FKCA1030

Dual N-Ch Fast Switching MOSFETs

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

Product Summary

Green

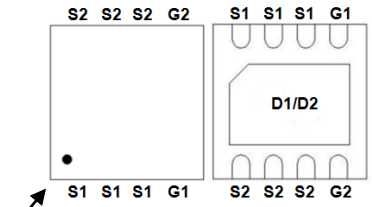
BVDSS	RDSON	ID
12V	5.2mΩ	56A

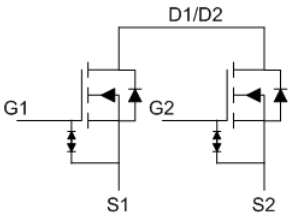
General Description

The FKCA1030 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

The FKCA1030 meet the RoHS and Green Product requirement with full function reliability approved.

DFN3x3 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	12	V
V_{GS}	Gate-Source Voltage	±8	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 4.5V[1]	56	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 4.5V[1]	35.6	A
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 4.5V[1]	19	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 4.5V[1]	15	A
I_{DM}	Pulsed Drain Current[2]	100	A
P_D@T_C=25°C	Total Power Dissipation[1]	31	W
P_D@T_A=25°C	Total Power Dissipation[1]	3.6	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]	---	35	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	4	°C/W

N-Channel Electrical Characteristics (T_J=25 ˚C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	12	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V , I_D=3A	---	4.2	5.2	mΩ
		V_{GS}=3.9V , I_D=3A	---	4.3	6.5	
		V_{GS}=2.5V , I_D=3A	---	5	7	
		V_{GS}=1.8V , I_D=3A	---	7	11	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.4	---	1.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=12V , V_{GS}=0V , T_J=25˚C	---	---	1	uA
		V_{DS}=12V , V_{GS}=0V , T_J=55˚C	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V , V_{DS}=0V	---	---	±10	uA
gfs	Forward Transconductance	V_{DS}=5V , I_D=3A	---	42	---	S
Q_g	Total Gate Charge (4.5V)	V_{DS}=10V , I_D=3A	---	38	---	nC
	Total Gate Charge (3.9V)		---	33	---	
Q_{gs}	Gate-Source Charge		---	4.5	---	
Q_{gd}	Gate-Drain Charge		---	12	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=4.5V , R_G=6Ω I_D=3A	---	22	---	ns
T_r	Rise Time		---	41	---	
$T_{d(off)}$	Turn-Off Delay Time		---	77	---	
T_f	Fall Time		---	21	---	
C_{iss}	Input Capacitance	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	3165	---	pF
C_{oss}	Output Capacitance		---	380	---	
C_{rss}	Reverse Transfer Capacitance		---	325	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1]	V_G=V_D=0V , Force Current	---	---	30	A
I_{SM}	Pulsed Source Current[2]		---	---	100	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=3A , T_J=25˚C	---	---	1.2	V

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper, t ≤10s.
2.The data tested by pulsed , pulse width ≦ 10us , duty cycle ≦ 1%

Typical Characteristics

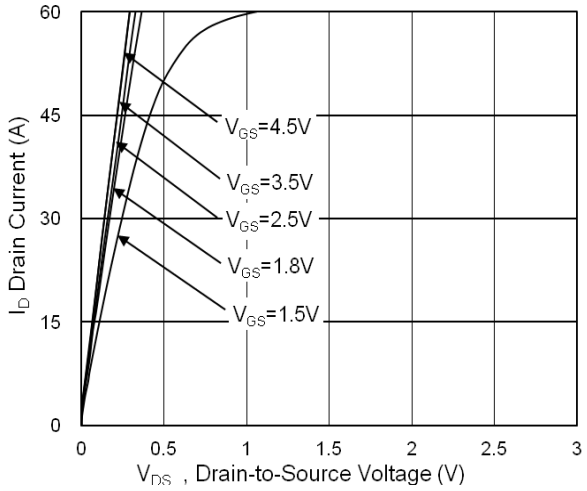


Fig.1 Typical Output Characteristics

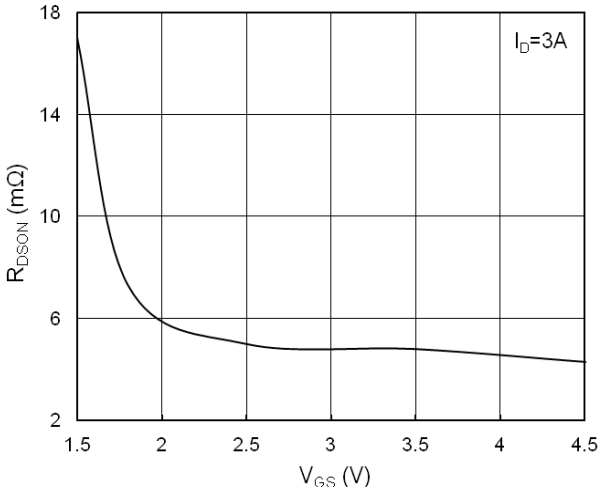


Fig.2 On-Resistance vs. Gate-Source Voltage

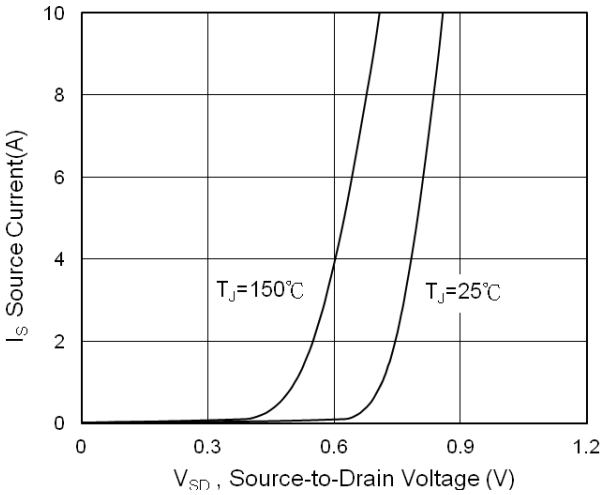


Fig.3 Forward Characteristics of Reverse

