NextGen Components,Inc.

PART CODE: NC1D120C30KTNG

SPECIFICATION SHEET

SPECIFICATION SHEET NO.	R0720- NC1D120C30KTNG	
DATE	July 20, 2024	
REVISION	A2	Updated With Most Recent
DESCRIPTION AND MAIN PARAMETRICS	Silicon Carbide (SiC) Enhanced Junction Barrier Schottky Diode (EJBS), TO-247-2L, NC1D Series, 2 Pins, Industrial Grade Repetitive Peak Reverse Voltage (V_{RRM}): 1200V, Continuous Forward Current (I_F) @Tc 152°C: 30A Operating Junction Temperature Range ($T_{j,Max}$): 175°C Package in Tube, 30pcs/Tube RoHS/RoHS III compliant and HF Free	
CUSTOMER		
CUSTOMER PART NO.		
CROSS REF. PART NO.		
ORIGINAL MFG/PART NO.	NovuSem/NC1D120C30KT	
PART CODE	NC1D120C30KTNG	

VENDOR APPROVE
Issued/Checked/Approved   
DATE: July 20, 2024

CUSTOMER APPROVE
DATE:

NextGen Components, Inc. sales@NextGenComponent.com www.NextGenComponent.com

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2472L 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 filed 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 (5μA) 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.

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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

CODE	NAME	KEY SPECIFICATION OPTION
NC1D	Product Series Code	NC1D: Novusem Silicon Carbide (SiC) Schottky Diode Gen 1 Industrial Grade series code NC1M: NovuSem Silicon Carbide (SiC) MOSFET 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
30	Continuous Forward Current (I_F)	10: 10A; 20: 20A; 30: 30A; 60: 60A; 120: 120A
K	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	Package Type Code	T: Tube; R: Tape & Reel
NG	Internal Control Code	Internal Control Code, letter or digits (A~Z, a~z or 1~9) for Special Parametric; Blank: N/A

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2472L NC1D SERIES

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

Case: TO-247-2L

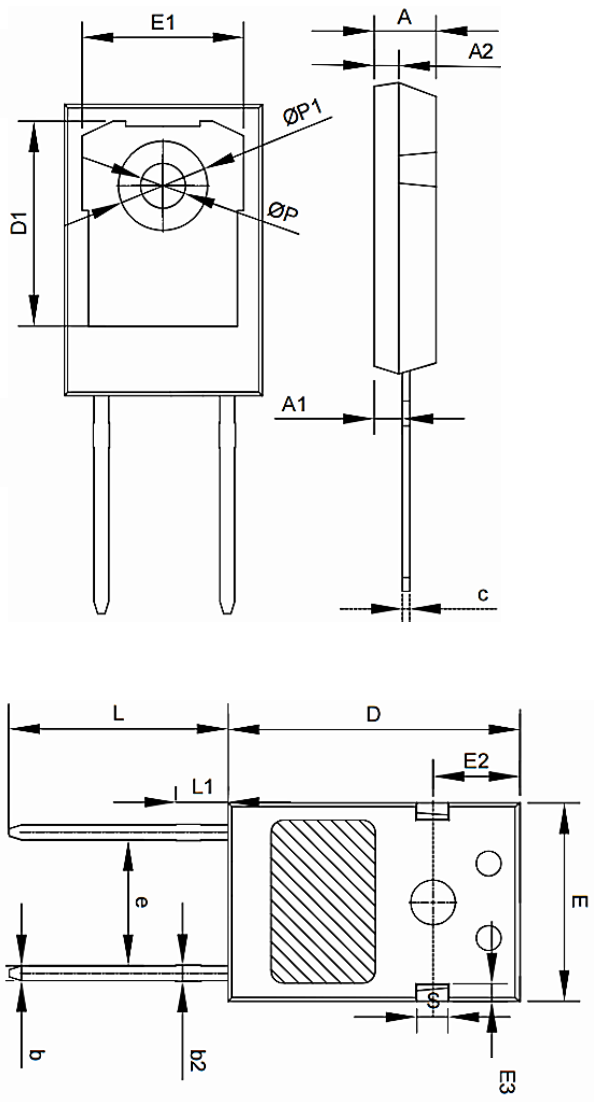
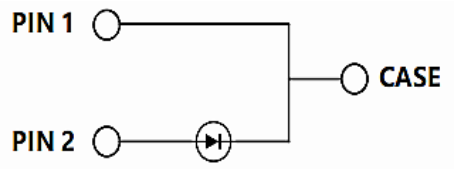


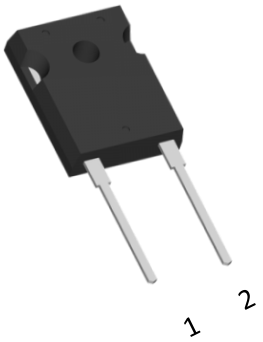
Table 1

SYMBOL	TO-247-2L		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
c	0.51	0.61	0.75
D	20.70	21.00	21.20
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.08	5.00	5.20
E3	2.30	2.50	2.70
e	10.88 Basic		
L	19.62	19.92	20.22
L1	-	-	4.30
S	6.15 Basic		
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2472L NC1D SERIES

INTERNAL CIRCUIT DIAGRAM





1200V SiC SCHOTTKY DIODE

V_{RRM}	I_F @ Tc = 152°C	$T_{j,\ Max.}$	PACKAGE/CASE
1200V	30A	175 °C	TO-247-2L

MAX. RATINGS @Tc=25 °C (unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Repetitive Peak Reverse Voltage	V_{RRM}		1200	V
DC Peak Reverse Voltage	V_R		1200	V
Continuous Forward Current	I_F	Tc=25°C	89	A
		Tc=135°C	42	
		Tc=152°C	30	
Repetitive Peak Forward Surge Current	I_{FRM}	Tc=25°C, tp=10ms, half sine wave, 0.1Hz	250	A
Non-Repetitive Forward Surge Current	I_{FSM}	Tc=25°C, tp=10ms, half sine wave	270	A
Power Dissipation	P_{tot}	Tc=25°C	405	W
		Tc=110°C	176	
i^2t Value	$\int i^2dt$	Tc=25°C, tp=10ms	362	A^2s
Operating Junction Tempe. Range	T_j		-55 ~ +175	°C
Storage Temperature Range	T_{stg}		-55 ~ +175	°C

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2472L NC1D SERIES

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX.	
Forward Voltage	V_F	I_F=20A, Tj=25°C	-	1.41	1.6	V
		I_F=20A, Tj=175°C	-	2.00	2.50	
Reverse Current	I_R	V_R=1200V, Tj=25°C	-	11	85	µA
		V_R=1200V, Tj=175°C	-	55	300	
Total Capacitance	C	V_R=0.1V, f=1MHz	-	2125	-	pF
		V_R=400V, f=1MHz	-	146	-	
		V_R=800V, f=1MHz	-	116	-	
Total Capacitive Charge	Qc	V_R =800V, T j=25°C	-	160	-	nC
Capacitance Stored Energy	Ec	V_R=800V	-	65	-	µJ

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE			UNIT
		MIN.	TYP.	MAX.	
Thermal Resistance from Junction to Case	R θJC	-	0.37	-	°C/W

SILICON CARBIDE (SiC) SCHOTTKY DIODE TO2472L NC1D SERIES

TYPICAL PERFORMANCE (For Reference Only)

