19-2428: Rev 0: 4/02

## 

### Precision, Micropower, Low-Dropout, SC70 Series Voltage Reference

#### **General Description**

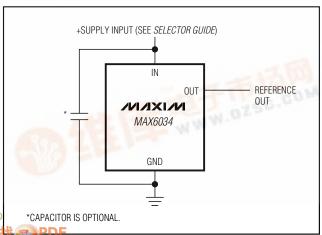
The MAX6034 family of precision, low-dropout, micropower voltage references are available in the miniature 3-pin SC70 surface-mount package. They feature a proprietary temperature coefficient curvature-correction circuit and laser-trimmed, thin-film resistors that result in a low temperature coefficient of 30ppm/°C (max) and initial accuracy of ±0.20% (max). These devices are available over the extended temperature range of -40°C to +85°C.

The MAX6034 family of series-mode voltage references typically draw only 90µA of supply current and can source 1mA and sink 200µA of load current. Unlike conventional shunt-mode (two terminal) references that waste supply current and require an external resistor, devices in the MAX6034 family offer supply current that is virtually independent of supply voltage (16µA/V, max variation) and do not require an external resistor. These internally compensated devices do not require an external compensation capacitor, but are stable with up to 1µF of load capacitance. Eliminating the external compensation capacitor saves valuable board space in space-critical applications. The low dropout voltage and supply-independent, ultra-low supply current make the MAX6034 ideal for battery-powered applications.

#### **Applications**

Hand-Held Equipment **Data-Acquisition Systems** Industrial and Process Control Systems Battery-Operated Equipment Hard-Disk Drives

#### **Typical Operating Circuit**



**MAXIM** 

#### **Features**

- ◆ Ultra-Small, 3-Pin SC70 Package
- ◆ ±0.2% (max) Initial Accuracy
- ♦ 30ppm/°C (max) Temperature Coefficient
- ♦ 90µA Supply Current
- ♦ 200mV (max) Dropout Voltage at 1mA Load Current
- ♦ Stable with C<sub>LOAD</sub> = 0 to 1µF
- ♦ No Output Capacitor Needed

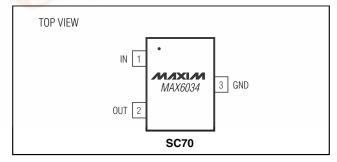
#### **Ordering Information**

TEMP RANGE	PIN- PACKAGE	TOP MARK
-40°C to +85°C	3 SC70-3	AJH
-40°C to +85°C	3 SC70-3	AJM
-40°C to +85°C	3 SC70-3	AJI
-40°C to +85°C	3 SC70-3	AJN
-40°C to +85°C	3 SC70-3	AJJ
-40°C to +85°C	3 SC70-3	AJO
-40°C to +85°C	3 SC70-3	AJK
-40°C to +85°C	3 SC70-3	AJP
-40°C to +85°C	3 SC70-3	AJL
-40°C to +85°C	3 SC70-3	AJQ
	-40°C to +85°C	TEMP RANGE         PACKAGE           -40°C to +85°C         3 SC70-3           -40°C to +85°C         3 SC70-3

#### **Selector Guide**

PART	Vout	INPUT VOLTAGE (V)
MAX6034_EXR21-T	2.048	2.5 to 5.5
MAX6034_EXR25-T	2.500	$(V_{OUT} + 200 mV)$ to 5.5
MAX6034_EXR30-T	3.000	(V <sub>OUT</sub> + 200mV) to 5.5
MAX6034_EXR33-T	3.300	(V <sub>OUT</sub> + 200mV) to 5.5
MAX6034_EXR41-T	4.096	(V <sub>OUT</sub> + 200mV) to 5.5

#### **Pin Configuration**



Maxim Integrated Products 1

#### **ABSOLUTE MAXIMUM RATINGS**

(Voltages Referenced to GND)	Operating Temperature Range40°C to +85°C
IN0.3V to +6.0V	Junction Temperature+150°C
OUT0.3V to (V <sub>IN</sub> + 0.3V)	Storage Temperature Range65°C to +150°C
Output Short Circuit to GND or INContinuous	Lead Temperature (soldering, 10s)+300°C
Continuous Power Dissipation ( $T_A = +70^{\circ}C$ )	
3-Pin SC70 (derate 2.9mW/°C above +70°C)235mW	

