Voltage Detectors , ME2808 Series

General Description

ME2808 Series are a set of three-terminal low power voltage detectors implemented in NMOS technology. Each voltage detector in the series detects a particular fixed voltage ranging from 2.0V to 7.0V. The voltage detectors consist of a high precision and low power consumption standard voltage source, a comparator, hysteresis circuit, and an output driver. NMOS technology ensures low power consumption.

Features

- Highly accuracy： ±1%
- Low power consumption：TYP 1.8uA (Vin=3V)
- Detect voltage range ： 2.0V~7.0V in 0.1V increments
- Operating voltage range：1.5V~18V
- Detect voltage temperature characteristics：TYP±0.9mV/℃
- Output configuration： NMOS
- Package：SOT-23-3，SOT-23-5，SOT-89-3，TO-92

Typical Application

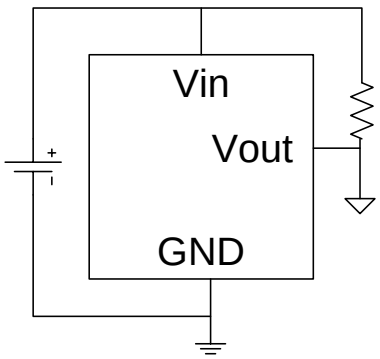
- battery checkers
- Level selectors
- Power failure detectors
- Microcomputer reset
- Battery backup of Memories

Package

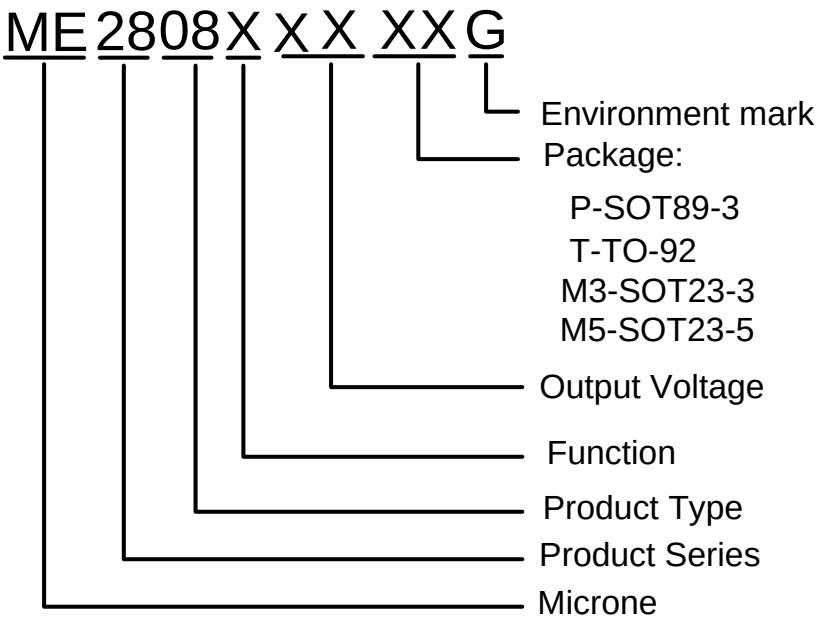
●3-pin SOT23-3、SOT89-3、TO-92

● 5-pin SOT23-5

Typical Application Circuit



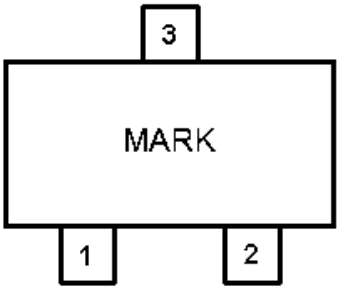
Selection Guide



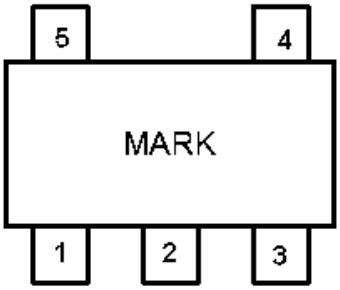
product series	product description
ME2808A22M3G	V_{OUT} =2.2V；Rising edge detection；Package：SOT23-3
ME2808A33M3G	V_{OUT} =3.3V；Rising edge detection；Package：SOT23-3
ME2808A30PG	V_{OUT} =3.0V；Rising edge detection；Package：SOT89-3
ME2808A27TG	V_{OUT} =2.7V；Rising edge detection；Package：TO-92
ME2808A42M5G	V_{OUT} =4.2V；Rising edge detection； Package：SOT23-5
ME2808B28M3G	V_{OUT} =2.8V；Falling edge detection；Package：SOT23-3

NOTE: At present ,there are seventeen kinds of voltage value: 2.2V、2.4V、2.5V、2.7V、2.8V、3.0V、3.2V、3.3V、3.5V、3.6V、3.8V、3.9V、4.0V、4.2V、4.3V、4.5V、5.0V。If you need other voltage and package, please contact our sales staff.

