

**Features**

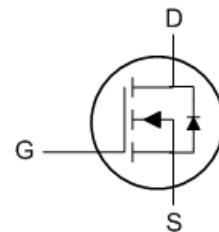
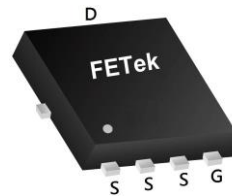
- Low  $R_{DS(ON)}$
- Green Device Available
- 100% EAS Tested
- Advanced Trench MOS Technology

**Applications**

- Power Management in TV Converter.
- DC/DC Converter.

**Product Summary**

BVDSS	RDSON	ID
150V	56mΩ	23A

**PRPAK5X6 Pin Configuration****Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	150	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	23	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	16	A
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	4.5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	3.8	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	60	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	75	W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	2.7	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	2.0	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=10A$	---	47	56	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2	---	4	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=120V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=120V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=10A$	---	25	---	S
$Q_g$	Total Gate Charge	$V_{DS}=75V, V_{GS}=10V, I_D=10A$	---	23	---	nC
$Q_{gs}$	Gate-Source Charge		---	5.8	---	
$Q_{gd}$	Gate-Drain Charge		---	4.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=75V, V_{GS}=10V, R_G=3.3\Omega, I_D=10A$	---	16.2	---	ns
$T_r$	Rise Time		---	18.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	28.5	---	
$T_f$	Fall Time		---	6.5	---	
$C_{iss}$	Input Capacitance	$V_{DS}=75V, V_{GS}=0V, f=1\text{MHz}$	---	1190	---	$\mu F$
$C_{oss}$	Output Capacitance		---	73	---	
$C_{rss}$	Reverse Transfer Capacitance		---	4	---	

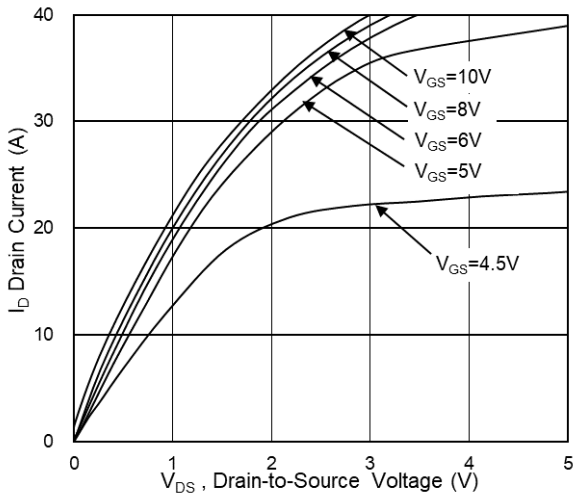
**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,4</sup>	$V_G=V_D=0V$ , Force Current	---	---	20	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	45	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	138	---	nC

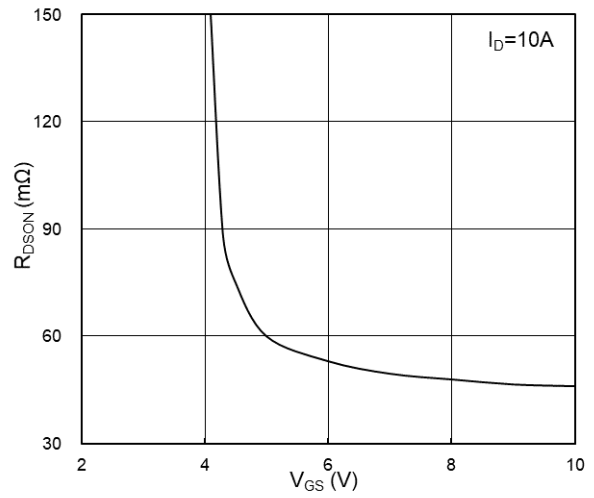
Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- 3.The power dissipation is limited by 150 $^\circ\text{C}$  junction temperature
- 4.The data is theoretically the same as  $I_D$  and  $I_{DM}$ , in real applications , should be limited by total power dissipation.

