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

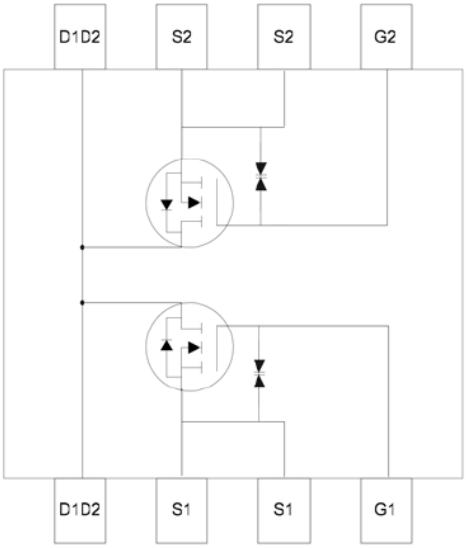
- V_{DS}(V)=20V
- I_D=8A (V_{GS}=10V)
- TSSOP-8
  $R_{DS(ON)}$<13 mΩ (V_{GS}=10V)
  $R_{DS(ON)}$<14 mΩ (V_{GS}=4.5V)
  $R_{DS(ON)}$<19 mΩ (V_{GS}=2.5V)
  $R_{DS(ON)}$<27 mΩ (V_{GS}=1.8V)
- DFN2*5
  $R_{DS(ON)}$<13 mΩ (V_{GS}=10V)
  $R_{DS(ON)}$<16 mΩ (V_{GS}=4.5V)
  $R_{DS(ON)}$<22 mΩ (V_{GS}=2.5V)
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

Absolute Maximum Ratings

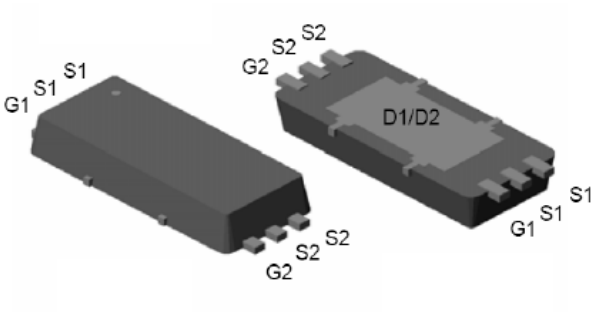
Parameter			Symbol	Max	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current *AC		T_A=25℃	I_D	8	A
		T_A=70℃		6.4	
Pulsed Drain Current			I_{DM}	30	A
Power Dissipation	TSSOP-8	T_A=25℃	P_D	1.5	W
		T_A=70℃		1	
	DFN2*5	T_A=25℃		1.6	
		T_A=70℃		1	
Operating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

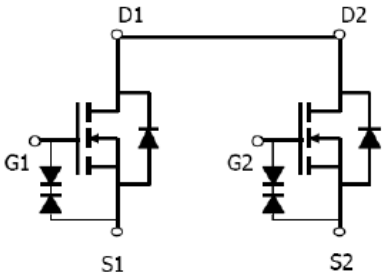
Packaging Type

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

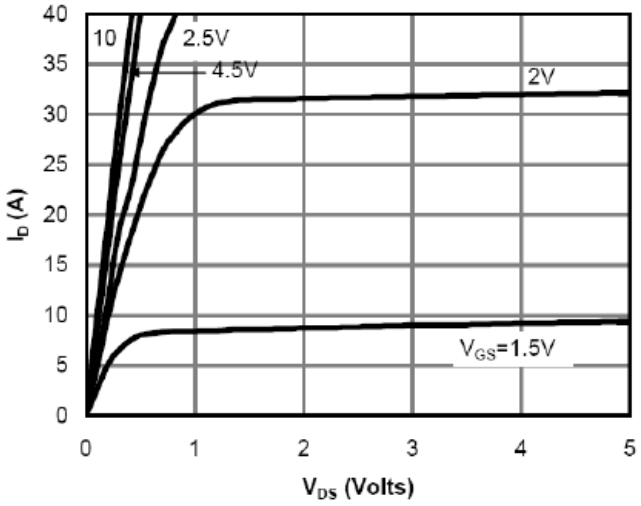


Fig 1: On-Region Characteristics

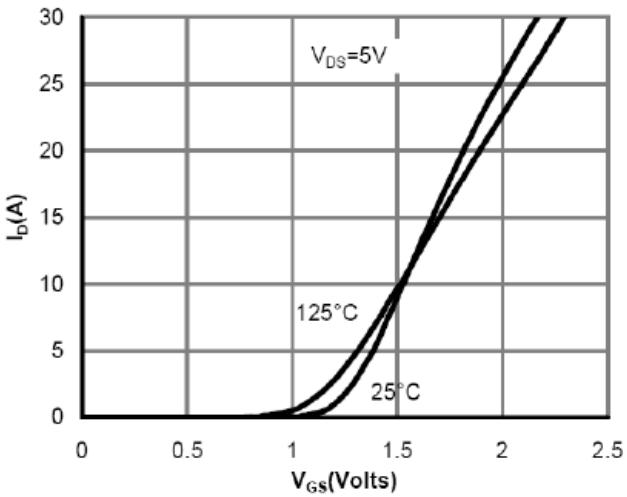


Figure 2: Transfer Characteristics

