JJMICROELECTRONICS

30V, 21A, 7.3mΩ N-channel Power SGT MOSFET

JMSL0315PV

Features

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

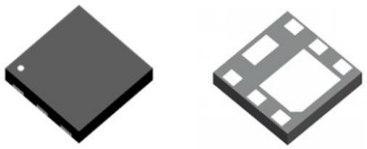
Applications

- Load Switch
- PWM Application
- Power Management

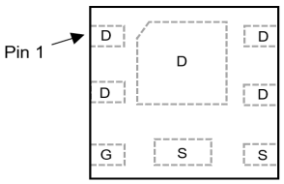
Product Summary

Parameters	Value	Unit
V_{DSS}	30	V
$V_{GS(th)_Typ}$	1.7	V
I_D(@V_{GS}=10V)	21	A
$R_{DS(ON)_Typ}$(@V_{GS}=10V)	7.3	mΩ
$R_{DS(ON)_Typ}$(@V_{GS}=4.5V)	11.4	mΩ

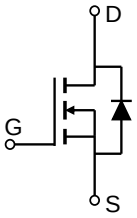
RoHS



DFN2020-6L



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSL0315PV-7	BM	1	Tape&Reel	DFN2020-6L	3000	30000

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	21	A
		T_C = 100°C	13	
I_{DM}	Pulsed Drain Current (1)		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy (2)		26	mJ
P_D	Power Dissipation	T_C = 25°C	7	W
		T_C = 100°C	2.8	
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)	85	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	18	

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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	1.2	1.7	2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 15A	-	7.3	9.5	mΩ
		V_{GS} = 4.5V, I_D = 10A	-	11.4	14.9	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	2.2	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	-	470	705	pF
C_{oss}	Output Capacitance		-	292	438	pF
C_{rss}	Reverse Transfer Capacitance		-	7.0	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 15V, I_D = 15A	-	8.3	-	nC
Q_{gs}	Gate Source Charge		-	1.9	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1.6	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} =15V, I_D= 15A, R_{GEN} = 3Ω	-	4.6	-	ns
t_r	Turn-On Rise Time		-	12	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	12	-	ns
t_f	Turn-Off Fall Time		-	2.8	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	21	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	85	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 15A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 15A, di/dt = 100A/us	-	19	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	8.3	-	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}=4.2A, 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%.

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Typical Performance Characteristics

Figure 1: Power De-rating

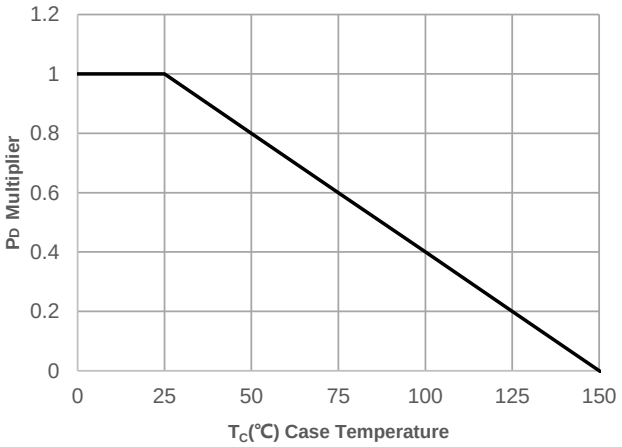


Figure 2: Current De-rating

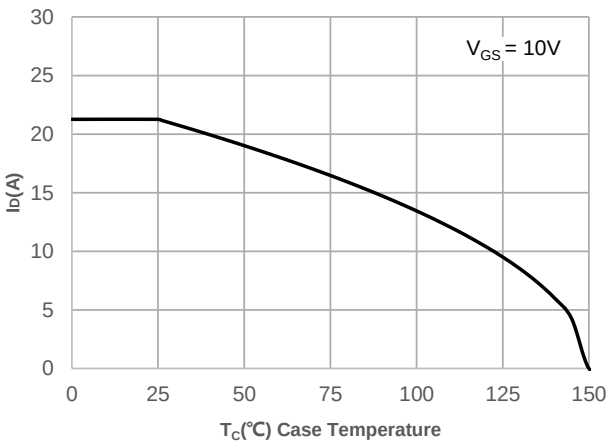


Figure 3: Normalized Maximum Transient Thermal Impedance

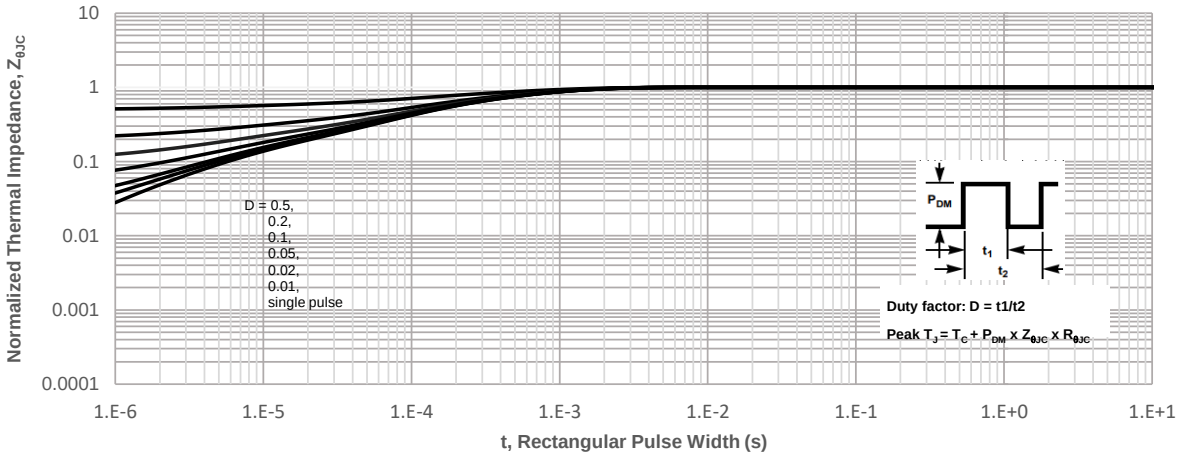
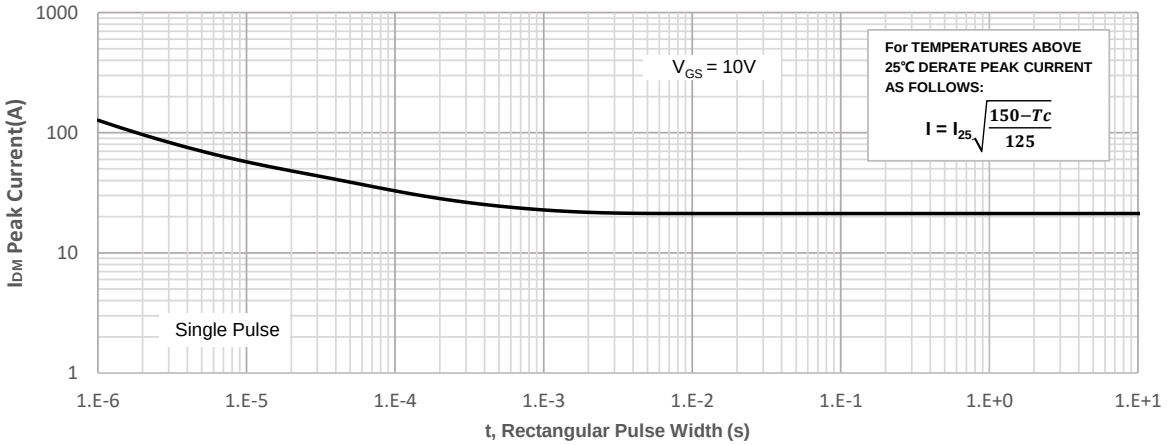


Figure 4: Peak Current Capacity



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Typical Performance Characteristics

Figure 5: Output Characteristics

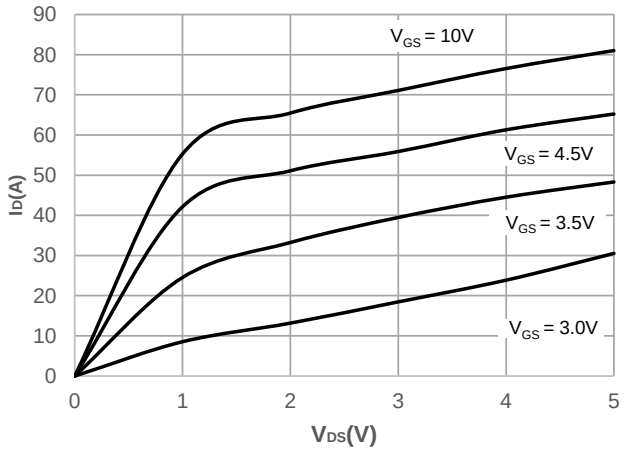


Figure 6: Typical Transfer Characteristics

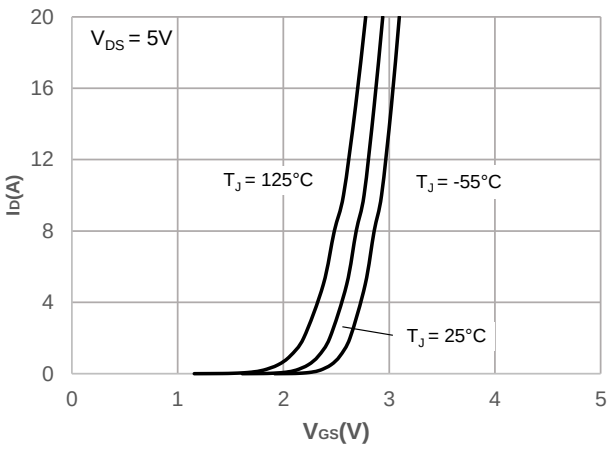


Figure 7: On-resistance vs. Drain Current

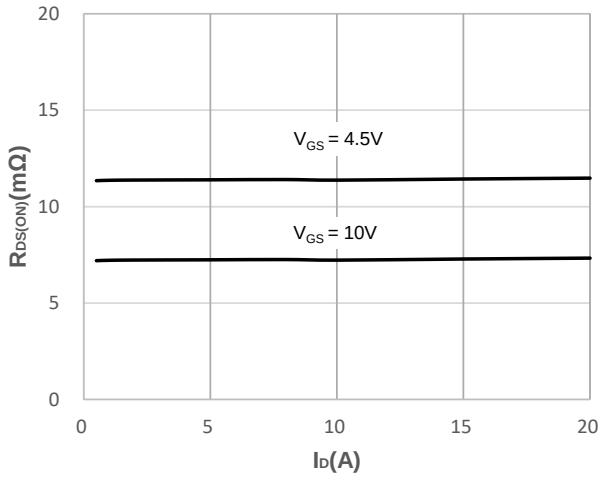


Figure 8: Body Diode Characteristics

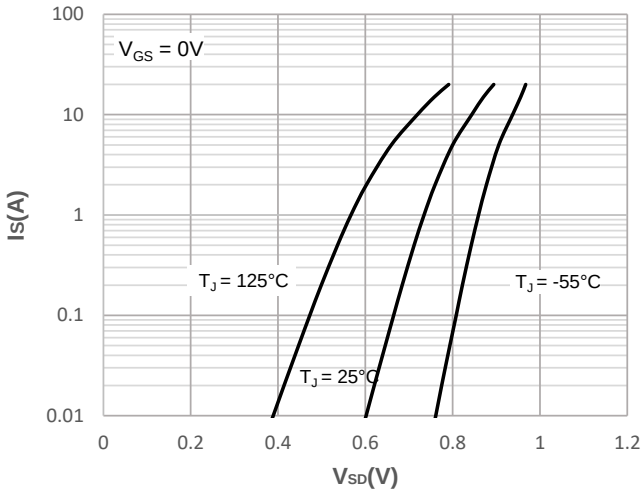


Figure 9: Gate Charge Characteristics

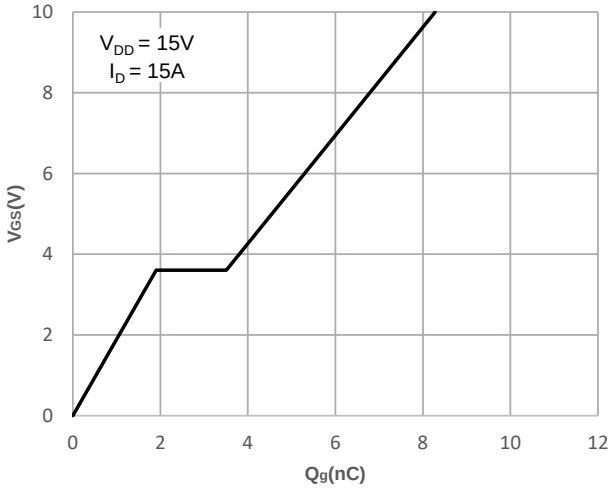
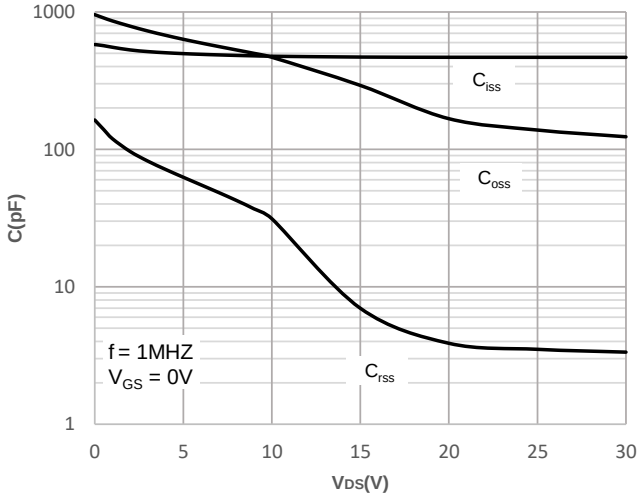


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

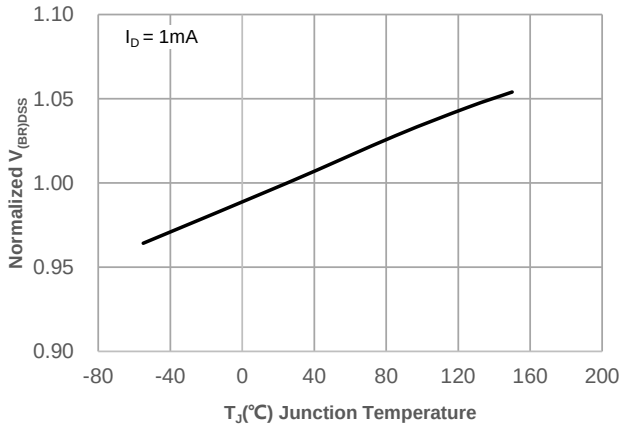


Figure 12: Normalized on Resistance vs. Junction Temperature

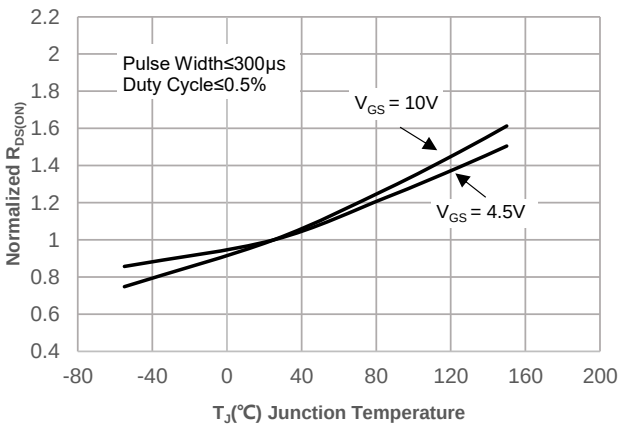


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

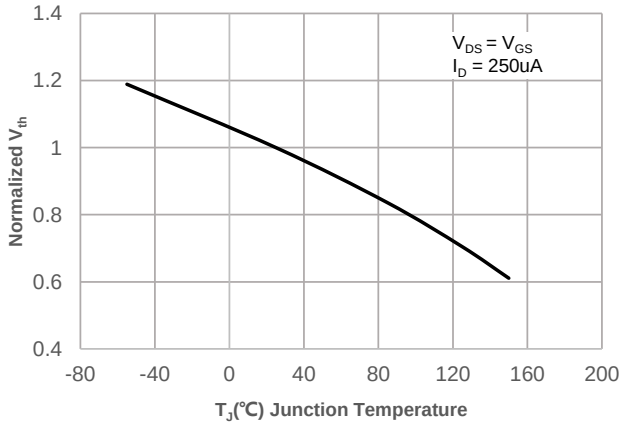


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

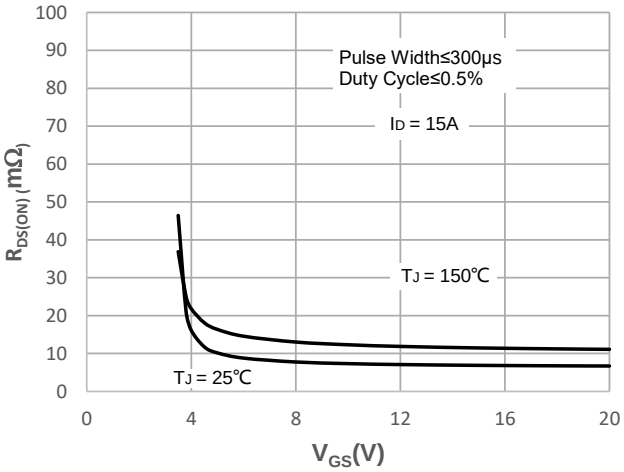
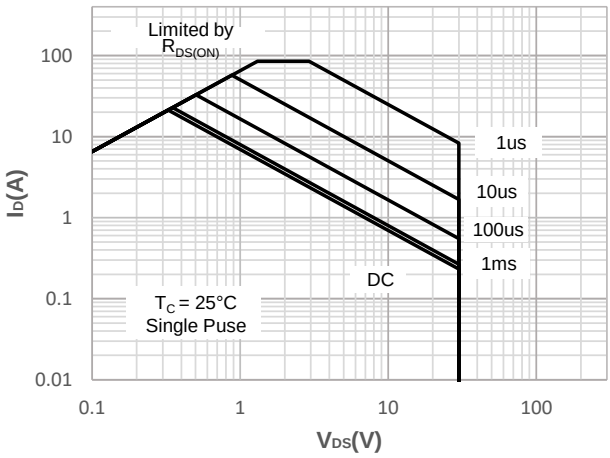


Figure 15: Maximum Safe Operating Area



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Test Circuit

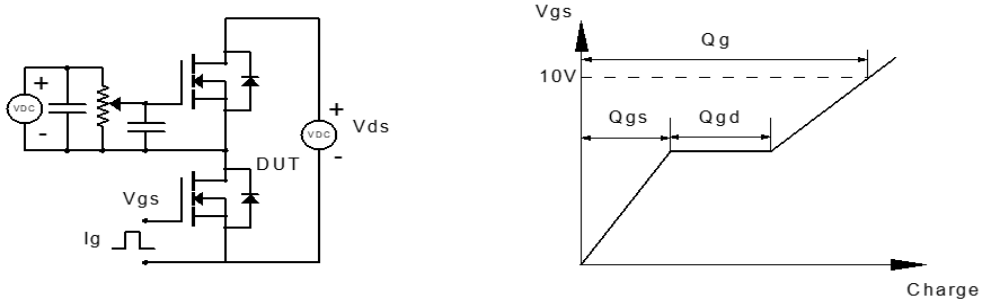

Figure 1: Gate Charge Test Circuit & Waveform

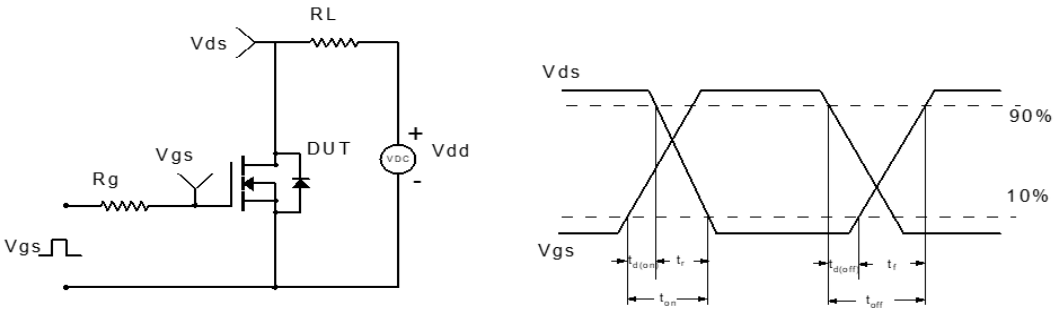

Figure 2: Resistive Switching Test Circuit & Waveform

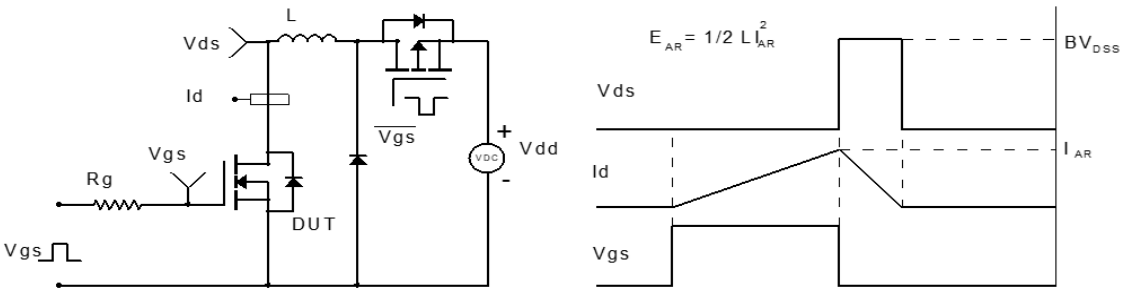

Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

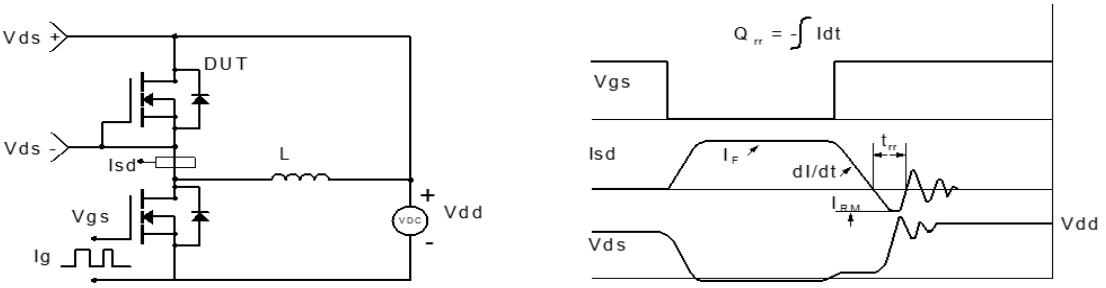

Figure 4: Diode Recovery Test Circuit & Waveform

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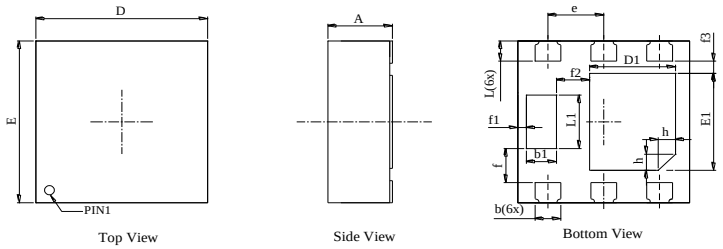
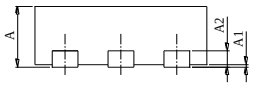
Package Mechanical Data(DFN2020-6L)

Package Outline



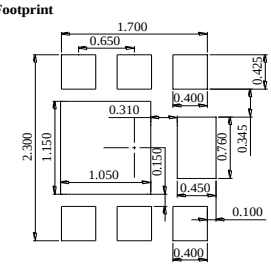
Top View　　Side View　　Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.700	0.750	0.800
A1	-	-	0.005
A2	-	0.203	-
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D1	0.900	1.000	1.100
E1	1.100	1.200	1.300
b	0.250	0.300	0.350
b1	0.300	0.350	0.400
L	0.200	0.250	0.300
L1	0.560	0.660	0.760
e	0.650 BSC		
f	0.420 REF		
f1	0.100 REF		
f2	0.385 REF		
f3	0.150 REF		
h	0.150 REF		

Recommended Soldering Footprint



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