

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.

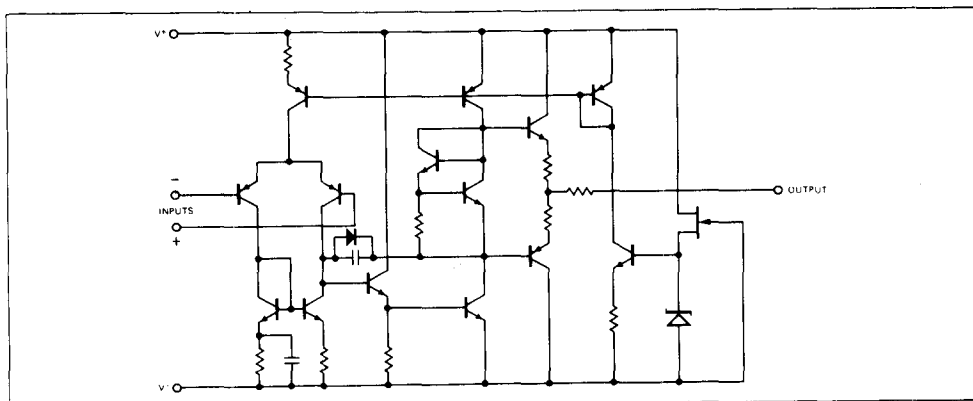
These amplifiers feature guaranteed AC performance which far exceeds that of the 741-type amplifiers. The specially designed low-noise input transistors allow the 4559 to be used in low-noise signal processing applications such as audio pre amplifiers and signal conditioners.

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

FEATURES

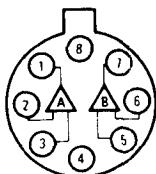
	Typical	Guaranteed
• Unity Gain Bandwidth	4.0 MHz	3.0 MHz
• Slew Rate	2.0 V/ μ sec	1.5 V/ μ sec
• Low Noise Voltage	1.4 μ V RMS	2.0 μ V RMS
• Supply Voltage ± 22 V for RM4559 and ± 18 V for RC4559		
• No Frequency Compensation Required		
• No Latch Up		
• Large Common Mode and Differential Voltage Ranges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

SCHEMATIC DIAGRAM (1/2 Shown)



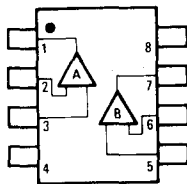
CONNECTION INFORMATION

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 ⁺

Dual High Performance Operational Amplifier

4559

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	RM4559: $\pm 22\text{V}$ RC4559: $\pm 18\text{V}$	Operating Temperature Range	RM4559: -55°C to $+125^\circ\text{C}$ RV4559: -40°C to $+85^\circ\text{C}$ RC4559: 0°C to $+70^\circ\text{C}$
Internal Power Dissipation (Note 1)	500mW	Lead Temperature (Soldering, 60 sec)	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 ($T_A = 25^\circ\text{C}$, $V_{CC} = \pm 15\text{V}$ unless otherwise specified.)

PARAMETER	CONDITIONS	RM4559			RV/RC4559			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	100		5	100	nA
Input Bias Current			40	250		40	250	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		V/V
Output Voltage Swing	$R_L \geq 3\text{k}\Omega$	± 12	± 13		± 12	± 13		V
	$R_L \geq 600\Omega$	± 9.5	± 10		± 9.5	± 10		V
Input Voltage Range		± 12	± 13		± 12	± 13		V
Common Mode Rejection Ratio	$R_S \leq 10\text{k}\Omega$	80	100		80	100		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{k}\Omega$		10	75		10	75	$\mu\text{V/V}$
Supply Current	$R_L = \infty$ (All Amplifiers)		3.3	5.6		3.3	5.6	mA
Transient Response (unity gain)	$V_{IN} = 20\text{mV}$, $R_L = 2\text{k}\Omega$, $C_L \leq 100\text{pF}$							
Rise Time			80			80		nsec
Overshoot			18			18		%
Slew Rate (unity gain)		1.5	2.0		1.5	2.0		V/ μs
Unity Gain Bandwidth		3.0	4.0		3.0	4.0		MHz
Full Power Bandwidth	$V_O = 20\text{V}_{p-p}$	24	32		24	32		kHz
Input Noise Voltage	$f = 20\text{Hz}$ to 20kHz		1.4	2.0		1.4	2.0	μV_{RMS}
Input Noise Current	$f = 20\text{Hz}$ to 20kHz		25			25		pA RMS
Channel Separation	Gain = 100 $f = 10\text{kHz}$, $R_S = 1\text{k}\Omega$		90			90		dB

The following specifications apply for $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$ for RM4559; $0^\circ\text{C} \leq T_A \leq +70^\circ\text{C}$ for RC4559

Input Offset Voltage	$R_S \leq 10\text{k}\Omega$			6.0			7.5	mV
Input Offset Current				300			200	nA
Input Bias Current				500			500	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
Supply Current (All Amplifiers)	$V_S = \pm 15\text{V}$, $R_L = \infty$ $T_A = +125^\circ\text{C}$ $T_A = -55^\circ\text{C}$		3	5		3	5	mA
			4	6.6		4	6.6	

