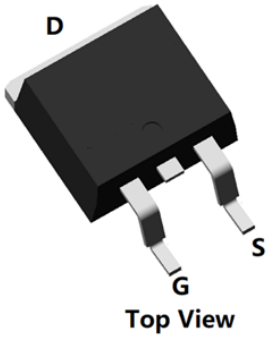
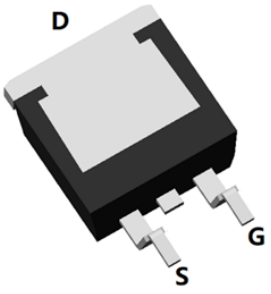
# N-Channel Enhancement Mode Field Effect Transistor

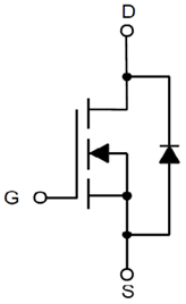



Top View




Bottom View

TO-263




## Product Summary

- $V_{DS}$ 60V
- $I_D$ 200A
- $R_{DS(ON)}$( at $V_{GS}$=10V) ＜2.9 mohm
- 100% EAS Tested
- 100% ▽$V_{DS}$ Tested

## General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- Consumer electronic power supply
- Isolated DC-DC Converters
- Motor control
- Invertors

## ■ Absolute Maximum Ratings ($T_A$=25℃unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-source Voltage | | $V_{DS}$ | 60 | V |
| Gate-source Voltage | | $V_{GS}$ | ±20 | V |
| Drain Current [A] | $T_A$=25℃ | $I_D$ | 25 | A |
| | $T_A$=100℃ | | 15 | |
| | $T_C$=25℃ | | 200 | |
| | $T_C$=100℃ | | 125 | |
| Pulsed Drain Current [B] | | $I_{DM}$ | 600 | A |
| Avalanche energy [C] | | $E_{AS}$ | 500 | mJ |
| Total Power Dissipation [D] | $T_A$=25℃ | $P_D$ | 4.4 | W |
| | $T_A$=100℃ | | 1.7 | |
| | $T_C$=25℃ | | 260 | |
| | $T_C$ =100℃ | | 104 | |
| Thermal Resistance Junction-to-Case | | $R_{\theta JC}$ | 0.48 | ℃/ W |
| Thermal Resistance Junction-to-Ambient [E] | | $R_{\theta JA}$ | 28 | |
| Junction and Storage Temperature Range | | $T_J$ ,$T_{STG}$ | -55～+150 | ℃ |

## ■ Ordering Information (Example)

| PREFERED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| B200G06B | F2 | B200G06B | 800 | / | 8000 | 13“ reel |

## ■ Electrical Characteristics ($T_J$=25℃ unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static Parameter** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$= 0V, $I_D$=250μA | 60 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60V,$V_{GS}$=0V | | | 1 | μA |
| | | $V_{DS}$=60V, $V_{GS}$=0V, Tj=150℃ | | | 100 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$= ±20V, $V_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$= $V_{GS}$, $I_D$=250μA | 2.0 | 2.8 | 4.0 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$= 10V, $I_D$=20A | | 2.3 | 2.9 | mΩ |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=20A,$V_{GS}$=0V | | | 1.2 | V |
| Gate resistance | $R_G$ | f=1MHz | - | 2.3 | - | Ω |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 200 | A |
| **Dynamic Parameters** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V,$V_{GS}$=0V,f=100KHZ | | 4165 | | pF |
| Output Capacitance | $C_{oss}$ | | | 900 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 59 | | |
| **Switching Parameters** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{GS}$=10V,$V_{DS}$=50V,$I_D$=50A | | 65 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 11.9 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 9.8 | | |
| Reverse Recovery Chrage | $Q_{rr}$ | $I_F$=25A, di/dt=100A/us | | 63 | | |
| Reverse Recovery Time | $t_{rr}$ | | | 58 | | ns |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{GS}$=10V,$V_{DD}$=30V,$I_D$=25A $R_{GEN}$=2Ω | | 22.5 | | |
| Turn-on Rise Time | $t_r$ | | | 6.7 | | |
| Turn-off Delay Time | $t_{d(off)}$ | | | 80.3 | | |
| Turn-off fall Time | $t_f$ | | | 26.9 | | |

**Note:**

A. The maximum current rating is package limited.
B. Repetitive rating; pulse width limited by max. junction temperature.
C. $V_{DD}$=50 V, $R_G$=25 Ω, L=0.5mH, starting $T_j$=25 ℃.
D. $P_D$ is based on max. junction temperature, using junction-case thermal resistance.
E. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 ℃.

## ■ Typical Performance Characteristics

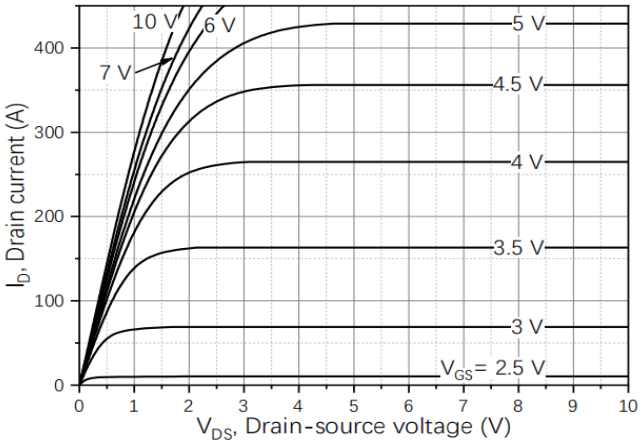



