30V N-Channel MOSFETs

General Description

These N-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.

BVDSS	RDSON	ID
30V	17mΩ	8.5A

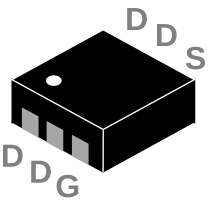
Features

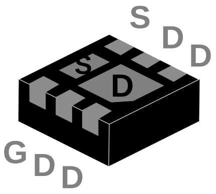
- *30V,8.5A, RDS(ON) =17mΩ @VGS = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *100% EAS Guaranteed*
- *Green Device Available*

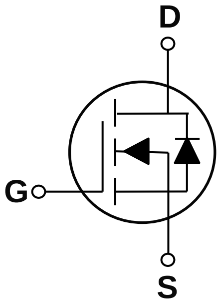
Applications

- *MB / VGA / Vcore*
- *POL Applications*
- *SMPS 2nd SR*

DFN2x2-6L 2EP Pin Configuration







Absolute Maximum Ratings **(Tc=25℃ unless otherwise noted)**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_A=25℃)	8.5	A
	Drain Current – Continuous (T_A=70℃)	6.8	A
I_{DM}	Drain Current – Pulsed[1]	34	A
EAS	Single Pulse Avalanche Energy[2]	13	mJ
IAS	Single Pulse Avalanched Current[2]	16	A
P_D	Power Dissipation (T_C=25℃)	2.01	W
	Power Dissipation – Derate above 25℃	0.016	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
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	℃/W

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Electrical Characteristics **(T_J=25 ℃, unless otherwise noted)**

Off Characteristics

Symbol	**Parameter**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BV_{DSS}/△T_J	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.04	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=30V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=± 20V , V_{DS}=0V	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance[3]	V_{GS}=10V , I_D=6A	---	13.5	17	mΩ
		V_{GS}=4.5V , I_D=4A	---	17	22	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.8	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_D=3A	---	6	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3 , 4]	V_{DS}=15V , V_{GS}=4.5V , I_D=5A	---	7.4	12	nC
Q_{gs}	Gate-Source Charge[3 , 4]		---	2.3	5	
Q_{gd}	Gate-Drain Charge[3 , 4]		---	3	6	
$T_{d(on)}$	Turn-On Delay Time[3 , 4]	V_{DD}=15V , V_{GS}=10V , R_G=6Ω I_D=1A	---	3.8	7	ns
T_r	Rise Time[3 , 4]		---	10	19	
$T_{d(off)}$	Turn-Off Delay Time[3 , 4]		---	22	42	
T_f	Fall Time[3 , 4]		---	6.6	13	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	620	900	pF
C_{oss}	Output Capacitance		---	85	125	
C_{rss}	Reverse Transfer Capacitance		---	60	90	
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	2.8	5.6	Ω

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[3]		---	---	17	A
V_{SD}	Diode Forward Voltage[3]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=16A.,R_G=25Ω , Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

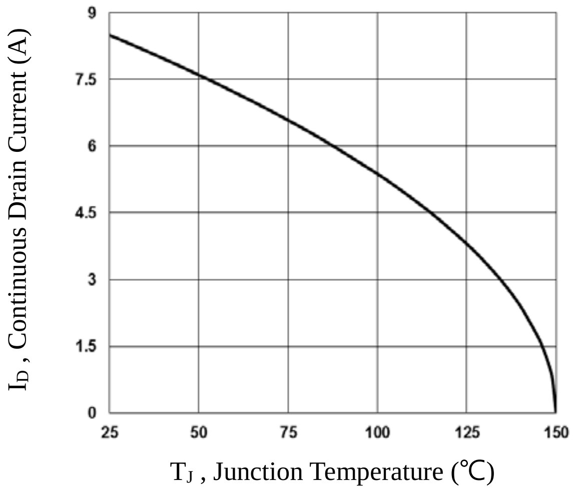

Fig.1 Continuous Drain Current vs. T_C

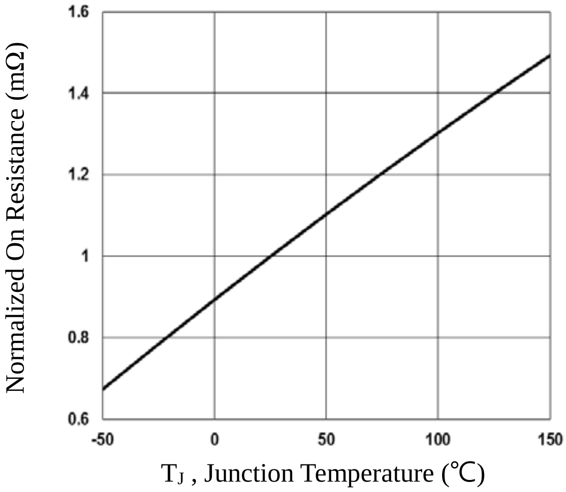

Fig.2 Normalized RDSON vs. T_J

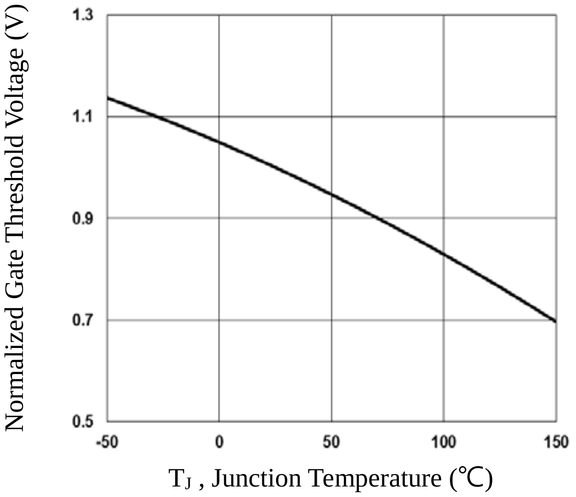

Fig.3 Normalized V_{th} vs. T_J

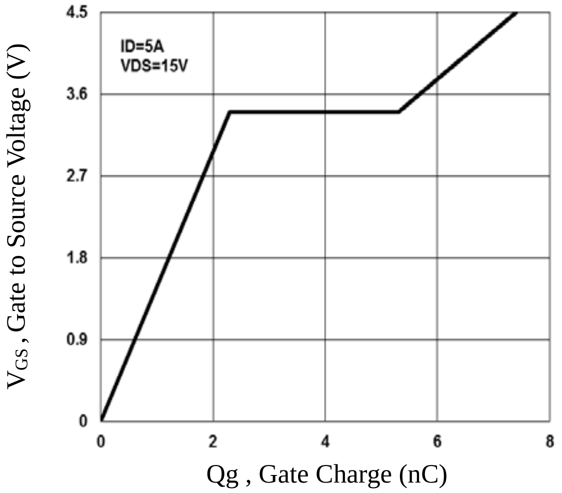

Fig.4 Gate Charge Waveform

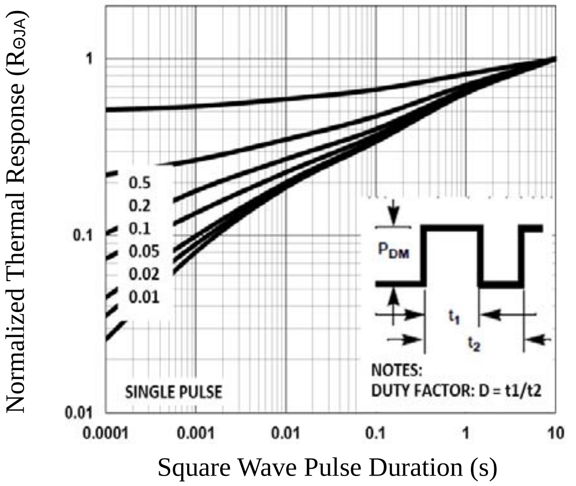

Fig.5 Normalized Transient Response

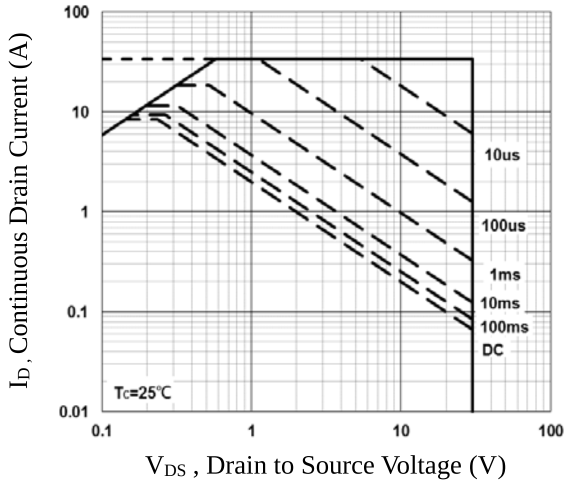

Fig.6 Maximum Safe Operation Area

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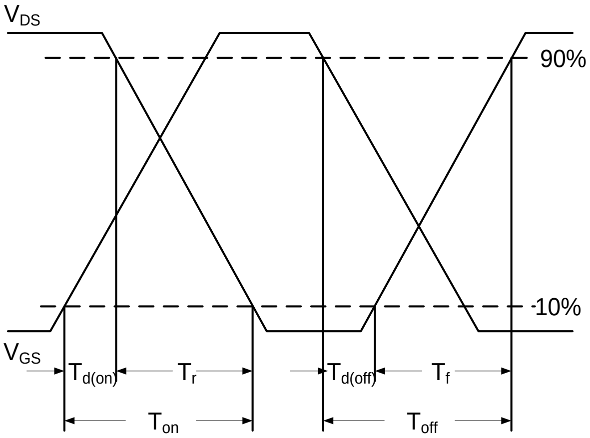


Fig.7 Switching Time Waveform

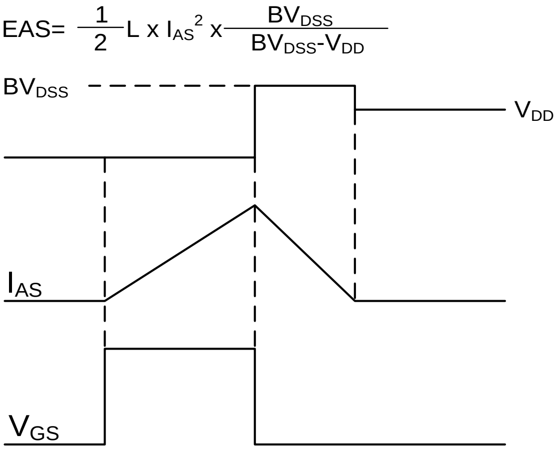
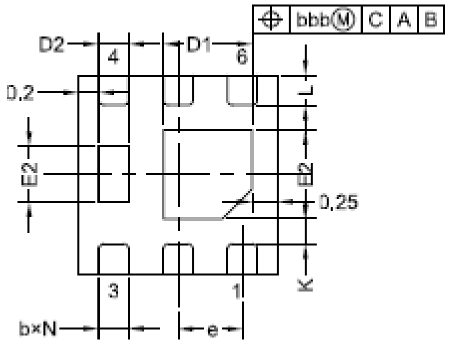
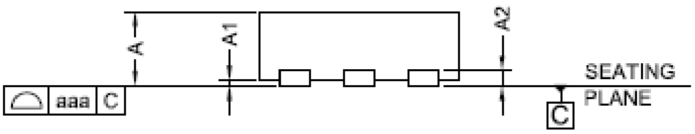


Fig.8 EAS Waveform

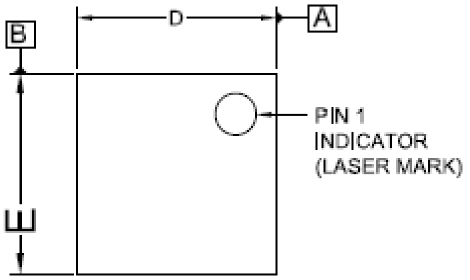
DFN2X2-6L 2EP PACKAGE INFORMATION



BOTTOM VIEW



SIDE VIEW



TOP VIEW

Symbol	Dimensions In Millimeters		
	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	6.00		
aaa	0.08		
bbb	0.10		