MC8069

Features

- **Low Bias Current (Min) 50μA**
- **Low Dynamic Impedance**
- **Low Reverse Voltage**
- **Low Cost**

Description

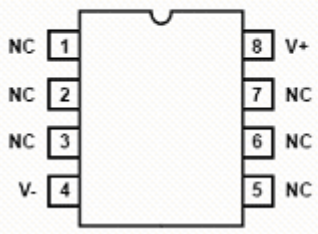
The MC8069 is a 1.2V temperature-compensated voltage reference. It uses the band-gap principle to achieve excellent stability and low noise at reverse currents down to 50μA. Applications include analog-to-digital converters, digital-toanalog converters, threshold detectors, and voltage regulators. Its low power consumption makes it especially suitable for battery operated equipment.

Ordering Information

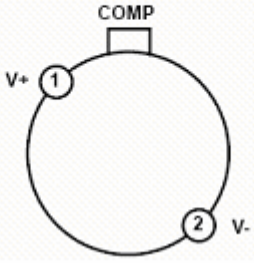
PART NUMBER	MAXIMUM TEMPCO	TEMP. RANGE (^{O}C)	PACKAGE	PKG. NO.
ICL8069CCZR	0.005%/^{O}C	0 to 70	SIP Package (TO-92)	Z3.05
ICL8069CCSQ	0.005%/^{O}C	0 to 70	Metal Can Package (TO-52)	T2.A
ICL8069DCZR	0.01%/^{O}C	0 to 70	SIP Package (TO-92)	Z3.05
ICL8069DCSQ	0.01%/^{O}C	0 to 70	Metal Can Package (TO-52)	T2.A
ICL8069CCBA	0.005%/^{O}C	0 to 70	8 Ld SOIC	M8.15
ICL8069DCBA	0.01%/^{O}C	0 to 70	8 Ld SOIC	M8.15
ICL8069CMSQ	0.005%/^{O}C	-55 to 125	Metal Can Package (TO-52)	T2.A
ICL8069DMSQ	0.01%/^{O}C	-55 to 125	Metal Can Package (TO-52)	T2.A

