



# BCA65S20D3

## Silicon Carbide Schottky Diode

650V, 20A

### Description

BCA65S20D3 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

### Benefits

- Higher frequency
- Low heat dissipation requirements
- Reduce size and cost of the system
- High-reliability
- System efficiency improvement

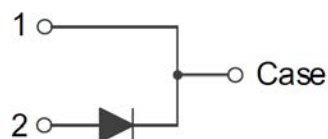
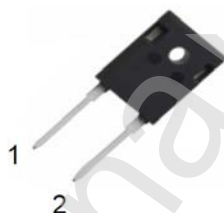
### Applications

- Switch mode power supply
- Solar inverter
- Data Center
- Uninterruptible power supply

### Features

$V_{RRM}$	$I_F$	$T_C$	$Q_C$
650 V	20 A	148 °C	65 nC

- High surge current capability
- No reverse recovery
- Positive Temperature Coefficient
- Easy to paralleling
- Halogen-free / RoHS compliant



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

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage	650	V
$I_F$	Forward Current	$T_C = 25^\circ\text{C}$	54 A
		$T_C = 135^\circ\text{C}$	25 A
		$T_C = 148^\circ\text{C}$	20 A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 25^\circ\text{C}, t_p = 10 \text{ ms}$	170 A
		$T_C = 110^\circ\text{C}, t_p = 10 \text{ ms}$	154 A
$I_{F,RM}$	Repetitive Peak Forward Surge Current	$T_C = 25^\circ\text{C}, t_p = 10 \text{ ms}$	159 A
$I^2dt$ value	$\int I^2 dt$	$T_C = 25^\circ\text{C}, t_p = 10 \text{ ms}$	144 A <sup>2</sup> s
		$T_C = 110^\circ\text{C}, t_p = 10 \text{ ms}$	118 A <sup>2</sup> s
$P_{tot}$	Power Dissipation	$T_C = 25^\circ\text{C}$	204 W
		$T_C = 110^\circ\text{C}$	88 W
		$T_C = 150^\circ\text{C}$	34 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, Typ.	0.735	°C/W

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{DC}$	DC blocking voltage		650	-	-	V
$V_F$	Forward Voltage	$I_F = 20\text{A}, T_J = 25^\circ\text{C}$	-	1.45	1.7	V
		$I_F = 20\text{A}, T_J = 175^\circ\text{C}$	-	1.7	-	
$I_R$	Reverse Current	$V_R = 650\text{V}, T_J = 25^\circ\text{C}$	-	2	20	$\mu\text{A}$
		$V_R = 650\text{V}, T_J = 175^\circ\text{C}$	-	40	-	
$Q_C$	Total Capacitive Charge	$V_R = 400\text{V}, T_J = 25^\circ\text{C}$	-	65	-	nC
C	Total Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$	-	1340	-	pF
		$V_R = 200\text{V}, f = 1\text{MHz}$	-	120	-	
		$V_R = 400\text{V}, f = 1\text{MHz}$	-	109	-	
$E_C$	Capacitance Stored Energy	$V_R = 400\text{V}, T_C = 25^\circ\text{C}$	-	16	-	$\mu\text{J}$

## Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCA65S20D3	BCA65S20D3	TO247-2	Tube	30 units

### Typical Performance Characteristics

Figure 1. Forward Characteristics

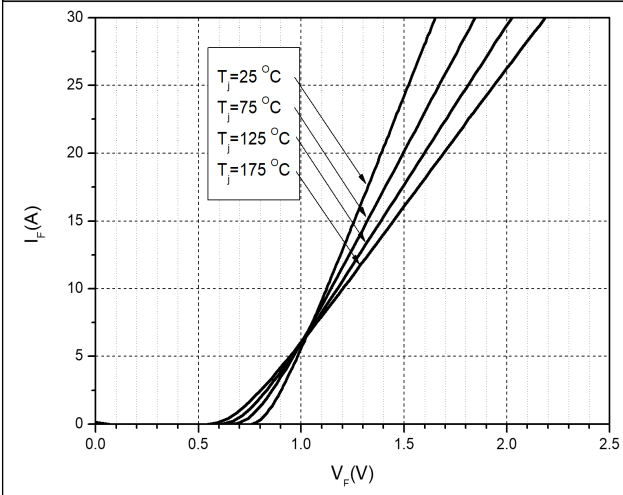


Figure 2. Reverse Characteristics

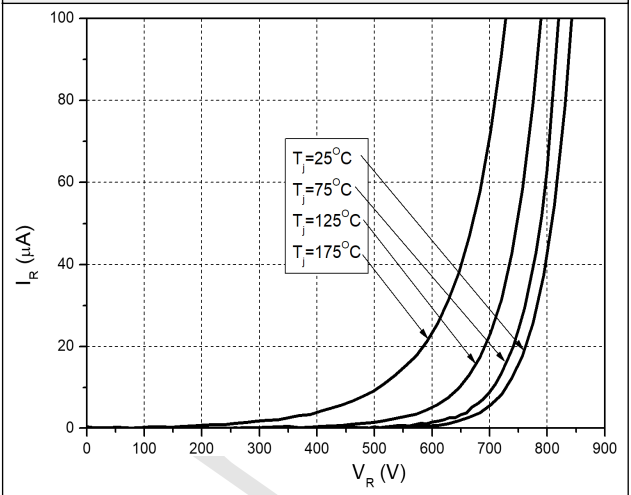


Figure 3. Peak Forward Current Derating

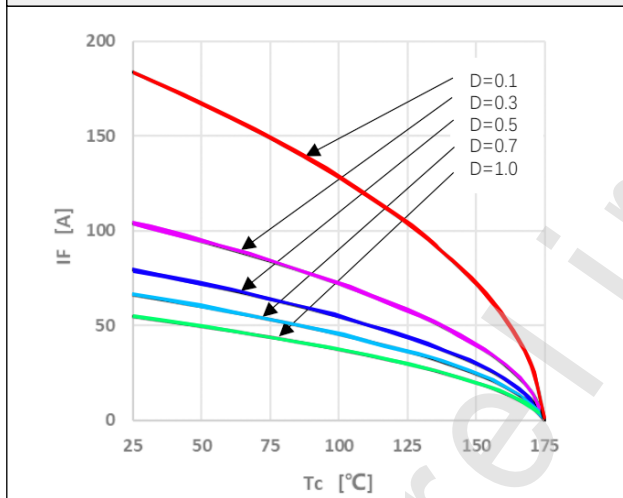


Figure 4. Power Dissipation

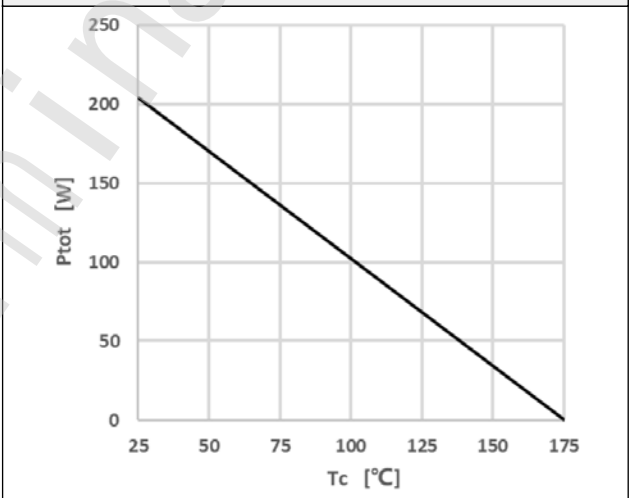


Figure 5. Capacitance vs. Reverse Voltage

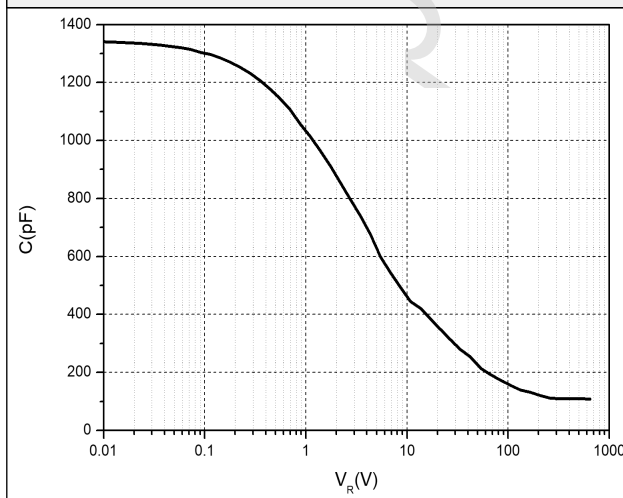
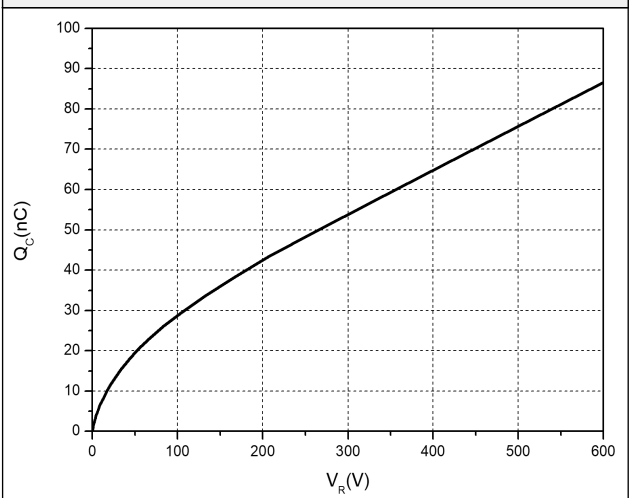
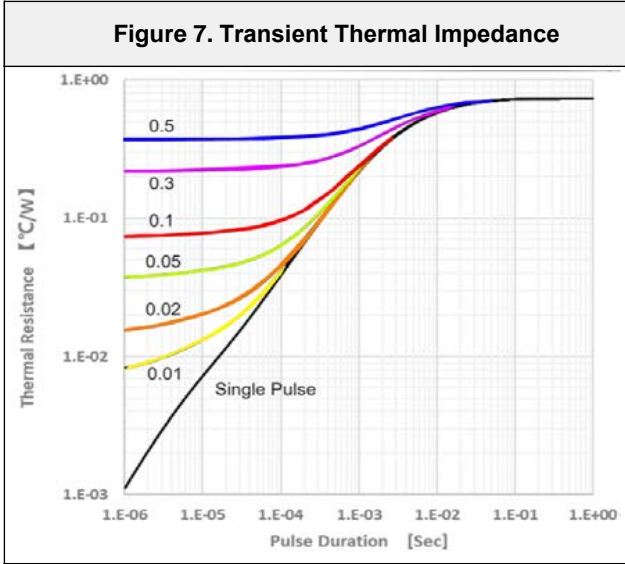


Figure 6. Capacitance Charge vs. Reverse Voltage



### Typical Performance Characteristics

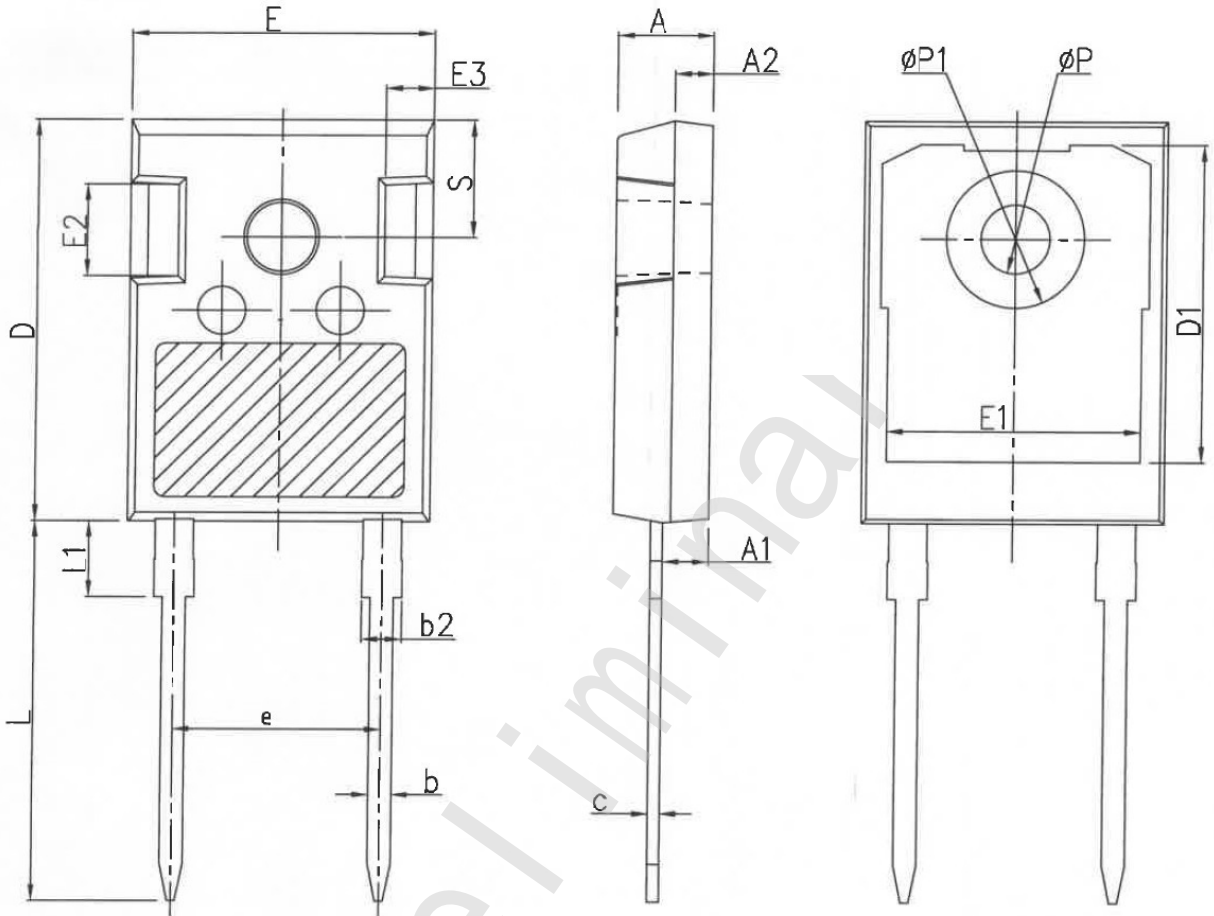
Figure 7. Transient Thermal Impedance



preliminary

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
ΦP1	-	-	7.30
S	6.15BSC		

\* Dimensions in millimeters

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