

Features

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

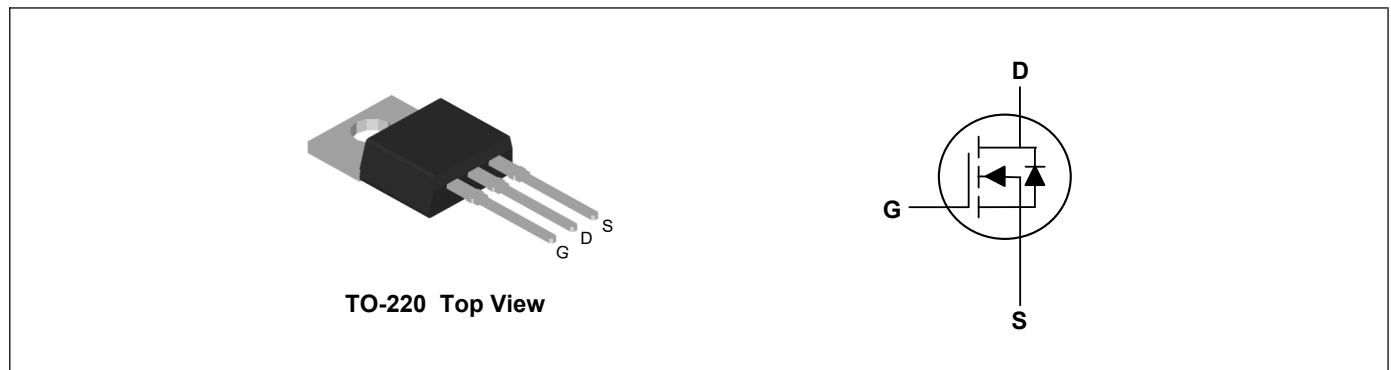
Product Summary



| | | |
|---------------------------------|-----|------------|
| V_{DS} | 120 | V |
| I_D | 60 | A |
| $R_{DS(ON)}$ (at $V_{GS}=10V$) | 11 | m Ω |

Applications

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



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

| Parameter | Symbol | Rating | Units |
|--|-------------------------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 120 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | 60 | A |
| Continuous Drain Current | $I_{D@T_C=100^\circ\text{C}}$ | 42.4 | A |
| Pulsed Drain Current | I_{DM} | 240 | A |
| Single Pulse Avalanche Energy ³ | EAS | 290 | mJ |
| Total Power Dissipation | P_D | 105 | 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-Case ¹ | $R_{\theta JC}$ | --- | 1.4 | $^\circ\text{C/W}$ |

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 | 120 | --- | --- | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =30A | --- | 10 | 11 | mΩ |
| Gate Threshold Voltage | V _{GS(th)} | V _{GS} =V _{DS} , I _D =250uA | 2.0 | 3.0 | 4.0 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =120V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| Forward Transconductance | g _{fs} | V _{DS} =5V, I _D =30A | --- | 40 | --- | S |
| Total Gate Charge | Q _g | V _{DS} =60V, V _{GS} =10V, I _D =30A | --- | 37 | --- | nC |
| Gate-Source Charge | Q _{gs} | | --- | 14 | --- | |
| Gate-Drain Charge | Q _{gd} | | --- | 8 | --- | |
| Turn-On Delay Time | T _{d(on)} | V _{DD} =50V, I _D =30A, V _{GS} =10V, R _G =3Ω | --- | 11 | --- | ns |
| Rise Time | T _r | | --- | 7.5 | --- | |
| Turn-Off Delay Time | T _{d(off)} | | --- | 26 | --- | |
| Fall Time | T _f | | --- | 4 | --- | |
| Input Capacitance | C _{iss} | V _{DS} =60V, V _{GS} =0V, f=1MHz | --- | 2500 | --- | pF |
| Output Capacitance | C _{oss} | | --- | 273 | --- | |
| Reverse Transfer Capacitance | C _{rss} | | --- | 27 | --- | |

Drain-Source Diode Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|-----------------|---|-----|-----|-----|------|
| Continuous Source Current ² | I _S | | --- | --- | 60 | A |
| Diode Forward Voltage ¹ | V _{SD} | V _{GS} =0V, I _F =60A, T _J =25°C | --- | --- | 1.2 | V |
| Reverse Recovery Time | t _{rr} | I _F =I _S , di/dt=100A/μs, T _J =25°C | --- | 58 | --- | nS |
| Reverse Recovery Charge | Q _{rr} | | --- | 149 | --- | nC |

