

A red line-art illustration of a hand, palm up, positioned above the title.

## PRODUCT DATA SHEET

A red line-art illustration of a hand, palm up, positioned below the title.

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**Datasheet**



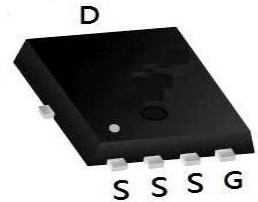
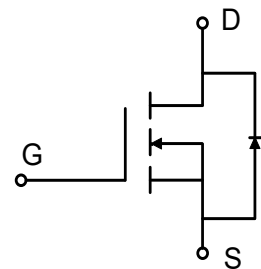
**Resources**



**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](http://www.jg-semi.cn). Please email any questions regarding the system integration to [JINGAO\\_questions@jgsemi.com](mailto:JINGAO_questions@jgsemi.com).

<b>BVDSS</b>	<b>R<sub>DS(ON)</sub></b>	<b>ID</b>
100V	3.6mΩ	120A


**PDFN5060-8L**

**Features**

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low R<sub>DS(ON)</sub>

**Applications**

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1,6</sup>	120	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1,6</sup>	81	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	512	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	486	mJ
I <sub>AS</sub>	Avalanche Current	67	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation <sup>4</sup>	178	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient <sup>1</sup>	---	56	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	---	0.8	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	---	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	3.6	4.4	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	---	---	---	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	3.0	4.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	---	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =100°C	---	---	100	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =20A	---	35	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	1.6	---	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	69	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	24	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	18.5	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, R <sub>G</sub> =3Ω, I <sub>D</sub> =20A	---	18.0	---	ns
T <sub>r</sub>	Rise Time		---	23	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	37	---	
T <sub>f</sub>	Fall Time		---	15.7	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	---	4102	---	pF
C <sub>oss</sub>	Output Capacitance		---	592	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	19.8	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	120	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V

Note :

F The data is tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

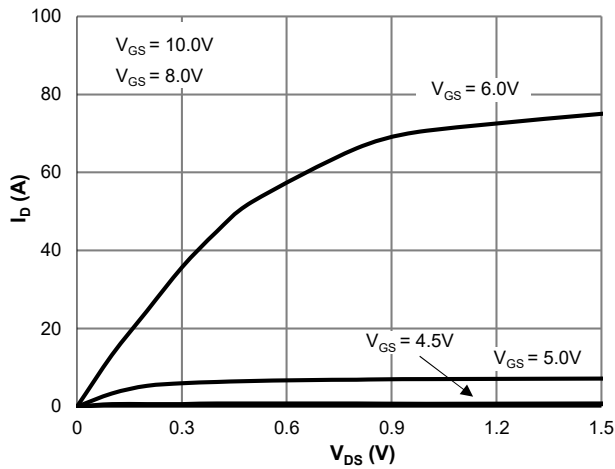
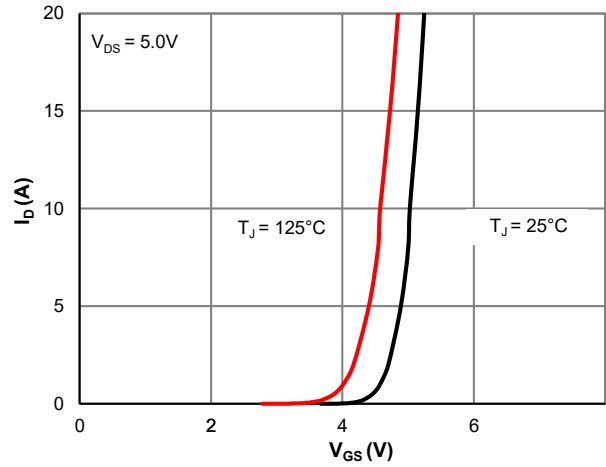
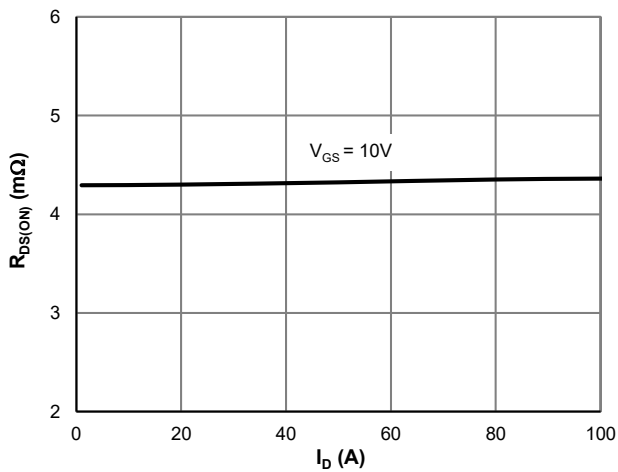
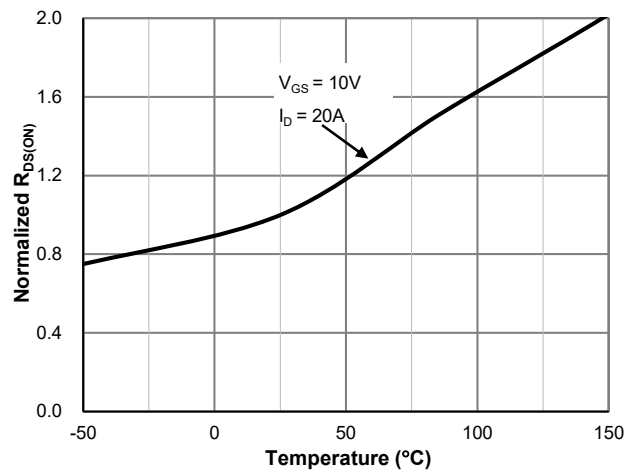
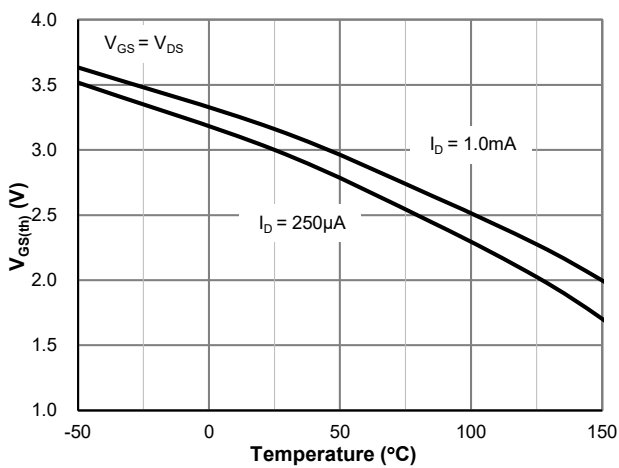
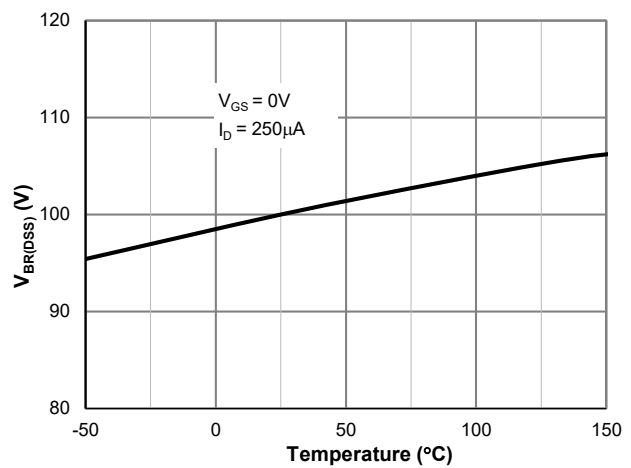
G The data is tested by pulsed pulse width ≤ 300us, duty cycle ≤ 2%

H The EAS data shows Max. rating. The test condition is T<sub>J</sub> = 25°C, L = 3.0mH, I<sub>AS</sub> = 18A, V<sub>GS</sub> = 10V, V<sub>DD</sub> = 50V; 100% test at L = 0.1mH, I<sub>AS</sub> = 67A.

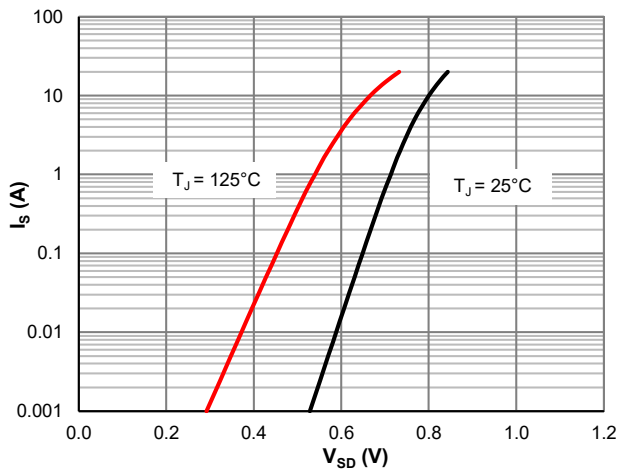
I The power dissipation is limited by 150°C junction temperature

í The data is theoretically the same as I<sub>DM</sub> and I<sub>DMA</sub>. In real applications it should be limited by total power

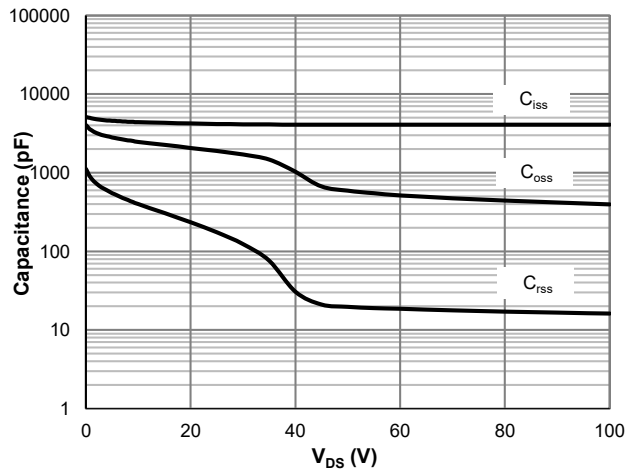
dissipation.

**Typical Electrical & Thermal Characteristics**

**Figure 1: Saturation Characteristics**

**Figure 2: Transfer Characteristics**

**Figure 3:  $R_{DS(ON)}$  vs. Drain Current**

**Figure 4:  $R_{DS(ON)}$  vs. Junction Temperature**

**Figure 5:  $V_{GS(th)}$  vs. Junction Temperature**

**Figure 6:  $V_{BR(DSS)}$  vs. Junction Temperature**

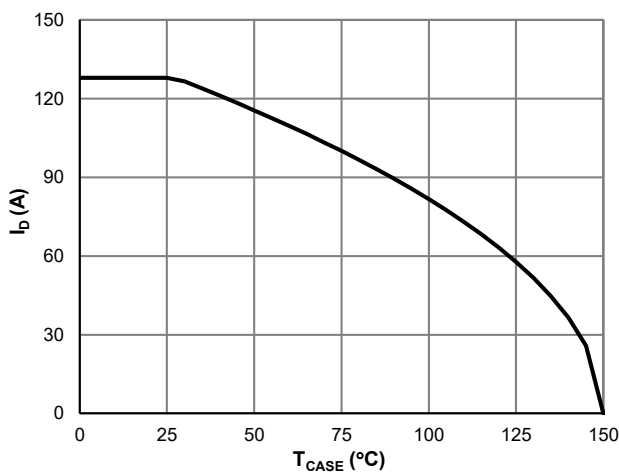
**Typical Electrical & Thermal Characteristics**



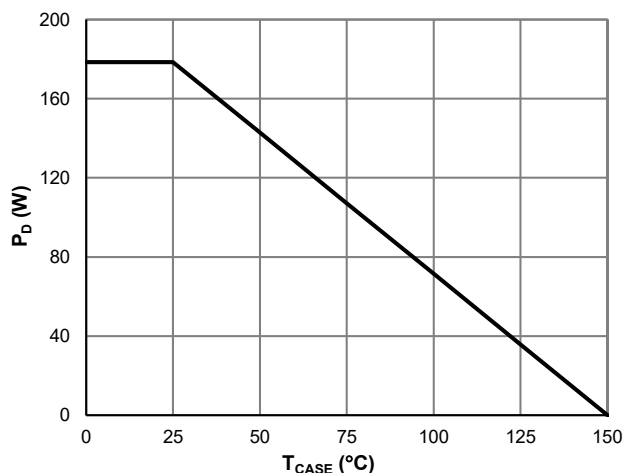
**Figure 7: Body-Diode Characteristics**



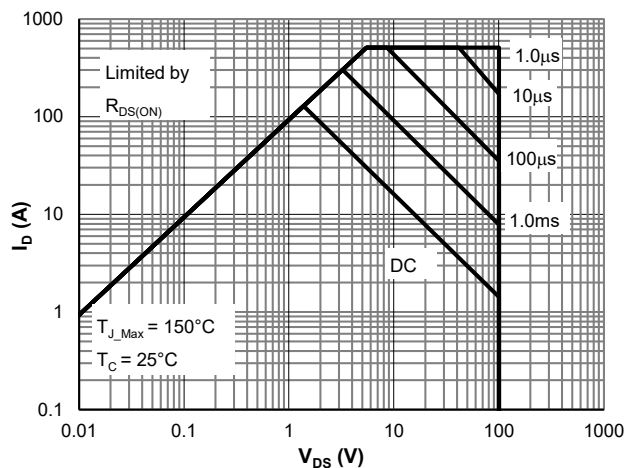
**Figure 8: Capacitance Characteristics**



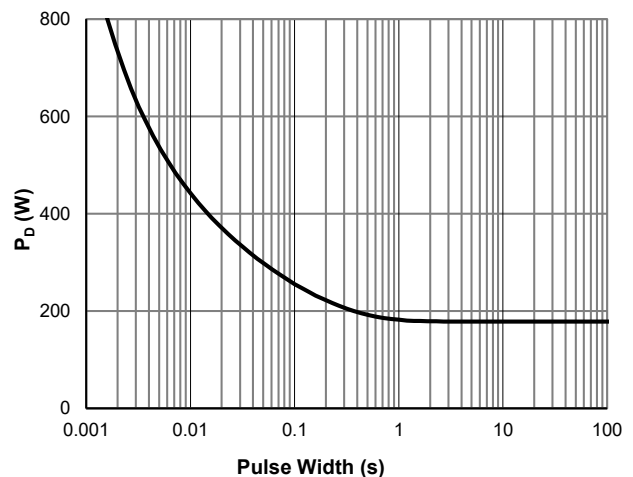
**Figure 9: Current De-rating**



**Figure 10: Power De-rating**

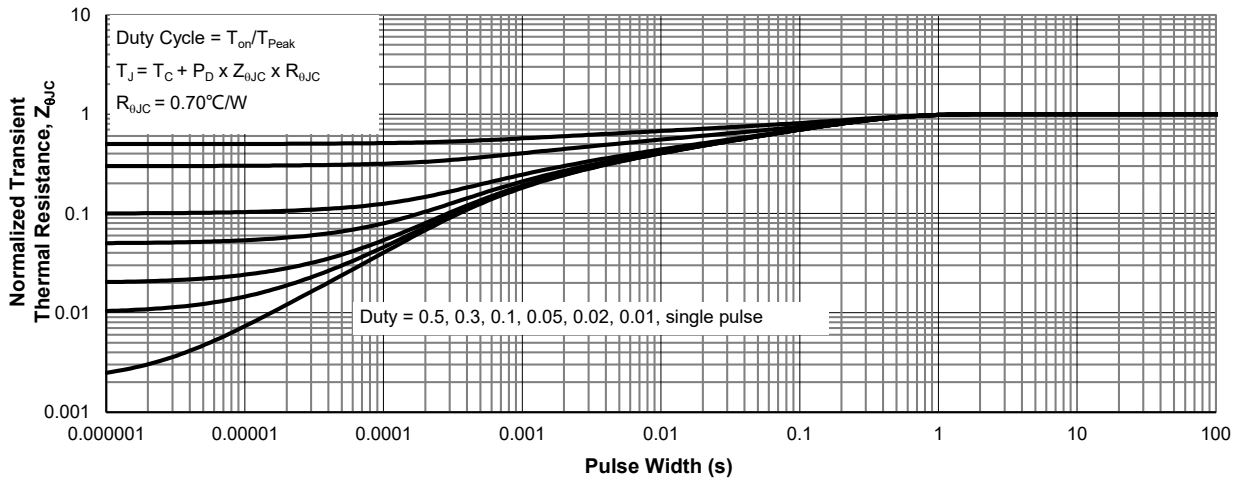


**Figure 11: Maximum Safe Operating Area**

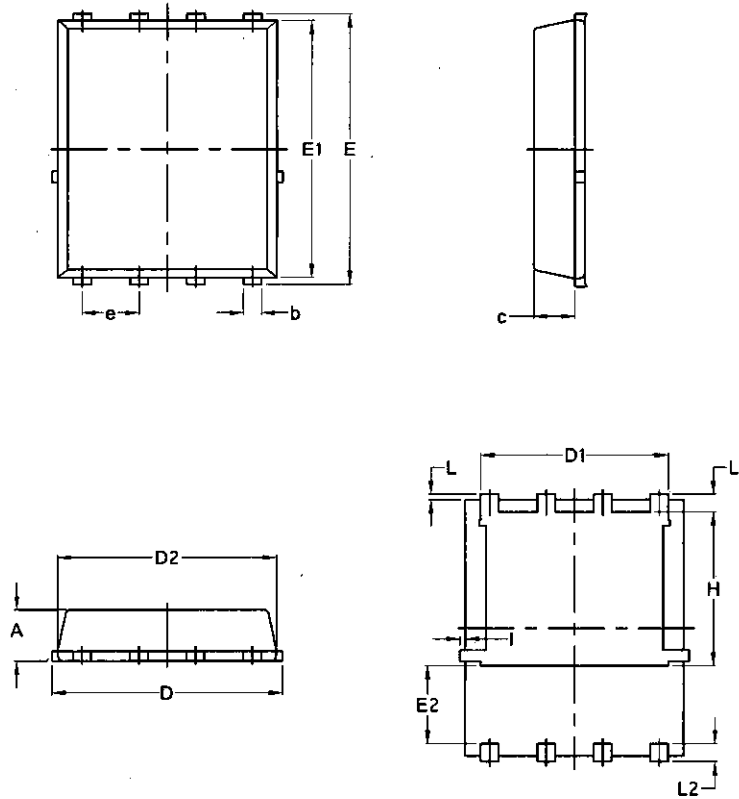


**Figure 12: Single Pulse Power Rating, Junction-to-Case**

**Typical Electrical & Thermal Characteristics**



**Figure 13: Normalized Maximum Transient Thermal Impedance**

**Package Mechanical Data-PDFN5060-8L-JQ Single**


Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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