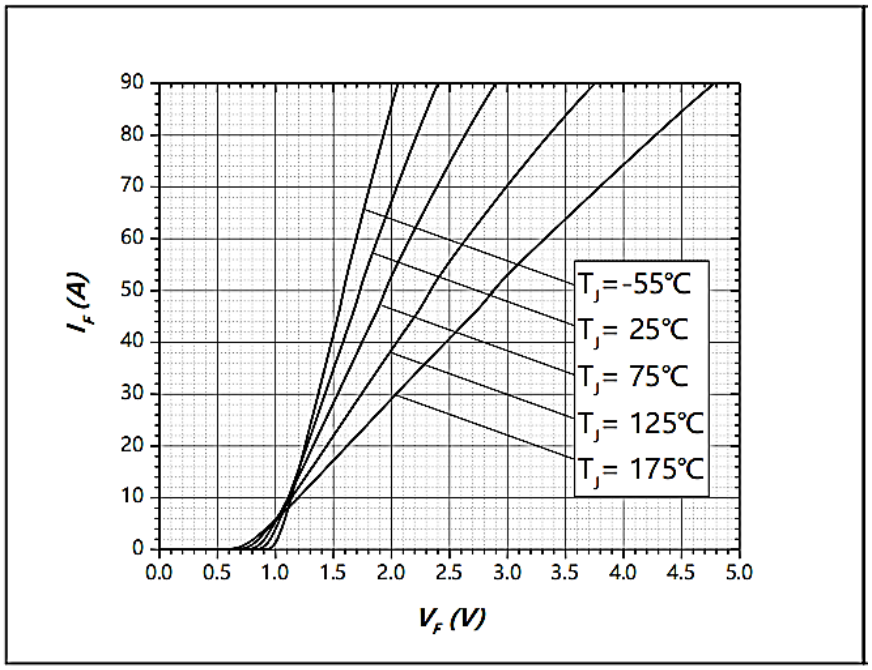


Figure 1. Forward Characteristics

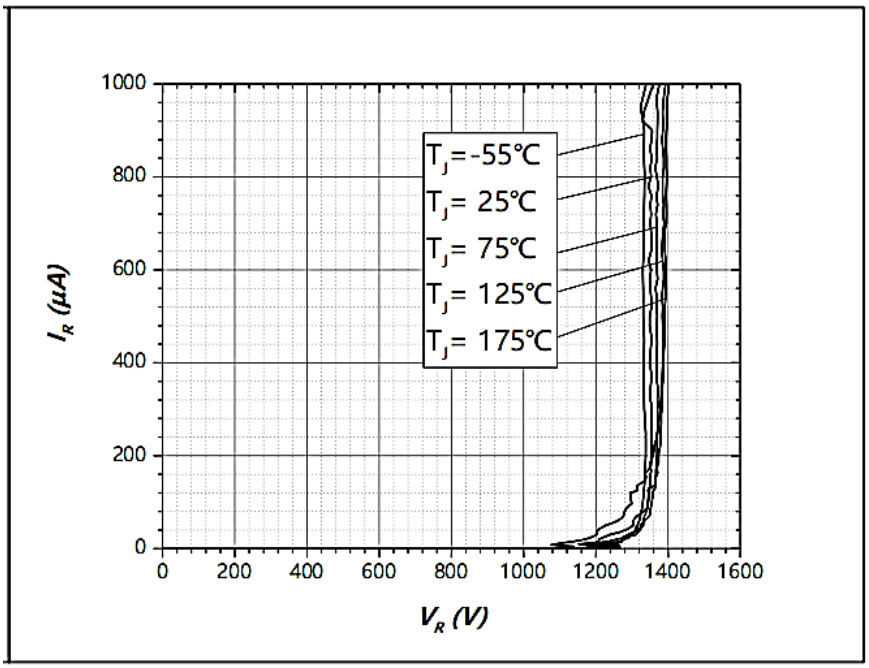


Figure 2. Reverse Characteristics

TYPICAL PERFORMANCE (For Reference Only)

