

General Description

These dual N Channel enhancement mode power fieldeffect transistors are using trench DMOS technology.

This advanced technology has been especially tailoredto minimize on-state resistance, provide superior switching performance, and withstand high energypulse in the avalanche and commutation mode. Thesedevices are well suited for high efficiency fast switchingapplications.

Features

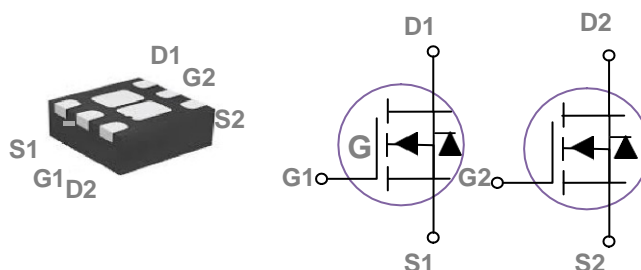
- Fast switching
- Green Device Available
- Suit for 1.8V Gate Drive Applications
- Marking : WA

Applications

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

BVDSS	RDSON	ID
20V	22mΩ	6.5A

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	± 12	V
I_D	Drain Current - Continuous ($T_c=25^{\circ}\text{C}$)	6.5	A
	Drain Current - Continuous ($T_c=100^{\circ}\text{C}$)	4.3	A
I_{DM}	Drain Current - Pulsed _r	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	$^{\circ}\text{C}/\text{W}$

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
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	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} =±10V, V _{DS} =0V			±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =3A		22	25	mΩ
		V _{GS} =2.5V, I _D =2A		26	30	mΩ
		V _{GS} =1.8V, I _D =1.5A		40	45	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.3	0.6	1	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	V _{GS(th)} Temperature Coefficient			-2		mV/°C
g _{fs}	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 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	

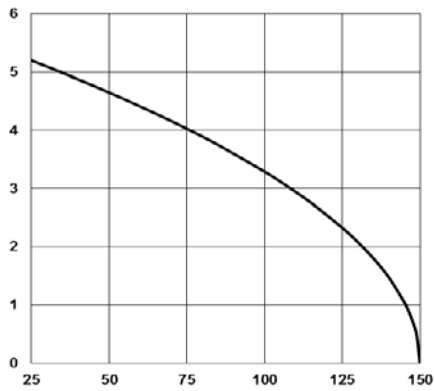
Drain-Source Diode Characteristics and Maximum Ratings

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°C			1	V

Note :

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

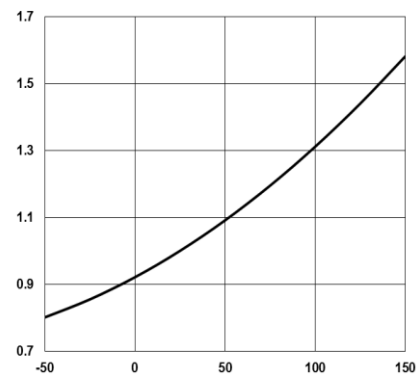
I_D , Continuous Drain Current (A)



T_C , Case Temperature ($^{\circ}C$)

Fig.1 Continuous Drain Current vs. T_C

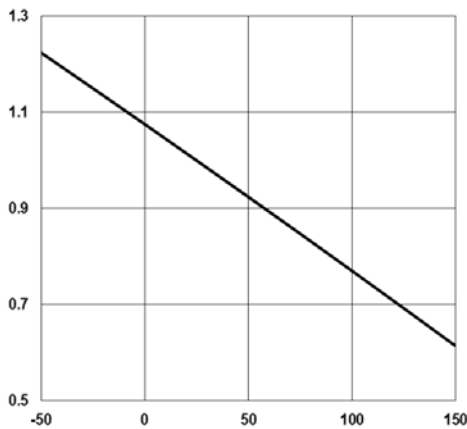
Normalized On Resistance (m)



T_J , Junction Temperature ($^{\circ}C$)

Fig.2 Normalized $R_{DS(on)}$ vs. T_J

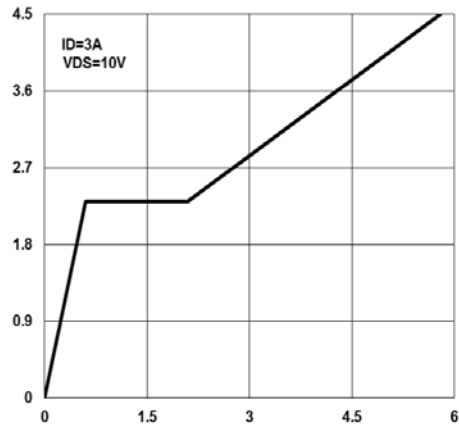
Normalized Gate Threshold Voltage (V)



T_J , Junction Temperature ($^{\circ}C$)

Fig.3 Normalized V_{th} vs. T_J

V_{GS} , Gate to Source Voltage (V)



Q_g , Gate Charge (nC)

Fig.4 Gate Charge Waveform

Normalized Thermal Response ($R_{\theta JA}$)

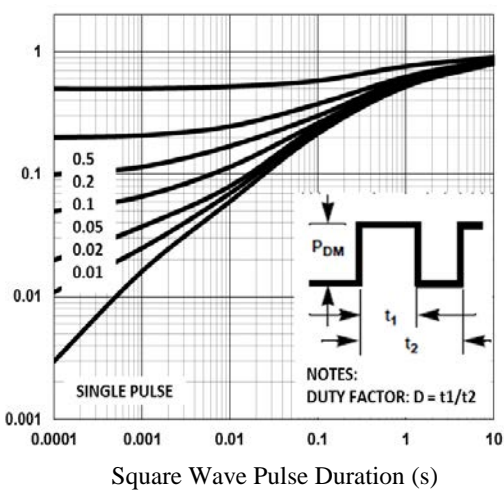


Fig.5 Normalized Transient Impedance

I_D , Continuous Drain Current (A)

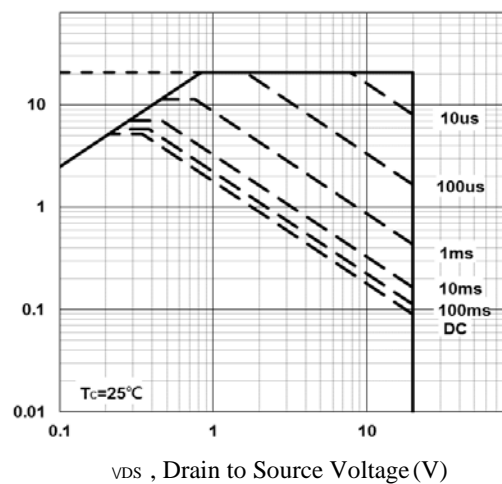


Fig.6 Maximum Safe Operation Area

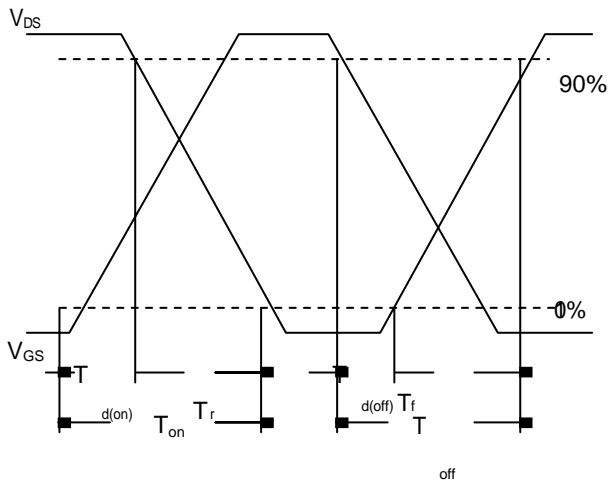


Fig.7 Switching Time Waveform

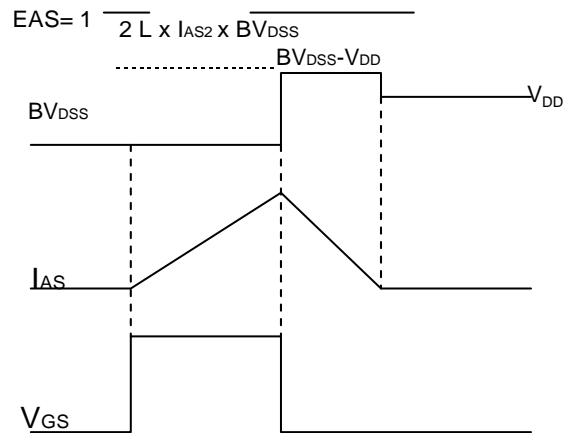
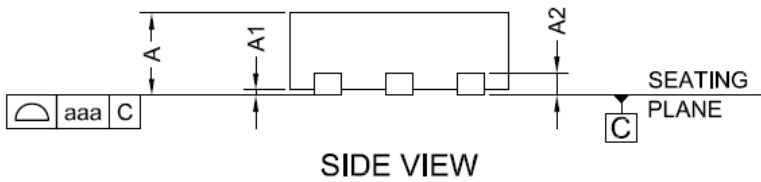
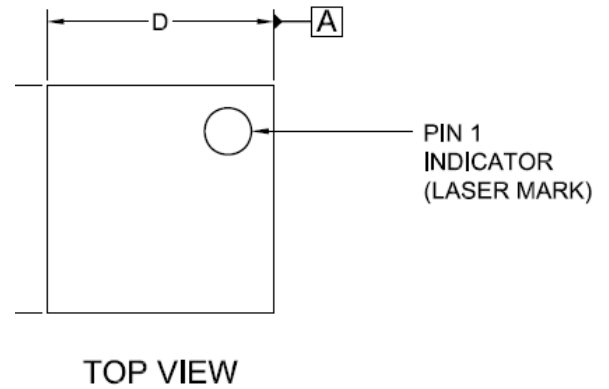
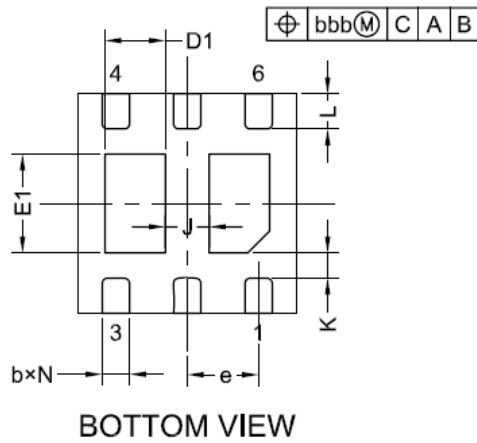


Fig.8 EAS Waveform

PPAK2X2 Dual 2EP PACKAGE INFORMATION



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		