

N-Channel 200-V (D-S) MOSFET

Key Features:

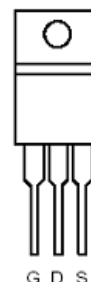
- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

Typical Applications:

- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

| PRODUCT SUMMARY | | |
|-----------------|----------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (m Ω) | I_D (A) |
| 200 | 400 @ $V_{GS} = 10V$ | 9 |
| | 450 @ $V_{GS} = 5.5V$ | 8.5 |

TO-220CFM



Top View

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|--------------------------|----------------|------------|------------------|
| Parameter | | Symbol | Limit | Units |
| Drain-Source Voltage | | V_{DS} | 200 | V |
| Gate-Source Voltage | | V_{GS} | ± 20 | |
| Continuous Drain Current | $T_C = 25^\circ\text{C}$ | I_D | 9 | A |
| Pulsed Drain Current ^a | | I_{DM} | 50 | |
| Continuous Source Current (Diode Conduction) | | I_S | 50 | A |
| Power Dissipation | $T_C = 25^\circ\text{C}$ | P_D | 60 | W |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 175 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | |
|-----------------------------|-----------------|---------|--------------------|
| Parameter | Symbol | Maximum | Units |
| Maximum Junction-to-Ambient | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Case | $R_{\theta JC}$ | 2.5 | |

Notes

- a. Pulse width limited by maximum junction temperature

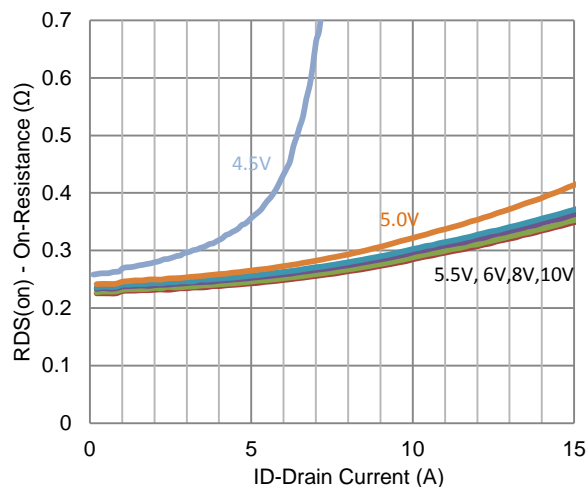
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|--------------|---|-----|------|----------|------------|
| Static | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250 \mu A$ | 1 | | 3.5 | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0 V$, $V_{GS} = 20 V$ | | | ± 10 | μA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 160 V$, $V_{GS} = 0 V$ | | | 1 | μA |
| | | $V_{DS} = 160 V$, $V_{GS} = 0 V$, $T_J = 55^\circ C$ | | | 25 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} = 5 V$, $V_{GS} = 10 V$ | 34 | | | A |
| Drain-Source On-Resistance | $r_{DS(on)}$ | $V_{GS} = 10 V$, $I_D = 9 A$ | | | 400 | m Ω |
| | | $V_{GS} = 5.5 V$, $I_D = 8.5 A$ | | | 450 | |
| Forward Transconductance | g_{fs} | $V_{DS} = 15 V$, $I_D = 10 A$ | | 20 | | S |
| Diode Forward Voltage | V_{SD} | $I_S = 25 A$, $V_{GS} = 0 V$ | | 0.95 | | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 100 V$, $V_{GS} = 10 V$, $I_D = 6 A$ | | 15.8 | | nC |
| Gate-Source Charge | Q_{gs} | | | 4.2 | | |
| Gate-Drain Charge | Q_{gd} | | | 4.4 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 100 V$, $R_L = 10 \Omega$, $I_D = 6 A$, $V_{GEN} = 10 V$, $R_{GEN} = 6 \Omega$ | | 10.8 | | nS |
| Rise Time | t_r | | | 17.6 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 32.2 | | |
| Fall-Time | t_f | | | 30.2 | | |
| Input Capacitance | C_{iss} | $V_{DS} = 15 V$, $V_{GS} = 0 V$, $f = 1 MHz$ | | 807 | | pF |
| Output Capacitance | C_{oss} | | | 81 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 38 | | |

Notes

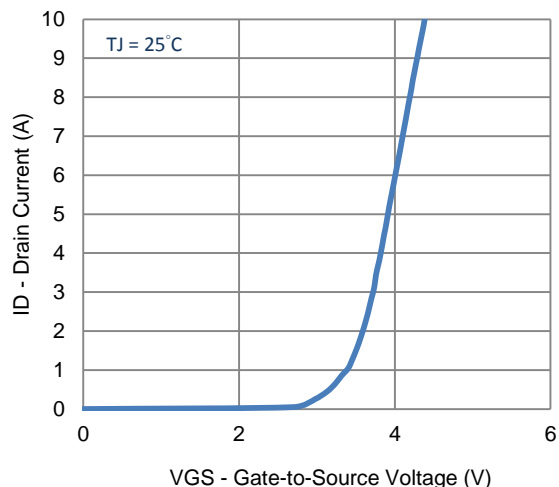
- Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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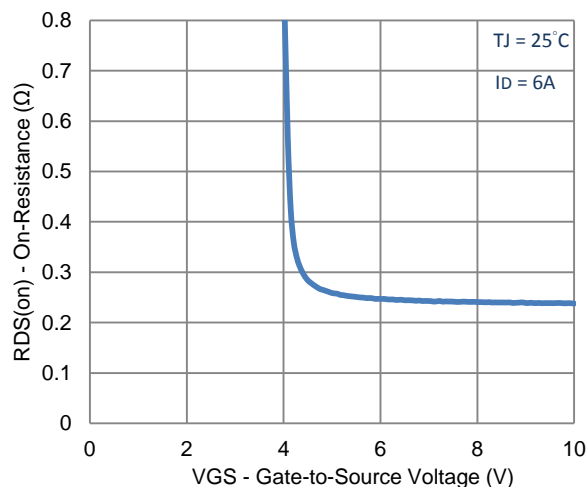
Typical Electrical Characteristics



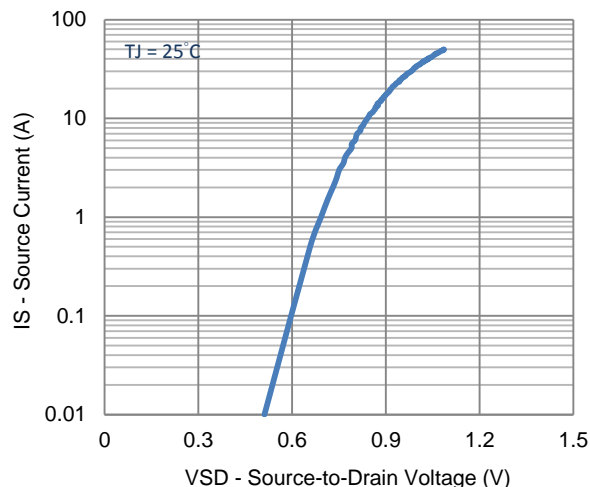
1. On-Resistance vs. Drain Current



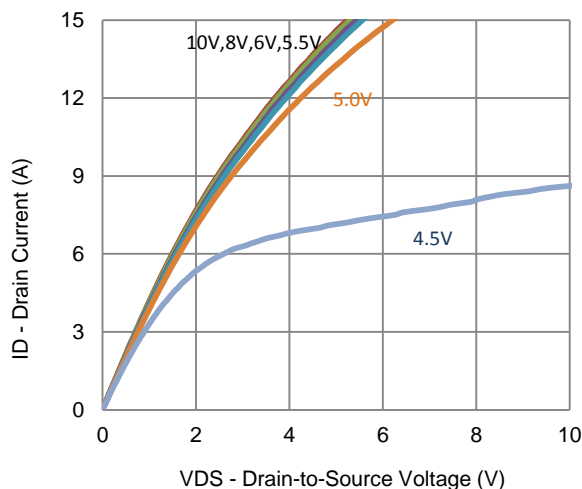
2. Transfer Characteristics



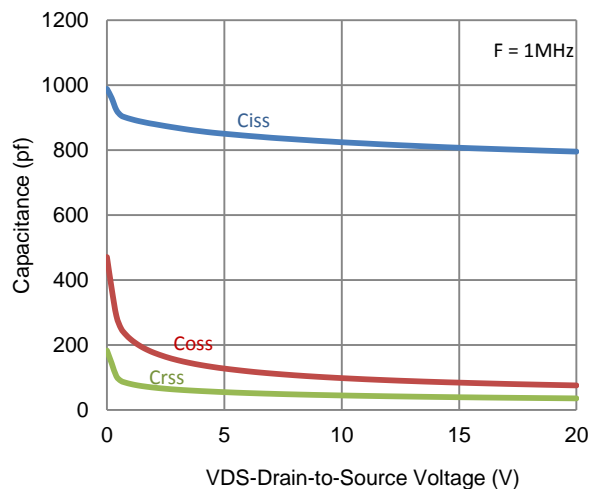
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

