

MFBA2V1005

Automotive multilayer chip ferrite bead



Product features

- AEC-Q200
- Multilayer monolithic construction yields high reliability
- 0402 (1005 metric) surface mount package
- Ultra-low direct current resistance (DCR)
- Impedance range: 10 ohms to 600 ohms
- Moisture sensitivity level (MSL): 1

Applications

- Body electronics (keyless entry, ECU, antennas)
- Advanced driver assistance systems (ADAS)
- Infotainment and cluster electronics
- Safety electronics systems
- WLAN, WiFi, Bluetooth
- Portable medical devices
- Inventory management equipment
- Displays/monitors
- IoT, remote monitoring
- Testing equipment
- Automation equipment
- Sensors

Environmental compliance and general specifications

- Operating temperature range: -55 °C to +150 °C (ambient plus self-temperature rise)
- Storage temperature (component): -55 °C to +150 °C
- Solder reflow temperature: J-STD-020 (latest revision) compliant



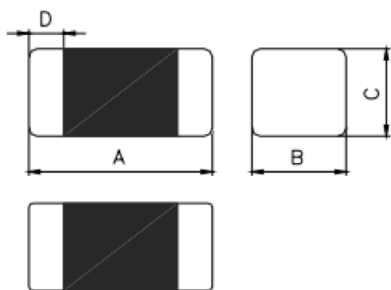
Product specifications

| Part number ² | Impedance (Ω) 100 MHz, $\pm 25\%$, @ +25°C | DCR (Ω) maximum @ +25°C | Rated current ¹ (mA) maximum |
|--------------------------|--|-------------------------------------|---|
| MFBA2V1005P-100-R | 10 | 0.018 | 4000 |
| MFBA2V1005-330-R | 33 | 0.03 | 4000 |
| MFBA2V1005-600-R | 60 | 0.04 | 3000 |
| MFBA2V1005-900-R | 90 | 0.04 | 3000 |
| MFBA2V1005-101-R | 100 | 0.1 | 2000 |
| MFBA2V1005-121-R | 120 | 0.095 | 2000 |
| MFBA2V1005-221-R | 220 | 0.15 | 1500 |
| MFBA2V1005P-301-R | 300 | 0.15 | 1200 |
| MFBA2V1005P-471-R | 470 | 0.18 | 1100 |
| MFBA2V1005P-601-R | 600 | 0.2 | 1000 |

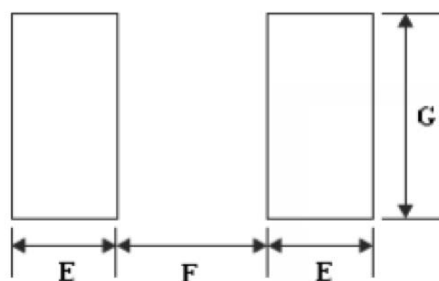
1. Rated current: DC current rating for an approximate self-temperature rise of 40 °C or less.

2. Part number definition: MFBA2V1005-xxx-R or MFBA2V1005P-xxx-R
MFBA2V1005 = Product code and size
MFBA2V1005P = Product code and size
xxx = Impedance value in Ω , last character equals number of zeros
-R suffix = RoHS compliant

Mechanical parameters (mm)



Recommended pad layout



Schematic



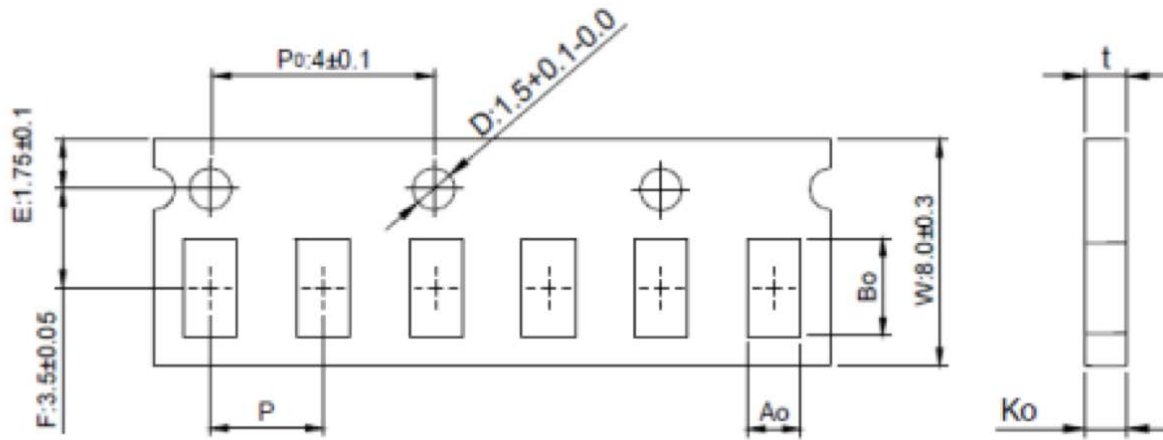
| Part number | A | B | C | D | E (ref.) | F (ref.) | G (ref.) |
|---------------------|----------------|-----------------|-----------------|-----------------|----------|----------|----------|
| MFBA2V1005(P)-xxx-R | 1.0 \pm 0.10 | 0.50 \pm 0.10 | 0.50 \pm 0.10 | 0.25 \pm 0.10 | 0.50 | 0.40 | 0.60 |

Part marking: No marking
All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ± 0.1 millimeters unless stated otherwise
Pad layout dimensions are reference only
Traces or vias underneath the inductor is not recommended

Packaging information (mm)

Drawing not to scale

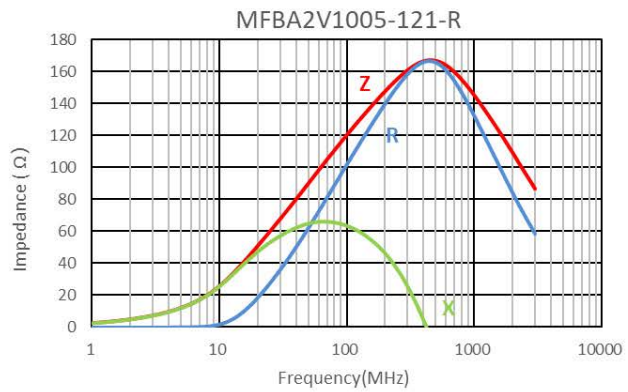
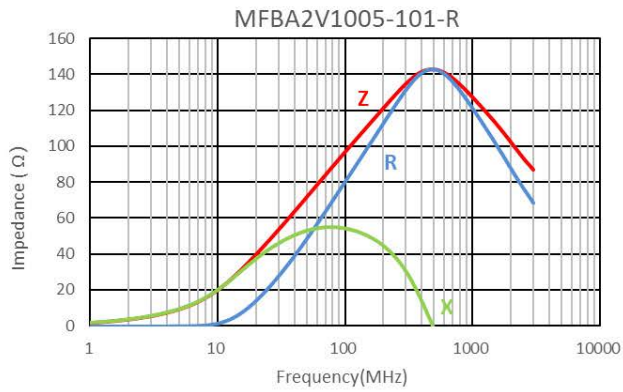
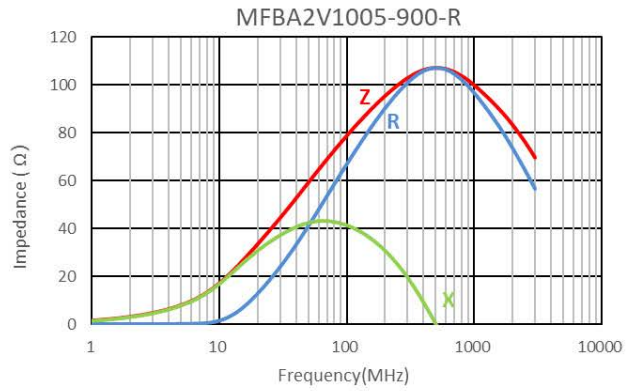
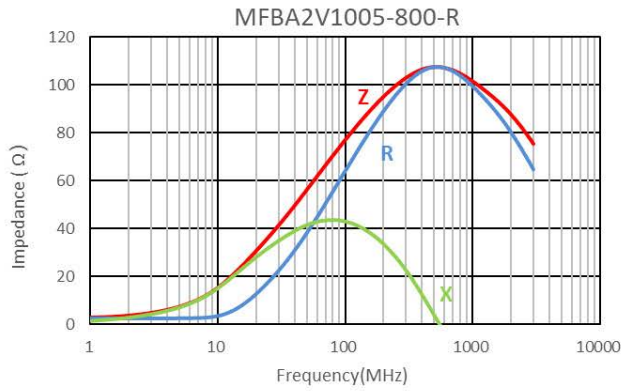
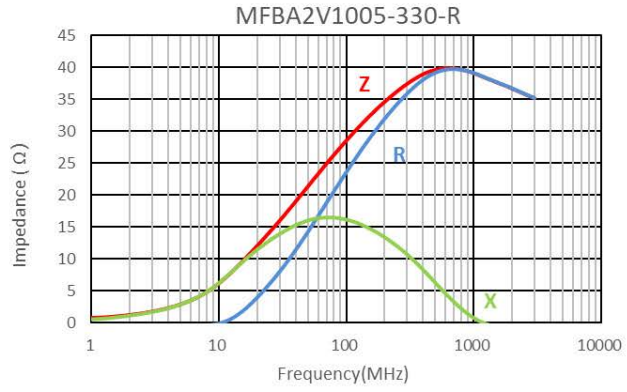
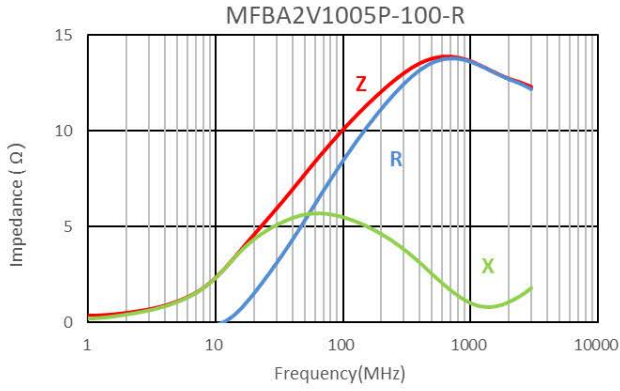
Supplied in tape and reel packaging, 10000 parts per 7" diameter reel (EIA-481 compliant)



