



bestirpower

BMS65N340C1

N-Channel Power MOSFET

650 V, 14 A, 340 mΩ

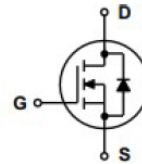
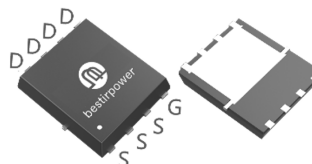
Description

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 $R_{ds(on)} \cdot Q_g$ and E_{oss} .
- Very high commutation ruggedness.



Applications

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



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ 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⁾	$V_{GS} = 10 \text{ V}, (T_C = 25^\circ\text{C})$	14	A
		$V_{GS} = 10 \text{ V}, (T_C = 100^\circ\text{C})$	9	
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	$^\circ\text{C}$
T_J	Maximum Operating Junction Temperature		150	$^\circ\text{C}$
T_L	Maximum Lead Temperature for Soldering, 1/8" from Case for 10 Seconds		260	$^\circ\text{C}$

1)Limited by T_J max. Maximum duty cycle $D=0.75$.

2)Pulse width t_p limited by T_J max.

3) $V_{DD}=50\text{V}$, $L=50\text{mH}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.

4) $V_{DClink}=400\text{V}$; $V_{DS,peak} < V_{(BR)DSS}$; 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	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max. *minimal footprint	62	

Electrical Characteristics (T_J= 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
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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 T _J =25°C	-	-	1	μA
		V _{DS} = 650 V, V _{GS} = 0 V T _J =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 T _J =25°C	-	280	340	mΩ
		V _{GS} = 10 V, I _D = 4A T _J =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 open drain	-	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 _{rm}	Reverse Recovery Current		-	10.7	-	A

