Voltage Detectors , ME2803 Series

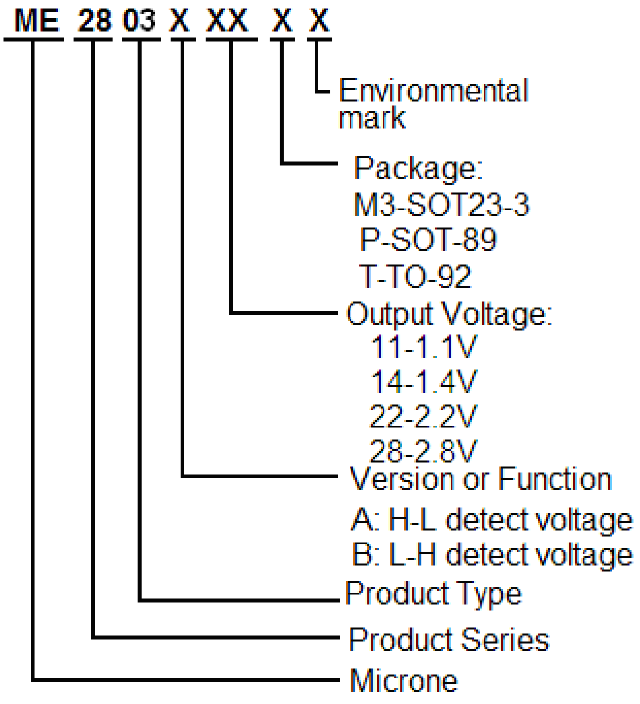
General Description

ME2803 Series are highly precise, low power consumption voltage detectors, manufactured using CMOS technologies. Detect voltage is extremely accurate with minimal temperature drift. CMOS output configurations are available.

Features

- Highly accuracy： ±1% (-VDET=2.2V 以上)
- Low power consumption：
  TYP 0.7uA (VIN=3.5V, -VDET=2.2V)
- Detect voltage range：1.0V~6.5V in 0.1V increments
- Operating voltage range：0.7V~7V
- Detect voltage temperature characteristics：
  TYP±100ppm/℃
- Output configuration： CMOS

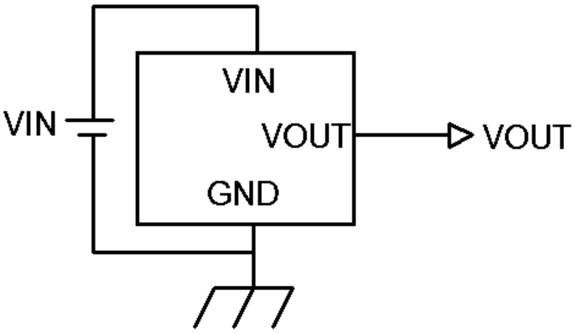
Selection Guide



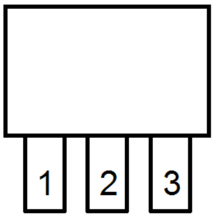
Typical Application

- Microprocessor reset circuitry
- Memory battery back-up circuits
- Power-on reset circuits
- Power failure detection

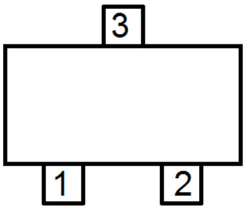
Typical Application Circuit



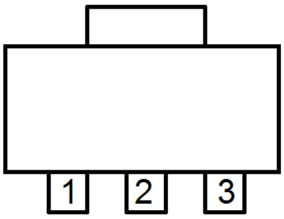
Pin Configuration



TO-92



SOT-23-3



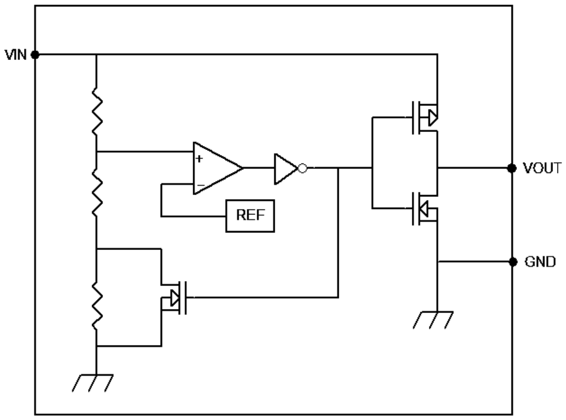
SOT-89-3

Pin Assignment

ME2803XX

Pin Number			Pin Name	Functions
SOT-23-3	SOT-89-3	TO-92		
2	3	3	GND	Ground
1	1	1	VOUT	Output Voltage
3	2	2	VIN	Input Voltage

Block Diagram



Absolute Maximum Ratings

PARAMETER		SYMBAL	RATINGS	UNITS
V_{IN} Input Voltage		V_{IN}	8	V
Output Current		I_{OUT}	50	mA
Output Voltage	CMOS	V_{OUT}	GND-0.3~V_{IN}+0.3	V
Continuous Total Power Dissipation	SOT-23-3	Pd	300	mW
	SOT-89-3		500	
	TO-92		500	
Operating Ambient Temperature		T_{Opr}	-40~+85	℃
Storage Temperature		T_{stg}	-40~+125	℃
Soldering temperature and time		T_{solder}	260℃, 10s	
ESD		MM	400	V
		HBM	4000	V

Electrical Characteristics

(-V_{DET}(S)=1.0V to 6.5V±1% ,Ta=25^{O}C ,unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Units
Detect Voltage	-VDET	-VDET（S）≦2.2V	-VDET（S）×0.98	-VDET(S)	-VDET(S) ×1.02	V
		-VDET（S）>2.2V	-VDET（S）×0.99	-VDET(S)	-VDET(S) ×1.01	
Hysteresis Range	VHYS	-	0.03	0.06	0.1	V
Supply Current	ISS	VIN=2V (1.0V-1.5V)	-	0.7	1	uA
		VIN =3.5V (1.6V-2.5V)	-	0.7	1	
		VIN=4.5V (2.6V-3.9V)		1.2	2	
		VIN =6V (4.0V-5.6V)	-	1.1	2	
		VIN=7V (5.7V-6.5V)		1	2	
Output Current	Iout N-ch	VDS=0.5V VIN =0.7V	0.01	0.14	--	mA
	Iout P-ch	VDS=0.5V VIN =7V	1.7	3.4	--	mA
Operating voltage	VIN	-	0.7	-	7	V
Responding time	tpLH				60	us
Temperature characteristics	$\frac{\Delta -VDET}{\Delta Ta \bullet -VDET}$	ΔTa=-40℃ ~ 85℃	-	±100	±350	ppm/℃

Note： 1、-VDET(S) ：Specified Detection Voltage value
2、-VDET ：Actual Detection Voltage value
3、Release Voltage：+VDET=-VDET+VHYS

Functional Description：

1、 When input voltage (V_{IN}) rises above detect voltage (–VDET), output voltage (V_{OUT}) will be equal to V_{IN}.

2、 When input voltage (V_{IN}) falls below detect voltage (–VDET), output voltage (V_{OUT}) will be equal to the ground voltage (GND) level.

3、 When input voltage (V_{IN}) falls to a level below that of the minimum operating voltage (V_{MIN}), output will become unstable. In this condition, V_{IN} will equal the pulled-up output (should output be pulled-up.)

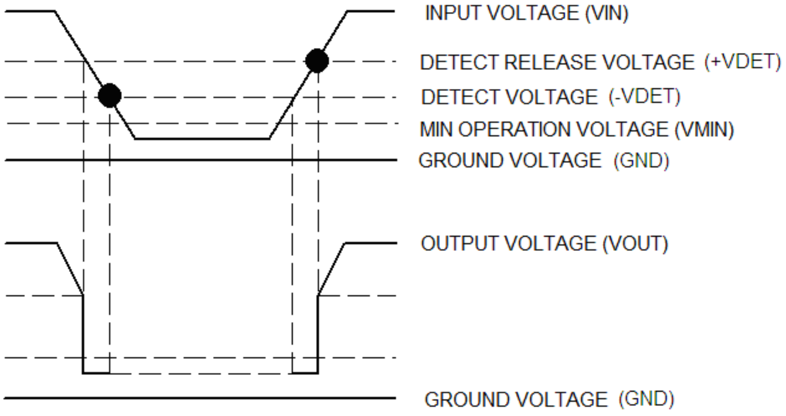
4、 When input voltage (V_{IN}) rises above the ground voltage (GND) level, output will be unstable at levels below the minimum operating voltage (V_{MIN}). Between the VMIN and detect release voltage +VDET) levels, the ground voltage (GND) level will be maintained.

5、 When input voltage (V_{IN}) rises above detect release voltage (+VDET), output voltage (V_{OUT}) will be equal to V_{IN}.

6、 The difference between +VDET and –VDET represents the hysteresis range.

Timing Chart：

ME2803XX:



Directions for use：

1、 Please use this IC within the stated maximum ratings. Operation beyond these limits may cause degrading or permanent damage to the device.

2、When a resistor is connected between the V_{IN} pin and the input with CMOS output configurations, oscillation may occur as a result of voltage drops at R_{IN} if load current(I_{OUT}) exists.(refer to the Oscillation Description(1) below)

3、When a resistor is connected between the V_{IN} pin and the input with CMOS output configurations, oscillation may occur as a result of through current at the time of voltage release even if load current(I_{OUT}) does not exist. (refer to the Oscillation Description(2) below)

4、With a resistor connected between the V_{IN} and the input, detect and release voltage will rise as a result of the IC's supply current flowing through the V_{IN} pin.

5、In order to stabilize the IC's operations, please ensure that V_{IN} pin's input frequency's rise and fall times are more than several u Sec/V.

Oscillation Description：

1、Output current oscillation with the CMOS output configuration

When the voltage applied at IN rises, release operations commence and the detector's output voltage increase. Load current (I_{OUT}) will flow at R_L. Because a voltage drop ($R_{IN}*I_{OUT}$) is produces at the R_{IN} resistor, located between the input (IN) and the V_{IN} pin. The load current will flow via the IC's pin. The voltage drop will also lead to a fall in the voltage level at the V_{IN} pin. When the V_{IN} pin voltage level falls below the detect voltage level, detect operations will commence. Fllowing detect operations, load current flow will cease and since voltage drop at R_{IN} will disapper, the voltage level at the V_{IN} pin will rise and release operations will begin over again. Oscillation may occur with this "release-detect-release" repetition. Further, this condition will also appear via means of a similar mechanism during detect operations.

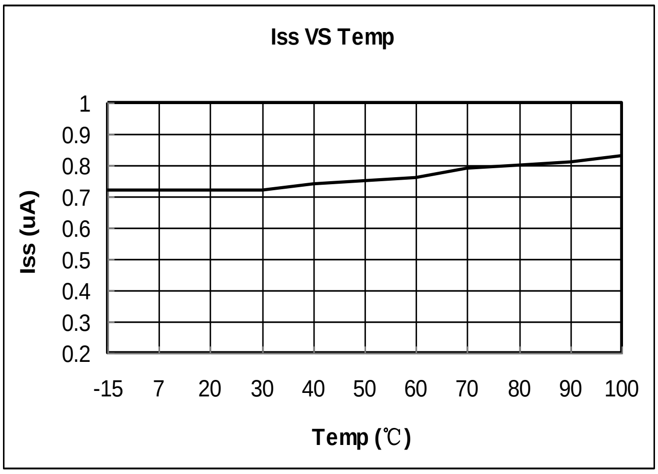
2、Oscillation as a result of through current

Since the ME2803 series are CMOS IC's, through current will flow when the IC's internal circuit switching operates (during release and detect operations). Consequently, oscillation is liable to occur as a result of drops in voltage at the through current's resistor (R_{IN}) during release voltage operations.(refer to diagram 2) since hysteresis exists during detect operations, oscillation is unlikely to occur.

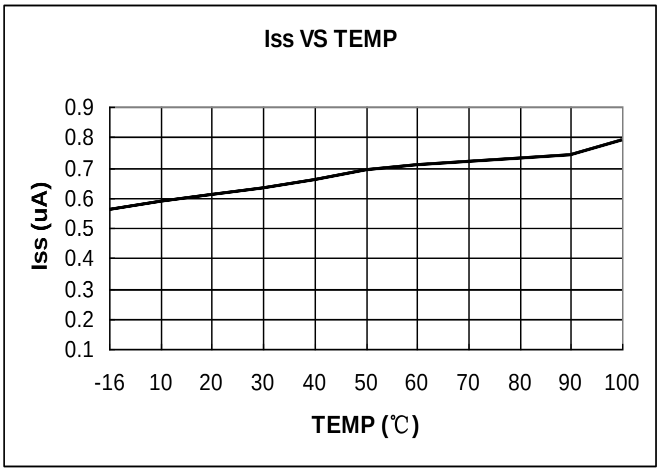
Type Characteristics

1、SUPPLY CURRENT VS. AMBIENT TEMPERATURE

VIN=2V,-VDET=1.1V

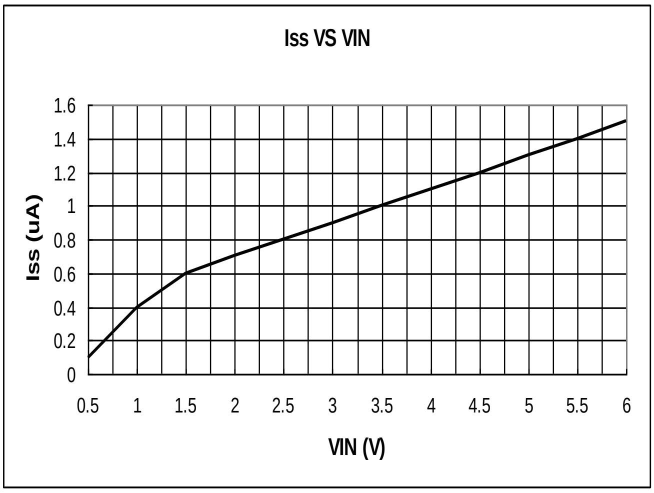


VIN=3V,-VDET=2.2V

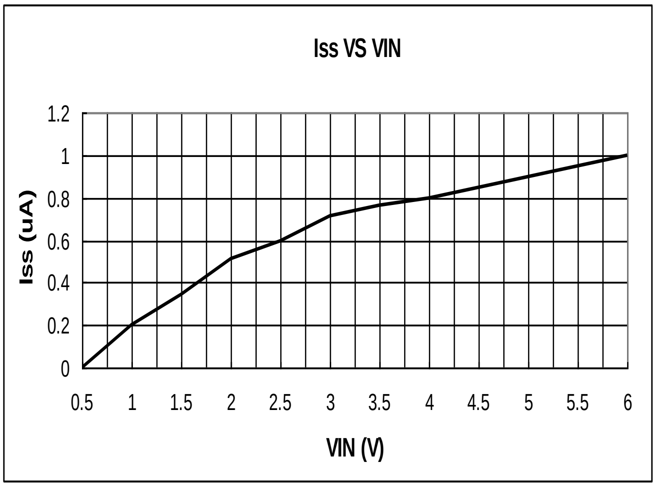


2、SUPPLY CURRENT VS. INPUT VOLTAGE

-VDET=1.1V （T=25℃）

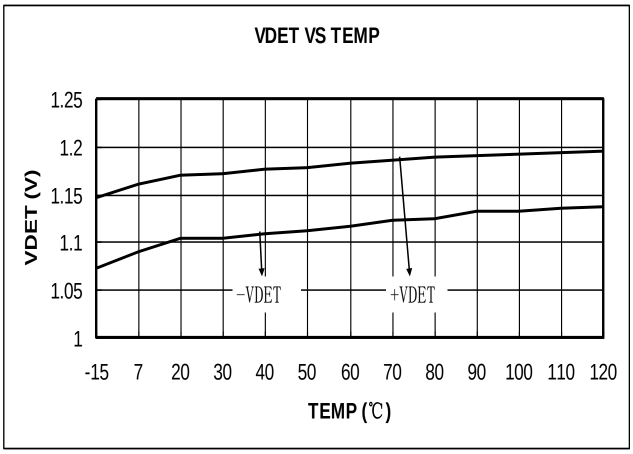


