# ACE8212B

**Common Drain N-Channel Enhancement Mode Field Effect Transistor with ESD**

## Description

The ACE8212B uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. They offer operation over a wide gate drive range from 1.8V to 12V. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

## Features

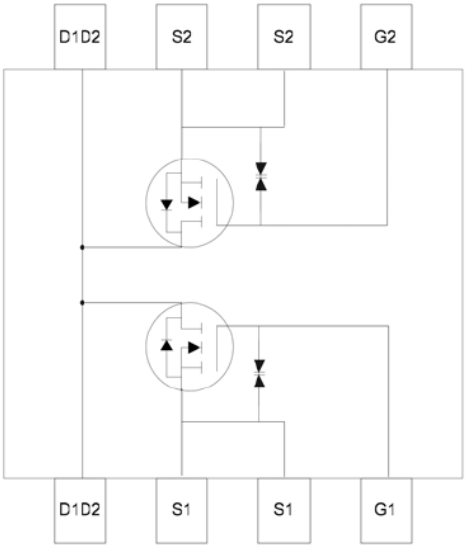
- $V_{DS}$(V)=20V
- $I_D$=8A ($V_{GS}$=10V)
- TSSOP-8
  $R_{DS(ON)}$<13 mΩ ($V_{GS}$=10V)
  $R_{DS(ON)}$<14 mΩ ($V_{GS}$=4.5V)
  $R_{DS(ON)}$<19 mΩ ($V_{GS}$=2.5V)
  $R_{DS(ON)}$<27 mΩ ($V_{GS}$=1.8V)
- DFN2*5
  $R_{DS(ON)}$<13 mΩ ($V_{GS}$=10V)
  $R_{DS(ON)}$<16 mΩ ($V_{GS}$=4.5V)
  $R_{DS(ON)}$<22 mΩ ($V_{GS}$=2.5V)
  $R_{DS(ON)}$<35 mΩ ($V_{GS}$=1.8V)
- ESD Protected: 2000V

## Absolute Maximum Ratings

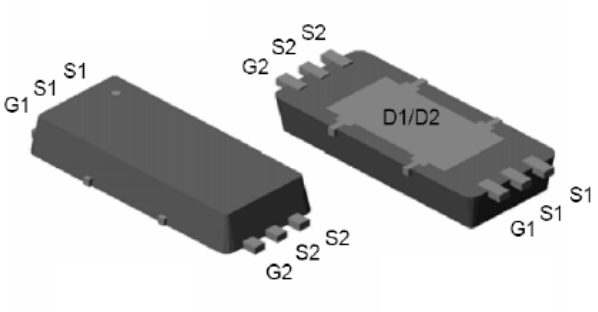
| Parameter | | | Symbol | Max | Unit |
|---|---|---|---|---|---|
| Drain-Source Voltage | | | $V_{DSS}$ | 20 | V |
| Gate-Source Voltage | | | $V_{GSS}$ | ±12 | V |
| Continuous Drain Current *AC | | $T_A$=25℃ | $I_D$ | 8 | A |
| | | $T_A$=70℃ | | 6.4 | |
| Pulsed Drain Current | | | $I_{DM}$ | 30 | A |
| Power Dissipation | TSSOP-8 | $T_A$=25℃ | $P_D$ | 1.5 | W |
| | | $T_A$=70℃ | | 1 | |
| | DFN2*5 | $T_A$=25℃ | | 1.6 | |
| | | $T_A$=70℃ | | 1 | |
| Operating Junction Temperature / Storage Temperature Range | | | $T_J/T_{STG}$ | -55/150 | °C |

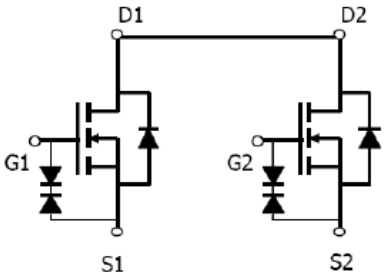
## Packaging Type

TSSOP-8




DFN2*5




## Ordering information

ACE8212B XX + H

- Halogen - free
- Pb - free
- TM : TSSOP-8
  JN : DFN2*5

## Electrical Characteristics

$T_A$=25℃, unless otherwise noted.

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=250 uA | 20 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_{DS}$=250uA | 0.5 | 0.72 | 1 | |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=±12V | | | 10 | uA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | | | 1 | uA |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 2.4 | A |
| Drain-Source On-Resistance (TSSOP-8) | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=8A | | 8.2 | 13 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=5A | | 9.2 | 14 | |
| | | $V_{GS}$=2.5V, $I_D$=4A | | 12 | 19 | |
| | | $V_{GS}$=1.8V, $I_D$=3A | | 18 | 27 | |
| Drain-Source On-Resistance (DFN2*5) | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=8A | | 10 | 13 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=7A | | 11 | 16 | |
| | | $V_{GS}$=2.5V, $I_D$=6A | | 14 | 22 | |
| | | $V_{GS}$=1.8V, $I_D$=4.5A | | 21 | 35 | |
| Forward Transconductance | gfs | $V_{DS}$=10V,$I_D$=8A | | 30 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_{SD}$=1A, $V_{GS}$=0V | | 0.72 | 1.0 | V |
| Switching | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=10V, $V_{GS}$=4.5V, $I_D$=8A | | 4.65 | 6.05 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.12 | 1.46 | |
| Gate-Drain Charge | $Q_{gd}$ | | | 3.72 | 4.84 | |
| Turn-On Time | td(on) | $V_{GS}$=10V, $R_L$=10Ω, $V_{DS}$=10V, $R_{GEN}$=3Ω | | 487.6 | 975.2 | ns |
| | tr | | | 800.4 | 1600.8 | |
| Turn-Off Time | td(off) | | | 1728 | 3456 | |
| | tf | | | 6180 | 12360 | |
| Dynamic | | | | | | |
| Input Capacitance | Ciss | $V_{GS}$=0V, $V_{DS}$=10V, f=1MHz | | 36.45 | | pF |
| Output Capacitance | Coss | | | 183.88 | | |
| REVERSE Transfer Capacitance | Crss | | | 14.57 | | |

Note:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C. The value in any given application depends on the user's specific board design.
2. Repetitive rating, pulse width limited by junction temperature.
3. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

## Typical Performance Characteristics

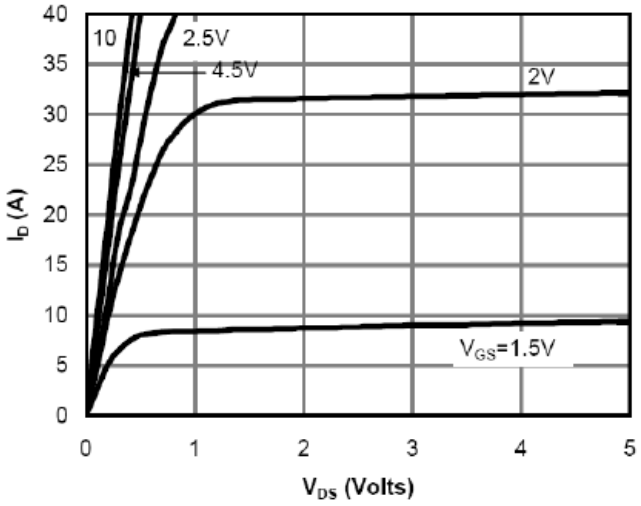



Fig 1: On-Region Characteristics

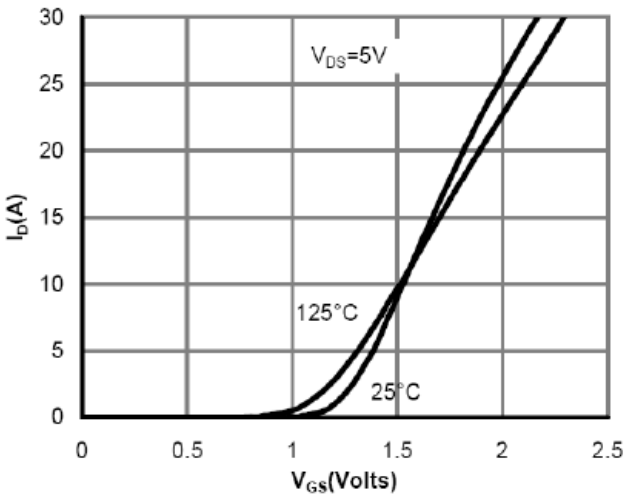



Figure 2: Transfer Characteristics

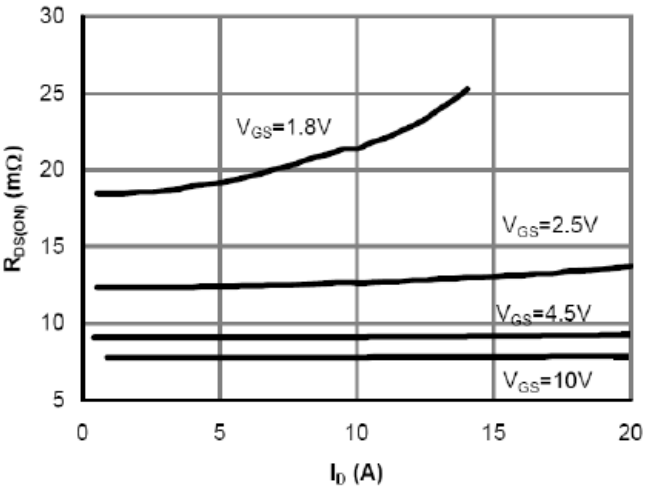



Figure 3: On-Resistance vs. Drain Current and Gate Voltage

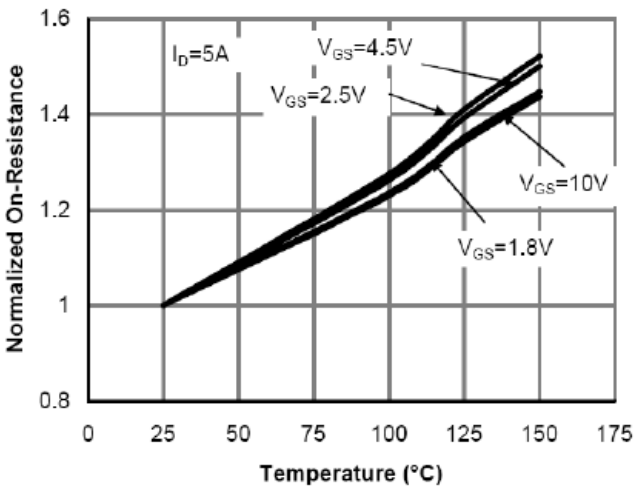



Figure 4: On-Resistance vs. Junction Temperature

## Typical Performance Characteristics

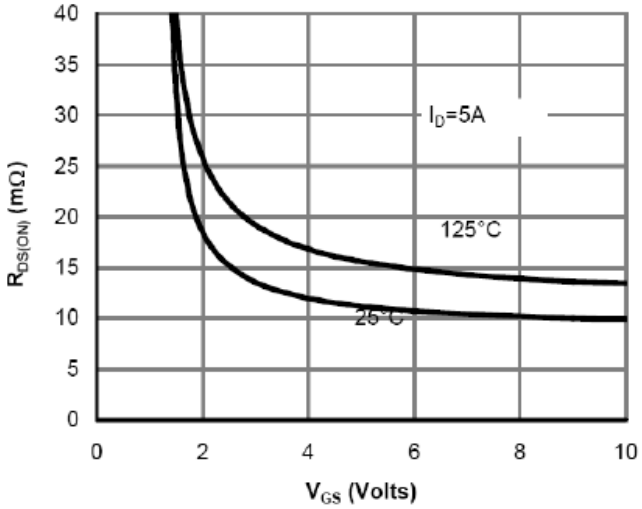



Figure 5: On-Resistance vs. Gate-Source Voltage

