GENERAL DESCRIPTION

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

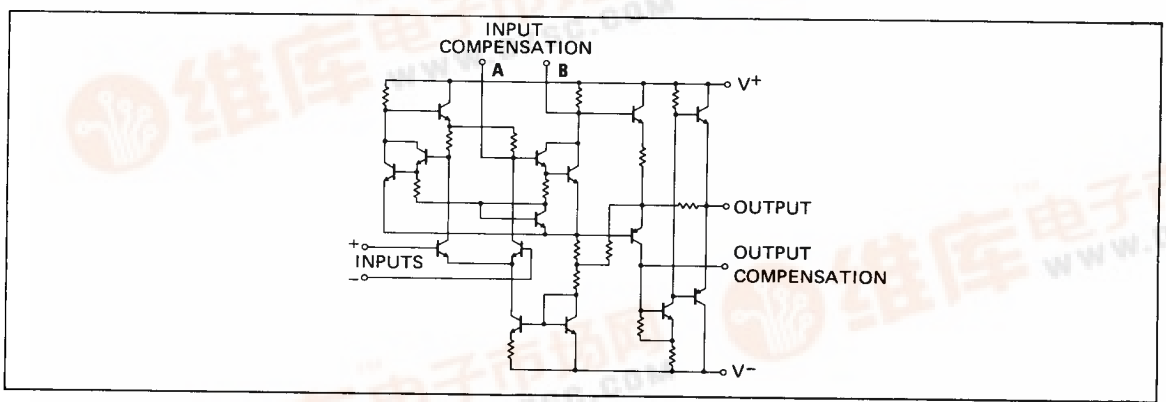
These devices are designed for use in operational amplifier signal processing, low level instrumentation, control systems and for the generation of special linear and non-linear transfer functions.

The RM709 operates over the full military temperature range from −55°C to +125°C. The RC709 is the commercial device intended to operate over a temperature range of 0°C to +70°C.

DESIGN FEATURES

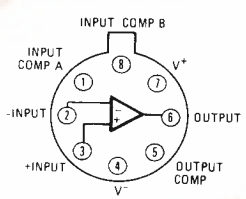
- Low Input Offset Voltage ±1.0mV Maximum
- Low Temperature Drift of Input Offset Voltage ±6μV/°C Maximum
- Low Temperature Drift of Input Offset Current
  (+25°C to +125°C) 0.3nA/°C Maximum
  (−55°C to +25°C) 1.0nA/°C Maximum
- Low Power Consumption 90mW Maximum
- High Performance Open Loop Gain Characteristics 45k Typical

SCHEMATIC DIAGRAM



CONNECTION INFORMATION

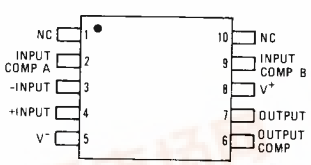
TE (TO-99)
Metal Can Package
(Top View)



NOTE: Pin 4 connected to case.

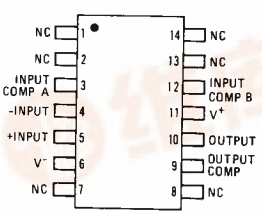
Order Part Nos.:
RM709T, RC709T

CQ
Flat Package
(Top View)



Order Part Nos.:
RM709CQ

DC
Dual In-line Package
(Top View)



NOTE: Pin 7 connected to bottom of package.

Order Part Nos.:
RM709DC, RC709DC

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... ±18V
Differential Input Voltage ..... ±5V
Input Voltage ..... ±10V
Power Dissipation (Note)
Dual In-line Package 300mW
TO-5 Package 300mW
Flat Package 250mW

Output Short-Circuit Duration (T_A = 25°C) ..... 5 sec
Storage Temperature Range ..... −65°C to +150°C
Operating Temperature Range
RM709/709A ..... −55°C to +125°C
RC709 ..... 0°C to +70°C
Lead Temperature (Soldering, 60s) ..... 300°C

ELECTRICAL CHARACTERISTICS ($\pm 9 \leq V_S \leq \pm 15V$, T_A = 25°C unless otherwise specified)

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

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