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-MAX6034\_21 (Vout = 2.048V)**

 $(V_{IN} = 2.7V, I_{OUT} = 0, T_A = T_{MIN} \text{ to } T_{MAX}, \text{ unless otherwise noted. Typical values are at } T_A = +25^{\circ}C.)$  (Note 1)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
OUTPUT							
Output Voltage V <sub>OUT</sub>		T 0500	MAX6034A_21 (±0.2%)	2.044	2.048	2.052	
	VOUT	$T_A = +25^{\circ}C$	MAX6034B_21 (±0.4%)	2.040	2.048	2.056	V
Output Voltage Temperature	TOV	MAX6034A_21	•		7	30	
Coefficient (Note 2)	TCV <sub>OUT</sub>	MAX6034B_21			7	75	ppm/°C
Line Regulation	ΔV <sub>OUT</sub> / ΔV <sub>IN</sub>	2.5V ≤ V <sub>IN</sub> ≤ 5.5V	V		33	220	μV/V
Load Doculation	ΔV <sub>OUT</sub> /	Sourcing: 0 ≤ IOI	UT ≤ 1mA		0.25	1.0	
Load Regulation	Δlout	Sinking: 0 ≤ I <sub>OU7</sub>	r ≤ 200μA		2.1	62	mV/m/
OUT Short-Circuit Current	laa	Short to GND			12		m 1
OUT SHORT-CIRCUIT CUITERIT	I <sub>SC</sub>	Short to IN			4		- mA
Temperature Hysteresis	ΔV <sub>OUT</sub> / cycle	(Note 3)			100		ppm
Long-Term Stability	ΔV <sub>OUT</sub> / time	1000hr at T <sub>A</sub> = +25°C			90		ppm/ 1000h
DYNAMIC							
Noise Voltage	00117	f = 0.1Hz to 10H	Z		45		μV <sub>P-P</sub>
Noise voitage	eout	f = 10Hz to 10kH	łz		46		μV <sub>RMS</sub>
Ripple Rejection	ΔV <sub>OUT</sub> / ΔV <sub>IN</sub>	V <sub>IN</sub> = 2.7V ±100mV, f = 120Hz			80		dB
Turn-On Settling Time	t <sub>R</sub>	To V <sub>OUT</sub> = 0.1% of final value, C <sub>OUT</sub> = 50pF			85		μs
Capacitive-Load Stability Range	Cout	(Note 4)		0		1	μF
INPUT							
Supply Voltage Range	V <sub>IN</sub>	Guaranteed by line-regulation test		2.5		5.5	V
Quiescent Supply Current	I <sub>IN</sub>				85	115	μΑ
Change in Supply Current Per Change in Input Voltage	ΔΙ <sub>ΙΝ</sub> /ΔV <sub>ΙΝ</sub>	2.5V ≤ V <sub>IN</sub> ≤ 5.5V			4.1	16	μA/V

