



BCW120N160W1

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

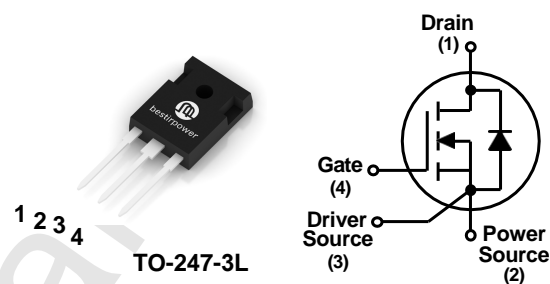
$BV_{DSS, T_C=25^\circ C}$	$I_D, T_C=25^\circ C$	$R_{DS(on), typ}$	$Q_{g, typ}$
1200 V	22 A	160 mΩ	40 nC

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	$^\circ C$

Electrical Characteristics (T_C = 25°C, 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-On Switching 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		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		

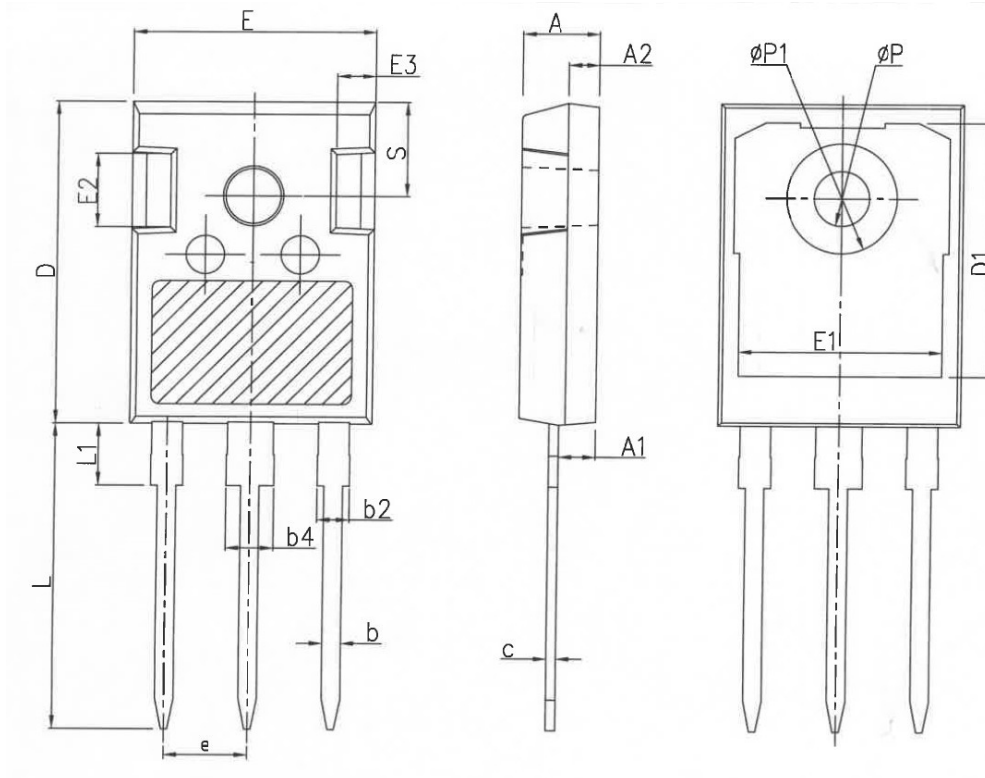
Reverse Diode Characteristics

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°C			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

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