Raytheon

Decompensated Wide-Bandwidth Dual Operational Amplifier

RC4562

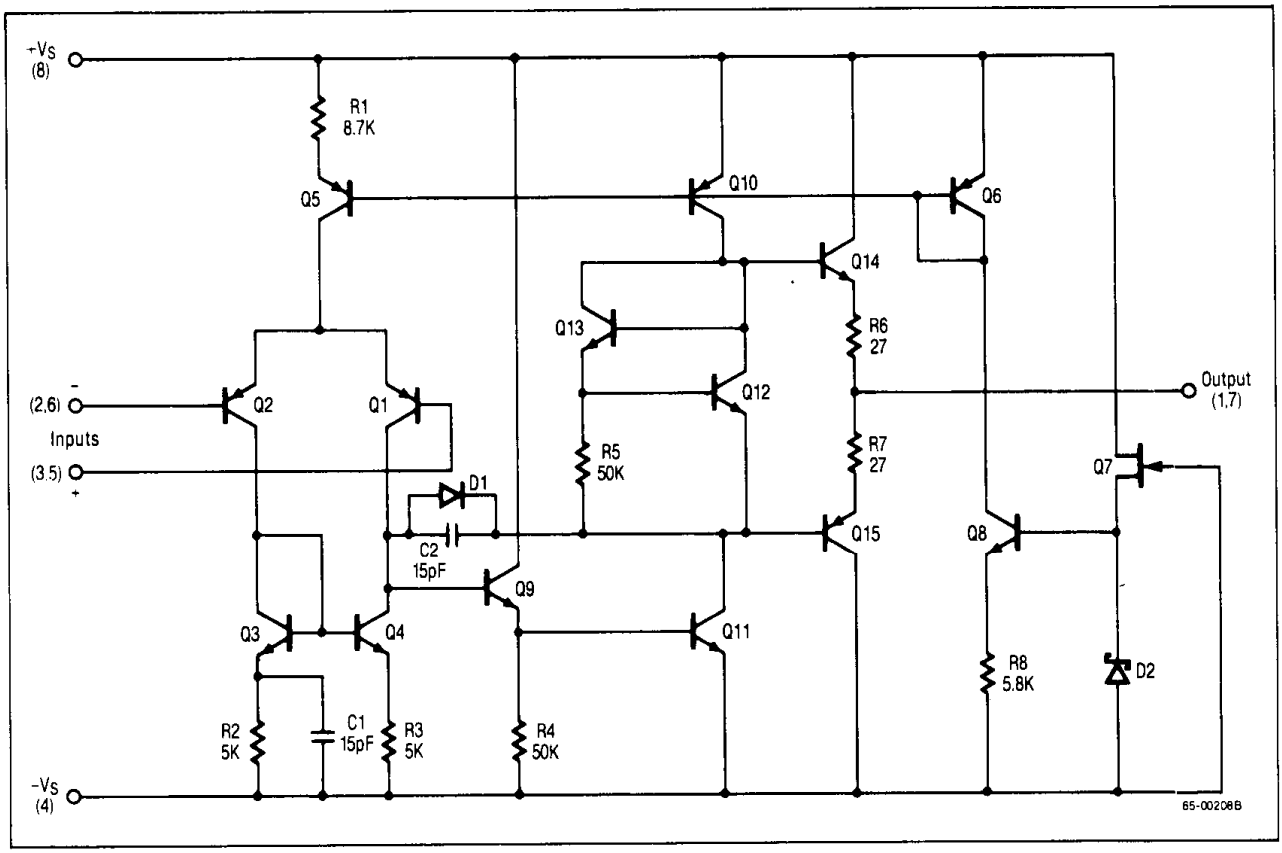
Features

- Frequency compensated for gains >10
- Unity gain bandwidth — 15MHz
- Slew rate — 7.0V/μS
- Noise voltage at 1kHz — 5.5nV/$\sqrt{Hz}$
- Noise current at 1kHz — 0.2pA/$\sqrt{Hz}$
- $\pm$10V Output into 600Ω loads
- 0.005% distortion at 9.0V_{RMS}
- Supply current per amplifier — 1.8mA
- Output short circuit protected

Description

The 4562 integrated circuit is a high gain, wide-bandwidth, low noise, dual operational amplifier capable of driving 20V peak-to-peak into 600Ω loads. The 4562 is frequency compensated for closed loop gains greater than 10. The 4562 combines many of the features of the popular 4558 as well as providing the capability of wider bandwidth, and higher slew rate and less noise make the 4562 ideal for audio preamplifiers, active filters, telecommunications, and many instrumentation applications. The availability of the 4562 in the surface mounted micro-package allows the 4562 to be used in critical applications requiring very high packing densities.

Schematic Diagram (1/2 Shown)



RC4562

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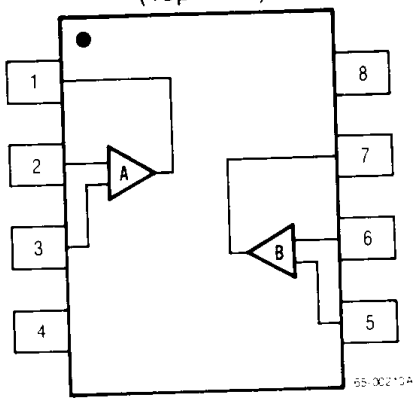
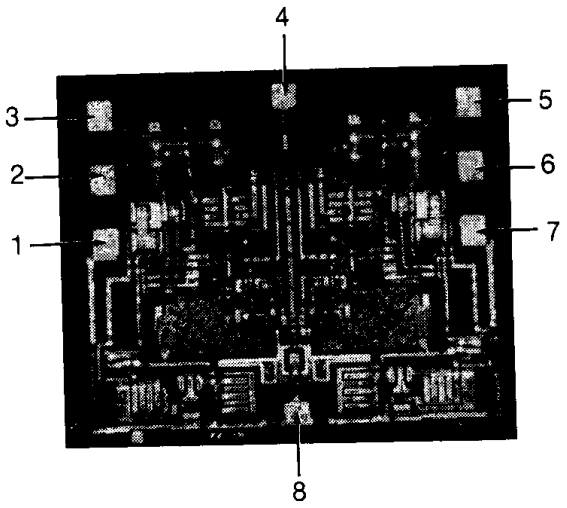
Connection Information

8-Lead
Dual In-Line Package
(Top View)



Pin	Function
1	A Output
2	A -Input
3	A +Input
4	$-V_S$
5	B +Input
6	B -Input
7	B Output
8	$+V_S$

Mask Pattern



Die Size: 52 x 61 mils
Min. Pad Dimensions: 4 x 4 mils

Thermal Characteristics

	8-Lead Micro-Pak Plastic DIP	8-Lead Plastic DIP
Max. Junction Temp.	125° C	125° C
Max. P_D $T_A < 50°C$	300mW	468mW
Therm. Res. θ_{JC}	—	—
Therm. Res. θ_{JA}	240° C/W	160° C/W
For $T_A > 50°C$ Derate at	4.17mW per °C	6.25mW per °C

Ordering Information

Part Number	Package	Operating Temperature Range
RC4562M	Micro-Plastic	-20° C to +75° C
RC4562NB	Plastic	-20° C to +75° C

Absolute Maximum Ratings

Supply Voltage ..... ±18V
Input Voltage[1] ..... ±15V
Differential Input Voltage 30V
Output Short Circuit Duration[2] ..... Indefinite
Operating Temperature
Range ..... -20° C to +75° C
Lead Soldering Temperature (10 Sec)
RC4562NB ..... +300° C
RC4562M ..... +260° C

Notes: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
2. Short circuit may be to ground on one amp only. Rating applies to +75° C ambient temperature.

Matching Characteristics

(V_S = ±15V, T_A = +25° C)

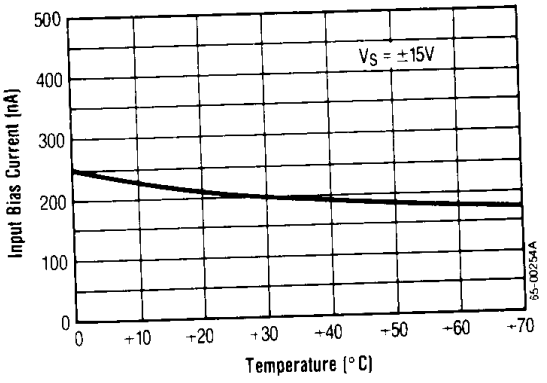
Parameter	Conditions	Typ	Units
Voltage Gain	$R_L \geq 2k\Omega$	±1.0	dB
Input Bias Current		±15	nA
Input Offset Current		±7.5	nA
Input Offset Voltage	$R_S \geq 10k\Omega$	±0.2	mV

Electrical Characteristics (V_S = ±15V and T_A = +25°C unless otherwise specified)

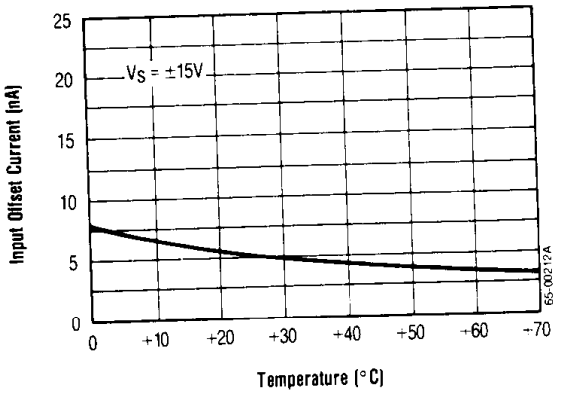
Parameters	Test Conditions	Min	Typ	Max	Units
Input Offset Voltage	$R_S \leq 10k\Omega$		1.0	6.0	mV
Input Offset Current			5.0	200	nA
Input Bias Current			200	500	nA
Input Resistance		0.3	1.0		MΩ
Large Signal Voltage Gain	$R_L \geq 2k\Omega$, V_{OUT} = ±10V	20	300		V/mV
Output Voltage Swing	$R_L \geq 10k\Omega$	±12	±14		V
	$R_L \geq 2k\Omega$	±10	±13		
Input Voltage Range		±12	±14		V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	70	90		dB
Power Supply Rejection Ratio	$R_S \leq 10k\Omega$	76	90		dB
Power Consumption (All Amplifiers)	$R_L = \infty$		100	170	mW
Transient Response Rise Time	V_{IN} = 20mV, R_L = 2kΩ		0.06		μS
Overshoot	$C_L \leq 100pF$, Gain = 10		60		%
Slew Rate	$R_L \leq 2k\Omega$, Gain = 10		7.0		V/μS
Channel Separation	f = 10kHz R_S = 1kΩ, Gain = 100		90		dB
Unity Gain Bandwidth	Gain = 10	8.5	15		MHz
The following specifications apply for -20°C ≤ T_A ≤ +75°C					
Input Offset Voltage	$R_S \leq 10k\Omega$			7.5	mV
Input Offset Current				300	nA
Input Bias Current				800	nA
Large Signal Voltage Gain	$R_L \geq 2k\Omega$, V_{OUT} = ±10V	15			V/mV
Output Voltage Swing	$R_L \geq 2k\Omega$	±10			V
Power Consumption	T_A = +75°C		90	150	mW
	T_A = -20°C		120	200	

