

- ◆ 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. $1.0\mu\text{A}$

Applications

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

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.

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)

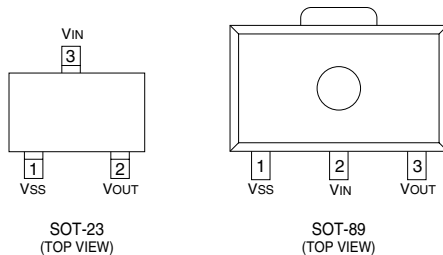
Low power consumption: Typ. $1.0\mu\text{A}$ at $V_{\text{OUT}} = 1.54\text{V}$

Maximum input voltage: Max. 7V

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

5

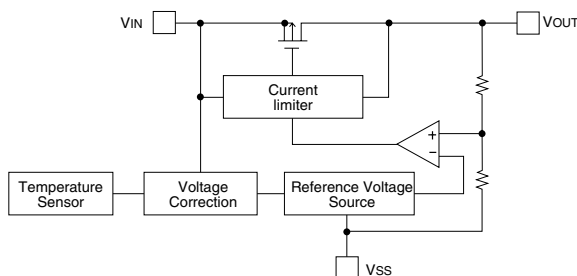
Pin Configuration



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

Block Diagram



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

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	150	mW
	SOT-89	500	
Operating Ambient Temperature	T_{opr}	$-30 \sim +80$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-40 \sim +125$	$^\circ\text{C}$

Electrical Characteristics

XC31PNSOAMR

Ta=25°C, CL=0.1μF

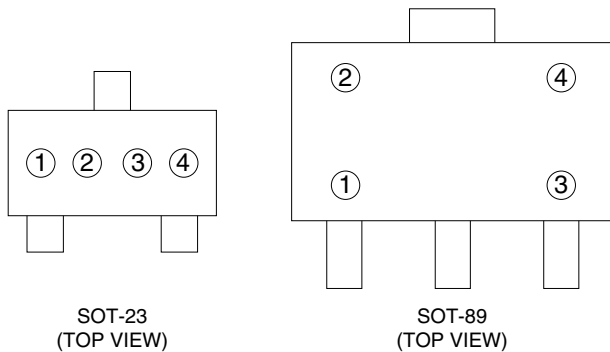
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT 1}	I _{OUT} =10μA, V _{IN} =5.0V	1.44	1.5	1.64	V
Load Stability	ΔV _{OUT}	V _{IN} =5.0V 1μA ≤ I _{OUT} ≤ 10μA		30		mV
Input Stability	ΔV _{OUT 2}	I _{OUT} =10μA, C _L =0.1μF 3.0V ≤ V _{IN} ≤ 7.0V	1.39		1.69	V
Detectable Temperature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

Ordering Information

XC31xxxxxxx
 |||T|||
 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.

-
1. The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this catalog is up to date.
 2. We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this catalog.
 3. Please ensure suitable shipping controls (including fail-safe designs and aging protection) are in force for equipment employing products listed in this catalog.
 4. The products in this catalog are not developed, designed, or approved for use with such equipment whose failure or malfunction can be reasonably expected to directly endanger the life of, or cause significant injury to, the user.
(e.g. Atomic energy; aerospace; transport; combustion and associated safety equipment thereof.)
 5. Please use the products listed in this catalog within the specified ranges.
Should you wish to use the products under conditions exceeding the specifications, please consult us or our representatives.
 6. We assume no responsibility for damage or loss due to abnormal use.
 7. All rights reserved. No part of this catalog may be copied or reproduced without the prior permission of Torex Semiconductor Ltd.

TOREX SEMICONDUCTOR LTD.