

AX358P / AX358S

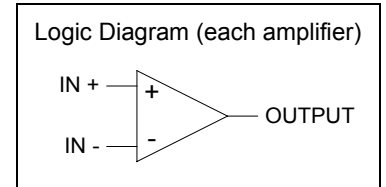
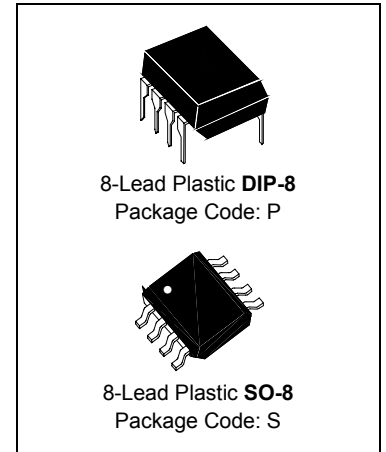
Low Power Dual Operational Amplifiers

Description

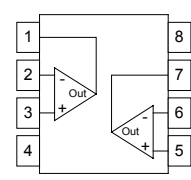
These devices consist of two independent, high gain, internally frequency-compensated operational amplifiers designed operate from a single supply over a wide range of voltages. Operation from split supplies also is possible if the difference between the two supplies is 3V to 32V, and Vcc is at least 1.5V more positive than the input common-mode voltage, The low supply-current drain is independent of the magnitude of the power supply voltage.

Features

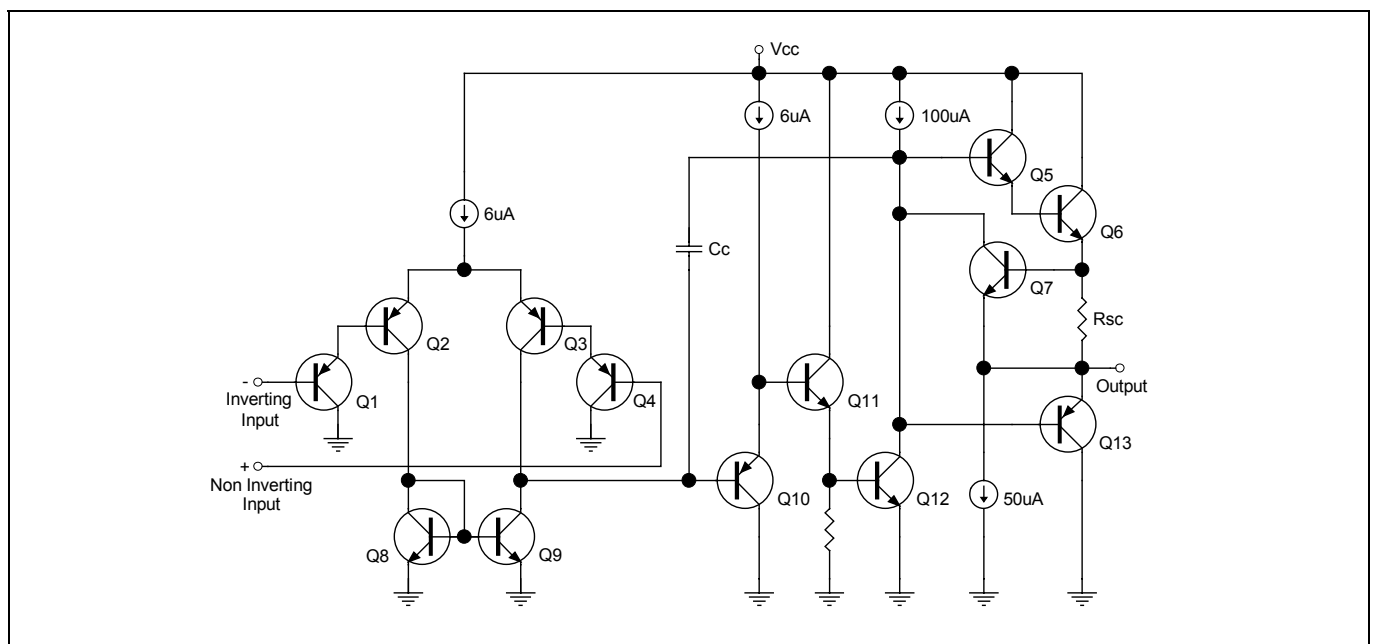
- Two internally compensated OP amps
- Internally frequency compensated for unity gain
- Short Circuit Protected Outputs
- Wide power supply range: $3V_{DC}$ to $32V_{DC}$ (Single supply)
- Input common-mode voltage range includes ground
- Large output voltage swing: $0V_{DC}$ to $V_{CC}-1.5V_{DC}$



Pin Configurations

	Pin 1: Output 1	Pin 5 : Non Inverting Input 2
	Pin 2: Inverting Input 1	Pin 6 : Inverting Input 2
	Pin 3: Non Inverting Input 1	Pin 7 : Output 2
	Pin 4: V_{EE}	Pin 8 : V_{CC}

Schematic Diagram



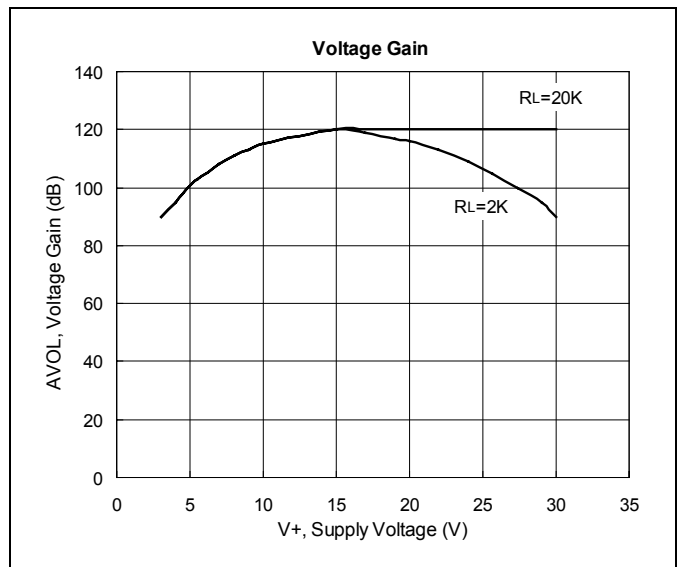
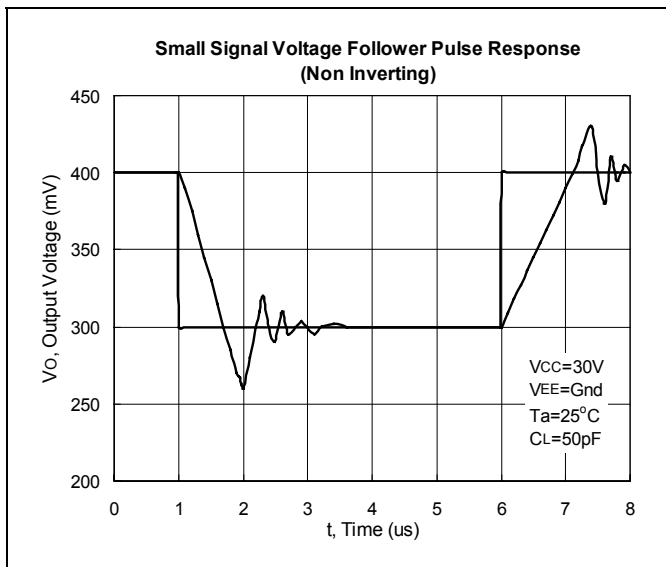
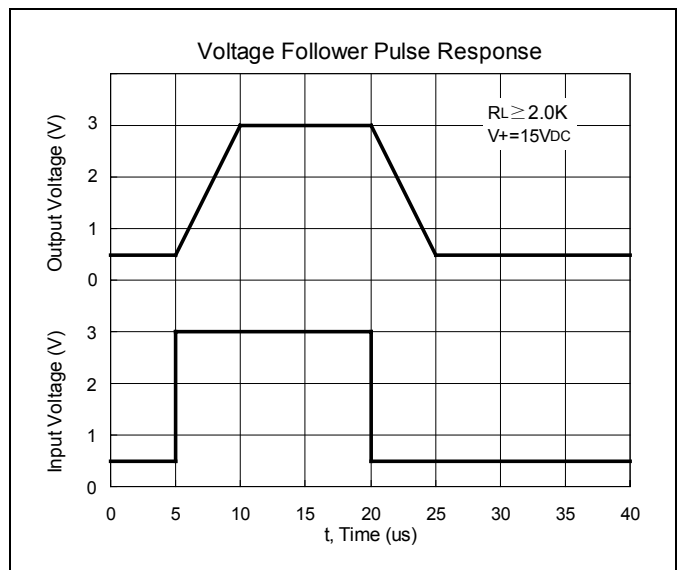
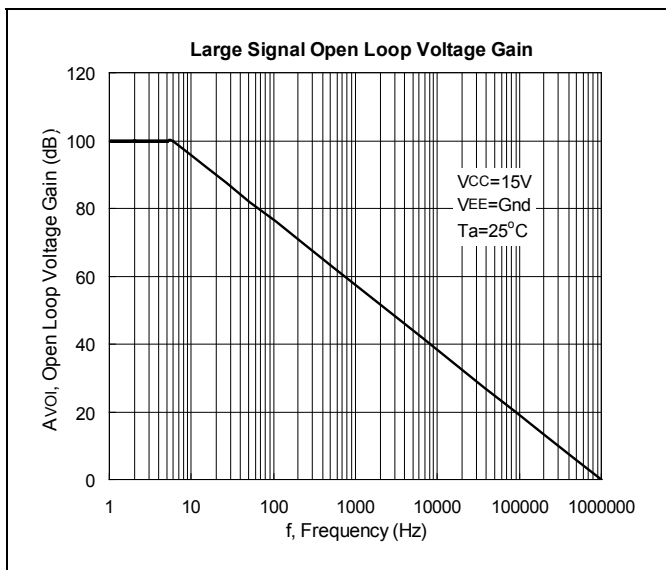
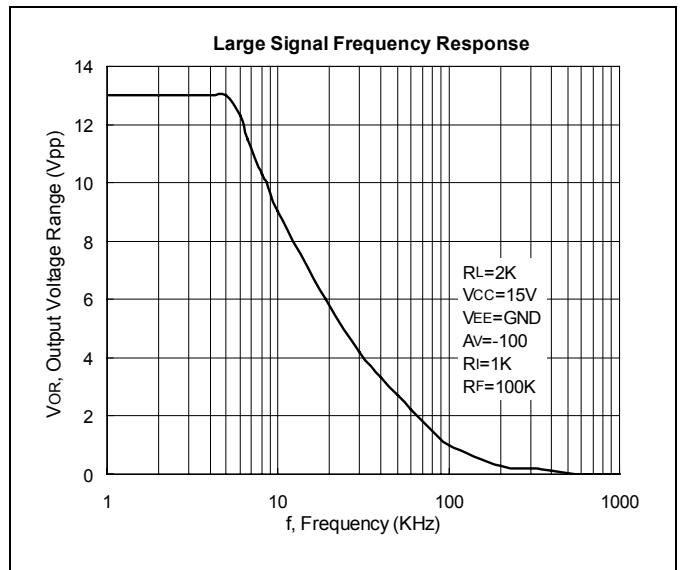
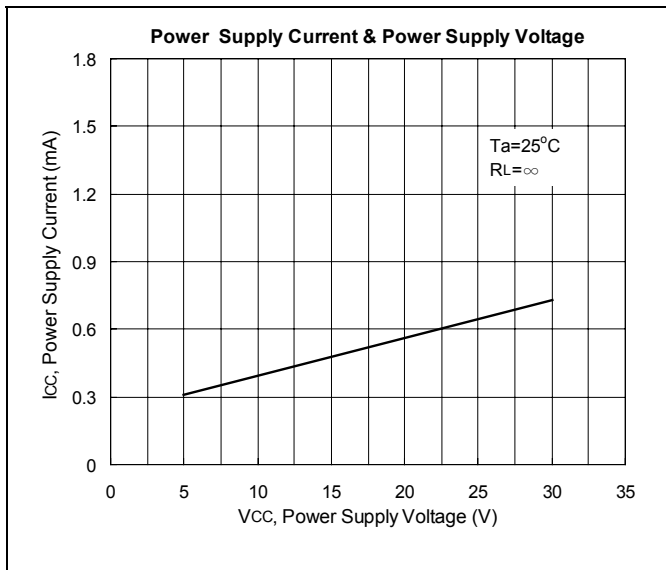
Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)

Symbol	Parameter	Range	Units
V _{CC}	Power Supply Voltage (Single Supply)	32	V _{DC}
V _{CC} , V _{EE}	Power Supply Voltage (Split Supplies)	±16	V _{DC}
V _{IDR}	Input Differential Voltage Range	±32	V _{DC}
V _{ICR}	Input Common Mode Voltage Range	-0.3 to +32	V _{DC}
t _{SC}	Output Short Circuit Duration	Continuous	
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature Range	-55 to +125	°C
T _A	Operating Ambient Temperature Range	0 to +70	°C
P _D	Maximum Power Dissipation (DIP-8) Maximum Power Dissipation (SO-8)	800 500	mW

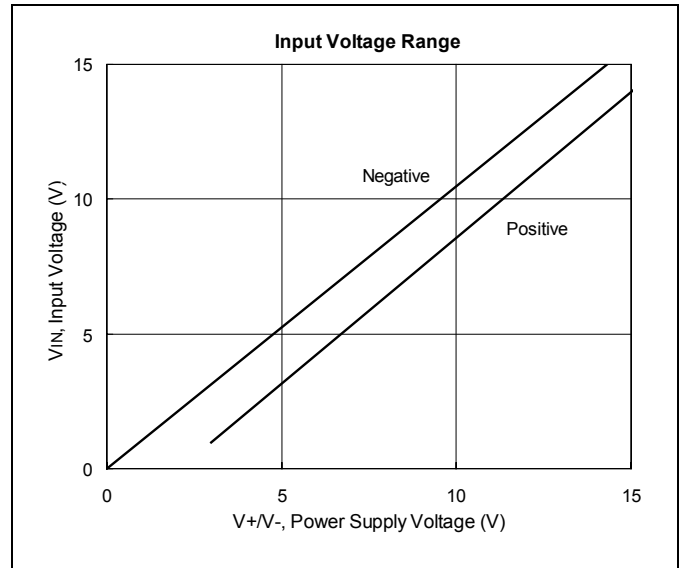
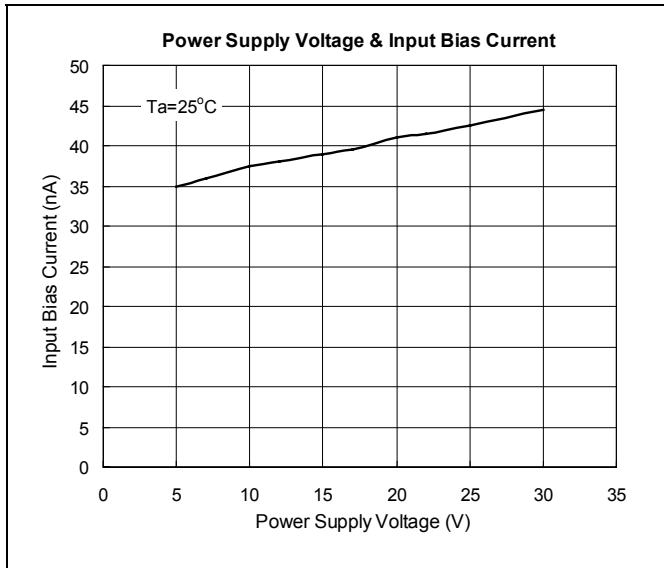
Electrical Characteristics (V_{CC}=5V, V_{EE}=Ground, Ta=25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	AX358P/S			Unit
			Min	Typ	Max	
V _{IO}	Input Offset Voltage	V _{CC} =5V~30V, V _{ICR} =0V~V _{CC} -1.5V, V _O =1.4V, R _S =0Ω	-	2	7	mV
I _{IO}	Input Offset Current	I _{IN(+)} -I _{IN(-)}	-	-	30	nA
I _{IB}	Input Bias Current	I _{IN(+)} or I _{IN(-)}	-	35	200	nA
A _{VOL}	Large Signal Voltage Gain	V _{CC} =15V, R _L =2KΩ	25	100	-	V/mV
CMR	Common-Mode Rejection Ratio	V _{CM} =0V~V _{CC} -1.5V	65	85	-	dB
CS	Channel Separation	1KHz≤f≤20KHz	-	-120	-	dB
PSR	Power Supply Rejection	V _{CC} =5V~30V	65	100	-	dB
ΔV _{IO} /ΔT	Average Temperature Coefficient of Input Offset Voltage	R _S =0Ω	-	7	-	uV/°C
ΔI _{IO} /ΔT	Average Temperature Coefficient of Input Offset Current	R _S =0Ω	-	10	-	pA/°C
V _{ICR}	Input Common Mode Voltage Range	V _{CC} =30V			V _{CC} -2V	V
V _{OH}	Output Voltage (High Limit)	V _{CC} =30V, R _L =2KΩ	26	27	-	V
		V _{CC} =30V, R _L =10KΩ	27	28	-	
V _{OL}	Output Voltage (Low Limit)	R _L =10KΩ	-	5	20	mV
I _{CC}	Supply current	R _L =∞, V _{CC} =30V	-	1	2	mA
I _{Source}	Output Source Current	V _{CC} =15V, V _{IN+} =1V, V _{IN-} =0V, V _O =2V	20	40	-	mA
I _{Sink}	Output Sink Current	V _{CC} =15V, V _{IN+} =0V, V _{IN-} =1V, V _O =2V	10	20	-	mA
I _{CC}	Power Supply Current	V _{CC} =30V, Ta=T _{high} to T _{low}	-	1	2	mA
		V _{CC} =5V, Ta=T _{high} to T _{low}	-	0.6	1.2	mA
I _{SC}	Output Short Circuit to Ground	V _{CC} =5V, GND at -5V, V _O =0V	-	40	60	mA

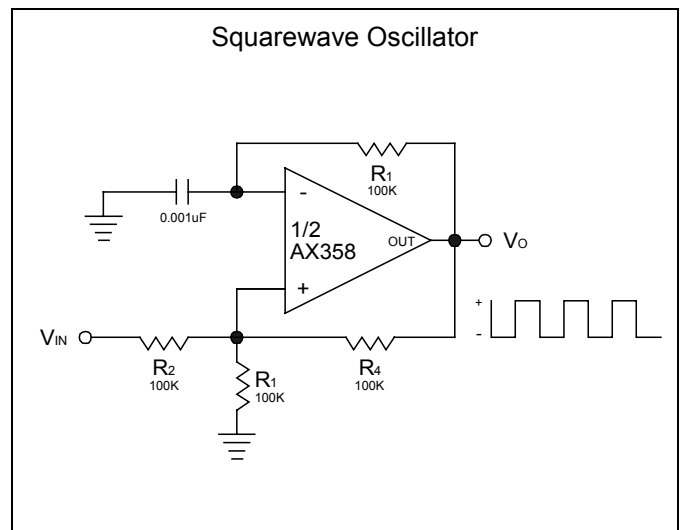
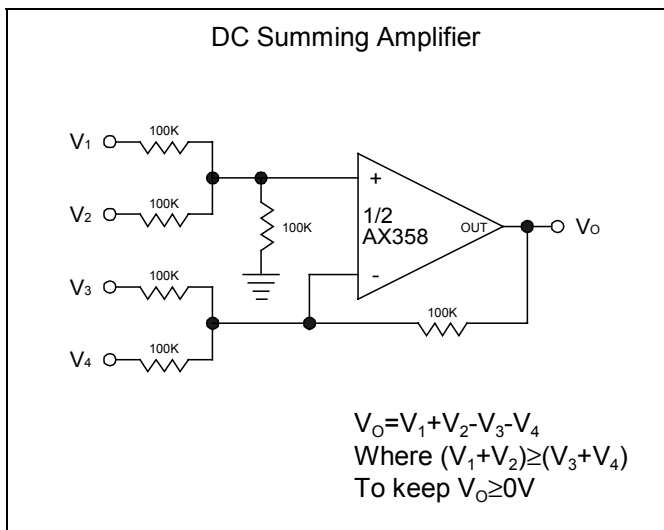
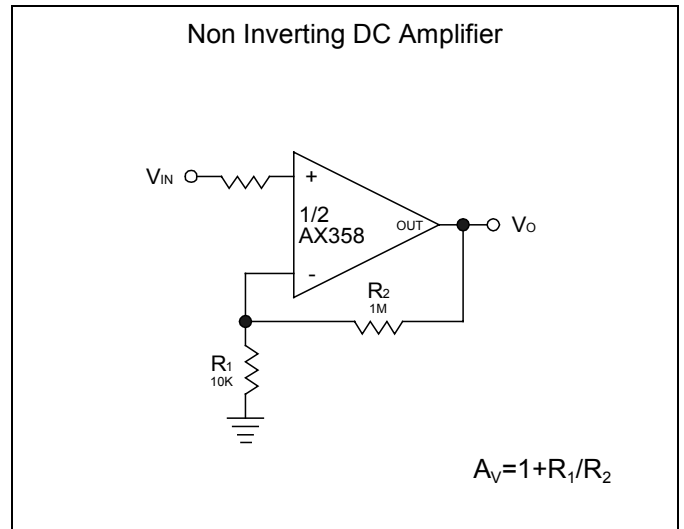
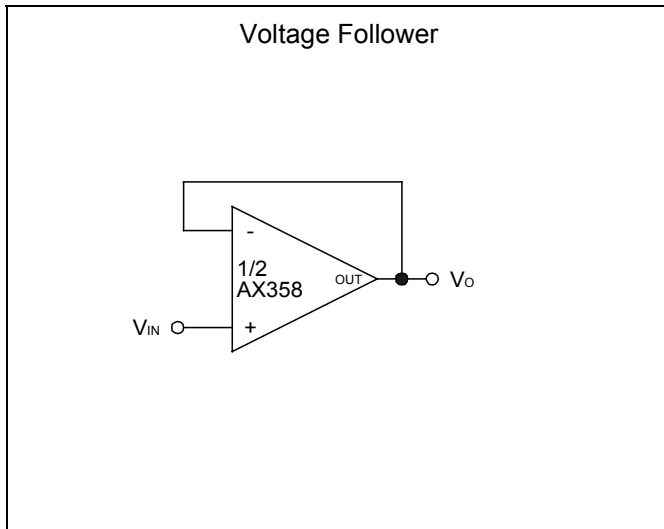
Characteristics Curve



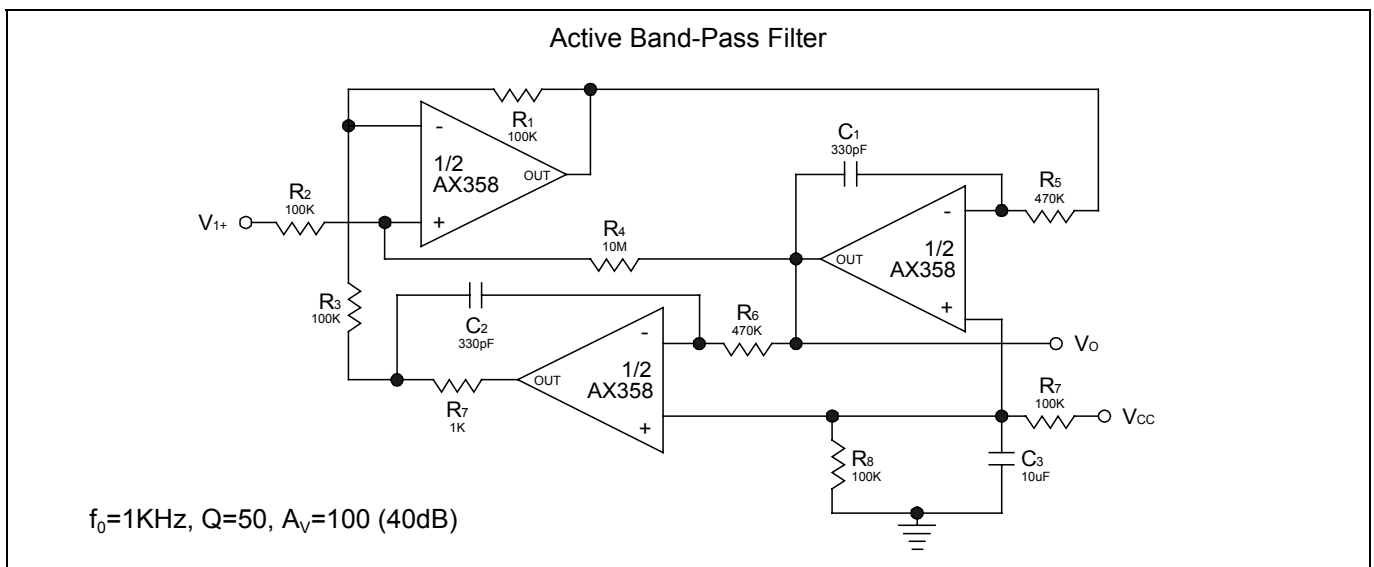
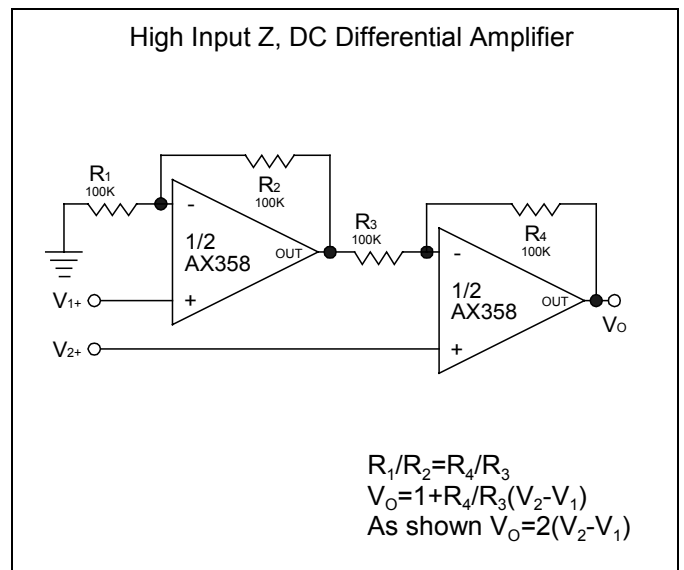
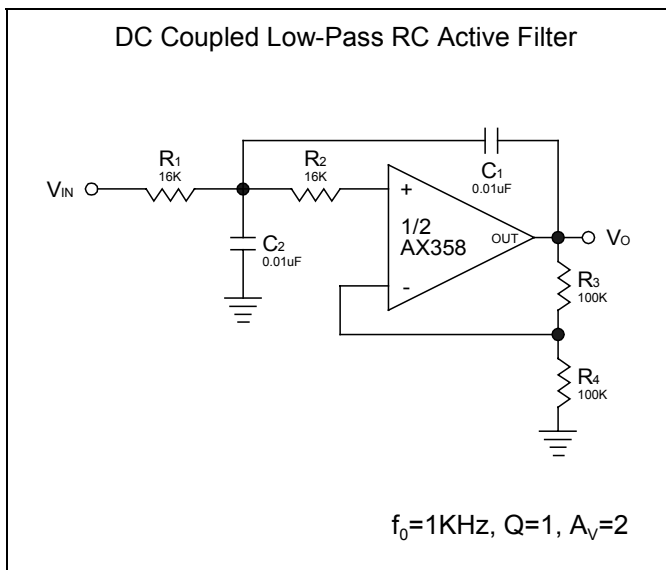
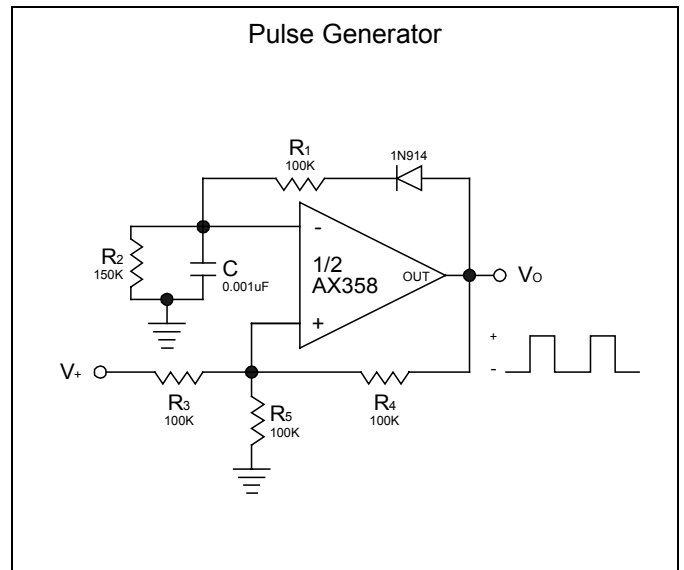
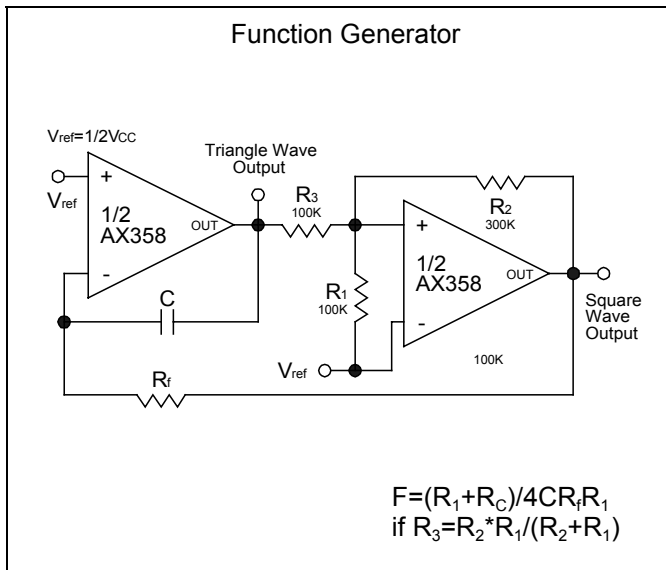
Characteristics Curve



