

EMI Ferrite Bead Automotive Grade ABPY Series



Overview

EMI ferrite beads are made of ferrite material, which can block high-frequency noise while allowing required signals to pass through, providing high impedance and noise attenuation to improve signal integrity/efficiency and reduce power loss.

Benefits

1. Automotive grade available
2. Compliance with EMI regulations.
3. Reduced power loss and improved system efficiency
4. Operating temperature range: -55 ~ +125°C
5. Improved signal integrity
6. For Power Line

Applications

1. Automotive
2. Industrial
3. Communications
4. Consumer Electronics
5. Medical Devices

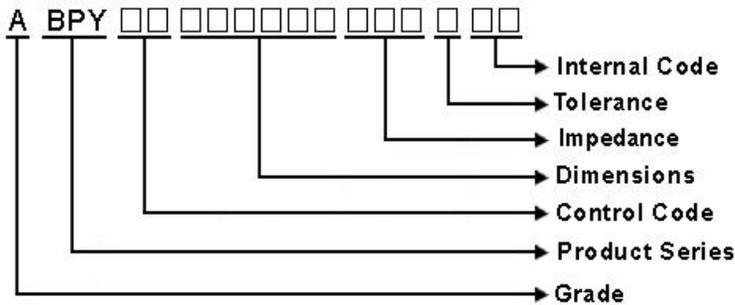
Product Information

| Series | Size Code (JIS/EIA) | Impedance (Ω) |
|--------|--|------------------------|
| ABPY | 1005/0402 1608/0603 2012/0805 3216/1206 | 10 ~ 1000 |



1 Scope: This specification applies to Multilayer Chip ferrite Bead for Automotive Electronics based on AEC-Q200 except for Power train and Safety.

2 Part Numbering:



3 Rating:

Operating Temperature: - 5 5 °C ~ 1 2 5 °C

Storage Temperature: - 5 5 °C ~ 1 2 5 °C(after PCB)

- 5 °C~ 4 0 °C, Humidity 4 0 %~ 7 0 %(before PCB)

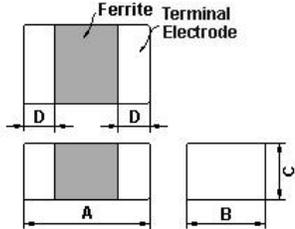
4 Marking:

No Marking

5 Standard Testing Condition

| | Unless otherwise specified | In case of doubt |
|-------------|----------------------------------|------------------|
| Temperature | Ordinary Temperature(15 to 35°C) | 20 to 30°C |
| Humidity | Ordinary Humidity(25 to 85% RH) | 50 to 80 %RH |

6 Configuration and Dimensions:



Dimensions in mm

| TYPE | 201209 |
|------|-----------|
| A | 2.00±0.20 |
| B | 1.25±0.20 |
| C | 0.90±0.20 |
| D | 0.50±0.30 |

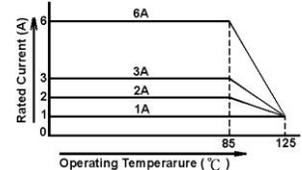
| Net Weight (grms) | |
|-------------------|-------------------|
| Size Code | Net Weight (grms) |
| 201209 | 0.01231 |

7 Electrical Characteristics:

| Part No. | Impedance (Ω) | Test Freq. | RDC (Ω)Max. | Rated Current (mA)Max. |
|--------------------|---------------|----------------|-------------|------------------------|
| ABPY00201209100□00 | 10 | 100 MHz,200 mV | 0.01 | 6000 |
| ABPY00201209300□00 | 30 | 100 MHz,200 mV | 0.015 | 4000 |
| ABPY00201209600□00 | 60 | 100 MHz,200 mV | 0.03 | 3000 |
| ABPY00201209800□00 | 80 | 100 MHz,200 mV | 0.04 | 3000 |
| ABPY00201209121□00 | 120 | 100 MHz,200 mV | 0.04 | 3000 |
| ABPY00201209201□00 | 200 | 100 MHz,200 mV | 0.05 | 2500 |
| ABPY00201209221□00 | 220 | 100 MHz,200 mV | 0.08 | 2000 |
| ABPY00201209301□00 | 300 | 100 MHz,200 mV | 0.08 | 2000 |
| ABPY00201209471□00 | 470 | 100 MHz,200 mV | 0.1 | 2000 |
| ABPY00201209601□00 | 600 | 100 MHz,200 mV | 0.1 | 2000 |
| ABPY00201209102□00 | 1000 | 100 MHz,200 mV | 0.12 | 1500 |

