

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

ABSOLUTE MAXIMUM RATINGS

(Voltages Referenced to GND)

IN-0.3V to +13.5V
 OUT-0.3V to ($V_{IN} + 0.3V$)
 Output Short-Circuit Duration to GND or IN ($V_{IN} < 6V$)...Continuous
 Output Short-Circuit Duration to GND or IN ($V_{IN} \geq 6V$).....60s

Continuous Power Dissipation ($T_A = +70^\circ\text{C}$)

3-Pin SOT23 (derate 4.0mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$).....320mW
 Operating Temperature Range-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
 Storage Temperature Range.....-65 $^\circ\text{C}$ to +150 $^\circ\text{C}$
 Lead Temperature (soldering, 10s).....+300 $^\circ\text{C}$

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—MAX6061, $V_{OUT} = 1.25V$

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	$T_A = +25^\circ\text{C}$				V
		MAX6061A (0.32%)	1.244	1.248	1.252	
		MAX6061B (0.48%)	1.242	1.248	1.254	
Output Voltage Temperature Coefficient (Note 2)	TCV_{OUT}	MAX6061A		6	20	ppm/ $^\circ\text{C}$
		MAX6061B		6	30	
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$2.5V \leq V_{IN} \leq 12.6V$		10	90	$\mu\text{V/V}$
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	Sourcing: $0 \leq I_{OUT} \leq 5\text{mA}$		0.5	0.9	mV/mA
		Sinking: $-2\text{mA} \leq I_{OUT} \leq 0$		1.3	3.0	
OUT Short-Circuit Current	I_{SC}	Short to GND		25		mA
		Short to IN		25		
Long-Term Stability	$\Delta V_{OUT}/\text{time}$	1000hr at $+25^\circ\text{C}$		62		ppm/1000hr
Output Voltage Hysteresis (Note 3)	$\Delta V_{OUT}/\text{cycle}$			130		ppm
DYNAMIC CHARACTERISTICS						
Noise Voltage	e_{OUT}	$f = 0.1\text{Hz to } 10\text{Hz}$		13		$\mu\text{Vp-p}$
		$f = 10\text{Hz to } 10\text{kHz}$		15		μVRMS
Ripple Rejection	$\Delta V_{OUT}/\Delta V_{IN}$	$V_{IN} = 5V \pm 100\text{mV}$, $f = 120\text{Hz}$		86		dB
Turn-On Settling Time	t_R	To $V_{OUT} = 0.1\%$ of final value, $C_{OUT} = 50\text{pF}$		50		μs
INPUT CHARACTERISTICS						
Supply Voltage Range	V_{IN}	Guaranteed by line regulation test	2.5		12.6	V
Quiescent Supply Current	I_{IN}			90	125	μA
Change in Supply Current	$\Delta I_{IN}/\Delta V_{IN}$	$2.5V \leq V_{IN} \leq 12.6V$		3.4	8.0	$\mu\text{A/V}$

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

ELECTRICAL CHARACTERISTICS—MAX6068, $V_{OUT} = 1.80V$

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	$T_A = +25^{\circ}C$				V
		MAX6068A (0.17%)	1.797	1.800	1.803	
		MAX6068B (0.39%)	1.793	1.800	1.807	
Output Voltage Temperature Coefficient (Note 2)	TCV_{OUT}	MAX6068A		6	20	ppm/ $^{\circ}C$
		MAX6068B		6	30	
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$2.5V \leq V_{IN} \leq 12.6V$		33	200	$\mu V/V$
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	Sourcing: $0 \leq I_{OUT} \leq 5mA$		0.5	0.9	mV/mA
		Sinking: $-2mA \leq I_{OUT} \leq 0$		1.5	4	
OUT Short-Circuit Current	I_{SC}	Short to GND		25		mA
		Short to IN		25		
Long-Term Stability	$\Delta V_{OUT}/\text{time}$	1000hr at $+25^{\circ}C$		62		ppm/1000hr
Output Voltage Hysteresis (Note 3)	$\Delta V_{OUT}/\text{cycle}$			130		ppm
DYNAMIC CHARACTERISTICS						
Noise Voltage	e_{OUT}	$f = 0.1Hz$ to $10Hz$		22		μV_{p-p}
		$f = 10Hz$ to $10kHz$		25		μV_{RMS}
Ripple Rejection	$\Delta V_{OUT}/\Delta V_{IN}$	$V_{IN} = 5V \pm 100mV$, $f = 120Hz$		86		dB
Turn-On Settling Time	t_R	To $V_{OUT} = 0.1\%$ of final value, $C_{OUT} = 50pF$		115		μs
INPUT CHARACTERISTICS						
Supply Voltage Range	V_{IN}	Guaranteed by line regulation test	2.5		12.6	V
Quiescent Supply Current	I_{IN}			90	125	μA
Change in Supply Current	$\Delta I_{IN}/\Delta V_{IN}$	$2.5V \leq V_{IN} \leq 12.6V$		3.3	8.0	$\mu A/V$

MAX6061-MAX6068

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

ELECTRICAL CHARACTERISTICS—MAX6062, $V_{OUT} = 2.048V$

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

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT}	T _A = +25°C	MAX6062A (0.24%)	2.043	2.048	2.053	V
			MAX6062B (0.39%)	2.040	2.048	2.056	
Output Voltage Temperature Coefficient (Note 2)	TCV _{OUT}	MAX6062A		6		20	ppm/°C
		MAX6062B		6		30	
Line Regulation	ΔV _{OUT} /ΔV _{IN}	2.5V ≤ V _{IN} ≤ 12.6V		33		200	μV/V
Load Regulation	ΔV _{OUT} /ΔI _{OUT}	Sourcing: 0 ≤ I _{OUT} ≤ 5mA		0.5		0.9	mV/mA
		Sinking: -2mA ≤ I _{OUT} ≤ 0		1.5		4	
OUT Short-Circuit Current	I _{SC}	Short to GND		25			mA
		Short to IN		25			
Long-Term Stability	ΔV _{OUT} /time	1000hr at +25°C		62			ppm/1000hr
Output Voltage Hysteresis (Note 3)	ΔV _{OUT} /cycle			130			ppm
DYNAMIC CHARACTERISTICS							
Noise Voltage	e _{OUT}	f = 0.1Hz to 10Hz		22			μVp-p
		f = 10Hz to 10kHz		25			μVRMS
Ripple Rejection	ΔV _{OUT} /ΔV _{IN}	V _{IN} = 5V ±100mV, f = 120Hz		86			dB
Turn-On Settling Time	t _R	To V _{OUT} = 0.1% of final value, C _{OUT} = 50pF		115			μs
INPUT CHARACTERISTICS							
Supply Voltage Range	V _{IN}	Guaranteed by line-regulation test		2.5		12.6	V
Quiescent Supply Current	I _{IN}			90		125	μA
Change in Supply Current	I _{IN} /V _{IN}	2.5V ≤ V _{IN} ≤ 12.6V		3.3		8.0	μA/V

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

ELECTRICAL CHARACTERISTICS—MAX6066, $V_{OUT} = 2.500V$

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	$T_A = +25^\circ C$				V
		MAX6066A (0.2%)	2.495	2.500	2.505	
		MAX6066B (0.4%)	2.490	2.500	2.510	
Output Voltage Temperature Coefficient (Note 2)	TCV_{OUT}	MAX6066A		6	20	ppm/ $^\circ C$
		MAX6066B		6	30	
Line Regulation	$\Delta V_{OUT} / \Delta V_{IN}$	$(V_{OUT} + 0.2V) \leq V_{IN} \leq 12.6V$		60	300	$\mu V/V$
Load Regulation	$\Delta V_{OUT} / \Delta I_{OUT}$	Sourcing: $0 \leq I_{OUT} \leq 5mA$		0.5	0.9	mV/mA
		Sinking: $-2mA \leq I_{OUT} \leq 0$		1.6	5	
Dropout Voltage (Note 4)	$V_{IN} - V_{OUT}$	$I_{OUT} = 1mA$		50	200	mV
OUT Short-Circuit Current	I_{SC}	Short to GND		25		mA
		Short to IN		25		
Long-Term Stability	$\Delta V_{OUT} / \text{time}$	1000hr at $+25^\circ C$		62		ppm/1000hr
Output Voltage Hysteresis (Note 3)	$\Delta V_{OUT} / \text{cycle}$			130		ppm
DYNAMIC CHARACTERISTICS						
Noise Voltage	e_{OUT}	$f = 0.1Hz$ to $10Hz$		27		μV_{p-p}
		$f = 10Hz$ to $10kHz$		30		μV_{RMS}
Ripple Rejection	$\Delta V_{OUT} / \Delta V_{IN}$	$V_{IN} = 5V \pm 100mV$, $f = 120Hz$		86		dB
Turn-On Settling Time	t_R	To $V_{OUT} = 0.1\%$ of final value, $C_{OUT} = 50pF$		115		μs
INPUT CHARACTERISTICS						
Supply Voltage Range	V_{IN}	Guaranteed by line-regulation test	$V_{OUT} + 0.2$		12.6	V
Quiescent Supply Current	I_{IN}		90		125	μA
Change in Supply Current	I_{IN}/V_{IN}	$(V_{OUT} + 0.2V) \leq V_{IN} \leq 12.6V$	3.3		8.0	$\mu A/V$

MAX6061-MAX6068

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

ELECTRICAL CHARACTERISTICS—MAX6063, $V_{OUT} = 3.0V$

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

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT}	T _A = +25°C	MAX6063A (0.2%)	2.994	3.000	3.006	V
			MAX6063B (0.4%)	2.988	3.000	3.012	
Output Voltage Temperature Coefficient (Note 2)	TCV _{OUT}	MAX6063A		6		20	ppm/°C
		MAX6063B		6		30	
Line Regulation	ΔV _{OUT} /ΔV _{IN}	(V _{OUT} + 0.2V) ≤ V _{IN} ≤ 12.6V		90		400	μV/V
Load Regulation	ΔV _{OUT} /ΔI _{OUT}	Sourcing: 0 ≤ I _{OUT} ≤ 5mA		0.5		0.9	mV/mA
		Sinking: -2mA ≤ I _{OUT} ≤ 0		2.0		6.0	
Dropout Voltage (Note 4)	V _{IN} - V _{OUT}	I _{OUT} = 1mA		50		200	mV
OUT Short-Circuit Current	I _{SC}	Short to GND		25			mA
		Short to IN		25			
Long-Term Stability	ΔV _{OUT} /time	1000hr at +25°C		62			ppm/1000hr
Output Voltage Hysteresis (Note 3)	ΔV _{OUT} /cycle			130			ppm
DYNAMIC CHARACTERISTICS							
Noise Voltage	e _{OUT}	f = 0.1Hz to 10Hz		35			μVp-p
		f = 10Hz to 10kHz		40			μVRMS
Ripple Rejection	ΔV _{OUT} /ΔV _{IN}	V _{IN} = 5V ±100mV, f = 120Hz		76			dB
Turn-On Settling Time	t _R	To V _{OUT} = 0.1% of final value, C _{OUT} = 50pF		115			μs
INPUT CHARACTERISTICS							
Supply Voltage Range	V _{IN}	Guaranteed by line-regulation test		V _{OUT} + 0.2		12.6	V
Quiescent Supply Current	I _{IN}			90		125	μA
Change in Supply Current	I _{IN} /V _{IN}	(V _{OUT} + 0.2V) ≤ V _{IN} ≤ 12.6V		3.4		8.0	μA/V

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

MAX6061-MAX6068

ELECTRICAL CHARACTERISTICS—MAX6064, $V_{OUT} = 4.096V$

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	$T_A = +25^{\circ}C$				V
		MAX6064A (0.2%)	4.088	4.096	4.104	
		MAX6064B (0.4%)	4.080	4.096	4.112	
Output Voltage Temperature Coefficient (Note 2)	TCV_{OUT}	MAX6064A		6	20	ppm/ $^{\circ}C$
		MAX6064B		6	30	
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	$(V_{OUT} + 0.2V) \leq V_{IN} \leq 12.6V$		130	430	$\mu V/V$
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	Sourcing: $0 \leq I_{OUT} \leq 5mA$		0.5	0.9	mV/mA
		Sinking: $-2mA \leq I_{OUT} \leq 0$		2.2	8	
Dropout Voltage (Note 4)	$V_{IN} - V_{OUT}$	$I_{OUT} = 1mA$		50	200	mV
OUT Short-Circuit Current	I_{SC}	Short to GND		25		mA
		Short to IN		25		
Long-Term Stability	$\frac{\Delta V_{OUT}}{\text{time}}$	1000hr at $+25^{\circ}C$		62		ppm/1000hr
Output Voltage Hysteresis (Note 3)	$\frac{\Delta V_{OUT}}{\text{cycle}}$			130		ppm
DYNAMIC CHARACTERISTICS						
Noise Voltage	e_{OUT}	$f = 0.1Hz$ to $10Hz$		50		μV_{p-p}
		$f = 10Hz$ to $10kHz$		50		μV_{RMS}
Ripple Rejection	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	$V_{IN} = 5V \pm 100mV$, $f = 120Hz$		72		dB
Turn-On Settling Time	t_R	To $V_{OUT} = 0.1\%$ of final value, $C_{OUT} = 50pF$		190		μs
INPUT CHARACTERISTICS						
Supply Voltage Range	V_{IN}	Guaranteed by line-regulation test	$V_{OUT} + 0.2$		12.6	V
Quiescent Supply Current	I_{IN}			90	125	μA
Change in Supply Current	I_{IN}/V_{IN}	$(V_{OUT} + 0.2V) \leq V_{IN} \leq 12.6V$		3.2	8.0	$\mu A/V$

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

ELECTRICAL CHARACTERISTICS—MAX6067, $V_{OUT} = 4.500V$

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

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT}	T _A = +25°C	MAX6067A (0.2%)	4.491	4.500	4.509	V
			MAX6067B (0.4%)	4.482	4.500	4.518	
Output Voltage Temperature Coefficient (Note 2)	TCV _{OUT}	MAX6067A		6		20	ppm/°C
		MAX6067B		6		30	
Line Regulation	ΔV _{OUT} /ΔV _{IN}	(V _{OUT} + 0.2V) ≤ V _{IN} ≤ 12.6V		170		550	μV/V
Load Regulation	ΔV _{OUT} /ΔI _{OUT}	Sourcing: 0 ≤ I _{OUT} ≤ 5mA		0.5		0.9	mV/mA
		Sinking: -2mA ≤ I _{OUT} ≤ 0		2.4		8	
Dropout Voltage (Note 4)	V _{IN} - V _{OUT}	I _{OUT} = 1mA		50		200	mV
OUT Short-Circuit Current	I _{SC}	Short to GND		25			mA
		Short to IN		25			
Long-Term Stability	ΔV _{OUT} /time	1000hr at +25°C		62			ppm/1000hr
Output Voltage Hysteresis (Note 3)	ΔV _{OUT} /cycle			130			ppm
DYNAMIC CHARACTERISTICS							
Noise Voltage	e _{OUT}	f = 0.1Hz to 10Hz		55			μVp-p
		f = 10Hz to 10kHz		55			μVRMS
Ripple Rejection	ΔV _{OUT} /ΔV _{IN}	V _{IN} = 5V ±100mV, f = 120Hz		70			dB
Turn-On Settling Time	t _R	To V _{OUT} = 0.1% of final value, C _{OUT} = 50pF		230			μs
INPUT CHARACTERISTICS							
Supply Voltage Range	V _{IN}	Guaranteed by line-regulation test		V _{OUT} + 0.2		12.6	V
Quiescent Supply Current	I _{IN}			90		125	μA
Change in Supply Current	I _{IN} /V _{IN}	(V _{OUT} + 0.2V) ≤ V _{IN} ≤ 12.6V		3.2		8.0	μA/V

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

MAX6061-MAX6068

ELECTRICAL CHARACTERISTICS—MAX6065, $V_{OUT} = 5.000V$

($V_{IN} = +5.2V$, $I_{OUT} = 0$, $T_A = T_{MIN}$ to T_{MAX} , unless otherwise noted. Typical values are at $T_A = +25^{\circ}C$.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	$T_A = +25^{\circ}C$				V
		MAX6065A (0.2%)	4.990	5.000	5.010	
		MAX6065B (0.4%)	4.980	5.000	5.020	
Output Voltage Temperature Coefficient (Note 2)	TCV_{OUT}	MAX6065A		6	20	ppm/ $^{\circ}C$
		MAX6065B		6	30	
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$(V_{OUT} + 0.2V) \leq V_{IN} \leq 12.6V$		180	550	$\mu V/V$
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	Sourcing: $0 \leq I_{OUT} \leq 5mA$		0.5	0.9	mV/mA
		Sinking: $-2mA \leq I_{OUT} \leq 0$		2.4	8.0	
Dropout Voltage (Note 4)	$V_{IN} - V_{OUT}$	$I_{OUT} = 1mA$		50	200	mV
OUT Short-Circuit Current	I_{SC}	Short to GND		25		mA
		Short to IN		25		
Long-Term Stability	$\Delta V_{OUT}/\text{time}$	1000hr at $+25^{\circ}C$		62		ppm/1000hr
Output Voltage Hysteresis (Note 3)	$\Delta V_{OUT}/\text{cycle}$			130		ppm
DYNAMIC CHARACTERISTICS						
Noise Voltage	e_{OUT}	$f = 0.1Hz$ to $10Hz$		60		μV_{p-p}
		$f = 10Hz$ to $10kHz$		60		μV_{RMS}
Ripple Rejection	$\Delta V_{OUT}/\Delta V_{IN}$	$V_{IN} = 5V \pm 100mV$, $f = 120Hz$		65		dB
Turn-On Settling Time	t_R	To $V_{OUT} = 0.1\%$ of final value, $C_{OUT} = 50pF$		300		μs
INPUT CHARACTERISTICS						
Supply Voltage Range	V_{IN}	Guaranteed by line-regulation test		$V_{OUT} + 0.2$	12.6	V
Quiescent Supply Current	I_{IN}			90	125	μA
Change in Supply Current	I_{IN}/V_{IN}	$(V_{OUT} + 0.2V) \leq V_{IN} \leq 12.6V$		3.2	8.0	$\mu A/V$

Note 1: All devices are 100% production tested at $T_A = +25^{\circ}C$ and are guaranteed by design for $T_A = T_{MIN}$ to T_{MAX} , as specified.

Note 2: Temperature Coefficient is measured by the "box" method, i.e., the maximum ΔV_{OUT} is divided by the maximum ΔT .

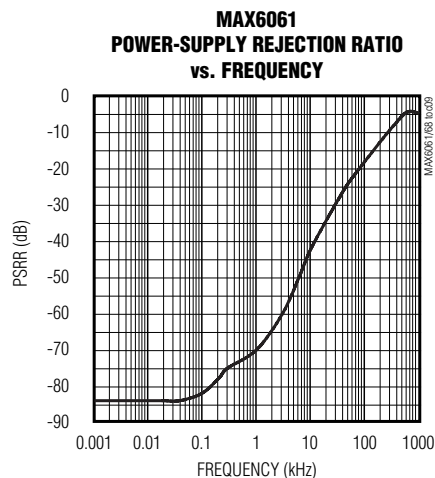
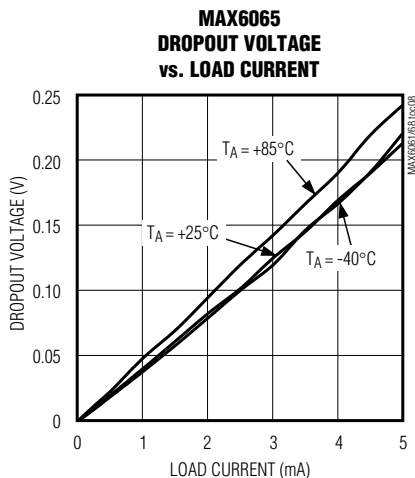
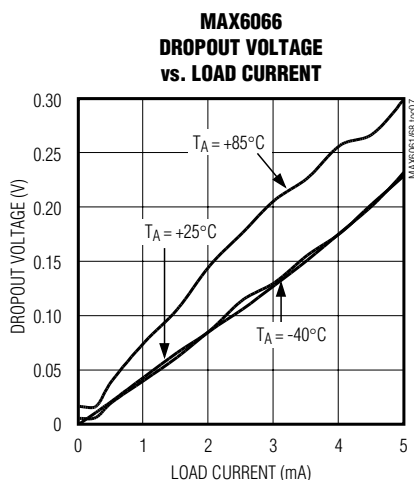
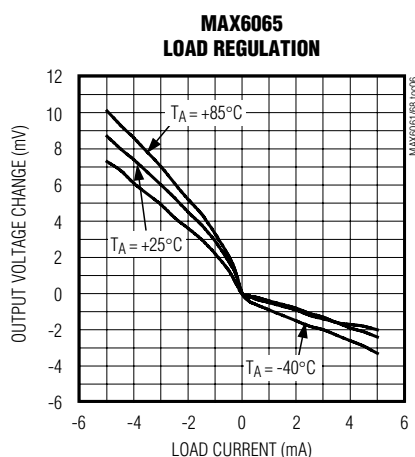
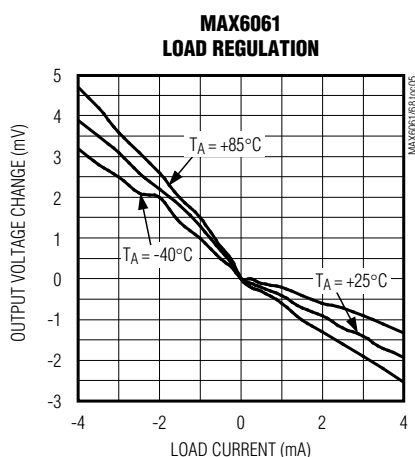
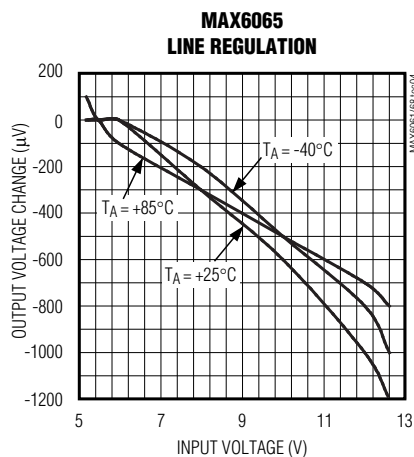
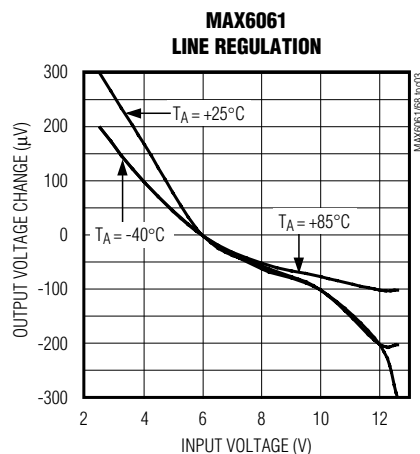
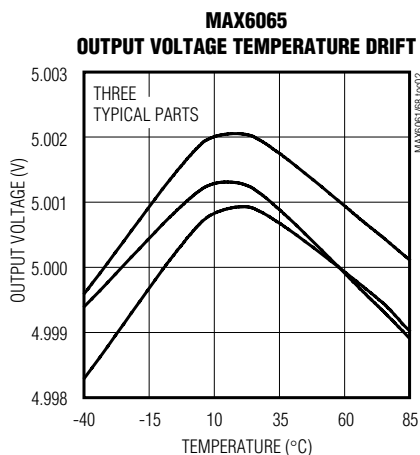
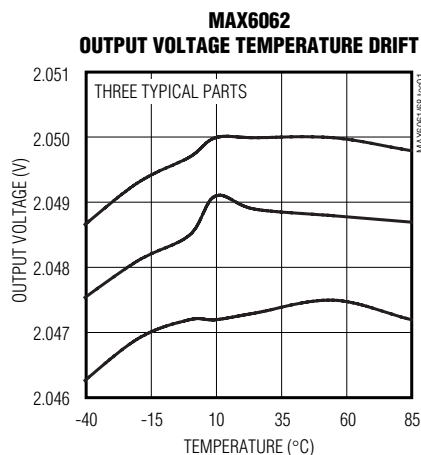
Note 3: Temperature Hysteresis is defined as the change in $+25^{\circ}C$ output voltage before and after cycling the device from T_{MIN} to T_{MAX} .

Note 4: Dropout voltage is the minimum input voltage at which V_{OUT} changes $\leq 0.2\%$ from V_{OUT} at $V_{IN} = 5.0V$ ($V_{IN} = 5.5V$ for MAX6065).

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

Typical Operating Characteristics

($V_{IN} = +5V$ for MAX6061-MAX6068, $V_{IN} = +5.5V$ for MAX6065, $I_{OUT} = 0$, $T_A = +25^\circ C$, unless otherwise noted.) (Note 5)

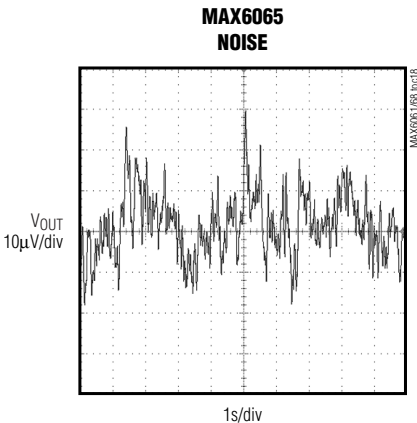
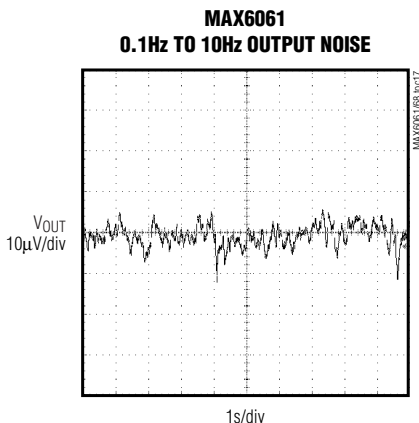
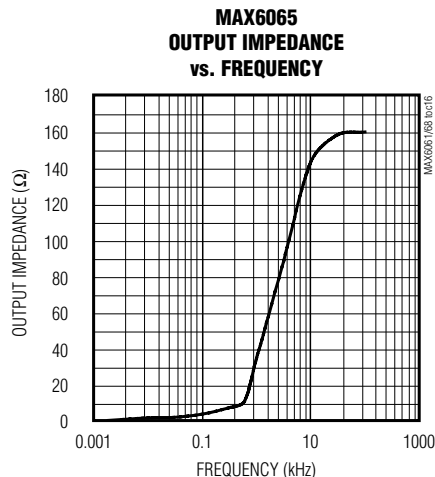
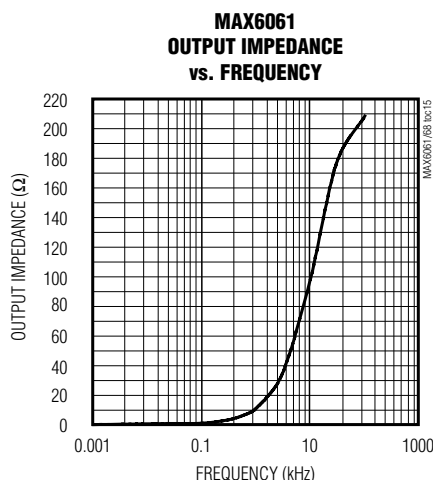
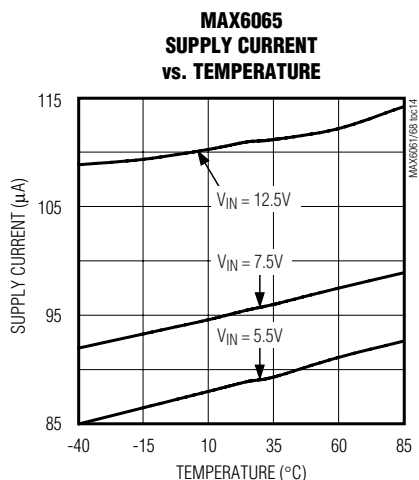
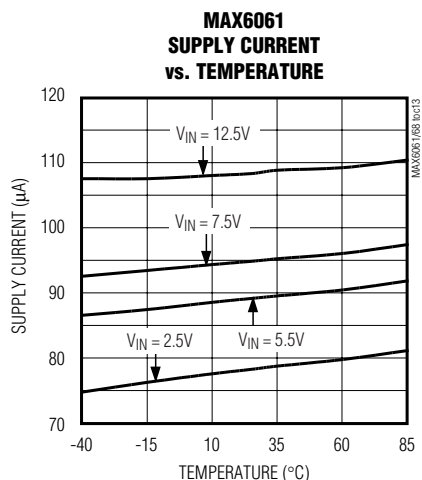
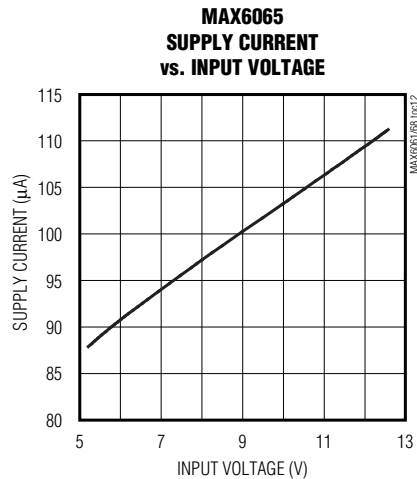
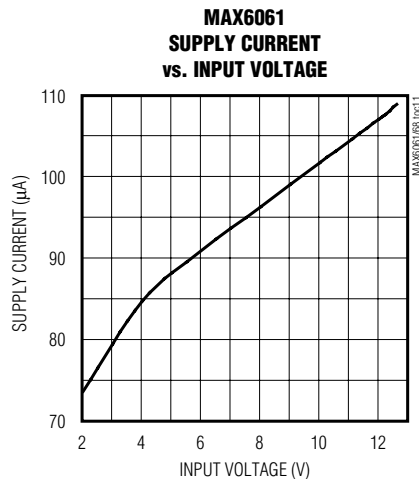
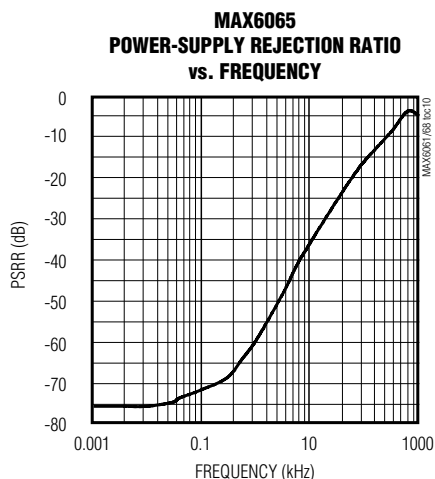


Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

Typical Operating Characteristics (continued)

($V_{IN} = +5V$ for MAX6061–MAX6068, $V_{IN} = +5.5V$ for MAX6065, $I_{OUT} = 0$, $T_A = +25^\circ C$, unless otherwise noted.) (Note 5)

MAX6061–MAX6068

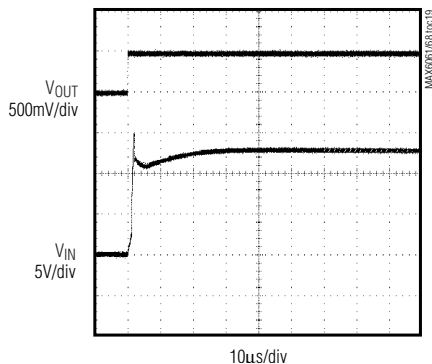


Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

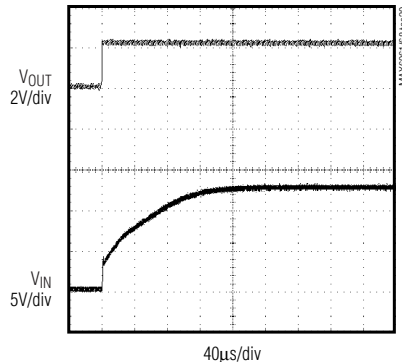
Typical Operating Characteristics (continued)

($V_{IN} = +5V$ for MAX6061-MAX6068, $V_{IN} = +5.5V$ for MAX6065, $I_{OUT} = 0$, $T_A = +25^\circ C$, unless otherwise noted.) (Note 5)

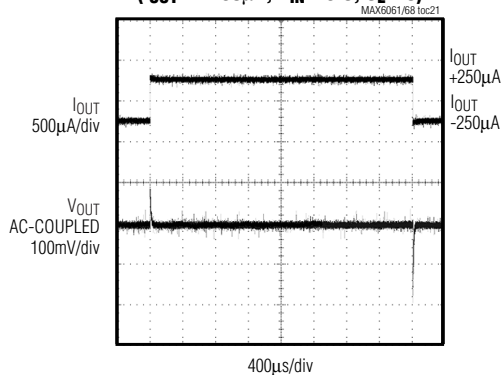
MAX6061
TURN-ON TRANSIENT
($C_L = 50pF$)



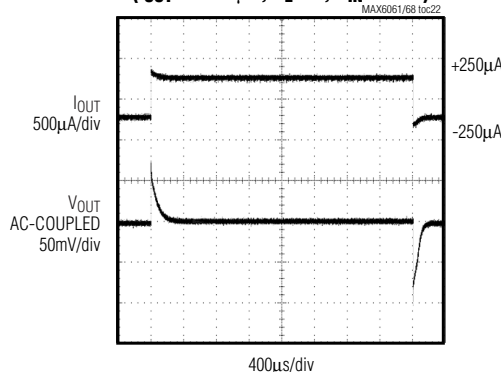
MAX6065
TURN-ON TRANSIENT
($C_L = 50pF$)



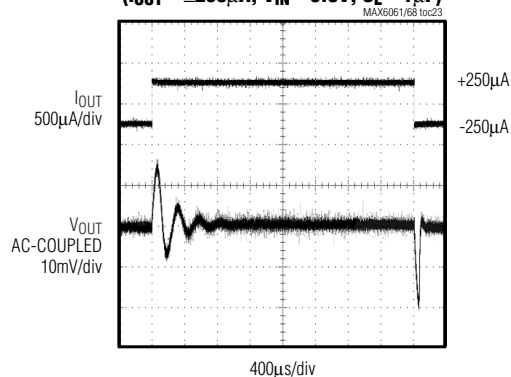
MAX6061
LOAD TRANSIENT
($I_{OUT} = \pm 250\mu A$, $V_{IN} = 5.0$, $C_L = 0$)



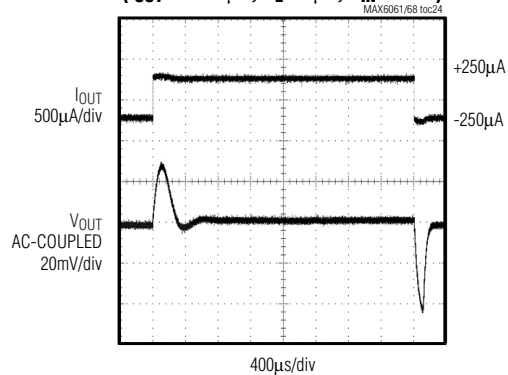
MAX6065
LOAD TRANSIENT
($I_{OUT} = \pm 250\mu A$, $C_L = 0$, $V_{IN} = 5.5V$)



MAX6061
LOAD TRANSIENT
($I_{OUT} = \pm 250\mu A$, $V_{IN} = 5.0V$, $C_L = 1\mu F$)



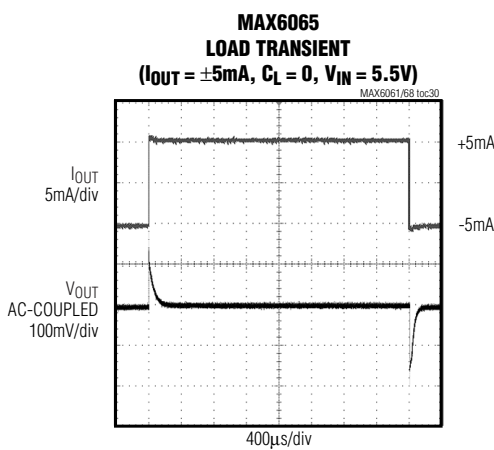
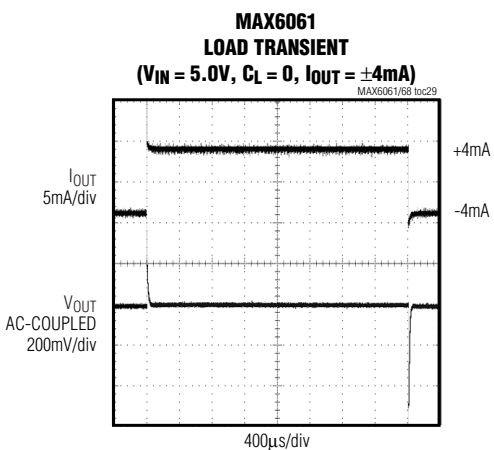
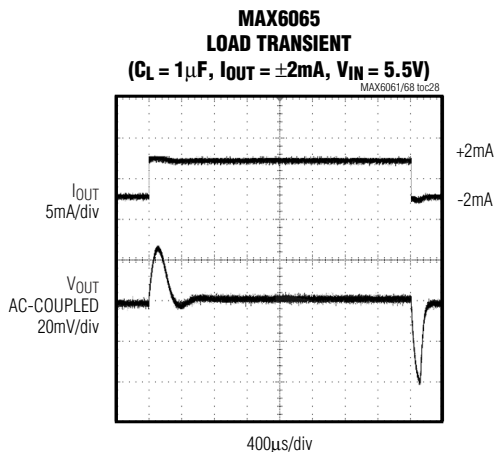
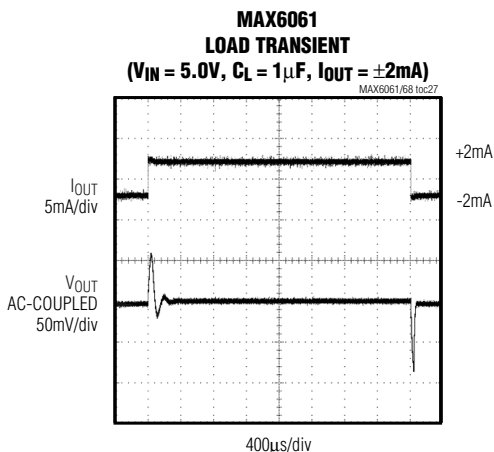
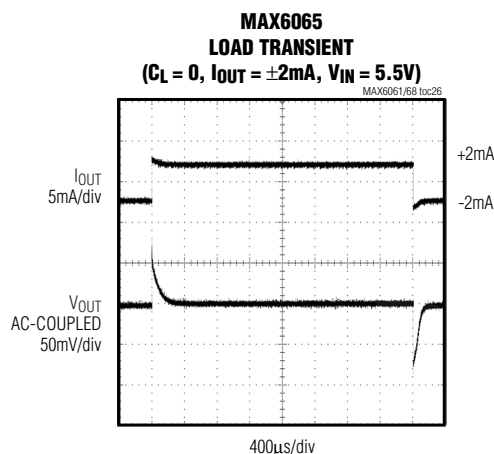
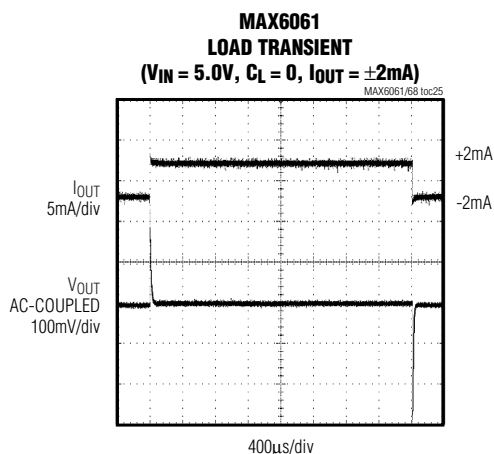
MAX6065
LOAD TRANSIENT
($I_{OUT} = \pm 250\mu A$, $C_L = 1\mu F$, $V_{IN} = 5.5V$)



Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

Typical Operating Characteristics (continued)

($V_{IN} = +5V$ for MAX6061–MAX6068, $V_{IN} = +5.5V$ for MAX6065, $I_{OUT} = 0$, $T_A = +25^\circ C$, unless otherwise noted.) (Note 5)

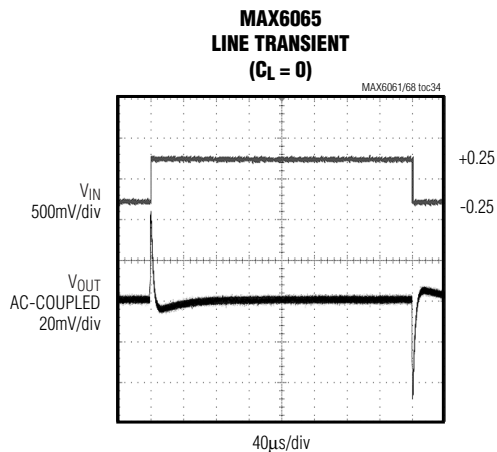
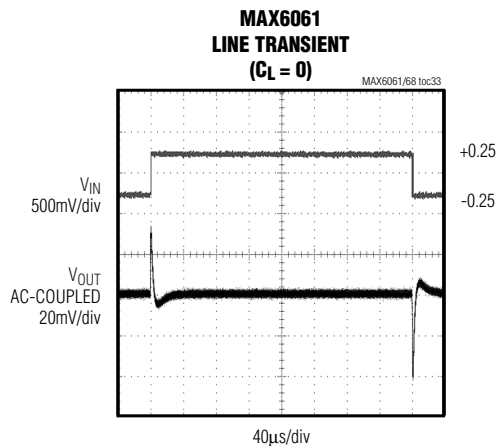
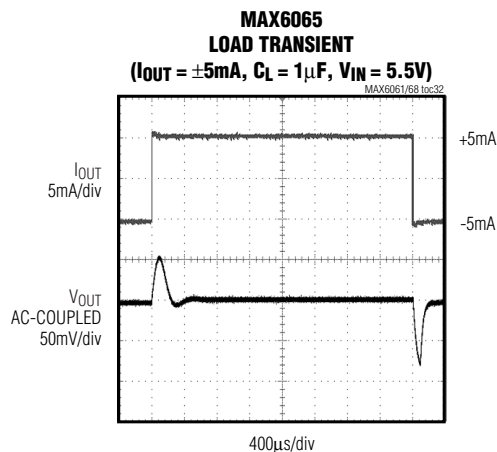
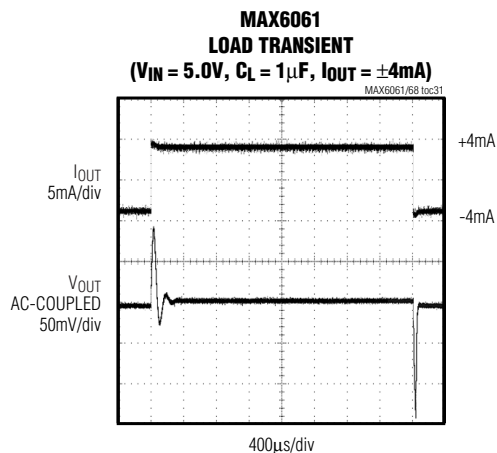


MAX6061–MAX6068

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

Typical Operating Characteristics (continued)

($V_{IN} = +5V$ for MAX6061-MAX6068, $V_{IN} = +5.5V$ for MAX6065, $I_{OUT} = 0$, $T_A = +25^\circ C$, unless otherwise noted.) (Note 5)



Note 5: Many of the MAX6061 family *Typical Operating Characteristics* are extremely similar. The extremes of these characteristics are found in the MAX6061 (1.25V output) and the MAX6065 (5.0V output). The *Typical Operating Characteristics* of the remainder of the MAX6061 family, typically lie between these two extremes and can be estimated based on their output voltages.

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

Pin Description

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

Applications Information

Input Bypassing

For the best line-transient performance, decouple the input with a 0.1 μ F ceramic capacitor as shown in the *Typical Operating Circuit*. Locate the capacitor as close to IN as possible. Where transient performance is less important, no capacitor is necessary.

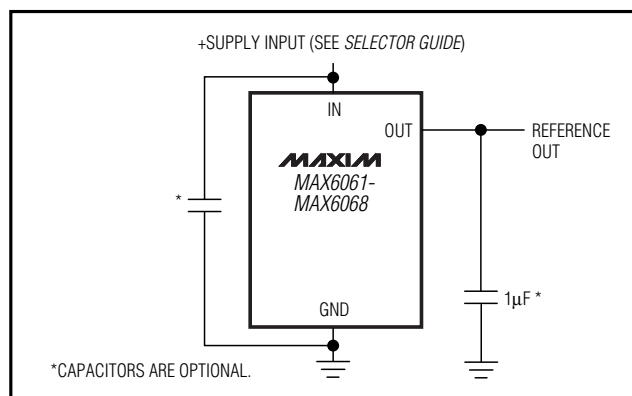
Output/Load Capacitance

Devices in the MAX6061 family do not require an output capacitance for frequency stability. In applications where the load or the supply can experience step changes, an output capacitor of at least 0.1 μ F will reduce the amount of overshoot (undershoot) and improve the circuit's transient response. Many applications do not require an external capacitor, and the MAX6061 family can offer a significant advantage in these applications when board space is critical.

Supply Current

The quiescent supply current of the series-mode MAX6061 family is typically 90 μ A and is virtually independent of the supply voltage, with only an 8 μ A/V (max) variation with supply voltage. Unlike series references, shunt-mode references operate with a series resistor connected to the power supply. The quiescent current of a shunt-mode reference is thus a function of the input voltage. Additionally, shunt-mode references have to be biased at the maximum expected load current, even if the load current is not present at the time. In the MAX6061 family, the load current is drawn from the input voltage only when required, so supply current is not wasted and efficiency is maximized at all input voltages. This improved efficiency reduces power dissipation and extends battery life. When the supply voltage is below the minimum specified input voltage (as during turn-on), the devices can draw up to 400 μ A beyond the nominal supply current. The input voltage source must be capable of providing this current to ensure reliable turn-on.

Typical Operating Circuit



Ordering Information (continued)

PART	TEMP. RANGE	PIN-PACKAGE	TOP MARK
MAX6067AEUR-T	-40°C to +85°C	3 SOT23-3	FZFS
MAX6067BEUR-T	-40°C to +85°C	3 SOT23-3	FZFT
MAX6068AEUR-T	-40°C to +85°C	3 SOT23-3	FZIB
MAX6068BEUR-T	-40°C to +85°C	3 SOT23-3	FZIC

Output Voltage Hysteresis

Output voltage hysteresis is the change of output voltage at $T_A = +25^\circ\text{C}$ 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 is 130ppm.

Turn-On Time

These devices typically turn on and settle to within 0.1% of their final value in 50 μ s to 300 μ s, depending on the device. The turn-on time can increase up to 1.5ms with the device operating at the minimum dropout voltage and the maximum load.

Chip Information

TRANSISTOR COUNT: 117

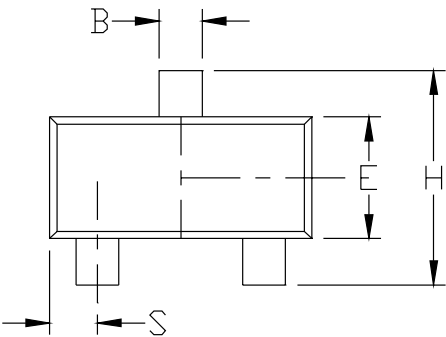
PROCESS: BiCMOS

Precision, Micropower, Low-Dropout, High-Output-Current, SOT23 Voltage References

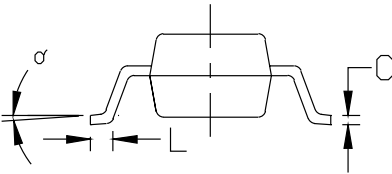
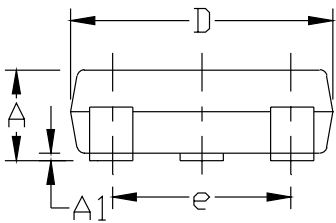
Package Information

NOTES:

- 1. D&E DO NOT INCLUDE MOLD FLASH.
- 2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")
- 3. CONTROLLING DIMENSION: MILLIMETER



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.031	0.047	0.787	1.194
A1	0.001	0.005	0.025	0.127
B	0.014	0.022	0.356	0.559
C	0.0034	0.006	0.086	0.152
D	0.105	0.120	2.667	3.048
E	0.047	0.055	1.194	1.397
e	0.070	0.080	1.778	2.032
H	0.082	0.098	2.083	2.489
L	0.004	0.012	0.102	0.305
S	0.017	0.022	0.432	0.559
α	0°	8°	0°	8°



PROPRIETARY INFORMATION

TITLE:

PACKAGE OUTLINE, SOT-23, 3L

APPROVAL

DOCUMENT CONTROL NO.

21-0051

REV

C

1/1

SOT23LEPS

Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.

16 Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600

© 2001 Maxim Integrated Products Printed USA MAXIM is a registered trademark of Maxim Integrated Products.