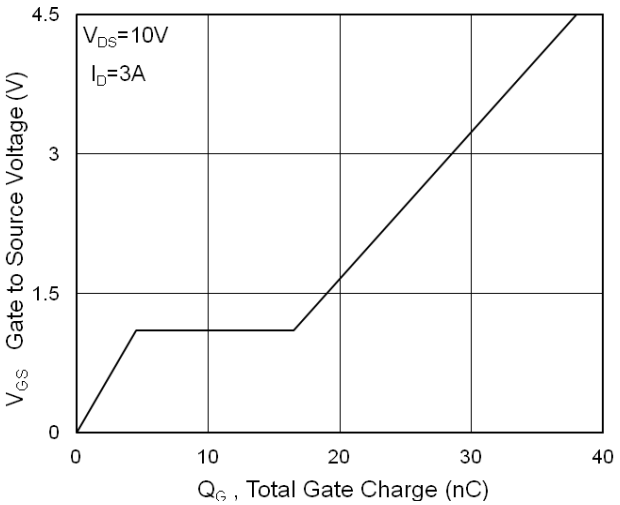


Fig.4 Gate-Charge Characteristics

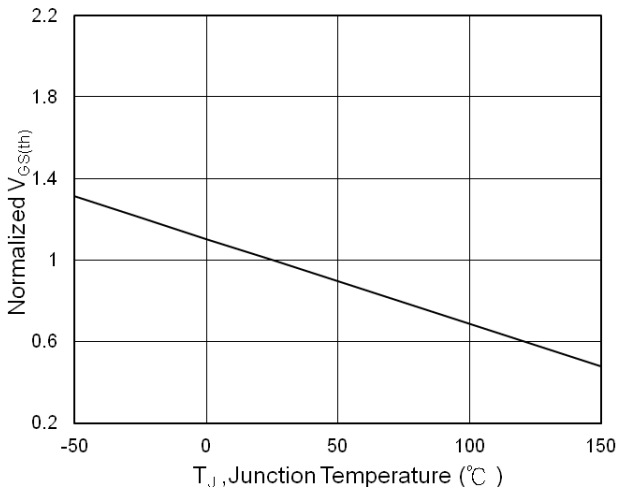


Fig.5 $V_{GS(th)}$ vs. T_J

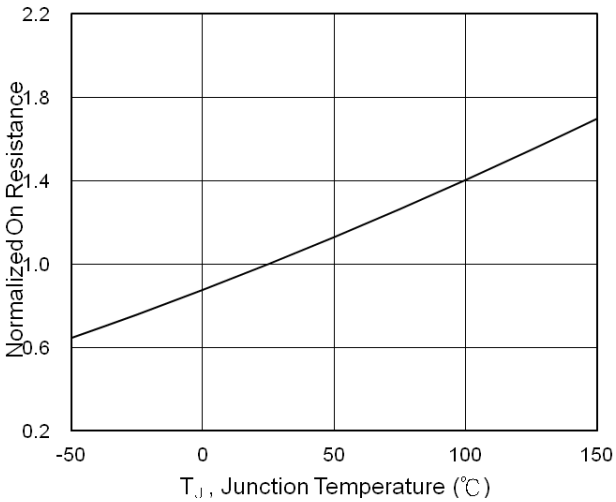


Fig.6 Normalized R_{DSON} vs. T_J

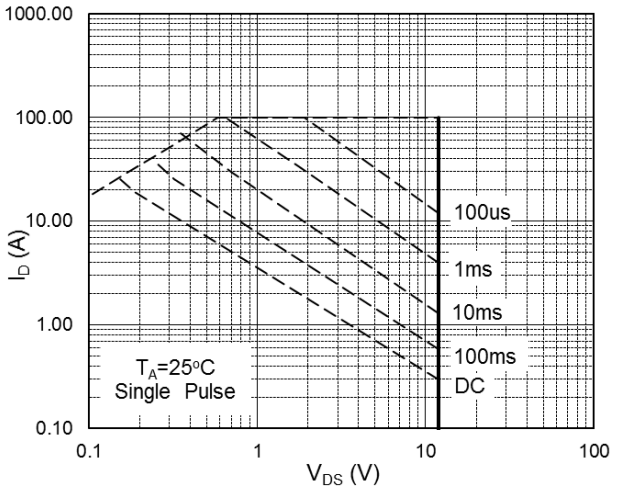


Fig.7 Safe Operating Area

