GS4558

Dual Wide Bandwidth Operational Amplifier

Product Description

The GS4558 device is dual general-purpose operational amplifier with each half electrically similar to the μA741 except that offset null capability is not provided.

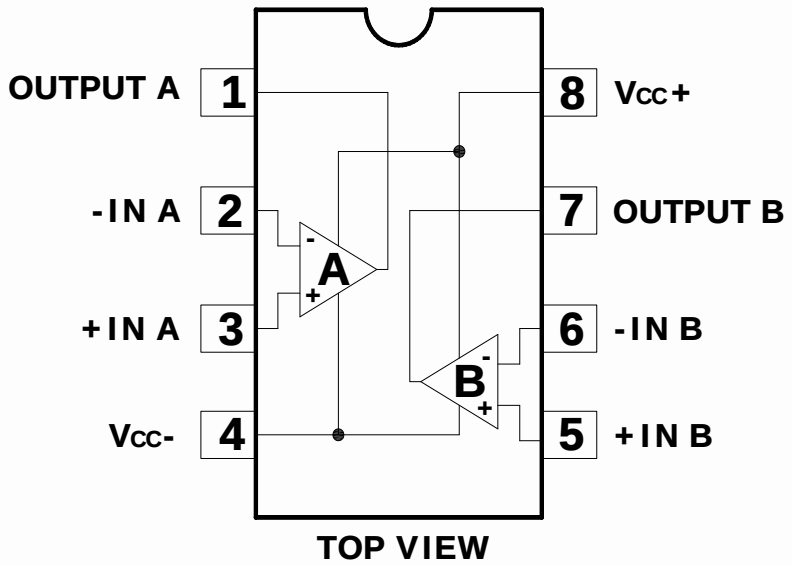
The high common-mode input voltage range and the absence of latch-up make this amplifier ideal for voltage-follower applications. The device is short-circuit protected and the internal frequency compensation ensures stability without external components.

The GS4558 is characterized for operation from 0°C to 70°C.

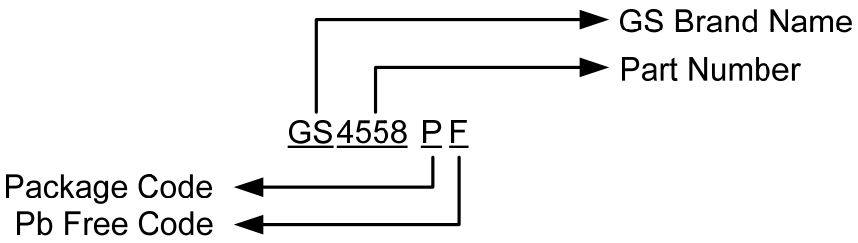
Features

- Continuous-Short-Circuit Protection
- Wide Common-Mode and Differential Voltage Ranges
- No Frequency Compensation Required
- Low Power Consumption
- No Latch-Up
- Unity-Gain Bandwidth: 3 MHz Typ.
- Gain and Phase Match Between Amplifiers
- Low Noise: 8 nV $\sqrt{HZ}$. (TYP at 1 kHz)

Packages & Pin Assignments

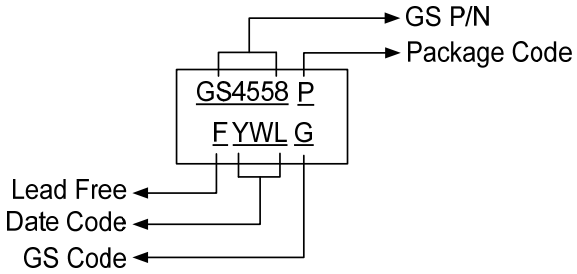


Ordering Information



Device	Package
GS4558S	SOP-8
GS4558P	DIP-8

Marking Information



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}^{+}	Supply Voltage **(Note 1)**	22	V
V_{CC}^{-}		-22	
V_{IN}	Input Voltage **(Note 1, 3)**	±15	V
V_{ID}	Differential Input Voltage – **(Note 2)**	±30	V
	Duration of output short circuit to ground, one amplifier at a time **(Note 4)**	Unlimited	
T_{STG}	Storage temperature range	-65 to 150	°C

NOTE:
Stresses above 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 above those indicated in the operation sections of the specifications is not implied.
Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

Note 1: All voltage values, unless otherwise noted, are with respect to the midpoint between **VCC^{+}** and **VCC^{-}**.
Note 2: Differential voltages are at **IN^{+}** with respect to **IN^{-}**.
Note 3: The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15V, whichever is less.
Note 4: Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.

