

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

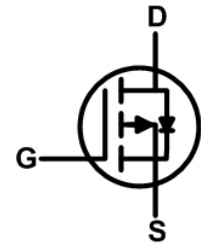
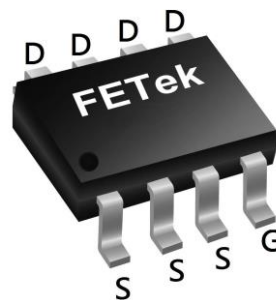
Product Summary


BVDSS	RDSON	ID
-30V	42mΩ	-5.5A

Description

The FKS3101 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 FKS3101 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

SOP8 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, $V_{GS} @ -10V^1$	-5.5	A
$I_D@T_A=70^{\circ}C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-4.5	A
I_{DM}	Pulsed Drain Current ²	-25	A
EAS	Single Pulse Avalanche Energy ³	18.1	mJ
I_{AS}	Avalanche Current	-19	A
$P_D@T_A=25^{\circ}C$	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	---	85	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	25	°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 =-250uA	-30	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C , I _D =-1mA	---	-0.023	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-4A	---	---	42	mΩ
		V _{GS} =-4.5V , I _D =-3A	---	---	78	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	---	-2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	4	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-24V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =-24V , V _{GS} =0V , T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V , I _D =-4A	---	11	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-15V , V _{GS} =-4.5V , I _D =-4A	---	6.4	---	nC
Q _{gs}	Gate-Source Charge		---	2.3	---	
Q _{gd}	Gate-Drain Charge		---	2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-15V , V _{GS} =-10V , R _G =3.3Ω, I _D =-4A	---	2.8	---	ns
T _r	Rise Time		---	8.4	---	
T _{d(off)}	Turn-Off Delay Time		---	39	---	
T _f	Fall Time		---	6	---	
C _{iss}	Input Capacitance	V _{DS} =-15V , V _{GS} =0V , f=1MHz	---	585	---	pF
C _{oss}	Output Capacitance		---	100	---	
C _{rss}	Reverse Transfer Capacitance		---	85	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	-4.9	A
I _{SM}	Pulsed Source Current ^{2,5}		---	---	-25	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-4A , dI/dt=100A/μs , T _J =25°C	---	7.8	---	nS
Q _{rr}	Reverse Recovery Charge		---	2.5	---	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}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-19A
- 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

