

NW6506TZ1

650V Silicon Carbide Schottky Diode

Parameter	Value	Unit
V_{RRM}	650	V
Q_C	22	nC
I_F ($T_C = 153^{\circ}\text{C}$)	6	A

Features

- 650 V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching



TO-220-2



Applications

- Switch Mode Power Supplies
- Boost Diodes in PFC
- DC/DC Converters
- AC/DC Converters
- Free Wheeling Diodes in Inverter

Description

The NW6506TZ1 is a 650V, SiC Schottky Barrier Diode (SBD) is based on NovaWave's advanced SiC power technology resulting in high performance and long-term reliability. It supports high-temperature operation while showing minimal losses, zero reverse recovery, and low leakage current.

Part Description

Part Number	Package	Marking
NW6506TZ1	TO-220-2	NW6506TZ1

Absolute Maximum Ratings

$T_J = 25\text{ }^{\circ}\text{C}$ except as noted. Exceeding the maximum ratings may damage the device.

Parameter	Symbol	Value	Unit	Test conditions
Repetitive Peak Reverse Voltage	V_{RRM}	650	V	
Continuous Drain Current	V_{RSM}	650	V	
DC Peak Reverse Voltage	V_R	650	V	
Continuous Forward Current	I_F	20 9 6	A	$T_C = 25\text{ }^{\circ}\text{C}$ $T_C = 125\text{ }^{\circ}\text{C}$ $T_C = 153\text{ }^{\circ}\text{C}$
Non-Repetitive Forward Surge Current	I_{FSM}	66	A	$T_C = 25\text{ }^{\circ}\text{C}$, $t_p = 10\text{ ms}$, Half Sine Pulse
Power Dissipation	P_{tot}	83 36	W	$T_C = 25\text{ }^{\circ}\text{C}$ $T_C = 110\text{ }^{\circ}\text{C}$
Operating Junction Range	T_J	-55 to +175	$^{\circ}\text{C}$	-
Storage Temperature Range	T_S	-55 to +175	$^{\circ}\text{C}$	-

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance from Junction to Case	$R_{TH,J-C}$	--	1.8	--	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

Parameters	Symbol	Min	Typ	Max	Unit	Condition
Forward Voltage	V_F	--	1.38 1.8	1.65 2.4	V	$I_F=6\text{ A}$, $T_C = 25\text{ }^{\circ}\text{C}$ $I_F=6\text{ A}$, $T_C = 175\text{ }^{\circ}\text{C}$
Reverse Current	I_R	--	2 15	50 180	μA	$V_R=650\text{ V}$, $T_C = 25\text{ }^{\circ}\text{C}$ $V_R=650\text{ V}$, $T_C = 175\text{ }^{\circ}\text{C}$
Total Capacitive Charge	Q_C	--	22	--	nC	$V_R=400\text{ V}$, $I_F=6\text{ A}$, $T_C = 25\text{ }^{\circ}\text{C}$

Total Capacitance	C	--	398 43 33	--	pF	$V_R=0\text{ V}$, $T_C=25\text{ }^{\circ}\text{C}$, $f=1\text{ MHz}$ $V_R=200\text{ V}$, $T_C=25\text{ }^{\circ}\text{C}$, $f=1\text{ MHz}$ $V_R=400\text{ V}$, $T_C=25\text{ }^{\circ}\text{C}$, $f=1\text{ MHz}$
Capacitance Stored Energy	E_C	--	2.8	--	μJ	$V_R=400\text{ V}$

