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2025 Product Selection Guide

Photo by Jeffrey Cheng

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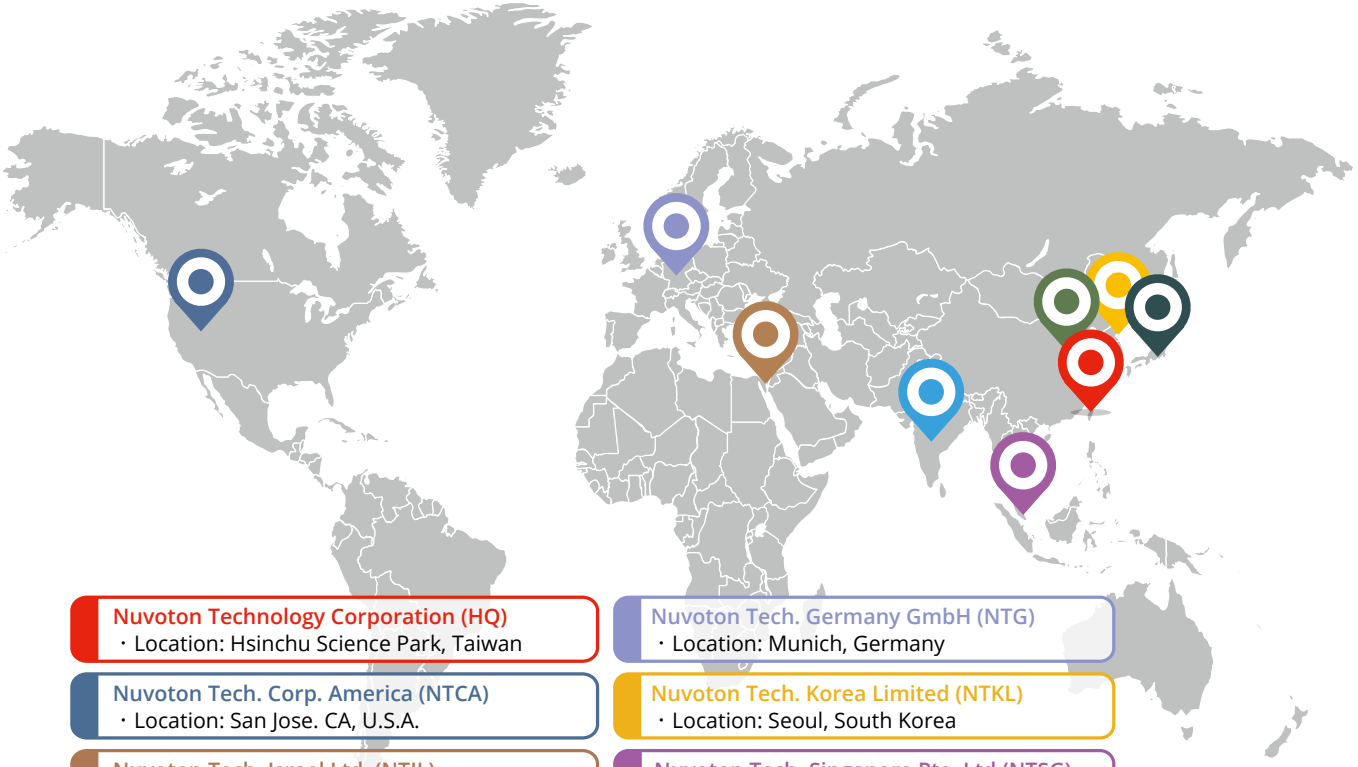
新唐科技

Nuvoton Technology Corporation (Nuvoton) was founded to bring innovative semiconductor solutions to the market. Nuvoton was spun-off as a Winbond Electronics affiliate in July 2008 and went public in September 2010 on the Taiwan Stock Exchange (TWSE). Nuvoton focuses on the developments of microcontroller/audio, cloud security, battery monitoring, component, visual sensing and IoT with security ICs and has strong market share in Industrial, Automotive, Communication, Consumer and Computer markets. Nuvoton owns 6-inch wafer fabs equipped with diversified processing technologies to provide professional wafer foundry services. Nuvoton provides products with a high performance/cost ratio for its customers by leveraging flexible technology, advanced design capability, and integration of digital and analog technologies. Nuvoton values long term relationships with its partners and customers and is dedicated to continuous innovation of its products, processes, and services. Nuvoton has established subsidiaries in the USA, China, Israel, India, Singapore, Korea, Japan and Germany to strengthen regional customer support and global management. For more information, please visit https://www.nuvoton.com



Nuvoton Technology Corporation (HQ)
・Location: Hsinchu Science Park, Taiwan

Nuvoton Tech. Germany GmbH (NTG)
・Location: Munich, Germany

Nuvoton Tech. Corp. America (NTCA)
・Location: San Jose. CA, U.S.A.

Nuvoton Tech. Korea Limited (NTKL)
・Location: Seoul, South Korea

Nuvoton Tech. Israel Ltd. (NTIL)
・Location: Herzliya, Israel

Nuvoton Tech. Singapore Pte. Ltd (NTSG)
・Location: Singapore

Nuvoton Technology Corporation Japan (NTCJ)
・Location: Japan

Nuvoton Tech. India Private Limited (NTIPL)
・Location: Bangalore, Karnataka, India

Nuvoton Elect. Tech. (NTSH) / Nuvoton Elect. Tech. (NTSZ) / Nuvoton Elect. Tech. (NTHK) / Nuvoton Elect. Tech. (NTNJ)
・Location: Shanghai / Shenzhen / Hong Kong / Nanjing

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Microcontrollers

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NuMicro® Product Selection Guide

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Smart Home

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NuMotor MCU
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Nuvoton – Leading Microcontroller Platform Provider

Nuvoton provides a comprehensive ecosystem from product selection and development to mass production to shorten our partner's design cycles and accelerate time-to-market.

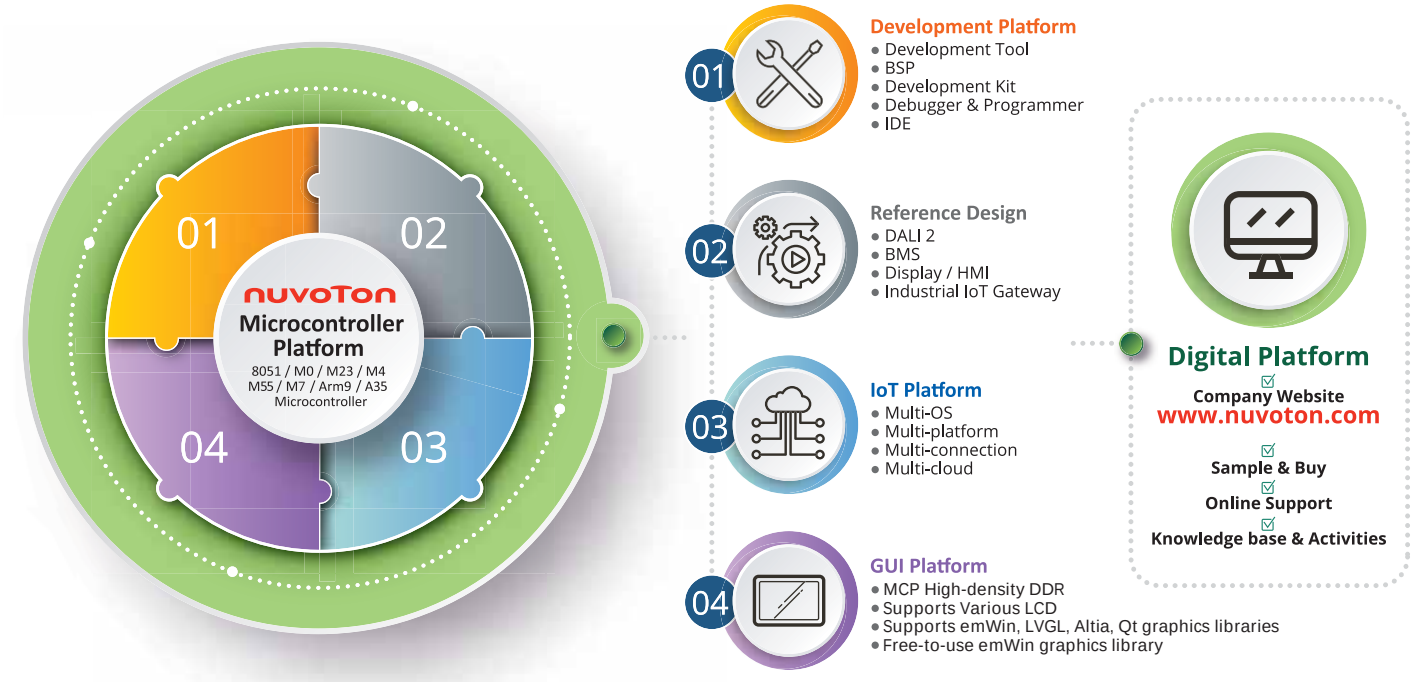
From the core of the NuMicro ecosystem, Nuvoton provides a rich product portfolio from 8051, Arm® Cortex-M0/ M23/ M4/ M55/ M7, and Arm9 to Cortex-A35-based microcontrollers, offering over 600 parts for selection.

To provide an easy development experience, Nuvoton builds a development platform with multiple IDEs, including Arm Keil, IAR Embedded Workbench, and NuEclipse. The development tools, BSPs, development kits, debuggers, and programmers are also included to boost project development.

Nuvoton offers rich reference designs and an integral IoT platform to realize innovative ideas in various fields. Customers could easily implement IoT projects with the Nuvoton low-power or IoT secure microcontroller on the Nuvoton IoT platform, which supports multi-OS with multi-platform and is available for multi-connection to multi-cloud.

As a microcontroller platform provider, Nuvoton has been devoted to supporting our customers worldwide with our digital platform. Nuvoton's digital platform can meet various needs including but not limited to product selection, product resources, product purchasing, sales/ technical support, and knowledge-based learning.

NuMicro® Ecosystem



Microcontroller Platform

Cortex® M55
Machince Learning
Endpoint AI
Security

Cortex® A35
Industrial Control & HMI
Machine Learning
Edge Gateway
New Energy
AIoT

Cortex® M7
Motor & Power Control

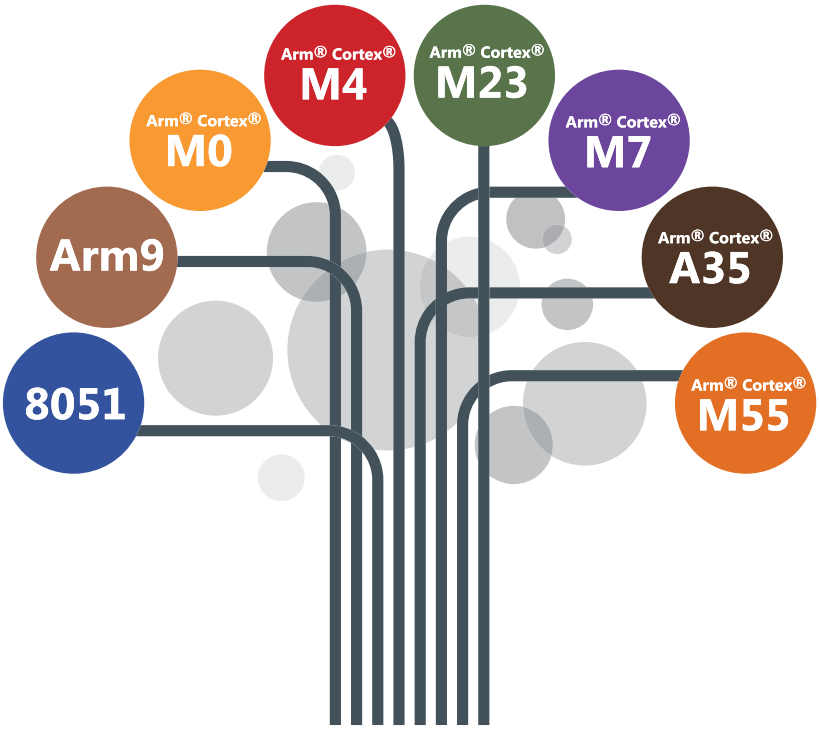
Cortex® M23
IoT Security
Low Power

Cortex® M4
High Performance
Security
IoT
Audio Enhancement & HMI

Cortex® M0
Comprehensive Platform
Industrial Control
Automotive
Interactive Learning

Arm 9™
Industrial Control
HMI
IoT

8051
Low Power
Industrial Control



Operating Frequency	8051	Cortex®-M0	Cortex®-M23	Cortex®-M4	Cortex®-M55	Cortex®-M7	MPU
800 MHz							Cortex®-A35: MA35D1 V E CF L U; MA35D0 E CF L U; MA35H0 V E CF L U
650 MHz							
300 MHz							
192 MHz		NUC1261 U	M2354 L U	ISD94100 A U	M55M1 N E CF U	KM1M7AF CF P	Arm9™: NUC980 E C U; NUC970 E C L U; N9H V E C L U; N329 V E L U
120 MHz		NUC126 U; M091; M031G; M029G/M030G; M032 U; M031	M2L31 T CF U; M2A23 CF; M2351 U; NUC1263 U; NUC1262 U	M460 E CF U; M480 E C U; M433 C U; M471 U; KM1M4BF M; M453 C; M452 U; M451	M5531 E CF U	KM1M7BF M; KM1M7CF CF P	
72 MHz		NUC029 U; NUC230 C; NUC131U C; NUC1311 C; ISD9160 A; ISD91500 A; ISD91200 A; N574 A T; N572 U A T; N570 A T; M0A23 C; M071; M051; Mini51; Nano100	M263 C U; M262 U; M261; M258 T L U; M256 T L; M254 L; M253 CF U; M252 U; M251; M2003				
64 MHz							
24 MHz	ML56 T L; ML54 L; ML51; MG51; MS51; N76E						
7 MHz	MUG51						

Over 1200 parts ready for selection

Operating Voltage: 1.8 1.8V; 3.3 3.3V; 5 5V

Feature: A Audio; E Ethernet; V Video Code; U USB; L LCD; N NPU; C CAN; T Touch Key; M Motor; CF CAN FD; BT Bluetooth; P Power; AEC-Q100; Low Power; TrustZone

Key Feature Selection: **Automotive Microcontroller**

The NuMicro® automotive microcontrollers pass the AEC-Q100 standards and are suitable for auto-mo-tive applications. Nuvoton automotive microcontrollers are embedded with Cortex-M0 and Cortex-M4, up to 4 sets of CAN FD. The operating frequency ranges from 48 to 200 MHz, and the Flash size ranges from 32 to 2.5 Mbytes.

NuMicro® automotive microcontroller provides a comprehensive system solution with high perfor-mance and high reliability for ECU , Body Control, ADAS, and Automotive Lighting.

Multiple IDEs are supported, including the free-to-use Keil MDK Nuvoton Edition, IAR EWARM, and NuEclipse.

	M0A23	NUC131	M2A23	NUC230/ NUC240	M253	M453	M483	M487	M463	M467
Core	Cortex-M0	Cortex-M0	Cortex-M23	Cortex-M0	Cortex-M23	Cortex-M4	Cortex-M4	Cortex-M4	Cortex-M4	Cortex-M4
Speed (MHz)	48	50	72	50	48	72	192	192	200	200
Flash (Kbytes)	32	68	256	128	128	256	256	2560	256	1024
LIN	2	3	1	3	2	2	2	2	2	2
CAN/CAN FD	1/-	1/-	-/3	2/-	-/1	1/-	3/-	2/-	-/2	-/4
Operating Temperature (℃)	-40 ~ +125	-40 ~ +105	-40 ~ +125	-40 ~ +105	-40 ~ +105	-40 ~ +105	-40 ~ +105	-40 ~ +105	-40 ~ +125	-40 ~ +105
AEC-Q100	✓	✓	✓	-	-	-	-	-	-	-

Key Feature Selection: **Industrial Control Microcontroller**

Nuvoton Technology is a leading microcontroller provider in industrial control industry. With the high quality and longevity, Nuvoton is an indispensable partner of industrial control customers.

- Longevity :
  Full commitment to ensuring supply continuity and stability for as long as 10 years.
- High manufacturing quality :
  NuMicro products are made by tier-one foundry, package, and testing partners to achieve the high and stable product quality.
- Extended operating temperature grades :
  from -40 to 105°C for all new microcontroller product and -40 to +85°C for all new MPU product.
- **IEC 60730 Class B Certified Software Test Library (STL) supported**

Cortex-A35 Family
Core Speed: up to 800 MHz
ESD (HBM) : up to 2 kV

Arm9 Family
Core Speed: up to 300 MHz
ESD (HBM) : up to 4 kV / EFT : up to 4.4 kV

Cortex-M55 Family
Core Speed: up to 220MHz
ESD (HBM): up to 3kV / EFT: up to 4.4 kV

Cortex-M4 Family
Core Speed: up to 200 MHz
ESD (HBM) : up to 8 kV / EFT : up to 4.4 kV

Cortex-M23 Family
Core Speed: up to 96 MHz
ESD (HBM) : up to 7 kV / EFT : up to 4.4 kV

Cortex-M0 Family
Core Speed: up to 72 MHz
ESD (HBM) : up to 8 kV / EFT : up to 4.4 kV

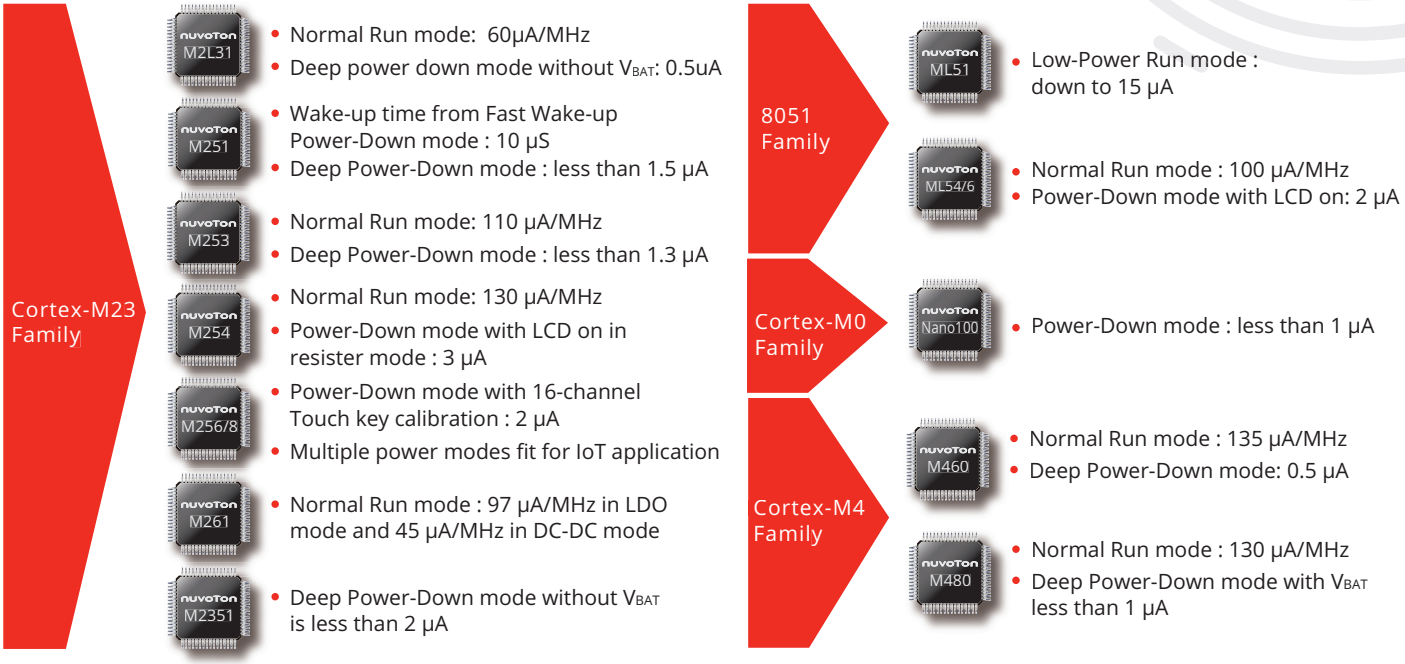
8051 Family
Core Speed: up to 24 MHz
ESD (HBM) : up to 8 kV / EFT : up to 4.4 kV

Industrial Control Field	NuMicro Series Recommendation
 Battery Management System	[A35] MA35D1/MA35D0 (Data Collector)/ MA35H0 (HMI) [Arm9] NUC980 (Data Collector) [M4] M433/M483 (Energy Storage System) [M23] M253/M2L31/M2A23(E-Scooter BMS), M2003(Power Tool) [M0] M0A23 (E-bike BMS) [8051] MG51/MS51/ ML51 (Power Tools)
 LED Lightening	[Arm9] NUC980 (Large LED Advertising Display) [M4] M463/M433 (Mini LED Local Dimming Control) [M23] NUC1262/NUC1263 (ARGB LED), M2003(LED Control Module) [M0] NDA102 (DALI) [8051] MG51/MS51 (LED Control Module)
 Industrial Connectivity	[A35] MA35D1/MA35D0 (Ethernet 10/100/1000, CAN FD) [Arm9] NUC980 (Ethernet 10/100, CAN) [M55] M5531 (Ethernet 10/100, CAN FD) [M4] M467 (Ethernet 10/100, CAN FD), M487 (Ethernet 10/100, CAN), M433 (CAN), M471(WLCSP100) [M23] M2351/M2354 (Trustzone, CAN), M2L31/ M253 / M2A23 (CAN FD), M2003 (UART) [M0] M0A23 (CAN) [8051] MG51/MS51 (UART)
 Industrial Automation	[A35] MA35D1/MA35D0 (Industrial Switch) [Arm9] NUC980 (Industrial Switch) [M55] M55 (PLC Protocol Converter) [M4] M480/M460/M433 (Sensor Fusion, Motor Control) [M23] M2L31/M2003 (Sensor Module), M2A23 (CAN FD Converter) [M0] M0A23 (CAN Converter), M032/M031 (Sensor module) [8051] MG51/ MS51/ ML51 (Sensor Module) [OPA] NOP912/NOP914 (BLDC Motor Control)
 Grid Infrastructure	[A35] MA35D1/MA35D0/MA35H0 (Charging Pile) [Arm9] NUC980 (Concentrator) [M55] M5531 (Charging Pile) [M4] M467 (Charging Pile), M463/M480 (Smart Circuit Breaker) [M23] M2351/ M2354 (AMI 2.0 Smart Meter), M2L31/ M253 (USB to UART Converter) [8051] MG51/MS51 (Circuit Breaker) [ADC] NADC24 (Precision ADC)
 Smart Building	[A35] MA35D1/MA35D0 (Edge Gateway)/ MA35H0 (HMI) [Arm9] NUC980 (Fire Alarm Controller) [M55] M5531 (Thermostat) [M4] M467 (Fire Alarm Controller, Thermostat) [M23] M254/ M256/ M258 (Thermostat), M2351/ M2354 (Smart Speaker) [M0] M0A23 (Elevator) [8051] ML51 (Smoke Detector), ML54/ML56 (Thermostat)
 5V MCU	[M4] M451/ M471 [M23] M251/ M253/ M254/ M256/ M258/ M2003/ M2A23 [M0] M0A23/ M071/ NUC131/ NUC230/ NUC029 [8051] MG51/ MS51/ ML51/ MUG51

Key Feature Selection: **Low Power Microcontroller**

Power consumption is a significant factor for microcontroller selection especially in a battery-powered application as IoT devices. In addition to considering the power consumption in different power modes, the wake-up time is also vital for the application in power mode switching.

Nuvoton devotes to offer the low-power microcontroller solutions with robust security for various application scenarios. The ML51 series has exclusive low-power run mode with less than 15 µA; the ML54/ML56 series has exclusive power down current with less than 2 µA with LCD panel display on; the Power-Down mode of Nano100 series is less than 1 µA; the wake-up time from Fast Wake-up Power-Down mode of M251 series is 10 µS; the M254/M256/M258 series consume less than 2 µA while finishing all touch keys scanning; the Deep Power-Down mode of M251 is less than 1.5 µA and less than 1 µA of M480 Series. Furthermore, there are additional DC-DC mode for M261 and M2351 series to halve the power consumption in LDO mode.



Low-power Application	NuMicro Series Recommendation									
	ML51	ML54/ ML56	Nano100	M251	M253	M254/ M256/M258	M261/ M2351	M2L31	M480	M463/ M467
Core	8051	8051	Cortex-M0	Cortex-M23	Cortex-M23	Cortex-M23	Cortex-M23	Cortex-M23	Cortex-M4	Cortex-M4
Speed (MHz)	24	24	32 - 42	48	48	48	64	72	192	200
Flash (Kbytes)	16 - 64	64	16 - 128	32 - 256	128	64-256	512	64 - 512	2560	1024
Smoke Sensor	○	○	△	△	△			○		
Glucose Meter	△		○	○	○	○	○	○		
GPS Tracker	△	○	○	○	○	○		○		
Handheld Meter	△		○	○	○	○	○	○	○	○
Wireless Keyboard/ Mouse	△		○	○	○	○		○		
Smart Lock	○	○	○	○	○	○	○	○	○	○
Oximeter		○	○	○	○	○		○		

○ : Function could be fully satisfied △ : Basic function

Key Feature Selection: **Optical Transceiver Microcontroller**

Nuvoton serves a total solution of Optical Transceiver from Datacom to Telecom, or even from current optical transmission scenarios to new WDM (Wavelength Division Multiplexing) scenarios in 5G Fronthaul.

All of NuMicro M029G/ M030G/ M031G series have a built-in temperature sensor, package selections of small size including QFN24 and QFN33, and 2 sets of strong I²C, which fully meet the requirement of traditional Optical Transceiver Module applications: (1) precise temperature measurement, (2) small form factor and (3) an I²C interface for communication. Moreover, to implement the Pilot Tone Modulation in WDM for OAM (Operation Administration and Maintenance) data transmission, NuMicro M031G series is also equipped with a Hardware Manchester Codec with CRC and 1 set of DAC supporting “Auto Data Generation” function.

- Hardware Manchester Codec* with CRC :
  to encode and decode the low-frequency dither signal
- DAC with Auto Data Generation Function* :
  to generate the smooth sine waveform up to 500 kHz 32 points for the output of Pilot Tone Modulation
- Accurate Temp. Sensor :
  with ±1.6°C deviation from 0 °C to 70 °C and ± 2 °C deviation from - 40 °C to 105°C
- Small Package :
  QFN24 3x3 mm / QFN33 4x4 mm
- Strong I²C :
  supports 400 kHz(M029G) or 1 MHz(M030G/M031G) Slave mode and non-stretch mode

*Only for M031G

For high speed optical transceiver, Nuvoton provides the choices of M471 and M485 series.
The two MCU series are based on Cortex-M4 core, and provides the benefit of:

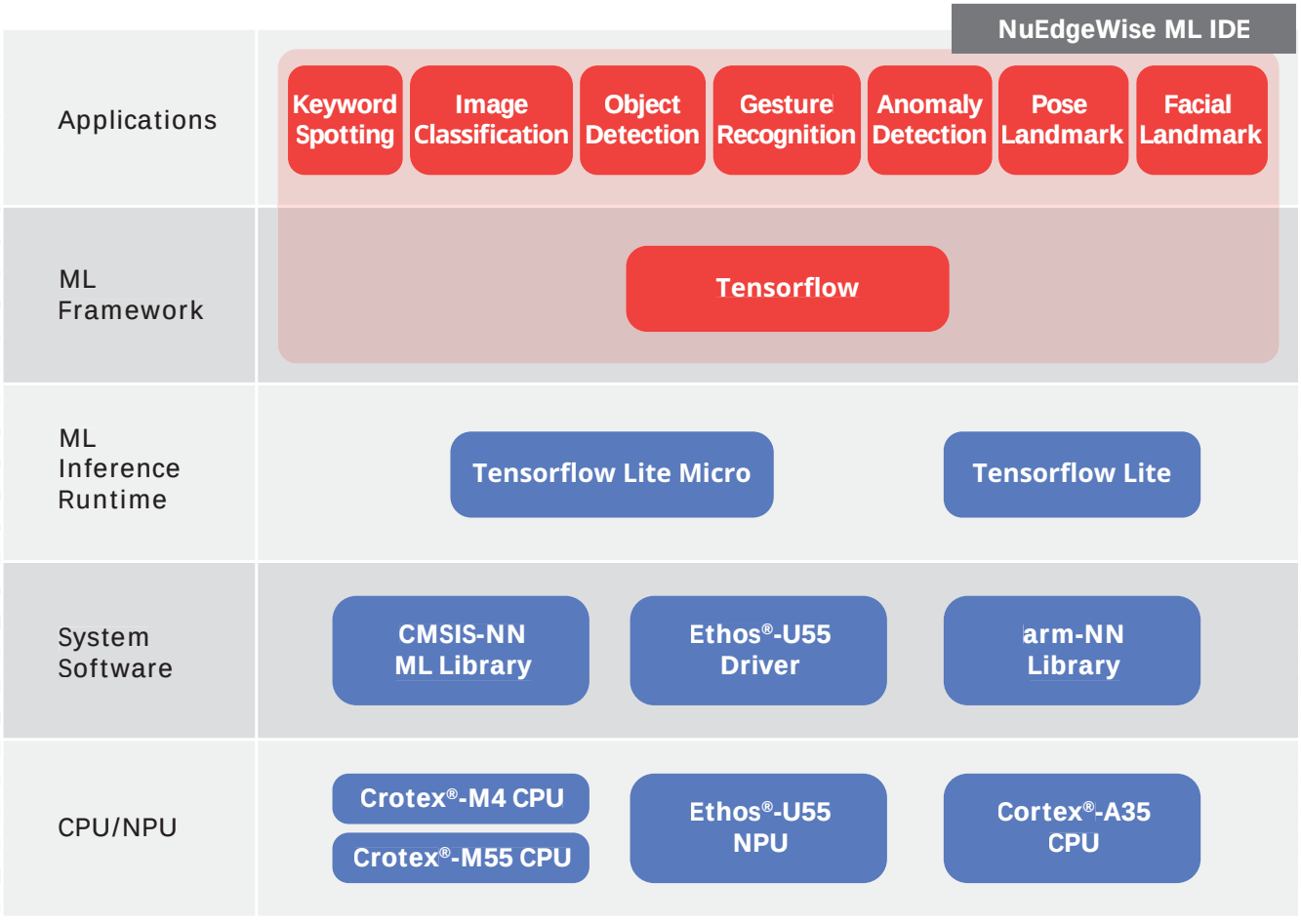
- Small package QFN48 5x5mm and WLCSP100 4.5x4.5mm
- Flash memory in dual bank structure for OTA
- Multiple ADC channel
- Strong I²C, up to 3.4 MHz

Optical Transceiver Application	NuMicro Series Recommendation									
	M029G	M030G			M031G				M471CI8AE	M485YIDAE
Core	Cortex-M0	Cortex-M0			Cortex-M0				Cortex-M4	Cortex-M4
Operating Frequency (MHz)	48	48			72				120	192
Flash (Kbytes)	32	32	64		32	64			512 (dual bank)	512 (dual bank)
SRAM (Kbytes)	2	4			8				64	160
Hardware Manchester Codec	-	-	-		✓	✓			-	-
DAC with Auto Data Generation	-	-	-		✓	✓			-	-
ADC	11	11/16	11/16		11/16	11/16			24	16
Temperature Sensor	✓	✓	✓		✓	✓			✓	✓
Package	QFN24	QFN24	QFN33	QFN24	QFN33	QFN24	QFN24	QFN33	QFN33	WLCSP100	QFN48
Scenario	General Purpose (Entry & Middle Speed)				Pilot Tone Modulation General Purpose (Middle Speed)				General Purpose (High Speed)	

NuMicro® Ecosystem – AI and Machine Learning Platform

The era of AI technology has arrived, and embedded systems products must now integrate AI features to meet user expectations. NuMicro supports this transition by equipping its advanced microcontrollers and microprocessors with AI and machine learning capabilities through a comprehensive software ecosystem. In the realm of MCU-based AI applications, combining sensors with machine learning models enables real-time recognition and decision-making across various fields such as machine vision, speech recognition, and smart sensing. NuMicro's M467 series MCU, M55M1 series MCU, and MA35D1 series MPU support running trained machine learning models for real-time inference. The primary software tool for this is NuEdgeWise, which offers a range of pretrained models and facilitates the entire ML development process—from data collection and preprocessing to model training, quantization, optimization, and performance verification.

Developers can use two methods to implement machine learning applications with NuMicro MCUs: Bring Your Own Data (BYOD) and Bring Your Own Model (BYOM). BYOD leverages NuEdgeWise's examples and pretrained models, allowing developers to retrain the model with data collected from their specific scenarios. BYOM allows developers to deploy and run their custom-trained models by leveraging the specific machine learning runtime, machine learning libraries, and NPU drivers.



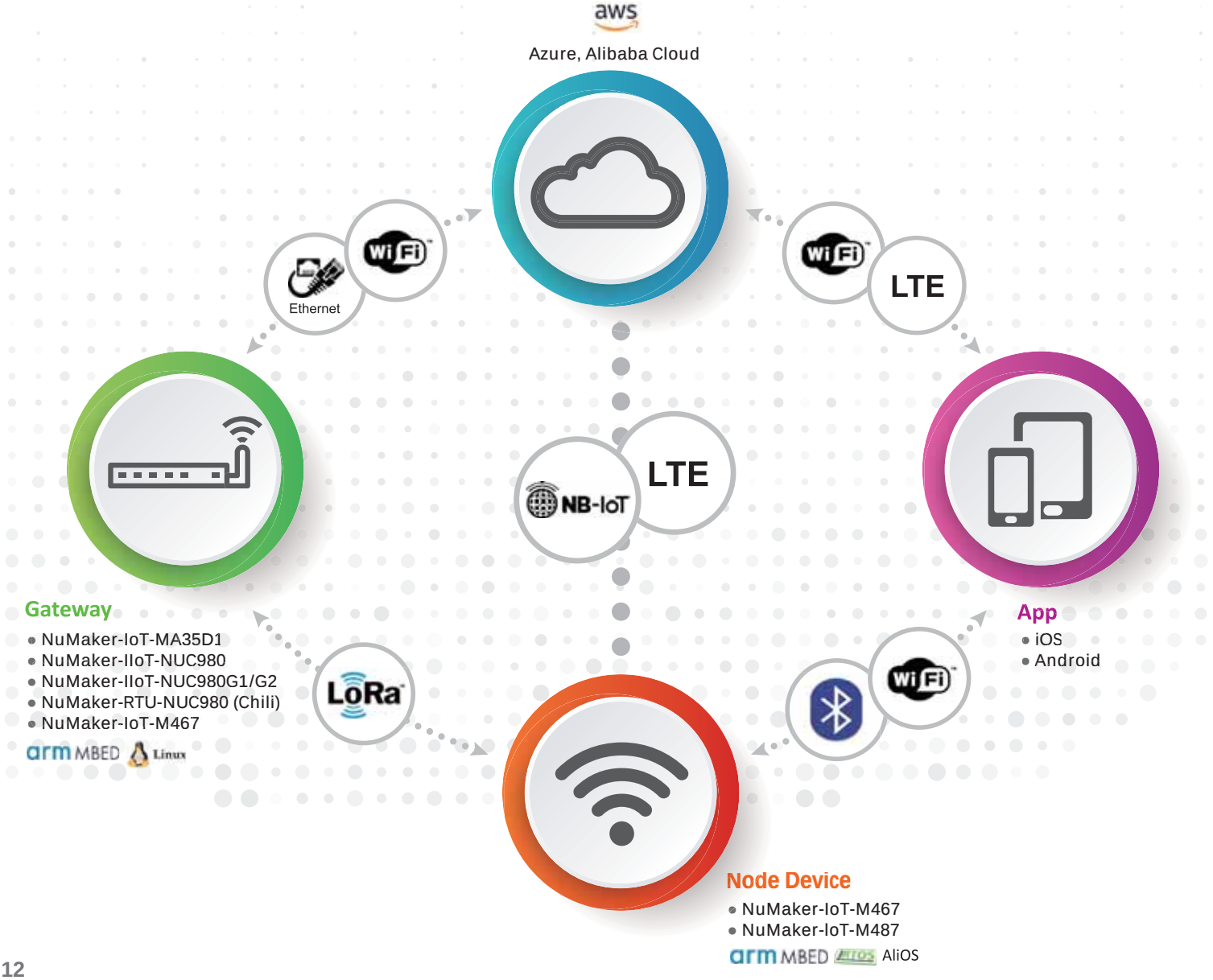
IoT Platform

Supports multi-OS with multi-platform; Provides multi-connection to multi-cloud.

Nuvoton offers a comprehensive IoT platform, which supports multi-OS with multi-platform and provides multi-connection to multi-cloud. The NuMaker-IoT-M467 and NuMaker-IoT-M487 are excellent for being a node device with sensor and connectivity. Besides, the NuMaker-IoT-MA35D1, NuMaker-IIoT-NUC980, NuMaker-IIoT-NUC980G1/G2, NuMaker-RTU-NUC980(Chili) and NuMaker-IoT-M467 are fit for being a gate-way.

Nuvoton links all aspects of the IoT platform to facilitate IoT innovation. NuMicro IoT platform supports Linux, Arm Mbed OS, Amazon FreeRTOS, AliOS Things and RT-thread RTOS on selected NuMaker platform with embedded crypto accelerators to boost communication performance and strengthen connectivity security. Besides, the NuMaker platform can connect to various cloud services, such as Amazon Web Service (AWS), Alibaba Cloud and Microsoft Azure via various connectivity options including Ethernet, Wi-Fi, NB-IoT, and LTE.

Welcome to download the Nuvoton IoT resource reference file (https://www.nuvoton.com/iot_startup). The content includes rich information, such as development resource, quick-start examples, application tutorial videos, etc.



NuMaker Board	OS / RTOS	IP Connectivity					Non-IP Connectivity	Clouds		
		Ethernet	Wi-Fi	NB-IoT CAT-M1 Quectel BG96A	NB-IoT SIMCOM 7020E	LTE Quectel EC21A	LoRa Device SX1276	Amazon AWS	Alibaba Cloud	Microsoft Azure
NuMaker-IoT-MA35D1	Linux	●	●	●		●		●	●	
	RT-Thread	●							●	●
NuMaker-IIoT-NUC980G1 NuMaker-IIoT-NUC980G2	Linux	●	●	●		●		●	●	
	FreeRTOS	●								
	RT-Thread	●							●	●
NuMaker-RTU-NUC980(Chili)	Linux	●	●	●		●		●	●	
	FreeRTOS	●								
	RT-Thread	●							●	●
NuMaker-IoT-M467	MbedOS	●	●	●	●	●		●	●	●
	Amazon FreeRTOS		●					●		
	RT-Thread	●	●						●	●
NuMaker-IoT-M487	MbedOS	●	●	●	●	●		●	●	●
	Amazon FreeRTOS	●	●	●				●		
	AliOS Things	●	●						●	
	RT-Thread	●	●						●	●
NuMaker-LoRaD-M252	MbedOS/Non-OS*2						●*1			

*1 US915/EU868/CN470 Bands *2 Non-OS is NuLoRaNode

IoT Security Platform

To strengthen the security of MCUs and MPUs with software execution security, storage security, and connectivity security, Nuvoton has been developing a series of hardware and software mixture technologies to achieve the security targets of NuMicro® Family products, which covers:

- All data assets in the microcontroller are well identified and protected.
- All potential security threats while the microcontroller firmware is running are well addressed.
- All potential security vulnerabilities of the microcontroller, both in hardware and software, are well avoided.

Nuvoton has dedicated to enhancing the security of microcontrollers, the NuMicro® M2351 series is the first Arm® Cortex®-M23 based MCUs that has been both PSA Certified™ Level 1 (Feb. 2019), Level 2 (Jul. 2020) and PSA Functional API Certified (Feb. 2019).

The M2354 Series is based on M2351 Series' security fondation with enhancement on Side-Channel Attack mitigation of cryptographic hardware and physical secuirty of secure key storage.

Furthermore, M2354 Series , M480 Series and M460 Series elaborate comprehensively supporting for FreeRTOS, RT-Thread and Mbed OS 6.x for easy implementation of an IoT Device and its connection to varied clod services.

The MA35D1 Series introduces Trusted Secure Island (TSI) as a secure subsystem of microprocessors, contributing information security assurance for a range of embedded and IoT applications.

Targeted Applications : Smart Home, Smart City, Smart Building, Smart Transportation, Smart Agriculture, Smart Metering, Environment Surveillance (CCTV), Mobile POS, IoT Node Devices, IoT Gateways.

Security Technology	Item	NuMicro Series Recommendation					
		M261	M2351	M2354	M480	M460	MA35D1
Secure Boot ROM	Secure Bootloader (based on ECDSA signature)	✓	✓	✓	✓	✓	✓
	Secure Frmware Update (FOTA)	✓	✓	✓			✓
	Driver APIs	✓	✓	✓	✓	✓	
	Debug Authentication (temporarily unlock)		✓	✓			✓
Security Reference Code / Lib /Tool	TrustZone reference code		✓	✓			✓
	Key Generation Tool	✓	✓	✓		✓	✓
	Firmware Image Signing Tool	✓	✓	✓		✓	✓
	Key/Certificate provisioning service	✓	✓	✓			
Isolation	Peripheral privileged mode		✓	✓			✓
	TrustZone partition for Cortex-M		✓	✓			✓
Flash Memory Protection	Flash Lock (read protection)	✓	✓	✓	✓	✓	
	eXecute Only Memory	✓	✓	✓	✓	✓	✓
	Dual Bank (with bank remapping)	✓	✓	✓		✓	
	Flash Write Protection	✓	✓	✓	✓		
Crypto Processors	DES/3DES	✓	✓				✓
	AES-256	✓	✓	✓	✓	✓	✓
	AES with CCM, GCM and GMAC modes			✓		✓	✓
	ECC (key generation, ECDH-ECDSA)	✓	✓	✓	✓	✓	✓
	RSA-4096			✓		✓	✓
	Side Channel Attacks mitigation of AES, RSA, ECC			✓			
	SHA1/SHA2-384	✓	✓	✓	✓	✓	✓
	SHA2-512, HMAC-512			✓	✓	✓	✓
	SM2/3/4 (Chinese national cryptography standard)			✓			✓
	TRNG + PRNG	✓	✓	✓	✓	✓	✓
	Cryptographic KeyStore (secure key storage)			✓		✓	
Device Identity	Unique ID	✓	✓	✓	✓	✓	
	Customer Unique ID	✓	✓	✓	✓	✓	
Anti-Tamper	Tamper Pin Detection	✓	✓	✓	✓	✓	
	RTC backup registers	✓	✓	✓	✓	✓	
Environment Sensor	Temperature sensor	✓	✓	✓	✓	✓	
	Clock monitor	✓	✓	✓	✓	✓	
	Voltage glitch detection			✓			
Platform Security	Booting Status Monitor		✓	✓			
	Life Cycle Management		✓	✓			
	Firmware Version Counter		✓	✓			
	Debug Port Management (DPM)		✓	✓			

Audio Platform

Audio Microcontroller Cortex®-M0 Series

ISD91000 series is a 32-bit Arm® Cortex®-M0 based Audio SoCs provide powerful and cost-effective single-chip MCU solution for voice/audio feature applications.

In addition to built-in flash and SRAM memory, Audio SoCs have a variety of MCU functions, audio features and control interfaces - GPIO, PDMA, RTC , SAR ADC, PWM, UART, SPI, I²C.
Running up to 49 MHz, Arm Cortex-M0 Series support compact version of voice recognition engine for low-cost voice control applications.

- ISD91500 series MCU: Mono 16-bit Sigma-Delta ADC with 90dB SNR, 8-48kHz sample rate; Stereo 24-bit DAC with headphone driver which provided 20 mW per channel drive capability. Support USB 1.1 FS Device (Compatible with 2.0).
- ISD9100 series MCU: Mono 16-bit Sigma-Delta ADC with 92 dB SNR; Mono audio differential amplifier with 1 W drive capability into 8 ohm load.
- ISD91200 series MCU: Mono 16-bit Sigma-Delta ADC; Mono audio differential amplifier with 0.5 W drive capability into 8 ohm load. High resolution 24-bit bridge sense ADC (ISD91200B series only).

Flash Memory/ SRAM(kbytes)	Package QFN48	Package LQFP64
64 / 20	ISD91535AQI	ISD91535ADI
64 / 12	ISD91530AQI	ISD91530ADI

Flash Memory/ SRAM(kbytes)	Package QFN33	Package LQFP48
145 / 12	ISD9160YI	ISD9160FI
68 / 12	ISD9130YI	ISD9130FI

Flash Memory/ SRAM(kbytes)	Package QFN32	Package LQFP64
128 / 12	ISD91260YI	ISD91260RI
64 / 12	ISD92130YI	ISD92130RI

Audio Microcontroller Cortex®-M4 Series

ISD94100 series is a 32-bit microcontroller embedded Arm® Cortex®-M4F with DSP extensions and Floating Point Unit which can run up to 200 MHz.

It provides up to 512 KB of flash memory and up to 192 KB of SRAM.

ISD94100 series also has a variety of peripheral devices, such as multi-function timers, watchdog timers, RTC, PDMA, UART, SPI, I²C, PWM, GPIO, 12-bit ADC, USB1.1 device and equipped with an outstanding AI based noise reduction and echo cancellation which is an ideal algorithm for intercom communication device.

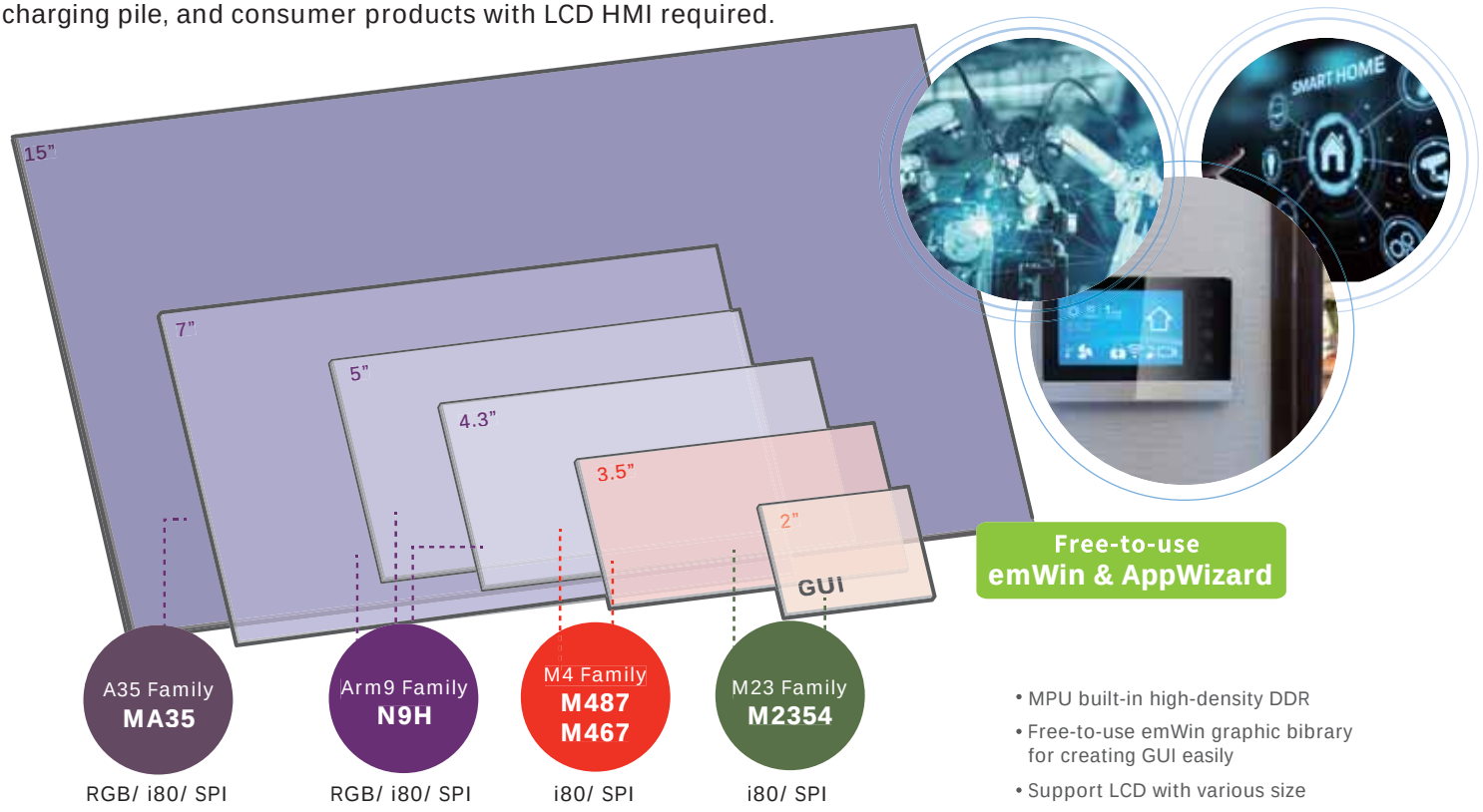
Flash Memory/ SRAM(kbytes)	Package QFN48 6x6mm Pitch 0.4mm	Package LQFP64 7x7mm Pitch 0.4mm
512 / 192	ISD94124AYI	ISD94124ADI
512 / 128	ISD94123AYI	ISD94123ADI
256 / 128	ISD94113AYI	ISD94113ADI

GUI Platform

Nuvoton provides rich GUI platform resources, the platforms support SEGGER emWin, LVGL, and Qt graphic libraries that help users create modern GUIs. In addition, we provide the powerful PC GUI tool SEGGER AppWizard for composing embedded GUI. It is easy to use, significantly saves development time, and is use-in-free for your HMI product.

Nuvoton MPUs built-in high-capacity DDR reduces circuit design difficulty and manufacturing cost.
Support mono, gray, and color OLED and LCD modules, resolution up to 1920 x 1080 in 16M colors. Moreover, the MPUs integrate 2D graphic accelerator, H.264, and JPEG codec to speed up graphics processing and improve users' experience of HMI applications.
Users can choose bare metal (non-OS), RTOS, or Linux to be the OS according to application requirements.

Nuvoton GUI platforms are suitable in industrial control, smart building, smart appliance, medical device, charging pile, and consumer products with LCD HMI required.



- MPU built-in high-density DDR
- Free-to-use emWin graphic bibrary for creating GUI easily
- Support LCD with various size

Product Series	CPU Core (MHz)	SRAM Size	Flash Size	LCD Resolution & Interface	Hardware Accelerator For Graphics	EVB P/N	EVB LCD Size & Resolution
MA35D1	Dual Cortex-A35 800 MHz	MCP DDR 128/256/512 MB	External	1920x1080 RGB/ SPI/ i80	2D GFx JPEG decoder H.264 decoder	NuMaker-HMI-MA35D1-S1	7" (1024x600)
MA35H0	Dual Cortex-A35 650 MHz	MCP DDR 128 MB	External	1280x800 RGB/ SPI/ i80	2D GFx H.264 Decoder JPEG Decoder	NuMaker-HMI-MA35H0-A1 NuMaker-HMI-MA35H0-A2	7" (1024x600)
N9H31	Arm9 300 MHz	MCP DDR 32 MB	External	1024x768 RGB/ SPI/ i80	2D GFx JPEG Codec	NuMaker-HMI-N9H31-A1 NuMaker-HMI-N9H31-A2	7" (800x480)
N9H30	Arm9 300 MHz	MCP DDR 64/128 MB	External	1024x768 RGB/ SPI/ i80	2D GFx JPEG Codec	NuMaker-HMI-N9H30	7" (800x480)
N9H26	Arm9 240 MHz	MCP DDR 64 MB	External	1024x768 RGB/ SPI/ i80	2D GFx JPEG Codec H.264 Codec	NuMaker-HMI-N9H26	5" (800x480)
N9H20	Arm9 200MHz	MCP DDR 2/8/32 MB	External	1024x768 RGB/ SPI/ i80	2D GFx JPEG Codec	NuMaker-HMI-N9H20	4.3" (480x272)
M460	Cortex-M4 200 MHz	512 KB	1024 KB	480x272 SPI/ i80	N/A	NuMaker-HMI-M467	4.3" (480x272)
M480	Cortex-M4 192 MHz	160 KB	512 KB	480x272 SPI/ i80	N/A	NuMaker-HMI-M487	3.2" (320x240)
M2354	Cortex-M23 96 MHz	256 KB	1024 KB	320x240 SPI/ i80	N/A	NuMaker-HMI-M2354	2.4" (320x240)

Smart Home Appliance Platform

- As the purist for quality of life continues, Smart Home Appliances have become essential for homes. Nuvoton microcontrollers integrate demands for Smart Home Appliances system. Critical features include: 1.8V to 5.5V operating voltage, packages with more than 0.5 mm wide pin pitch, a software library of self-test, and functional safety for IEC-60730 Class B. Robust anti-interference protection circuits of Electrostatic discharge (ESD) and Electrical fast transients (EFT) are also provided. Nuvoton microcontrollers support firmware update on the air (FOTA) by using the dual bank flash memory or in system programming (ISP) with loader ROM(LDROM). Nuvoton's human machine interface (HMI) microcontrollers incorporate high immunity features. The touch-key with waterproof and noise immunity can support 2 mm depth water droplet. The LCD charging pump patent can maintain the operating voltage and keep the display clear even when the voltage is insufficient.

- Nuvoton provides a rich product portfolio for Smart Home Appliances, including MG51, MS51 and ML51series based on 8051; M071, M032 series based on Cortex®-M0; M2003, M251/ M252, M254/ M256/ M258 and M2354 series based on Cortex®-M23; M471, M480 and M460 series based on Cortex®-M4; N9H series based on Arm9; and MA35D1 based on Cortex®-A35 and Cortex-M4. All products offer long-term supply guarantee.

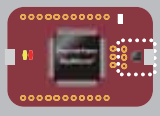
- Nuvoton microcontrollers provide rich-function features to meet various applications.
  - Main control: MG51, MS51, ML51, M2003, M251/ M252, M071 and M471 series
  - Display with COM/SEG LCD: ML54 and M254 series
  - Display with TFT LCD: M032, M2354, M480, M460, N9H and MA35D1 series
  - Touch-key with COM/SEG LCD: ML56 and M256/ M258 series
  - Wireless with consumer infrared receiver: M471 series

- Target applications: Smart Small Appliances, White Goods, Health Care Appliances, Smart Homes.

Home Appliance		MG51/ MS51/ ML51	M2003	M251/ M252	M071	M471	ML54/ ML56	M254/ M256/ M258	M032	M2354	M480	M460	N9H	MA35D1
Application		Main Control	Main Control	Main Control	Main Control	Main Control	Display + Touch	Display + Touch	Display	Display	Display	Display	Display	Display
Core		8051-1T	Cortex-M23	Cortex-M23	Cortex-M0	Cortex-M4	8051-1T	Cortex-M23	Cortex-M0	Cortex-M23	Cortex-M4	Cortex-M4	Arm9	Dual Cortex-A35 + M4
Operating Frequency (MHz)		24	24	48	50 / 72	72 /120	24	48	72	96	192	200	200 / 240 / 300	800 MHz / 180 MHz
Flash (KB)		8 / 16 / 32 / 64	32	32 / 64 / 128 / 256	64 / 128 / 256	64 /128 / 256	64	64 / 128 / 256	512	1024	512	1024	External	External
SRAM (KB)		1 / 1.2 / 2 / 4	4	8 / 16 / 32	8/ 16 / 20	32 / 64	4	8 / 16 / 32	96	256	160	512	2 / 8 / 32 / 64 / 128MB	128 / 256 / 512MB
Operating Voltage (V)		2.5 ~ 5.5	2.4 ~ 5.5	1.8 ~ 5.5	2.5 ~ 5.5	2.5 ~ 5.5	1.8 ~ 3.6	1.75 ~ 5.5	1.8 ~ 3.6	1.7 ~ 3.6	1.8 ~ 3.6	1.7 ~ 3.6	3.0 ~ 3.6	3.0 ~ 3.6
IEC-60730 Class B STL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Display							COM/SEG LCD 8x28	COM/SEG LCD 8x44	TFTLCD 3.5" 320x240	TFTLCD 3.5" 320x240	TFTLCD 4.3" 320x240	TFTLCD 5" 480x272	TFTLCD 7" 1024x768	TFTLCD 15" 1920x1080
Touch-key							✓ 14	✓ 15 / 24						
Low Power		✓ (ML51)		✓			✓	✓		✓				
Infrared Receiver						✓								
Wide Pin Pitch	0.5mm Pin Pitch	✓		✓	✓	✓	✓				✓	✓		
	0.65mm Pin Pitch	✓	✓	✓										
	0.8mm Pin Pitch	✓			✓	✓	✓	✓						

NuDeveloper Ecosystem – Make Engineers' Jobs Easier

Nuvoton provides a comprehensive development platform to assist our customer to achieve rapid development, high-capacity mass production, and easy upgrade.



Evaluation Board (NuMaker)

- NuMaker Series
  - Comprehensive peripherals, rapid practice your idea.
  - Designed for general purpose development
  - On board debugger & programmer
- **Application Specific**

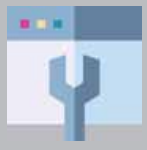
  Designed for DALI/IoT/ HMI/Touch key/COM/SEG LCD development.

Debugger & Programmer (Nu-Link)

- 1 to 1 Debugger & Programmer

  Nu-Link Series Debug Adapter is a USB debugger/programmer and can be applied to the development of NuMicro products. Besides, it supports off-line programming which can be triggered by a button.
- MP Programmer

  The Nu-Link-Gang Programmer is designed for mass-production in the customer site. With flexible programming option which can offline programming 4 chips simultaneously or individually, fit for automatic IC programing system.



Software Tool (NuTool)

- Programming Tool
  - ICP Tool
    Mass-production programming tool with code encryption, protect IP of customer.
  - ISP Tool
    Provides sample code for end-product firmware update.
  - Nu-Link Command
    Supports programming up to 16 target chips simultaneously.
- General Tool

  PinConfigure Tool
  To configure I/O with multi-functions and generate OrCAD library.

  PinView Tool
  A monitoring and visualization tool that can immediately show the current status of I/O pins.

  Clock Configure Tool
  Check the clock tree and generate the clock initiate code.
  - CodeGenerator Tool
    Code generating for NuMicro M031/M032/M251/NUC1262/M2003C projects with the initial peripheral, pin, and clock configurations.
- **Application Specific**
  - DALIController
    Supports monitoring and recording of DALI bus communication and send DALI commands.
  - LCDView
    Creates customized LCD panel and COM/SEG table and emulators real-time COM/SEG status.

  TouchView
  Supports adjusting parameters and calibrating touch key system.

