

MC4741
MC4741C

(Quad MC1741)
Operational Amplifiers

The MC4741,C is a true quad MC1741. Integrated on a single monolithic chip are four independent, low power operational amplifiers which have been designed to provide operating characteristics identical to those of the industry standard MC1741, and can be applied with no change in circuit performance.

The MC4741,C can be used in applications where amplifier matching or high packing density is important. Other applications include high impedance buffer amplifiers and active filter amplifiers.

- Each Amplifier is Functionally Equivalent to the MC1741
- Class AB Output Stage Eliminates Crossover Distortion
- True Differential Inputs
- Internally Frequency Compensated
- Short Circuit Protection
- Low Power Supply Current (0.6 mA/Amplifier)

(QUAD MC1741)
DIFFERENTIAL INPUT
OPERATIONAL AMPLIFIERS

SILICON MONOLITHIC
INTEGRATED CIRCUIT



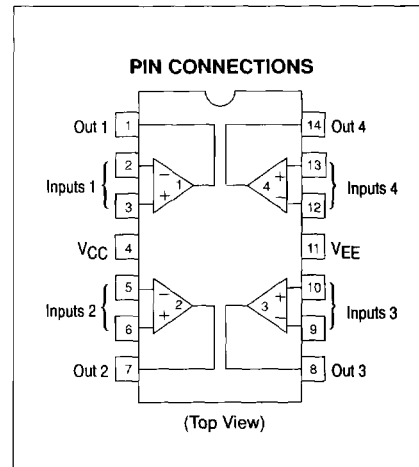
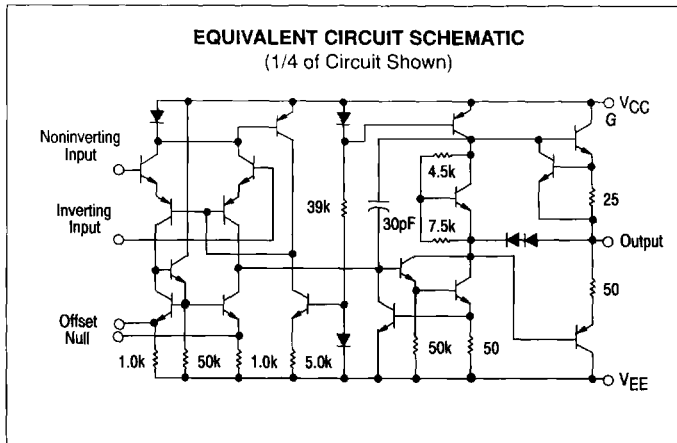
L SUFFIX
 CERAMIC PACKAGE
 CASE 632



P SUFFIX
 PLASTIC PACKAGE
 CASE 646



D SUFFIX
 PLASTIC PACKAGE
 CASE 751A
 (SO-14)



ORDERING INFORMATION

Device	Temperature Range	Package
MC4741L	-55° to +125°C	Ceramic DIP
MC4741CD	0° to +70°C	SO-14
MC4741CL		Ceramic DIP
MC4741CP		Plastic DIP

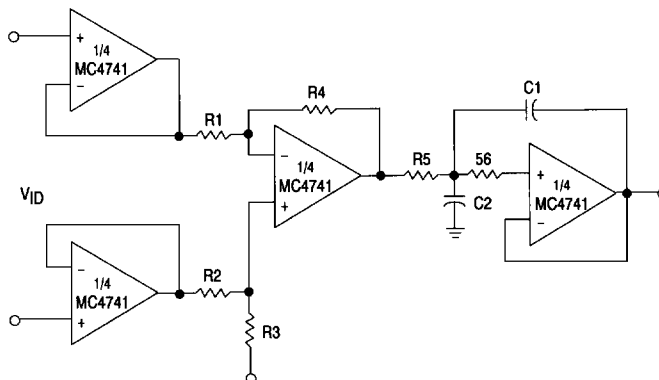
MC4741, MC4741C

2

MAXIMUM RATINGS ($T_A = +25^\circ\text{C}$, unless otherwise noted.)

Rating	Symbol	MC4741	MC4741C	Unit
Power Supply Voltage	V_{CC}	+22	+18	Vdc
	V_{EE}	-22	-18	
Input Differential Voltage	V_{ID}	± 44	± 36	V
Input Common Mode Voltage	V_{ICM}	± 22	± 18	V
Output Short Circuit Duration	t_{SC}	Continuous		
Operating Ambient Temperature Range	T_A	-55 to +125	0 to +70	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	Ceramic Package		$^\circ\text{C}$
		Plastic Package		
Junction Temperature	T_J	Ceramic Package		$^\circ\text{C}$
		Plastic Package		

High Impedance Instrumentation Buffer/Filter



MC4741, MC4741C

ELECTRICAL CHARACTERISTICS ($V_{CC} = +15$ V, $V_{EE} = -15$ V, $T_A = 25^\circ\text{C}$, unless otherwise noted.)

Characteristics	Symbol	MC4741			MC4741C			Unit
		Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage ($R_S \leq 10$ k)	V_{IO}	—	1.0	5.0	—	2.0	6.0	mV
Input Offset Current	I_{IO}	—	20	200	—	20	200	nA
Input Bias Current	I_{IB}	—	80	500	—	80	500	nA
Input Resistance	r_i	0.3	2.0	—	0.3	2.0	—	M Ω
Input Capacitance	C_i	—	1.4	—	—	1.4	—	pF
Offset Voltage Adjustment Range	V_{IOR}	—	± 15	—	—	± 15	—	mV
Common Mode Input Voltage Range	V_{ICR}	± 12	± 13	—	± 12	± 13	—	V
Large Signal Voltage Gain ($V_O = \pm 10$ V, $R_L \geq 2.0$ k)	A_V	50	200	—	20	200	—	V/mV
Output Resistance	r_o	—	75	—	—	75	—	Ω
Common Mode Rejection ($R_S \leq 10$ k)	CMR	70	90	—	70	90	—	dB
Supply Voltage Rejection Ratio ($R_S \leq 10$ k)	PSRR	—	30	150	—	30	150	$\mu\text{V/V}$
Output Voltage Swing ($R_L \geq 10$ k) ($R_L \geq 2$ k)	V_O	± 12 ± 10	± 14 ± 13	—	± 12 ± 10	± 14 ± 13	—	V
Output Short Circuit Current	I_{SC}	—	20	—	—	20	—	mA
Supply Current — (All Amplifiers)	I_D	—	2.4	4.0	—	3.5	7.0	mA
Power Consumption (All Amplifiers)	P_C	—	72	120	—	105	210	mW
Transient Response (Unity Gain — Non-Inverting) ($V_i = 20$ mV, $R_L \geq 2$ k Ω , $C_L \leq 100$ pF) Rise Time ($V_i = 20$ mV, $R_L \geq 2$ k Ω , $C_L \leq 100$ pF) Overshoot ($V_i = 10$ V, $R_L \geq 2$ k Ω , $C_L \leq 100$ pF) Slew Rate	t_{LH} os SR	—	0.3 15 0.5	—	—	0.3 15 0.5	—	μs % V/ μs

ELECTRICAL CHARACTERISTICS ($V_{CC} = +15$ V, $V_{EE} = -15$ V, $T_A = * T_{high}$ to T_{low} , unless otherwise noted.)

Characteristics	Symbol	MC4741			MC4741C			Unit
		Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage ($R_S \leq 10$ k Ω)	V_{IO}	—	1.0	6.0	—	—	7.5	mV
Input Offset Current ($T_A = 125^\circ\text{C}$) ($T_A = -55^\circ\text{C}$) ($T_A = 0^\circ$ to $+70^\circ\text{C}$)	I_{IO}	—	7.0 85 —	200 500 —	—	—	— — 300	nA
Input Bias Current ($T_A = 125^\circ\text{C}$) ($T_A = -55^\circ\text{C}$) ($T_A = 0^\circ$ to $+70^\circ\text{C}$)	I_{IB}	—	30 300 —	500 1500 —	—	—	— — 800	nA
Common Mode Input Voltage Range	V_{ICR}	± 12	± 13	—	—	—	—	V
Large Signal Voltage Gain ($R_L \geq 2$ k, $V_{OUT} = \pm 10$ V)	A_V	25	—	—	15	—	—	V/mV
Common Mode Rejection ($R_S \leq 10$ k)	CMR	70	90	—	—	—	—	dB
Supply Voltage Rejection Ratio ($R_S \leq 10$ k)	PSRR	—	30	150	—	—	—	$\mu\text{V/V}$
Output Voltage Swing ($R_L \geq 10$ k) ($R_L \geq 2$ k)	V_O	± 12 ± 10	± 14 ± 13	—	± 10 ± 13	—	—	V
Supply Currents — (All Amplifiers) ($T_A = 125^\circ\text{C}$) ($T_A = -55^\circ\text{C}$)	I_D	—	2.4 3.6	3.4 5.0	—	—	—	mA
Power Consumption ($T_A = +125^\circ\text{C}$) ($T_A = -55^\circ\text{C}$)	P_C	—	72 108	102 150	—	—	—	mW

* $T_{high} = 125^\circ\text{C}$ for MC4741 and 70°C for MC4741C.
 $T_{low} = -55^\circ\text{C}$ for MC4741 and 0°C for MC4741C.

MC4741, MC4741C

2

**Figure 1. Power Bandwidth
(Large Signal Swing versus Frequency)**

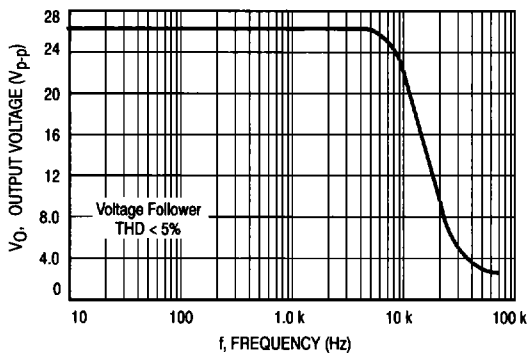
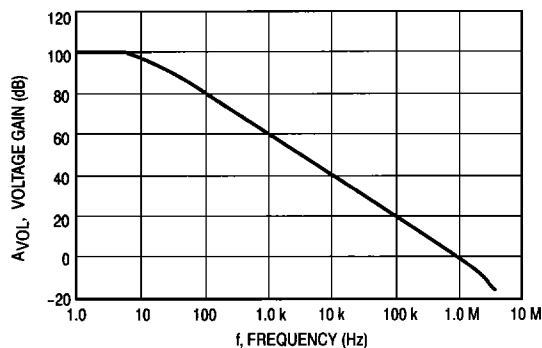
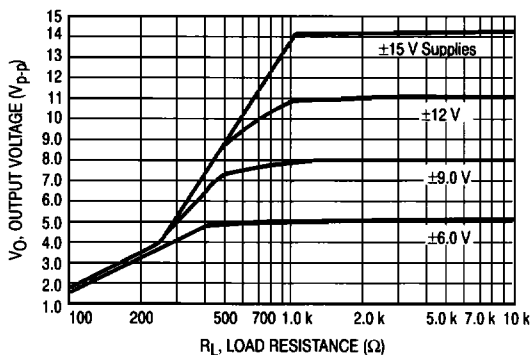