Recommended Operating Conditions

Symbol	Parameter	Value	Unit
V_{CC}+	Supply voltage	5 to 15	V
V_{CC}-		-5 to -15	V
T_A	Operating free-air temperature	0 to 70	ºC

Electrical Characteristics

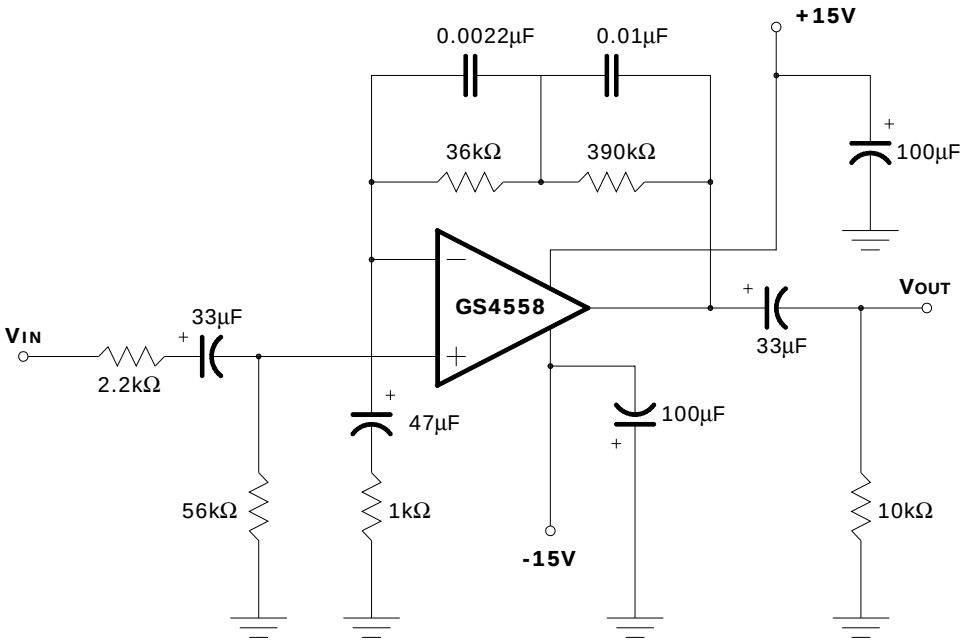
at specified free-air temperature, V_{CC}+= 15V, V_{CC}- = –15V (Wafer Form)

Symbol	Parameter		Condition		Value MIN	Value TYP	Value MAX	Unit
V_{IO}	Input offset voltage		V_O = 0	25ºC		0.5	5	mV
				Full range			6	
I_{IO}	Input offset current		V_O = 0	25ºC		5	200	nA
				Full range			500	
I_{IB}	Input bias current		V_O = 0	25ºC		140	500	nA
				Full range			1500	
V_{ICR}	Common-mode input voltage range			25ºC	±12	±14		V
V_{OM}	Maximum output voltage swing		R_L = 10kΩ	25ºC	±12	±14		V
			R_L = 2kΩ	25ºC	±10	±13		
			R_L ≧ 2kΩ	Full range	±10			
A_{VD}	Large signal differential voltage amplification		R_L ≧ 2kΩ, V_O = ±10V	25ºC	50	350		V/mV
				Full range	25			
r_j	Input resistance			25ºC	0.3	5		MΩ
CMRR	Common-mode rejection ratio			25ºC	70	90		dB
k_{SVS}	Supply-voltage sensitivity (ΔV_{IO} / ΔV_{CC})			25ºC		30	150	μV/V
I_{CC}	Supply current (both amplifiers)		V_O = 0 , No load	25ºC		2.5	5.6	mA
				T_A(min)		3	6.6	
				T_A(max)		2	5	
V_{O1} / V_{O2}	Crosstalk attenuation	Open loop	R_S = 100Ω	25ºC		85		
		A_{VD} = 100	f = 1kHz			105		

