

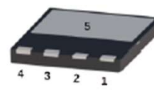
NW6510TD1

650V Silicon Carbide Schottky Diode

Parameter	Value	Unit
V_{RRM}	650	V
Q_C	36	nC
I_F (TC = 153°C)	10	A

Features

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



DFN 8*8



Applications

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

Description

The NW6510TD1 is a 650 V, SiC Schottky Barrier Diode based on NovaWave's advanced SiC 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
NW6510TD1	DFN 8*8	NW6510TD1

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	
Surge Peak Reverse Voltage	V_{RSM}	650	V	
DC Peak Reverse Voltage	V_R	650	V	
Continuous Forward Current	I_F	33 15 10	A	$T_C = 25\text{ }^{\circ}\text{C}$ $T_C = 135\text{ }^{\circ}\text{C}$ $T_C = 153\text{ }^{\circ}\text{C}$
Non-Repetitive Forward Surge Current	I_{FSM}	80	A	$T_C = 25\text{ }^{\circ}\text{C}$, $t_p = 10\text{ ms}$, Half Sine Pulse
Power Dissipation	P_{tot}	120 52	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_{Stg}	-55 to +175	$^{\circ}\text{C}$	-

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Case	$R_{TH, J-C}$	1.25	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

Parameters	Symbol	Min	Typ	Max	Unit	Condition
Forward Voltage	V_F	-	1.4 1.65	1.7 2.2	V	$I_F = 10\text{ A}$, $T_J = 25\text{ }^{\circ}\text{C}$ $I_F = 10\text{ A}$, $T_J = 175\text{ }^{\circ}\text{C}$
Reverse Current	I_R	-	2 10	50 200	μA	$V_R = 650\text{ V}$, $T_J = 25\text{ }^{\circ}\text{C}$ $V_R = 650\text{ V}$, $T_J = 175\text{ }^{\circ}\text{C}$

Total Capacitive Charge	Q_c	-	36	nC	$V_R = 400\text{ V}, I_F = 10\text{ A}, T_J = 25\text{ }^\circ\text{C}$
Total Capacitance	C	-	695 69 52	pF	$V_R = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 200\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 400\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$
Capacitance Stored Energy	E_C		4.6	μJ	$V_R = 400\text{ V}$

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Electrical Performance Graphs

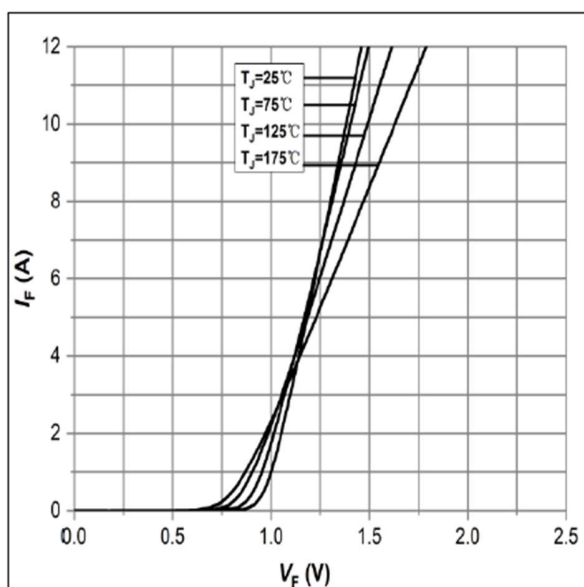


Figure 1: Forward Characteristics

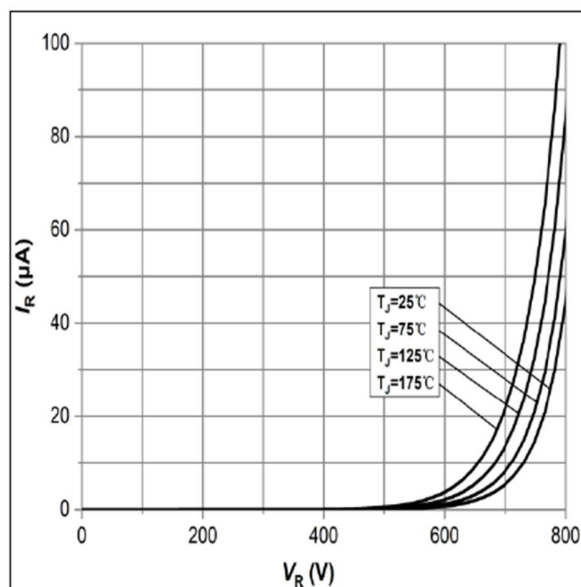


Figure 2: Reverse Characteristics

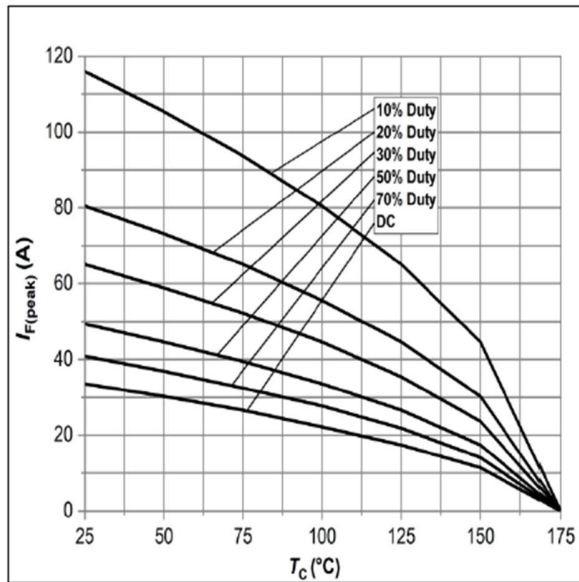


Figure 3: Current Derating

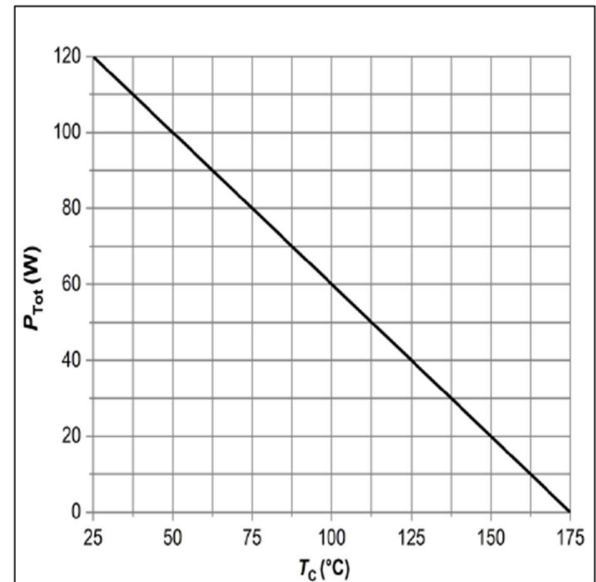


Figure 4: Power Derating

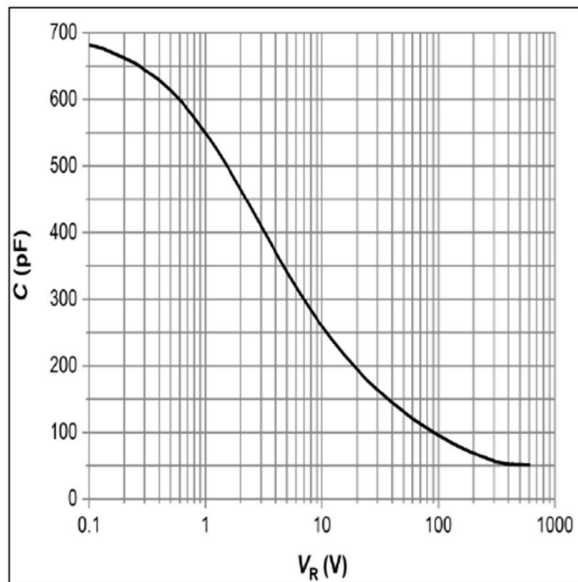


Figure 5: Capacitance vs. Reverse Voltage

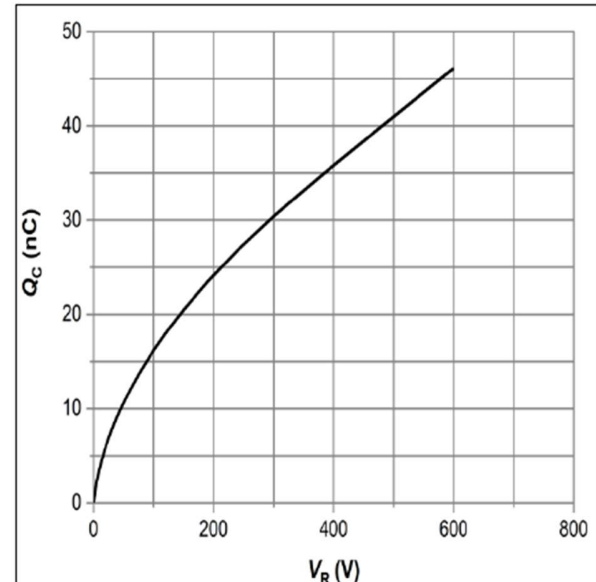


Figure 6: Total Capacitance Charge vs. Reverse Voltage

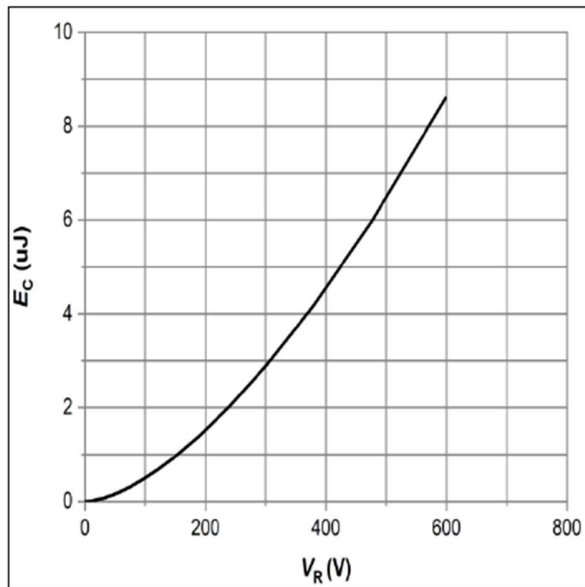


Figure 7: Typical Capacitance Stored Energy

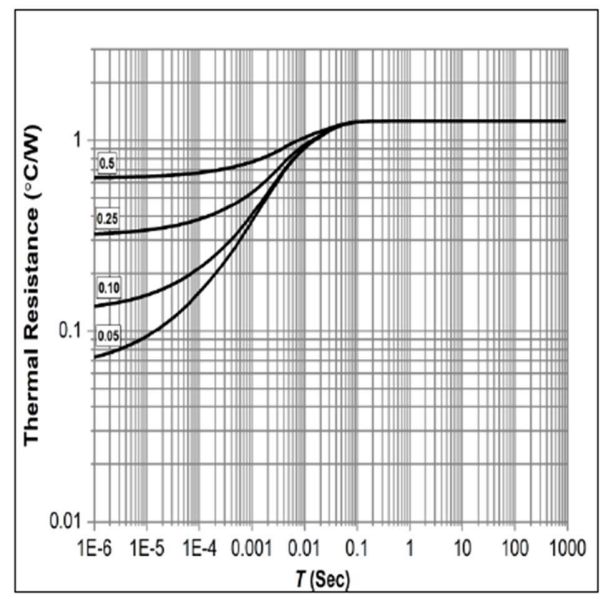
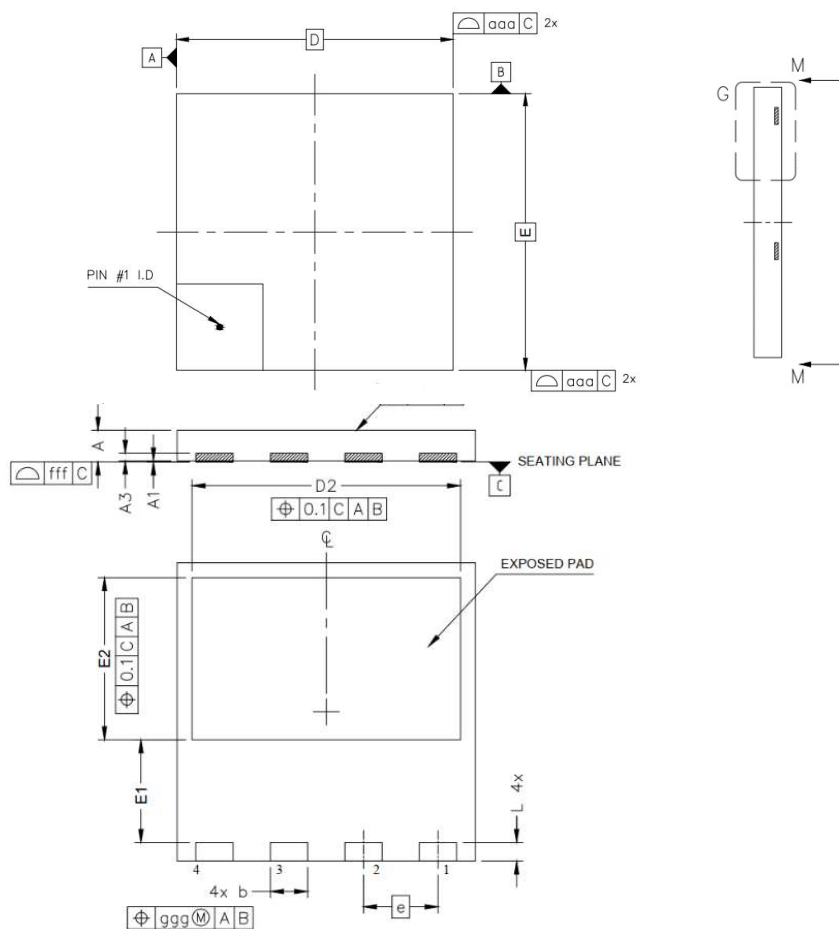


Figure 8: Transient Thermal Impedance

Package Dimensions

Package: DFN 8*8



SYMBOL	DIMENSIONS		
	Min.	NOM	Max.
A	0.75		0.95
A1	0.00		0.05
A3	0.10		0.30
b	0.90		1.10
D	7.90		8.10
E	7.90		8.10
D2	7.10		7.30
E1	2.65		2.85
E2	4.25		4.45
e	2.00 BSC		
L	0.40		0.60
aaa	0.10		
ggg	0.05		
ccc	0.05		
fff	0.05		

Disclaimer

The information given in this document is intended as a reference only and shall not in any event be regarded as a guarantee of performance. Novawave does not assume any liability arising out of the use of any product described herein, including but not limited to any personal injury, death, or property or environmental damage. The products shown herein are not designed for use as critical components in medical, life-saving, or life-sustaining applications, whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness. No licenses, patent rights, or any other intellectual property rights is granted or conveyed. Novawave reserves the right to make changes without further notice to any products herein to improve reliability, function, or design. Novawave standard terms and conditions apply. All rights reserved.