# MFBA3V1005

## Automotive high impedance multilayer chip ferrite bead

### Product features

- AEC-Q200
- 0402 (1005 metric) surface mount package
- Impedance range 30 ohms to 1000 ohms
- Multilayer monolithic construction yields high reliability
- 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

Pb HALOGEN HF FREE RoHS

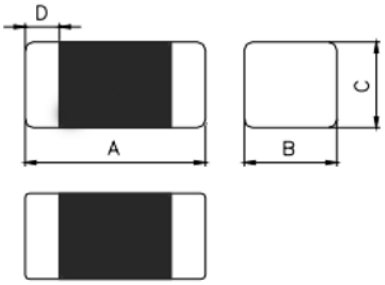
Powering Business Worldwide

## Product specifications

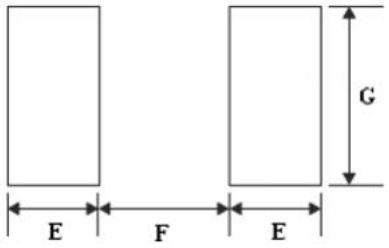
| Part number[2] | Impedance (Ω) 100 MHz, ±25%, @ +25°C | DCR (Ω) maximum @ +25 °C | Rated current[1] (mA) maximum |
|---|---|---|---|
| MFBA3V1005K-300-R | 30 | 0.2 | 300 |
| MFBA3V1005K-600-R | 60 | 0.25 | 300 |
| MFBA3V1005K-121-R | 120 | 0.3 | 100 |
| MFBA3V1005K-221-R | 220 | 0.4 | 100 |
| MFBA3V1005K-301-R | 300 | 0.5 | 100 |
| MFBA3V1005K-601-R | 600 | 0.8 | 200 |
| MFBA3V1005K-102-R | 1000 | 1.2 | 200 |
| MFBA3V1005M-600-R | 60 | 0.2 | 500 |
| MFBA3V1005M-121-R | 120 | 0.35 | 300 |
| MFBA3V1005M-221-R | 220 | 0.45 | 250 |
| MFBA3V1005M-301-R | 300 | 0.6 | 200 |

1. Rated current: DC current for an approximate temperature rise of 40 °C without core loss.
2. Part number definition: MFBA3V1005y-xxx-R
MFBA3V1005y = Product code and size (y=Internal code)
xxx = Impedance value in Ω, last character equals number of zeros
-R suffix = RoHS compliant

### Mechanical parameters (mm)




### Recommended pad layout




### Schematic

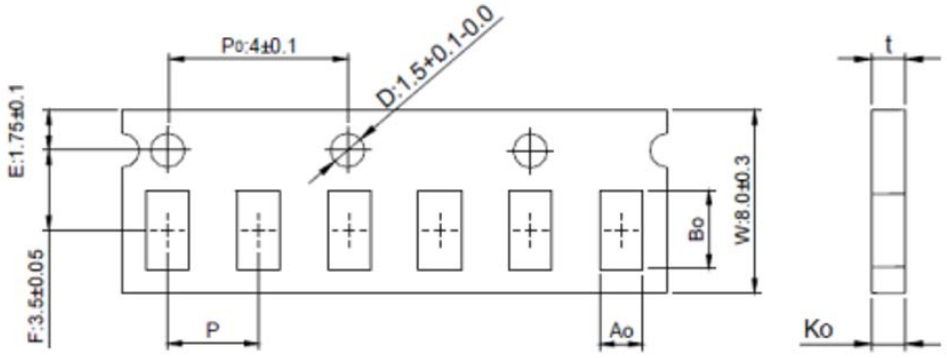
| Part number | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| MFBA3V1005y-xxx-R | 1.00 ± 0.10 | 0.50 ± 0.10 | 0.50 ± 0.10 | 0.25 ± 0.10 | 0.50 | 0.40 | 0.60 |

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

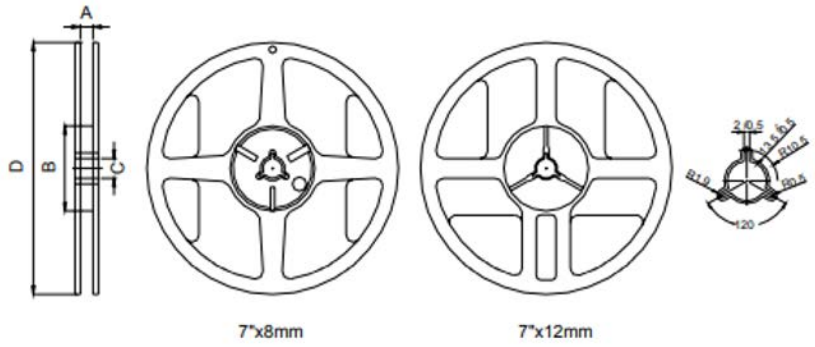
**Packaging information (mm)**

Drawing not to scale

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

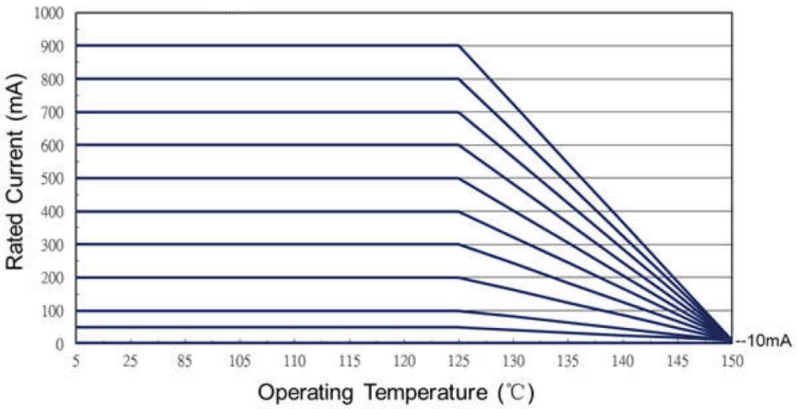



| | |
|---|---|
| Bo | 1.12 ± 0.03 |
| Ao | 0.62 ± 0.03 |
| Ko | 0.60 ± 0.03 |
| P | 2.0 ± 0.05 |
| t | 0.60 ± 0.03 |