#### **ELECTRICAL CHARACTERISTICS-MAX6034\_25 (Vout = 2.500V)**

 $(V_{IN} = 2.7V, I_{OUT} = 0, T_A = T_{MIN} \text{ to } T_{MAX}, \text{ unless otherwise noted. Typical values are at } T_A = +25^{\circ}\text{C.})$  (Note 1)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
OUTPUT							
Output Voltage	V	T <sub>A</sub> = +25°C	MAX6034A_25 (±0.2%)	2.495	2.500	2.505	V
Output Voltage	Vout	TA = +25 C	MAX6034B_25 (±0.4%)	2.490	2.500	2.510	V
Output Voltage Temperature	TCV <sub>OUT</sub>	MAX6034A_25			7	30	ppm/°C
Coefficient (Note 2)	10,001	MAX6034B_25			7	75	ррпі, С
Line Regulation	$\Delta V_{OUT}/$ $\Delta V_{IN}$	(V <sub>OUT</sub> + 200mV):	≤ V <sub>IN</sub> ≤ 5.5V		40	250	μV/V
Load Regulation	ΔV <sub>OUT</sub> /	Sourcing: 0 ≤ I <sub>OU</sub>	T ≤ 1mA		0.22	1.0	mV/mA
Load Negulation	Δlout	Sinking: 0 ≤ I <sub>OUT</sub>	≤ 200µA		2.5	8	IIIV/III/A
OUT Short-Circuit Current	I <sub>SC</sub>	Short to GND			12		mA
COT GHOIL GIRCUIT GUITCH	130	Short to IN			4		1117 (
Dropout Voltage	V <sub>IN</sub> - V <sub>OUT</sub>	I <sub>OUT</sub> = 1mA (Note	I <sub>OUT</sub> = 1mA (Note 5)		70	200	mV
Temperature Hysteresis	ΔV <sub>OUT</sub> / cycle	(Note 3)			100		ppm
Long-Term Stability	ΔV <sub>OUT</sub> / time	1000hr at T <sub>A</sub> = +25°C			90		ppm/ 1000hr
DYNAMIC				•			
Niciae Valtage	0.01.17	f = 0.1Hz to 10Hz			55		μV <sub>P-P</sub>
Noise Voltage	eout	f = 10Hz to $10kHz$	f = 10Hz to 10kHz		64		μV <sub>RMS</sub>
Ripple Rejection	ΔV <sub>OUT</sub> / ΔV <sub>IN</sub>	V <sub>IN</sub> = 2.7V ±100mV, f = 120Hz			80		dB
Turn-On Settling Time	t <sub>R</sub>	To V <sub>OUT</sub> = 0.1% of final value, C <sub>OUT</sub> = 50pF			140		μs
Capacitive-Load Stability Range	Cout	(Note 4)		0		1	μF
INPUT							
Supply Voltage Range	VIN	Guaranteed by line-regulation test		VOUT + 0.2		5.5	V
Quiescent Supply Current	I <sub>IN</sub>				85	115	μΑ
Change in Supply Current Per Change in Input Voltage	ΔΙ <sub>ΙΝ</sub> /ΔV <sub>ΙΝ</sub>	(V <sub>OUT</sub> + 200mV)	≤ V <sub>IN</sub> ≤ 5.5V		4.2	16	μΑ/V

#### **ELECTRICAL CHARACTERISTICS-MAX6034\_30 (Vout = 3.000V)**

 $(V_{IN} = 5V, I_{OUT} = 0, T_A = T_{MIN} \text{ to } T_{MAX}, \text{ unless otherwise noted. Typical values are at } T_A = +25^{\circ}\text{C.})$  (Note 1)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
OUTPUT							
Output Valtage	\/	T 05°C	MAX6034A_30 (±0.2%)	2.994	3.000	3.006	V
Output Voltage	Vout	$T_A = +25^{\circ}C$	MAX6034B_30 (±0.4%)	2.988	3.000	3.012	T V
Output Voltage Temperature	TOV	MAX6034A_30			7	30	10 to 100
Coefficient (Note 2)	TCV <sub>OUT</sub>	MAX6034B_30			7	75	ppm/°C
Line Regulation	$\Delta V_{OUT}/$ $\Delta V_{IN}$	(V <sub>OUT</sub> + 200mV)	≤ V <sub>IN</sub> ≤ 5.5V		43	280	μV/V
Land Danielation	ΔV <sub>OUT</sub> /	Sourcing: 0 ≤ I <sub>OU</sub>	JT ≤ 1mA		0.30	1.3	\ // A
Load Regulation	Δlout	Sinking: 0 ≤ I <sub>OUT</sub>	- ≤ 200µA		2.6	8	mV/mA
OUT OL LOC CO		Short to GND			13		
OUT Short-Circuit Current	Isc	Short to IN			4		mA
Dropout Voltage	V <sub>IN</sub> - V <sub>OUT</sub>	I <sub>OUT</sub> = 1mA (Not	e 5)		70	200	mV
Temperature Hysteresis	ΔV <sub>OUT</sub> / cycle	(Note 3)			100		ppm
Long-Term Stability	ΔV <sub>OUT</sub> / time	1000hr at T <sub>A</sub> = +25°C			90		ppm/ 1000hr
DYNAMIC							
Naisa Valtaga		f = 0.1Hz to 10H	Z		66		μV <sub>P-P</sub>
Noise Voltage	eout	f = 10Hz to 10kH	z		80		μV <sub>RMS</sub>
Ripple Rejection	$\Delta V_{OUT}/$ $\Delta V_{IN}$	V <sub>IN</sub> = 5V ±100mV, f = 120Hz			76		dB
Turn-On Settling Time	t <sub>R</sub>	To V <sub>OUT</sub> = 0.1% of final value, C <sub>OUT</sub> = 50pF			165		μs
Capacitive-Load Stability Range	Cout	(Note 4)		0		1	μF
INPUT							
Supply Voltage Range	V <sub>IN</sub>	Guaranteed by line-regulation test		V <sub>OUT</sub> + 0.2		5.5	V
Quiescent Supply Current	I <sub>IN</sub>				95	125	μΑ
Change in Supply Current Per Change in Input Voltage	$\Delta I_{IN}/\Delta V_{IN}$	(V <sub>OUT</sub> + 200mV)	≤ V <sub>IN</sub> ≤ 5.5V		4.5	16	μΑ/V

