+10V Precision Voltage Reference

ABSOLUTE MAXIMUM RATINGS

Input Voltage 40V
Power Dissipation
  TO-99 (TV) (derate at 7.1mW/ C above +80°C).....500mW
  CERDIP (J) (derate at 6.7mW/ C above +75°C).....500mW
  Plastic DIP (P) (derate at 5.6mW/ C above +36°C).....500mW
  Narrow SO (S) (derate at 5.0mW/ C above +55°C).....300mW
Storage Temperature Range .....-65°C to +150°C
Operating Temperature Range
  MAX674C.....0°C to +70°C
  MAX674E.....-40°C to +85°C
  MAX674M.....-55°C to +125°C
Dice Junction Temperature (T_J) .....-65°C to +150°C
Output Short-Circuit Duration
  (to Ground or V_{IN}).....Indefinite
Lead Temperature (soldering, 60s) .....+300°C

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

(V_{IN} = +15V, T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage Tolerance		I_L = 0mA			±15	mV
Output Voltage Temperature Coefficient (Note 1)	TCV_O	MAX674CTV/CPA/CSA			12	ppm/°C
		MAX674ETV/EJA/EPA/ESA			15	
		MAX674MTV/MJA			20	
Output Adjustment Range	V_{TRIM}	Rp = 10	±300	±600		mV
Line Regulation (Note 2)		V_{IN} = 13V to 33V		0.006	0.01	%/V
Load Regulation (Note 2)		I_L = 0 to 10mA		0.001	0.002	%/mA
Turn-On Settling Time	t_{ON}	To ±0.1% of final value		5		µs
Quiescent Supply Current	I_Q	No load		750	1400	µA
Noise (Note 3)	$e_{N(P-P)}$	0.1Hz to 10Hz		20	30	$µV_{P-P}$
Sink Current	I_S		0.3	0.5		mA
Short-Circuit Current	I_{SC}	V_{OUT} = 0V		30		mA

Note 1: Temperature coefficient is measured by the "box" method, i.e., the maximum ΔV_{OUT} is divided by ΔT.
Note 2: Line and load regulation specifications include the effect of self-heating.
Note 3: Guaranteed by design for MAX674CPA, MAX674CSA, MAX674EPA, MAX674ESA; sample tested for all other grades and packages.

Output Adjustment

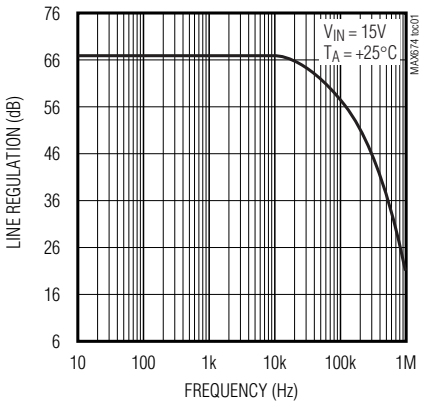
The MAX674 trim terminal can be used to adjust the output voltage over a 10V ±300mV range. This feature allows system errors to be trimmed by setting the reference to a voltage other than 10V such as 10.240V for binary applications (see the *Typical Operating Circuit*). The trim terminal may, of course, be left open if no adjustment is needed.

Adjustment of the output does not significantly affect the temperature performance of the device. The temperature coefficient change is approximately 0.7ppm/°C for 100mV of output adjustment from its initial value.

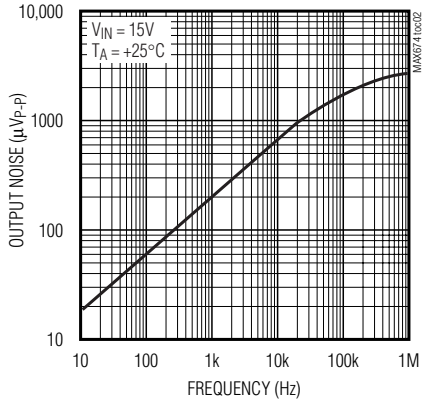
Typical Operating Characteristics

(T_A = +25°C, unless otherwise noted.)

