Voltage Detectors , ME2807 Series

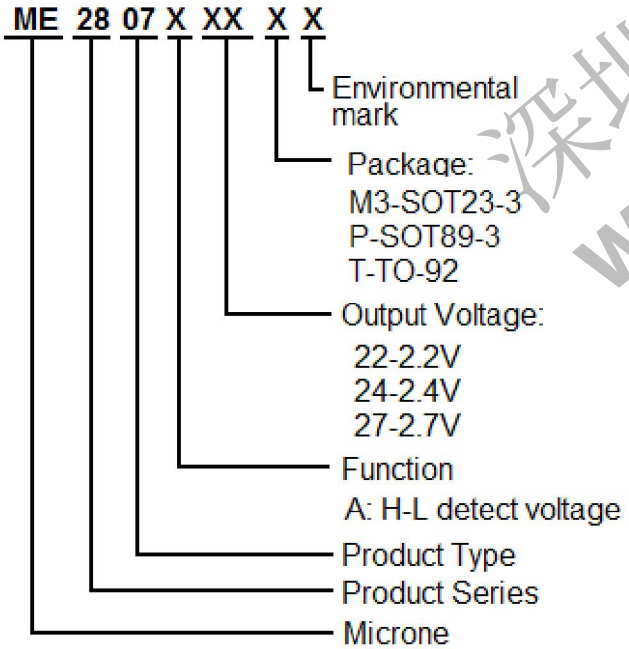
General Description

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 7.5V. 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~7.5V in 0.1V increments
- Operating voltage range：1.5V~18V
- Detect voltage temperature characteristics：TYP±0.9mV/℃
- Output configuration： CMOS
- Package： SOT-23-3，SOT-89-3，TO-92

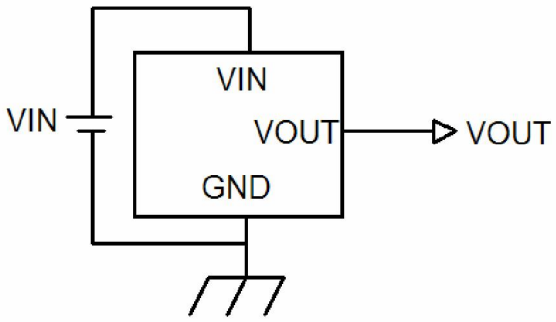
Selection Guide



Typical Application

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

Typical Application Circuit



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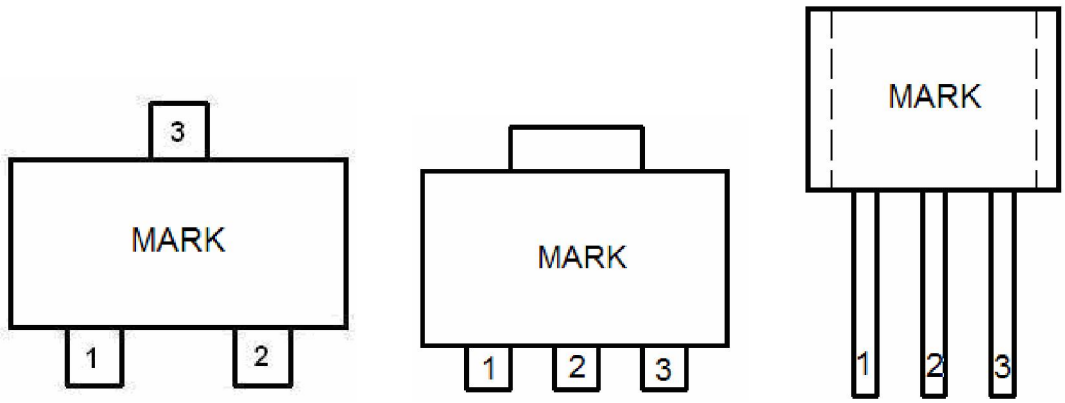
Pin Configuration



