

## DUAL OPERATIONAL AMPLIFIERS

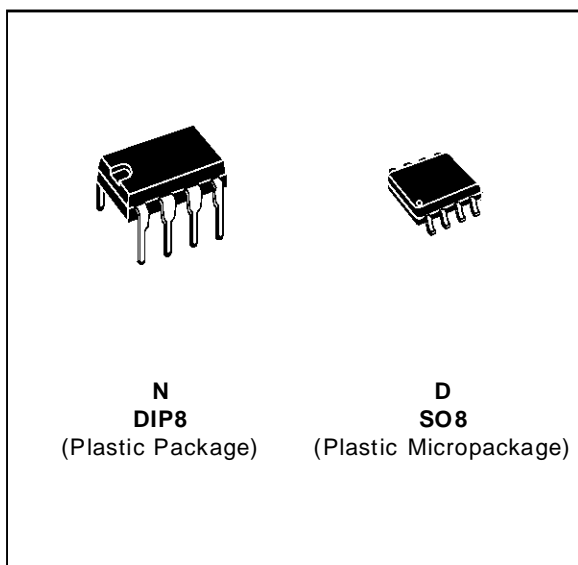
- LOW POWER CONSUMPTION
- LARGE INPUT VOLTAGE RANGE
- NO LATCH-UP
- HIGH GAIN
- SHORT-CIRCUIT PROTECTION
- NO FREQUENCY COMPENSATION REQUIRED

### DESCRIPTION

The MC1458 is a high performance monolithic dual operational amplifier constructed on a single silicon chip. It is intended for a wide range of analog applications.

- Summing amplifier
- Voltage follower
- Integrator
- Active filter
- Function generator

The high gain and wide range of operating voltages provide superior performance in integrator, summing amplifier, and general feedback applications.



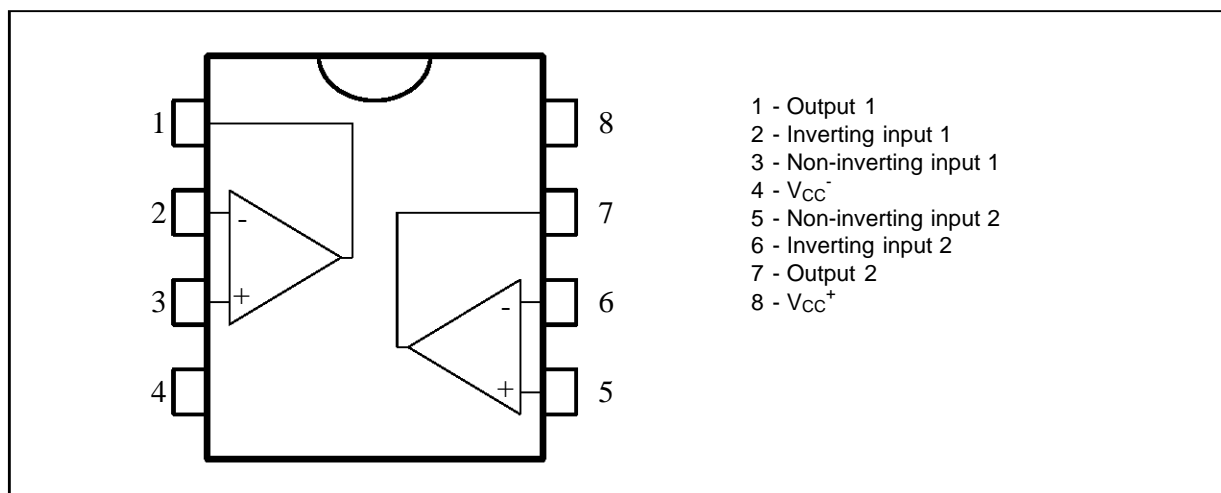
### ORDER CODES

Part Number	Temperature Range	Package	
		N	D
MC1458	0, +70°C	•	•
MC1458I	-40, +105°C	•	•
MC1558	-55, +125°C	•	•

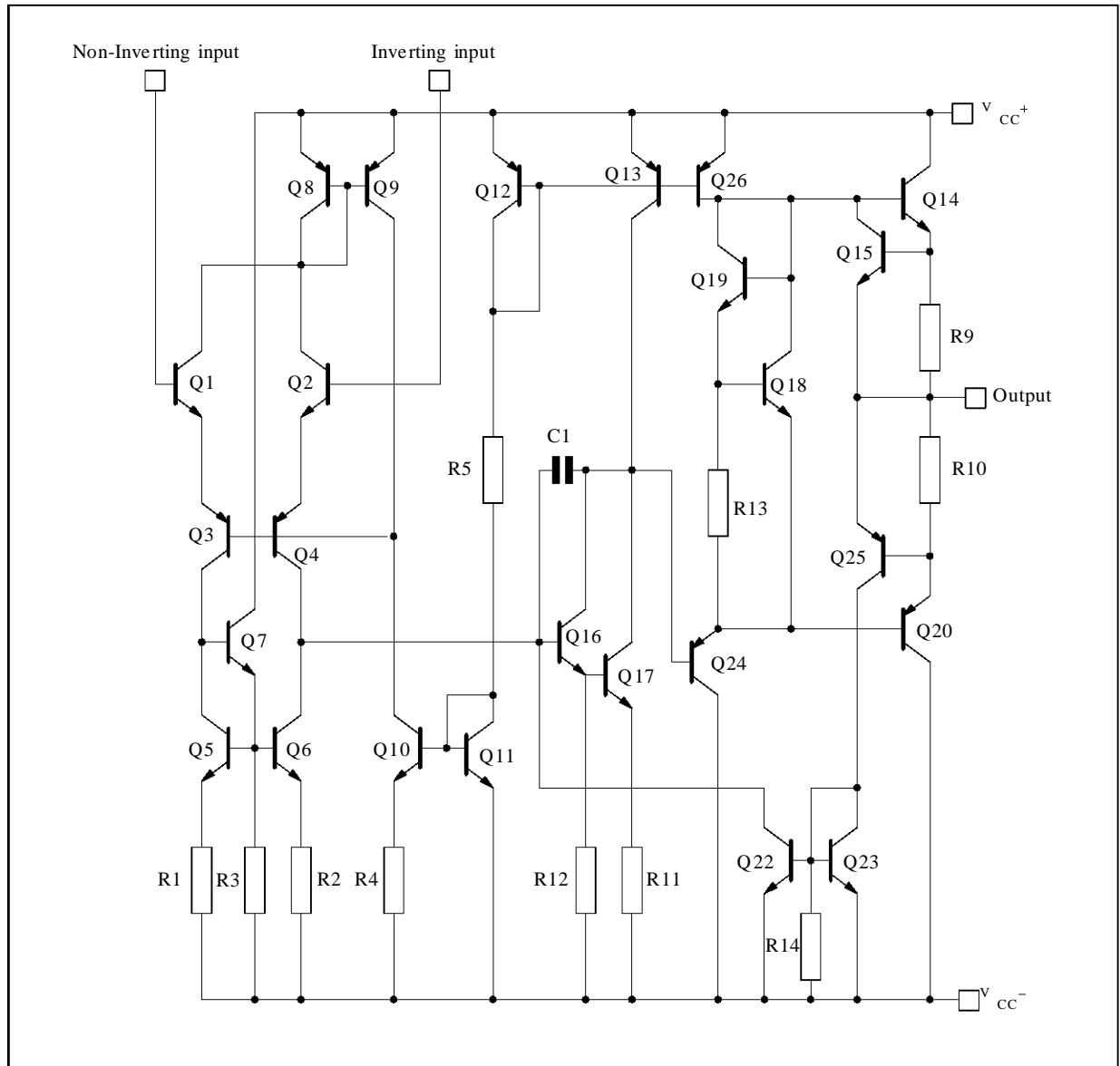
**Example :** MC1458H

1458-01 TEL

### PIN CONNECTIONS (top view)



**SCHEMATIC DIAGRAM**



1458-03.EPS

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	MC1458	MC1458I	MC1558	Unit
V <sub>CC</sub>	Supply Voltage	±22	±22	±22	V
V <sub>i</sub>	Input Voltage	±15	±15	±15	V
V <sub>id</sub>	Differential Input Voltage	±30	±30	±30	V
P <sub>tot</sub>	Power Dissipation	D Suffix N Suffix 300 500			mW
	Output Short-circuit Duration	Infinite			
T <sub>oper</sub>	Operating Free-air Temperature Range	0 to +70	-40 to +105	-55 to +125	°C
T <sub>stg</sub>	Storage Temperature Range	-65 to +150	-65 to +150	-65 to +150	°C

1458-02.TEL

**ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = ±15V, T<sub>amb</sub> = 25°C, (unless otherwise specified)

Symbol	Parameter	MC1458 - 1458I - 1558			Unit
		Min.	Typ.	Max.	
V <sub>io</sub>	Input Offset Voltage (R <sub>S</sub> ≤ 10kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		1	5 6	mV
I <sub>io</sub>	Input Offset Current T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		2	200 300	nA
I <sub>ib</sub>	Input Bias Current T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		30	500 800	nA
A <sub>vd</sub>	Large Signal Voltage Gain (V <sub>O</sub> = ±10V, R <sub>L</sub> = 2kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	50 25	200		V/mV
SVR	Supply Voltage Rejection Ratio (R <sub>S</sub> ≤ 10kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	77 77	90		dB
I <sub>CC</sub>	Supply Current, all Amp, no Load T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>		2.3	5 6	mA
V <sub>icm</sub>	Input Common Mode Voltage Range T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	±12 ±12			V
CMR	Common-mode Rejection Ratio (R <sub>S</sub> ≤ 10 kΩ) T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	70 70	90		dB
I <sub>OS</sub>	Output Short-circuit Current T <sub>amb</sub> = 25°C	10	20	35	mA
±V <sub>OPP</sub>	Output Voltage Swing T <sub>amb</sub> = 25°C T <sub>min.</sub> ≤ T <sub>amb</sub> ≤ T <sub>max.</sub>	12 10 12 10	14 13		V
SR	Slew Rate (V <sub>I</sub> = ±10V, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)	0.2	0.8		V/μs
t <sub>r</sub>	Rise Time (V <sub>I</sub> = 20mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)		0.3		μs
K <sub>OV</sub>	Overshoot (V <sub>I</sub> = 20mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C, unity gain)		5		%
R <sub>I</sub>	Input Resistance	0.3	2		MΩ
Z <sub>ic</sub>	Common-mode Input Impedance		200		MΩ
C <sub>I</sub>	Input Capacitance		1.4		pF
R <sub>O</sub>	Output Resistance		75		Ω
FPB	Full Power Bandwidth (R <sub>L</sub> = 2kΩ, V <sub>O</sub> ≥ ±10V, A <sub>VD</sub> = 1, THD ≤ 5%)		14		KHz
B	Unity Gain Bandwidth (V <sub>I</sub> = 10mV, R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, T <sub>amb</sub> = 25°C)		1		MHz

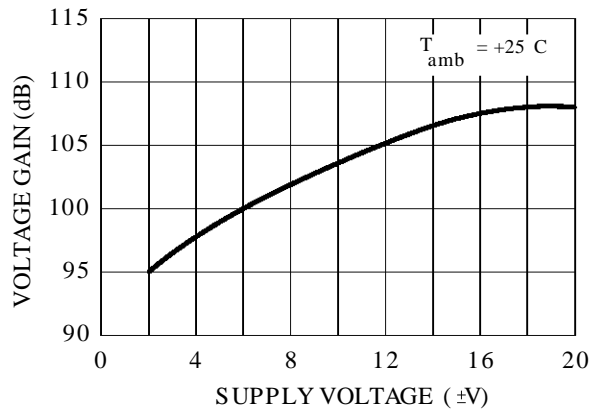
1458-03 TEL

**ELECTRICAL CHARACTERISTICS** (continued)

Symbol	Parameter	MC1458 - 1458I MC1558			Unit
		Min.	Typ.	Max.	
GBP	Gain Bandwidth Product ( $V_i = 10\text{mV}$ , $R_L = 2\text{k}\Omega$ , $C_L = 100\text{pF}$ , $f = 100\text{kHz}$ , $T_{\text{amb}} = 25^\circ\text{C}$ )	0.4	1		MHz
THD	Total Harmonic Distortion ( $f = 1\text{kHz}$ , $A_V = 20\text{dB}$ , $R_L = 2\text{k}\Omega$ , $V_O = 2V_{\text{PP}}$ , $C_L = 100\text{pF}$ , $T_{\text{amb}} = 25^\circ\text{C}$ )		0.02		%
$e_n$	Equivalent Input Noise Voltage ( $f = \text{kHz}$ , $R_s = 100\Omega$ )		45		$\frac{\text{nV}}{\sqrt{\text{Hz}}}$
$\phi_m$	Phase Margin		65		Degrees
Am	Gain Margin		11		dB
$V_{O1}/V_{O2}$	Channel Separation		120		dB

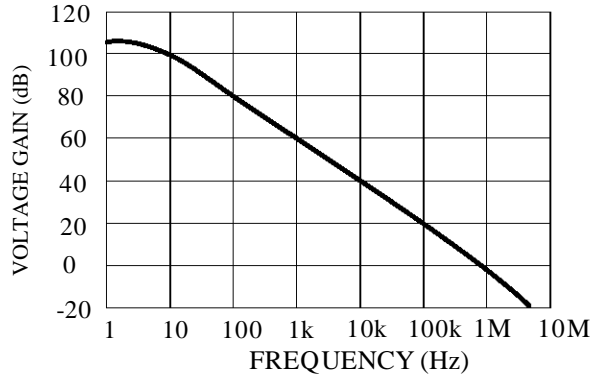
1458-04 TEL

**OPEN LOOP VOLTAGE GAIN**



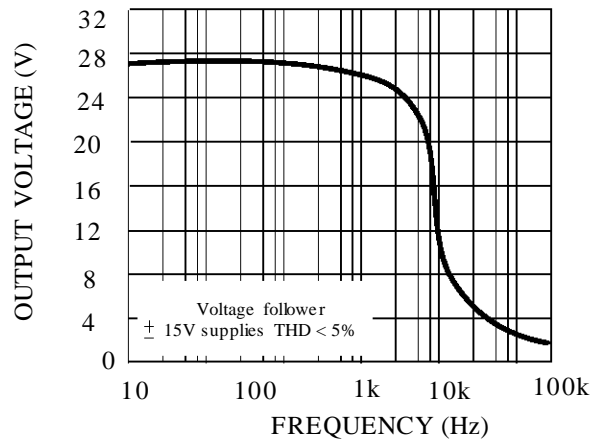
1458-04 EPS

**OPEN LOOP FREQUENCY RESPONSE**



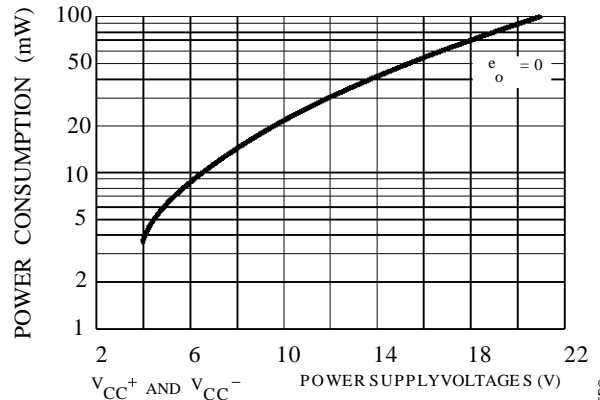
1458-05 EPS

**POWER BANDWIDTH  
(LARGE SIGNAL SWING)**

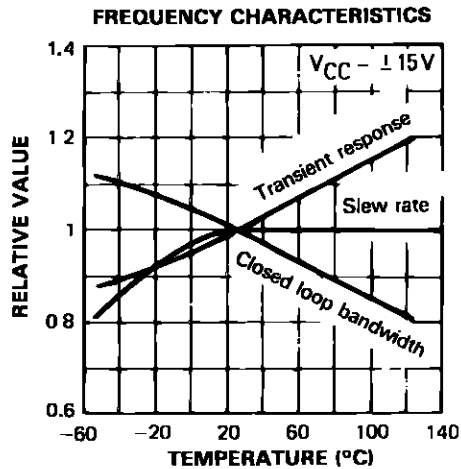
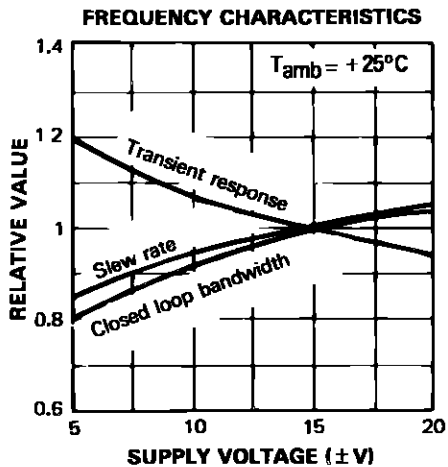
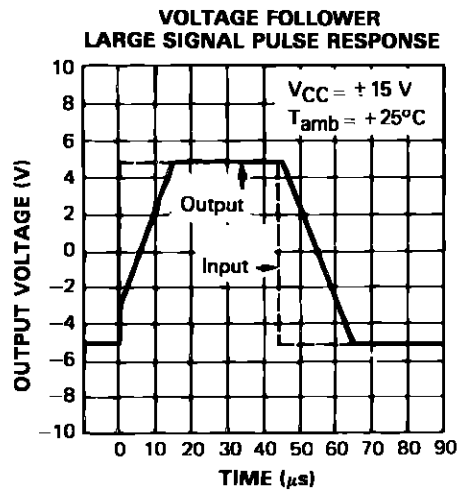
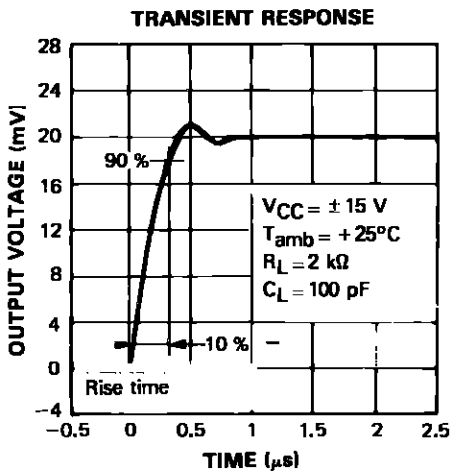
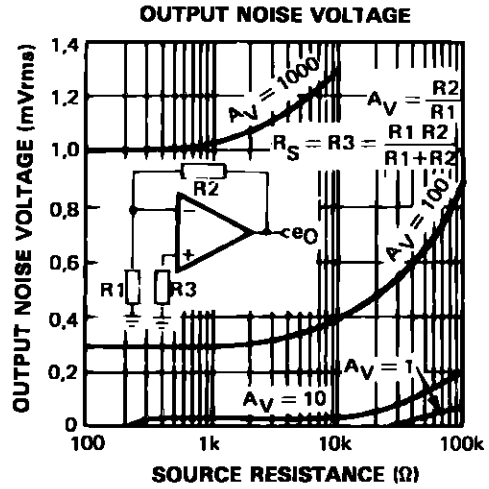
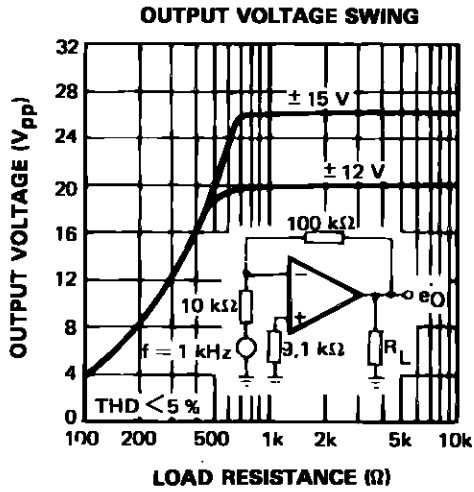


