BMS65N340C1

N-Channel Power MOSFET

650 V, 14 A, 340 mΩ

Description

BMS65N340C1 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.

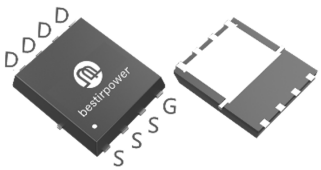
Features

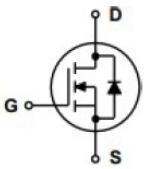
V_{DS} @ $T_{J,max}$	I_D	$R_{DS(on),max}$	$Q_{g,typ}$
700 V	14A	340 mΩ	20 nC

- Extremely low losses due to very low FOM Rdson*Qg and Eoss.
- Very high commutation ruggedness.

Applications

- PFC stages
- switching PWM stages
- LCD TV
- Lighting
- UPS





Absolute Maximum Ratings (T_C = 25℃ unless otherwisenoted)

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]	Continuous (T_C = 25℃)	14	A
		Continuous (T_C = 125℃)	7.5	
I_{DM}	Drain Current	Pulsed	29	A
P_D	Power Dissipation		104.2	W
E_{AS}	Single Pulsed Avalanche Energy[3]		250	mJ
dv/dt	MOSFET dv/dt ruggedness		50	V/ns
	Diode Recovery dv/dt ruggedness[4]		15	
T_{STG}	Storage Temperature Range		-55 to 150	℃
T_J	Maximum Operating Junction Temperature		150	℃
T_L	Maximum Lead Temperature for Soldering, 1/8" from Case for 10 Seconds		260	℃

1)Limited by T_j max. Maximum duty cycle D=0.75.
2)Pulse width t_p limited by T_j,max.
3)V_{DD}=50V, L=50mH, R_G=25Ω, Starting T_j=25°C.
4)V_{DClink}=400V; $V_{DS,peak}$<$V_{(BR)DSS}$; identical low side and high side switch with identical R_G.

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	1.2	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max. *minimal footprint	62	

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BMS65N340C1	65N340C1	DFN5*6	Tape & Reel	5000 units

Electrical Characteristics (T_C = 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 = 250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V Tj=25°C	-	-	1	μA
		V_{DS} = 650 V, V_{GS} = 0 V Tj=150°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 = 250μA	2.5	3.3	4.5	V
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 4A Tj=25°C	-	280	340	mΩ
		V_{GS} = 10 V, I_D = 4A Tj=150°C	-	730	850	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=100V, f=250KHz	-	781	-	pF
C_{oss}	Output Capacitance		-	30	-	pF
C_{rss}	Reverse Transfer Capacitance		-	1.5	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 - 10V, V_{DD} =400V, I_D = 7A	-	20.4	-	nC
Q_{gs}	Gate to Source Charge		-	2.77	-	nC
Q_{gd}	Gate to Drain “Miller” Charge		-	5.8	-	nC
$V_{plateau}$	Gate plateau voltage		-	3.71	-	V
R_G	Gate Resistance	V_{GS} = 0V, f = 1.0MHz	-	3	-	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} = 13V, V_{DD} = 400V, I_D = 7A	-	6.2	-	ns
t_r	Turn-On Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	29	-	ns
t_f	Turn-Off Fall Time		-	22	-	ns
Reverse Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_F = 7A, V_{GS} = 0V	-	0.85	-	V
t_{rr}	Reverse Recovery Time	V_R = 400V, I_F=7A, di_F/dt = 50A/μs	-	218	-	ns
Q_{rr}	Reverse Recovery Charge		-	1.1	-	μC
I_{rrm}	Reverse Recovery Current		-	10.7	-	A

Typical Performance Characteristics

Figure 1. Power dissipation

P_{tot}=f(T_C)

