

**1W Fully Differential Audio Power Amplifier
 with Internal Feedback Resistors**

CE0030

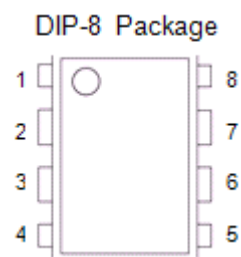
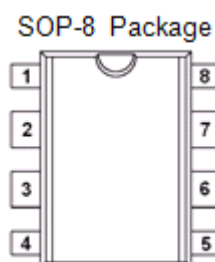
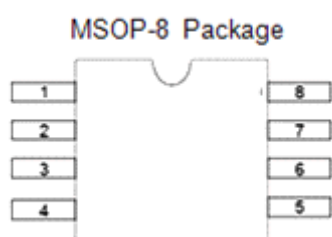
■ **INTRODUCTION**

The CE0030 is a fully differential audio power amplifier designed for portable communication device applications. It is capable of delivering 1 watt of continuous average power to an 8Ω BTL load with less than 1% distortion (THD+N) from 5V battery voltage. It operates from 2.2 to 6.8V. Features like 83dB PSRR at 217Hz, improved RF-rectification immunity, the space-saving 8-pin MSOP8 and SOP8 package, the advanced pop & click circuitry, a minimal count of external components and low-power shutdown mode make CE0030 ideal for wireless handsets. The CE0030 is unity-gain stable, and the gain can be configured by external input resistors and internal feedback resistors.

■ **APPLICATIONS**

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

■ **PIN DIAGRAM**



■ **FEATURES**

- Fully differential amplifier
- Improved PSRR at 217Hz ($V_{DD}>3.0V$) 83dB (Typ.)
- Power output at 5.0V & 1% THD 1W (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 & DICE

■ **ORDER INFORMATION**

CE0030①

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

■ PIN CONFIGURATION

MSOP8	SOP8	DIP8	SYMBOL	TYPE	FUNCTION
1	1	1	SPN	O	Negative output.
2	2	2	SPP	O	Positive output.
3	3	3	V _{SS}	I	Ground.
4	4	4	INN	I	Negative input.
5	5	5	ACIN	I	Positive input.
6	6	6	VREF	O	Common-mode voltage, connect a Bypass capacitor to Ground.
7	7	7	CE	I	Chip Enable Logical Control, "High" is active.
8	8	8	V _{DD}	O	Power Supply.