#### **ELECTRICAL CHARACTERISTICS-MAX6034\_33 (Vout = 3.300V)**

 $(V_{IN} = 5V, I_{OUT} = 0, T_A = T_{MIN} \text{ to } T_{MAX}, \text{ unless otherwise noted. Typical values are at } T_A = +25^{\circ}\text{C.})$  (Note 1)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
OUTPUT				•			
Output Voltage	Volum	T <sub>A</sub> = +25°C	MAX6034A_33 (±0.2%)	3.293	3.300	3.307	V
Output Voltage	Vout	1A = +25 C	MAX6034B_33 (±0.4%)	3.287	3.300	3.313	V
Output Voltage Temperature	TCV <sub>OUT</sub>	MAX6034A_33			7	30	ppm/°C
Coefficient (Note 2)	10,0001	MAX6034B_33			7	75	ррпі, С
Line Regulation	$\Delta V_{OUT}/$ $\Delta V_{IN}$	(V <sub>OUT</sub> + 200m)	$V$ ) $\leq$ $V$ <sub>IN</sub> $\leq$ 5.5 $V$		45	300	μV/V
Load Regulation	ΔV <sub>OUT</sub> /	Sourcing: 0 ≤ I	OUT ≤ 1mA		0.3	1.3	m\//m \
Load negulation	$\Delta$ lout	Sinking: 0 ≤ I <sub>Ol</sub>	JT ≤ 200μA		3	8.6	mV/mA
OUT Short-Circuit Current	loo	Short to GND			13		mA
OUT SHORT-CITCUIT CUTTERIT	I <sub>SC</sub>	Short to IN			4		IIIA
Dropout Voltage	V <sub>IN</sub> - V <sub>OUT</sub>	$I_{OUT} = 1mA (N$	ote 5)		70	200	mV
Temperature Hysteresis	ΔV <sub>OUT</sub> / cycle	(Note 3)			100		ppm
Long-Term Stability	ΔV <sub>OUT</sub> / time	1000hr at T <sub>A</sub> = +25°C			90		ppm/ 1000hr
DYNAMIC				•			
Noise Voltage	T 100	f = 0.1Hz to 10	Hz		73		μV <sub>P-P</sub>
Noise Voitage	eout	f = 10Hz to $10k$	Hz		88		μV <sub>RMS</sub>
Ripple Rejection	$\Delta V_{OUT}/$ $\Delta V_{IN}$	V <sub>IN</sub> = 5V ±100r	mV, f = 120Hz		76		dB
Turn-On Settling Time	t <sub>R</sub>	To V <sub>OUT</sub> = 0.1% of final value, C <sub>OUT</sub> = 50pF			200		μs
Capacitive-Load Stability Range	Cout	(Note 4)		0		1	μF
INPUT							
Supply Voltage Range	V <sub>IN</sub>	Guaranteed by line-regulation test		V <sub>OUT</sub> + 0.2		5.5	V
Quiescent Supply Current	I <sub>IN</sub>				95	125	μΑ
Change in Supply Current Per Change in Input Voltage	ΔΙ <sub>ΙΝ</sub> /ΔV <sub>ΙΝ</sub>	(V <sub>OUT</sub> + 200m)	V) ≤ V <sub>IN</sub> ≤ 5.5V		3.8	16	μA/V

#### **ELECTRICAL CHARACTERISTICS-MAX6034\_41 (Vout = 4.096V)**

(VIN = 5V, IOUT = 0, TA = TMIN to TMAX, unless otherwise noted. Typical values are at TA = +25°C.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
OUTPUT							
Output Voltage	Vout	T <sub>A</sub> = +25°C	MAX6034A_41 (±0.2%)	4.088	4.096	4.104	V
	1001		MAX6034B_41 (±0.4%)	4.080	4.096	4.112	
Output Voltage Temperature	TCV <sub>OUT</sub>	MAX6034A_41			7	30	ppm/°C
Coefficient (Note 2)		MAX6034B_41			7	75	1-1- / -
Line Regulation	$\Delta V_{OUT}/$ $\Delta V_{IN}$	(V <sub>OUT</sub> + 200m\	$V$ ) $\leq$ $V_{IN} \leq 5.5V$		50	350	μV/V
Load Regulation	ΔV <sub>OUT</sub> /	Sourcing: 0 ≤ I			0.35	1.5	mV/mA
Load Regulation	$\Delta$ lout	Sinking: 0 ≤ IOU	JT ≤ 200μA		3.4	9.8	IIIV/IIIA
OUT Short-Circuit Current	laa	Short to GND			13		mA
OUT Short-Circuit Current	I <sub>SC</sub>	Short to IN			7		IIIA
Dropout Voltage	V <sub>IN</sub> - V <sub>OUT</sub>	I <sub>OUT</sub> = 1mA (No	ote 5)		70	200	mV
Temperature Hysteresis	ΔV <sub>OUT</sub> / cycle	(Note 3)			100		ppm
Long-Term Stability	ΔV <sub>OUT</sub> / time	1000hr at T <sub>A</sub> = +25°C			90		ppm/ 1000hr
DYNAMIC				•			
Nicion Welkers		f = 0.1Hz to 10l	-lz		90		μV <sub>P-P</sub>
Noise Voltage	eout	f = 10Hz to 10k	f = 10Hz to 10kHz		105		μV <sub>RMS</sub>
Ripple Rejection	ΔV <sub>OUT</sub> / ΔV <sub>IN</sub>	V <sub>IN</sub> = 5V ±100mV, f = 120Hz			73		dB
Turn-On Settling Time	t <sub>R</sub>	To V <sub>OUT</sub> = 0.1% of final value, C <sub>OUT</sub> = 50pF			260		μs
Capacitive-Load Stability Range	Cout	(Note 4)		0		1	μF
INPUT							
Supply Voltage Range	VIN	Guaranteed by line-regulation test		V <sub>OUT</sub> + 0.2		5.5	V
Quiescent Supply Current	I <sub>IN</sub>				95	125	μΑ
Change in Supply Current Per Change in Input Voltage	ΔΙ <sub>ΙΝ</sub> /ΔV <sub>ΙΝ</sub>	(V <sub>OUT</sub> + 200m\	/) ≤ V <sub>IN</sub> ≤ 5.5V		4.7	16	μΑ/V

Note 1: All devices are 100% production tested at TA = +25°C and are guaranteed by design for TA = TMIN to TMAX as specified.

Note 2: Temperature coefficient is measured by the "box" method, i.e. the maximum ΔV<sub>OUT</sub> / V<sub>OUT</sub> is divided by the maximum ΔT.

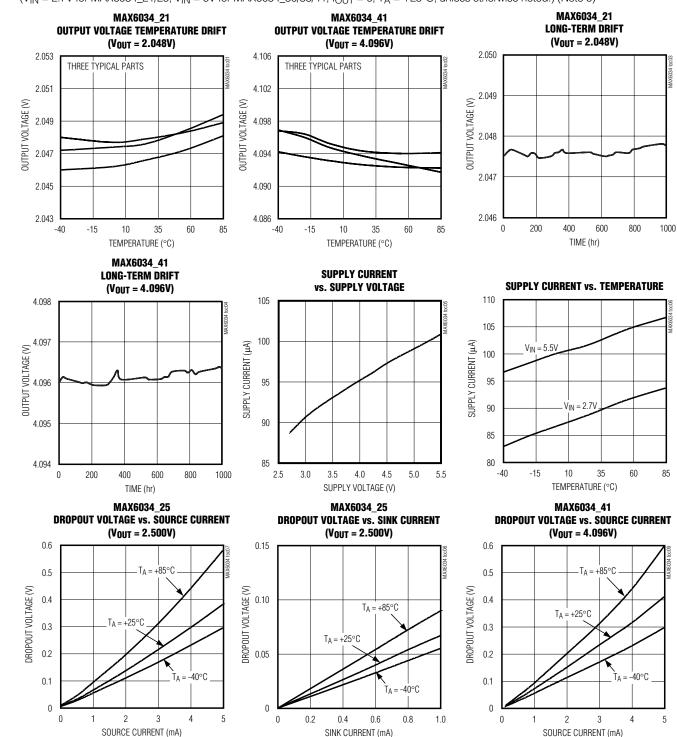
Note 3: Temperature hysteresis is defined as the change in +25°C output voltage after cycling the device from T<sub>MIN</sub> to T<sub>MAX</sub>.

Note 4: Not production tested. Guaranteed by design.

Note 5: Dropout voltage is defined as the minimum differential voltage (V<sub>IN</sub> - V<sub>OUT)</sub> at which V<sub>OUT</sub> decreases by 0.2% from its original value at V<sub>IN</sub> = 5.0V (V<sub>IN</sub> = 2.7V for MAX6034\_25).

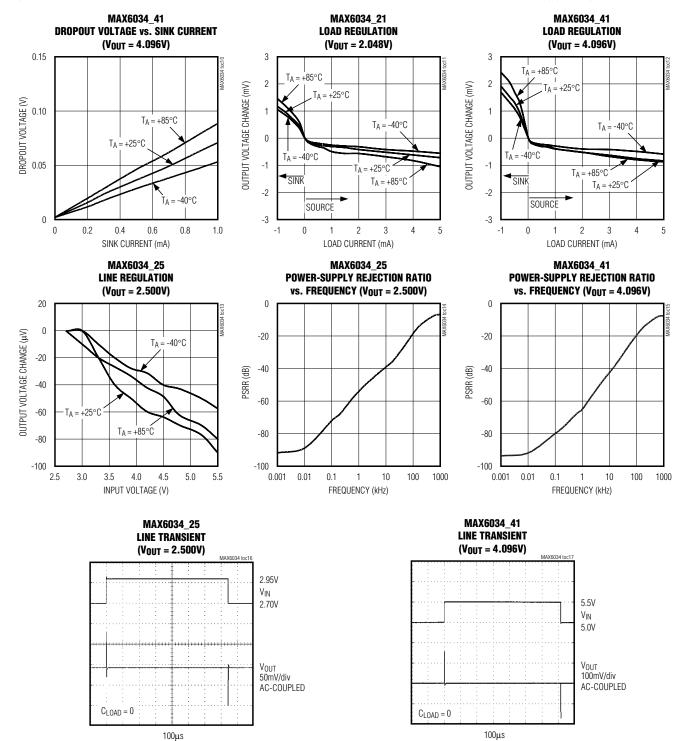
#### **Typical Operating Characteristics**

 $(V_{IN} = 2.7V \text{ for MAX6034}\_21/25, V_{IN} = 5V \text{ for MAX6034}\_30/33/41, I_{OUT} = 0, T_{A} = +25^{\circ}C, unless otherwise noted.) (Note 6)$ 



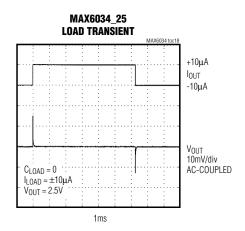
#### Typical Operating Characteristics (continued)

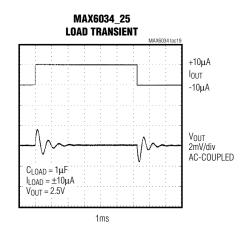
 $(V_{IN} = 2.7V \text{ for MAX6034\_21/25}, V_{IN} = 5V \text{ for MAX6034\_30/33/41}, I_{OUT} = 0, T_{A} = +25^{\circ}C, unless otherwise noted.) (Note 6)$ 

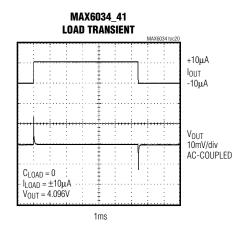


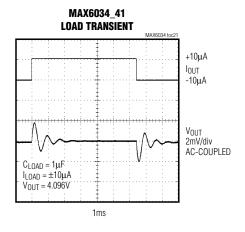
#### Typical Operating Characteristics (continued)

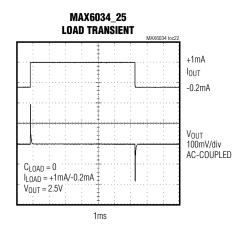
 $(V_{IN} = 2.7V \text{ for MAX6034}\_21/25, V_{IN} = 5V \text{ for MAX6034}\_30/33/41, I_{OUT} = 0, T_{A} = +25^{\circ}C, unless otherwise noted.) (Note 6)$ 

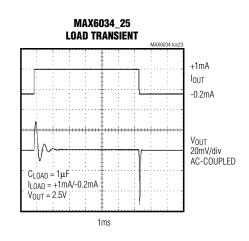






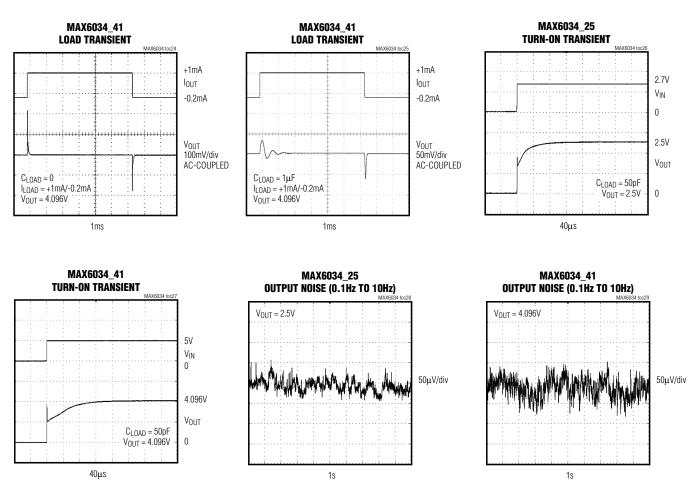






#### Typical Operating Characteristics (continued)

 $(V_{IN} = 2.7V \text{ for MAX6034}\_21/25, V_{IN} = 5V \text{ for MAX6034}\_30/33/41, I_{OUT} = 0, T_{A} = +25^{\circ}C, unless otherwise noted.) (Note 6)$ 



**Note 6:** Many of the MAX6034 family *Typical Operating Characteristics* are extremely similar. The extremes of these characteristics are found in the MAX6034\_21 (2.048V output) and the MAX6034\_41 (4.096V output). The *Typical Operating Characteristics* of the remainder of the MAX6034 family typically lie between those two extremes and can be estimated based on their output voltages.

#### **Pin Description**

PIN	NAME	FUNCTION
1	IN	Supply Voltage Input
2	OUT	Reference Voltage Output
3	GND	Ground

#### **Detailed Description**

The MAX6034 family of precision bandgap references use a proprietary temperature coefficient curvature-correction circuit and laser-trimmed, thin-film resistors, resulting in a low temperature coefficient of less than 30ppm/°C and initial accuracy of better than 0.2%. These devices can source up to 1mA and sink up to 200µA with less than 200mV of dropout voltage, making them attractive for use in low-voltage applications.

