BMW95N180UE1Z

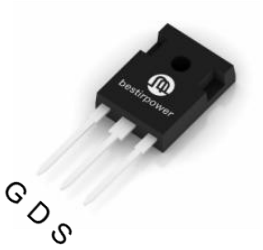
Super Junction Power MOSFET

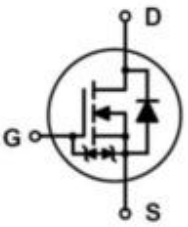
950 V, 36 A, 180 mΩ

Description

BMW95N180UE1Z 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.

BV_{DSS} @ $T_{J,max}$	I_D	$R_{DS(on),max}$	$Q_{g,typ}$
1000 V	36 A	180 mΩ	83





Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- Charger

Features

- Reduced Switching & Conduction Losses
- Fast-Recovery body diode
- Lower Switching Noise
- Integrated Zener diode for high ESD
- 100% Avalanche Tested
- Halogen Free, and RoHS Compliant

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

Symbol	Parameter		Value	Unit	Note
V_{DSS}	Drain to Source Voltage		950	V	
V_{GSS}	Gate to Source Voltage		±30	V	
I_D	Drain Current	Continuous (T_C = 25℃)	36	A	Fig 9
		Continuous (T_C = 100℃)	23		
I_{DM}	Drain Current	Pulsed (Note1)	108	A	
E_{AS}	Single Pulsed Avalanche Energy (Note2)		1033	mJ	
I_{AS}	Avalanche Current (Note2)		8.3	A	
dv/dt	MOSFET dv/dt		50	V/ns	
	Peak Diode Recovery dv/dt (Note3)		15		
P_D	Power Dissipation	(T_C = 25℃)	568	W	Fig 10
		Derate Above 25℃	4.5	W/℃	
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 150	℃	

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.22	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	26	
T_{sold}	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	Note
Off Characteristics							
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	950	-	-	V	
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 950 V, V_{GS} = 0 V	-	-	10	μA	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±30 V, V_{DS} = 0 V	-	-	±10	μA	
On Characteristics							
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 uA	3.0	4.0	5.0	V	Fig 8
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 13 A, T_J = 25℃	-	160	180	mΩ	Fig 3
		V_{GS} = 10 V, I_D = 13 A, T_J = 150℃	-	425	468	mΩ	Fig 7
Dynamic Characteristics							
C_{iss}	Input Capacitance	V_{DS} = 400 V, V_{GS} = 0 V, f = 100kHz	-	3125	-	pF	Fig 5
C_{oss}	Output Capacitance		-	60	-	pF	
C_{rss}	Reverse transfer capacitance		-	7	-	pF	
$Q_{g(tot)}$	Total Gate Charge at 10 V	V_{DS} = 400 V, I_D =13 A, V_{GS} = 10 V	-	83	-	nC	Fig 6
Q_{gs}	Gate to Source Charge		-	17	-	nC	
Q_{gd}	Gate to Drain “Miller” Charge		-	39	-	nC	
R_G	Gate Resistance	f = 1 MHz, Open Drain	-	6.9	-	Ω	
Switching Characteristics							
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 400 V, I_D = 13 A, V_{GS} = 10 V, R_G = 4.7 Ω	-	7	-	ns	
t_r	Turn-On Rise Time		-	10.5	-	ns	
$t_{d(off)}$	Turn-Off Delay Time		-	19.3	-	ns	
t_f	Turn-Off Fall Time		-	15	-	ns	
Source-Drain Diode Characteristics							
I_S	Maximum Continuous Diode Forward Current		-	-	36	A	
I_{SM}	Maximum Pulsed Diode Forward Current		-	-	108	A	
V_{SD}	Diode Forward Voltage	V_{GS} = 0 V, I_{SD} = 13 A	-	0.9	1.2	V	Fig 4
t_{rr}	Reverse Recovery Time	V_{DD} = 600 V, I_{SD} = 13 A, dI_F/dt = 100 A/μs	-	193	-	ns	
Q_{rr}	Reverse Recovery Charge		-	1.6	-	μC	

※Notes:
1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. L=30mH, R_G = 25 Ω, starting T_J = 25℃.
3. I_{SD} ≤ 4 A, di/dt ≤ 100 A/μs, V_{DD} ≤ 400 V, starting T_J = 25℃.

Typical Performance Characteristics

Figure 1. On-Region Characteristics

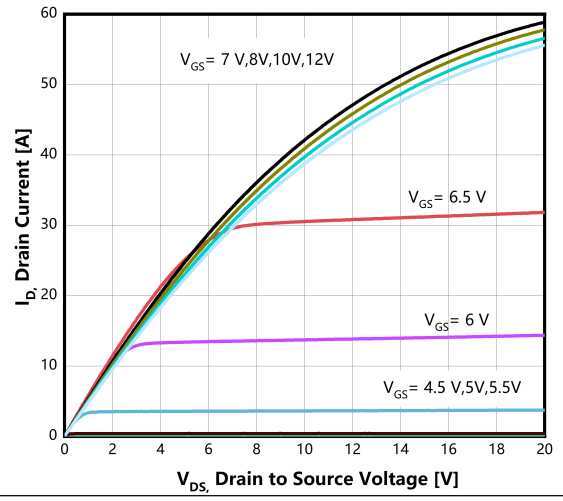


Figure 2. Transfer Characteristics

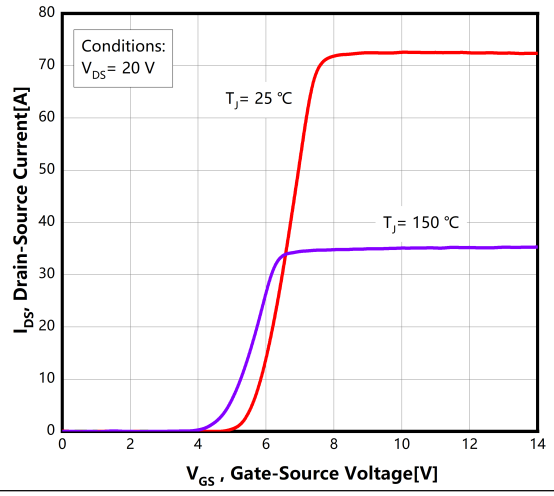


Figure 3. On-Resistance vs. Drain Current

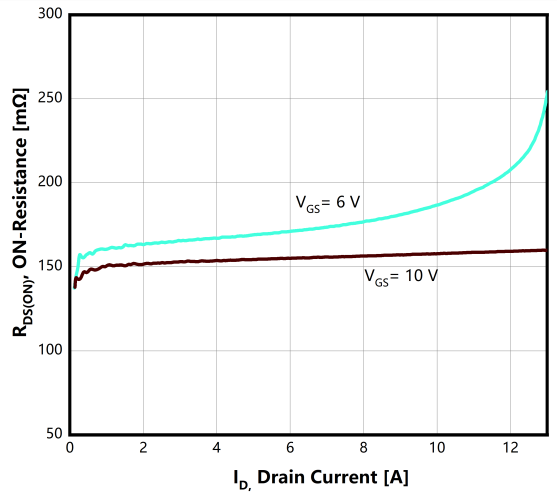


Figure 4. Body-Diode Characteristics

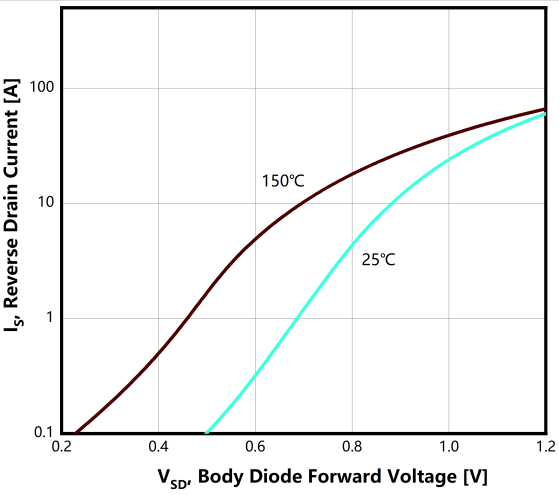


Figure 5. Capacitance Characteristics

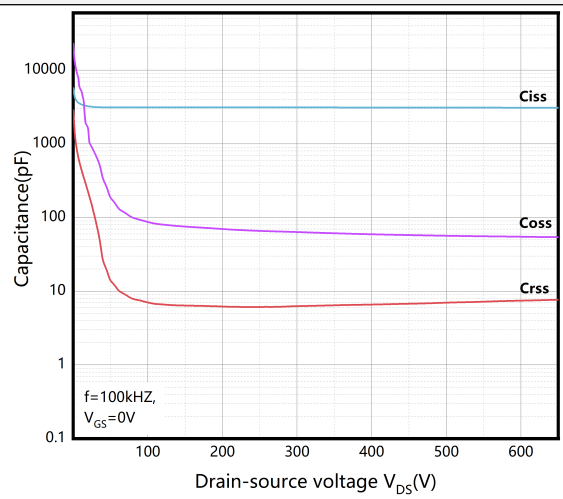
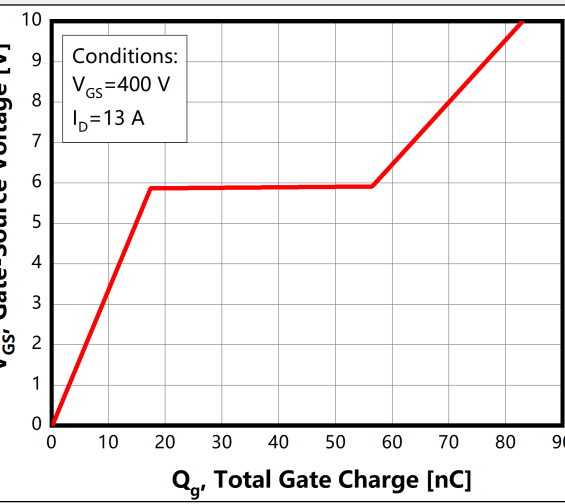


Figure 6. Gate Charge Characteristics



Typical Performance Characteristics

Figure 7. On-Resistance vs. Temperature

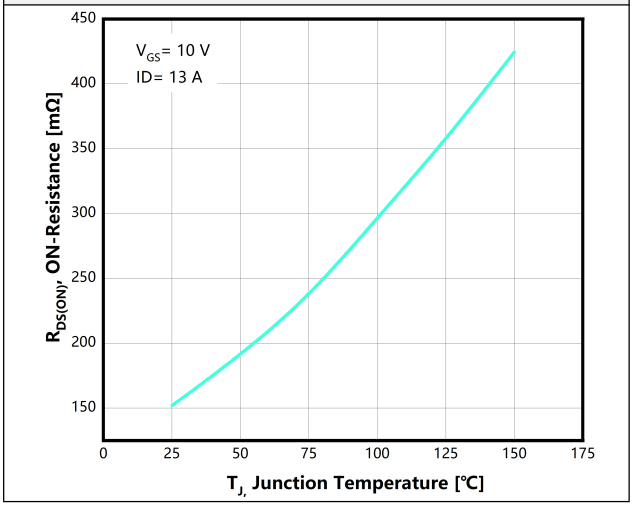


Figure 8. Threshold Voltage vs. Temperature

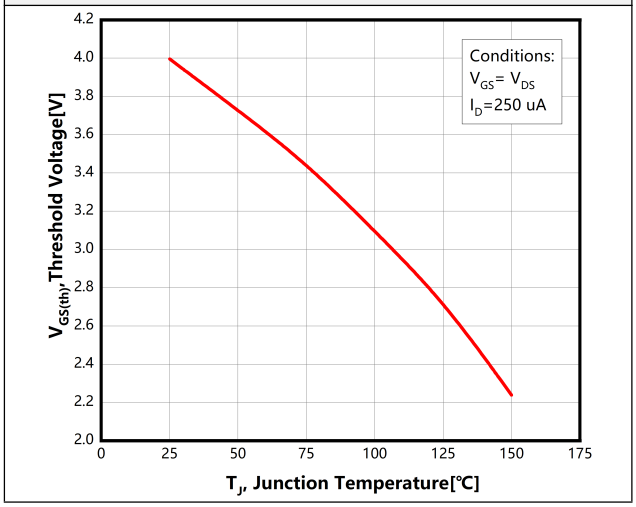


Figure 9. Drain Current vs. Temperature

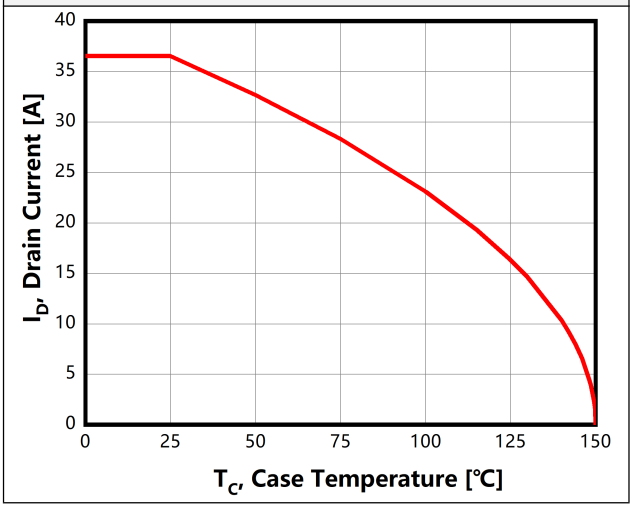


Figure 10. Power Dissipation vs. Temperature

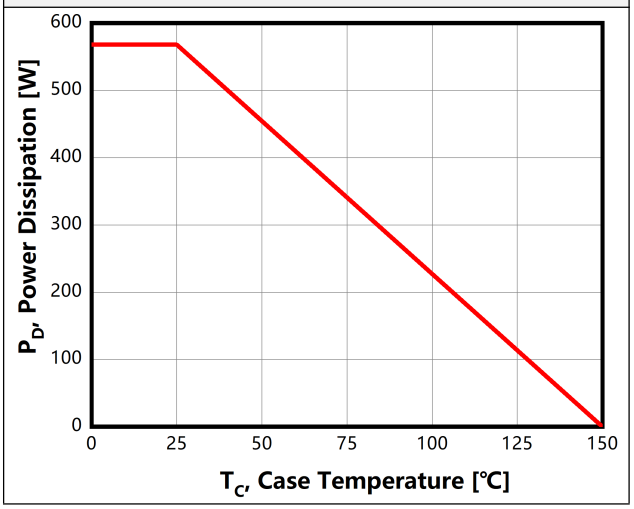


Figure 11. Maximum Safe Operating Area

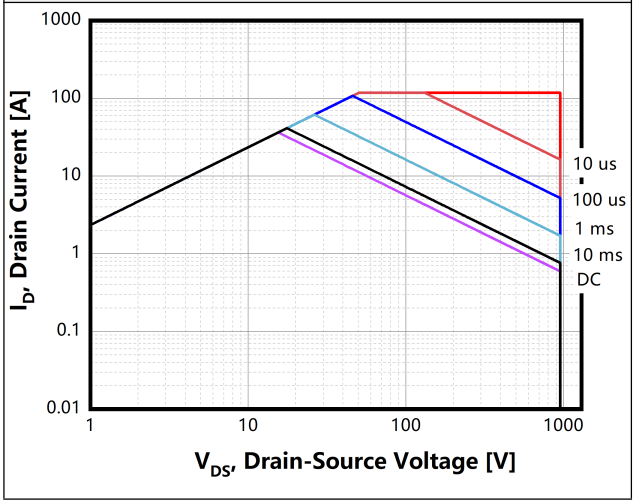
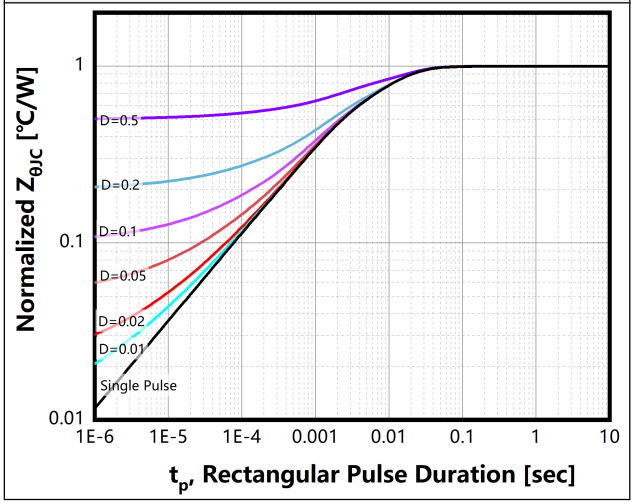


Figure 12. Max. Transient Thermal Impedance



Test Circuits

Figure 13. Switching times test circuit for inductive load and Switching times waveform

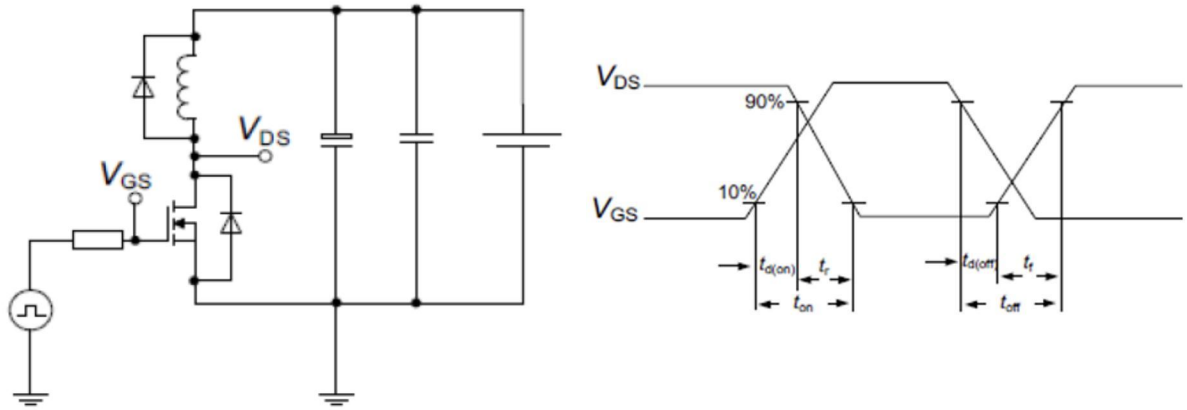


Figure 14.Test circuit for diode characteristics and Diode recovery waveform

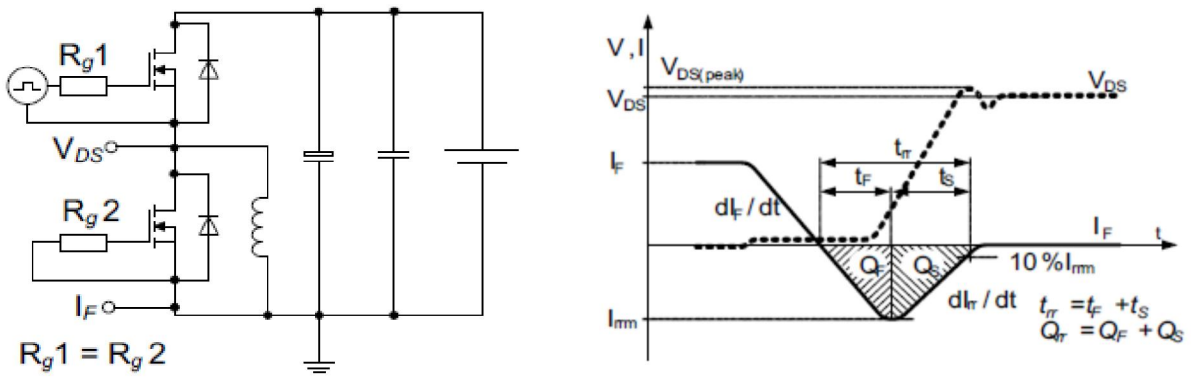
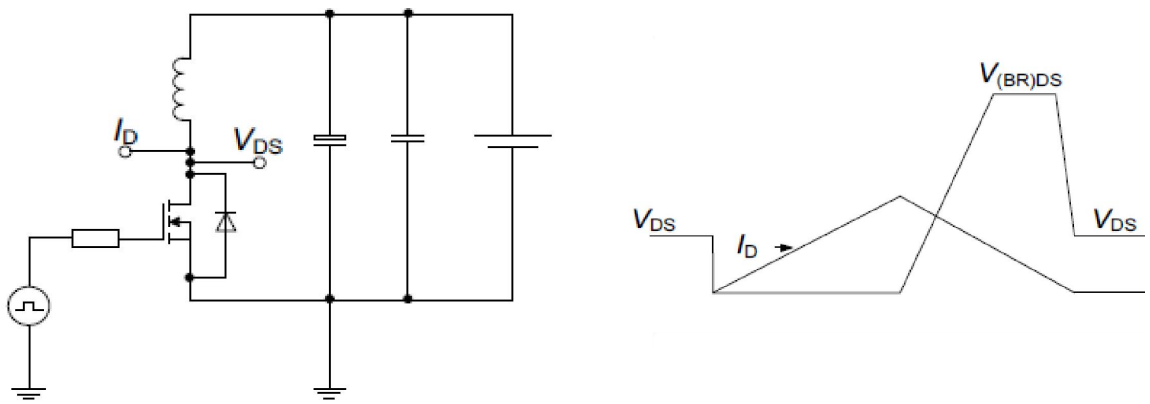
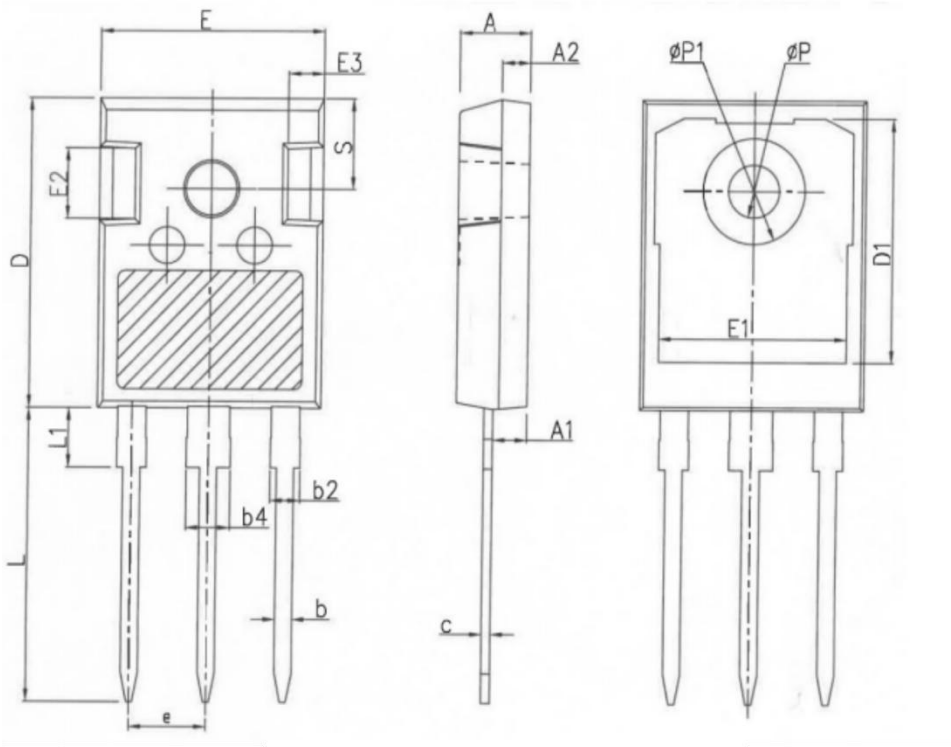


Figure 15. Unclamped inductive load test circuit and Unclamped inductive waveform



Package Outlines

TO247-3L



SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.29	2.42	2.54
A2	1.90	2.00	2.10
b	1.10	1.20	1.30
b1	1.91	2.06	2.20
b2	2.92	3.06	3.20
c	0.50	0.60	0.70
D	20.80	21.07	21.34
D1	17.43	17.63	17.83
E	15.75	15.94	16.13
E1	13.06	13.26	13.46
E2	4.32	4.58	4.83
e	5.45 BSC		
L	19.85	20.05	20.25
L1	4.05	4.27	4.49
ΦP	3.55	3.60	3.65
Q	5.59	5.89	6.19
S	6.15 BSC		

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BMW95N180UE1Z	BMW95N180UE1Z	TO247-3L	Tube	30 units

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