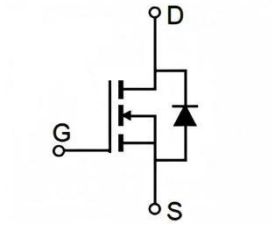
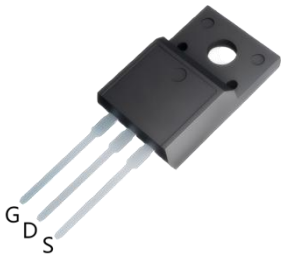
## N-Channel Super Junction MOSFET

| Parameter | Value | Unit |
|---|---|---|
| $V_{DS}$ | 600 | V |
| $R_{DS(max)}$ | 70 | mΩ |
| $I_D$ | 50 | A |




TO-220F

### Features

- Multi-layer Epitaxial Chip Technology
- Low On-Resistance
- 100% avalanche tested

### Applications

- Adapter
- DC-DC Converters
- PFC Power Supply Stages
- Switching Applications

### Absolute Maximum Ratings ($T_C$=25℃,unless otherwise noted)

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 600 | V |
| $V_{GS}$ | Gate-Source Voltage | ±30 | V |
| $I_D$ | Continuous Drain Current ($T_C$=25℃) | 50* | A |
| | Continuous Drain Current ($T_C$=100℃) | 31.6* | A |
| $I_{DM}$ | Pulsed Drain Current | 200* | A |
| $E_{AS}$ | Single Pulse Avalanche Energy (Note 1) | 600 | mJ |
| $P_D$ | Total Power Dissipation ($T_C$=25℃) | 40 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | 150 | ℃ |

* Drain current limited by maximum junction temperature.

### Thermal Data

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient | 62.5 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case | 3.13 | ℃/W |

## Electrical Characteristics($T_J$=25℃,unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 600 | -- | -- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10V , $I_D$=15A | -- | 56 | 70 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$=250uA | 3 | -- | 5 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=600V , $V_{GS}$=0V | -- | -- | 13 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±30V , $V_{DS}$=0V | -- | -- | ±100 | nA |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=10V , $I_D$=15A | -- | 27 | -- | S |
| $R_g$ | Total Gate Charge | $I_D$=45A<br>$V_{DS}$=480V<br>$V_{GS}$=10V | -- | 88 | -- | nC |
| $Q_g$ | Gate-Source Charge | | -- | 28 | -- | |
| $Q_{gs}$ | Gate-Drain Charge | | -- | 35 | -- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=300V<br>$V_{GS}$=10V, $I_D$=50A<br>$R_G$=2Ω | -- | 33 | -- | ns |
| $T_r$ | Rise Time | | -- | 160 | -- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | -- | 76 | -- | |
| $T_f$ | Fall Time | | -- | 5 | -- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=100V, $V_{GS}$=0V<br>f=1MHz | -- | 3600 | -- | pF |
| $C_{oss}$ | Output Capacitance | | -- | 150 | -- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | -- | 5 | -- | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V, Force Current | -- | -- | 50 | A |
| $I_{SM}$ | Pulsed Source Current | | -- | -- | 200 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V, $I_S$=30A | -- | 0.88 | 1.4 | V |
| $t_{rr}$ | Reverse Recovery Time | $V_{DD}$=100V, $I_S$=50A<br>dIF/dt=100A/μs | -- | 280 | -- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | -- | 2.69 | -- | μC |

Note :
1..The EAS data shows Max. rating . The test condition is VDD=50V , VGS=10V , L=5mH , I D=15.5A

