

- ★ Green Device Available
- ★ Low Gate Charge
- ★ Excellent CdV/dt effect decline

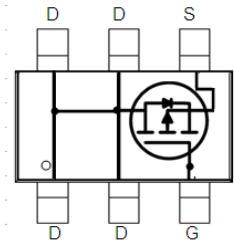
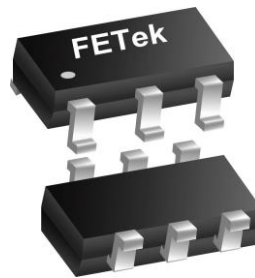
**Product Summary**


BVDSS	RDSON	ID
-30V	34mΩ	-7.5A

**Description**

The FKQ3113 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The FKQ3113 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

**TSOP6 Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D@T_A=25^{\circ}C$	Continuous Drain Current, $V_{GS}$ @ -10V <sup>1</sup>	-7.5	A
$I_D@T_A=70^{\circ}C$	Continuous Drain Current, $V_{GS}$ @ -10V <sup>1</sup>	-6	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	-24	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	45	mJ
$I_{AS}$	Avalanche Current	-30	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation <sup>4</sup>	1.9	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 <sup>1</sup>	---	65	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup> (t<5s)	---	50	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-6A	---	---	34	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A	---	---	55	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.0	--	-2.5	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	5	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6A	---	16	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz		15	---	Ω
Q <sub>g</sub>	Total Gate Charge (-4.5V)	V <sub>DS</sub> =-20V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	---	9.8	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	2.2	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	3.4	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-24V, V <sub>GS</sub> =-10V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =-1A	---	16.4	---	ns
T <sub>r</sub>	Rise Time		---	20.2	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	55	---	
T <sub>f</sub>	Fall Time		---	10	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz	---	930	---	pF
C <sub>oss</sub>	Output Capacitance		---	148	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	115	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-3.5	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> 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<sub>DD</sub>=-25V, V<sub>GS</sub>=-10V, L=0.1mH, I<sub>AS</sub>=-30A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

Typical Characteristics

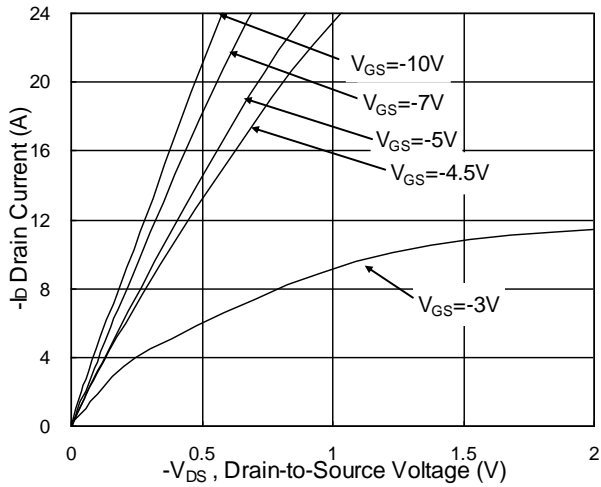


Fig.1 Typical Output Characteristics

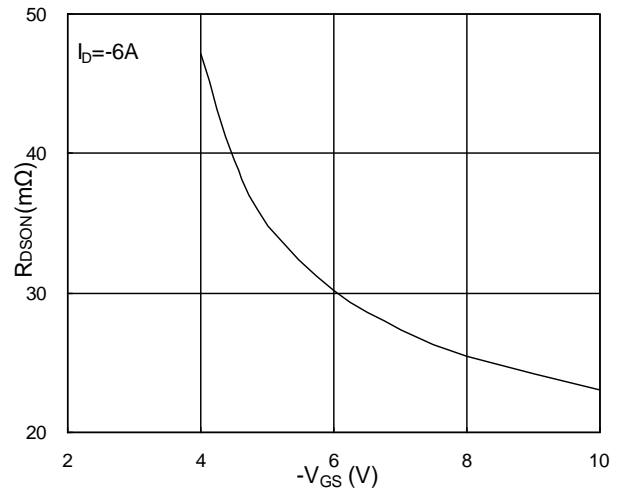


Fig.2 On-Resistance vs G-S Voltage

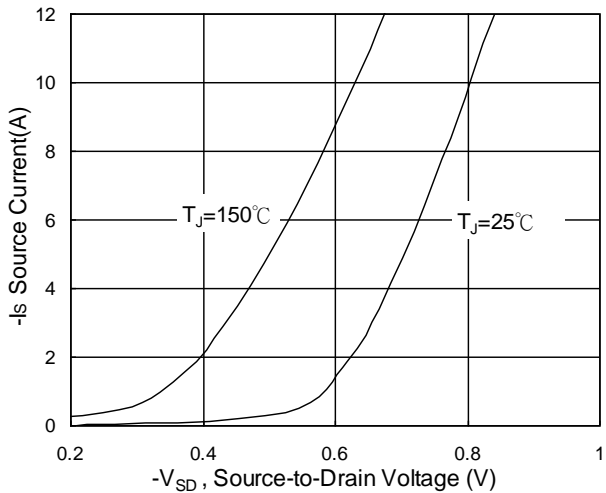


Fig.3 Source Drain Forward Characteristics

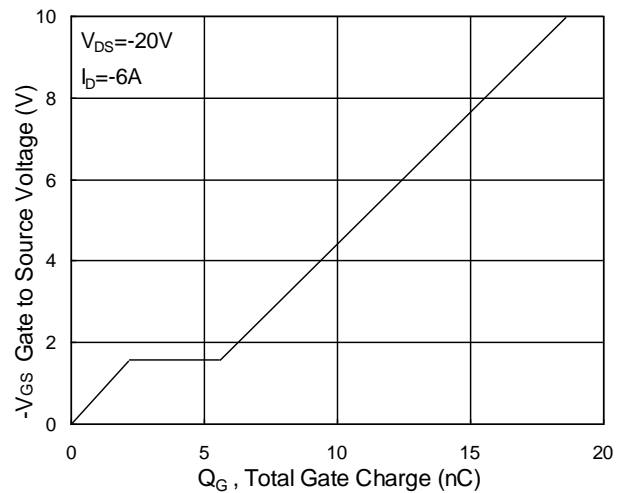


Fig.4 Gate-Charge Characteristics

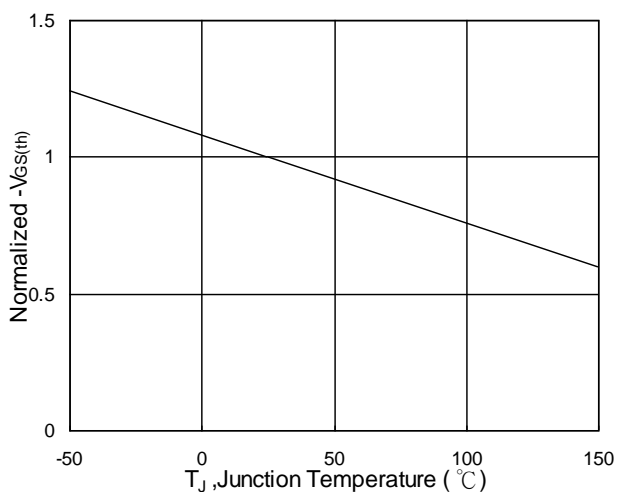


Fig.5 Normalized V<sub>GS(th)</sub> vs T<sub>J</sub>

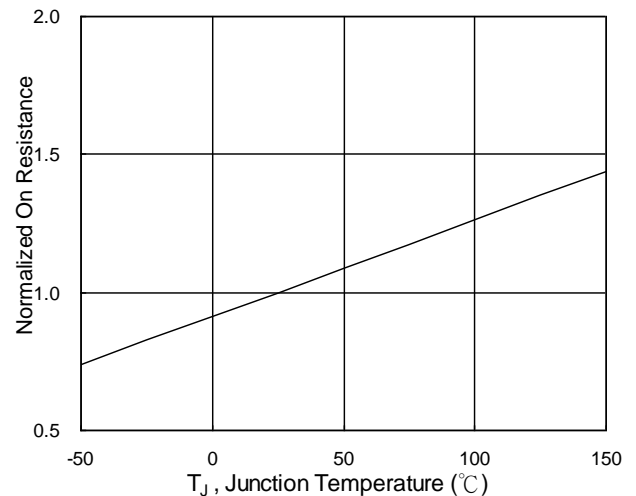


Fig.6 Normalized R<sub>DS(on)</sub> vs T<sub>J</sub>

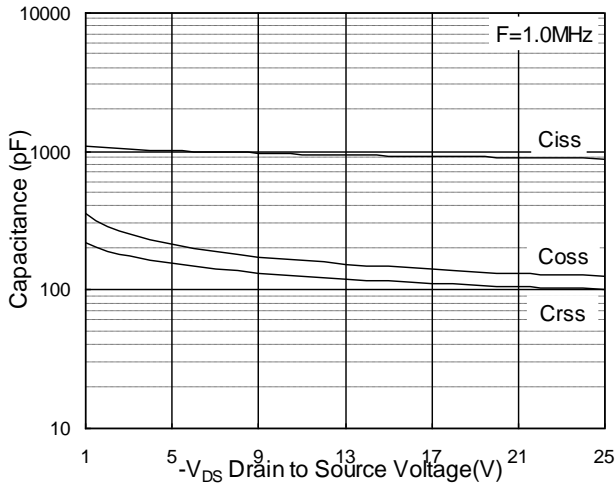


Fig.7 Capacitance

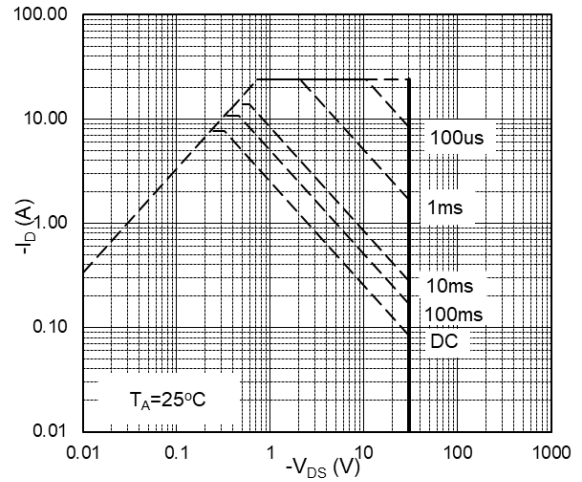


Fig.8 Safe Operating Area

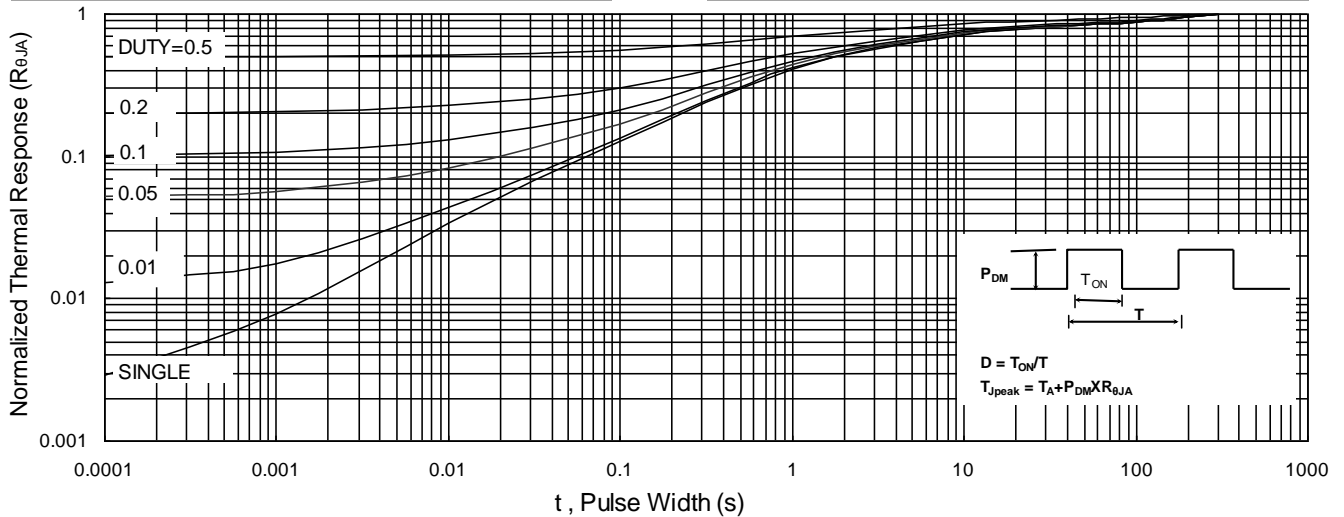


Fig.9 Normalized Maximum Transient Thermal Impedance

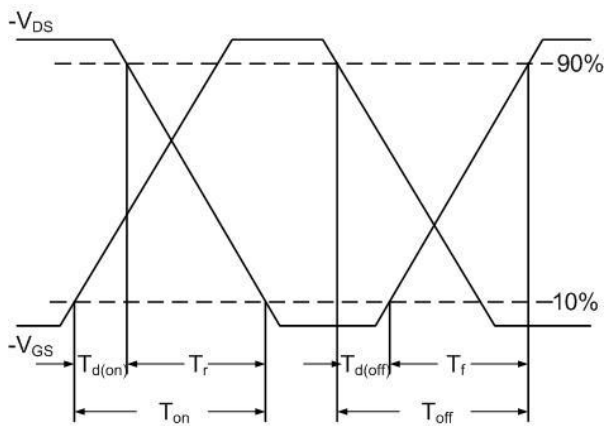


Fig.10 Switching Time Waveform

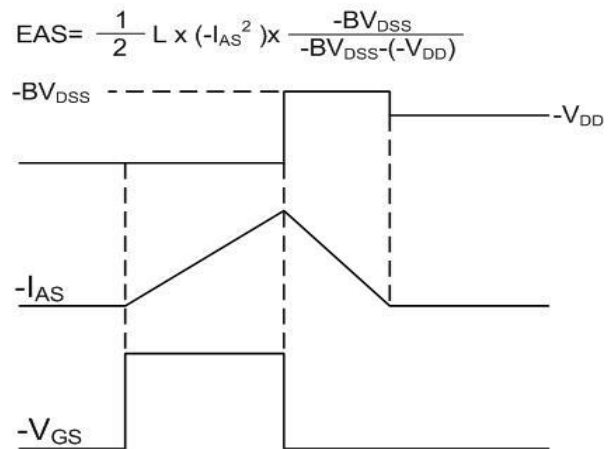
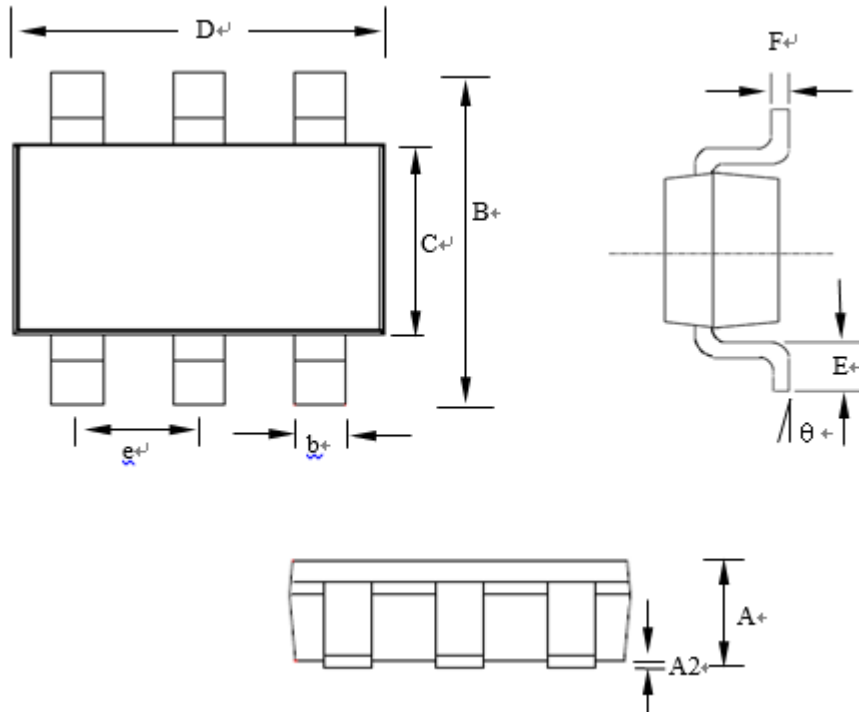


Fig.11 Unclamped Inductive Switching Waveform

# TSOP6 Package Outline Dimensions



SYMBOLS	MILLIMETERS <sup>⌀</sup>			INCHES <sup>⌀</sup>		
	MIN <sup>⌀</sup>	NOM <sup>⌀</sup>	MAX <sup>⌀</sup>	MIN <sup>⌀</sup>	NOM <sup>⌀</sup>	MAX <sup>⌀</sup>
A <sup>⌀</sup>	0.70 <sup>⌀</sup>	-- <sup>⌀</sup>	0.9 <sup>⌀</sup>	0.028 <sup>⌀</sup>	-- <sup>⌀</sup>	0.035 <sup>⌀</sup>
A2 <sup>⌀</sup>	0.00 <sup>⌀</sup>	-- <sup>⌀</sup>	0.10 <sup>⌀</sup>	0.000 <sup>⌀</sup>	-- <sup>⌀</sup>	0.004 <sup>⌀</sup>
B <sup>⌀</sup>	2.60 <sup>⌀</sup>	2.80 <sup>⌀</sup>	3.00 <sup>⌀</sup>	0.102 <sup>⌀</sup>	0.110 <sup>⌀</sup>	0.118 <sup>⌀</sup>
C <sup>⌀</sup>	1.40 <sup>⌀</sup>	1.60 <sup>⌀</sup>	1.80 <sup>⌀</sup>	0.055 <sup>⌀</sup>	0.063 <sup>⌀</sup>	0.071 <sup>⌀</sup>
D <sup>⌀</sup>	2.70 <sup>⌀</sup>	2.90 <sup>⌀</sup>	3.10 <sup>⌀</sup>	0.106 <sup>⌀</sup>	0.114 <sup>⌀</sup>	0.122 <sup>⌀</sup>
E <sup>⌀</sup>	0.30 <sup>⌀</sup>	0.40 <sup>⌀</sup>	0.60 <sup>⌀</sup>	0.012 <sup>⌀</sup>	0.016 <sup>⌀</sup>	0.024 <sup>⌀</sup>
F <sup>⌀</sup>	0.07 <sup>⌀</sup>	0.127 <sup>⌀</sup>	0.20 <sup>⌀</sup>	0.003 <sup>⌀</sup>	0.005 <sup>⌀</sup>	0.008 <sup>⌀</sup>
b <sup>⌀</sup>	0.30 <sup>⌀</sup>	0.40 <sup>⌀</sup>	0.50 <sup>⌀</sup>	0.012 <sup>⌀</sup>	0.016 <sup>⌀</sup>	0.020 <sup>⌀</sup>
e <sup>⌀</sup>	-- <sup>⌀</sup>	0.95 <sup>⌀</sup>	-- <sup>⌀</sup>	-- <sup>⌀</sup>	0.037 <sup>⌀</sup>	-- <sup>⌀</sup>
θ <sup>⌀</sup>	0° <sup>⌀</sup>	5° <sup>⌀</sup>	10° <sup>⌀</sup>	0° <sup>⌀</sup>	5° <sup>⌀</sup>	10° <sup>⌀</sup>