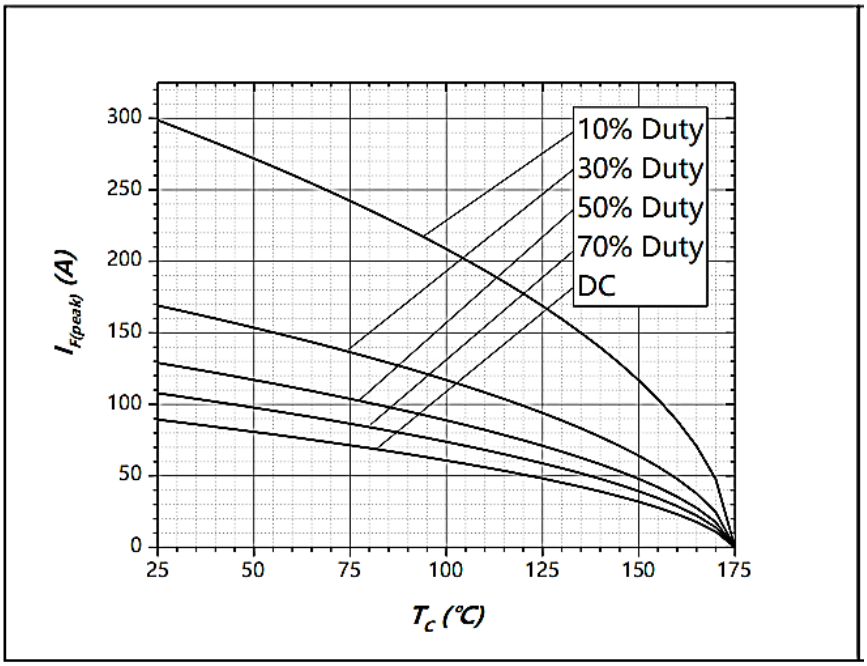


Figure 3. Current Derating

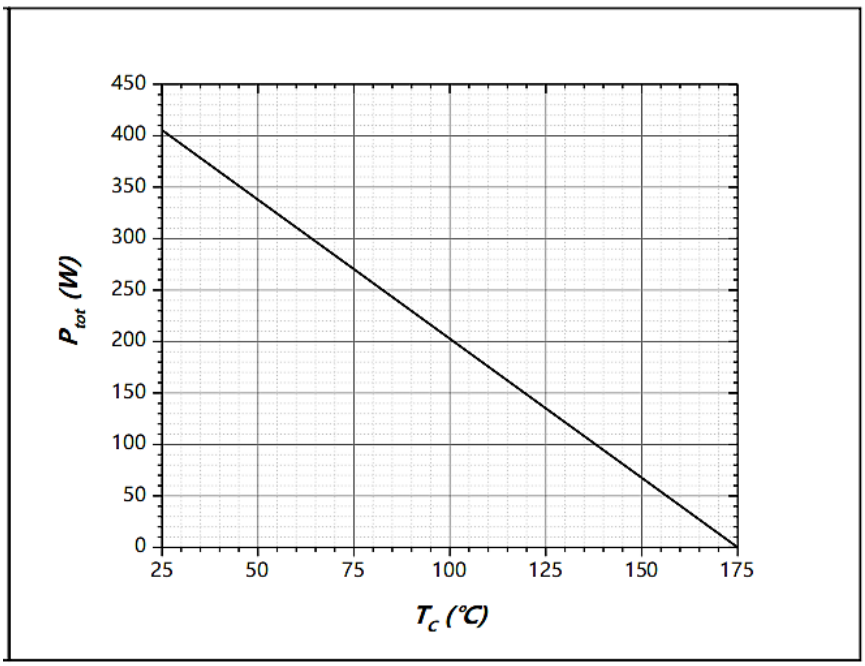


Figure 4. Power Derating

TYPICAL PERFORMANCE (For Reference Only)

