LM358

GENERAL DESCRIPTION

The LM358 consists two independent high gain operational amplifiers with internal compensated . The two op-amps operate over a wide voltage range from a single power supply. Also use a split power supply. The device has low power supply voltage. The low power drain also makes the LM358 a good choice for battery operation.

When your project calls for a traditional op-amp function, now you can streamline your design with a simple any digital system or personal computer application, without requiring an extra 15V power supply just to have the interface electronics you need.

The LM358 is a versatile, rugged workhorse with a thousand-and-one use, from amplifying signals from a variety of transducers to drain blocks, or any op-amp function. The attached pages offer some recipes that will have your project cooking in no time.

FEATURES

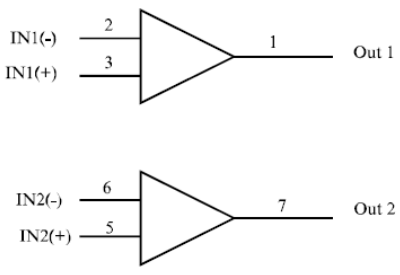
- Internally frequency compensated for unity gain.
- Large DC voltage gain:100dB Wide power supply range: 3V~30V(or ±1.5V~ ±15V),
- Input common-mode voltage range includes ground
- Large output voltage swing:0V DC to Vcc-1.5V DC.
- Power drain suitable for battery operation
- Differential inpit voltage and offset current
- Wide gain bandwidth product: 5 MHz Slew rate: 2V/μs
- Package outline: DIP8, SOIC8

Applications

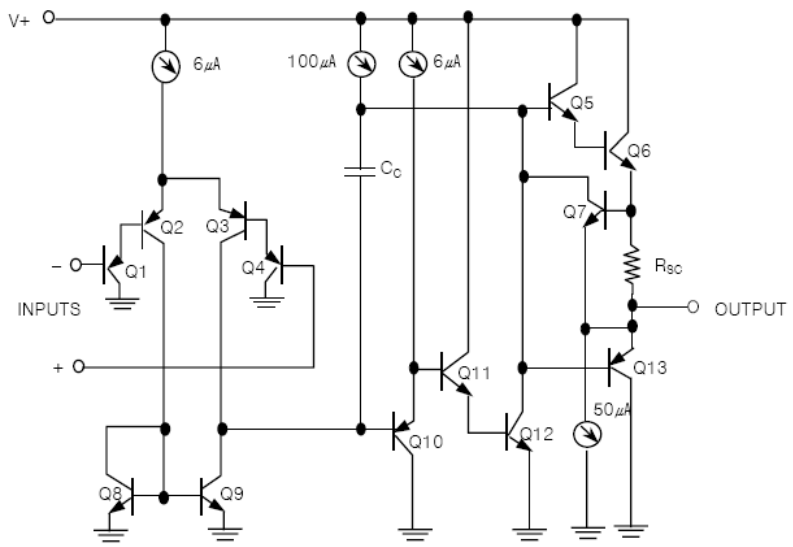
- Cordless Telephone
- Switching Power Supply
- Battery Chargers

Internal Diagram

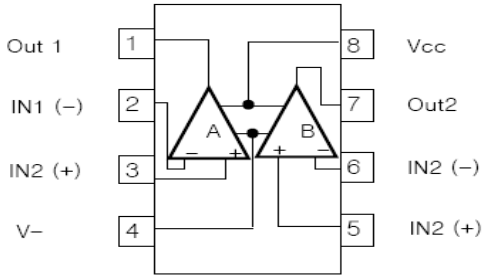
Logic Diagram



Equivalent Circuit



Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
Vcc	Power supply Voltage	30 or±15	V
V_{IDR}	Input Differential Voltage Range(a)	±30	V
V_{ICR}	Input Common Mode Voltage Range	-0.3 to 30	V
T_{OPR}	Operating Temperature Range	-40 to 80	℃
Tstg	storage Temperature (TA=+25℃)	-55 to +125	℃
T_L	Lead Temperatur,1mm from Case for 10 Seconds	280	℃

