BMF65N340E2

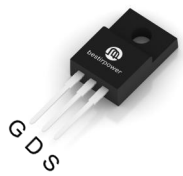
Super Junction Power MOSFET

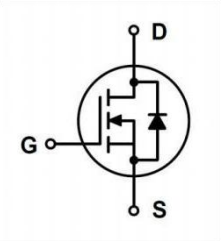
650 V, 12 A, 340 mΩ

Description

BMF65N340E2 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	$R_{DS(on),max}$	$Q_{g,typ}$
700 V	12 A	340 mΩ	19 nC





Applications

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

Features

- Reduced Switching & Conduction Losses
- Lower Switching Noise
- 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		650	V	
V_{GSS}	Gate to Source Voltage		±30	V	
I_D	Drain Current (continuous)	V_{GS}=10V, T_C = 25℃	12	A	Fig 10
		V_{GS}=10V, T_C = 100℃	7.6		
I_{DM}	Drain Current	Pulsed (Note1)	36	A	
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	245	mJ	
I_{AS}	Avalanche Current	(Note2)	7	A	
dv/dt	MOSFET dv/dt		50	V/ns	
	Peak Diode Recovery dv/dt	(Note3)	15		
P_D	Power Dissipation	(T_C = 25℃)	30	W	Fig 11
		Derate Above 25℃	0.24	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.	4.1	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	62	
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	650	-	-	V	Fig 7
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	-	-	1	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 = 250 uA	2.0	3.0	4.0	V	Fig 9
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 4.8 A, T_J = 25℃	-	315	340	mΩ	Fig 3
		V_{GS} = 10 V, I_D = 4.8 A, T_J = 150℃	-	790	850	mΩ	Fig 8
Dynamic Characteristics							
C_{iss}	Input Capacitance	V_{DS} = 400 V, V_{GS} = 0 V, f = 1 MHz	-	801	-	pF	Fig 5
C_{oss}	Output Capacitance		-	28	-	pF	
C_{rss}	Reverse transfer capacitance		-	3.8	-	pF	
$Q_{g(tot)}$	Total Gate Charge at 10 V	V_{DS} = 400 V, I_D =5.5 A, V_{GS} = 10 V	-	19	-	nC	Fig 6
Q_{gs}	Gate to Source Charge		-	2.9	-	nC	
Q_{gd}	Gate to Drain “Miller” Charge		-	9.7	-	nC	
R_G	Gate Resistance	f = 1 MHz, Open Drain	-	5.6	-	Ω	
Switching Characteristics							
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 400 V, I_D = 5.5 A, V_{GS} = 10 V, R_G = 10 Ω	-	16	-	ns	
t_r	Turn-On Rise Time		-	6	-	ns	
$t_{d(off)}$	Turn-Off Delay Time		-	29	-	ns	
t_f	Turn-Off Fall Time		-	22	-	ns	
Source-Drain Diode Characteristics							
I_S	Maximum Continuous Diode Forward Current		-	-	12	A	
I_{SM}	Maximum Pulsed Diode Forward Current		-	-	36	A	
V_{SD}	Diode Forward Voltage	V_{GS} = 0 V, I_{SD} = 11 A	-	0.9	1.2	V	Fig 4
t_{rr}	Reverse Recovery Time	V_{DD} = 400 V, I_{SD} = 5.5A, dI_F/dt = 100 A/μs	-	198	-	ns	
Q_{rr}	Reverse Recovery Charge		-	1.93	-	μC	

※Notes:
1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. L=10mH, 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

