



MOTOROLA

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MC1748C

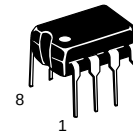
High Performance Operational Amplifier

The MC1748C is designed for use as a summing amplifier, integrator, or amplifier with operating characteristics as a function of the external feedback components.

- Noncompensated MC1741C
- Single 30 pF Capacitor Compensation Required for Unity Gain
- Short Circuit Protection
- Offset Voltage Null Capability
- Wide Common Mode and Differential Voltage Ranges
- Low Power Consumption
- No Latch Up

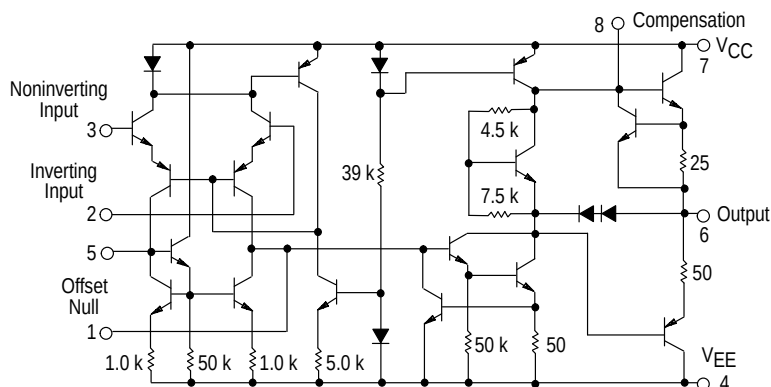
OPERATIONAL AMPLIFIER

SEMICONDUCTOR TECHNICAL DATA

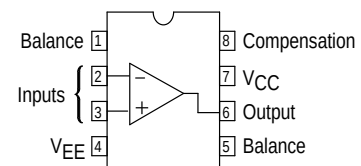


P1 SUFFIX
PLASTIC PACKAGE
CASE 626

Representative Schematic Diagram



PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC1748CP1	T _A = 0° to +70°C	Plastic DIP

Typical Compensation Circuits

Figure 1. Offset Adjust and Frequency Compensation

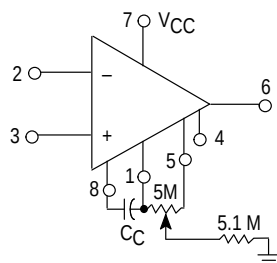


Figure 2. Single-Pole Compensation

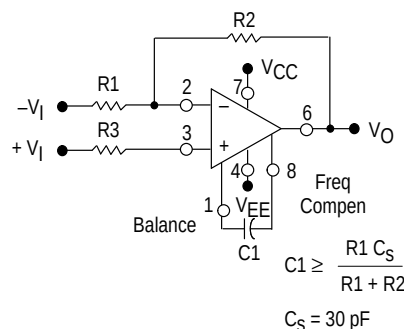
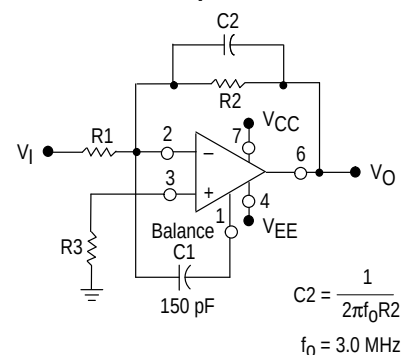


