RC4741
General Purpose Operational Amplifier

Description

The RC4741 is a monolithic integrated circuit, consisting of four independent operational amplifiers constructed with the planar epitaxial process.

These amplifiers feature AC and DC performance which exceed that of the 741 type amplifiers. Its superior bandwidth, slew rate and noise characteristics make it an excellent choice for active filter or audio amplifier applications.

A wide range of supply voltages (±2V to ±20V) can be used to power the RC4741, making it compatible with almost any system including battery powered equipment.

Features

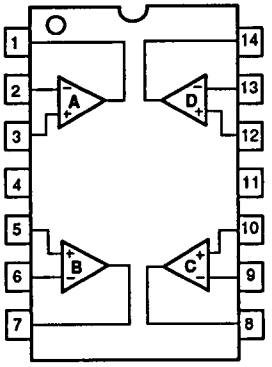
- Unity gain bandwidth — 3.5 MHz
- High slew rate — 1.6 V/μS
- Low noise voltage — 9 nV/$\sqrt{Hz}$
- Input offset voltage — 0.5 mV
- Input bias current — 60 nA
- Indefinite short circuit protection
- No crossover distortion
- Internal compensation
- Wide power supply range — ±2V to ±20V

Applications

- Universal active filters
- Audio amplifiers
- Battery powered equipment

Connection Information

14-Lead Dual In-Line Package
(Top View)



65-0418

Pin	Function
1	Output (A)
2	-Input (A)
3	+ Input (A)
4	$+V_S$
5	+Input (B)
6	-Input (B)
7	Output (B)
8	Output (C)
9	-Input (C)
10	+Input (C)
11	$-V_S$
12	+Input (D)
13	-Input (D)
14	Output (D)

Ordering Information

Part Number	Package	Operating Temperature Range
RC4741M	M	0°C to +70°C
RC4741N	N	0°C to +70°C
RM4741D	D	-55°C to +125°C
RM4741D/883B	D	-55°C to +125°C

Notes:
/883B suffix denotes Mil-Std-883, Level B processing
N = 14-lead plastic DIP
D = 14-lead ceramic DIP
M = 14-lead small outline

Absolute Maximum Ratings

Supply Voltage ..... ±20V
Differential Input Voltage 30V
Input Voltage[1] ..... ±15V
Output Short Circuit
Duration[2] ..... Indefinite
Storage Temperature
Range ..... -65°C to +150°C
Operating Temperature Range
RM4741 ..... -55°C to +125°C
RC4741 ..... 0°C to +70°C
Lead Soldering Temperature
(60 Sec, DIP) ..... +300°C
(10 Sec, SOIC) ..... +260°C

Notes:
1. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
2. Short circuit to ground on one amplifier only.

Thermal Characteristics

	14-Lead Small Outline	14-Lead Plastic DIP	14-Lead Ceramic DIP
Max. Junction Temp	+125°C	+125°C	+175°C
Max. P_D T_A,50°C	300 mW	468 mW	1042 mW
Therm. Res θ_{JC}	-	-	60°C/W
Therm Res. θ_{JC}	200°C/W	160°C/W	120°C/W
For T_A > 50°C Derate at	5.0 mW/°C	6.25 mW/°C	8.38 mW/°C

Electrical Characteristics

(V_S = ±15V and T_A = 25°C unless otherwise specified)

		RM4741			RC4741			
Parameters	**Test Conditions**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Units**
Input Offset Voltage	R_S ≤10kΩ		0.5	3.0		1.0	5.0	mV
Input Offset Current			15	30		30	50	nA
Input Bias Current			60	200		60	300	nA
Input Resistance			0.5			0.5		MΩ
Large Signal Voltage Gain	R_L ≥ 2kΩ V_{OUT} ±10V	50	100		25	50		V/mV
Input Voltage Range		±12			±12			V
Output Resistance			300			300		Ω
Output Current	V_{OUT} ±10V	±5	±15		±5	±15		mA
Common Mode Rejection Ratio	R_S ≤10kΩ ΔV = ±5	80			80			dB
Supply Current (All Amplifiers)			4.5	5.0		5.0	7.0	mA
Transient Response								
Rise Time			75			75		nS
Overshoot			25			25		%
Slew Rate			1.6			1.6		V/μS
Unity Gain Bandwidth			3.5			3.5		MHz
Power Bandwidth	V_{OUT} = 20Vp-p R_L = 2k		25			25		kHz
Input Noise Voltage Density	F=1kHz		9.0			9.0		nV/√Hz
Channel Separation			108			108		dB

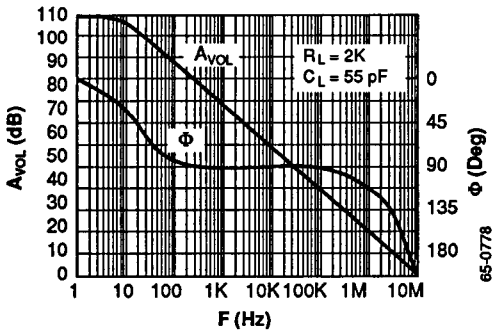
Electrical Characteristics

(VS = ±15V, RM = -55° C ≤ T_A ≤ +125° C, RC = 0°C ≤ T_A + 70°C)

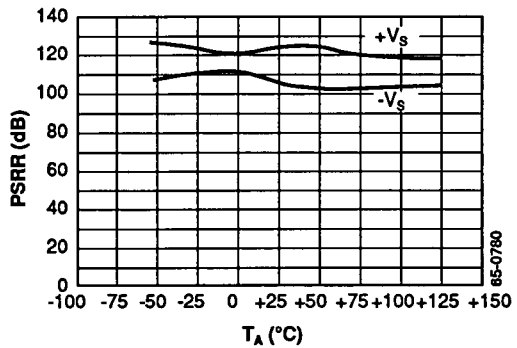
Parameters	Test Conditions	RM4741			RC4741			Units
		Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	R_S ≤ 10kΩ		4.0	5.0		5.0	6.5	mV
Input Offset Current				75			100	nA
Input Bias Current				325			400	nA
Large Signal Voltage Gain	R_L ≥ 2kΩ V_{OUT} ±10V	25			15			V/mV
Output Voltage Swing	R_L ≥ 10kΩ	±12	±13.7		±12	±13.7		V
	R_L ≥ 2kΩ	±10	±12.5		±10	±12.5		
Supply Current (All Amplifiers)			10			10		mA
Average Input Offset Voltage Drift			5.0			5.0		µV/°C
Common Mode Rejection Ratio	R_S ≤ 10kΩ ΔV ± 5.0V	74			74			dB
Power Supply Rejection Ratio	R_S ≤ 10kΩ ΔV ± 5.0V	80			80			dB

Typical Performance Characteristics

Open Loop Gain, Phase vs. Frequency

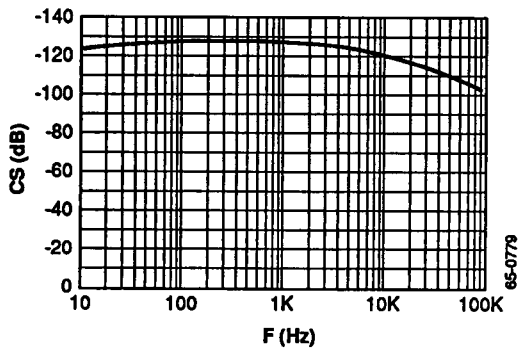


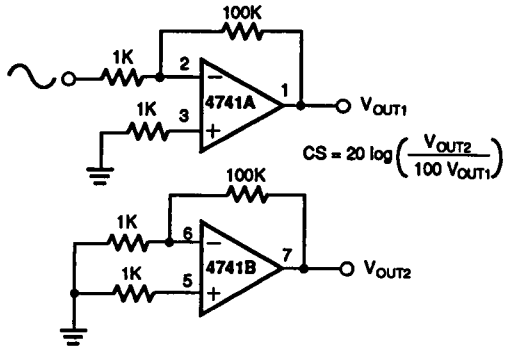
PSRR vs. Temperature



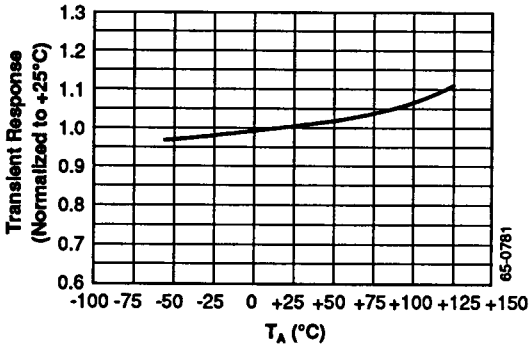
Typical Performance Characteristics (Continued)

