Ultra-High-Speed, Low-Noise, Low-Power, SOT23 Open-Loop Buffers

General Description

The MAX4200–MAX4205 are ultra-high-speed, open-loop buffers featuring high slew rate, high output current, low noise, and excellent capacitive-load-driving capability. The MAX4200/MAX4201/MAX4202 are single buffers, while the MAX4203/MAX4204/MAX4205 are dual buffers. The MAX4201/MAX4204 have integrated 50Ω termination resistors, making them ideal for driving 50Ω transmission lines. The MAX4202/MAX4205 include 75Ω back-termination resistors for driving 75Ω transmission lines. The MAX4200/MAX4203 have no internal termination resistors.

The MAX4200–MAX4205 use a proprietary architecture to achieve up to 780MHz -3dB bandwidth, 280MHz 0.1dB gain flatness, 4200V/µs slew rate, and ±90mA output current drive capability. They operate from ±5V supplies and draw only 2.2mA of quiescent current. These features, along with low-noise performance, make these buffers suitable for driving high-speed analog-to-digital converter (ADC) inputs or for data-communications applications.

Applications

High-Speed DAC Buffers

Wireless LANs

Digital-Transmission Line Drivers

High-Speed ADC Input Buffers

IF/Communications Systems

Selector Guide

PART	NO. OF BUFFERS	INTERNAL OUTPUT TERMINATION (Ω)	PIN-PACKAGE
MAX4200	1	—	8 SO, 5 SOT23
MAX4201	1	50	8 SO, 5 SOT23
MAX4202	1	75	8 SO, 5 SOT23
MAX4203	2	—	8 SO/µMAX
MAX4204	2	50	8 SO/µMAX
MAX4205	2	75	8 SO/µMAX

Pin Configurations appear at end of data sheet.

Features

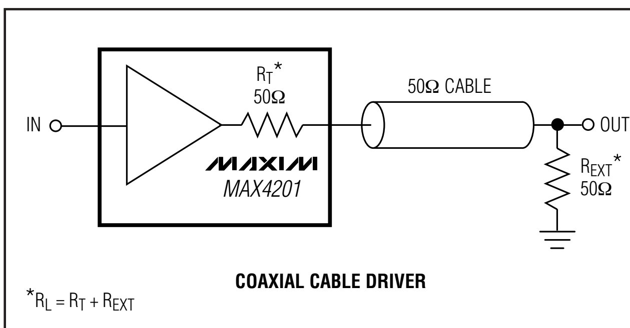
- ♦ **2.2mA Supply Current**
- ♦ **High Speed**
  - **780MHz -3dB Bandwidth (MAX4201/MAX4202)**
  - **280MHz 0.1dB Gain Flatness (MAX4201/MAX4202)**
  - **4200V/µs Slew Rate**
- ♦ **Low 2.1nV/√Hz Voltage-Noise Density**
- ♦ **Low 0.8pA/√Hz Current-Noise Density**
- ♦ **High ±90mA Output Drive (MAX4200/MAX4203)**
- ♦ **Excellent Capacitive-Load-Driving Capability**
- ♦ **Available in Space-Saving SOT23 or µMAX® Packages**

Ordering Information

PART	PIN-PACKAGE	TOP MARK	PKG CODE
MAX4200ESA	8 SO	—	S8-2
MAX4200EUK-T	5 SOT23-5	AABZ	U5-1
MAX4201ESA	8 SO	—	S8-2
MAX4201EUK-T	5 SOT23-5	ABAA	U5-1
MAX4202ESA	8 SO	—	S8-2
MAX4202EUK-T	5 SOT23-5	ABAB	U5-1
MAX4203ESA	8 SO	—	S8-2
MAX4203EUA-T	8 µMAX-8	—	U8-1
MAX4204ESA	8 SO	—	S8-2
MAX4204EUA-T	8 µMAX-8	—	U8-1
MAX4205ESA	8 SO	—	S8-2
MAX4205EUA-T	8 µMAX-8	—	U8-1

Note: *All devices are specified over the -40°C to +85°C operating temperature range.*

Typical Application Circuit



ABSOLUTE MAXIMUM RATINGS

Supply Voltage (V_{CC} to V_{EE})...+12V
Voltage on Any Pin to GND..............(V_{EE} - 0.3V) to (V_{CC} + 0.3V)
Output Short-Circuit Duration to GND........................Continuous
Continuous Power Dissipation (T_A = +70°C)
  5-Pin SOT23 (derate 7.1mW/°C above +70°C).............571mW
  8-Pin μMAX (derate 4.1mW/°C above +70°C)..............330mW
  8-Pin SO (derate 5.9mW/°C above +70°C)...................471mW
Operating Temperature Range ....-40°C to +85°C
Storage Temperature Range ....-65°C to +150°C
Lead Temperature (soldering, 10s) ....+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.

DC ELECTRICAL CHARACTERISTICS

(V_{CC} = +5V, V_{EE} = -5V, R_L = ∞, T_A = T_{MIN} to T_{MAX}, unless otherwise noted. Typical values are at T_A = +25°C.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Operating Supply Voltage	V_S	Guaranteed by PSR test		±4		±5.5	V
Quiescent Supply Current	I_S	Per buffer, V_{IN} = 0V			2.2	4	mA
Input Offset Voltage	V_{OS}	V_{IN} = 0V			1	15	mV
Input Offset Voltage Drift	TCV_{OS}	V_{IN} = 0V			20		μV/°C
Input Offset Voltage Matching		MAX4203/MAX4204/MAX4205			0.4		mV
Input Bias Current	I_B				0.8	10	μA
Input Resistance	R_{IN}	(Note 1)			500		kΩ
Voltage Gain	A_V	-3.0V ≤ V_{OUT} ≤ 3.0V	MAX4200/MAX4203, R_{EXT} = 150Ω	0.9	0.96	1.1	V/V
			MAX4201/MAX4204, R_{EXT} = 50Ω	0.42	0.50	0.58	
			MAX4202/MAX4205, R_{EXT} = 75Ω	0.41	0.50	0.59	
Power-Supply Rejection	PSR	V_S = ±4V to ±5.5V		55	72		dB
Output Resistance	R_{OUT}	f = DC	MAX4200/MAX4203		8		Ω
			MAX4201/MAX4204		50		
			MAX4202/MAX4205		75		
Output Current	I_{OUT}	R_L = 30Ω	MAX4200/MAX4203		±90		mA
			MAX4201/MAX4204		±52		
			MAX4202/MAX4205		±44		
Short-Circuit Output Current	I_{SC}	Sinking or sourcing	MAX4200/MAX4203		150		mA
			MAX4201/MAX4204		90		
			MAX4202/MAX4205		75		
Output-Voltage Swing	V_{OUT}	MAX4200/MAX4203	R_L = 150Ω	±3.3	±3.8		V
			R_L = 100Ω	±3.2	±3.7		
			R_L = 37.5Ω		±3.3		
		MAX4201/MAX4204	R_L = 50Ω	±1.9	±2.1		
		MAX4202/MAX4205	R_L = 75Ω	±2.0	±2.3		

AC ELECTRICAL CHARACTERISTICS

(V_{CC} = +5V, V_{EE} = -5V, R_L = 100Ω for MAX4200/MAX4201/MAX4203/MAX4204, R_L = 150Ω for MAX4202/MAX4205, T_A = T_{MIN} to T_{MAX}, unless otherwise noted. Typical values are at T_A = +25°C.)

PARAMETER	SYMBOL	CONDITIONS			MIN	TYP	MAX	UNITS
-3dB Bandwidth	$BW_{(-3dB)}$	V_{OUT} ≤ 100mV_{RMS}	MAX4200			660		MHz
			MAX4201/MAX4202			780		
			MAX4203			530		
			MAX4204/MAX4205			720		
0.1dB Bandwidth	$BW_{(0.1dB)}$	V_{OUT} ≤ 100mV_{RMS}	MAX4200			220		MHz
			MAX4201/MAX4202			280		
			MAX4203			130		
			MAX4204/MAX4205			230		
Full-Power Bandwidth	FPBW	V_{OUT} ≤ 2V_{P-P}	MAX4200/MAX4201/MAX4202			490		MHz
			MAX4203/MAX4204/MAX4205			310		
Slew Rate	SR	V_{OUT} = 2V step				4200		V/µs
Group Delay Time						405		ps
Settling Time to 0.1%	t_S	V_{OUT} = 2V step				12		ns
Spurious-Free Dynamic Range	SFDR	V_{OUT} = 2V_{P-P}	MAX4200/MAX4201/ MAX4202	f = 5MHz		-48		dBc
				f = 20MHz		-45		
				f = 100MHz		-34		
			MAX4203/MAX4204/ MAX4205	f = 5MHz		-47		
				f = 20MHz		-44		
				f = 100MHz		-32		
Harmonic Distortion	HD	MAX4200/MAX4201/ MAX4202, f = 500kHz, V_{OUT} = 2V_{P-P}	Second harmonic			-72		dBc
			Third harmonic			-48		
			Total harmonic			-48		
		MAX4203/MAX4204/l MAX4205, f = 500kHz, V_{OUT} = 2V_{P-P}	Second harmonic			-83		
			Third harmonic			-47		
			Total harmonic			-47		
Differential Gain Error	DG	NTSC, R_L = 150Ω				1.3		%
Differential Phase Error	DP	NTSC, R_L = 150Ω				0.15		degrees
Input Voltage-Noise Density	e_n	f = 1MHz				2.1		nV/√Hz
Input Current-Noise Density	i_n	f = 1MHz				0.8		pA/√Hz
Input Capacitance	C_{IN}					2		pF
Output Impedance	Z_{OUT}	f = 10MHz				6		Ω
Amplifier Crosstalk	X_{TALK}	V_{OUT} = 2V_{P-P}	f = 10MHz			-87		dB
			f = 100MHz			-65		

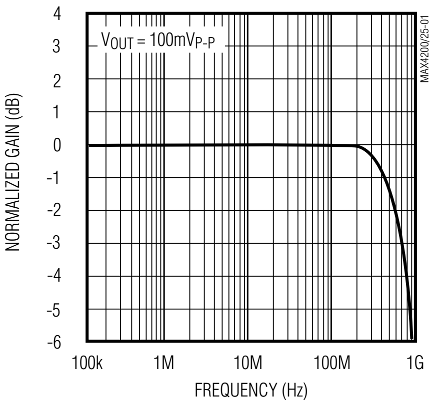
Note 1: Tested with no load; increasing load will decrease input impedance.

Ultra-High-Speed, Low-Noise, Low-Power, SOT23 Open-Loop Buffers

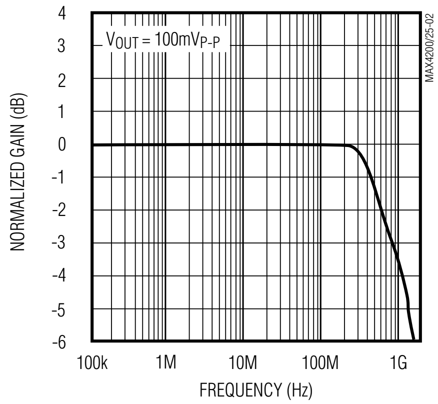
Typical Operating Characteristics

(V_{CC} = +5V, V_{EE} = -5V, R_L = 100Ω for MAX4200/MAX4201/MAX4203/MAX4204, R_L = 150Ω for MAX4202/MAX4205, unless otherwise noted.)

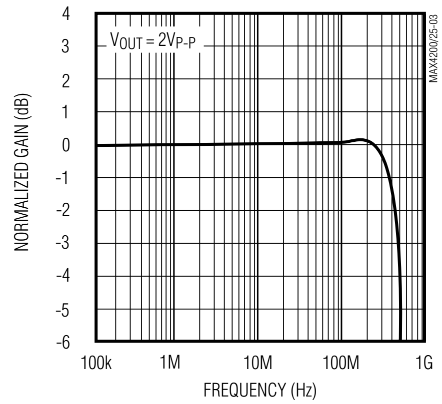
MAX4200 SMALL-SIGNAL GAIN vs. FREQUENCY



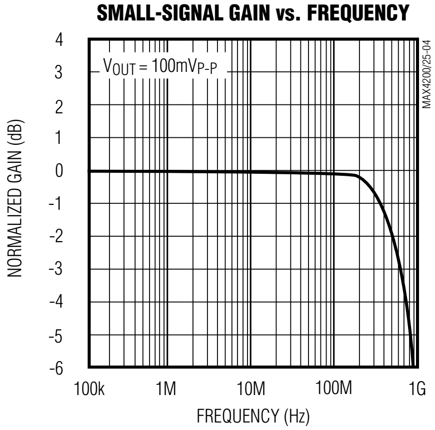
MAX4201/MAX4202 SMALL-SIGNAL GAIN vs. FREQUENCY



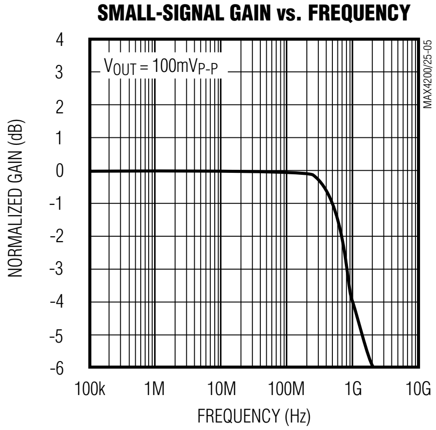
MAX4200/MAX4201/MAX4202 LARGE-SIGNAL GAIN vs. FREQUENCY



