

JMSH1001MTHL

Product Summary

Parameters	Value	Unit
V_{DSS}	100	V
$V_{GS(th_Typ)}$	2.9	V
$I_D(@V_{GS}=10V)$	447	A
$R_{DS(ON_Typ)}(@V_{GS}=10V)$	1.1	mΩ

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSH1001MTHL-13	SH1001M	1	Tape&Reel	TOLT	1800	9000

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-to-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	±20	V
I_D	Continuous Drain Current	$T_C = 25^{\circ}C$ 447 $T_C = 100^{\circ}C$ 283	A
I_{DM}	Pulsed Drain Current ⁽¹⁾	Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	1987	mJ
P_D	Power Dissipation	$T_C = 25^{\circ}C$ $T_C = 100^{\circ}C$	W
T_J, T_{STG}			$^{\circ}C$

Symbol	Parameter	Max	Unit
R	Thermal Resistance, Junction to Ambient ⁽³⁾	33	$^{\circ}C/W$
R	Thermal Resistance, Junction to Case	0.255 $\text{f}^{\circ}C/W$	

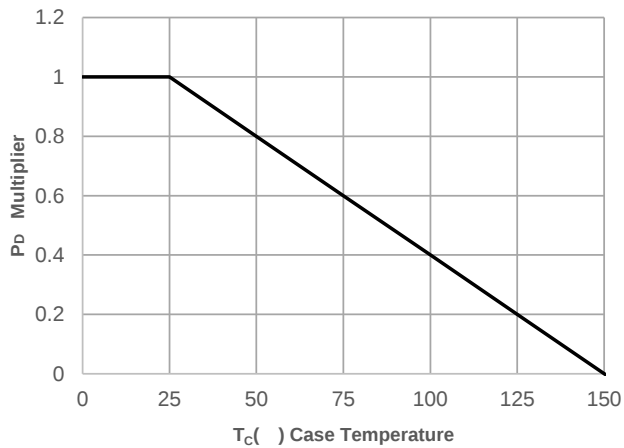
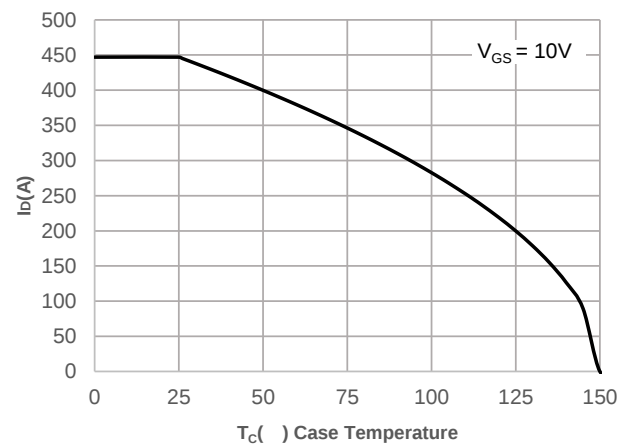
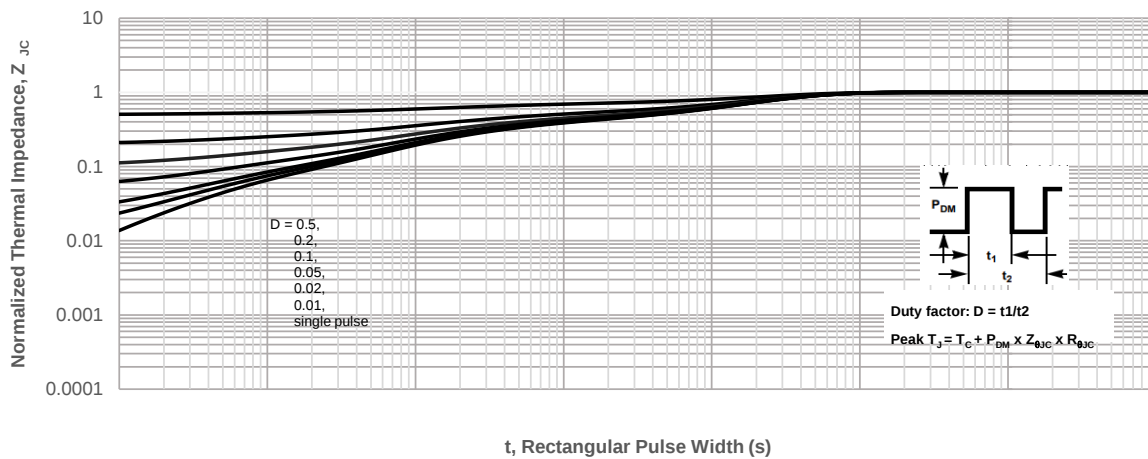
**Electrical Characteristics** ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 80V, 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	2.0	2.9	3.8	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _D = 20A	-	1.1	1.4	mΩ
Dynamic Characteristics						
R _g	Gate Resistance	f = 1MHz	-	3.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 50V, f = 1MHz	-	13360	20040	pF
C _{oss}	Output Capacitance		-	5113	7669	pF
C _{rss}	Reverse Transfer Capacitance		-	122	244	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 50V, I _D = 20A	-	217	-	nC
Q _{gs}	Gate Source Charge		-	65	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	57	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 50V I _D = 20A, R _{GEN} = 3Ω	-	41	-	ns
t _r	Turn-On Rise Time		-	69	-	ns
t _{d(off)}	Turn-Off DelayTime		-	157	-	ns
t _f	Turn-Off Fall Time		-	92	-	ns
Body Diode Characteristics						
I _S	Maximum Continuous Body Diode Forward Current		-	-	447	A
I _{SM}	Maximum Pulsed Body Diode Forward Current		-	-	1788	A
V _{SD}	Body Diode Forward Voltage	V _{GS} = 0V, I _S = 20A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 20A, di/dt = 100A/us	65	130	196	ns
Qrr	Body Diode Reverse Recovery Charge		-	374	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 50\text{V}$, $V_{GS} = 10\text{V}$, $R_G = 25\text{ohm}$, $L = 3\text{mH}$, $I_{AS} = 36.4\text{A}$, $V_{DD} = 0\text{V}$ during time in avalanche.
 3. R is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
 4. Pulse Test: Pulse Width 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

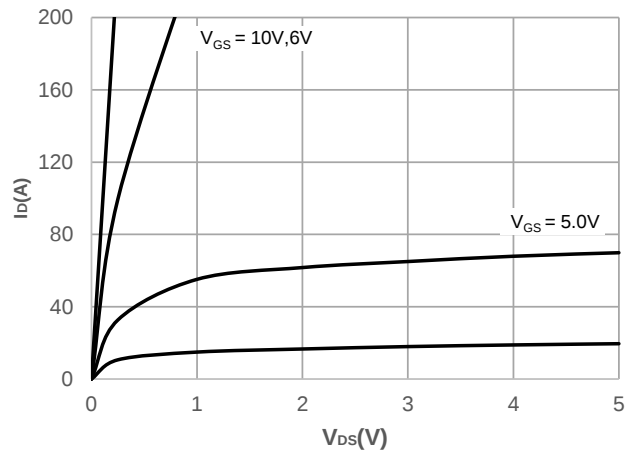


Figure 6: Typical Transfer Characteristics

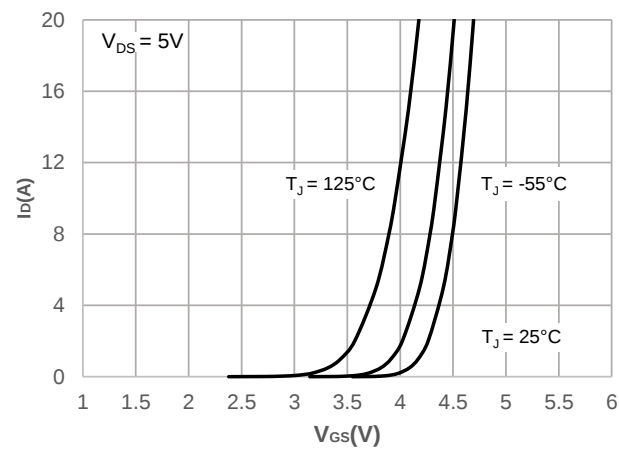


Figure 7: On-resistance vs. Drain Current

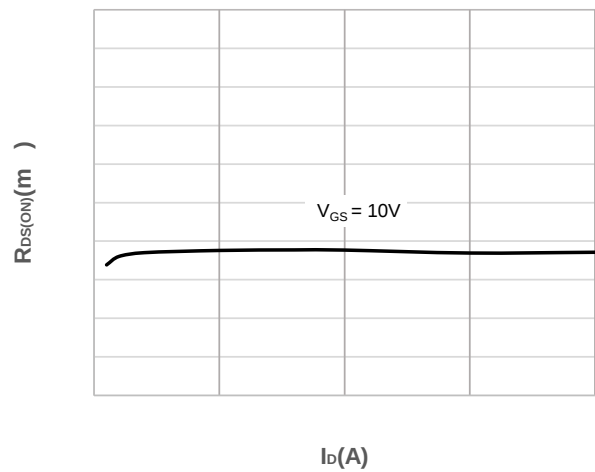


Figure 8: Body Diode Characteristics

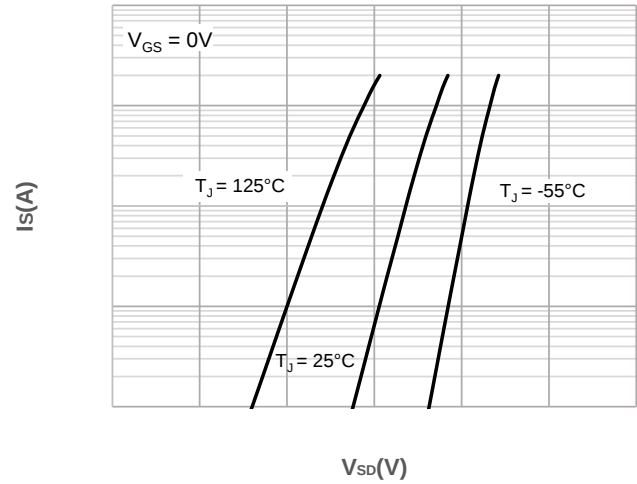
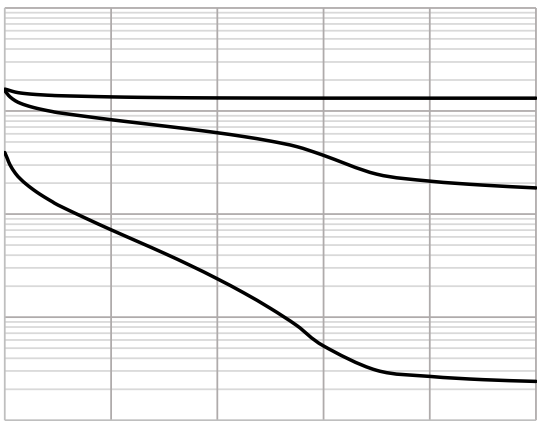
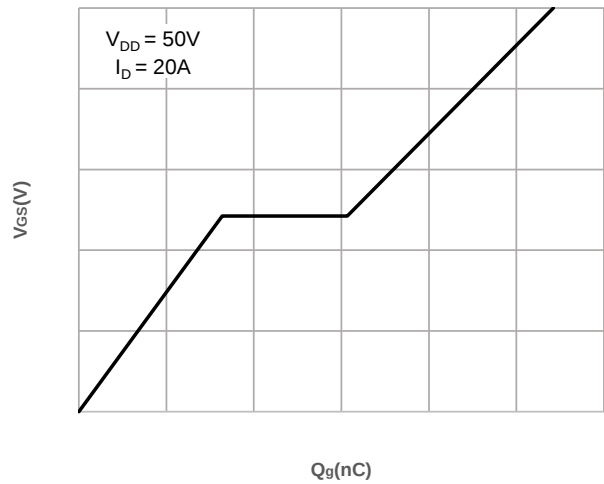


Figure 9: Gate Charge Characteristics



Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

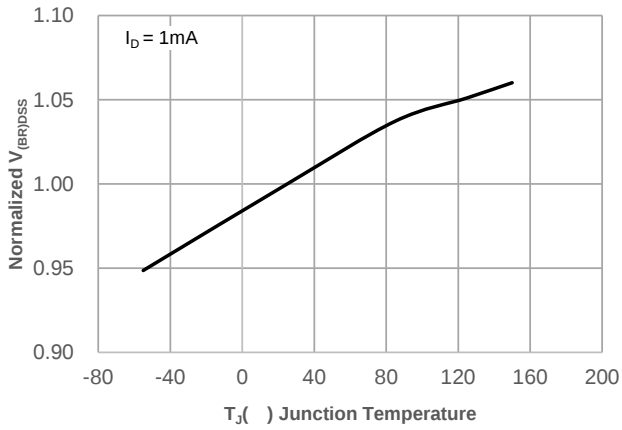


Figure 12: Normalized on Resistance vs. Junction Temperature

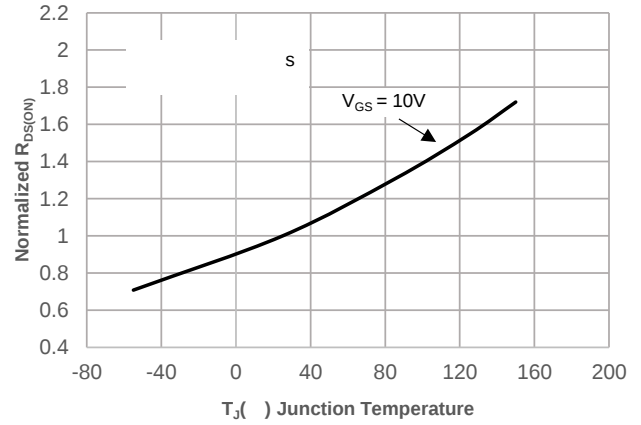


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

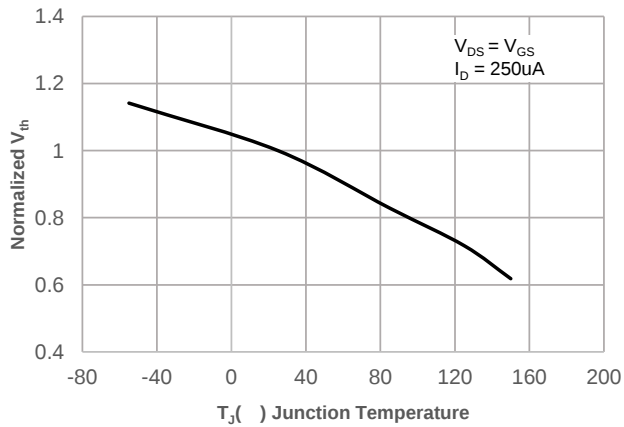


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

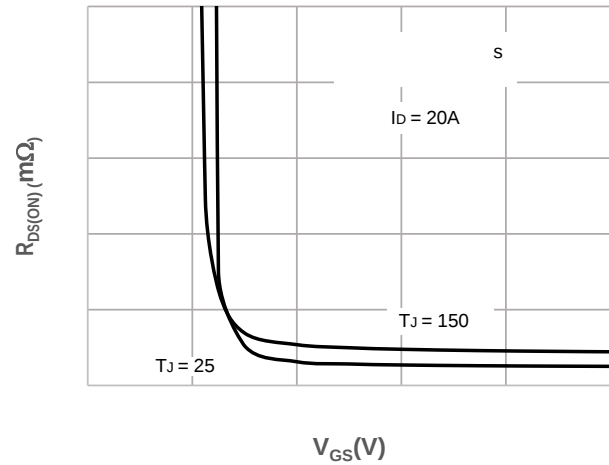
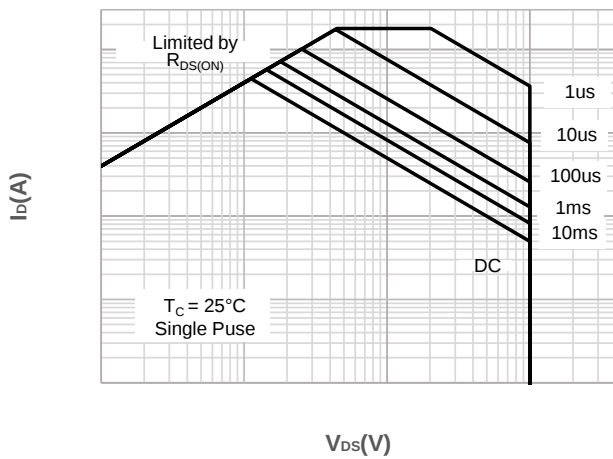


Figure 15: Maximum Safe Operating Area



Test Circuit



Figure 1: Gate Charge Test Circuit & Waveform

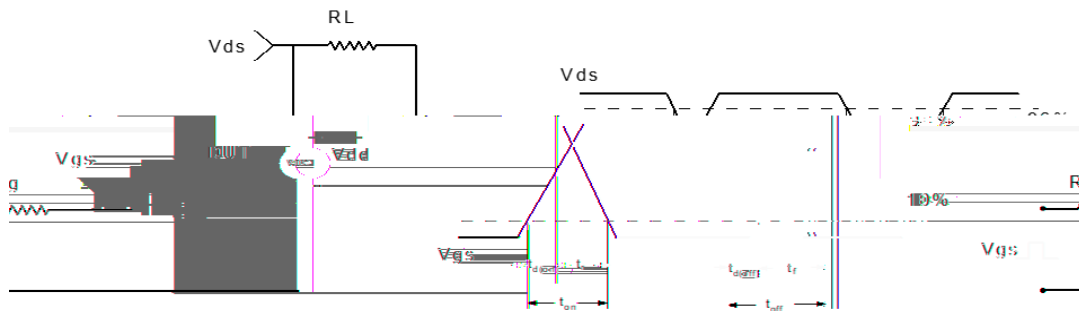


Figure 2: Resistive Switching Test Circuit & Waveform

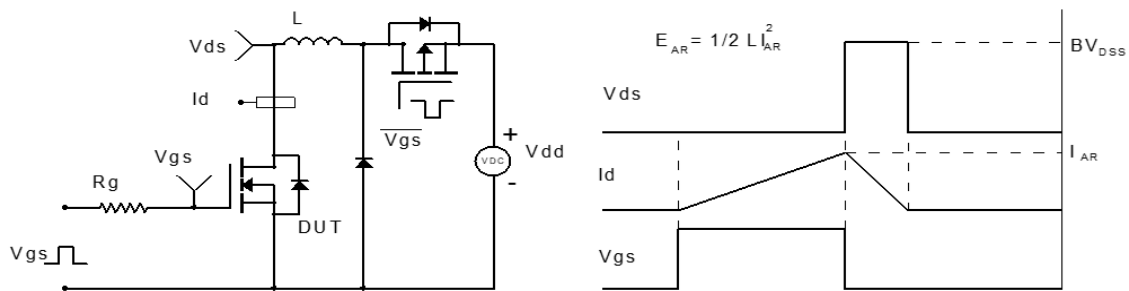


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

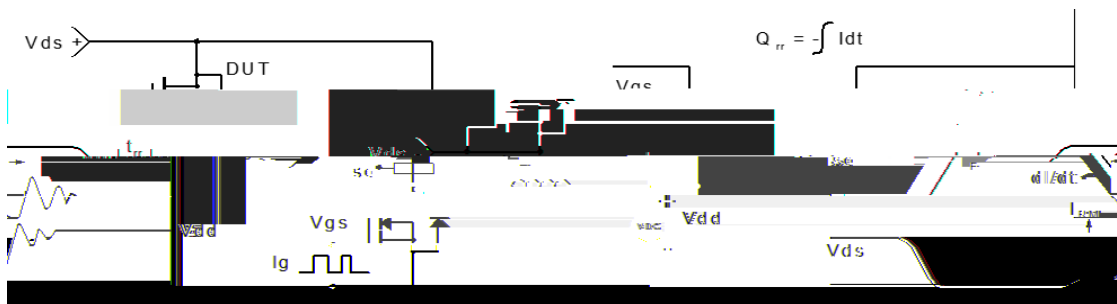


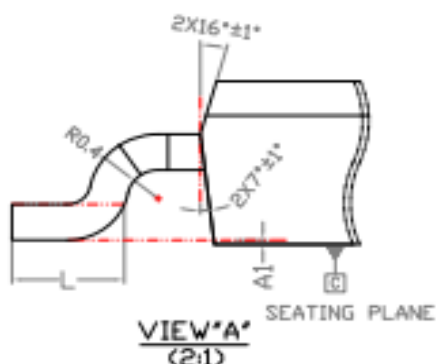
Figure 4: Diode Recovery Test Circuit & Waveform

The drawing shows three views of a mechanical part:

- Side View:** Shows the profile of the part with dimensions $2 \times 12 \pm 1$ and $2 \times 10 \pm 1$. It includes a section line A-A and a feature callout A2.
- Bottom View:** Shows the bottom of the part with dimensions 15 and 9 . It includes a section line B-B and a feature callout B2.
- Top View:** Shows the top of the part with dimensions 15 and 9 . It includes a section line C-C and a feature callout C2.

