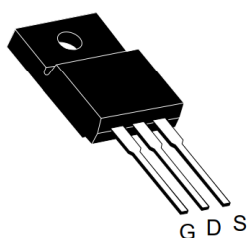


N-Channel 900 V (D-S) MOSFET

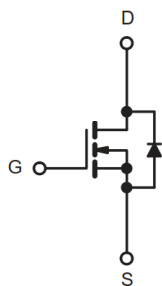
PRODUCT SUMMARY

| V_{DS} (V) | $R_{DS(on)}$ (m Ω)(Typ.) | I_D (A) | Q_g (Typ.) |
|--------------|----------------------------------|-----------|--------------|
| 900 | 280 at $V_{GS} = 10$ V | 12 | 54 nC |

TO-220 FULLPAK



Top View



N-Channel MOSFET

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS tested
- Low $R_{DS(on)}$ × FOM
- Extremely low switching loss
- Excellent stability and uniformity

APPLICATIONS

- PC power
- LED lighting
- Telecom power
- Server power
- EV Charger
- Solar/UPS



RoHS
COMPLIANT

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|----------------|-------------|------|
| Drain-Source Voltage(Typ.) | V_{DS} | 900 | V |
| Gate-Source Voltage | V_{GS} | ± 30 | |
| Continuous Drain Current ($T_J = 150$ °C) ^a | I_D | 12 | A |
| | | 7.6 | |
| Pulsed Drain Current ^b | I_{DM} | 36 | |
| Single Avalanche Energy | E_{AS} | 360 | mJ |
| Maximum Power Dissipation ^c | P_D | 34 | W |
| | | 13.6 | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | °C |

THERMAL RESISTANCE RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|------------|-------|------|
| Junction-to-Ambient (PCB Mount) ^d | R_{thJA} | 63 | °C/W |
| Junction-to-Case (Drain) | R_{thJC} | 3.67 | |

Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{thJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25$ °C.

| SPECIFICATIONS (T _J = 25 °C, unless otherwise noted) | | | | | | |
|---|---------------------|--|------|------|-------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{DS} | V _{GS} = 0 V, I _D = 250 μA | 900 | - | - | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 2 | - | 4 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ± 30 V | - | - | ± 100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 900 V, V _{GS} = 0 V | - | - | 1 | μA |
| Drain-Source On-State Resistance ^a | R _{DS(on)} | V _{GS} = 10 V, I _D = 6 A | - | 280 | 340 | mΩ |
| | | V _{GS} = 10 V, I _D = 6 A, T _j =150 °C | - | 980 | - | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 10 V, I _D = 6 A | - | 12 | - | S |
| Dynamic ^b | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = 50 V, f = 100 KHz | - | 2786 | - | pF |
| Output Capacitance | C _{oss} | | - | 94 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 4 | - | |
| Total Gate Charge ^c | Q _g | V _{DS} = 400 V, V _{GS} = 10 V, I _D = 10 A | - | 54 | - | nC |
| Gate-Source Charge ^c | Q _{gs} | | - | 15.6 | - | |
| Gate-Drain Charge ^c | Q _{gd} | | - | 14.5 | - | |
| Gate Resistance | R _g | f = 1 MHz | - | 17 | - | Ω |
| Turn-On Delay Time ^c | t _{d(on)} | V _{DD} = 400 V, I _D = 10 A, V _{GEN} = 10 V, R _g = 2 Ω | - | 50 | - | ns |
| Rise Time ^c | t _r | | - | 32 | - | |
| Turn-Off Delay Time ^c | t _{d(off)} | | - | 120 | - | |
| Fall Time ^c | t _f | | - | 27 | - | |
| Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C) | | | | | | |
| Continuous Source Current | I _S | T _C = 25 °C | - | - | 12 | A |
| Pulsed Current (t = 100 μs) | I _{SM} | | - | - | 36 | A |
| Forward Voltage ^a | V _{SD} | I _S = 12 A, V _{GS} = 0 V | - | - | 1.3 | V |
| Reverse Recovery Time | t _{rr} | V _R = 400 V I _S = 10 A, di/dt = 100 A/μs | - | 300 | - | ns |
| Reverse Recovery Charge | Q _{rr} | | - | 4.2 | - | μC |
| Peak reverse recovery current | I _{rrm} | | - | 25.5 | - | A |

Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

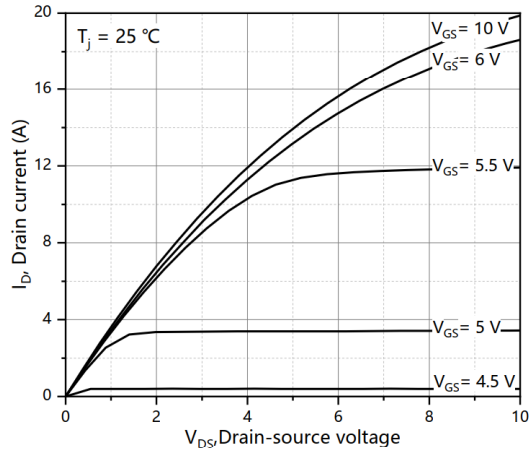


Figure 1. Typ. output characteristics

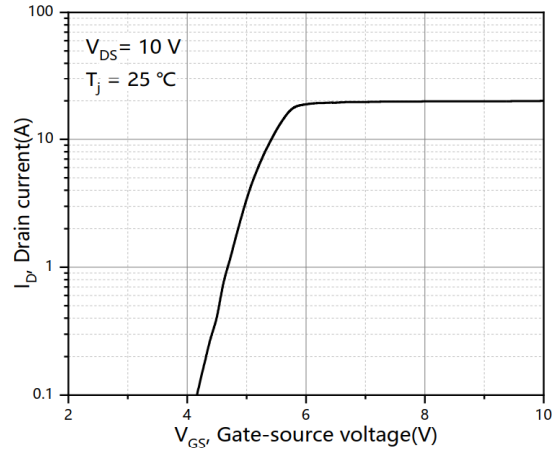


Figure 2. Typ. transfer characteristics

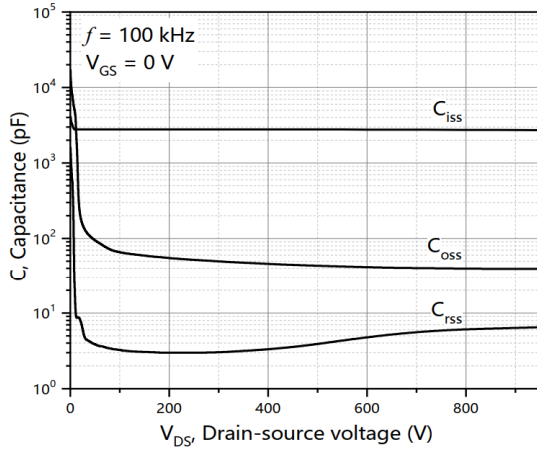


Figure 3. Typ. capacitances

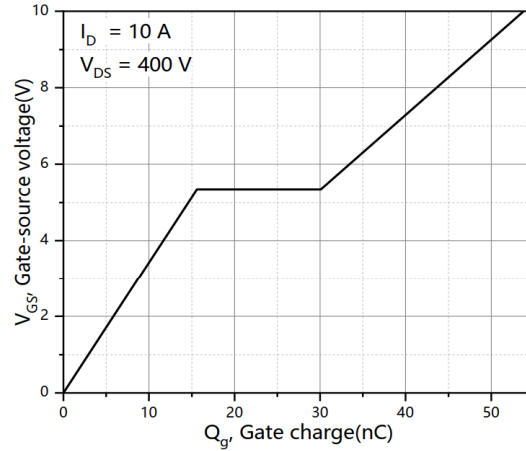


Figure 4. Typ. gate charge

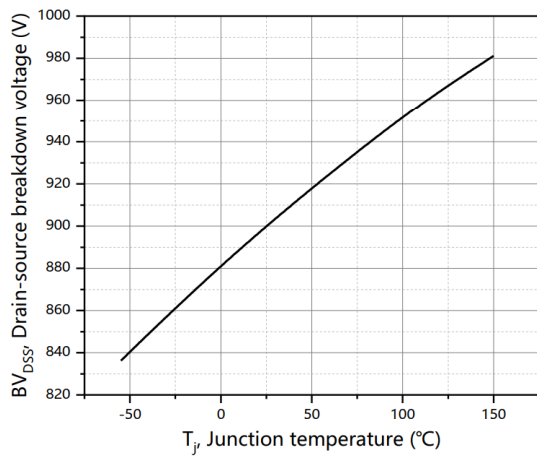


Figure 5. Drain-source breakdown voltage

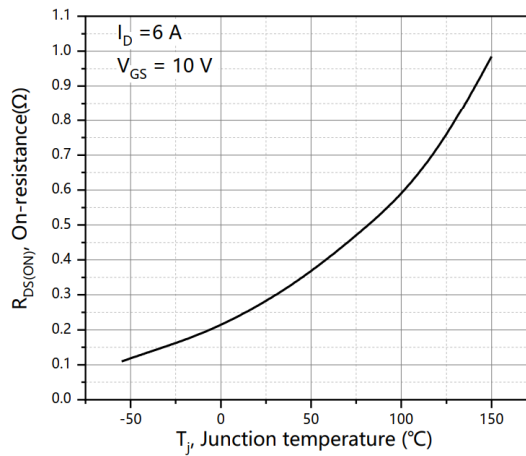


Figure 6. Drain-source on-state resistance

TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

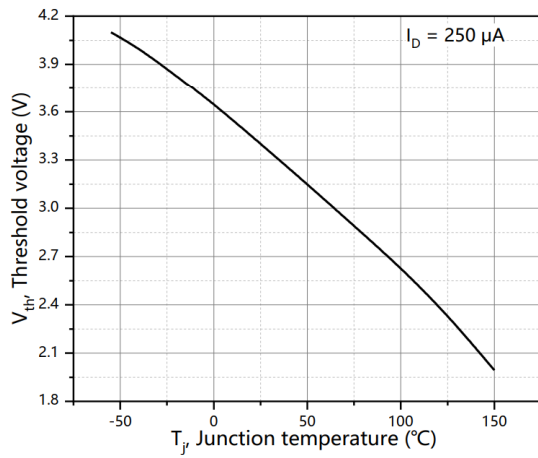


Figure 7. Threshold voltage

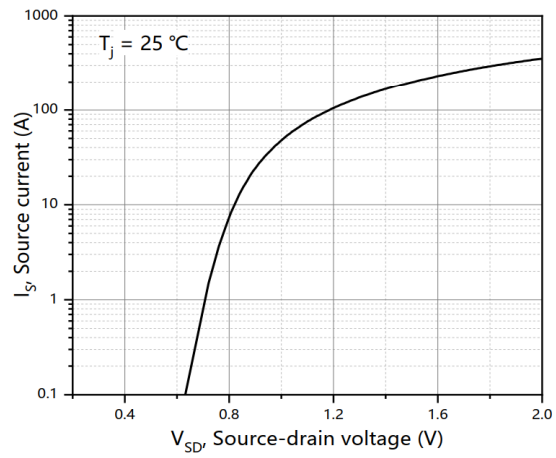


Figure 8. Forward characteristic of body diode

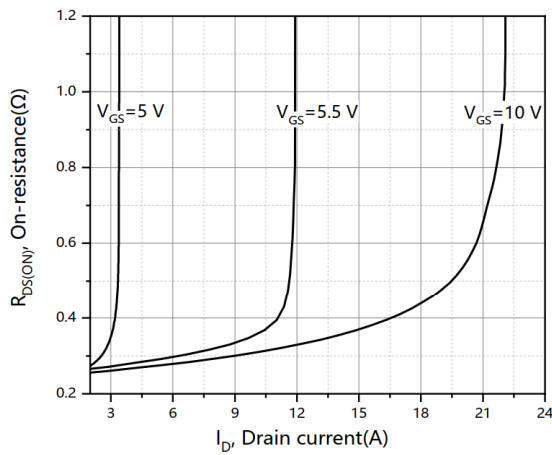


Figure 9. Drain-source on-state resistance

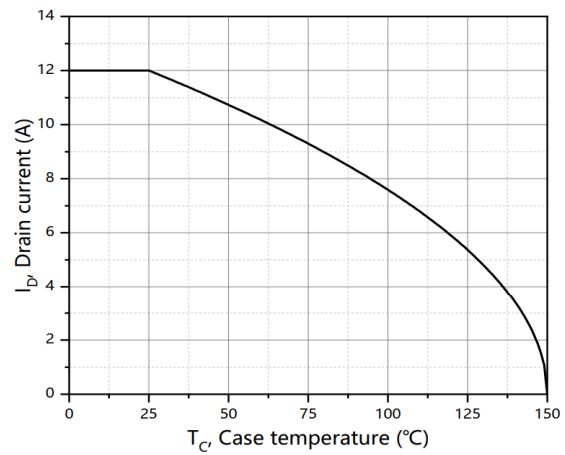


Figure 10. Drain current

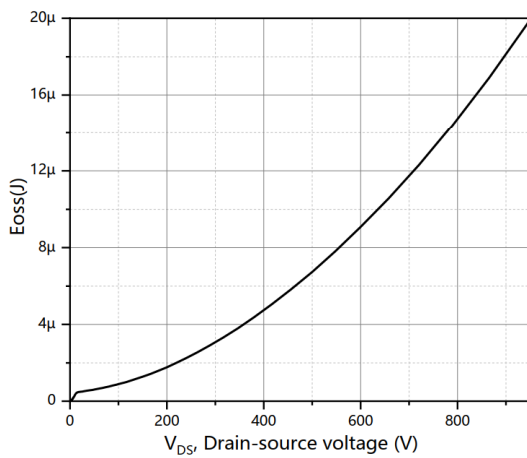


Figure 11. Typ. coss stored energy

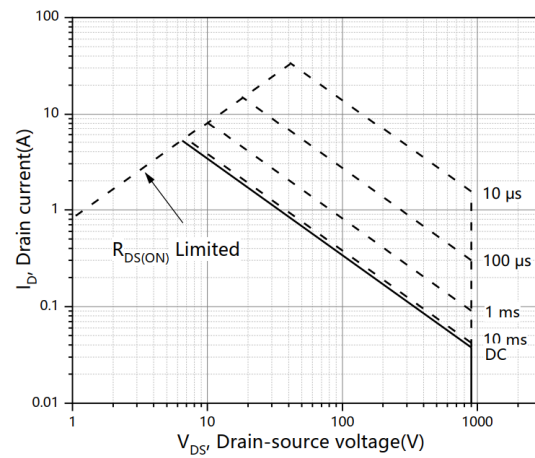
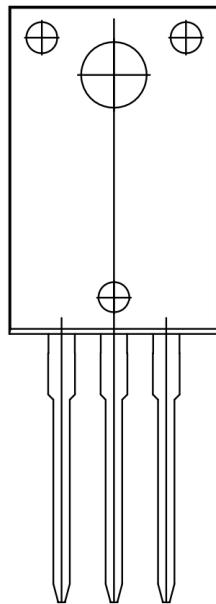
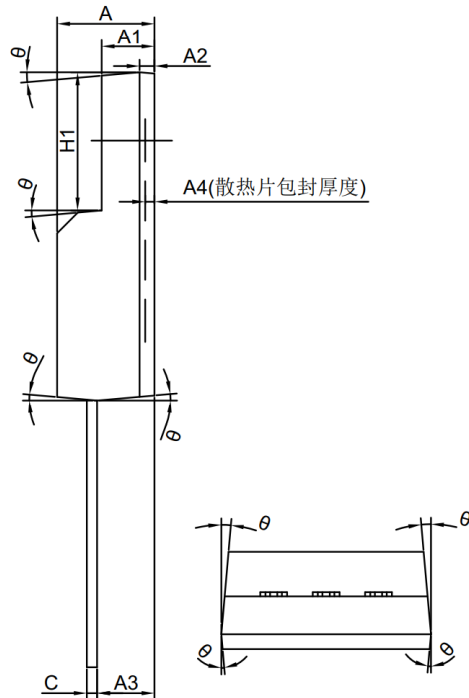
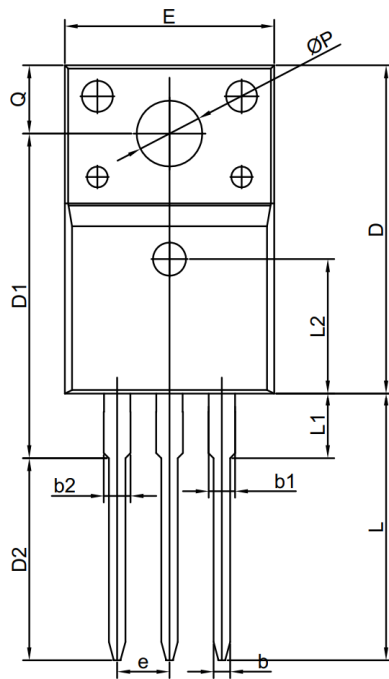


Figure 12. Safe operation area $T_c=25\text{ }^{\circ}\text{C}$

TO-220F-3L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN | NOM | MAX |
|----------|----------|-------|-------|
| A | 4.30 | 4.72 | 5.10 |
| A1 | 2.25 | 2.56 | 2.90 |
| A2 | 0.72 REF | | |
| A3 | 2.28 | 2.78 | 3.50 |
| A4 | 0.45 MAX | | |
| b | 0.65 | - | 0.95 |
| b1 | 1.00 | - | 1.55 |
| b2 | - | - | 1.55 |
| c | 0.40 | 0.50 | 0.65 |
| D | 15.47 | 15.87 | 16.37 |
| D1 | 15.35 | 15.75 | 16.25 |
| E | 9.76 | 10.16 | 10.76 |
| e | 2.54 BSC | | |
| H1 | 6.28 | 6.68 | 7.08 |
| L | 12.48 | 12.98 | 13.50 |
| L1 | 2.90 | - | 3.80 |
| L2 | 2.54 BSC | | |
| ØP | 2.98 | 3.18 | 3.50 |
| Q | 3.00 | - | 3.60 |
| θ | 3° | 5° | 7° |

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