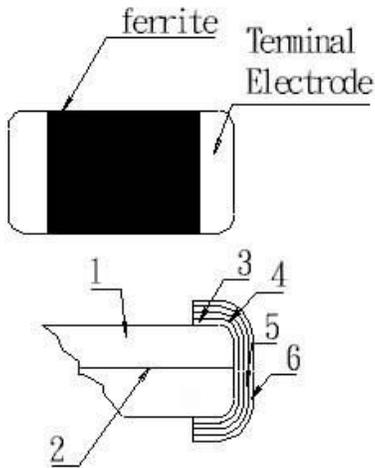
NOTE: □-tolerance Y=±25% / T=±30%

1. Operating temperature range - 5 5°C ~ 1 2 5°C
2. Rate Current : Applied the current to coils, the temperature rise shall not be more than 30°C
3. As for ABPY type. Rated Current is derated as right figure depending on the operating temperature.



8 ABPY00201209 Series

8.1 Construction:

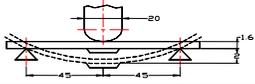
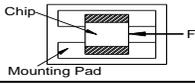


8.2 Material List:

| No | Part | Material |
|----|-------------------|---------------------|
| 1 | Ferrite Substance | NiO-CuO-ZnO-Ferrite |
| 2 | Silver electrode | Ag |
| 3 | Silver electrode | Ag |
| 4 | Cu plating | Cu |
| 5 | Ni plating | Ni |
| 6 | Sn plating | Sn |

9 Reliability Of Ferrite Multilayer Chip Bead

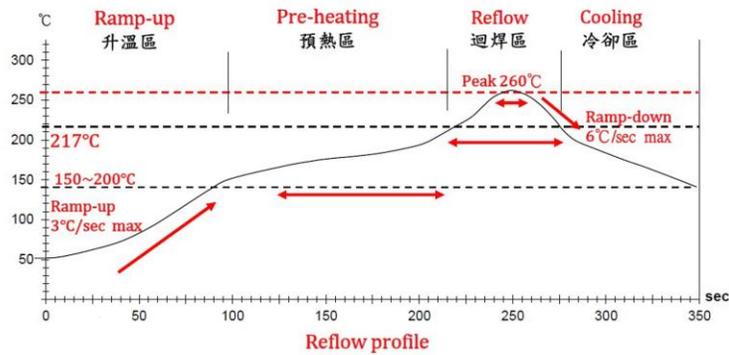
1-1.Mechanical Performance

| No | Item | Specification | Test Method |
|-------|------------------------------|---|--|
| 1-1-1 | Board Flex | The forces applied on the right conditions must not damage the terminal electrode and the ferrite | Refer to AEC-Q200-005 Test device shall be soldered on the substrate Substrate Dimension: 100x40x1.6mm Deflection: 2.0mm Keeping Time: 60 sec  |
| 1-1-2 | Resistance to Soldering Heat | Appearance: No damage Impedance change shall be within±30% | Refer to MIL-STD-202 Method 210 Pre-heating: 150-200°C, 60-100 sec Above 217°C, 60-150 secs Peak Temperature: 260±5°C, 20-40 sec Cycles : 2 times |
| 1-1-3 | Solder ability | The electrodes shall be at least 95% covered with new solder coating | Refer to J-STD-002 Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free) Solder Temperature: 245±5°C (Pb-Free) Immersion Time: 4±1sec |
| 1-1-4 | Terminal Strength Test | The chip must not damage the terminal electrode and the ferrite | Refer to AEC-Q200-006 Test device shall be soldered on the substrate Force 2N for 60±1 seconds for 0603 series Force 5N for 60±1 seconds for 1005 series Force 10N for 60±1 seconds for 1608 series Force 1.8Kg for 60±1 seconds for the other series.  |
| 1-1-5 | Vibration Test | Appearance: No damage Impedance change shall be within±30% | Refer to MIL-STD-202 Method 204 Vibration waveform: Sine waveform Vibration frequency: 10Hz~2000Hz Vibration acceleration: 5g 10Hz~20KHz and back to 10Hz should be down in 20 minutes Duration of test: 12 cycles each of 3 orientations, 20 minutes for each cycle, 12 hr total Vibration axes: X, Y & Z |
| 1-1-6 | Mechanical Shock Test | Appearance: No damage Impedance change shall be within±30% | Refer to MIL-STD-202 Method 213 Units are non-operating. Pulse shape : Half-sine waveform Impact acceleration : 100 g Pulse duration : 6 ms Number of shocks : 18 shocks (3 shocks for each face) |
| 1-1-7 | Physical Dimension | The chip must not damage the terminal electrode and the ferrite | Refer to JESD22 Method JB-100 Verify physical dimensions to the applicable device specification. Note : User(s) and Suppliers spec. Electrical Test not Required. |
| 1-1-8 | Resistance to Solvent | There must be no change in appearance or obliteration of marking | Refer to MIL-STD-202 Method 215 Inductors must withstand 6 minutes of alcohol or water. |
| 1-1-9 | ESD | Appearance: No damage Impedance change shall be within±30% | Refer to AEC-Q200-002 ESD Rank 2 :2kV |