-VDET=2.2V （T=25℃）

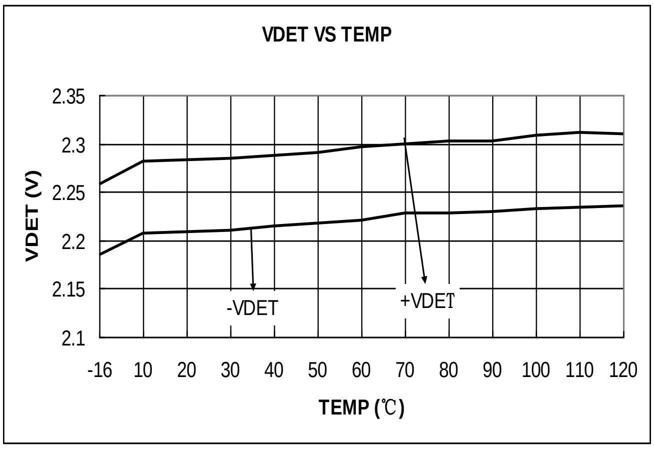


3、DETECT,RELEASE VOLTAGE VS. AMBIENT TEMPERATURE

-VDET=1.1V

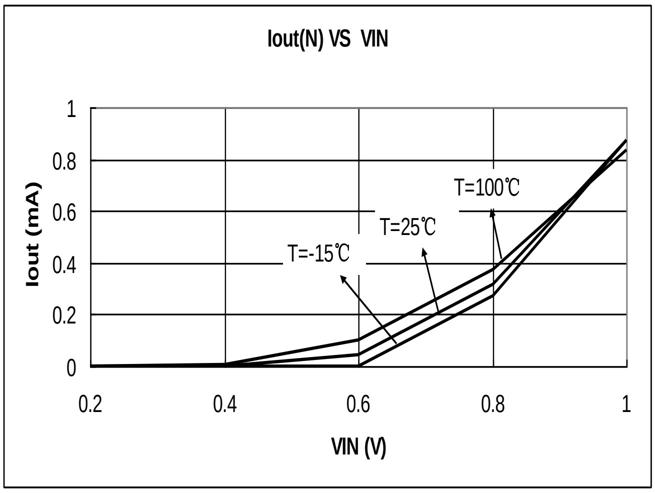


-VDET=2.2V

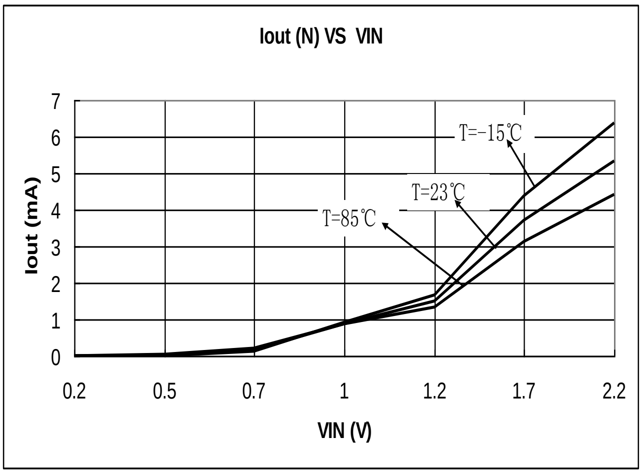


4、 N-ch OUTPUT CURRENT VS. INPUT VOLTAGE

VDS=0.5V -VDET=1.1V

