GENERAL DESCRIPTION

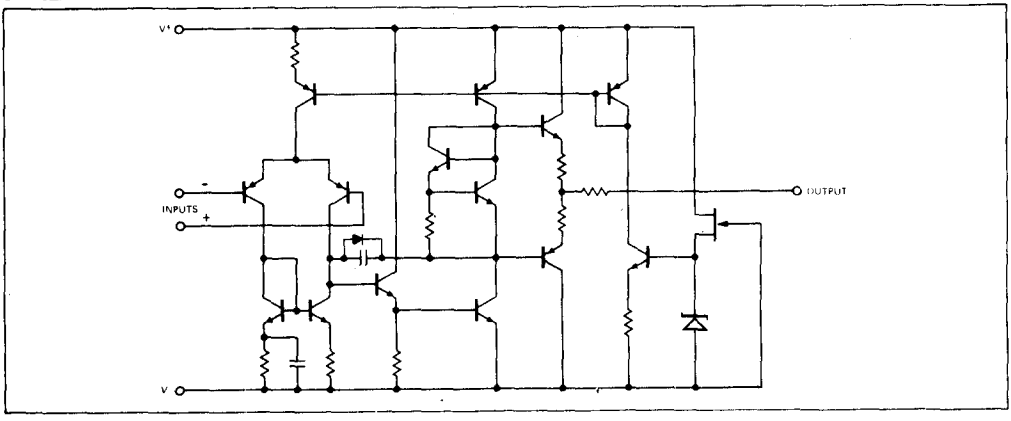
The RC4739 dual low-noise operational amplifier is fabricated on a single silicon chip using the planar epitaxial process. It was designed primarily for preamplifiers in consumer and industrial signal processing equipment. The device is pin compatible with the μA739 and MC1303, however, compensation is internal. This permits a lowered external parts count and simplfied application.

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

DESIGN FEATURES

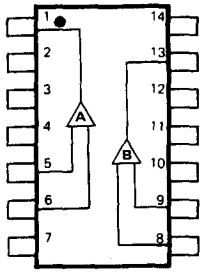
- Internally Compensated Replacement for μA739 and MC1303
- Signal-to-Noise Ratio 76 dB (RIAA 10 mV ref.)
- Channel Separation 125 dB
- Unity Gain Bandwidth 3MHz
- Output Short-Circuit Protected
- 0.1% Distortion at 8.5 V RMS Output into 2 kΩ Load

SCHEMATIC DIAGRAM (1/2 Shown)



CONNECTION INFORMATION

DB
Dual In-line Package
(Top View)



Order Part No.:
RC4739DB

PIN	FUNCTION
1	A OUTPUT
2	NC
3	NC
4	NC
5	+A INPUT
6	-A INPUT
7	V^-
8	B INPUT
9	+B INPUT
10	NC
11	NC
12	NC
13	B OUTPUT
14	V^+

RAYTHEON

ABSOLUTE MAXIMUM RATINGS

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

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

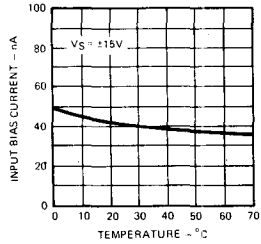
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$R_S \leq 10\ k\Omega$		2.0	6.0	mV
Input Offset Current			5.0	200	nA
Input Bias Current			40	500	nA
Input Resistance		0.3	5.0		MΩ
Large-Signal Voltage Gain	$R_L \geq 2\ k\Omega$				
	V_{out} = ±10V	20,000	300,000		V/V
Output Voltage Swing	$R_L \geq 10\ k\Omega$	±12	±14		V
	$R_L \geq 2\ k\Omega$	±10	±13		V
Input Voltage Range		±12	±14		V
Common Mode Rejection Ratio	$R_S \leq 10\ k\Omega$	70	100		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\ k\Omega$		10	150	μV/V
Power Consumption			105	170	mW
Transient Response (unity gain)	V_{in} = 20 mV				
Risetime	R_L = 2 kΩ				
	$C_L \leq$ 100pF		0.15		μs
Transient Response (unity gain)	V_{in} = 20 mV				
Overshoot	R_L = 2 kΩ				
	$C_L \leq$ 100 pF		10		%
Slew Rate (unity gain)	$R_L \geq 2\ k\Omega$		1.0		V/μs
Broadband Noise Voltage	B_W = 10-30 KHz				
	R_S = 1 kΩ		2.5		μV_{RMS}
Channel Separation	f = 1.0 kHz				
	A_V = 40 dB				
	R_S = 1 kΩ		125		dB
The following specification apply for 0°C ≤ T_A ≤ 70°C unless otherwise specified.					
Input Offset Voltage	$R_S \leq 10\ k\Omega$		3.0	7.5	mV
Input Offset Current			7.0	300	nA
Input Bias Current			50	800	nA
Large-Signal Voltage Gain	$R_L \geq 2\ k\Omega$				
	V_{out} = ±10V	15,000	200,000		
Output Voltage Swing	$R_L \geq 2\ k\Omega$	±10	±13		V
Power Consumption	V_S = ±15V				
	T_A = 70°C		100	150	mW
	T_A = 0°C		110	220	mW

