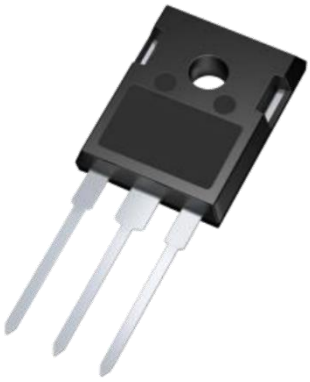


B2D20065HC1

650V ▲ 2x10A ▲ SiC SCHOTTKY DIODE

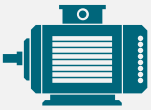
SILICON CARBIDE SiC SCHOTTKY DIODE ▲ THT type
Common cathode circuit configuration
Easy paralleling due to positive V_F temperature coefficient
TO-247-3L package ▲ Epoxy meets UL94-V0
Temperature independent switching
Ultra-low forward voltage and high surge current

SPECIFICATION

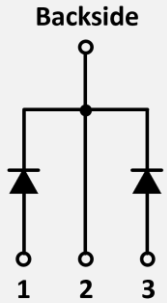
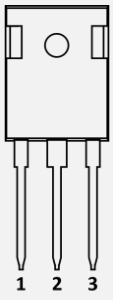
Item (T_C = 25°C, unless otherwise noted)		Characteristics
Operating Temperature Range	T_J	-55°C to +175°C
Storage Temperature Range	T_S	-55°C to +175°C
Repetitive Peak Reverse Voltage	V_{RRM}	650V
Continuous Forward Current at T_C = 160°C Note 1	I_F	10A
Continuous Forward Current at T_C = 160°C Note 2	I_F	20A
Total Capacitive Charge (T_J = 25°C) Note 2	Q_C	62nC
Diode Forward Voltage (T_J = 175°C, I_F = 10A) Note 1	V_F	1.75V
Power Dissipation Note 1	P_{TOT}	172W

Notes
1: **Per leg**
2: **Per device**

APPLICATIONS

EV Charging	Industrial Inverters	Motors & Drives	Power Factor Correction	Renewable Energy	SMPS	UPS
						

PIN DESCRIPTION

Circuit Diagram	Outline ▪ Front View	Pin No.	Description
		1 2 3	Anode Diode 1 Common Cathode (Backside) Anode Diode 2

ABSOLUT MAXIMUM RATINGS ▲ T_C = 25°C, unless otherwise noted

Item	Condition	Symbol		Unit
Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Non-Repetitive Peak Reverse Voltage		V_{RSM}	650	V
Single Pulse Avalanche Energy	T_C = 25°C, L = 1mH, I_{AS} = 9A, V = 140V	E_{AS}	41 Note 1	mJ
Continuous Forward Current	T_C = 25°C	I_F	38 Note 1 / 76 Note 2	A
Continuous Forward Current	T_C = 160°C	I_F	10 Note 1 / 20 Note 2	A
Non-Repetitive Forward Surge Current	T_C = 25°C, t_p = 10ms, Half Sine Wave	I_{FSM}	70 Note 1	A
Repetitive Forward Surge Current	T_C = 25°C, t_p = 10ms, Half Sine Wave	I_{FRM}	35 Note 1	A
I^2t Value	T_C = 25°C, t_p = 10ms	$\int i^2dt$	25 Note 1	A^2s
Power Dissipation	T_C = 25°C	P_{TOT}	172 Note 1	W
Power Dissipation	T_C = 110°C	P_{TOT}	74 Note 1	W
Operating Junction Temperature		T_J	-55 to +175	°C
Storage Temperature Range		T_{STG}	-55 to +175	°C
TO-247 Mounting Torque	M3 Screw		0.7	Nm

Notes

1: **Per leg**

2: **Per device**

ELECTRICAL CHARACTERISTICS ▲ PER LEG

Item	Condition	Symbol	Min.	Typ.	Max.	Unit
Static Characteristics						
DC Blocking Voltage	T_J = 25°C	V_{DC}	650			V
Diode Forward Voltage	I_F = 10A, T_J = 25°C	V_F		1.34	1.60	V
Diode Forward Voltage	I_F = 10A, T_J = 175°C	V_F		1.75	2.50	V
Reverse Current	V_R = 1200V, T_J = 25°C	I_R		5	70	µA
Reverse Current	V_R = 1200V, T_J = 175°C	I_R		30	300	µA

Item	Condition	Symbol	Min.	Typ.	Max.	Unit
Dynamic Characteristics						
Total Capacitive Charge	V_R = 400V, T_J = 25°C $Q_C = \int_0^{V_R} C\,(V)dV$	Q_C		31		nC
Total Capacitance	V_R = 1V, f = 1MHz, T_J = 25°C	C		475		pF
Total Capacitance	V_R = 300V, f = 1MHz, T_J = 25°C	C		54		pF
Total Capacitance	V_R = 600V, f = 1MHz, T_J = 25°C	C		53		pF
Capacitance Stored Energy	V_R = 300V, T_J = 25°C	E_C		8		µJ

THERMAL RESISTANCE PERFORMANCE

Item	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case, per Leg	$R_{\theta,JC}$		0.874		K/W
Thermal Resistance, Junction to Case, per Device	$R_{\theta,JC}$		0.437		K/W

REFERENCE DATA ▲ TYPICAL PERFORMANCE PER LEG

Fig. 1 ▪ Typical Forward Characteristics I_F vs. V_F

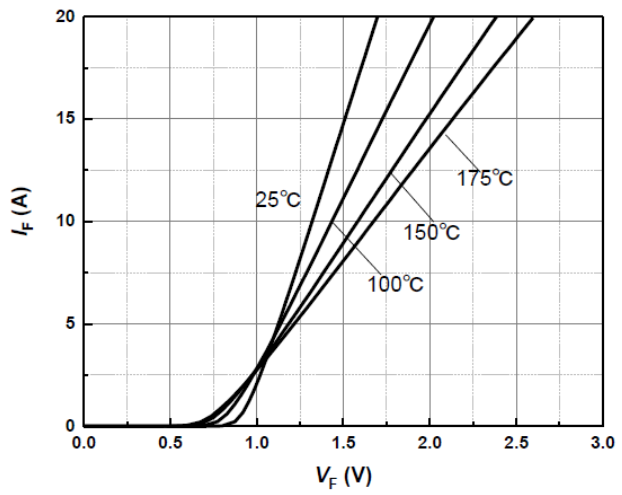


Fig. 2 ▪ Typical Reverse Current I_R as function of Reverse Voltage V_R

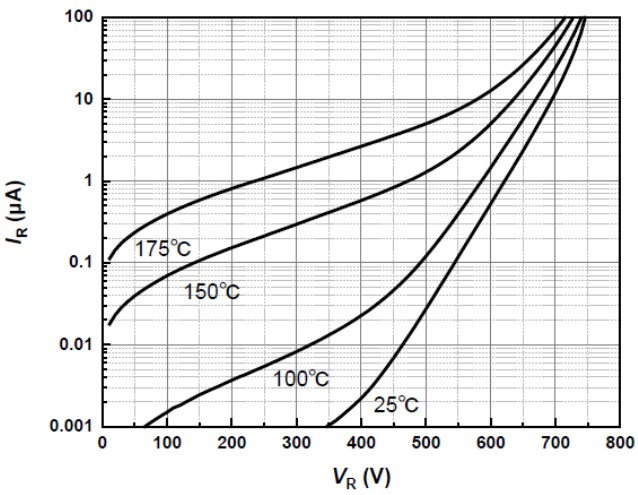


Fig. 3 ▪ Diode Forward Current I_F as function of Case Temperature T_C (D = Duty Cycle)

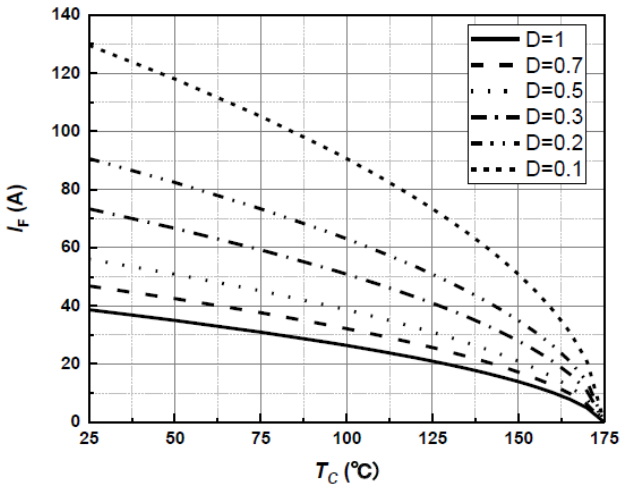


Fig. 4 ▪ Typical Capacitance C as function of Reverse Voltage V_R, C =f(V_R), T_J = 25°C, f = 1MHz

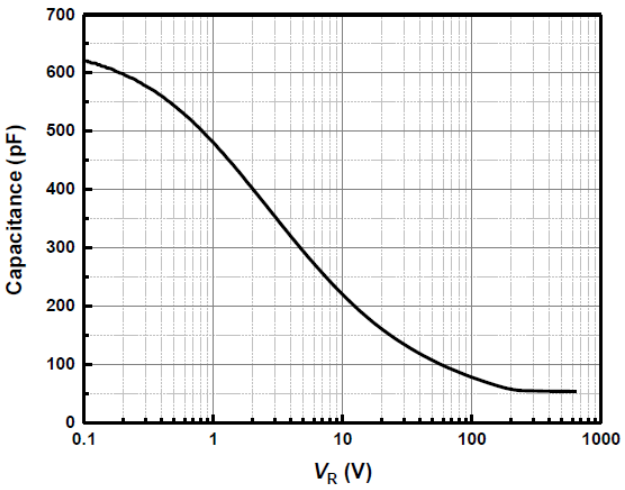


Fig. 5 ▪ Typical Reverse Charge Q_C as function of Reverse Voltage V_R

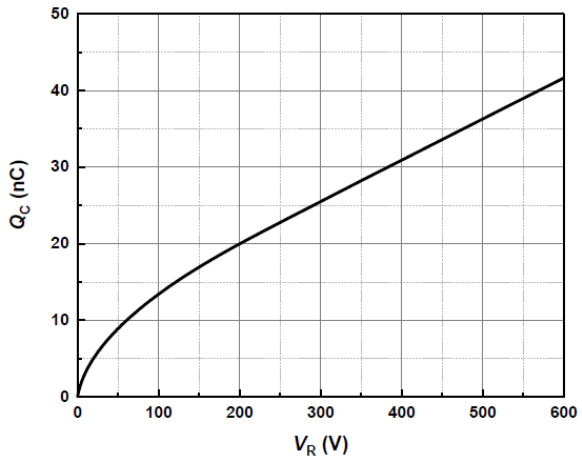
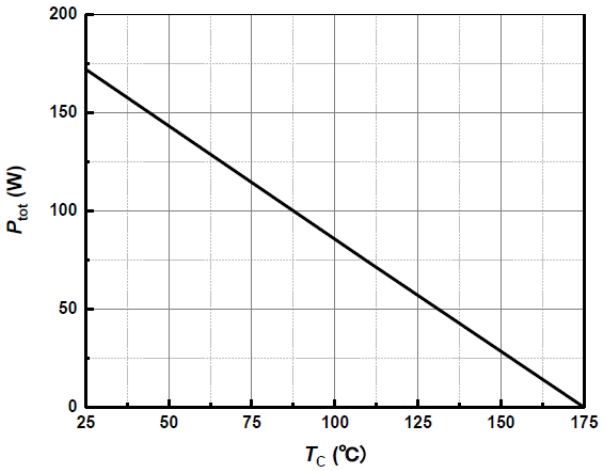


Fig. 6 ▪ Power Dissipation P_{TOT} as function of Case Temperature T_C



REFERENCE DATA ▲ TYPICAL PERFORMANCE PER LEG

Fig. 7 ▪ Capacitance Stored Energy

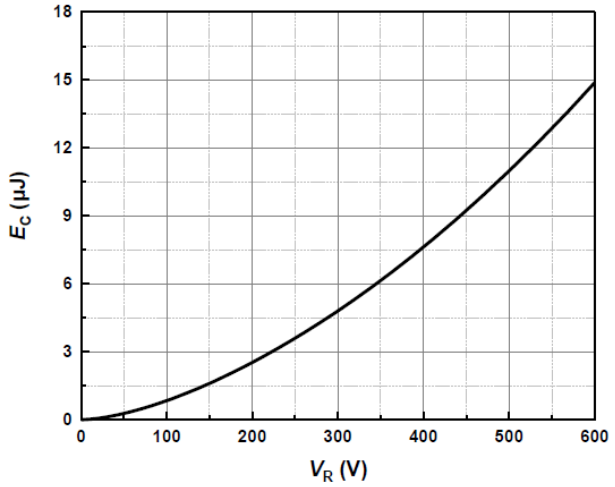
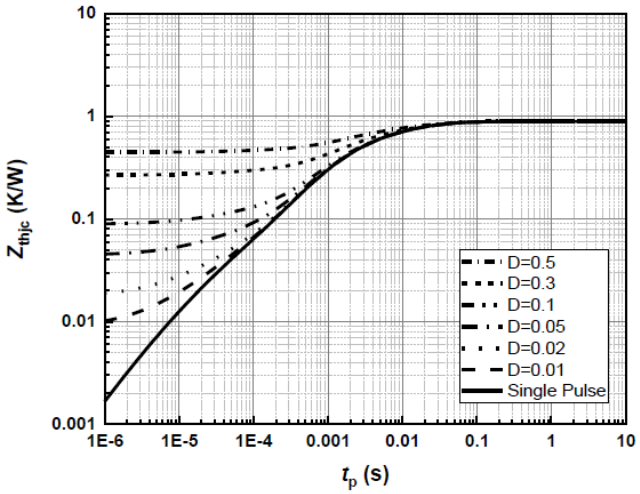
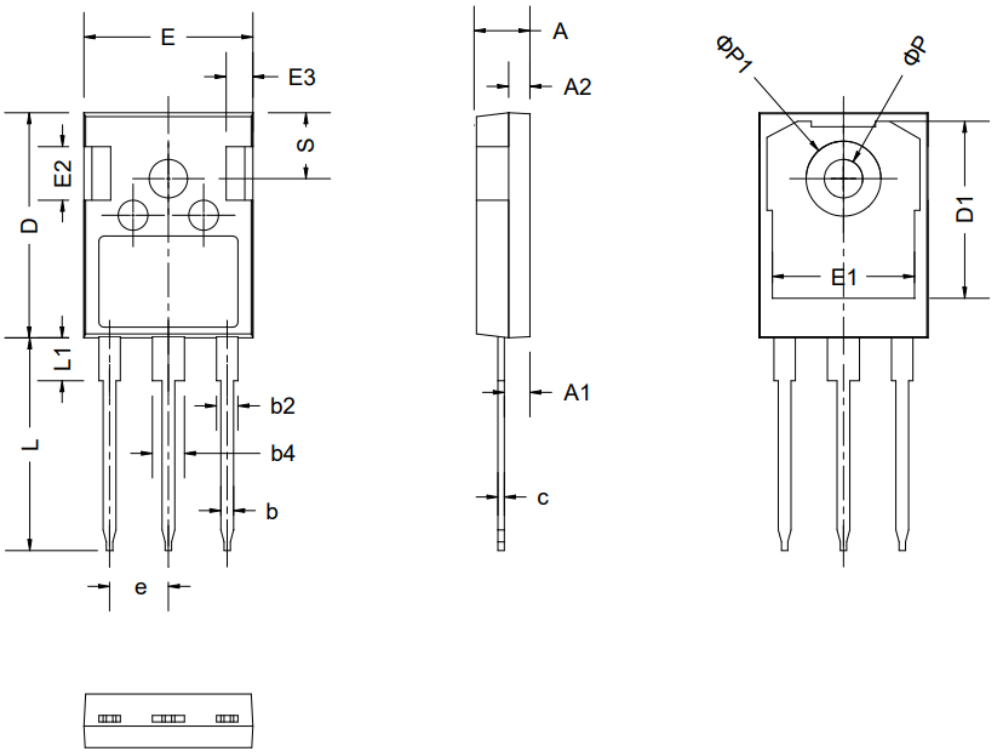


Fig. 8 ▪ Maximum Transient Thermal Impedance, Z_{thjc} = f(t), Parameter: D = t/T



PACKAGE OUTLINE



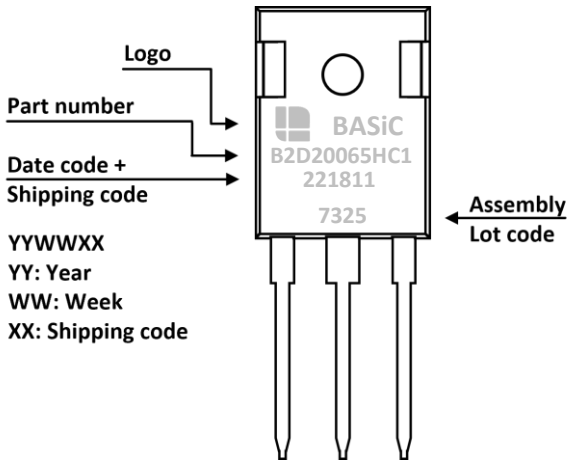
Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.80	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10

Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e		5.44 BSC	
L	19.62	19.92	20.22
L1	-	-	4.30
ØP	3.40	3.60	3.80
ØP1	-	-	7.30
S		6.16 BSC	

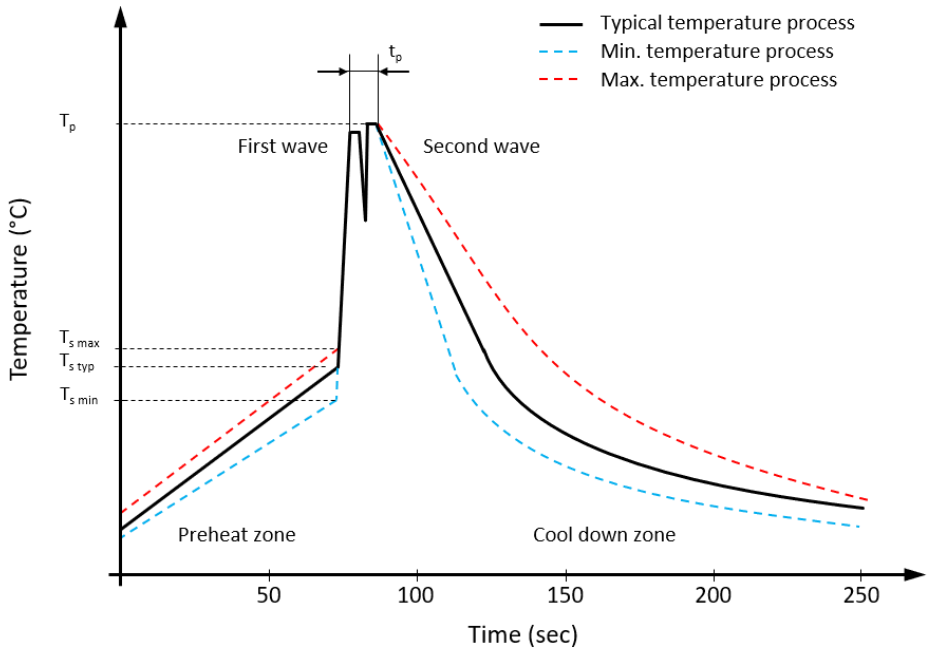
ORDERING INFORMATION

Part Number	Package	Packing	Tube Qty.	Inner Box Qty.	Outer Box Qty.
B2D20065HC1	TO-247-3L	Tube	30pcs	300pcs	1,800pcs

PART MARKING



RECOMMENDED WAVE SOLDERING PROFILE ▲ THT PACKAGE



Classification wave soldering profile ▲ Refer to EN 61760-1: 2006

Profile Features		Value ▲ Sn-Pb Assembly	Value ▲ Pb-free Assembly
Preheat temperature min.	$T_{s\,min}$	100 °C	100 °C
Preheat temperature typical	$T_{s\,typ}$	120 °C	120 °C
Preheat temperature max.	$T_{s\,max}$	130 °C	130 °C
Preheat time t_s from $T_{s\,min}$ to $T_{s\,max}$	t_s	70 seconds	70 seconds
Peak temperature	T_p	235 °C to 260 °C	245 °C to 260 °C
Time of actual peak temperature	t_p	Max. 10 seconds Max. 5 second each wave	Max. 10 seconds Max. 5 second each wave
Ramp-down date min.		~ 2 °C/second	~ 2 °C/second
Ramp-down rate typical		~ 3.5 °C/second	~ 3.5 °C/second
Ramp-down rate max.		~ 5 °C/second	~ 5 °C/second

REVISION TABLE

Revision	Date	Status	Notes
001	30/09/2022	Initial release	Initial publication

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