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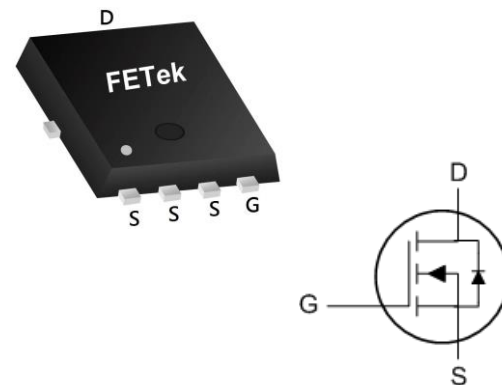
N-Ch 30V Fast Switching MOSFETs

Features

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

Applications

● Power Management in Desktop Computer
● DC/DC Converters

Product Summary

BVDSS	RDSON	ID
30V	1.6mΩ	100A

PRPAK5X6 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25°C$	Continuous Drain Current, V_{GS} @ 10V[1,6]	100	A
$I_D@T_C=100°C$	Continuous Drain Current, V_{GS} @ 10V[1,6]	97	A
$I_D@T_A=25°C$	Continuous Drain Current, V_{GS} @ 10V[1]	31	A
$I_D@T_A=70°C$	Continuous Drain Current, V_{GS} @ 10V[1]	25	A
I_{DM}	Pulsed Drain Current[2]	350	A
EAS	Single Pulse Avalanche Energy[3]	151	mJ
I_{AS}	Avalanche Current	55	A
$P_D@T_C=25°C$	Total Power Dissipation[4]	62.5	W
$P_D@T_A=25°C$	Total Power Dissipation[4]	2.5	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	2.0	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	1.3	1.6	mΩ
		V_{GS}=4.5V , I_D=20A	---	1.9	2.5	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.6	2.2	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	35	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.0	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=10V , I_D=20A	---	45	---	nC
Q_{gs}	Gate-Source Charge		---	9.8	---	
Q_{gd}	Gate-Drain Charge		---	6.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω, I_D=20A	---	10.3	---	ns
T_r	Rise Time		---	6.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	56	---	
T_f	Fall Time		---	8.4	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	3420	---	pF
C_{oss}	Output Capacitance		---	1916	---	
C_{rss}	Reverse Transfer Capacitance		---	196	---	

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℃	---	---	1.2	V
T_{rr}	Reverse Recovery Time	I_F=20A , dI/dt=100A/μs , T_J=25℃	---	38	---	nS
Q_{rr}	Reverse Recovery Charge		---	30	---	nC

Note :

1.The data tested by surface mounted on a 1 inch[2] FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=55A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

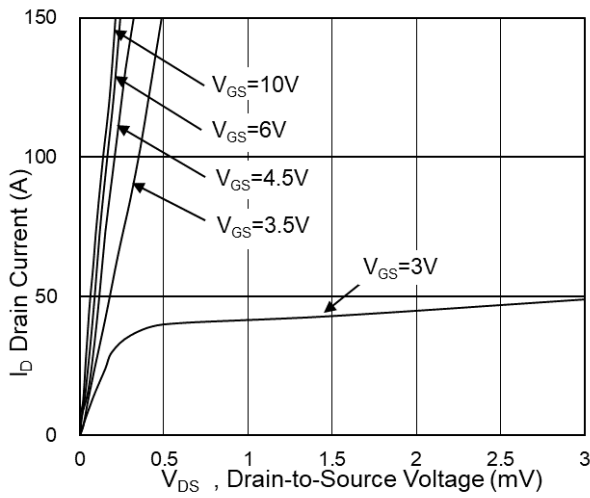6.Package limitation current is 85A.