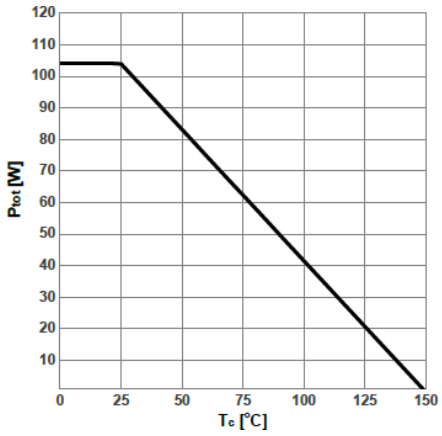


Figure 2. Max. transient thermal impedance

Z_{thJC}=f(t_p); parameter: D= t_p/T

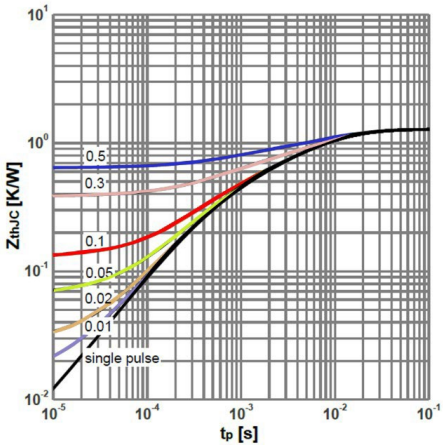


Figure 3: Safe operating area

I_D=f(V_{DS}); T_j=25° C; D=0; parameter: t_p

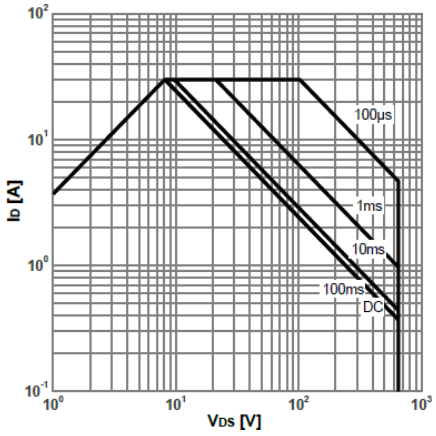


Figure 4: Typ. output characteristics

I_D=f(V_{DS}); T_j=25° C; parameter: V_{GS}

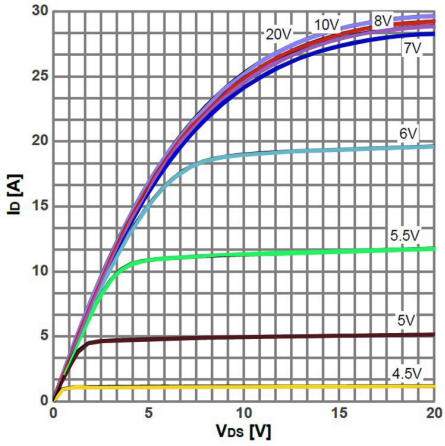


Figure 5:Typ. output characteristics

I_D=f(V_{DS}); T_j=125° C; parameter: V_{GS}

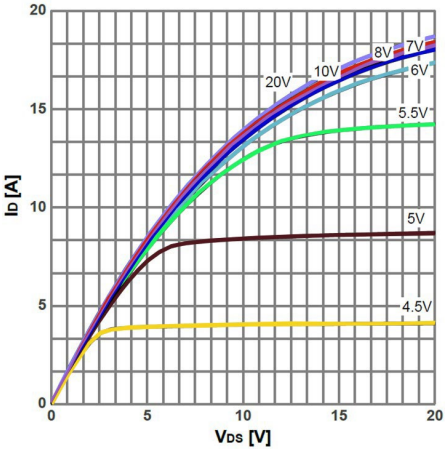
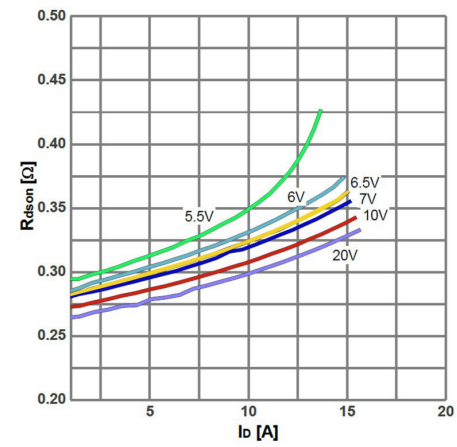


