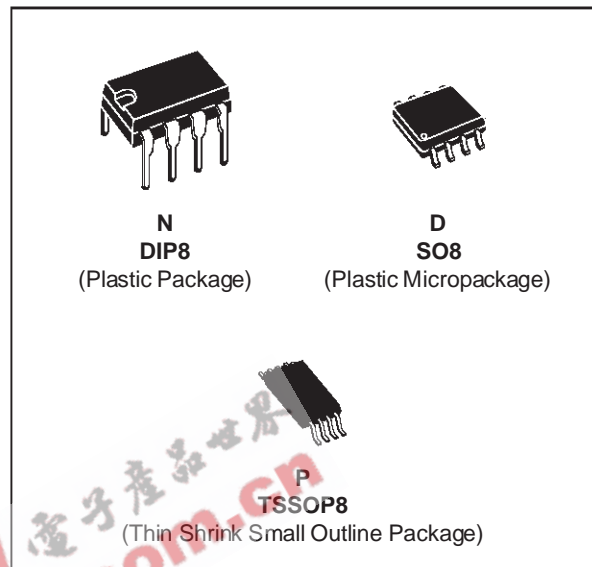




MC4558

WIDE BANDWIDTH DUAL BIPOLAR OPERATIONAL AMPLIFIERS

- INTERNALLY COMPENSATED
- SHORT-CIRCUIT PROTECTION
- GAIN AND PHASE MATCH BETWEEN AMPLIFIERS
- LOW POWER CONSUMPTION
- PIN TO PIN COMPATIBLE WITH MC1458/LM358
- GAIN BANDWIDTH PRODUCT (at 100kHz) 5.5MHz



DESCRIPTION

The MC4558 is a high performance monolithic dual operational amplifier.

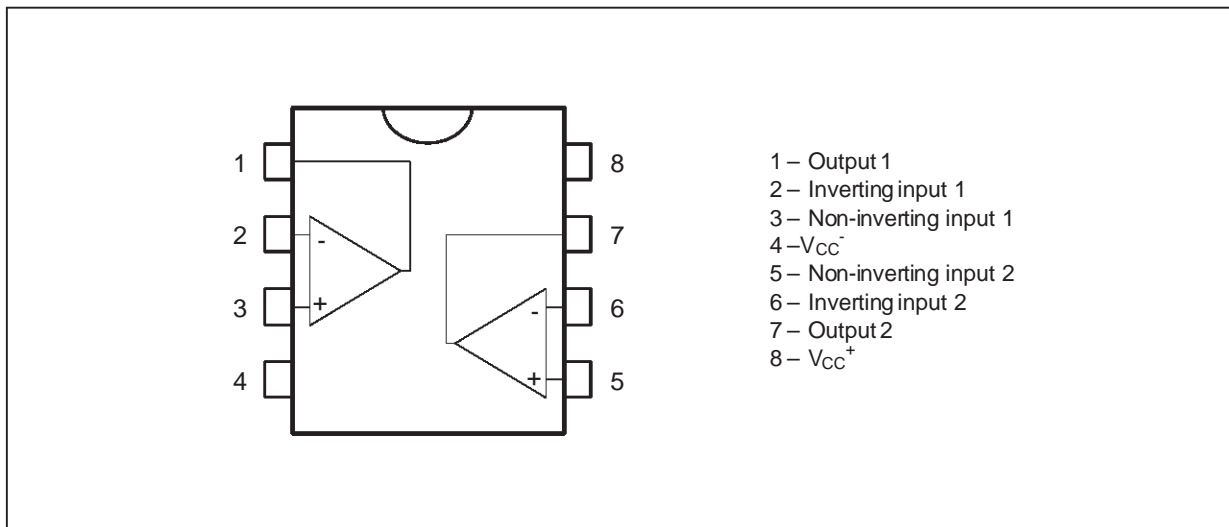
The circuit combines all the outstanding features of the MC1458 and, in addition, possesses three times the unity gain bandwidth of the industry standard.

