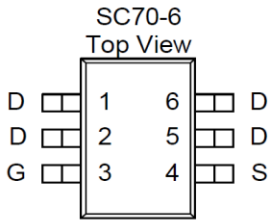
# P-Channel 150-V (D-S) MOSFET

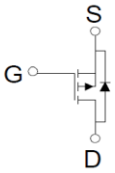
| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ (Ω) | $I_D$ (A) |
| -150 | 3 @ $V_{GS}$ = -10V | -0.6 |
| | 3.2 @ $V_{GS}$ = -5.5V | -0.6 |

**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




P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | |
|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Limit** | **Units** |
| Drain-Source Voltage | | $V_{DS}$ | -150 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current [a] | $T_A$=25°C | $I_D$ | -0.6 | A |
| | $T_A$=70°C | | -0.43 | |
| Pulsed Drain Current [b] | | $I_{DM}$ | -2.5 | |
| Continuous Source Current (Diode Conduction) [a] | | $I_S$ | -0.6 | A |
| Power Dissipation [a] | $T_A$=25°C | $P_D$ | 1.56 | W |
| | $T_A$=70°C | | 0.81 | |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | -55 to 150 | °C |

| THERMAL RESISTANCE RATINGS | | | | |
|---|---|---|---|---|
| **Parameter** | | **Symbol** | **Maximum** | **Units** |
| Maximum Junction-to-Ambient [a] | t <= 10 sec | $R_{\theta JA}$ | 80 | °C/W |
| | Steady State | | 125 | |

Notes
a. Surface Mounted on 1” x 1” FR4 Board.
b. Pulse width limited by maximum junction temperature

## Electrical Characteristics

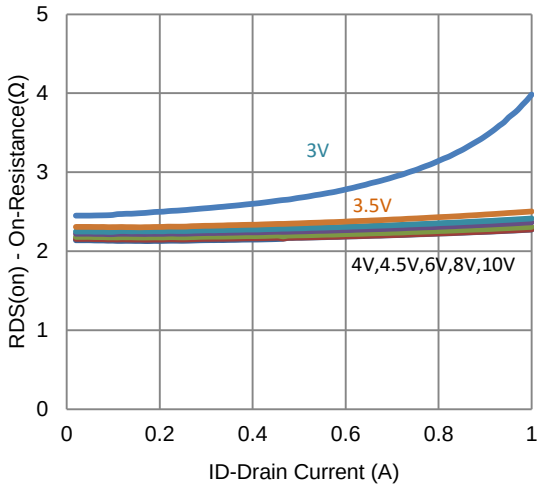
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = -250 uA | -1 | | | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = -120 V, $V_{GS}$ = 0 V | | | -1 | uA |
| | | $V_{DS}$ = -120 V, $V_{GS}$ = 0 V, $T_J$ = 55°C | | | -10 | |
| On-State Drain Current [a] | $I_{D(on)}$ | $V_{DS}$ = -5 V, $V_{GS}$ = -10 V | -1 | | | A |
| Drain-Source On-Resistance [a] | $r_{DS(on)}$ | $V_{GS}$ = -10 V, $I_D$ = -0.5 A | | | 3 | Ω |
| | | $V_{GS}$ = -5.5 V, $I_D$ = -0.4 A | | | 3.2 | |
| Forward Transconductance [a] | $g_{fs}$ | $V_{DS}$ = -15 V, $I_D$ = -0.5 A | | 2 | | S |
| Diode Forward Voltage [a] | $V_{SD}$ | $I_S$ = -0.5 A, $V_{GS}$ = 0 V | | -0.76 | | V |
| **Dynamic [b]** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = -75 V, $V_{GS}$ = -5.5 V, $I_D$ = -0.5 A | | 3.7 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 0.9 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 1.6 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}$ = -75 V, $R_L$ = 150 Ω, $I_D$ = -0.5 A, $V_{GEN}$ = -10 V, $R_{GEN}$ = 6 Ω | | 5 | | ns |
| Rise Time | $t_r$ | | | 4 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 16 | | |
| Fall Time | $t_f$ | | | 6 | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = -15 V, $V_{GS}$ = 0 V, f = 1 Mhz | | 370 | | pF |
| Output Capacitance | $C_{oss}$ | | | 30 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 15 | | |

Notes

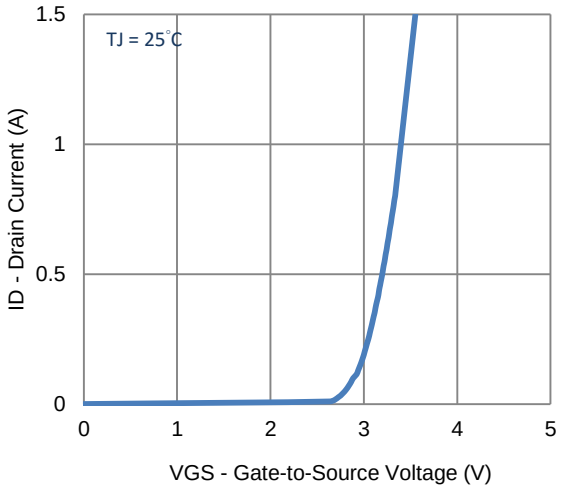
a. Pulse test: PW <= 300us duty cycle <= 2%.

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

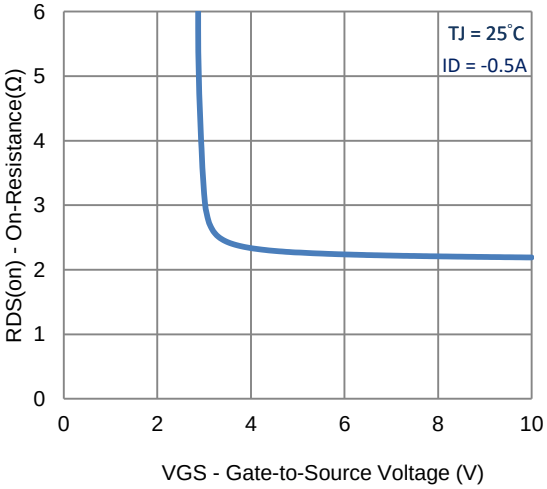
## Typical Electrical Characteristics



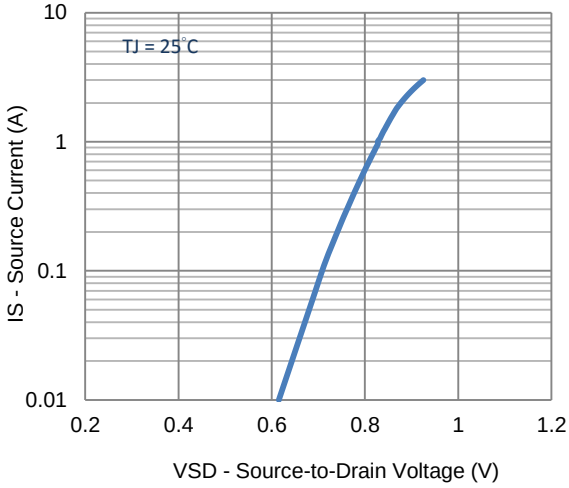

**1. On-Resistance vs. Drain Current**



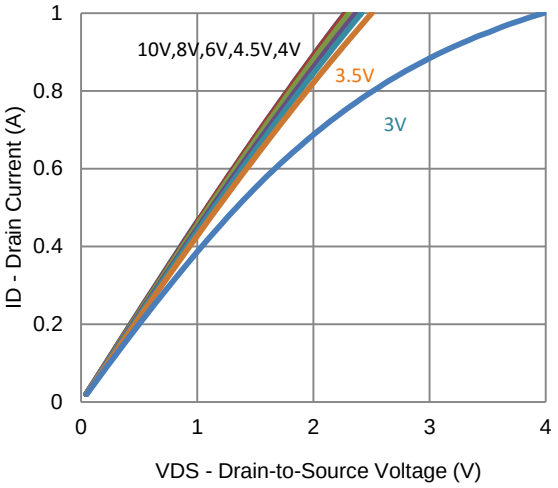

**2. Transfer Characteristics**



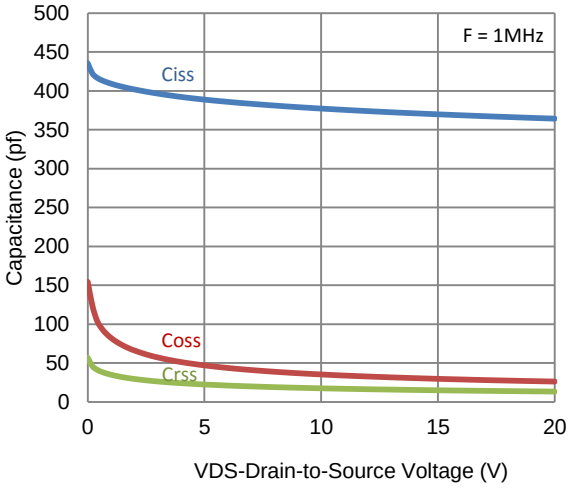

**3. On-Resistance vs. Gate-to-Source Voltage**




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

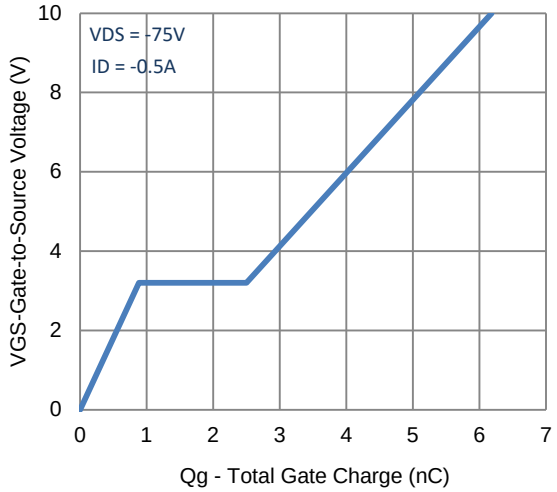



