

N-Channel 250-V (D-S) MOSFET

Key Features:

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

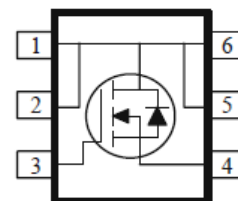
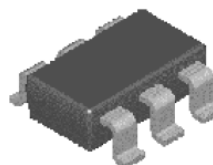
Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits



RoHS
COMPLIANT
HALOGEN
FREE

TSOP-6



| PRODUCT SUMMARY | | |
|-----------------|----------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (m Ω) | I_D (A) |
| 250 | 1109 @ $V_{GS} = 10V$ | 1.10 |
| | 1138 @ $V_{GS} = 6.5V$ | 1.09 |

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|--------------------------|----------------|------------|------------------|
| Parameter | | Symbol | Limit | Units |
| Drain-Source Voltage | | V_{DS} | 250 | V |
| Gate-Source Voltage | | V_{GS} | ± 20 | |
| Continuous Drain Current ^a | $T_A = 25^\circ\text{C}$ | I_D | 1.1 | A |
| | $T_A = 70^\circ\text{C}$ | | 0.9 | |
| Pulsed Drain Current ^b | | I_{DM} | 10 | |
| Continuous Source Current (Diode Conduction) ^a | | I_S | 2.5 | A |
| Power Dissipation ^a | $T_A = 25^\circ\text{C}$ | P_D | 2 | W |
| | $T_A = 70^\circ\text{C}$ | | 1.3 | |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 150 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | | |
|--|-------------------------|-----------------|---------|--------------------|
| Parameter | | Symbol | Maximum | Units |
| Maximum Junction-to-Ambient ^a | $t \leq 10 \text{ sec}$ | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |
| | Steady State | | 110 | |

