

DUAL OPERATIONAL AMPLIFIERS

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

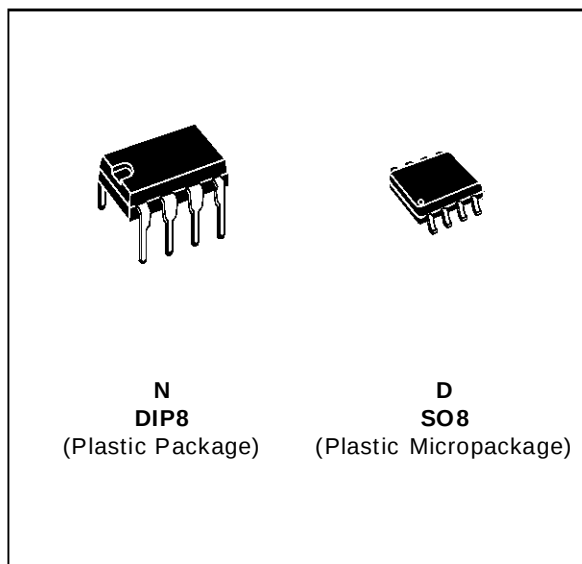
DESCRIPTION

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.

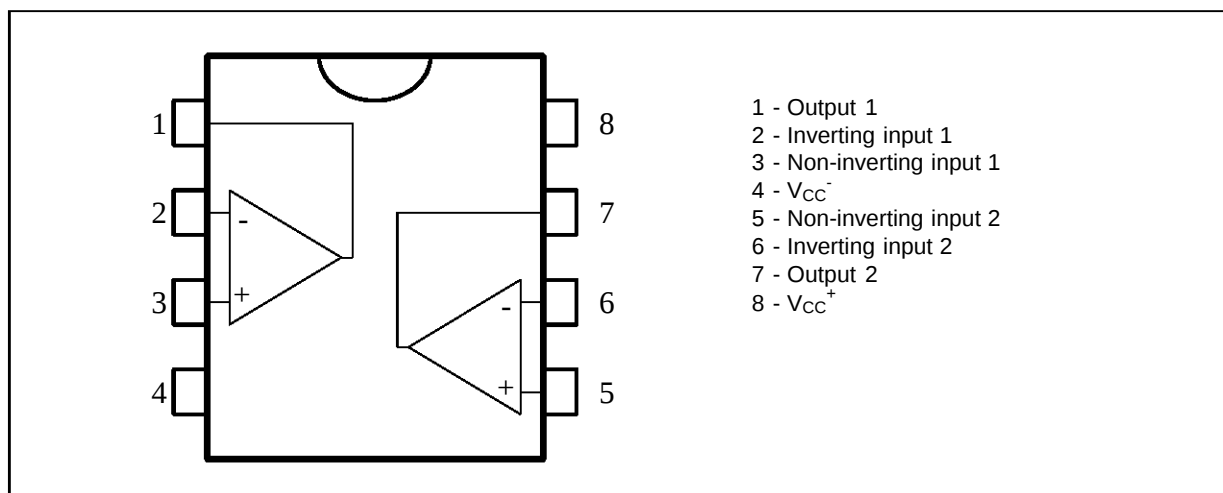


ORDER CODES

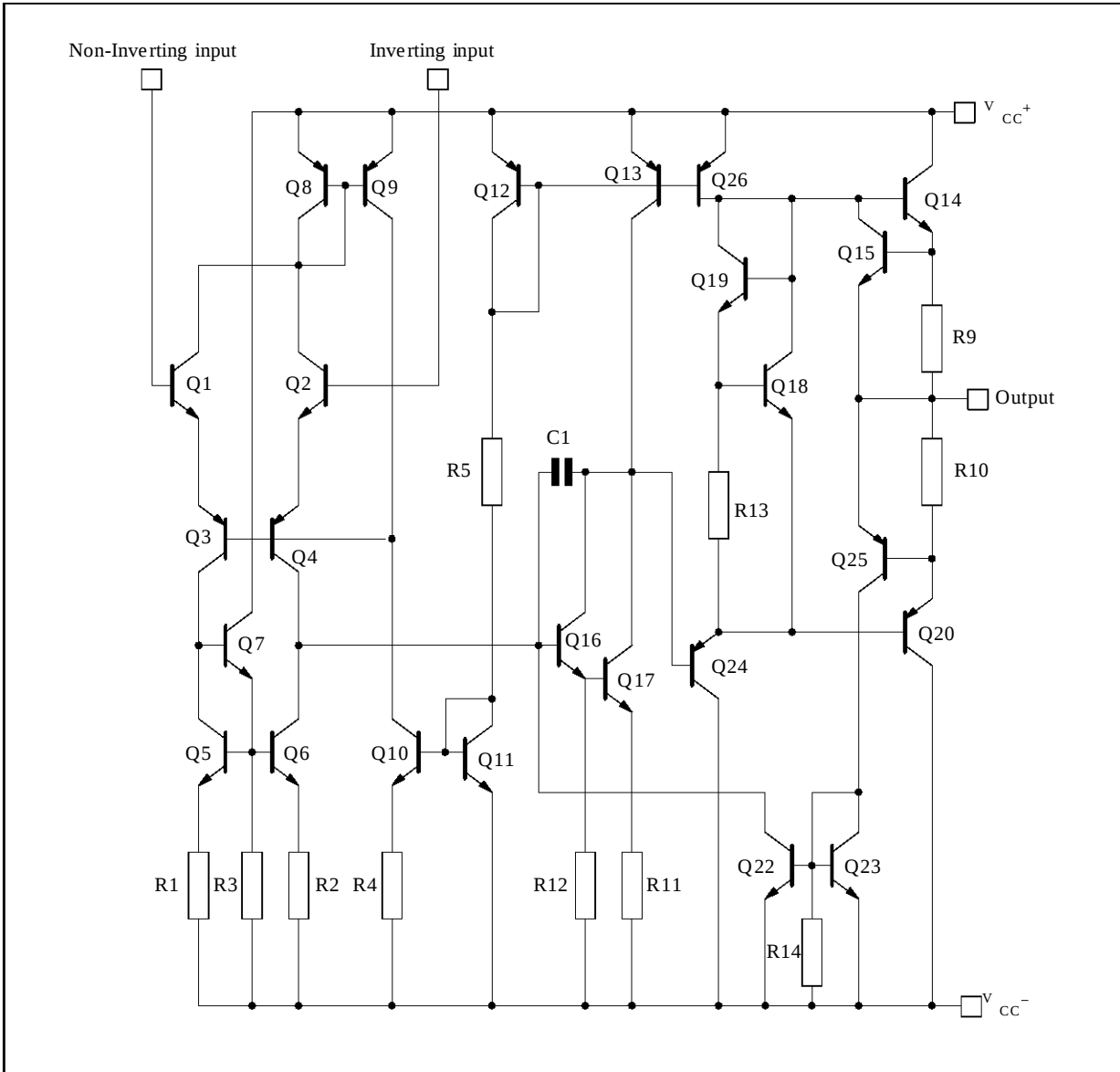
Part Number	Temperature Range	Package	
		N	D
MC1458	0, +70°C	•	•
MC1458I	-40, +105°C	•	•
MC1558	-55, +125°C	•	•

Example : MC1458N

PIN CONNECTIONS (top view)



SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	MC1458	MC1458I	MC1558	Unit
V _{CC}	Supply Voltage	±22	±22	±22	V
V _i	Input Voltage	±15	±15	±15	V
V _{id}	Differential Input Voltage	±30	±30	±30	V
P _{tot}	Power Dissipation	300 500			mW
	Output Short-circuit Duration	Infinite			
T _{oper}	Operating Free-air Temperature Range	0 to +70	−40 to +105	−55 to +125	°C
T _{stg}	Storage Temperature Range	−65 to +150	−65 to +150	−65 to +150	°C

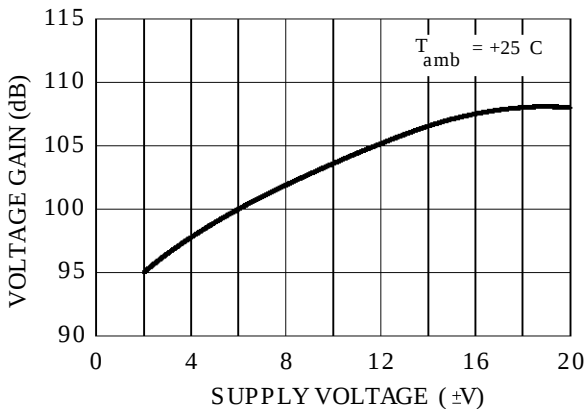
ELECTRICAL CHARACTERISTICS $V_{CC} = \pm 15V$, $T_{amb} = 25^{\circ}C$, (unless otherwise specified)

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 $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$	± 12 ± 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 $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$ $R_L = 10k\Omega$ $R_L = 2k\Omega$ $R_L = 10k\Omega$ $R_L = 2k\Omega$	12 10 12 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/ μs
t_r	Rise Time ($V_I = 20mV$, $R_L = 2k\Omega$, $C_L = 100pF$, $T_{amb} = 25^{\circ}C$, unity gain)		0.3		μs
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 Ω
Z_{ic}	Common-mode Input Impedance		200		M Ω
C_i	Input Capacitance		1.4		pF
R_o	Output Resistance		75		Ω
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

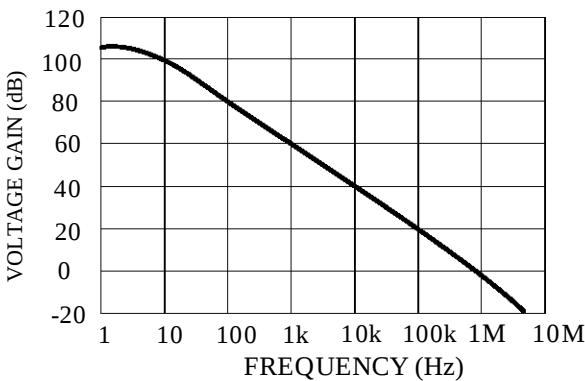
ELECTRICAL CHARACTERISTICS (continued)

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		$\frac{\text{nV}}{\sqrt{\text{Hz}}}$
ϕ_m	Phase Margin		65		Degrees
Am	Gain Margin		11		dB
V_{O1}/V_{O2}	Channel Separation		120		dB

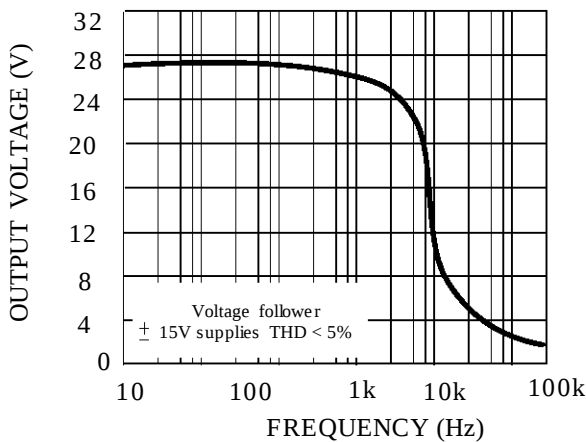
OPEN LOOP VOLTAGE GAIN



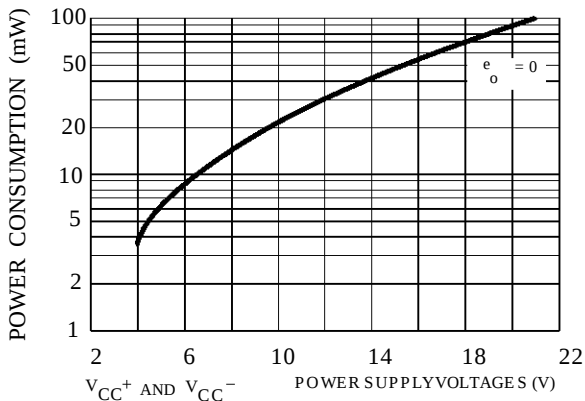
OPEN LOOP FREQUENCY RESPONSE

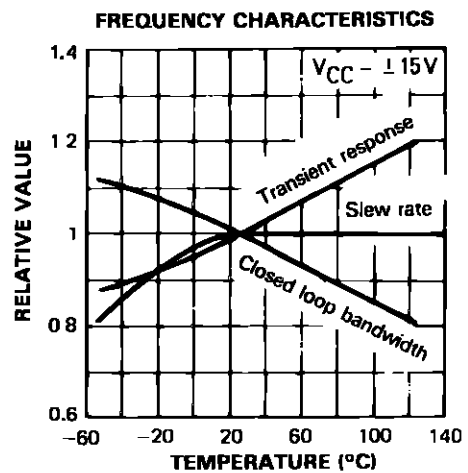
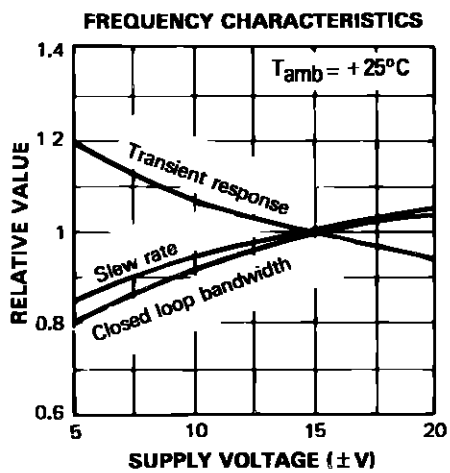
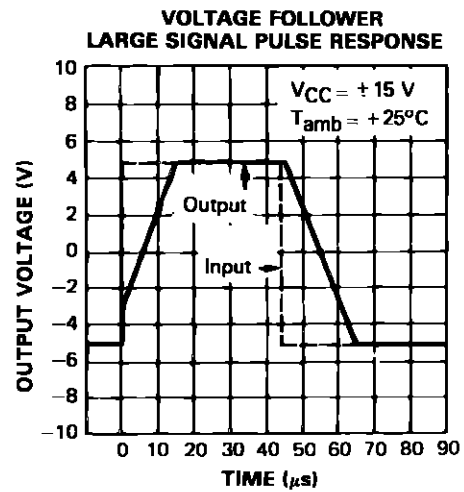
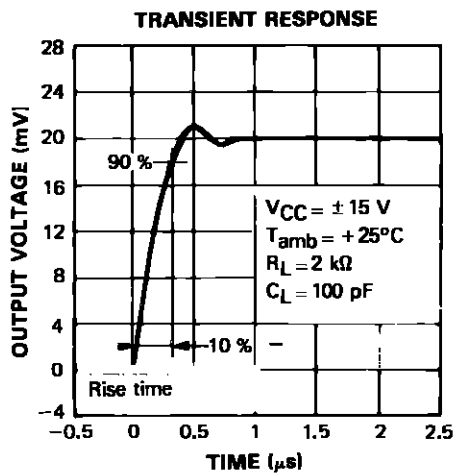
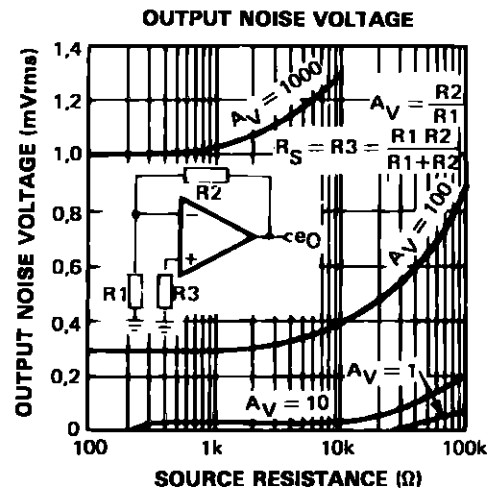
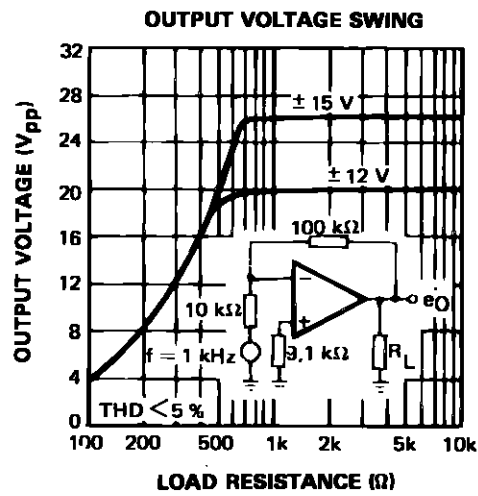


