

**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.

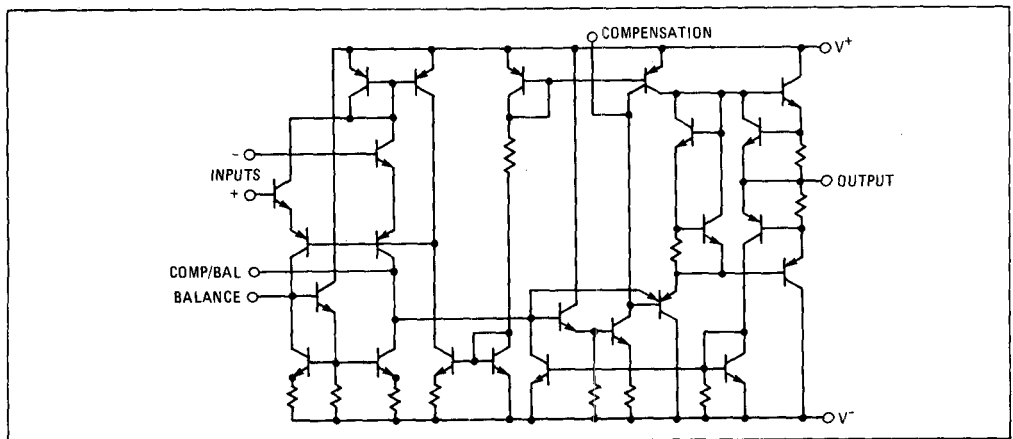
High common-mode voltage range and absence of latch-up tendencies make the RM748 and RC748 ideal for use as a voltage follower. High gain and wide ranges of operating voltages provide superior performance in integrators, summing amplifiers and general feedback applications. Unity gain compensation is 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  $-55^{\circ}\text{C}$  to  $+115^{\circ}\text{C}$  while the commercial version RC748 operates from  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ .

**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

**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage	RM748: $\pm 22\text{V}$ RC748: $\pm 18\text{V}$	Operating Temperature Range RM748: $-55^\circ\text{C}$ to $+125^\circ\text{C}$ RC748: $0^\circ\text{C}$ to $+70^\circ\text{C}$
Internal Power Dissipation (Note 1)	500mW	Lead Temperature (Soldering, 60s): $300^\circ\text{C}$
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	$-65^\circ\text{C}$ to $+150^\circ\text{C}$	

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

PARAMETER	CONDITIONS	RM748			RC748			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			20	200		20	200	nA
Input Bias Current			80	500		80	500	nA
Input Resistance		0.3	2.0		0.3	2.0		M $\Omega$
Large-Signal Voltage Gain	$R_L \geq 2\text{k}\Omega$ , $V_{out} = \pm 10\text{V}$	50,000	200,000		20,000	200,000		
Output Voltage Swing	$R_L \geq 10\text{k}\Omega$	$\pm 12$	$\pm 14$		$\pm 12$	$\pm 14$		V
	$R_L \geq 2\text{k}\Omega$	$\pm 10$	$\pm 13$		$\pm 10$	$\pm 13$		V
Input Voltage Range		$\pm 12$	$\pm 13$		$\pm 12$	$\pm 13$		V
Common Mode Rejection Ratio	$R_S \leq 10\text{k}\Omega$	70	90		70	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{k}\Omega$		30	150		30	150	$\mu\text{V}/\text{V}$
Power Consumption			50	85		50	85	mW
Transient Response (unity gain)	$V_{in} = 20\text{mV}$ , $R_L = 2\text{k}\Omega$ , $C_L \leq 100\text{pF}$ (Note 4)							
		Risetime		0.3		0.3		$\mu\text{s}$
Overshoot			5.0		5.0		%	
Slew Rate (unity gain)	$R_L \geq 2\text{k}\Omega$ (Note 4)		0.5			0.5		V/ $\mu\text{s}$

The following specifications apply for  $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$  for RM748 ;  $0^\circ\text{C} \leq T_A \leq +70^\circ\text{C}$  for RC748.

Input Offset Voltage	$R_S \leq 10\text{k}\Omega$			6.0			7.5	mV
Input Offset Current	$+125^\circ\text{C}, +70^\circ\text{C}$ $-55^\circ\text{C}, +70^\circ\text{C}$			200			300	nA
				500			800	
Input Bias Current	$+125^\circ\text{C}, +70^\circ\text{C}$ $-55^\circ\text{C}, +70^\circ\text{C}$						800	nA
							800	
Large-Signal Voltage Gain	$R_L \geq 2\text{k}\Omega$ , $V_{out} = \pm 10\text{V}$	25,000				15,000		
Output Voltage Swing	$R_L \geq 10\text{k}$	$\pm 12$						V
	$R_L \geq 2\text{k}$	$\pm 10$				$\pm 10$		
Common Mode Rejection Ratio	$R_S \leq 10\text{k}\Omega$	70						dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{k}\Omega$			150				$\mu\text{V}/\text{V}$

**NOTES:**

- Rating applies for case temperatures to  $+125^\circ\text{C}$ ; derate linearly at  $6.5\text{mW}/^\circ\text{C}$  for ambient temperatures above  $+75^\circ\text{C}$  for RM748.
- For supply voltages less than  $\pm 15\text{V}$ , the absolute maximum input voltage is equal to the supply voltage.
- Short-circuit may be to ground or either supply. Rating applies to  $+125^\circ\text{C}$  case temperature or  $+75^\circ\text{C}$  ambient temperature for RM748.
- Compensation capacitor:  $30\text{pF}$ .