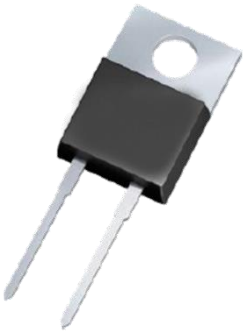


B1D02065K

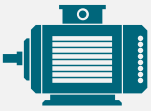
650V ▲ 2A ▲ SiC SCHOTTKY DIODE

SILICON CARBIDE SiC SCHOTTKY DIODE ▲ THT type
Excellent surge capability
Easy paralleling due to positive V_F temperature coefficient
TO-220-2L package ▲ Epoxy meets UL94-V0
Low forward voltage
Temperature independent switching

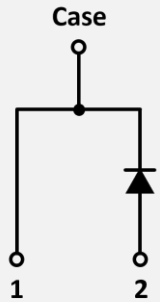
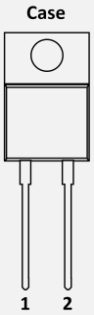
SPECIFICATION

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	I_F	2A
Total Capacitive Charge (T_J = 25°C)	Q_C	6.8nC
Capacitance Stored Energy (V_R = 400V)	E_C	1.6μJ
Diode Forward Voltage (T_J = 175°C, I_F = 2A)	V_F	1.7V
Power Dissipation	P_{TOT}	43W

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	Cathode (Case Backside) Anode

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
Continuous Forward Current	T_C = 25°C	I_F	9	A
Continuous Forward Current	T_C = 160°C	I_F	2	A
Non-Repetitive Forward Surge Current	T_C = 25°C, t_p = 10ms, Half Sine Wave	I_{FSM}	16	A
I^2t Value	T_C = 25°C, t_p = 10ms	$\int i^2dt$	1.28	A^2s
Power Dissipation	T_C = 25°C	P_{TOT}	43	W
Power Dissipation	T_C = 110°C	P_{TOT}	18	W
Operating Junction Temperature		T_J	-55 to +175	°C
Storage Temperature Range		T_{STG}	-55 to +175	°C
TO-220 Mounting Torque	M3 Screw		0.7	Nm

ELECTRICAL CHARACTERISTICS

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 = 2A, T_J = 25°C	V_F		1.40		V
Diode Forward Voltage	I_F = 2A, T_J = 175°C	V_F		1.70		V
Reverse Current	V_R = 650V, T_J = 25°C	I_R		0.1		µA
Reverse Current	V_R = 650V, T_J = 175°C	I_R		1		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		6.8		nC
Total Capacitance	V_R = 1V, f = 1MHz, T_J = 25°C	C		99		pF
Total Capacitance	V_R = 300V, f = 1MHz, T_J = 25°C	C		11.9		pF
Total Capacitance	V_R = 600V, f = 1MHz, T_J = 25°C	C		11.8		pF
Capacitance Stored Energy	V_R = 400V, T_J = 25°C	E_C		1.6		µJ

THERMAL RESISTANCE PERFORMANCE

Item	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	$R_{\theta,JC}$		3.482		K/W

REFERENCE DATA ▲ TYPICAL PERFORMANCE

Fig. 1 ▪ Typical Forward Characteristics I_F vs. V_F

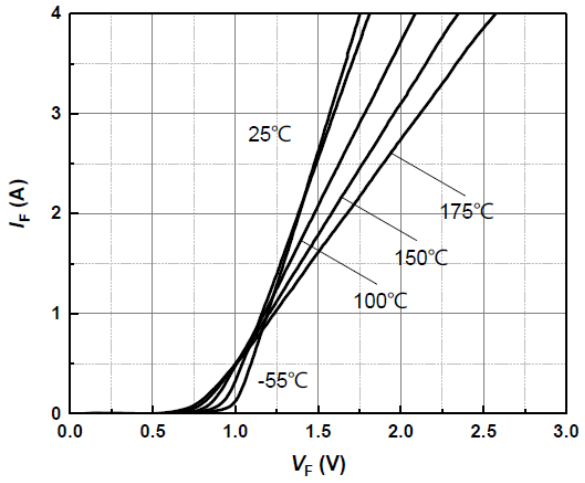


Fig. 2 ▪ Typical Reverse Current I_R as function of Reverse Voltage V_R

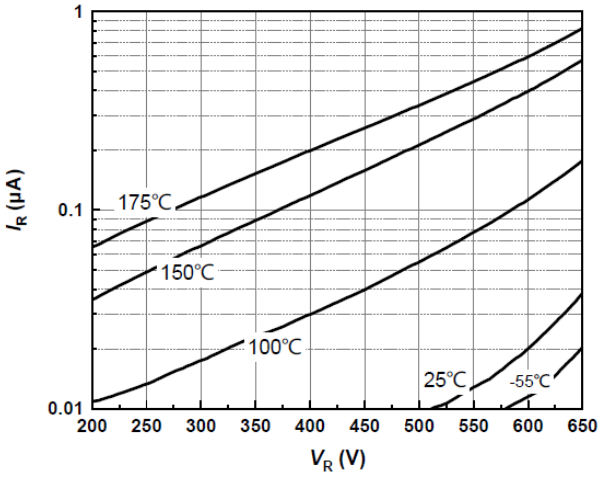


Fig. 3 ▪ Diode Forward Current I_F as function of Case Temperature T_C (D = Duty Cycle)

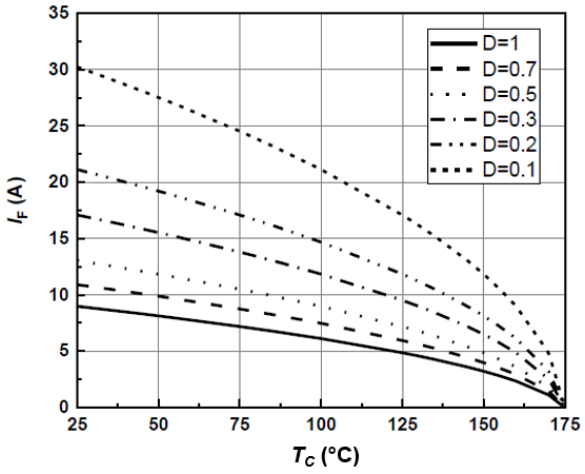


Fig. 4 ▪ Typical Capacitance C as function of Reverse Voltage V_R, C =f(V_R), T_J = 25°C, f = 1MHz

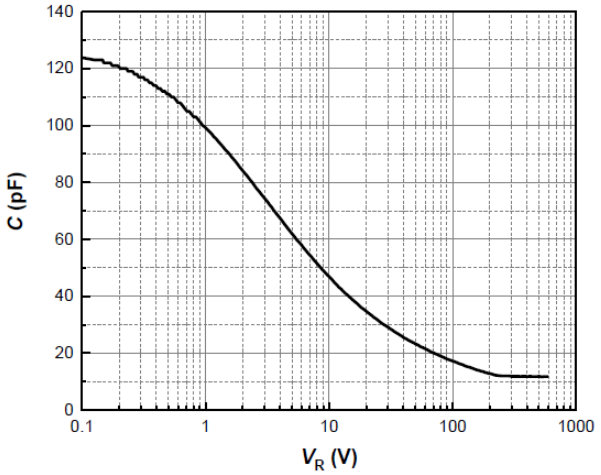


Fig. 5 ▪ Typical Reverse Charge Q_C as function of Reverse Voltage V_R

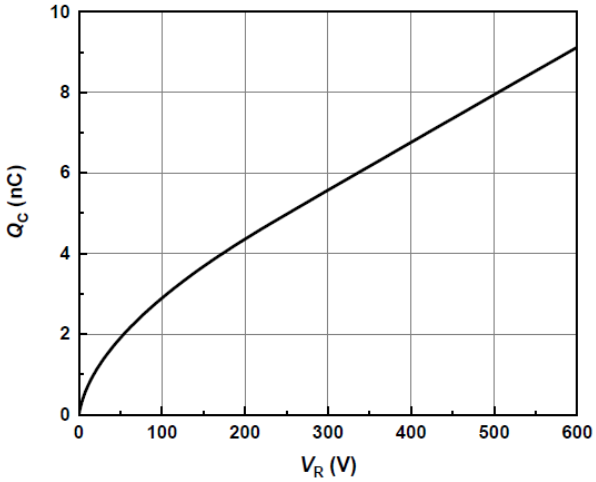
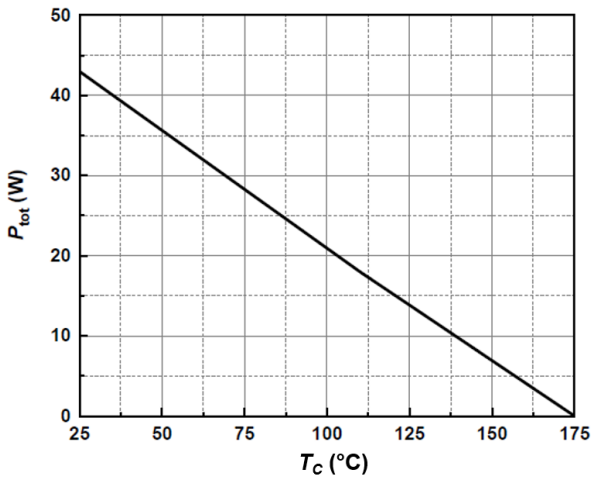


Fig. 6 ▪ Power Dissipation P_{TOT} as function of Case Temperature T_C



REFERENCE DATA ▲ TYPICAL PERFORMANCE

Fig. 7 ▪ Capacitance Stored Energy

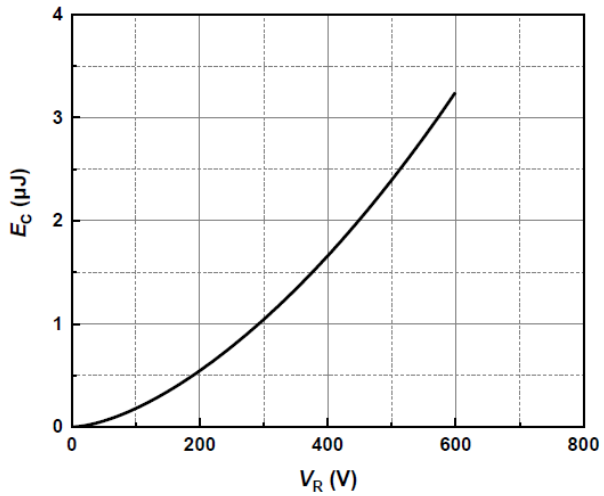
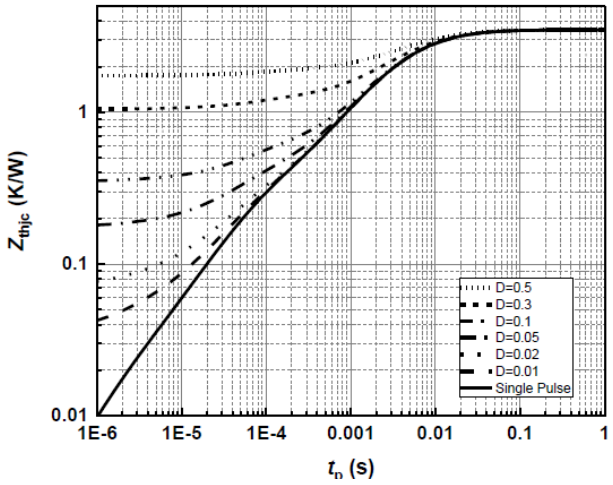
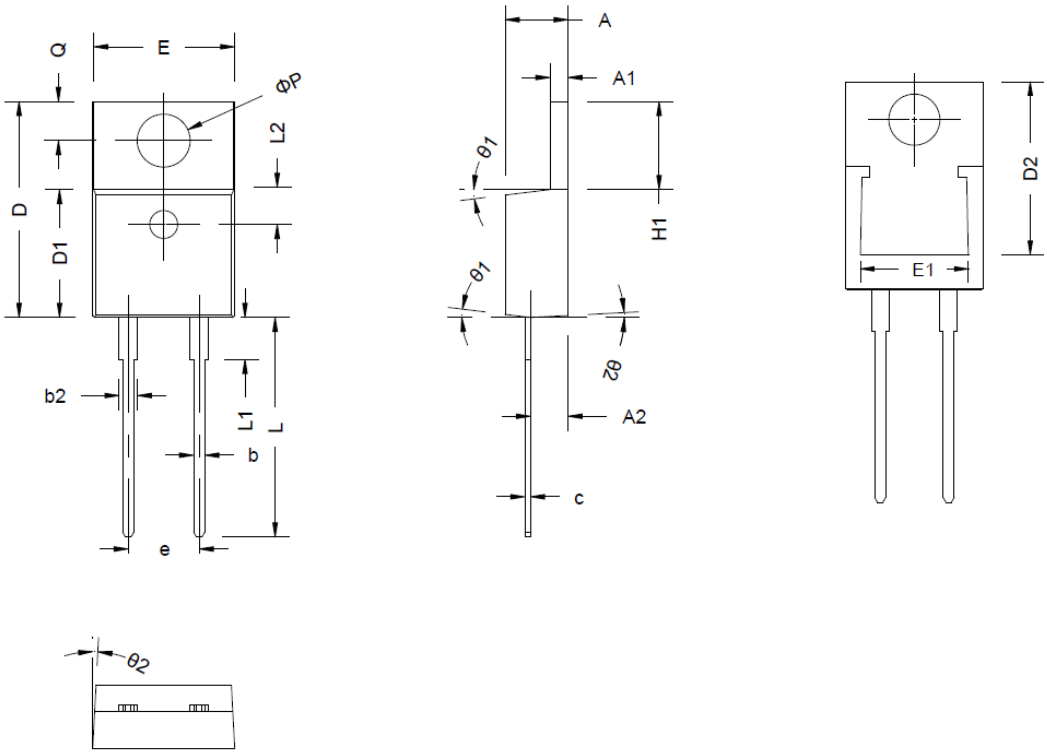


Fig. 8 ▪ Maximum Transient Thermal Impedance, Z_{thjc} = f(t), Parameter: D = t/T



PACKAGE OUTLINE



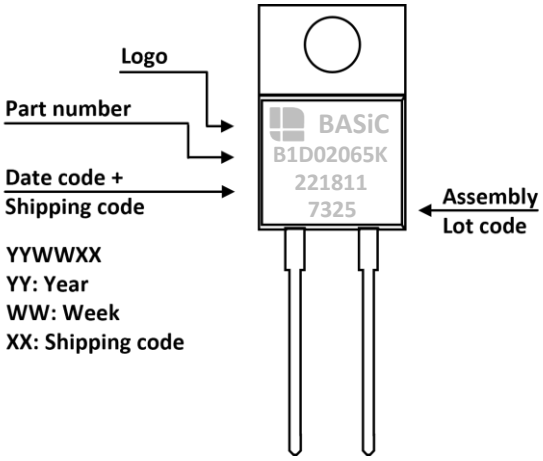
Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	4.37	4.57	4.77
A1	1.22	-	1.40
A2	2.49	2.69	2.89
b	0.75	-	0.96
b2	1.22	-	1.47
c	0.30	-	0.48
D	15.15	15.45	15.75
D1	9.05	9.15	9.25
D2	11.40	-	12.88
E	9.86	10.16	10.36

Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
E1	6.86	-	8.89
e	4.98	5.08	5.18
H1	6.10	6.30	6.50
L	12.70	-	13.70
L1	-	-	4.10
L2		2.50 REF	
ØP	3.70	3.84	3.99
Q	2.54	-	2.94
θ 1	5°	7°	9°
θ 2	1°	3°	5°

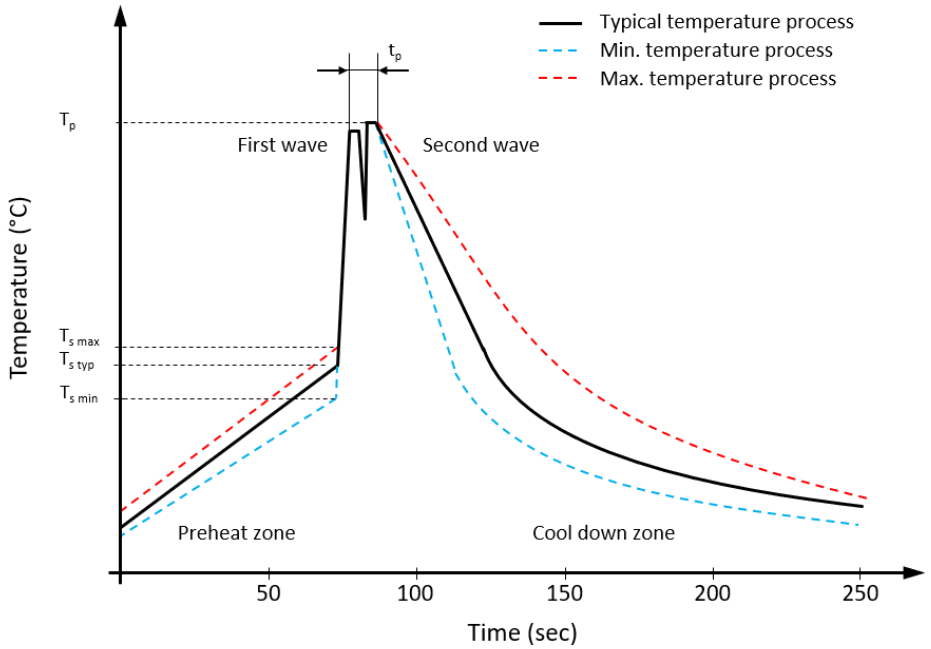
ORDERING INFORMATION

Part Number	Package	Packing	Tube Qty.	Inner Box Qty.	Outer Box Qty.
B1D02065K	TO-220-2L	Tube	50pcs	500pcs	5,000pcs

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
Time 25°C to 25°C		4 minutes	4 minutes

REVISION TABLE

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

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