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

Electrical Characteristics

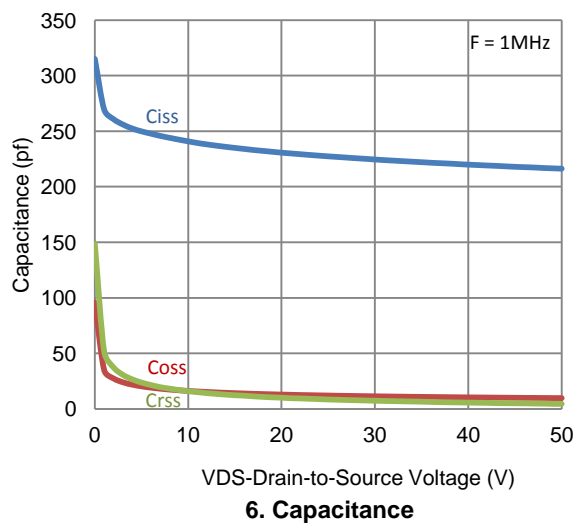
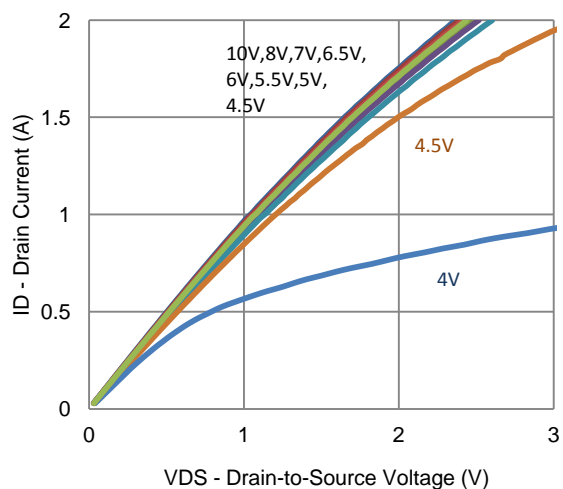
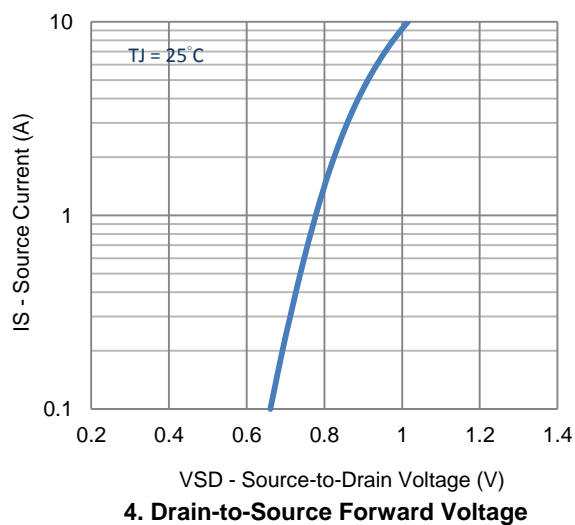
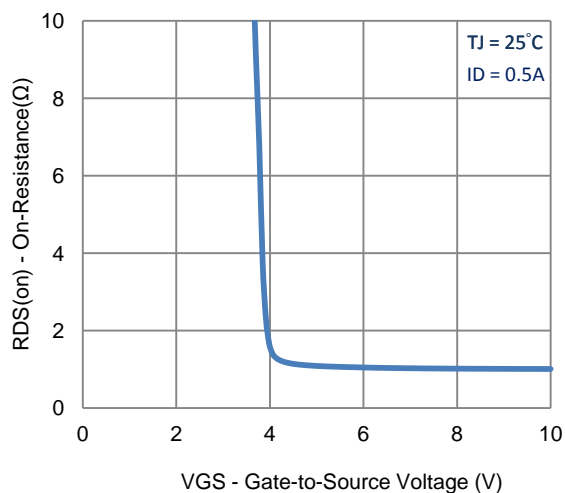
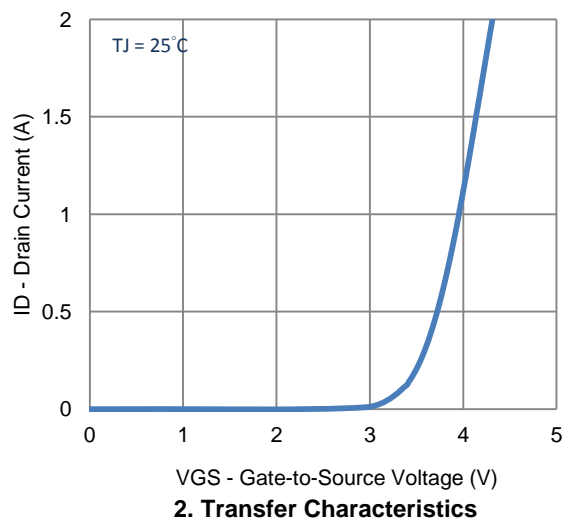
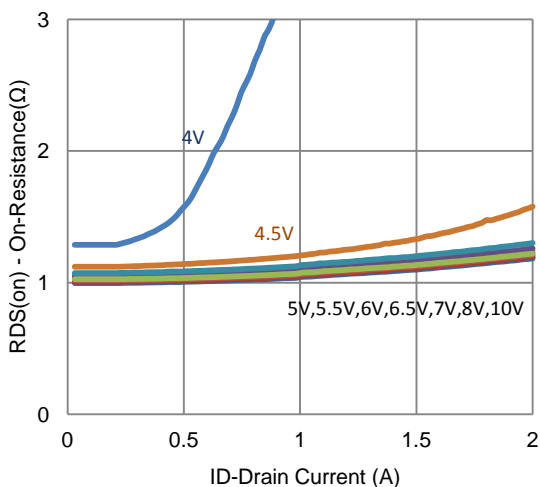
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|--------------|---|------|-----|-----------|------------|
| Static | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250 \mu A$ | 1 | | | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0 V$, $V_{GS} = \pm 20 V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 200 V$, $V_{GS} = 0 V$ | | | 1 | μA |
| | | $V_{DS} = 200 V$, $V_{GS} = 0 V$, $T_J = 55^\circ C$ | | | 10 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{DS} = 5 V$, $V_{GS} = 10 V$ | 1.65 | | | A |
| Drain-Source On-Resistance ^a | $r_{DS(on)}$ | $V_{GS} = 10 V$, $I_D = 1.1 A$ | | | 1109 | m Ω |
| | | $V_{GS} = 6.5 V$, $I_D = 0.9 A$ | | | 1138 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = 50 V$, $I_D = 1.1 A$ | | 2 | | S |
| Diode Forward Voltage ^a | V_{SD} | $I_S = 1.25 A$, $V_{GS} = 0 V$ | | 0.8 | | V |
| Dynamic ^b | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 100 V$, $V_{GS} = 6.5 V$, $I_D = 0.5 A$ | | 5 | | nC |
| Gate-Source Charge | Q_{gs} | | | 1.8 | | |
| Gate-Drain Charge | Q_{gd} | | | 2.2 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS} = 100 V$, $R_L = 200 \Omega$, $I_D = 0.5 A$, $V_{GEN} = 10 V$, $R_{GEN} = 6 \Omega$ | | 5 | | ns |
| Rise Time | t_r | | | 3 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 15 | | |
| Fall Time | t_f | | | 7 | | |
| Input Capacitance | C_{iss} | $V_{DS} = 50 V$, $V_{GS} = 0 V$, $f = 1 Mhz$ | | 216 | | pF |
| Output Capacitance | C_{oss} | | | 10 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 5 | | |

Notes

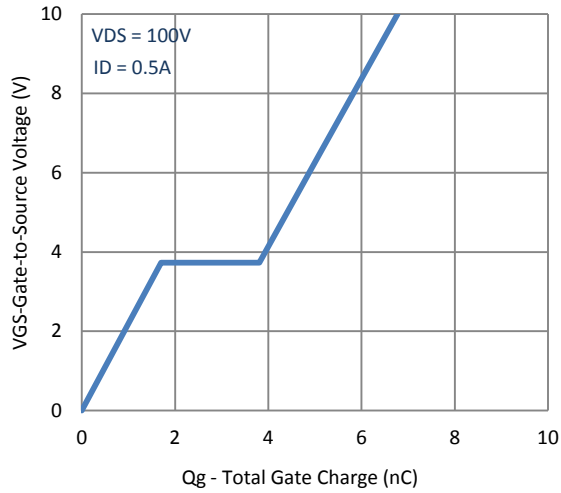
- a. Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

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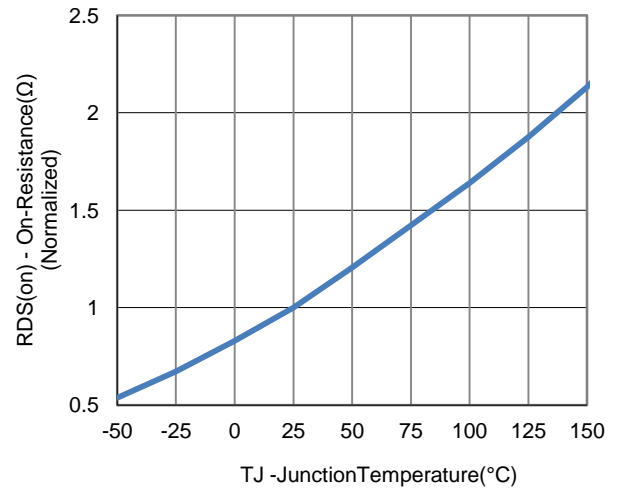
Typical Electrical Characteristics



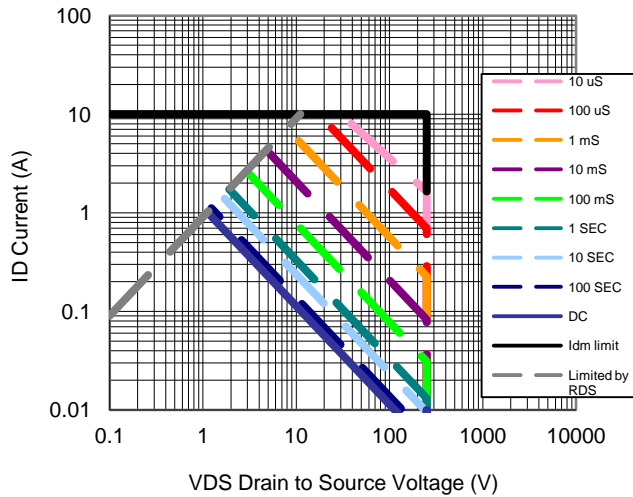
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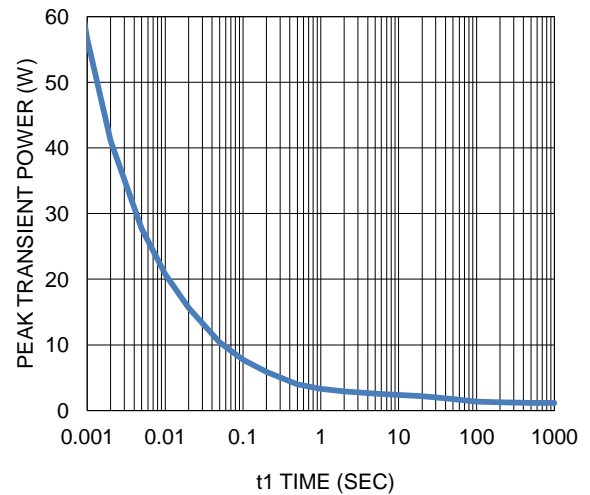
7. Gate Charge