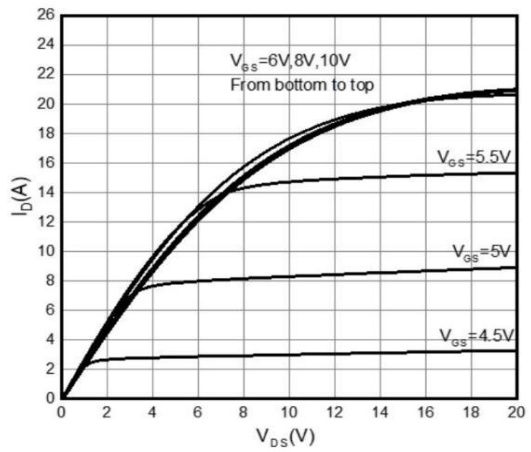


Figure 2. Transfer Characteristics

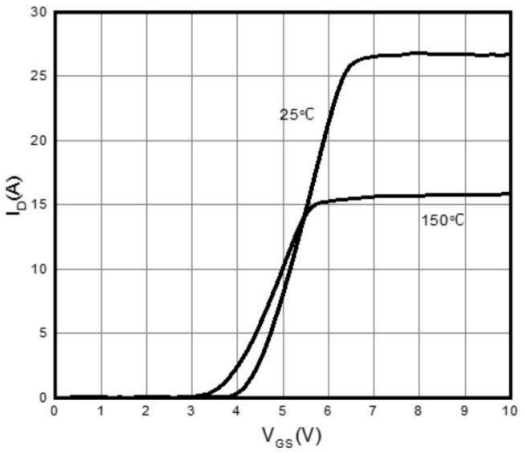


Figure 3. On-Resistance vs. Drain Current

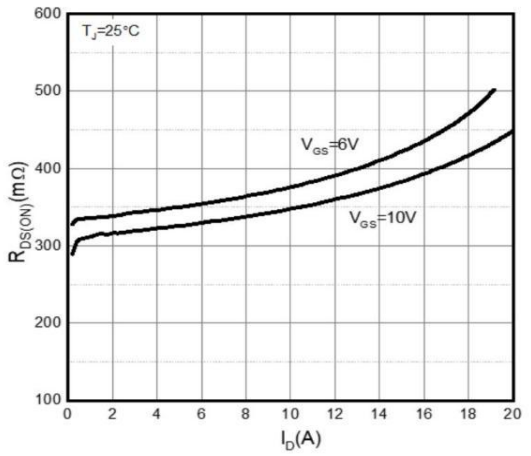


Figure 4. Body-Diode Characteristics

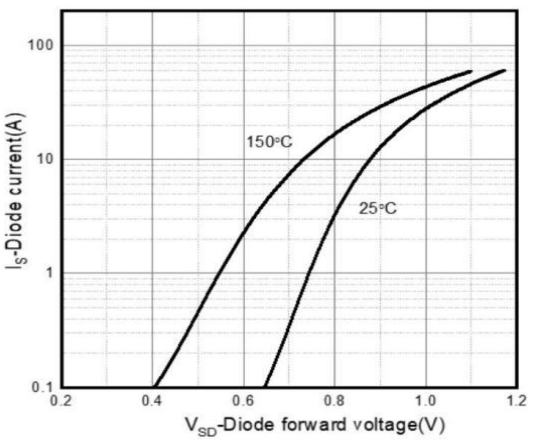


Figure 5. Capacitance Characteristics

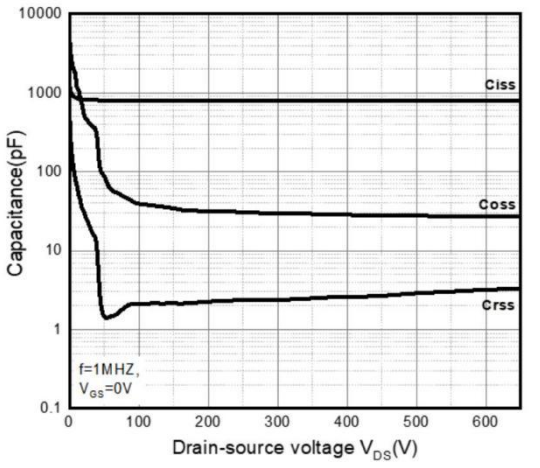
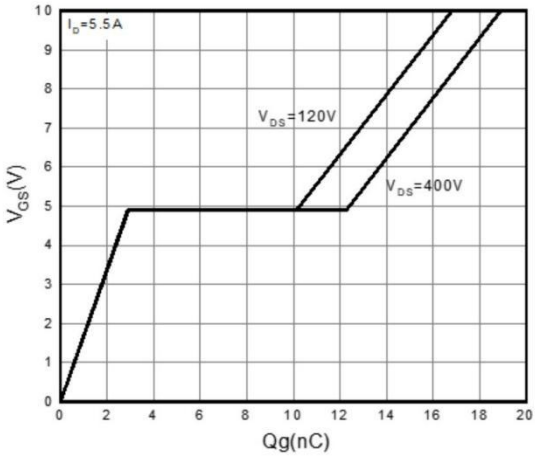