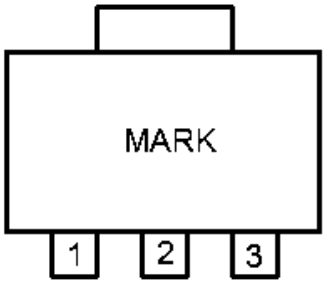
Pin Configuration



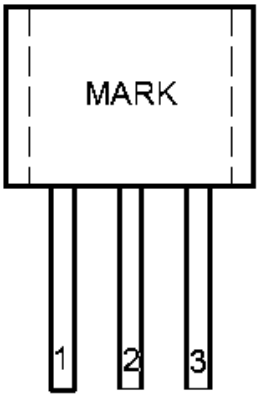
SOT23-3



SOT23-5



SOT89-3

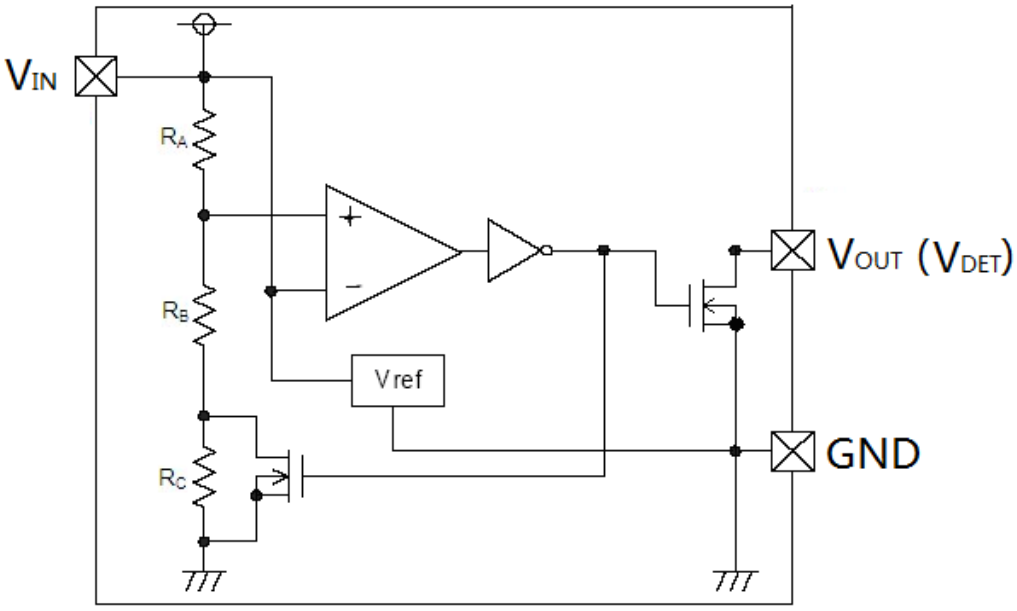


TO-92

Pin Assignment

Pin Number				Pin Name	Functions
SOT-23-3	SOT-23-5	SOT-89-3	TO-92		
2	3	3	3	GND	Ground
1	1	1	1	V_{OUT}	Output Voltage
3	2	2	2	V_{IN}	Input Voltage
	4			NC	No Connection
	5			NC	No Connection

Block Diagram



Absolute Maximum Ratings

PARAMETER		SYMBAL	RATINGS	UNITS
V_{IN} Input Voltage		V_{IN}	18	V
Output Current		I_{OUT}	50	mA
Output Voltage	NMOS	V_{OUT}	GND-0.3~ V_{IN} +0.3	V
Continuous Total Power Dissipation	SOT23-3/5	P_D	300	mW
	SOT89-3		500	
	TO-92		500	
Operating Ambient Temperature		T_{Opr}	-40~+85	℃
Storage Temperature		T_{stg}	-50~+125	℃
Soldering temperature and time		T_{solder}	260℃, 10s	

Electrical Characteristics (V_{DET} =2.0V to 7.0V ,T_A=25℃ ,unless otherwise noted)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
V_{DET}	Detect Voltage			V_{DET}×0.99	V_{DET}	V_{DET}×1.01	V
V_{HYS}	Hysteresis Width			V_{DET}×0.02	V_{DET}×0.05	V_{DET}×0.1	V
I_{IN}	Operating Current	V_{DET}=2.0V~ 2.8V	V_{IN} =3.0V	-	1.8	3	μA
		V_{DET} =2.8V~ 3.6V	V_{IN} =4.0V	-	1.8	4	
		V_{DET} =3.6V ~ 4.7V	V_{IN} =5.0V	-	2.1	4	
		V_{DET} =4.7V~ 7.0V	V_{IN} =8.0V	-	2.5	4	
V_{IN}	Operating Voltage	V_{DET} =2.0V to 7.0V		0.7	-	18	V
I_{OL}	Output Sink Current	V_{DET}=2.0V~ 2.8V	V_{IN} =-$V_{DET(S)}$ -0.2 V , V_{OUT}=0.2V	0.5			mA
		V_{DET} =2.8V~ 3.6V	V_{IN} =-$V_{DET(S)}$ -0.5 V , V_{OUT}=0.3V	0.5			
		V_{DET} =3.6V ~ 4.7V	V_{IN} =-$V_{DET(S)}$ -0.5 V , V_{OUT}=0.3V	1.2			
		V_{DET} =4.7V~ 7.0V	V_{IN} =-$V_{DET(S)}$ -0.5 V , V_{OUT}=0.3V	2.5			
$\Delta V_{DET}/\Delta T_A$	Temperature characteristics	0℃≤T_{opr}≤70℃			±0.9		mV/℃

Note: 1、VDF(S) ： Specified Detection Voltage value

2、VDF ： Actual Detection Voltage value

3、Release Voltage：VDR=VDF+VHYS (ME2808A series)

VDR=VDF-VHYS (ME2808B series)

Functional Description

The ME2808 series is a set of voltage detectors equipped with a high stability voltage reference which is connected to the negative input of a comparator — denoted as V_{REF} in the following figure (Fig. 1).When the voltage drop to the positive input of the comparator (i,e,V_B) is higher than V_{REF}, V_{OUT} goes high, M1 turns off, and V_B is ex-pressed as $V_{BH}=V_{IN}\times(R_B+R_C)/(R_A+R_B+R_C)$.If V_{IN} is decreased so that V_B falls to a value that is less than V_{REF}, the comparator output inverts (from high to low), V_{OUT} goes low, V_C is high, M1 turns on, R_C is bypassed, and V_B becomes: $V_{BL}=V_{IN}\times R_B/(R_A+R_B)$, which is less than V_{BH}. By so doing the comparator out-put will stay low to prevent the circuit from oscillating when $V_B \approx V_{REF}$. If V_{IN} falls bellow the minimum operating voltage, the output becomes undefined. When V_{IN} goes from low to $V_{IN}\times R_B/(R_A+R_B) > V_{REF}$, the comparator output goes high and V_{OUT} goes high again. The detection voltage is as defined:

$$V_{DET(-)}=(R_A+R_B+R_C)\times V_{REF}/(R_B+R_C)$$

The release voltage is as defined:

$$V_{DET(+)}=(R_A+R_B)\times V_{REF} / R_B$$

The hysteresis width is:

$$V_{HYS}=V_{DET(+)}-V_{DET(-)}$$

Fig.1 demonstrates the NMOS output type with positive output polarity (V_{OUT} is normally high, active low).

