

#### Features

- Operating Voltage :  $\pm 1.5 \sim \pm 8V$  or  $3 \sim 16V$
- Large DC Voltage Gain: 100 dB
- High input Resistance :  $1M\Omega$
- Low Voltage Operation : 1.5V
- Bipolar Technology
- Low Power Consumption

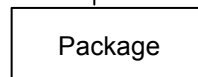
#### Description

The CO4558L consists of two independent, high gain, internally compensated amplifiers which were designed specifically to operate from a single or split power supply.

Application areas include transducer amplifier, DC gain blocks and all the conventional operational amplifier circuits.

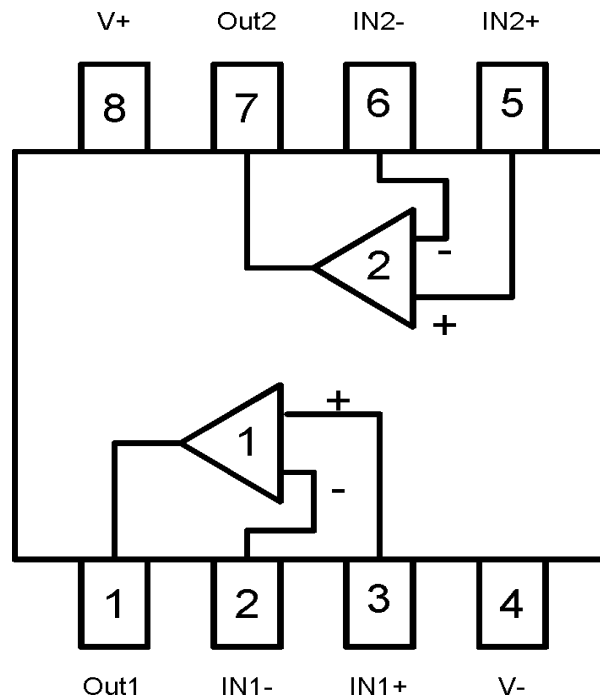
#### ORDERING INFORMATION

CO4558LN



Blank SO-8  
N=PDIP8  
A=SO-8 & taping

#### BLOCK DIAGRAM



\* All specs and applications shown above subject to change without prior notice.

**Absolute maximum ratings (Ta = 25°C)**

Parameter	Symbol	Limits	unit
Power supply voltage	V+/V-	±8	V
Differential Input Voltage	V <sub>ID</sub>	±7	V
Power Dissipation	P <sub>D</sub>	500	mW
Operating temperature	T <sub>opr</sub>	0~+85	°C
Storage temperature	T <sub>stg</sub>	-55~+150	°C

\*Stresses beyond those listed under “ absolute maximum ratings” may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

**Recommended Operating Condition**

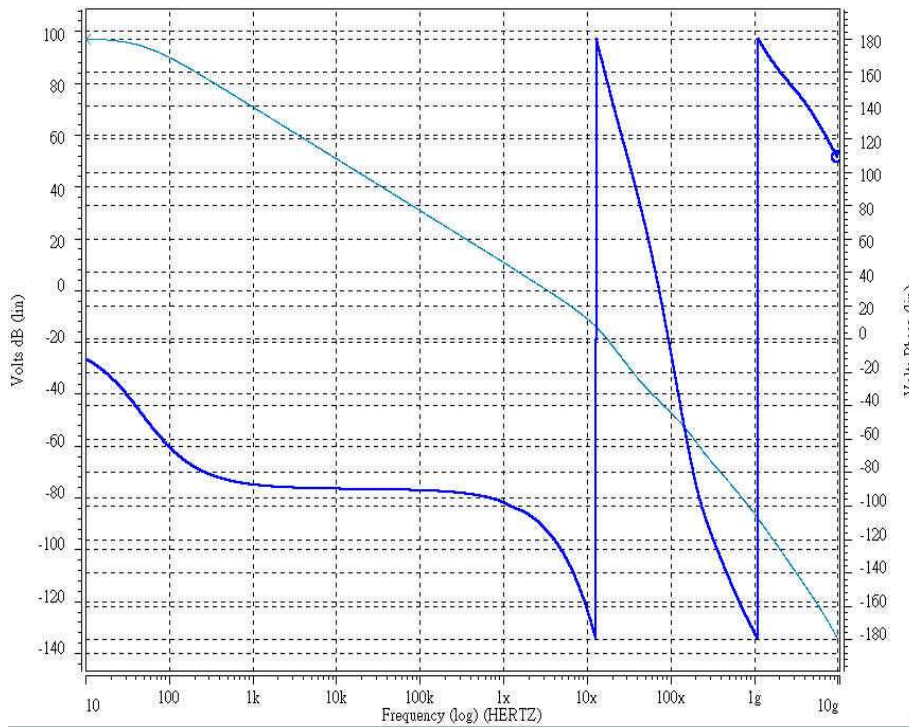
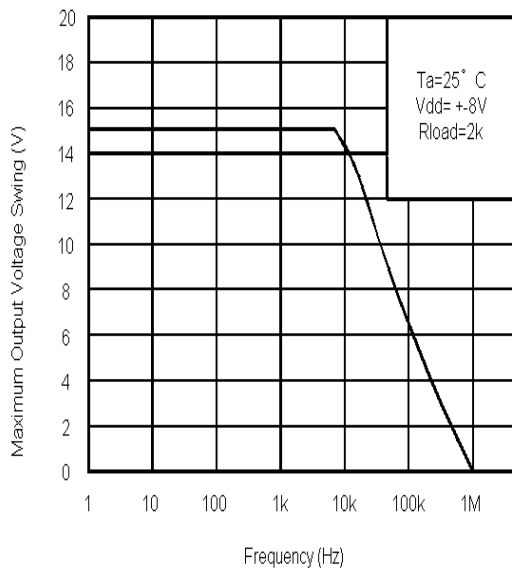
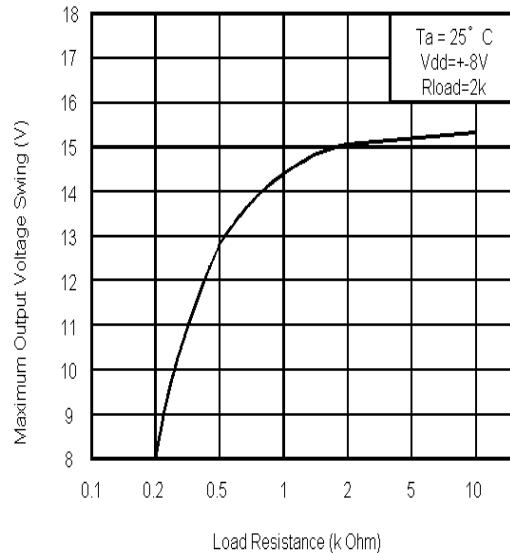
Parameter	Symbol	Limits	unit
Power supply voltage	V+/V-	±1.5~±8(3~16)	V

**Electrical characteristics (unless otherwise noted, Ta = 25°C, V+ = 6V, V- = -6V)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input Offset Voltage	V <sub>IO</sub>	-	0.7	6	mV	R <sub>S</sub> ≤ 10KΩ
Input Offset Current	I <sub>IO</sub>	-	5	200	nA	
Input Bias Current	I <sub>B</sub>	-	70	500	nA	
Input Resistance	R <sub>IN</sub>	0.5	0.8	-	MΩ	
Input Voltage Range	V <sub>in</sub>	-	-	±5	V	
Large Signal Voltage Gain	A <sub>v</sub>	86	100	-	dB	
Gain Bandwidth	GBW	-	3	-	MHz	
Phase Margin	θ <sub>m</sub>	-	60	-	deg.	
Output Voltage Swing	V <sub>sw</sub>	-	±5	-	V	R <sub>L</sub> = 10KΩ
DC common mode Rejection ratio	CMRR	-	98	-	dB	
Power supply rejection Ratio	PSRR	-	95	-	dB	R <sub>S</sub> ≤ 10KΩ, f <sub>in</sub> = 100Hz V <sub>p-p</sub> = 100mV
Slew rate	SR	0.9	1.0	-	V/μS	R <sub>L</sub> = 2KΩ C <sub>L</sub> = 100pF
Input Noise Voltage	V <sub>noise</sub>	-	1.94	-	uV <sub>rms</sub>	RIAA, R <sub>S</sub> = 1KΩ, 30kHz, LPF
Output Resistance	R <sub>o</sub>	-	75	-	Ω	
Output Short-Circuit Current	I <sub>os</sub>	-	100	-	mA	*
Channel separation	α	-	100	-	dB	f = 1KHz~20KHz
Rise Time	Tr	-	55	-	ns	
Operating Current	I <sub>cc</sub>	-	5.5	10	mA	

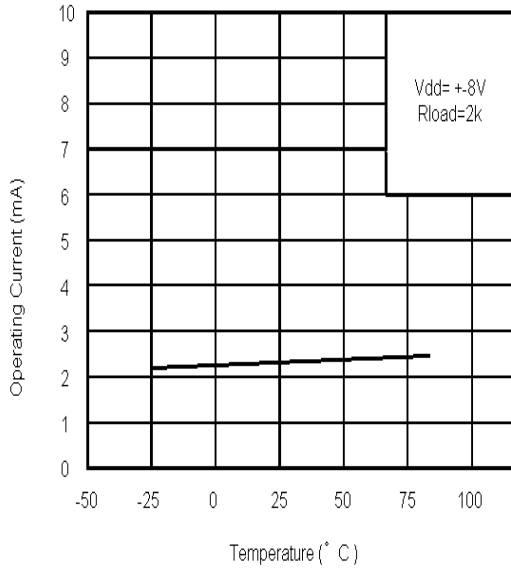
\*1 Due to power dissipation issue, it is not allowed for both channels to operate at this condition at the same moment.

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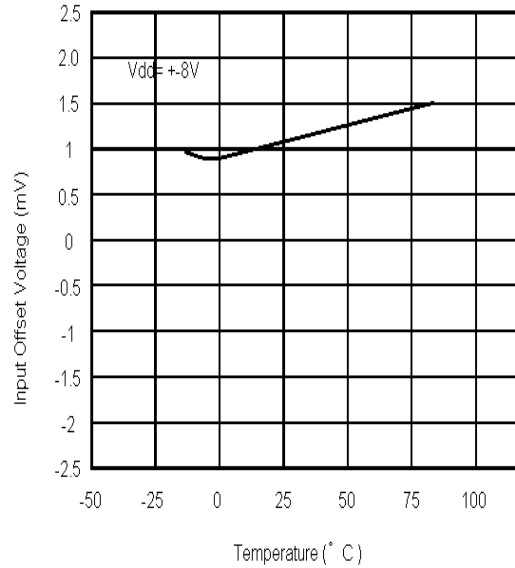
**Typical Curve**
**Open-Loop Gain Bandwidth and Phase Margin**

**Maximum Output Voltage Swing vs Frequency**

**Maximum Output Voltage Swing vs Load Resistance**


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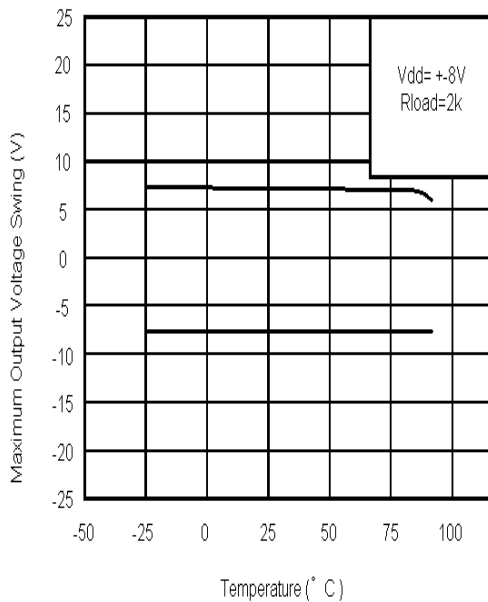
Operating Current vs Temperature



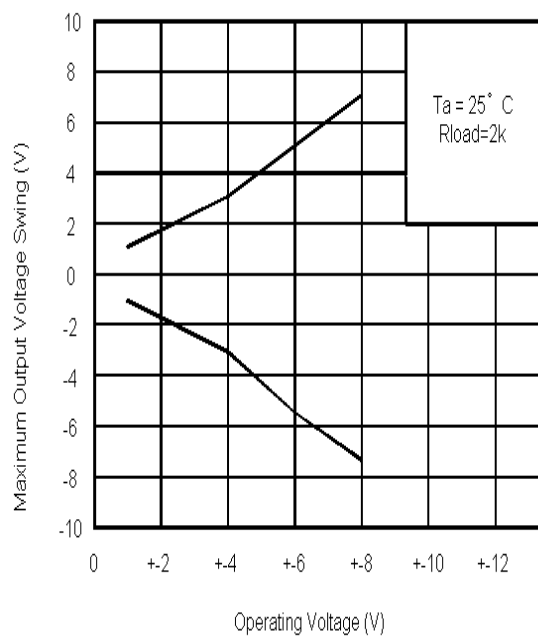
Input Offset Voltage vs Temperature



Maximum Output Voltage Swing vs Temperature

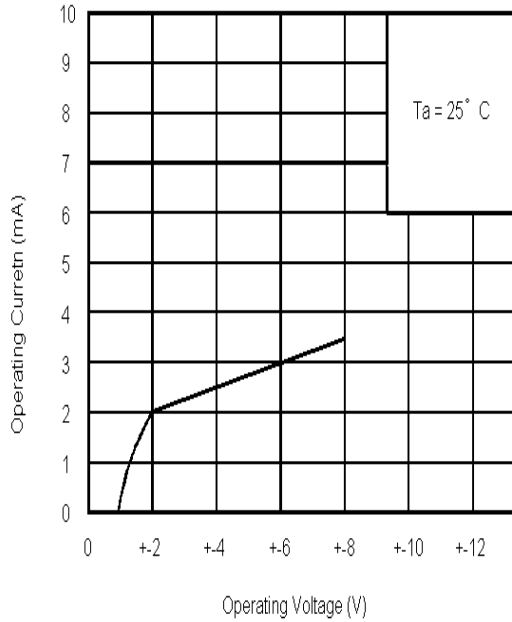


Maximum Output Voltage Swing vs Operating Voltage

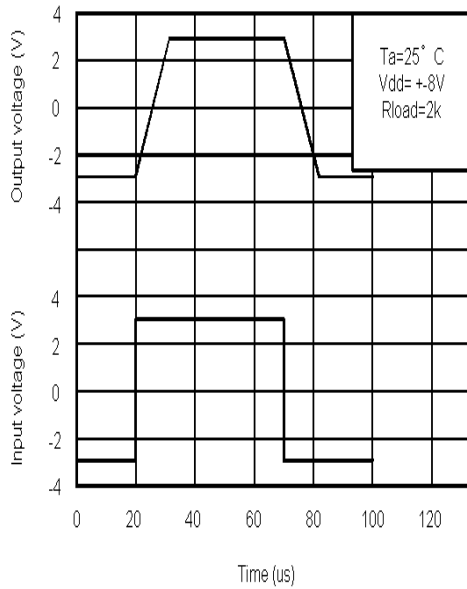


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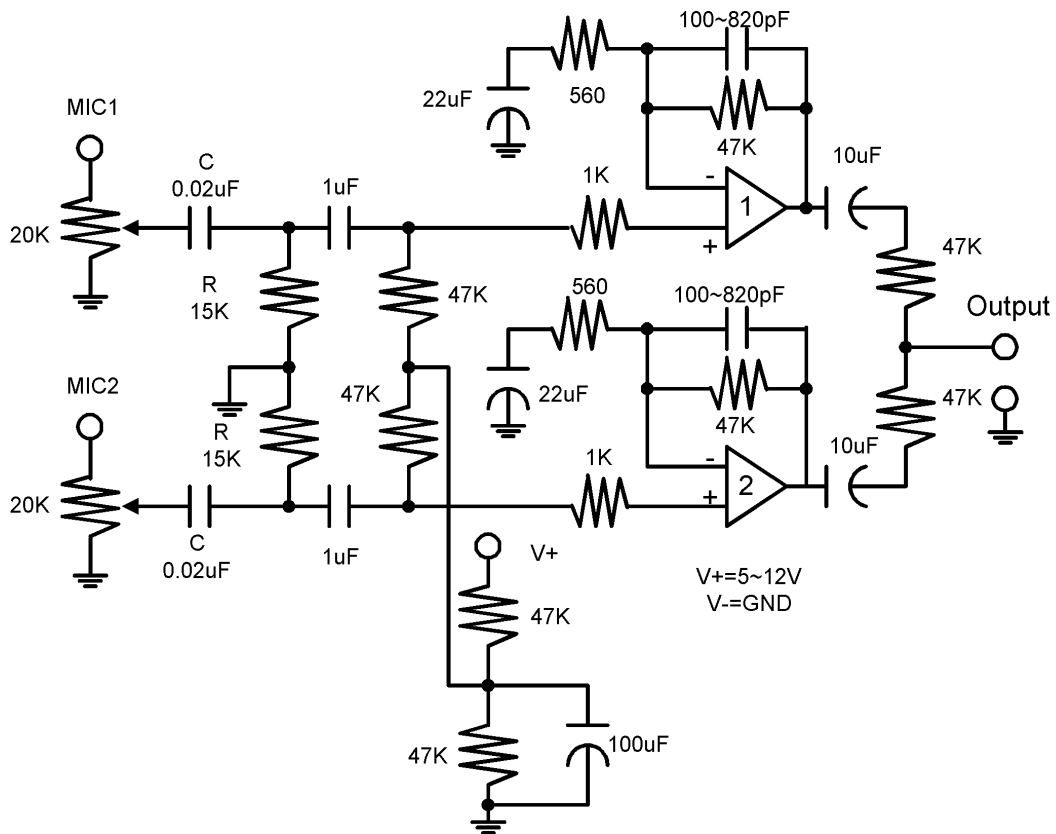
Operating Current vs Operating Voltage



Voltage Follower pulse response

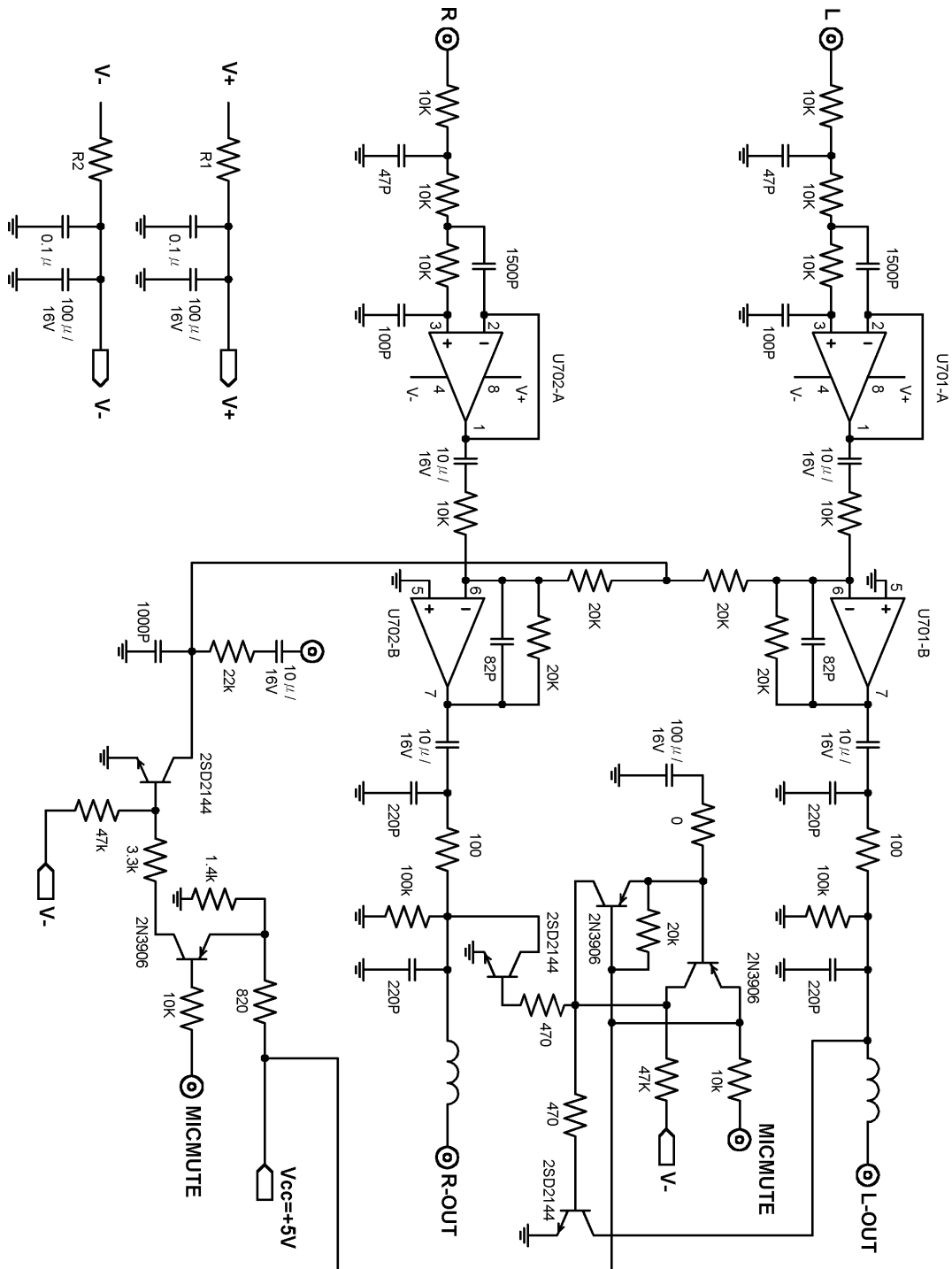


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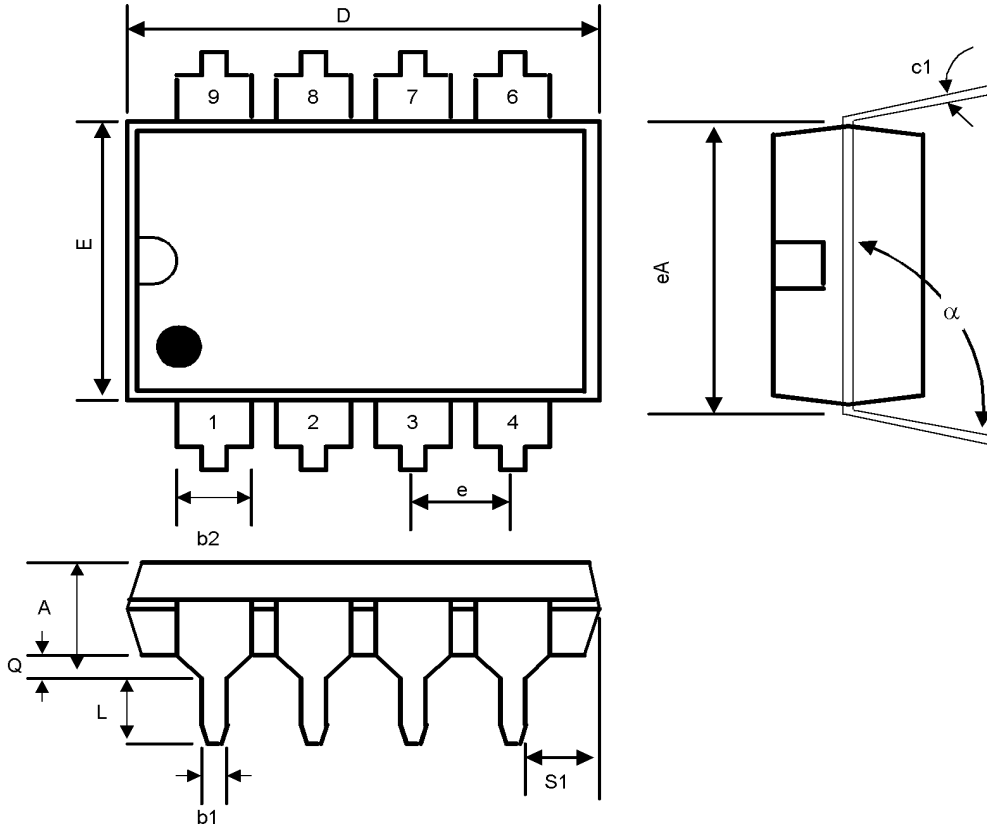
**Application Circuit**
**MIC Pre-Amp circuit for ECHO Application**


- Change the value of the R and C to adjust the cutoff frequency of the high pass filter as you like.
- The output is connected to the input point of the echo application circuit.

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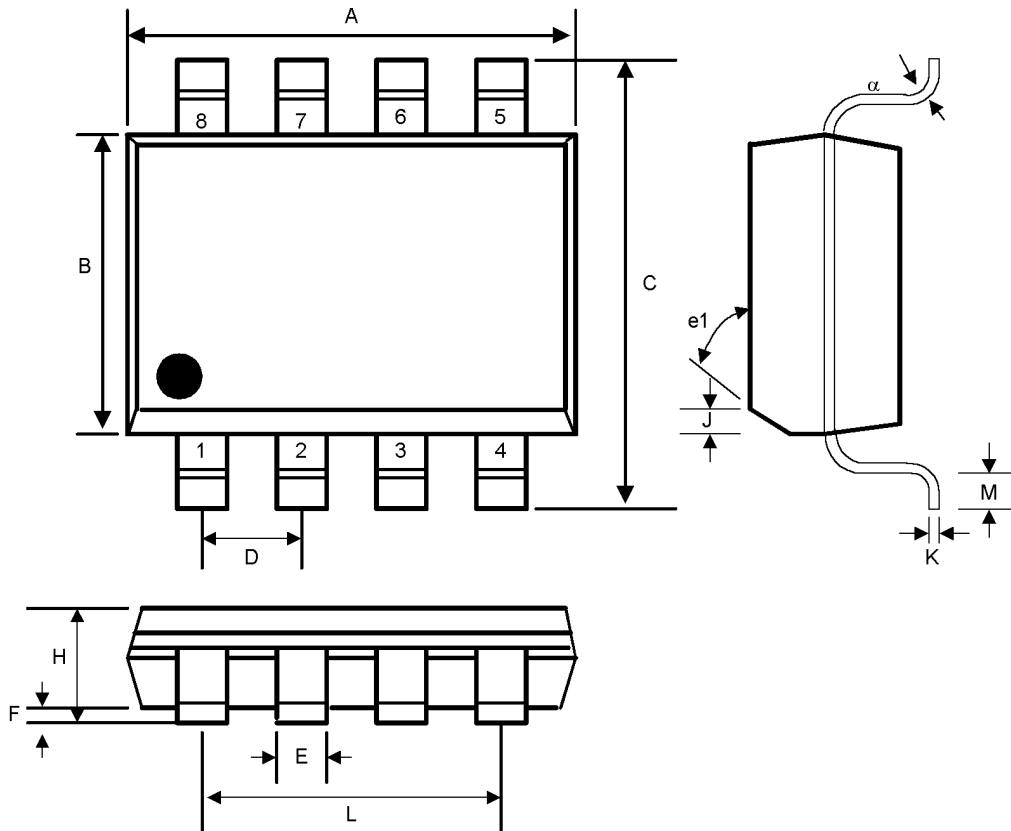
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**Package Outlines : DIP-8**


SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b1	0.014	0.023	0.36	0.58	-
b2	0.045	0.065	1.14	1.65	-
c1	0.008	0.015	0.20	0.38	-
D	0.355	0.400	9.02	10.16	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	-
s1	0.005	-	0.13	-	-
$\alpha$	90 <sup>0</sup>	105 <sup>0</sup>	90 <sup>0</sup>	105 <sup>0</sup>	-

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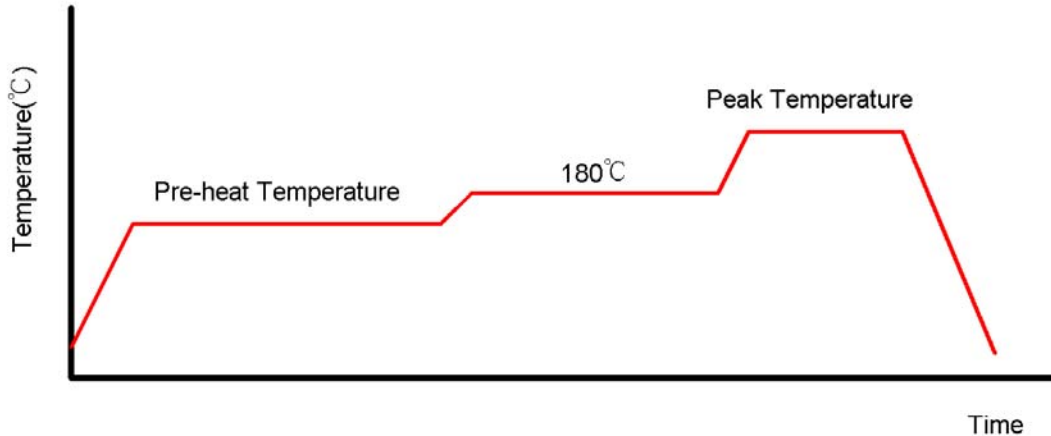
**Small Outline SOP-8**


SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.188	0.197	4.80	5.00	-
B	0.149	0.158	3.80	4.00	-
C	0.228	0.244	5.80	6.20	-
D	0.050 BSC		1.27 BSC		-
E	0.013	0.020	0.33	0.51	-
F	0.004	0.010	0.10	0.25	-
H	0.053	0.069	1.35	1.75	-
J	0.011	0.019	0.28	0.48	-
K	0.007	0.010	0.19	0.25	-
M	0.016	0.050	0.40	1.27	-
L	0.150 REF		3.81 REF		-
e1	45°		45°		-
α	0°	8°	0°	8°	-

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**Reflow Condition (IR/Convection or VPR Reflow)**

Reference JEDEC Standard J-STD-020A


**Classification Reflow Profiles**

	Convection or IR/Convection	VPR
Average Heating Rate(180°C to peak)	5°C/second max.	10°C/second max.
Preheat Temperature(125±20°C)	120 seconds max.	
Temperature maintained above 180°C	10~150 seconds	
Time within 5°C of actual Peak Temperature	10~20 seconds	60 seconds
Peak Temperature Range(Note 1)	219~225°C or 235~240°C	219~225°C or 235~240°C
Cooling Rate	6°C/second max.	10°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	

\*1 The maximum peak temperatures for IR and VP reflow are depending on package dimensions.

**Package Reflow Conditions**

Pkg. Thickness ≥2.5mm and all bags	Pkg. Thickness <2.5mm and Pkg. Volume ≥350 mm <sup>3</sup>	Pkg. Thickness <2.5mm and Pkg. Volume <350 mm <sup>3</sup>
Convection 219~225°C		Convection 235~240°C
VPR 219~225°C		VPR 235~240°C
IR/Convection 219~225°C		IR/Convection 235~240°C

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