

- ◆ CMOS
- ◆ Output Voltage Range: 1.5V~5.5V
- ◆ Accuracy: $\pm 5\%$
- ◆ Output Voltage Temperature Coefficient:
Typ. $-3000\text{ppm}/^\circ\text{C}$
- ◆ Detectable Temperature Range: $-20^\circ\text{C} \sim 60^\circ\text{C}$
- ◆ No-Load Supply Current: Typ. $1.0\mu\text{A}$

General Description

The XC31 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 XC31 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. $-3000\text{ppm}/^\circ\text{C}$

Detectable temperature range: $-20^\circ\text{C} \sim 60^\circ\text{C}$

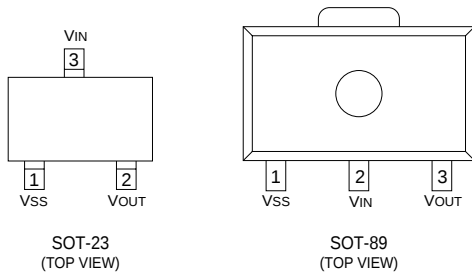
Maximum output current: 50mA (within maximum power dissipation)

Low power consumption: Typ. $1.0\mu\text{A}$ at $V_{\text{OUT}} = 1.54\text{V}$

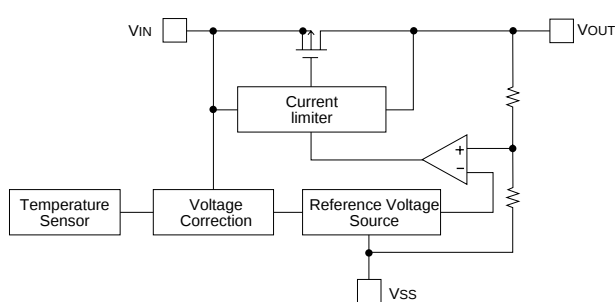
Maximum input voltage: Max. 7V

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

Pin Configuration



Block Diagram



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

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

Absolute Maximum Ratings

$T_a = 25^\circ\text{C}$

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage	V_{IN}	9	V
Output Current	I_{OUT}	50	mA
Output Voltage	V_{OUT}	$V_{\text{SS}} - 0.3 \sim V_{\text{IN}} + 0.3$	V
Continuous Total Power Dissipation	SOT-23	Pd	150
	SOT-89	Pd	500
			mW
Operating Ambient Temperature	T_{opr}	$-30 \sim +80$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-40 \sim +125$	$^\circ\text{C}$

■ Electrical Characteristics

XC31PNSOOAMR

Ta=25°C, CL=0.1μF

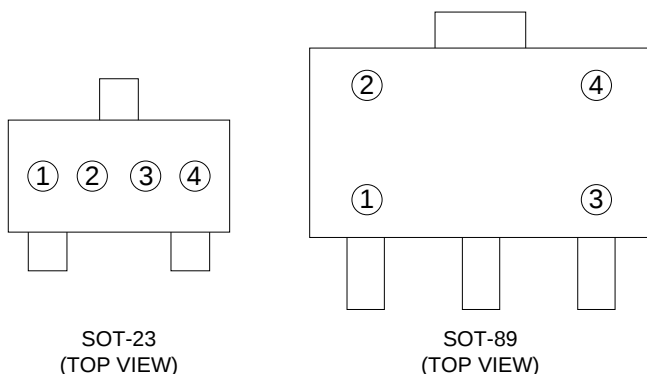
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT 1}	I _{OUT} =10μA, V _{IN} =5.0V	1.44	1.5	1.64	V
Load Stability	ΔV _{OUT}	V _{IN} =5.0V 1μA ≤ I _{OUT} ≤ 10μA		30		mV
Input Stability	ΔV _{OUT 2}	I _{OUT} =10μA, CL=0.1μF 3.0V ≤ V _{IN} ≤ 7.0V	1.39		1.69	V
Detectable Temperature Range	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

■ Ordering Information

XC31xxxxxxxx
↑↑↑↑↑
a b c d e f g

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

■ Marking



- ① "A", which denotes the XC31 Series.
- ② Represents first digit of serial number.
- ③ Represents second digit of serial number.
- ④ Denotes lot number.

Based on internal standards.