

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

Product Summary



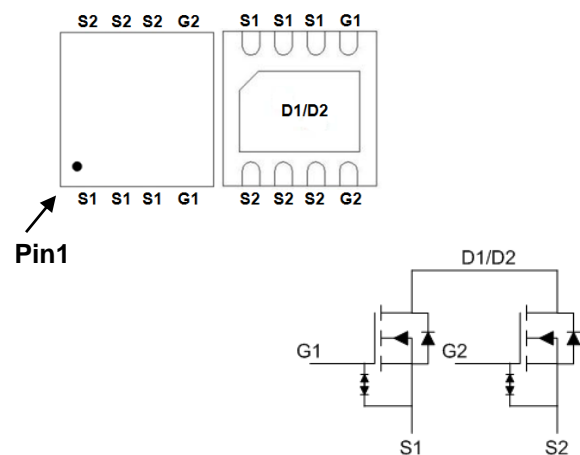
BVDSS	RDSON	ID
12V	4.3mΩ	56A

General Description

The FKCA1030 is the low RDSON trenched N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack 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
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	56	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	35.6	A
$I_D@T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	19	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	15	A
I_{DM}	Pulsed Drain Current ²	100	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ¹	31	W
$P_D@T_A=25^\circ C$	Total Power Dissipation ¹	3.6	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	35	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	4	$^\circ C/W$



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	2.3	3.3	4.3	mΩ
		V _{GS} =4.0V , I _D =3A	2.4	3.4	4.4	
		V _{GS} =3.1V , I _D =3A	2.6	3.6	4.7	
		V _{GS} =2.5V , I _D =3A	3	4	5.6	
		V _{GS} =1.8V , I _D =3A	4	5.4	7.6	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.4	0.6	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
g _{fs}	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	
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 inch² FR-4 board with 20Z copper, t ≤10s.
- 2.The data tested by pulsed , pulse width ≤ 10us , duty cycle ≤ 1%

Typical Characteristics

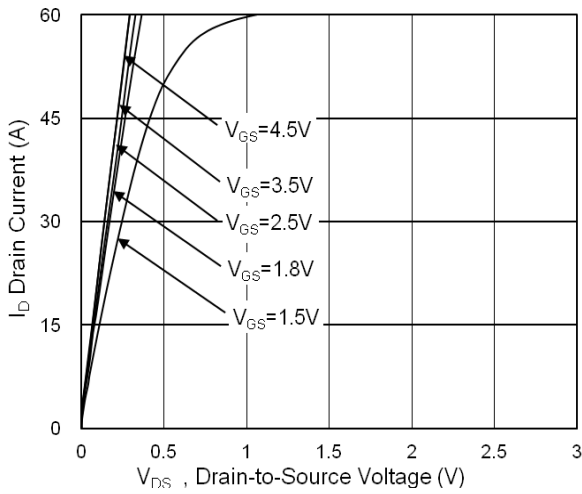


Fig.1 Typical Output Characteristics

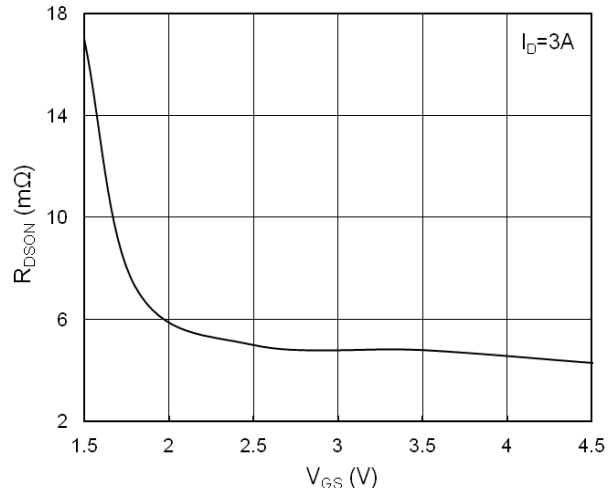


Fig.2 On-Resistance vs. Gate-Source Voltage

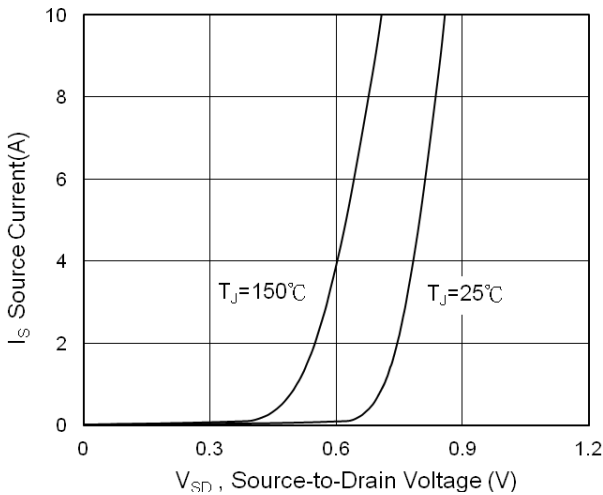


Fig.3 Source Drain Forward Characteristics

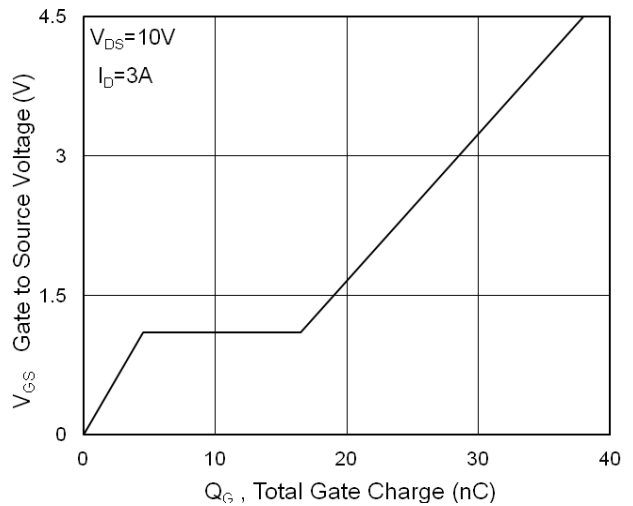


Fig.4 Gate-Charge Characteristics

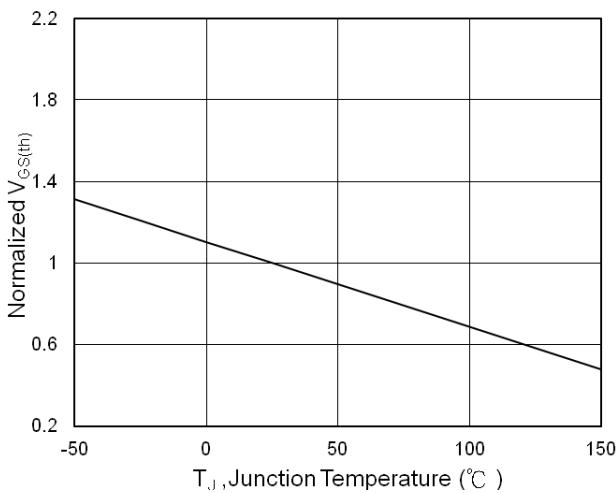


Fig.5 $V_{GS(th)}$ vs. T_J

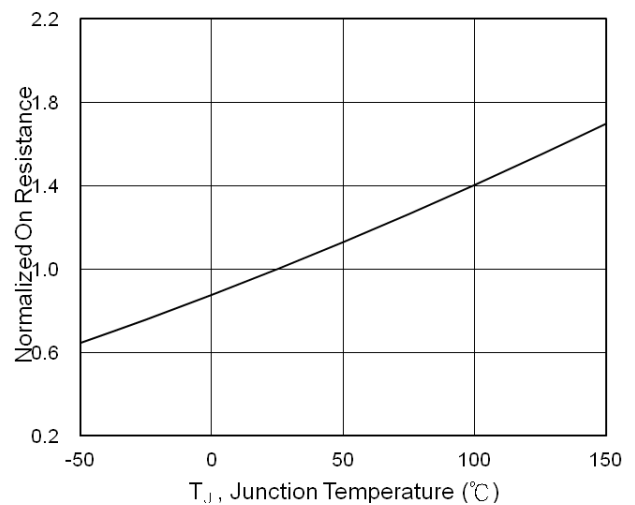


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

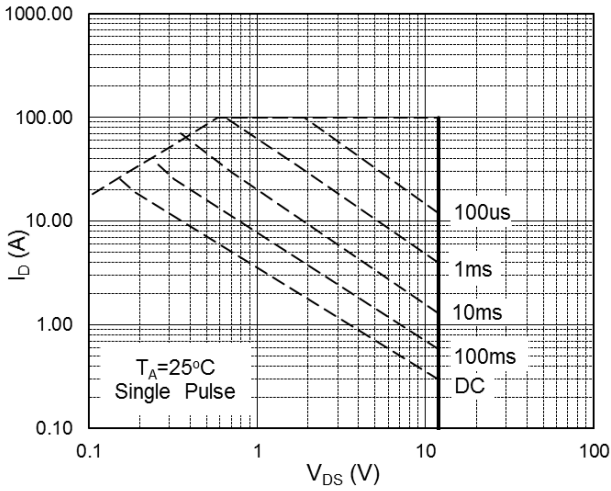


Fig.7 Safe Operating Area

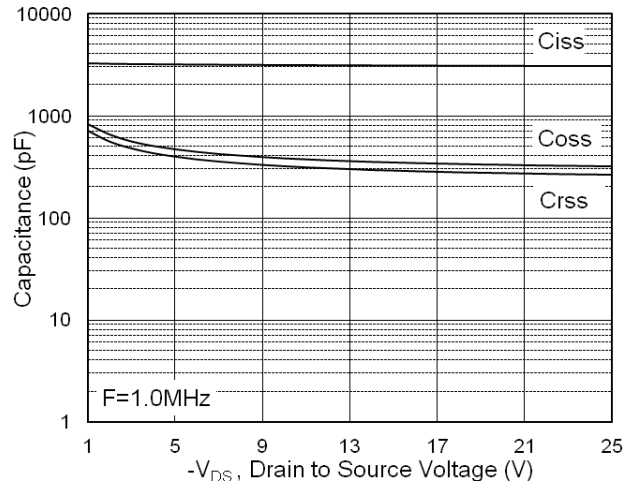


Fig.8 Capacitance

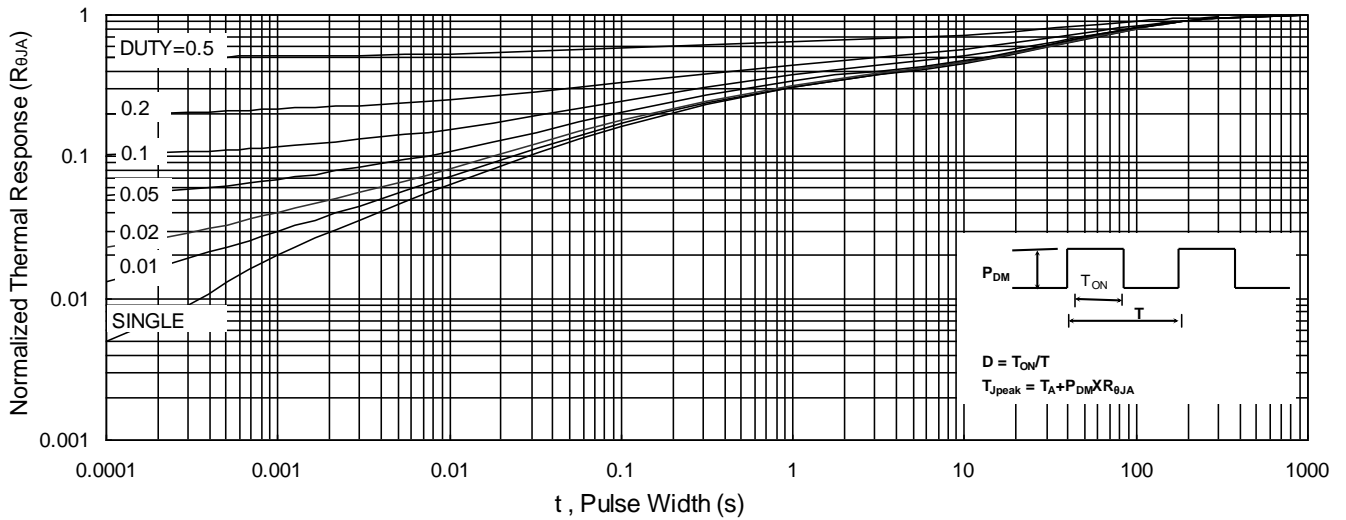


Fig.9 Normalized Maximum Transient Thermal Impedance

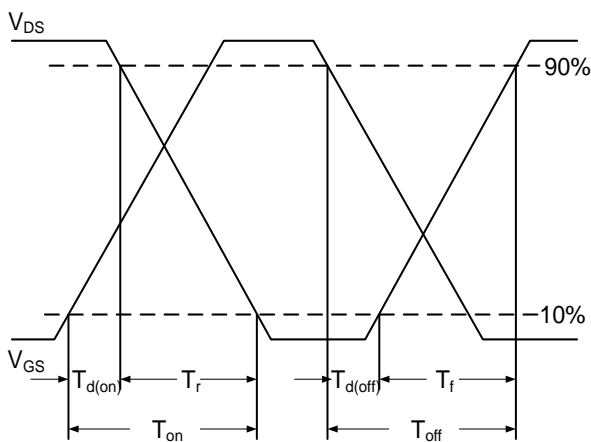


Fig.10 Switching Time Waveform

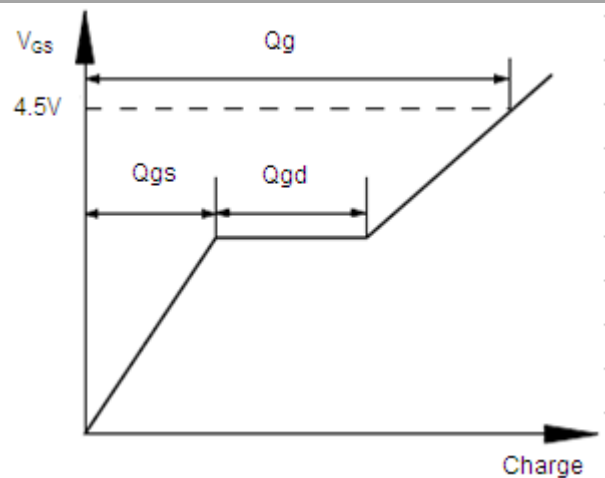
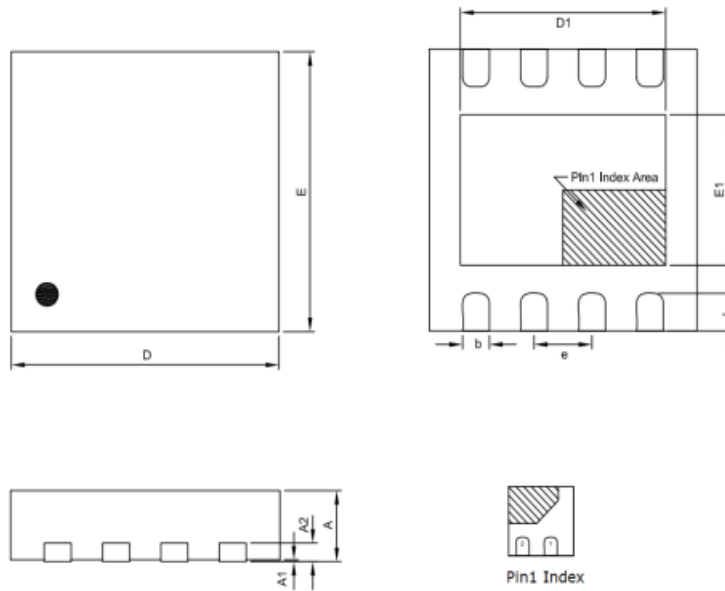


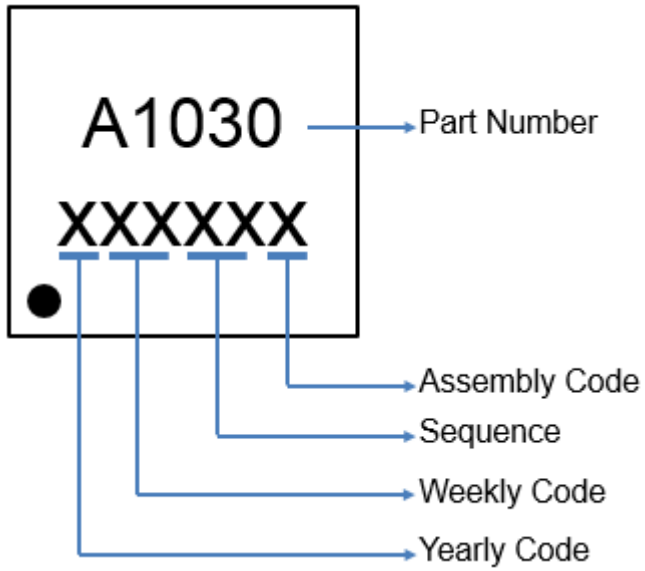
Fig.11 Gate Charge Waveform

DFN3x3 Package Outline Dimensions



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.0276	0.0295	0.0315
A1	0.00	--	0.05	0.000	--	0.002
A2	0.19	0.20	0.21	0.0075	0.0079	0.0083
D	2.90	3.00	3.10	0.114	0.118	0.122
E	2.90	3.00	3.10	0.114	0.118	0.122
D1	2.25	2.30	2.35	0.0886	0.0906	0.0925
E1	1.55	1.6	1.65	0.061	0.063	0.065
L	0.35	0.40	0.45	0.0138	0.0177	0.0207
b	0.25	0.30	0.35	0.0098	0.0118	0.0138
e	--	0.65	--	--	0.0256	--

Marking Instruction



DFN3x3 Tape and Reel Data

