

Features

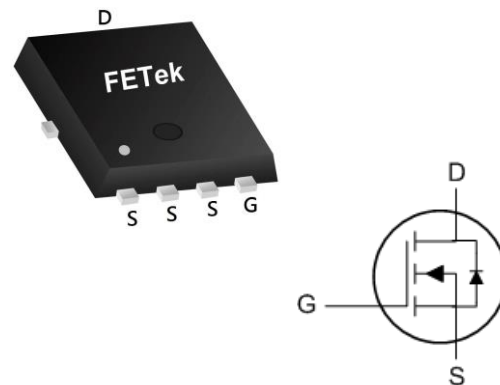
- ★ 100% UIS Tested
- ★ Advanced Trench Technology
- ★ High Current Capability
- ★ RoHS and Halogen-Free Compliant

Product Summary


| BVDSS | RDSON | ID |
|-------|-------|------|
| 30V | 2.8mΩ | 110A |

Applications

- Power Management in Desktop Computer
- DC/DC Converters

PRPAK5X6 Pin Configuration

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|-----------------------|--|------------|------------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D@T_C=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^{1,6}$ | 110 | A |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^{1,6}$ | 71 | A |
| $I_D@T_A=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 24.6 | A |
| $I_D@T_A=70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 19.7 | A |
| I_{DM} | Pulsed Drain Current ² | 400 | A |
| EAS | Single Pulse Avalanche Energy ³ | 204 | mJ |
| I_{AS} | Avalanche Current | 64 | A |
| $P_D@T_C=25^\circ C$ | Total Power Dissipation ⁴ | 52 | W |
| $P_D@T_A=25^\circ C$ | Total Power Dissipation ⁴ | 2.5 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|--|------|------|--------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ¹ | --- | 50 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ¹ | --- | 2.4 | $^\circ C/W$ |

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------|--|---|------|------|-----------|------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=10V, I_D=15A$ | --- | 2.4 | 2.8 | m Ω |
| | | $V_{GS}=4.5V, I_D=15A$ | --- | 3.6 | 4.5 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 1.2 | 1.8 | 2.2 | V |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=24V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | 1 | μA |
| | | $V_{DS}=24V, V_{GS}=0V, T_J=55^\circ\text{C}$ | --- | --- | 5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| R_g | Gate Resistance | $V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$ | --- | 1.6 | --- | Ω |
| Q_g | Total Gate Charge | $V_{DS}=15V, V_{GS}=4.5V, I_D=15A$ | --- | 20.4 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 6.7 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 8.6 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=15V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$ | --- | 12 | --- | ns |
| T_r | Rise Time | | --- | 25 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 39 | --- | |
| T_f | Fall Time | | --- | 23 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$ | --- | 2235 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 956 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 156 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|--|---|------|------|------|------|
| I_S | Continuous Source Current ^{1,6} | $V_G=V_D=0V$, Force Current | --- | --- | 100 | A |
| V_{SD} | Diode Forward Voltage ² | $V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$ | --- | --- | 1.2 | V |
| T_{rr} | Reverse Recovery Time | $I_F=15A, di/dt=100A/\mu s,$ | --- | 62.2 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | $T_J=25^\circ\text{C}$ | --- | 46.4 | --- | nC |

Note :

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=52A$
- The power dissipation is limited by 150 $^\circ\text{C}$ junction temperature
- The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.
- Package limitation current is 100A.