POWER BANDWIDTH
(LARGE SIGNAL SWING)



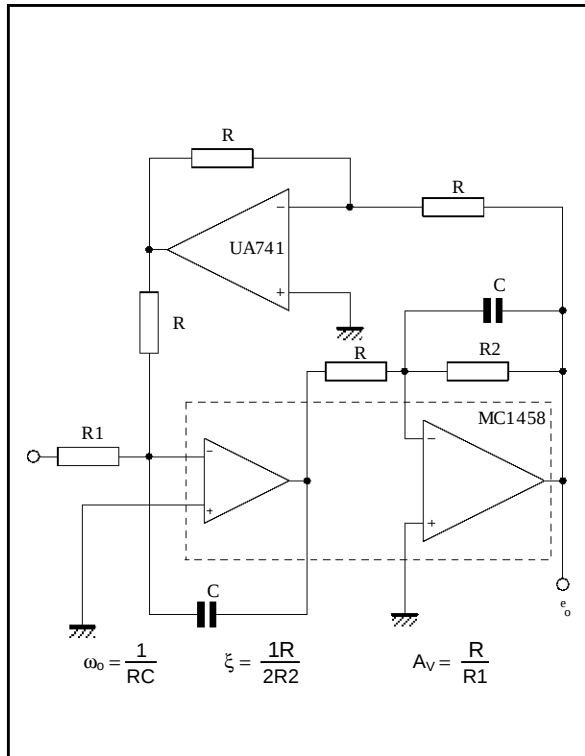
POWER CONSUMPTION



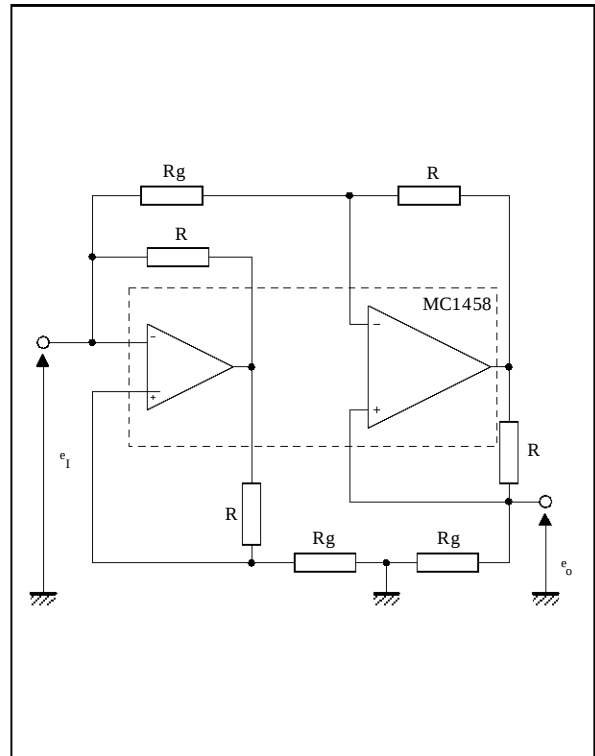


TYPICAL APPLICATIONS

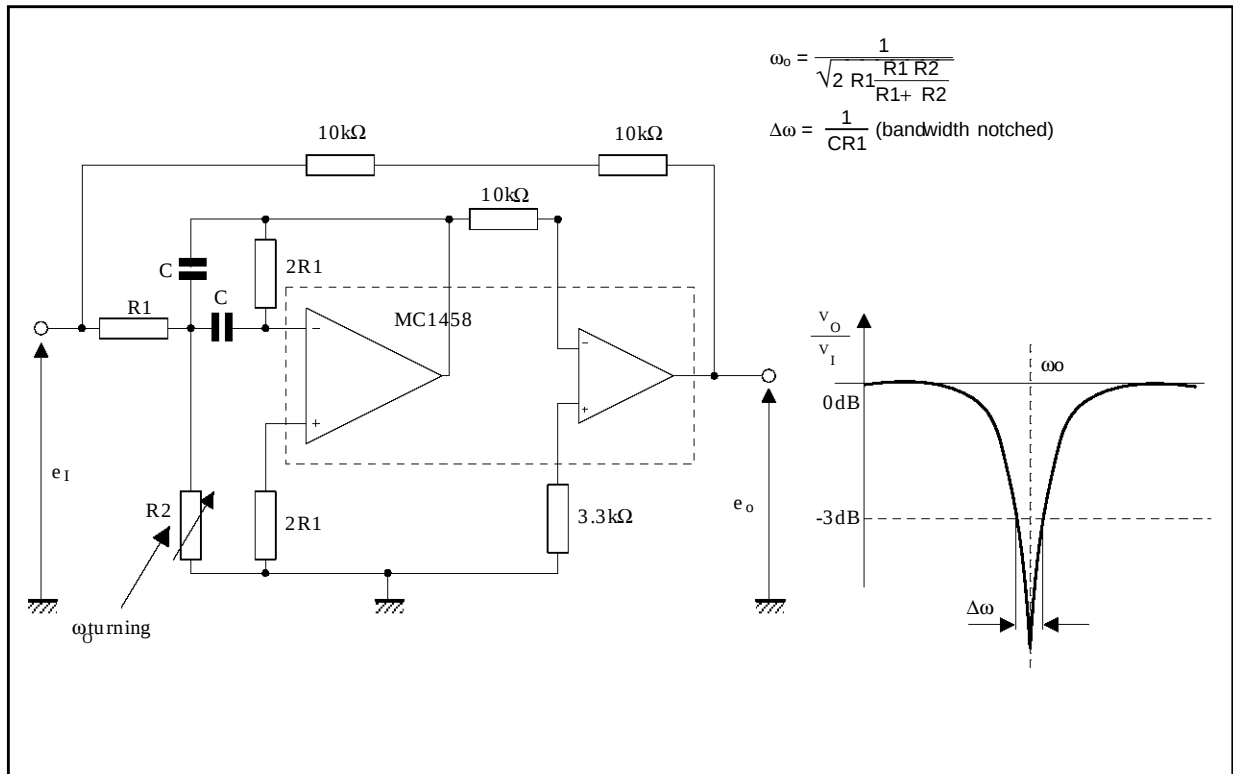