**5. Output Characteristics**

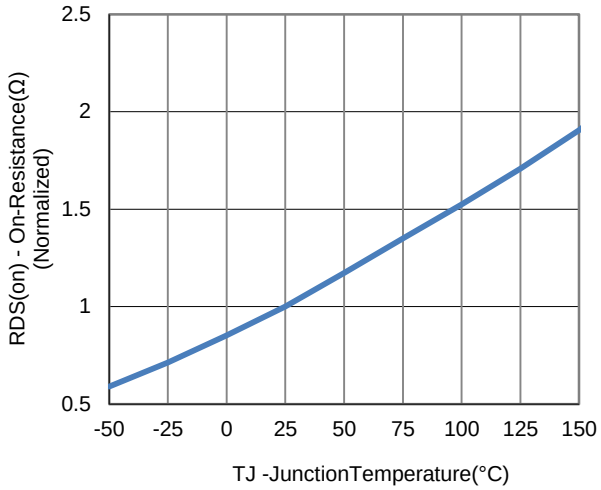



**6. Capacitance**

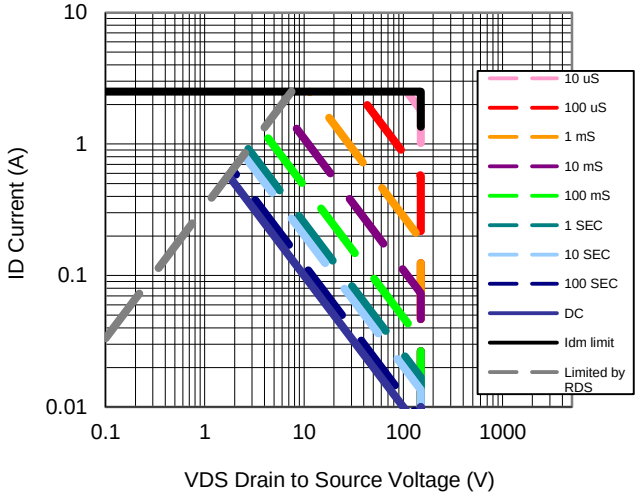
## Typical Electrical Characteristics



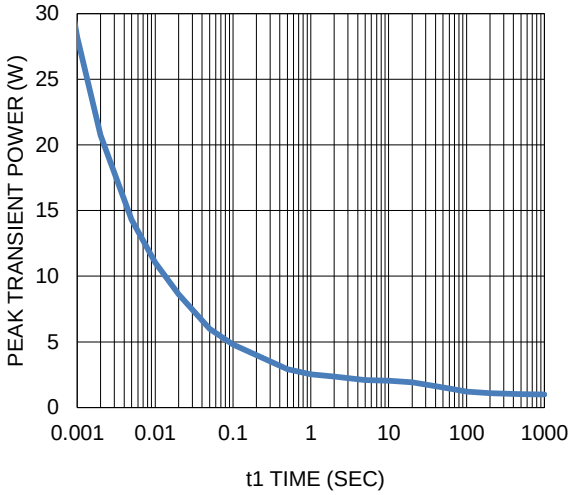

**7. Gate Charge**



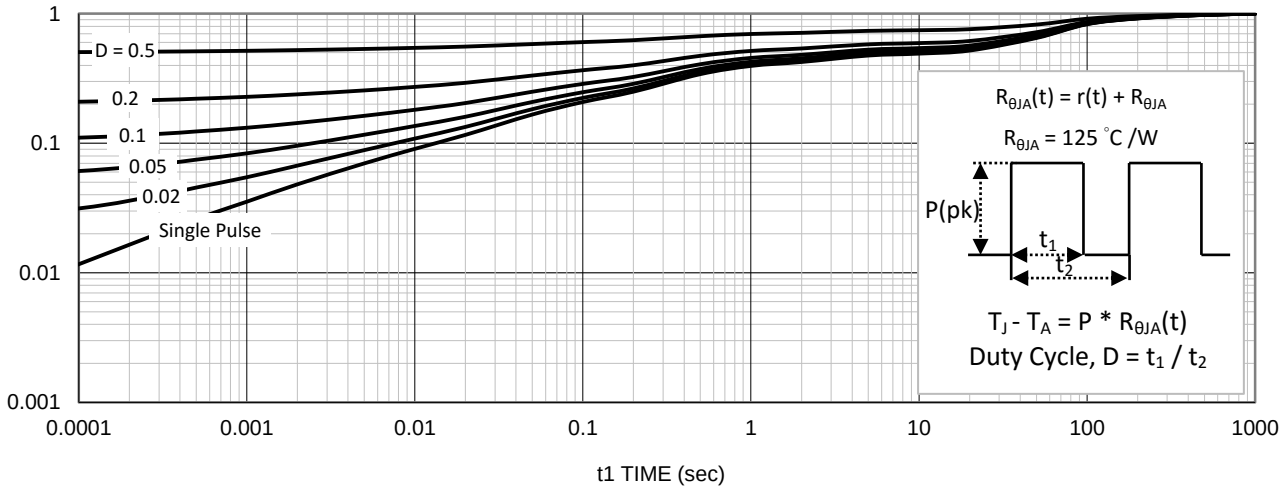

**8. Normalized On-Resistance Vs Junction Temperature**




**9. Safe Operating Area**

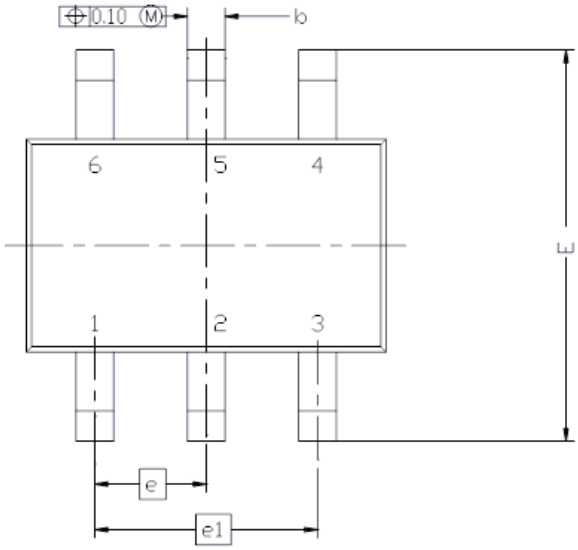



**10. Single Pulse Maximum Power Dissipation**




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

## Package Information




| DIM. | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.900 | 0.95 | 1.10 | 0.035 | 0.037 | 0.043 |
| A1 | 0.00 | --- | 0.10 | 0.000 | --- | 0.004 |
| A2 | 0.70 | 0.90 | 1.00 | 0.028 | 0.035 | 0.039 |
| b | 0.15 | 0.22 | 0.30 | 0.006 | 0.016 | 0.012 |
| c | 0.08 | 0.127 | 0.20 | 0.003 | 0.005 | 0.008 |
| D | 2.10 BSC | | | 0.083 BSC | | |
| E | 2.30 BSC | | | 0.091 BSC | | |
| E1 | 1.30 BSC | | | 0.051 BSC | | |
| e | 0.65 BSC | | | 0.026 BSC | | |
| e1 | 1.30 BSC | | | 0.051 BSC | | |
| L | 0.26 | 0.40 | 0.46 | 0.010 | 0.015 | 0.018 |
| L2 | 0.254BSC | | | 0.010BSC | | |
| R | 0.10 | --- | --- | 0.004 | --- | --- |
| θ | 0? | 4? | 8? | 0? | 4? | 8? |
| θ1 | 7?NOM | | | 7?NOM | | |