GENERAL DESCRIPTION

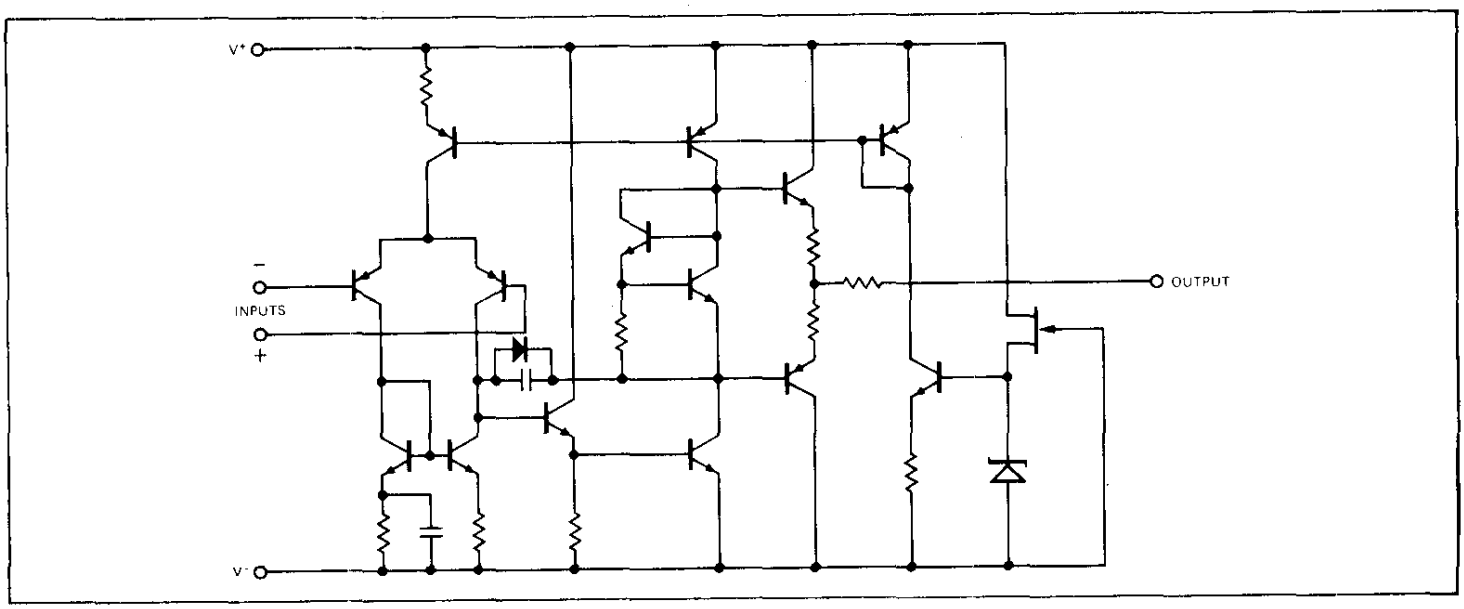
The 4558 integrated circuit is a dual high gain operational amplifier internally compensated and constructed on a single silicon chip using the planar epitaxial process.

Combining the features of the 741 with the close parameter matching and tracking of a dual device on a monolithic chip results in unique performance characteristics. Excellent channel separation allows the use of the dual device in single 741 operational amplifier applications providing the highest possible packaging density. It is especially well suited for applications in differential-in, differential-out as well as in potentiometric amplifiers and where gain and phase matched channels are mandatory.

DESIGN FEATURES

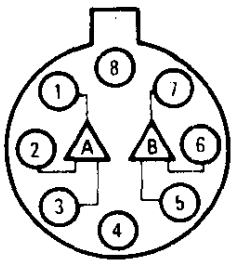
- 2.5 MHz Unity Gain Bandwidth Guaranteed
- Supply Voltage ±22V for RM4558 and ±15V for RC4558
- Short-Circuit Protection
- No Frequency Compensation Required
- No Latch-Up
- Large Common-Mode and Differential Voltage Ranges
- Low Power Consumption
- Parameter Tracking Over Temperature Range
- Gain and Phase Match Between Amplifiers

SCHEMATIC DIAGRAM (1/2 Shown)



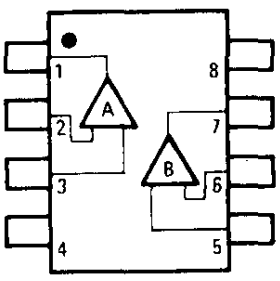
CONNECTION INFORMATION

TE (TO-99)
Metal Can Package
(Top View)



Order Part Nos.:
RC4558T, RM4558T

DE and NB
Dual In-line Packages
(Top View)