NOTES:

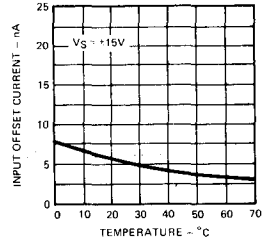
1. Rating applies for ambient temperatures below +70°C.
2. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
3. Short-circuit may be to ground, typically 45 mA. Rating applies to +125°C case temperature or +75°C ambient temperature.

TYPICAL ELECTRICAL DATA

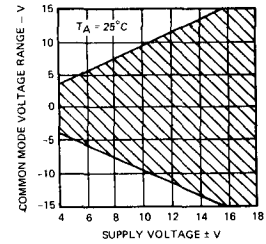
Input Bias Current as a Function of Ambient Temperature



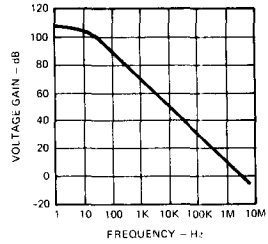
Input Offset Current as a Function of Ambient Temperature



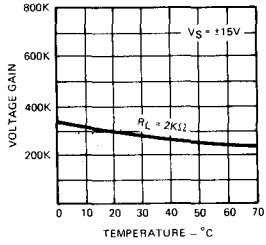
Common Mode Range as a Function of Supply Voltage



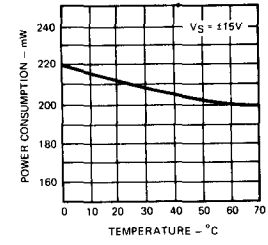
Open Loop Voltage Gain as a Function of Frequency



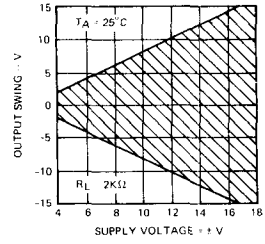
Open Loop Gain as a Function of Temperature



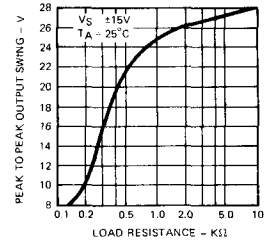
Power Consumption as a Function of Ambient Temperature



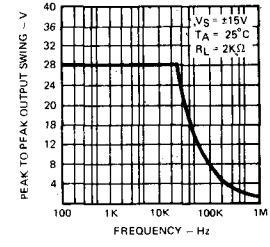
Typical Output Voltage as a Function of Supply Voltage



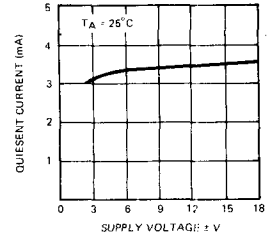
Output Voltage Swing as a Function of Load Resistance



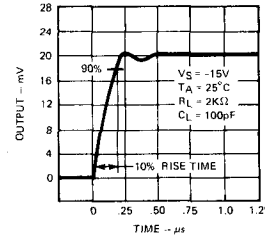
Output Voltage Swing as a Function of Frequency



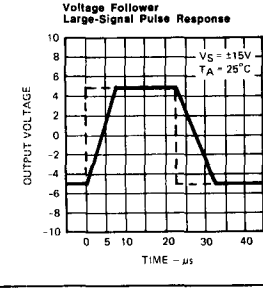
Quiescent Current as a Function of Supply Voltage



Transient Response



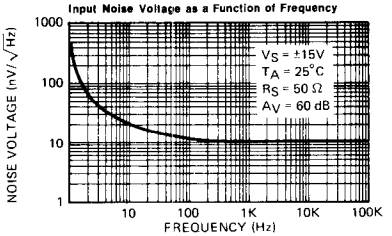
Voltage Follower Large-Signal Pulse Response



