

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced Trench MOS Technology

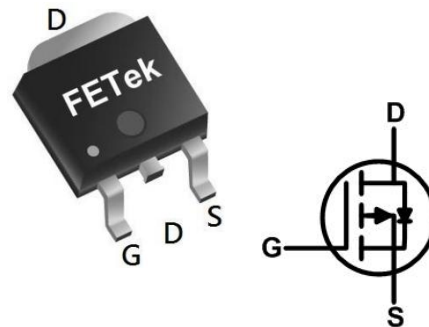
Product Summary


BVDSS	RDSON	ID
-60V	14mΩ	-60A

Description

The FKD6117 is the high cell density trenched P-Ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The FKD6117 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-60	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-38	A
I_{DM}	Pulsed Drain Current ²	-170	A
EAS	Single Pulse Avalanche Energy ³	126.5	mJ
I_{AS}	Avalanche Current	-22.5	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	90	W
$P_D@T_C=100^\circ C$	Total Power Dissipation ⁴	36	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	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.4	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-150	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-20A	---	10.2	14	mΩ
		V _{GS} =-4.5V, I _D =-20A	---	12.5	17	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1.0	---	-2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-48V, V _{GS} =0V, T _J =25°C	---	---	-1	μA
		V _{DS} =-48V, V _{GS} =0V, T _J =55°C	---	---	-5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	4.3	---	Ω
Q _g	Total Gate Charge	V _{DS} =-30V, V _{GS} =-10V, I _D =-12A	---	144	---	nC
Q _{gs}	Gate-Source Charge		---	17	---	
Q _{gd}	Gate-Drain Charge		---	25	---	
T _{d(on)}	Turn-On Delay Time		---	18	---	
T _r	Rise Time	V _{DD} =-30V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	---	16	---	ns
T _{d(off)}	Turn-Off Delay Time		---	225	---	
T _f	Fall Time		---	61	---	
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	---	7944	---	pF
C _{oss}	Output Capacitance		---	524	---	
C _{rss}	Reverse Transfer Capacitance		---	241	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	-60	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	-1.2	A
V _{SD}	Diode Forward Voltage ²	I _S = -1 A, V _{GS} =0V, T _J =25°C	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F = -1 A, dI/dt = 100A/μs, T _J =25°C	---	27.8	---	nS
Q _{rr}	Reverse Recovery Charge		---	24.4	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² 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}=-30V, V_{GS}=-10V, L=0.5mH, I_{AS}=-22.5A.
- 4.The power dissipation is limited by 150°C 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.

Typical Characteristics

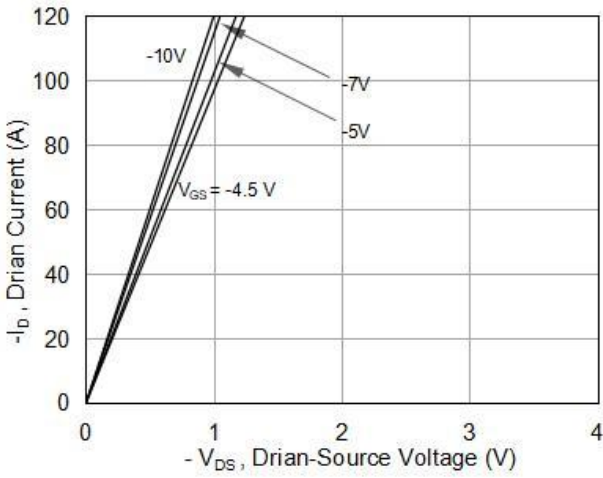


Fig.1 Typical Output Characteristics

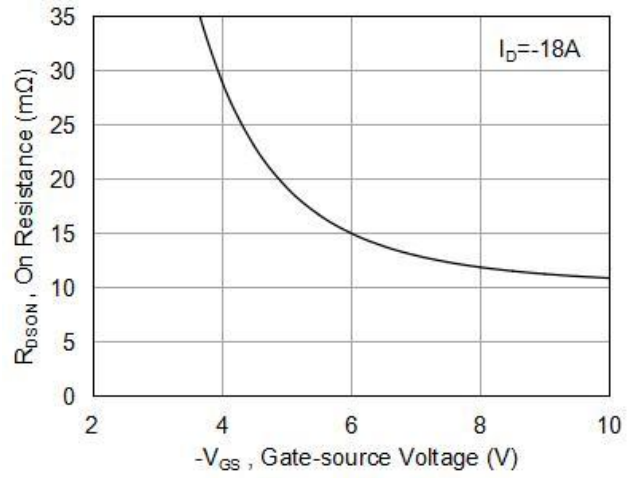


Fig.2 On-Resistance v.s Gate-Source

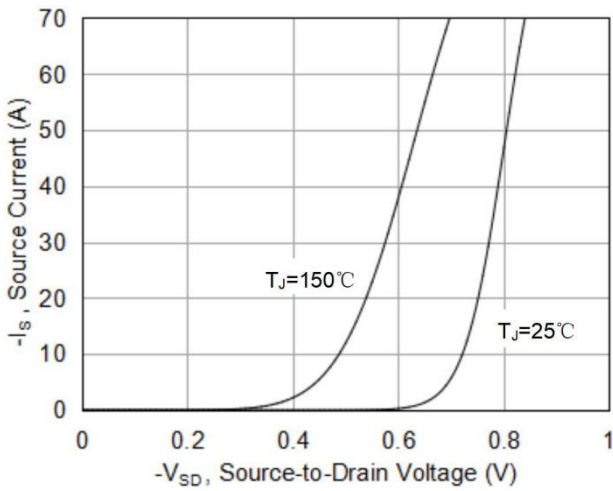


Fig.3 Source Drain Forward Characteristics

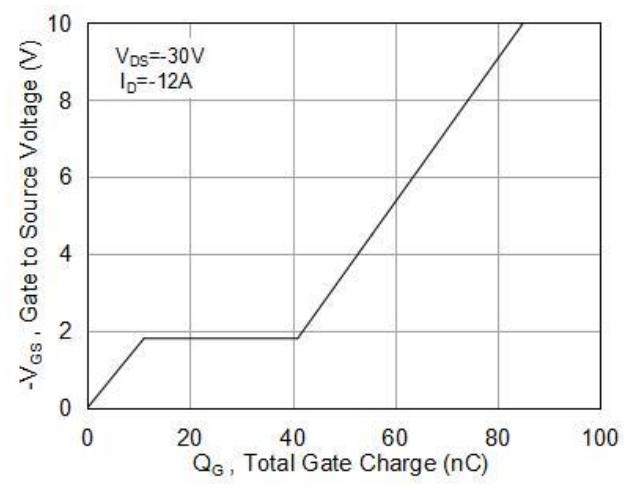


Fig.4 Gate-Charge Characteristics

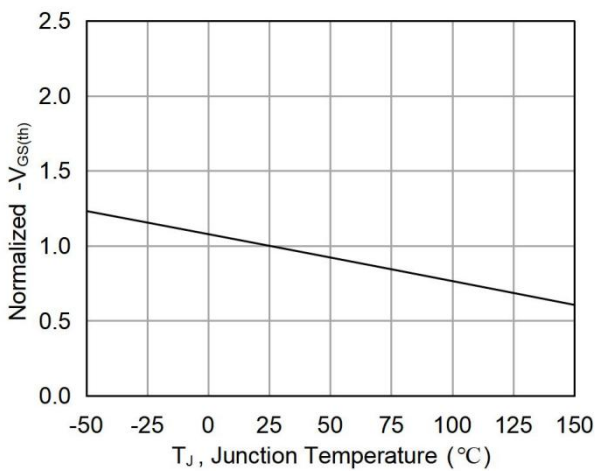


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

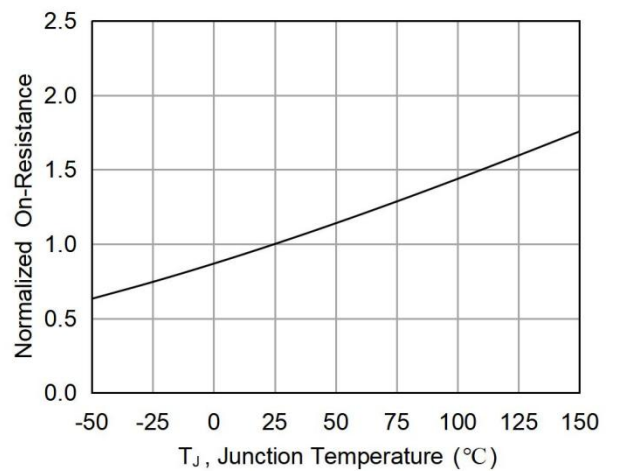


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

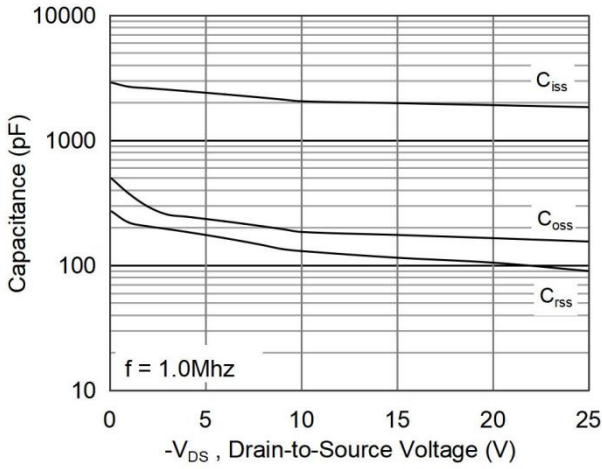


Fig.7 Capacitance

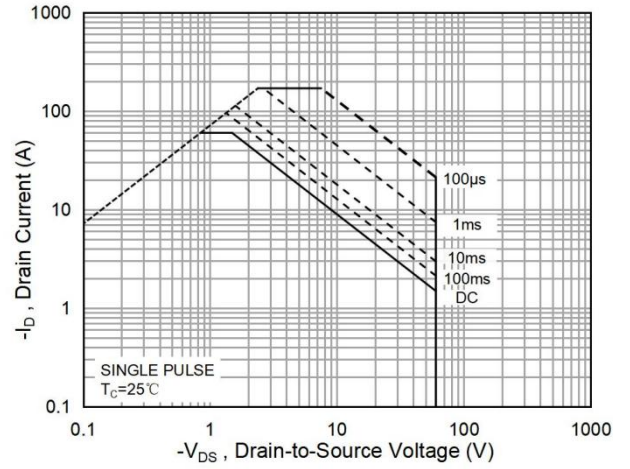


Fig.8 Safe Operating Area

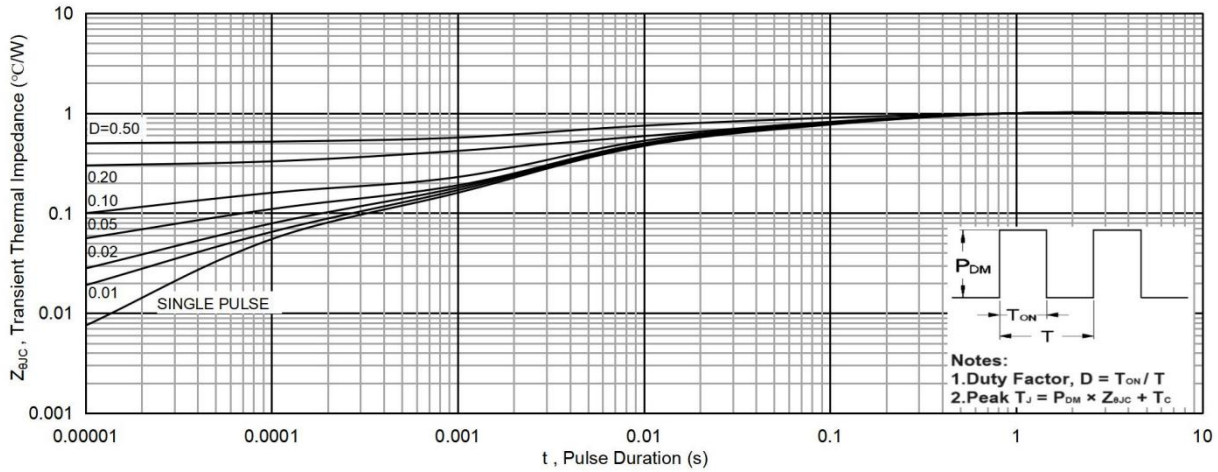


Fig.9 Normalized Maximum Transient Thermal Impedance

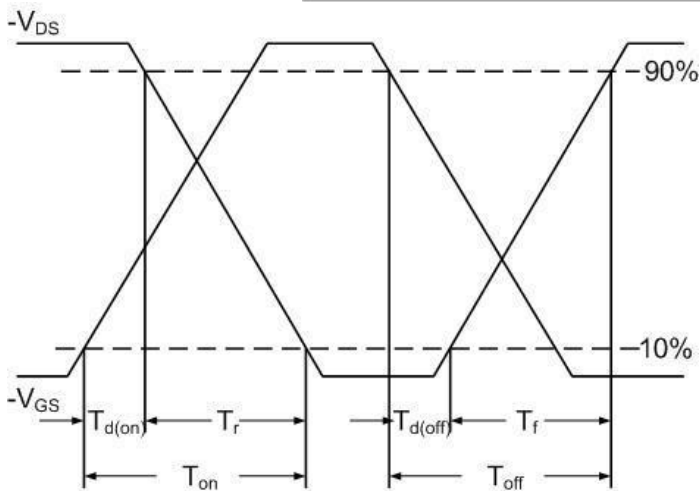


Fig.10 Switching Time Waveform

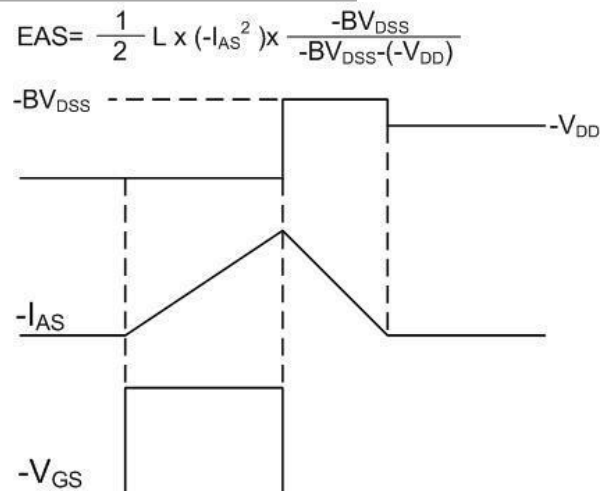


Fig.11 Unclamped Inductive Waveform