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 Detection voltage： ± 1%
- Low power consumption：TYP 1.8uA (Vin=3V)
- Detection 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

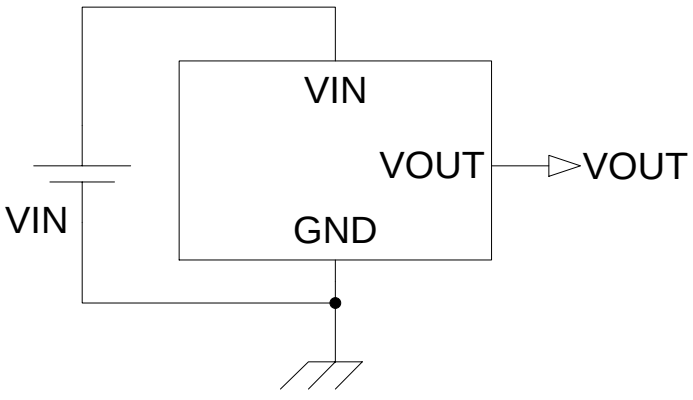
Typical Application

- battery checkers
- Level selectors
- Power failure detectors
- Microcomputer reset
- Battery backup of Memories
- Store non-volatile RAM signal protectors

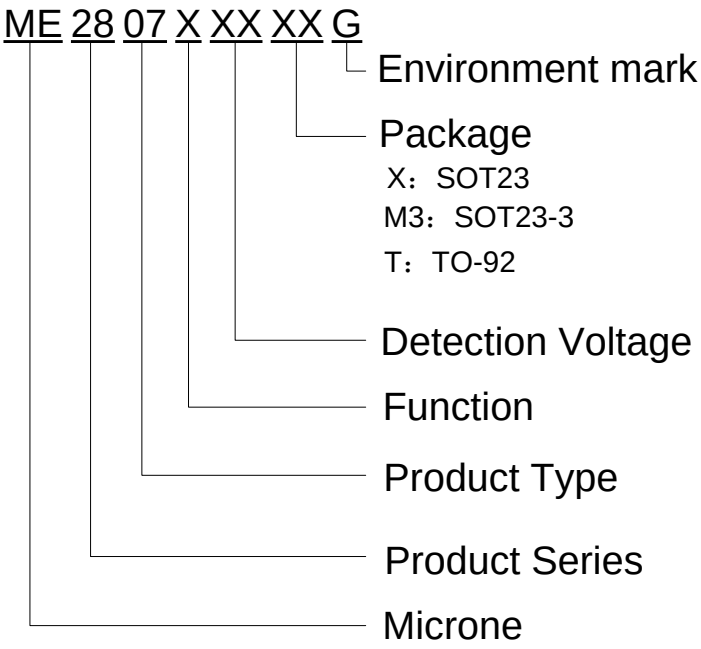
Package

- 3-pin SOT23、SOT23-3、TO-92

Typical Application Circuit



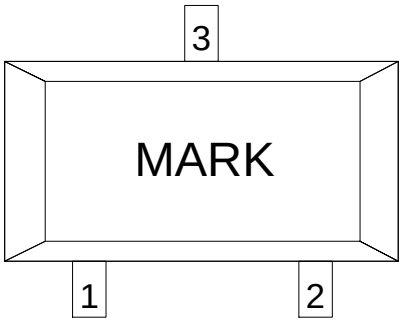
Selection Guide



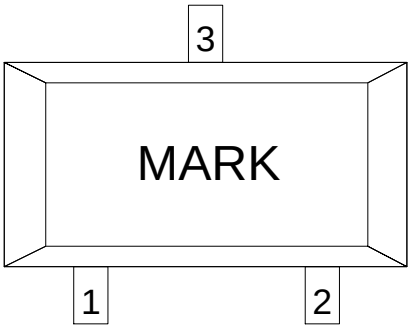
product series	product description
ME2807A27XG	VIN=H⟶L V_{DET} =2.7V； VIN Falling edge detection；Package：SOT23
ME2807A33XG	VIN=H⟶L V_{DET} =3.3V； VIN Falling edge detection；Package：SOT23
ME2807A22M3G	VIN=H⟶L V_{DET} =2.2V； VIN Falling edge detection；Package：SOT23-3
ME2807A33M3G	VIN=H⟶L V_{DET} =3.3V； VIN Falling edge detection；Package：SOT23-3
ME2807A22TG	VIN=H⟶L V_{DET} =2.2V； VIN Falling edge detection；Package：TO-92
ME2807B33M3G	VIN=L⟶H V_{DET} =3.3V； VIN Rising edge detection；Package：SOT23-3

NOTE: At present ,there are seventeen kinds of detection 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 detection voltage and package, please contact our sales staff.

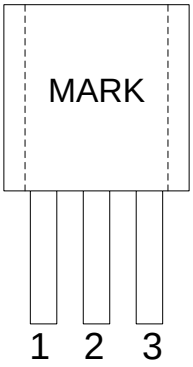
Pin Configuration



SOT23



SOT23-3

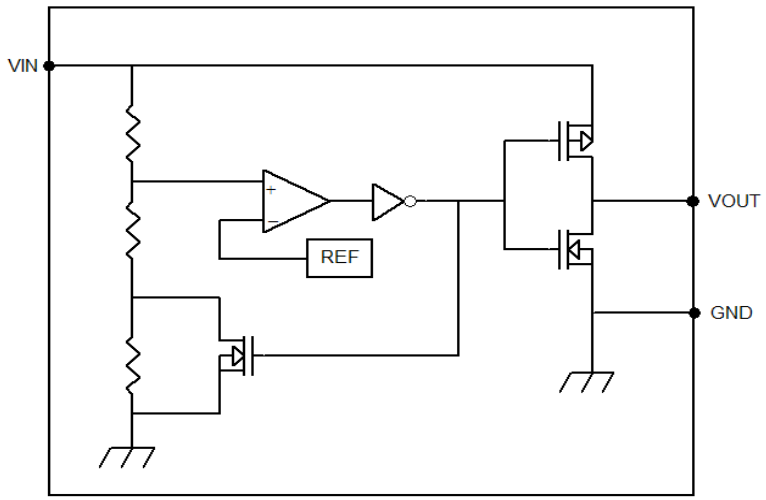


TO-92

Pin Assignment

Pin Number			Pin Name	Functions
SOT23	SOT23-3	TO-92		
2	2	3	GND	Ground
1	1	1	V_{OUT}	Output Voltage
3	3	2	V_{IN}	Input Voltage

Block Diagram



Absolute Maximum Ratings

PARAMETER		SYMBAL	RATINGS	UNITS
V_{IN} Input Voltage		V_{INmax}	18	V
Output Current		I_{OUTmax}	20	mA
Output Voltage	CMOS	V_{OUT}	GND-0.3~ V_{IN} +0.3	V
Continuous Total Power Dissipation	SOT23	P_D	0.38	W
	SOT23-3		0.54	
	TO-92		0.83	
Thermal resistance (Junction to air)	SOT23	θ_{JA}	330	ºC /W
	SOT23-3		230	
	TO-92		150	
Maximum junction temperature		T_J	-40~+150	℃
Operating Ambient Temperature		T_{Opr}	-40~+85	℃
Storage Temperature		T_{stg}	-55~+150	℃
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
Detect Voltage	V_{DET}	ME2807A V_{IN}=H→L		V_{DET}×0.99	V_{DET}	V_{DET}×1.01	V
		ME2807B V_{IN}=L→H					
Hysteresis Width	V_{HYS}	V_{IN}=L→H→L V_{HYS} =$V_{DET(+)}$ - $V_{DET(-)}$		V_{DET}×0.02	V_{DET}×0.05	V_{DET}×0.1	V
Operating Current	I_{IN}	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	
Operating Voltage	V_{IN}	V_{DET} =2.0V ~ 7.0V		0.7	-	18	V
Output Sink Current	I_{OL}	V_{DET}=2.2V	V_{IN} =2V V_{OUT}=0.2V	0.5	1		mA
		V_{DET}=2.4V					
		V_{DET}=2.7V					
Output Source Current	I_{OH}	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		
Temperature characteristics	ΔVDET/ΔTA	0℃≤Topr≤70℃			±0.9		mV/℃

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.

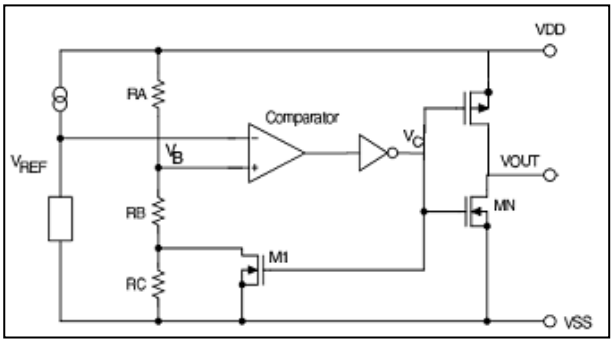


Fig.1 CMOS output voltage detector (ME2807)

ME2807A: The detection voltage is as defined:

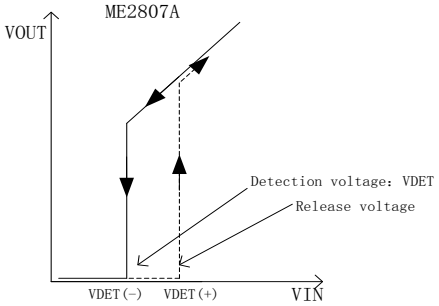
$V_{DET}=V_{DET(-)}=(R_A+R_B+R_C)\times V_{REF}/(R_B+R_C)$

The release voltage is as defined:

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

The hysteresis width is:

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



ME2807B: The detection voltage is as defined:

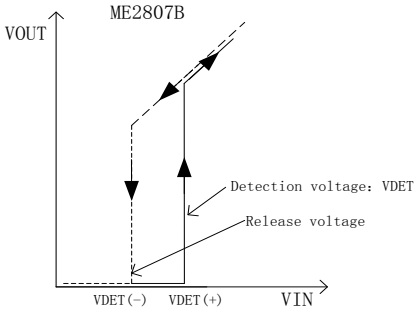
$V_{DET}=V_{DET(+)}=(R_A+R_B)\times V_{REF}/R_B$

The release voltage is as defined:

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

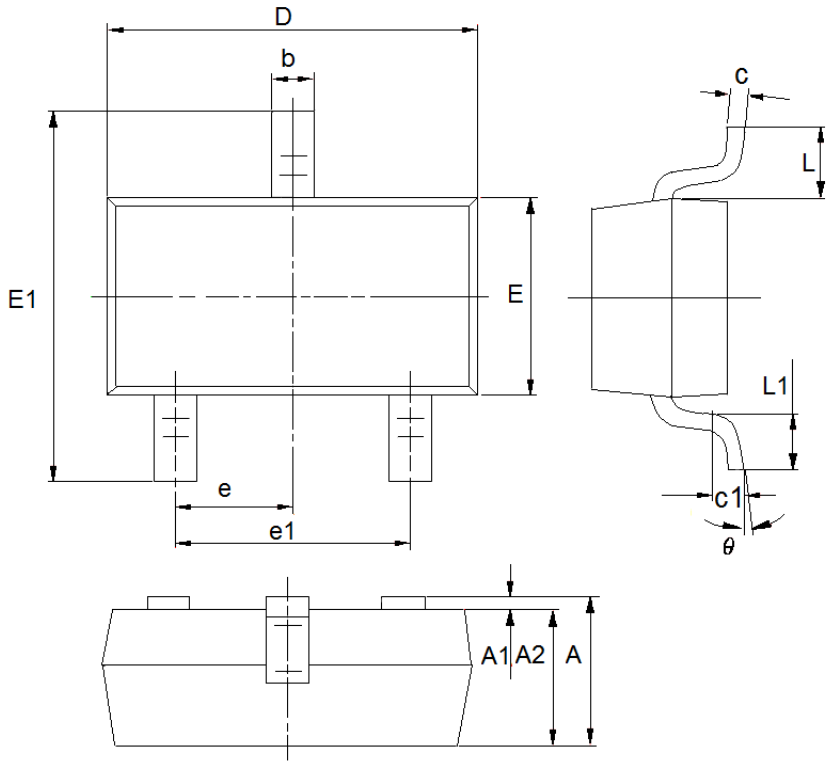
The hysteresis width is:

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



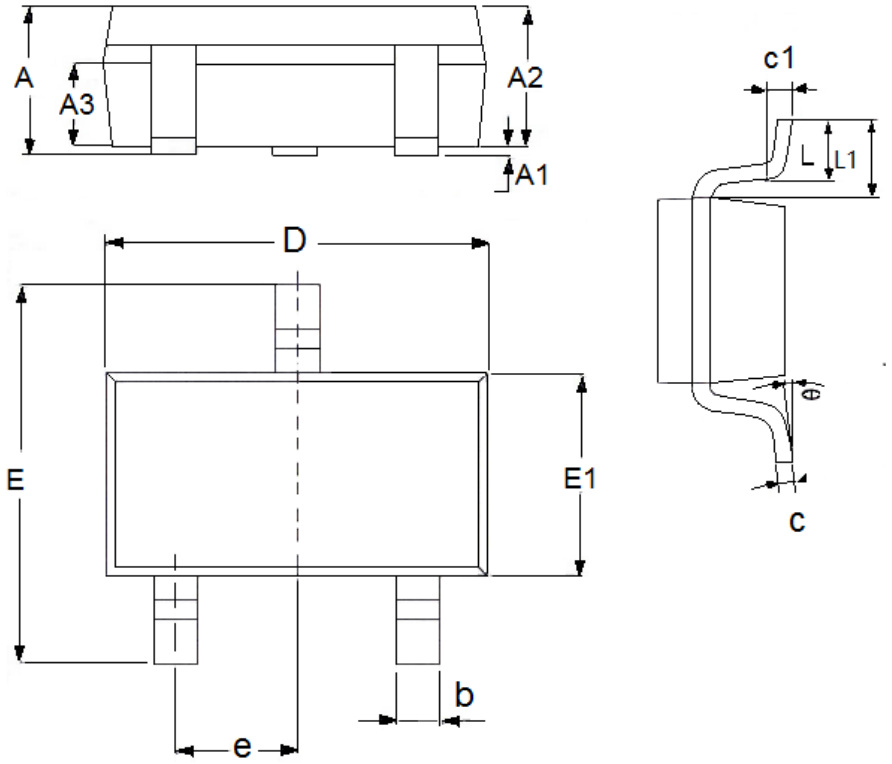
Packaging Information

- SOT23



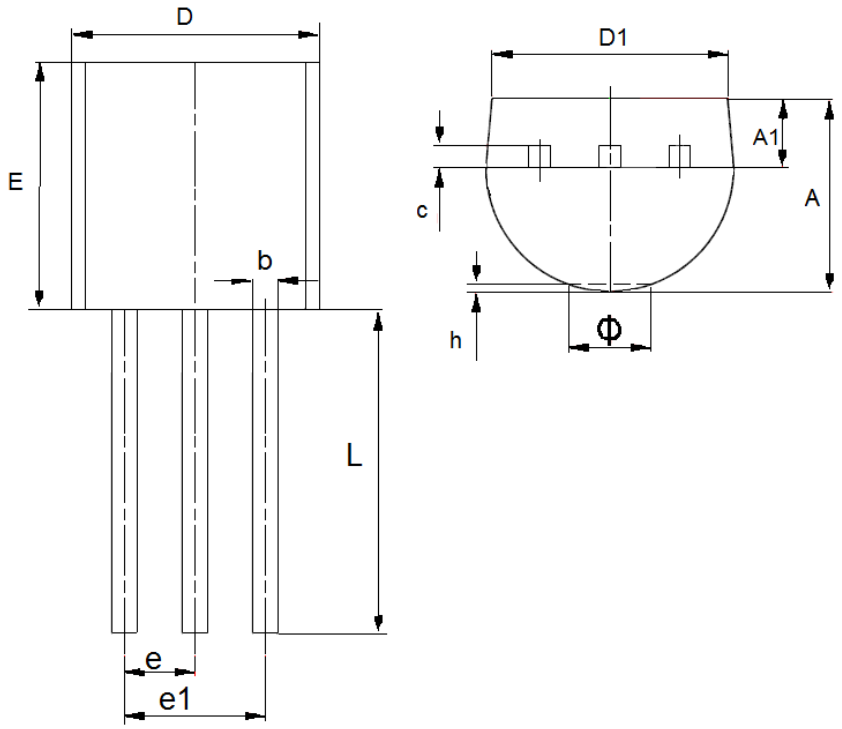
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.9	1.15	0.0354	0.0453
A1	0	0.14	0.0000	0.0055
A2	0.9	1.05	0.0354	0.0413
b	0.28	0.52	0.0110	0.0205
c	0.07	0.23	0.0028	0.0091
D	2.8	3.0	0.1102	0.1181
e1	1.8	2.0	0.0709	0.0787
E	1.2	1.4	0.0472	0.0551
E1	2.2	2.6	0.0866	0.1024
e	0.95(TYP)		0.0374(TYP)	
L	0.55(TYP)		0.0217(TYP)	
L1	0.25	0.55	0.0098	0.0217
θ	0	8°	0.0000	8°
c1	0.25(TYP)		0.0098(TYP)	

- SOT23-3



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.8	3.1	0.1102	0.1220
E	2.6	3.1	0.1023	0.1220
E1	1.5	1.8	0.0591	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

● TO-92



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	3.3	3.7	0.1299	0.1457
A1	1.1	1.4	0.0433	0.0551
b	0.38	0.55	0.015	0.0217
c	0.36	0.51	0.0142	0.0201
D	4.3	4.7	0.1693	0.185
D1	3.43	—	0.135	—
E	4.3	4.7	0.1693	0.185
e	1.27TYP		0.05TYP	
e1	2.44	2.64	0.0961	0.1039
L	14.1	14.5	0.5551	0.5709
h	0	0.38	0	0.015
Φ	—	1.6	—	0.063

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