



MC1458
MC1558

DUAL OPERATIONAL AMPLIFIERS

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

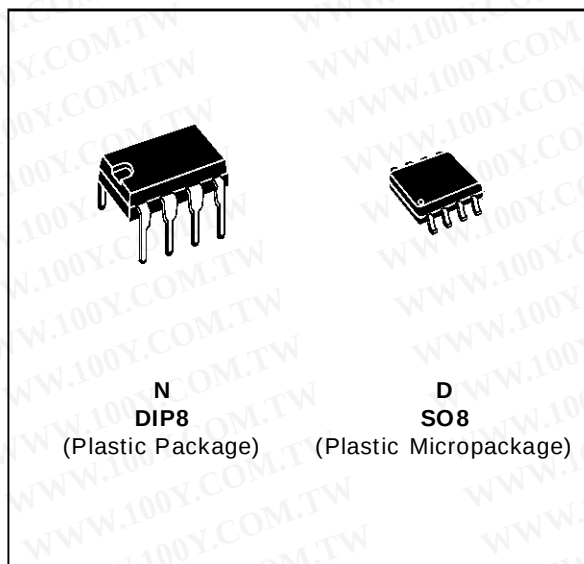
DESCRIPTION

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.

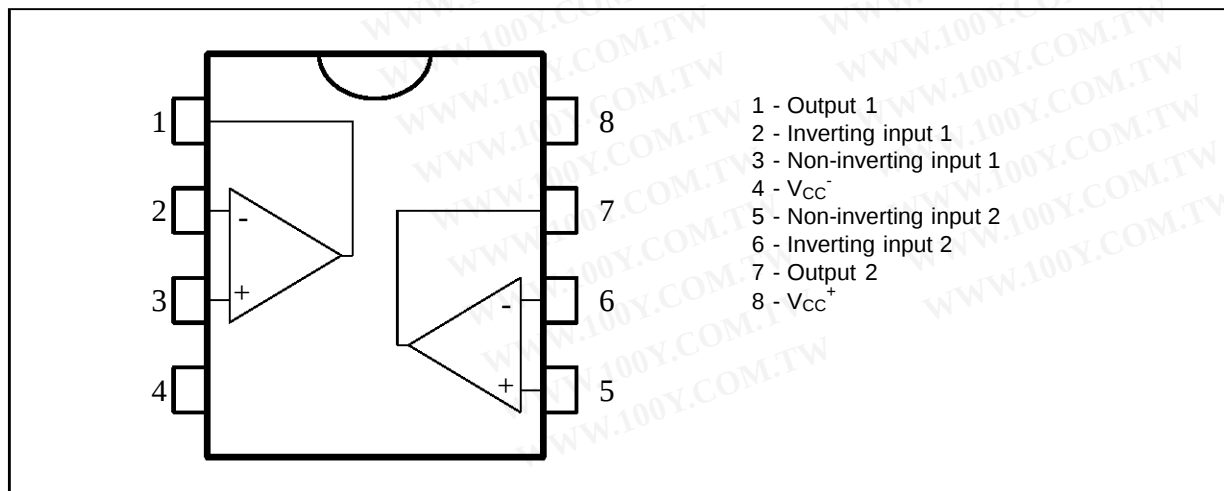


ORDER CODES

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

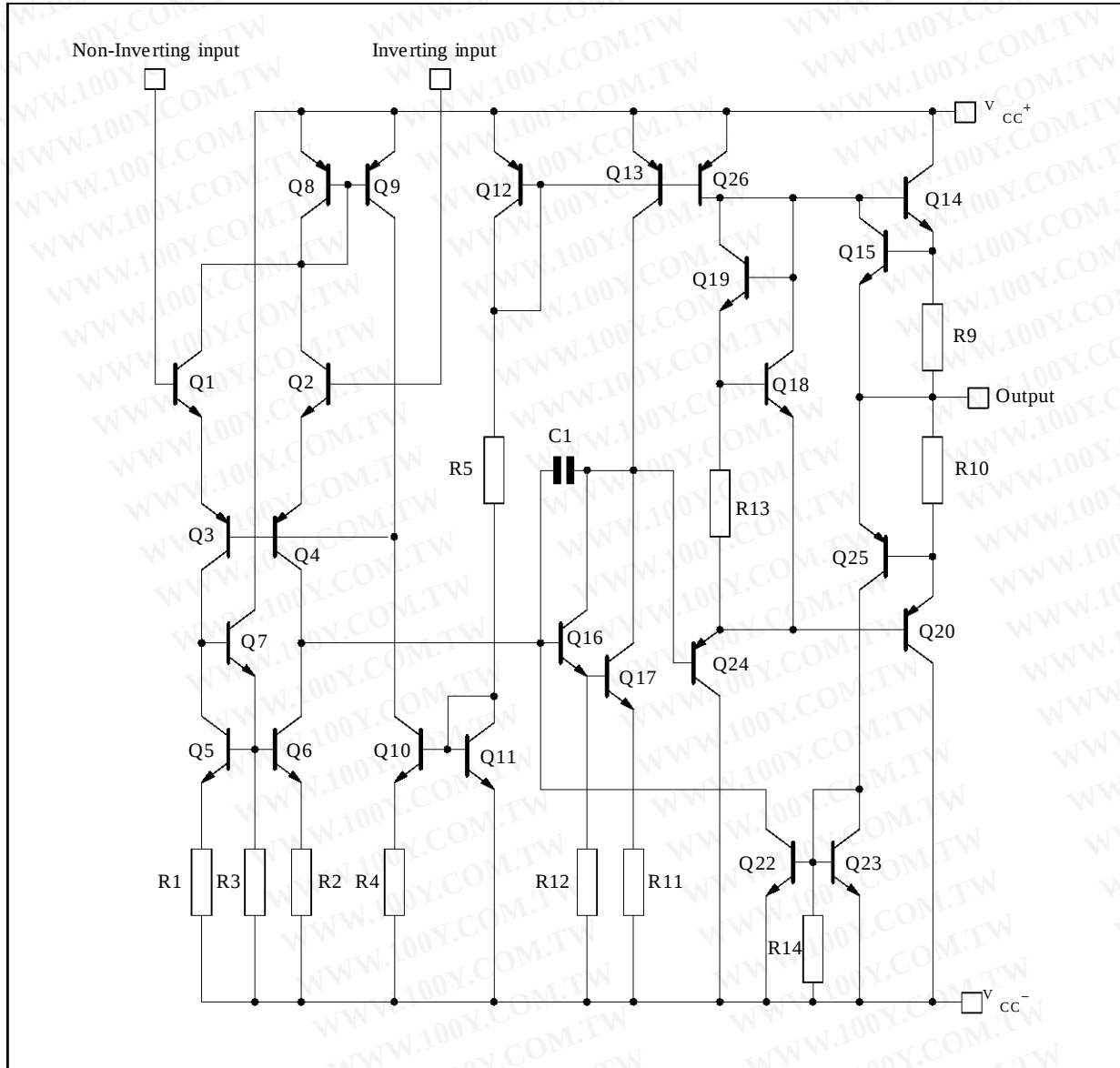
Example : MC1458N

PIN CONNECTIONS (top view)



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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)

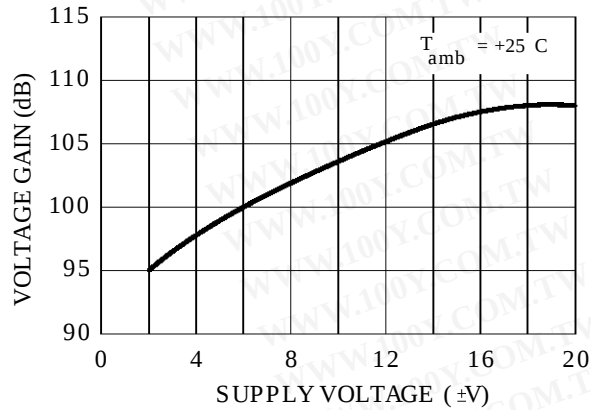
Symbol	Parameter	MC1458 - 1458I - 1558			Unit
		Min.	Typ.	Max.	
V_{io}	Input Offset Voltage ($R_S \leq 10k\Omega$) $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		1	5 6	mV
I_{io}	Input Offset Current $T_{amb} = 25^{\circ}C$ $T_{min.} \leq T_{amb} \leq T_{max.}$		2	200 300	nA
I_{ib}	Input 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

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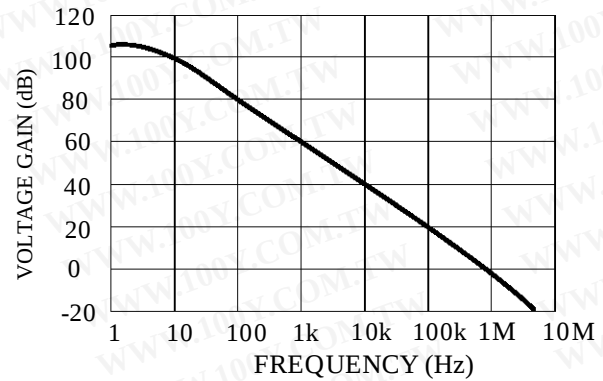
ELECTRICAL CHARACTERISTICS (continued)

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

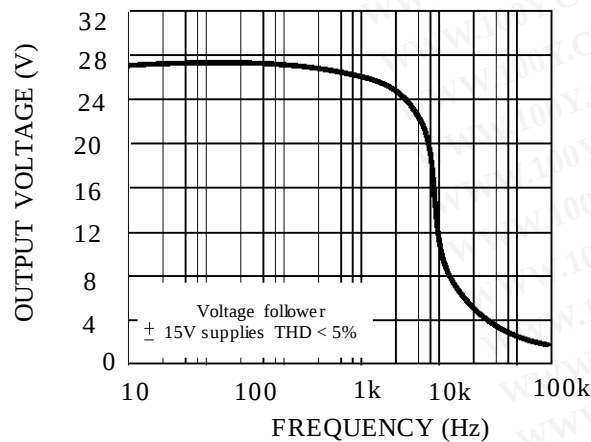
OPEN LOOP VOLTAGE GAIN



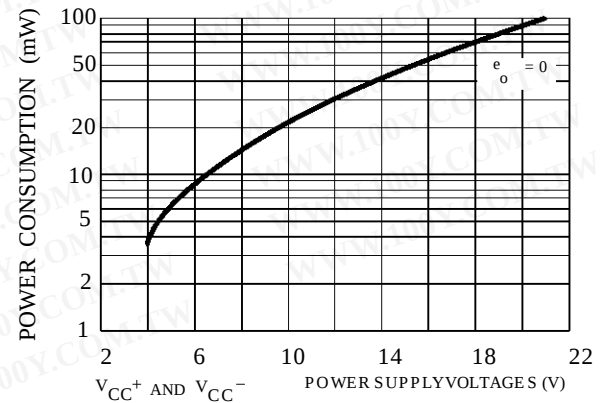
