

JMTLB138K

Features

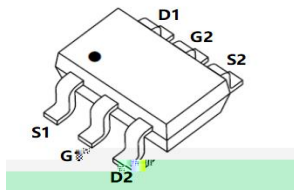
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Halogen-free; RoHS-compliant
- Pb-free plating

Applications

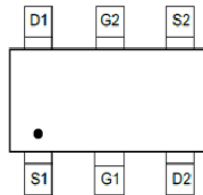
- Load Switch
- PWM Application
- Power Management

Product Summary

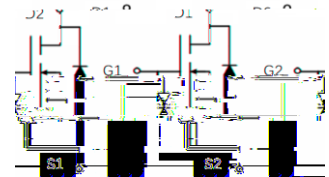
Parameters	Value	Unit
V_{DSS}	60	V
$V_{GS(th_Typ)}$	1.0	V
$I_D(@V_{GS}=10V)$	0.41	A
$R_{DS(ON_Typ)}(@V_{GS}=10V)$	805	mΩ
$R_{DS(ON_Typ)}(@V_{GS}=4.5V)$	871	mΩ



SOT-363-6L Dual top view



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMTLB138K	B138K	3	Tape&Reel	SOT-363-6L	3000	120000

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-to-Source Voltage	60	V
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ\text{C}$	A
		$T_A = 100^\circ\text{C}$	
I_{DM}	Pulsed Drain Current ⁽¹⁾	Refer to Fig.4	A
P_D	Power Dissipation	$T_A = 25^\circ\text{C}$	W
		$T_A = 100^\circ\text{C}$	
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

