

Power Supply Supervisor

Features

- Low power consumption
- Low temperature coefficient
- Built-in delay circuit: 200ms
- High input voltage (up to 8V)
- Output voltage accuracy: tolerance $\pm 2\%$
- SOT23, SOT23-3 and SOT89 package

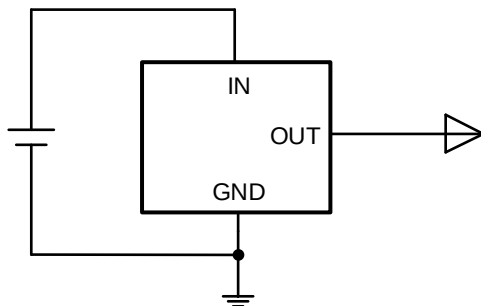
Applications

- Microprocessor reset circuitry
- Memory battery back-up circuits
- Power on reset circuits
- System battery life and charge voltage monitors
- Delay circuitry
- Power failure detection

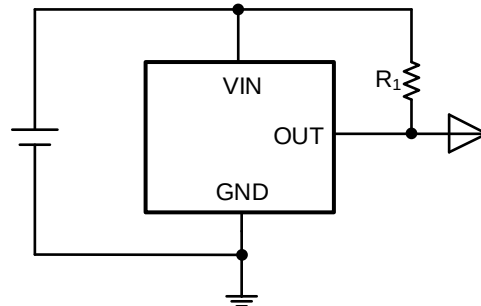
General Description

The RY809 series are highly accurate, low power consumption voltage detectors, manufactured using CMOS and laser trimming technologies. A delay circuit is built-in to each detector. Detect voltage is extremely accurate with minimal temperature drift. Both CMOS and N-ch open drain output configurations are available. Since the delay circuit is built-in, peripherals are unnecessary and high-density mounting is possible.

Typical Application Circuit



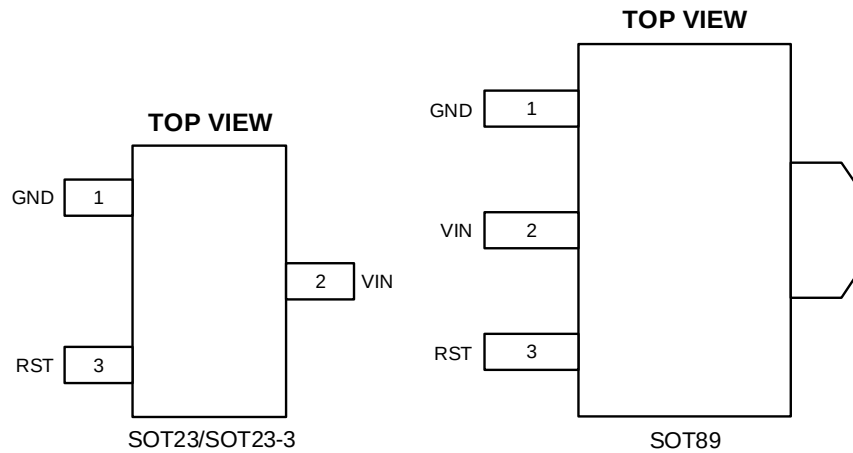
CMOS Output



NMOS Open Drain Output

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Pin Configuration



SOT23/ SOT23-3	SOT89	Pin Name	Function
1	1	GND	GND pin
2	2	VIN	Input voltage pin
3	3	RST	Reset pin

Selection Table

Part No	Detec Voltage	Delay Time	Tolerance	Package
RY809Y-xxxXX	4.38V	200ms	±2%	SOT23 SOT23-3 SOT89
RY809Y-xxxXX	4.00V		±2%	
RY809Y-xxxXX	3.08V		±2%	
RY809Y-xxxXX	2.93V		±2%	
RY809Y-xxxXX	2.63V		±2%	

Note: 'Y' is CMOS or NMOS output. 'xxx' stands for detectable voltages. 'XX' stands for package.

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Order Information

RY809①-②③④⑤⑥

Designator		Symbol	Description		
①		C	CMOS output		
		N	NMOS output		
②③④		xxx	Detect voltage		
⑤		N	Package: SOT23		
		M	Package: SOT23-3		
		P	Package: SOT89		
⑥		R	RoHS / Pb Free		
		G	Halogen Free		
Marking	Part No.	Model	Description	Package	T/R Qty
AFAA	70704001	RY809C-263NR	RY809 CMOS Power Supply Supervisor IC, 2.63V, SOT23	SOT23	3000 PCS
AFAA	70704002	RY809C-263MR	RY809 CMOS Power Supply Supervisor IC, 2.63V, SOT23-3	SOT23-3	3000 PCS
AFAA	70704003	RY809C-263PR	RY809 CMOS Power Supply Supervisor IC, 2.63V, SOT89	SOT89	1000 PCS
ADAA	70704004	RY809C-293NR	RY809 CMOS Power Supply Supervisor IC, 2.93V, SOT23	SOT23	3000 PCS
ADAA	70704005	RY809C-293MR	RY809 CMOS Power Supply Supervisor IC, 2.93V, SOT23-3	SOT23-3	3000 PCS
ADAA	70704006	RY809C-293PR	RY809 CMOS Power Supply Supervisor IC, 2.93V, SOT89	SOT89	1000 PCS
ACAA	70704007	RY809C-308NR	RY809 CMOS Power Supply Supervisor IC, 3.08V, SOT23	SOT23	3000 PCS
ACAA	70704008	RY809C-308MR	RY809 CMOS Power Supply Supervisor IC, 3.08V, SOT23-3	SOT23-3	3000 PCS
ACAA	70704009	RY809C-308PR	RY809 CMOS Power Supply Supervisor IC, 3.08V, SOT89	SOT89	1000PCS
CWAA	70704010	RY809C-400NR	RY809 CMOS Power Supply Supervisor IC, 4.00V, SOT23	SOT23	3000 PCS
CWAA	70704011	RY809C-400MR	RY809 CMOS Power Supply Supervisor IC, 4.00V, SOT23-3	SOT23-3	3000 PCS
CWAA	70704012	RY809C-400PR	RY809 CMOS Power Supply Supervisor IC, 4.00V, SOT89	SOT89	1000 PCS
ABAA	70704013	RY809C-438NR	RY809 CMOS Power Supply Supervisor IC, 4.38V, SOT23	SOT23	3000 PCS

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ABAA	70704014	RY809C-438MR	RY809 CMOS Power Supply Supervisor IC, 4.38V, SOT23-3	SOT23-3	3000 PCS
ABAA	70704015	RY809C-438PR	RY809 CMOS Power Supply Supervisor IC, 4.38V, SOT89	SOT89	1000 PCS
BFAA	70704016	RY809N-263NR	RY809 NMOS Power Supply Supervisor IC, 2.63V, SOT23	SOT23	3000 PCS
BFAA	70704017	RY809N-263MR	RY809 NMOS Power Supply Supervisor IC, 2.63V, SOT23-3	SOT23-3	3000 PCS
BFAA	70704018	RY809N-263PR	RY809 NMOS Power Supply Supervisor IC, 2.63V, SOT89	SOT89	1000 PCS
BDAA	70704019	RY809N-293NR	RY809 NMOS Power Supply Supervisor IC, 2.93V, SOT23	SOT23	3000 PCS
BDAA	70704020	RY809N-293MR	RY809 NMOS Power Supply Supervisor IC, 2.93V, SOT23-3	SOT23-3	3000 PCS
BDAA	70704021	RY809N-293PR	RY809 NMOS Power Supply Supervisor IC, 2.93V, SOT89	SOT89	1000 PCS
BCAA	70704022	RY809N-308NR	RY809 NMOS Power Supply Supervisor IC, 3.08V, SOT23	SOT23	3000 PCS
BCAA	70704023	RY809N-308MR	RY809 NMOS Power Supply Supervisor IC, 3.08V, SOT23-3	SOT23-3	3000 PCS
BCAA	70704024	RY809N-308PR	RY809 NMOS Power Supply Supervisor IC, 3.08V, SOT89	SOT89	1000 PCS
BWAA	70704025	RY809N-400NR	RY809 NMOS Power Supply Supervisor IC, 4.00V, SOT23	SOT23	3000 PCS
BWAA	70704026	RY809N-400MR	RY809 NMOS Power Supply Supervisor IC, 4.00V, SOT23-3	SOT23-3	3000 PCS
BWAA	70704027	RY809N-400PR	RY809 NMOS Power Supply Supervisor IC, 4.00V, SOT89	SOT89	1000 PCS
BBAA	70704028	RY809N-438NR	RY809 NMOS Power Supply Supervisor IC, 4.38V, SOT23	SOT23	3000 PCS
BBAA	70704029	RY809N-438MR	RY809 NMOS Power Supply Supervisor IC, 4.38V, SOT23-3	SOT23-3	3000 PCS
BBAA	70704030	RY809N-438PR	RY809 NMOS Power Supply Supervisor IC, 4.38V, SOT89	SOT89	1000 PCS

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Absolute Maximum Ratings

Item	Min	Max	Unit
V _{IN} voltage	-0.3	8.0	V
Operating Ambient Temperature	-30	80	°C
Storage temperature, T _{stg}	-40	125	°C
Lead Temperature (Soldering, 10sec.)		260	°C

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Thermal Information

Symbol	Parameter	Package	Max.	Unit
θ_{JA}	Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heat sink)	SOT23-3	250	°C/W
		SOT89	500	°C/W
P _D	Power Dissipation	SOT23-3	0.20	W
		SOT89	0.50	W

Note: P_D is measured at T_a= 25°C

Electrical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{CC}	Input Voltage (V _{CC}) Range	25°C	1.2		7.5	V
I _{SS}	Supply Current	V _{IN} =6V, V _{DET} =2.93V	2.3	3.0	3.7	μA
V _{TH}	Reset Threshold	T _A =25°C	4.31	4.38	4.45	V
		T _A =25°C	3.93	4.00	4.06	
		T _A =25°C	3.04	3.08	3.11	
		T _A =25°C	2.89	2.93	2.96	
		T _A =25°C	2.59	2.63	2.66	
	Reset Threshold Stability			30		Ppm/°C
	V _{CC} to Reset Delay	V _{CC} = V _{TH} to V _{TH} - 100mV		10		us
V _{OL}	Reset Active Timeout Period		100	150	200	ms

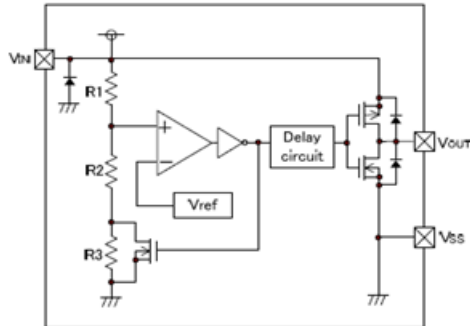
V_{DET}: Setting detect voltage value

Note: The power consumption during power-start to output being stable (release operation) is 2A greater it is after that period (completion of release operation) because of delay circuit through current.

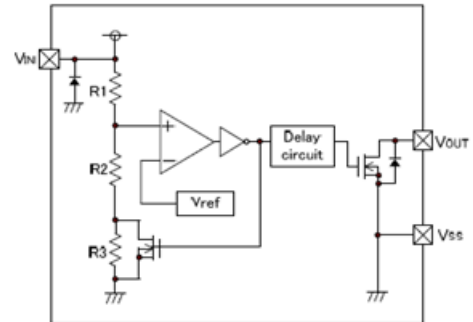
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Block Diagram

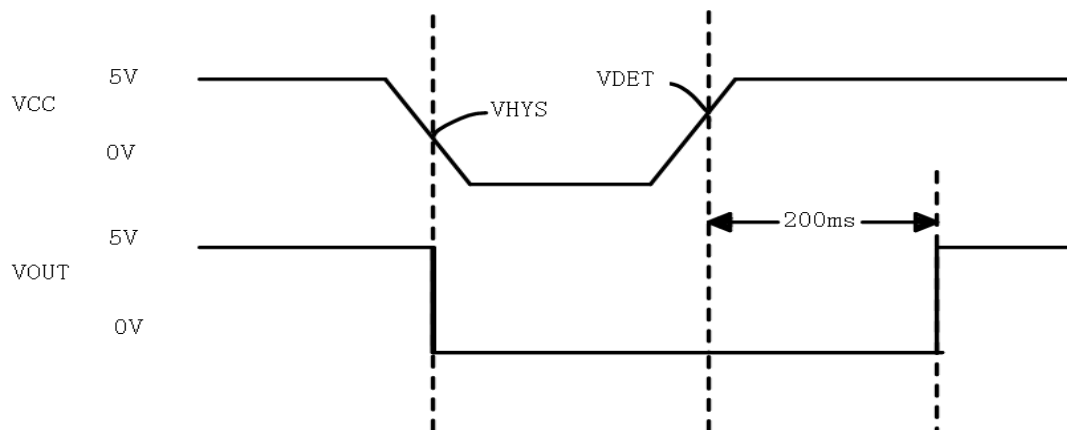
(1) CMOS Output



(2) N-ch Open Drain Output



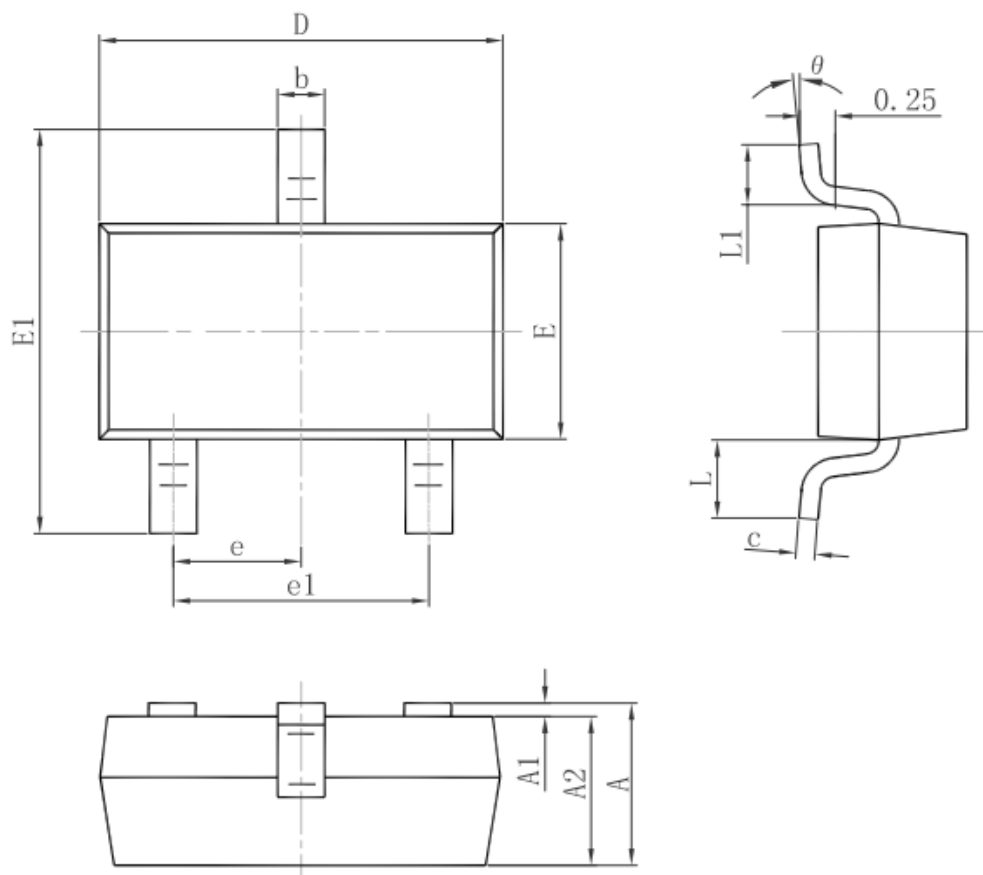
Timing Chart



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Packaging Information

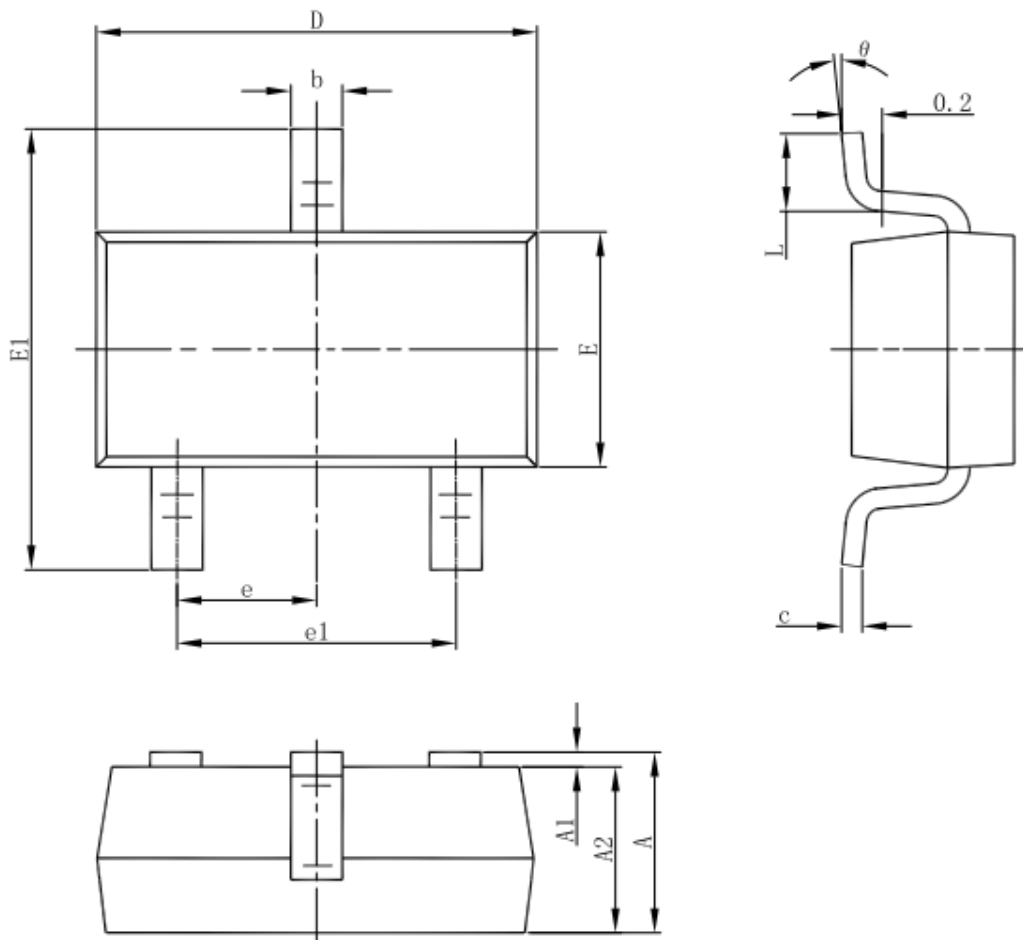
3-pin SOT23 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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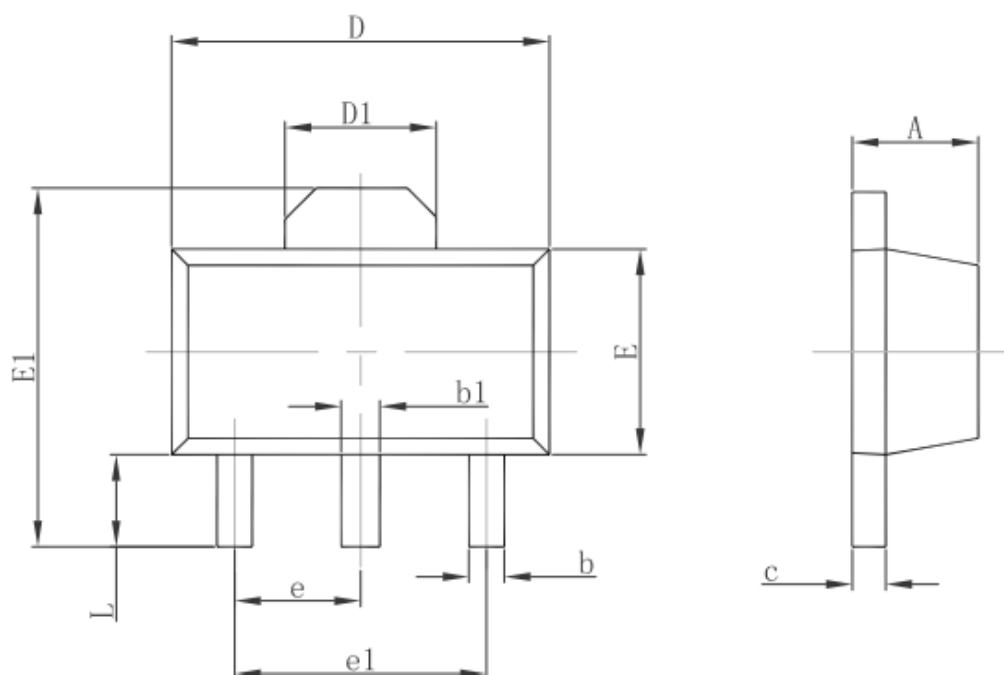
3-pin SOT23-3 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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3-pin SOT89 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047