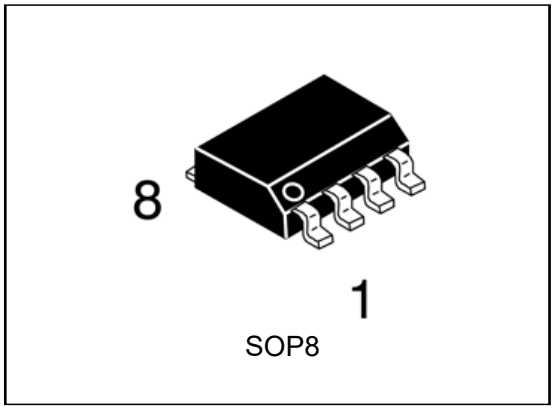
General Description

The LM358 series consists of two independent, high gain,internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Application areas include transducer amplifiers, dc gain blocks and all the conventional op amp circuits which now can be more easily implemented in single power supply systems. For example, the LM358 series can be directly operated off of the standard +5V power supply voltage which is used in digital systems and will easily provide the required interface electronics without requiring the additional±15V power supplies.



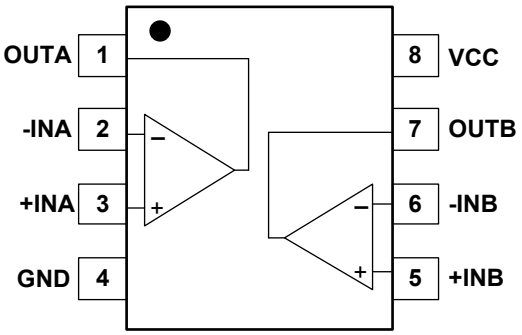
Applications

★ Walkie-Talkie
★ Battery Management Solution
★ Transducer Amplifiers
★ Summing Amplifiers
★ Multivibrators
★ Oscillators
★ Portable Systems

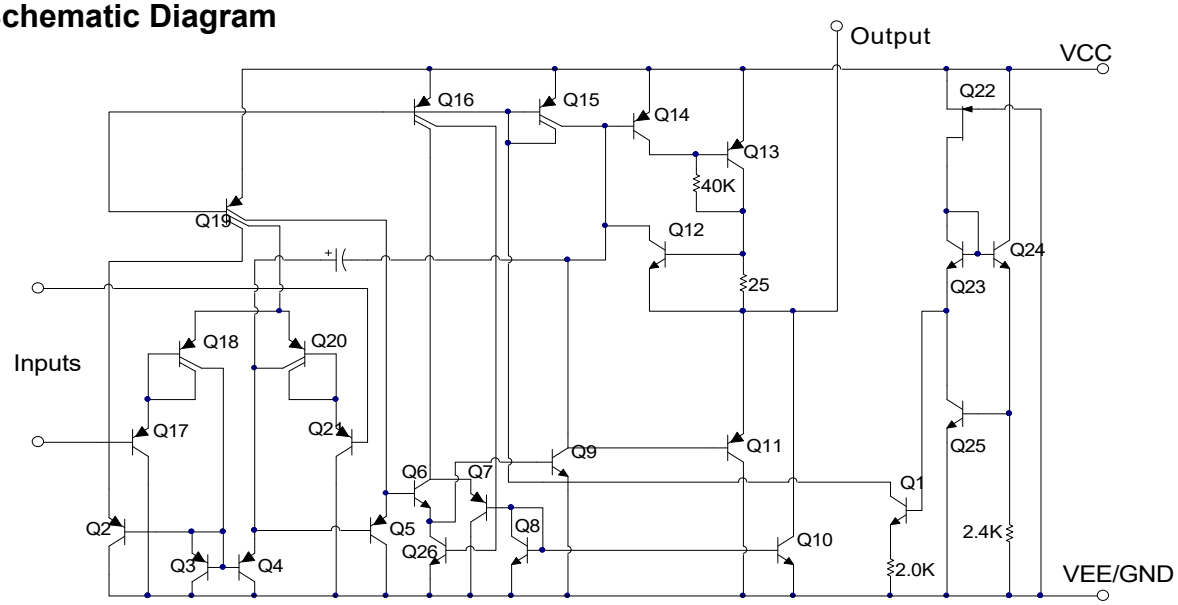
Features

★ Wide power supply range:
  - Single supply: 4V to 32V
  - or dual supplies: ±2V to ±16V
★ Very low supply current drain (500 μA)
  - essentially independent of supply voltage
★ Wide bandwidth (unity gain): 1 MHz
★ Low Input Bias Currents
★ Common Mode Range Extends to Negative Supply

PIN CONNECTIONS



Schematic Diagram



MAXIMUM RATINGS(TA = +25℃, unless otherwise noted.)

Rating		Value	Unit
Power Supply Voltages		32 or ±16	V
Input Differential Voltage Range		32	V
Input Common Mode Voltage Range		-0.3 ～ VCC	V
Power Dissipation (Note1)	SOP8	530	mW
Output Short Circuit Duration （ One Amplifier ）（V≤15V,Ta=25℃）		Continuous	
Input Current（VIN<-0.3V）		50	mA
Junction Temperature		150	℃
Operating Temperature Range		0 ～ 70	℃
Storage Temperature Range		-65 ～ 150	℃

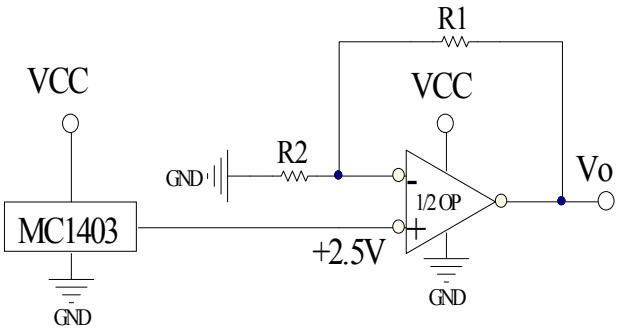
Note1：LM358 must be derated based on a +150°C maximum junction temperature.

ELECTRICAL CHARACTERISTICS （Vcc=5.0V, TA = +25 ℃, unless otherwise noted.）

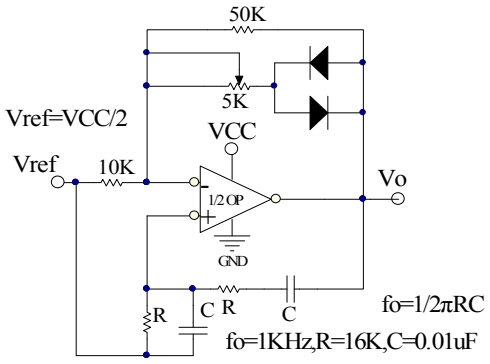
Parameter	Conditions	LM358			Units
		Min	Typ	Max	
Input Offset Voltage	Ta=25℃, VCC = 5.0 V to 30 V, VO =1.4 V,		2	5	mV
Input Bias Current	Ta=25℃，IIN(+) or IIN（-），VCM=0V		45	150	nA
Input Offset Current	Ta=25℃，IIN(+) - IIN（-），VCM=0V		3	30	nA
Input Common Mode Voltage Range	Ta=25℃，V^+=30V	0		Vcc -1.5	V

Power Supply Current		RL=∞, Total Device	Vcc =30V		1	2	mA
			Vcc =5V		0.5	1.2	mA
Large Signal Open Loop Voltage Gain		Vcc =15V，Ta=25℃，RL≥2kΩ（for Vo=1~11V）		25	100		V/mV
Common Mode Rejection		DC，Ta=25℃，VCM=0~Vcc-1.5V		65	90		dB
Power Supply Rejection		DC，Ta=25℃，Vcc =5~30V		65	100		dB
Output Source Current		VIN(+)=1V,VIN(-)=0V,Vcc=15V,Vo=2V,Ta=25℃		20	40		mA
Output Sink Current		VIN(-)=1V,VIN(+)=0V,Vcc=15V,Vo=2V,Ta=25℃		10	15		mA
		VIN(-)=1V,VIN(+)=0V,Vcc=15V,Vo=200mV, Ta=25℃		12	50		μA
Output Short Circuit to Ground		Vcc=15V， Ta=25℃			40	60	mA
Output Voltage Swing	VOH	Vcc=30V	RL=2kΩ	26			V
		Vcc=30V	RL=10kΩ	27	28		V
	VOL	Vcc=5V，RL=10kΩ			5	20	mV

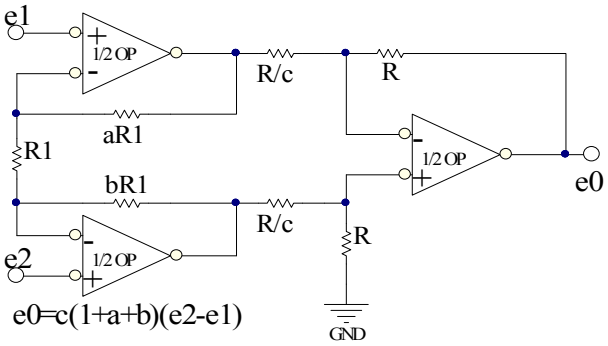
Typical Applications



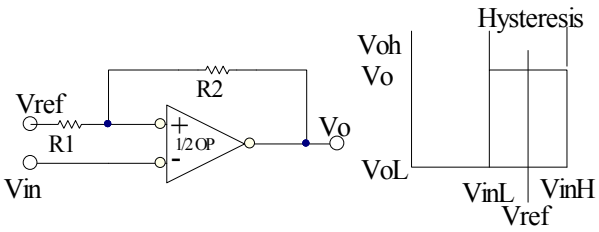
Voltage Reference, Vo=2.5V (1+R1/R2)



Wien Bridge Oscillator

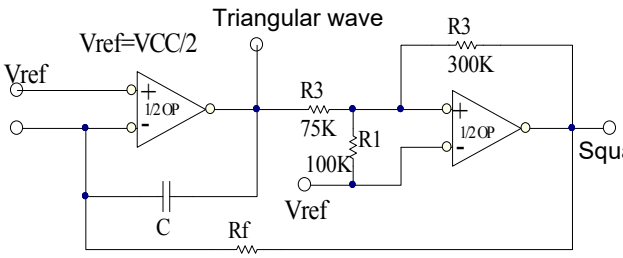


High Impedance Differential Amplifier

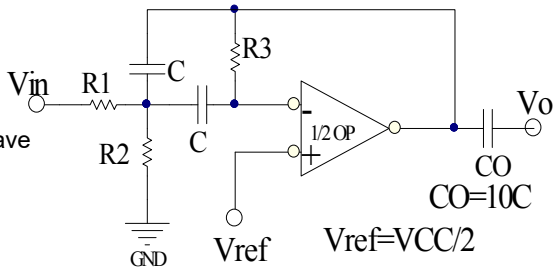


VinL=(R1/(R1+R2))*(VoL-Vref)+Vref
VinH=(R1/(R1+R2))*(VoH-Vref)+Vref
H=(R1/(R1+R2))*(VoH-VoL)

