MB358

LOW POWER DUAL OPERATIONAL AMPLIFIERS

CBC Microelectronics
http://www.cbcv.net

General Description

The MB358 consists of two independent, high gains and internally frequency compensated operational amplifiers; it is specifically designed to operate from a single power supply. Operation from split power supply is also possible and the low power supply current drain is independent of the magnitude of the power supply voltages. Typical applications include transducer amplifiers, DC gain blocks and most conventional operational amplifier circuits.

The MB358 is compatible with industry standard 358. MB358 has more stringent input offset voltage than MB358.

The MB358 are available in two industry standard packages: DIP-8 and SOP-8.

SOP8 DIP8

Figure 1: Package Types of MB358

Features

- Internally Frequency Compensated for Unity Gain
- Large Voltage Gain: 100dB (Typical)
- Low Input Bias Current: 20nA (Typical)
- Low Input Offset Voltage: 2mV (Typical)
- Low Supply Current: 0.5mA (Typical)
- Wide Power Supply Voltage:
  Single Supply: 3V to 36V
  Dual Supplies: ±1.5V to ±18V
- Input Common Mode Voltage Range Includes Ground
- Large Output Voltage Swing: 0V to VCC-1.5V

Pin Configuration (DIP8 / SOP8)

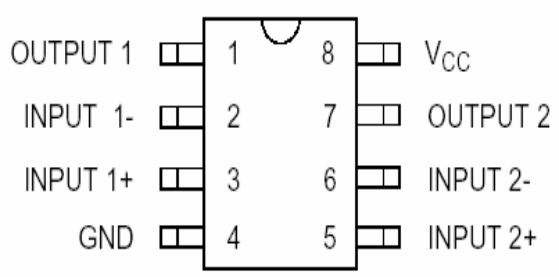
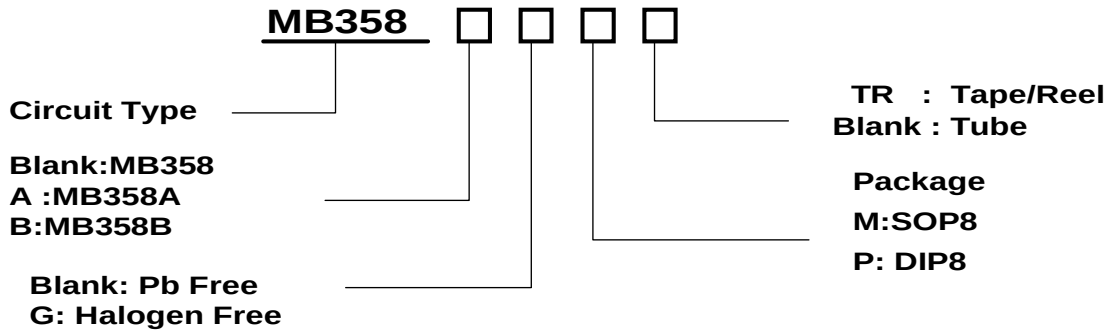


Figure 2: Pin Configuration of MB358 (Top View)

Applications

- Battery Charger
- Cordless Telephone
- Switching Power Supply

Ordering Information



Package	Condition	Part Number		Marking ID		Packing Type
		Pb-free	Halogen-Free	Pb-free	Halogen-Free	
SOP-8	1.5mV	MB358AM	MB358AGM	358AM	358AGM	Tube
	1.5mV	MB358AMTR	MB358AGMTR	358AM	358AGM	Tape & Reel
DIP-8	1.5mV	MB358AP	MB358AGP	MB358AP	MB358AGP	Tube
SOP-8	3mV	MB358BM	MB358BGM	358BM	358BGM	Tube
	3mV	MB358BMTR	MB358BGMTR	358BM	358BGM	Tape & Reel
DIP-8	3mV	MB358BP	MB358BGP	MB358BP	358BGP	Tube
SOP-8	5mV	MB358M	MB358GM	358M	358GM	Tube
	5mV	MB358MTR	MB358GMTR	358M	358GM	Tape & Reel
DIP-8	5mV	MB358P	MB358GP	MB358P	MB358GP	Tube

Typical Application

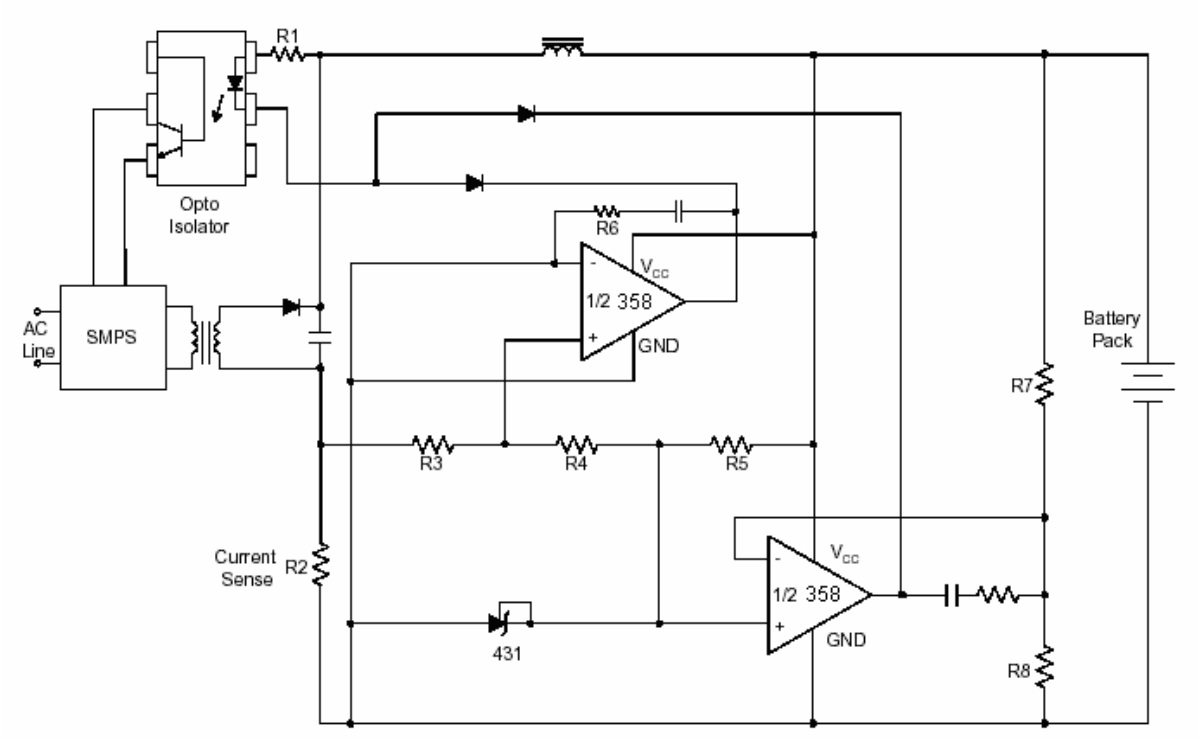


Figure 3: Battery Charger

Typical Application

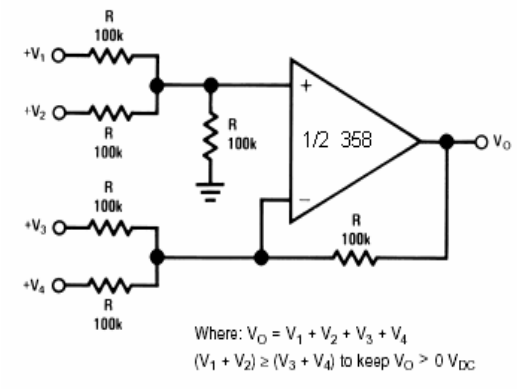


Figure 4: DC Summing Amplifier

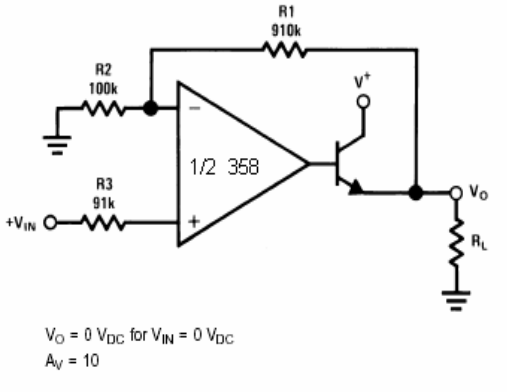


Figure 5: Power Amplifier

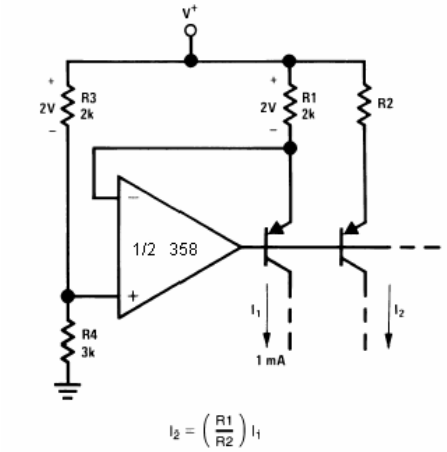


Figure 6: Fixed Current Sources

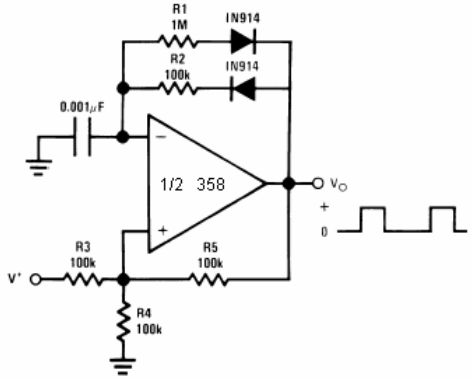


Figure 7: Pulse Generator

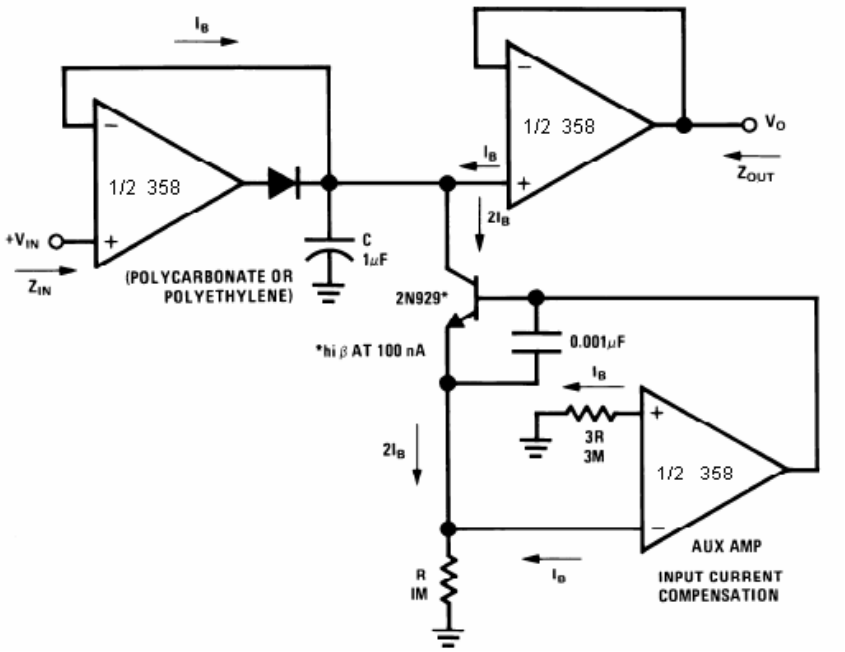


Figure 8: Low Drift Detector

Functional Block Diagram

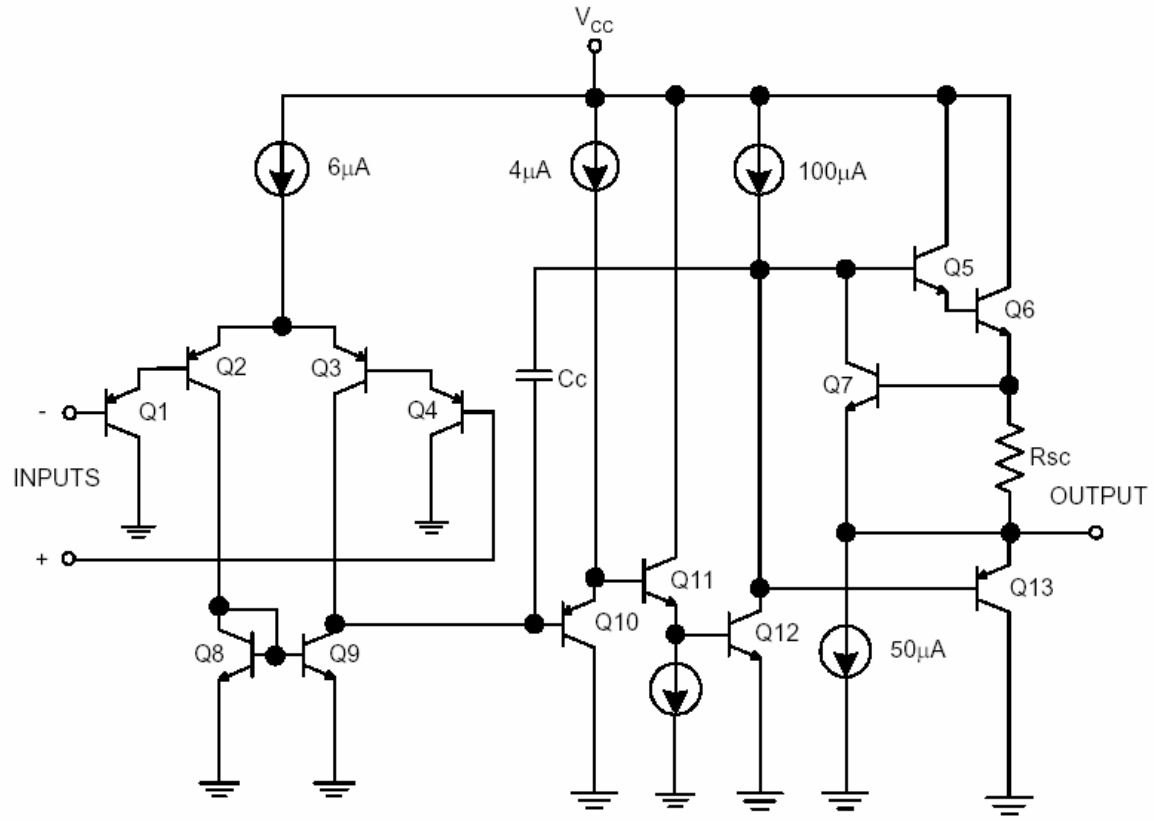


Figure 9. Functional Block Diagram of MB358 (Each Amplifier)

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	40	V
Differential Input Voltage	V_{ID}	40	V
Input Voltage	V_{IC}	-0.3 to 40	V
Power Dissipation	P_D	DIP-8: 830	mW
		SOP-8: 550	mW
Storage Temperature Range	Tstg	-50 to 150	°C
Lead Temperature (Soldering,10 Seconds)		260	°C

Note1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	3	36	V
Ambient Operating Temperature	T_A	-20	+85	℃

Electrical Characteristics

V_{CC} = 5V, GND = 0V, T_A = 25℃ unless otherwise specified.

Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Input Offset Voltage	V_{IO}	V_O=1.4V,R_S=0 V_{CC}=5V to 30V	MB358A			1.5	mV
			MB358B			3.0	
Average Temperature Coefficient of V_{IO}	$\Delta V_{IO}/\Delta T$	T_A= -20 to 85℃			7.0		μV/℃
Input Bias Current	I_{BIAS}	I_{IN}+ or I_{IN}-, V_{CM}=0V			20	200	nA
Input Offset Current	I_{IO}	I_{IN}+ - I_{IN}-, V_{CM}=0V			5	35	nA
Input Common Mode Voltage Range	V_{IR}	V_{CC}=30V		0		V_{CC}-1.5	V
Supply Current	I_{CC}	T_A=-20 to 85 ℃,V_{CC}=30V			0.9	2.0	mA
		T_A=-20 to 85 ℃,V_{CC}=5V			0.6	1.2	mA
Large Signal Voltage Gain	G_V	V_{CC}=15V,V_O=1V to 11V R_L≥2KΩ		85	100		dB
Common Mode Rejection Ratio	CMRR	DC,V_{CM}=0 to (V_{CC}-1.5)V		60	70		dB
Power Supply Rejection Ratio	PSRR	V_{CC}=5V to 30V		70	100		dB
Channel Separation	CS	f=1kHz to 20kHz			-120		dB
Output Source Current	I_{SOURCE}	V+=1V,V-=0V,V_{CC}=15V V_O=2V		20	40		mA
Output Sink Current	I_{SINK}	V+=0V,V-=1V,V_{CC}=15V V_O=2V		10	15		mA
		V+=0V,V-=1V,V_{CC}=15V V_O=0.2V		12	50		μA
Output Short circuit current to Ground	I_{SC}	V_{CC}=15V			40	60	mA
Output Voltage Swing	V_{OH}	V_{CC}=30V, R_L=2KΩ		26			V
		V_{CC}=30V, R_L=10KΩ		27	28		V
	V_{OL}	V_{CC}=5V, R_L=10KΩ			5	20	mV

Typical Performance Characteristics

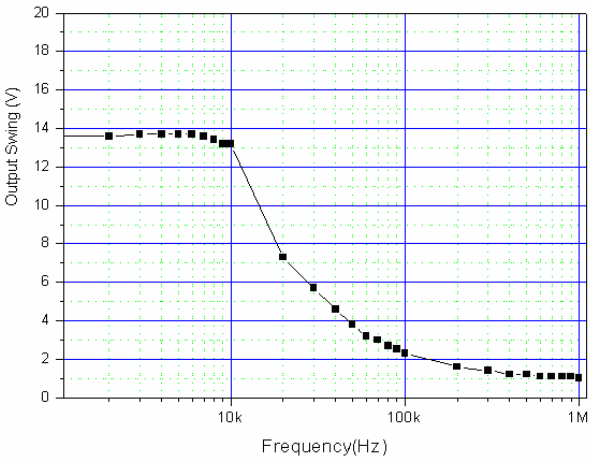


Figure 10: Large Frequency Response

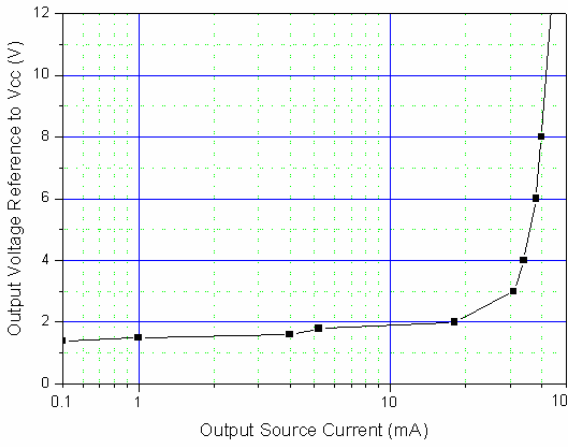


Figure 11: Output Current Sourcing

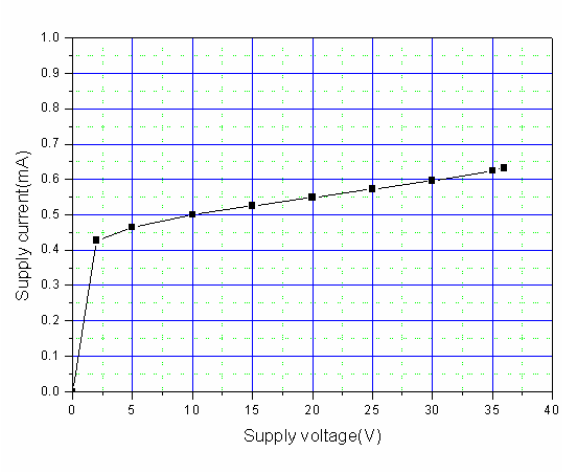


Figure 12: Supply Current

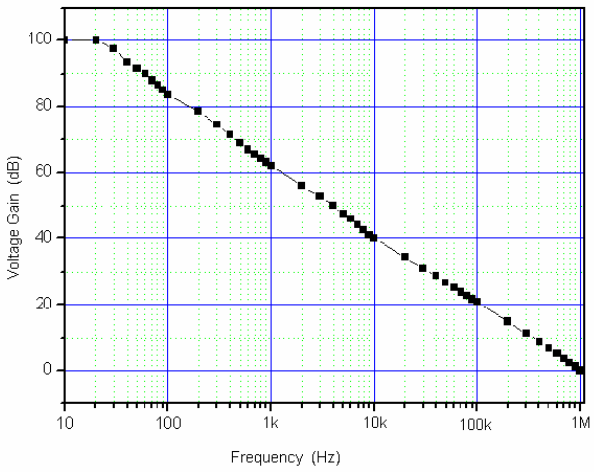


Figure 13: Open Loop Frequency Response

Typical Performance Characteristics (Continued)

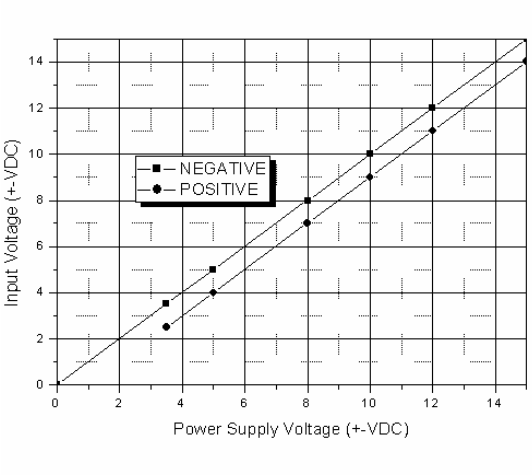


Figure 14: Input Voltage Range

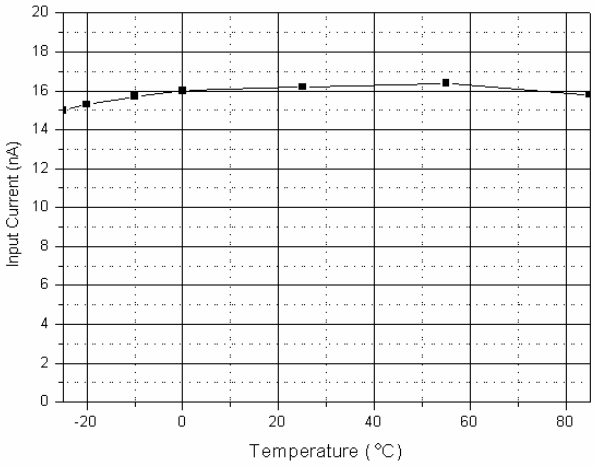


Figure 15: Input Bias Current

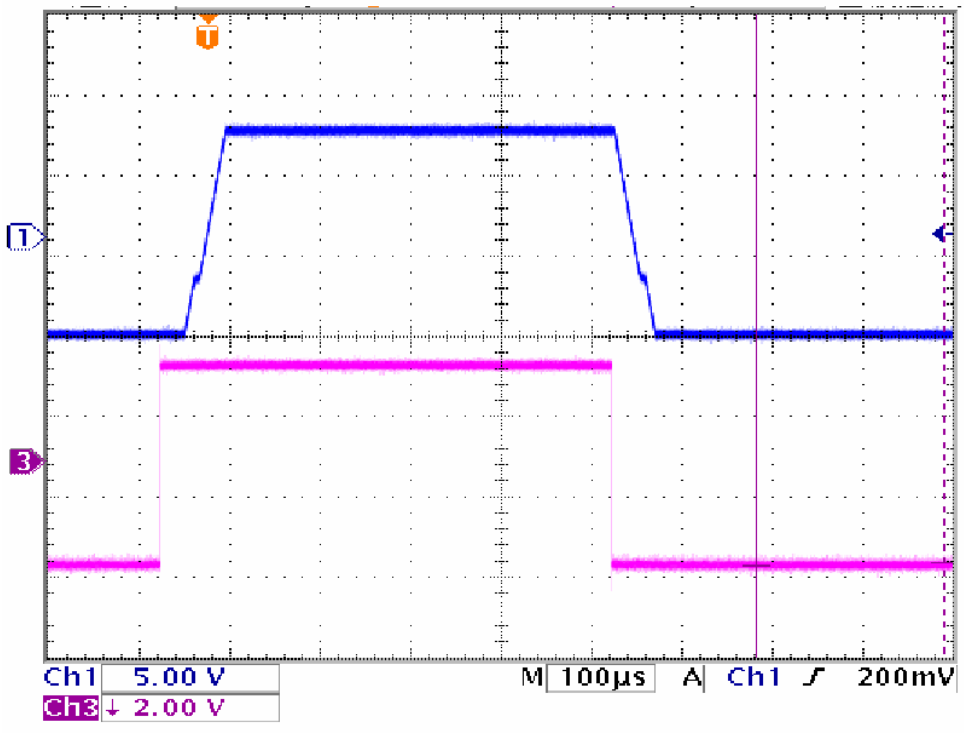
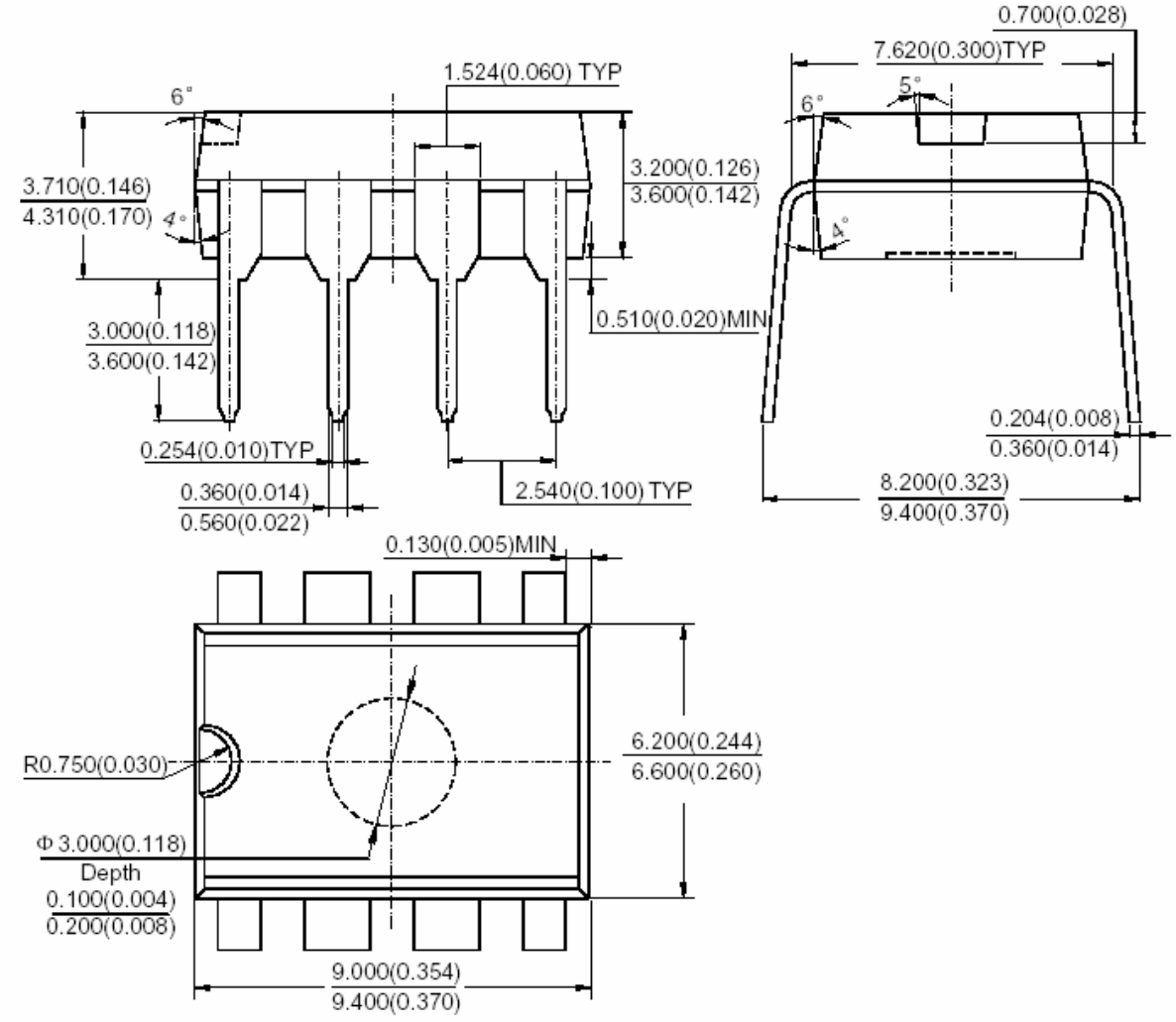


Figure 16: Voltage Follower Pulse Response

Mechanical Dimensions

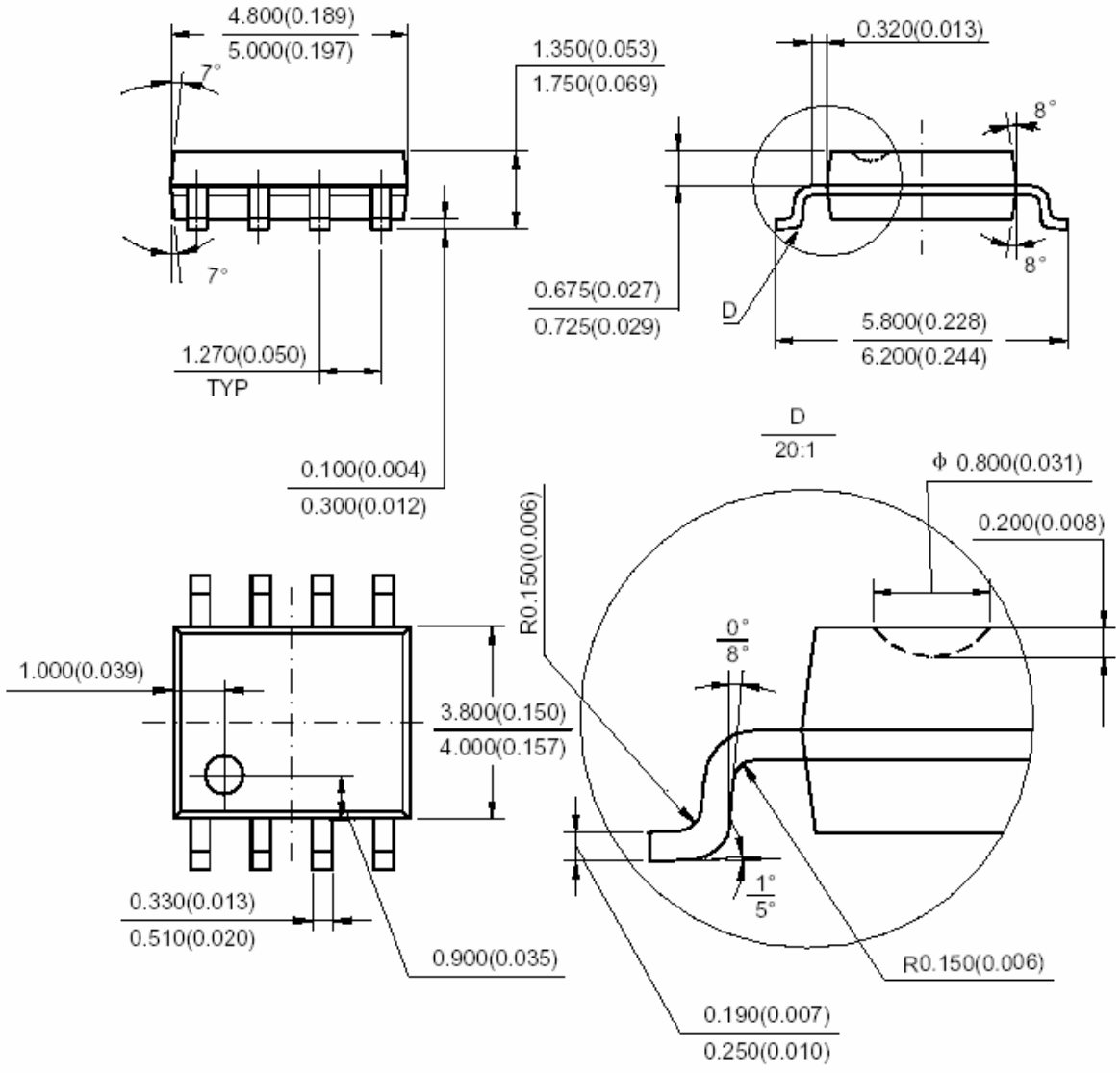
DIP-8 Unit: mm(inch)



Mechanical Dimensions (Continued)

SOP-8

Unit: mm(inch)



IMPORTANT NOTICE

CBC Microelectronics Co., LTD reserves the right to make changes without further notice to any products or specifications herein. CBC Microelectronics Co., LTD does not assume any responsibility for use of any its products for any particular purpose, nor does CBC Microelectronics Co., LTD assume any liability arising out of the application or use of any its products or circuits. CBC Microelectronics Co., LTD does not convey any license under its patent rights or other rights nor the rights of others.