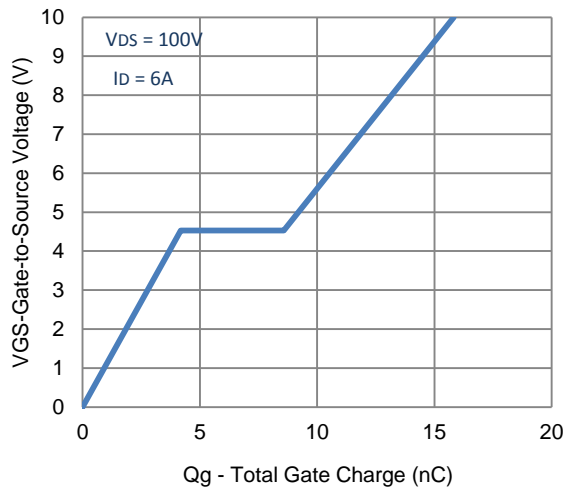


5. Output Characteristics

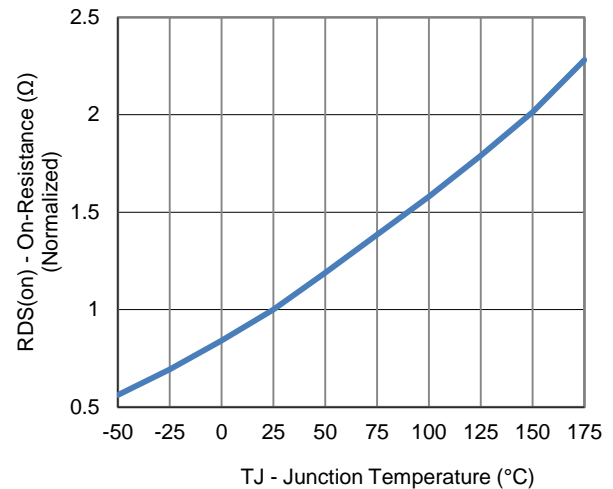


6. Capacitance

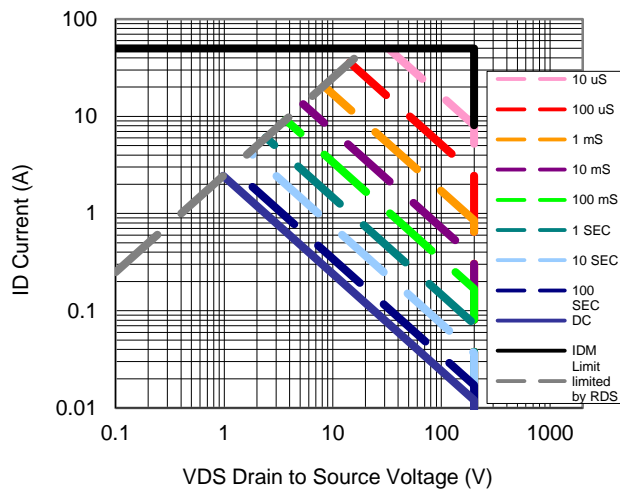
Typical Electrical Characteristics



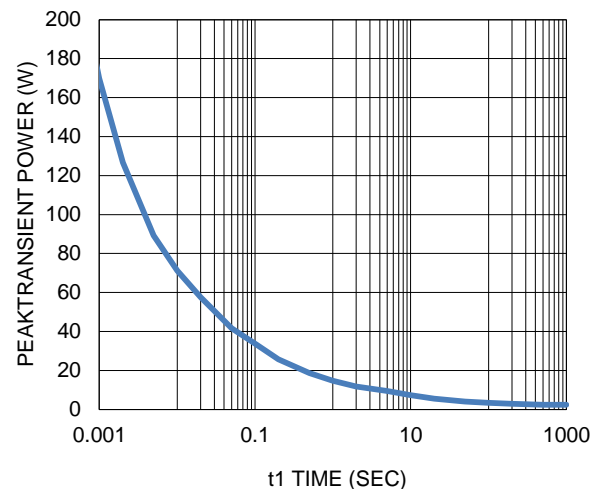
7. Gate Charge



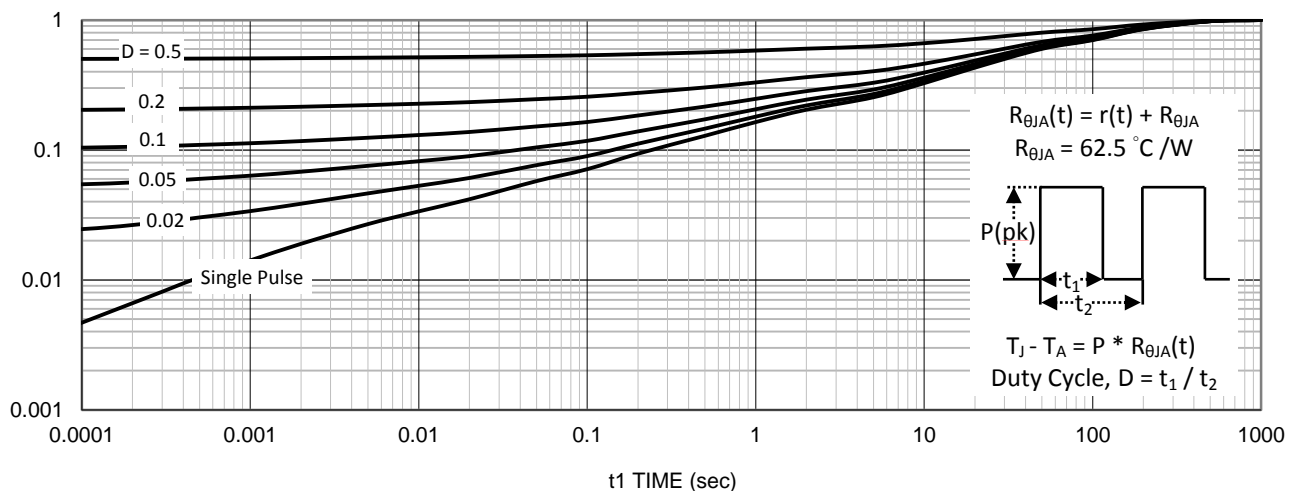
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

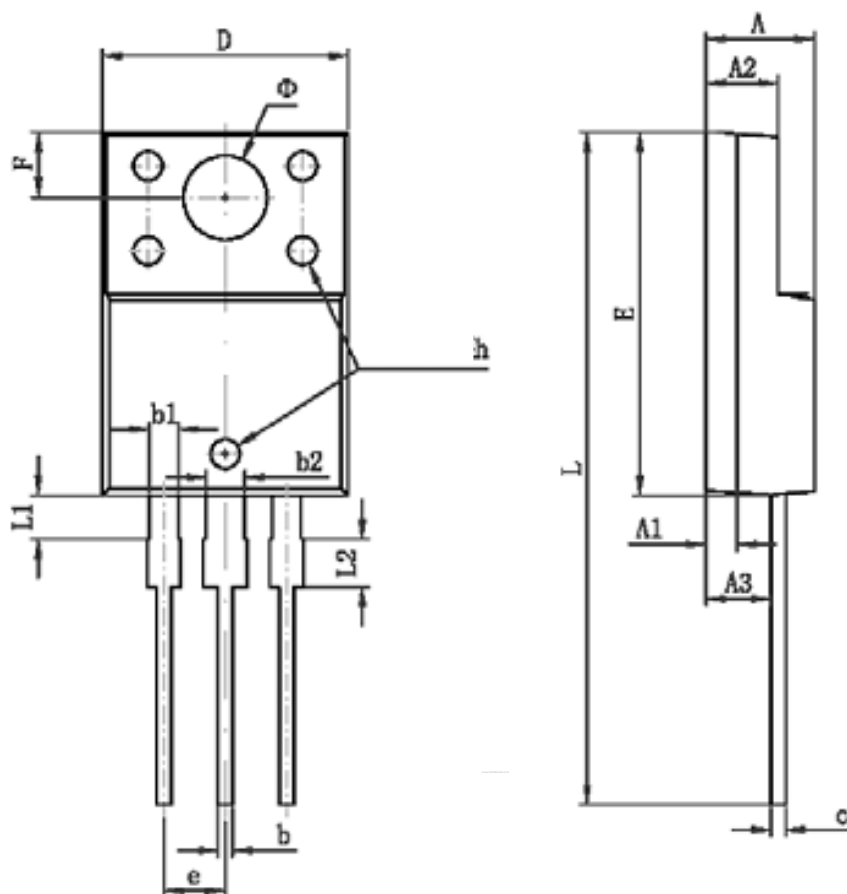


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.300 | 4.700 | 0.169 | 0.185 |
| A1 | 1.300 REF | | 0.051 REF | |
| A2 | 2.800 | 3.200 | 0.110 | 0.126 |
| A3 | 2.500 | 2.900 | 0.098 | 0.114 |
| b | 0.500 | 0.750 | 0.020 | 0.030 |
| b1 | 1.100 | 1.350 | 0.043 | 0.053 |
| b2 | 1.500 | 1.750 | 0.059 | 0.069 |
| c | 0.500 | 0.750 | 0.020 | 0.030 |
| D | 9.960 | 10.360 | 0.392 | 0.408 |
| E | 14.800 | 15.200 | 0.583 | 0.598 |
| e | 2.540 TYP | | 0.100 TYP | |
| F | 2.700 REF | | 0.106 REF | |
| Φ | 3.500 REF | | 0.138 REF | |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| L | 28.000 | 28.400 | 1.102 | 1.118 |
| L1 | 1.700 | 1.900 | 0.067 | 0.075 |
| L2 | 1.900 | 2.100 | 0.075 | 0.083 |