## Typical Characteristics

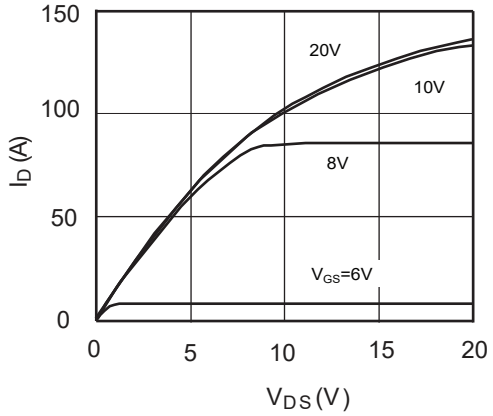



Fig 1. Output Characteristics

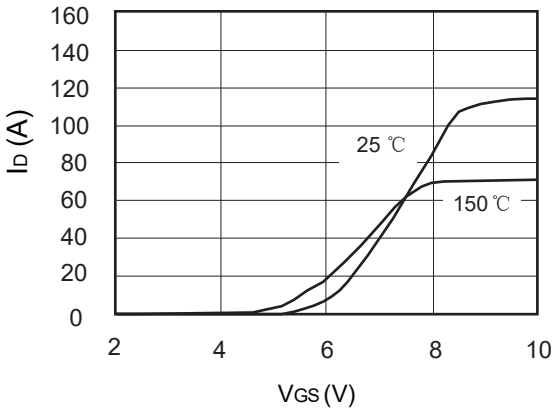



Fig 2. transfer characteristics

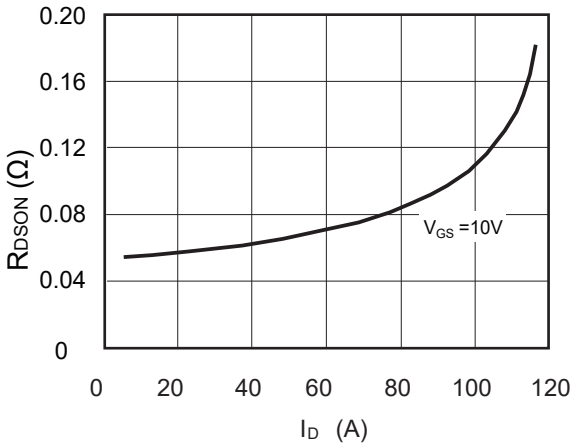



Fig 3. drain-source on-resistance

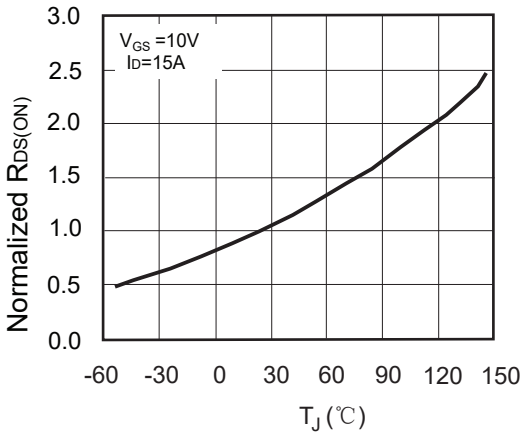



Fig 4.On-Resistance vs. Junction Temperature

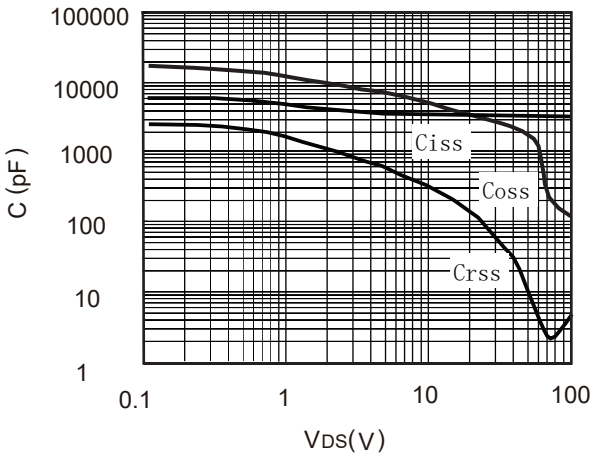



Fig 5. Capacitance Characteristics

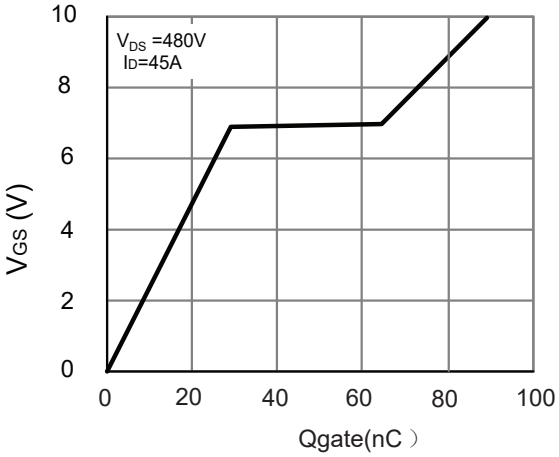



Fig 6. Gate charge vs gate-source voltage

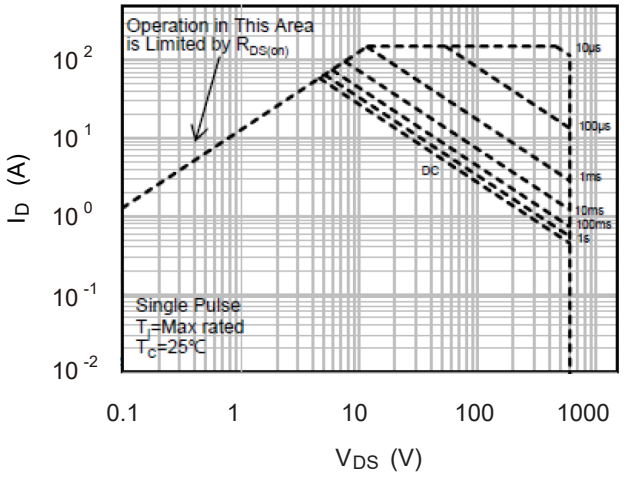
