

CHIP NOISE FILTER NFZ2MSD□□□SZ10L REFERENCE SPECIFICATION
Murata Standard Specification [AEC-Q200]

1. Scope

This reference specification applies to NFZ2MSD_SZ10L, Chip Noise Filter for Automotive Electronic based on AEC-Q200. (except for Power train and Safety)

2. Part Numbering

| | | | | | | | | | | |
|------|------------|-----------|-----------------|-----------------|-----------------------------|-------------|----------|------------------------|-----------------------|---------------|
| (ex) | NF | Z | 2M | SD | 101 | S | Z | 1 | 0 | L |
| | Product ID | Structure | Dimension (L×W) | Characteristics | Typical Impedance at 100MHz | Performance | Category | Numbers Of Circuit (T) | Special Specification | Packaging |
| | | | | | | | | | | L: Φ180Taping |

3. Rating

- Operating Temperature Range
 (Ambient temperature; Self-temperature rise is not included) -40 to +85°C
 (Product temperature; Self-temperature rise is included) -40 to +125°C
- Storage Temperature Range. -40 to +85°C
- Withstand voltage 20V

| Customer Part Number | Murata Part Number | Impedance at 10MHz | | Impedance at 100MHz | DC Resistance Max | *1 Rated Current | ESD Rank 1A:0.5kV |
|----------------------|--------------------|--------------------|-----------|---------------------|-------------------|------------------|----------------------|
| | | (Ω) | Tolerance | Typ (Ω) | (mΩ) | (A) | |
| | NFZ2MSD101SZ10L | 9 | ±30% | 100 | 18 | 5.2 | 1 A |
| | NFZ2MSD181SZ10L | 15 | | 180 | 22 | 4.0 | 1 A |
| | NFZ2MSD301SZ10L | 21 | | 300 | 26 | 3.8 | 1 A |
| | NFZ2MSD501SZ10L | 29 | | 500 | 32 | 3.2 | 1 A |
| | NFZ2MSD102SZ10L | 46 | | 1000 | 46 | 2.5 | 1 A |

*1: When applied Rated current to the Products, self temperature rise shall be limited to 40°C max.

4. Testing Conditions (Standard atmospheric conditions)

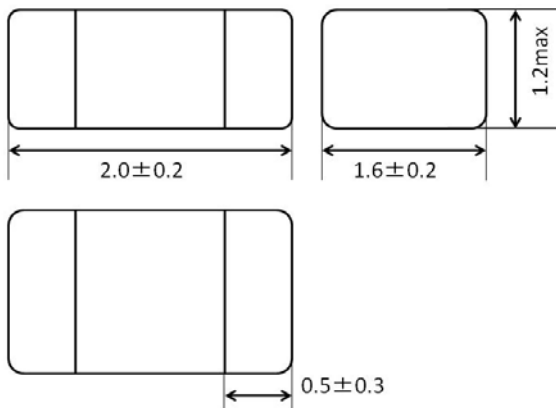
<Unless otherwise specified>

Temperature : Ordinary Temperature (15 to 35°C)
 Humidity : Ordinary Humidity (25 to 85 %(RH))

<In case of doubt>

Temperature : 20 ± 2°C
 Humidity : 60 to 70 %(RH)
 Atmospheric Pressure : 86 to 106 kPa

5. Appearance and Dimensions



✕no marking

(in mm)

■ Unit Mass (Typical value) 0.0188g

6. Electrical Performance

| No. | No. | Item | Specification |
|-----|---------------|--------------|--|
| 6.1 | Impedance | Meet item 3. | Measuring Equipment: KEYSIGHT 4287A or equivalent (0.5V) |
| 6.2 | DC Resistance | | Measuring Frequency: 10MHz Measuring Equipment: Digital multi meter |

7. Q200 Requirement

AEC-Q200 Rev.D issued June 1. 2010

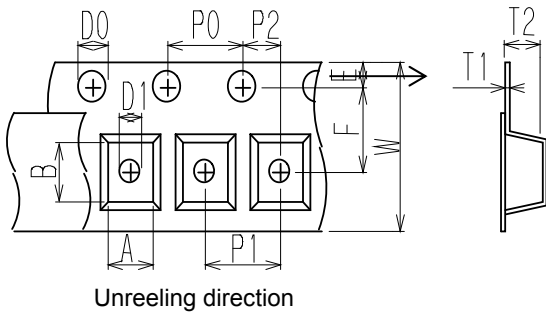
| AEC-Q200 | | | Murata Specification / Deviation | | | | |
|-----------------------------|-------------------------------|--|---|------------|-----------|-----------------------------|-------------|
| No. | Stress | Test Method | | | | | |
| 3 | High Temperature Exposure | 1000hours at 125 deg C Set for 24hours at room temperature, then measured. | Meet Table A after testing. <u>Table A</u> <table border="1" style="margin-left: 20px;"> <tr> <td>Appearance</td> <td>No damage</td> </tr> <tr> <td>Impedance Change (at 10MHz)</td> <td>Within ±30%</td> </tr> </table> | Appearance | No damage | Impedance Change (at 10MHz) | Within ±30% |
| Appearance | No damage | | | | | | |
| Impedance Change (at 10MHz) | Within ±30% | | | | | | |
| 4 | Temperature Cycling | 1000cycles -40 deg C to +125 deg C Set for 24hours at room temperature, then measured. | | | | | |
| 5 | Destructive Physical Analysis | Per EIA469 No electrical tests | Not Applicable | | | | |
| 7 | Biased Humidity | 1000hours at 85 deg C, 85%RH | Meet Table A after testing. | | | | |

Reference Only

| AEC-Q200 | | | Murata Specification / Deviation |
|----------|---------------------------------|---|--|
| No. | Stress | Test Method | |
| 8 | Operational Life | Apply 125 deg C 1000hours Set for 24hours at room temperature, then measured | Meet Table A after testing. The operating temperature should be 85 deg C. |
| 9 | External Visual | Visual inspection | No abnormalities |
| 10 | Physical Dimension | Meet ITEM 5 (Appearance and Dimensions) | No defects |
| 12 | Resistance to Solvents | Per MIL-STD-202 Method 215 | Not Applicable |
| 13 | Mechanical Shock | Per MIL-STD-202 Method 213 Condition C 100g's(0.98N)/6ms/Half sine | Meet Table A after testing. |
| 14 | Vibration | 5g's(0.049N) for 20 minutes, 12cycles each of 3 orientations Test from 10-2000Hz. | |
| 15 | Resistance to Soldering Heat | Solder temperature 250+5/-5 deg C Immersion time 30±5s | Pre-heating: above 183 deg C, 90 to120s Meet Table A after testing. |
| 17 | ESD | Per AEC-Q200-002 | Meet Table A after testing. ESD Rank: Meet Item 3 (Rating) |
| 18 | Solderability | Per J-STD-002 | Method b : Not Applicable 90% of the terminations is to be soldered. |
| 19 | Electrical Characterization | Measured : Impedance | No defects |
| 20 | Flammability | Per UL-94 | Not Applicable |
| 21 | Board Flex | Epoxy-PCB(1.6mm) Deflection 2mm(min) 60s minimum holding time | Meet Table A after testing. |
| 22 | Terminal Strength | Per AEC-Q200-006 | No defects |
| 30 | Electrical Transient Conduction | Per ISO-7637-2 | Not Applicable |

8. Specification of Packaging

8.1 Appearance and Dimensions of plastic tape



| | | | |
|----|---|----|------------|
| A | 1.85 ±0.1 | P0 | 4.0 ±0.1 |
| B | 2.25 ±0.1 | P1 | 4.0 ±0.1 |
| D0 | $\phi 1.5 \begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$ | P2 | 2.0 ±0.05 |
| D1 | $\phi 1.0 \begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$ | T1 | 0.25 ±0.05 |
| E | 1.75 ±0.1 | T2 | 1.3 ±0.1 |
| F | 3.5 ±0.05 | W | 8.0 ±0.2 |

(in mm)

8.2 Specification of Taping

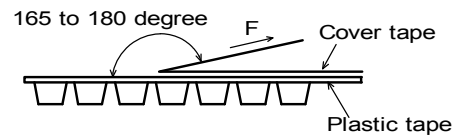
- (1) Packing quantity (standard quantity)
3,000 pcs / reel
- (2) Packing Method
Products shall be packed in the each embossed cavity of plastic tape and sealed by cover tape.
- (3) Sprocket hole
The sprocket holes are to the right as the tape is pulled toward the user.
- (4) Spliced point
Plastic tape and Cover tape has no spliced point.
- (5) Missing components number
Missing components number within 0.1 % of the number per reel or 1 pc., whichever is greater, and are not continuous. The specified quantity per reel is kept.

8.3 Pull Strength

| | |
|-----------------------|-----------|
| Embossed carrier tape | 9.8N min. |
| Cover tape | 5N min. |

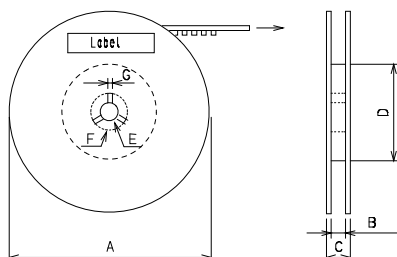
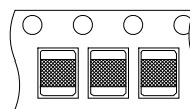
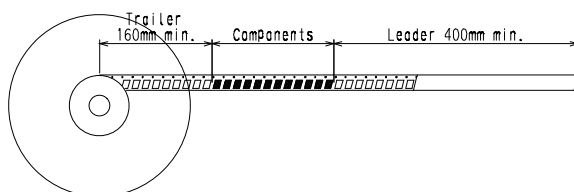
8.4 Peeling off force of cover tape

| | |
|----------------------|---|
| Speed of Peeling off | 300mm/min |
| Peeling off force | 0.1 to 0.7N (minimum value is typical) |



8.5 Dimensions of Leader-tape, Trailer and Reel

There shall be leader-tape(cover tape) and trailer-tape (empty tape) as follows.



| | |
|---|---|
| A | $\phi 180 \begin{smallmatrix} +0 \\ -3 \end{smallmatrix}$ |
| B | 9 ±0.3 |
| C | 11.4 ±1 |
| D | $\phi 60 \pm 1$ |
| E | $\phi 13 \pm 0.2$ |
| F | $\phi 21 \pm 0.8$ |
| G | 2.0 ±0.5 |

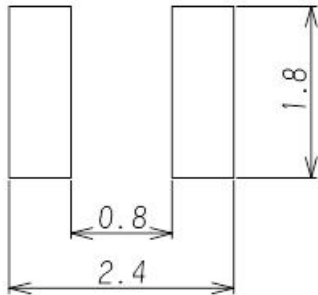
(in mm)

10.1 Land pattern designing (Reflow Soldering)

Recommended land pattern for reflow soldering is as follows:

It has been designed for Electric characteristics and solderability.

Please follow the recommended patterns. Otherwise, their performance which includes electrical performance or solderability may be affected, or result to "position shift" in soldering process.



(in mm)

10.2 Flux, Solder

| | |
|--------|--|
| Flux | <ul style="list-style-type: none"> • Use rosin-based flux. • Don't use highly acidic flux with halide content exceeding 0.2(wt)% (chlorine conversion value). • Don't use water-soluble flux. |
| Solder | <ul style="list-style-type: none"> • Use Sn-3.0Ag-0.5Cu solder • Standard thickness of solder paste : 100μm to 150μm |

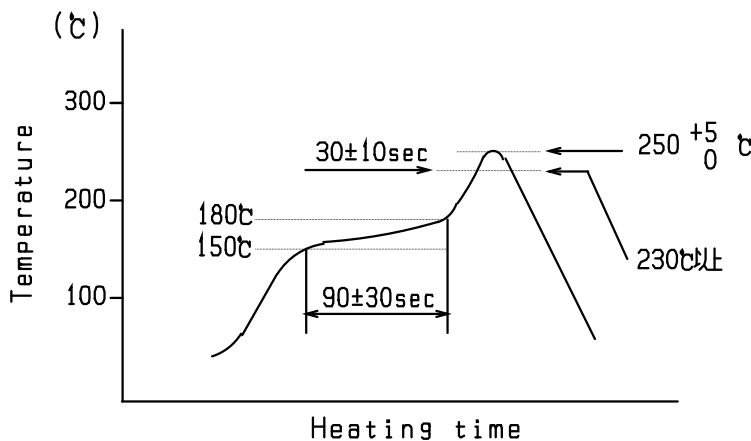
Other flux (except (above) Please contact us for details, then use.

10.3 soldering conditions (Reflow)

- Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 100°C max. Cooling into solvent after soldering also should be in such a way that the temperature difference is limited to 100°C max.

Insufficient pre-heating may cause cracks on the product, resulting in the deterioration of product quality.

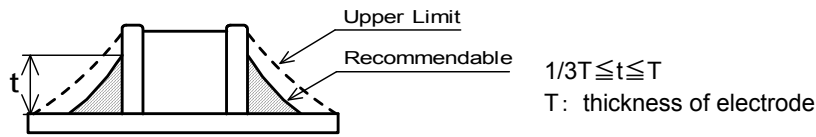
- Standard soldering profile profile is as follows.



| Standard Profile | |
|------------------|---------------------|
| Pre-heating | 150°C~180°C、90s±30s |
| Heating | above 230°C、20s~40s |
| Peak temperature | 250°C+5/-0°C |
| Cycle of reflow | 2 times |

10.4 Solder Volume

- Solder shall be used not to be exceeded the upper limits as shown below.
- Accordingly increasing the solder volume, the mechanical stress to Chip is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance.

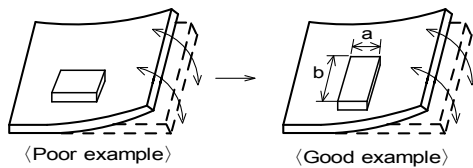


10.5 Product's location

The following shall be considered when designing and laying out P.C.B.'s.

- (1) P.C.B. shall be designed so that products are not subject to the mechanical stress due to warping the board.

[Products direction]



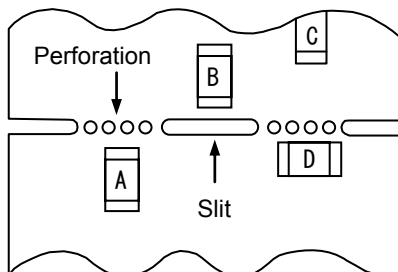
Products shall be located in the sideways direction to the mechanical stress.

- (2) Components location on P.C.B. separation.

It is effective to implement the following measures, to reduce stress in separating the board.

It is best to implement all of the following three measures; however, implement as many measures as possible to reduce stress.

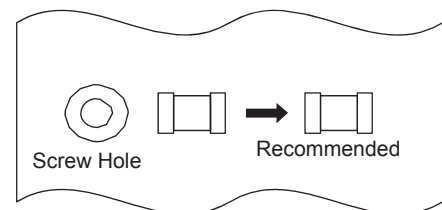
| Contents of Measures | Stress Level |
|--|--------------|
| (1) Turn the mounting direction of the component parallel to the board separation surface. | $A > D *1$ |
| (2) Add slits in the board separation part. | $A > B$ |
| (3) Keep the mounting position of the component away from the board separation surface. | $A > C$ |



*1 $A > D$ is valid when stress is added vertically to the perforation as with Hand Separation. If a Cutting Disc is used, stress will be diagonal to the PCB, therefore $A > D$ is invalid.

- (3) Mounting Components Near Screw Holes

When a component is mounted near a screw hole, it may be affected by the board deflection that occurs during the tightening of the screw. Mount the component in a position as far away from the screw holes as possible.



10.6 Resin coating

The Impedance value may change and/or it may affect on the product's performance due to high cure-stress of resin to be used for coating/molding products. So please pay your careful attention when you select resin.

In prior to use, please make the reliability evaluation with the product mounted in your application set.

10.7 Temperature rating of the circuit board and components located around

Temperature may rise up to max. 40 °C when applying the rated current to the Products.

Be careful of the temperature rating of the circuit board and components located around.

10.8 Caution for use

There is possibility that the Impedance value change due to magnetism. Don't use a magnet or a pair of tweezers with magnetism when chip coil are handled. (The tip of the tweezers should be molded with resin or pottery.)

10.9 Magnetic Saturation

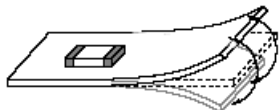
When the excessive current over rated current is applied, the Impedance value may change due to magnetism.

10.10 Handling of a substrate

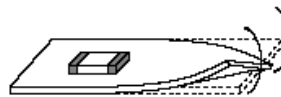
After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting to the substrate when cropping the substrate, inserting and removing a connector from the substrate or tightening screw to the substrate.

Excessive mechanical stress may cause cracking in the product.

Bending



Twisting



10.11 Storage and Handling Requirements

(1) Storage period

Use the products within 6 months after delivered.
Solderability should be checked if this period is exceeded.

(2) Storage conditions

•Products should be stored in the warehouse on the following conditions.

Temperature : -10°C to 40°C

Humidity : 15% to 85% relative humidity No rapid change on temperature and humidity

Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solderability.

•Products should be stored on the palette for the prevention of the influence from humidity, dust and so on.

•Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.

•Products should be stored under the airtight packaged condition.

(3) Handling Condition

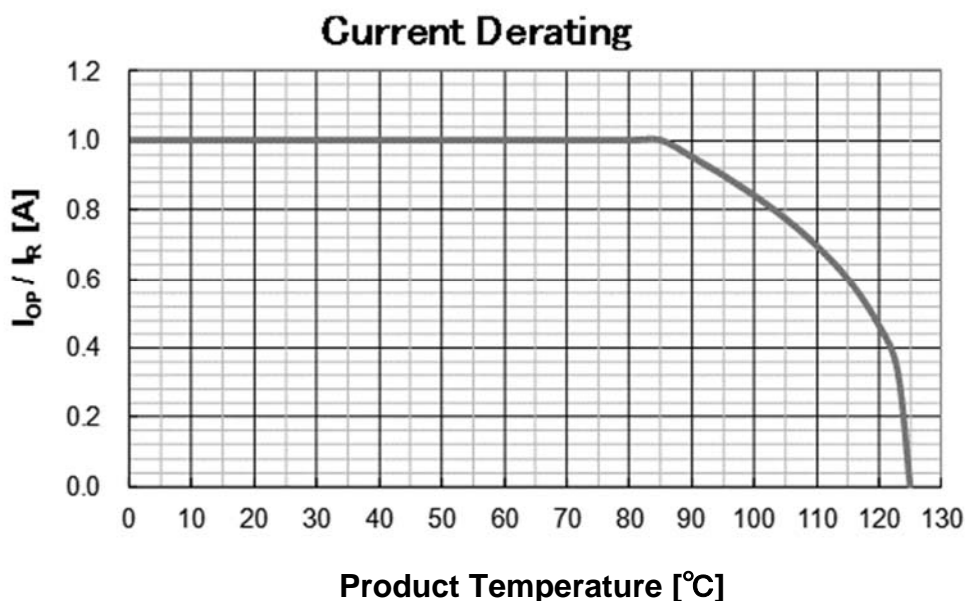
Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

10.12 Derating

Max. current (DC, AC) as function of product temperature (derating curve)

I_{OP} : Loaded Current

I_R : Rated Current



11. ⚠ Note

- (1) Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
 - (2) You are requested not to use our product deviating from the reference specifications.
 - (3) The contents of this reference specification are subject to change without advance notice.
- Please approve our product specifications or transact the approval sheet for product specifications before ordering.