Voltage Detectors , ME2807 Series

General Description

ME2807 Series are a set of three-terminal low power voltage detectors implemented in CMOS 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. CMOS 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： CMOS

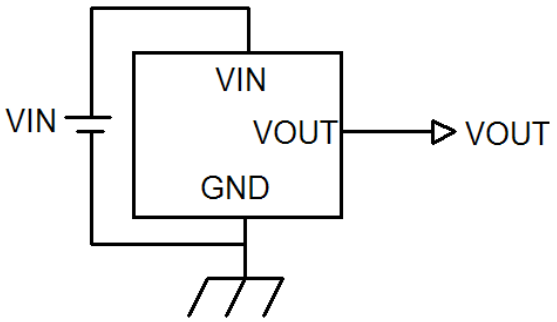
Typical Application

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

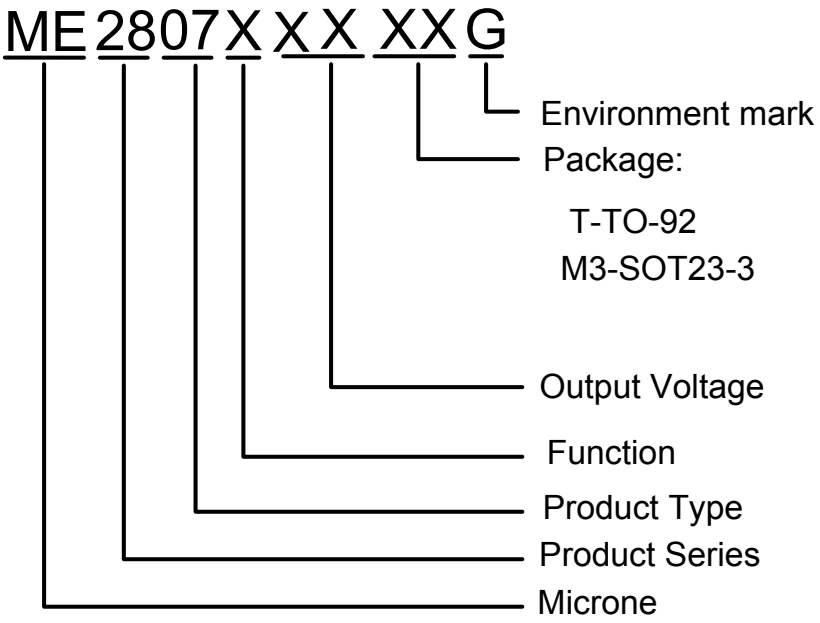
Package

●3-pin SOT23-3、TO-92

Typical Application Circuit



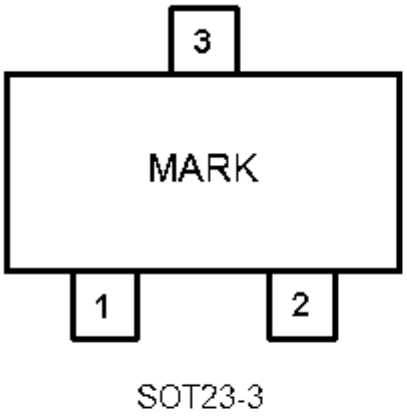
Selection Guide



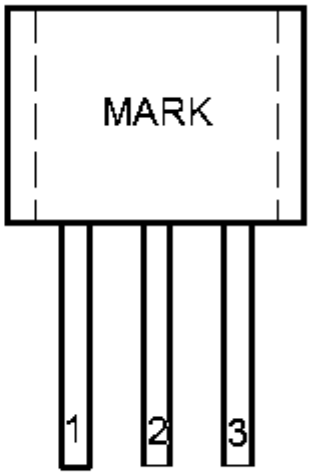
product series	product description
ME2807A22M3G	V_{OUT} =2.2V；Rising edge detection；Package：SOT23-3
ME2807A33M3G	V_{OUT} =3.3V；Rising edge detection；Package：SOT23-3
ME2807A22TG	V_{OUT} =2.2V；Rising edge detection；Package：TO-92
ME2807B33M3G	V_{OUT} =3.3V；Falling edge detection；Package：SOT23-3

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

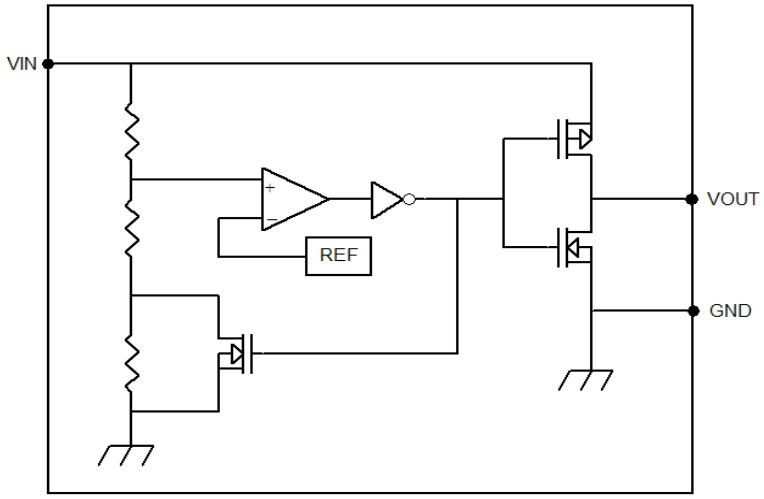


TO-92

Pin Assignment

Pin Number		Pin Name	Functions
SOT-23-3	TO-92		
2	3	GND	Ground
1	1	V_{OUT}	Output Voltage
3	2	V_{IN}	Input Voltage

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	CMOS	V_{OUT}	GND-0.3~ V_{IN} +0.3	V
Continuous Total Power Dissipation	SOT23-3	P_D	300	mW
	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	4	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	7	
		V_{DET} =4.7V~7.0V	V_{IN} =6.0V	-	2.5	7	
V_{IN}	Operating Voltage	V_{DET} =2.0V to 7.0V		0.7	-	18	V
I_{OL}	Output Sink Current	V_{DET}=2.2V	V_{IN} =2V V_{OUT}=0.2V	0.5	1		mA
		V_{DET}=2.4V					
		V_{DET}=2.7V					
I_{OH}	Output Source Current	V_{DET}=2.2V	V_{IN} =2.5V V_{OUT} =2.2V	-0.3	-0.5		mA
		V_{DET}=2.4V	V_{IN} =3V V_{OUT} =2.7V	-0.3	-0.5		
		V_{DET}=2.7V	V_{IN} =3.2V V_{OUT} =2.9V	-0.3	-0.5		
ΔVDET/ΔTA	Temperature characteristics	0℃≤Topr≤70℃			±0.9		mV/℃

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

2、VDF ： Actual Detection Voltage value

3、Release Voltage：VDR=VDF+VHYS (ME2807A series)

VDR=VDF-VHYS (ME2807B series)

Functional Description

The ME2807 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:

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

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

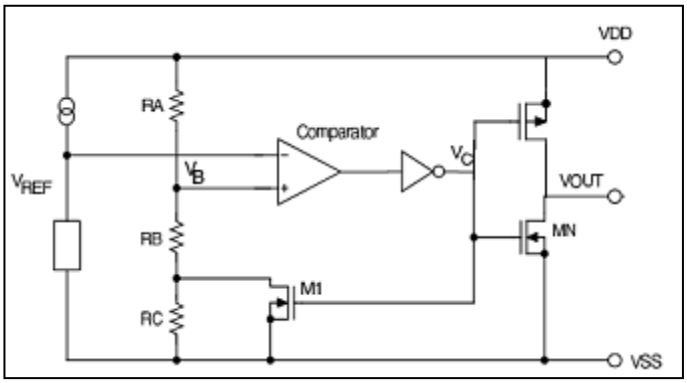
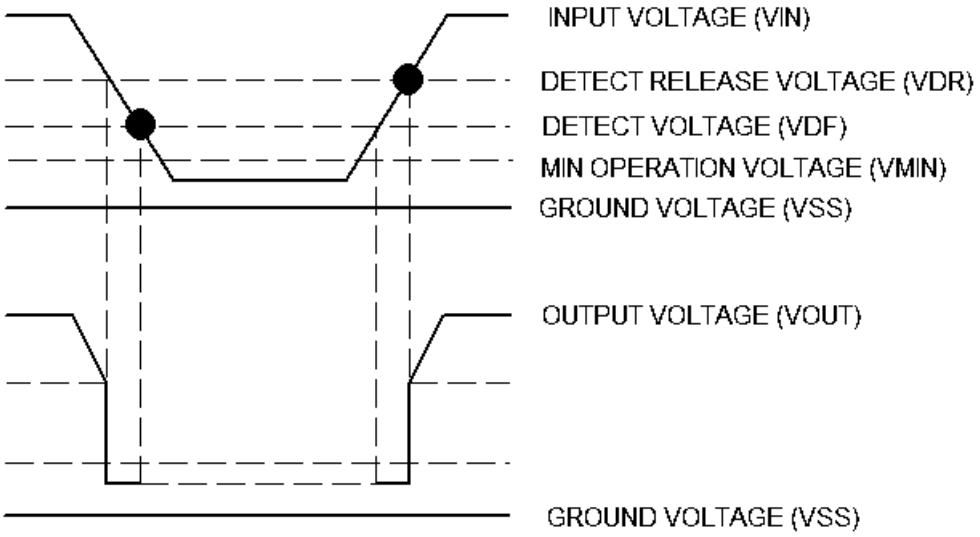


