



# Chip Beads

For general signal line

## MMZ series

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|                |                          |
|----------------|--------------------------|
| <b>MMZ0402</b> | <b>0402[01005 inch]*</b> |
| <b>MMZ0603</b> | <b>0603[0201 inch]</b>   |
| <b>MMZ1005</b> | <b>1005[0402 inch]</b>   |
| <b>MMZ1608</b> | <b>1608[0603 inch]</b>   |
| <b>MMZ2012</b> | <b>2012[0805 inch]</b>   |

\* Dimensions Code JIS[EIA]

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## REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

### SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

#### REMINDERS

- The storage period is less than 12 months. Be sure to follow the storage conditions (Temperature: 5 to 40°C, Humidity: 10 to 75% RH or less).  
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Before soldering, be sure to preheat components.  
The preheating temperature should be set so that the temperature difference between the solder temperature and chip temperature does not exceed 150°C.
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications.  
If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- When embedding a printed circuit board where a chip is mounted to a set, be sure that residual stress is not given to the chip due to the overall distortion of the printed circuit board and partial distortion such as at screw tightening portions.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Carefully lay out the coil for the circuit board design of the non-magnetic shield type.  
A malfunction may occur due to magnetic interference.
- Use a wrist band to discharge static electricity in your body through the grounding wire.
- Do not expose the products to magnets or magnetic fields.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.  
The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.  
If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

- (1) Aerospace/Aviation equipment
- (2) Transportation equipment (cars, electric trains, ships, etc.)
- (3) Medical equipment
- (4) Power-generation control equipment
- (5) Atomic energy-related equipment
- (6) Seabed equipment
- (7) Transportation control equipment

- (8) Public information-processing equipment
- (9) Military equipment
- (10) Electric heating apparatus, burning equipment
- (11) Disaster prevention/crime prevention equipment
- (12) Safety equipment
- (13) Other applications that are not considered general-purpose applications

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

# Chip Beads

## For general signal line

Product compatible with RoHS directive  
Halogen-free  
Compatible with lead-free solders

# Overview of the MMZ Series

## FEATURES

- Noise reduction solution for general signal line.
- Lineup includes 5 sizes from 0402 to 2012.
- Various frequency characteristics with 8 materials of different features for countermeasures against everything from general signals to high-speed signals.

## APPLICATION

- Noise removal for mobile devices such as smartphones and tablet terminals, and various modules.
- Noise removal for PCs and recorders, household appliances such as STBs, smart grids, and industrial equipment.

## PART NUMBER CONSTRUCTION

| MMZ         | 0402                  | S           | 121           | C                                | T   | 000                 |                 |               |
|-------------|-----------------------|-------------|---------------|----------------------------------|-----|---------------------|-----------------|---------------|
| Series name | LxWxT Dimensions (mm) |             | Material name | Impedance ( $\Omega$ ) at 100MHz |     | Characteristic type | Packaging style | Internal code |
|             | 0402                  | 0.4x0.2x0.2 |               | A                                | 121 |                     |                 |               |
| 0603        | 0.6x0.3x0.3           | B           |               |                                  | A   |                     | A00             |               |
| 1005        | 1.0x0.5x0.5           | D           |               |                                  | B   |                     | AH0             |               |
| 1608        | 1.6x0.8x0.6           | F           |               |                                  | H   |                     |                 |               |
|             | 1.6x0.8x0.8           | Q           |               |                                  |     |                     |                 |               |
| 2012        | 2.0x1.25x0.85         | R           |               |                                  |     |                     |                 |               |
|             |                       | S           |               |                                  |     |                     |                 |               |
|             |                       |             |               |                                  |     |                     |                 |               |
|             |                       | Y           |               |                                  |     |                     |                 |               |

## OPERATING TEMPERATURE RANGE, PACKAGE QUANTITY, PRODUCT WEIGHT

| Type    | Temperature range          |                           | Package quantity (pieces/reel) | Individual weight (mg) |             |
|---------|----------------------------|---------------------------|--------------------------------|------------------------|-------------|
|         | Operating temperature (°C) | Storage temperature* (°C) |                                |                        |             |
|         | MMZ0402                    | -55 to +125               |                                |                        | -55 to +125 |
| MMZ0603 | -55 to +125                | -55 to +125               | 15,000                         | 0.3                    |             |
| MMZ1005 | -55 to +125                | -55 to +125               | 10,000                         | 1                      |             |
| MMZ1608 | t=0.6mm                    | -55 to +125               | -55 to +125                    | 4,000                  | 3           |
|         | t=0.8mm                    | -55 to +125               | -55 to +125                    | 4,000                  | 4           |
| MMZ2012 | -55 to +125                | -55 to +125               | 4,000                          | 8                      |             |

\* The Storage temperature range is for after the circuit board is mounted.

- RoHS Directive Compliant Product: See the following for more details related to RoHS Directive compliant products. <http://www.tdk.co.jp/rohs/>
- Halogen-free: Indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

• All specifications are subject to change without notice.

# Overview of the MMZ Series

## RECOMMENDED REFLOW PROFILE



| Preheating |       |            | Soldering |           | Peak         |      |
|------------|-------|------------|-----------|-----------|--------------|------|
| Temp.      | Temp. | Time       | Temp.     | Time      | Temp.        | Time |
| T1         | T2    | t1         | T3        | t2        | T4           | t3   |
| 150°C      | 180°C | 60 to 120s | 230°C     | 30 to 60s | 250 to 260°C | 10s  |

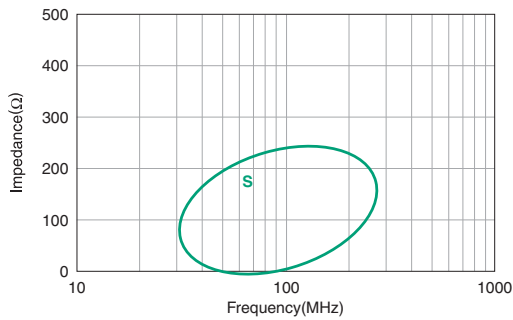
# Overview of the MMZ Series

## MATERIAL CHARACTERISTICS

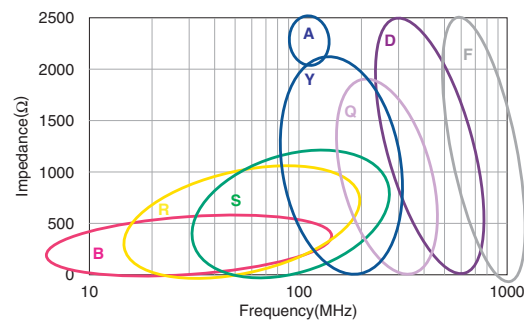
- B material:** This type is perfectly suited for fast digital signals. By equalizing R components and X components that beads possess at a frequency of 5MHz, it is able to suppress overshooting, undershooting and ringing of fast digital signals.
- R material:** For wide frequency applications calling for broad impedance characteristics. For digital signal line applications calling requiring good waveform integrity. Impedance values selected for effectiveness at 10 to 200MHz.
- S material:** Standard type that features impedance characteristics similar to those of a typical ferrite core. For signal line applications in which the blocking region is near 100MHz. Impedance values selected for effectiveness at 40 to 300MHz.
- Y material:** High frequency range type intended for the 100MHz region and above.  
For signal line applications in which the signal frequency is far from the cutoff frequency. Impedance values selected for effectiveness at 80 to 400MHz.
- A material:** This high-impedance product is based on the impedance frequency characteristics of our Y-material. The product offers excellent impedance characteristics, which is greater than 2500Ω, in the vicinity of 100MHz range (MMZ1608A252B).
- Q material:** For high-band applications designed for 100MHz and above. Impedance values selected for effectiveness at 100 to 800MHz.
- D material:** For applications calling for low insertion loss at low frequencies and sharply increasing impedance at high frequencies. Designed for high impedance at high frequencies (300MHz to 1GHz) for signal line applications.
- F material:** This new product inherits the characteristic of our D-material, namely its sharp impedance rise time, and its impedance peak frequency has been shifted higher into range. The product offers excellent noise suppression from 600MHz to as high as in the GHz range.

## TYPICAL MATERIAL IMPEDANCE CHARACTERISTICS

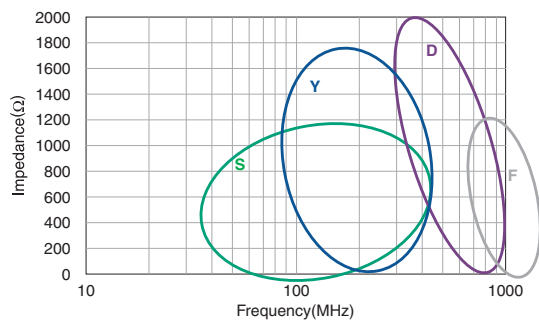
MMZ0402 Type



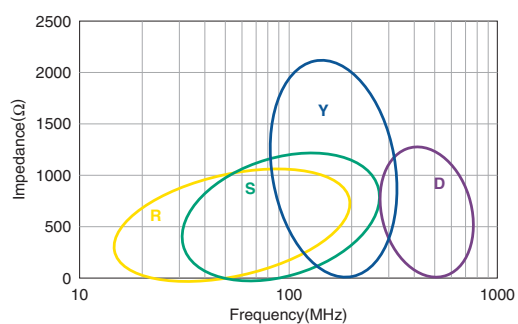
MMZ1608 Type



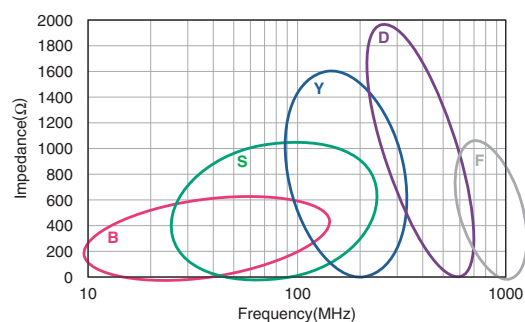
MMZ0603 Type



MMZ2012 Type



MMZ1005 Type



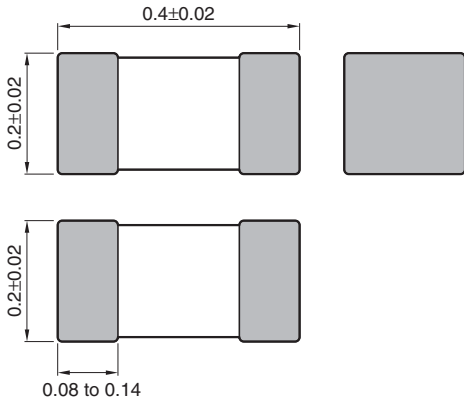
• All specifications are subject to change without notice.

MMZ series

# MMZ0402 Type

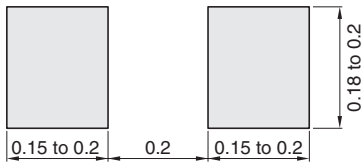


## SHAPE & DIMENSIONS



Dimensions in mm

## RECOMMENDED LAND PATTERN



Dimensions in mm

• All specifications are subject to change without notice.

# MMZ series **MMZ0402 Type**

## ■ ELECTRICAL CHARACTERISTICS

### □ CHARACTERISTICS SPECIFICATION TABLE

| Impedance<br>[100MHz]<br>( $\Omega$ ) | Tolerance     | DC resistance<br>( $\Omega$ )max. | Rated current<br>(mA)max. | Part No.         |
|---------------------------------------|---------------|-----------------------------------|---------------------------|------------------|
| 10                                    | $\pm 5\Omega$ | 0.07                              | 750                       | MMZ0402S100CT000 |
| 70                                    | $\pm 25\%$    | 0.36                              | 300                       | MMZ0402S700CT000 |
| 120                                   | $\pm 25\%$    | 0.70                              | 210                       | MMZ0402S121CT000 |
| 150                                   | $\pm 25\%$    | 0.70                              | 200                       | MMZ0402S151CT000 |

### ○ Measurement equipment

| Measurement item | Product No.   | Manufacturer         |
|------------------|---------------|----------------------|
| Impedance        | E4991A+16196D | Agilent Technologies |
| DC resistance    | Type-7556     | Yokogawa             |

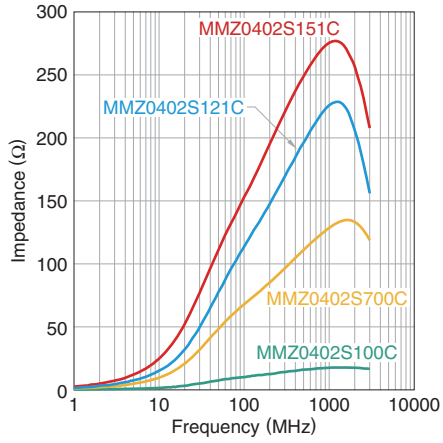
\* Equivalent measurement equipment may be used.

# MMZ series **MMZ0402 Type**

## ■ ELECTRICAL CHARACTERISTICS

### □ Z VS. FREQUENCY CHARACTERISTICS (BY SERIES)

#### MMZ0402S SERIES



• All specifications are subject to change without notice.