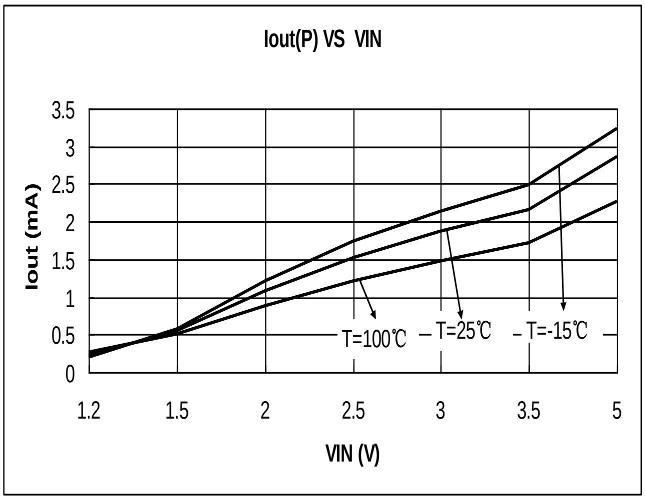


VDS=0.5V -VDET=2.2V

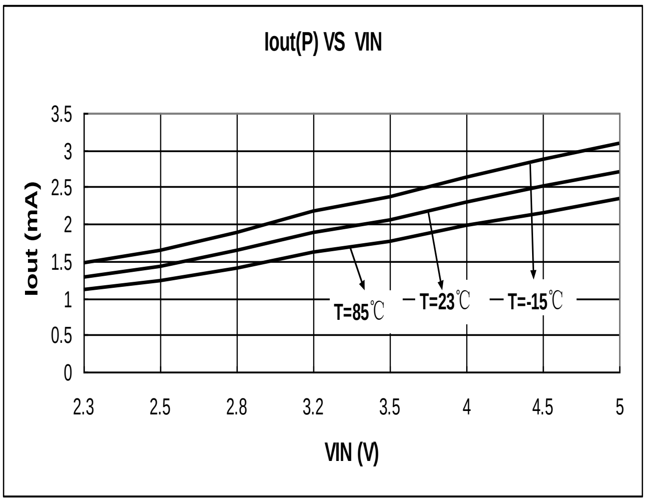


5、P-ch OUTPUT CURRENT VS. INPUT VOLTAGE

VDS=0.5V -VDET=1.1V

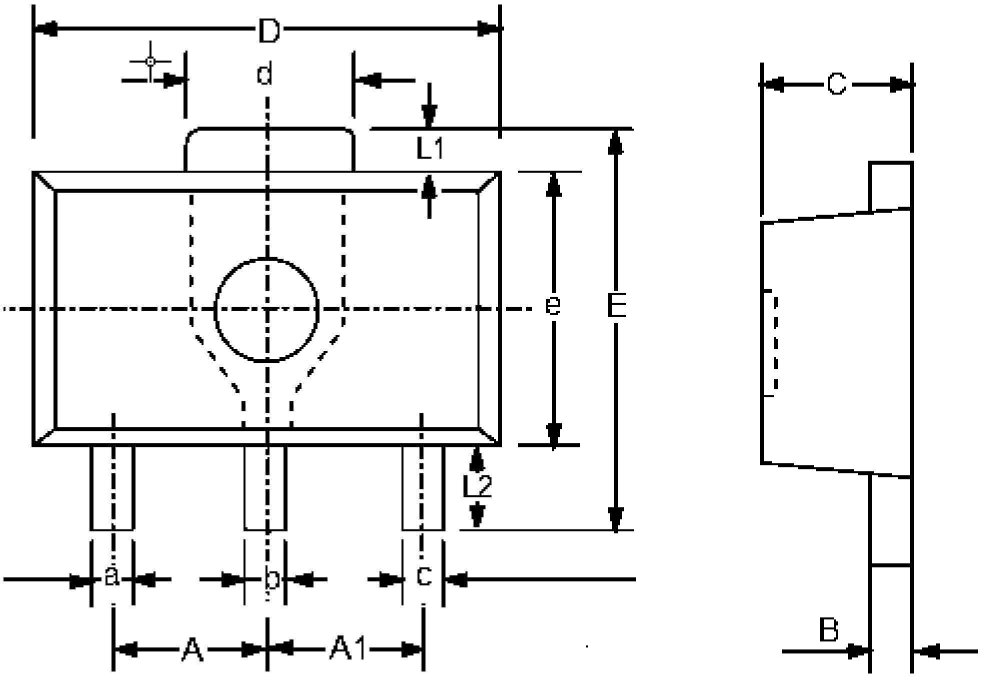


VDS=0.5V -VDET=2.2V



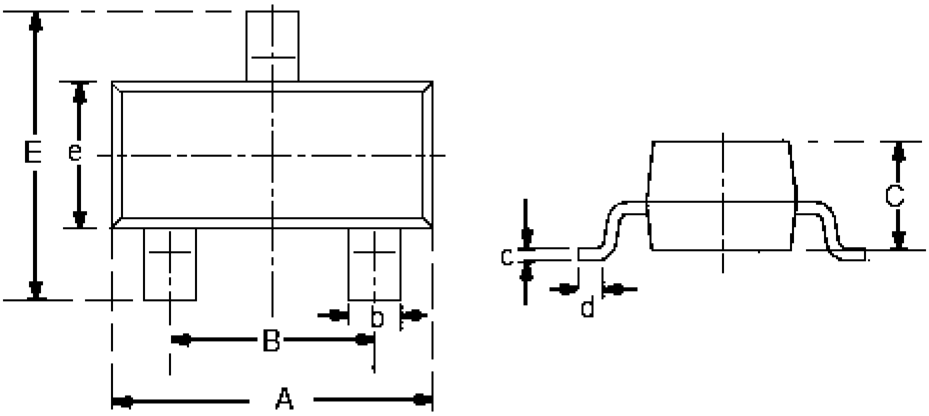
Package Information

·SOT-89-3



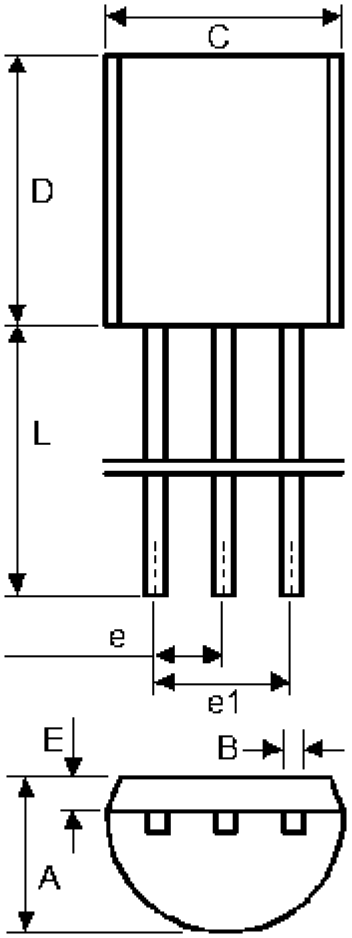
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945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

- **SOT-23-3**



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

- **TO-92**



	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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