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REVISION HISTORY

7/12—Rev. D to Rev. E

Added Power Sequencing Section 5
Added Figure 28 and Figure 29; Renumbered Sequentially 10

8/11—Rev. C to Rev. D

Added Input Capacitance, Common Mode Parameter and Input Capacitance, Differential Mode Parameter, Table 3 4

6/10—Rev. B to Rev. C

Changes to Figure 10 7

5/10—Rev. A to Rev. B

Changes to General Description Section 1
Added Table 1; Renumbered Sequentially 1
Changes to Table 2 3
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Added Figure 27; Renumbered Sequentially 10
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4/07—Rev. 0 to Rev. A

Added Figure 7 and Figure 8; Renumbered Sequentially 6

10/05—Revision 0: Initial Version

SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

V_S = ±5.0 V, V_{CM} = 0 V, V_O = 0 V, T_A = +25°C, unless otherwise specified.

Table 2.

Parameter	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
INPUT CHARACTERISTICS						
Offset Voltage	V_{OS}			10	75	µV
		−40°C ≤ T_A ≤ +125°C		12	240	µV
Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	−40°C ≤ T_A ≤ +125°C		0.2	0.6	µV/°C
Input Bias Current	I_B		−2	+0.5	+2	nA
		−40°C ≤ T_A ≤ +125°C	−5.5	−2	+5.5	nA
Input Offset Current	I_{OS}		−1	+0.1	+1	nA
		−40°C ≤ T_A ≤ +125°C	−2.8	+0.1	+2.8	nA
Input Voltage Range	IVR		−3.0		+3.0	V
Common-Mode Rejection Ratio	CMRR	V_{CM} = −3.0 V to +3.0 V	105	130		dB
		−40°C ≤ T_A ≤ +125°C	105			dB
Open-Loop Gain	A_{VO}	R_L = 2 kΩ to ground,	120	126		dB
		V_O = −3.5 V to +3.5 V				
		−40°C ≤ T_A ≤ +125°C	117			dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	R_L = 10 kΩ to ground	4.90	4.95		V
		−40°C ≤ T_A ≤ +125°C	4.85			V
		R_L = 2 kΩ to ground	4.80	4.90		V
		−40°C ≤ T_A ≤ +125°C	4.75			V
Output Voltage Low	V_{OL}	R_L = 10 kΩ to ground		−4.98	−4.90	V
		−40°C ≤ T_A ≤ +125°C			−4.85	V
		R_L = 2 kΩ to ground		−4.91	−4.86	V
		−40°C ≤ T_A ≤ +125°C			−4.82	V
Short-Circuit Limit	I_{SC}			±35		mA
POWER SUPPLY						
Power Supply Rejection Ratio	PSRR	V_S = ±5.0 V to ±15.0 V	120	140		dB
		−40°C ≤ T_A ≤ +125°C	120			dB
Supply Current/Amplifier	I_{SY}	V_O = 0 V		2.3	2.7	mA
		−40°C ≤ T_A ≤ +125°C			3.4	mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	R_L = 2 kΩ		2.5		V/µs
Gain Bandwidth Product	GBP			10		MHz
NOISE PERFORMANCE						
Voltage Noise	$e_{n\ p\text{-}p}$	0.1 Hz to 10 Hz		0.1		µV p-p
Voltage Noise Density	e_n	f = 1 kHz		2.8		nV/√Hz
Current Noise Density	i_n	f = 10 Hz		0.3		pA/√Hz

V_S = ±15 V, V_{CM} = 0 V, V_O = 0 V, T_A = +25°C, unless otherwise specified.

Table 3.