Comparator with Hysteresis



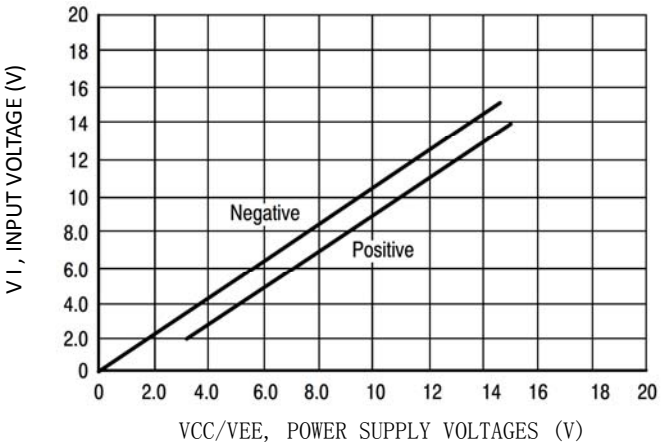
Function Generator



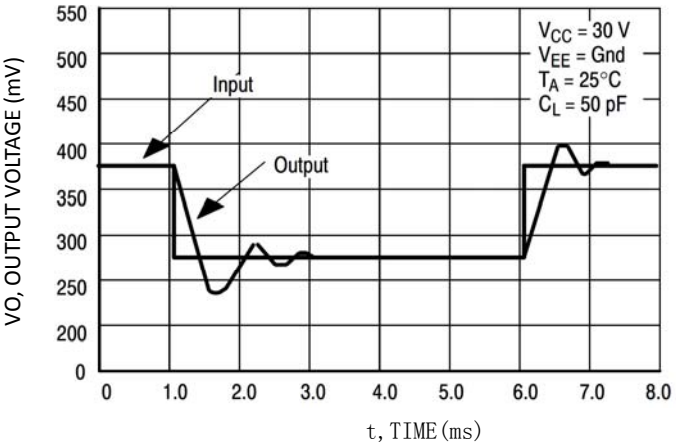
fo = center frequency

Multiple Feedback Bandpass Filter

Typical Performance Characteristics

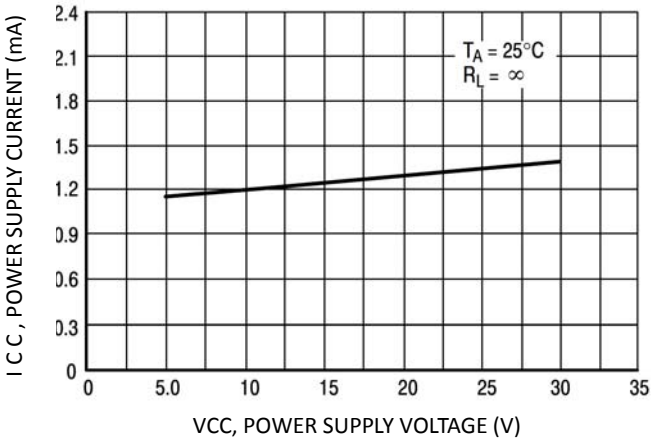


Input Voltage Range

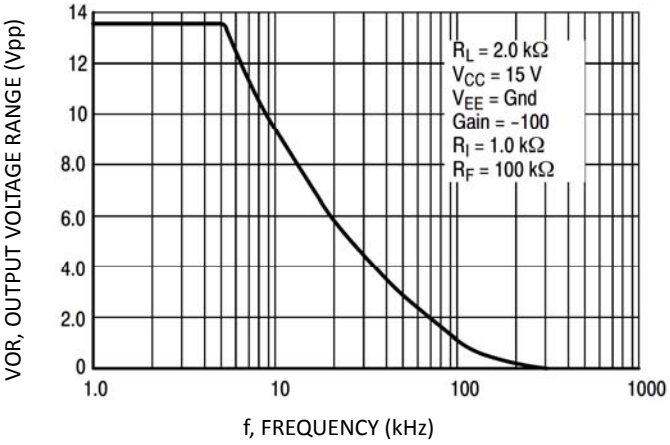


Small Signal Voltage Follower Pulse Response

(Noninverting)