9 Reliability Of Ferrite Multilayer Chip Bead

1-2.Environmental Performance

| No | Item | Specification | Test Method |
|-------|-------------------------------------|--|---|
| 1-2-1 | Temperature Cycle | Appearance: No damage Impedance change shall be within±30% or meet spec | Refer to JESD Method JA-104 Total cycles: 1000 cycles 30 minutes exposure to -40°C 30 minutes exposure to 125°C 1 min. maximum transition between temperatures Measured after exposure in the room condition for 24hrs |
| 1-2-2 | Biased Humidity Resistance | | Refer to MIL-STD-202 Method 103 Temperature: 85±2°C Relative Humidity:85% / Time: 1000hrs Measured after exposure in the room condition for 24hrs |
| 1-2-3 | High Temperature Exposure (Storage) | | Refer to MIL-STD-202 Method 108 Temperature: 125±3°C / Relative Humidity: 0% Time: 1000hrs Measured after exposure in the room condition for 24hrs |
| 1-2-4 | Operational Life | Appearance: No damage Impedance change shall be within±30% If the rated current of parts exceed 1A,the operating temperature should be 85 deg C. | Temperature: 125±3°C Applied Current: Rated Current/ Time: 1000hrs Measured after exposure in the room condition for 24hrs |



Lead-Free(LF)標準溫度分析範圍

Refer to J-STD-020C

| 管制項目 Item. | 升溫區 Ramp-up | 預熱區 Pre-heating | 迴焊區 Reflow | Peak Temp | 冷卻區 Cooling |
|---------------------|----------------|--------------------|---------------|-------------|------------------|
| 溫度範圍 Temp.scope | R.T ~ 150°C | 150°C ~ 200°C | Above 217°C | 260±5°C | Peak Temp.~150°C |
| 標準時間 Time spec. | - | 60 ~ 180 sec | 60 ~ 150 sec | 20 ~ 40 sec | - |
| 實際時間 Time result | - | 75 ~ 100 sec | 90 ~ 120 sec | 20 ~ 35 sec | - |

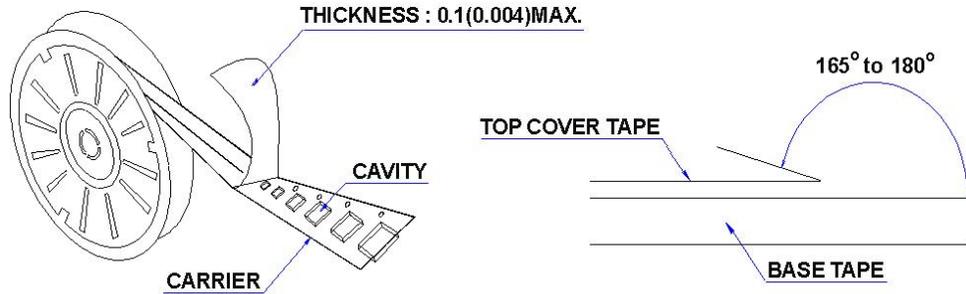
NOTE :

1. Re-flow possible times : within 2 times
2. Nitrogen adopted is recommended while in re-flow
3. Products can only be soldered with reflow

11 Packaging:

11.1 Packaging -Cover Tape

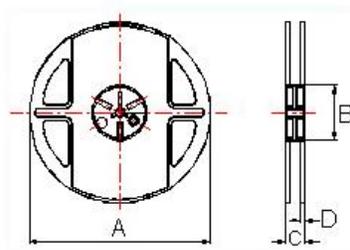
The force for tearing off cover tape is 10 to 100 grams in the arrow direction.



