

### GENERAL DESCRIPTION

The HT358 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 HT358 a good choice for battery operation.

The HT358 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

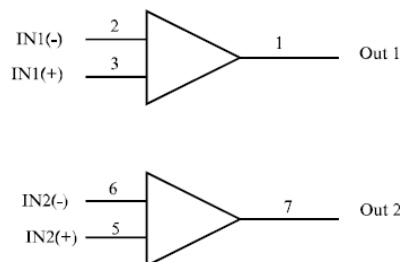
- ◆ Internally frequency compensated for unity gain.
- ◆ Large DC voltage gain:100dB
- ◆ Wide power supply range: 3V~40V(or  $\pm 1.5V \sim \pm 16V$ ),
- ◆ Input common-mode voltage range includes ground
- ◆ Large output voltage swing:0V DC to  $V_{cc}-1.5V$  DC.
- ◆ Low input offset voltage:2mV(TYP.),and offset current 5nADC
- ◆ Wide bandwidth (unity gain): 1 MHz Package outline: DIP8, SOP8

### Applications

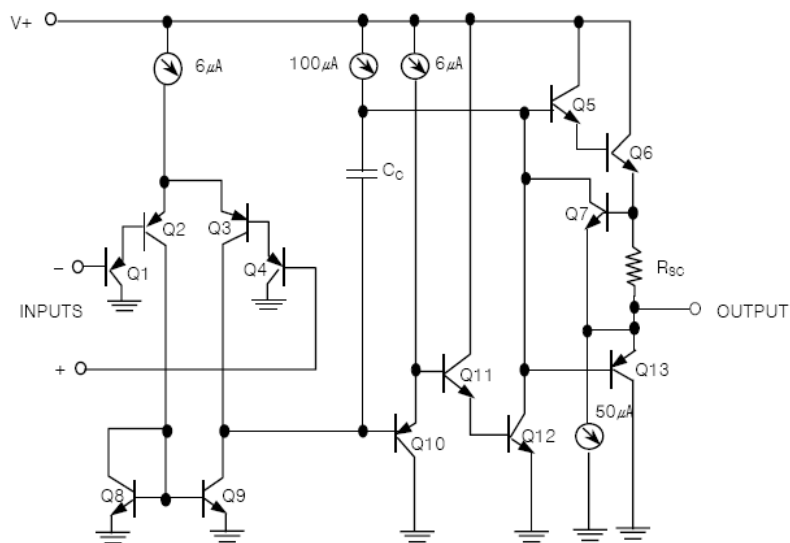
- Cordless Telephone
- Switching Power Supply
- Battery Chargers

### Internal Diagram

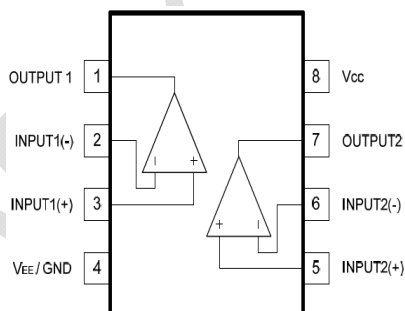
### Logic Diagram



## Equivalent Circuit



## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Power supply Voltage	40 or ±16	V
V <sub>IDR</sub>	Input Differential Voltage Range(a)	±40	V
V <sub>ICR</sub>	Input Common Mode Voltage Range	-0.3 to 40	V
T <sub>OPR</sub>	Operating Temperature Range	-25 to 85	°C
T <sub>stg</sub>	storage Temperature (T <sub>A</sub> =+25°C)	-55 to +150	°C
T <sub>L</sub>	Lead Temperatur, 1mm from Case for 10 Seconds	280	°C

Maximum Ratings are those Values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

Notes:

