BMB65N046UE1

Super Junction Power MOSFET

650 V, 76 A, 46 mΩ

Description

BMB65N046UE1 is power MOSFET using bestirpower 's advanced super junction technology that can realize very low on resistance and gate charge.
It will provide much high efficiency by using optimized charge coupling technology. These user friendly devices give an advantage of Low EMI to designers as well as low switching loss.

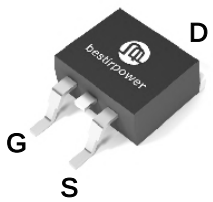
Features

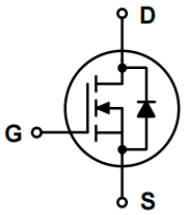
BV_{DSS} @ $T_{J,max}$	I_D	$R_{DS(on),max}$	$Q_{g,typ}$
700 V	76 A	46 mΩ	138 nC

- Ultra-fast body diode
- Extremely low losses due to very low FOM Rdson*Qg and Eoss
- Very high commutation ruggedness

Applications

- PC power
- Server power supply
- Telecom
- Solar invertor
- Super charger for automobiiles





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

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to Source Voltage(1)		650	V
V_{GSS}	Gate to Source Voltage		±30	V
I_D	Drain Current(2)	V_{GS} = 10 V, (T_C = 25℃)	76	A
		V_{GS} = 10 V, (T_C = 100℃)	48	
I_{DM}	Drain Current	Pulsed	242	A
E_{AS}	Single Pulsed Avalanche Energy(3)		375	mJ
dv/dt	MOSFET dv/dt		120	V/ns
	Peak Diode Recovery dv/dt		70	
P_D	Power Dissipation	(T_C = 25℃)	500	W
T_J , T_{STG}	Operating and Storage Temperature Range		-55 to150	℃
Is	Continuous diode forward current		76	A
Is Pulse	Diode pulse current(2)		242	A

1) Limited by Tj max. Maximum duty cycle D=0.75.
2) Pulse width tp limited by Tj,max.
3) VDD=100V, RG=25Ω, Starting Tj=25℃.

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case.	0.25	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient.	26	
Tsold	Soldering temperature, wave soldering only allowed at leads.	260	℃

Electrical Characteristics (T_J = 25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS} = 0 V, I_D =1mA	650			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V, T_J=25°C			10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±30 V, V_{DS} = 0 V			± 100	nA
On Characteristics						
$V_{(GS)th}$	Gate Threshold Voltage	V_{GS} = V_{DS} , I_D = 0.25 mA	2.0	3.0	4.0	V
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} =10 V, I_D = 15 A		41	46	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0 V,V_{DS} = 100 V, f = 1 MHz		5233		pF
C_{oss}	Output Capacitance			112		pF
C_{rss}	Reverse transfer capacitance			3.2		pF
$Q_{g(tot)}$	Total Gate Charge at 10 V	V_{DD} = 480 V, I_D = 15 A, V_{GS} = 0 to10 V		138		nC
Q_{gs}	Gate to Source Charge			33.7		nC
Q_{gd}	Gate to Drain “Miller” Charge			52.3		nC
R_G	Gate Resistance	V_{DD}= 0 V, V_{GS} = 0 V,f = 1 MHz		3.9		Ω
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 300 V, I_D = 15 A, V_{GS} = 10 V		152		ns
t_r	Turn-On Rise Time			6		ns
$t_{d(off)}$	Turn-Off Delay Time			483		ns
t_f	Turn-Off Fall Time			25		ns
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS} = 0 V,I_F =15 A T_J = 25 ℃		0.97		V
t_{rr}	Reverse Recovery Time	V_R = 50 V, I_F = 15 A, di_F/dt = 100 A/μs		163		ns
Q_{rr}	Reverse Recovery Charge			0.9		μC
I_{rrm}	Peak reverse recovery current			8.6		A

