

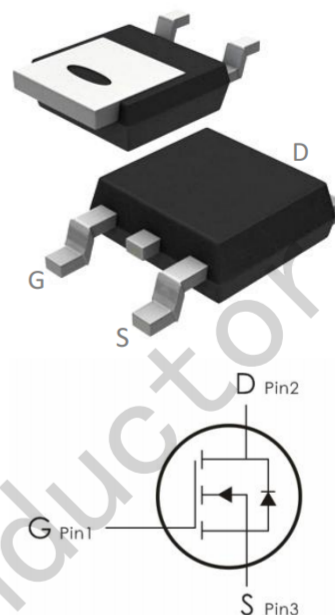
Description:

This N-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=36A, R_{DS(ON)}<20m\ \Omega$ @ $V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



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

| Symbol | Parameter | Ratings | Units |
|----------------|---|-------------|------------|
| V_{DS} | Drain-Source Voltage | 100 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Continuous Drain Current ¹⁾ , $T_C=25^\circ C$ | 36 | A |
| $I_{D, pulse}$ | Pulsed drain current ²⁾ , $T_C=25^\circ C$ | 90 | A |
| I_S | Continuous diode forward current ¹⁾ , $T_C=25^\circ C$ | 30 | A |
| $I_{S, pulse}$ | Diode pulsed current ²⁾ , $T_C=25^\circ C$ | 90 | A |
| P_D | Power dissipation ³⁾ , $T_C=25^\circ C$ | 71 | W |
| E_{AS} | Single pulsed avalanche energy ⁵⁾ | 57 | mJ |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ C$ |

Thermal Characteristics:

| Symbol | Parameter | Max | Units |
|-----------------|---|------|--------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 1.76 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient ⁴⁾ | 62 | |

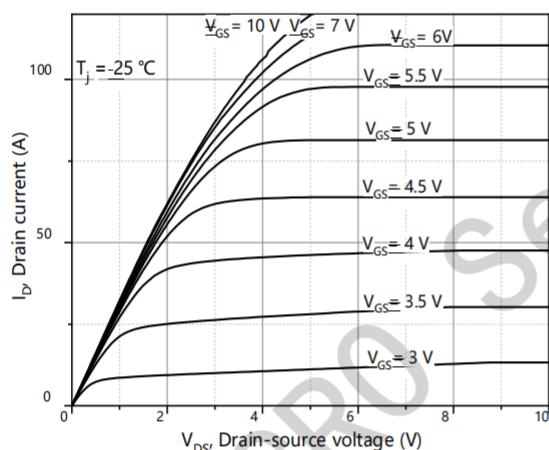
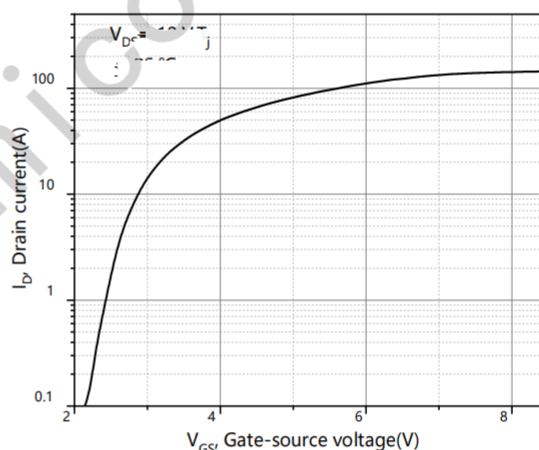
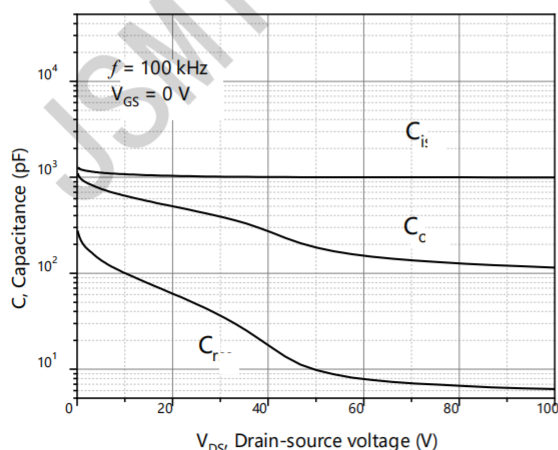
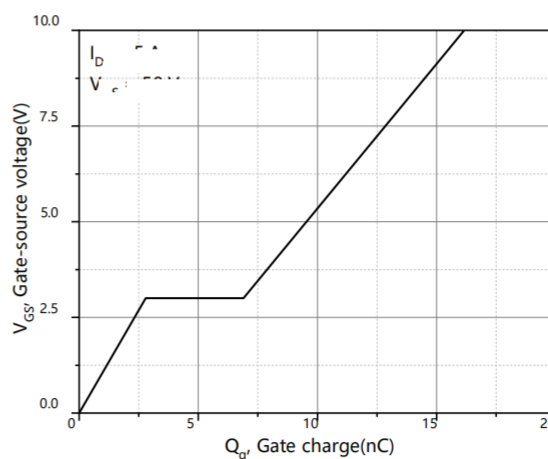
Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

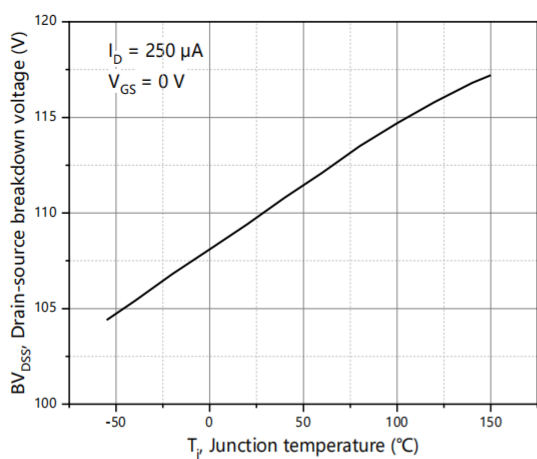
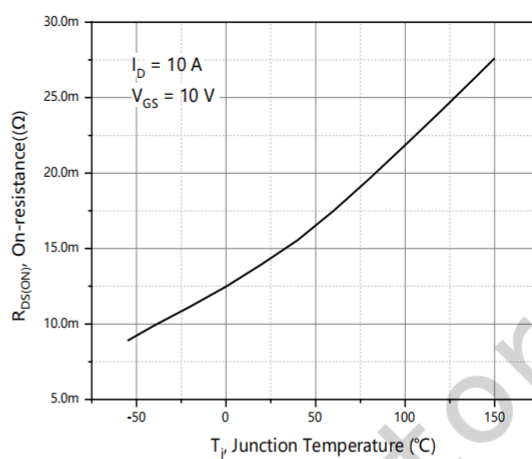
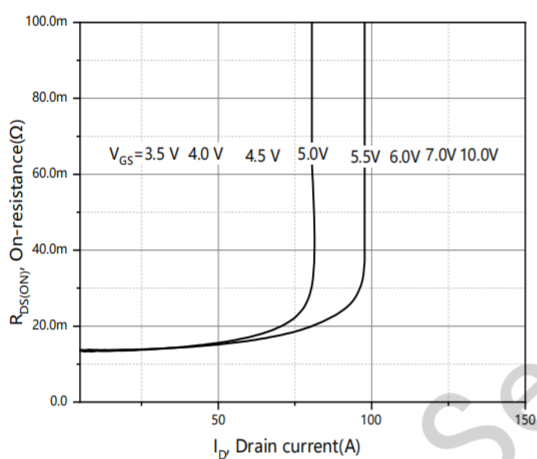
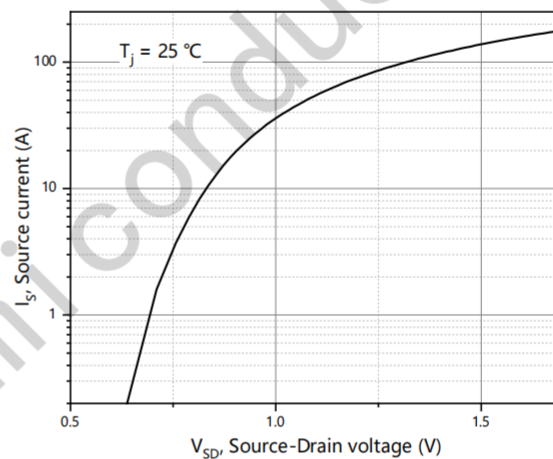
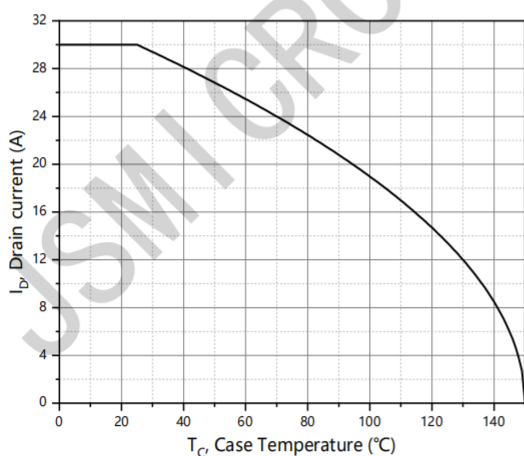
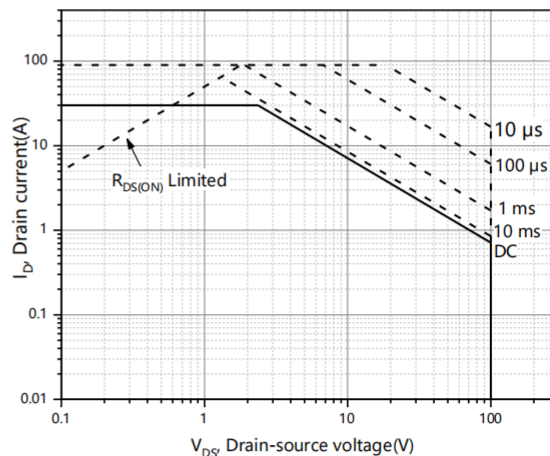
| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|------------------------------------|--|-----|------|-----------|---------------|
| Off Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\ \mu\text{A}$ | 100 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{GS}=0V, V_{DS}=100V$ | --- | --- | 1 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0A$ | --- | --- | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$ | 1.4 | --- | 2.5 | V |
| $R_{DS(on)}$ | Drain-Source On Resistance | $V_{GS}=10V, I_D=10A$ | --- | 13.8 | 20 | m Ω |
| | | $V_{GS}=4.5V, I_D=7A$ | --- | 17.4 | 26 | |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=50V, V_{GS}=0V, f=100\text{KHz}$ | --- | 1000 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 180 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 9.5 | --- | |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}=50V, I_D=5A, V_{GS}=10V, R_G=10\Omega$ | --- | 16.6 | -- | ns |
| t_r | Rise Time | | --- | 3.8 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | --- | 75.5 | --- | ns |
| t_f | Fall Time | | --- | 46 | --- | ns |
| Q_g | Total Gate Charge | | --- | 16.2 | --- | nC |
| Q_{gs} | Gate-Source Charge | $V_{GS}=10V, V_{DS}=50V, I_D=5A$ | --- | 2.8 | --- | nC |
| Q_{gd} | Gate-Drain Charge | | --- | 4.1 | --- | nC |
| $V_{plateau}$ | Gate plateau voltage | | --- | 3 | --- | V |
| Drain-Source Diode Characteristics | | | | | | |
| V_{SD} | Source-Drain Diode Forward Voltage | $V_{GS}=0V, I_S=12A$ | --- | --- | 1.3 | V |

| | | | | | | |
|------------------------|-------------------------------|---|------|------|------|-----|
| trr | Reverse Recovery Time | $V_R=50\text{ V}, I_S=5\text{ A},$ $di/dt=100\text{ A}/\mu\text{ s}$ | ---- | 49 | ---- | Nsn |
| qrr | Reverse Recovery Charge | | ---- | 61.8 | ---- | c |
| I_{rmm} | Peak reverse recovery current | | | 2.4 | | A |

Notes:

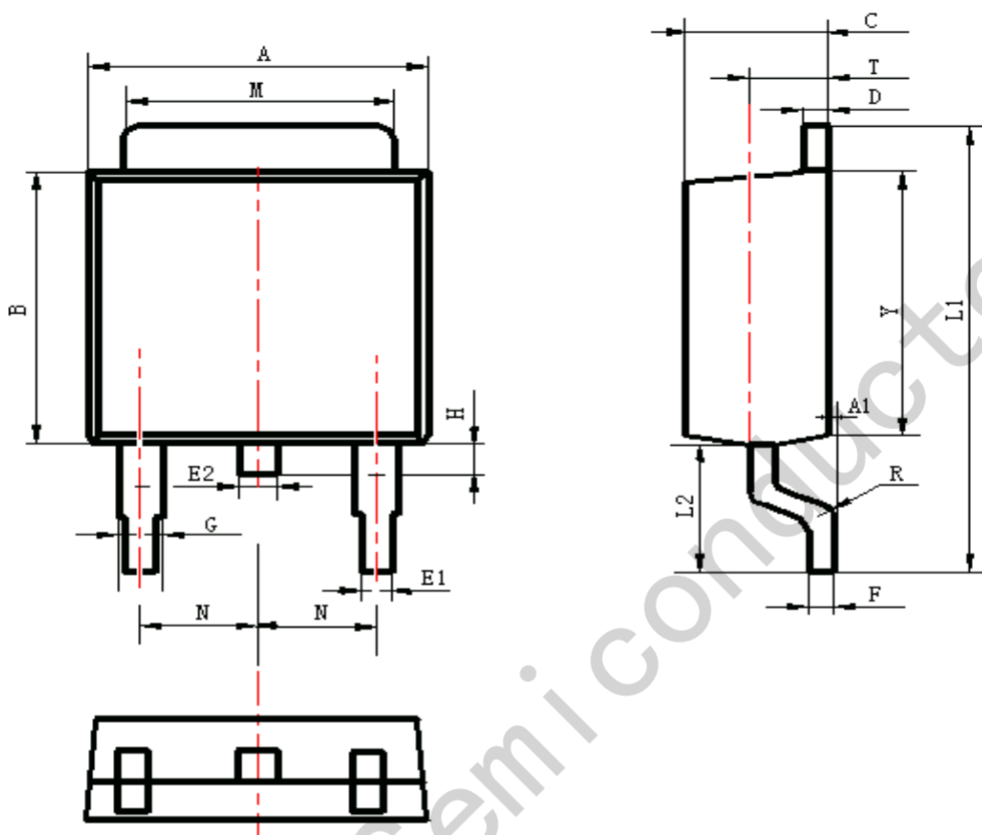
- 1)2 Calculated continuous current based on maximum allowable junction temperature.
- 3) Repetitive rating; pulse width limited by max. junction temperature.
- 4)5 Pd is based on max. junction temperature, using junction-case thermal resistance.
-) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25\text{ }^\circ\text{C}$.
 $V_{DD}=50\text{ V}, V_{GS}=10\text{ V}, L=0.3\text{ mH}$, starting $T_j=25\text{ }^\circ\text{C}$.

Typical Characteristics: ($T_C=25\text{ }^\circ\text{C}$ unless otherwise noted)

Figure 1. Typ. output characteristics

Figure 2. Typ. transfer characteristics

Figure 3. Typ. capacitances

Figure 4. Typ. gate charge


Figure 5. Drain-source breakdown voltage

Figure 6. Drain-source on-state resistance

Figure 7. Drain-source on-state resistance

Figure 8. Forward characteristic of body diode

Figure 9. Drain current

Figure 10. Safe operation area $T_C=25\text{ }^\circ\text{C}$

Package Information

TO-252



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 6.30 | 6.90 | 0.248 | 0.272 |
| A1 | 0.00 | 0.16 | 0.000 | 0.006 |
| B | 5.70 | 6.30 | 0.224 | 0.248 |
| C | 2.10 | 2.50 | 0.083 | 0.098 |
| D | 0.30 | 0.70 | 0.012 | 0.028 |
| E1 | 0.60 | 0.90 | 0.024 | 0.035 |
| E2 | 0.70 | 1.00 | 0.028 | 0.039 |
| F | 0.30 | 0.60 | 0.012 | 0.024 |
| G | 0.70 | 1.20 | 0.028 | 0.047 |
| L1 | 9.60 | 10.50 | 0.378 | 0.413 |
| L2 | 2.70 | 3.10 | 0.106 | 0.122 |
| H | 0.40 | 1.00 | 0.016 | 0.039 |
| M | 5.10 | 5.50 | 0.201 | 0.217 |
| N | 2.09 | 2.49 | 0.082 | 0.098 |
| R | 0.30 | | 0.012 | |
| T | 1.40 | 1.60 | 0.055 | 0.063 |
| Y | 5.10 | 6.30 | 0.201 | 0.248 |

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