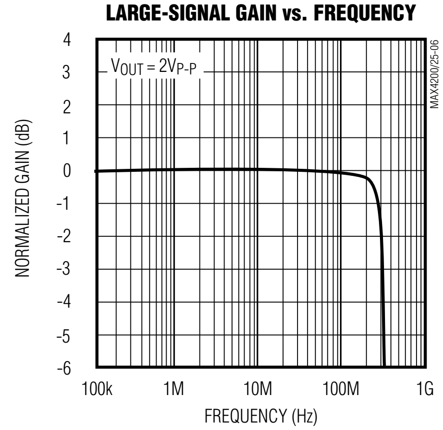
MAX4203 SMALL-SIGNAL GAIN vs. FREQUENCY



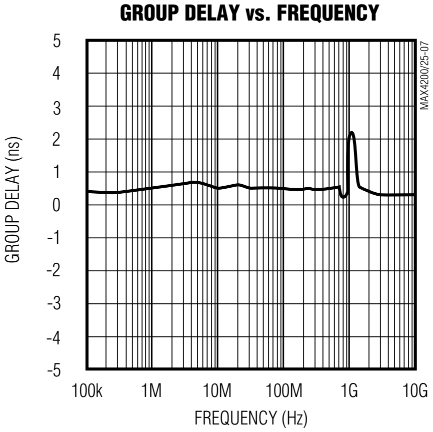
MAX4204/MAX4205 SMALL-SIGNAL GAIN vs. FREQUENCY



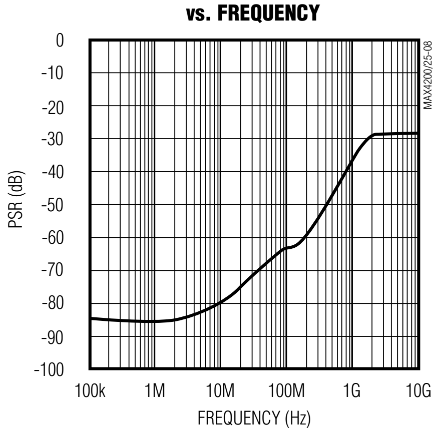
MAX4203/MAX4204/MAX4205 LARGE-SIGNAL GAIN vs. FREQUENCY



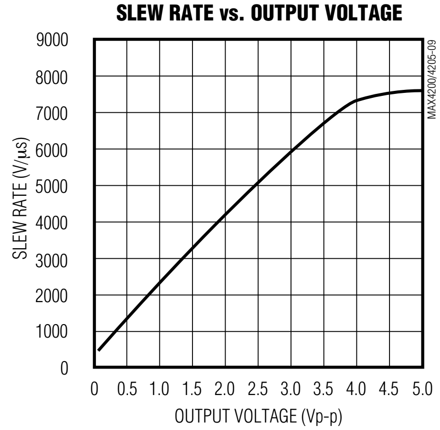
GROUP DELAY vs. FREQUENCY



POWER-SUPPLY REJECTION vs. FREQUENCY



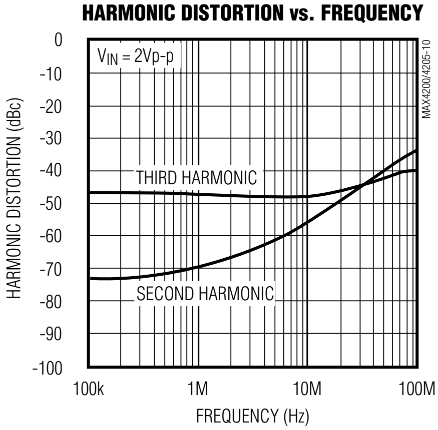
SLEW RATE vs. OUTPUT VOLTAGE



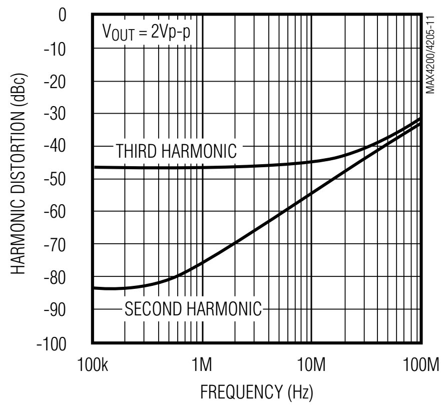
Typical Operating Characteristics (continued)

(V_{CC} = +5V, V_{EE} = -5V, R_L = 100Ω for MAX4200/MAX4201/MAX4203/MAX4204, R_L = 150Ω for MAX4202/MAX4205, unless otherwise noted.)

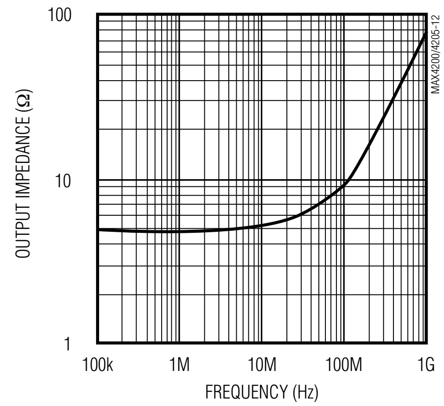
MAX4200/MAX4201/MAX4202
HARMONIC DISTORTION vs. FREQUENCY



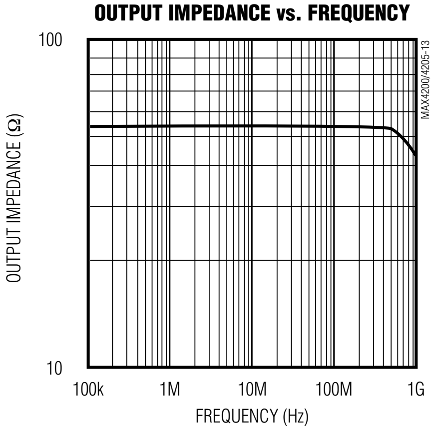
MAX4203/MAX4204/MAX4205
HARMONIC DISTORTION vs. FREQUENCY



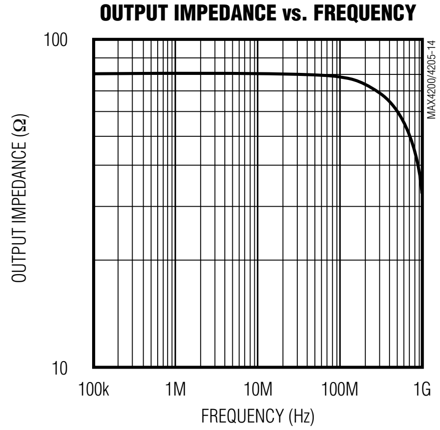
MAX4200/MAX4203
OUTPUT IMPEDANCE vs. FREQUENCY



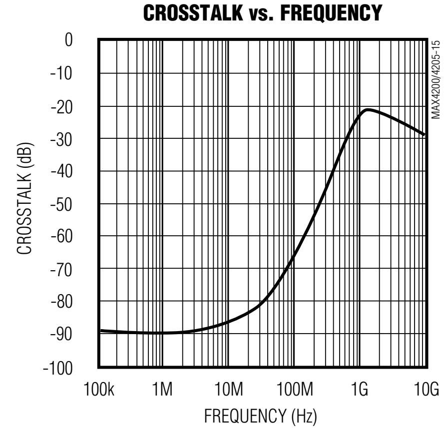
MAX4201/MAX4204
OUTPUT IMPEDANCE vs. FREQUENCY