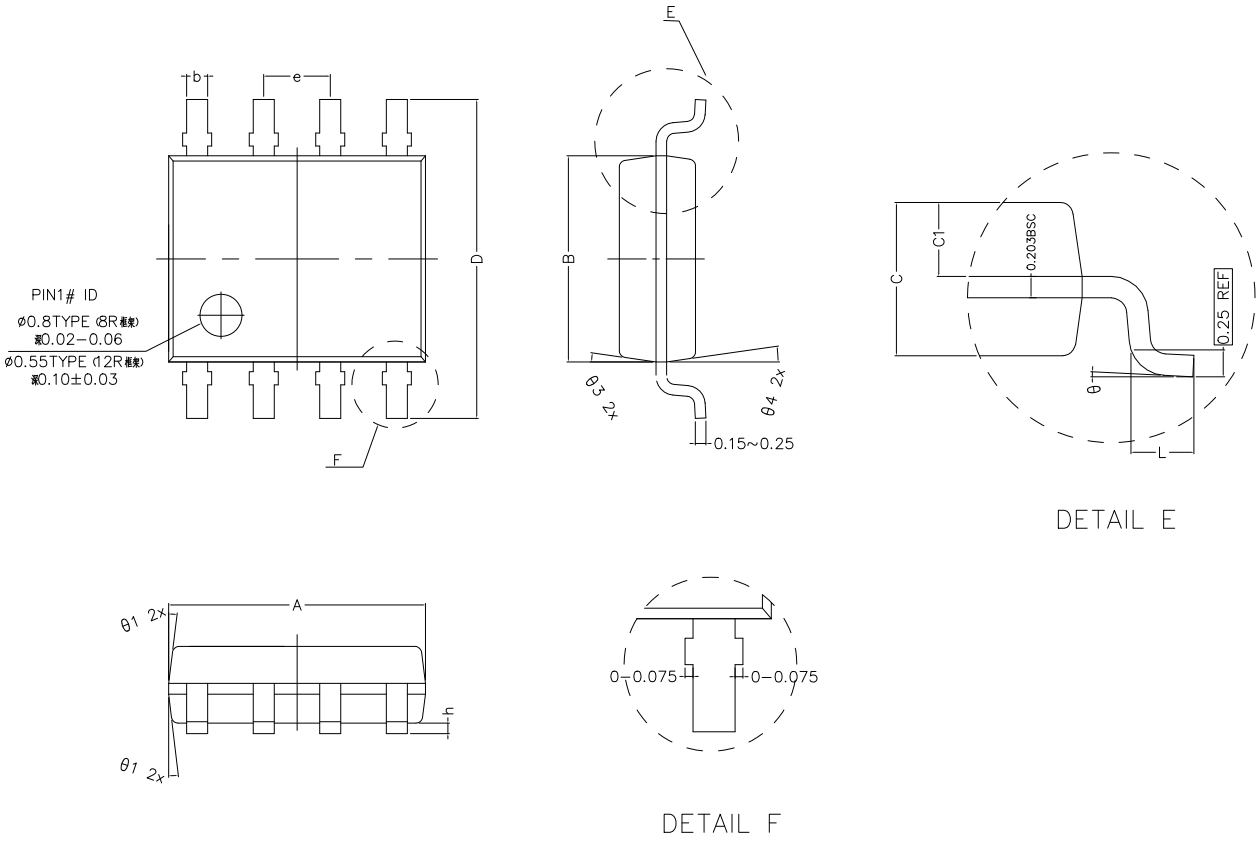


Power Supply Current versus Power Supply Voltage



Large-Signal Frequency Response

PACKAGE OUTLINE DIMENSIONS: SOP8



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	4.800	4.900	5.000
B	3.800	3.900	4.000
C	1.350	1.450	1.550
C1	0.650	0.700	0.750
⚠B D	5.900	6.100	6.300
⚠B L	0.500	0.600	0.700
b	0.350	0.400	0.450
⚠B h	0.050	0.150	0.250
e	1.270TYPE		
θ_1	7° TYPE(8R)	12° TYPE(12R)	
θ_2	7° TYPE(8R)	10° TYPE(12R)	
θ_3	8° TYPE(8R)	12° TYPE(12R)	
θ_4	8° TYPE(8R)	10° TYPE(12R)	
θ	0° ~ 8°		