  NuEdgeWise
  Nuvoton Machine Learning Development Tool for TinyML

Embedded Software (BSP & Example Code)

- Board Support Package (BSP)

  Offers rich peripheral application example codes. With the unified API names of all NuMicro products and Nuvoton Code Generator, customer could easily start or migrate a NuMicro project.
- Example Code

  Offers rich popular applications : Audio codec, LED lighting, Fan speed detect, Mobus, SPI flash and EEPROM, Power detection, Temperature detection, etc.

IDE and Driver

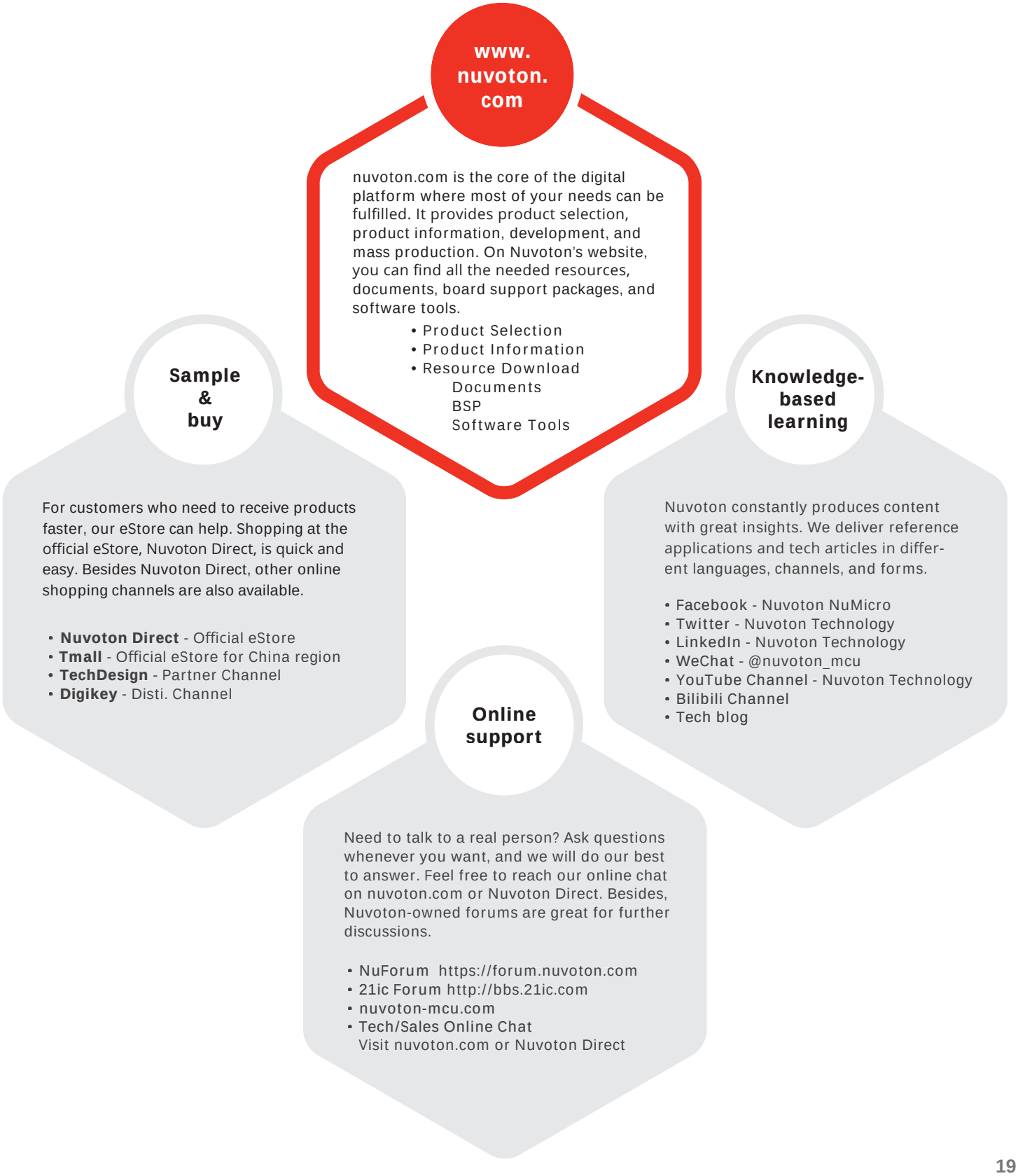
Offers multiple IDEs for customers

- Arm Keil

  Free-to-use for NuMicro Cortex-M projects.
- IAR Embedded Workbench
- NuEclipse within the GNU Eclipse framework

Digital Platform

Nuvoton has been devoted to supporting our customers worldwide through our digital platform. Nuvoton's digital platform can meet various needs including but not limited to product selection, product resources, product purchasing, sales/technical support, and knowledge-based learning.



List of Abbreviations, Acronyms & Codes

Abbreviation/ Code of Chip Specification		Description
ACMP		Analog Comparator
EMAC		Ethernet MAC
LP UART		Low-power UART
OPA		OP Amplifier
PDMA		Peripheral Direct Memory Access
QSPI		Quad SPI
RTC		Real-Time Clock
RTC (V_{BAT})		The RTC could be powered via VBAT pin when power off or in in Power-Down mode.
SPI Master		Master mode used only for this SPI.
USB	USB FS	USB Full Speed
	USB HS	USB High Speed
	O	On-The-Go (OTG)
	D	USB Device
	H	USB Host
	H/D	Allows to act as a USB host or device but not OTG
PSIO		Programmable Serial I/O
VAI		Voltage Adjustment Interface
USCI		Universal Serial Control Interface Controller USCI supports UART, SPI and I^2C mode.
XOM		eXecute-Only Memory
TSI		Trusted Secure Island

Code of Chip Package	Package	Pin	Body Size (mm)	Pitch Size (mm)
A	QFN	68	8 x 8	0.4
B	MSOP	10	3 x 3	0.5
C	WLCSP	-	-	-
D	TSSOP	14	4.4 x 5.0	0.65
E	TSSOP	28	4.4 x 9.7	0.65
F	TSSOP	20	4.4 x 6.5	0.65
G	QFN	24	3 x 3	0.4
H	LQFP	176	24 x 24	0.5
H2	LQFP	176	24 x 24	0.5
I	SOP	8	4 x 5 (150 mil)	1.27
J	LQFP	144	20 x 20	0.5
J2	LQFP	144	20 x 20	0.5
K	LQFP	128	14 x 14	0.4
K1	LQFP	128	14 x 20	0.5
K2	LQFP	128	14 x 14	0.4
L	LQFP	48	7 x 7	0.5
M	LQFP	44	10 x 10	0.8
N	QFN	48	7 x 7	0.5
O	SOP	20	7.6 x 13 (300 mil)	1.27
P	LQFP	32	7 x 7	0.8
Q	LQFP	80	14 x 14	0.65
R	LQFP	64	10 x 10	0.5
R1	LQFP	64	14 x 14	0.8
S	LQFP	64	7 x 7	0.4
S2	LQFP	64	7 x 7	0.4
T	QFN	33	4 x 4	0.4
T1	QFN	16	4 x 4	0.65
U	SOP	28	7.6 x 18.1 (300 mil)	1.27
V	LQFP	100	14 x 14	0.5
V1	LQFP	100	14 x 20	0.65
W	Wafer	-	-	-
X	QFN	20	3 x 3	0.4
			4 x 4	0.5
Y	QFN	48	5 x 5	0.35
Z	QFN	33	5 x 5	0.5

NuMicro® Family Arm® Cortex®-A35 MPUs

High-performance Edge IIoT Series

The NuMicro® MA35 family is based on the Arm® Cortex-A35 core in Armv8-A 64-bit architecture and the Arm Cortex-M4 core. It supports TrustZone security technology for high-end industrial control, edge IIoT gateway, and HMI applications.

The MA35 family provides multiple cores architecture to meet the high computing power and real-time control requirements at the same time. The MA35 family supports 16-bit DDR2 and DDR3/ DDR3L SDRAM. For an easy system design and manufacture, the MA35 family also offers LQFP and BGA packages stacked with a DDR2/DDR3L SDRAM and the density up to 512 MB, which significantly reduces PCB layer, size and electromagnetic interference (EMI).

The MA35 family also provides rich features such as advanced security, Nuvoton TSI (Trusted Secure Island), Gigabit Ethernet, SDIO3.0 host controller, high-speed USB2.0 controller, and CAN FD for high-speed connectivity. It is also equipped with a LCD controller, 2D graphic accelerator, JPEG, and H.264 decoder for graphics HMI applications. Furthermore, the complete ecosystem is provided to shorten the customer's development time in embedded Linux.

MA35D1 Series

The NuMicro® MA35D1 series is a heterogeneous multi-core microprocessor targeted to high-end edge IIoT gateway. It is based on dual 64-bit Arm® Cortex®-A35 cores with speed up to 800 MHz, and one 180 MHz Arm® Cortex®-M4 core. Based on the high-performance cores, the MA35D1 series facilities the tiny AI/ML for edge computing.
The MA35D1 supports 16-bit DDR2 and DDR3/ DDR3L SDRAM. For an easy system design and manufacture, the MA35D1 series also offers LQFP and BGA packages stacked with the DDR2/DDR3L SDRAM and density up to 512 MB, which significantly reduces PCB layer, size and electromagnetic interference (EMI).

The MA35D1 series is a trusted system for IoT products' security requirements. It includes several advanced security mechanisms such as Nuvoton Trusted Secure Island (TSI) an isolated secure hardware unit, TrustZone, secure boot, tamper-detection, built-in cryptographic accelerators, and a TRNG, as well as Key Store and OTP memory. All the security operations are performed in the TSI to protect sensitive and high-value data. The features also satisfy customers in IEC 62443 certification requirements.

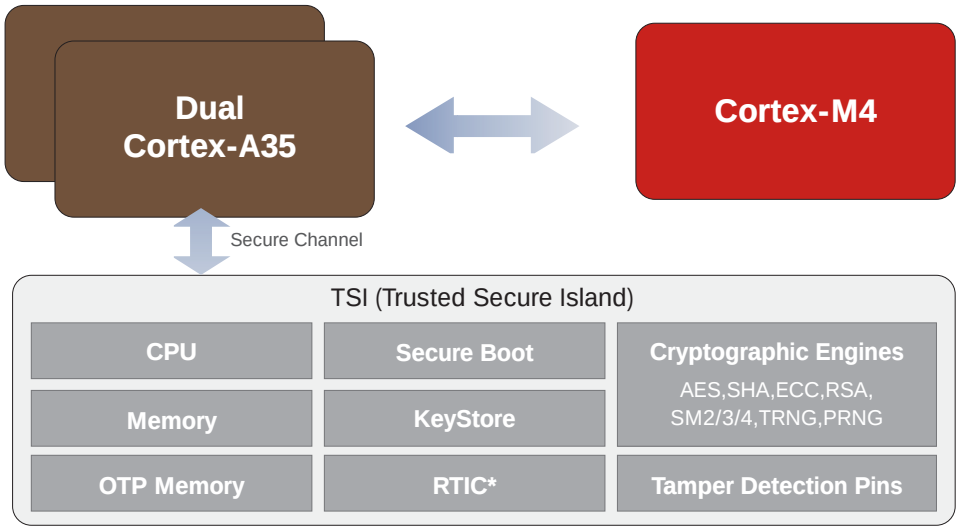
For high-end edge IIoT gateway requirements, the MA35D1 series provides multiple advanced and high-speed connection interfaces, such as Gigabit Ethernet, SDIO3.0, USB 2.0 HS, and CAN FD, for edge gateway and new energy applications.
For HMI applications, the MA35D1 series provides a LCD display controller with the resolution up to 1920x1080 at 60 FPS, a 2D graphic engine, a JPEG and a H.264 decoder integrated for better graphical HMI effects and video playback.

Boot Source: SPI NOR, SPI NAND, NAND, SD, eMMC, USB
Target Applications: Edge Gateway, Tiny AI/ML, HMI & Industrial Control, New Energy Applications

Part No.	Package	MCP DDR	Ethernet	Temper Pins	EADC	GPIOs
MA35D16F787C	LQFP216	128 MB	Megabit + Gigabit Ethernet	-	-	154
MA35D16F887C	LQFP216	256 MB	Megabit + Gigabit Ethernet	-	-	154
MA35D16F987C	LQFP216	512 MB	Megabit + Gigabit Ethernet	-	-	154
MA35D16A887C	BGA312	256 MB	2 sets of Gigabit Ethernet	√	√	208
MA35D16AJ87C	BGA312	512 MB	2 sets of Gigabit Ethernet	√	√	208
MA35D16A087C	BGA364	-	2 sets of Gigabit Ethernet	√	√	208

Key Features: Dual Cortex-A35 high-performance cores, One real-time processor Cortex-M4, MCP industrial DDR in LQFP & BGA packages, Advanced security Nuvoton TSI, 1080P display, 2D graphic engine, JPEG&H.264 decoder, 2 sets of 10/100/1000 Ethernet MAC, 2 sets of USB High Speed Host, 1 set of SD3.0, 4 sets of CAN FD.

MA35D1's Innovative Secure Subsystem Security for MPU



The MA35D1 is a trusted system for IoT products' security requirements

The Nuvoton TSI is an isolated secure hardware unit where operation is not affected by MA35D1's main dual-core CPU system.

Multiple built-in security features in the subsystem to carry out :

- **Software Execution Security**
  Secure Boot, TrustZone, *Run-Time Integrity Checker (RTIC)
- **Communication Security**
  True Random Number Generator (TRNG), Pseudo Random Number Generator (PRNG), Hardware Cryptographic Accelerators
- **Chip-level Storage Security**
  Secure key storage (KeyStore) and OTP memory accessed by the cryptographic engines without needs of CPU intervention, supporting product lifecycle management (PLM)
- **System Security**
  Tamper pins for system-level intrusion detection

Customers can easily utilize TSI's secure environment and features to realize the Protection, Detection, and Recovery for IoT devices.

Part No.	System						Memory			Memory Interface	Timer				Analog		Connectivity												Display				TSI	Security	Package		Status	Tool
	Core	Real-Time Processor (RTP)	Operating Frequency (MHz)	Operating Temperature (Tj, min)(°C)	Operating Temperature (Tj, max)(°C)	GPIO	SRAM (KB)	DDR(MB)	PDMA (ch)	SDRAM Interface	Timer/PWM	Enhanced PWM (EPWM) (16-bit)	Quadrature Encoder Interface (QEI)	Enhanced Capture (ECAP)	ADC (12-bit)	Enhanced ADC (EADC)(12-bit)	Low-power UART (LPUART)	ISO-7816-3	Quad SPI (QSPI)	I²C	SPI / I²S	I²S	CAN FD	Secure Digital Host Controller (SDHC)	USB HS Host	USB HS Device/ Host	Ethernet 10/100 Mbps	Ethernet 10/100/1000 Mbps	External Bus Interface (EBI)	Camera Interface	TFT-LCD Interface	2D Graphics Engine	Video Codec	Trusted Secure Island (TSI)	Tamper Detection Pin	Package Type	Package Size	Mass Production	EVB
MA35D16 F787C	Cortex-A35 Dual	Cortex-M4	800	-40	105	154	256 + 128	128	40	-	12	18	2	3	8	-	17	2	2	6	4	2	4	2	1	1	1	1	√	2	24 bit	√	H.264 decoder JPEG decoder	√	-	LQFP 216-EP	24 x 24	√	-
MA35D16 F887C	Cortex-A35 Dual	Cortex-M4	800	-40	105	154	256 + 128	256	40	-	12	18	2	3	8	-	17	2	2	6	4	2	4	2	1	1	1	1	√	2	24 bit	√	H.264 decoder JPEG decoder	√	-	LQFP 216-EP	24 x 24	√	-
MA35D16 F987C	Cortex-A35 Dual	Cortex-M4	800	-40	105	154	256 + 128	512	40	-	12	18	2	3	8	-	17	2	2	6	4	2	4	2	1	1	1	1	√	2	24 bit	√	H.264 decoder JPEG decoder	√	-	LQFP 216-EP	24 x 24	√	NuMaker-IoT-MA35D1-A1
MA35D16 A887C	Cortex-A35 Dual	Cortex-M4	800	-40	105	208	256 + 128	256	40	-	12	18	3	3	8	8	17	2	2	6	4	2	4	2	1	1	-	2	√	2	24 bit	√	H.264 decoder JPEG decoder	√	2	BGA 312	15 x 15	√	NuMaker-HMI-MA35D1-S1
MA35D16 AJ87C	Cortex-A35 Dual	Cortex-M4	800	-40	105	208	256 + 128	512	40	-	12	18	3	3	8	8	17	2	2	6	4	2	4	2	1	1	-	2	√	2	24 bit	√	H.264 decoder JPEG decoder	√	2	BGA 312	15 x 15	√	NuMaker-HMI-MA35D1-S1
MA35D16 A087C	Cortex-A35 Dual	Cortex-M4	800	-40	105	208	256 + 128	-	40	√	12	18	3	3	8	8	17	2	2	6	4	2	4	2	1	1	-	2	√	2	24 bit	√	H.264 decoder JPEG decoder	√	2	BGA 364	14 x 14	√	-

MA35H0 Series

The NuMicro® MA35H0 series is a high-performance microprocessor targeted to industrial HMI applications. It is based on dual 64/32-bit Arm® Cortex®-A35 cores, the high-performance cores run up to 650 MHz and include 32/32 KB I/D L1 cache for each core, and a 512 KB shared L2 cache.

The MA35H0 series supports secure booting from four modes, USB, SD/eMMC, NAND, and SPI Flash (SPI NOR/SPI NAND). In order to provide easy system design and manufacture, MA35H0 series also offers LQFP package stacked with a DDR SDRAM and the size of 128 MB, which significantly reduces PCB layer, size and electromagnetic interference (EMI).

The MA35H0 series is a trusted system for industrial HMI applications security requirement. It includes practical security mechanisms such as Arm® TrustZone® technology and secure boot, built-in cryptographic accelerators with AES, SHA, ECC, RSA, SM2/3/4, and a TRNG, also Key Store and OTP memory to protect sensitive and high-value data.

To obtain better graphical HMI effects, the MA35H0 series provides an LCD Display controller with the resolution up to 1920 x 1080 at 60 fps, a 2D graphic engine, a JPEG and a H.264 decoder for video decoding. Furthermore, the MA35H0 series also provides high-speed connectivity and advanced control interfaces for high-performance HMI applications, such as Megabit Ethernet, high-speed USB host and device, SD3.0/eMMC, and CAN FD.

Boot Source: SPI NOR, SPI NAND, NAND, SD, eMMC, USB
Target Applications: Factory Automation, Industrial HMI, Smart Building, Smart Home, Smart Appliance, Smart Medical, New Energy

Part No.	Package	MCP DDR	Ethernet	Temper Pins	EADC	GPIOs
MA35H04F764C	LQFP216	128 MB	Megabit	-	-	154

Key Features: Dual Cortex-A35 high-performance cores, MCP industrial DDR in LQFP package, Practical security Nuvoton, 1080P display, 2D graphic engine, JPEG & H.264 decoder, Megabit Ethernet MAC, USB High Speed Host & Device, SD3.0, CAN FD.

New Option for Industrial HMI

MA35H0 EVB & Demos
NuMaker-HMI-MA35H0-A1

EV Charging Station

Industrial Control

Coffee Machine

Speed Meter

High-Performance with Power Efficiency

Ddual-core 64-bit Cortex-A35 CPU with a clock speed of 650 MHz.

Smooth Graphics & Video Playback

Supports 1080P HMI, built-in a LCD interface, a 2D graphics accelerator, and JPEG & H.264 decoders.

Industrial Grade Operating Temp.

Supports industrial-grade operating temperatures, ranging from -40 to +125 degrees Celsius in junction.

Rich Design Resource

HMI software supports mainstream graphics libraries such as SEGGER emWin, LVGL, and Qt.Additionally, provides user-friendly PC GUI tools for UI development, significantly reducing development time.

Part No.	System						Memory			Memory Interface	Timer				Analog		Connectivity												Display				TSI	Security	Package		Status	Tool
	Core	Real-Time Processor (RTP)	Operating Frequency (MHz)	Operating Temperature (Tj, min)(°C)	Operating Temperature (Tj, max)(°C)	GPIO	SRAM (KB)	DDR(MB)	PDMA (ch)	SDRAM Interface	Timer/PWM	Enhanced PWM (EPWM) (16-bit)	Quadrature Encoder Interface (QEI)	Enhanced Capture (ECAP)	ADC (12-bit)	Enhanced ADC (EADC)(12-bit)	Low-power UART (LPUART)	ISO-7816-3	Quad SPI (QSPI)	I²C	SPI/ I²S	I²S	CAN FD	Secure Digital Host Controller (SDHC)	USB HS Device/ Host	USB HS Host	Ethernet 10/100 Mbps	Ethernet 10/100/1000 Mbps	External Bus Interface (EBI)	Camera Interface	TFT-LCD Interface	2D Graphics Engine	Video Codec	Trusted Secure Island (TSI)	Tamper Detection Pin	Package Type	Package Size	Mass Production	EVB
MA35H04F764C	Cortex-A35 Dual	-	650	-40	125	154	384	128	40	-	12	18	-	-	8	-	6	2	1	3	2	1	2	2	1	1	1	-	v	-	24 bit	√	H.264 decoder JPEG decoder	-	-	LQFP 216-EP	24 x 24	2024 Q1	NuMaker-HMI-MA35H0-A1 NuMaker-HMI-MA35H0-A2

MA35D0 Series

The NuMicro MA35D0 series is a high-performance microprocessor designed for industrial edge device applications. It features dual 64/32-bit Arm Cortex-A35 cores, running at speeds of up to 650 MHz. Each core includes a 32/32 KB I/D L1 cache, and there is a 512 KB shared L2 cache.

The MA35D0 series comes with a built-in 128 KB IBR (Internal Boot ROM) and supports secure booting from four modes: USB, SD/eMMC, NAND, and SPI Flash (SPI NOR/SPI NAND). To facilitate system design and manufacturing, the MA35D0 series offers an LQFP package stacked with DDR SDRAM, with capacities of up to 256 MB. This integration significantly reduces PCB layers, size, and electromagnetic interference (EMI).

For industrial applications requiring high security, the MA35D0 series provides practical security mechanisms such as Arm TrustZone technology and secure boot. It also includes built-in cryptographic accelerators for AES, SHA, ECC, RSA, SM2/3/4, and a TRNG, as well as Key Store and OTP memory to protect sensitive and high-value data.

In addition to security features, the MA35D0 series offers high-speed connectivity and advanced control interfaces suitable for edge device applications. These include Megabit Ethernet, high-speed USB host and device, SD3.0/eMMC, and CAN FD. The series also features an LCD Display controller supporting resolutions up to 1920 x 1080 at 60 fps, a 2D graphic engine, and JPEG image decoding capabilities.

Boot Source: SPI NOR, SPI NAND, NAND, SD, eMMC, USB
Target Applications: Factory Automation, Industrial Gateway, New Energy, Edge Device

Part No.	Package	MCP DDR	Ethernet	Temper Pins	EADC	GPIOs
MA35D03F864C	LQFP216	256 MB	Megabit	-	-	154
MA35D03F764C	LQFP216	128 MB	Megabit	-	-	154

Key Features: Dual Cortex-A35 high-performance cores, MCP industrial DDR in LQFP package, Practical security Nuvoton, 1080P display, 2D graphic engine, Megabit Ethernet MAC, USB High Speed Host & Device, SD3.0, CAN FD.

New Option for Industrial Edge Device Applications

NuMaker-IoT-MA35D0-A1

Nuvoton provides rich design resources for MA35D0 to meet diverse and complex application needs

The MA35D0 EVB is pre-loaded with remote operation examples, allowing you to start evaluation and development immediately

BSP & Docs

SW Tools

EVB

OS

Part No.	System						Memory			Memory Interface	Timer				Analog		Connectivity												Display				TSI	Security	Package		Status	Tool
	Core	Real-Time Processor (RTP)	Operating Frequency (MHz)	Operating Temperature (Tj, min)(°C)	Operating Temperature (Tj, max)(°C)	GPIO	SRAM (KB)	DDR(MB)	PDMA (ch)	SDRAM Interface	Timer/PWM	Enhanced PWM (EPWM) (16-bit)	Quadrature Encoder Interface (QEI)	Enhanced Capture (ECAP)	ADC (12-bit)	Enhanced ADC (EADC)(12-bit)	Low-power UART (LPUART)	ISO-7816-3	Quad SPI (QSPI)	I²C	SPI/ I²S	I²S	CAN FD	Secure Digital Host Controller (SDHC)	USB HS Device/ Host	USB HS Host	Ethernet 10/100 Mbps	Ethernet 10/100/1000 Mbps	External Bus Interface (EBI)	Camera Interface	TFT-LCD Interface	2D Graphics Engine	Video Codec	Trusted Secure Island (TSI)	Tamper Detection Pin	Package Type	Package Size	Mass Production	EVB
MA35D03F864C	Cortex-A35 Dual	-	650	-40	125	154	384	256	40	-	12	18	-	-	8	-	11	2	1	3	2	1	3	2	1	1	2	-	√	-	24 bit	√	JPEG decoder	-	-	LQFP 216-EP	24 x 24	2024 Q1	NuMaker-IoT-MA35D0
MA35D03F764C	Cortex-A35 Dual	-	650	-40	125	154	384	128	40	-	12	18	-	-	8	-	11	2	1	3	2	1	3	2	1	1	2	-	√	-	24 bit	√	JPEG decoder	-	-	LQFP 216-EP	24 x 24	2024 Q2	-

NuMicro® Family Arm® Cortex®-M55 Microcontrollers

The NuMicro M55 family offers lifted computing performance, robust security, and a rich set of peripheral functions in its microcontrollers. The M55 family includes two product sub-series: M55M1 and M5531. The core of the M55 family of MCUs is the Arm Cortex-M55 CPU, which operates at speeds up to 220 MHz. The main difference between the M55M1 and M5531 series is that the M55M1 integrates an Arm Ethos-U55 NPU (Neural Processing Unit) for accelerating neural network computations.

The NuMicro M55 family, featuring the Arm Cortex-M55 core based on the Arm v8.1-M architecture, enhances computing performance with lifted DMIPS/MHz and CoreMark/MHz. It incorporates advanced DSP and vector processing instructions, leading to significant performance improvements in signal processing and machine learning tasks. In addition to its powerful CPU, the M55 family is equipped with substantial memory capacity, including up to 1.5MB of SRAM and 2MB of embedded flash memory. Besides its internal memories, the M55 family MCU also features HyperBus interface, which can be used to expand RAM or flash memory by connecting HyperRAM, HyperFlash, or OctoSPI flash.

The M55M1, equipped with its NPU, is designed for real-time AI tasks such as object detection, presence detection, and speech recognition. The M5531, with its advanced CPU and extensive memory, is well-suited for applications like digital signal processing, sensor fusion, and video streaming by USB video class.

M55M1 Series

The NuMicro M55M1 stands as a powerful microcontroller, purpose-built to deliver lifted performance in signal processing and on-device machine learning inference. This strength is effectively enabled by its Arm Cortex-M55 processor, clocked at speeds of up to 220 MHz. Moreover, the M55M1 series integrates an advanced Arm Ethos®-U55 micro neural processing unit (micro-NPU), dedicated for accelerating neural network operations, with the aim of facilitating state-of-the-art endpoint AI applications. Its operating voltage ranges from 1.7V to 3.6V while its operating temperature ranges from -40°C to 105°C.

Target Applications: AIoT, AI home appliance, Smart home, Presence detection, Access control
Key Features: DSP extension, Vector processing extension, NPU, Extensive SRAM and Flash memory, camera interface, digital microphone inerface, TrustZone, Crypto, HyperBus, 10/100 Ethernet MAC, USB HS/FS, CAN FD.

Part No.	System									Memory						Timer		Analog					Connectivity																		Security			Crypto	Display	Package		Status	Tool	
	CPU	NPU	Operating Frequency (MHz)	NPU MAC (MAC/cc)	Operating Voltage (min)(V)	Operating Voltage (max)(V)	Operating Temperature (min)(°C)	Operating Temperature (max)(°C)	GPIO (pin)	LDROM Flash (KB)	APROM Flash (MB)	SRAM (MB)	GDMA (ch)	PDMA (ch)	LPPDMA (ch)	Timer	RTC	EADC (ch)	LPADC (ch)	DAC (ch)	ECAP	ACMP	UART	QSPI	I²C	I3C	SPI/ I²S	SPIM	CAN FD	SDHC	USB FS OTG	USB HS OTG	10/100 EMAC	DMIC (ch)	EBI	TRNG	XOM	Key Store	Crypto	Camera Interface	Package Type	Package Size	Mass Production	EVB	MP Programmer
M55M1 H2LJAE	Cortex-M55	Ethos-U55	220	256	1.7	3.6	-40	105	143	8	2	1.5	2	32	4	4	1	24	24	2	4	4	10	2	4	1	4	1	2	2	1	1	1	4	1	√	√	√	√	√	LQFP 176	24 x 24	√	NK-M55M1HL	NLG-M55M1H
M55M1 K2LJAE	Cortex-M55	Ethos-U55	220	256	1.7	3.6	-40	105	97	8	2	1.5	2	32	4	4	1	24	24	2	4	4	10	2	4	1	4	1	2	2	1	1	1	4	1	√	√	√	√	√	LQFP 128	14 x 14	√	NK-M55M1HL	NLG-M55M1K
M55M1 R2LJAE	Cortex-M55	Ethos-U55	220	256	1.7	3.6	-40	105	39	8	2	1.5	2	32	4	4	1	24	24	2	4	4	10	2	4	1	4	1	2	2	1	1	1	4	1	√	√	√	√	√	LQFP 64	10 x 10	√	NK-M55M1HL	NLG-M55M1R

M5531 Series

The NuMicro M5531 is a robust and secure microcontroller designed to enhance computing performance, particularly for signal and vector processing tasks. This capability is powered by its Arm Cortex-M55 processor, which operates at speeds up to 220 MHz. The M5531 is equipped with substantial on-chip memory, including up to 1.5MB of SRAM and 2MB of flash memory. It operates within a voltage range of 1.7V to 3.6V and is capable of functioning in temperatures ranging from -40°C to 105°C.

Target Applications: Sensor hub, IoT, Robotic control, Medical device
Key Features: DSP extension, Vector processing extension, Extensive SRAM and Flash memory, camera interface, digital microphone inerface, TrustZone, Crypto, HyperBus, 10/100 Ethernet MAC, USB HS/FS, CAN FD.

Part No.	System								Memory					Timer		Analog					Connectivity															Security			Crypto	Display	Package		Status	Tool	
	CPU	Operating Frequency (MHz)	Operating Voltage (min)(V)	Operating Voltage (max)(V)	Operating Temperature (min)(°C)	Operating Temperature (max)(°C)	GPIO (pin)	LDROM Flash (KB)	APROM Flash (MB)	SRAM (MB)	GDMA (ch)	PDMA (ch)	LPPDMA (ch)	Timer	RTC	EADC (ch)	LPADC (ch)	DAC (ch)	ECAP	ACMP	UART	QSPI	I²C	I3C	SPI/ I²S	SPIM	CAN FD	SDHC	USB FS OTG	USB HS OTG	10/100 EMAC	DMIC (ch)	EBI	TRNG	XOM	Key Store	Crypto	Camera Interface	Package Type	Package Size	Mass Production	EVB	MP Programmer
M5531 K2LJAE	Cortex-M55	220	1.7	3.6	-40	105	97	8	2	1.5	2	32	4	4	1	24	24	2	4	4	10	2	4	1	4	1	2	2	1	1	1	4	1	√	√	√	√	√	LQFP 128	14 x 14	√	NK-M5531KL	NLG-M55M1K
M5531 R2LJAE	Cortex-M55	220	1.7	3.6	-40	105	39	8	2	1.5	2	32	4	4	1	24	24	2	4	4	10	2	4	1	4	1	2	2	1	1	1	4	1	√	√	√	√	√	LQFP 64	10 x 10	√	NK-M5531KL	NLG-M55M1R
M5531 R2JIAE	Cortex-M55	220	1.7	3.6	-40	105	39	8	1	1.2	2	32	4	4	1	24	24	2	4	4	10	2	4	1	4	1	2	2	1	1	1	4	1	√	√	√	√	√	LQFP 64	10 x 10	√	NK-M5531KL	NLG-M55M1R

NuMicro® Family Arm® Cortex®-M4 Microcontrollers

The NuMicro® Family Cortex®-M4 based MCUs provide high performance system design with up to 90-240 DMIPS operating at up to 72-200 MHz. When executing from the embedded Flash memory, the power consumption can be lowered to 130 µA/MHz with dynamic power scaling function supported by the M480 series.

The NuMicro® Family Cortex®-M4 based MCUs are composed of the following product series.

M460 Series: 200 MHz CPU, up to 1024 KB of dual bank Flash memory, up to 512 KB of SRAM memory, secure boot, key store (KS), programmable audio PLL, hyperbus interface (HBI), programmable serial I/O (PSIO), SPI Master interface with XIP (eXecute-In-Place), and external bus interface (EBI)

M463 Series – Dual CAN FD, USB High Speed (HS) OTG with on-chip PHY
M467 Series – Ethernet 10/100 MAC, hardware cryptography engine, Quad CAN FD, USB High Speed (HS) OTG and USB Full Speed (FS) OTG both with on-chip PHY

M480 Series: 192 MHz CPU, up to 512 KB of dual bank Flash memory, up to 160 KB of SRAM memory, secure boot, SPI Master interface with XIP (eXecute-In-Place), and external bus interface (EBI)

M481 Series – Base line
M482 Series – USB 2.0 Full Speed (FS) OTG with on-chip PHY
M483 Series – Dual/Triple CAN 2.0B, USB High Speed (HS) OTG and USB Full Speed (FS) OTG both with on-chip PHY.
M484 Series – USB High Speed (HS) OTG and USB Full Speed (FS) OTG both with on-chip PHY.
M485 Series – Hardware cryptography engine, USB High Speed (HS) OTG and USB Full Speed (FS) OTG both with on-chip PHY.
M487 Series – Ethernet 10/100 MAC, hardware cryptography engine, dual CAN 2.0B, and USB High Speed (HS) OTG and USB Full Speed (FS) OTG both with on-chip PHY

M433 Series: 144 MHz CPU, up to 128 KB Flash memory, up to 64 KB of SRAM memory, Dual CAN 2.0B, USB Full Speed (FS) OTG with on-chip PHY.

M471 Series: 120 MHz CPU, up to 512 Kbytes of dual bank Flash memory, up to 64 Kbytes of SRAM memory, an independent 32 Kbytes of data Flash, wide pin pitch packages, and certified IEC60730-1 Class B Software Test Library (STL)

M471 V/K Series – 2 Msps, 12-bit, up to 24 channels SAR ADC, and hardware Customize IR receiver interface

M451 Series: 72 MHz CPU, up to 256 KB of Flash memory, up to 32 KB of SRAM memory, and Quad-SPI interface

M451 Series – 144 MHz PWM, 1 Msps ADC, 1 Msps DAC
M452 Series – USB 2.0 Full Speed device/host/OTG with integrated OTG PHY
M453 Series – USB 2.0 Full Speed device/host/OTG with integrated OTG PHY, CAN 2.0B

M460 Series

The NuMicro® M460 series is a 32-bit microcontroller based on Arm® Cortex®-M4F core, with DSP instruction set and single-precision floating-point unit (FPU), targeting IoT gateway, industrial control, telecom, and data center. The M460 series runs up to 200 MHz, provides up to 1024 KB dual-bank Flash and 512 KB SRAM, and features 1.7V to 3.6V wide operating voltage, -40°C to +85°C/105°C/125°C wide operating temperature, a variety of packages choice, and excellent high immunity characteristics by ESD HBM 2 kV and EFT 4.4 kV.

M460 Series	USB FS	USB HS	CAN FD	Crypto Engine	Ethernet	Temperature
M467 Ethernet/Crypto Series	√	√	√	√	√	85°C/105°C
M463 CAN FD/USB HS Series		√	√	AES		105°C/125°C

Target Applications: IoT Gateway, Industrial Control, Telecom, and Data Center

• M467 Series

Key Features: Secure Boot, Key Store, CAN FD, Audio PLL, PSIO, Ethernet 10/100 MAC, Crypto Engine, TRNG, PRNG, USB HS/FS OTG, Intel 8080 on EBI, HyperBus interface, 3 sets of 12-bit 5 Msps ADC, 4 sets of Comparator, 4 sets of Enhanced QEI, Camera Interface, ICP/IAP/ISP

Part No.	System							Memory				Timer		Analog			Connectivity															Security			Crypto	Display		Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	ISO-7816	QSPI	I²C	USCI	SPI/I²S	SPIM	I²S	CAN FD	SDHC	PSIO	USB FS OTG	USB HS OTG	EMAC	EBI	TRNG	XOM	Key Store	Crypto	Camera Interface	Keypad Interface	Package Type	Package Size	Mass Production	EVB	MP Programmer
M467H2JHAE	Cortex-M4	200	1.7	3.6	-40	105	146	8	1024	512	32	4	√	28	2	4	10	3	2	5	1	4	1	2	4	2	8	1	1	1	√	√	√	√	√	√	6x8	LQFP 176	24x24	√	NK-M467HJ	NLG-176H
M467HJHAN	Cortex-M4	200	1.7	3.6	-40	85	146	8	1024	512	32	4	√	28	2	4	10	3	2	5	1	4	1	2	4	2	8	1	1	1	√	√	√	√	√	√	6x8	LQFP 176	24x24	√	NK-M467HJ	NLG-176H
M467J2JHAE	Cortex-M4	200	1.7	3.6	-40	105	114	8	1024	512	32	4	√	28	2	4	10	3	2	5	1	4	1	2	4	2	8	1	1	1	√	√	√	√	√	√	6x8	LQFP 144	20x20	√	NK-M467HJ	NLG-144J
M467JJHAN	Cortex-M4	200	1.7	3.6	-40	85	114	8	1024	512	32	4	√	28	2	4	10	3	2	5	1	4	1	2	4	2	8	1	1	1	√	√	√	√	√	√	6x8	LQFP 144	20x20	√	NK-M467HJ	NLG-144J
M467K2JHAE	Cortex-M4	200	1.7	3.6	-40	105	100	8	1024	512	32	4	√	28	2	4	10	3	2	5	1	4	1	2	4	2	8	1	1	1	√	√	√	√	√	√	6x8	LQFP 128	14x14	√	NK-M467HJ	NLG-128K
M467KJHAN	Cortex-M4	200	1.7	3.6	-40	85	100	8	1024	512	32	4	√	28	2	4	10	3	2	5	1	4	1	2	4	2	8	1	1	1	√	√	√	√	√	√	6x8	LQFP 128	14x14	√	NK-M467HJ	NLG-128K
M467S2JHAE	Cortex-M4	200	1.7	3.6	-40	105	44	8	1024	512	32	4	√	20	2	4	9	3	2	5	1	4	1	2	4	2	4	1	1	1	√	√	√	√	√	√	6x8	LQFP 64	7x7	√	NK-M467HJ	NLG-64S
M467SJHAN	Cortex-M4	200	1.7	3.6	-40	85	44	8	1024	512	32	4	√	20	2	4	9	3	2	5	1	4	1	2	4	2	4	1	1	1	√	√	√	√	√	√	6x8	LQFP 64	7x7	√	NK-M467HJ	NLG-64S

• M463 Series

Key Features: 125°C, Key Store, CAN FD, Secure Boot, Crypto Engine, TRNG, PRNG, USB HS OTG, Intel 8080 on EBI

Part No.	System							Memory				Timer		Analog			Connectivity															Security			Crypto	Display		Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	ISO-7816	QSPI	I²C	USCI	SPI/I²S	SPIM	I²S	CAN FD	SDHC	PSIO	USB FS OTG	USB HS OTG	EMAC	EBI	TRNG	XOM	Key Store	Crypto	Camera Interface	Keypad Interface	Package Type	Package Size	Mass Production	EVB	MP Programmer
M463K2GCAC	Cortex-M4	200	1.7	3.6	-40	125	100	8	256	128	16	4	v	16	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	v	v	v	v	AES	-	6x8	LQFP 128	14x14	v	NK-M463KG	NLG-128K
M463KGCAE	Cortex-M4	200	1.7	3.6	-40	105	100	8	256	128	16	4	√	16	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	√	√	√	√	AES	-	6x8	LQFP 128	14x14	√	NK-M463KG	NLG-128K
M463S2GCAC	Cortex-M4	200	1.7	3.6	-40	125	44	8	256	128	16	4	√	16	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	√	√	√	√	AES	-	6x8	LQFP 64	7x7	√	NK-M463KG	NLG-64S
M463SGCAE	Cortex-M4	200	1.7	3.6	-40	105	44	8	256	128	16	4	√	16	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	√	√	√	√	AES	-	6x8	LQFP 64	7x7	√	NK-M463KG	NLG-64S
M463L2GCAC	Cortex-M4	200	1.7	3.6	-40	125	33	8	256	128	16	4	√	12	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	√	√	√	√	AES	-	6x8	LQFP 48	7x7	√	NK-M463KG	NLG-48L
M463LGCAE	Cortex-M4	200	1.7	3.6	-40	105	33	8	256	128	16	4	√	12	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	√	√	√	√	AES	-	6x8	LQFP 48	7x7	√	NK-M463KG	NLG-48L
M463YGCAE	Cortex-M4	200	1.7	3.6	-40	105	33	8	256	128	16	4	√	12	-	2	8	1	2	5	1	4	-	-	2	1	1	-	1	-	√	√	√	√	AES	-	6x8	QFN 48	5x5	√	NK-M463KG	NLG-48Y

M433 Series

The NuMicro® M433 series is a 32-bit microcontroller based on Arm® Cortex®-M4F core, with DSP instruction set and single-precision floating-point unit (FPU), targeting IoT, Industrial, and consumer applications. The M433 series runs up to 144 MHz, provides up to 128 KB Flash memory, 64 KB SRAM, and features 1.8V to 3.6V wide operating voltage, -40°C to +105°C wide operating temperature, a variety of packages choice, and excellent high immunity characteristics by ESD HBM 2 kV and EFT 4.4 kV.

Target Applications: Local Dimming, Motor Control, Industrial Control, Telecom
Key Features: CAN 2.0B, USB FS OTG, 2 sets of Comparator, ICP/IAP/ISP

Part No.	System							Memory				Timer			Analog		Connectivity							Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (CH)	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	EADC (12-bit)	ACMP	LPUART	QSPI	I²C	SPI/ I²S	CAN	USB FS OTG	Package Type	Package Size	Mass Production	EVB	MP Programmer
M433LE8AE	Cortex-M4	144	1.8	3.6	-40	105	41	4	128	64	9	4	12	6	12	2	4	1	2	2	2	1	LQFP48	7x7	√	NK-M433LE	NLG-48L
M433SE8AE	Cortex-M4	144	1.8	3.6	-40	105	52	4	128	64	9	4	12	6	16	2	4	1	2	2	2	1	LQFP64	7x7	√	NK-M433SE	NLG-64S

M480 Series

The NuMicro® M480 series is a 32-bit microcontroller based on Arm® Cortex®-M4F core, with DSP instruction set and single-precision floating-point unit (FPU), targeted for IoT, Industrial, and consumer applications. The M480 series runs up to 192 MHz, provides up to 2560 KB Flash memory, 160 KB SRAM, and features 1.8V to 3.6V wide operating voltage, -40°C to +105°C wide operating temperature, a variety of packages choice, and excellent high immunity characteristics by ESD HBM 2 kV and EFT 4.4 kV.

Target Applications: IoT market such as UART to Ethernet Converter; Industrial market such as Energy Storage System; Consumer market such as Label Printer, Gaming market such as Gamepad

M480 Series	USB FS	USB HS	CAN 2.0B	Crypto Engine	Ethernet
M481 Base Series					
M482 USB FS Series	√				
M483 CAN2.0B Series	√	√	√		
M484 USB HS Series	√	√			
M485 Crypto Series	√		√	√	
M487 Ethernet Series	√	√	√	√	√

• M487/M485 Series

Key Features: Ethernet 10/100 MAC, Crypto Engine, random number generator, CAN 2.0B, USB HS OTG, USB FS OTG, EBI/i80 interface

Part No.	System							Memory				Timer				Analog			Connectivity												Security	Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	Camera Interface	USB FS OTG	USB HS OTG	EMAC	PRNG	Crypto	Package Type	Package Size	Mass Production	EVB	MP Programmer
M487KMCAN	Cortex-M4	192	1.8	3.6	-40	85	114	4	2560	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	2	-	1	1	1	√	√	LQFP 128	14x14	√	NK-M487KM	NLG-128K
M487JIDAE	Cortex-M4	192	1.8	3.6	-40	105	114	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	2	-	1	1	1	√	√	LQFP 144	20x20	√	NK-BEDM487	NLG-144J
M487KIDAE	Cortex-M4	192	1.8	3.6	-40	105	100	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	2	-	1	1	1	√	√	LQFP 128	14x14	√	NK-BEDM487	NLG-128K
M487SIDAE	Cortex-M4	192	1.8	3.6	-40	105	44	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	2	-	-	1	1	√	√	LQFP 64	7x7	√	NK-BEDM487	NLG-64S
M485YIDAE	Cortex-M4	192	1.8	3.6	-40	105	40	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	1	-	1	-	-	√	√	QFN 48	5x5	√	NK-BEDM487	NLG-48Y

• M484 Series

Key Features: USB HS OTG, USB FS OTG, EBI/i80 interface

Part No.	System							Memory				Timer				Analog			Connectivity												Security	Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	Camera Interface	USB FS OTG	USB HS OTG	EMAC	PRNG	Crypto	Package Type	Package Size	Mass Production	EVB	MP Programmer
M484KIDAE	Cortex-M4	192	1.8	3.6	-40	105	100	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	-	2	-	1	1	-	-	-	LQFP 128	14x14	√	NK-BEDM487	NLG-128K
M484SIDAE2U	Cortex-M4	192	1.8	3.6	-40	105	44	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	-	2	-	1	1	-	-	-	LQFP 64	7x7	√	NK-BEDM487	NLG-64S
M484SIDAE	Cortex-M4	192	1.8	3.6	-40	105	44	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	-	2	-	-	1	-	-	-	LQFP 64	7x7	√	NK-BEDM487	NLG-64S

• M483 Series

Key Features: CAN 2.0B, USB HS OTG, USB FS OTG, EBI/i80 interface, camera interface

Part No.	System							Memory				Timer				Analog			Connectivity												Security	Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	Camera Interface	USB FS OTG	USB HS OTG	EMAC	PRNG	Crypto	Package Type	Package Size	Mass Production	EVB	MP Programmer
M483KIDAE	Cortex-M4	192	1.8	3.6	-40	105	100	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	2	-	1	1	-	-	-	LQFP 128	14x14	√	NK-BEDM487	NLG-128K
M483SIDAE	Cortex-M4	192	1.8	3.6	-40	105	44	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	2	2	-	-	1	-	-	-	LQFP 64	7x7	√	NK-BEDM487	NLG-64S
M483KGCAE	Cortex-M4	192	1.8	3.6	-40	105	100	4	256	128	16	4	12	12	√	16	1	2	8	2	3	-	3	3	1	√	1	-	-	√	√	LQFP 128	14x14	√	NK-M483KG	NLG-128K
M483KGCAE2A	Cortex-M4	192	1.8	3.6	-40	105	100	4	256	128	16	4	12	12	√	16+8	1	2	8	2	3	-	3	3	1	√	1	-	-	√	√	LQFP 128	14x14	√	NK-M483KG	NLG-128K
M483SGCAE	Cortex-M4	192	1.8	3.6	-40	105	52	4	256	128	16	4	12	12	√	16	1	2	8	2	3	-	3	2	1	√	1	-	-	√	√	LQFP 64	7x7	√	NK-M483KG	NLG-64S
M483SGCAE2A	Cortex-M4	192	1.8	3.6	-40	105	52	4	256	128	16	4	12	12	√	8+8	1	2	8	2	3	-	3	2	1	√	1	-	-	√	√	LQFP 64	7x7	√	NK-M483KG	NLG-64S

• M482 Series

Key Features: USB FS OTG, EBI/i80 interface, camera interface

Part No.	System							Memory				Timer				Analog			Connectivity												Security	Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	Camera Interface	USB FS OTG	USB HS OTG	EMAC	PRNG	Crypto	Package Type	Package Size	Mass Production	EVB	MP Programmer
M482KIDAE	Cortex-M4	192	1.8	3.6	-40	105	100	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	-	2	-	1	-	-	-	-	LQFP 128	14x14	√	NK-BEDM487	NLG-128K
M482SIDAE	Cortex-M4	192	1.8	3.6	-40	105	52	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	-	2	-	1	-	-	-	-	LQFP 64	7x7	√	NK-BEDM487	NLG-64S
M482LIDAE	Cortex-M4	192	1.8	3.6	-40	105	41	4	512	160	16	4	12	12	√	12	2	2	6	1	3	2	3	-	2	-	1	-	-	-	-	LQFP 48	7x7	√	NK-BEDM487	NLG-48L
M482ZIDAE	Cortex-M4	192	1.8	3.6	-40	105	26	4	512	160	16	4	12	12	√	10	2	2	6	1	3	2	3	-	1	-	1	-	-	-	-	QFN 33	5x5	√	NK-BEDM487	NLG-32Z
M482KGCAE	Cortex-M4	192	1.8	3.6	-40	105	100	4	256	128	16	4	12	12	√	16	1	2	8	2	3	-	3	-	1	√	1	-	-	√	√	LQFP 128	14x14	√	NK-M483KG	NLG-128K
M482SGCAE	Cortex-M4	192	1.8	3.6	-40	105	52	4	256	128	16	4	12	12	√	16	1	2	8	2	3	-	3	-	1	√	1	-	-	√	√	LQFP 64	7x7	√	NK-M483KG	NLG-64S
M482LGCAE	Cortex-M4	192	1.8	3.6	-40	105	41	4	256	128	16	4	12	12	√	12	1	2	8	2	3	-	2	-	1	-	1	-	-	√	√	LQFP 48	7x7	√	NK-M483KG	NLG-48L
M482ZGCAE	Cortex-M4	192	1.8	3.6	-40	105	26	4	256	128	16	4	12	12	√	10	1	2	8	2	3	-	2	-	1	-	1	-	-	√	√	QFN 33	5x5	√	NK-M483KG	NLG-32Z

• M481 Series

Key Features: EBI/i80 interface, camera interface

Part No.	System							Memory				Timer				Analog			Connectivity											Security	Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	LPUART	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	Camera Interface	USB FS OTG	USB HS OTG	EMAC	PRNG	Crypto	Package Type	Package Size	Mass Production	EVB	MP Programmer
M481SIDAE	Cortex-M4	192	1.8	3.6	-40	105	52	4	512	160	16	4	12	12	√	16	2	2	6	1	3	2	4	-	2	-	-	-	-	-	-	LQFP 64	7x7	√	NK-BEDM487	NLG-64S
M481LIDAE	Cortex-M4	192	1.8	3.6	-40	105	41	4	512	160	16	4	12	12	√	12	2	2	6	1	3	2	3	-	2	-	-	-	-	-	-	LQFP 48	7x7	√	NK-BEDM487	NLG-48L
M481ZIDAE	Cortex-M4	192	1.8	3.6	-40	105	26	4	512	160	16	4	12	12	√	10	2	2	6	1	3	2	3	-	1	-	-	-	-	-	-	QFN 33	5x5	√	NK-BEDM487	NLG-32Z
M481SGCAE2A	Cortex-M4	192	1.8	3.6	-40	105	52	4	256	128	16	4	12	12	√	8+8	1	2	8	2	3	-	3	-	1	√	-	-	-	√	√	LQFP 64	7x7	√	NK-M483KG	NLG-64S
M481SGCAE	Cortex-M4	192	1.8	3.6	-40	105	52	4	256	128	16	4	12	12	√	16	1	2	8	2	3	-	3	-	1	√	-	-	-	√	√	LQFP 64	7x7	√	NK-M483KG	NLG-64S
M481LGCAE	Cortex-M4	192	1.8	3.6	-40	105	41	4	256	128	16	4	12	12	√	12	1	2	8	2	3	-	2	-	1	-	-	-	-	√	√	LQFP 48	7x7	√	NK-M483KG	NLG-48L
M481ZGCAE	Cortex-M4	192	1.8	3.6	-40	105	26	4	256	128	16	4	12	12	√	10	1	2	8	2	3	-	2	-	1	-	-	-	-	√	√	QFN 33	5x5	√	NK-M483KG	NLG-32Z

M471 Series

The NuMicro® M471 series is a 32-bit microcontroller based on Arm® Cortex®-M4F core, with DSP instruction set and single-precision floating-point unit (FPU), targeted for smart home appliance applications. The M471 series runs up to 120 MHz, provides 512 KB onchip Flash, 64 KB on-chip SRAM, and features 2.5V to 5.5V wide operating voltage, -40°C to +105°C wide operating temperature, wide pin pitch packages, WLCSP100 package, and excellent high immunity characteristics by ESD HBM 8 kV and EFT 4.4 kV.

Target Applications: Washing Machine, Refrigerator, Air Conditioner, other Smart Home Appliances, and 400G/800G optical transceiver
Key Features: Wide pin pitch package, WLCSP100 package, independent 32 Kbytes data flash, 1.8 Msps ADC (up to 24-ch), EBI/i80 interface, ICP/ISP/IAP

Part No.	System							Memory						Timer					Analog			Connectivity						Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Dual-Bank Flash	Data Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	EPWM (16-bit)	RTC	EADC (12-bit)	DAC (8-bit)	ACMP	UART	LPUART	I²C	SPI/ I²S	USB FS Device/ Host	PRNG	Package Type	Package Size	Mass Production	EVB	MP Programmer
M471KI8AE	Cortex-M4	120	2.5	5.5	-40	105	119	4	512	√	32	64	6	4	-	12	12	√	24	1	2	-	6	2	2	-	√	LQFP 128	14x14	√	NK-M471KI	NLG-128K
M471VI8AE	Cortex-M4	120	2.5	5.5	-40	105	91	4	512	√	32	64	6	4	-	12	12	√	23	1	2	-	6	2	2	-	√	LQFP 100	14x14	√	NK-M471KI	NLG-100V
M471CI8AE	Cortex-M4	120	2.5	5.5	-40	105	91	4	512	√	32	64	6	4	-	12	12	√	24	1	2	-	6	2	2	-	√	WLCSP 100	4.5x4.5	√	NK-M471KI	NLG-100C

M451 Series

The NuMicro® M451 series is a 32-bit microcontroller based on Arm® Cortex®-M4F core, with DSP instruction set and single-precision floating-point unit (FPU), targeted for Industrial, and consumer applications. The M451 series runs up to 72 MHz, provides 256 KB on-chip Flash, 32 KB on-chip SRAM, and features 2.5V to 5.5V wide operating voltage, -40°C to +105°C wide operating temperature, a variety of packages choice, and excellent high immunity characteristics by ESD HBM 6 kV and EFT 4.4 kV.

Target Applications: Industrial market such as Smart Capacitor; Smart home appliances market such as Air Purifier

M451 Series	USB FS	CAN 2.0B
M451 Base Series		
M4521 USB FS Series	√	
M452 USB FS Series	√	
M453 CAN 2.0B Series	√	√

Key Features: Configurable Data flash, Voltage Adjustable Interface, 16+16 bytes UART FIFO for TX/ RX, 1 Msps ADC, USB full speed device/ host/ OTG with on-chip PHY, Intel 8080 on EBI, ICP/ ISP.