Figure 3. Feedforward Compensation



MC1748C

MAXIMUM RATINGS (T_A = +25°C, unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	V _{CC} V _{EE}	+18 –18	Vdc
Differential Input Signal	V _{in}	±30	V
Common Mode Input Swing (Note 1)	V _{ICR}	±15	V
Output Short Circuit Duration	t _{SC}	Continuous	
Power Dissipation (Package Limitation) Derate above T _A = +25°C	P _D	680 4.6	mW mW/°C
Operating Temperature Range	T _A	0 to +70	°C
Storage Temperature Range	T _{stg}	–65 to +150	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = +15 Vdc, V_{EE} = –15 V, T_A = +25°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Input Bias Current T _A = +25°C T _A = T _{low} to T _{high} (Note 2)	I _{IB}	– –	0.08 –	0.5 0.8	μAdc
Input Offset Current T _A = +25°C T _A = T _{low} to T _{high}	I _{IO}	– –	0.02 –	0.2 0.3	μAdc
Input Offset Voltage (R _S ≤ 10 k Ω) T _A = +25°C T _A = T _{low} to T _{high}	V _{IO}	– –	1.0 –	6.0 7.5	mVdc
Differential Input Impedance (Open Loop, f = 20 Hz) Parallel Input Resistance Parallel Input Capacitance	R _p C _p	0.3 –	2.0 1.4	– –	MΩ pF
Common Mode Input Impedance (f = 20 Hz)	z _{in}	–	200		MΩ
Common Mode Input Voltage Swing	V _{ICR}	±12	±13	–	V _{pk}
Common Mode Rejection (f = 100 Hz)	CMR	70	90	–	dB
Open Loop Voltage Gain, (V _O = ±10 V, R _L = 2.0 kΩ) T _A = +25°C T _A = T _{low} to T _{high}	A _{VOL}	20,000 15,000	200,000 –	– –	V/V
Step Response (V _{in} = 20 mV, C _c = 30 pF, R _L = 2.0 kΩ, C _L = 100 pF) Rise Time Overshoot Slew Rate	t _r o _s dV _{out} /dt	– – –	0.3 5.0 0.8	– – –	μs % V/μs
Output Impedance (f = 20 Hz)	z _O	–	75	–	Ω
Short Circuit Output Current	I _{sc}	–	25	–	mAdc
Output Voltage Swing (R _L = 10 kΩ) R _L = 2 kΩ (T _A = T _{low} to T _{high})	V _O	±12 ±10	±14 ±13	– –	V _{pk}
Power Supply Sensitivity V _{EE} = constant, R _S ≤ 10 kΩ V _{CC} = constant, R _S ≤ 10 kΩ	PSR+ PSR–	75 75	– –	– –	dB
Power Supply Current	I _D + I _D –	– –	1.67 1.67	2.83 2.83	mAdc
DC Quiescent Power Dissipation (V _O = 0 V)	P _D	–	50	85	mW

NOTES: 1. For supply voltages of less than ±15 V, the maximum input voltage is equal to the supply voltage.
2. T_{low} = 0°C T_{high} = +70°C

Figure 4. Minimum Input Voltage Range

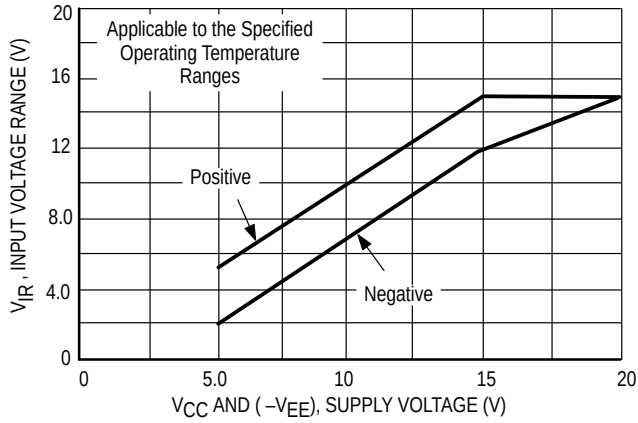


Figure 5. Minimum Output Voltage Swing

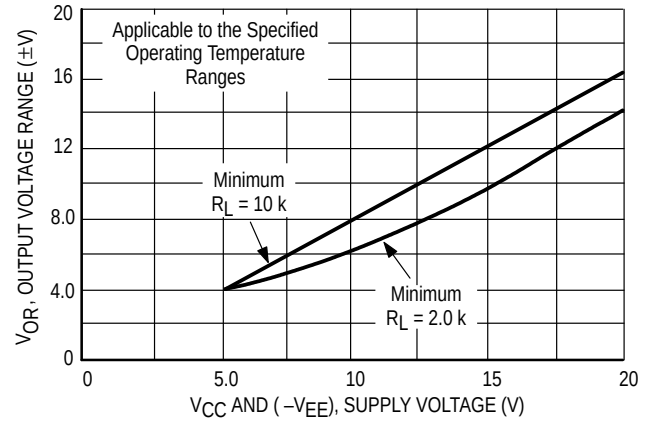


Figure 6. Minimum Voltage Gain

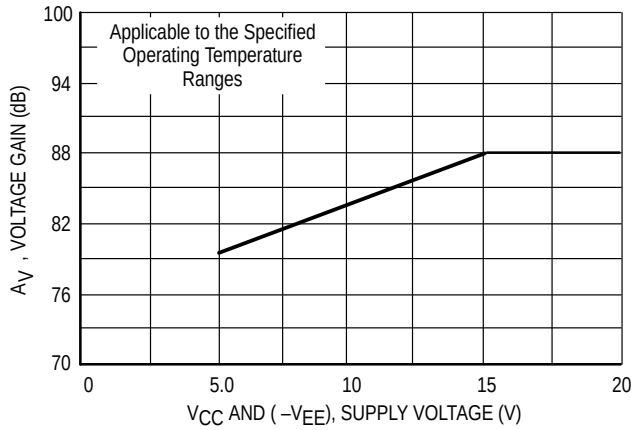


Figure 7. Typical Supply Currents

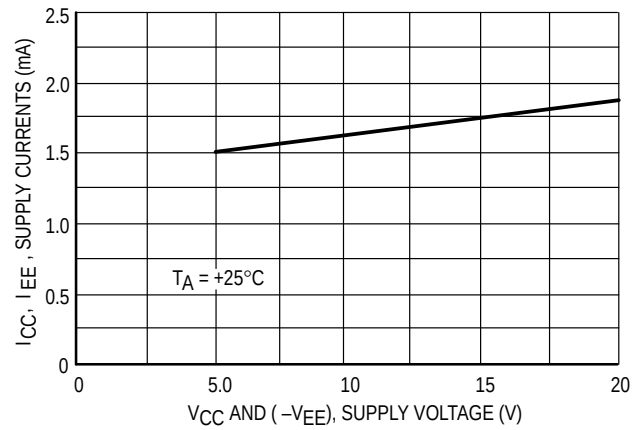


Figure 8. Open Loop Frequency Response

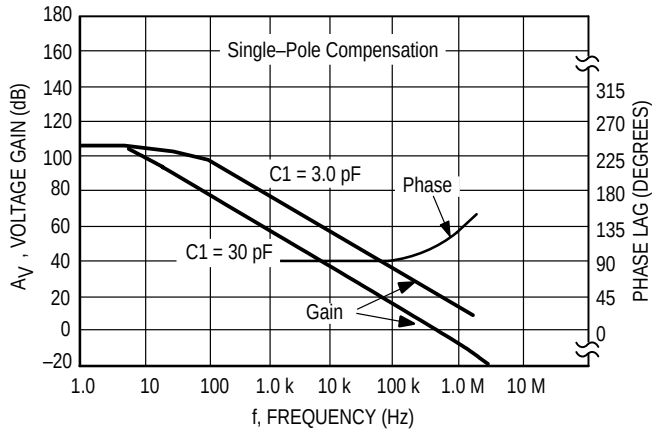


Figure 9. Large-Signal Frequency Response

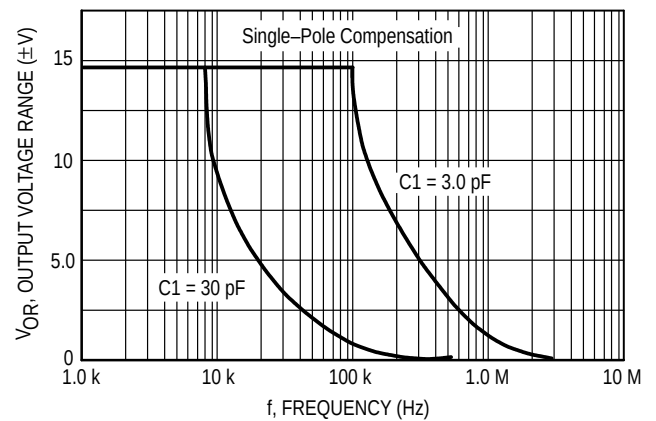


Figure 10. Voltage Follower Pulse Response

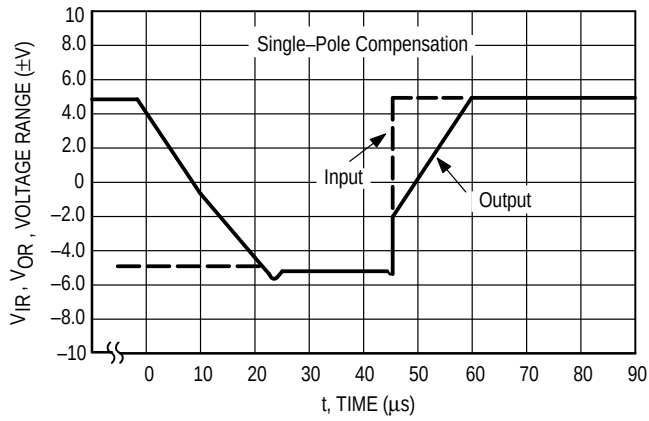


Figure 11. Open Loop Frequency Response

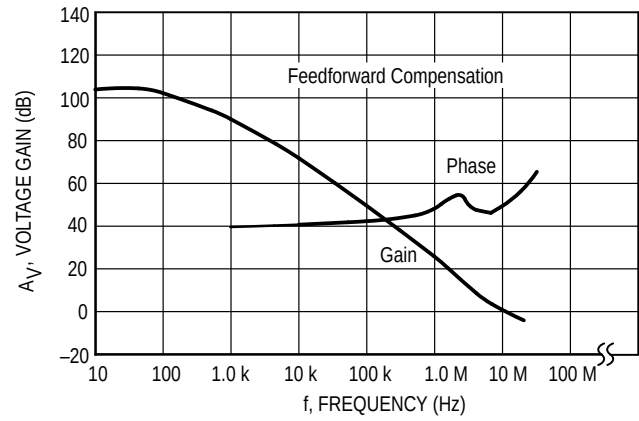


Figure 12. Large-Signal Frequency Response

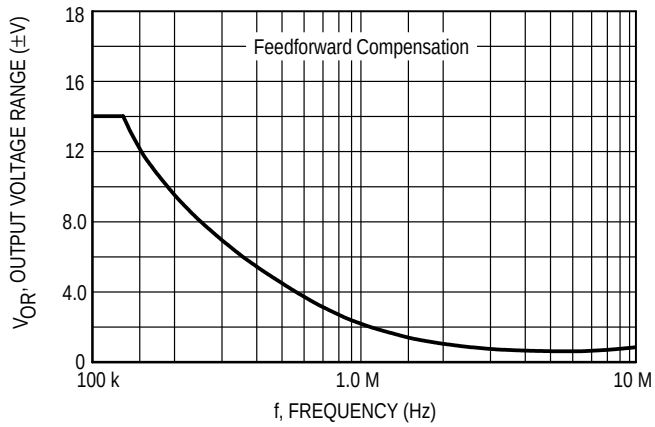
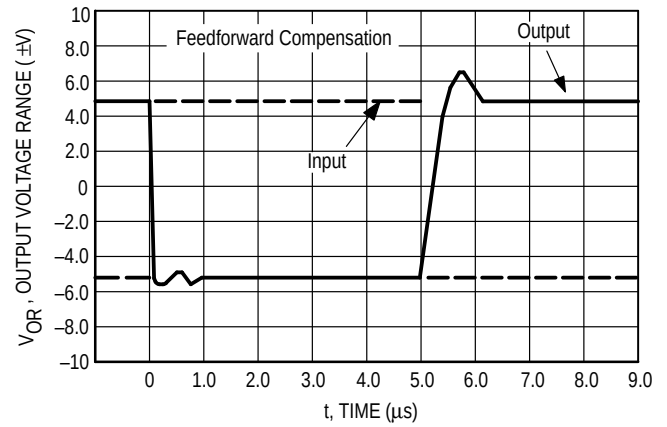


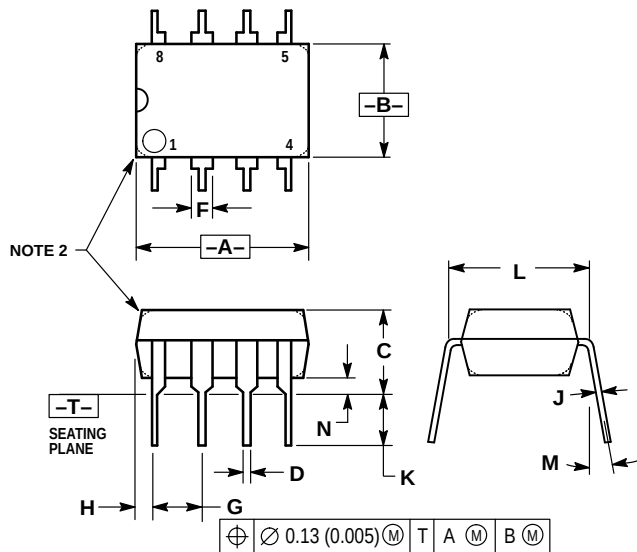
Figure 13. Inverter Pulse Response



MC1748C

OUTLINE DIMENSIONS

P1 SUFFIX
PLASTIC PACKAGE
CASE 626-05
ISSUE K



- NOTES:
- 1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
 - 2. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
 - 3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	0.76	1.27	0.030	0.050
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	10°		10°	
N	0.76	1.01	0.030	0.040

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