| | |
|----|-------------|
| Bo | 1.12 ± 0.03 |
| Ao | 0.62 ± 0.03 |
| Ko | 0.60 ± 0.03 |
| P | 2.0 ± 0.05 |
| t | 0.60 ± 0.03 |

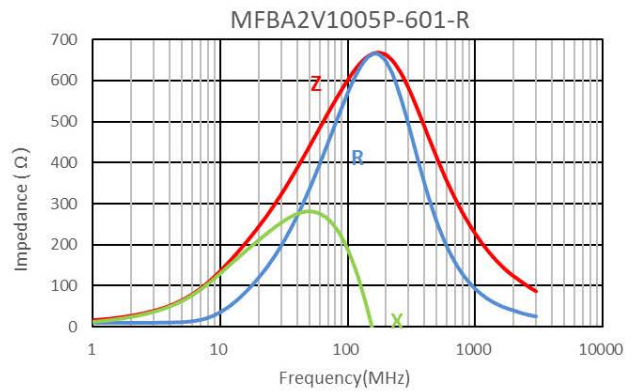
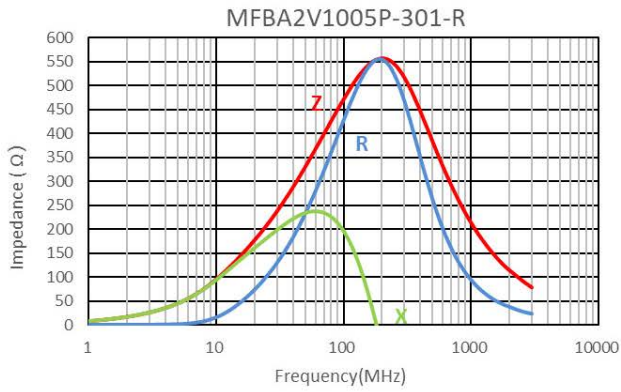
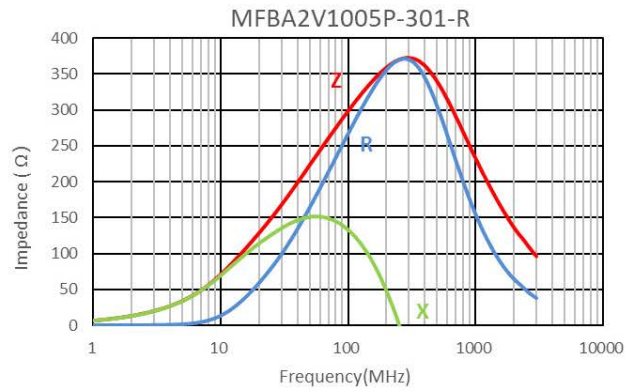
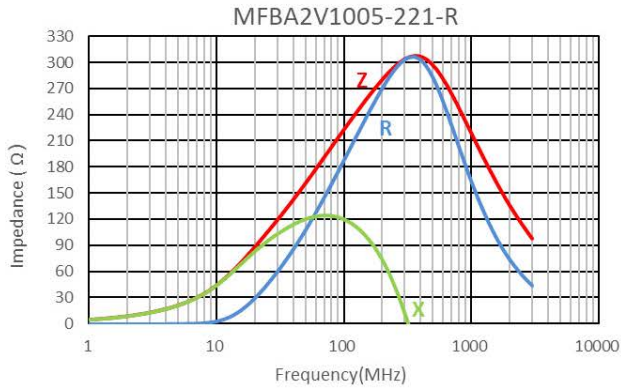
Performance curves

Z= impedance, R= resistance, X= reactance

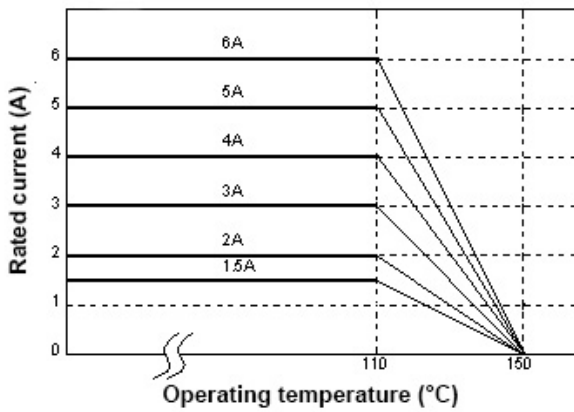


Performance curves

Z= impedance, R= resistance, X= reactance



Derating curve



Solder reflow profile

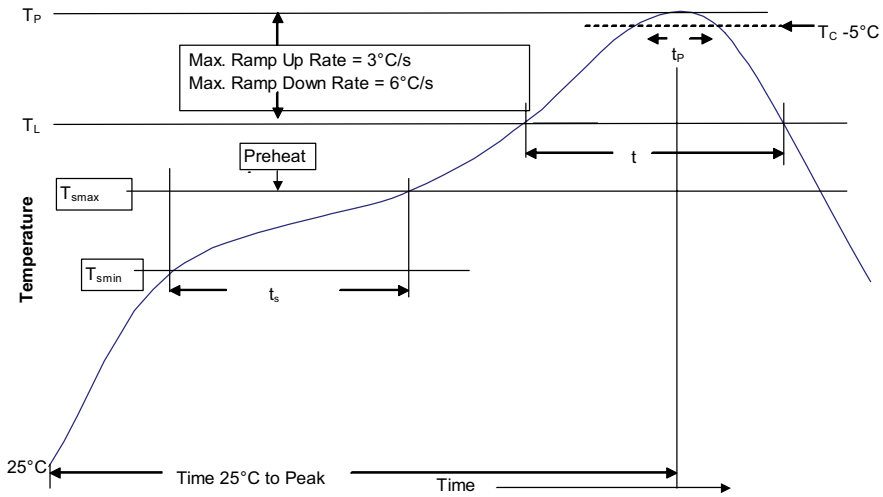


Table 1 - Standard SnPb solder (T_C)

| Package thickness | Volume mm ³ <350 | Volume mm ³ ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5 mm | 235 °C | 220 °C |
| ≥2.5 mm | 220 °C | 220 °C |

Table 2 - Lead (Pb) free solder (T_C)

| Package thickness | Volume mm ³ <350 | Volume mm ³ 350 - 2000 | Volume mm ³ >2000 |
|-------------------|-----------------------------|-----------------------------------|------------------------------|
| <1.6 mm | 260 °C | 260 °C | 260 °C |
| 1.6 – 2.5 mm | 260 °C | 250 °C | 245 °C |
| >2.5 mm | 250 °C | 245 °C | 245 °C |

Reference J-STD-020

| Profile feature | Standard SnPb solder | Lead (Pb) free solder |
|---|----------------------|-----------------------|
| Preheat and soak | | |
| • Temperature min. (T _{smin}) | 100 °C | 150 °C |
| • Temperature max. (T _{smax}) | 150 °C | 200 °C |
| • Time (T _{smin} to T _{smax}) (t _s) | 60-120 seconds | 60-120 seconds |
| Ramp up rate T _L to T _p | 3 °C/ second max. | 3 °C/ second max. |
| Liquidous temperature (T _L) | 183 °C | 217 °C |
| Time (t _L) maintained above T _L | 60-150 seconds | 60-150 seconds |
| Peak package body temperature (T _p)* | Table 1 | Table 2 |
| Time (t _p)* within 5 °C of the specified classification temperature (T _C) | 20 seconds* | 30 seconds* |
| Ramp-down rate (T _p to T _L) | 6 °C/ second max. | 6 °C/ second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

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