FKS4105

40V P-Channel MOSFET

FETek Technology Corp.

Features

- Advanced Trench MOS Technology
- Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available

Applications

- Load Switches
- Hard Switching and High Speed Circuit

Product Summary

BVDSS	RDSON	ID
-40V	22mΩ	-9.8A

Green

SOP8 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	-9.8	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	-7.8	A
I_{DM}	Pulsed Drain Current[2]	-40	A
EAS	Single Pulse Avalanche Energy[3]	31	mJ
I_{AS}	Avalanche Current	-25	A
P_D@T_A=25°C	Total Power Dissipation[4]	1.67	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]	---	75	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]($t \leq$10S)	---	40	°C/W

Electrical Characteristics (T$_J$=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=-250uA	-40	---	---	V
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=-10V , I$_D$=-8A	---	17	22	mΩ
		V$_{GS}$=-4.5V , I$_D$=-6A	---	24	30	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =-250uA	-1.0	-1.6	-2.2	V
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=-32V , V$_{GS}$=0V , T$_J$=25℃	---	---	-1	uA
		V$_{DS}$=-32V , V$_{GS}$=0V , T$_J$=55℃	---	---	-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	---	10	---	Ω
Q$_g$	Total Gate Charge (-4.5V)	V$_{DS}$=-20V , V$_{GS}$=-4.5V , I$_D$=-8A	---	19.5	---	nC
Q$_{gs}$	Gate-Source Charge		---	6.1	---	
Q$_{gd}$	Gate-Drain Charge		---	6.6	---	
T$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=-20V , V$_{GS}$=-10V , R$_G$=6Ω, I$_D$=-1A	---	13	---	ns
T$_r$	Rise Time		---	24	---	
T$_{d(off)}$	Turn-Off Delay Time		---	28	---	
T$_f$	Fall Time		---	23	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=-20V , V$_{GS}$=0V , f=1MHz	---	2370	---	pF
C$_{oss}$	Output Capacitance		---	189	---	
C$_{rss}$	Reverse Transfer Capacitance		---	160	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1]	V$_G$=V$_D$=0V , Force Current	---	---	-9.8	A
V$_{SD}$	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_S$=-1A , T$_J$=25℃	---	---	-1.2	V

Note :

1.The data tested by surface mounted on a 1 inch[2] 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$_{AS}$=-25A

4.The power dissipation is limited by 150℃ 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.

FETek Technology Corp.

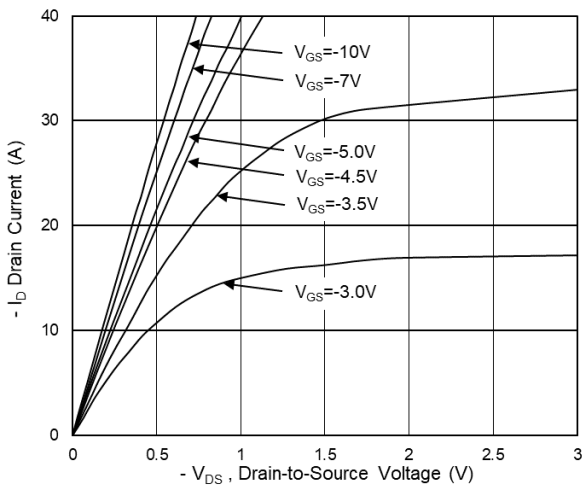## Typical Characteristics

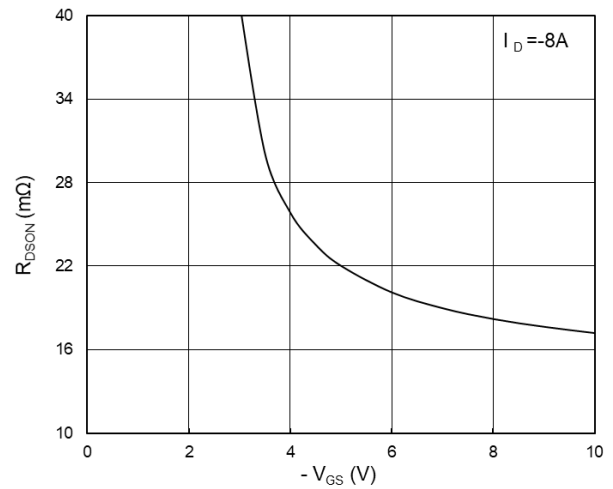**Fig.1 Typical Output Characteristics**
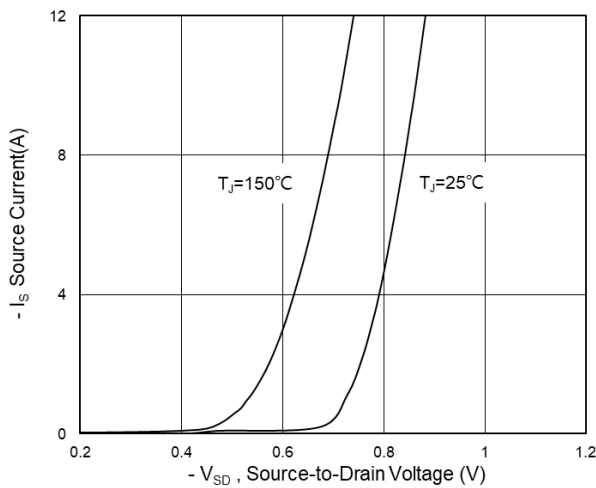

Fig.2 On-Resistance vs G-S Voltage

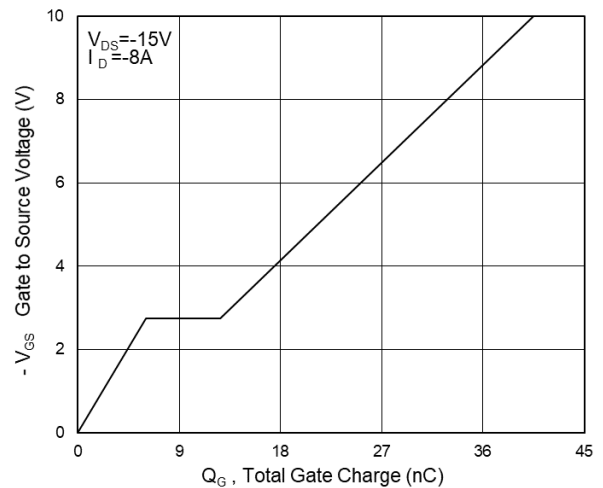**Fig.3 Source Drain Forward Characteristics**

Fig.4 Gate-Charge Characteristics
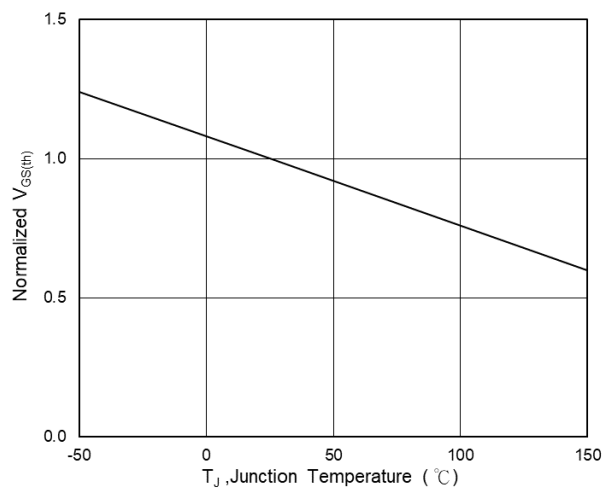
Fig.5 Normalized $V_{GS(th)}$ vs T_J
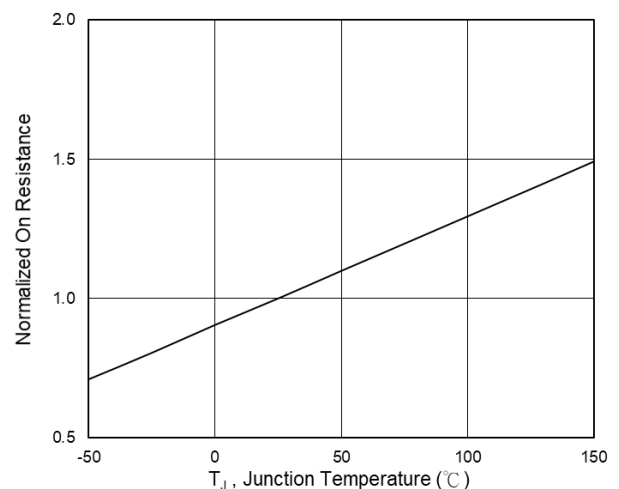
Fig.6 Normalized R_{DSON} vs T_J

FETek Technology Corp.
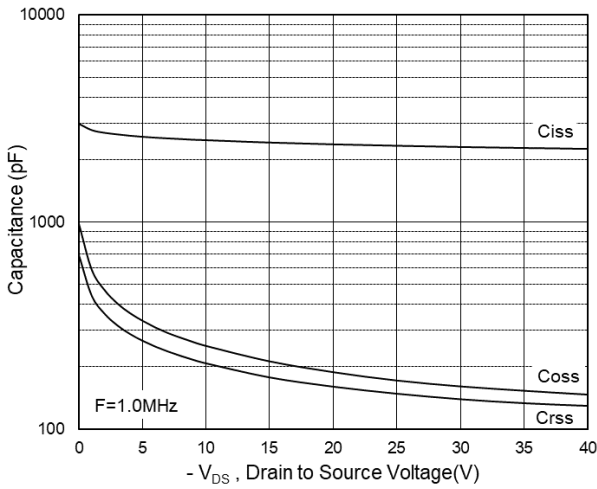
Fig.7 Capacitance
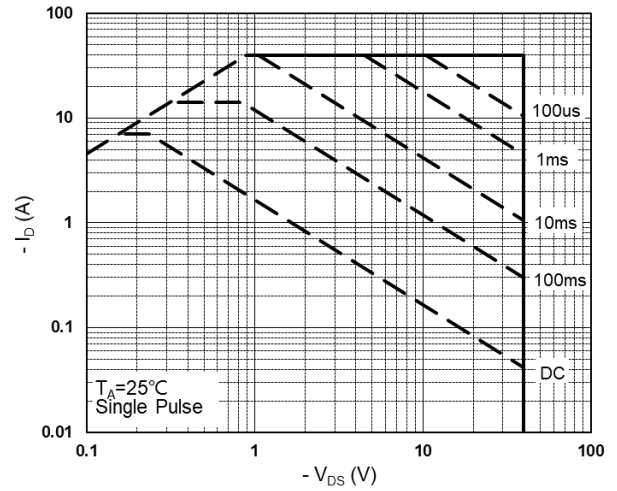
Fig.8 Safe Operating Area

$$D = T_{ON}/T$$
$$T_{Jpeak} = T_C + P_{DM} \times R_{\theta JC}$$
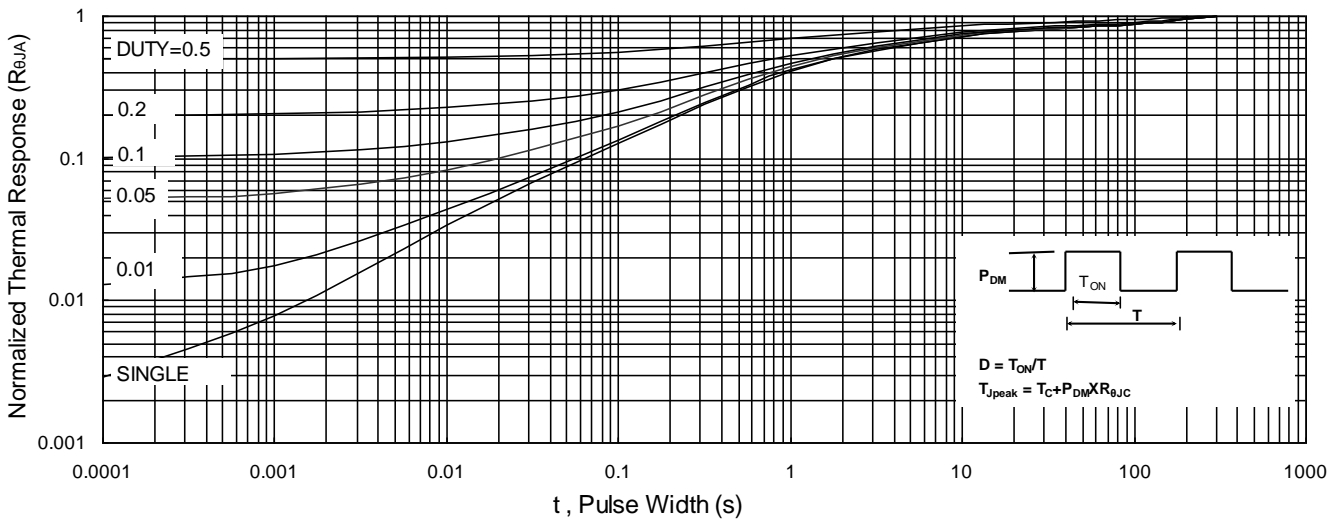
Fig.9 Normalized Maximum Transient Thermal Impedance
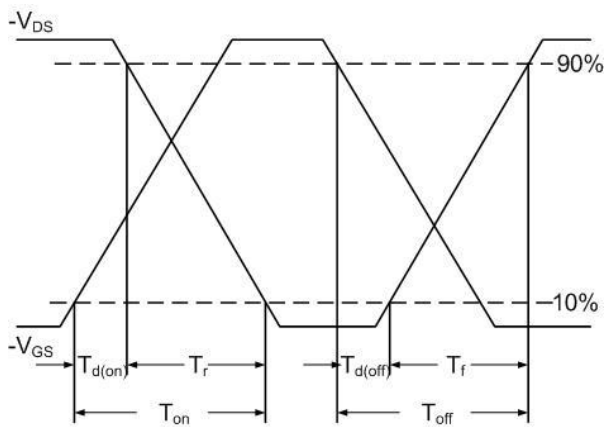
Fig.10 Switching Time Waveform

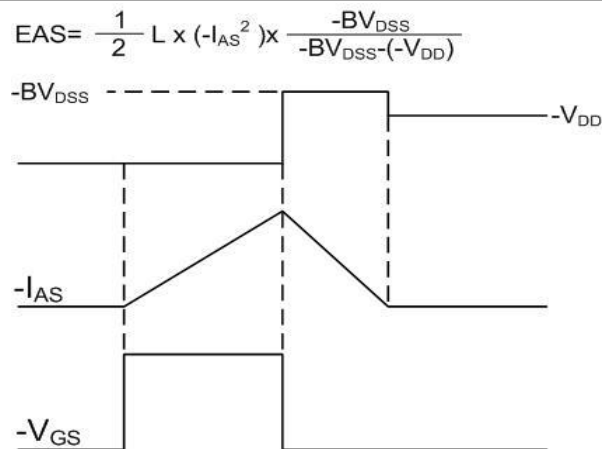$$EAS = \frac{1}{2} L \times (-I_{AS}^2) \times \frac{-BV_{DSS}}{-BV_{DSS}-(-V_{DD})}$$

Fig.11 Unclamped Inductive Switching Waveform