Features

- Low power consumption
- Low temperature coefficient
- Built-in delay circuit: 200ms
- High input voltage (up to 9V)
- Output voltage accuracy: tolerance ±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 TX70D 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
TX70DYLxx	4.63V	200ms	±2%	SOT23 SOT23-3 SOT89	AAAA
TX70DYMxx	4.38V		±2%		ABAA
TX70DYJxx	4.00V		±2%		CWAA
TX70DYTxx	3.08V		±2%		ACAA
TX70DYSxx	2.93V		±2%		ADAA
TX70DYRxx	2.63V		±2%		AFAA
TX70DYXXxx			±2%		

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

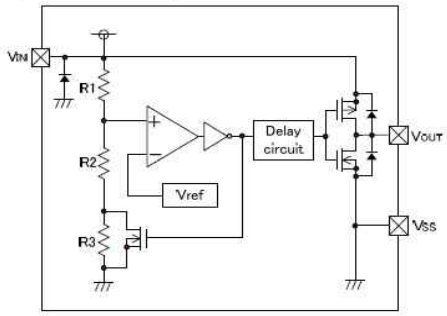
Order Information

TX70①②③④⑤

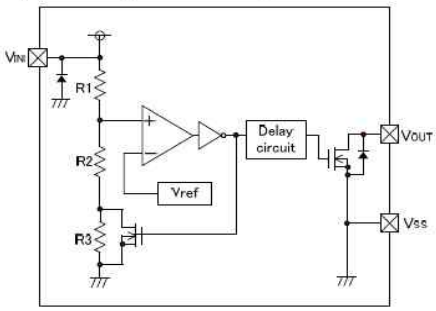
Designator	Symbol	Description
①	D	Standard
②	C	CMOS output
	N	NMOS output
③	XX	Detect voltage
④	N	Package:SOT23
	M	Package:SOT23-3
	P	Package:SOT89
⑤	R	RoHS / Pb Free
	G	Halogen Free

Block Diagram

(1) CMOS output

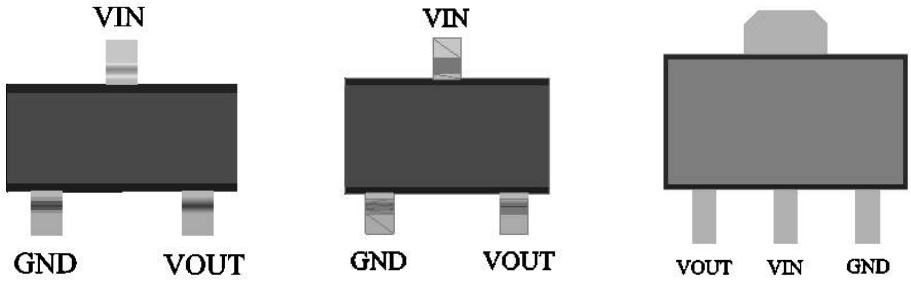


(2) N-ch open drain output



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℃ to 125℃

Operating Temperature .....-30℃ to 80℃

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	℃/W
		SOT89	500	℃/W
P_D	Power Dissipation	SOT23-3	0.20	W
		SOT89	0.50	W

Note: P_D is measured at Ta= 25℃

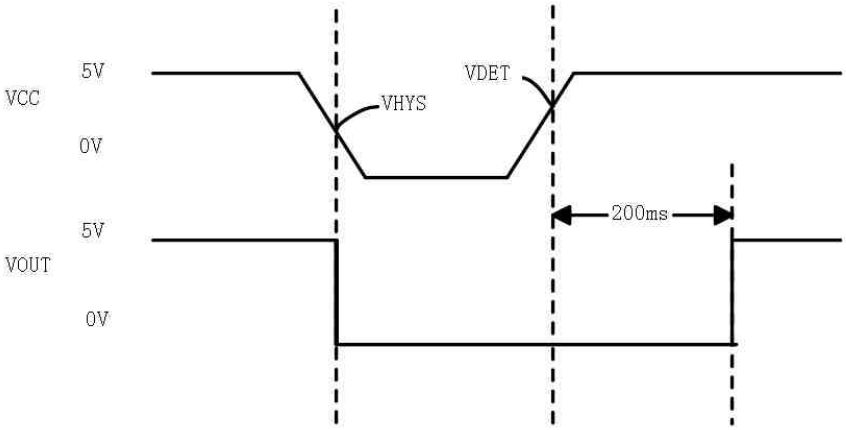
Electrical Characteristics

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

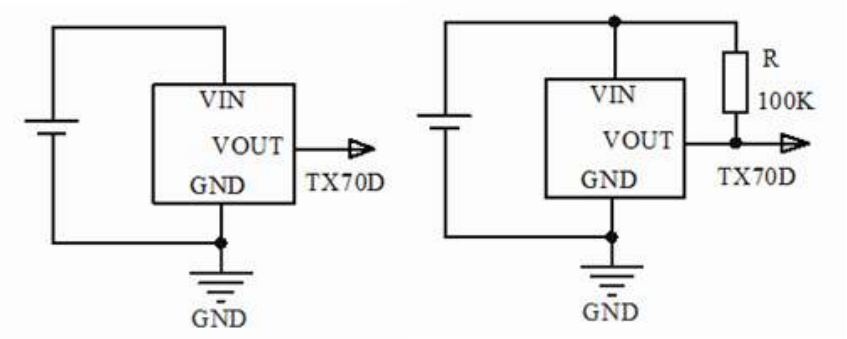
VDF(T): Setting detect voltage value

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.

Timing Chart



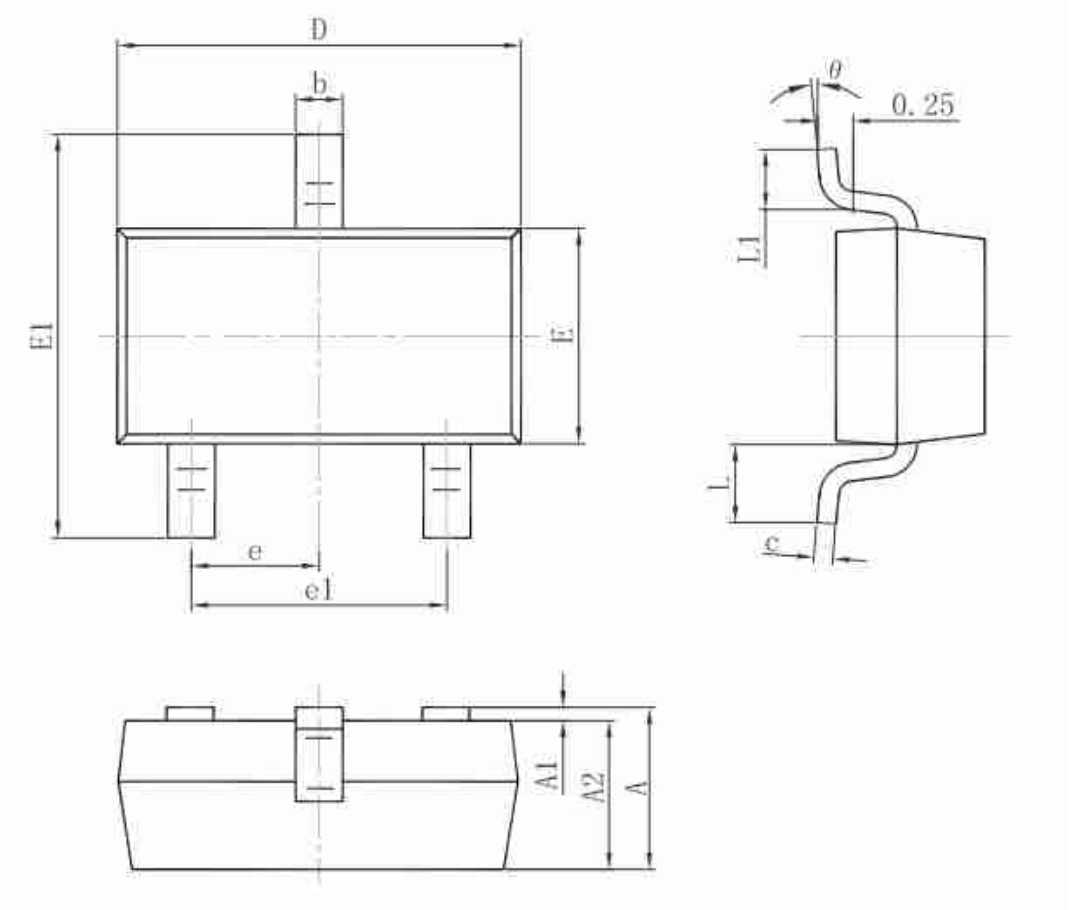
Application Circuits



CMOS OUTPUT NMOS OPEN DRAIN OUTPUT

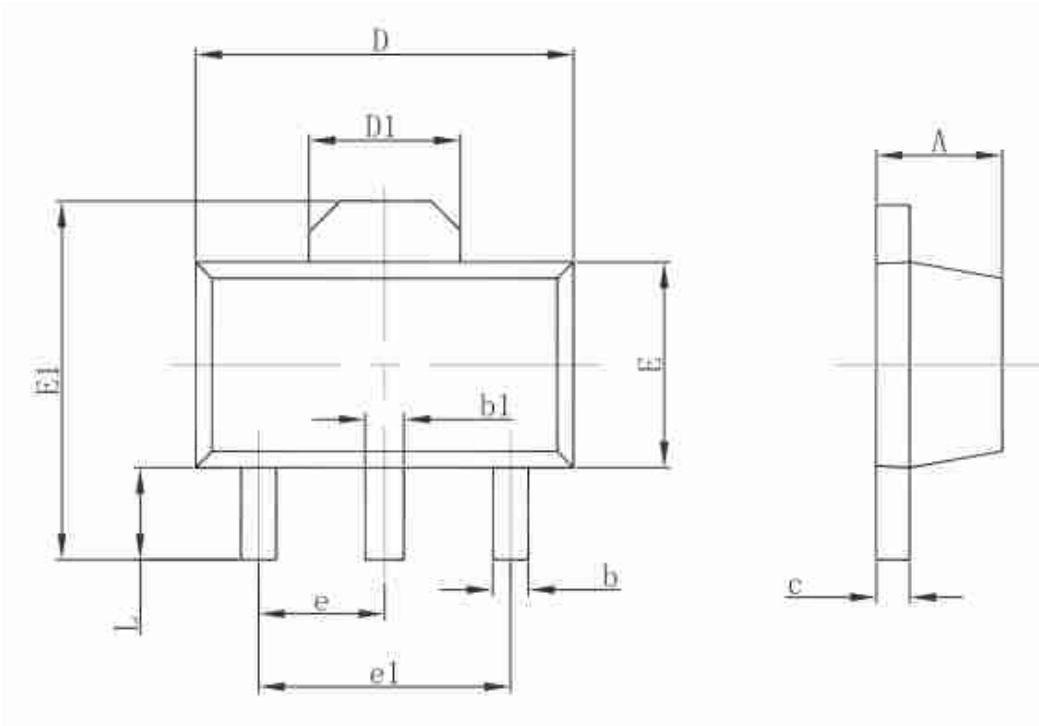
Package Information

3-pin SOT23 Outline Dimensions



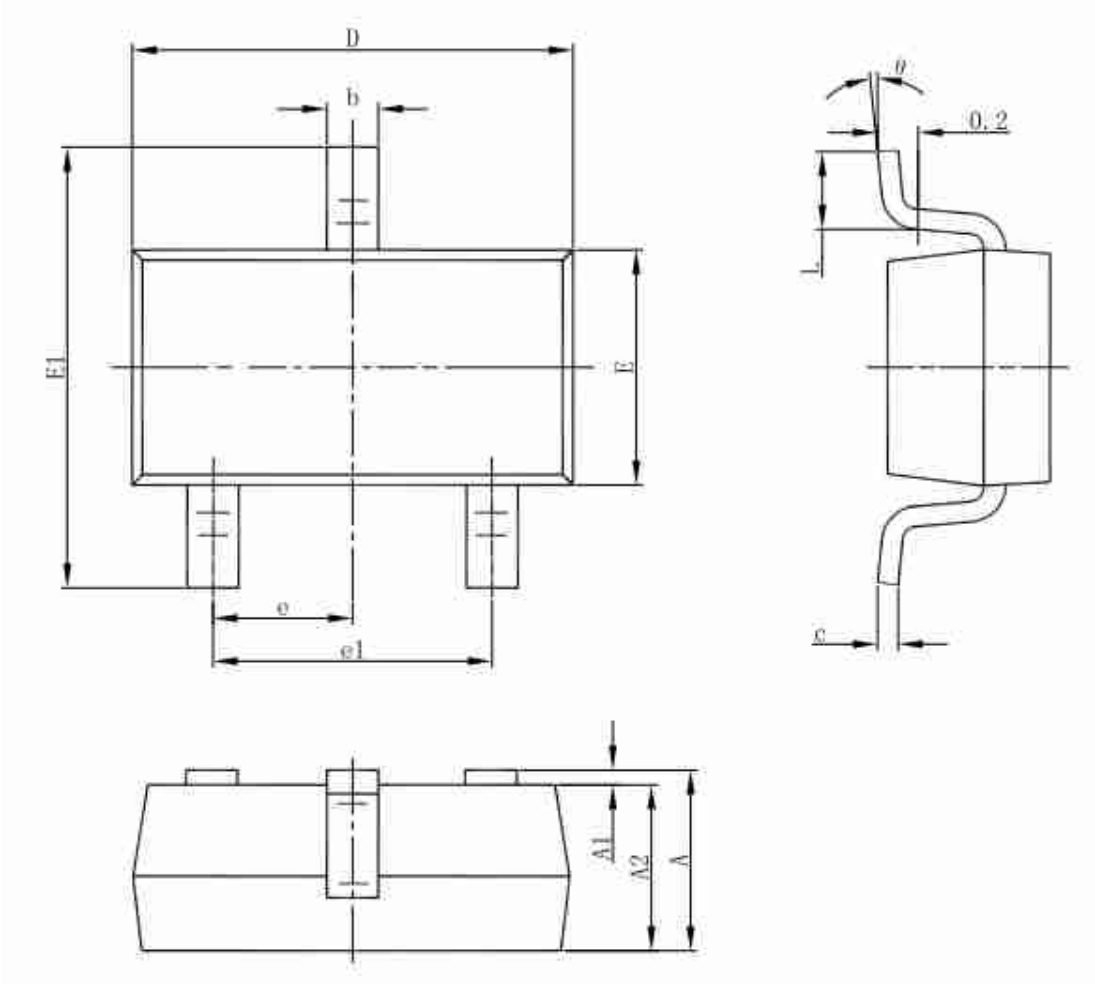
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.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

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

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°