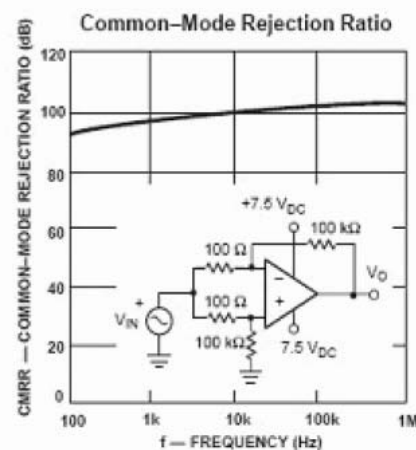
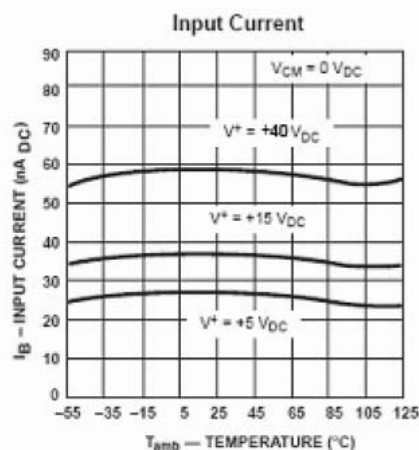
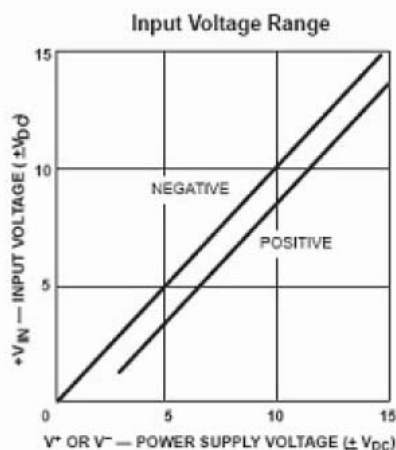
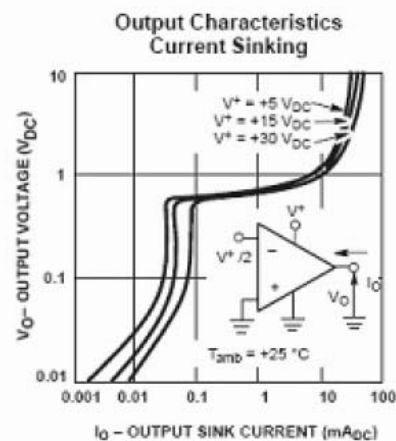
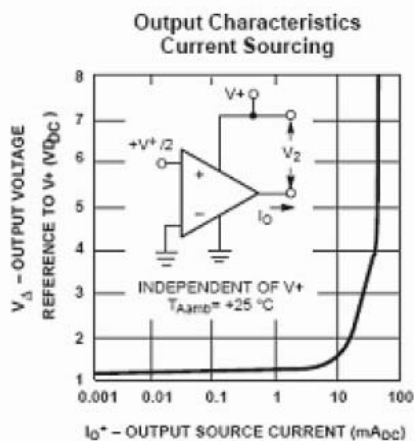
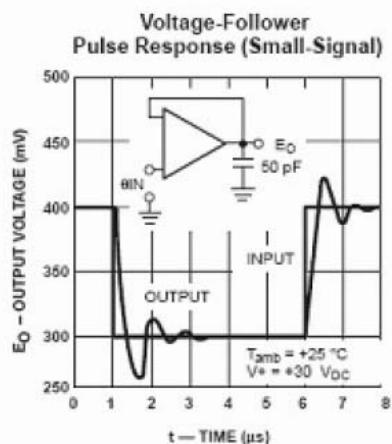
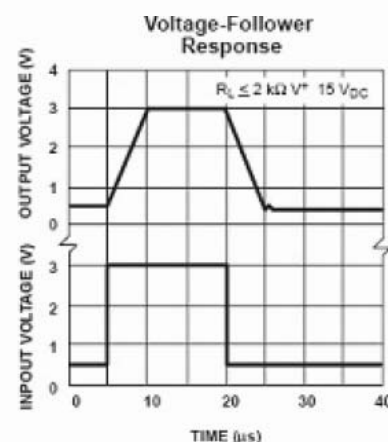
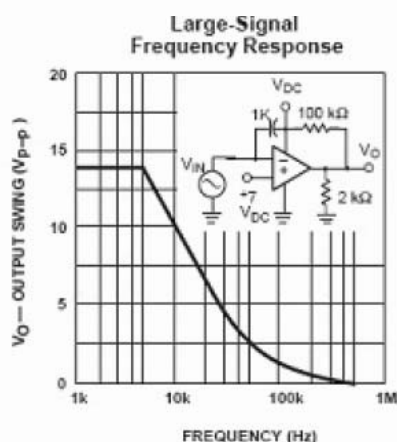
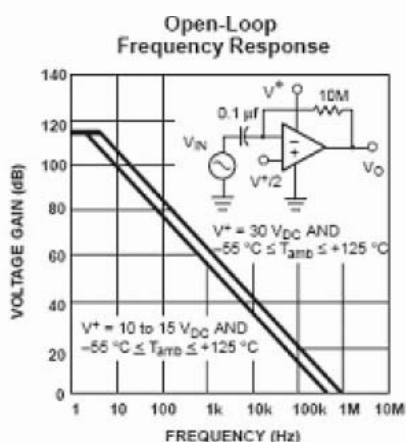
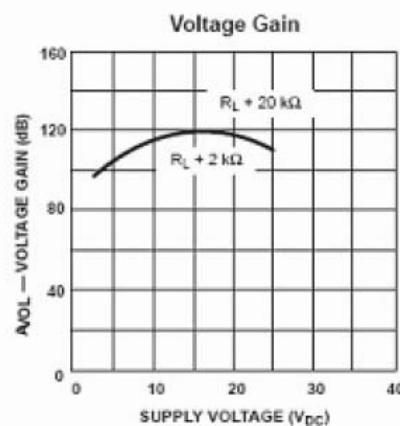
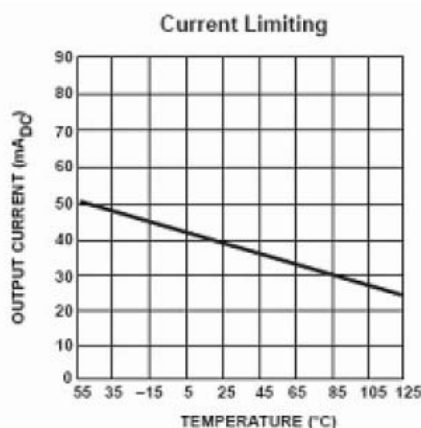
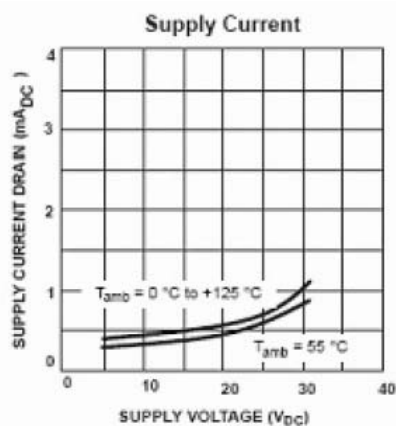
a. Split Power Supplies.