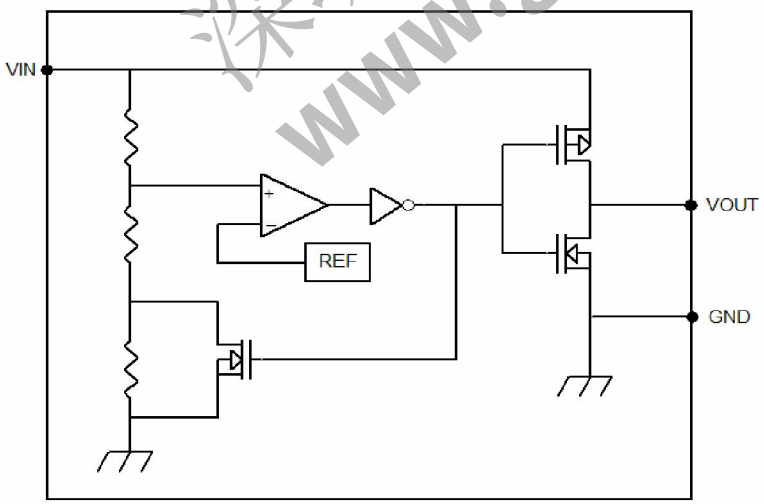
SOT23-3 **SOT89-3** **TO-92**

Pin Assignment

ME2807

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



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Absolute Maximum Ratings

PARAMETER		SYMBAL	RATINGS	UNITS
V_{IN} Input Voltage		V_{IN}	18	V
Output Current		Iout	50	mA
Output Voltage	CMOS	Vout	Vss-0.3~Vin+0.3	V
Continuous Total Power Dissipation	SOT23-3	Pd	300	mW
	SOT89-3		500	
	TO-92		500	
Operating Ambient Temperature		T_{Opr}	0~+70	℃
Storage Temperature		T_{stg}	-50~+125	℃
Soldering temperature and time		T_{solder}	260℃, 10s	

Electrical Characteristics

(V_{DET} =2.0V to 7.5V ,Ta=25^{O}C ,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_{DD}	Operating Current	V_{DET}=2.0V~ 2.8V	Vin=3.0V	-	1.8	4	uA
		V_{DET} =2.8V~ 3.6V	Vin=4.0V	-	1.8	4	
		V_{DET} =3.6V ~ 4.6V	Vin=5.0V	-	2.1	7	
		V_{DET} =4.6V~ 5.8V	Vin=6.0V	-	2.5	7	
		V_{DET} =5.8V~ 7.5V	Vin=8.0V	-	3	7	
V_{DD}	Operating Voltage	V_{DET} =2.0V to 7.5V		0.7	-	18	V
I_{OL}	Output Sink Current	V_{DET}=2.2V	V_{DD}=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_{DD}=2.5V V_{OUT} =2.2V	-0.3	-0.5		mA
		V_{DET}=2.4V	V_{DD}=3V V_{OUT} =2.7V	-0.3	-0.5		
		V_{DET}=2.7V	V_{DD}=3.2V V_{OUT} =2.9V	-0.3	-0.5		
ΔVDET/ΔTA	Temperature characteristics	0℃≤Topr≤70℃			±0.9		mV/°C

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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}, VOUT goes high, M1 turns off, and VB is ex-pressed as VBH=VDD×(RB+RC)/(RA+RB+RC).If VDD is decreased so that VB falls to a value that is less than V_{REF}, the comparator output inverts (from high to low), VOUT goes low, V_C is high, M1 turns on, RC is bypassed, and V_B becomes: V_{BL}=VDD×RB/(RA+RB), 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 VDD falls bellow the minimum operating voltage, the output becomes undefined. When VDD goes from low to VDD×RB/(RA+RB) >V_{REF}, the comparator output goes high and VOUT goes high again.The detection voltage is as defined:

$$V_{DET(-)}=(RA+RB+RC)\times V_{REF}/(RB+RC)$$

The release voltage is as defined:

$$V_{DET(+)}=(RA+RB)\times V_{REF}/RB$$

The hysteresis width is:

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

Figure 1 demonstrates the CMOS output type with positive output polarity (VOUT is normally high, active low).

