

MB358

LOW POWER DUAL OPERATIONAL AMPLIFIERS

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

Features

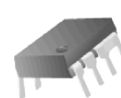
- Internally Frequency Compensated for Unity Gain
- Large Voltage Gain: 100dB (Typical)
- Low Input Bias Current: 20nA (Typical)
- Low Input Offset Voltage: 2mV (Typical)
- Low Supply Current: 0.5mA (Typical)
- Wide Power Supply Voltage:
- Single Supply: 3V to 36V
- Dual Supplies: $\pm 1.5V$ to $\pm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

Applications

- Battery Charger
- Cordless Telephone
- Switching Power Supply



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DIP-8



SOP-8

Figure 1: Package Types of MB358

Pin Configuration (DIP-8 / SOP-8)

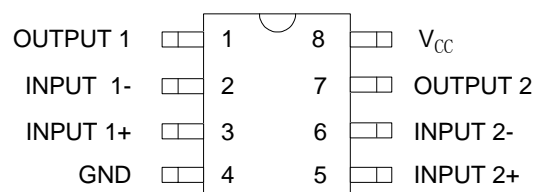
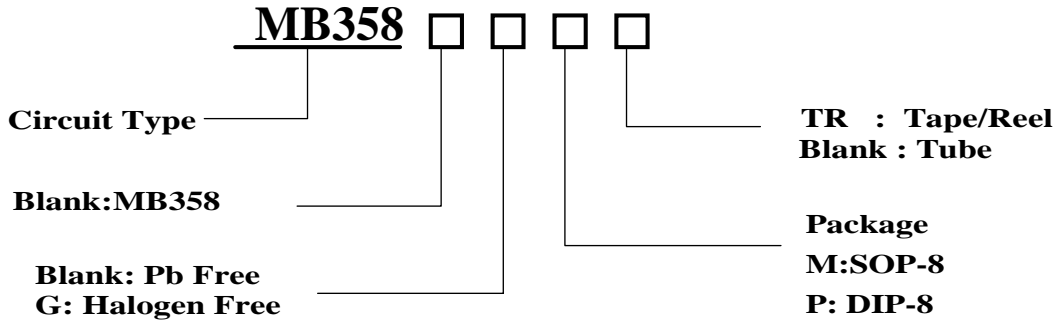


Figure 2: Pin Configuration of MB358 (Top View)

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Order Information



Package	Condition	Part Number		Marking ID		Packing Type
		Pb-Free	Halogen-Free	Pb-FreeTin	Halogen-Free	
SOP-8	3.0mV	MB358M	MB358GM	MB358M	MB358GM	Tube
	3.0mV	MB358MTR	MB358GMTR	MB358M	MB358GM	Tape&Reel
DIP-8	3.0mV	MB358P	MB358GP	MB358P	MB358GP	Tube

