

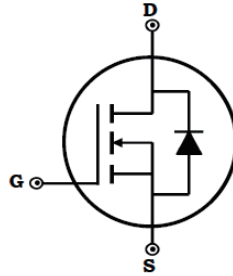


N-Channel Enhancement Mode MOSFET

Features

- ◆ $V_{DSS} = 150V$
- ◆ $R_{DS(ON)} < 4.5\ m\Omega @ V_{GS} = 10\ V$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation Base Plate

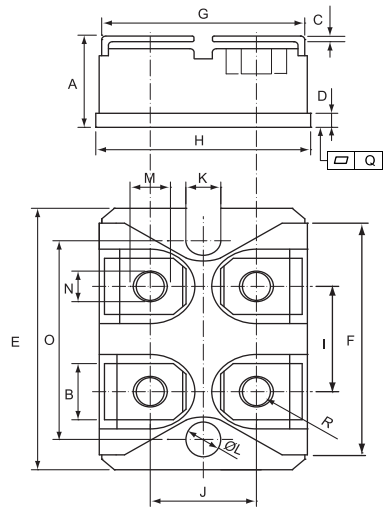
Preliminary



Dimensions in inches and (millimeters)

Applications

- ◆ Backlighting
- ◆ Power Converters
- ◆ Synchronous Rectifiers
- ◆ Battery Chargers
- ◆ AC Motor Drivers



Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

| Parameter | Symbol | Ratings | Unit |
|--|-----------------------------|-------------|------|
| Drain-Source Voltage | V_{DS} | 150 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Drain Current-Continuous @ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$ | I_D | 300 180 | A |
| Drain Current-Pulsed @ $T_c = 25^\circ C$ | I_{DM} | 1050 | A |
| Maximum Power Dissipation | P_D | 320 | W |
| Storage Temperature Range | T_{STG} | -50 to +150 | °C |
| Operating Junction Temperature Range | T_J | -50 to +150 | °C |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 0.20 | °C/W |
| Isolation Voltage (A.C. 1 minute) | V_{ISO} | 2500 | V |
| Mounting torque (M4 Screw) | To heatsink To terminals | 1.5 1.3 | Nm |

| | DIMENSIONS | | | |
|---|------------|-------|-------|-------|
| | INCHES | | MM | |
| | MIN | MAX | MIN | MAX |
| A | 0.460 | 0.483 | 11.68 | 12.28 |
| B | 0.307 | 0.323 | 7.80 | 8.20 |
| C | 0.030 | 0.033 | 0.75 | 0.85 |
| D | 0.071 | 0.081 | 1.80 | 2.05 |
| E | 1.488 | 1.504 | 37.80 | 38.20 |
| F | 1.248 | 1.260 | 31.70 | 32.00 |
| G | 0.917 | 0.957 | 23.30 | 24.30 |
| H | 0.996 | 1.008 | 25.30 | 25.60 |
| I | 0.579 | 0.602 | 14.70 | 15.30 |
| J | 0.492 | 0.516 | 12.50 | 13.10 |
| K | 0.161 | 0.169 | 4.10 | 4.30 |
| L | 0.161 | 0.169 | 4.10 | 4.30 |
| M | 0.181 | 0.197 | 4.60 | 5.00 |
| N | 0.165 | 0.181 | 4.20 | 4.60 |
| O | 1.181 | 1.197 | 30.00 | 30.40 |
| Q | -0.002 | 0.004 | -0.05 | 0.10 |
| R | M4*8 | | | |