1458-06 EPS

**POWER CONSUMPTION**



1458-07 EPS

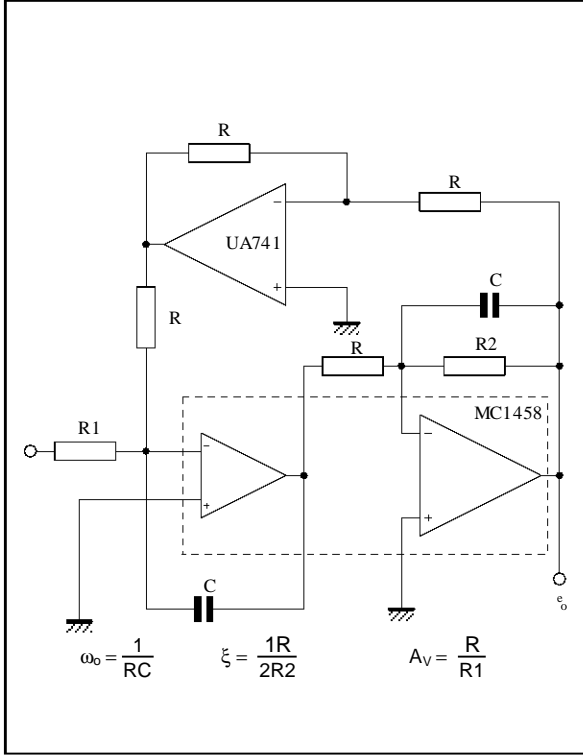


1458-08.EPS

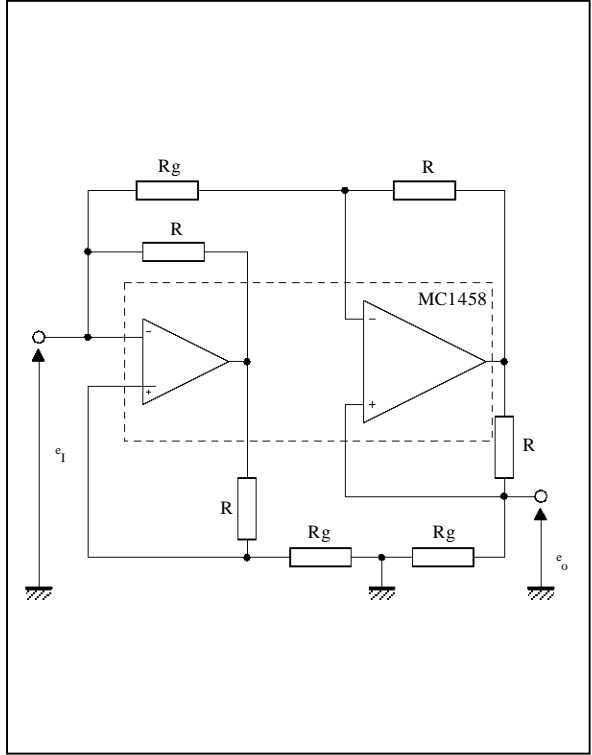
1458-09.EPS

TYPICAL APPLICATIONS

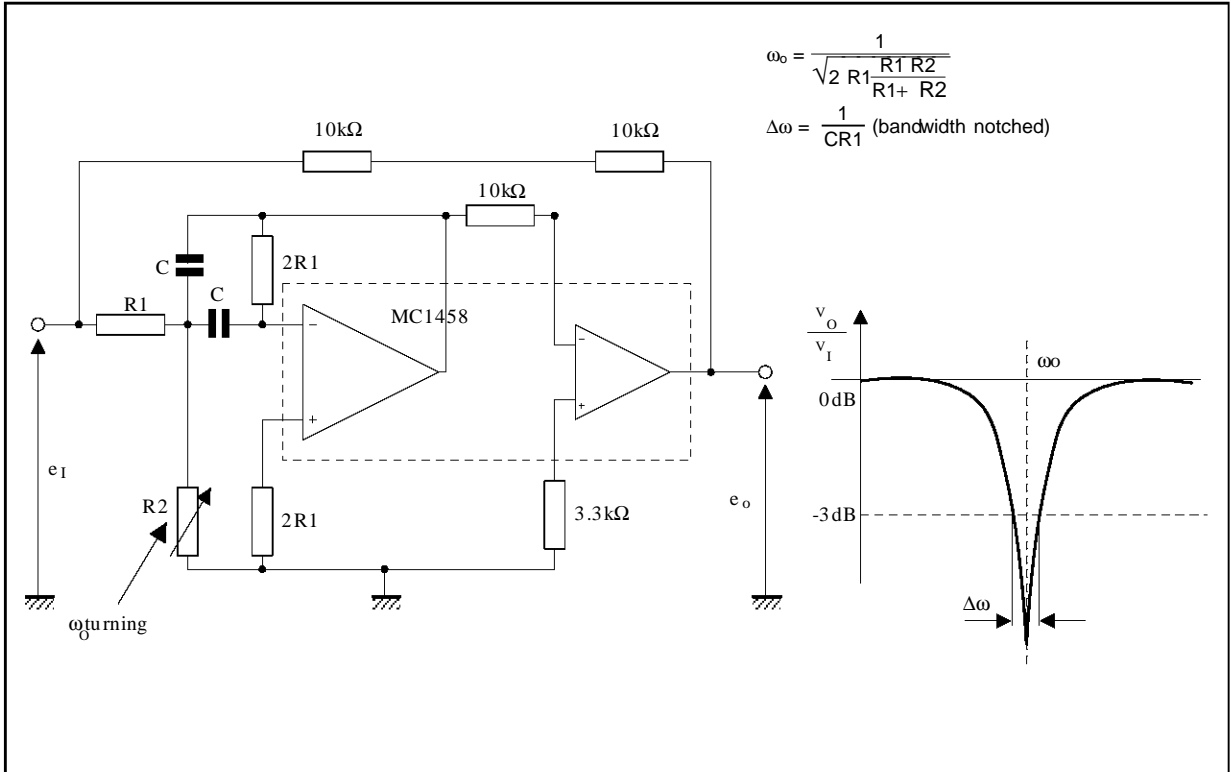
LOW PASS FILTER



