FKBA20N15S

N-Ch 150V Fast Switching MOSFETs

FETek Technology Corp.

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
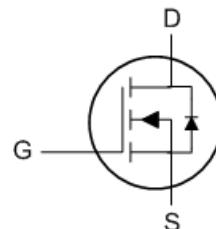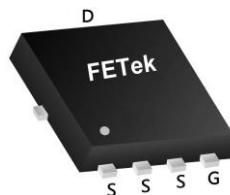
Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1]	23	A
I_D@T_C=100℃	Continuous Drain Current[1]	16	A
I_D@T_A=25℃	Continuous Drain Current[1]	4.5	A
I_D@T_A=70℃	Continuous Drain Current[1]	3.8	A
I_{DM}	Pulsed Drain Current[2]	60	A
P_D@T_C=25℃	Total Power Dissipation[3]	72.6	W
P_D@T_A=25℃	Total Power Dissipation[3]	2.7	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	55	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	2.0	℃/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	150	---	---	V
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=10V , I$_D$=10A	---	47	56	mΩ
	Static Drain-Source On-Resistance[2]	V$_{GS}$=4.5V , I$_D$=10A	---	53	68	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	1.2	---	2.5	V
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=120V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=120V , 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$_D$=10A	---	25	---	S
Q$_g$	Total Gate Charge	V$_{DS}$=75V , V$_{GS}$=10V , I$_D$=10A	---	19	---	nC
Q$_{gs}$	Gate-Source Charge		---	4.5	---	
Q$_{gd}$	Gate-Drain Charge		---	2.6	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=75V , V$_{GS}$=10V , R$_G$=3.3Ω I$_D$=10A	---	18	---	ns
T$_r$	Rise Time		---	5.8	---	
T$_{d(off)}$	Turn-Off Delay Time		---	26.5	---	
T$_f$	Fall Time		---	4.5	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=25V , V$_{GS}$=0V , f=1MHz	---	1090	---	pF
C$_{oss}$	Output Capacitance		---	93	---	
C$_{rss}$	Reverse Transfer Capacitance		---	6	---	

Diode Characteristics

| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,4]	V$_G$=V$_D$=0V , Force Current	---	---	20	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$_F$=10A , dI/dt=100A/µs , T$_J$=25℃	---	45	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	138	---	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 power dissipation is limited by 150℃ 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.

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Typical Characteristics
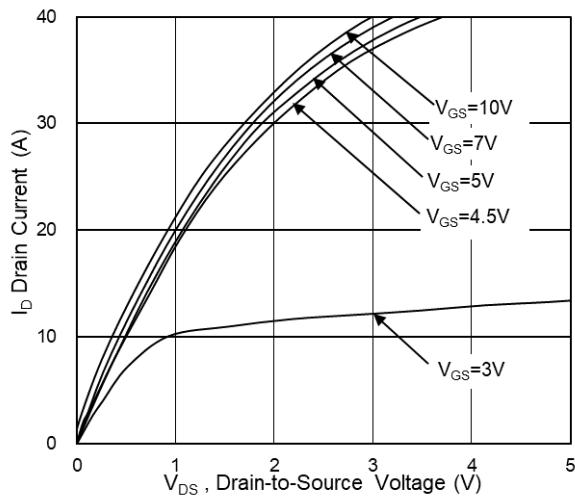

Fig.1 Typical Output Characteristics
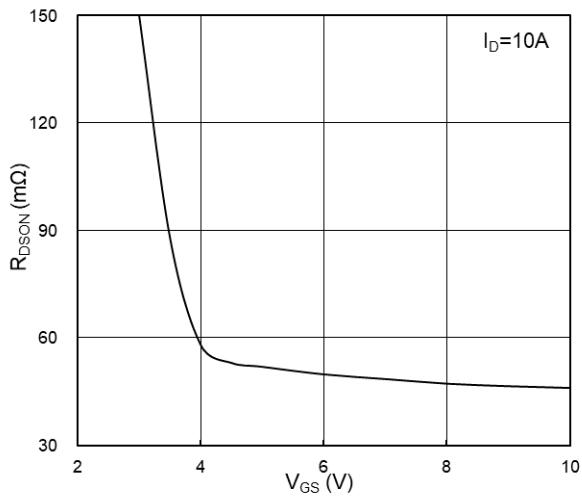
**Fig.2 On-Resistance vs G-S Voltage**
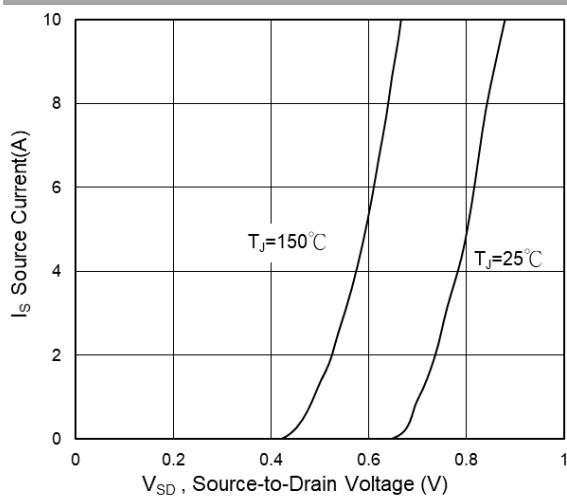

Fig.3 Source Drain Forward Characteristics
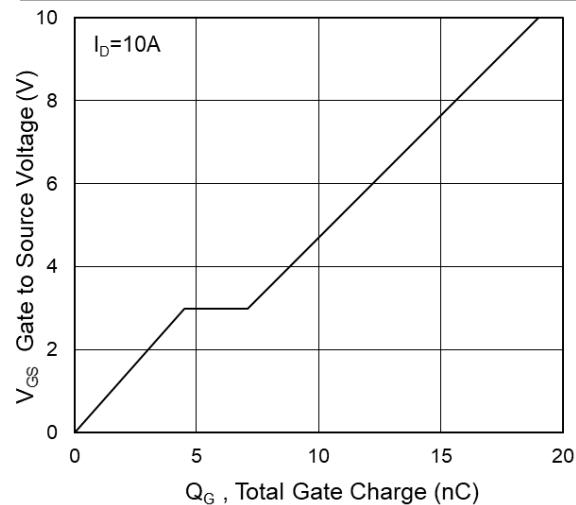

Fig.4 Gate-Charge Characteristics
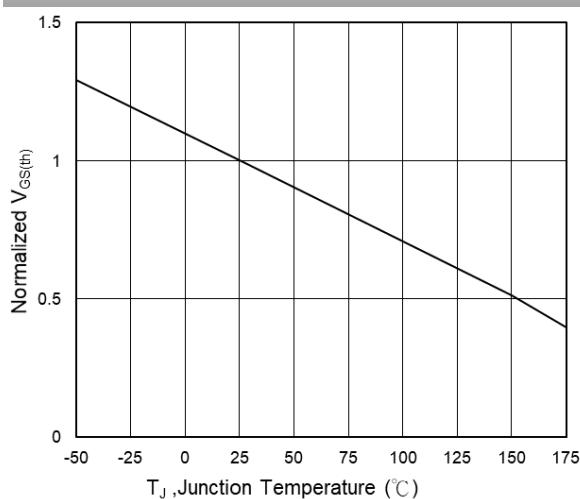

Fig.5 Normalized $V_{GS(th)}$ vs T_J
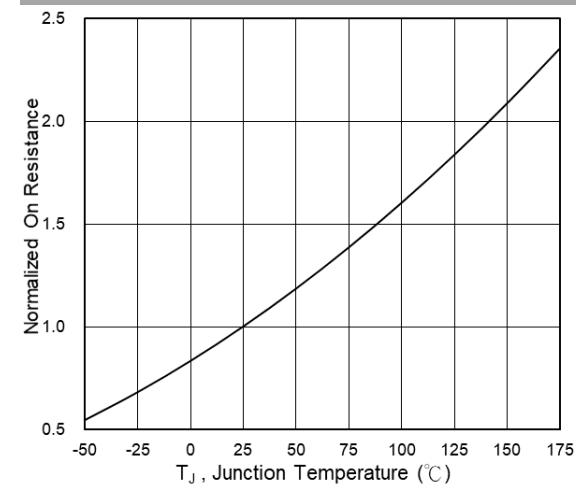
Fig.6 Normalized R_{DSON} vs T_J
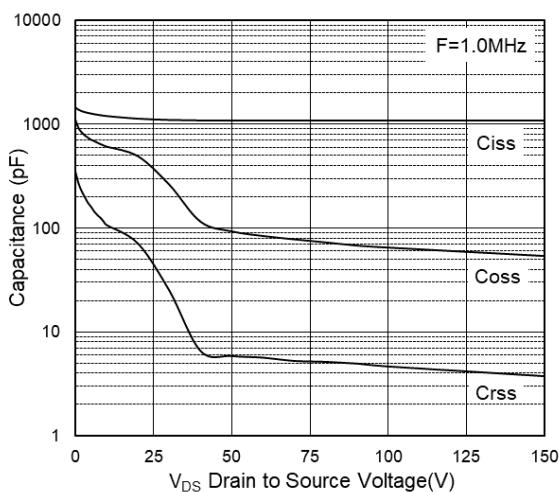
Fig.7 Capacitance
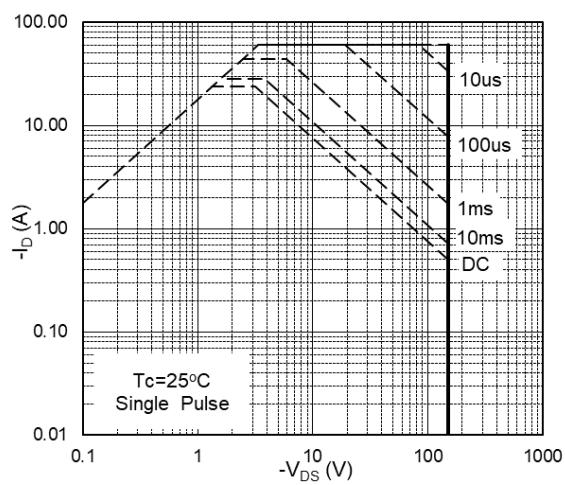
Fig.8 Safe Operating Area
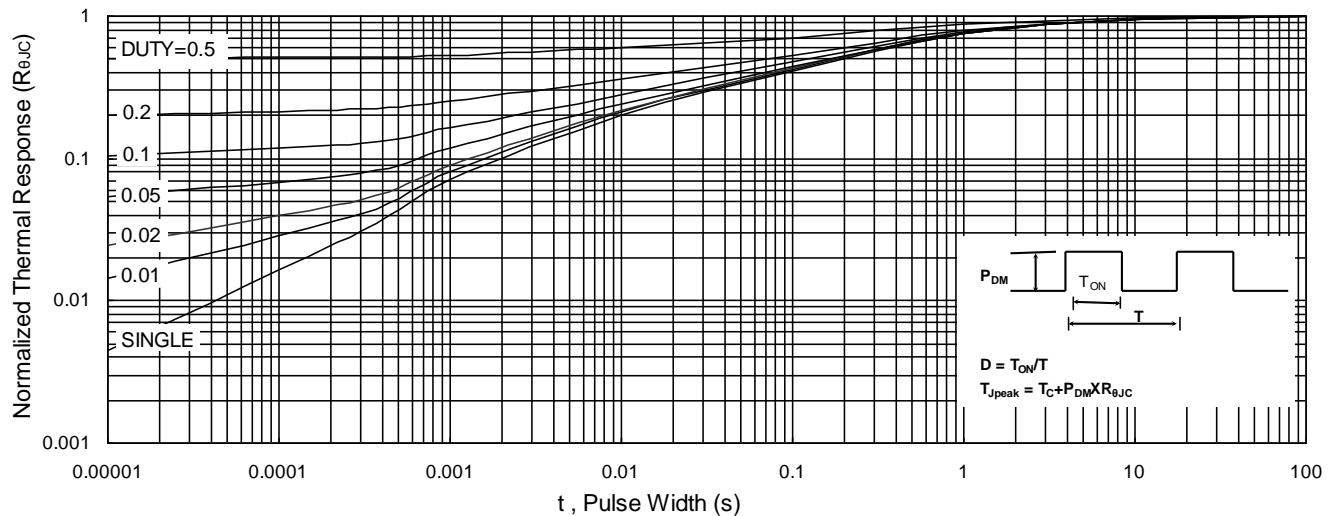
Fig.9 Normalized Maximum Transient Thermal Impedance

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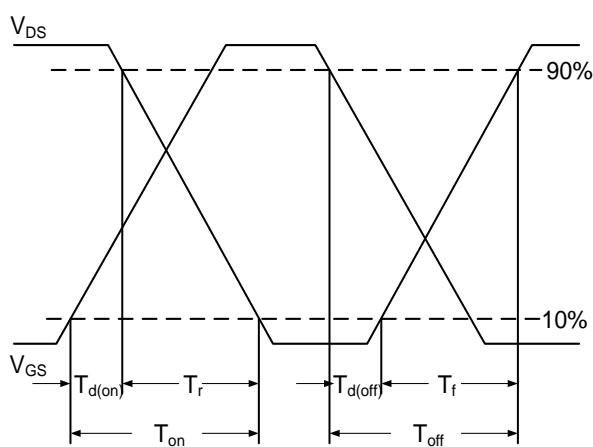
Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$
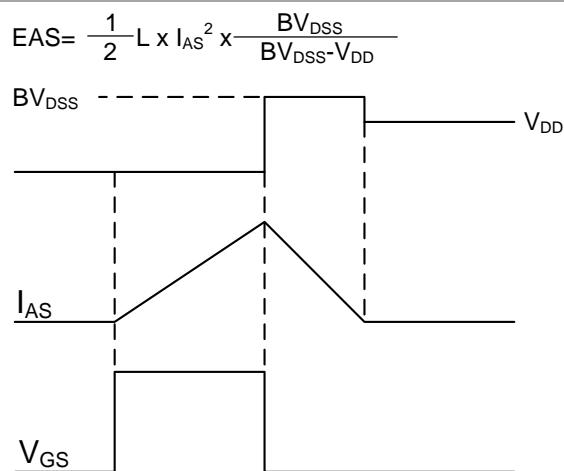
Fig.11 Unclamped Inductive Switching Waveform