Order Part Nos.:
RC4558NB, RV4558NB
RC4558DE, RV4558DE
RM4558DE

PIN	FUNCTION
1	A OUTPUT
2	A -INPUT
3	A +INPUT
4	V^-
5	B +INPUT
6	B -INPUT
7	B OUTPUT
8	V^+

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	RM4558: ±22V RC4558: ±18V	Operating Temperature Range	RM4558: −55°C to +125°C RV4558: −40°C to +85°C RC4558: 0°C to +70°C
Internal Power Dissipation (Note 1)	500mW	Lead Temperature (Soldering, 60s)	300°C
Differential Input Voltage	±30V	Output Short-Circuit Duration (Note 3)	Indefinite
Input Voltage (Note 2)	±15V		
Storage Temperature Range	−65°C to +150°C		

ELECTRICAL CHARACTERISTICS (V_{CC} = ±15V, T_A = 25°C unless otherwise specified)

PARAMETER	CONDITIONS	RM4558 MIN	RM4558 TYP	RM4558 MAX	RV/RC4558 MIN	RV/RC4558 TYP	RV/RC4558 MAX	UNITS
Input Offset Voltage	$R_S \leq 10k\Omega$		1.0	5.0		2.0	6.0	mV
Input Offset Current			5.0	200		30	200	nA
Input Bias Current			40	500		200	500	nA
Input Resistance		0.3	1.0		0.3	1.0		MΩ
Large-Signal Voltage Gain	$R_L \geq 2k\Omega$ $V_{out} = \pm 10V$	50,000	300,000		20,000	300,000		
Output Voltage Swing	$R_L \geq 10k\Omega$	±12	±14		±12	±14		V
	$R_L \geq 2k\Omega$	±10	±13		±10	±13		V
Input Voltage Range		±12	±13		±12	±13		V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	70	100		70	100		dB
Supply Voltage Rejection Ratio	$R_S \leq 10k\Omega$		10	150		10	150	μV/V
Power Consumption (All Amplifiers)	$R_L = \infty$		100	170		100	170	mW
Transient Response (unity gain)	V_{IN} = 20mV R_L = 2kΩ $C_L \leq$ 100pF							
Risetime			0.3			0.3		μs
Overshoot			15.0			15.0		%
Slew Rate (unity gain)	$R_L \geq 2k\Omega$		0.5			0.5		V/μs
Channel Separation (Gain = 100)	f = 10kHz R_S = 1kΩ		90			90		dB
Unity Gain Bandwidth (Gain = 1)		2.5	3.0		2.0	3.0		MHz
The following specifications apply for $-55°C \leq T_A \leq +125°C$ for RM4558; $0°C \leq T_A \leq +70°C$ for RC4558; $-40°C \leq T_A \leq +85°C$ for RV4558								
Input Offset Voltage	$R_S \leq 10k\Omega$			6.0			7.5	mV
Input Offset Current				500			300/500*	nA
Input Bias Current				1500			800/1500	nA
Large-Signal Voltage Gain	$R_L \geq 2k\Omega$ $V_{out} = \pm 10V$	25,000			15,000			
Output Voltage Swing	$R_L \geq 2k\Omega$	±10			±10			V
Power Consumption	$V_S = \pm 15V$							
	T_A = +125°C		90	150		90	150	mW
	T_A = −55°C		120	200		120	200	mW

*RV4558

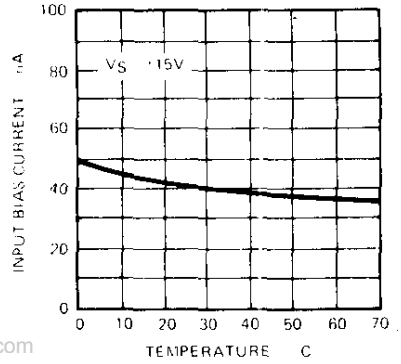
MATCHING CHARACTERISTICS (V_{CC} = ±15V, T_A = 25°C unless otherwise specified)

PARAMETER	CONDITIONS	RM4558 TYP	RC4558 TYP	UNITS
Voltage Gain	$R_L \geq 2k\Omega$	±.5	±1.0	dB
Input Bias Current		±15	±15	nA
Input Offset Current		±7.5	±7.5	nA
Input Offset Voltage	$R_S \geq 10k\Omega$	±.1	±.2	mV

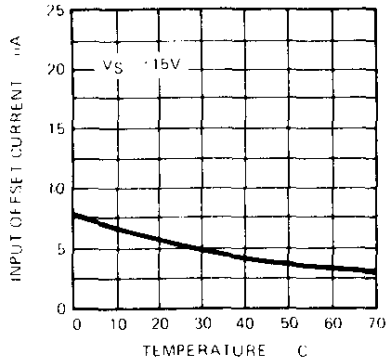
NOTE 1: Rating applies for case temperatures to 125°C; derate linearly at 6.5mW/°C for ambient temperatures above +75°C for RM4558.
NOTE 2: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
NOTE 3: Short circuit may be to ground on one amp only. Rating applies to +125°C case temperature or +75°C ambient temperature for RC4558 and to +85°C ambient temperature for RV4558.

TYPICAL ELECTRICAL DATA

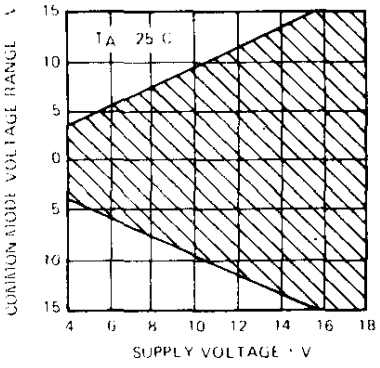
Input Bias Current as a Function of Ambient Temperature



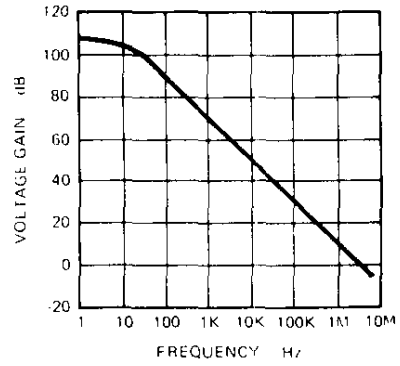
Input Offset Current as a Function of Ambient Temperature



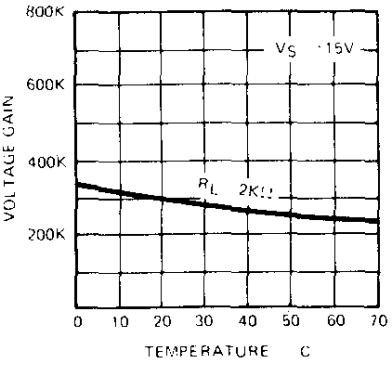
Common Mode Range as a Function of Supply Voltage



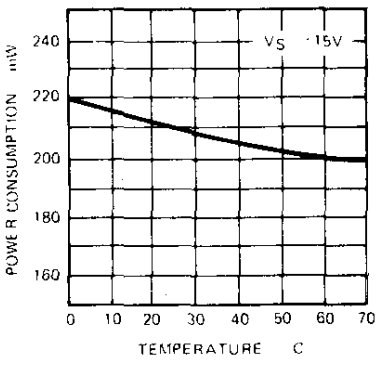
Open Loop Voltage Gain as a Function of Frequency



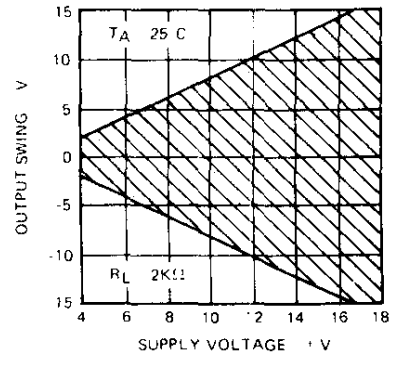
Open Loop Gain as a Function of Temperature



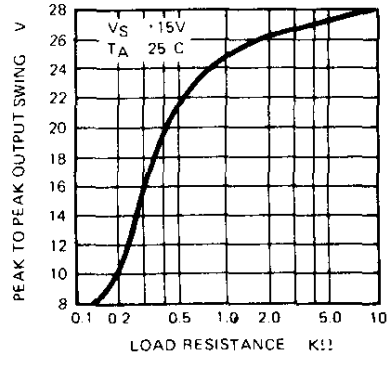
Power Consumption as a Function of Ambient Temperature



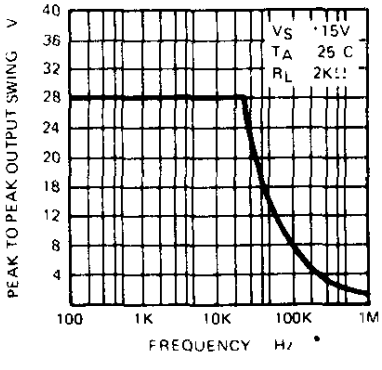
Typical Output Voltage as a Function of Supply Voltage



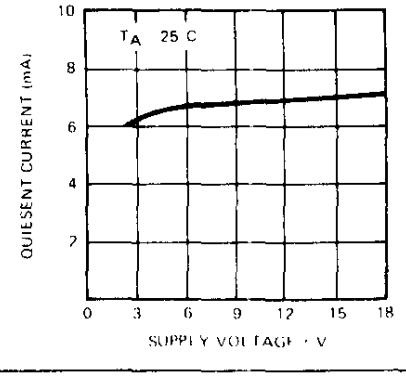
Output Voltage Swing as a Function of Load Resistance



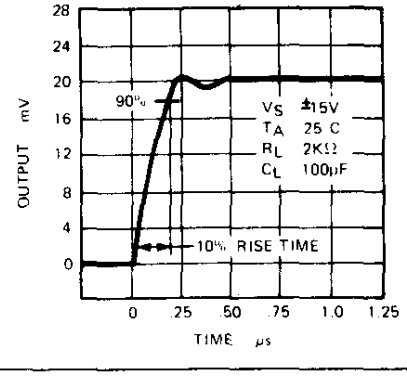
Output Voltage Swing as a Function of Frequency



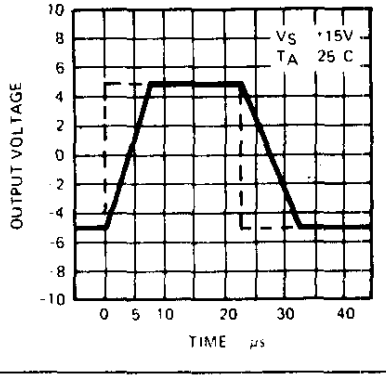
Quiescent Current as a Function of Supply Voltage



Transient Response

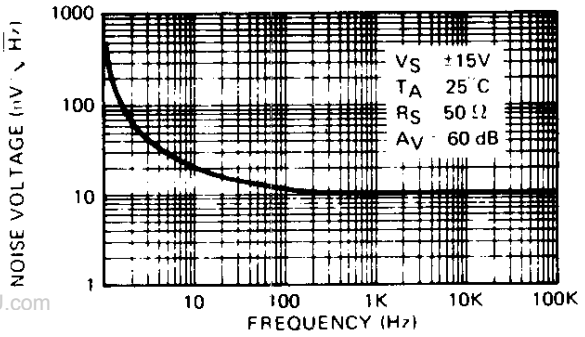


Voltage Follower Large-Signal Pulse Response

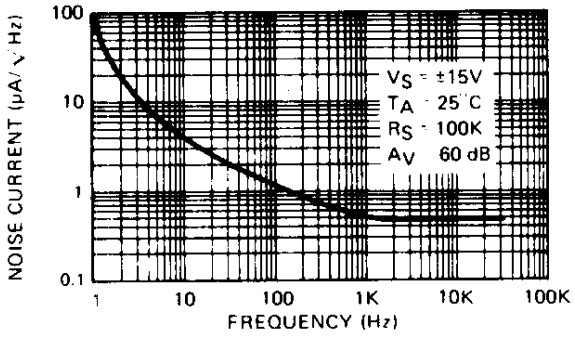


TYPICAL ELECTRICAL DATA

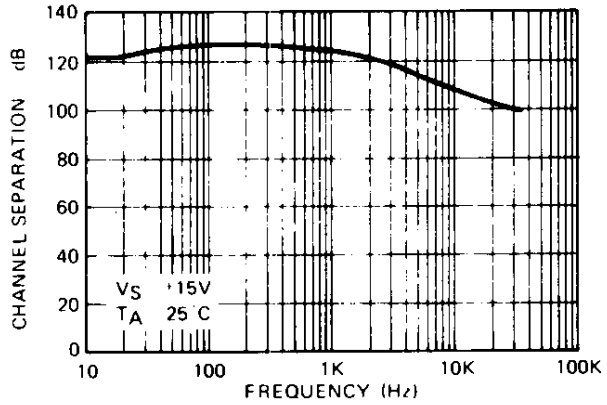
Input Noise Voltage as a Function of Frequency



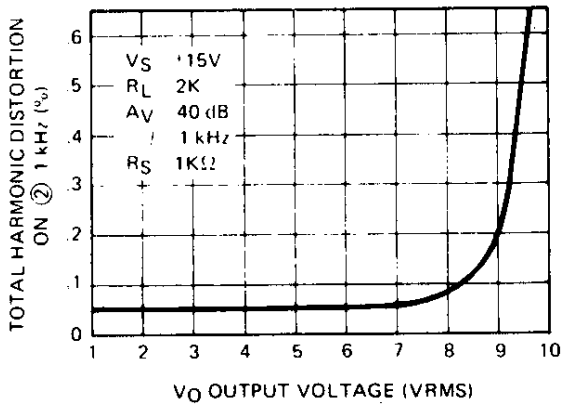
Input Noise Current as a Function of Frequency



Channel Separation



Total Harmonic Distortion vs Output Voltage



Distortion vs Frequency
V_O = 1vrms