

Typical Applications

PCS Base Stations
 Land Mobile Radio
 Cellular Telephony
 Radio in the Local Loop

Previous Vectron Model Numbers

Frequency range

Standard frequencies

Features

EFC Standard
 Standard Surface Mount Package
Low Phase Noise option
 Low Profile

STO50; STO50S3; STO50S3-01

6.4 MHz – 800 MHz

10; 12.288; 12.8; 19,44 MHz,
 20; 20,48, 77.76, 100 MHz



Frequency stabilities¹ [Standard TCXO]

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code ⁵
vs. operating temperature range (Referenced to +25°C)	-2.5		+2.5	ppm	-40 ... +85°C	F256
	-1.0		+1.0	ppm	-40 ... +85°C	F106
	-2.5		+2.5	ppm	-20 ... +70°C	D256
	-1.0		+1.0	ppm	-20 ... +70°C	D106
	-1.0		+1.0	ppm	0 ... +50°C	B106
	-0.5		+0.5	ppm	0 ... +50°C	B507
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	- 1.5		+1.5	ppm	at time of shipment, nominal EFC V _S ± 5% Load ± 10%	
vs. supply voltage change	- 0.2		+0.2	ppm		
vs. load change	- 0.2		+0.2	ppm		
vs aging /1. Year	- 1.0		+1.0	ppm		

Frequency stabilities¹ [Stratum 3 TCXO]

Parameter	Min	Typ	Max.	Units	Operating temp range	Ordering Code ⁵
vs. operating temperature range (Referenced to +25°C)	-0.8		+0.8	ppm	-40 ... +85°C	F807
	-0.28		+0.28	ppm	-30 ... +85°C	G287*
	-0.8		+0.8	ppm	-20 ... +70°C	D807
	-0.28		+0.28	ppm	-20 ... +70°C	D287*
	-0.28		+0.28	ppm	0 ... +50°C	B287*
	-0.28		+0.28	ppm	0 ... +50°C	B287*
Parameter	Min	Typ	Max.	Units	Condition	
Initial tolerance	- 1.0		+1.0	ppm	at time of shipment, nominal EFC V _S ± 5% Load ± 10%	
vs. supply voltage change	- 0.2		+0.2	ppm		
vs. load change	- 0.1		+0.1	ppm		
vs aging /15 Years	- 2.5		+2.5	ppm		
overall tolerance	-4.6		-4.6	ppm	Note: * Stratum 3 per GR-1244-CORE: <±4.6 ppm for all causes and 20 years aging, Holdover: <±0.37 ppm over 24 hours (Code: D287 & B287)	

Supply voltage (Vs)

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code ⁵
Supply voltage [Standard]	3.135	3.3	3.465	VDC		SV033
Supply voltage [Option]	4.75	5	5.25	VDC		SV050
Current consumption			35	mA	steady state @ +25°C & 3.3VDC	
			35	mA	steady state @ +25°C & 5.0VDC	

RF output

Parameter	Min	Typ	Max.	Units	Condition	Ordering Code ⁵
Signal [Standard]	HCMOS					RFH
Load	13.5	15	16.5	pF	with Vs= 5.0V and 15pF load with Vs=3.3V and 15pF load with Vs= 5.0V and 15pF load with Vs=3.3V and 15pF load	
Signal Level (Vol)			0.5	VDC		
Signal Level (Voh)	4.5		0.3	VDC		
	3.0			VDC		
Rise and Fall time			5	ns	@ (Voh-Vol)/2	
Duty cycle	40	50	60	%		
Signal [Option]	clipped Sinewave				> 12.288MHz	RFC
Load R	9	10	11	kΩ	@ 10kΩ 10pF	
C	9	10	11	pF		
Output power	0.7			V _{pp}		
Signal [Standard]	PECL					RFP
Load		50		Ω	to Vs-2V 20 to 80%	
Rise and Fall time			1	ns		
Duty cycle	45	50	55	%		
Subharmonics	-45			dBc		

Frequency Tuning (EFC)

