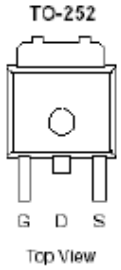
# N-Channel 100-V (D-S) MOSFET

**Key Features:**
- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

**Typical Applications:**
- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ (mΩ) | $I_D$(A) |
| 100 | 280 @ $V_{GS}$ = 10V | 11 |
| | 355 @ $V_{GS}$ = 4.5V | 10 |

Pb-free
RoHS
COMPLIANT
HALOGEN
FREE




| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | |
|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Limit** | **Units** |
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | 11 | A |
| Pulsed Drain Current [b] | | $I_{DM}$ | 50 | |
| Continuous Source Current (Diode Conduction) | | $I_S$ | 28 | A |
| Power Dissipation | $T_C$=25°C | $P_D$ | 50 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | -55 to 175 | °C |

| THERMAL RESISTANCE RATINGS | | | |
|---|---|---|---|
| **Parameter** | **Symbol** | **Maximum** | **Units** |
| Maximum Junction-to-Ambient [a] | $R_{\theta JA}$ | 40 | °C/W |
| Maximum Junction-to-Case | $R_{\theta JC}$ | 3 | |

Notes

a. Surface Mounted on 1” x 1” FR4 Board, drain pad using 2 oz copper, value dependent on PC board thermal characteristics

b. Pulse width limited by maximum junction temperature

## Typical Electrical Characteristics

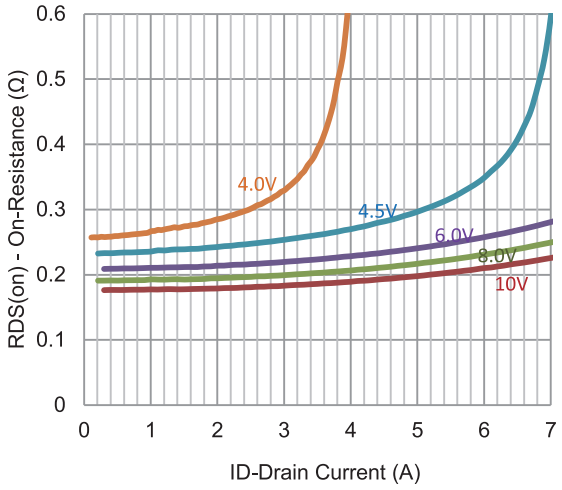
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, ID = 250 uA | 1 | | 3.5 | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = 20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 80 V, $V_{GS}$ = 0 V | | | 1 | uA |
| | | $V_{DS}$ = 80 V, $V_{GS}$ = 0 V, $T_J$ = 55°C | | | 25 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}$ = 5 V, $V_{GS}$ = 10 V | 34 | | | A |
| Drain-Source On-Resistance | $r_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 4.5 A | | | 280 | mΩ |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 4 A | | | 355 | |
| Forward Transconductance | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 4.5 A | | 5 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$ = 14 A, $V_{GS}$ = 0 V | | 0.95 | | V |
| **Dynamic** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 50 V, $V_{GS}$ = 4.5 V, $I_D$ = 4.5 A | | 3.8 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.3 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 1.7 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 50 V, $R_L$ = 14.3 Ω , $I_D$ = 4.5 A, $V_{GEN}$ = 10 V, $R_{GEN}$ = 6 Ω | | 4.8 | | nS |
| Rise Time | $t_r$ | | | 3.9 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 12.7 | | |
| Fall Time | $t_f$ | | | 3.2 | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V, f =1 MHz | | 332 | | pF |
| Output Capacitance | $C_{oss}$ | | | 40 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 29 | | |
| Gate Resistance | $R_g$ | f = 1 MHz | | 0.3 | | Ω |

Notes

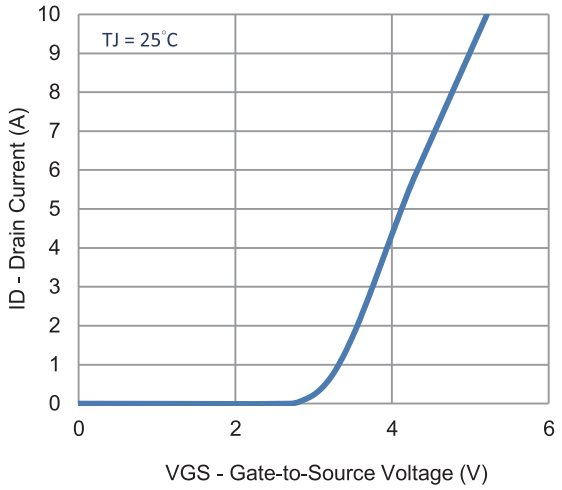
a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

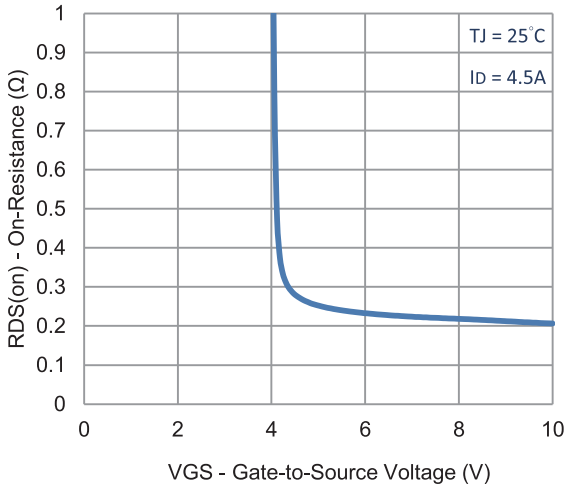
## Typical Electrical Characteristics



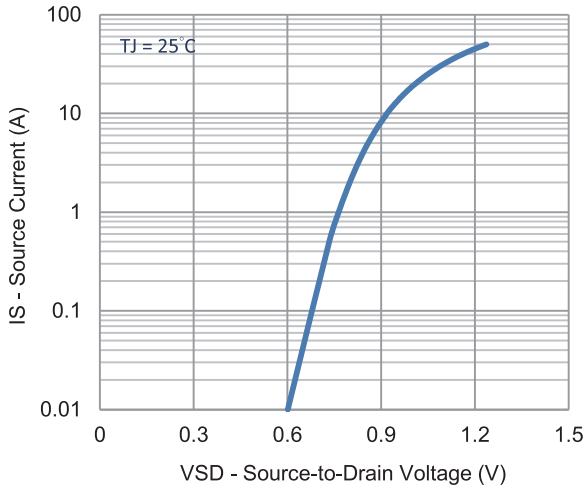

**1. On-Resistance vs. Drain Current**



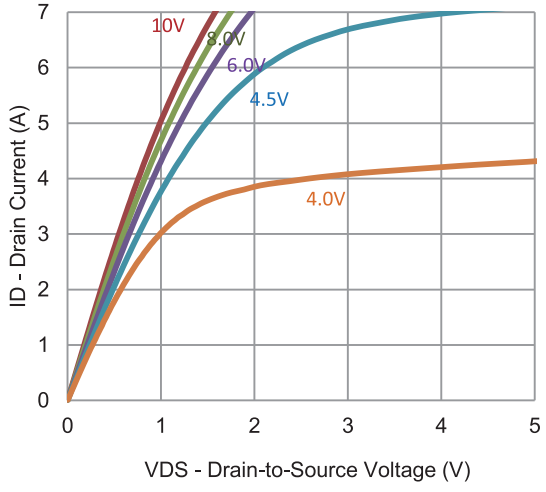

**2. Transfer Characteristics**



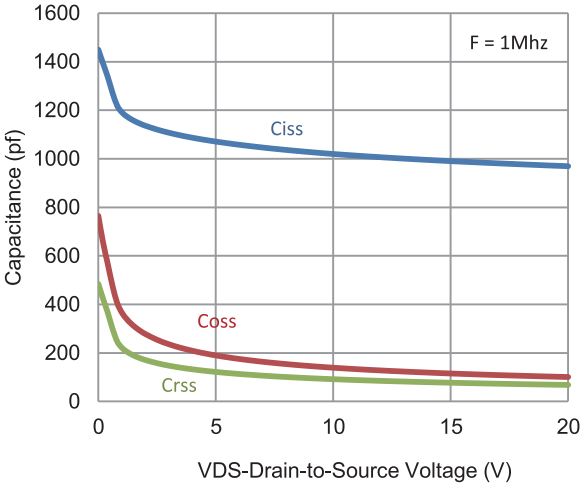

**3. On-Resistance vs. Gate-to-Source Voltage**




**4. Drain-to-Source Forward Voltage**

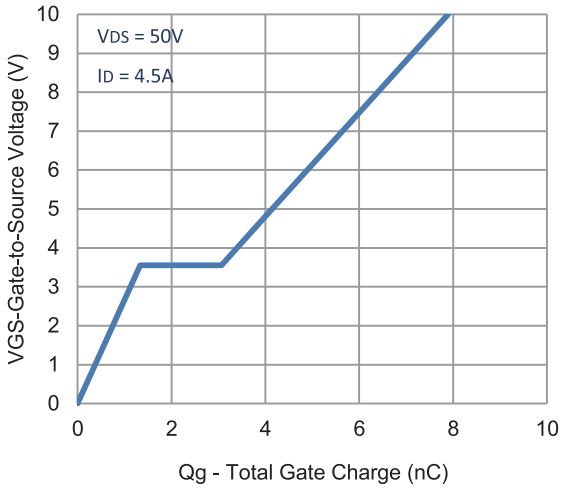



