FKL0016

FETek Technology Corp.

N-Ch 100V Fast Switching MOSFETs

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology

Product Summary

BVDSS	RDSON	ID
100V	47mΩ	6A

Description

The FKL0016 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The FKL0016 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

SOT223 Pin Configuration
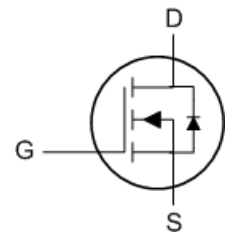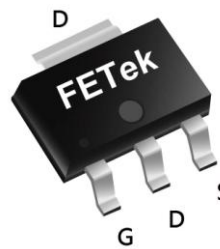
Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	6	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	4.7	A
I_{DM}	Pulsed Drain Current[2]	24	A
EAS	Single Pulse Avalanche Energy[3]	11.3	mJ
I_{AS}	Avalanche Current	15	A
P_D@T_A=25°C	Total Power Dissipation[4]	1.5	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](Steady State)	---	70	°C/W
	Thermal Resistance Junction-ambient [1](t≤10s)	---	35	°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	100	---	---	V
△BV$_{DSS}$/△T$_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I$_D$=1mA	---	0.098	---	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=10V , I$_D$=5A	---	---	47	mΩ
		V$_{GS}$=4.5V , I$_D$=5A	---	---	50	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	1.2	---	2.5	V
△V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	-5.52	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=25℃	---	---	10	uA
		V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=55℃	---	---	100	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
gfs	Forward Transconductance	V$_{DS}$=5V , I$_D$=5A	---	6.2	---	S
Q$_g$	Total Gate Charge (10V)	V$_{DS}$=80V , V$_{GS}$=10V , I$_D$=5A	---	60	---	nC
Q$_{gs}$	Gate-Source Charge		---	9.2	---	
Q$_{gd}$	Gate-Drain Charge		---	9.9	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=50V , V$_{GS}$=10V , R$_G$=3.3Ω I$_D$=3A	---	10.8	---	ns
T$_r$	Rise Time		---	27	---	
T$_{d(off)}$	Turn-Off Delay Time		---	56	---	
T$_f$	Fall Time		---	24	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	3848	---	pF
C$_{oss}$	Output Capacitance		---	137	---	
C$_{rss}$	Reverse Transfer Capacitance		---	82	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,5]	V$_G$=V$_D$=0V , Force Current	---	---	6	A
I$_{SM}$	Pulsed Source Current[2,5]		---	---	24	A
V$_{SD}$	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_S$=1A , T$_J$=25℃	---	---	1.2	V
t$_{rr}$	Reverse Recovery Time	IF=5A , dI/dt=100A/μs , T$_J$=25℃	---	25	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	29	---	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$_{AS}$=15A
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.

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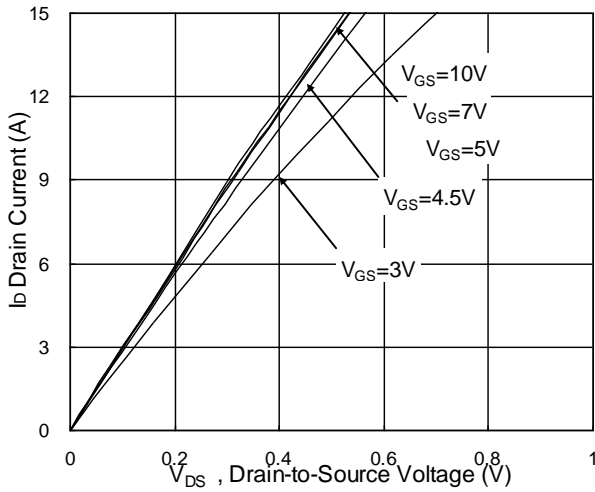## Typical Characteristics

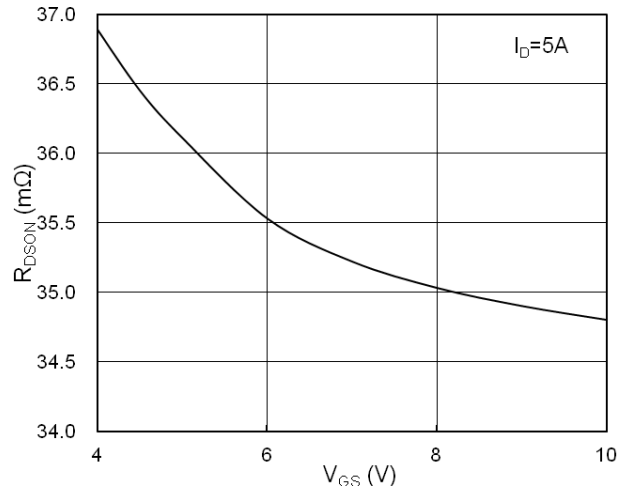**Fig.1 Typical Output Characteristics**
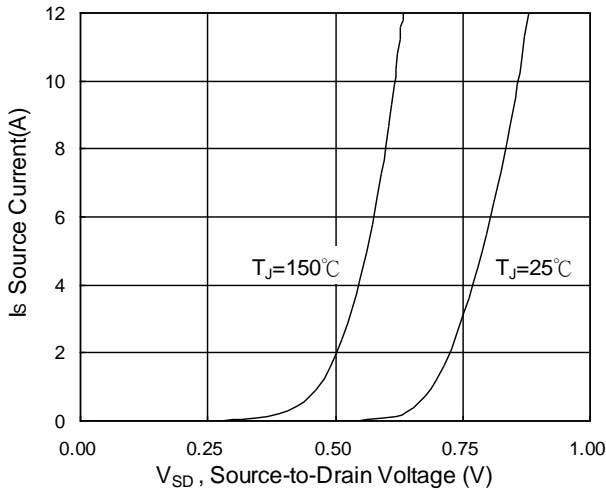
Fig.2 On-Resistance vs. Gate-Source

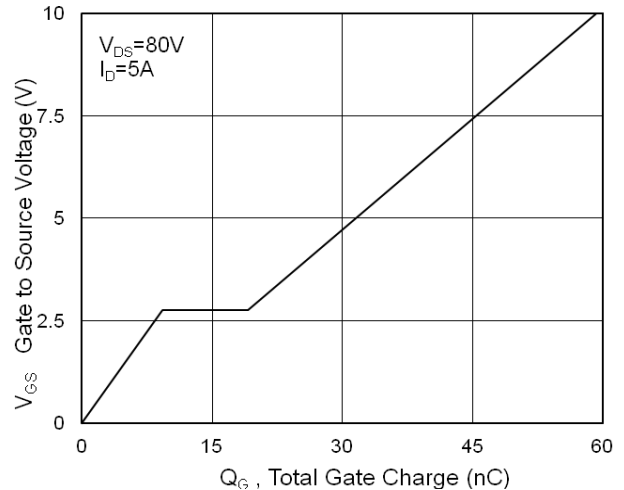**Fig.3 Forward Characteristics Of Reverse**
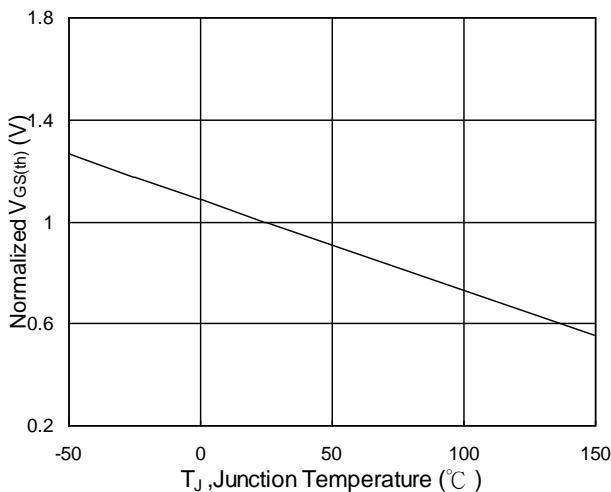
Fig.4 Gate-Charge Characteristics

Fig.5 Normalized $V_{GS(th)}$ vs. T_J
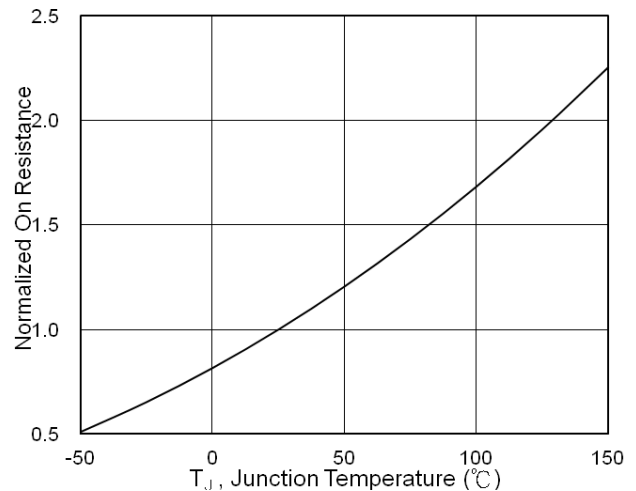
Fig.6 Normalized R_{DSON} vs. T_J

Data and specifications subject to change without notice.
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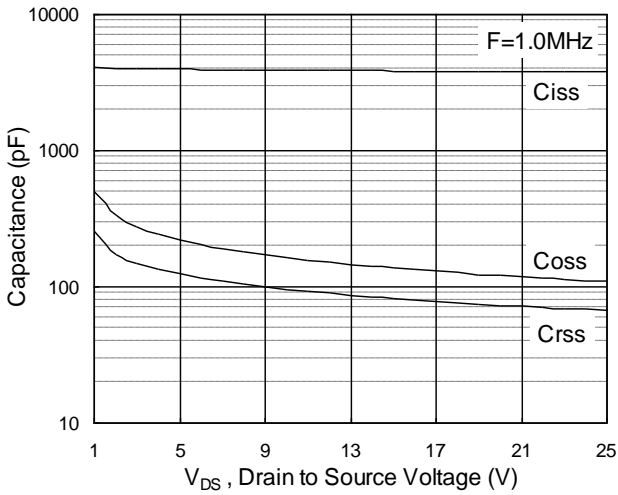
Fig.7 Capacitance
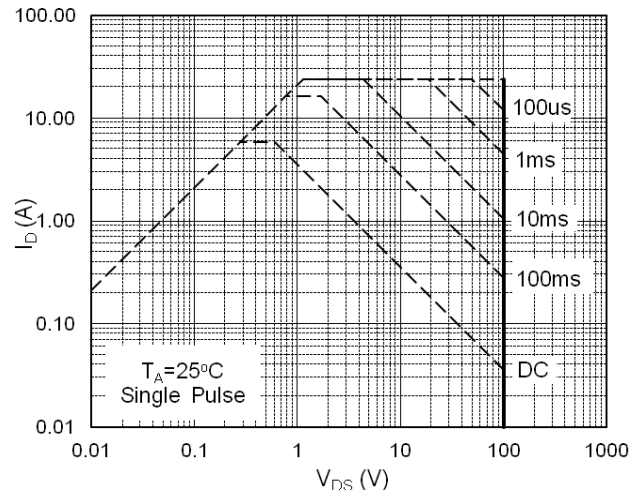
Fig.8 Safe Operating Area
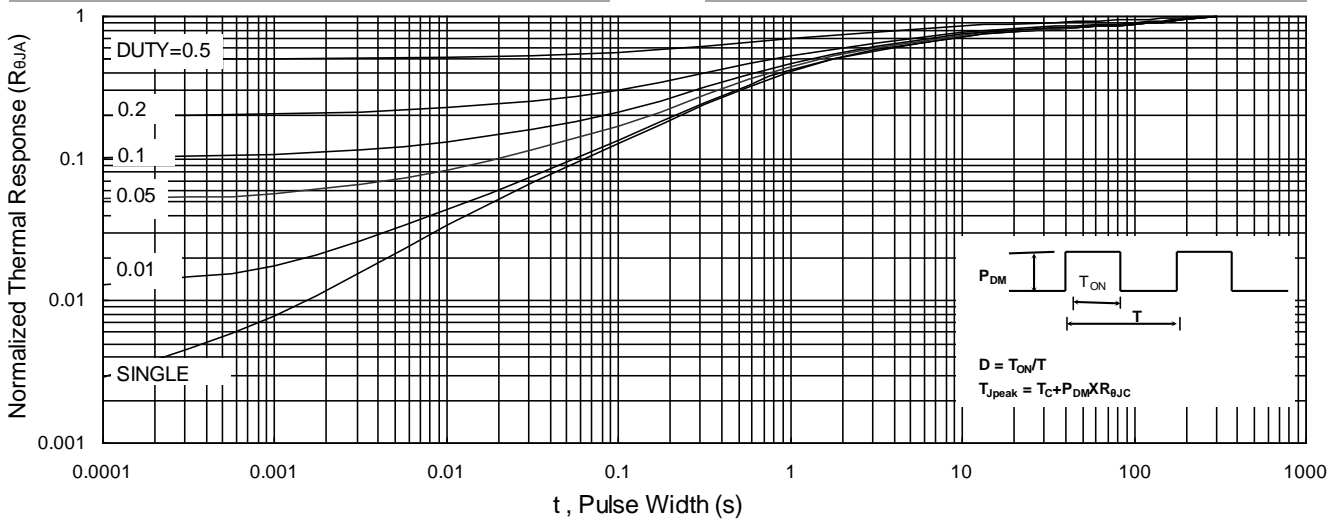
Fig.9 Normalized Maximum Transient Thermal Impedance

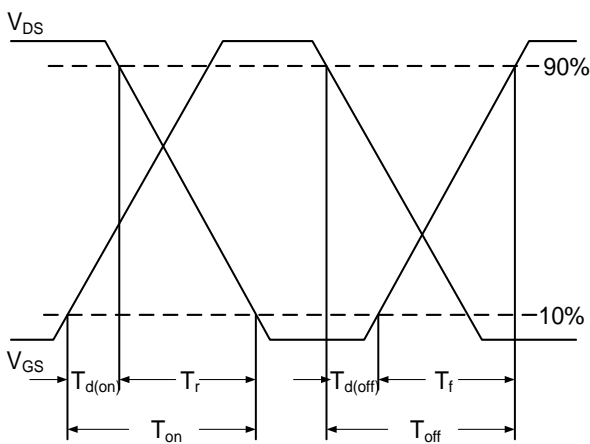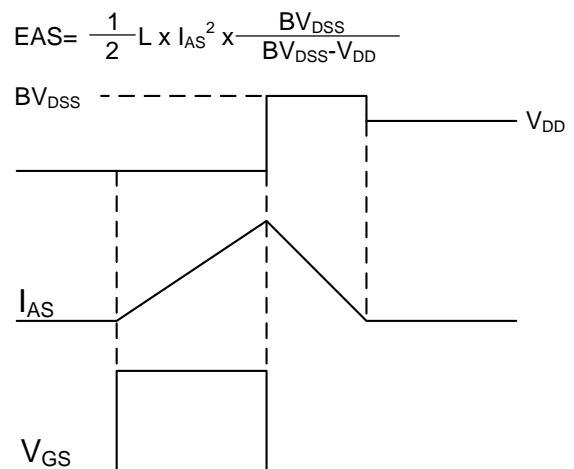$$EAS= \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Fig.10 Switching Time Waveform

Fig.11 Unclamped Inductive Switching Waveform