Part No.		System							Memory					Timer			Analog			Connectivity									Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	VBAT	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	RTC	EADC (12-bit)	DAC (12-bit)	ACMP	UART	ISO-7816-3	QSPI	I²C	SPI/ I²S	CAN	USB FS Device/ Host	USB FS OTG	EBI	Package Type	Package Size	Mass Production	EVB	MP Programmer
M451LC3AE	Cortex-M4	72	2.5	5.5	-40	105	39	√	4	40	Configurable	16	8	4	12	√	10	1	2	4	1	1	2	1	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451L
M451LD3AE	Cortex-M4	72	2.5	5.5	-40	105	39	√	4	72	Configurable	16	8	4	12	√	10	1	2	4	1	1	2	1	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451L
M451LE6AE	Cortex-M4	72	2.5	5.5	-40	105	39	√	4	128	Configurable	32	12	4	12	√	8	1	2	3	1	1	2	2	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451L
M451LG6AE	Cortex-M4	72	2.5	5.5	-40	105	39	√	4	256	Configurable	32	12	4	12	√	8	1	2	3	1	1	2	2	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451L
M451MLC3AE	Cortex-M4	72	2.5	5.5	-40	105	42	-	4	40	Configurable	16	8	4	12	-	11	1	2	4	1	1	2	1	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451ML
M451MLD3AE	Cortex-M4	72	2.5	5.5	-40	105	42	-	4	72	Configurable	16	8	4	12	-	11	1	2	4	1	1	2	1	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451ML
M451MLE6AE	Cortex-M4	72	2.5	5.5	-40	105	42	-	4	128	Configurable	32	12	4	12	-	9	1	2	4	1	1	2	2	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451ML
M451MLG6AE	Cortex-M4	72	2.5	5.5	-40	105	42	-	4	256	Configurable	32	12	4	12	-	9	1	2	3	1	1	2	2	-	-	-	√	LQFP48	7x7	√	NT-M451V	NG-M451ML
M451MSC3AE	Cortex-M4	72	2.5	5.5	-40	105	55	-	4	40	Configurable	16	8	4	12	-	13	1	2	4	1	1	2	1	-	-	-	√	LQFP64	7x7	√	NT-M451V	NG-M451MS
M451MSD3AE	Cortex-M4	72	2.5	5.5	-40	105	55	-	4	72	Configurable	16	8	4	12	-	13	1	2	4	1	1	2	1	-	-	-	√	LQFP64	7x7	√	NT-M451V	NG-M451MS
M451RC3AE	Cortex-M4	72	2.5	5.5	-40	105	53	√	4	40	Configurable	16	8	4	12	√	16	1	2	4	1	1	2	1	-	-	-	√	LQFP64	10x10	√	NT-M451V	NG-M451R
M451RD3AE	Cortex-M4	72	2.5	5.5	-40	105	53	√	4	72	Configurable	16	8	4	12	√	16	1	2	4	1	1	2	1	-	-	-	√	LQFP64	10x10	√	NT-M451V	NG-M451R
M451RE6AE	Cortex-M4	72	2.5	5.5	-40	105	53	√	4	128	Configurable	32	12	4	12	√	12	1	2	4	1	1	2	2	-	-	-	√	LQFP64	10x10	√	NT-M451V	NG-M451R
M451RG6AE	Cortex-M4	72	2.5	5.5	-40	105	53	√	4	256	Configurable	32	12	4	12	√	12	1	2	4	1	1	2	2	-	-	-	√	LQFP64	10x10	√	NT-M451V	NG-M451R
M451VE6AE	Cortex-M4	72	2.5	5.5	-40	105	85	√	4	128	Configurable	32	12	4	12	√	16	1	2	4	1	1	2	2	-	-	-	√	LQFP100	14x14	√	NT-M451V	NG-M451V
M451VG6AE	Cortex-M4	72	2.5	5.5	-40	105	85	√	4	256	Configurable	32	12	4	12	√	16	1	2	4	1	1	2	2	-	-	-	√	LQFP100	14x14	√	NT-M451V	NG-M451V
M4521LE6AE	Cortex-M4	72	2.5	5.5	-40	105	35	√	4	128	Configurable	32	8	4	10	√	10	-	-	3	1	1	2	1	-	1	-	√	LQFP48	7x7	√	NT-M4521S	NG-M453L
M4521SE6AE	Cortex-M4	72	2.5	5.5	-40	105	49	√	4	128	Configurable	32	8	4	12	√	16	-	-	4	1	1	2	1	-	1	-	√	LQFP64	7x7	√	NT-M4521S	NG-M453S
M452LC3AE	Cortex-M4	72	2.5	5.5	-40	105	35	√	4	40	Configurable	16	8	4	10	√	10	1	2	4	1	1	2	1	-	1	-	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M452LD3AE	Cortex-M4	72	2.5	5.5	-40	105	35	√	4	72	Configurable	16	8	4	10	√	10	1	2	4	1	1	2	1	-	1	-	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M452LE6AE	Cortex-M4	72	2.5	5.5	-40	105	34	√	4	128	Configurable	32	12	4	10	√	8	1	2	3	1	1	2	1	-	-	1	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M452LG6AE	Cortex-M4	72	2.5	5.5	-40	105	34	√	4	256	Configurable	32	12	4	10	√	8	1	2	3	1	1	2	1	-	-	1	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M452RD3AE	Cortex-M4	72	2.5	5.5	-40	105	49	√	4	72	Configurable	16	8	4	12	√	16	1	2	4	1	1	2	1	-	1	-	√	LQFP64	10x10	√	NT-M451V	NG-M453R
M452RE6AE	Cortex-M4	72	2.5	5.5	-40	105	48	√	4	128	Configurable	32	12	4	12	√	12	1	2	4	1	1	2	2	-	-	1	√	LQFP64	10x10	√	NT-M451V	NG-M453R
M452RG6AE	Cortex-M4	72	2.5	5.5	-40	105	48	√	4	256	Configurable	32	12	4	12	√	12	1	2	4	1	1	2	2	-	-	1	√	LQFP64	10x10	√	NT-M451V	NG-M453R
M452VE6AE	Cortex-M4	72	2.5	5.5	-40	105	80	√	4	128	Configurable	32	12	4	12	√	16	1	2	4	1	1	2	2	-	-	1	√	LQFP100	14x14	√	NT-M451V	NG-M453V
M452VG6AE	Cortex-M4	72	2.5	5.5	-40	105	80	√	4	256	Configurable	32	12	4	12	√	16	1	2	4	1	1	2	2	-	-	1	√	LQFP100	14x14	√	NT-M451V	NG-M453V
M453LC3AE	Cortex-M4	72	2.5	5.5	-40	105	35	√	4	40	Configurable	16	8	4	10	√	10	1	2	4	1	1	2	1	1	1	-	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M453LD3AE	Cortex-M4	72	2.5	5.5	-40	105	35	√	4	72	Configurable	16	8	4	10	√	10	1	2	4	1	1	2	1	1	1	-	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M453LE6AE	Cortex-M4	72	2.5	5.5	-40	105	34	√	4	128	Configurable	32	12	4	10	√	8	1	2	3	1	1	2	2	1	-	1	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M453LG6AE	Cortex-M4	72	2.5	5.5	-40	105	34	√	4	256	Configurable	32	12	4	10	√	8	1	2	3	1	1	2	2	1	-	1	√	LQFP48	7x7	√	NT-M451V	NG-M453L
M453RD3AE	Cortex-M4	72	2.5	5.5	-40	105	49	√	4	72	Configurable	16	8	4	12	√	16	1	2	4	1	1	2	1	1	1	-	√	LQFP64	10x10	√	NT-M451V	NG-M453R
M453RE6AE	Cortex-M4	72	2.5	5.5	-40	105	48	√	4	128	Configurable	32	12	4	12	√	12	1	2	4	1	1	2	2	1	-	1	√	LQFP64	10x10	√	NT-M451V	NG-M453R
M453RG6AE	Cortex-M4	72	2.5	5.5	-40	105	48	√	4	256	Configurable	32	12	4	12	√	12	1	2	4	1	1	2	2	1	-	1	√	LQFP64	10x10	√	NT-M451V	NG-M453R
M453VD3AE	Cortex-M4	72	2.5	5.5	-40	105	72	√	4	72	Configurable	16	8	4	12	√	16	1	2	4	1	1	2	1	1	1	-	√	LQFP100	14x14	√	NT-M451V	NG-M453V
M453VE6AE	Cortex-M4	72	2.5	5.5	-40	105	80	√	4	128	Configurable	32	12	4	12	√	16	1	2	4	1	1	2	2	1	-	1	√	LQFP100	14x14	√	NT-M451V	NG-M453V
M453VG6AE	Cortex-M4	72	2.5	5.5	-40	105	80	√	4	256	Configurable	32	12	4	12	√	16	1	2	4	1	1	2	2	1	-	1	√	LQFP100	14x14	√	NT-M451V	NG-M453V

KM1M4B Inverter Control Series

KM1M4B Series MCU is a 32-bit MCU with Arm® Cortex® M4F, which have a good balance between high speed processing ability and low power consumption.
High speed/high-precision analog functions and assist functions are embedded, which can satisfy the request of motor control.
Accessing EEPROM becomes more efficient by using RWW(Read While Write) flash.
They can contribute to the power management system which needs high-efficiency, super low-power consumption and miniaturization.

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I/O	Timer (16-bit)	Power control PWM	Connectivity				ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
								Clock synchronous	UART	SPI	I²C	Channel	Unit							
KM1M4BF05G	120	136	16	8	37	14	8	4	4	4	4	10	3	6	1	4	2	v	v	LQFP48 (7x7)
KM1M4BF54G	120	136	16	8	51	14	8	7	7	7	7	13	3	6	1	4	2	v	v	LQFP64 (10x10)
KM1M4BF54K	120	264	16	32	51	14	8	7	7	7	7	13	3	6	1	4	2	v	v	LQFP64 (10x10)
KM1M4BF53G	120	136	16	8	65	14	8	7	7	7	7	18	3	6	1	4	2	v	v	LQFP80 (12x12)
KM1M4BF53K	120	264	16	32	65	14	8	7	7	7	7	18	3	6	1	4	2	v	v	LQFP80 (12x12)
KM1M4BF52G	120	136	16	8	85	14	8	7	7	7	7	23	3	6	1	4	2	v	v	LQFP100 (14x14)
KM1M4BF52K	120	264	16	32	85	14	8	7	7	7	7	23	3	6	1	4	2	v	v	LQFP100 (14x14)

ISD®94100 Series

Nuvoton has developed a series of 32-bit Cortex-M4F integrated MCUs dedicated for audio applications. In addition to built-in Flash and SRAM memory, Nuvoton also has a variety of audio and control interfaces RTC, PDMA, UART, SPI, I2C, PWM, GPIO, SAR ADC, USB, Cortex-M4F supports DSP instruction set and floating-point microprocessor. The main frequency can run up to 200MHz. It also supports multiple peripheral interfaces such as UART, SPI, I2C, I2S, and USB. It supports FS1.1 and is compatible with 2.0. The current content build high-quality noise reduction and echo cancellation algorithms, or high-level speech recognition. Used to handle calls or speech recognition solutions.

Part No.	CPU	APROM	SRAM	I/O	Timer	ADC	RTC	Audio		Developemnt Tools	Other	Package
								MIC.	Speaker			
ISD94113A	Cortex®-M4 200 MHz	256 KB	128 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	-	USB 2.0 FS, VAD	LQFP64 QFN48
ISD94113B	Cortex®-M4 200 MHz Basic Feature	256 KB	128 KB	57	4	12-bit SAR	√	-	-	-	USB 2.0 FS	LQFP64 QFN48
ISD94113S	Cortex®-M4 200 MHz	256 KB	128 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	-	USB 2.0 FS, VAD, AEC+NR	LQFP64 QFN48
ISD94123B	Cortex®-M4 200 MHz Basic Feature	512 KB	128 KB	57	4	12-bit SAR	√	-	-	-	USB 2.0 FS	LQFP64 QFN48
ISD94123S	Cortex®-M4 200 MHz	512 KB	128 KB	41	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	-	USB 2.0 FS, VAD, AEC+NR	QFN48
ISD94124A	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NM-94100_AM NM-94100_DM	USB 2.0 FS, VAD	LQFP64 QFN48
ISD94124B	Cortex®-M4 200 MHz, Basic fetaure	512 KB	192 KB	57	4	12-bit SAR	√	-	-	NM-94100_AM NM-94100_DM	USB 2.0 FS	LQFP64 QFN48
ISD94124C	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NM-94100_AM NM-94100_DM	USB 2.0 FS, VAD, VR	LQFP64
ISD94124D	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NM-94100_AM NM-94100_DM	USB 2.0 FS, VAD, BF+NR	LQFP64
ISD94124P	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NM-94100_AM NM-94100_DM	USB 2.0 FS, VAD, VR, BF+NR	LQFP64
ISD94124S	Cortex®-M4 200 MHz	512 KB	192 KB	57	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NM-94100_AM NM-94100_DM	USB 2.0 FS, VAD, AEC+NR	LQFP64
ISD941A24A	Cortex®-M4 200MHz Stereo CODEC MCP	512 KB	192 KB	29	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NV-ISD941A24	USB 2.0 FS, VAD	LQFP64
ISD941A24S	Cortex®-M4 200MHz Stereo CODEC MCP	512 KB	192 KB	29	4	12-bit SAR	√	4x DMIC	DPWM/I2S to ext. amp	NV-ISD941A24	USB 2.0 FS, VAD, AEC+NR	LQFP64

Development Tools for ISD®94100 Series

Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NP-SPK1	• NP-SPK1	Differential Audio Output	• 8-Ohm Speaker	
NU-NULINKISD	• NU-NULINKISD	Audio SoCs products	• USB Dongle • Support ICP (In-Circuit Programming) • Support Debug Mode	
NU-NULINKPRO	NU-NULINKPRO	ISD91500 Series ISD941A24	• USB dongle • Adjustable Voltage Regulation @ 3V / 5V	
NV-ISD94100	• NV-ISD94100	ISD94100 Series	• Demo Board for ISD94100 with audio CODEC (NAU88C22) • USB Dongle Required for PC Connection (NU-NULINKISD)	
NV-ISD941A24	• NV-ISD941A24	ISD941A24SDI	• Demo Board for ISD941A24SDI	

NuMicro® Family Arm® Cortex®-M23 Microcontrollers

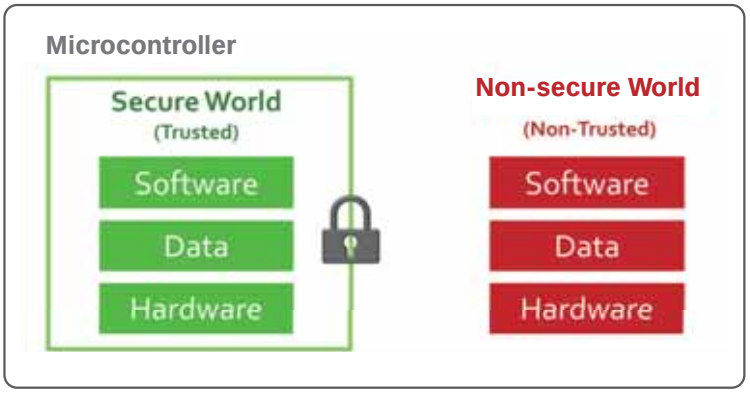
Offers the next industry standard for secure IoT devices

The NuMicro® M23 Family is based on the Arm® Cortex®-M23 core and is empowered by the Arm® TrustZone® for Armv8-M architecture.

With TrustZone® implemented, memory and peripherals could be divided into secure and non-secure worlds to achieve data integrity, firmware update and operation security. In addition, TrustZone® for Armv8-M provides the key benefit of context switching between secure and non-secure worlds by hardware for faster transitions and greater power efficiency.

In additional to the security capability, NuMicro® M23 Series inherits the standard set of Cortex-M0+ as the ultra-low power microprocessor in a tiny footprint.

With the two key features of security and ultra-low power, NuMicro® M23 is built for small, energy-sipping IoT and embedded products. With the capability of the small-sized and low-power devices, NuMicro® M23 provides security, enhanced efficiency, performance and scalability for deployment even in the most constrained contexts.



M2L31 Series

The NuMicro® M2L31 series is based on Arm Cortex-M23 core at Armv8-M architecture with a single-cycle hardware multiplier/divider. It runs up to 72 MHz and features 64 to 512 Kbytes ReRAM, 40 to 168 Kbytes SRAM, 1.71V to 3.6V operating voltage, -40°C to 105°C wide operating temperature, a variety of packages choices, and excellent high immunity characteristics by 4 kV ESD HBM and 4.4 kV EFT. The dual bank design of 512 Kbytes ReRAM supports firmware update through the Over-The-Air (FOTA) process.

Target Applications: Smart Home/ Smart Home Appliances, Industrial Control/ Industrial Automation, Smart City, IoT Device, Security Alarm System, PC Peripherals, Battery Management System

Key Features: Provides up to three PGA, three ACMP, 24-ch 12-bit 3.6MSPS ADC, two 12-bit 1 MSPS DAC, 24-ch high speed PWM, USB 2.0 Type-C Power Delivery 3.1 Controller, The hardware crypto accelerators, including AES, PRNG, and TRNG. Ultra-Low-Power Consumption with 60μA/MHz (Normal), 33μA/MHz (Idle), 2.4 μA (Power Down, RTC on, RAM retention) and 0.5 μA (Power Down, RTC off, RAM retention)

Part No.	System								Memory				Timer						Analog						Connectivity														Security			Crypto	Package	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	VBAT	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer/ PWM	EPWM (16-bit)	PWM (16-bit)	RTC	QEI	ECAP	EADC	DAC (12-bit)	ACMP	PGA	Touch Key	Internal Voltage Reference	LPUART	UART	LIN	I²C	USCI	SPI/ I²S	USB FS OTG	EBI	CAN FD	Power delivery	True Random Number Generator (TRNG)	Pseudorandom Number Generator (PRNG)	XOM	Tamper	AES	Package Type	EVB	MP Programmer
M2L31XD4AE	Cortex-M23	72	1.71	3.6	-40	105	√	18	8	64	40	10	4	12	-	√	1	1	6	-	2	1	-	√	1	5	2	2	-	2	√	-	1	-	-	-	√	3	√	WLCSP 25	NK-M2L31SG	-
M2L31ZD4AE	Cortex-M23	72	1.71	3.6	-40	105	√	26	8	64	40	10	4	12	-	√	2	2	10	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	QFN 33	NK-M2L31SG	NLG-33Z
M2L31LD4AE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	64	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	LQFP 48	NK-M2L31SG	NLG-48Y
M2L31YD4AE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	64	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	QFN 48	NK-M2L31SG	NLG-48Y
M2L31ZE4AE	Cortex-M23	72	1.71	3.6	-40	105	√	26	8	128	40	10	4	12	-	√	2	2	10	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	QFN32	NK-M2L31SG	NLG-32Z
M2L31YE4AE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	128	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	QFN 48	NK-M2L31SG	NLG-48Y
M2L31LE4AE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	128	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	LQFP 48	NK-M2L31SG	NLG-48Y
M2L31SE4AE	Cortex-M23	72	1.71	3.6	-40	105	√	53	8	128	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	LQFP 64	NK-M2L31SG	NLG-64S
M2L31YG4AE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	256	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	QFN 48	NK-M2L31SG	NLG-48Y
M2L31YGDAE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	256	168	16	4	12	12	√	2	2	16	2	3	3	12	√	1	8	2	4	2	4	√	V	2	√	√	√	√	√	3	√	QFN 48	NK-M2L31KI	NLG-48Y
M2L31LG4AE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	256	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	LQFP 48	NK-M2L31SG	NLG-48Y
M2L31LGDAE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	256	168	16	4	12	12	√	2	2	16	2	3	3	12	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	LQFP 48	NK-M2L31KI	NLG-48L
M2L31CGDAE	Cortex-M23	72	1.71	3.6	-40	105	√	40	8	256	168	16	4	12	12	√	2	2	16	1	3	2	12	√	1	6	2	2	1	2	√	√	1	√	√	√	√	√	3	√	WLCSP 49	NK-M2L31KI	-
M2L31SGDAE	Cortex-M23	72	1.71	3.6	-40	105	√	53	8	256	168	16	4	12	12	√	2	2	20	2	3	3	17	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	LQFP 64	NK-M2L31KI	NLG-64S
M2L31SG4AE	Cortex-M23	72	1.71	3.6	-40	105	√	53	8	256	40	10	4	12	-	√	2	2	16	1	3	2	-	√	1	6	2	2	1	2	√	-	1	√	-	-	√	3	√	LQFP 64	NK-M2L31SG	NLG-64S
M2L31KGDAE	Cortex-M23	72	1.71	3.6	-40	105	√	109	8	256	168	16	4	12	12	√	2	2	24	2	3	3	18	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	LQFP 128	NK-M2L31KI	NLG-128KX
M2L31YIDAE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	512	168	16	4	12	12	√	2	2	16	2	3	3	12	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	QFN 48	NK-M2L31KI	NLG-48Y
M2L31LIDAE	Cortex-M23	72	1.71	3.6	-40	105	√	41	8	512	168	16	4	12	12	√	2	2	16	2	3	3	12	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	LQFP 48	NK-M2L31KI	NLG-48L
M2L31CIDAE	Cortex-M23	72	1.71	3.6	-40	105	√	40	8	512	168	16	4	12	12	√	2	2	16	1	3	2	12	√	1	6	2	2	1	2	√	√	1	√	√	√	√	√	3	√	WLCSP 49	NK-M2L31KI	-
M2L31SIDAE	Cortex-M23	72	1.71	3.6	-40	105	√	53	8	512	168	16	4	12	12	√	2	2	20	2	3	3	17	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	LQFP 64	NK-M2L31KI	NLG-64S
M2L31KIDAE	Cortex-M23	72	1.71	3.6	-40	105	√	109	8	512	168	16	4	12	12	√	2	2	24	2	3	3	18	√	1	8	2	4	2	4	√	√	2	√	√	√	√	√	3	√	LQFP 128	NK-M2L31KI	NLG-128KX

M2003 Series

The NuMicro® M2003 series 32-bit microcontroller is based on Arm Cortex-M23 core with 32-bit hardware multiplier/divider. It runs up to 24 MHz and features 32 Kbytes, 4 Kbytes SRAM, 2.4V ~ 5.5V operating voltage, and -40°C ~105°C operating temperature. The M2003 series provides plenty of peripherals including 4 sets of 32-bit Timers, Watchdog Timers, up to 2 sets of UART, 1 set of I2C and 1 sets of Universal Serial Control Interface (USCI) that can be set as UART/SPI/I2C flexibly. The M2003 series also provides rich analog peripherals including 8 single-end analog input channels of 500 kSPS 12-bit ADC and 6 channels of 16-bit PWM.

Target Applications: Suitable for a wide range of application such as Smart Building, Smart Home, Smart Home Appliances, Industrial Control, BMS etc.

Key Features: Most commonly used small package size TSSOP20 and QFN20. Pin Compatible with N76E003AT20, N76E003AQ20, N76E003BQ20, MS51FB9AE, MS51XB9AE, MS51XB9BE and MG51 Series

Part No.	System							Memory				Timer					Analog	Connectivity			Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash(KB)	APROM Flash(KB)	Data Flash(KB)	SRAM(KB)	WDT	WWDT	Timer(32-bit)	PWM(16-bit)	ECAP	ADC (12-bit)	UART	I²C	USCI	SPROM(B)	Package Type	Package Size	Mass Production	EVB	MP Programmer
M2003FC1AE	Cortex-M23	24	2.4	5.5	-40	105	18	4	32	Configurable	4	√	√	4	6	1	8	2	1	1	1024	TSSOP20	4.4x6.5	√	NK-M2003FC	-
M2003XC1AE	Cortex-M23	24	2.4	5.5	-40	105	18	4	32	Configurable	4	√	√	4	6	1	8	2	1	1	1024	QFN20	3x3	√	NK-M2003FC	-

M251/M252 Series

The NuMicro® M251/M252 series is a low-power microcontroller platform based on Arm® Cortex®-M23 core for Armv8-M architecture. It runs up to 48 MHz with 32 ~ 256 Kbytes embedded Flash Memory and 8 ~ 32 Kbytes embedded SRAM, 4 Kbytes Flash loader memory (LDROM) for In-System Programming (ISP). The 32-bit low-power microcontrollers supports wide supply voltage from 1.75V ~ 5.5V and operating temperature range from -40°C ~ +105°C. It features highly flexible PSIO and plenty of peripherals, such as VAI interface, crystal-less USB 2.0 full-speed device and rich peripherals.

Target Applications: Smart Home/ Smart Home Appliances, Industrial Control/ Industrial Automation, Smart City, IoT Device, Security Alarm System, Electronic Payments, Communication Modules, Portable Wireless Data Collector, Smart Door Lock, Handheld Medical Device, (GPS) Location Tracker, Electronic Shelf Labels (ESL)

• M251 Series

Key Features: Up to 8-channel PSIO that is capable of emulating various serial communication protocols. Ultra-low power consumption with 138 µA/MHz (Normal Run Mode), 60 µA/MHz (Idle Mode), 2.5 µA (Power Down, RTC on, RAM retention) and 1.5 µA (Power Down, RTC off, RAM retention)

Part No.	System							Memory				Timer				Analog			Connectivity									Security		Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer/ PWM	PWM (16-bit)	BPWM (16-bit)	RTC	EADC	DAC (12-bit)	ACMP	UART	LIN	ISO-7816-3	QSPI	I²C	USCI	SPI/ I²S	PSIO	USB FS Device Crystal-less	XOM	Tamper	Package Type	Package Size	Mass Production	EVB	MP Programmer
M251FC2AE	Cortex-M23	48	1.75	5.5	-40	105	15	4	32	8	5	4	9	-	-	7	-	-	2	1	1	1	2	1	-	-	-	√	-	TSSOP20	4.4x6.5	√	NK-M251SD	NLG-20F
M251EC2AE	Cortex-M23	48	1.75	5.5	-40	105	23	4	32	8	5	4	11	-	-	9	-	-	2	1	1	1	2	1	-	-	-	√	-	TSSOP28	4.4x9.7	√	NK-M251SD	NLG-28E
M251ZC2AE	Cortex-M23	48	1.75	5.5	-40	105	26	4	32	8	5	4	12	-	√	10	-	-	2	1	1	1	2	1	-	-	-	√	-	QFN33	5x5	√	NK-M251SD	NLG-32Z
M251LC2AE	Cortex-M23	48	1.75	5.5	-40	105	41	4	32	12	5	4	12	12	√	12	-	2	3	1	1	1	2	2	1	4	-	√	-	LQFP48	7x7	√	NK-M251SD	NLG-48L
M251SC2AE	Cortex-M23	48	1.75	5.5	-40	105	54	4	32	12	5	4	12	12	√	16	-	2	3	1	1	1	2	2	1	4	-	√	√	LQFP64	7x7	√	NK-M251SD	NLG-64S
M251ZD2AE	Cortex-M23	48	1.75	5.5	-40	105	26	4	64	12	5	4	12	12	√	10	-	2	3	1	1	1	2	2	1	4	-	√	-	QFN33	5x5	√	NK-M251SD	NLG-32Z
M251LD2AE	Cortex-M23	48	1.75	5.5	-40	105	41	4	64	12	5	4	12	12	√	12	-	2	3	1	1	1	2	2	1	4	-	√	-	LQFP48	7x7	√	NK-M251SD	NLG-48L
M251SD2AE	Cortex-M23	48	1.75	5.5	-40	105	54	4	64	12	5	4	12	12	√	16	-	2	3	1	1	1	2	2	1	4	-	√	√	LQFP64	7x7	√	NK-M251SD	NLG-64S
M251LE3AE	Cortex-M23	48	1.75	5.5	-40	105	41	4	128	16	8	4	12	12	√	12	-	2	3	1	1	1	2	3	1	8	-	√	-	LQFP48	7x7	√	NK-M251KG	NLG-48L
M251SE3AE	Cortex-M23	48	1.75	5.5	-40	105	53	4	128	16	8	4	12	12	√	16	-	2	3	1	1	1	2	3	1	8	-	√	√	LQFP64	7x7	√	NK-M251KG	NLG-64S
M251KE3AE	Cortex-M23	48	1.75	5.5	-40	105	85	4	128	16	8	4	12	12	√	16	-	2	3	1	1	1	2	3	1	8	-	√	√	LQFP128	14x14	√	NK-M251KG	NLG-128KX
M251KG6AE	Cortex-M23	48	1.75	5.5	-40	105	85	4	256	32	8	4	12	12	√	16	1	2	3	1	1	1	2	3	1	8	-	√	√	LQFP128	14x14	√	NK-M251KG	NLG-128KX
M251KG6AE	Cortex-M23	48	1.75	5.5	-40	105	85	4	256	32	8	4	12	12	√	16	1	2	3	1	1	1	2	3	1	8	-	√	√	LQFP128	14x14	√	NK-M251KG	NLG-128KX
M251KG6AE	Cortex-M23	48	1.75	5.5	-40	105	85	4	256	32	8	4	12	12	√	16	1	2	3	1	1	1	2	3	1	8	-	√	√	LQFP128	14x14	√	NK-M251KG	NLG-128KX

• M252 Series

Key Features: USB 2.0 full speed device Crystal-less and up to 8-channel PSIO capable of emulating various serial communication protocols. Ultra-low power Consumption with 138 µA/MHz (Normal Run Mode), 60 µA/MHz (Idle Mode), 2.5 µA (Power Down, RTC on, RAM retention) and 1.5 µA (Power Down, RTC off, RAM retention)

Part No.	System							Memory				Timer				Analog			Connectivity									Security		Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer/ PWM	PWM (16-bit)	BPWM (16-bit)	RTC	EADC	DAC (12-bit)	ACMP	UART	LIN	ISO-7816-3	QSPI	I²C	USCI	SPI/ I²S	PSIO	USB FS Device Crystal-less	XOM	Tamper	Package Type	Package Size	Mass Production	EVB	MP Programmer
M252FC2AE	Cortex-M23	48	1.75	5.5	-40	105	11	4	32	8	5	4	7	-	-	3	-	-	2	1	1	1	2	1	-	-	√	√	-	TSSOP20	4.4x6.5	√	NK-M252SD	NLG-20F
M252EC2AE	Cortex-M23	48	1.75	5.5	-40	105	19	4	32	8	5	4	11	-	-	9	-	-	2	1	1	1	2	1	-	-	√	√	-	TSSOP28	4.4x9.7	√	NK-M252SD	NLG-28E
M252ZC2AE	Cortex-M23	48	1.75	5.5	-40	105	23	4	32	8	5	4	12	-	√	10	-	-	2	1	1	1	2	1	-	-	√	√	-	QFN33	5x5	√	NK-M252SD	NLG-32Z
M252LC2AE	Cortex-M23	48	1.75	5.5	-40	105	37	4	32	12	5	4	12	8	√	12	-	2	3	1	1	1	2	2	1	4	√	√	-	LQFP48	7x7	√	NK-M252SD	NLG-48L
M252SC2AE	Cortex-M23	48	1.75	5.5	-40	105	50	4	32	12	5	4	12	12	√	16	-	2	3	1	1	1	2	2	1	4	√	√	√	LQFP64	7x7	√	NK-M252SD	NLG-64S
M252ZD2AE	Cortex-M23	48	1.75	5.5	-40	105	22	4	64	12	5	4	12	12	√	10	-	2	3	1	1	1	2	2	1	4	√	√	-	QFN33	5x5	√	NK-M252SD	NLG-32Z
M252LD2AE	Cortex-M23	48	1.75	5.5	-40	105	37	4	64	12	5	4	12	12	√	12	-	2	3	1	1	1	2	2	1	4	√	√	-	LQFP48	7x7	√	NK-M252SD	NLG-48L
M252SD2AE	Cortex-M23	48	1.75	5.5	-40	105	50	4	64	12	5	4	12	12	√	16	-	2	3	1	1	1	2	2	1	4	√	√	√	LQFP64	7x7	√	NK-M252SD	NLG-64S
M252LE3AE	Cortex-M23	48	1.75	5.5	-40	105	37	4	128	16	8	4	12	12	√	12	-	2	3	1	1	1	2	3	1	8	√	√	-	LQFP48	7x7	√	NK-M252KG	NLG-48L
M252SE3AE	Cortex-M23	48	1.75	5.5	-40	105	49	4	128	16	8	4	12	12	√	16	-	2	3	1	1	1	2	3	1	8	√	√	√	LQFP64	7x7	√	NK-M252KG	NLG-64S
M252KE3AE	Cortex-M23	48	1.75	5.5	-40	105	81	4	128	16	8	4	12	12	√	16	-	2	3	1	1	1	2	3	1	8	√	√	√	LQFP128	14x14	√	NK-M252KG	NLG-128KX
M252LG6AE	Cortex-M23	48	1.75	5.5	-40	105	37	4	256	32	8	4	12	12	√	12	1	2	3	1	1	1	2	3	1	8	√	√	-	LQFP48	7x7	√	NK-M252KG	NLG-48L
M252SG6AE	Cortex-M23	48	1.75	5.5	-40	105	49	4	256	32	8	4	12	12	√	16	1	2	3	1	1	1	2	3	1	8	√	√	√	LQFP64	7x7	√	NK-M252KG	NLG-64S
M252KG6AE	Cortex-M23	48	1.75	5.5	-40	105	81	4	256	32	8	4	12	12	√	16	1	2	3	1	1	1	2	3	1	8	√	√	√	LQFP128	14x14	√	NK-M252KG	NLG-128KX

M253 Series

The Nuvoton NuMicro® M253 microcontroller based on Arm® Cortex®-M23 core runs up to 48 MHz with 128 Kbytes embedded Flash Memory and 16 Kbytes embedded SRAM. It features CAN-FD interface, crystal-less USB 2.0 full speed device and rich peripherals. The M253 series supports wide supply voltage from 1.8V ~ 5.5V and operating temperature from -40°C ~ +105°C, providing 8kV HBM ESD and 4.4kV EFT high immunity.

Target Applications: Smart Home/ Smart Home Appliances , Industrial Control/ Industrial Automation, Battery Management System
Key Features: USB 2.0 full speed device interface with up to 17 configurable endpoints, 5 virtual COM ports, and one set of CAN FD interface, supporting up to 64 bytes per message.

Part No.	System							Memory				Timer			Analog		Connectivity							Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash	APROM Flash	SRAM	PDMA	Timer (32-bit)	BPWM (16-bit)	RTC	EADC	ACMP	UART	I²C	USCI	SPI/ I²S	CAN FD	USB FS Device	USB FS Device Crystal-less	XOM	Package Type	Package Size	Mass Production	EVB	MP Programmer
M253LD3BE	Cortex-M23	48	1.75	5.5	-40	105	37	4	64	16	5	4	6	√	12	2	5	2	1	1	1	1	√	√	LQFP48	7x7	√	NK-M253LE	NLG-48L
M253ZE3BE	Cortex-M23	48	1.75	5.5	-40	105	22	4	128	16	5	4	6	√	10	2	5	2	1	1	1	1	√	√	QFN33	5x5	√	NK-M253LE	NLG-32Z
M253LE3BE	Cortex-M23	48	1.75	5.5	-40	105	37	4	128	16	5	4	6	√	12	2	5	2	1	1	1	1	√	√	LQFP48	7x7	√	NK-M253LE	NLG-48L

M254/M256/M258 Series

The NuMicro® M254/M256/M258 series is a low-power microcontroller platform based on Arm® Cortex®-M23 core using Armv8-M architecture. It runs up to 48 MHz with 64 to 256 Kbytes embedded Flash Memory, 8 to 32 Kbytes embedded SRAM, 4 Kbytes Flash loader memory (LDROM) for In-System Programming (ISP). It features COM/SEG LCD driver, capacitive touch sensing function for smart home appliance HMI, and USB 2.0 full speed device, 1.75V to 5.5V wide operating voltage, 5V I/O tolerance, and -40°C to +105°C operating temperature.

Target Applications: Handheld Meter, Thermostat, Smart Home/ Home Appliances, Industrial Control/ Industrial Automation, Temperature/ Humidity Logger

• M254 Series

Key Features: A 8x44, 6x46, 4x48 COM/SEG LCD is available on M254 series. The COM/SEG LCD driver is built-in charge-pump, supports 3 ~ 5V LCD panel, with selectable bias voltage (1/2, 1/3, 1/4) and duty (1/4, 1/6, 1/8)

Part No.	System							Memory				Timer			Analog				Connectivity									Security	Crypto	Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash	APROM Flash	SRAM	PDMA	Timer/ PWM	BPWM (16-bit)	RTC	EADC	DAC (12-bit)	ACMP	Touch Key	UART	LIN	ISO-7816-3	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	XOM	AES	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
M254MD2AE	Cortex-M23	48	1.75	5.5	-40	105	37	4	64	8	5	4	6	√	12	-	2	-	3	1	1	1	1	1	-	-	√	-	4 x 20 6 x 18 8 x 16	LQFP 44	10x10	√	NK-M256SD	-
M254SD2AE	Cortex-M23	48	1.75	5.5	-40	105	54	4	64	8	5	4	6	√	16	-	2	-	3	1	1	1	1	1	-	-	√	-	4 x 32 6 x 30 8 x 28	LQFP 64	7x7	√	NK-M256SD	NLG-64S
M254SE3AE	Cortex-M23	48	1.75	5.5	-40	105	53	4	128	16	5	4	6	√	16	-	2	-	3	1	1	1	1	1	-	-	√	-	4 x 32 6 x 30 8 x 28	LQFP 64	7x7	√	NK-M258KE	NLG-64S
M254KE3AE	Cortex-M23	48	1.75	5.5	-40	105	86	4	128	16	5	4	6	√	16	-	2	-	3	1	1	1	1	1	-	-	√	-	4 x 40 6 x 42 8 x 44	LQFP 128	14x14	√	NK-M258KE	NLG-128KX
M254SG6AE	Cortex-M23	48	1.75	5.5	-40	105	53	4	256	32	8	4	12	√	16	2	2	-	4	1	1	2	2	2	-	-	√	√	4 x 32 6 x 30 8 x 28	LQFP 64	7x7	√	NK-M258KG	NLG-64S
M254KG6AE	Cortex-M23	48	1.75	5.5	-40	105	86	4	256	32	8	4	12	√	16	2	2	-	4	1	1	2	2	2	-	-	√	√	4 x 40 6 x 42 8 x 44	LQFP 128	14x14	√	NK-M258KG	NKG-128KX

• M256 Series

Key Features: Supports 8x44, 6x46, 4x48 COM/SEG LCD driver and capacitive touch sensing function, intergrated up to 14 touch-keys with single-scan or programmable periodic key-scans.

Part No.	System							Memory				Timer			Analog				Connectivity									Security	Crypto	Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA	Timer/ PWM	BPWM (16-bit)	RTC	EADC	DAC (12-bit)	ACMP	Touch Key	UART	LIN	ISO-7816-3	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	XOM	AES	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
M256MD2AE	Cortex-M23	48	1.75	5.5	-40	105	37	4	64	8	5	4	6	√	12	-	2	6	3	1	1	1	1	1	-	-	√	-	4 x 20 6 x 18 8 x 16	LQFP44	10x10	√	NK-M256SD	-
M256SD2AE	Cortex-M23	48	1.75	5.5	-40	105	54	4	64	8	5	4	6	√	16	-	2	14	3	1	1	1	1	1	-	-	√	-	4 x 32 6 x 30 8 x 28	LQFP64	7x7	√	NK-M256SD	NLG-64S
M256SE3AE	Cortex-M23	48	1.75	5.5	-40	105	53	4	128	16	5	4	6	√	16	-	2	14	3	1	1	1	1	1	-	-	√	-	4 x 32 6 x 30 8 x 28	LQFP64	7x7	√	NK-M258KE	NLG-64S
M256KE3AE	Cortex-M23	48	1.75	5.5	-40	105	86	4	128	16	5	4	6	√	16	-	2	15	3	1	1	1	1	1	-	-	√	-	4 x 40 6 x 42 8 x 44	LQFP128	14x14	√	NK-M258KE	NLG-128KX
M256SG6AE	Cortex-M23	48	1.75	5.5	-40	105	53	4	256	32	8	4	12	√	16	2	2	20	4	1	1	2	2	2	-	-	√	√	4 x 40 6 x 42 8 x 44	LQFP64	7x7	√	NK-M258KG	NLG-64S
M256KG6AE	Cortex-M23	48	1.75	5.5	-40	105	86	4	256	32	8	4	12	√	16	2	2	24	4	1	1	2	2	2	-	-	√	√	4 x 40 6 x 42 8 x 44	LQFP128	14x14	√	NK-M258KG	NLG-128KX

• M258 Series

Key Features: Supports 8x40, 6x42, 4x44 COM/SEG LCD driver, capacitive touch sensing function, and a crystal-less USB 2.0 full speed device with Battery Charging Detection v1.2 (BC 1.2) profile.

Part No.	System							Memory				Timer			Analog				Connectivity									Security	Crypto	Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash	APROM Flash	SRAM	PDMA	Timer/ PWM	BPWM (16-bit)	RTC	EADC	DAC (12-bit)	ACMP	Touch Key	UART	LIN	ISO-7816-3	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	XOM	AES	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
M258SE3AE	Cortex-M23	48	1.75	5.5	-40	105	49	4	128	16	5	4	6	√	16	-	2	14	3	1	1	1	1	1	1	√	√	-	8x28 6x26 4x24	LQFP 64	7x7	√	NK-M258KE	NLG-64S
M258KE3AE	Cortex-M23	48	1.75	5.5	-40	105	82	4	128	16	5	4	6	√	16	-	2	15	3	1	1	1	1	1	1	√	√	-	8x40 6x42 4x44	LQFP 128	14x14	√	NK-M258KE	NLG-128KX
M258SG6AE	Cortex-M23	48	1.75	5.5	-40	105	49	4	256	32	8	4	12	√	16	2	2	20	4	1	1	2	2	2	1	√	√	√	8x28 6x26 4x24	LQFP 64	7x7	√	NK-M258KG	NKG-64S
M258KG6AE	Cortex-M23	48	1.75	5.5	-40	105	82	4	256	32	8	4	12	√	16	2	2	24	4	1	1	2	2	2	1	√	√	√	8x40 6x42 4x44	LQFP 128	14x14	√	NK-M258KG	NLG-128KX

M261/M262/M263 Series

The NuMicro® M261/M262/M263 series is a low-power microcontroller platform based on Arm® Cortex®-M23 core for Arm®v8-M architecture. It runs up to 64 MHz with 512 Kbytes embedded Flash memory in dual bank mode supporting Over-The-Air (OTA) firmware update and 96 Kbytes embedded SRAM. It also supports low supply voltage from 1.8V ~ 3.6V and operating temperature range from -40°C ~ +105°C.

Target Applications: Smart Door Lock, Fingerprint Card, Smart Home Appliances, Smart Building, Wireless Sensor Node Devices, Smart Metering, Mobile Data Loggers, Handheld Medical Devices
Key Features: 512 Kbytes Flash in dual bank mode for OTA, USB 2.0 full speed OTG, CAN Bus 2.0B, SDHC 2.0, Secure Boot function, Hardware Crypto Engine, one 16-channel 12-bit 3.76 Msps SAR ADC, two 12-bit 1 Msps DAC, two rail-to-rail analog comparators (ACMP), Low power consumption: 97 µA/MHz (LDO mode), 45 µA/MHz (DC-DC mode) in Normal Run Mode, 2.8 µA in Standby Power-down Mode, and less than 2 µA in Deep Power-down Mode.

Part No.	System							Memory				Timer						Analog			Connectivity												Security			Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash	APROM Flash	SRAM	PDMA	Timer/ PWM	BPWM (16-bit)	EPWM (16-bit)	QEI	ECAP	RTC	EADC	DAC (12-bit)	ACMP	LIN	LPUART	ISO-7816-3	QSPI	I²C	USCI	SPI/ I²S	I²S	CAN	SDHC	USB FS OTG	EBI	TRNG	XOM	Tamper	Crypto	Package Type	Package Size	Mass Production	EVB	MP Programmer
M261KIAAE	Cortex-M23	64	1.8	3.6	-40	105	107	4	512	96	16	4	12	12	2	2	√	16	2	2	2	6	3	1	3	2	4	1	-	1	-	√	√	√	6	√	LQFP128	14x14	√	NK-M263KI	NLG-128KX
M261SIAAE	Cortex-M23	64	1.8	3.6	-40	105	51	4	512	96	16	4	12	12	2	1	√	16	2	2	2	6	3	1	3	2	4	1	-	1	-	√	√	√	1	√	LQFP64	7x7	√	NK-M263KI	NLG-64S
M261ZIAAE	Cortex-M23	64	1.8	3.6	-40	105	25	4	512	96	16	4	12	12	1	-	√	9	2	2	2	6	3	1	3	2	3	1	-	1	-	-	√	√	-	√	QFN33	5x5	√	NK-M263KI	NLG-32Z
M262KIAAE	Cortex-M23	64	1.8	3.6	-40	105	107	4	512	96	16	4	12	12	2	2	√	16	2	2	2	6	3	1	3	2	4	1	-	1	1	√	√	√	6	√	LQFP128	14x14	√	NK-M263KI	NLG-128KX
M262SIAAE	Cortex-M23	64	1.8	3.6	-40	105	51	4	512	96	16	4	12	12	2	1	√	16	2	2	2	6	3	1	3	2	4	1	-	1	1	√	√	√	1	√	LQFP64	7x7	√	NK-M263KI	NLG-64S
M262ZIAAE	Cortex-M23	64	1.8	3.6	-40	105	25	4	512	96	16	4	12	12	1	-	√	9	2	2	2	6	3	1	3	2	3	1	-	1	1	-	√	√	-	√	QFN33	5x5	√	NK-M263KI	NLG-32Z
M263KIAAE	Cortex-M23	64	1.8	3.6	-40	105	107	4	512	96	16	4	12	12	2	2	√	16	2	2	2	6	3	1	3	2	4	1	1	1	1	√	√	√	6	√	LQFP128	14x14	√	NK-M263KI	NLG-128KX
M263SIAAE	Cortex-M23	64	1.8	3.6	-40	105	51	4	512	96	16	4	12	12	2	1	√	16	2	2	2	6	3	1	3	2	4	1	1	1	1	√	√	√	1	√	LQFP64	7x7	√	NK-M263KI	NLG-64S
M263ZIAAE	Cortex-M23	64	1.8	3.6	-40	105	25	4	512	96	16	4	12	12	1	-	√	9	2	2	2	6	3	1	3	2	3	1	1	1	1	-	√	√	-	√	QFN33	5x5	√	NK-M263KI	NLG-32Z

NUC1262/NUC1263 Series

The NuMicro® NUC1262/NUC1263 series 32-bit microcontroller is based on Arm® Cortex®-M23 core for Armv8-M architecture, running up to 72 MHz and features up to 128 Kbytes of Flash, 20 Kbytes of SRAM. With LED Light Strip Interface (LLSI), I3C, and crystal-less USB2.0 full-speed device make it an ideal solution for PC accessories and industrial control applications. It can support 2.5V to 5.5V operating voltage and -40°C to +105°C operating temperature.

Target Applications: Sensor hub, gaming peripherals, DDR5 DIMM module, VGA card
Key Features: 20 KB SRAM, up to 2 sets of 1V I3C, up to 24 channel PWM outputs, up to 11 channels of LED Light stripe Control interface (LLSI), 50 mA high sink current pins, up to 4 channels of 8-bit 200 ksps DAC, up to 16 channels of 12-bit 800 ksps ADC, up to 4 sets of analog comparators (ACMP)

• NUC1262 Series

The NuMicro® NUC1262 series is based on the Arm® Cortex®-M23 core with Arm®v8-M architecture. It runs up to 72 MHz and incorporates 128 Kbytes of Flash memory and 20 Kbytes of SRAM. It features LED Light Strip Interface (LLSI), USB2.0 full-speed device using built-in 48 MHz oscillator for communication with PC and Mobile accessories. It supports 2.5V ~ 5.5V wide operating voltage and works in operating temperature from -40°C to +105°C.

Key Features: Up to 10-channel LED Light Strip Interface (LLSI), Up to 24-channel 72 MHz BPWM, 8-channel 800 ksps ADC,10-channel PDMA.

Part No.	System							Memory						Timer						Analog	Connectivity							Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash(KB)	SRAM(KB)	PDMA(ch)	WDT	WWDT	Timer/ PWM	BPWM(16-bit)	RTC	ADC(12-bit)	LLSI	UART	I²C	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	SPROM(B)	Package Type	Package Size	Mass Production	Evaluation Board (Ordering No.)	Mass Production Programmer
NUC1262NE4AE	Cortex-M23	72	2.5	5.5	-40	105	38	4	128	Configurable	20	10	√	√	4	24	-	8	8	2	2	2	1	√	2048	QFN48	7x7	√	NK-NUC1262SE	NLG-NUC126N
NUC1262LE4AE	Cortex-M23	72	2.5	5.5	-40	105	38	4	128	Configurable	20	10	√	√	4	24	-	8	8	2	2	2	1	√	2048	LQFP48	7x7	√	NK-NUC1262SE	NLG-NUC126L
NUC1262SE4AE	Cortex-M23	72	2.5	5.5	-40	105	50	4	128	Configurable	20	10	√	√	4	24	-	8	10	2	2	2	1	√	2048	LQFP64	7x7	√	NK-NUC1262SE	NLG-NUC126S
NUC1262YE4AE	Cortex-M23	72	2.5	5.5	-40	105	38	4	128	Configurable	20	10	√	√	4	24	-	8	8	2	2	2	1	√	2048	QFN48	5x5	√	NK-NUC1262SE	NLG-NUC126Y

• NUC1263 Series

The NuMicro® NUC1263 series is based on the Arm® Cortex®-M23 core with Arm®v8-M architecture. It runs up to 72 MHz and incorporates 64 Kbytes of Flash memory and 20 Kbytes of SRAM. It features I^3C interface, LED Light Strip Interface (LLSI), USB2.0 full-speed device using built-in 48 MHz oscillator for communication with PC and Mobile accessories, 4 sets of ACMP and 4 sets of DAC. It supports 2.5V ~ 5.5V wide operating voltage and works in operating temperature from -40°C to +105°C .

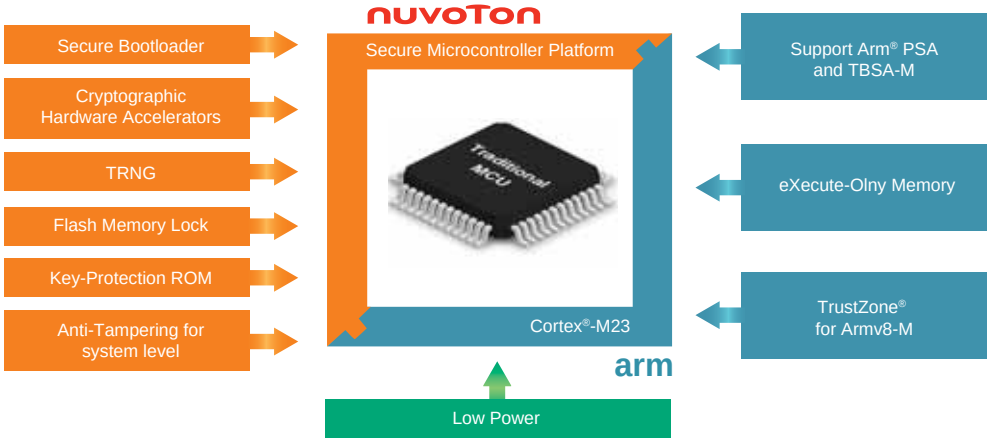
Key Features: Up to 6-channel LED Light Strip Interface (LLSI), Up to 24-channel 144 MHz BPWM, 16-channel 800 ksps ADC, 10-channel PDMA.

Part No.	System							Memory						Timer						Analog			Connectivity								Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer/ PWM	BPWM (16-bit)	RTC	ADC (12-bit)	ACMP	DAC	I²C	LLSI	UART	I²C	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	SPROM(B)	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC1263ZD4CE	Cortex-M23	72	2.5	5.5	-40	105	22	4	64	Configurable	20	10	√	√	4	24	-	16	4	4	2	6	3	3	3	1	√	2048	QFN 33	5x5	2023 Q2	NK-NUC1263S	NLG-NUC126Z
NUC1263ND4CE	Cortex-M23	72	2.5	5.5	-40	105	36	4	64	Configurable	20	10	√	√	4	24	-	16	4	4	2	6	3	3	3	1	√	2048	QFN 48	7x7	2023 Q2	NK-NUC1263S	NLG-NUC126N
NUC1263LD4CE	Cortex-M23	72	2.5	5.5	-40	105	36	4	64	Configurable	20	10	√	√	4	24	-	16	4	4	2	6	3	3	3	1	√	2048	LQFP 48	7x7	2023 Q2	NK-NUC1263S	NLG-NUC126L
NUC1263SD4CE	Cortex-M23	72	2.5	5.5	-40	105	49	4	64	Configurable	20	10	√	√	4	24	-	16	4	4	2	6	3	3	3	1	√	2048	LQFP 64	7x7	2023 Q2	NK-NUC1263S	NLG-NUC126S

M2351 Series

The rise of the internet of things (IoT) era has increased awareness for the integration of physical worlds into digital systems. While the digitization of our everyday lives leads to efficiency improvements and economic benefits, it has also caused pressure on system designers who are now required to come up with innovative IoT products capable of performing secure connection and data exchange with low power consumption. Since security and power consumption are both key requirements for IoT applications, Nuvoton has developed the NuMicro® M2351 Series, which excels in supporting the proliferation of intelligent connected devices. The NuMicro® M2351 microcontroller series is based on the Arm® Cortex®-M23 core with TrustZone® for Armv8-M architecture, which elevates the traditional firmware security to a new level of robust hardware security.

The low power M2351 series microcontroller operates at up to 64 MHz, with up to 512 Kbytes Flash in dual bank mode, supporting secure firmware Over-The-Air (OTA) update and up to 96 Kbytes SRAM. Furthermore, the M2351 series also provides high-performance connectivity peripheral interfaces such as UART, SPI, I²C, GPIOs, USB and ISO 7816-3 for smart card readers. Its secure and efficient power management features strengthen the innovation of IoT security.



*For more information, please visit https://m2351.nuvoton.com

Target Applications: Smart Door Lock, Fingerprint Card, Smart Home Appliances, Smart Building, Wireless Sensor Node Devices, Smart Metering, Mobile Data Loggers, Digital Currency Authentication

Key Features: TrustZone® for Armv8-M Technology, 8 regions MPU_NS (for non-secure world) and 8 regions MPU_S (for secure world), Hardware Crypto Accelerators, CRC calculation unit, Up to 6 tamper detection pins, Arm® Platform Security Architecture (PSA) and Trusted Base System Architecture-M (TBSA-M) supported, Multiple power modes.

Part No.	System									Memory				Timer					Analog				Connectivity													Security		Crypto	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	ETM	V_{BAT}	LDROM Flash (KB)	APROM Flash (KB)	Secure Flash (KB)	SRAM (KB)	PDMA (ch)	Timer/ PWM	BPWM (16-bit)	EPWM (16-bit)	QEI	ECAP	EADC	DAC (12-bit)	ACMP	LPUART	ISO-7816-3	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	USB FS OTG	EBI	TRNG	Tamper	AES/DES/3DS/SHA/ECC	Package Type	Package Size	Mass Production	EVB	MP Programmer
M2351CIAAE	Cortex-M23	64	1.7	3.6	-40	105	41	-	-	4	512	-	96	16	4	12	12	2	1	16	2	2	6	3	1	3	2	3	1	1	1	√	√	-	√	WLCSP 49	3.0x 3.0	√	NK-BEDM 2351	-
M2351KIAAE	Cortex-M23	64	1.7	3.6	-40	105	107	√	√	4	512	-	96	16	4	12	12	2	2	16	2	2	6	3	1	3	2	4	1	1	1	√	√	6	√	LQFP 128	14x 14	√	NK-BEDM 2351	NLG-128KX
M2351SFSIAAE	Cortex-M23	64	1.7	3.6	-40	85	45	-	√	4	512	4096	96	16	4	12	12	2	1	16	2	2	6	3	-	3	2	4	1	1	1	√	√	1	√	LQFP 64	7x7	√	NK-M2351 SF	NLG-64S
M2351SIAAE	Cortex-M23	64	1.7	3.6	-40	105	51	-	√	4	512	-	96	16	4	12	12	2	1	16	2	2	6	3	1	3	2	4	1	1	1	√	√	1	√	LQFP 64	7x7	√	NK-BEDM 2351	NLG-64S
M2351ZIAAE	Cortex-M23	64	1.7	3.6	-40	105	25	-	-	4	512	-	96	16	4	12	11	1	-	10	2	2	6	3	1	3	2	3	1	1	1	-	√	-	√	QFN 33	5x5	√	NK-BEDM 2351	NLG-32Z

M2354 Series

NuMicro® M2354 series microcontrollers are based on Arm® Cortex®-M23. In addition to the built-in TrustZone® technology of the Armv8-M architecture, it also adds protection functions against side-channel attacks to cryptographic hardware accelerators as well as fault injection attacks of voltage and clock pin surges. Furthermore, M2354 Series has implemented the microcontroller platform security hardware features, including debug port management (Debug Port Management), product life cycle management (Product Lifecycle Management), Firmware Version Counter and a Secure Key storage area with chip physical level security, allowing the microcontroller application system to easily realize data storage security, software execution security and message communication security.

The M2354 series of microcontrollers can run at a frequency of up to 96 MHz, built-in 1 MBytes dual-bank architecture Flash Memory, can support real-time memory re-map to execute the updated firmware version after a successful firmware over-the-air update (Secure FOTA Update).

Target Applications: Smart Door Lock, Fingerprint Card, Smart Home Appliances, Smart Building, Wireless Sensor Node Devices, Smart Metering, Mobile Data Loggers, Digital Currency Authentication, Mobile Payment Facilities

Key Features: Tamper-resistant key storage in Flash and SRAM, Up to 8 Com. x 40 Seg. LCD controller, TrustZone for Armv8-M Technology, 8 regions MPU_NS (for normal world) and 8 regions MPU_S (for secure world), Hardware Crypto Accelerators, CRC calculation unit, Up to 6 tamper detection pins, Arm Platform Security Architecture (PSA Certified Level 2 /Level 3) supported, Multiple power mode.

Part No.	System									Memory				Timer			Analog		Connectivity											Security			Crypto	Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	ETM	V_{BAT}	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer/ PWM	BPWM (16-bit)	EPWM (16-bit)	EADC	DAC (12-bit)	LPUART	ISO-7816-3	QSPI	I²C	USCI	SPI/ I²S	CAN	SDHC	USB FS OTG	EBI	TRNG	Tamper	Key Store	AES/ECC/SRA/ SM2/3/4	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
M2354KJFAE	Cortex-M23	96	1.7	3.6	-40	105	106	√	√	16	1024	256	16	4	12	12	16	2	6	3	1	3	2	4	1	1	1	√	√	6	√	√	8x40	LQFP128	14x14	√	NK-BEDM2354	NLG-128KX
M2354LJFAE	Cortex-M23	96	1.7	3.6	-40	105	40	-	-	16	1024	256	16	4	12	12	11	2	6	3	1	3	2	3	1	1	1	√	√	1	√	√	-	LQFP48	7x7	√	NK-BEDM2354	NLG-48L
M2354SJFAE	Cortex-M23	96	1.7	3.6	-40	105	50	-	√	16	1024	256	16	4	12	12	16	2	6	3	1	3	2	4	1	1	1	√	√	1	√	√	8X13	LQFP64	7x7	√	NK-BEDM2354	NLG-64S

NuMicro® Family Arm® Cortex® - M7 Microcontroller

The KM1M7 series is a 32-bit flash microcontroller equipped with Arm® Cortex®-M7, which features both high processing power and low power consumption.

Equipped with high-performance PWM, high-speed / high-precision AD converter, and feedback control assist function that are ideal for motor control / digital power supply control, it contributes to the creation of high-efficiency / low heat generation / miniaturization power management systems.

KM1M7A/KM1M7C Digital Power Control Series

KM1M7 Series MCU is a 32-bit MCU with Arm® Cortex® M7, which have a good balance between high speed processing ability and low power consumption.

High speed/high-precision analog functions and assist functions are embedded, which can satisfy the request of power control.

This series has communication functions such as CAN and SM-BUS necessary for power supply control.

They can contribute to the power management system which needs high-efficiency, super low-power consumption and miniaturization

• KM1M7AFxx

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I-RAM (KB)	I/O	Timer (16-bit)	Power control PWM	Connectivity						ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
									Clock synchronous	UART	SPI	I²C	SM-Bus	CAN	Channel	Unit							
KM1M7AF52N	160	512	64	64	64	82	20	10	7	6	3	2	-	2	23	3	10	2	5	5	v	v	HQFP100 (14x14)
KM1M7AF50N	160	512	64	64	64	123	20	12	8	7	3	2	1	2	32	3	10	2	5	5	v	v	HQFP144 (20x20)

• KM1M7CFxx

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I-RAM (KB)	I/O	Timer (16-bit)	Power control PWM	RTC	Connectivity						ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
										Clock synchronous	UART	SPI	I²C	SM-Bus	CAN	Channel	Unit							
KM1M7CF06N	160	512	64	32	64	24	14	3	1	7	7	7	2	1	1	11	3	7	6	v	v	-	-	TQFP32 (7x7)
KM1M7CF05N	160	512	64	32	64	38	14	5	1	7	7	7	2	1	1	16	3	12	10	v	v	-	-	TQFP48 (7x7)
KM1M7CF04N	160	512	64	32	64	52	14	6	1	7	7	7	2	1	1	18	3	12	12	v	v	-	-	TQFP64 (10x10)
KM1M7CF03N	160	512	64	32	64	68	14	8	1	7	7	7	2	1	1	26	3	12	12	v	v	-	-	TQFP80 (12x12)
KM1M7CF16N	160	512	64	32	64	24	14	3	1	7	7	7	2	1	1	11	3	7	6	v	v	v	v	TQFP32 (7x7)
KM1M7CF15N	160	512	64	32	64	38	14	5	1	7	7	7	2	1	1	16	3	12	10	v	v	v	v	TQFP48 (7x7)
KM1M7CF14N	160	512	64	32	64	52	14	6	1	7	7	7	2	1	1	18	3	12	12	v	v	v	v	TQFP64 (10x10)
KM1M7CF13N	160	512	64	32	64	68	14	8	1	7	7	7	2	1	1	26	3	12	12	v	v	v	v	TQFP80 (12x12)

KM1M7B Inverter Control Series

KM1M7 Series MCU is a 32-bit MCU with Arm® Cortex® M7, which have a good balance between high speed processing ability and low power consumption.

