Green Product

BLM06N10

100V N-Channel Power MOSFET

DESCRIPTION

The BLM06N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

Application

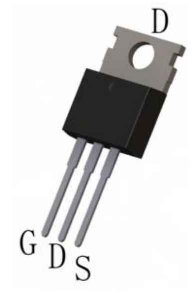
- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

KEY CHARACTERISTICS

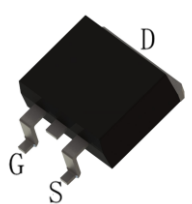
- V_{DS} = 100V, I_D = 180A
  $R_{DS(ON)}$ < 6mΩ @ V_{GS}=10V
- Special process technology for high ESD capability
- High density cell design for lower Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

100% UIS TESTED!

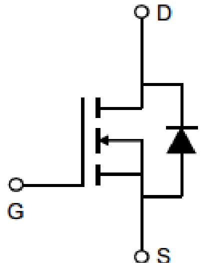
100% DVDS TESTED!



TO-220 Top View



TO-263 Top View



Schematic diagram

Package Marking And Ordering Information

Device Marking	Ordering Codes	Package	Product Code	Packing
M06N10	BLM06N10-P	TO-220	BLM06N10	Tube
M06N10	BLM06N10-B	TO-263	BLM06N10	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	330	A
Drain Current-Pulsed (Note 1)	I_{DM}	720	A
Maximum Power Dissipation(Tc=25℃)	P_D	211	W
Single pulse avalanche energy(Note 2)	E_{AS}	1200	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	$R_{θJC}$	0.36	℃/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=50A	-	5	6	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=40A	170	-	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, *f*=1.0MHz	-	6600	-	pF
Output Capacitance	C_{oss}		-	590	-	pF
Reverse Transfer Capacitance	C_{rss}		-	210	-	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V, ID=20A, V_{GS}=10V,R_{GEN}=3Ω	-	29	-	nS
Turn-on Rise Time	t_r		-	23	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	44	-	nS
Turn-Off Fall Time	t_f			15	-	nS
Total Gate Charge	Q_g	V_{DS}=50V,I_D=30A V_{GS}=10V	-	108	-	nC
Gate-Source Charge	Q_{gs}		-	29	-	nC
Gate-Drain Charge	Q_{gd}		-	40	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=50A	-	-	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=1mH,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

I_D,Drain Current,A vs. V_{DS},Drain-to-Source Voltage,V

VGS=7V, VGS=6V, VGS=5.5V, VGS=5V

Figure 2 Transfer Characteristics

I_D,Drain Current,A vs. V_{GS},Gate-to-Source Voltage,V

V_{DS}=5V, T_J=125℃, T_J=25℃

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

$R_{DS(on)}$,Drain-to-Source On Resistance（mΩ） vs. ID,Drain Current,A

V_{GS}=10V

Figure 4 On-Resistance vs. Junction Temperature

Normalized On-Resistance vs. TJ-Junction Temperature

I_D=20A

Figure 5 On-Resistance vs. V_{GS}

RDS(on),Drain-to-Source On Resistance（mΩ） vs. VGS,Gate-to-Source Voltage,V

I_D=20A, T_J=125℃, T_J=25℃

Figure 6 Body Diode Forward Voltage

IS(A) vs. VSD(V)

125℃, 25℃

Figure 7 Gate-Charge Characteristics	Figure 8 Capacitance Characteristics
V_{DS} =50V I_D = 20A V_{GS},Gate-to-Source Voltage,V Q_G,Total Gate Charge,nC	Ciss Coss Crss Capacitance(pF) V_{DS},Drain-to-Source Voltage,V
Figure 9 Maximum Forward Biased Safe Operation Area	**Figure 10 Single Pulse Power Rating Junction-to-Ambient**
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	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

$T_{J,PK}=T_C+P_{DM}.Z_{\theta JC}.R_{\theta JC}$

$R_{\theta JC}$=0.36℃/W

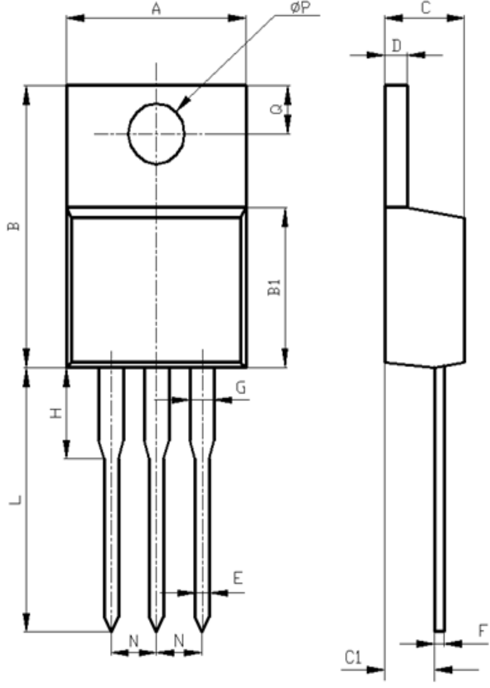
$Z_{\theta JC}$,Normalized Transient Thermal Resistance

T , Rectangular Pulse Duration [sec]

Test Circuit and Waveform

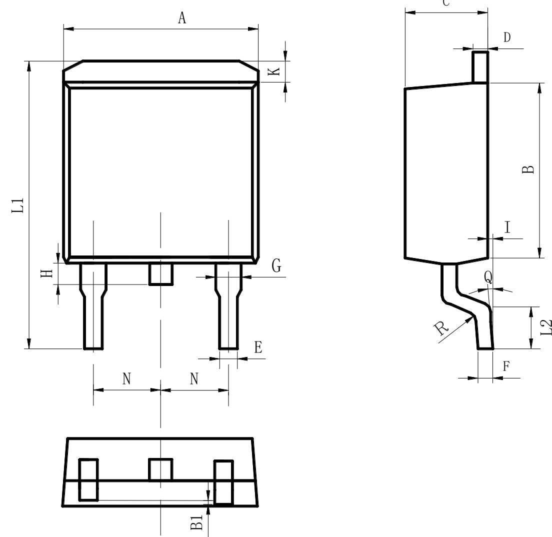
Gate Charge Test Circuit	Gate Charge Test Waveform
VDC + - Vds DUT Vgs Ig	Vgs Qg 10V Qgs Qgd Charge
Resistive Switching Test Circuit	**Resistive Switching Test Waveforms**
RL Vds DUT + VDC Vdd - Vgs Rg Vgs	Vds 90% 10% Vgs $t_{d(on)}$ t_r t_{on} $t_{d(off)}$ t_f t_{off}
Unclamped Inductive Switching (UIS) Test Circuit	**Unclamped Inductive Switching (UIS) Test Waveforms**
L Vds Id Vgs + VDC Vdd - Vgs Rg DUT 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 + VDC Vdc - Ig	$Q_{rr} = -\int Idt$ 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.

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