Typical Performance Characteristics

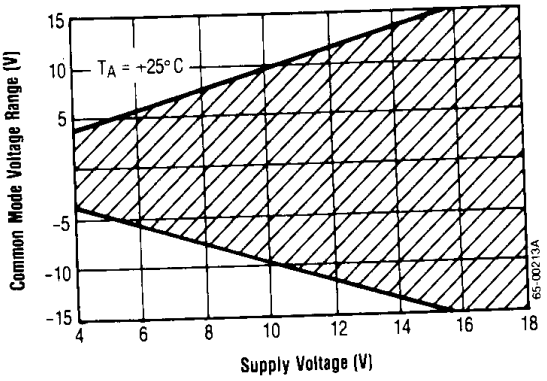
Input Bias Current as a Function of Ambient Temperature



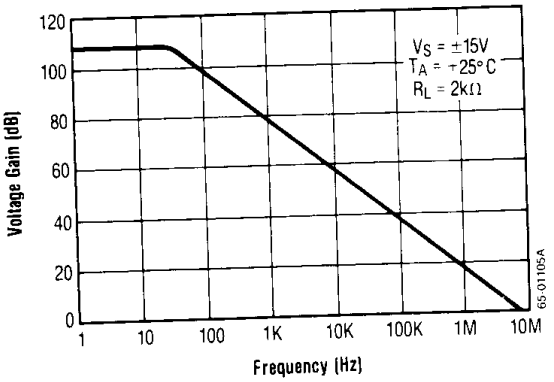
Input Offset Current as a Function of Ambient Temperature



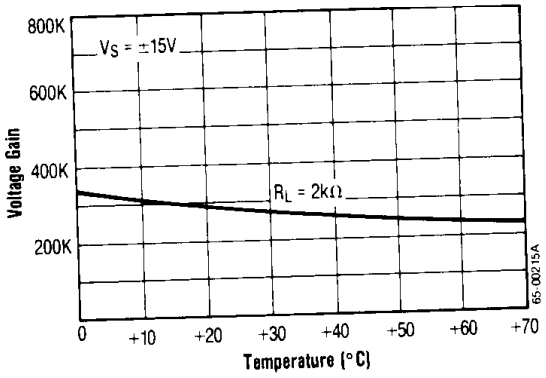
Common Mode Range as a Function of Supply Voltage



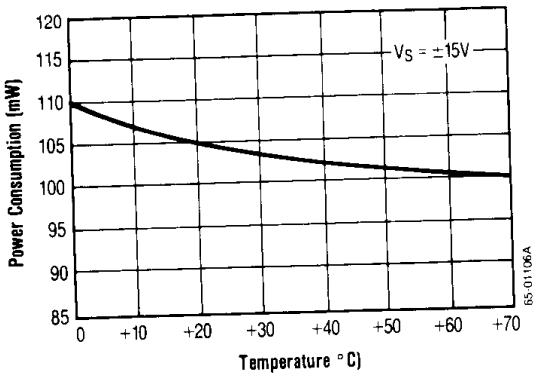
Open Loop Voltage Gain as a Function of Frequency



Open Loop Gain as a Function of Temperature

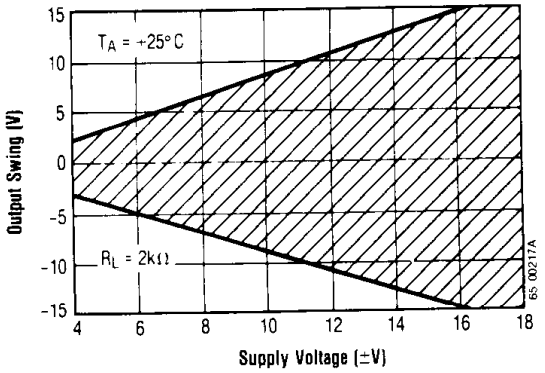


Power Consumption as a Function of Ambient Temperature

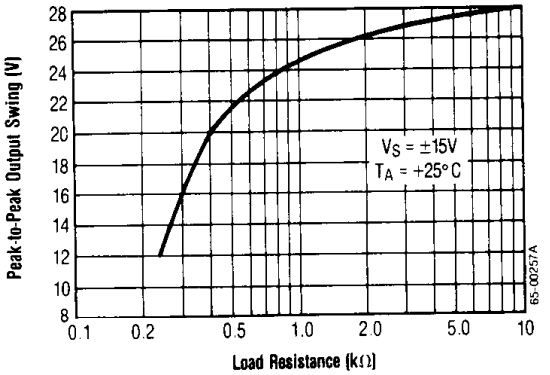


Typical Performance Characteristics (Continued)

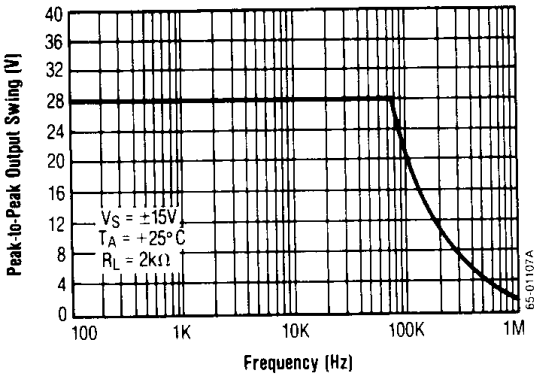
Typical Output Voltage as a Function of Supply Voltage



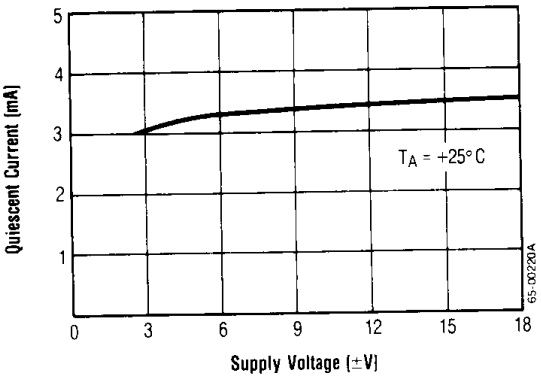
Output Voltage Swing as a Function of Load Resistance



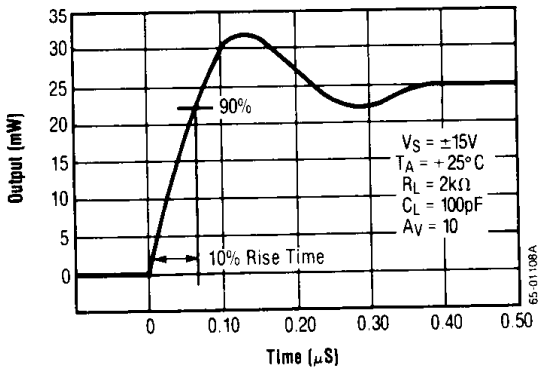
Output Voltage Swing as a Function of Frequency



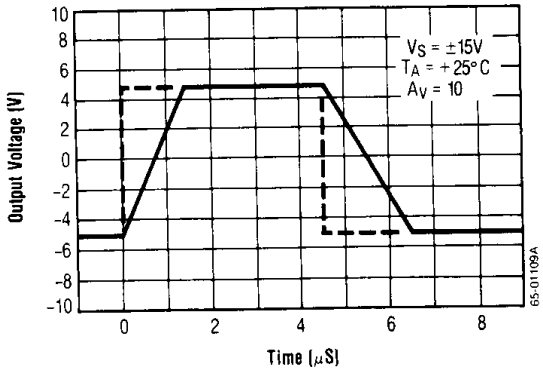
Quiescent Current as a Function of Supply Voltage



