Description

JMT N-channel Enhancement Mode Power MOSFET

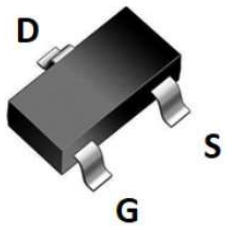
Features

- V_{DS}=50V, I_D=0.22A
  $R_{DS(ON)}$ <3Ω @ V_{GS} = 10V
  $R_{DS(ON)}$ <4Ω @ V_{GS} = 4.5V
- High Power and Current Handing Capability
- Lead Free Product is Acquired
- Surface Mount Package

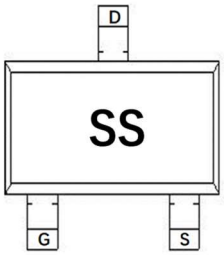
Application

- Battery Protection
- Load Switch
- Power Management

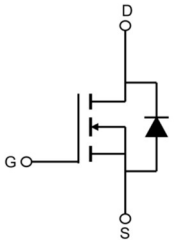
RoHS



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)
SS	JMTL138A	TAPING	SOT-23	13inch	4000	40000

Absolute Maximum Ratings (T_A=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		50	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25℃	220	mA
		T_A = 100℃	143	
I_{DM}	Pulsed Drain Current note1		880	mA
P_D	Power Dissipation	T_A = 25℃	0.3	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		417	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	50	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=50V, V_{GS}=0V,	-	-	1	μA
I_{GSS}	Gate to 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	0.8	1	1.45	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS}=10V, I_D=0.5A	-	1.5	3	Ω
		V_{GS}=4.5V, I_D=0.2A	-	1.8	4	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	40	-	pF
C_{oss}	Output Capacitance		-	12	-	pF
C_{rss}	Reverse Transfer Capacitance		-	3.5	-	pF
Qg	Total Gate Charge	VDS =25V, ID =0.2A, VGS =10V	-	3	-	nC
Qgs	Gate-Source Charge		-	0.6	-	nC
Qgd	Gate-Drain(“Miller”) Charge		-	0.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=20V, I_D=0.2A, R_{GEN}=10Ω, V_{GS}=10V,	-	-	20	ns
$t_{d(off)}$	Turn-off Delay Time		-	-	20	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.22	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	0.88	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =0.2A	-	-	1.2	V

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

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

Typical Performance Characteristics

Figure1: Output Characteristics

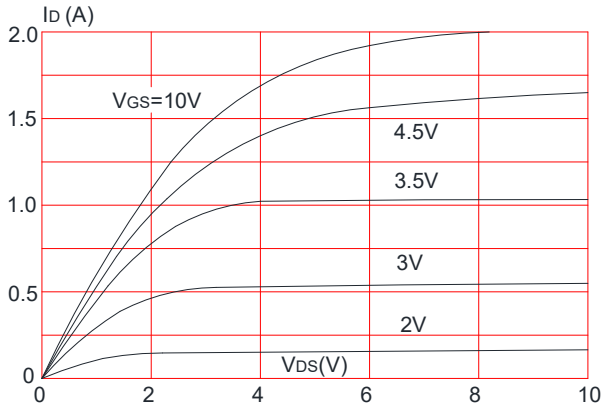


Figure 2: Typical Transfer Characteristics

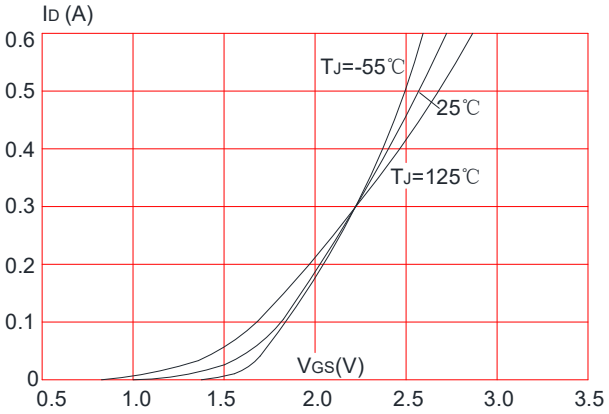


Figure 3: On-resistance vs. Drain Current

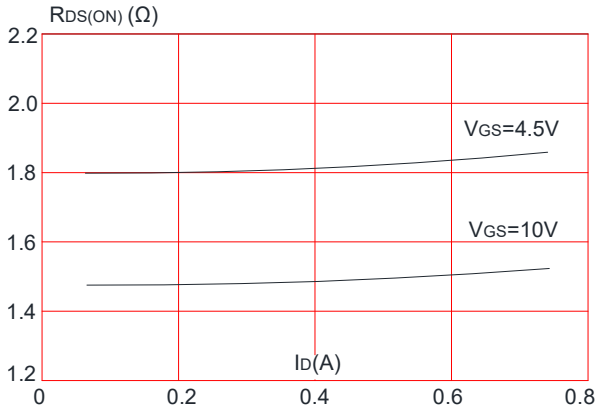


Figure 4: Body Diode Characteristics

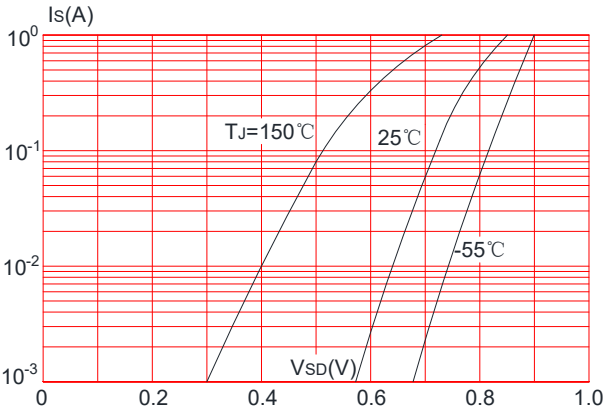


Figure 5: Gate Charge Characteristics

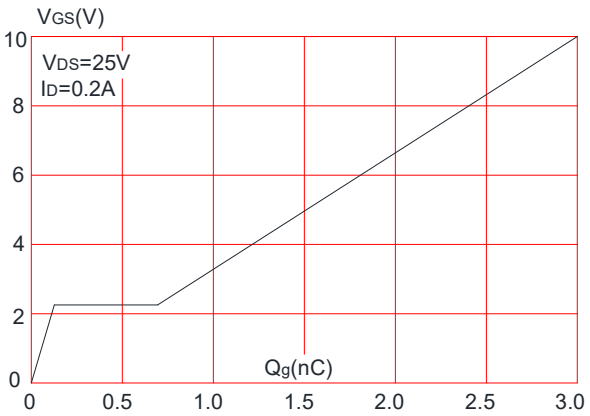


Figure 6: Capacitance Characteristics

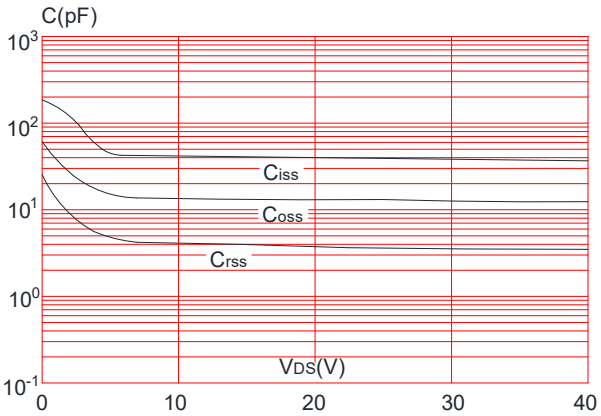


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

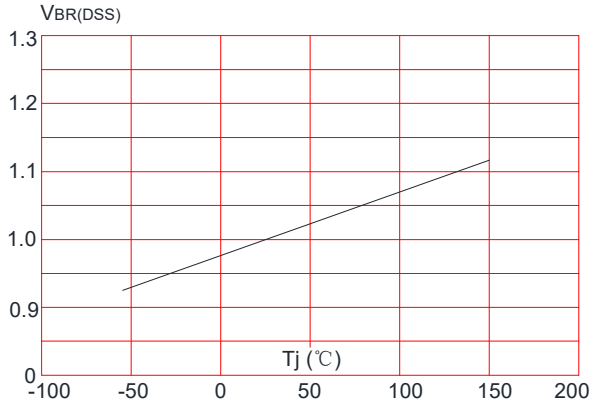


Figure 8: Normalized on Resistance vs. Junction Temperature

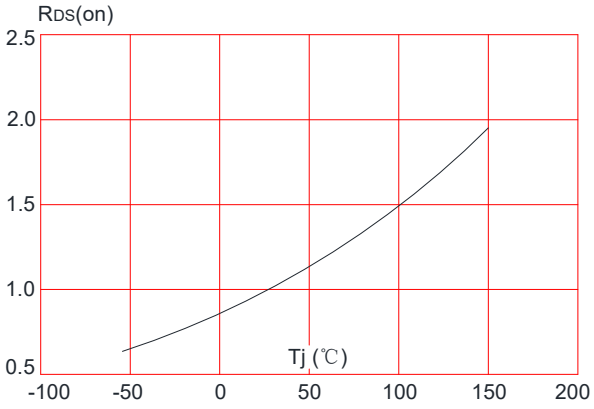


Figure 9: Maximum Safe Operating Area

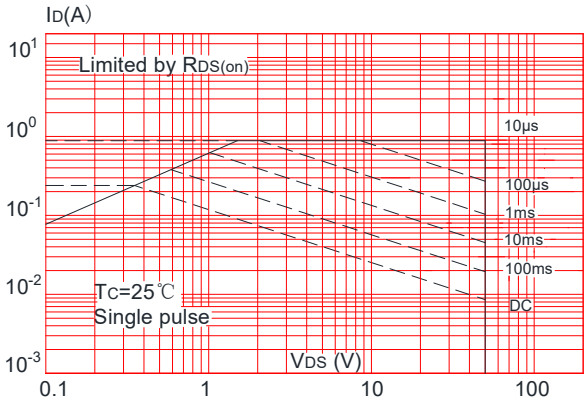


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

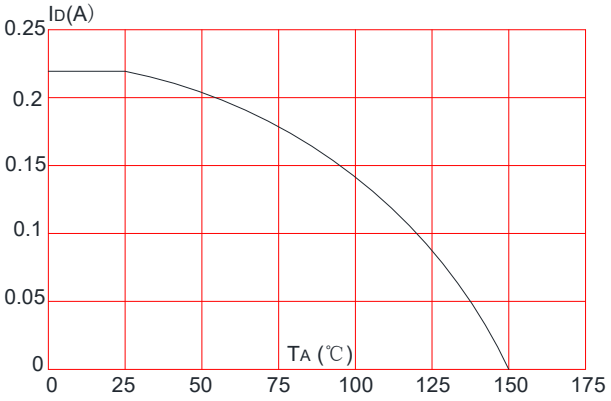
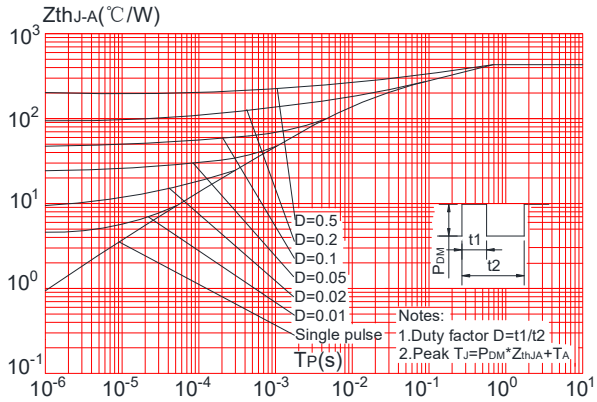


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit

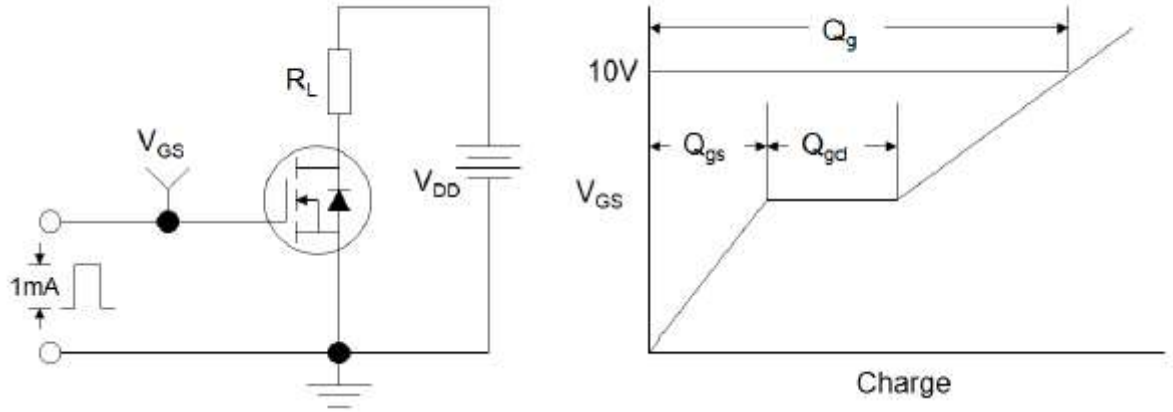


Figure1:Gate Charge Test Circuit & Waveform

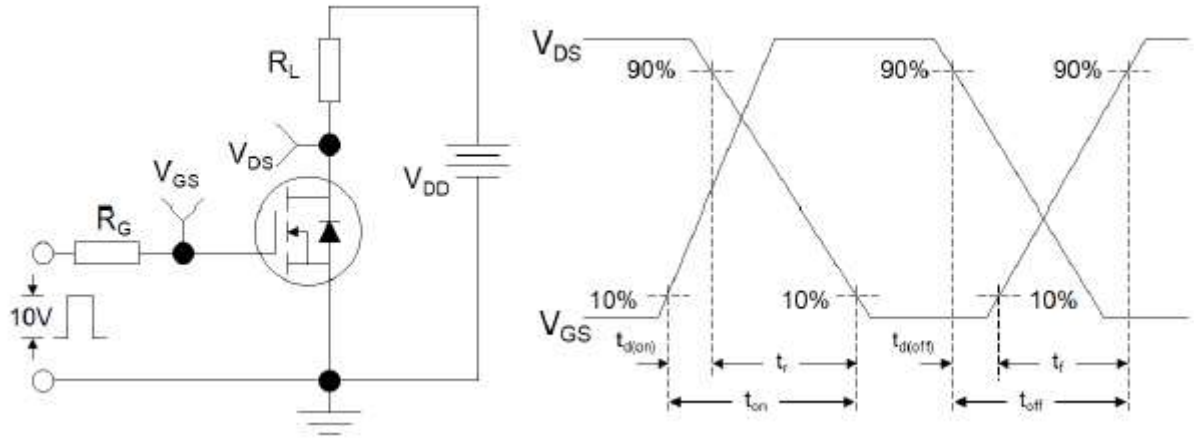


Figure 2: Resistive Switching Test Circuit & Waveforms

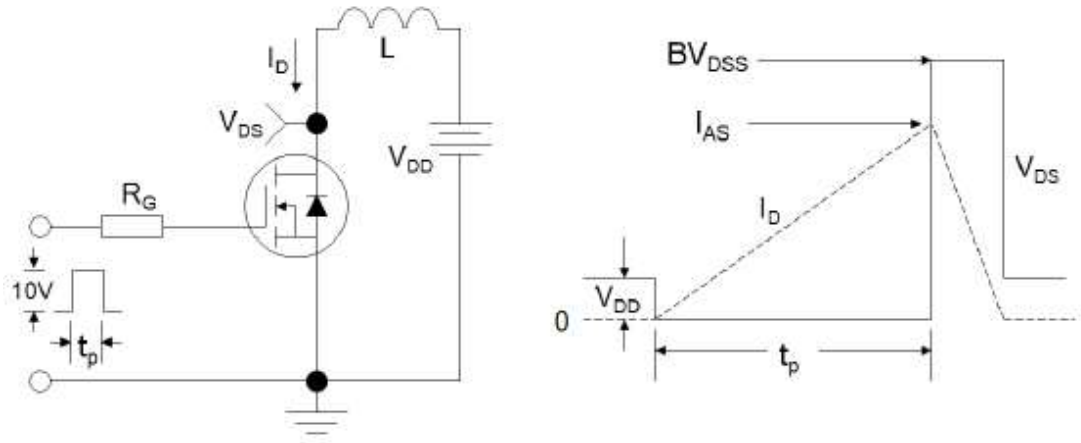
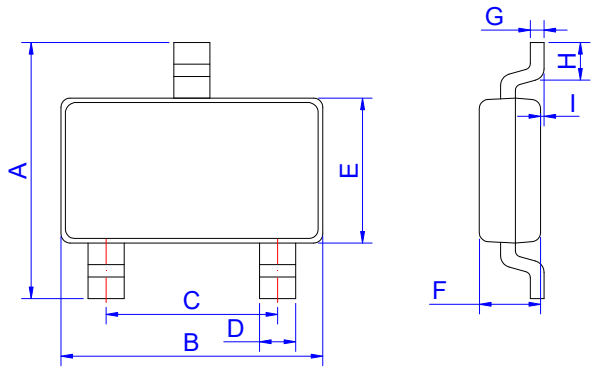


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

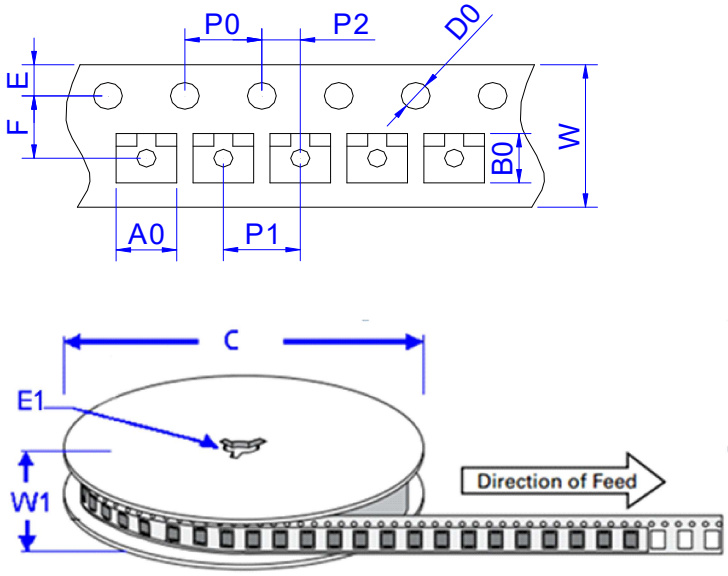
Package Mechanical Data-SOT-23



SOT-23

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

Package Information-SOT-23



Ref.	Dimensions	
	Millimeters	Inches
A0	3.15 ± 0.3	0.124 ± 0.012
B0	2.77 ± 0.3	0.109 ± 0.012
C	178	7.0
D0	1.50±0.1	0.059 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3±0.3	0.524± 0.012
F	3.5 ± 0.2	0.138 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	8.00 ± 0.2	0.315 ± 0.008
W1	11.5±1.0	0.453 ± 0.039

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