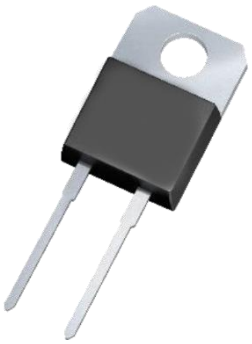


B1D06065KS

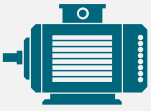
650V ▲ 6A ▲ SiC SCHOTTKY DIODE

SILICON CARBIDE SiC SCHOTTKY DIODE ▲ THT type
Excellent surge capability
Easy paralleling due to positive V_F temperature coefficient
Temperature independent switching
Low forward voltage
TO-220 ISO-2L ceramic package ▲ 2.5kV isolation voltage

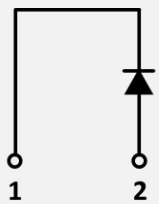
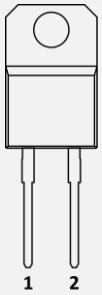
SPECIFICATION

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 = 150°C	I_F	6A
Total Capacitive Charge (T_J = 25°C)	Q_C	17nC
Capacitance Stored Energy (V_R = 400V)	E_C	4.5µJ
Diode Forward Voltage (T_J = 175°C, I_F = 6A)	V_F	1.75V
Power Dissipation	P_{TOT}	70W

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 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	18	A
Continuous Forward Current	T_C = 150°C	I_F	6	A
Non-Repetitive Forward Surge Current	T_C = 25°C, t_p = 10ms, Half Sine Wave	I_{FSM}	45	A
I^2t Value	T_C = 25°C, t_p = 10ms	$\int i^2dt$	10.12	A^2s
Power Dissipation	T_C = 25°C	P_{TOT}	70	W
Power Dissipation	T_C = 110°C	P_{TOT}	30	W
Operating Junction Temperature		T_J	-55 to +175	°C
Storage Temperature Range		T_{STG}	-55 to +175	°C
Isolation Voltage	AC, t = 1s	V_{ISOL}	2500	V_{RMS}
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 = 6A, T_J = 25°C	V_F		1.44	1.60	V
Diode Forward Voltage	I_F = 6A, T_J = 175°C	V_F		1.75	2.20	V
Reverse Current	V_R = 650V, T_J = 25°C	I_R		1	60	µA
Reverse Current	V_R = 650V, T_J = 175°C	I_R		20	200	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		17		nC
Total Capacitance	V_R = 1V, f = 1MHz, T_J = 25°C	C		271		pF
Total Capacitance	V_R = 300V, f = 1MHz, T_J = 25°C	C		30.1		pF
Total Capacitance	V_R = 600V, f = 1MHz, T_J = 25°C	C		29.8		pF
Capacitance Stored Energy	V_R = 400V, T_J = 25°C	E_C		4.5		µJ

THERMAL RESISTANCE PERFORMANCE

Item	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	$R_{\theta,JC}$		2.117		K/W

REFERENCE DATA ▲ TYPICAL PERFORMANCE

Fig. 1 ▪ Typical Forward Characteristics I_F vs. V_F

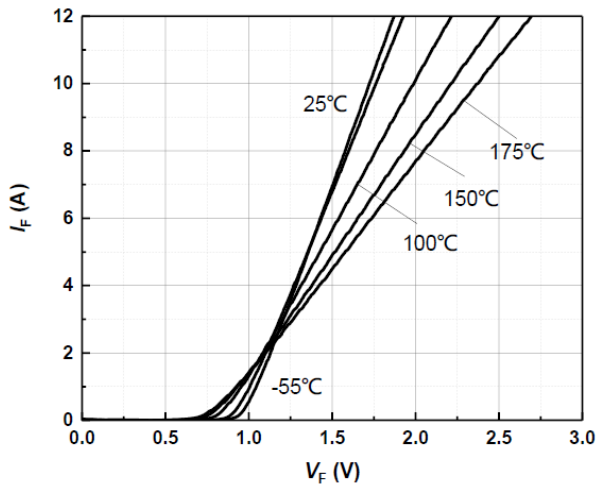


Fig. 2 ▪ Typical Reverse Current I_R as function of Reverse Voltage V_R

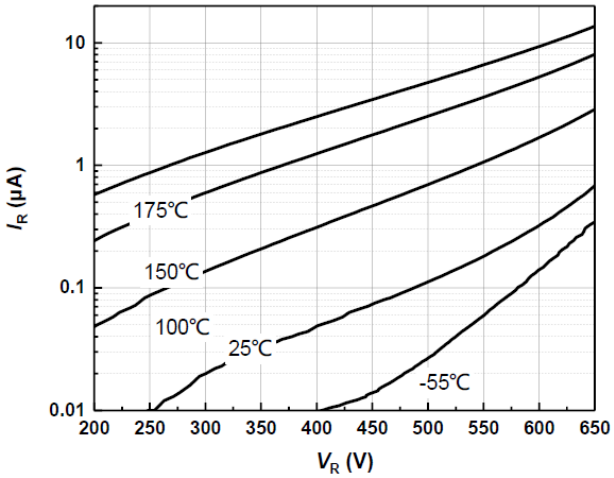


Fig. 3 ▪ Diode Forward Current I_F as function of Case Temperature T_C (D = Duty Cycle)

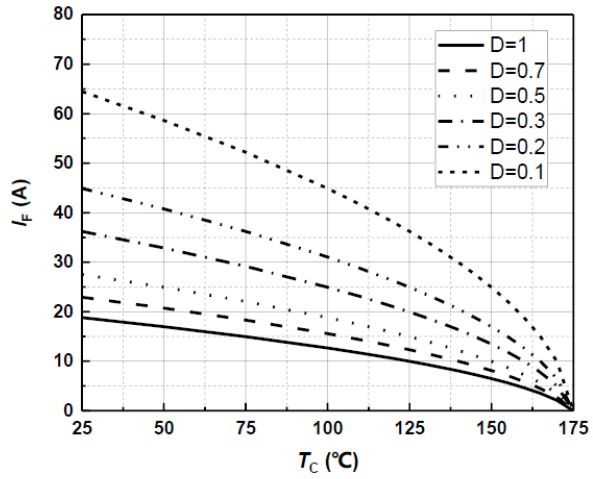


Fig. 4 ▪ Typical Capacitance C as function of Reverse Voltage V_R, C =f(V_R), T_J = 25°C, f = 1MHz

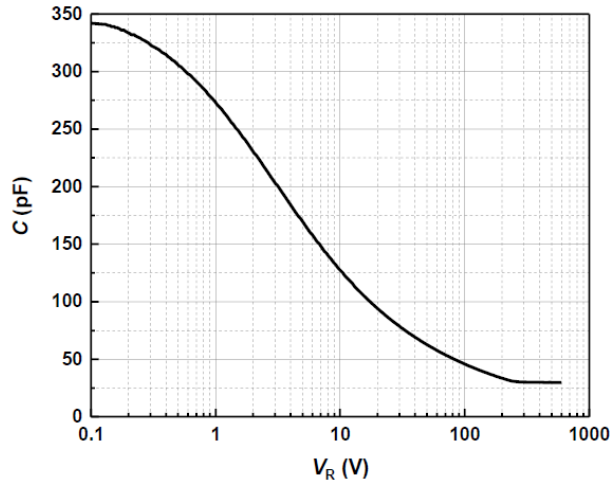


Fig. 5 ▪ Typical Reverse Charge Q_C as function of Reverse Voltage V_R

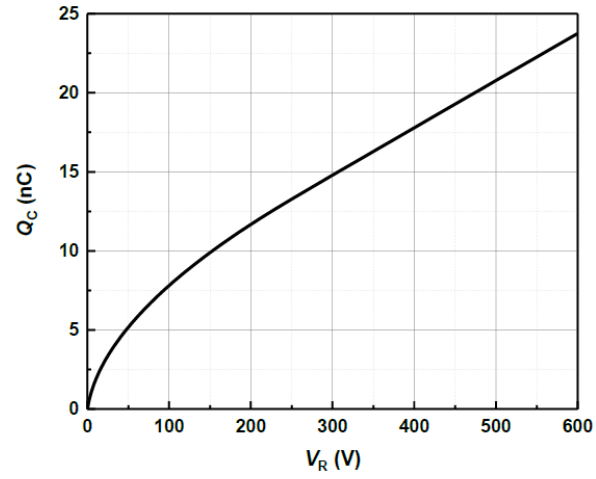
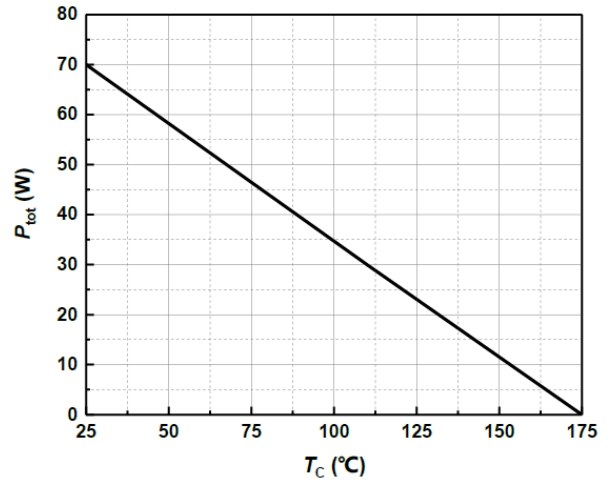


Fig. 6 ▪ Power Dissipation P_{TOT} as function of Case Temperature T_C



REFERENCE DATA ▲ TYPICAL PERFORMANCE

Fig. 7 ▪ Capacitance Stored Energy

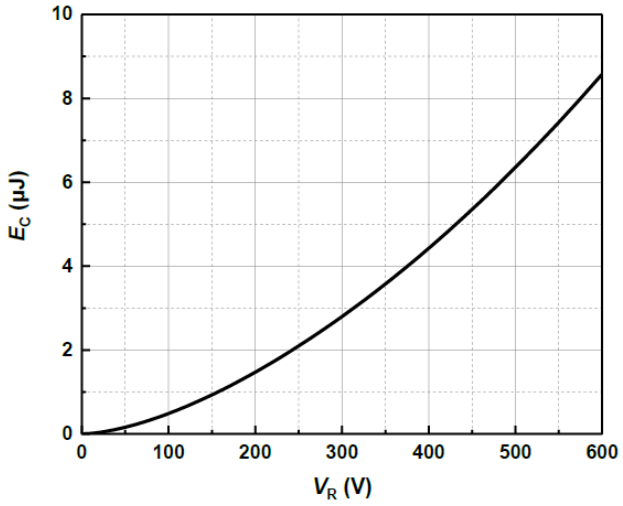
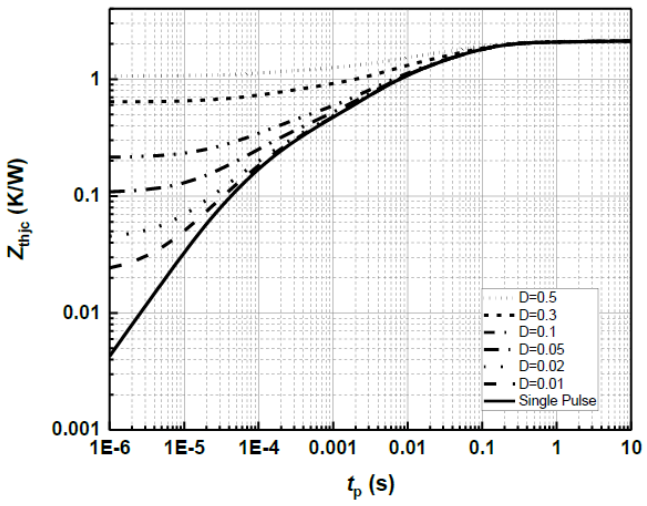
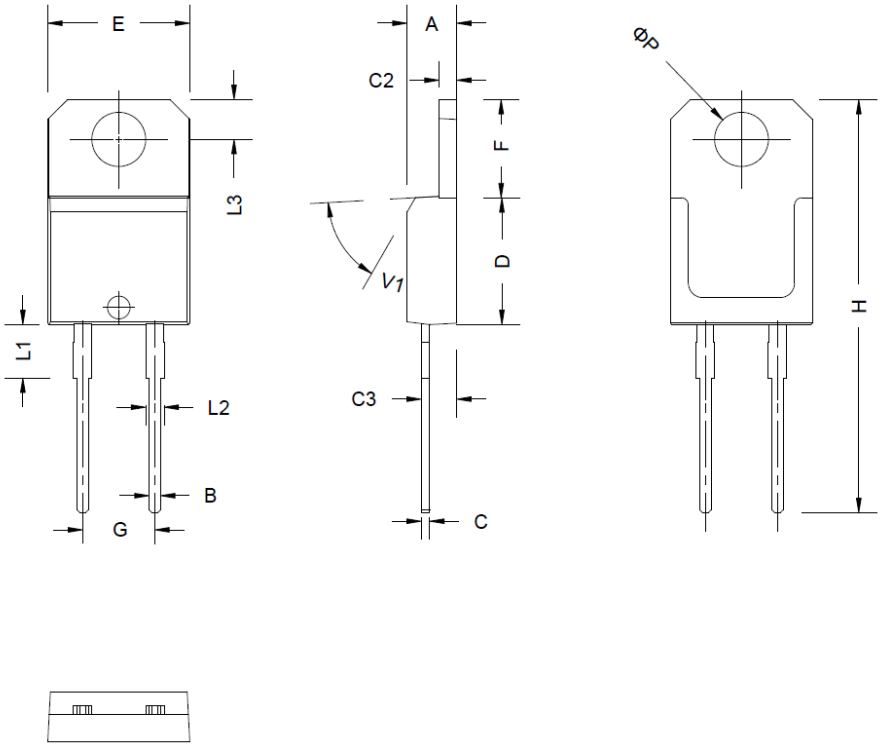


Fig. 8 ▪ Maximum Transient Thermal Impedance, Z_{thjc} = f(t), Parameter: D = t/T



PACKAGE OUTLINE



Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	4.40	4.50	4.60
B	0.61	0.75	0.88
C	0.46	0.58	0.70
C2	1.21	1.265	1.32
C3	2.40	2.56	2.72
D	8.60	9.15	9.70
E	9.80	10.10	10.40
F	6.55	6.75	6.95

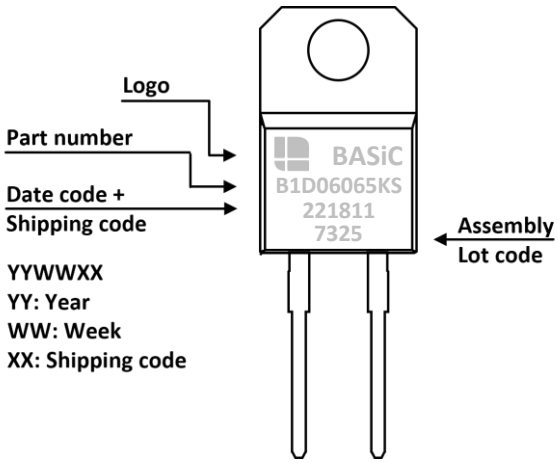
Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
G		5.08 BSC	
H	28.00	28.90	29.80
L1	-	3.75	-
L2	1.14	-	1.70
L3	2.65	2.80	2.95
V1	-	45°	-
ØP	-	-	3.88

TO-220 ISO-2L package ▲ Epoxy meets UL94-V0

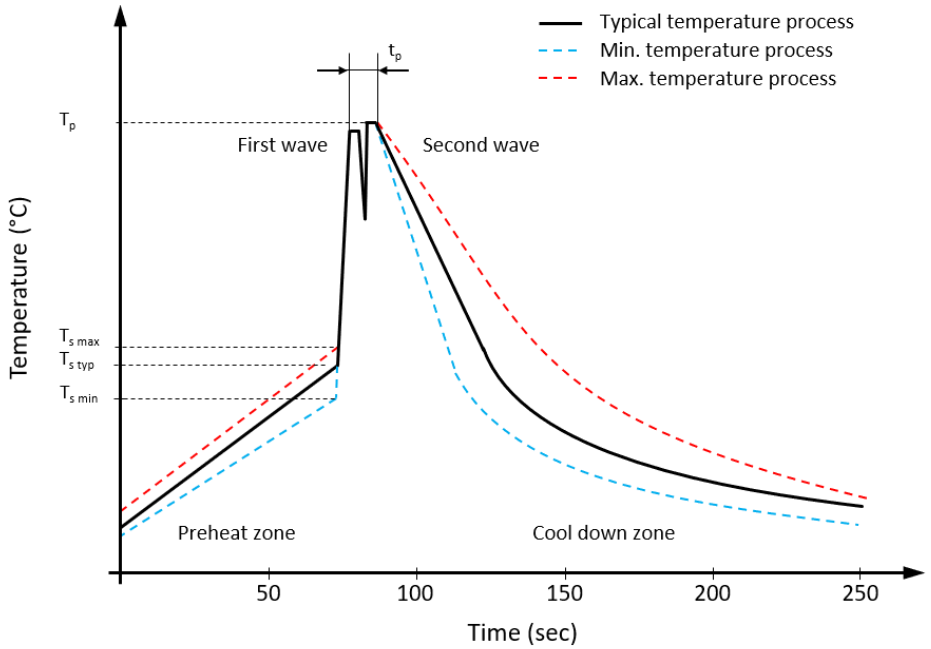
ORDERING INFORMATION

Part Number	Package	Packing	Tube Qty.	Inner Box Qty.	Outer Box Qty.
B1D06065KS	TO-220 ISO-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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