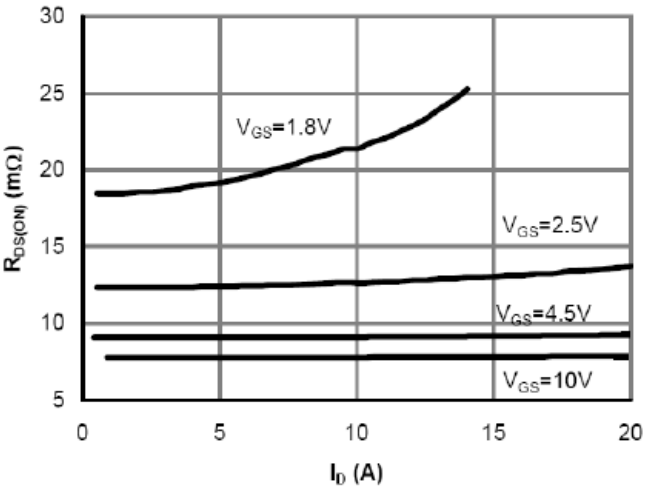


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

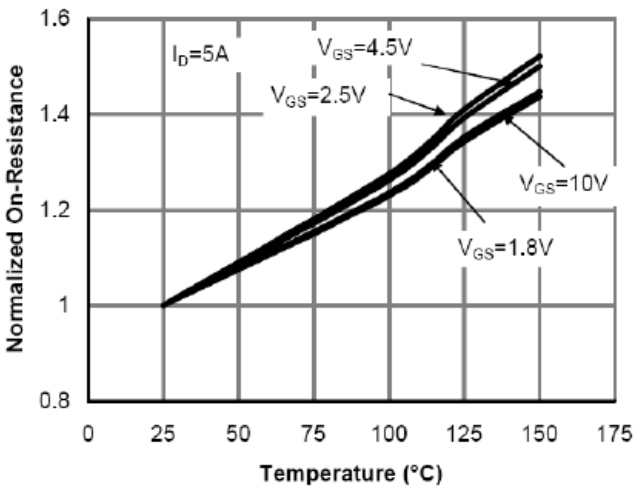


Figure 4: On-Resistance vs. Junction Temperature

Typical Performance Characteristics

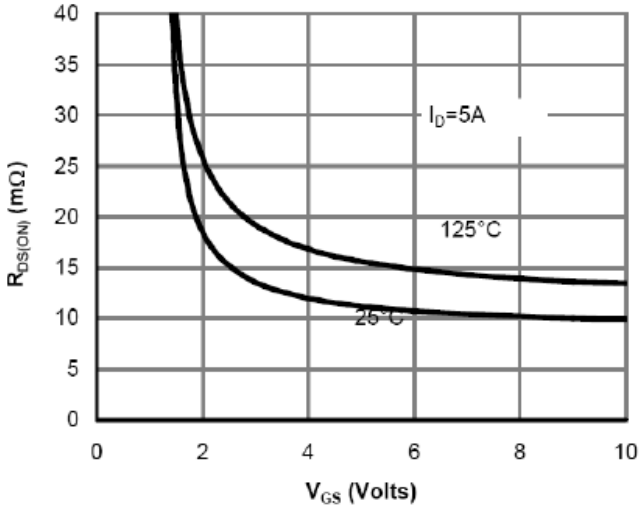


Figure 5: On-Resistance vs. Gate-Source Voltage

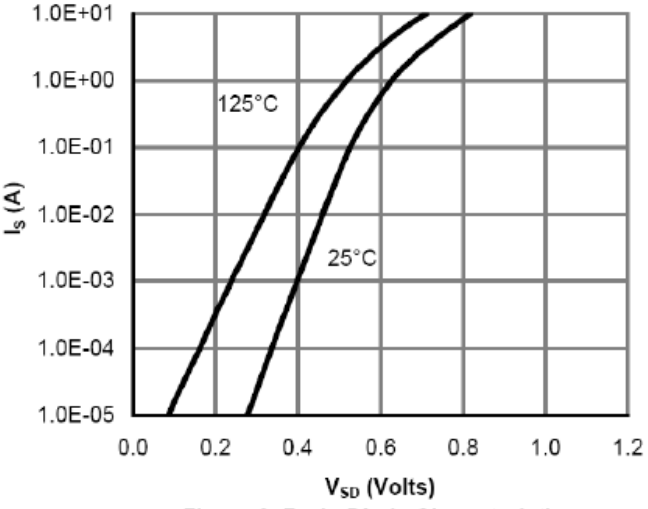


Figure 6: Body-Diode Characteristics

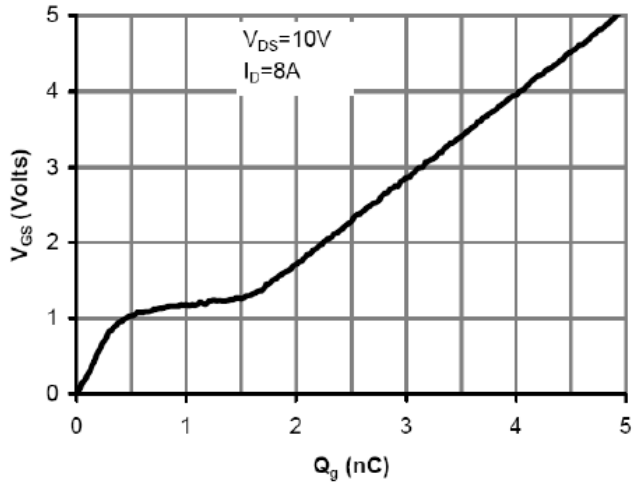


Figure 7: Gate-Charge Characteristics

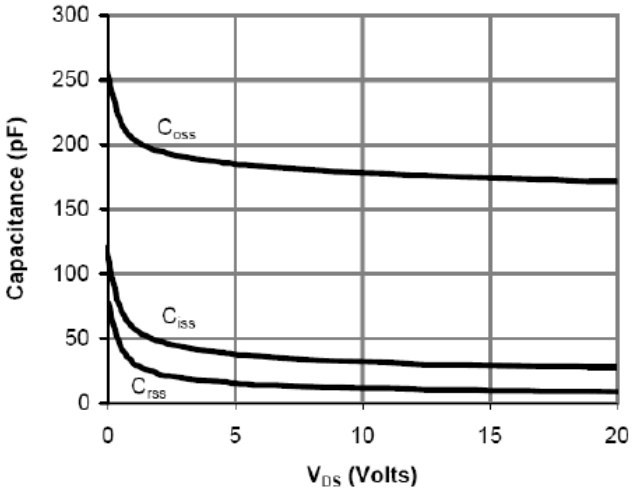


Figure 8: Capacitance Characteristics

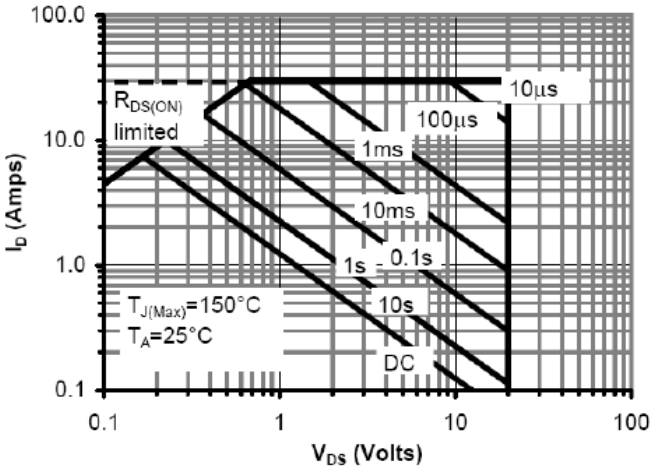


Figure 9: Maximum Forward Biased Safe Operating Area

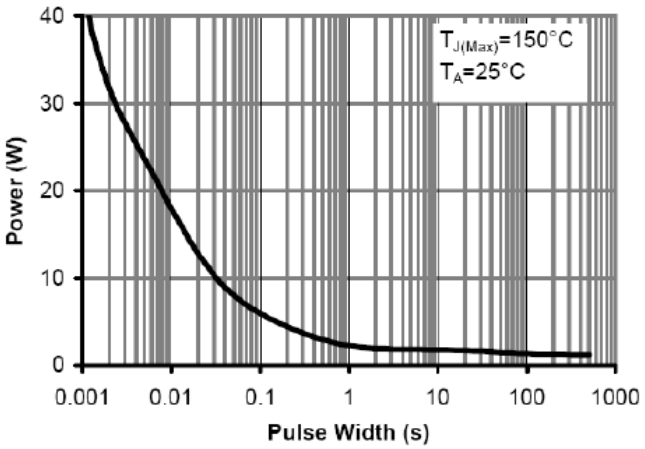


Figure 10: Single Pulse Power Rating Junction-to-Ambient

Typical Performance Characteristics

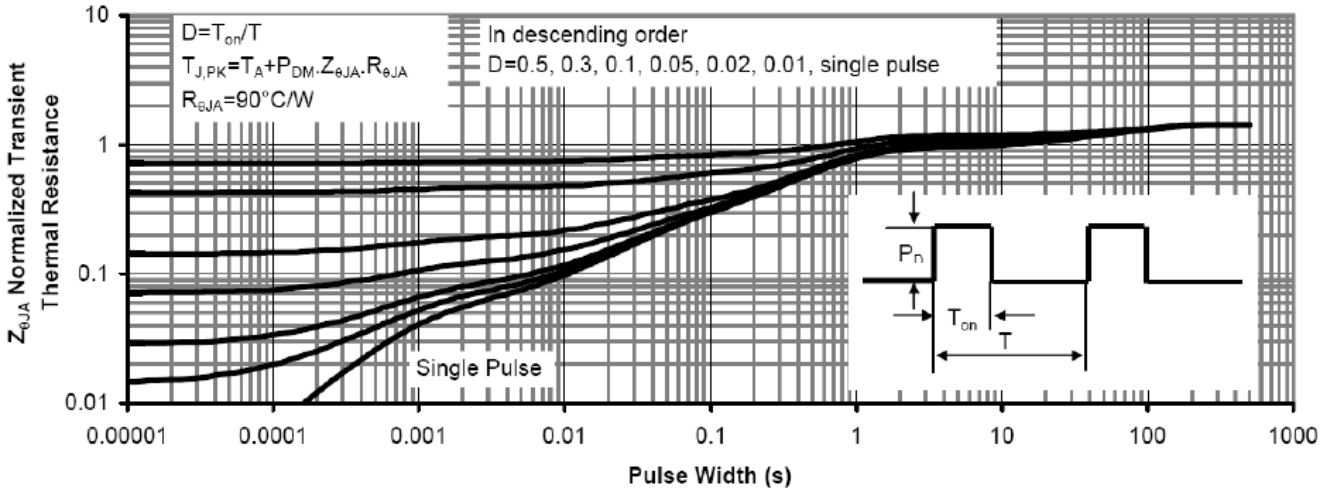
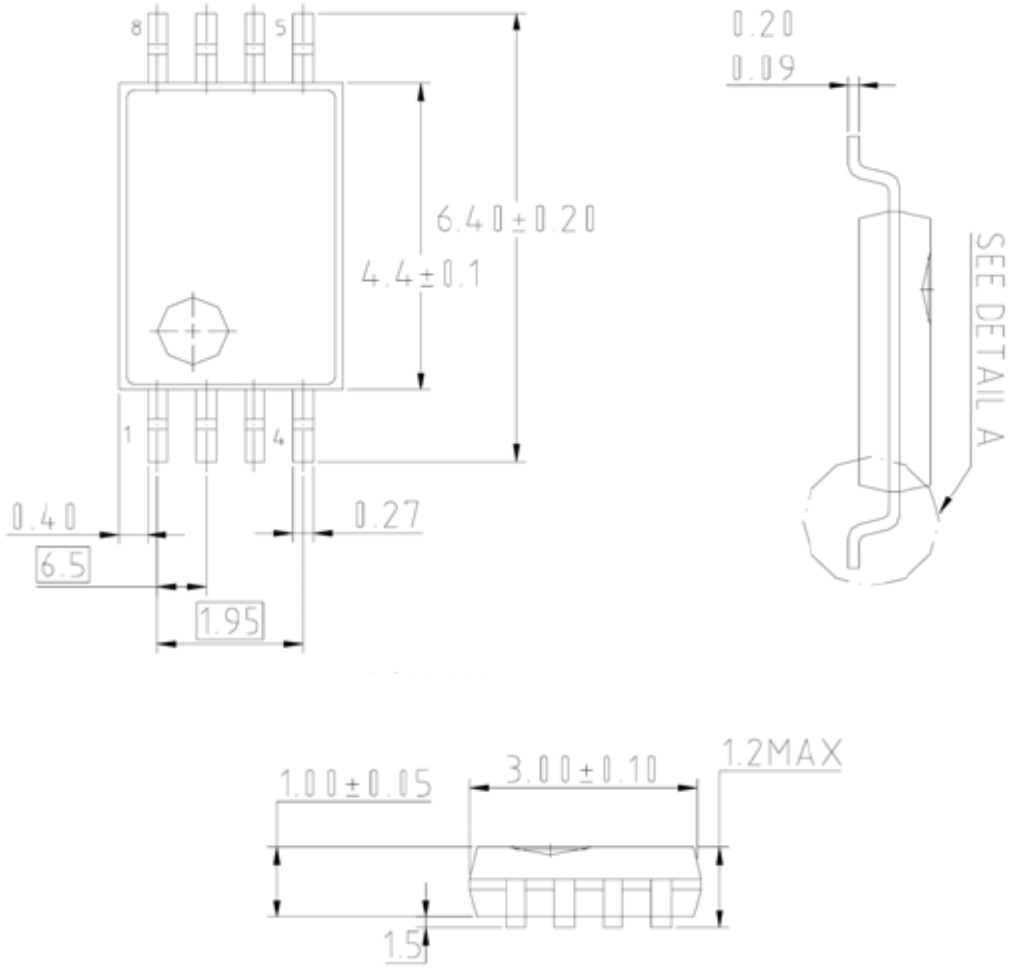


Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

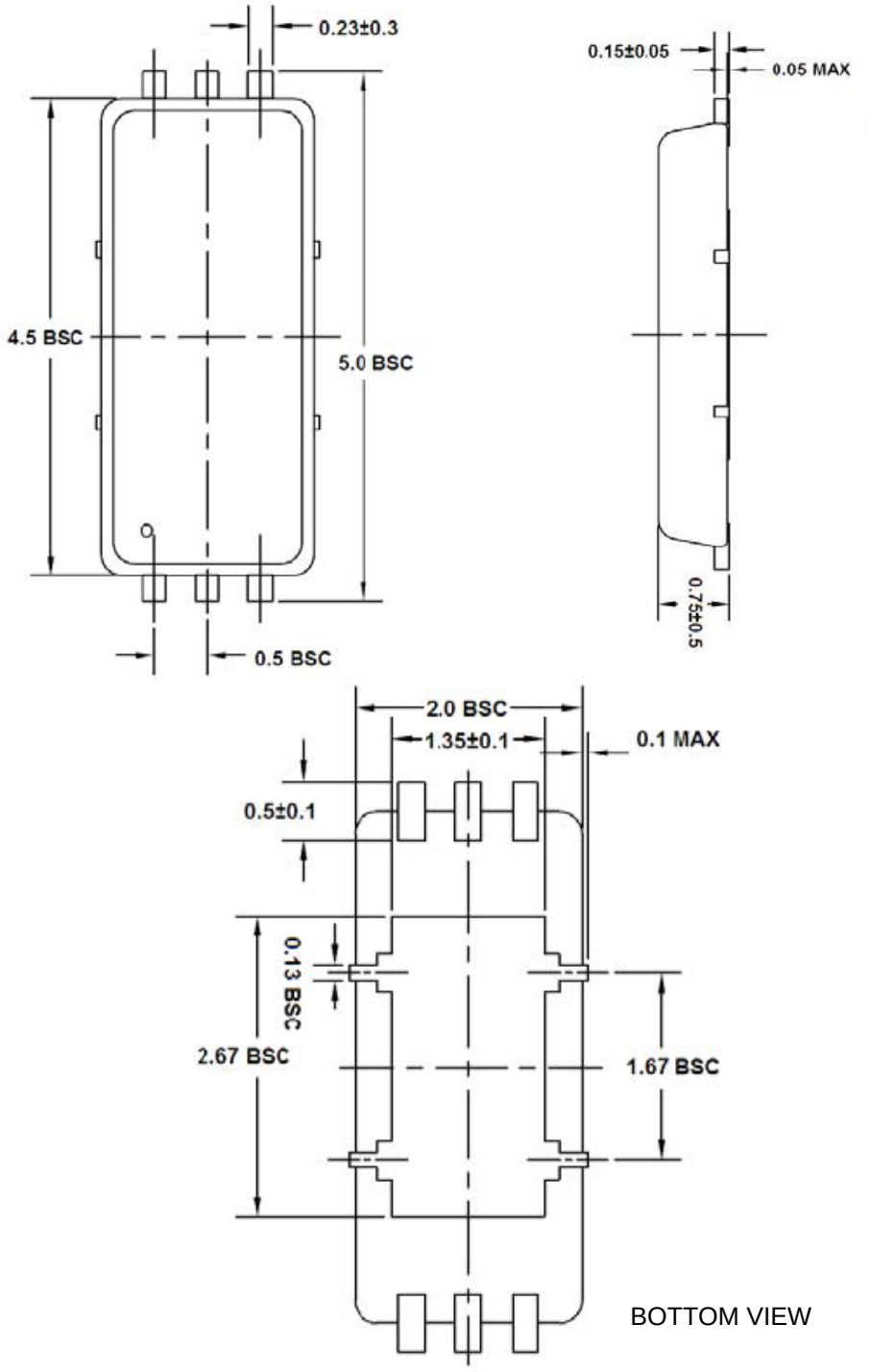
TSSOP-8



Unit: mm

Packing Information

DFN2*5



Unit: mm

Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
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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