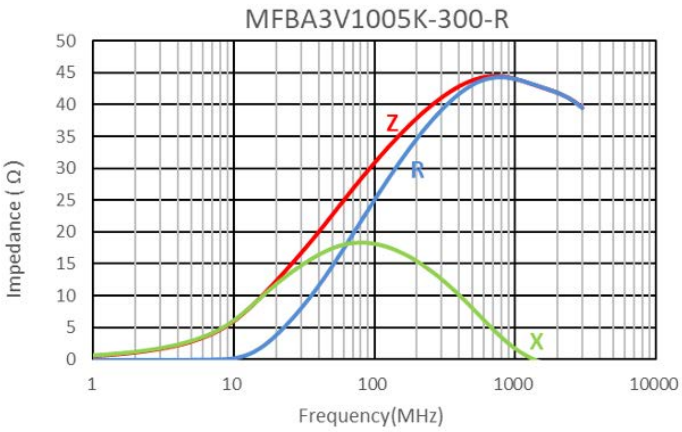


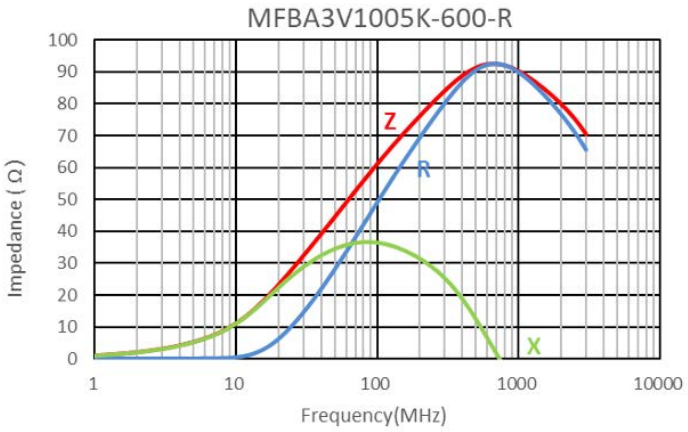

| | |
|---|---|
| Type | 7"*8 |
| A | 9.0 ± 0.5 |
| B | 60 ± 2 |
| C | 13.5 ± 0.5 |
| D | 178 ± 2 |

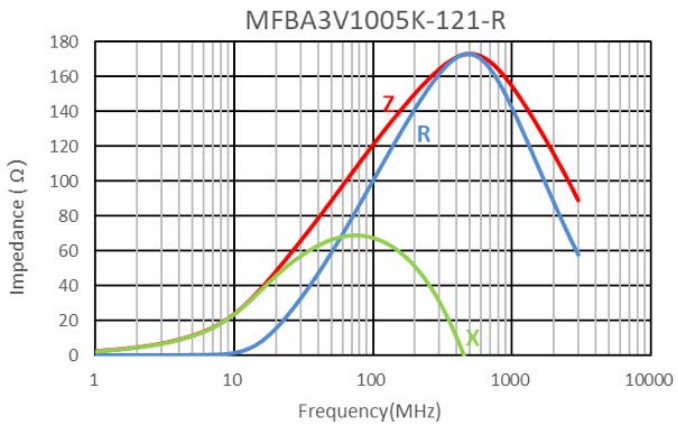
**Derating curve for rated current < 1000 mA**

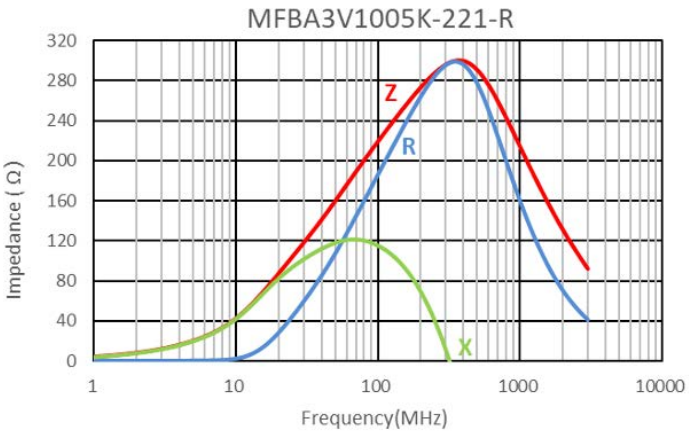


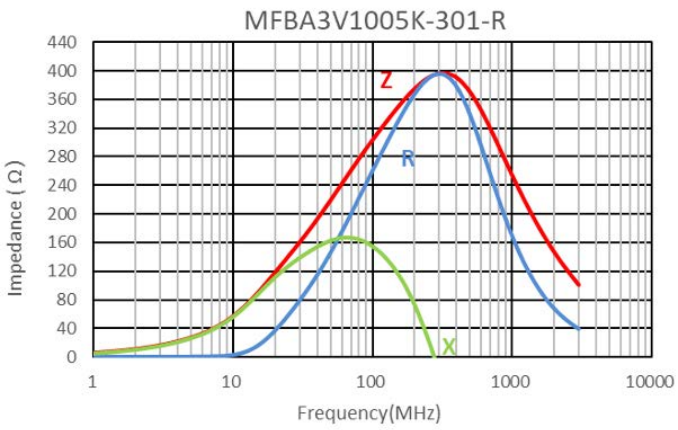
**Impedance vs frequency**
Z=Impedance, R-Resistance, X=Reactance

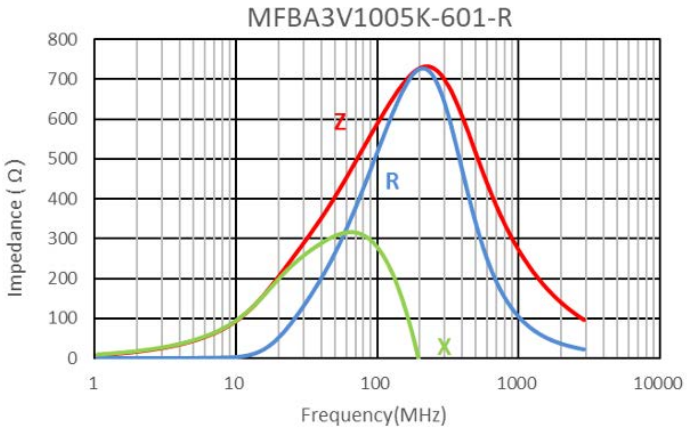


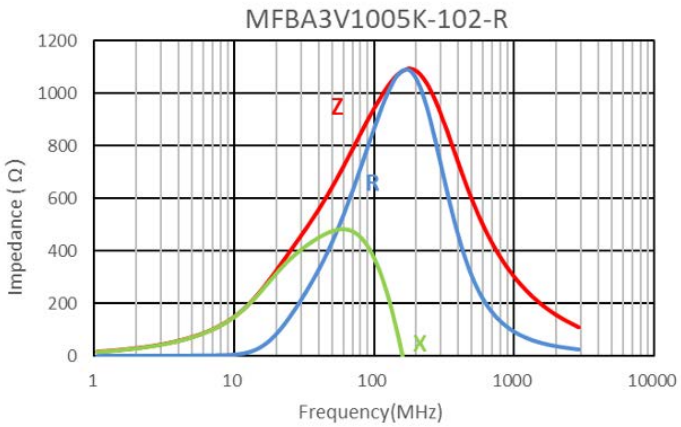



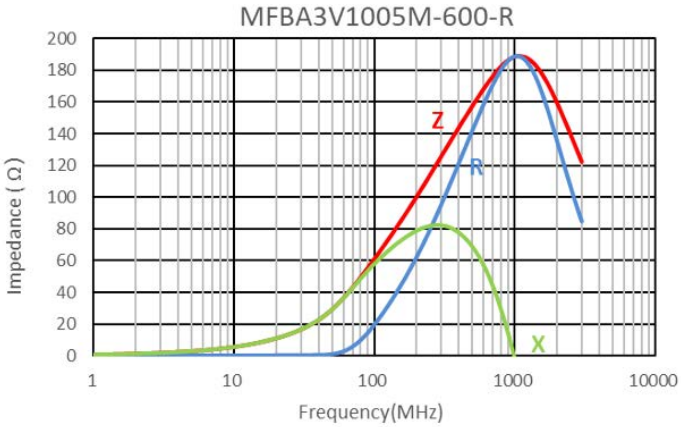



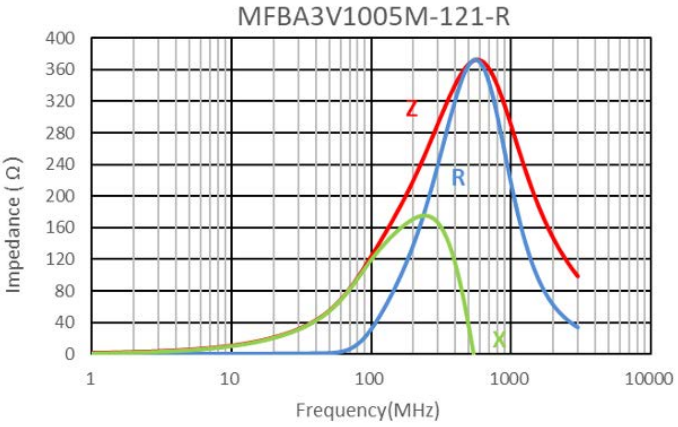



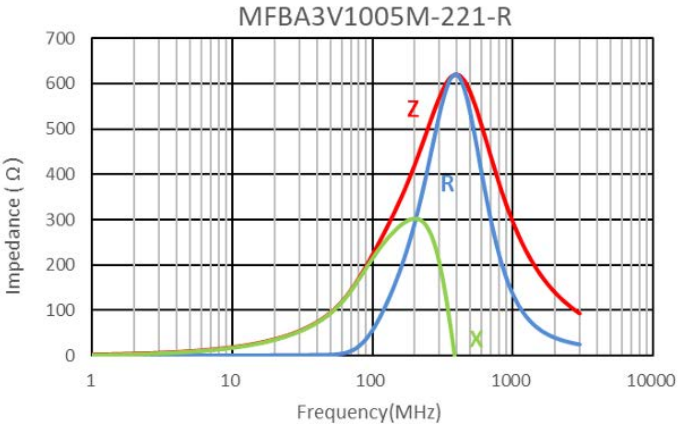



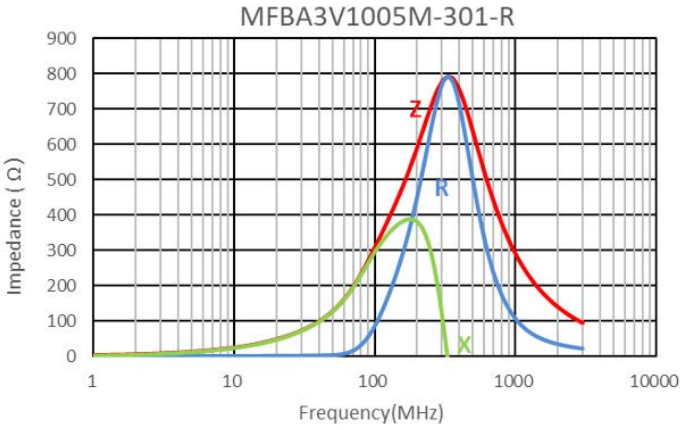
**Impedance vs frequency, continued**
Z=Impedance, R-Resistance, X=Reactance



## Solder reflow profile

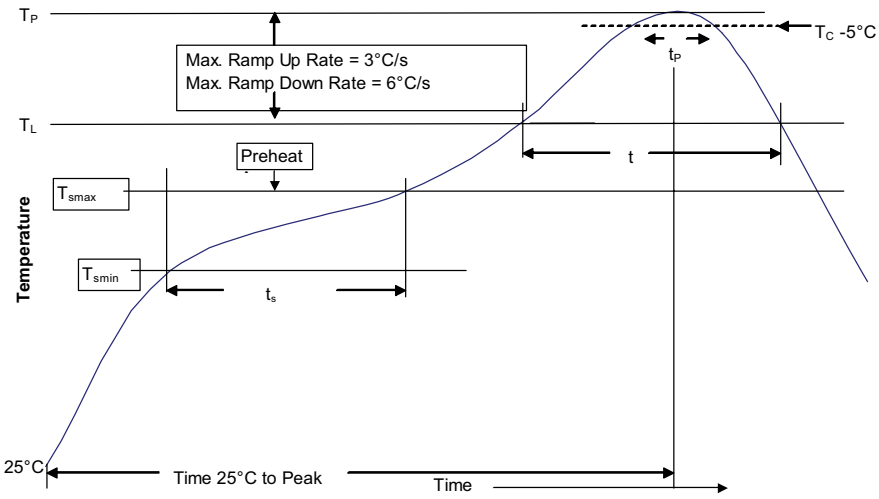



**Table 1 - Standard SnPb solder ($T_C$)**

| Package thickness | Volume mm3 <350 | Volume mm3 ≥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 ($T_L$)<br>Time ($t_L$) maintained above $T_L$ | | 183 °C<br>60-150 seconds | 217 °C<br>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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