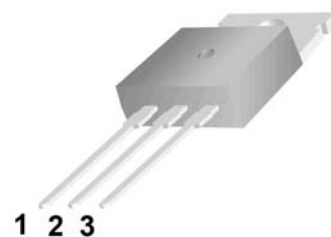
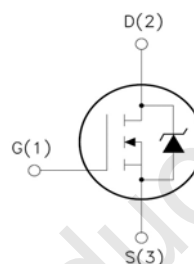


●Features:

- 16A, 650V, $R_{DS(on)(Typ)} = 0.5\Omega @ V_{GS}=10V$
- Low Gate Charge
- Low C_{rSS}
- 100% Avalanche Tested
- Fast Switching
- Improved dv/dt Capability

●Application:

- High Frequency Switching Mode Power Supply
- Active Power Factor Correction


TO-220


1. Gate (G)
2. Drain (D)
3. Source (S)

Absolute Maximum Ratings($T_C=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|---------------------|
| V_{DSS} | Drain-Source Voltage | 650 | V |
| I_D | Drain Current - Continuous($T_C=25^\circ\text{C}$) - Continuous($T_C=100^\circ\text{C}$) | 16* | A |
| | | 10* | A |
| I_{DM} | Drain Current -Pulsed (Note1) | 64* | A |
| V_{GSS} | Gate-Source Voltage | ± 30 | V |
| E_{AS} | Single Pulsed Avalanche Energy (Note2) | 980 | mJ |
| I_{AR} | Avalanche Current (Note1) | 16.0 | A |
| E_{AR} | Repetitive Avalanche Energy (Note1) | 32 | mJ |
| dv/dt | Peak Diode Recovery dv/dt (Note3) | 4.5 | V/ns |
| P_D | Power Dissipation($T_C =25^\circ\text{C}$) -Derate above 25°C | 64 | W |
| | | 0.51 | W/ $^\circ\text{C}$ |
| T_j | Operating Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature Range | -55 to+150 | $^\circ\text{C}$ |

* Drain Current Limited by Maximum Junction Temperature.

Thermal Characteristics

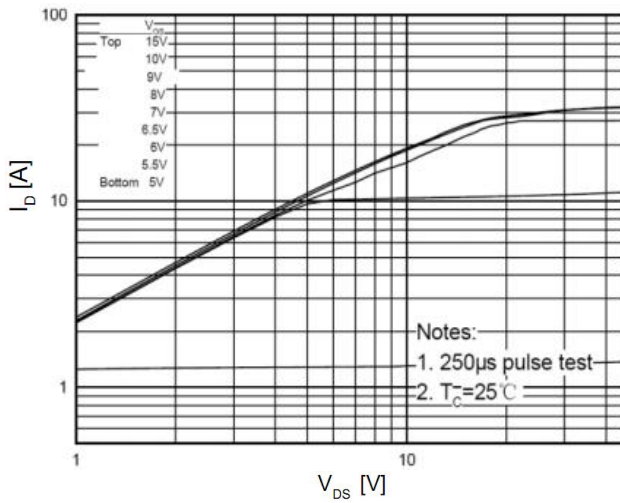
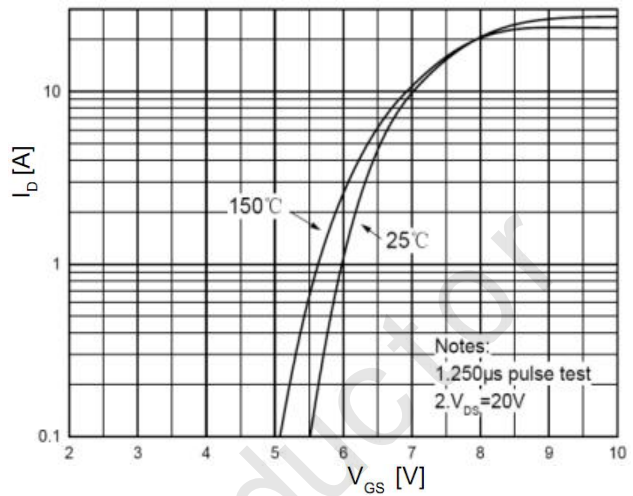
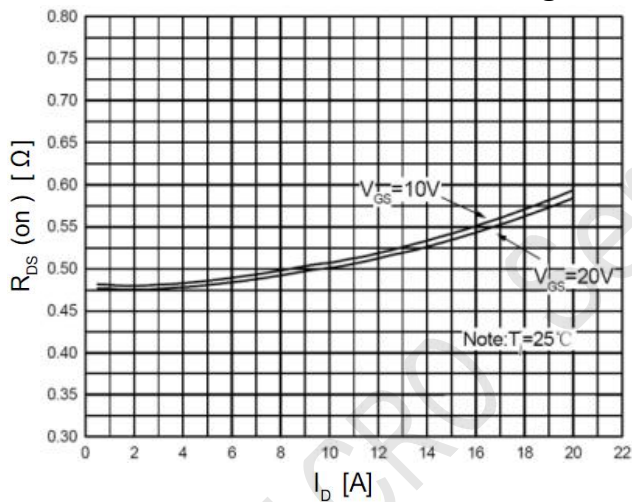
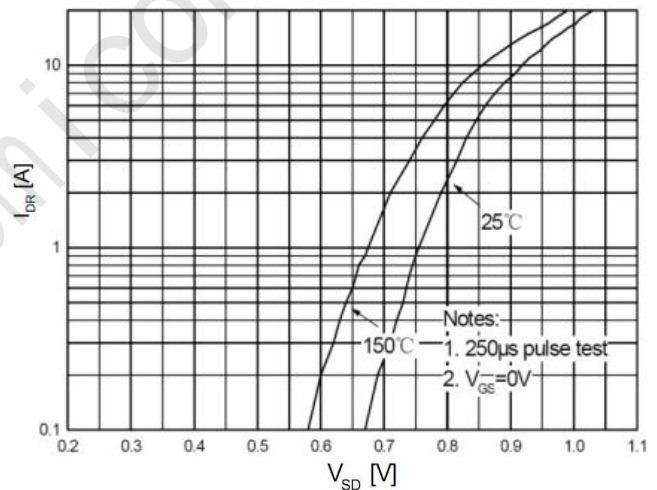
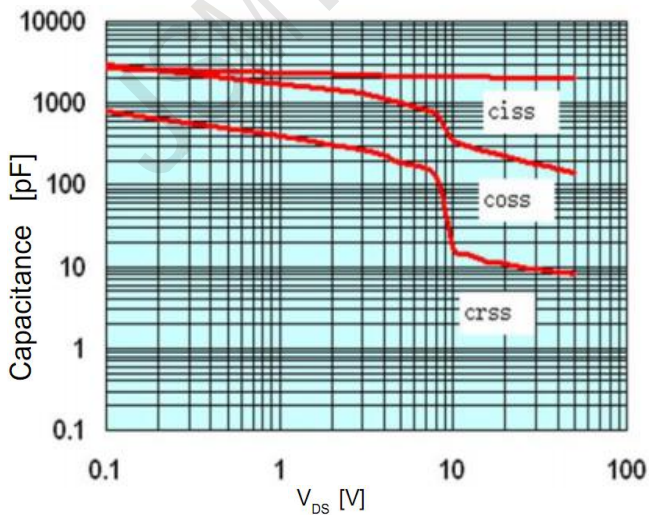
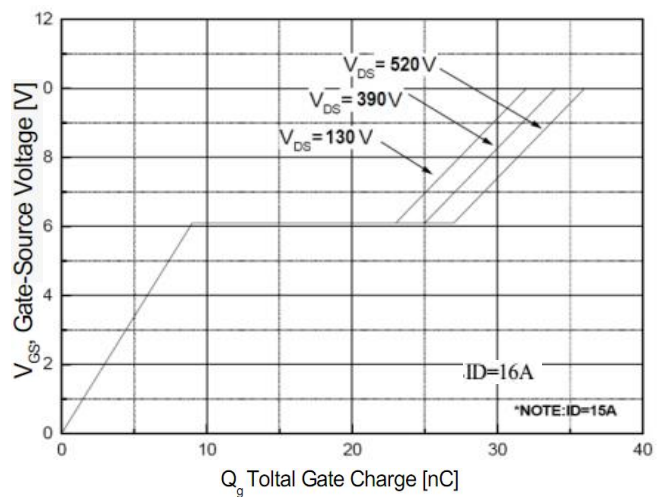
| Symbol | Parameter | Max | Unit |
|-----------------|---|------|-----------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 1.95 | $^\circ\text{C} / \text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 62.5 | $^\circ\text{C} / \text{W}$ |

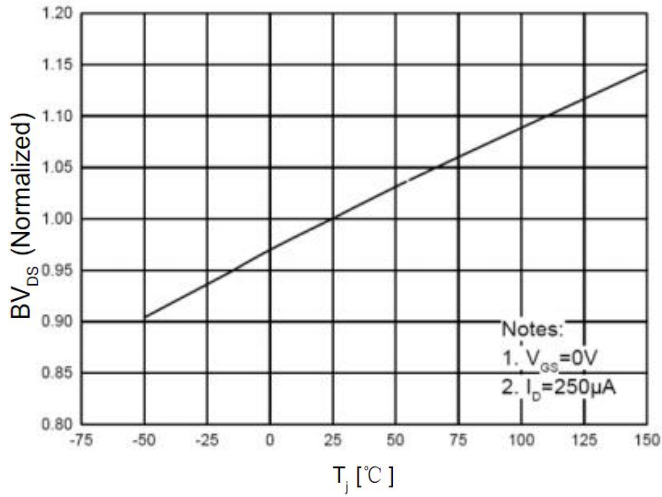
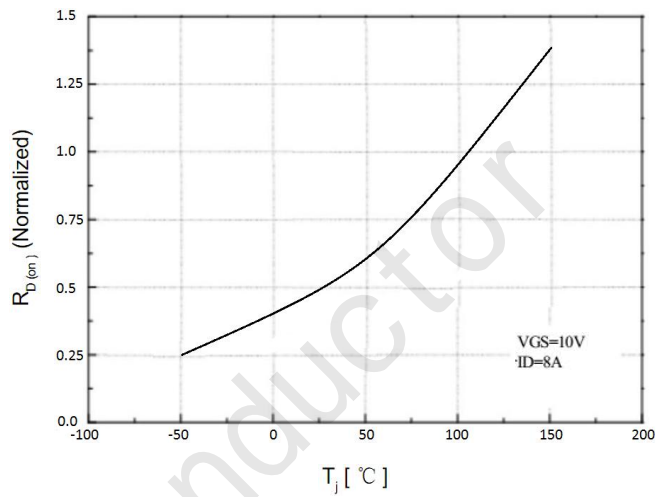
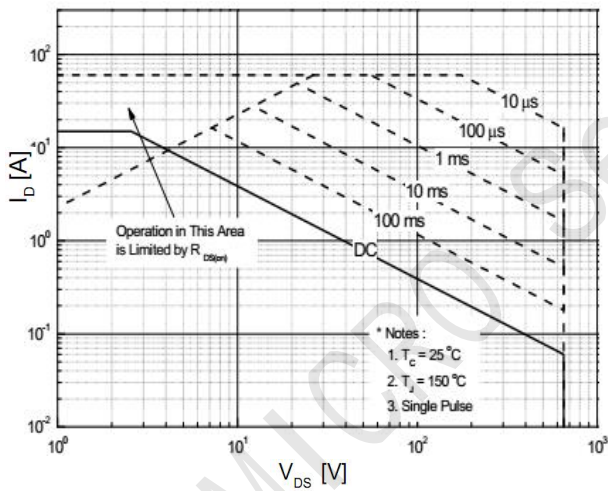
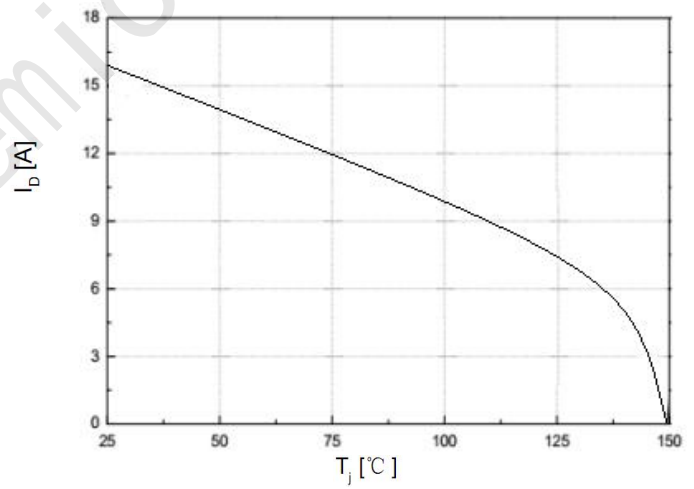
Electrical Characteristics(Tc=25°C unless otherwise noted)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|---|---|--|-----|------|------|------|
| Off Characteristics | | | | | | |
| BV _{DSS} | Drain-source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 650 | -- | -- | V |
| ΔBV _{DSS} /ΔT _J | Breakdown Voltage Temperature Coefficient | I _D =250μA (Referenced to 25°C) | -- | 0.65 | -- | V/°C |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =650V, V _{GS} =0V | -- | -- | 1 | μA |
| | | V _{DS} =520V, Tc=125°C | -- | -- | 10 | μA |
| I _{GSSF} | Gate-Body Leakage Current, Forward | V _{GS} =+30V, V _{DS} =0V | -- | -- | 100 | nA |
| I _{GSSR} | Gate-Body Leakage Current, Reverse | V _{GS} =-30V, V _{DS} =0V | -- | -- | -100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D =250μA | 2.0 | -- | 4.0 | V |
| R _{DS(on)} | Static Drain-Source On-Resistance | V _{GS} =10 V, I _D =8.0A | -- | 0.5 | 0.6 | Ω |
| g _{FS} | Forward Transconductance | V _{DS} =20 V, I _D =8.0A (Note4) | -- | 15 | -- | S |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =25V, V _{GS} =0V, f=1.0MHz | -- | 2250 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 205 | -- | pF |
| C _{rss} | Reverse Transfer Capacitance | | -- | 23.2 | -- | pF |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-On Delay Time | V _{DD} = 325 V, I _D = 16 A, R _G = 25 Ω (Note4,5) | -- | 38 | -- | ns |
| t _r | Turn-On Rise Time | | -- | 99 | -- | ns |
| t _{d(off)} | Turn-Off Delay Time | | -- | 149 | -- | ns |
| t _f | Turn-Off Fall Time | | -- | 98 | -- | ns |
| Q _g | Total Gate Charge | V _{DS} = 520 V, I _D =16.0 A, V _{GS} = 10 V (Note4,5) | -- | 52 | -- | nC |
| Q _{gs} | Gate-Source Charge | | -- | 10 | -- | nC |
| Q _{gd} | Gate-Drain Charge | | -- | 23 | -- | nC |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain-Source Diode Forward Current | | -- | -- | 16 | A |
| I _{SM} | Maximum Pulsed Drain-Source Diode Forward Current | | -- | -- | 64 | A |
| V _{SD} | Drain-Source Diode Forward Voltage | V _{GS} =0V, I _S =16.0A | -- | -- | 1.3 | V |
| t _{rr} | Reverse Recovery Time | V _{GS} =0V, I _S =16.0A, d I _F /dt=100A/μs (Note4) | -- | 455 | -- | ns |
| Q _{rr} | Reverse Recovery Charge | | -- | 4.95 | -- | μC |

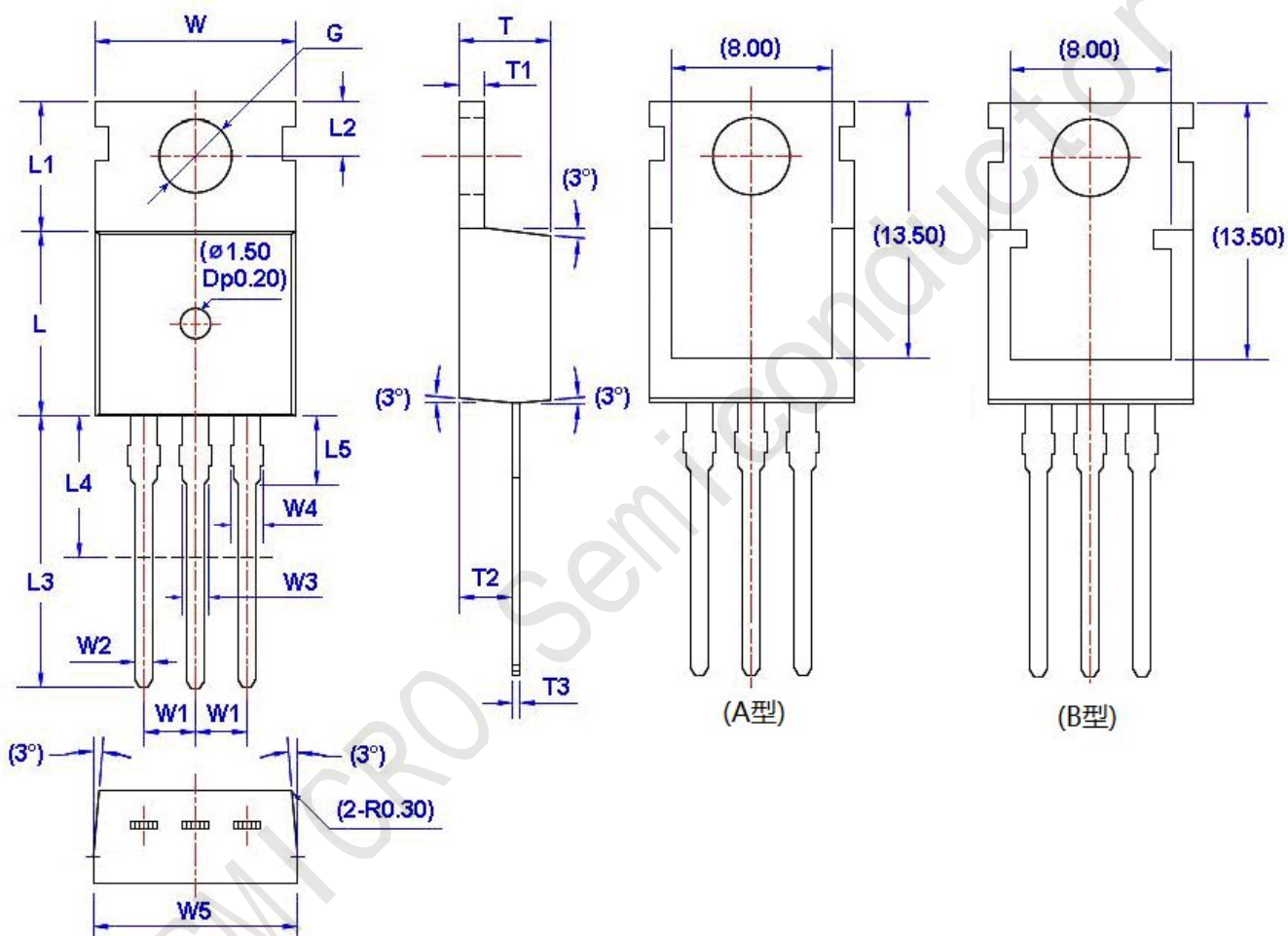
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、L = 7mH, I_{AS} =16.0A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C.
- 3、I_{SD}≤16.0A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J = 25°C.
- 4、Pulse Test : Pulse Width ≤300 μ s, Duty Cycle≤2%.
- 5、Essentially Independent of Operating Temperature.

On-Regin Characteristics

Transfer Characteristics

On-Resistance Variation vs. Drain Current and Gate Voltage

Body Diode Forward Voltage Variation vs. Source Current and Temperature

Capacitance Characteristics

Gate Charge Characteristics


Breakdown Voltage Variation vs. Temperature

On-Resistance Variation vs. Temperature

Maximum Safe Operating Area

Maximum Drain Current Vs. Case Temperature


TO-220 Package Dimensions



Unit: mm

| Symbol | Size | | Symbol | Size | | Symbol | Size | | Symbol | Size | |
|--------|------------|-------|--------|-------|-------|--------|------|------|--------|------|------|
| | Min | Max | | Min | Max | | Min | Max | | Min | Max |
| W | 9.66 | 10.28 | W5 | 9.80 | 10.20 | L4** | 6.20 | 6.60 | T3 | 0.45 | 0.60 |
| W1 | 2.54 (TYP) | | L | 9.00 | 9.40 | L5 | 2.79 | 3.30 | G(Φ) | 3.50 | 3.70 |
| W2 | 0.70 | 0.95 | L1 | 6.40 | 6.80 | T | 4.30 | 4.70 | | | |
| W3 | 1.17 | 1.37 | L2 | 2.70 | 2.90 | T1 | 1.15 | 1.40 | | | |
| W4* | 1.32 | 1.72 | L3 | 12.70 | 14.27 | T2 | 2.20 | 2.60 | | | |