B1D08065KF

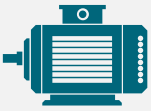
650V ▲ 8A ▲ SiC SCHOTTKY DIODE

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-220F-2L package ▲ Electrical insulated mounting tab

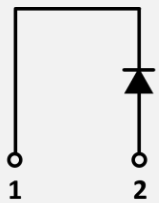
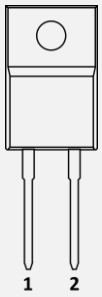
SPECIFICATION

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 = 130°C	I_F	8A
Total Capacitive Charge (T_J = 25°C)	Q_C	24nC
Capacitance Stored Energy (V_R = 400V)	E_C	6μJ
Diode Forward Voltage (T_J = 175°C, I_F = 8A)	V_F	1.69V
Power Dissipation	P_{TOT}	48W

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	17	A
Continuous Forward Current	T_C = 130°C	I_F	8	A
Non-Repetitive Forward Surge Current	T_C = 25°C, t_p = 10ms, Half Sine Wave	I_{FSM}	64	A
I^2t Value	T_C = 25°C, t_p = 10ms	$\int i^2dt$	20.48	A^2s
Power Dissipation	T_C = 25°C	P_{TOT}	48	W
Power Dissipation	T_C = 110°C	P_{TOT}	20	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 = 8A, T_J = 25°C	V_F		1.40	1.60	V
Diode Forward Voltage	I_F = 8A, T_J = 175°C	V_F		1.69	2.00	V
Reverse Current	V_R = 650V, T_J = 25°C	I_R		1	70	µA
Reverse Current	V_R = 650V, T_J = 175°C	I_R		10	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		24		nC
Total Capacitance	V_R = 1V, f = 1MHz, T_J = 25°C	C		365		pF
Total Capacitance	V_R = 300V, f = 1MHz, T_J = 25°C	C		41.1		pF
Total Capacitance	V_R = 600V, f = 1MHz, T_J = 25°C	C		40.7		pF
Capacitance Stored Energy	V_R = 400V, T_J = 25°C	E_C		6		µJ

THERMAL RESISTANCE PERFORMANCE

Item	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	$R_{\theta,JC}$		3.1		K/W

REFERENCE DATA ▲ TYPICAL PERFORMANCE

Fig. 1 ▪ Typical Forward Characteristics I_F vs. V_F

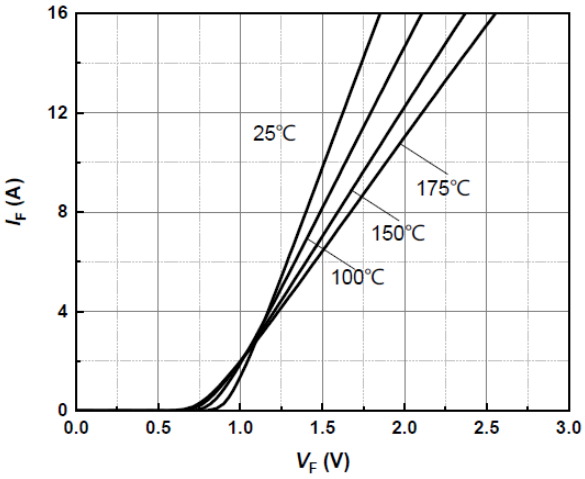


Fig. 2 ▪ Typical Reverse Current I_R as function of Reverse Voltage V_R

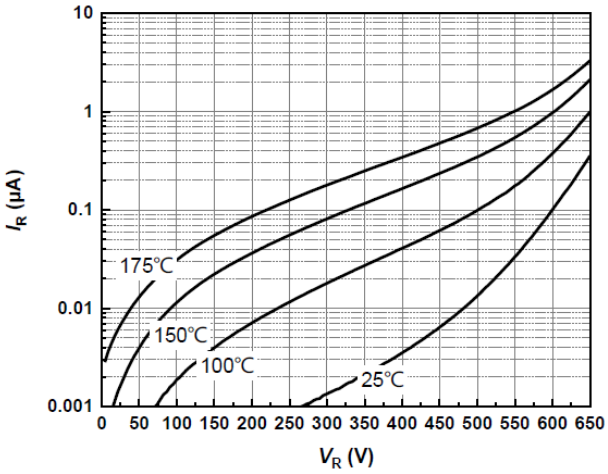


Fig. 3 ▪ Diode Forward Current I_F as function of Case Temperature T_C (D = Duty Cycle)

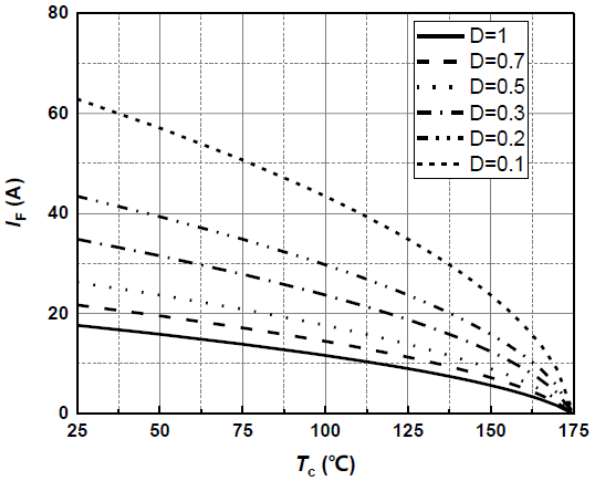


Fig. 4 ▪ Typical Capacitance C as function of Reverse Voltage V_R, C =f(V_R), T_J = 25°C, f = 1MHz

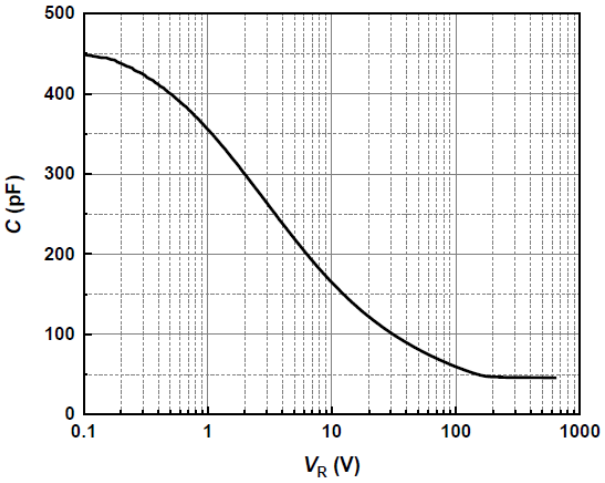


Fig. 5 ▪ Typical Reverse Charge Q_C as function of Reverse Voltage V_R

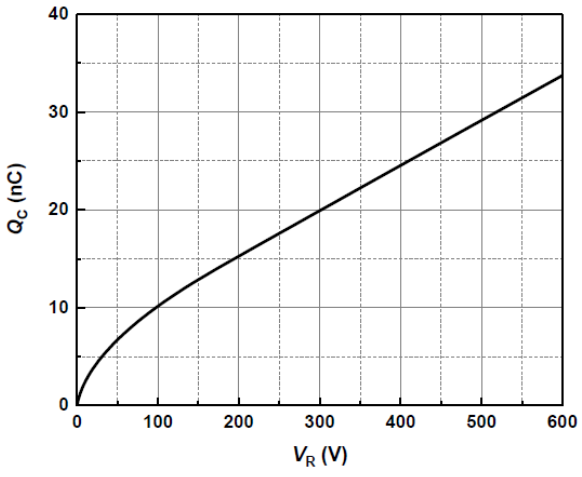
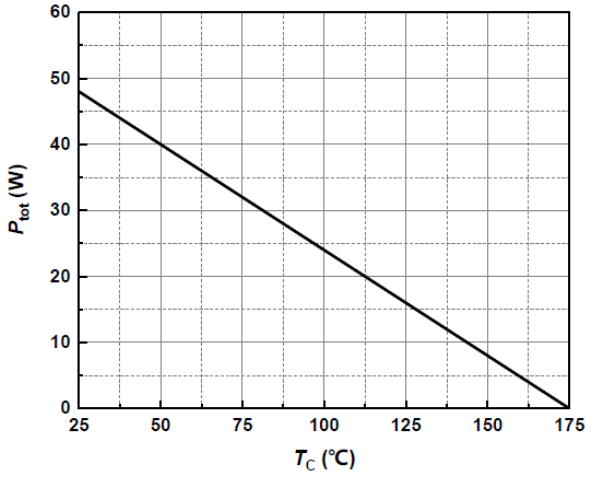


