

ESD NOISE CLIPPING DIODE NNCD6.8RH

LOW CAPACITANCE TYPE ELECTROSTATIC DISCHARGE NOISE CLIPPING DIODE (QUARTO TYPE: COMMON ANODE) 5-PIN SUPER SMALL MINI MOLD

DESCRIPTION

The NNCD6.8RH is a low capacitance type diode developed for ESD (Electrostatic Discharge) absorption. Based on the IEC61000-4-2 test on electromagnetic interference (EMI), the diode assures an endurance of no less than 8 kV, and capacitance is small with 10 pF between the terminal.

This product series is the most suitable for ESD absorption in the high-speed data communication bus such as USB.

With four elements mounted in the 5-PIN super mini mold package, the product can cope with more high density assembling.

FEATURES

- Base on the electrostatic discharge immunity test (IEC 61000-4-2), the product assures the minimum endurance of 8 kV.
- Capacitance: 10 pF (at $V_R = 0$ V, $f = 1$ MHz) between the terminal
The low capacitance can realize the excellent frequency characteristic.
- With four elements in the mini mold package, the products can achieve high density and automatic packaging.

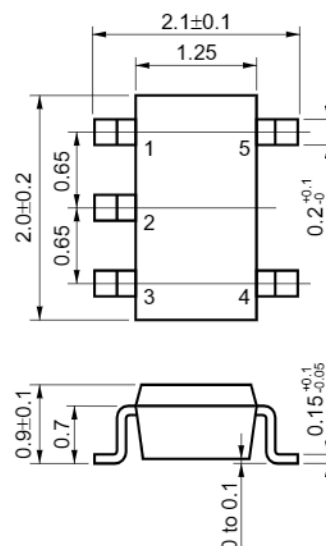
APPLICATIONS

- External interface circuit ESD absorption in the high-speed data communication bus such as USB.

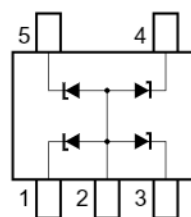
MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Item	Symbol	Rating	Unit	Remark
Power Dissipation	P	200	mW	Total
Surge Reverse Power	P_{RSM}	2 ($t = 10 \mu\text{s}$ 1 pulse)	W	
Junction Temperature	T_j	150	$^\circ\text{C}$	
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	

PACKAGE DIMENSION (Unit: mm)



ELECTRODE CONNECTION



1. K1: Cathode 1
2. A : Anode (common)
3. K2: Cathode 2
4. K3: Cathode 3
5. K4: Cathode 4

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

ELECTRICAL CHARACTERISTICS (T_A = 25°C (A to K1, A to K2, A to K3, A to K4))

TYPE No.	Breakdown Voltage ^{Note1} V _{BR} (V)			Capacitance C _t (pF)		Reverse Leakage I _R (μA)		Dynamic impedance ^{Note2} Z _z (Ω)		ESD Voltage ^{Note3} (kV)	
	MIN.	MAX.	I _T (mA)	TYP.	Condition	MAX.	V _R (V)	MAX.	I _T (mA)	MIN.	Condition
NNCD6.8RH	6.2	7.1	5	10	V _R = 0 V f = 1 MHz	2	3.5	40	5	8	C = 150 pF R = 330 Ω Contact discharge

Notes 1. tested with pulse (40 ms)

2. Z_z is measured at I_T given a small A.C. signal.

3. Biased upon with IEC 61000-4-2

TYPICAL CHARACTERISTICS (T_A = 25°C)

Figure 1. POWER DISSIPATION vs.
AMBIENT TEMPERATURE

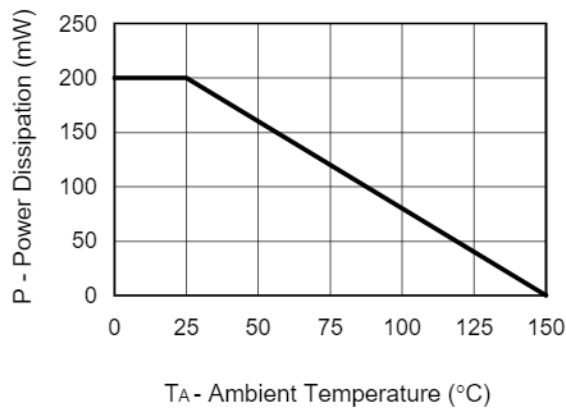


Figure 2. I_T - V_{BR} CHARACTERISTICS
(A-K1, A-K2, A-K3, A-K4)

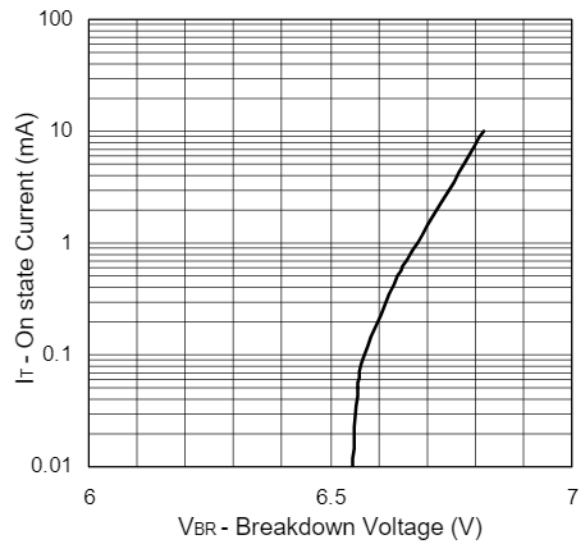


Figure 3. Z_z - I_T

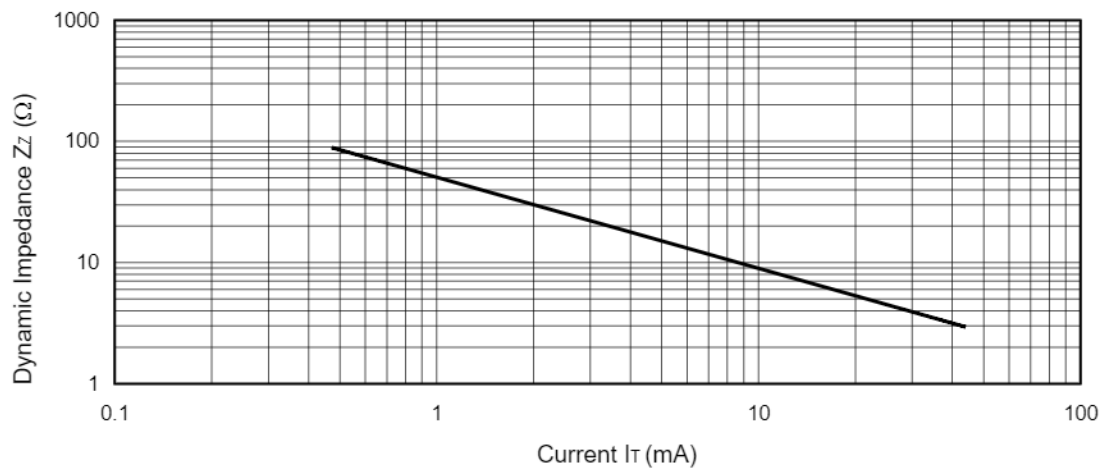


Figure 4. C_t - V_R CHARACTERISTICS

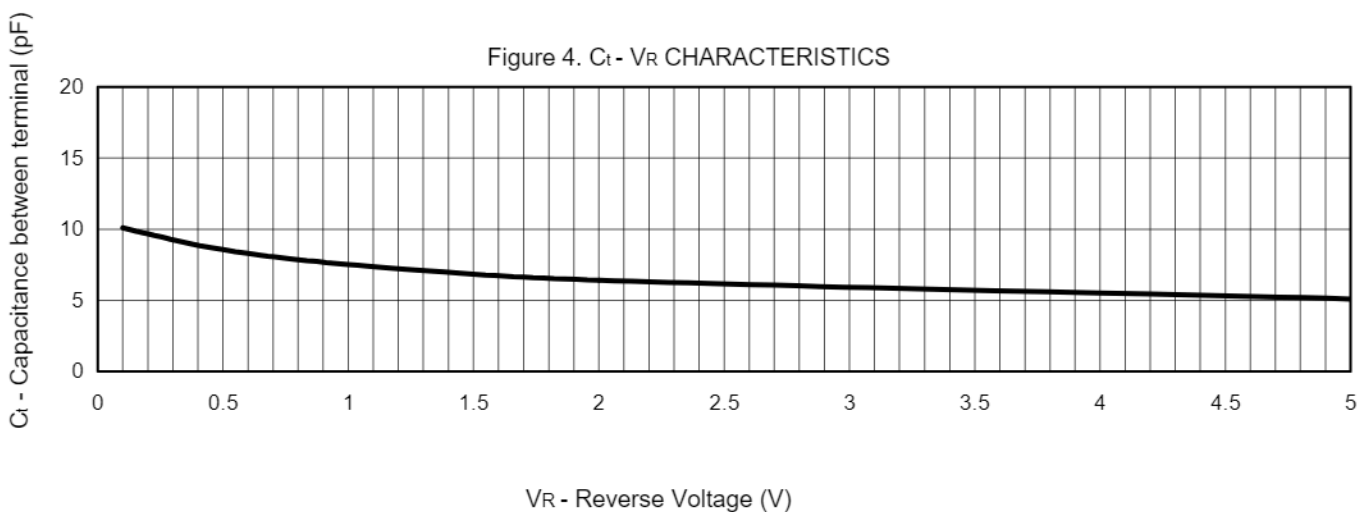
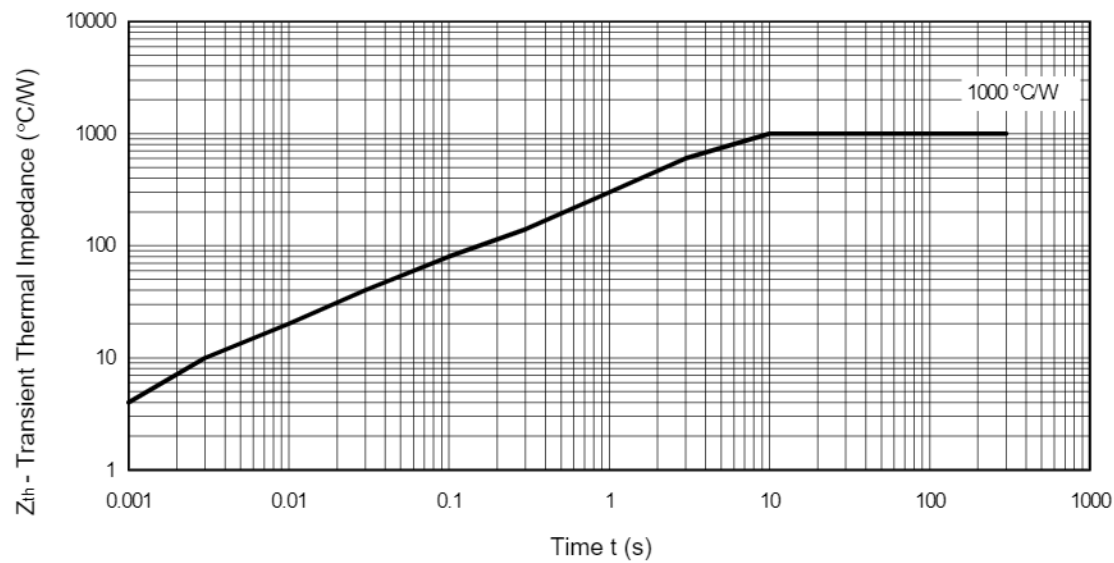
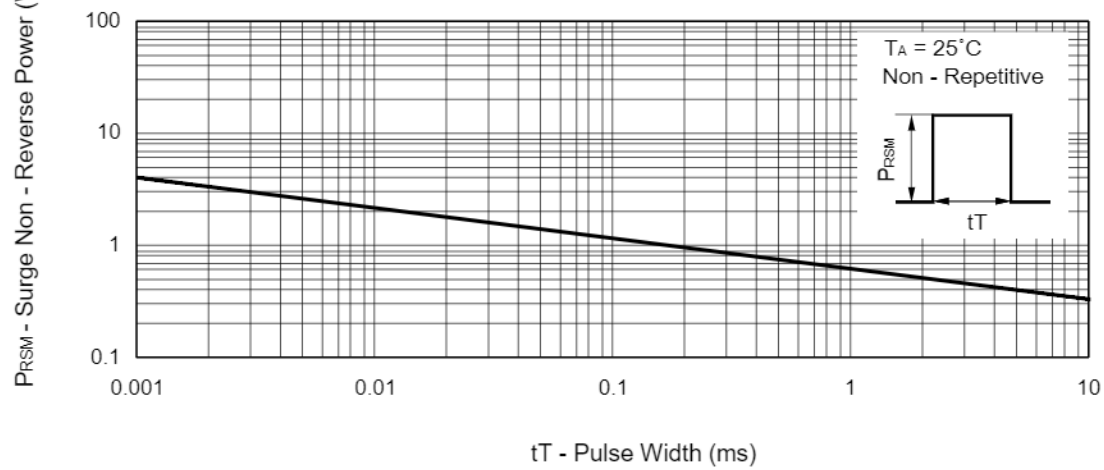


Figure 5. TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS



★

Figure 6. SURGE REVERSE POWER RATINGS



[MEMO]

- **The information in this document is current as of September, 2002. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC's data sheets or data books, etc., for the most up-to-date specifications of NEC semiconductor products. Not all products and/or types are available in every country. Please check with an NEC sales representative for availability and additional information.**
- No part of this document may be copied or reproduced in any form or by any means without prior written consent of NEC. NEC assumes no responsibility for any errors that may appear in this document.
- NEC does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC semiconductor products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of customer's equipment shall be done under the full responsibility of customer. NEC assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC endeavours to enhance the quality, reliability and safety of NEC semiconductor products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC semiconductor products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment, and anti-failure features.
- NEC semiconductor products are classified into the following three quality grades:
 "Standard", "Special" and "Specific". The "Specific" quality grade applies only to semiconductor products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of a semiconductor product depend on its quality grade, as indicated below. Customers must check the quality grade of each semiconductor product before using it in a particular application.
 "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots
 "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
 "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.
 The quality grade of NEC semiconductor products is "Standard" unless otherwise expressly specified in NEC's data sheets or data books, etc. If customers wish to use NEC semiconductor products in applications not intended by NEC, they must contact an NEC sales representative in advance to determine NEC's willingness to support a given application.
 (Note)
 (1) "NEC" as used in this statement means NEC Corporation and also includes its majority-owned subsidiaries.
 (2) "NEC semiconductor products" means any semiconductor product developed or manufactured by or for NEC (as defined above).