High speed/high-precision analog functions and assist functions are embedded, which can satisfy the request of motor control.

Accessing EEPROM becomes more efficient by using RWW(Read While Write) flash.

They can contribute to the power management system which needs high-efficiency, super low-power consumption and miniaturization.

• KM1M7BFxx

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I-RAM (KB)	I/O	Timer (16-bit)	Power control PWM	Connectivity					ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
									Clock synchronous	UART	SPI	I²C	SM-Bus	Channel	Unit							
KM1M7BF02K	160	256	32	64	64	82	20	10	7	6	3	2	-	23	3	10	2	5	5	v	v	HQFP100 (14x14)
KM1M7BF02M	160	384	48	64	64	82	20	10	7	6	3	2	-	23	3	10	2	5	5	v	v	HQFP100 (14x14)
KM1M7BF02N	160	512	64	64	64	82	20	10	7	6	3	2	-	23	3	10	2	5	5	v	v	HQFP100 (14x14)
KM1M7BF00K	160	256	32	64	64	123	20	12	8	7	3	2	1	32	3	10	2	5	5	v	v	HQFP144 (20x20)
KM1M7BF00M	160	384	48	64	64	123	20	12	8	7	3	2	1	32	3	10	2	5	5	v	v	HQFP144 (20x20)
KM1M7BF00N	160	512	64	64	64	123	20	12	8	7	3	2	1	32	3	10	2	5	5	v	v	HQFP144 (20x20)

NuMicro® Automotive Family

The NuMicro® Automotive/CAN microcontroller is a new microcontroller product line qualified by AEC-Q100, with built-in Controller Area Network(CAN) 2.0B interface that designed for automotive applications.

Target Applications: Reverse Parking Assistanc, Automotive lighting, Body control module, Head Up Display, etc.

NuMicro® CAN/Automotive series MCUs are composed of the following product series.
M0A21/M0A23 Series: Qualified by AEC-Q100 grade 1, up to 125°C, 48 MHz, up to 32KB Flash, CAN/LIN interface, PDMA, DAC, ACMP
NUC131U Series: Qualified by AEC-Q100 grade 2, up to 105°C, 50 MHz, up to 68KB Flash, CAN/LIN interface, up to 6 UART

M0A23 CAN Series

NuMicro® M0A23 is based on the Arm® Cortex®-M0 core and designed for automotive applications, provides up to 32 KB Flash, 4 KB SRAM, CAN/LIN interface and high reliability with the capability of withstanding up to 125°C ambient temperature.

Target Applications: Automotive, Lighting, Industrial Communication, Industrial Automation, Power Control, etc.
Key Features: Hardware Divider, up to 125°C, LIN/CAN interface, PDMA, UART with the One-Wire

Part No.	System								Memory						Timer		Analog				Connectivity				Package		Status	Tool		Certification
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	Temperature Sensor	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	ADC (12-bit)	DAC (5-bit)	ACMP	Internal Voltage Reference	UART	LIN	USCI	CAN	Package Type	Package Size	Mass Production	EVB	MP Programmer	AEC-Q100
M0A23OC1ACU	Cortex-M0	48	2.4	5.5	-40	125	18	√	2	32	Configurable	4	5	4	6	17	1	2	√	2	2	2	1	SSOP20	5.3x7.2	-	NK-M0A23OC	NLG-M0A21O	Grade 1
M0A23EC1ACU	Cortex-M0	48	2.4	5.5	-40	125	26	√	2	32	Configurable	4	5	4	6	17	1	2	√	2	2	2	1	TSSOP28	4.4x9.7	√	NK-M0A23EC	NLG-M0A21E	Grade 1
M0A23OC1AC	Cortex-M0	48	2.4	5.5	-40	125	18	√	2	32	Configurable	4	5	4	6	17	1	2	√	2	2	2	1	SSOP20	5.3x7.2	√	NK-M0A23OC	NLG-M0A21O	-
M0A23EC1AC	Cortex-M0	48	2.4	5.5	-40	125	26	√	2	32	Configurable	4	5	4	6	17	1	2	√	2	2	2	1	TSSOP28	4.4x9.7	√	NK-M0A23EC	NLG-M0A21E	-

M2A23 CAN FD Series

The NuMicro® M2A23 is an automotive-grade microcontroller platform with an operating temperature range of -40°C to 125°C, an operating voltage of 2.4V to 5.5V, and up to 3 sets of CAN FD functionality. It is based on the Arm® Cortex®-M23 core, running up to 72 MHz, and includes a single-cycle hardware multiplier/divider. It features up to 256 Kbytes of Flash memory and 24 Kbytes of SRAM. The dual-bank design of the 256 Kbytes Flash memory supports firmware updates via the Over-The-Air (FOTA) process and includes function safety protection features designed for automotive applications.

Target Applications: Automotive, Lighting, Industrial Communication, Industrial Automation, Power Control, etc.

Key Features: 72MHz, up to 125°C, CAN FD x3/LIN interface, AEC-Q100, Dual Bank

Part No.	System								Memory					Timer		Analog		Connectivity							Package		Status	Tool		Certification
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	Temperature Sensor	LDROM Flash (KB)	APROM Flash (KB)	Data Flash	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	ADC (12-bit)	ACMP	CAN-FD	LIN	UART	USCI	I²C	SPI	Package Type	Package Size	Mass Production	EVB	MP Programmer	AEC-Q100
M2A23SE5AC	Cortex-M23	72	2.4	5.5	-40	125	55	√	4	128	Configurable	24	6	4	12	16	2	3	1	2	2	1	1	LQFP64	7x7	24Q3	NK-M2A23SG	NLG-64S	-
M2A23LE5AC	Cortex-M23	72	2.4	5.5	-40	125	42	√	4	128	Configurable	24	6	4	12	16	2	3	1	2	2	1	1	LQFP48	7x7	24Q3	NK-M2A23SG	NLG-48L	-
M2A23SG5AC	Cortex-M23	72	2.4	5.5	-40	125	55	√	4	256	Configurable	24	6	4	12	16	2	3	1	2	2	1	1	LQFP64	7x7	24Q3	NK-M2A23SG	NLG-64S	-
M2A23SG5AC	Cortex-M23	72	2.4	5.5	-40	125	55	√	4	256	Configurable	24	6	4	12	16	2	3	1	2	2	1	1	LQFP64	7x7	24Q3	NK-M2A23SG	NLG-64S	-
M2A23LG5AC	Cortex-M23	72	2.4	5.5	-40	125	42	√	4	256	Configurable	24	6	4	12	16	2	3	1	2	2	1	1	LQFP48	7x7	24Q3	NK-M2A23SG	NLG-48L	-
M2A23YG5AC	Cortex-M23	72	2.4	5.5	-40	125	42	√	4	256	Configurable	24	6	4	12	16	2	3	1	2	2	1	1	QFN48	5x5	24Q3	NK-M2A23SG	NLG-48Y	-

NUC131U Series

The NUC131SD2AEU/NUC131LD2AEU is a 32-bit ARM® Cortex®-M0 based microcontroller running up to 50 MHz with 68 KB Flash, 8 KB SRAM, and 4 KB ISP ROM, built-in Controller Area Network (CAN) 2.0 B interface, qualified by AEC-Q100 grade 2, designed for automotive, industrial control applications which needs reliable and robust CAN communication.

Target Applications: Elevator, Motor Control, BMS, Charger, CAN Module
Key Features: Hardware Divider, LIN/CAN interface, 6 sets of UART, 24-channel 100 MHz PWM

Part No.	System							Memory				Timer		Analog	Connectivity						Package		Status	Tool		Certification
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	Timer (32-bit)	PWM (16-bit)	ADC (12-bit)	UART	LIN	SPI	I²C	CAN	Package Type	Package Size	Mass Production	EVB	MP Programmer	AEC-Q100
NUC131LD2AEU	Cortex-M0	50	2.5	5.5	-40	105	42	4	68	Configurable	8	4	12	8	6	3	1	2	1	LQFP 48	7x7	√	NK-NUC131U	NLG-NUC131L	Grade 2
NUC131SD2AEU	Cortex-M0	50	2.5	5.5	-40	105	56	4	68	Configurable	8	4	12	8	6	3	1	2	1	LQFP 64	7x7	√	NK-NUC131U	NLG-NUC131S	Grade 2

NuMicro® Family Arm® Cortex®-M0 Microcontrollers

As one of the leading Microcontroller (MCU) companies in the world, Nuvoton provides the state-of-the–art NuMicro® 32-bit MCU family powered by the ARM® Cortex®-M0 core. The Cortex®-M0 MCUs provide wide operating voltage (1.8V~3.6V,2.5V-5.5V), industrial temperature (-40°C-105°C), high accuracy oscillator and high immunity (8kV ESD, 4kV EFT).

The Cortex®-M0 MCU family includes Industrial control 1.8V M031 series, 5V NUC029 series, NUC121/123/125/126 series with USB 2.0 FS device, NUC131/230/240 series with Controller Area Network (CAN) bus, Mini51 and M051 series for value solutions and ultra-low power solution Nano100 series(1.8V-3.6V), targeting at battery powered applications. They are ideal solutions for industrial control systems, industrial automation, consumer products, embedded network control, energy, power systems and motor control.

M029G/M030G/M031G Series

The NuMicro® M029G/M030G/M031G series is an Optical Transceiver Module specific microcontroller platform based on Arm® Cortex®-M0 core with 32-bit hardware multiplier/divider. It runs up to 48/72 MHz with 32/64 Kbytes embedded Flash Memory, 2/4/8 Kbytes embedded SRAM, 2 Kbytes Flash loader memory (LDROM) for In-System Programming (ISP). It features Hardware Manchester Codec (M031G series) and DAC with automatic data generation function (M031G series) for pilot tone signal, plentiful analog peripheral including 12-bit DAC and up to 2MSPS 12-bit ADC, built-in temperature sensor, small package, QFN24 and QFN33, and I²C with 400 KHz/1 MHz of slave mode for general Optical Transceiver Module application, 2.7V to 3.6V operating voltage, 5V I/O tolerance, and -40°C to +105°C operating temperature.

Specific Applications: Optical Transceiver. Also suitable for small size applications requiring analog circuit, such as Power Module, Small Screen, Pico Projector, Small Appliance, Wearable Device, Sensor, etc.

• M029G/M030G Series

Key Features: Build-in Temperature Sensor, 400 KHz(M029G)/ 1 MHz(M030G) Slave Mode I²C, QFN24/33 Small Form Factor Package

Part No.	System									Memory					Clock			Timer		Analog			Connectivity			Package		Status	Tool	
	Core	Operating Frequency (MHz)	CRC	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	Temperature Sensor Accuracy (°C)	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	LIRC (kHz)	HIRC (MHz)	PLL (MHz)	Timer (32-bit)	BPWM (16-bit)	ADC (12-bit)	DAC (12-bit)	Internal Voltage Reference	UART	I²C	SPI/ I²S	Package Type	Package Size	Mass Production	EVB	MP Programmer
M029GGC0AE	Cortex-M0	48	√	2.7	3.6	-40	105	19	±2	2	32	Configurable	2	5	38.4	48	-	2	6	11	2	√	1	2	1	QFN24	3x3	-	NK-M029GGC	NLG-M031GG
M030GGC1AE	Cortex-M0	48	√	2.7	3.6	-40	105	19	±2	2	32	Configurable	4	5	38.4	48	-	2	6	11	4	√	1	2	1	QFN24	3x3	√	NK-M030GTD	NLG-M031GG
M030GGD1AE	Cortex-M0	48	√	2.7	3.6	-40	105	19	±2	2	64	Configurable	4	5	38.4	48	-	2	6	11	4	√	1	2	1	QFN24	3x3	√	NK-M030GTD	NLG-M031GG
M030GTC1AE	Cortex-M0	48	√	2.7	3.6	-40	105	28	±2	2	32	Configurable	4	5	38.4	48	-	2	6	16	4	√	1	2	1	QFN33	4x4	√	NK-M030GTD	NLG-M031GT
M030GTD1AE	Cortex-M0	48	√	2.7	3.6	-40	105	28	±2	2	64	Configurable	4	5	38.4	48	-	2	6	16	4	√	1	2	1	QFN33	4x4	√	NK-M030GTD	NLG-M031GT

• M031G Series

Key Features: Hardware Manchester Codec, 1 set of DAC with Auto Data Generation Function, Build-in Temperature Sensor, 1MHz Slave Mode I²C, QFN24/33 Small Form Factor Package

Part No.	System									Memory					Clock			Timer		Analog			Connectivity			Package		Status	Tool		Others	
	Core	Operating Frequency (MHz)	CRC	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	Temperature Sensor Accuracy (°C)	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	LIRC (kHz)	HIRC (MHz)	PLL (MHz)	Timer (32-bit)	BPWM (16-bit)	ADC (12-bit)	DAC (12-bit)	Internal Voltage Reference	UART	I²C	SPI/ I²S	Package Type	Package Size	Mass Production	EVB	MP Programmer	DAC Auto Data Generation	Hardware Manchester Codec
M031GGC2AE	Cortex-M0	72	√	2.7	3.6	-40	105	19	±2	2	32	Configurable	8	7	38.4	48	144	6	6	11	4	√	1	2	1	QFN24	3x3	√	NK-M031GTD	NLG-M031GG	√	√
M031GGD2AE	Cortex-M0	72	√	2.7	3.6	-40	105	19	±2	2	64	Configurable	8	7	38.4	48	144	6	6	11	4	√	1	2	1	QFN24	3x3	√	NK-M031GTD	NLG-M031GG	√	√
M031GTC2AE	Cortex-M0	72	√	2.7	3.6	-40	105	28	±2	2	32	Configurable	8	7	38.4	48	144	6	6	16	4	√	1	2	1	QFN33	4x4	√	NK-M031GTD	NLG-M031GT	√	√
M031GTD2AE	Cortex-M0	72	√	2.7	3.6	-40	105	28	±2	2	64	Configurable	8	7	38.4	48	144	6	6	16	4	√	1	2	1	QFN33	4x4	√	NK-M031GTD	NLG-M031GT	√	√

M031 Series

The NuMicro® M031 series is based on the Arm® Cortex®-M0 core, designed for 1.8V to 3.6V industrial applications. It features high performance and plenty of peripherals, such as 2 Msps ADC and up to 144 MHz PWM. It also supports IEC-60730 safety specifications. The M031 series supports built-in 16 to 512 Kbytes Flash and 2 to 96 Kbytes SRAM.

Target Applications: Industrial Control, High-Precision Meter, Wireless Charger, HMI, IoT Node Device, Security System, Motor Control, Communication System, etc.

Key Features: Configurable up to 10 UART, 144 MHz PWM, 2 Msps ADC, 24 MHz SPI, 1-wire UART, OTA, SPROM.

Part No.	System							Memory				Timer				Analog		Connectivity								Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	RTC	ADC (12-bit)	ACMP	UART	QSPI	I²C	SMBUS (Supported by I2C)	USCI	SPI/ I²S	EBI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
M031FB0AE	Cortex-M0	48	1.8	3.6	-40	105	15	2	16	2	-	2	6	-	-	7	-	3	-	2	-	-	1	-	512	TSSOP20	4.4x6.5	√	NK-M031TB	NLG-20F
M031EB0AE	Cortex-M0	48	1.8	3.6	-40	105	23	2	16	2	-	2	6	-	-	9	-	3	-	2	-	-	1	-	512	TSSOP28	4.4x9.7	√	NK-M031TB	NLG-28E
M031TB0AE	Cortex-M0	48	1.8	3.6	-40	105	27	2	16	2	-	2	6	-	-	10	-	3	-	2	-	-	1	-	512	QFN33	4x4	√	NK-M031TB	NLG-32T
M031FC1AE	Cortex-M0	48	1.8	3.6	-40	105	15	2	32	4	2	4	6	-	-	7	-	3	-	2	-	-	1	-	512	TSSOP20	4.4x6.5	√	NK-M031TC	NLG-20F
M031EC1AE	Cortex-M0	48	1.8	3.6	-40	105	23	2	32	4	2	4	6	-	-	9	-	3	-	2	-	-	1	-	512	TSSOP28	4.4x9.7	√	NK-M031TC	NLG-28E
M031TC1AE	Cortex-M0	48	1.8	3.6	-40	105	27	2	32	4	2	4	6	-	-	10	-	3	-	2	-	-	1	-	512	QFN33	4x4	√	NK-M031TC	NLG-32T
M031LC2AE	Cortex-M0	48	1.8	3.6	-40	105	42	2	32	8	5	4	12	-	-	12	2	3	-	2	-	1	1	-	512	LQFP48	7x7	√	NK-M031SD	NLG-48L
M031SC2AE	Cortex-M0	48	1.8	3.6	-40	105	55	2	32	8	5	4	12	-	-	16	2	3	-	2	-	1	1	-	512	LQFP64	7x7	√	NK-M031SD	NLG-64S
M031TD2AE	Cortex-M0	48	1.8	3.6	-40	105	27	2	64	8	5	4	12	-	-	10	2	3	-	2	-	1	1	-	512	QFN33	4x4	√	NK-M031SD	NLG-32T
M031LD2AE	Cortex-M0	48	1.8	3.6	-40	105	42	2	64	8	5	4	12	-	-	12	2	3	-	2	-	1	1	-	512	LQFP48	7x7	√	NK-M031SD	NLG-48L
M031SD2AE	Cortex-M0	48	1.8	3.6	-40	105	55	2	64	8	5	4	12	-	-	16	2	3	-	2	-	1	1	-	512	LQFP64	7x7	√	NK-M031SD	NLG-64S
M031TE3AE	Cortex-M0	48	1.8	3.6	-40	105	27	4	128	16	5	4	12	-	-	10	2	3	-	2	-	1	1	-	512	QFN33	4x4	√	NK-M031SE	NLG-32T
M031LE3AE	Cortex-M0	48	1.8	3.6	-40	105	42	4	128	16	5	4	12	-	-	12	2	3	-	2	-	1	1	√	512	LQFP48	7x7	√	NK-M031SE	NLG-48L
M031SE3AE	Cortex-M0	48	1.8	3.6	-40	105	55	4	128	16	5	4	12	-	-	16	2	3	-	2	-	1	1	√	512	LQFP64	7x7	√	NK-M031SE	NLG-64S
M031LG6AE	Cortex-M0	72	1.8	3.6	-40	105	42	4	256	32	7	4	12	12	√	12	2	6	1	2	1	2	1	√	2048	LQFP48	7x7	√	NK-M031KG	NLG-48L
M031LG8AE	Cortex-M0	72	1.8	3.6	-40	105	42	4	256	64	7	4	12	12	√	12	2	6	1	2	1	2	1	√	2048	LQFP48	7x7	√	NK-M031KG	NLG-48L
M031SG6AE	Cortex-M0	72	1.8	3.6	-40	105	55	4	256	32	7	4	12	12	√	16	2	6	1	2	1	2	1	√	2048	LQFP64	7x7	√	NK-M031KG	NLG-64S
M031SG8AE	Cortex-M0	72	1.8	3.6	-40	105	55	4	256	64	7	4	12	12	√	16	2	6	1	2	1	2	1	√	2048	LQFP64	7x7	√	NK-M031KG	NLG-64S
M031KG6AE	Cortex-M0	72	1.8	3.6	-40	105	111	4	256	32	7	4	12	12	√	16	2	6	1	2	1	2	1	√	2048	LQFP128	14x14	√	NK-M031KG	NLG-128KX
M031KG8AE	Cortex-M0	72	1.8	3.6	-40	105	111	4	256	64	7	4	12	12	√	16	2	6	1	2	1	2	1	√	2048	LQFP128	14x14	√	NK-M031KG	NLG-128KX
M031SIAAE	Cortex-M0	72	1.8	3.6	-40	105	55	8	512	96	9	4	12	12	√	16	2	8	1	-	-	2	1	√	2048	LQFP64	7x7	√	NK-M031KI	NLG-64S
M031KIAAE	Cortex-M0	72	1.8	3.6	-40	105	111	8	512	96	9	4	12	12	√	16	2	8	1	-	-	2	1	√	2048	LQFP128	14x14	√	NK-M031KI	NLG-128KX

M032 Series

The NuMicro® M032 series, embedded with the Arm® Cortex®-M0 core, is designed for 1.8V to 3.6V industrial applications. It's equipped with high performance and plenty of peripherals, such as 2 Msps ADC and up to 144 MHz PWM. It also supports IEC60730 safety specifications and crystal-less USB FS Device. Built-in 16 to 512 Kbytes Flash, 2 to 96 Kbytes SRAM.

Target Applications: Mouse, Keyboard, Gaming Monitor, HMI, IoT Node Device, Security System, Motor Control, Communication System, etc.
Key Features: Configurable up to 10 UARTs, 144 MHz PWM, 2 Msps ADC, 24 MHz SPI, Support 1-wire UART, OTA, Crystal-less USB FS device, Security Protection ROM (SPROM).

Part No.	System							Memory				Timer				Analog		Connectivity									Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	RTC	ADC (12-bit)	ACMP	UART	QSPI	I²C	SMBUS (Supported by I2C)	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	EBI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
M032FC1AE	Cortex-M0	48	1.8	3.6	-40	105	11	2	32	4	2	2	-	6	-	3	-	1	-	-	-	1	1	1	√	-	512	TSSOP20	4.4x6.5	√	NK-M032TC	NLG-20F
M032EC1AE	Cortex-M0	48	1.8	3.6	-40	105	19	2	32	4	2	2	-	6	-	9	-	1	-	-	-	1	1	1	√	-	512	TSSOP28	4.4x9.7	√	NK-M032TC	NLG-28E
M032TC1AE	Cortex-M0	48	1.8	3.6	-40	105	23	2	32	4	2	2	-	6	-	10	-	1	-	-	-	1	1	1	√	-	512	QFN33	4x4	√	NK-M032TC	NLG-32T
M032LC2AE	Cortex-M0	48	1.8	3.6	-40	105	38	2	32	8	2	4	-	12	-	12	-	1	1	-	-	2	1	1	√	-	512	LQFP48	7x7	√	NK-M032LD	NLG-48L
M032TD2AE	Cortex-M0	48	1.8	3.6	-40	105	23	2	64	8	2	4	-	12	-	10	-	1	1	-	-	2	1	1	√	-	512	QFN33	4x4	√	NK-M032LD	NLG-32T
M032LD2AE	Cortex-M0	48	1.8	3.6	-40	105	38	2	64	8	2	4	-	12	-	12	-	1	1	-	-	2	1	1	√	-	512	LQFP48	7x7	√	NK-M032LD	NLG-48L
M032LE3AE	Cortex-M0	48	1.8	3.6	-40	105	38	4	128	16	4	4	12	-	-	12	2	3	-	2	0	1	1	1	√	√	512	LQFP48	7x7	√	NK-M032SE	NLG-48L
M032SE3AE	Cortex-M0	48	1.8	3.6	-40	105	51	4	128	16	4	4	12	-	-	16	2	3	-	2	0	1	1	1	√	√	512	LQFP64	7x7	√	NK-M032SE	NLG-64S
M032LG6AE	Cortex-M0	72	1.8	3.6	-40	105	38	4	256	32	4	4	12	12	√	12	2	6	1	2	1	2	1	1	√	√	2048	LQFP48	7x7	√	NK-M032KG	NLG-48L
M032LG8AE	Cortex-M0	72	1.8	3.6	-40	105	38	4	256	64	4	4	12	12	√	12	2	6	1	2	1	2	1	1	√	√	2048	LQFP48	7x7	√	NK-M032KG	NLG-48L
M032SG6AE	Cortex-M0	72	1.8	3.6	-40	105	51	4	256	32	4	4	12	12	√	16	2	6	1	2	1	2	1	1	√	√	2048	LQFP64	7x7	√	NK-M032KG	NLG-64S
M032SG8AE	Cortex-M0	72	1.8	3.6	-40	105	51	4	256	64	4	4	12	12	√	16	2	6	1	2	1	2	1	1	√	√	2048	LQFP64	7x7	√	NK-M032KG	NLG-64S
M032SIAAE	Cortex-M0	72	1.8	3.6	-40	105	51	8	512	96	8	4	12	12	√	16	2	8	1	2	1	2	1	1	√	√	2048	LQFP64	7x7	√	NK-M032KI	NLG-64S
M032KIAAE	Cortex-M0	72	1.8	3.6	-40	105	107	8	512	96	8	4	12	12	√	16	2	8	1	2	1	2	1	1	√	√	2048	LQFP128	14x14	√	NK-M032KI	NLG-128KX
M032KG6AE	Cortex-M0	72	1.8	3.6	-40	105	107	4	256	32	4	4	12	12	√	16	2	6	1	2	1	2	1	1	√	√	2048	LQFP128	14x14	√	NK-M032KG	NLG-128KX
M032KG8AE	Cortex-M0	72	1.8	3.6	-40	105	107	4	256	64	4	4	12	12	√	16	2	6	1	2	1	2	1	1	√	√	2048	LQFP128	14x14	√	NK-M032KG	NLG-128KX

M051 Series

The NuMicro® M051 series is based on the Arm® Cortex®-M0 core, equipped with plenty of resources and peripherals, such as 8 to 256 Kbytes Flash, 4 to 20 Kbytes SRAM, and 4/ 8 Kbytes Flash loader memory for In-System Programming (ISP), up to 20-channel ADC, and 14-channel PWM. It supports Low Voltage Reset , Brown-Out Detector , 96-bit Unique ID and 128-bit Unique Customer ID.

Target Applications: Industrial Control, Security/ Alarms, Temperature Sensors, Motors, etc.
Key Features: 4 Kbytes Data Flash, Hardware Divider, 4x comparators

Part No.	System							Memory				Timer				Analog		Connectivity					Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	ADC (12-bit)	ACMP	UART	LIN	SPI	I²C	EBI	Package Type	Package Size	Mass Production	EVB	MP Programmer
M052LBN	Cortex-M0	50	2.5	5.5	-40	85	40	4	8	4	4	√	-	4	8	8	2	2	2	2	1	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M052LDE	Cortex-M0	50	2.5	5.5	-40	105	40	4	8	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M052LDN	Cortex-M0	50	2.5	5.5	-40	85	40	4	8	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M052ZBN	Cortex-M0	50	2.5	5.5	-40	85	24	4	8	4	4	√	-	4	5	5	2	2	2	1	1	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M052ZDE	Cortex-M0	50	2.5	5.5	-40	105	24	4	8	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M052ZDN	Cortex-M0	50	2.5	5.5	-40	85	24	4	8	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M054LBN	Cortex-M0	50	2.5	5.5	-40	85	40	4	16	4	4	√	-	4	8	8	2	2	2	2	1	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M054LDE	Cortex-M0	50	2.5	5.5	-40	105	40	4	16	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M054LDN	Cortex-M0	50	2.5	5.5	-40	85	40	4	16	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M054ZBN	Cortex-M0	50	2.5	5.5	-40	85	24	4	16	4	4	√	-	4	5	5	2	2	2	1	1	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M054ZDE	Cortex-M0	50	2.5	5.5	-40	105	24	4	16	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M054ZDN	Cortex-M0	50	2.5	5.5	-40	85	24	4	16	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M058LBN	Cortex-M0	50	2.5	5.5	-40	85	40	4	32	4	4	√	-	4	8	8	2	2	2	2	1	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M058LDE	Cortex-M0	50	2.5	5.5	-40	105	40	4	32	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M058LDN	Cortex-M0	50	2.5	5.5	-40	85	40	4	32	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M058ZBN	Cortex-M0	50	2.5	5.5	-40	85	24	4	32	4	4	√	-	4	5	5	2	2	2	1	1	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M058ZDE	Cortex-M0	50	2.5	5.5	-40	105	24	4	32	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M058ZDN	Cortex-M0	50	2.5	5.5	-40	85	24	4	32	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M0516LBN	Cortex-M0	50	2.5	5.5	-40	85	40	4	64	4	4	√	-	4	8	8	2	2	2	2	1	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M0516LDE	Cortex-M0	50	2.5	5.5	-40	105	40	4	64	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M0516LDN	Cortex-M0	50	2.5	5.5	-40	85	40	4	64	4	4	√	√	4	8	8	4	2	2	2	2	√	LQFP48	7x7	√	NK-M051L	NLG-M051L
M0516ZBN	Cortex-M0	50	2.5	5.5	-40	85	24	4	64	4	4	√	-	4	5	5	2	2	2	1	1	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M0516ZDE	Cortex-M0	50	2.5	5.5	-40	105	24	4	64	4	4	√	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z
M0516ZDN	Cortex-M0	50	2.5	5.5	-40	85	24	4	64	4	4	v	√	4	5	5	4	2	2	1	2	-	QFN33	5X5	√	NK-M051L	NLG-M051Z

• M0518 Series

Key Features: Configurable Data Flash, 24-channel 100 MHz PWM output, 6x UART

Part No.	System							Memory					Timer						Analog	Connectivity			Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ADC (12-bit)	UART	SPI	I²C	Package Type	Package Size	Mass Production	EVB	MP Programmer
M0518LC2AE	Cortex-M0	50	2.5	5.5	-40	105	42	4	36	Configurable	8	-	√	√	4	12	12	8	6	1	2	LQFP48	7x7	√	NT-M0518S	NLG-M0518L
M0518LD2AE	Cortex-M0	50	2.5	5.5	-40	105	42	4	68	Configurable	8	-	√	√	4	12	12	8	6	1	2	LQFP48	7x7	√	NT-M0518S	NLG-M0518L
M0518SC2AE	Cortex-M0	50	2.5	5.5	-40	105	56	4	36	Configurable	8	-	√	√	4	12	12	8	6	1	2	LQFP64	7x7	√	NT-M0518S	NLG-M0518S
M0518SD2AE	Cortex-M0	50	2.5	5.5	-40	105	56	4	68	Configurable	8	-	√	√	4	12	12	8	6	1	2	LQFP64	7x7	√	NT-M0518S	NLG-M0518S

• M0519 Series

Key Features: Hardware Divider, Dual ADC, 2x OPAs, 3x Comparators

Part No.	System							Memory				Timer							Analog		Connectivity				Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	WDT	WWDT	Timer (32-bit)	BPWM (16-bit)	EPWM (16-bit)	ECAP	ADC (12-bit)	ACMP	UART	LIN	SPI	I²C	Package Type	Package Size	Mass Production	EVB	MP Programmer
M0519LD3AE	Cortex-M0	72	2.5	5.5	-40	105	38	8	64	4	16	√	√	4	2	4	-	16	2	2	2	1	1	LQFP48	7X7	√	NT-M0519V	NLG-M0519L
M0519LE3AE	Cortex-M0	72	2.5	5.5	-40	105	38	8	128	Configurable	16	√	√	4	2	4	-	16	2	2	2	1	1	LQFP48	7X7	√	NT-M0519V	NLG-M0519L
M0519SD3AE	Cortex-M0	72	2.5	5.5	-40	105	51	8	64	4	16	√	√	4	2	8	-	16	2	2	2	2	1	LQFP64	7X7	√	NT-M0519V	NLG-M0519S
M0519SE3AE	Cortex-M0	72	2.5	5.5	-40	105	51	8	128	Configurable	16	√	√	4	2	8	-	16	2	2	2	2	1	LQFP64	7X7	√	NT-M0519V	NLG-M0519S
M0519VE3AE	Cortex-M0	72	2.5	5.5	-40	105	82	8	128	Configurable	16	√	√	4	2	12	6	16	3	2	2	3	1	LQFP100	14X14	√	NT-M0519V	NLG-M0519V

• M0564 Series

Key Features: Configurable Data Flash, Hardware Divider, Up to 8x UART, 144 MHz PWM output, 800 ksps ADC

Part No.	System							Memory					Timer					Analog		Connectivity							Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer/ PWM	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	UART	ISO-7816-3	I²C	USCI	SPI/ I²S	EBI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
M0564LE4AE	Cortex-M0	72	2.5	5.5	-40	105	41	4	128	Configurable	20	5	√	√	4	12	√	10	2	3	2	2	3	2	√	2048	LQFP48	7x7	√	NT-M0564V	NLG-M0564L
M0564LG4AE	Cortex-M0	72	2.5	5.5	-40	105	41	4	128	Configurable	20	5	√	√	4	12	√	10	2	3	2	2	3	2	√	2048	LQFP48	7x7	√	NT-M0564V	NLG-M0564L
M0564SE4AE	Cortex-M0	72	2.5	5.5	-40	105	53	4	256	Configurable	20	5	√	√	4	12	√	15	2	3	2	2	3	2	√	2048	LQFP64	7x7	√	NT-M0564V	NLG-M0564S
M0564SG4AE	Cortex-M0	72	2.5	5.5	-40	105	53	4	128	Configurable	20	5	√	√	4	12	√	15	2	3	2	2	3	2	√	2048	LQFP64	7x7	√	NT-M0564V	NLG-M0564S
M0564VG4AE	Cortex-M0	72	2.5	5.5	-40	105	85	4	256	Configurable	20	5	√	√	4	12	√	20	2	3	2	2	3	2	√	2048	LQF100	14X14	√	NT-M0564V	NLG-M0564V

M071 Series

The NuMicro® M071 series microcontroller is 32-bit microcontroller based on Arm® Cortex®-M0 and is designed for HA applications with 0.65/0.8mm pin-pitch. The series provides 16 to 256 Kbytes Flash memory, 8 to 20 Kbytes SRAM, rich communication interfaces (such as USB, UART, SPI, I²C... etc.), and comes with ADC, comparator and other rich analog interfaces.

Target Applications: Smart Home Appliances, Motor Control, White Goods, Industrial Control
Key Features: Hardware Divider, VAI, RTC, EBI, PDMA

Part No.	System							Memory				Timer				Analog			Connectivity										Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	Timer/ PWM	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Internal Voltage Reference	UART	LIN	ISO-7816-3	SPI	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	EBI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
M071MC2AE	Cortex-M0	50	2.5	5.5	-40	105	38	4	36	8	-	4	-	12	-	8	-	-	4	3	-	1	1	-	-	-	-	-	-	LQFP44	10x10	√	NK-M071MD	NLG-M071M
M071MD2AE	Cortex-M0	50	2.5	5.5	-40	105	38	4	68	8	-	4	-	12	-	8	-	-	4	3	-	1	1	-	-	-	-	-	-	LQFP44	10x10	√	NK-M071MD	NLG-M071M
M071R1D3AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	64	16	9	4	-	6	√	12	-	-	3	3	-	2	2	-	-	1	√	√	-	LQFP64	14x14	√	NK-M071R1E	NLG-M071R1
M071R1E3AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	128	16	9	4	-	6	√	12	-	-	3	3	-	2	2	-	-	1	√	√	-	LQFP64	14x14	√	NK-M071R1E	NLG-M071R1
M071SD3AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	64	16	9	4	-	6	√	12	-	-	3	3	-	2	2	-	-	1	√	√	-	LQFP64	7x7	√	NK-M071R1E	NLG-M071S
M071SE3AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	128	16	9	4	-	6	√	12	-	-	3	3	-	2	2	-	-	1	√	√	-	LQFP64	7x7	√	NK-M071R1E	NLG-M071S
M071VG4AE	Cortex-M0	72	2.5	5.5	-40	105	85	4	256	20	5	-	4	12	√	20	2	√	3	3	2	-	2	3	2	-	-	√	2048	LQFP100	14x14	√	NK-M071VG	NLG-M071V

M091 Series

The NuMicro® M091 series is designed for analog sensor applications based on Arm® Cortex®-M0 core with 32-bit hardware multiplier/ divider. It runs up to 72 MHz with 32/64 Kbytes embedded Flash Memory, 8 Kbytes embedded SRAM, 2 Kbytes Flash loader memory (LDROM) for In-System Programming (ISP). It is equipped with plentiful analog peripheral including up to 4 sets of 8 MHz gain bandwidth (GBW) with 50uV operational amplifier (OPA), 4 sets of 12-bit DAC, 2 levels of internal voltage reference, up to 16 channels of 2MSPS 12-bit SAR ADC and built-in temperature sensor with ±1.6°C deviation from 0°C to 70°C and ±2°C deviation from -40°C to 105°C. It also features small package, QFN33 4x4mm and QFN48 5x5mm, 2.7V to 3.6V operating voltage, 5V I/O tolerance, and -40°C to +105°C operating temperature.

Target Applications: Photoelectric sensor, Pressure sensor, position sensor, etc.
Key Features: 8 MHz gain bandwidth (GBW) with 50uV operational amplifier (OPA), 4 sets of DAC, 16 channels of ADC, Built-in Temperature Sensor, QFN33/48 Small Form Factor Package

Part No.	System								Memory						Clock			Timer		Analog				Connectivity			Package		Status	Tool		Others	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	CRC	GPIO	Temperature Sensor Accuracy (°C)	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (CH)	LIRC (kHz)	HIRC (kHz)	PLL (kHz)	Timer (32-bit)	BPWM (16-bit)	ADC (12-bit)	DAC (12-bit)	OP Amplifier (OPA)	Internal Voltage Reference	UART	I²C	SPI/ I²S	Package Type	Package Size	Mass Production	EVB	MP Programmer	DAC Auto Data Generation	Hardware Manchester Codec
M091TC2AE	Cortex-M0	72	2.7	3.6	-40	105	√	22	±2	2	32	Configurable	8	7	38.4	48	144	6	6	14	4	2	√	1	2	1	QFN33	4x4	√	NK-M091YD	-	√	√
M091TD2AE	Cortex-M0	72	2.7	3.6	-40	105	√	22	±2	2	64	Configurable	8	7	38.4	48	144	6	6	14	4	2	√	1	2	1	QFN33	4x4	√	NK-M091YD	-	√	√
M091YC2AE	Cortex-M0	72	2.7	3.6	-40	105	√	29	±2	2	32	Configurable	8	7	38.4	48	144	6	6	16	4	4	√	1	2	1	QFN48	5x5	√	NK-M091YD	-	√	√
M091YD2AE	Cortex-M0	72	2.7	3.6	-40	105	√	29	±2	2	64	Configurable	8	7	38.4	48	144	6	6	16	4	4	√	1	2	1	QFN48	5x5	√	NK-M091YD	-	√	√

Mini51 Series

The NuMicro® Mini51 series is based on the Arm® Cortex®-M0 core runs at up to 50 MHz with 4 to 32 Kbytes Flash memory and 2/4 Kbytes SRAM. The Mini51 series is equipped with plenty of ADC and PWM for different industrial applications, supporting Low Voltage Reset, Brown-Out Detector, 96-bit Unique ID, and 128-bit Unique Customer ID.

Target Applications: Wireless Chargers, Smart Home Appliances, Security/ Alarms, Temperature Sensors, Motors, Industrial Control, etc.
Key Features: Configurable Data Flash, 2 Kbytes ISP loader

Part No.	System							Memory			Timer				Analog					Connectivity				Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ECAP	ADC (10-bit)	ADC (12-bit)	ACMP	PGA	Internal Voltage Reference	UART	SPI	I²C	USCI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
MINI51FDE	Cortex-M0	24	2.5	5.5	-40	105	17	2	4	2	2	3	-	-	4	-	-	-	-	1	1	1	-	-	TSSOP20	4.4x6.5	√	NT-Mini51F	NLG-Mini51F
MINI51LDE	Cortex-M0	24	2.5	5.5	-40	105	30	2	4	2	2	6	-	-	8	-	2	-	-	1	1	1	-	-	LQFP48	7x7	√	NT-Mini51L	NLG-Mini51L
MINI51TDE	Cortex-M0	24	2.5	5.5	-40	105	29	2	4	2	2	6	-	-	8	-	2	-	-	1	1	1	-	-	QFN33	4x4	√	NT-Mini51L	NLG-Mini51T
MINI51ZDE	Cortex-M0	24	2.5	5.5	-40	105	29	2	4	2	2	6	-	-	8	-	2	-	-	1	1	1	-	-	QFN33	5x5	√	NT-Mini51L	NLG-Mini51Z
MINI52FDE	Cortex-M0	24	2.5	5.5	-40	105	17	2	8	2	2	3	-	-	4	-	-	-	-	1	1	1	-	-	TSSOP20	4.4x6.5	√	NT-Mini51F	NLG-Mini51F
MINI52LDE	Cortex-M0	24	2.5	5.5	-40	105	30	2	8	2	2	6	-	-	8	-	2	-	√	1	1	1	-	-	LQFP48	7x7	√	NT-Mini51L	NLG-Mini51L
MINI52TDE	Cortex-M0	24	2.5	5.5	-40	105	29	2	8	2	2	6	-	-	8	-	2	-	-	1	1	1	-	-	QFN33	4x4	√	NT-Mini51L	NLG-Mini51T
MINI52ZDE	Cortex-M0	24	2.5	5.5	-40	105	29	2	8	2	2	6	-	-	8	-	2	-	-	1	1	1	-	-	QFN33	5x5	√	NT-Mini51L	NLG-Mini51Z
MINI54FDE	Cortex-M0	24	2.5	5.5	-40	105	17	2	16	2	2	3	-	-	4	-	-	-	√	1	1	1	-	-	TSSOP20	4.4x6.5	√	NT-Mini51F	NLG-Mini51F
MINI54LDE	Cortex-M0	24	2.5	5.5	-40	105	30	2	16	2	2	6	-	-	8	-	2	-	√	1	1	1	-	-	LQFP48	7x7	√	NT-Mini51L	NLG-Mini51L
MINI54TDE	Cortex-M0	24	2.5	5.5	-40	105	29	2	16	2	2	6	-	-	8	-	2	-	√	1	1	1	-	-	QFN33	4x4	√	NT-Mini51L	NLG-Mini51T
MINI54ZDE	Cortex-M0	24	2.5	5.5	-40	105	29	2	16	2	2	6	-	-	8	-	2	-	√	1	1	1	-	-	QFN33	5x5	√	NT-Mini51L	NLG-Mini51Z

• Mini55 Series

Key Features: Supports Hardware Divider

Part No.	System							Memory			Timer				Analog					Connectivity				Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ECAP	ADC (10-bit)	ADC (12-bit)	ACMP	PGA	Internal Voltage Reference	UART	SPI	I²C	USCI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
MINI55LDE	Cortex-M0	48	2.1	5.5	-40	105	33	2	17.5	2	2	6	-	-	12	-	2	-	√	2	1	1	-	-	LQFP48	7x7	√	NT-Mini55L	NLG-Mini51L
MINI55TDE	Cortex-M0	48	2.1	5.5	-40	105	29	2	17.5	2	2	6	-	-	12	-	2	-	√	2	1	1	-	-	QFN33	4x4	√	NT-Mini55L	NLG-Mini51T

• Mini57 Series

Key Features: Supports Hardware Divider

Part No.	System							Memory			Timer				Analog					Connectivity				Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ECAP	ADC (10-bit)	ADC (12-bit)	ACMP	PGA	Internal Voltage Reference	UART	SPI	I²C	USCI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
MINI57EDE	Cortex-M0	48	2.1	5.5	-40	105	22	2	29.5	4	2	6	2	3	-	8	2	√	√	-	-	-	2	512x3	TSSOP28	4.4x9.7	√	NT-Mini57E	NLG-Mini57E
MINI57FDE	Cortex-M0	48	2.1	5.5	-40	105	18	2	29.5	4	2	6	2	3	-	8	2	√	√	-	-	-	2	512x3	TSSOP20	4.4x6.5	√	NT-Mini57E	NLG-Mini57F
MINI57TDE	Cortex-M0	48	2.1	5.5	-40	105	22	2	29.5	4	2	6	2	3	-	8	2	√	√	-	-	-	2	512x3	QFN33	4x4	√	NT-Mini57E	NLG-Mini57T

• Mini58 Series

Key Features: Configurable Data Flash

Part No.	System							Memory			Timer				Analog					Connectivity				Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	SRAM (KB)	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ECAP	ADC (10-bit)	ADC (12-bit)	ACMP	PGA	Internal Voltage Reference	UART	SPI	I²C	USCI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
MINI58FDE	Cortex-M0	50	2.5	5.5	-40	105	17	2.5	32	4	2	6	-	-	4	-	-	-	√	2	1	2	-	512	TSSOP20	4.4x6.5	√	NT-Mini58L	NLG-Mini51F
MINI58LDE	Cortex-M0	50	2.5	5.5	-40	105	30	2.5	32	4	2	6	-	-	8	-	2	-	√	2	1	2	-	512	LQFP48	7x7	√	NT-Mini58L	NLG-Mini51L
MINI58TDE	Cortex-M0	50	2.5	5.5	-40	105	29	2.5	32	4	2	6	-	-	8	-	2	-	√	2	1	2	-	512	QFN33	4x4	√	NT-Mini58L	NLG-Mini51T
MINI58ZDE	Cortex-M0	50	2.5	5.5	-40	105	29	2.5	32	4	2	6	-	-	8	-	2	-	√	2	1	2	-	512	QFN33	5x5	√	NT-Mini58L	NLG-Mini51Z

NUC029 Series

The NuMicro® NUC029 series is designed for industrial applications supported by the robust noise immunity EFT features. It is based on the Arm® Cortex®-M0 core with 5V operating voltage. NUC029 series provides 16 to 256 Kbytes Flash, 2 to 20 Kbytes SRAM, and high performance peripherals such as 12-bit ADC, UART, PWM, SPI, I²C, etc. Specific parts support hardware divider, comparator, and USB 2.0 full speed device (Crystal-less).

Target Applications: Industrial Control, High-precision Meters, HMI, Motor Control, Communication Systems, etc.
Key Features: 5V industrial control, Robust noise immunity EFT 4.4 kV, Strong ESD up to HBM 8 kV.

Part No.	System							Memory					Timer			Analog			Connectivity								Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min)	Operating Voltage (max)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	RTC	ADC (10-bit)	ADC (12-bit)	ACMP	UART	SPI	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	EBI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC029FAE	Cortex-M0	24	2.5	5.5	-40	105	17	2	16	Configurable	2	-	2	3	-	4	-	2	1	1	-	-	-	-	-	√	-	TSSOP20	4.4x6.5	√	NT-NUC029F	NLG-NUC029FA
NUC029KGE	Cortex-M0	72	2.5	5.5	-40	105	86	4	256	Configurable	20	5	4	12	√	-	20	2	3	-	2	3	2	1	√	√	2048	LQFP128	14x14	√	NT-NUC029SG	NLG-NUC029KG
NUC029LAN	Cortex-M0	50	2.5	5.5	-40	85	40	4	64	4	4	-	4	8	-	-	8	4	2	2	-	-	-	-	-	√	-	LQFP48	7x7	√	NK-NUC029L	NLG-NUC029LD
NUC029LDE	Cortex-M0	50	2.5	5.5	-40	105	42	4	68	Configurable	20	-	4	12	-	-	8	-	4	1	-	-	-	-	-	-	-	LQFP48	7x7	√	NT-NUC029SD	NLG-NUC029LD
NUC029LEE	Cortex-M0	72	2.5	5.5	-40	105	31	8	128	Configurable	16	9	4	4	√	-	10	-	2	1	-	-	-	1	√	√	-	LQFP48	7x7	√	NT-NUC029SE	NLG-NUC029LE
NUC029LGE	Cortex-M0	72	2.5	5.5	-40	105	35	4	256	Configurable	20	5	4	10	√	-	9	2	3	-	2	3	2	1	√	√	2048	LQFP48	7x7	√	NT-NUC029SG	NLG-NUC029LG
NUC029NAN	Cortex-M0	50	2.5	5.5	-40	85	40	4	64	4	4	-	4	8	-	-	8	4	2	2	-	-	-	-	-	√	-	QFN48	7x7	√	NK-NUC029L	NLG-NUC029NA
NUC029SDE	Cortex-M0	50	2.5	5.5	-40	105	56	4	68	Configurable	20	-	4	12	-	-	8	-	4	1	-	-	-	-	-	-	-	LQFP64	7x7	√	NT-NUC029SD	NLG-NUC029SD
NUC029SEE	Cortex-M0	72	2.5	5.5	-40	105	45	8	128	Configurable	16	9	4	6	√	-	12	-	3	2	-	-	-	1	√	√	-	LQFP64	7x7	√	NT-NUC029SE	NLG-NUC029SE
NUC029SGE	Cortex-M0	72	2.5	5.5	-40	105	49	4	256	Configurable	20	5	4	12	√	-	15	2	3	-	2	3	2	1	√	√	2048	LQFP64	7x7	√	NT-NUC029SG	NLG-NUC029SG
NUC029TAN	Cortex-M0	50	2.5	5.5	-40	85	24	4	32	4	4	-	4	5	-	-	5	3	2	1	-	-	-	-	-	√	-	QFN33	4x4	√	NK-NUC029L	NLG-NUC029TA
NUC029ZAN	Cortex-M0	50	2.5	5.5	-40	85	24	4	64	4	4	-	4	5	-	-	5	3	2	1	-	-	-	-	-	√	-	QFN33	5x5	√	NK-NUC029L	NLG-NUC029ZA

NUC121 Series

The NuMicro® NUC121 series is based on the Arm® Cortex®-M0 core with 32 to 256 Kbytes Flash memory, 8 to 20 Kbytes SRAM, and 4 Kbytes Flash loader memory for In-System Programming (ISP). This series is a standard USB series supporting crystal-less (except NUC123). 48 MHz high speed RC oscillator supports crystal-less USB transfer and 24-channel PWM/BPWM supports external components control. In addition, NUC121 series provides plenty of selections with up to 24-channel PWM and 20-channel ADC.

Target Applications: USB Composite Devices, Gaming Mouse/ Keyboards/ Pads, USB Type-C Earphones, Industrial Automation, IoT devices, etc.

Key Features: Over 4 Kbytes ISP loader, USB 2.0 full speed device crystal-less (except NUC123). NUC125/ NUC126 supports voltage adjustable interface (VAI) with individual I/O (1.8V to 5.5V) connecting to the external components allowing flexbile for product design.

• NUC121 Series

Part No.	System							Memory					Timer						Analog	Connectivity								Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ADC (12-bit)	UART	LIN	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC121LC2AE	Cortex-M0	50	2.5	5.5	-40	105	38	4.5	32	Configurable	8	5	√	√	4	24	14	10	1	1	2	1	1	1	√	512	LQFP48	7x7	√	NT-NUC121S	NLG-NUC121L
NUC121SC2AE	Cortex-M0	50	2.5	5.5	-40	105	52	4.5	32	Configurable	8	5	√	√	4	24	17	12	1	1	2	1	1	1	√	512	LQFP64	7x7	√	NT-NUC121S	NLG-NUC121S
NUC121ZC2AE	Cortex-M0	50	2.5	5.5	-40	105	22	4.5	32	Configurable	8	5	√	√	4	17	7	4	1	1	2	1	1	1	√	512	QFN33	5x5	√	NT-NUC121S	NLG-NUC121Z

• NUC125 Series

Key Features: Voltage Adjustable Interface from 1.8V to 5.5V, up to 12-channel ADC

Part No.	System							Memory					Timer						Analog	Connectivity								Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ADC (12-bit)	UART	LIN	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC125LC2AE	Cortex-M0	50	2.5	5.5	-40	105	37	4.5	32	Configurable	8	5	√	√	4	23	13	9	1	1	2	1	1	1	√	512	LQFP48	7x7	√	NT-NUC125S	NLG-NUC125L
NUC125SC2AE	Cortex-M0	50	2.5	5.5	-40	105	51	4.5	32	Configurable	8	5	√	√	4	23	16	11	1	1	2	1	1	1	√	512	LQFP64	7x7	√	NT-NUC125S	NLG-NUC125S
NUC125ZC2AE	Cortex-M0	50	2.5	5.5	-40	105	22	4.5	32	Configurable	8	5	√	√	4	17	7	4	1	1	2	1	1	1	√	512	QFN33	5x5	√	NT-NUC125S	NLG-NUC125Z

NUC123 Series

Part No.	System							Memory					Timer					Analog	Connectivity						Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	ADC (10-bit)	UART	SPI	I²C	I²S	PS/2 Device	USB FS Device	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC123LC2AE1	Cortex-M0	72	2.5	5.5	-40	105	36	4	36	Configurable	12	6	√	√	4	4	8	2	3	2	1	1	1	LQFP48	7x7	√	NK-NUC123SE	NLG-NUC123L
NUC123LC2AN1	Cortex-M0	72	2.5	5.5	-40	85	36	4	36	Configurable	12	6	√	√	4	4	8	2	3	2	1	1	1	LQFP48	7x7	√	NK-NUC123SE	NLG-NUC123L
NUC123LD4AE0	Cortex-M0	72	2.5	5.5	-40	105	36	4	68	Configurable	20	6	√	√	4	4	8	2	3	2	1	1	1	LQFP48	7x7	√	NK-NUC123SE	NLG-NUC123L
NUC123LD4AN0	Cortex-M0	72	2.5	5.5	-40	85	36	4	68	Configurable	20	6	√	√	4	4	8	2	3	2	1	1	1	LQFP48	7x7	√	NK-NUC123SE	NLG-NUC123L
NUC123SC2AE1	Cortex-M0	72	2.5	5.5	-40	105	47	4	36	Configurable	12	6	√	√	4	4	8	2	3	2	1	1	1	LQFP64	7x7	√	NK-NUC123SE	NLG-NUC123S
NUC123SC2AN1	Cortex-M0	72	2.5	5.5	-40	85	47	4	36	Configurable	12	6	√	√	4	4	8	2	3	2	1	1	1	LQFP64	7x7	√	NK-NUC123SE	NLG-NUC123S
NUC123SD4AE0	Cortex-M0	72	2.5	5.5	-40	105	47	4	68	Configurable	20	6	√	√	4	4	8	2	3	2	1	1	1	LQFP64	7x7	√	NK-NUC123SE	NLG-NUC123S
NUC123SD4AN0	Cortex-M0	72	2.5	5.5	-40	85	47	4	68	Configurable	20	6	√	√	4	4	8	2	3	2	1	1	1	LQFP64	7x7	√	NK-NUC123SE	NLG-NUC123S
NUC123ZC2AE1	Cortex-M0	72	2.5	5.5	-40	105	20	4	36	Configurable	12	6	√	√	4	3	3	1	3	1	1	-	1	QFN33	5x5	√	NK-NUC123SE	NLG-NUC123Z
NUC123ZC2AN1	Cortex-M0	72	2.5	5.5	-40	85	20	4	36	Configurable	12	6	√	√	4	2	3	1	3	1	1	-	1	QFN33	5x5	√	NK-NUC123SE	NLG-NUC123Z
NUC123ZD4AE0	Cortex-M0	72	2.5	5.5	-40	105	20	4	68	Configurable	20	6	√	√	4	3	3	1	3	1	1	-	1	QFN33	5x5	√	NK-NUC123SE	NLG-NUC123Z
NUC123ZD4AN0	Cortex-M0	72	2.5	5.5	-40	85	20	4	68	Configurable	20	6	√	√	4	2	3	1	3	1	1	-	1	QFN33	5x5	√	NK-NUC123SE	NLG-NUC123Z

• NUC1261 Series

Key Features: Up to 12-channel 144 MHz PWM, 20-channel 800 ksps ADC, Hardware Divider.

Part No.	System							Memory					Timer						Analog		Connectivity							Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer/ PWM	PWM (16-bit)	RTC	BPWM (16-bit)	ADC (12-bit)	ACMP	UART	ISO-7816-3	I²C	USCI	SPI/ I²S	USB FS Device	USB FS Device Crystal-less	EBI	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC1261NE4AE	Cortex-M0	72	2.5	5.5	-40	105	35	4	128	Configurable	20	5	√	√	4	10	√	-	9	2	3	2	3	2	1	√	√	2048	QFN 48	7x7	√	NT-NUC1261S	NLG-NUC126N	NLG-NUC126L
NUC1261LE4AE	Cortex-M0	72	2.5	5.5	-40	105	35	4	128	Configurable	20	5	√	√	4	10	√	-	9	2	3	2	3	2	1	√	√	2048	LQFP 48	7x7	√	NT-NUC1261S	NLG-NUC126L	NLG-NUC126L
NUC1261LG4AE	Cortex-M0	72	2.5	5.5	-40	105	35	4	256	Configurable	20	5	√	√	4	10	√	-	9	2	3	2	3	2	1	√	√	2048	LQFP 48	7x7	√	NT-NUC1261S	NLG-NUC126L	NLG-NUC126N
NUC1261SE4AE	Cortex-M0	72	2.5	5.5	-40	105	49	4	128	Configurable	20	5	√	√	4	12	√	-	15	2	3	2	3	2	1	√	√	2048	LQFP 64	7x7	√	NT-NUC1261S	NLG-NUC126S	NLG-NUC126S
NUC1261SG4AE	Cortex-M0	72	2.5	5.5	-40	105	49	4	256	Configurable	20	5	√	√	4	12	√	-	15	2	3	2	3	2	1	√	√	2048	LQFP 64	7x7	√	NT-NUC1261S	NLG-NUC126S	NLG-NUC126S

NUC131/ NUC230/ NUC240 CAN Series

The NuMicro® NUC131/230/240 series with CAN Bus is based on the Arm® Cortex®-M0 core with 32 to 128 Kbytes Flash memory, 4 to 16 Kbytes SRAM, and 4/ 8 Kbytes Flash loader memory for In-System Programming (ISP). This series is designed for CAN applications. It is equipped with a variety of peripherals for general connectivity functions such as LIN, USB 2.0 full speed device, UART, I²C, and ADC. In addition, the NUC131/ NUC230/ NUC240 CAN Series features Analog Comparator, Low Voltage Reset, and Brown-Out Detector.

