

## 1.25W Fully Differential Audio Power Amplifier with External Feedback Resistors

# CE4890

### ■ INTRODUCTION

The CE4890 is a fully differential audio power amplifier designed for portable communication device applications. It is capable of delivering 1.25 watt of continuous average power to an 8Ω BTL load with less than 1% distortion (THD+N) from a 5V battery voltage. It operates from 2.2 to 5.5V. Features like 86dB PSRR at 217Hz, improved RF-rectification immunity, the space-saving 8-pin MSOP8 , SOP8 and DIP8 package, the advanced pop & click circuitry, a minimal count of external components and low-power shutdown mode make CE4890 ideal for wireless handsets. The CE4890 is unity-gain stable, and the gain can be configured by external input resistors and external feedback resistors.

### ■ APPLICATIONS

- Wireless handsets
- Portable audio devices
- PDAs
- Notebook computer

### ■ FEATURES

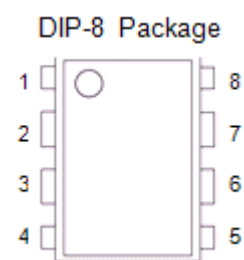
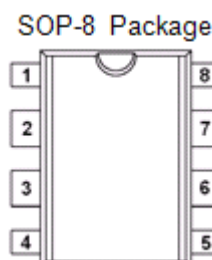
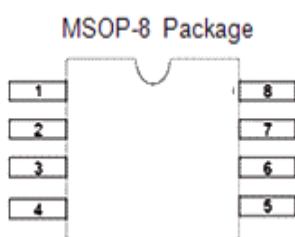
- Fully differential amplifier
- Improved PSRR at 217Hz( $V_{DD}>3.0V$ ) 86dB (Typ.)
- Power output at 5.0V & 1% THD 1.25W (Typ.)
- Power output at 3.6V & 1% THD 0.5W (Typ.)
- Ultra low shutdown current 0.1μA (Typ.)
- Improved pop & click circuitry eliminates noises during turn-on and turn-off transitions
- Thermal overload protection circuitry
- No output coupling capacitors, bootstrap capacitors required
- Unity-gain stable
- External gain configuration capability
- Available in space-saving packages: 8-pin MSOP8,SOP8,DIP8

### ■ ORDER INFORMATION

#### CE4890①

DESIGNATOR	SYMBOL	DESCRIPTION
①	SM	Package: MSOP8
	S	Package: SOP8
	D	Package: DIP8
	—	Package: DICE

### ■ PIN DIAGRAM



■ PIN CONFIGURATION

MSOP8	SOP8	DIP8	SYMBOL	TYPE	FUNCTION
1	1	1	SHUTDOWN	I	Shut-down Logical Control , "0" is active
2	2	2	BYPASS	I	Common-mode voltage, connect a Bypass capacitor to ground
3	3	3	IN+	I	Positive input.
4	4	4	IN-	I	Negative input.
5	5	5	VO1	O	Positive output.
6	6	6	V <sub>DD</sub>	I	Power Supply.
7	7	7	V <sub>SS</sub>	I	Ground.
8	8	8	VO2	O	Negative output.

