1. Description

BLM90N10L uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

KEY CHARACTERISTICS

Parameter	Value	Unit
V_{DS}	100	V
I_D	14	A
$R_{DS(ON).Typ}$@10V	75	mΩ
$R_{DS(ON).Typ}$@4.5V	105	mΩ

TO-252 Top View

TO-251 Top View

FEATURES

- High power and current handing capability
- Lead free product is acquired
- 100% avalanche tested
- RoHS product

APPLICATIONS

- Load switch
- Power management

ORDERING INFORMATION

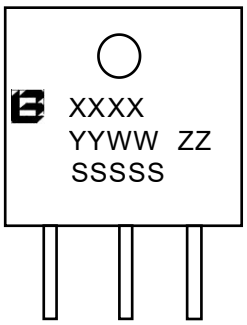
Device Marking	Ordering Codes	Package	Product Code	Packing
M90N10L	BLM90N10L-D	TO-252	BLM90N10L	Reel
M90N10L	BLM90N10L-U	TO-251	BLM90N10L	Tube

BLM90N10L-D,U

(2) Package type

(1) Chip name

(1)BLM90N10L:100V 90mΩ
(2)D:TO-252 U:TO-251



XXXX：Device Marking

YYWW：Year&Week

ZZ：Assembly Code

SSSSS：Lot Code

2. ABSOLUTE RATINGS

at T_C = 25°C, unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	100	V
I_D	Continuous Drain Current	14	A
	Continuous Drain Current T_C = 100 °C	10	A
I_{DM}	Pulsed Drain Current(Note1)	56	A
P_D	Power Dissipation	38	W
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy(Note2)	16	mJ
T_J， T_{stg}	Operating Junction and Storage Temperature Range	175，-55 to 175	℃
T_L	Maximum Temperature for Soldering	300	℃

3. Thermal characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Junction-to-Case	3.9	℃/W

4. Electrical Characteristics

at T_C = 25°C, unless otherwise specified

OFF Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} =100V, V_{GS}= 0V, T_j= 25℃	--	--	1	μA
I_{GSS}	Gate to Source Forward Leakage	V_{GS} =±20V	--	--	±100	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=6A(Note3)	--	75	90	mΩ
		V_{GS}=4.5V, I_D=4A(Note3)	--	105	130	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D =250μA(Note3)	1.0	2.0	2.5	V

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
R_g	Gate resistance	f = 1.0MHz	--	1.0	--	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	--	670	--	pF
C_{oss}	Output Capacitance		--	47	--	
C_{rss}	Reverse Transfer Capacitance		--	38	--	

Switching Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =5A V_{DD} =50V V_{GS} = 10V R_G =2.5Ω	--	10	--	ns
t_r	Rise Time		--	7	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	34	--	
t_f	Fall Time		--	9	--	
Q_g	Total Gate Charge	I_D =10A V_{DS} =80V V_{GS} = 10V	--	20	--	nC
Q_{gs}	Gate to Source Charge		--	5	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	5.7	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)	T_C=25 °C	--	--	14	A
V_{SD}	Diode Forward Voltage	I_S=6A, V_{GS}=0V(Note3)	--	--	1.2	V

Note1: Pulse width limited by maximum junction temperature
Note2: Eas condition：Vg=10V,L=0.5mH, Vds=50V, Start TJ=25℃, Ias=8A
Note3: Pulse width tp≤300μs, δ≤2%

5. Characteristics Curves

Figure 1 Output Characteristics

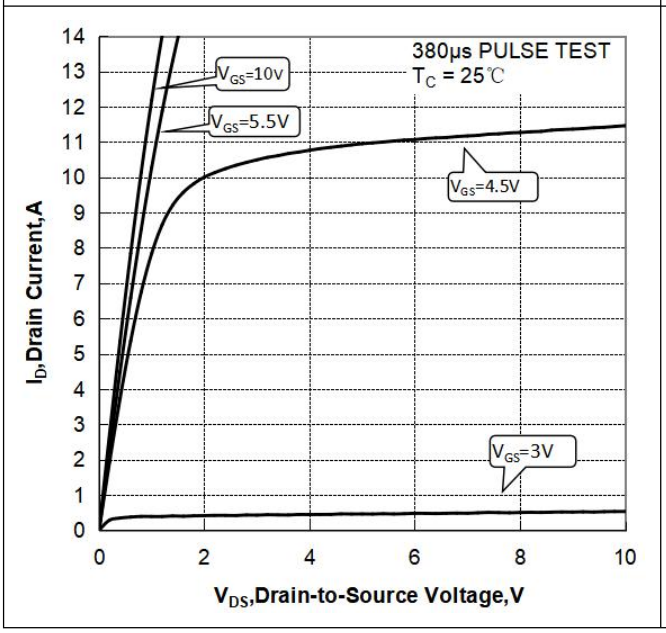


Figure 2 Transfer Characteristics

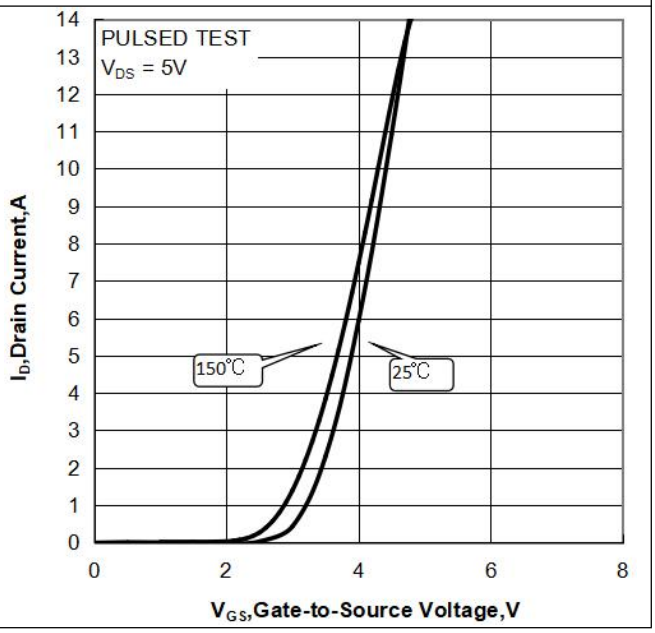


Figure 3 On-Resistance vs. I_D

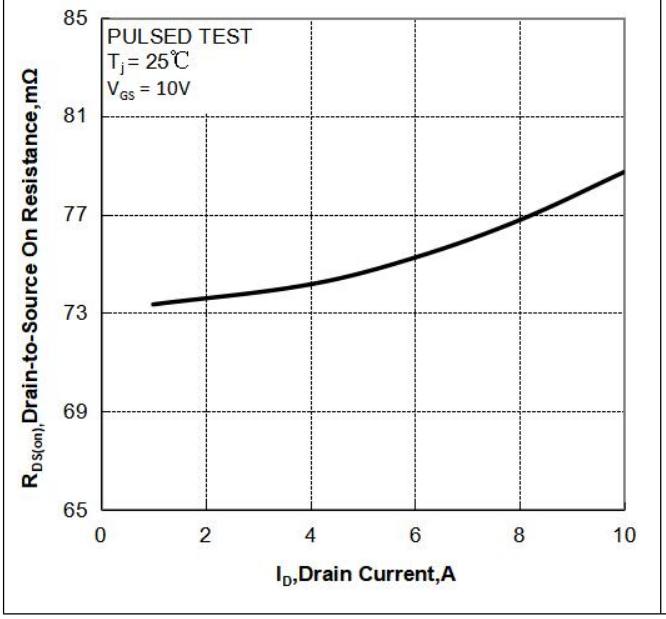


Figure 4 On-Resistance vs. Junction Temperature

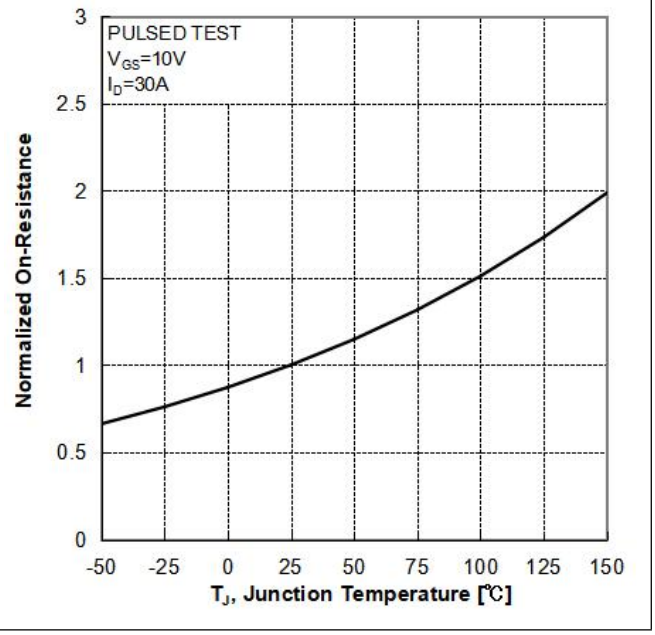


Figure 5 BV vs Junction Temperature

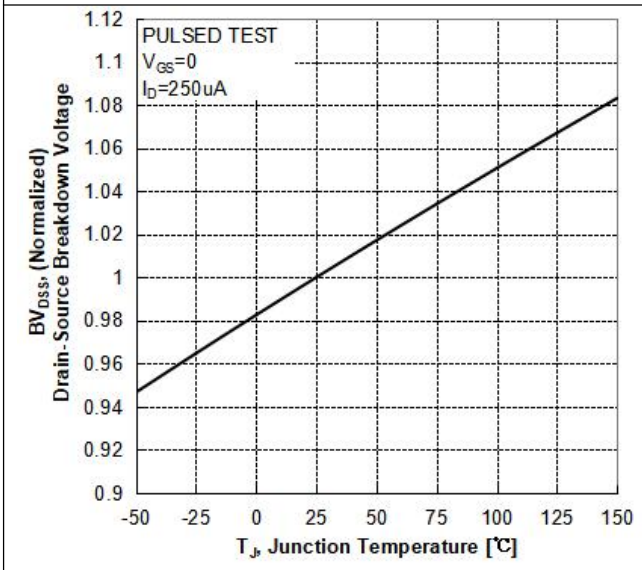


Figure 6 Vth vs Junction Temperature

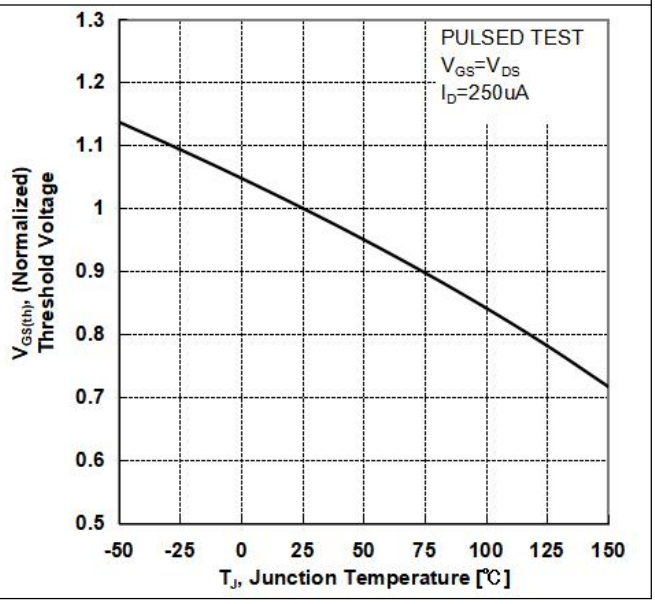


Figure 7 Gate-Charge Characteristics

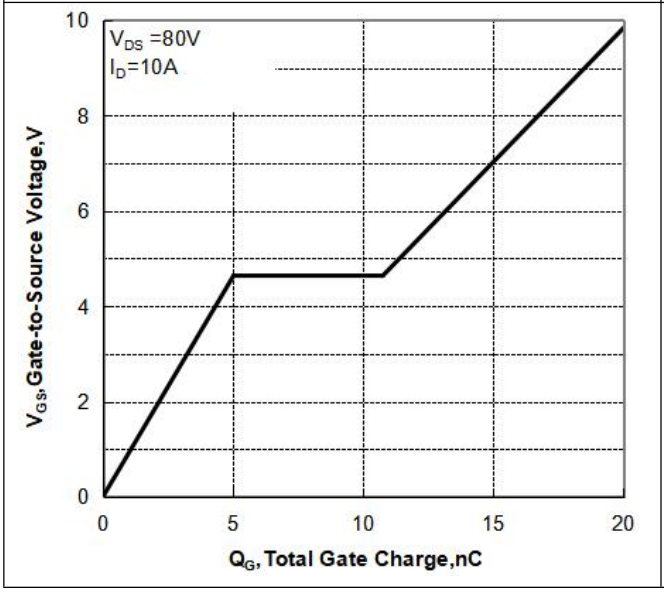


Figure 8 Capacitance Characteristics

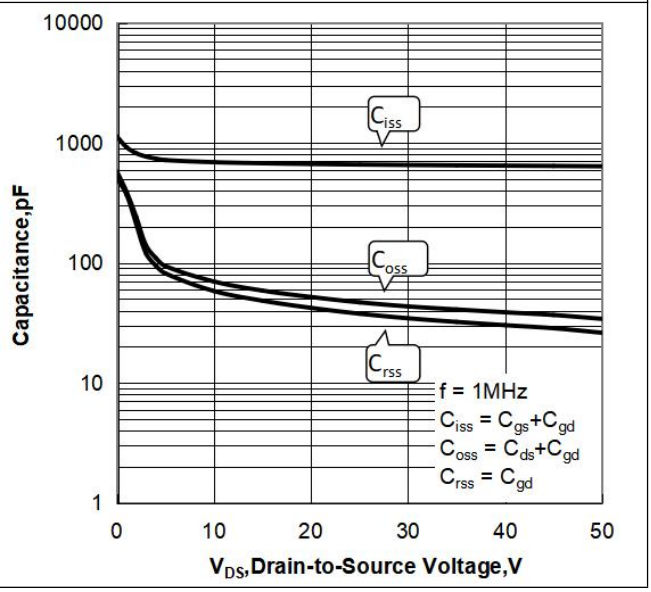


Figure 9 Body Diode Forward Voltage

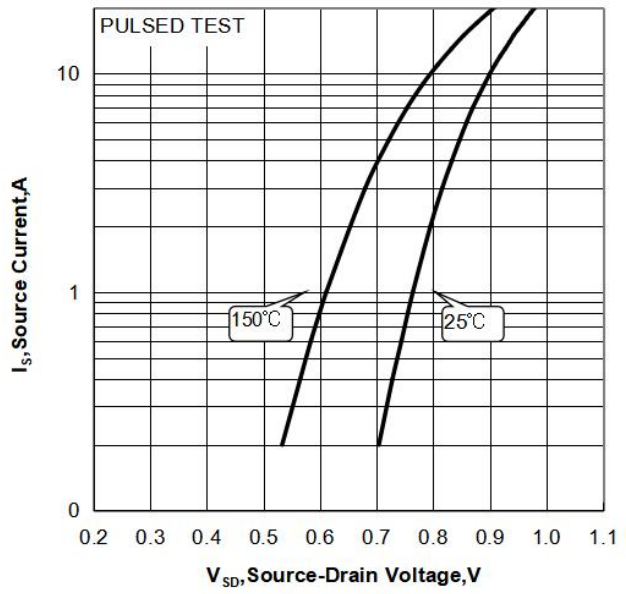


Figure 10 Maximum Safe Operating Area

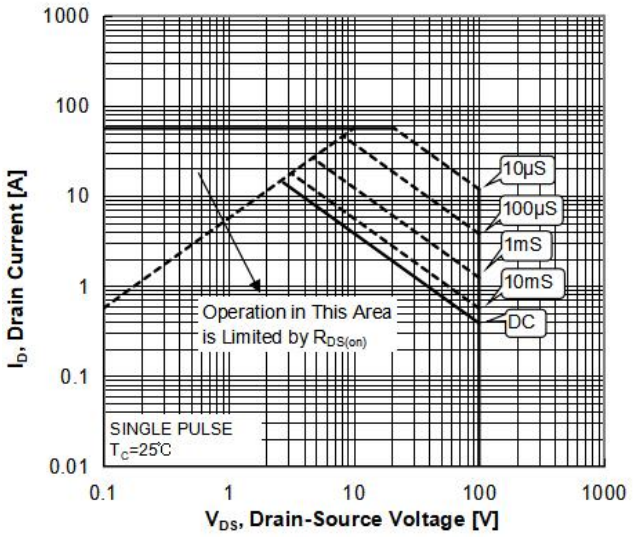
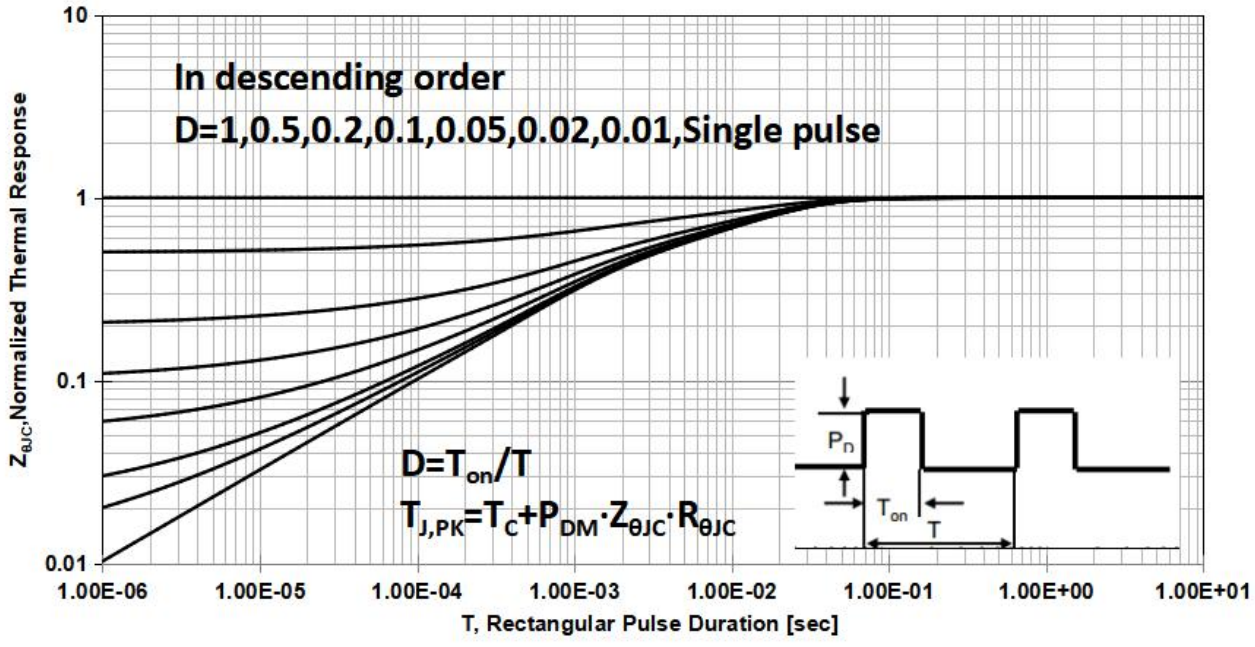
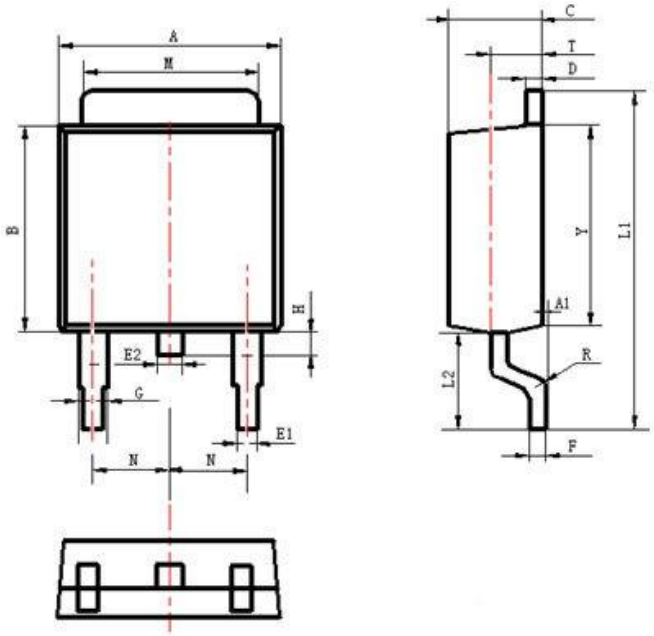


Figure 11 Transient Thermal Impedance

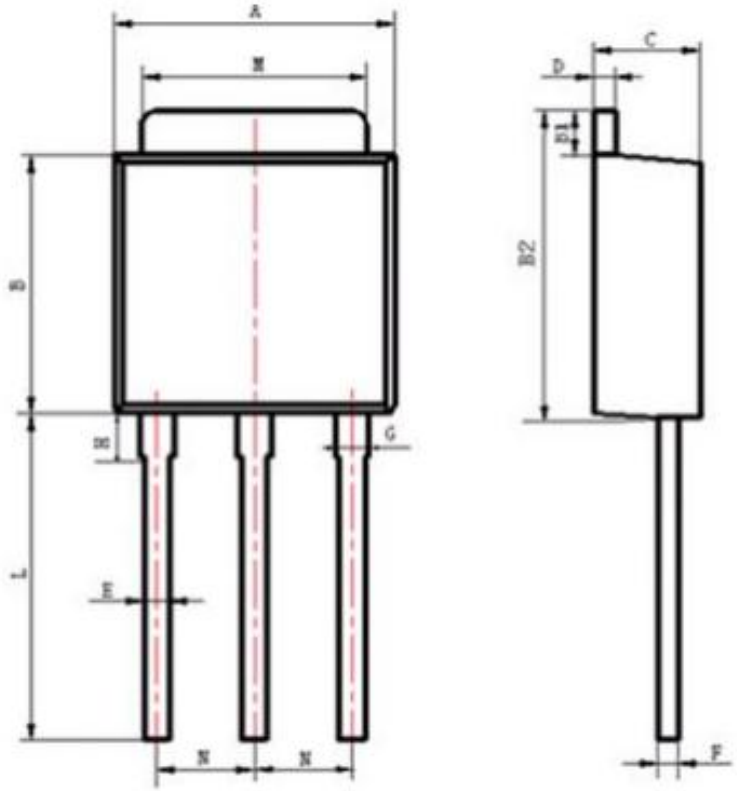


6. Package Description



Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
A1	0	0.13
B	5.70	6.30
C	2.10	2.50
D	0.30	0.60
E1	0.60	0.90
E2	0.70	1.00
F	0.30	0.60
G	0.70	1.20
L1	9.60	10.50
L2	2.70	3.10
H	0.60	1.00
M	5.10	5.50
N	2.09	2.49
R	0 .3	
T	1.40	1.60
Y	5.10	6.30

TO-252 Package



Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
B	5.70	6.30
B	1.00	1.20
B	6.80	7.40
C	2.10	2.50
D	0.30	0.60
E	0.50	0.70
F	0.30	0.60
G	0.70	1.00
H	1.60	2.40
L*	3.90	4.30
M	5.10	5.50
N	2.09	2.49

TO-251 Package

NOTE:

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shanghai Belling reserves the right to make changes in this specification sheet and is subject to change without prior notice.

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