

FEATURES

- 1.2 V precision output
- Excellent line regulation: 2 ppm/V typical
- High power supply ripple rejection: -80 dB at 220 Hz
- Ultralow power supply current: 16 μ A maximum
- Temperature coefficient: 40 ppm/ $^{\circ}$ C maximum
- Low noise, 12.5 nV/ $\sqrt{\text{Hz}}$ typical
- Operating supply range, 2.4 V to 5.5 V
- Compact 3-lead SOT-23 and SC70 packages

APPLICATIONS

- List GSM, GPRS, 3G mobile stations
- Portable battery-operated electronics
- Low voltage converter references
- Wireless devices

GENERAL DESCRIPTION

The ADR280 is a 1.2 V band gap core reference with excellent line regulation and power supply rejection designed specifically for applications experiencing heavy dynamic supply variations, such as data converter references in GSM, GPRS, and 3G mobile station applications. Devices such as the AD6535 that have an analog baseband IC with on-board baseband, audio codecs, voltage regulators, and battery chargers rely on the ability of the ADR280 to reject input battery voltage variations during RF power amplifier activity.

In addition to mobile stations, the ADR280 is suitable for a variety of general-purpose applications. Most band gap references include internal gain for specific outputs, which simplifies the user's design, but compromises on the cost, form factor, and flexibility. The ADR280, on the other hand, optimizes the band gap core voltage and allows users to tailor the voltage, current, or transient response by simply adding their preferred op amps.

The ADR280 operates on a wide supply voltage range from 2.4 V to 5.5 V. It is available in compact 3-lead SOT-23 and SC70 packages. The device is specified over the extended industrial temperature range of -40°C to $+85^{\circ}\text{C}$.

PIN CONFIGURATIONS

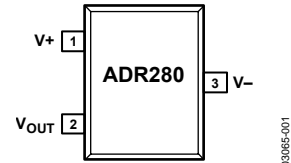


Figure 1. 3-Lead SOT-23
(RT Suffix)

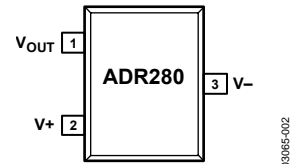


Figure 2. 3-Lead SC70
(KS Suffix)

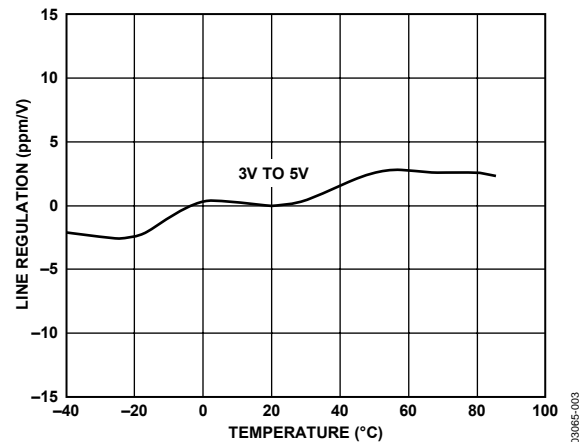


Figure 3. Line Regulation vs. Temperature

Rev. C

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REVISION HISTORY

4/07—Rev. B to Rev. C

Updated Format	Universal
Changes to Figure 1, Figure 2.....	1
Deleted Pin Function Descriptions Section and Pin Configurations Section	2
Changes to Figure 20 and Figure 21	9
Updated Outline Dimensions	10

10/04—Rev. A to Rev. B

Changes to Pin Configurations.....	Universal
Changes to Ordering Guide	2
Changes to Outline Dimensions.....	7

6/03—Rev. 0 to Rev. A

Added SC70 package.....	Universal
Changes to Features	1
Changes to General Description	1
Changes to Specifications.....	2
Changes to Ordering Guide	2
Changes to TPCs 4, 6, and 7	3
Updated SOT-23 Outline Dimensions	7

11/02—Revision 0: Initial Version

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

$V_{IN} = 2.55\text{ V}$ to 5.5 V , $T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 1.

Parameter	Symbol	Conditions	Min	Typ ¹	Max	Unit
Output Voltage	V_{OUT}	$2.4\text{ V} < V_{IN} < 5.5\text{ V}$, $0\ \mu\text{A} < I_{OUT} < 10\ \mu\text{A}$, $-40^\circ\text{C} < T_A < +85^\circ\text{C}$	1.195	1.200	1.205	V
Temperature Coefficient	TCV_O	$0^\circ\text{C} < T_A < 50^\circ\text{C}$		5	20	ppm/ $^\circ\text{C}$
		$-40^\circ\text{C} < T_A < +85^\circ\text{C}$		10	40	ppm/ $^\circ\text{C}$
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$2.55\text{ V} < V_{IN} < 5.5\text{ V}$, no load		2	12	ppm/V
Supply Current	I_{IN}	$2.4\text{ V} < V_{IN} < 5.5\text{ V}$, no load		10	16	μA
Ground Current	I_{GND}	V- grounded, $I_{LOAD} = 10\ \mu\text{A}$		12	20	μA
Input Voltage Range	V_{IN}		2.4		5.5	V
Operating Temperature Range	T_A		-40		+85	$^\circ\text{C}$
Nominal Load Capacitance	C_{OUT}		1			μF
Output Noise Voltage	$V_N\text{ rms}$	$f = 10\text{ Hz}$ to 10 kHz		12.5		$\mu\text{V rms}$
Voltage Noise Density	e_N	$f = 400\text{ kHz}$		12.5		$\text{nV}/\sqrt{\text{Hz}}$
Power Supply Ripple Rejection ²	PSRR	$I_{LOAD} = 10\ \mu\text{A}$		-80		dB
Start-Up Time	t_{ON}			2		ms

¹ Typical values represent average readings taken at room temperature.

² Power supply ripple rejection measurement applies to a changing input voltage (V_{IN}) waveform with a nominal 3.6 V baseline that drops to a 3 V value for 380 μs at a 4.6 ms repetition rate.

ADR280

ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 2.

Parameter	Rating
Supply Voltage	6 V
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Operating Temperature Range	-40°C to $+85^\circ\text{C}$
Junction Temperature Range	-65°C to $+150^\circ\text{C}$
Lead Temperature Range (Soldering, 60 Sec)	300°C

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL RESISTANCE

θ_{JA} is specified for the worst-case conditions, that is, θ_{JA} is specified for a device soldered in circuit board for surface-mount packages.

Table 3.

Package Type	θ_{JA}	θ_{JC}	Unit
SOT-23	230	146	$^\circ\text{C}/\text{W}$
SC70	376	102	$^\circ\text{C}/\text{W}$

ESD CAUTION



ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

