

Specification for Approval

Date: 2024/1/1

Customer: _____

BYTEK P/N: BAM2012NF-900T01-03

CUSTOMER P/N: _____

DESCRIPTION: _____

QUANTITY: _____ pcs

| | | |
|----------------------------|--|--|
| REMARK: | | |
| Customer Approval Feedback | | |
| | | |

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Sales Dep.

| APPROVED | CHECKED |
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R&D Center

| APPROVED | CHECKED | DRAWN |
|----------|---------|-------|
| 文睿 | 谢庆芬 | 兰静 |

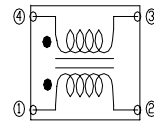
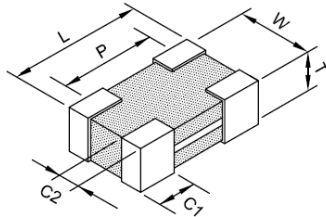
Multilayer Common Mode Choke Coils

BAM2012NF-900T01-03

1. Scope

This specification applies to Multilayer Common Mode Choke Coil, BAM Series Its Application is limited for the High speed differential transmission line like as followings.
 USB, LVDS, MIPI, MDDI, MHL, HDMI, DVI.

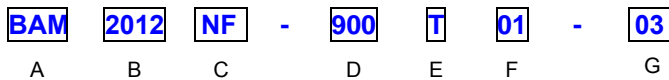
2. Dimensions



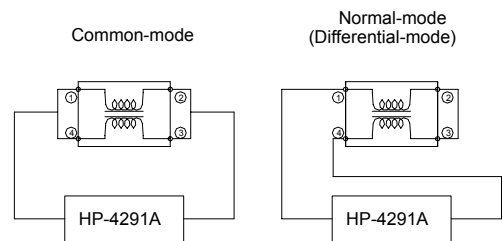
| Chip Size | | | | | | |
|-----------|-----------|-----------|------------|-----------|-----------|-----------|
| Size | L | W | T | P | C1 | C2 |
| 2012 | 2.00±0.20 | 1.25±0.20 | 1.00 ±0.10 | 1.60±0.20 | 0.40±0.20 | 0.30±0.20 |

Units: mm

3. Part Numbering

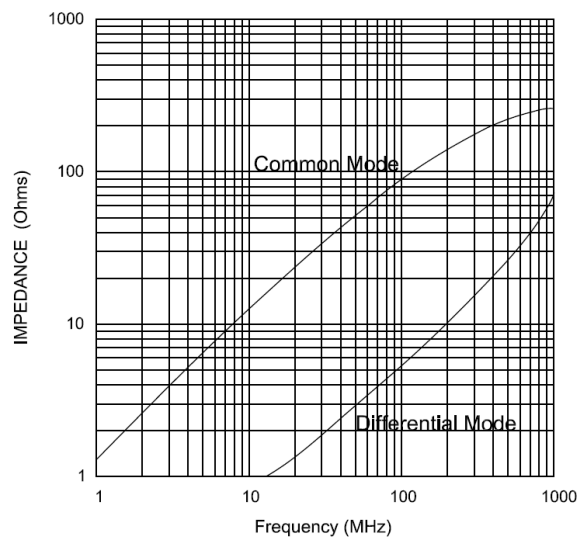


- A: Series
- B: Dimension A x B
- C: Material Lead Free Code
- D: Impedance Common Mode Impedance 900=90
- E: Packaging T=Taping and Reel , B=Bulk(Bags)
- F: Explain
- G: Code



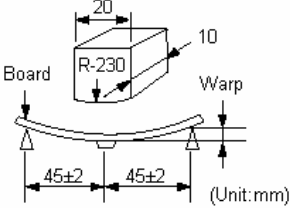
4. Specification

| Part Number | Common Mode Impedance () | Test Frequency (MHz) | Rated Voltage (Vdc) max. | Insulation Resistance (M) min. | DC Resistance () max. | Rated Current (mA) max. |
|---------------------|---------------------------|----------------------|--------------------------|---------------------------------|------------------------|-------------------------|
| BAM2012NF-900T01-03 | 90±25% | 100 | 10 | 200 | 0.4 | 400 |



5. Reliability and Test Condition

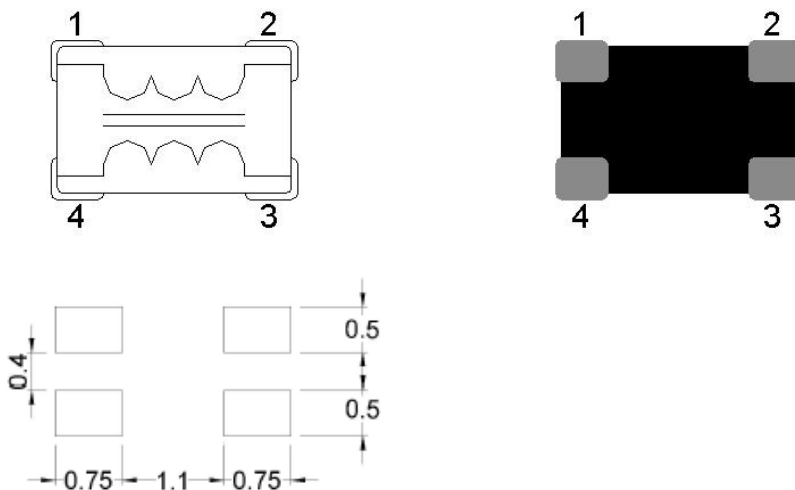
| Item | Performance | Test Condition | | | | | | | | | | | | | | | | | |
|------------------------------------|--|---|----------------------|------------------------------|------------------------------|-----------------------|----------------|---|---------------------------|--------------|-------------------|-------|-----------|-------------------|------|-------------|--------------|---|---|
| Series No. | BAM | -- | | | | | | | | | | | | | | | | | |
| Operating Temperature | -40~+85 (Including self-generated heat) | -- | | | | | | | | | | | | | | | | | |
| Transportation Storage Temperature | -40~+85 | For long storage conditions, please see the Application Notice | | | | | | | | | | | | | | | | | |
| Impedance (Z) | Within the specified tolerance | Measuring equipment:4291A or its equivalent Measuring jig: 16192A (or its equivalent) | | | | | | | | | | | | | | | | | |
| Insulation Resistance | | Measuring points: 1 to 2 or 3 to 4 Measuring voltage: Rated voltage | | | | | | | | | | | | | | | | | |
| DC Resistance | | Measuring points: 1 to 2 or 3 to 4 | | | | | | | | | | | | | | | | | |
| Rated Current | | | | | | | | | | | | | | | | | | | |
| Vibration | Per table 1. <u>Table 1</u> <table border="1"> <tr> <td>Appearance</td> <td>No remarkable Defect</td> </tr> <tr> <td>Common Impedance change rate</td> <td>Within±20%</td> </tr> <tr> <td>Insulation resistance</td> <td>100mΩ min</td> </tr> </table> | Appearance | No remarkable Defect | Common Impedance change rate | Within±20% | Insulation resistance | 100mΩ min | Test sample shall be soldered to test board and the test shall be conducted under the conditions shown in Table 2. <u>Table 2</u> <table border="1"> <tr> <td>Vibration frequency range</td> <td>10Hz to 55Hz</td> </tr> <tr> <td>Overall amplitude</td> <td>1.5mm</td> </tr> <tr> <td>1 cycle</td> <td>1min.(10 55 10Hz)</td> </tr> <tr> <td rowspan="3">Time</td> <td>X</td> <td rowspan="3">2 hours each</td> </tr> <tr> <td>Y</td> </tr> <tr> <td>Z</td> </tr> </table> | Vibration frequency range | 10Hz to 55Hz | Overall amplitude | 1.5mm | 1 cycle | 1min.(10 55 10Hz) | Time | X | 2 hours each | Y | Z |
| Appearance | No remarkable Defect | | | | | | | | | | | | | | | | | | |
| Common Impedance change rate | Within±20% | | | | | | | | | | | | | | | | | | |
| Insulation resistance | 100mΩ min | | | | | | | | | | | | | | | | | | |
| Vibration frequency range | 10Hz to 55Hz | | | | | | | | | | | | | | | | | | |
| Overall amplitude | 1.5mm | | | | | | | | | | | | | | | | | | |
| 1 cycle | 1min.(10 55 10Hz) | | | | | | | | | | | | | | | | | | |
| Time | X | 2 hours each | | | | | | | | | | | | | | | | | |
| | Y | | | | | | | | | | | | | | | | | | |
| | Z | | | | | | | | | | | | | | | | | | |
| Solderability | More than 75% of terminal electrode shall be covered with fresh solder. | Test sample shall be immersed into molten solder under the conditions shown in Table 3 after immersed into flux. After this, test samples shall be taken out and visually checked. The speed for immersion and taking out shall be 25 mm/s. <u>Table 3</u> <table border="1"> <tr> <td>Solder temperature</td> <td>245 ±3</td> </tr> <tr> <td>Immersion time</td> <td>4s±1s</td> </tr> </table> | Solder temperature | 245 ±3 | Immersion time | 4s±1s | | | | | | | | | | | | | |
| Solder temperature | 245 ±3 | | | | | | | | | | | | | | | | | | |
| Immersion time | 4s±1s | | | | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | Per table 1. | Test sample shall be immersed into molten solder after immersed into flux and preheated under the conditions shown in Table 4. After this, test samples shall be taken out and measured after kept at room temperature for 2 to 3 hours.(Note 1) The speed for immersion and taking out shall be 25mm/s. <u>Table 4</u> <table border="1"> <tr> <td>Preheating</td> <td>150 , 3min.</td> </tr> <tr> <td>Resistance to Soldering Heat</td> <td>260 ±5</td> </tr> <tr> <td>Immersion time</td> <td>10s±0.5s</td> </tr> </table> | Preheating | 150 , 3min. | Resistance to Soldering Heat | 260 ±5 | Immersion time | 10s±0.5s | | | | | | | | | | | |
| Preheating | 150 , 3min. | | | | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | 260 ±5 | | | | | | | | | | | | | | | | | | |
| Immersion time | 10s±0.5s | | | | | | | | | | | | | | | | | | |
| Thermal Shock | Per table 1. | Steps 1 to 4 shown in Table 5 as one cycle shall be repeated 5 times. After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 2 hours, then measurement shall be conducted.(Note 1) <u>Table 5</u> <table border="1"> <tr> <th>Step</th> <th>Temperature()</th> <th>Duration (min)</th> </tr> <tr> <td>1</td> <td>-40 +0/-3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Normal temp</td> <td>2~3</td> </tr> <tr> <td>3</td> <td>+85 +3/-0</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Normal temp</td> <td>2~3</td> </tr> </table> | Step | Temperature() | Duration (min) | 1 | -40 +0/-3 | 30±3 | 2 | Normal temp | 2~3 | 3 | +85 +3/-0 | 30±3 | 4 | Normal temp | 2~3 | | |
| Step | Temperature() | Duration (min) | | | | | | | | | | | | | | | | | |
| 1 | -40 +0/-3 | 30±3 | | | | | | | | | | | | | | | | | |
| 2 | Normal temp | 2~3 | | | | | | | | | | | | | | | | | |
| 3 | +85 +3/-0 | 30±3 | | | | | | | | | | | | | | | | | |
| 4 | Normal temp | 2~3 | | | | | | | | | | | | | | | | | |
| Resistance to Humidity | Per table 1. | Test board shall be kept in a thermo hygrostat at temperature of 40 ±2 and relative humidity of 90% to 95% for 500+24/-0 hours. After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted.(Note 1) | | | | | | | | | | | | | | | | | |
| High Temperature Load Life Test | Per table 1. | Test board shall be kept in a thermostatic oven with temperature of 85 ±2 for 500+24/-0 hours while supplying 1 to 2 and 3 -4 with rated current. After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted.(Note 1) | | | | | | | | | | | | | | | | | |

| Item | Performance | Test Condition |
|----------------------------|--------------------------------------|--|
| High Temperature Life Test | Per table 1. | Test board shall be kept in an atmosphere with temperature of 85 ± 2 for 500+24/-0 hours. After the test, keep the test sample at a normal temperature with a normal humidity for 2 to 3 hours, then measurement shall be conducted.(Note 1) |
| Bending Strength | Appearance: No mechanical damage. |  <p>Warp : 2mm(1210),1mm(0806) Testing board : Glass epoxy-resin substrate Thickness : 0.8mm</p> |

(Note 1) If question is found in the result of measurement, another measurement shall be conducted after test samples shall be kept for 48+/-2 hours.

6. Soldering and Mounting

6-1. Recommended PC Board Pattern Units: mm



PC board should be designed so that products can prevent damage from mechanical stress when warping the board. Products shall be positioned in the sideways direction against the mechanical stress to prevent failure.

6-2. Soldering

Mildly activated rosin fluxes are preferred. The terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

Note.

If wave soldering is used ,there will be some risk.

Re-flow soldering temperatures below 240 degrees, there will be non-wetting risk

6-2.1 Lead Free Solder re-flow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1.

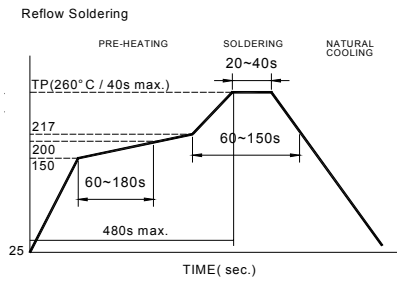
6-2.2 Soldering Iron:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. for Iron Soldering in Figure 2.

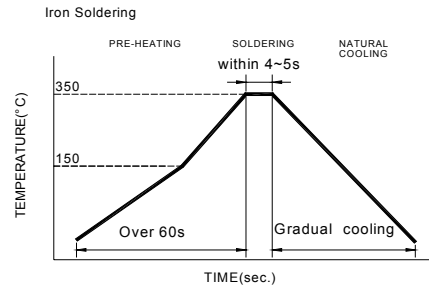
Preheat circuit and products to 150
350 tip temperature (max)

Never contact the ceramic with the iron tip
1.0mm tip diameter (max)

Use a 20 watt soldering iron with tip diameter of 1.0mm
Limit soldering time to 4-5sec.



Reflow times: 3 times max
Fig.1

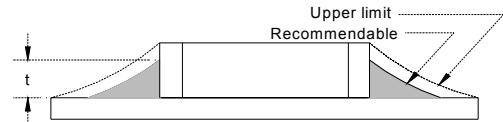


Iron Soldering times : 1 times max
Fig.2

6-2.3 Solder Volume:

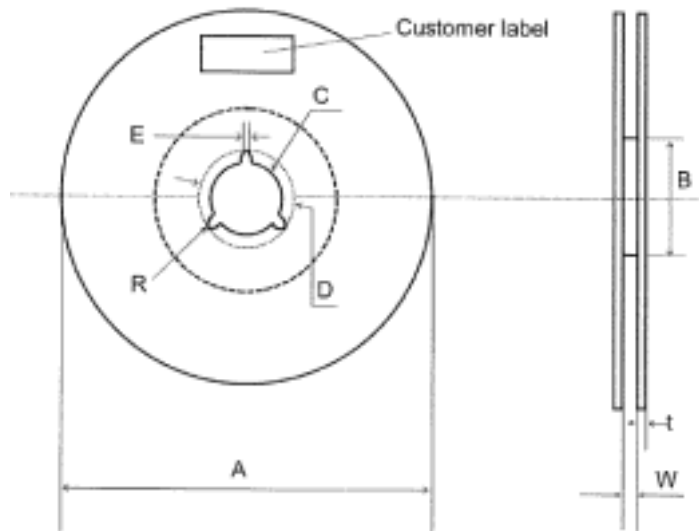
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in right side:

Minimum fillet height = soldering thickness + 25% product height



7.Packaging Information

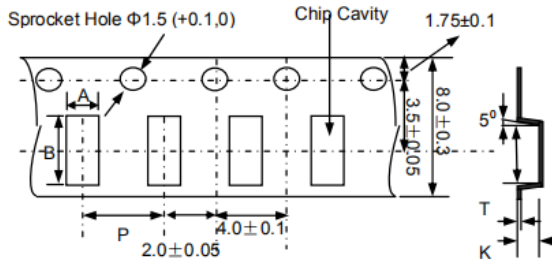
7-1. Reel Dimension



| Code | A | B | C | D | E | W | t | R |
|-----------|---------|--------|--------|--------|---------|--------|---------|-----|
| Dimension | 178±2.0 | 50 min | 13±0.2 | 21±0.8 | 2.0±0.5 | 10±1.5 | 2.5 max | 1.0 |

Units: mm

7-2. Tape Dimension (paper)

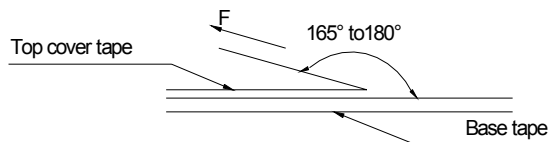


| EMbossed Tape | | | | | Units: mm | |
|---------------|---------|---------|---------|------|-----------|--|
| 型号Type | A | B | P | Pmax | Tmax | |
| 2012[0805] | 1.4±0.2 | 2.3±0.2 | 4.0±0.1 | 1.25 | 0.3 | |

7-3. Packaging Quantity

| Chip size | 0806 | 1210 | 2012 |
|------------|--------|--------|--------|
| Chip /Reel | 10000 | 4000 | 3000 |
| Inner box | 50000 | 20000 | 15000 |
| Middle box | 250000 | 100000 | 75000 |
| Carton | 500000 | 200000 | 150000 |

7-4. Tearing Off Force



The force for tearing off cover tape is 15 to 60 grams in the arrow direction under the following conditions.

| Room Temp. () | Room Humidity (%) | Room atm (hPa) | Tearing Speed mm/min |
|-------------------|----------------------|-------------------|-------------------------|
| 5~35 | 45~85 | 860~1060 | 300 |

Application Notice

Storage Conditions

To maintain the solder ability of terminal electrodes:

1. BYTEK products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40 and 60% RH.
3. Recommended products should be used within 12 months from the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.

Transportation

1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.