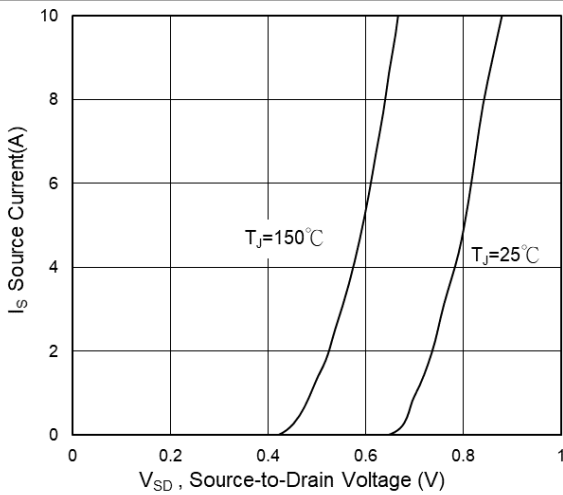
### Typical Characteristics



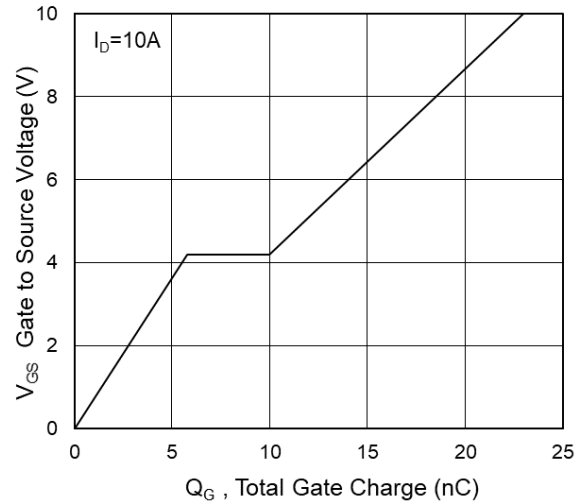
**Fig.1 Typical Output Characteristics**



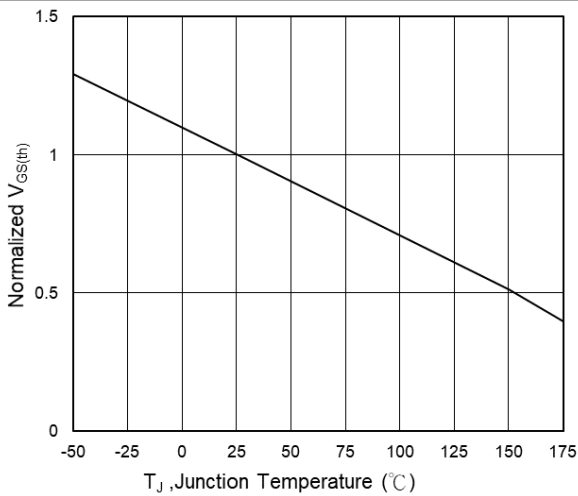
**Fig.2 On-Resistance vs G-S Voltage**



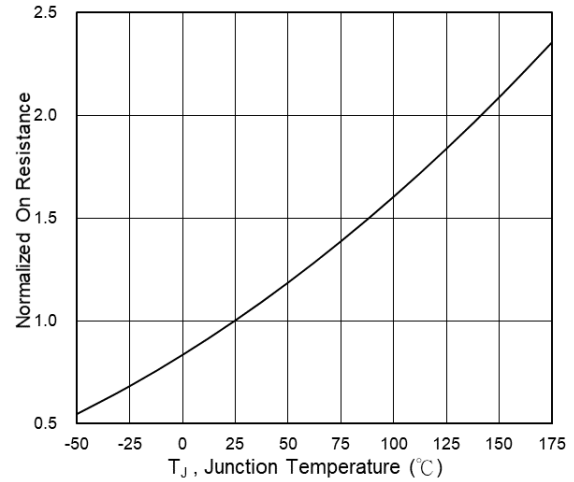
**Fig.3 Source Drain Forward Characteristics**



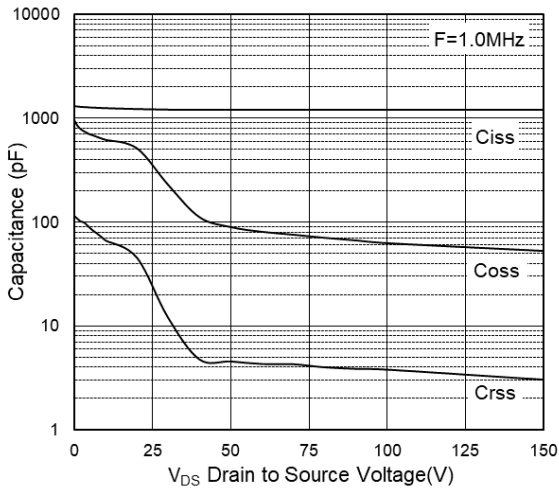
**Fig.4 Gate-Charge Characteristics**



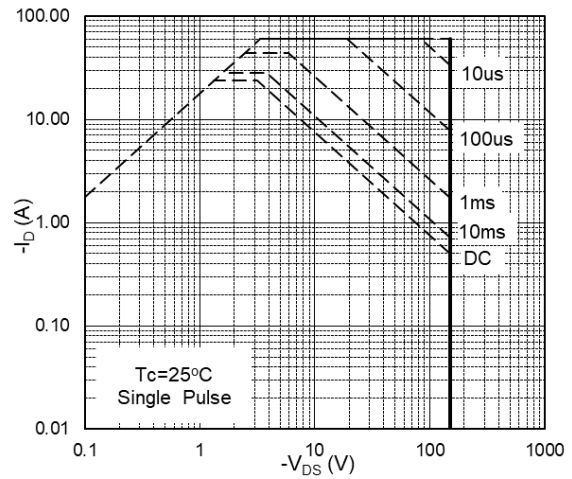
**Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$**



