

BMD65N340C1

Super Junction Power MOSFET

650 V, 14 A, 340 mΩ

Description

BMD65N340C1 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.

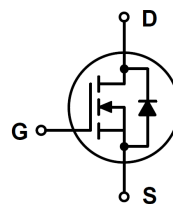
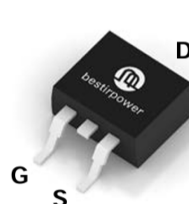
Features

$V_{DS} @ T_{J,max}$	I_D	$V_{TH,typ}$	$R_{DS(on),max}$	$Q_{g,typ}$
700 V	14 A	3.3 V	340 mΩ	20.4 nC

- Extremely low losses due to very low FOM $R_{DS(on)} * Q_g$ and E_{oss} .
- Very high commutation ruggedness.

Applications

ÇPFC.
ÇSPWM.
ÇLCD TV.
ÇLighting.
ÇUPS.



Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ 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	29.3	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	°C
T_J	Maximum Operating Junction Temperature		150	°C
T_L	Maximum Lead Temperature for Soldering, 1/8" from Case for 10 Seconds		260	°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) $V_{DClamp}=400\text{V}$; $V_{DS,peak} < V_{(BR)DSS}$; 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 $T_C = 25^\circ\text{C}$	1.2	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient $T_C = 25^\circ\text{C}$	62	

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Reel Size	Tape Width	Quantity
BMD65N340C1	BMD65N340C1	D-Pak	Tape & Reel	330 mm	16 mm	2500 units

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
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Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}, T_J = 25^\circ\text{C}$	-	-	1	μA
		$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}, T_J = 150^\circ\text{C}$	-	-	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	-	-	± 100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	2.5	3.3	4.5	V
$R_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 10\text{ V}, I_D = 4\text{ A}, T_J = 25^\circ\text{C}$	-	280	340	mΩ
		$V_{GS} = 10\text{ V}, I_D = 4\text{ A}, T_J = 150^\circ\text{C}$	-	730	850	mΩ

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 100\text{V}, f = 250\text{KHz}$	-	781	-	pF
C_{oss}	Output Capacitance		-	30.3	-	pF
C_{rss}	Reverse Transfer Capacitance		-	1.47	-	pF
Q_g	Total Gate Charge	$V_{GS} = 0-10\text{V},$ $V_{DD} = 400\text{V}, I_D = 7\text{A}$	-	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	$V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	-	3	-	Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 13\text{V}, V_{DD} = 400\text{V}, I_D = 7\text{A}$	-	6.2	-	ns
t_r	Turn-On Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	28.8	-	ns
t_f	Turn-Off Fall Time		-	22.4	-	ns

Reverse Diode Characteristics

I_{SD}	Continuous Diode Forward Current	$T_C = 25^\circ\text{C}$	-	-	14	A
V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{V}, I_F = 7\text{A}, T_J = 25^\circ\text{C}$	-	0.846	-	V
t_{rr}	Reverse Recovery Time	$V_R = 400\text{V}, I_F = 7\text{A}$ $di_F/dt = 50\text{A}/\mu\text{s}$ $V_R = 400\text{V}$	-	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

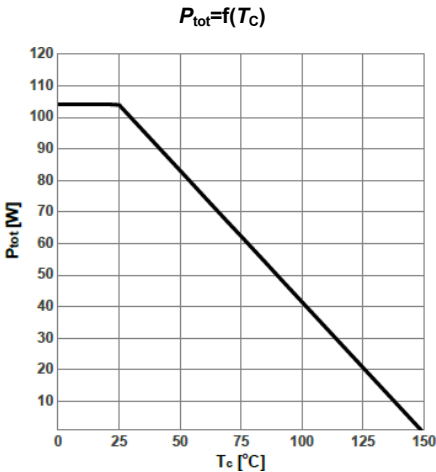


Figure 2. Max. transient thermal impedance

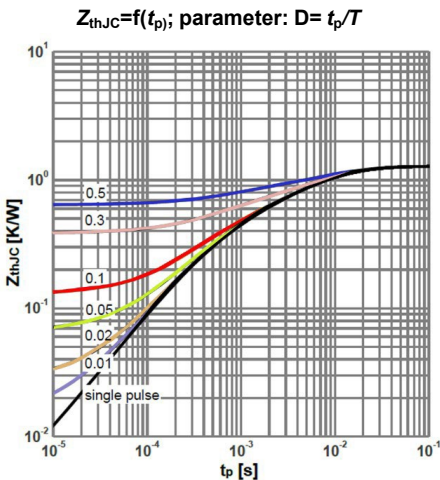


Figure 3: Safe operating area

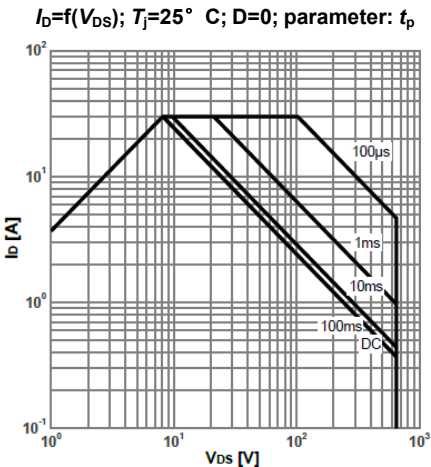


Figure 4: Typ. output characteristics

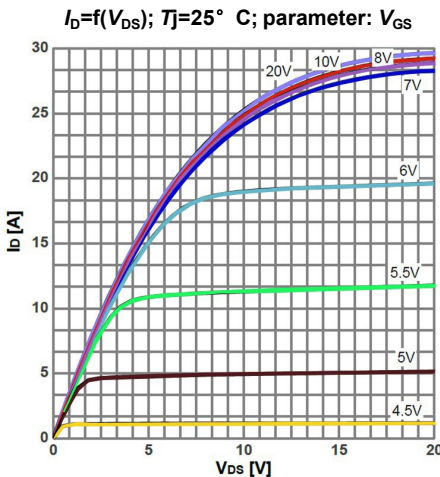


Figure 5:Typ. output characteristics

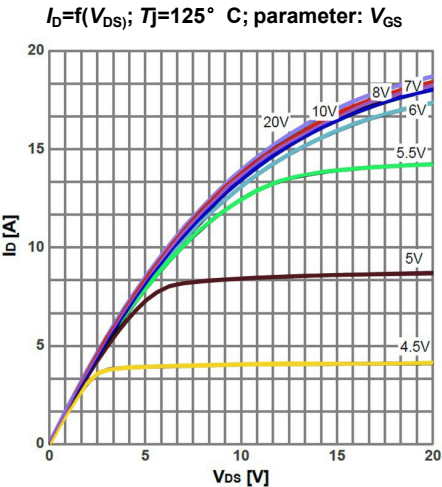
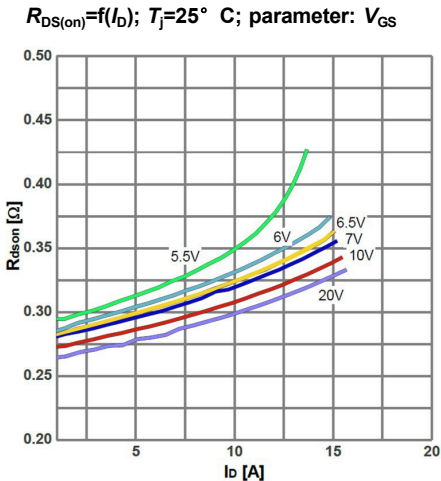