The drawing also includes a detail view of a hole with a diameter of $\phi 0.8$ and a depth of 1.3 . The part is labeled with a part number $1.3-REF$.

SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
*A	2.200	2.300	2.400	0.087	0.091	0.094
A1	0.010	—	0.050	0.0004	—	0.002
A2	1.500	1.540	1.580	0.059	0.061	0.062
*b	0.600	0.700	0.800	0.024	0.028	0.031
C	0.400	0.500	0.600	0.016	0.020	0.024
*D	9.700	9.900	10.100	0.382	0.390	0.398
D1	8.300 REF	—	—	0.327 REF	—	—
D2	9.460 REF	—	—	0.372 REF	—	—
E	14.800	15.000	15.200	0.583	0.591	0.598
*E1	10.000	10.100	10.300	0.394	0.398	0.406
E2	5.570	—	5.770	0.219	—	0.227
E3	2.240 REF	—	—	0.088 REF	—	—
E4	2.000 REF	—	—	0.079 REF	—	—
*e	1.200 BSC	—	—	0.047 BSC	—	—
e1	8.400 BSC	—	—	0.331 BSC	—	—
e2	0.750 BSC	—	—	0.030 BSC	—	—
H	4.850	5.050	5.250	0.191	0.199	0.207
K	2.570 REF	—	—	0.101 REF	—	—
*L	1.363	1.463	1.563	0.054	0.058	0.062
L1	2.250	2.450	2.650	0.089	0.096	0.104
P	2.900	3.000	3.100	0.114	0.118	0.122
φ	0"	1"	2"	—	—	—



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.