Channel Separation vs. Frequency

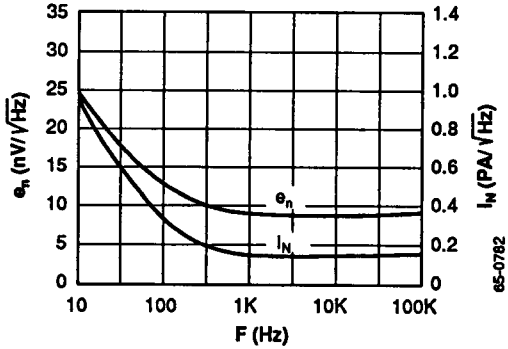




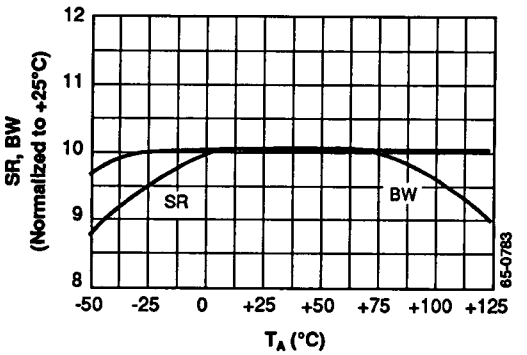
Transient Response vs. Temperature



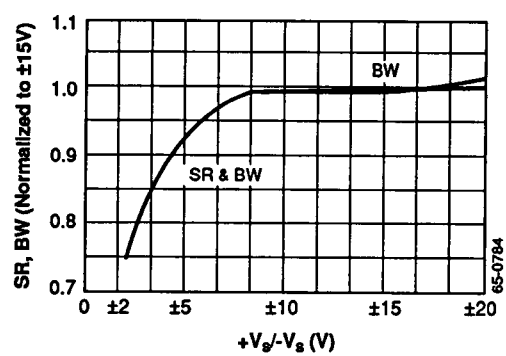
Input Noise Voltage vs. Frequency



Slew Rate, Bandwidth vs. Temperature



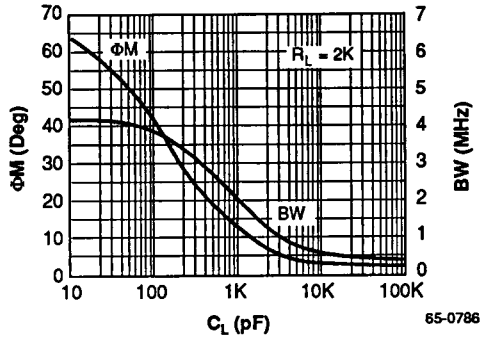
Slew Rate, Bandwidth vs. Supply Voltage



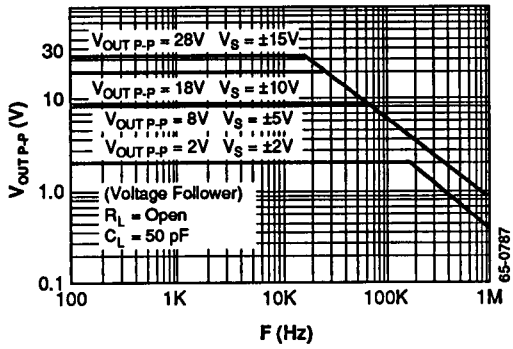
Linear

Typical Performance Characteristics (Continued)

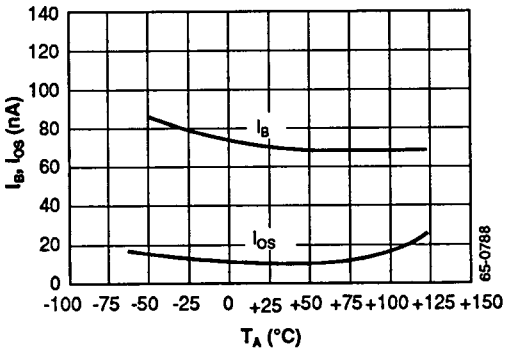
Small Signal Phase Margin, Unity Gain Bandwidth vs. Load Capacitance



