

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

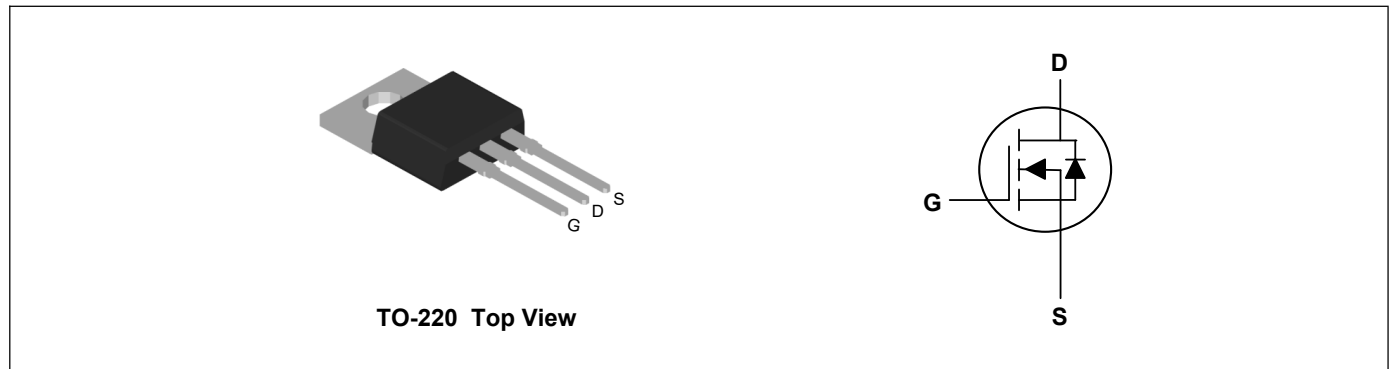
Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

Product Summary



| | | |
|-------------------------------------|-----|------------|
| V_{DS} | 80 | V |
| I_D | 210 | A |
| $R_{DS(ON)}$ Typ (at $V_{GS}=10V$) | 2.9 | m Ω |



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

| Parameter | Symbol | Rating | Units |
|--|-----------------------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 80 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ¹ | $I_D@T_C=25^\circ\text{C}$ | 210 | A |
| Continuous Drain Current ¹ | $I_D@T_C=100^\circ\text{C}$ | 142 | A |
| Pulsed Drain Current ² | I_{DM} | 840 | A |
| Single Pulse Avalanche Energy ³ | E_{AS} | 884 | mJ |
| Total Power Dissipation ⁴ | P_D | 179 | W |
| Storage Temperature Range | T_{STG} | -55 to 175 | $^\circ\text{C}$ |
| Operating Junction Temperature Range | T_J | -55 to 175 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Unit |
|--|-----------------|-----|------|---------------------------|
| Thermal Resistance Junction-Ambient ¹ | $R_{\theta JA}$ | --- | 62 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction-Case ¹ | $R_{\theta JC}$ | --- | 0.84 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics (T_J=25°C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|-----------------------------------|---------------------|--|-----|------|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250uA | 80 | --- | --- | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =20A | --- | 2.9 | 3.3 | mΩ |
| Gate Threshold Voltage | V _{GS(th)} | V _{GS} =V _{DS} , I _D =250uA | 2.5 | --- | 4.5 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =80V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| Gate Resistance | R _g | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 0.7 | --- | Ω |
| Total Gate Charge | Q _g | V _{DS} =40V, V _{GS} =10V, I _D =20A | --- | 108 | --- | nC |
| Gate-Source Charge | Q _{gs} | | --- | 28 | --- | |
| Gate-Drain Charge | Q _{gd} | | --- | 26 | --- | |
| Turn-On Delay Time | T _{d(on)} | V _{DS} =40V, V _{GS} =10V, R _G =10Ω, I _D =20A | --- | 24 | --- | ns |
| Rise Time | T _r | | --- | 53 | --- | |
| Turn-Off Delay Time | T _{d(off)} | | --- | 107 | --- | |
| Fall Time | T _f | | --- | 66 | --- | |
| Input Capacitance | C _{iss} | V _{DS} =40V, V _{GS} =0V, f=1MHz | --- | 7465 | --- | pF |
| Output Capacitance | C _{oss} | | --- | 1292 | --- | |
| Reverse Transfer Capacitance | C _{rss} | | --- | 43 | --- | |