Typical Performance Characteristics

Figure 1. Power dissipation

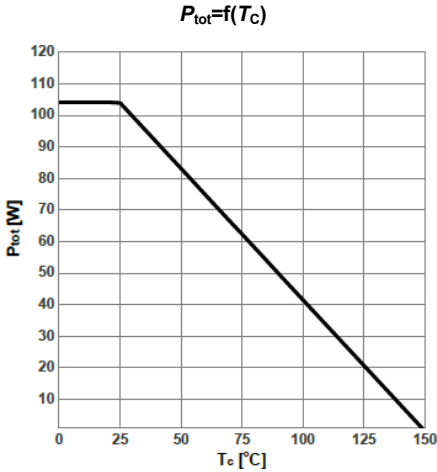


Figure 2. Max. transient thermal impedance

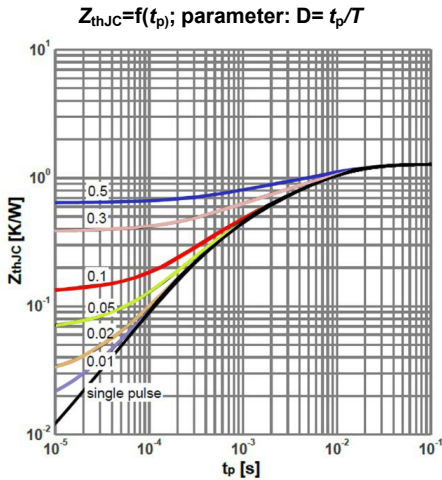


Figure 3: Safe operating area

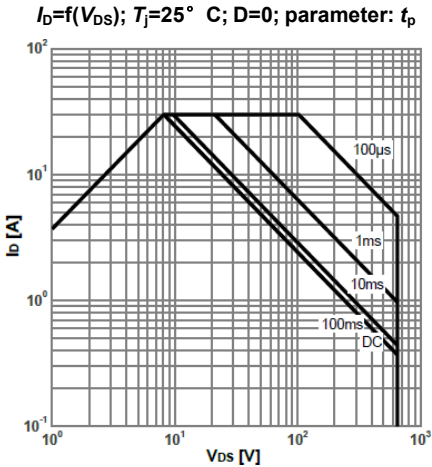


Figure 4: Typ. output characteristics

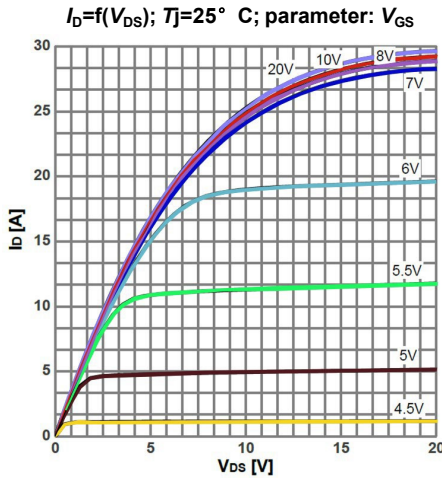


Figure 5:Typ. output characteristics

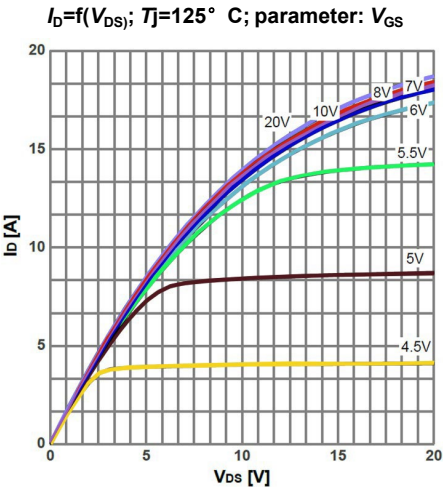
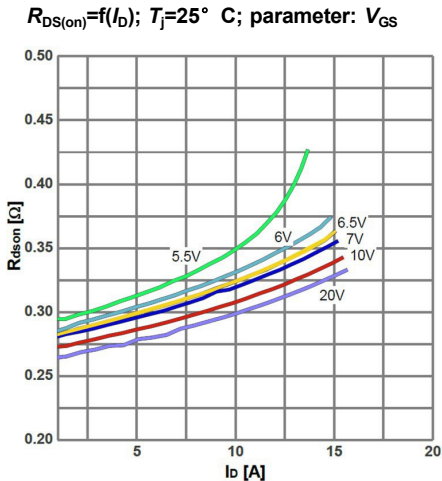