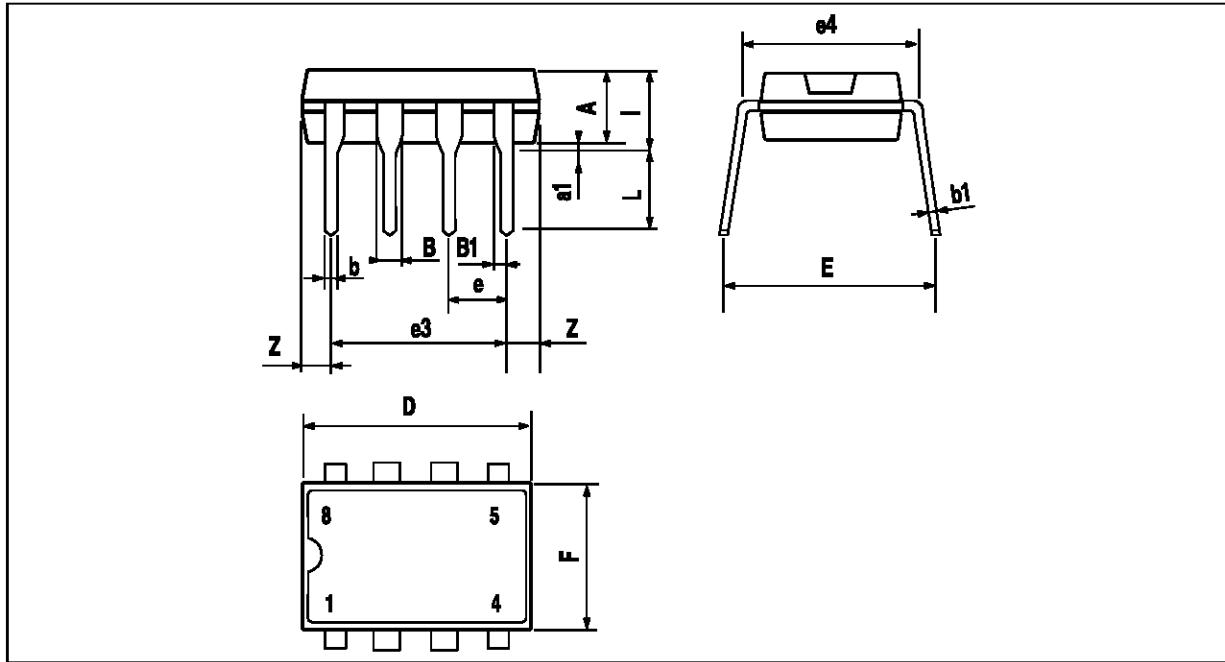
GIRATOR



TURNABLE NOTCH FILTER



**PACKAGE MECHANICAL DATA**  
8 PINS - PLASTIC DIP OR CERDIP



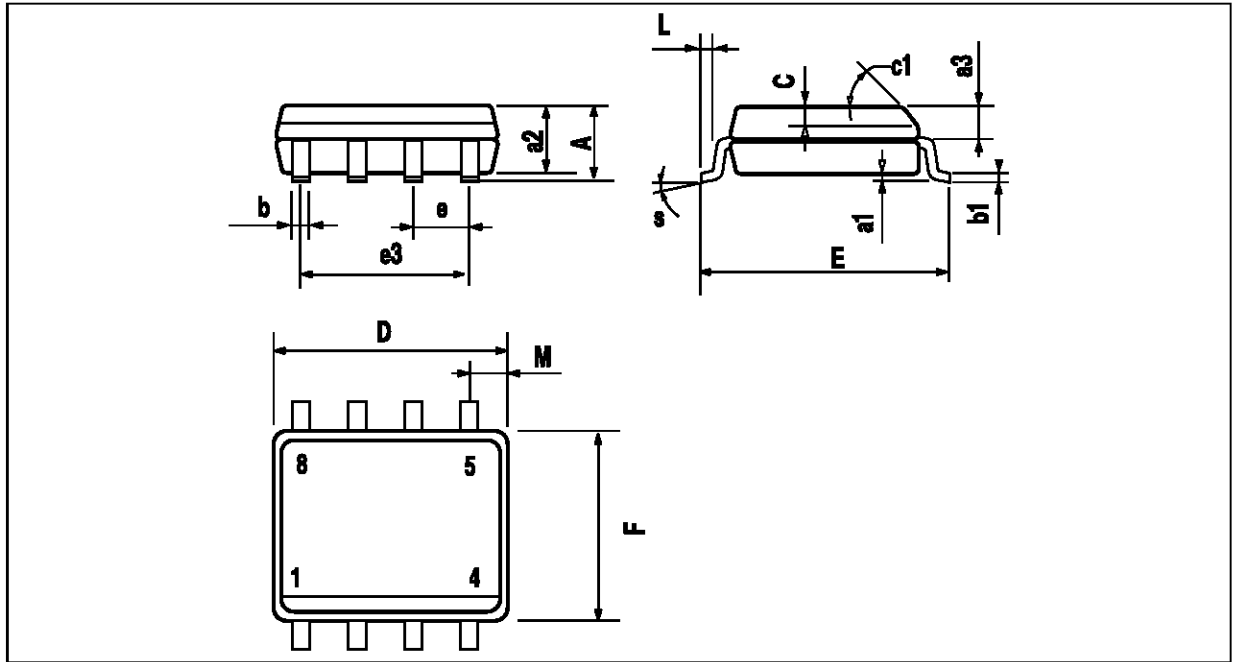
PM-DIP&EFS

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

DIP&TEL

MC1458 - MC1558

PACKAGE MECHANICAL DATA  
8 PINS - PLASTIC MICROPACKAGE (SO)



P1M-SOR-EFS

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.)					

SOR-TBL

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