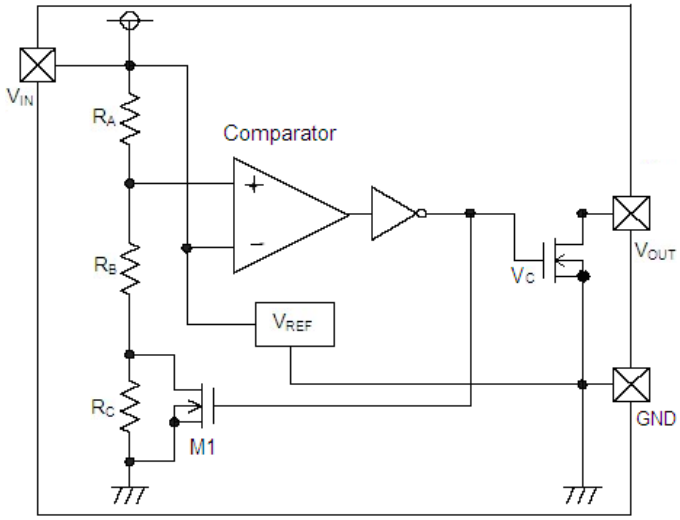
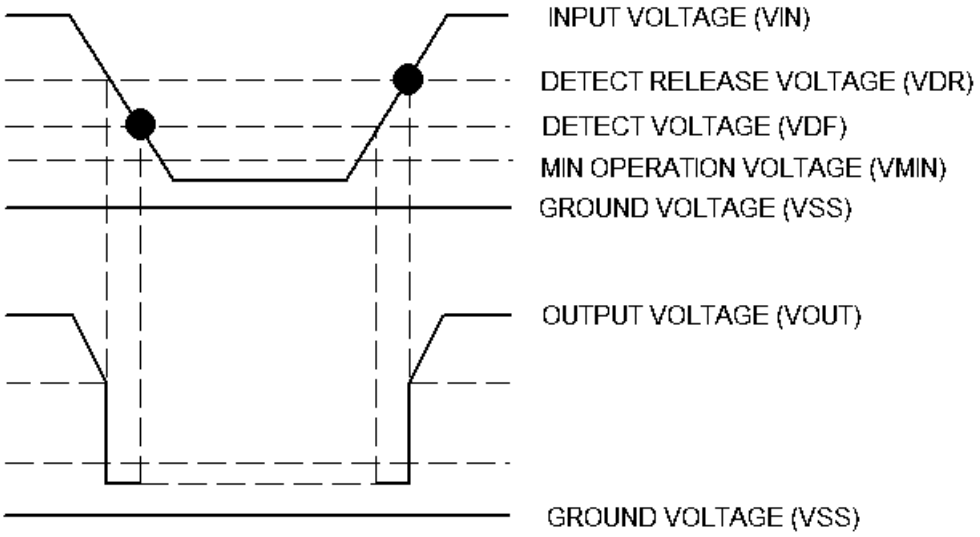


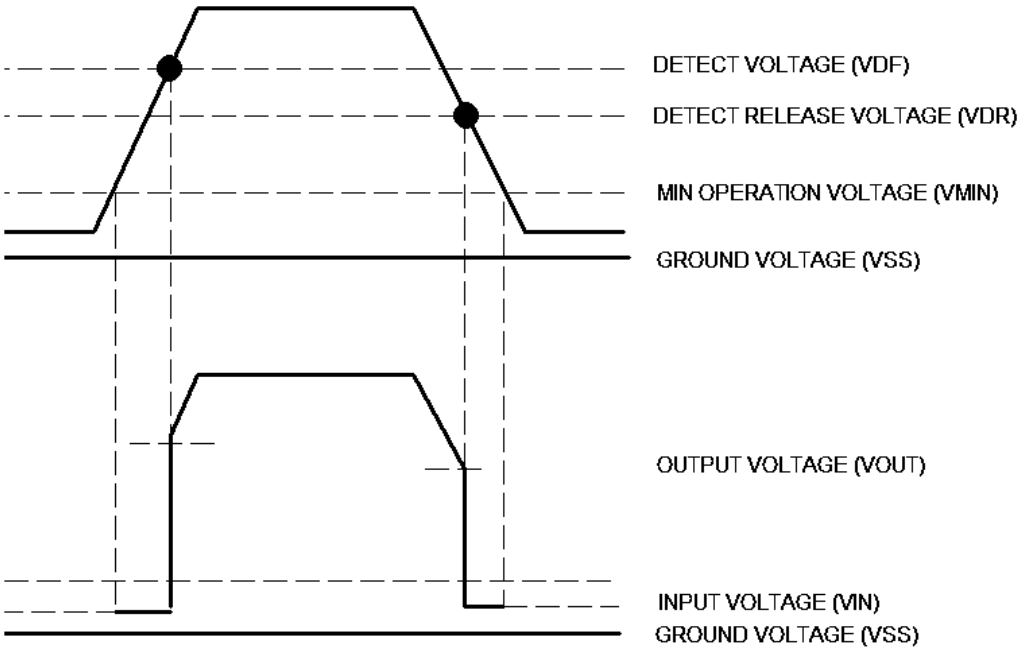
Fig.1 NMOS output voltage detector (ME2808)

Timing Chart

ME2808A:

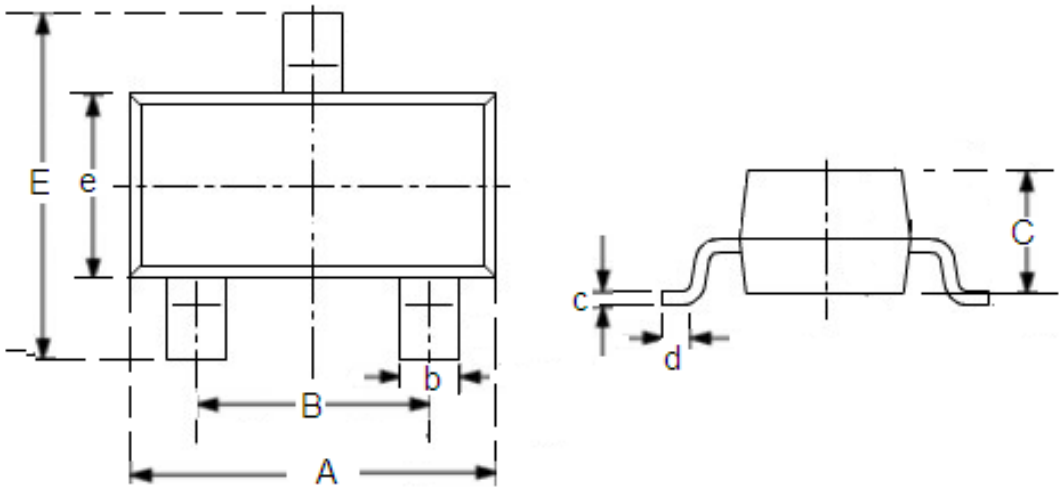


ME2808B:



