

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

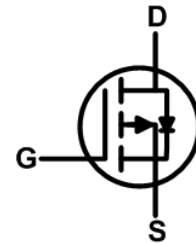
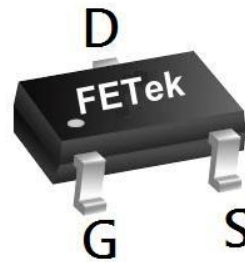
**Product Summary**


BVDSS	RDSON	ID
-30V	80mΩ	-3.2A

**Description**

The FKN3603 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The FKN3603 meet the RoHS and Green Product requirement with full function reliability approved.

**SOT 23 Pin Configurations**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	±12	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5\text{V}^1$	-3.2	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5\text{V}^1$	-2.6	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	-10	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	1.38	W
$P_D@T_A=70^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	0.88	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>	---	90	°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	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-3A$	---	---	60	m $\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	---	80	
		$V_{GS}=-2.5V, I_D=-2A$	---	---	120	
		$V_{GS}=-1.8V, I_D=-1A$	---	---	200	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.5	---	-1.2	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V, T_J=25^\circ C$	---	---	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=55^\circ C$	---	---	-5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=-5V, I_D=-3A$	---	9	---	S
$Q_g$	Total Gate Charge (-4.5V)	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-2A$	---	8.1	11.3	nC
$Q_{gs}$	Gate-Source Charge		---	1.2	1.7	
$Q_{gd}$	Gate-Drain Charge		---	2.1	2.9	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, V_{GS}=-4.5V,$ $R_G=3.3\Omega, I_D=-2A$	---	4	8.0	ns
$T_r$	Rise Time		---	33.2	60	
$T_{d(off)}$	Turn-Off Delay Time		---	26	52	
$T_f$	Fall Time		---	11.6	23.2	
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	---	750	1050	pF
$C_{oss}$	Output Capacitance		---	79	111	
$C_{riss}$	Reverse Transfer Capacitance		---	57	80	

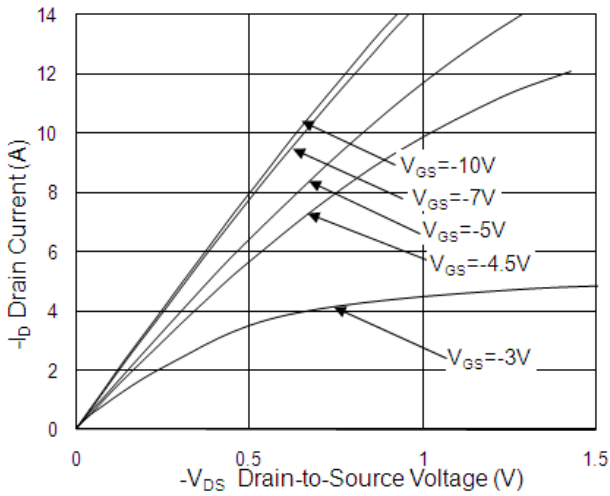
**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,4</sup>	$V_G=V_D=0V$ , Force Current	---	---	-2.6	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	---	---	-1	V
$t_{rr}$	Reverse Recovery Time	$I_F=-3A, dI/dt=100A/\mu s,$ $T_J=25^\circ C$	---	20	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	16	---	nC

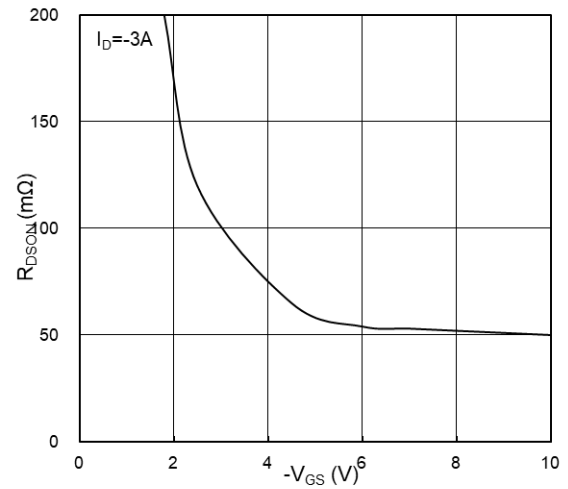
Note :

- 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 power dissipation is limited by 150 $^\circ\text{C}$  junction temperature
- 4.The data is theoretically the same as  $I_D$  and  $I_{DM}$ , in real applications , should be limited by total power dissipation.

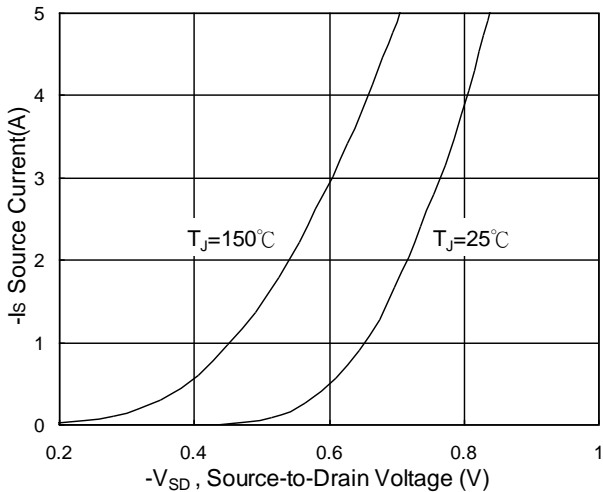
**Typical Characteristics**



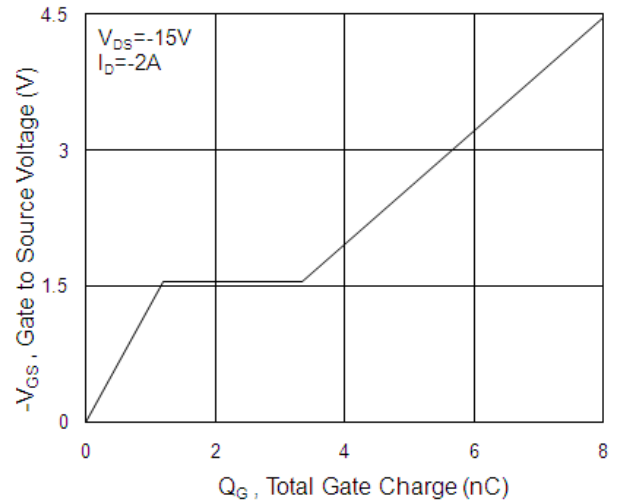
**Fig.1 Typical Output Characteristics**



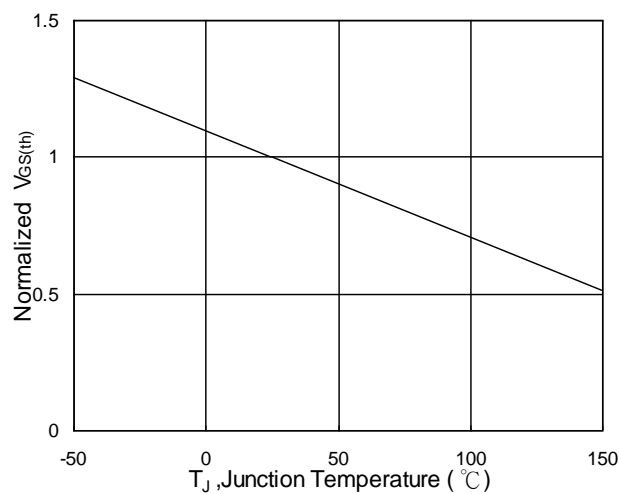
**Fig.2 On-Resistance vs G-S Voltage**



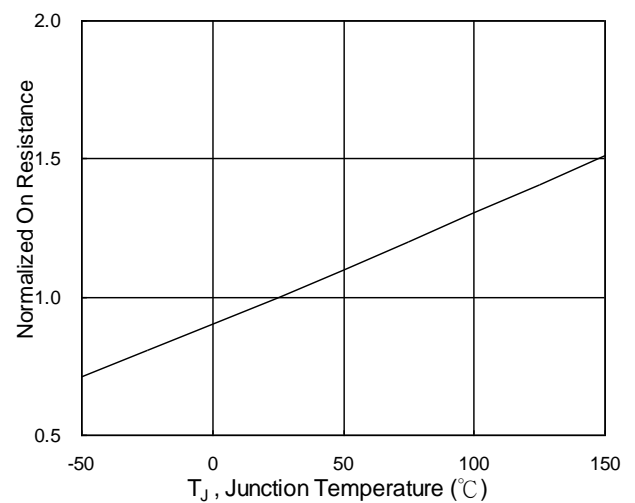
**Fig.3 Source Drain Forward Characteristics**



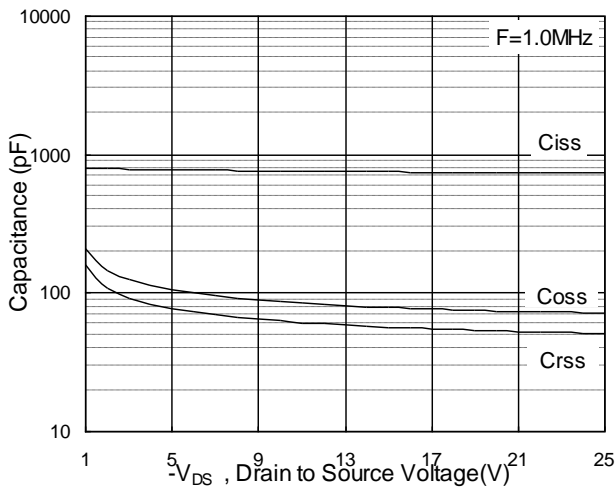
**Fig.4 Gate-Charge Characteristics**



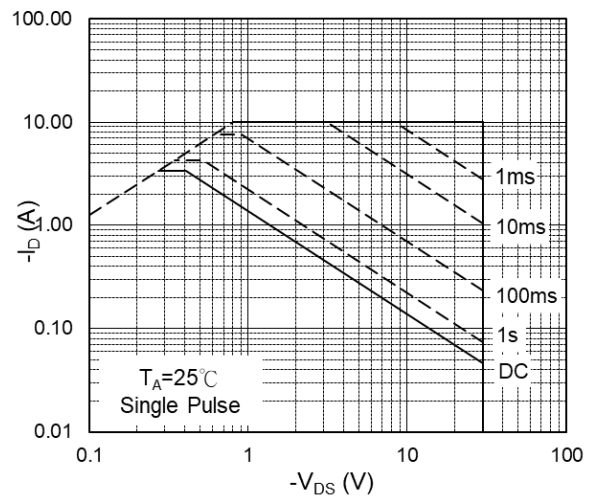
**Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$**



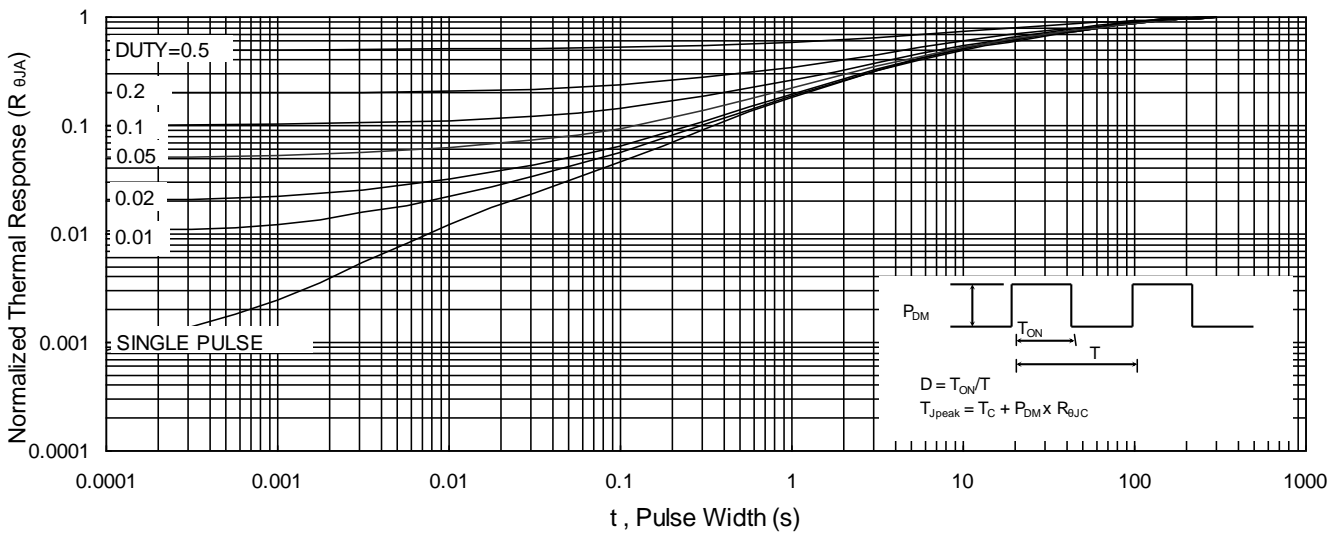
**Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$**



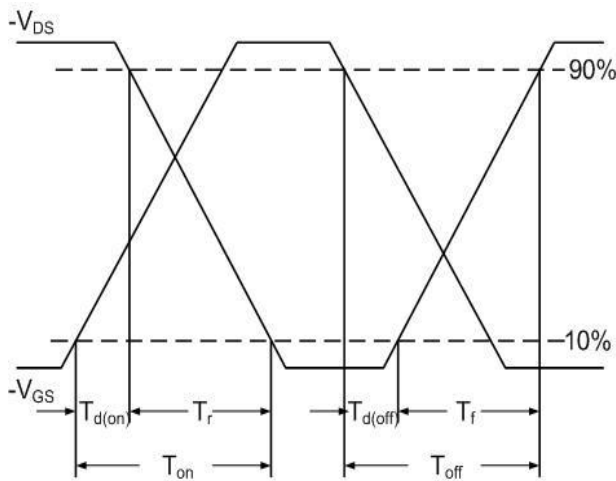
**Fig.7 Capacitance**



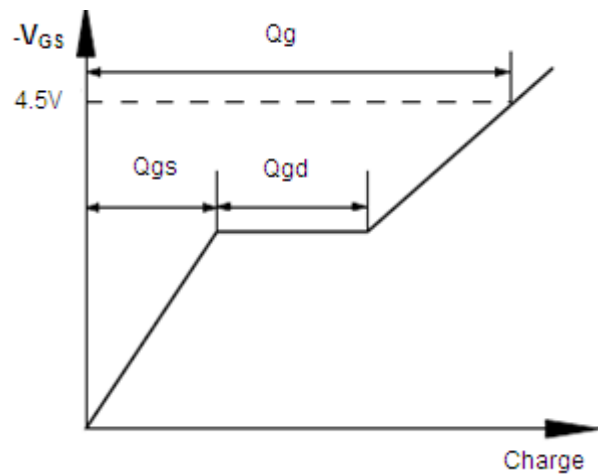
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



**Fig.11 Gate Charge Waveform**