

N-Channel Enhancement Mode MOSFET

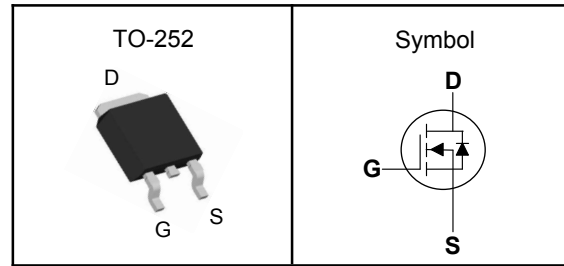
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



| | | |
|------------------|-----|------------|
| V_{DSS} | 60 | V |
| $R_{DS(ON)-Typ}$ | 9.5 | m Ω |
| I_D | 75 | A |

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$, Unless Otherwise Noted)

| Symbol | Parameter | N-Channel | Unit |
|--------------|----------------------------------------------------|------------|------------------|
| V_{DSS} | Drain-Source Voltage | 60 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | V |
| T_J | Maximum Junction Temperature | -55 to 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| E_{AS} | Single Pulse Avalanche Energy ₃ (L=1mH) | 460 | mJ |
| $I_{DM}^{①}$ | 300 μs Pulse Drain Current Tested | 290 | A |
| I_D | Continuous Drain Current | 75 | A |
| P_D | Maximum Power Dissipation | 110 | W |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|--------------------------------------------------|--------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ₁ | 50 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ₁ | 2.5 | $^\circ\text{C}/\text{W}$ |

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$.

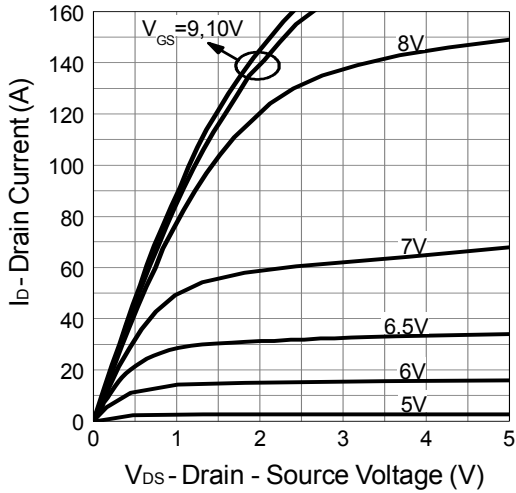
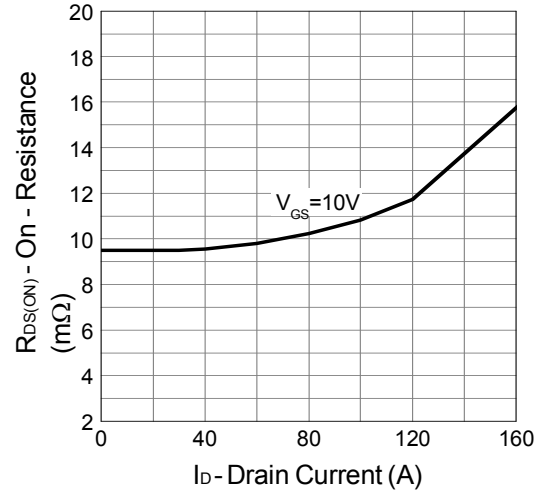
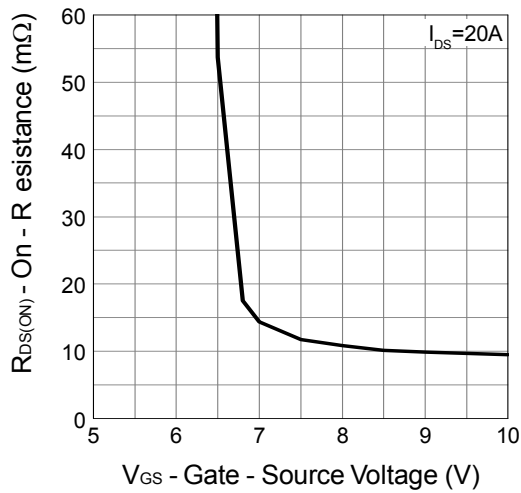
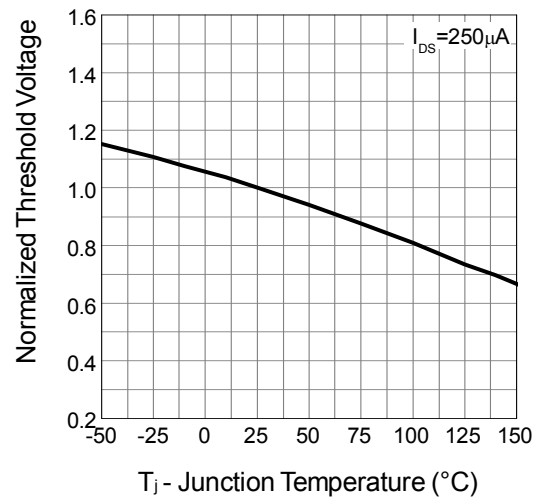
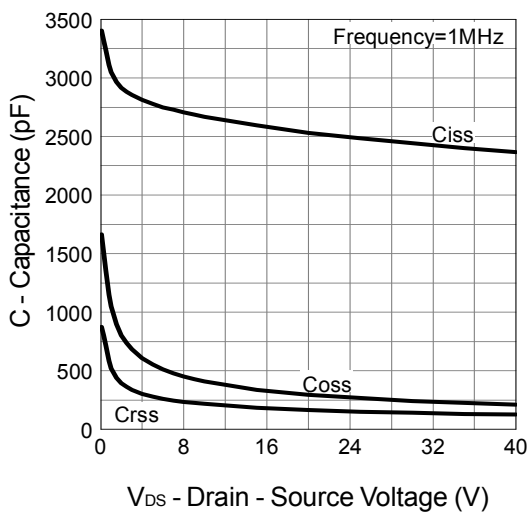
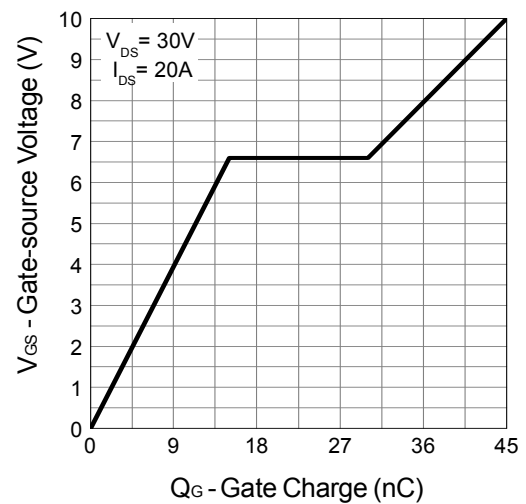
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|----------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------|-----|------|-----------|------------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250mA$ | 60 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=48V, V_{GS}=0V$ | --- | --- | 1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | --- | 4 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=20A$ | --- | 9.5 | 12.5 | m Ω |
| Dynamic Characteristics ^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=30V,$ Freq.=1MHz | --- | 2400 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 245 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 140 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DD}=30V, R_L=30\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=6\Omega$ | --- | 20 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 18 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 50 | --- | |
| T_f | Turn-off Fall Time | | --- | 25 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=30V,$ $V_{GS}=10V, I_{DS}=20A$ | --- | 45 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 15 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 15 | --- | |
| Source-Drain Characteristics ($T_J=25^\circ\text{C}$) | | | | | | |
| V_{SD} | Diode Forward Voltage _z | $V_{GS}=0V, I_S=20A, T_J=25^\circ\text{C}$ | --- | 0.85 | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $I_S=20A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$ | --- | 45 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 60 | --- | nC |

Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

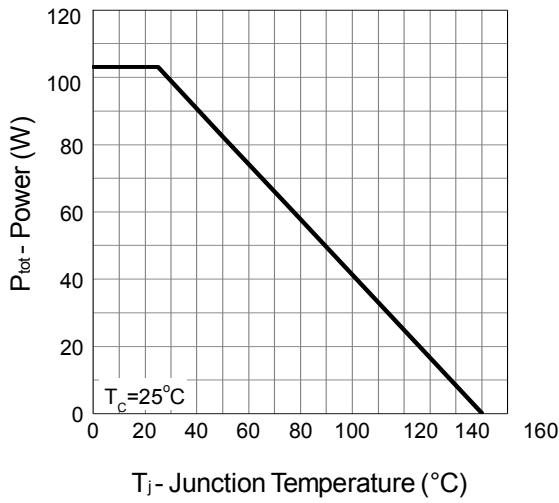
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET
Typical Characteristics
Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage

Capacitance

Gate Charge


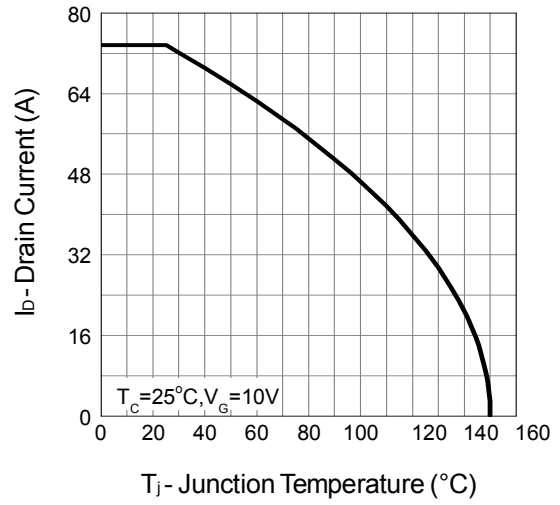


N-Channel Enhancement Mode MOSFET

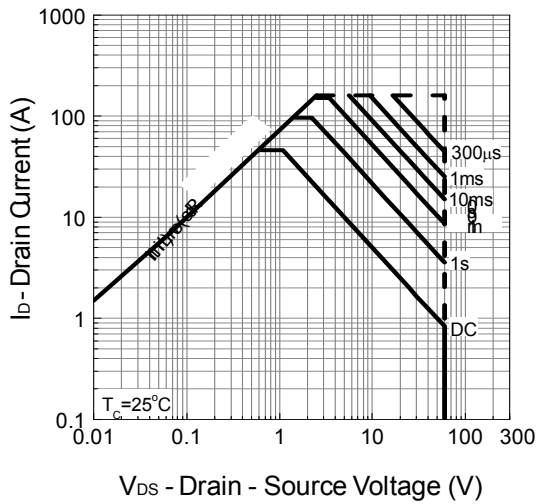
Power Dissipation



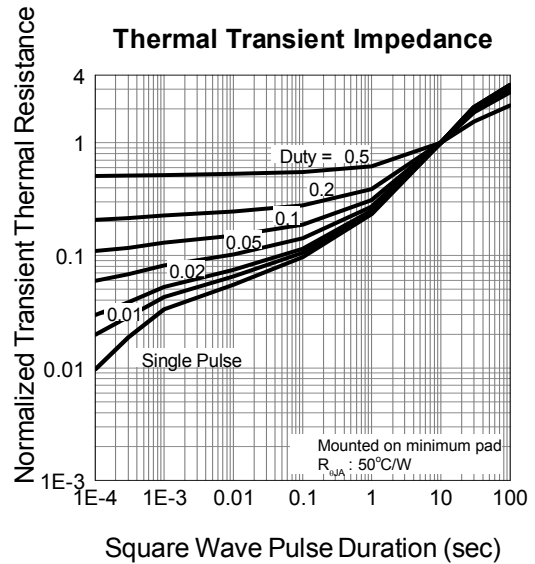
Drain Current



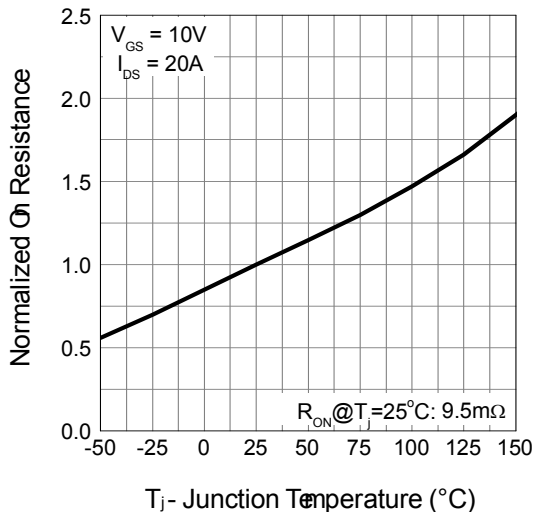
Safe Operation Area



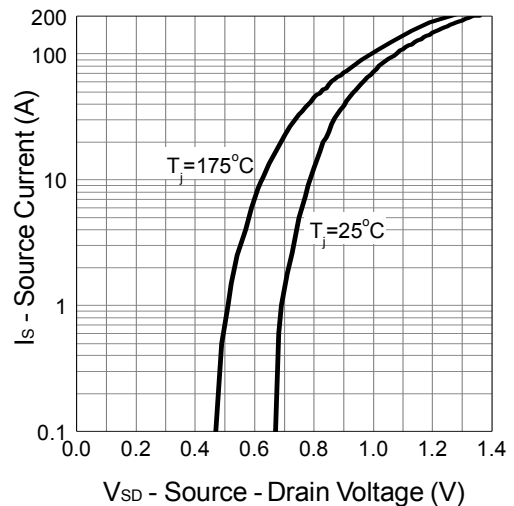
Thermal Transient Impedance

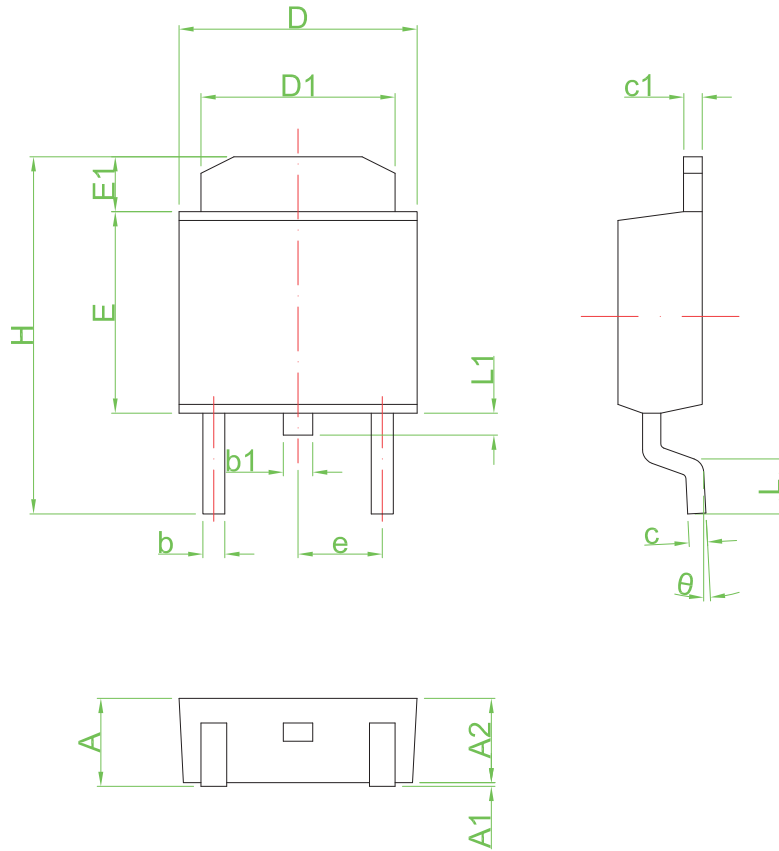


Drain-Source On Resistance



Source-Drain Diode Forward



N-Channel Enhancement Mode MOSFET
TO-252 Package Outline Dimensions


| Symbol | Dimensions in Millimeters | | Dimensions in Inches | |
|--------|---------------------------|------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 2.25 | 2.65 | 0.089 | 0.104 |
| A1 | 0.00 | 0.15 | 0.000 | 0.006 |
| A2 | 2.20 | 2.40 | 0.087 | 0.094 |
| b | 0.50 | 0.70 | 0.020 | 0.028 |
| b1 | 0.70 | 0.90 | 0.028 | 0.035 |
| c | 0.46 | 0.66 | 0.018 | 0.026 |
| c1 | 0.46 | 0.66 | 0.018 | 0.026 |
| D | 6.30 | 6.70 | 0.248 | 0.264 |
| D1 | 5.20 | 5.40 | 0.205 | 0.213 |
| E | 5.30 | 5.70 | 0.209 | 0.224 |
| E1 | 1.40 | 1.60 | 0.055 | 0.063 |
| H | 9.40 | 9.90 | 0.370 | 0.390 |
| e | 2.30 TYP | | 0.09 TYP | |
| L | 1.40 | 1.77 | 0.055 | 0.070 |
| L1 | 0.50 | 0.70 | 0.020 | 0.028 |
| theta | 0° | 8° | 0° | 8° |