

General Description

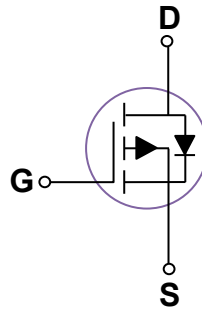
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

| | |
|-----------------------------------|--------------------|
| V_{DS} | -40V |
| I_D (at $V_{GS}=-10V$) | -60A |
| $R_{DS(ON)}$ (at $V_{GS}=-10V$) | 10m Ω (Typ) |
| $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) | 13m Ω (Typ) |

100% UIS TESTED!
100% ΔV_{ds} TESTED!

PDFN5x6



Absolute Maximum Ratings $T_A=25^{\circ}C$ unless otherwise noted

| Parameter | Symbol | Maximum | Units | |
|--|--------------------|------------|-------------|---|
| Drain-Source Voltage | V_{DS} | -40 | V | |
| Gate-Source Voltage | V_{GS} | ± 20 | V | |
| Drain Current-Continuous | TC=25 $^{\circ}C$ | I_D | -60 | A |
| | TC=100 $^{\circ}C$ | I_D | -38 | A |
| Drain Current - Pulsed | I_{DM} | -240 | A | |
| Single Pulse Avalanche Energy | EAS | 160 | mJ | |
| Maximum Power Dissipation | P_D | 82 | W | |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 150 | $^{\circ}C$ | |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Unit |
|--|-----------------|-----|-----|---------------|
| Thermal Resistance junction-case | $R_{\theta Jc}$ | | 1.7 | $^{\circ}C/W$ |
| Thermal Resistance junction-to-Ambient | $R_{\theta JA}$ | | 62 | $^{\circ}C/W$ |

Electrical Characteristics (T_J=25 °C unless otherwise noted)

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|-----------------------------|----------------------------------|--|------|------|-----------|------------|
| STATIC PARAMETERS | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -40 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=-40V, V_{GS}=0V$ | | | -1 | μA |
| I_{GSS} | Gate-Body Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1.0 | -1.6 | -2.5 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}=-10V, I_D=-10A$ | | 10 | 13 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-8A$ | | 13 | 17 | m Ω |
| DYNAMIC PARAMETERS | | | | | | |
| C_{ISS} | Input Capacitance | $V_{DS}=-25V, V_{GS}=0V,$ $F=1.0MHz$ | | 2700 | | pF |
| C_{OSS} | Output Capacitance | | | 240 | | pF |
| C_{RSS} | Reverse Transfer Capacitance | | | 130 | | pF |
| SWITCHING PARAMETERS | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DS}=-20V, I_D=-1A,$ $V_{GS}=-10V,$ $R_G=6\Omega$ | | 23 | | nS |
| t_r | Turn-on Rise Time | | | 10 | | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 135 | | nS |
| t_f | Turn-Off Fall Time | | | 46 | | nS |
| Q_g | Total Gate Charge | $V_{DS}=-20V, I_D=-5A,$ $V_{GS}=-4.5V$ | | 22 | | nC |
| Q_{gs} | Gate-Source Charge | | | 8.2 | | nC |
| Q_{gd} | Gate-Drain Charge | | | 8.8 | | nC |
| V_{SD} | Diode Forward Voltage | $V_{GS}=0V, I_{SD}=-1A$ | | 0.7 | 1.2 | V |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-51A, R_G=25\Omega, Starting T_J=25^\circ C.$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