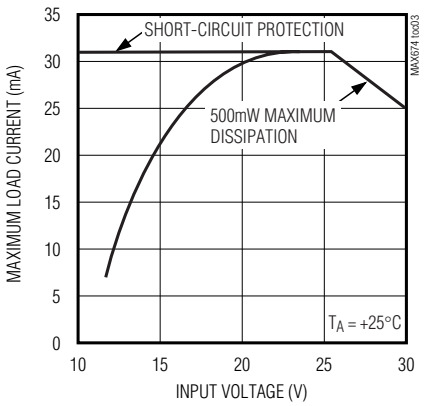
LINE REGULATION vs. FREQUENCY



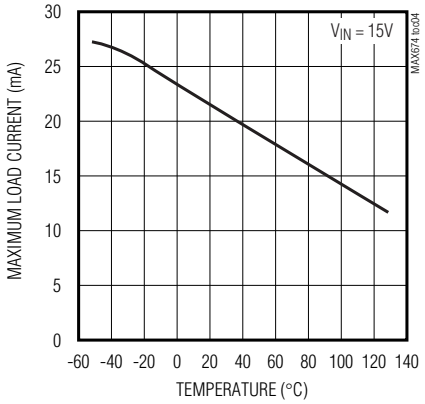
MAX674 OUTPUT WIDEBAND NOISE vs. BANDWIDTH (0.1Hz TO FREQUENCY INDICATED)



