



EC70D series Power Supply Supervisor

Features

- Low power consumption
- Low temperature coefficient
- Built-in delay circuit: 200ms
- High input voltage (up to 9V)
- 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 EC70D series are highly accurate, low power consumption voltage detectors, manufactured using CMOS and laser trimming technologies. A delay circuit is built-in to each detectors. 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.

Selection Table

Part No	Detectable Voltage	Delay Time	Tolerance	Package	Marking
EC70DYLxx	4.63V	200ms	$\pm 2\%$	SOT23 SOT23-3 SOT89	AAAA
EC70DYMxx	4.38V		$\pm 2\%$		ABAA
EC70DYJxx	4.00V		$\pm 2\%$		CWAA
EC70DYTxx	3.08V		$\pm 2\%$		ACAA
EC70DYSxx	2.93V		$\pm 2\%$		ADAA
EC70DYRxx	2.63V		$\pm 2\%$		AFAA
EC70DYXXxx			$\pm 2\%$		

Note: "Y" is CMOS or NMOS output."XX" stands for output voltages."xx" stands for package.

Order Information

EC70 ①②③④⑤

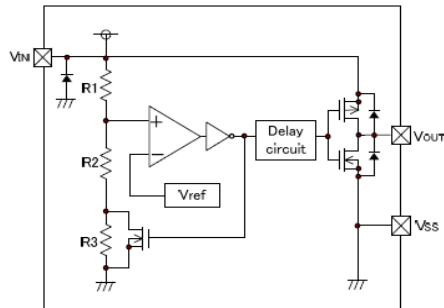
Designator	Symbol	Description
①	D	Standard
②	C	CMOS output
	N	NMOS output
③	XX	Detect voltage
④	N	Package:SOT23
	M	Package:SOT23-3
	P	Package:SOT89
⑤	R	RoHS / Pb Free
	G	Halogen Free



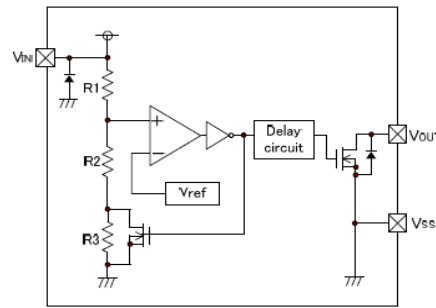
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Block Diagram

(1) CMOS output

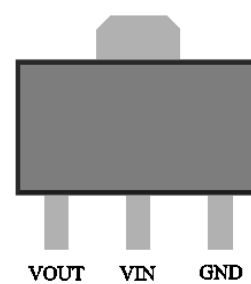
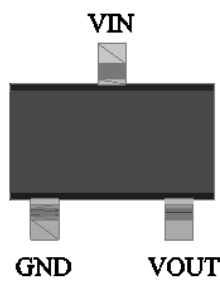
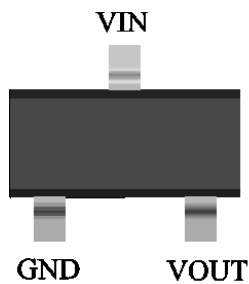


(2) N-ch open drain output



Pin Assignment

SOT23 (Top view) SOT23-3 (Top view) SOT89 (Top view)



Absolute Maximum Ratings

Input Voltage-0.3V to 10.0V

Storage Temperature-40°C to 125°C

Operating Temperature-30°C to 80°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 $T_a = 25^\circ\text{C}$



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Electrical Characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V_{CC}	Input Voltage (V_{CC}) Range	$TA=0^{\circ}C$ to $70^{\circ}C$ $TA=-40^{\circ}C$ to $105^{\circ}C$		1.1 1.2		7.5 7.5	V
I_{SS}	Supply Current	$TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	$V_{CC}<5.5V, L/M/J$ $V_{CC}<3.6V, R/S/T$ $V_{CC}<5.5V, L/M/J$ $V_{CC}<3.6V, R/S/T$		1.5 1	1.8 1.2 2.8 2.5	μA
V_{TH}	Reset Threshold	L devices	$TA=25^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	4.56 4.50 4.40	4.63	4.70 4.75 4.86	V
		M devices	$TA=25^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	4.31 4.25 4.16	4.38	4.45 4.50 4.56	
		J devices	$TA=25^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	3.93 3.89 3.80	4.00	4.06 4.10 4.20	
		T devices	$TA=25^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	3.04 3.00 2.92	3.08	3.11 3.15 3.23	
		S devices	$TA=25^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	2.89 2.85 2.78	2.93	2.96 3.00 3.08	
		R devices	$TA=25^{\circ}C$ $TA=-40^{\circ}C$ to $85^{\circ}C$ $TA=85^{\circ}C$ to $105^{\circ}C$	2.59 2.55 2.50	2.63	2.66 2.70 2.76	
	Reset Threshold Stability				30		Ppm/ $^{\circ}C$
	V_{CC} to Reset Delay	$V_{CC}=V_{TH}$ to $V_{TH}-100mV$			20		μs
V_{OL}	Reset Active Timeout Period	$TA=-40^{\circ}C$ to $85^{\circ}C$		150	200	250	ms
		$TA=85^{\circ}C$ to $105^{\circ}C$		100		300	

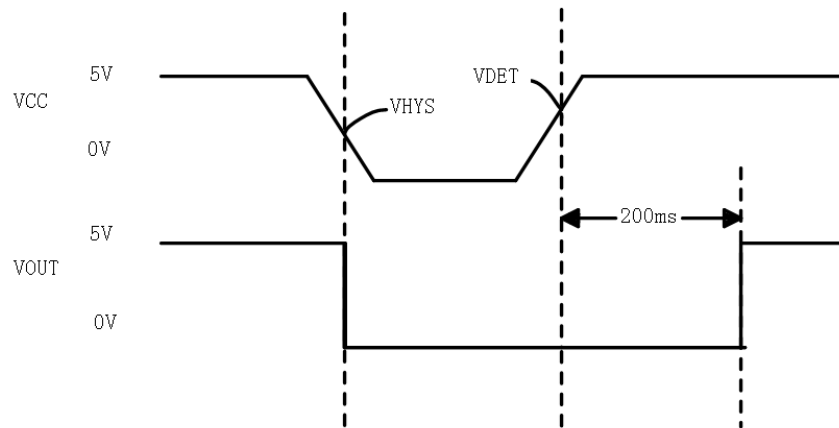
VDF(T): Setting detect voltage value

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.

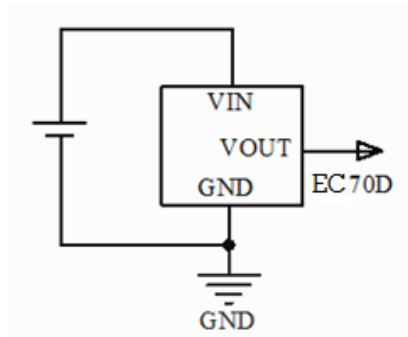


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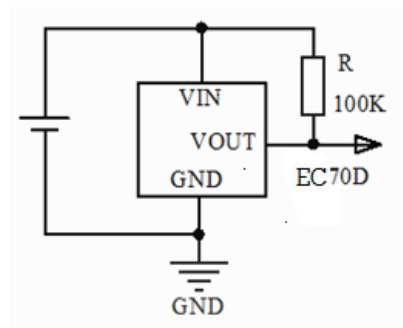
Timing Chart



Application Circuits



CMOS OUTPUT



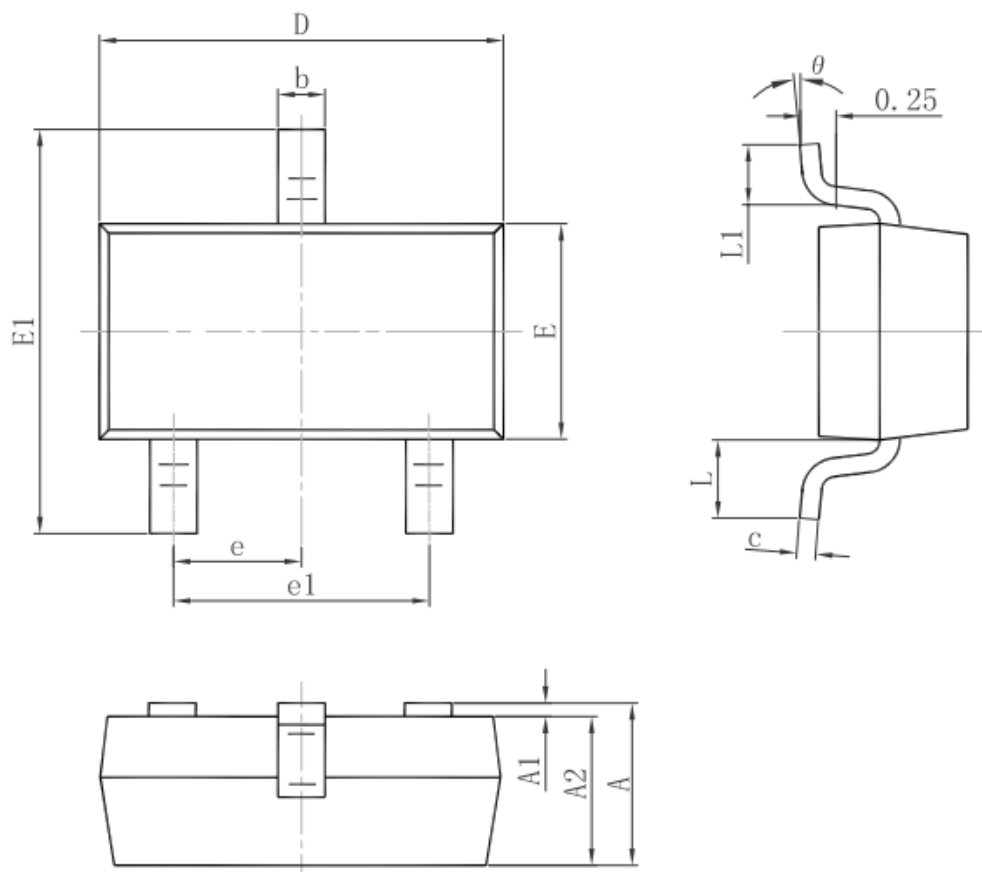
NMOS OPEN DRAIN OUTPUT



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Package Information

3-pin SOT23 Outline Dimensions



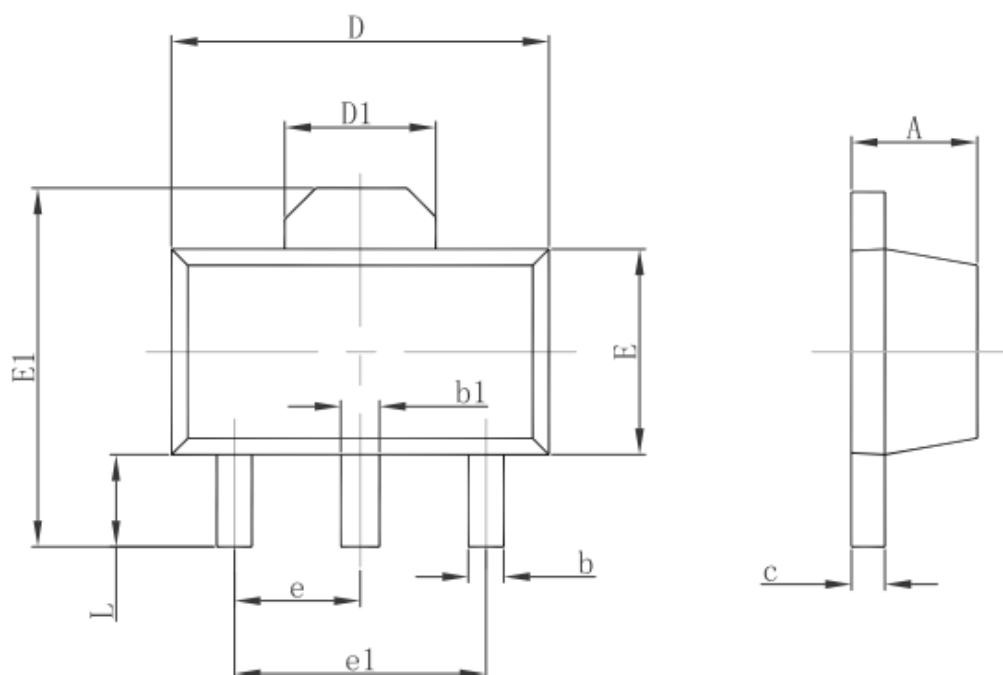
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		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 SOT89 Outline Dimensions

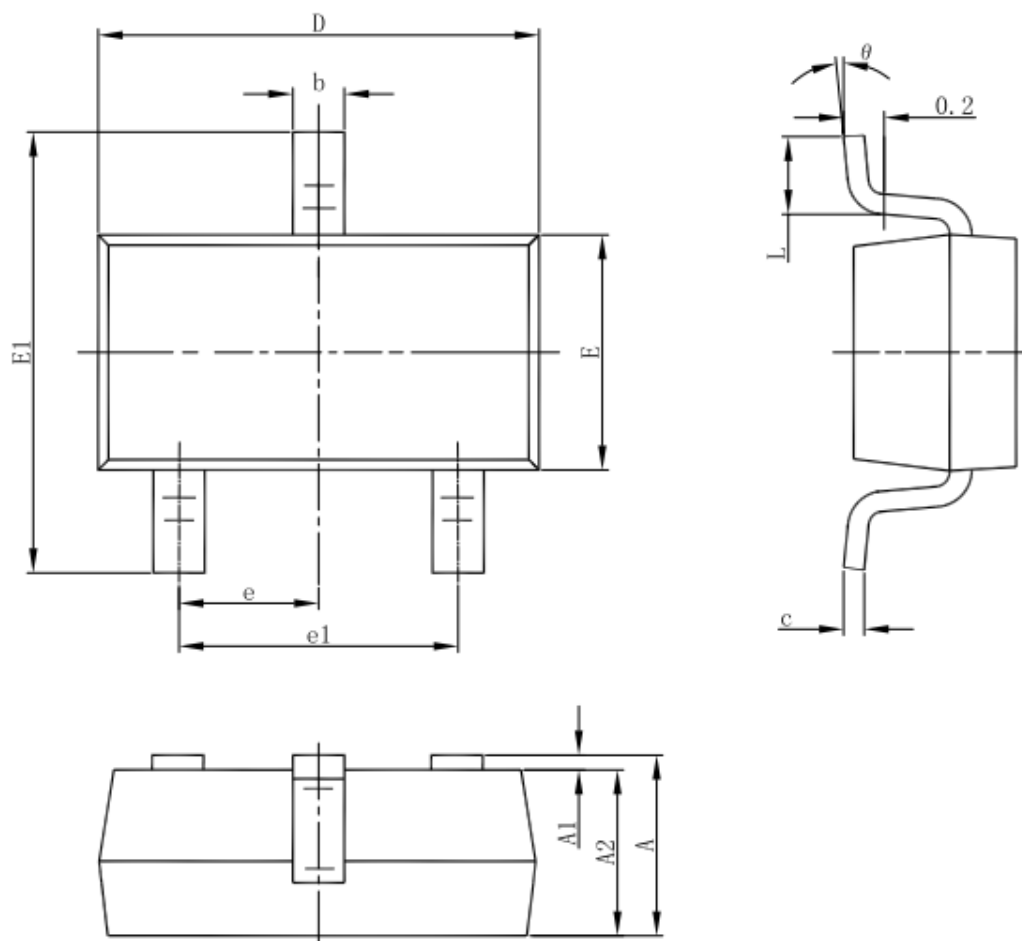


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.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



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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°