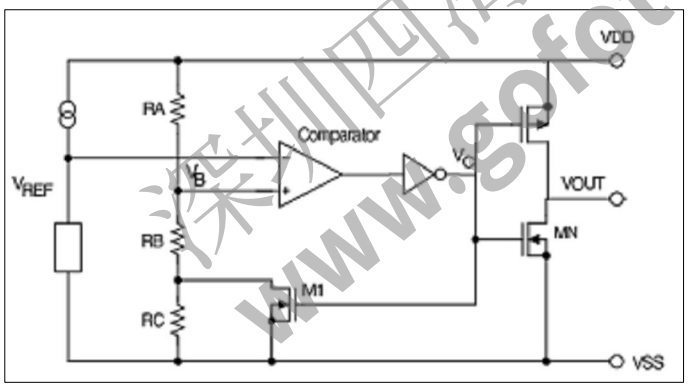
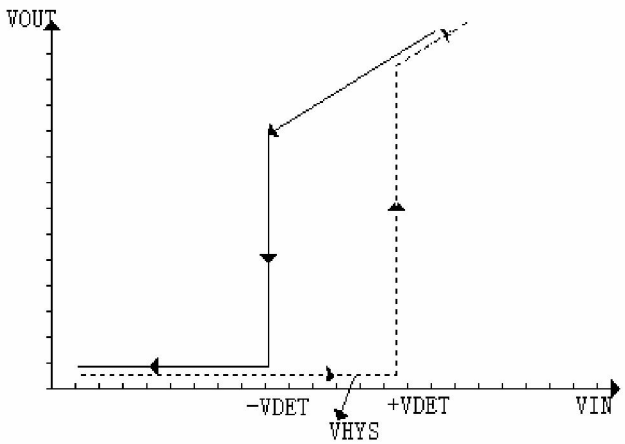


Fig.1 CMOS output voltage detector (ME2807)

Timing Chart

ME2807:



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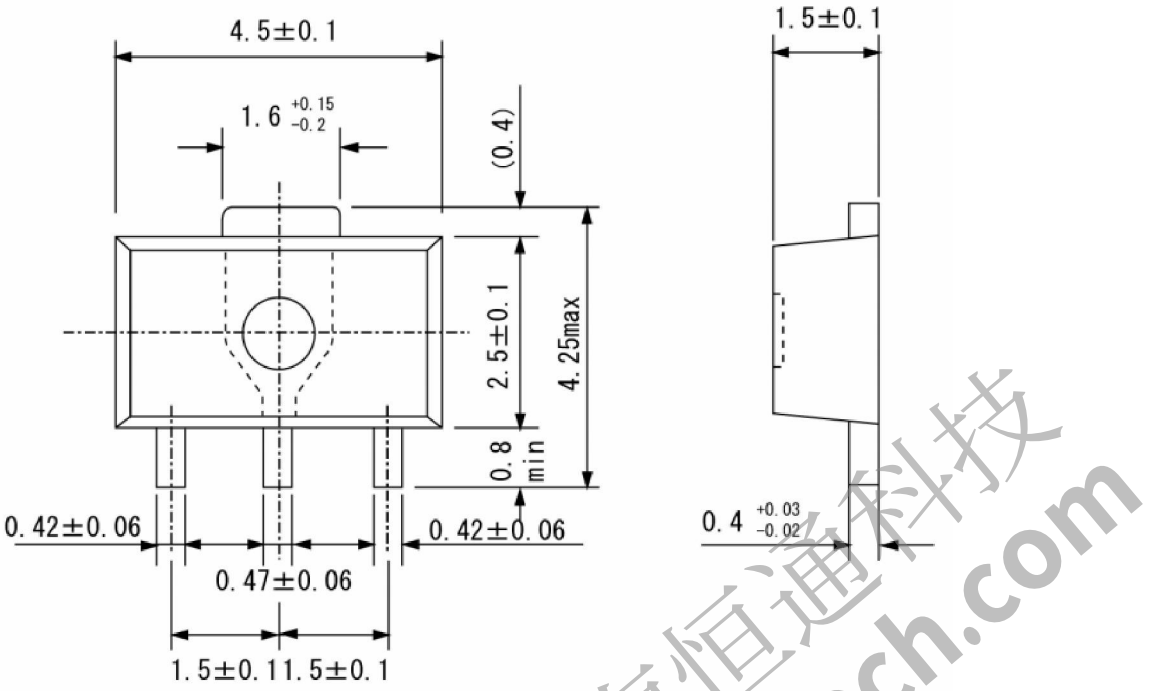
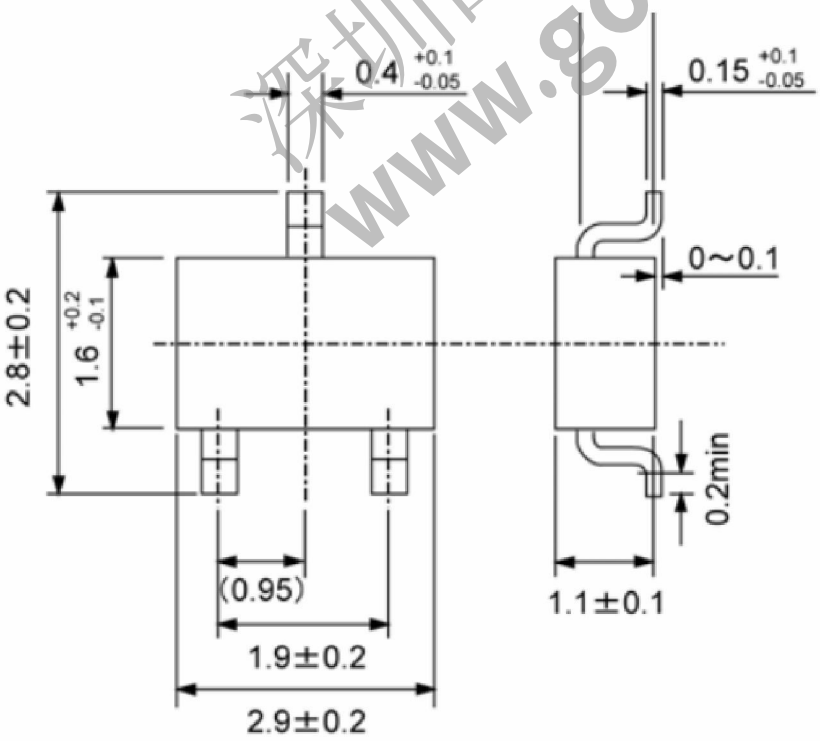
Package Information

● SOT89-3



● SOT23-3



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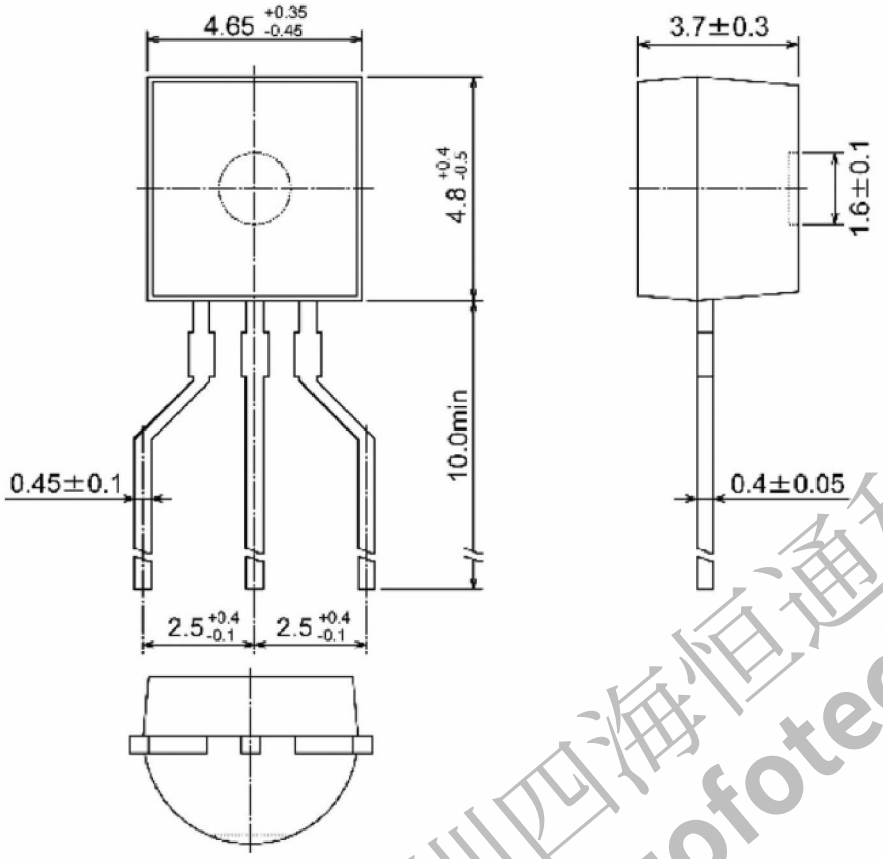
● TO-92



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