Figure 6: Typ. drain-source on-state resistance

$R_{DS(on)}$=f(I_D); T_j=25° C; parameter: V_{GS}



Typical Performance Characteristics

Figure 7: drain-source on-state resistance

$R_{DS(on)}=f(T_j)$; $I_D=7A$; $V_{GS}=10V$

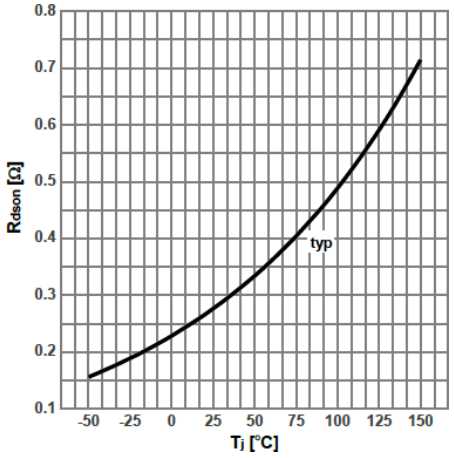


Figure 8: Typ. transfer characteristics

$I_D=f(V_{GS})$; $V_{DS}=20V$; parameter: T_j

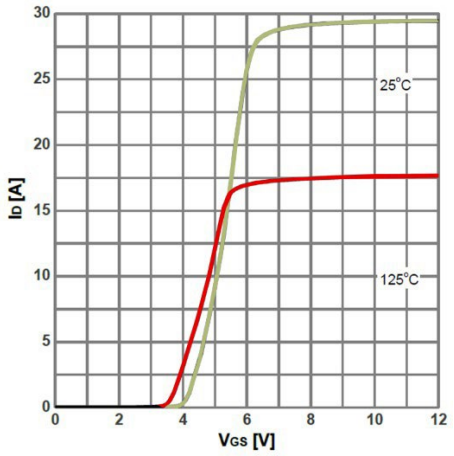


Figure 9:Typ. gate charge

$V_{GS}=f(Q_{gate})$; $I_D=7A$ pulsed; $V_{DS}=400V$

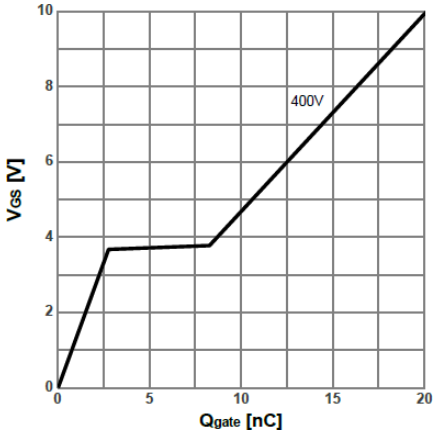


Figure 10:Forward characteristics of reverse diode

$I_F=f(V_{SD})$; parameter: T_j

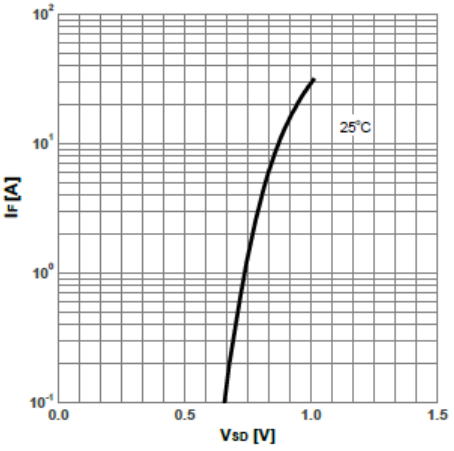


Figure 11:Drain-source breakdown voltage

$V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$

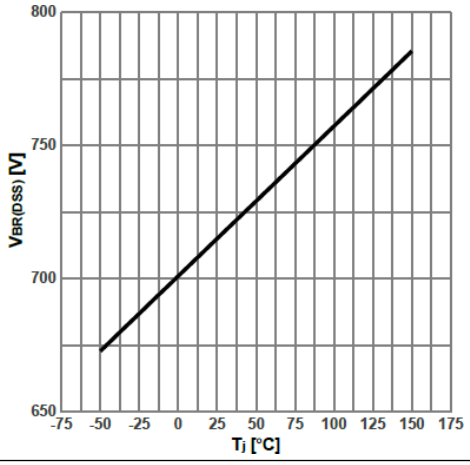
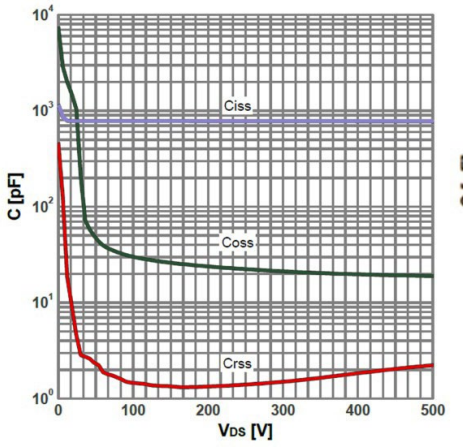