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. ESD condition: T_J=25°C, V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25Ω

Typical Characteristics

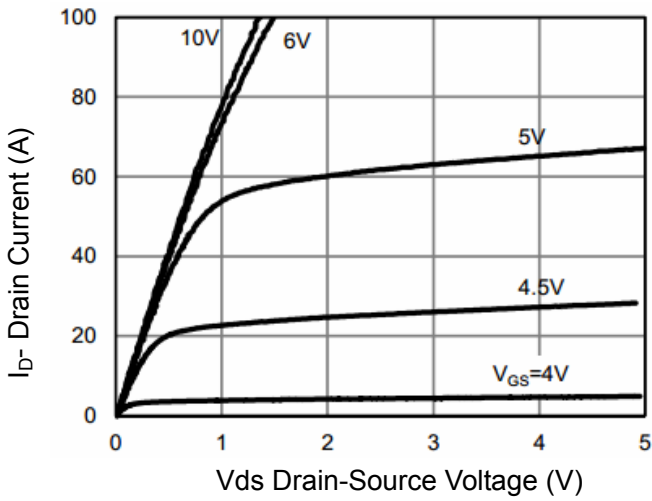


Figure 1 Output Characteristics

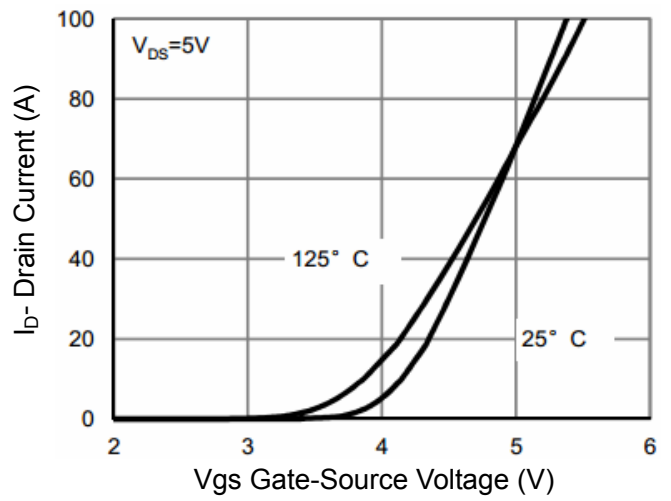


