

SPECIFICATION SHEET

SPECIFICATION SHEET NO.	Q1021- NC1D120C10ATNG	
DATE	Oct. 21, 2023	
REVISION	A0	Updated With Most Recent Data - Official First Release
DESCRIPTION AND MAIN PARAMETRICS	<p>Silicon Carbide (SiC) Enhanced Junction Barrier Schottky Diode (EJBS), TO-220-2L, NC1D Series, 2 Pins, Industrial Grade</p> <p>Repetitive Peak Reverse Voltage (VRRM): 1200V, Continuous Forward Current (If) @Tc 160°C: 10A, Operating Junction Temperature Range (Tj,Max): 175°C</p> <p>Package in Tube</p> <p>RoHS/RoHS III compliant and HF Free</p>	
CUSTOMER		
CUSTOMER PART NO.		
CROSS REF. PART NO.		
ORIGINAL MFG/PART NO.	NovuSem/NC1D120C10AT	
PART CODE	NC1D120C10ATNG	

VENDOR APPROVE

Issued/Checked/Approved



DATE: Oct. 21, 2023

CUSTOMER APPROVE

DATE:

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES**DESCRIPTION**

Silicon Carbide (SiC) Enhanced Junction Barrier Schottky (EJBS) diode is cost-effective, quality-oriented, and is proven in accordance with industrial standards. SiC Schottky Diode is a composite structure of a PiN Diode and SBD structure. The PiN structure, in the reverse blocking state of the device, is used to shield the electric field of the Schottky region to reduce leakage current. The SBD structure realizes the low forward voltage through unipolar conduction. NovuSem has developed a SiC EJBS diode through the optimization of device structure and manufacturing process. The SiC EJBS diode features ultra-low leakage current (5 μ A) and high surge current capability comparable to that of the MPS (Merged PiN Schottky) structure.

MAIN FEATURE

- High Surge Current Capability
- Low Leakage Current
- No Reverse Recovery Current/Forward Recovery Voltage
- 175 °C Operating Junction Temperature
- Low Forward Voltage (VF) Drop With Positive Temperature Coefficient
- Temperature-Independent Switching Behavior
- RoHS III Compliant & HF Free

**APPLICATION**

- PV Inverters
- Charging Piles
- Energy Storage Systems
- Industrial Power Supply
- Industrial Motors
- Automotive Electronics.

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES

APPLICATION PERFORMANCE

- 1100V PV System Boost PFC: In the application of 11kW PV inverters, compared with FRD, NovuSem SiC EJBs diode reduces system loss by 30%, and reduces temperature increases in silicon-based IGBTs and SiC diodes by 6°C and 13°C respectively, greatly improving overall power density.
- Vienna rectifier for 20 kW charging piles: NovuSem SiC EJBs diode improves system efficiency by 1.05% while reducing switching loss by 91% and total loss by 50% compared to FRD.

RFQ

[Request For Quotation](#)

PART CODE GUIDE

NC1D	120	C	10	A	T	NG
1	2	3	4	5	6	7

- NC1D: Novusem Silicon Carbide (SiC) Schottky Diode Gen 1 Industrial Grade series code
- 120: Repetitive Peak Reverse Voltage (V_{RRM}) code, 120: 1200V; 65: 650V
- C: Material code, C: SiC; S: Silicon
- 10: Continuous Forward Current (I_F) @ T_c 152°C Code: 10: 10A.
- A: Package/Case code, A: TO-220-2L; D: TO-252; F: TO-220F; G: TO-247-3L; H: TO-247-4L; K: TO-247-2L; M: DFN5X6
R: TO-263-7L; S: TO-263; T: TO-220-3L
- T: Packing type code, T: Tube; R: Tape & Reel
- NG: Internal Control Code, letter or digits (A~Z or 1~9) for Special Parametric; Blank: N/A

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DIMENSION – See Table 1 (Unit: mm)

1). All dimensions are listed in millimeters, angles are in degrees. 2). All Metal Surfaces are Tin Plate (Matte) except Area of Cut.

