JJMICROELECTRONICS

30V, 358A, 0.88mΩ N-channel Power SGT MOSFET

JMSL030SPG

Features

- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS Tested
- 100% ΔVds Tested
- Halogen-free; RoHS-compliant

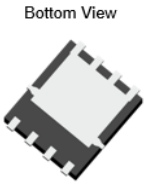
Applications

- Load Switch
- PWM Application
- Power Management

Product Summary

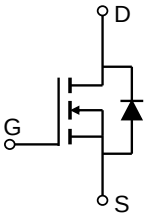
Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th)_Typ}$	1.6	V
I_D(@V_{GS}=10V)	358	A
$R_{DS(ON)_Typ}$(@V_{GS}=10V	0.6	mΩ
$R_{DS(ON)_Typ}$(@V_{GS}=4.5V	0.88	mΩ

RoHS



PDFN5X6-8L

Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSL030SPG-13	SL030SP	1	Tape&Reel	PDFN5x6-8L	5000	50000

Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		30	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	358	A
		T_C = 100°C	226	
I_{DM}	Pulsed Drain Current (1)		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy (2)		850	mJ
P_D	Power Dissipation	T_C = 25°C	156	W
		T_C = 100°C	63	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)	41	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.8	

All product information is copyrighted and subject to legal disclaimers.

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 24V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.1	1.6	2.3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 20A	-	0.6	0.8	mΩ
		V_{GS} = 4.5V, I_D = 15A	-	0.88	1.1	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	2.2	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	7728	-	pF
C_{oss}	Output Capacitance		-	3845	-	pF
C_{rss}	Reverse Transfer Capacitance		-	100	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 15V, I_D = 20A	-	116	-	nC
Q_{gs}	Gate Source Charge		-	24	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	19	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V, I_D= 20A, R_{GEN} = 3Ω	-	16	-	ns
t_r	Turn-On Rise Time		-	39	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	94	-	ns
t_f	Turn-Off Fall Time		-	39	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	358	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	1432	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 20A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 20A, di/dt = 100A/us	-	74	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	113	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25C, V_{DD}=15V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=23.8A, V_{DD}=0V during time in avalanche.
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

All product information is copyrighted and subject to legal disclaimers.

Typical Performance Characteristics

Figure 1: Power De-rating

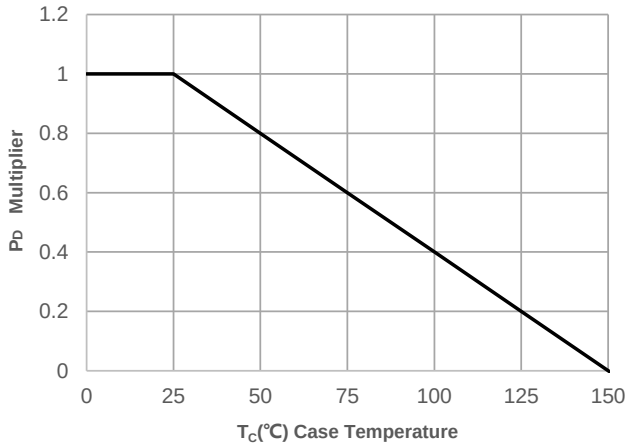


Figure 2: Current De-rating

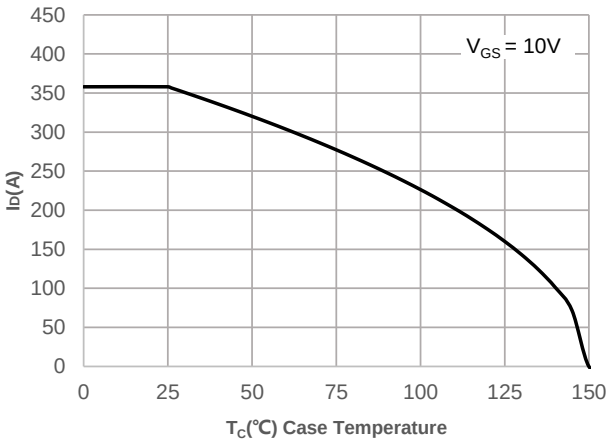


Figure 3: Normalized Maximum Transient Thermal Impedance

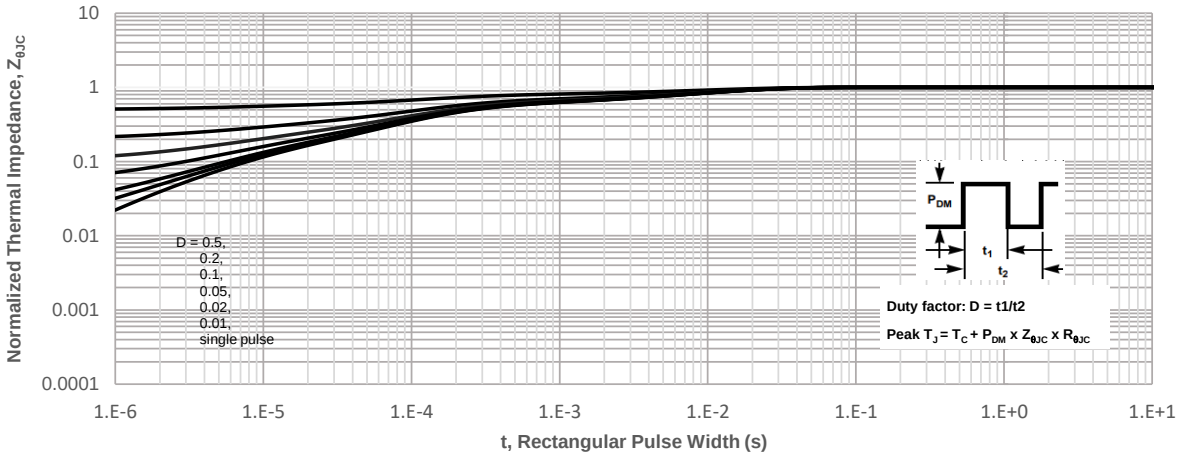
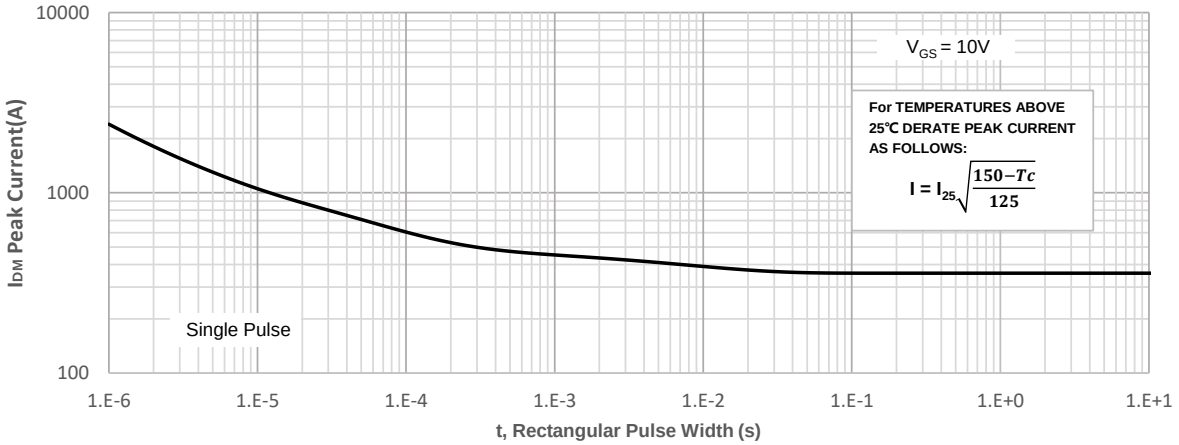


Figure 4: Peak Current Capacity



All product information is copyrighted and subject to legal disclaimers.

Typical Performance Characteristics

Figure 5: Output Characteristics

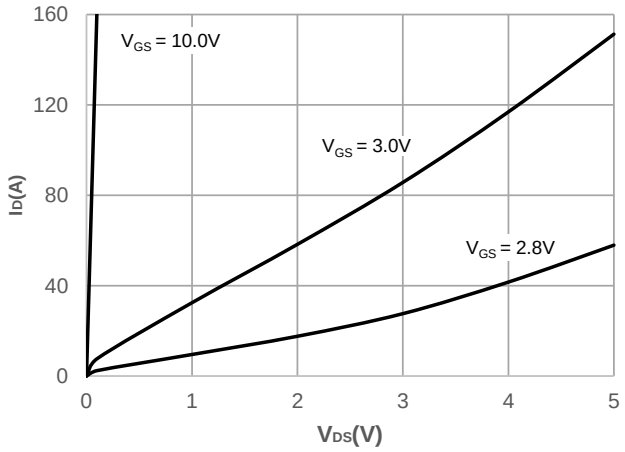


Figure 6: Typical Transfer Characteristics

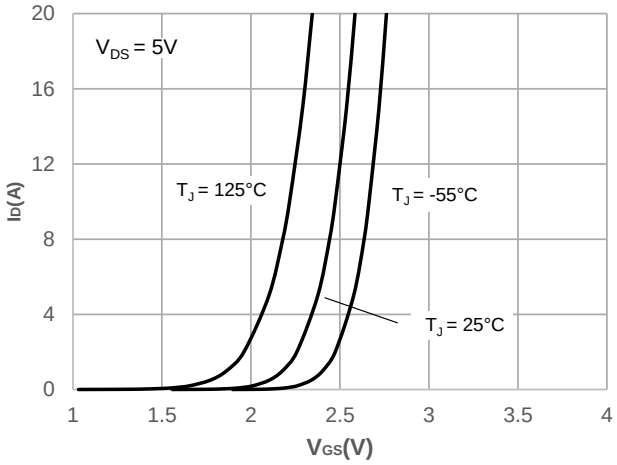


Figure 7: On-resistance vs. Drain Current

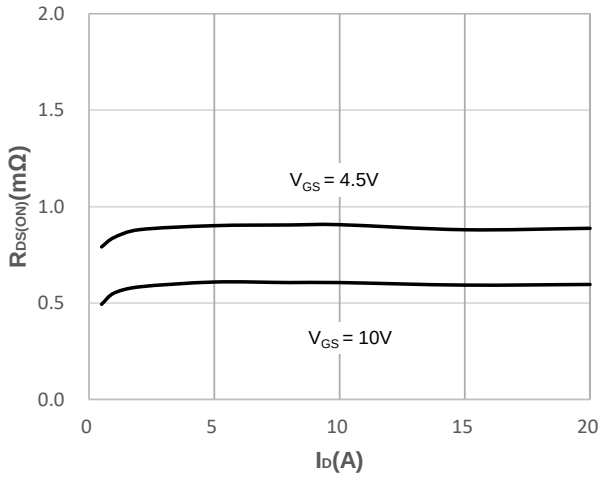


Figure 8: Body Diode Characteristics

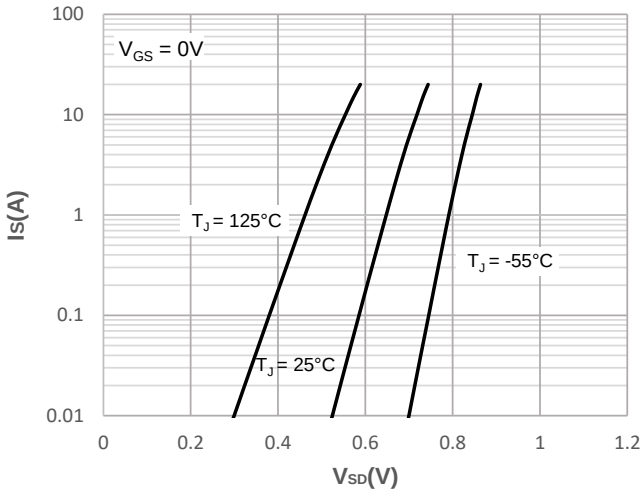


Figure 9: Gate Charge Characteristics

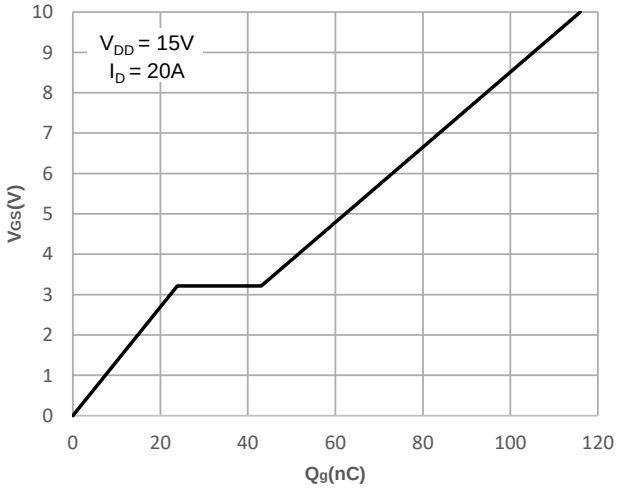
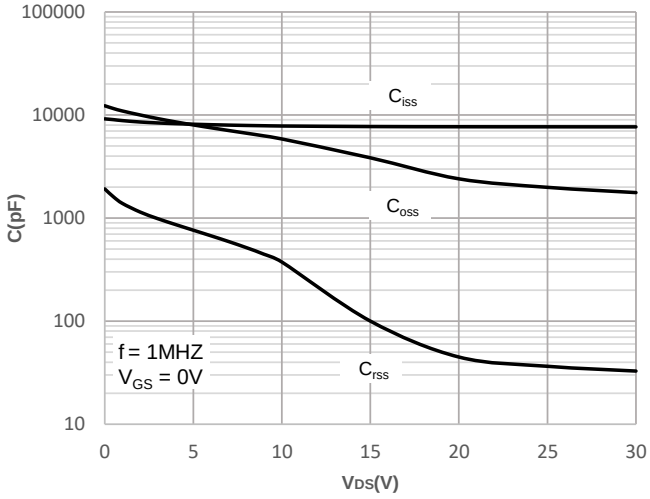


Figure 10: Capacitance Characteristics



All product information is copyrighted and subject to legal disclaimers.

Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

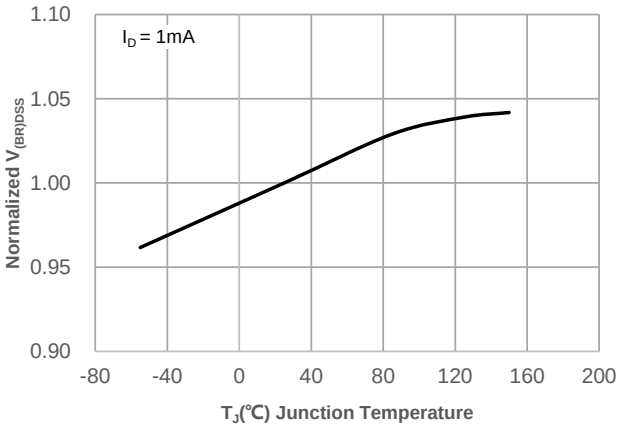


Figure 12: Normalized on Resistance vs. Junction Temperature

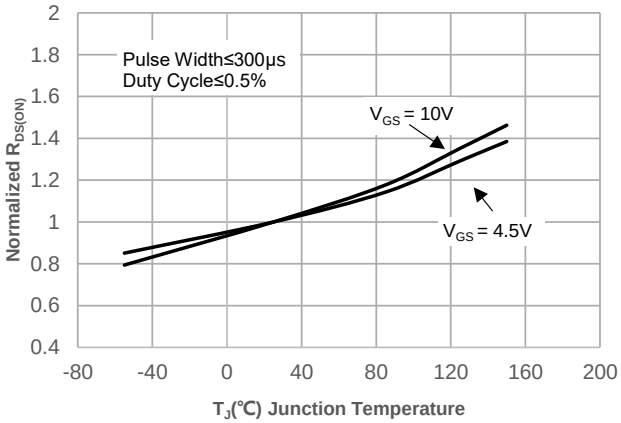


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

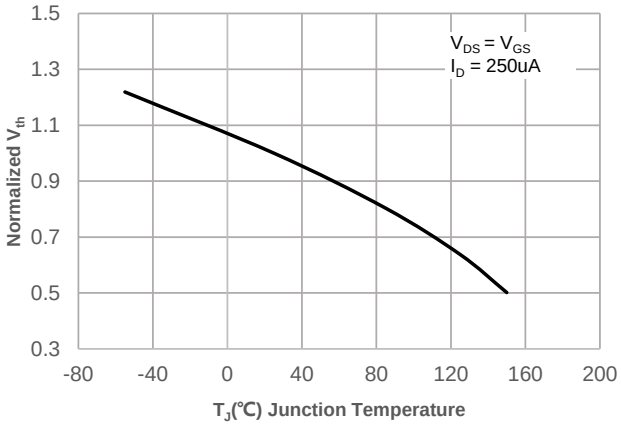


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

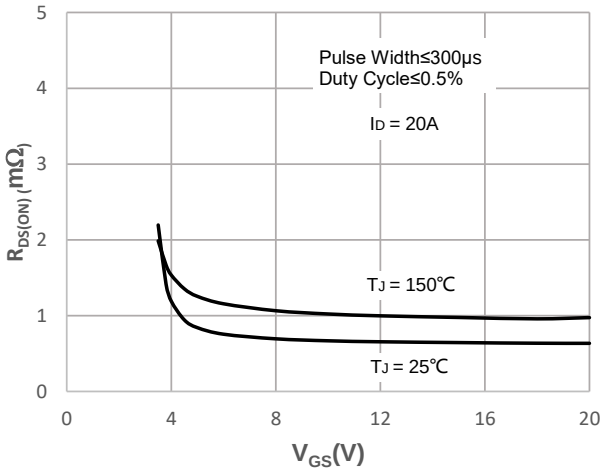
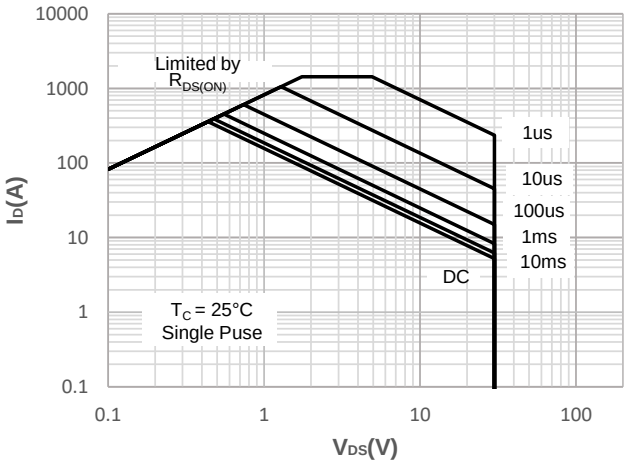


Figure 15: Maximum Safe Operating Area



All product information is copyrighted and subject to legal disclaimers.

Test Circuit

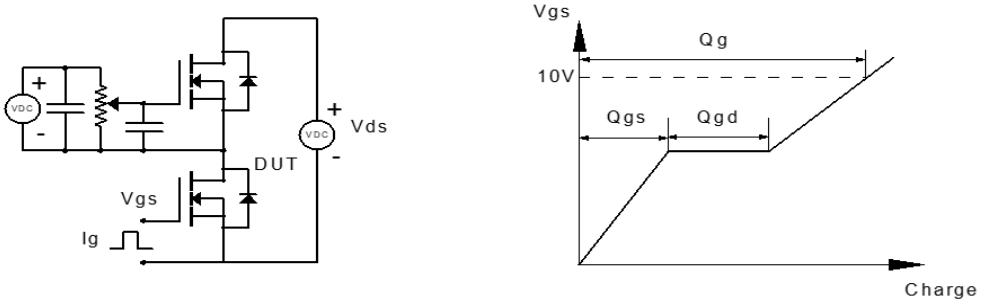


Figure 1: Gate Charge Test Circuit & Waveform

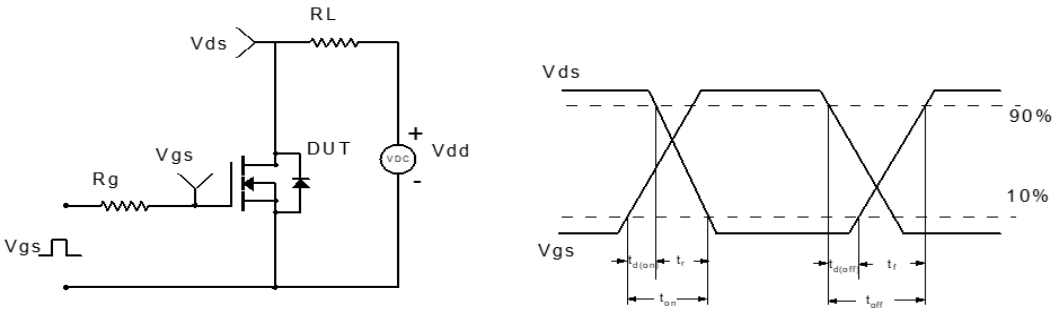


Figure 2: Resistive Switching Test Circuit & Waveform

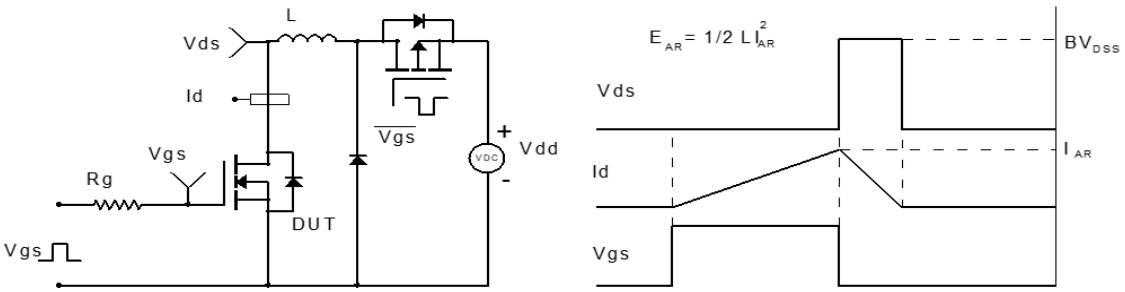


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

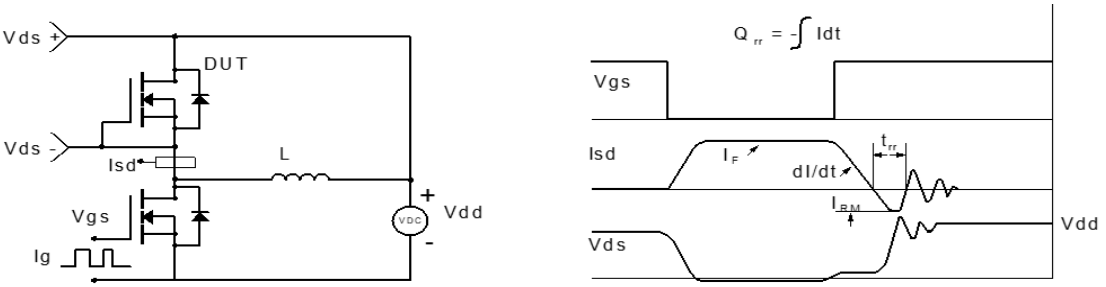
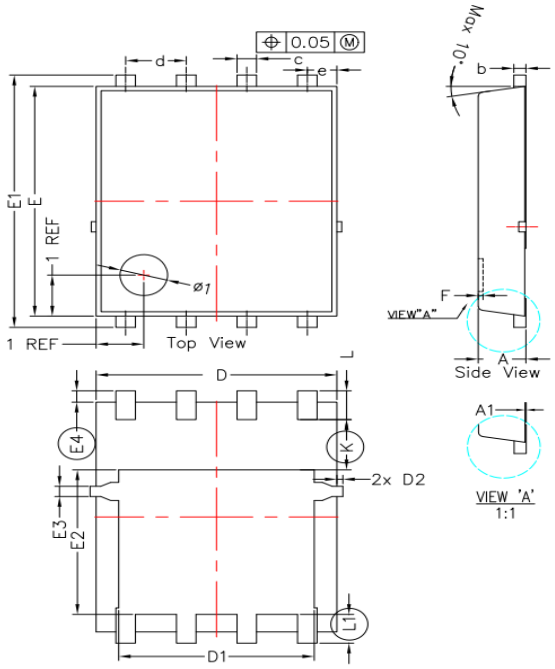


Figure 4: Diode Recovery Test Circuit & Waveform

All product information is copyrighted and subject to legal disclaimers.

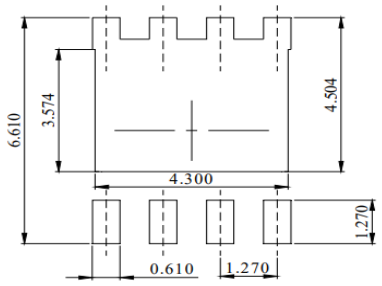
Package Mechanical Data(PDFN5X6-8L)

Package Outline



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
*A	0.900	1.000	1.150	0.035	0.039	0.045
A1	0.000	---	0.050	0.000	----	0.002
b	0.246	0.254	0.350	0.010	0.010	0.014
*C	0.310	0.410	0.510	0.012	0.016	0.020
d		1.27BSC			0.050BSC	
*D	4.950	5.050	5.150	0.195	0.199	0.203
D1	4.000	4.100	4.200	0.157	0.161	0.165
*D2		0.125REF			0.005REF	
e		0.62BSC			0.024BSC	
*E	5.500	5.600	5.700	0.217	0.220	0.224
*E1	6.050	6.150	6.250	0.238	0.242	0.246
E2	3.425	3.525	3.625	0.135	0.139	0.143
E3		0.250REF			0.010REF	
* E4		0.275REF			0.011REF	
F	-	-	0.100	-	-	0.004
*L	0.500	0.600	0.700	0.02	0.02	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03
K		1.225REF			0.05REF	

Recommended Soldering Footprint



DIMENSIONS:MILLIMETERS

Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Microelectronics Co.,Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it. Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu JieJie complies with the agreement. Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.

is a registered trademark of Jiangsu JieJie Microelectronics Co.,Ltd.