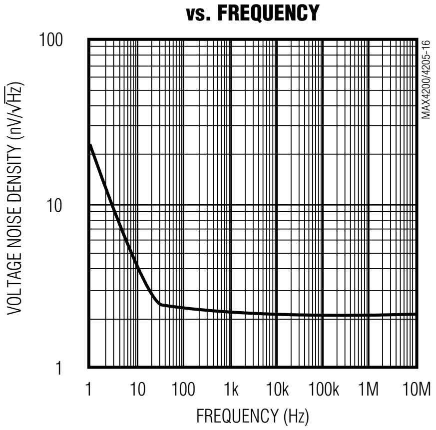
MAX4202/MAX4205
OUTPUT IMPEDANCE vs. FREQUENCY



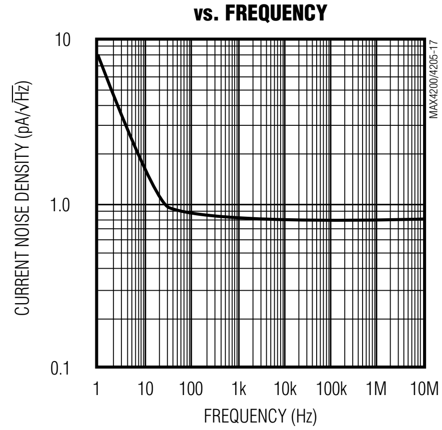
MAX4203/MAX4204/MAX4205
CROSSTALK vs. FREQUENCY



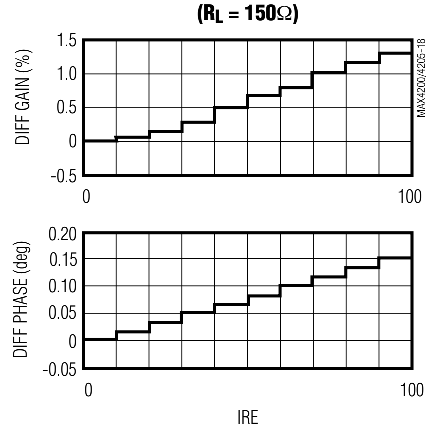
INPUT VOLTAGE-NOISE DENSITY
vs. FREQUENCY



INPUT CURRENT-NOISE DENSITY
vs. FREQUENCY



DIFFERENTIAL GAIN AND PHASE
(R_L = 150Ω)

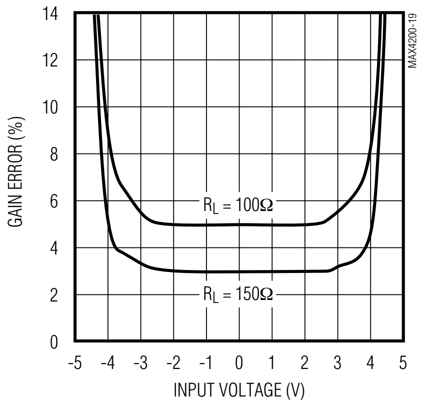


Ultra-High-Speed, Low-Noise, Low-Power, SOT23 Open-Loop Buffers

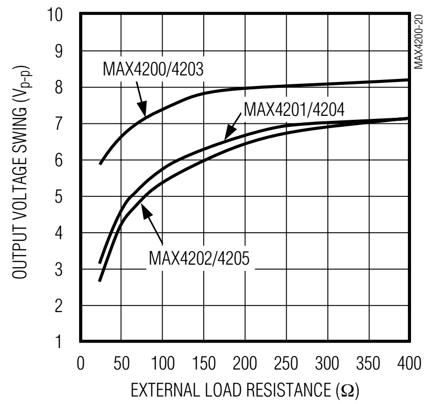
Typical Operating Characteristics (continued)

(V_{CC} = +5V, V_{EE} = -5V, R_L = 100Ω for MAX4200/MAX4201/MAX4203/MAX4204, R_L = 150Ω for MAX4202/MAX4205, unless otherwise noted.)

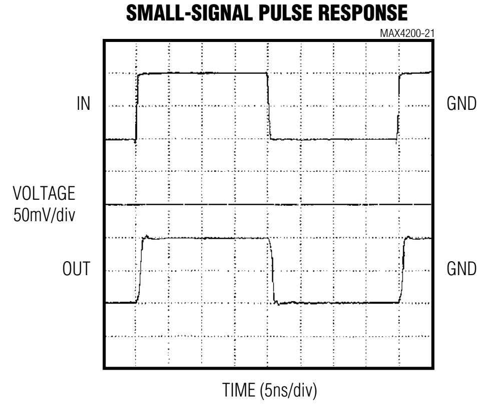
GAIN ERROR vs. INPUT VOLTAGE



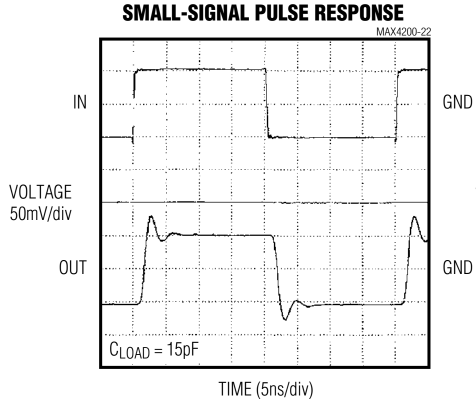
OUTPUT VOLTAGE SWING vs. EXTERNAL LOAD RESISTANCE



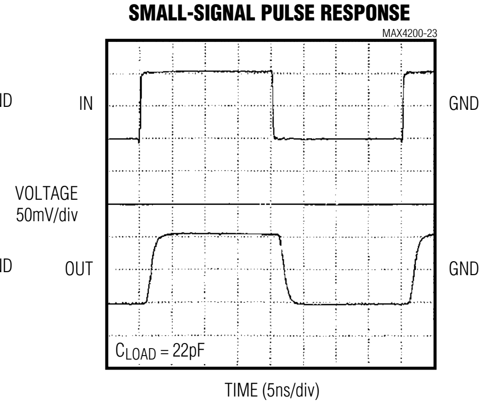
SMALL-SIGNAL PULSE RESPONSE



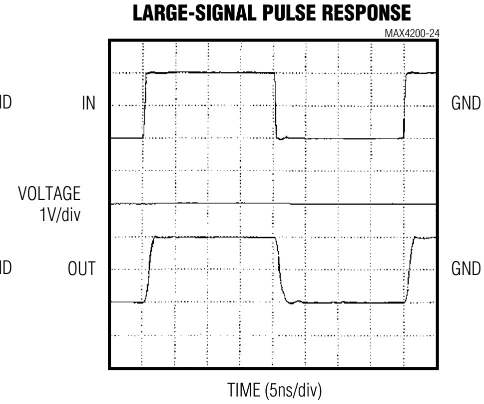
MAX4200/MAX4203 SMALL-SIGNAL PULSE RESPONSE



