

Description

The AMS 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 AMS 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 AMS 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

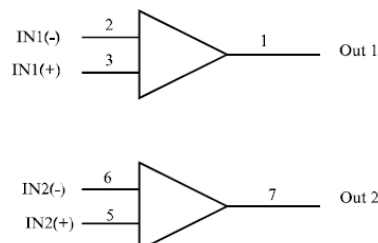
- ✧ Internally frequency compensated for unity gain
- ✧ Large DC voltage gain:100dB Wide power supply range: 3V~30V(or $\pm 1.5V \sim \pm 15V$)
- ✧ Input common-mode voltage range includes ground
- ✧ Large output voltage swing:0V DC to $V_{cc}-1.5V$ DC
- ✧ Power drain suitable for battery operation
- ✧ Differential input voltage and offset current
- ✧ Wide gain bandwidth product: 5 MHz Slew rate: 2V/ μ s
- ✧ Package outline: DIP8, SOIC8

Applications

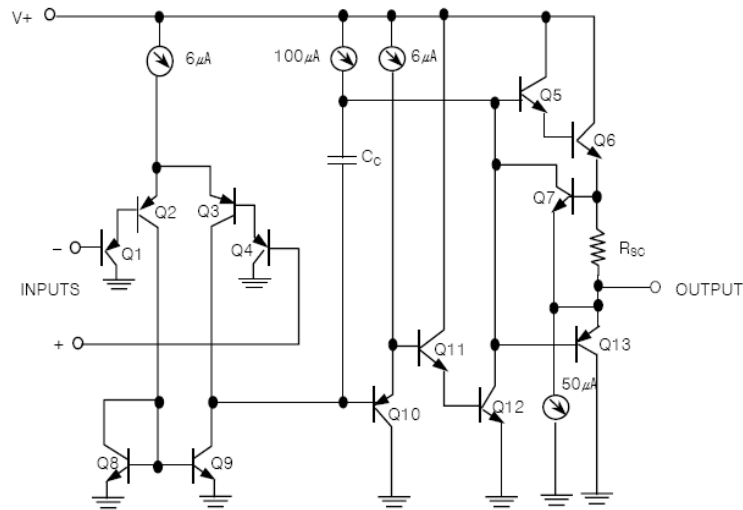
- ✧ Cordless Telephone
- ✧ Switching Power Supply
- ✧ Battery Chargers

Internal Diagram

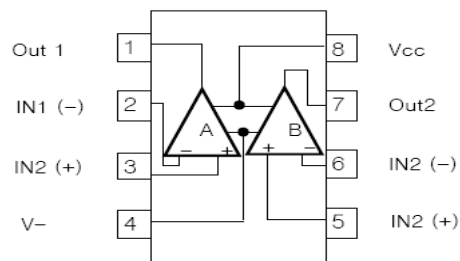
Logic Diagram



Equivalent Circuit



Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{CC}	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	°C
T _{stg}	storage Temperature (TA=+25°C)	-55 to +125	°C
T _L	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, $V_{ICR}=V_{ICR\ Min},$ $V_O=1.4V$	25°C		3	7	mV
			Full range			9	
αV_{IO}	Average temperature coefficient of input offset voltage		Full range		10		PA/°C
I_{IB}	Input bias Current	$V_O=1.4V$	25°C		-20	-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
		$V_{CC}=15V, R_L=2K\Omega$	Full range	12			
		$V_{CC}=15V, R_L=10K\Omega$	Full range	12.5	13.5		
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	$V_{CC}=15V, V_{CM}=0V$ 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		
			Full range	3			
I_{OS}	Short-circuit output current	V_{CC} at 5V GND at -5V, $V_O=0$	25°C		+40	+60	mA
I_{CC}	supply current (two amplifiers)	$V_O=-2.5V, \text{No load}$	Full range		0.7	1.2	mA
		$V_{CC}=\text{MAX}, V_O=0.5V_{CC}, \text{No load}$	Full range		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

