



## PRODUCT DATA SHEET



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Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at [www.jg-semi.cn](http://www.jg-semi.cn). Please email any questions regarding the system integration to [JINGAO\\_questions@jgsemi.com](mailto:JINGAO_questions@jgsemi.com).

## 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.

BVDSS	RDSON	ID
-30V	9.5mΩ	-25A

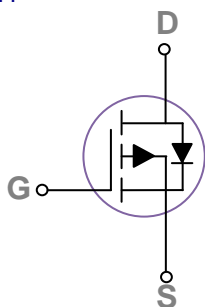
## Features

- -30V, -25A,  $R_{DS(ON)} = 9.5m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

## Applications

- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Application

## PDFN3x3 Pin Configuration



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

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	-25	A
	Drain Current – Continuous ( $T_C=100^\circ\text{C}$ )	-18	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	-75	A
$P_D$	Power Dissipation ( $T_C=25^\circ\text{C}$ )	35	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.18	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 125	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	35	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	5.4	$^\circ\text{C/W}$

## 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	$V_{GS}=0V$ , $I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=-1mA$	---	-0.03	---	$V/^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-30V$ , $V_{GS}=0V$ , $T_J=25^\circ\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-24V$ , $V_{GS}=0V$ , $T_J=125^\circ\text{C}$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V$ , $V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V$ , $I_D=-12A$	---	9.5	13	$m\Omega$
		$V_{GS}=-4.5V$ , $I_D=-7A$	---	13	18	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=-250\mu A$	-1.0	-1.5	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS}=-10V$ , $I_D=-8A$	---	10.5	---	S

### Dynamic and switching Characteristics

$Q_g$	Total Gate Charge <sup>2, 3</sup>	$V_{DS}=-15V$ , $V_{GS}=-4.5V$ , $I_D=-8A$	---	14.6	---	nC
$Q_{gs}$	Gate-Source Charge <sup>2, 3</sup>		---	4.1	---	
$Q_{gd}$	Gate-Drain Charge <sup>2, 3</sup>		---	6.3	---	
$T_{d(on)}$	Turn-On Delay Time <sup>2, 3</sup>	$V_{DD}=-15V$ , $V_{GS}=-10V$ , $R_G=6\Omega$ $I_D=-1A$	---	9	---	ns
$T_r$	Rise Time <sup>2, 3</sup>		---	21.8	---	
$T_{d(off)}$	Turn-Off Delay Time <sup>2, 3</sup>		---	59.8	---	
$T_f$	Fall Time <sup>2, 3</sup>		---	14.4	---	
$C_{iss}$	Input Capacitance	$V_{DS}=-15V$ , $V_{GS}=0V$ , $F=1MHz$	---	1730	---	pF
$C_{oss}$	Output Capacitance		---	230	---	
$C_{rss}$	Reverse Transfer Capacitance		---	200	---	

### 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	---	---	-25	A
$I_{SM}$	Pulsed Source Current		---	---	-50	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V$ , $I_S=-1A$ , $T_J=25^\circ\text{C}$	---	---	-1.2	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.

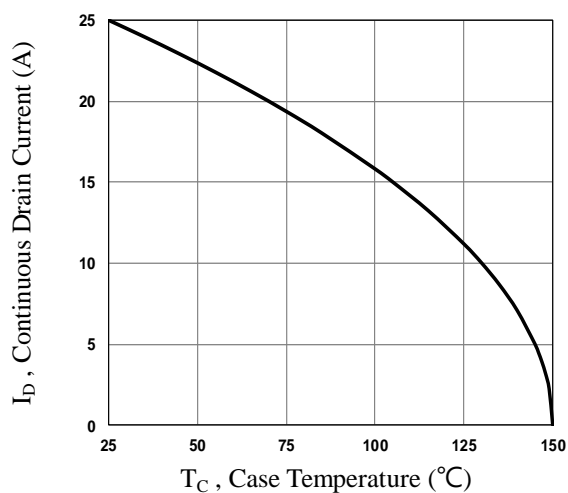


Fig.1 Continuous Drain Current vs.  $T_C$

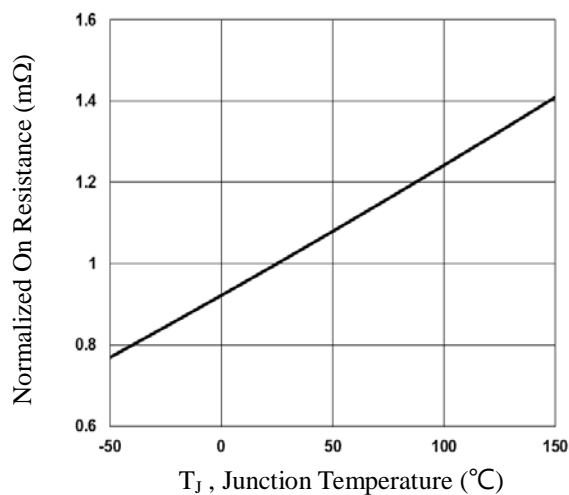


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$

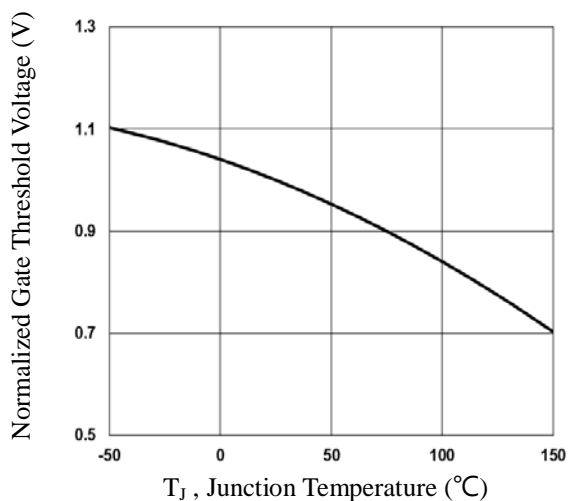


Fig.3 Normalized  $V_{th}$  vs.  $T_J$

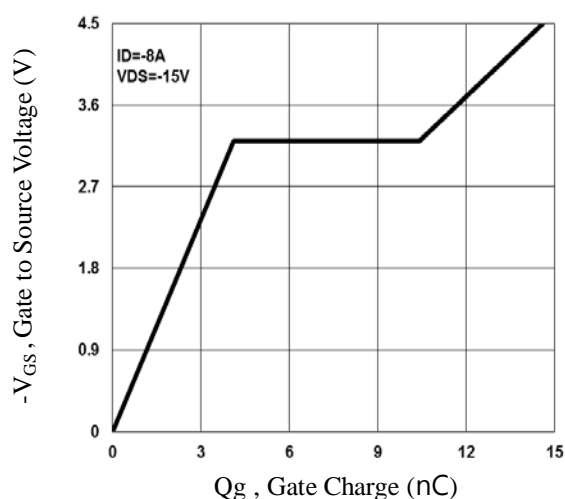


Fig.4 Gate Charge Waveform

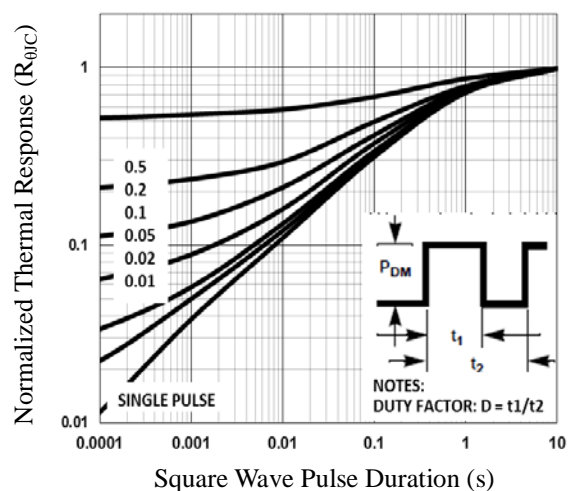


Fig.5 Normalized Transient Impedance

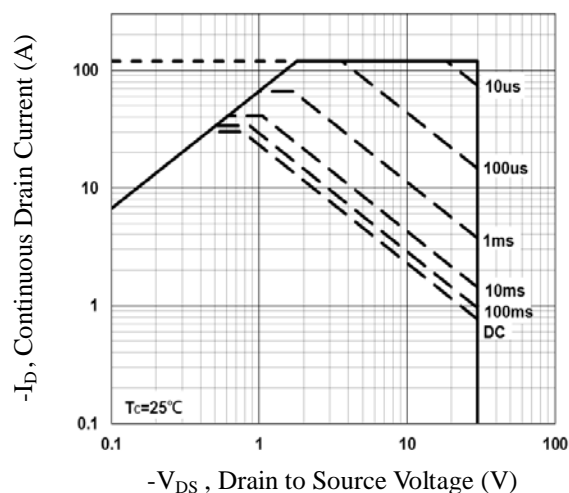
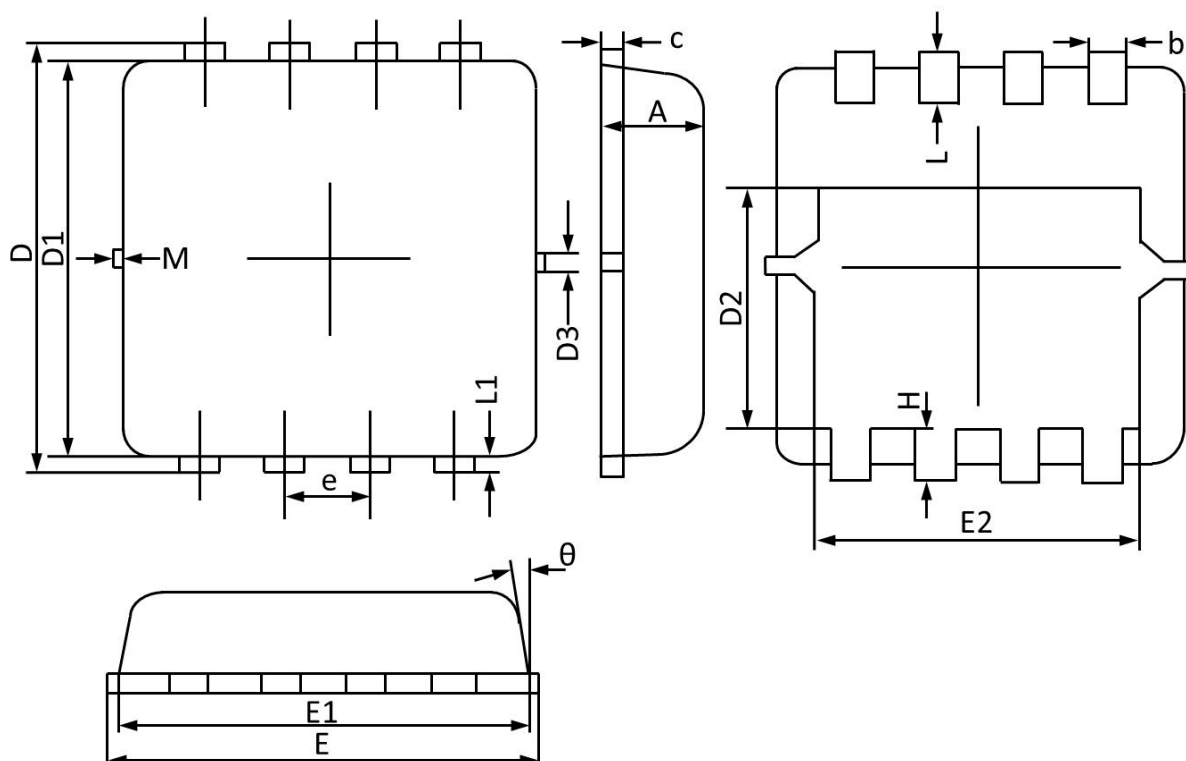


Fig.6 Maximum Safe Operation Area

## PDFN3x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

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