**5. Output Characteristics**

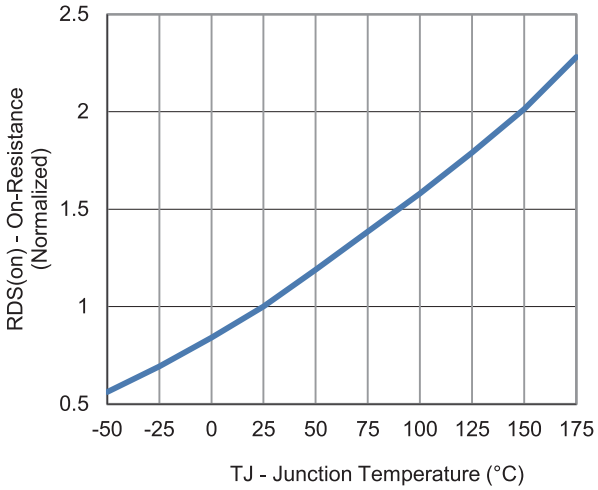



**6. Capacitance**

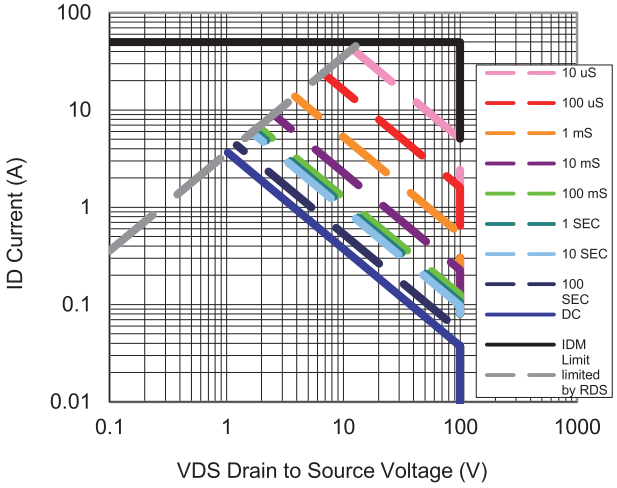
## Typical Electrical Characteristics



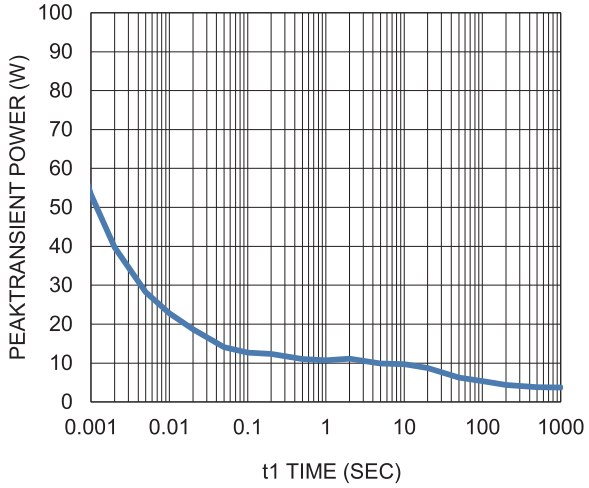

**7. Gate Charge**



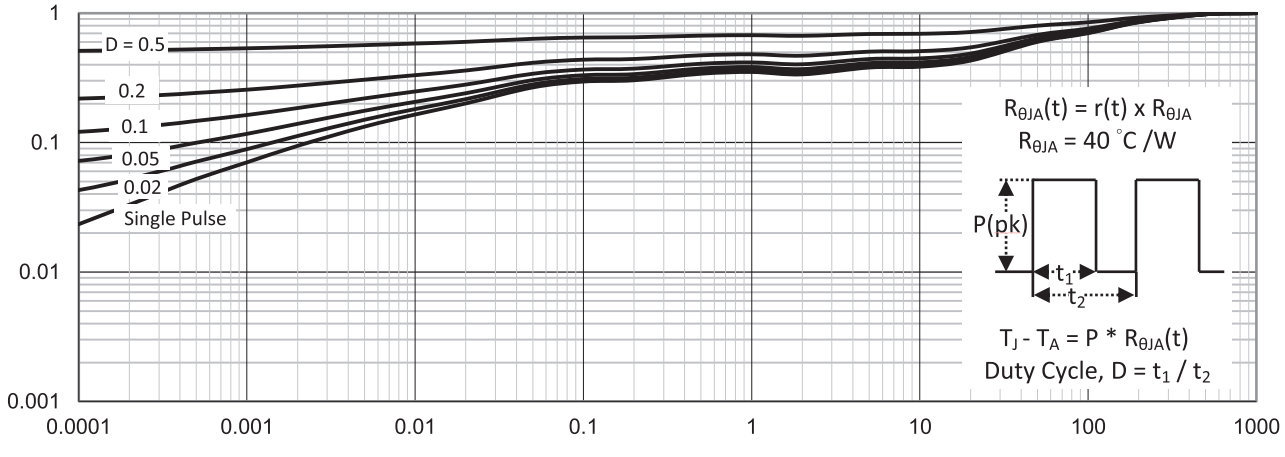

**8. Normalized On-Resistance Vs Junction Temperature**




**9. Safe Operating Area**




**10. Single Pulse Maximum Power Dissipation**




**11. Normalized Thermal Transient Junction to Ambient**