FETek Technology Corp.

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

Product Summary

BVDSS	RDSON	ID
100V	112mΩ	2.5A

SOT223 Pin Configuration

Description

The FKL0004 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications. The FKL0004 meets the RoHS and Green Product requirement with full function reliability approved.
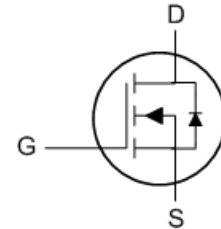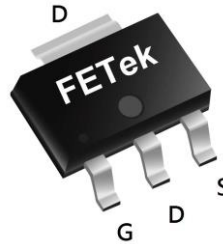
Absolute Maximum Ratings

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]	2.5	A
$I_D@T_A=70°C$	Continuous Drain Current, V_{GS} @ 10V[1]	2	A
I_{DM}	Pulsed Drain Current[2]	10	A
$P_D@T_A=25°C$	Total Power Dissipation[3]	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
$R_{θJA}$	Thermal Resistance Junction-ambient [1]	---	85	°C/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	---	30	°C/W

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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$_D$=2A	---	90	112	mΩ
		V$_{GS}$=4.5V , I$_D$=1A	---	95	120	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	1.0	1.5	2.5	V
△V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	-4.57	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=80V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=80V , 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$_D$=2A	---	20	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	2	4	Ω
Q$_g$	Total Gate Charge (10V)	V$_{DS}$=80V , V$_{GS}$=10V , I$_D$=2A	---	26.2	36.7	nC
Q$_{gs}$	Gate-Source Charge		---	3.8	5.32	
Q$_{gd}$	Gate-Drain Charge		---	4.8	6.7	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=50V , V$_{GS}$=10V , R$_G$=3.3Ω I$_D$=2A	---	4.2	8.4	ns
T$_r$	Rise Time		---	7.6	14	
T$_{d(off)}$	Turn-Off Delay Time		---	41	82	
T$_f$	Fall Time		---	14	28	
C$_{iss}$	Input Capacitance	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	1535	2149	pF
C$_{oss}$	Output Capacitance		---	60	84	
C$_{rss}$	Reverse Transfer Capacitance		---	37	52	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,4]	V$_G$=V$_D$=0V , Force Current	---	---	2.5	A
I$_{SM}$	Pulsed Source Current[2,4]		---	---	10	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$_F$=2A , dI/dt=100A/μs , T$_J$=25℃	---	35	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	17	---	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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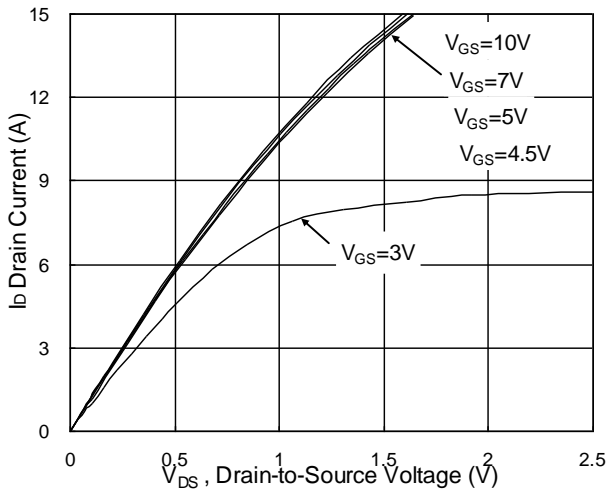
Typical Characteristics
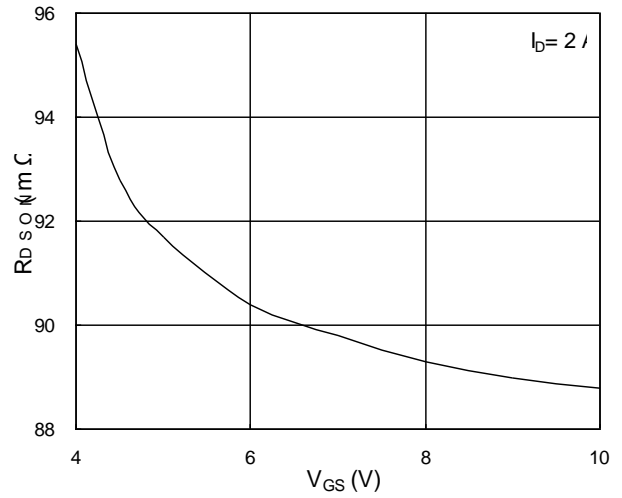
Fig.1 Typical Output Characteristics

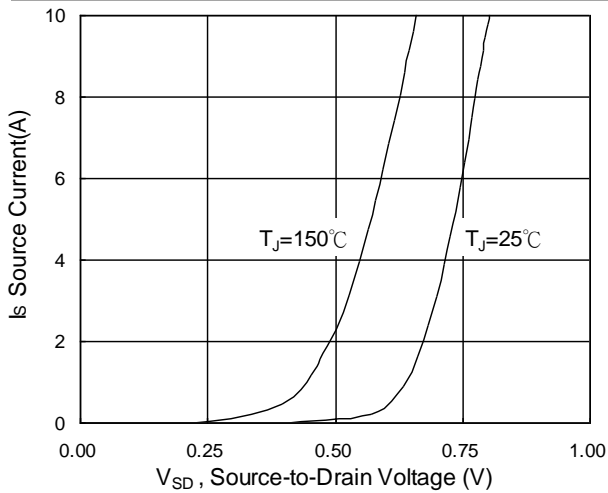**Fig.2 On-Resistance vs. Gate-Source**

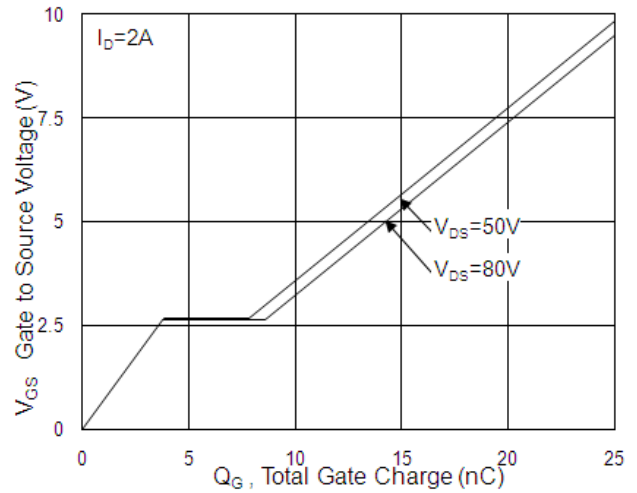**Fig.3 Forward Characteristics of Reverse**

Fig.4 Gate-Charge Characteristics
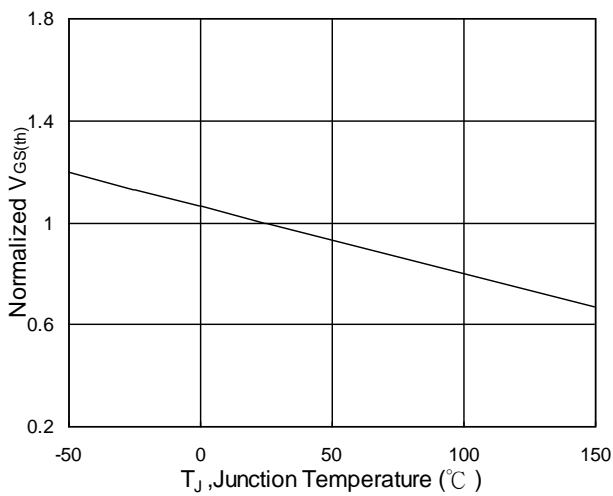
Fig.5 Normalized V$_{GS(th)}$ vs. T$_J$
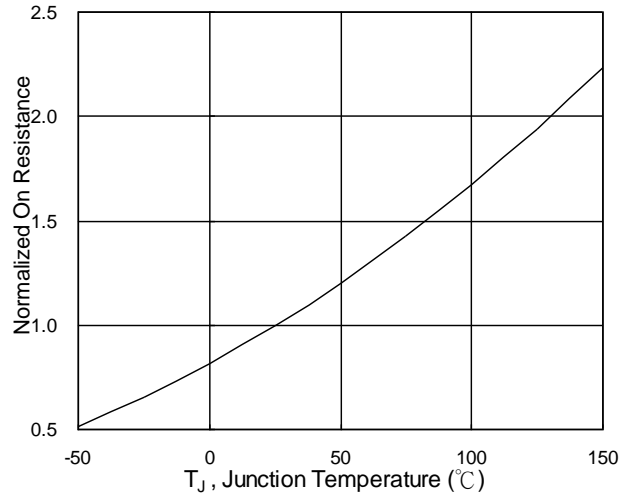
Fig.6 Normalized R$_{DSON}$ vs. T$_J$
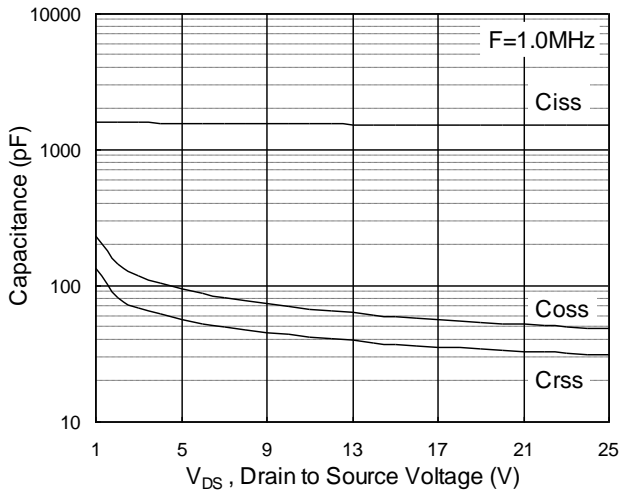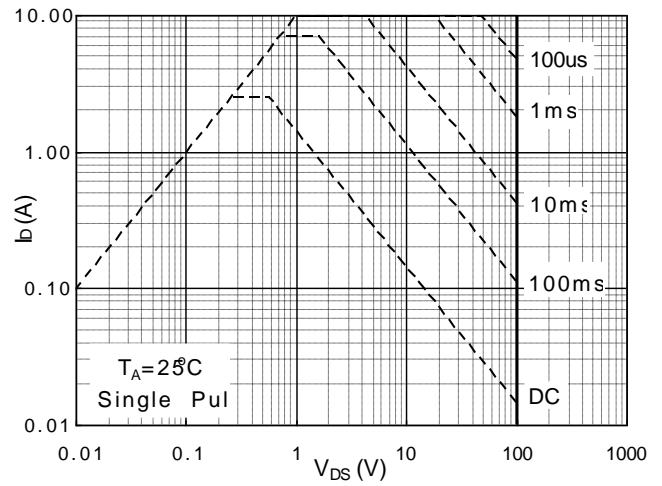
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Fig.7 Capacitance
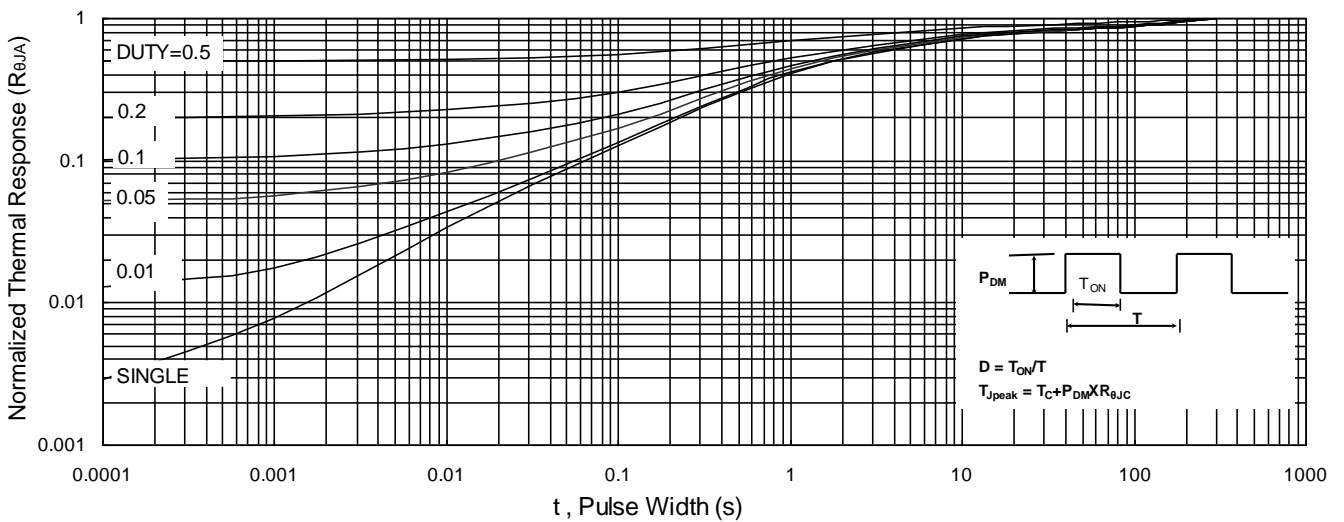
Fig.8 Safe Operating Area
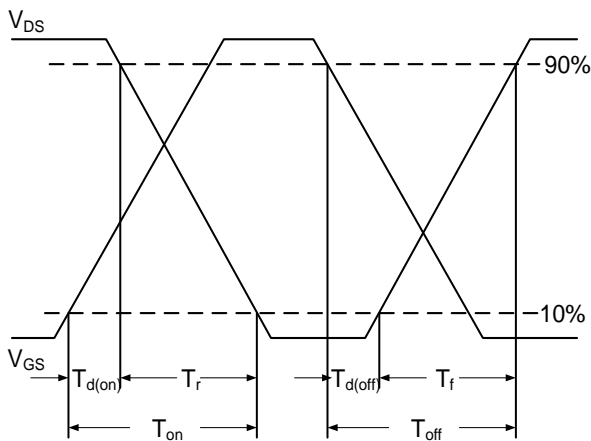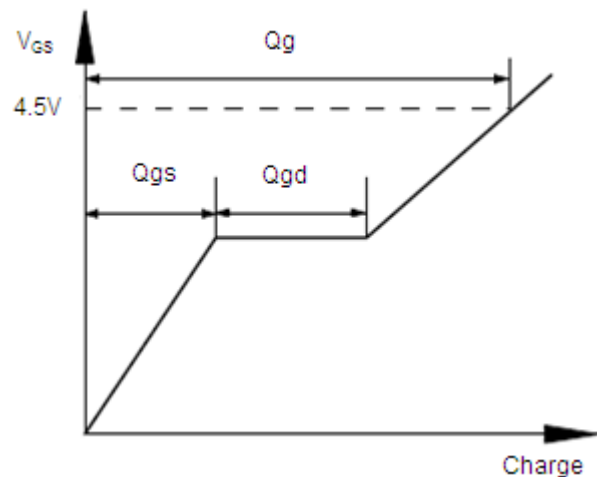
Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform