

GENERAL DESCRIPTION

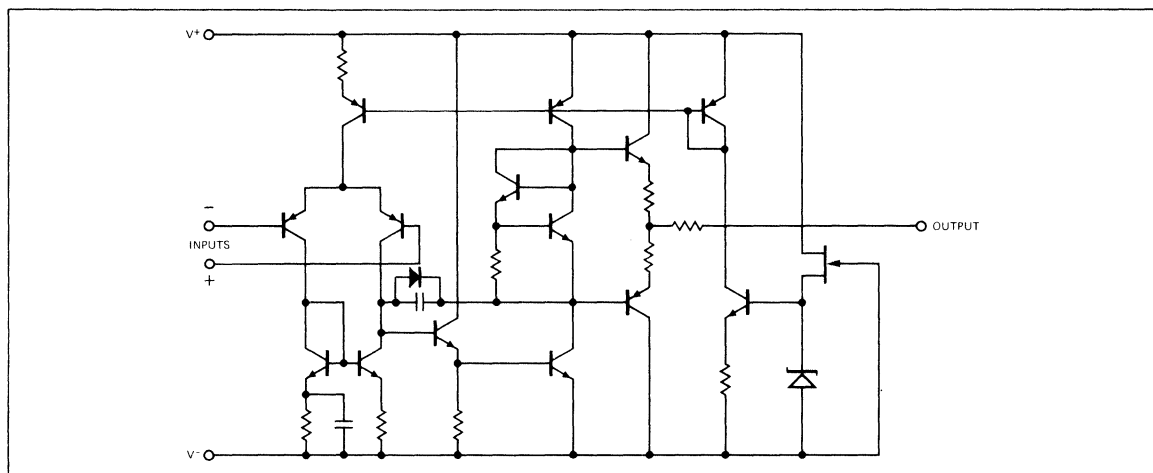
The 4558 integrated circuit is a dual high gain operational amplifier internally compensated and constructed on a single silicon chip using the planar epitaxial process.

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

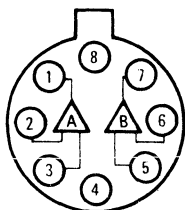
- 2.5 MHz Unity Gain Bandwidth Guaranteed
- Supply Voltage $\pm 22V$ for RM4558 and $\pm 15V$ for RC4558
- Short-Circuit Protection
- No Frequency Compensation Required
- No Latch-Up
- Large Common-Mode and Differential Voltage Ranges
- Low Power Consumption
- Parameter Tracking Over Temperature Range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

SCHEMATIC DIAGRAM (1/2 Shown)



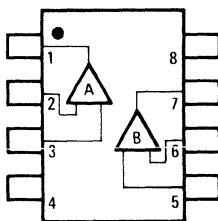
CONNECTION INFORMATION

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

ELECTRICAL CHARACTERISTICS ($V_{CC} = \pm 15\text{V}$, $T_A = 25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	CONDITIONS	RM4558			RV/RC4558			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$R_S \leq 10\text{k}\Omega$		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		M Ω
Large-Signal Voltage Gain	$R_L \geq 2\text{k}\Omega$ $V_{out} = \pm 10\text{V}$	50,000	300,000		20,000	300,000		
Output Voltage Swing	$R_L \geq 10\text{k}\Omega$	± 12	± 14		± 12	± 14		V
	$R_L \geq 2\text{k}\Omega$	± 10	± 13		± 10	± 13		V
Input Voltage Range		± 12	± 13		± 12	± 13		V
Common Mode Rejection Ratio	$R_S \leq 10\text{k}\Omega$	70	100		70	100		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{k}\Omega$		10	150		10	150	$\mu\text{V/V}$
Power Consumption (All Amplifiers)	$R_L = \infty$		100	170		100	170	mW
Transient Response (unity gain)	$V_{IN} = 20\text{mV}$ $R_L = 2\text{k}\Omega$ $C_L \leq 100\text{pF}$							
Risetime			0.3			0.3		μs
Overshoot			15.0			15.0		%
Slew Rate (unity gain)	$R_L \geq 2\text{k}\Omega$		0.5			0.5		V/ μs
Channel Separation (Gain = 100)	$f = 10\text{kHz}$ $R_S = 1\text{k}\Omega$		90			90		dB
Unity Gain Bandwidth (Gain = 1)		2.5	3.0		2.0	3.0		MHz