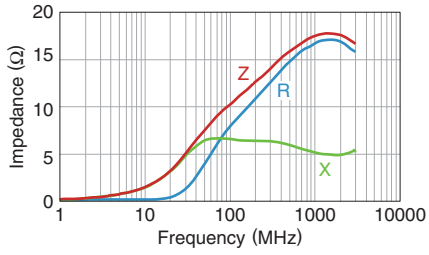


# MMZ series **MMZ0402 Type**

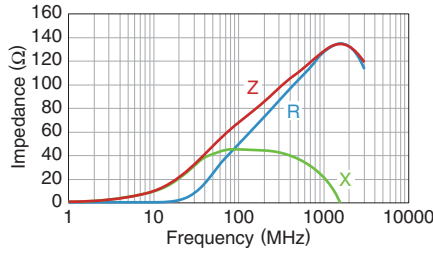
## ■ ELECTRICAL CHARACTERISTICS

### □ Z, X, R VS. FREQUENCY CHARACTERISTICS

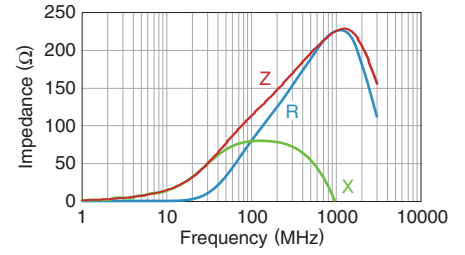
**MMZ0402S100CT000**



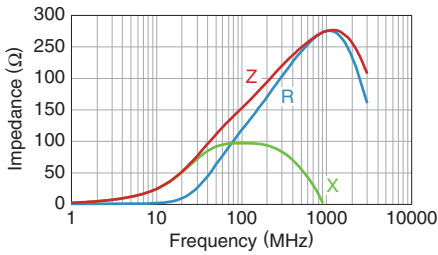
**MMZ0402S700CT000**



**MMZ0402S121CT000**



**MMZ0402S151CT000**



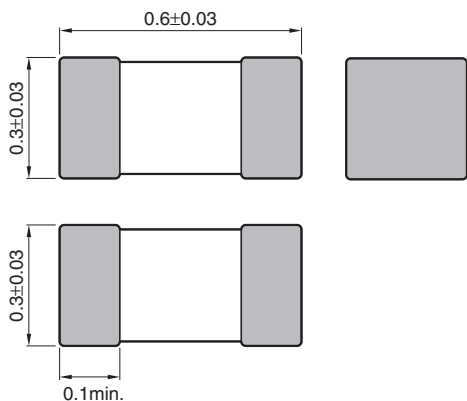
• All specifications are subject to change without notice.

MMZ series

# MMZ0603 Type

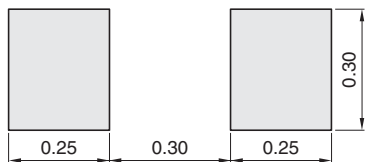


## ■ SHAPE & DIMENSIONS



Dimensions in mm

## ■ RECOMMENDED LAND PATTERN



Dimensions in mm

• All specifications are subject to change without notice.

# MMZ series MMZ0603 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

| Impedance<br>[100MHz]<br>( $\Omega$ ) | Tolerance     | DC resistance<br>( $\Omega$ )max. | Rated current<br>(mA)max. | Part No.         |
|---------------------------------------|---------------|-----------------------------------|---------------------------|------------------|
| 10                                    | $\pm 5\Omega$ | 0.09                              | 500                       | MMZ0603S100CT000 |
| 80                                    | $\pm 25\%$    | 0.30                              | 200                       | MMZ0603S800CT000 |
| 120                                   | $\pm 25\%$    | 0.45                              | 200                       | MMZ0603S121CT000 |
| 240                                   | $\pm 25\%$    | 0.57                              | 200                       | MMZ0603S241CT000 |
| 470                                   | $\pm 25\%$    | 1.30                              | 100                       | MMZ0603S471CT000 |
| 600                                   | $\pm 25\%$    | 1.45                              | 100                       | MMZ0603S601CT000 |
| 80                                    | $\pm 25\%$    | 0.18                              | 520                       | MMZ0603S800HT000 |
| 120                                   | $\pm 25\%$    | 0.22                              | 480                       | MMZ0603S121HT000 |
| 240                                   | $\pm 25\%$    | 0.32                              | 420                       | MMZ0603S241HT000 |
| 470                                   | $\pm 25\%$    | 0.65                              | 310                       | MMZ0603S471HT000 |
| 600                                   | $\pm 25\%$    | 0.75                              | 280                       | MMZ0603S601HT000 |
| 1000                                  | $\pm 25\%$    | 1.25                              | 200                       | MMZ0603S102HT000 |
| 75                                    | $\pm 25\%$    | 0.35                              | 300                       | MMZ0603Y750CT000 |
| 120                                   | $\pm 25\%$    | 0.39                              | 200                       | MMZ0603Y121CT000 |
| 240                                   | $\pm 25\%$    | 0.80                              | 200                       | MMZ0603Y241CT000 |
| 470                                   | $\pm 25\%$    | 1.40                              | 200                       | MMZ0603Y471CT000 |
| 600                                   | $\pm 25\%$    | 1.50                              | 200                       | MMZ0603Y601CT000 |
| 33                                    | $\pm 25\%$    | 0.70                              | 200                       | MMZ0603D330CT000 |
| 47                                    | $\pm 25\%$    | 0.70                              | 200                       | MMZ0603D470CT000 |
| 56                                    | $\pm 25\%$    | 0.95                              | 100                       | MMZ0603D560CT000 |
| 80                                    | $\pm 25\%$    | 1.25                              | 100                       | MMZ0603D800CT000 |
| 120                                   | $\pm 25\%$    | 1.40                              | 100                       | MMZ0603D121CT000 |
| 10                                    | $\pm 5\Omega$ | 0.50                              | 200                       | MMZ0603F100CT000 |
| 22                                    | $\pm 25\%$    | 1.00                              | 200                       | MMZ0603F220CT000 |
| 33                                    | $\pm 25\%$    | 1.30                              | 150                       | MMZ0603F330CT000 |

#### ○ Measurement equipment

| Measurement item | Product No.  | Manufacturer         |
|------------------|--------------|----------------------|
| Impedance        | E4991A+16197 | Agilent Technologies |
| DC resistance    | Type-7556    | Yokogawa             |

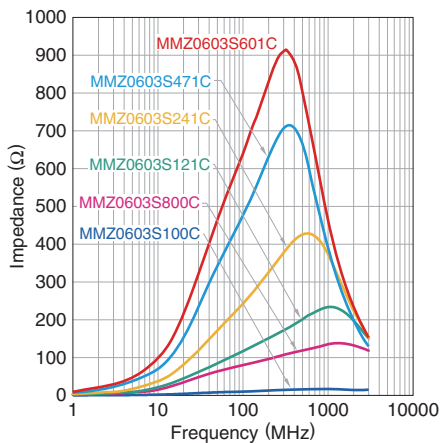
\* Equivalent measurement equipment may be used.

# MMZ series MMZ0603 Type

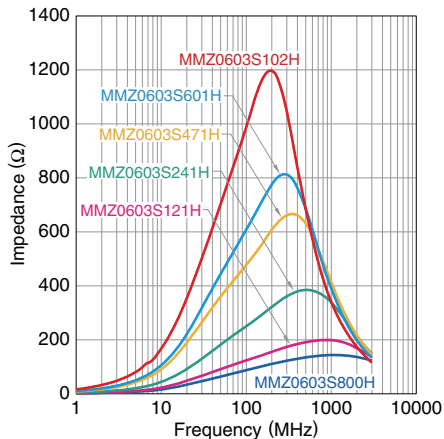
## ELECTRICAL CHARACTERISTICS

### Z VS. FREQUENCY CHARACTERISTICS (BY SERIES)

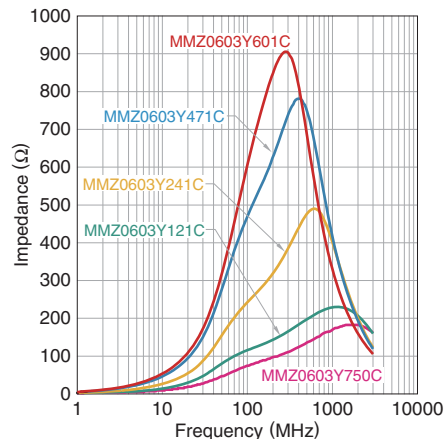
MMZ0603S-C SERIES



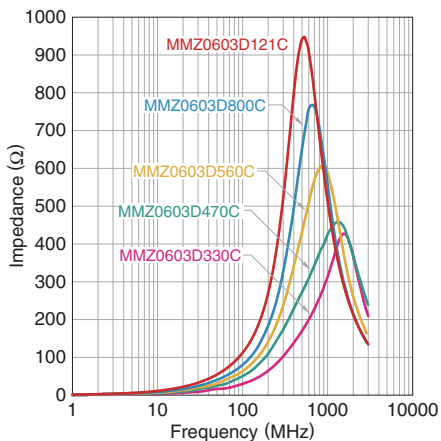
MMZ0603S-H SERIES



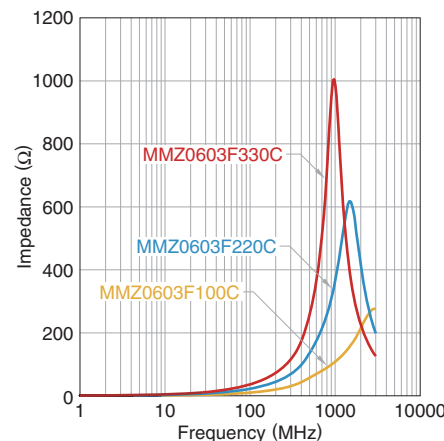
MMZ0603Y SERIES



MMZ0603D SERIES



MMZ0603F SERIES



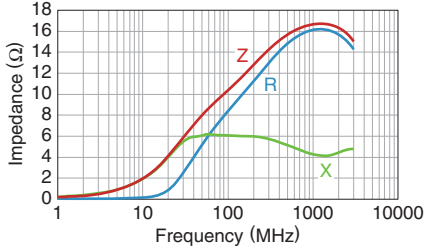
• All specifications are subject to change without notice.

# MMZ series MMZ0603 Type

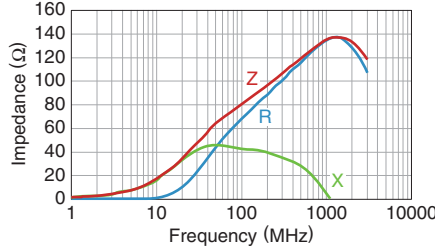
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

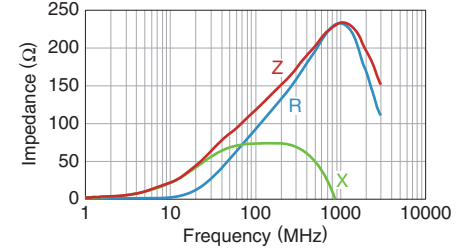
MMZ0603S100CT000



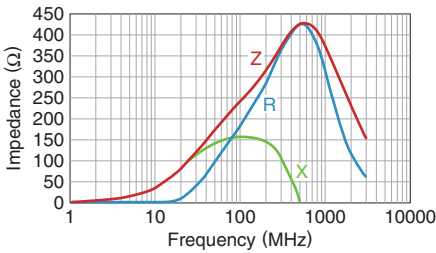
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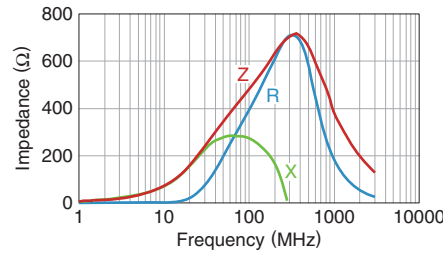
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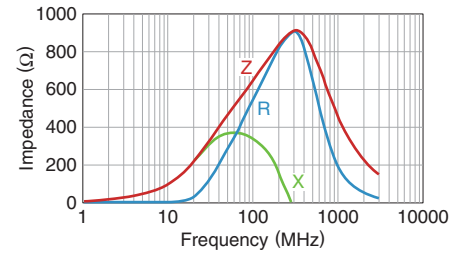
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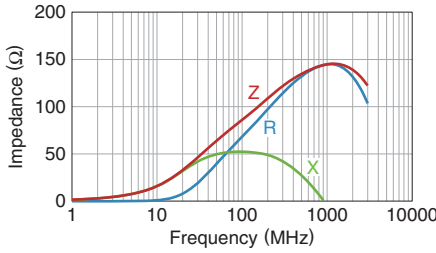
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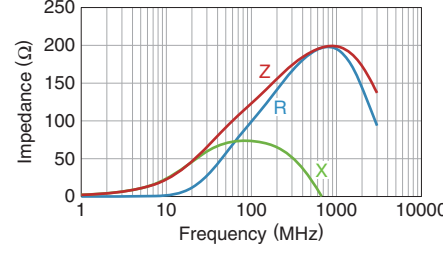
MMZ0603S601CT000



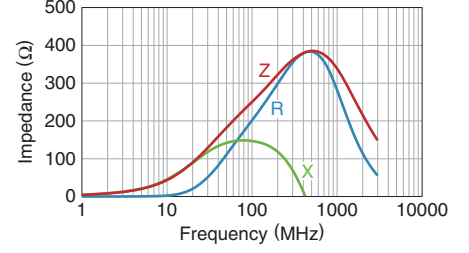
MMZ0603S800HT000



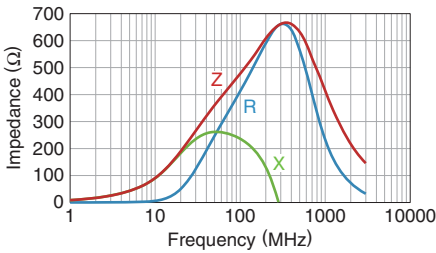
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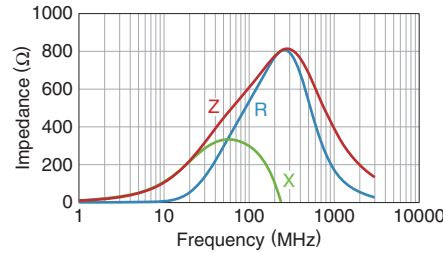
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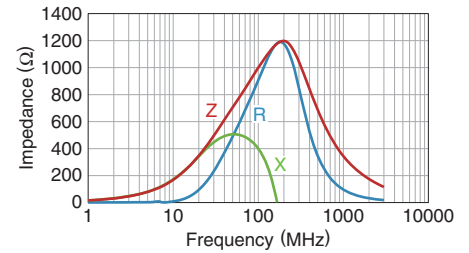
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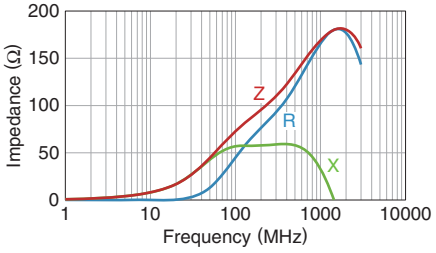
MMZ0603S601HT000



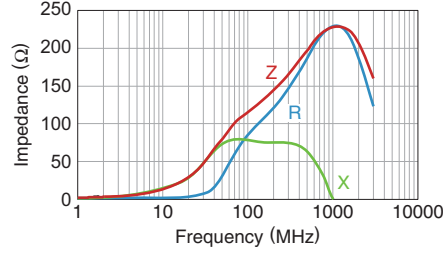
MMZ0603S102HT000



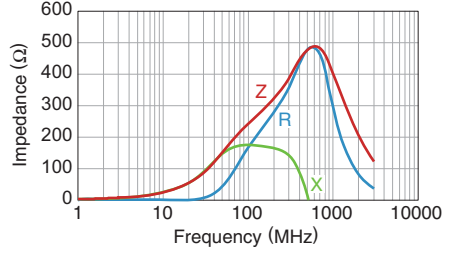
MMZ0603Y750CT000



MMZ0603Y121CT000



MMZ0603Y241CT000



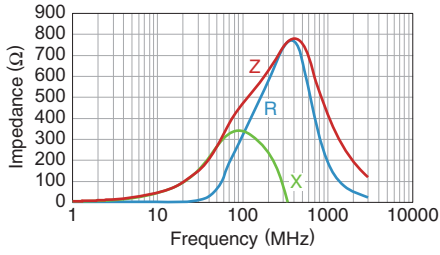
• All specifications are subject to change without notice.

# MMZ series MMZ0603 Type

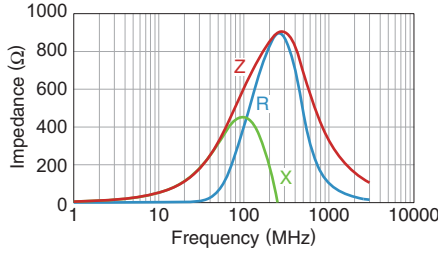
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

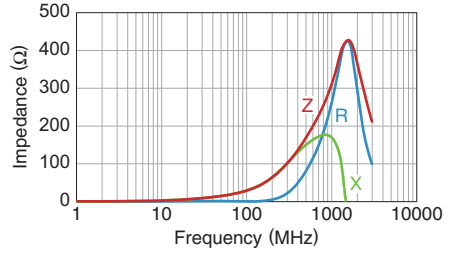
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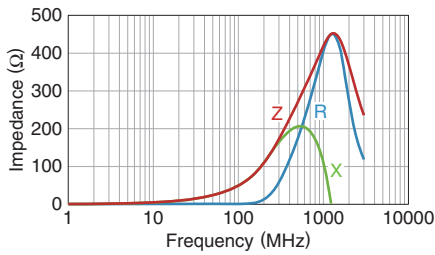
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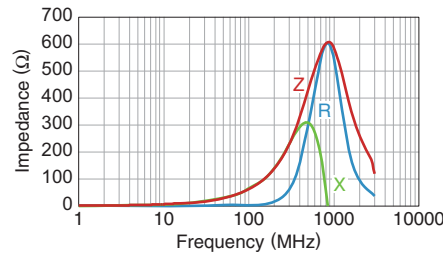
MMZ0603D330CT000



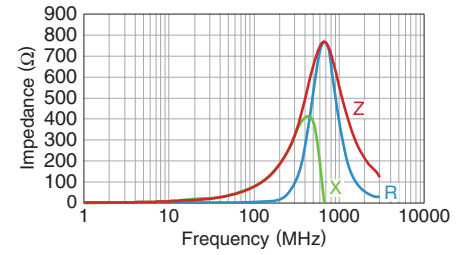
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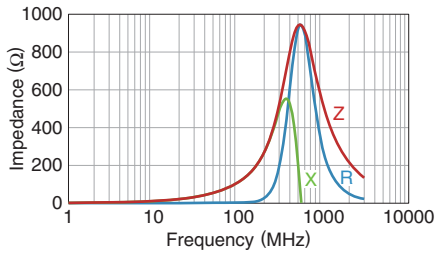
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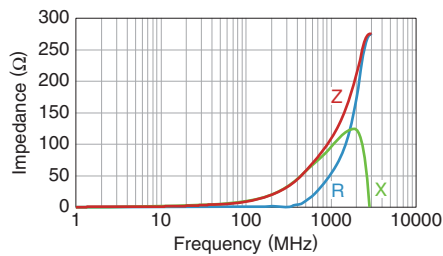
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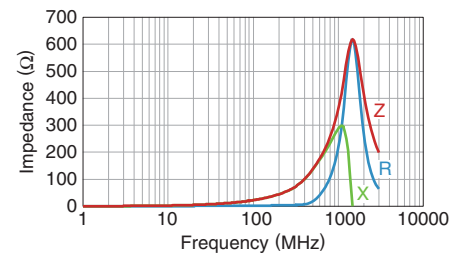
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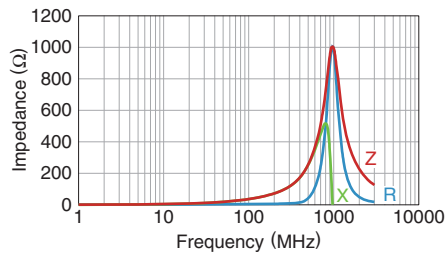
MMZ0603F100CT000



MMZ0603F220CT000



MMZ0603F330CT000



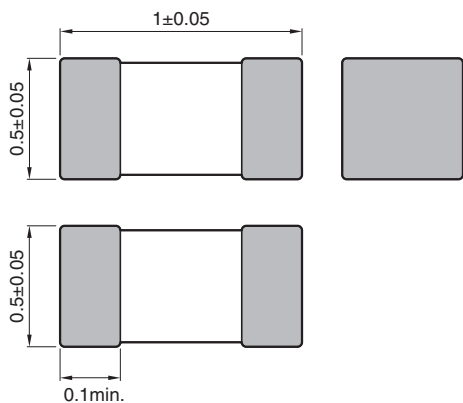
• All specifications are subject to change without notice.

MMZ series

# MMZ1005 Type

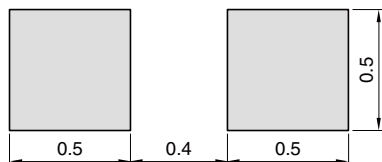


## SHAPE & DIMENSIONS



Dimensions in mm

## RECOMMENDED LAND PATTERN



Dimensions in mm

• All specifications are subject to change without notice.

# MMZ series MMZ1005 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

| Impedance<br>[100MHz]<br>( $\Omega$ ) | Tolerance     | DC resistance<br>( $\Omega$ )max. | Rated current<br>(mA)max. | Part No.         |
|---------------------------------------|---------------|-----------------------------------|---------------------------|------------------|
| 80                                    | $\pm 25\%$    | 0.19                              | 450                       | MMZ1005B800CT000 |
| 120                                   | $\pm 25\%$    | 0.25                              | 400                       | MMZ1005B121CT000 |
| 600                                   | $\pm 25\%$    | 0.85                              | 200                       | MMZ1005B601CT000 |
| 80                                    | $\pm 25\%$    | 0.12                              | 500                       | MMZ1005S800CT000 |
| 120                                   | $\pm 25\%$    | 0.22                              | 500                       | MMZ1005S121CT000 |
| 240                                   | $\pm 25\%$    | 0.28                              | 400                       | MMZ1005S241CT000 |
| 600                                   | $\pm 25\%$    | 0.52                              | 300                       | MMZ1005S601CT000 |
| 1000                                  | $\pm 25\%$    | 0.75                              | 200                       | MMZ1005S102CT000 |
| 40                                    | $\pm 25\%$    | 0.10                              | 550                       | MMZ1005Y400CT000 |
| 80                                    | $\pm 25\%$    | 0.17                              | 450                       | MMZ1005Y800CT000 |
| 120                                   | $\pm 25\%$    | 0.18                              | 400                       | MMZ1005Y121CT000 |
| 240                                   | $\pm 25\%$    | 0.26                              | 300                       | MMZ1005Y241CT000 |
| 300                                   | $\pm 25\%$    | 0.38                              | 250                       | MMZ1005Y301CT000 |
| 470                                   | $\pm 25\%$    | 0.47                              | 250                       | MMZ1005Y471CT000 |
| 600                                   | $\pm 25\%$    | 0.54                              | 250                       | MMZ1005Y601CT000 |
| 1000                                  | $\pm 25\%$    | 0.70                              | 200                       | MMZ1005Y102CT000 |
| 1500                                  | $\pm 25\%$    | 1.00                              | 100                       | MMZ1005Y152CT000 |
| 1800                                  | $\pm 25\%$    | 0.85                              | 150                       | MMZ1005Y182CT000 |
| 10                                    | $\pm 5\Omega$ | 0.10                              | 500                       | MMZ1005D100CT000 |
| 22                                    | $\pm 25\%$    | 0.17                              | 400                       | MMZ1005D220CT000 |
| 33                                    | $\pm 25\%$    | 0.24                              | 400                       | MMZ1005D330CT000 |
| 68                                    | $\pm 25\%$    | 0.38                              | 400                       | MMZ1005D680CT000 |
| 120                                   | $\pm 25\%$    | 0.60                              | 350                       | MMZ1005D121CT000 |
| 240                                   | $\pm 25\%$    | 0.90                              | 200                       | MMZ1005D241CT000 |
| 33                                    | $\pm 25\%$    | 0.50                              | 200                       | MMZ1005F330CT000 |
| 47                                    | $\pm 25\%$    | 0.60                              | 100                       | MMZ1005F470CT000 |
| 56                                    | $\pm 25\%$    | 0.70                              | 100                       | MMZ1005F560CT000 |

### Measurement equipment

| Measurement item | Product No.   | Manufacturer         |
|------------------|---------------|----------------------|
| Impedance        | E4991A+16192A | Agilent Technologies |
| DC resistance    | Type-7556     | Yokogawa             |

\* Equivalent measurement equipment may be used.

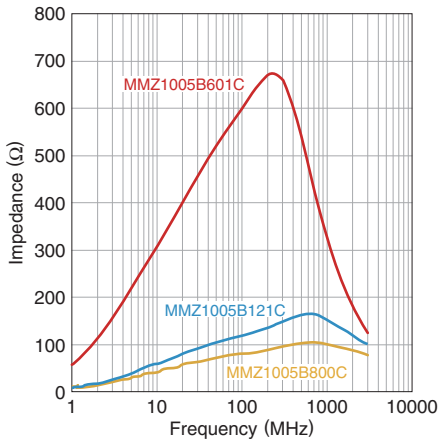


# MMZ series **MMZ1005 Type**

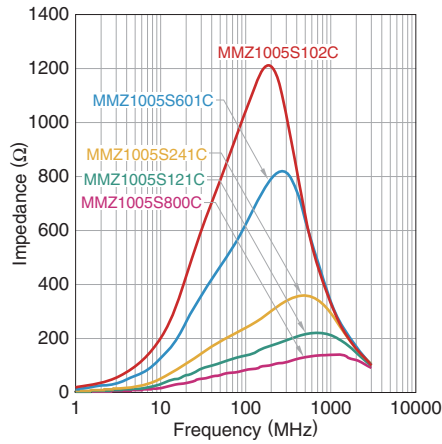
## ■ ELECTRICAL CHARACTERISTICS

### □ Z VS. FREQUENCY CHARACTERISTICS (BY SERIES)

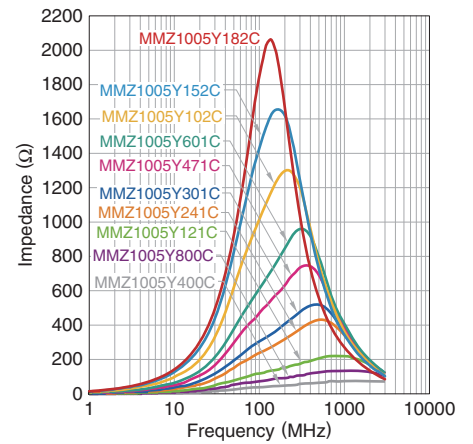
**MMZ1005B SERIES**



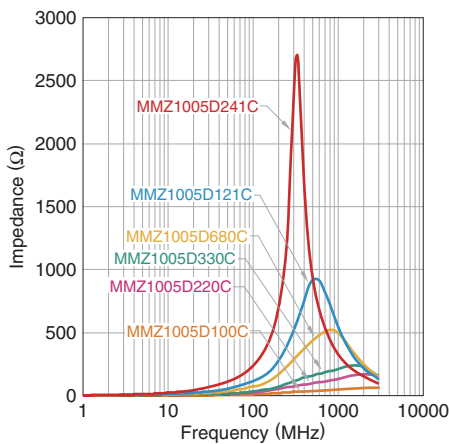
**MMZ1005S SERIES**



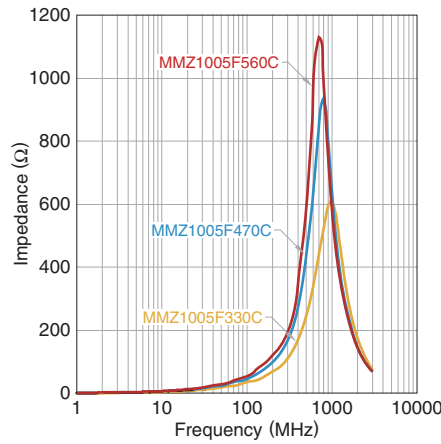
**MMZ1005Y SERIES**



**MMZ1005D SERIES**



**MMZ1005F SERIES**



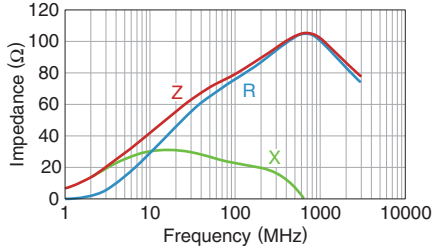
• All specifications are subject to change without notice.