NUC131/ NUC230/ NUC240 CAN Series	USB FS	LIN	CAN
NUC131		√	√
NUC230		√	√
NUC240	√	√	√

• NUC131 Series

Part No.	System							Memory				Timer					Analog	Connectivity							Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	BPWM (16-bit)	ADC (12-bit)	UART	LIN	SPI	I²C	CAN	LPUART	ISO-7816-3	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC131LC2AE	Cortex-M0	50	2.5	5.5	-40	105	42	4	36	Configurable	8	√	√	4	12	12	8	6	3	1	2	1	-	-	LQFP 48	7x7	√	NK-NUC131	NLG-NUC131L
NUC131LD2AE	Cortex-M0	50	2.5	5.5	-40	105	42	4	68	Configurable	8	√	√	4	12	12	8	6	3	1	2	1	-	-	LQFP 48	7x7	√	NK-NUC131	NLG-NUC131L
NUC131SC2AE	Cortex-M0	50	2.5	5.5	-40	105	56	4	36	Configurable	8	√	√	4	12	12	8	6	3	1	2	1	-	-	LQFP 64	7x7	√	NK-NUC131	NLG-NUC131S
NUC131SD2AE	Cortex-M0	50	2.5	5.5	-40	105	56	4	68	Configurable	8	√	√	4	12	12	8	6	3	1	2	1	-	-	LQFP 64	7x7	√	NK-NUC131	NLG-NUC131S
NUC1311LC2AE	Cortex-M0	50	2.5	5.5	-40	105	42	4	36	Configurable	8	√	√	4	12	-	8	4	3	1	1	1	-	-	LQFP 48	7x7	√	NK-NUC1311	NLG-NUC1311
NUC1311LD2AE	Cortex-M0	50	2.5	5.5	-40	105	42	4	68	Configurable	8	√	√	4	12	-	8	4	3	1	1	1	-	-	LQFP 48	7x7	√	NK-NUC1311	NLG-NUC1311

• NUC230 Series

Part No.	System							Memory					Timer					Analog		Connectivity									Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	UART	LIN	ISO-7816-3	SPI	I²C	I²S	CAN	PS/2 Device	EBI	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC230LC2AE	Cortex-M0	72	2.5	5.5	-40	105	35	8	32	4	8	9	√	√	4	4	√	7	1	3	3	2	1	2	1	2	-	-	LQFP48	7x7	√	NK-NUC240V	NLG-NUC200L
NUC230LD2AE	Cortex-M0	72	2.5	5.5	-40	105	35	8	64	4	8	9	√	√	4	4	√	7	1	3	3	2	1	2	1	2	-	-	LQFP48	7x7	√	NK-NUC240V	NLG-NUC200L
NUC230LE3AE	Cortex-M0	72	2.5	5.5	-40	105	35	8	128	Configurable	16	9	√	√	4	4	√	7	1	3	3	2	1	2	1	2	-	-	LQFP48	7x7	√	NK-NUC240V	NLG-NUC200L
NUC230SC2AE	Cortex-M0	72	2.5	5.5	-40	105	49	8	32	4	8	9	√	√	4	6	√	7	2	3	3	2	2	2	1	2	-	√	LQFP64	7x7	√	NK-NUC240V	NLG-NUC200S
NUC230SD2AE	Cortex-M0	72	2.5	5.5	-40	105	49	8	64	4	8	9	√	√	4	6	√	7	2	3	3	2	2	2	1	2	-	√	LQFP64	7x7	√	NK-NUC240V	NLG-NUC200S
NUC230SE3AE	Cortex-M0	72	2.5	5.5	-40	105	49	8	128	Configurable	16	9	√	√	4	6	√	7	2	3	3	2	2	2	1	2	-	√	LQFP64	7x7	√	NK-NUC240V	NLG-NUC200S
NUC230VE3AE	Cortex-M0	72	2.5	5.5	-40	105	83	8	128	Configurable	16	9	√	√	4	8	√	8	2	3	3	3	4	2	1	2	1	√	LQFP100	14x14	√	NK-NUC240V	NLG-NUC200V

• NUC240 Series

Part No.	System							Memory					Timer					Analog		Connectivity										Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	UART	LIN	ISO-7816-3	SPI	I²C	I²S	CAN	PS/2 Device	USB FS Device	EBI	Package Type	Package Size	Mass Production	EVB	MP Programmer
NUC240LC2AE	Cortex-M0	72	2.5	5.5	-40	105	31	8	32	4	8	9	√	√	4	4	√	7	1	2	2	1	1	2	1	2	-	1	-	LQFP48	7x7	√	NK-NUC240V	NLG-NUC200L
NUC240LD2AE	Cortex-M0	72	2.5	5.5	-40	105	31	8	64	4	8	9	√	√	4	4	√	7	1	2	2	1	1	2	1	2	-	1	-	LQFP48	7x7	√	NK-NUC240V	NLG-NUC200L
NUC240LE3AE	Cortex-M0	72	2.5	5.5	-40	105	31	8	128	Configurable	16	9	√	√	4	4	√	7	1	2	2	1	1	2	1	2	-	1	-	LQFP48	7x7	√	NK-NUC240V	NLG-NUC200L
NUC240SC2AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	32	4	8	9	√	√	4	4	√	7	2	3	3	2	2	2	1	2	-	1	√	LQFP64	7x7	√	NK-NUC240V	NLG-NUC200S
NUC240SD2AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	64	4	8	9	√	√	4	4	√	7	2	3	3	2	2	2	1	2	-	1	√	LQFP64	7x7	√	NK-NUC240V	NLG-NUC200S
NUC240SE3AE	Cortex-M0	72	2.5	5.5	-40	105	45	8	128	Configurable	16	9	√	√	4	4	√	7	2	3	3	2	2	2	1	2	-	1	√	LQFP64	7x7	√	NK-NUC240V	NLG-NUC200S
NUC240VE3AE	Cortex-M0	72	2.5	5.5	-40	105	79	8	128	Configurable	16	9	√	√	4	8	√	8	2	3	3	3	4	2	1	2	1	1	√	LQFP100	14x14	√	NK-NUC240V	NLG-NUC200V

Nano100 Series

The NuMicro® Nano100 series supports Ultra-Low power consumption. It is based on the Arm® Cortex®-M0 core with 16 to 128 Kbytes Flash, 4 to 16 Kbytes SRAM, and 4 Kbytes Flash loader memory for In-System Programming (ISP). The Nano series integrates COM/ SEG LCD controller, RTC, ADC, DAC, USB 2.0 full speed device, ISO 7816-3, and rich peripherals, supporting fast wake-up via different interfaces.

Key Features: Ultra-low power and short wake-up time.

Target Applications: Suitable for battery-powered devices such as Smart Wearable Devices, IoT Devices, Portable Medical Devices, Smart Home Appliances, Security Alarms Monitoring, Mobile Payment Smart Card Readers, GPS Data Collector, Wireless Communication (Zigbee, LoRa, etc.), Node Device, Electronic Shelf Label (ESL), RFID, Smart Heat/ Water/ Gas Meters, etc.

• Nano100 Series

Key Features: Ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time

Part No.	System							Memory						Timer						Analog		Connectivity							Package		Status	Package	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	DAC (12-bit)	UART	LIN	ISO-7816-3	SPI	I²C	I²S	Package Type	Package Size	Mass Production	EVB	MP Programmer
NANO100KD3BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	64	Configurable	16	8	√	√	4	8	√	12	2	2	2	3	3	2	1	LQFP128	14X14	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100K
NANO100KE3BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	128	Configurable	16	8	√	√	4	8	√	12	2	2	2	3	3	2	1	LQFP128	14X14	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100K
NANO100LC2BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	32	Configurable	8	8	√	√	4	6	√	7	2	2	2	2	3	2	1	LQFP48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100L
NANO100LD2BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	64	Configurable	8	8	√	√	4	6	√	7	2	2	2	2	3	2	1	LQFP48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100L
NANO100LD3BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	64	Configurable	16	8	√	√	4	6	√	7	2	2	2	2	3	2	1	LQFP48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100L
NANO100LE3BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	128	Configurable	16	8	√	√	4	6	√	7	2	2	2	2	3	2	1	LQFP48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100L
NANO100NC2BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	32	Configurable	8	8	√	√	4	6	√	7	2	2	2	2	3	2	1	QFN48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100N
NANO100ND2BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	64	Configurable	8	8	√	√	4	6	√	7	2	2	2	2	3	2	1	QFN48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100N
NANO100ND3BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	64	Configurable	16	8	√	√	4	6	√	7	2	2	2	2	3	2	1	QFN48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100N
NANO100NE3BN	Cortex-M0	42	1.8	3.6	-40	85	38	4	128	Configurable	16	8	√	√	4	6	√	7	2	2	2	2	3	2	1	QFN48	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100N
NANO100SC2BN	Cortex-M0	42	1.8	3.6	-40	85	52	4	32	Configurable	8	8	√	√	4	8	√	7	2	2	2	3	3	2	1	LQFP64	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100S
NANO100SD2BN	Cortex-M0	42	1.8	3.6	-40	85	52	4	64	Configurable	8	8	√	√	4	8	√	7	2	2	2	3	3	2	1	LQFP64	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100S
NANO100SD3BN	Cortex-M0	42	1.8	3.6	-40	85	52	4	64	Configurable	16	8	√	√	4	8	√	7	2	2	2	3	3	2	1	LQFP64	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100S
NANO100SE3BN	Cortex-M0	42	1.8	3.6	-40	85	52	4	128	Configurable	16	8	√	√	4	8	√	7	2	2	2	3	3	2	1	LQFP64	7X7	√	NT-Nano100K / NT-Nano120K / NT-Nano130K	NLG-Nano100S

• Nano102 Series

Key Features: Ultra-low power: 150 µA/MHz (Normal), 65 µA/MHz (Idle), 1.5 µA (Power Down, RTC On, RAM retention) and 0.65 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time

Part No.	System							Memory					Timer						Analog			Connectivity				Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	Package Type	Package Size	Mass Production	EVB	MP Programmer
NANO102LB1AN	Cortex-M0	32	1.8	3.6	-40	85	40	4	16	Configurable	4	4	√	√	4	4	√	7	2	√	2	2	2	2	LQFP48	7x7	√	NT-Nano102S	NLG-Nano112L
NANO102LC2AN	Cortex-M0	32	1.8	3.6	-40	85	40	4	32	Configurable	8	4	√	√	4	4	√	7	2	√	2	2	2	2	LQFP48	7x7	√	NT-Nano102S	NLG-Nano112L
NANO102SC2AN	Cortex-M0	32	1.8	3.6	-40	85	58	4	32	Configurable	8	4	√	√	4	4	√	7	2	√	2	2	2	2	LQFP64	7x7	√	NT-Nano102S	NLG-Nano112S
NANO102ZB1AN	Cortex-M0	32	1.8	3.6	-40	85	27	4	16	Configurable	4	4	√	√	4	4	√	2	2	√	2	1	2	2	QFN33	5x5	√	NT-Nano102S	NLG-Nano102Z
NANO102ZC2AN	Cortex-M0	32	1.8	3.6	-40	85	27	4	32	Configurable	8	4	√	√	4	4	√	2	2	√	2	1	2	2	QFN33	5x5	√	NT-Nano102S	NLG-Nano102Z

• Nano103 Series

Key Features: Ultra-low power: 180 µA/MHz (Normal), 75 µA/MHz (Idle), 2 µA (Power Down, RTC On, RAM retention)

Part No.	System							Memory					Timer					Analog			Connectivity				Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	Package Type	Package Size	Mass Production	EVB	MP Programmer
NANO103LD3AE	Cortex-M0	36	1.8	3.6	-40	105	39	4	64	Configurable	16	4	√	√	4	6	√	8	1	√	2	2	4	2	LQFP48	7x7	√	NT-Nano103S	NLG-Nano103L
NANO103SD3AE	Cortex-M0	36	1.8	3.6	-40	105	53	4	64	Configurable	16	4	√	√	4	6	√	8	1	√	2	2	4	2	LQFP64	7x7	√	NT-Nano103S	NLG-Nano103S
NANO103ZD3AE	Cortex-M0	36	1.8	3.6	-40	105	26	4	64	Configurable	16	4	√	√	4	2	√	6	1	√	2	2	4	2	QFN33	5x5	√	NT-Nano103S	NLG-Nano103Z

• Nano110 Series

Key Features: Integrates 4x40 & 6x38 COM/SEG LCD controller, ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time

Part No.	System							Memory					Timer					Analog		Connectivity						Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	DAC (12-bit)	UART	LIN	ISO-7816-3	SPI	I²C	I²S	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
NANO110KC2BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	32	Configurable	8	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO110KD2BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	64	Configurable	8	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO110KD3BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	64	Configurable	16	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO110KE3BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	128	Configurable	16	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO110RC2BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	32	Configurable	8	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	10X10	√	NT-Nano130K	NLG-Nano100R
NANO110RD2BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	64	Configurable	8	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	10X10	√	NT-Nano130K	NLG-Nano100R
NANO110RD3BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	64	Configurable	16	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	10X10	√	NT-Nano130K	NLG-Nano100R
NANO110RE3BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	128	Configurable	16	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	10X10	√	NT-Nano130K	NLG-Nano100R
NANO110SC2BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	32	Configurable	8	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S
NANO110SD2BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	64	Configurable	8	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S
NANO110SD3BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	64	Configurable	16	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S
NANO110SE3BN	Cortex-M0	42	1.8	3.6	-40	85	51	4	128	Configurable	16	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S

• Nano120 Series

Key Features: Integrates USB 2.0 FS device interface,ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time

Part No.	System							Memory					Timer						Analog			Connectivity				Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
NANO112LB1AN	Cortex-M0	32	1.8	3.6	-40	85	40	4	16	Configurable	4	4	√	√	4	4	√	7	2	√	2	2	2	2	4x20/6x18	LQFP48	7x7	√	NT-Nano112V	NLG-Nano112L
NANO112LC2AN	Cortex-M0	32	1.8	3.6	-40	85	40	4	32	Configurable	8	4	√	√	4	4	√	7	2	√	2	2	2	2	4x20/6x18	LQFP48	7x7	√	NT-Nano112V	NLG-Nano112L
NANO112RB1AN	Cortex-M0	32	1.8	3.6	-40	85	58	4	16	Configurable	4	4	√	√	4	4	√	7	2	√	2	2	2	2	4x32/6x30	LQFP64	10x10	√	NT-Nano112V	NLG-Nano112R
NANO112RC2AN	Cortex-M0	32	1.8	3.6	-40	85	58	4	32	Configurable	8	4	√	√	4	4	√	7	2	√	2	2	2	2	4x32/6x30	LQFP64	10x10	√	NT-Nano112V	NLG-Nano112R
NANO112SB1AN	Cortex-M0	32	1.8	3.6	-40	85	58	4	16	Configurable	4	4	√	√	4	4	√	7	2	√	2	2	2	2	4x32/6x30	LQFP64	7x7	√	NT-Nano112V	NLG-Nano112S
NANO112SC2AN	Cortex-M0	32	1.8	3.6	-40	85	58	4	32	Configurable	8	4	√	√	4	4	√	7	2	√	2	2	2	2	4x32/6x30	LQFP64	7x7	√	NT-Nano112V	NLG-Nano112S
NANO112VC2AN	Cortex-M0	32	1.8	3.6	-40	85	80	4	32	Configurable	8	4	√	√	4	4	√	8	2	√	2	2	2	2	4x36/6x34	LQFP100	14x14	√	NT-Nano112V	NLG-Nano112V

• Nano130 Series

Key Features: Integrates both 4x40 & 6x38 COM/SEG LCD controller and USB 2.0 FS device interface,ultra-low power: 200 µA/MHz (Normal), 75 µA/MHz (Idle), 2.5 µA (Power Down, RTC On, RAM retention) and 1 µA (Power Down, RAM retention) and less than 3.5 µs wake-up time

Part No.	System							Memory					Timer						Analog		Connectivity							Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	WWDT	Timer (32-bit)	PWM (16-bit)	RTC	ADC (12-bit)	DAC (12-bit)	UART	LIN	ISO-7816-3	SPI	I²C	I²S	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
NANO130KC2BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	32	Configurable	8	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO130KD2BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	64	Configurable	8	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO130KD3BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	64	Configurable	16	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO130KE3BN	Cortex-M0	42	1.8	3.6	-40	85	86	4	128	Configurable	16	8	√	√	4	8	√	12	2	2	2	3	3	2	1	4x40/6x38	LQFP128	14X14	√	NT-Nano130K	NLG-Nano100K
NANO130SC2BN	Cortex-M0	42	1.8	3.6	-40	85	47	4	32	Configurable	8	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S
NANO130SD2BN	Cortex-M0	42	1.8	3.6	-40	85	47	4	64	Configurable	8	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S
NANO130SD3BN	Cortex-M0	42	1.8	3.6	-40	85	47	4	64	Configurable	16	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S
NANO130SE3BN	Cortex-M0	42	1.8	3.6	-40	85	47	4	128	Configurable	16	8	√	√	4	7	√	7	2	2	2	3	3	2	1	4x31/6x29	LQFP64	7X7	√	NT-Nano130K	NLG-Nano100S

NuVoice™ Series

NuVoice, 32-bit Cortex M0 based with embedded Flash. The N570 and N574 families provide high resolution ADC and flexible algorithms for MIC, voice changing and voice recognition applications.

• N570H, 32-bit Cortex-M0 with Embedded Flash, 10-bit ADC, Touch Wake-up

Part No.	CPU	APROM Flash	VDD(V)	SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Touch Wakeup	Voice Recognition
								Mic.	Speaker			
N570H064	Cortex®-M0 49 MHz	64 KB	1.8~5.5	6 KB	28	SPI x 2, UART	8	√	DPWM	10-bit 5-ch	√	-
N570HC64	Cortex®-M0 49 MHz	64 KB	1.8~5.5	6 KB	28	SPI x 2, UART	8	√	DPWM	10-bit 5-ch	√	√

• N570J, 32-bit Cortex-M0 with Embedded Flash, 10-bit ADC, Touch Wake-up, Long Duration Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec)	SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Touch Wakeup	Package
					8KHz					Mic.	Speaker			
N570J08AL	Cortex®-M0 49 MHz	64 KB	8Mbit	2.4~5.5	1,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J08DL	Cortex®-M0 49 MHz	64 KB	8Mbit	2.0~5.5	1,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J09DF	Cortex®-M0 49 MHz	64 KB	8Mbit	2.0~5.5	1,000	6 KB	11	UART	4	√	DPWM	10-bit 4-ch	√	TSSOP20
N570J16AL	Cortex®-M0 49 MHz	64 KB	16Mbit	2.4~5.5	2,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J16DL	Cortex®-M0 49 MHz	64 KB	16Mbit	2.0~5.5	2,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J32AL	Cortex®-M0 49 MHz	64 KB	32Mbit	2.4~5.5	4,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J32DL	Cortex®-M0 49 MHz	64 KB	32Mbit	2.0~5.5	4,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J64L	Cortex®-M0 49 MHz	64 KB	64Mbit	2.4~5.5	8,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP48
N570J01GR	Cortex®-M0 49 MHz	64 KB	1Gbit	2.4~5.5	128,000	6 KB	24	SPI, UART	8	√	DPWM	10-bit 5-ch	√	LQFP64

• N572F/C, N572S, 32-bit Cortex-M0 with Embedded Flash and 12-bit ADC Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec)	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
					8KHz					Mic.	Speaker				
N572F072	Cortex®-M0 48 MHz	72 KB	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572C072	Cortex®-M0 48 MHz	72 KB	-	2.4~5.5	-	8 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	Voice Recognition	LQFP64
N572S16A	Cortex®-M0 48 MHz	64 KB	16Mbit	2.4~5.5	2,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S32A	Cortex®-M0 48 MHz	64 KB	32Mbit	2.4~5.5	4,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572S64A	Cortex®-M0 48 MHz	64 KB	64Mbit	2.4~5.5	8,000	8 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64

• N572H, 32-bit Cortex-M0 with Embedded Flash and 12-bit ADC Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec)	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
					8KHz					Mic.	Speaker				
N572H064	Cortex®-M0 48 MHz	64 KB	-	2.0~5.5	-	6 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	
N572H064S	Cortex®-M0 48 MHz	64 KB	-	2.0~5.5	-	6 KB	32	SPI x 2	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64
N572H16A	Cortex®-M0 48 MHz	64 KB	16Mbit	2.0~5.5	2,000	6 KB	26	SPI	4	√	Class-AB (400mW)	√	12-bit 8-ch	-	LQFP64

• N574F, 32-bit Cortex-M0 with Embedded Flash, 10 bit ADC, Cap Touch

Part No.	CPU	APROM Flash	V_{DD} (V)	Duration (Sec.)		SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Cap Touch	Voice Recognition	LDO33 for SPI Flash
				12KHz	16KHz					Mic.	Speaker				
N574F128	Cortex®-M0	128 KB	1.8~5.5	63	47	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	-	√
N574C128	Cortex®-M0	128 KB	1.8~5.5	63	47	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	√	√
N574F256	Cortex®-M0	256 KB	1.8~5.5	142	106	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	-	-
N574C256	Cortex®-M0	256 KB	1.8~5.5	142	106	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	√	-
N574F512	Cortex®-M0	512 KB	1.8~5.5	303	228	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	-	-
N574C512	Cortex®-M0	512 KB	1.8~5.5	303	228	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	√	-
N574F1K0	Cortex®-M0	1024 KB	1.8~5.5	627	470	12 KB	40	SPI, UART, 2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	-	-
N574C1K0	Cortex®-M0	1024 KB	1.8~5.5	627	470	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	√	-

• N574F, 32-bit Cortex-M0 with Embedded Flash, 10 bit ADC, Cap Touch

Part No.	CPU	APROM Flash	V_{DD} (V)	Duration (Sec.)		SRAM	GPIO	I/O Interface	PWM Output	Audio		ADC	Cap Touch	Voice Recognition	LDO33 for SPI Flash
				12KHz	16KHz					Mic.	Speaker				
N574F1K5	Cortex®-M0	1536 KB	1.8~5.5	951	713	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	-	-
N574C1K5	Cortex®-M0	1536 KB	1.8~5.5	951	713	12 KB	40	SPI, UART, I2C, Addr. LED	12	√	DPWM	10-bit 5-ch	16	√	-

• N575, 32-bit Cortex-M0 with Embedded Flash and 16-bit ADC Solution

Part No.	CPU	APROM Flash	Flash Memory	V_{DD} (V)	Duration(Sec)	SRAM	I/O	I/O Interface	PWM Output	Audio		LDO	ADC	Other	Package
					8KHz					Mic.	Speaker				
N575F145	Cortex®-M0 48 MHz	145 KB	-	2.4~5.5	-	12 KB	24	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC	LQFP48
N575C145	Cortex®-M0 48 MHz	145 KB	-	2.4~5.5	-	12 KB	24	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC, Voice Recognition	LQFP48
N575S64A	Cortex®-M0 48 MHz	145 KB	64 Mbit	2.4~5.5	8,000	12 KB	20	UART, I²C, I²S, SPI	2	√	DPWM (1W)	√	16-bit, sigma delta	8-ch Touch Key, Temperature Alarm, PDMA, CRC	LQFP64

Development Tools for NuVoice Series

Ordering No.	Board Name	Content	Description	Picture
NuVoice® Family				
NuVoice Demo Board, Evaluation Board				
NV-N570C064	NHS-570C064-EVB	• N570F/C064 EVB	• N570F/C064 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application Support: N570F064, N570C064	
NV-N569S8K0	NHS-N569S8K0	• N569S8K0 (MCP) EVB	• N569S (w/ 64Mbit Flash) Evaluation Board (EVB) with I/O Interface Support: N569S502/1K0/2K0/4K0/8K0	
NV-N570SC64	NHS-570SC64	• N570SC64 (MCP) EVB	• N570SC64 (w/ 64Mbit Flash) Evaluation Board with I/O Interface & Microphone for Voice Recognition Application Support: N570S08A/16A/32A/64A, N570SC08/16/32/64	
N570HC64-EVB	NHS-570H064-EVB	• N570H064 EVB	• N570H064 and N570HC64 Evaluation Board (EVB) with Push Button for Demo	
N570J32A-EVB	NHS-N570J32A	• N570J32A (MCP) EVB VDD: 2.4~5.5V	• N570J32AL (w/ 32Mbit Spi-Flash) Evaluation Board Support: N570J08AL, N570J16AL and N570J32AL	
NV-N572F065	NHS-572F065-EVB	• N572F065 EVB	• N572F065 Evaluation Board (EVB) with I/O Interface	
NV-N572C072	NHS-572C072-EVB	• N572F/C072 EVB	• N572F/C072 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application Support: N572F072, N572C072	
N574F1K5-EVB	N574F1K5-EVB	N574F1K5 Evaluation Board	N574F1K5-EVB Supports N574F256, N574F512, N574F1K0, N574F1K5	
N574F128-EVB	N574F128-EVB	N574F128 Evaluation Board	N574F128-EVB Support N574F128	
NV-N575C145	NHS-575C145	• N575F/C145 EVB	• N575F/C145 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application Support: N575F145, N575C145	
NT-N575C145	NHS-575C145	• N575C145-EVB + Daughter Board	• N575F/C145 Evaluation Board (EVB) with I/O Interface & Microphone for Voice Recognition Application with Daughter Board	

Ordering No.	Board name	Content	Description	Picture
NuVoice Dongle, Writer				
NW-NULINK2	Nu-Link2	• Nu-Link2 Dongle	• Nu-Link2 Dongle as NuVoice 1 to 1 Writer. Support to:N570F/C064, N570H064, N570HC64, N572F/C072, N572F065, N574F/C-256/512/1K0/1K5 MCP Series: N569S, N570S, N570J	
NW-570F064-F	NW-570F064-F	• NW-570F064-F 1-8 Gang Writer w/ LQFP48 Adaptor and Socket	• N570F064 LQFP48 1-8 Gang Writer. Support: N570F064L, N570FW64L	
NW-570F064-S	NW-570F064-S	N570F064 LQFP48 Adaptor with Socket	N570F064 LQFP48 Adaptor with Socket for N570F064 Gang Writer	
NW-570H574-F	Flash Gang Writer (Full Set)	• The 2 to 8 Gang Writer Full Set Includes NW-N570H574-M (Mother Board), 8 x LQFP48 Socket with Adaptor Board	• This 2 to 8 Gang Writer Full Set is for N570H064L (LQFP48)	
NW-570H574-M	Flash Gang Writer (Main Board)	• 2 to 8 Gang Writer Main Board (N570H/N574F)	• 2 to 8 Gang Writer Main Board for N570H064, N570J, N569J, N574F	
NW-N570J32-F	NW-N570J32-F	• NW-N570J32-M x 1 (2 to 8 Gang Writer Main Board) N570J32 adaptor board x 8 and LQFP48 Socket x 8	• N570J32AL/DL 2 to 8 Gang Writer Full Set. It Supports 570J08AL/16AL/32AL, N570J08DL/16DL/32DL, and N569J1K0/2K0	
NW-N570J32-M	NW-N570J32-M	• NW-N570J32-M (2 to 8 Gang Writer Main Board)	• N570J32AL/DL 2 to 8 Gang Writer Main Board. It Supports N570J08AL/16AL/32AL, N570J08DL/16DL/32DL, and N569J1K0/2K0/4K0	
NW-570S64A-F	Flash Gang Writer	• N569S/N570S 1-8 Gang Writer	• N569S/N570S (MCP) 1 to 8 Gang Writer Support: N569S502/1K0/2K0/4K0/8K0, and N570S08A/16A/32A/64A	
NW-569SAK2-F	NW-569SAK2-F	• N569SAK2/N570S130 1-8 Gang Writer	• N569SAK2/N570S130 (MCP) 1 to 8 Gang Writer • Support: N569SAK2 and N570S130 (w/ 128Mbit Spi-Flash)	
NW-572H16A-F	NW-572H16A-F	• N572H16A Gang Writer Main Board, Adaptor Board and LQFP64 Socket	• N572H16A 1 to 8 Gang Writer Full Set to Program N572H16A MCP (LQFP64, 7x7mm^2) Chip	
NW-572H064-F	NW-572H064-F	• N572H064S Gang Writer Main Board, Adaptor Board and LQFP64 Socket	• N572H064S 1 to 8 Gang Writer Full Set to Program N572H064S (LQFP64, 7x7mm^2) Chip	

ISD®9100 Series

Nuvoton has developed a series of 32-bit Arm Cortex-M0 integrated MCUs dedicated for audio applications. In addition to built-in Flash and SRAM memory, Nuvoton also has a variety of audio and control interfaces RTC, PDMA, UART, SPI, I2C, PWM, GPIO, SAR ADC, USB, Arm Cortex-M0 built-in small watt power amplifier, the main frequency can run up to 49 MHz to carry a compact version of voice recognition engine for voice control applications, suitable for highly integrated peripheral devices. It supports FS1.1 and is compatible with 2.0. The current content build high-quality noise reduction and echo cancellation algorithms, or high-level speech recognition. Used to handle calls or speech recognition solutions.

Part No.	CPU	APROM	SRAM	I/O	Timer	ADC	RTC	Audio		Developemnt Tools	Other	Package
								MIC.	Speaker			
ISD9130	Cortex®-M0 49 MHz	68 KB	12 KB	24	2	16-bit Sigma-Delta	√	1	Class-D (1W)	NM-ISD9160	-	LQFP48 QFN33
ISD9160	Cortex®-M0 49 MHz	145 KB	12 KB	24	2	16-bit Sigma-Delta	√	1	Class-D (1W)	NM-ISD9160	-	LQFP48 QFN33
ISD9160C	Cortex®-M0 49 MHz	145 KB	12 KB	24	2	16-bit Sigma-Delta	√	1	Class-D (1W)	NM-ISD9160	Voice Recognition	LQFP48 QFN33
ISD91230	Cortex®-M0 49 MHz	64 KB	12 KB	32	2	12-bit SAR	√	1	Class-D (0.45W)	NM-ISD91260	-	LQFP64 QFN33
ISD91230B	Cortex®-M0 49 MHz	64 KB	12 KB	32	2	12-bit SAR 24-bitBridgeSense	√	-	Class-D (0.45W)	NM-ISD91260B	BridgeSensing	LQFP64
ISD91260	Cortex®-M0 49 MHz	128 KB	12 KB	32	2	12-bit SAR	√	1	Class-D (0.45W)	NM-ISD91260	-	LQFP64 QFN33
ISD91260B	Cortex®-M0 49 MHz	128 KB	12 KB	32	2	12-bit SAR 24-bit BridgeSense	√	-	Class-D (0.45W)	NM-ISD91260B	BridgeSensing	LQFP64
ISD91260C	Cortex®-M0 49 MHz	128 KB	12 KB	32	2	12-bit SAR	√	1	Class-D (0.45W)	NM-ISD91260	Voice Recognition	LQFP64 QFN33
ISD91530	Cortex®-M0 49 MHz	64 KB Flash	12KB	50	3	12-bit SAR 16-bit Sigma-Delta	-	1	Class-AB (0.02W)	NM-ISD91500	USB 2.0 FS	LQFP64 QFN48
ISD91535	Cortex®-M0 49 MHz	64 KB Flash	20KB	50	3	12-bit SAR 16-bit Sigma-Delta	-	1	Class-AB (0.02W)	NM-ISD91500	USB 2.0 FS	LQFP64 QFN48

Development Tools for ISD®9100 Series

Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NP-SPK1	• NP-SPK1	Differential Audio Output	• 8-Ohm Speaker	
NU-NULINKISD	• NU-NULINKISD	Audio SoCs products	• USB Dongle • Support ICP (In-Circuit Programming) • Support Debug Mode	
NU-NULINKPRO	NU-NULINKPRO	ISD91500 Series ISD941A24	• USB dongle • Adjustable Voltage Regulation @ 3V / 5V	
NM-ISD9160	• NT-ISD9160 • NU-NULINKISD • NP-ISD9160-T • NP-ISD9160-K • NP-SPK1	ISD9100 Series	• Evaluation and Demo Kit for ISD9100 Series	
NT-ISD9160	• NT-ISD9160	ISD9100 Series	• Demo Board for ISD9100 Series • USB Dongle Required for PC Connection (NU-NULINKISD)	
NP-ISD9160-T	• NP-ISD9160-T	ISD9100 Series	• 8-input Touch Pad for NT-ISD9160	
NP-ISD9160-K	• NP-ISD9160-K	ISD9100 Series	• 8-input Key Pad for NT-ISD9160	
NM-ISD91260	• NT-ISD91260 • NU-NULINKISD • NP-SPK1	ISD91200C Series	• Evaluation and Demo Kit for ISD91200C Series	

Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NM-ISD91260B	• NT-ISD91260B • NU-NULINKISD • NP-SPK1	ISD91200B Series	• Evaluation and Demo Kit for ISD91200B Series	
NT-ISD91260	• NT-ISD91260	ISD91200C Series	• Demo Board for ISD91200C Series • USB Dongle Required for PC Connection (NU-NULINKISD)	
NT-ISD91260B	• NT-ISD91260B	ISD91200B Series	• Demo Board for ISD91200B Series • USB Dongle Required for PC Connection (NU-NULINKISD)	
NM-ISD91500	• NT-ISD91500 • NU-NULINKISD • NP-SPK1	ISD91500 Series	• Evaluation and Demo Kit for ISD91500 Series	
NT-ISD91500	• NT-ISD91500	ISD91500 Series	• Demo Board for ISD91500 Series • USB Dongle Required for PC Connection (NU-NULINKISD)	

NuMicro® Family 8051 Microcontrollers

As a leading supplier of 8051 microcontrollers, Nuvoton offers a variety of products with a great price-performance ratio which is critical to the success of consumers and industrial products. The 8-bit microcontrollers are equipped with rich peripherals to meet various system requirements and are supported by the toolchain from world-leading tool makers for rapid product development.

MUG51 series is a Flash embedded 1T 8051-based low-power microcontroller which is suitable for battery-free device which harvests power from the magnetic field of coil, such as stylus pen powered by EMR (Electro-magnetic Resonance) technology and RFID card.

MG51 series is an embedded Flash type 1T 8051-based microcontroller. It supports 16/24 MHz core speed and features up to 32 Kbytes Flash memory, 256 Bytes of RAM and 1 Kbyte of auxiliary RAM (XRAM), 2.4V to 5.5V operating voltage, and -40°C to105°C operating temperature.

MS51 series is suitable for cost-conscious applications by being based on the 1T 8051 core and rich peripherals in various compact packages. GPIO is equipped with 20 mA high sink current. This series provides high immunity 8 kV ESD.

ML51/ML54/ML56 low power series provides up to 64 Kbytes Flash memory and 4 Kbytes SRAM. The operating current is 80 µA/MHz and the powerdown current can be as low as 0.8 µA.

ML51 - Basic low power line

ML54 - Low power with an LCD driver line

ML56 - Low power with LCD driver and Touch key line

MUG51 Low-power Series

The Low Power MUG51 series is a Flash embedded 1T 8051-based low-power microcontroller. It runs up to 7.3728 MHz with 16 Kbytes embedded Flash memory, 1 Kbytes embedded SRAM, 4 Kbytes Flash loader memory (LDROM), 1.8V ~ 5.5V operating voltage, and -40°C ~ 105°C operating temperature. The Low Power MUG51 series supports enhanced low current consumption at 200 µA while CPU Power-on before Flash memory is initialized. Its low-power feature makes it suitable for battery-free device which harvests power from the magnetic field of coil such as stylus pen powered by EMR (Electro-magnetic Resonance) technology and RFID card.

The Low Power MUG51 series features low current consumption at 200 µA while CPU Power-on before Flash memory is initialized. It is suitable for battery-free devices such as stylus pen powered by EMR (Electro-magnetic Resonance) technology and RFID card. The current consumption is less than 1.3 mA in normal run mode at 7.3728 MHz, and less than 1 µA in Power-down mode.

The Low Power MUG51 series provides rich peripherals including 24 general purpose I/Os with internal inverter, four 16-bit Timers/Counters, 2 sets of UARTs with frame error detection and automatic address recognition, 1 set of ISO7816 Smartcard interface, 1 set of SPI, 2 sets of I2C, 6 enhanced PWM output channels with dead zone control, 2 sets of analog comparators, eight-channel shared pin interrupt for all I/O ports, low voltage reset (LVR) and brown-out detector (BOD) to enhance product performance, reduce external components and form factor simultaneously.

The Low Power MUG51 series includes the QFN33 (4mm x 4mm) package.

Target Applications: Suitable for Passive Stylus Pen and RFID card

Key Features: The Low Power MUG51 series supports enhanced low current consumption at 200 µA while CPU Power-on before Flash memory is initialized, The current consumption is less than 1.3 mA in normal run mode at 7.3728 MHz, and less than 1 µA in Power-down mode.

Part No.	System							Memory					Timer				Analog				Connectivity				Security			Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA(ch)	WDT	Timer (16-bit)	PWM (10-bit)	RTC	ADC (12-bit)	ACMP	Touch Key	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	SPROM(B)	UID	UCID	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
MUG51TB9AE	8051	7.3728	1.8	5.5	-40	105	24	4	16	Shared with APROM	1 + 256(B)	2	√	4	6	-	-	2	-	-	2	1	1	2	128	-	-	-	QFN33	4x4	√	NK-MUG51TB	-

MG51 Industrial Control Series

The NuMicro MG51 series microcontrollers are a subset of the NuMicro 8051 product line, featuring a 1T 8051 CPU with configurable core speeds of 16 MHz or 24 MHz. The MG51 series MCU includes 256 bytes of internal RAM supporting direct addressing, and up to 4 kbytes of SRAM supporting indirect addressing. For ROM, it offers up to 64 kbytes of Flash memory, with up to 4 kbytes allocated for LDROM to store the bootloader. MG51 series operates within a voltage range of 2.4V to 5.5V and a wide temperature range of -40°C to +105°C, making them suitable for industrial-grade applications.

Target Applications: LED lighting control, Home Appliances, Industrial Control, User interface, BMS, etc.
Key Features: 2 UARTS, 1 SPI, 1 I2C, Up to 15-ch 12-bit ADC, Up to 12-ch PWM.

Part No.	System							Memory				Timer			Analog	Connectivity				Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	WDT	Timer (16-bit)	PWM (16-bit)	ADC (12-bit)	UART	ISO-7816-3	SPI	I²C	SPROM(B)	Package Type	Package Size	Mass Production	EVB	MP Programmer
MG51FB9AE	8051	16/24	2.4	5.5	-40	105	18	4	16	Shared with APROM	1 + 256 (B)	√	4	6	8	2	-	1	1	128	TSSOP20	4.4x6.5	√	NK-MG51FC	NLG-MS51F
MG51XB9AE	8051	16/24	2.4	5.5	-40	105	18	4	16	Shared with APROM	1 + 256 (B)	√	4	6	8	2	-	1	1	128	QFN20	3x3	√	NK-MG51FC	-
MG51FC9AE	8051	16/24	2.4	5.5	-40	105	18	4	32	Shared with APROM	1 + 256 (B)	√	4	6	8	2	-	1	1	128	TSSOP20	4.4x6.5	√	NK-MG51FC	NLG-MS51F
MG51XC9AE	8051	16/24	2.4	5.5	-40	105	18	4	32	Shared with APROM	1 + 256 (B)	√	4	6	8	2	-	1	1	128	QFN20	3x3	√	NK-MG51FC	-
MG51EC1AE	8051	16/24	2.4	5.5	-40	105	26	4	32	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	TSSOP28	4.4x9.7	√	NK-MG51LD	-
MG51TC1AE	8051	16/24	2.4	5.5	-40	105	30	4	32	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	QFN33	4x4	√	NK-MG51LD	-
MG51PC1AE	8051	16/24	2.4	5.5	-40	105	30	4	32	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	LQFP32	7x7	√	NK-MG51LD	-
MG51LC1AE	8051	16/24	2.4	5.5	-40	105	46	4	32	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	LQFP48	7x7	√	NK-MG51LD	-
MG51TD1AE	8051	16/24	2.4	5.5	-40	105	30	4	64	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	QFN33	4x4	√	NK-MG51LD	-
MG51PD1AE	8051	16/24	2.4	5.5	-40	105	30	4	64	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	LQFP32	7x7	√	NK-MG51LD	-
MG51LD1AE	8051	16/24	2.4	5.5	-40	105	46	4	64	Shared with APROM	4 + 256 (B)	√	4	12	15	2	3	1	1	128	LQFP48	7x7	√	NK-MG51LD	-

MS51 Industrial Control Series

The NuMicro® MS51 series is a 8-bit high performance 1T 8051-based microcontroller. The instruction set is fully compatible with the standard 80C51 and performance enhanced. It runs up to 24 MHz with 8 to 32 Kbytes embedded Flash Memory, 1 to 2 Kbytes embedded SRAM, configurable 1 to 4 Kbytes Flash loader memory (LDROM) for In-System Programming (ISP). It features rich peripherals, up to 15-channel 12-bit ADC with DMA, up to 5 sets of UART, up to 12-channel 16-bit PWM, strong ESD and EFT immunity.

Target Applications: Suitable for a wide range of application such as Smart Building, Smart Home, Smart Home Appliances, Industrial Control, BMS etc.
Key Features: Configurable Data Flash, ESD resistivity 8 kV and EFT resistivity 4.4 kV, GPIO supports 20 mA driving capability.

Part No.	System							Memory				Timer			Analog	Connectivity				Security	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	WDT	Timer (16-bit)	PWM (16-bit)	ADC (12-bit)	UART	ISO-7816-3	SPI	I²C	SPROM (Byte)	Package Type	Package Size	Mass Production	EVB	MP Programmer
MS51BA9AE	8051	16/24	2.4	5.5	-40	105	8	4	8	Shared with APROM	1 + 256(B)	√	4	5	5	2	-	1	1	128	MSOP10	3x3	√	NT-MS51DA	-
MS51DA9AE	8051	16/24	2.4	5.5	-40	105	12	4	8	Shared with APROM	1 + 256(B)	√	4	5	8	2	-	1	1	128	TSSOP14	4.4x5	√	NT-MS51DA	-
MS51EB0AE	8051	16/24	2.4	5.5	-40	105	26	4	16	Shared with APROM	2 + 256(B)	√	4	12	15	2	3	1	1	128	TSSOP28	4.4x9.7	√	NK-MS51PC	NLG-MS51E
MS51EC0AE	8051	16/24	2.4	5.5	-40	105	26	4	32	Shared with APROM	2 + 256(B)	√	4	12	15	2	3	1	1	128	TSSOP28	4.4x9.7	√	NK-MS51PC	NLG-MS51E
MS51FB9AE	8051	16/24	2.4	5.5	-40	105	18	4	16	Shared with APROM	1 + 256(B)	√	4	6	8	2	-	1	1	128	TSSOP20	4.4x6.5	√	NT-MS51FB	NLG-MS51F
MS51FC0AE	8051	16/24	2.4	5.5	-40	105	18	4	32	Shared with APROM	2 + 256(B)	√	4	11	15	2	3	1	1	128	TSSOP20	4.4x6.5	√	NK-MS51PC	NLG-MS51F
MS51PC0AE	8051	16/24	2.4	5.5	-40	105	30	4	32	Shared with APROM	2 + 256(B)	√	4	12	15	2	3	1	1	128	LQFP32	7x7	√	NK-MS51PC	-
MS51TC0AE	8051	16/24	2.4	5.5	-40	105	30	4	32	Shared with APROM	2 + 256(B)	√	4	12	15	2	3	1	1	128	QFN33	4x4	√	NK-MS51PC	-
MS51XB9AE	8051	16/24	2.4	5.5	-40	105	18	4	16	Shared with APROM	1 + 256(B)	√	4	6	8	2	-	1	1	128	QFN20	3x3	√	NT-MS51FB	-
MS51XB9BE	8051	16/24	2.4	5.5	-40	105	18	4	16	Shared with APROM	1 + 256(B)	√	4	6	8	2	-	1	1	128	QFN20	3x3	√	NT-MS51FB	NLG-20XB
MS51XC0BE	8051	16/24	2.4	5.5	-40	105	18	4	32	Shared with APROM	2 + 256(B)	√	4	12	15	2	3	1	1	128	QFN20	3x3	√	NK-MS51PC	-

ML51 / ML54 / ML56 Low-power Series

The NuMicro® ML51/ML54/ML56 series is a low-power microcontroller platform based on 1T 8051-based microcontroller. The instruction set is fully compatible with the standard 80C51 and performance enhanced. It runs up to 24 MHz with 16 to 64 Kbytes embedded Flash Memory, 1 to 4 Kbytes embedded SRAM, configurable 1 to 4 Kbytes Flash loader memory(LDROM) for In-System Programming (ISP). It features COM/SEG LCD driver, capacitive touch sensing function for smart home appliance HMI, 1.8V to 5.5V wide operating voltage (ML51 32/16 KB), 5V tolerance I/O, and -40°C to +105°C operating temperature.

Target Applications: Suitable for limited battery-powered device such as Handheld Meter, Thermostat, Healthcare, HMI, Smart Home, Smart Home Appliances, Industrial Control, Industrial Automation, Temperature/Humidity Logger
Key Features: The operating current can support 80 µA/MHz, 15 µA power consumption for low power run mode, 13 µA for low power idle mode, 0.8 µA (at 3.3V) for Power-down mode, 10 µs fast wake-up time, high immunity (8 kV ESD, 4 kV EFT), 20 mA large sink current, making this series also ideal for industrial applications.

• ML51 Low Power Series

Part No.	System							Memory					Timer				Analog				Connectivity				Security			Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	Timer (16-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Touch Key	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	SPROM (Byte)	UID	UCID	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
ML51BB9AE	8051	24	1.8	5.5	-40	105	7	4	16	Shared with APROM	1 + 256(B)	2	√	4	4	-	2	-	-	-	2	-	-	1	128	96	128	-	MSOP10	3x3	√	NT-ML51EB	-
ML51DB9AE	8051	24	1.8	5.5	-40	105	11	4	16	Shared with APROM	1 + 256(B)	2	√	4	4	-	3	-	-	-	2	1	1	2	128	96	128	-	TSSOP14	4.4x5.0	√	NT-ML51EB	-
ML51EB9AE	8051	24	1.8	5.5	-40	105	24	4	16	Shared with APROM	1 + 256(B)	2	√	4	6	-	8	-	-	-	2	1	1	2	128	96	128	-	TSSOP28	4.4x9.7	√	NT-ML51EB	NLG-28E
ML51EC0AE	8051	24	1.8	5.5	-40	105	24	4	32	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	2	-	√	2	1	2	2	128	96	128	-	TSSOP28	4.4x9.7	√	NK-ML51PC	NLG-28E
ML51FB9AE	8051	24	1.8	5.5	-40	105	16	4	16	Shared with APROM	1 + 256(B)	2	√	4	6	-	6	-	-	-	2	1	1	2	128	96	128	-	TSSOP20	4.4x6.5	√	NT-ML51EB	NLG-20F
ML51LD1AE	8051	24	1.8	3.6	-40	105	43	4	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	10	2	-	√	2	2	2	2	128	96	128	-	LQFP48	7x7	√	NK-ML51SD	NLG-48L
ML51OB9AE	8051	24	1.8	5.5	-40	105	16	4	16	Shared with APROM	1 + 256(B)	2	√	4	6	-	6	-	-	-	2	1	1	2	128	96	128	-	SOP20	7.6x13	√	NT-ML51EB	-
ML51PB9AE	8051	24	1.8	5.5	-40	105	28	4	16	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	2	-	√	2	1	1	2	128	96	128	-	LQFP32	7x7	√	NK-ML51PC	-
ML51PC0AE	8051	24	1.8	5.5	-40	105	28	4	32	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	2	-	√	2	1	2	2	128	96	128	-	LQFP32	7x7	√	NK-ML51PC	-
ML51SD1AE	8051	24	1.8	3.6	-40	105	56	4	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	14	2	-	√	2	2	2	2	128	96	128	-	LQFP64	7x7	√	NK-ML51SD	NLG-64S
ML51TB9AE	8051	24	1.8	5.5	-40	105	28	4	16	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	2	-	√	2	1	1	2	128	96	128	-	QFN33	4x4	√	NK-ML51PC	NLG-32T
ML51TC0AE	8051	24	1.8	5.5	-40	105	28	4	32	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	2	-	√	2	1	2	2	128	96	128	-	QFN33	4x4	√	NK-ML51PC	NLG-32T
ML51TD1AE	8051	24	1.8	3.6	-40	105	28	4	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	9	2	-	√	2	2	2	2	128	96	128	-	QFN33	4x4	√	NK-ML51SD	NLG-32T
ML51UB9AE	8051	24	1.8	5.5	-40	105	24	4	16	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	-	-	√	2	1	1	2	128	96	128	-	SOP28	7.6x18	√	NT-ML51EB	-
ML51UC0AE	8051	24	1.8	5.5	-40	105	24	4	32	Shared with APROM	2 + 256(B)	2	√	4	6	-	8	2	-	√	2	1	2	2	128	96	128	-	SOP28	7.6x18	√	NK-ML51PC	-
ML51XB9AE	8051	24	1.8	5.5	-40	105	17	4	16	Shared with APROM	1 + 256(B)	2	√	4	6	-	6	-	-	-	2	1	1	2	128	96	128	-	QFN20	3x3	√	NT-ML51EB	-

• ML54 Low Power LCD Series

Part No.	System							Memory					Timer					Analog				Connectivity				Security			Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	Timer (16-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Touch Key	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	SPROM (Byte)	UID	UCID	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
ML54LD1AE	8051	24	1.8	3.6	-40	105	42	-	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	10	2	-	√	2	2	2	2	128	96	128	4x22/6x20/8x18	LQFP48	7x7	√	NK-ML54SD	NLG-48L
ML54MD1AE	8051	24	1.8	3.6	-40	105	38	-	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	10	2	-	√	2	2	2	2	128	96	128	4x21/6x19/8x17	LQFP44	10x10	√	NK-ML54SD	-
ML54SD1AE	8051	24	1.8	3.6	-40	105	55	-	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	14	2	-	√	2	2	2	2	128	96	128	4x32/6x30/8x28	LQFP64	7x7	√	NK-ML54SD	NLG-64S

• ML56 Low Power Touch Key Series

Part No.	System							Memory					Timer				Analog				Connectivity				Security			Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	PDMA (ch)	WDT	Timer (16-bit)	PWM (16-bit)	RTC	ADC (12-bit)	ACMP	Touch Key	Internal Voltage Reference	UART	ISO-7816-3	SPI	I²C	SPROM (Byte)	UID	UCID	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
ML56LD1AE	8051	24	1.8	3.6	-40	105	42	-	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	10	2	9	√	2	2	2	2	128	96	128	4x22/6x20/8x18	LQFP48	7x7	√	NK-ML56SD	NLG-48L
ML56MD1AE	8051	24	1.8	3.6	-40	105	38	-	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	10	2	6	√	2	2	2	2	128	96	128	4x21/6x19/8x17	LQFP44	10x10	√	NK-ML56SD	-
ML56SD1AE	8051	24	1.8	3.6	-40	105	55	-	64	Shared with APROM	4 + 256(B)	4	√	4	12	√	14	2	14	√	2	2	2	2	128	96	128	4x32/6x30/8x28	LQFP64	7x7	√	NK-ML56SD	NLG-64S

N76E Series

As a leading supplier of 8051 microcontrollers (MCUs), Nuvoton offers a variety of products with the best-in-class price/performance critical to the success of consumers and industrial products. The 8-bit MCU comes equipped with rich peripherals to meet various system requirements and is supported by the tool chain from world leading tool makers for rapid product development.

Key Features: N76E series offer high-value features by integrating high resolution of ADC, power management circuit such as LDO, POR and BOD.

Part No.	System							Memory				Timer					Analog		Connectivity			Display	Package		Status	Tool	
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	LDROM Flash (KB)	APROM Flash (KB)	Data Flash (KB)	SRAM (KB)	WDT	Timer (16-bit)	PWM (10-bit)	PWM (12-bit)	PWM (16-bit)	ADC (10-bit)	ADC (12-bit)	UART	SPI	I²C	ComSeg LCD	Package Type	Package Size	Mass Production	EVB	MP Programmer
N76E003AQ20	8051	16	2.4	5.5	-40	105	18	4	18	Shared with APROM	768(B) + 256(B)	√	4	-	-	6	-	8	2	1	1	-	QFN20	3x3	√	NT-N76E003	-
N76E003AT20	8051	16	2.4	5.5	-40	105	18	4	18	Shared with APROM	768(B) + 256(B)	√	4	-	-	6	-	8	2	1	1	-	TSSOP20	4.4x6.5	√	NT-N76E003	NLG-MS51F
N76E003BQ20	8051	16	2.4	5.5	-40	105	18	4	18	Shared with APROM	768(B) + 256(B)	√	4	-	-	6	-	8	2	1	1	-	QFN20	3x3	√	NT-N76E003	NLG-20XB
N76E616AF44	8051	16	2.4	5.5	-40	105	42	4	18	Shared with APROM	256(B) + 256(B)	√	4	-	-	6	8	-	2	-	1	4x32/6x30	PQFP44	10x10	√	NT-N76E616	-
N76E616AL48	8051	16	2.4	5.5	-40	105	46	4	18	Shared with APROM	256(B) + 256(B)	√	4	-	-	6	8	-	2	-	1	4x32/6x30	LQFP48	7x7	√	NT-N76E616	-
N76E616AM44	8051	16	2.4	5.5	-40	105	42	4	18	Shared with APROM	256(B) + 256(B)	√	4	-	-	6	8	-	2	-	1	4x32/6x30	LQFP44	10x10	√	NT-N76E616	-
N76E885AQ20	8051	25	2.4	5.5	-40	105	18	4	18	Shared with APROM	256(B) + 256(B)	√	4	-	6	-	10	-	2	1	1	-	QFN20	4x4	√	NT-N76E885	-
N76E885AT20	8051	25	2.4	5.5	-40	105	18	4	18	Shared with APROM	256(B) + 256(B)	√	4	-	6	-	10	-	2	1	1	-	TSSOP20	4.4x6.5	√	NT-N76E885	-
N76E885AT28	8051	25	2.4	5.5	-40	105	26	4	18	Shared with APROM	256(B) + 256(B)	√	4	-	6	-	10	-	2	1	1	-	TSSOP28	4.4x9.7	√	NT-N76E885	-

Standard 8051

The Nuvoton standard 8051 series is based on 6/12 cycle core structure, providing 22.1184 MHz internal oscillator (1% accuracy at 25°C, 5V), Data Flash configurable and high immunity (8 kV ESD, 4 kV EFT).

Target Applications: Industrial Control, Power Management, etc.
Key Features: 16 to 64 Kbytes Flash, with sufficient IO, pin supports from 40 to 48. Standard line also includes energy management circuit such as LDO, POR, and BOD.

• W78 Series

Part No.	Core	Flash (KB)	SRAM (bytes)	ISP ROM (KB)	I/O	Connectivity			ADC (10-bit)	Comp	ISP	INT	PWM (8-bit)	Timer (16-bit)	Special Function	Package	Mass Production
						I²C	SPI	UART									
W78E052D	8051	8	256	2	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48//TQFP44	√
W78E054D	8051	16	256	2	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48//TQFP44	√
W78E058D	8051	32	256 + 256	4	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48	√
W78E516D	8051	64	256 + 256	4	36	-	-	1	-	-	√	4	-	3	6T/12T option, Extra I/O port	PDIP40/PLCC44/PQFP44/ LQFP48	√

NuMicro® Family Arm9 MPUs

NUC970/NUC980 Series

Nuvoton's Arm9 Industrial network series offers LQFP packages stacked with 64 to 128 Mbytes DDR memory to reduce PCB size and EMI issues. Rich peripherals include 11 sets of UART, dual Ethernet, SDIO/ eMMC interface, NAND Flash interface, LCD controller, CAN Bus 2.0B interface, and USB 2.0 high speed host/ device controller, allowing flexibility for product design. The Arm9 Industrial network series also integrates the crypto engine which provides hardware acceleration for AES, ECC, RSA, and SHA functions.

Boot Source: SPI NOR, SPI NAND, NAND, SD, eMMC, USB

Target Applications: Industrial Control, HMI, Industrial IoT Gateway, Network Printer, Smart Meter, and Smart Home Gateway applications.

NUC970/980 Series	EBI	LCD	Crypto Engine	Linux
NUC980DF	√	-	AES/ECC/RSA/SHA	√
NUC980DK	√	-	AES/ECC/RSA/SHA	√
NUC980DR	-	-	AES/ECC/RSA/SHA	√
NUC972DF	√	√	AES/ECC/SHA/DES/3DES	√
NUC975DK	-	-	AES/ECC/SHA/DES/3DES	√
NUC976DK	-	√	AES/ECC/SHA/DES/3DES	√
NUC977DK	-	√	AES/ECC/SHA/DES/3DES	√

Key Features: MCP industrial DDR in LQFP package, Dual USB high speed host, Dual 10/100M Ethernet MAC.

NUC970/NUC980 Series

Part No.	System							Memory			Timer	Analog	Connectivity												Security	Crypto	Display		Package		Status	Tool
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	SRAM (KB)	DDR (MB)	PDMA	PWM (16-bit)	ADC (12-bit)	UART	ISO-7816-3	QSPI	SPI	I²C	CAN	SDHC	USB FS Host	USB HS Host	USB HS Device/ Host	EMAC	EBI	OTP	Crypto	Camera Interface	TFT-LCD Interface	Package Type	Package Size	Mass Production	EVB
NUC980DF63YC	ARM926EJ-S	300	2.97	3.63	-40	85	104	16	64	20	8	8	10	2	1	2	4	4	2	HL*6	1	1	2	√	-	√	2	-	LQFP 216	24x24	√	NK-NUC980
NUC980DF71YC	ARM926EJ-S	300	2.97	3.63	-40	85	104	16	128	20	8	8	10	2	1	2	4	4	2	HL*6	1	1	2	√	-	√	2	-	LQFP 216	24x24	√	-
NUC980DK63YC	ARM926EJ-S	300	2.97	3.63	-40	85	92	16	64	20	8	8	10	2	1	2	4	4	2	HL*6	1	1	2	√	-	√	2	-	LQFP 128	14x14	√	NK-980IOTG1/D
NUC980DK71YC	ARM926EJ-S	300	2.97	3.63	-40	85	92	16	128	20	8	8	10	2	1	2	4	4	2	HL*6	1	1	2	√	-	√	2	-	LQFP 128	14x14	√	NK-980IOTG2/D
NUC980DR63YC	ARM926EJ-S	300	2.97	3.63	-40	85	40	16	64	20	5	2	8	2	-	2	2	2	1	HL*6	-	1	1	-	-	√	1	-	LQFP 64-EP	10x10	√	NK-RTU980
NUC972DF63YC	ARM926EJ-S	300	2.97	3.63	-40	85	146	56	64	-	4	8	11	2	-	2	2	2	2	-	2	1	2	√	√	√	1	24bit	LQFP 216	24x24	√	ND-NUC972
NUC972DF71YC	ARM926EJ-S	300	2.97	3.63	-40	85	146	56	128	-	4	8	11	2	-	2	2	2	2	-	2	1	2	√	√	√	1	24bit	LQFP 216	24x24	√	-
NUC975DK63YC	ARM926EJ-S	300	2.97	3.63	-40	85	87	56	64	-	2	4	10	2	-	2	2	1	2	-	2	1	1	-	√	√	1	-	LQFP 128	14x14	√	ND-NUC972
NUC976DK63YC	ARM926EJ-S	300	2.97	3.63	-40	85	80	56	64	-	4	4	6	2	-	2	2	1	2	-	2	1	1	-	√	√	1	16bit	LQFP 128	14x14	√	ND-NUC972
NUC977DK63YC	ARM926EJ-S	300	2.97	3.63	-40	85	87	56	64	-	4	-	8	2	-	2	2	1	2	-	2	1	1	-	√	√	1	16bit	LQFP 128	14x14	√	ND-NUC972

N9H Series

The N9H series is based on the ARM926EJ-S core. The series includes N9H20, N9H26 and N9H30 with CPUs operating at up to 200 MHz , 240 MHz and 300 MHz respectively. It uses Multi Chip Package (MCP) with SDRAM stacked, size ranging from 2 MB to 128 MB, which significantly reduces PCB size and electromagnetic interference (EMI) to minimize system design efforts and shorten the product design cycle time. The N9H series also provides built-in 24-bit TFT RGB interface with resolution support up to 1024x768, 2D graphics accelerator, JPEG/ H.264 video codec as well as resistive touch screen interface. Furthermore, Nuvoton licensed industrial leading emWin embedded GUI library from SEGGER to allow developers to create smooth, professional, high quality GUI on N9H series free of charge.

Boot Source: SPI NOR, NAND, SD, eMMC

Target Applications: Industrial Control, Smart Building, Smart Appliances, Medical Devices, New Energy Applications, and Consumer Products

Series	CPU (MHz)	LCD	Video CODEC	Audio DAC	Ethernet	CAN	Operating Temp
N9H20	200	16 / 24bit	JPEG	√	-	-	-20°C to 85°C
N9H26	240	24bit	JPEG/ H.264	√	√	-	-20°C to 85°C
N9H30	300	16 / 24bit	JPEG	-	√	√	-40°C to 85°C
N9H31	300	24bit	JPEG	-	√	√	-40°C to 85°C

Key Features: MCP Memory up to 128 Mbytes, LCD resolution up to 1024x768 24-bit RGB, free-to-use emWin graphic library.

Part No.	System							Memory			Timer		Analog		Connectivity												Display				Package		Status	Tool
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	SRAM (KB)	DDR (MB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	ADC (10-bit)	ADC (12-bit)	UART	ISO-7816-3	SPI	I²C	CAN	SDHC	USB FS Host	USB HS Device	USB HS Host	USB HS Device/ Host	EMAC	EBI	Camera Interface	TFT-LCD Interface	2D Graphics Engine	Video Codec	Package Type	Package Size	Mass Production	EVB
N9H20K11N	ARM926EJ-S	200	2.97	3.63	-20	85	70	8	2	4	2	4	7	-	2	-	2	1	-	3	1	1	-	-	-	-	-	24bit	√	JPEG	LQFP128	14x14	√	-
N9H20K31N	ARM926EJ-S	200	2.97	3.63	-20	85	70	8	8	4	2	4	7	-	2	-	2	1	-	3	1	1	-	-	-	-	-	24bit	√	JPEG	LQFP128	14x14	√	-
N9H20K51N	ARM926EJ-S	200	2.97	3.63	-20	85	70	8	32	4	2	4	7	-	2	-	2	1	-	3	1	1	-	-	-	-	-	24bit	√	JPEG	LQFP128	14x14	√	NK-N9H20
N9H20R11N	ARM926EJ-S	200	2.97	3.63	-20	85	44	8	2	4	2	4	-	-	2	-	1	1	-	1	1	1	-	-	-	-	-	16bit	√	JPEG	TQFP64-EP	10x10	√	-
N9H26K63N	ARM926EJ-S	240	2.97	3.63	-20	85	80	8	64	4	4	4	-	7	2	-	2	1	-	3	2	1	1	-	2	-	-	24bit	√	JPEG/ H.264	LQFP128	14x14	√	NK-N9H26
N9H30F63IEC	ARM926EJ-S	300	2.97	3.63	-40	85	146	56	64	-	5	4	-	8	11	2	2	2	2	2	-	-	2	1	2	√	1	24bit	√	JPEG	LQFP216	24x24	√	NK-N9H30
N9H30F71IEC	ARM926EJ-S	300	2.97	3.63	-40	85	146	56	128	-	5	4	-	8	11	2	2	2	2	2	-	-	2	1	2	√	1	24bit	√	JPEG	LQFP216	24x24	√	-
N9H30K63IEC	ARM926EJ-S	300	2.97	3.63	-40	85	86	56	64	-	5	4	-	5	9	2	2	2	1	2	-	-	2	1	1	-	1	16bit	√	JPEG	LQFP128	14x14	√	-
N9H31K51IFC	ARM926EJ-S	300	2.97	3.63	-40	85	86	56	32	-	5	2	-	4	8	-	2	2	1	2	-	-	2	1	1	-	1	24bit	√	JPEG	LQFP128	14x14	√	NK-N9H31A1 NK-N9H31A2

N329 Series

Designed for cost-effective solutions targeting consumer electronics, the ARM926EJ-S based SoC is embedded with various hardware accelerators and useful peripherals. All part numbers come up with a unique Multi-Chip Package (MCP) in the LQFP footprint, which is ideal in terms of several key design factors: high performance, small dimension, much less EMI, high production yield, and lower BOM cost.

Boot Source: SPI NOR, NAND, SD, eMMC

Series	CPU (MHz)	Video CODEC	Linux
N3290xR	200	JPEG	√
N3290xU	200	JPEG	√
N3290xK	200	JPEG	√
N3292xU	240	JPEG/ H.264	√

Key Features: 2D GFX, H.264/ JPEG CODEC, LQFP MCP Memory up to 64 Mbytes, LCD Display, Built-in Audio CODEC.

Part No.	System							Memory			Timer		Analog		Connectivity								Display				Package		Status	Tool
	Core	Operating Frequency (MHz)	Operating Voltage (min) (V)	Operating Voltage (max) (V)	Operating Temperature (min) (°C)	Operating Temperature (max) (°C)	GPIO	SRAM (KB)	DDR (MB)	PDMA (ch)	Timer (32-bit)	PWM (16-bit)	ADC (10-bit)	ADC (12-bit)	UART	SPI	I²C	SDHC	USB FS Host	USB HS Device	USB HS Host	EMAC	Camera Interface	TFT-LCD Interface	2D Graphics Engine	Video Codec	Package Type	Package Size	Mass Production	EVB
N32903K5DN	ARM926EJ-S	200	2.97	3.63	-20	85	70	8	8	4	2	4	7	-	2	2	1	3	1	1	-	-	1	24bit	√	JPEG	LQFP128	14x14	√	-
N32905K5DN	ARM926EJ-S	200	2.97	3.63	-20	85	70	8	32	4	2	4	7	-	2	2	1	3	1	1	-	-	1	24bit	√	JPEG	LQFP128	14x14	√	-
N32901R1DN	ARM926EJ-S	200	2.97	3.63	-20	85	34	8	2	4	2	2	3	-	2	1	-	2	1	1	-	-	1	-	-	JPEG	LQFP64	10x10	√	-
N32903R5DN	ARM926EJ-S	200	2.97	3.63	-20	85	34	8	8	4	2	2	3	-	2	1	-	2	1	1	-	-	1	-	-	JPEG	TQFP64-EP	10x10	√	-
N32905R3DN	ARM926EJ-S	200	2.97	3.63	-20	85	34	8	32	4	2	2	3	-	2	1	-	2	1	1	-	-	1	-	-	JPEG	TQFP64-EP	10x10	√	-
N32901U1DN	ARM926EJ-S	200	2.97	3.63	-20	85	64	8	2	4	2	4	8	-	2	2	1	3	1	1	-	-	1	18bit	√	JPEG	LQFP128	14x14	√	-
N32903U5DN	ARM926EJ-S	200	2.97	3.63	-20	85	64	8	8	4	2	4	8	-	2	2	1	3	1	1	-	-	1	18bit	√	JPEG	LQFP128	14x14	√	-
N32905U3DN	ARM926EJ-S	200	2.97	3.63	-20	85	64	8	32	4	2	4	8	-	2	2	1	3	1	1	-	-	1	18bit	√	JPEG	LQFP128	14x14	√	ND-N32905
N32926U6DN	ARM926EJ-S	240	2.97	3.63	-20	85	80	8	64	4	4	4	-	7	2	2	1	3	2	1	1	2	2	24bit	√	JPEG/ H.264	LQFP128	14x14	√	ND-N32926

nuvoTon

Smart Home

Smart Toy

PowerSpeech® Series
NuSpeech Series
BandDirector® Series
ViewTalk® Series
Peripheral Series

NSP

NSP Series

NSC

NSC Series

Audio Converters

Audio CODEC Series - Mono CODEC
Audio CODEC Series - Stereo CODEC
Audio CODEC Series - ULP (Ultra Low Power) CODEC
Audio ADC Series
Audio DAC Series
Precision ADC Series

Audio Amplifiers

2Vrms Line Driver Series
Class-AB Series
Class-D Series
Smart Amp Series

Audio Enhancement

ISD ChipCorder®

Digital ChipCorder® Series
MLS ChipCorder® Series

Smart Toy & NSP Development Tools

Audio Development Tools

Contact us: Audio@nuvoton.com

Smart Toy

Smart Toy family contains PowerSpeech, BandDirector, ViewTalk, Peripheral and NuVoice series which with 4-bit, 8-bit or 32-bit uC based and/or embedded Flash to fulfill various applications.

PowerSpeech, the N589 families with embedded flash to implement up to 2000” voice duration. It equips 8-bit uC, ADC, IR wake up, Addressable LED, Cap Touch, SPI and ICE.

BandDirector, the N566 families provides both Mask ROM and embedded OTP with 4-ch to 8-ch high quality MIDI solution.

ViewTalk, the N539T families support up to 2K dot B/W or Grey LCD driver and high quality 8-ch MIDI solution.

NuVoice, 32-bit Cortex M0 based with embedded Flash. The N570 and N574 families provide high resolution ADC and flexible algorithms for MIC, voice changing and voice recognition applications.

Peripheral series contain various peripheral devices apply with Speech IC, such as I/O expander, PWM signal PA, MFID reader and tags, and Cap Touch.

Smart Toy

PowerSpeech® Series

• W584A 4-bit µC Base, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584A011	300	9	7	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A016	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A021	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A031	1020	34	25	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A041	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A052	1580	53	40	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A062	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584A017	460	15	11	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A022	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A032	1020	34	25	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A042	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A051	1580	53	40	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A061	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A071	2220	75	56	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A081	2540	86	64	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584A025	620	20	15	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A035	1020	35	26	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A045	1260	42	32	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W584A 4-bit µC Base, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584A065	1900	64	48	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A075	2220	75	56	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A085	2540	86	64	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A100	3180	108	81	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A120	3820	129	97	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A151	4460	151	113	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A171	5100	173	130	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A191	5740	195	146	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A300	9100	310	232	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584A340	10220	348	261	2.2~5.5	1 + DTM	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W584B 4-bit µC Base, 1-ch Voice Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC			
W584B010	300	9	7	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B015	460	15	11	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B020	620	20	15	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B030	1020	34	25	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B040	1260	42	32	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B052	1580	53	40	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B062	1900	64	48	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	8 I/O	8-pin
W584B016	460	15	11	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B021	620	20	15	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B031	1020	34	25	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B041	1260	42	32	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B070	2220	75	56	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B080	2540	86	64	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	12 I/O	8-pin
W584B100	3180	108	81	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B120	3820	129	97	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B150	4460	151	113	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B170	5100	173	130	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin
W584B190	5740	195	146	2.2~5.5	1	4,8	Ring	9-bit	10-bit	128	16 I/O	8-pin

• W588L 8-bit µC Base, 2 Batteries, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
W588L020	94	23	18	1.8~3.6	1	4, 6	Ring	12-bit	-	96	8 I/O
W588L030	126	32	24	1.8~3.6	1	4, 6	Ring	12-bit	-	96	8 I/O
W588L035	170	44	33	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L040	192	50	37	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L050	224	58	43	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L060	254	66	49	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L070	330	86	65	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L080	382	100	75	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O
W588L100	448	118	88	1.8~3.6	2	4, 6	Ring	12-bit	-	128	16 I/O

• W588C 8-bit µC Base, 2-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO
		(6 KHz)	(8 KHz)					PWM	DAC		
W588C003	20	5	4	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C006	30	8	6	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C009	50	14	11	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C012	62	18	14	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C015	78	23	17	2.2~5.5	2	4~8	Ring	12-bit	-	96	8 I/O
W588C020	98	29	22	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
W588C025	114	35	26	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
W588C030	126	38	29	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	12 I/O
***W588C036**	170	52	39	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C041**	192	59	44	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C046**	205	63	48	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C051**	224	69	52	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C056**	240	74	56	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C061**	254	79	59	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C071**	330	103	77	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C081**	382	119	90	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C101**	448	140	105	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
***W588C121**	510	160	120	2.2~5.5	2	4~8	Ring	12-bit	13-bit	128	16 I/O
W588C150	640	201	151	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C170	768	242	181	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C210	896	282	212	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C260	1022	322	242	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O
W588C300	1180	372	279	2.2~5.5	2	4~8	Ring	12-bit	13-bit	192	16 I/O

*DAC w/o Noise Shaping

• W588D 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Sub-Clock 32KHz	Audio		RAM (Bytes)	GPIO	SIM SPI
		(6 KHz)	(8 KHz)						PWM	DAC			
W588D003	20	5	4	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	192	16 I/O	√
W588D006	30	8	6	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	192	16 I/O	√
W588D009	50	14	11	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D012	62	18	14	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D015	78	23	17	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D020	98	29	22	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D025	114	35	26	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D030	126	38	29	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D035	170	52	39	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D040	192	59	44	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D045	205	63	48	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D050	224	69	52	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D055	240	74	56	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D060	254	79	59	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588DF060 (MTP)	254	79	59	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	16 I/O	√
W588D070	330	103	77	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D080	382	119	90	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D100	448	140	105	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D120	510	160	120	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	256	24 I/O	√
W588D150	640	201	151	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D170	768	242	181	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D210	896	282	212	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D260	1022	322	242	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	384	24 I/O	√
W588D300	1180	372	279	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√
W588D350	1348	425	319	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√
W588D400	1534	484	363	2.2~5.5	3	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	8I, 24 I/O	√

• N584L 4-bit µC Base, 1~2 Battery, 1-ch Voice + Dual Tone Melody Synthesizer

Part No.	ROM (Kbits)	Duration (Sec.) @ 5-bit MDM		V_{DD} (V)	Booster Output (V)	CH	Fsys (MHz)	OSC	Audio		RAM (N)	GPIO
		(6 KHz)	(8 KHz)						PWM	DAC		
N584L020	620	20	15	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L030	1020	34	25	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L040	1260	42	32	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	8 I/O
N584L080	2540	86	64	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L120	3820	129	97	1.0~1.8	3	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L031	1020	34	25	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L041	1260	42	32	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L061	1900	64	48	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L081	2540	86	64	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O
N584L121	3820	129	97	1.0~3.6	4	1 + DTM	4~8	Ring	9-bit	-	128	12 I/O

• N588L 1.0~3.6V, 8-bit µC Base, 2-ch Voice Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD}	CH	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)					PWM	DAC					
N588L040	126	40	30	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L080	254	80	60	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L120	416	132	99	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L160	528	167	125	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L200	638	202	152	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L240	768	243	182	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L280	896	284	213	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N588L330	1022	324	243	1.0~3.6V	2	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

• N588LP (OTP), 1.0~3.6V, 8-bit µC base, 2-ch Voice Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD}	CH	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)					PWM	DAC					
N588LP122	416	132	99	1.0~3.6V	2	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	16 I/O	2-pin
N588LP162	528	167	125	1.0~3.6V	2	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	16 I/O	2-pin
N588LP202	638	202	152	1.0~3.6V	2	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	16 I/O	2-pin
N588LP242	768	243	182	1.0~3.6V	2	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	16 I/O	2-pin
N588LP282	896	284	213	1.0~3.6V	2	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	16 I/O	2-pin
N588LP332	1022	324	243	1.0~3.6V	2	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	16 I/O	2-pin

• N584H High Sound Quality 1-ch Voice

Part No.	ROM (Kbits)	Duration (Sec.) @ 4-bit NM4		V_{DD} (4 MHz)	CH	Fsys (MHz)	OSC	Audio		Cap Sensor	RAM (N)	LVD	GPIO	High Sink
		(6 KHz)	(8 KHz)					PWM	DAC					
N584H009	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H019	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H029	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H039	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	4 I/O	4-pin
N584H010	300	12	9	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H020	620	24	18	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H030	940	37	28	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H040	1260	49	37	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H060	1740	68	51	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H070	1900	74	56	1.8~5.5V	1	4, 8	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584H120	3340	131	98	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H160	4070	159	119	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit		8-pin	224	√	16 I/O	8-pin
N584H170	4460	175	131	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H210	5740	225	169	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H260	7020	275	206	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584H300	7980	312	234	1.8~5.5V	1 + DTM	4, 8	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin

• N584P (OTP), High Sound Quality 1-ch Voice

Part No.	ROM (Kbits)	Duration (Sec.) @ 4-bit NM4		V_{DD} (8 MHz)	CH	OSC	Audio		Cap Sensor	RAM (N)	LVD	GPIO	High Sink
		(6 KHz)	(8 KHz)				PWM	DAC					
N584P040	1260	49	37	1.8~5.5V	1	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584P070	1900	74	56	1.8~5.5V	1	TRIM	9-bit	-	-	96	√	8 I/O	8-pin
N584P120	3340	131	98	1.8~5.5V	1 + DTM	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584P170	4460	175	131	1.8~5.5V	1 + DTM	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584P210	5740	225	169	1.8~5.5V	1 + DTM	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584P260	7020	275	206	1.8~5.5V	1 + DTM	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin
N584P300	7980	312	234	1.8~5.5V	1 + DTM	TRIM	9-bit	-	8-pin	224	√	16 I/O	8-pin

• N588J 8-bit µC Base, 1-ch Voice Synthesizer w/ PWM Direct Driver

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD}	CH	Fsys (MHz)	Audio		RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)				PWM	DAC				
N588J010	30	10	7	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J040	126	40	30	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J060	206	65	49	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J080	254	80	60	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J120	414	131	98	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J170	510	162	121	2.2~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588J200	704	223	167	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J250	830	263	197	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J340	1020	324	243	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J480	1534	486	364	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588J650	2044	648	486	2.2~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair

• N588JP (OTP), 8-bit µC Base, 1-ch Voice Synthesizer w/ PWM Direct Driver

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD}	CH	Fsys (MHz)	Audio		RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)				PWM	DAC				
N588JP062	206	65	49	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP082	254	80	60	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP122	414	131	98	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP172	510	162	121	2.0~5.5V	1	4,6,8	12-bit	-	128	√	16 I/O	3-pair
N588JP202	704	223	167	2.0~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP252	830	263	197	2.0~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair
N588JP342	1020	324	243	2.0~5.5V	1	4,6,8	12-bit	-	192	√	24 I/O	3-pair

• N588H 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)					PWM	DAC				
N588H061	206	65	49	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H081	254	80	60	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H120	414	131	98	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H170	510	162	121	2.2~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588H200	704	223	167	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H250	830	263	197	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H340	1022	324	243	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H480	1534	486	364	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588H650	2044	648	486	2.2~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair

• N588HP (OTP), 8-bit µC Base, 3-ch Voice + Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)					PWM	DAC				
N588HP062	206	65	49	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP082	254	80	60	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP122	414	131	98	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP172	510	162	121	2.0~5.5	3	4,6,8	TRIM	12-bit	-	128	√	16 I/O	3-pair
N588HP202	704	223	167	2.0~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP252	830	263	197	2.0~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair
N588HP342	1022	324	243	2.0~5.5	3	4,6,8	TRIM	12-bit	-	192	√	24 I/O	3-pair

NuSpeech Series

• N589A, 8-bit µC Base, 2-ch Voice or 8-ch MIDI, w/ SPIO, SPIM, ADC, IR Wake-up

Part No.	Duration (Sec)		V_{DD} (V)	LVR (V)	Speech/ MIDI CH	ADC	Audio	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR Wake up	LRC
	12KHz	16KHz					PWM								
N589A150	85	64	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589A200	126	94	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589A280	166	125	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589A400	247	185	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589A600	409	307	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589A900	571	428	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589A1K4	895	671	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589A1K9	1218	914	2.0~5.5	1.9	2/8	4ch, 6bit	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes

• N589B, 8-bit µC Base, 2-ch Voice, w/ SPIO, SPIM, ADC, IR Wake-up

Part No.	Duration (Sec)		V_{DD} (V)	LVR (V)	Voice CH	ADC	Audio	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR Wake up	LRC
	12KHz	16KHz					PWM								
N589B120	83	62	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B170	103	77	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	22 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B200	144	108	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B250	184	138	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B340	225	168	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	28 I/O	SPIO, SPIM	6 pin	6 pin	Yes	Yes	Yes
N589B480	305	229	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589B650	467	350	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589B960	629	472	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589B125	83	62	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, SPIM	9 pin	8 pin	Yes	Yes	Yes
N589B175	103	77	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, SPIM	9 pin	8 pin	Yes	Yes	Yes
N589B205	144	108	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, SPIM	9 pin	8 pin	Yes	Yes	Yes
N589B255	184	138	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, SPIM	9 pin	8 pin	Yes	Yes	Yes
N589B345	225	168	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, SPIM	9 pin	8 pin	Yes	Yes	Yes
N589B485	305	229	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	16 pin	12 pin	Yes	Yes	Yes
N589B655	467	350	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	16 pin	12 pin	Yes	Yes	Yes
N589B965	629	472	2.0~5.5	1.9	2	4ch, 6bit	13-bit	512	32 I/O	SPIO, UART, Addr. LED	16 pin	12 pin	Yes	Yes	Yes
N589B1K5	953	714	2.0~5.5	1.9	2	4ch, 6bit	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589B2K0	1276	957	2.0~5.5	1.9	2	4ch, 6bit	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes

• N589C, 8-bit µC Base, 2-ch Voice, with SPIO, IR Wake-up

Part No.	Duration (Sec)		V_{DD} (V)	LVR (V)	Voice CH	ADC	Audio	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR Wake up	LRC
	12KHz	16KHz					PWM								
N589C080	63	47	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	6 pin	Yes	Yes	Yes
N589C120	83	62	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	6 pin	Yes	Yes	Yes
N589C170	103	77	2.0~5.5	1.9	2	NO	13-bit	512	16 I/O	NO	3 pin	6 pin	Yes	Yes	Yes
N589C200	144	108	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	6 pin	Yes	Yes	Yes
N589C250	184	138	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	6 pin	Yes	Yes	Yes
N589C340	225	168	2.0~5.5	1.9	2	NO	13-bit	512	22 I/O	SPIO	6 pin	6 pin	Yes	Yes	Yes
N589C480	305	229	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589C650	467	350	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589C960	629	472	2.0~5.5	1.9	2	NO	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589C1K5	953	714	2.0~5.5	1.9	2	NO	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589C2K0	1276	957	2.0~5.5	1.9	2	NO	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes

• N589D, 8-bit µC Base, 1-ch Voice, with SPIO, IR Wake-up

Part No.	Duration (Sec)		V_{DD} (V)	LVR (V)	Speech CH	ADC	Audio	RAM (Bytes)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR Wake up	LRC
	12KHz	16KHz					PWM								
N589D081	63	47	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D121	83	62	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D171	103	77	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D201	144	108	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D251	184	138	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D341	225	168	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D481	305	229	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	3 pin	8 pin	Yes	Yes	Yes
N589D085	63	47	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	9 pin	8 pin	Yes	Yes	Yes
N589D125	83	62	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	9 pin	8 pin	Yes	Yes	Yes
N589D175	103	77	2.0~5.5	1.9	1	NO	13-bit	384	16 I/O	SPIO	9 pin	8 pin	Yes	Yes	Yes
N589D205	144	108	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	12 pin	8 pin	Yes	Yes	Yes
N589D255	184	138	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	12 pin	8 pin	Yes	Yes	Yes
N589D345	225	168	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	12 pin	8 pin	Yes	Yes	Yes
N589D485	305	229	2.0~5.5	1.9	1	NO	13-bit	384	25 I/O	SPIO	12 pin	8 pin	Yes	Yes	Yes
N589D650	467	350	2.0~5.5	1.9	1	NO	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589D960	629	472	2.0~5.5	1.9	1	NO	13-bit	512	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589D1K5	953	714	2.0~5.5	1.9	1	NO	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes
N589D2K0	1276	957	2.0~5.5	1.9	1	NO	13-bit	1K	32 I/O	SPIO, UART, Addr. LED	6 pin	12 pin	Yes	Yes	Yes

• N589E, 8-bit µC Base, 1-ch Voice Synthesizer

Part No.	Flash (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	Voice CH	Audio	RAM (Bytes)	GPIO	PWM Output	Cap Touch	LVD	IR Carrier	LVR (V)
		(8 KHz)	(12 KHz)			PWM							
N589E041	128	30	20	2.0~5.5	1	13-bit	384	8 I/O	3 pin	4 pin	Yes	Yes	1.9
N589E061	192	45	30	2.0~5.5	1	13-bit	384	8 I/O	3 pin	4 pin	Yes	Yes	1.9
N589E081	256	60	40	2.0~5.5	1	13-bit	384	8 I/O	3 pin	4 pin	Yes	Yes	1.9

• N589S, 8-bit µC Base, 2-ch Voice w/ SPIO, SPIM, ADC, IR wake-up

Part No.	Duration (Sec.)		V_{DD} (V)	LVR (V)	Speech CH	ADC	Audio	RAM (Byte)	GPIO	Interface	PWM Output	Touch I/O	LVD	IR wake up	LRC
	12 KHz	16 KHz					PWM								
N589S080	63	47	2.0~5.5	1.9	2	4ch, 6bit	13-bit	768	24 I/O	SPIO, SPIM, I2C, Addr. LED	12 pin	12 pin	Yes	Yes	Yes

• N589L (Flash), 1.0~3.6V, 8-bit µC Base, 1-ch Voice Synthesizer with IR Wake up and Cap Touch

Part No.	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	LVR (V)	Voice CH	Booster Output VP (V)	Audio	RAM (Byte)	GPIO	LRC	PWM Output	Touch I/O	LVD	IR wake up
	12 KHz	16 KHz					PWM							
N589L120	83	62	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	16 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589L170	103	77	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	16 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589L200	144	108	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	16 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589L250	184	138	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	16 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589L340	225	168	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	16 I/O	10 KHz	3 pin	4 pin	Yes	Yes

• N589LS (Flash), 1.0~3.6V, 8-bit µC base, 1-ch Voice Synthesizer with IR Wake up and Cap Touch (MCP)

Part No.	Duration (Sec.)		Flash	V_{DD} (V)	LVR (V)	Voice CH	Booster Output VP (V)	Audio	RAM (Byte)	Package, GPIO	LRC	PWM Output	Touch I/O	LVD	IR wake up
	12 KHz	16 KHz	Mbit					PWM							
N589LS08	632	474	8	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	TSSOP28, 12 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589LS16	1264	948	16	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	TSSOP28, 12 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589LS32	2528	1896	32	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	TSSOP28, 12 I/O	10 KHz	3 pin	4 pin	Yes	Yes
N589LS64	5057	3793	64	1.0~3.6	2.2	1	2.4, 3.0, 3.3, 3.6, 4.2	13-bit	384	TSSOP28, 12 I/O	10 KHz	3 pin	4 pin	Yes	Yes

BandDirector® Series

• W567C 8-bit µC Base, 16-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		Fsys (MHz)	OSC	Sub-Clock 32 KHz	Audio		RAM (Bytes)	GPIO	PWM Output	SIM SPI	PAN Stereo
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
W567C070	336	99	74	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C080	416	124	93	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C100	464	139	104	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C120	508	152	114	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C151	640	193	145	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C171	768	233	174	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C210	896	272	204	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C260	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C300	1232	376	282	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C340	1376	421	316	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C380	1532	469	352	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-
W567C126	508	152	114	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C266	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C306	1232	376	282	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C346	1376	421	316	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567C386	1532	469	352	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	√
W567CP260 (OTP)	1020	311	233	2	16	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√	-

• N567G 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO	PWM Output	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC				
N567G030	126	34	26	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567G041	158	44	33	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567G080	286	84	63	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	√
N567G121	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G161	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G201	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567G240	768	233	174	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567G280	896	272	204	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567G330	1022	311	233	2.2~5.5	4	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√

• N567K 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	PWM Output	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC					
N567K030	126	34	26	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	24 I/O	-	√
N567K041	158	44	33	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	24 I/O	-	√
N567K080	286	84	63	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	√
N567K081	254	80	60	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	√	24 I/O	-	√
N567K121	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K161	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K201	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	13-bit	384	-	24 I/O	-	-
N567K240	768	233	174	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√
N567K280	896	272	204	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√
N567K330	1022	311	233	2.2~5.5	6	4,6,8	TRIM/X'tal	12-bit	13-bit	384	-	8I, 24 I/O	3-pair	√

• N567H 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	GPIO	PWM Output	SIM SPI
		(6 KHz)	(8 KHz)					PWM	DAC				
N567H030	126	34	26	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567H041	158	44	33	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	24 I/O	-	√
N567H080	286	84	63	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	√
N567H121	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H161	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H201	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	13-bit	384	24 I/O	-	-
N567H240	768	233	174	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567H280	896	272	204	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567H330	1022	311	233	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√
N567HP330 (OTP)	1022	311	233	2.2~5.5	8	4,6,8	TRIM/X'tal	12-bit	13-bit	384	8I, 24 I/O	3-pair	√

• N567D 8-bit µC Base, 14-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		Fsys (MHz)	OSC	Sub-Clock 32 KHz	Audio		RAM (Bytes)	GPIO	PWM Output	SIM SPI
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC				
N567D070	224	71	53	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D100	336	106	80	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D120	416	132	99	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D140	464	147	110	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D160	508	161	121	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D200	640	203	152	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D240	768	243	183	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D280	896	284	213	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D320	1020	323	242	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D380	1232	390	293	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D420	1376	436	327	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567D470	1532	485	364	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√
N567DP320 (OTP)	1020	323	242	2	14	4~8	Ring/X'tal	X'tal	12-bit	13-bit	512	24 I/O	3-pin	√

• N567L 1.0~3.6V, 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		VDD	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	GPIO	PWM Output
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC					
N567L080	254	80	60	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L120	416	132	99	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L160	528	167	125	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L200	638	202	152	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L240	768	243	182	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L280	896	284	213	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567L330	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair
N567LP330 (OTP)	1022	324	243	2	8	1.0~3.6V	4,6,8	TRIM/X'tal	12-bit	-	3.3, 4.2	384	√	16 I/O	3-pair

• N566G 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		VDD (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	PWM Output	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC					
N566G120	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G160	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G200	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G240	768	233	174	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G280	896	272	204	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√
N566G320	1022	311	233	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	√

• N566GP (OTP), 8-bit µC Base, 4-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	GPIO	PWM Output	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC					
N566GP120	416	124	93	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP160	528	158	119	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP200	638	192	144	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP240	768	233	174	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP280	896	272	204	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-
N566GP320	1022	311	233	2.2~5.5	4	4,6,8	TRIM	12-bit	-	384	√	24 I/O	2-pin	-

• N566K 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	PWM Output	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566K080	254	74	55	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566K120	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K160	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K200	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K240	768	233	174	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K280	896	272	204	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566K320	1022	311	233	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√

• N566KP (OTP), 8-bit µC Base, 6-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	PWM Output	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566KP081	254	74	55	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	-
N566KP120	416	124	93	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP160	528	158	119	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP200	638	192	144	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP240	768	233	174	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP280	896	272	204	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566KP320	1022	311	233	2.2~5.5	6	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-

• N566H 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	PWM Output	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566H080	254	74	55	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	√
N566H120	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H160	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H200	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H240	768	233	174	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H280	896	272	204	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√
N566H320	1022	311	233	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	√

• N566HP (OTP), 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer, w/ LVD

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		V_{DD} (V)	CH	Fsys (MHz)	OSC	Audio		RAM (Bytes)	LVD	SIM	GPIO	PWM Output	Constant Current
		(6 KHz)	(8 KHz)					PWM	DAC						
N566HP081	254	74	55	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	√	24 I/O	2-pin	-
N566HP120	416	124	93	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP160	528	158	119	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP200	638	192	144	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP240	768	233	174	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP280	896	272	204	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-
N566HP321	1022	311	233	2.2~5.5	8	4,6,8	TRIM	12-bit	-	384	√	-	24 I/O	2-pin	-

• N566LP (OTP), 1.0~3.6V, 8-bit µC Base, 8-ch Voice/Melody Synthesizer

Part No.	ROM (Kbytes)	Duration (Sec.) @ 4-bit NM4		Channel		V_{DD}	Fsys (MHz)	OSC	Audio		Vp (V)	RAM (Bytes)	LVD	PWM Output
		(6 KHz)	(8 KHz)	Voice	WTM				PWM	DAC				
N566LP120	416	124	93	2	8	1.0~3.6V	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	2-pin
N566LP160	528	158	119	2	8	1.0~3.6V	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	2-pin
N566LP200	638	192	144	2	8	1.0~3.6V	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	2-pin
N566LP240	768	233	174	2	8	1.0~3.6V	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	2-pin
N566LP280	896	272	204	2	8	1.0~3.6V	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	2-pin
N566LP320	1022	311	233	2	8	1.0~3.6V	4,6,8	TRIM	12-bit	-	3.3, 4.2	384	√	2-pin

ViewTalk® Series

• N531A170 8-bit µC Base, 2-ch Voice + Dual Tone Melody Synthesizer w/ B/W 1K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	Bias	Duty
						PWM	DAC			
N531A170	509	1K	170	128x2	16 I/O	12-bit	-	64x16	1/4, 1/5	1/8, 1/16

• N539T 8-bit µC Base, 8-ch Voice + Wavetable Melody Synthesizer w/ 4-Gray Level, 2K-Dot LCD Driver

Part No.	ROM (Kbytes)	Working RAM (Bytes)	Duration (Sec.)	Dual Page LCD RAM (Bytes)	GPIO	Audio		LCD Resolution (SEGxCOM)	PWM Output	SIM	Bias	Duty
						PWM	DAC					
N539T171	509	1K	120	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539T261	765	1K	180	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539T341	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	6-pin	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32
N539TP340 (OTP)	1021	1K	250	256x2x2	24 I/O	12-bit	13-bit	64x32 or 72x24	-	√	1/4, 1/5, 1/6, 1/7	1/16, 1/24, 1/32

Peripheral Series

■ Nu-Touch

• N55T Capacitor Sensor Controller

Part No.	Input	Wake Up	V_{DD}(V)	Interface
N55T16	16	√	2.1~5.5	I²C, SPI
N55T24	24	√	2.1~5.5	I²C, SPI

■ ADC

• N55AD SAR ADC

Part No.	Channel	Resolution	V_{DD}(V)	Conversion Rate
N55AD808	8	8-bit	2.7~5.5	50 KHz

■ I/O Expander

• N55P, I/O Expander w/ 24 I/O Pins and SPI Interface

Part No.	Interface	GPIO	Wake Up	H/W PWM	Constant Current
N55P242	SPI	24 I/O	√	24-pin	24-pin
N55P243	SPI	24 I/O	√	24-pin	24-pin

■ MFID Family

• N55MID, 13.56MHz MFID w/ Single-Tag/Multi-Tag and Reader

Part No.	Category	Frequency (MHz)	ID type	ID No.	Anti-collision	μC Interface
N55MID16	Single-tag	13.56	Bonding-ID	729	-	-
N55MID36	Multi-tag	13.56	Bonding-ID	729	4~6 tags	-
N55MID51	Reader	13.56	-	-	-	Serial/Parallel

■ PA Family

N55PA, PWM Power Amplifier

Part No.	VDD (V)	Mute Function	Gain Control	MIC Line In	Output Power	Package
N55PA01A	2.0~5.5V	Yes	Ext. R	Yes	1W (@ 5.5V, 8Ω, THD + N =1%)	SOP8
N55PA03A	2.0~5.5V	Yes	Ext. R	Yes	3W (@ 5.5V, 4Ω, THD + N =10%)	SOP8

NSP Series

NSP series are advanced Voice IC with embedded Flash and equips with new algorithm to implement Voice Prompt applications with high-level of sound quality. It provides I2C, UART and GPIO interface to communicate with host MCU. NSP series also support ISP (In System Program) for content update, and support high resolution PWM output to drive speaker directly, which is suitable for all the voice assistance applications.

NSP2xxxA series with 0.5W output power by the SOP8 package form.

NSP2xxxA01G series with 1.0W output power by the SOP16 package form

NSP2xxxT06E series with 6 Cap Touch pads by TSSOP28 package form

NSP2xxxT16L series support up to 16 Cap Touch pads by LQFP48 package form

• NSPxxx, Embedded Flash, 1-ch Voice for Voice Assistance Application

Part No.	Package	Duration(Sec)		V_{DD} (V)	LVR (V)	Speech CH	Audio	Output Power (@VDD 5.5V)	Interface to MCU	ISP	Operation Temperature
		8KHz	12KHz				PWM				
NSP040A	SOP8	60	40	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire	No	-20°C~ 85°C
NSP082A	SOP8	94	63	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire	Yes	-20°C~ 85°C
NSP172A	SOP8	155	103	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire	Yes	-20°C~ 85°C
NSP342A	SOP8	337	225	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire	Yes	-20°C~ 85°C
NSP481A	SOP8	458	305	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire	Yes	-20°C~ 85°C
NSP650B	SOP14	701	467	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire, UART	Yes	-20°C~ 85°C
NSP960B	SOP14	944	629	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire, UART	Yes	-20°C~ 85°C
NSP2K0B	SOP14	1896	1264	2.0~5.5	1.9	1	13-bit	0.5W	One-Wire, Two-Wire, UART	Yes	-20°C~ 85°C

• NSP2xxx, Embedded Flash, 2-ch Voice for Voice Assistance Application w/ I2C and UART

Part No.	Package	Duration(Sec)		V_{DD} (V)	LVR (V)	Speech CH	Audio	Output Power (@VDD 5.5V)	Interface to MCU	ISP	Operation Temperature
		12KHz	16KHz				PWM				
NSP2080A	SOP8	96	72	2.0~5.5	1.9	2	13-bit	0.5W	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2170A	SOP8	177	133	2.0~5.5	1.9	2	13-bit	0.5W	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2340A	SOP8	420	315	2.0~5.5	1.9	2	13-bit	0.5W	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2080A01G	SOP16	96	72	2.0~5.5	1.9	2	13-bit	1.0W	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2170A01G	SOP16	177	133	2.0~5.5	1.9	2	13-bit	1.0W	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2340A01G	SOP16	420	315	2.0~5.5	1.9	2	13-bit	1.0W	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2080A03G	SOP16	96	72	2.0~5.5	1.9	2	13-bit	3.0W (@4Ω)	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2170A03G	SOP16	177	133	2.0~5.5	1.9	2	13-bit	3.0W (@4Ω)	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C
NSP2340A03G	SOP16	420	315	2.0~5.5	1.9	2	13-bit	3.0W (@4Ω)	One-Wire, Two-Wire, I2C, UART	Yes	-40°C~ 85°C

• NSPxx, Embedded OTP, 1-ch Voice for Voice Prompt Application

Part No.	Package	Duration(Sec)		V_{DD} (V)	LVR (V)	Speech CH	Audio	Output Power (@VDD 5.5V)	Operation Temperature
		8KHz	12KHz				PWM		
NSP075A	SOP8	81	49	2.0~5.5	2.0	1	12-bit	0.5W	-20°C~ 70°C
NSP165A	SOP8	162	97	2.0~5.5	2.0	1	12-bit	0.5W	-20°C~ 70°C
NSP335A	SOP8	324	194	2.0~5.5	2.0	1	12-bit	0.5W	-20°C~ 70°C

• NSP2xxxT, Embedded Flash, 2-ch Voice for Voice Assistance Application w/ I2C, UART and Cap Touch

Part No.	Package	Duration(Sec)		V_{DD} (V)	LVR (V)	Speech CH	Audio	Output Power (@VDD 5.5V)	Interface to MCU	ISP	Cap Touch	Operation Temperature
		12KHz	16KHz				PWM					
NSP2080T06E	TSSOP28	96	72	2.1~5.5	1.9	2	13-bit	0.5W	Two-Wire, I2C, UART	Yes	6-pin	-40°C~ 85°C
NSP2170T06E	TSSOP28	177	133	2.1~5.5	1.9	2	13-bit	0.5W	Two-Wire, I2C, UART	Yes	6-pin	-40°C~ 85°C
NSP2340T06E	TSSOP28	420	315	2.1~5.5	1.9	2	13-bit	0.5W	Two-Wire, I2C, UART	Yes	6-pin	-40°C~ 85°C
NSP2080T16L	LQFP48	96	72	2.1~5.5	1.9	2	13-bit	0.5W	Two-Wire, I2C, UART	Yes	16-pin	-40°C~ 85°C
NSP2170T16L	LQFP48	177	133	2.1~5.5	1.9	2	13-bit	0.5W	Two-Wire, I2C, UART	Yes	16-pin	-40°C~ 85°C
NSP2340T16L	LQFP48	420	315	2.1~5.5	1.9	2	13-bit	0.5W	Two-Wire, I2C, UART	Yes	16-pin	-40°C~ 85°C

NSC Series

NSC74 series are powerful sound controller chip by using ARM® Cortex-M0 32-bit microcontroller core. NSC74 series embedded 256KB ~ 1,536 KB of non-volatile Flash memory with 6 KB boot loader, and 12 KB of SRAM. NSC74 provide peripheral devices including ADC, Timers, Peripheral Direct Memory Access (PDMA), IR carrier, Brown-Out Detector (BOD), Low Voltage Reset (LVR), MIC and up to 30 GPIO to share with SPI, UART, Addressable LED, I2C, IR, PWM output, and CapTouch keys.
NSC74xxxZ series support 19 GPIO by QFN32 Package
NSC74xxxL series support 30 GPIO by LQFP48 Package

• NSCxx, 32-bit Cortex M0 w/ Embedded Flash, GPIO, ADC, MIC, CapTouch

Part No.	Package	VDD (V)	Flash (KByte)	Duration (Sec)	GPIO	Interface	ADC (10 bit)	Cap Touch	MIC	Audio	ICE	BOD	LVR	Operation Temperature
				12KHz						Output				
NSC74256L	LQFP48	1.8 ~ 5.5	256	128	30	SPI, UART, I2C, Addr. LED	5-ch	12-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC74512L	LQFP48	1.8 ~ 5.5	512	286	30	SPI, UART, I2C, Addr. LED	5-ch	12-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC741K0L	LQFP48	1.8 ~ 5.5	1024	602	30	SPI, UART, I2C, Addr. LED	5-ch	12-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC741K5L	LQFP48	1.8 ~ 5.5	1536	919	30	SPI, UART, I2C, Addr. LED	5-ch	12-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC74256Z	QFN32	1.8 ~ 5.5	256	128	19	SPI, UART, I2C	-	5-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC74512Z	QFN32	1.8 ~ 5.5	512	286	19	SPI, UART, I2C	-	5-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC741K0Z	QFN32	1.8 ~ 5.5	1024	602	19	SPI, UART, I2C	-	5-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C
NSC741K5Z	QFN32	1.8 ~ 5.5	1536	919	19	SPI, UART, I2C	-	5-pin	Yes	DPWM	Yes	Yes	Yes	-40°C~ 85°C

Audio Converters

Nuvoton Audio Converters provide high-performance and cost-effective solution for general audio converting applications between analog & digital.

Nuvoton Audio CODEC Series support microphone input, speaker/headphone output with 5-Band Equalizer, ALC (Automatic Level Control), PGA (Programmable Gain Amplifier), on-chip PLL (Phase Lock Loop) and compatible with standard I2S or PCM audio Interface.
Nuvoton Audio ADC Series support microphone/line-level input with PGA (Programmable Gain Amplifier) and bypass sidetone line-level outputs.
Nuvoton Audio DAC Series support speaker driver/headphone output, 5-Band Equalizer, DRC (Dynamic Range Compressor) and on-chip PLL (Phase Lock Loop).
Nuvoton Precision ADC Series support high resolution measurement with 24-bit sigma-delta ADC designed for weight scales, industrial process control, data acquisition, portable Instrumentation and fluid/gas analyzers.
Nuvoton Voiceband CODEC Series (CoSlic Family) support one Foreign Exchange Station (FXS), combining programmable CODEC, SLIC (Subscriber Line Interface Circuit) and DCDC controller on a single CMOS circuit. With SPI bus for control command and PCM bus for voice from SoC, CoSlic Family supports VBAT as low as -100V under satisfactory BORSCHT characteristics designed for applications such as ONT (Optical Network Terminal) , 4G/5G CPE, PBX (Private Branch Exchange), Telephone Fiber Optic Multiplexer, VoIP gateway, ATA (analog telephone adapter). We can fulfil any types of devices with RJ11 or FXS port which need connect external analog telephone.

• Audio CODEC Series - Mono CODEC

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	Control Interface	Analog/Digital (V)	Package
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8810 **NAU88U10 (AEC-Q100)**	Mono Audio CODEC	1	1	91	93	-79	-84	8~48	I2S PCM(TDM)	NL-NAU88C10	2-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN20 (4x4)
NAU88C10	Mono Audio CODEC	1	1	91	93	-79	-84	8~48	I2S PCM(TDM)	NL-NAU88C10	2-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN20 (4x4)
NAU8812	Mono Audio CODEC with Speaker Driver	1	1	91	93	-79	-84	8~48	I2S PCM(TDM)	-	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (5x5) SSOP-28
NAU8814 **NAU88U14 (AEC-Q100)**	Mono Audio CODEC with Speaker Driver, Equalizer	1	1	91	93	-79	-84	8~48	I2S PCM(TDM)	NL-NAU88C14	2-Wire 3-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN24 (4x4)
NAU88C14	Mono Audio CODEC with Speaker Driver, Equalizer	1	1	91	93	-79	-84	8~48	I2S PCM(TDM)	NL-NAU88C14	2-Wire 3-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN24 (4x4)

• Audio CODEC Series - Stereo CODEC

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	Control Interface	Analog/Digital (V)	Package
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8820	Stereo Audio CODEC	2	2	90	94	-80	-84	8 ~ 48	I2S PCM(TDM)	-	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (5x5)
NAU8822A **NAU88U22A (AEC-Q100)**	Stereo Audio CODEC with Speaker Driver	2	2	90	94	-80	-84	8 ~ 48	I2S PCM(TDM)	NL-NAU88C22	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (5x5)
NAU88C22	Stereo Audio CODEC with Speaker Driver	2	2	89	89	-78	-84	8 ~ 192	I2S PCM(TDM)	NL-NAU88C22	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (4x4) QFN32 (5x5)

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• Audio CODEC Series - ULP (Ultra Low Power) CODEC

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	Control Interface	Analog/Digital (V)	Package
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU88L11	ULP Mono Audio CODEC with Class-G Headphone Driver	1	1	103	105	-93	-85	8 ~ 96	I2S PCM(TDM)	NL-NAU88L11	2-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN20 (4x4)
NAU88L20	ULP Stereo CODEC with Stereo Differential Lineout Driver	2	2	98	100	-91	-85	8 ~ 96	I2S PCM(TDM)	NL-NAU88L20	2-Wire	2.5 ~ 3.6 2.5 ~ 3.6	QFN32 (4x4)
NAU88L21	ULP Stereo Audio CODEC with Class-G Headphone Driver	2	2	103	105	-91	-80	8 ~ 192	I2S PCM(TDM)	NL-NAU88L21	2-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN32 (4x4) QFN32 (5x5)
NAU88L21C	ULP Stereo Audio CODEC with Class-G Headphone Driver	2	2	103	105	-93	-85	8 ~ 192	I2S PCM(TDM)	NL-NAU88L21C	2-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN32 (5x5)
NAU88L24	ULP Stereo Audio CODEC with Advanced Headset Feature Class-D Amp	2	2	100	103	-85	-77	8 ~ 96	I2S PCM(TDM)	NL-NAU88L24I	2-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN48 (6x6) QFN48 (7x7) WLCSP56
NAU88L25B	ULP Stereo Audio CODEC with Advanced Headset Feature & Detection Class-G Headphone Driver	1	2	101	124	-91	-89	8 ~ 192	I2S PCM(TDM)	NL-NAU88L25B	2-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN32 (5x5) WLCSP42

• Audio ADC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	Control Interface	Analog/Digital (V)	Package
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8501	Stereo Audio ADC with Line Input Differential Microphone Inputs	2	-	90	-	-80	-	8~48	I2S PCM(TDM)	-	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (4x4)
NAU8502	Stereo Audio ADC with Differential Microphone Inputs	2	-	90	-	-80	-	8~48	I2S PCM(TDM)	-	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (5x5)
NAU85L20B	ULP Stereo Audio ADC with Integrated FLL Microphone Preamplifier	2	-	101	-	-91	-	8~96	I2S PCM(TDM)	NL-NAU85L20B	2-Wire 3-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN28 (4x4)
NAU85L40B	ULP Quad Audio ADC with Integrated FLL Microphone Preamplifier	4	-	101	-	-91	-	8~96	I2S PCM(TDM)	NL-NAU85L40B	2-Wire 3-Wire	1.6 ~ 2.0 1.6 ~ 3.6	QFN28 (4x4)

• Audio DAC Series

Part No.	Description	# of		SNR (dB)		THD (dB)		Sample Rate (KHz)	Audio Format	Development Tools	Control Interface	Analog/Digital (V)	Package
		ADC	DAC	ADC	DAC	ADC	DAC						
NAU8401	Stereo Audio DAC with Speaker Driver	-	2	-	94	-	-84	8 ~ 48	I2S PCM(TDM)	-	2-Wire 3-Wire 4-Wire	2.5 ~ 3.6 1.6 ~ 3.6	QFN32 (5x5)
NAU8402	Stereo Audio DAC with 2Vrms Line Output	-	2	-	98	-	-82	24 ~ 96	I2S PCM(TDM)	-	-	3.0 ~ 3.6 1.6 ~ 3.6	TSSOP 16
***NAU8421**	Stereo Audio DAC with 8Vpp Differential Output	-	2	-	122	-	-100	8 ~ 192	I2S PCM(TDM)	-	2-Wire	-	QFN32 (5x5)

* Under Development

• Precision ADC Series

Part No.	Description	# of		Resolution Bits	ADC Type	ENOB (Gain=1, 10SPS)	RMS Noise (PGA=128)	Sample Rate Max (Hz)	Gain	Development Tools	Control Interface	Analog/Digital (V)	Package
		ADC	DAC										
NAU7802	Precision Audio ADC	2	-	24	Sigma-Delta	23	50nV in 10 SPS 150nV in 80 SPS	10, 20, 40, 80 & 320	1x, 2x, 4x, 8x, 16x, 32x, 64x, 128x	NL-NAU7802SG NL-NAU7802QG	2-Wire	2.7 ~ 5.5 2.7 ~ 5.5	SOP16 PDIP16

• Voiceband CODEC Series

Part No.	Description	# FXS Channel	Battery Input Voltage	PCM	BORSCHT	DTMF Detection	Audio Format	Development Tools	Control Interface	Temp (°C)	Package
N681389	Single Channel CoSlic	1	-100 ~ -10	G.711 A-law, μ-law, 16 bit-linear	Yes	Yes	PCM	NE-N681389	SPI	-40 ~ 85	QFN44

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Audio Amplifiers

Nuvoton Audio Amplifiers provide high-performance and cost-effective solution for general audio output amplifying applications.

Nuvoton 2Vrms Line Driver Series support analog input and output line driver. Operating at single 3.3V positive supply voltage, the integrated charge pump can provide full 5.5Vpp output level.
Nuvoton Class-AB Series support driving a resistive speaker load up to 2W output power. with extremely low standby current and excellent pop-and-click performance, Class-AB amplifiers have current limit and a chip-enable pin designed for toys and portable electronics.
Nuvoton Class-D Series support low operating current, fast start-up time, better THD+N and EMI performance targetting industry-leading sound quality for smart phones, tablet PC, docking stations, portable audio/video players, GPS/Navigators, LCD/LED TVs, and toys.
Nuvoton Smart Amp Series support safe operation of small speakers at the physical limits for more acoustical output, deeper bass, and better sound quality with reliable protection against thermal and mechanical overload.

• 2Vrms Line Driver Series

Part No.	Description	Output Performance		SNR (dB)	Output Noise (μVrms)	Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Development Tools	Package
		Power (W)	THD+N (%)							
NAU8220	2Vrms Line Driver	-	<0.1	108	-	-	-	3.0 ~ 3.6	NE-NAU8220	SOP14 TSSOP14

• Class-AB Series

Part No.	Description	Output Performance		SNR (dB)	Output Noise (μVrms)	Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Development Tools	Package
		Power (W)	THD+N (%)							
ISD8101	1.5W Class-AB Audio Amplifier with Chip Enable, Differential/ Single-Ended Inputs, Low Pop and Click	0.5 (5V,8Ω)	<0.1	100	-	0 ~ 26	<1	2.4 ~ 5.5	NT-ISD8101	SOP8
		0.825 (5V,8Ω)	<1							
		1.1 (5V,8Ω)	<10							
ISD8102	2W Class-AB Audio Amplifier with Chip Enable, Single-Ended Inputs, Low Pop and Click	2 (5V,4Ω)	<10	100	-	0 ~ 26	<1	2.0 ~ 5.5	NT-ISD8102	SOP8
ISD8104	2W Class-AB Audio Amplifier with Chip Enable, Differential Inputs, Low Pop and Click	2 (5V,4Ω)	<10	100	-	0 ~ 26	<1	2.0 ~ 5.5	NT-ISD8104	SOP8

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• Class D Series

Part No.	Description	Output Performance		SNR (dB)	Output Noise (μVrms)	Gain (dB)	Standby Current (uA)	Operating Voltage (V)	Development Tools	Package
		Power (W)	THD+N (%)							
NAU82011	2.9W Mono Class-D Audio Amplifier with Differential/Single-Ended Inputs	2.9 (5.0V,4Ω)	<10	-	20	Variable	<1	2.5 ~ 5.5	NE-NAU82011V NE-NAU82011Y	QFN16 WLCSP9
NAU82039	3.2W Mono Class-D Audio Amplifier with Differential/Single-Ended Inputs	3.2 (5.0V,4Ω)	<10	-	27	6, 12	<1	2.5 ~ 5.5	-	QFN16 WLCSP9
***NAU82106**	6W Mono Class-D Audio Amplifier with Voltage Booster, Multi-Level AGC, Differential/Single-Ended Inputs	5.5 (5.0V,4Ω)	<10	-	18	Variable	-	2.8 ~ 5.5	-	QFN20
NAU82110	10W Mono Class-D Audio Amplifier with Differential/Single-Ended Inputs	10 (5.0V,8Ω)	<10	-	41	Variable	-	2.7 ~ 5.5	-	QFN20
NAU8223	3.1W Stereo Filer-Free Class-D Audio Amplifier with Differential/Single-Ended Inputs	3.1 (5.0V,4Ω)	<10	-	20	0, 6, 12, 18, 24	<1	2.5 ~ 5.5	NE-NAU8223	QFN20
NAU8224	3.1W Stereo Filer-Free Class-D Audio Amplifier with 2-Wire Interface, Differential/Single-Ended Inputs	3.1 (5.0V,4Ω)	<10	-	20	0, 6, 12, 18, 24	<1	2.5 ~ 5.5	NE-NAU8224	QFN20
NAU82250	50W Stereo Filer-Free Class-D Audio Amplifier with Heat Sink, Differential/ Single-Ended Inputs	50 (22.5V,4Ω)	10	103	70	14, 17, 20, 23, 26, 29, 32, 36	-	5 ~ 26	-	QFN56
NAU8315 ***NAU83U15 (AEC-Q100)**	3.1W Mono Filer-Free Class-D Audio Amplifier with I2S	3.1 (5.0V,4Ω)	<10	-	12	3, 6, 9, 12	<1	2.5 ~ 5.5	NL-NAU8315 NL-NAU8315B	QFN20 WLCSP9 WLCSP12
NAU8318	3.2W Mono Filer-Free Class-D Audio Amplifierwith I2S	3.1 (5.0V,4Ω)	<10	-	9	3, 6, 9, 12	<1	2.5 ~ 5.5	NL-NAU8318 NL-NAU8318B	QFN20 WLCSP14
NAU8325 ***NAU83U25 (AEC-Q100)**	3.1W Mono Filer-Free Class-D Audio Amplifier with I2S, 2-Wire Interface	3.1 (5.0V,4Ω)	<10	-	18	3, 6, 9, 12	<2	2.5 ~ 5.5	NL-NAU8325	QFN20

* Under Development

• Smart Amp Series

Part No.	Description	Output Performance		SNR (dB)	Output Noise (μVrms)	Speaker Protection	Standby Current (uA)	Operating Voltage (V)	Development Tools	Package
		Power (W)	THD+N (%)							
NAU83G10	12W Mono Boosted Class-D Amplifier with Klippel Controlled Sound DSP	12 (5.0V,4Ω) 8 (5.0V,8Ω)	<10	101	55	Integrated DSP	<13	2.9 ~ 5.5	NV-NAU83G10S	WLCSP50
NAU83G20	20W Mono Boosted Class-D Amplifier with Klippel Controlled Sound DSP	20 (12.6V,4Ω) 11 (12.6V,8Ω)	<10	101	65	Integrated DSP	<16	2.9 ~ 14	NV-NAU83G20S	WLCSP50
***NAU83G60** ***NAU83G60U (AEC-Q100)**	30W Stereo / 60W Mono Boosted Class-D Amplifier with Klippel Controlled Sound DSP	30 (26V,4Ω)	<10	-	-	Integrated DSP	-	8 ~ 26	-	QFN56

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Audio Enhancement

Nuvoton Audio Enhancement MaxxAudio® based or DPS®based provide enriched sound reproduction, and remastering enhancing algorithm for superior audio performance.

Audio Enhancement - MaxxAudio Series support MaxxAudio®Waves patented algorithm of speaker correction, psycho-acoustic feature, and powerful amplification designed for smart TV, gaming monitor and gaming headset.
Audio Enhancement - Bongiovi Series support Bongiovi®DPS (Digital PowerStation) patented algorithm of Bongiovi AGC, psycho-acoustic feature, dynamic stereo enhancement designed for smart TV, gaming monitor and gaming headset.

