

Raytheon

**Low Noise
Dual Operational Amplifier**

RC4739

Features

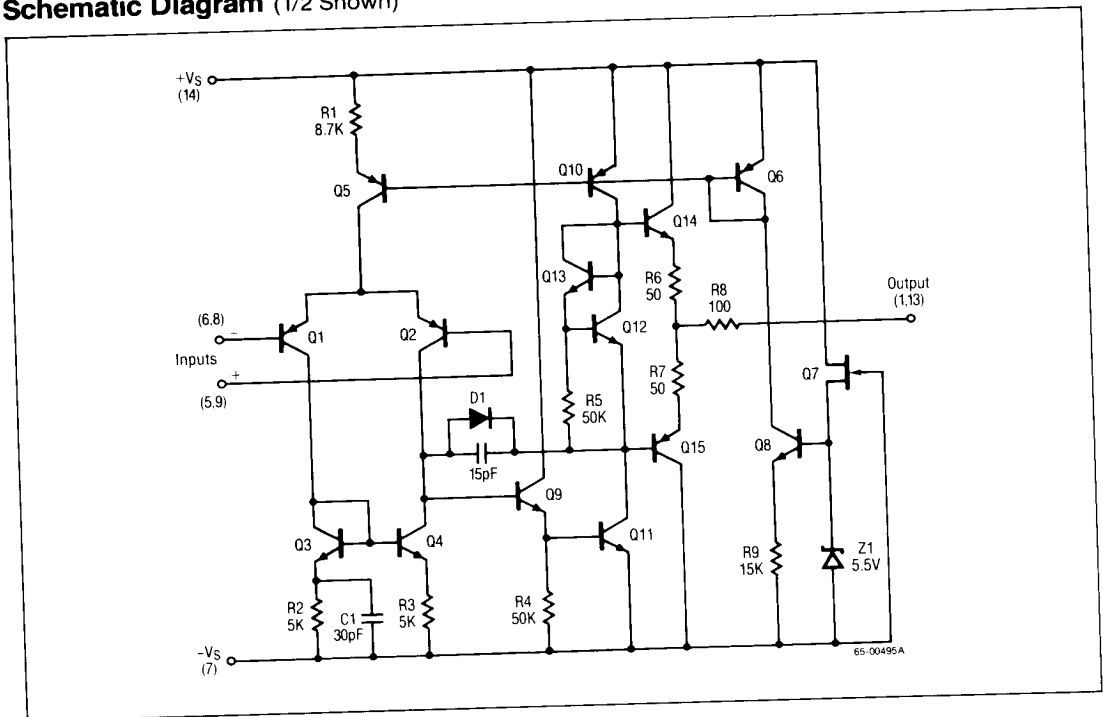
- Internally compensated replacement for μ A739 and MC1303
- Signal-to-noise ratio — 76dB (RIAA 10mV ref.)
- Channel separation — 125dB
- Unity gain bandwidth — 3MHz
- Output short-circuit protected
- <0.05% distortion into 2k Ω load
- 10nV/ $\sqrt{\text{Hz}}$ noise at 100Hz

Description

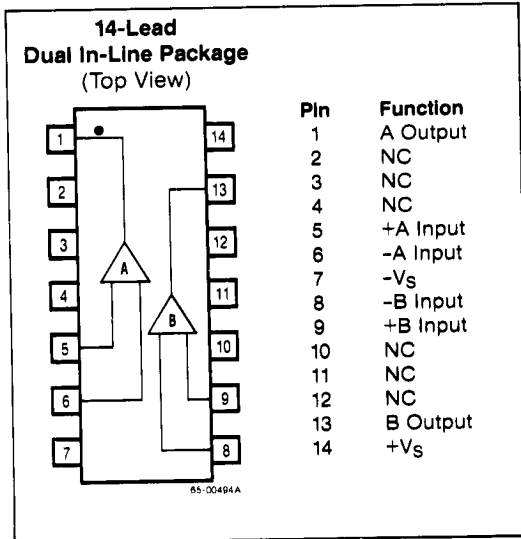
The RC4739 low noise dual operational amplifier is fabricated on a single silicon chip using the planar epitaxial process. It was designed primarily for preamplifiers in consumer and industrial signal processing equipment. The device is pin compatible with the μ A739 and MC1303, however, compensation is internal. This permits a lowered external parts count and simplified application.