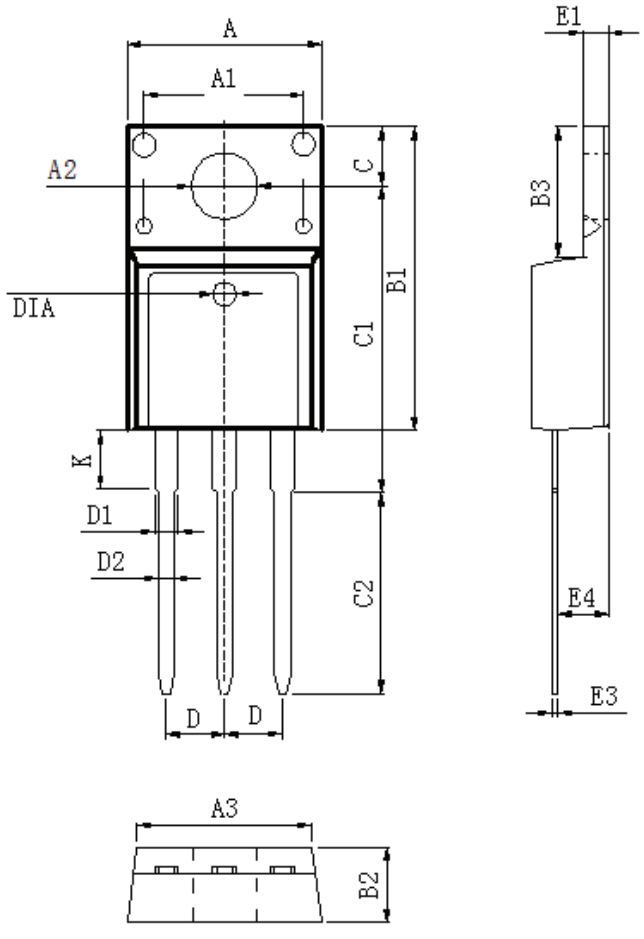



Fig 7. Safe Operating Area

## Package Outline(Unit :mm)

### TO-220F




| DIM | MILLIMETERS |
|---|---|
| A | 10.16±0.3 |
| A1 | 7.00±0.1 |
| A2 | 3.3±0.2 |
| A3 | 9.5±0.2 |
| B1 | 15.87±0.3 |
| B2 | 4.7±0.2 |
| B3 | 6.68±0.4 |
| C | 3.3±0.2 |
| C1 | 12.57±0.3 |
| C2 | 10.02±0.5 |
| D | 2.54±0.05 |
| D1 | 1.28±0.2 |
| D2 | 0.8±0.1 |
| K | 3.1±0.3 |
| E1 | 2.54±0.1 |
| E3 | 0.5±0.1 |
| E4 | 2.76±0.2 |
| DIA | ⊙1.5(deep 0.2) |

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