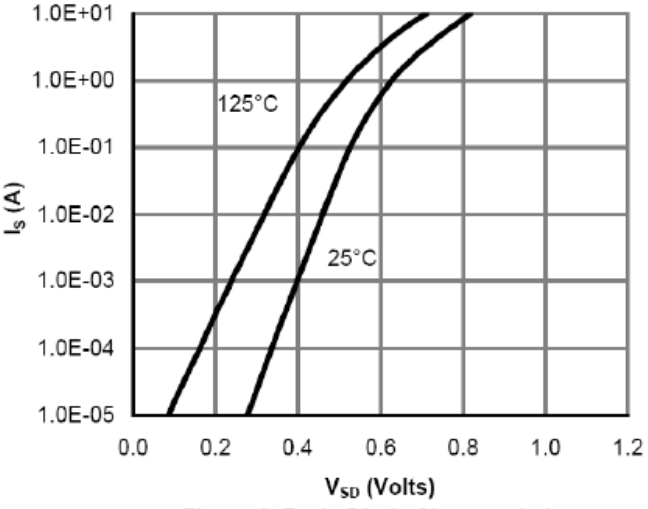



Figure 6: Body-Diode Characteristics

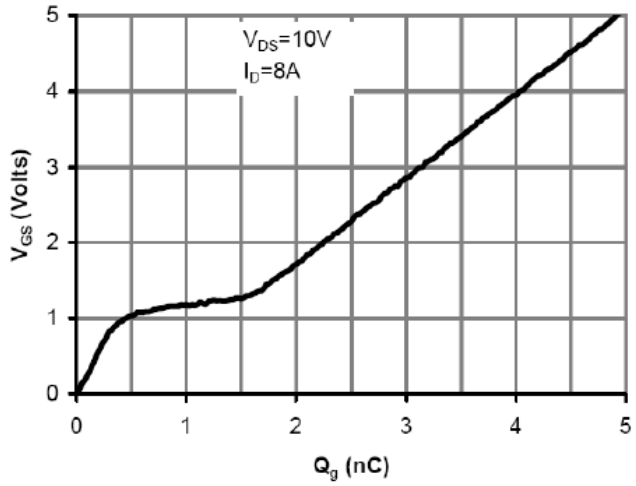



Figure 7: Gate-Charge Characteristics

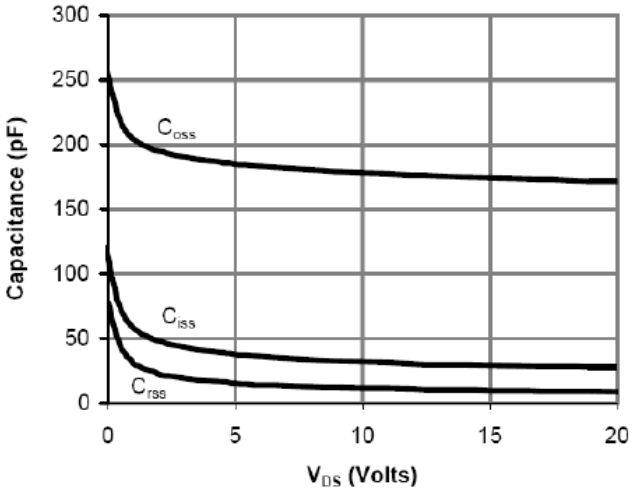



Figure 8: Capacitance Characteristics

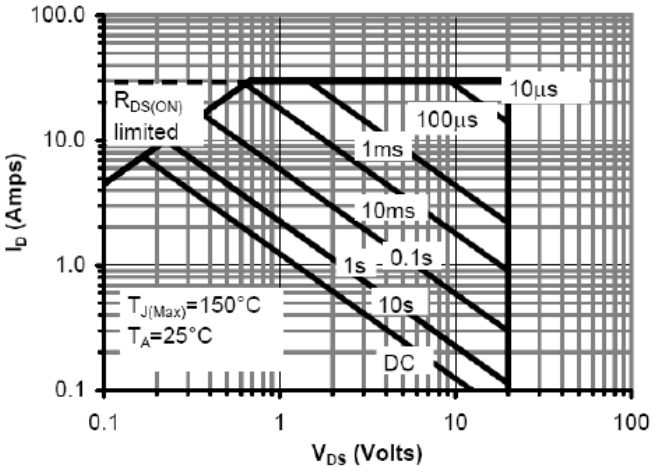



Figure 9: Maximum Forward Biased Safe Operating Area

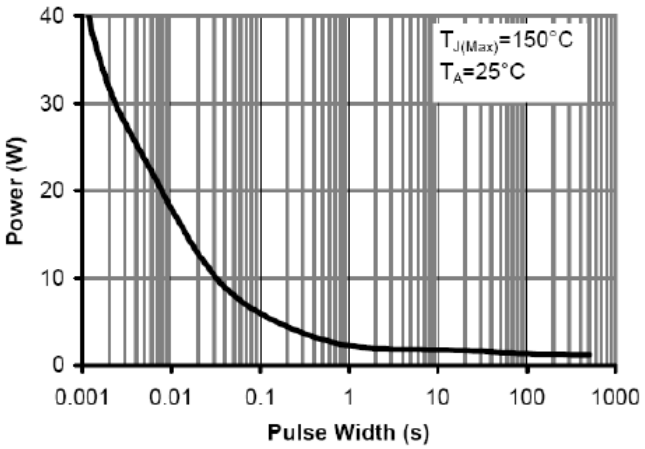



Figure 10: Single Pulse Power Rating Junction-to-Ambient

## Typical Performance Characteristics

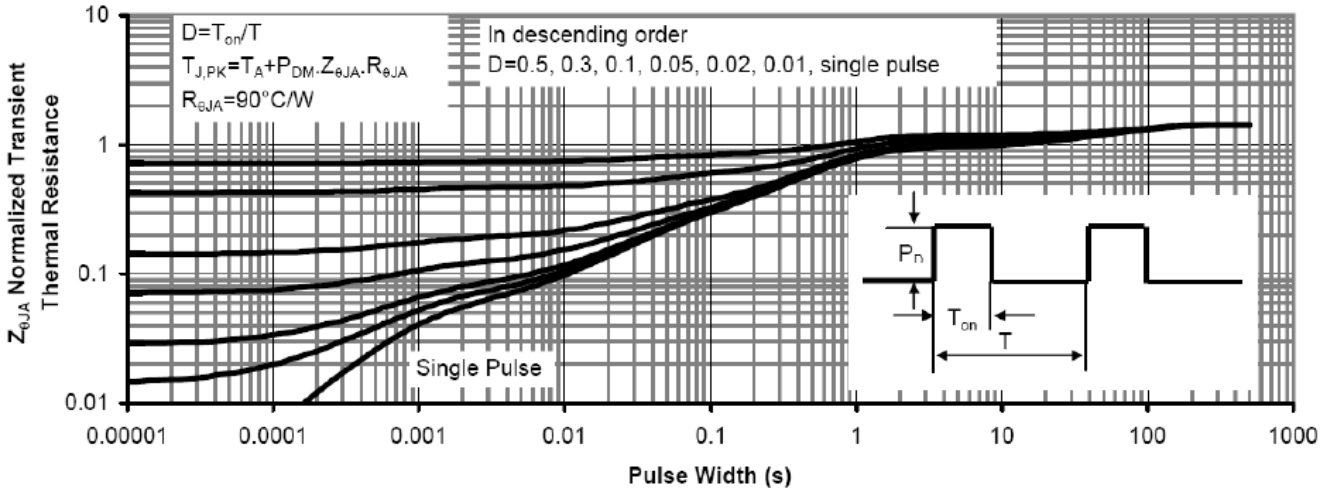
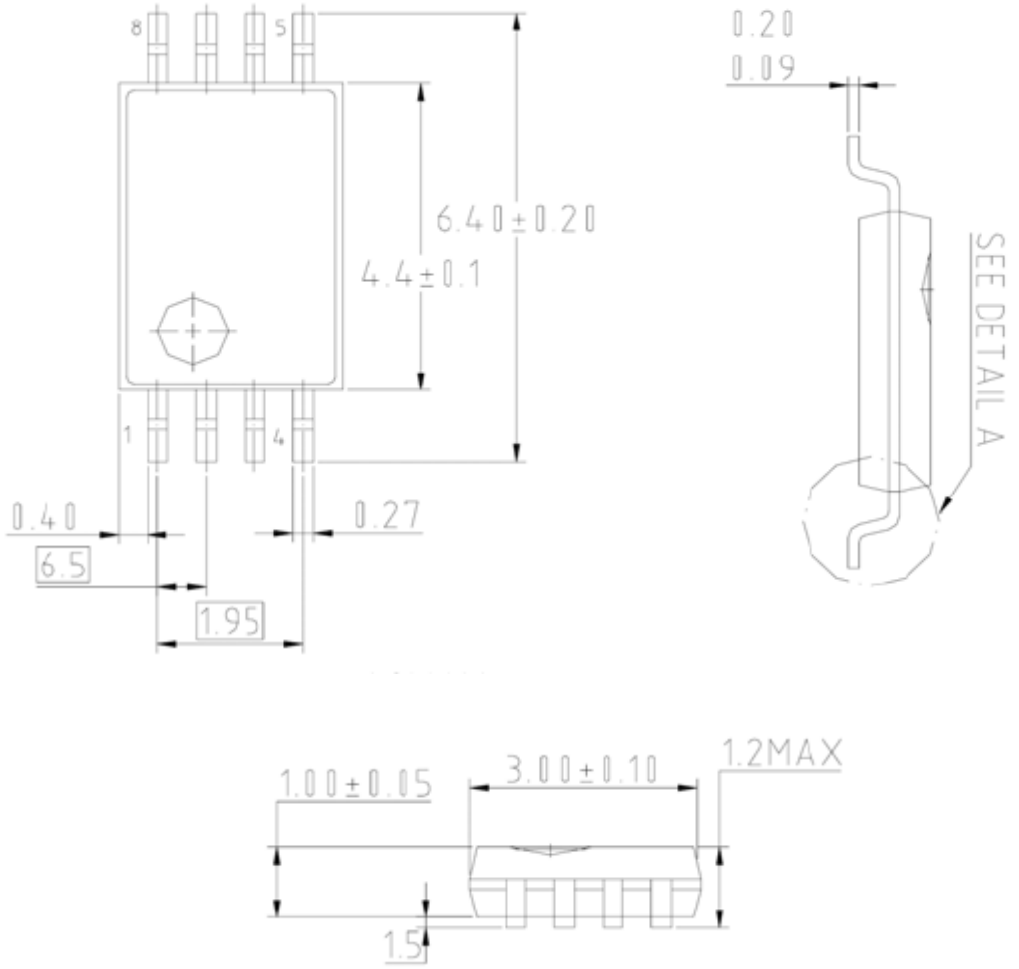



Figure 11: Normalized Maximum Transient Thermal Impedance

## Packing Information

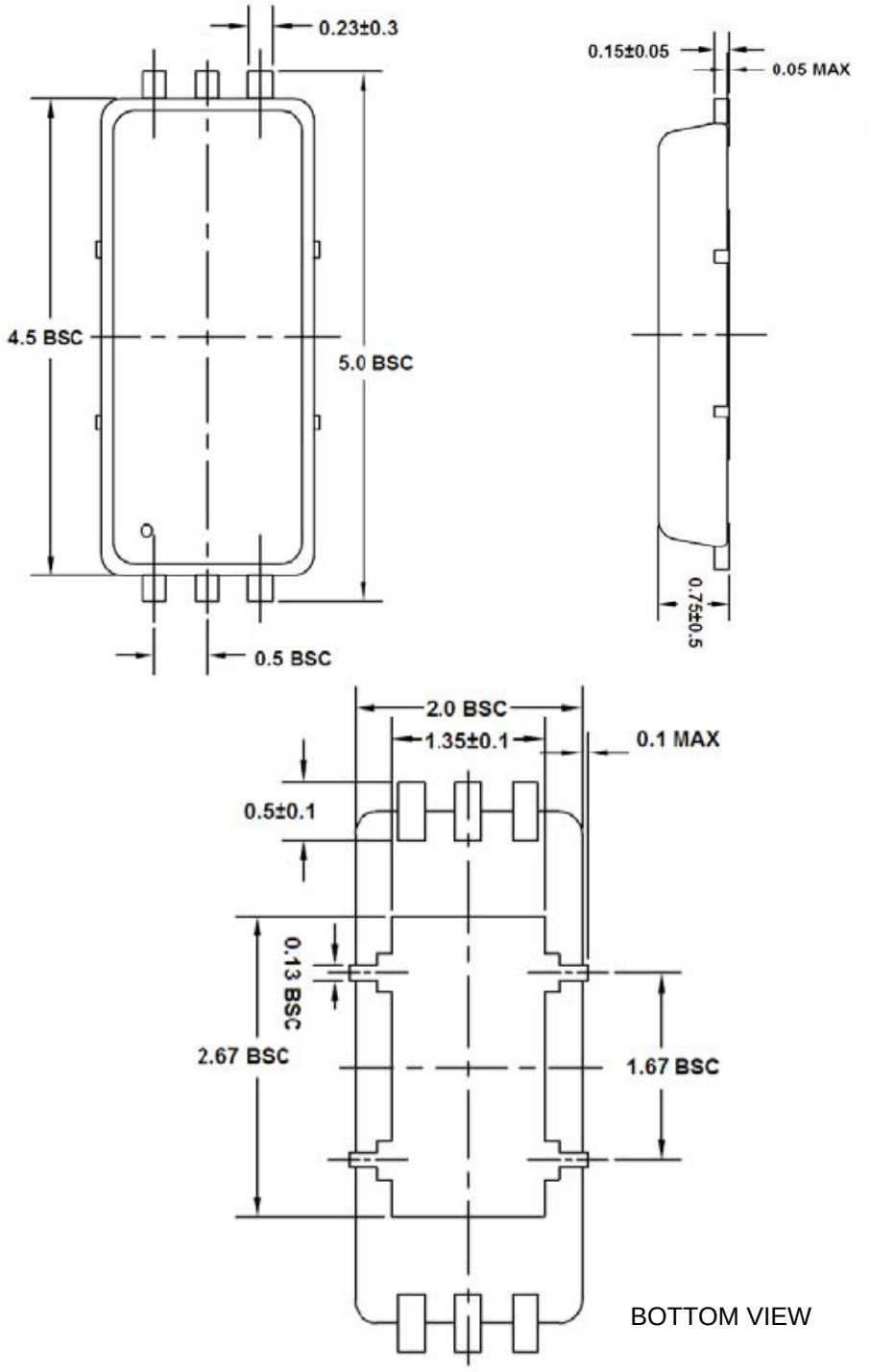
### TSSOP-8




Unit: mm

## Packing Information

### DFN2*5




Unit: mm

Notes

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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