Pinouts

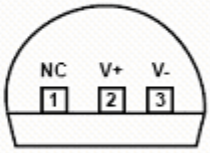
MC8069
(SOIC)
TOP VIEW



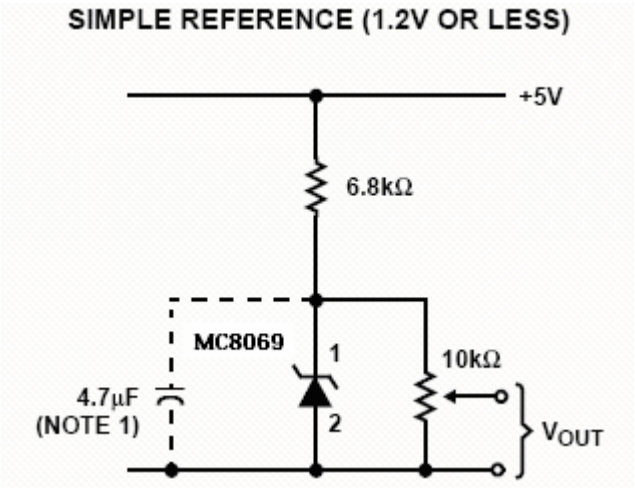
MC8069
(METAL CAN TO-52)
TOP VIEW



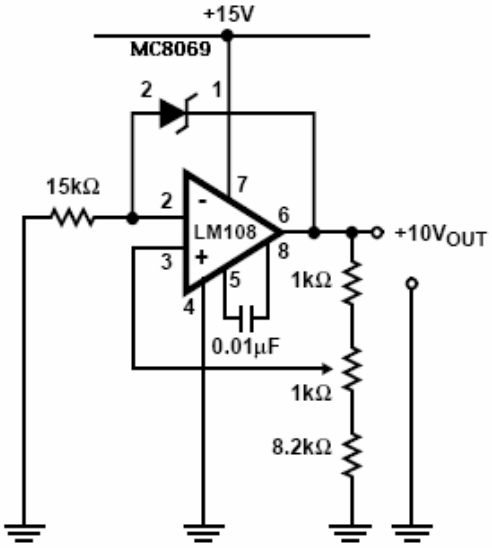
MC8069
(SIP TO-92)
TOP VIEW



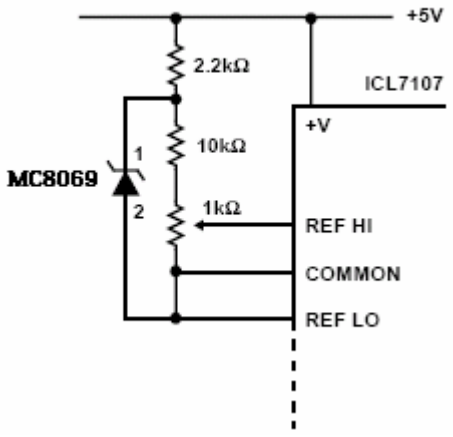
Functional Block Diagrams



BUFFERED 10V REFERENCE USING A SINGLE SUPPLY



DOUBLE REGULATED 100mV REFERENCE FOR ICL7107 ONE-CHIP DPM CIRCUIT



Absolute Maximum Ratings

Reverse Voltage . . . . . See Note 3

Forward Current 10mA

Reverse Current 10mA

Operating Conditions

Temperature Ranges

MC8069C . . . . . .0oC to 70oC

MC8069M . . . . . -55oC to 125oC

Thermal Information

Thermal Resistance (Typical, Note 1) θJA (oC/W) θJC (oC/W)

SOIC Package . . . . . 170 N/A

SIP (TO-92) Package. . . . . 200 N/A

Metal Can Package 200 120

Power Dissipation Limited by MAX Forward/Reverse Current

Maximum Junction Temperature (Metal Can Package) 175oC

Maximum Junction Temperature (SOIC Package) 150oC

Maximum Storage Temperature Range . . . . . .-65oC to 150oC

Maximum Lead Temperature (Soldering 10s) 300oC

(SOIC - Lead Tips Only)

CAUTION: Stresses above those listed in “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

1. θJA is measured with the component mounted on an evaluation PC board in free air.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Reverse Breakdown Voltage	I_R = 500μA	1.20	1.23	1.25	V
Reverse Breakdown Voltage Change	50μA ≤ I_R ≤ 5mA	-	15	20	mV
Reverse Dynamic Impedance	I_R = 50μA	-	1	2	Ω
	I_R = 500μA	-	1	2	Ω
Forward Voltage Drop	I_F = 500μA	-	0.7	1	V
RMS Noise Voltage	10Hz ≤ F ≤ 10kHz, I_R = 500μA	-	5	-	μV
Long Term Stability	I_R = 4.75mA, T_A = 25°C	-	1	-	ppm/kHR
Breakdown Voltage Temperature Coefficient **MC8069C**	I_R = 500μA, T_A = Operating Temperature Range (Note 3)	-	-	0.005	%/°C
MC8069D		-	-	0.01	%/°C
Reverse Current Range	1.18V to 1.27V	0.050	-	5	mA

NOTES:

1. If circuit strays in excess of 200pF are anticipated, a 4.7μF shunt capacitor will ensure stability under all operating conditions.
2. 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.
3. For the military part, measurements are made at 25oC, -55oC, and 125oC. The unit is then classified as a function of the worst case TC from 25oC to -55oC, or 25oC to 125oC.

Typical Performance Curves

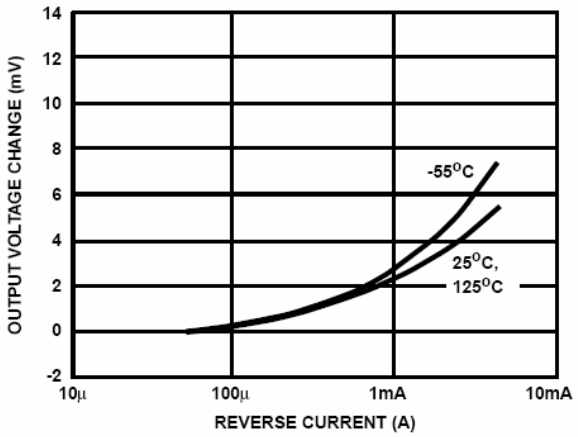


FIGURE 1. VOLTAGE CHANGE AS A FUNCTION OF REVERSE CURRENT

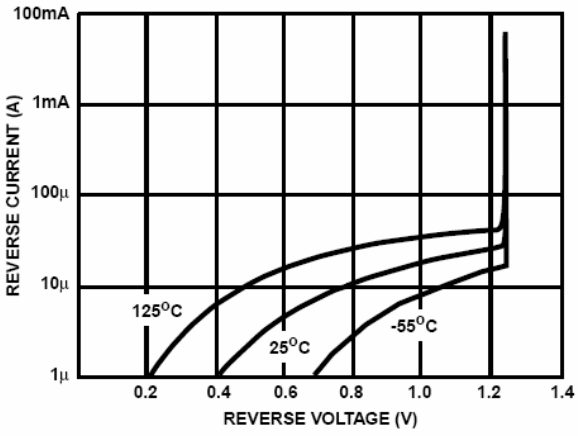


FIGURE 2. REVERSE VOLTAGE AS A FUNCTION OF CURRENT

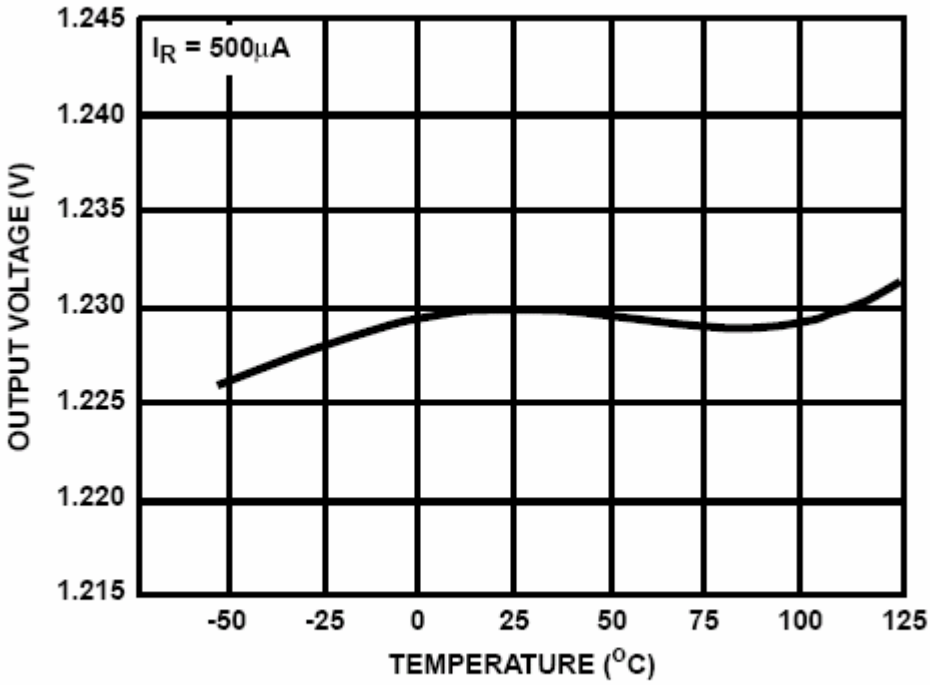


FIGURE 3. REVERSE VOLTAGE AS A FUNCTION OF TEMPERATURE