XC61A
Series
Low Voltage Detectors (V$_{DF}$=0.8V)

TOREX

◆**CMOS**
◆**Highly Accurate** : ± 2%
◆**Low Power Consumption : 1.0μA (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

2

■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 : ± 2%
Low power consumption : TYP 1.0 μA [V$_{IN}$=2.0V]
Detect voltage range : 0.8V (N-ch open drain)
Operating voltage range : 0.7V ~ 6.0V
Detect voltage temperature characteristics
                     : TYP± 100ppm/°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
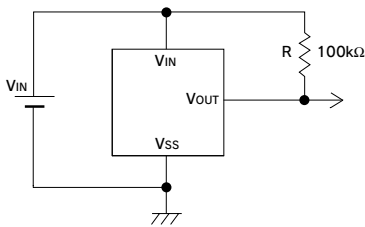
N-ch Open Drain Output

■Pin Configuration

SOT-23 (TOP VIEW)

SOT-89 (TOP VIEW)

TO-92 (T Type) (TOP VIEW)

TO-92 (L Type) (TOP VIEW)
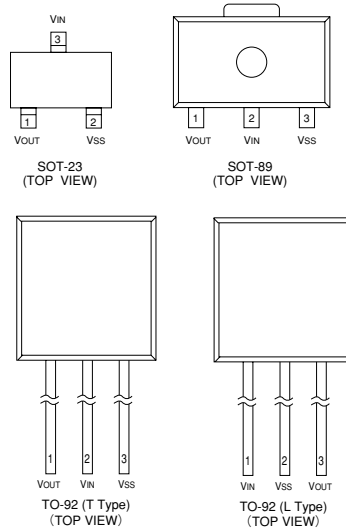
■Pin Assignment

PIN NUMBER				PIN NAME	FUNCTION
SOT-23	SOT-89	TO-92 (T)	TO-92 (L)		
3	2	2	1	V$_{IN}$	Supply Voltage Input
2	3	3	2	V$_{SS}$	Ground
1	1	1	3	V$_{OUT}$	Output

XC61A Series

■Product Classification
●Ordering Information

XC61A x x x x x x x
　　　　a　b c d e f

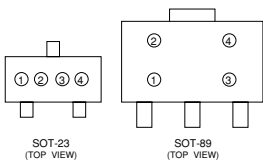| DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
a	Output Configuration : N = N-ch open drain	e	Package Type : M = SOT-23 P = SOT-89 T = TO-92 (regular) L = TO-92 (Custom pin Configuration)
b	Detect Voltage : 08 = 0.8V		
c	Output Delay : 0 = No delay	f	Device Orientation : R = Embossed Tape (Right) L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

■Packaging Information
●SOT-23

● SOT-89

4.5±0.1

1.6 +0.15 -0.2

(0.4)

1.5±0.1

2.5±0.1

4.25max

0.8 min

0.42±0.06

0.47±0.06

0.42±0.06

1.5±0.1 1.5±0.1

0.4 +0.03 -0.02

2

● TO-92

4.65 +0.35 -0.45

3.7±0.3

4.8 +0.4 -0.5

1.6±0.1

0.45±0.1

10.0min

0.4±0.05

2.5 +0.4 -0.1 2.5 +0.4 -0.1
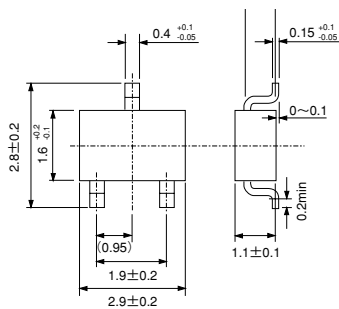
■Marking

● SOT-23, SOT-89

SOT-23
(TOP VIEW)

SOT-89
(TOP VIEW)

2

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

61A ①
②③④⑤ L
⑥⑦

TO-92 (L Type)
(TOP VIEW)

61A ①
②③④⑤
⑥⑦

TO-92 (T Type)
(TOP VIEW)
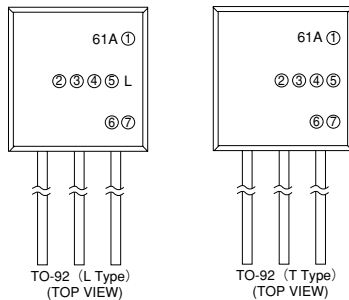
① Represents the output configuration

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 ±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

N-ch Open Drain Output
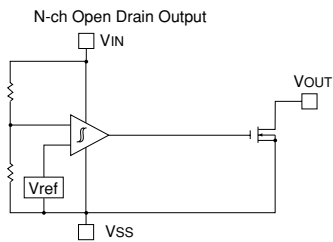
■Absolute Maximum Ratings

Ta = 25℃

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	mW
	SOT-89		500	
	TO-92		300	
Operating Ambient Temperature		Topr	-30 〜 +80	℃
Storage Temperature		Tstg	-40 〜 +125	℃

2

■Electrical Characteristics

Ta = 25℃

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	$\frac{\Delta V_{DF}}{\Delta Topr \cdot V_{DF}}$	-30℃ ≤ Topr ≤ 80℃			± 100		ppm/℃
Delay Time (V_{DR}➡V_{OUT} inversion)	tDLY					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 establis hed
　　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

INPUT VOLTAGE (V_{IN})
DETECT RELEASE VOLTAGE (V_{DR})
⑥ DETECT VOLTAGE (V_{DF})
MIN. OPERATING VOLTAGE (V_{MIN})
GROUND VOLTAGE (V_{SS})
OUTPUT VOLTAGE (V_{OUT})
GROUND VOLTAGE (V_{SS})

① ② ③ ④ ⑤
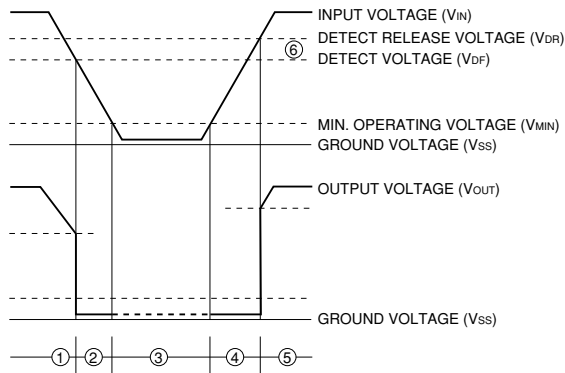
■Directions for use

●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 1k Ω and a capacitor with a value of more than 0.1 μF be used in order to avoid oscillation.
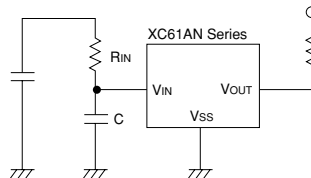

Diagram: Circuit using an input resistor