Parameter	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
INPUT CHARACTERISTICS						
Offset Voltage	V_{OS}			10	75	µV
		−40°C ≤ T_A ≤ +125°C		12	240	µV
Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	−40°C ≤ T_A ≤ +125°C		0.2	0.6	µV/°C
Input Bias Current	I_B		−2	+0.5	+2	nA
		−40°C ≤ T_A ≤ +125°C	−4.5	+1	+4.5	nA
Input Offset Current	I_{OS}		−1	+0.1	+1	nA
		−40°C ≤ T_A ≤ +125°C	−2.8	+0.1	+2.8	nA
Input Voltage Range	IVR		−12.5		+12.5	V
Common-Mode Rejection Ratio	CMRR	V_{CM} = −12.5 V to +12.5 V	114	130		dB
		−40°C ≤ T_A ≤ +125°C	114			dB
Open-Loop Gain	A_{VO}	R_L = 2 kΩ to ground, V_O = −13.5 V to +13.5 V	123	132		dB
		−40°C ≤ T_A ≤ +125°C	117			dB
Input Capacitance, Common Mode	C_{INCM}			3.8		pF
Input Capacitance, Differential Mode	C_{INDM}			9.6		pF
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	R_L = 10 kΩ to ground	14.85	14.92		V
		−40°C ≤ T_A ≤ +125°C	14.80			V
		R_L = 2 kΩ to ground	14.60	14.80		V
		−40°C ≤ T_A ≤ +125°C	14.40			V
Output Voltage Low	V_{OL}	R_L = 10 kΩ to ground		−14.96	−14.94	V
		−40°C ≤ T_A ≤ +125°C			−14.90	V
		R_L = 2 kΩ to ground		−14.85	−14.75	V
		−40°C ≤ T_A ≤ +125°C			−14.69	V
Short-Circuit Limit	I_{SC}			±35		mA
POWER SUPPLY						
Power Supply Rejection Ratio	PSRR	V_S = ±5.0 V to ±15.0 V	120	140		dB
		−40°C ≤ T_A ≤ +125°C	120			dB
Supply Current/Amplifier	I_{SY}	V_O = 0 V		2.5	2.9	mA
		−40°C ≤ T_A ≤ +125°C			3.8	mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	R_L = 10 kΩ		2.5		V/µs
Gain Bandwidth Product	GBP			10		MHz
NOISE PERFORMANCE						
Voltage Noise	$e_{n\ p\text{-}p}$	0.1 Hz to 10 Hz		0.1		µV p-p
Voltage Noise Density	e_n	f = 1 kHz		2.8		nV/√Hz
Current Noise Density	i_n	f = 10 Hz		0.3		pA/√Hz

ABSOLUTE MAXIMUM RATINGS

Table 4.

Parameter	Rating
Supply Voltage	±18 V
Input Voltage	±V supply
Input Current	±5 mA
Differential Input Voltage	±0.7 V
Output Short-Circuit Duration to GND	Indefinite
Storage Temperature Range	
RM-8, R-8 Packages	−65°C to +150°C
Operating Temperature Range	−40°C to +125°C
Junction Temperature Range	
RM-8, R-8 Packages	−65°C to +150°C
Lead Temperature Range (Soldering, 10 sec)	300°C
NULL Pins (Pin 1, Pin 8), Input Current Maximum	<50 µA, V_S < V+

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL RESISTANCE

θ_{JA} is specified for the worst-case conditions, that is, a device soldered in a circuit board for surface-mount packages and measured using a standard 4-layer board, unless otherwise specified.

Table 5. Thermal Resistance

Package Type	θ_{JA}	θ_{JC}	Unit
8-Lead MSOP (RM-8)	142	45	°C/W
8-Lead SOIC_N (R-8)	120	45	°C/W

POWER SEQUENCING

Establish the op amp supplies simultaneously with, or before, any input signals are applied. If this is not possible, the input current must be limited to 10 mA.

ESD CAUTION

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

TYPICAL PERFORMANCE CHARACTERISTICS

±15 V and ±5 V, T_A = 25°C, unless otherwise specified.