Typical Application

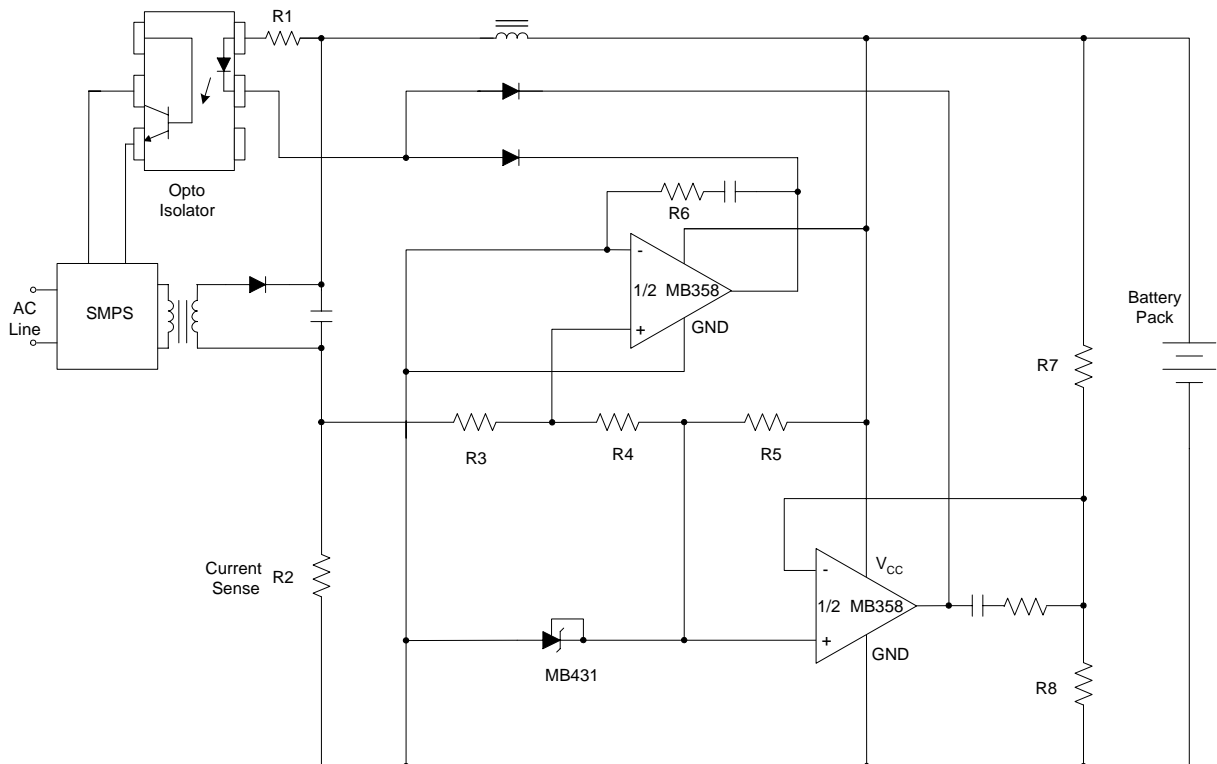


Figure 3: Battery Charger

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Typical Application

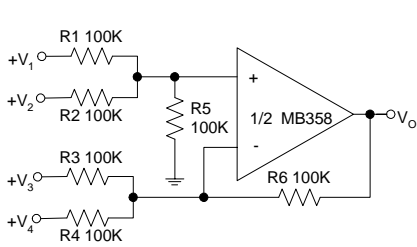


Figure 4: DC Summing Amplifier

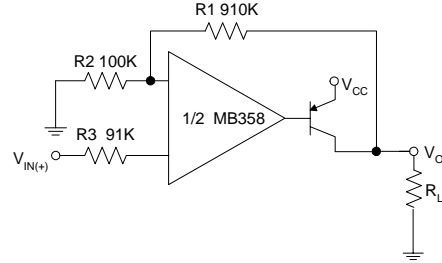


Figure 5: Power Amplifier

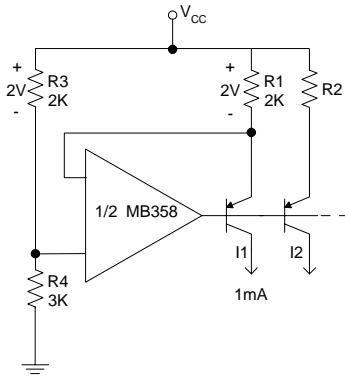


Figure 6: Fixed Current Sources

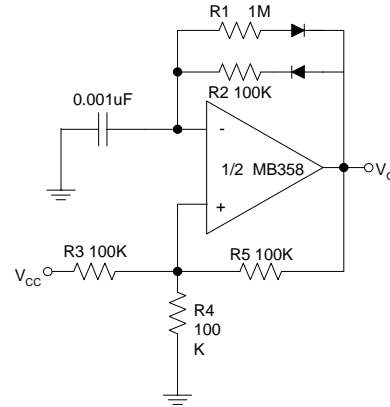


Figure 7: Pulse Generator

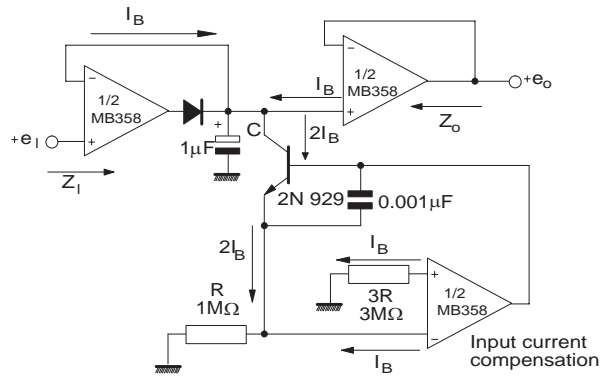


Figure 8: Low Drift Detector

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Functional Block Diagram

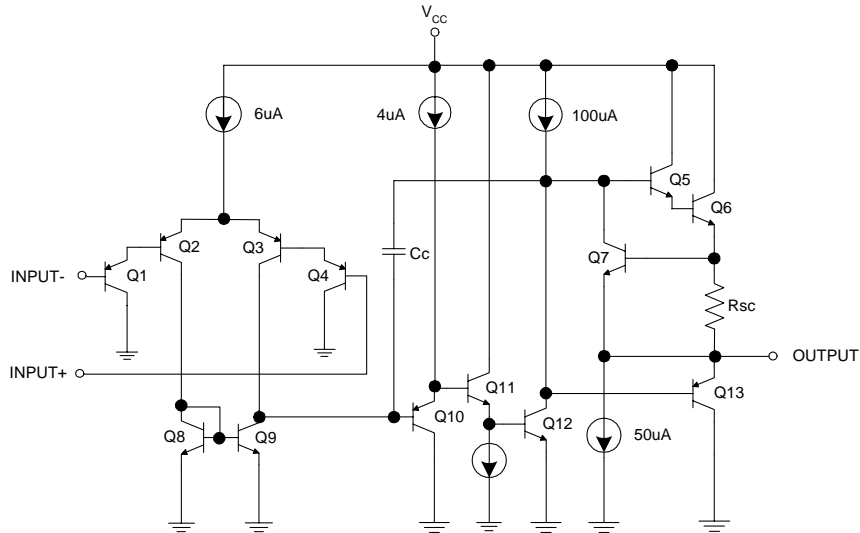


Figure 9. Functional Block Diagram of MB358 (Each Amplifier)

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Power Supply Voltage	VCC	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	T _{stg}	-50 to 150	
Lead Temperature (Soldering, 10 Seconds)		260	

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.

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Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	VCC	3	36	V
Ambient Operating Temperature	TA	-20	+85	