Typical Performance Characteristics

Figure 1. Typ.output characteristics

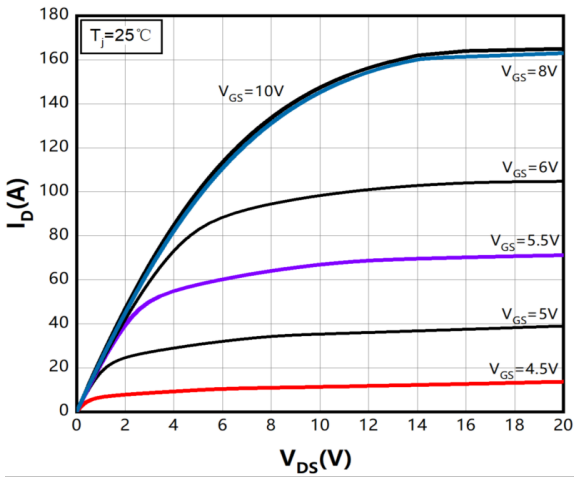


Figure 2. Typ.output characteristics

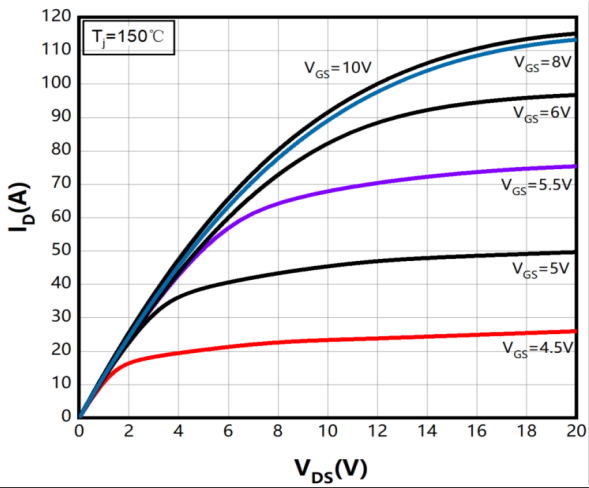


Figure 3. Typ.transfer characteristics

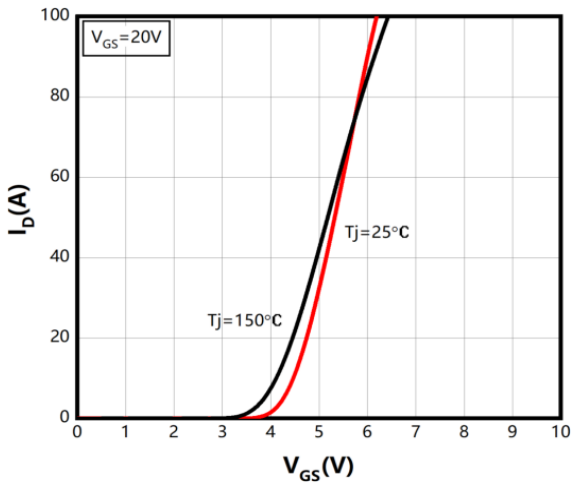


Figure 4. Typ. drain-source on-state resistance

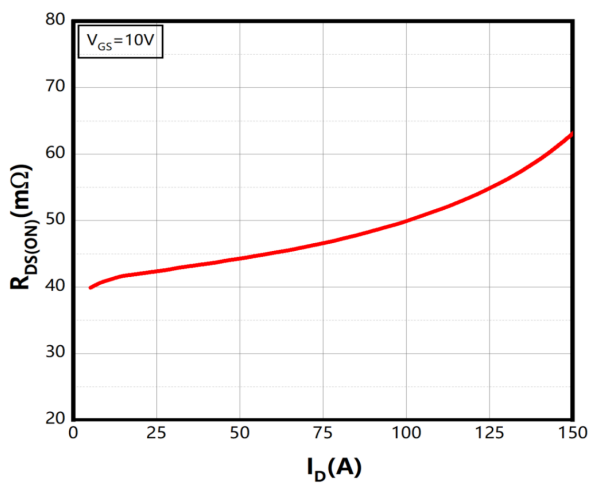


Figure 5. Drain-source on-state resistance

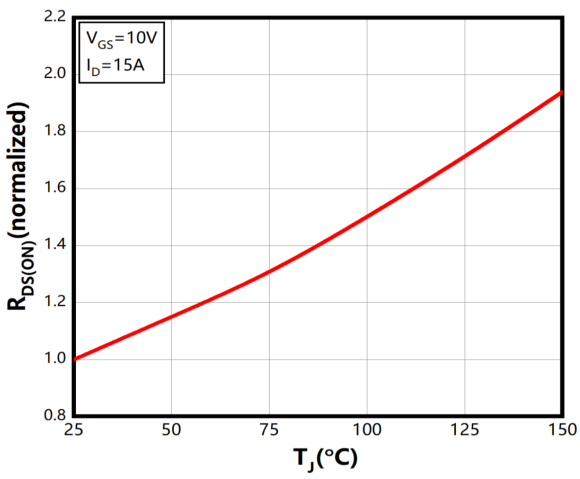
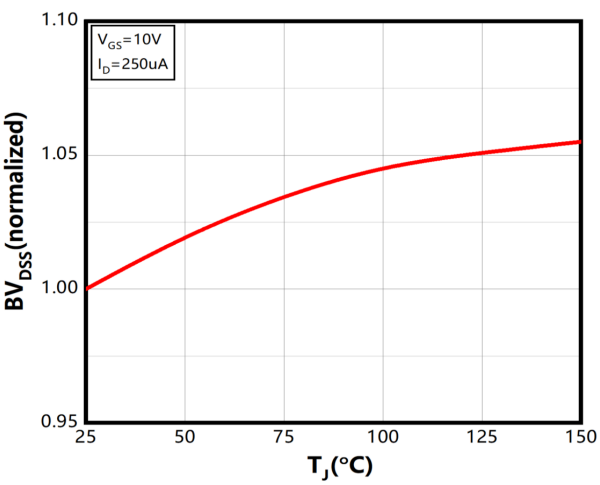


Figure 6. Breakdown voltage



Typical Performance Characteristics

Figure 7. Threshold voltage

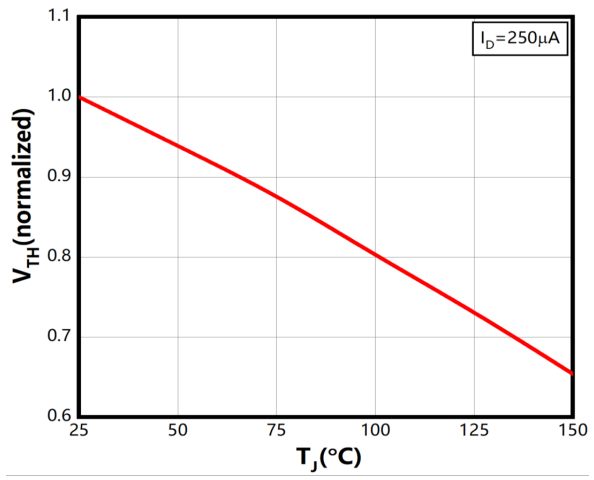


Figure 8. Typ. capacitances

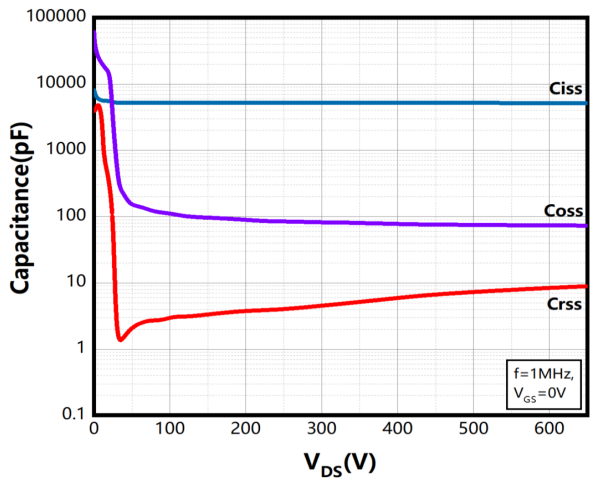


Figure 9. Typ.gate charge

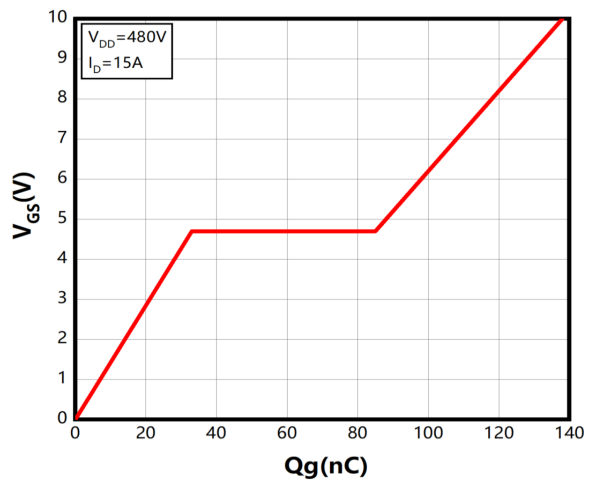


Figure 10. Body-Diode Character

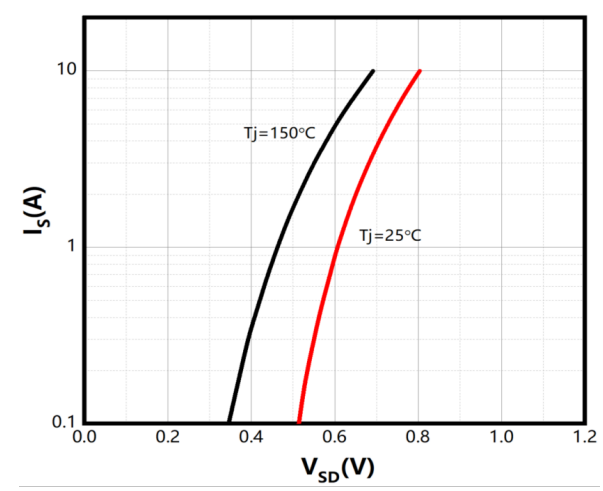


Figure 11. Power dissipation

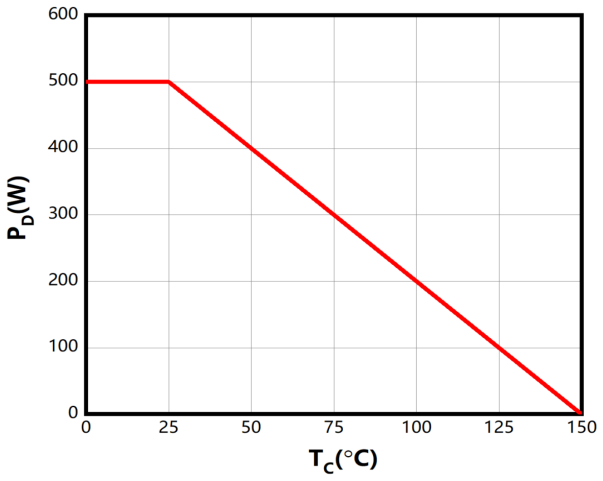
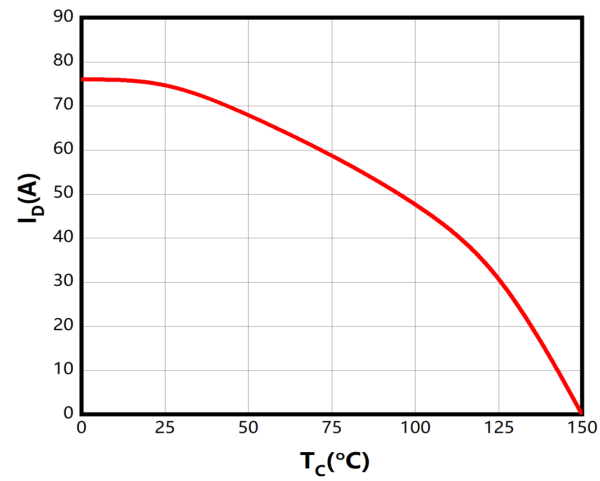


Figure 12. Drain Current



Typical Performance Characteristics

Figure 13. Safe operating area

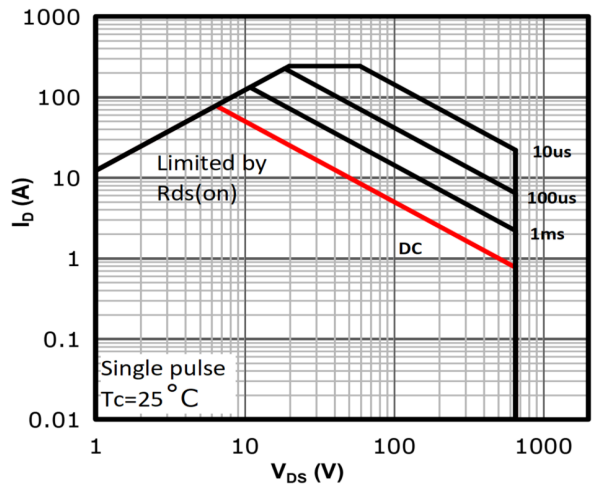
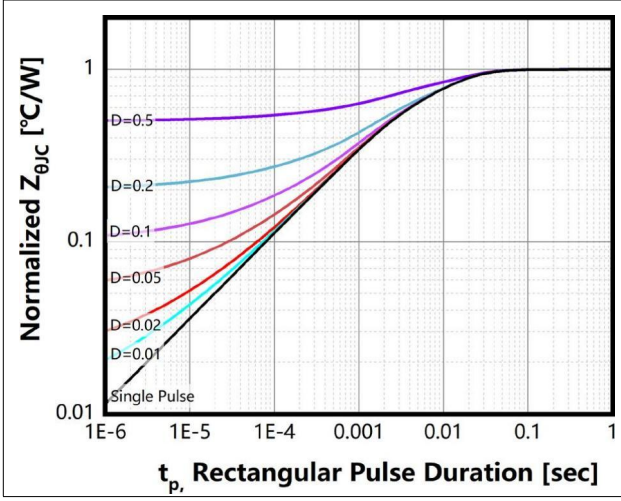


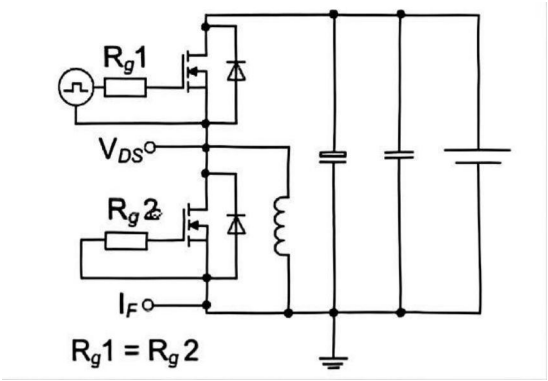
Figure 14. Max transient thermal impedance



Test Circuits

Figure 15. Diode Characteristics

Test circuit for diode characteristics and Diode recovery waveform



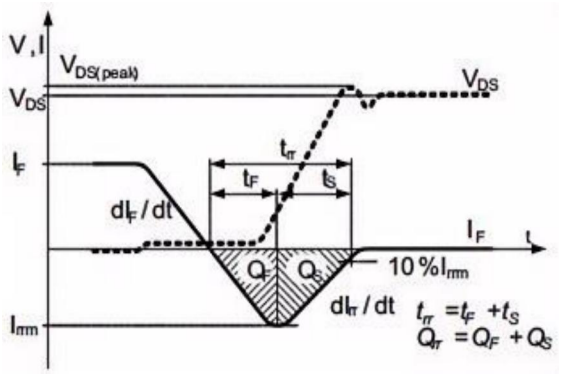
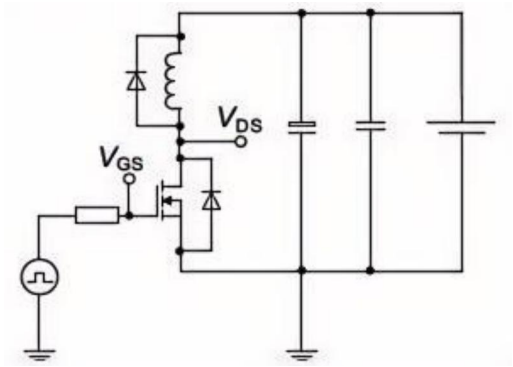


Figure 16. Switching Times

Switching times test circuit for inductive load and Switching times waveform



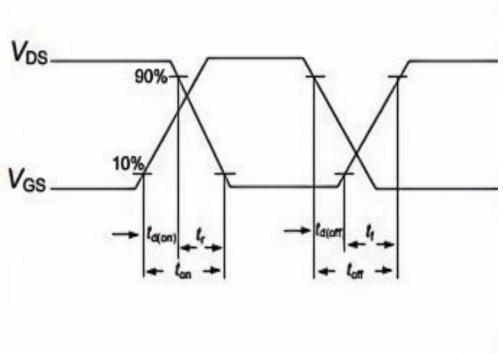
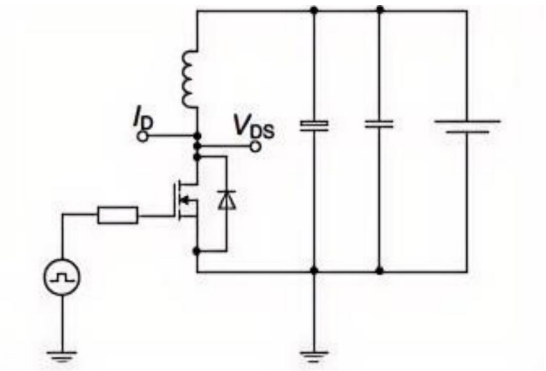
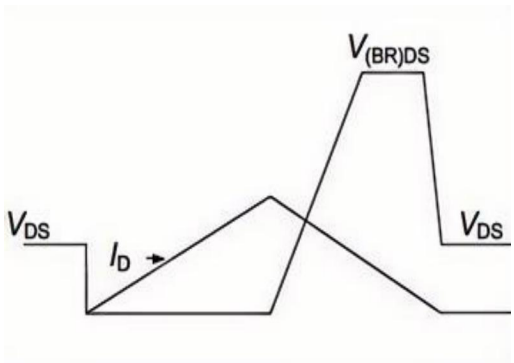


Figure 17.Unclamped Inductive Load

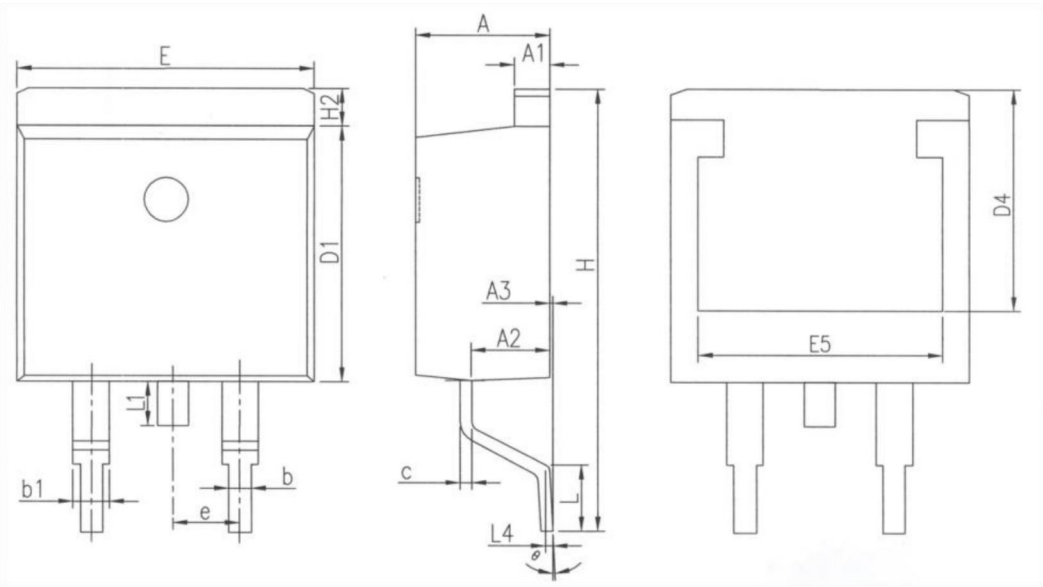
Unclamped inductive load test circuit and Unclamped inductive waveform





Package Outlines

D²PAK



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0.00	0.13	0.25
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D1	8.50	8.70	8.90
D4	6.60	-	-
E	9.86	10.16	10.36
E5	7.50	-	-
e	2.54BSC		
H	14.70	15.10	15.50
H2	1.07	1.27	1.47
L	2.00	2.30	2.60
L1	1.40	1.55	1.70
L4	0.25BSC		
θ	0°	5°	9°

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BMB65N046UE1	BMB65N046UE1	D^2PAK	Tape & Reel	800 units

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