

XC31P

Series



Temperature Controlled Voltage Regulators

◆CMOS

◆Output Voltage Range : 1.5V~5.5V

◆Accuracy : $\pm 5\%$

◆Output Voltage Temperature Coefficient
: Typ. -3000ppm/°C

◆Detectable Temperature Range
: -20°C~60°C

◆No-Load Supply Current: Typ. 1.0μA

■General Description

The XC31P series is a group of temperature sensitive, positive voltage output, three-pin regulators, that provide voltage in response to sensed ambient temperatures. This function is very useful for correcting temperature characteristics of LCD devices etc. It can also be used as a temperature sensor.

The XC31P consists of a temperature sensor, a voltage correction circuit, a high-precision voltage reference source, an error correction circuit, and a current limited output driver.

Laser trimming increases output voltage accuracy and provides output stability against the variations in input voltage and output current. CMOS production technology reduces power consumption.

SOT-23 (150mW) and SOT-89 (500mW) packages are available.

■Applications

- Temperature compensation power supply
- Battery-powered equipment
- LCD based systems
- Cameras, Video Recorders, and OA systems

■Features

Set-up output voltage range

: 1.5V ~ 5.5V in 0.1V increments.

Highly accurate : Set-up voltage $\pm 5\%$

Output voltage temperature coefficients
: Typ. -3000ppm/°C

Detectable temperature range

: -20°C ~ 60°C

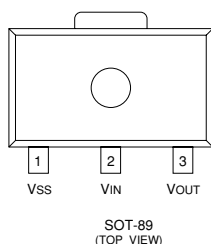
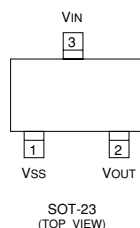
Maximum output current : 50mA (within maximum power dissipation)

Low power consumption : Typ. 1.0μA at $V_{OUT} = 1.54V$

Maximum input voltage : Max. 7V (max)

Ultra small package : SOT-23 (150mW) mini-mold
: SOT-89 (500mW) power mini-mold

■Pin Configuration



■Pin Assignment

PIN NUMBER		PIN NAME	FUNCTION
SOT-23	SOT-89		
3	2	V _{IN}	Supply voltage input
1	1	V _{SS}	Ground
2	3	V _{OUT}	Regulated voltage output

■ Product Classification

●Ordering Information

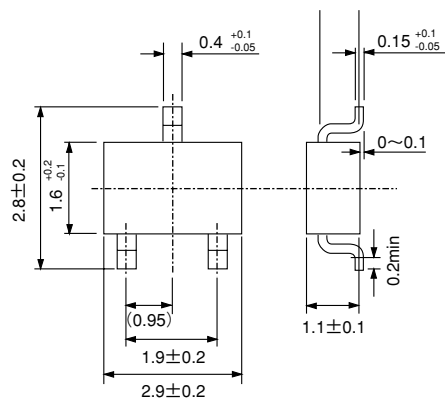
XC31Pxxxxxx

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
a b c d e f g h

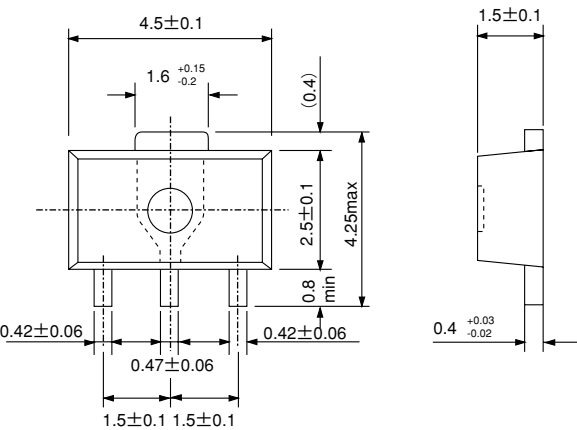
DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
a	<u>Polarity of Output Voltage</u> P=Positive	f	<u>Revision Character</u> A ~
b	<u>Temperature Coefficient</u> P=Positive N=Negative	g	<u>Package Type</u> M=SOT-23 P=SOT-89
c	Indicates the following two digits (d) are control reference numbers. S	h	<u>Device Orientation</u> R=Embossed Tape (Standard Feed) L=Embossed Tape (Reverse Feed)
d e	<u>Control Reference</u> 00 ~		

■ Packaging Information

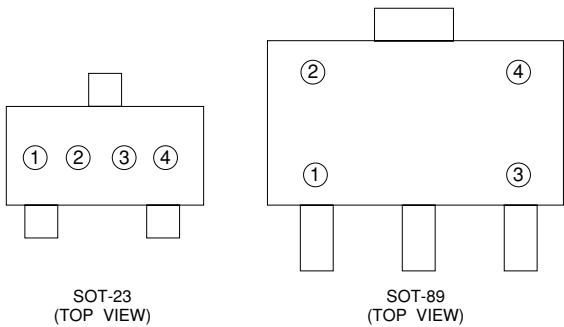
●SOT-23



●SOT-89



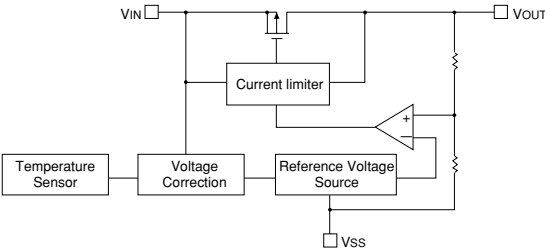
■Marking



- ① "A", which denotes the XC31P Series.
- ② Represents first digit of serial number.
- ③ Represents second digit of serial number.
- ④ Denotes lot number.

Based on internal standards.

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		V _{OUT}	V _{SS} -0.3 ~ V _{IN} +0.3	V
Power Dissipation	SOT-23	P _d	150	mW
	SOT-89		500	
Operating Ambient Temperature		T _{opr}	-30 ~ +80	°C
Storage Temperature		T _{stg}	-40 ~ +125	°C

Note: I_{OUT} must be less than P_d/(V_{IN}-V_{OUT})

Electrical Characteristics

XC31PNSOAM

Ta=25°C, C_L=0.1μF

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT 1}	I _{OUT} =10μA, V _{IN} =5.0V	1.44	1.5	1.64	V
Load Stability	ΔV _{OUT}	V _{IN} =5.0V 1μA ≤ I _{OUT} ≤ 10μA		30		mV
Input Stability	V _{OUT 2}	I _{OUT} =10μA, C _L =0.1μF 3.0V ≤ V _{IN} ≤ 7.0V	1.39		1.69	V
Detectable Temperature Range	T _D		-20		60	°C
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a \cdot V_{OUT 1}}$	I _{OUT} =10μA -20°C ≤ T _a ≤ 60°C		-3328		ppm/°C
Input Voltage	V _{IN}				7	V
Supply Current	I _{SS}	V _{IN} =5.0V		1.0	3.0	μA