## Features

- Split Gate Trench MOSFET Technology
- Low $R_{DS(on)}$ & FOM
- Excellent Stability and Uniformity
- Extremely Low Switching Loss
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

# P-CHANNEL MOSFET

## Maximum Ratings

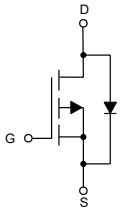
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 105°C/W Junction to Ambient
- Thermal Resistance: 1.75°C/W Junction to Case

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -100 | V |
| Gate-Source Volltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | -18 | A |
| | $T_C$=100°C | | -12 | A |
| Pulsed Drain Current (1) | | $I_{DM}$ | -72 | A |
| Avalanche Energy (2) | | $E_{AS}$ | 100 | mJ |
| Total Power Dissipation | | $P_D$ | 70 | W |

Note:

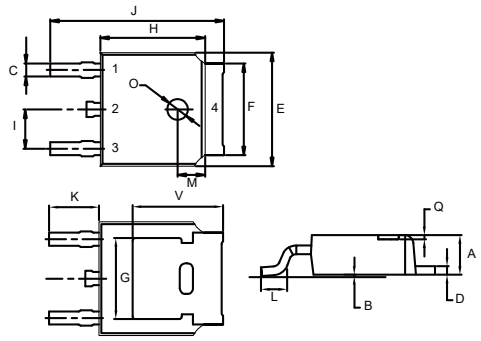
1. Pulse Test: Pulse Width≤300μs,Duty Cycle ≤2%.
2. $T_J$=25°C, $V_{DD}$=-50V, $V_G$=-10V, L=0.5mH, $R_g$=25Ω.

## Internal Structure




1.GATE
2.DRAIN
3.SOURCE
4.DRAIN

## DPAK




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | 0.087 | 0.094 | 2.20 | 2.40 | |
| B | 0.000 | 0.005 | 0.00 | 0.13 | |
| C | 0.026 | 0.034 | 0.66 | 0.86 | |
| D | 0.018 | 0.023 | 0.46 | 0.58 | |
| E | 0.256 | 0.264 | 6.50 | 6.70 | |
| F | 0.201 | 0.215 | 5.10 | 5.46 | |
| G | 0.190 | | 4.83 | | TYP. |
| H | 0.236 | 0.244 | 6.00 | 6.20 | |
| I | 0.086 | 0.094 | 2.18 | 2.39 | |
| J | 0.386 | 0.409 | 9.80 | 10.40 | |
| K | 0.114 | | 2.90 | | TYP. |
| L | 0.055 | 0.067 | 1.40 | 1.70 | |
| M | 0.063 | | 1.60 | | TYP. |
| O | 0.043 | 0.051 | 1.10 | 1.30 | |
| Q | 0.000 | 0.012 | 0.00 | 0.30 | |
| V | 0.211 | | 5.35 | | TYP. |

## Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=-250μA | -100 | | | V |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$ =±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-100V, $V_{GS}$=0V | | | -1 | μA |
| | | $V_{DS}$=-100V, $V_{GS}$=0V, $T_J$=55°C | | | -5 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1 | -1.8 | -2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=-10V, $I_D$=-10A | | 90 | 110 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-5A | | 100 | 130 | mΩ |
| **Diode Characteristics** | | | | | | |
| Continuous Body Diode Current | $I_S$ | | | | -18 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=-10A | | | -1.5 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_S$=-5A,di/dt=100A/μs | | 70 | | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | | 140 | | nC |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-80V,$V_{GS}$=0V,f=1MHz | | 1050 | | pF |
| Output Capacitance | $C_{oss}$ | | | 97 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 18 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-50V,$V_{GS}$=-10V,$I_D$=-5A | | 20 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 3.9 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 4.3 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$=-10V,$V_{DD}$=-50V,$R_L$=2.5Ω $R_{GEN}$=6Ω | | 10 | | ns |
| Turn-On Rise Time | $t_r$ | | | 30 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 77 | | |
| Turn-Off Fall Time | $t_f$ | | | 81 | | |

