

A4G10D650NF2

650V Silicon Carbide Schottky Diode

Features

- New Thin Wafer Technology
- Low Forward Voltage Drop (VF)
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on VF
- Temperature-independent Switching

Benefits

- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

Applications

- Switch Mode Power Supplies
- Uninterruptible Power Supplies
- Server/Telecom Power Supplies
- Industrial Power Supplies

Product Summary

V _{DS}	650V
I _D	19A



Ordering Information

Part Number	Marking	Package	Packaging
A4G10D650NF2	A4G10D650NF2	TO-220-2	Tube

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	650	V
V _{RSM}	Surge Peak Reverse Voltage	650	
V _R	DC Blocking Voltage	650	
I _F	Forward Current	38 (T _C ≤ 25°C)	A
		19 (T _C ≤ 135°C)	
		10 (T _C ≤ 156°C)	
I _{FSM}	Non-Repetitive Forward Surge Current	86	A
P _{tot}	Power Dissipation	150 (T _C = 25°C)	W
T _J , T _{stg}	Operating Junction and Storage Temperature	-55 to +175	°C

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

Typical Performance-Static

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _F	Forward Voltage	I _F = 10A, T _J = 25°C		1.27	1.5	V
		I _F = 10A, T _J = 175°C		1.38	1.6	V
I _R	Reverse Current	V _R = 650V, T _J = 25°C		6	50	μA
		V _R = 650V, T _J = 175°C		25	200	μA

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C	Total Capacitance	$V_R = 0V, T_J = 25^{\circ}C, f = 1MHz$	640	pF
		$V_R = 200V, T_J = 25^{\circ}C, f = 1MHz$	66	pF
		$V_R = 400V, T_J = 25^{\circ}C, f = 1MHz$	48	pF
Q _c	Total Capacitive Charge	$V_R = 400V, I_F = 10A$ $di/dt = 200A/\mu s, T_J = 25^{\circ}C$	25	nC

Thermal Characteristics

Symbol	Parameter	Value	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	1.0	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	80	°C/W
T _{sold}	Soldering Temperature	260	°C