MAX4201/MAX4202/MAX4204/MAX4205 SMALL-SIGNAL PULSE RESPONSE

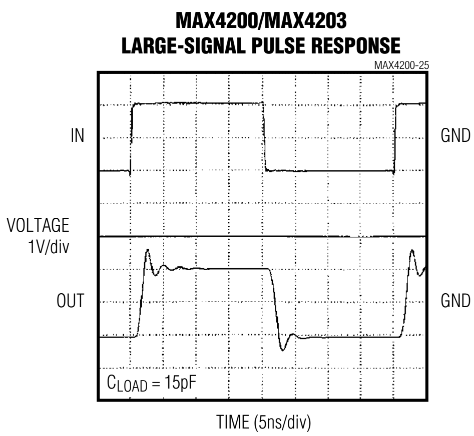


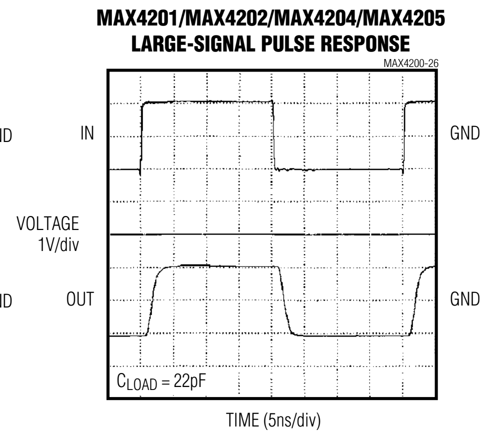
LARGE-SIGNAL PULSE RESPONSE

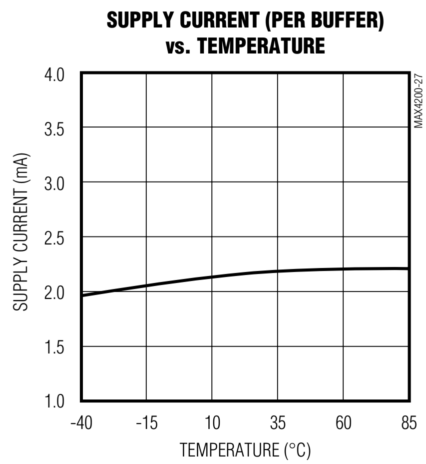


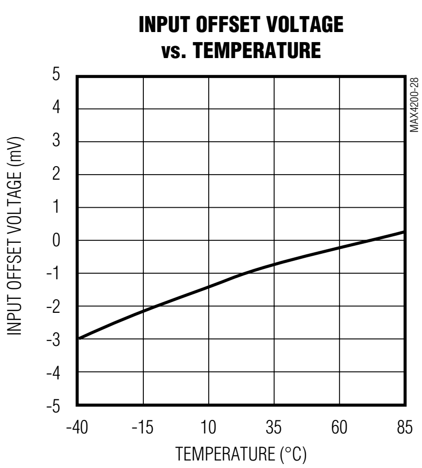
Typical Operating Characteristics (continued)

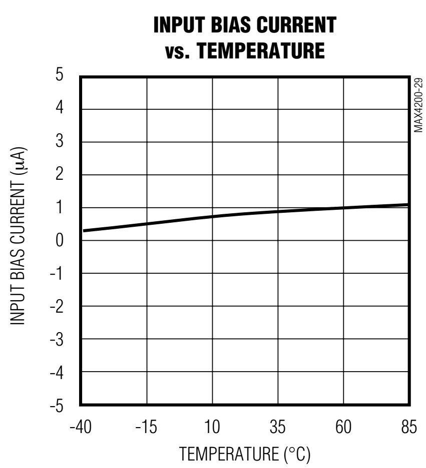
(V_{CC} = +5V, V_{EE} = -5V, R_L = 100Ω for MAX4200/MAX4201/MAX4203/MAX4204, R_L = 150Ω for MAX4202/MAX4205, unless otherwise noted.)

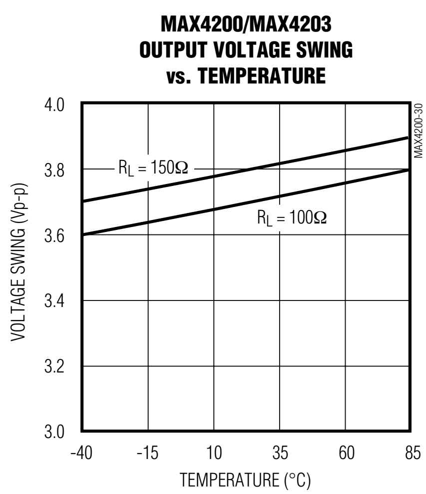












Ultra-High-Speed, Low-Noise, Low-Power, SOT23 Open-Loop Buffers

Pin Description

PIN			NAME	FUNCTION
MAX4200/MAX4201/MAX4202		MAX4203 MAX4204 MAX4205		
SOT23-5	SO	SO/μMAX		
1	1, 2, 5, 8	—	N.C.	No Connection. Not Internally Connected
3	3	—	IN	Buffer Input
—	—	1	IN1	Buffer 1 Input
—	—	2	OUT1	Buffer 1 Output
2	4	—	V_{EE}	Negative Power Supply
—	—	3	V_{EE1}	Negative Power Supply for Buffer 1
—	—	4	V_{EE2}	Negative Power Supply for Buffer 2
—	—	5	IN2	Buffer 2 Input
—	—	6	OUT2	Buffer 2 Output
5	6	—	OUT	Buffer Output
4	7	—	V_{CC}	Positive Power Supply
—	—	7	V_{CC2}	Positive Power Supply for Buffer 2
—	—	8	V_{CC1}	Positive Power Supply for Buffer 1

Detailed Description

The MAX4200–MAX4205 wide-band, open-loop buffers feature high slew rates, high output current, low 2.1nV/√Hz voltage-noise density, and excellent capacitive-load-driving capability. The MAX4200/MAX4203 are single/dual buffers with up to 660MHz bandwidth, 230MHz 0.1dB gain flatness, and a 4200V/µs slew rate. The MAX4201/MAX4204 single/dual buffers with integrated 50Ω output termination resistors, up to 780MHz bandwidth, 280MHz gain flatness, and a 4200V/µs slew rate, are ideally suited for driving high-speed signals over 50Ω cables. The MAX4202/MAX4205 provide bandwidths up to 720MHz, 230MHz gain flatness, 4200V/µs slew rate, and integrated 75Ω output termination resistors for driving 75Ω cables.

With an open-loop gain that is slightly less than +1V/V, these devices do not have to be compensated with the internal dominant pole (and its associated phase shift) that is present in voltage-feedback devices. This feature allows the MAX4200–MAX4205 to achieve a nearly constant group delay time of 405ps over their full frequency range, making them well suited for a variety of RF and IF signal-processing applications.

These buffers operate with ±5V supplies and consume only 2.2mA of quiescent supply current per buffer while providing up to ±90mA of output current drive capability.

Applications Information

Power Supplies

The MAX4200–MAX4205 operate with dual supplies from ±4V to ±5.5V. Both V_{CC} and V_{EE} should be bypassed to the ground plane with a 0.1µF capacitor located as close to the device pin as possible.

Layout Techniques

Maxim recommends using microstrip and stripline techniques to obtain full bandwidth. To ensure that the PC board does not degrade the amplifier's performance, design it for a frequency greater than 6GHz. Pay careful attention to inputs and outputs to avoid large parasitic capacitance. Whether or not you use a constant-impedance board, observe the following guidelines when designing the board:

- Do not use wire-wrap boards, because they are too inductive.
- Do not use IC sockets, because they increase parasitic capacitance and inductance.