Transient Response

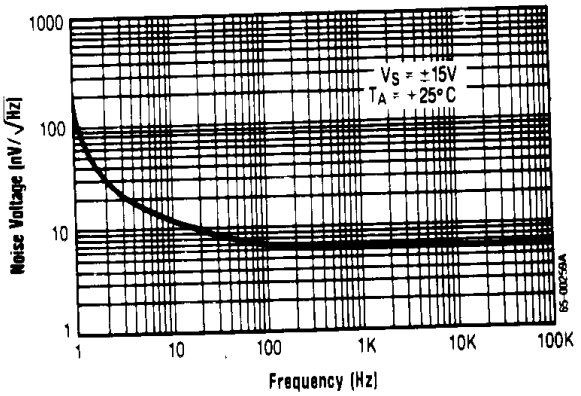


Voltage Follower Large Signal Pulse Response

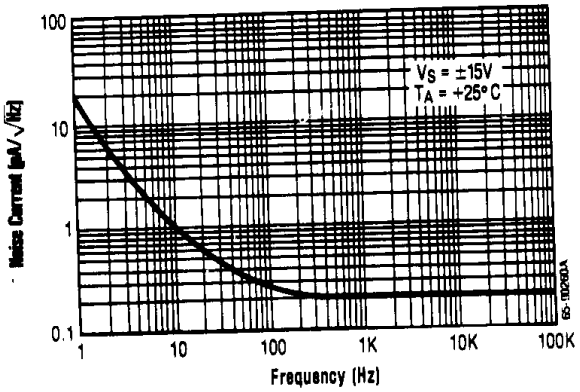


Typical Performance Characteristics (Continued)

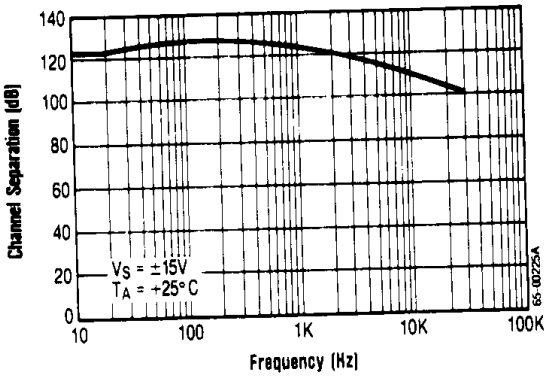
Input Noise Voltage as a Function of Frequency



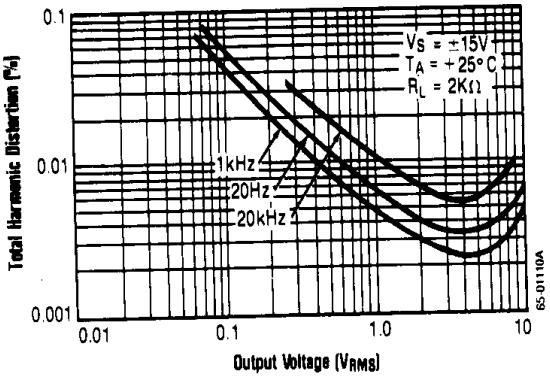
Input Noise Current as a Function of Frequency



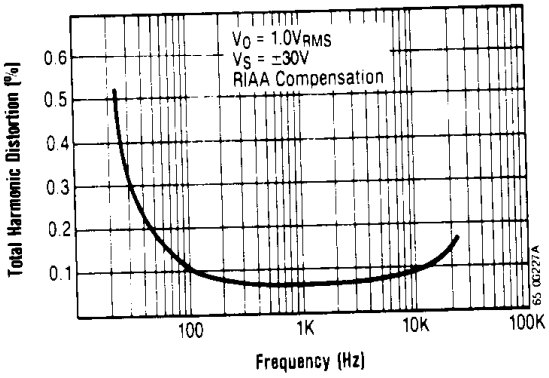
Channel Separation



Total Harmonic Distortion vs. Output Voltage



Distortion vs. Frequency



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Comparison of Standard vs Micro-Pak