■ BLOCK DIAGRAM AND TYPICAL APPLICATION

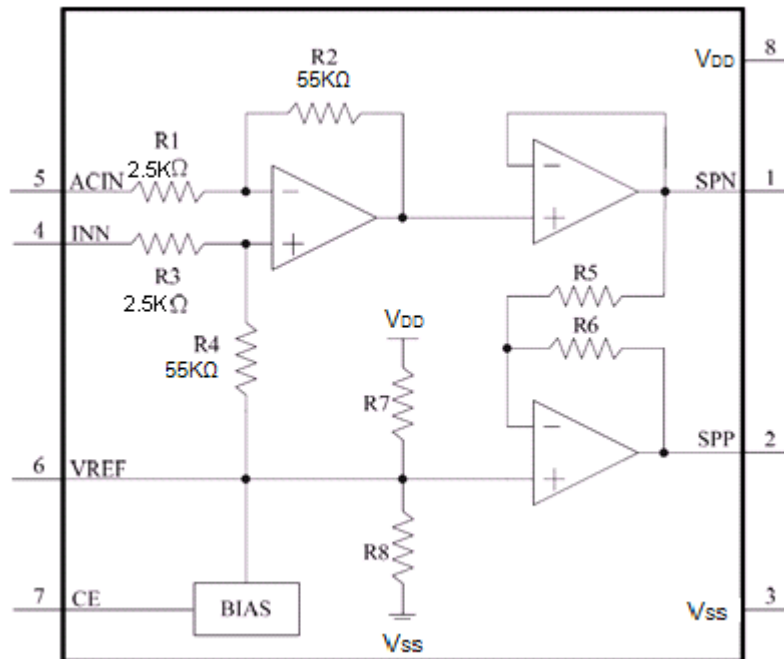


Fig1 BLOCK DIAGRAM

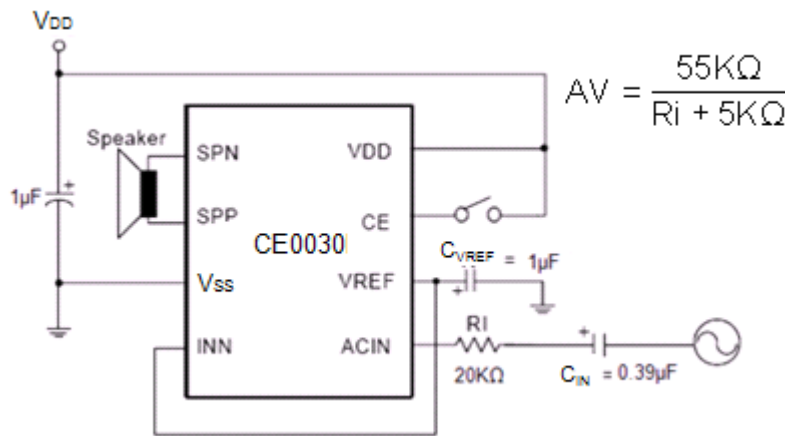


Fig2 SINGLE END APPLICATION

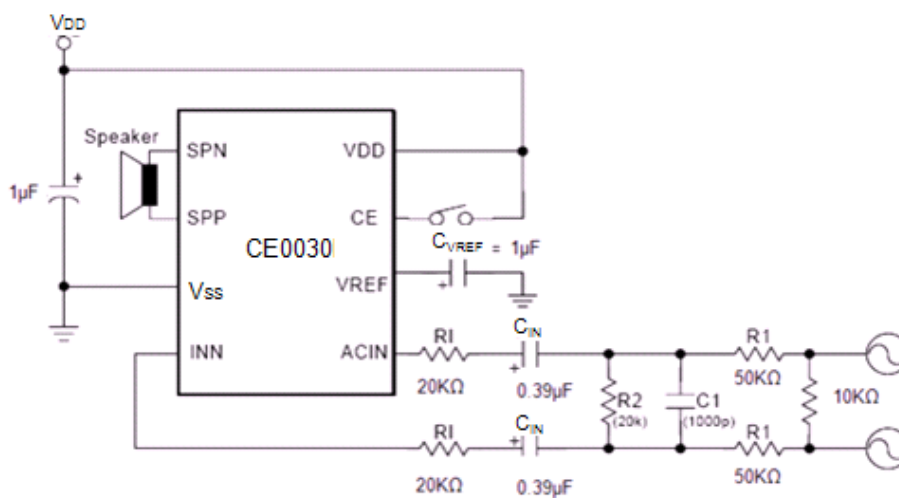


Fig3 DOUBLE END APPLICATION (With Input Filter Circuit)

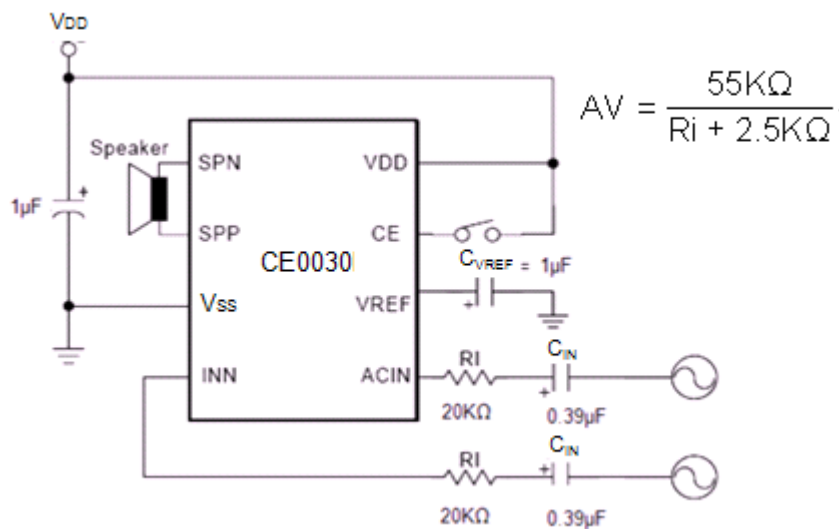


Fig4 DOUBLE END APPLICATION (Without Input Filter Circuit)

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

■ ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, $T_a=25^{\circ}\text{C}$)

