BCW120N160W1

N-Channel Silicon Carbide Power MOSFET

1200 V, 22 A, 160 mΩ

bestirpower

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

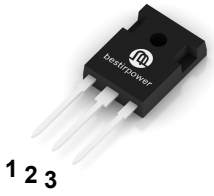
$BV_{DSS,\ Tc=25℃}$	$I_{D,\ Tc=25℃}$	$R_{DS(on),typ}$	$Q_{g,typ}$
1200 V	22 A	160 mΩ	40 nC

Benefits

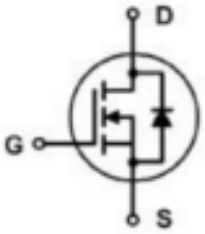
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

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



TO-247-3L



Absolute Maximum Ratings (T_J = 25℃ unless otherwisenoted)

Symbol	Parameter	Test Conditions	Value	Unit
V_{DSmax}	Drain - Source Voltage	V_{GS}=0V,I_D=100μA	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˚C	22	A
		V_{GS}=18V, T_C=100˚C	16	
I_{DM}	Pulse Drain Current	Pulse width limited by T_{jmax}	58	A
T_J, T_{STG}	Operating Junction and StorageTemperature		-55 to 175	˚C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	1.19	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	27.47	
Tsold	Soldering temperature, wave soldering only allowed at leads	260	℃

Electrical Characteristics (T_J = 25℃, Note1)

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

Reverse Diode Characteristics

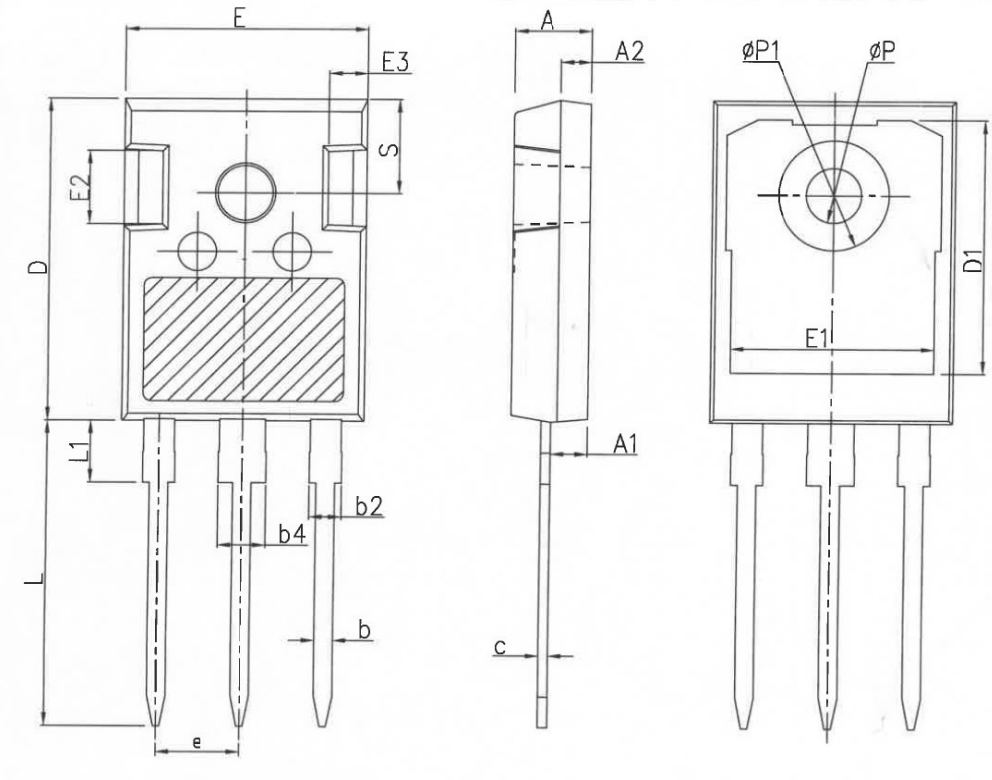
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{SD}	Diode Forward Voltage	V_{GS} = -5 V, I_{SD} = 5 A,T_J = 25˚C	-	3.5	-	V
		V_{GS} = -5 V, I_{SD} = 5 A,T_J = 175˚C	-	3.2	-	
I_S	Continuous Diode Forward Current	T_C = 25℃	-	-	30	A
t_{rr}	Reverse Recovery time	V_{GS} = -5V, I_{SD} = 10 A, V_R= 800V,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

※. Note 1 : Limited by maximum junction temperature.

Package

Outlines

TO247-3



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	–	–	4.30
ΦP	3.40	3.60	3.80
ΦP1	–	–	7.30
S	6.15BSC		

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCW120N160W1	BCW120N160W1	TO247-3L	Tube	30 units

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.