

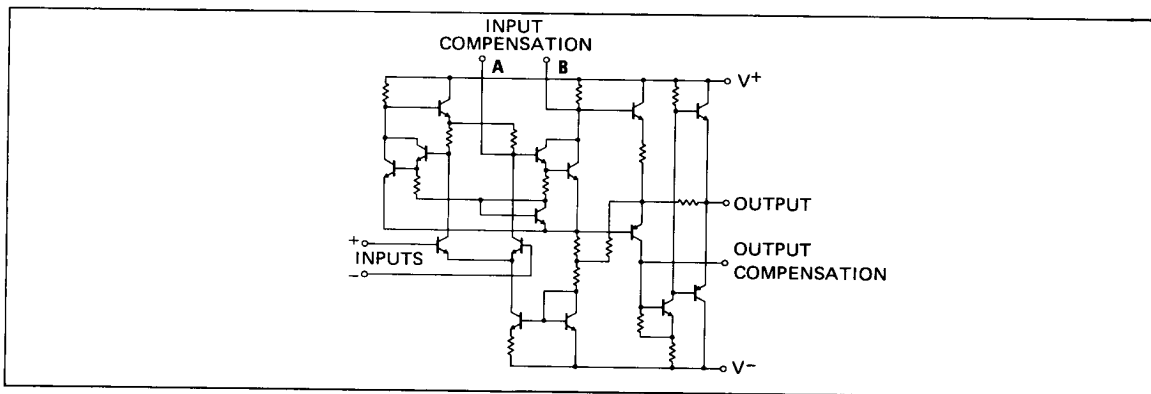
GENERAL DESCRIPTION

The RM709 and RC709 are monolithic, high gain DC operational amplifiers fabricated on a single silicon chip by the planar process.

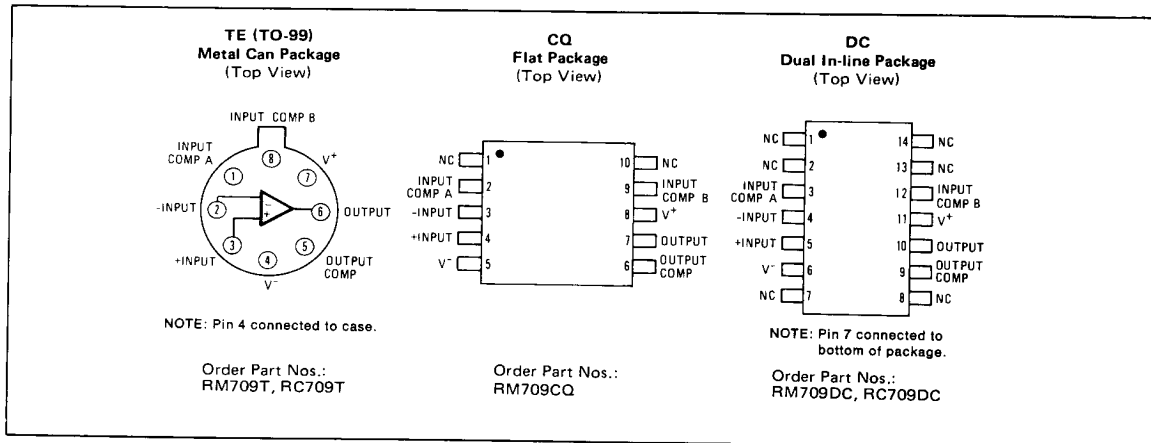
These devices are designed for use in operational amplifier signal processing, low level instrumentation, control systems and for the generation of special linear and non-linear transfer functions.

The RM709 operates over the full military temperature range from -55°C to $+125^{\circ}\text{C}$. The RC709 is the commercial device intended to operate over a temperature range of 0°C to $+70^{\circ}\text{C}$.

SCHEMATIC DIAGRAM



CONNECTION INFORMATION



ABSOLUTE MAXIMUM RATINGS

Supply Voltage	±18V	Output Short-Circuit Duration ($T_A = 25^\circ\text{C}$)	5 sec
Differential Input Voltage	±5V	Storage Temperature Range	-65°C to +150°C
Input Voltage	±10V	Operating Temperature Range	
Power Dissipation (Note)		RM709/709A	-55°C to +125°C
Dual In-line Package	300mW	RC709	0°C to +70°C
TO-5 Package	300mW	Lead Temperature (Soldering, 60s)	300°C
Flat Package	250mW		

ELECTRICAL CHARACTERISTICS ($\pm 9 \leq V_S \leq \pm 15\text{V}$, $T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	CONDITIONS	RM709			RC709			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$R_S \leq 10\text{k}\Omega$	1.0	3.0		2.0	7.5		mV
Input Offset Current		25	100		100	500		nA
Input Bias Current		180	300		300	1500		nA
Input Resistance		220	400		50	250		k Ω
Output Resistance			150		150			Ω
Supply Current	$V_S = \pm 15\text{V}$	2.6	4.0		6.6			mA
Power Consumption	$V_S = \pm 15\text{V}$	80	120		80	200		mW
Transient Response	$R_L = 2\text{k}\Omega$, $V_S = \pm 15\text{V}$, $V_{IN} = 20\text{mV}$							
Rise Time	$C_1 = 5\text{nF}$, $R_1 = 1.5\text{k}$, $C_2 = 200\text{pF}$, $R_2 = 50\text{k}\Omega$	0.3	1.0		0.3	1.0		μs
Overshoot	$C_L \leq 100\text{pF}$	10	30		10	30		%
Slew Rate	$V_S = \pm 15\text{V}$, $R_L \geq 10\text{k}\Omega$, $A_V = 1$	0.15	0.4		0.4			V/ μs
Large Signal Voltage Gain	$V_S = \pm 15\text{V}$, $R_L = 2\text{k}$, $V_{OUT} = \pm 10\text{V}$				15	45		kV/V
The following specifications apply for $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$ for RM; $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ for RC.								
Large Signal Voltage Gain	$V_S = \pm 15\text{V}$, $R_L \geq 2\text{k}$, $V_{OUT} = \pm 10\text{V}$	25	45	70	12			kV/V
Input Offset Voltage	$R_S \leq 10\text{k}\Omega$		4.0		10			mV
Input Offset Current	$T_A = \text{max}$	10	100					nA
	$T_A = \text{min}$	50	300		750			nA
Input Bias Current	$T_A = \text{min}$	400	1000		2000			nA
Average Temperature of Coefficient of Input Offset Voltage	$R_S = 50\Omega$, $T_A = 25^\circ\text{C}$ to $T_A = \text{max}$	1.8	10					$\mu\text{V}/^\circ\text{C}$
	$R_S = 50\Omega$, $T_A = 25^\circ\text{C}$ to $T_A = \text{min}$	1.8	10					
	$R_S = 10\text{k}$, $T_A = 25^\circ\text{C}$ to $T_A = \text{max}$	2.0	15					
	$R_S = 10\text{k}$, $T_A = 25^\circ\text{C}$ to $T_A = \text{min}$	6.0	15					
Average Temperature Coefficient of Input Offset Current	$T_A = +25^\circ\text{C}$ to max							nA/ $^\circ\text{C}$
	$T_A = +25^\circ\text{C}$ to min							
Input Voltage Range	$V_S = \pm 15\text{V}$	± 8.0	± 10		± 8.0	± 10		V
Output Voltage Swing	$V_S = \pm 15\text{V}$, $R_L \geq 10\text{k}\Omega$	± 12	± 14		± 12	± 14		V
	$V_S = \pm 15\text{V}$, $R_L \geq 2\text{k}\Omega$	± 10	± 13		± 10	± 13		
Input Resistance	$T_A = \text{min}$	50	125		35	125		k Ω
Common Mode Rejection Ratio	$R_S \leq 10\text{k}\Omega$	70	90		65	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10\text{k}\Omega$	25	150		25	200		$\mu\text{V}/\text{V}$
Supply Current	$V_S = \pm 15\text{V}$, $T_A = \text{max}$							mA
	$V_S = \pm 15\text{V}$, $T_A = \text{min}$							
Power Consumption	$V_S = \pm 15\text{V}$, $T_A = \text{max}$							mW
	$V_S = \pm 15\text{V}$, $T_A = \text{min}$							

NOTE:

Derate linearly the maximum power dissipation of the dual in-line package at 8.6mW/ $^\circ\text{C}$ for ambient temperature above +115°C, of the TO-5 package at 5.6mW/ $^\circ\text{C}$ for ambient temperature above +95°C and of the flat package at 5.4mW/ $^\circ\text{C}$ for ambient temperature above +103°C. For RC709, rating applies for case temperatures to +70°C.