The RC4739 is available in molded dual in-line 14-pin package and operates over the commercial temperature range from 0°C to +70°C.

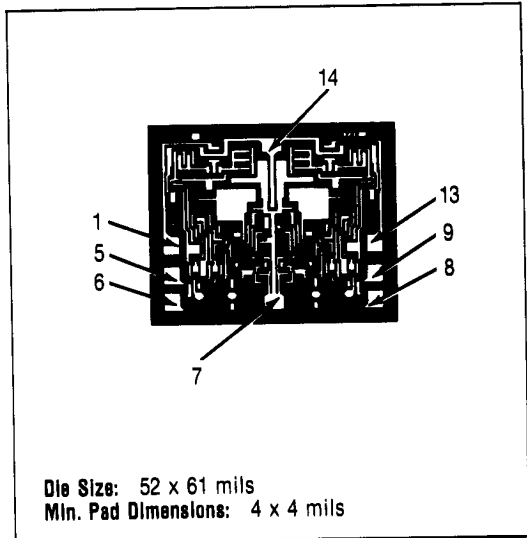
Schematic Diagram (1/2 Shown)



Connection Information



Mask Pattern



Absolute Maximum Ratings

Supply Voltage	±18V
Input Voltage ¹	±15V
Differential Input Voltage	30V
Output Short Circuit Duration ²	Indefinite
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	0°C to +70°C
Lead Soldering Temperature (60 Sec)	+300°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, typically 45mA.

Thermal Characteristics

	14-Lead Plastic DIP
Max. Junction Temp.	125°C
Max. P _D T _A < 50°C	468mW
Therm. Res. θ _{JC}	—
Therm. Res. θ _{JA}	160°C/W
For T _A > 50°C Derate at	6.25mW per °C

Ordering Information

Part Number	Package	Operating Temperature Range
RC4739DB	Plastic	0°C to +70°C

Low Noise Dual Operational Amplifier

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Electrical Characteristics ($V_S = +15V$ and $T_A = +25^\circ C$)

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 (Differential Mode)		0.3	5.0		M Ω
Large Signal Voltage Gain	$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	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	100		dB
Power Supply Rejection Ratio	$R_S \leq 10k\Omega$	76	100		dB
Power Consumption			105	170	mW
Transient Response	$V_{IN} = 20mV$, $R_L = 2k\Omega$		0.15		μS
Overshoot	$C_L \leq 100pF$		10		%
Slew Rate	$R_L \geq 2k\Omega$		1.0		V/ μS
Input Voltage Noise	$BW = 10-30kHz$, $R_S = 1k\Omega$		2.5		μV_{RMS}
Channel Separation	$f = 1.0kHz$, $A_V = 40dB$, $R_S = 1k\Omega$		125		dB
The following specification applies for $0^\circ C \leq T_A \leq +70^\circ C$ unless otherwise specified. $V_S = \pm 15V$					
Input Offset Voltage	$R_S \leq 10k\Omega$		3.0	7.5	mV
Input Offset Current			7.0	300	nA
Input Bias Current			50	800	nA
Large Signal Voltage Gain	$R_L \geq 2k\Omega$, $V_{OUT} = \pm 10V$	15	200		V/mV
Output Voltage Swing	$R_L \geq 2k\Omega$, $V_S = \pm 15V$	± 10	± 13		V
Power Consumption	$T_S = +70^\circ C$		100	150	mW
	$T_A = 0^\circ C$		110	220	mW

