# Dual N-Channel Enhancement Mode MOSFET TDM3484

## DESCRIPTION

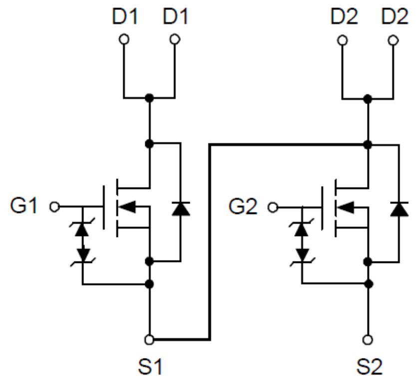
The TDM3484 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

## GENERAL FEATURES

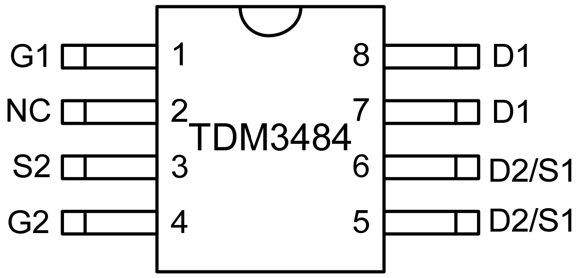
- RDS(ON) < 18.5mΩ @ VGS=4.5V
  RDS(ON) < 15mΩ @ VGS=10V
- High Power and current handling capability
- Lead free product is available
- SOP-8 Package

## Application

- PWM applications
- Load switch
- Power management



N-Channel MOSFET



Top of SOP8

ABSOLUTE MAXIMUM RATINGS($T_A$=25℃unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 40 | V |
| Gate-Source Voltage | $V_{GS}$ | $\pm$20 | V |
| Drain Current @ Continuous | $I_D$（$T_A$=25℃） | 12 | A |
| | $I_D$（$T_A$=70℃） | 9.6 | A |
| Drain Current @ Current-Pulsed (Note 1) | $I_{DM}$ （$T_C$=25℃） | 60 | A |
| Drain Current @ Continuous | $I_D$（$T_C$=25℃） | 43 | A |
| | $I_D$（$T_C$=100℃） | 28 | A |
| Maximum Power Dissipation ($T_A$=25℃) | $P_D$ | 2 | W |
| Maximum Operating Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 To 150 | ℃ |

THERMAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (t<10s) | $R_{\theta JA}$ | 50 | ℃/W |

## ELECTRICAL CHARACTERISTICS ($T_A$=25℃unless otherwise noted)

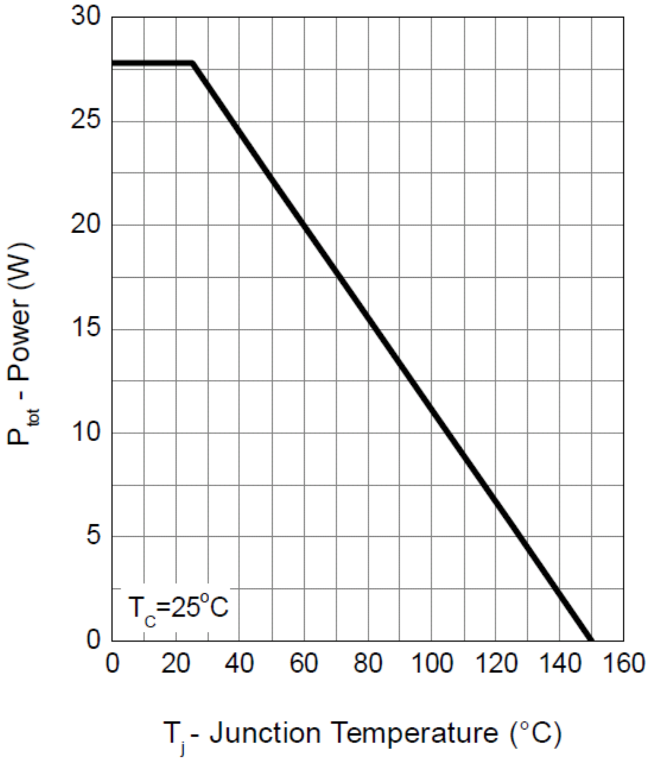
| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=250μA | 40 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=32V,$V_{GS}$=0V | - | - | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V,$V_{DS}$=0V | - | - | ±10 | μA |
| ON CHARACTERISTICS (Note 2) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=VGS,$I_D$=250μA | 1.4 | 1.7 | 2.5 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=4.5V, $I_D$=8A | - | 14.6 | 18.5 | mΩ |
| | | $V_{GS}$=10V, $I_D$=15A | - | 11 | 15 | mΩ |
| DYNAMIC CHARACTERISTICS (Note4) | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=20V,$V_{GS}$=0V, F=1.0MHz | - | 700 | - | PF |
| Output Capacitance | $C_{oss}$ | | - | 191 | - | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 30 | - | PF |
| SWITCHING CHARACTERISTICS (Note 3) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}$=20V, $R_L$=20Ω, $V_{GEN}$=10V,$R_G$=6Ω $I_D$=1A | - | 10 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 6.6 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 18 | - | nS |
| Turn-Off Fall Time | $t_f$ | | - | 12 | - | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=20V,$I_D$=15A,$V_{GS}$=4.5V | - | 5.1 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 2.9 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1.1 | - | nC |
| Body Diode Reverse Recovery Time | $T_{rr}$ | $I_F$=5A, dI/dt=100A/μs | - | 18.8 | - | nS |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | - | 4.5 | - | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS | | | | | | |
| Diode Forward Voltage (Note 2) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=20A | - | 0.8 | 1.1 | V |

NOTES:

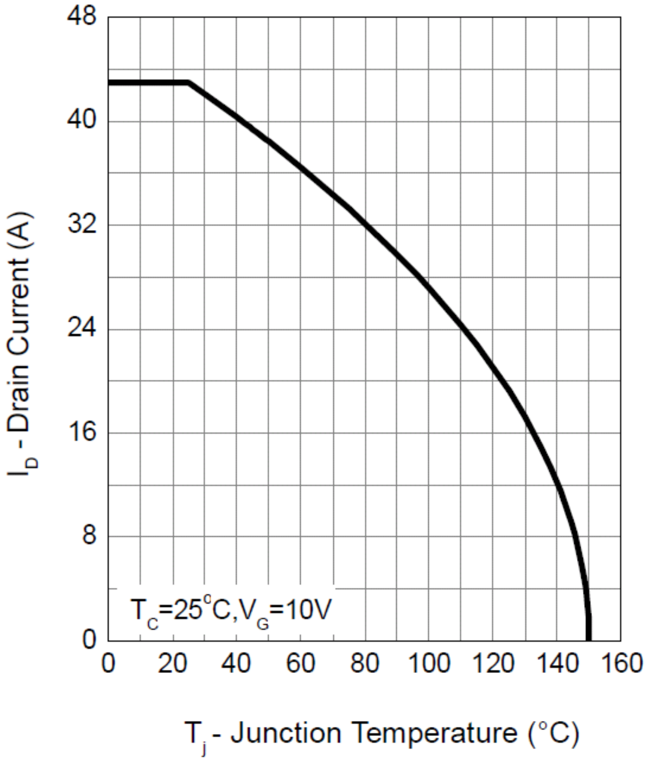
1. Pulse width limited by max. junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production testing

## Typical Operating Characteristics

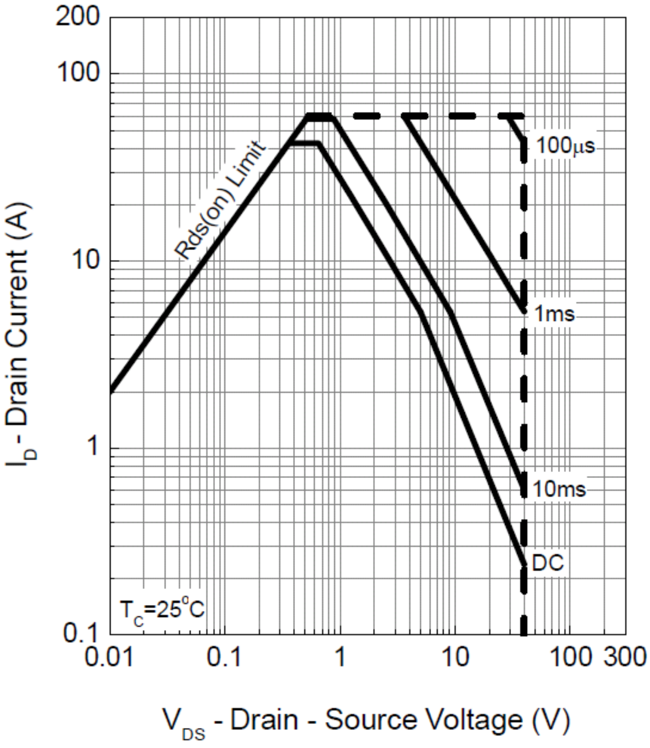
**Power Dissipation**



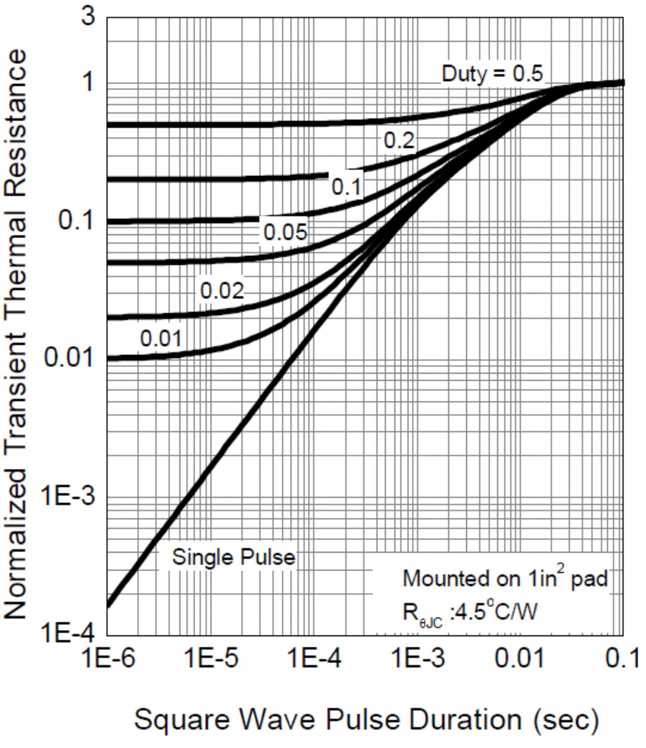
**Drain Current**



**Safe Operation Area**

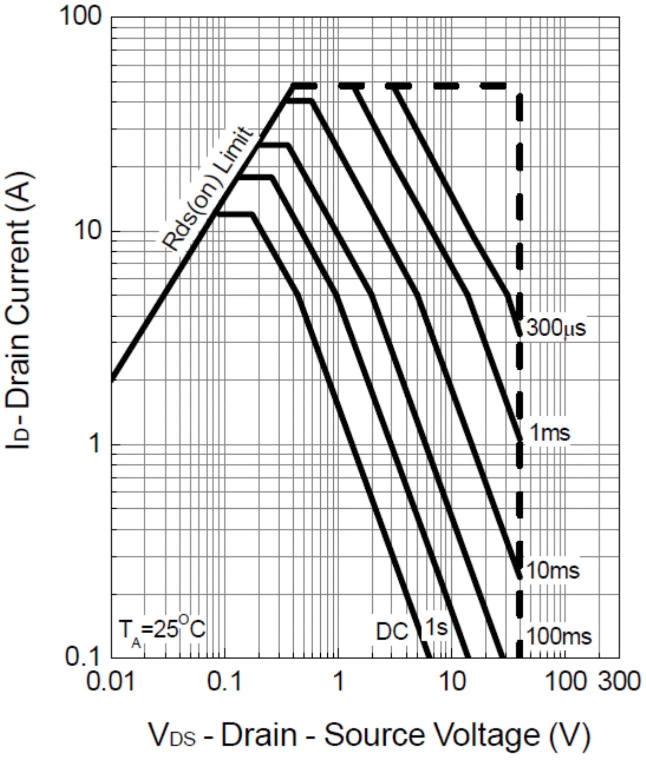


**Thermal Transient Impedance**

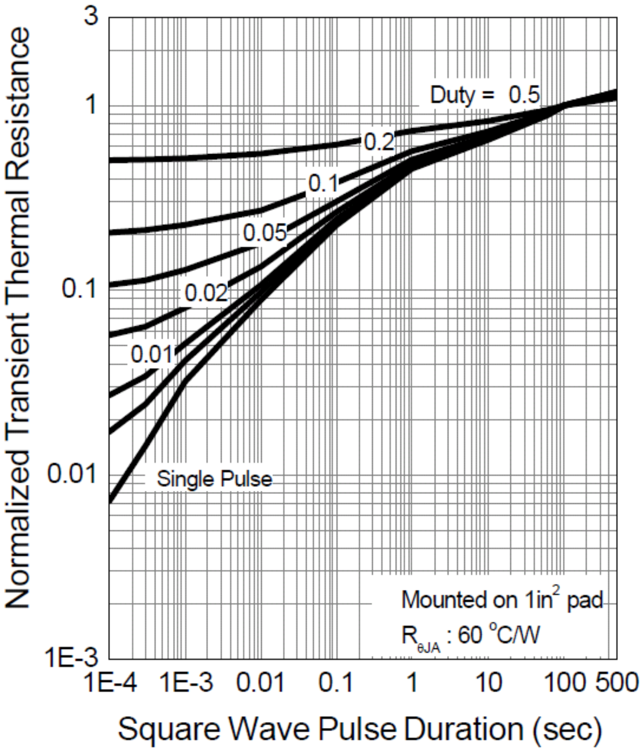


## Typical Operating Characteristics(Cont.)

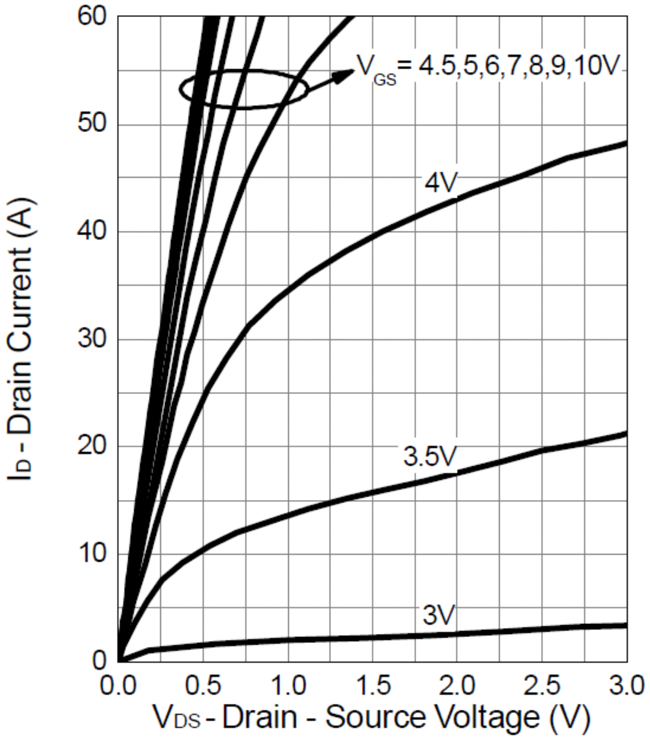
### Safe Operation Area



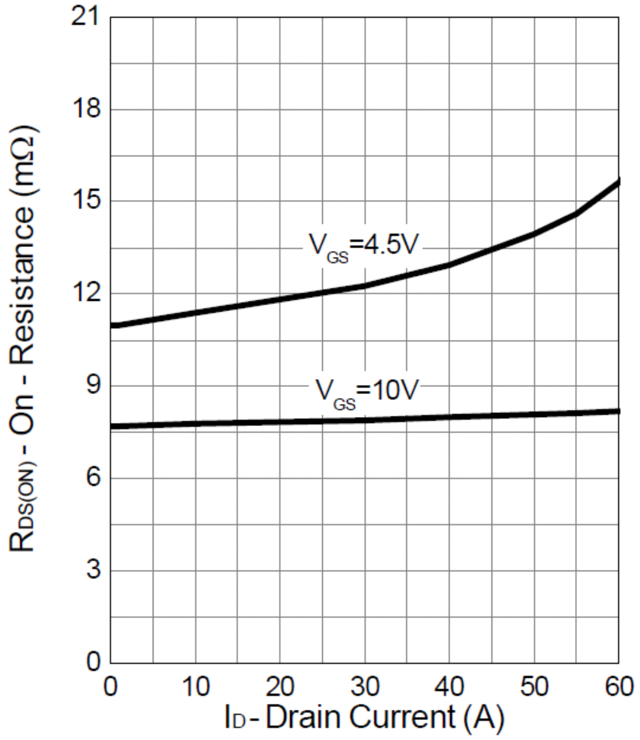
### Thermal Transient Impedance



### Output Characteristics

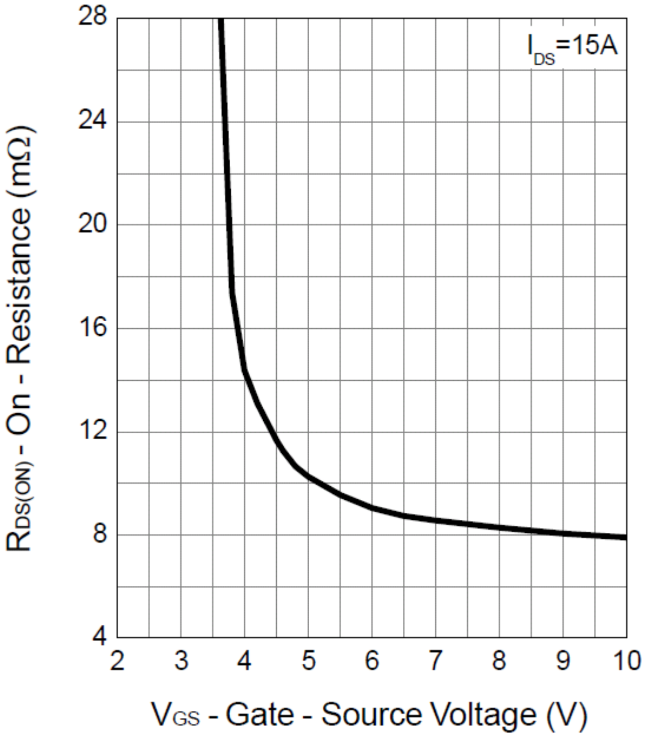


### Drain-Source On Resistance

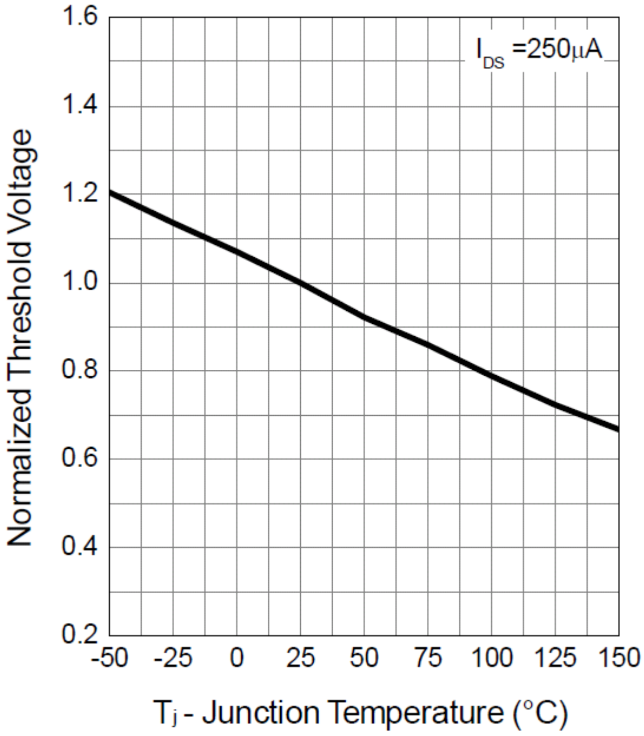


## Typical Operating Characteristics(Cont.)

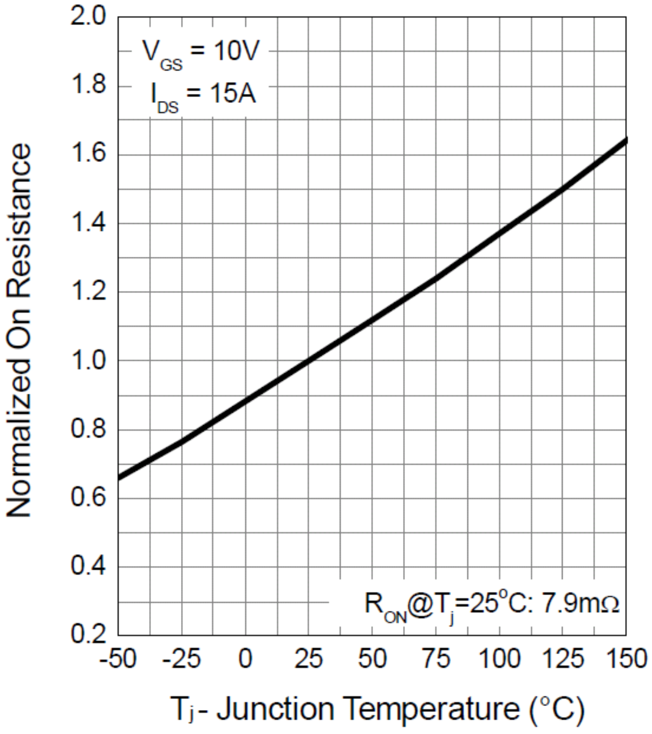
**Gate-Source On Resistance**



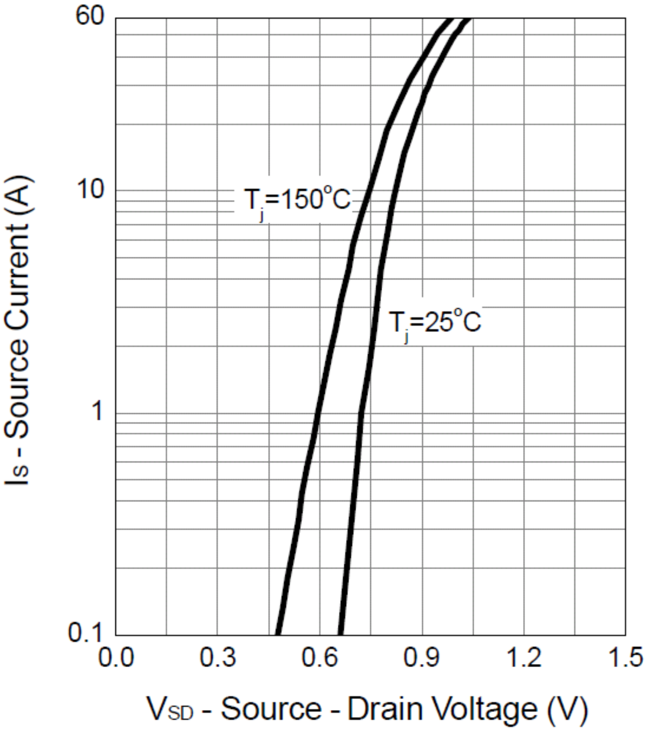
**Gate Threshold Voltage**



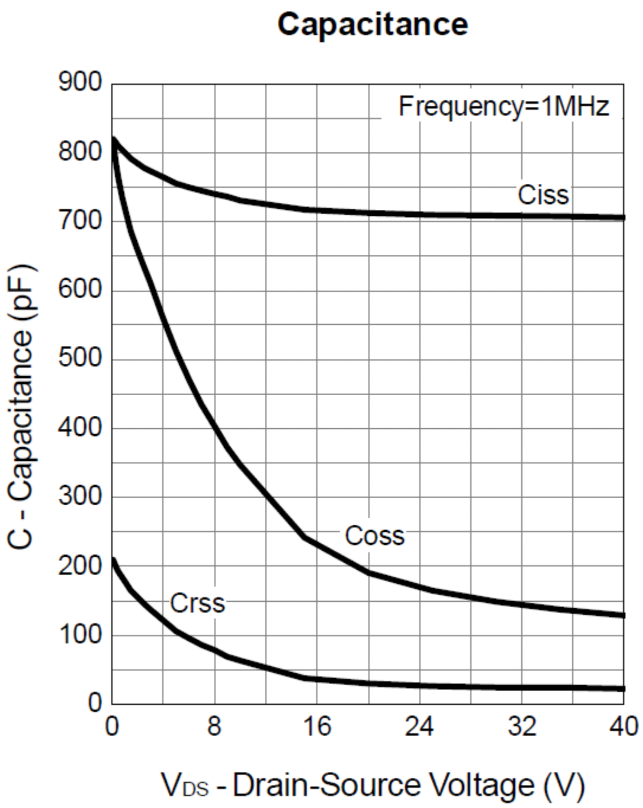
**Drain-Source On Resistance**

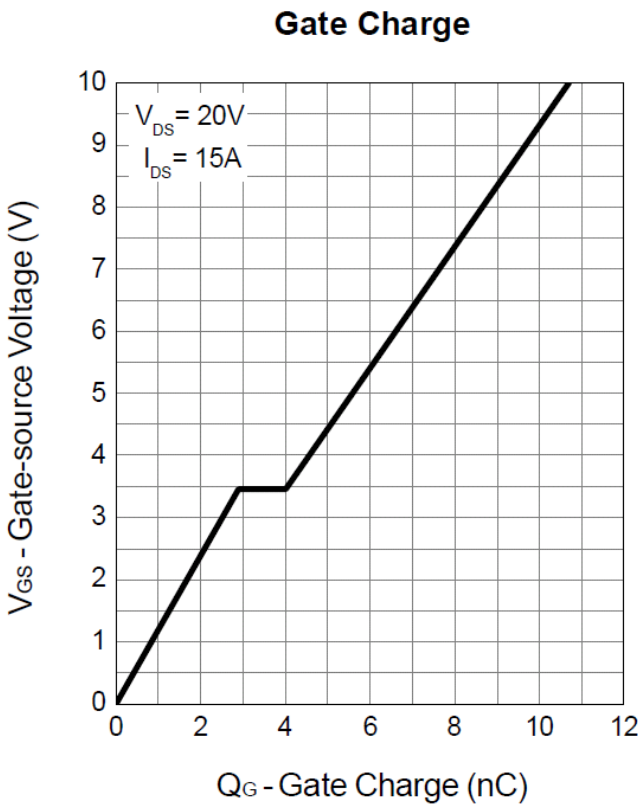


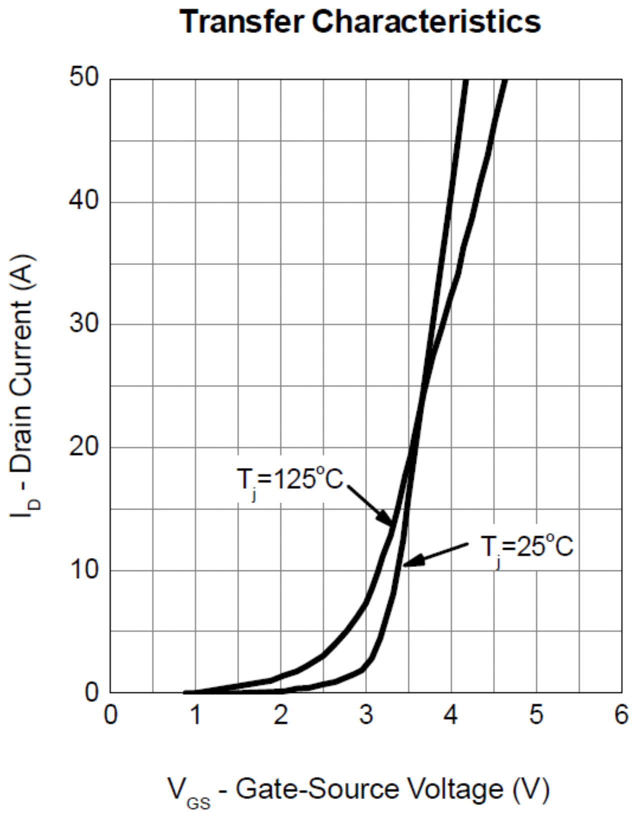
**Source-Drain Diode Forward**



## Typical Operating Characteristics(Cont.)

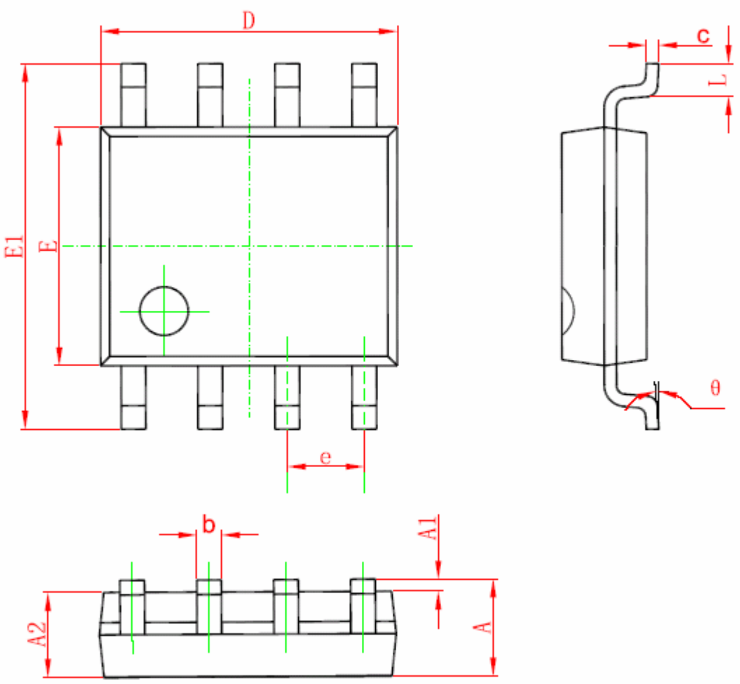






## Package Information

SOP-8 Package



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.006 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.200 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270(BSC) | | 0.050(BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

## Design Notes