

BCA65S40D4

Silicon Carbide Schottky Diode

650V, 40A

Description

BCA65S40D4 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 frequency
- Low heat dissipation requirements
- Reduce size and cost of the system
- High-reliability

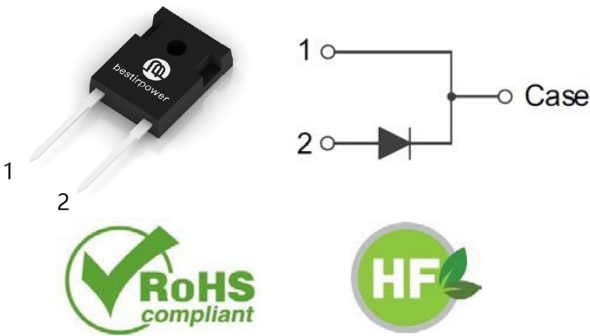
Applications

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

Features

V_{RRM}	I_F	T_C	Q_c
650 V	40 A	138 °C	91 nC

- Negligible reverse recovery
- High-speed switching
- Positive Temperature Coefficient
- Temperature-Independent Switching
- 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	$T_C = 25^{\circ}\text{C}$	81	A
		$T_C = 135^{\circ}\text{C}$	42	A
		$T_C = 138^{\circ}\text{C}$	40	A
$I_{F,SM}$	Non-Repetitive Forward Surge Current	$T_C = 25^{\circ}\text{C}, t_p = 10\text{ ms}$	243	A
		$T_C = 110^{\circ}\text{C}, t_p = 10\text{ ms}$	159	A
$I_{F,RM}$	Repetitive Peak Forward Surge Current	$T_C = 25^{\circ}\text{C}, t_p = 10\text{ ms}$	219	A
I^2dt value	$\int I^2 dt$	$T_C = 25^{\circ}\text{C}, t_p = 10\text{ ms}$	295	A^2s
		$T_C = 110^{\circ}\text{C}, t_p = 10\text{ ms}$	126	A^2s
P_{tot}	Power Dissipation	$T_C = 25^{\circ}\text{C}$	363	W
		$T_C = 110^{\circ}\text{C}$	157	W
		$T_C = 150^{\circ}\text{C}$	61	W
T_J, T_{STG}	Operating Junction and Storage Temperature		-55 to +175	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Typ.	0.413	$^{\circ}\text{C}/\text{W}$

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	$I_F=40\text{A}, T_J=25^{\circ}\text{C}$	-	1.60	1.8	V
		$I_F=40\text{A}, T_J=175^{\circ}\text{C}$	-	2.23	-	
I_R	Reverse Current	$V_R = 650\text{ V}, T_J = 25^{\circ}\text{C}$	-	0.01	5	μA
		$V_R = 650\text{ V}, T_J = 175^{\circ}\text{C}$	-	1	-	
Q_C	Total Capacitive Charge	$V_R = 400\text{ V}, T_J = 25^{\circ}\text{C}$	-	91	-	nC
C	Total Capacitance	$V_R = 0\text{ V}, f = 1\text{MHz}$	-	1700	-	pF
		$V_R = 200\text{ V}, f = 1\text{MHz}$	-	171	-	
		$V_R = 400\text{ V}, f = 1\text{MHz}$	-	161	-	
E_C	Capacitance Stored Energy	$V_R = 400\text{ V}, T_C = 25^{\circ}\text{C}$	-	22	-	μJ

Typical Performance Characteristics

Figure 1. Forward Characteristics

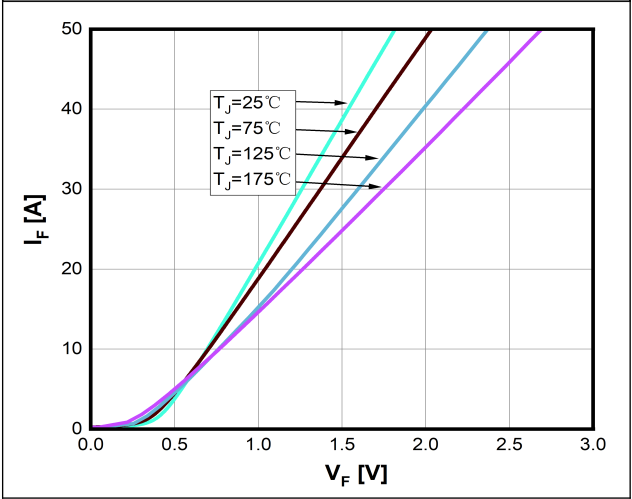


Figure 2. Reverse Characteristics

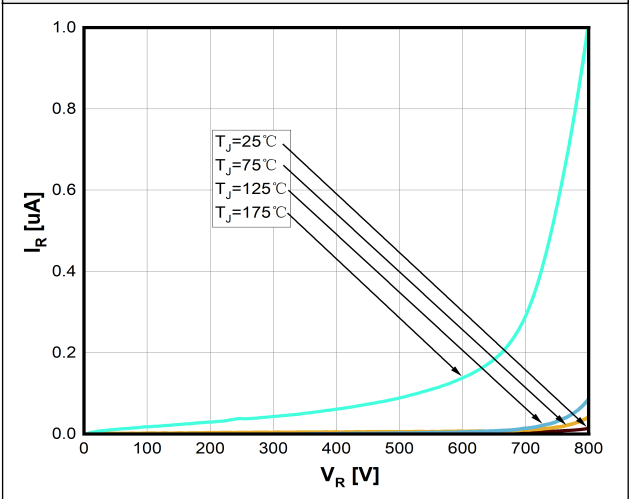


Figure 3. Peak Forward Current Derating

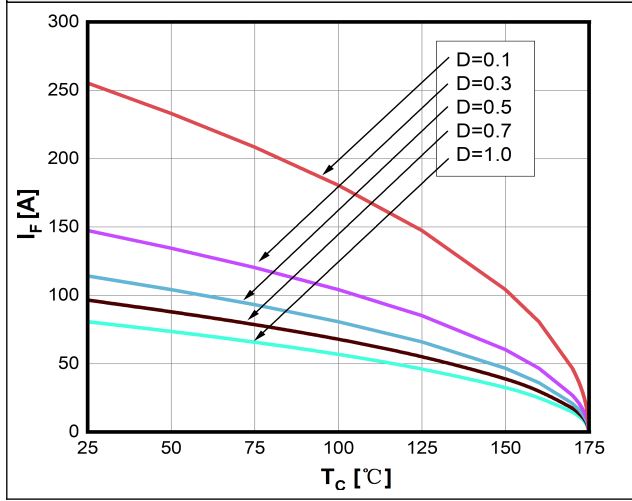


Figure 4. Power Dissipation

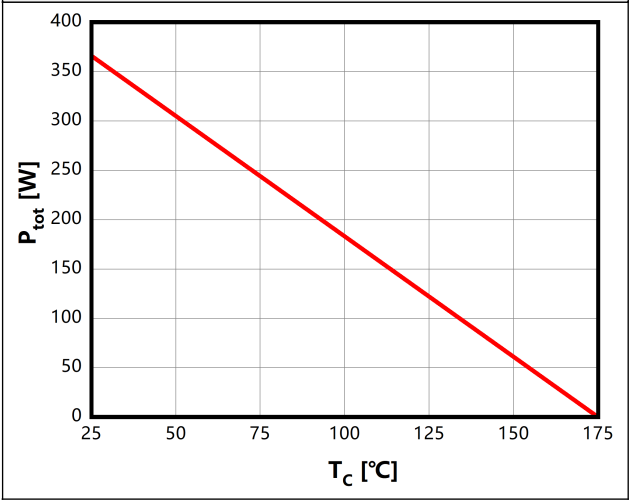


Figure 5. Capacitance vs. Reverse Voltage

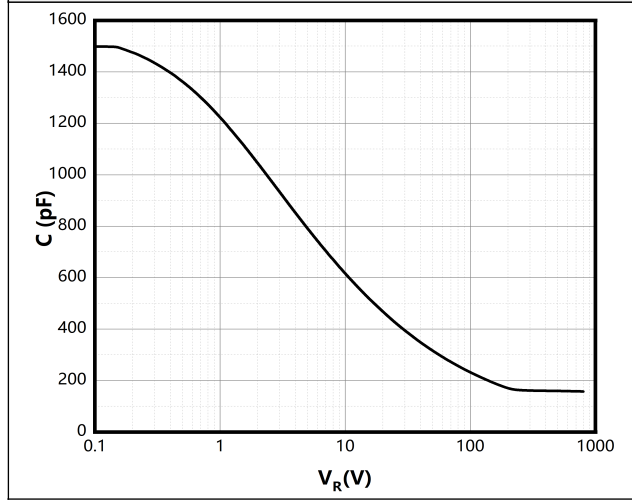
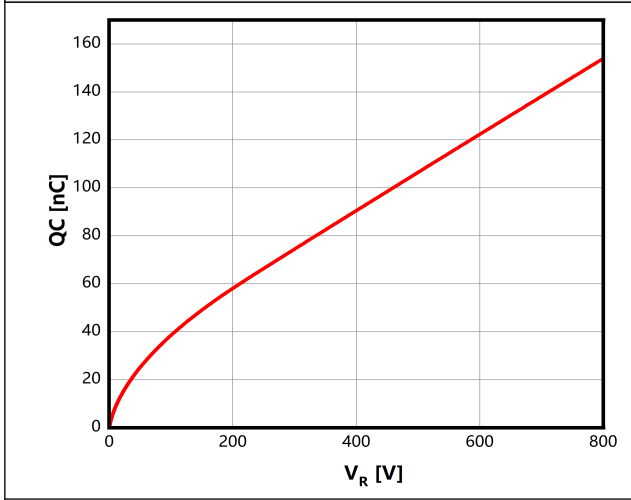
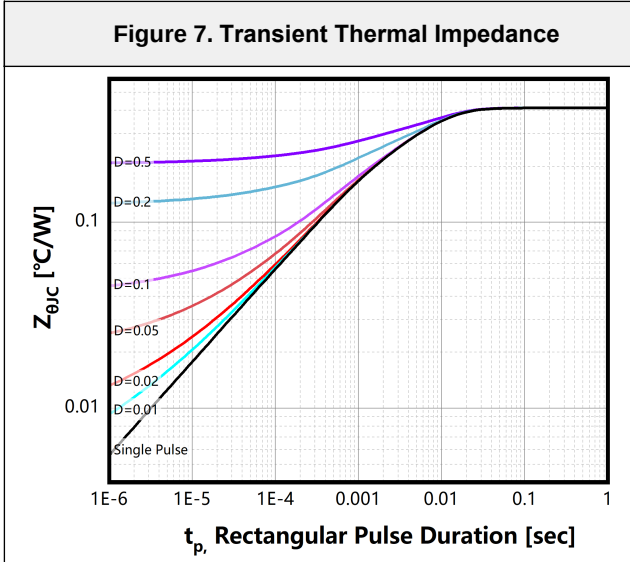


Figure 6. Capacitance Charge vs. Reverse Voltage

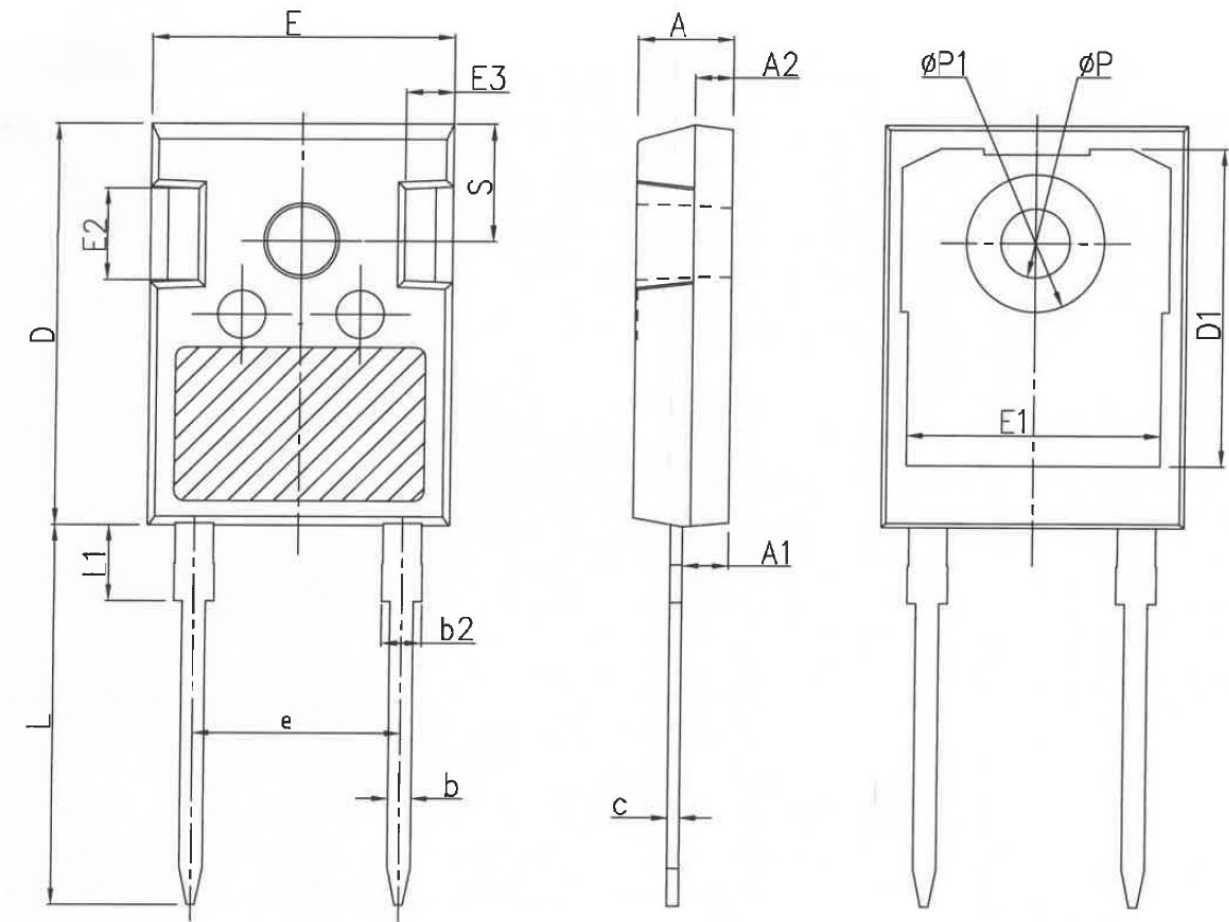


Typical Performance Characteristics

Figure 7. Transient Thermal Impedance



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
BCA65S40D4	BCA65S40D4	TO247-2	Tube	30 units

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