■ TYPICAL APPLICATION

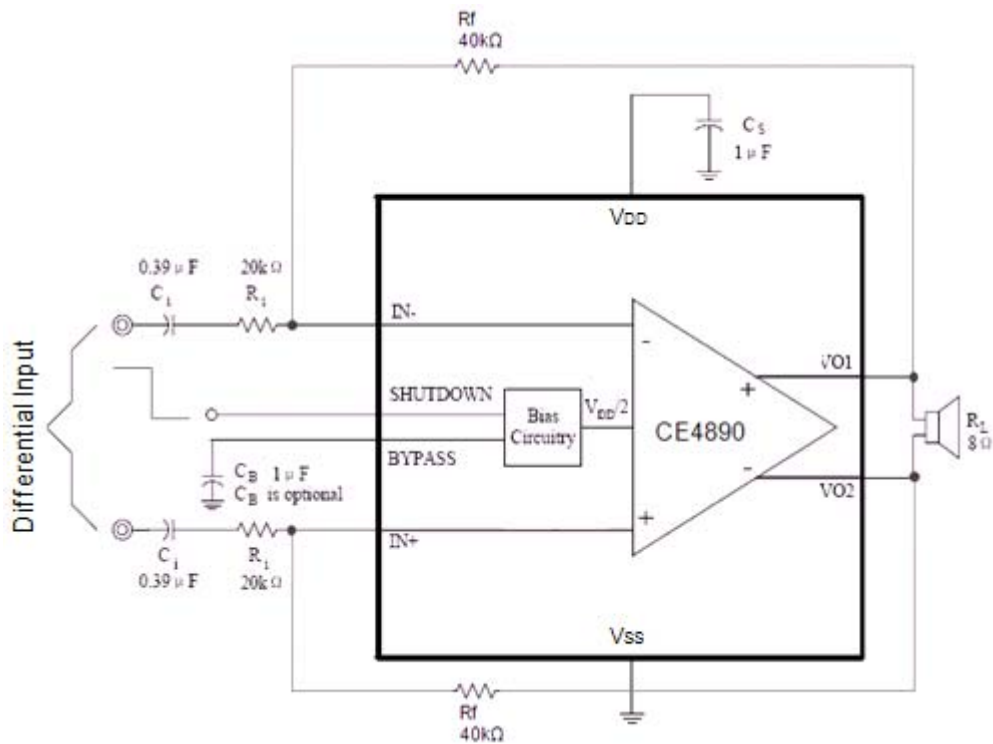


Fig1. Differential Input Application

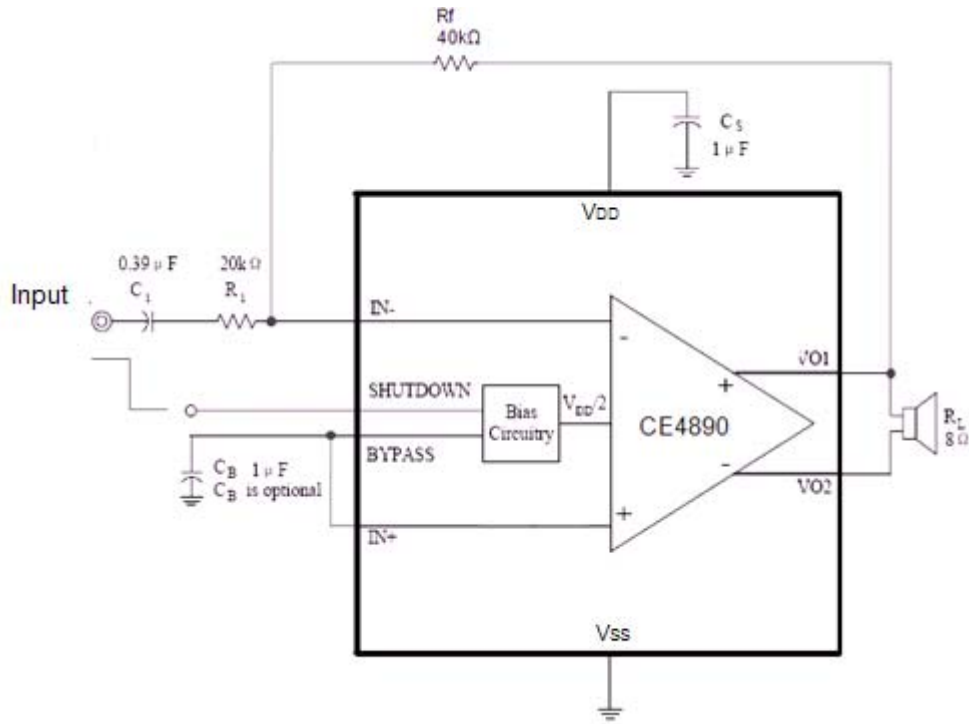


Fig2. Single-Ended Input Application

**Note :** Capacitor in the application can be Tantalum, Electrolytic and Ceramic etc.

■ **ABSOLUTE MAXIMUM RATINGS**

(Unless otherwise specified, Ta=25°C)

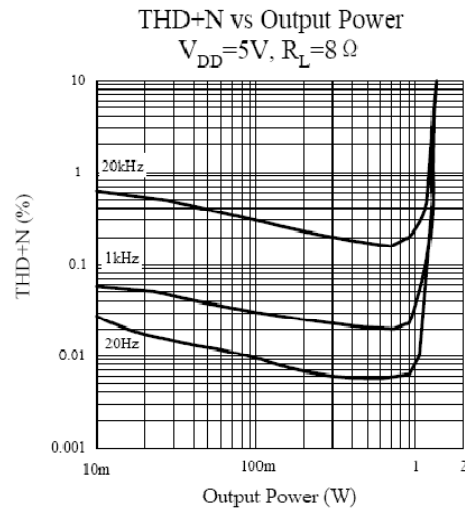
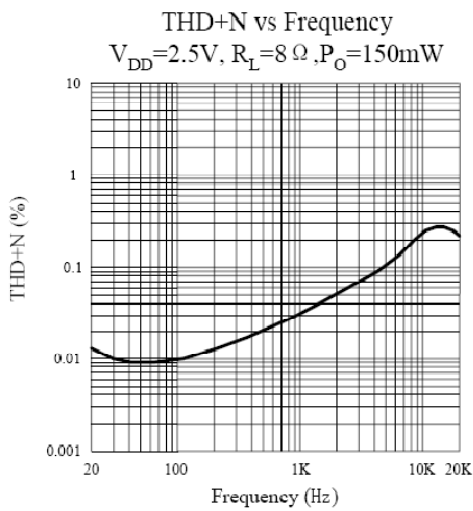
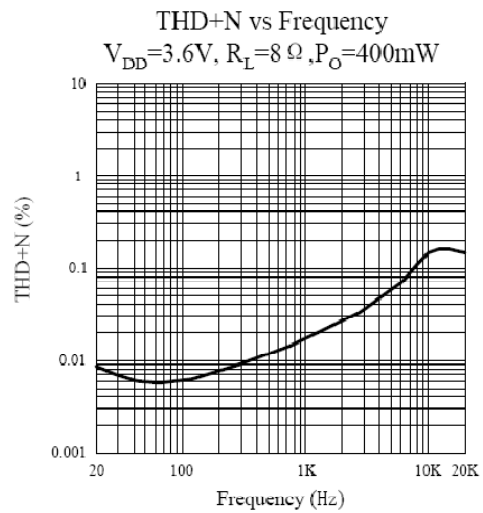
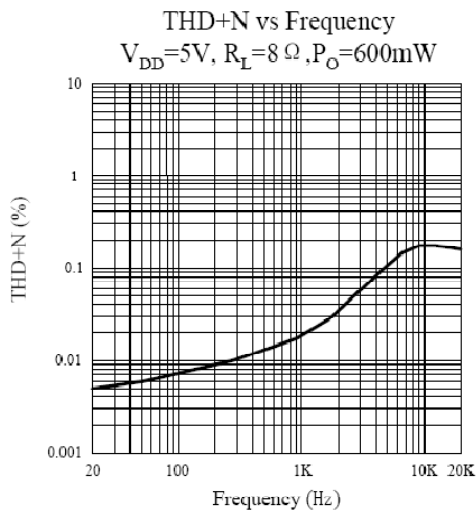
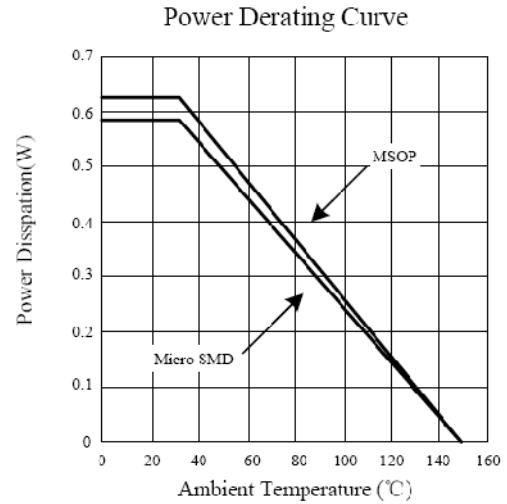
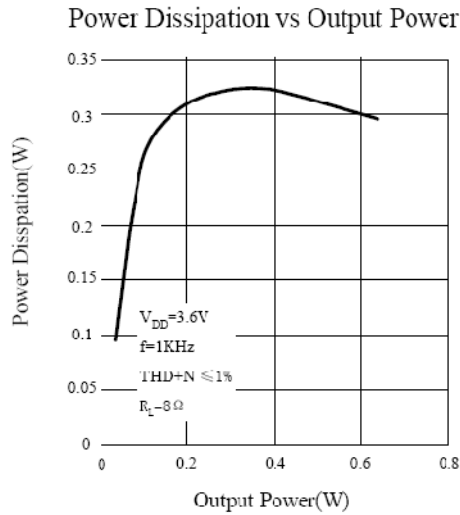
PARAMETER		SYMBOL	RATINGS	UNITS
V <sub>DD</sub> pin voltage		V <sub>DD</sub>	V <sub>SS</sub> -0.3 ~ V <sub>SS</sub> +8	V
Power dissipation	MSOP8	PD	500	mW
	SOP8		300	mW
	DIP8		500	mW
Operating temperature		T <sub>opr</sub>	-40 ~ +85	°C
Storage temperature		T <sub>stg</sub>	-40 ~ +125	°C
Soldering Temperature & Time		T <sub>solder</sub>	260°C, 10s	

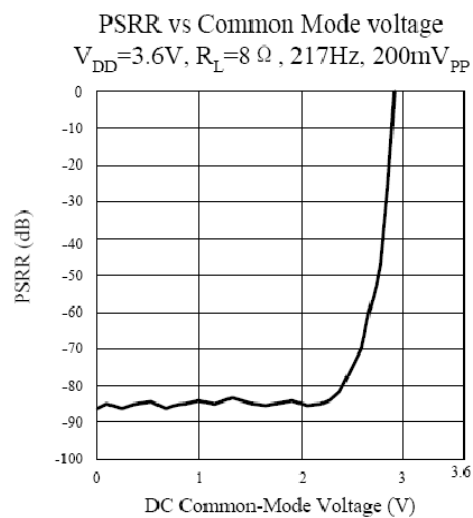
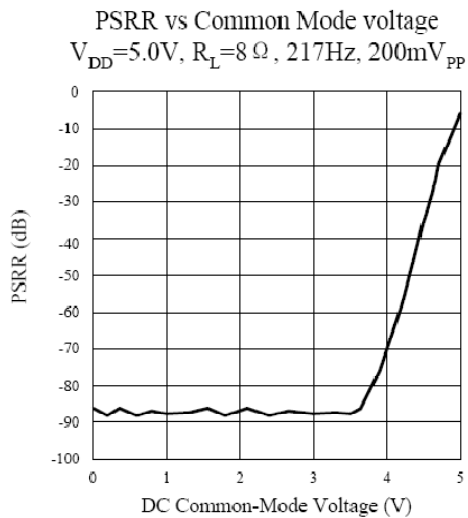
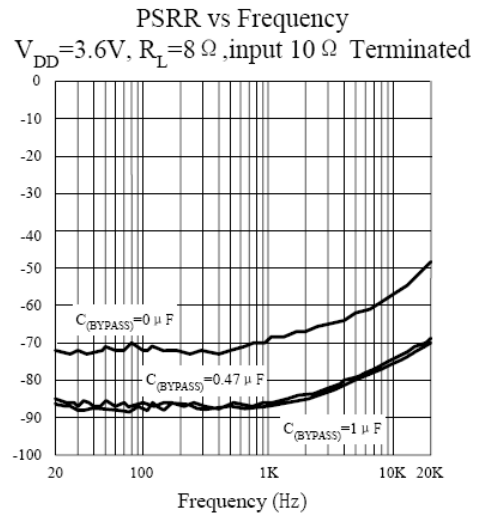
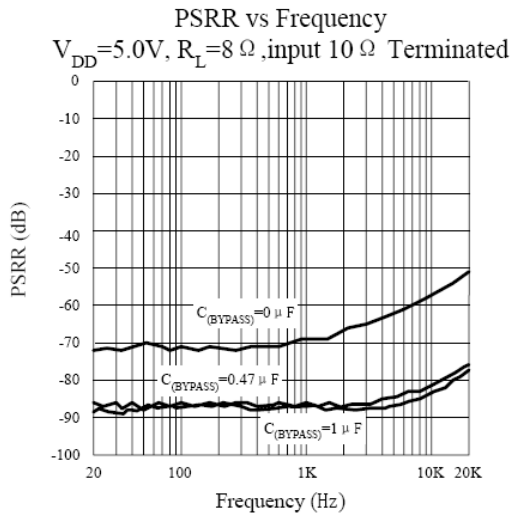
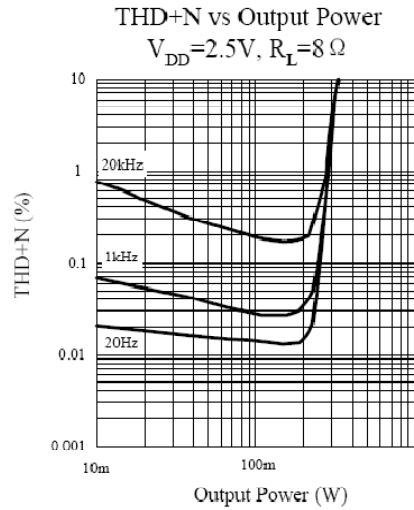
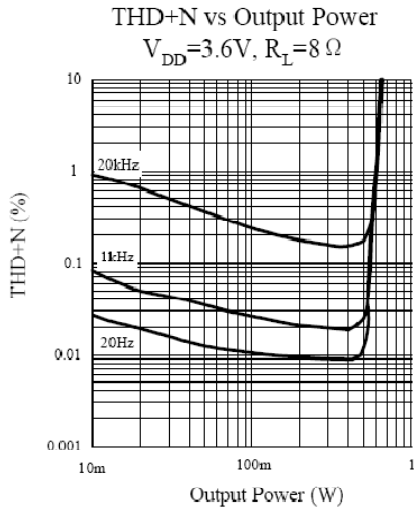
■ ELECTRICAL CHARACTERISTICS

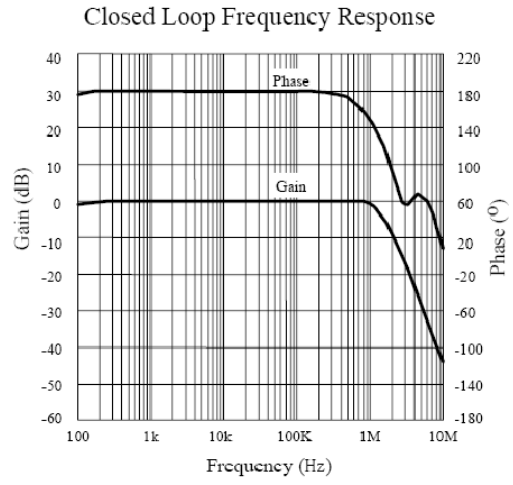
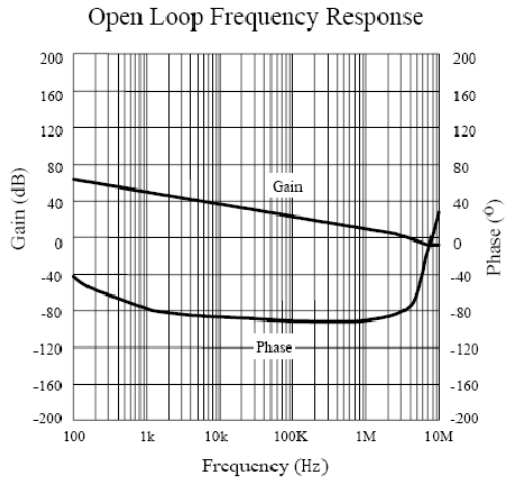
$V_{DD}=5V(8\Omega\text{load}, AV=1V, Ta=25^{\circ}C)$

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Current consumption	$I_{DD}$	$V_{IN}=0V$ , no load		2.5		mA
		$V_{IN}=0V$ , $R_L=8\Omega$		4		mA.
Current consumption during shutdown	$I_{SHDN}$	Shutdown= $V_{SS}$		0.1	1.0	$\mu A$
Output Power	$P_O$	THD=1% (max); f=1KHz		1.25		W
Total Harmonic Distortion+ Noise	THD+N	$P_o=0.6W_{rms}$ ; f=1KHz		0.02		%
Power Supply Rejection Ratio	PSRR	$V_{ripple}=200mV$ sine P-P				
		f=217Hz		-86		dB
		f=1KHz		-83		dB
Common Mode Rejection Ratio	CMRR	f=217Hz, $V_{CM}=200mV_{pp}$		-78		dB
Output Offset Voltage	$V_{OS}$	$V_{IN}=0V$		2		mV
Shutdown Voltage Input High	$V_{SDIH}$		1.5			V
Shutdown Voltage Output Low	$V_{SDIL}$				0.3	V
Closed Loop Gain	$A_V$			$\frac{R_f}{R_i}$		V/V

■ TYPICAL PERFORMANCE CHARACTERISTICS

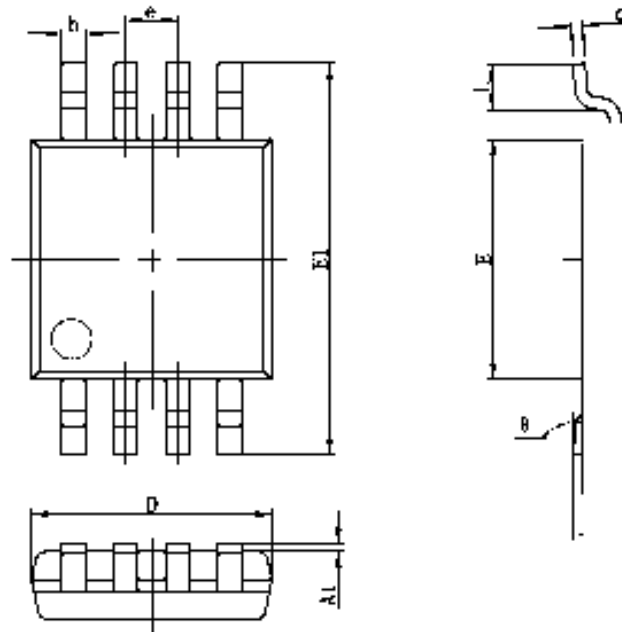






■ PACKAGING INFORMATION

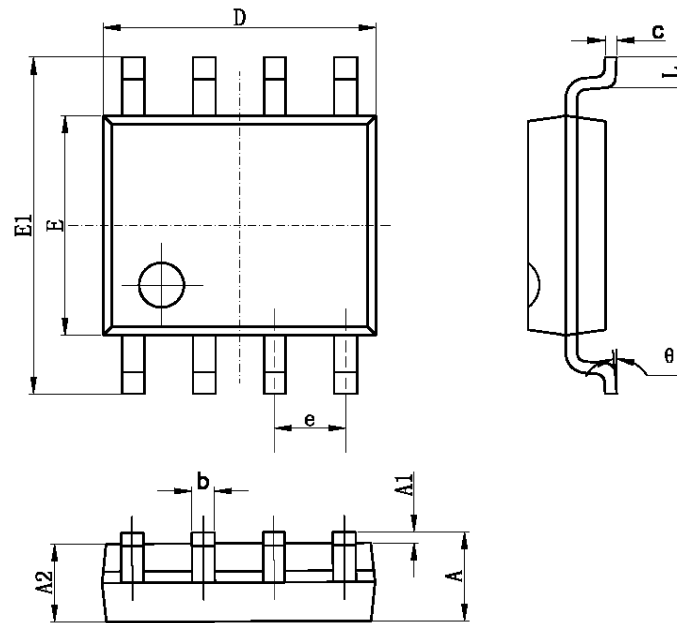
● MSOP8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.650(BSC)		0.026(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

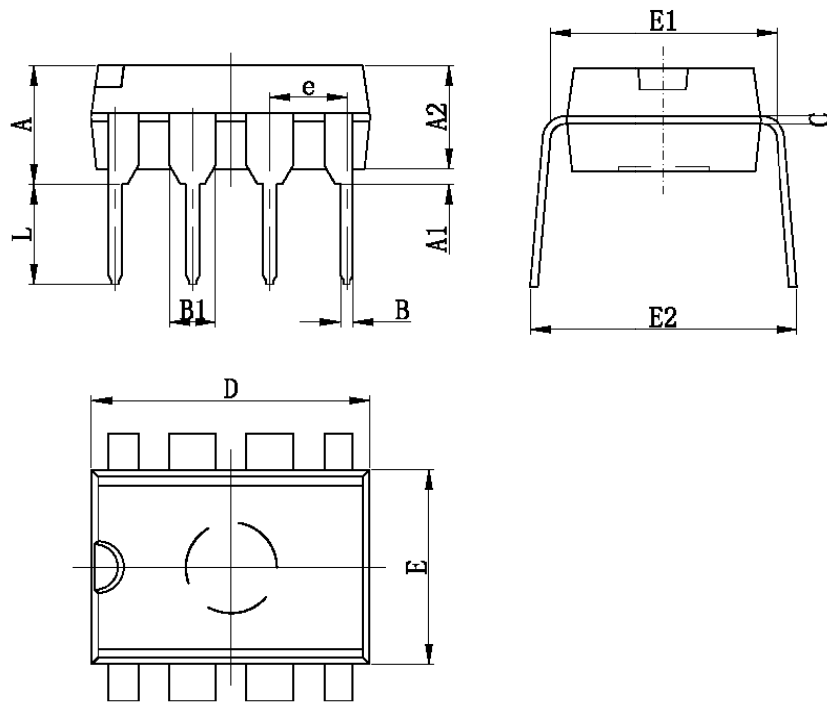


● SOP8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

● DIP8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524 (BSC)		0.060 (BSC)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

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