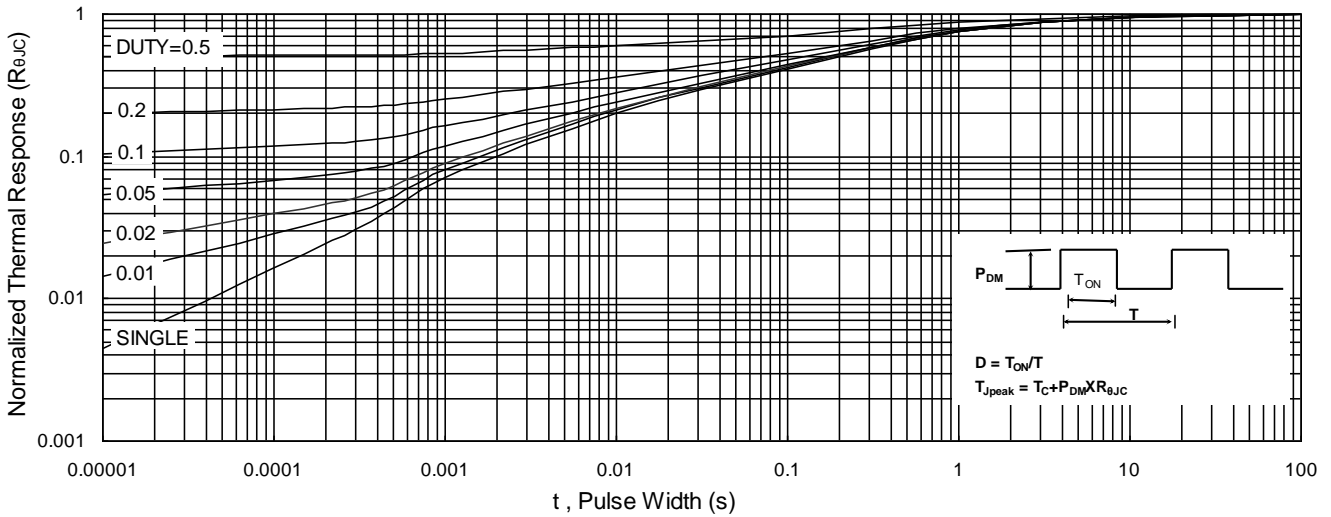
**Fig.6 Normalized  $R_{DSON}$  vs  $T_J$**



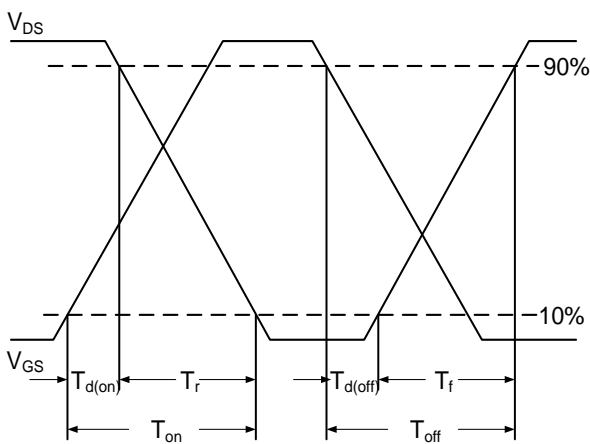
**Fig.7 Capacitance**



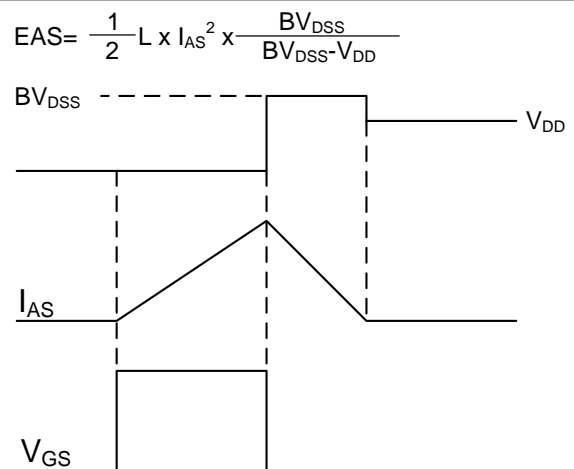
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**