Typical Characteristics

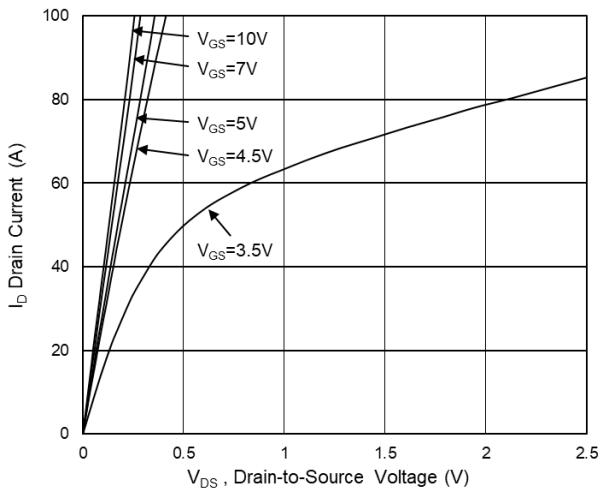


Fig.1 Typical Output Characteristics

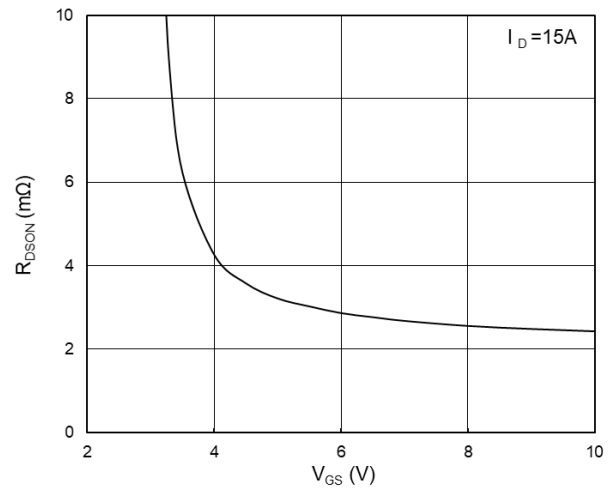


Fig.2 On-Resistance vs G-S Voltage

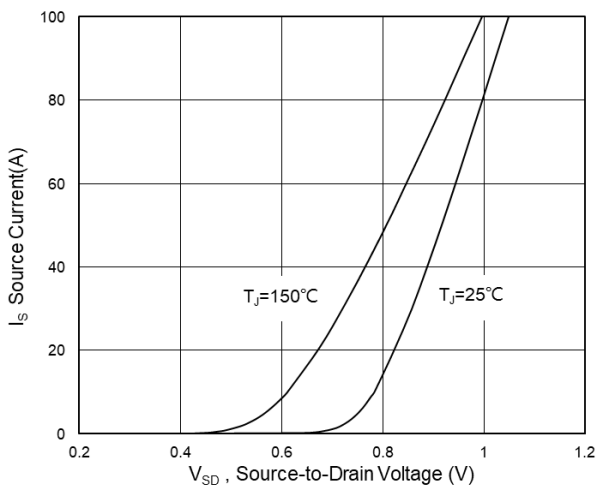


Fig.3 Source Drain Forward Characteristics

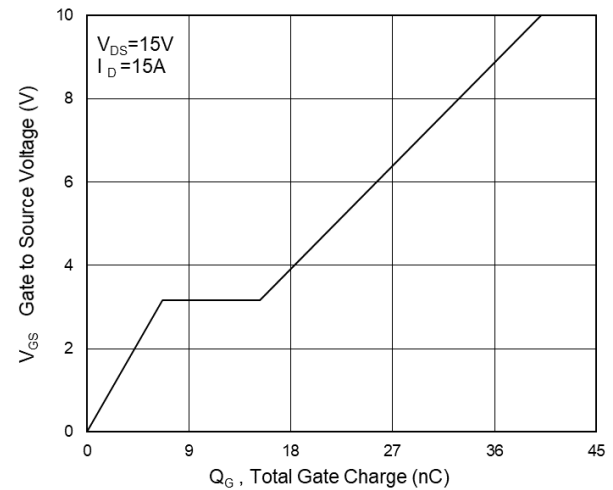


Fig.4 Gate-Charge Characteristics

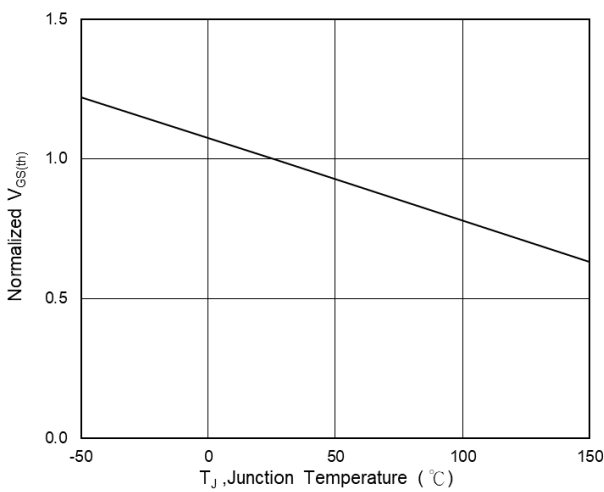


Fig.5 Normalized $V_{GS(th)}$ vs T_J

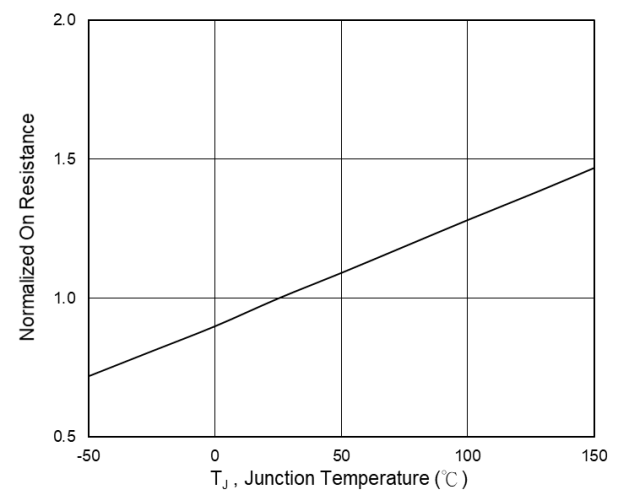


Fig.6 Normalized $R_{DS(on)}$ vs T_J

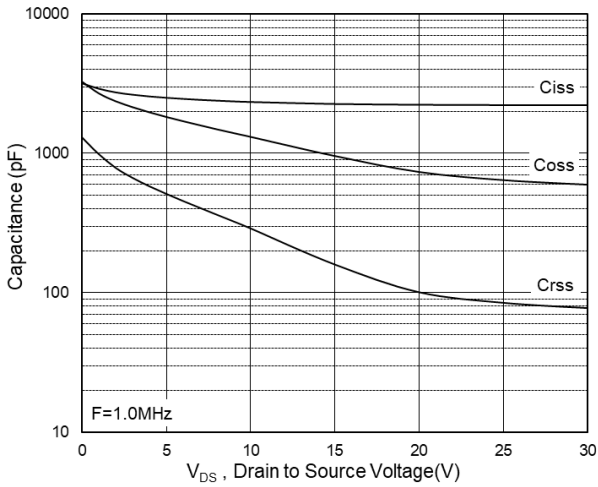


Fig.7 Capacitance

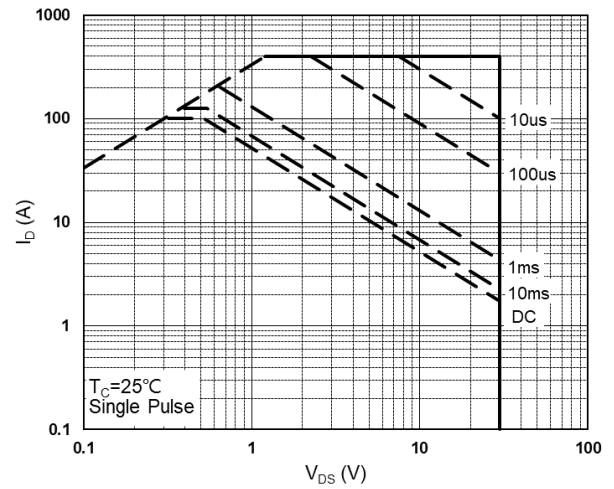


Fig.8 Safe Operating Area

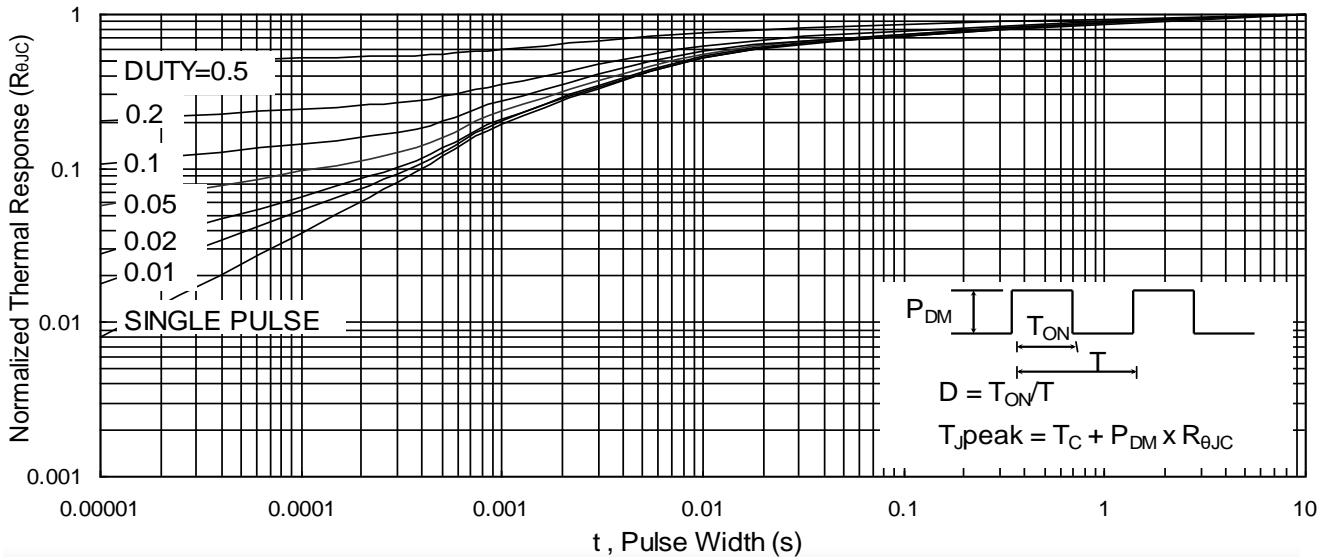


Fig.9 Normalized Maximum Transient Thermal Impedance

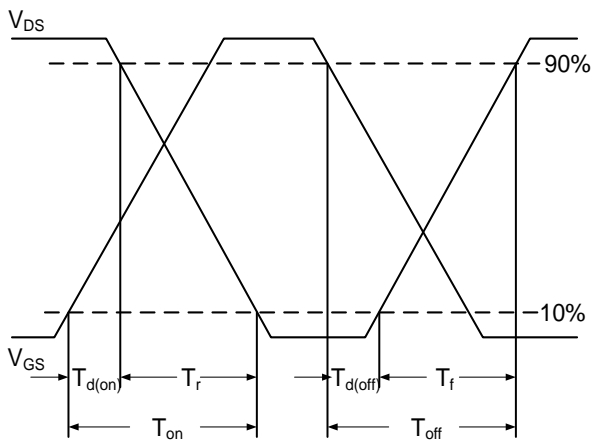


Fig.10 Switching Time Waveform

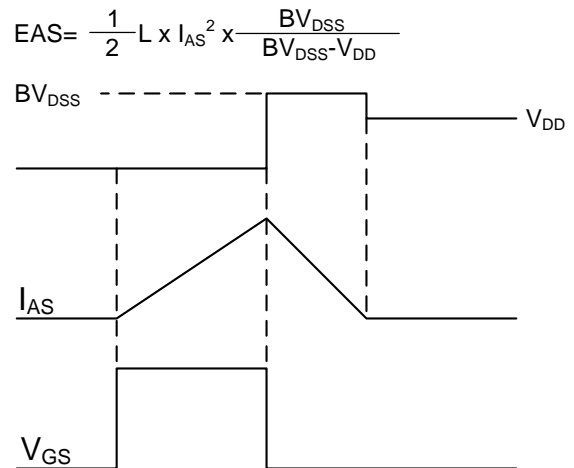


Fig.11 Unclamped Inductive Switching Waveform