Raytheon

High Output Current Dual Operational Amplifier

RC4556

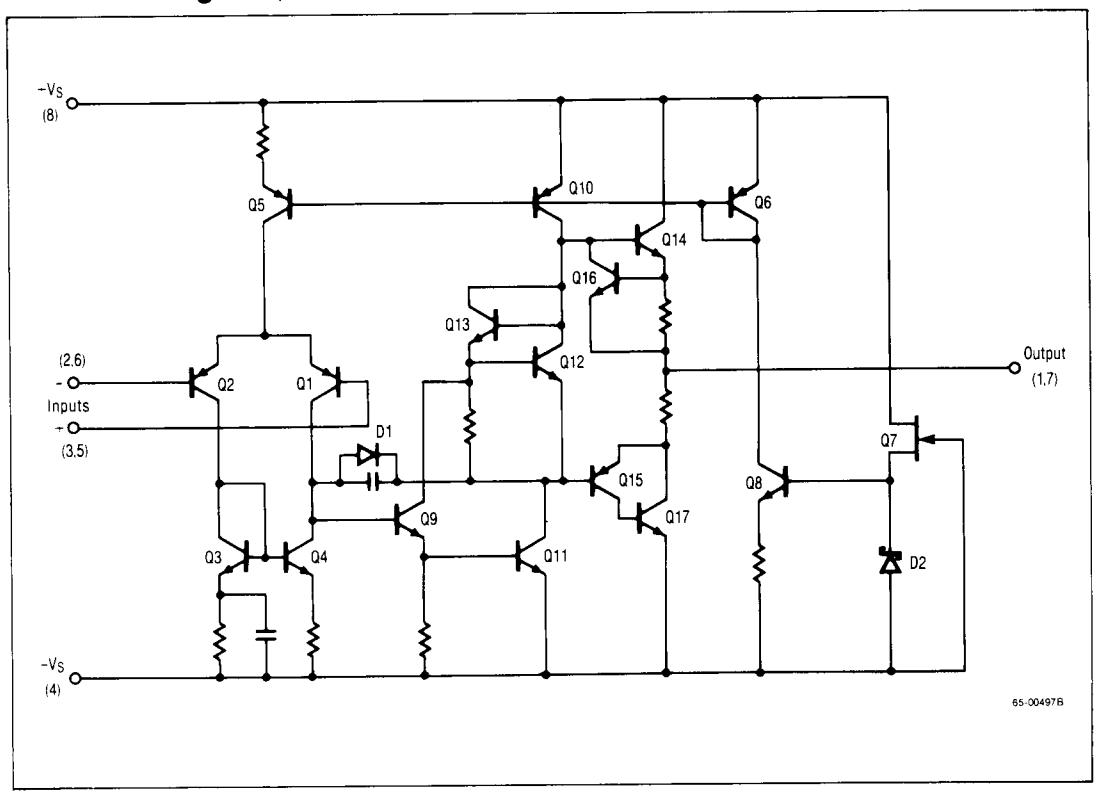
Features

- Unity gain bandwidth — 8.0MHz
- Drives ±10.5V min into 150Ω (±10mA)
- Slew rate — 3.0V/μS
- Current drain per amplifier — 4.5mA
- Input offset voltage — 0.5mV
- Input offset current — 5.0nA
- Input bias current — 180nA
- $10nV/\sqrt{Hz}$ noise at 1kHz
- Unity gain frequency compensated

Description

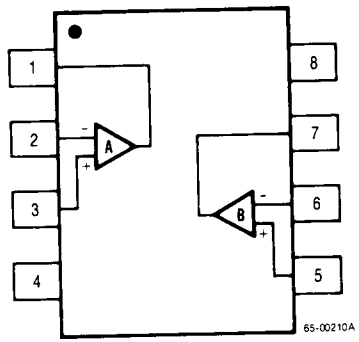
The 4556 integrated circuit is a high-gain, high output current dual operational amplifier capable of driving ±70mA into 150Ω loads (±10.5V output voltage). The 4556 combines many of the features of the popular 4558 as well as having the capability of driving 150Ω loads. In addition, the wide bandwidth, low noise, high slew rate and low distortion of the 4556 make it ideal for many audio, telecommunications and instrumentation applications.

Schematic Diagram (1/2 Shown)



Connection Information

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



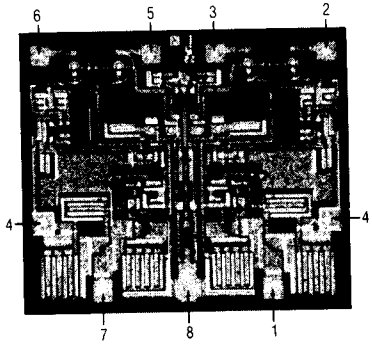
Pin	Function
1	A Output
2	A -Input
3	A +Input
4	$-V_S$
5	B +Input
6	B -Input
7	B Output
8	$+V_S$

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)
RC4556NB ..... +300°C
RC4556M ..... +260°C

Notes: 1. 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.

Mask Pattern



Die Size: 52 x 61 mils
Min. Pad Dimensions: 4 x 4 mils
65-02068A

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
RC4556M	Micro-Plastic	-20°C to +75°C
RC4556NB	Plastic	-20°C to +75°C

Matching Characteristics

($V_S = \pm 15V$, $T_A = +25°C$)

Parameter	Conditions	Typ	Units
Voltage Gain	$R_L \geq 20k\Omega$	±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 ($V_S = \pm 15V$ and $T_A = +25°C$ unless otherwise specified)

Parameters	Test Conditions	Min	Typ	Max	Units
Input Offset Voltage	$R_S \leq 10k\Omega$		2.0	6.0	mV
Input Offset Current			5.0	200	nA
Input Bias Current			40	500	nA
Input Resistance		0.3	1.0		MΩ
Large Signal Voltage Gain	$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	20	100		V/mV
Output Voltage Swing	$R_L \geq 2k\Omega$	±12	±13.5		V
	$R_L = 150\Omega$	±10.5	±11		
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	$R_L = \infty$		270	360	mW
Transient Response Rise Time	$V_{IN} = 20mV$, $R_L = 2k\Omega$		0.03		μS
Overshoot	$C_L \leq 100pF$		40		%
Slew Rate	$R_L \geq 2k\Omega$		3.0		V/μS
Channel Separation	f = 10kHz, R_S = 1kΩ, Gain = 100		90		dB
Unity Gain Bandwidth		5.0	8.0		MHz
The following specifications apply for $-20°C \leq T_A \leq +75°C$					
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	$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	15			V/mV
Output Voltage Swing	$R_L \geq 2k\Omega$	±10			V
Power Consumption	$T_A = +75°C$		260	340	mW
	$T_A = -20°C$		290	380	

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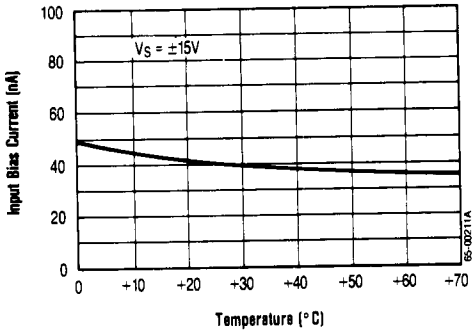
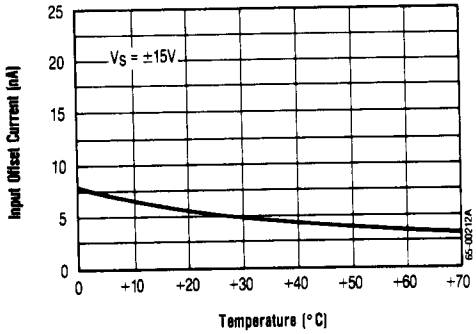
Typical Performance Characteristics

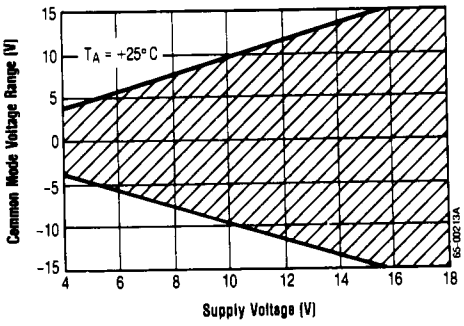
Input Bias Current as a Function of Ambient Temperature



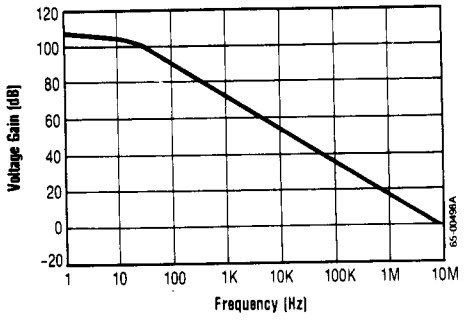
Input Offset Current as a Function of Ambient Temperature



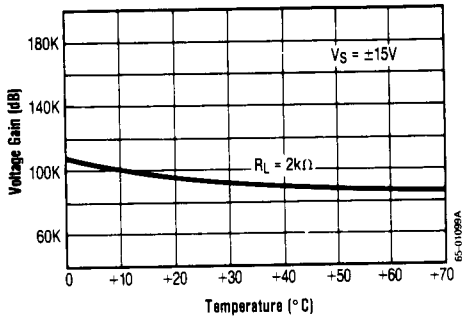
Common Mode Range as a Function of Supply Voltage



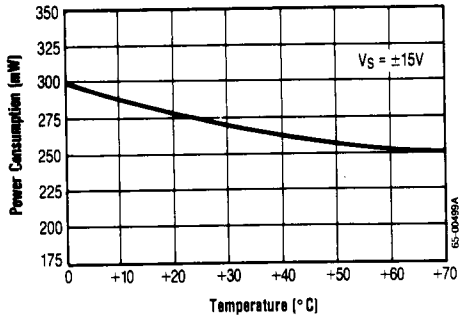
Open Loop Gain as a Function of Temperature



Open Loop Voltage Gain as a Function of Frequency

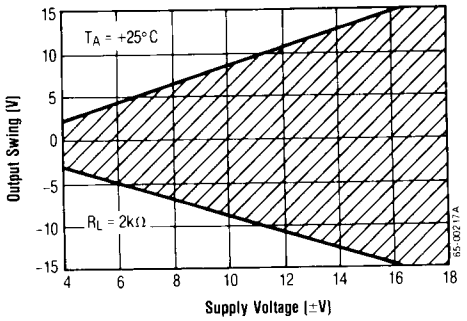


Power Consumption as a Function of Ambient Temperature

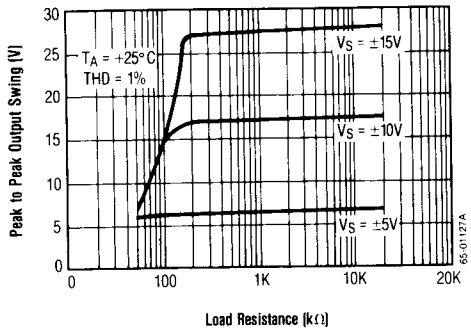


Typical Performance Characteristics (Continued)

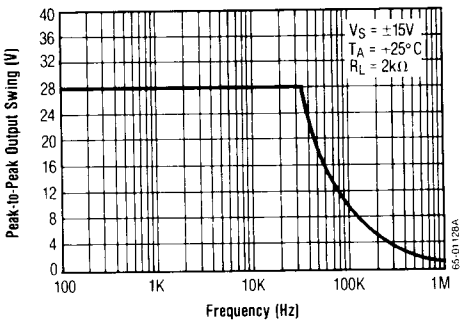
Typical Output Voltage as a Function of Supply Voltage



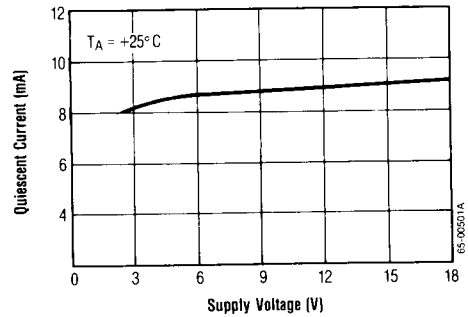
Output Voltage Swing as a Function of Load Resistance



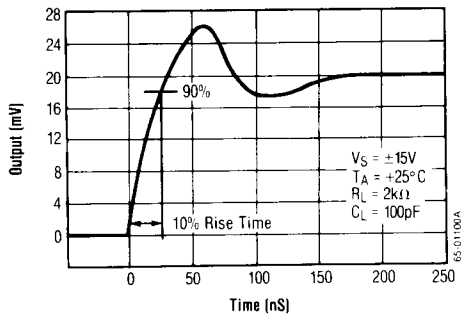
Output Voltage Swing as a Function of Frequency



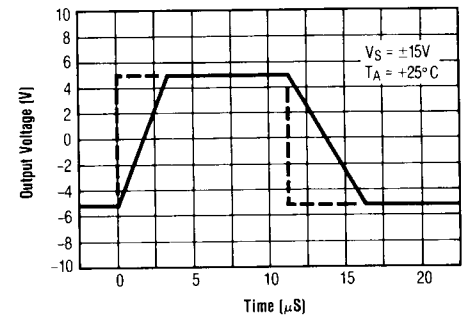
Quiescent Current as a Function of Supply Voltage



Transient Response

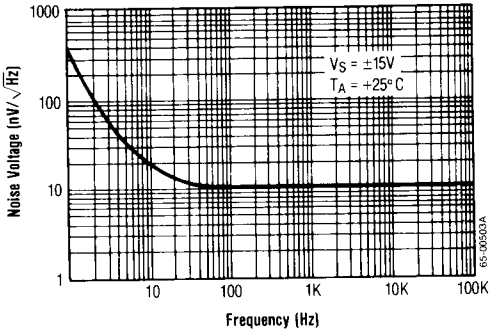


Voltage Follower Large Signal Pulse Response

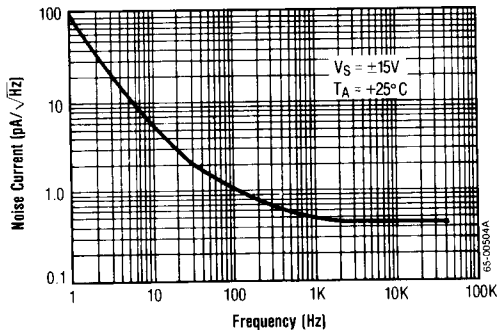


Typical Performance Characteristics (Continued)

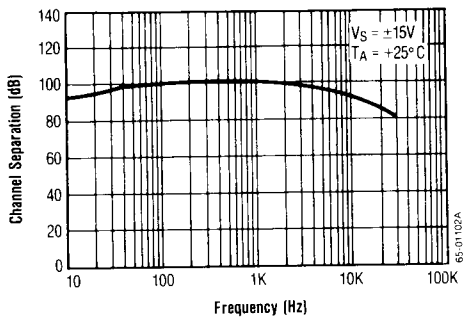
Input Noise Voltage as a Function of Frequency



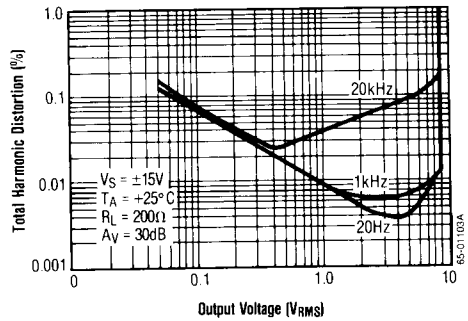
Input Noise Current as a Function of Frequency



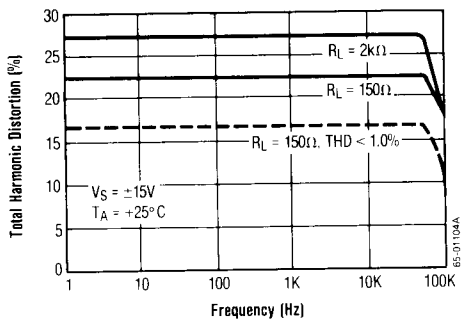
Channel Separation



Total Harmonic Distortion vs. Output Voltage



Distortion vs. Frequency



Comparison of Standard vs. Micro-Package