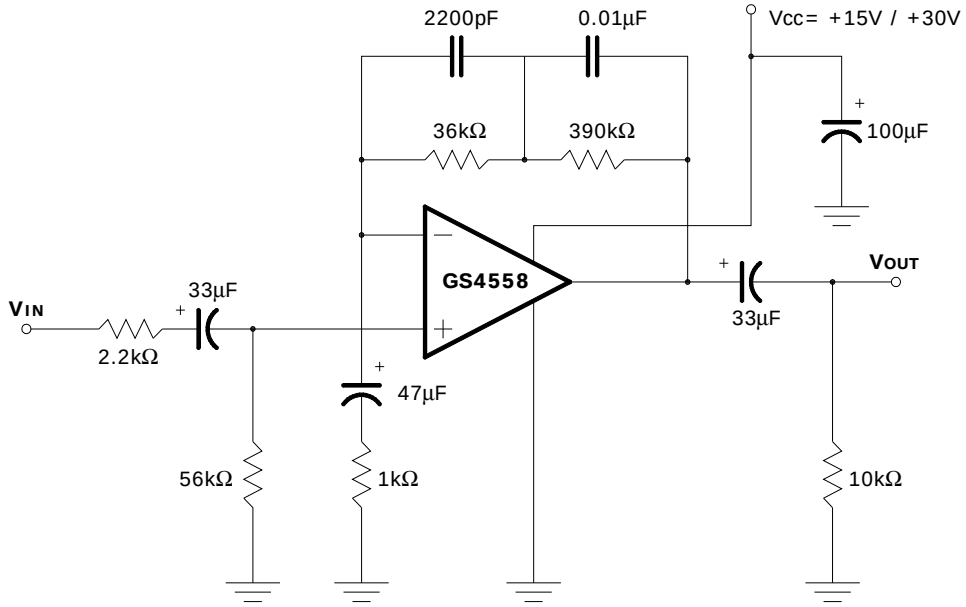
All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. Full range is 0ºC to 70ºC. T_A(min) = 0ºC. T_A(max) = 70ºC.

Typical Applications

RIAA PRE-AMPLIFIER (BIPOLAR VOLTAGE OPERATION)

