

BCT8890H

2.2W BTL Output Class AB Audio Power Amplifier

GENERAL DESCRIPTION

The BCT8890H audio power amplifier is ideal for portable audio devices with internal speakers. A bridge-tied load (BTL) architecture minimizes external component count, while providing high-quality audio reproduction. The device is available as adjustable gain amplifier, reducing component count.

A low-power enable mode disables the bias generator and amplifiers, reducing quiescent current consumption to less than 1uA. This device feature Broadchip's industry-leading, comprehensive click-and-pop suppression that reduces audible clicks and pops during startup and enable.

The BCT8890H is available in 8-pin MSOP8 /DFN3x3-8L/DFN2x2-8L package. This device operates over the -40°C to +85°C extended temperature range.



FEATURES

- 2.5V to 5.5V Single-Supply Operation
- PO at 10% THD+N, f=1KHz, V_{DD}=5V
RL=8 Ω 1.5W(Typ.)
RL=4 Ω 2.2W(Typ.)
- Less than 1uA Low-Power Enable Mode
- 64dB PSRR at 1KHz
- Temperature Range: -40°C to 85°C
- No Audible Clicks or Pops at Power-Up/Down
- Available in MSOP8/DFN3x3-8L/DFN2x2-8L package

APPLICATIONS

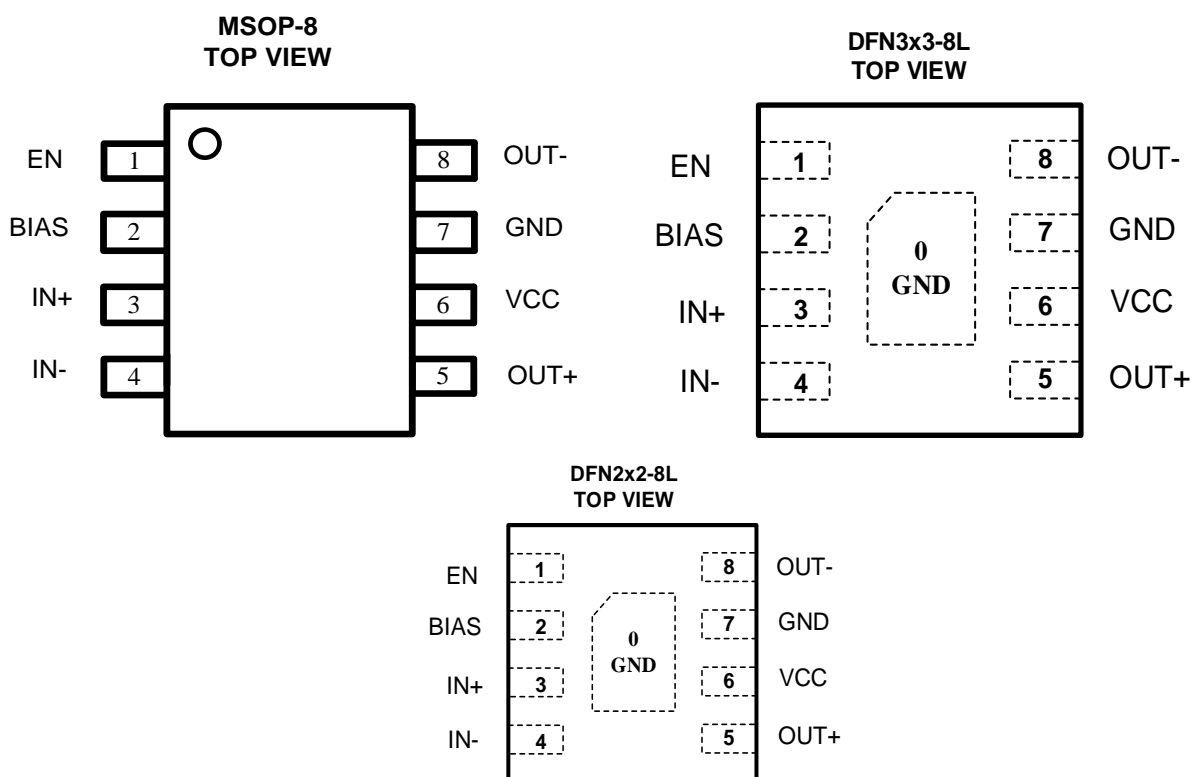
- PDAs
- Portable Instrumentation

ORDERING INFORMATION

| Order Number | Package Type | Temperature Range | Marking | QTY/Reel |
|----------------|--------------|-------------------|---|----------|
| BCT8890HEMA-TR | MSOP8 | -40°C to +85°C |  8890H XXXXX | 4000 |
| BCT8890HEGA-TR | DFN3x3-8L | -40°C to +85°C |  8890H XXXXX | 3000 |
| BCT8890HELA-TR | DFN2x2-8L | -40°C to +85°C | 8890H XXXXX | 3000 |

Note: "XXXXX" in Marking will be appeared as the batch code.

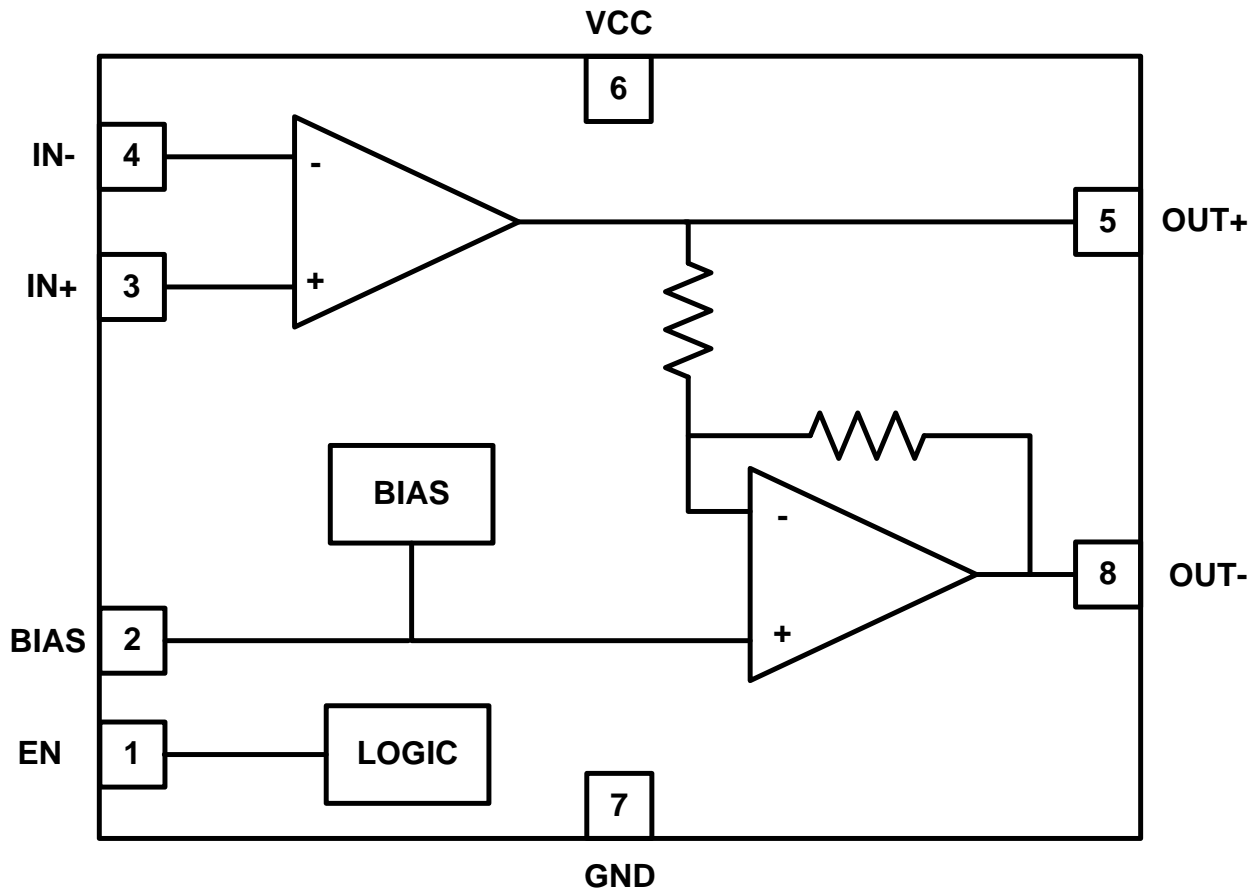
PIN CONFIGURATION (TOP VIEW)



PIN DESCRIPTION

| Pin | Name | Function |
|-----|------|--|
| 1 | EN | Enable Input, Active-High |
| 2 | BIAS | DC Bias Bypass Capacitor Connection, Bypass BIAS to ground with a 1uF capacitor. |
| 3 | IN+ | Noninverting Input |
| 4 | IN- | Inverting Input |
| 5 | OUT+ | Bridge Amplifier Positive Output |
| 6 | VCC | Power Supply, Bypass Vcc with a 1uF capacitor to ground. |
| 7 | GND | Ground |
| 8 | OUT- | Bridge Amplifier Negative Output. |

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| | |
|--|------------------------|
| Supply Voltage (VCC to GND) | 6V |
| All Other Pins | - 0.3V to (VCC + 0.3V) |
| Continuous Power Dissipation (TA = +25°C): | |
| MSOP8(derate 215°C/W) | 0.58W |
| DFN3x3-8L (derate 95°C/W) | 1.32W |
| DFN2x2-8L (derate 140°C/W) | 0.82W |
| Operating Temperature Range | -40°C to +85°C |
| Junction Temperature | +150°C |
| Storage Temperature Range | -65°C to +150°C |
| Lead Temperature (soldering, 10s) | +260°C |
| ESD Susceptibility (HBM) | 2KV |

Note 1:

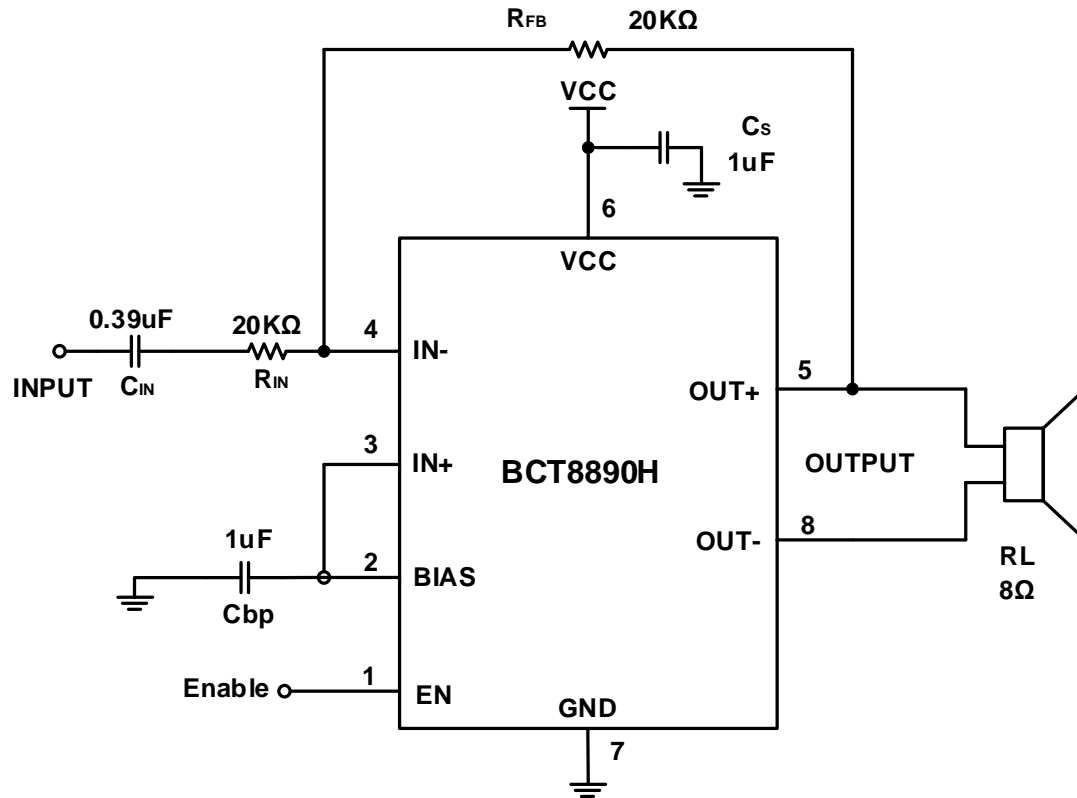
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

(V_{CC}=5V, GND=0, EN=V_{CC}, T_A=+25°C, C_{BIAS}=1uF, R_{IN}=R_{FB}=20KΩ, IN+=BIAS, R_L>=4Ω)

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|-----------------|-----------------------------------|---|---------|-----|-----|-------|
| I _{CC} | Supply Current | No input signal, no load EN=V _{CC} | | 2.5 | 6 | mA |
| I _{EN} | Enable Mode Current | No input signal, R _L =8ohms, EN=GND | | | 1 | uA |
| V _{OO} | Output Offset Voltage | No input signal, R _L =8ohms | | | ±10 | mV |
| P _O | Output Power | THD=1%, f=1KHz, R _L =8Ω | | 1.1 | | W |
| | | THD=10%, f=1KHz, R _L =8Ω | | 1.5 | | |
| | | THD=1%, f=1KHz, R _L =4Ω | | 1.8 | | W |
| | | THD=10%, f=1KHz, R _L =4Ω | | 2.2 | | |
| THD+N | Total Harmonic Distortion + Noise | P _O =1.0 W Av=2, 20Hz<F<20kHz, R _L =8Ω | | 0.1 | 0.2 | % |
| PSRR | Power Supply Rejection Ratio | R _L =8Ω, Av=2, V _{ripple} = 200mVpp, Input Grounded | f=217Hz | 55 | 62 | dB |
| | | | f=1kHz | 55 | 64 | |
| T _{WU} | Wake-Up Time | C _{BIAS} =1uF | | 100 | | ms |
| T _{EN} | Enable time | | | 0.2 | | us |
| V _{IH} | EN High Input Voltage | | 1.3 | | | V |
| V _{IL} | EN Low Input Voltage | | | | 0.4 | V |

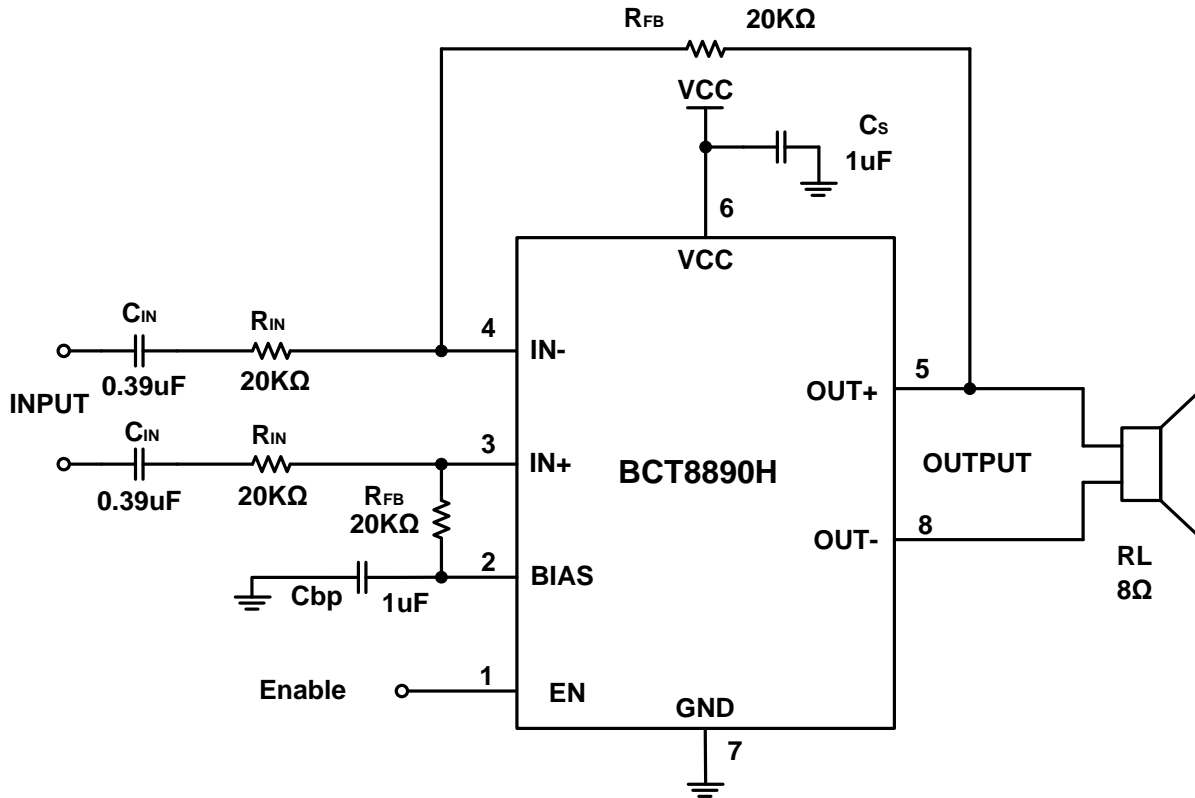
TYPICAL APPLICATION CIRCUIT



Note1: Gain $A_v = 2 R_{FB}/R_{IN}$

Note2: High Pass Frequency $f = 1 / (2\pi C_{IN} R_{IN})$

TYPICAL APPLICATION CIRCUIT

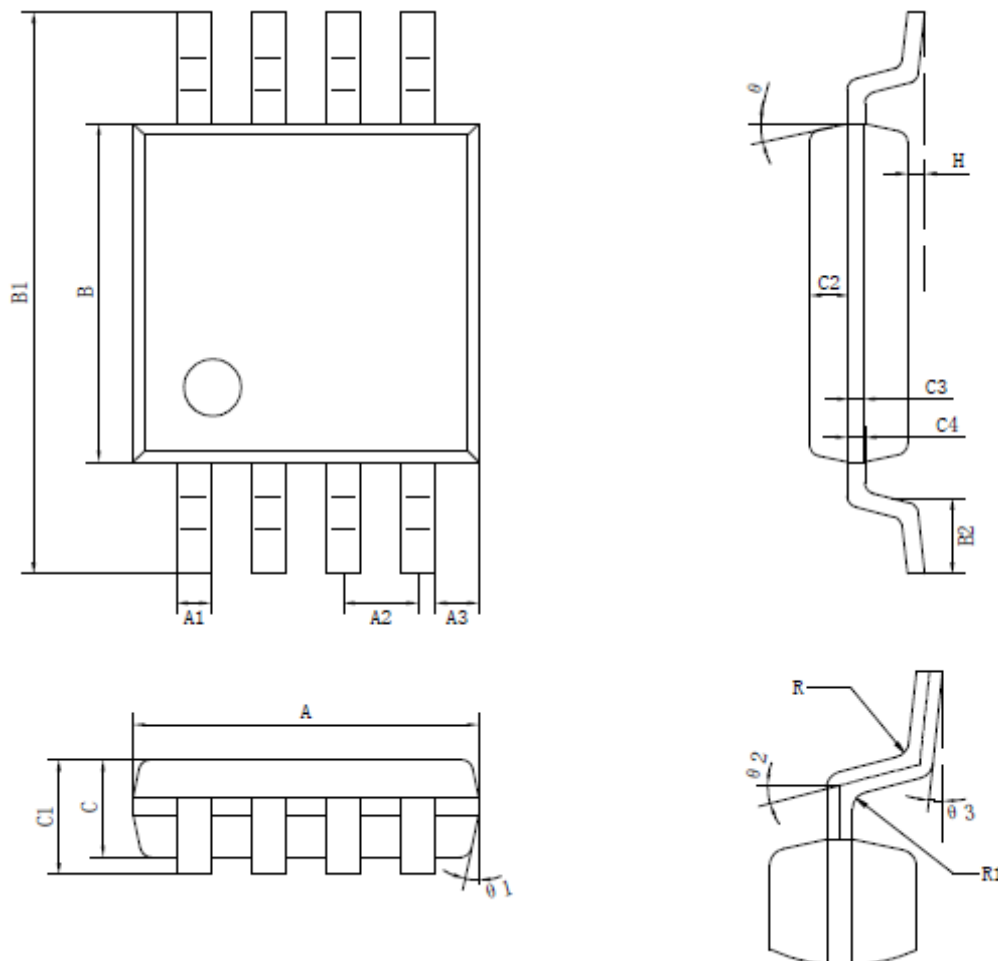


Note1: Gain $A_v = 2 R_{FB}/R_{IN}$

Note2: High Pass Frequency $f = 1 / (2\pi C_{IN} R_{IN})$

PACKAGE OUTLINE DIMENSIONS

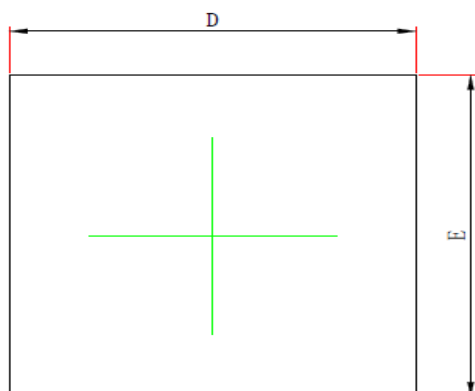
MSOP8



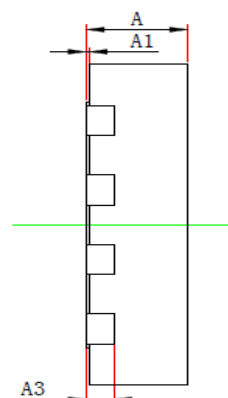
| Symbol | Min | Max | Symbol | Min | Max |
|--------|-----------|------|------------|-----------|------|
| A | 2.90 | 3.10 | C3 | 0.152 Typ | |
| A1 | 0.28 | 0.35 | C4 | 0.15 | 0.23 |
| A2 | 0.65 Typ | | H | 0.00 | 0.09 |
| A3 | 0.375 Typ | | θ | 12 ° Typ | |
| B | 2.90 | 3.10 | $\theta 1$ | 12 ° Typ | |
| B1 | 4.70 | 5.10 | $\theta 2$ | 14 ° Typ | |
| B2 | 0.45 | 0.75 | $\theta 3$ | 0° | 6° |
| C | 0.75 | 0.95 | R | 0.15 Typ | |
| C1 | 0.75 | 1.10 | R1 | 0.15 Typ | |
| C2 | 0.328 Typ | | | | |

MSOP8 Surface Mount Package

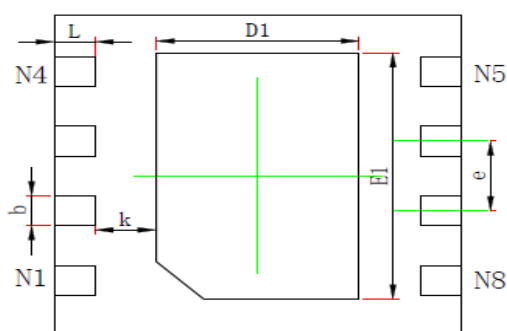
DFN3x3-8L



TOP VIEW



SIDE VIEW

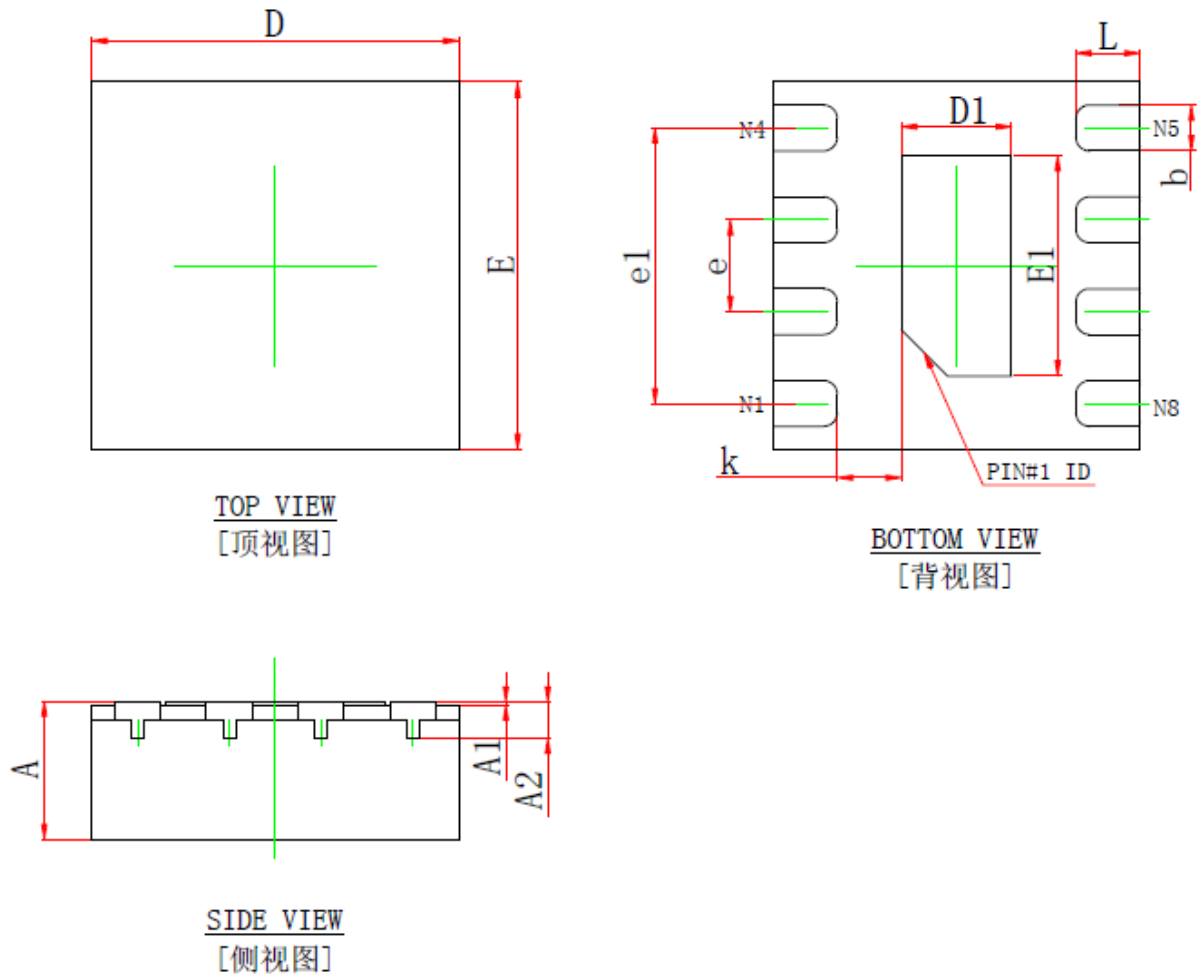


BOTTOM VIEW

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A3 | 0.203REF. | | 0.008REF. | |
| D | 2.950 | 3.050 | 0.116 | 0.120 |
| E | 2.950 | 3.050 | 0.116 | 0.120 |
| D1 | 1.450 | 1.550 | 0.057 | 0.061 |
| E1 | 2.250 | 2.350 | 0.089 | 0.093 |
| b | 0.230 | 0.330 | 0.009 | 0.013 |
| k | 0.450REF. | | 0.018REF. | |
| e | 0.650BSC. | | 0.026BSC. | |
| L | 0.250 | 0.350 | 0.010 | 0.014 |

DFN3x3-8L Surface Mount Package

DFN2x2-8L



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A2 | 0.203REF. | | 0.008REF. | |
| D | 1.924 | 2.076 | 0.076 | 0.082 |
| E | 1.924 | 2.076 | 0.076 | 0.082 |
| D1 | 0.550 | 0.650 | 0.022 | 0.026 |
| E1 | 1.150 | 1.250 | 0.045 | 0.049 |
| b | 0.200 | 0.300 | 0.008 | 0.012 |
| e | 0.500BSC. | | 0.020BSC. | |
| e1 | 1.450 | 1.550 | 0.057 | 0.061 |
| k | 0.300 | 0.400 | 0.012 | 0.016 |
| L | 0.300 | 0.400 | 0.012 | 0.016 |

DFN2x2-8L Surface Mount Package