The following specifications apply for $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ for RM4558; $0^{\circ}\text{C} \leq T_A \leq +70^{\circ}\text{C}$ for RC4558;
 $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ for RV4558

Input Offset Voltage	$R_S \leq 10\text{k}\Omega$			6.0			7.5	mV
Input Offset Current				500			300/500*	nA
Input Bias Current				1500			800/1500	nA
Large-Signal Voltage Gain	$R_L \geq 2\text{k}\Omega$ $V_{out} = \pm 10\text{V}$	25,000			15,000			
Output Voltage Swing	$R_L \geq 2\text{k}\Omega$	± 10			± 10			V
Power Consumption	$V_S = \pm 15\text{V}$ $T_A = +125^{\circ}\text{C}$ $T_A = -55^{\circ}\text{C}$		90 120	150 200		90 120	150 200	mW

*RV4558

MATCHING CHARACTERISTICS ($V_{CC} = \pm 15\text{V}$, $T_A = 25^{\circ}\text{C}$ unless otherwise specified)

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

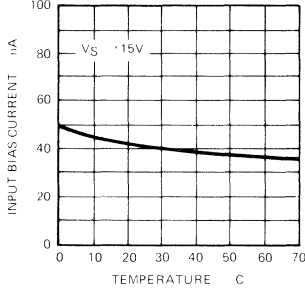
NOTE 1: Rating applies for case temperatures to 125°C ; derate linearly at $6.5\text{mW}/^{\circ}\text{C}$ for ambient temperatures above $+75^{\circ}\text{C}$ for RM4558.

NOTE 2: For supply voltages less than $\pm 15\text{V}$, the absolute maximum input voltage is equal to the supply voltage.

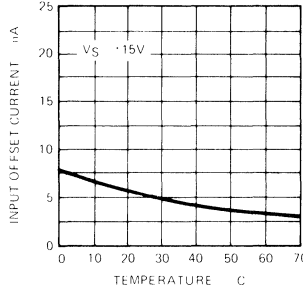
NOTE 3: Short circuit may be to ground on one amp only. Rating applies to $+125^{\circ}\text{C}$ case temperature or $+75^{\circ}\text{C}$ ambient temperature for RC4558 and to $+85^{\circ}\text{C}$ ambient temperature for RV4558.

TYPICAL ELECTRICAL DATA

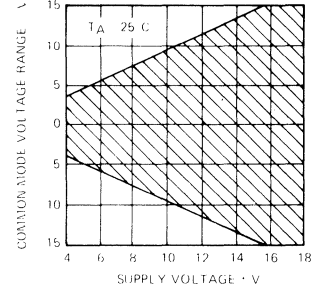
Input Bias Current as a Function of Ambient Temperature



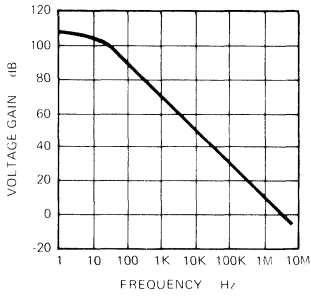
Input Offset Current as a Function of Ambient Temperature



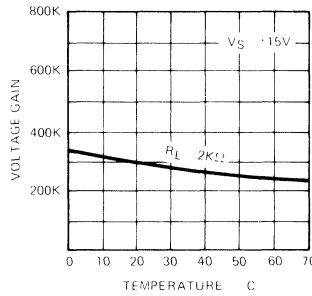
Common Mode Range as a Function of Supply Voltage