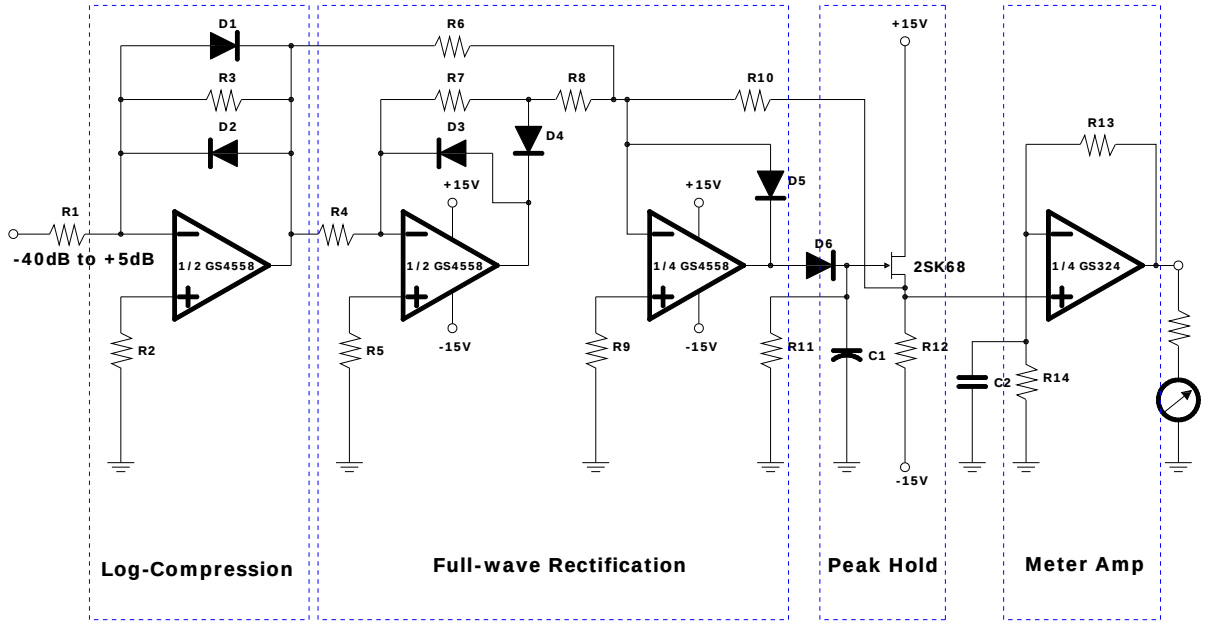


RIAA PRE-AMPLIFIER (SINGLE VOLTAGE OPERATION)



Typical Applications (Continue)

PEAK LEVEL METER

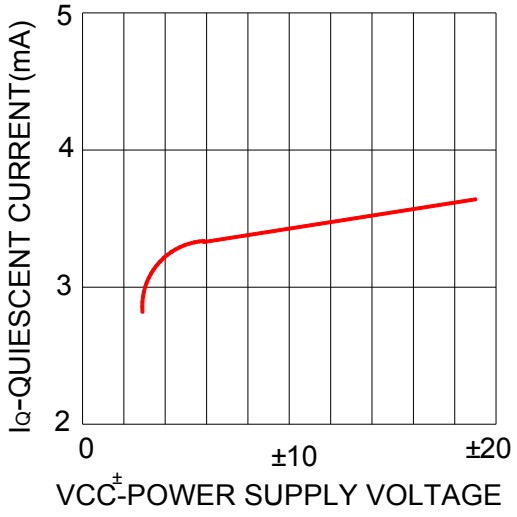


R1=51k，R2=100k，R3=100k，R4=30k，R5=30k，R6=30k，R7=30k，R8=15k，R9=30k，R10=30k，R11=200k
R12=10k，R13=20k，C1=3.3μ，C2=0.22μ，all diode=1S953

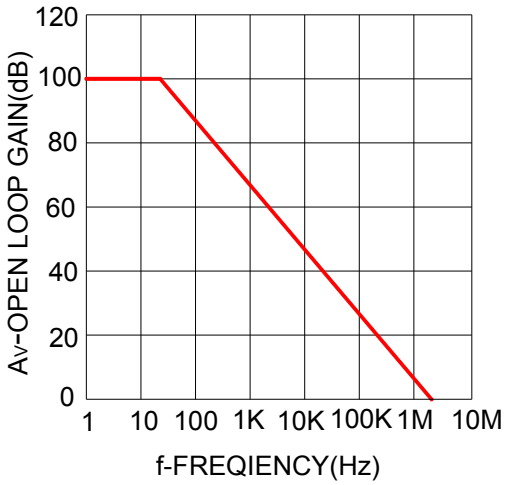
This circuit converts the peak voltage (about ±10mV to ±10V of the input signal to a DC voltage (about 0.2V to 1.3V) and drives the meter.
Since the output voltage is proportional to the logarithmic value of the peak voltage of the input signal, indication of a much wider dynamic range can be obtained compared to conventional linear indicating methods.

Typical Characteristics

Power Dissipation Versus Ambient Temperature

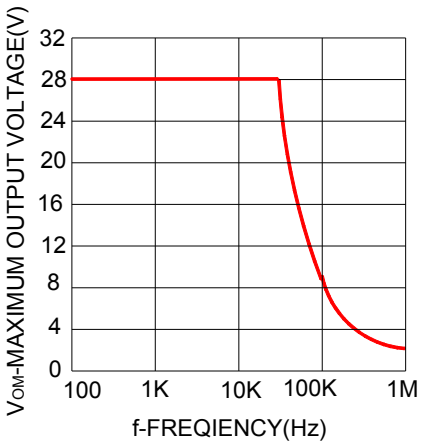


Quiescent Current Versus Power Supply Voltage

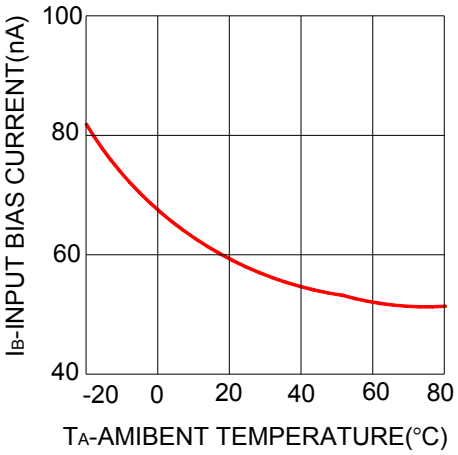


Typical Characteristics (Continue)

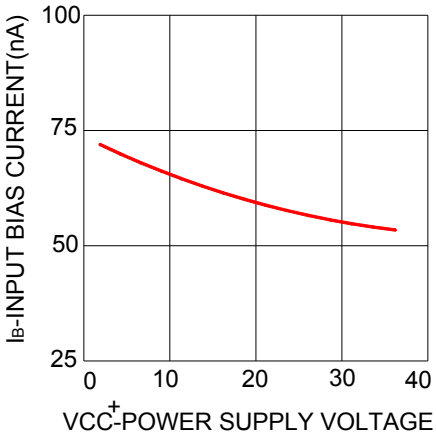
Open Loop Voltage Gain Versus Frequency



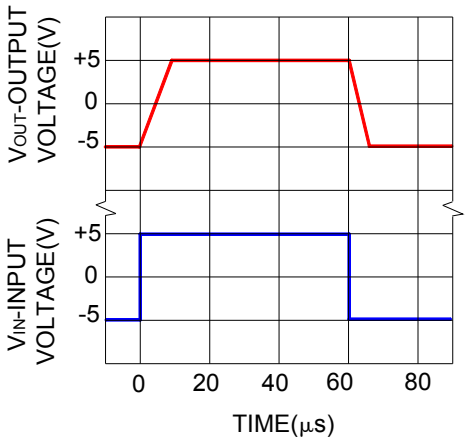
Input Bias Current Versus Ambient Temperature



Input Bias Current Versus Power Supply Voltage

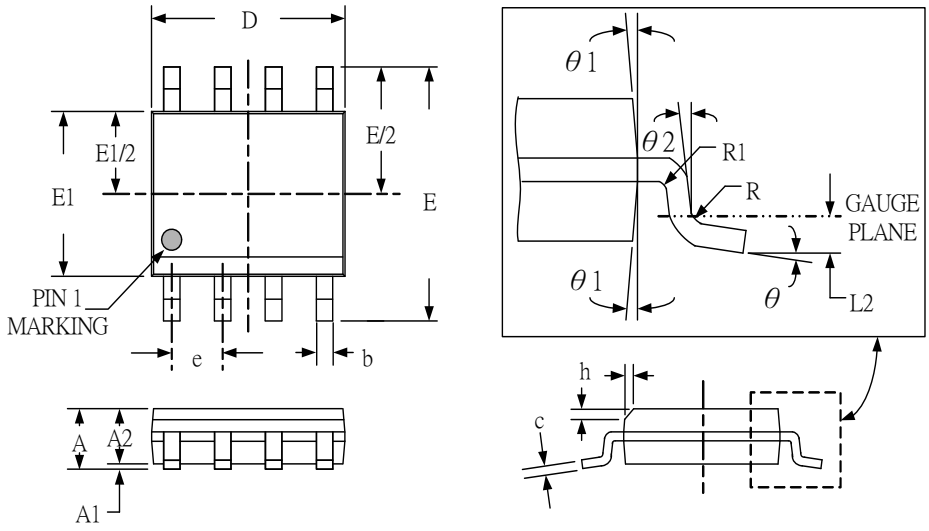


Output Response Characteristics



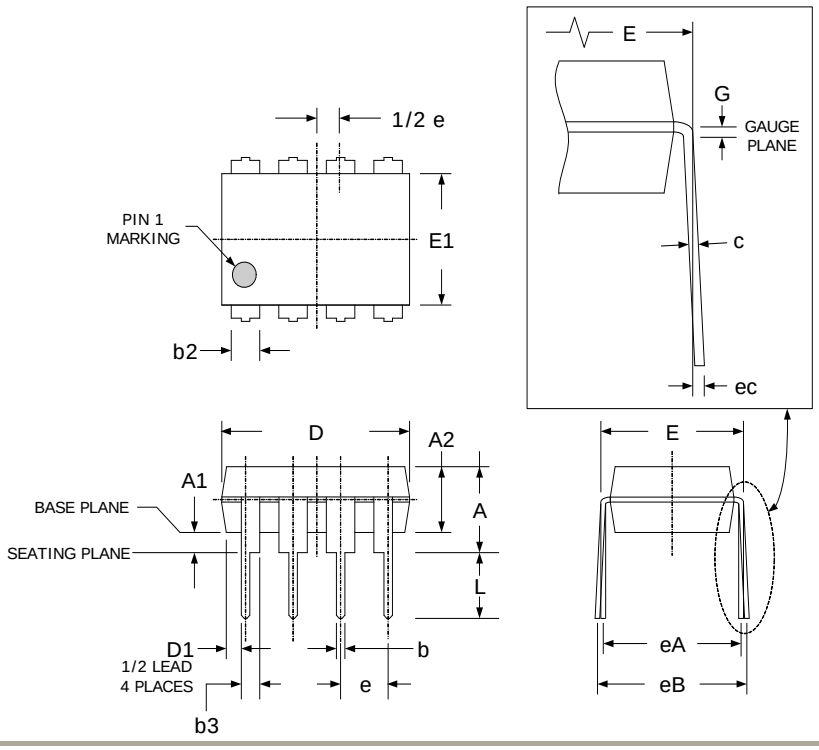
Package Dimension

SOP-8 PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.35	1.75	.053	.069
A1	0.10	0.25	.004	.010
A2	1.25	1.65	.049	.065
b	0.31	0.51	.012	.020
b1	0.28	0.48	.011	.019
c	0.17	0.25	.007	.010
D	4.90 (TYP)		.193 (TYP)	
E	6.00 (TYP)		.236 (TYP)	
E1	3.90 (TYP)		.154 (TYP)	
e	1.27 (TYP)		.050 (TYP)	
L	0.40	1.27	.016	.050
L1	1.04 (TYP)		.041 (TYP)	
L2	0.25 (TYP)		.010 (TYP)	
R	0.07	-	.003	-
R1	0.07	-	.003	-
h	0.25	0.50	.010	.020
θ	0°	8°	0°	8°
θ1	5°	15°	5°	15°
θ2	0°	-	0°	-

DIP-8 PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	-	5.33	-	.210
A1	0.38	-	.015	-
A2	2.92	4.95	.115	.195
b	0.36	0.56	.014	.022
b2	1.14	1.78	.045	.070
b3	0.76	1.14	.030	.045
c	0.20	0.36	.008	.014
D	9.02	10.16	.355	.400
D1	0.13	-	.005	-
E	7.62	8.26	.300	.325
E1	6.10	7.11	.240	.280
e	2.54 (TYP)		.100 (TYP)	
eA	7.62 (TYP)		.300 (TYP)	
eB	-	10.92	-	.430
eC	0.00	1.52	.000	.060
L	2.92	3.81	.115	.150
G	0.38 (TYP)		.015 (TYP)	

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