



Description

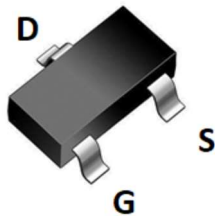
JMD N-channel Depletion Mode Power MOSFET

Features

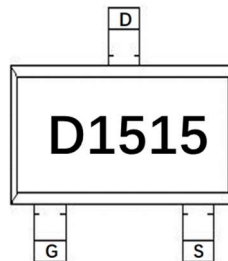
- 150V, 0.2A
 $R_{DS(ON)} < 10\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 15\Omega @ V_{GS} = 0V$
- Self-aligned planner technology
- Pb-free lead plating
- Halogen free
- ESD improved capability

Application

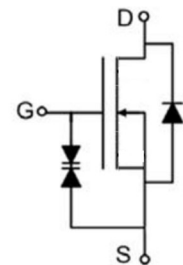
- Load Switch
- PWM Application
- Power management



SOT-23 top view



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
D1515	JMDL1515A	TAPING	SOT-23	7inch	3000	180000

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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	150	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ\text{C}$	0.2
		$T_A = 100^\circ\text{C}$	0.13
I_{DM}	Pulsed Drain Current <small>note1</small>	0.8	A
dv/dt	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	$T_A = 25^\circ\text{C}$	0.5
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	250	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = -15V, I _D =250μA	150	-	-	V
I _{D(off)}	Off-state Drain to Source Current	V _{DS} =150V, V _{GS} = -15V, T _J =25°C	-	-	0.1	μA
		V _{DS} =120V, V _{GS} =-15V, T _J =125°C	-	-	10	μA
I _{GSS}	Gate to Source Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
I _{DSS}	On-state drain current	V _{GS} =0V, V _{DS} =25V	0.2	-	-	A
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =3V, I _D =8μA	-8.0	-6.5	-5.0	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note2</small>	V _{GS} =10V, I _D =0.2A	-	7.3	10	Ω
		V _{GS} =0V, I _D =0.2A	-	9.5	15	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =-15V, f = 1.0MHz	-	12	-	pF
C _{oss}	Output Capacitance		-	5.5	-	pF
C _{rss}	Reverse Transfer Capacitance		-	2.1	-	pF
Q _g	Total Gate Charge	V _{DS} =75V, I _D =0.2A, V _{GS} =-10V to 0V	-	1.5	-	nC
Q _{gs}	Gate-Source Charge		-	0.8	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	0.55	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =75V, I _D =0.2A, R _{GEN} =20Ω, V _{GS} =-10V to 0V	-	9.5	-	ns
t _r	Turn-on Rise Time		-	21	-	ns
t _{d(off)}	Turn-off Delay Time		-	9	-	ns
t _f	Turn-off Fall Time		-	25	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.2	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	0.8	A
V _{SD}	Diode Forward Voltage	I _F =0.2A, V _{GS} =-15V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} =-15V, I _F =0.01A,	-	260	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	650	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



Figure 1: Output Characteristics

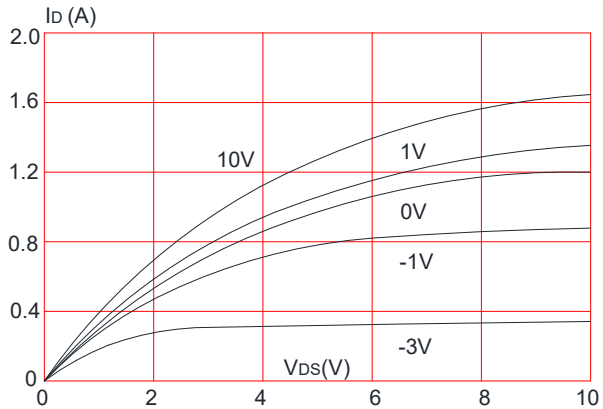


Figure 2: Typical Transfer Characteristics

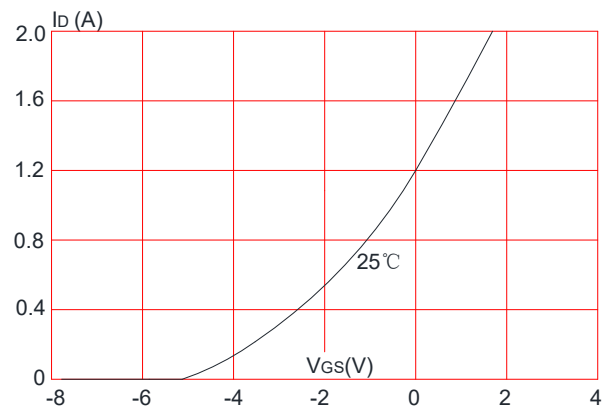


Figure 3: On-resistance vs. Drain Current

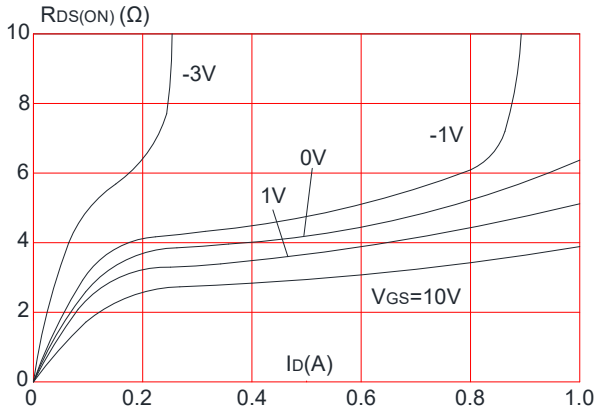


Figure 4: Body Diode Characteristics

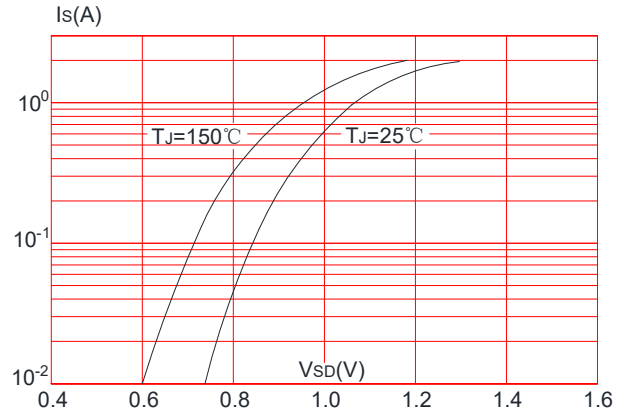


Figure 5: Gate Charge Characteristics

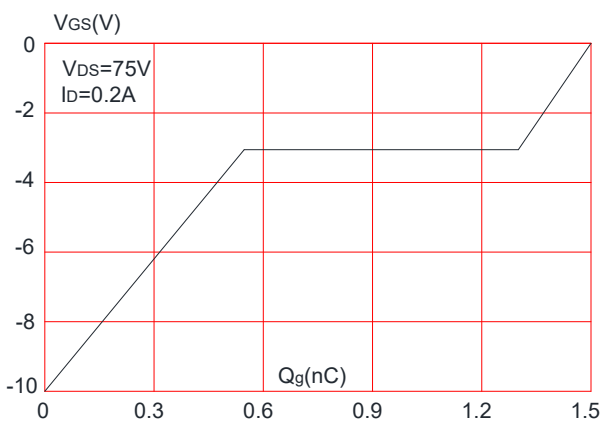


Figure 6: Capacitance Characteristics

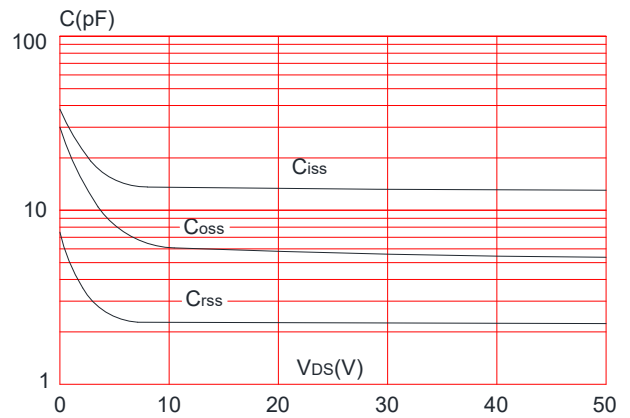




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

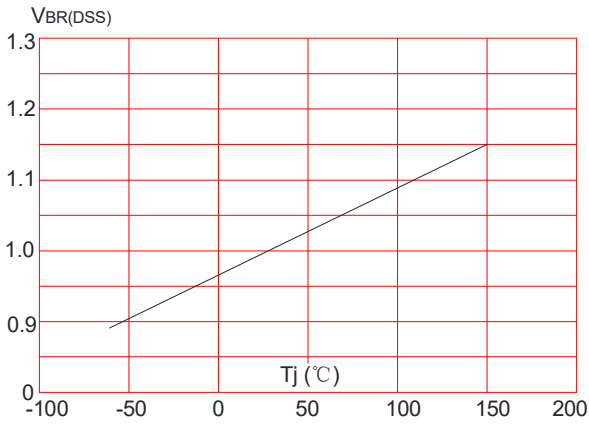


Figure 8: Normalized on Resistance vs. Junction Temperature

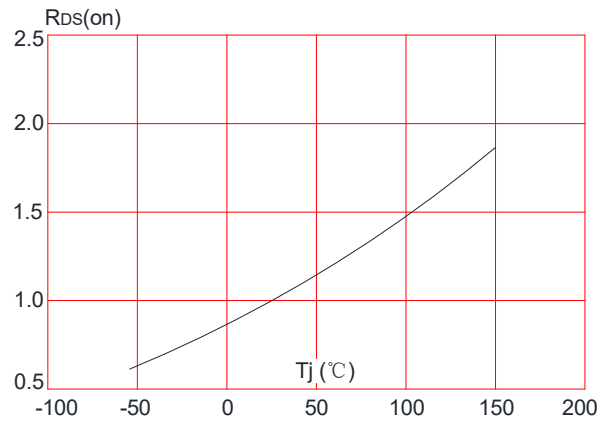


Figure 9: Maximum Safe Operating Area

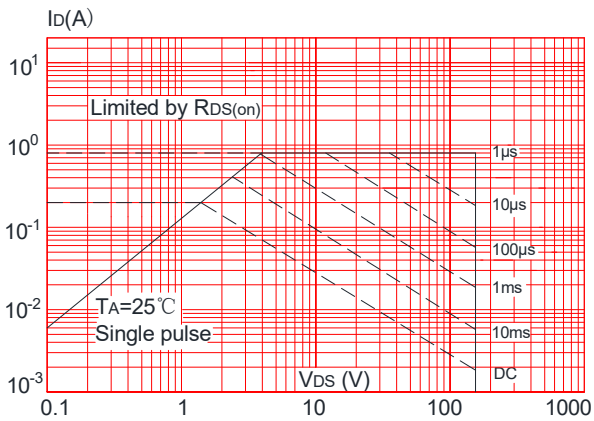


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

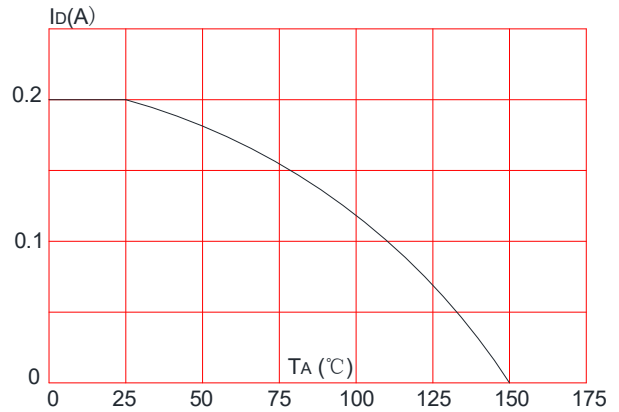
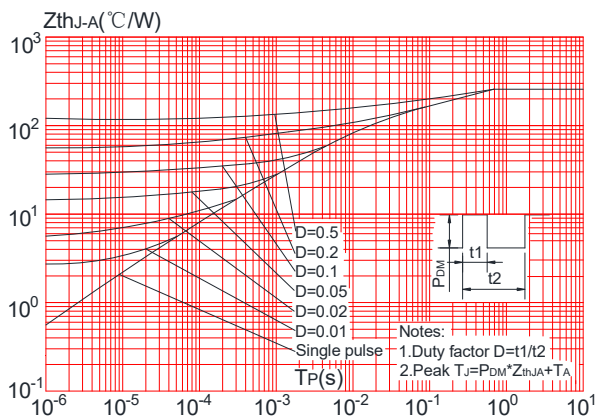


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit

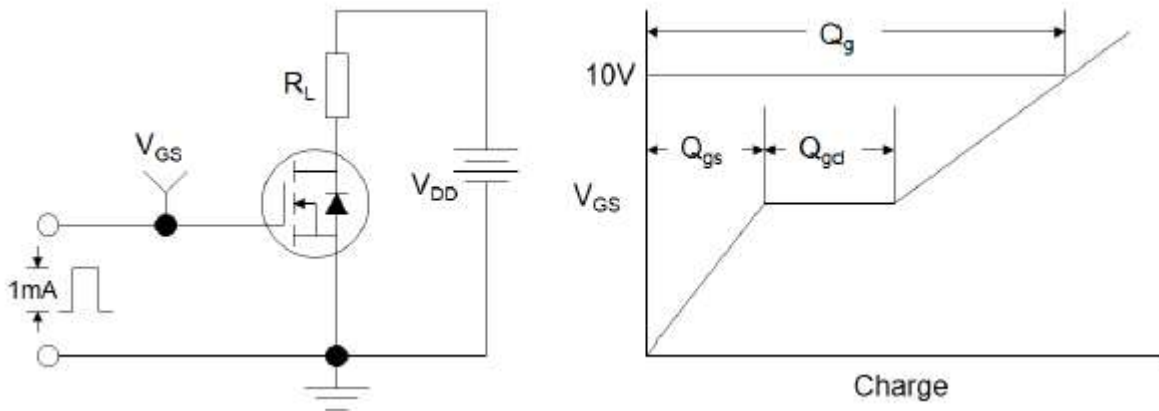


Figure1:Gate Charge Test Circuit & Waveform

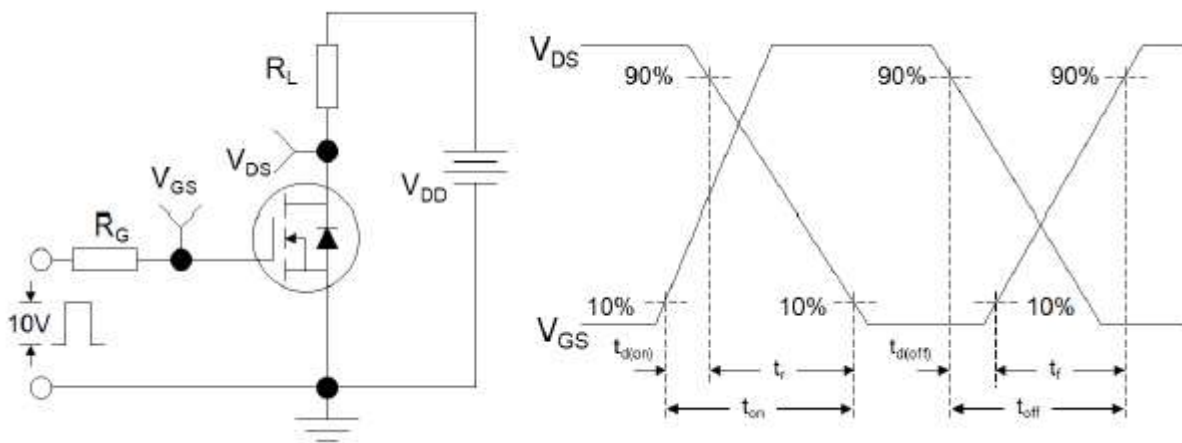


Figure 2: Resistive Switching Test Circuit & Waveforms

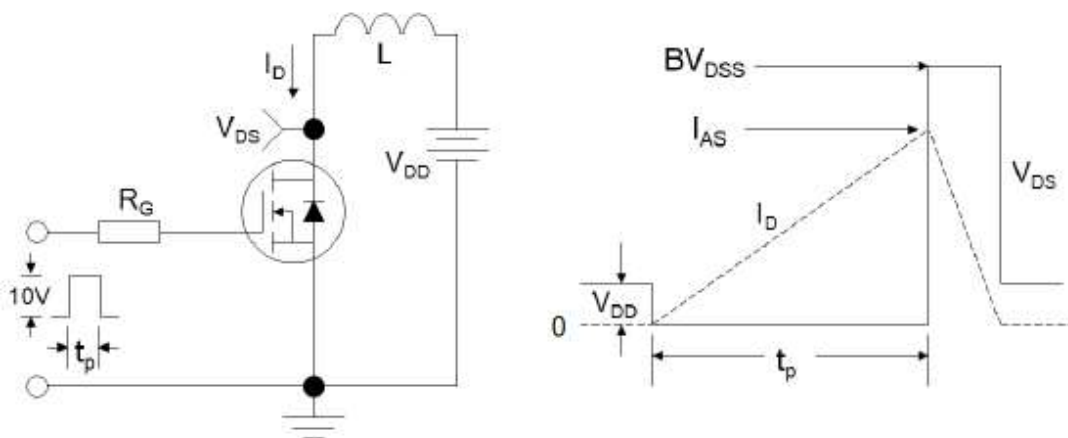



Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



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