Image for Reference



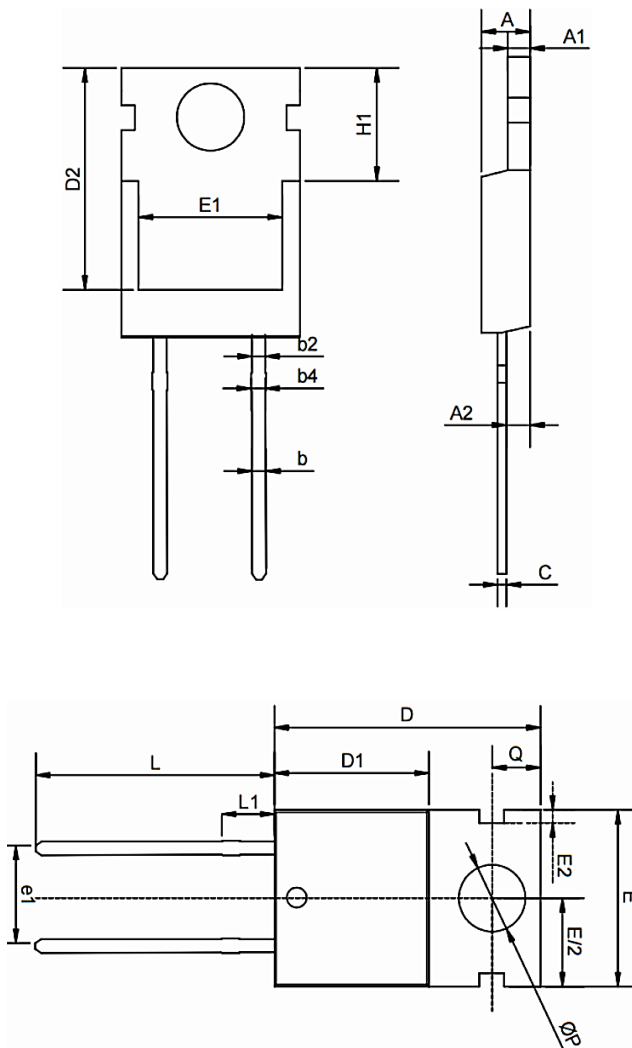
Marking:

Line 1: Initial Part Code

Line 2/Line 3: Internal QC Code

Package/Case: TO-220-2L

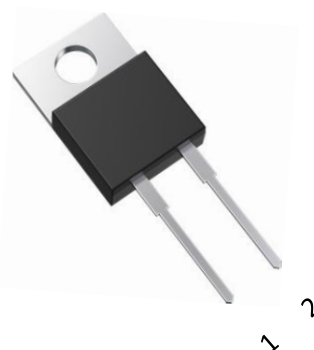
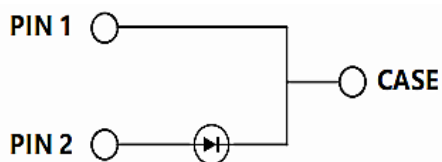
Table 1



SYMBOL	TO-220-2L		
	Min.	Typ.	Max.
A	4.24	4.44	4.64
A1	1.17	1.27	1.37
A2	2.30	2.48	2.70
b	0.70	0.80	0.90
b2	1.25	1.45	1.65
b4	1.25	1.55	1.75
c	0.40	0.50	0.60
D	14.87	15.37	15.87
D1	8.82	8.92	9.02
D2	12.43	12.73	12.83
E	9.96	10.16	10.36
E1	6.86	7.77	8.89
E2	0.76 Max.		
e1	5.08 Basic		
H1	6.30	6.45	6.60
L	13.47	13.72	13.97
L1	3.60	3.80	4.00
ΦP	3.75	3.84	3.93
Q	2.6	2.8	3.00

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INTERNAL CIRCUIT DIAGRAM



1200V SiC SCHOTTKY DIODE

VRRM	IF @ Tc = 160°C	Tj, Max.	PACKAGE/CASE
1200V	10A	175 °C	TO-220-2L

MAX. RATINGS @Tc=25 °C (Unless Otherwise Specified)

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Repetitive Peak Reverse Voltage	VRRM		1200	V
DC Peak Reverse Voltage	VR		1200	V
Continuous Forward Current	IF	Tc=25°C	39	A
		Tc=100°C	19	
		Tc=160°C	10	
Repetitive Peak Forward Surge Current	IFRM	Tc=25°C, tp=10ms, half sine wave, 0.1Hz	100	A
Non-Repetitive Forward Surge Current	IFSM	Tc=25°C, tp=10ms, half sine wave	118	A
Power Dissipation	Ptot	Tc=25°C	208	W
		Tc=110°C	90	
i²t Value	∫i²dt	Tc=25°C, tp=10ms	70	A²s
Operating Junction Tempe. Range	Tj		-55 ~ +175	°C
Storage Temperature Range	Tstg		-55 ~ +175	°C