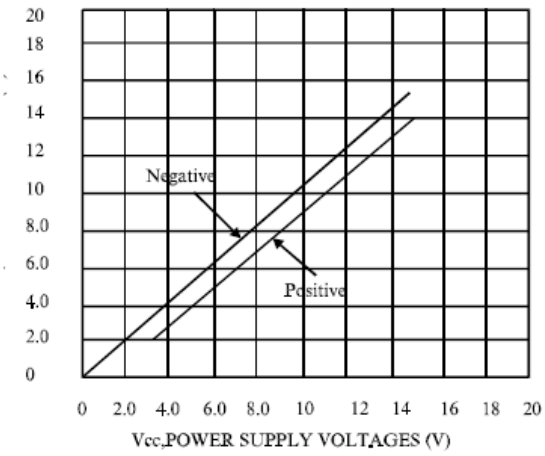
Maximum Ratings are those Values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.
Notes:
a. Split Power Supplies.

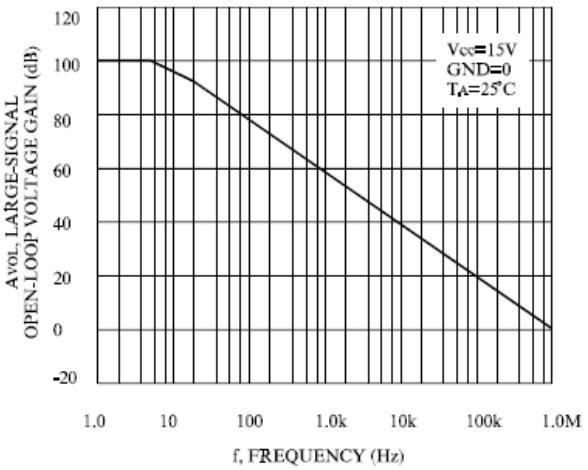
Electrical Characteristics (At specified free-air temperature, Vcc= 5V [unless otherwise noted]) LM358

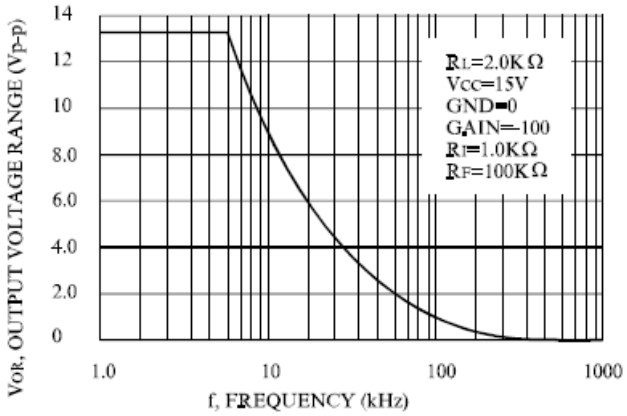
Symbol	Parameter	Test conditions*		Min.	Typ.	Max.	Unit
V_{IO}	Input Offset voltage	Vcc=5V to MAX, Vic=$V_{ICR\ Min}$, Vo=1.4V	25℃		3	7	mV
			Full range			9	
αV_{IO}	Average temperature coefficient of input offset voltage		Full range		10		PA/℃
I_{IB}	Input bias Current	Vo=1.4V	25℃		-20	-250	nA
			Full range			-500	
V_{ICR}	Common-mode input voltage range	Vcc=5V to MAX	25℃	0 to Vcc-1.5			V
			Full range	0 to Vcc-2			
V_{OH}	High-level output voltage	RL≥2KΩ	25℃	Vcc-1.5		V	V
		Vcc=15V, R_L=2KΩ	Full range	12			
		Vcc=15V, R_L=10KΩ	Full range	12.5	13.5		
V_{OL}	Low-level output voltage	Vcc=5V, R_L=10KΩ	Full range		5	20	mV
A_{VD}	Large-signal differential voltage amplification	Vcc=15V, Vo=1V to 11V, R_L≥2KΩ	25℃	25	100		V/mV
			Full range	15			
CMRR	Common-mode rejection ratio	Vcc=15V, V_{CM}=0V to (V_{CC}-1.5V)	25℃	65	85		dB
K_{SVR}	Supply voltage rejection ratio (△Vcc/△V_{IO})	Vcc=15v, R_L≥2KΩ, V_O=1V to 11V	25℃	85	100		dB
Vo1/Vo2	Crosstalk attenuation	f=1 kHz to 20 kHz	25℃			120	dB
Io	Output current	V_{IN+}=1V, V_{IN-}=0V, Vcc=15V, Vo=2V	25℃	-20	-30		mA
			Full range	-10			
		V_{IN+}=0V, V_{IN-}=1V, Vcc=15V, Vo=2V	25℃	5	8		
			Full range	3			
Ios	Short-circuit output current	Vcc at 5V GND at -5V, Vo=0	25℃		+40	+60	mA
Icc	supply current(two amplifiers)	Vo=-2.5V, No load	Full range		0.7	1.2	mA
		Vcc=MAX, Vo=0.5Vcc, No load	Full range		1	2	

