

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

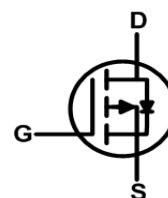
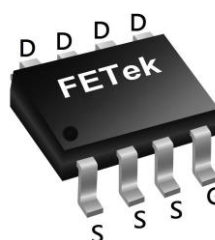
Product Summary


BVDSS	RDSON	ID
-30V	7mΩ	-16.8A

Description

The FKS3031 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 FKS3031 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°C	Continuous Drain Current, V _{GS} @ -10V ¹	-16.8	A
I _D @T _A =100°C	Continuous Drain Current, V _{GS} @ -10V ¹	-10.6	A
I _{DM}	Pulsed Drain Current ²	-120	A
EAS	Single Pulse Avalanche Energy ³	80	mJ
I _{AS}	Avalanche Current	-40	A
P _D @T _A =25°C	Total Power Dissipation ⁴	3.1	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 (t≤10S)	---	40	°C/W
	Thermal Resistance Junction-ambient ¹ (Steady State)	---	75	°C/W
R _{θJC}	Thermal Resistance Junction-case ¹	---	24	°C/W

**Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-15A$	---	---	7	m Ω
		$V_{GS}=-4.5V$, $I_D=-10A$	---	---	11	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.2	---	-2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.2	---	Ω
Q_g	Total Gate Charge (-10V)	$V_{DS}=-15V$, $V_{GS}=-10V$, $I_D=-15A$	---	60	---	nC
Q_{gs}	Gate-Source Charge		---	9	---	
Q_{gd}	Gate-Drain Charge		---	15	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V$, $V_{GS}=-10V$, $R_G=3.3\Omega$, $I_D=-10A$	---	17	---	ns
T_r	Rise Time		---	40	---	
$T_{d(off)}$	Turn-Off Delay Time		---	55	---	
T_f	Fall Time		---	13	---	
C_{iss}	Input Capacitance	$V_{DS}=-25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	3450	---	pF
C_{oss}	Output Capacitance		---	255	---	
C_{rss}	Reverse Transfer Capacitance		---	140	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	-16.8	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	$I_F=-20A$, $di/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	22	---	nS
Q_{rr}	Reverse Recovery Charge		---	72	---	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=-50V$, $V_{GS}=-10V$, $L=0.1mH$, $I_{AS}=-40A$
- 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

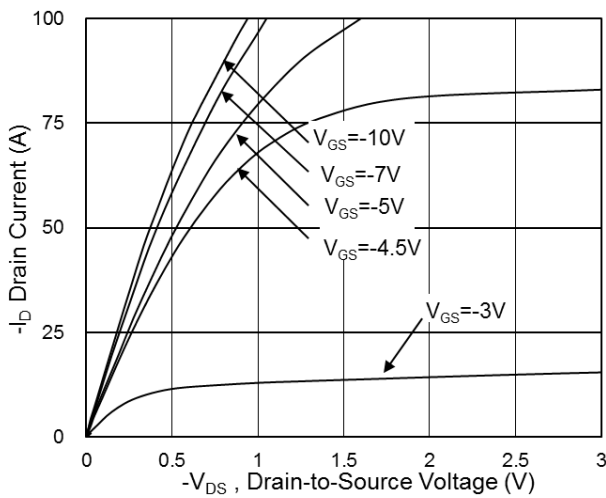


Fig.1 Typical Output Characteristics

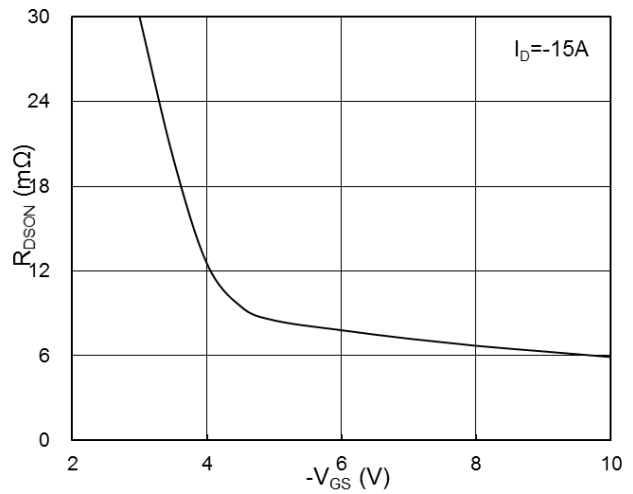


Fig.2 On-Resistance vs. Gate-Source Voltage

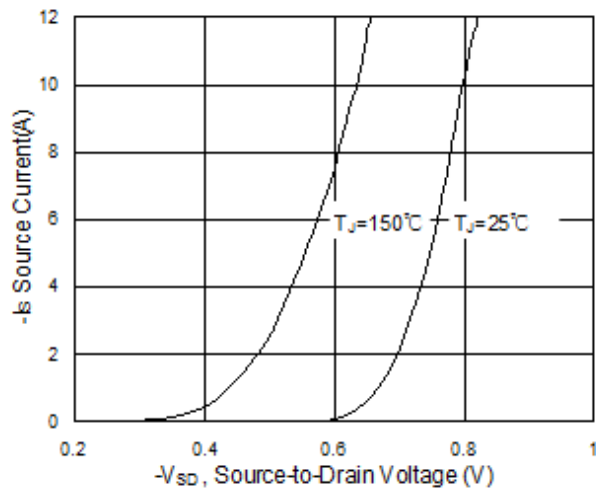


Fig.3 Forward Characteristics of Reverse

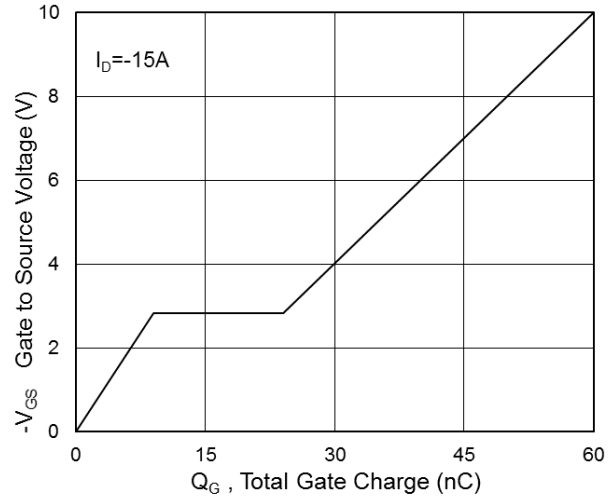


Fig.4 Gate-Charge Characteristics

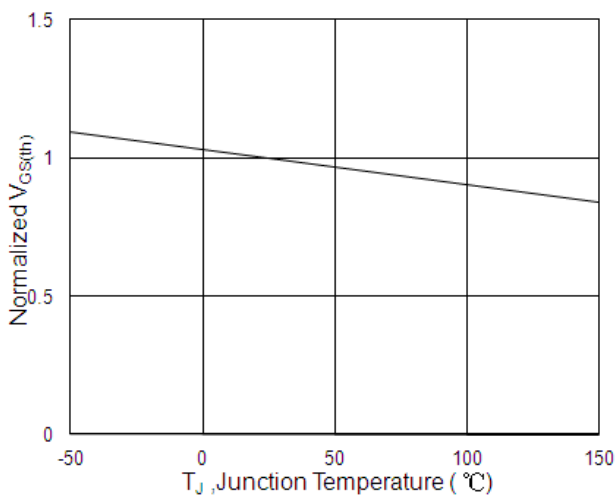


Fig.5 Normalized $-V_{GS(th)}$ vs. T_J

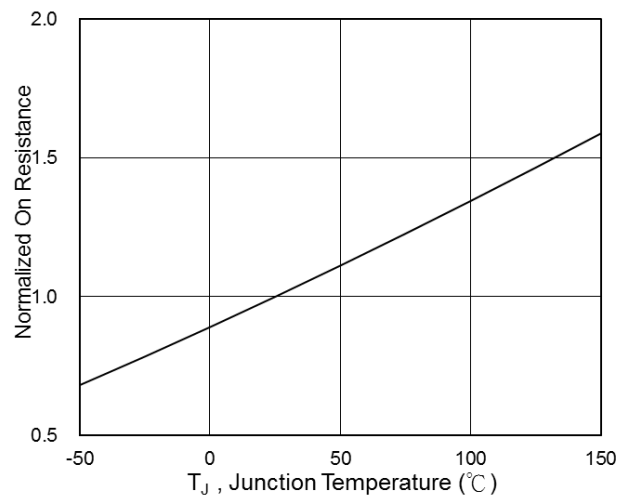


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

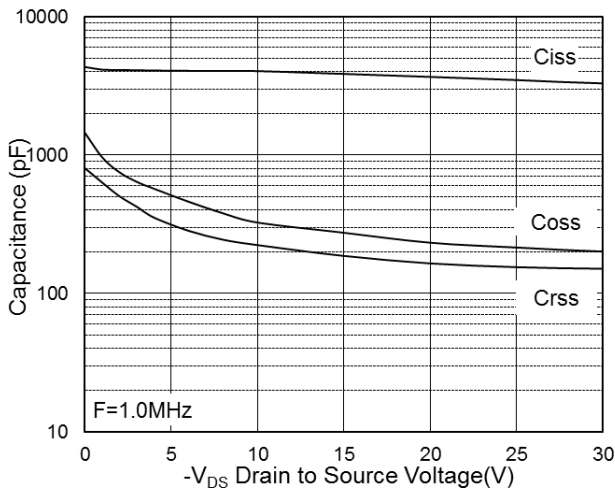


Fig.7 Capacitance

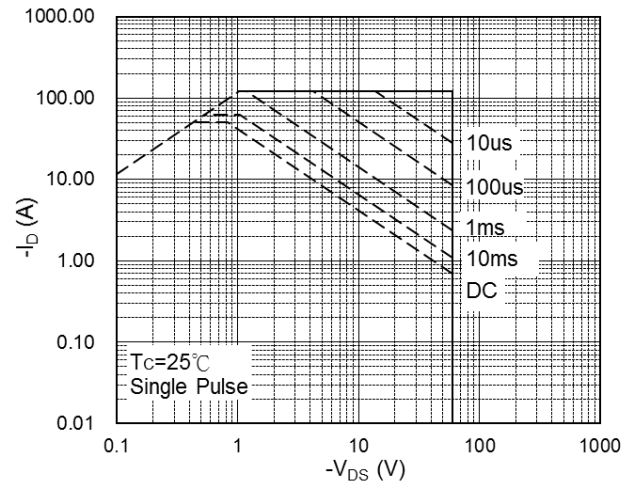


Fig.8 Safe Operating Area

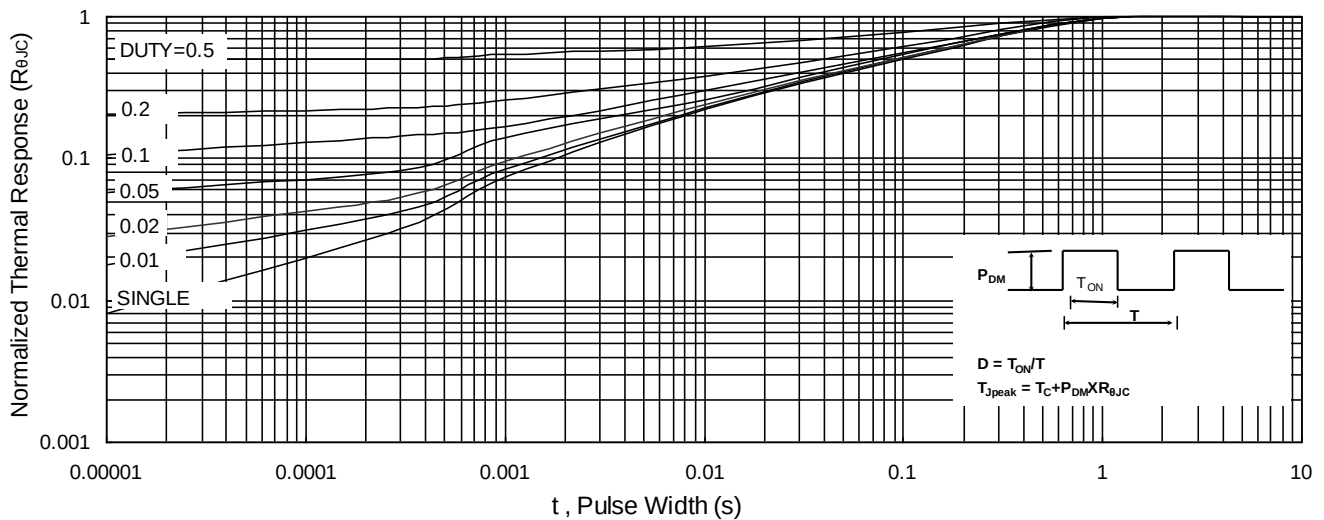


Fig.9 Normalized Maximum Transient Thermal Impedance

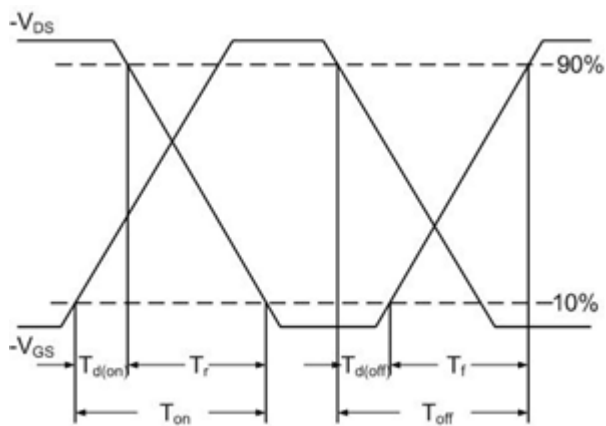


Fig.10 Switching Time Waveform

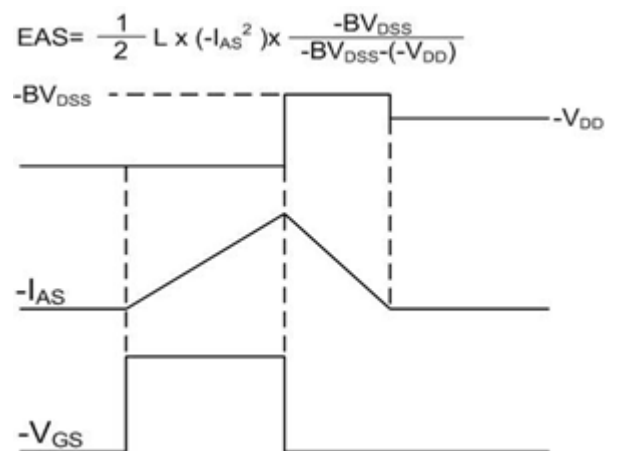


Fig.11 Unclamped Inductive Switching Waveform