**Electrical Characteristics** (At specified free-air temperature,  $V_{CC}= 5V$  [unless otherwise noted])

Symbol	Parameter	Test conditions*		Min.	Typ.	Max.	Unit
$V_{IO}$	Input Offset voltage	$V_{CC}=5V$ to MAX, $V_{IC}=V_{ICR\ MIN}$ , $V_O=1.4V$	25°C		2	4	mV
			Full range			7	
$\alpha V_{IO}$	Average temperature coefficient of input offset voltage		Full range		10		PA/°C
$I_{IB}$	Input bias Current	$V_O=1.4V$	25°C		-40	-250	nA
			Full range			-500	
$V_{ICR}$	Common-mode input voltage range	$V_{CC}=5V$ to MAX	25°C	0 to $V_{CC}-1.5$			V
			Full range	0 to $V_{CC}-2$			
$V_{OH}$	High-level output voltage	$R_L \geq 2K\Omega$	25°C	$V_{CC}-1.5$			V
		$V_{CC}=30V, R_L=2K\Omega$	Full range	26			
		$V_{CC}=30V, R_L=10K\Omega$	Full range	27	28		
$V_{OL}$	Low-level output voltage	$V_{CC}=5V, R_L=10K\Omega$	Full range		5	20	mV
$A_{VD}$	Large-signal differential voltage amplification	$V_{CC}=15V, V_O=1V$ to 11V, $R_L \geq 2K\Omega$	25°C	25	100		V/mV
			Full range	15			
CMRR	Common-mode rejection ratio	$V_{CC}=30V, V_{CM}=0V$ to $(V_{CC}-1.5V)$	25°C	65	85		dB
$K_{SVR}$	Supply voltage rejection ratio ( $\Delta V_{CC}/\Delta V_{IO}$ )	$V_{CC}=15V, R_L \geq 2K\Omega, V_O=1V$ to 11V	25°C	85	100		dB
$V_{O1}/V_{O2}$	Crosstalk attenuation	$f=1\text{ kHz}$ to 20 kHz	25°C			120	dB
$I_O$	Output current	$V_{IN+}=1V, V_{IN-}=0V, V_{CC}=15V, V_O=2V$	25°C	-20	-30		mA
			Full range	-10			
			25°C	5	8		
$I_{OS}$	Short-circuit output current	$V_{CC}$ at 5V GND at -5V, $V_O=0$	25°C		+40	+60	mA
			Full range				
$I_{CC}$	supply current (two amplifiers)	$V_O=-2.5V$ , No load	Full range		0.5	1.0	mA
		$V_{CC}=30$ , No load	Full range		0.6	1.2	