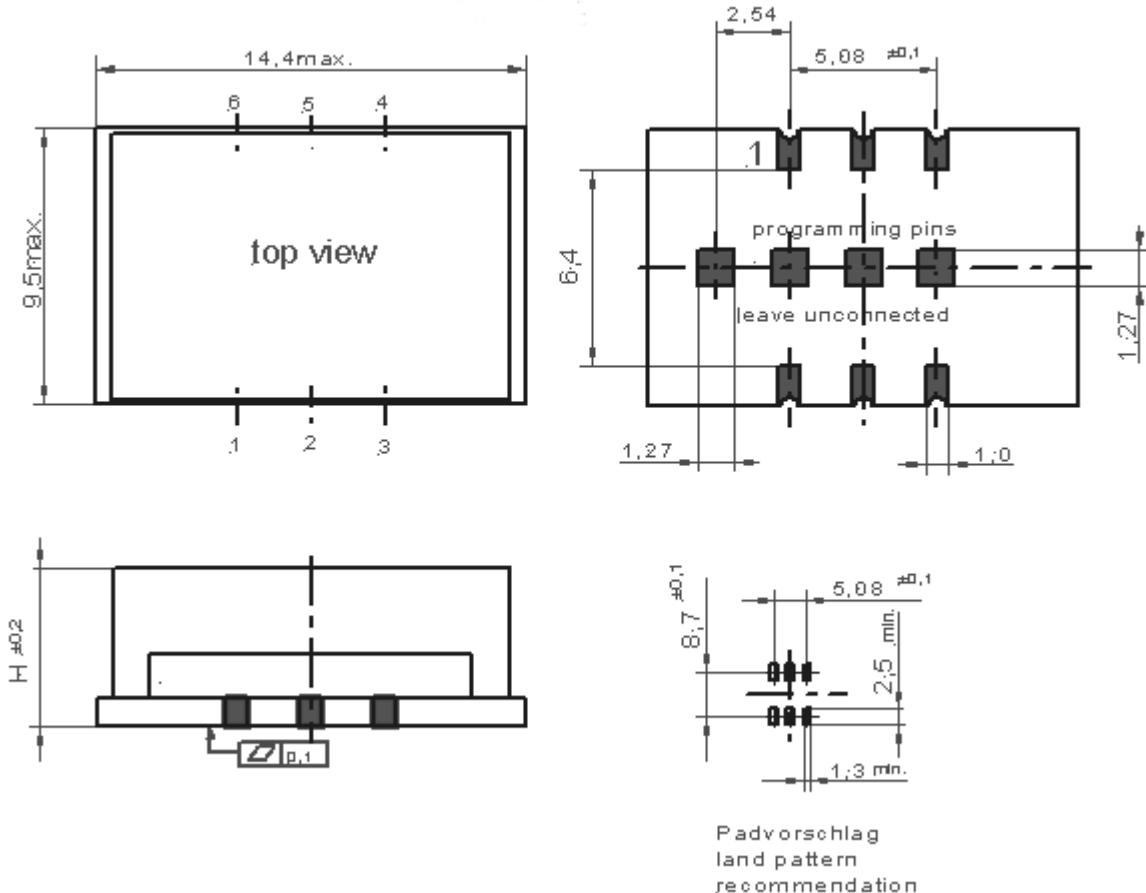
Parameter	Min	Typ	Max.	Units	Condition
Tuning Range	± 8.0	±14.0	± 20.0	ppm	Standard Version
	± 5.0	±12.0	± 20.0	ppm	S3 Version
Linearity			10	%	
Tuning Slope	Positive				
Control Voltage Range	0.3	1.65	3.0	VDC	with Vs=3.3VDC
	0.5	2.5	4.5	VDC	with Vs=5.0VDC
Freq. control input impedance	10			kΩ	

Additional parameters

Parameter	Min	Typ	Max.	Units	Condition
Phase Noise ³		-90		dBc/Hz	10 Hz TCXO @19.44MHz
		-120		dBc/Hz	100 Hz
		-135		dBc/Hz	1 kHz
		-140		dBc/Hz	10 kHz
		-145		dBc/Hz	100 kHz
Phase Noise ³		-98		dBc/Hz	10 Hz Low Phase Noise TCXO @12.8 MHz
		-125		dBc/Hz	100 Hz
		-147		dBc/Hz	1 kHz
		-153		dBc/Hz	10 kHz
		-154		dBc/Hz	100 kHz
Weight			3	g	

Processing & Packing	Handling & processing note	
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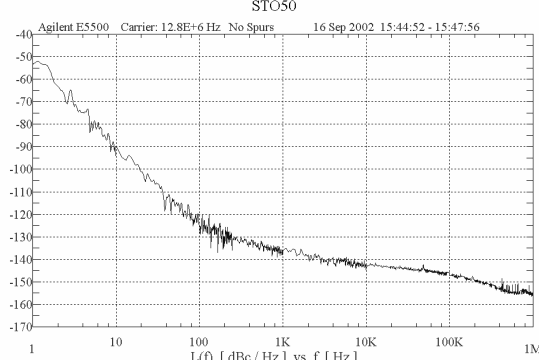
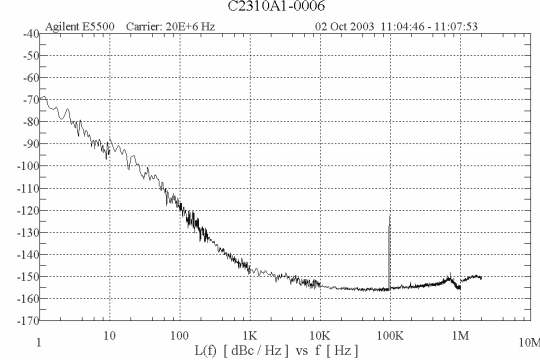
Enclosures

Type G214B			
Package Codes:			
Code A1	Height "H" 5.9	Pin Length "L" NA	
G 214  Dimensions: mm			
Pin Connections		Marking	
1	Voltage Control (Vc)	C2310-xxx	
2	N.C.	Frequency	
3	GND, case	* C AYYWW	
4	RF output		
5	N.C. / RF output compl.		
6	Supply Voltage (Vs)		
Outline Drawing: G214B			

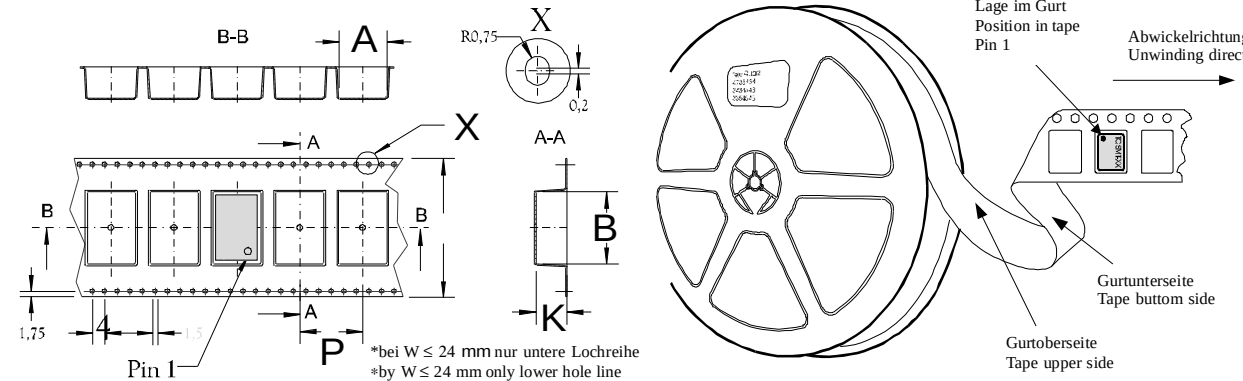
Absolute Maximum Ratings

Parameter	Min	Typ	Max.	Units	Condition
Supply voltage (Vs)			6.0	V	
Control Voltage	0		Vs	V	
Maximum output load @ CMOS			40	pF	
Operable temperature range	-40		+85	°C	
Storage temperature range	-55		+125	°C	