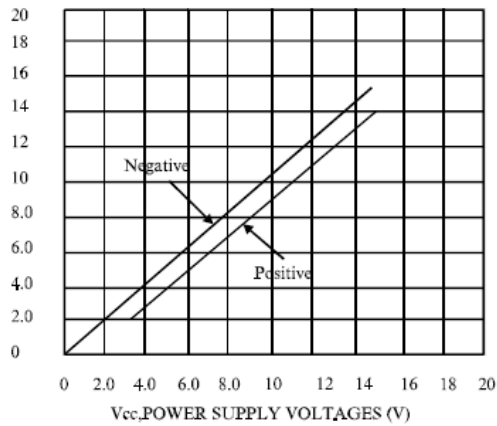


Figure 1. Input Voltage Range

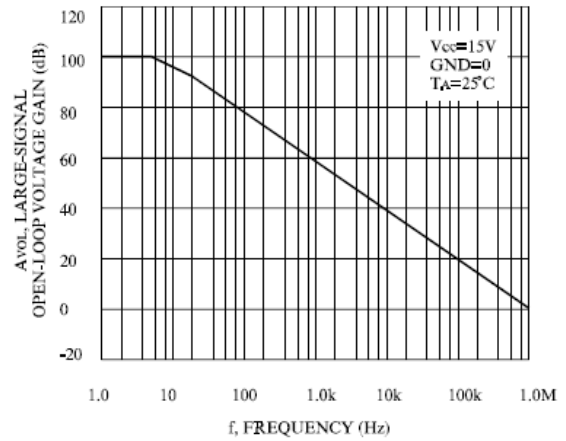


Figure 2. Open-Loop Frequency

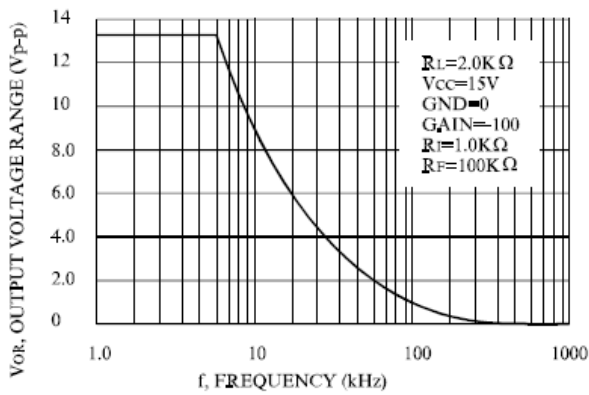


Figure 3. Large-Signal Frequency Response

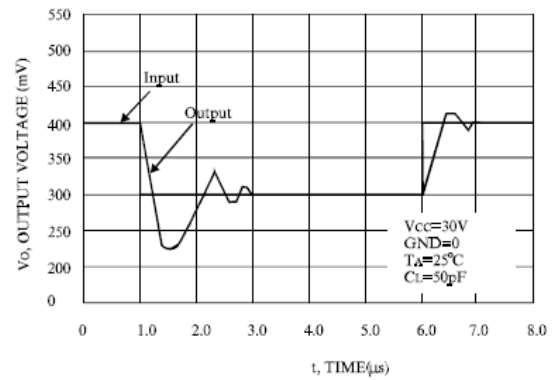


Figure 4. Small-Signal Voltage Follower Pulse Response (Noninverting)

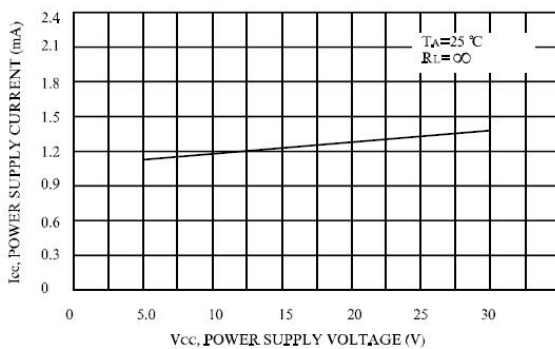


Figure 5. Power Supply Current versus Power

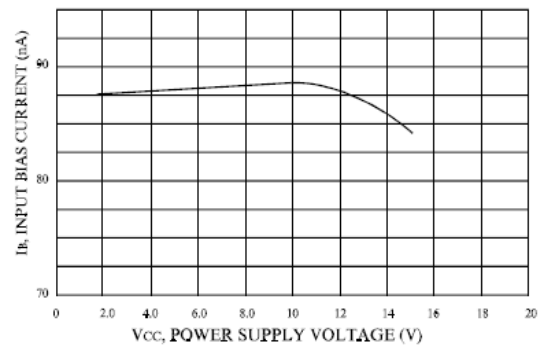
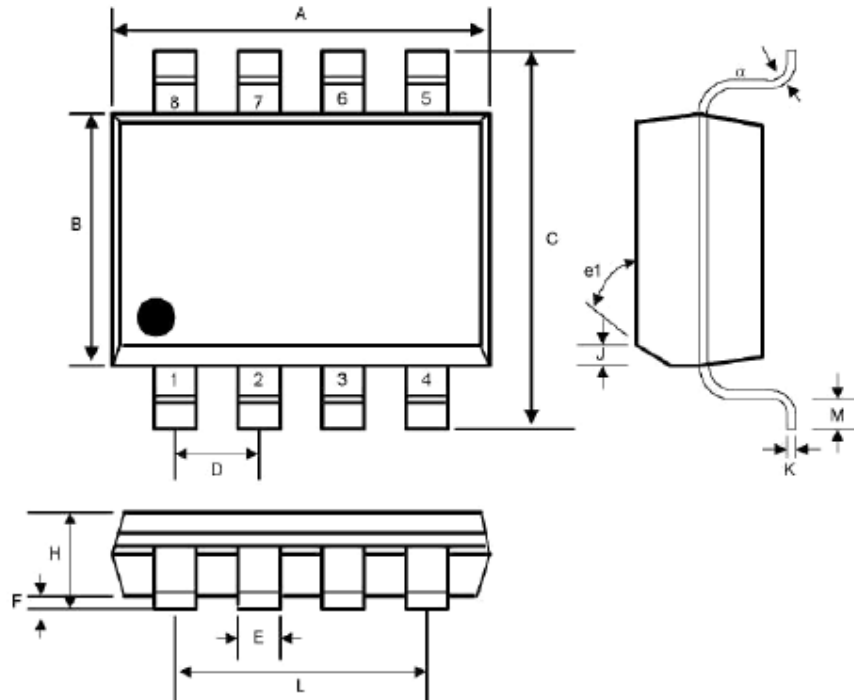


Figure 6. Input Bias Current versus Power Supply Voltage

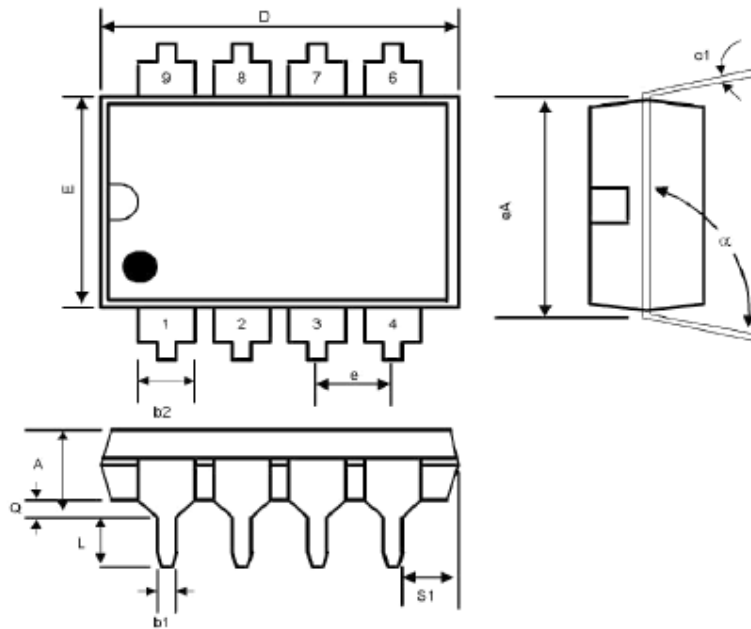
PACKAGE DESCRIPTION

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°	-
a	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 ⁰	105 ⁰	90 ⁰	105 ⁰	-



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- AMS will supply the best possible product for customers!