ORDER CODES

| Part Number | Temperature Range | Package | | |
|-------------|-------------------|---------|---|---|
| | | N | D | P |
| MC4558C | 0°C, +70°C | • | • | • |
| MC4558I | -40°C, +105°C | • | • | • |

Example : MC4558CN

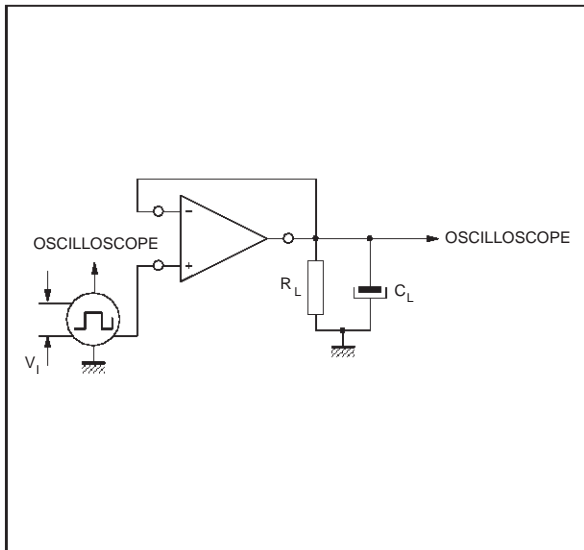
PIN CONNECTIONS (top view)



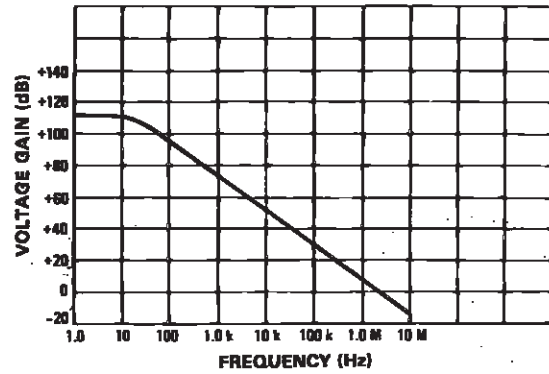
ELECTRICAL CHARACTERISTICSV_{CC} = ±15V, T_{amb} = 25°C (unless otherwise specified)

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|------------|------------------------|
| V _{io} | Input Offset Voltage (R _S ≤ 10 kΩ) T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | 1 | 5 6 | mV |
| I _{io} | Input Offset Current T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | 20 | 100 200 | nA |
| I _{ib} | Input Bias Current T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | 50 | 400 500 | nA |
| A _{vd} | Large Signal Voltage Gain (V _O = ±10V, R _L = 2kΩ) T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | 50 25 | 200 | | V/mV |
| SVR | Supply Voltage Rejection Ratio (R _S ≤ 10kΩ) T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | 77 77 | 90 | | dB |
| I _{CC} | Supply Current, all Amp, no Load T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | 2.3 | 4.5 6 | mA |
| V _{icm} | Input Common Mode Voltage Range T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | | | V |
| CMR | Common-mode Rejection Ratio (R _S ≤ 10kΩ) T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | 90 | | dB |
| I _{os} | Output Short-circuit Current | 10 | 20 | 40 | mA |
| V _o | Output Voltage Swing T _{amb} = 25°C T _{min.} ≤ T _{amb} ≤ T _{max.} | | | | V |
| SR | Slew Rate (V _I = ±10V, R _L = 2kΩ, C _L = 100pF, T _{amb} = 25°C, unity gain) | 1.5 | 2.2 | | V/μs |
| t _r | Rise Time (V _I = ±20mV, R _L = 2kΩ, C _L = 100pF, T _{amb} = 25°C, unity gain) | | 0.3 | | μs |
| K _{OV} | Overshoot (V _I = ±20 mV, R _L = 2kΩ, C _L = 100pF, T _{amb} = 25°C, unity gain) | | 15 | | % |
| R _i | Input Resistance | 0.3 | 2 | | MΩ |
| C _i | Input Capacitance | | 1.4 | | pF |
| R _O | Output Resistance | | 75 | | Ω |
| B | Unity Gain Bandwidth | | 2.8 | | MHz |
| GBP | Gain Bandwidth Product (V _I = 10mV, R _L = 2kΩ, C _L = 100pF, f = 100kHz, T _{amb} = 25°C) | | 5.5 | | MHz |
| THD | Total Harmonic Distortion (f = 1kHz, A _v = 20dB, R _L = 2kΩ, V _o = 2V _{pp} , C _L = 100pF, T _{amb} = 25°C) | | 0.008 | | % |
| e _n | Equivalent Input Noise Voltage (f = 1kHz, R _S = 100Ω) | | 12 | | $\frac{nV}{\sqrt{Hz}}$ |
| V _{O1} /V _{O2} | Channel Separation | | 120 | | dB |

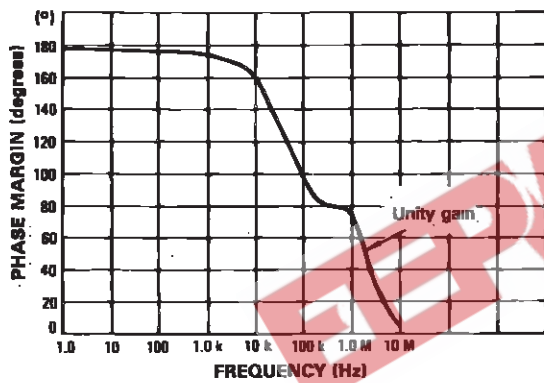
TRANSIENT RESPONSE TEST CIRCUIT



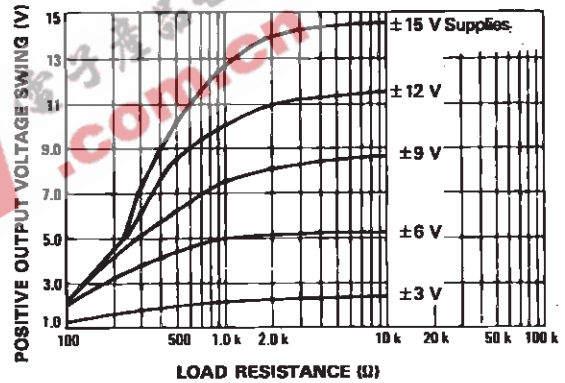
OPEN LOOP FREQUENCY RESPONSE



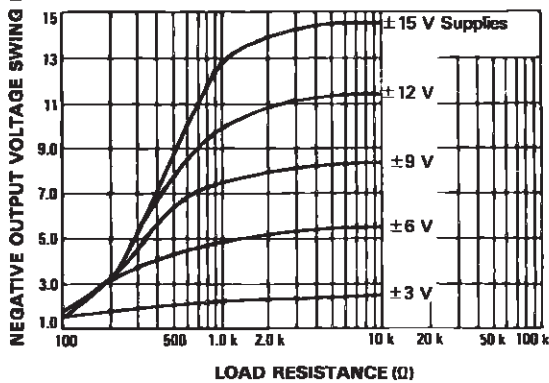
PHASE MARGIN VERSUS FREQUENCY



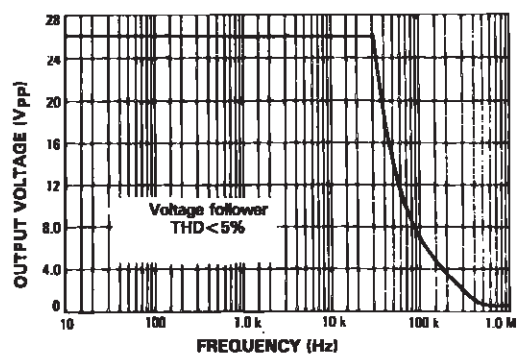
POSITIVE OUTPUT VOLTAGE SWING VERSUS LOAD RESISTANCE



NEGATIVE OUTPUT VOLTAGE SWING VERSUS LOAD RESISTANCE

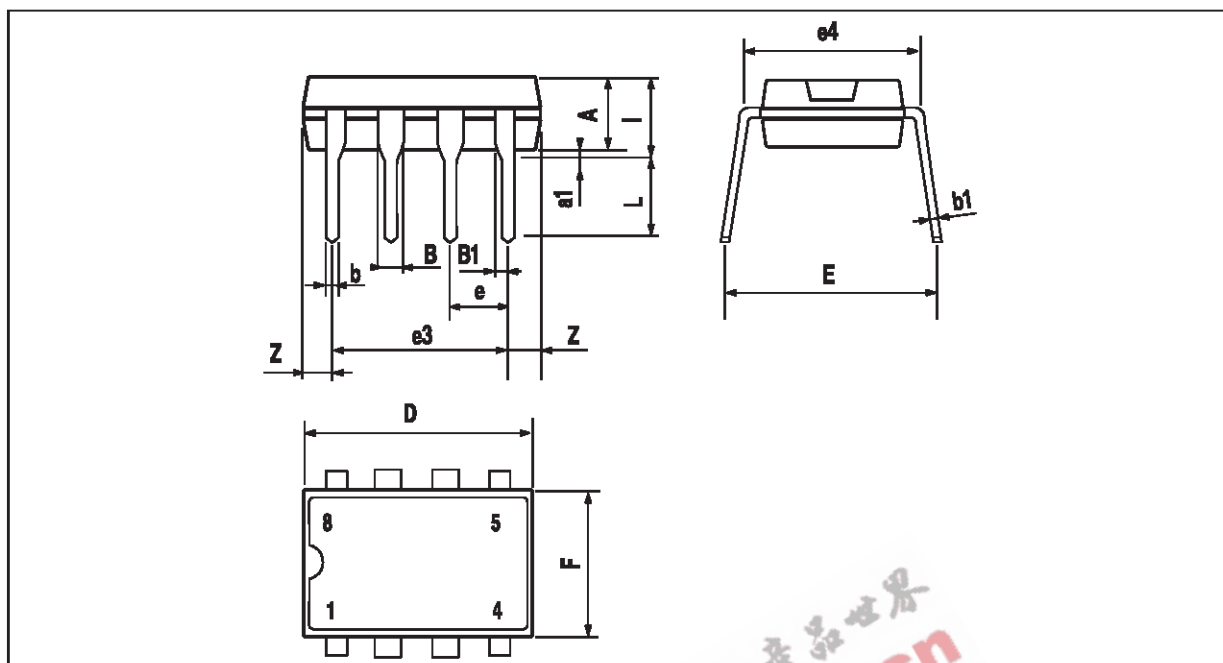


POWER BANDWIDTH (Large signal swing versus frequency)



PACKAGE MECHANICAL DATA

8 PINS – PLASTIC DIP



PM-DIP8EFS

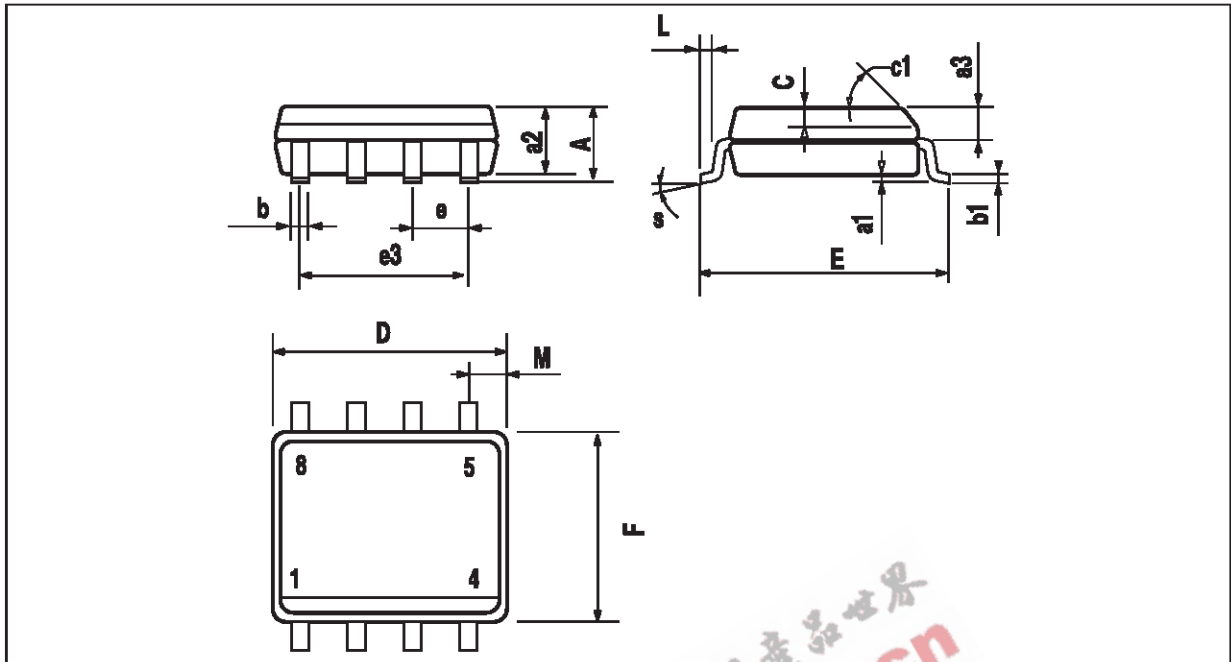
| Dimensions | Millimeters | | | Inches | | |
|------------|-------------|------|-------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | 3.32 | | | 0.131 | |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.15 | | 1.65 | 0.045 | | 0.065 |
| b | 0.356 | | 0.55 | 0.014 | | 0.022 |
| b1 | 0.204 | | 0.304 | 0.008 | | 0.012 |
| D | | | 10.92 | | | 0.430 |
| E | 7.95 | | 9.75 | 0.313 | | 0.384 |
| e | | 2.54 | | | 0.100 | |
| e3 | | 7.62 | | | 0.300 | |
| e4 | | 7.62 | | | 0.300 | |
| F | | | 6.6 | | | 0.260 |
| i | | | 5.08 | | | 0.200 |
| L | 3.18 | | 3.81 | 0.125 | | 0.150 |
| Z | | | 1.52 | | | 0.060 |

DIP8.TBL

MC4558

PACKAGE MECHANICAL DATA

8 PINS – PLASTIC MICROPACKAGE (SO)



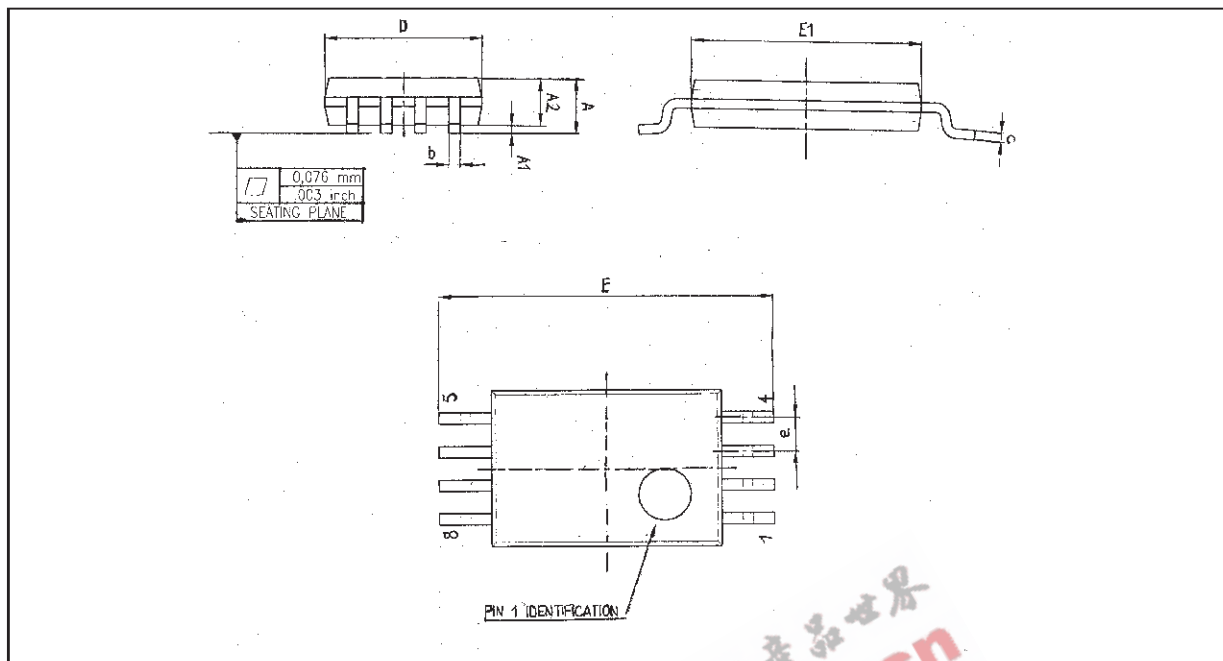
PM-SO8.EPS

| Dimensions | Millimeters | | | Inches | | |
|------------|-------------|------|------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.75 | | | 0.069 |
| a1 | 0.1 | | 0.25 | 0.004 | | 0.010 |
| a2 | | | 1.65 | | | 0.065 |
| a3 | 0.65 | | 0.85 | 0.026 | | 0.033 |
| b | 0.35 | | 0.48 | 0.014 | | 0.019 |
| b1 | 0.19 | | 0.25 | 0.007 | | 0.010 |
| C | 0.25 | | 0.5 | 0.010 | | 0.020 |
| c1 | 45° (typ.) | | | | | |
| D | 4.8 | | 5.0 | 0.189 | | 0.197 |
| E | 5.8 | | 6.2 | 0.228 | | 0.244 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 3.81 | | | 0.150 | |
| F | 3.8 | | 4.0 | 0.150 | | 0.157 |
| L | 0.4 | | 1.27 | 0.016 | | 0.050 |
| M | | | 0.6 | | | 0.024 |
| S | 8° (max.) | | | | | |

SO8.TBL

PACKAGE MECHANICAL DATA

8 PINS – THIN SHRINK SMALL OUTLINE PACKAGE



| Dim. | Millimeters | | | Inches | | |
|------|-------------|------|------|--------|--------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.20 | | | 0.05 |
| A1 | 0.05 | | 0.15 | 0.01 | | 0.006 |
| A2 | 0.80 | 1.00 | 1.05 | 0.031 | 0.039 | 0.041 |
| b | 0.19 | | 0.30 | 0.007 | | 0.15 |
| c | 0.09 | | 0.20 | 0.003 | | 0.012 |
| D | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |
| E | | 6.40 | | | 0.252 | |
| E1 | 4.30 | 4.40 | 4.50 | 0.169 | 0.173 | 0.177 |
| e | | 0.65 | | | 0.025 | |
| k | 0° | | 8° | 0° | | 8° |
| l | 0.50 | 0.60 | 0.75 | 0.09 | 0.0236 | 0.030 |

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