- Use surface-mount instead of through-hole components for better high-frequency performance.
- Use a PC board with at least two layers; it should be as free from voids as possible.
- Keep signal lines as short and as straight as possible. Do not make 90° turns; round all corners.

Input Impedance

The MAX4200–MAX4205 input impedance looks like a 500kΩ resistor in parallel with a 2pF capacitor. Since these devices operate without negative feedback, there is no loop gain to transform the input impedance upward, as in closed-loop buffers. As a consequence, the input impedance is directly related to the output impedance. If the output load impedance decreases, the input impedance also decreases. Inductive input sources (such as an unterminated cable) may react with the input capacitance and produce some peaking in the buffer's frequency response. This effect can usually be minimized by using a properly terminated transmission line at the buffer input, as shown in Figure 1.

Output Current and Gain Sensitivity

The absence of negative feedback means that open-loop buffers have no loop gain to reduce their effective output impedance. As a result, open-loop devices usually suffer from decreasing gain as the output current is decreased. The MAX4200–MAX4205 include local feedback around the buffer's class-AB output stage to ensure low output impedance and reduce gain sensitivity to load variations. This feedback also produces demand-driven current bias to the output transistors for ±90mA (MAX4200/MAX4203) drive capability that is relatively independent of the output voltage (see *Typical Operating Characteristics*).

Output Capacitive Loading and Stability

The MAX4200–MAX4205 provide maximum AC performance with no load capacitance. This is the case when the load is a properly terminated transmission line. However, these devices are designed to drive any load capacitance without oscillating, but with reduced AC performance.

Since the MAX4200–MAX4205 operate in an open-loop configuration, there is no negative feedback to be transformed into positive feedback through phase shift introduced by a capacitive load. Therefore, these devices will not oscillate with capacitive loading, unlike similar buffers operating in a closed-loop configuration. However, a capacitive load reacting with the buffer's output impedance can still affect circuit performance. A capacitive load will form a lowpass filter with the buffer's output resistance, thereby limiting system bandwidth. With higher capacitive loads, bandwidth is dominated by the RC network formed by R_T and C_L; the bandwidth of the buffer itself is much higher. Also note that the isolation resistor forms a divider that decreases the voltage delivered to the load.

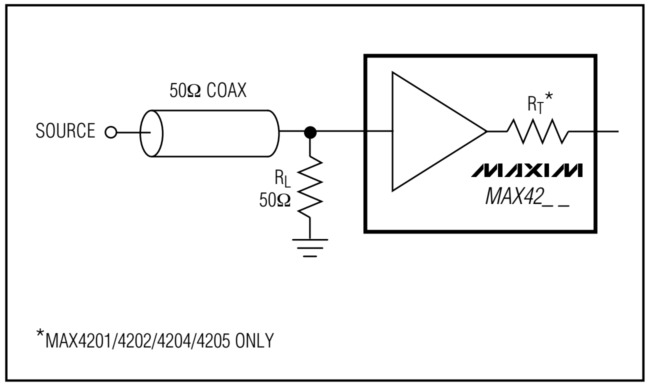


Figure 1. Using a Properly Terminated Input Source

Another concern when driving capacitive loads results from the amplifier's output impedance, which looks inductive at high frequency. This inductance forms an L-C resonant circuit with the capacitive load and causes peaking in the buffer's frequency response.

Figure 2 shows the frequency response of the MAX4200/MAX4203 under different capacitive loads. To settle out some of the peaking, the output requires an isolation resistor like the one shown in Figure 3. Figure 4 is a plot of the MAX4200/MAX4203 frequency response with capacitive loading and a 10Ω isolation resistor. In many applications, the output termination resistors included in the MAX4201/MAX4202/ MAX4204/MAX4205 will serve this purpose, reducing component count and board space. Figure 5 shows the MAX4201/MAX4202/ MAX4204/MAX4205 frequency response with capacitive loads of 47pF, 68pF, and 120pF.

Coaxial Cable Drivers

Coaxial cable and other transmission lines are easily driven when properly terminated at both ends with their characteristic impedance. Driving back-terminated transmission lines essentially eliminates the line's capacitance. The MAX4201/MAX4204, with their integrated 50Ω output termination resistors, are ideal for driving 50Ω cables. The MAX4202/MAX4205 include integrated 75Ω termination resistors for driving 75Ω cables. Note that the output termination resistor forms a voltage divider with the load resistance, thereby decreasing the amplitude of the signal at the receiving end of the cable by one half (see the *Typical Application Circuit)*.

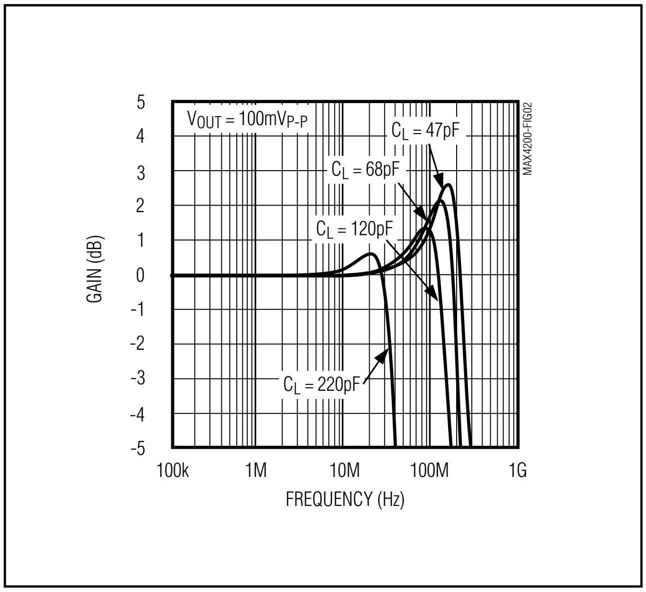


Figure 2. MAX4200/MAX4203 Small-Signal Gain vs. Frequency with Load Capacitance and No Isolation Resistor