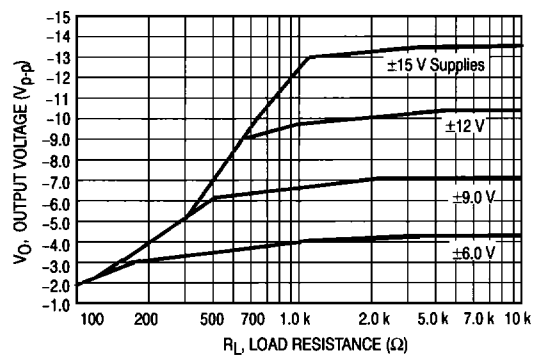
Figure 2. Open-Loop Frequency Response



**Figure 3. Positive Output Voltage Swing
versus Load Resistance**



**Figure 4. Negative Output Voltage Swing
versus Load Resistance**



**Figure 5. Output Voltage Swing versus
Load Resistance (Single Supply Operation)**

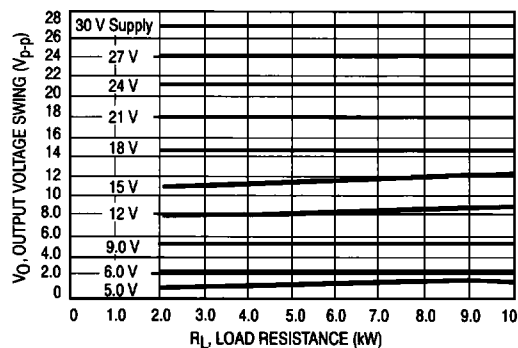
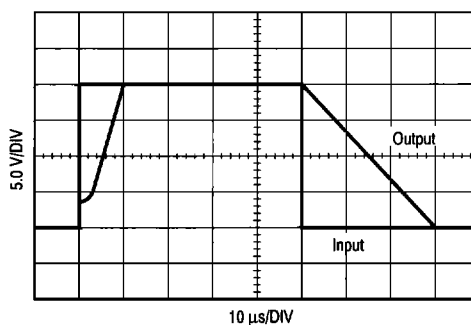


Figure 6. Noninverting Pulse Response



MC4741, MC4741C

Figure 7. Bi-Quad Filter

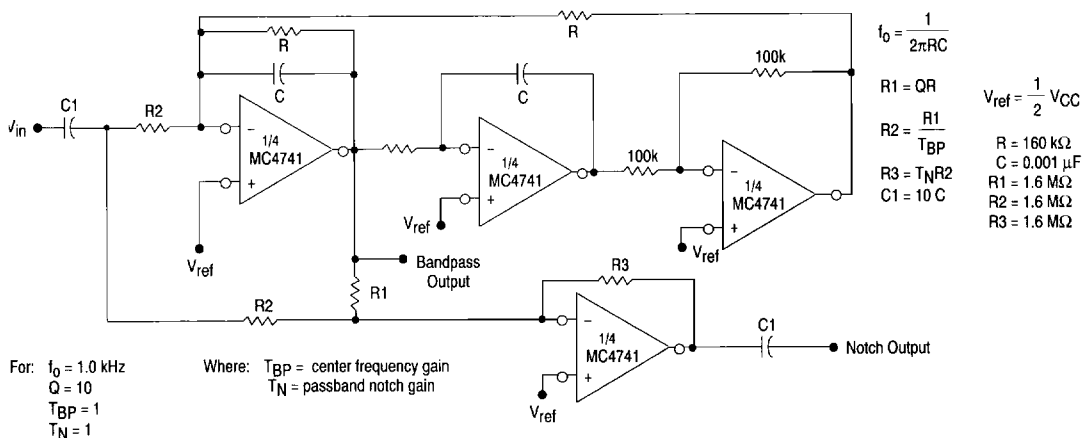


Figure 8. Open-Loop Voltage Gain versus Supply Voltage

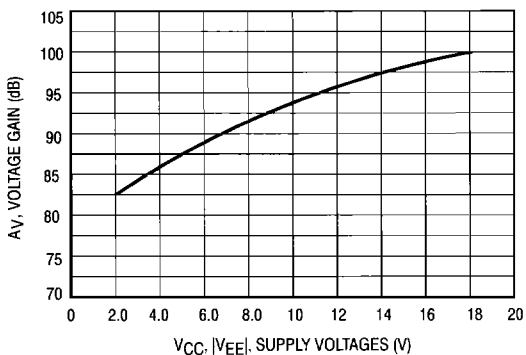


Figure 9. Transient Response Test Circuit

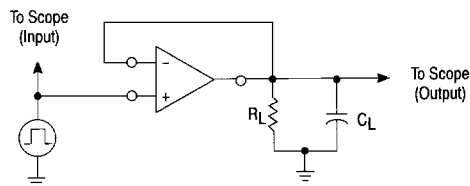


Figure 10. Absolute Value DVM Front End