11.2 Packaging Quantity

| TYPE | PCS/REEL |
|--------|----------|
| 060303 | 15000 |
| 100505 | 10000 |
| 160808 | 4000 |
| 201209 | 4000 |

11.3 Reel Dimensions

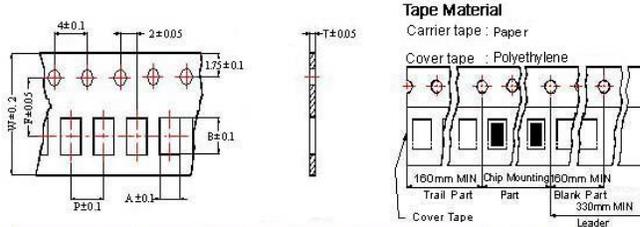


Dimensions in mm

| TYPE | A | B | C | D |
|--------|-----|----|----|-----|
| 060303 | 178 | 60 | 12 | 1.5 |
| 100505 | 178 | 60 | 12 | 1.5 |
| 160808 | 178 | 60 | 12 | 1.5 |
| 201209 | 178 | 60 | 12 | 1.5 |

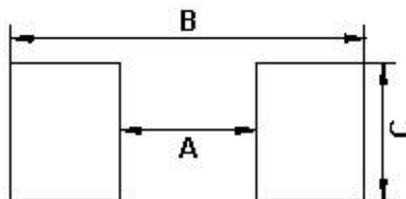
11 Packaging:

11.4 Tape Dimensions in mm



| TYPE | A | B | T | W | P | F |
|--------|------|------|------|---|---|-----|
| 060303 | 0.37 | 0.67 | 0.42 | 8 | 2 | 3.5 |
| 100505 | 0.62 | 1.12 | 0.60 | 8 | 2 | 3.5 |
| 160808 | 1.05 | 1.85 | 0.95 | 8 | 4 | 3.5 |
| 201209 | 1.50 | 2.30 | 0.97 | 8 | 4 | 3.5 |

12 Recommended Land Pattern:



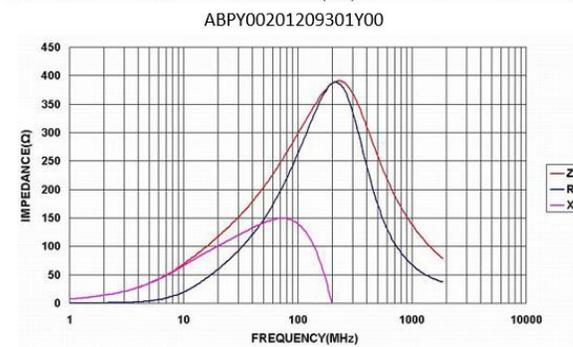
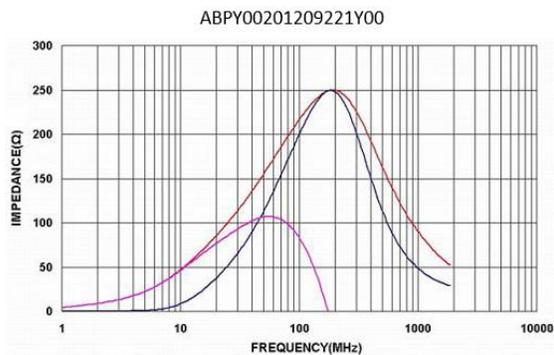
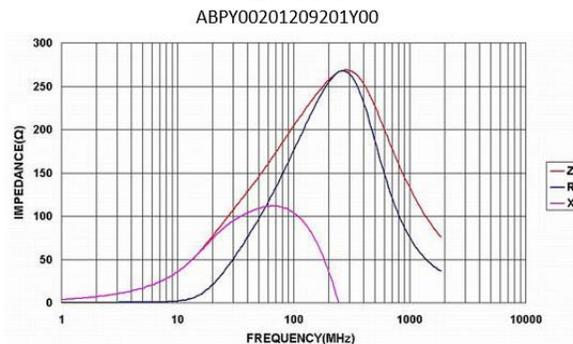
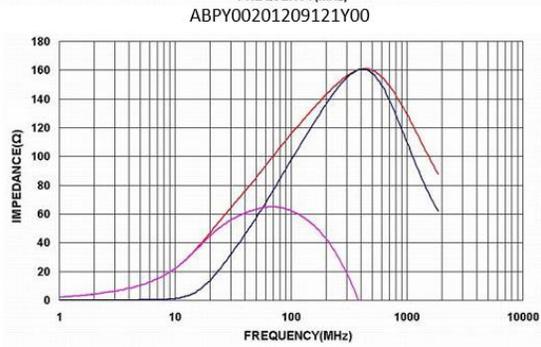
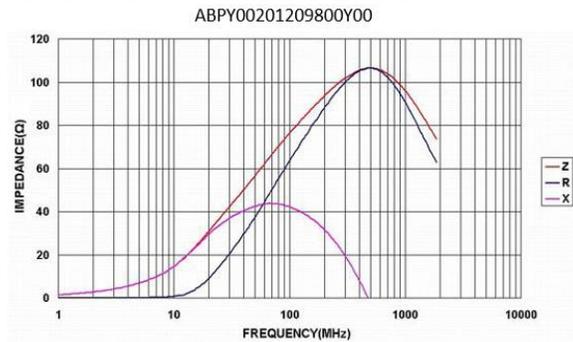
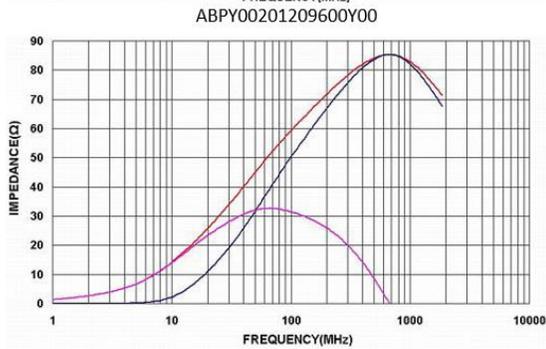
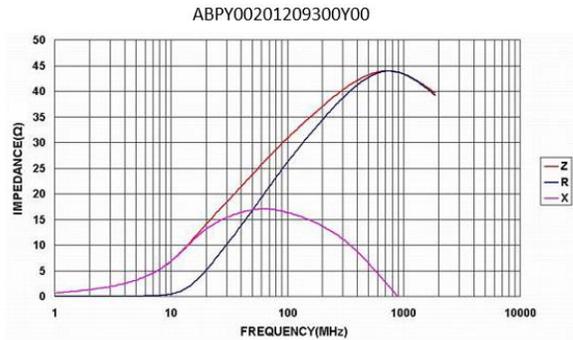
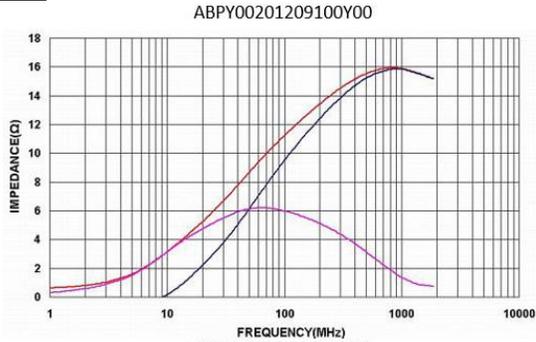
Dimensions in mm

| TYPE | A | B | C |
|--------|-----------|-----------|-----------|
| 201209 | 1.0 ~ 1.2 | 2.6 ~ 4.0 | 1.0 ~ 1.4 |

13 Note:

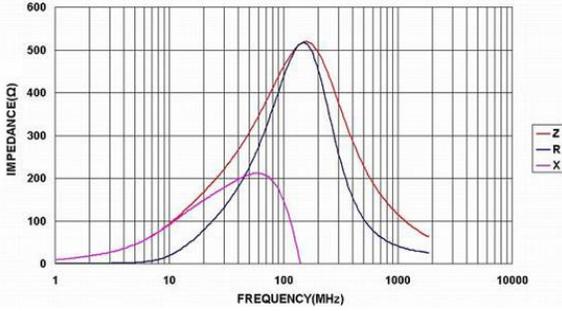
1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Do not knock nor drop.
3. All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
4. Please keep the distance between transformer/coil and other components (refer to the standard IEC 950)
5. The moisture sensitivity level (MSL) of products is classified as level 1.

14 Graph:

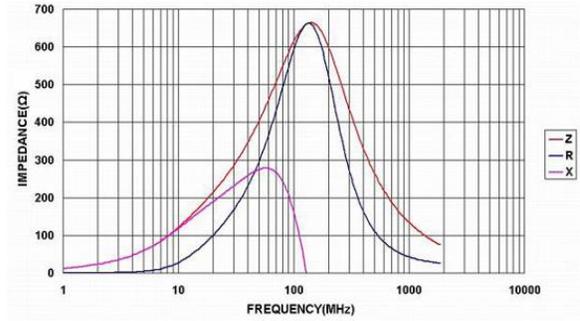


14 Graph:

ABPY00201209471Y00



ABPY00201209601Y00



ABPY00201209102Y00