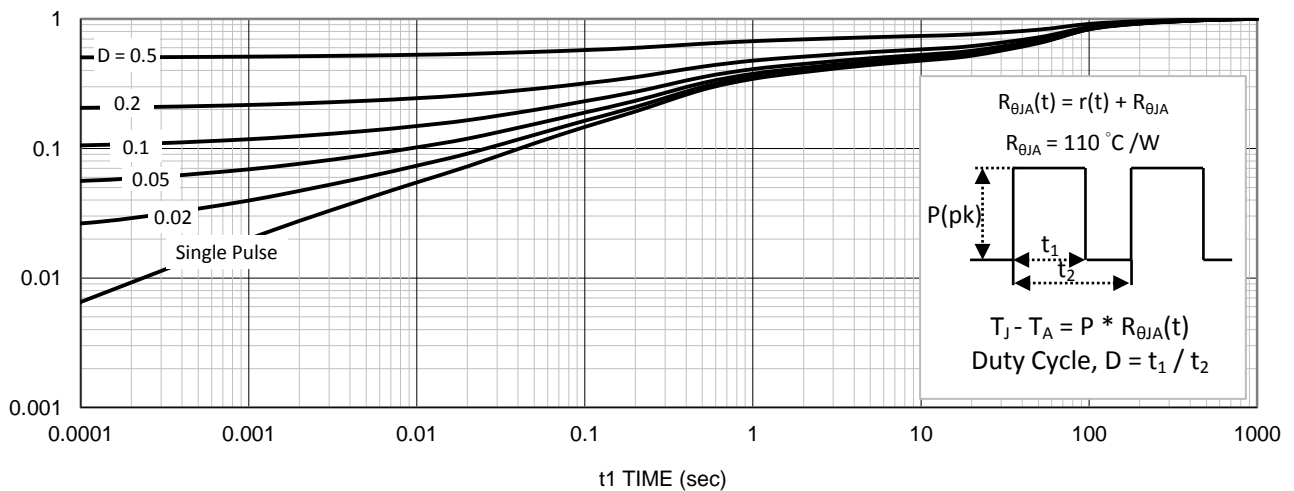
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

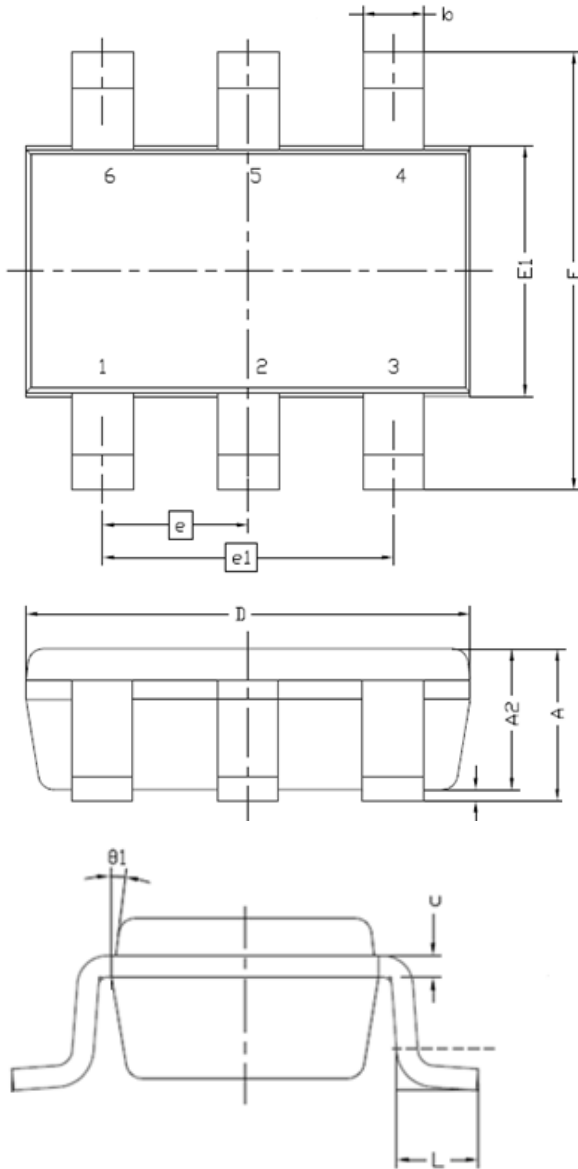


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



| Symbol | MILLIMETERS | |
|--------|-------------|-----|
| | MIN | MAX |
| A | 0.8 | 1.2 |
| A1 | 0 | 0.1 |
| A2 | 0.7 | 1.1 |
| b | 0.3 | 0.5 |
| c | 0.1 | 0.2 |
| D | 2.8 | 3.1 |
| E | 2.6 | 3 |
| E1 | 1.4 | 1.7 |
| e | 0.9 | 1 |
| e1 | 1.8 | 2 |
| L | 0.3 | 0.6 |
| θ1 | 7° NOM | |

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