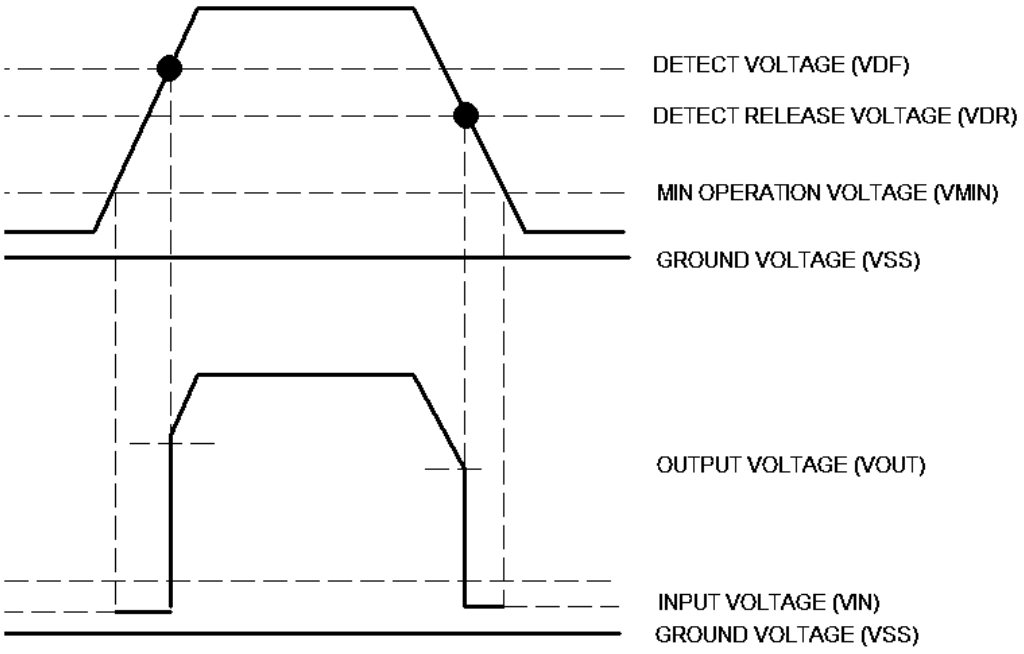
Fig.1 CMOS output voltage detector (ME2807)

Timing Chart

ME2807A:

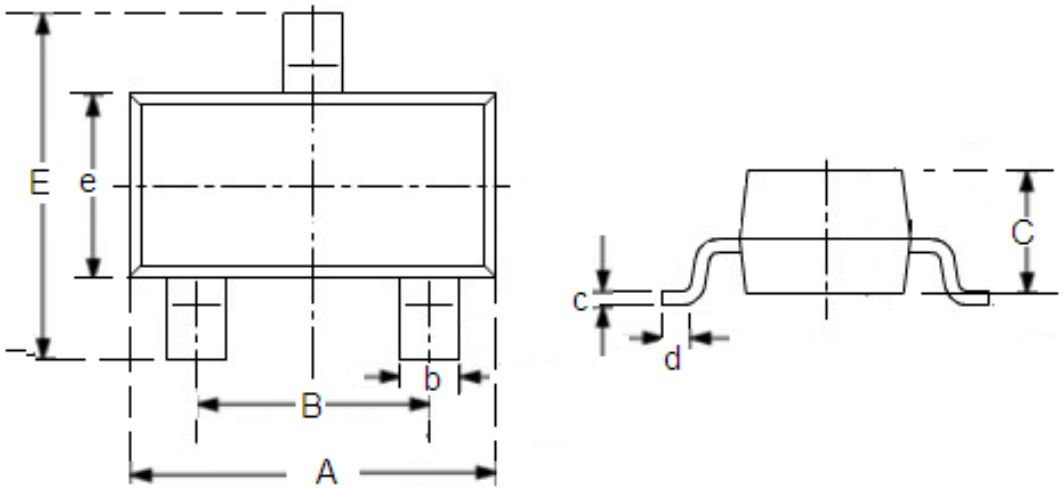


ME2807B:



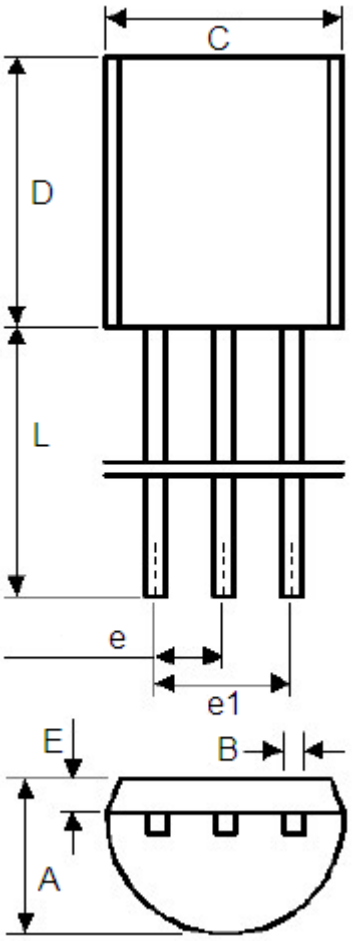
Packaging Information

● 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

● 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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