STEIFPOWER TECHNOLOGY

General Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

DFN2x2-6L 2EP Pin Configuration
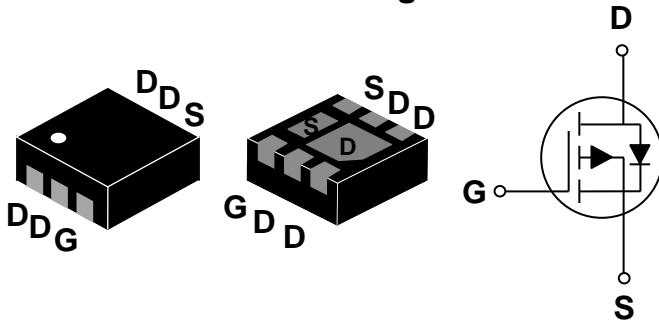
BVDSS	RDSON	ID
-20V	28mΩ	-8.5A

Features

- *-20V,-8.5A, RDS(ON) =28mΩ@VGS = -4.5V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*
- *Suit for -1.8V Gate Drive Applications*

Applications

- *Notebook*
- *Load Switch*
- *Battery Protection*
- *Hand-held Instruments*

RoHS COMPLIANT

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±10	V
I_D	Drain Current – Continuous (T_C=25℃)	-8.5	A
	Drain Current – Continuous (T_C=100℃)	-5.4	A
I_{DM}	Drain Current – Pulsed[1]	-34	A
P_D	Power Dissipation (T_C=25℃)	3.3	W
	Power Dissipation – Derate above 25℃	0.026	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction to ambient	---	62	℃/W
$R_{θJC}$	Thermal Resistance Junction to Case	---	38	℃/W

Electrical Characteristics (T_J=25 $°C$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-20	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25$°C$, I_D=-1mA	---	-0.02	---	V/$°C$
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25$°C$	---	---	-1	uA
		V_{DS}=-16V , V_{GS}=0V , T_J=125$°C$	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=$\pm$10V , V_{DS}=0V	---	---	$\pm$100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-4.5V , I_D=-4A	---	22	28	mΩ
		V_{GS}=-2.5V , I_D=-3A	---	27	37	
		V_{GS}=-1.8V , I_D=-2A	---	33	45	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.3	-0.6	-1	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2	---	mV/$°C$
gfs	Forward Transconductance	V_{DS}=-10V , I_S=-3A	---	8.4	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge[2,3]	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-4A	---	16.1	25	nC
Q_{gs}	Gate-Source Charge[2,3]		---	1.8	3	
Q_{gd}	Gate-Drain Charge[2,3]		---	3.8	7	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-10V , V_{GS}=-4.5V , R_G=25Ω I_D=-1A	---	8.2	16	nS
T_r	Rise Time[2,3]		---	30	57	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	71.1	135	
T_f	Fall Time[2,3]		---	19.8	38	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	---	1440	2100	pF
C_{oss}	Output Capacitance		---	155	230	
C_{rss}	Reverse Transfer Capacitance		---	115	170	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-8.5	A
I_{SM}	Pulsed Source Current		---	---	-17	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25$°C$	---	---	-1	V

Note :
1.   Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.   The data tested by pulsed , pulse width $\leqq$ 300us , duty cycle $\leqq$ 2%.
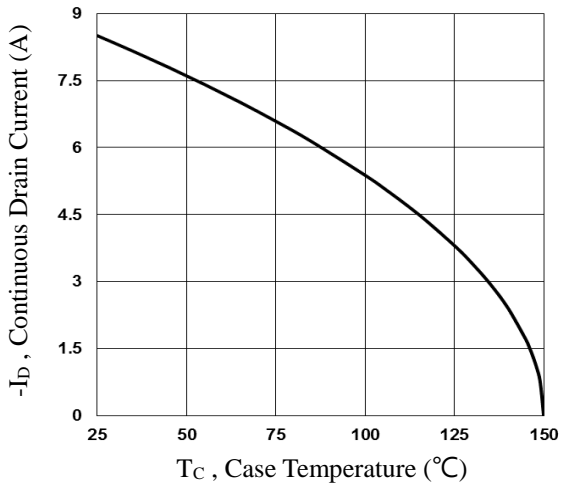3.   Essentially independent of operating temperature.
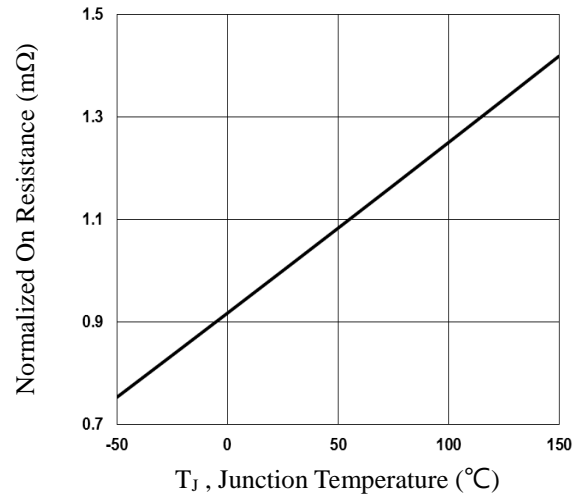
Fig.1   Continuous Drain Current vs. T_C