Typical Characteristics

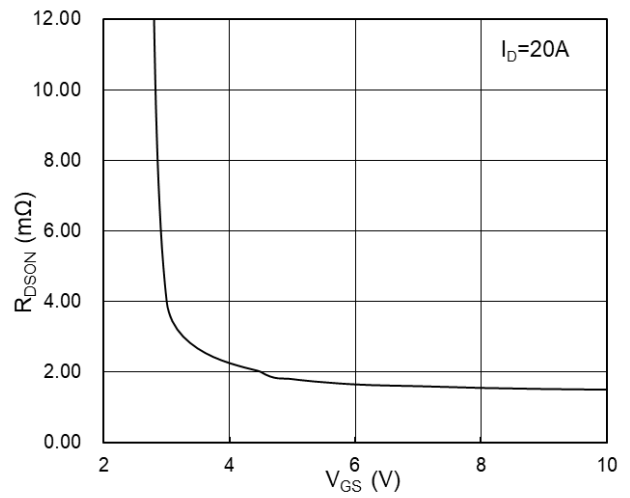**Fig.1 Typical Output Characteristics**

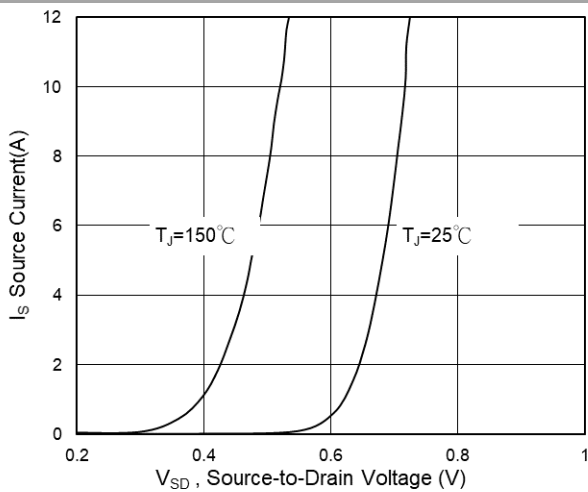**Fig.2 On-Resistance vs G-S Voltage**

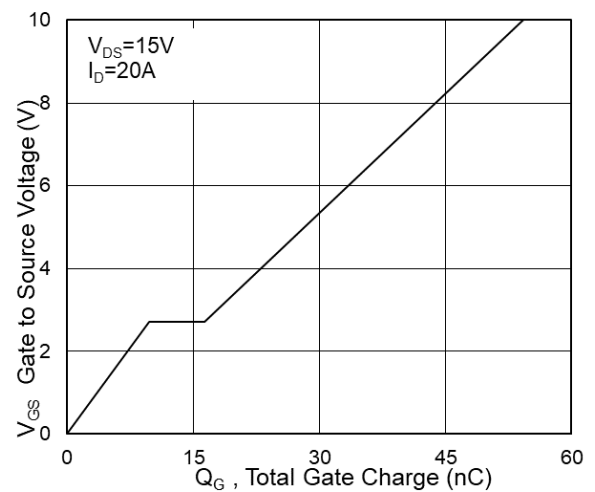**Fig.3 Source Drain Forward Characteristics**

Fig.4 Gate-Charge Characteristics
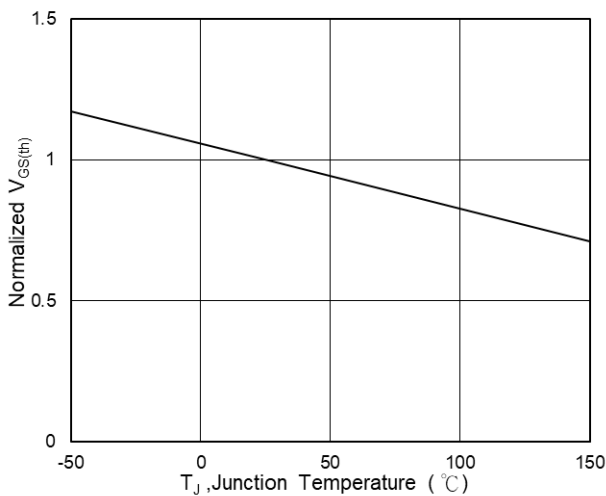
Fig.5 Normalized $V_{GS(th)}$ vs T_J
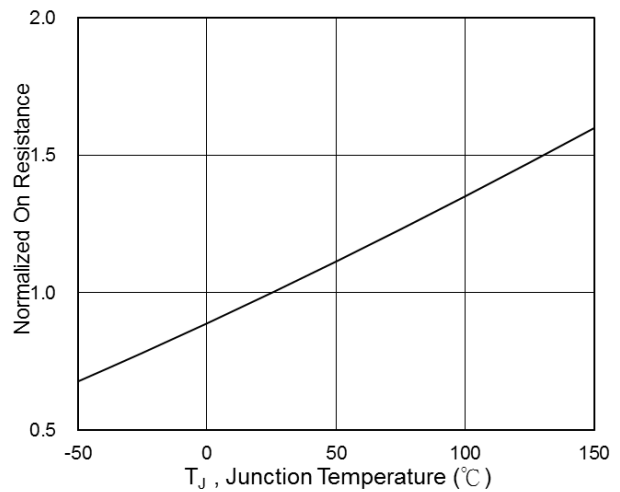
Fig.6 Normalized R_{DSON} vs T_J

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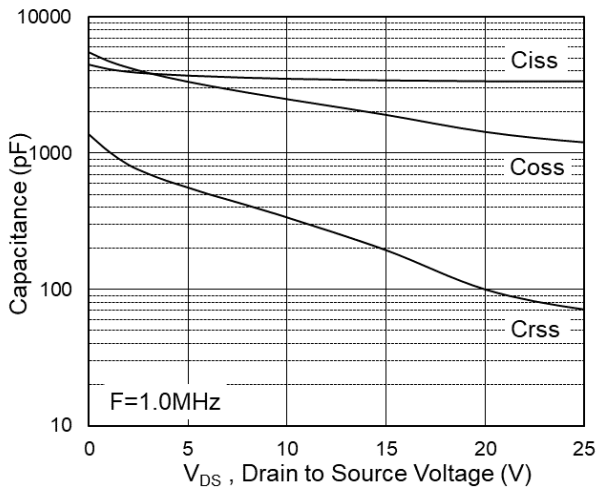
Fig.7 Capacitance
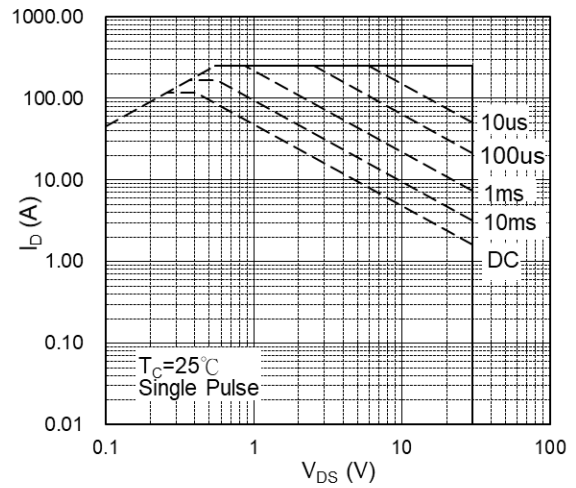
Fig.8 Safe Operating Area
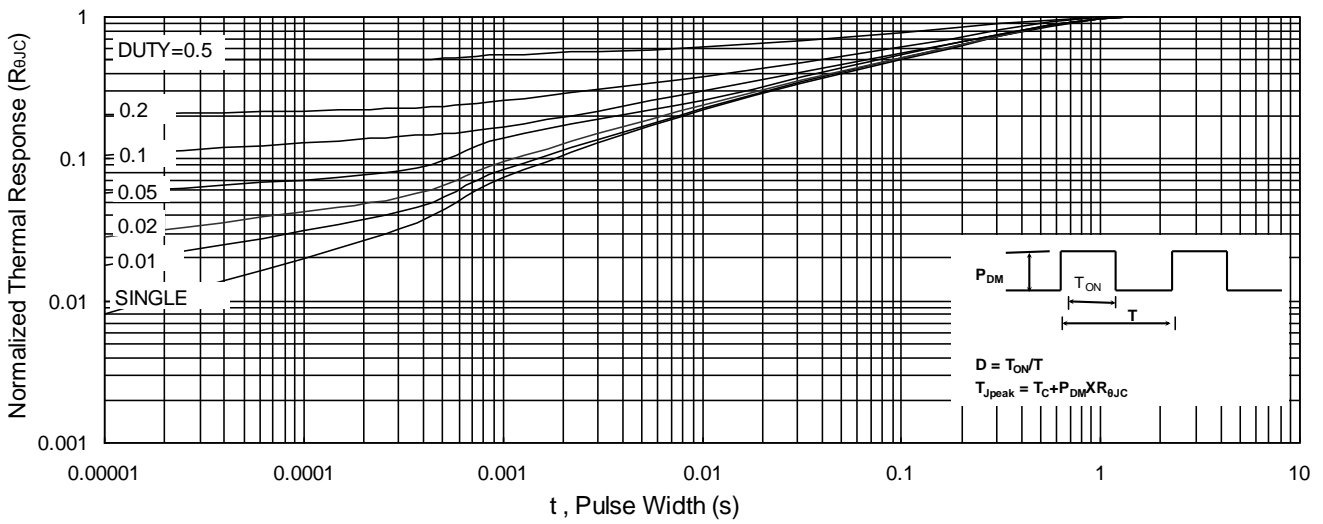
Fig.9 Normalized Maximum Transient Thermal Impedance

$$D = T_{ON}/T$$

$$T_{Jpeak} = T_C + P_{DM} \times R_{\theta JC}$$
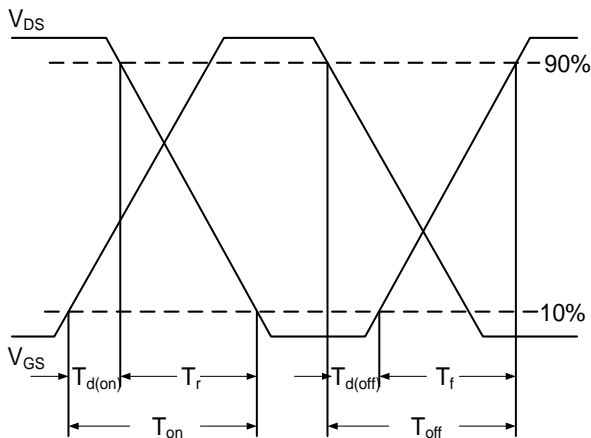
Fig.10 Switching Time Waveform

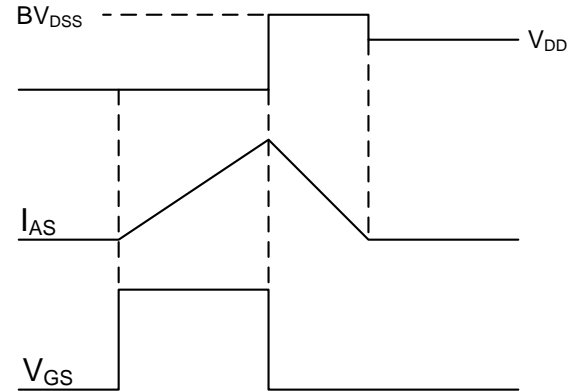$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

Fig.11 Unclamped Inductive Switching Waveform