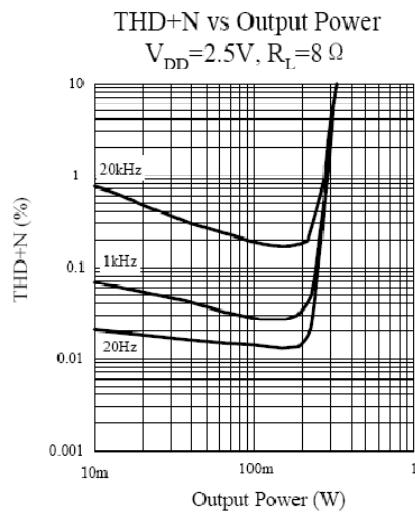
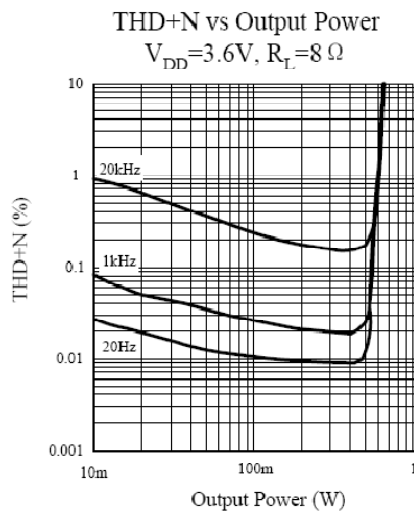
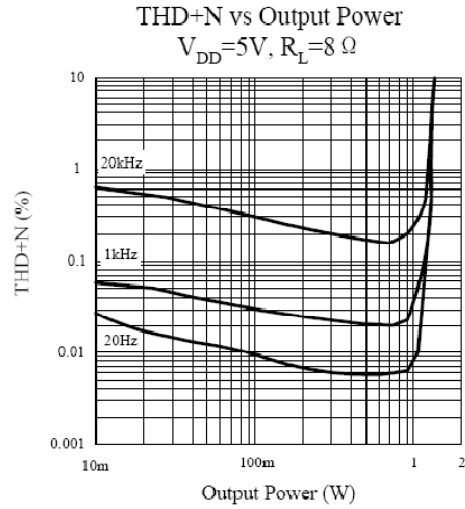
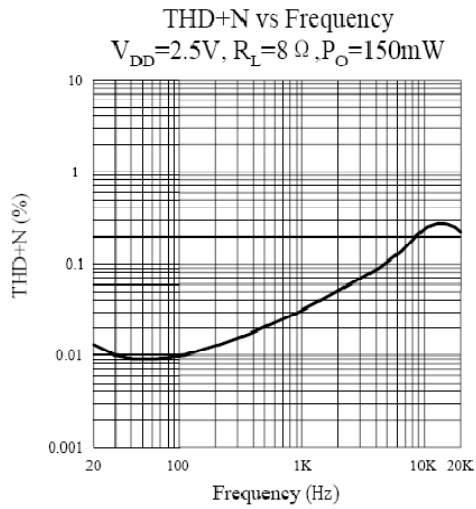
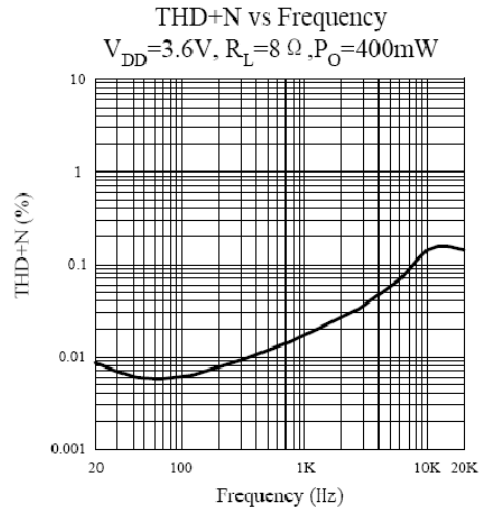
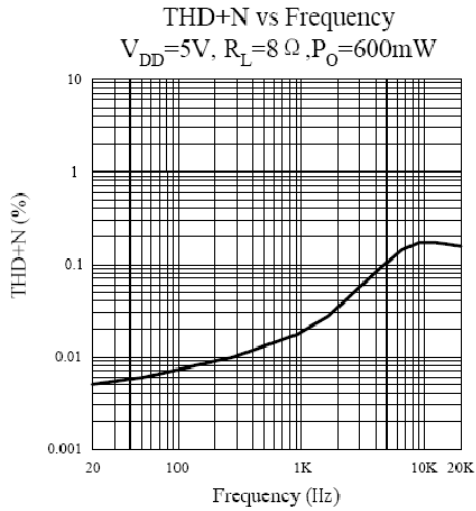
PARAMETER	SYMBOL	RATINGS	UNITS
V_{DD} pin voltage	V_{DD}	$V_{SS}-0.3 \sim V_{SS}+8$	V
Power dissipation	MSOP8	PD	500
	SOP8	PD	300
	DIP8	PD	500
Operating temperature	T_{opr}	$-40 \sim +85$	$^{\circ}\text{C}$
Storage temperature	T_{stg}	$-40 \sim +125$	$^{\circ}\text{C}$
Soldering Temperature & Time	T_{solder}	$260^{\circ}\text{C}, 10\text{s}$	

