

MAXIM

Low-Voltage Reference

MAX8069

General Description

The MAX8069 is a 1.2V temperature-compensated voltage reference. It uses the bandgap principle to achieve excellent stability and low noise at reverse currents down to 60µA. The MAX8069 also features excellent stability, freedom from oscillation. The MAX8069 is a functional alternative to Maxim's ICL8069 with an identical pinout.

Applications

- Analog-to-Digital Converters
- Digital-to-Analog Converters
- Threshold Detectors
- Voltage Regulators
- Portable Instruments

Features

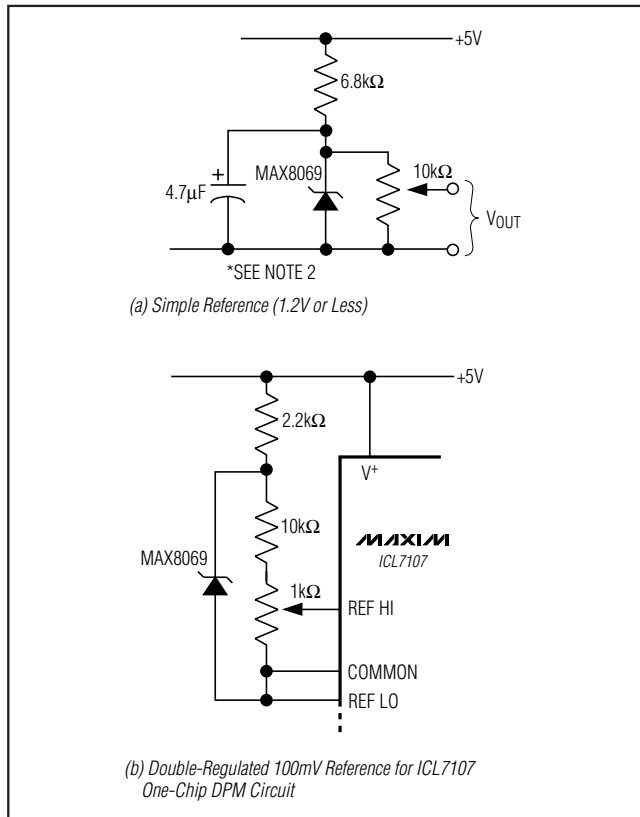
- ◆ Temperature Coefficient Guaranteed to 25ppm/°C (max)
- ◆ Low Bias Current: 60µA (min)
- ◆ Low Dynamic Impedance
- ◆ Low Reverse Voltage
- ◆ Low Cost

Ordering Information

| PART | TEMP RANGE | PIN-PACKAGE | PKG CODE |
|-------------|----------------|-------------|----------|
| MAX8069ESA+ | -40°C to +85°C | 8 SO | S8-2 |
| MAX8069CCZQ | 0°C to +70°C | TO-92 | C92-2 |

+Denotes lead-free package.

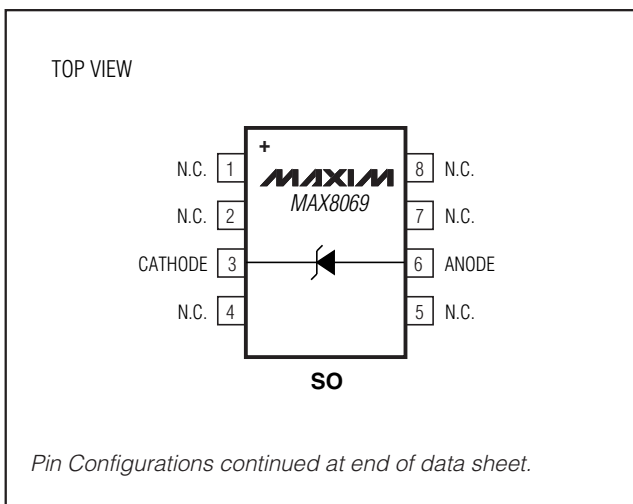
Typical Operating Circuit



Selector Guide

| PART | TEMP RANGE | PIN-PACKAGE | MAX TEMPCO (ppm/°C) |
|-------------|----------------|-------------|---------------------|
| MAX8069ESA+ | -40°C to +85°C | 8 SO | 25 |
| MAX8069CCZQ | 0°C to +70°C | TO-92 | 50 |

Pin Configurations



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ABSOLUTE MAXIMUM RATINGS

| | | |
|---------------------------------|--|---|
| Reverse Voltage | (Note 1) | Operating Temperature Range |
| Forward Current | 10mA | MAX8069CCZQ |
| Reverse Current | 10mA | MAX8069ESA |
| Power Dissipation | Limited by Max Forward/Reverse Current | Lead Temperature (soldering, 10s) |
| Storage Temperature Range | -65°C to +150°C | |

Note 1: In normal use, the reverse voltage cannot exceed the reference voltage. However, when plugging units into a powered-up test fixture, an instantaneous voltage equal to the compliance of the test circuit will be seen. This should not exceed 20V.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

($T_A = +25^\circ\text{C}$, unless otherwise noted.) (Note 2)

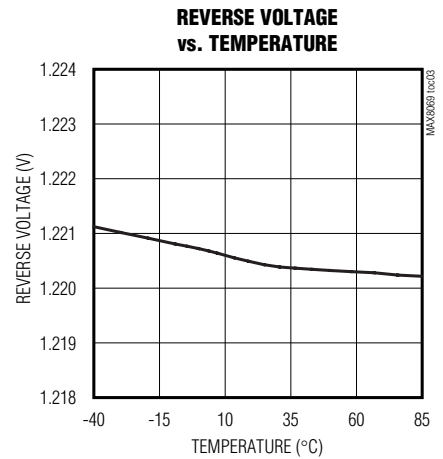
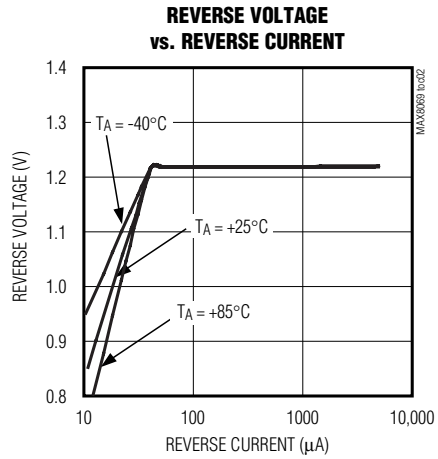
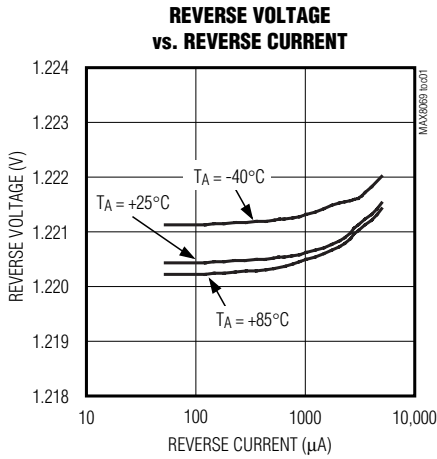
| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|--|--|-------------|------|------|-----------------------|
| Output Voltage | $I_R = 500\mu\text{A}$ | 1.20 | 1.22 | 1.25 | V |
| Output Voltage Temperature Coefficient | $I_R = 500\mu\text{A}$, $T_A = T_{\text{MIN}}$ to T_{MAX} | MAX8069ESA | | 25 | ppm/ $^\circ\text{C}$ |
| | | MAX8069CCZQ | | 50 | |
| Output Voltage Change | $60\mu\text{A} \leq I_R \leq 5\text{mA}$ | | 15 | 20 | mV |
| Reverse Dynamic Impedance | $I_R = 60\mu\text{A}$ | | 1 | 2 | Ω |
| | $I_R = 500\mu\text{A}$ | | 0.6 | 2 | |
| Forward Voltage Drop | $I_R = 500\mu\text{A}$ | | 0.6 | 1 | V |
| RMS Noise Voltage | $10\text{Hz} \leq f \leq 10\text{kHz}$, $I_R = 500\mu\text{A}$ | | 20 | | μV |
| Reverse Current Range | | 0.06 | | 5.0 | mA |

Note 2: If circuit strays in excess of 200pF are anticipated, a 4.7 μF shunt capacitor will ensure stability under all operating conditions.

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Typical Operating Characteristics

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



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Pin Configurations (continued)