Part No.	Description	HW Configuration					Algorithms									
		I²S Stereo Inputs	ADC Stereo Inputs	I²S Stereo Output	DAC Single Output	Power Output	Bass	Pro. Eq.	3D	Treble	Volume	Level	Dialog	DRC	V3D	Package
NPCA110B	MaxxAudio	1	2	1	2	-	Y	Y	-	-	Y	-	-	-	-	QFN32
NPCA110D	MaxxAudio	3	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN32
NPCA110P	MaxxAudio	2	3	3	4	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN40
NPCA110T	MaxxAudio	3	0	3	3	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN32
NPCA112D	MaxxAudio	4	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	-	-	QFN32
NPCP215F	MaxxAudio	4	0	3	0	20W (8R)	Y	Y	Y	Y	Y	Y	Y	-	-	QFN48
NPCA120D	DPS	2	0	2	0	-	Y	Y	Y	Y	Y	Y	Y	Y	-	LQFP64
NPCA121D	DPS	3	0	3	0	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	LQFP64

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ISD ChipCorder®

ISD ChipCorder® Family provide powerful and cost-effective single chip solution for general commercial or industrial applications of voice/audio recording and playback.

Digital ChipCorder Series support full management solution of multiple audio tracks. VPE software provides high flexibility of loading pre-recorded messages or general PC media files.
Two operation modes are available for development: SPI controlled by MCU or Button triggered as standalone device.

ISD ChipCorder®

• Digital ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Development Tools	Temp (°C)	Package
ISD2115A	Multi-Message, Playback-Only with Int. Flash Memory, SPI	16 sec	Up to 32	2.7 ~ 3.6	NM-ISD2100S NM-ISD2100Q	-40 ~ 85	SOP14 QFN20
ISD2130		32 sec					
ISD2360	Multi-Message, 3-Channel Audio, Playback-Only with Int. Flash Memory	64 sec	Up to 32	2.4 ~ 5.5	NM-ISD2360S NM-ISD2360Q	-40 ~ 85	SOP16 QFN32
ISD2361	Multi-Message, 3-Channel Audio, Playback-Only with Int. Flash Memory, SPI	60 sec + Ext. Flash up to 1024 min	Up to 32	2.4 ~ 5.5	NM-ISD2361	-40 ~ 105	SOP16 QFN32
ISD3800 **ISD15D00 (AEC-Q100)**	Multi-Message, Playback-Only with Ext. Flash Memory, SPI	Ext. Flash up to 64 min	Up to 48	2.7 ~ 5.5	NM-ISD3800 NM-ISD15D00	-40 ~ 85	LQFP48 QFN32
***ISD3810**	Multi-Message, Playback-Only with Ext. Flash Memory, SPI, I2C	Ext. Flash up to 1024 min	Up to 48	2.7 ~ 5.5	-	-40 ~ 105	LQFP48 QFN32
ISD15102	Multi-Message, Record/Playback with Int. Flash Memory, SPI	2 min	Up to 48	2.7 ~ 3.6	NM-ISD15100	-40 ~ 85	LQFP48
ISD15104		4 min					
ISD15108		8 min					
ISD3900 **ISD15C00 (AEC-Q100)**	Multi-Message, Record/Playback with Ext. Flash Memory, SPI	Ext. Flash up to 64 min	Up to 48	2.7 ~ 3.6	NM-ISD3900 NM-ISD15C00	-40 ~ 85	LQFP48

* Under Development

• MLS ChipCorder® Series

Part No.	Description	Duration	Sample Rate (KHz)	Operating Voltage (V)	Development Tools	Temp (°C)	Package
ISD4002	Multi-Message Record/Playback with Int. Flash Memory, SPI	2 ~ 16 min	Up to 8	2.7 ~ 3.3	-	0 ~ 50 0 ~ 70 -40 ~ 85	DIE PDIP28 SOP28
ISD4003							
ISD4004							

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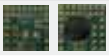
Smart Toy & NSP Development Tools

PowerSpeech Family

Ordering No.	Board Name	Content	Description	Picture
PowerSpeech (584, 588) ICE Development System				
ICE-N584H	NHS-584H-ICE	• N584H ICE System	• N584H (Mask) and N584HP/N584P (OTP) ICE Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Verification & Debugging	
ICE-W588D-FS	WHS-588D-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-588D-ICE System V3.3	• W588C/D ICE Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Verification & Debugging	
ICE-W584A-FS	WHS-584A-ICE	• WHS-584A-ICE-IL System V1.1 • WHS-584A-ICE System V1.2	• W584A ICE Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Verification & Debugging	
ICE-N588H	NHS-588H-ICE	• WHS-MINI-USB-ICE System V1.1 • NHS-588H-ICE System V1.1	• N588H/J (Mask) and N588HP/JP (OTP) ICE Dev. Kit. Provide In-Circuit Emulation w/ Program, Execute, Verification & Debugging.	
PowerSpeech (584, 588) Evaluation Board, Tiny Board, Writer				
NV-W584A-H	WHS-584AH-16M	• W584A/B/C Series EVB	• W584A/B/C Series Evaluation Board with 16Mbit Flash	
NV-W584AP20	NHS-584AP20	• W584AP065(W584AP20) OTP EVB	• W584AP065(W584AP20) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-W584AP05	NHS-584AP05	• W584AP017(W584AP05) OTP EVB	• W584AP017(W584AP05) One-Time Programmable (OTP) Evaluation Board (EVB)	
N584P070-TB	N584P070-TB	• N584P070 Tiny Board	• N584P070 Tiny Board to Cover N584P040, N584P070	
N584P170-TB	N584P170-TB	• N584P170 Tiny Board	• N584P170 Tiny Board to Cover N584P120, N584P170	
N584P300-TB	N584P300-TB	• N584P300 Tiny Board	• N584P300 Tiny Board to Cover N584P210, N584P260, N584P300	
NV-N584H	NHS-584H-16M	• N584H Series EVB	• N584H Series Evaluation Board w/ 16Mbit Flash	

Ordering No.	Board Name	Content	Description	Picture
PowerSpeech (584, 588) Evaluation Board, Tiny Board, Writer				
NV-N584HP300	NHS-584HP300	• N584HP300 OTP Demo Board	• N584HP300 (OTP) Demo Board (COB)	
NV-N584L-3V	NHS-584L-16M-3V	• N584L Series EVB with Vp=3V	• N584L Series Evaluation Board w/ 16Mbit Flash for Vp=3V	
NV-N584L-4V	NHS-584L-16M-4V	• N584L Series EVB with Vp=4V	• N584L Series Evaluation Board w/ 16Mbit Flash for Vp=4V	
NV-W588D	WHS-588C/D-16M	• W588C/D Series EVB	• W588C/D Series Evaluation Board with 16Mbit Flash	
NV-W588DF20B	WHS-W588DF20-H1	• W588DF060 (W588DF20) EVB	• W588DF060(W588DF20) Evaluation Board	
NV-N588H	NHS-588H-16M	• NHS-588H-16M EVB	• N588H/J Series Evaluation Board with 16Mbit Flash Support: N588H061~650/J010~650, and N588HP062~342/JP062~342 (OTP)	
NV-N588H-L	NHS-588H-08ML	• NHS-588H-08ML EVB	• N588H/J Series Evaluation Board w/ 8Mbit Low Voltage Flash Support: N588H061~340 /J010~340, and N588HP062~342/JP062~342 (OTP)	
NV-N588HP080	NHS-588HP080	• N588HP080 OTP EVB	• N588HP080 (OTP) Demo Board (COB)	
NV-N588HP170	NHS-588HP170	• N588HP170 OTP Demo Board	• N588HP170 (OTP) Demo Board (COB)	
NV-N588HP340	NHS-588HP340	• N588HP340 OTP Demo Board	• N588HP340 (OTP) Demo Board (COB)	
NV-N588HP650	NHS-N588HP650	• N588HP650 OTP Demo Board	• N588HP650 (OTP) Demo Board (COB)	
N588HP082-TB	N588HP082-TB	• N588HP082 Tiny Board	• N588HP082 (OTP) Tiny Demo Board (COB) Support: N588HP062/082, N588JP062/082	
N588HP172-TB	N588HP172-TB	• N588HP172 Tiny Board	• N588HP172 (OTP) Tiny Demo Board (COB) Support: N588HP122/172 and N588JP122/172	

Contact us: ChipCorder@nuvoton.com

Ordering No.	Board Name	Content	Description	Picture
PowerSpeech (584, 588) Evaluation Board, Tiny Board, Writer				
N588HP342-TB	N588HP342-TB	• N588HP342 Tiny Board	• N588HP342 (OTP) Tiny Demo Board (COB) Support: N588HP202/252/342 and N588JP202/252/342	
NV-N588L	NHS-N588L-16M	• N588L Series EVB	• N588L Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N588LP330	NHS-588LP330	• N588LP330 OTP EVB	• N588LP330 (OTP) Demo Board (COB)	
NW-NUOTP-M	NuOTP Gang Writer	• NuOTP Gang Writer Main Board	• New OTP Series 1 to 8 Gang Writer. Support for: N566GP/KP-120/160/200/240/280/320 N566HP-120/160/200/240/280/321 N588HP/JP-062/082/122/172/202/252/342 N584P040/070/120/170/210/260/300 NSP075A/165A/335A	
NW-OTP	Nuvoton OTP Writer	• Old OTP Series Writer	• Old OTP Series 1 on 1 Writer Support: N588HPxx0, N588JPxx0, N567HP330, N566HP320, N584HPxxx	
NW-OTP-SP	NW-OTP-SP	• New OTP Writer	• New OTP Writer Dongle for: N566GP/KP-120/160/200/240/280/320 N566HP-120/160/200/240/280/321 N588HP/JP-062/082/122/172/202/252/342 N584P-030/040/070/120/170/210/260/300	
NW-USB	WHS-USB-Writer	• USB Writer	• EVB USB Writer to Cover PowerSpeech/ViewTalk/ BandDirectorEVB, and NSP-OTP-EVB	
PowerSpeech (N589) Evaluation Board, Tiny Board, Adaptor, Writer				
NV-N589EVB	NHS-589EVB	• N589A/B/C EVB	• N589A/B/C Series Evaluation Board Support: N589A080~280, B080~340, C080~340	
N589A1K9-EVB	N589A1K9-EVB	• N589A1K9 Evaluation Board	• N589A1K9 Evaluation Board to Cover N589A/B/C/D-1K4,1K5, 1K9,2K0	
N589A1K9-TB	N589A1K9-TB	• N589A1K9 Tiny Board	• N589A1K9 Tiny Board to Cover N589A/B/C/D-1K9,2K0,1K4,1K5	
N589A900-EVB	N589A900-EVB	• N589A900 EVB	• N589A/B/C/D Series Evaluation Board Support: N589A400/600/900, N589B342/480/650/960, N589C480/650/960, N589D342/480/650/960	
N589D171-EVB	N589D171-EVB	• N589D171 EVB	• N589D171 Evaluation Board Support: N589D081, N589D121 and N589D171	
N589D175-EVB	N589D175-EVB	• N589D175 Evaluation Board	• N589D175 Evaluation Board to Cover N589D085, N589D125 and N589D175	
N589D175-TB	N589D175-TB	• N589D175 Tiny Board	• N589D175 Tiny Board Supports N589D085, N589D125 and N589D175	

Ordering No.	Board Name	Content	Description	Picture
PowerSpeech (N589) Evaluation Board, Tiny Board, Adaptor, Writer				
N589D481-EVB	N589D481-EVB	• N589D481-EVB	• N589D481 Evaluation Board Support: N589D201, D251, D341 and D481	
N589D485-EVB	N589D485-EVB	• N589D485 Evaluation Board	• N589D485-EVB Support for N589D205, N589D255, N589D345 and N589D485	
N589D485-TB	N589D485-TB	• N589D485-TB	• N589D485 Tiny Board. It Supports on N589D345, N589D255 and N589D205	
N589A-TB	N589A Tboard	• N589A/B/C (COB) Tiny Board	• N589A/B/C Series Tiny Demo Board Support: N589A080~280, B080~340, C080~340	
N589A900-TB	N589A900-Tboard	• N589A900 (COB) Tiny Board	• N589A/B/C/D Series Tiny Demo Board Support: N589A400/600/900, N589B342/480/650/960, N589C480/650/960, N589D342/480/650/960	
N589B345-TB	N589B345-TB	• N589B345 Tiny Board	• N589B345 Tiny Board to Cover N589B085, N589B125, N589B175, N589B205, N589B255, N589B345	
N589D171-TB	N589D171TBoard	• N589D171 (COB) Tiny Board	• N589D171 (COB) Tiny Demo Board Support: N589D081/121/171	
N589D481-TB	N589D481-TB	• N589D481 Tiny Board	• N589D481 Tiny Demo Board Support: N589D201/251/341/481	
N589A-STB	N589A_TOP_ BOARD	• N589A Dev Platform Standard Top Board	• N589A/B/C Series Dev. Platform Standard Top Board Support: N589A080~280/B080~340/C080~340	
N589D171-STB	N589D171_TOP_ Board	• N589D171 Top Board	• N589D171 Standard Top Board w/ Passive Parts Support: N589D081/121/171	
N589E081-TB	N589E081-TB	• N589E Tiny Board	• N589E Tiny Board to Support N589E041/061/081	
N589-1-WTR	N589 1-1 Writer	• N589 1-1 Writer	• N589A/B/C/D Series USB Songle, Supports 1 to 1 Writer and ICE Debug	
N589-8-WTR-M	N589 1-8 Writer	• N589 Gang Writer Main Board	• N589A/B/C/D 1 to 8 Gang Writer (Mother Board)	
N589-8-WTR-F	N589 GANG WRITER 20180724	• N589 1-8 Gang Writer Main Board, SOP14 Adaptor Board x 8, SOP14 Socket x 8	• N589 Gang Writer Full Set, Main Board x 1, Socket Adaptor SOP14 x 8 Support N589B/C-080B/120B/170B/200B/250B/340B (SOP14)	

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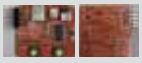
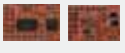
NSP Family

Ordering No.	Board Name	Content	Description	Picture
NSP-Flash Evaluation Board, Tiny Board, Adaptor, Writer				
FS2323NB0808	FS2323NB0808	8Ω, 0.5W, speaker	8Ω, 0.5Watt, Speaker	
NSP040A-TB	NSP040A-TB	NSP040A Tiny Board	NSP040A (SOP8) Tiny Board	
NSP171A-TB1	NSP171A-TB1	• NSP171A (SOP8) Tiny Board	• NSP171A (SOP8) Tiny Demo Board Support: NSP081A, NSP171A	
NSP2340A-TB1	NSP2340A-TB1	• NSP2340A Tiny Board	• NSP2.0 Tiny Board to Support NSP2080A, NSP2170A, NSP2340A	
NSP2340A01GT	NSP2340A01G-TB	• NSP2340A01G-TB	• NSP2340A01G with 1W Output Power (@ 5.5V, 8 ohm) Tiny Board. It Is Suitable for The Part Number of NSP2080A01G, NSP2170A01G, and NSP2340A01G.	
NSP2340A03GT	NSP2340A03GT	NSP2340A03G Tiny Board	NSP2340A03G (3 Watt) SOP16 Tiny Board to Cover: NSP2080A03G, NSP2170A03G and NSP2340A03G	
NSP2340A1D1	NSP2340A1D1	NSP2340A1D1 Demo Board	The NSP2340A1D1 Demo Board Can Be Demo for (1) ISP Content Update via Bluetooth; (2) Dual Channels Sound Effect. This Demo Board Is Suitable for NSP2080A, NSP2170A and NSP2340A	
NSP2340A1EP1	NSP2340A1EP1	• NSP2340A EV Board with N55PA01A	• NSP2.0 Evaluation Board to Support NSP2080A, NSP2170A, NSP2340A	
NSP2340BTM	NSP2340BTM	NSP2340A and Bluetooth Module	NSP2340BTM Is an Ultra-Low-Power Bluetooth®5.0 Module for Low Energy Wireless Applications	
NSP2340T06EE	NSP2340T06EE	NSP2340T06E EVB	The EVB Cover Part No.: NSP2080T06E, NSP2170T06E, NSP2340T06E	
NSP2340T16LE	NSP2340T16LE	NSP2340T16L EVB	The EVB Cover Part No.:NSP080T16L, NSP2170T16L, NSP2340T16L	
NSP2K0B1EP1	NSP2K0B1EP1	• NSP2K0B EVB	• NSP2K0B Evaluation Board. Support Part No: NSP2K0B.	
NSP340A-TB1	NSP340A-TB1	• NSP340A (SOP8) Tiny Board	• NSP340A (SOP8) Tiny Demo Board Support: NSP080A, NSP170A, NSP340A	
NSP340B-TB1	NSP340B-TB1	• NSP340B (SOP14) Tiny Board	• NSP340B (SOP14) Tiny Demo Board Support: NSP080B, NSP170B, NSP340B	
NSP342A-TB1	NSP342A-TB1	• NSP342A Tiny Board	• NSP342A Tiny Board to Support NSP082A, NSP172A, NSP342A	
NSP342A1EP1	NSP342A1EP1	• NSP342A EV Board with N55PA01A	• NSP342A EV Board with NSP082A, NSP172A, NSP342A	
NSP481A-TB3	NSP481A-TB3	• NSP481A-TB3 Tiny Board	• NSP481A with N55PA01A Tiny Board for Demo and Evaluation. It Is for NSP341A and NSP481A	
NSP960B-TB1	NSP960B-TB1	• NSP960B (SOP14) Tiny Board	• NSP960B (SOP14) Tiny Demo Board Support: NSP480B/650B/960B	
NSP960B-TB3	NSP960B-TB3	• NSP960B with N55PA01A Tiny Board	• NSP960B-TB3 Is Tiny Board with N55PA01A for NSP480B, NSP650B, NSP960B	

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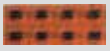
Ordering No.	Board Name	Content	Description	Picture
NSP-Flash Evaluation Board, Tiny Board, Adaptor, Writer				
NSP-1-WTR	NSP 1-1 Writer	• NSP-Flash 1 to 1 Writer	NSP-Flash 1 to 1 Writer to Support NSP080A/081A/170A/171A/340A/341A/481A, NSP080B/170B/340B/480B/650B/960B NSP2080A/NSP2170A/NSP2340A NSP2080A01G/NSP2170A01G/NSP2340A01G	
NSP-8-WTR-F	NSP-8-WTR-F	• NSP-Flash Gang Writer Main Board	NSP Series 1 to 8 Gang Writer Full Set Support: NSP040A,NSP080A/NSP081A/NSP082A,NSP170A/NSP171A/NSP172A,NSP340A/NSP341A,NSP481A NSP2080A/NSP2170A/NSP2340A NSP2080A01G/NSP2170A01G/NSP2340A01G	
NSP-AP-A-1	NSP-AP-A-1	• NSP-SOP8-1 (with Adapter) * 8	• For NSP SOP8 Chip	
NSP-AP-A-2	NSP-AP-A-2	• Adaptor Board with SOP8 Socket	• Adaptor Board with SOP8 Socket for NSP082A/172A/342A and NSP2080A/2170A/2340A Gang Writer	
NSP-SOP8	Adaptor of NSP-SOP8	• NSP-Flash SOP8 Adaptor	• NSP-Flash SOP8 Adaptor on NSP-8-WTR-M (Gang Writer) Support: NSP080A/081A/170A/171A/340A	
NSP-SOP8-2	NSP-SOP8-2	• Adaptor PCB	• NSP SOP8 Adaptor Board for NSP082A/172A/342A and NSP2080A/2170A/2340A Gang Writer	
NSP-SOP14	Adaptor of NSP SOP14	• NSP-Flash SOP14 Adaptor	• NSP-Flash SOP14 Adaptor on NSP-8-WTR-M (Gang Writer) Support: NSP080B/170B/340B	
NSP-SOP14-2	Adaptor of NSP-SOP14-2	• NSP-Flash SOP14-2 Adaptor	• NSP-Flash SOP14 Adaptor on NSP-8-WTR-M (Gang Writer) Support: NSP480B/650B/960B	
NSP-SOP16-1	NSP-SOP16-1	NSP-SOP16-1 Socket Adaptor Board	Gang Writer Socket Adaptor Board for NSP2340A01G, NSP2170A01G and NSP2080A01G	
NSP-OTP Evaluation Board, Tiny Board, Adaptor, Writer				
NSP-OTP-EVB	NSP-OTP-EVB	• NSP-OTP Series EVB	• NSP-OTP Series Evaluation Board Support: NSP075A/165A/335A, NSP075B/165B/335B	
NSP165A-TB2	NSP165A-TB2	• NSP165A Tiny Board	• NSP165A OTP Tiny Board for NSP165A Chip.	
NW-OTP-SP	NW-OTP-SP	• New OTP Writer	• NSP-OTP 1 to 1 Writer (Dongle) Support: NSP075A/165A/335A, NSP075B/165B/335B	
NSP-OTP-D-S8	NSP-OTP-D-S8	• NSP-OTP SOP8 Adaptor	• NSP-OTP SOP8 Adaptor for NSPO-8-GW-M (Gang Writer) Support: NSP075A, NSP165A and NSP335A	

BandDirector® Family

Ordering No.	Board Name	Content	Description	Picture
BandDirector ICE Development Kit				
ICE-W567C	WHS-BD567C	• WHS-MINI-USB-ICE System V1.1 • WHS-567C-IC System V1.3	• W567C/J In-Circuit Emulation (ICE) Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Step Through Features for Design Development, Verification & Debugging	
ICE-N566H	NHS-566H001-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-566H001-ICE System V1.0	• N566H/K/G In-Circuit Emulation (ICE) Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Step Through Features for Design Development, Verification & Debugging	
ICE-N567H	WHS-N567H-ICE	• WHS-MINI-USB-ICE System V1.1 • WHS-N567H-ICE System V3.0	• N567G/H/K In-Circuit Emulation (ICE) Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Step Through Features For Design Development, Verification & Debugging	

BandDirector® Family

Ordering No.	Board Name	Content	Description	Picture
BandDirector Evaluation Board (EVB), Writer				
NV-W567C	WHS-567C-16M	• W567C/J Series EVB	• W567C/J Series Evaluation Board (EVB) with 16Mbit Flash	
N566H-EVB	NHS-566H001-16M	• N566H/K/G Series EVB	• N566H/K/G Evaluation Board (EVB) with 16M-bit Parallel Flash	
NV-N567H	WHS-N567-H1	• N567G/H/K Series EVB	• N567G/H/K Series Evaluation Board (EVB) with 16Mbit Flash	
NV-N567L	NHS-N567L-16M	• N567L Series EVB	• N567L Series Evaluation Board (EVB) with 16Mbit Flash	
NV-W567CP80	NHS-W567CP80	• W567CP260(W567CP80) OTP EVB	• W567CP260(W567CP80) One-Time Programmable (OTP) Evaluation Board (EVB)	
N566HP080EVB	NHS-566HP080	• N566HP080 EVB	• N566HP080 OTP EV Board w/ Components	
N566HP200EVB	NHS-566HP200	•N566HP200 EVB	• N566HP200 EVB Is for N566 Series Evaluation Board or Demo Board. It Supports: N566GP120/160/200, N566KP120/160/200 and N566HP120/160/200	
NV-N566HP320	NHS-N566HP320	• N566HP320 EVB	• N566HP320 COB with Passive Parts	
N566HP321EVB	N566HP321-EVB	• N566HP321 (New OTP) EVB	• N566HP/KP/GP (New OTP) Evaluation Board Support N566HP240/280/321, N566KP240/280/320, N566GP240/280/320	
NV-N567HP80	NHS-567HP80	• N567HP330(N567HP80) OTP EVB	• N567HP330(N567HP80) One-Time Programmable (OTP) Evaluation Board (EVB)	
NV-N567LP330	NHS-567LP330	• N567LP330 OTP EVB	• N567LP330 EVB One-Time Programmable (OTP) Evaluation Board (EVB)	

ViewTalk® Family

Ordering No.	Board Name	Content	Description	Picture
ViewTalk Development Kit				
ICE-N539T-FS	NHS-539-ICE	• WHS-MINI-USB-ICE System V1.1 • NHS-539-ICE System V1.2	• N539 In-Circuit Emulation (ICE) Dev. Kit. Provide In-Circuit Emulation with Program, Execute, Verification & Debugging Support: N539T170/171/260/261/340/341, N531A170	
ViewTalk Evaluation Board				
NV-N531-16M	NHS-531-16M	• N531A170 EVB	• N531A170 Evaluation Board with 16Mbit Flash Support: N531A170	
NV-N539T001	NHS-539001-16M	• N539Txx1 Series EVB	• N539Txx1 Series Evaluation Board with 16Mbit Flash Support: N539T171/261/341	
NV-N539T000	NHS-539-16M	• N539Txx0 Series EVB	• N539Txx0 Series Evaluation Board with 16Mbit Flash Support: N539T170/260/340	

Peripheral Family

Ordering No.	Board name	Content	Description	Picture
N55T Demo Board, Evaluation Board				
NV-N55T16	NHS-55T16-EV	• N55T16 EVB	• N55T16 Evaluation Board (EVB)	
N55T16-16KEY	NHS-55T16-KEY	• 16 Key Touch Pad Board	• N55T16 16 x Key Touch Pad Evaluation/Demo Board	
IO Expander Evaluation Board, Demo Board				
NV-N55P242	NHS-55P242	• N55P242 EVB	• N55P242 Evaluation Board (EVB)	
NV-N55P242-R	N55P242_RING_TYPE_DEMO_BOARD_V1.0	• N55P242 Demo Board (Circle)	• N55P242 Circle Demo Board w/ 16 RGB LEDs	
NV-N55P242-S	N55P242_SINGLE_STRIP_DEMO_BOARD_V1.0	• N55P242 Demo Board (Rectangle)	• N55P242 Rectangle Demo Board w/ 8 RGB LEDs	
MFID Evaluation Board, Demo Board				
N55MID16-EVB	NHS-55MID16.D3ANT2	• N55MID16 EVB	• N55MID16 MFID Single-Tag Tiny Board	
N55MID36-EVB	NHS-55MID36.D4	• N55MID36 EVB	• N55MID36 MFID Multi-Tag Tiny Board	
N55MID51-EVB	N55MID51-001	• N55MID51 EVB	• N55MID51 MFID Reader for N55MID16 and N55MID36	

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Audio Development Tools

Development Tools for Audio Converters

Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NU-NAUSB2I2C	• NU-NAUSB2I2C	Audio Converters products	• USB Control Board	
NL-NAU88C10	• NL-NAU88C10	NAU88C10	• Demo Board for NAU88C10YG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88C14	• NL-NAU88C14	NAU88C14	• Demo Board for NAU88C14YG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88L11	• NL-NAU88L11	NAU88L11	• Demo Board for NAU88L11YG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88L20	• NL-NAU88L20	NAU88L20	• Demo Board for NAU88L20YG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88L21	• NL-NAU88L21	NAU88L21	• Demo Board for NAU88L21YG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88L21C	• NL-NAU88L21C	NAU88L21C	• Demo Board for NAU88L21CYG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88C22	• NL-NAU88C22	NAU88C22	• Demo Board for NAU88C22YG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88L24I	• NL-NAU88L24I	NAU88L24I	" Demo Board for NAU88L24IG • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU88L25B	• NL-NAU88L25B	NAU88L25B	• Demo Board for NAU88L25YGB • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU85L20B	• NL-NAU85L20B	NAU85L20B	• Demo Board for NAU85L20YGB • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU85L40B	• NL-NAU85L40B	NAU85L40B	• Demo Board for NAU85L40YGB • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU85L40S	• NL-NAU85L40S	NAU85L40S	• Demo Board for NAU85L40SYG with single-ended microphone • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU7802	• NL-NAU7802	NAU7802	• Demo Board for NAU7802 • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU7802SG	• NL-NAU7802SG	NAU7802SGI	• Demo Board for NAU7802SGI • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NL-NAU7802QG	• NL-NAU7802QG	NAU7802QGI	• Demo Board for NAU7802QGI • USB Control Board Required for PC Connection (NU-NAUSB2I2C)	
NE-N681389	• NE-PROXBASE • NT-N681389	MotherBoard+N681389-EVB	• Pro-X Motherboard + N681389 Evaluation Board	
NT-N681389	• NT-N681389	N681389-EVB	• Evaluation Board for N681389	
NE-NAU8220	• NE-NAU8220	NAU8220	• Demo Board for NAU8220WG	
NT-ISD8101	• NT-ISD8101	ISD8101	• Demo Board for I8101SYI	
NT-ISD8102	• NT-ISD8102	ISD8102	• Demo Board for I8102SYI	
NT-ISD8104	• NT-ISD8104	ISD8104	• Demo Board for I8104SYI	

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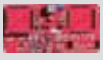
Development Tools for Audio Amplifiers

Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NE-NAU82011V	• NE-NAU82011V	NAU82011	• Demo Board for NAU82011VG	
NE-NAU82011Y	• NE-NAU82011Y	NAU82011	• Demo Board for NAU82011YG	
NE-NAU8223	• NE-NAU8223	NAU8223	• Demo Board for NAU8223YG	
NE-NAU8224	• NE-NAU8224	NAU8224	• Demo Board for NAU8224YG	
NL-NAU8315	• NL-NAU8315	NAU8315	• Demo Board for NAU8315YG	
NL-NAU8315B	• NL-NAU8315B	NAU8315	• Demo Board for NAU8315B31VG	
NL-NAU8318	• NL-NAU8318	NAU8318	• Demo Board for NAU8318YG	
NL-NAU8318B	• NL-NAU8318B	NAU8318	• Demo Board for NAU8318VG	
NL-NAU8325	• NL-NAU8325	NAU8325	• Demo Board for NAU8325YG	
NV-NADBASE	• NV-NADBASE	NAU83G10 NAU83G20	• Base Board of Smart Amp Series	
NT-NAU83G10	• NT-NAU83G10	NAU83G10	• NAU83G10 Daughter Card	
NT-NAU83G20	• NT-NAU83G20	NAU83G20	• NAU83G20 Daughter Card	
NV-NAU83G10S	• NV-NADBASE • 2x NT-NAU83G10	NAU83G10	• Demo Board for NAU83G10 Stereo	
NV-NAU83G20S	• NV-NADBASE • 2x NT-NAU83G20	NAU83G20	• Demo Board for NAU83G20 Stereo	
NM-N83G10MA	• NV-NADBASE • BRS-161200	NAU83G10	• Demo Board for NAU83G10 Mono with Bujeon BRS-161200	
NM-N83G10SA	• NV-NADBASE • 2x BRS-161200	NAU83G10	• Demo Board for NAU83G10 Stereo with 2x Bujeon BRS-161200	
NM-N83G10MB	• NV-NADBASE • BRS-181300	NAU83G10	• Demo Board for NAU83G10 Mono with Bujeon BRS-181300	
NM-N83G10SB	• NV-NADBASE • 2x BRS-181300	NAU83G10	• Demo Board for NAU83G10 Stereo with 2x Bujeon BRS-181300	
NM-N83G20MA	• NV-NADBASE • BUF-4203	NAU83G20	• Demo Board for NAU83G20 Mono with Bujeon BUF-4203	
NM-N83G20MB	• NV-NADBASE • TEBM28C10	NAU83G20	• Demo Board for NAU83G20 Mono with Tecktonic TEBM28C10	
NM-N83G20SA	• NV-NADBASE • 2x BUF-4203	NAU83G20	• Demo Board for NAU83G20 Stereo with 2x Bujeon BUF-4203	
NM-N83G20SB	• NV-NADBASE • 2x TEBM28C10	NAU83G20	• Demo Board for NAU83G20 Stereo with 2x Tecktonic TEBM28C10	

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Development Tools for Audio Enhancement

Ordering No. Part No.	Content	Supported Devices		Picture
NU-NAUSB2I2C	• NU-NAUSB2I2C	NPCA120DD NPCA121DD NPCA120DY	• USB Control Board	
NU-NPUSB2I2C	• NU-NPUSB2I2C	NPCA110X NPCP215F	• USB Control Board for NPCA110X & NPCP215X	
NT-NPCA110PP	• NT-NPCA110PP	NPCA110P	• NPCA110P Piggy Board	
NE-NPCA110XB	• NE-NPCA110XB	NPCA110X	• NPCA110X 1 Watt Base Board	
NE-NPCP215F	• NE-NPCP215F	NPCP215F	• NPCP215F Demo Board	
NE-NPCA120	• NE-NPCA120	NPCA120DD	• NPCA120 Audio Enhancement, Bongiovi DPS, Standard Level Demo Board	
NL-NPCA120	• NL-NPCA120	NPCA120DD	• NPCA120DD LQFP-64 Audio Enhancement, Bongiovi DPS, Standard Level Demo Board	
NL-NPCA120DY	• NL-NPCA120DY	NPCA120DY	• NPCA120DY QFN-48 Audio Enhancement, Bongiovi DPS, Standard Level Demo Board	
NE-NPCA121	• NE-NPCA121	NPCA121DD	• NPCA121 Audio Enhancement, Bongiovi DPS, Premium Level Demo Board	
NL-NPCA121	• NL-NPCA121	NPCA121DD	• NPCA121DD LQFP-64 Audio Enhancement, Bongiovi DPS, Standard Level Demo Board	

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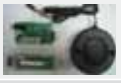
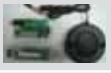
Development Tools for ISD ChipCorder®

Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NP-SPK1	• NP-SPK1	Differential Audio Output	• 8-Ohm Speaker	
NU-ISDMINUSB	• NU-ISDMINUSB	ISD ChipCorder products	• USB Dongle • Support ISD VPE Software on PC	
NM-ISD2100S	• NT-ISD2100S • NU-ISDMINUSB • NP-SPK1	ISD2100 Series	• Evaluation and Demo Kit for ISD2100 Series	
NM-ISD2100Q	• NT-ISD2100Q • NU-ISDMINUSB • NP-SPK1	ISD2100 Series	• Evaluation and Demo Kit for ISD2100 Series	
NT-ISD2100S	• NT-ISD2100S	ISD2100 Series	• Demo Board for ISD2130SYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NT-ISD2100Q	• NT-ISD2100Q	ISD2100 Series	• Demo Board for ISD2130YYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD2360S	• NT-ISD2360S • NU-ISDMINUSB • NP-SPK1	ISD2360	• Evaluation and Demo Kit for ISD2360	
NM-ISD2360Q	• NT-ISD2360Q • NU-ISDMINUSB • NP-SPK1	ISD2360	• Evaluation and Demo Kit for ISD2360	
NT-ISD2360S	• NT-ISD2360S	ISD2360	• Demo Board for ISD2360SYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NT-ISD2360Q	• NT-ISD2360Q	ISD2360	• Demo Board for ISD2360YYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD2361	• NT-ISD2361 • NU-ISDMINUSB • NP-SPK1	ISD2361	• Evaluation and Demo Kit for ISD2361	

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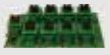
Ordering No. / Part No.	Content	Supported Devices	Description	Picture
NT-ISD2361	• NT-ISD2361	ISD2361	• Demo Board for ISD2361YYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD3800	• NT-ISD3800 • NU-ISDMINUSB • NP-SPK1	ISD3800	• Evaluation and Demo Kit for ISD3800	
NT-ISD3800	• NT-ISD3800	ISD3800	• Demo Board for ISD3800FYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD15D00	• NT-ISD15D00 • NU-ISDMINUSB • NP-SPK1	ISD15D00	• Evaluation and Demo Kit for ISD15D00	
NT-ISD15D00	• NT-ISD15D00	ISD15D00	• Demo Board for ISD15D00YYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD3900	• NT-ISD3900 • NU-ISDMINUSB • NP-SPK1	ISD3900	• Evaluation and Demo Kit for ISD3900	
NT-ISD3900	• NT-ISD3900	ISD3900	• Demo Board for ISD3900FYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD15100	• NT-ISD15100 • NU-ISDMINUSB • NP-SPK1	ISD15100 Series	• Evaluation and Demo Kit for ISD15100 Series	
NT-ISD15100	• NT-ISD15100	ISD15100 Series	• Demo Board for ISD15100 Series • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NM-ISD15C00	• NT-ISD15C00 • NU-ISDMINUSB • NP-SPK1	ISD15C00	• Evaluation and Demo Kit for ISD15C00	
NT-ISD15C00	• NT-ISD15C00	ISD15C00	• Demo Board for ISD15C00FYI • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NW-ISD2100S	• NW-ISD2100S	ISD2100 Series	• ISD2100 SOP Single Socket Programmer • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NW-ISD2100Q	• NW-ISD2100Q	ISD2100 Series	• ISD2100 QFN Single Socket Programmer • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NG-ISD2100S	• NG-ISD2100S	ISD2100 Series	• ISD2100 SOP Standalone Gang Programmer	
NG-ISD2100Q	• NG-ISD2100Q	ISD2100 Series	• ISD2100 QFN Standalone Gang Programmer	
NW-ISD2360S	• NW-ISD2360S	ISD2360SYI	• ISD2360 SOP Single Socket Programmer • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NW-ISD2360Q	• NW-ISD2360Q	ISD2360YYI	• ISD2360 QFN Single Socket Programmer • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NG-ISD2360S	• NG-ISD2360S	ISD2360SYI	• ISD2360 SOP Standalone Gang Programmer	
NG-ISD2360Q	• NG-ISD2360Q	ISD2360YYI	• ISD2360 QFN Standalone Gang Programmer	
NW-ISD15100	• NW-ISD15100	ISD15100 Series	• ISD15100 LQFP Single Socket Programmer • USB Dongle Required for PC Connection (NU-ISDMINUSB)	
NW-ISDPROG	• NW-ISDPROG	ISD2100 Series ISD15100 Series ISD15D00 Series	• Digital ChipCorder Standalone Programmer • Support ISD2100/ISD15100/ISD15D00 Series	

nuvoTon

Cloud Security

EC

EC for Portable Applications

Security

Trusted Platform Module (TPM)

Hardware Monitors

Desktop / Server Series
NB and Networking / Storage Series

Interface Logic

Switches and Multiplexers
Interface Logic Series

I/O

General Purpose I/O Series
Super I/O Series
eSIO Series

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EC

EC for Portable Applications

Nuvoton's highly-integrated embedded controller (EC) device has an embedded 32-bit/16-bit, high-performance RISC core and integrated advanced functions. It is targeted for a wide range of portable applications and provides best-in-class, complete EC functionality. The EC uses either the Low Pin Count (LPC), the Enhanced Serial Peripheral Interface (eSPI), or I²C Host interface and is designed to best meet the requirements of mobile systems.

Part No.	Core Type	Core Max Freq.	Internal Flash Memory	SRAM	SPI Flash I/F	eSPI	LPC	SMBus /I²C	I3C	Core UART	Peripheral SPI Ctrl	PECI	ADC	Host I/F Ch.	8042 KBC	Host Mailbox	PWM Ch./ with HB	Fan TACHs	KBD Scan	PS/2	JTAG	Package
NPCE6mnx	CR16CPlus	50 MHz	Up to 512 KB	32 KB	Up to 64 MB	√	√	5 Controllers/ 7 Ports	-	1	Master	3.1	Up to 10-bit / Up to 10 inputs	4	√	4	8 / 8	6	18 x 8	3	Standard/ Serial	LQFP128 VFBGA128
NPCX796FC	Arm® Cortex®-M4	100 MHz	512 KB	256 KB	N/A	√	√	8 Controllers/ 10 Ports	-	2	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144
NPCX797FC	Arm® Cortex®-M4	100 MHz	512 MB	384 KB	N/A	√	√	8 Controllers/ 10 Ports	-	2	Master/ Slave	3.1	Up to 10-bit / Up to 10 inputs	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144
NPCX993FA	Arm® Cortex®-M4	100 MHz	512 KB	320 KB	N/A	√	√	8 Controllers/ 10 Ports	1	4	Master/ Slave	4.0	10-bit / Up to 12 inputs	4	√	4	10 / 8	4	18 x 8	4	Standard/ SWD	VFBGA144
NPCX998FA	Arm® Cortex®-M4	100 MHz	1 MB	512KB	NA	√	√	8 controllers / 10 ports	1	4	Master/ Slave	4.0	10-bit / Up to 12 inputs	4	V	4	10 / 8	4	18x8	4	Standard/ SWD	VFBGA144

Hardware Monitors

Desktop / Server Series

Nuvoton's Desktop & Server Hardware Monitoring IC Series is one of Nuvoton's most popular computer product categories. Hardware Monitoring ICs are widely adopted in desktop and server motherboards and in Industrial PC applications. Hardware Monitoring ICs monitor important hardware parameters including voltage, temperature, and fan speed and are able to issue alarms or warning signals to prevent system damage when abnormal events are detected.

Part No.	System Interface	On-chip Thermal Sensor	Remote Thermal Sensor Inputs	Voltage Monitor Inputs	Fan Tachometer Inputs	Fan Speed Control Outputs	Operation Voltage	PECI I/F	Package
NCT7802Y	SMBus/I²C	Y	3(max)	5(max)	3	3	3.3V	3.1	QFN20
NCT7906D	SMBus/I²C	Y	4(max)	16(max)	8	4	3.3V	3.1	TQFP64
NCT7904D	SMBus/I²C	Y	4(max)	17(max)	12(max)	4	3.3V	3.1	LQFP48
W83795ADG	SMBus/I²C	N	6	18(max)	14(max)	2	3.3V	2.0	LQFP48
W83795G	SMBus/I²C	N	6	21(max)	14(max)	8(max)	3.3V	2.0	LQFP64
NCT7201Y/W	SMBus/I²C	N	N	8 (max)	N	N	3.3V	N	QFN16/TSSOP16
NCT7202Y/W	SMBus/I²C	N	N	12 (max)	N	N	3.3V	N	QFN20/TSSOP20
NCT7362Y	SMBus/I²C	N	N	N	16	16	2.7V-5.5V	N	QFN24
NCT7363Y	SMBus/I²C	N	N	N	16	16	2.7V-5.5V	N	QFN24

NB and Networking / Storage Series

Nuvoton's Notebook and Networking/Storage Hardware Monitoring IC series is widely adopted in the industry and monitor important hardware parameters including voltage, temperature, and fan speed. These devices prevent system damage by issuing alarms or warning signals when abnormal events are detected.

Part No.	System Interface	On-chip Thermal Sensor	Remote Thermal Sensor Inputs	Voltage Monitor Inputs	Fan Tachometer Inputs	Fan Speed Control Outputs	Operation Voltage	PECI I/F	Package
NCT7511Y	SMBus/I²C	Y	2 (max)	N	1	1	3.3V	N	QFN16
NCT7717U	SMBus/I²C	Y	N	N	N	N	3.3V	N	SOT23-5
NCT7718W	SMBus/I²C	Y	1	N	N	N	3.3V	N	MSOP8
NCT7719W	SMBus/I²C	Y	2	N	N	N	3.3V	N	MSOP10
W83773G	SMBus/I²C	Y	2	N	N	N	3.3V	N	MSOP8
NCT7601Y/W	SMBus/I²C	N	8 (max)	N	N	N	3.3V	N	QFN16/TSSOP16
NCT7602Y/W	SMBus/I²C	N	12 (max)	N	N	N	3.3V	N	QFN20/TSSOP20
NCT7716Y/U	SMBus/I²C	Y	N	N	N	N	3.3V	N	DFN6/SOT23-6
NCT7728W/S	SMBus/I²C	Y	N	N	N	N	3.3V	N	MSOP8/SOP8
NCT7725W/S	SMBus/I²C	Y	N	N	N	N	3.3V	N	MSOP8/SOP8
NCT7715W	SMBus/I²C	Y	N	N	N	N	1.7V ~ 3.6V	N	MSOP8

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I/O

Super I/O Series

Nuvoton's Super I/O series are widely adopted in the motherboard, industrial PC, AIO and workstation applications and support both traditional legacy functions (serial port, parallel port, KBC, and General Purpose I/O) as well as advanced hardware monitoring functions and control features.

Part No.	Interface	KBC	UART	Parallel Port	Hardware Monitor	ACPI	SMBus Master	PECI I/F	SB-TSI I/F	EuP Power Saving	Port 80	Package
NCT5104D	LPC	N	4	N	N	N	N	N	N	N	N	LQFP48
NCT5124D	LPC / eSPI	N	4	N	N	N	N	N	N	N	N	LQFP48
NCT5585D	LPC / eSPI	Y	1	N	Y	Y	Y	3.1	Y	Y	Y	LQFP64
NCT6796D-E	LPC / eSPI	Y	2	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6106D	LPC	Y	6	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128
NCT6126D	LPC / eSPI	Y	6	Y	Y	Y	Y	3.1	Y	Y	Y	LQFP128

eSIO Series

Nuvoton's family of eSIO devices combines built-in microcontroller and traditional legacy SIO functions in a single device. These devices can perform traditional Super I/O functions and the programmable core allows a rich set of customized features including advanced fan control and flexible power sequence control. The eSIO series is widely adopted in gaming PCs, AIOs, workstations, datacenter and entry-level server applications.

Part No.	Interface	KBC	UART	Parallel Port	Hardware Monitor	ACPI	SMBus Master	SPI I/F	PECI I/F	SB-TSI I/F	EuP Power Saving	Port 80	Built-in uC	Package
NCT6686D	LPC / eSPI	Y	2	Y	Y	Y	Y	Y	3.1	Y	Y	Y	Y	LQFP128

General Purpose I/O Series

Nuvoton's General Purpose I/O Expansion IC series allows the easy addition of multiple GPIO capabilities over a standard SMBus interface. These devices include strappable address setting, Input interrupts, and LED and BEEP functions.

Part No.	Supply Voltage	GPIO	Interface	Package
NCT5655W/Y	2.3V ~ 5.5V	16	SMBus	TSSOP24/QFN24
NCT5635W/Y	2.3V ~ 5.5V	16	SMBus	TSSOP24/QFN24
NCT5616W/Y	1.8V ~5.5V	16	SMBus	TSSOP24/QFN24
NCT5608W/Y	1.8V ~5.5V	8	SMBus	TSSOP16/QFN16
NCT5605Y	3.3V	14	SMBus	QFN20
W83L603G	3.3V	8	SMBus	SOP14
W83601G	5V	15	SMBus	SSOP20

Security

Trusted Platform Module (TPM)

Nuvoton's Trusted Platform Module (TPM) (NPCT7xx) is a seventh-generation Nuvoton SafeKeeper™ device that implements the Trusted Platform Module (TPM) 2.0 specifications for PC-Client TPM.

Part No.	Description	TPM Main Specification Version Compliance	TCG PC Client Specific TIS Version	Compliances	Interface	Operation Temperature (°C)	Package Options
NPCT7xx	SafeKeeper™ Trusted Platform Module (TPM)	Version 2.0 revision 01.16	PTP v1.03 Rev 22	CC EAL4+ and FIPS 140-2 Level 2	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16
		Version 2.0 revision 01.38	PTP v1.04 Rev 0.37	CC EAL4+ and FIPS 140-2 Level 2 with Physical security level 3	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16
		Version 2.0 revision 01.59	PTP v1.05 Rev 14	CC EAL4+ and FIPS 140-2 Level 2 with Physical security level 3	SPI, I²C (1.8V-3.3V)	0 ~ 70 or -40 ~ 85	QFN32 UQFN16

Interface Logic

Voltage Level Shifter

Nuvoton level shifter series provides the ability to interface a variety of devices with different operating voltages. High ESD protection and speeds are supported. These devices are suitable for all Desktop, Workstation, Industrial PC, Server and Cloud computing applications.

Part No.	Operation Voltage	Interface	Inputs	Outputs	Operation Temperature (°C)	Package
NCT5927W	0.8V-5.5V/ 2.2V-5.5V	SMBus/I²C	1	1	-40~85	MSOP 8
NCT5914W	0.5V-6.0V	GTL to LVTTL	4	4	-40~85	TSSOP14

Switches and Multiplexers

Nuvoton Switches and multiplexers allow the connection of devices that operate at different voltage levels but share the same bus, and isolate devices when not in use to reduce overall system capacitive loading. They are widely used in Workstation, Industrial PC, Server and Cloud computing applications.

Part No.	Frequency	Operation Voltage	Interface	Inputs	Outputs	Operation Temperature (°C)	Package
NCT5945W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	4	-40~85	TSSOP20/QFN20
NCT5946W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	4	-40~85	TSSOP16/QFN16
NCT5948W/Y	1 MHz	2.3-5.5V	SMBus/I²C	1	8	-40~85	TSSOP24/QFN24

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Power Management

TCPC (Type C Port Controller)

TCPC (Type C Port Controller) Series

Power Switch

Power Switch Series

Voltage Regulators

DDR Bus Termination Series
Fan Driver IC Series
Linear Regulator Series

TCPC (Type C Port Controller)

TCPC (Type C Port Controller) Series

Part No.	Description	Main Specification Version Compliance	Interface	Power Role	VCONN Switch	Type-C Ports	No. of GPIOs		Package
							Multiplexed	Dedicated	
NCT3807A0YX	Type-C Port Controller with integrated VCONN switch and GPIO expander	Type-C Cable and Connector, Revision 2.0 Power Delivery (PD), Revision 3.0, v2.0 Type-C Port Controller Interface (TCPCI), Revision 2.0, v1.1	I2C, up to 1MHz	Sink, Source and Dual Power Role	Integrated, up to 1.5W with automatic turn-off protection	1	7	9	QFN32, 5x5
NCT3808A0YX	Type-C Port Controller with integrated VCONN	Type-C Cable and Connector, Revision 2.0 Power Delivery (PD), Revision 3.0, v2.0 Type-C Port Controller Interface (TCPCI) Revision 2.0, v1.1	I2C, up to 1MHz	Sink, Source and Dual Power Role	Integrated, up to 1.5W with automatic turn-off protection	2	10	-	QFN32, 5x5

Power Switch

Power Switch Series

Nuvoton's Power Switch Series are solutions of high integration and cost-effectiveness. Our products offer PCB space saving and are ideal for high side over current protection and system power saving applications. Our series feature low RDS (ON), low input voltage and abundant protections such as over current protection, short circuit, over temperature and reverse voltage/current protections.

Part No.	Input Voltage (VIN)	Features	Rdson (typ.)	Output Current (typ.)	Flag indicator	OCP Adjustable	Output Discharge	Package
NCT3521U	2.7V ~ 5.5V	Enable; Adj. Soft-start & Shutdown Output Discharge, UVLO, OCP, RCP, RVP, OTP	80 m-ohm	2.0A	Y	N	Y	SOT23-5 SOT23-6
NCT3521U-2	2.7V ~ 5.5V	Enable; Adj. Soft-start & Shutdown Output Discharge, UVLO, OCP, RCP, RVP, OTP	80 m-ohm	2.0A	Y	N	Y	SOT23-5 SOT23-6
NCT3527U	3.0V ~ 5.5V	Enable; OCP adjustable, UVLO, OCP, RCP, RVP, OTP; Output Latched off when Flag# Alerted	70 m-ohm	2.5A	Y	Y	Y	TSOT23-6
NCT3527U-A	3.0V ~ 5.5V	Enable; OCP adjustable, UVLO, OCP, RCP, RVP, OTP; Output cycle by cycle re-try when Flag# Alerted	70 m-ohm	2.5A	Y	Y	Y	TSOT23-6
NCT3530Y	4.5V ~ 5.5V	Enable; OCP, UVLO, OCP, RCP, RVP, OTP; HDMI/DVI DDC I²C, HPD Level Shifters	0.6 ohm	0.25A	Y	N	Y	DFN10
NCT3532Y	3.0V ~ 5.5V	Enable; OCP, UVLO, OCP, RCP, RVP, OTP; Dual Mode Display Port (DP++) Auxiliary Channels Splitter with HDMI DDC I²C, HPD Voltage Level Translators	0.2 ohm	0.5A	N	N	N	QFN16

Voltage Regulators

DDR Bus Termination Series

Nuvoton's family of DDR bus termination regulators series provides bi-directional (sinking/ sourcing) current outputs for high speed bus termination applications. These devices provide stable termination power (VTT) and fast transient response for DDR, DDR2, DDR3x, and DDR4 VTT bus termination applications, and are intended for high-performance, low cost DDR designs.

Part No.	Input Voltage (VIN)	Features	Control Voltage	Memory Supported	VTT Output offset (max)	Sink/Source Current (max)	Package
NCT3103S	1.0V ~ 5.5V	Sleep S3 & DDR VTT Enable Control Signals, OCP & OTP	3.0V ~ 5.5V	DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	SOP8 with Exposed Pad
NCT3105Y	1.0V ~ 3.6V	EN with Suspend to RAM (STR) Functionality, Power Good, OCP & OTP	2.3V ~ 5.5V	DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	DFN10
NCT3101S	1.0V ~ 5.5V	OCP & OTP	3.0V ~ 5.5V	DDRI, DDRII, DDRIII, DDRIV	-20mV ~ +20mV	2A	SOP8 with Exposed Pad

Fan Driver IC Series

Nuvoton's Fan Driver devices are highly integrated and cost-effective solutions providing small PCB footprint and reduced BOM cost. These devices can be coupled with Nuvoton's Super IO Series to drive low cost DC or PWM fans and feature over-current protection, short circuit protection and thermal shutdown for enhanced design safety.

Part No.	Input Voltage (VIN)	Output Voltage	Features	V_{SET} / DCIN	Current Limit Trigger	Output Current (typ.)	Package
NCT3941S	8.0V ~ 17.6V	Follow V_{SET} *4.0 times	OCP, SCP & OTP EN: NCT3941S FON#: NCT3941S-A	1.0 ~ VIN	1.6A (typ.)	0.5A	SOP8 with Exposed Pad
NCT3941S-A	8.0V ~ 17.6V	Follow V_{SET} *4.0 times	OCP, SCP & OTP EN: NCT3941S FON#: NCT3941S-A	1.0 ~ VIN	1.6A (typ.)	0.5A	SOP8 with Exposed Pad
NCT3947S-A	10.8V ~ 13.2V	DC Mode: 3.8 * DCIN; PWM Mode: follows VIN	Auto Fan Type Detection (DC/PWM Fan), Manual Mode, Fault#, OCP, SCP & OTP	0 ~ 3.6V	3.0A ~ 4.0A	2.0A	SOP8 with Exposed Pad

Linear Regulator Series

Nuvoton's Linear Regulator Series provides high performance, low input voltage and low dropout voltage features. Our products provide on/off control (enable pin) for power saving and feature over-current protection, short circuit protection and thermal shutdown for enhanced design safety.

Part No.	Input Voltage (VIN)	Features	Control Voltage	Dropout (typ.)	Output Current (typ.)	Package
NCT3720S	1V ~ 5.5V	EN, PG, UVLO, OCP, SCP & OTP	3V ~ 5.5V	150mV	2A	SOP8 with Exposed Pad
NCT3730S	1V ~ 5.5V	EN, PG, UVLO, OCP, SCP & OTP	3V ~ 5.5V	210mV	3A	SOP8 with Exposed Pad

Contact us: ComputerIC@nuvoton.com

NuMotor MCU

NuMotor MCU

NuMotor MCU Series

NuMotor MCP(MCU + Gate driver)

NuMotor MCP Series

NuMotor MCU

NuMotor MCU Series

NuMotor MCU Series for motor application
All series built-in complementary PWM linked with ADC for motor drive
All series built-in analog comparators, rail-to-rail OPA or PGA(except NM1200)
Operating voltage : 2.5V ~ 5.5V
Operating temperature : -40°C ~ 105°C

• NM1200 series (Applicable to: Fan, Ceiling fan, Water pump…)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 32-bit	EPWM 16-bit	ADC ch 10-bit	Comp	UART SPI I2C	MAX HCLK	Package Type
NM1100FBAE	17.5	2	17	2	6	8	2	1/0/0	48	TSSOP20
NM1200ZBAE	17.5	2	29	2	6	12	2	2/1/1	48	QFN33 (5x5)
NM1200LBAE	17.5	2	33	2	6	12	2	2/1/1	48	LQFP48(7x7)

• NM1120 sereis (Applicable to : Fan, Cooling fan, Hand-held machine tool, Garden tool, Water pump…)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 32-bit	EPWM 16-bit	ADC ch 12-bit	Comp	UART SPI I2C	MAX HCLK	BPWM 16-bit	ECAP 24-bit	PGA	SPROM (kB)	Package Type
NM1120XC1AE	29.5	4	18	2	6	8	2	2/2/2	48	2	3	1	3x0.5	QFN20 (4x4)
NM1120FC1AE	29.5	4	18	2	6	8	2	2/2/2	48	2	3	1	3x0.5	TSSOP20
NM1120EC1AE	29.5	4	22	2	6	8	2	2/2/2	48	2	3	1	3x0.5	TSSOP28

• NM1244 series (Applicable to: Home fan, Ceiling fan, Ebike, Electric scooter, Sewing machine, Hand-held machine, Garden tool...)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 32-bit	EPWM 16-bit	ADC ch 12-bit	Comp	UART SPI I2C	MAX HCLK	BPWM 16-bit	ECAP 24-bit	GDMA	SPROM (kB)	OPA	DAC 12-bit	Package Type
NM1244D48	64	8	44	3	6	20	1	2/1/2	60	2	3	2	3x0.5	1	2	LQFP48 (7x7)
NM1244Y48	64	8	44	3	6	20	1	2/1/2	60	2	3	2	3x0.5	1	2	QFN48 (7x7)
NM1244Y	64	8	29	3	6	16	1	2/1/2	60	2	3	2	3x0.5	1	2	QFN33 (4x4)

• NM1234 series (Applicable to: Quadrature encoder interface, Home fan, Ceiling fan, Ebike, Sewing machine, White goods...)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 32-bit	EPWM 16-bit	ADC ch 12-bit	Comp	UART SPI I2C	MAX HCLK	BPWM 16-bit	ECAP 24-bit	PGA	SPROM (kB)	OPA	QEI (A/B/IDX)	DAC 12-bit	Package Type
NM1234D	64	16	44	4	6	16	2	3/2/3	72	2	3	1	3x0.5	3	1	2	LQFP48 (7x7)
NM1234Y	64	16	44	4	6	16	2	3/2/3	72	2	3	1	3x0.5	3	1	2	QFN48 (7x7)

• NM1530 series (Applicable to: Quadrature encoder interface, CAN bus, Dual motor control, Ebike, Sewing machine, White goods...)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 32-bit	EPWM 16-bit	ADC ch 12-bit	Comp	UART SPI I2C	MAX HCLK	BPWM 16-bit	ECAP 24-bit	CAN2.0	MDU	OPA	QEI (A/B/IDX)	Package Type
NM1520LD2AE	64	8	38	4	9	9	1	2/1/1	72	0	3	1	√	2	1	LQFP48 (7x7)
NM1520RD2AE	64	8	51	4	12	14	2	2/1/1	72	1	3	1	√	2	1	LQFP64 (10x10)
NM1520RC2AE	32	8	51	4	12	14	2	2/1/1	72	1	3	1	√	2	1	LQFP64 (10x10)
NM1530VD3AE	64	16	82	4	12	16	3	2/3/1	72	2	6	1	√	2	2	LQFP100 (14x14)
NM1530VE3AE	128	16	82	4	12	16	3	2/3/1	72	2	6	1	√	2	2	LQFP100 (14x14)

Refer to the following web site for more information
www.nuvoton-mcu.com/forum.php?mod=viewthread&tid=1819&fromuid=177288

NuMotor MCP(MCU + Gate driver)

NuMotor MCP Series

Operating temperature : -40°C ~ 105°C

• NM18107 series (NM1120 + 40V_Gate Driver) (Applicable to: Hand-held machine, Garden tool, Fan...)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 32-bit	EPWM 16-bit	ADC ch 12-bit	Comp	UART SPI I2C	MAX HCLK	BPWM 16-bit	ECAP 24-bit	PGA	SPROM (kB)	LDO	Package Type
NM18107Y	29.5	4	14	2	6	8	2	2/1/2	48	2	3	1	3x0.5	5V & 12V	QFN33 (5x5)

• NM18002 series (MS51FB9AE(1T-8051) + 40V_Gate Driver(High P-ch/Low N-ch MOSFET) (Applicable to: Single-phase Server Fan, Cooling Fan, BDC...)