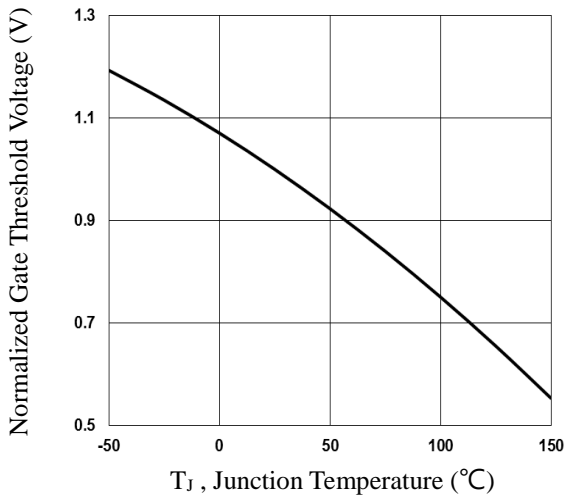Fig.2   Normalized RDSON vs. T_J

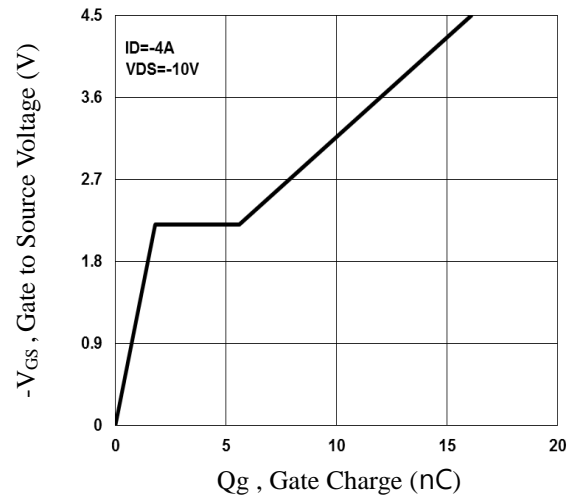Fig.3   Normalized V_{th} vs. T_J
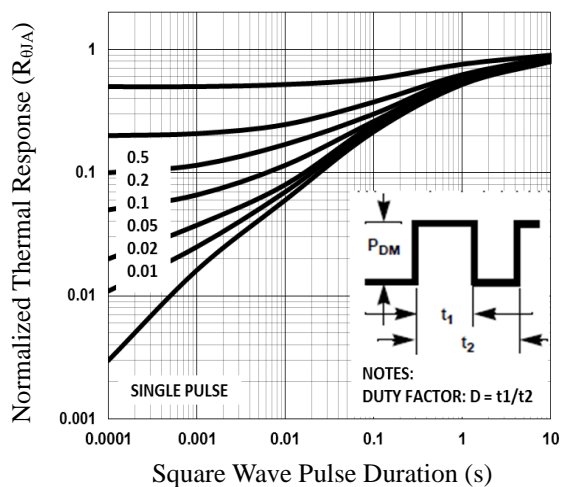

Fig.4   Gate Charge Waveform
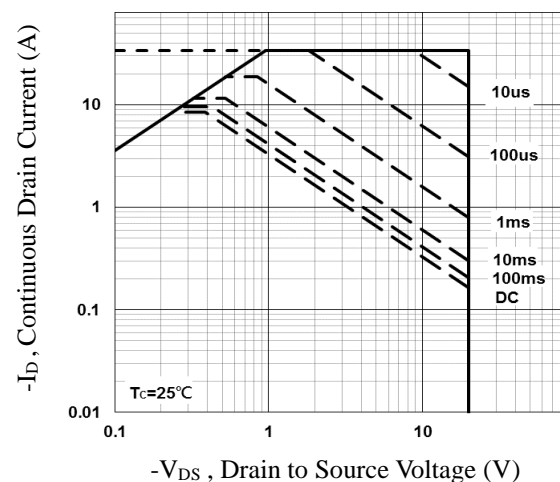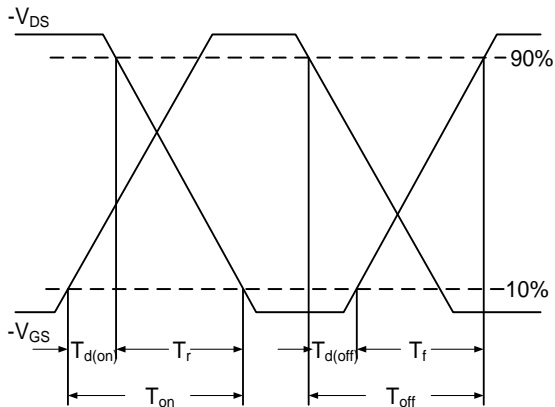

Fig.5   Normalized Transient Impedance

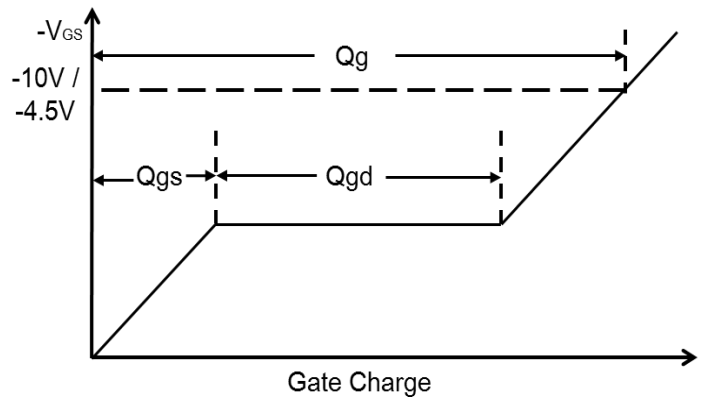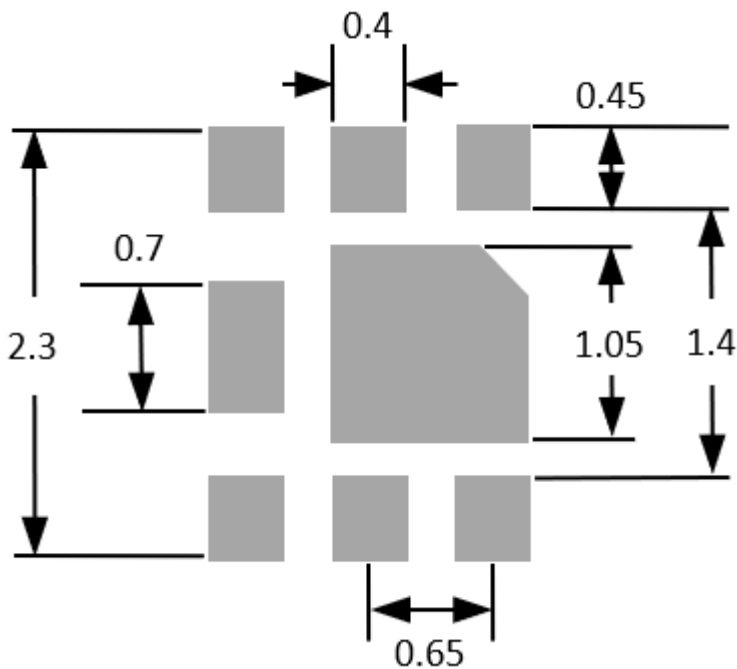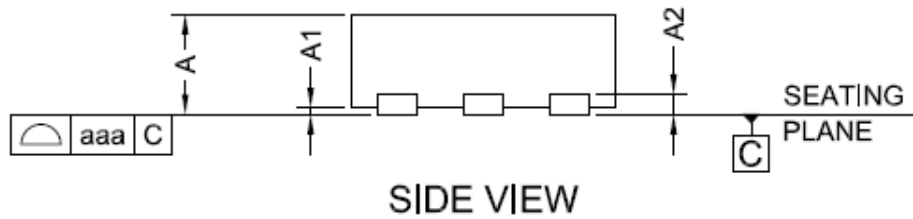Fig.6   Maximum Safe Operation Area

Fig.7 Switching Time Waveform

Fig.8 Gate Charge Waveform

DFN2x2-6L 2EP PACKAGE INFORMATION

BOTTOM VIEW

TOP VIEW

SIDE VIEW
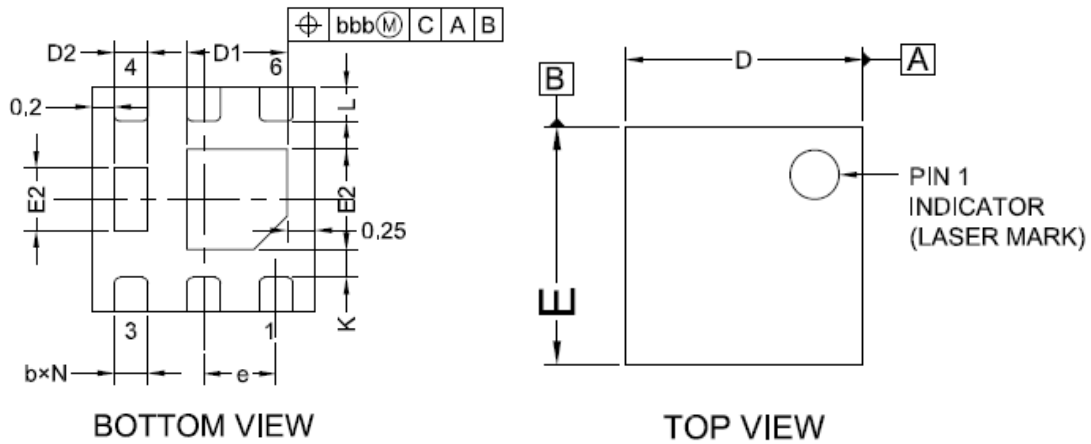
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A2		0.152REF.	
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e		0.65BSC	
L	0.25	0.30	0.35
J		0.40BSC	
K		0.20MIN	
N		6	
aaa		0.08	
bbb		0.10	