#### Applications Information

#### **Input Bypassing**

For the best line-transient performance, decouple the input with a  $0.1\mu F$  ceramic capacitor as shown in the *Typical Operating Circuit*. Locate the capacitor as close to IN as possible.

#### **Output/Load Capacitance**

Devices in the MAX6034 family do not require an output capacitor for frequency stability. They are stable for capacitive loads from 0 to 1µF. However, in applications where the load or the supply can experience step changes, an output capacitor reduces the amount of overshoot (or undershoot) and improves the circuit's transient response. Many applications do not need an external capacitor, and the MAX6034 can offer a significant advantage in these applications when board space is critical.

#### **Supply Current**

The quiescent supply current of the series-mode MAX6034 family is typically  $90\mu$ A and is virtually independent of the supply voltage, with only a  $16\mu$ A/V (max) variation with supply voltage.

When the supply voltage is below the minimum-specified input voltage (as during turn-on), the device can draw up to 50µA beyond the nominal supply current. The input-voltage source must be capable of providing this current to ensure reliable turn-on.

#### **Output Voltage Hysteresis**

Output voltage hysteresis is the change in the output voltage at  $T_A = +25$ °C before and after the device is cycled over its entire operating temperature range. Hysteresis is caused by differential package stress appearing across the bandgap core transistors. The typical temperature hysteresis value for the MAX6034 family is 100ppm.

#### **Turn-On Time**

These devices typically turn on and settle to within 0.1% of their final value in 85µs to 260µs depending on the device. The turn-on time can increase up to 1.25ms with the device operating at the minimum dropout voltage and the maximum load.

# Temperature Coefficient vs. Operating Temperature Range for a 1LSB Maximum Error

In a data converter application, the reference voltage of the converter must stay within a certain limit to keep the error in the data converter smaller than the resolution limit through the operating temperature range. Figure 1 shows the maximum allowable reference voltage temperature coefficient to keep the conversion error to less than 1LSB, as a function of the operating temperature range (TMAX - TMIN) with the converter resolution as a parameter. The graph assumes the reference-voltage temperature coefficient as the only parameter affecting accuracy.

In reality, the absolute static accuracy of a data converter is dependent on the combination of many parameters such as integral nonlinearity, differential nonlinearity, offset error, gain error, as well as voltage reference changes.

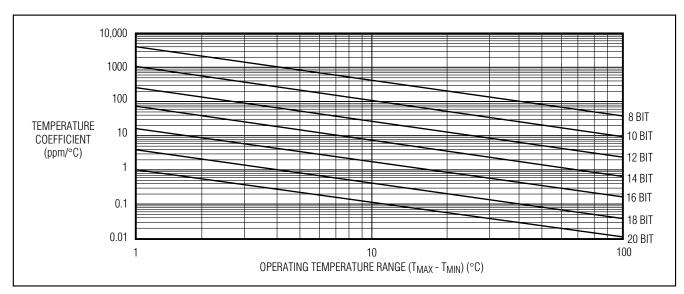


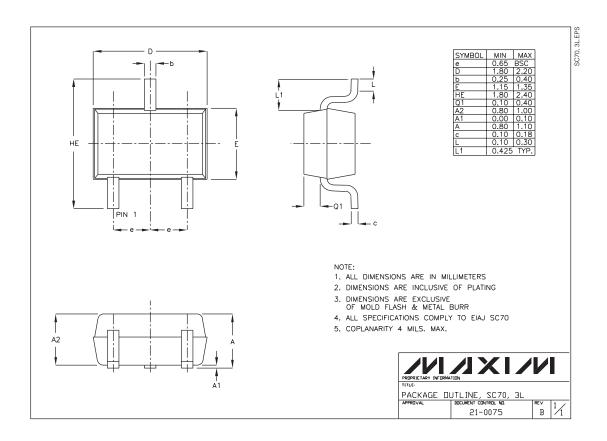
Figure 1. Temperature Coefficient vs. Operating Temperature Range for a 1LSB Maximum Error

#### \_Chip Information

TRANSISTOR COUNT: 113

PROCESS: BICMOS

#### **Package Information**



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