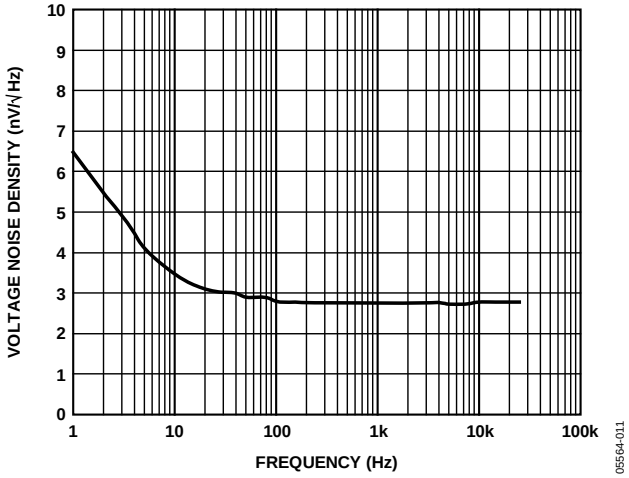

Figure 3. Voltage Noise Density vs. Frequency

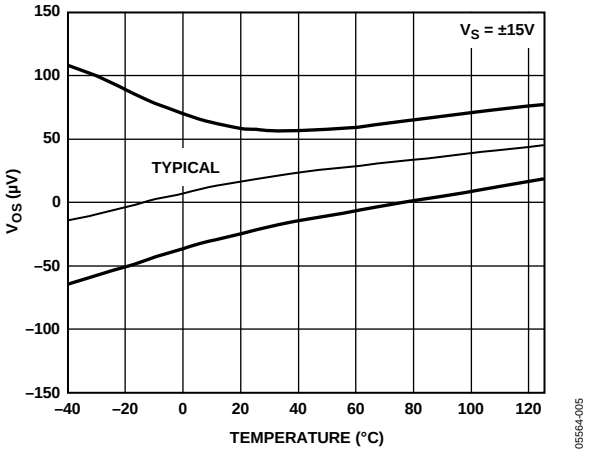

Figure 6. Offset Voltage vs. Temperature

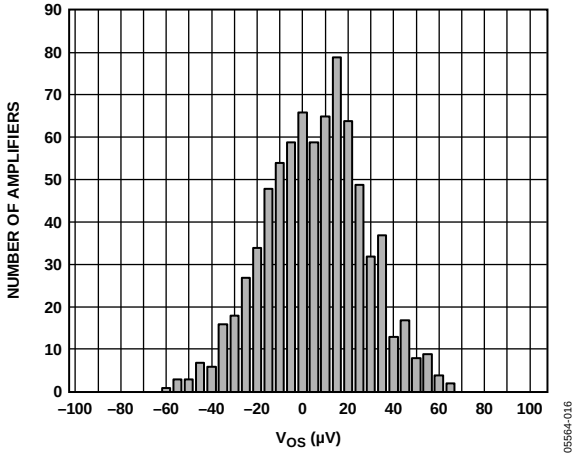

Figure 4. Input Offset Voltage Distribution

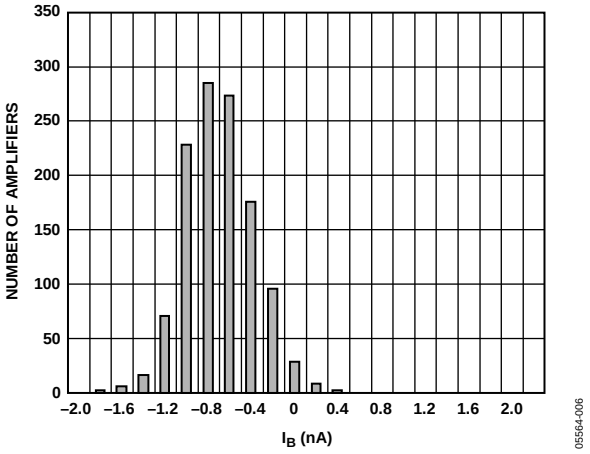

Figure 7. Input Bias Current, V_S = ±15 V

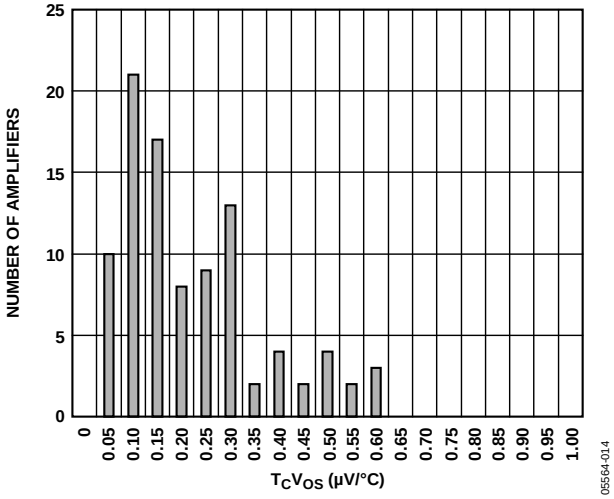

Figure 5. T_CV_{OS}

