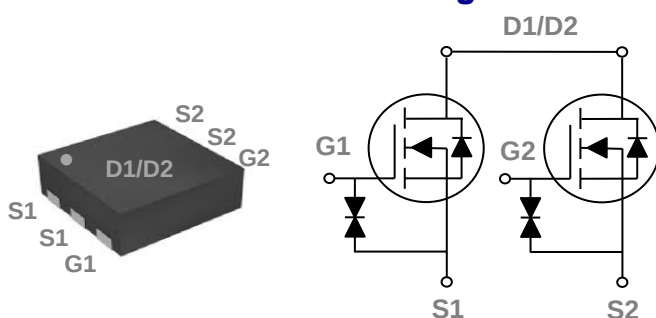


General Description

These dual 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.

DFN2X2-6L Dual 1EP Pin Configuration



BVDSS	RDS(ON)	ID
12V	23mΩ	6A

Features

- 12V, 6A, $R_{DS(ON)} = 23m\Omega$ @ $V_{GS} = 4.5V$
- Fast switching
- Green Device Available
- G-S ESD Protection Diode Embedded

Applications

- Notebook
- Load Switch
- Networking
- Hand-held Instruments

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	12	V
V_{GS}	Gate-Source Voltage	± 8	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	6	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	3.8	A
I_{DM}	Drain Current – Pulsed ¹	36	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.25	W
	Power Dissipation – Derate above 25°C	0.01	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	100	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise) noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	12	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=12V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=10V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 8V$, $V_{DS}=0V$	---	---	± 10	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=3A$	15	19	23	$m\Omega$
		$V_{GS}=4.0V$, $I_D=3A$	16	21	25	$m\Omega$
		$V_{GS}=3.8V$, $I_D=2A$	17	22	27	$m\Omega$
		$V_{GS}=3.1V$, $I_D=2A$	18	24	30	$m\Omega$
		$V_{GS}=2.5V$, $I_D=2A$	19	26	34	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.3	0.6	1	V
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=1A$	---	3.4	---	S

Dynamic and switching Characteristics

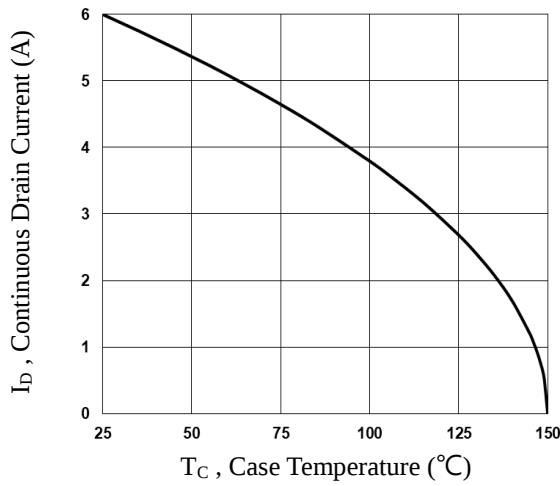
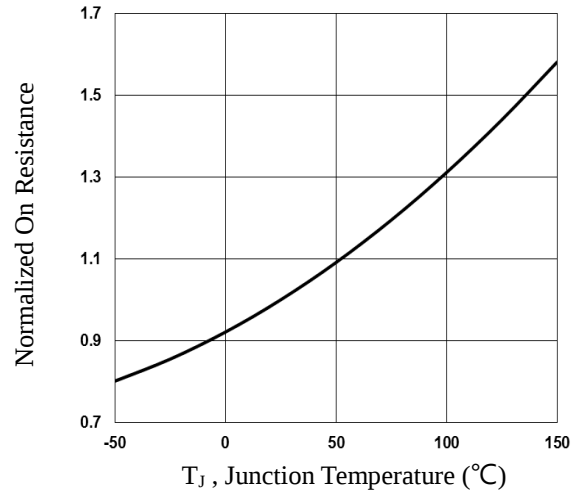
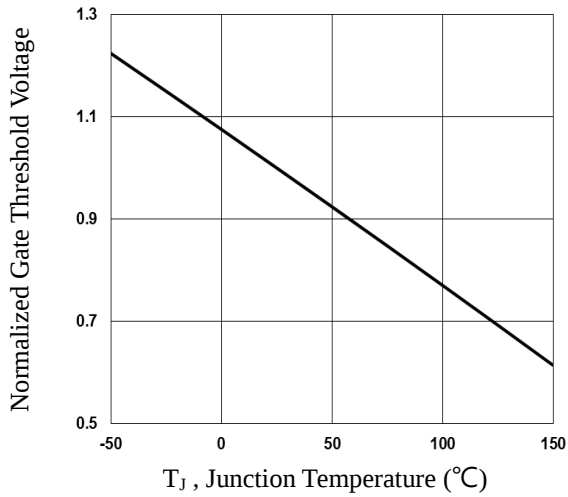
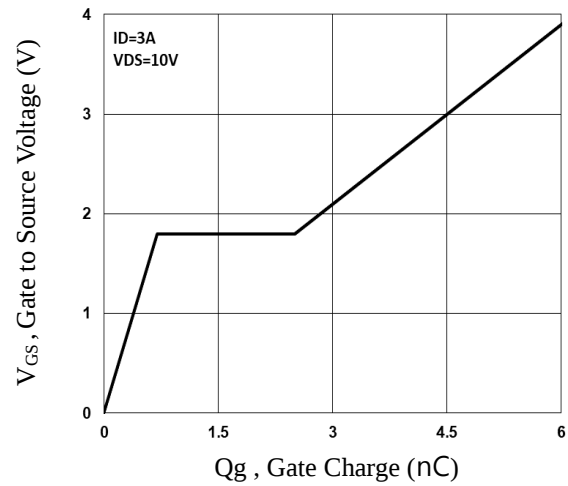
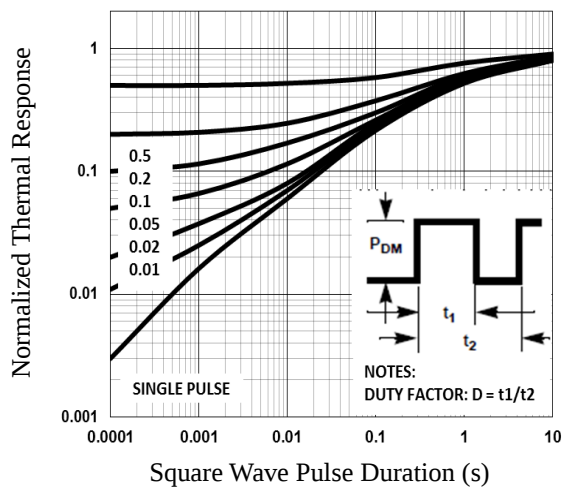
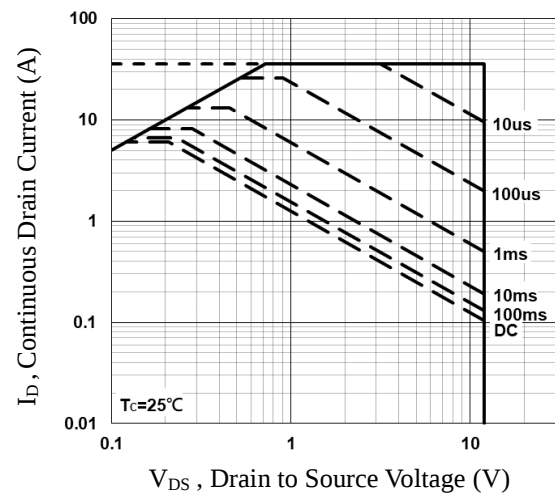
Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=3A$	---	7	---	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.7	---	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	1.8	---	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_G=25\Omega$ $I_D=1A$	---	2.9	---	ns
T_r	Rise Time ^{2, 3}		---	8.4	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	19.2	---	
T_f	Fall Time ^{2, 3}		---	5.6	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	370	---	pF
C_{oss}	Output Capacitance		---	60	---	
C_{rss}	Reverse Transfer Capacitance		---	48	---	

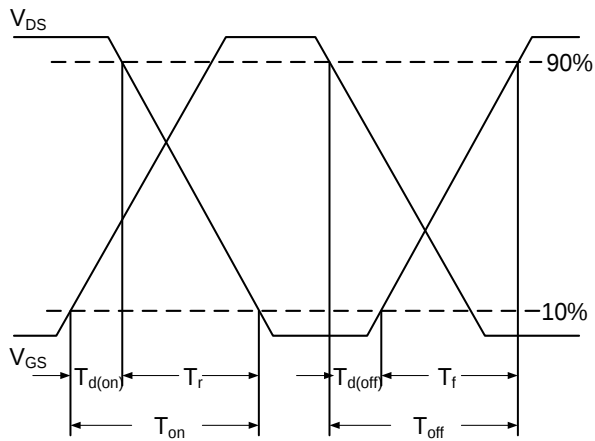
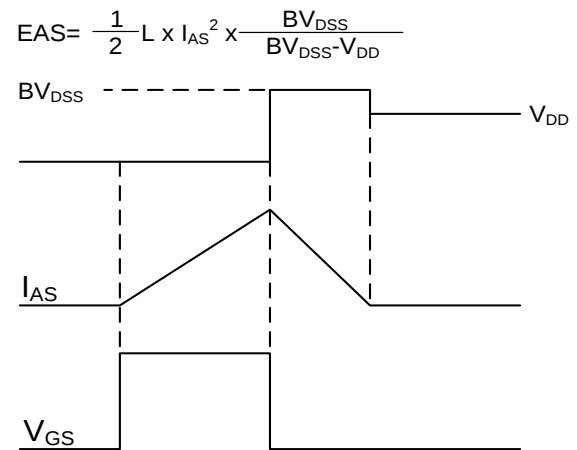
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	6	A
I_{SM}	Pulsed Source Current		---	---	12	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=1A$, $T_J=25^{\circ}\text{C}$	---	---	1	V

Note :

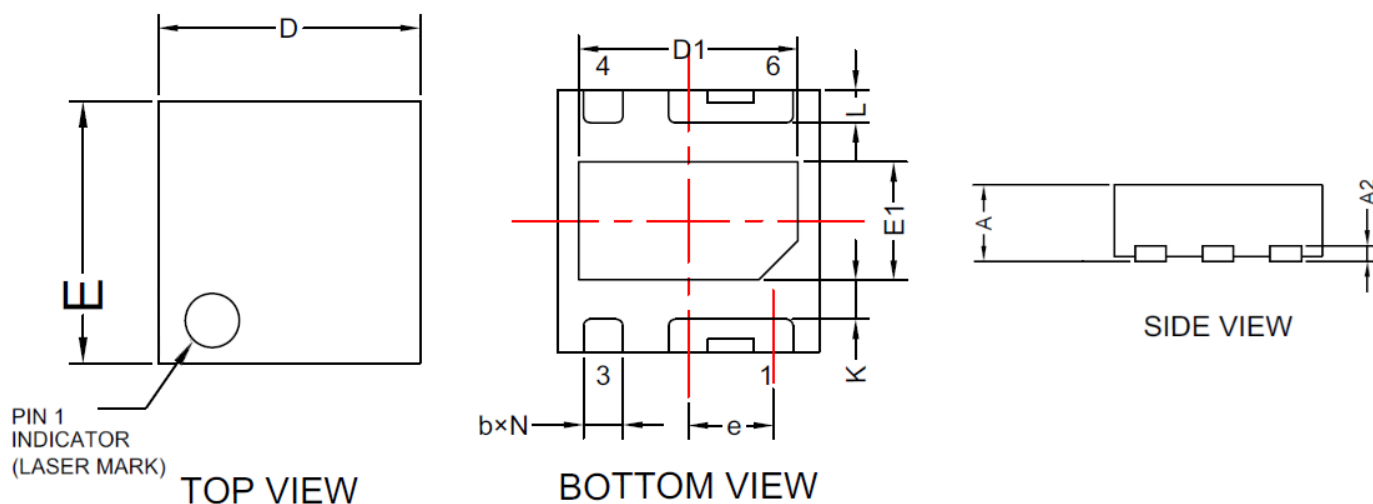
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.


Fig.1 Continuous Drain Current vs. T_C

Fig.2 Normalized $R_{DS(on)}$ 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 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

DFN2X2-6L Dual 1EP PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.600	0.500	0.024	0.019
A2	0.150REF		0.006REF	
b	0.350	0.250	0.014	0.010
D	2.050	1.950	0.081	0.076
D1	1.730	1.630	0.068	0.064
E	2.050	1.950	0.081	0.076
E1	0.950	0.850	0.037	0.033
e	0.650BSC		0.026BSC	
K	---	0.200	---	0.008
L	0.350	0.250	0.014	0.010
N	6pin		6pin	