

## DUAL OPERATIONAL AMPLIFIERS

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

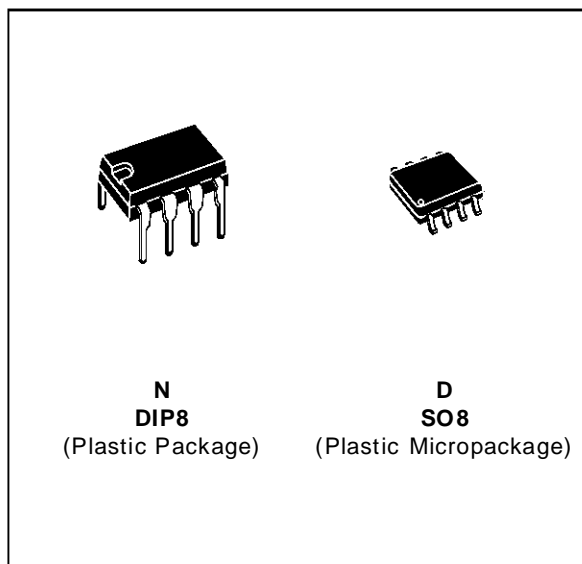
### DESCRIPTION

The MC1458 is a high performance monolithic dual operational amplifier 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 feed back applications.

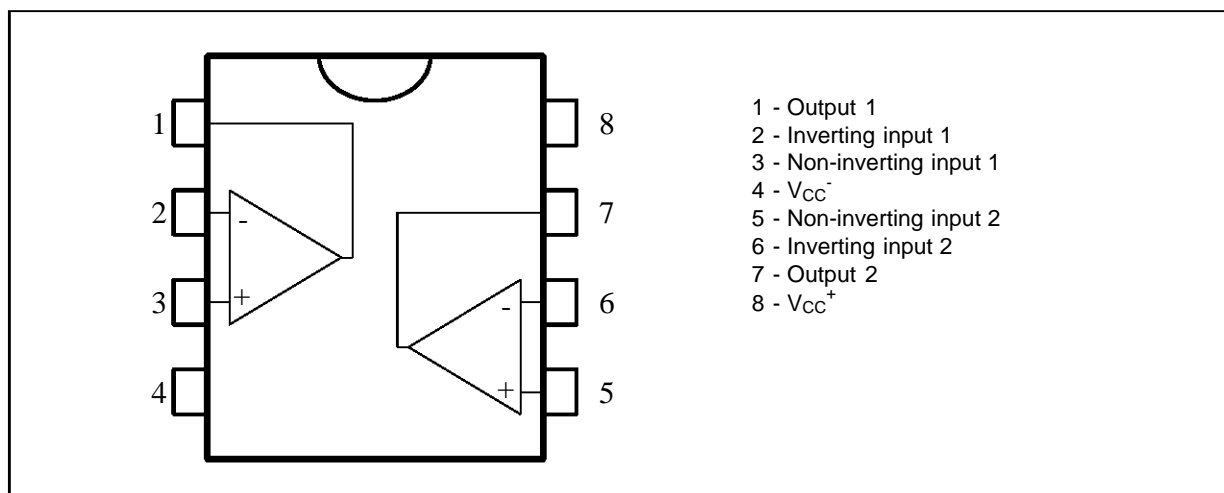


### ORDER CODES

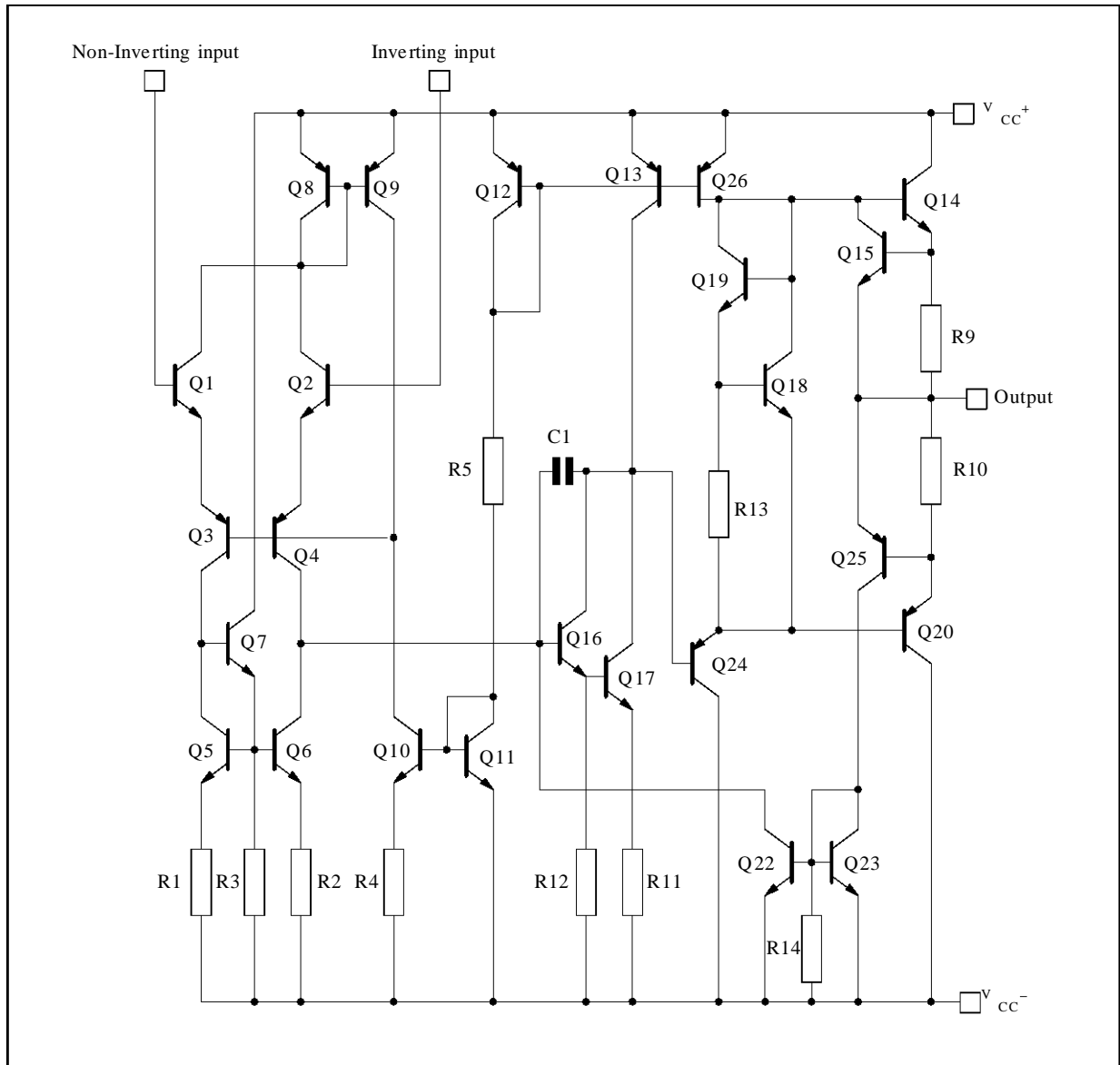
Part Number	Temperature Range	Package	
		N	D
MC1458	0, +70°C	•	•
MC1458I	-40, +105°C	•	•
MC1558	-55, +125°C	•	•

**Example :** MC1458N

### PIN CONNECTIONS (top view)



**SCHEMATIC DIAGRAM**



**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

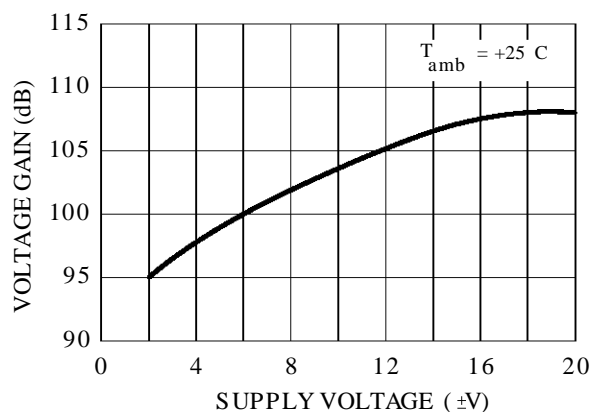
**ELECTRICAL CHARACTERISTICS** $V_{CC} = \pm 15V$ ,  $T_{amb} = 25^{\circ}C$ , (unless otherwise specified)

Symbol	Parameter	MC1458 - 1458I - 1558			Unit
		Min.	Typ.	Max.	
$V_{io}$	Input Offset Voltage ( $R_S \leq 10k\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		1	5 6	mV
$I_{io}$	Input Offset Current $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		2	200 300	nA
$I_{ib}$	Input Bias Current $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		30	500 800	nA
$A_{vd}$	Large Signal Voltage Gain ( $V_O = \pm 10V$ , $R_L = 2k\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	50 25	200		V/mV
SVR	Supply Voltage Rejection Ratio ( $R_S \leq 10k\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	77 77	90		dB
$I_{CC}$	Supply Current, all Amp, no Load $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		2.3	5 6	mA
$V_{icm}$	Input Common Mode Voltage Range $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	$\pm 12$ $\pm 12$			V
CMR	Common-mode Rejection Ratio ( $R_S \leq 10k\Omega$ ) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	70 70	90		dB
$I_{OS}$	Output Short-circuit Current $T_{amb} = 25^{\circ}C$	10	20	35	mA
$\pm V_{OPP}$	Output Voltage Swing $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	$R_L = 10k\Omega$ 12 $R_L = 2k\Omega$ 10 $R_L = 10k\Omega$ 12 $R_L = 2k\Omega$ 10	14 13		V
SR	Slew Rate ( $V_I = \pm 10V$ , $R_L = 2k\Omega$ , $C_L = 100pF$ , $T_{amb} = 25^{\circ}C$ , unity gain)	0.2	0.8		V/ $\mu s$
$t_r$	Rise Time ( $V_I = 20mV$ , $R_L = 2k\Omega$ , $C_L = 100pF$ , $T_{amb} = 25^{\circ}C$ , unity gain)		0.3		$\mu s$
$K_{OV}$	Overshoot ( $V_I = 20mV$ , $R_L = 2k\Omega$ , $C_L = 100pF$ , $T_{amb} = 25^{\circ}C$ , unity gain)		5		%
$R_I$	Input Resistance	0.3	2		M $\Omega$
$Z_{ic}$	Common-mode Input Impedance		200		M $\Omega$
$C_I$	Input Capacitance		1.4		pF
$R_O$	Output Resistance		75		$\Omega$
FPB	Full Power Bandwidth ( $R_L = 2k\Omega$ , $V_O \geq \pm 10V$ , $A_{VD} = 1$ , THD $\leq 5\%$ )		14		KHz
B	Unity Gain Bandwidth ( $V_I = 10mV$ , $R_L = 2k\Omega$ , $C_L = 100pF$ , $T_{amb} = 25^{\circ}C$ )		1		MHz

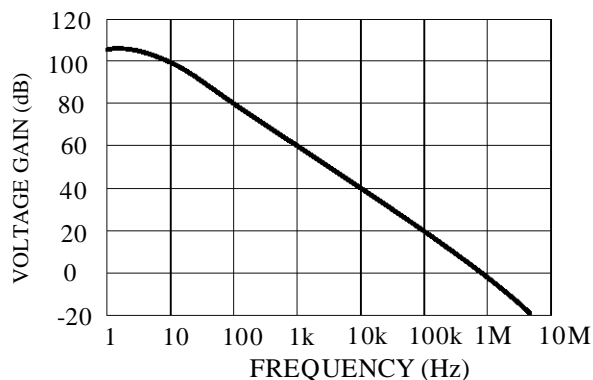
**ELECTRICAL CHARACTERISTICS** (continued)

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

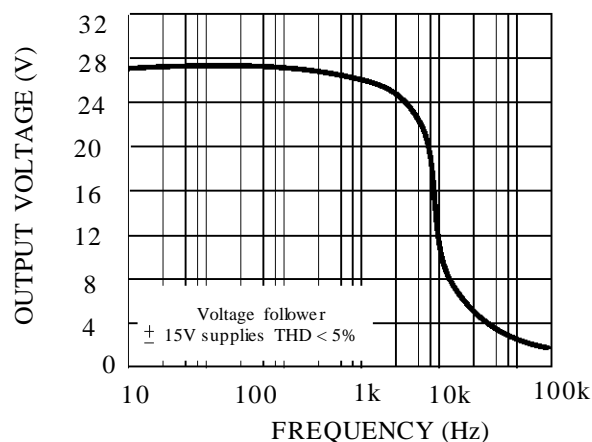
**OPEN LOOP VOLTAGE GAIN**



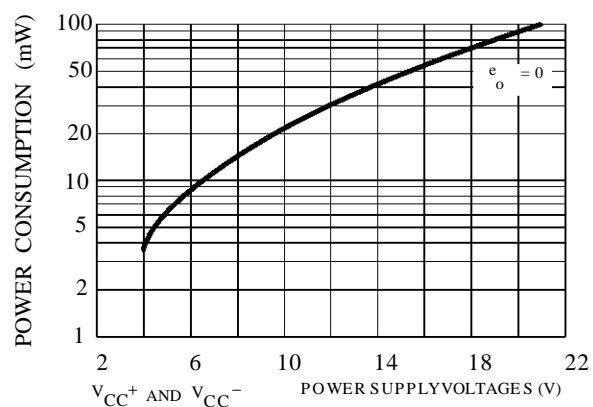
**OPEN LOOP FREQUENCY RESPONSE**

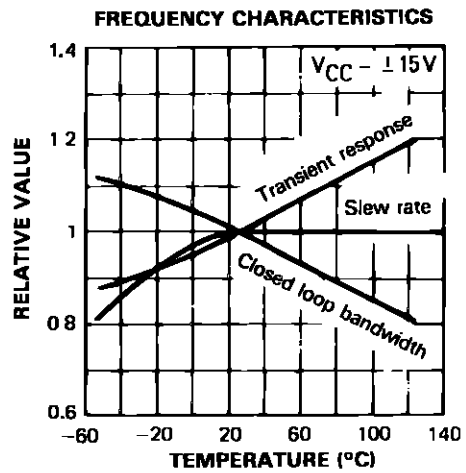
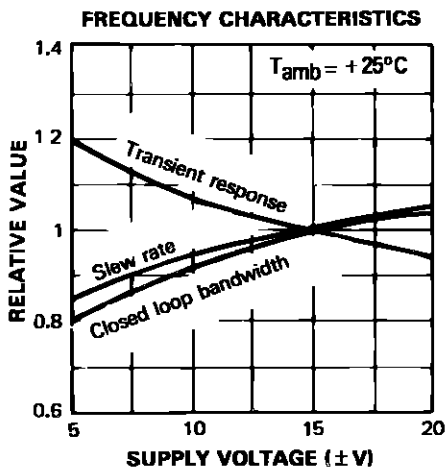
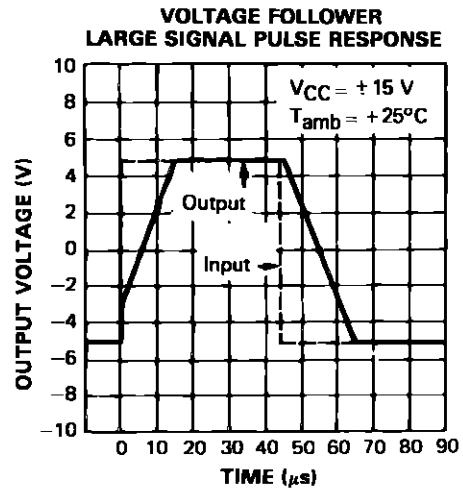
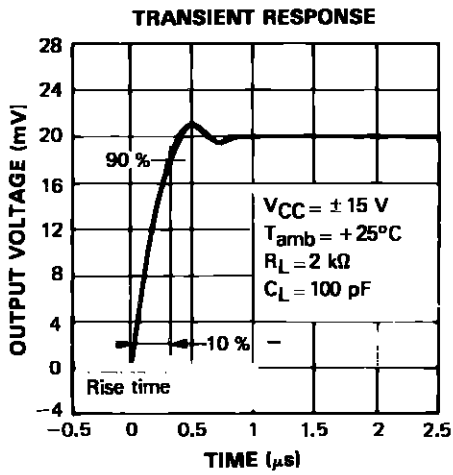
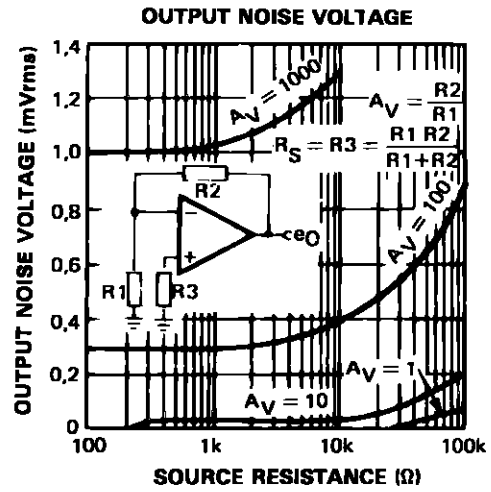
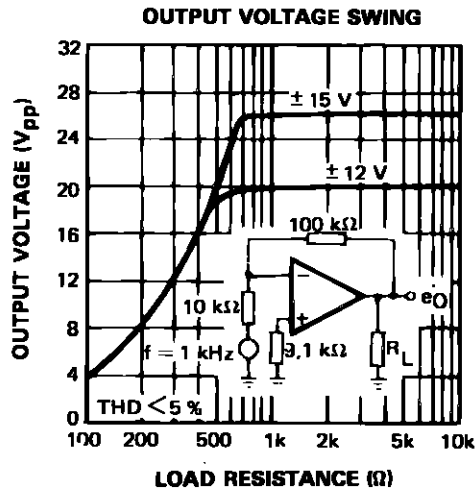


**POWER BANDWIDTH (LARGE SIGNAL SWING)**



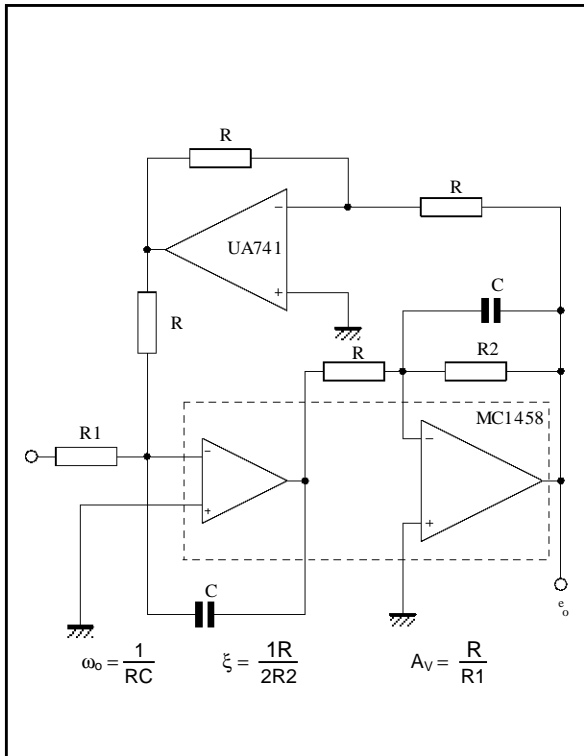
**POWER CONSUMPTION**



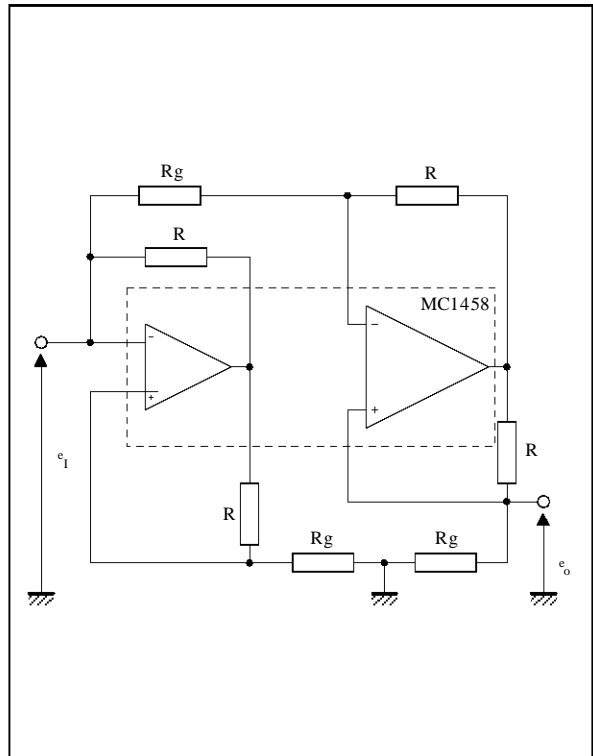


TYPICAL APPLICATIONS

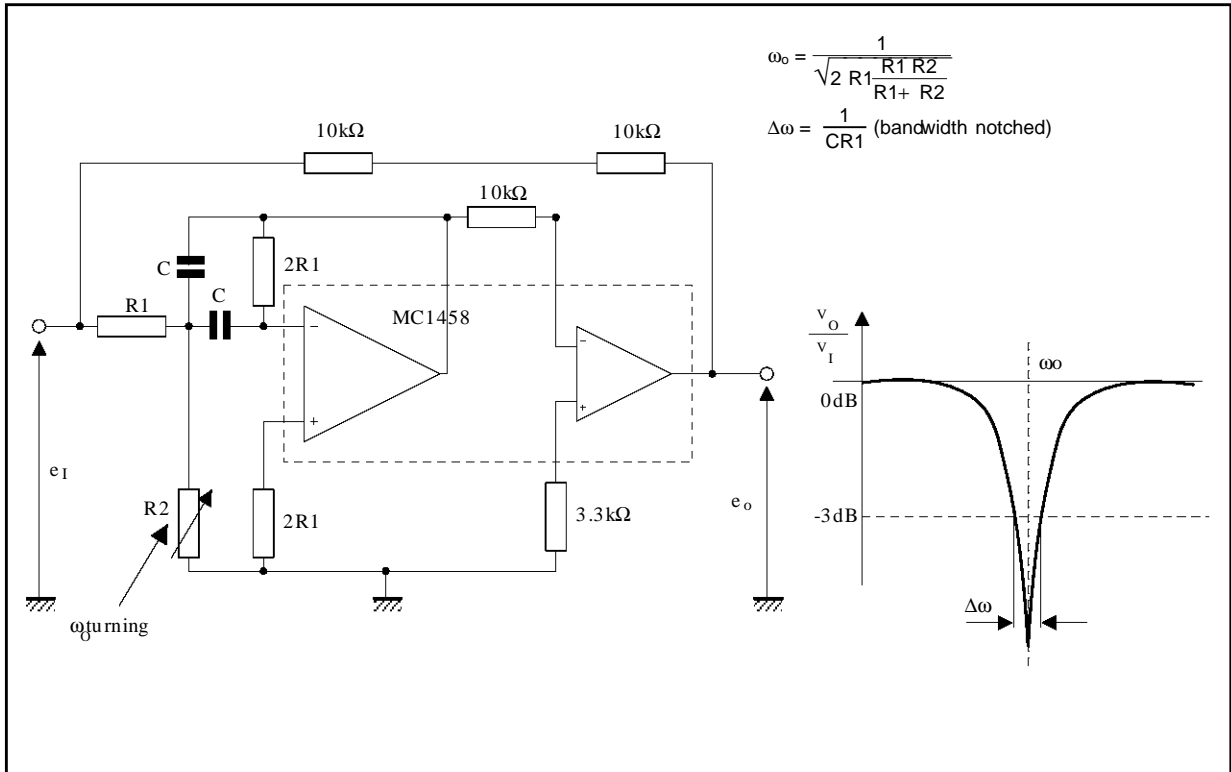
LOW PASS FILTER



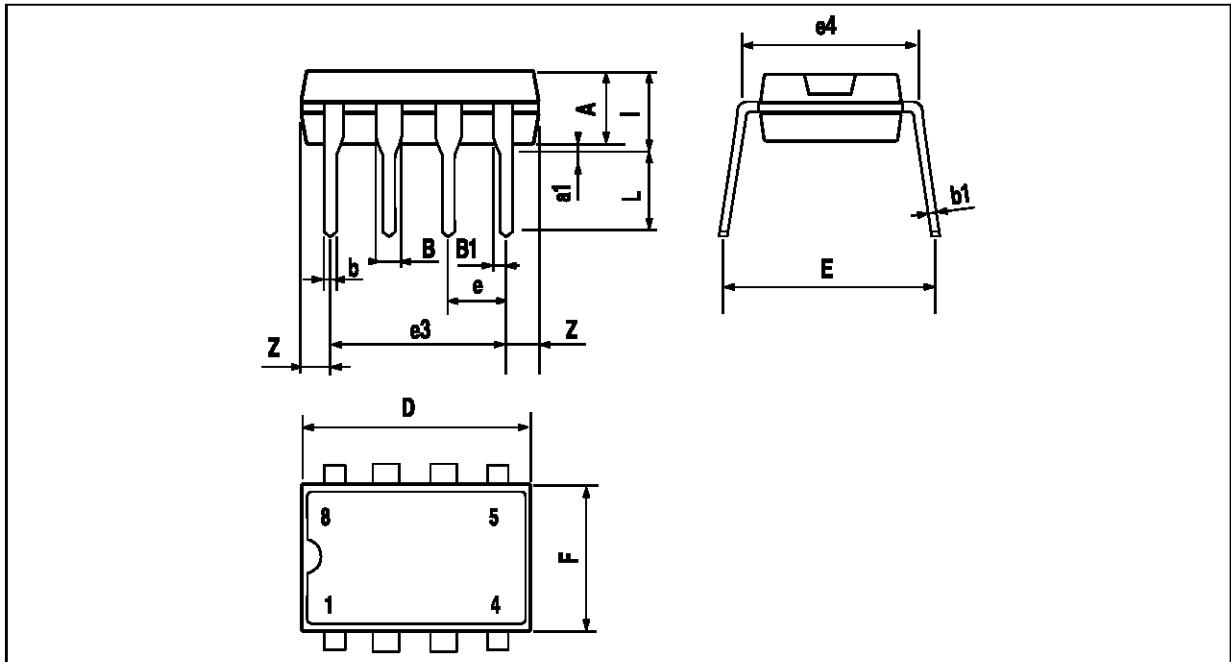
GIRATOR



TURNABLE NOTCH FILTER



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

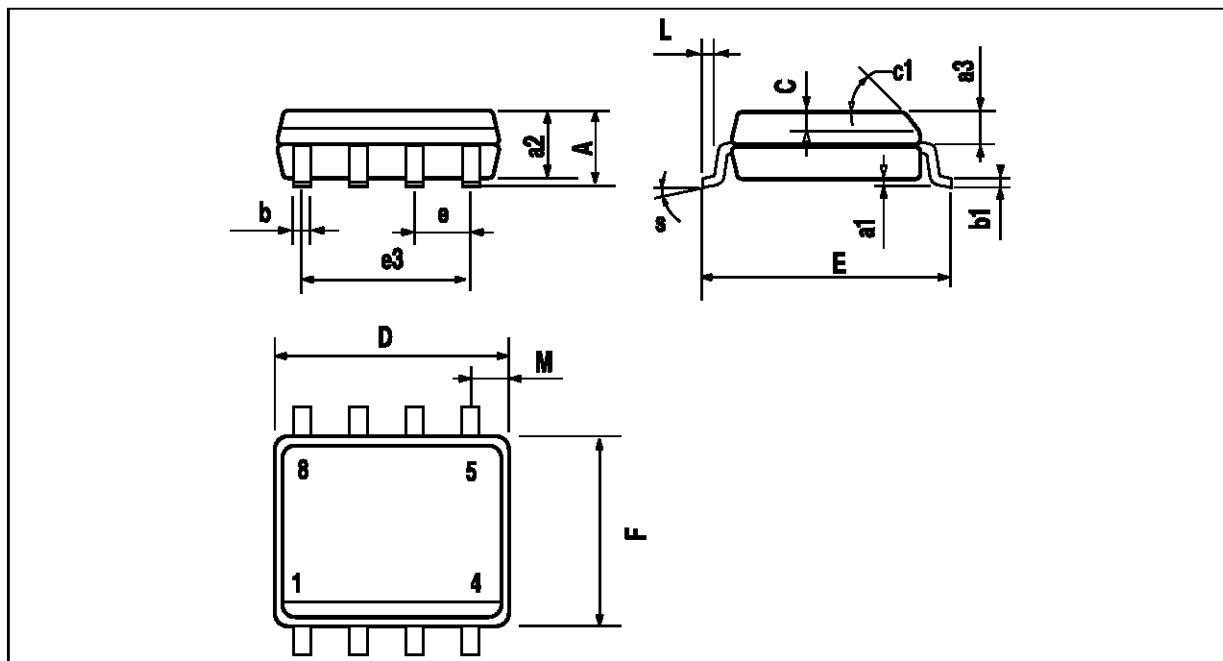


PM-DIP8.EPS

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

**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

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