

Voltage Detectors , ME2804 Series

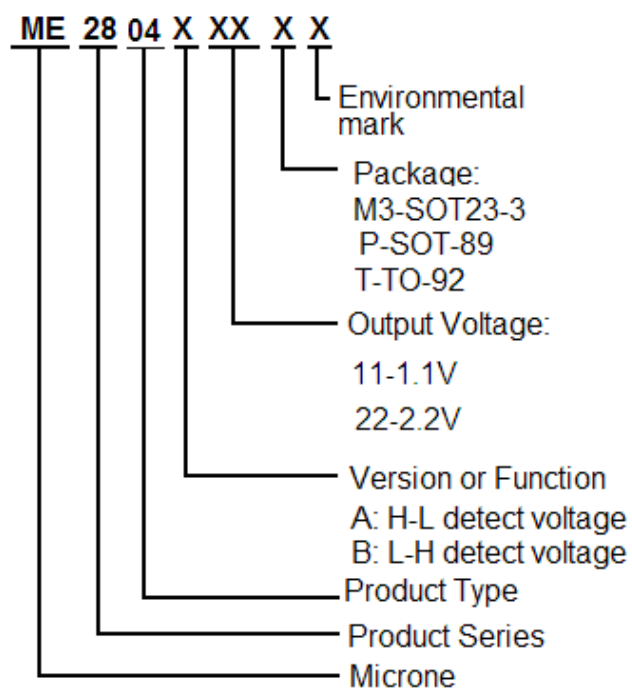
General Description

ME2804 Series are highly precise, low power consumption voltage detectors, manufactured using NMOS technologies. Detect voltage is extremely accurate with minimal temperature drift. NMOS output configurations are available.

Features

- Highly accuracy: $\pm 1\%$ ($-V_{DET}=2.2V$ 以上)
- Low power consumption:
TYP 0.7 μA ($V_{IN}=3.5V$, $-V_{DET}=2.2V$)
- Detect voltage range: 1.0V~6.5V in 0.1V increments
- Operating voltage range: 0.7V~7V
- Detect voltage temperature characteristics:
TYP $\pm 100ppm/^{\circ}C$
- Output configuration: NMOS

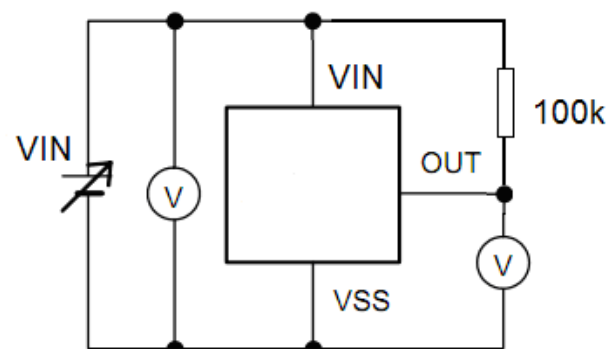
Selection Guide



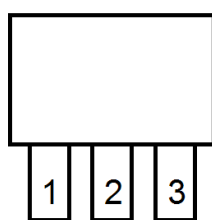
Typical Application

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

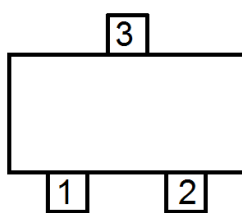
Typical Application Circuit



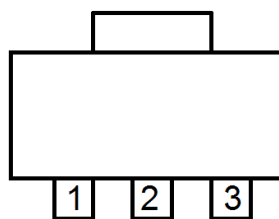
Pin Configuration



TO-92



SOT-23-3



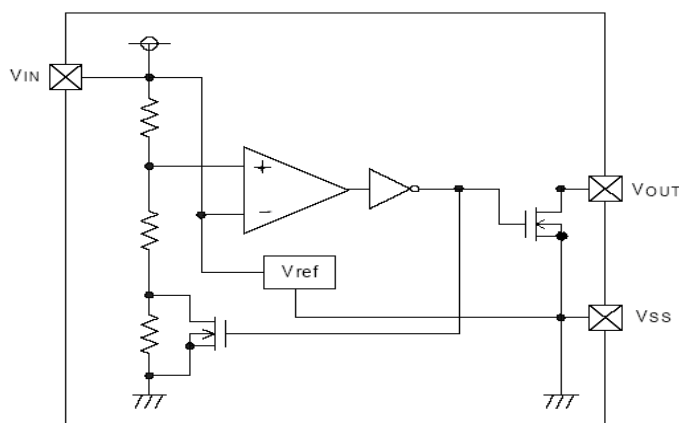
SOT-89-3

Pin Assignment

ME2804XX

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

Block Diagram



Absolute Maximum Ratings

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

Electrical Characteristics

($-V_{DET}(S)=1.0V$ to $6.5V$, $T_a=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Units
Detect Voltage	-VDET	$-V_{DET}(S) \leq 2.2V$	$-V_{DET}(S) \times 0.98$	-VDET(S)	$-V_{DET}(S) \times 1.02$	V
		$-V_{DET}(S) > 2.2V$	$-V_{DET}(S) \times 0.99$	-VDET(S)	$-V_{DET}(S) \times 1.01$	
Hysteresis Range	VHYS	-	0.03	0.06	0.1	V
Supply Current	ISS	$V_{IN}=2V$ (1.0V-1.5V)		0.7	1	μA
		$V_{IN}=3.5V$ (1.6V-2.5V)		0.7	1	
		$V_{IN}=4.5V$ (2.6V-3.9V)		1.2	2	
		$V_{IN}=6V$ (4.0V-5.6V)		1.1	2	
		$V_{IN}=7V$ (5.7V-6.5V)		1	2	
Output Current	Iout N-ch	$V_{DS}=0.5V$ $V_{IN}=0.7V$	0.01	0.14	--	mA
Operating voltage	VIN	-	0.7	-	7	V
Responding time	tpLH				60	μs
Temperature characteristics	$\frac{\Delta -V_{DET}}{\Delta T_a \bullet -V_{DET}}$	$\Delta T_a = -40^{\circ}C \sim 85^{\circ}C$	-	± 100	± 350	ppm/ $^{\circ}C$

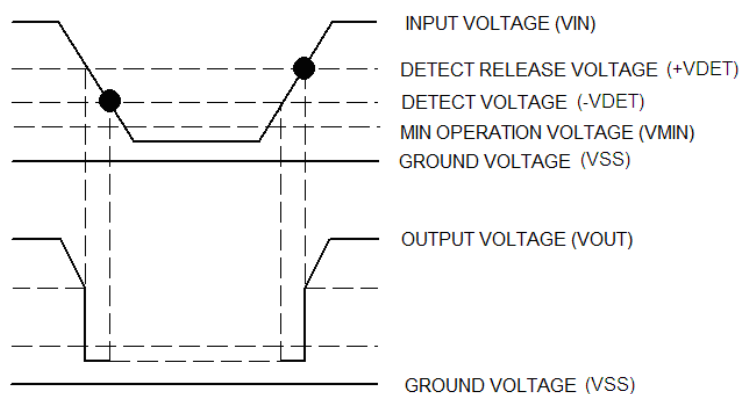
Note: 1、-VDET(S) : Specified Detection Voltage value
2、-VDET : Actual Detection Voltage value
3、Release Voltage: +VDET=-VDET+VHYS

Functional Description:

- When input voltage (V_{IN}) rises above detect voltage ($-V_{DET}$), output voltage (V_{OUT}) will be equal to V_{IN} .
- When input voltage (V_{IN}) falls below detect voltage ($-V_{DET}$), output voltage (V_{OUT}) will be equal to the ground voltage (V_{SS}) level.
- 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.)
- When input voltage (V_{IN}) rises above the ground voltage (V_{SS}) level, output will be unstable at levels below the minimum operating voltage (V_{MIN}). Between the V_{MIN} and detect release voltage (+VDET) levels, the ground voltage (V_{SS}) level will be maintained.
- When input voltage (V_{IN}) rises above detect release voltage (+VDET), output voltage (V_{OUT}) will be equal to V_{IN} .
- The difference between +VDET and $-V_{DET}$ represents the hysteresis range.

Timing Chart:

ME2804AXX:



Directions for use:

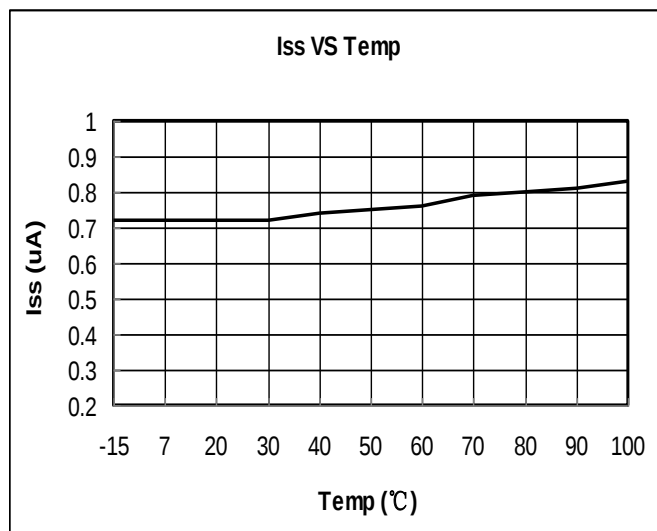
Notes on Use

- 1、 Please use this IC within the stated maximum ratings. Operation beyond these limits may cause degrading or permanent damage to the device.
- 2、 In order to stabilize the IC's operations, please ensure that VIN pin's input frequency's rise and fall times are more than several $\mu\text{Sec/V}$.

Type Characteristics

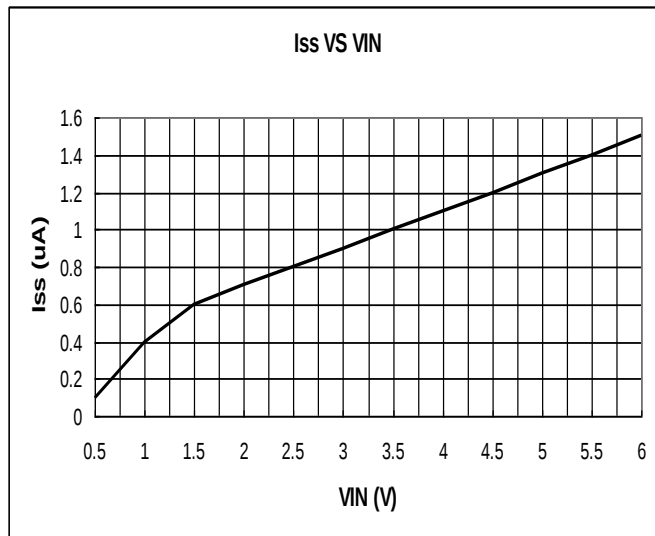
1、SUPPLY CURRENT VS. AMBIENT TEMPERATURE

$V_{IN}=2V, -V_{DET}=1.1V$



2、SUPPLY CURRENT VS. INPUT VOLTAGE

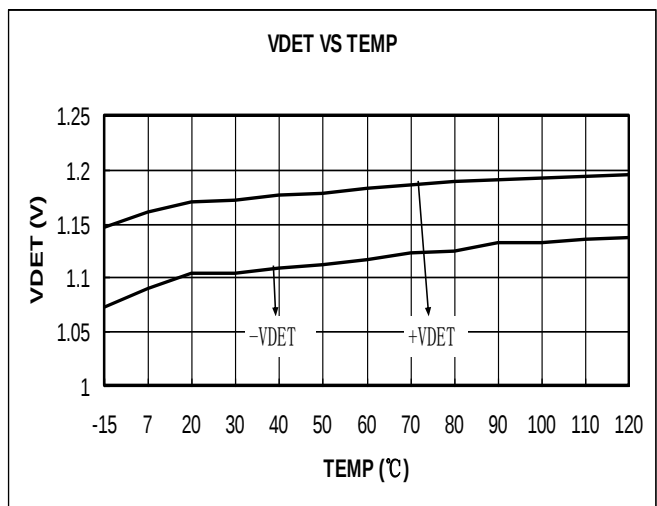
$-V_{DET}=1.1V$ ($T=25^{\circ}C$)



3、DETECT, RELEASE VOLTAGE

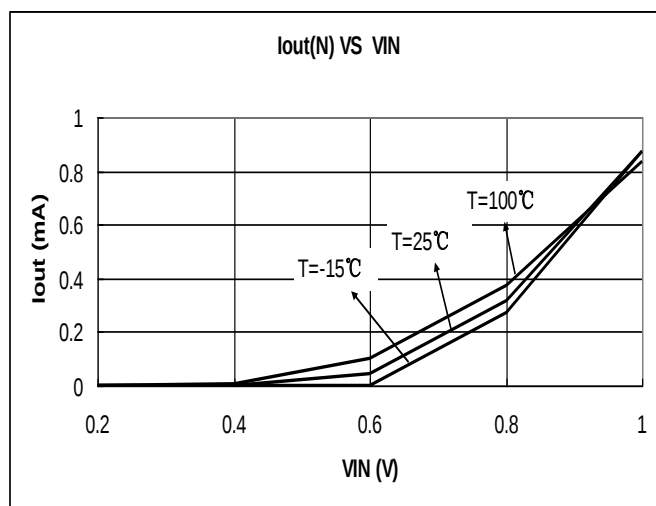
VS. AMBIENT TEMPERATURE

$-V_{DET}=1.1V$



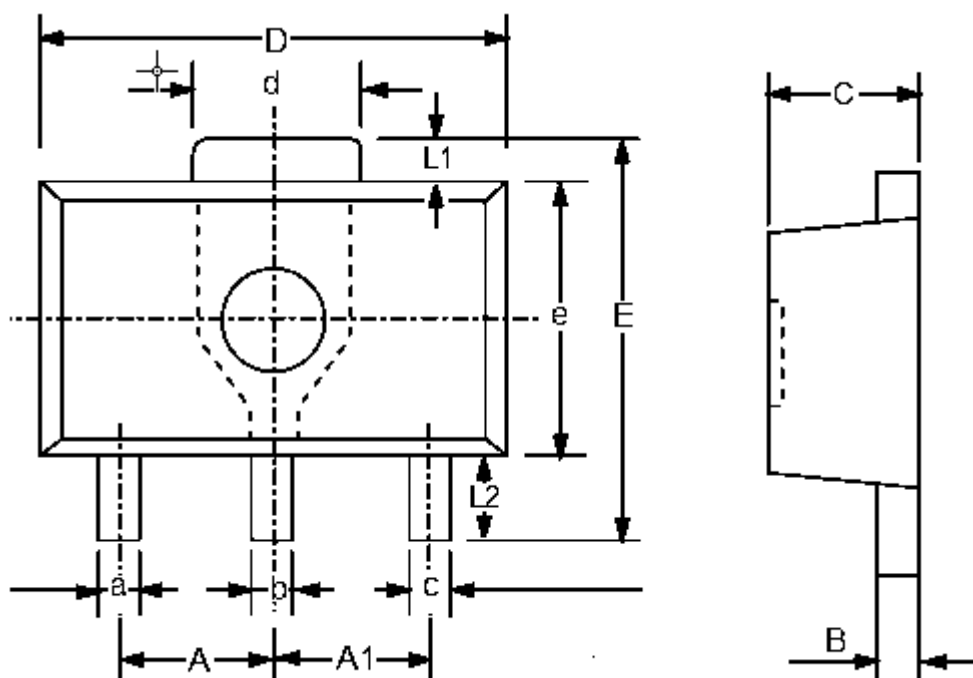
4、N-ch OUTPUT CURRENT VS. INPUT VOLTAGE

$V_{DS}=0.5V$ $-V_{DET}=1.1V$



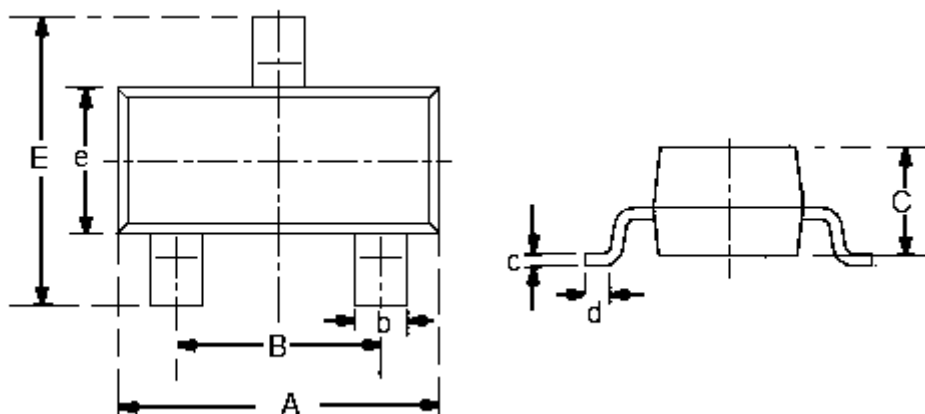
Package Information

• SOT-89-3



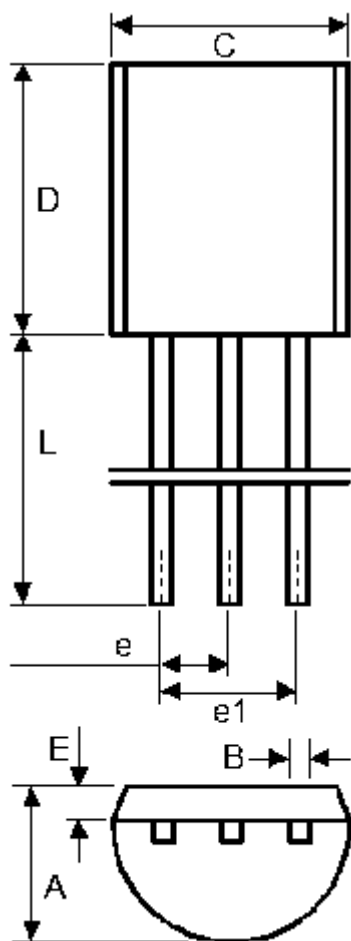
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945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