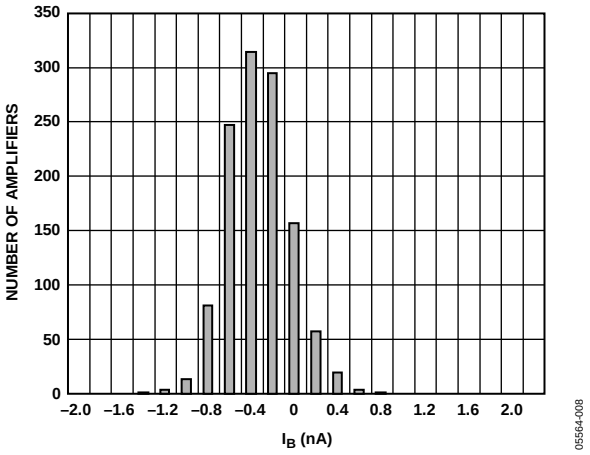

Figure 8. Input Bias Current, V_S = ±5 V

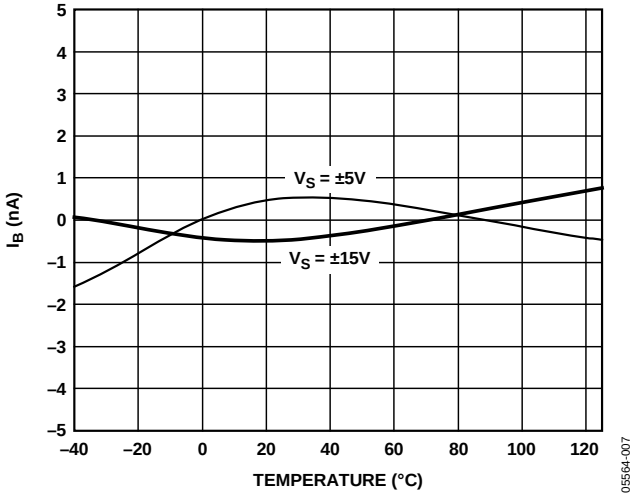

Figure 9. Input Bias Current vs. Temperature

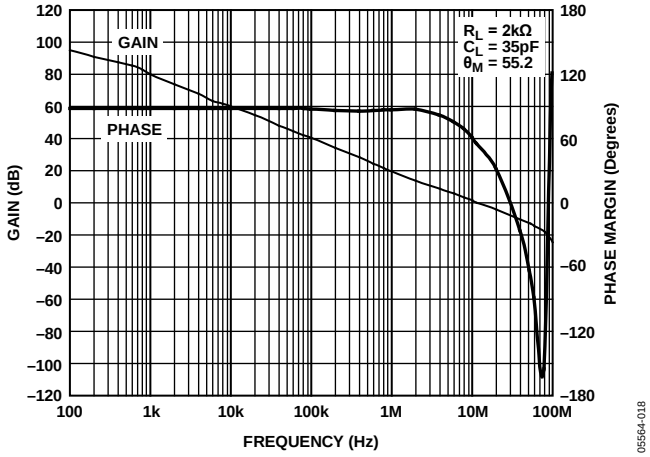

Figure 12. Gain and Phase vs. Frequency

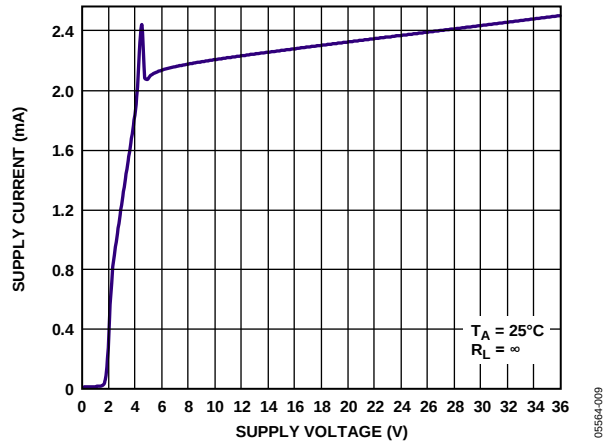

Figure 10. Supply Current vs. Total Supply Voltage

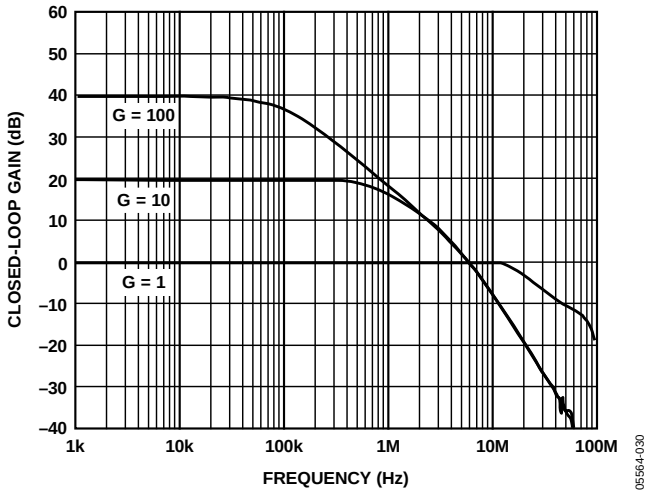