Electrical Characteristics @ T_J =25°C (unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------------|----------------------|---|------|-------|------|------|
| OFF Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V , I _{DS} =3mA | 150 | - | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{GS} =0V , V _{DS} =150V | - | - | 50 | uA |
| Gate-Body Leakage | I _{GSS} | V _{GS} =±20V , V _{DS} =0V | - | - | 200 | nA |
| ON Characteristics | | | | | | |
| Gate Threshold Voltage | V _{TH} | V _{DS} =V _{GS} , I _{DS} =8mA | 2.0 | 2.5 | 3.5 | V |
| Drain-Source On-State Resistance | R _{DS(on)} | V _{GS} =10V , I _{DS} =100A | - | 4.3 | 4.5 | mΩ |
| Gate Resistance | R _G | | - | 1.6 | 2.9 | Ω |
| Forward Transconductance | g _{fs} | V _{DS} > 2 I _D R _{DS(on)M} , I _D =100A ^{Note1} | - | 122 | - | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =25V | - | 45000 | - | pF |
| Output Capacitance | C _{oss} | V _{GS} =0V | - | 1246 | - | |
| Reverse Transfer Capacitance | C _{rss} | Freq.=1MHz | - | 870 | - | |
| Switching Characteristics | | | | | | |
| Turn-On Delay Time | t _{d(on)} | V _{DS} =75V V _{GS} =10V I _{DS} =150A | - | 116 | - | ns |
| Rise Time | t _r | | - | 44 | - | |
| Turn-Off Delay Time | t _{d(off)} | | - | 248 | - | |
| Fall Time | t _f | | - | 44 | - | |
| Total Gate Charge at 10V | Q _g | V _{DS} =75V | - | 318 | - | nC |
| Gate to Source Charge | Q _{gs} | V _{GS} =10V | - | 211 | - | |
| Gate to Drain Charge | Q _{gd} | I _{DS} =150A | - | 187 | - | |
| Reverse Diode Characteristics | | | | | | |
| Drain-Source Diode Forward Voltage | V _F | T _J =25°C , I _F =100A | - | - | 0.85 | V |
| Diode Continuous Forward Current | I _F | | - | - | 180 | A |
| Diode Pulsed Current ^{Note1} | I _{F,pulse} | | - | - | 1050 | A |
| Reverse Recovery time | T _{RR} | I _F =0.5V , I _R =1.0A , I _{RR} =0.25A | - | - | 300 | ns |

Notes:

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle > 2%.



Typical Characteristics

Fig 1. Power dissipation

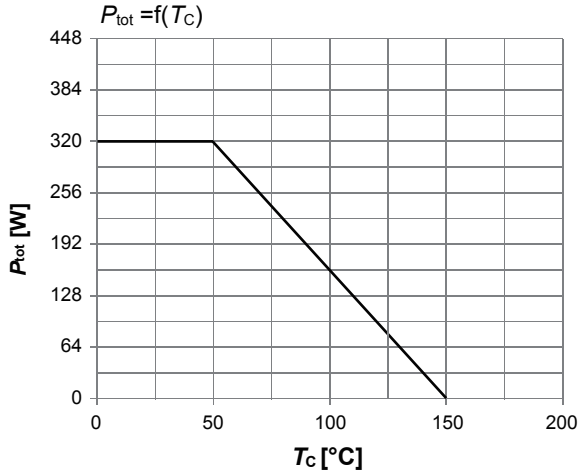


Fig 2. Drain current

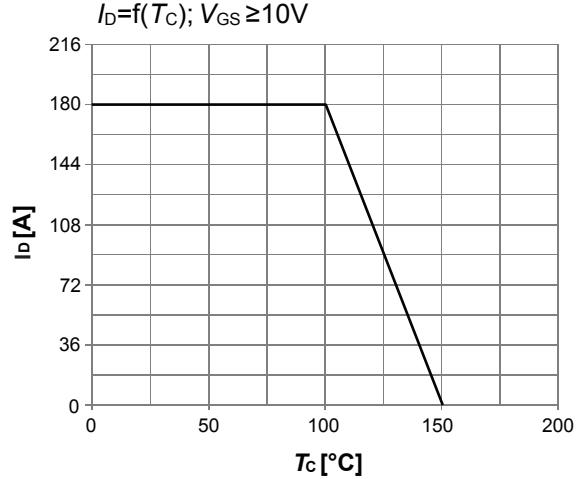


Fig 3. Safe operating area

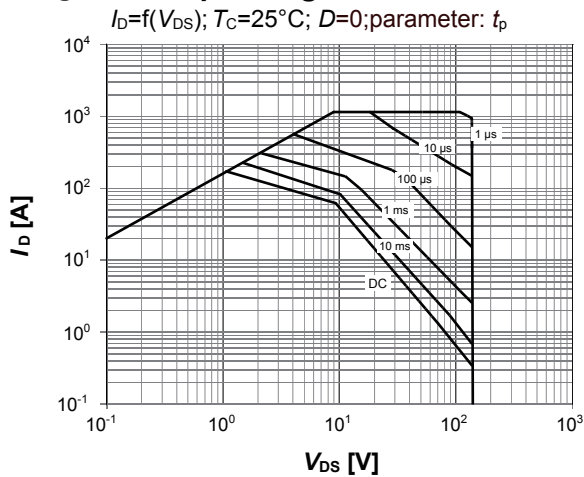


Fig 4. Maximum Transient Thermal Impedance

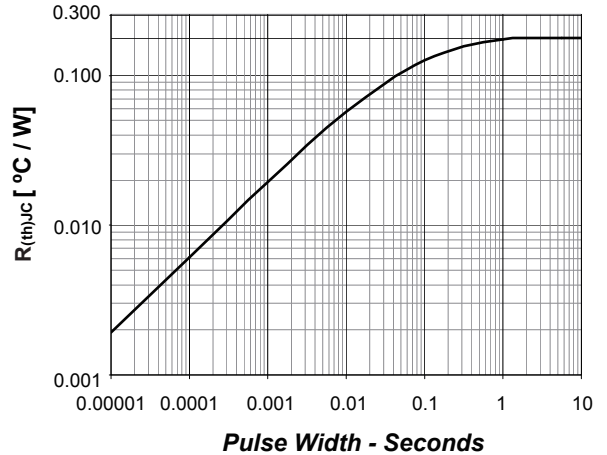


Fig 5. Typ. output characteristics

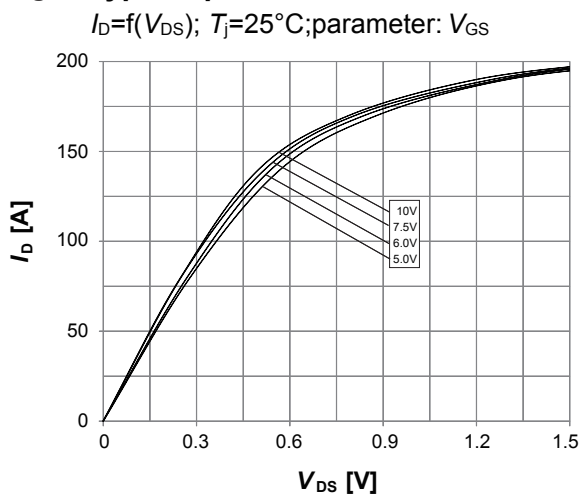
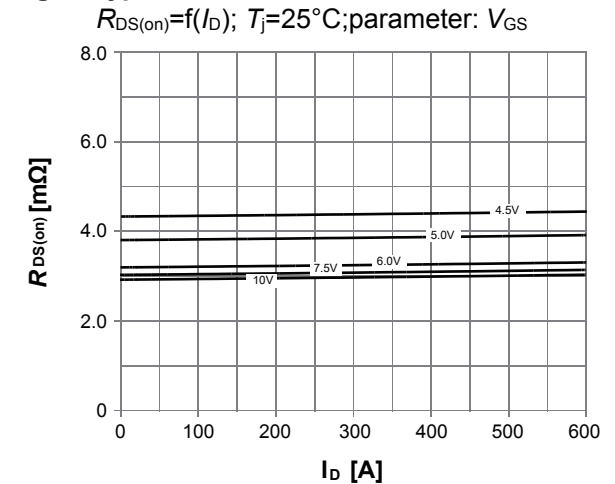


Fig 6. Typ. drain-source on resistance





Typical Characteristics

Fig 7. Typ. transfer characteristics

$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}; \text{parameter: } T_j$

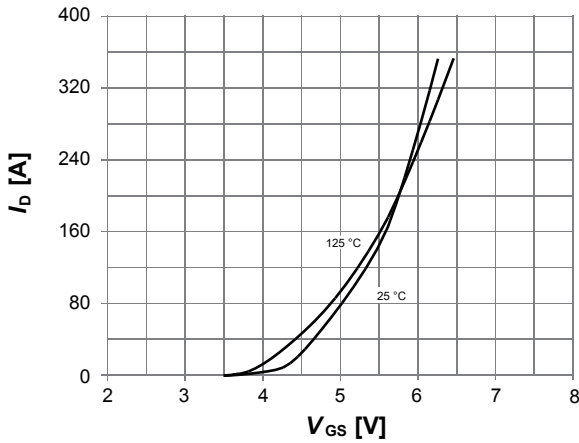


Fig 8. Typ. forward transconductance

$g_{fs} = f(I_D); T_j = 25^\circ\text{C}$

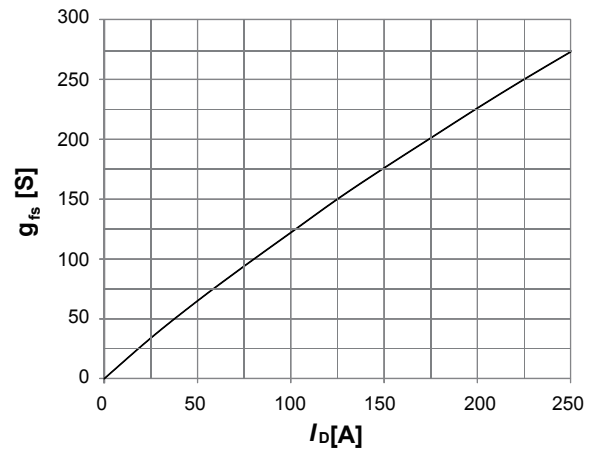


Fig 9. Drain-source on-state resistance

$R_{DS(on)} = f(T_j); I_D = 150\text{A}; V_{GS} = 10\text{V}$

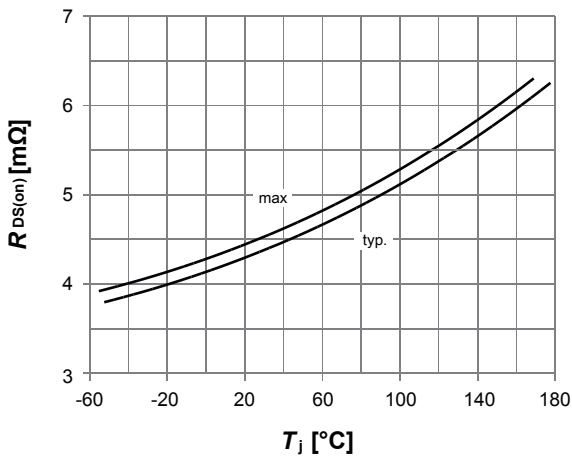


Fig 10. Typ. gate threshold voltage

$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; \text{parameter: } I_D$

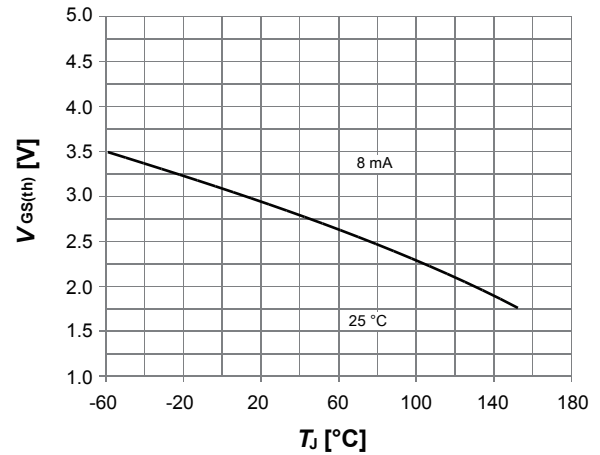


Fig 11. Typ. capacitances

$C = f(V_{DS}); V_{GS} = 0\text{V}; f = 1\text{MHz}$

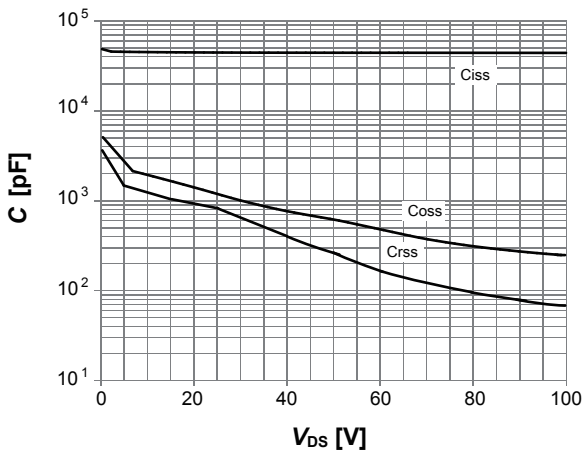
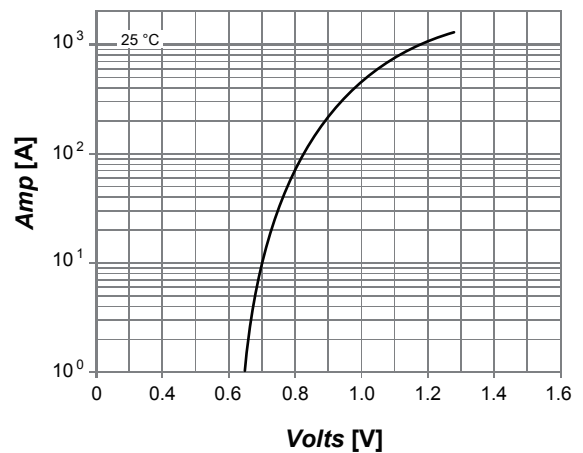


Fig 12. Typical forward characteristics of reverse diode





Typical Characteristics

Fig 13. Forward derating curve of reverse diode

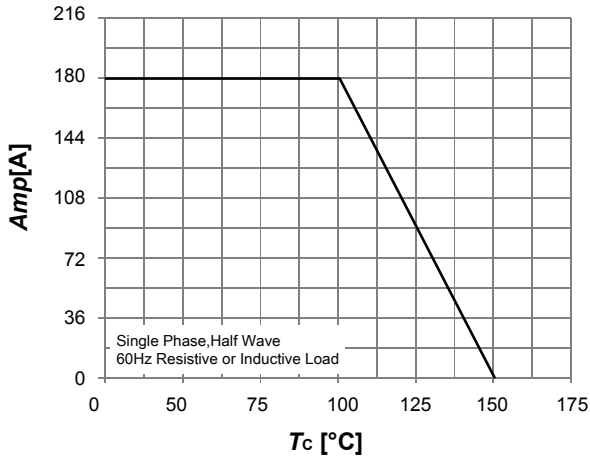


Fig 14. Peak forward surge current of reverse diode

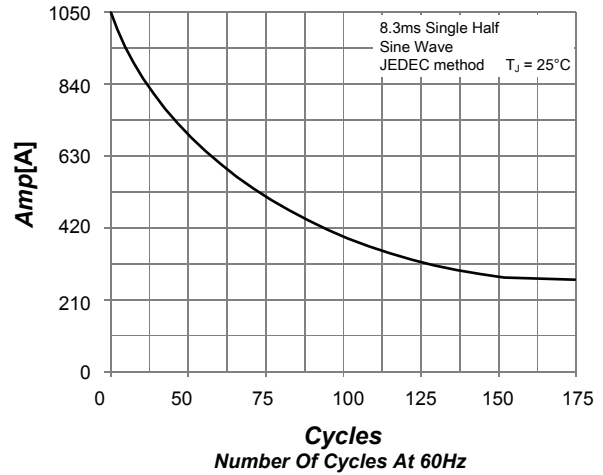


Fig 15. Typical reverse diode characteristics

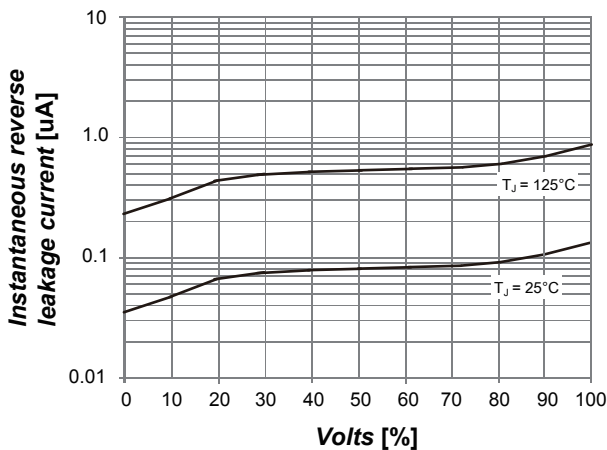


Fig 16. Typ. gate charge

$V_{GS} = f(Q_{gate})$; $I_D = 100A$ pulsed; parameter: V_{DD}

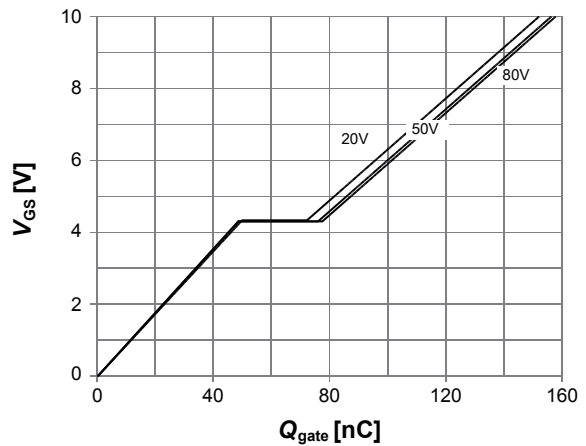
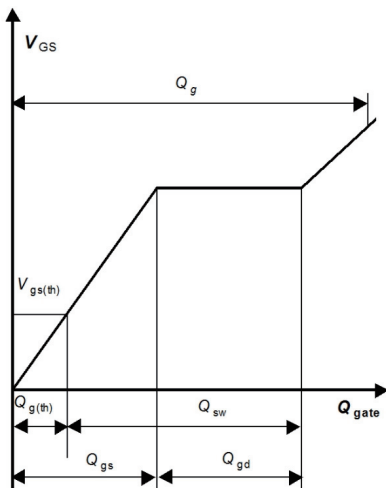


Fig 17. Gate charge waveforms





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