Typical measurement data

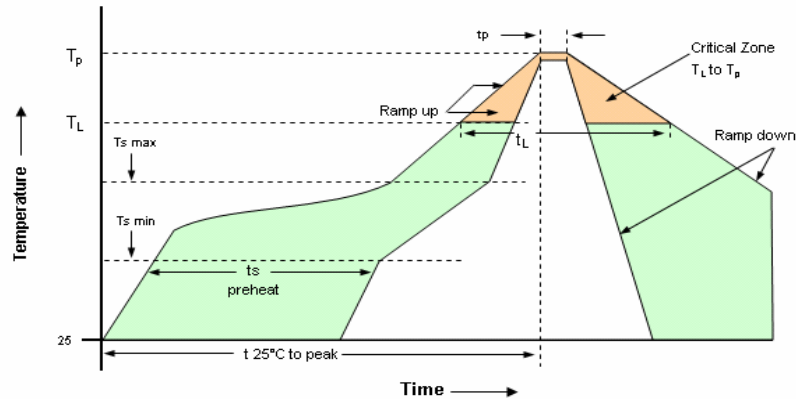
Phase Noise and Jitter				
C2310 @12.8MHz STO50 			C2310 @20MHz Low phase Noise Version C2310A1-0006 	
Frequency range [Hz]	S ₀ (f) [dB]	Jitter [ps rms]		
20Hz to 0.5 MHz	-85,30 dB	0,675 ps		
20kHz to 0.5MHz	-89,10 dB	0,436 ps		

Standard Shipping Method

 Production tolerance complying DIN IEC 286-3 *bei W ≤ 24 mm nur untere Lochreihe *by W ≤ 24 mm only lower hole line					
Enclosure Type	Tape width W [mm]	Quantity per meter	Quantity per reel	Dimension P	
G214B	24	83.3	850	12	

Recommended Reflow Profile

Solderprofile:



Profile Feature	Pb-Free Assembly /Sn-Pb Assembly	Profile Feature	Pb-Free Assembly /Sn-Pb Assembly
Average ramp-up rate (T_L to T_p)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat - Temperature Min T_{smin} - Temperature Min T_{smax} - Time (min to max) (t_s)	150°C 200°C 60-180 seconds	Time maintained above - Temperature (T_L) - Time (t_L)	217°C 60-150 seconds
T_{smax} to T_L - Ramp-up Rate	3°C/second max.		
Time maintained above - Temperature (T_L) - Time (t_L)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Peak Temperature (T_p)	max 260°C	Ramp-down Rate	6°C/second max.

Note: All temperatures refer to topside of the package, measured on the package body surface.

How to order this product:

Vectron International · www.vectron.com

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Model	Stability Code	Supply Voltage Code	RF Output Code	Package Code	Frequency
C2310	F256	SV033	RFP	A1	6,4MHz

Vs.operat. Temp. Range

F256	±2.5ppm	-40 ... +85°C
F106	±1.0ppm	-40 ... +85°C
D256	±2.5ppm	-20 ... +70°C
D106	±1.0ppm	-20 ... +70°C
B106	±1.0ppm	0 ... +50°C
B507	±0.5ppm	0 ... +50°C
F807	±0.8ppm	-40 ... +85°C
G287	±0.28ppm	-30 ... +85°C
D807	±0.8ppm	-20 ... +70°C
D287	±0.28ppm	-20 ... +70°C
B287	±0.28ppm	0 ... +50°C

Supply:

SV033: 3.3V
SV050: 5V

Signal:

RFP: PECL
RFC: clipped sinewave
RFH: HCMOS

Enclosure:

A1: G214B

Notes:

- 1 Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
- 2 Unless otherwise stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C)
- 3 Phase noise degrades with increasing output frequency.
- 4 Subject to technical modification.
- 5 Contact factory for availability.