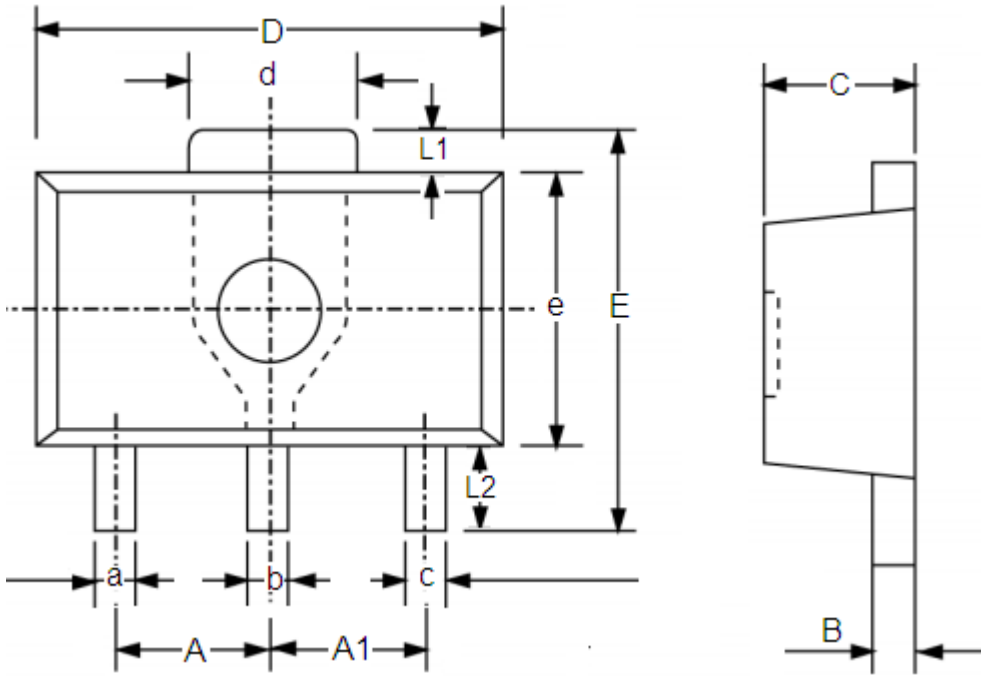
Packaging Information

- SOT23-3



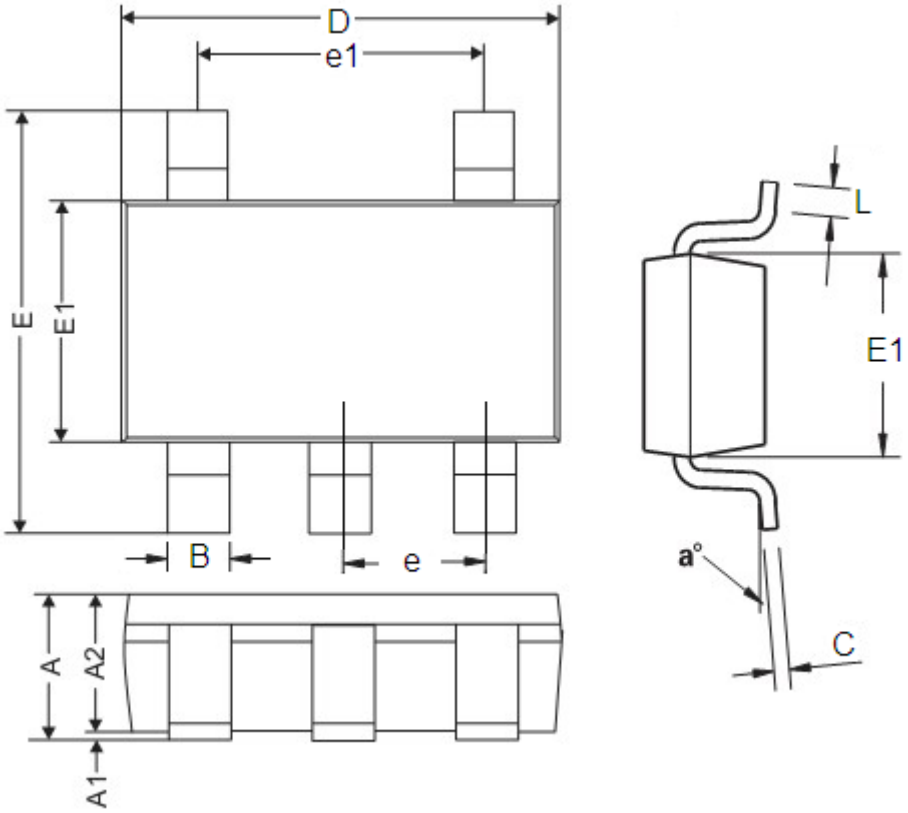
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.6	3.0	0.1023	0.1181
e	1.5	1.8	0.059	0.0708

● SOT89-3



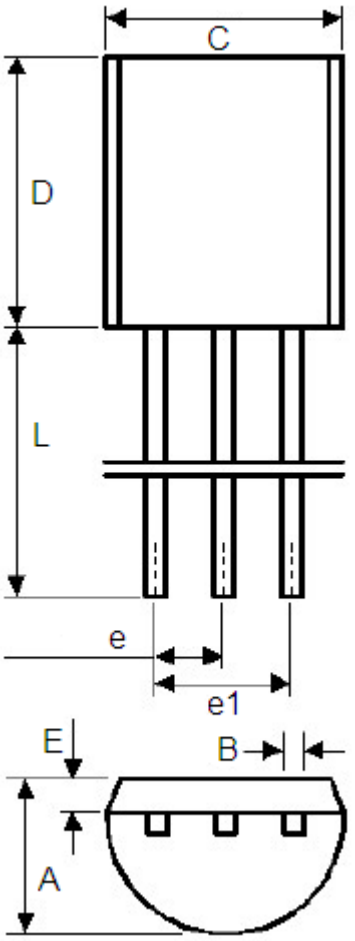
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945	0.1023
L1	0.4	-	0.0157	-
L2	0.8	-	0.0315	-

● SOT23-5



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.9	1.45	0.0354	0.0570
A1	0	0.15	0	0.0059
A2	0.9	1.3	0.0354	0.0511
B	0.2	0.5	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.7	3.10	0.1062	0.1220
E	2.2	3.2	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
e	0.95REF		0.0374REF	
e1	1.90REF		0.0748REF	
L	0.10	0.60	0.0039	0.0236
a^0	0^0	30^0	0^0	30^0

● TO-92



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	3.4	3.8	0.13386	0.1496
B	0.3	0.5	0.0118	0.0197
C	4.4	4.8	0.1732	0.189
D	4.4	4.8	0.1732	0.189
E	0.9	1.5	0.0354	0.059
e	1.17	1.37	0.046	0.0539
e1	2.39	2.69	0.094	0.1059
L	12	16	0.4724	0.6299

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