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

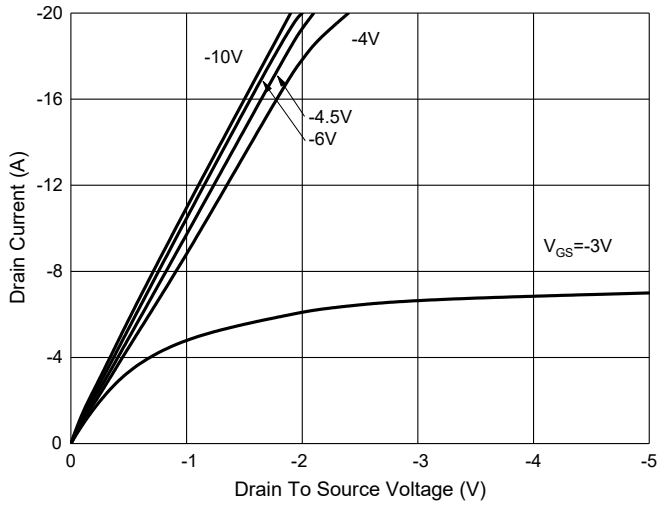



Fig. 2 - Transfer Characteristics

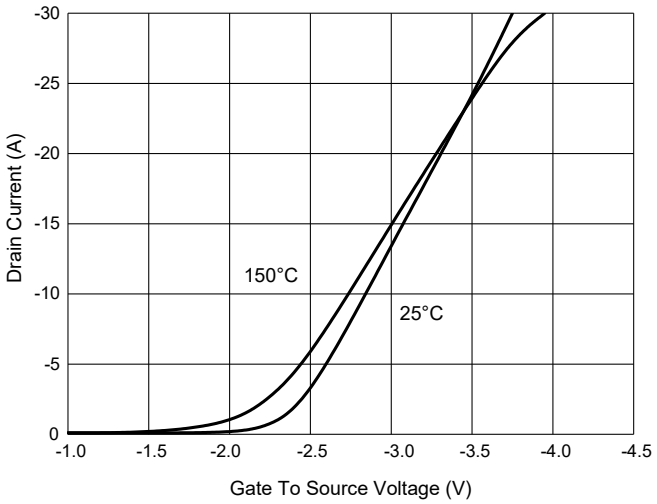



Fig. 3 - $R_{DS(ON)}$—$V_{GS}$

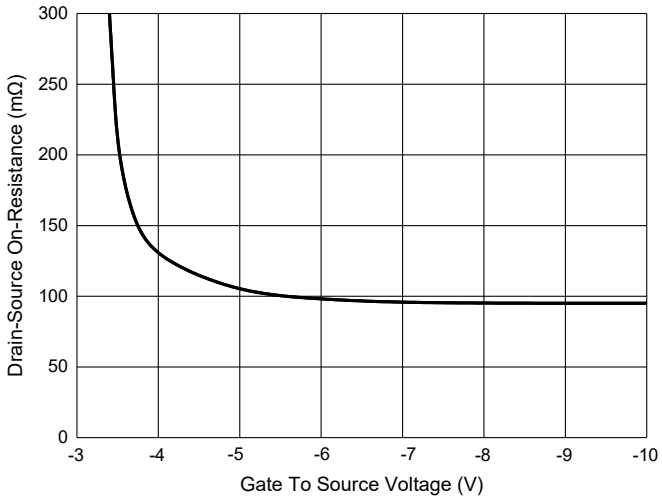



Fig. 4 - Normalized On Resistance Characteristics

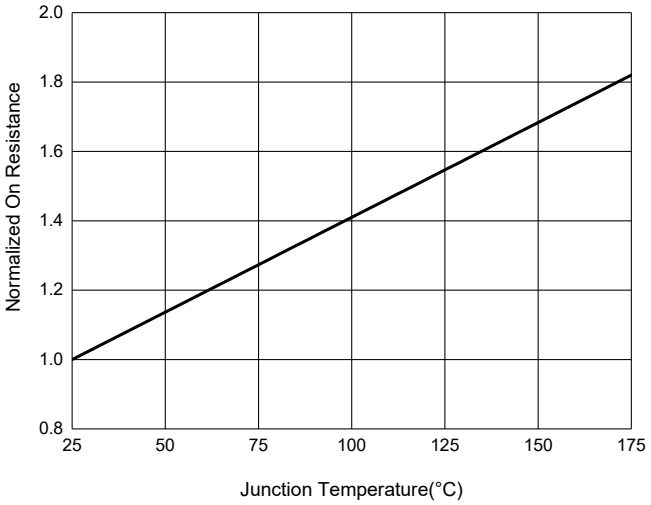



Fig. 5 - Capacitance Characteristics

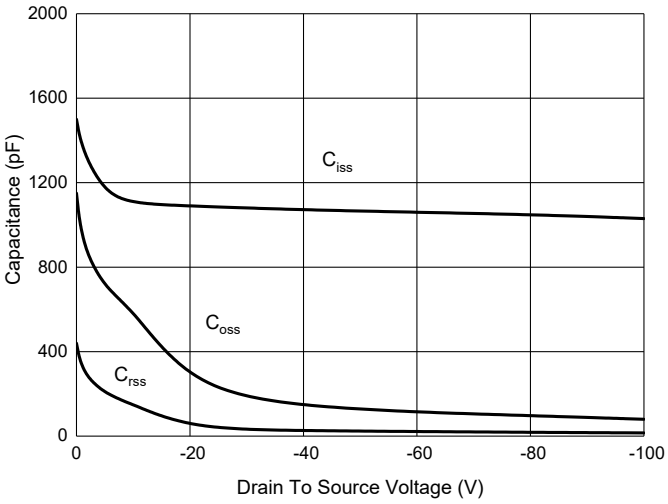
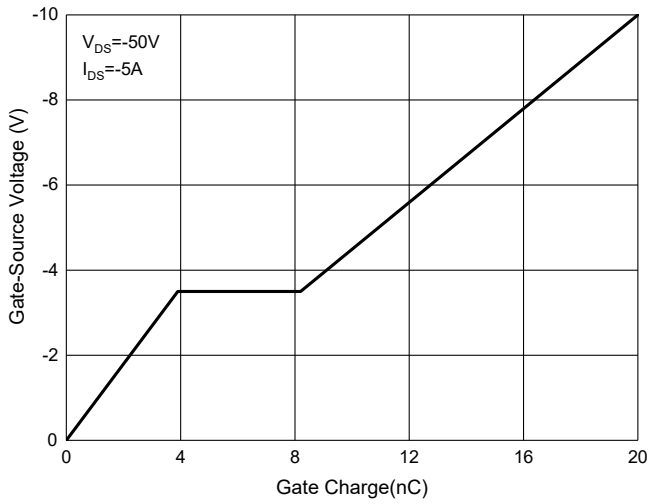
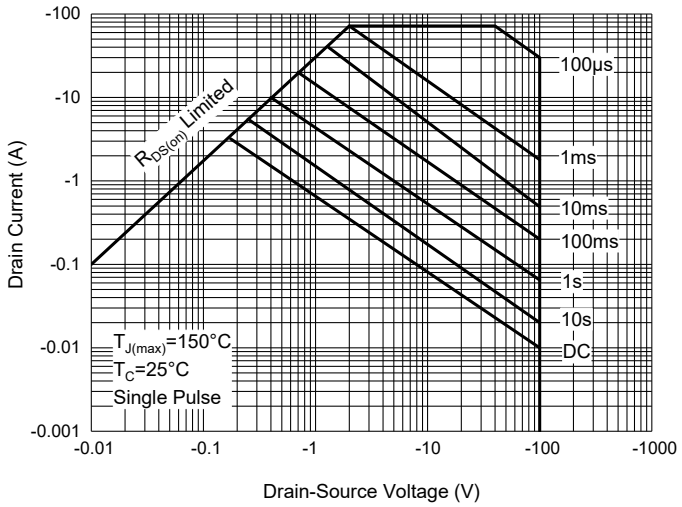



Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Safe Operation Area



## Ordering Information

| Device | Packing |
|---|---|
| Part Number-TP | Tape&Reel: 2.5Kpcs/Reel |

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF