Green Product

BLM08N10

100V N-Channel Power MOSFET

DESCRIPTION

The BLM08N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

Application

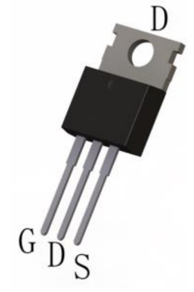
- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

KEY CHARACTERISTICS

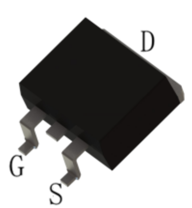
- V_{DS} = 100V, I_D = 110A
  $R_{DS(ON)}$ < 8mΩ @ V_{GS}=10V
- Special process technology for high ESD capability
- High density cell design for lower Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

100% UIS TESTED!

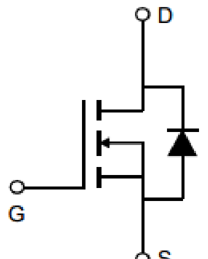
100% DVDS TESTED!



TO-220 Top View



TO-263 Top View



Schematic diagram

Package Marking And Ordering Information

Device Marking	Ordering Codes	Package	Product Code	Packing
M08N10	BLM08N10-P	TO-220	BLM08N10	Tube
M08N10	BLM08N10-B	TO-263	BLM08N10	Reel

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	110	A
Drain Current-Pulsed (Note 1)	I_{DM}	440	A
Maximum Power Dissipation(Tc=25℃)	P_D	211	W
Single pulse avalanche energy (Note 2)	E_{AS}	1100	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.71	℃/W

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	3	4	V
Drain-Source On-State Resistance (Note 3)	$R_{DS(ON)}$	V_{GS}=10V, I_D=55A	-	7.5	8	mΩ
Forward Transconductance	g_{FS}	V_{DS}=25V,I_D=57A	90	-	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, *f*=1.0MHz	-	6550	-	pF
Output Capacitance	C_{oss}		-	370	-	pF
Reverse Transfer Capacitance	C_{rss}		-	340	-	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V, ID=40A, V_{GS}=10V,R_{GEN}=3Ω	-	25	-	nS
Turn-on Rise Time	t_r		-	24	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	90	-	nS
Turn-Off Fall Time	t_f			40	-	nS
Total Gate Charge	Q_g	V_{DS}=30V,I_D=30A V_{GS}=10V	-	162	-	nC
Gate-Source Charge	Q_{gs}		-	30	-	nC
Gate-Drain Charge	Q_{gd}		-	65	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=40A	-	-	1.2	V

Notes:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. E_{AS} condition :T_j=25℃,V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production.

Characteristics Curves

Figure 1 Output Characteristics

VGS=10V
VGS=6V
VGS=5V
VGS=4.5V

I_D,Drain Current,A (0–100)

V_{DS},Drain-to-Source Voltage,V (0–5)

Figure 2 Transfer Characteristics

V_{DS}=5V
T_J=125℃
T_J=25℃

I_D,Drain Current,A (0–100)

V_{GS},Gate-to-Source Voltage,V (2–8)

Figure 3 On-Resistance vs. I_D and V_{GS}

V_{GS}=10V

$R_{DS(on)}$,Drain-to-Source On Resistance（mΩ） (6–10)

ID,Drain Current,A (0–80)

Figure 4 On-Resistance vs. Junction Temperature

PULSED TEST
V_{GS} = 10V
I_D =55A

$R_{DS(on)}$,(Normalized) Drain-to-Source On Resistance (0.7–1.9)

T_J,Junction Temperature(℃) (25–175)

Figure 5 On-Resistance vs. V_{GS}

I_D=55A
T_J=125℃
T_J=25℃

$R_{DS(on)}$,Drain-to-Source On Resistance,mΩ (4–24)

V_{GS},Gate-to-Source Voltage,V (3–10)

Figure 6 Body Diode Forward Voltage

125℃
25℃

I_S(A) (0.00001–100)

V_{SD}(V) (0–1.2)

Figure 7 Gate-Charge Characteristics

V_{DS} =30V
I_D = 30A

V_{GS},Gate-to-Source Voltage,V

Q_G,Total Gate Charge,nC

Figure 8 Capacitance Characteristics

Ciss
Coss
Crss

Capacitance (pF)

V_{DS},Drain-to-Source Voltage,V

Figure 9 Maximum Forward Biased Safe Operation Area

10μs
100μs
1ms
10ms
DC

Operation in This Area is Limited by $R_{DS(on)}$

SINGLE PULSE
T_C=25℃
T_J=175℃

I_D,Drain Current,A

V_{DS},Drain-to-Source Voltage,V

Figure 10 Single Pulse Power Rating Junction-to-Ambient

T_A=25℃
$T_{J(MAX)}$=175℃
Single Pulse

Power (W)

Pluse Width (S)

Figure 11 Normalized Maximum Transient Thermal Impedance

In descending order
D=0.5,0.2,0.1,0.05,0.02,0.01, Sing Pulse

P_D
T_{on}
T

D=T_{on}/T
$T_{J,PK}=T_C+P_{DM}\cdot Z_{\theta JC}\cdot R_{\theta JC}$
$R_{\theta JC}$=0.71

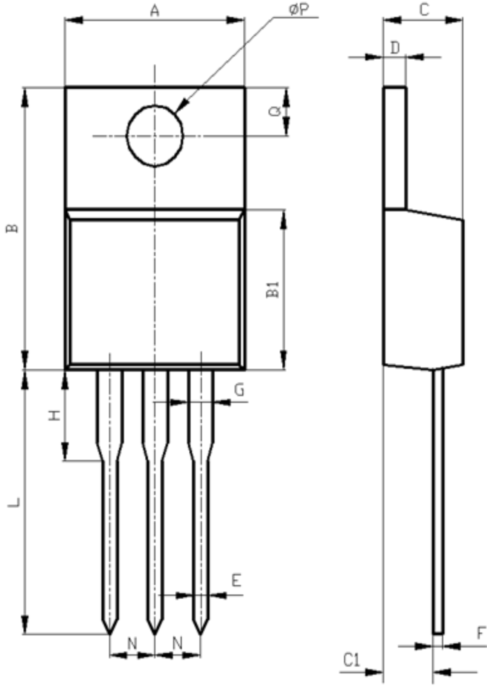
$Z_{\theta JC}$,Normalized Transient Thermal Resistance

T , Rectangular Pulse Duration [sec]

Test Circuit and Waveform

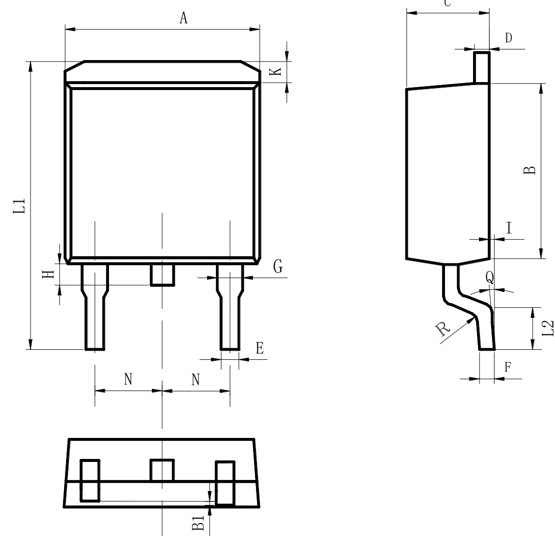
Gate Charge Test Circuit	Gate Charge Test Waveform
+ VDC - Vds DUT Vgs Ig	Vgs Qg 10V Qgs Qgd Charge
Resistive Switching Test Circuit	**Resistive Switching Test Waveforms**
RL Vds DUT Vgs Rg Vdd Vgs	Vds 90% 10% Vgs $t_{d(on)}$ t_r t_{on} $t_{d(off)}$ t_f t_{off}
Unclamped Inductive Switching (UIS) Test Circuit	**Unclamped Inductive Switching (UIS) Test Waveforms**
L Vds Id Vgs Rg Vgs DUT Vdd Vgs	$E_{AR}= 1/2\ LI_{AR}^2$ BV_{DSS} Vds Id I_{AR} Vgs
Diode Recovery Test Circuit	**Diode Recovery Test Waveforms**
Vds + DUT Vds - Isd L Vgs Ig Vdc	$Q_{rr} = -\int Idt$ Vgs Isd I_F dI/dt t_{rr} I_{RM} Vds Vdd

Package Description



Items	Values(mm)	
	MIN	MAX
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
Φ P	3.50	3.90

TO-220 Package



Items	Values(mm)	
	MIN	MAX
A	9.80	10.40
B	8.90	9.50
B1	0	0.10
C	4.40	4.80
D	1.16	1.37
E	0.70	0.95
F	0.30	0.60
G	1.07	1.47
H	1.30	1.80
K	0.95	1.37
L1	14.50	16.50
L2	1.60	2.30
I	0	0.2
Q	0°	8°
R	0.4	
N	2.39	2.69

TO-263 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.

CONTACT:

上海贝岭股份有限公司（总部）

地址：上海市宜山路 810 号

邮编：200233

电话：021-24261000

产品业务咨询及技术支持

电话：021-24261326

传真 2：021-64852222

邮箱 2：marketing@belling.com.cn

上海贝岭深圳分公司（华南区）

地址：深圳市福田中心区民田路新华保险大厦 1510 室

邮编：518031

电话：0755-33336776 0755-33336770

传真：0755-33336788

上海贝岭北京办事处（华北区）

地址：北京市西城区新华里 16 号院锦官苑小区 10 号楼 1 单元 1505 室

邮编：100044

电话：010-64179374

传真：010-8835 9236