

DESCRIPTION

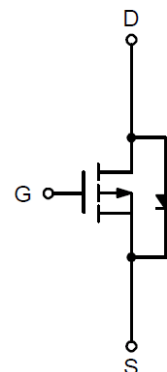
The TDM3607 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

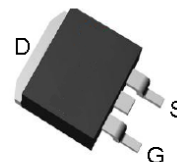
- -60V/-132A
- RDS(ON) < 7.2mΩ @ VGS=-10V
- Reliable and Rugged
- Lead free product is available
- TO263 Package

Application

- PWM applications
- Load switch
- Power management



P-Channel MOSFET



Top View of TO-263-3

ABSOLUTE MAXIMUM RATINGS(T_A=25°C unless otherwise noted)

| Parameter | Symbol | Rating | Unit |
|--|--|---------------------------|------|
| Drain-Source Voltage | V _{DS} | -60 | V |
| Gate-Source Voltage | V _{GS} | ±25 | V |
| Diode Continuous Forward Current | I _S | -80 | A |
| Pulse Drain Current Tested | I _{DP} (T _C =25°C) | -264 | A |
| Continuous Drain Current | I _D (T _C =25°C) | -132 <small>note1</small> | A |
| | I _D (T _C =100°C) | -83 | A |
| Maximum Power Dissipation | P _D (T _C =25°C) | 250 | W |
| | P _D (T _C =100°C) | 100 | W |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 50 | °C/W |
| Thermal Resistance-Junction to Case | R _{θJC} | 0.5 | °C/W |

NOTES:

1. Max continuous current is limited by bonding wire.

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

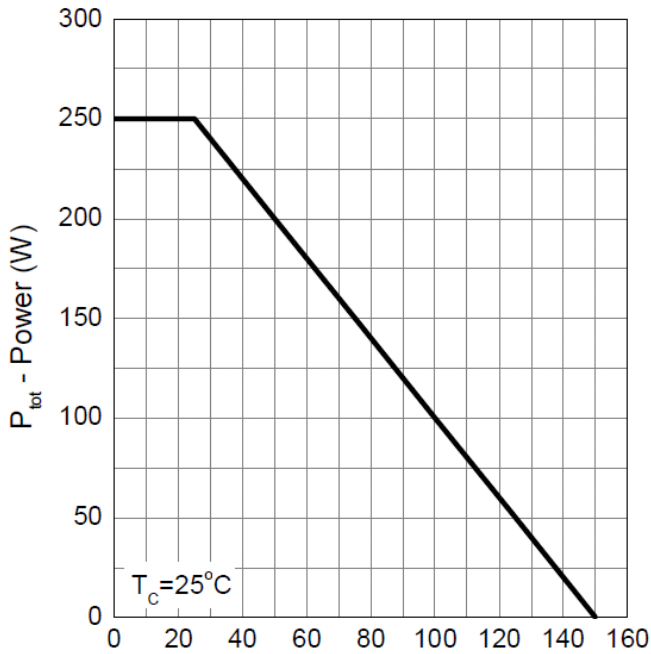
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|--------------|--|-----|------|-----------|------------|
| STATIC CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=-250\mu A$ | -60 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-48V, V_{GS}=0V$ | | | -1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 25V, V_{DS}=0V$ | | | ± 100 | nA |
| ON CHARACTERISTICS (Note 2) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1 | | -3 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=-10V, I_{DS}=-20A$ | | 5.6 | 7.2 | m Ω |
| DYNAMIC CHARACTERISTICS (Note 3) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-30V, V_{GS}=0V, F=1.0\text{MHz}$ | | 6095 | | PF |
| Output Capacitance | C_{oss} | | | 1080 | | PF |
| Reverse Transfer Capacitance | C_{rss} | | | 430 | | PF |
| SWITCHING CHARACTERISTICS (Note 3) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=-30V, R_L=30\Omega, V_{GEN}=-10V, R_G=6\Omega, I_{DS}=-1A$ | | 18 | 33 | nS |
| Turn-on Rise Time | t_r | | | 20 | 36 | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 200 | 360 | nS |
| Turn-Off Fall Time | t_f | | | 120 | 216 | nS |
| Total Gate Charge | Q_g | $V_{DS}=-30V, I_{DS}=-20A, V_{GS}=-10V$ | | 136 | | nC |
| Gate-Source Charge | Q_{gs} | | | 20 | | nC |
| Gate-Drain Charge | Q_{gd} | | | 33 | | nC |
| Body Diode Reverse Recovery Time | T_{rr} | $I_{DS}=-20A, di/dt=100A/\mu s$ | | 51 | | nS |
| Body Diode Reverse Recovery Charge | Q_{rr} | | | 90 | | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode Forward Voltage (Note 2) | V_{SD} | $V_{GS}=0V, I_{SD}=-1A$ | | -0.7 | -1 | V |