OPEN LOOP FREQUENCY RESPONSE

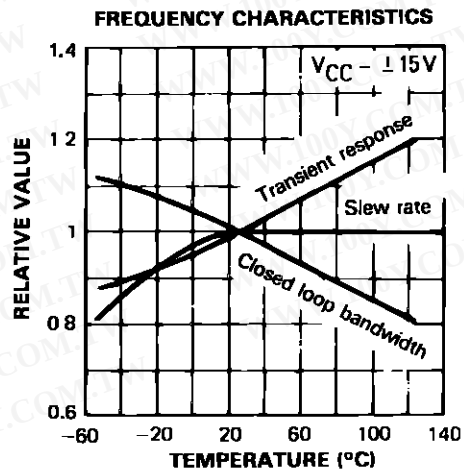
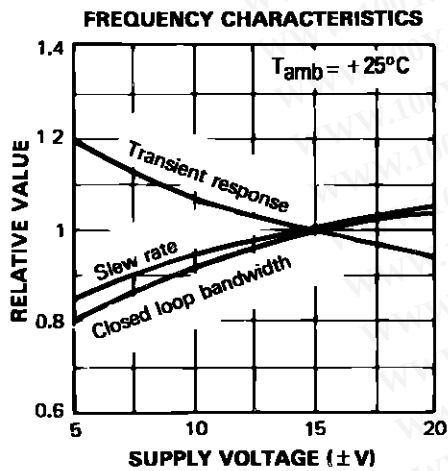
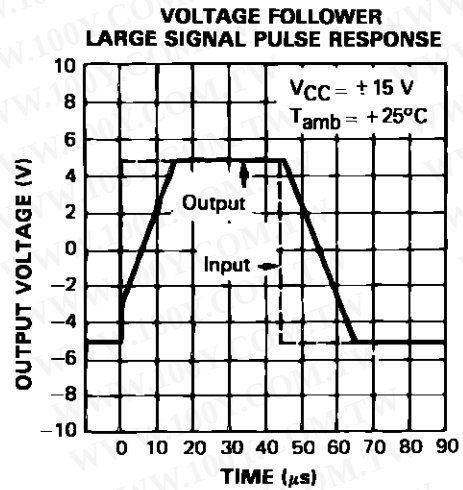
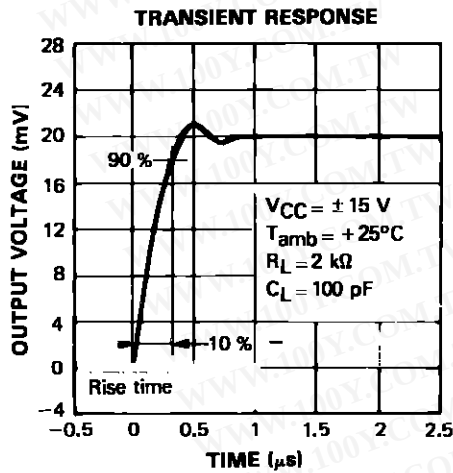
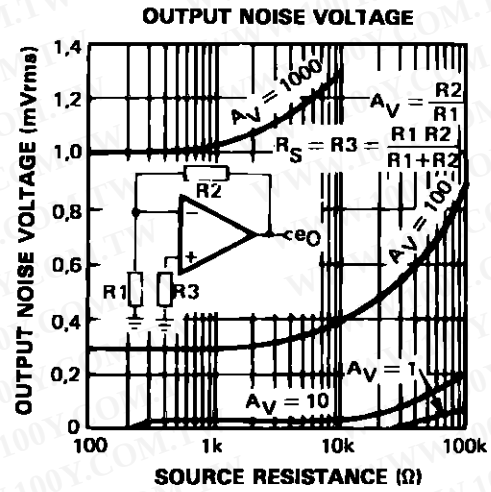
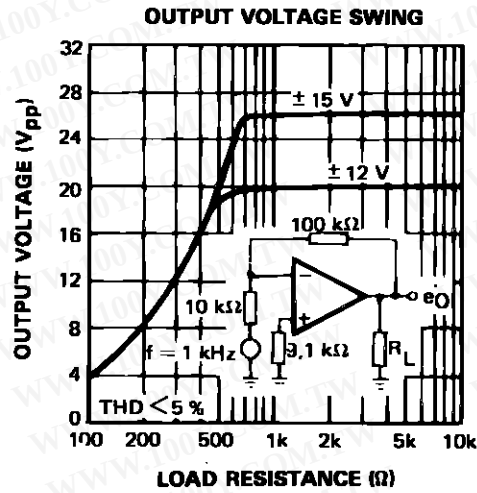


