

1200V 20A Silicon Carbide Schottky Diode AKCK2D020WBHH

Features:

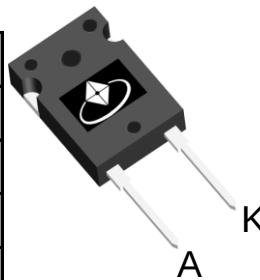
- No Reverse Recovery Current
- High Surge Current Capability
- High-Frequency Operation
- Temperature-Independent Switching
- High Non-repetitive Peak Forward Surge Current(I_{FSM})

Applications:

- PFC Boost Topology
- Free Wheeling Diodes in Inverter Stages
- AC/DC Converters
- Data Center

Key Performance Parameters:

Parameter	Value	Unit
V_{RRM}	1200	V
I_F	20	A
Q_C	110	nC
P_D	330	W
T_J	175	°C



Ordering Information:

Ordering Code	Package Type	Marking Code	Form	Packing
AKCK2D020WBHH	TO-247-2L	CK2D020WBHH	Tube	600 per box

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady-State	0.45	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Steady-State	40	°C/W

Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage		1200	V
I_F	Continues Forward Current	$T_C = 25^\circ\text{C}$	98	A
		$T_C = 125^\circ\text{C}$	37	A
		$T_C = 155^\circ\text{C}$	20	A
I_{FRM}	Repetive Peak Forward Surge Current	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	120	A
		$T_C = 110^\circ\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	80	A
I_{FSM}	Non-Repetive Peak Forward Surge Current	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	190	A
		$T_C = 110^\circ\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	150	A
$I_{F,max}$	Non-Repetive Peak Forward Surge Current	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$, Pulse	1500	A
		$T_C = 110^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$, Pulse	1200	A
dv/dt	Diode dv/dt	$V_R = 0\sim 960\text{V}$	200	V/ns
$\int i^2 dt$	$i^2 t$ value	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ ms}$	180	A
		$T_C = 110^\circ\text{C}$, $t_p = 10\text{ ms}$	112	A
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	330	W
		$T_C = 110^\circ\text{C}$	140	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^\circ\text{C}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_F	Forward Voltage	$I_F = 20\text{ A}, T_J = 25^\circ\text{C}$	-	1.48	1.65	V
		$I_F = 20\text{ A}, T_J = 175^\circ\text{C}$	-	2.3	3	V
I_R	Reverse Current	$V_R = 1200\text{ V}, T_J = 25^\circ\text{C}$	-	10	200	μA
		$V_R = 1200\text{ V}, T_J = 175^\circ\text{C}$	-	65	400	μA
Q_C	Total Capacitance Charge	$V_R = 800\text{V}, I_F = 20\text{ A}$ $Q_C = \int_0^{V_R} C(V_R) dV(V_R)$	-	110	-	nC
C	Total Capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}$	-	1140	-	pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}$	-	105	-	pF
		$V_R = 800\text{ V}, f = 1\text{ MHz}$	-	80	-	pF
E_C	Capacitance Stored Energy	$V_R = 800\text{ V}$	-	32	-	μJ

Notes:

1. Contact ALKAIDSEMI sales for detail information

Electrical Characteristics Diagrams

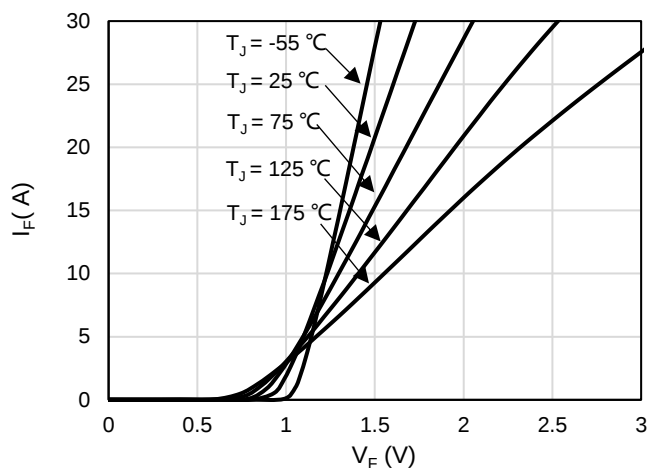


Figure 1: Forward Characteristics

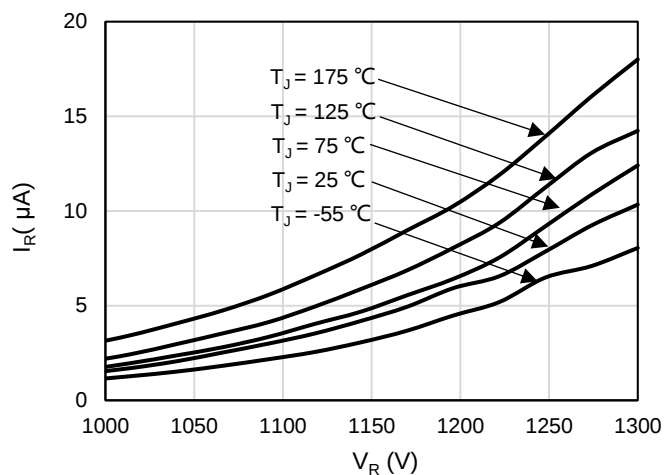


Figure 2: Reverse Characteristics

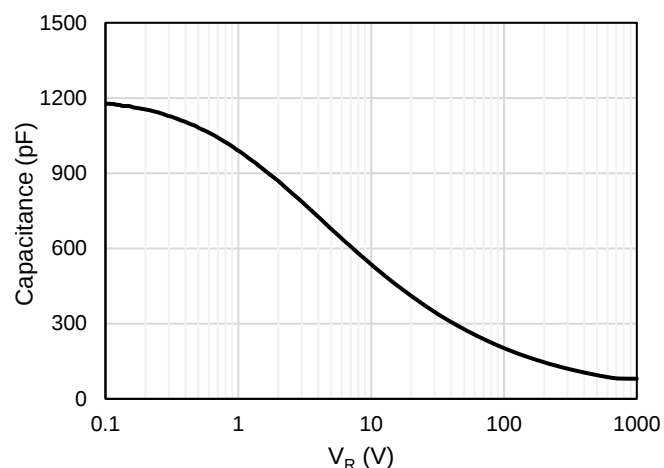


Figure 3: Capacitance Characteristics

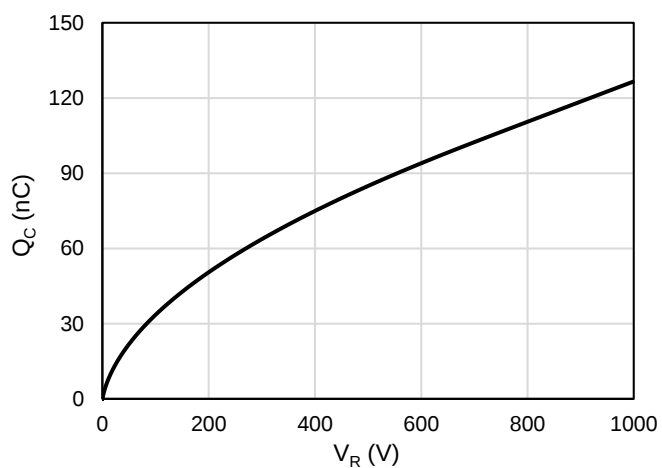


Figure 4: Total Capacitance Charge

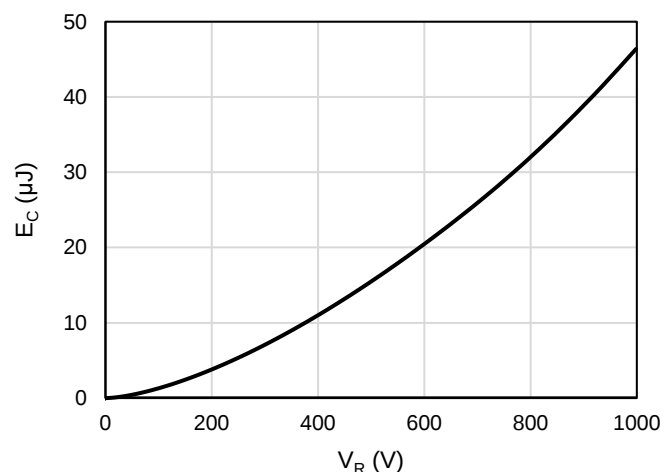


Figure 5: Capacitance Stored Energy

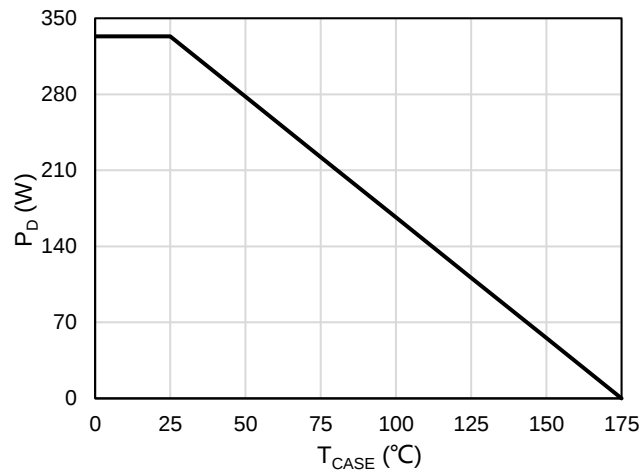
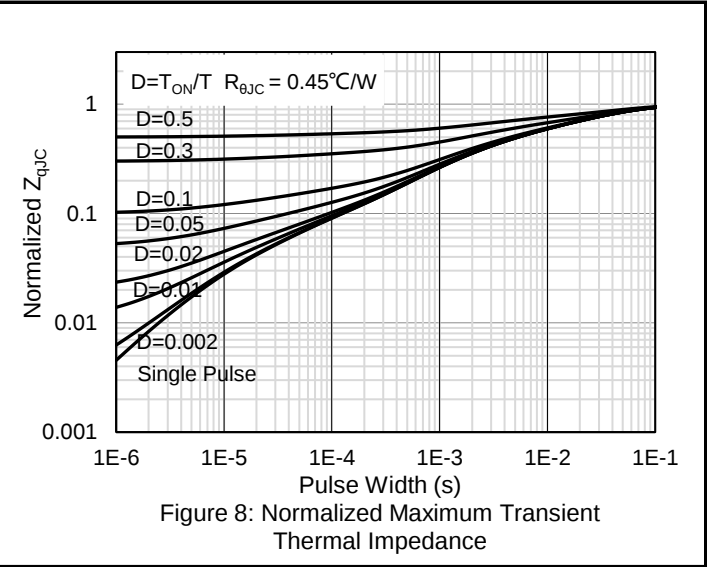
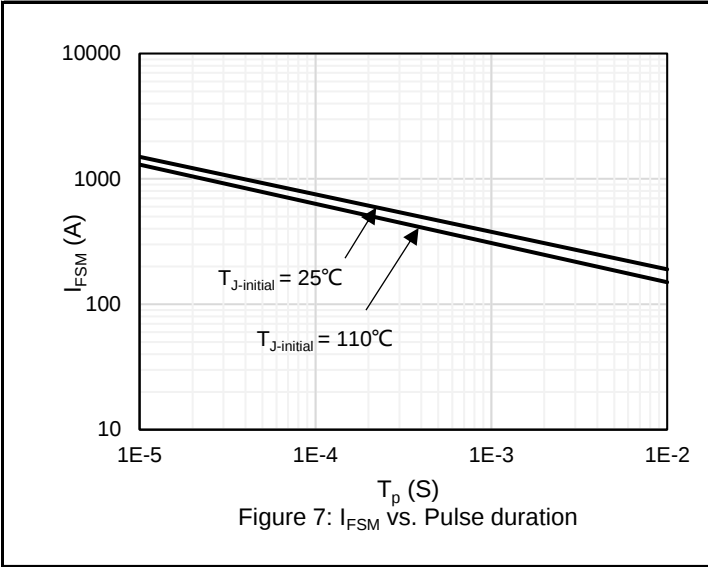
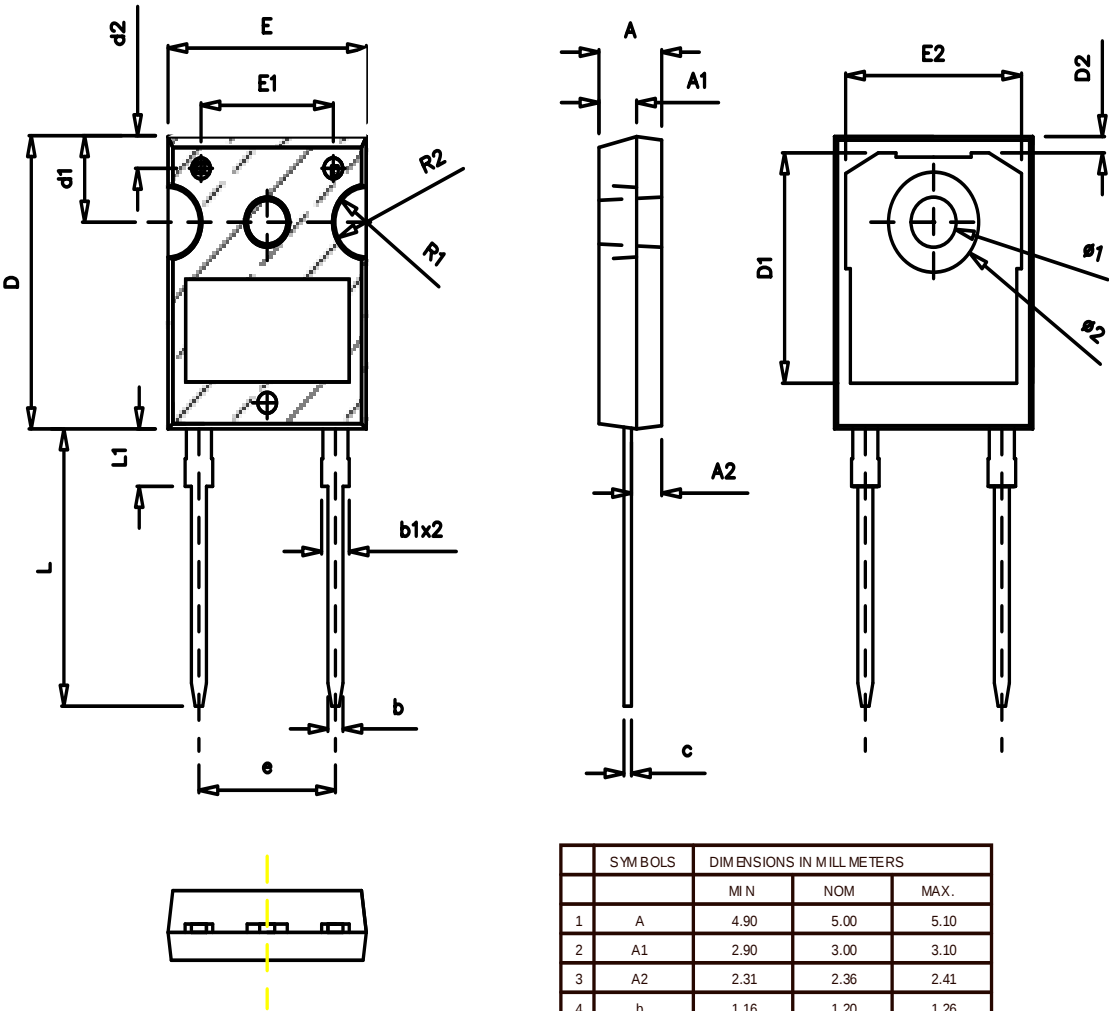


Figure 6: Power Derating



Package Outlines



	SYMBOLS	DIMENSIONS IN MILL METERS		
		MIN	NOM	MAX.
1	A	4.90	5.00	5.10
2	A1	2.90	3.00	3.10
3	A2	2.31	2.36	2.41
4	b	1.16	1.20	1.26
5	b1	2.05	-	2.20
6	b2	-	-	-
7	c	0.58	0.60	0.66
8	D	20.9	21.00	21.1
9	D1	16.46	16.56	16.76
10	D2		1.17	
11	d1	6.05	6.15	6.25
12	d2	2.2	2.3	2.4
13	E	15.7	15.8	15.9
14	E1		10.5	
15	E2		14.02	
16	e	-	2.54bcs	-
17	L	19.82	19.92	20.02
18	L1	1.88	1.98	2.08
19	θ	0°	7°	8°
20	R1	-	2.7	-
21	R2	-	2.5	-
22	φ1		3.6	
23	φ2	-	7.19	-

Marking Information



Note:

CK2D020WBHH = Product Name Code

XXXXXXX = Date Code

Contact ALKAIDSEMI sales for detail information

Revision History

Revision	Release Date	Remark
Rev.1.2	2022/7/18	Initial Release

Disclaimer

The information given in this document describes the independent performance of the product, but similar performance is not guaranteed under other working conditions, and cannot be guaranteed when installed with other products or equipment. To achieve the required performance of the product in actual scenarios, the customer should conduct a complete application test to assess the functionality of the product.

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