

BCA120S40D3

Silicon Carbide Schottky Diode

1200V, 40A



bestirpower

Description

BCA120S40D3 utilizes bestirpower's advanced silicon carbide diode technology. This technology combines the benefits of excellent low forward voltage and robustness. Consequently, the family is suitable for application requiring high power efficiency

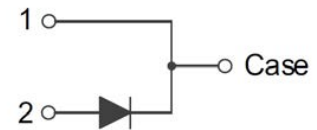
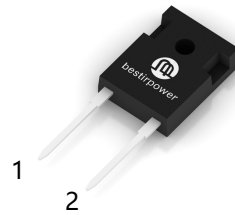
Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drive, PV Inverter, Wind Power Station

Features

V_{RRM}	I_F	T_C	Q_C
1200 V	40 A	154 °C	190 nC

- Zero Reverse Recovery Current
- Positive Temperature Coefficient on VF
- Temperature-Independent Switching
- 175°C Operating Junction Temperature
- Reduction of Heat Sink Size
- Low Switching Losses



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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_C = 25^\circ\text{C}$	1200	V
V_{RSM}	Surge Peak Reverse Voltage	$T_C = 25^\circ\text{C}$	1200	V
V_{DC}	DC Blocking Voltage	$T_C = 25^\circ\text{C}$	1200	V
I_F	Forward Current	$T_C = 25^\circ\text{C}$	172.3	A
		$T_C = 135^\circ\text{C}$	62.1	A
		$T_C = 154^\circ\text{C}$	40	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ ms}$	250	A
P_{tot}	Power Dissipation	$T_C = 25^\circ\text{C}$	536	W
		$T_C = 110^\circ\text{C}$	232	W
T_J, T_{STG}	Operating Junction and Storage Temperature		-55 to +175	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.28	°C/W

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_F	Forward Voltage	$I_F = 40\text{ A}, T_C = 25^\circ\text{C}$		1.5	1.8	V
		$I_F = 40\text{ A}, T_C = 175^\circ\text{C}$		2.0	2.3	
I_R	Reverse Current	$V_R = 1200\text{ V}, T_C = 25^\circ\text{C}$		2	100	μA
		$V_R = 1200\text{ V}, T_C = 175^\circ\text{C}$		14	200	
Q_C	Total Capacitive Charge	$V_R = 800\text{ V}, T_C = 25^\circ\text{C}$		190		nC
C	Total Capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}$		2734		pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}$		178		
		$V_R = 800\text{ V}, f = 1\text{ MHz}$		131		
E_C	Capacitance Stored Energy	$V_R = 800\text{ V}, T_C = 25^\circ\text{C}$		54.8		μJ

Typical Performance Characteristics

Figure 1. Forward Characteristics

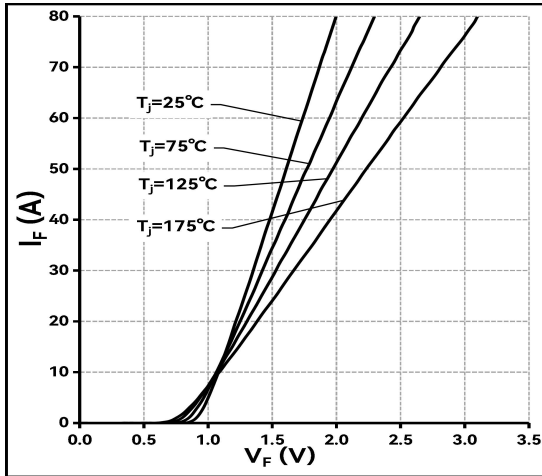


Figure 2. Reverse Characteristics

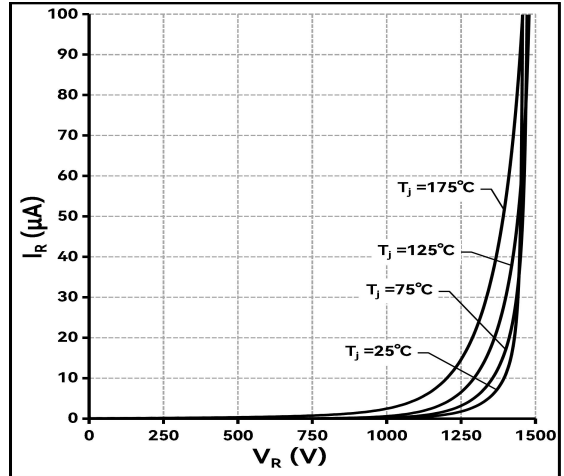


Figure 3. Current Derating

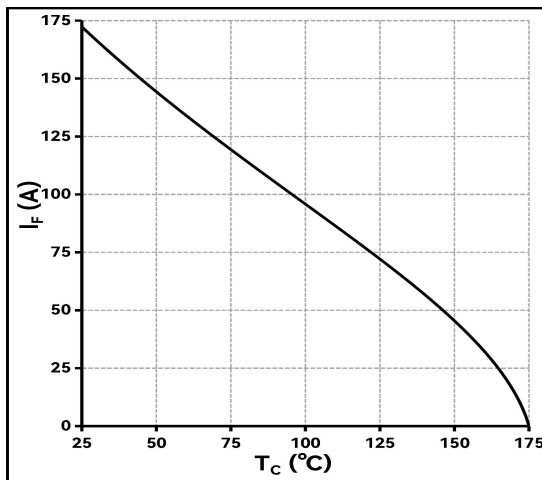


Figure 4. Power Derating

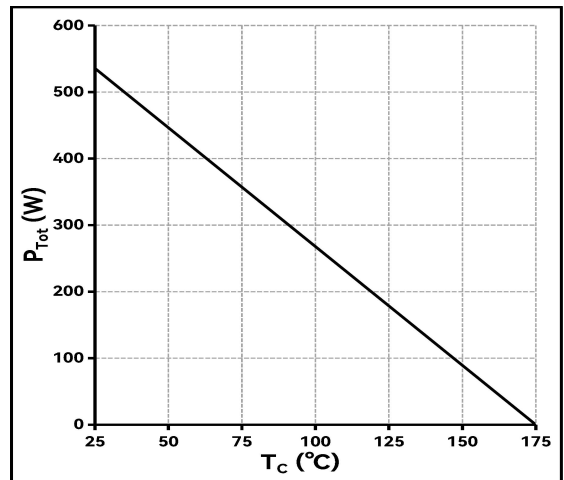


Figure 5. Total Capacitive Charge vs Reverse Voltage

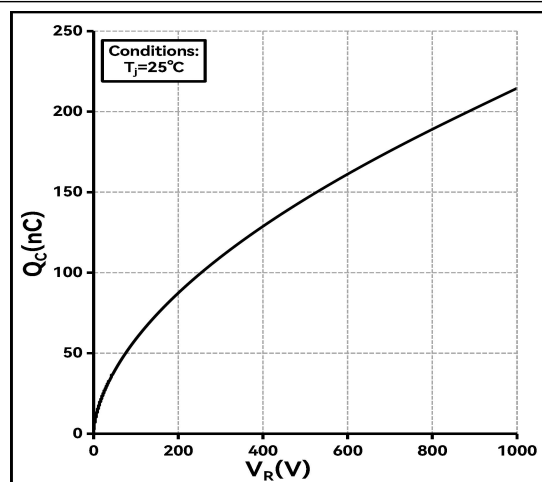
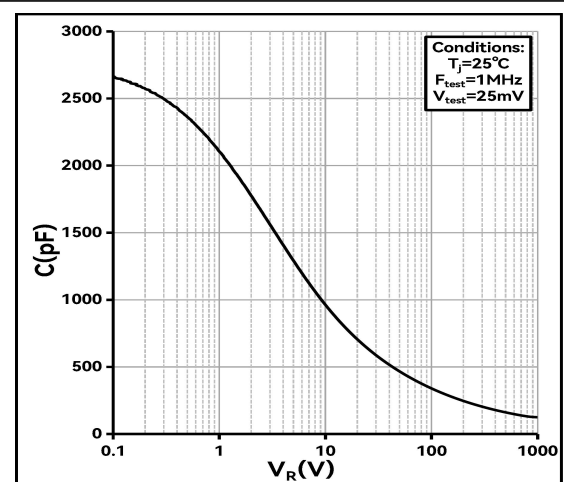


Figure 6. Total Capacitance vs Reverse Voltage



Typical Performance Characteristics

Figure 7. Typical Capacitance Stored Energy

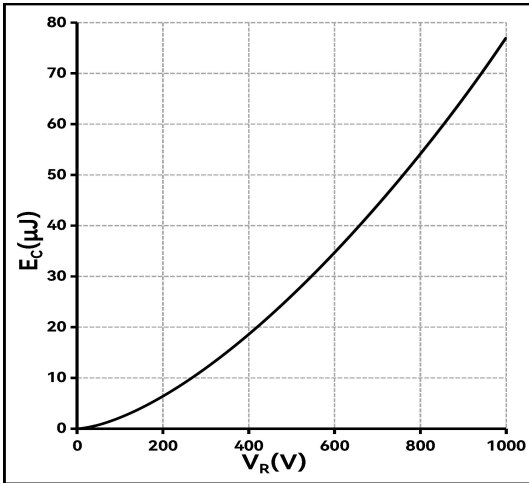
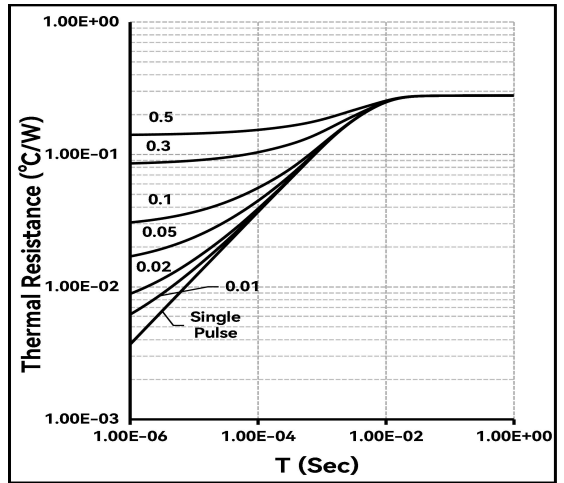
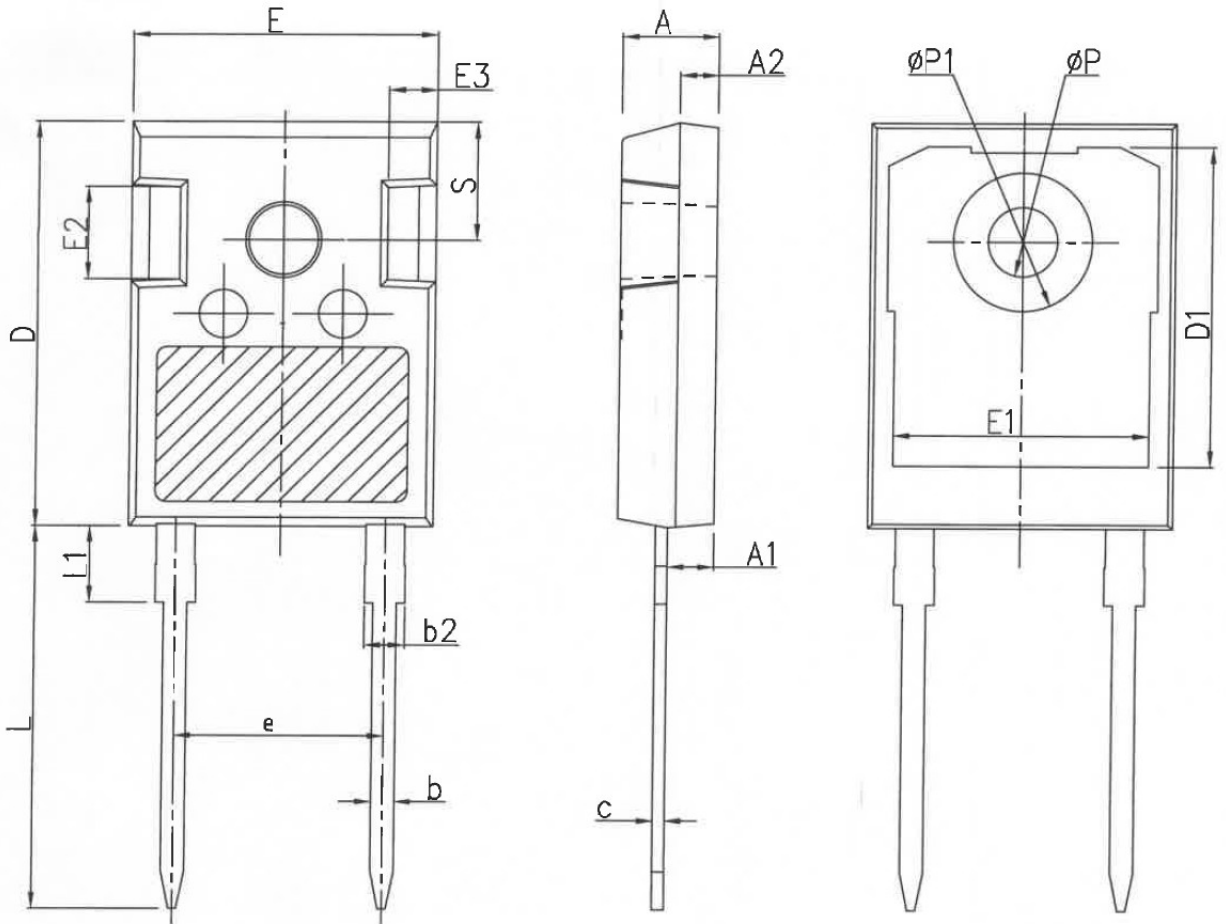


Figure 8. Transient Thermal Impedance



Package Outlines

TO247-2



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
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	10.88BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
$\Phi P1$	-	-	7.30
S	6.15BSC		

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCA120S40D3	BCA120S40D3	TO247-2	Tube	30 units

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