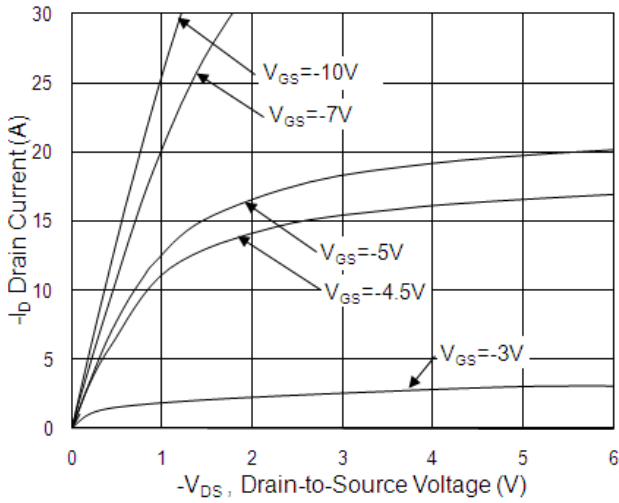


Fig.1 Typical Output Characteristics

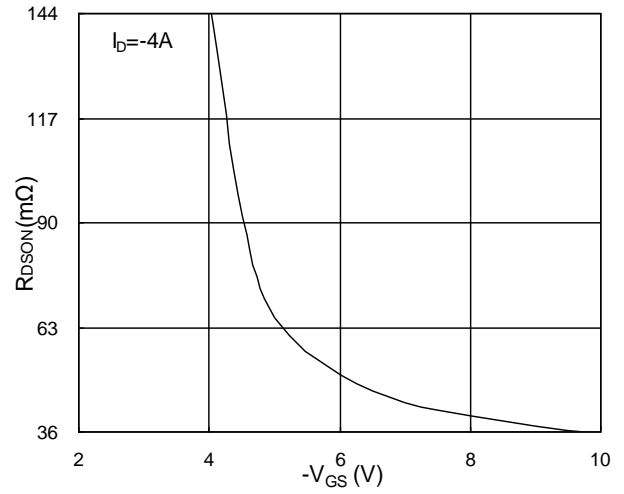


Fig.2 On-Resistance vs. G-S Voltage

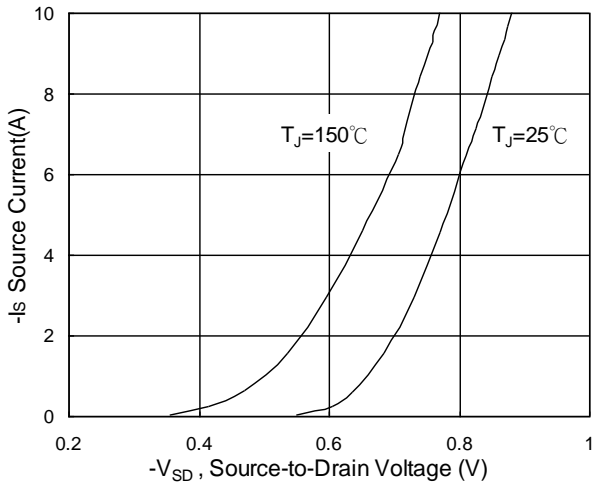


Fig.3 Source Drain Forward Characteristics

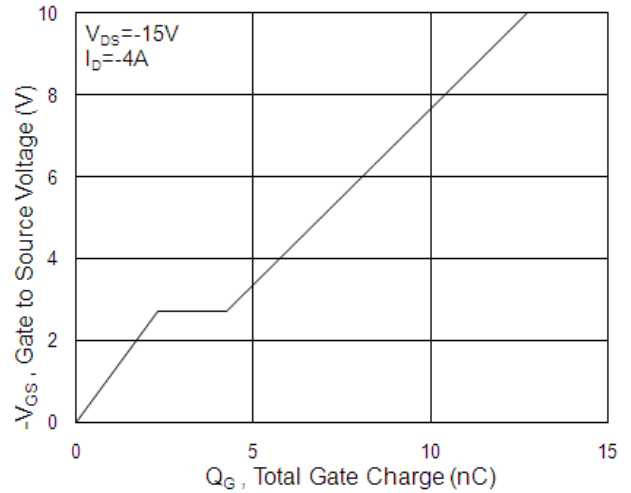


Fig.4 Gate-Charge Characteristics

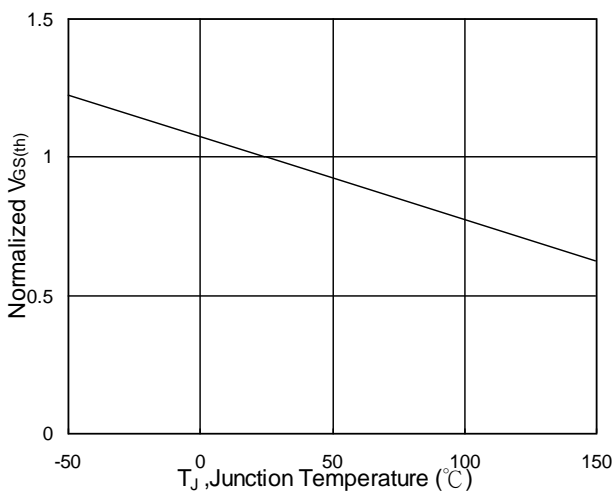


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

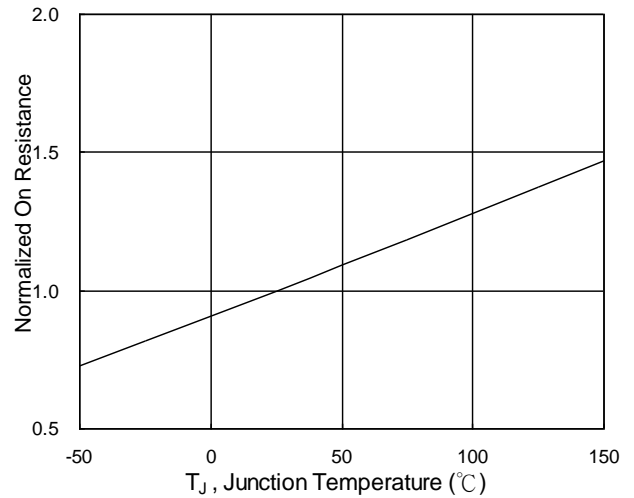


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

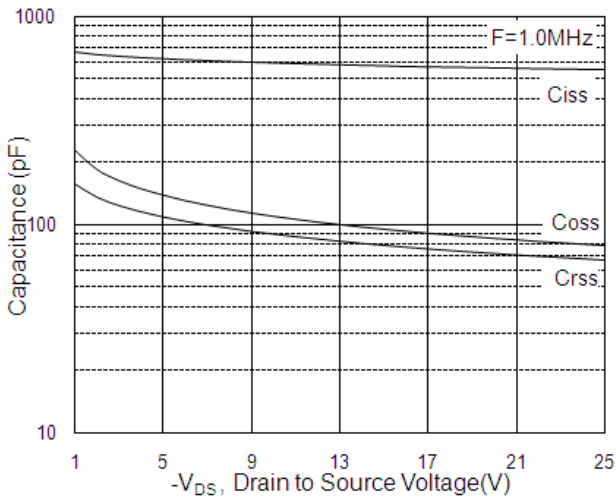


Fig.7 Capacitance

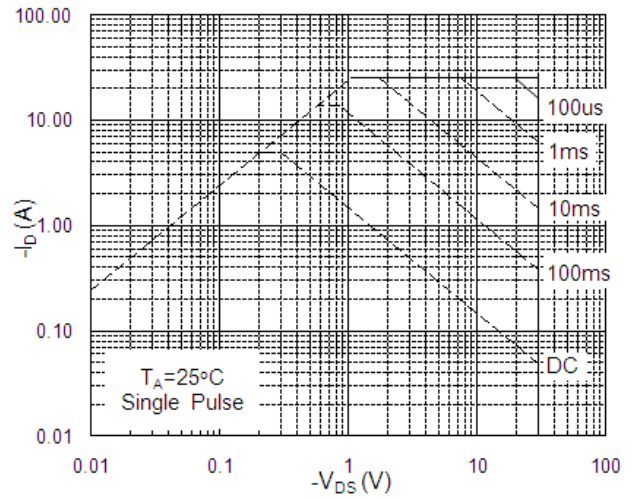


Fig.8 Safe Operating Area

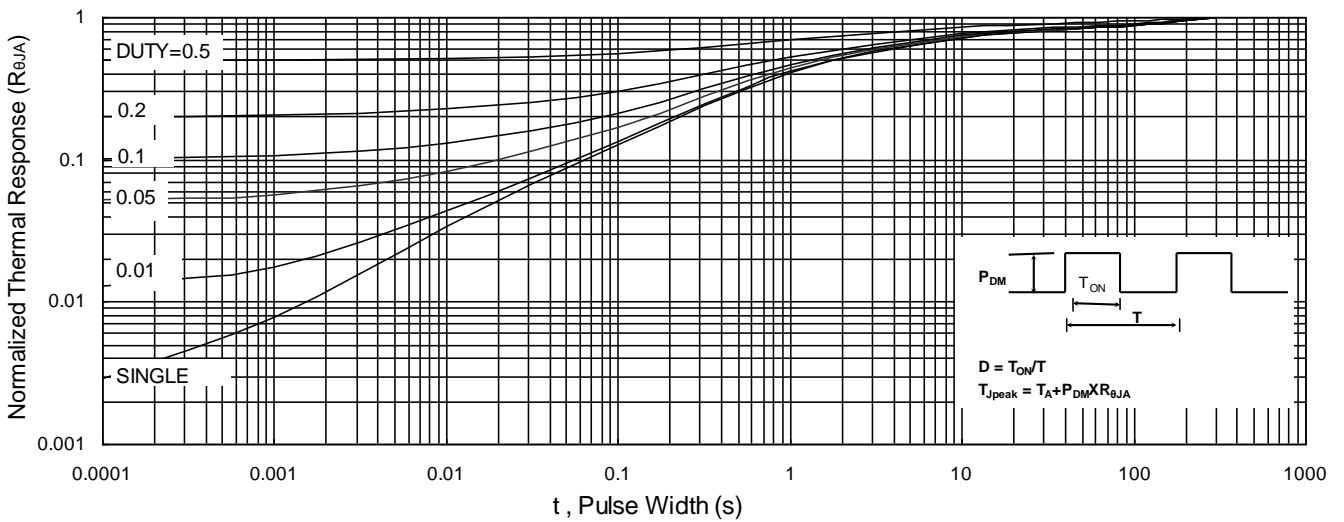


Fig.9 Normalized Maximum Transient Thermal Impedance

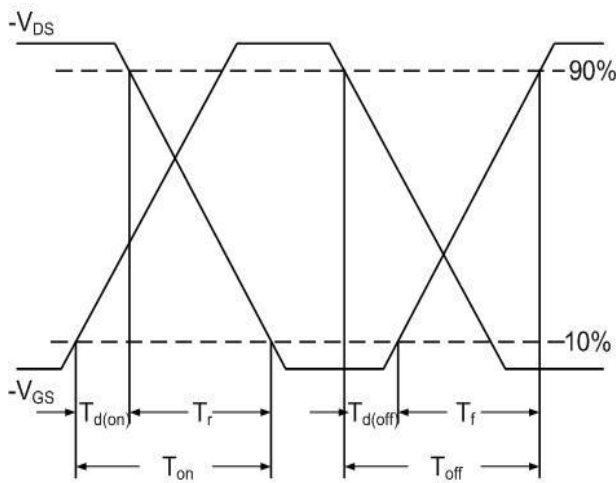


Fig.10 Switching Time Waveform

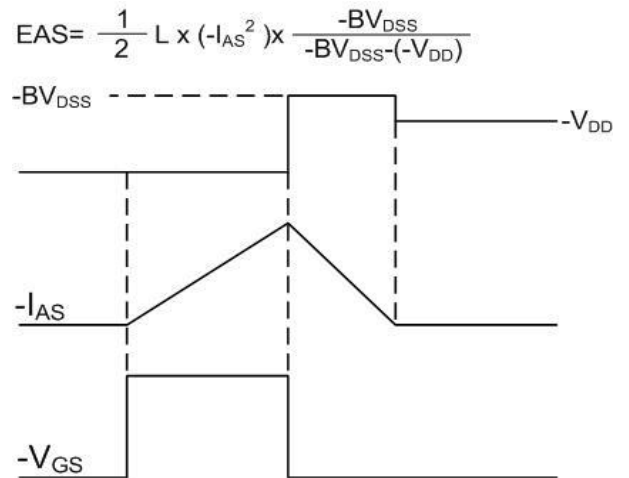


Fig.11 Unclamped Inductive Switching Waveform