



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

## Product Summary



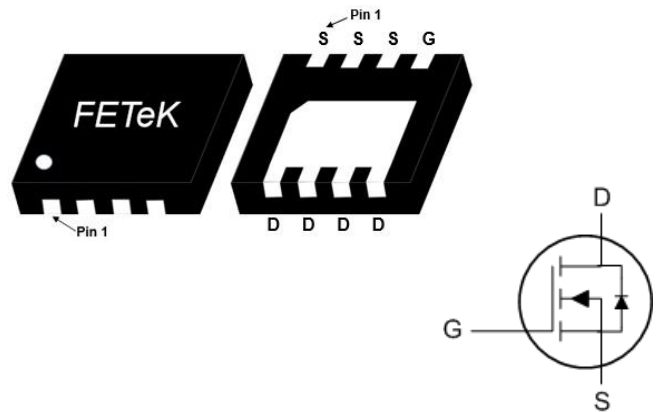
BVDSS	RDSON	ID
75V	12mΩ	45A

## Description

The FKCE8016 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The FKCE8016 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## DFN3.3X3.3 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	75	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	45	A
$I_D@T_C=70^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	36	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	100	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	80	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation <sup>4</sup>	41	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup> ( $t \leq 10\text{S}$ )	---	35	$^\circ\text{C/W}$
	Thermal Resistance Junction-ambient <sup>1</sup> (Steady State)	---	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-case <sup>1</sup>	---	3	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	75	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=10A$	---	9.6	12	m $\Omega$
		$V_{GS}=4.5V, I_D=8A$	---	12	14.5	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	---	2.5	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=64V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	$\mu A$
		$V_{DS}=64V, V_{GS}=0V, T_J=55^\circ C$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=10A$	---	32	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	0.66	---	$\Omega$
$Q_g$	Total Gate Charge (10V)	$V_{DS}=64V, V_{GS}=10V, I_D=4A$	---	60.9	---	nC
$Q_{gs}$	Gate-Source Charge		---	8.1	---	
$Q_{gd}$	Gate-Drain Charge		---	17.9	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=40V, V_{GS}=10V, R_G=3.3\Omega, I_D=4A$	---	12.2	---	ns
$T_r$	Rise Time		---	24.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	50.5	---	
$T_f$	Fall Time		---	17.6	---	
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	---	3120	---	$\mu F$
$C_{oss}$	Output Capacitance		---	140	---	
$C_{rss}$	Reverse Transfer Capacitance		---	110	---	

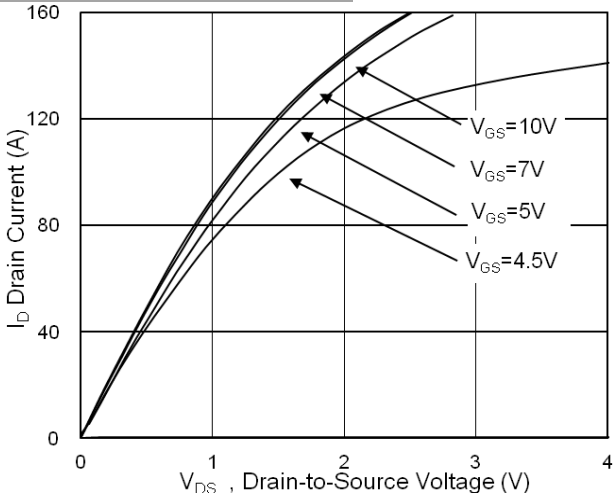
**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V$ , Force Current	---	---	62	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=4A, di/dt=100A/\mu s, T_J=25^\circ C$	---	18.6	---	nS
$Q_{rr}$	Reverse Recovery Charge	$T_J=25^\circ C$	---	65	---	nC

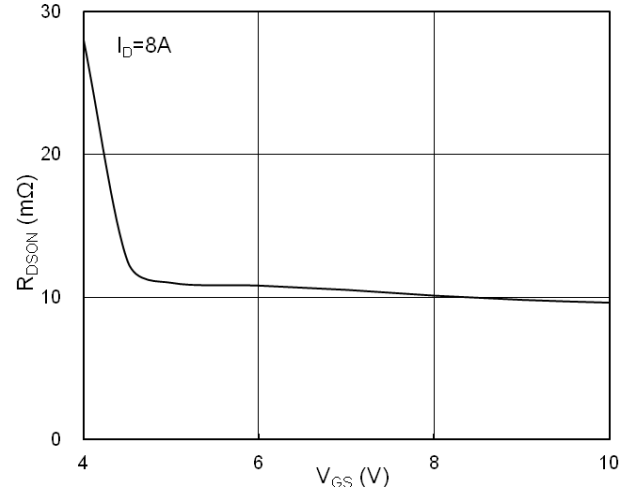
**Note :**

- 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  $\leq 300\mu s$ , 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 $^\circ C$  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.

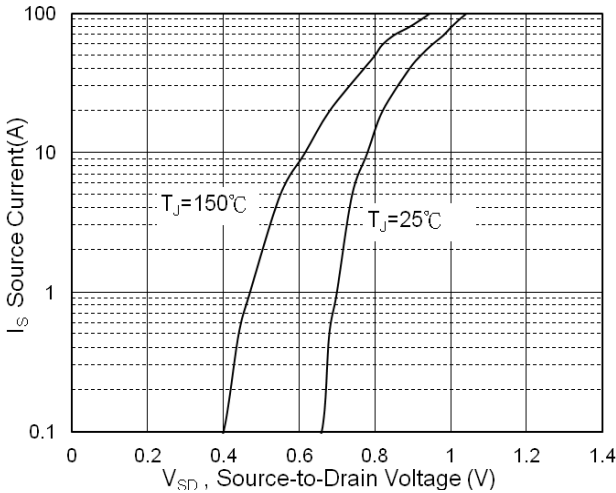
**Typical Characteristics**



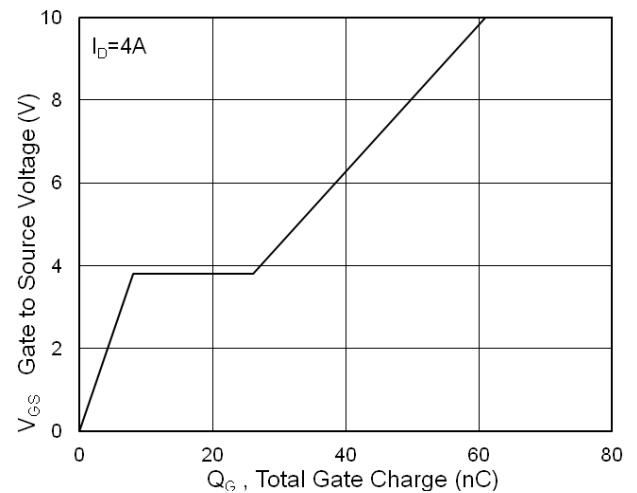
**Fig.1 Typical Output Characteristics**



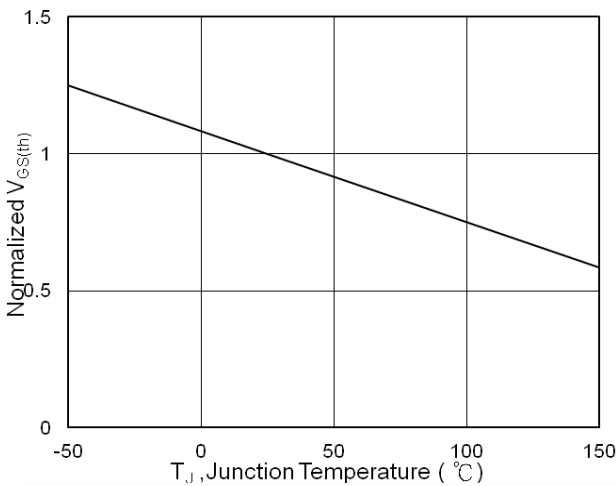
**Fig.2 On-Resistance vs. G-S Voltage**



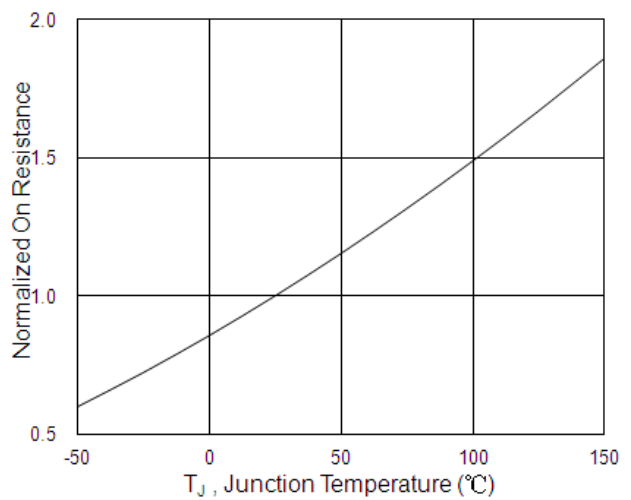
**Fig.3 Source Drain Forward Characteristics**



**Fig.4 Gate-Charge Characteristics**



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



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

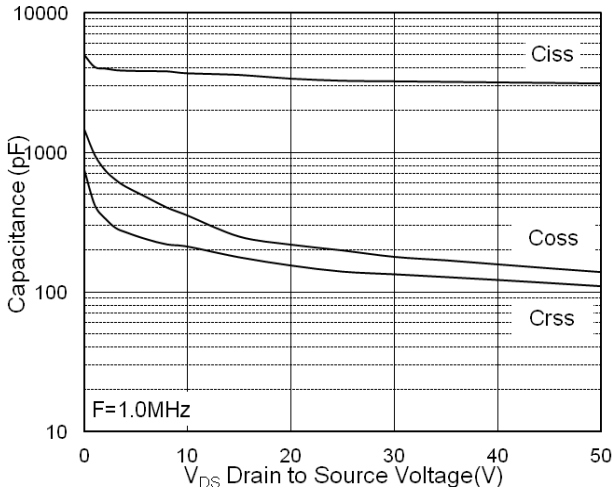


Fig.7 Capacitance

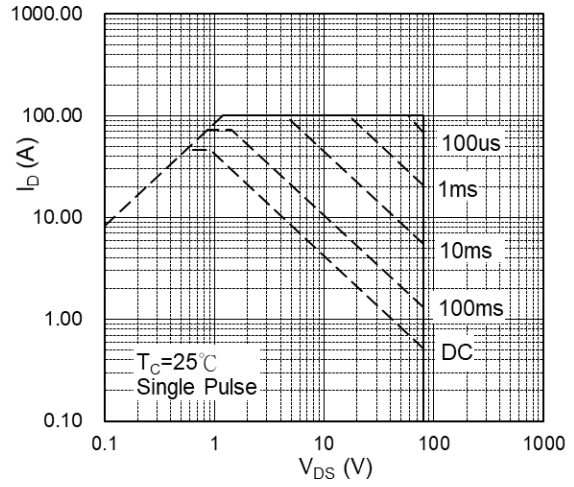


Fig.8 Safe Operating Area

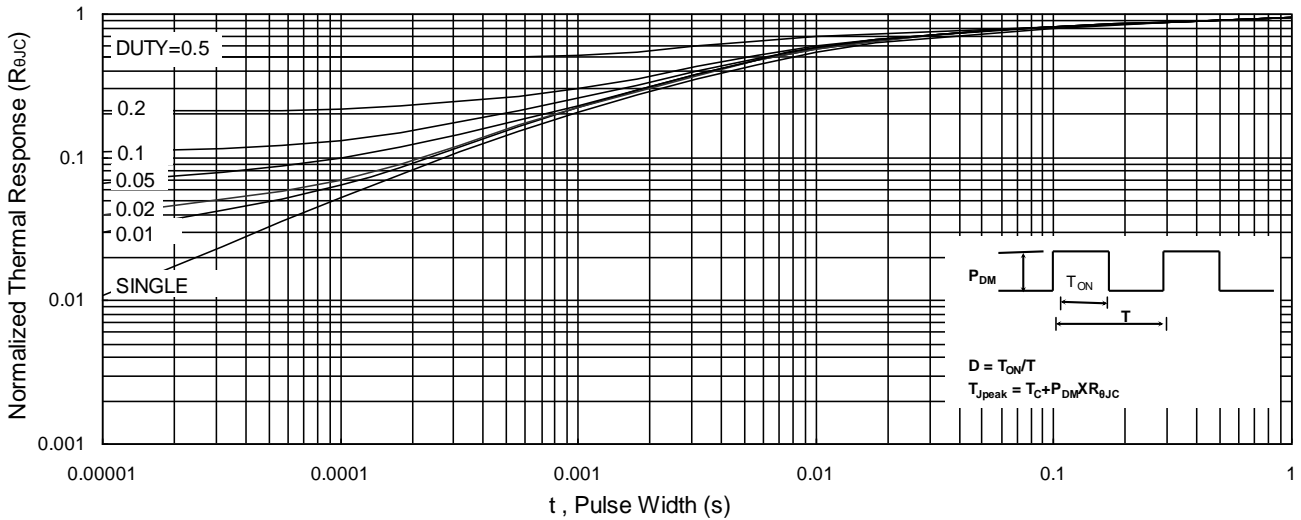


Fig.9 Normalized Maximum Transient Thermal Impedance

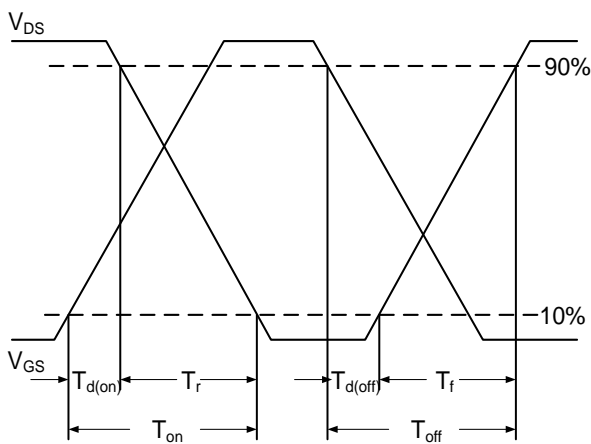


Fig.10 Switching Time Waveform

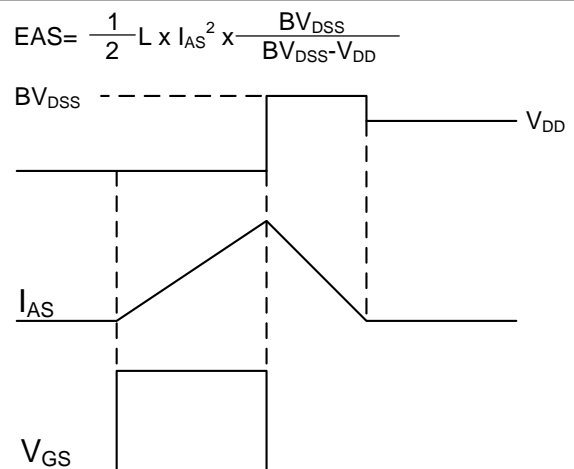


Fig.11 Unclamped Inductive Switching Waveform