NOTES:

- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing

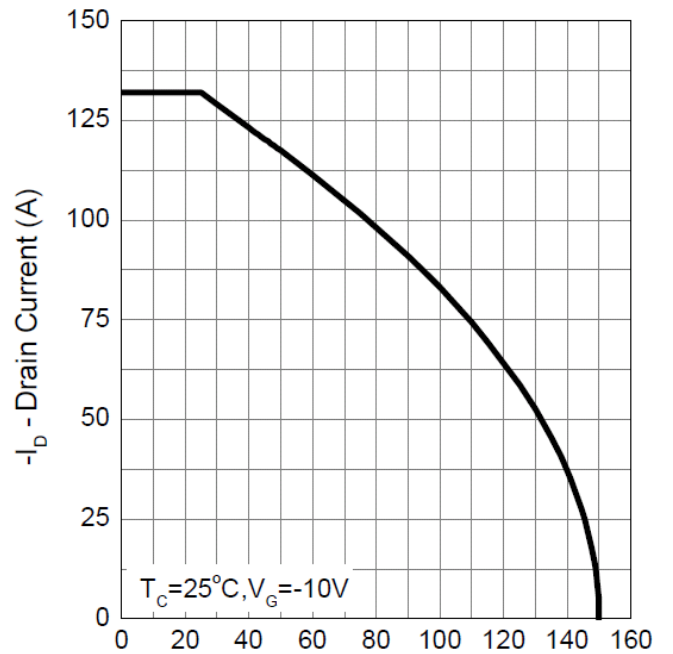
Typical Operating Characteristics

Power Dissipation



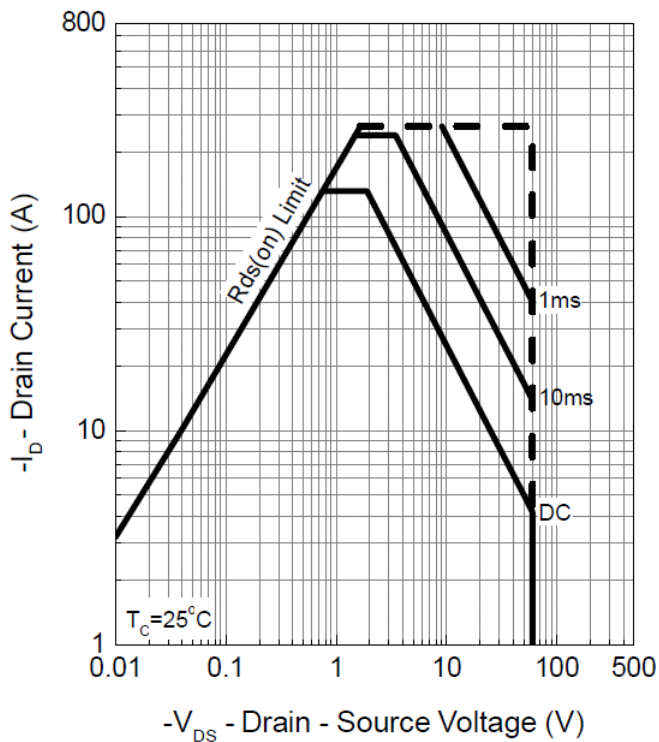
T_j - Junction Temperature ($^\circ C$)

Drain Current

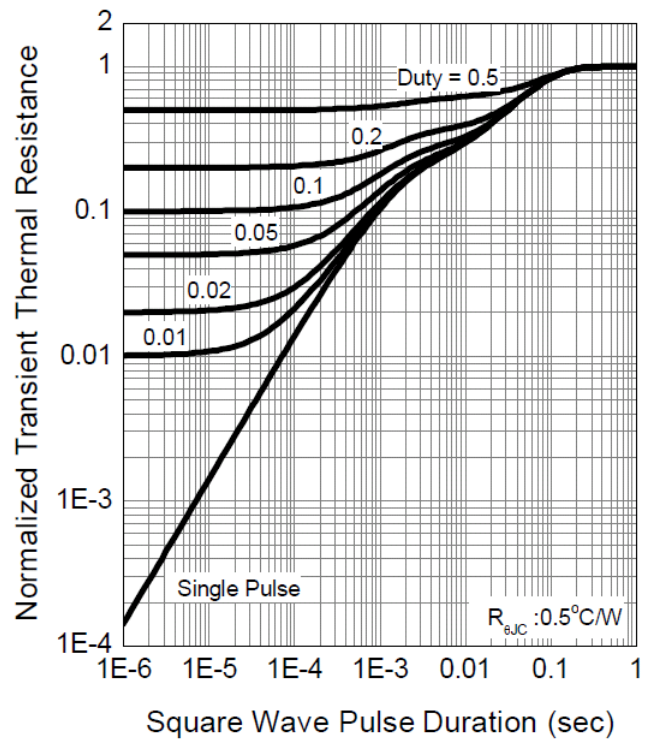


T_j - Junction Temperature ($^\circ C$)