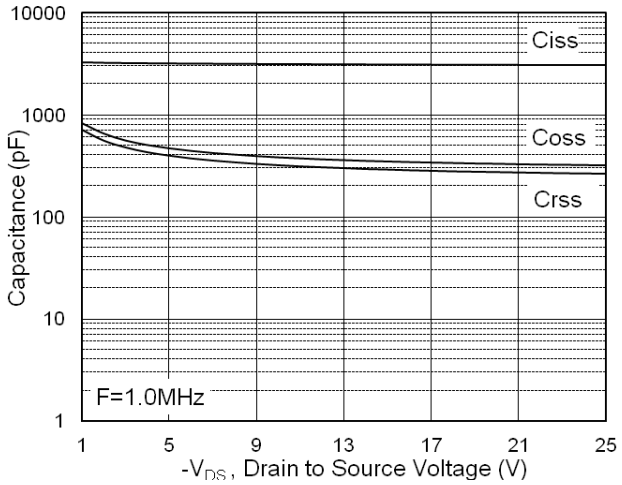


Fig.8 Capacitance

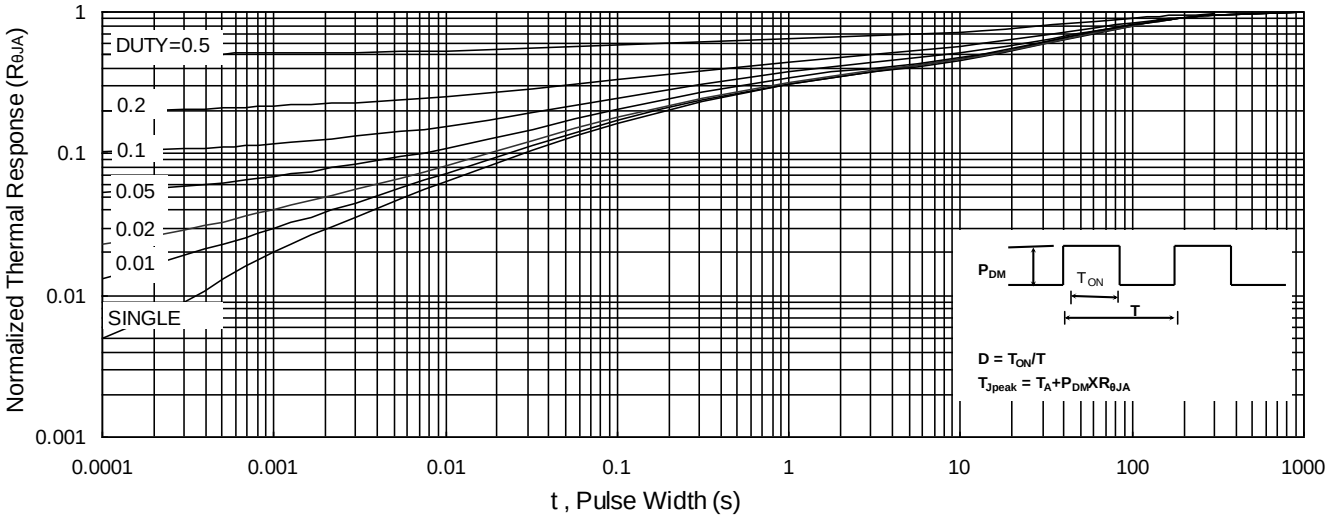


Fig.9 Normalized Maximum Transient Thermal Impedance

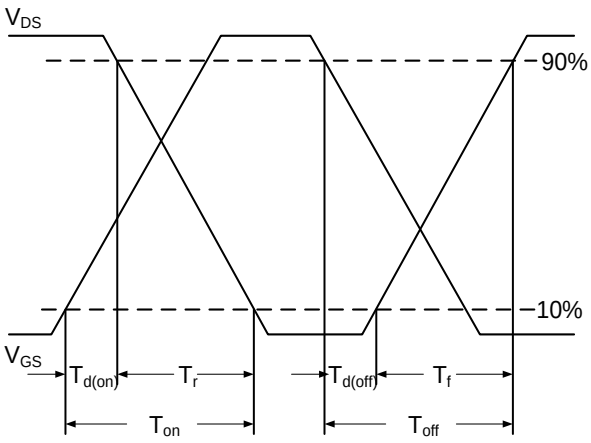


Fig.10 Switching Time Waveform

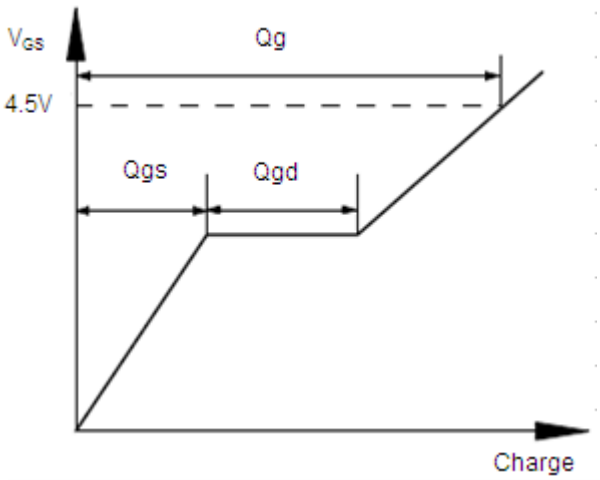


Fig.11 Gate Charge Waveform