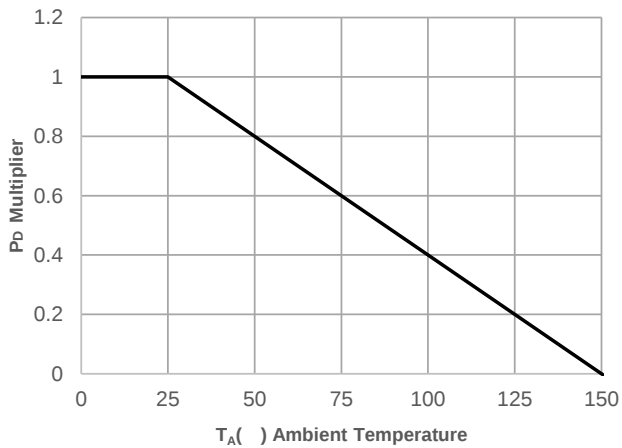
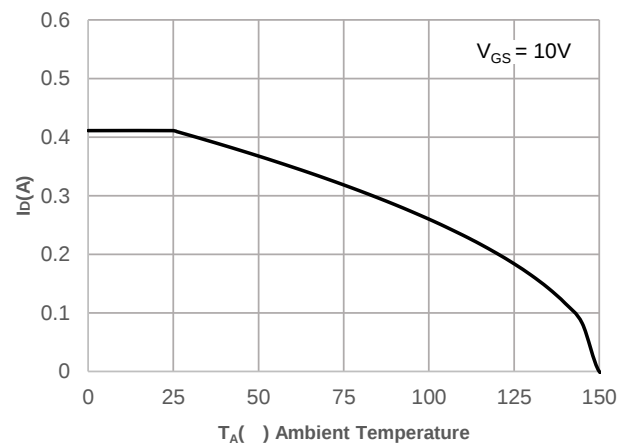
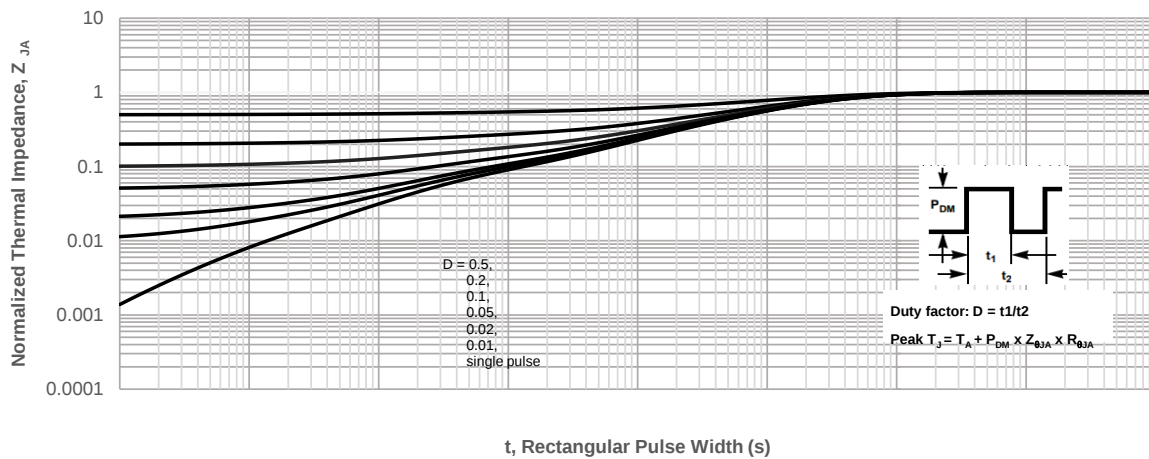
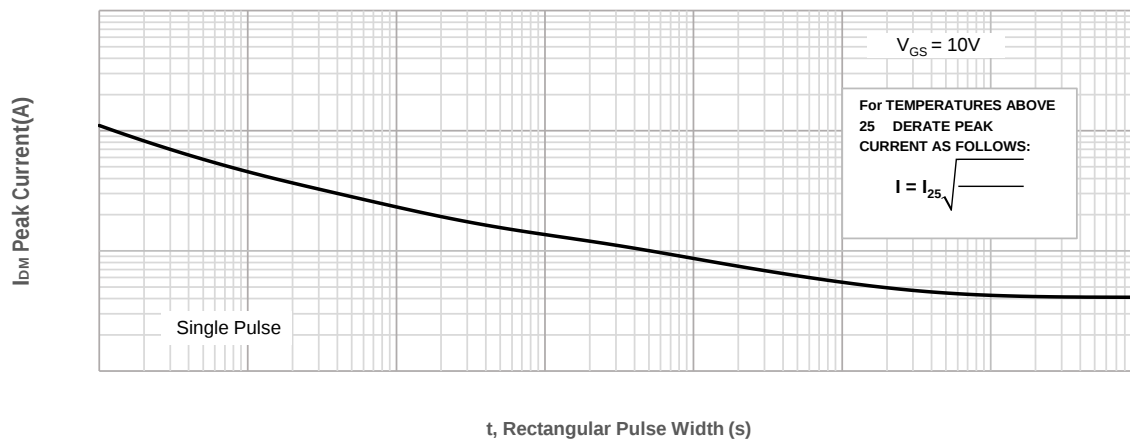
Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽²⁾	231	$^\circ\text{C/W}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ 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	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±10	μA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.6	1.0	1.6	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10, I _D = 0.3A	-	805	1600	mΩ
		V _{GS} = 4.5V, I _D = 0.2A	-	871	1700	mΩ
Dynamic Characteristics						
R _g	Gate Resistance	f = 1MHz	-	6.8	-	Ω
C _{iSS}	Input Capacitance	V _{GS} = 0V, V _{DS} = 30V, f = 1MHz	-	38	56	pF
C _{oss}	Output Capacitance		-	5.8	-	pF
C _{rSS}	Reverse Transfer Capacitance		-	2.1	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 30V, I _D = 1A	-	1.7	-	nC
Q _{gs}	Gate Source Charge		-	0.3	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	0.2	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 30V I _D = 0.3A, R _{GEN} = 3Ω	-	0.6	-	ns
t _r	Turn-On Rise Time		-	2.4	-	ns
t _{d(off)}	Turn-Off DelayTime		-	6.3	-	ns
t _f	Turn-Off Fall Time		-	9.2	-	ns
Body Diode Characteristics						
I _S	Maximum Continuous Body Diode Forward Current		-	-	0.41	A
I _{SM}	Maximum Pulsed Body Diode Forward Current		-	-	1.6	A
V _{SD}	Body Diode Forward Voltage	V _{GS} = 0V, I _S = 0.3A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 1A, di/dt = 100A/us	-	15	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	6.1	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
 3. Pulse Test: Pulse Width 300 μs , Duty Cycle 0.5%.