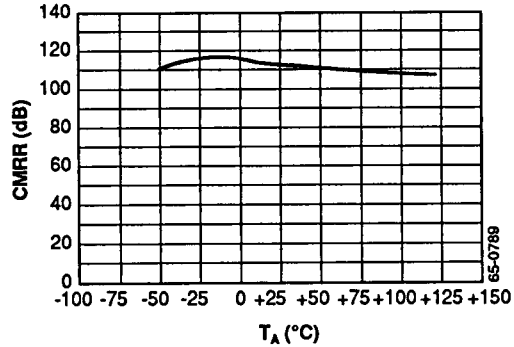
Output Voltage Swing vs. Frequency



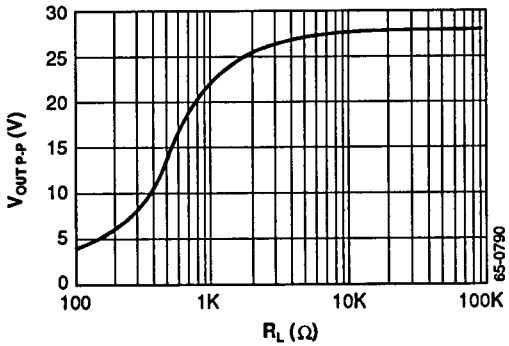
Input Bias, Offset Current vs. Temperature



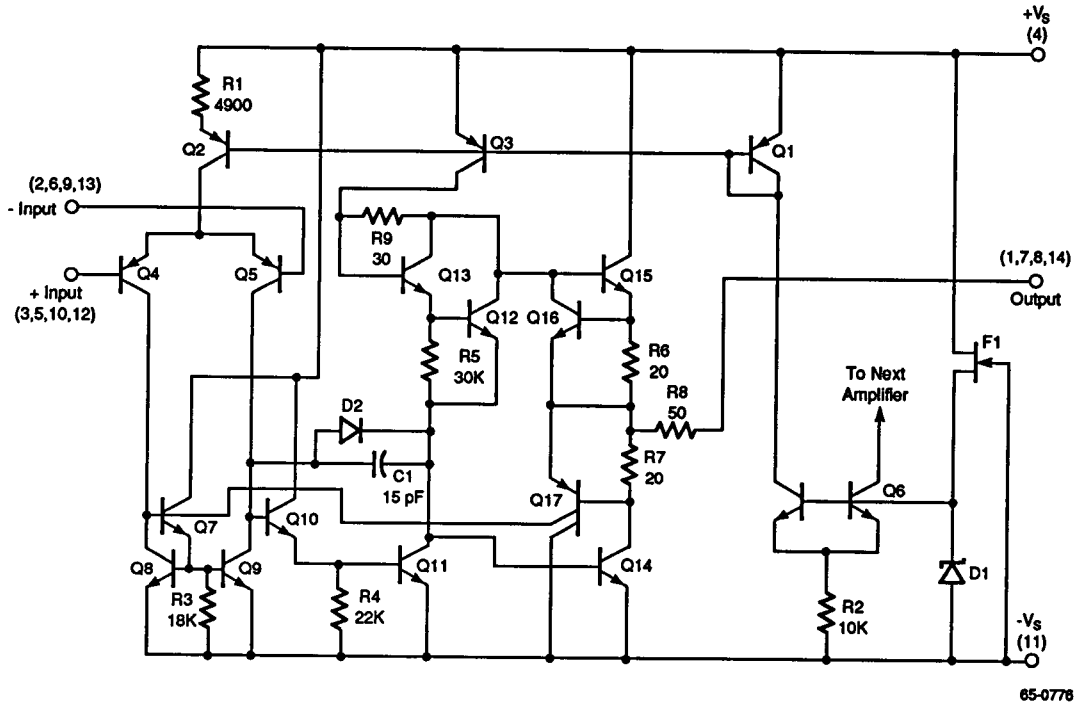
CMRR vs. Temperature



Output Voltage Swing vs. Load Resistance



Schematic Diagram (1/4 Shown)



Linear

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