

# DATA SHEET

## METAL FILM RESISTORS

Professional  
MF0 Series

$\pm 0.5\%$ ,  $\pm 1\%$ ,  $\pm 2\%$ ,  $\pm 5\%$

0.4W AND 0.6W

RoHS compliant & Halogen Free



**YAGEO**

Product specification – March 1, 2022 V.1





## APPLICATIONS

- All general purpose applications
- Power applications

## FEATURES

- AEC-Q200 qualified
- Wide resistance range
- Miniature & high power rating
- High stability
- RoHS compliant & halogen-free

## ORDERING INFORMATION

Part number of the professional t metal film resistor are identified by the series, power rating, tolerance, packing, temperature coefficient, forming and resistance value.

## PART NUMBER

| MF0<br>(1) | 204<br>(2) | F<br>(3) | T<br>(4) | F<br>(5) | 52-<br>(6) | 100R<br>(7) |
|------------|------------|----------|----------|----------|------------|-------------|
|------------|------------|----------|----------|----------|------------|-------------|

### (1) SERIES

MF0 Series

### (2) POWER RATING

204 = 0.4W

207 = 0.6W

### (3) TOLERANCE

D =  $\pm 0.5\%$

J =  $\pm 5\%$

F =  $\pm 1\%$

- = for 0R

G =  $\pm 2\%$

### (4) PACKAGING

R = Reel Pack

B = Bulk

T = Box Pack

### (5) TEMPERATURE COEFFICIENT OF RESISTANCE

E =  $\pm 50\text{ppm}/^{\circ}\text{C}$

- = for 0R

F =  $\pm 100\text{ppm}/^{\circ}\text{C}$

### (6) FORMING

26- = 26mm

52- = 52.4mm

52B = 52.4mm,  $\Phi d = 0.45 \pm 0.02\text{mm}$

52C = 52.4mm,  $\Phi d = 0.5 \pm 0.02\text{mm}$

52H = 52.4mm, non-painting on soldering spots

M = M-Type Forming

MB = M-form W/flat

MT = MT Type Forming

FT = FT Type Forming

PN = PANAsert

AV = AVIsert

### (7) RESISTANCE VALUE

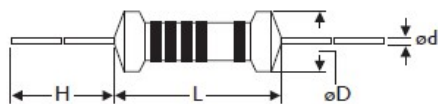
E24 & E96 Series

Example:

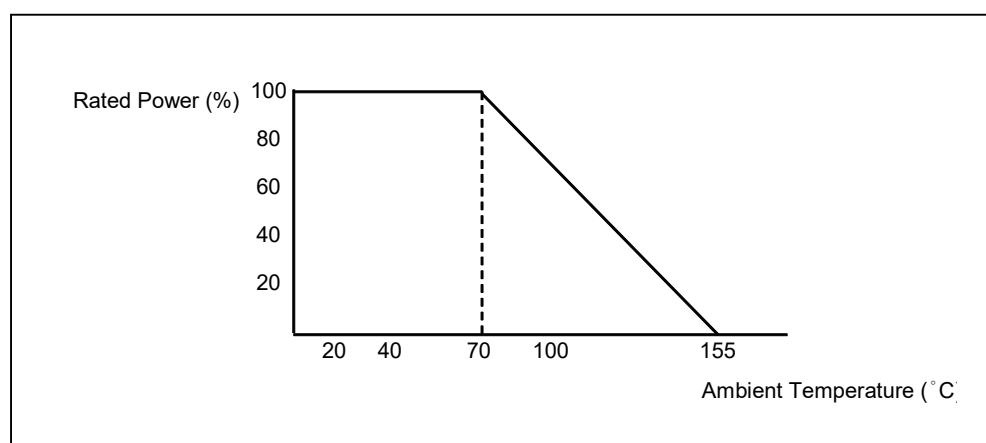
100R = 100 $\Omega$ , 10K = 10,000 $\Omega$ , 1M = 1,000,000 $\Omega$

**DIMENSIONS**

Unit: mm



| Miniature | L         | ψD        | H        | φd          |
|-----------|-----------|-----------|----------|-------------|
| MF0204    | 3.4 ± 0.3 | 1.9 ± 0.2 | 28 ± 2.0 | 0.45 ± 0.05 |
| MF0207    | 6.3 ± 0.5 | 2.4 ± 0.2 | 28 ± 2.0 | 0.55 ± 0.05 |

**DERATING CURVE****ELECTRICAL CHARACTERISTICS**

| CHARACTERISTICS             | MF0204                            | MF0207 |
|-----------------------------|-----------------------------------|--------|
| Power Rating at 70 °C       | 0.4W                              | 0.6W   |
| Maximum Working Voltage     | 250V                              | 350V   |
| Maximum Overload Voltage    | 500V                              | 700V   |
| Voltage Proof on Insulation | 300V                              | 500V   |
| Resistance Range            | 1Ω ~4M7Ω for E24&E96 series value |        |
| Operating Temp. Range       | - 55°C to +155°C                  |        |
| Temperature Coefficient     | ±50ppm/°C, ±100ppm/°C             |        |

Note: For resistance value out of above range is by request.