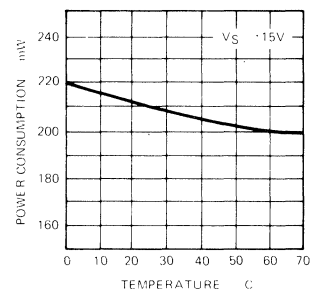
Open Loop Voltage Gain as a Function of Frequency



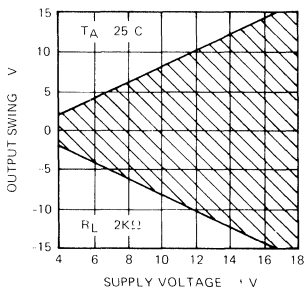
Open Loop Gain as a Function of Temperature



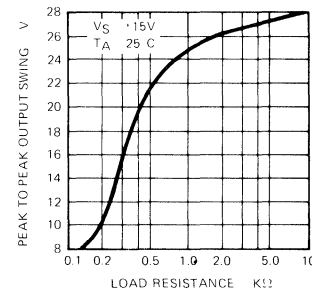
Power Consumption as a Function of Ambient Temperature



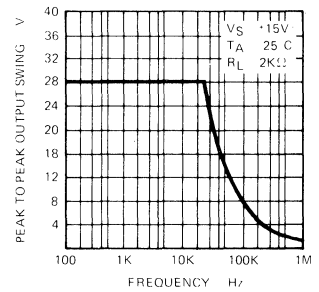
Typical Output Voltage as a Function of Supply Voltage



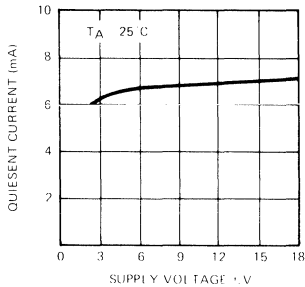
Output Voltage Swing as a Function of Load Resistance



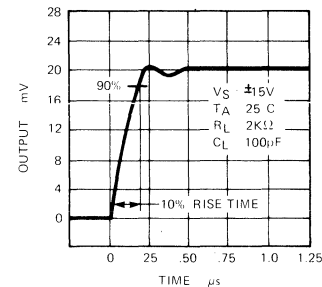
Output Voltage Swing as a Function of Frequency



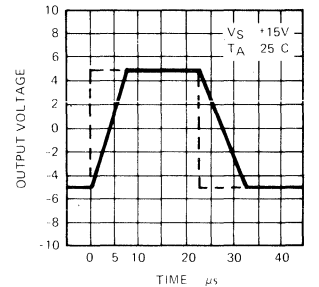
Quiescent Current as a Function of Supply Voltage



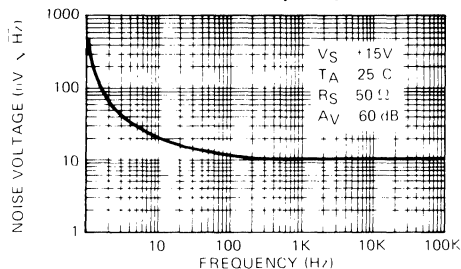
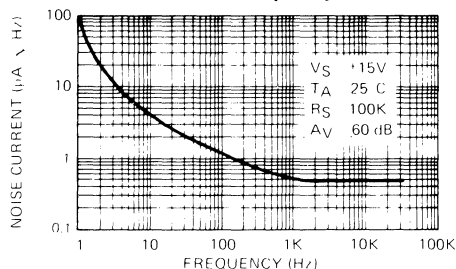
Transient Response



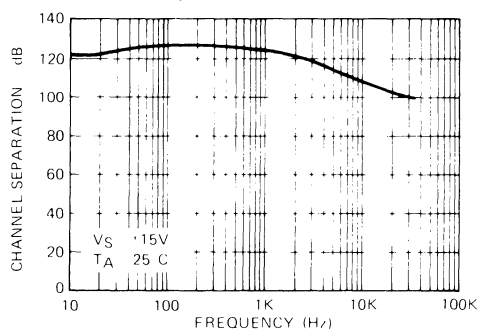
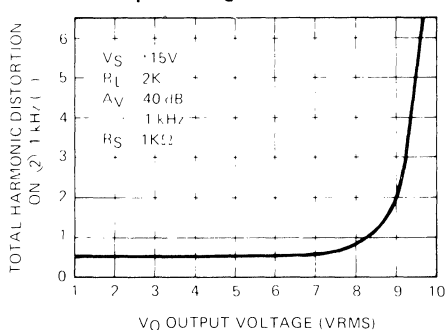
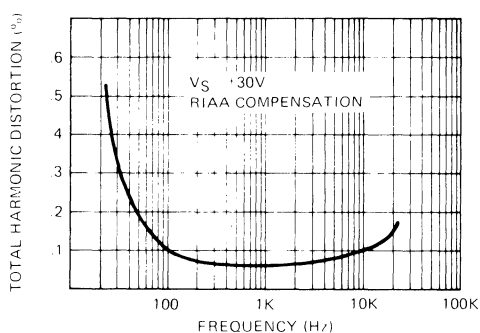
Voltage Follower Large-Signal Pulse Response



TYPICAL ELECTRICAL DATA

Input Noise Voltage
as a Function of FrequencyInput Noise Current
as a Function of Frequency

Channel Separation

Total Harmonic Distortion
vs Output VoltageDistortion vs Frequency
 $V_O = 1vrms$ 

GENERAL DESCRIPTION

The 4559 integrated circuit is a dual high performance operational amplifier internally compensated and constructed on a single silicon chip using the planar epitaxial process.

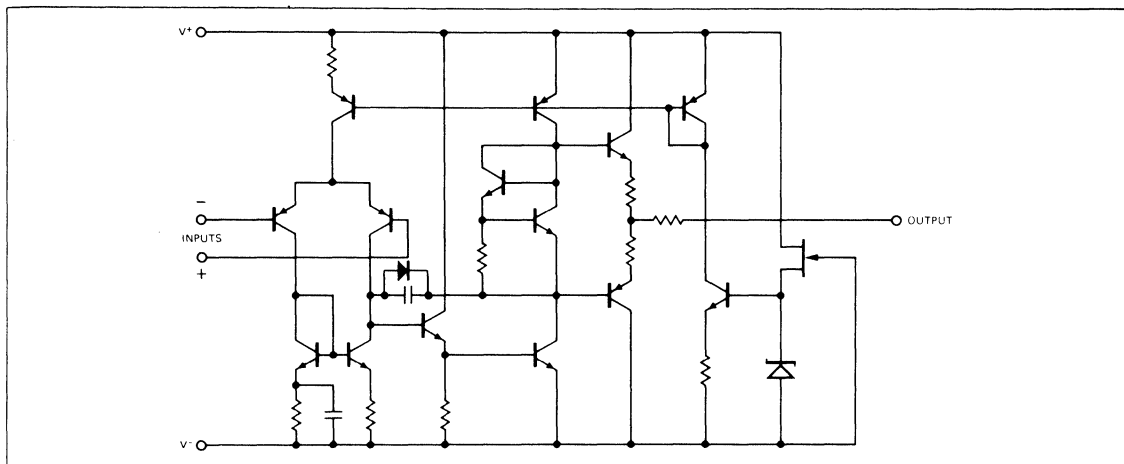
These amplifiers feature guaranteed AC performance which far exceeds that of the 741-type amplifiers. The specially designed low-noise input transistors allow the 4559 to be used in low-noise signal processing applications such as audio pre amplifiers and signal conditioners.

The 4559 also has more output drive than 741-type amplifiers and can be used to drive a 600 ohm load.