Part No.	Flash ROM (kB)	SRAM (kB)	I/O	Timer 16-bit	EPWM 16-bit	ADC ch 12-bit	Comp	UART SPI I2C	MAX HCLK	SPROM (kB)	LDO	Package Type
NM18002Y	16	1	9	4	4	4	2	2/1	24	128	5V	QFN24 (4x4)

Refer to the following web site for more information
www.nuvoton-mcu.com/forum.php?mod=viewthread&tid=1819&fromuid=177288

Component

MOSFET

MOSFET for Li-ion Battery Protection
MOSFET for Li-ion Battery Charging Control
MOSFET for General Switching
MOSFET for Automotive Switching Circuit

MOSFET

CSP MOSFET Feature

1.Low on-resistance
2.Small package size
3.Good thermal performance
4.Low inductance
5.Low failure rate

CSP MOSFET for Li-ion Battery Protection

• 12V-30V Nch Dual MOSFET

1.Fast charge long battery life
2.Miniaturization
3.Long storage period

- Low on-resistance; 0.9mΩ
- Small size; 0.6 x 0.6mm
- Low leakage current; IGSS=0.1μA

• VSS=12V

Part No.	Type	VSS [V]	VGS [V]	IS*1 [A]	Rss(on)Typ.[mΩ]				Package Size		
					VGS 4.5V	VGS 3.8V	VGS 3.1V	VGS 2.5V	x[mm]	y[mm]	t[μm]
KFCAB21B10L	N-Dual	12	±8	22.7	0.85	0.90	1.15	1.55	3.20	1.95	106
KFCAB21C00L	N-Dual	12	±8	20.0	1.00	1.10	1.25	1.60	3.00	2.74	95
KFCAB21860L	N-Dual	12	±8	17.0	1.35	1.50	1.70	2.25	2.52	2.30	95
KFCAB21520L	N-Dual	12	±8	16.0	1.45	1.60	1.80	2.30	3.54	1.77	110
KFCAB21B50L	N-Dual	12	±8	15.0	1.50	1.60	1.90	2.45	1.84	1.96	72
KFCAB21890L	N-Dual	12	±8	14.5	1.75	1.95	2.25	2.90	2.98	1.49	75
KFCAB21770L	N-Dual	12	±8	14.5	1.80	2.00	2.20	2.70	3.54	1.77	110
KFCAB21260L	N-Dual	12	±8	12.0	2.00	2.20	2.40	3.10	3.54	1.77	110
KFCAB21B30L	N-Dual	12	±8	14.6	2.05	2.20	2.55	3.30	2.08	1.45	72
KFCAB21740L	N-Dual	12	±8	13.6	2.10	2.20	2.60	3.50	1.96	1.84	80
KFCAB21490L	N-Dual	12	±8	13.5	2.10	2.20	2.40	3.10	2.98	1.49	110
KFCAB21A50L	N-Dual	12	±8	13.5	2.10	2.20	2.40	3.10	2.98	1.49	110
KFCAB21350L	N-Dual	12	±8	12.0	2.10	2.20	2.40	3.10	3.05	1.77	110
KFCAB21830L	N-Dual	12	±8	12.4	2.20	2.50	3.10	4.30	1.84	1.96	80
KFCAB12004NL	N-Dual	12	±8	10.3	2.90	3.15	3.40	3.50	1.79	1.47	72
KFC6B21150L	N-Dual	12	±10.5	8.0	4.00	4.30	4.80	5.90	2.14	1.67	110
KFC6B21B70L	N-Dual	12	±8	9.0	4.20	4.60	5.40	7.40	1.89	1.24	80
FC6B21100L	N-Dual	12	±8	8.0	4.50	4.90	5.50	6.50	2.67	1.67	100
KFC4B21A30L	N-Dual	12	±8	4.6	11.5	13.0	15.0	19.5	1.11	1.11	110
KFC4B21210L	N-Dual	12	±8	4.7	12.0	13.0	14.0	17.0	1.29	1.29	100
KFC4B21280L	N-Dual	12	±8	4.0	16.0	17.0	19.0	23.0	1.11	1.11	100
KFC4B21220L	N-Dual	12	±8	3.0	21.0	23.0	26.0	33.0	0.97	0.97	100
KFC4B21080L	N-Dual	12	±12	2.9	27.0	30.0	39.0	60.0	1.11	1.11	100
KFC4B21320L	N-Dual	12	±8	2.5	36.0	39.0	45.0	58.0	0.80	0.80	100
KFC4A21300L	N-Dual	12	±8	1.5	70.0	80.0	90.0	115	0.60	0.60	200
KFC4B21300L	N-Dual	12	±8	1.5	70.0	80.0	90.0	115	0.60	0.60	100
KFC4B21330L	N-Dual	12	±8	1.5	95.0	100	115	145	0.80	0.80	100

*1: FR4 board (25.4mm x 25.4mm x t1.0mm), Min Cu

• VSS=20V-24V

Part No.	Type	VSS [V]	VGS [V]	IS*1 [A]	Rss(on)Typ.[mΩ]				Package Size		
					VGS 4.5V	VGS 3.8V	VGS 3.1V	VGS 2.5V	x[mm]	y[mm]	t[μm]
KFCAB22370L	N-Dual	20	±12	10.0	3.10	3.30	3.80	4.60	3.05	1.77	110
KFC6B22160L	N-Dual	20	±8	8.0	4.70	4.90	5.20	6.00	2.65	1.67	110
KFCAB22510L	N-Dual	20	±12	8.5	5.00	5.30	5.90	7.10	2.34	1.56	110
KFC6B22500L	N-Dual	20	±12	6.2	7.90	8.30	9.20	11.1	2.02	1.33	110
KFC4B22180L	N-Dual	20	±8	5.0	9.40	10.0	11.1	13.4	1.74	1.74	110
KFC4B22270L	N-Dual	20	±12	4.0	17.0	18.0	19.0	22.0	1.29	1.29	100
KFC4B22690L	N-Dual	20	±12	3.4	28.0	30.5	33.0	36.0	1.10	1.10	100
KFC4B22670L	N-Dual	20	±12	2.9	35.0	37.5	42.0	64.0	1.10	1.10	100
KFC4B22830L	N-Dual	20	±12	2.3	51.5	55.5	61.5	-	0.80	0.80	100
KFCAB22014NL	N-Dual	22	±12	16.7	1.50	1.60	1.75	2.15	3.20	2.10	106
KFCAB22020NL	N-Dual	22	±12	15.3	1.80	1.90	2.05	2.40	3.20	2.10	95
KFCAB22630L	N-Dual	23	±12	13.8	2.20	2.40	2.80	5.00	3.40	1.96	95
KFCAB22620L	N-Dual	23	±12	13.8	2.20	2.40	2.80	5.00	3.40	1.96	95
KFCAB22680L	N-Dual	23	±12	13.0	2.45	2.65	3.00	3.85	3.20	2.10	95
KFC6B22100L	N-Dual	24	±12	6.0	8.20	8.70	9.70	12.5	2.56	1.67	100
KFC6B22220L	N-Dual	24	±12	13.0 *2	8.20	8.70	9.70	12.5	2.56	1.67	100
KFC4B22070L	N-Dual	24	±12	3.5 *2	17.5	-	20.0	23.0	1.67	1.67	100

∗1: FR4 board (25.4mm x 25.4mm x t1.0mm), Min Cu
∗2: Mounted on Ceramic substrate (70mm x 70mm x t1.0mm)

•VSS=24V-30V

Part No.	Type	VSS [V]	VGS [V]	IS*1 [A]	Rss(on)Typ.[mΩ]				Package Size		
					VGS 10V	VGS 8.0V	VGS 4.5V	VGS 3.8V	x[mm]	y[mm]	t[μm]
KFCAB22900L	N-Dual	24	+16/-14	17.5	1.40	1.55	2.30	-	3.00	3.00	95
KFC7P23440L	N-Dual	30	±20	19.0	2.00	2.20	3.40	-	6.00	3.00	345
KFCAB30029NL	N-Dual	30	+20/-16	11.8	3.80	4.10	7.80	-	3.50	1.90	95

∗1: FR4 board (25.4mm x 25.4mm x t1.0mm), Min Cu

MOSFET for Li-ion Battery Charging Control

• 12V-20V Nch Dual MOSFET

1.Reduce battery charging time
2.Highly efficient charging and discharging
3.Miniaturization

- Low on-resistance; 3.2mΩ
- Low on-resistance; 3.2mΩ
- Small size; 2.58 x 1.29mm

• VSS=12V-20V

Part No.	Type	VSS [V]	VGS [V]	IS*1 [A]	Rss(on)Typ.[mΩ]				Package Size		
					VGS 4.5V	VGS 3.8V	VGS 3.1V	VGS 2.5V	x[mm]	y[mm]	t[μm]
KFCAB21C30L	N-Dual	12	±12	9.8	2.65	3.20	-	-	2.58	1.29	80
FCAB21A60L	N-Dual	12	±8	8.5	3.50	4.40	-	-	2.58	1.29	80
FCAB21910L	N-Dual	12	±8	8.5	3.50	4.40	-	-	2.58	1.29	80
KFCAB22860L	N-Dual	20	±12	6.7	5.00	7.00	-	-	2.58	1.29	80
FCAB22710L	N-Dual	20	±12	6.1	5.50	7.50	16.5	-	2.58	1.29	80

∗1: FR4 board (25.4mm x 25.4mm x t1.0mm), Min Cu

MOSFET for General Switching

• 12V-25V Nch/Pch Single MOSFET

1. Small package size
2. Low power consumption
3. Low failure rate

- Small size; 0.6 x 0.6mm
- Low on-resistance; 9.5mΩ
- Failure rate; Failure rate; 1/30 of mold resin package *Based NTCJ record

• VDS=12V-25V

Part No.	Type	VSS [V]	VGS [V]	ID*1 [A]	Rds(on)Typ. [mΩ]				Package Size		
					VGS 4.5V	VGS 2.5V	VGS 1.8V	VGS 1.5V	x[mm]	y[mm]	t[µm]
FK4B01110L	N-Single	12	±8	3.4	47.0	57.0	70.0	91.0	0.60	0.60	100
KFK4B12034NL	N-Single	12	+8/-4	4.3	39.0	50.0	66.0	82.0	0.60	0.60	110
KFK4A12035NL	N-Single	12	+8/-4	5.3	28.0	35.0	44.0	53.0	0.78	0.78	370
FK4B01100L	N-Single	12	±8	5.2	22.0	27.0	33.0	43.0	0.80	0.80	100
FK4B01120L	N-Single	12	±8	6.5	14.0	17.0	21.0	27.0	1.00	1.00	100
KFK4B02910L	N-Single	22	±12	5.8	21.0	31.0	-	-	0.80	0.80	110
KFK4A25019NL	N-Single	25	±12	4.2	43.0	53.0	-	-	0.78	0.78	330
KFJ4B01110L	P-Single	-12	±8	-2.2	118	141	169	199	0.60	0.60	100
KFJ4B01100L	P-Single	-12	±8	-3.3	57.0	68.0	82.0	97.0	0.80	0.80	100
KFJ4B01120L	P-Single	-12	±8	-4.2	34.0	40.0	48.0	57.0	1.00	1.00	100

＊1 FR4 board (25.4m x 25.4mm x t1.0mm), Full Cu

MOSFET for Automotive Switching Circuit

• 40V-60V Nch/Pch Single MOSFET

1. Low failure rate
2. Small package size
3. Prevent malfunction caused by noise

- Failure rate; 1/30 of mold resin package *Based NTCJ record
- Small size; 1.2 x 1.2mm
- Low inductance; L=0.01nH

• VDS=40V-60V

Part No.	Type	VSS [V]	VGS [V]	ID*1 [A]	Rds(on)Typ. [mΩ]		Package Size		
					VGS 10V	VGS 4.5V	x[mm]	y[mm]	t[µm]
FK9B0439ZL	N-Single	40	+20/-10	11.0	9.50	11.0	1.94	1.94	100
KFK9B0463ZL	N-Single	40	+20/-10	10.8	11.0	16.0	3.05	3.05	500
KFK4B40028NU	N-Single	40	+20/-10	5.5	25.0	31.0	1.20	1.20	100
KFK9B0652ZL	N-Single	60	+20/-10	8.3	18.0	20.0	1.94	1.94	100
KFK4B0613ZL	N-Single	60	+20/-10	3.5	57.0	63.0	1.20	1.20	100
KFJ9B0458ZL	P-Single	-40	-20/+10	-11.6	10.0	12.0	3.05	3.05	100
KFJ9B0438ZL	P-Single	-40	-20/+10	-7.8	20.0	23.0	2.14	2.14	100
KFJ9B0466ZL	P-Single	-40	-20/+10	-7.0	27.0	30.0	3.05	3.05	500
KFJ4B0421ZL	P-Single	-40	-20/+10	-3.2	74.0	83.0	1.20	1.20	100
KFJ9B0639ZL	P-Single	-60	-20/+10	-7.5	24.0	26.0	3.05	3.05	100
KFJ4B0622ZL	P-Single	-60	-20/+10	-3.8	56.0	60.0	2.00	2.00	100

＊1 FR4 board (25.4m x 25.4mm x t1.0mm), Full Cu

Laser Diodes

VIolet/Ultra-Violet

Blue-Violet

Laser Diodes

Violet/Ultra-Violet

Nuvoton Technology Corporation Japan (NTCJ)'s blue-violet laser diode has realized a high-power, high-reliability laser suitable for industrial applications by using its unique compound semiconductor process technology and low light loss structure.

• KLC4 Series

The KLC4 series is available in a TO-CAN package with a peak wavelength of 402 nm.
Wide operating temperature range, suitable for industrial applications.

Part No.	Wavelength [Typ] (nm)	Rated Operating Power(mW)	Operating Case Temperature(°C)	Package
KLC431FS01WW	402	800(CW)	0 ~ 50	Φ5.6CAN
KLC433FS01WW	402	1200(CW)	0 ~ 50	Φ5.6CAN
KLC432FL01WW	402	3000(CW)	0 ~ 50	Φ9CAN

• KLC3 Series(Ultra-Violet)

The KLC3 series is available in a TO-CAN package with a peak wavelength of 375 nm. Wide operating temperature range, suitable for industrial applications.

Part No.	Wavelength [Typ] (nm)	Rated Operating Power(mW)	Operating Case Temperature(°C)	Package
KLC310FL01WW	375	500(CW)	20~ 30	Φ9CAN

Visual Sensing

Image Sensors

3D TOF Sensors

DSP / ISPs

Human Machine Interface Display LSIs

Audio Integrated LSIs

Image Sensors

3D TOF Sensors

• Shipped to automotive market and industrial market
• A wide range of spatial sensing by sensor with high spatial resolution
• Sensors can be used for indoors and outdoors

• KM349 Series

• TOF (Time-of-Flight) Sensors of “Pulse-TOF System”, which contribute to mitigate motion blurs.
• High robustness under sunlight /high temperature allows applications as recognition, detection, etc. both in the indoor & outdoor use cases.
• Small profile & footprints of “1/4 & “1/8 size sensor at high spatial resolutions.

• KM34906BRA

KM34906BRA is a type -1/4”
VGA supports
In-Direct TOF (Time of Flight) operation
Bare Die type

• KM34906B1S

KM34906B1S is a type -1/4”
VGA supports
In-Direct TOF (Time of Flight) operation for Automotive
Package type

• KW330 Series

• TOF (Time-of-Flight) Sensors of “Pulse-TOF System”, which contribute to mitigate motion blurs.
• High robustness under sunlight /high temperature allows applications as recognition, detection, etc. both in the indoor & outdoor use cases.
• Small profile & footprints of “1/4 size sensor at high spatial resolutions.
• Built-in depth processing circuits help to release CPU resources from the backend processor.

• KW33000ARA

KW33000ARA is a type -1/4”
VGA supports
In-Direct TOF (Time of Flight) operation
Bare Die type

• KW33000A1T

KW33000A1T is a type -1/4”
VGA supports
In-Direct TOF (Time of Flight) operation for Automotive
Package type

• KW33000A1K

KW33000A1K is a type -1/4”
VGA supports
In-Direct TOF (Time of Flight) operation
Package type

PartNo	Number of pixels	Output depth frame rate	Pixel size	Power supply voltage	Register I/F	Output I/F	Package	Automotive quality	Remarks
KM34906BRA	640x480	30fps	5.6µm x 5.6µm	3.3V/9V/1.8V/-5.7V	Dedicated I/F (*1)	Analog I/F (*1)	CHIP/WAFER	N/A	*1 Please refer to the specifications of external ISP(ADDI9036).
KM34906B1S	640x480	30fps	5.6µm x 5.6µm	3.3V/9V/1.8V/-5.7V	Dedicated I/F (*1)	Analog I/F (*1)	FBGA057-P-0808	AEC-Q100 Grade2	*1 Please refer to the specifications of external ISP(ADDI9036).
KW33000ARA	640x480	60fps (ROI(*2) mode 120 fps)	5.6µm x 5.6µm	2.8V/1.8V/1.1V	(1) I²C (2)SPI	MIPI(CSI2)	CHIP/WAFER	N/A	*2 Region of interest
KW33000A1T	640x480	60fps (ROI(*2) mode 120 fps)	5.6µm x 5.6µm	2.8V/1.8V/1.1V	(1) I²C (2)SPI	MIPI(CSI2)	iBGA, 9.5mm x 10mm, 97pins	AEC-Q100 Grade2	*2 Region of interest
KW33000A1K	640x480	60fps (ROI(*2) mode 120 fps)	5.6µm x 5.6µm	2.8V/1.8V/1.1V	(1) I²C (2)SPI	MIPI(CSI2)	iBGA, 9.5mm x 10mm, 97pins	N/A	*2 Region of interest

DSP / ISPs

Human Machine Interface Display LSIs

- Over 10 years of mass production achieved and cumulative shipment exceeding 73 million units
- An in-vehicle information display having high-class sense harmonized with the interior and functional extensibility can be achieved by various graphic functions and video input interface
- Gerda® is our trademark

Features

- The high-quality high-qualirt 2.5D graphics
 graphics can be displayed on information devices
- Achieve comfortable display with quick boot up and high resolution
 (worth the level of high-end display performance)
- Supporting composite analog input and the latest digital video input can expand the system and product lineup
- The embedded CPU can execute the HMI scenario and extend applications(e.g. for connected car)

• Gerda™-EINS Series

- High resolution system (recommendation: 1920x480)
- Enhanced 2.5D graphics
- Camera I/F: Analog, Digital & MIPI
- Display output after image processing
- Image quality processing engine
 High visibility under foggy, dark or dirty lens condition
- Warping Engine
- Embedded frame buffer memory

• Gerda™-4L Series

- High resolution system (recommendation: 1280x800)
- Enhanced 2.5D graphics
- Camera I/F: Analog, Digital & MIPI
- Display output after image processing
- Image quality processing engine
- Warping Engine
- Embedded frame buffer memory with compression engine

• Gerda™-ZWEI Series

- Basic resolution system (recommendation: 800x480)
- Enhanced 2.5D graphics
- Camera I/F: Analog, Digital
- Display output after image processing
- Image quality processing engine
- Software Warping
- Embedded frame buffer memory

Part No.	Series Name	CPU	Graphics	Display size	Video input	Mipi-Rx	Video output channel	LVDS-Tx	External Memory IF	Boot Memory	Embedded Memory			CAN-FD	Security	Package
KM2KSZ120UA	Gerda™-EINS	ARM Cortex®-M7 Single	2.5D	1920 x 480 (recommended)	Analog, Digital	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	8MB	-	-	-	-	QFP 24mm 216pins
KM2KSZ180UA	Gerda™-EINS	ARM Cortex®-M7 Single	2.5D	1920 x 480 (recommended)	Analog, Digita	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	10MB	-	-	-	-	QFP 24mm 216pins
KM2KSZ1206UA	Gerda™-EINS	ARM Cortex®-M7 Single	2.5D	1920 x 480 (recommended)	Analog, Digita	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	8MB	Yes	Yes	Yes	-	QFP 24mm 216pins
KM2KSZ1806UA	Gerda™-EINS	ARM Cortex®-M7 Single	2.5D	1920 x 480 (recommended)	Analog, Digita	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	10MB	Yes	Yes	Yes	-	QFP 24mm 216pins
KM2KSZ12Z6UA	Gerda™-EINS	ARM Cortex®-M7 Single	2.5D	1920 x 480 (recommended)	Analog, Digita	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	8MB	Yes	Yes	Yes	Yes	QFP 24mm 216pins
KM2KSZ18Z6UA	Gerda™-EINS	ARM Cortex®-M7 Single	2.5D	1920 x 480 (recommended)	Analog, Digita	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	10MB	Yes	Yes	Yes	Yes	QFP 24mm 216pins
KM2KSD4302UA	Gerda™-4L	ARM Cortex®-M7 Single	2.5D	1280x800 (recommended)	Analog, Digital	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	5MB	Yes	-	Yes	(Optional)	QFP 24mm 216pins
KM2KSD400ZUA	Gerda™-4L	ARM Cortex®-M7 Single	2.5D	1280x800 (recommended)	Analog, Digital	Mipi-CSI2	1ch	Single	S-Flash	S-Flash	6MB	Yes	Yes	Yes	(Optional)	QFP 24mm 216pins
KM2KSD4D02UA	Gerda™-4L	ARM Cortex®-M7 Single	2.5D	1280x800 (recommended)	Analog, Digital	Mipi-CSI2	1ch	Single	S-Flash SDRAM	S-Flash	5MB	Yes	-	Yes	(Optional)	QFP 28mm 256pins
KM2KSD4A0ZUA	Gerda™-4L	ARM Cortex®-M7 Single	2.5D	1280x800 (recommended)	Analog, Digital	Mipi-CSI2	1ch	Single	S-Flash SDRAM	S-Flash	6MB	Yes	Yes	Yes	(Optional)	QFP 28mm 256pins
KM2KSZ200UA	Gerda™-ZWEI	ARM Cortex®-M33 Single	2.5D	800x480 (recommended)	Analog, Digital	-	1ch	Single	S-Flash	S-Flash	3.5MB	-	-	(Optional)	(Optional)	QFP 12mm 100pins
KM2KSZ210UA	Gerda™-ZWEI	ARM Cortex®-M33 Single	2.5D	800x480 (recommended)	Analog, Digital	-	1ch	Single	S-Flash	S-Flash	3.5MB	-	-	(Optional)	(Optional)	QFP 14mm 128pins
KM2KSZ250UA	Gerda™-ZWEI	ARM Cortex®-M33 Single	2.5D	800x480 (recommended)	Analog, Digital	-	1ch	- (Digital output)	S-Flash	S-Flash	3.5MB	-	Yes	(Optional)	(Optional)	QFP 20mm 144pins

Audio Integrated LSIs

Audio integrated LSI supports variety of audio interfaces, multiple DSP cores, and 32-bit CPU.
It perform principal audio processing in various applications with a single chip.

Application

- In-vehicle audio system
- Multi channel audio application
  (Mixer, Amplifier, Speaker, Conference system,Karaoke)

• KM103S Audio Series

KM103S Audio Series is an Audio integrated LSI that supports multi-channel audio signal processing.

Feature

- Supports multi-channel audio with analog / digital interfaces and sampling rate converters.
- Multi-DSP enables various sound enhanced processing and original algorithms.
- The embedded CPU can be used as a peripheral system controller or coprocessor

• KM103S0G0QAA

- Audio DSP Dual
- Cadence® Tensilica® HiFi EP Single
- TDM, I2S, PCM, SPDIF
- Audio ADC/DAC
- Sampling Rate Converter
- 32bit CPU Single
- GPIO, SPI, UART, I2C
- HQFP216 24mmx24mm

• KM103S0H0QAA / KMZS0H0QAAUB

- Audio DSP Dual
- Cadence® Tensilica® HiFi EP Single
- TDM, I2S, PCM, SPDIF
- Audio ADC/DAC
- Sampling Rate Converter
- AM32 (32bit CPU) Single
- GPIO, SPI, UART, I2C
- AEC-Q100 support (KMZS0H0QAAUB only)
- LQFP128 18mmx18mm

Part No.	CPU	DSP	Digital input	Analog input	Digital output	Analog output	Sampling Rate Converter	Peripherals	Operation Temperature (°C)	Package
KM103S0G0QAA	AM32 (original CPU) Single	ACORE (original DSP) Dual Tensilica® HiFi EP Single	TDM, I2S, PCM, SPDIF	ADC 6ch	TDM, I2S, PCM, SPDIF	DAC 6ch	2ch x 9	GPIO, SPI, UART, I2C	0 ~ 70	HQFP216 24x24
KM103S0H0QAA	AM32 (original CPU) Single	ACORE (original DSP) Dual Tensilica® HiFi EP Single	TDM, I2S, PCM, SPDIF	ADC 6ch	TDM, I2S, PCM, SPDIF	DAC 6ch	2ch x 9	GPIO, SPI, UART, I2C	0 ~ 70	LQFP128 18x18
KMZS0H0QAAUB	AM32 (original CPU) Single	ACORE (original DSP) Dual Tensilica® HiFi EP Single	TDM, I2S, PCM, SPDIF	ADC 6ch	TDM, I2S, PCM, SPDIF	DAC 6ch	2ch x 9	GPIO, SPI, UART, I2C	-40 ~ 85	LQFP128 18x18

Battery and Analog Solutions

Analog ICs

- Battery Monitoring ICs NEW
- Motor Driver ICs NEW
- LED Drivers
- Operational Amplifiers
- Analog-to-Digital Converters (ADC)

Analog ICs

Battery Monitoring ICs

Wide range of battery cell abnormalities and BMS failures can be detect by Nuvoton BM-ICs that include diagnosis and safety functions. High precision voltage measurement error help to extend the battery duration. Measuring up to 25 connected battery cells in series and BMS can be configured with smaller number of components for a high-voltage battery system with many battery cells connected in series, contributing to the miniaturization of the battery module.
Automotive qualified BM-ICs include redundant measurement system consisting duplicates of the battery cell input terminal, multiplexer, and AD converter in a single IC. It is equipped with more robust daisy communication function. This will enable automakers and battery module manufacturers to easily develop and design battery systems that comply with ISO26262 ASIL-D requirements.

Nuvoton offers a lineup of high performance battery monitoring ICs including automotive qualified, stackable, and built-in current sensor. Applications include electric and hybrid electric vehicles, energy storage systems and e-bikes.

• Automotive qualified

For Lithium-ion batteries in an electric vehicle, ensuring high safety against dangerous events such as smoke and fire are required. Nuvoton automotive qualified battery monitoring ICs include a redundant measurement system in which the elements and functional blocks are electrically separated by utilizing the characteristics of in-house development SOI process and achieve high security and reliability with a highly redundant communication topology. This makes it easier for customers to design and develop an automotive battery system compliant with ISO26262 ASIL-D. High precision voltage measurement help to extend the cruising range of BEVs and the guaranteed voltage measurement error in wide input voltage ranges and wide temperatures enable to provide a common platform for various vehicle models and applications.

Part No.	Description	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Operating Temperature [Min] (°C)	Operating Temperature [Max] (°C)	Max Series Cells	Cell Voltage Measurement Accuracy (mV)	Monitoring Function	Daisy Chain Connection	High-Side FET Control	Package
KA84923UA	Stackable	10	100	-40	125	20	±1.5	Voltage/ Temperature	Available	N/A	HQFP080-P-1414
KA84933UA	Stackable	10	100	-40	125	20	±1.5	Voltage/ Temperature	Available	N/A	HQFP080-P-1414
KA84939UA	Stackable	10	100	-40	125	20	±1.5	Voltage/ Temperature	Available	N/A	HQFP080-P-1414
KA84921UA	Stackable	4.5	5.5	-40	125	N/A	N/A	N/A	Available	N/A	SSOP024-P-0300
KA84917UA	Stackable	4.5	5.5	-40	125	N/A	±0.3 %	Voltage/ Current/ Temperature	Available	N/A	TQFP048-P-0707
KA84922UA	Stackable	4.5	5.5	-40	125	N/A	N/A	N/A	Available	N/A	SSOP024-P-0225
KA84930UA	Stackable	11	100	-40	125	20	±1.5 mV	Voltage/ Temperature	Available	N/A	LQFP100-P-1414
KA84950UA	Stackable	11	125	-40	125	25	±1.5 mV	Voltage/ Temperature	Available	N/A	LQFP100-P-1414

• Stackable

A large number of batteries are stacked in series for high voltage energy storage system or electric vehicles. Nuvoton stackable battery monitoring ICs can be connected in series with one host processor connection for all devices.

Part No.	Description	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Operating Temperature [Min] (°C)	Operating Temperature [Max] (°C)	Max Series Cells	Cell Voltage Measurement Accuracy (mV)	Monitoring Function	Daisy Chain Connection	High-Side FET Control	Package
KA84923UA	Stackable	10	100	-40	125	20	±1.5	Voltage/ Temperature	Available	N/A	HQFP080-P-1414
KA84933UA	Stackable	10	100	-40	125	20	±1.5	Voltage/ Temperature	Available	N/A	HQFP080-P-1414
KA84939UA	Stackable	10	100	-40	125	20	±1.5	Voltage/ Temperature	Available	N/A	HQFP080-P-1414
KA84921UA	Stackable	4.5	5.5	-40	125	N/A	N/A	N/A	Available	N/A	SSOP024-P-0300
KA84917UA	Stackable	4.5	5.5	-40	125	N/A	±0.3 %	Voltage/ Current/ Temperature	Available	N/A	TQFP048-P-0707
KA84922UA	Stackable	4.5	5.5	-40	125	N/A	N/A	N/A	Available	N/A	SSOP024-P-0225
KA84930UA	Stackable	11	100	-40	125	20	±1.5 mV	Voltage/ Temperature	Available	N/A	LQFP100-P-1414
KA84950UA	Stackable	11	125	-40	125	25	±1.5 mV	Voltage/ Temperature	Available	N/A	LQFP100-P-1414

•Non-Stackable

Nuvoton non-stackable battery monitoring ICs include high resolution ADC and correctly measure battery cell voltage and current. Our non-stackable battery monitoring ICs include built-in regulator necessary for the peripheral circuits and makes it easier for customers to build the control of cell balancing switch and charge and discharge. Our one chip battery monitoring ICs with the functions required for battery system enable customers to achieve simple battery system without switching devices and level shifter circuits.

Part No.	Description	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Operating Temperature [Min] (°C)	Operating Temperature [Max] (°C)	Max Series Cells	Cell Voltage Measurement Accuracy (mV)	Monitoring Function	Daisy Chain Connection	High-Side FET Control	Package
KA49503A	Non stackable	12.5	85	-40	105	16	±10	Voltage/ Current/ Temperature	N/A	Available	LQFP080-P-1414
KA49511A	Non stackable	12.5	45	-40	105	10	±10	Voltage	N/A	Available	TQFP056-P-1010
KA49517A	Non stackable	12.5	85	-40	105	17	±5	Voltage/ Current/ Temperature	N/A	Available	HQFP064-P-1010
KA49522A	Non stackable	12.5	110	-40	85	22	±5	Voltage/ Current/ Temperature	N/A	Available	HQFP064-P-1010
KA49701A	Non stackable	12.5	85	-40	105	17	±2.9	Voltage/ Current/ Temperature	N/A	N/A	HQFP048
KA49702A	Non stackable	12.5	85	-40	105	17	±2.9	Voltage/ Current/ Temperature	N/A	Available	HQFP048

Motor Driver ICs

Over current caused by motor heat generation leads to motor failure and shorter motor life. Our technology for creating optimum current phase and waveform can efficiently operate the motor and reduce heat generation. Nuvoton motor driver IC series uses unique current control technology to optimize current to realize safer motor with longer life.

Nuvoton motor driver IC line up consists of brushless DC motor drivers, stepper motor drivers and lens motor drivers. Our products can be used in a wide range of applications such as Enable to use wide range of applications, data servers, base stations, office automation equipment and cameras.

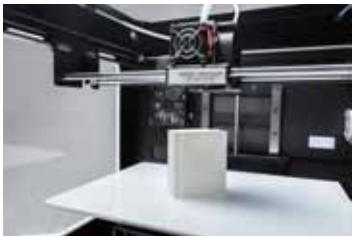
•Brushless DC Motor Drivers

Brushless DC motors are highly efficient and are advantageous for energy saving. In addition, due to its high design flexibility, it is used in various applications with diversified voltage, rotation speed and load requirement. Nuvoton brushless DC motor drivers maximize the motor characteristics performance with our original Auto Phase Control (APC) technology for motor current phase that previously required adjustment.

This will help to achieve high efficiency with any motor during motor platform design.

Part No.	Sub-Family Description	Control Method	Sensor	Control Interface	Ron(Ω)	Operating Voltage(V)	Output Voltage [max](V)	Output Current [max](A)	Operating ambient temperature [min](°C)	Operating ambient temperature [max](°C)	Package
KA44143A	Three-phase BLDC motor driver	APC, PWM sinusoidal control	1	PWM/DC	1	12V/24V	28	2.2	-40	105	HQFN024-A-0404
KA44168A	Single-phase BLDC motor driver	APC, PWM softswitching	1	-	1.6	12V/24V	35	1	-40	105	MSOP008-P-0150
KA44169A	Single-phase BLDC motor driver	APC, PWM softswitching	1	PWM	1.6	12V/24V	36	1.4	-40	105	MSOP014-P-0225
KA44169AB	Single-phase BLDC motor driver	APC, PWM softswitching	1	DC	1.6	12V/24V	36	1.4	-40	105	MSOP014-P-0225
KA44170A	Single-phase BLDC motor driver	APC, PWM softswitching	1	PWM	1.25	12V/24V	36	1.6	-40	105	MSOP014-P-0225
KA44171A	Single-phase BLDC motor driver	APRaS, PWM softswitching	1	PWM/DC	Pre-Driver	12V/24V/48V	39	0.03	-40	105	HQFN020-A-0303
KA44370A	Single-phase BLDC motor driver	A2PRaS, PWM Sinusoidal control	1	PWM/DC	Pre-Driver	12V/24V/48V	100	0.1	-40	105	HQFN032-A-0404

• Stepper Motor Drivers



Stepper motors are used in office automation, industrial equipment, and required to have low heat generation, low vibration, and low EMI. Nuvoton stepper motor drivers can control bipolar two phase stepper motors with a single chip. Mixed-decay automatic control which is one of our strengths in current control technology, helps to constantly detects and attenuates excessive current that does not contribute to torque., This function help to easily realize low heat generation and low vibration drive. In addition, the original power drive control suppresses noise, when a large output current is needed, contributing to low EMI of the motor.

Part No.	Sub-Family Description	Control Method	Sensor	Control interface	Ron(Ω)	Operating Voltage (V)	Output Voltage [max](V)	Output Current [max](A)	Operating ambient temperature [min] (°C)	Operating ambient temperature [max] (°C)	Package
KA44180A	Dual bipolar stepper motor driver	Full step to Quarter step, Mixed-Decay control	-	parallel	0.95	12V/24V	37	1.5	-20	85	HQFN036-A-0505

• Lens Motor Drivers

Lens motor are used for surveillance camera and web camera. The requirements for these applications are small size, low power consumption, and low acoustic noise. Nuvoton lens motor driver has the functions for hall-iris control and zoom/focus control in one package that allows the design of a circuit board for a smaller camera. In addition, the hall-iris position control operates with low power consumption and low acoustic noise by our unique digital circuit technology, compared with conventional configuration of discrete components. Easy settings through SPI communication contribute to your platform development of lens module.

Part No.	Sub-Family Description	Control Method	Sensor	Control interface	Ron(Ω)	Operating Voltage (V)	Output Voltage [max](V)	Output Current [max](A)	Operating ambient temperature [min] (°C)	Operating ambient temperature [max] (°C)	Package
KA41908B	Zoom, focus and iris control lens driver	CAP (Correction Amplitude & Phase) control, 256 microstep	1(Iris)	SPI	2.5 /5.0	3.3V/5V	4V/6V	0.25A/ 0.15A	-40	105	HQFN044-A-0606

LED Drivers

Nuvoton's LED Driver ICs prepare product lineup from RGB LED for consumer products to controllers for in-vehicle headlights with unique LED drive technology suitable for each application.
We can help your production of various LED lighting applications.

• RGB LED Drivers

Nuvoton's RGB LED driver ICs prepare product lineup from the string LED deriver to the matrix LED driver, and enable high-accuracy representation by adopting a current control of up to 256 steps and an original light control technology.
Our LED Driver ICs are used for various LED applications including mobile, wearable, AV equipment, home appliances and others, by additional music synchronization and persistence of vision (POV) functions.
You can choose an RGB LED driver that meets the needs of communications interface, power line wiring reduction, realize the LED lighting suitable for your equipment.

Features

- New LED driver circuits enable over 67 million RGB color
- Brightness is freely controlled by original lighting control method
- Reduce power line wiring or harnesses/connectors by built-in LDO

• KA32180A

KA32180A is a 16 Dots (4 x 4) Matrix LED Driver. It can drive up to 4 channels of RGB LEDs.

Features

- 4 x 4 LED Matrix Driver (Total LED that can be driven = 16)
- LED Selectable Maximum Current
- LED Music Synchronizing Function
- I^2C interface (Standard Mode, Fast Mode and Fast Mode Plus)
  (4 Slave address selectable)
- 16 pin Plastic Quad Flat Non-leaded Package (QFN Type)

• KA32182A

KA32182A is a 36 dots (6 x 6) Matrix LED driver. It can drive up to 12 RGB LEDs.

Features

- 6 x 6 LED Matrix Driver (Total LED that can be driven = 36)
- LED Selectable Maximum Current
- LED Music Synchronizing function
- I^2C interface (Standard Mode, Fast Mode and Fast Mode Plus) (4 Slave address selectable)
- 20 pin Plastic Quad Flat Non-leaded Package (QFN Type)

• KA32183A

KA32183A is a 81 Dots (9 x 9) Matrix LED Driver. It can drive up to 27 RGB LEDs.

Features

- 9 x 9 LED Matrix Driver (Total LED that can be driven = 81)
- LED Selectable Maximum Current
- LED Music Synchronizing Function
- I^2C interface (Standard Mode, Fast Mode and Fast Mode Plus) (4 Slave address selectable)
- 24 pin Shrink Small Outline Package (SSOP Type)

Part No.	Series	Matrix LEDs	number of channels	Number of PWM step	Number of Current step	constant current control	Host I/F	Operating Voltage [Min] (V)	Operating Voltage [Max] (V)	Package
KA32180A	LED Matrix Driver	4 x 4	-	256	16	-	I2C	3.1	5.5	HQFN016-A-0304
KA32182A	LED Matrix Driver	6 x 6	-	256	16	-	I2C	3.1	5.5	HQFN020-A-0304
KA32183A	LED Matrix Driver	9 x 9	-	256	16	-	I2C	3.1	5.5	SSOP024-P-0225

Operational Amplifiers

An operational amplifier, commonly abbreviated as an op amp, stands as a highly versatile and widely used electronic component within analog electronic circuits, serving functions such as amplification, summing, integration, differentiation, buffering, filtering, etc. Nuvoton provides precision op amp products suited for a broad range of applications.

• NOP912/NOP914

The NOP912/NOP914 series is a family of single supply precision operational amplifiers (op amps) with operating voltage from 2.7 V to 5.5 V and operating temperature from -40 °C to 105 °C. In this product series, the NOP912 consists of 2 amplifiers, and the NOP914 comprises 4 amplifiers inside. Based on the chopper-stabilized amplifier design, the NOP912/NOP914 series boasts outstanding features including low offset voltage of 50 μV, low temperature drift of 0.05 μV/°C, wide gain bandwidth of 8 MHz, high slew rate of 6V/μs and rail-to-rail input and output voltage ranges. These advantages make the NOP912/NOP914 series suited for signal conditioning in a diverse array of applications. The NOP912 is available in the SOIC-8 package, while the NOP914 is available in the TSSOP-14 package.

Key Features: Low offset voltage: 50 μV, Low temperature drift: 0.05 μV/°C , Wide GBW: 8 MHz, Slew rate: 6V/μs, Rail-to-rail input and output voltage range.
Target Applications: Photoelectric sensors, Smoke detectors, PIR detectors, Force sensor, Pulse oximeter, Blood pressure sensor, Glucose meter, Solar inverter, Motor controller

Part No.	Number of Amps	Operating Voltage (min)	Operating Voltage (max)	Operating Temperature (min)	Operating Temperature (max)	GBW (MHz)	V_{OFFSET}@ 25°C (μV)	Offset Drift (uV/°C)	Slew Rate (V/μS)	Rail-to-rail	I_{DD} (mA)	Package Type	Package Size
NOP912	2	2.7	5.5	-40	105	8	50	0.05	6	In,Out	2.5	SOIC8	3.91 x 4.9
NOP914	4	2.7	5.5	-40	105	8	50	0.05	6	In,Out	4	TSSOP14	4.4 x 5.0

Analog-to-Digital Converters (ADC)

The Analog-to-Digital Converter (ADC) stands as a key component in electronic designs, facilitating the transformation of analog signals into precise digital data. In addition to the SAR ADCs which are integrated within the NuMicro MCU, Nuvoton introduces NADC24, a series of 24-bit Delta-sigma ADC that delivers exceptional performance in terms of resolution, precision, speed, and more.

• NADC24 Series ADC

The NADC24 series is a family of high-precision, 24-bit delta-sigma (ΔΣ) analog-to-digital converters (ADCs). These ADCs are excellent at measuring small signals with high preceision and speed. To achive a high level of integration, NADC24 incorporates a programmable gain amplifier (PGA) with configurable gain from 1 to 128, an internal refernce voltage generator (1.2 V or 2.4 V), an internal 49.152MHz oscillator, a temperature sensor, a 12-bit DAC for sensor driving, and SPI interface for ADC configuration.

Key Features: High precision: Up to 22-bit ENOB, High speed: up to 96Ksps output data rate, Integrated 12-bit DAC, Integrated temperature sensor, Internal V_{REF} of 1.2V/ 2.4V
Target Applications: Power meters, Power distribution unit (PDU), Electronic weighing scales, Pressure sensors, Gas sensors, Oximeters

Part No.	Vdd (V)	Operating Temperature (min)(°C)	Operating Temperature (max)(°C)	Architecture (Type)	Input Channels (Differential) (Ch)	Input Channels (Single-ended) (Ch)	Resolution (Bit)	Output data rate (SPS)	12-bit DAC (Set)	Internal VREF (V)	Temperature Sensor Accuracy (°C)	SPI (Set)	Package Type (Type)	Package size (mm x mm)
NADC24D003FA	2.7 ~ 3.6	-40	105	Delta-Sigma	3	6	24	1.25~96K	-	1.2 or 2.4	±2	1	TSSOP20	4.4 x 6.5
NADC24D004TA	2.7 ~ 3.6	-40	105	Delta-Sigma	4	8	24	1.25~96K	1	1.2 or 2.4	±2	1	QFN32	4 x 4

IoT with Security

Microcontrollers

32bit KM103 MCUs

Microcontrollers

32bit KM103 MCUs

The KM103 series is a 32-bit flash MCU with a built-in original 32-bit CPU "AM32R" that is ideal for inverter motor control and features both high processing power and low power consumption.
This MCU is equipped with high-function PWM circuit, high-speed A / D converter, and motor feedback control, enabling highly efficient and high-performance motor control.

• KM103H Inverter Control Series

KM103H Series MCU embedded 32-bit flash MCU with original 32-bit CPU, have high speed processing ability and low power consumption.
These MCUs are a high-performance PWM circuit that is ideal for inverter motor control, a high-speed A/D converter, an inverter/ converter dedicated arithmetic unit (3phase-2phase conversion, Trigonometric function, square root, n-order multiply–accumulate operation, flash dedicated cache) . This realizes highly efficient and high-performance motor control.

• KM103HFBx

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I/O	Timer (8-bit)	Timer (16-bit)	Motor PWM	Power control PWM	Connectivity				ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
										Clock synchronous	UART	SPI	I²C	Channel	Unit							
KM103HFB3G	80	132	16	16	25	12	5	1	3	2	2	1	1	8	2	6	2	4	2	v	v	TQFP48 (7x7)
KM103HFB4G	80	132	16	16	41	12	5	2	6	3	3	1	1	10	2	6	2	4	2	v	v	TQFP64 (10x10)
KM103HFB5K	80	264	20	32	54	12	6	2	6	4	4	1	1	16	3	6	2	4	2	v	v	TQFP80 (12x12) LQFP80 (14x14)

• KM103HFDx/C4

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I-RAM (KB)	I/O	Timer (8-bit)	Timer (16-bit)	Motor PWM	Connectivity				ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
										Clock synchronous	UART	SPI	I²C	Channel	Unit							
KM103HFC4K	120	264	12	32	16	44	12	6	2	3	3	1	1	12	3	6	2	4	-	v	v	TQFP64 (10x10)
KM103HFD5K	120	264	12	32	16	54	16	8	2	5	5	1	1	16	3	9	2	6	3	v	v	TQFP80 (12x12)
KM103HFD5M	120	408	20	64	20	54	16	8	2	5	5	1	1	16	3	9	2	6	3	v	v	TQFP80 (12x12)
KM103HFD6M	120	408	20	64	20	74	16	8	2	5	5	1	1	20	3	9	2	6	3	v	v	LQFP100 (14x14)
KM103HFD6N	120	512	32	64	32	74	16	8	2	5	5	1	1	20	3	9	2	6	3	v	v	LQFP100 (14x14)
KM103HFD7N	120	512	32	64	32	100	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP128 (18x18)
KM103HFD8N	120	512	32	64	32	112	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP144 (20x20)

• KM103HFGx

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I-RAM (KB)	I/O	Timer (8-bit)	Timer (16-bit)	Motor PWM	Connectivity				ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
										Clock synchronous	UART	SPI	I²C	Channel	Unit							
KM103HFG4K	120	264	12	32	16	44	12	6	2	3	3	1	1	12	3	6	2	4	2	v	v	TQFP64 (10x10)
KM103HFG4M	120	408	20	64	20	44	12	6	2	3	3	1	1	12	3	6	2	4	2	v	v	TQFP64 (10x10)
KM103HFG5K	120	264	12	32	16	54	16	8	2	5	5	1	1	16	3	9	2	6	3	v	v	TQFP80 (12x12)
KM103HFG5M	120	408	20	64	20	54	16	8	2	5	5	1	1	16	3	9	2	6	3	v	v	TQFP80 (12x12)
KM103HFG5N	120	512	32	64	32	54	16	8	2	5	5	1	1	16	3	9	2	6	3	v	v	TQFP80 (12x12)
KM103HFG6K	120	264	12	32	16	74	16	8	2	5	5	1	1	20	3	9	2	6	3	v	v	LQFP100 (14x14)
KM103HFG6M	120	408	20	64	20	74	16	8	2	5	5	1	1	20	3	9	2	6	3	v	v	LQFP100 (14x14)
KM103HFG6N	120	512	32	64	32	74	16	8	2	5	5	1	1	20	3	9	2	6	3	v	v	LQFP100 (14x14)
KM103HFG7K	120	264	12	32	16	100	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP128 (18x18)
KM103HFG7M	120	408	20	64	20	100	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP128 (18x18)
KM103HFG7N	120	512	32	64	32	100	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP128 (18x18)
KM103HFG8M	120	408	20	64	20	112	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP144 (20x20)
KM103HFG8N	120	512	32	64	32	112	20	10	3	7	7	1	1	28	3	9	2	6	3	v	v	LQFP144 (20x20)

• KM103HFKx

Part No.	Core speed (MHz)	Flash (KB)	SRAM (KB)	Data Flash	I-RAM (KB)	I/O	Timer (8-bit)	Timer (16-bit)	Motor PWM	Connectivity				ADC(12-bit)		DAC (8-bit)	DAC (10-bit)	Comparator	VGA	Flash/SRAM ECC	CRC	Package
										Clock synchronous	UART	SPI	I²C	Channel	Unit							
KM103HFK4Y	120	264	12	32	32	44	12	6	2	3	3	1	1	12	3	12	2	8	4	v	v	TQFP64 (10x10)
KM103HFK5Y	120	264	12	32	32	54	16	8	2	5	5	1	1	16	3	12	2	8	4	v	v	TQFP80 (12x12)
KM103HFK5N	120	512	32	64	32	54	16	8	2	5	5	1	1	16	3	12	2	8	4	v	v	TQFP80 (12x12)
KM103HFK6Y	120	264	12	32	32	74	16	8	2	5	5	1	1	20	3	12	2	8	4	v	v	LQFP100 (14x14)
KM103HFK6N	120	512	32	64	32	74	16	8	2	5	5	1	1	20	3	12	2	8	4	v	v	LQFP100 (14x14)
KM103HFK7N	120	512	32	64	32	100	20	10	3	7	7	1	1	28	3	12	2	8	4	v	v	LQFP128 (18x18)
KM103HFK8N	120	512	32	64	32	112	20	10	3	7	7	1	1	28	3	12	2	8	4	v	v	LQFP144 (20x20)

Communication & Interface LSIs

High Speed Interface LSIs

• KM864 Series

Product Overview

Nuvoton is a leading supplier of HDMI(High Definition Multimedia Interface)ICs used in various applications of AV receiver, sound bar, switcher, game, VR, signage and measuring equipment of HDMI.
KM86473D is a bridge IC that convert HDMI2.0 and Display Port to MIPI, used in head mount display of VR. KM864788 is a matrix switch IC that supports HDMI2.0 with 4 input and 2 output, used in AV receiver, sound bar, switcher etc. KM864807 is a matric switch IC that supports HDMI2.1 with 4 input and 2 output.

Features

- KM86473D: Selectable input of HDMI2.0 and Display Port 1.4. MIPI DSI 2.5Gbps x 16 lanes output. Support HDCP 1.4/2.3, Audio output of I2S/TDM/SPDIF, DSC encode, OSD, Up Scaler and I2C slave control.
- KM864788: 4 HDMI2.0 input and 2 HDMI2.0 output. Resolution of up to 4k/60Hz. Support HDCP1.4/2.3, Audio output of I2S/SPDIF, OSD, Up and Down scaler, ARC, and I2C slave control.
- 64807: 4 HDMI2.1 input and 2 HDMI2.1 output. Resolution of up to 8k/60Hz and 4k/120Hz.Support HDCP1.4/2.3, Audio output of I2S/TDM/SPDIF, OSD, Up and Down scaler, eARC input, and I2C slave control.

Parts	Input interface	Output interface	HDCP	Power supply	Power consumption	Package	Other functions
KM86473D	Selectable of HDMI2.0 and Display Port 1.4	MIPI DSI 2.5Gbps x 16 lanes	HDCP 1.4 and 2.3	I0.9V, 1.8V, 3.3V	0.9W	8x8mm BGA 160pin 0.5mm pitch	Audio output of I2S/TDM/SPDIF, DSC encode, OSD, UP scaler and I2C slave control.
KM864788	4 input of HDMI2.0	2 output of HDMI2.0	HDCP 1.4 and 2.3	1.1V, 3.3V	3.5W	20x20mm QFP 144pin 0.5mm pitch	Audio output of I2S/TDM/SPDIF, DSC encode, OSD, UP scaler and I2C slave control.
KM864807	4 input of HDMI2.1	2 output of HDMI2.1	HDCP 1.4 and 2.3	0.9V, 1.8V, 3.3V	3.8W	16x16mm BGA 378pin 0.65mm pitch	Audio output of I2S/SPDIF, OSD, UP and down scaler, eARC input, DSC pass through, Dynamic HDR, HDR,HDR10+, VRR, ALLM, and I2C slave control.

Foundry Service

Nuvoton Foundry Service

About us
Focus on Technology
Available Technologies
Applications
Service Values

Nuvoton Foundry Service

About us

Nuvoton Foundry Service (previous Winbond FAB2: 6 inch fab) has a capacity of 45,000 wafers per month. As a semiconductor manufacturing foundry, our mission is to deliver excellent foundry capabilities as a manufacturing partner to fabless semiconductor companies.

Nuvoton Foundry FAB offers a variety of technologies including Generic Logic, Mixed Signal (Mixed Mode), High Voltage, HVIC, Ultra High Voltage, Power Management, Mask ROM (Flat Cell), embedded Logic Non-Volatile Memory, Power GaN, and customized processes (e.g. MOSFET, TVS, Sensor, etc.) based on 0.35um to 1.0um technologies.

In addition to its mature, stable, and customized processes, Nuvoton also provides long-term stable production capacity, high quality, and accurate delivery schedules.

In addition, Nuvoton's foundry has a process development team with more than 20 years of experience in Devices, Integration, Modules, ESD, and SPICE Modeling to meet your customized process needs.

Nuvoton's foundry also has a product service team to provide customers with complete IDM class service. We have an internationally certified laboratory (with ESD, EMMI, OBIRCH, FIB, SEM, and TEM electrical / physical analysis equipment) to ensure product reliability and certification requirements.

Nuvoton has a wealth of resources and support services, and operates with a More-Than-Foundry thinking process. Nuvoton Foundry Service can meet market capacity demand and enable customers to achieve business goals. Nuvoton Foundry Service is your best foundry choice.

FAB
6 inch (class-1)

Capacity
45k pcs/M

Technology
1.0um to 0.35um

Specialty Process

Focus on Technology

Nuvoton Foundry's process technology currently offers 0.35um processes, including Integrated-circuit (logic, Mix-mode, Flat-cell ROM, eNVM, HVCMOS, BCD, Ultra-HV, Gate-driver HVIC), GaN on Si Power Device (Enhance-mode HEMT, Depletion-mode MIS-HEMT) , Sensor (Light, Thermal, Humidity, Gas, Pressure) more and more process and customized.

Specialty Process

CMOS IC
Power (HV/ BCD/ UHV/ HVIC), Logic/ eNVM, Mixed signal, Mask ROM/ Flat cell

Sensor
Thermal, Pressure, Light, Gas, Humidity

Discrete
TVS, MOSFET

GaN-on-Si Power
Enhance-mode HEMT, Depletion-mode MIS-HEMT

Available Technologies

Process	Technology	Process Feature
Power (HV/ BCD/ UHV/ HVIC)	0.35um	5/12~40V BCD G2 (NEW)
		5/12~40V BCD (with OTP)
		5/60~80V BCD
		5/16/60~120V BCD (Developing)
	0.5um	7/9/30/40/150~700V UHV G2 (NEW)
		5/20/120~600V HVIC G2 (NEW)
		5/7/9/25V HVCMOS
	0.6um	5/12/16/20V BCD
		5/25/40V BCD
		5/25/40/120/500V UHV
	0.8um	5/40V HVCMOS (N-sub)
	1.0um	5/40V HVCMOS (P-epi)
Logic / Mixed Mode	0.35um	1.5/3.3/5V Logic 3.3/5V Logic 5V Logic
	0.45um	3.3V Logic 5V Logic
	0.5um	1.5V Logic 3.3V Logic 5V Logic
Logic / Mixed Mode + eNVM	0.35um	3.3/5V Logic (YMC_eNVM)
Mask ROM / Flat Cell	0.32um	1.5/3.3/5V embedded 0.32 flat cell
	0.37um	5V embedded 0.37 flat cell

Contact us: Foundry@nuvoton.com

Applications

Nuvoton Foundry's process technologies are highly focused on High-Voltage, power management, LED Driver, and logic related fields. Current customers have successfully used our processes to create MCUs, Speech ICs, DC / DC converters, AC / DC SMPS, LDOs, USB Switches, Chargers, LCD drivers, Fan Drivers, Hall Sensors and LED B/L driver products in volumes exceeding several million wafers.

In addition to general IC processes, Nuvoton also provides customized process services to support HV MOSFETs, TVS, Light Sensor, Pressure Sensors, GaN HEMT etc. Applications include industrial control, high power conversion systems, mobile devices, sensors, system electrostatic protection, and more. Nuvoton also has a strong R&D team that can create a variety of customized processes for customer requirements.

- DC/DC Converter & Controller
- AC/DC SMPS (PFC and PWM)
- LDO, USB Switch
- LED Lighting, LED Display
- HVIC, MOSFET, SBD
- MCU, Speech
- Motor Driver, Fan Driver,
- Audio Amp, Sensor, TVS
- Car Charger
- Pressure sensor
- Thermal Sensor, Light sensor
- Gas sensor, Humidity Sensor

Service Values

In production services, we provide stable production capacity, best quality and accurate delivery. We have complete hardware and software equipment and technical service resources, and obtained a number of international certification files. With the thinking of More-Than-Foundry, we provide excellent foundry services to meet your needs in the market. Nuvoton technology foundry is determined to become the best partner for customers.

Multi-Layer Mask (MLM)

Multi-Layer Mask (MLM) services are available for engineering lots on all processes. The MLM service configures images with multiple design layers using similar mask specifications on a single reticle. This service not only saves development cost, but provides tape-out flexibility allowing customers to tape-out products at any time without being dependent on pre-set prototyping schedules.

Customized Technology and Excellent Cycle Time

Nuvoton's modular platform provides customers customized processes and quick Cycle Time for fast prototyping to help customers' Time to Market in a fast changing world

Best R&D team
TD, ESD, Model, PDK

Strong technical support team
CE, PIE, Product

Professional analysis machine
TLP, EMMI, OBRICH, FIB, SEM, TEM

International certifications LAB
IATF 16949, QC 080000, ISO 14001, ISO 45001

Design Kit	Vender	Tools / Version	
Design Rule & Sample Layout	Nuvoton Own	Layout Design Rule	Device sample layout
	Nuvoton Own	ESD/Latch-Up Layout Design Rule	ESD sample layout
Schematic Entry	Cadence	Virtuoso Schematic	
SPICE Model	Synopsys	HSPICE	BSIM4 (L54) (+ macro)
	Cadence	Spectre	BSIM4 (L54) (+ macro)
DRC	Siemens	Calibre 2013.2	
LVS	Siemens	Calibre 2013.2	
LPE	Siemens	Calibre 2013.2	
Cell Library	Nuvoton Own	Standard Cell Library	
PDK	Cadence	Virtuoso IC51 & IC61, P-Cells	
	Siemens	Tanner Tools PDK	

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