Typical Performance

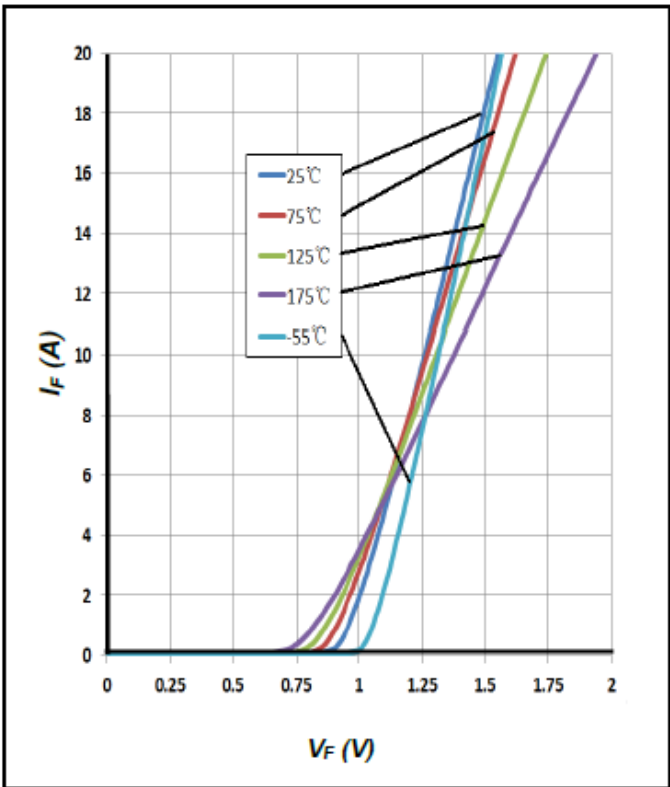


Figure 1. Forward Characteristics

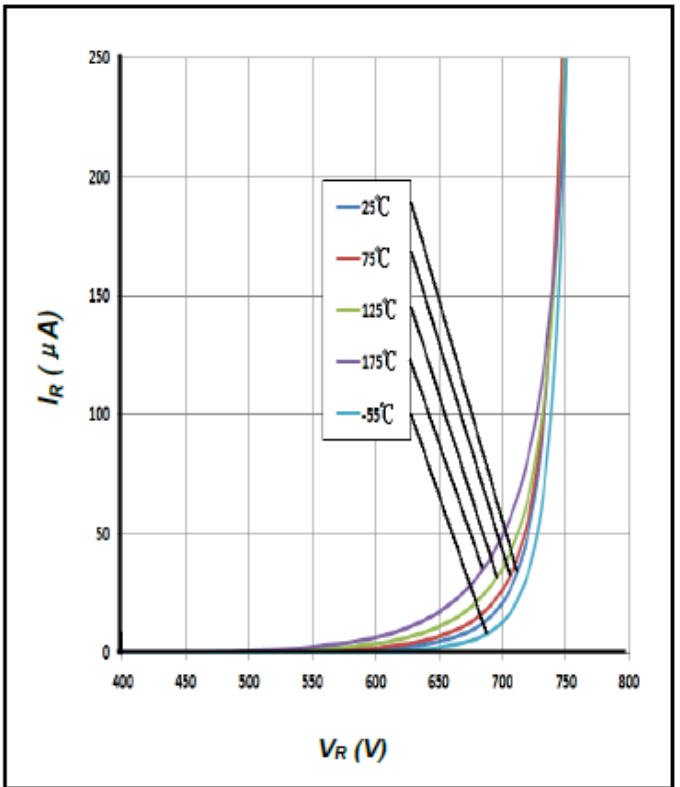


Figure 2. Reverse Characteristics

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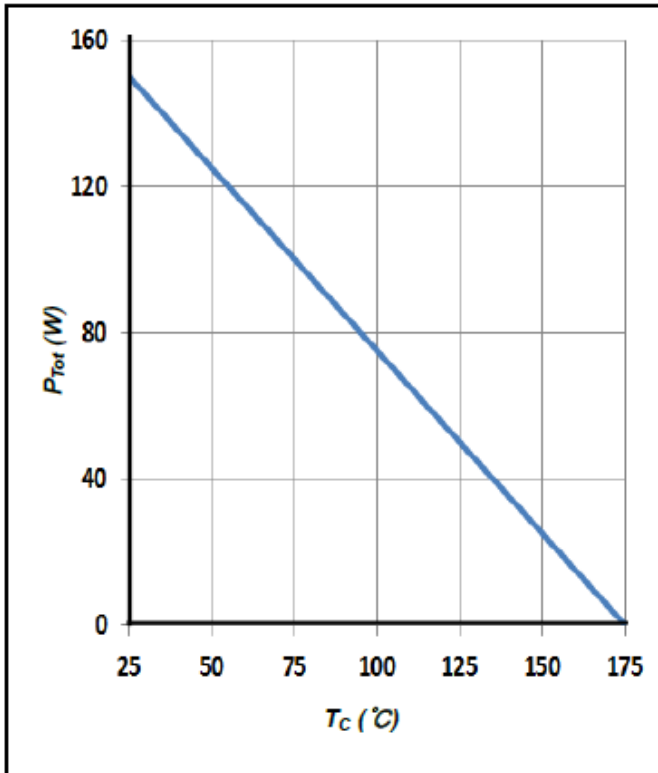