FEATURES

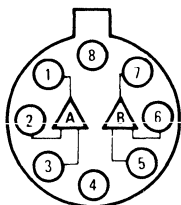
	Typical	Guaranteed
• Unity Gain Bandwidth	4.0 MHz	3.0 MHz
• Slew Rate	2.0 V/ μ sec	1.5 V/ μ sec
• Low Noise Voltage	1.4 μ V RMS	2.0 μ V RMS
• Supply Voltage ± 22 V for RM4559 and ± 18 V for RC4559		
• No Frequency Compensation Required		
• No Latch Up		
• Large Common Mode and Differential Voltage Ranges		
• Low Power Consumption		
• Parametric Tracking Over Temperature Range		
• Gain and Phase Match Between Amplifiers		

SCHEMATIC DIAGRAM (1/2 Shown)



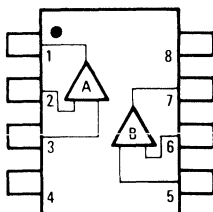
CONNECTION INFORMATION

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



Order Part Nos.:
RC4559T, RM4559T

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

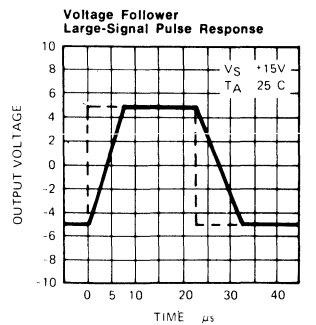
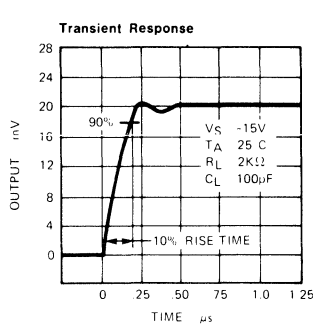
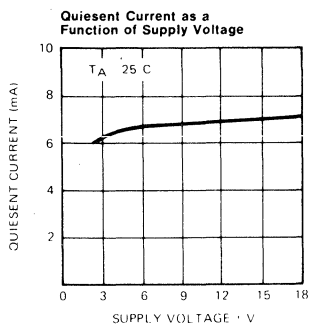
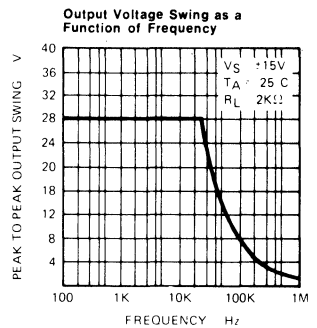
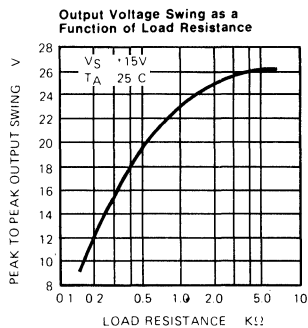
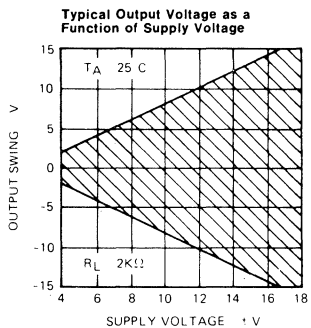
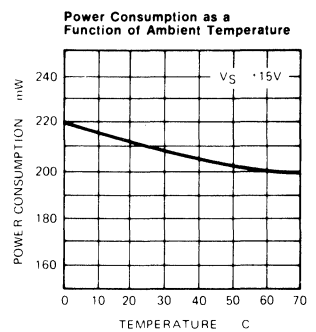
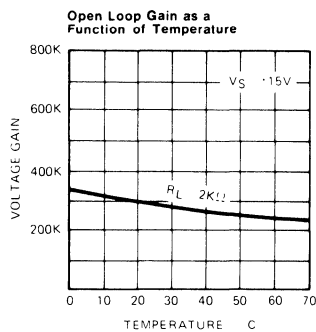
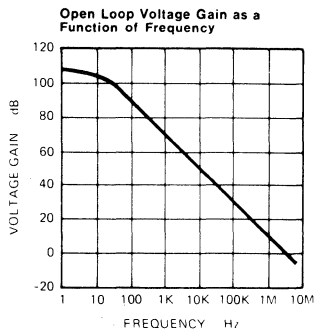
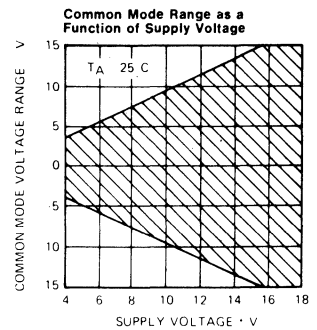
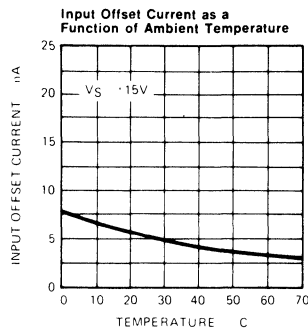
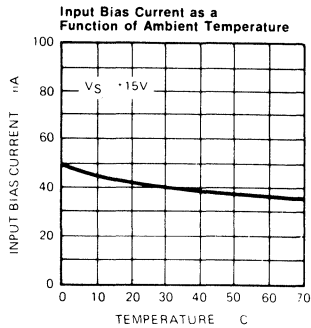