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES

ELECTRICAL CHARACTERISTICS @Tc=25 °C (Unless Otherwise Specified)

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Forward Voltage	VF	IF=10A, Tj=25°C	-	1.39	1.6	V
		IF=10A, Tj=175°C	-	1.97	2.50	
Reverse Current	IR	VR=1200V, Tj=25°C	-	3.0	35	μA
		VR=1200V, Tj=175°C	-	20	200	
Total Capacitance	C	VR=0.1V, f=1MHz	-	670	-	pF
		VR=400V, f=1MHz	-	53	-	
		VR=800V, f=1MHz	-	43	-	
Total Capacitive Charge	Qc	VR =800V, T j=25°C	-	55	-	nC
Capacitance Stored Energy	Ec	VR=800V	-	14	-	μJ

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE			UNIT
		Min.	Typ.	Max.	
Thermal Resistance from Junction to Case	R θJC	-	0.72	-	°C/W

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES

TYPICAL PERFORMANCE (For Reference Only)

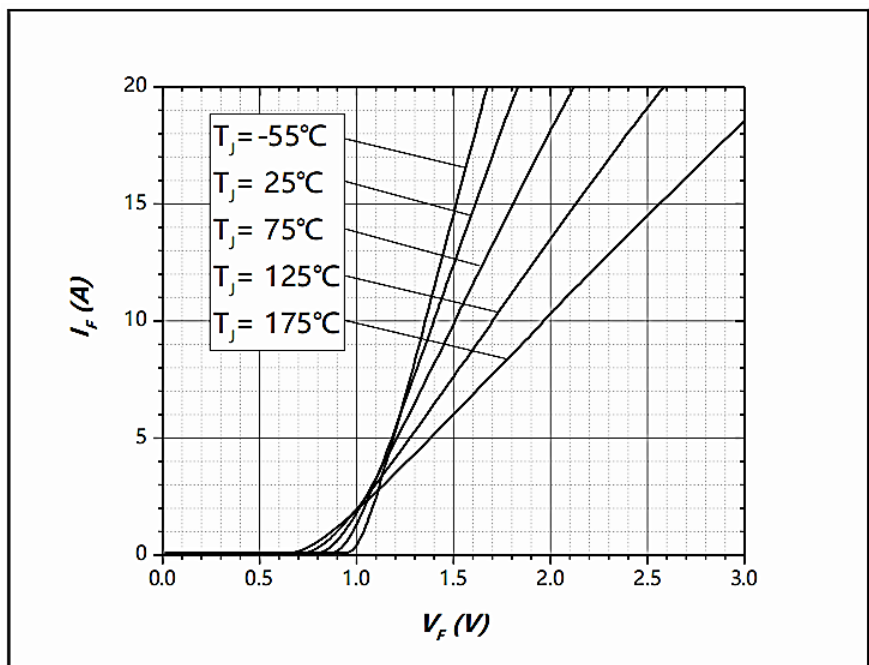


Figure 1. Forward Characteristics

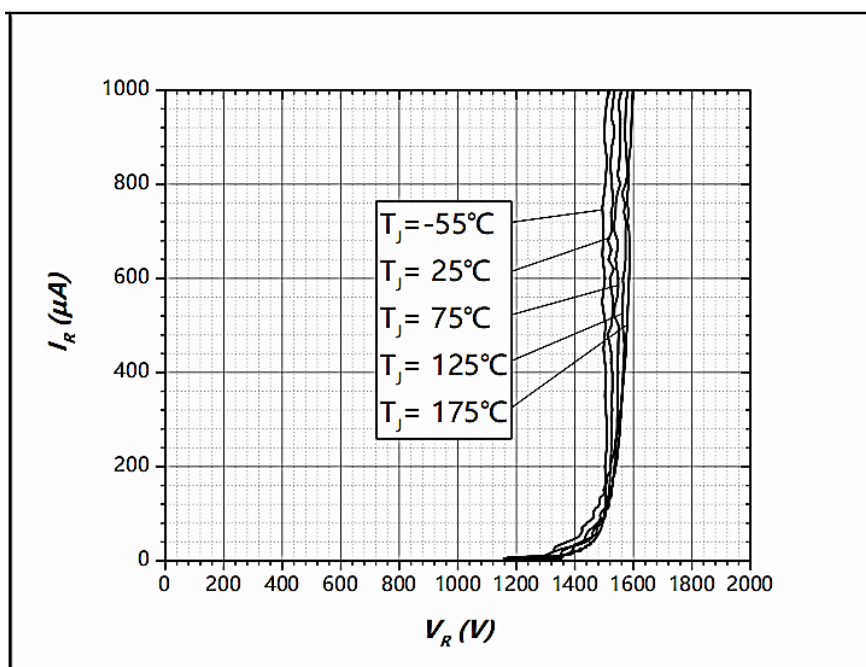


Figure 2. Reverse Characteristics

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES

TYPICAL PERFORMANCE (For Reference Only)

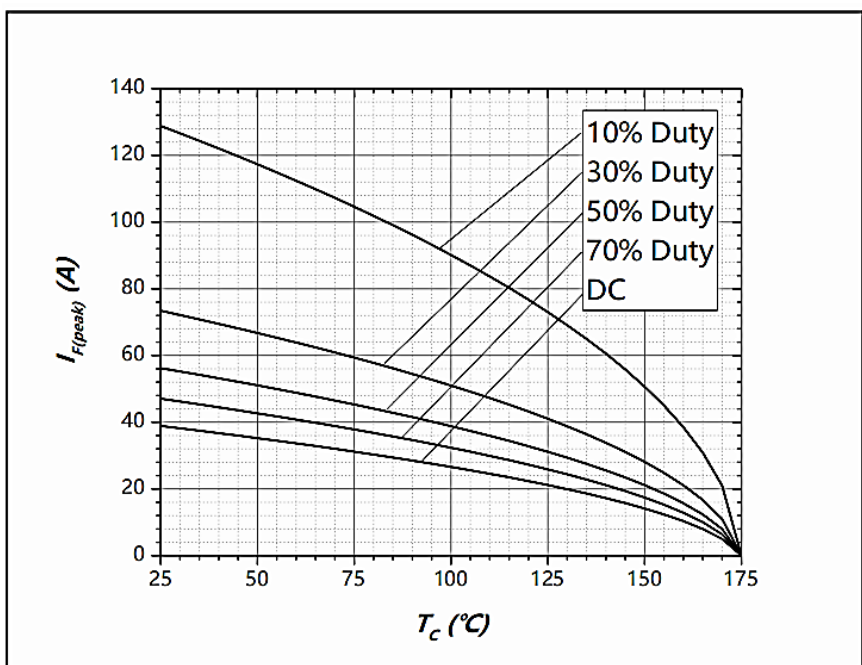


Figure 3. Current Derating

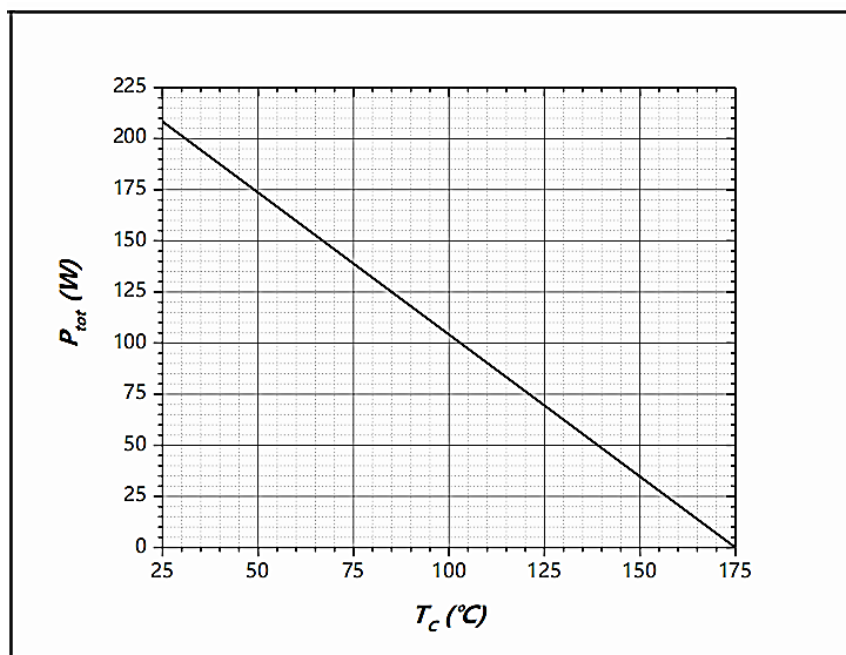


Figure 4. Power Derating

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES

TYPICAL PERFORMANCE (For Reference Only)

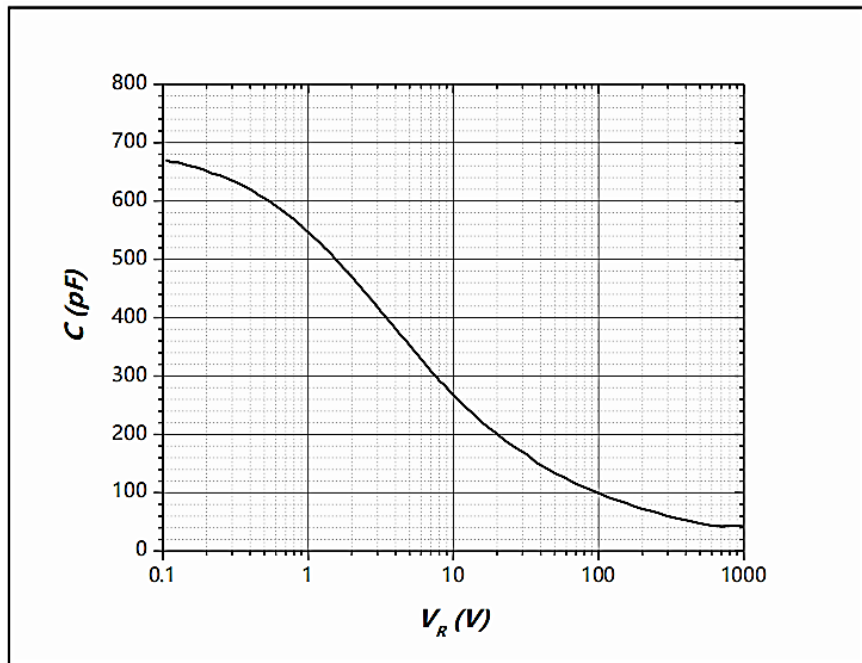


Figure 5. Capacitance vs. Reverse Voltage

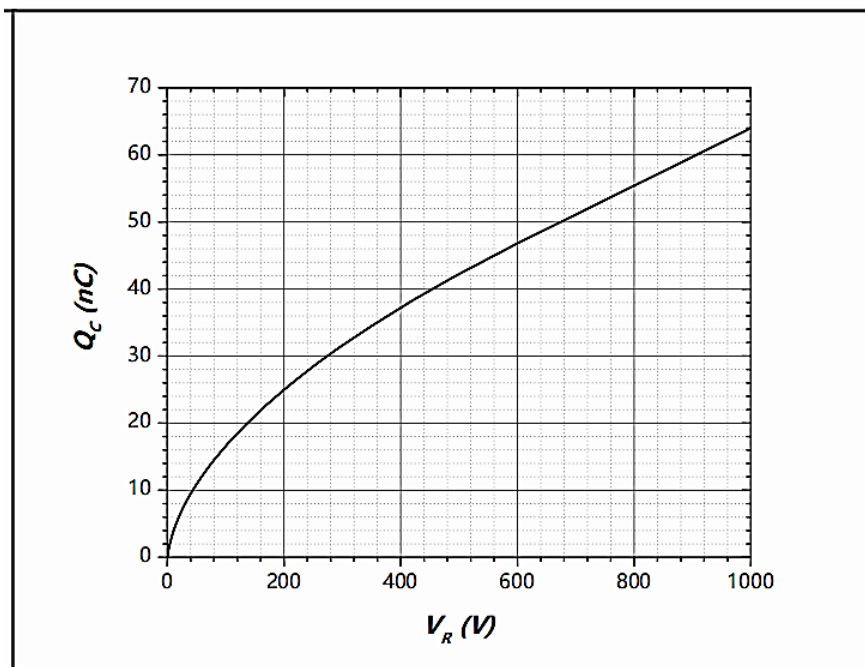


Figure 6. Total Capacitance Charge vs. Reverse Voltage

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES

TYPICAL PERFORMANCE (For Reference Only)

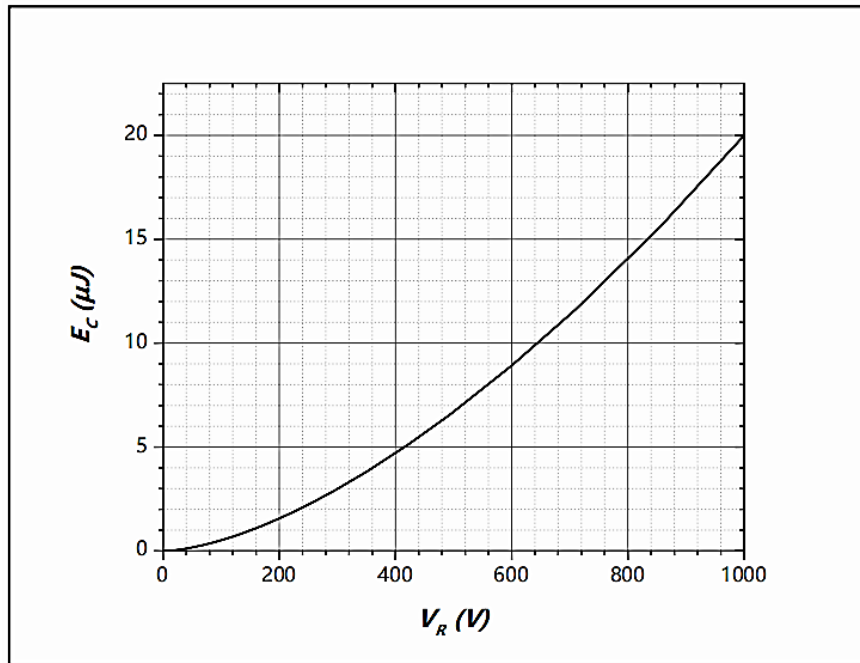


Figure 7. Capacitance Stored Energy

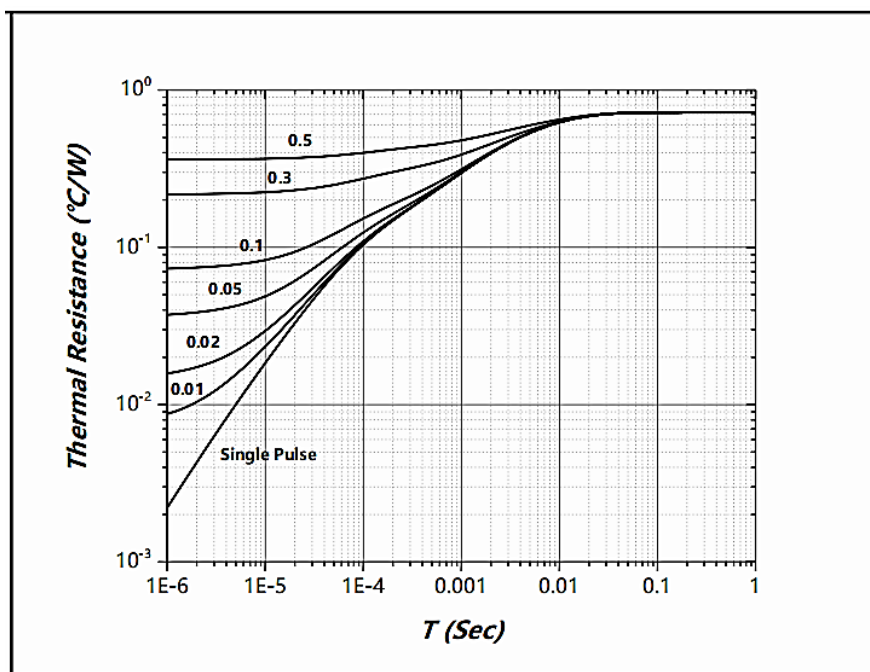


Figure 8. Transient Thermal Impedance

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2202L NC1D SERIES**ROHS COMPLIANCE**

- The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained from Download Center at www.nextgencomponent.com.

REACH COMPLIANCE

- REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained from Download Center at www.nextgencomponent.com.

IMPORTANT NOTES AND DISCLAIMER

- 1) All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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