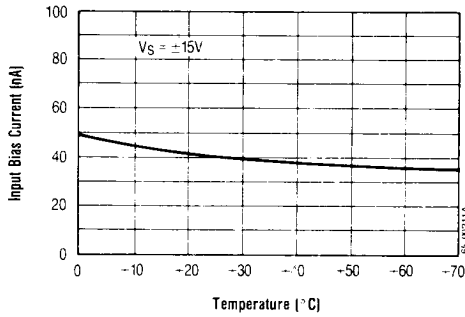
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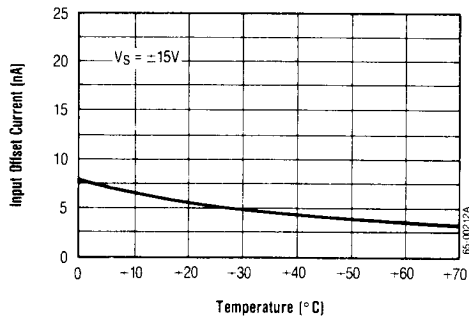
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Typical Performance Characteristics

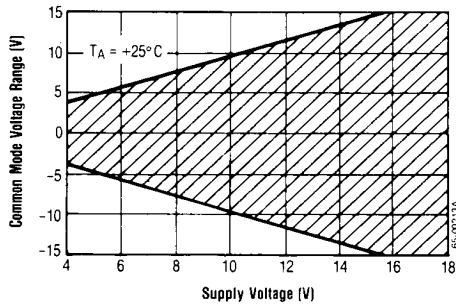
Input Bias Current as a Function of Ambient Temperature



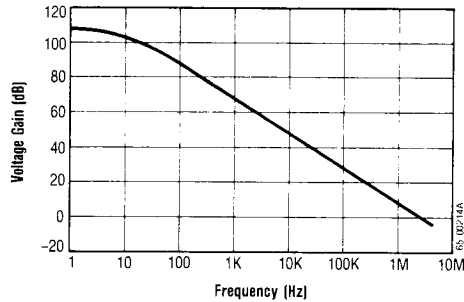
Input Offset Current as a Function of Ambient Temperature



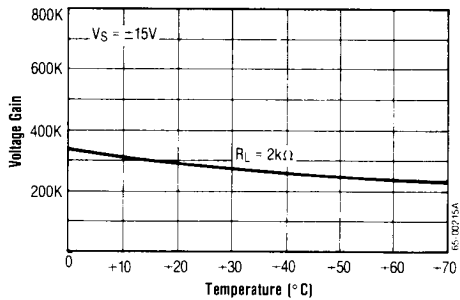
Common Mode Range as a Function of Supply Voltage



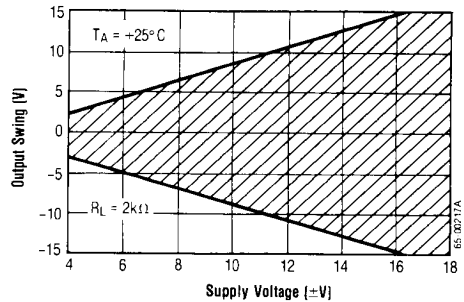
Open Loop Voltage Gain as a Function of Frequency



Open Loop Gain as a Function of Temperature

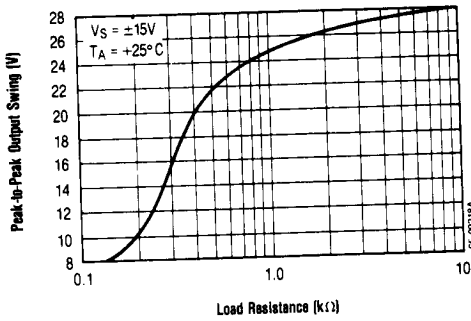


Typical Output Voltage as a Function of Supply Voltage

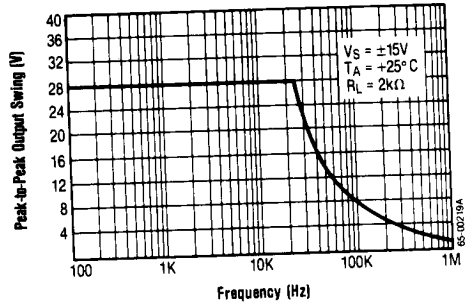


Typical Performance Characteristics (Continued)

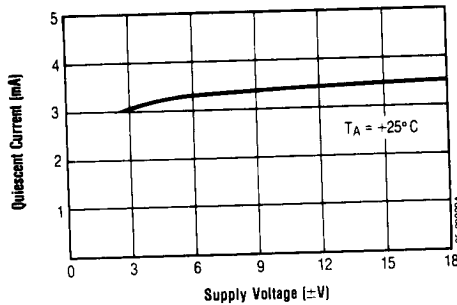
Output Voltage Swing as a Function of Load Resistance



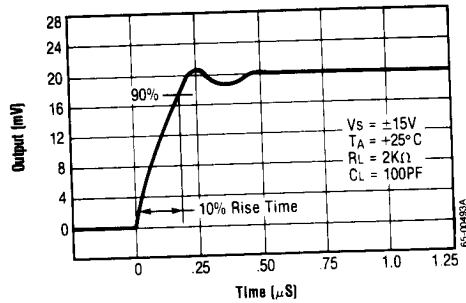
Output Voltage Swing as a Function of Frequency



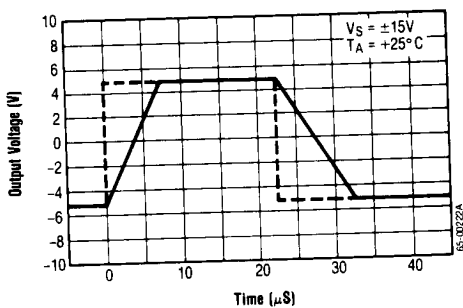
Quiescent Current as a Function of Supply Voltage



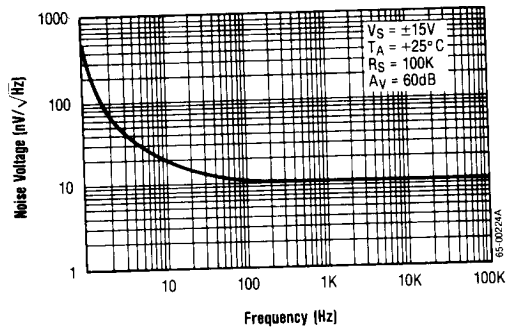
Transient Response



Voltage Follower Large Signal Pulse Response

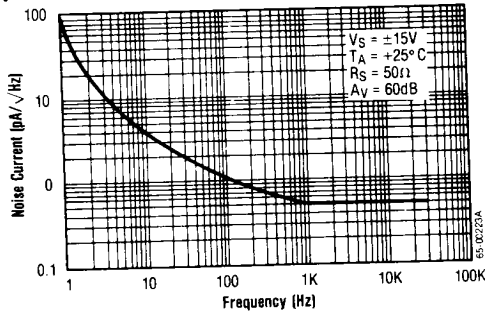


Input Noise Voltage as a Function of Frequency

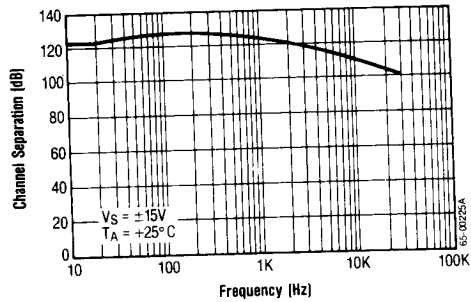


Typical Performance Characteristics (Continued)

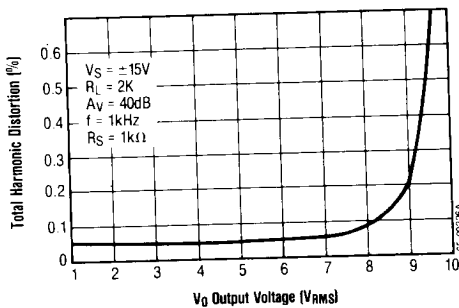
Input Noise Current as a Function of Frequency



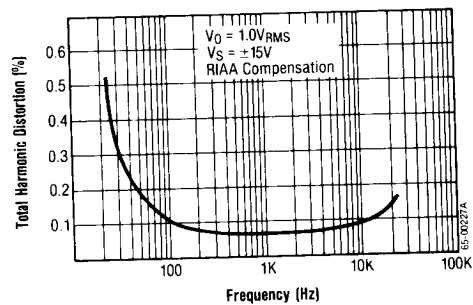
Channel Separation



Total Harmonic Distortion vs. Output Voltage



Distortion vs. Frequency



Typical Applications