Figure 6: Typ. drain-source on-state resistance



Typical Performance Characteristics

Figure 7: drain-source on-state resistance

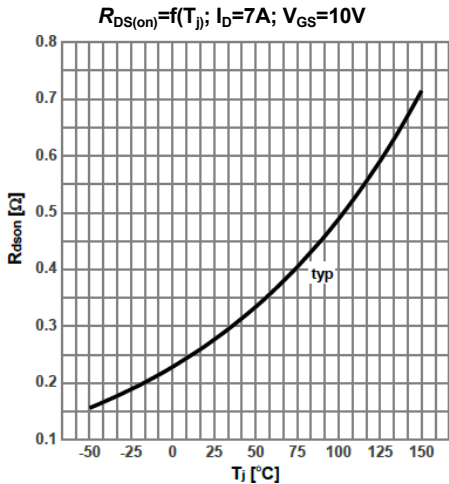


Figure 8: Typ. transfer characteristics

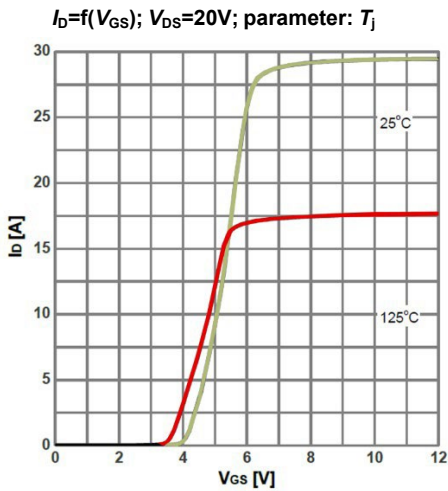


Figure 9:Typ. gate charge

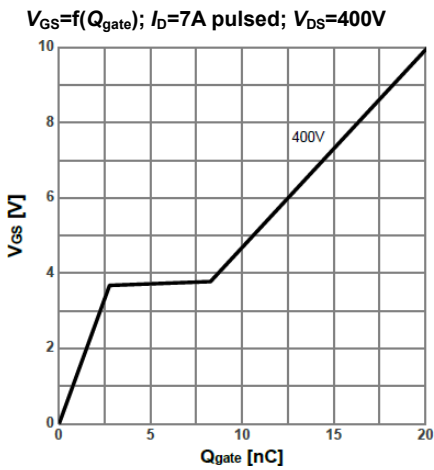


Figure 10:Forward characteristics of reverse diode

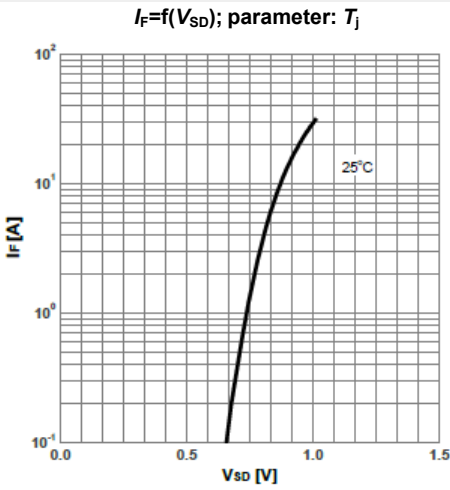


Figure 11:Drain-source breakdown voltage

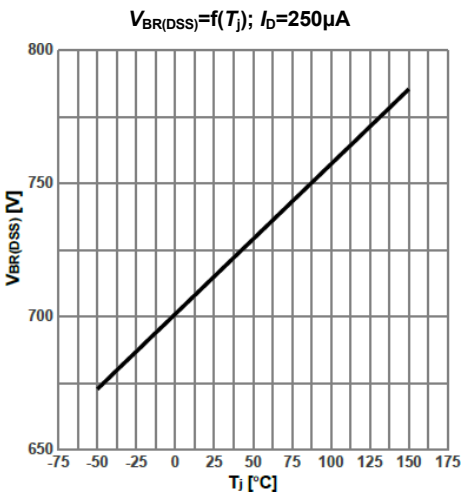
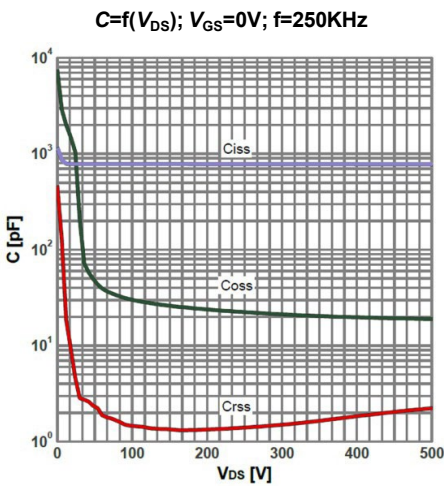
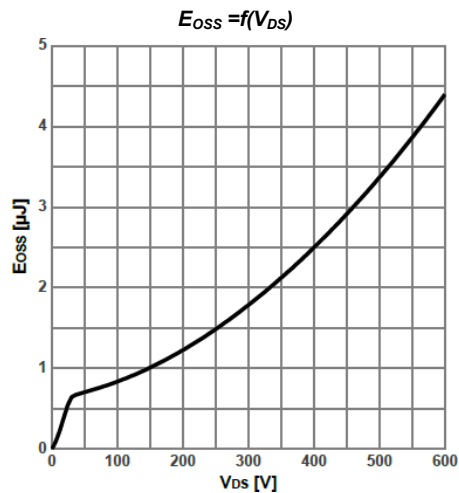


Figure 12:Typ. capacitances



Typical Performance Characteristics

Figure 13:Typ. Coss stored energy



Test Circuits

Figure 14:Diode Characteristics

Test circuit for diode characteristics and Diode recovery waveform

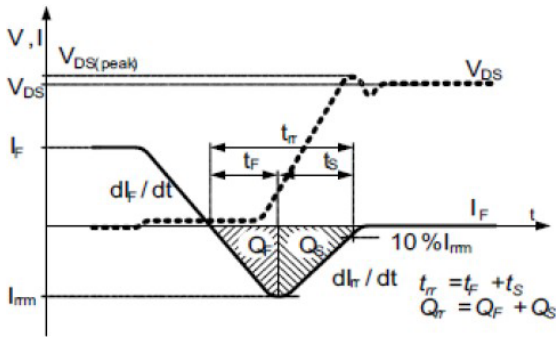
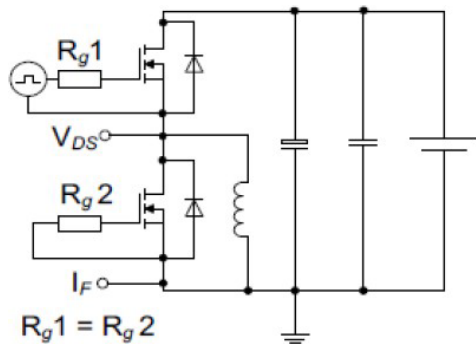


Figure 15:Switching Times

Switching times test circuit for inductive load and Switching times waveform

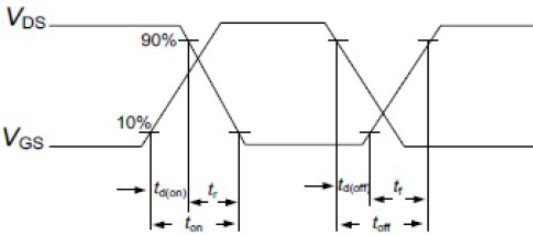
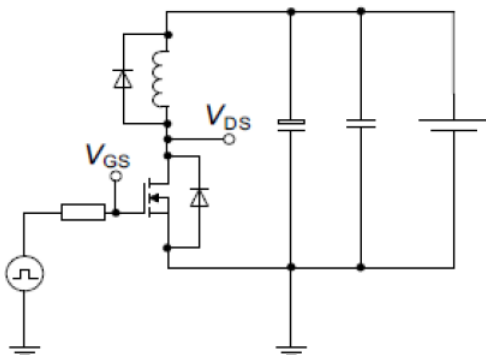
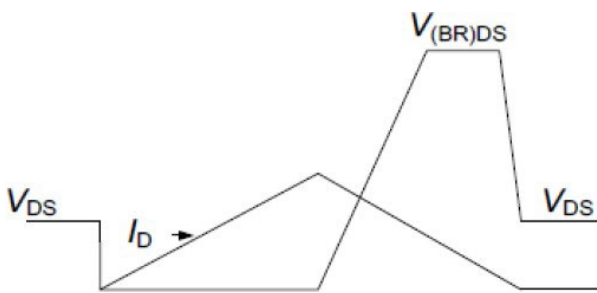
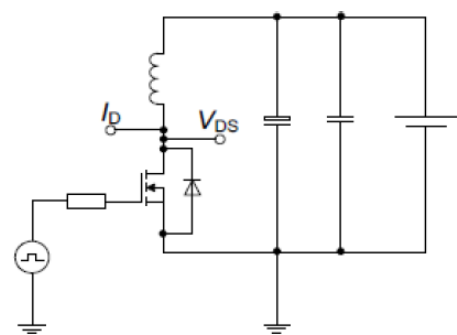


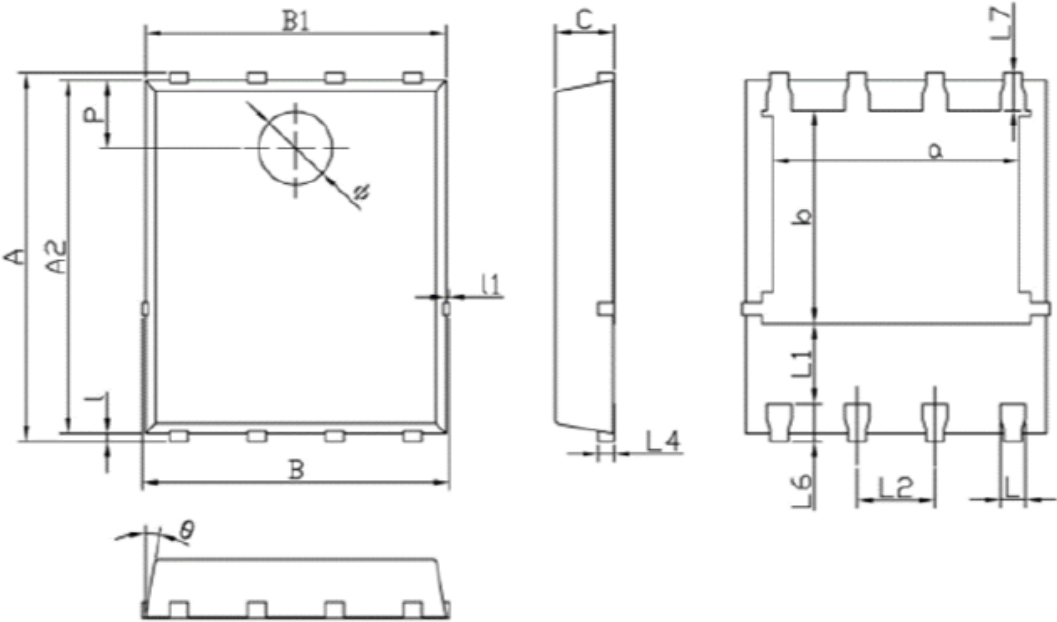
Figure 16:Unclamped Inductive Load

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

Package Marking and Ordering Information

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

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