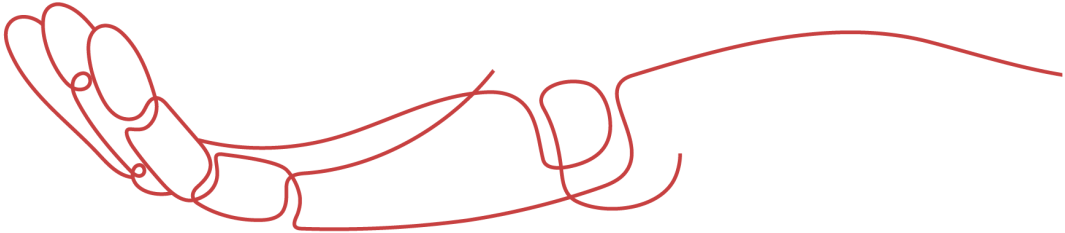




PRODUCT DATA SHEET



To learn more about JGSEMI, please visit our website at



Datasheet



Resources



Samples

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. Please email any questions regarding the system integration to JINGAO_questions@jgsemi.com.

General Description

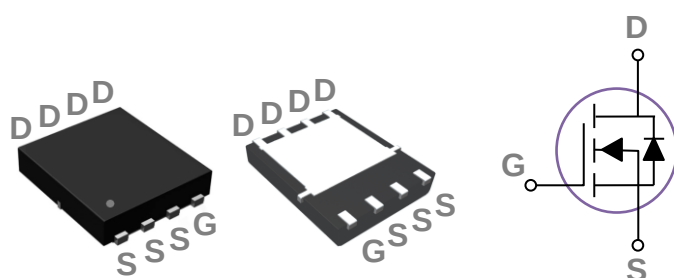
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BVDSS	RDS(ON)	ID
40V	2.3mΩ	60A

Features

- 40V, 60A, $R_{DS(ON)} = 2.3\text{m}\Omega @ V_{GS} = 10\text{V}$
- Improved dv/dt capability
- Fast switching
- Green Device Available

PDFN5X6 Pin Configuration



Applications

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

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	60	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	45	A
I_{DM}	Drain Current – Pulsed ¹	240	A
EAS	Single Pulse Avalanche Energy ²	95	mJ
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	51	W
	Power Dissipation – Derate above 25°C	0.41	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	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3.44	$^\circ\text{C/W}$

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	$V_{GS}=0V$, $I_D=250\mu A$	40	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.03	---	$V/^{\circ}\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=32V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

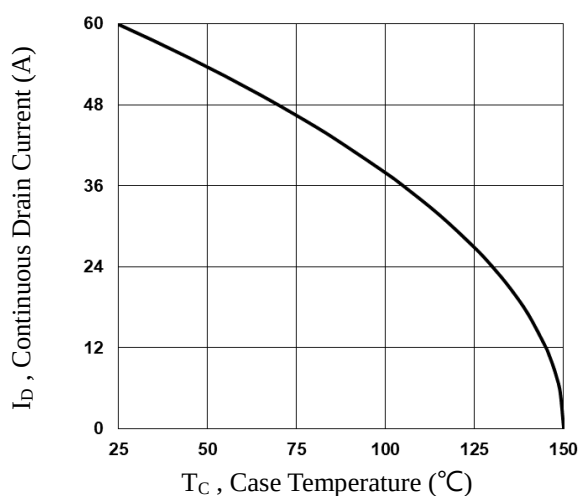
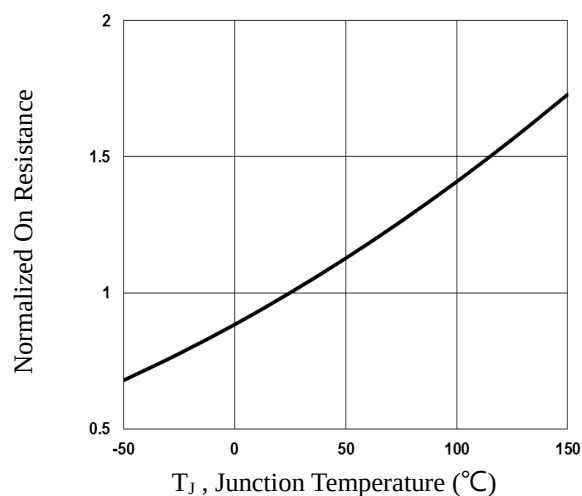
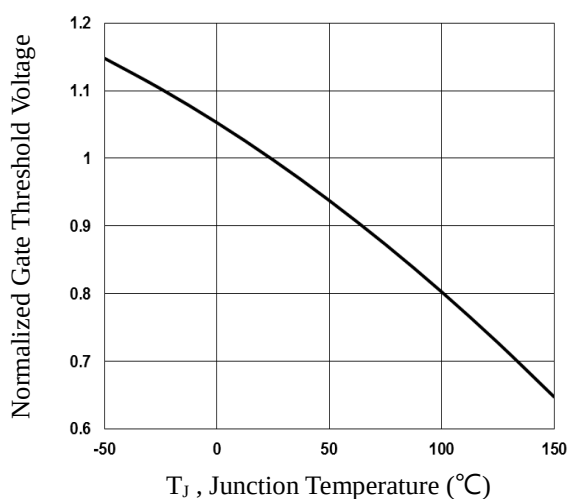
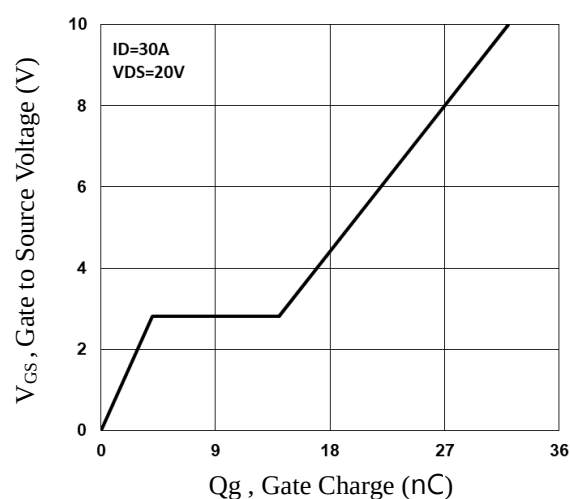
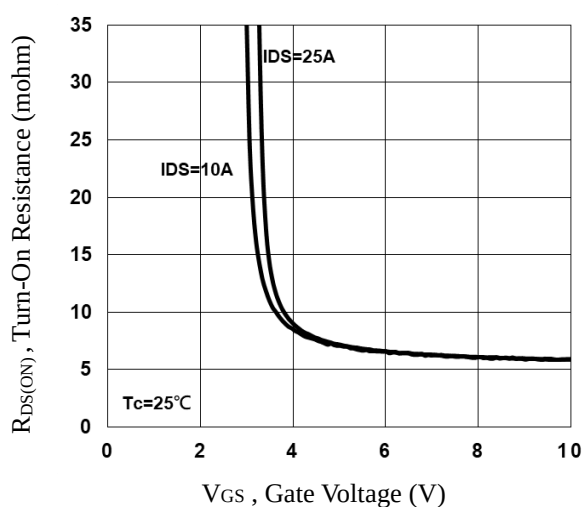
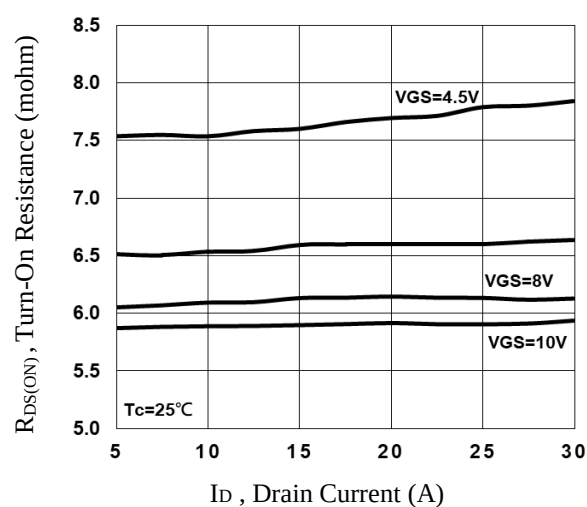
$R_{DS(ON)}$	Static Drain-Source On-Resistance ³	$V_{GS}=10V$, $I_D=10A$	---	2.3	3.0	$m\Omega$
		$V_{GS}=4.5V$, $I_D=5A$	---	3.5	4.5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.0	1.6	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5	---	$mV/^{\circ}\text{C}$
gfs	Forward Transconductance	$V_{DS}=10V$, $I_D=3A$	---	12	---	S

Dynamic Characteristics

Q_g	Total Gate Charge ^{3,4}	$V_{DS}=20V$, $V_{GS}=10V$, $I_D=30A$	---	84	---	nC
Q_{gs}	Gate-Source Charge ^{3,4}		---	16	---	
Q_{gd}	Gate-Drain Charge ^{3,4}		---	10	---	
$T_{d(on)}$	Turn-On Delay Time ^{3,4}	$V_{DD}=20V$, $V_{GS}=10V$, $R_G=6\Omega$ $I_D=30A$	---	16	---	ns
T_r	Rise Time ^{3,4}		---	45	---	
$T_{d(off)}$	Turn-Off Delay Time ^{3,4}		---	92	---	
T_f	Fall Time ^{3,4}		---	50	---	
C_{iss}	Input Capacitance	$V_{DS}=30V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	1400	---	pF
C_{oss}	Output Capacitance		---	300	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1\text{MHz}$	---	1.4	---	Ω

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	60	A
I_{SM}	Pulsed Source Current ³		---	---	120	A
V_{SD}	Diode Forward Voltage ³	$V_{GS}=0V$, $I_S=1A$, $T_J=25^{\circ}\text{C}$	---	---	1.3	V


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 Turn-On Resistance vs. V_{GS}

Fig.6 Turn-On Resistance vs. I_D

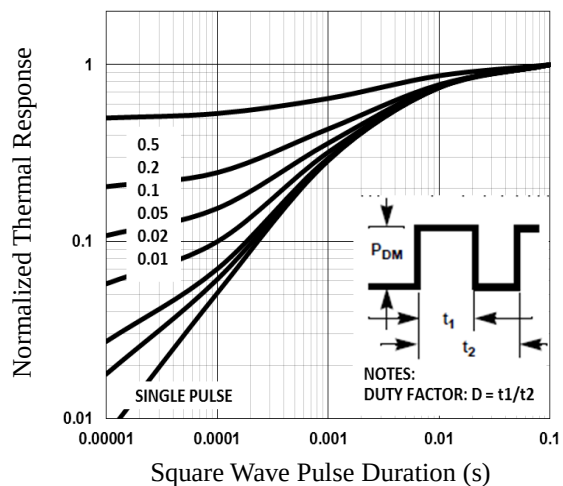


Fig.7 Normalized Transient Impedance

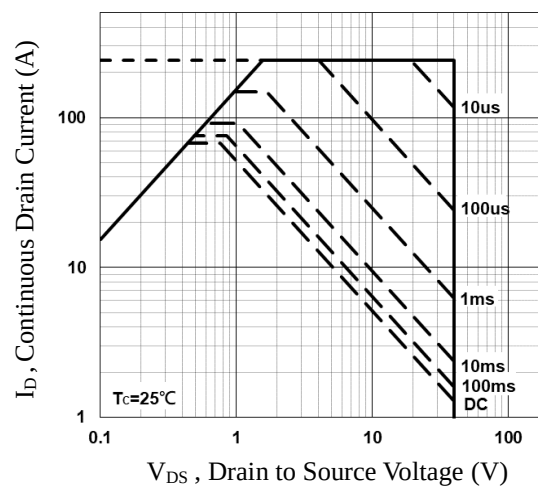
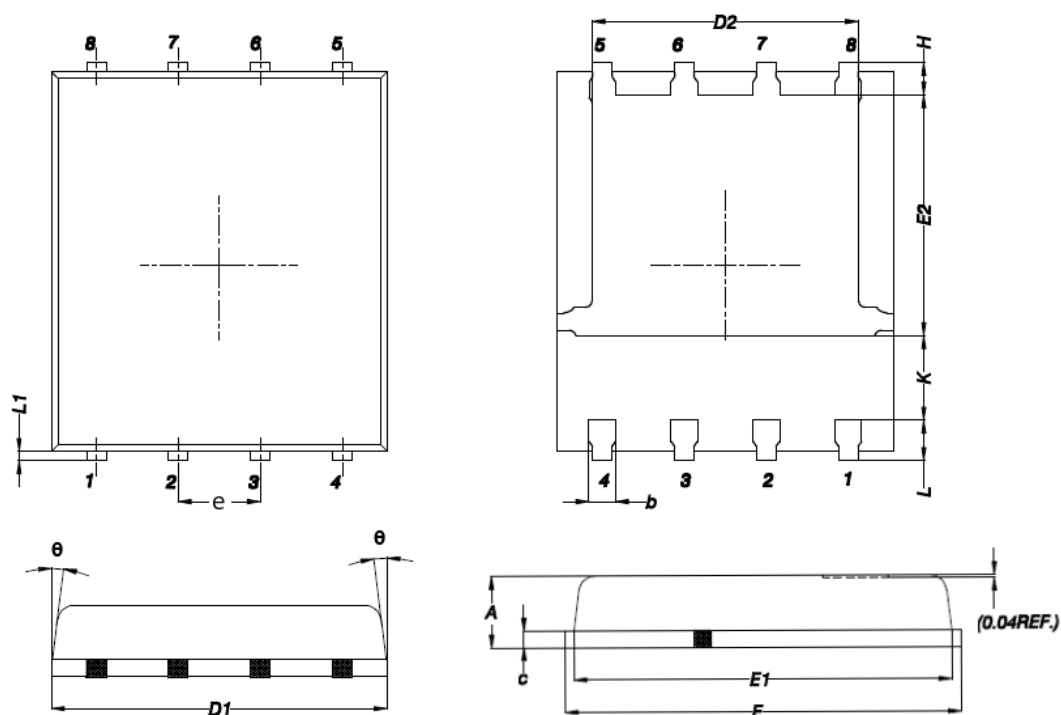


Fig.8 Maximum Safe Operation Area

PDFN5x6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	---	1.100	---	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°

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