



bestirpower

BCL120N160W1

N-Channel Silicon Carbide Power MOSFET

1200 V, 22 A, 160 mΩ

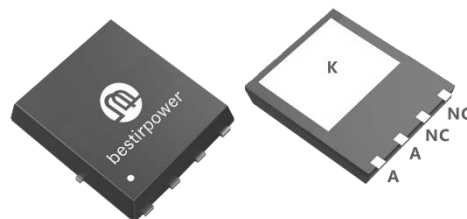
Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

$BV_{DSS, T_C=25^{\circ}C}$	$I_D, T_C=25^{\circ}C$	$R_{DS(on), typ}$	$Q_{g, typ}$
1200 V	22 A	160 mΩ	40 nC

Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency



Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power applications



Absolute Maximum Ratings ($T_C = 25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Value	Unit
V_{DSmax}	Drain - Source Voltage	$V_{GS}=0V, I_D=100\mu A$	1200	V
V_{GSmax}	Gate - Source Voltage	Absolute maximum values	-8 / +22	V
V_{GSop}	Gate - Source Voltage	Recommended operational values	-5 / +18	V
I_D	Continuous Drain Current	$V_{GS}=18V, T_C=25^{\circ}C$	22	A
		$V_{GS}=18V, T_C=100^{\circ}C$	16	
I_{DM}	Pulse Drain Current	Pulse width limited by T_{jmax}	58	A
T_J, T_{STG}	Operating Junction and Storage Temperature		-55 to 175	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.82	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	62	

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCL120N160W1	BCL120N160W1	DFN8*8	Tape & Reel	5000 units

Electrical Characteristics ($T_C = 25^\circ\text{C}$, Note1)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain to Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	1200			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5.0\text{ mA}, T_C = 25^\circ\text{C}$	2.0	3.5	4.0	V
		$V_{GS} = V_{DS}, I_D = 5.0\text{ mA}, T_C = 175^\circ\text{C}$		2.7		
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 1200\text{ V}, V_{GS} = 0\text{ V}$		10	100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = 18\text{ V}, V_{DS} = 0\text{ V}$		10	200	nA
$R_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 18\text{ V}, I_D = 10\text{ A}, T_C = 25^\circ\text{C}$		125	180	m Ω
		$V_{GS} = 15\text{ V}, I_D = 10\text{ A}, T_C = 25^\circ\text{C}$		160	190	
		$V_{GS} = 18\text{ V}, I_D = 10\text{ A}, T_C = 175^\circ\text{C}$		220		
g_{fs}	Transconductance	$V_{GS} = 18\text{ V}, I_D = 10\text{ A}, T_J = 25^\circ\text{C}$		7.0		S
		$V_{GS} = 18\text{ V}, I_D = 10\text{ A}, T_J = 175^\circ\text{C}$		6.0		
C_{iss}	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 800\text{ V}, f = 1\text{ MHz}, V_{AC} = 25\text{ mV}$		550		pF
C_{oss}	Output Capacitance			28		
C_{rss}	Reverse Transfer Capacitance			8		
E_{ON}	Turn-On Switching Energy	$V_{DS} = 800\text{ V}, V_{GS} = -5/18\text{ V}, I_D = 10\text{ A}, R_{G(ext)} = 0\Omega, L = 256\mu\text{H}$		200		μJ
E_{OFF}	Turn-Off Switching Energy			50		
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 800\text{ V}, V_{GS} = -5/18\text{ V}, I_D = 100\text{ A}, R_{G(ext)} = 0\Omega, \text{Timing relative to } V_{DS}$		20		ns
t_r	Rise Time			45		
$t_{d(off)}$	Turn-Off Delay Time			20		
t_f	Fall Time			15		
$R_{G(int)}$	Internal Gate Resistance	$f = 1\text{ MHz}, V_{AC} = 25\text{ mV}$		10.0		Ω
Q_{gs}	Gate to Source Charge	$V_{DD} = 800\text{ V}, V_{GS} = -5/18\text{ V}, I_D = 10\text{ A}$		11		nC
Q_{gd}	Gate to Drain Charge			8		
Q_g	Total Gate Charge			40		

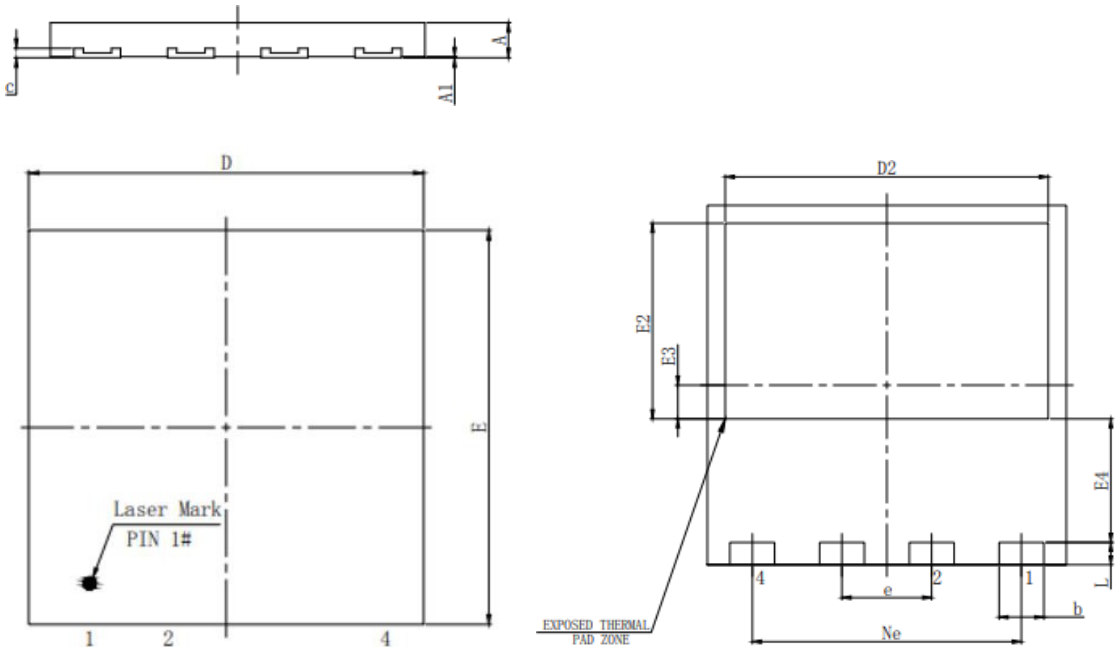
Reverse Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{SD}	Diode Forward Voltage	$V_{GS} = -5\text{ V}, I_{SD} = 5\text{ A}, T_J = 25^\circ\text{C}$		3.5		V
		$V_{GS} = -5\text{ V}, I_{SD} = 5\text{ A}, T_J = 175^\circ\text{C}$		3.2		
I_S	Continuous Diode Forward Current	$T_C = 25^\circ\text{C}$			30	A
t_{rr}	Reverse Recovery time	$V_{GS} = -5\text{ V}, I_{SD} = 10\text{ A}, V_R = 800\text{ V}, \text{dif} / \text{dt} = 1200\text{ A}/\mu\text{s};$		10		ns
Q_{rr}	Reverse Recovery Charge			40		nC
I_{rm}	Peak Reverse Recovery Current			3		A

※. Note 1 : Limited by maximum junction temperature.

Package Outlines

DFN 8*8



Symbol	Dimensions In Millimeters		
	Min	Nom	Max
D	7.90	8.00	8.10
E	7.90	8.00	8.10
D2	7.10	7.20	7.30
E2	4.25	4.35	4.45
e	2.00BSC		
E3	0.75REF		
E4	2.75REF		
Ne	6.00BSC		
b	0.95	1.00	1.05
A	0.70	0.75	0.80
c	0.203REF		
A1	0	/	0.050
L	0.40	0.50	0.55

Disclaimer

Bestirpower reserve the right to make changes, corrections, enhancements, modifications, and improvements to Bestirpower products and/or to this document at any time without notice.

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Bestirpower does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Products or technical information described in this document.

This document is the property of Bestirpower Co., LTD., and not allowed to copy or transformed to other format if not under the authority approval.

© 2024 bestirpower – All rights reserved