Drain-Source Diode Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|------------------------------------|------------------|---|-----|-----|-----|------|
| Diode Forward Voltage ² | V _{SD} | V _{GS} =0V, I _F =1A, T _J =25°C | --- | --- | 1.1 | V |
| Reverse recovery time | t _{rr} | I _F =20A, diF/dt=200A/μs | --- | 52 | --- | ns |
| Reverse recovery charge | Q _{rr} | | --- | 137 | --- | nC |
| Peak reverse recovery current | I _{rrm} | | --- | 3.7 | --- | A |

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=10mH
4. The power dissipation is limited by 150°C junction temperature

Typical Characteristics

Diagram 1: Typ. Output characteristics

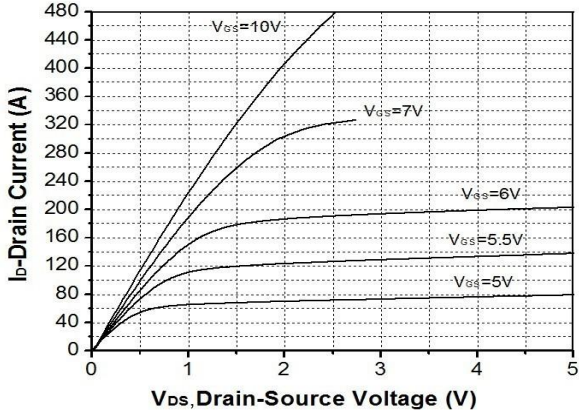


Diagram 2: Typ. Rdson – Drain Current

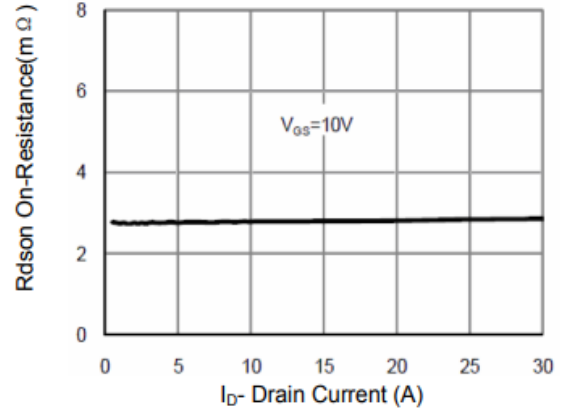


Diagram 3: Typ. Transfer characteristics

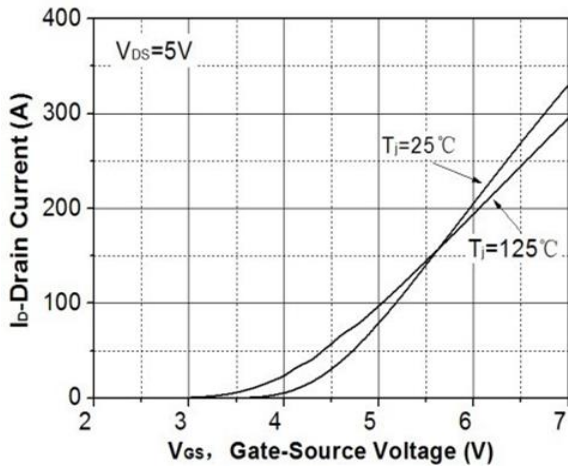


Diagram 4: Typ. Drain Current De-rating

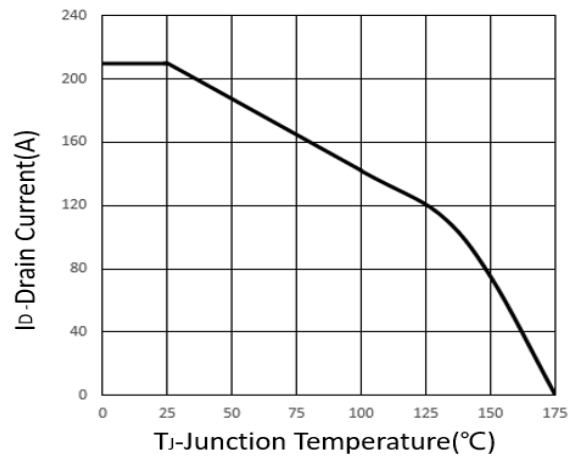


Diagram 5: Typ. Power Dissipation

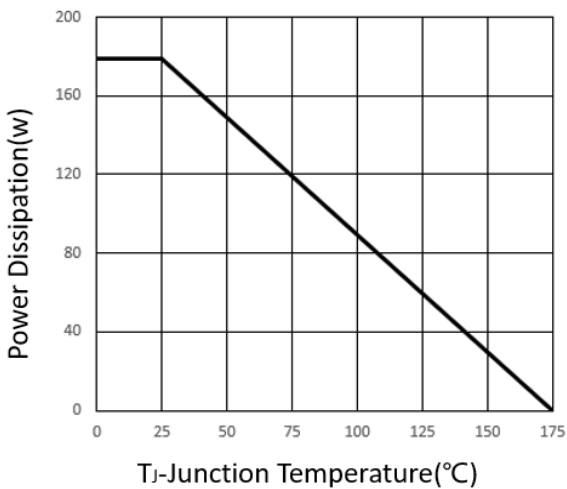


Diagram 6: Rdson – Junction Temperature

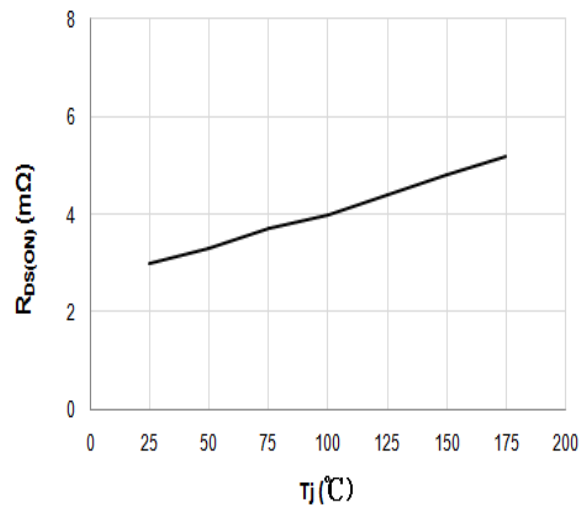


Diagram 7: Typ. Capacitances

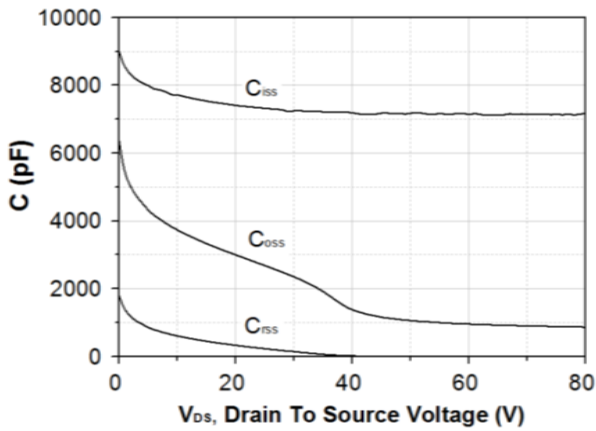


Diagram 8: Typ. Gate charge

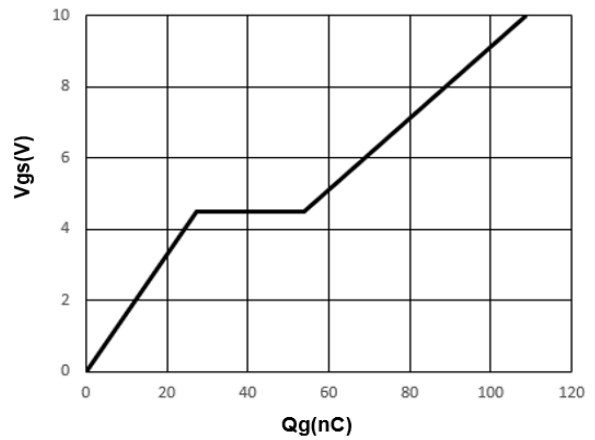


Diagram 9: Source – Drain Diode Forward

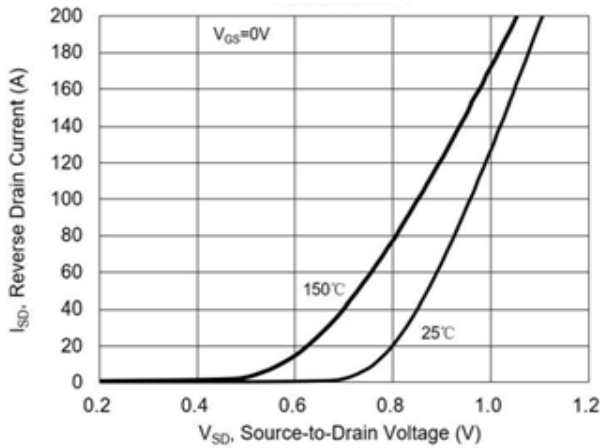


Diagram 10: Safe Operation Area

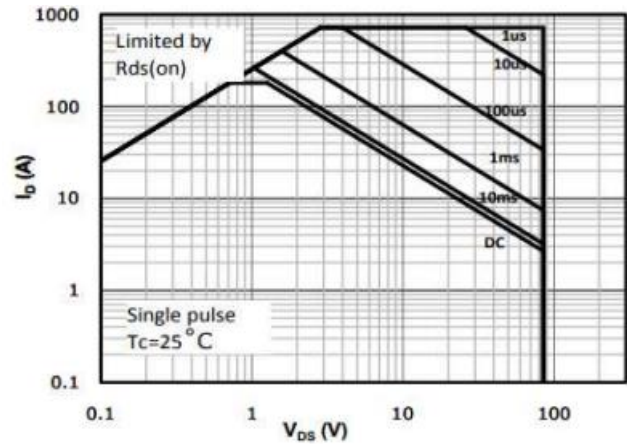
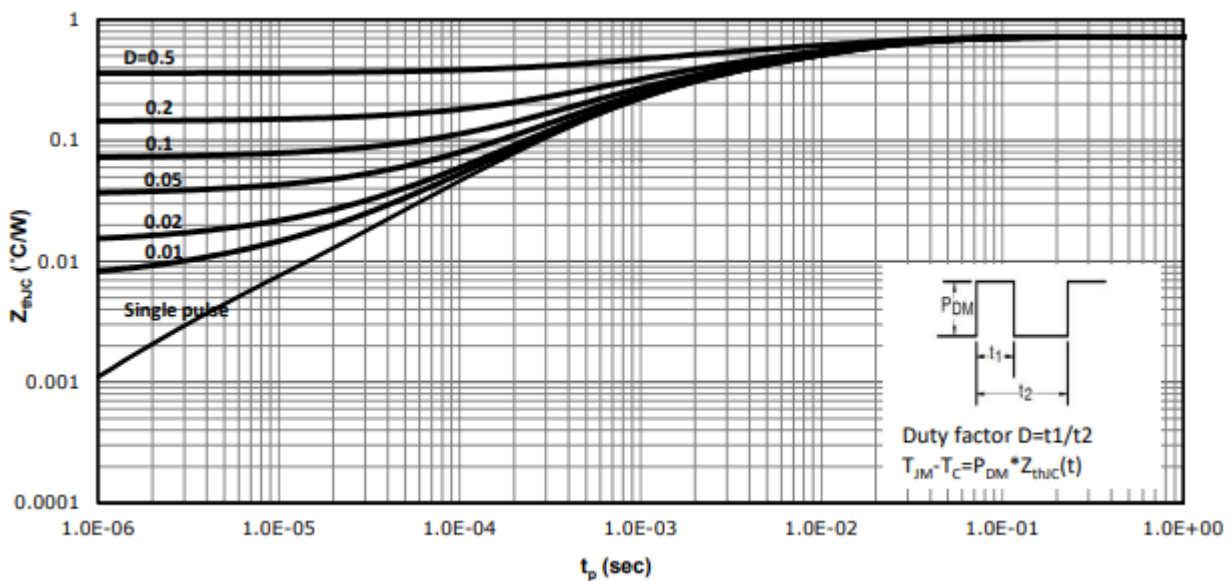
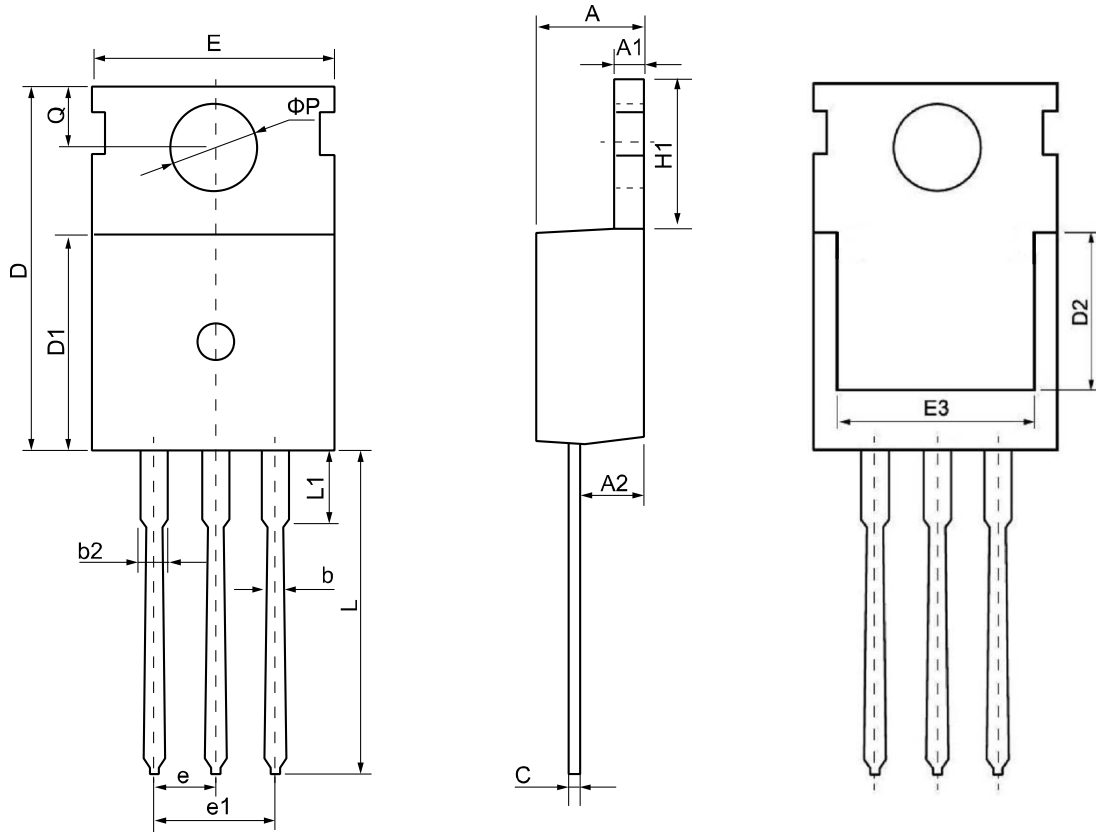


Figure 11: Normalized Maximum Transient Thermal Impedance



TO-220 Package Outline Dimensions



| Symbol | Dimensions (unit:mm) | | | Symbol | Dimensions (unit:mm) | | |
|-----------|----------------------|-------|-------|--------------|----------------------|-------|-------|
| | Min | Typ | Max | | Min | Typ | Max |
| A | 4.30 | 4.55 | 4.75 | E | 9.65 | 10.00 | 10.25 |
| A1 | 1.15 | 1.30 | 1.45 | E3 | 7.00 | -- | -- |
| A2 | 2.20 | 2.40 | 2.60 | e | 2.54 BSC | | |
| b | 0.70 | 0.80 | 0.95 | e1 | 5.08 BSC | | |
| b2 | 1.17 | 1.27 | 1.47 | H1 | 6.30 | 6.50 | 6.80 |
| c | 0.40 | 0.50 | 0.65 | L | 12.70 | 13.50 | 14.10 |
| D | 15.30 | 15.60 | 15.90 | L1 | -- | 3.20 | 3.95 |
| D1 | 8.90 | 9.10 | 9.35 | phi P | 3.40 | 3.60 | 3.80 |
| D2 | 5.50 | -- | -- | Q | 2.60 | 2.80 | 3.00 |

Printing Information

ATC =====Brand

XXXXXXX =====Material Code

XXYY =====XX Representative Year
 YY Representative Weeks