Electrical Characteristics

VCC = 5V, GND = 0V, TA = 25 unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit	
Input Offset Voltage	VIO	VO=1.4V, RS=0 VCC=5V to 30V	MB358	-1.7	2.7	3.0	mV
Average Temperature Coefficient of VIO	VIO/ T	TA= -20 to 85		7.0		μ V/	
Input Bias Current	IBIAS	IIN+ or IIN-, VCM=0V		20	200	nA	
Input Offset Current	IIO	IIN+ - IIN-, VCM=0V		5	35	nA	
Input Common Mode Voltage Range	VIR	VCC=30V	0		VCC-1.5	V	
Supply Current	ICC	TA=-20 to 85, VCC=30V		0.9	2.0	mA	
		TA=-20 to 85, VCC=5V		0.6	1.2	mA	
Large Signal Voltage Gain	GV	VCC=15V, VO=1V to 11V RL=2K.	85	100		dB	
Common Mode Rejection Ratio	CMRR	DC, VCM=0 to (VCC -1.5)V	60	70		dB	
Power Supply Rejection Ratio	PSRR	VCC =5V to 30V	70	100		dB	
Channel Separation	CS	f=1kHz to 20kHz		-120		dB	
Output Source Current	ISOURCE	V+=1V, V-=0V, VCC=15V VO=2V	20	40		mA	
Output Sink Current	ISINK	V+=0V, V-=1V, VCC=15V VO=2V	10	15		mA	
		V+=0V, V-=1V, VCC=15V VO=0.2V	12	50		μ A	
Output Short circuit current to Ground	ISC	VCC=15V		40	60	mA	
Output Voltage Swing	VOH	VCC=30V, RL=2K.	26			V	
		VCC=30V, RL=10K.	27	28		V	
	VOL	VCC=5V, RL=10K.		5	20	mV	

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Typical Performance Characteristics

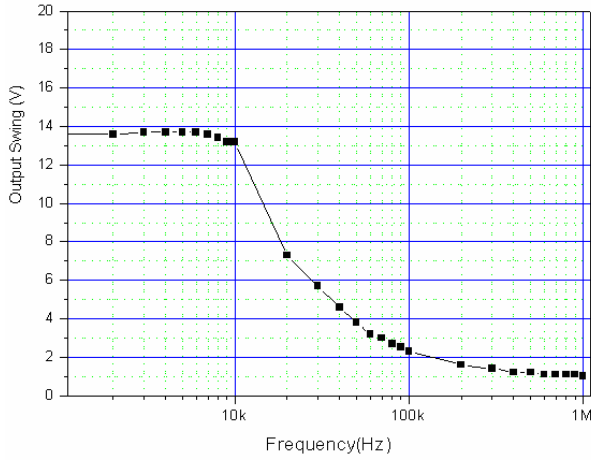


Figure 10: Large Frequency Response

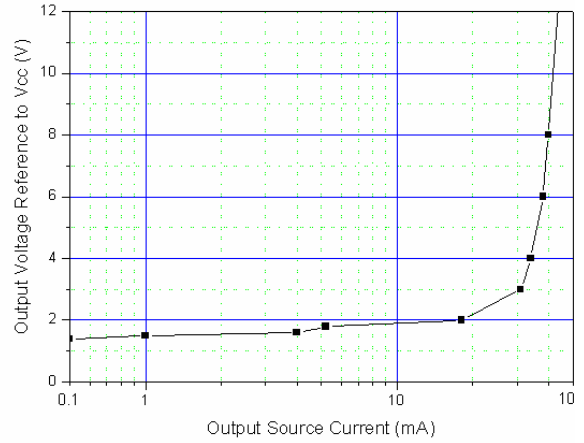


Figure 11: Output Current Sourcing

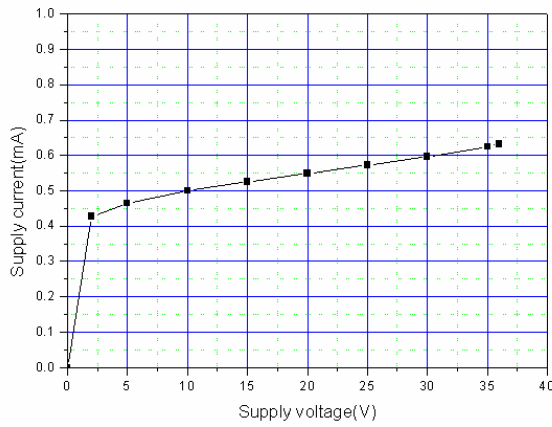


Figure 12: Supply Current

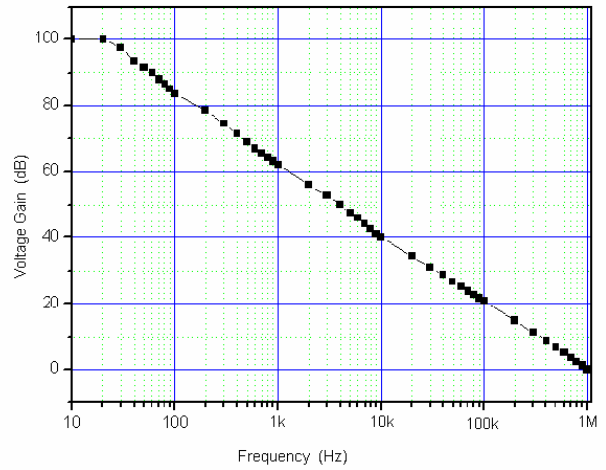


Figure 13: Open Loop Frequency Response

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Typical Performance Characteristics (Continued)

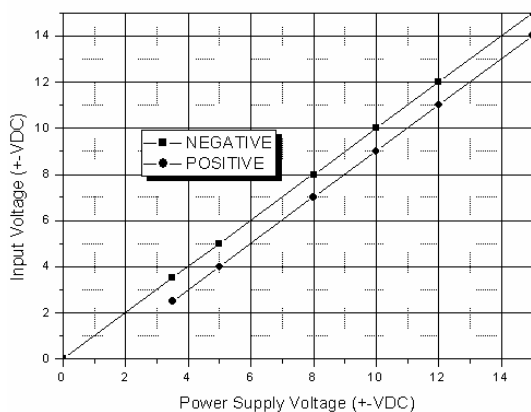


Figure 14: Input Voltage Range

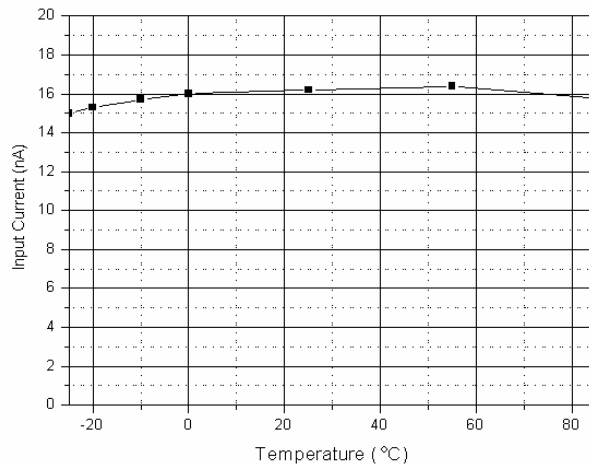


Figure 15: Input Bias Current

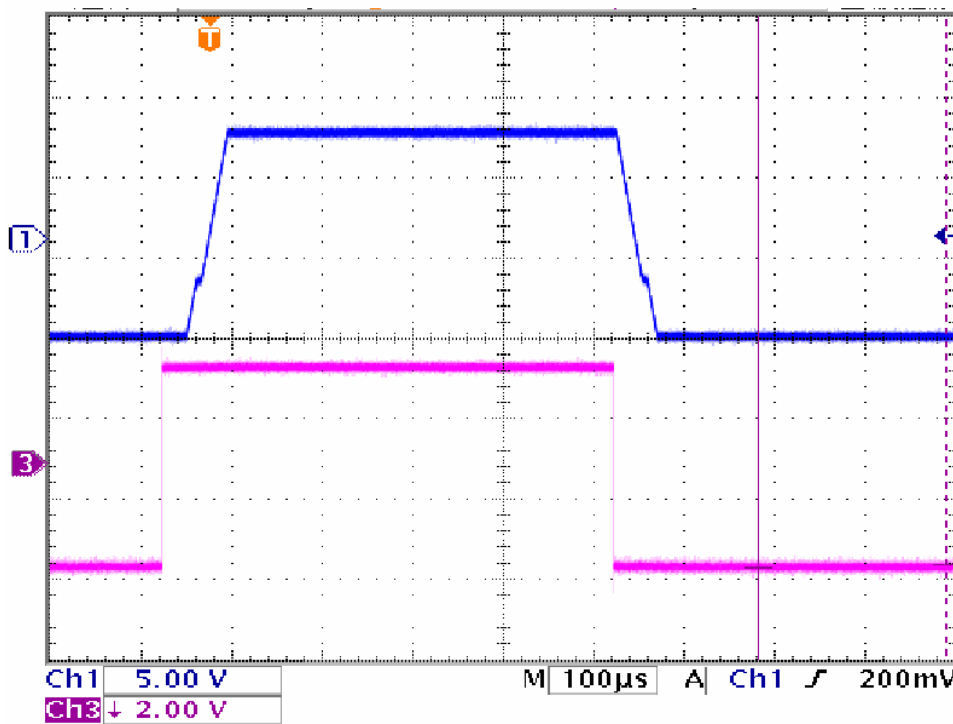