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


Typical Performance Characteristics

Figure 5: Output Characteristics

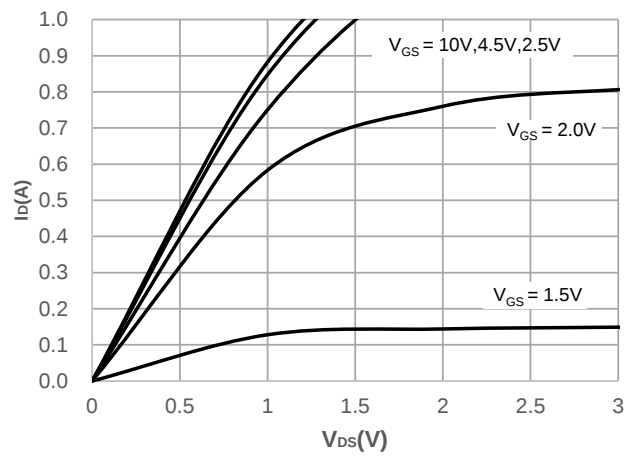


Figure 6: Typical Transfer Characteristics

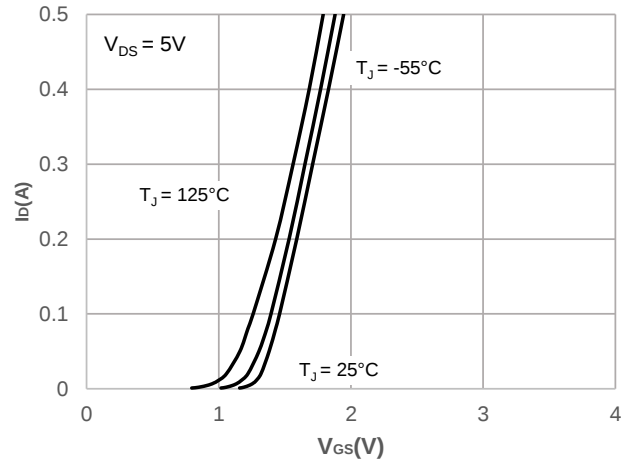
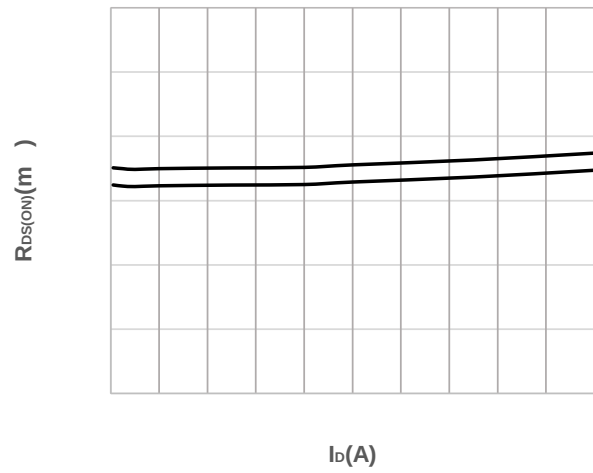


Figure 7: On-resistance vs. Drain Current



Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

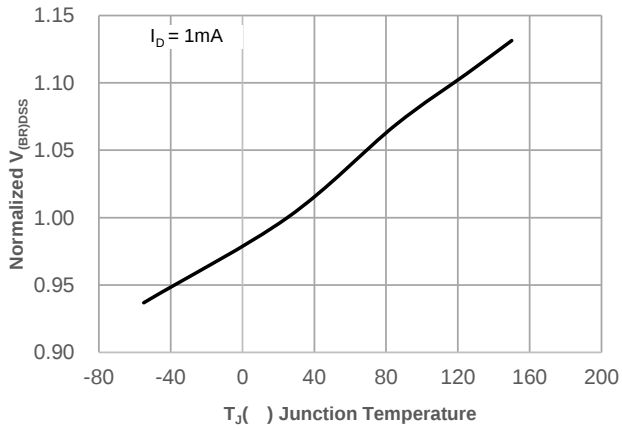


Figure 12: Normalized on Resistance vs. Junction Temperature

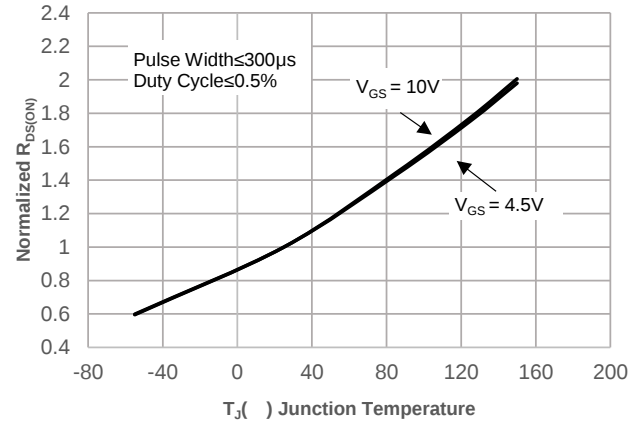


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

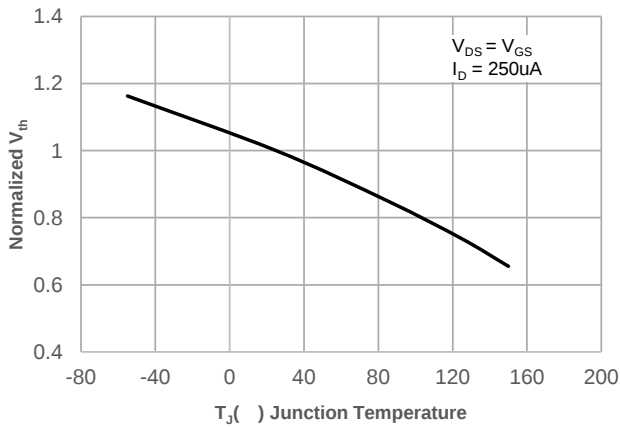


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

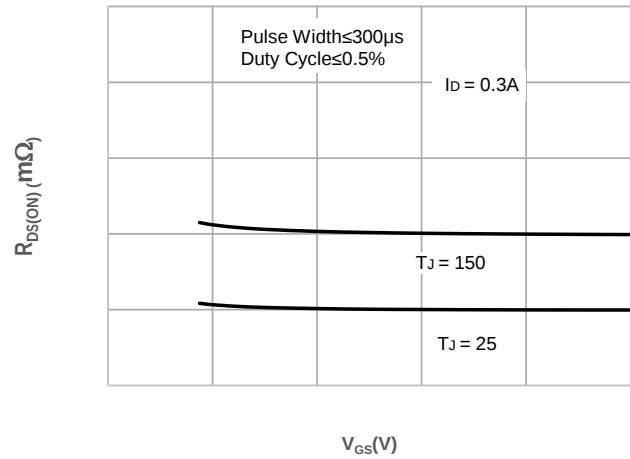
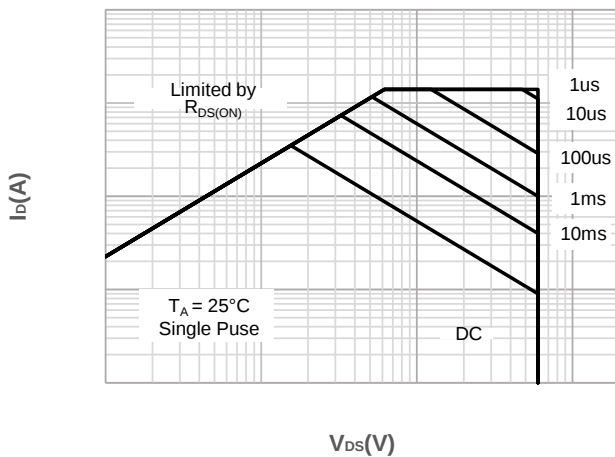


Figure 15: Maximum Safe Operating Area



Test Circuit



Figure 1: Gate Charge Test Circuit & Waveform

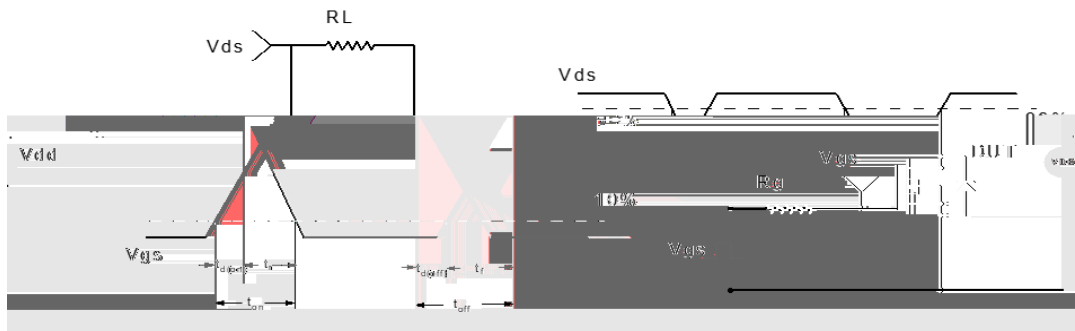


Figure 2: Resistive Switching Test Circuit & Waveform

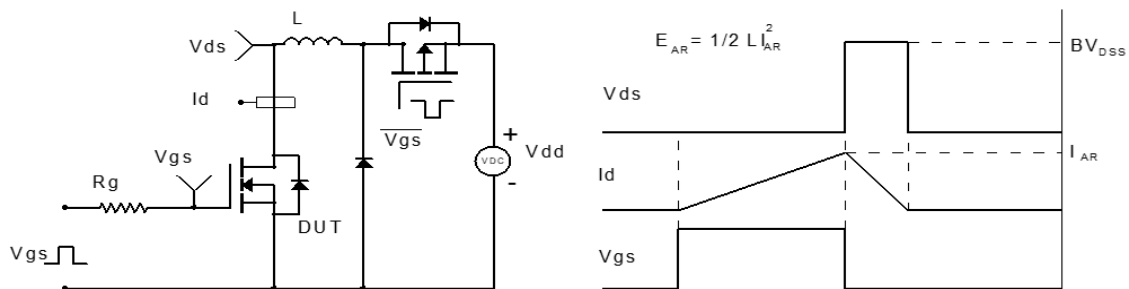


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

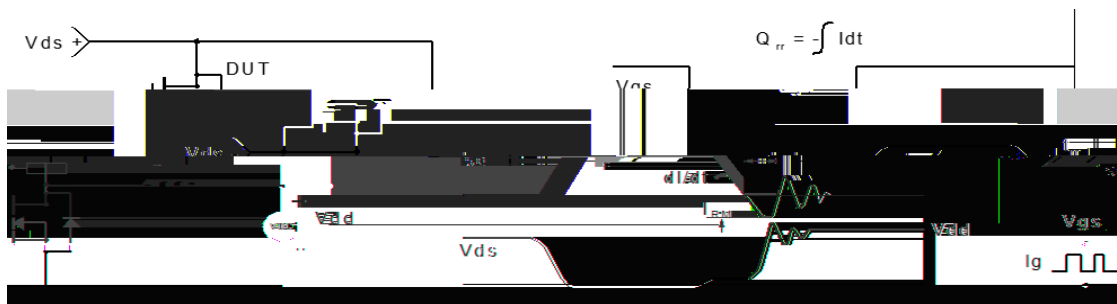
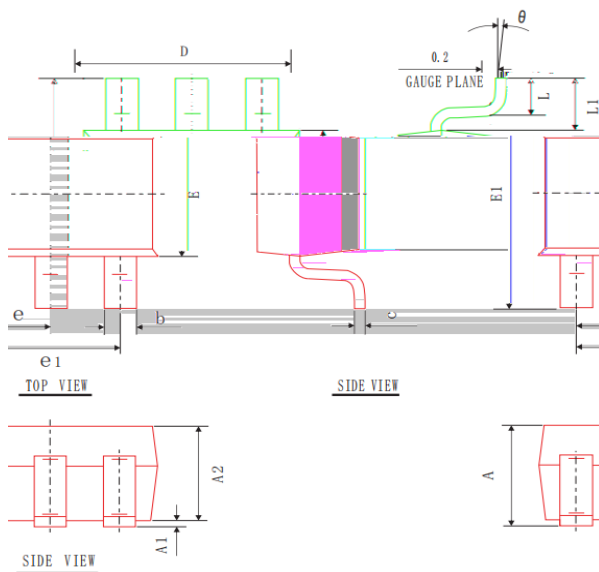


Figure 4: Diode Recovery Test Circuit & Waveform



Package Mechanical Data(SOT-363-6L)

Package Outline



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
0.45	0.40	0.50	0.55
0.95	0.90	1.00	1.05
0.25	0.20	0.30	0.35
0.10	0.05	0.15	0.20
1.30	1.20	1.40	1.50
2.10	2.00	2.20	2.30
1.25	1.15	1.35	1.45
2.30	2.20	2.40	2.50
0.36	0.30	0.46	0.50
4°	0°	8°	12°
0.525 REF			
0.65 TYP			
0A1			
0A2			
b			
c			
e1			
D			
E			
E1			
L			
θ			
L1			
e			

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.