Safe Operation Area



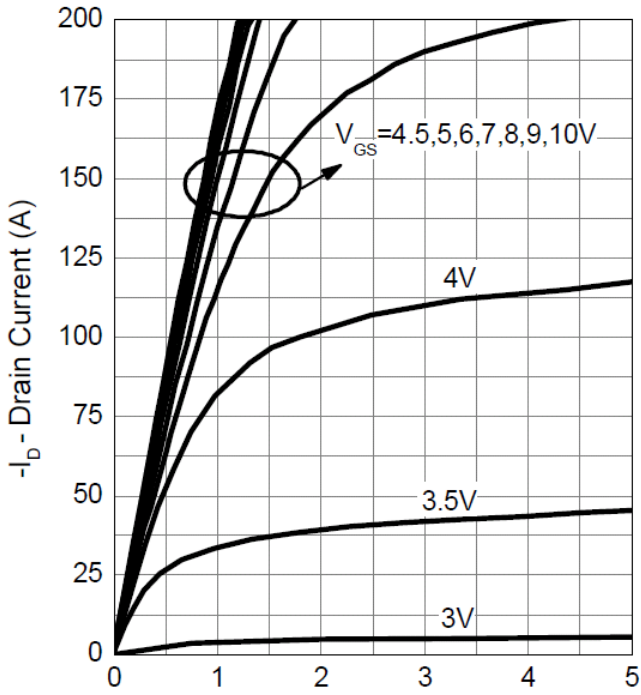
Thermal Transient Impedance



P-Channel Enhancement Mode MOSFET TDM3607

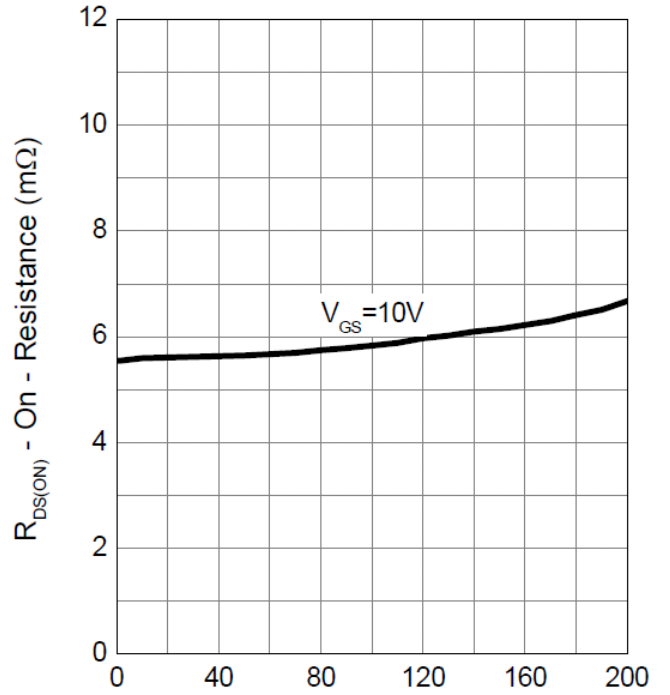
Typical Operating Characteristics(Cont.)

Output Characteristics

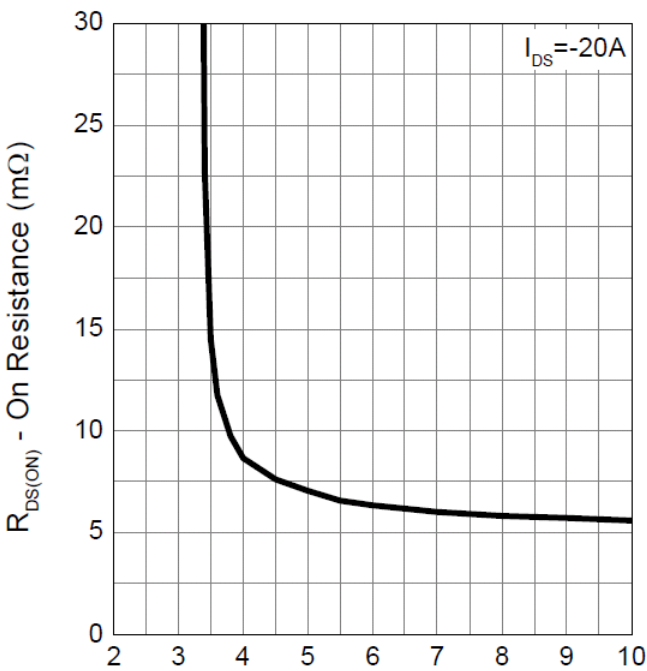


$-V_{DS}$ - Drain-Source Voltage (V)
Gate-Source On Resistance

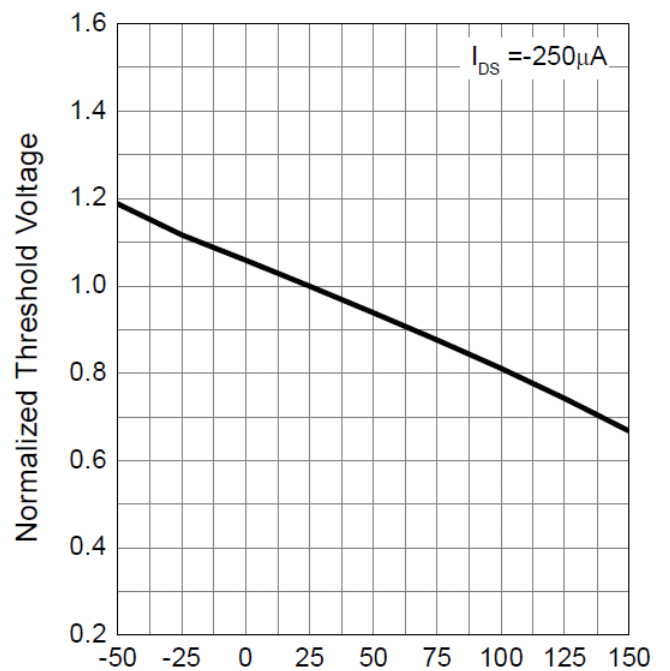
Drain-Source On Resistance



$-I_D$ - Drain Current (A)
Gate Threshold Voltage



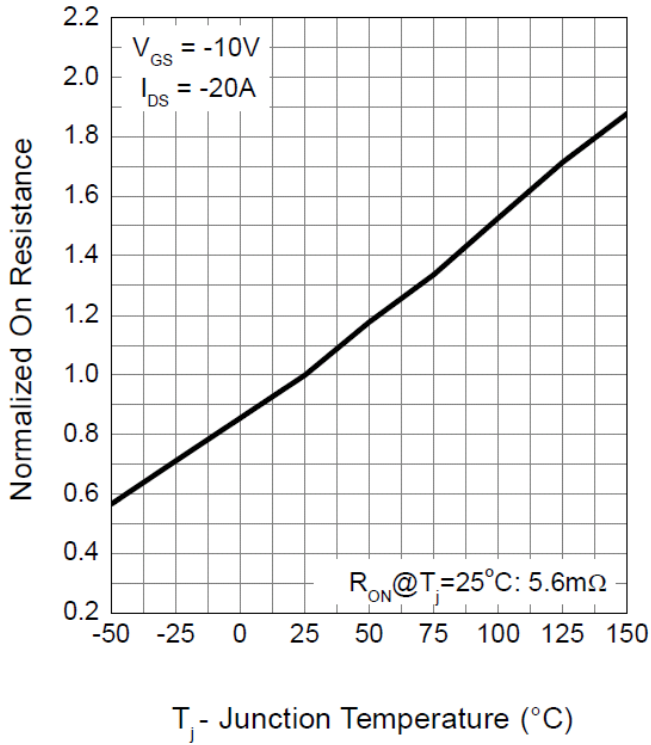
$-V_{GS}$ - Gate - Source Voltage (V)



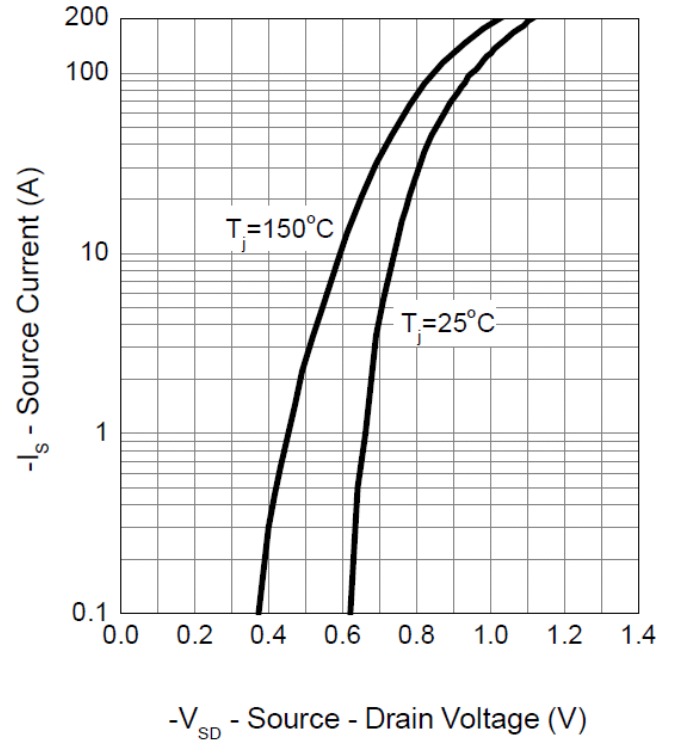
T_j - Junction Temperature (°C)

Typical Operating Characteristics (Cont.)

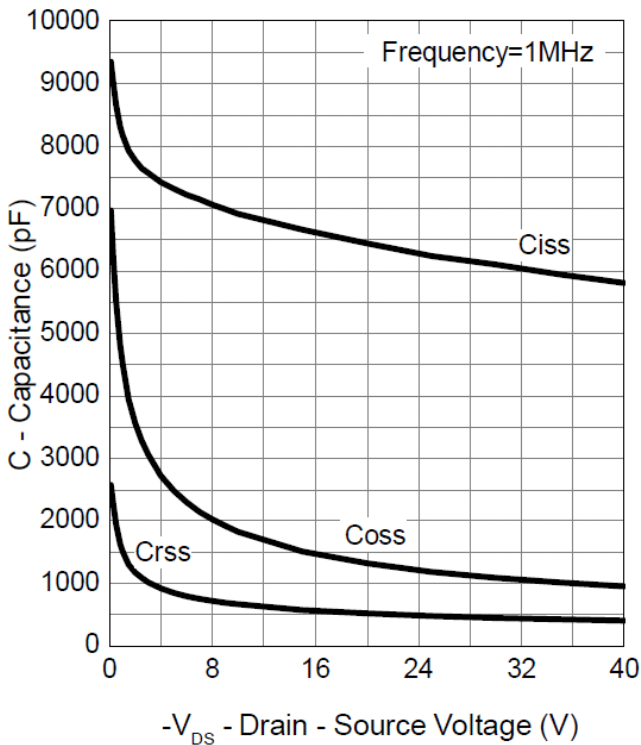
Drain-Source On Resistance



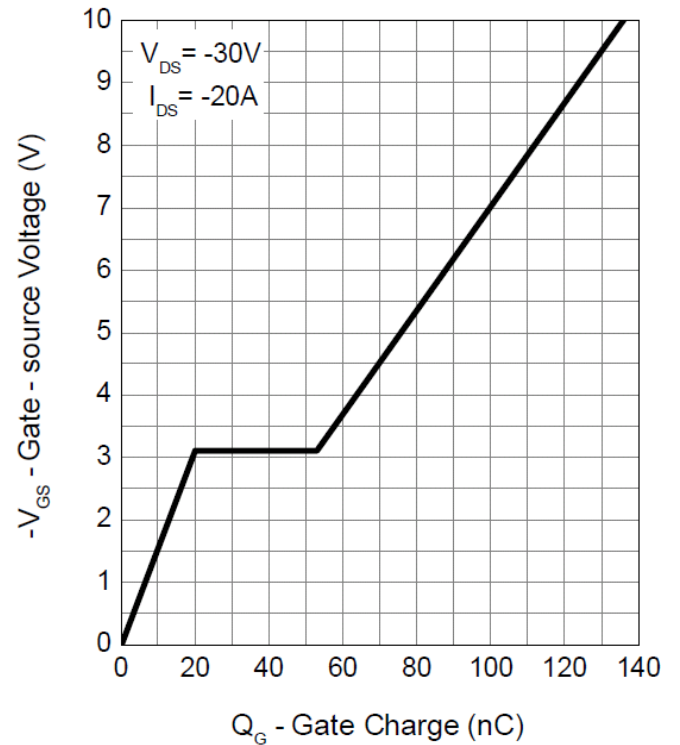
Source-Drain Diode Forward



Capacitance

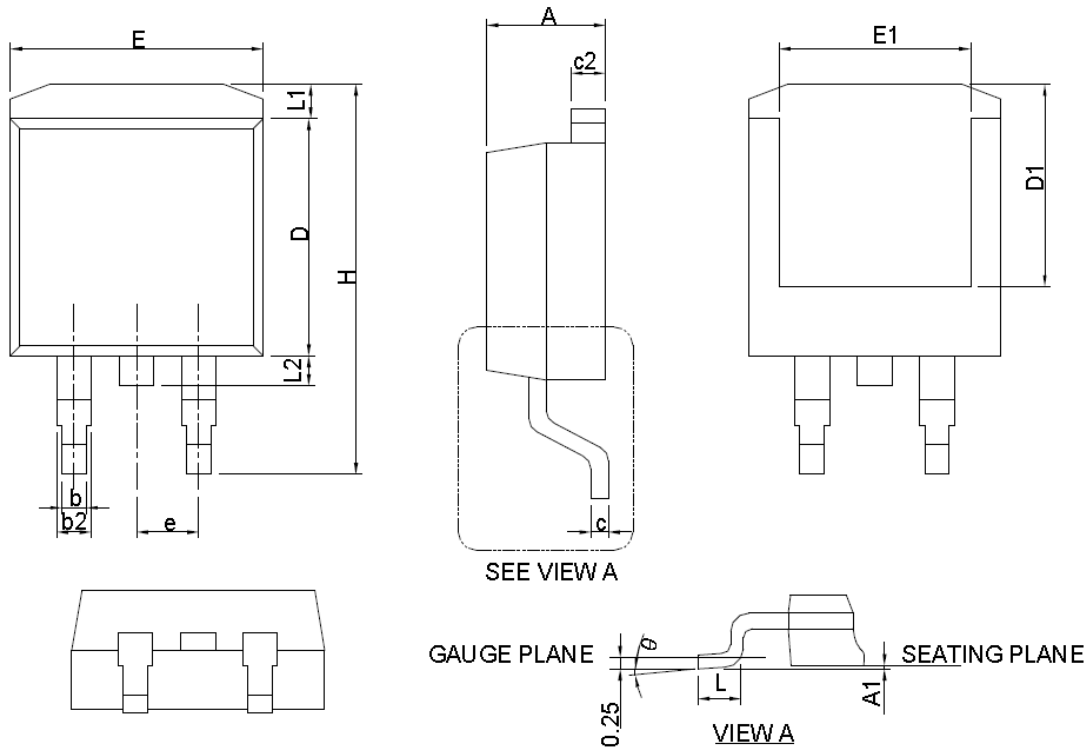


Gate Charge



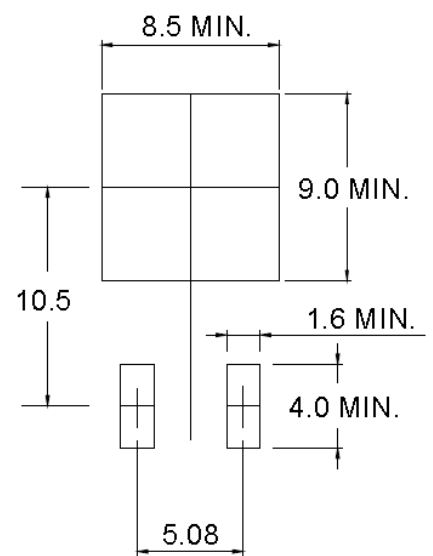
Package Information

TO-263 Package



| SYMBOL | TO-263-3 | | | |
|--------|-------------|-------|-----------|-------|
| | MILLIMETERS | | INCHES | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 4.06 | 4.83 | 0.160 | 0.190 |
| A1 | 0.00 | 0.25 | 0.000 | 0.010 |
| b | 0.51 | 0.99 | 0.020 | 0.039 |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 |
| c | 0.38 | 0.74 | 0.015 | 0.029 |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 |
| D | 8.38 | 9.65 | 0.330 | 0.380 |
| D1 | 6.00 | 9.00 | 0.236 | 0.354 |
| E | 9.65 | 11.43 | 0.380 | 0.450 |
| E1 | 6.22 | 9.00 | 0.245 | 0.354 |
| e | 2.54 BSC | | 0.100 BSC | |
| H | 14.61 | 15.88 | 0.575 | 0.625 |
| L | 1.78 | 2.79 | 0.070 | 0.110 |
| L1 | - | 1.68 | - | 0.066 |
| L2 | - | 1.78 | - | 0.070 |
| θ | 0° | 8° | 0° | 8° |

RECOMMENDED LAND PATTERN



UNIT: mm

Note : Follow JEDEC TO-263 AB.

Design Notes