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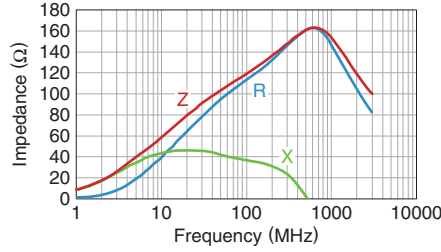
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

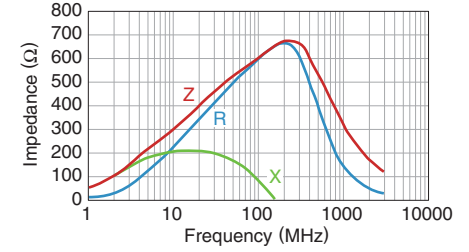
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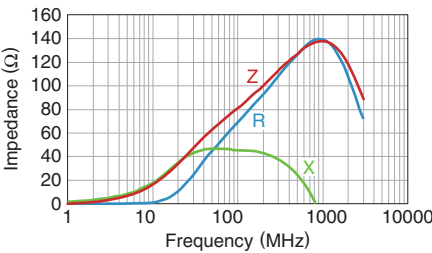
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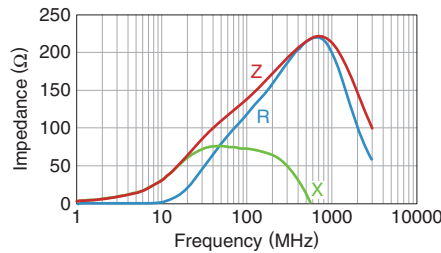
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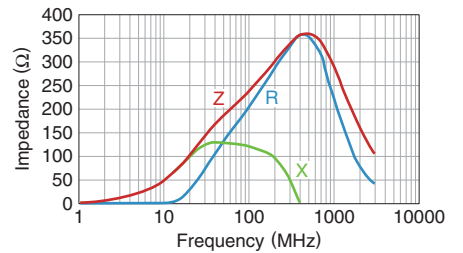
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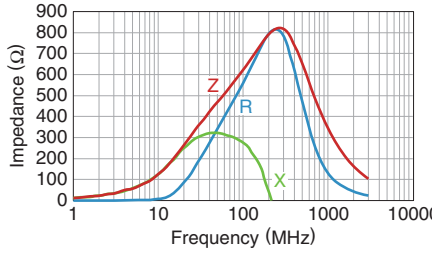
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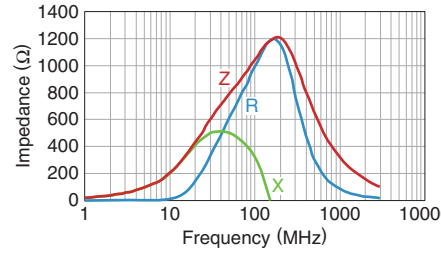
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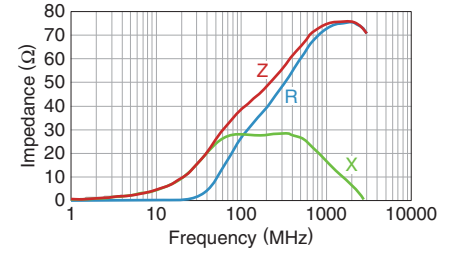
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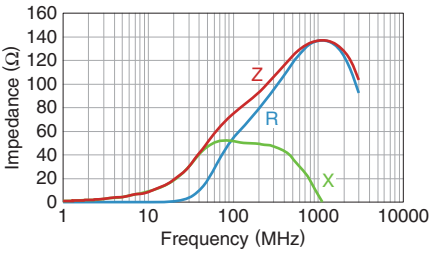
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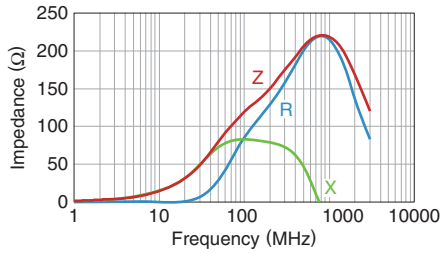
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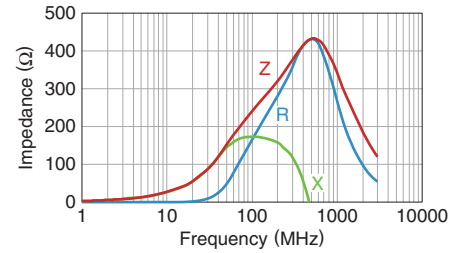
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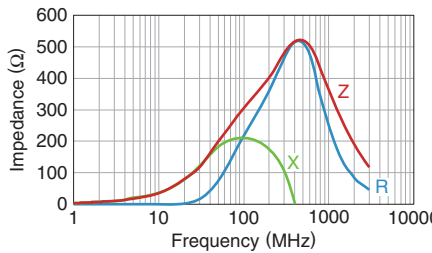
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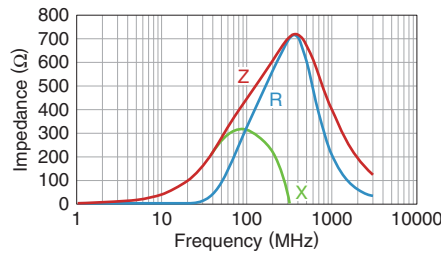
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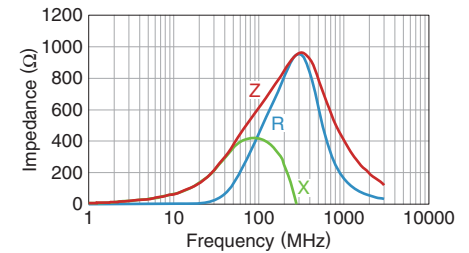
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MMZ1005Y471CT000



MMZ1005Y601CT000



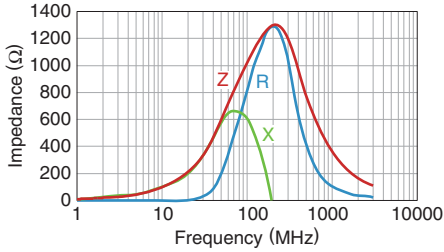
• All specifications are subject to change without notice.

# MMZ series MMZ1005 Type

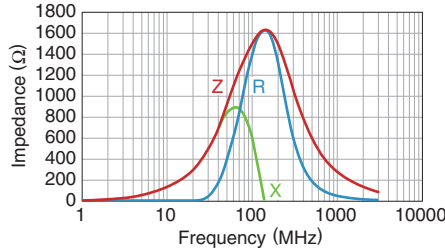
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

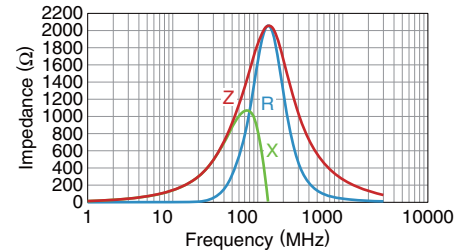
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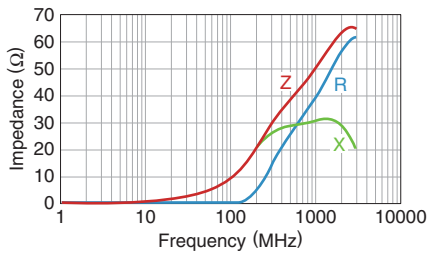
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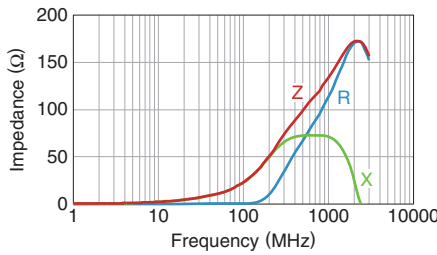
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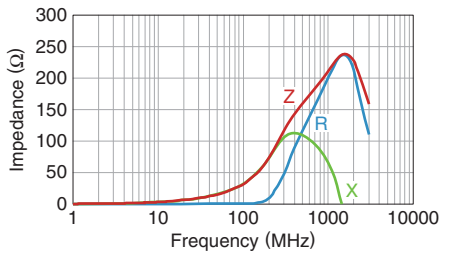
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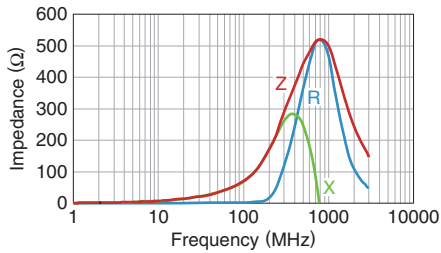
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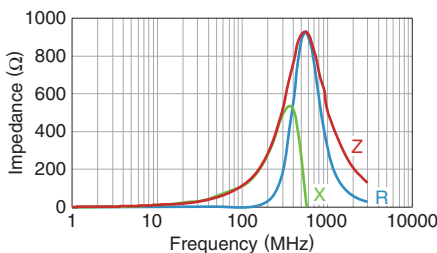
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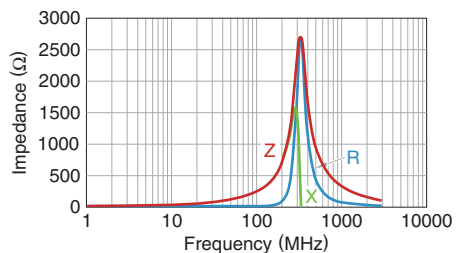
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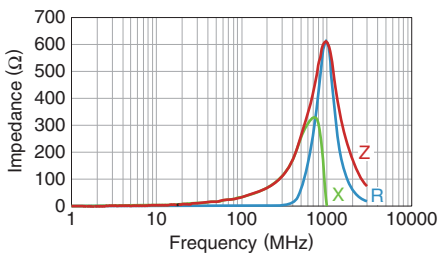
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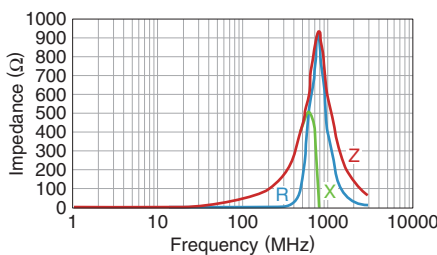
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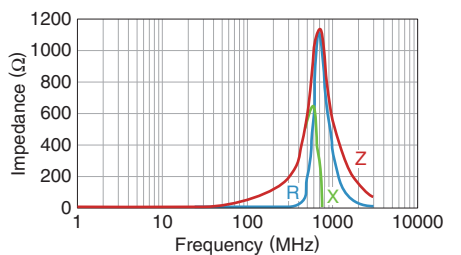
MMZ1005F330CT000



MMZ1005F470CT000



MMZ1005F560CT000



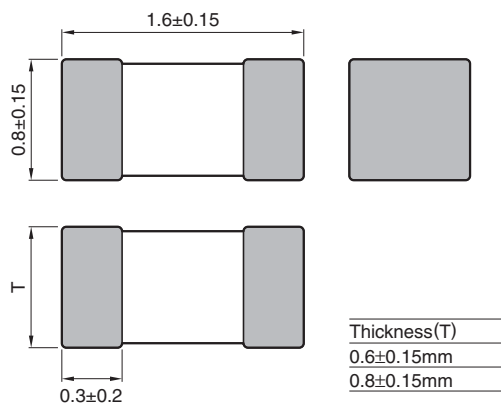
• All specifications are subject to change without notice.

MMZ series

# MMZ1608 Type

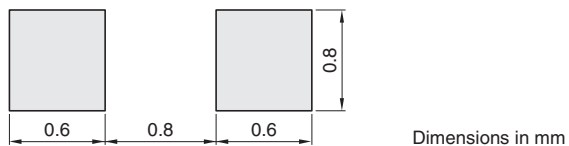


## SHAPE & DIMENSIONS



Dimensions in mm

## RECOMMENDED LAND PATTERN



Dimensions in mm

• All specifications are subject to change without notice.

