JJMICROELECTRONICS

650V, 6.8A, 283mΩ N-channel Power SuperJunction MOSFET

JMH65R360PK

Features

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

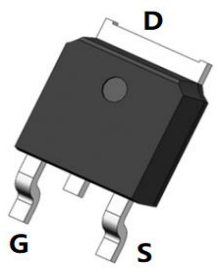
Applications

- SMPS with PFC,Flyback and LLC topologies
- Silver ATX,adapter,TV,lighting,Telecom

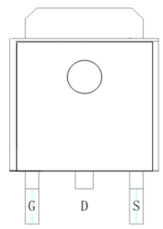
Product Summary

Parameters	Value	Unit
V_{DSS}	650	V
$V_{GS(th)_Typ}$	3.3	V
I_D(@V_{GS}=10V)	6.8	A
$R_{DS(ON)_Typ}$(@V_{GS}=10V	283	mΩ

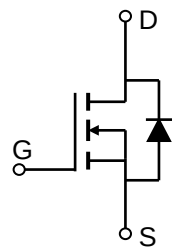
RoHS



TO-252-3L



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMH65R360PK	H65R360P	3	Tape&Reel	TO-252-3L	2500	25000

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

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		650	V
V_{GS}	Gate-to-Source Voltage		±30	V
I_D	Continuous Drain Current	T_C = 25°C	6.8	A
		T_C = 100°C	4.3	
I_{DM}	Pulsed Drain Current (1)		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy (2)		88	mJ
P_D	Power Dissipation	T_C = 25°C	43	W
		T_C = 100°C	17	
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)	39	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.9	

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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	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±30V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.3	3.3	4.3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 5.5A	-	283	368	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	18	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 325V, f = 1MHz	382	535	722	pF
C_{oss}	Output Capacitance		19	26	35	pF
C_{rss}	Reverse Transfer Capacitance		-	7.7	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 325V, I_D = 5.5A	12	17	24	nC
Q_{gs}	Gate Source Charge		-	3.6	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	7.4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} =325 V I_D= 5.5A, R_{GEN} = 24Ω	-	19	-	ns
t_r	Turn-On Rise Time		-	31	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	115	-	ns
t_f	Turn-Off Fall Time		-	21	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	7	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	27	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 5.5A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 5.5A, di/dt = 100A/us	192	269	363	ns
Qrr	Body Diode Reverse Recovery Charge		-	2.9	-	uC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25C, V_{DD}=75V, V_{GS}=10V, R_G=25ohm, L=10mH, 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

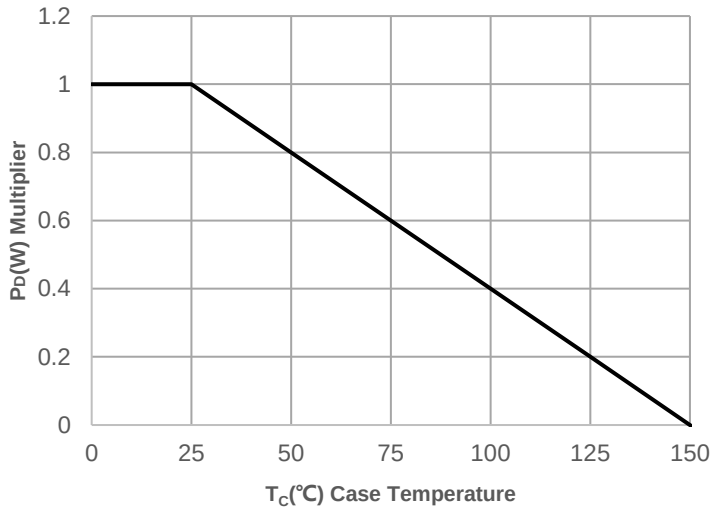


Figure 2: Current De-rating

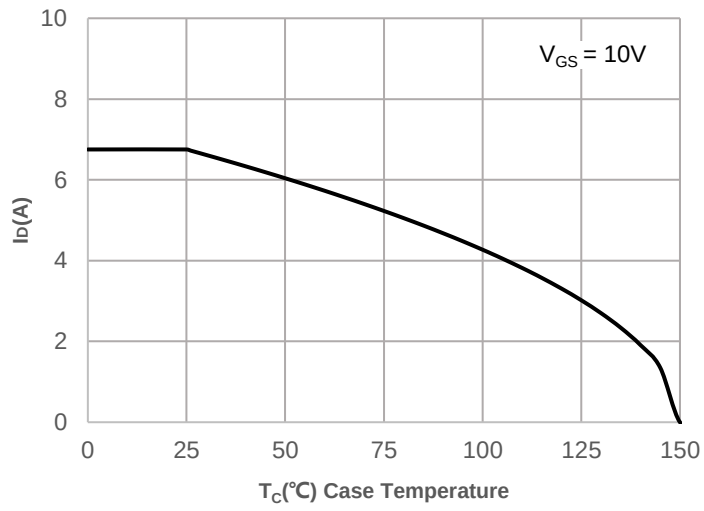


Figure 3: Normalized Maximum Transient Thermal Impedance

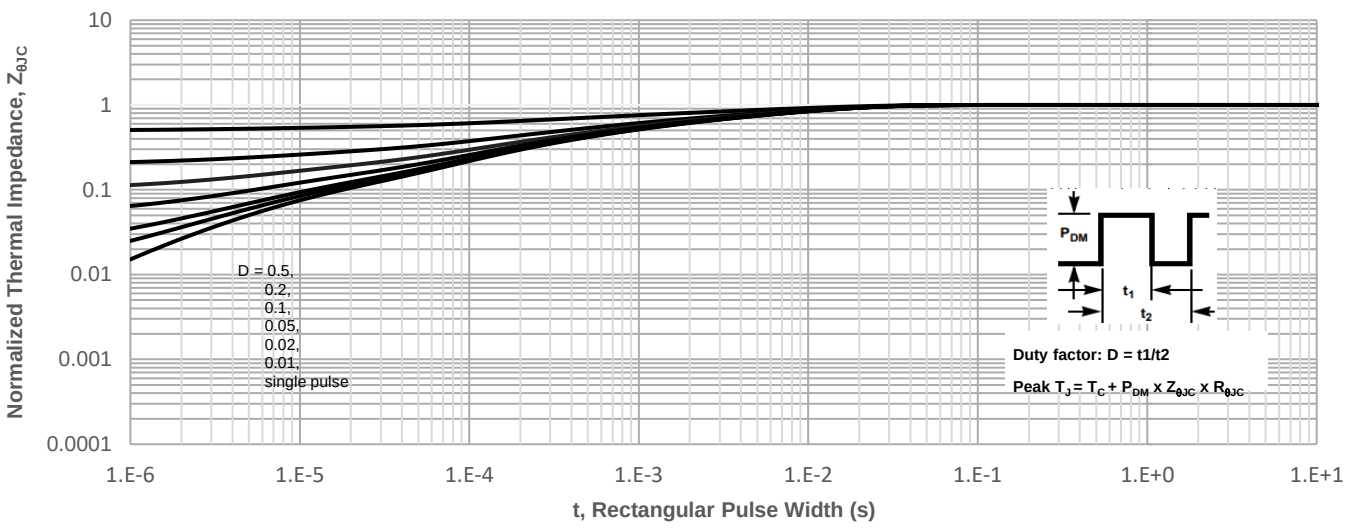
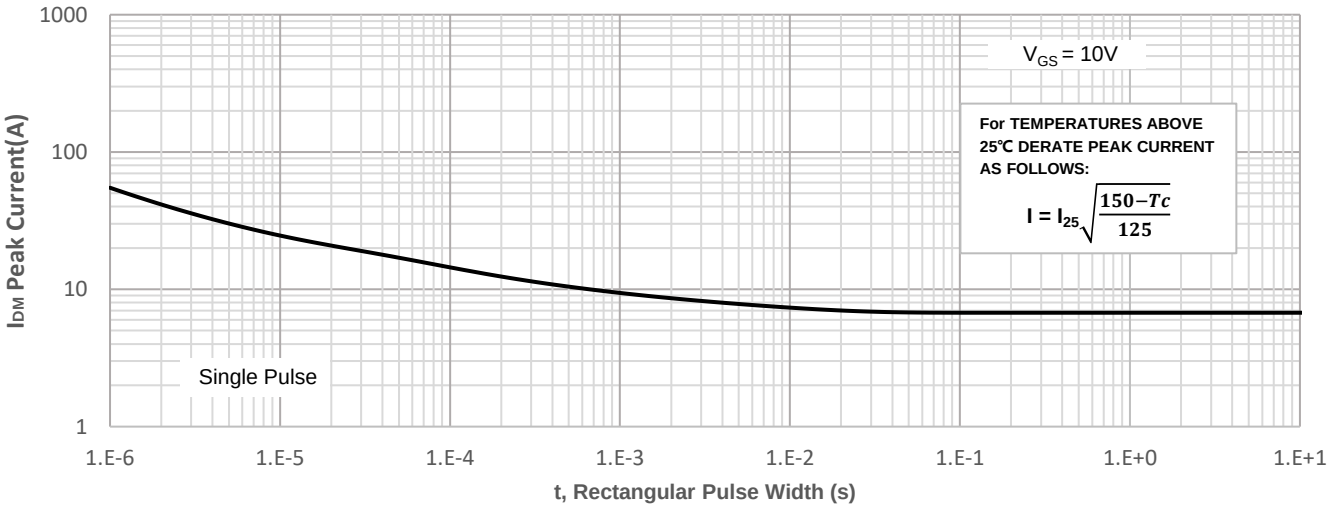


Figure 4: Peak Current Capacity



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Typical Performance Characteristics

Figure 5: Output Characteristics

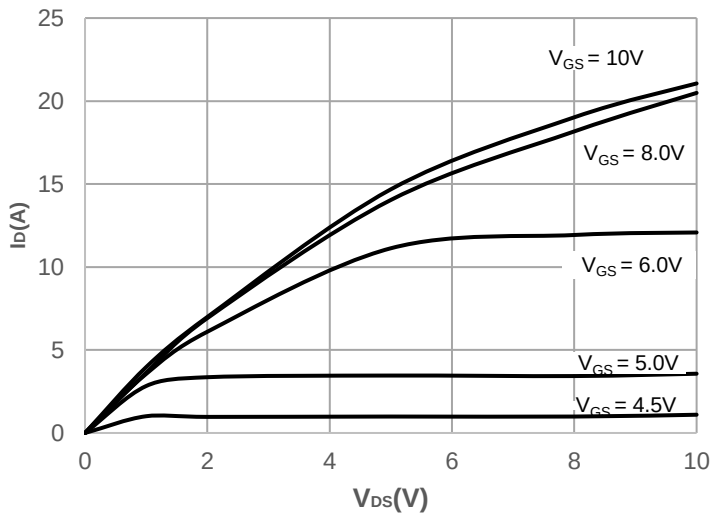


Figure 6: Typical Transfer Characteristics

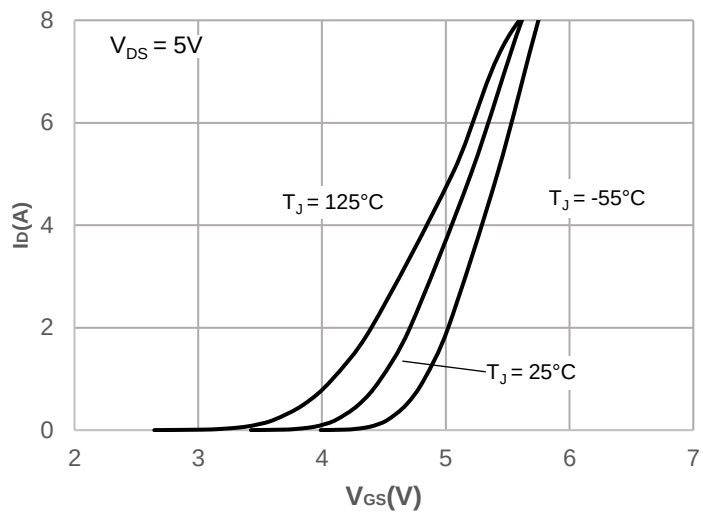


Figure 7: On-resistance vs. Drain Current

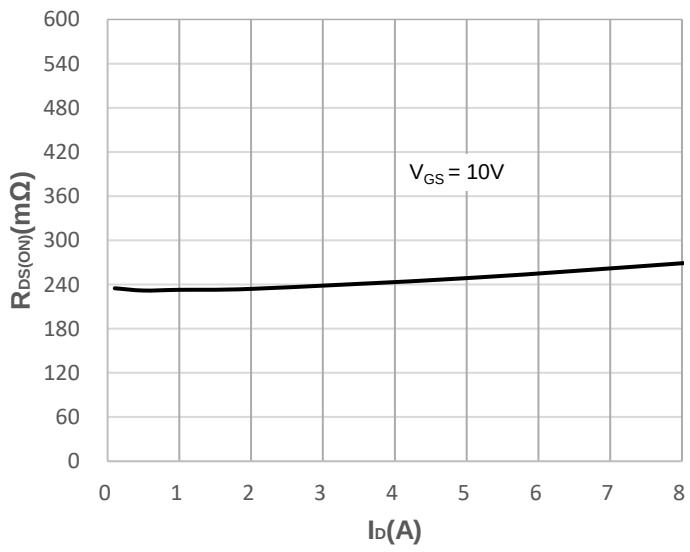


Figure 8: Body Diode Characteristics

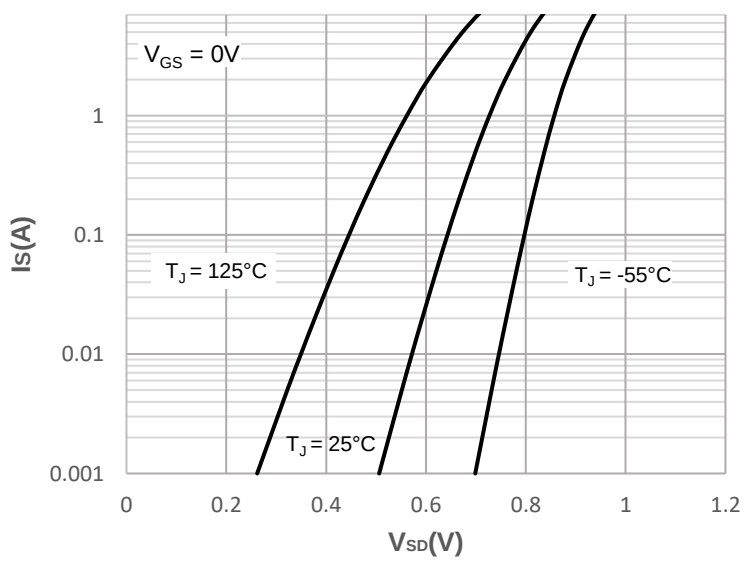


Figure 9: Gate Charge Characteristics

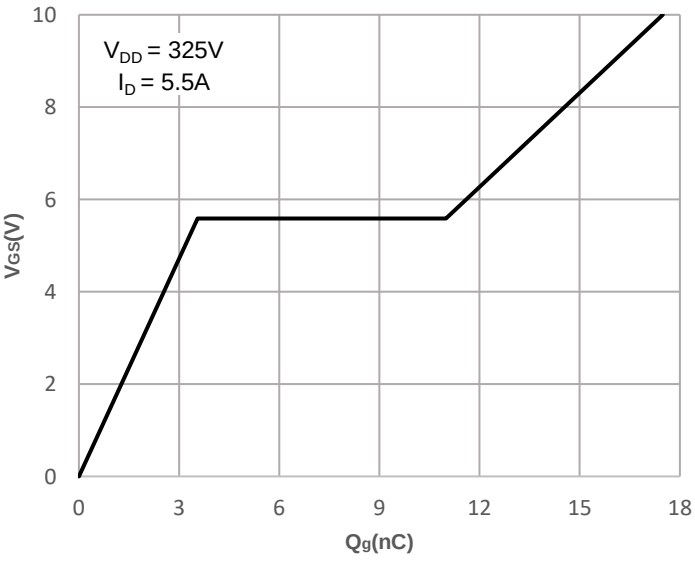
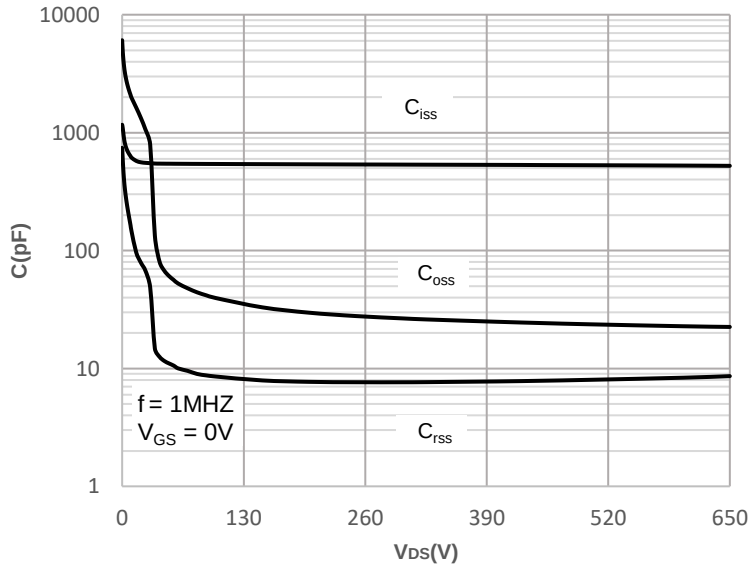


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

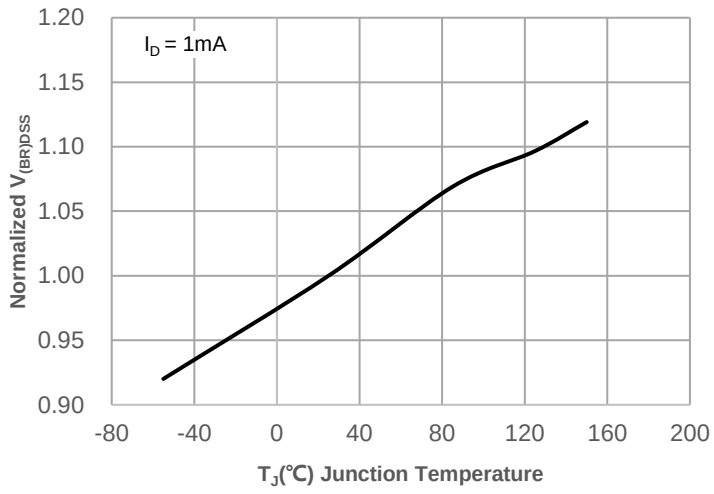


Figure 12: Normalized on Resistance vs. Junction Temperature

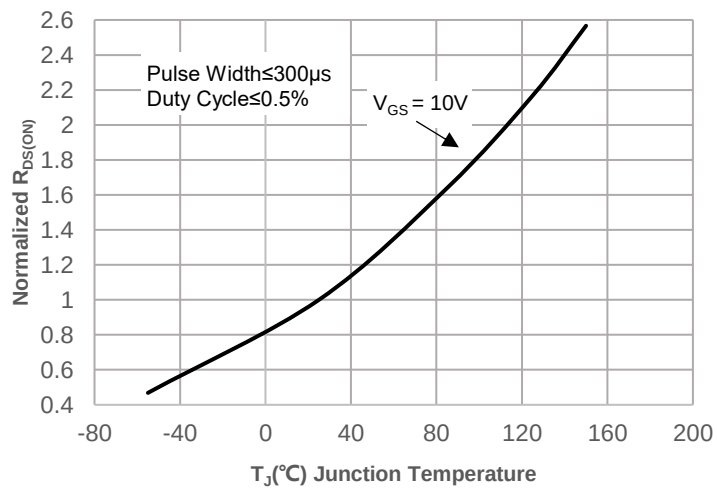


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

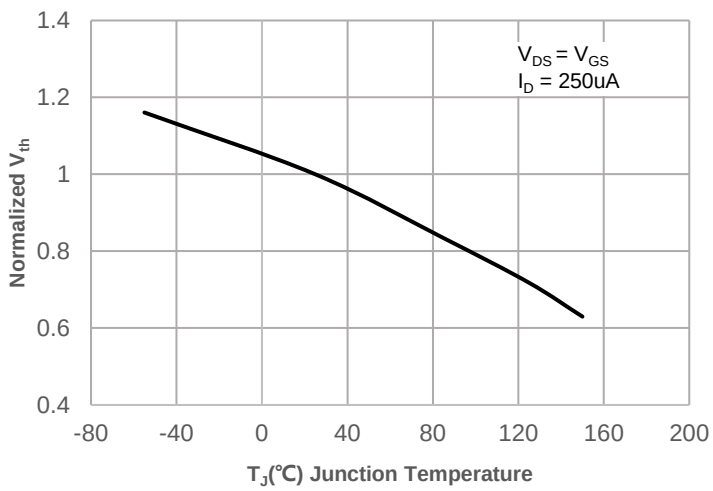


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

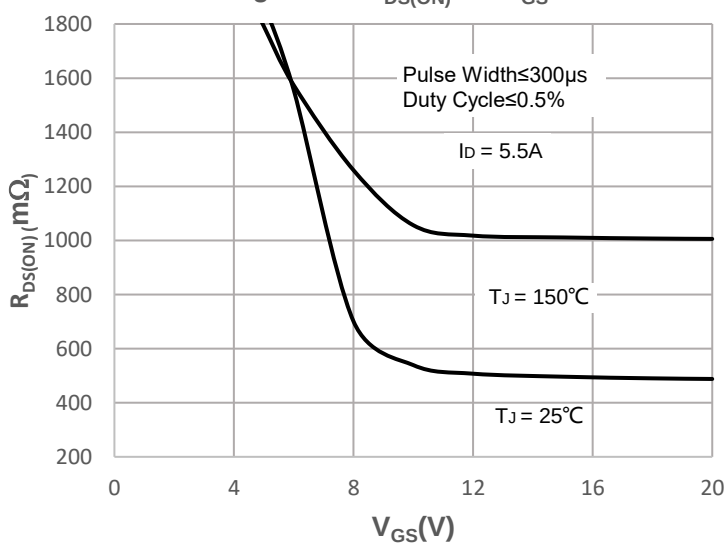
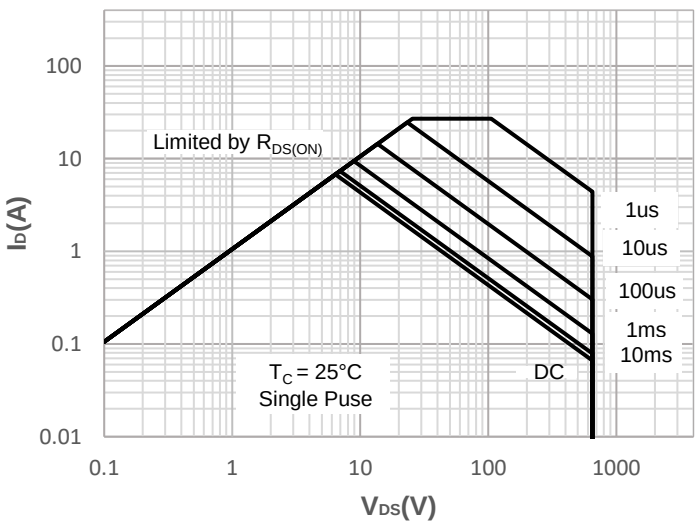


Figure 15: Maximum Safe Operating Area



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Test Circuit

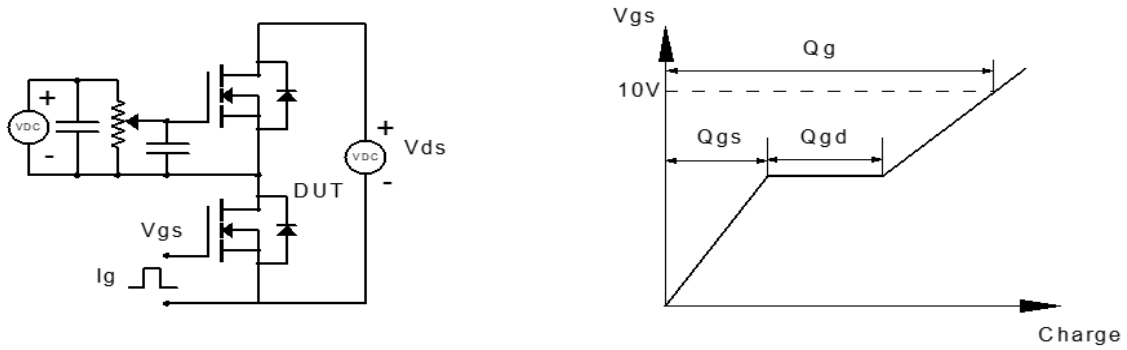

Figure 1: Gate Charge Test Circuit & Waveform

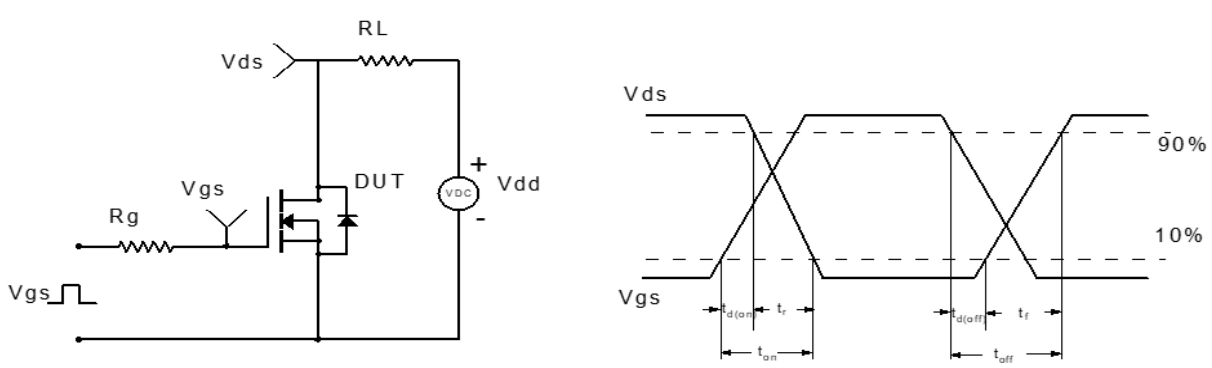

Figure 2: Resistive Switching Test Circuit & Waveform

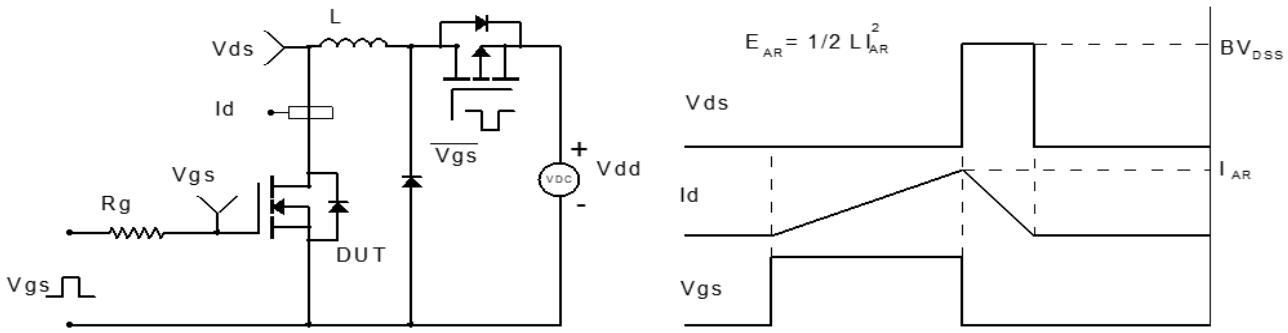

Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

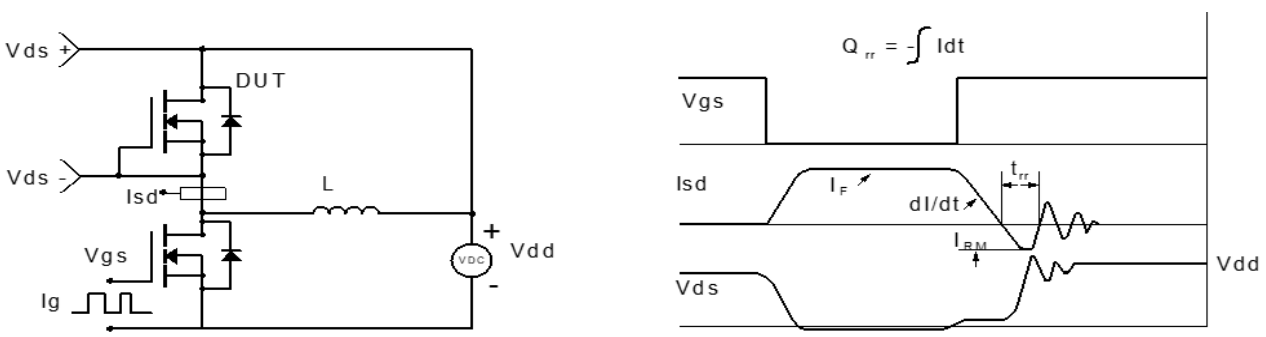

Figure 4: Diode Recovery Test Circuit & Waveform

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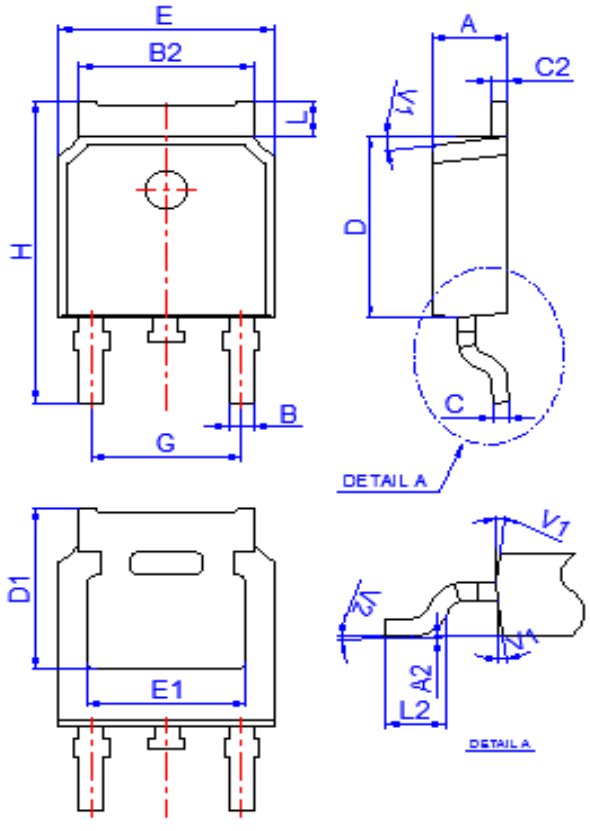
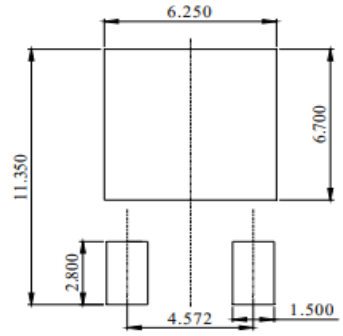
Package Mechanical Data(TO-252-3L)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.15	0		0.006
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Recommended Soldering Footprint



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