Fig. 6 ▪ Power Dissipation P_{TOT} as function of Case Temperature T_C



REFERENCE DATA ▲ TYPICAL PERFORMANCE

Fig. 7 ▪ Capacitance Stored Energy

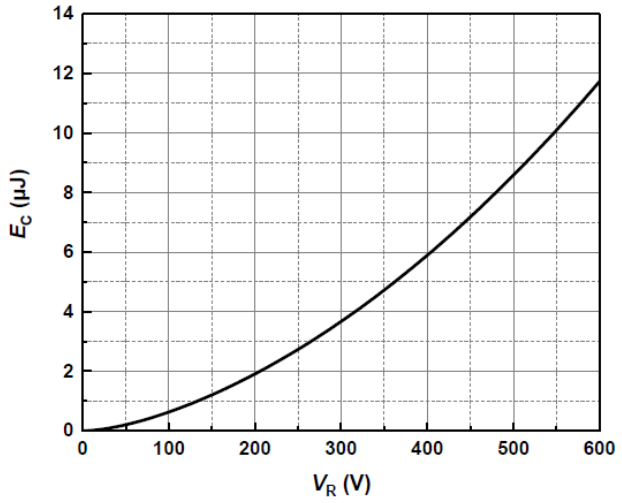
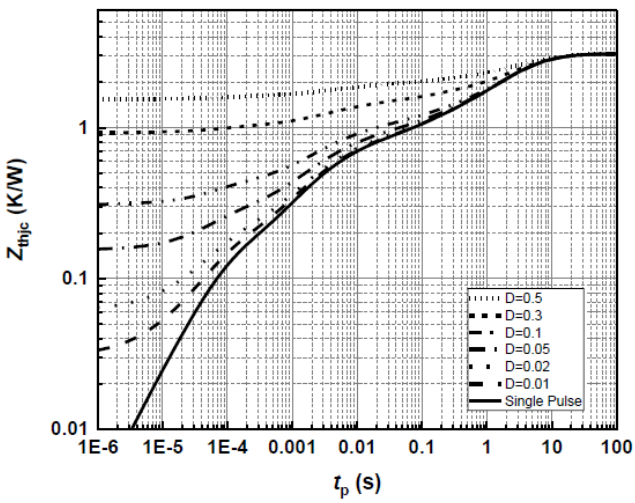
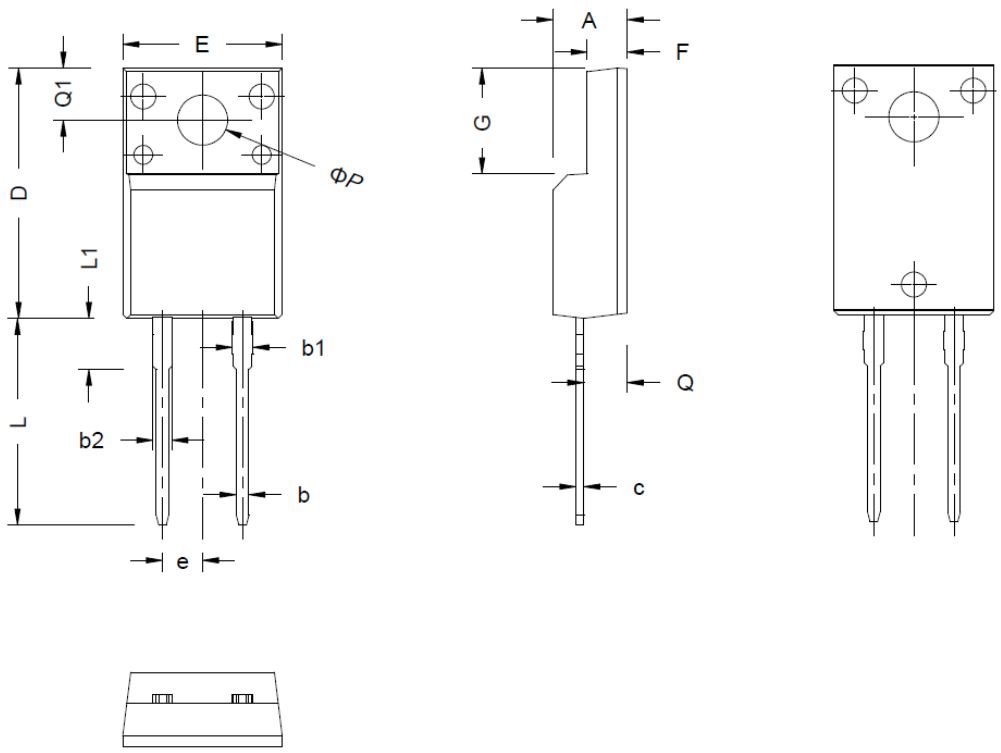


Fig. 8 ▪ Maximum Transient Thermal Impedance, Z_{thjc} = f(t), Parameter: D = t/T



PACKAGE OUTLINE



Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	4.60	4.70	4.80
b	0.70	0.80	0.91
b1	1.20	1.30	1.47
b2	1.10	1.20	1.30
c	0.45	0.50	0.63
D	15.80	15.87	15.97
D	15.15	15.45	15.75
e		2.54 BSC	
E	10.00	10.10	10.30

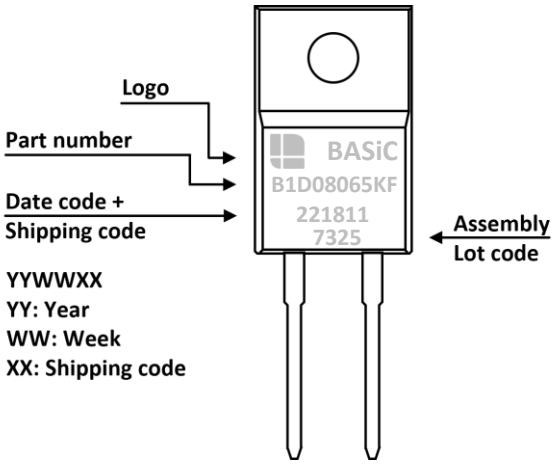
Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
F	2.44	2.54	2.64
G	6.50	6.70	6.90
L	12.90	13.10	13.30
L	12.70	-	13.70
L1	3.13	3.23	3.33
Q	2.65	2.75	2.85
Q1	3.20	3.30	3.40
ØP	2.08	3.18	3.28

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

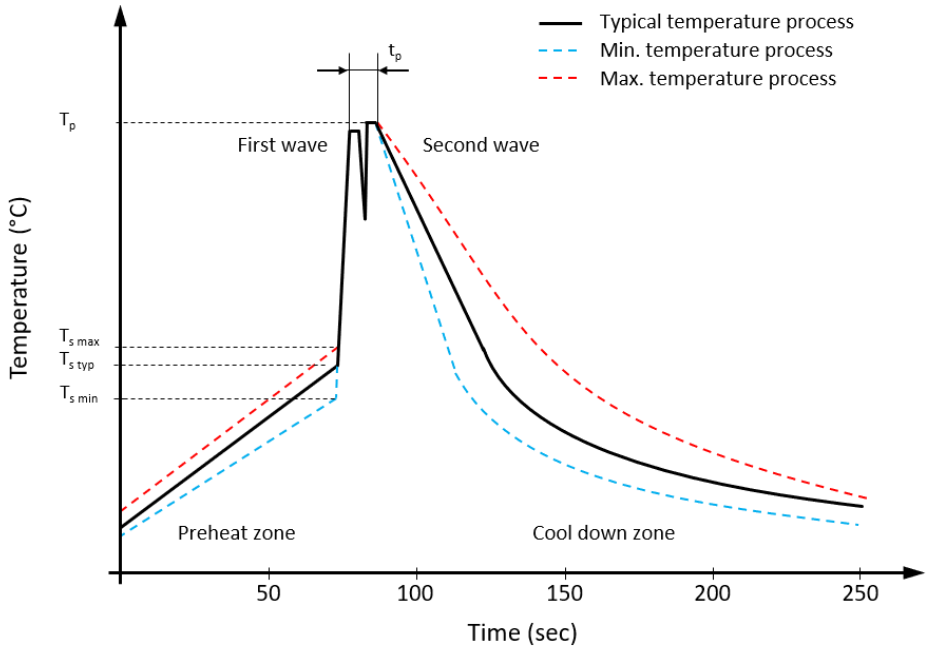
ORDERING INFORMATION

Part Number	Package	Packing	Tube Qty.	Inner Box Qty.	Outer Box Qty.
B1D08065KF	TO-220F-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

DISCLAIMER

Except for the written expressed warranties, MGT does not implicitly, by assumption or whatever else, warrant, under-take, promise any other warranty or guaranty for any MGT product.

All information and technical specifications made available by MGT are for guidance only and we reserve the right to change or modify them without prior notice. Unless expressly stated in writing by MGT, we reject any guarantees, obligations, or warranties.

All MGT products with the technical specifications described are suitable for use in certain applications. Operating, production, storage and environmental conditions can have a massive influence on the parameters mentioned in the data sheets, which cause the performance to vary over time.

It is subject to the user's duty of care to design and validate his products in such a way that appropriate measures are taken, such as protective circuits or redundant systems to ensure the safety standards required in the application.

MGT components are not designed or rated for use in life support, rescue, safety critical, military, or aerospace applications where failure or malfunction could result in property or environmental damage, serious injury or death. In the aforementioned cases, please contact us before using MGT products.

In principle, we reserve all rights and MGT's general terms and conditions apply. You can find them on our website www.mgt.co.com.