Electrical Performance Graphs

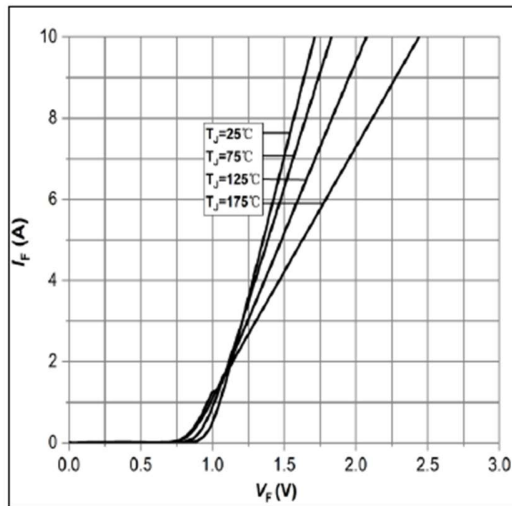


Figure 1: Forward Characteristics

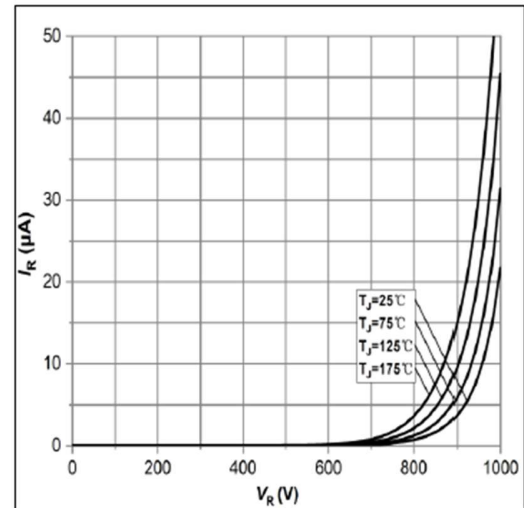


Figure 2: Reverse Characteristics

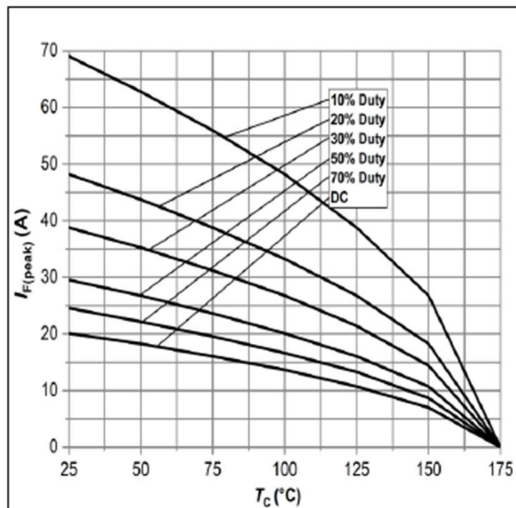


Figure 3: Current Derating

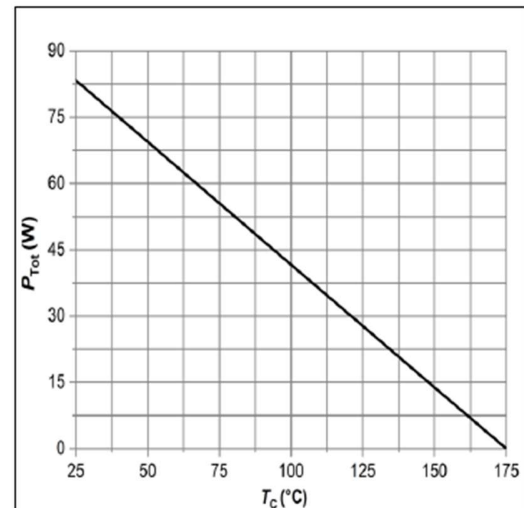


Figure 4: Power Derating

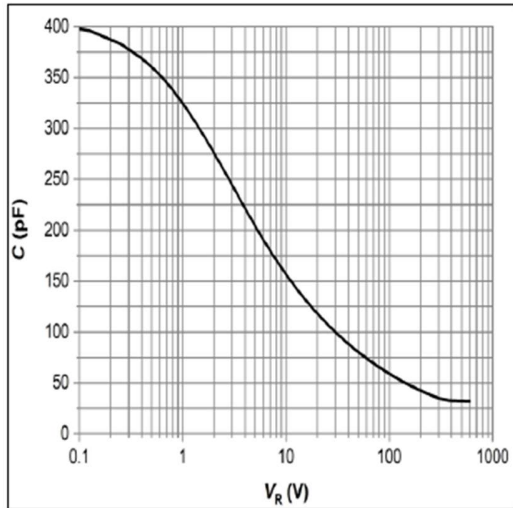


Figure 5: Capacitance vs. Reverse Voltage

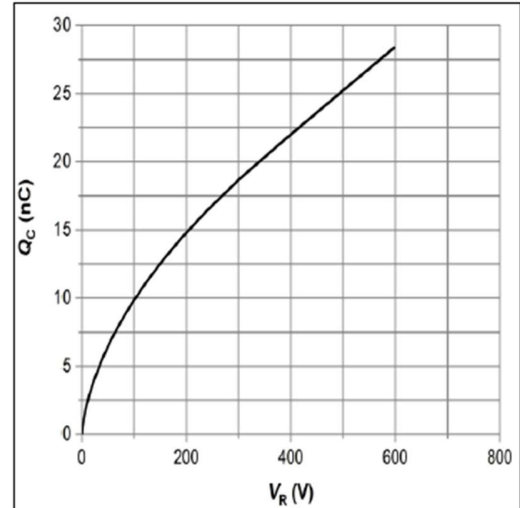


Figure 6: Total Capacitance Charge vs. Reverse Voltage

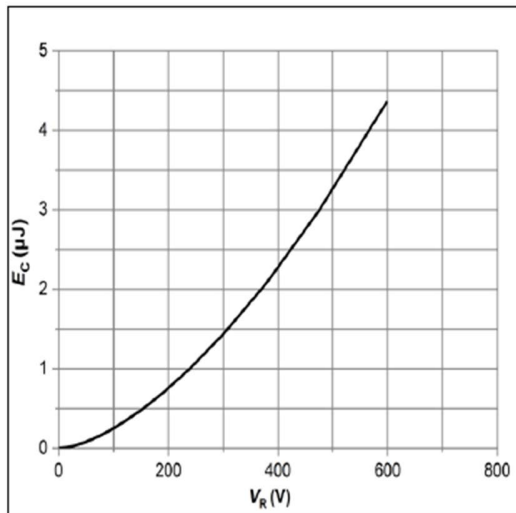


Figure 7: Typical Capacitance Stored Energy

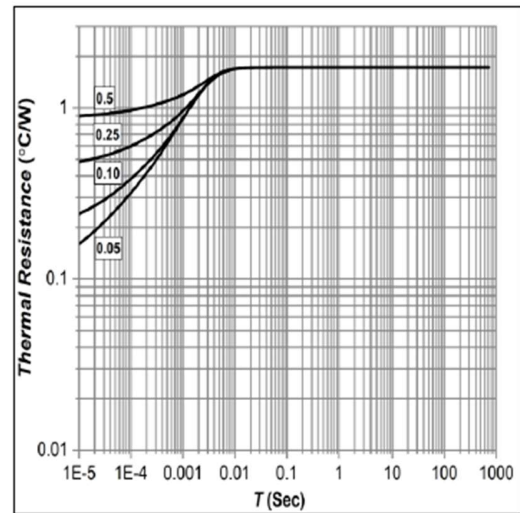
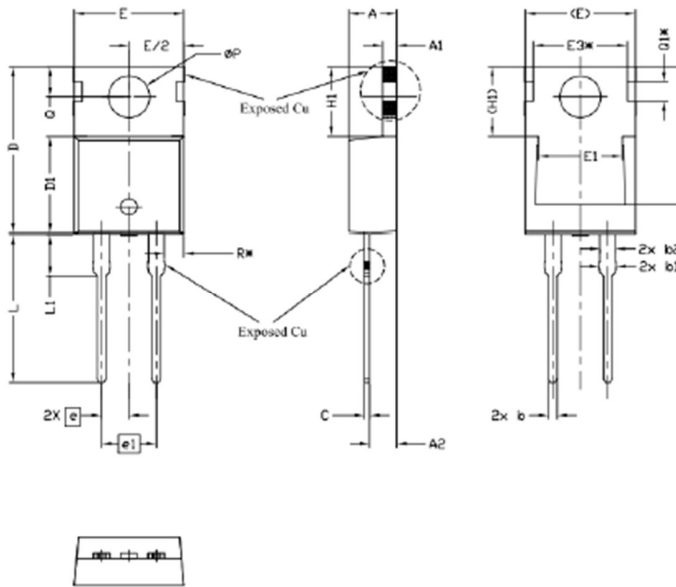


Figure 8: Transient Thermal Impedance

Package Dimensions

Package: TO-220-2



SYMBOL	DIMENSIONS			NOTES
	Min.	NOM	Max.	
A	4.24	4.44	4.64	
A1	1.15	1.27	1.40	
A2	2.30	2.48	2.70	
b	0.70	0.80	0.90	
b1	1.20	1.55	1.75	
b2	1.20	1.45	1.70	
c	0.40	0.50	0.60	
D	14.70	15.37	16.00	4
D1	8.82	8.92	9.02	
D2	12.43	12.73	12.83	5
E	9.96	10.16	10.36	4.5
E1	6.86	7.77	8.89	5
E3*	8.70 REF			
e	2.54 BSC			
e1	5.08 BSC			
H1	6.30	6.45	6.60	5.6
L	13.47	13.72	13.97	
L1	3.60	3.80	4.00	
ØP	3.75	3.84	3.93	
Q	2.60	2.80	3.00	
Q1*	1.73 REF			
R*	1.82 REF			

NOTE : Dimension L, M, W apply for Solder Dip Finish



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