Figure 6: Typ. drain-source on-state resistance



Typical Performance Characteristics

Figure 7: drain-source on-state resistance

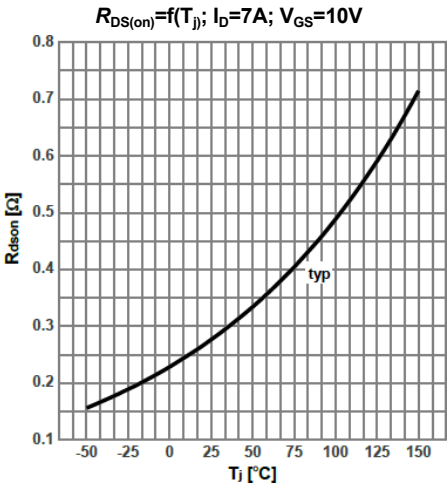


Figure 8: Typ. transfer characteristics

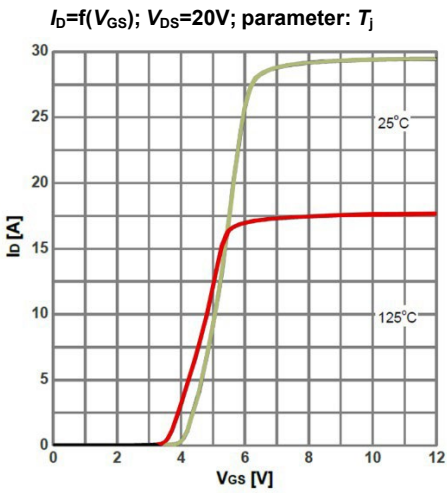


Figure 9:Typ. gate charge

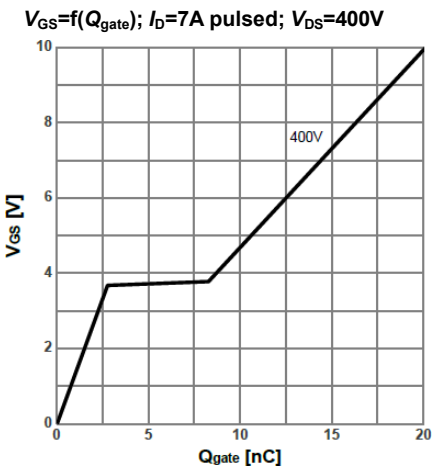


Figure 10:Forward characteristics of reverse diode

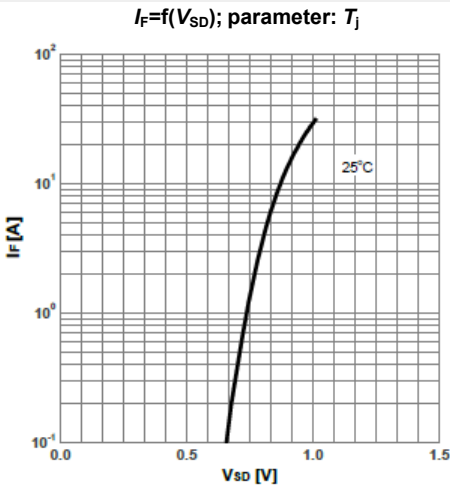


Figure 11:Drain-source breakdown voltage

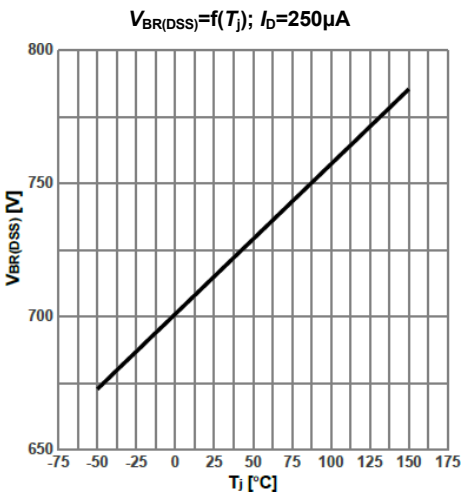
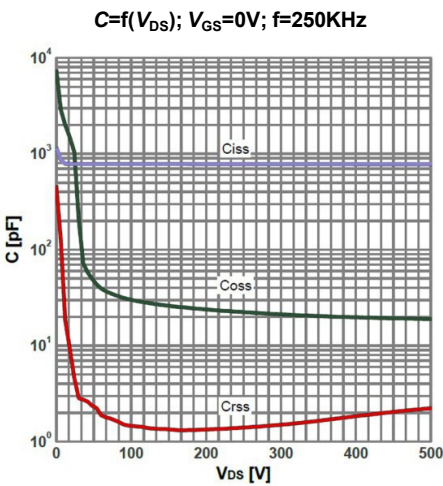


Figure 12:Typ. capacitances



Typical Performance Characteristics

Figure 13:Typ. Coss stored energy

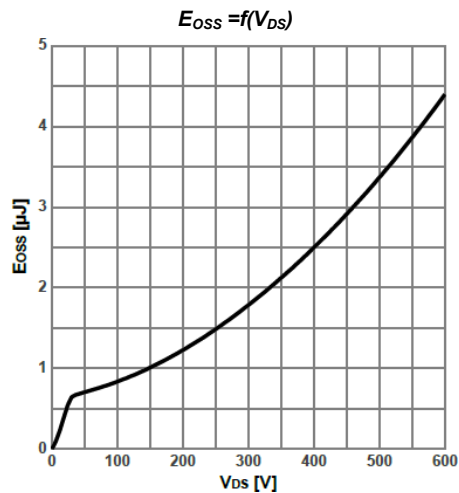
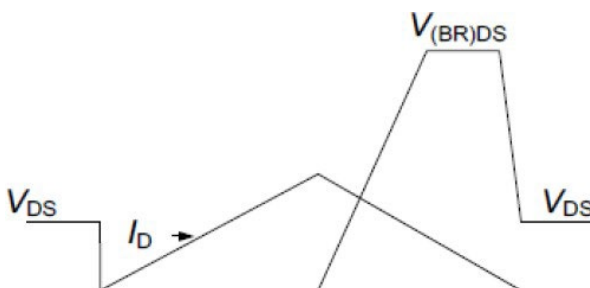
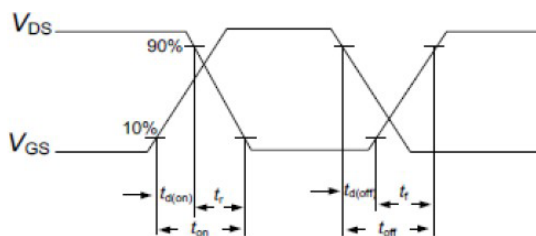
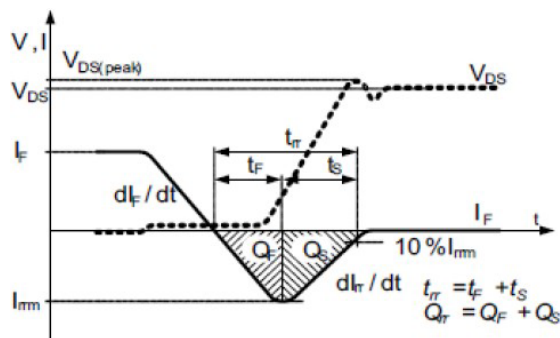
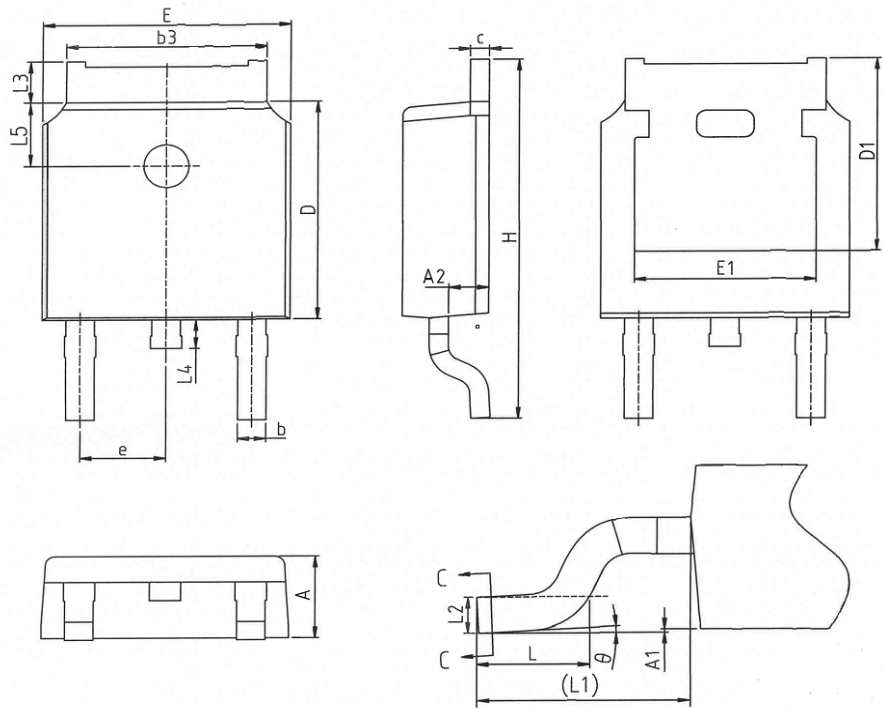


Figure 14: Diode Characteristics

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Package Outlines

D-Pak



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.00	—	0.12
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.46
c	0.43	0.53	0.61
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.73
E1	4.63	—	—
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	—	1.28
L4	0.50	—	1.00
L5	1.65	1.80	1.95
θ	0°	—	8°

* Dimensions in millimeters

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