Figure 6. Gate Charge Characteristics



Typical Performance Characteristics

Figure 7. Breakdown Voltage vs.Temperature

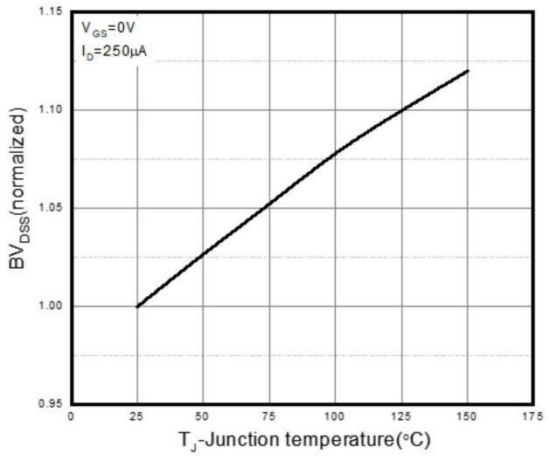


Figure 8. On-Resistance vs.Temperature

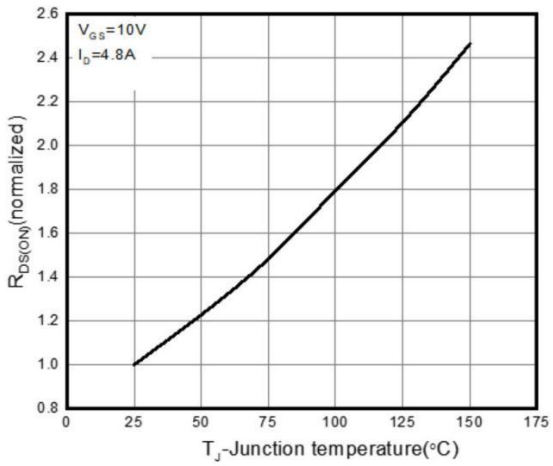


Figure 9. Threshold Voltage vs. Temperature

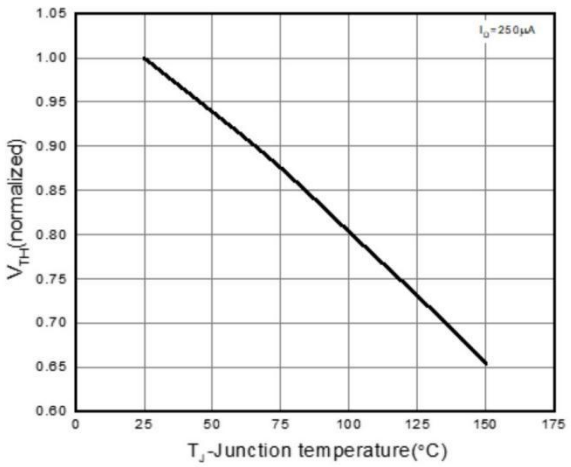


Figure 10. Drain Current vs. Temperature

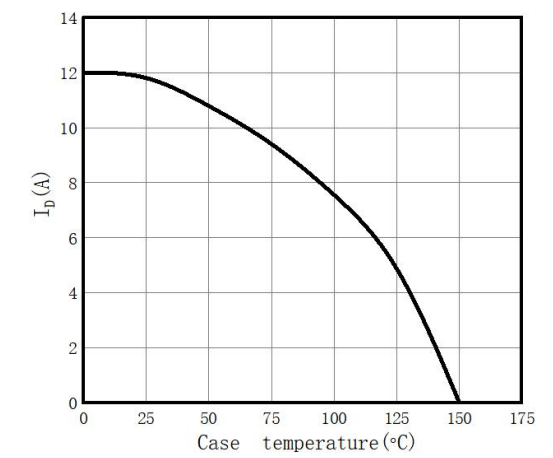


Figure 11. Power Dissipation vs. Temperature