Figure1. Output Characteristics

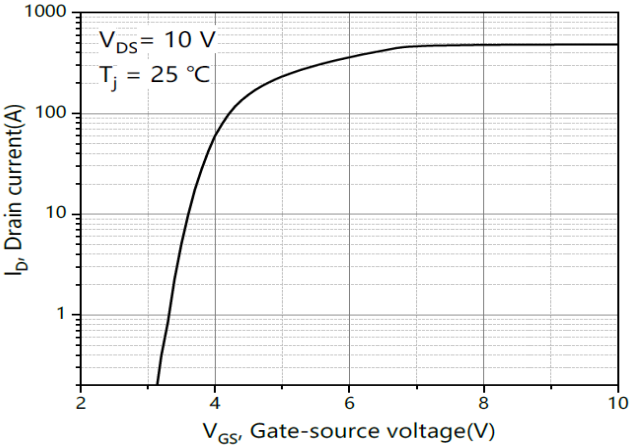



Figure2. Transfer Characteristics

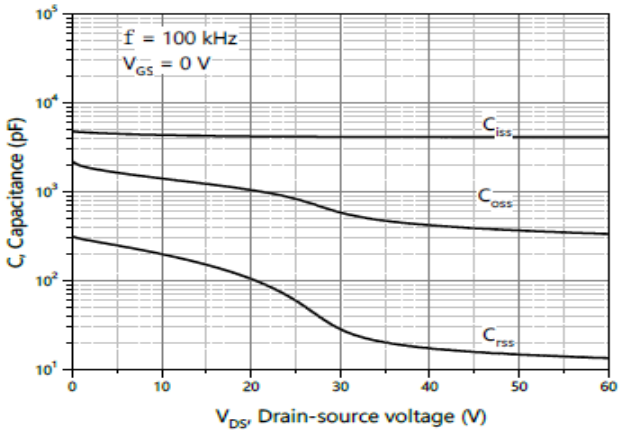



Figure3. Capacitance Characteristics

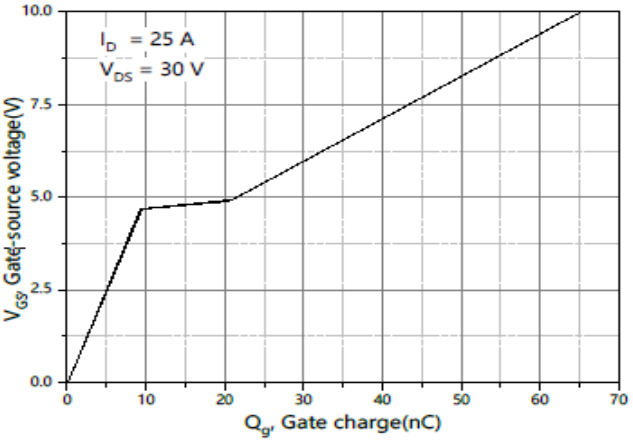



Figure4. Gate Charge

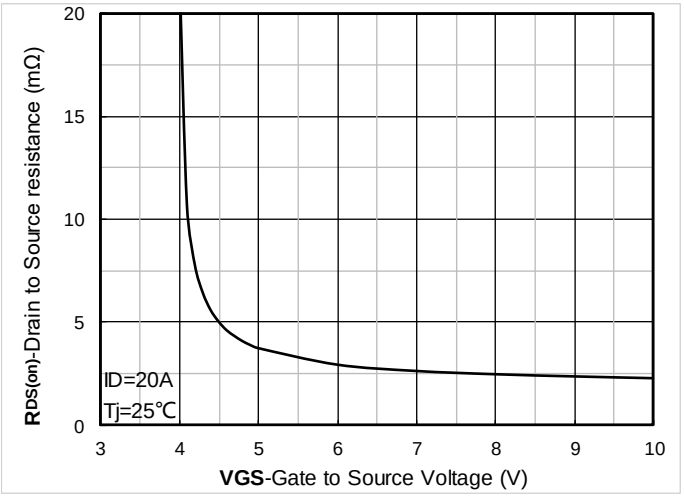



Figure 5. On-Resistance vs Gate to Source Voltage

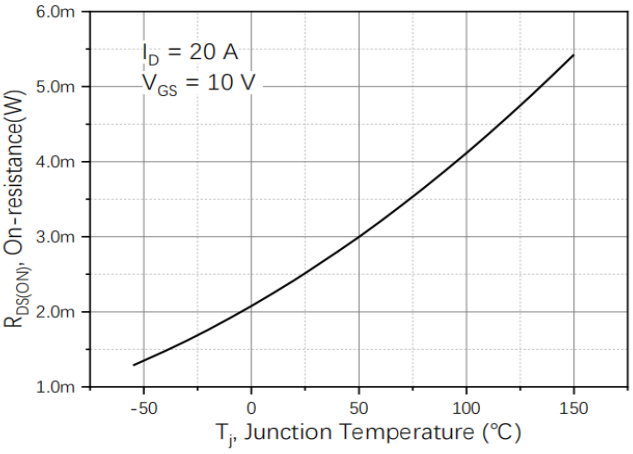



Figure 6. Drain-Source on Resistance

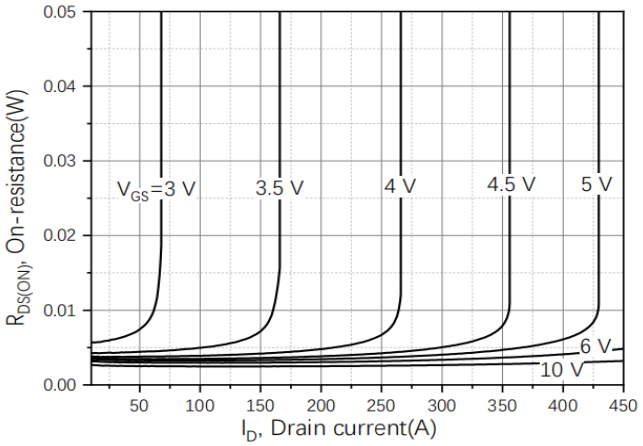



Figure 7. Drain-Source on Resistance

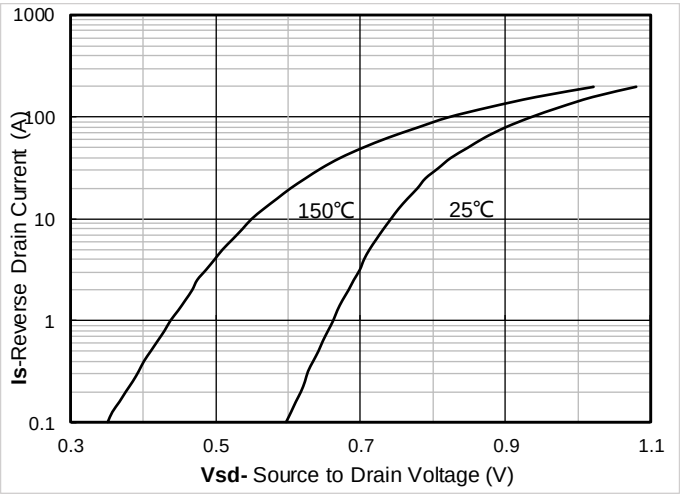



Figure 8. Forward characteristics of reverse diode

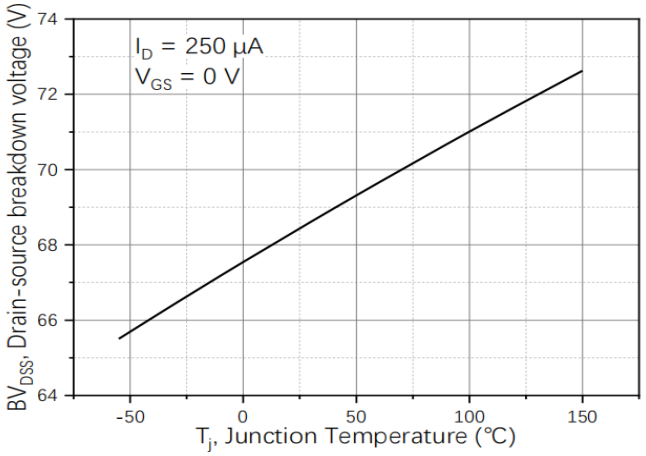



Figure 9. Drain-source breakdown voltage

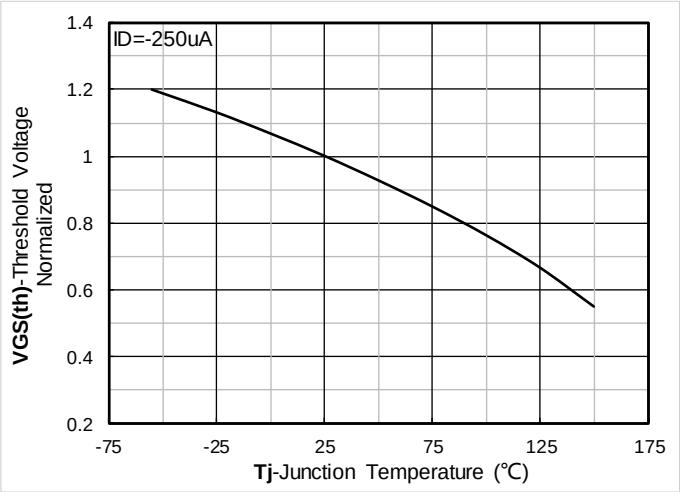



Figure 10. Normalized Threshold voltage

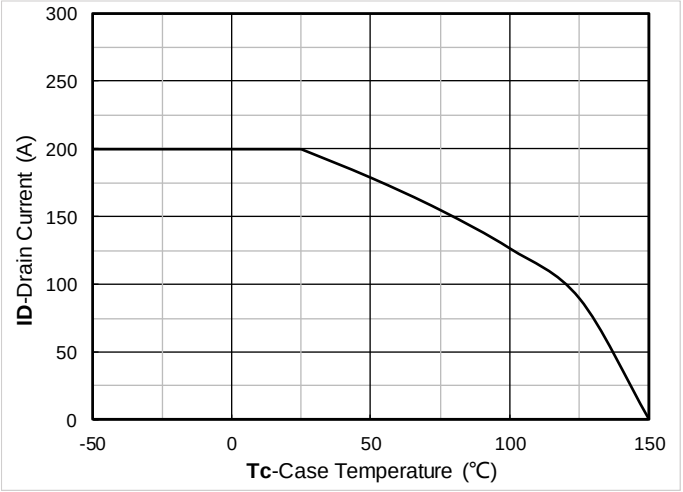



Figure 11. Current dissipation

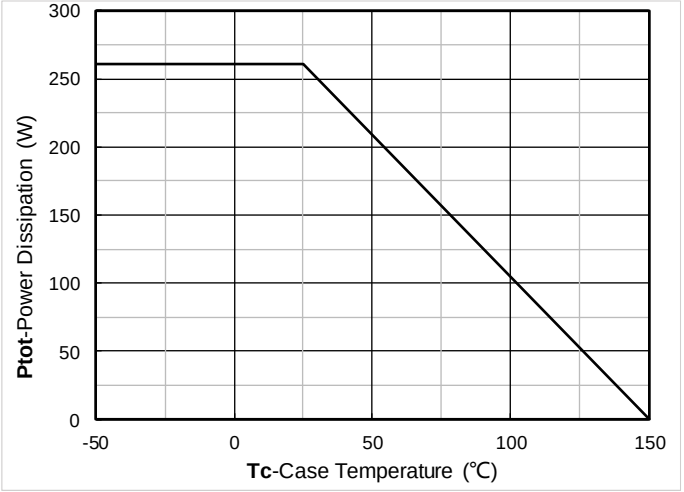



Figure 12. Power dissipation

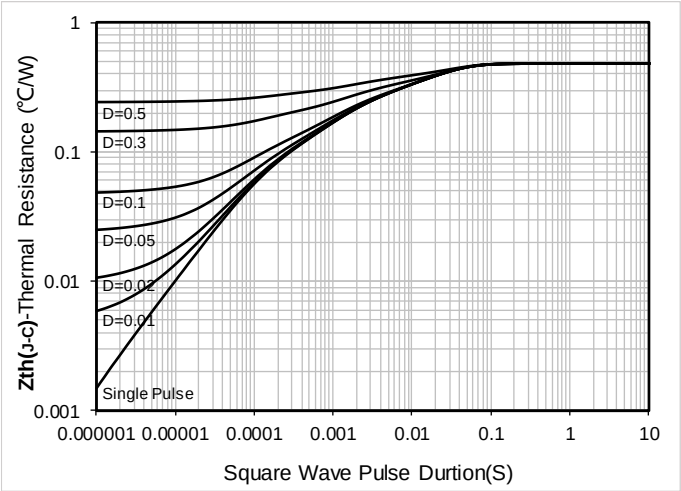



Figure 13. Maximum Transient Thermal Impedance

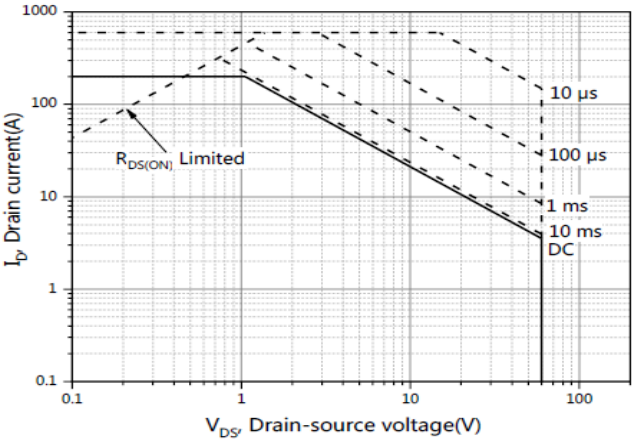
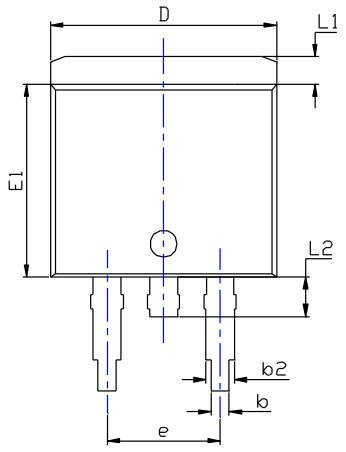
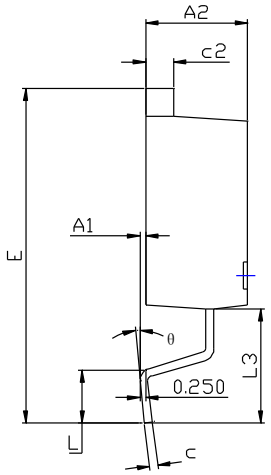



Figure 14. Safe Operation Area

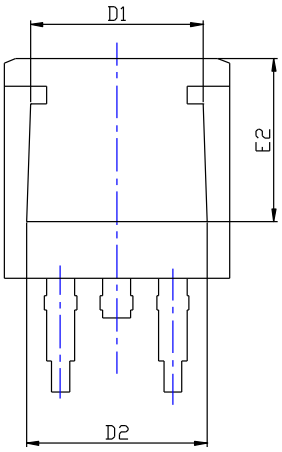
## ■ TO-263-HY Package information



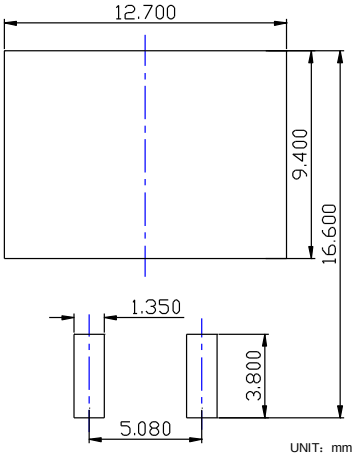

TOP VIEW




SIDE VIEW




BOTTOM VIEW




SUGGESTED SOLDER PAD LAYOUT

| DIMENSIONS | | | | | | |
|---|---|---|---|---|---|---|
| SYMBOL | INCHES | | | Millimeter | | |
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| A1 | 0.000 | --- | 0.010 | 0.000 | --- | 0.250 |
| A2 | 0.174 | 0.180 | 0.186 | 4.430 | 4.580 | 4.730 |
| b | 0.028 | 0.032 | 0.036 | 0.720 | 0.820 | 0.920 |
| b2 | 0.046 | 0.050 | 0.054 | 1.180 | 1.280 | 1.380 |
| c | 0.013 | 0.015 | 0.018 | 0.330 | 0.390 | 0.450 |
| c2 | 0.048 | 0.050 | 0.053 | 1.220 | 1.280 | 1.340 |
| D | 0.394 | 0.400 | 0.406 | 10.000 | 10.150 | 10.300 |
| D1 | 0.295 | 0.307 | 0.319 | 7.500 | 7.800 | 8.100 |
| D2 | 0.303 | 0.315 | 0.327 | 7.700 | 8.000 | 8.300 |
| E | 0.571 | 0.591 | 0.610 | 14.500 | 15.000 | 15.500 |
| E1 | 0.337 | 0.341 | 0.348 | 8.550 | 8.700 | 8.850 |
| E2 | 0.276 | 0.287 | 0.299 | 7.000 | 7.300 | 7.600 |
| e | 0.200BSC | | | 5.080BSC | | |
| L | 0.070 | --- | 0.110 | 1.790 | --- | 2.790 |
| L1 | 0.044 | --- | 0.056 | 1.120 | --- | 1.420 |
| L2 | 0.030 | --- | 0.070 | 0.770 | --- | 1.770 |
| L3 | 0.197REF | | | 5.000REF | | |
| θ | 0° | --- | 8° | 0° | --- | 8° |

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

## Notice

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