Figure 3. Power Derating

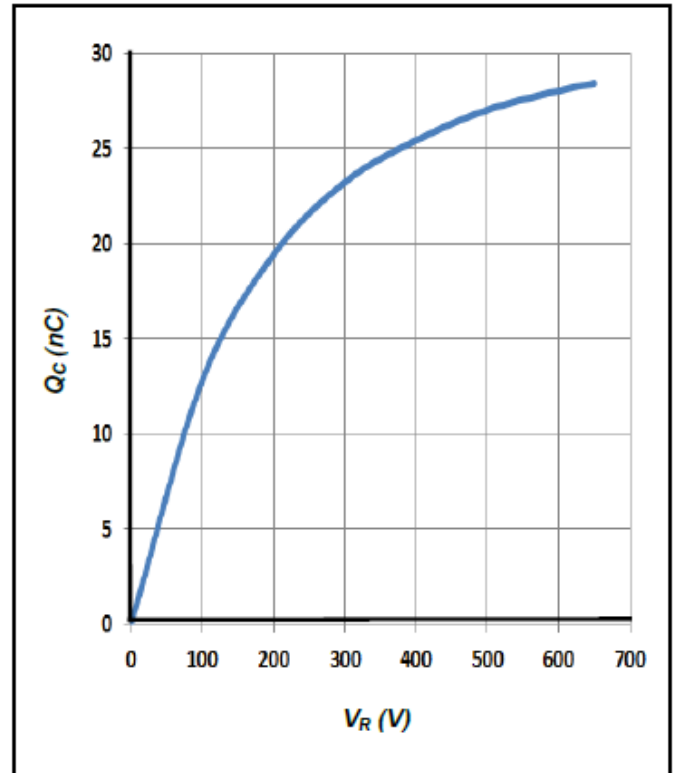


Figure 4. Total Capacitive Charge vs. Reverse Voltage

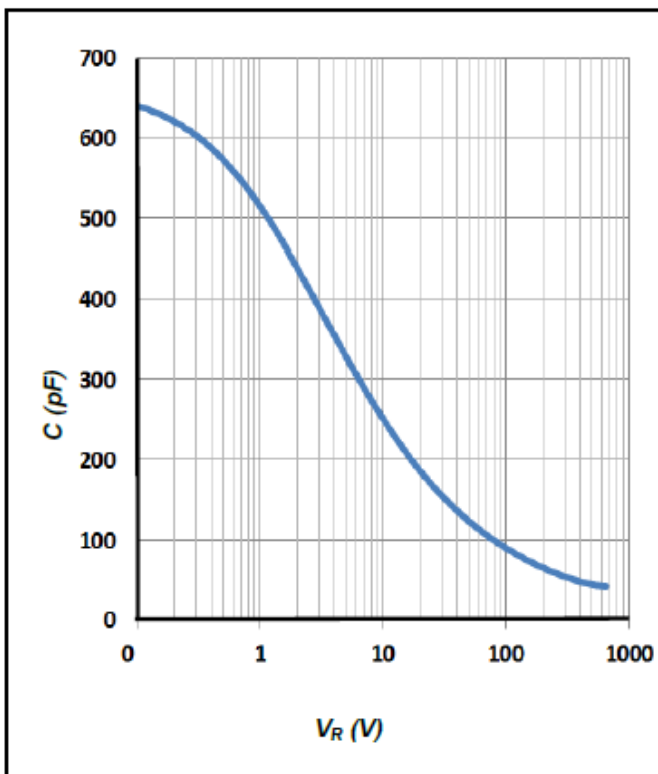


Figure 5. Total Capacitance vs. Reverse Voltage

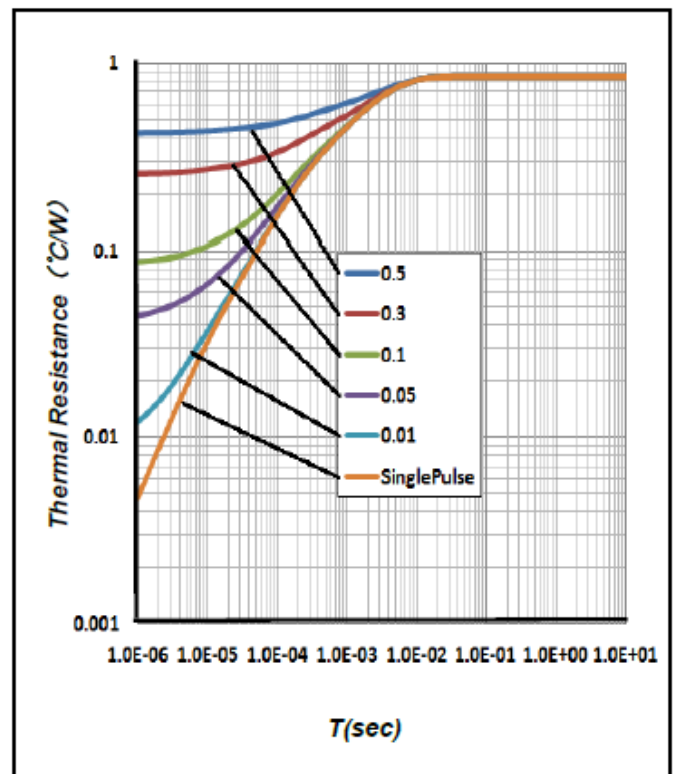
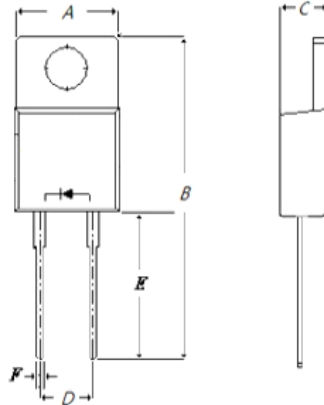


Figure 6. Transient Thermal Impedance

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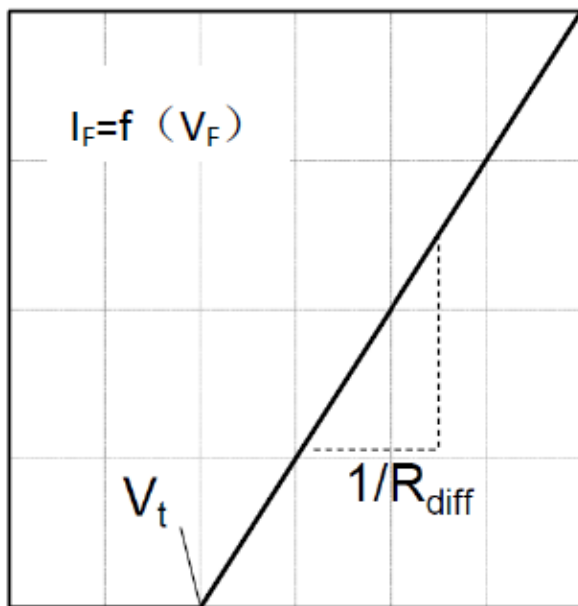
Package Drawing



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	9.17	10.08	10.91
B	27.00	28.58	30.00
C	3.89	4.50	5.00
D	4.20	5.10	5.80
E	11.70	13.30	14.97
F	0.50	0.80	1.21

Simplified Diode Model

Equivalent IV Curve for Model



Mathematical Equation

$$V_F = V_t + I_F \times R_{diff}$$

$$V_t = -0.001 \times T_j + 0.99 \text{ [V]}$$

$$R_{diff} = 6.9 \times 10^{-7} \times T_j^2 + 4.3 \times 10^{-5} \times T_j + 0.28 \text{ [\Omega]}$$

Note:

T_j = Diode Junction Temperature In Degrees Celsius,
valid from 25°C to 175°C

I_F = Forward Current

Less than 20A

Revision version	Description	Date
1	Initial	08.2025