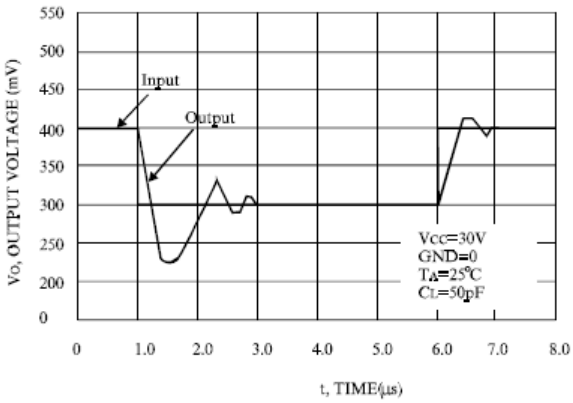
★ **All characteristics are measured under open loop conditions with zero common-mode input voltage unless otherwise specified. "MAX" Vcc for testing purposes is 30 V. Full range is** 0℃ to 80 ℃

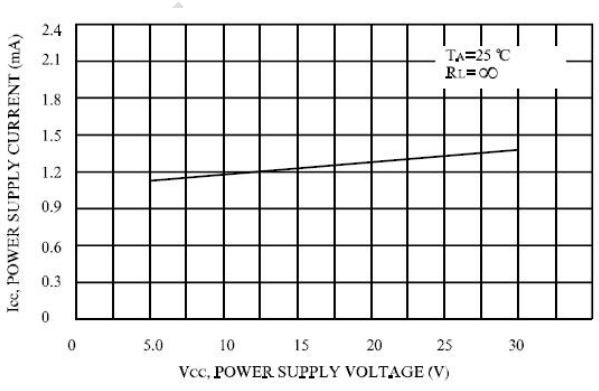
Typical Performance Characteristics

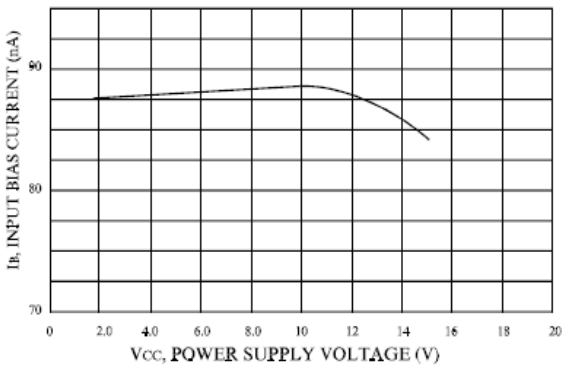


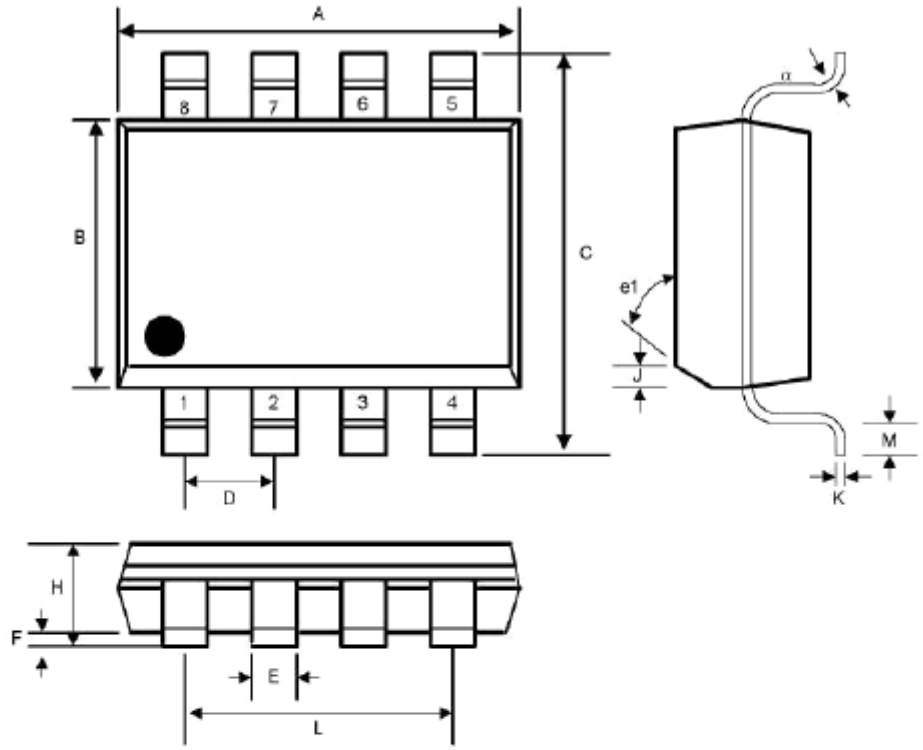






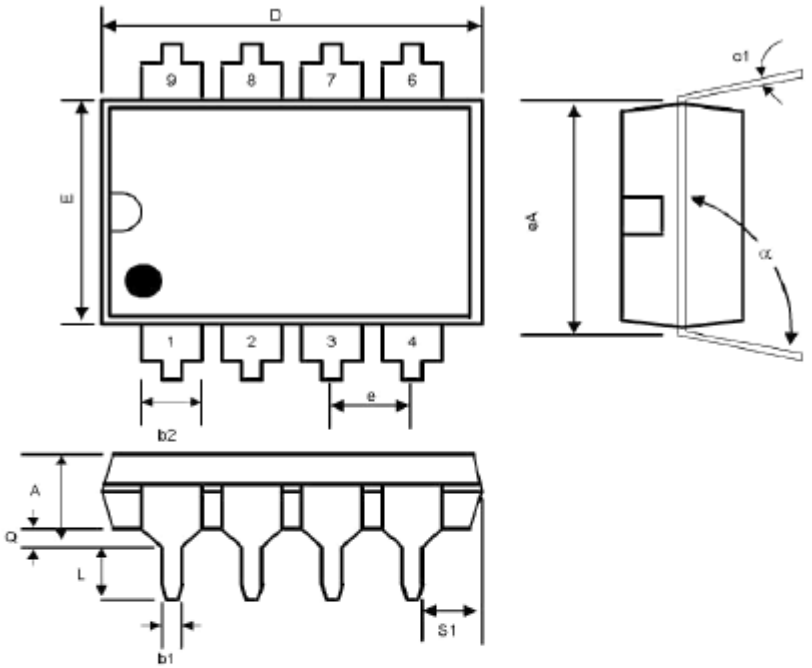






SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.188	0.197	4.80	5.00	-
B	0.149	0.158	3.80	4.00	-
C	0.228	0.244	5.80	6.20	-
D	0.050 BSC		1.27 BSC		-
E	0.013	0.020	0.33	0.51	-
F	0.004	0.010	0.10	0.25	-
H	0.053	0.069	1.35	1.75	-
J	0.011	0.019	0.28	0.48	
K	0.007	0.010	0.19	0.25	-
M	0.016	0.050	0.40	1.27	
L	0.150 REF		3.81 REF		-
e1	45^0		45^0		-
α	0^0	8^0	0^0	8^0	-

DIP8 PACKAGE OUTLINE DIMENSIONS



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b1	0.014	0.023	0.36	0.58	-
b2	0.045	0.065	1.14	1.65	-
c1	0.008	0.015	0.20	0.38	-
D	0.355	0.400	9.02	10.16	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	-
s1	0.005	-	0.13	-	-
α	90^0	105^0	90^0	105^0	-