



BCA65S40D3

Silicon Carbide Schottky Diode

650V, 40A

Description

BCA65S30D3 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

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

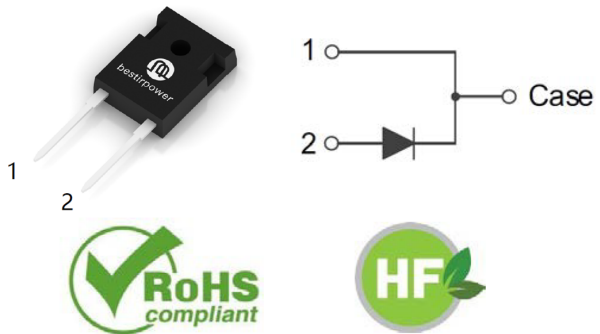
Applications

- Free Wheeling Diodes in Inverter stages
- Power factor correction
- Data Center
- Switch mode power supply

Features

V_{RRM}	I_F	T_C	Q_C
650 V	40 A	140°C	99 nC

- High surge current capability
- No reverse recovery
- Positive temperature coefficient
- Benchmark switching behavior
- RoHS compliant / Halogen-free



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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		650	V
V_{RSM}	Surge Peak Reverse Voltage	$T_C = 25^{\circ}C$	650	V
I_F	Forward Current	DC Blocking Voltage		
		$T_C = 25^{\circ}C$	121	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 140^{\circ}C$	40	A
		$T_C = 25^{\circ}C, t_p = 10\text{ ms}$	363	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 110^{\circ}C, t_p = 10\text{ ms}$	160	A
V_{DC}	DC Blocking Voltage	$T_C = 25^{\circ}C$	650	V
T_J, T_{STG}	Operating Junction and Storage Temperature		-55 to +175	$^{\circ}C$
P_{tot}	Power Dissipation	$T_C = 25^{\circ}C$	290	W
		$T_C = 110^{\circ}C$	125.5	W

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Typ.	0.52	°C/W

Electrical Characteristics (T_C = 25°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 =40A, T _J =25°C	-	1.46	1.8	V
		I _F =40A, T _J =175°C	-	1.8	2.2	
I _R	Reverse Current	V _R = 650 V, T _J = 25°C	-	1	100	μA
		V _R = 650 V, T _J = 175°C	-	6	400	
Q _C	Total Capacitive Charge	V _R = 400 V, T _J = 25°C	-	99	-	nC
C	Total Capacitance	V _R = 0V, f = 1MHz, T _J = 25°C	-	2040	-	pF
		V _R = 200V, f=1MHz, T _J = 25°C	-	188	-	
		V _R = 400V, f=1MHz, T _J = 25°C	-	158	-	
E _C	Capacitance Stored Energy	V _R = 400V	-	15	-	μJ

Typical Performance Characteristics

Figure 1. Forward Characteristics

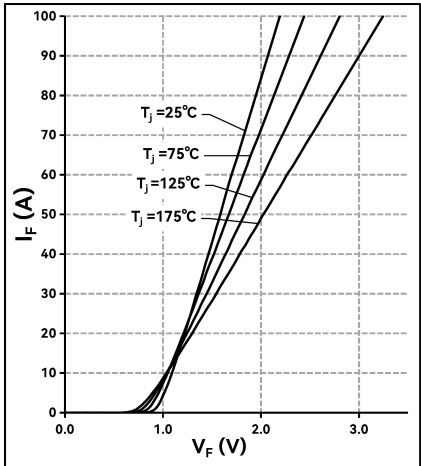


Figure 2. Reverse Characteristics

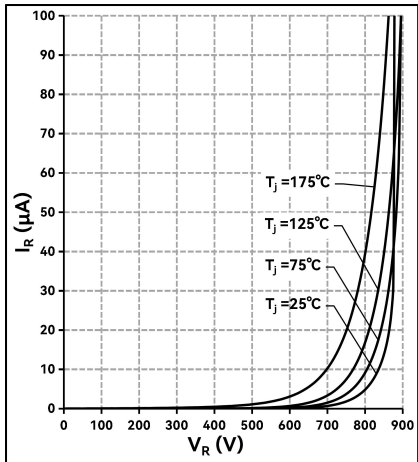


Figure 3. Peak Forward Current Derating

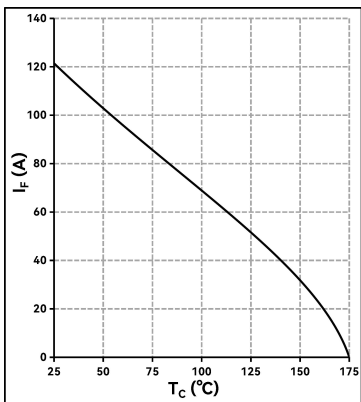


Figure 4. Power Dissipation

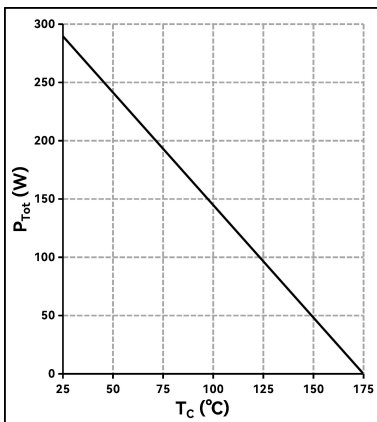


Figure 5. Total Capacitive Charge vs Reverse Voltage

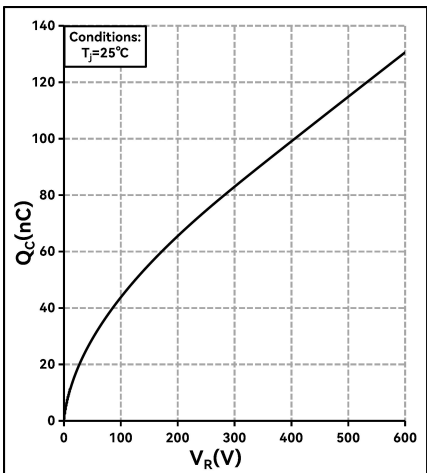
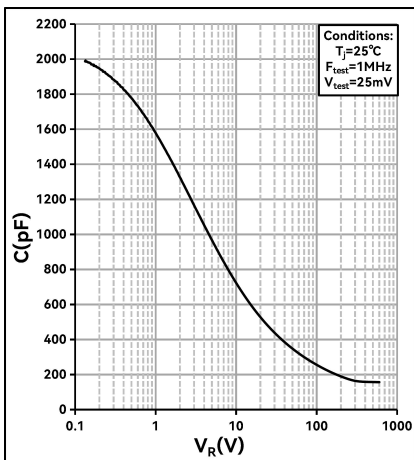


Figure 6. Capacitance Charge vs. Reverse Voltage



Typical Performance Characteristics

Figure 7. Typical Capacitance Stored Energy

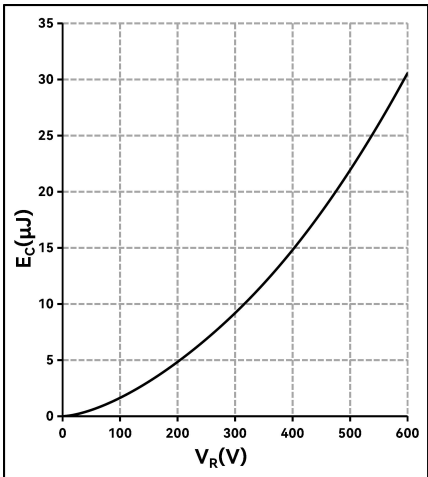
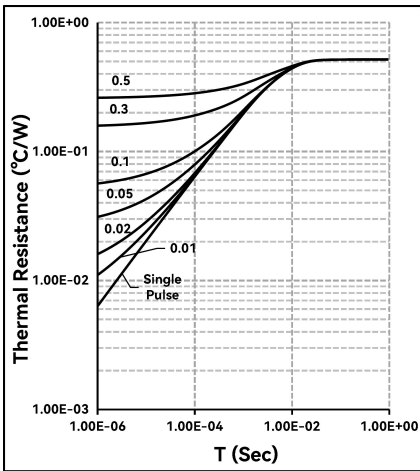
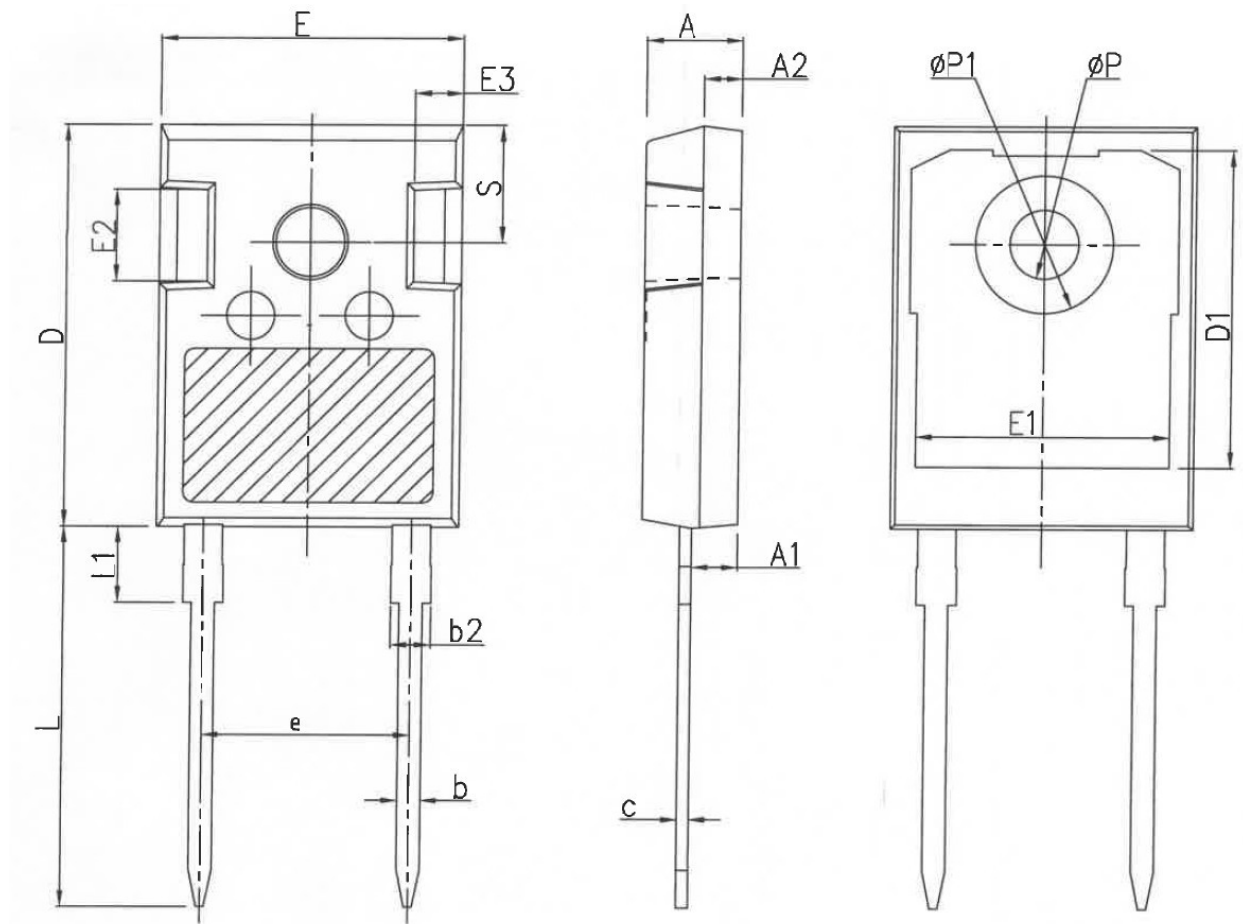


Figure 8. Transient Thermal Impedance



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
ΦP1	-	-	7.30
S	6.15BSC		

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCA65S40D3	BCA65S40D3	TO247-2	Tube	30units

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