Figure 2 Transfer Characteristics

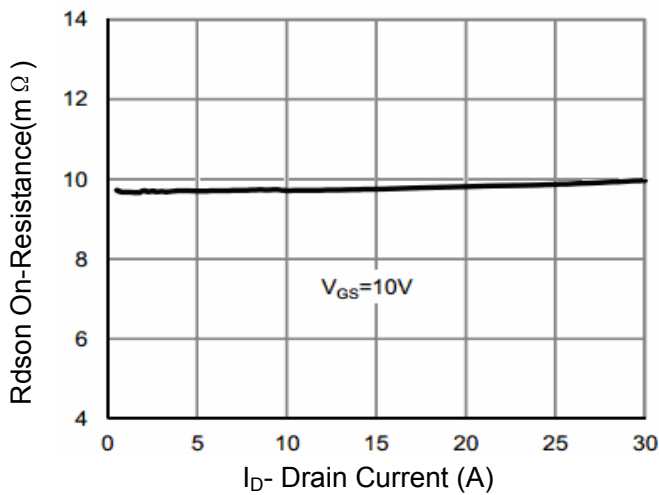


Figure 3 Rdson- Drain Current

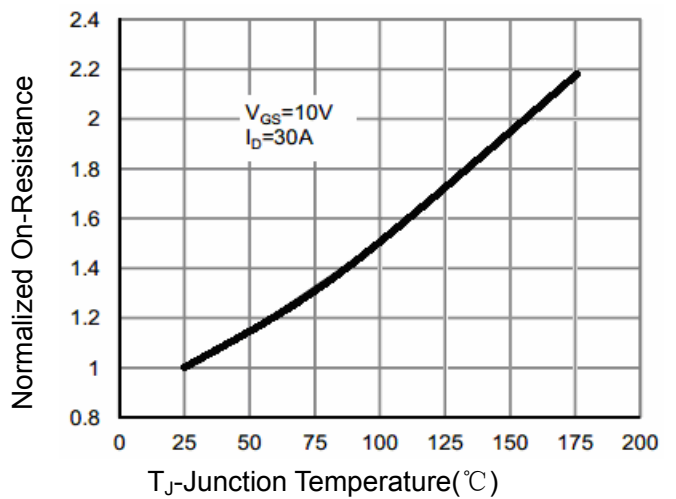


Figure 4 Rdson-Junction Temperature

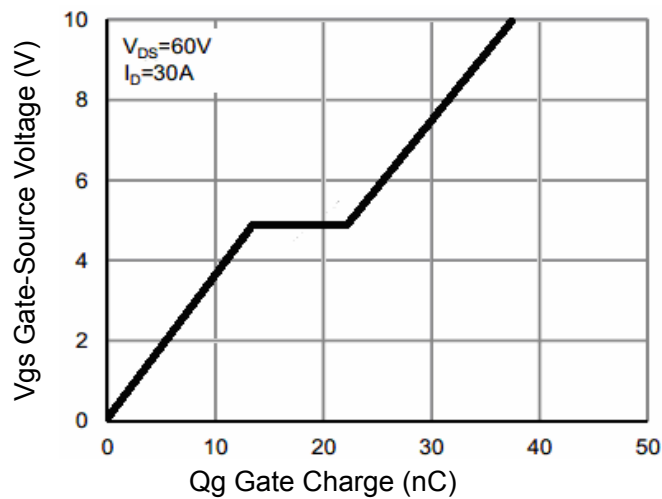


Figure 5 Gate Charge

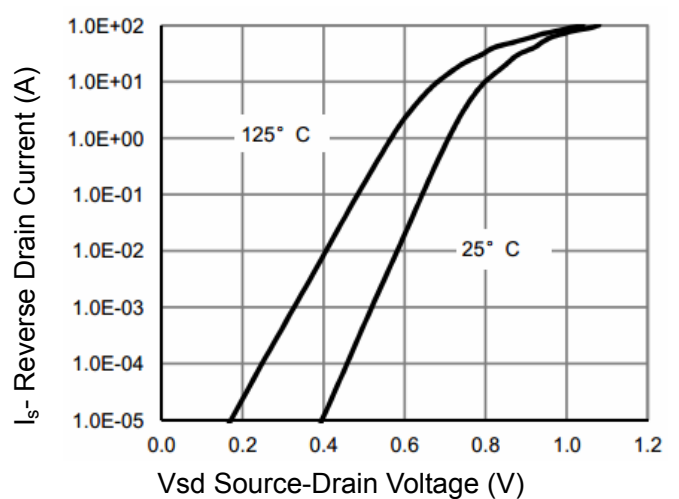


Figure 6 Source- Drain Diode Forward

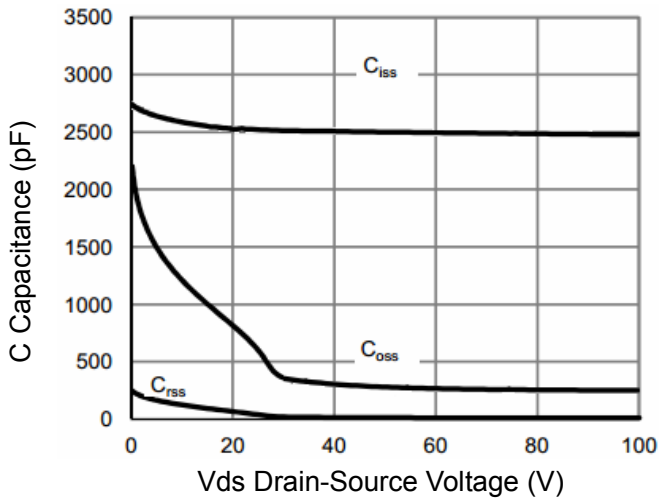


Figure 7 Capacitance vs Vds

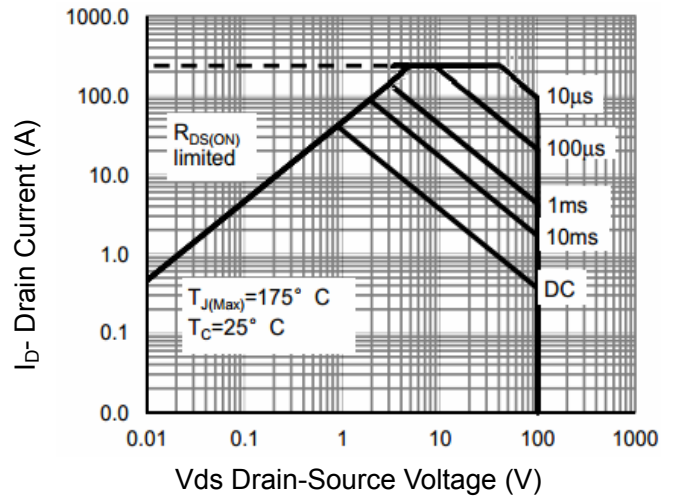


Figure 8 Safe Operation Area

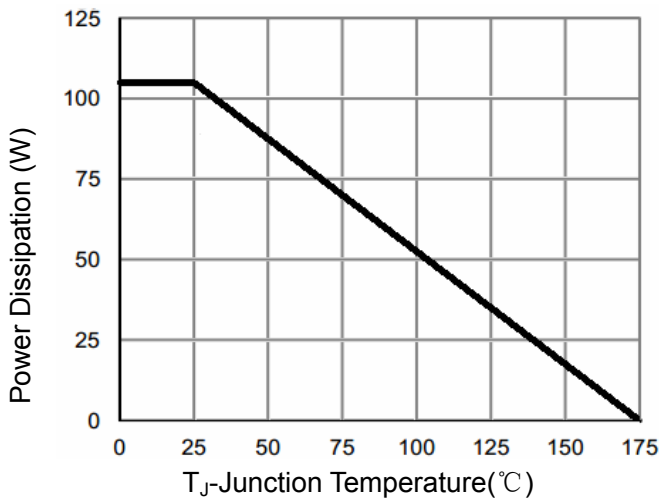


Figure 9 Power De-rating

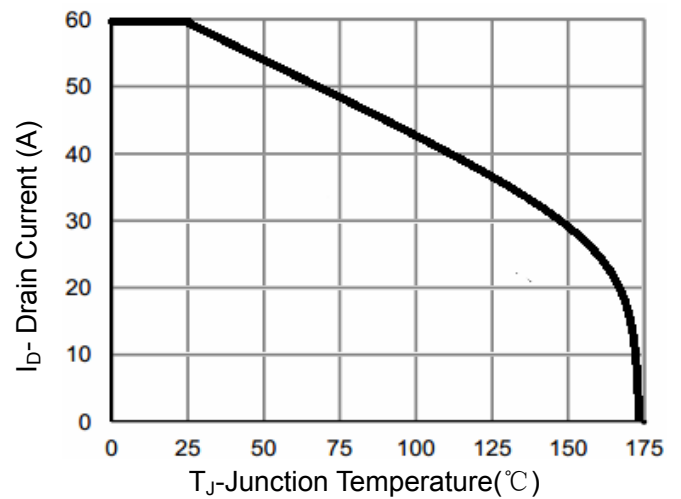


Figure 10 Current De-rating

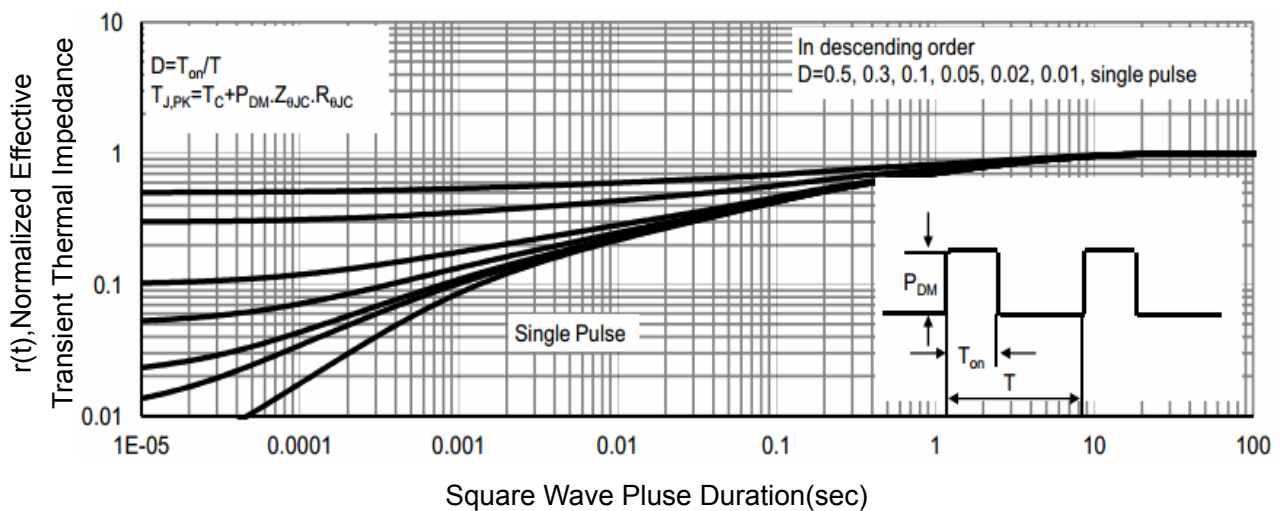
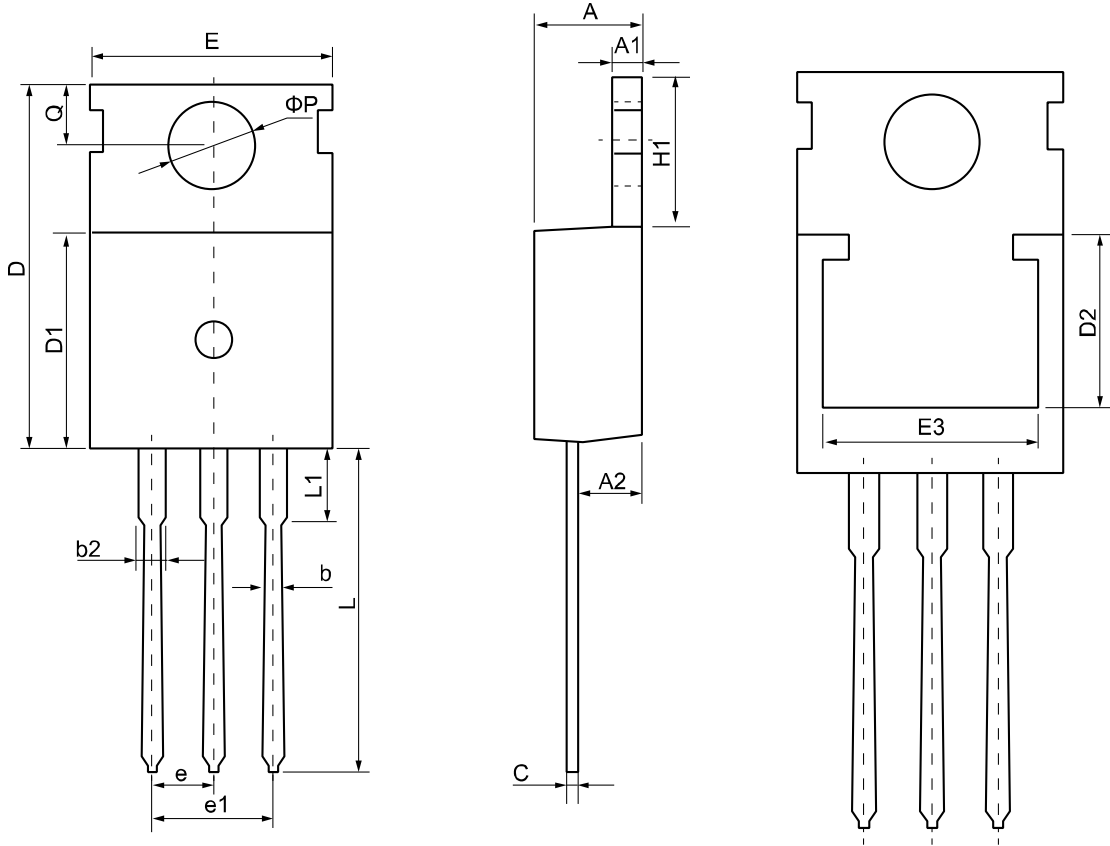


Figure 11 Normalized Maximum Transient Thermal Impedance

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 | φ P | 3.40 | 3.60 | 3.80 |
| D2 | 5.50 | -- | -- | Q | 2.60 | 2.80 | 3.00 |