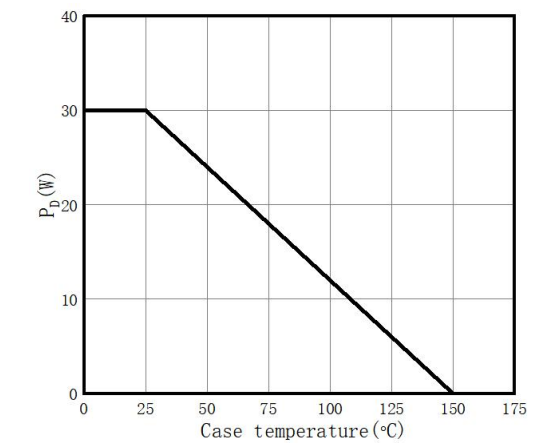


Figure 12. Maximum Safe Operating Area

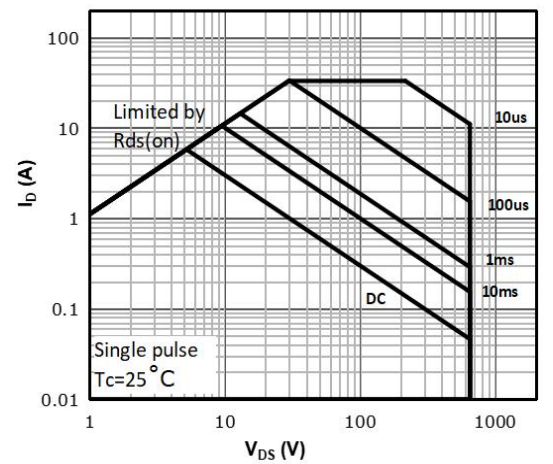
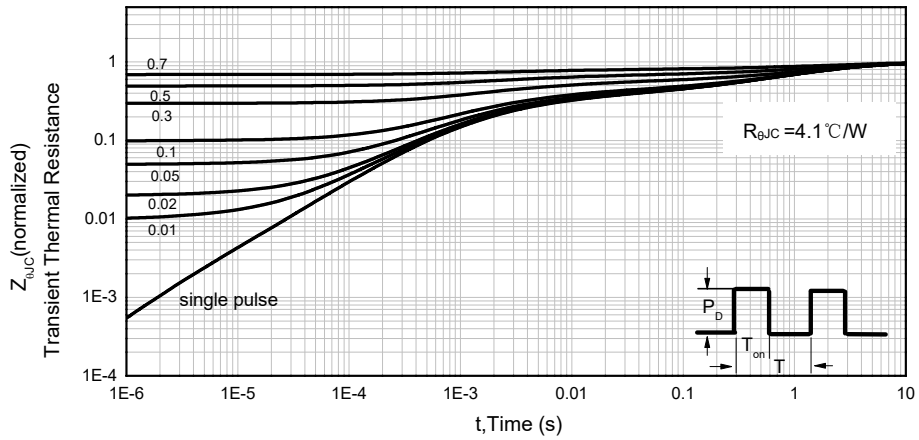
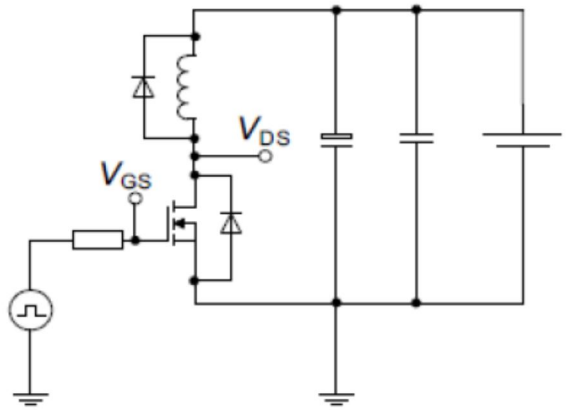


Figure 13. Normalized Maximum Transient Thermal Impedance



Test Circuits

Figure 14. Switching times test circuit for inductive load and Switching times waveform



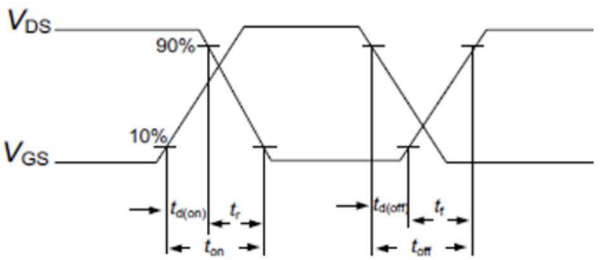
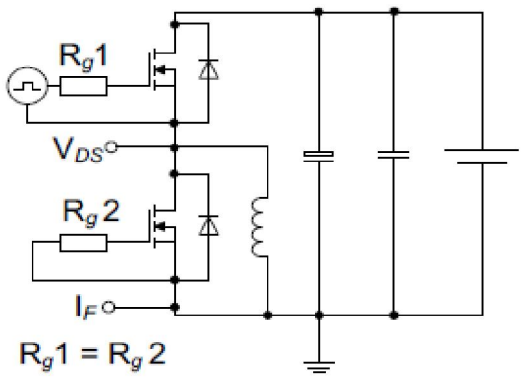


