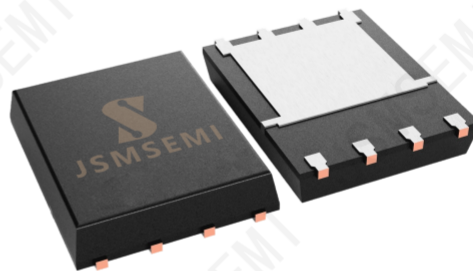


Product Summary

- V_{DS} 60V
- I_D 100A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<4.5m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested



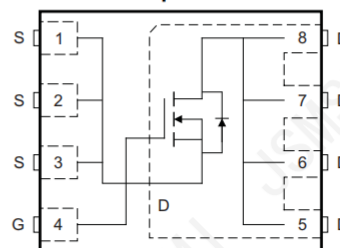
General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers

Top View



■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ\text{C}$	I_D	100	A
	$T_C=100^\circ\text{C}$		65	
Pulsed Drain Current ^A		I_{DM}	400	A
Avalanche energy ^B		EAS	221	mJ
Total Power Dissipation ^C	$T_C=25^\circ\text{C}$	P_D	78	W
	$T_C=100^\circ\text{C}$		51	
Junction and Storage Temperature Range		T_J, T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^D	Steady-State	$R_{\theta JA}$	55		$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.6		

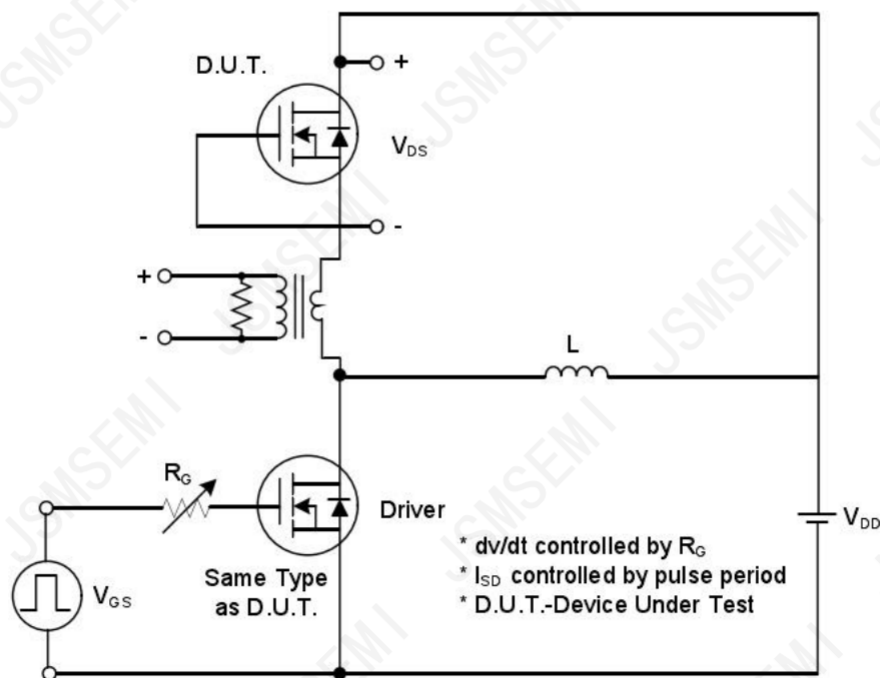
Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship,Quantity	Green
JSM045N06QG5L	DFN5060-8L	045N06QGL	-55 to 150°C	1	T&R,5000	RoHS

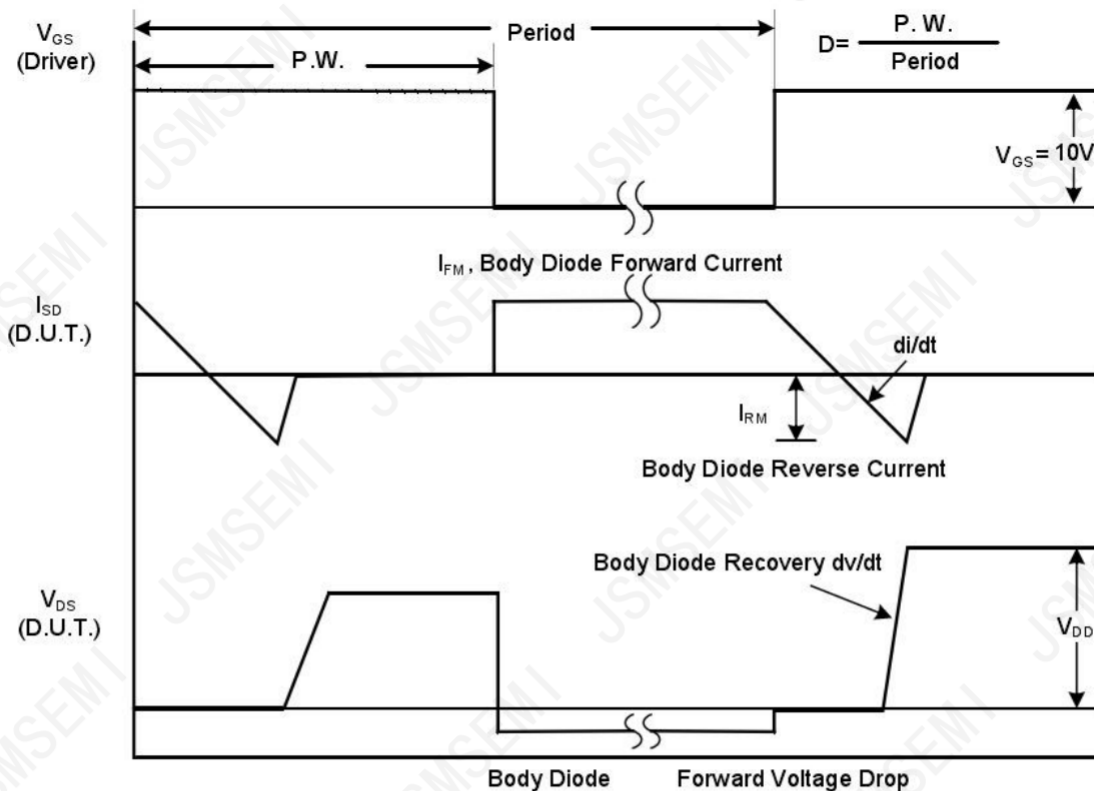
■ Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	60	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	1.2	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	0.02	1	μA	$V_{DS}=60V, V_{GS}=0V$ $T_j=25^{\circ}C$ $T_j=150^{\circ}C$
Gate-source leakage current	I_{GSS}	-	± 10	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	3.5	4.5	m Ω	$V_{GS}=10V, I_D=20A$
		-	4.8	6.5	m Ω	$V_{GS}=4.5V, I_D=20A$
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	2240	-	pF	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=300KHz$
Output Capacitance	C_{oss}	-	850	-		
Reverse Transfer Capacitance	C_{rss}	-	20	-		
Gate Total Charge	Q_G	-	33	-	nC	$V_{DS}=30V, I_D=20A,$ $V_{GS}=10V$
Gate-Source charge	Q_{gs}	-	4.5	-		
Gate-Drain charge	Q_{gd}	-	5	-		
Turn-on delay time	$t_{d(on)}$	-	6.5	-	ns	$V_{GS}=10V,$ $V_{DD}=30V,$ $R_{G_ext}=5\Omega, I_D=20A$
Rise time	t_r	-	8	-		
Turn-off delay time	$t_{d(off)}$	-	38	-		
Fall time	t_f	-	16	-		
Body Diode Characteristic						
Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.77	1.2	V	$V_{GS}=0V, I_{SD}=30A$
Body Diode Continuous Forward Current	I_S	-	-	100	A	$TC=25^{\circ}C$
Body Diode Pulsed Current	I_S pulse	-	-	260	A	$TC=25^{\circ}C$
Body Diode Reverse Recovery Time	t_{rr}	-	39	-	ns	$I_F=1A,$ $diF/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	-	45	-	nC	

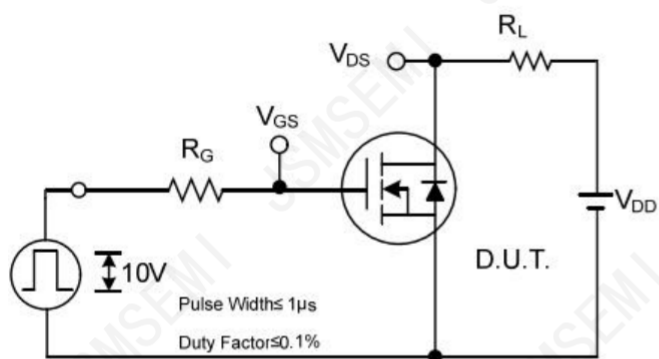
■ RATING AND CHARACTERISTIC CURVES



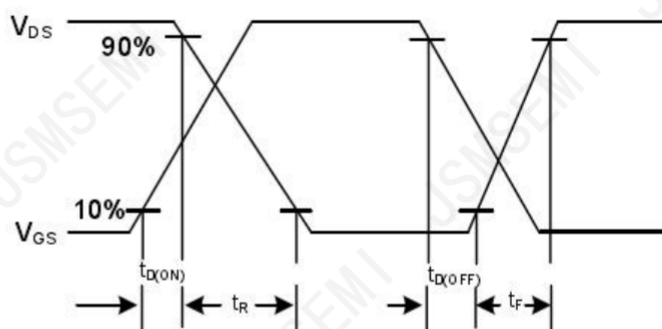
Peak Diode Recovery dv/dt Test Circuit



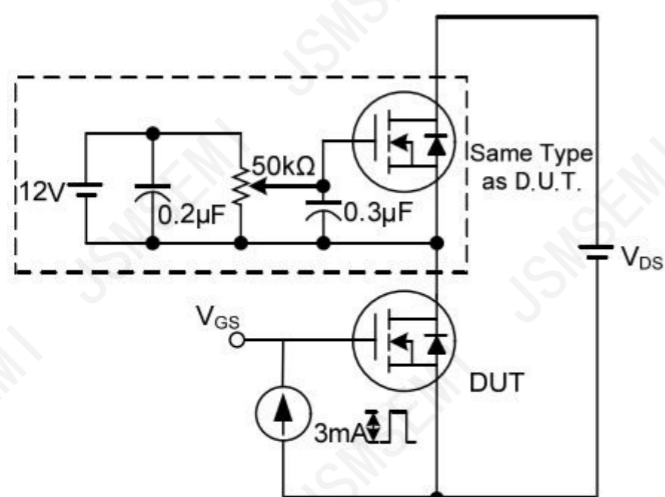
Peak Diode Recovery dv/dt Waveforms



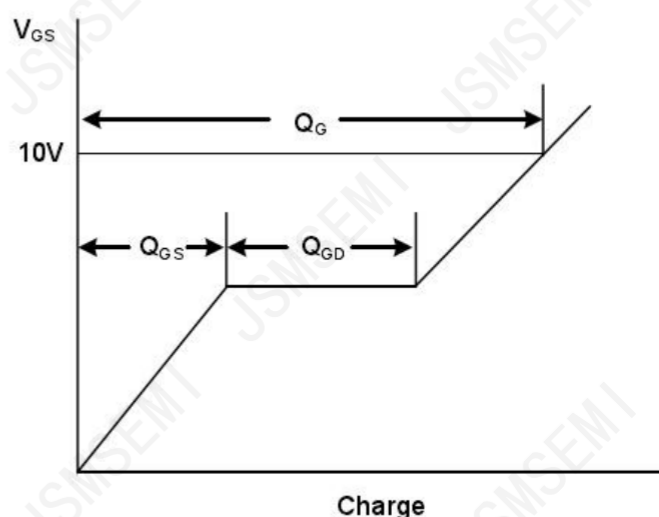
Switching Test Circuit



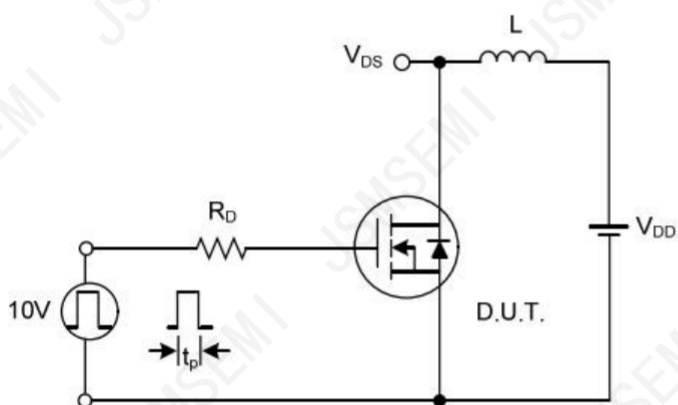
Switching Waveforms



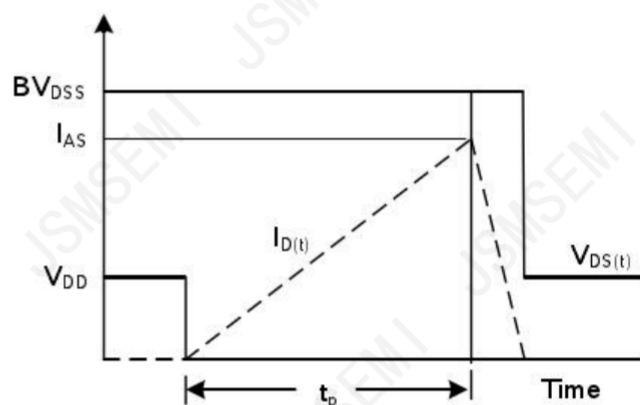
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ Typical Electrical and Thermal Characteristics Diagrams

Figure 1: Output Characteristics

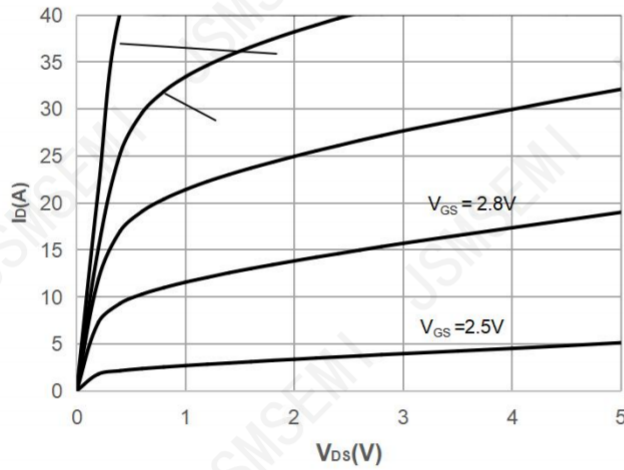


Figure 2: Typical Transfer Characteristics

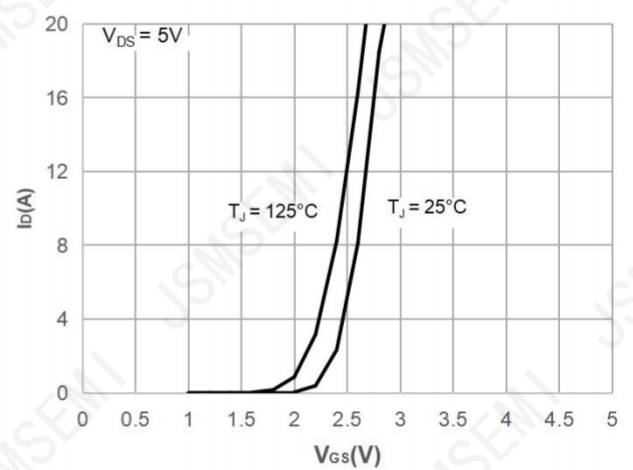


Figure 3: On-resistance vs. Drain Current

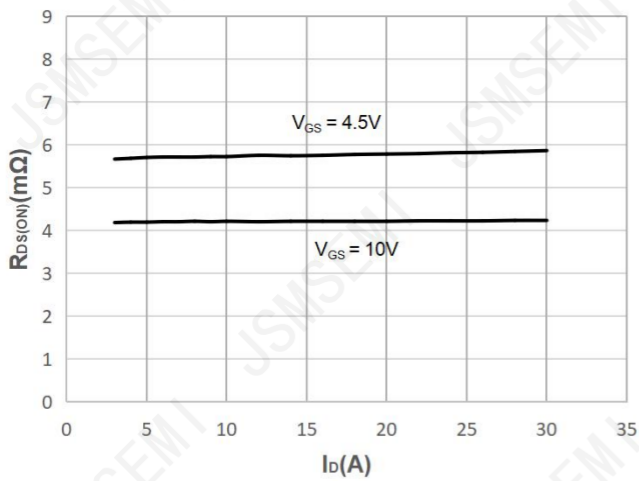


Figure 4: Body Diode Characteristics

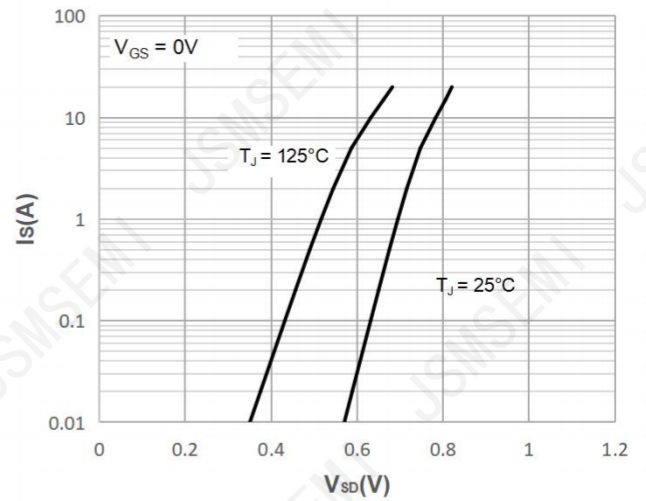


Figure 5: Gate Charge Characteristics

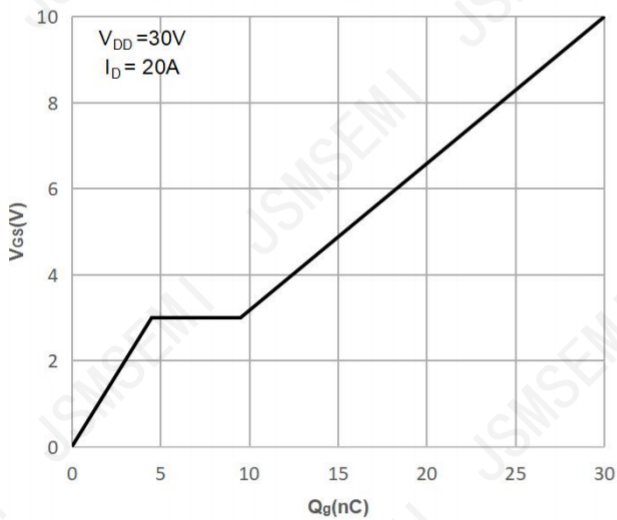


Figure 6: Capacitance Characteristics

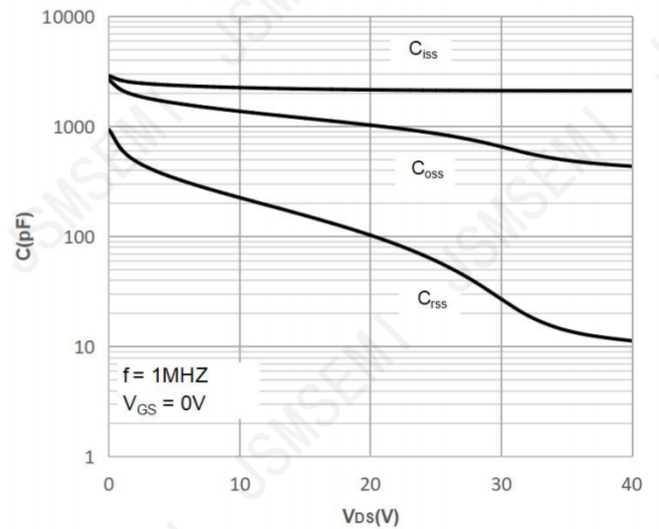


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

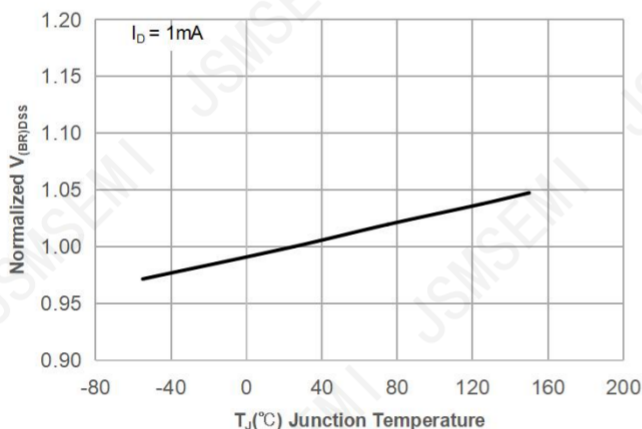


Figure 8: Normalized on Resistance vs. Junction Temperature

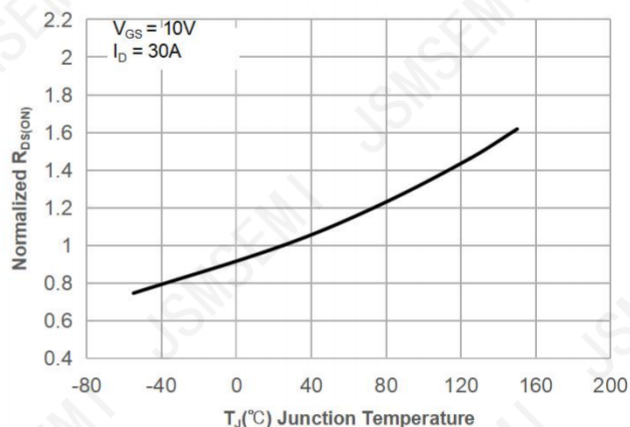


Figure 9: Maximum Safe Operating Area

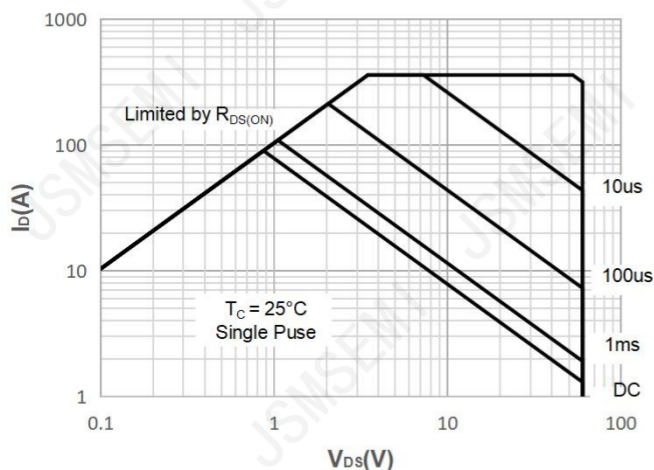


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

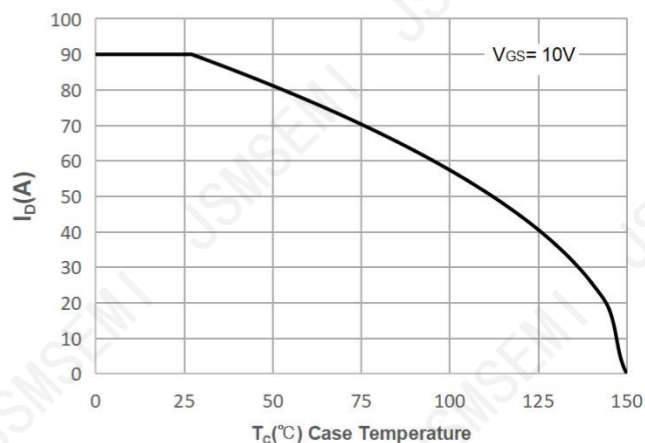


Figure 11: Normalized Maximum Transient Thermal Impedance

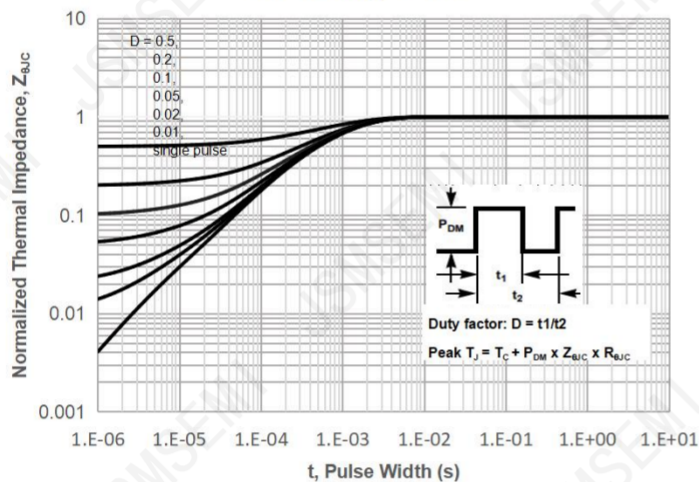
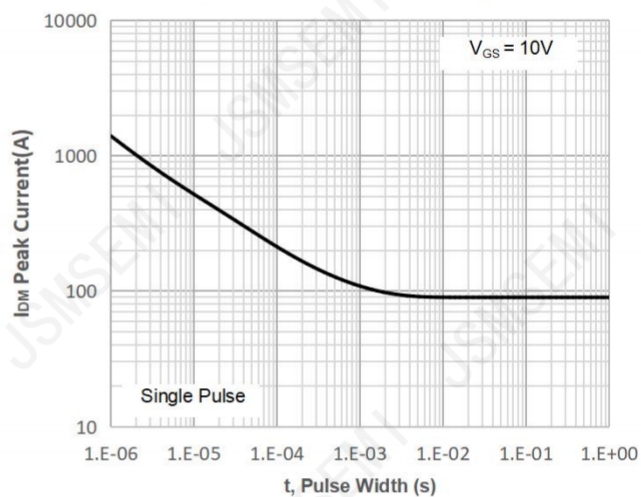
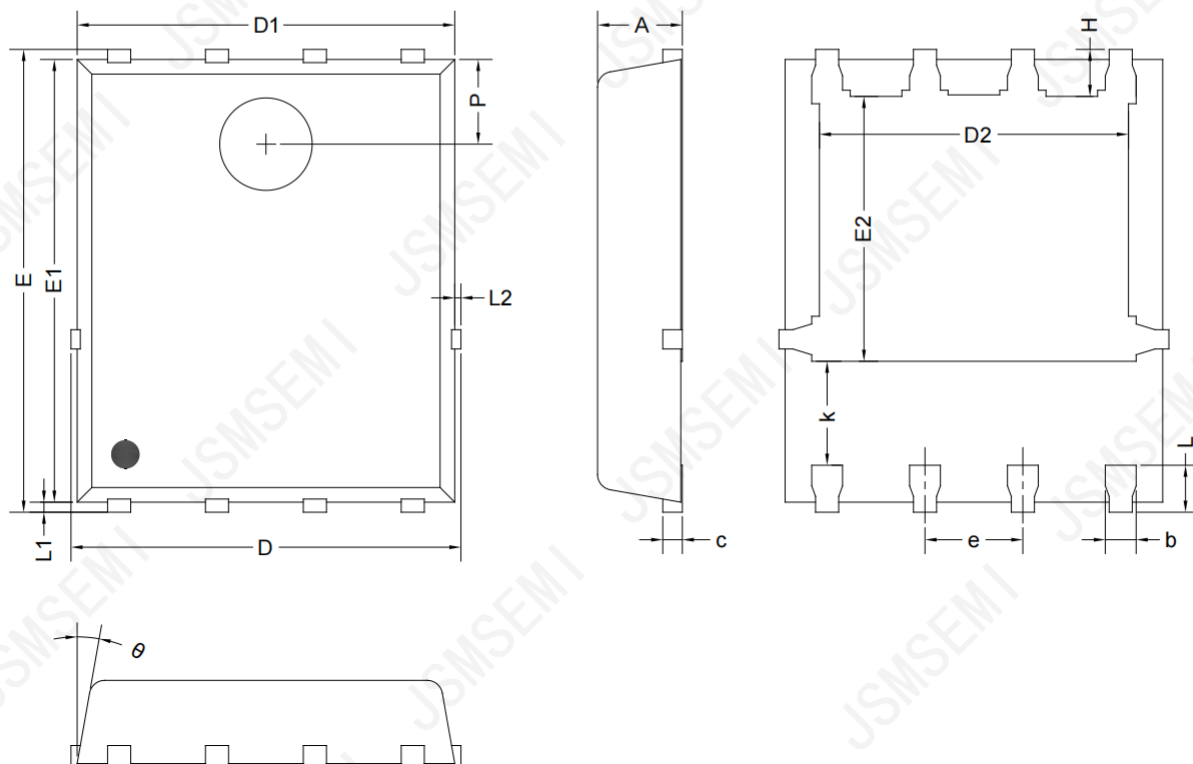


Figure 12: Peak Current Capacity



Package Information

PDFN5060-8L



Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	1.000	1.100	1.200
b	0.350	0.400	0.450
c	0.210	0.250	0.340
D	4.800	-	5.100
D1	4.800	4.900	5.000
D2	3.910	4.010	4.110
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.340	3.440	3.540
e	1.270 BSC		
H	0.510	0.610	0.710
k	1.100	-	-
L	0.510	0.610	0.710
L1	0.060	0.130	0.200
L2	-	-	0.100
P	1.000	1.100	1.200
θ	8°	10°	12°

NOTE: This drawing is subject to change without notice.

Revision History

Rev.	Change	Date
V1.0	Initial version	6/27/2021

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