# MMZ series MMZ1608 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

| Impedance<br>[100MHz]<br>(Ω) | Tolerance | DC resistance<br>(Ω)max. | Rated current<br>(mA)max. | Thickness T<br>(mm) | Part No.         |
|------------------------------|-----------|--------------------------|---------------------------|---------------------|------------------|
|                              |           |                          |                           |                     |                  |
| 120                          | ±25%      | 0.15                     | 600                       | 0.6                 | MMZ1608B121CTAH0 |
| 220                          | ±25%      | 0.25                     | 500                       | 0.6                 | MMZ1608B221CTAH0 |
| 300                          | ±25%      | 0.25                     | 500                       | 0.6                 | MMZ1608B301CTAH0 |
| 470                          | ±25%      | 0.30                     | 500                       | 0.6                 | MMZ1608B471CTAH0 |
| 600                          | ±25%      | 0.40                     | 500                       | 0.6                 | MMZ1608B601CTAH0 |
| 1000                         | ±25%      | 0.60                     | 300                       | 0.8                 | MMZ1608B102CTA00 |
| 15                           | ±25%      | 0.05                     | 1500                      | 0.8                 | MMZ1608R150ATA00 |
| 30                           | ±25%      | 0.05                     | 1500                      | 0.8                 | MMZ1608R300ATA00 |
| 60                           | ±25%      | 0.10                     | 800                       | 0.8                 | MMZ1608R600ATA00 |
| 120                          | ±25%      | 0.18                     | 500                       | 0.8                 | MMZ1608R121ATA00 |
| 300                          | ±25%      | 0.25                     | 500                       | 0.8                 | MMZ1608R301ATA00 |
| 470                          | ±25%      | 0.30                     | 500                       | 0.8                 | MMZ1608R471ATA00 |
| 600                          | ±25%      | 0.40                     | 500                       | 0.8                 | MMZ1608R601ATA00 |
| 1000                         | ±25%      | 0.50                     | 400                       | 0.8                 | MMZ1608R102ATA00 |
| 40                           | ±25%      | 0.10                     | 600                       | 0.8                 | MMZ1608S400ATA00 |
| 80                           | ±25%      | 0.15                     | 500                       | 0.8                 | MMZ1608S800ATA00 |
| 120                          | ±25%      | 0.15                     | 500                       | 0.8                 | MMZ1608S121ATA00 |
| 180                          | ±25%      | 0.20                     | 500                       | 0.8                 | MMZ1608S181ATA00 |
| 220                          | ±25%      | 0.20                     | 500                       | 0.8                 | MMZ1608S221ATA00 |
| 300                          | ±25%      | 0.30                     | 500                       | 0.8                 | MMZ1608S301ATA00 |
| 470                          | ±25%      | 0.30                     | 500                       | 0.8                 | MMZ1608S471ATA00 |
| 600                          | ±25%      | 0.35                     | 500                       | 0.8                 | MMZ1608S601ATA00 |
| 1000                         | ±25%      | 0.50                     | 400                       | 0.8                 | MMZ1608S102ATA00 |
| 2000                         | ±25%      | 0.90                     | 200                       | 0.8                 | MMZ1608S202ATA00 |
| 15                           | ±25%      | 0.05                     | 1500                      | 0.8                 | MMZ1608Y150BTA00 |
| 30                           | ±25%      | 0.05                     | 1500                      | 0.8                 | MMZ1608Y300BTA00 |
| 60                           | ±25%      | 0.15                     | 500                       | 0.8                 | MMZ1608Y600BTA00 |
| 120                          | ±25%      | 0.20                     | 500                       | 0.8                 | MMZ1608Y121BTA00 |
| 220                          | ±25%      | 0.30                     | 500                       | 0.8                 | MMZ1608Y221BTA00 |
| 300                          | ±25%      | 0.30                     | 500                       | 0.8                 | MMZ1608Y301BTA00 |
| 470                          | ±25%      | 0.35                     | 500                       | 0.8                 | MMZ1608Y471BTA00 |
| 600                          | ±25%      | 0.40                     | 500                       | 0.8                 | MMZ1608Y601BTA00 |
| 750                          | ±25%      | 0.45                     | 500                       | 0.8                 | MMZ1608Y751BTA00 |
| 1000                         | ±25%      | 0.50                     | 400                       | 0.8                 | MMZ1608Y102BTA00 |
| 1500                         | ±25%      | 0.60                     | 300                       | 0.8                 | MMZ1608Y152BTA00 |
| 1800                         | ±25%      | 0.80                     | 200                       | 0.8                 | MMZ1608A182BTA00 |
| 2200                         | ±25%      | 0.80                     | 200                       | 0.8                 | MMZ1608A222BTA00 |
| 2500                         | ±25%      | 0.80                     | 200                       | 0.8                 | MMZ1608A252BTA00 |
| 120                          | ±25%      | 0.30                     | 500                       | 0.8                 | MMZ1608Q121BTA00 |
| 220                          | ±25%      | 0.40                     | 500                       | 0.8                 | MMZ1608Q221BTA00 |
| 330                          | ±25%      | 0.50                     | 400                       | 0.8                 | MMZ1608Q331BTA00 |
| 470                          | ±25%      | 0.70                     | 300                       | 0.8                 | MMZ1608Q471BTA00 |
| 600                          | ±25%      | 0.80                     | 200                       | 0.8                 | MMZ1608Q601BTA00 |
| 1000                         | ±25%      | 1.00                     | 200                       | 0.8                 | MMZ1608Q102BTA00 |

#### ○ Measurement equipment

| Measurement item | Product No.   | Manufacturer         |
|------------------|---------------|----------------------|
| Impedance        | E4991A+16192A | Agilent Technologies |
| DC resistance    | Type-7556     | Yokogawa             |

\* Equivalent measurement equipment may be used.

# MMZ series **MMZ1608 Type**

## ■ ELECTRICAL CHARACTERISTICS

### □ CHARACTERISTICS SPECIFICATION TABLE

| Impedance<br>[100MHz]<br>( $\Omega$ ) | Tolerance     | DC resistance<br>( $\Omega$ )max. | Rated current<br>(mA)max. | Thickness T<br>(mm) | Part No.         |
|---------------------------------------|---------------|-----------------------------------|---------------------------|---------------------|------------------|
| 5                                     | $\pm 2\Omega$ | 0.05                              | 700                       | 0.8                 | MMZ1608D050CTA00 |
| 10                                    | $\pm 5\Omega$ | 0.10                              | 500                       | 0.6                 | MMZ1608D100CTAH0 |
| 22                                    | $\pm 25\%$    | 0.20                              | 500                       | 0.6                 | MMZ1608D220CTAH0 |
| 50                                    | $\pm 25\%$    | 0.25                              | 500                       | 0.6                 | MMZ1608D500CTAH0 |
| 80                                    | $\pm 25\%$    | 0.30                              | 500                       | 0.6                 | MMZ1608D800CTAH0 |
| 80                                    | $\pm 25\%$    | 0.30                              | 500                       | 0.8                 | MMZ1608D800BTA00 |
| 120                                   | $\pm 25\%$    | 0.30                              | 400                       | 0.6                 | MMZ1608D121CTAH0 |
| 120                                   | $\pm 25\%$    | 0.30                              | 400                       | 0.8                 | MMZ1608D121BTA00 |
| 240                                   | $\pm 25\%$    | 0.60                              | 300                       | 0.8                 | MMZ1608D241CTA00 |
| 300                                   | $\pm 25\%$    | 0.70                              | 300                       | 0.8                 | MMZ1608D301BTA00 |
| 3typ.                                 |               | 0.05                              | 700                       | 0.8                 | MMZ1608F030BTA00 |
| 47                                    | $\pm 25\%$    | 0.40                              | 500                       | 0.8                 | MMZ1608F470BTA00 |
| 75                                    | $\pm 25\%$    | 0.55                              | 300                       | 0.8                 | MMZ1608F750BTA00 |
| 120                                   | $\pm 25\%$    | 0.75                              | 200                       | 0.8                 | MMZ1608F121BTA00 |

### ○ Measurement equipment

| Measurement item | Product No.   | Manufacturer         |
|------------------|---------------|----------------------|
| Impedance        | E4991A+16192A | Agilent Technologies |
| DC resistance    | Type-7556     | Yokogawa             |

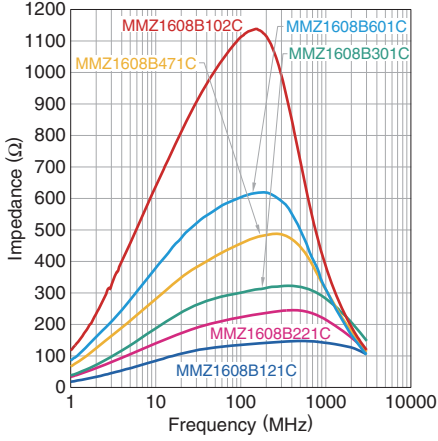
\* Equivalent measurement equipment may be used.

# MMZ series MMZ1608 Type

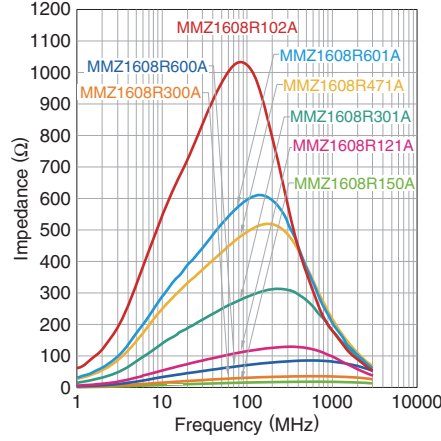
## ELECTRICAL CHARACTERISTICS

### Z VS. FREQUENCY CHARACTERISTICS (BY SERIES)

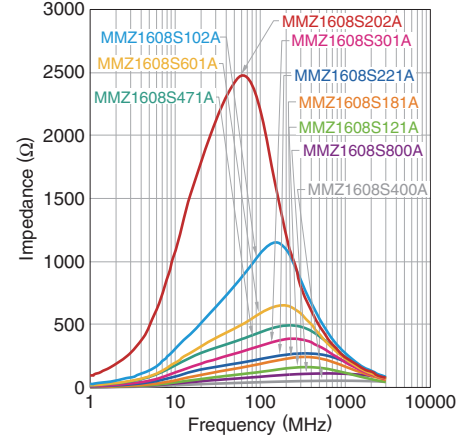
MMZ1608B SERIES



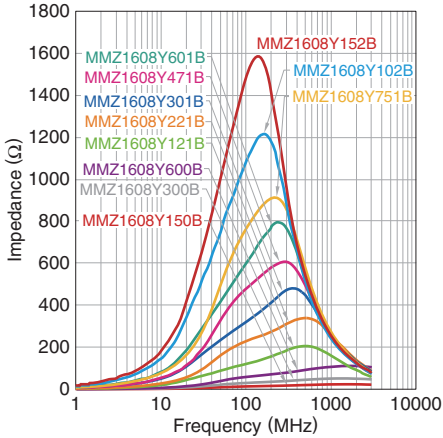
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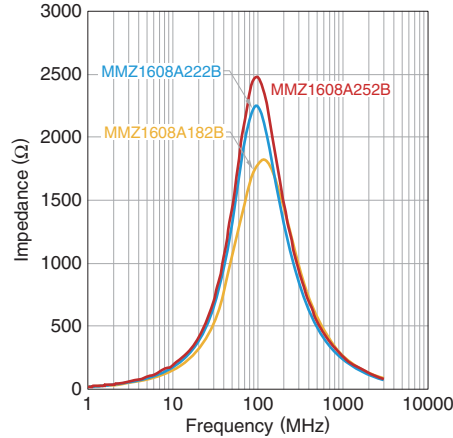
MMZ1608S SERIES



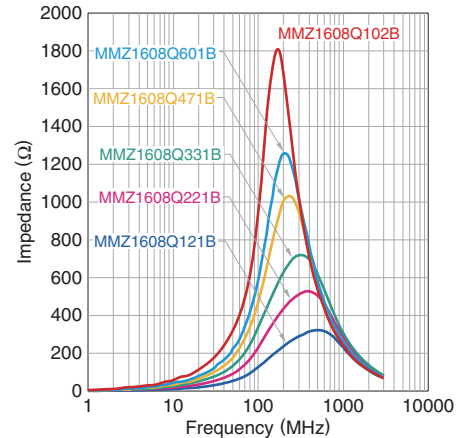
MMZ1608Y SERIES



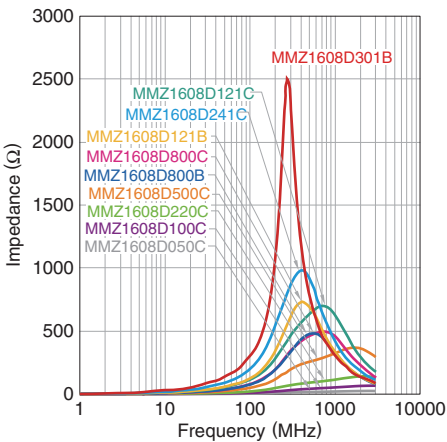
MMZ1608A SERIES



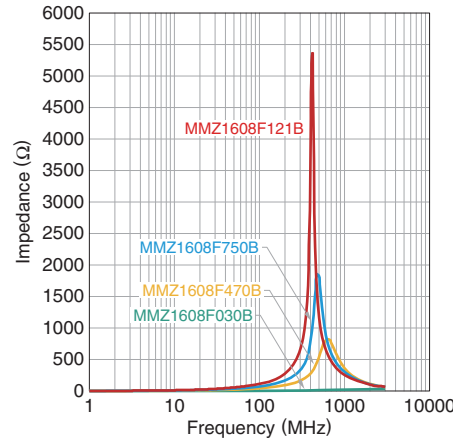
MMZ1608Q SERIES



MMZ1608D SERIES



MMZ1608F SERIES



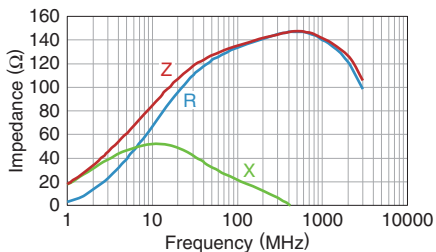
• All specifications are subject to change without notice.

# MMZ series MMZ1608 Type

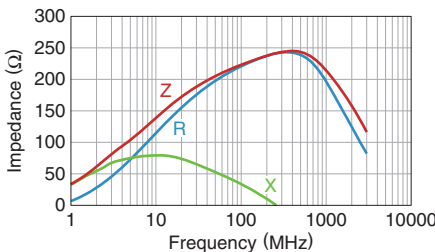
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

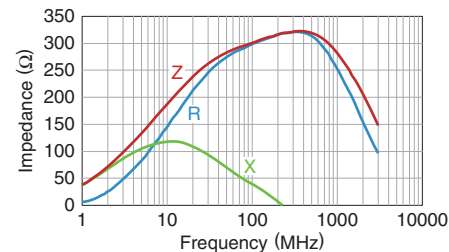
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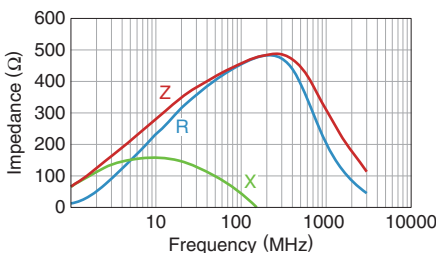
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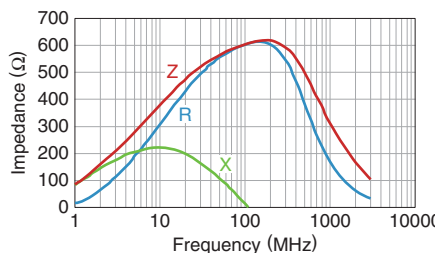
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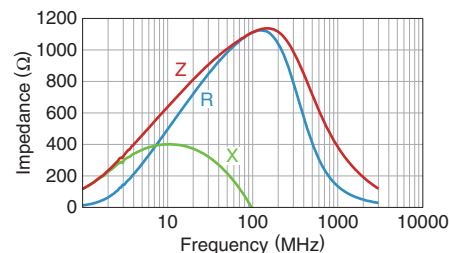
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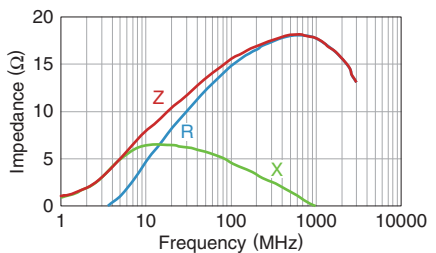
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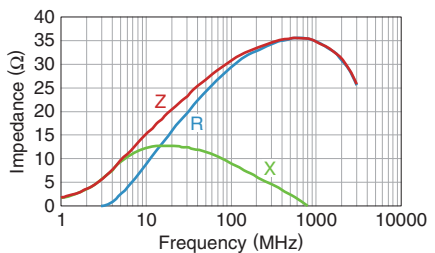
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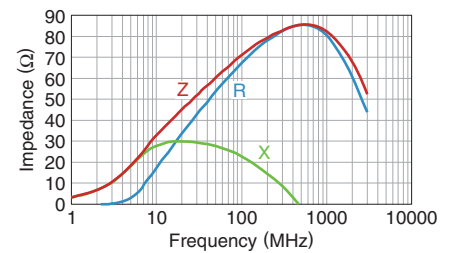
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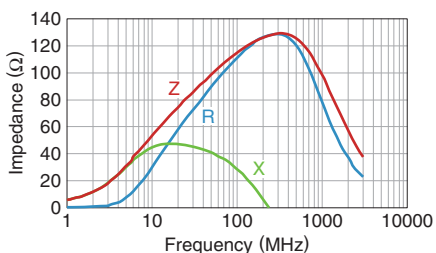
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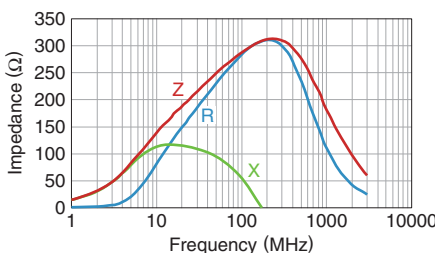
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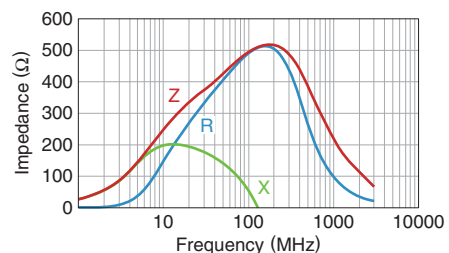
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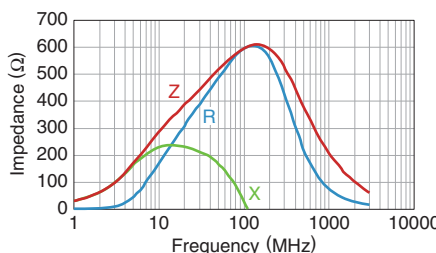
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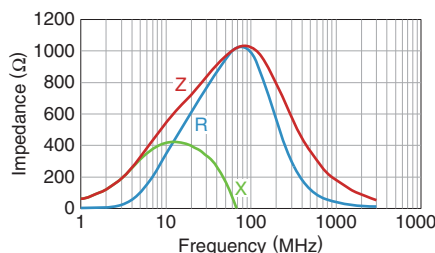
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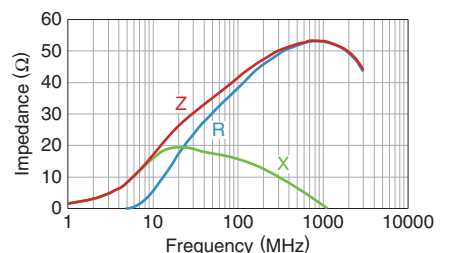
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MMZ1608R102ATA00



MMZ1608S400ATA00



• All specifications are subject to change without notice.

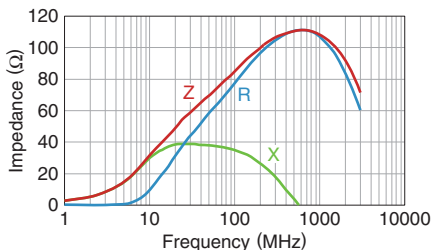


# MMZ series MMZ1608 Type

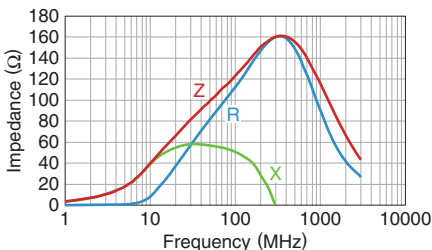
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

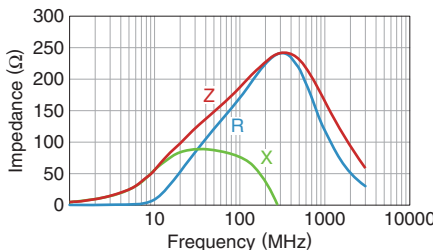
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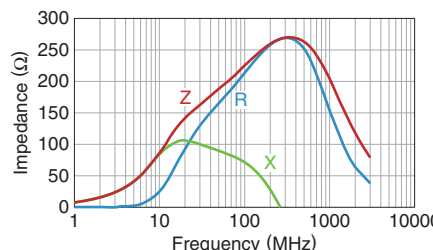
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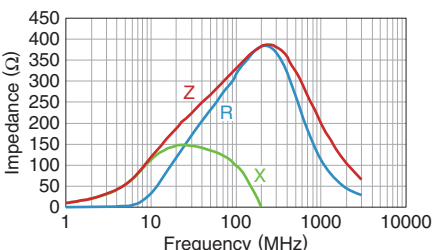
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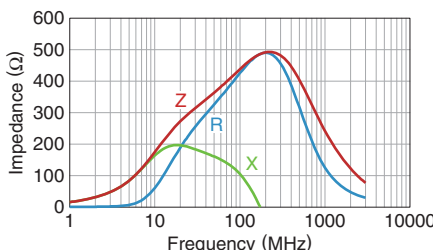
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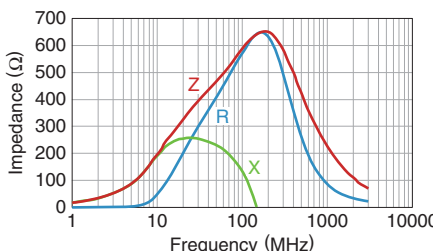
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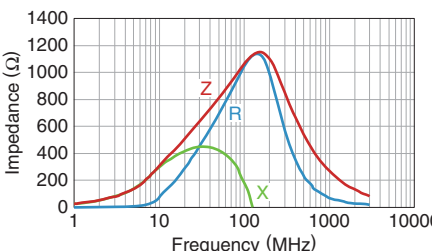
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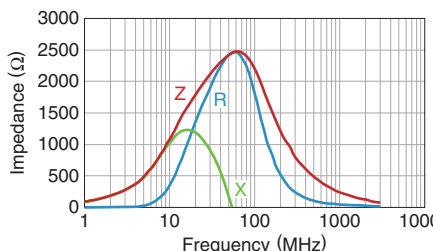
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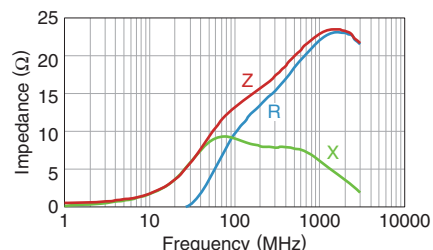
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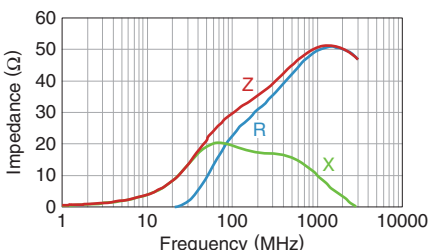
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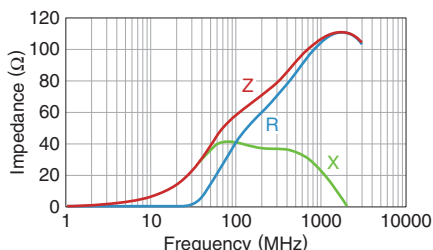
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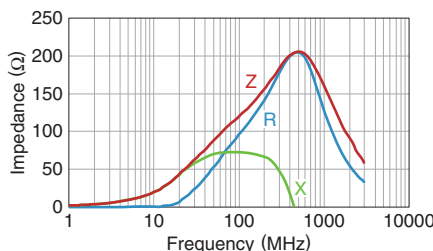
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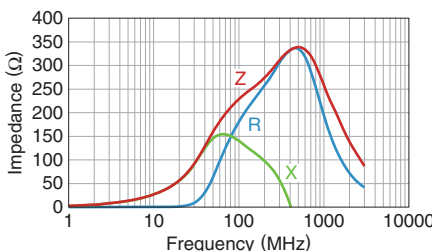
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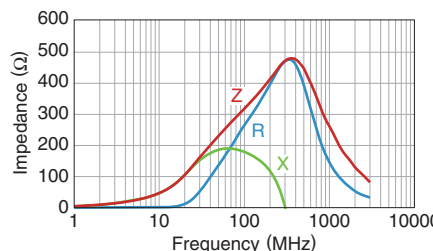
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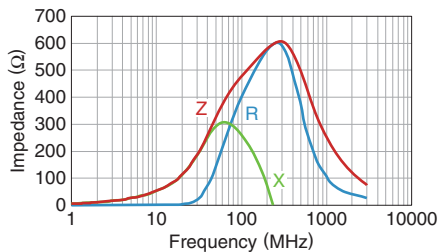
• All specifications are subject to change without notice.

# MMZ series MMZ1608 Type

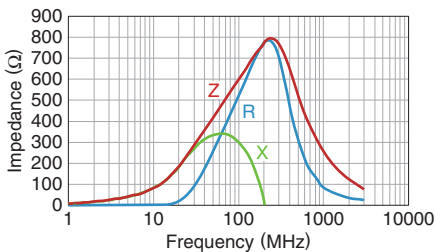
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

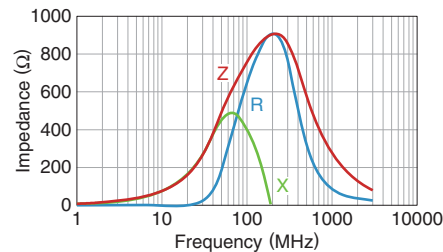
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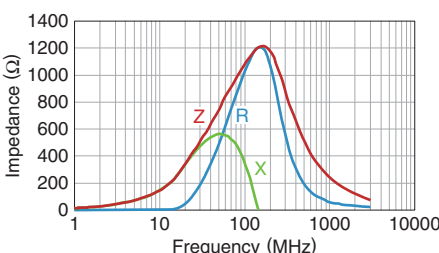
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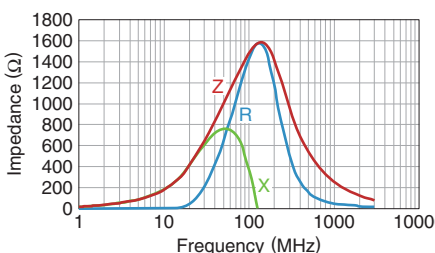
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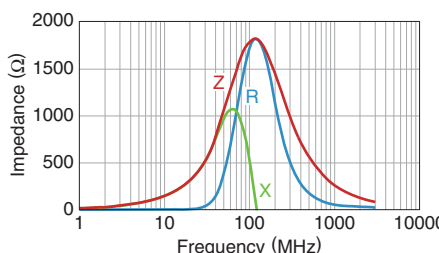
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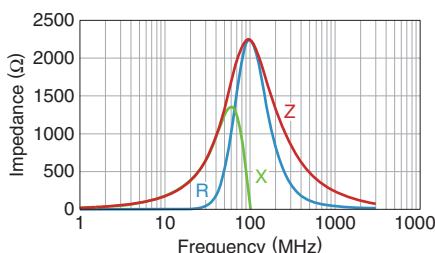
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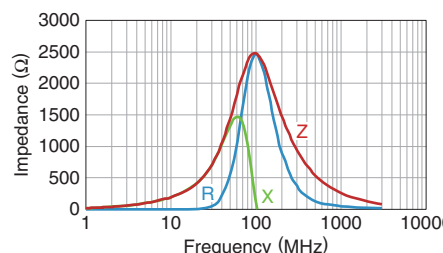
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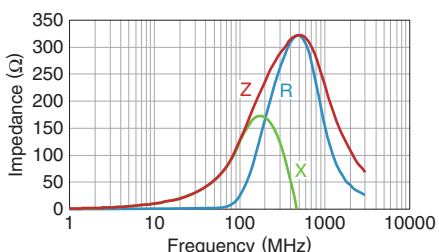
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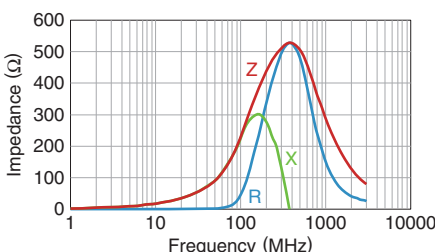
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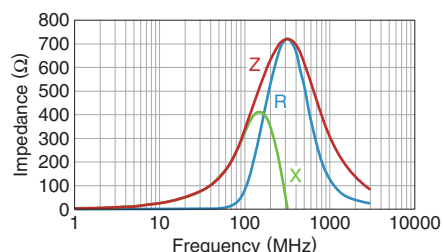
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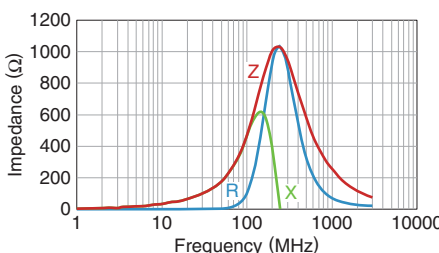
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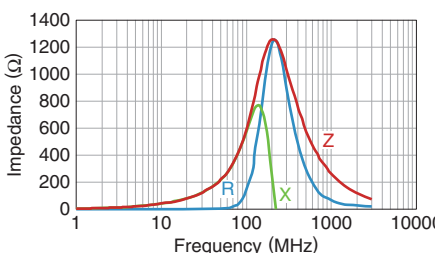
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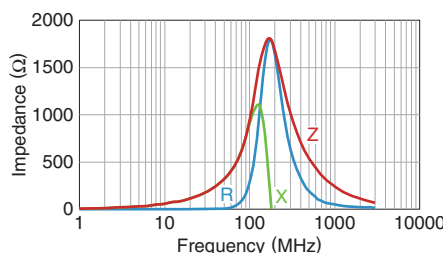
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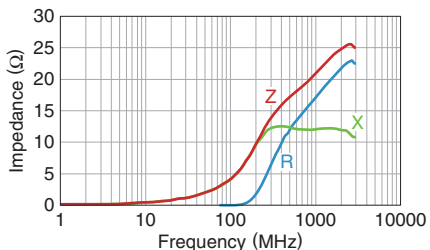
• All specifications are subject to change without notice.

# MMZ series **MMZ1608 Type**

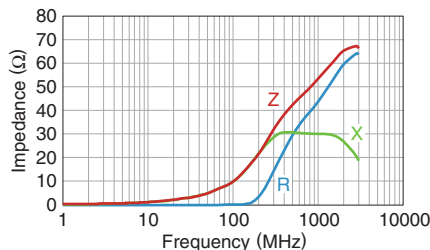
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

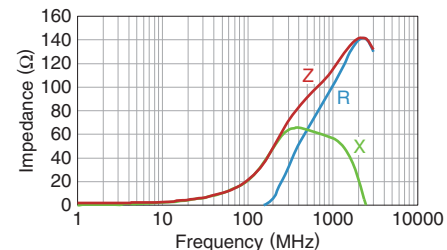
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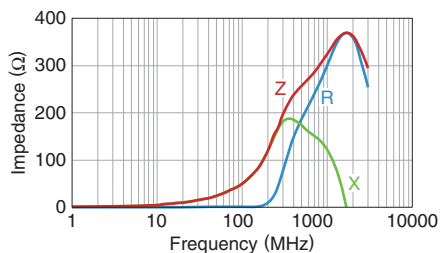
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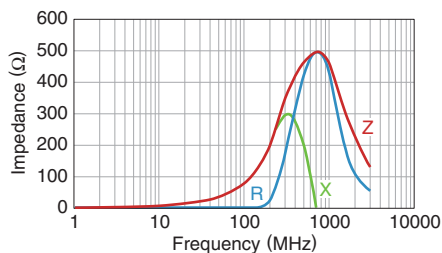
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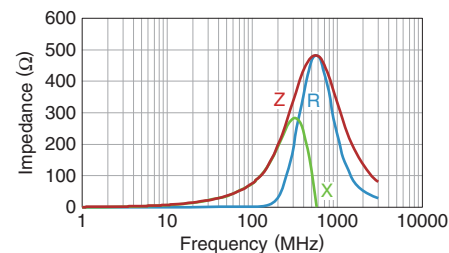
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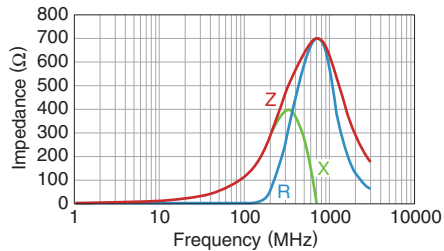
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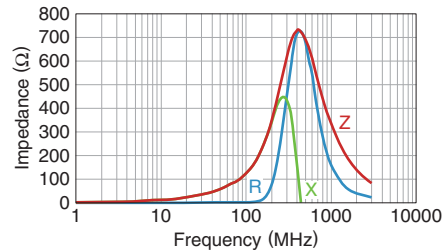
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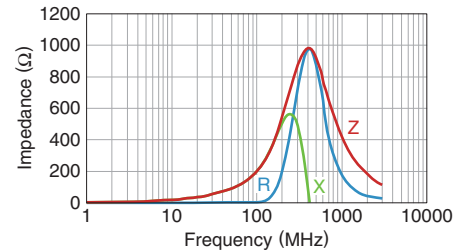
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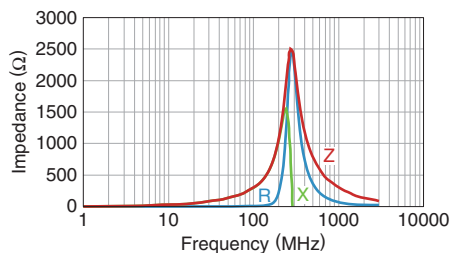
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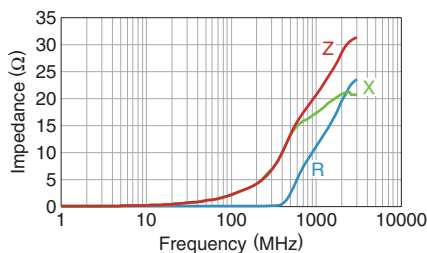
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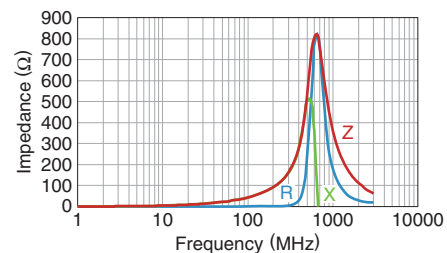
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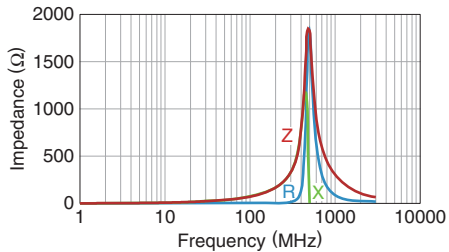
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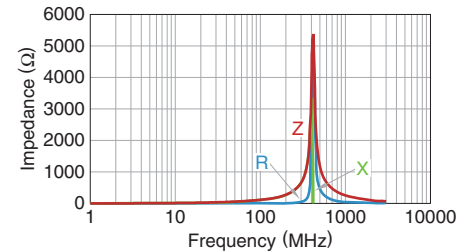
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**MMZ1608F750BTA00**



**MMZ1608F121BTA00**



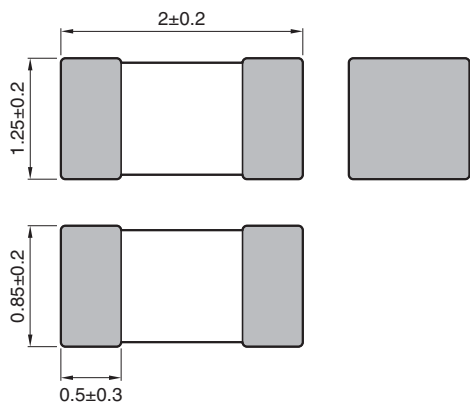
• All specifications are subject to change without notice.

MMZ series

# MMZ2012 Type



## SHAPE & DIMENSIONS



Dimensions in mm

## RECOMMENDED LAND PATTERN



Dimensions in mm

• All specifications are subject to change without notice.

# MMZ series MMZ2012 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

| Impedance<br>[100MHz]<br>( $\Omega$ ) | Tolerance  | DC resistance<br>( $\Omega$ )max. | Rated current<br>(mA)max. | Part No.         |
|---------------------------------------|------------|-----------------------------------|---------------------------|------------------|
| 15                                    | $\pm 25\%$ | 0.05                              | 1500                      | MMZ2012R150AT000 |
| 30                                    | $\pm 25\%$ | 0.05                              | 1500                      | MMZ2012R300AT000 |
| 60                                    | $\pm 25\%$ | 0.10                              | 1000                      | MMZ2012R600AT000 |
| 120                                   | $\pm 25\%$ | 0.12                              | 800                       | MMZ2012R121AT000 |
| 300                                   | $\pm 25\%$ | 0.15                              | 600                       | MMZ2012R301AT000 |
| 600                                   | $\pm 25\%$ | 0.20                              | 500                       | MMZ2012R601AT000 |
| 1000                                  | $\pm 25\%$ | 0.30                              | 500                       | MMZ2012R102AT000 |
| 40                                    | $\pm 25\%$ | 0.10                              | 1000                      | MMZ2012S400AT000 |
| 80                                    | $\pm 25\%$ | 0.10                              | 800                       | MMZ2012S800AT000 |
| 120                                   | $\pm 25\%$ | 0.15                              | 800                       | MMZ2012S121AT000 |
| 180                                   | $\pm 25\%$ | 0.15                              | 600                       | MMZ2012S181AT000 |
| 300                                   | $\pm 25\%$ | 0.20                              | 600                       | MMZ2012S301AT000 |
| 600                                   | $\pm 25\%$ | 0.30                              | 500                       | MMZ2012S601AT000 |
| 1000                                  | $\pm 25\%$ | 0.35                              | 500                       | MMZ2012S102AT000 |
| 15                                    | $\pm 25\%$ | 0.05                              | 1500                      | MMZ2012Y150BT000 |
| 30                                    | $\pm 25\%$ | 0.05                              | 1500                      | MMZ2012Y300BT000 |
| 60                                    | $\pm 25\%$ | 0.10                              | 1000                      | MMZ2012Y600BT000 |
| 120                                   | $\pm 25\%$ | 0.12                              | 800                       | MMZ2012Y121BT000 |
| 300                                   | $\pm 25\%$ | 0.15                              | 600                       | MMZ2012Y301BT000 |
| 600                                   | $\pm 25\%$ | 0.20                              | 500                       | MMZ2012Y601BT000 |
| 1000                                  | $\pm 25\%$ | 0.30                              | 500                       | MMZ2012Y102BT000 |
| 1500                                  | $\pm 25\%$ | 0.40                              | 500                       | MMZ2012Y152BT000 |
| 2000                                  | $\pm 25\%$ | 0.50                              | 400                       | MMZ2012Y202BT000 |
| 80                                    | $\pm 25\%$ | 0.30                              | 500                       | MMZ2012D800BT000 |
| 120                                   | $\pm 25\%$ | 0.30                              | 500                       | MMZ2012D121BT000 |
| 300                                   | $\pm 25\%$ | 0.50                              | 400                       | MMZ2012D301BT000 |

#### Measurement equipment

| Measurement item | Product No.   | Manufacturer         |
|------------------|---------------|----------------------|
| Impedance        | E4991A+16192A | Agilent Technologies |
| DC resistance    | Type-7556     | Yokogawa             |

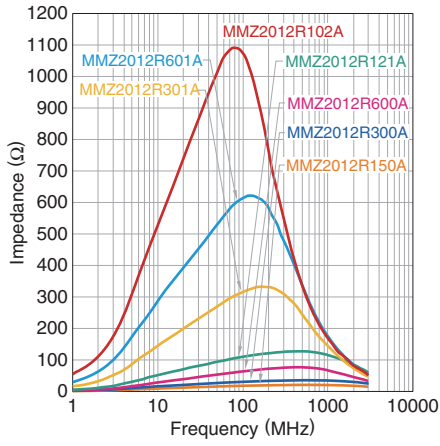
\* Equivalent measurement equipment may be used.

# MMZ series MMZ2012 Type

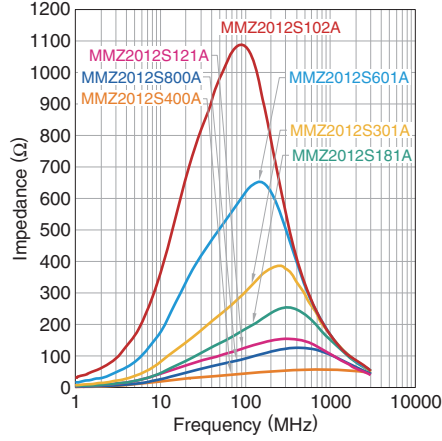
## ELECTRICAL CHARACTERISTICS

### Z VS. FREQUENCY CHARACTERISTICS (BY SERIES)

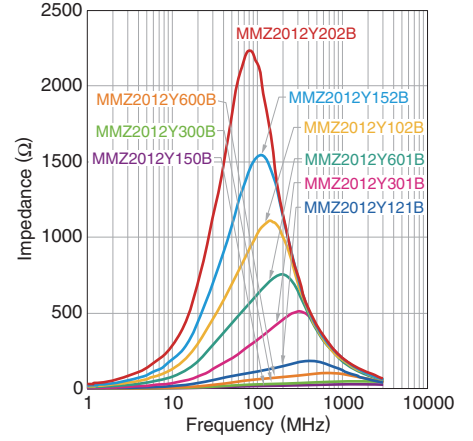
MMZ2012R SERIES



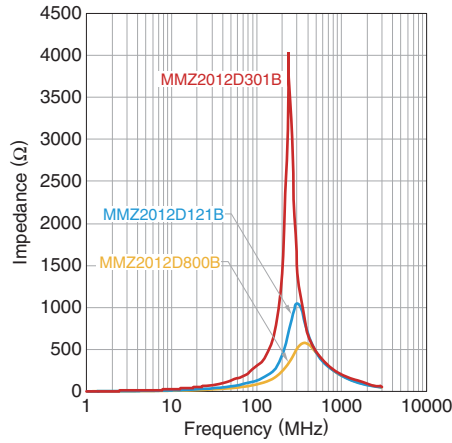
MMZ2012S SERIES



MMZ2012Y SERIES



MMZ2012D SERIES



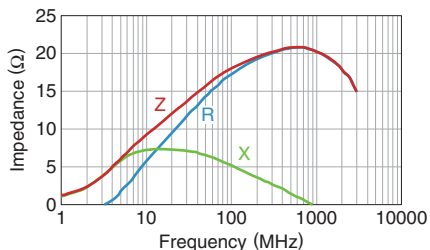
• All specifications are subject to change without notice.

# MMZ series **MMZ2012 Type**

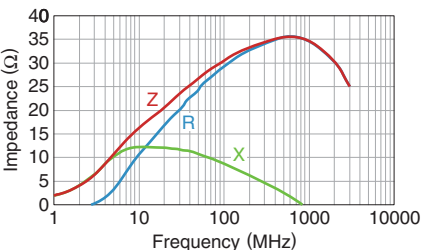
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

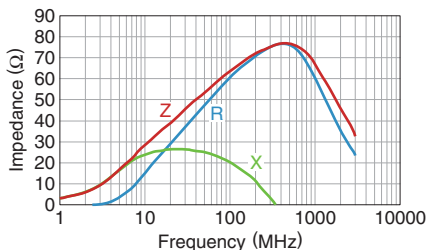
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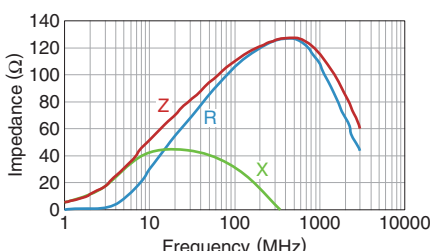
**MMZ2012R300AT000**



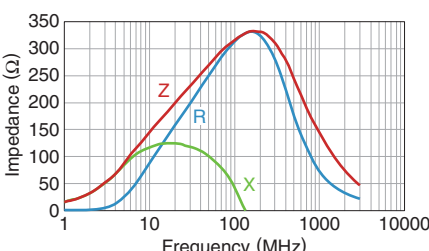
**MMZ2012R600AT000**



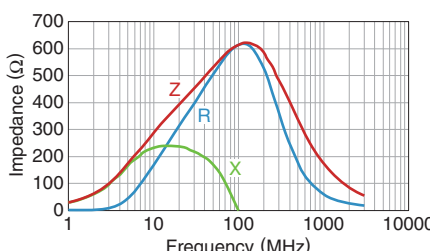
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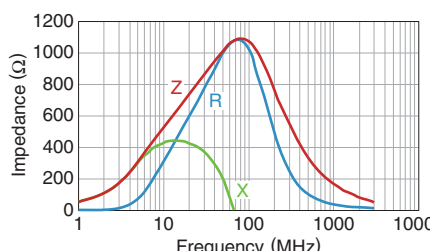
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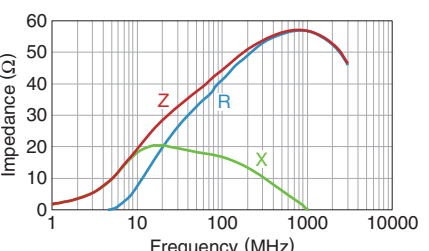
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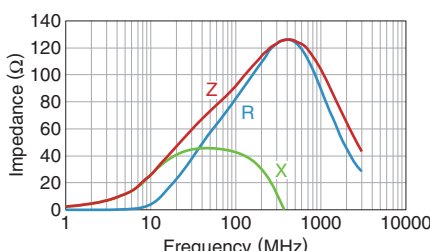
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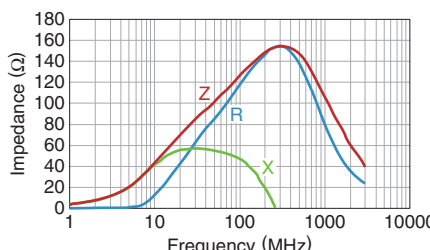
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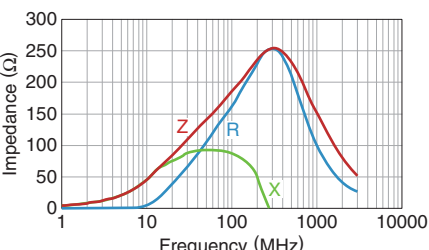
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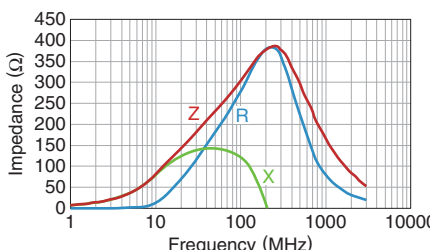
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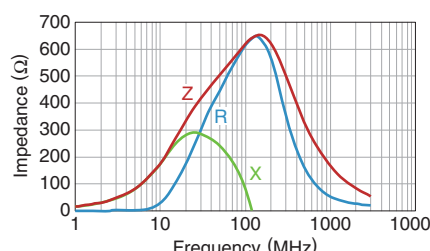
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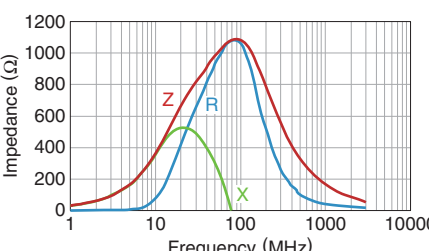
**MMZ2012S301AT000**



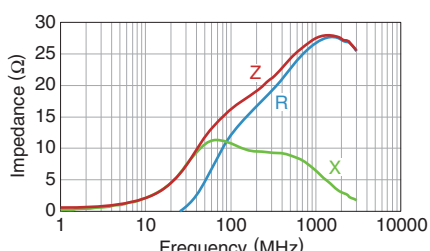
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**MMZ2012S102AT000**



**MMZ2012Y150BT000**



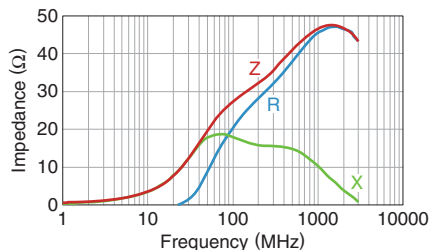
• All specifications are subject to change without notice.

# MMZ series MMZ2012 Type

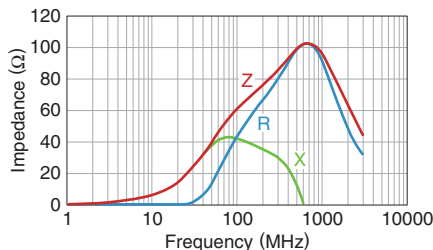
## ELECTRICAL CHARACTERISTICS

### Z, X, R VS. FREQUENCY CHARACTERISTICS

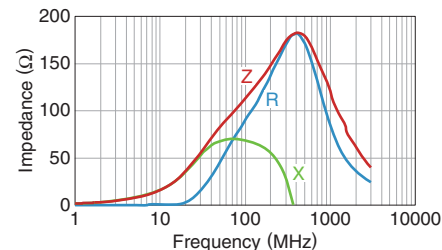
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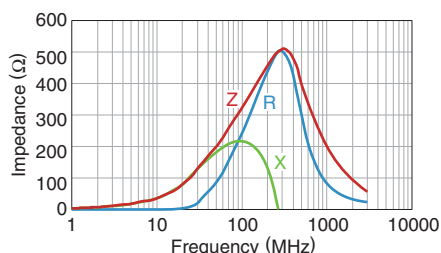
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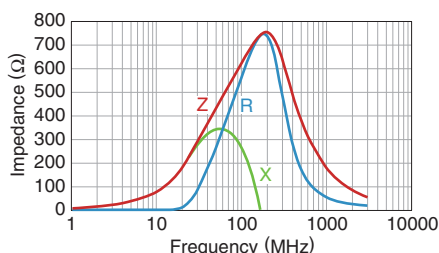
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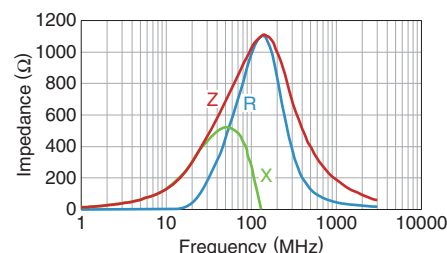
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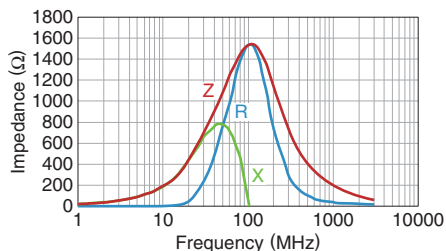
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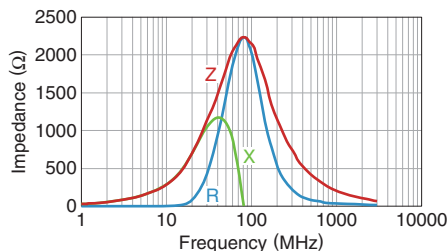
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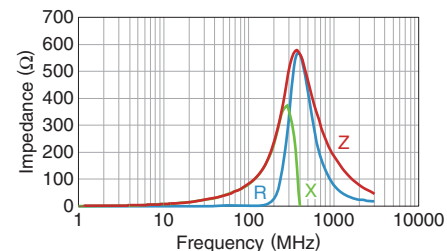
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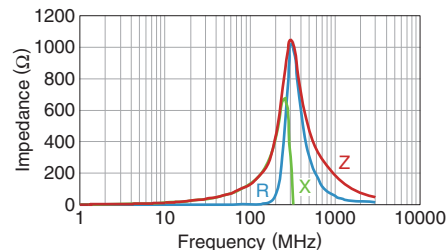
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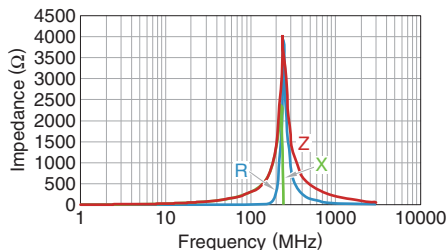
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MMZ2012D121BT000



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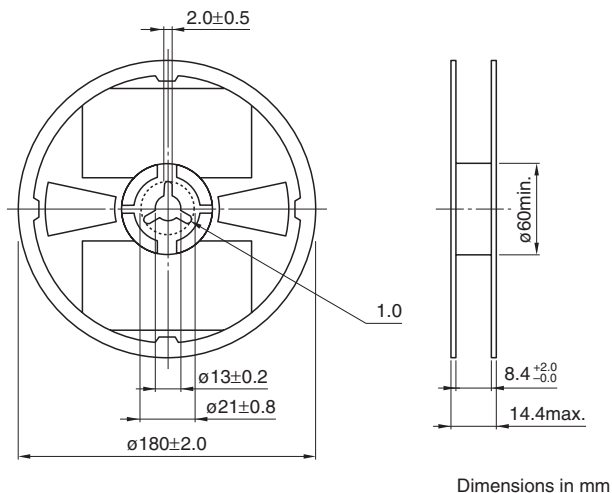
• All specifications are subject to change without notice.



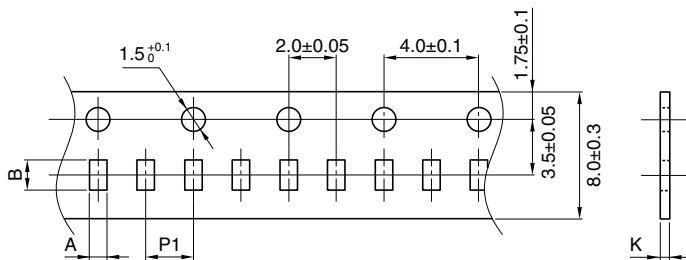
MMZ series

# Packaging style

## REEL DIMENSIONS

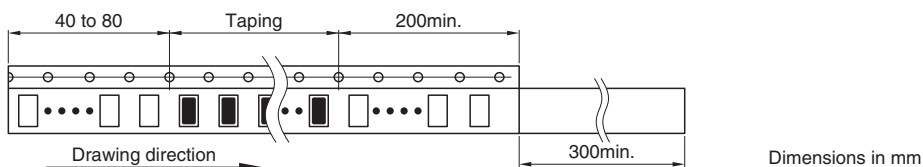


## TAPE DIMENSIONS



Dimensions in mm

| Type    | A               | B               | P1             | K       |
|---------|-----------------|-----------------|----------------|---------|
| MMZ0402 | $0.26 \pm 0.04$ | $0.46 \pm 0.04$ | $2.0 \pm 0.05$ | 0.4max. |
| MMZ0603 | $0.38 \pm 0.05$ | $0.68 \pm 0.05$ | $2.0 \pm 0.05$ | 0.5max. |
| MMZ1005 | $0.65 \pm 0.1$  | $1.15 \pm 0.1$  | $2.0 \pm 0.05$ | 0.8max. |
| MMZ1608 | $1.1 \pm 0.2$   | $1.9 \pm 0.2$   | $4.0 \pm 0.1$  | 1.1max. |
| MMZ2012 | $1.5 \pm 0.2$   | $2.3 \pm 0.2$   | $4.0 \pm 0.1$  | 1.1max. |



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