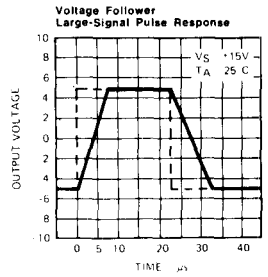
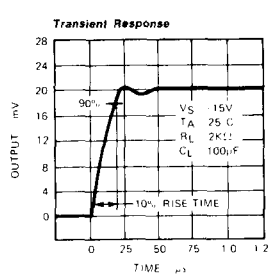
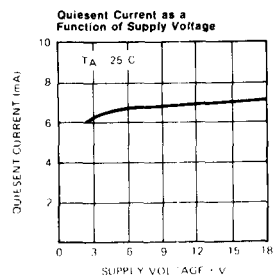
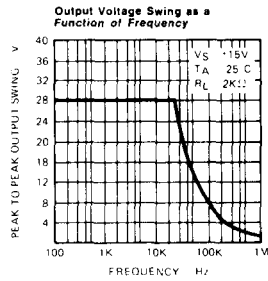
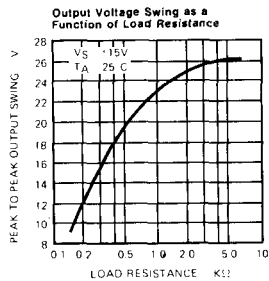
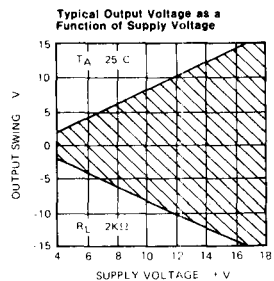
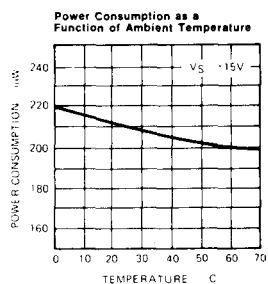
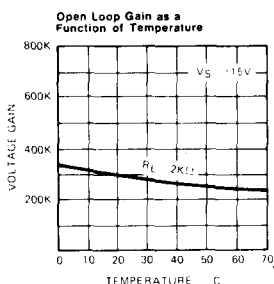
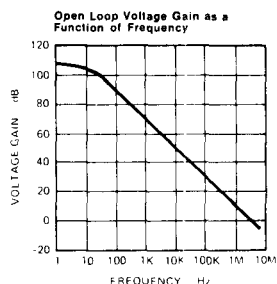
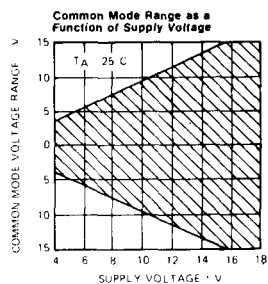
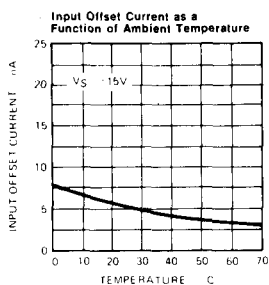
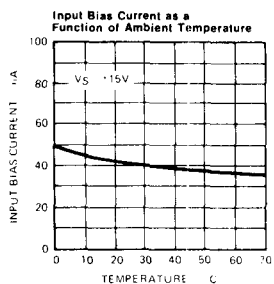
MATCHING CHARACTERISTICS ($V_{CC} = \pm 15\text{V}$, $T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	CONDITIONS	RM4559 TYP	RC4559 TYP	UNITS
Voltage Gain	$R_L \geq 2\text{k}\Omega$	± 0.5	± 1.0	dB
Input Bias Current		± 15	± 15	nA
Input Offset Current		± 7.5	± 7.5	nA
Input Offset Voltage	$R_S \geq 10\text{k}\Omega$	± 0.1	± 0.2	mV

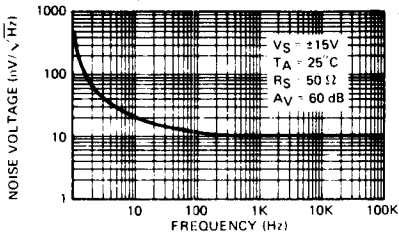
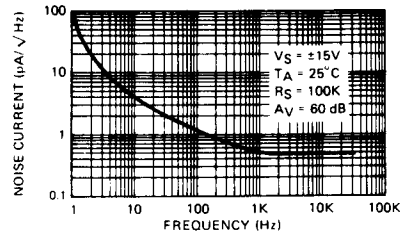
NOTES:

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 RM4559.
2. For supply voltages less than -15V , the absolute maximum input voltage is equal to the supply voltage.
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 RC4559 and to $+85^\circ\text{C}$ ambient temperature for RV4559.

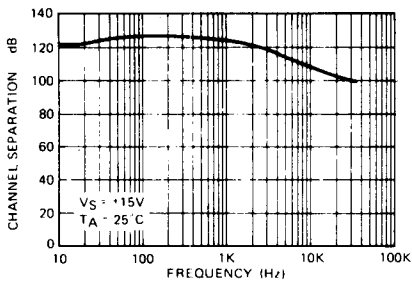
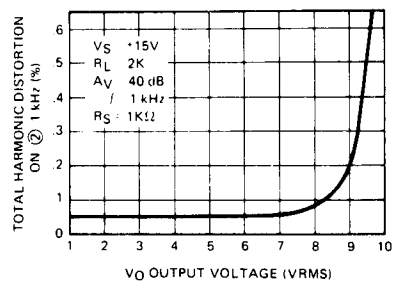
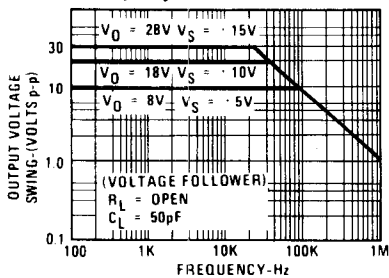
TYPICAL ELECTRICAL DATA



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 VoltageOutput Voltage Swing
vs. FrequencyDistortion vs Frequency
 $V_O = 1\text{vrms}$ 