Order Part Nos.:
RC4559NB, RV4559NB
RC4559DE, RV4559DE
RM4559DE

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

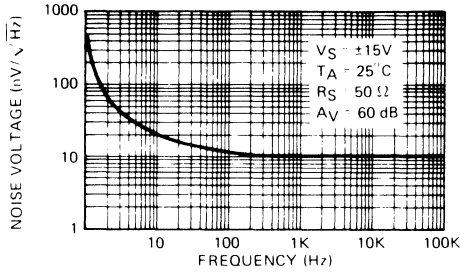
4559

TYPICAL ELECTRICAL DATA

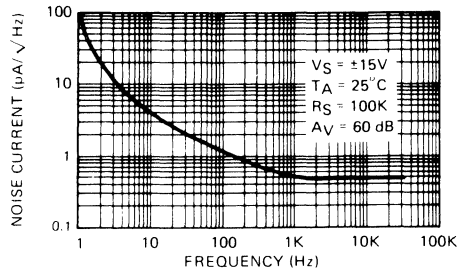


TYPICAL ELECTRICAL DATA

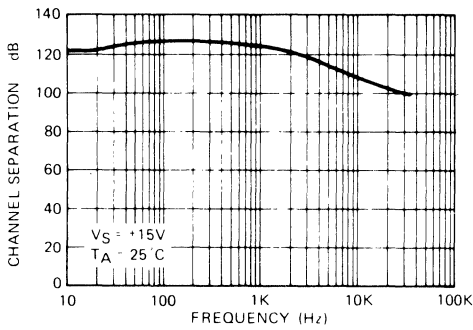
Input Noise Voltage
as a Function of Frequency



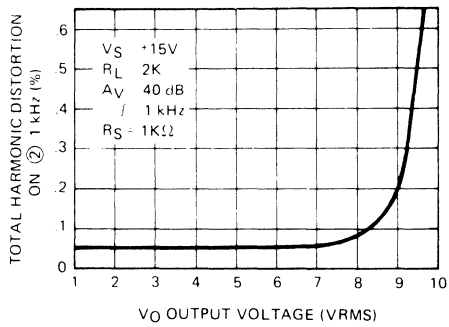
Input Noise Current
as a Function of Frequency



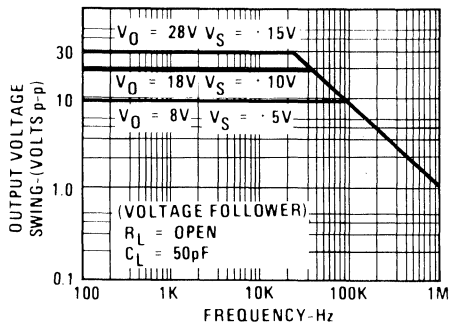
Channel Separation



Total Harmonic Distortion
vs Output Voltage



Output Voltage Swing
vs. Frequency



Distortion vs Frequency
 $V_O = 1vrms$