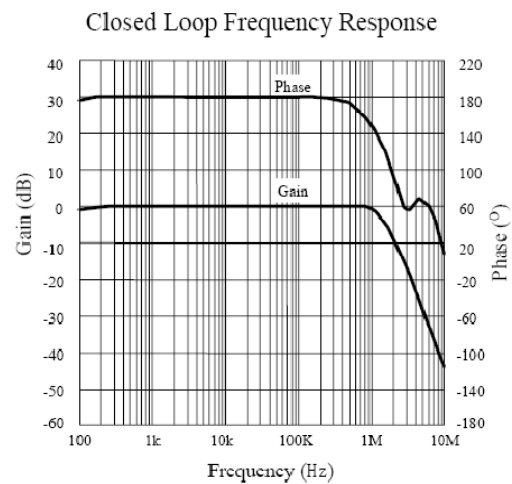
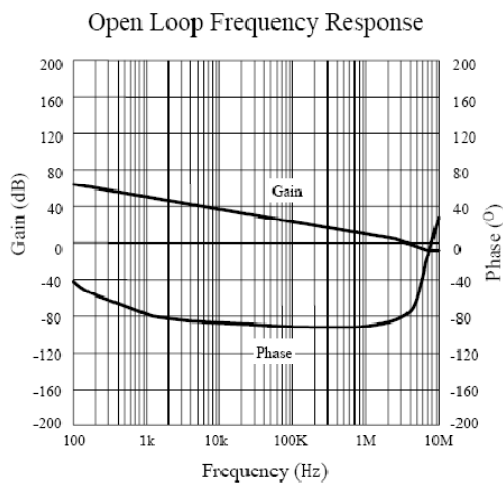
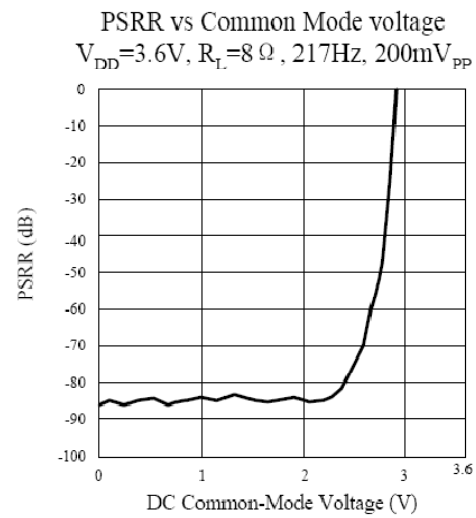
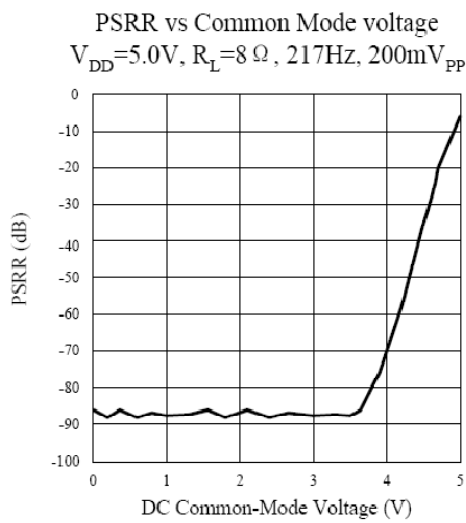
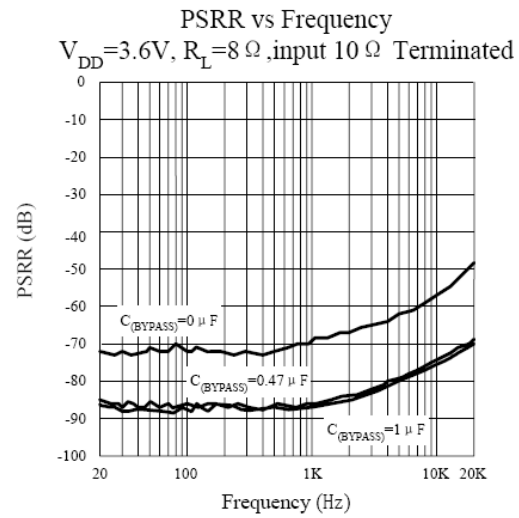
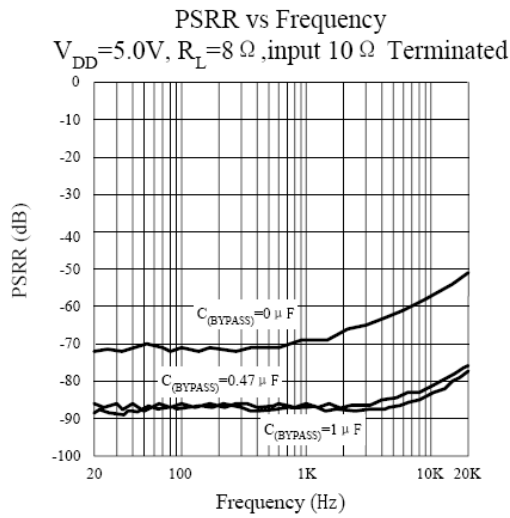
■ ELECTRICAL CHARACTERISTICS