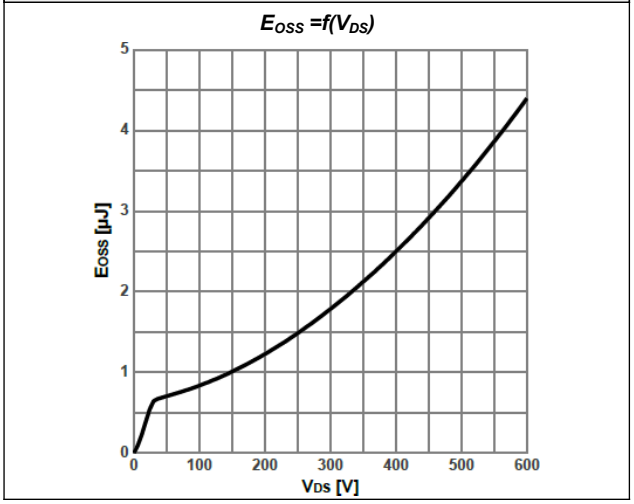
Figure 12:Typ. capacitances

$C=f(V_{DS})$; $V_{GS}=0V$; f=250KHz



Typical Performance Characteristics

Figure 13:Typ. Coss stored energy



Test Circuits

Figure 14:Diode Characteristics

Test circuit for diode characteristics and Diode recovery waveform

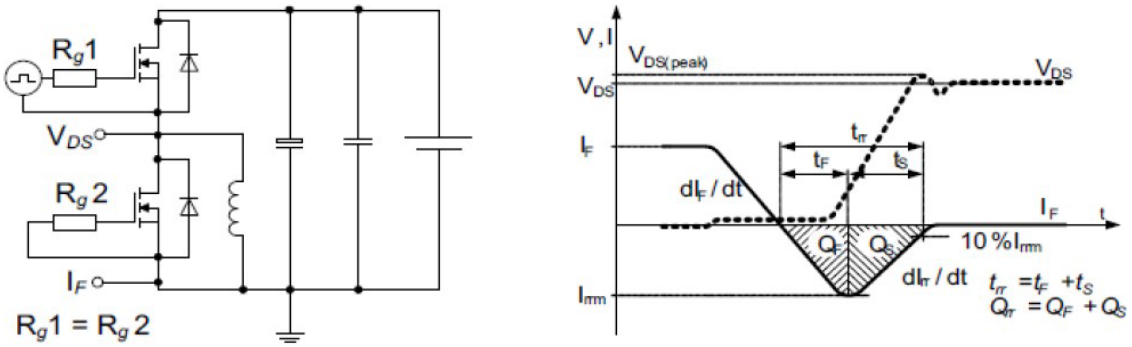


Figure 15:Switching Times

Switching times test circuit for inductive load and Switching times waveform

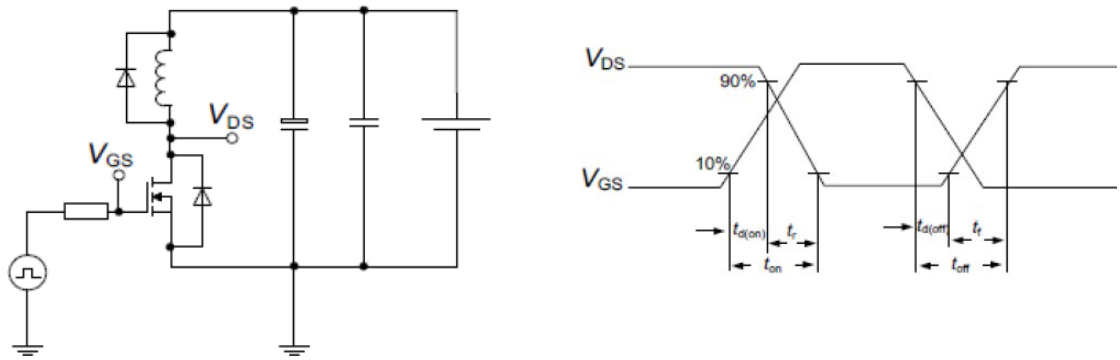
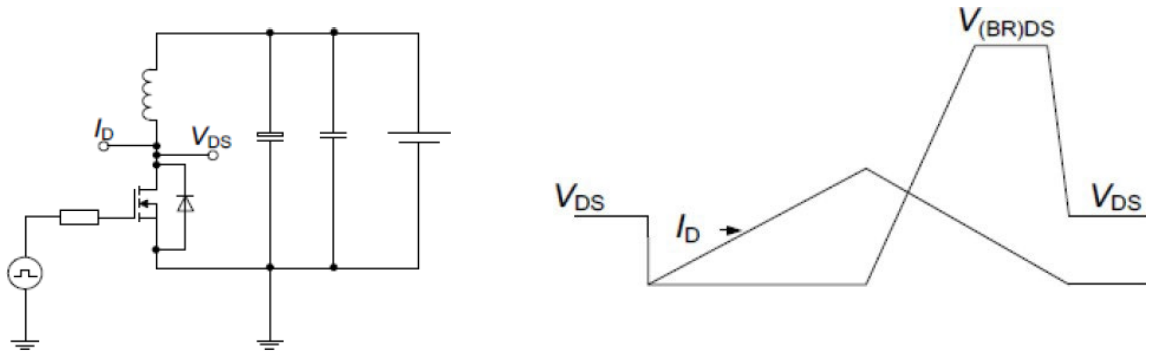


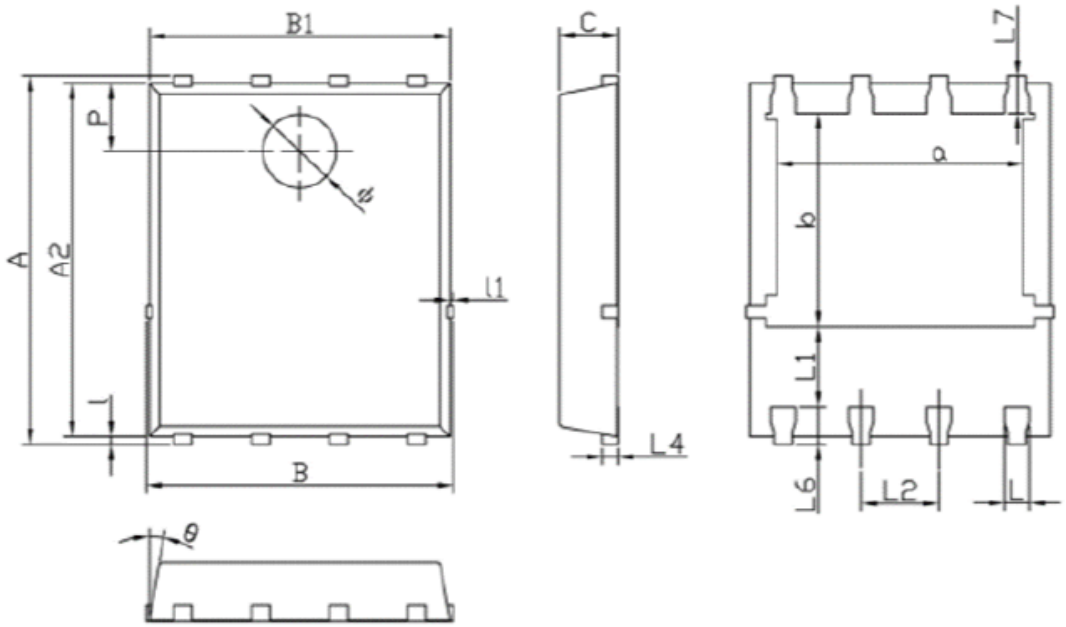
Figure 16:Unclamped Inductive Load

Unclamped inductive load test circuit and Unclamped inductive waveform



Package Outlines

DFN 5*6



Symbol	MIN	TYP	MAX
A	5.90	6.00	6.10
a	3.91	4.01	4.11
A2	5.70	5.75	5.80
B	4.90	5.00	5.10
b	3.37	3.47	3.57
B1	4.80	4.90	5.00
C	0.90	0.95	1.00
L	0.35	0.40	0.45
l	0.06	0.13	0.20
L1	1.10	-	-
l1	-	-	0.10
L2	1.17	1.27	1.37
L4	0.21	0.26	0.34
L6	0.51	0.61	0.71
L7	0.51	0.61	0.71
P	1.00	1.10	1.20
θ	8°	10°	12°
ϕ	1.10	1.20	1.30

* Dimensions in millimeters

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