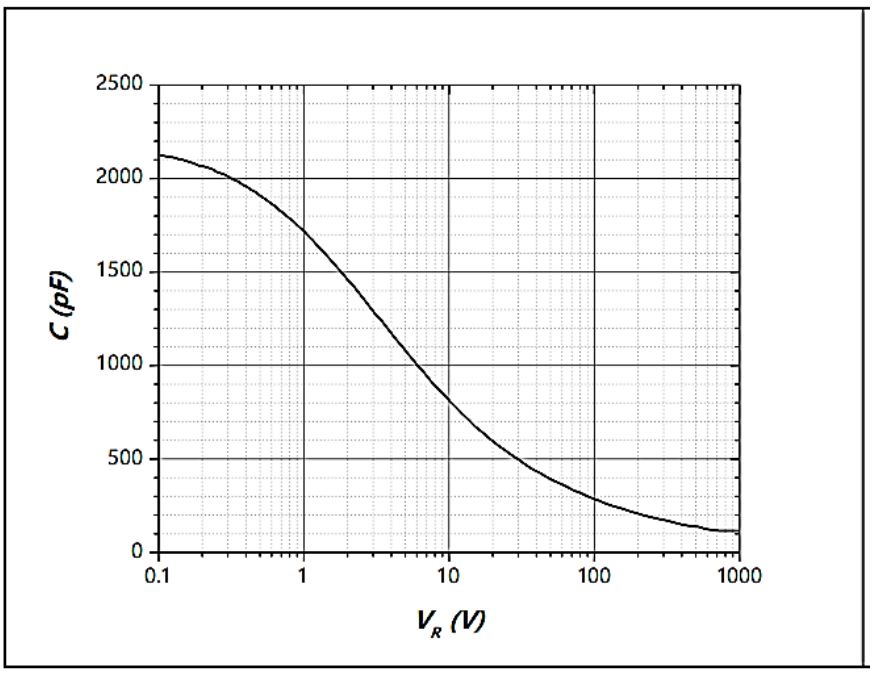


Figure 5. Capacitance vs. Reverse Voltage

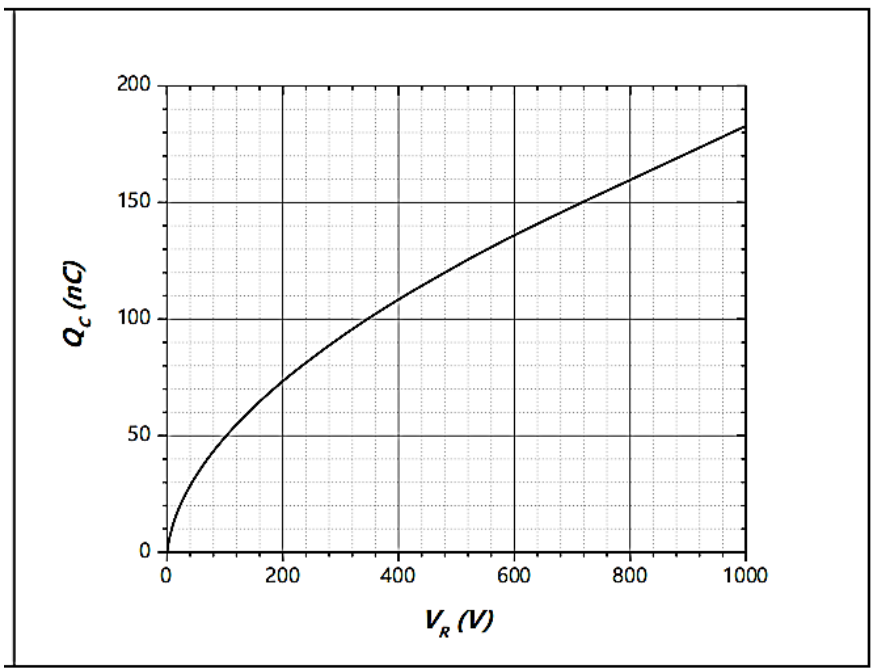


Figure 6. Total Capacitance Charge vs. Reverse Voltage

TYPICAL PERFORMANCE (For Reference Only)

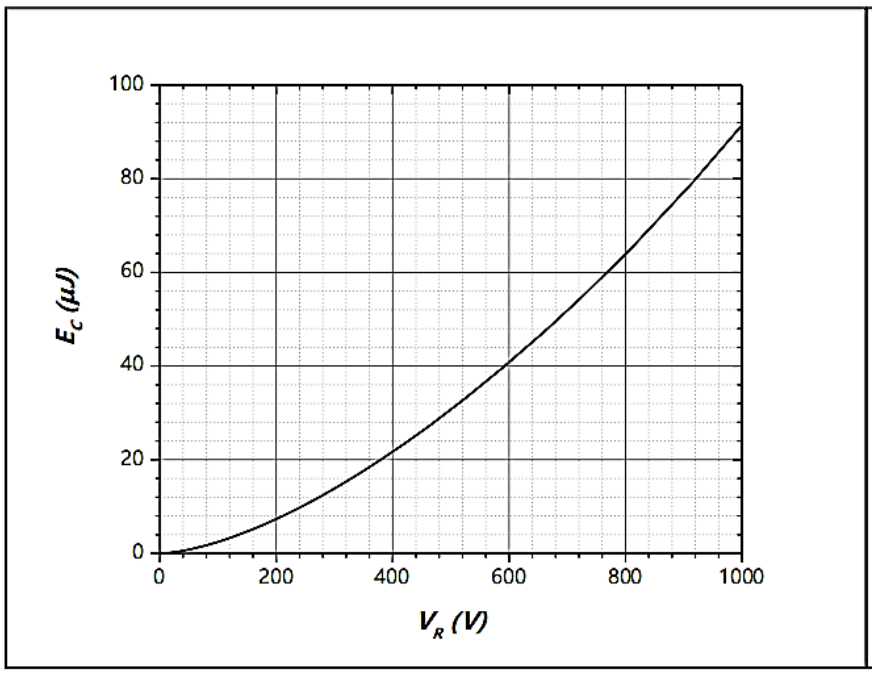


Figure 7. Capacitance Stored Energy

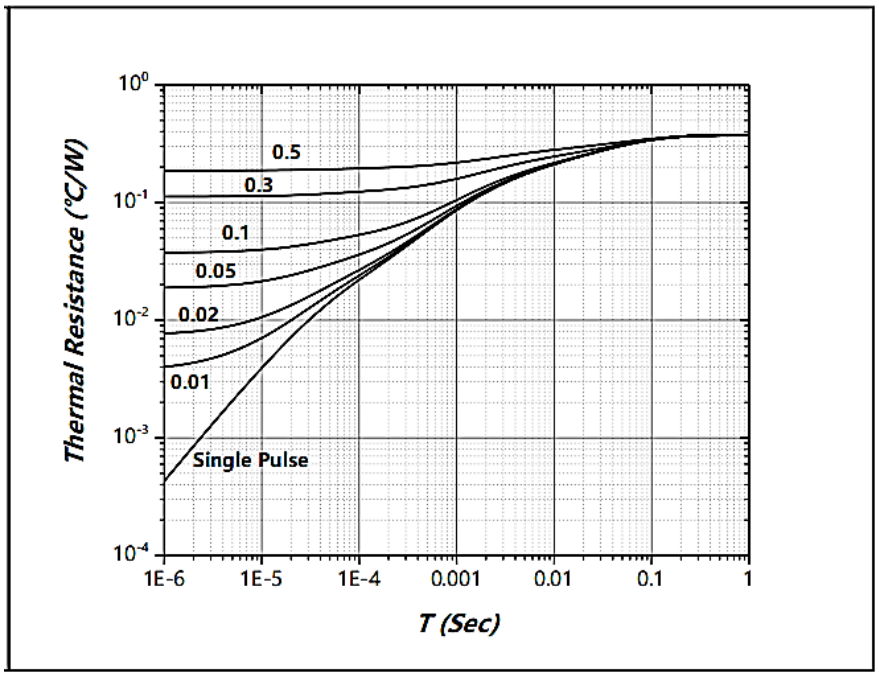


Figure 8. Transient Thermal Impedance

IMPORTANT NOTES AND DISCLAIMER

1. 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 can be obtained at Download Center.
2. 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 can be obtained at Download Center.
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