



- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Low Gate Charge

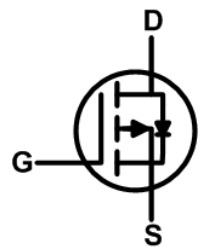
**Product Summary**

BVDSS	RDSON	ID
-100V	50mΩ	-35A

**Description**

The FKH0139 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and gate charge for use in a wide variety of other applications.

The FKH0139 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

**TO263 Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-100	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-35	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-23	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	-100	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	345	mJ
$I_{AS}$	Avalanche Current	28	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	104	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 <sup>1</sup>	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	1.2	°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	$V_{GS}=0V, I_D=-250\mu A$	-100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-10A$	---	42	50	m $\Omega$
		$V_{GS}=-4.5V, I_D=-8A$	---	46	55	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.8	-2.5	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-50	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=-10V, I_D=-10A$	---	32	---	S
$Q_g$	Total Gate Charge	$V_{DS}=-80V, V_{GS}=-10V, I_D=-14A$	---	92	---	nC
$Q_{gs}$	Gate-Source Charge		---	17.5	---	
$Q_{gd}$	Gate-Drain Charge		---	14	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-50V, V_{GS}=-10V, R_G=3.3\Omega, I_D=-14A$	---	20.5	---	ns
$T_r$	Rise Time		---	32.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	123	---	
$T_f$	Fall Time		---	63.7	---	
$C_{iss}$	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V, f=1\text{MHz}$	---	6516	---	pF
$C_{oss}$	Output Capacitance		---	223	---	
$C_{rss}$	Reverse Transfer Capacitance		---	125	---	

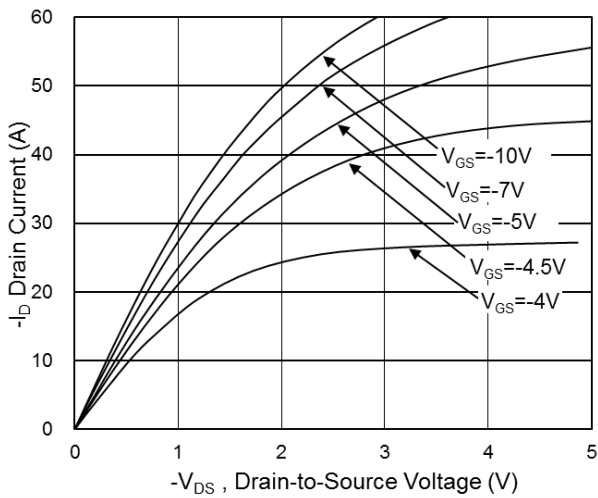
**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V$ , Force Current	---	---	-35	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=-14A, di/dt=-100A/\mu s,$	---	31.2	---	nS
$Q_{rr}$	Reverse Recovery Charge	$T_J=25^\circ\text{C}$	---	31.97	---	nC

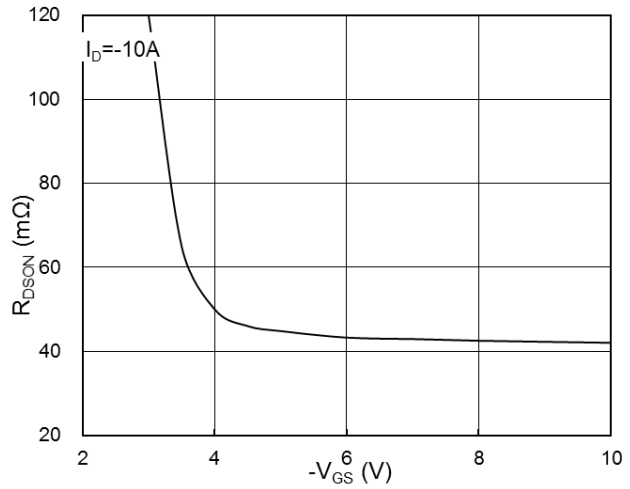
## Note :

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  $V_{DD}=-25V, V_{GS}=-10V, L=0.88\text{mH}, I_{AS}=-28A$
4. The power dissipation is limited by  $150^\circ\text{C}$  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.

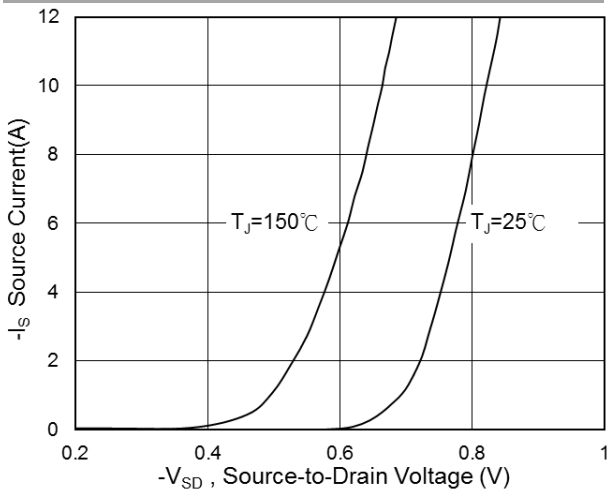
**Typical Characteristics**



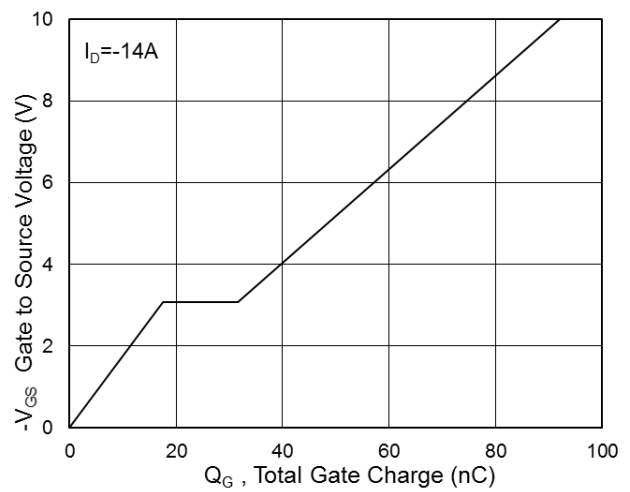
**Fig.1 Typical Output Characteristics**



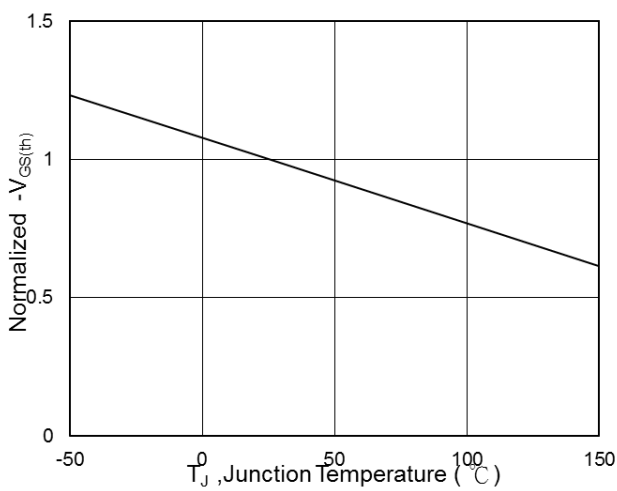
**Fig.2 On-Resistance vs G-S Voltage**



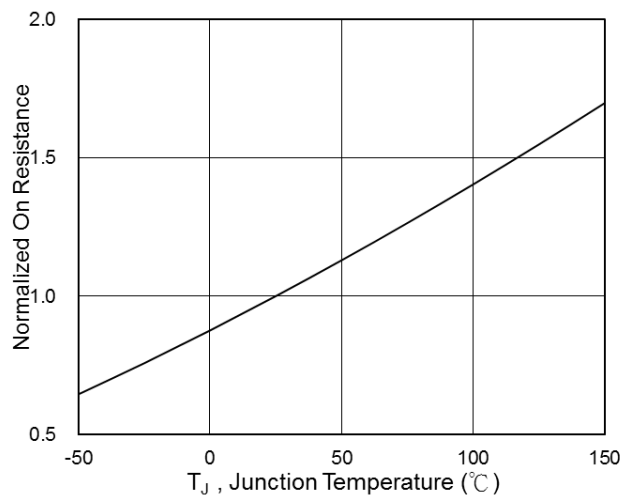
**Fig.3 Typical S-D Diode Forward Voltage**



**Fig.4 Gate-Charge Characteristics**



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



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

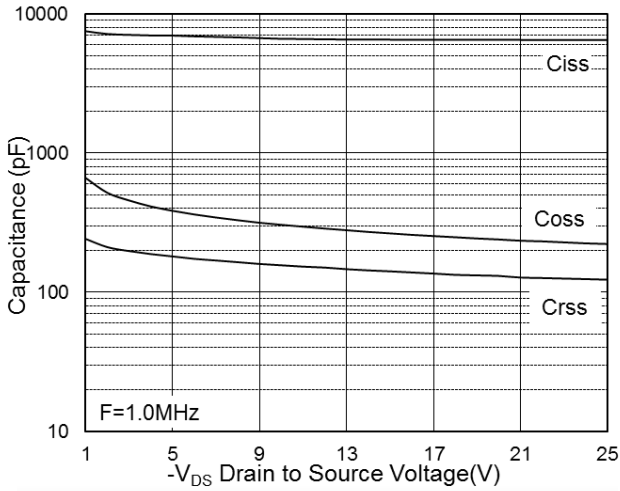


Fig.7 Capacitance

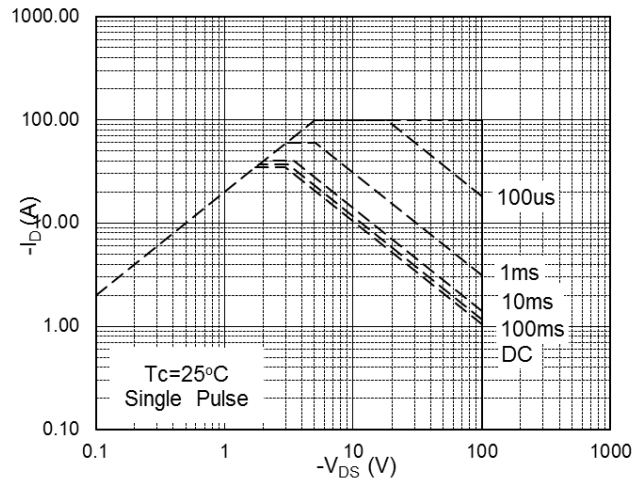


Fig.8 Safe Operating Area

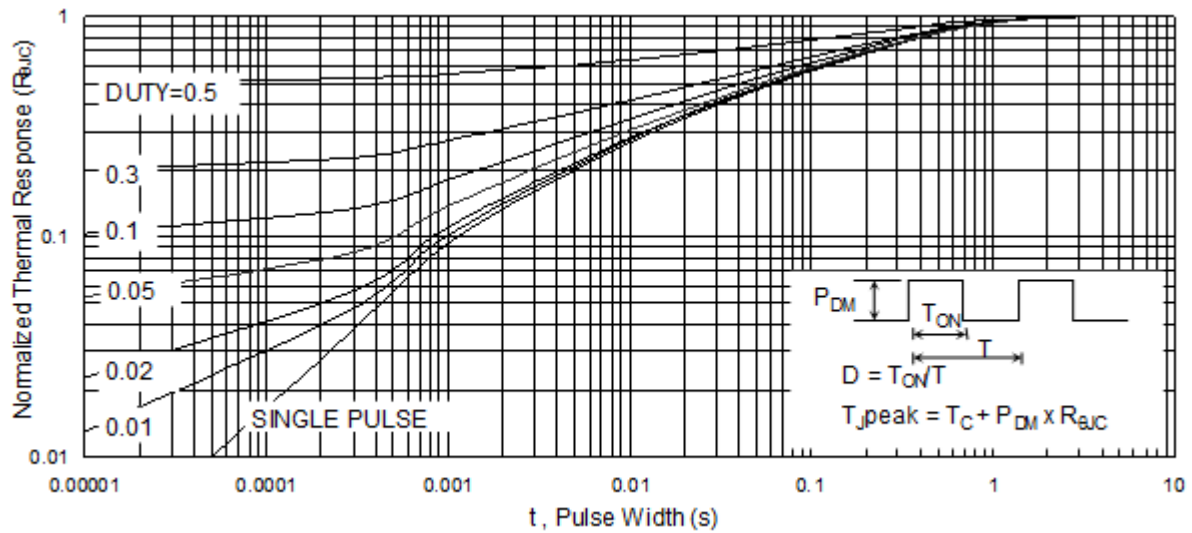


Fig.9 Normalized Maximum Transient Thermal Impedance

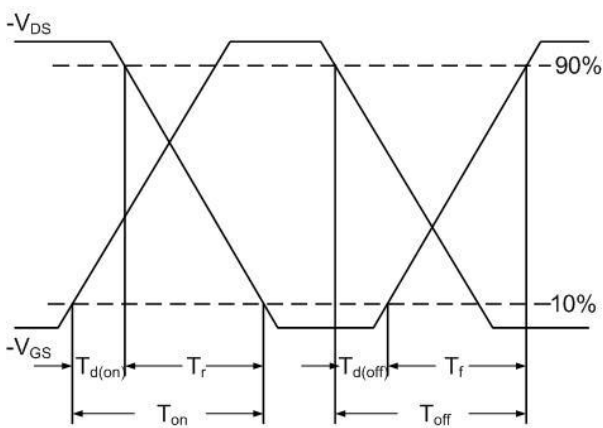


Fig.10 Switching Time Waveform

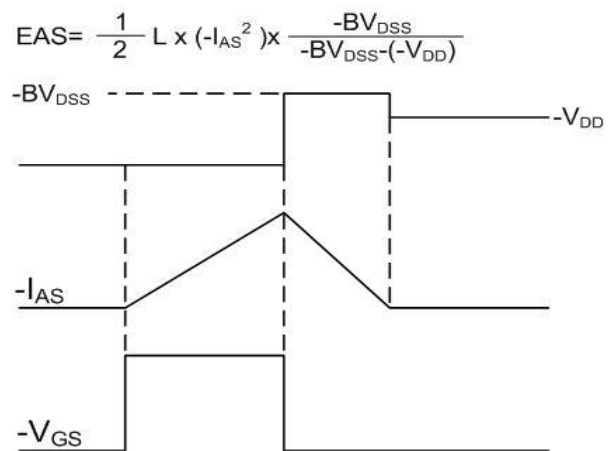


Fig.11 Unclamped Inductive Waveform