POWER BANDWIDTH (LARGE SIGNAL SWING)

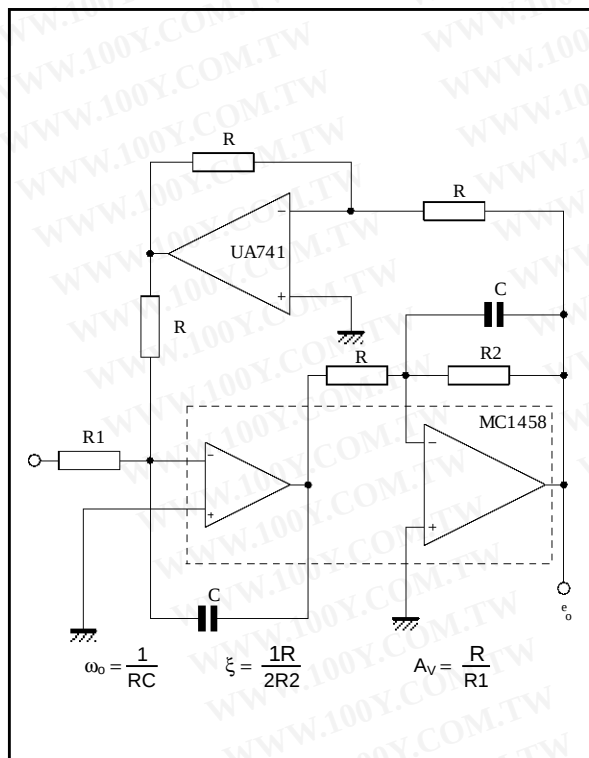


POWER CONSUMPTION





LOW PASS FILTER

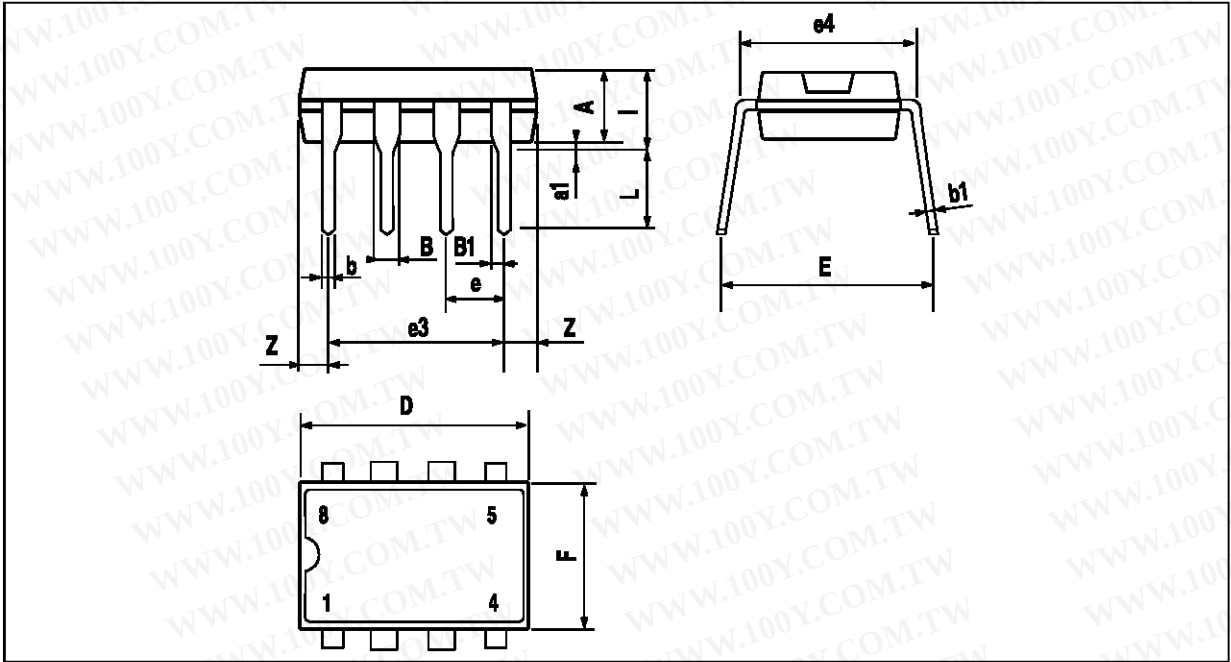


The diagram shows two MC1458 op-amp chips. The first chip is configured as a voltage follower. Its non-inverting input (+) is connected to the input signal e_i through a resistor R_g . Its inverting input (-) is connected to its output through a feedback resistor R . The output of the first stage is connected to the non-inverting input of the second chip. The second chip is configured as an inverting amplifier. Its inverting input (-) is connected to the output of the first stage through a resistor R_g . Its non-inverting input (+) is connected to ground through a resistor R . The feedback resistor R is connected between the output and the inverting input. The final output is labeled e_o .

$$\omega_0 = \frac{1}{\sqrt{2} R_1 \frac{R_1 R_2}{R_1 + R_2}}$$

$$\Delta\omega = \frac{1}{CR_1} \text{ (bandwidth notched)}$$

PACKAGE MECHANICAL DATA
8 PINS - PLASTIC DIP

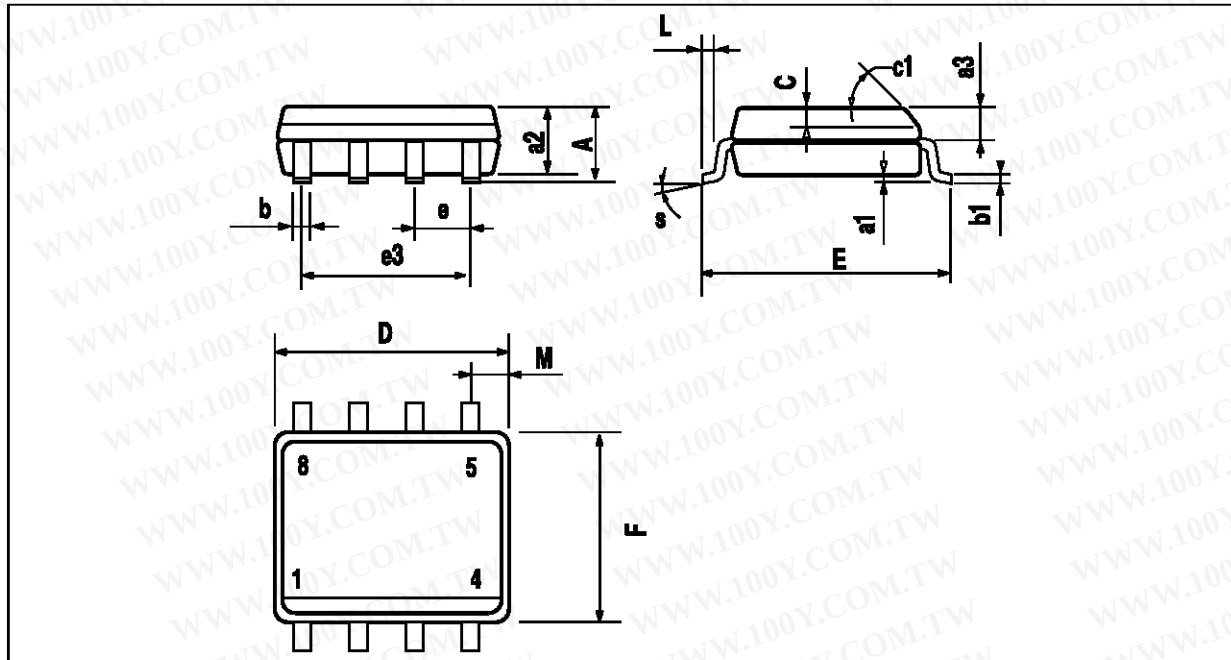


Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
i			5.08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

MC1458 - MC1558

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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