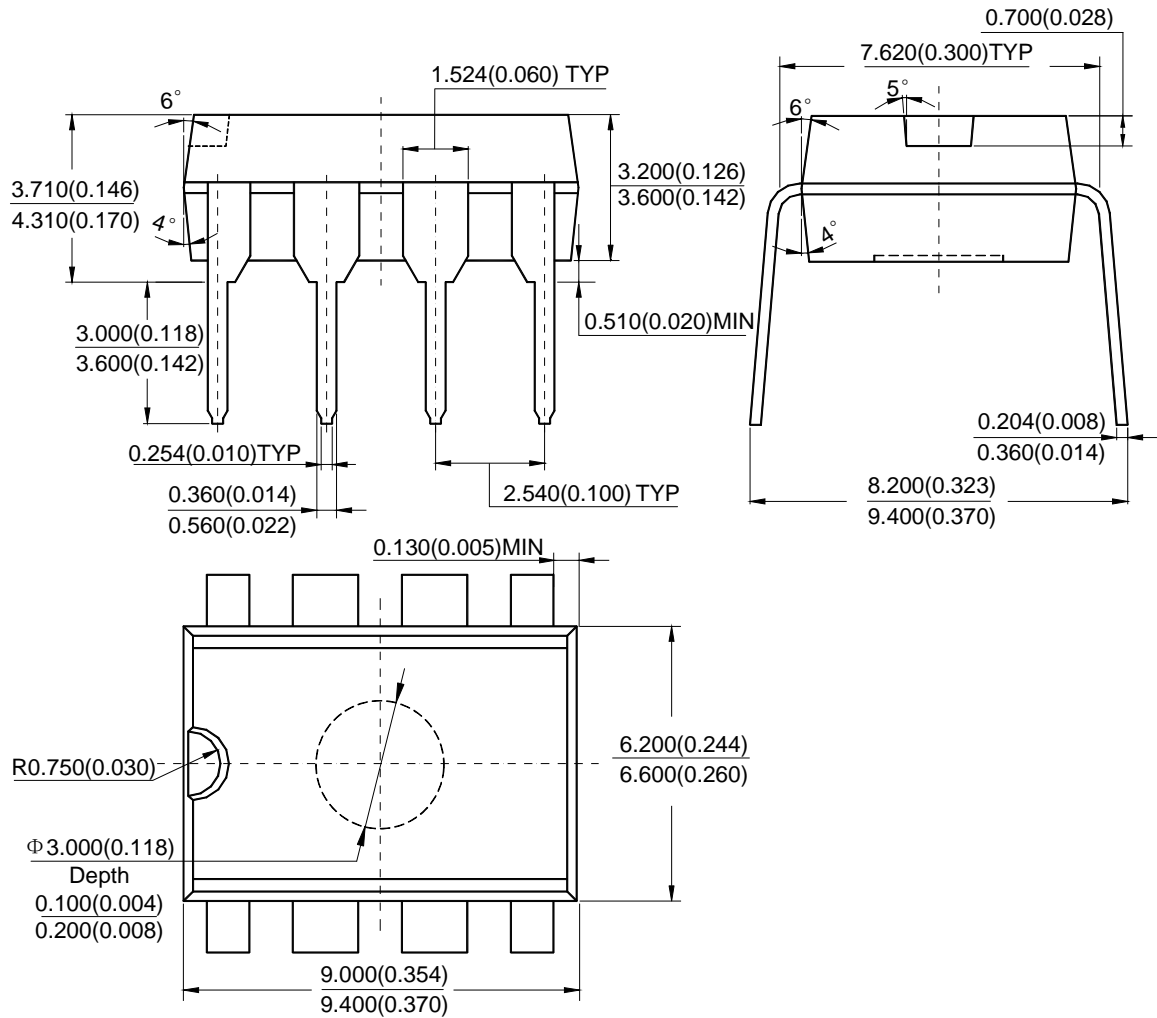
Figure 16: Voltage Follower Pulse Response

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Mechanical Dimensions

DIP-8

Unit: mm(inch)

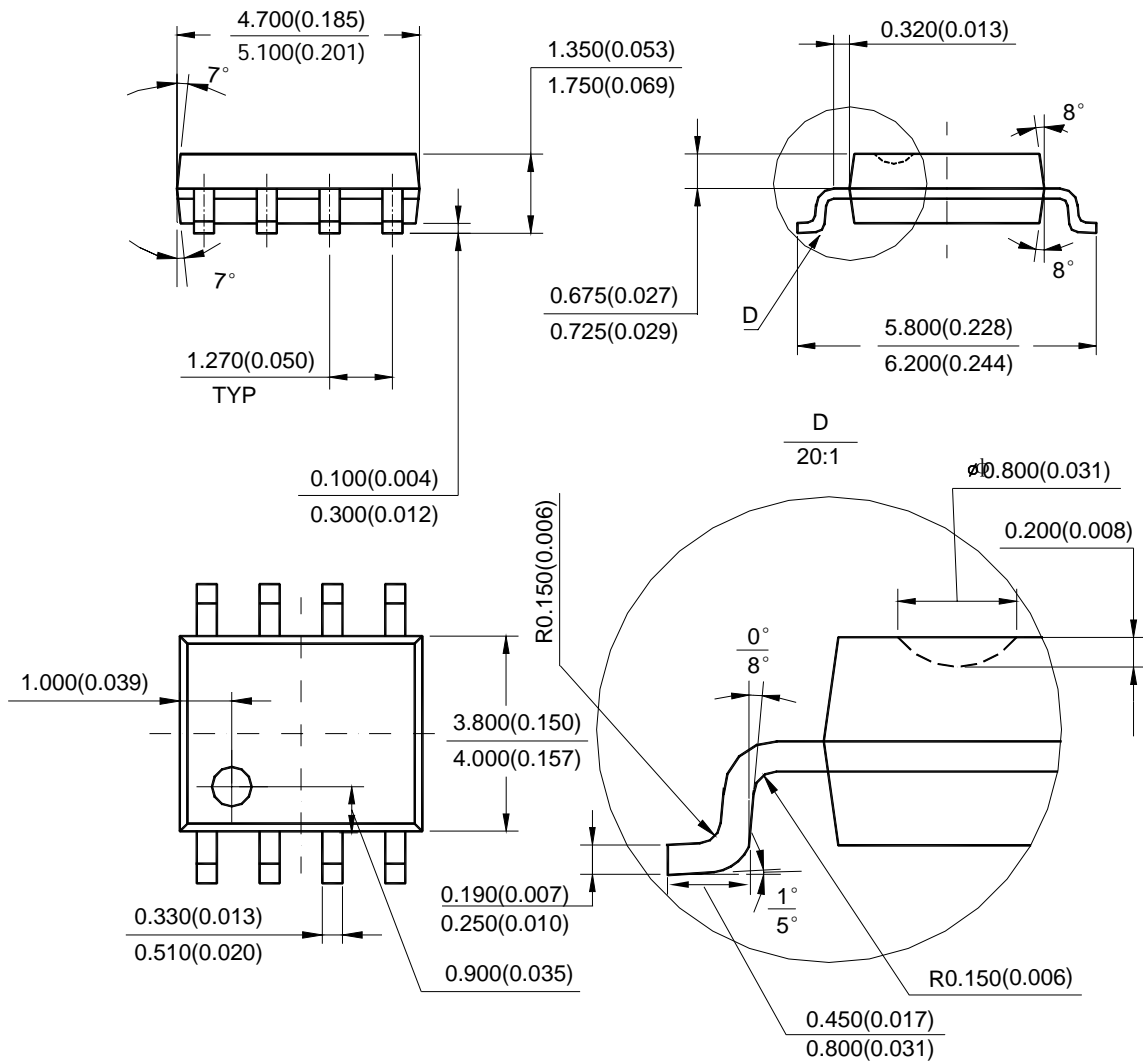


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Mechanical Dimensions (Cont'd)

SOP-8

Unit: mm(inch)



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