FKBA3072

FETek Technology Corp.

Single N-Channel MOSFET

Features

★ Advanced Trench MOS Technology
★ Low Gate Charge
★ 100% EAS Tested
★ Green Device Available

Applications

● Power Management in Desktop Computer
● DC/DC Converters

Product Summary

BVDSS	RDSON	ID
30V	2.0mΩ	120A

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]	120	A
$I_D@T_C=100°C$	Continuous Drain Current, V_{GS} @ 10V[1,6]	76	A
I_{DM}	Pulsed Drain Current[2]	240	A
EAS	Single Pulse Avalanche Energy[3]	80	mJ
I_{AS}	Avalanche Current	40	A
$P_D@T_C=25°C$	Total Power Dissipation[4]	50	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
$R_{θJA}$	Thermal Resistance Junction-Ambient [1]	---	60	°C/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	---	2.5	°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	---	1.65	2.0	mΩ
		V$_{GS}$=4.5V , I$_D$=20A	---	2.45	3.3	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$=250uA	1.2	1.6	2.3	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	---	40	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	2.0	---	Ω
Q$_g$	Total Gate Charge (10V)	V$_{DS}$=15V , V$_{GS}$=4.5V , I$_D$=20A	---	51.5	---	nC
Q$_g$	Total Gate Charge (4.5V)		---	26.1	---	
Q$_{gs}$	Gate-Source Charge		---	8	---	
Q$_{gd}$	Gate-Drain Charge		---	10.6	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=15V , V$_{GS}$=10V , R$_G$=3.3Ω, I$_D$=20A	---	11.5	---	ns
T$_r$	Rise Time		---	45.5	---	
T$_{d(off)}$	Turn-Off Delay Time		---	28.5	---	
T$_f$	Fall Time		---	7.1	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	2859	---	pF
C$_{oss}$	Output Capacitance		---	1259	---	
C$_{rss}$	Reverse Transfer Capacitance		---	229	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,6]	V$_G$=V$_D$=0V , Force Current	---	---	85	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$_F$=15A , dI/dt=100A/μs , T$_J$=25℃	---	35	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	19	---	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$_{AS}$=40A

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.

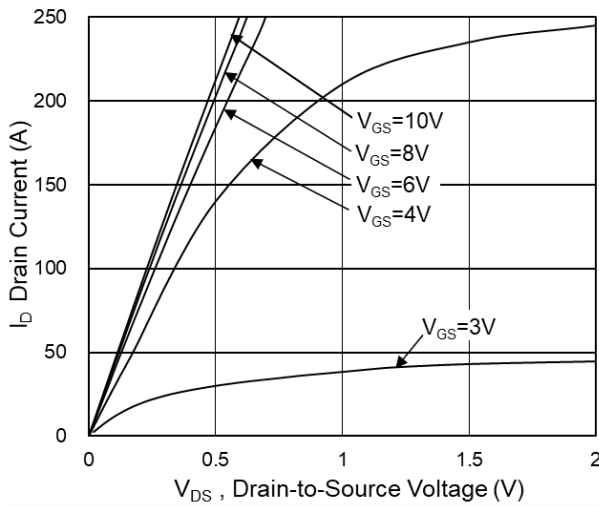6.Package limitation current is 85A.

Typical Characteristics
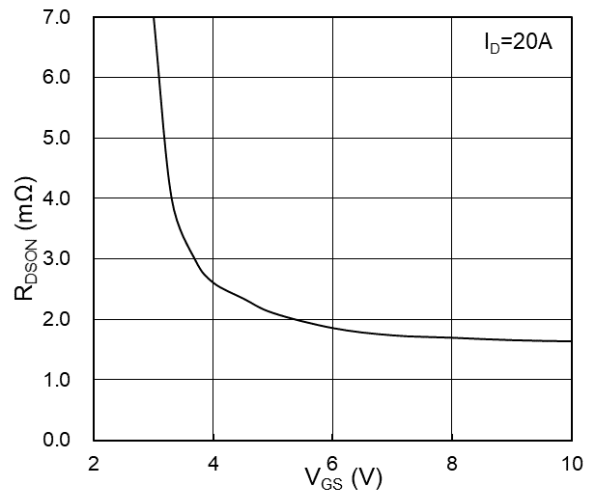

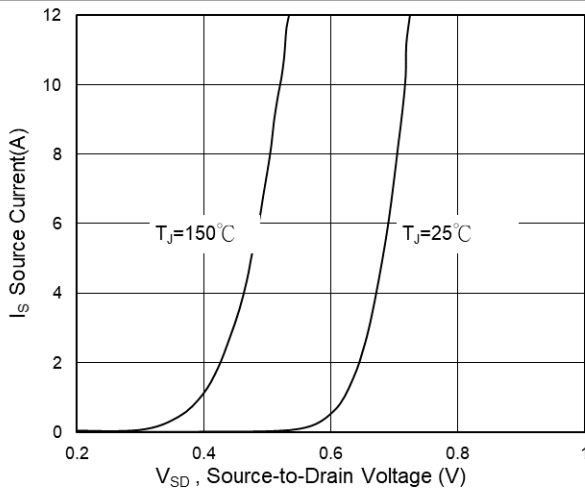**Fig.1 Typical Output Characteristics**

Fig.2 On-Resistance vs G-S Voltage

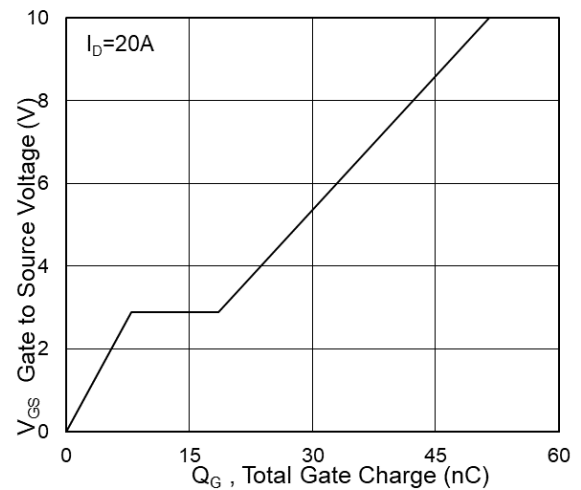**Fig.3 Source Drain Forward Characteristics**

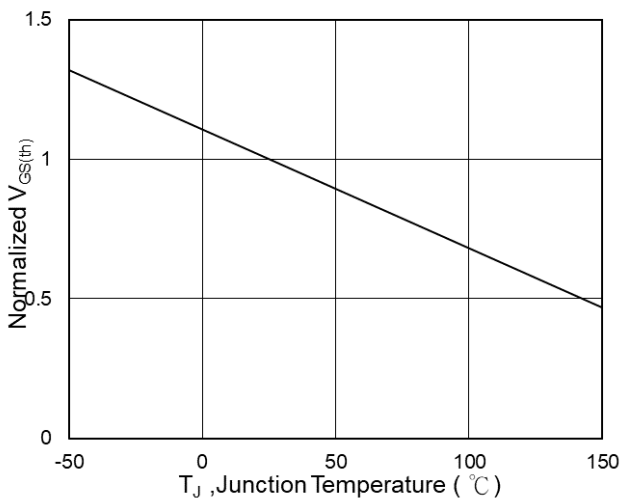**Fig.4 Gate-Charge Characteristics**

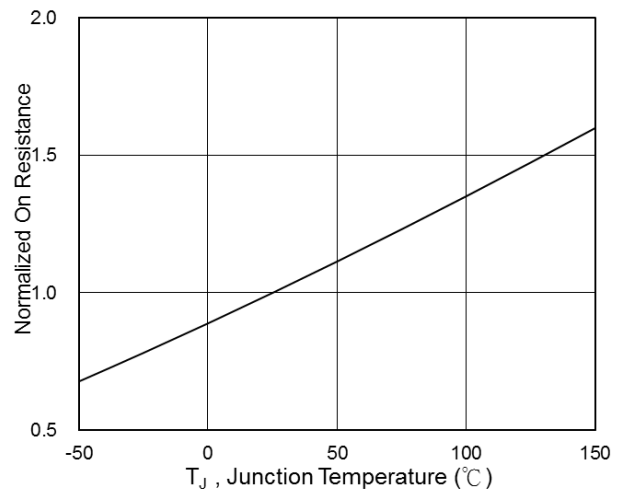**Fig.5 Normalized $V_{GS(th)}$ vs T_J**

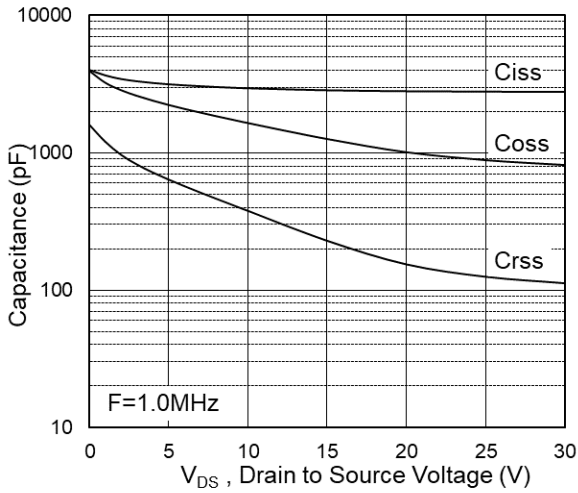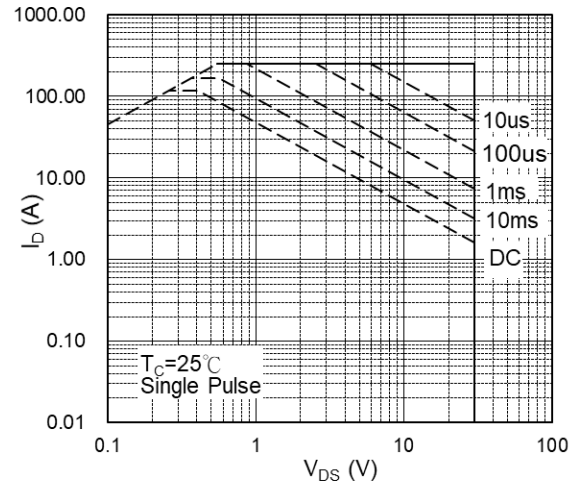**Fig.6 Normalized R_{DSON} vs T_J**

Fig.7 Capacitance

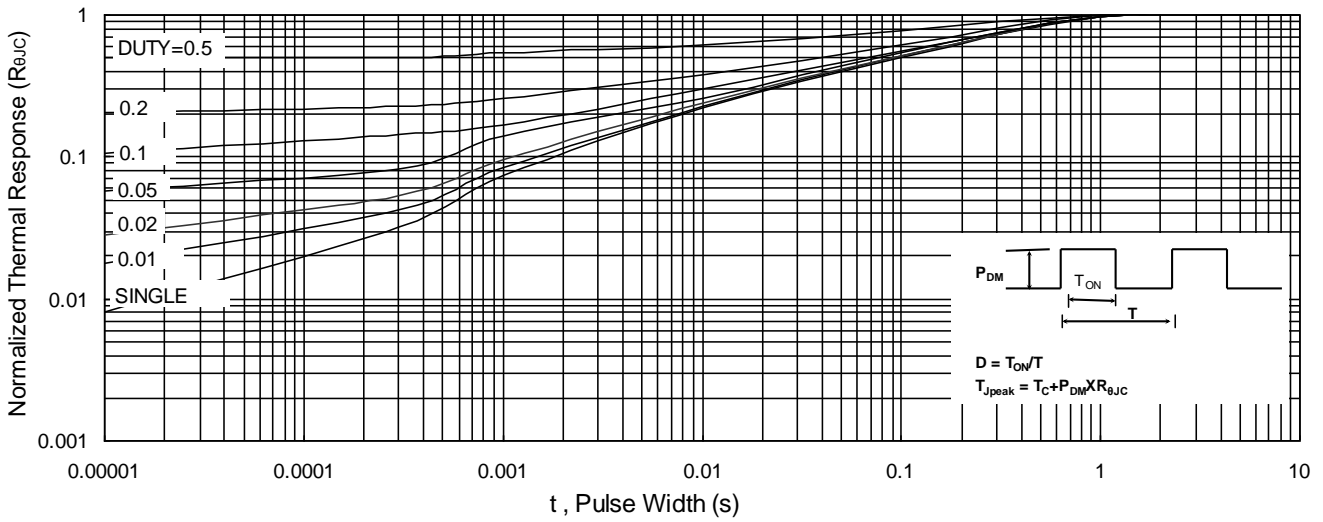**Fig.8 Safe Operating Area**

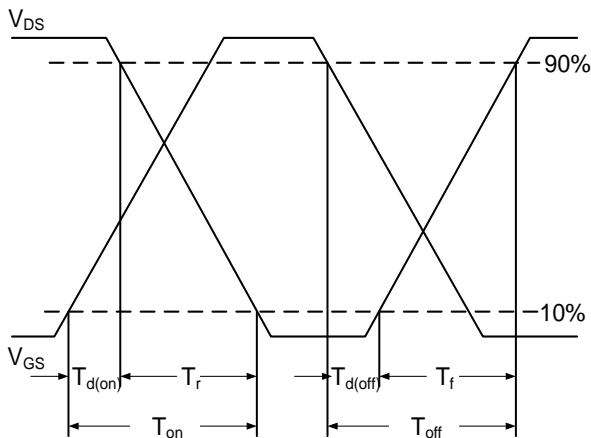**Fig.9 Normalized Maximum Transient Thermal Impedance**

Fig.10 Switching Time Waveform

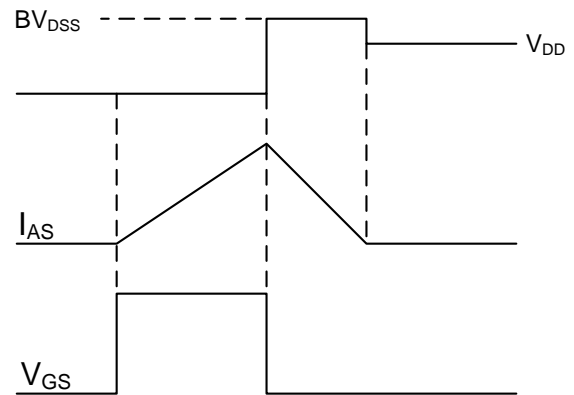$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Fig.11 Unclamped Inductive Switching Waveform