

General Description

These N+P dual 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	RDS(on)	ID
20V	40mΩ	5.2A

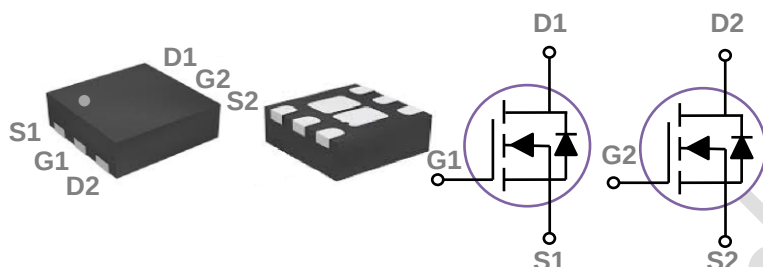
Features

- Fast switching
- Green Device Available
- Suit for 1.8V Gate Drive Applications

Applications

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

DFN2X2 Dual 2EP Pin Configuration



Absolute Maximum Ratings $T_c=25^\circ\text{C}$ 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 ($T_c=25^\circ\text{C}$)	5.2	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	3.3	A
I_{DM}	Drain Current – Pulsed ¹	20.8	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.78	W
	Power Dissipation – Derate above 25°C	0.02	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 ($T_J=25^\circ\text{C}$, unless otherwise) noted)
Off Characteristics

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

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=3A$	---	30	40	$m\Omega$
		$V_{GS}=2.5V$, $I_D=2A$	---	42	55	$m\Omega$
		$V_{GS}=1.8V$, $I_D=1.5A$		55	80	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.3	0.6	1	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2	---	$mV/^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS}=10V$, $I_D=2A$	---	4.4	---	S

Dynamic and switching Characteristics

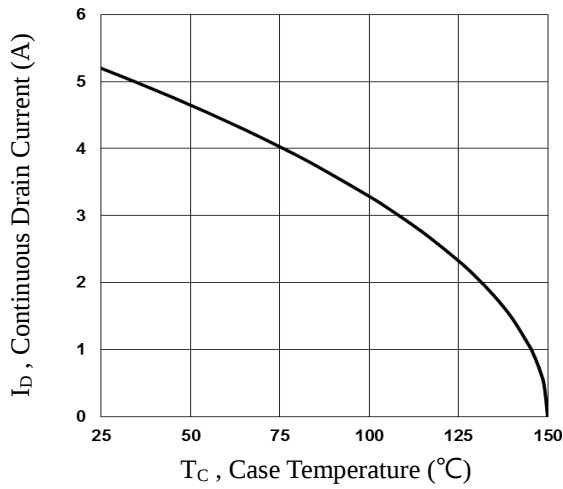
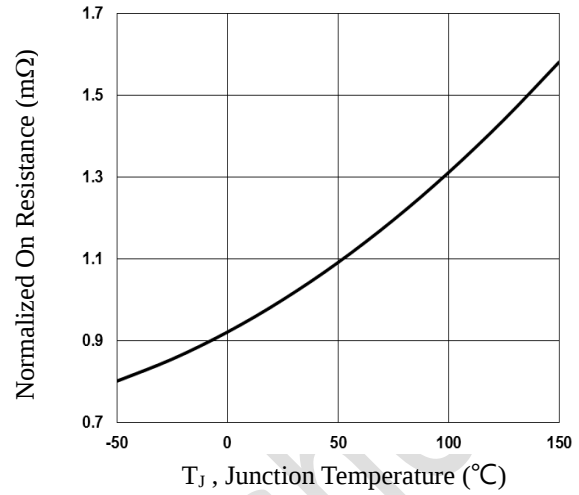
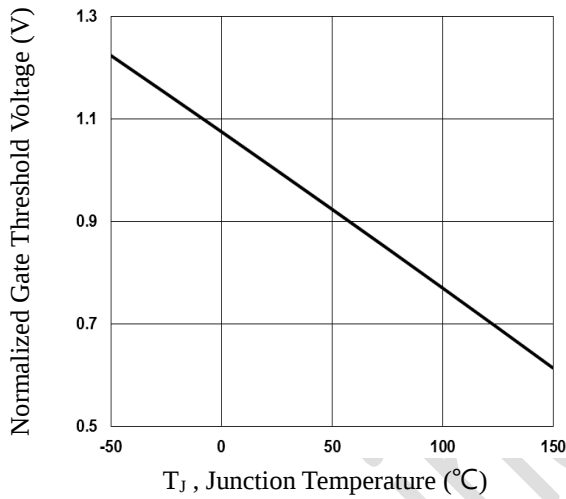
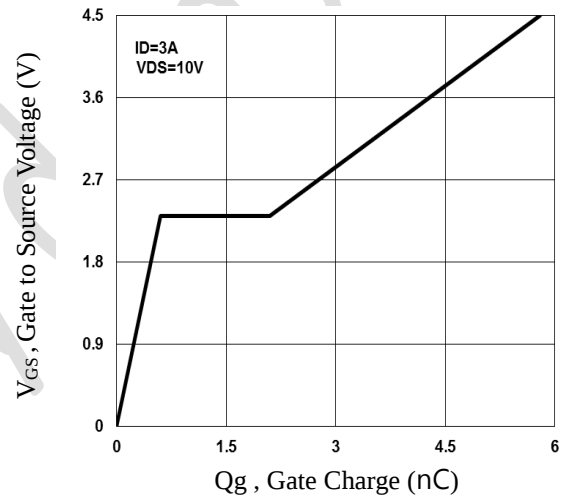
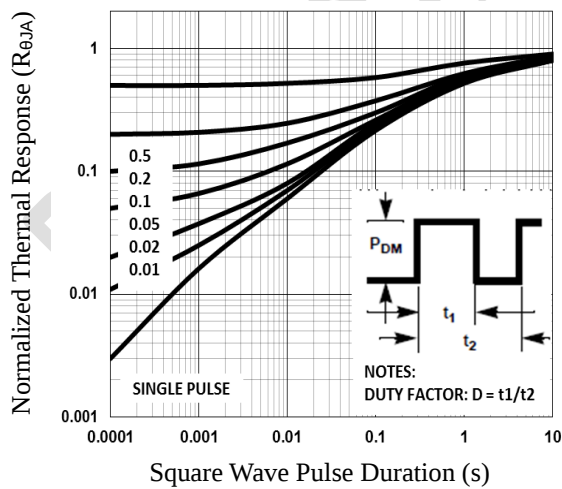
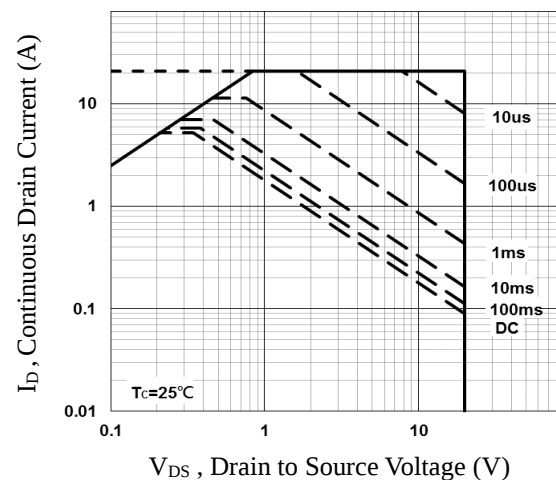
Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=3A$	---	5.8	10	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.6	1.5	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	1.5	3	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_G=25\Omega$ $I_D=1A$	---	2.9	6	ns
T_r	Rise Time ^{2, 3}		---	8.4	16	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	19.2	38	
T_f	Fall Time ^{2, 3}		---	5.6	12	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $F=1MHz$	---	315	600	pF
C_{oss}	Output Capacitance		---	50	80	
C_{rss}	Reverse Transfer Capacitance		---	40	60	

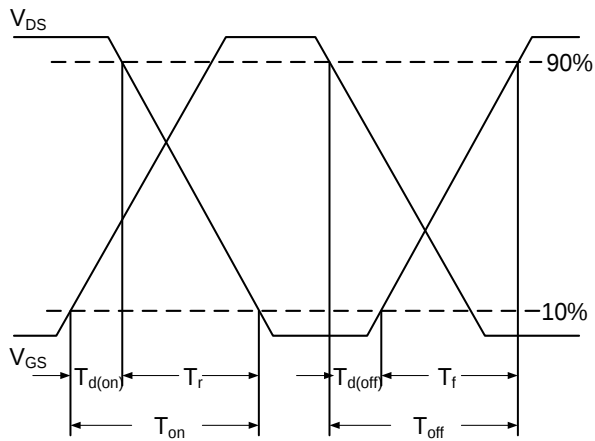
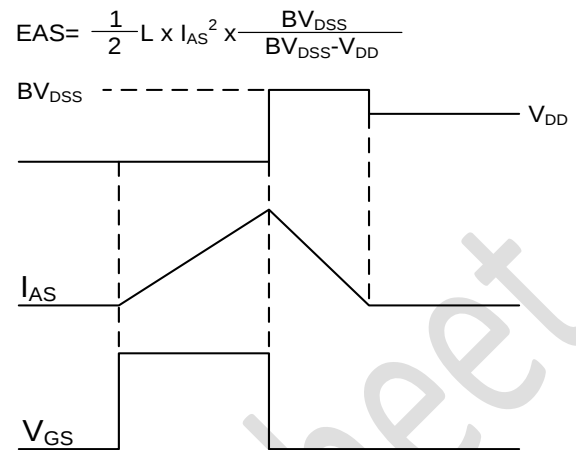
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	3.8	A
I_{SM}	Pulsed Source Current		---	---	7.6	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1	V

Note :

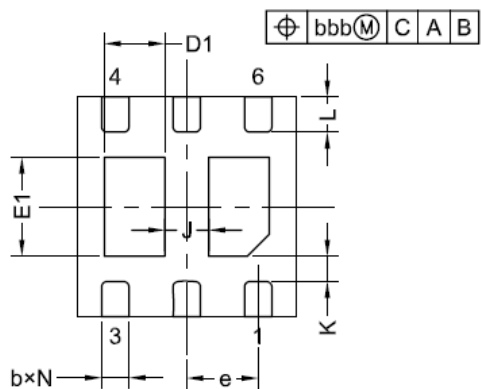
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.


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

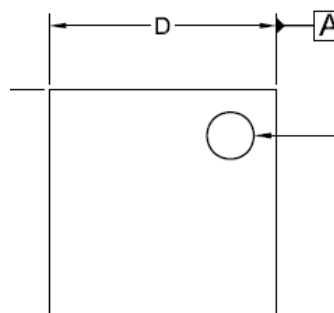

Fig.7 Switching Time Waveform

Fig.8 EAS Waveform

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

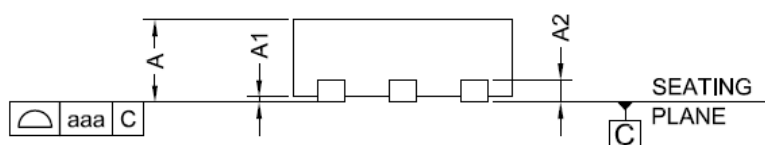
PPAK2X2 Dual 2EP PACKAGE INFORMATION



BOTTOM VIEW


PIN 1
INDICATOR
(LASER MARK)

TOP VIEW



SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.203	
b	0.20	0.25	0.30
D	1.95	2.00	2.05
D1	0.50	0.55	0.60
E	1.95	2.00	2.05
E1	0.85	0.90	0.95
e		0.65BSC	
L	0.27	0.32	0.37
J		0.40BSC	
K		0.20MIN	
N		6	
aaa		0.08	
bbb		0.10	