650V 8A Silicon Carbide Schottky Diode

AKC65D008PAHH

Features:

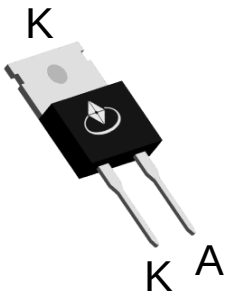
- Zero Reverse Recovery Current / Forward Recovery Voltage
- High Non-repetitive Peak Forward Surge Current (I_{FSM})
- Low Forward Voltage (V_F)
- Low Leakage Current (I_R)
- RoHS Compliant (Note 1)
- Halogen-free (Note 1)

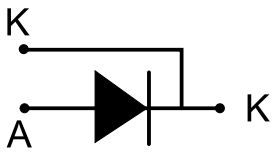
Applications:

- Solar Inverters
- Industrial Power Supplies
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Uninterruptible Power Supplies

Key Performance Parameters:

Parameter	Value	Unit
V_{RRM}	650	V
I_F	8	A
Q_C	26	nC
P_D	100	W
T_J	175	ºC





Ordering Information:

Ordering Code	Package Type	Marking Code	Form	Packing
AKC65D008PAHH	TO-220-2L	C65D008PAHH	Tube	1000 per box

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Steady-State	1.5	°C/W

Maximum Ratings (T_A = 25 °C unless otherwise noted)

Symbol	Parameter		Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage		650	V
I_F	Continuous Forward Current	T_C = 25 °C	28	A
		T_C = 125 °C	12	A
		T_C = 155 °C	8	A
I_{FRM}	Repetitive Peak Forward Surge Current	T_C = 25 °C, t_p = 10 ms, Half Sine Wave	38	A
		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	26	A
I_{FSM}	Non-repetitive Peak Forward Surge Current	T_C = 25 °C, t_p = 10 ms, Half Sine Wave	72	A
		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	60	A
$I_{F,max}$	Non-repetitive Peak Forward Surge Current	T_C = 25 °C, t_p = 10 μs, Pulse	660	A
		T_C = 110 °C, t_p = 10 μs, Pulse	530	A
P_D	Power Dissipation	T_C = 25 °C	100	W
		T_C = 110 °C	43	W
T_J	Operating Junction Temperature		175	°C
T_{STG}	Storage Temperature		-55~175	°C

Electrical Characteristics (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{BR}	Reverse Breakdown Voltage	I_R = 100 μA	650	-	-	V
V_F	Forward Voltage	I_F = 8 A, T_J = 25 °C	-	1.38	1.50	V
		I_F = 8 A, T_J = 175 °C	-	1.85	2.0	V
I_R	Reverse Leakage Current	V_R = 650 V, T_J = 25 °C	-	10	50	μA
		V_R = 650 V, T_J = 175 °C	-	20	150	μA
Q_C	Total Capacitive Charge	V_R = 400 V, $Q_C=\int_0^{V_R} C(V_R)dV(V_R)$	-	26	-	nC
C	Total Capacitance	V_R = 0 V, f = 100 kHz T_J = 25 °C	-	475	-	pF
		V_R = 400 V, f = 100 kHz T_J = 25 °C	-	38	-	pF
E_C	Capacitance Stored Energy	V_R = 400 V	-	3.8	-	μJ

Notes:

1. Contact ALKAIDSEMI sales for detail information

Electrical Characteristics Diagrams

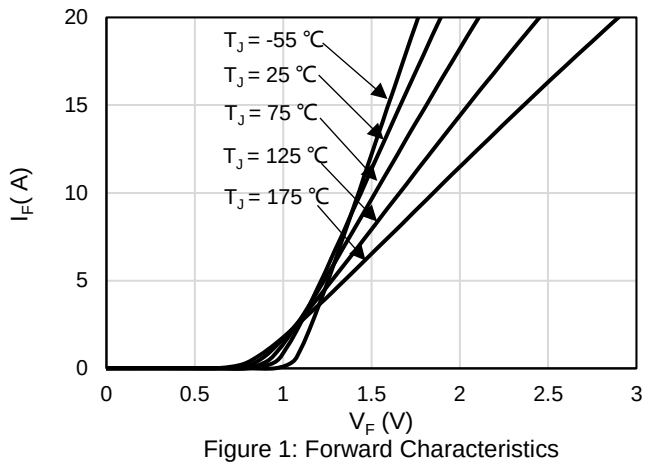


Figure 1: Forward Characteristics

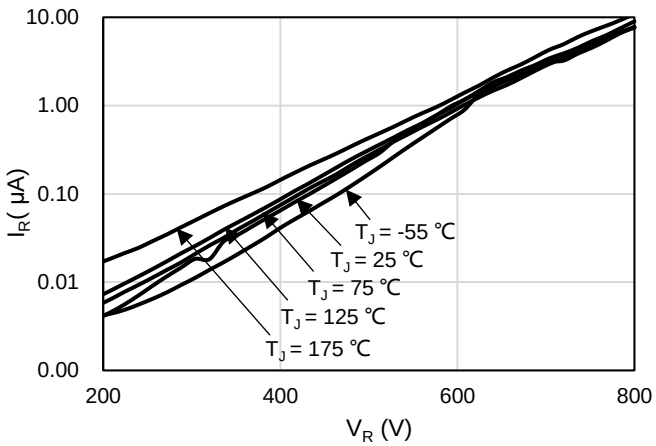


Figure 2: Reverse Characteristics

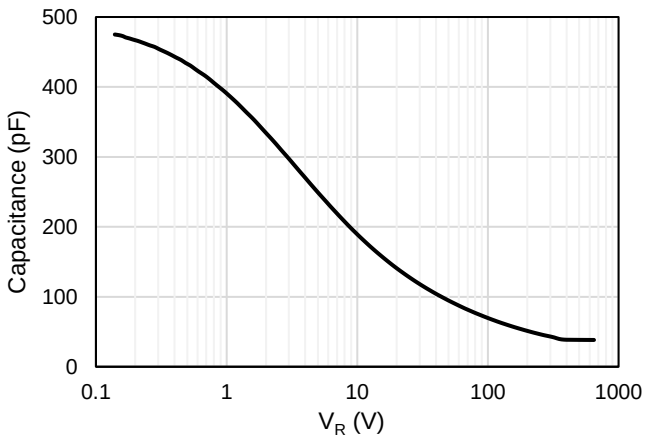


Figure 3: Capacitance Characteristics

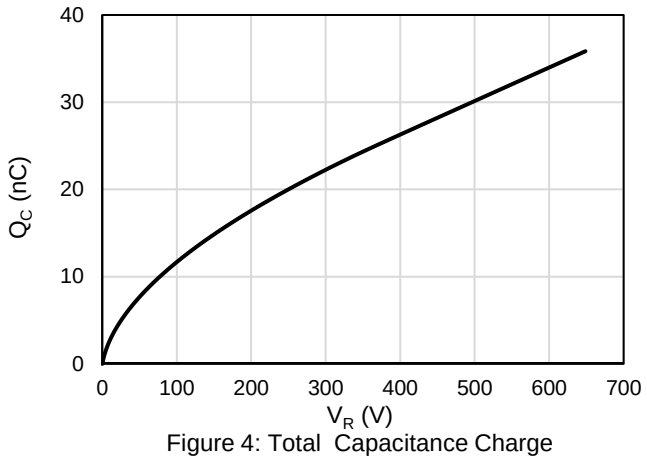


Figure 4: Total Capacitance Charge

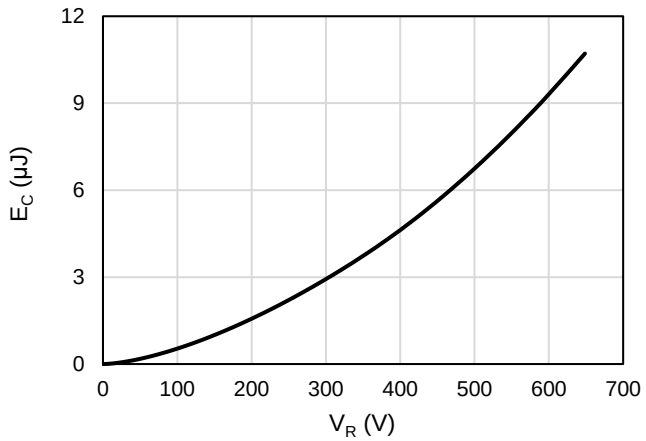


Figure 5: Capacitance Stored Energy

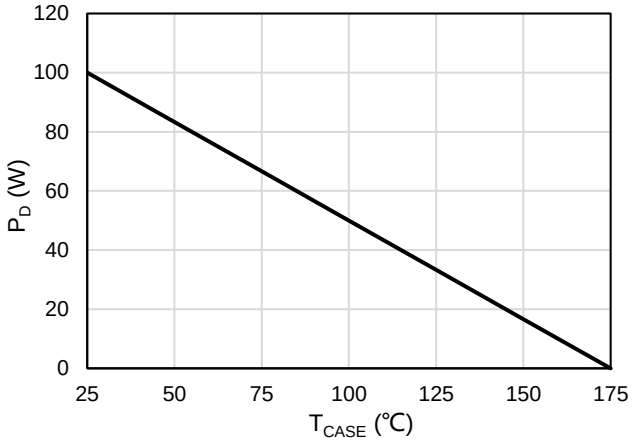


Figure 6: Power Derating

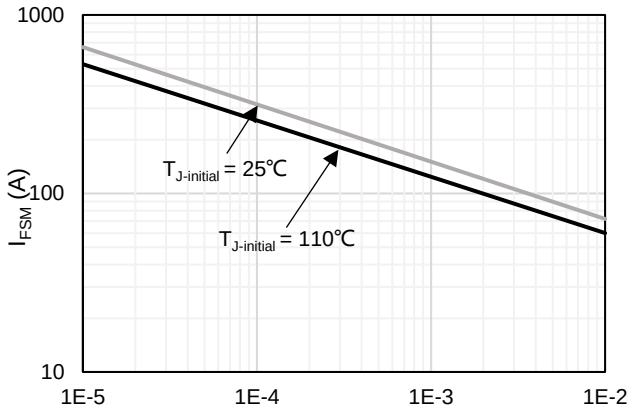


Figure 7: I_{FSM} vs. Pulse duration

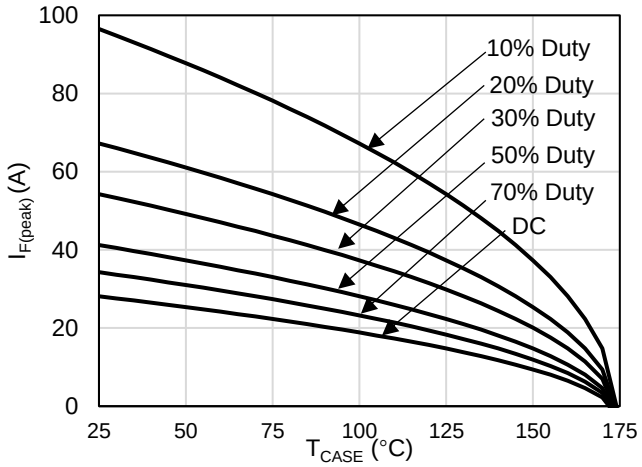