Figure 13. Closed-Loop Gain vs. Frequency

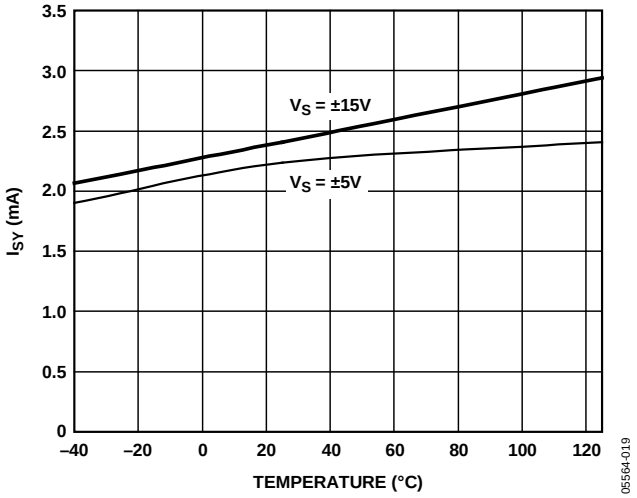

Figure 11. Supply Current vs. Temperature

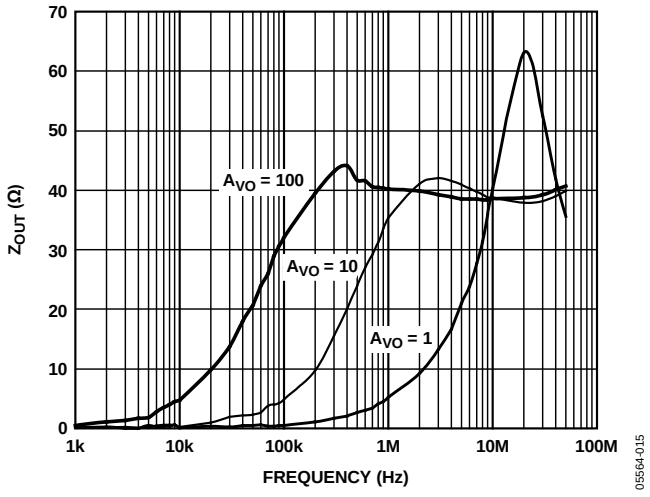

Figure 14. Z_{OUT} vs. Frequency

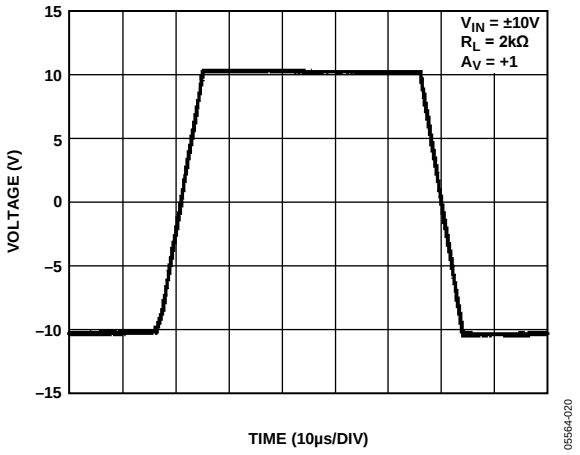

Figure 15. Large-Signal Transient Response, V_{SY} = ±15 V

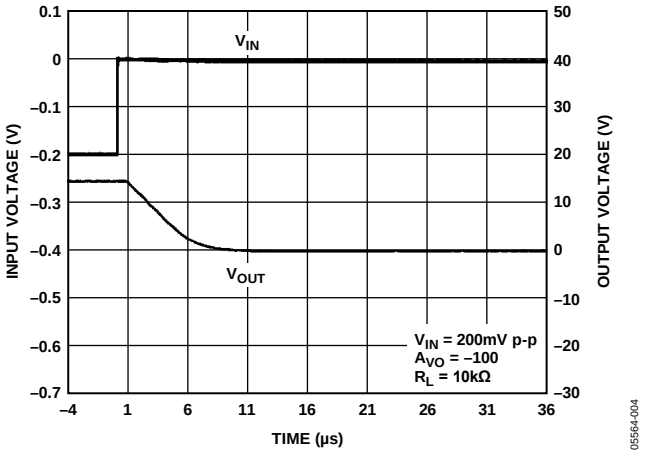

Figure 18. Positive Overvoltage Recovery