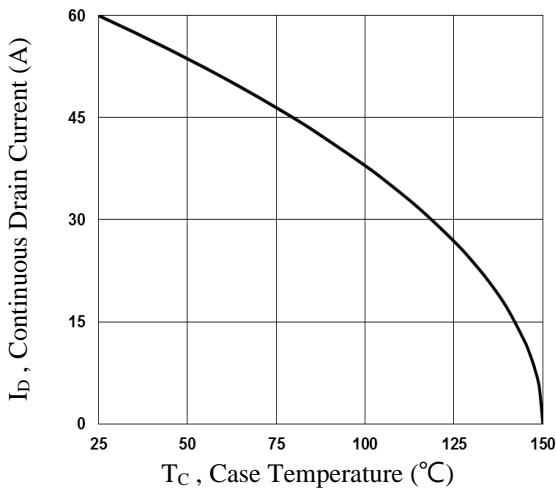


Fig.1 Continuous Drain Current vs. T_c

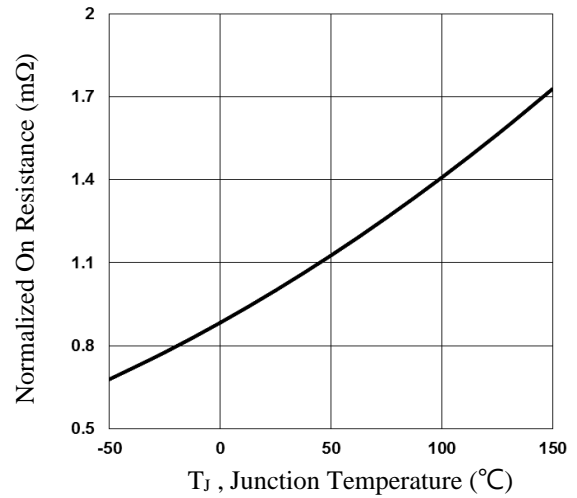


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

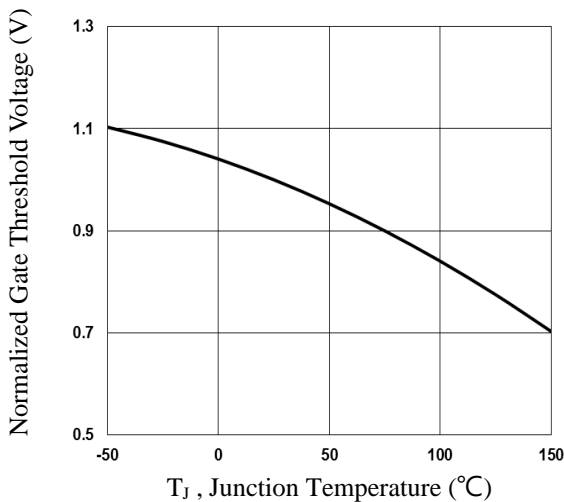


Fig.3 Normalized V_{th} vs. T_j

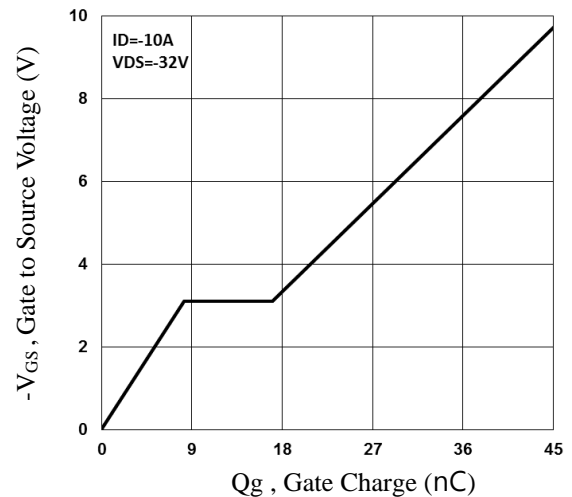


Fig.4 Gate Charge Waveform

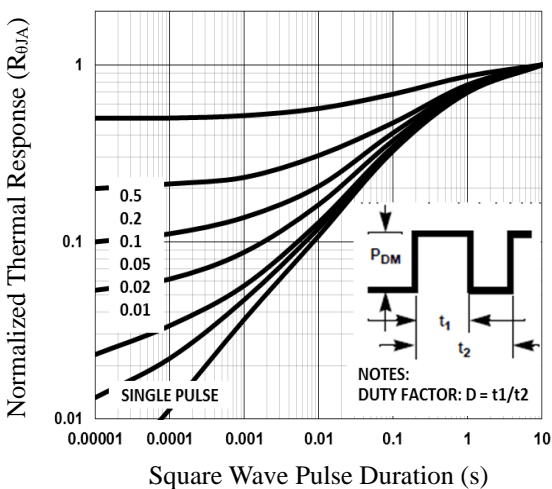


Fig.5 Normalized Transient Impedance

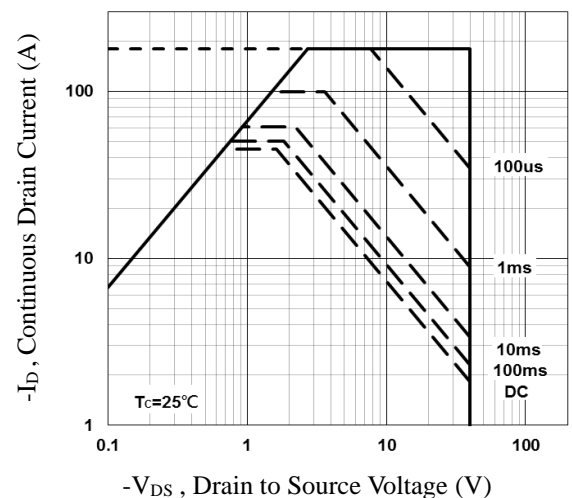


Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

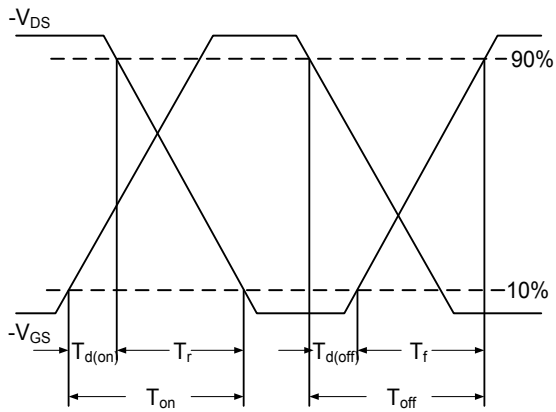


Fig.7 Switching Time Waveform

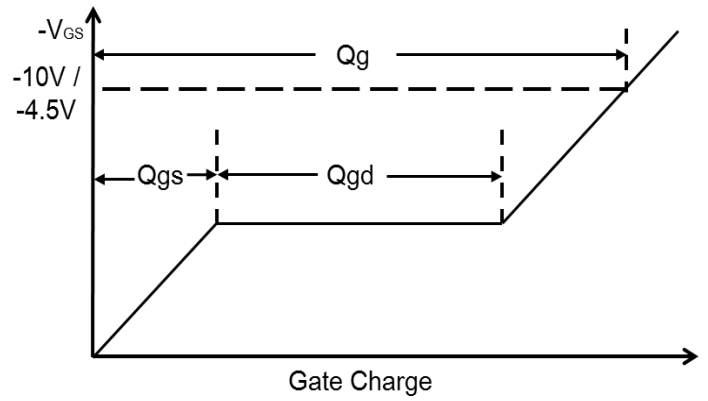
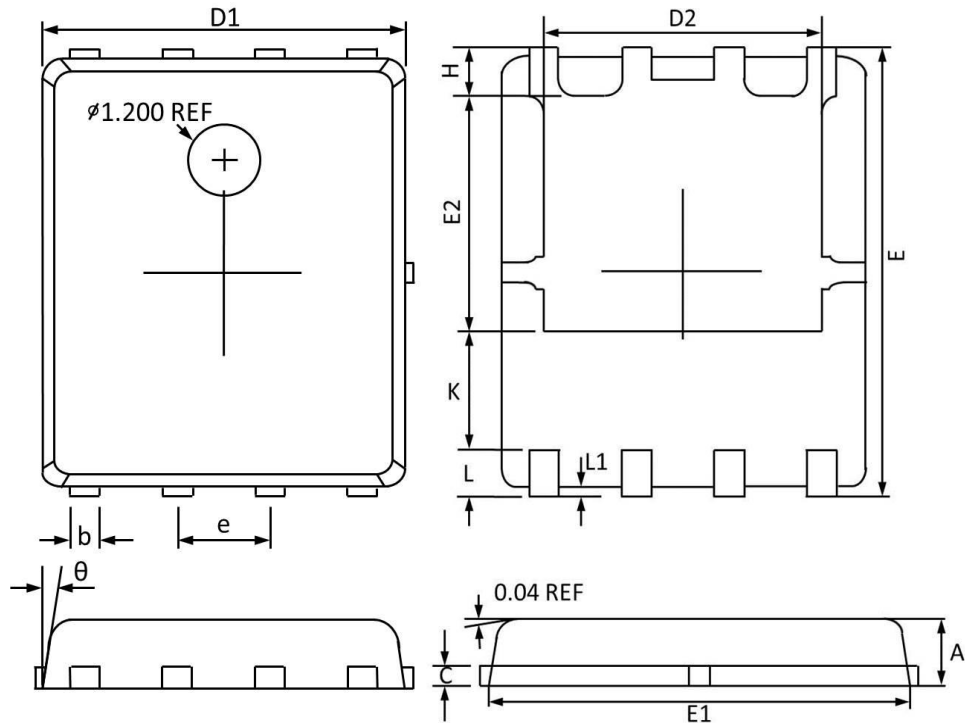


Fig.8 Gate Charge Waveform

PDFN5x6 PACKAGE INFORMATION



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | MAX | MIN | MAX | MIN |
| A | 1.100 | 0.800 | 0.043 | 0.031 |
| b | 0.510 | 0.330 | 0.020 | 0.013 |
| C | 0.300 | 0.200 | 0.012 | 0.008 |
| D1 | 5.100 | 4.800 | 0.201 | 0.189 |
| D2 | 4.100 | 3.610 | 0.161 | 0.142 |
| E | 6.200 | 5.900 | 0.244 | 0.232 |
| E1 | 5.900 | 5.700 | 0.232 | 0.224 |
| E2 | 3.780 | 3.350 | 0.149 | 0.132 |
| e | 1.27BSC | | 0.05BSC | |
| H | 0.700 | 0.410 | 0.028 | 0.016 |
| K | 1.500 | 1.100 | 0.059 | 0.043 |
| L | 0.710 | 0.510 | 0.028 | 0.020 |
| L1 | 0.200 | 0.060 | 0.008 | 0.002 |
| θ | 12° | 0° | 12° | 0° |