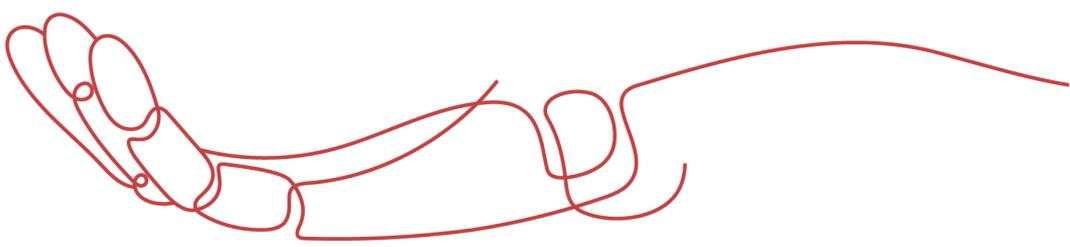


PRODUCT DATA SHEET



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

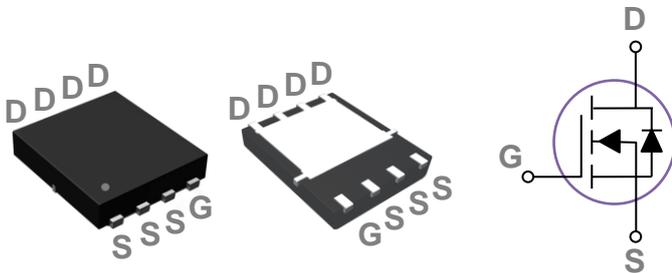
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	RDSON	ID
40V	0.75mΩ	225A

Features

- 40V,225A, $R_{DS(ON)} = 0.75m\Omega$ @VGS = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

PPAK5X6 Pin Configuration



Applications

- Motor Drive
- Power Tools
- LED Lighting
- Quick Charger

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 ($T_C=25^\circ\text{C}$)	225	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	141	A
I_{DM}	Drain Current – Pulsed ¹	900	A
EAS	Single Pulse Avalanche Energy ²	627	mJ
IAS	Single Pulse Avalanche Current ²	56	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	114	W
	Power Dissipation – Derate above 25°C	1.1	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.91	°C/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 =250μA	40	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V, T _J =25°C	---	---	1	μA
		V _{DS} =32V, V _{GS} =0V, T _J =100°C	---	---	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =17A	---	0.75	1	mΩ
		V _{GS} =4.5V, I _D =8A	---	1.05	1.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.2	1.7	2.4	V

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =20V, V _{GS} =10V, I _D =17A	---	77	120	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	7.6	12	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	18	30	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =20V, V _{GS} =10V, R _G =6Ω I _D =17A	---	10	15	ns
T _r	Rise Time ^{3, 4}		---	15	25	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	25	40	
T _f	Fall Time ^{3, 4}		---	30	45	
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, F=1MHz	---	3800	5700	pF
C _{oss}	Output Capacitance		---	1550	2400	
C _{rss}	Reverse Transfer Capacitance		---	60	120	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1	---	Ω

Guaranteed Avalanche Energy

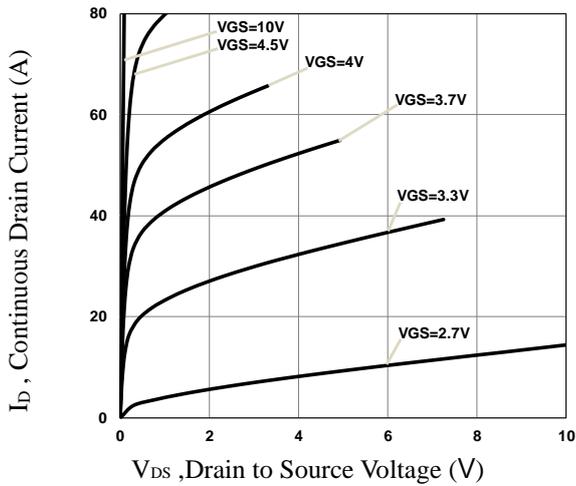
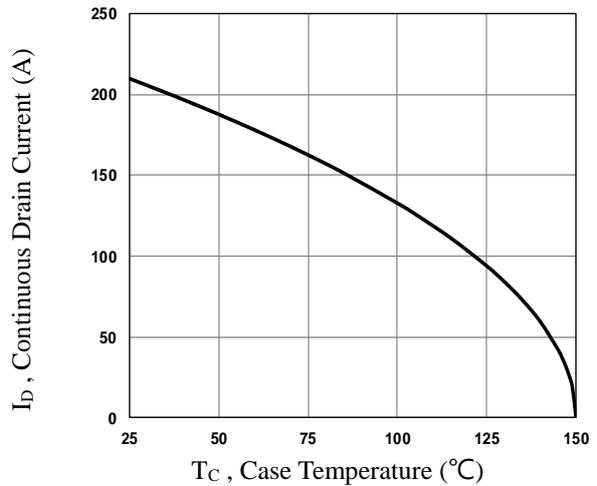
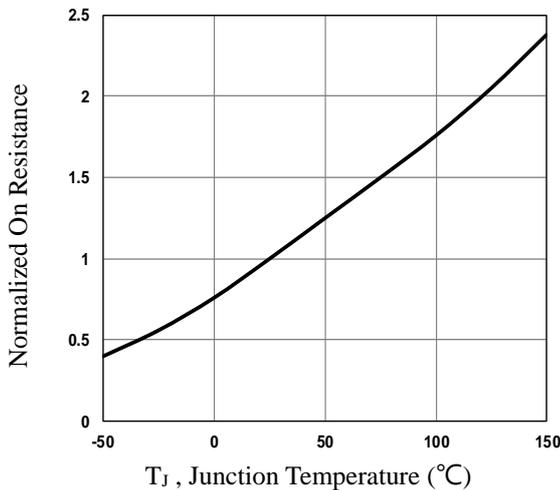
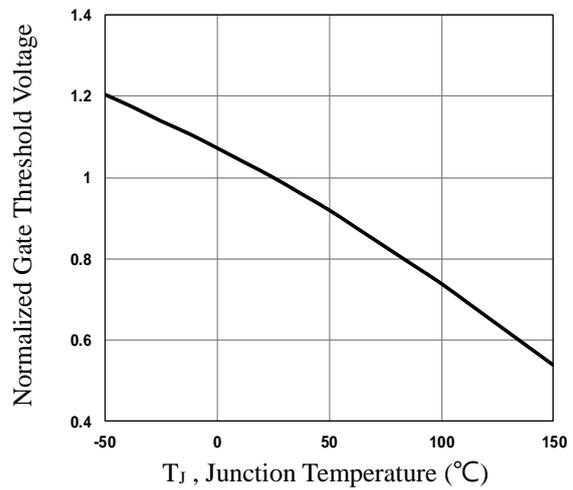
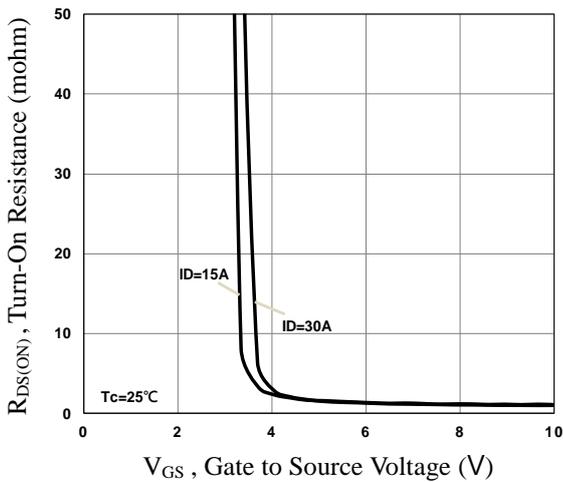
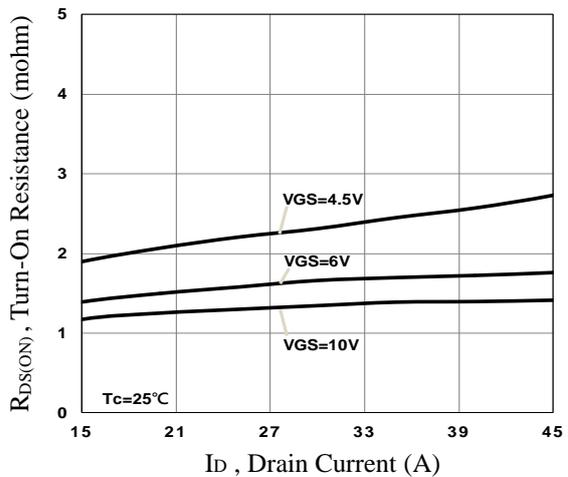
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy	V _{DD} =25V, L=0.1mH, I _{AS} =40A	80	---	---	mJ

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	---	---	225	A
I _{SM}	Pulsed Source Current		---	---	---	---
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
T _{rr}	Reverse Recovery Time	V _R =30V, I _S =10A	---	75	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs T _J =25°C	---	120	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=82A., R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.


Fig.1 Typical Output Characteristics

Fig.2 Continuous Drain Current vs. T_c

Fig.3 Normalized $R_{DS(on)}$ vs. T_j

Fig.4 Normalized V_{th} vs. T_j

Fig.5 Turn-On Resistance vs. V_{GS}

Fig.6 Turn-On Resistance vs. I_d

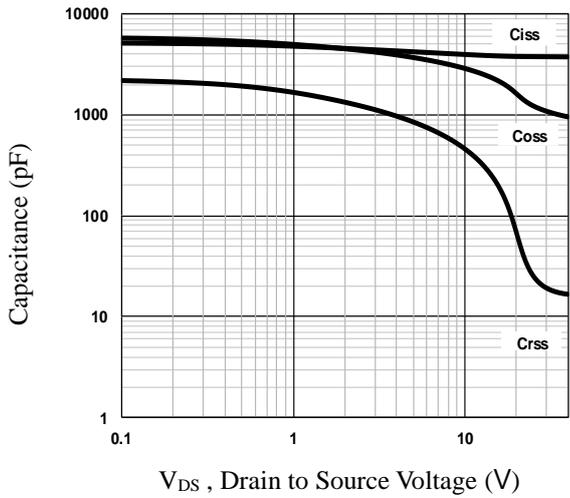


Fig.7 Capacitance Characteristics

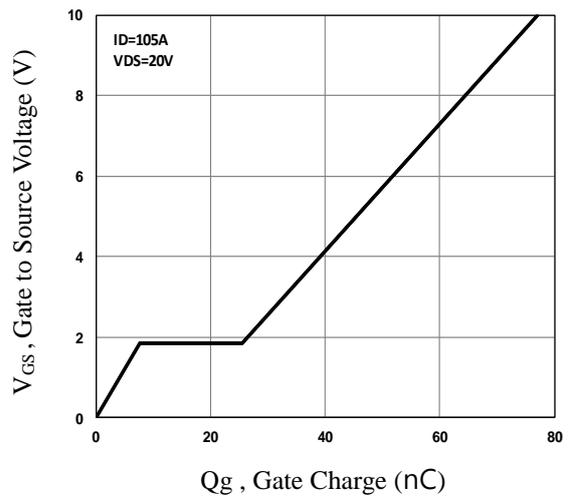


Fig.8 Gate Charge Characteristics

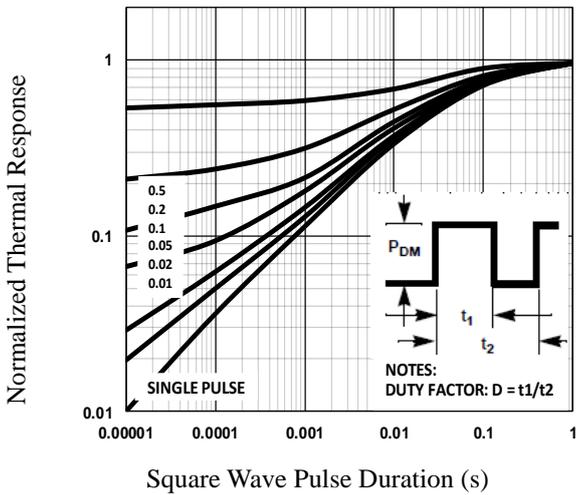


Fig.9 Normalized Transient Impedance

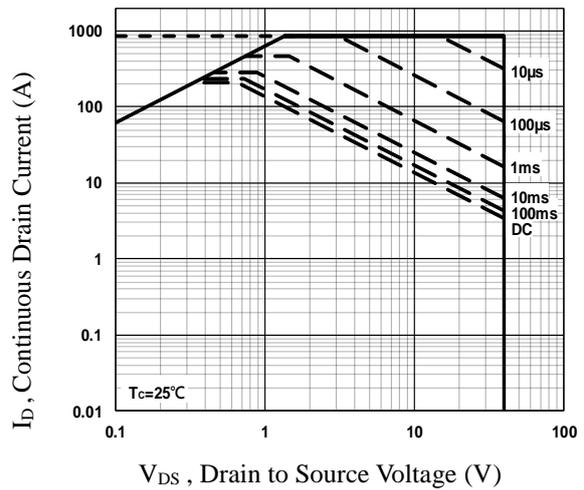


Fig.10 Maximum Safe Operation Area

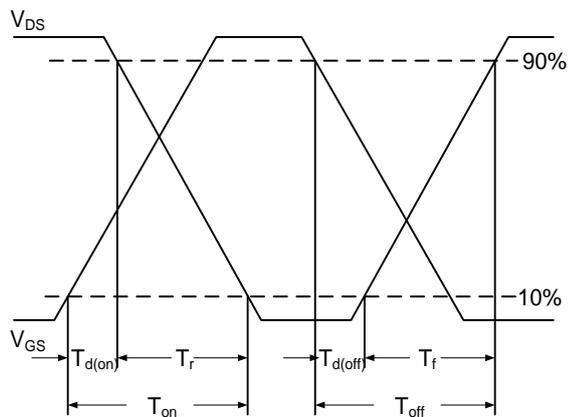


Fig.11 Switching Time Waveform

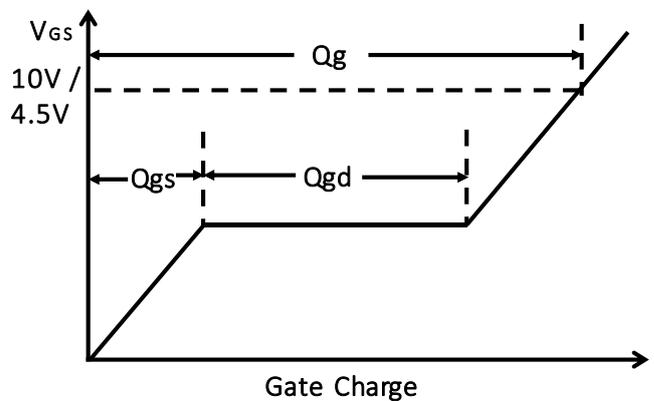
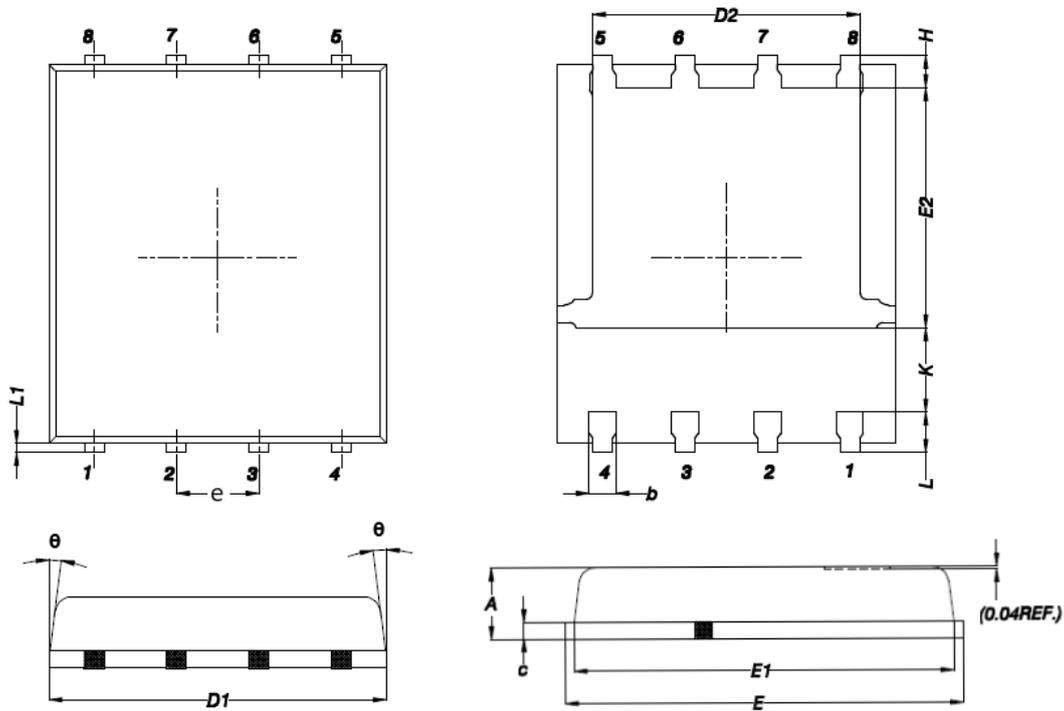
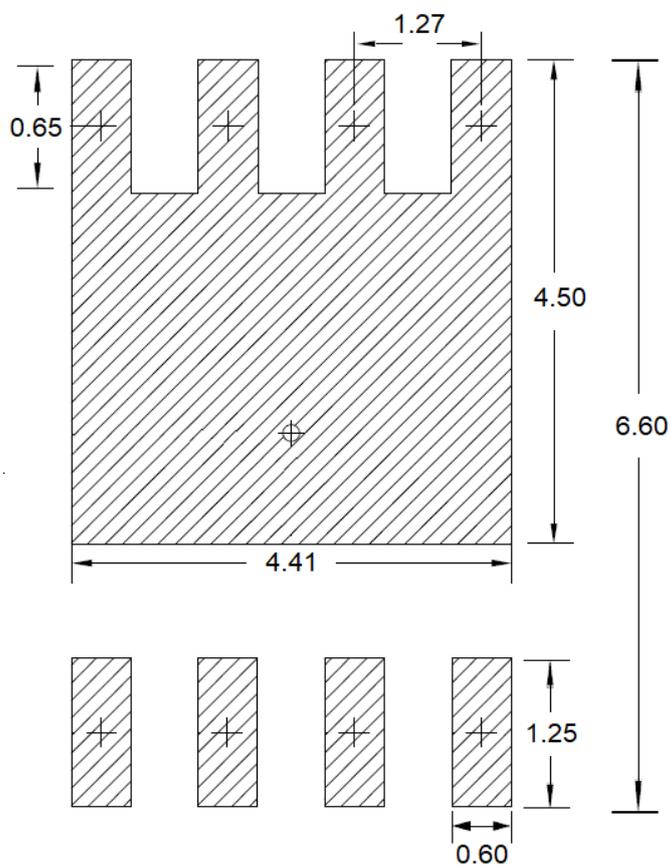


Fig.12 Gate Charge Waveform

PPAK5x6 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°

PPAK5X6 RECOMMENDED LAND PATTERN



unit : mm

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