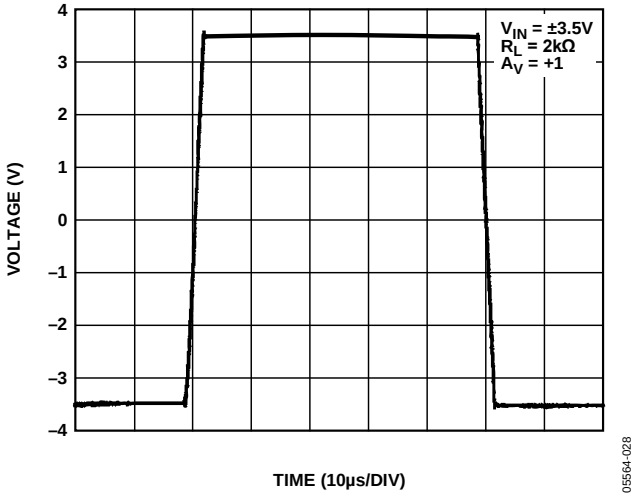

Figure 16. Large-Signal Transient Response, V_{SY} = ±5 V

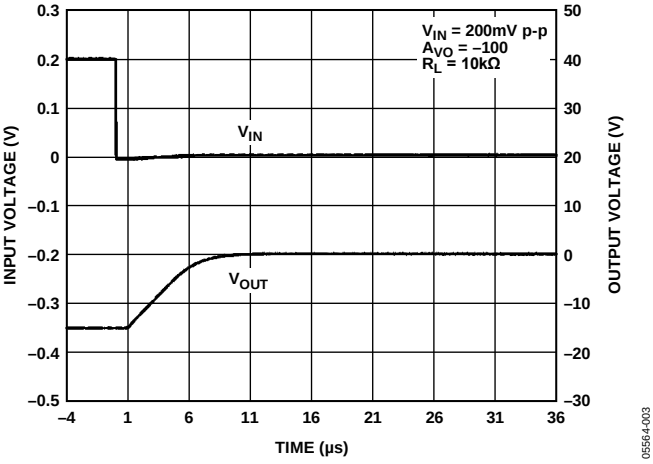

Figure 19. Negative Overvoltage Recovery

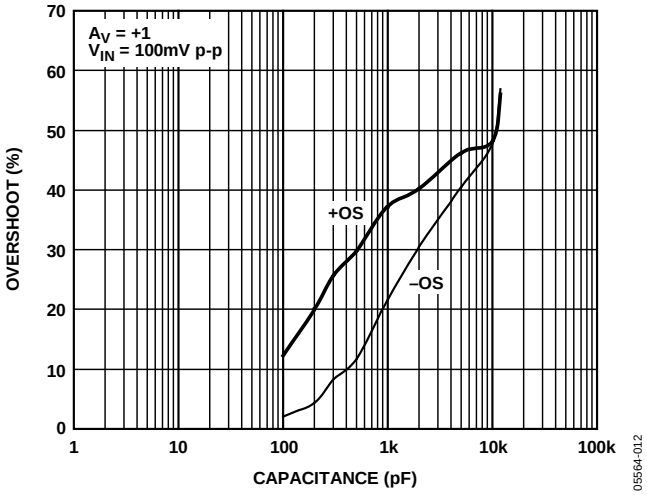

Figure 17. Small-Signal Overshoot vs. Load Capacitance

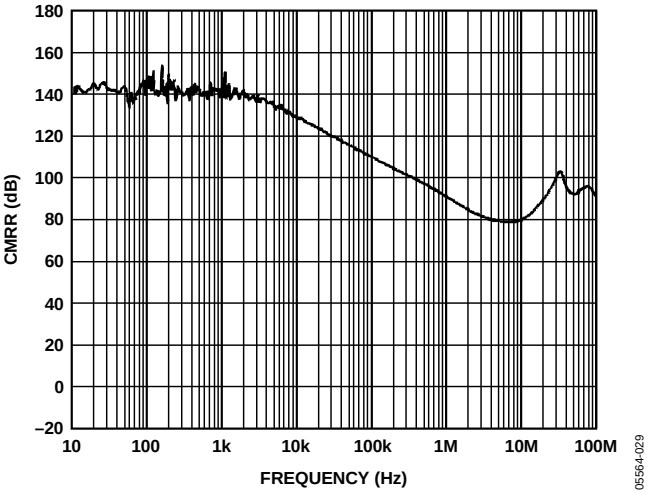

Figure 20. CMRR vs. Frequency

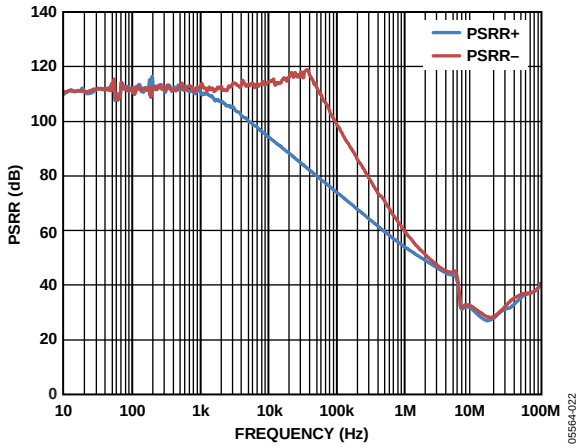

Figure 21. Power Supply Rejection Ratio vs. Frequency

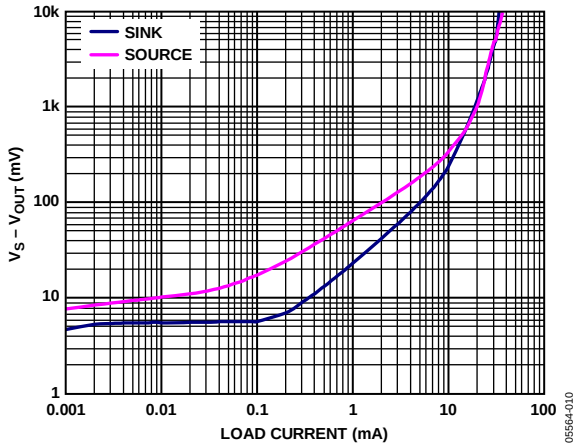

Figure 24. Output Saturation Voltage vs. Output Current

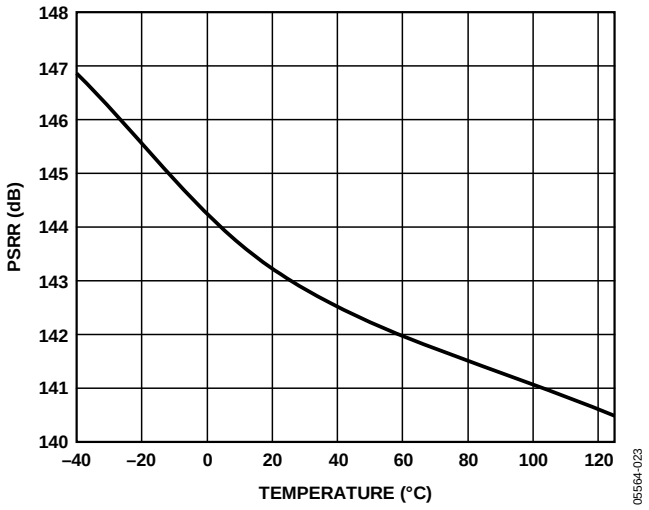

Figure 22. Power Supply Rejection Ratio vs. Temperature

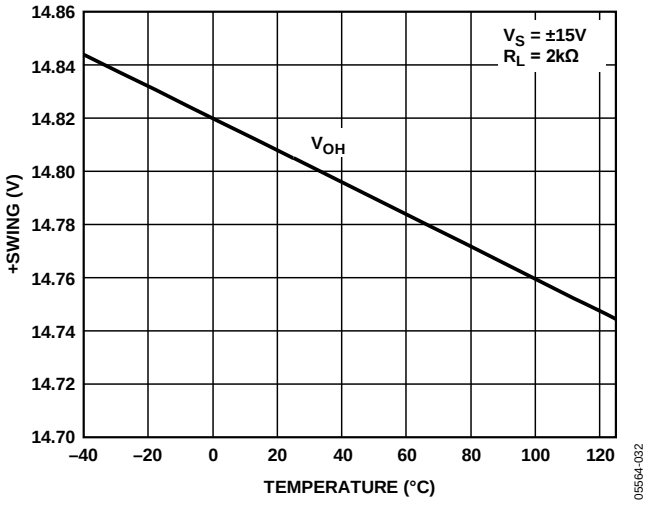

Figure 25. Swing vs. Temperature, V_{OH}

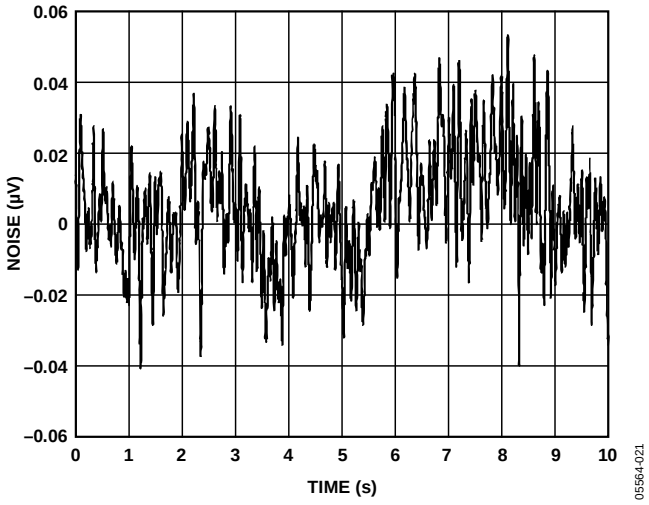

Figure 23. Voltage Noise (0.1 Hz to 10 Hz)

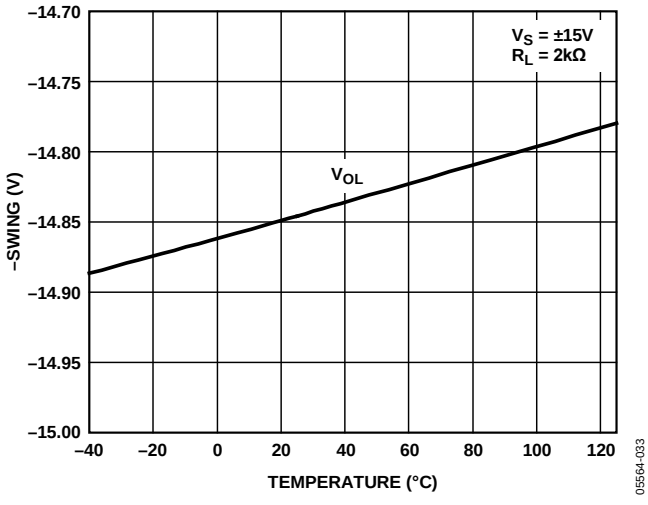

Figure 26. Swing vs. Temperature, V_{OL}

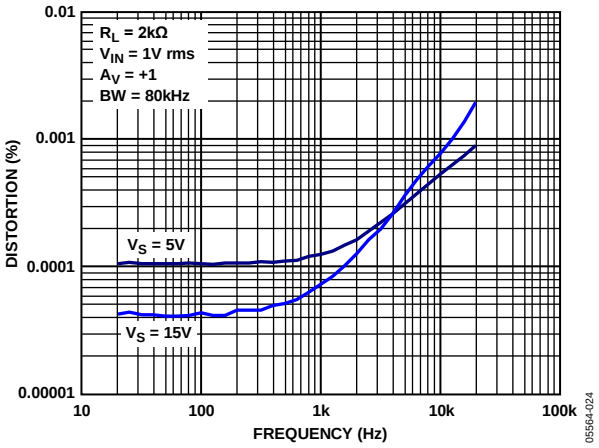

Figure 27. Distortion vs. Frequency

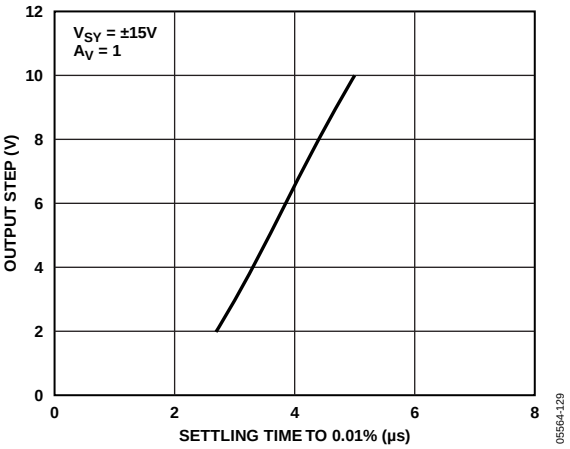

Figure 29. Output Step vs. Settling Time to 0.01%

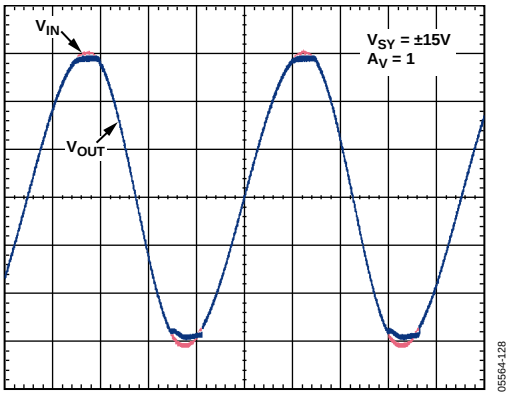

Figure 28. No Phase Reversal

TEST CIRCUIT

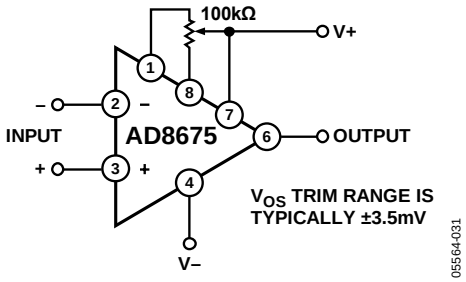

Figure 30. Optional Offset Nulling Circuit

OUTLINE DIMENSIONS

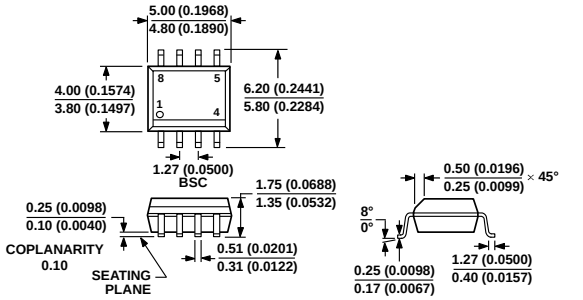

Figure 31. 8-Lead Standard Small Outline Package [SOIC_N]
Narrow Body (R-8)
Dimensions shown in millimeters and (inches)

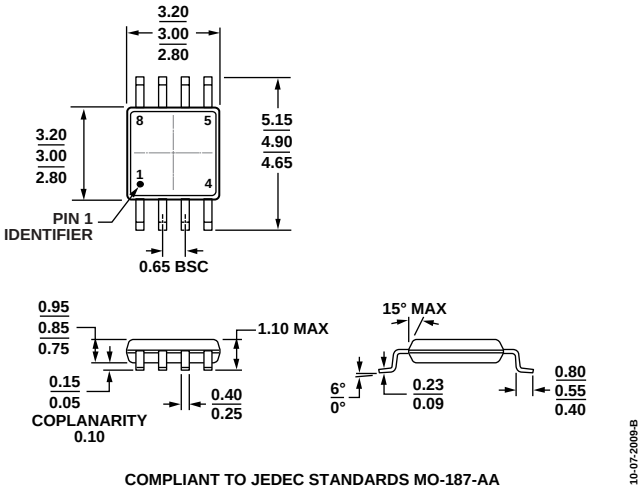

Figure 32. 8-Lead Mini Small Outline Package [MSOP]
(RM-8)
Dimensions shown in millimeters

ORDERING GUIDE

Model[1]	Temperature Range	Package Description	Package Option	Branding
AD8675ARMZ	−40°C to +125°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	A08
AD8675ARMZ-REEL	−40°C to +125°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	A08
AD8675ARZ	−40°C to +125°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
AD8675ARZ-REEL	−40°C to +125°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	
AD8675ARZ-REEL7	−40°C to +125°C	8-Lead Standard Small Outline Package [SOIC_N]	R-8	

[1] Z = RoHS Compliant Part.