60V N-Channel Power MOSFET

DESCRIPTION

The BLQM30N06L uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

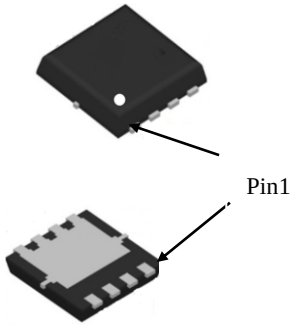
Application

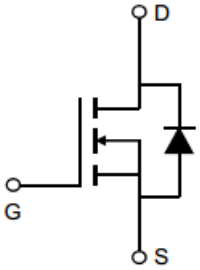
- Valves control
- Solenoids control
- Lighting

KEY CHARACTERISTICS

- V_{DS} = 60V,I_D = 20A
  $R_{DS(ON)}$ < 30mΩ @ V_{GS}=10V
  $R_{DS(ON)}$ < 40mΩ @ V_{GS}=4.5V
- Special process technology for high ESD capability
- High density cell design for lower Rdson
- 175°C operating temperature
- Good stability and uniformity with high EAS
- MSL1 up to 260°C peak reflow

100% DVDS TESTED!





Schematic diagram

Package Marking And Ordering Information

Ordering Codes	Package	Product Code	Packing
BLQM30N06L-R	PDFN3.3*3.3	BLQM30N06L	Reel

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	20	A
Drain Current-Pulsed (Note 1)	I_{DM}	80	A
Maximum Power Dissipation(Tc=25℃)	P_D	44	W
Single pulse avalanche energy(Note 2)	E_{AS}	56	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3.4	℃/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	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,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	1.3	1.8	2.3	V
Drain-Source On-State Resistance(Note 3)	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A	-	25	30	mΩ
		V_{GS}=4.5V, I_D=10A	-	30	40	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=10A	-	11	-	S
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, f=1.0MHz	-	670	-	pF
Output Capacitance	C_{oss}		-	76	-	pF
Reverse Transfer Capacitance	C_{rss}		-	66	-	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V, I_D =10A, V_{GS}=10V,R_{GEN}=10Ω	-	19.2	-	ns
Turn-on Rise Time	t_r		-	6.4	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	29.2	-	ns
Turn-Off Fall Time	t_f			8.2	-	ns
Total Gate Charge	Q_g	V_{DS}=48V,I_D=10A V_{GS}=10V	-	21	-	nC
Gate-Source Charge	Q_{gs}		-	5	-	nC
Gate-Drain Charge	Q_{gd}		-	6.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=20A	-	-	1.2	V
Reverse Recovery Time	T_{rr}	Tj=25℃，IF=10A，di/dt=100A/uS（note3）	-	33.6	-	nS
Reverse Recovery Charge	Q_{rr}		-	32.1	-	nC

Notes:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. E_{AS} condition :T_j=25℃,V_{DD}=30V,V_{GS}=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

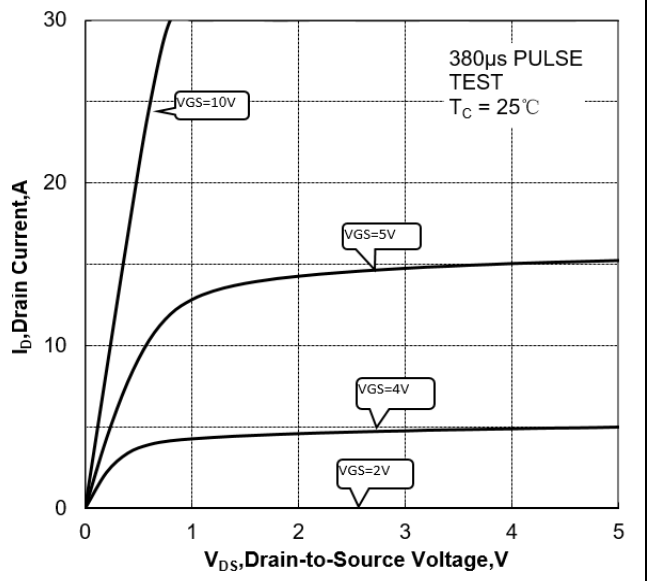


Figure 2 Transfer Characteristics

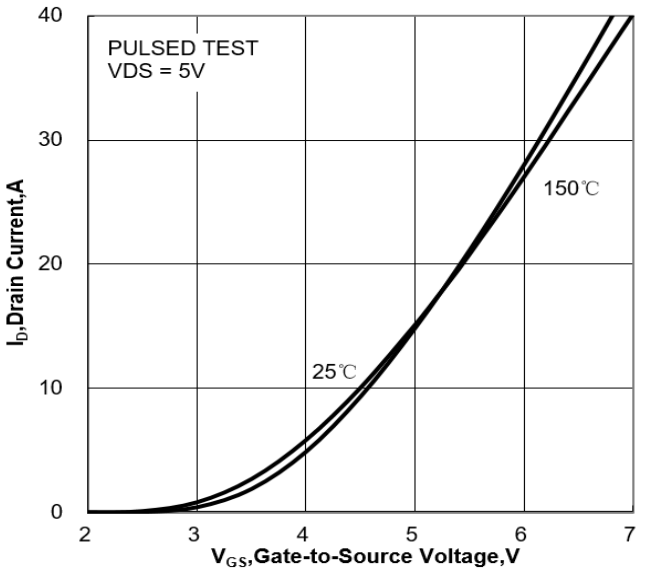


Figure 3 On-Resistance vs. I_D and V_{GS}

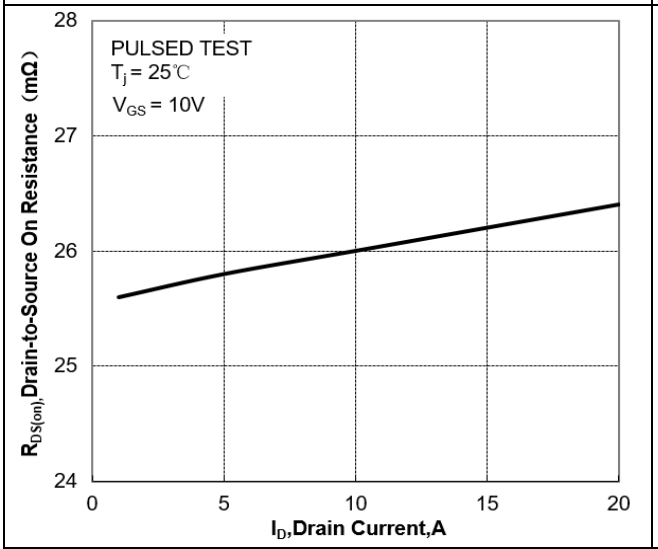


Figure 4 On-Resistance vs. Junction Temperature

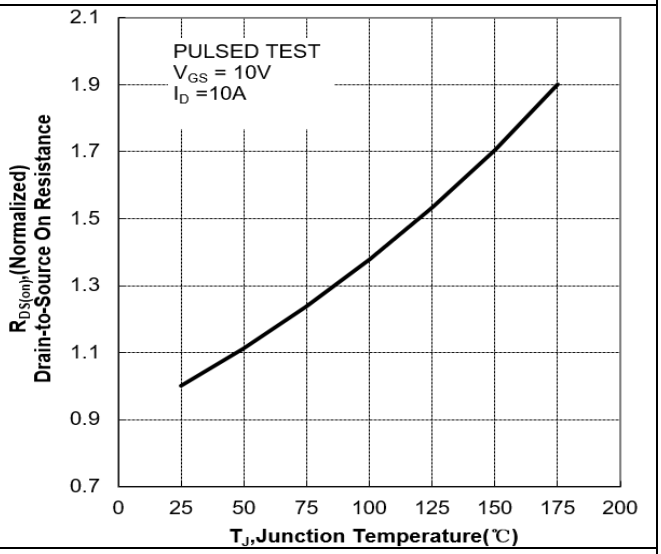


Figure 5 On-Resistance vs. V_{GS}

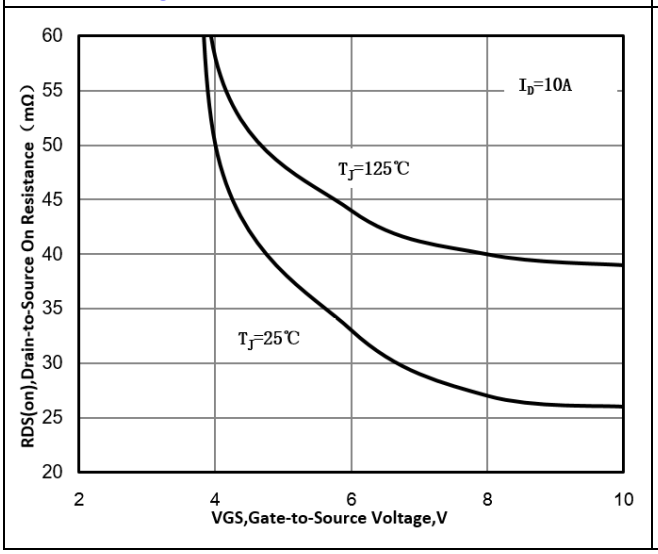


Figure 6 Body Diode Forward Voltage

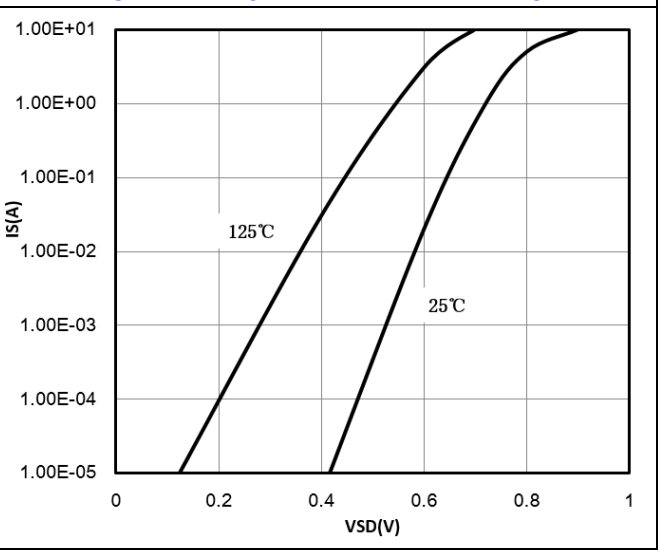


Figure 7 Gate-Charge Characteristics

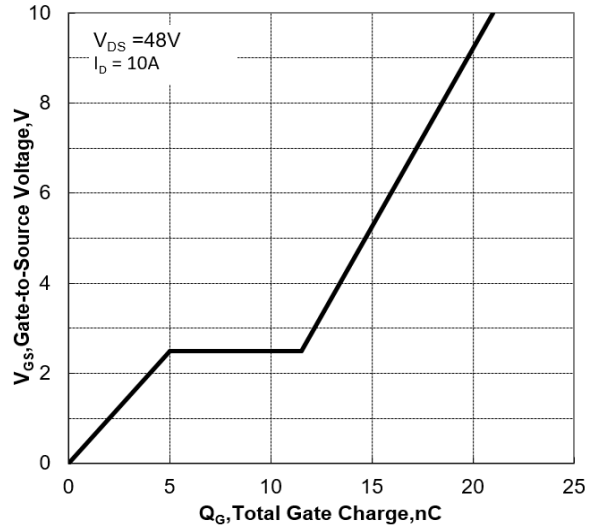


Figure 8 Capacitance Characteristics

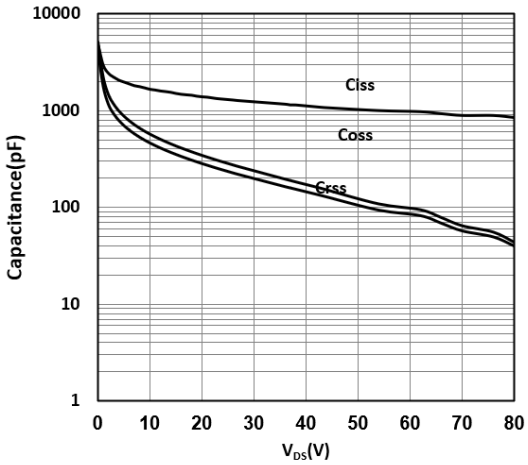


Figure 9 Maximum Forward Biased Safe Operation Area

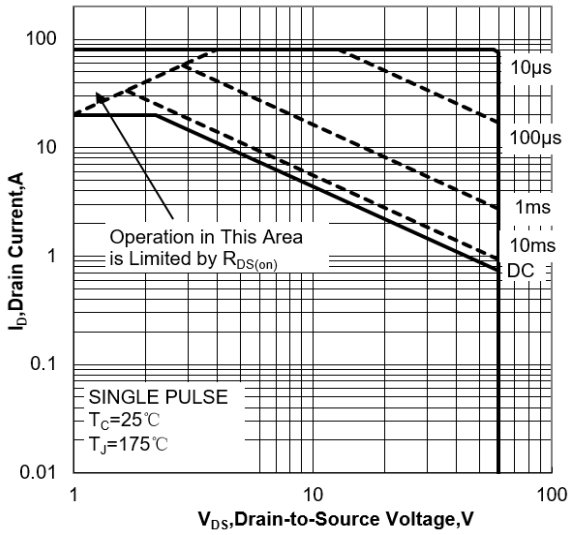


Figure 10 Single Pulse Power Rating Junction-to-Ambient

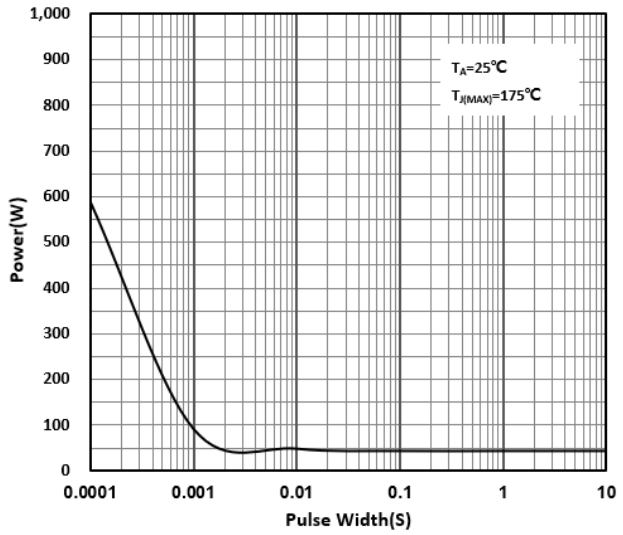
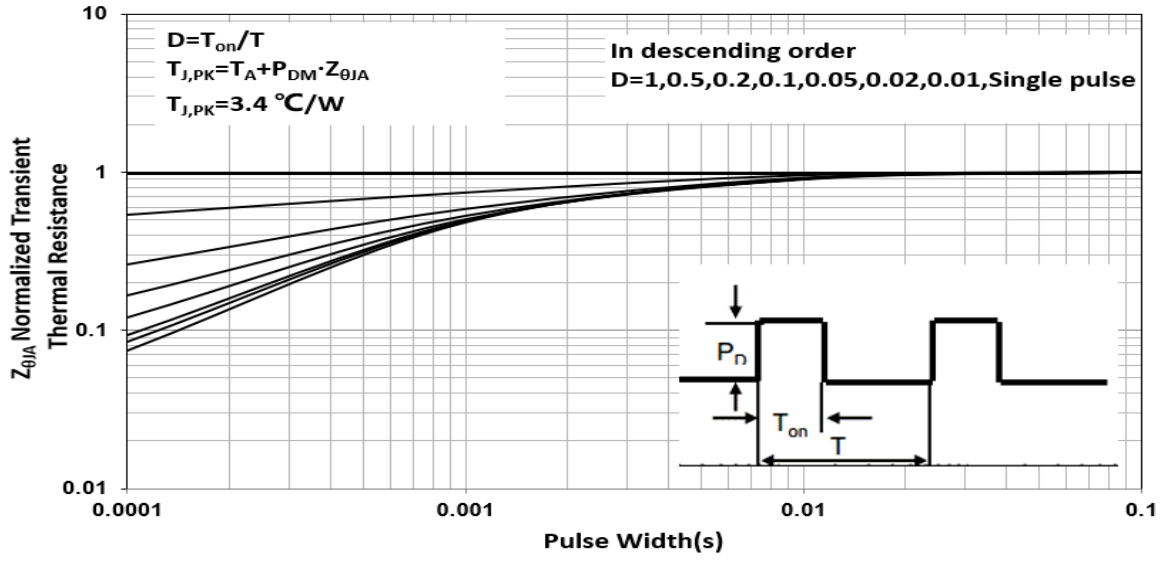
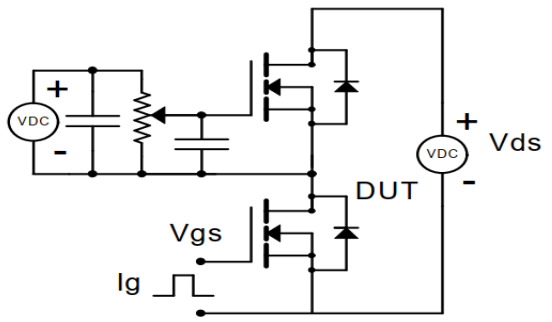


Figure 11 Normalized Maximum Transient Thermal Impedance

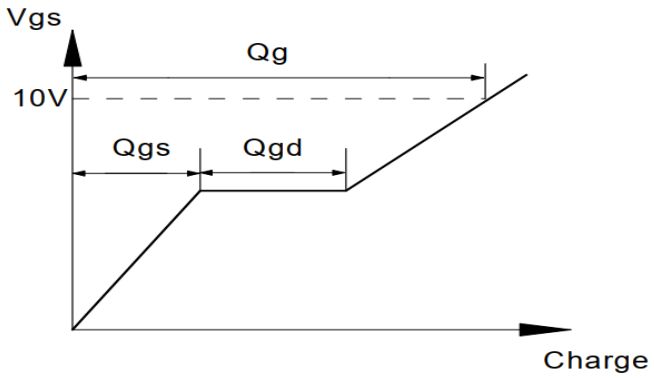


Test Circuit and Waveform

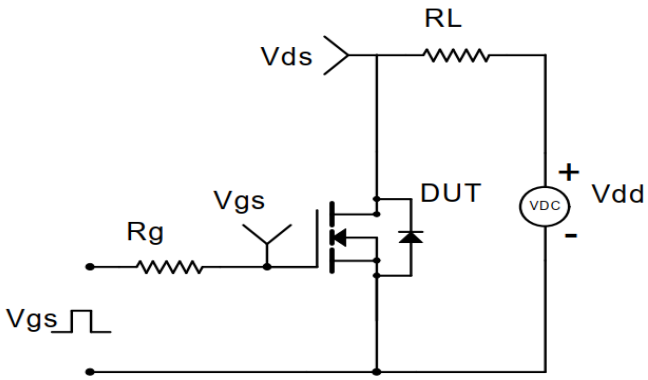
Gate Charge Test Circuit



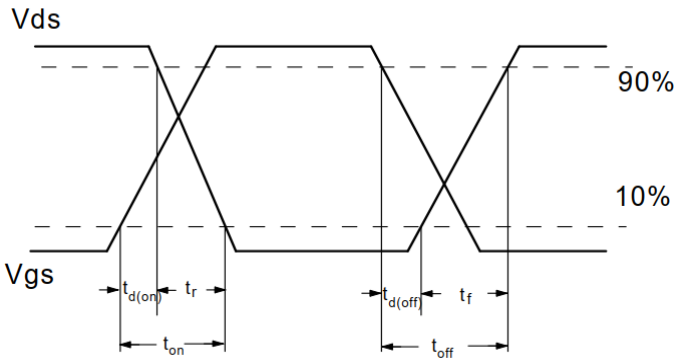
Gate Charge Test Waveform



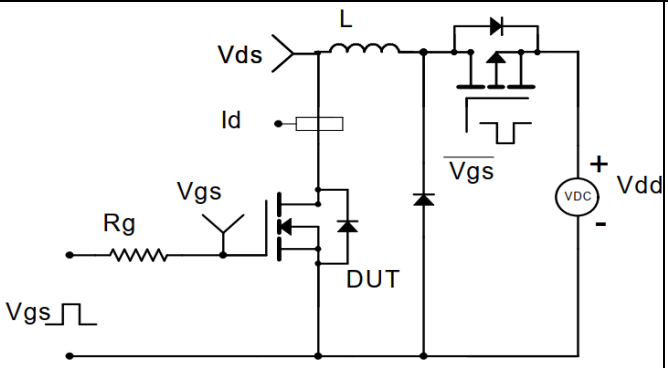
Resistive Switching Test Circuit



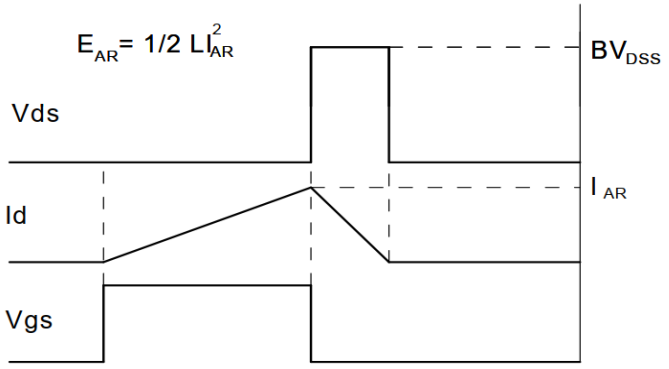
Resistive Switching Test Waveforms



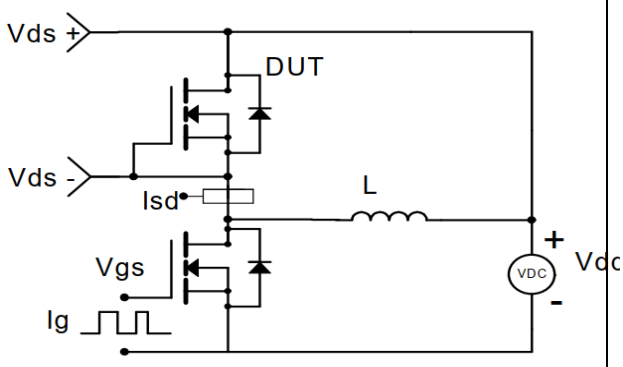
Unclamped Inductive Switching (UIS) Test Circuit



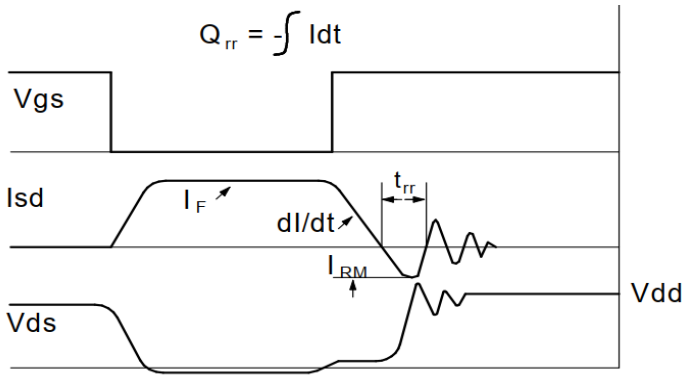
Unclamped Inductive Switching (UIS) Test Waveforms



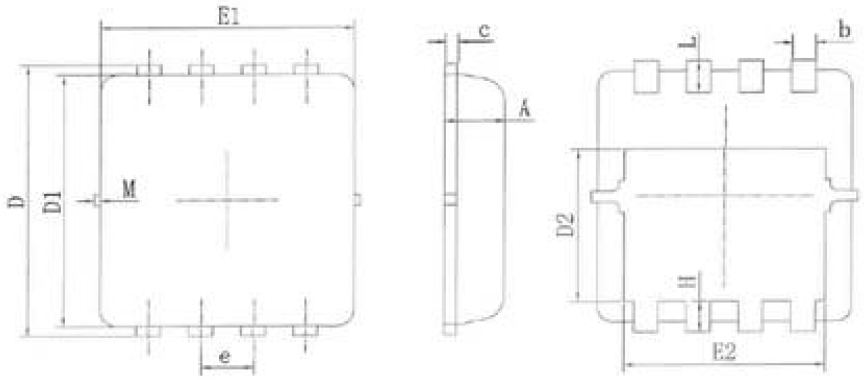
Diode Recovery Test Circuit



Diode Recovery Test Waveforms



Package Description



Items	Values(mm)		
	MIN	MON	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
C	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
E1	3.10	3.20	3.30
E2	2.44	2.54	2.65
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
M			0.10

PDFN3.3*3.3 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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