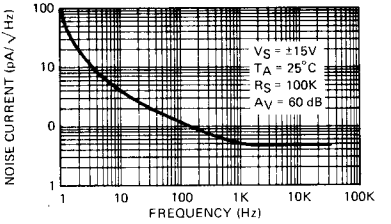
RAYTHEON

TYPICAL ELECTRICAL DATA

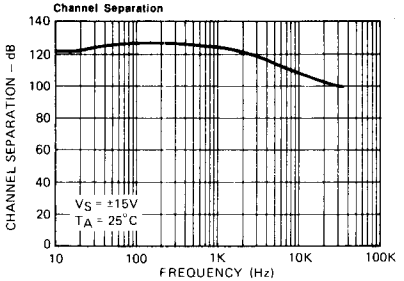
Input Noise Voltage as a Function of Frequency



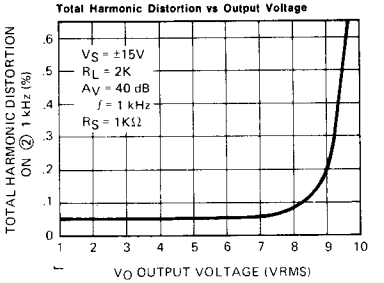
Input Noise Current as a Function of Frequency



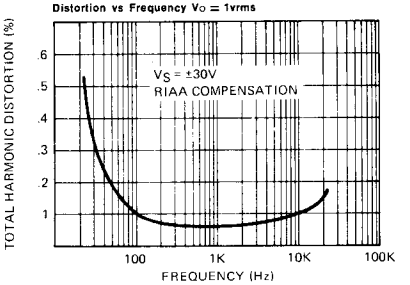
Channel Separation



Total Harmonic Distortion vs Output Voltage

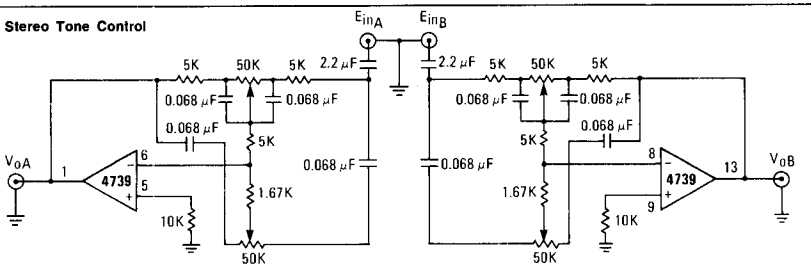


Distortion vs Frequency V_O = 1vrms



TYPICAL APPLICATIONS

Stereo Tone Control



	SYMBOL	RM/RC4558			RM/RC4559			RC4739			UNIT
Maximum Ratings			±4 to			±4 to			±4 to		
Supply Voltage Range	V_{CC}		±18			±18			±18		V
Differential Input Voltage	V_{ID}		±30			±30			±30		V
Input Voltage			±15			±15			±15		V
Power Dissipation	P_D		500			500			500		mW
Electrical Characteristics	@ 25°C	**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**	
Test Conditions	V_{CC}		±15			±15			±15		V
Input Offset Voltage	V_{ID}		1.0 2.0*	5.0 6.0*		1.0 2.0*	5.0 6.0*		2.0	6.0	mV
Input Offset Current	I_{IO}		5.0	200		5.0	200		5.0	200	nA
Input Bias Current	I_{IB}		40/200*	500		40/200*	500		40	500	nA
Input Common Mode Voltage Range	V_{ICR}	±12	±14		±12	±14		±12	±14		V
Supply Current	I_D		3.5	5.6		3.5	5.6		3.5	5.6	mA
Open Loop Voltage Gain	A_{VOL}	50/20*	300		50/20*	300		20	300		V/mV
Output Voltage Swing	V_{OR}	±12	±14		±12	±14		±12	±14		V
Common Mode Rejection Ratio	CMRR	70	100		70	100		70	100		dB
Power Supply Rejection Ratio	PSSR		10	150		10	150		10	150	μV/V
Unity Gain Bandwidth	BW	2.5/2.0*	3.0		3	4			3.0		MHz
Slew Rate	SR		0.5		1.5	2.0			1.0		V/μs
Channel Separation			-90			-90			-125		dB
Noise Voltage	V_N		10		2.0†	1.4†			2.5†		$nV/(Hz)^{1/2}$
Operating Temperature Range	T_A	-55 0	RM RC	+125 70	-55 0	RM RC	+125 70	0		70	°C
Package: Hermetic TO-5			TE			TE					
Hermetic Dip			DE			DE					
Plastic Dip			NB			NB			DB		

*Commercial temp range device.
†Broad Band noise voltage -20 Hz to 20 kHz (μV_{RMS}).