

# ESD NOISE CLIPPING DIODES NNCD5.6LG to NNCD6.8LG

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

This product series is a low capacitance type diode developed for ESD (Electrostatic Discharge) absorption. Based on the IEC1000-4-2 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 the ESD absorption in the high-speed data communication bus such as USB.

With four elements mounted in the 5Pin Mini Mold Package, that product can cope with high density assembling.

### FEATURES

- Based on the electrostatic discharge immunity test (IEC1000-4-2), the product assures the minimum endurance of 8 kV.
- Capacitance is small with 10 pF (at  $V_R = 0$  V,  $f = 1$  MHz) between the terminal. It is excellent in the frequency characteristic.
- With 4 elements mounted (common anode) in the 5-pin mini mold package, that product can cope with high density assembling.

### APPLICATIONS

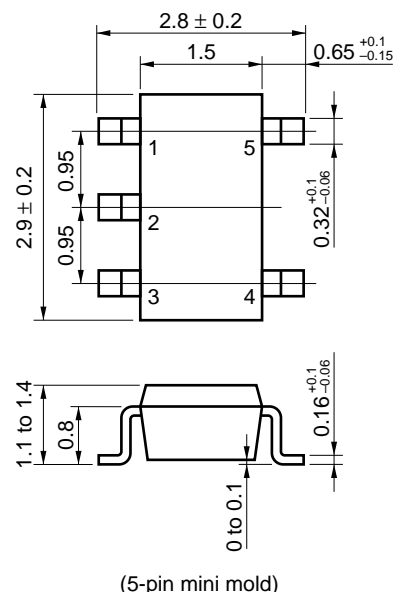
- External interface circuit ESD absorption in the high-speed data communication bus such as USB.

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

|                      |           |                                      |         |
|----------------------|-----------|--------------------------------------|---------|
| Power Dissipation    | P         | 200 mW                               | (Total) |
| Surge Reverse Power  | $P_{RSM}$ | 2W ( $t = 10 \mu\text{s}$ , 1 pulse) | Fig.5   |
| Junction Temperature | $T_j$     | 150°C                                |         |
| Storage Temperature  | $T_{stg}$ | -55°C to +150°C                      |         |

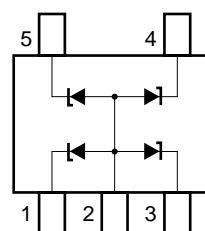
### PACKAGE DIMENSIONS

(in millimeters)



(5-pin mini mold)

### PIN CONNECTION



- 1: K1 Cathode 1
- 2: A Anode (Common)
- 3: K2 Cathode 2
- 4: K3 Cathode3
- 5: K4 Cathode4

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C) (A-K1, A-K2, A-K3, A-K4)**

| Type No   | Breakdown Voltage <sup>Note 1</sup><br>V <sub>BR</sub> (V) |      |                     | Dynamic <sup>Note 2</sup><br>Impedance<br>Z <sub>z</sub> (Ω) |                     | Reverse<br>Leakage<br>I <sub>R</sub> (μA) |                    | Capacitance<br>C <sub>t</sub> (pF) |                                   | ESD Voltage <sup>Note 3</sup><br>(kV) |                                                 |
|-----------|------------------------------------------------------------|------|---------------------|--------------------------------------------------------------|---------------------|-------------------------------------------|--------------------|------------------------------------|-----------------------------------|---------------------------------------|-------------------------------------------------|
|           | MIN.                                                       | MAX. | I <sub>T</sub> (mA) | MAX.                                                         | I <sub>T</sub> (mA) | MAX.                                      | V <sub>R</sub> (V) | TYP.                               | Test Condition                    | MIN.                                  | Test Condition                                  |
| NNCD5.6LG | 5.3                                                        | 6.3  | 5                   | 80                                                           | 5                   | 5                                         | 2.5                | 10                                 | V <sub>R</sub> = 0 V<br>f = 1 MHz | 8                                     | C = 150 pF<br>R = 330 Ω<br>Contact<br>discharge |
| NNCD6.2LG | 5.7                                                        | 6.7  | 5                   | 50                                                           | 5                   | 2                                         | 3.0                | 8                                  |                                   | 8                                     |                                                 |
| NNCD6.8LG | 6.2                                                        | 7.1  | 5                   | 30                                                           | 5                   | 2                                         | 3.5                | 7                                  |                                   | 8                                     |                                                 |

- Notes**
1. Tested with pulse (40 ms)
  2. Z<sub>z</sub> is measured at I<sub>T</sub> given a small A.C. signal.
  3. ESD voltage is measured based on the IEC1000-4-2 test on electromagnetic interference (EMI).

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

Figure 1. P - T<sub>A</sub> RATING

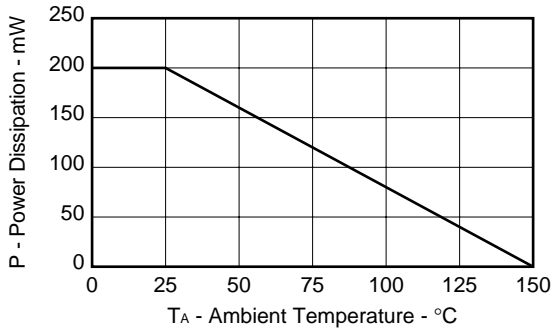


Figure 2. I<sub>T</sub> - V<sub>BR</sub> CHARACTERISTICS  
(A - K1, A - K2, A - K3, A - K4)

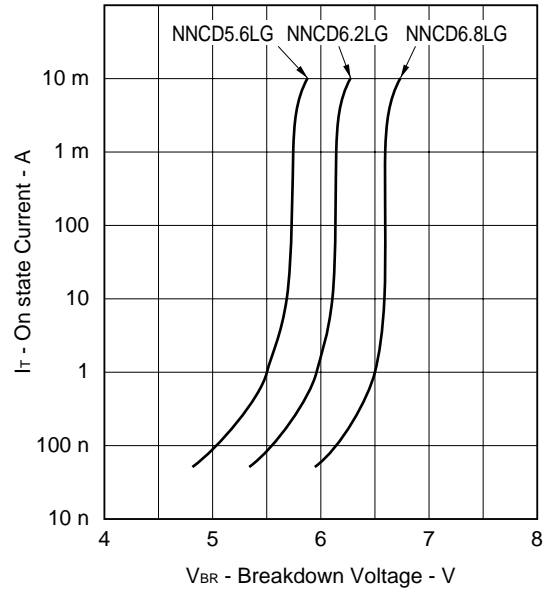


Figure 3. C<sub>t</sub> - V<sub>R</sub> CHARACTERISTICS

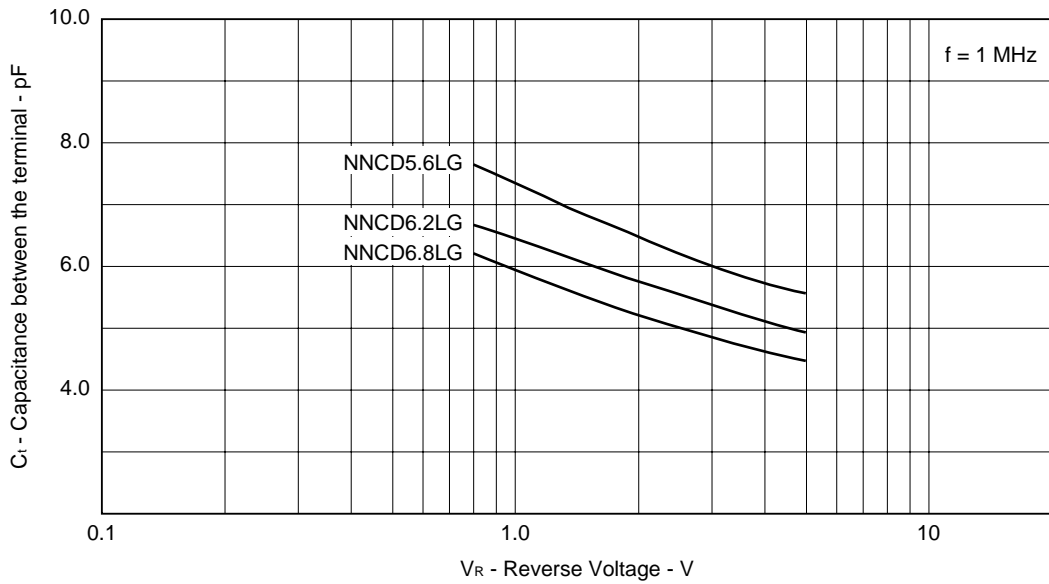


Figure 4. TRANSIENT THERMAL IMPEDANCE

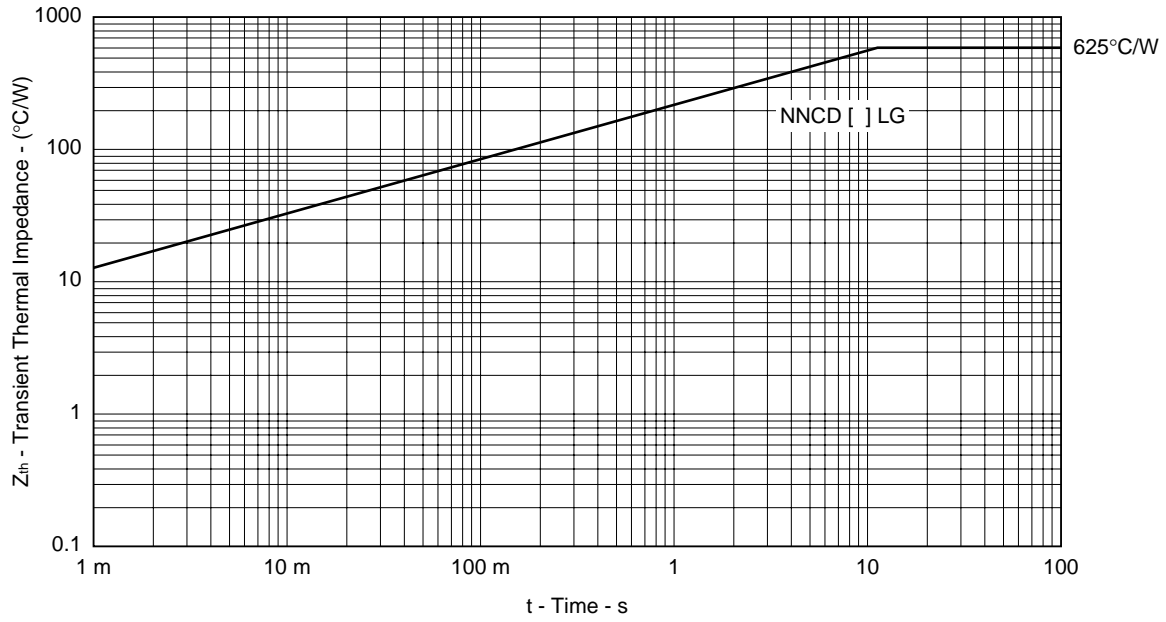
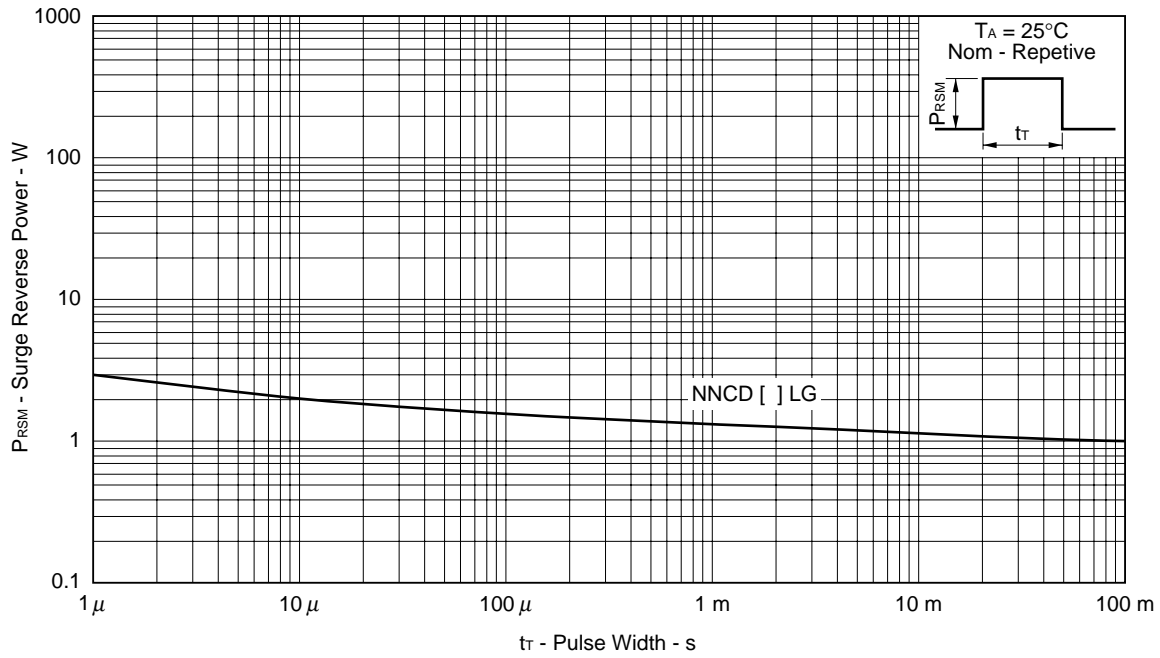


Figure 5. SURGE REVERSE POWER RATING



**REFERENCE**

| Document                                                    | Document No. |
|-------------------------------------------------------------|--------------|
| NEC semiconductor device reliability/quality control system | C11745E      |
| NEC semiconductor device reliability/quality control system | MEI - 1201   |
| Quality grade on NEC semiconductor device                   | C11531E      |
| Semiconductor device mounting technology manual             | C10535E      |

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Anti-radioactive design is not implemented in this product.



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