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

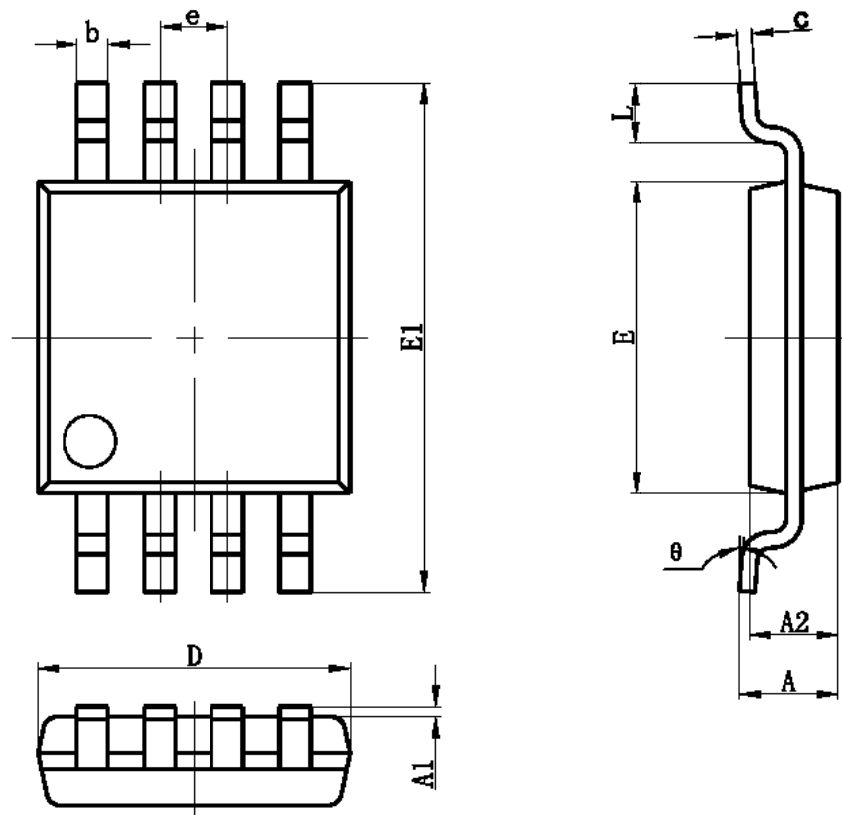
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operation Voltage	V_{DD}		2.2		6.8	V
Current consumption	I_{DD}	$V_{DD}=5V, V_{CE}=V_{DD}$, No Load		2.5		mA
		$V_{DD}=5V, V_{CE}=V_{DD}$, $R_L=8\Omega$		4		mA
Current consumption during shutdown	I_{SHDN}	Shutdown= V_{SS}		0.1	1.0	μA
Output Power	P_O	THD=1% (max) ; $f=1KHz$		1		W
Total Harmonic Distortion Noise	THD+N	$P_o=0.6W_{rms}$; $f=1KHz$		0.1		%
Power Supply Rejection Ratio	PSRR	$V_{ripple}=200mV$ sine P-P				
		$f=217Hz$		-83		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		$\frac{50K\Omega}{R_i + 2.5K\Omega}$	$\frac{55K\Omega}{R_i + 2.5K\Omega}$	$\frac{60K\Omega}{R_i + 2.5K\Omega}$	V/V
Enable Time	T_{ON}	$V_{DD}=5V, C_{IN}=0.39\mu F$, $C_{VREF}=0.33\mu F$		50		ms
		$V_{DD}=3V, C_{IN}=0.39\mu F$, $C_{VREF}=0.33\mu F$		35		ms