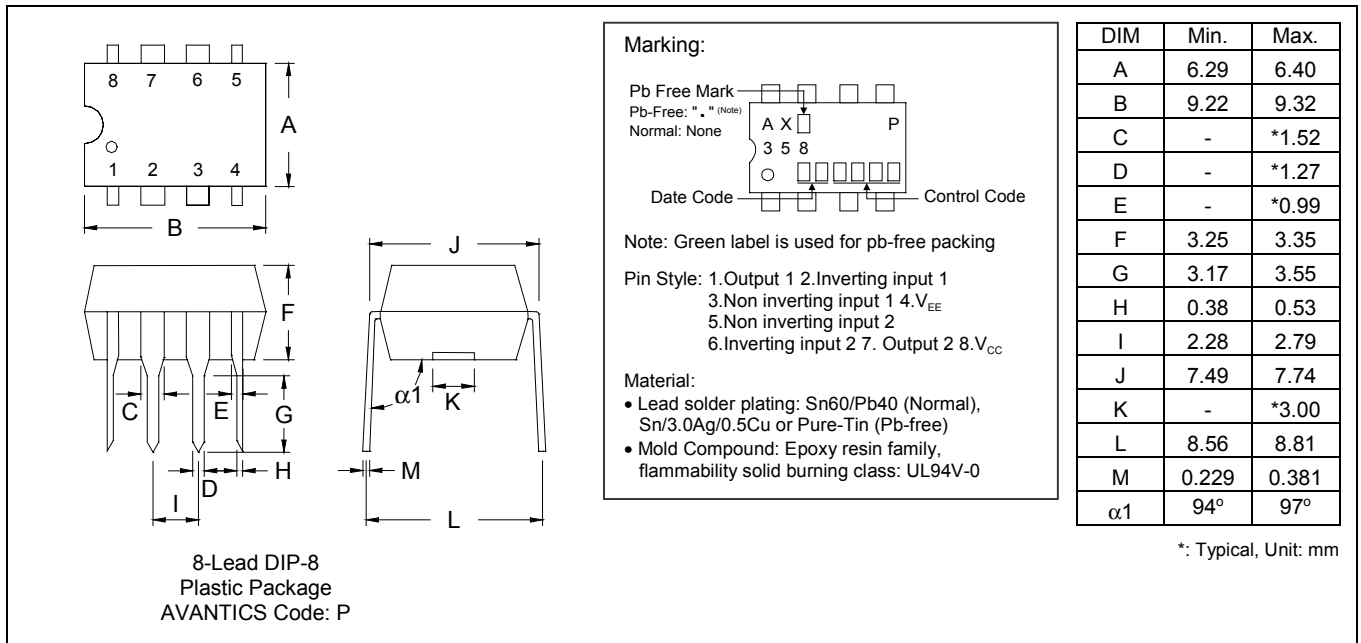
Typical Application Circuit



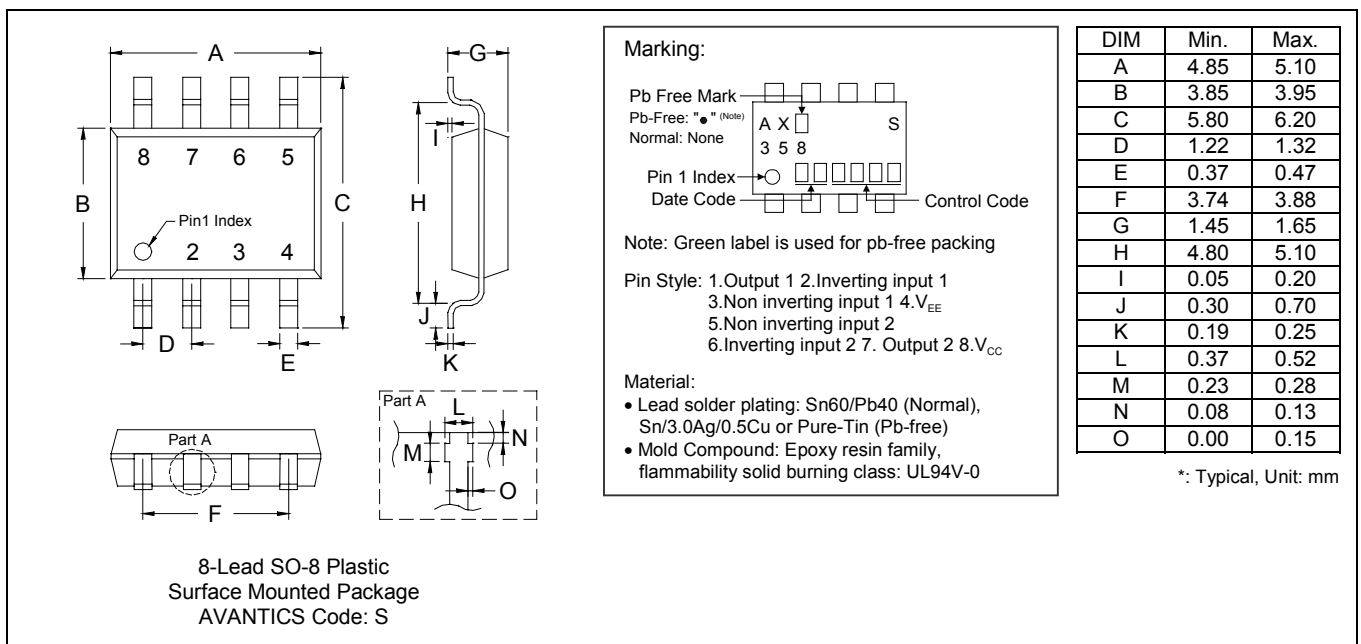
Typical Application Circuit



DIP-8 Dimension



SO-8 Dimension



Important Notice:

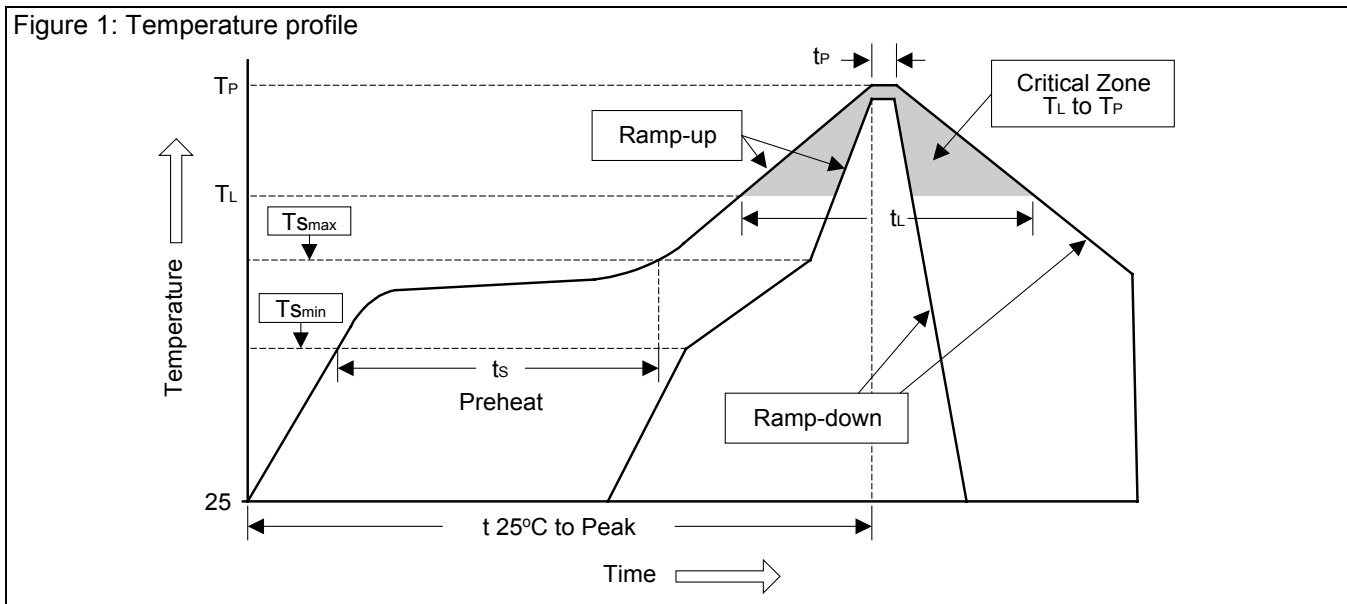
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Soldering Methods for AVANTICS's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (T_{Smin})	100°C	150°C
- Temperature Max (T_{Smax})	150°C	200°C
- Time (min to max) (t_s)	60~120 sec	60~180 sec
T_{Smax} to T_L		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60~150 sec	60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_p)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec