

ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

AC808 Series

The Ac808 series is a series of high-precision voltage detectors developed using CMOS process. The detection voltage is fixed internally with an accuracy of $\pm 2.0\%$. Two output forms, Nch open-drain and CMOS output, are available. Ultra-low current consumption and miniature package lineup can meet demand from the portable device applications.

■ Features

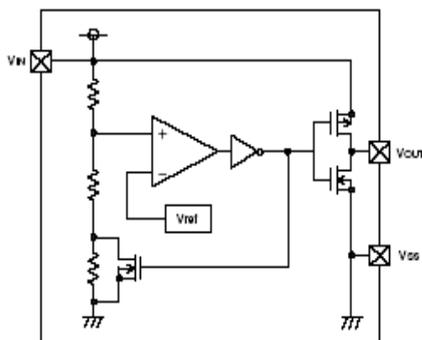
- Ultra-low current consumption $0.8 \mu\text{A typ.}$ ($V_{\text{in}}=1.5\text{V}$)
- High-precision detection voltage $\pm 2.0\%$
- Operating voltage range $0.7\text{ V to }8\text{ V}$
- Detection voltage $1.5\text{ V to }6.0\text{ V}$ (0.1 V step)
- Output form Nch open-drain output (Active Low) or CMOS output (Active Low)
- Small package: SOT23-3, SSOT-24, SOT-89, TO-92

■ Applications

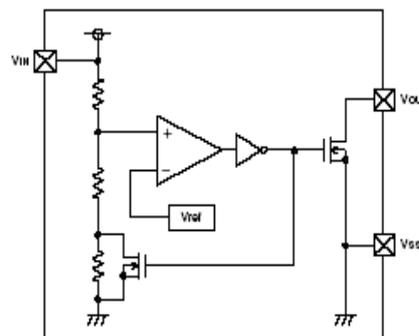
- Battery checkers
- Power failure detectors
- Power monitor for portable equipments such as pagers, calculators, electronic notebooks and remote controllers.
- Constant voltage power monitor for cameras, video equipments and communication devices.
- Power monitor for microcomputers and reset for CPUs.

■ Block Diagrams

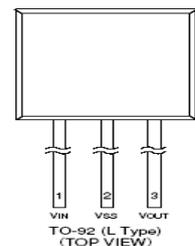
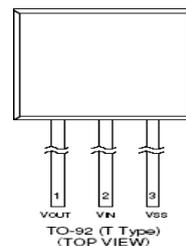
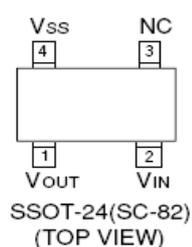
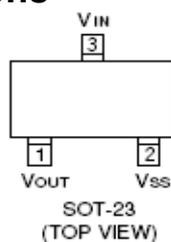
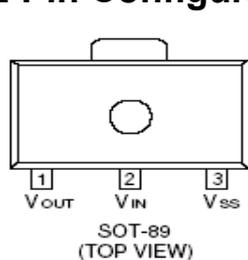
(1) CMOS Output Products



(2) Nch Open-drain Output Products



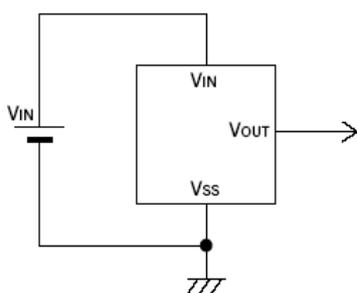
■ Pin Configurations



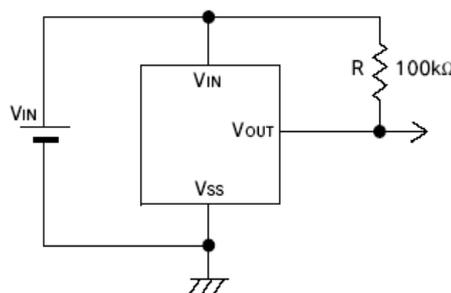
■ Pin Assignment

Pin No.					Pin name	Pin description
SOT23-3	SOT89-3	TO-92 (T)	TO-92 (L)	SSOT-24		
3	2	2	1	2	VIN	Voltage input pin
2	3	3	2	4	VSS	GND pin
1	1	1	3	1	VOUT	output pin
-	-	-	-	3	NC	No connection

■ Typical application



CMOS Output



Nch Open-drain Output

■ Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Absolute maximum ratings	unit
Power supply voltage	Vin	8	V
Output current	Iout	50	mA
Output voltage	CMOS	Vout	Vss-0.3~Vin+0.3
	N-ch		Vss-0.3~8
Power dissipation	SOT23-3	Pd	150
	SOT89-3		500
	SSOT-24		150
	TO-92		300
Operating ambient temperature	Topr	-40~+85	°C

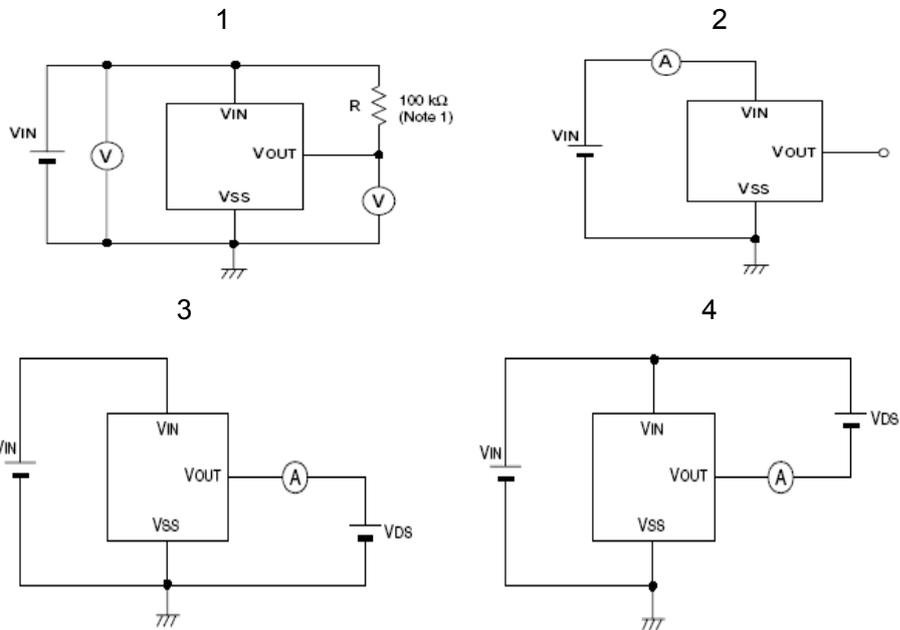
■ Electrical Characteristics

VDF (T) = 1.6 to 6.0V ±2%

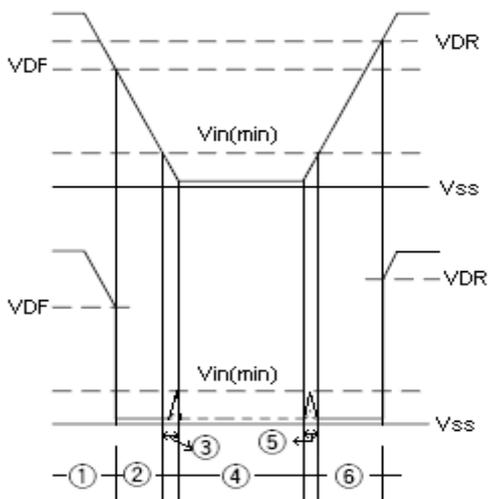
Item	Symbol	Condition	Min.	Typ.	Max.	unit	Test circuit
Detection voltage	VDF		VDF x0.98	VDF	VDF x1.02	V	1
Release voltage	VHYS		VDF x0.02	VDF x0.05	VDF x0.08	V	1
Current	Iss	Vin=1.5V		0.8	2.4	uA	2
		=2.0V		0.9	2.8		
		=3.0V		1.0	3.1		

consumption		=4.0V		1.1	3.3		
		=5.0V		1.2	3.7		
Operating voltage	Vin	VDF=1.60~6.0V	0.7		8	V	1
Output current	Iout	Nch Vds= 0.5V	Vin=1.0V	1.0	2.2	mA	3
			Vin=2.0V	3.0	7.7		
			Vin=3.0V	5.0	10.1		
			Vin=4.0V	6.0	11.5		
			Vin=5.0V	7.0	13.0		
		Pch vds=2.1 vin=8.0		-10	-2		4
temperature coefficient		-40~+85°C		±100		ppm/°C	

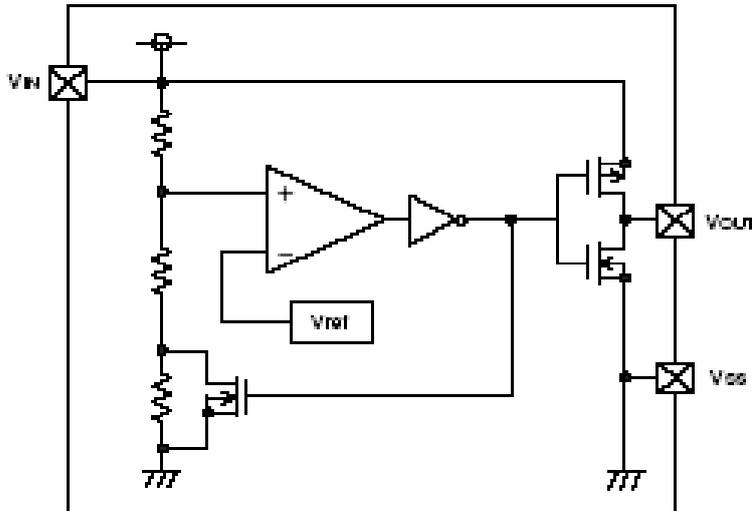
■ Test circuit



■ Timing Chart



■ Operation



1-1. When the power supply voltage (VDD) is higher than the release voltage (VDF), the Nch transistor is OFF and the Pch transistor is ON to provide VDD (high) at the output.

1-2. When the power supply voltage (VDD) is lower than the release voltage (VDF), the Nch transistor is ON and the Pch transistor is OFF to provide VSS (low) at the output.

1-3. When the VDD falls below the minimum operating voltage, the output becomes undefined, or goes to the VDD when the output is pulled up to the VDD.

1-4. The VSS level appears when the VDD is VSS level.

1-5. The VSS level appears when the VDD rises above the minimum operating voltage. The VSS level still appears even when the VDD surpasses $-VDF$, as long as it does not exceed the release voltage $+VDF$.

1-6. When the VDD rises above $+VDF$ the Nch transistor becomes OFF and the Pch transistor becomes ON to provide VDD level at the output.

■ Product Classification

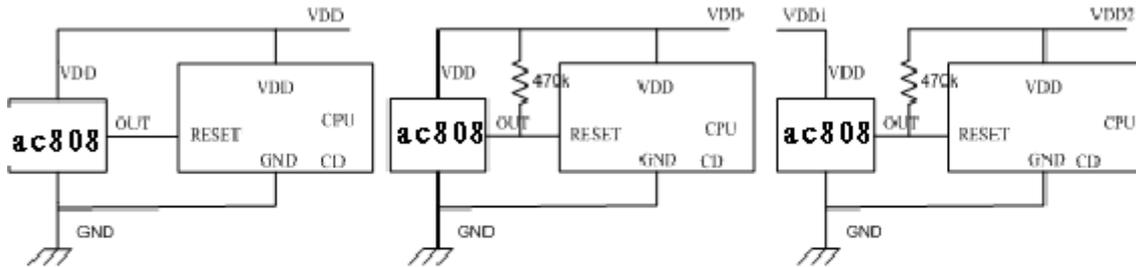
● Ordering Information

AC808 ①②③④⑤⑥⑦

DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
①②	Output Configuration: C=CMOS N=N-ch open drain	⑥	P-ROSH
③	Detect Voltage 25=2.5V 27=27 38=3.8V		
④	Output Delay 0=No delay	⑦	Package Type: V=SOT23-3 X=SOT89 N=SSOT-24 T=TO-92(Standard) L=TO-92(Custom pin configuration)
⑤	Detect Accuracy: 2=with $\pm 2\%$		

■ Application Circuit Examples

● Microcomputer Reset Circuits

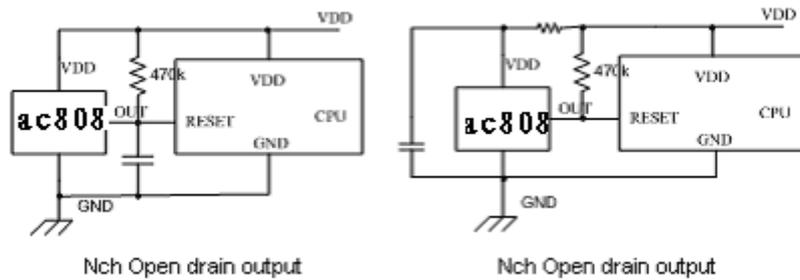


The Same supply voltage with CPU
(CMOS output)

The same supply voltage with CPU
(Nch Open drain output)

The different supply voltage with CPU
(Nch Open drain output)

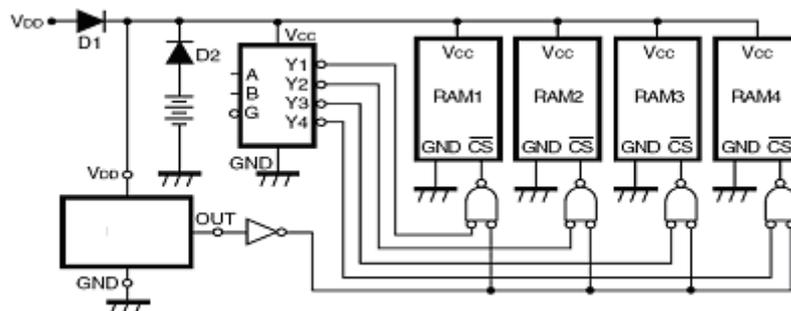
● Power-on Reset Circuit



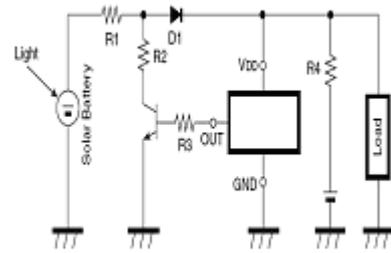
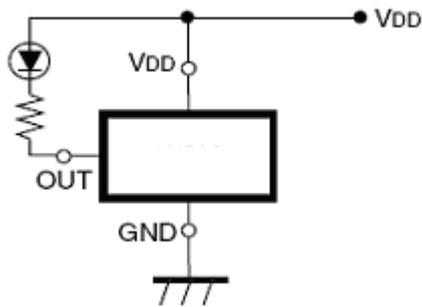
Nch Open drain output

Nch Open drain output

● Memory back-up circuit

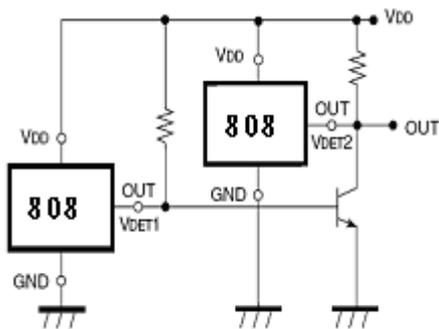


● Power failure detectors

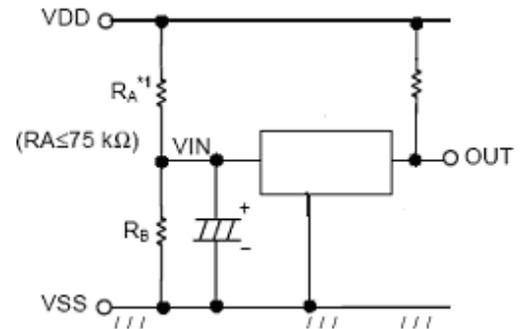


● Overcharge protect circuit

● Window Comparator Circuit

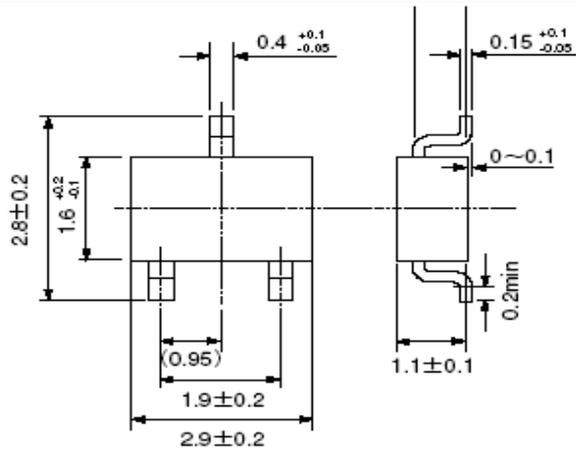


● Detector Adjustable Circuit

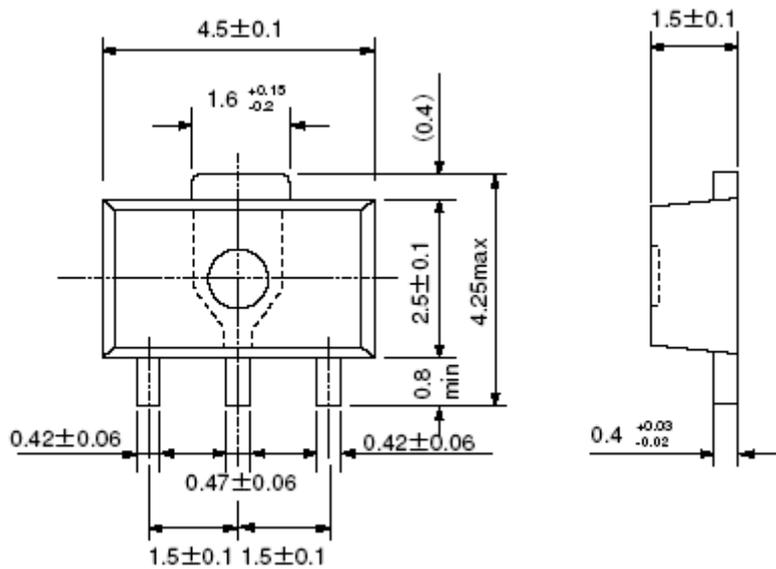


■ PACKAGE INFORMATION

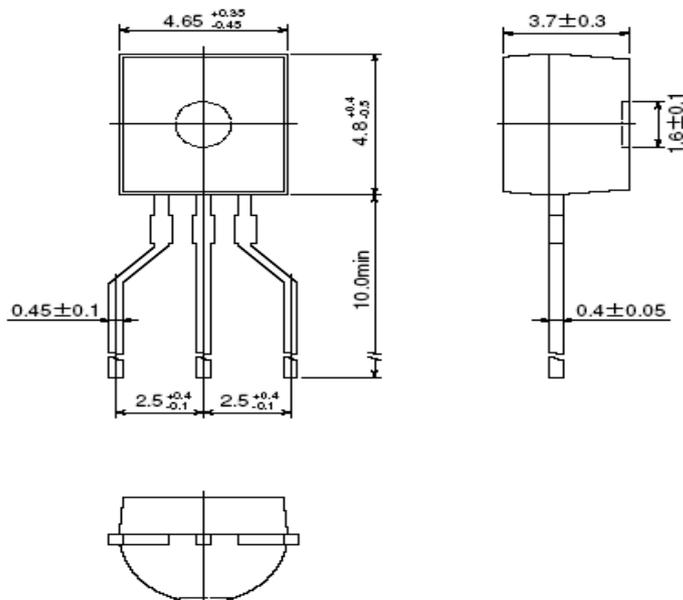
- SOT23-3



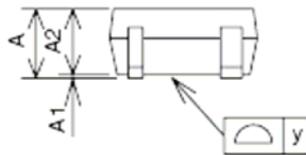
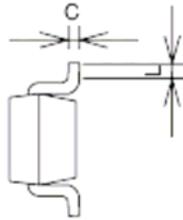
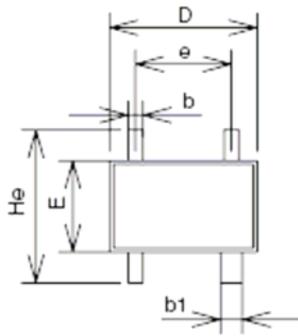
● SOT89-3



● T0-92



● SSOT-24



	SIZE mm		
	MIN	TYP	MAX
A	0.80	—	1.10
A1	0.00	—	0.10
A2	0.80	—	1.00
b	0.15	0.25	0.30
b1	0.25	0.35	0.40
C	0.075	0.125	0.225
D	1.80	2.00	2.20
E	1.15	1.25	1.45
He	1.80	2.10	2.40
e	1.10	1.30	1.50
L	0.10	0.30	—
y	—	—	0.10