Order this document by MCT4558C/D

MOTOROLA

Dual Wide Bandwidth Operational Amplifier

The MCT4558C combines all of the outstanding features of the MC1458 and, in addition, offers three times the unity gain bandwidth of the industry standard.

- 2.0 MHz Unity Gain Bandwidth Guaranteed
- Internally Compensated
- Short Circuit Protection
- Gain and Phase Match Between Amplifiers
- Low Power Consumption

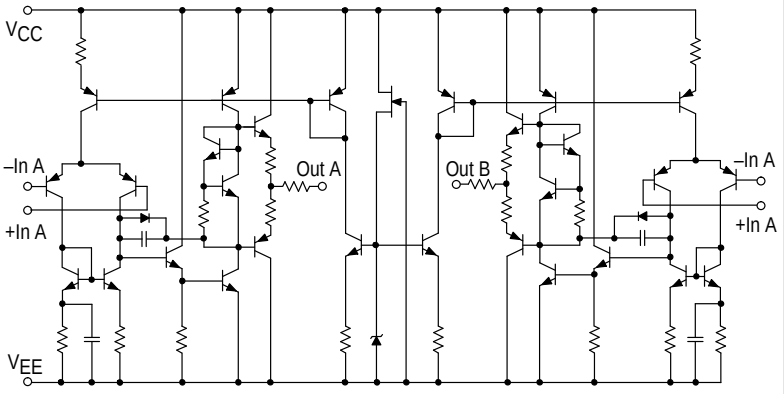
This MCT-prefixed device is intended to be a possible replacement for the similar device with the MC-prefix. Because the MCT device originates from different source material, there may be subtle differences in typical parameter values or characteristic curves. Due to the diversity of potential applications, Motorola can not assure identical performance in all circuits. Motorola recommends that the customer qualify the MCT-prefixed device in each potential application.

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

Rating	Symbol	Value	Unit
Power Supply Voltages	V_{CC} V_{EE}	+18 –18	Vdc
Input Differential Voltage	V_{ID}	±30	V
Input Common Mode Voltage (Note 1)	V_{ICM}	±15	V
Output Short Circuit Duration (Note 2)	t_{SC}	Continuous	
Ambient Temperature Range	T_A	0 to +70	°C
Storage Temperature Range	T_{stg}	–55 to +125	°C
Junction Temperature	T_J	150	°C

NOTES: 1. For supply voltages less than ±15 V, the absolute maximum input voltage is equal to the supply voltage.
2. Short circuit may be to ground or either supply.

Representative Schematic Diagram



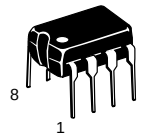
This device contains 29 active transistors.

CAUTION: These devices do not have internal ESD protection circuitry and are rated as CLASS 1 devices per the ESD test method in Mil-Std-833D. They should be handled using standard ESD prevention methods to avoid damage to the device.

MCT4558C

DUAL WIDE BANDWIDTH OPERATIONAL AMPLIFIER

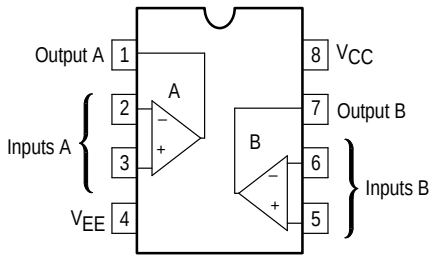
SEMICONDUCTOR TECHNICAL DATA



P1 SUFFIX
PLASTIC PACKAGE
CASE 626

D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO-8)

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

Device	Tested Operating Temperature Range	Package
MCT4558CD	T_A = 0° to +70°C	SO-8
MCT4558CPI		Plastic DIP

FREQUENCY CHARACTERISTICS (V_{CC} = +15 V, V_{EE} = –15 V, T_A = 25°C)

Characteristic	Symbol	Min	Typ	Max	Unit
Unity Gain Bandwidth	BW	2.0	2.8	—	MHz

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

Input Offset Voltage ($R_S \le 10$ kΩ)	V_{IO}	—	2.0	6.0	mV
Input Offset Current	I_{IO}	—	20	200	nA
Input Bias Current (Note 1)	I_{IB}	—	80	500	nA
Common Mode Input Voltage Range	V_{ICR}	±12	±13	—	V
Large Signal Voltage Gain (V_O = ±10 V, R_L = 2.0 kΩ)	A_{VOL}	20	200	—	V/mV
Common Mode Rejection ($R_S \le 10$ kΩ)	CMR	70	90	—	dB
Supply Voltage Rejection Ratio ($R_S \le 10$ kΩ)	PSRR	—	30	150	μV/V
Output Voltage Swing ($R_L \ge 10$ kΩ) ($R_L \ge 2.0$ kΩ)	V_O	 ±12 ±10	 ±14 ±13	 — —	V
Output Short Circuit Current	I_{SC}	10	20	75	mA
Supply Currents (Both Amplifiers)	I_D	—	4.0	5.6	mA
Power Consumption (Both Amplifiers)	P_C	—	70	170	mW
Transient Response (Unity Gain) (V_I = 20 mV, $R_L \ge 2.0$ kΩ, $C_L \le 100$ pF) Rise Time (V_I = 20 mV, $R_L \ge 2.0$ kΩ, $C_L \le 100$ pF) Overshoot (V_I = 10 V, $R_L \ge 2.0$ kΩ, $C_L \le 100$ pF) Slew Rate	 t_{TLH} os SR	 — — 1.0	 0.3 15 1.8	 — — —	 μs % V/μs

ELECTRICAL CHARACTERISTICS (V_{CC} = +15 V, V_{EE} = –15 V, T_A = T_{high} to T_{low}, [Note 2] unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Input Offset Voltage ($R_S \le 10$ kΩ)	V_{IO}	—	—	7.5	mV
Input Offset Current (T_A = 0° to +70°C)	I_{IO}	—	—	300	nA
Input Bias Current (T_A = 0° to +70°C)	I_{IB}	—	—	800	nA
Large Signal Voltage Gain (V_O = ±10 V, R_L = 2.0 kΩ)	A_{VOL}	15	—	—	V/mV
Output Voltage Swing ($R_L \ge 10$ kΩ) ($R_L \ge 2.0$ kΩ)	V_O	 ±12 ±10	 ±14 ±13	 — —	V
Supply Currents (Both Amplifiers) ($T_A = T_{high}$) ($T_A = T_{low}$)	I_D	 — —	 — —	 5.0 6.7	mA
Power Consumption (Both Amplifiers) ($T_A = T_{high}$) ($T_A = T_{low}$)	P_C	 — —	 — —	 150 200	mW

NOTES: 1. I_{IB} is out of the amplifier due to PNP input transistors.

2. T_{low} = 0°C T_{high} = +70°C

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

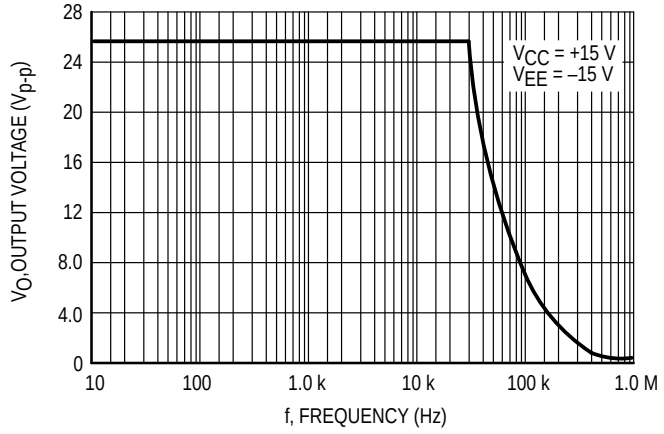


