Operational Amplifier

GENERAL DESCRIPTION

The RM748 and RC748 integrated circuits are high performance, high gain monolithic operational amplifiers fabricated on a single silicon chip using the planar epitaxial process. Frequency compensation can be tailored externally to cover a broad range of analog applications.

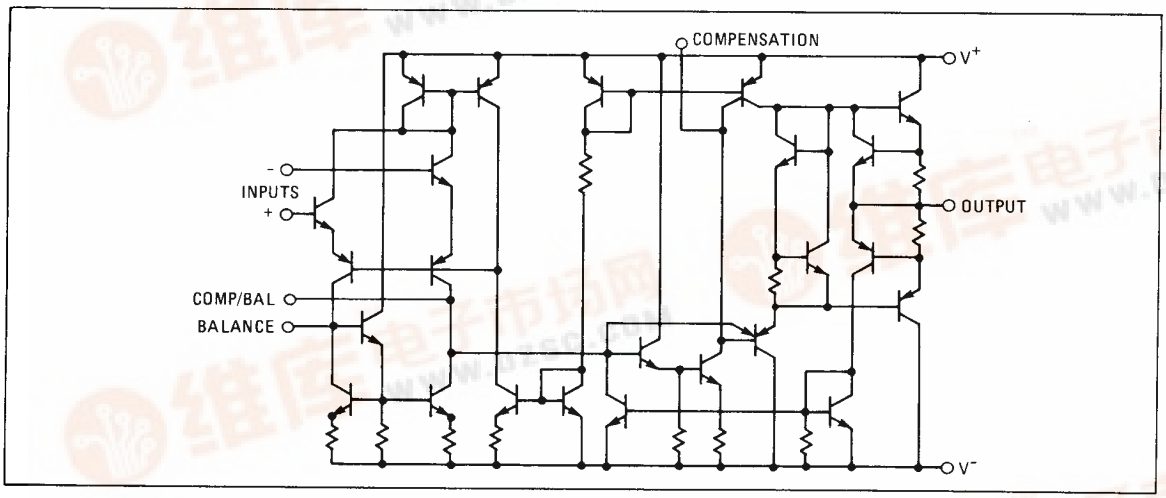
High common-mode voltage range and absence of latch-up tendencies make the RM748 and RC748 ideal for use as a voltage follower. High gain and wide ranges of operating voltages provide superior performance in integrators, summing amplifiers and general feedback applications. Unity gain compensation is achieved by means of a single 30pF capacitor.

Both RM748 and RC748 are pin compatible with the RM709, LM101 and RM4101. The military version, RM748 operates over a temperature range from −55°C to +115°C while the commercial version RC748 operates from 0°C to +70°C.

DESIGN FEATURES

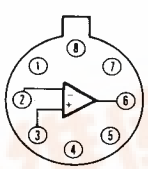
- Offset Voltage Null Capability
- Short-Circuit Protection
- No Latch-up
- Large Common-Mode and Differential Voltage Ranges
- Low Power Consumption

SCHEMATIC DIAGRAM



CONNECTION INFORMATION

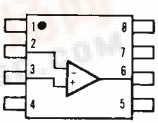
TE (TO-99)
Metal Can Package
(Top View)



Note: Pin 4 connected to case

Order Part Nos.:
RM748T, RC748T

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



Order Part Nos.:
RC748NB, RC748DE,
RM748DE

PIN	FUNCTION
1	COMP/BAL
2	-INPUT
3	+INPUT
4	V-
5	BAL
6	OUTPUT
7	V+
8	COMP

RAYTHEON

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	RM748: ±22V RC748: ±18V
Internal Power Dissipation (Note 1)	500mW
Differential Input Voltage	±30V
Input Voltage (Note 2)	±15V
Storage Temperature Range	−65°C to +150°C
Operating Temperature Range	
RM748	−55°C to +125°C
RC748	0°C to +70°C
Lead Temperature (Soldering, 60s)	300°C
Output Short-Circuit Duration (Note 3)	Indefinite

ELECTRICAL CHARACTERISTICS (V_S = ±15V, T_A = 25°C unless otherwise specified)

PARAMETER	CONDITIONS	RM748			RC748			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$R_S \leq 10k\Omega$		1.0	5.0		2.0	6.0	mV
Input Offset Current			20	200		20	200	nA
Input Bias Current			80	500		80	500	nA
Input Resistance		0.3	2.0		0.3	2.0		MΩ
Large-Signal Voltage Gain	$R_L \geq 2k\Omega$, $V_{out} = \pm 10V$	50,000	200,000		20,000	200,000		
Output Voltage Swing	$R_L \geq 10k\Omega$ $R_L \geq 2k\Omega$	±12 ±10	±14 ±13		±12 ±10	±14 ±13		V V
Input Voltage Range		±12	±13		±12	±13		V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	70	90		70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10k\Omega$		30	150		30	150	μV/V
Power Consumption			50	85		50	85	mW
Transient Response (unity gain) Risetime Overshoot	V_{in} = 20mV, R_L = 2kΩ, $C_L \leq$ 100pF (Note 4)		 0.3 5.0			 0.3 5.0		 μs %
Slew Rate (unity gain)	$R_L \geq 2k\Omega$ (Note 4)		0.5			0.5		V/μs
The following specifications apply for $-55°C \leq T_A \leq +125°C$ for RM748; $0°C \leq T_A \leq +70°C$ for RC748.								
Input Offset Voltage	$R_S \leq 10k\Omega$			6.0			7.5	mV
Input Offset Current	+125°C,+70°C −55°C,+70°C			200 500			300 800	nA
Input Bias Current	+125°C,+70°C −55°C,+70°C						800 800	nA
Large-Signal Voltage Gain	$R_L \geq 2k\Omega$, $V_{out} = \pm 10V$	25,000			15,000			
Output Voltage Swing	$R_L \geq 10k$ $R_L \geq 2k$	±12 ±10			±10			V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	70						dB
Supply Voltage Rejection Ratio	$R_S \leq 10k\Omega$			150				μV/V

NOTES:
1. Rating applies for case temperatures to +125°C; derate linearly at 6.5 mW/°C for ambient temperatures above +75°C for RM748.
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 or either supply. Rating applies to +125°C case temperature or +75°C ambient temperature for RM748.
4. Compensation capacitor: 30pF.