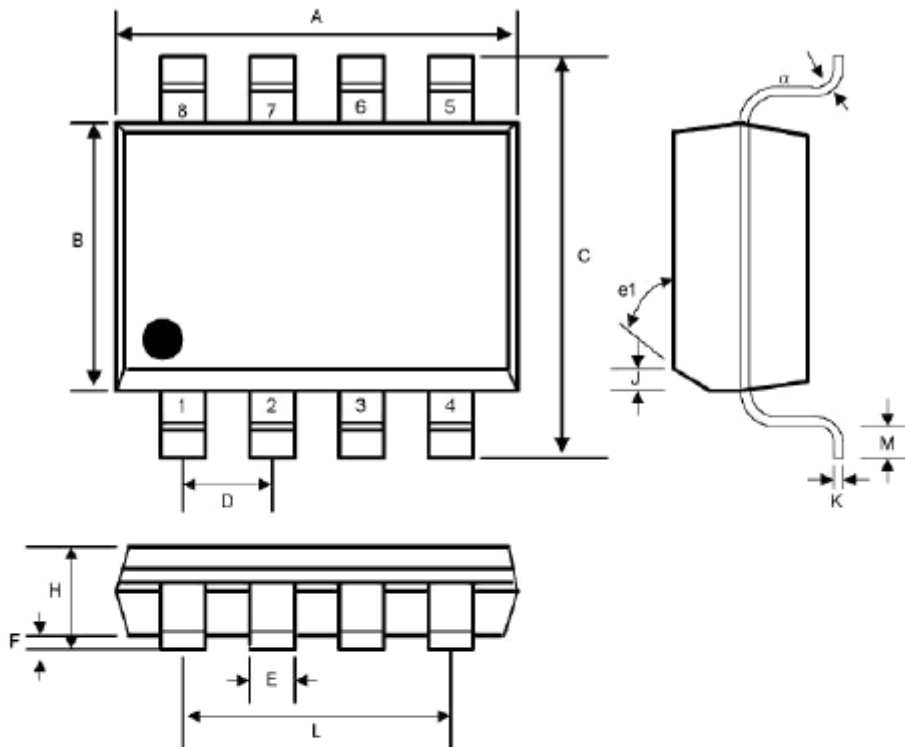
★ All characteristics are measured under open loop conditions with zero common-mode input voltage unless otherwise specified. "MAX"  $V_{CC}$  for testing purposes is 30 V. Full range is 0°C to 80 °C

## Typical Performance Characteristics



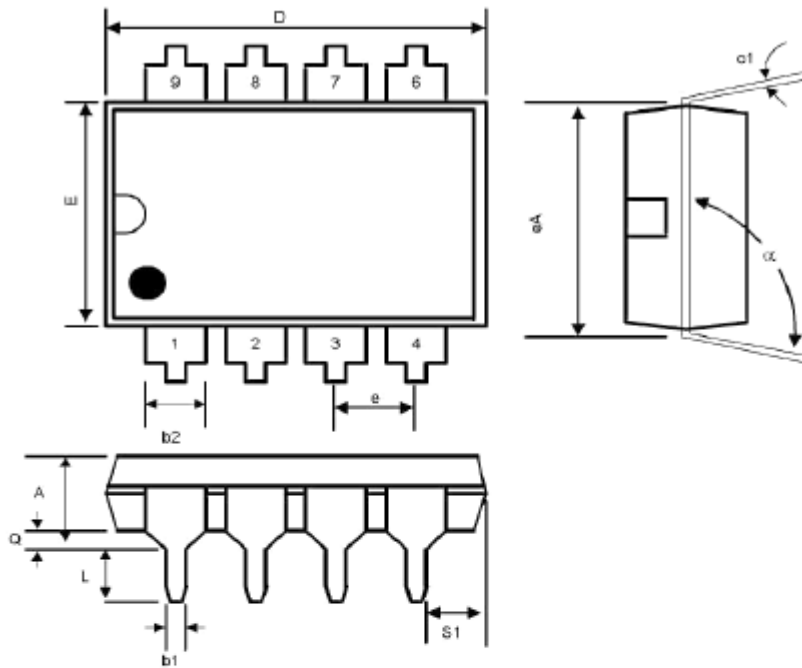
## PACKAGE DESCRIPTION

### SOP8 PACKAGE OUTLINE DIMENSIONS



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°		45°		-
alpha	0°	8°	0°	8°	-

## 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 <sup>0</sup>	105 <sup>0</sup>	90 <sup>0</sup>	105 <sup>0</sup>	-

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