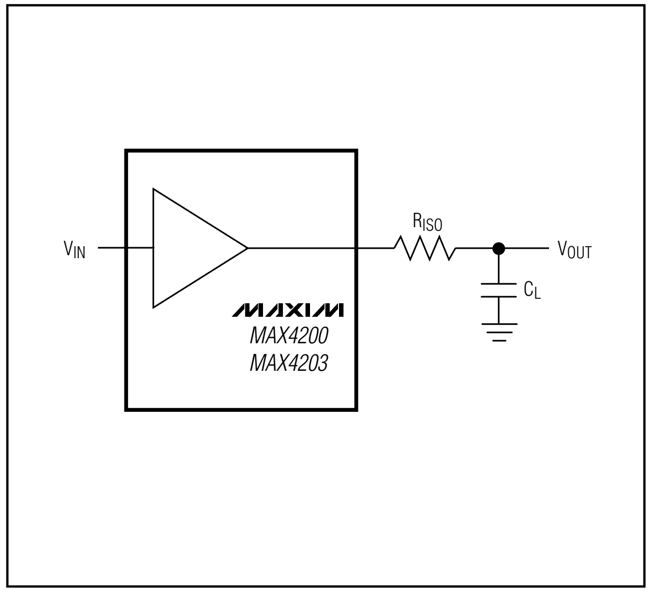


Figure 3. Driving a Capacitive Load Through an Isolation Resistor

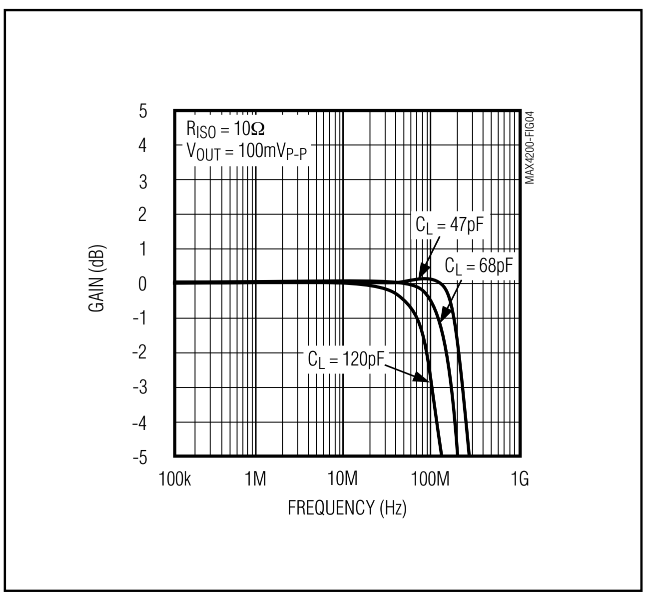


Figure 4. MAX4200/MAX4203 Small-Signal Gain vs. Frequency with Load Capacitance and 10Ω Isolation Resistor

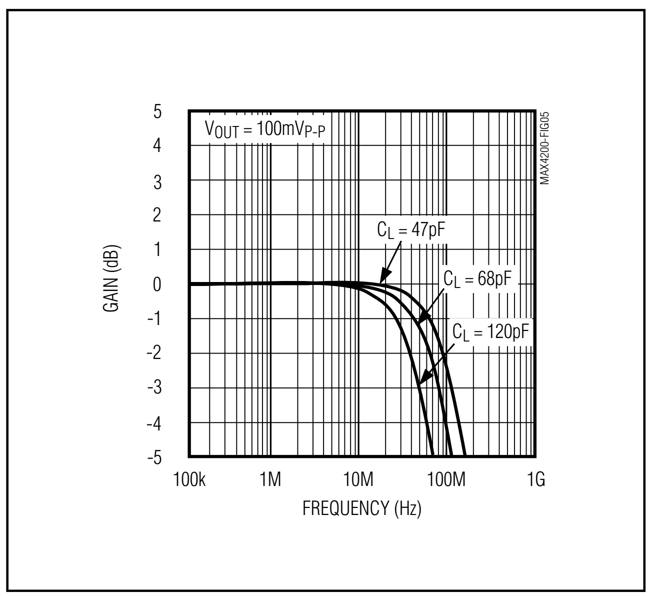
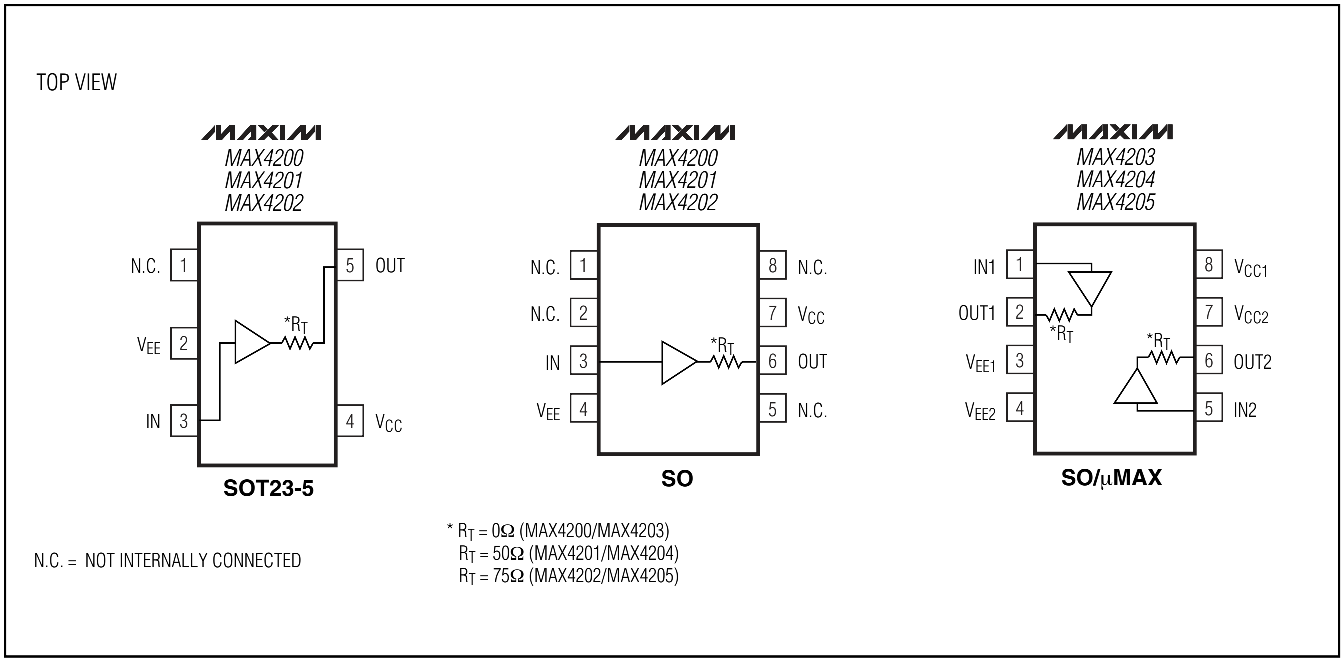


Figure 5. MAX4201/MAX4202/MAX4204/MAX4205 Small-Signal Gain vs. Frequency with Capacitive Load and No External Isolation Resistor

Pin Configurations



Chip Information

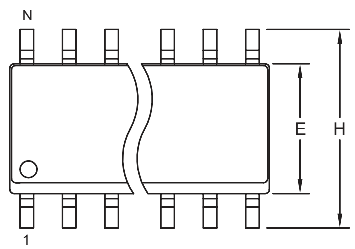
TRANSISTOR COUNTS:
MAX4200/MAX4201/MAX4202: 33
MAX4203/MAX4204/MAX4205: 67
SUBSTRATE CONNECTED TO V_{EE}

Package Information

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to **www.maxim-ic.com/packages**.)

SOICN .EPS

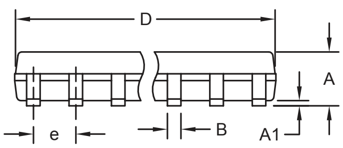
	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.053	0.069	1.35	1.75
A1	0.004	0.010	0.10	0.25
B	0.014	0.019	0.35	0.49
C	0.007	0.010	0.19	0.25
e	0.050 BSC		1.27 BSC	
E	0.150	0.157	3.80	4.00
H	0.228	0.244	5.80	6.20
L	0.016	0.050	0.40	1.27



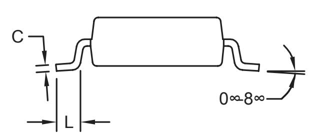
TOP VIEW

VARIATIONS:

	INCHES		MILLIMETERS			
DIM	MIN	MAX	MIN	MAX	N	MS012
D	0.189	0.197	4.80	5.00	8	AA
D	0.337	0.344	8.55	8.75	14	AB
D	0.386	0.394	9.80	10.00	16	AC



FRONT VIEW



SIDE VIEW

NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH.
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED 0.15mm (.006”).
3. LEADS TO BE COPLANAR WITHIN 0.10mm (.004”).
4. CONTROLLING DIMENSION: MILLIMETERS.
5. MEETS JEDEC MS012.
6. N = NUMBER OF PINS.

DALLAS SEMICONDUCTOR MAXIM

PROPRIETARY INFORMATION

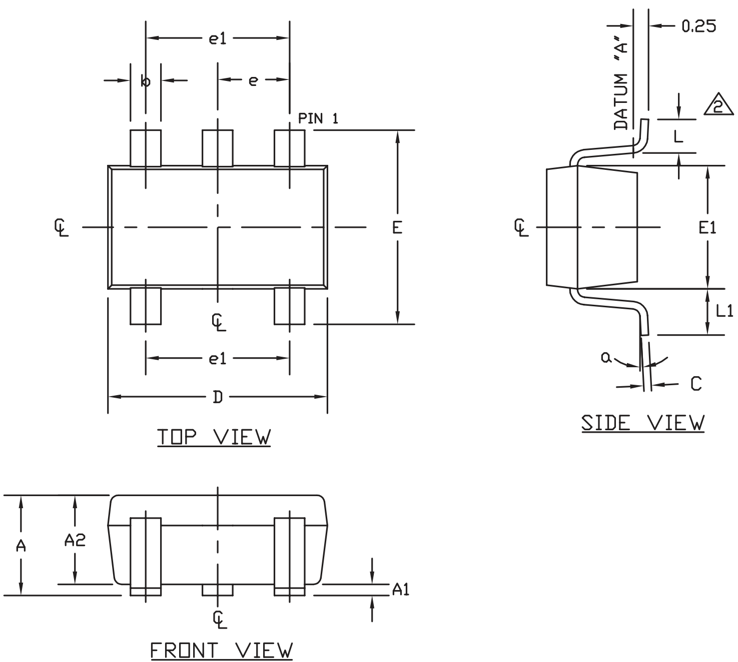
TITLE:

PACKAGE OUTLINE, .150" SOIC

APPROVAL	DOCUMENT CONTROL NO.	REV.	
	21-0041	B	1/1

Package Information (continued)

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to **www.maxim-ic.com/packages**.)



SYMBOL	MIN	NOM	MAX
A	0.90	1.25	1.45
A1	0.00	0.05	0.15
A2	0.90	1.10	1.30
b	0.35	0.40	0.50
C	0.08	0.15	0.20
D	2.80	2.90	3.00
E	2.60	2.80	3.00
E1	1.50	1.625	1.75
L	0.35	0.45	0.60
L1	0.60 REF		
e	0.95 BSC.		
e1	1.90 BSC.		
α	0°	2.5°	8°
PKG CODES: U5-1, U5-2			

SOT-23 5L .EPS

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. FOOT LENGTH MEASURED AT INTERCEPT POINT BETWEEN DATUM A & LEAD SURFACE.
3. PACKAGE OUTLINE EXCLUSIVE OF MOLD FLASH & METAL BURR. MOLD FLASH, PROTRUSION OR METAL BURR SHOULD NOT EXCEED 0.25 MM.
4. PACKAGE OUTLINE INCLUSIVE OF SOLDER PLATING.
5. MEETS JEDEC MO178, VARIATION AA.
6. LEADS TO BE COPLANAR WITHIN 0.10 mm.
7. SOLDER THICKNESS MEASURED AT FLAT SECTION OF LEAD BETWEEN 0.08mm AND 0.15mm FROM LEAD TIP.

DALLAS SEMICONDUCTOR MAXIM

PROPRIETARY INFORMATION

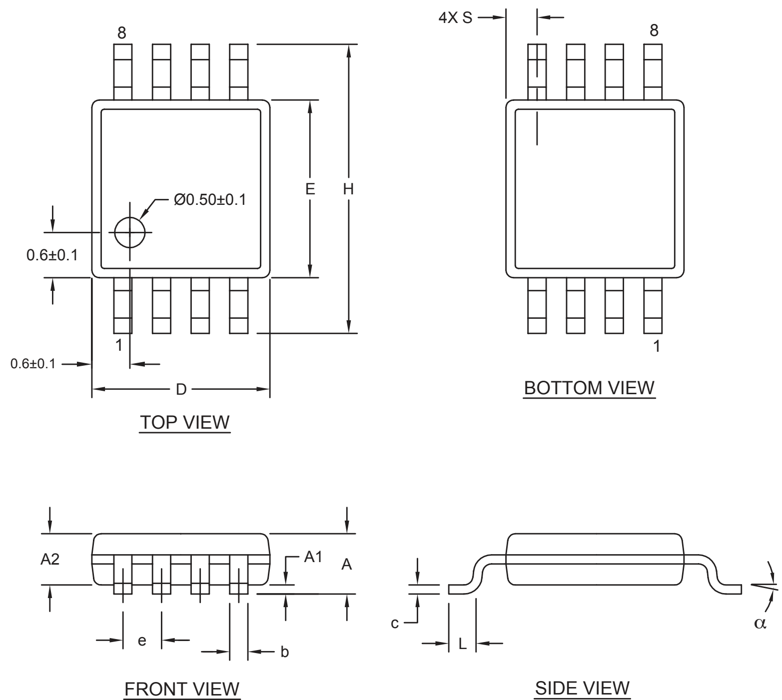
TITLE: PACKAGE OUTLINE, SOT-23, 5L

APPROVAL | DOCUMENT CONTROL NO. 21-0057 | REV. F | 1/1

Ultra-High-Speed, Low-Noise, Low-Power, SOT23 Open-Loop Buffers

Package Information (continued)

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to **www.maxim-ic.com/packages**.)



8LUMAXD.EPS

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	-	0.043	-	1.10
A1	0.002	0.006	0.05	0.15
A2	0.030	0.037	0.75	0.95
b	0.010	0.014	0.25	0.36
c	0.005	0.007	0.13	0.18
D	0.116	0.120	2.95	3.05
e	0.0256 BSC		0.65 BSC	
E	0.116	0.120	2.95	3.05
H	0.188	0.198	4.78	5.03
L	0.016	0.026	0.41	0.66
α	0°	6°	0°	6°
S	0.0207 BSC		0.5250 BSC	

NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH.
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED 0.15MM (.006").
3. CONTROLLING DIMENSION: MILLIMETERS.
4. MEETS JEDEC MO-187C-AA.

DALLAS SEMICONDUCTOR MAXIM
PROPRIETARY INFORMATION
TITLE:
PACKAGE OUTLINE, 8L uMAX/uSOP

APPROVAL	DOCUMENT CONTROL NO.	REV.	
	21-0036	J	1/1

Revision History

Pages changed at Rev 3: 1–5, 8, 10–14