Figure 2. Maximum Output Voltage Swing versus Load Resistance

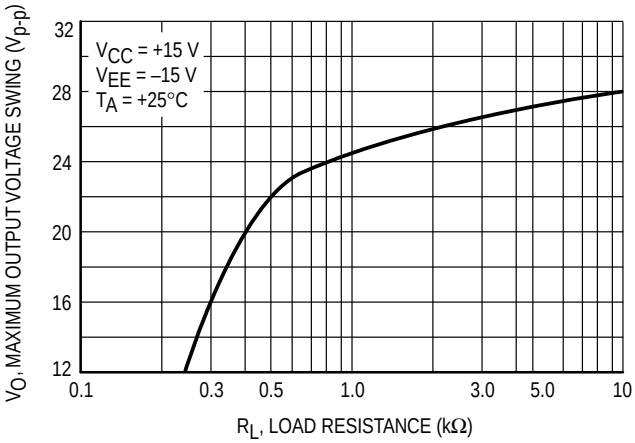


Figure 3. Equivalent Input Noise Voltage versus Frequency

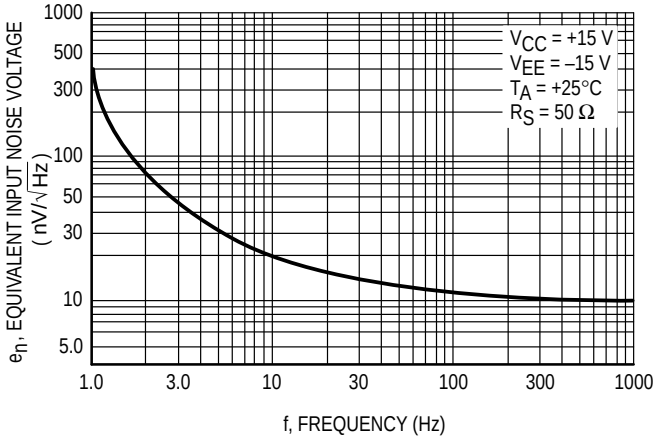


Figure 4. Input Bias Current versus Ambient Temperature

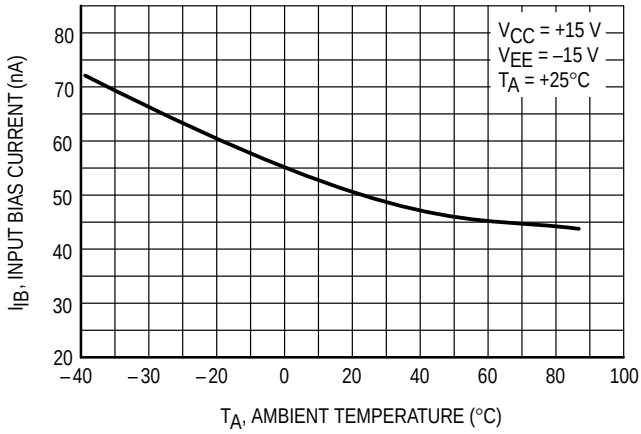


Figure 5. Voltage Gain and Phase versus Frequency

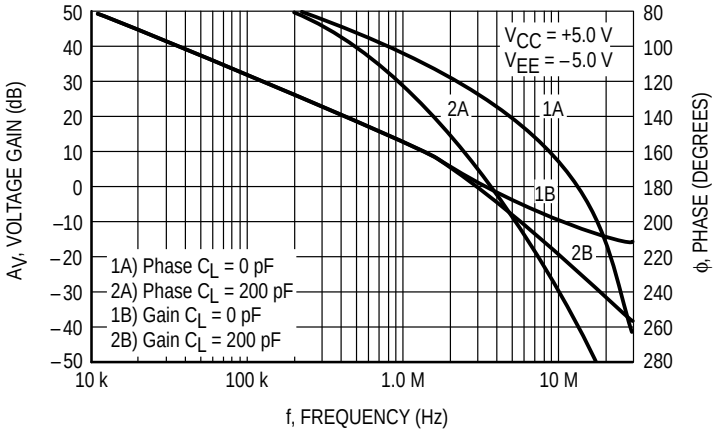
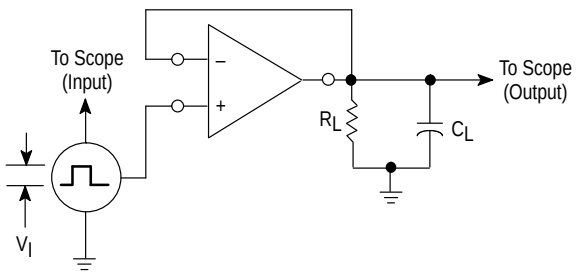
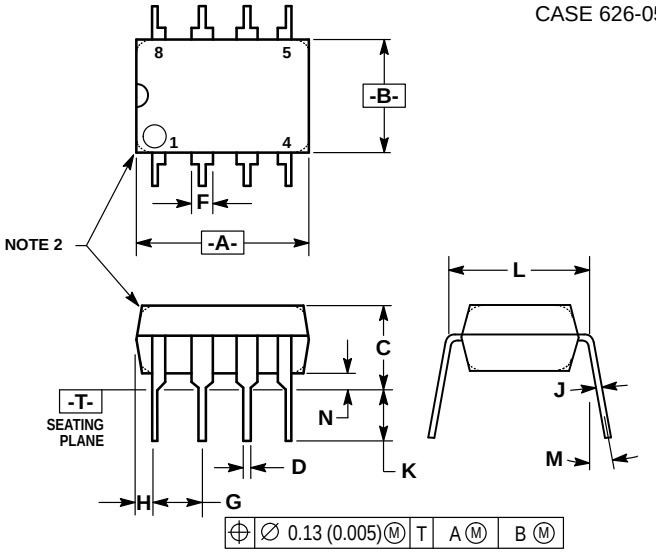


Figure 6. Transient Response Test Circuit



OUTLINE DIMENSIONS

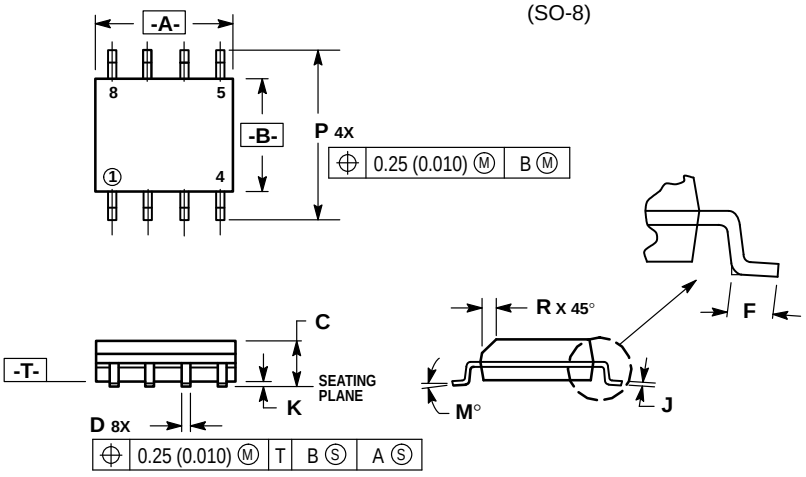
P1 SUFFIX
PLASTIC PACKAGE
CASE 626-05



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.

	MILLIMETERS		INCHES	
DIM	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

D SUFFIX
PLASTIC PACKAGE
CASE 751-05
(SO-8)



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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