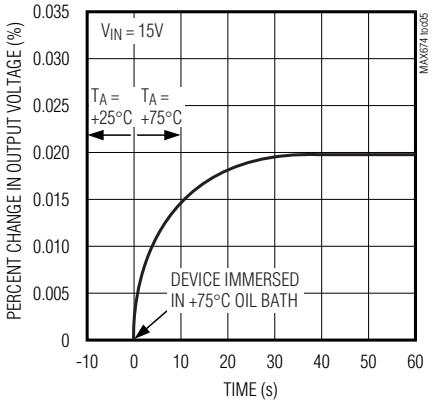
MAXIMUM LOAD CURRENT vs. INPUT VOLTAGE



MAXIMUM LOAD CURRENT vs. TEMPERATURE



OUTPUT CHANGE DUE TO THERMAL SHOCK



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Typical Applications

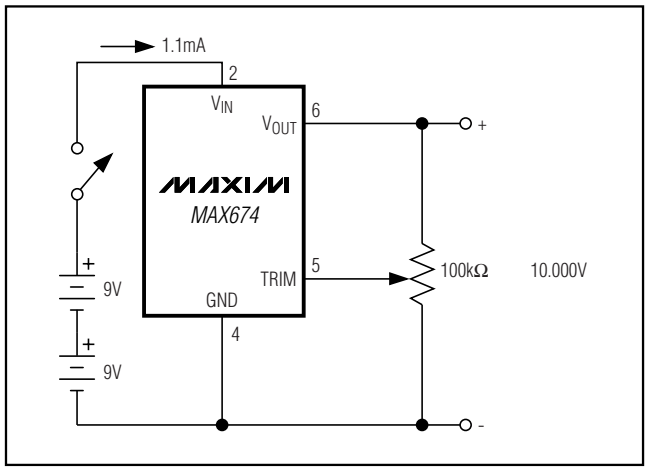

Figure 2. Precision Calibration Standard

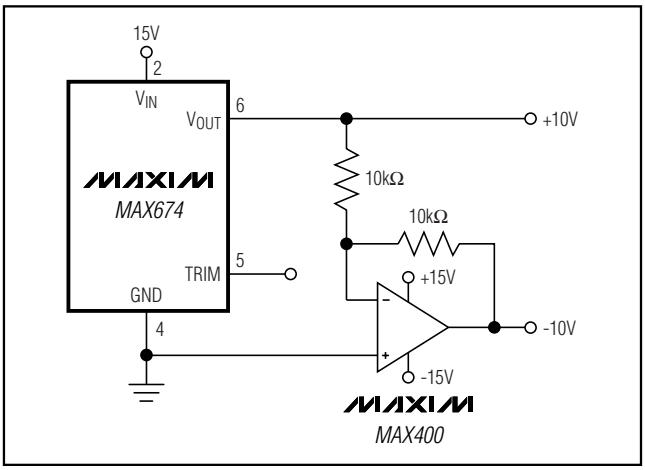

Figure 3. ±10V Reference

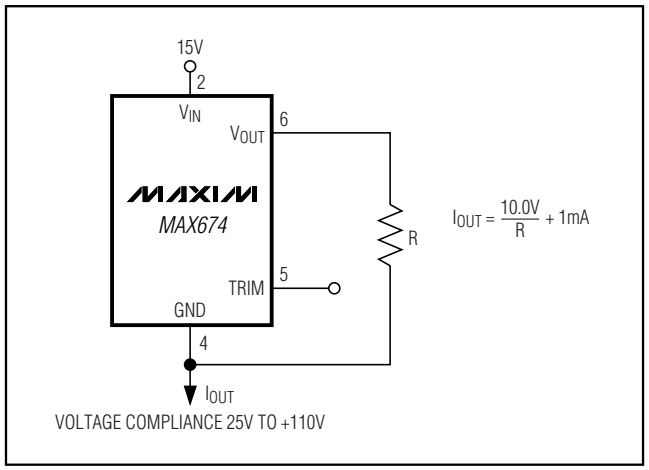

Figure 4. Current Source

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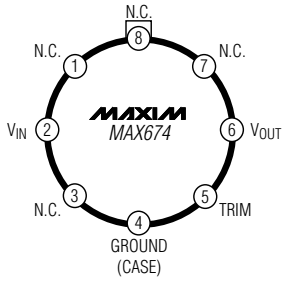
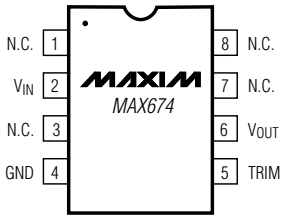
Pin Configurations (continued)

TOP VIEW

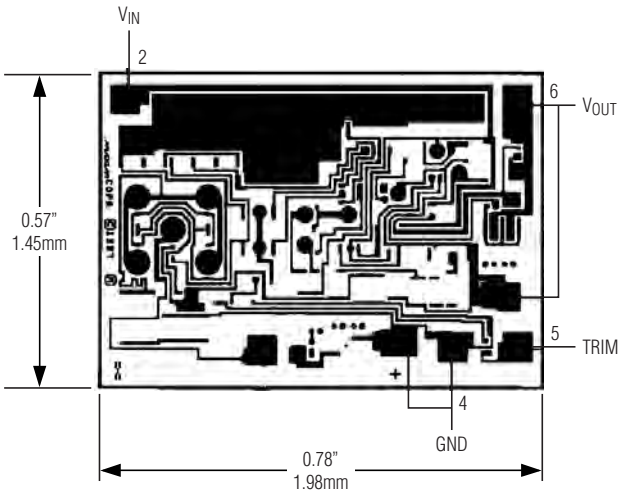


TO-99 METAL CAN



CERDIP

Chip Topography



Ordering Information (continued)

PART	TEMP RANGE	PIN-PACKAGE	TEMPCO (ppm/°C)	INITIAL ERROR (mV)
MAX674CTV*	0°C to +70°C	8 TO-99	12	15
MAX674ETV*	-40°C to +85°C	8 TO-99	15	15
MAX674EJA*	-40°C to +85°C	8 CERDIP	15	15
MAX674MTV*	-55°C to +125°C	8 TO-99	20	15
MAX674MJA*	-55°C to +125°C	8 CERDIP	20	15

**Contact factory for availability. Not recommended for new designs.*