

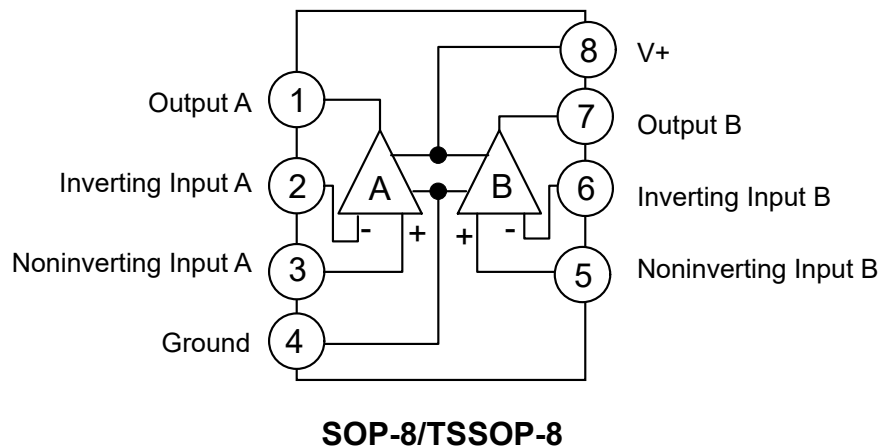
1. Description

The LM258 consists of two independent high-gain operational amplifiers. It can operate from either a single or dual power supply, and the current consumption is independent of the supply voltage. Applications include frequency converters, DC gain blocks, and all conventional operational amplifier circuits. Available in DIP8 or SOP8 packages.

2. Features

- Single or Dual Supply Operation
- Two Internally Compensated Operational Amplifiers in One Package
- Matched Logic Circuits
- Low Power Consumption
- Wide Frequency Range

3. Pinning Information





4. Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Value	Units
Supply Voltage		32 or ± 16	V
Differential Input Voltage		± 32	V
Input Voltage		-0.32 to 32	V
Power Dissipation (Note 1)	DIP package	550	mW
	SOP package	530	mW
Output Short-Circuit Current to Ground (1 Amplifier) (Note 2) ($V + 15\text{V}$, $T_A=25^{\circ}\text{C}$)		Continuous	
Input Current ($V_{IN} < -0.3\text{V}$) (Note 3)		50	mA
Operating Temperature		-20 to 85	$^{\circ}\text{C}$
Storage Temperature		-65 to 150	$^{\circ}\text{C}$



5. Electrical Characteristics (Unless otherwise specified, $V^+=5V$)

Parameter		Conditions		Min	Typ	Max	Units	
Input offset voltage		T _A =25°C			2	5	mV	
Input bias current		T _A =25°C, I _{IN(+)} or I _{IN(-)} , V _{CM} =0V			45	150	nA	
Input Offset Current		T _A =25°C, I _{IN(+)} - I _{IN(-)} , V _{CM} =0V			3	30	nA	
Input common mode voltage range		T _A =25°C, V ⁺ =30V		0		V ⁺ -1.5	V	
Power supply current		R _L =∞	V ⁺ =30V		1	2	mA	
			V ⁺ =5V		0.5	1.2	mA	
Large Signal Voltage Gain		V ⁺ =15V, T _A =25°C, R _L ≥2kΩ (for V _O =1~11V)		50	100		V/mV	
CMRR		DC, T _A =25°C, V _{CM} =0~V ⁺ -1.5V		70	85		dB	
PSRR		DC, T _A =25°C, V ⁺ =5~30V		65	100		dB	
Coupling system between amplifiers number		T _A =25°C, f=1~20kHz (all inputs)			120		dB	
Output source current		V _{IN(+)} =1V, V _{IN(-)} =0V, V ⁺ =15V V _O =2V, T _A =25°C		20	40		mA	
Output suction current		V _{IN(-)} =1V, V _{IN(+)} =0V, V ⁺ =15V V _O =2V, T _A =25°C		10	20		mA	
		V _{IN(-)} =1V, V _{IN(+)} =0V, V ⁺ =15V V _O =200mV, T _A =25°C		12	50		μA	
Short circuit current to ground		V ⁺ =15V, T _A =25°C			40	60	mA	
Output voltage swing		V _{OH}	V ⁺ =30V	R _L =2kΩ	26		V	
				R _L =10kΩ	27	28	V	
		V _{OL}	V ⁺ =5V, R _L =10kΩ			5	20	mV
The static curent ofeach amplifier		I _Q	V _O =2.5V, I _O =0A	T _A =0~70°C		350	600	μA
			V _S =30V, V _O =15V, I _O =0A			500	1000	μA

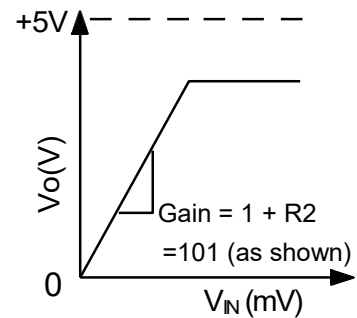
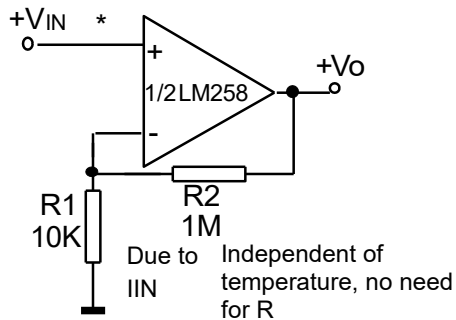


Parameter		Conditions	Min	Typ	Max	Units
Slew rate	SR	$V_{CC}^{+}=15V$, $V_i=0.5$ to $3V$, $R_L=2\text{ k}\Omega$ $C_L=100\text{pF}$, unity gain	0.3	0.6		$V/\mu s$
Gain bandwidth product	GBP	$V_{CC}^{+}=30V$, $f=100\text{kHz}$, $V_{in}=10\text{mV}$ $R_L=2\text{k}\Omega$, $C_L=100\text{pF}$	0.7	1.1		MHz
Total harmonic distortion	THD	$f=1\text{kHz}$, $A_v=20\text{dB}$, $R_L=2\text{k}\Omega$, $V_o=2V_{pp}$ $C_L=100\text{pF}$, $V_o=2V_{pp}$		0.02		%
Equivalent input noise voltage	e_n	$f=1\text{kHz}$, $R_s=100\Omega$, $V_{CC}^{+}=30V$		55		$\text{nV}/\sqrt{\text{Hz}}$



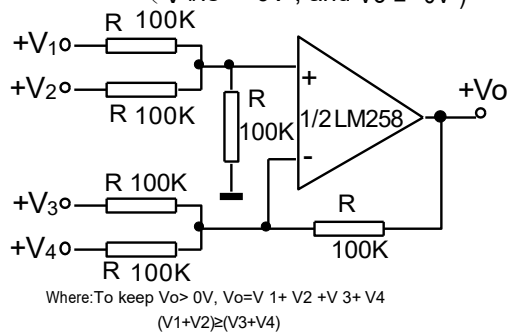
6. Typical Application

Non-inverting DC gain ($0\text{ V in} = 0\text{ V out}$)

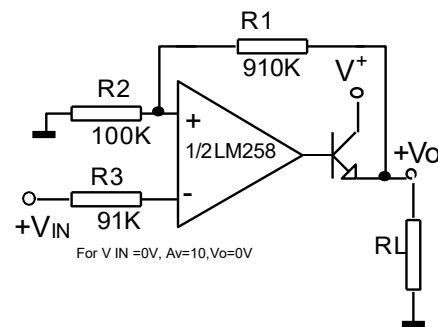


DC Summing Amplifier

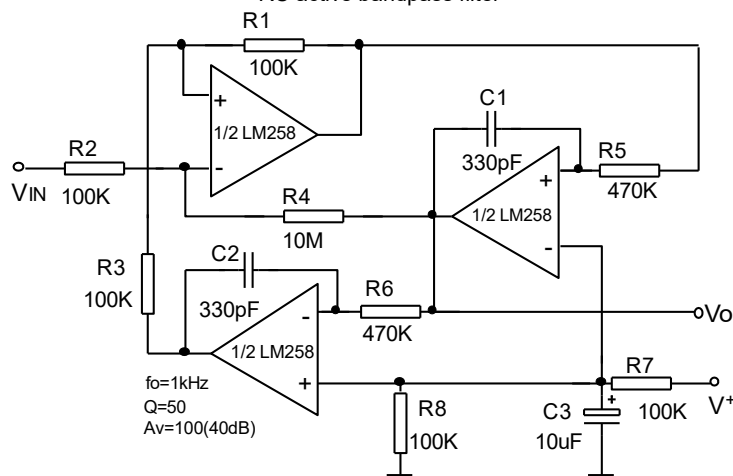
($V_{INs} \geq 0\text{ V}$, and $V_o \geq 0\text{ V}$)



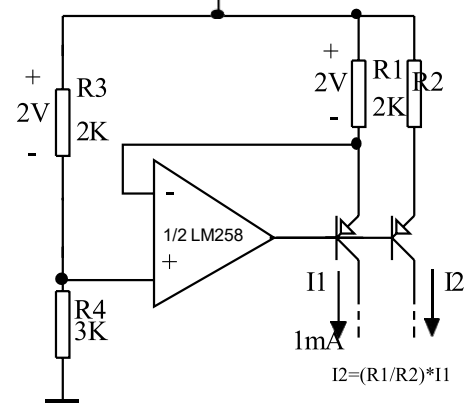
Power Amplifier



RC active bandpass filter



Fixed Current Source





7.1 Typical Characteristic

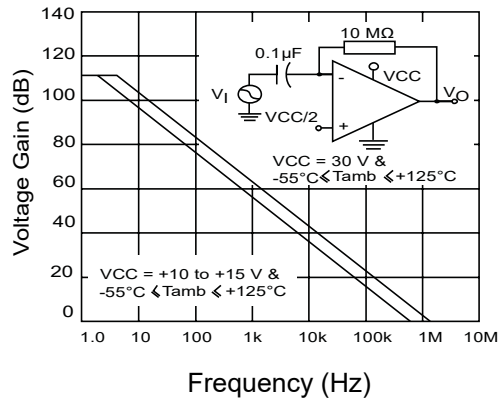


Figure 1: Open-loop frequency response

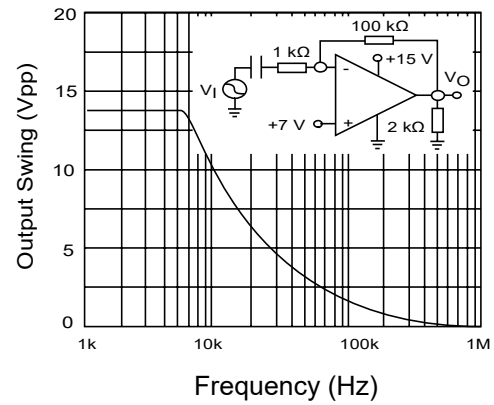


Figure 2: Large signal frequency response

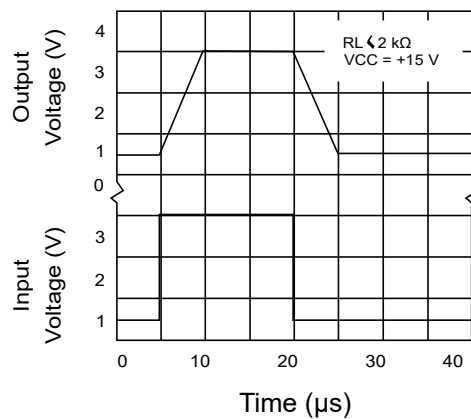
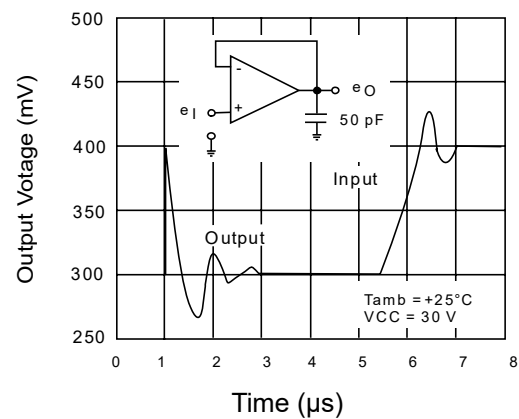
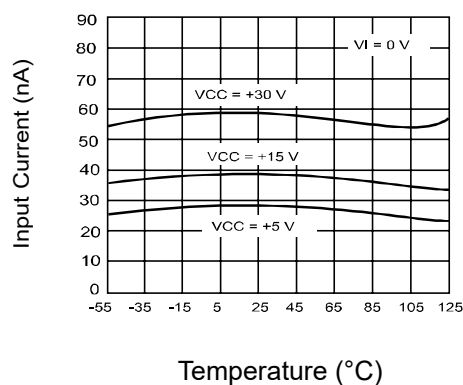
Figure 3: Voltage follower pulse response with $V_{CC} = 15$ VFigure 4: Voltage follower pulse response with $V_{CC} = 30$ V

Figure 5: Input current

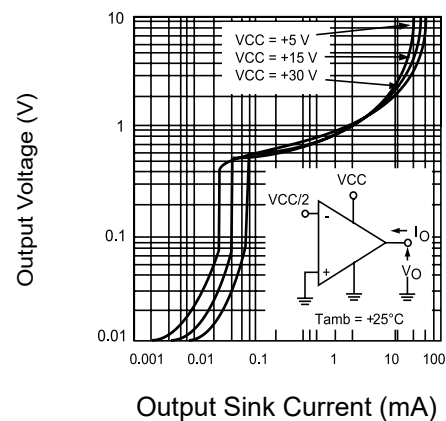
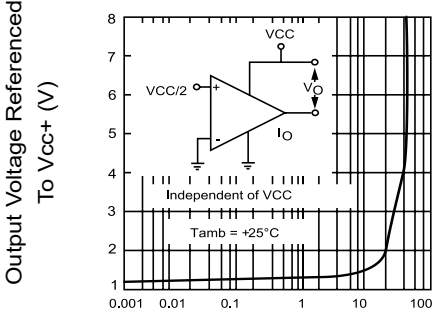
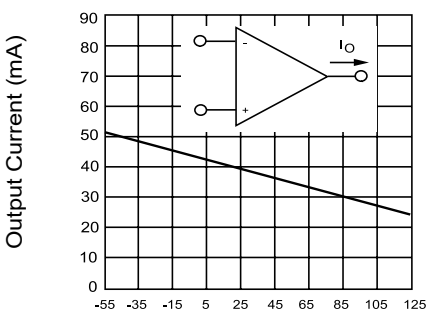
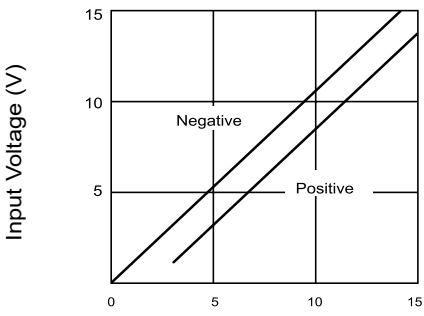
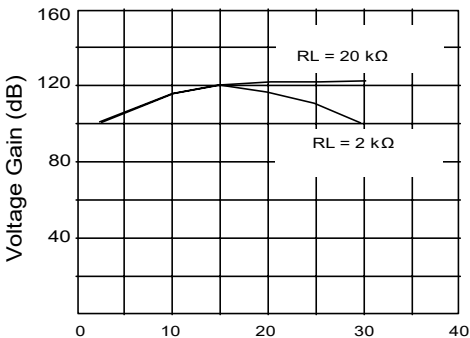
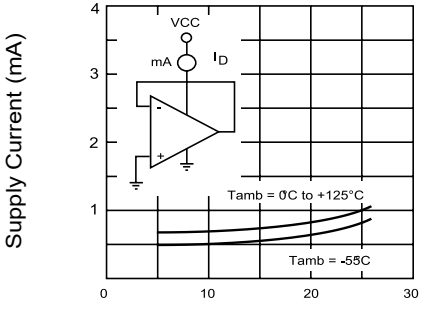
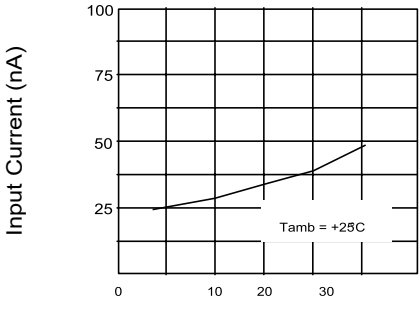


Figure 6: Output voltage vs sink current



7.2 Typical Characteristic

 Output Source Current (mA)	 Temperature (°C)
Figure 7: Output voltage vs source current	Figure 8: Current limiting
 Power Supply Voltage (±V)	 Positive Supply Voltage (V)
Figure 9: Input voltage range	Figure 10: Open-loop gain
 Positive Supply Voltage (V)	 Positive Supply Voltage (V)
Figure 11: Supply current	Figure 12: Input current

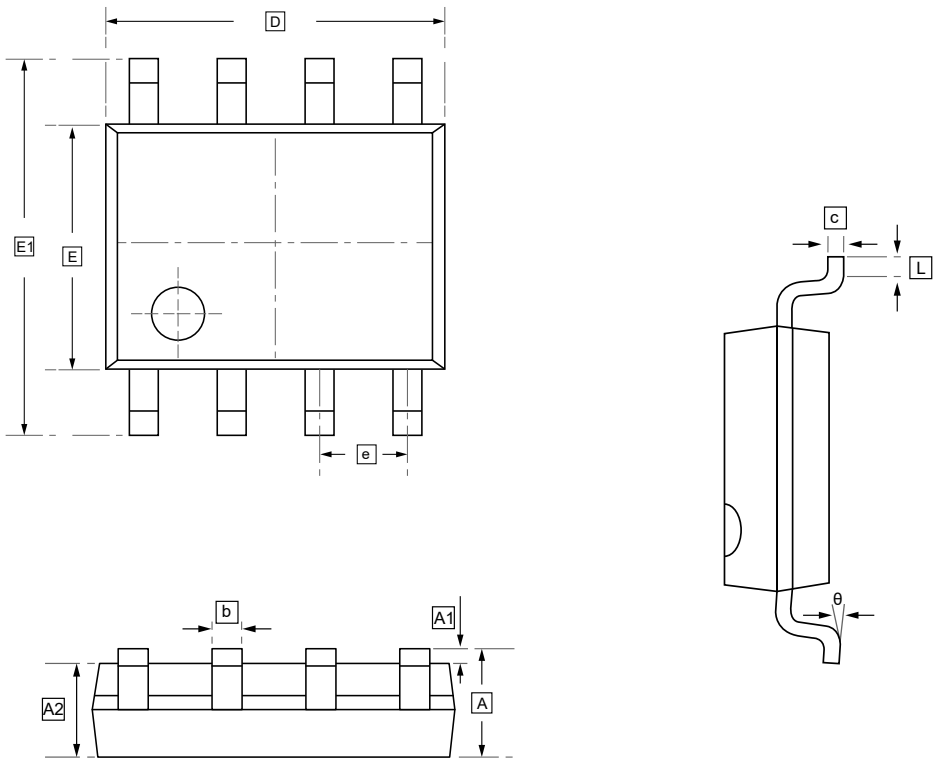


7.3 Typical Characteristic

Gain Bandwidth Product (MHz) Temperature (°C)	Power Supply Rejection Ratio (dB) Temperature (°C)
Figure 13: Gain bandwidth product	Figure 14: Power supply rejection ratio
Common Mode Rejection Ratio (dB) Temperature (°C)	Phase margin at Vcc = 15 V and Vicm = 7.5 V vs. Iout and capacitive load value lout (μA) Source for positive values/Sink for negative values
Figure 15: Common-mode rejection ratio	Figure 16: Phase margin vs. capacitive load



8.1 SOP-8 Package Outline Dimensions

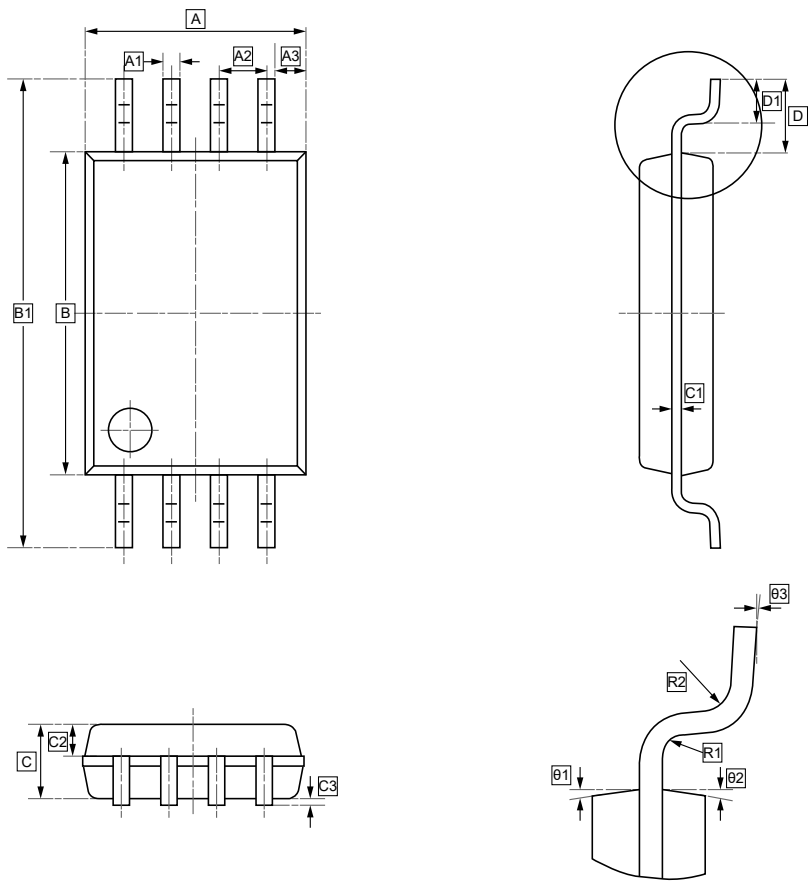


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°



8.2 TSSOP-8 Package Outline Dimensions



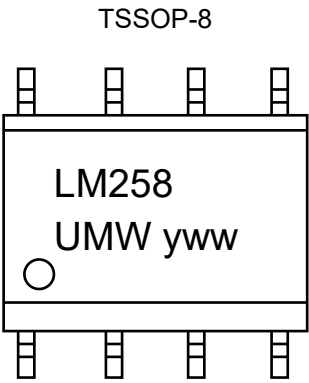
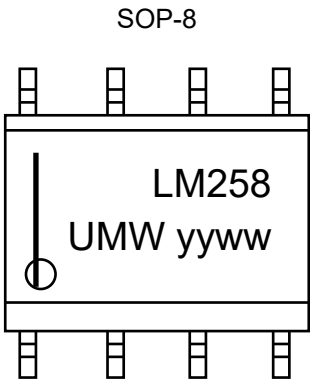
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	C	C1	C2	C3	D	D1
Min	2.90	0.20	0.65	0.36	4.30	6.30	0.95	0.127	0.39	0.05	1.00	0.50
Max	3.10	0.30	TYP	0.46	4.50	6.50	1.05	TYP	0.49	0.15	REF	0.70

Symbol	R1	R2	θ1	θ2	θ3
Min	0.15	0.15	12°	12°	0°
Max	TYP	TYP	TYP4	TYP4	7°



9.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW LM258DR	LM258	SOP-8	2500	Tape and reel
UMW LM258PT	LM258	TSSOP-8	4000	Tape and reel



10.Disclaimer

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