LOW PASS FILTER



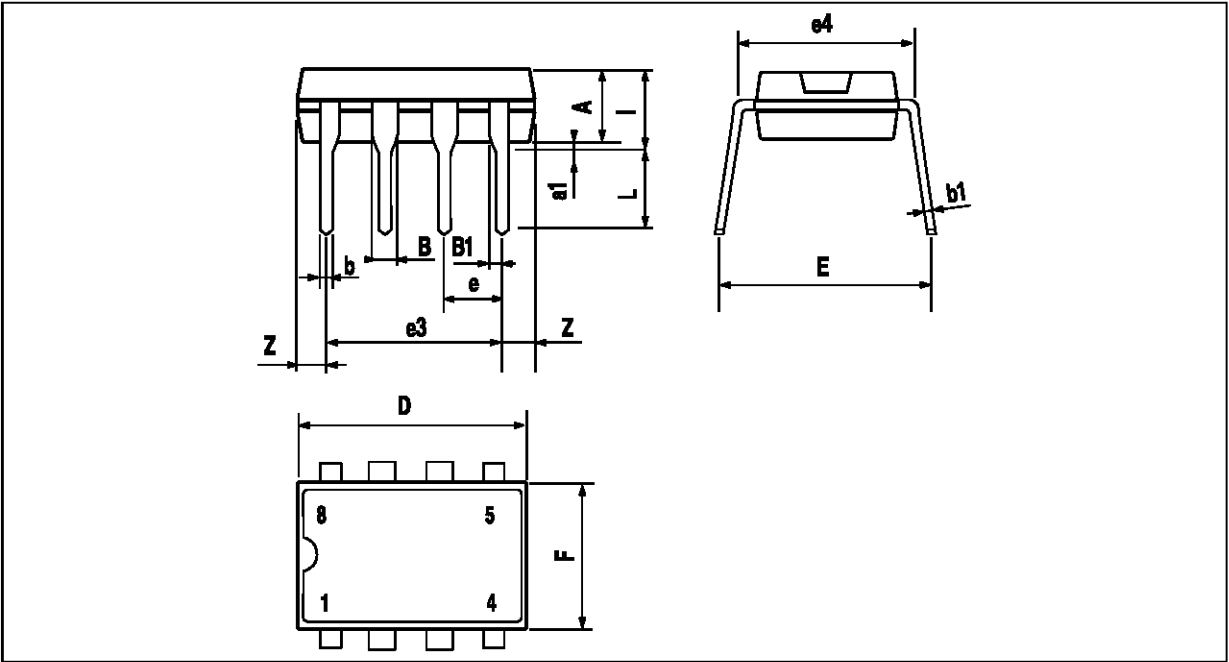
GIRATOR



TURNABLE NOTCH FILTER

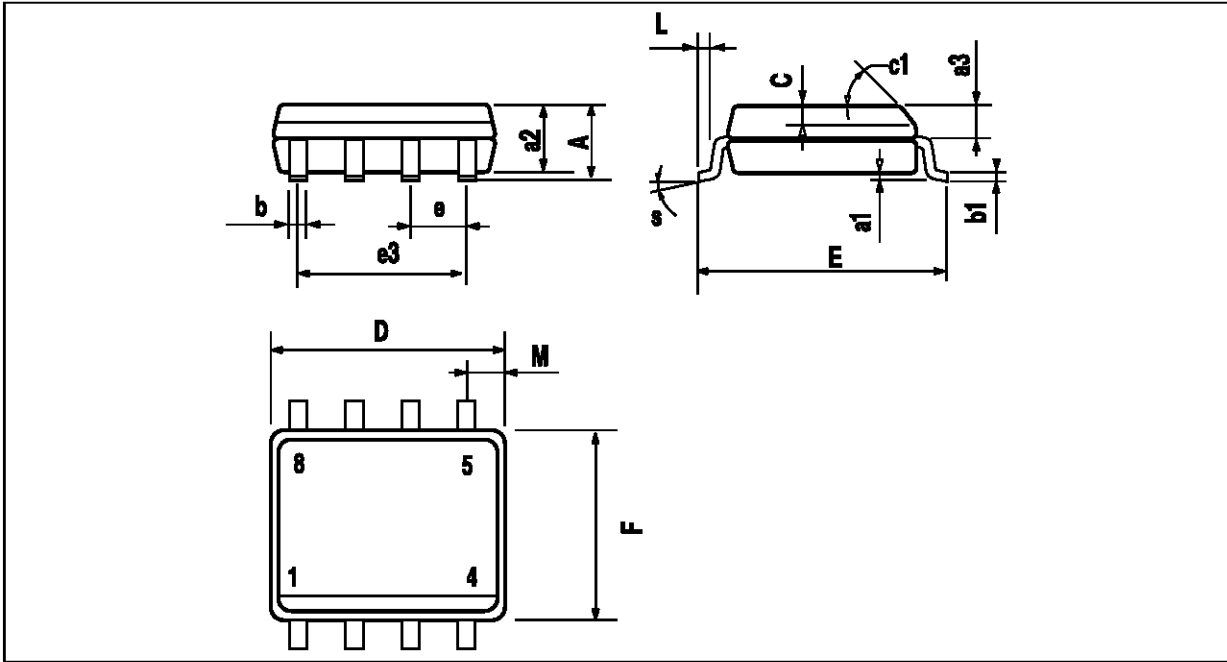


PACKAGE MECHANICAL DATA
8 PINS - PLASTIC DIP



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

PACKAGE MECHANICAL DATA
8 PINS - PLASTIC MICROPACKAGE (SO)



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.)					

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