■ TYPICAL PERFORMANCE CHARACTERISTICS



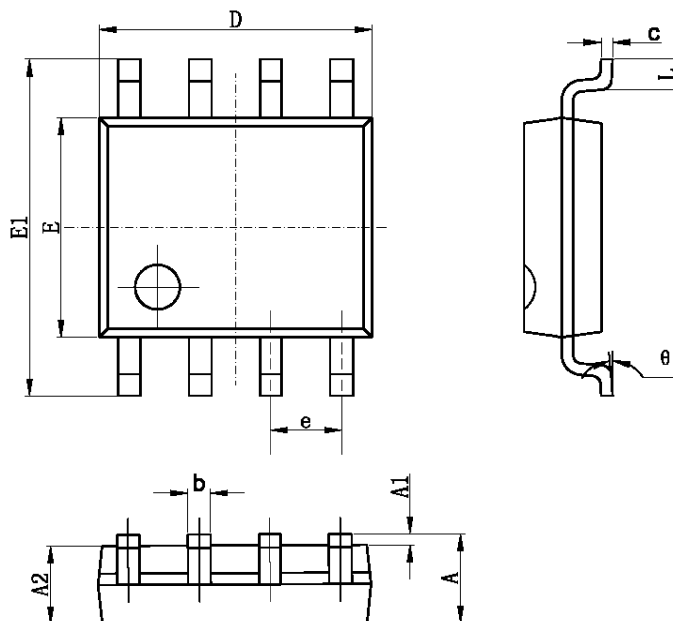


- PACKAGING INFORMATION
- MSOP8 PACKAGE OUTLINE DIMENSIONS



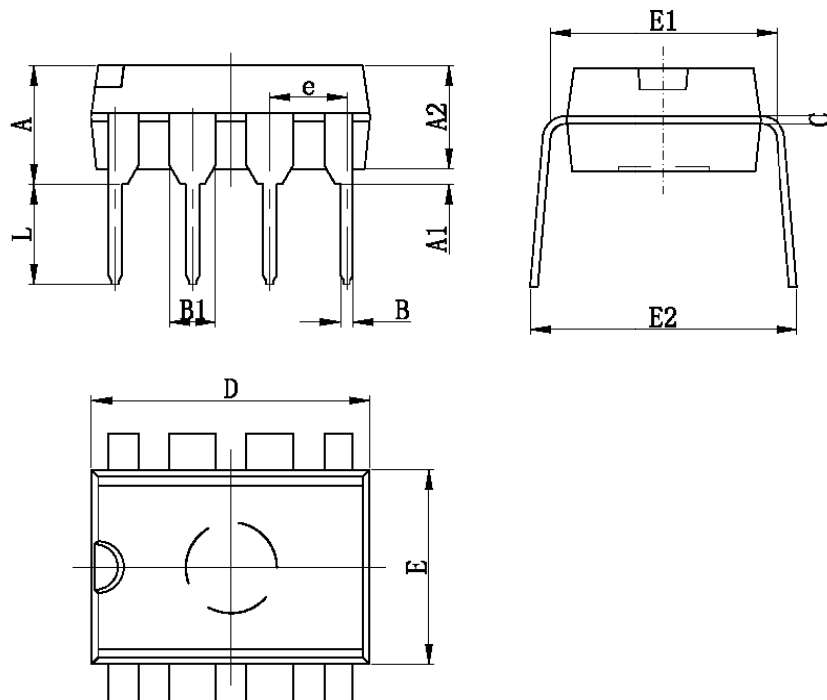
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.650(BSC)		0.026(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187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

● SOP8 PACKAGE OUTLINE DIMENSIONS



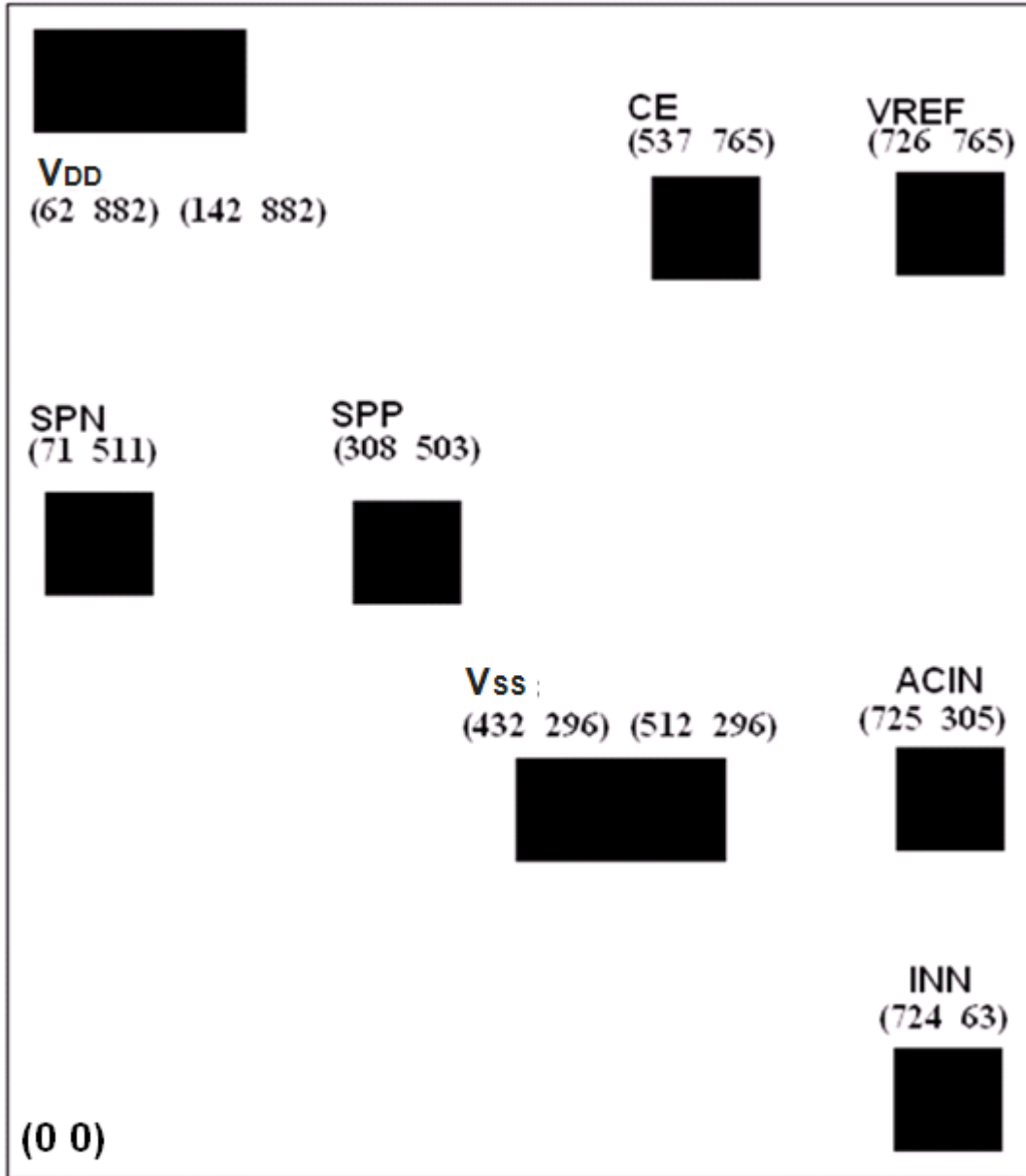
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050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

■ PAD ASSIGNMENT



This IC substrate should be connected to V_{SS}

© Nanjing Chipower Electronics Inc.

Chipower cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Chipower product. No circuit patent license, copyrights or other intellectual property rights are implied. Chipower reserves the right to make changes to their products or specifications without notice. Customers are advised to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete.