

XC61A

Series

Low Voltage Detectors ($V_{DF}=0.8V$)



◆CMOS

◆Highly Accurate : $\pm 2\%$

◆Low Power Consumption : $1.0\mu A$ ($V_{IN} = 2.0V$)

◆Ultra small Mini Mold Package

■Applications

- Microprocessor reset circuitry
- Memory battery back-up circuits
- Power-on reset circuits
- Power failure detection
- System battery life and charge voltage monitors

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■General Description

The XC61A series are highly precise, low power consumption voltage detectors, manufactured using CMOS and laser trimming technologies. Detect voltage is extremely accurate with minimal temperature drift.

N channel open drain output configurations is available.

■Features

Highly accurate : $\pm 2\%$

Low power consumption : TYP $1.0\mu A$ [$V_{IN}=2.0V$]

Detect voltage range : $0.8V$ (N-ch open drain)

Operating voltage range : $0.7V \sim 6.0V$

Detect voltage temperature characteristics

: TYP $\pm 100ppm/^{\circ}C$

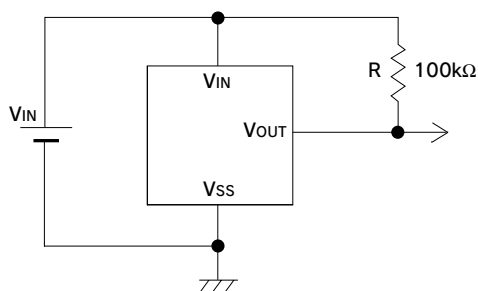
Output configuration : N-channel open drain

Ultra small package : SOT-23 (150mW) mini-mold

: SOT-89 (500mW) mini-mold

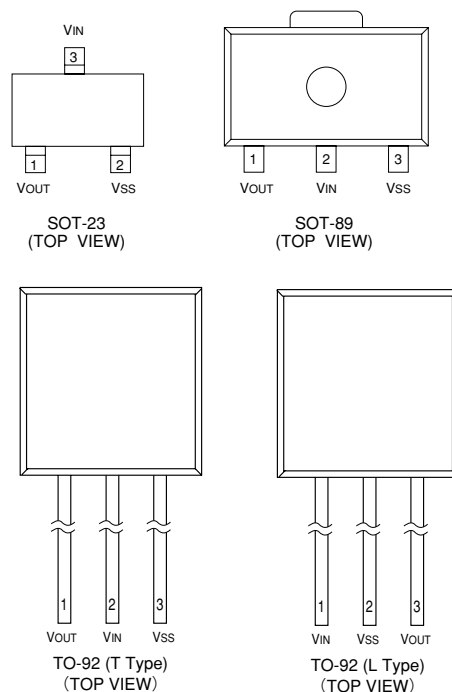
: TO-92 (300mW)

■Typical Application Circuit



N-ch Open Drain Output

■Pin Configuration



■Pin Assignment

PIN NUMBER				PIN NAME	FUNCTION
SOT-23	SOT-89	TO-92 (T)	TO-92 (L)		
3	2	2	1	VIN	Supply Voltage Input
2	3	3	2	VSS	Ground
1	1	1	3	VOUT	Output

Product Classification

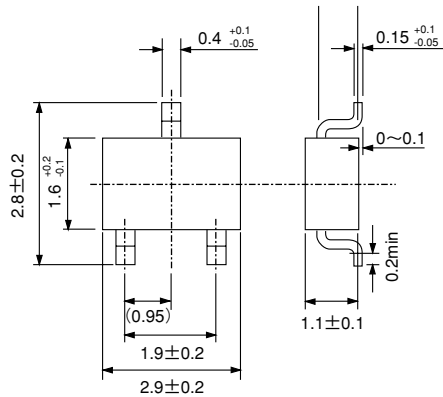
Ordering Information

XC61A x x x x x x x
a b c d e f

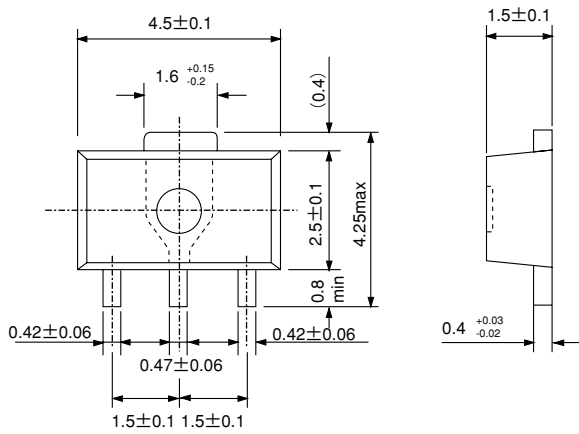
DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
a	Output Configuration : N = N-ch open drain	e	Package Type : M = SOT-23 P = SOT-89 T = TO-92 (regular) L = TO-92 (Custom pin Configuration)
b	Detect Voltage : 08 = 0.8V		
c	Output Delay : 0 = No delay	f	Device Orientation : R = Embossed Tape (Right) L = Embossed Tape (Left) H = Paper Tape (TO-92) B = Bag (TO-92)
d	Detect Accuracy : 2 = within $\pm 2.0\%$		

Packaging Information

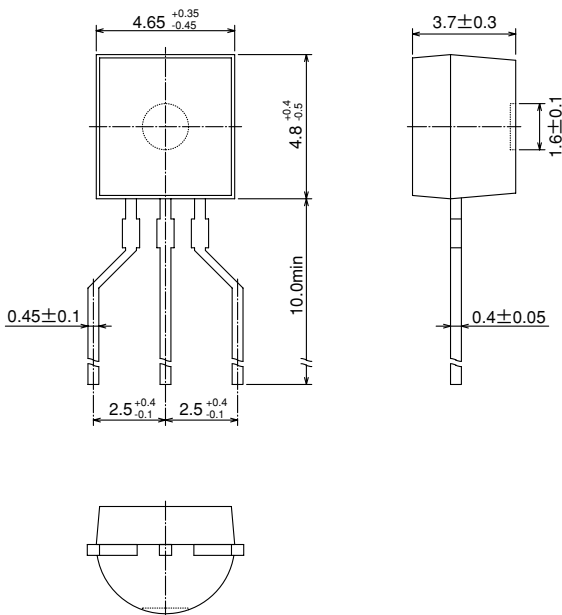
SOT-23



●SOT-89

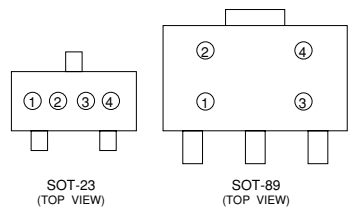


●TO-92



■Marking

●SOT-23, SOT-89



① Represents the integer of the Output Voltage and Detect Voltage

DESIGNATOR	CONFIGURATION	VOLTAGE
K	N-ch	0.②(V)

② Represents the decimal point of the Detect Voltage

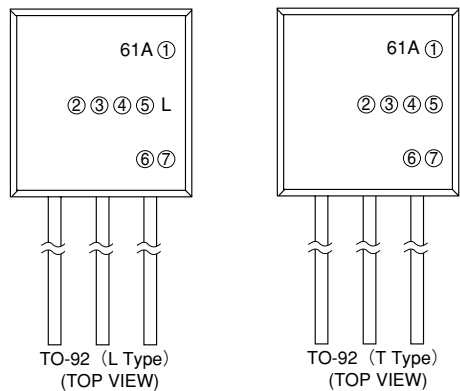
DESIGNATOR	VOLTAGE
8	①.8(V)

③ Indicates 'Delay Time'

DESIGNATOR	DELAY TIME
0	No Delay

④ Represents the assembly lot no.
Based on internal standards

●TO-92



① Represents the output configuration

DESIGNATOR	OUTPUT CONFIGURATION
N	N-ch

② Represents the Detect Voltage

DESIGNATOR		VOLTAGE (V)
②	③	
0	8	0.8

④ Indicates Delay Time

DESIGNATOR	DELAY TIME
0	No delay

⑤ Represents the Detect Voltage Accuracy

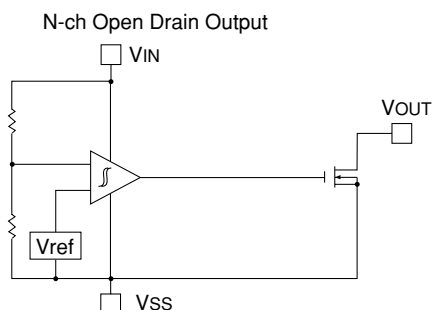
DESIGNATOR	DETECT VOLTAGE ACCURACY
2	within $\pm 2\%$

⑥ Represents a least significant digit of the produced year

DESIGNATOR	Produced year
0	2000
1	2001

⑦ Denotes the production lot number
0 to 9, A to Z repeated(G.I.J.O.Q.W excepted)

■Block Diagram



■Absolute Maximum Ratings

Ta = 25 °C

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage	V _{IN}	9	V
Output Current	I _{OUT}	50	mA
Output Voltage	N-ch open drain V _{OUT}	V _{SS} -0.3 ~ 9	V
Power Dissipation	SOT-23	Pd	150
	SOT-89		500
	TO-92		300
Operating Ambient Temperature	T _{opr}	-30 ~ +80	°C
Storage Temperature	T _{stg}	-40 ~ +125	°C

2

■Electrical Characteristics

Ta = 25 °C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Detect Voltage	V _{DF}		V _{DF} x 0.98	V _{DF}	V _{DF} x 1.02	V
Hysteresis Range	V _{HYS}		V _{DF} x 0.02	V _{DF} x 0.05	V _{DF} x 0.08	V
Supply Current	I _{SS}	V _{IN} = 1.5V		0.9	2.6	μA
		= 2.0V		1.0	3.0	
		= 3.0V		1.3	3.4	
		= 4.0V		1.6	3.8	
		= 5.0V		2.0	4.2	
Operating Voltage	V _{IN}	V _{DF} = 0.8V to 2.0V	0.7		6.0	V
Output Current	I _{OUT}	N-ch V _{DS} = 0.5V V _{IN} = 0.7V = 1.0V		0.35 2.2		mA
Temperature Characteristics	$\frac{\Delta V_{DF}}{\Delta T_{opr} + V_{DF}}$	-30°C ≤ T _{opr} ≤ 80°C		± 100		ppm/°C
Delay Time (V _{DR} → V _{OUT} inversion)	t _{DLY}				0.2	ms

Note :

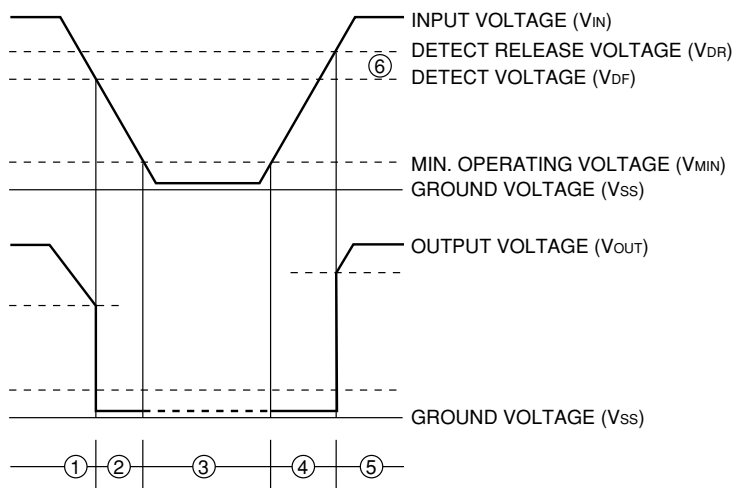
When a resistor is connected between the V_{IN} pin and the input, V_{DR} will increase and it may be the case that the established characteristics cannot be achieved.

Functional Description

Functional Description

- ① When input voltage (V_{IN}) rises above detect voltage (V_{DF}), output voltage (V_{OUT}) will be equal to V_{IN} .
(A condition of high impedance exists with Nch open drain output configurations.)
- ② When input voltage (V_{IN}) falls below detect voltage (V_{DF}), output voltage (V_{OUT}) will be equal to the ground voltage (V_{SS}) level.
- ③ 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.)
- ④ 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 (V_{DR}) levels, the ground voltage (V_{SS}) level will be maintained.
- ⑤ When input voltage (V_{IN}) rises above detect release voltage (V_{DR}), output voltage (V_{OUT}) will be equal to V_{IN} .
(A condition of high impedance exists with Nch open drain output configurations.)
- ⑥ The difference between V_{DR} and V_{DF} represents the hysteresis range.

Timing Chart



Directions for use

Notes on Use

When a resistor is connected between the V_{IN} pin and the input with N-channel open drain output configurations, we suggest that a resistor with an R_{IN} value of less than $1\text{k}\Omega$ and a capacitor with a value of more than $0.1\mu\text{F}$ be used in order to avoid oscillation.

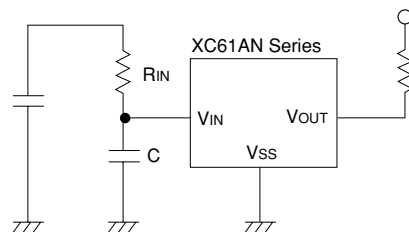


Diagram: Circuit using an input resistor