Figure 15.Test circuit for diode characteristics and Diode recovery waveform



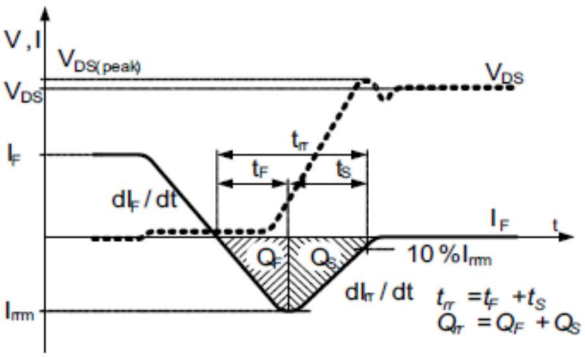
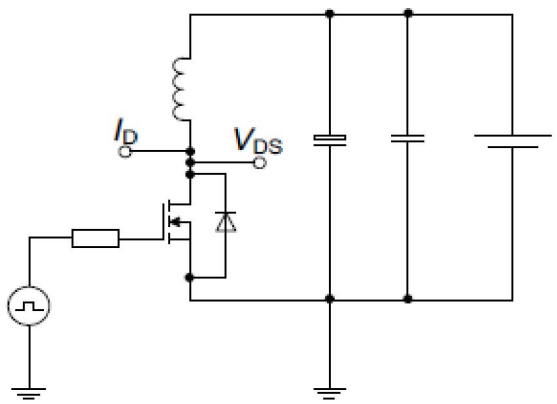
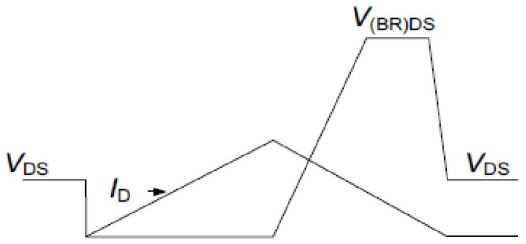


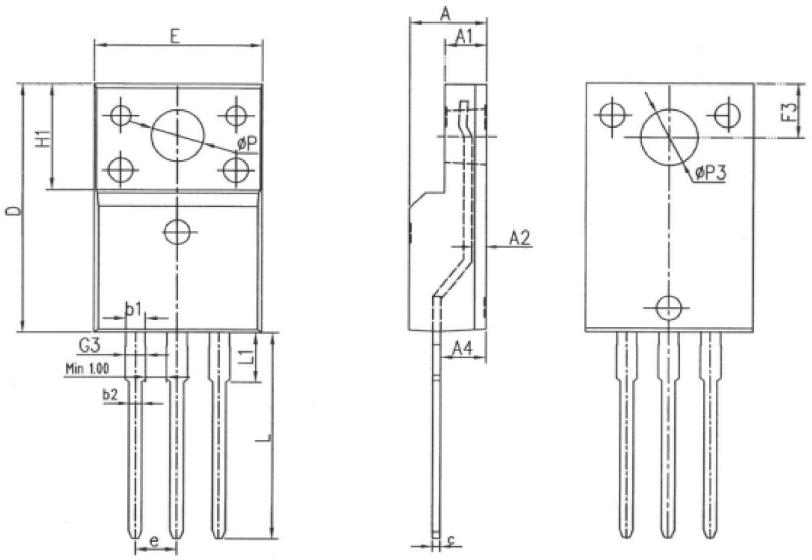
Figure 16. Unclamped inductive load test circuit and Unclamped inductive waveform





Package Outlines

TO220F



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
E	10.00	10.20	10.40
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.65	0.85	1.30
A4	2.55	2.75	2.95
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1	6.70REF		
e	2.54BSC		
ΦP	3.183REF		
L	12.68	12.98	13.28
L1	3.25	3.45	3.65
ΦP3	3.45REF		
F3	3.10	3.30	3.50
G3	1.10	1.30	1.50
b1	1.05	1.20	1.35
b2	0.70	0.80	0.92

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BMF65N340E2	BMF65N340E2	TO220F	Tube	50 units

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