Figure 8: Current De-rating

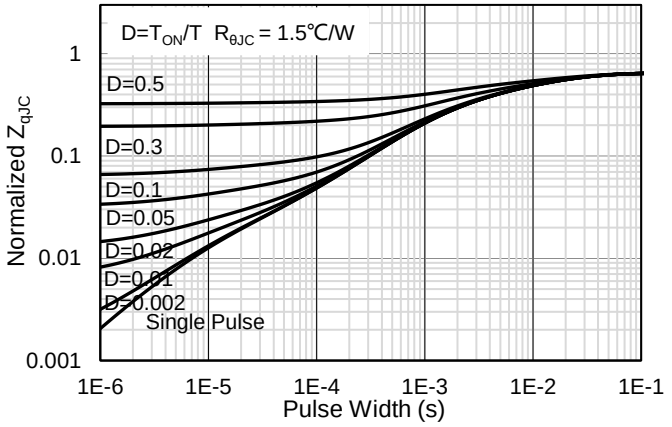
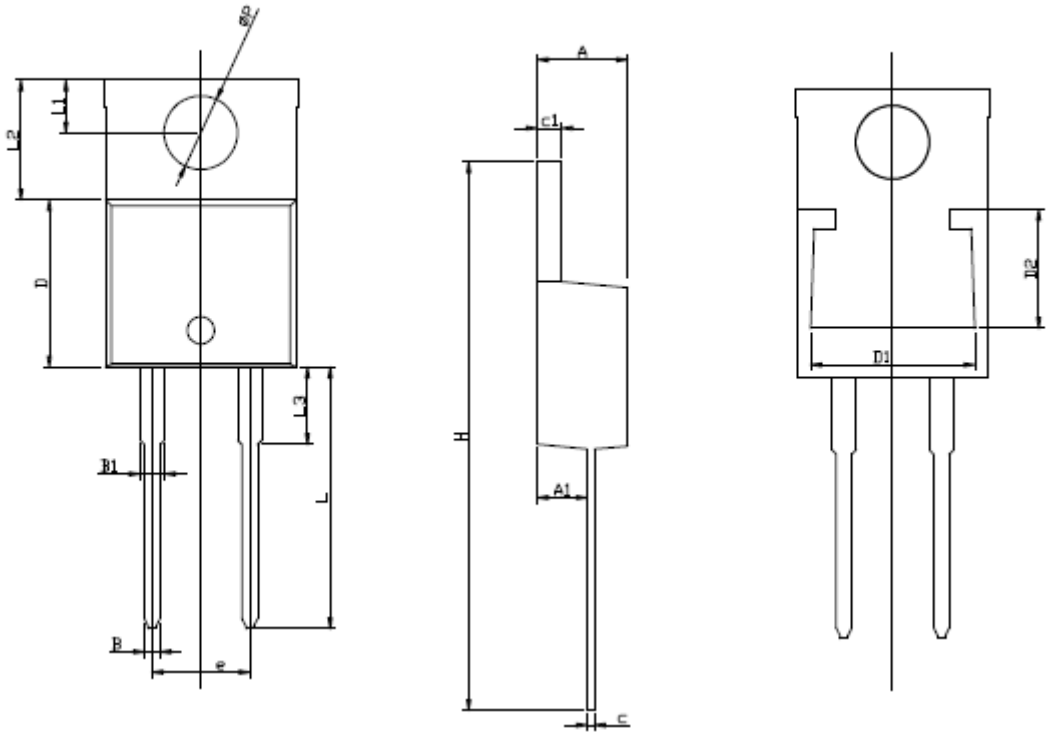
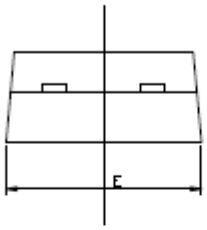


Figure 9: Normalized Maximum Transient Thermal Impedance

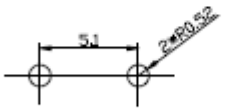
Package Outlines

TO-220AD-2L PACKAGE OUTLINE





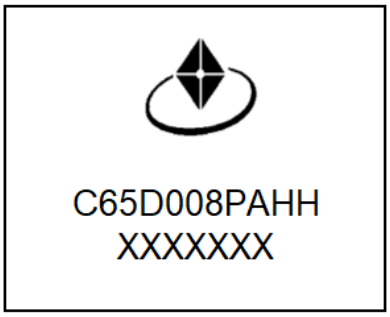
RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.50	4.70	4.90
A1	2.45	2.60	2.70
B	0.72	0.82	0.92
B1	1.12	1.27	1.42
c	0.28	0.38	0.48
c1	1.17	1.27	1.37
D	8.46	8.66	8.86
D1	7.70	7.90	8.40
D2	5.00	5.20	5.40
e		5.10	
E	9.85	10.15	10.45
H	28.00	28.50	29.00
ΦP		3.84	
L	13.1	13.6	14.1
L1	2.54	2.74	2.94
L2	6.04	6.24	6.44
L3	3.85	4.05	4.35

Marking Information



Note:
C65D008PAHH = Product Name Code
XXXXXXX = Date code
Contact ALKAIDSEMI sales for detail information

Revision History

Revision	Release Date	Remark
Rev.1.5	2022-08-11	

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.

Alkaidsemi assumes no responsibility for equipment failures result from using products at values that exceed the ratings, operating conditions, or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability. Customers using or selling these products for use in medical, life-saving, or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements, the information described or contained herein may be changed without prior notice.