**ELECTRICAL CHARACTERISTICS FOR 0R**

| TYPE                            | MF0204           | MF0207 |
|---------------------------------|------------------|--------|
| Power Rating at 70 °C           | 0.4W             | 0.6W   |
| Maximum Current Rating at 70 °C | 1.5A             | 2.5A   |
| Voltage Proof on Insulation     | 300V             | 500V   |
| Resistance Range                | 0R               |        |
| Operating Temp. Range           | - 55°C to +155°C |        |

**TEST AND REQUIREMENTS**

| TEST                          | TEST METHOD      | PROCEDURE                                                                          | APPRAISE                                                      |
|-------------------------------|------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Short Time Overload           | IEC 60115-1 4.13 | 2.5 times RCWV for 5 sec.(Not more than maximum overload voltage)                  | ±0.25%+0.05Ω for MF0207 type<br>±1.0 % +0.05Ω for MF0204 type |
| Voltage Proof on Insulation   | IEC 60115-1 4.7  | In V-Block for 60 sec. test voltage as above table                                 | No Breakdown                                                  |
| Temperature Coefficient       | IEC 60115-1 4.8  | Between -55°C to +155°C                                                            | By Type                                                       |
| Insulation Resistance         | IEC 60115-1 4.6  | In V-Block for 60 sec.                                                             | >10,000MΩ                                                     |
| Solderability                 | IEC 60115-1 4.17 | 245±5°C for 3±0.5 Sec.                                                             | 95% Min. coverage                                             |
| Solvent Resistance of Marking | IEC 60115-1 4.30 | IPA for 5±0.5 Min. with ultrasonic                                                 | No deterioration of coatings and markings                     |
| Robustness of Terminations    | IEC 60115-1 4.16 | Direct load for 10 Sec. in the direction of the terminal leads                     | ≥2.5Kg(24.5N)                                                 |
| Periodic-pulse Overload       | IEC 60115-1 4.39 | 4 times RCWV(or Umax., whichever less) 10,000 cycles (1 Sec. on, 25 Sec.off)       | ±1.0%+0.05Ω                                                   |
| Damp Heat Steady State        | IEC 60115-1 4.24 | 40±2°C,90-95% RH for 56 days, loaded with 0.1 times RCWV(or Umax., whichever less) | ±1.5%+0.05Ω                                                   |
| Endurance at 70°C             | IEC 60115-1 4.25 | 70±2°C at RCWV(or Umax., whichever less) for 1,000 Hr.(1.5 Hr.on,0.5 Hr. off)      | ±1.5%+0.05Ω                                                   |
| Temperature Cycling           | IEC 60115-1 4.19 | -55°C → Room Temp. → +155°C → Room Temp.(5 cycles)                                 | ±0.75%+0.05Ω                                                  |
| Resistance to Soldering Heat  | IEC 60115-1 4.18 | 260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body                   | ±0.25%+0.05Ω                                                  |

Note:.

**RCWV (Rated Continuous Working Voltage ):**

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V=\sqrt{(P \times R)}$$

or max. working voltage whichever is less

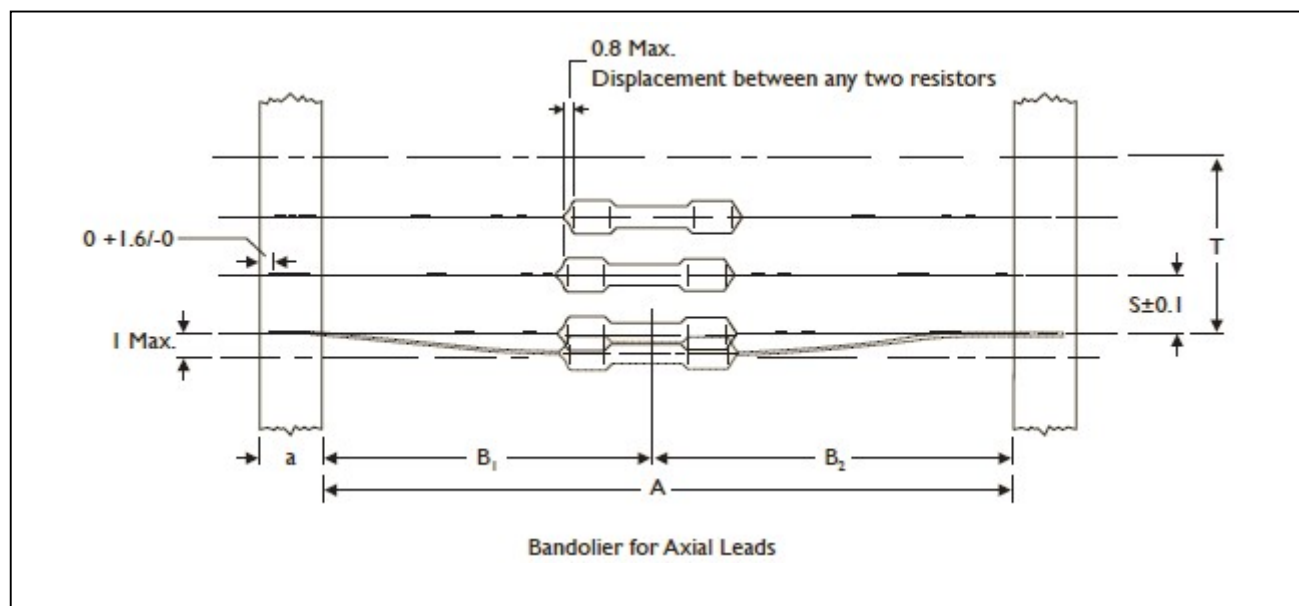
Where

V=Continuous rated DC or

AC (rms) working voltage (V)

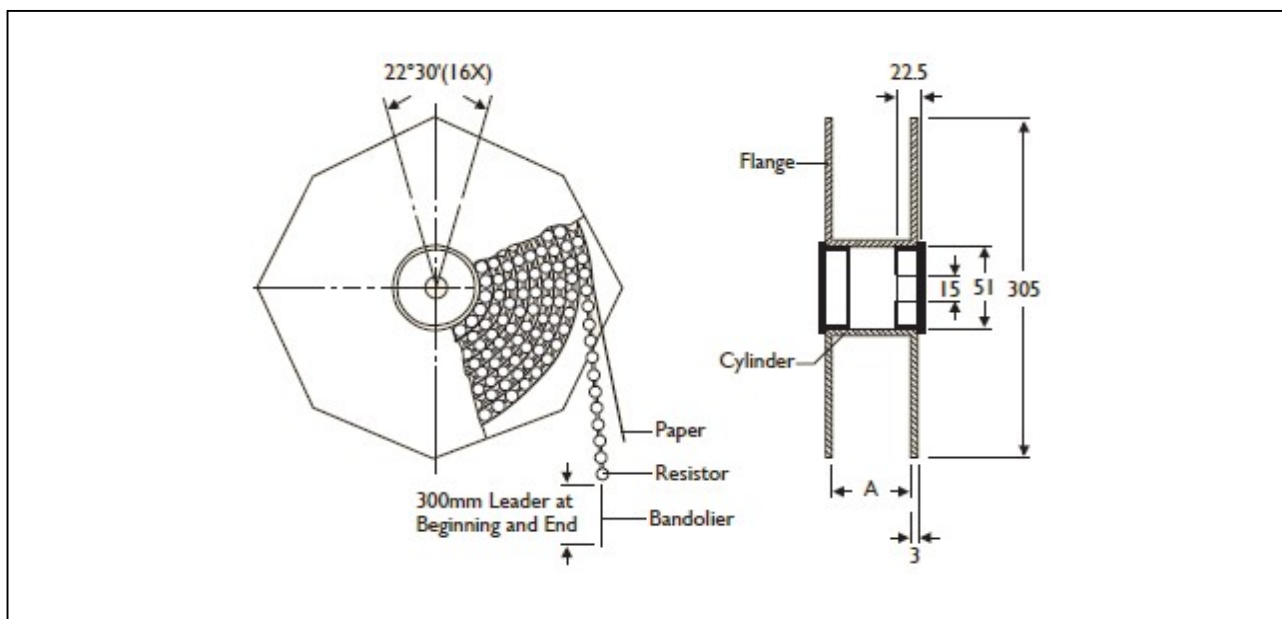
P=Rated power (W)

R=Resistance value (Ω)

**AXIAL / REEL TAPE SPECIFICATION**

Unit: mm

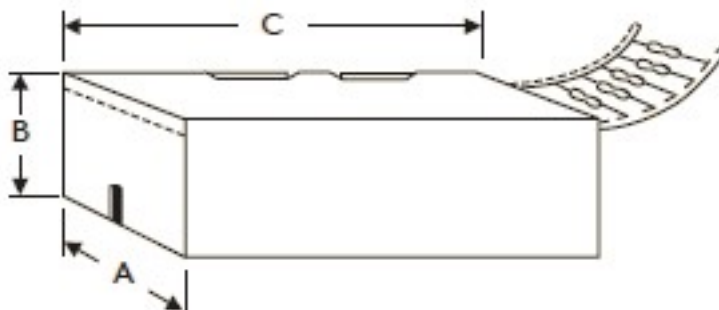
| Miniature | a       | A          | B1-B2 (Max.) | S (spacing) | T (max. deviation of spacing) |
|-----------|---------|------------|--------------|-------------|-------------------------------|
| MF0204    | 6 ± 0.5 | 52.4 ± 1.5 | 1.2          | 5           | 0.5 mm per 5 spacing          |
|           |         | 26.0 ± 1.5 | 1            |             |                               |
| MF0207    | 6 ± 0.5 | 52.4 ± 1.5 | 1.2          | 5           | 0.5 mm per 5 spacing          |
|           |         | 26.0 ± 1.5 | 1            |             |                               |

**TAPE ON REEL PACKING**

TYPE

Unit: mm/piece

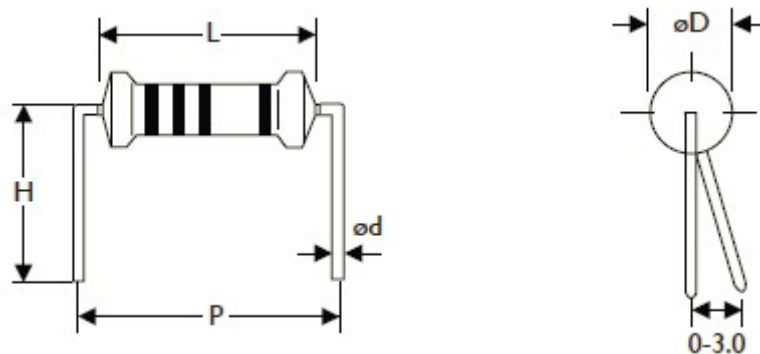
| Miniature | Across Flange(A) | B    | Quantity Per Reel |
|-----------|------------------|------|-------------------|
| MF0204    | 66.5             | 75.5 | 5,000             |
| MF0207    | 66.5             | 75.5 | 5,000             |

**TAPE ON BOX PACKING**

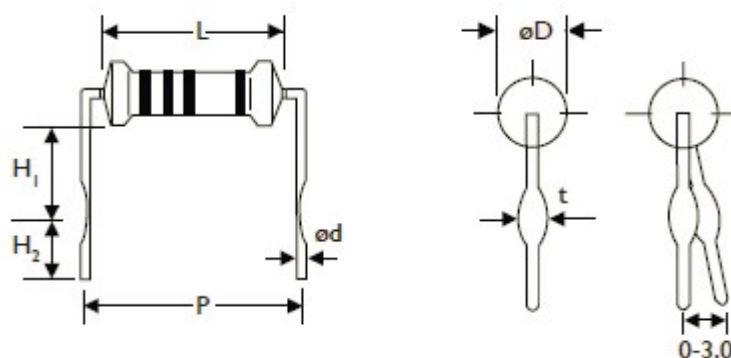
| TYPE      | DIMENSIONS |     |     | Unit: mm/piece   |
|-----------|------------|-----|-----|------------------|
| Miniature | A          | B   | C   | Quantity Per Box |
| MF0204    | 48         | 102 | 255 | 5,000            |
| MF0204    | 81         | 70  | 260 | 5,000            |
| MF0207    | 48         | 102 | 255 | 5,000            |
| MF0207    | 81         | 104 | 260 | 5,000            |

**BULK PACKING**

| Miniature | Piece/Per Inner Box | Bag/Per Inner Box | Piece Per Bag |
|-----------|---------------------|-------------------|---------------|
| MF0204    | 10,000              | 10                | 1,000         |
| MF0207    | 10,000              | 10                | 1,000         |

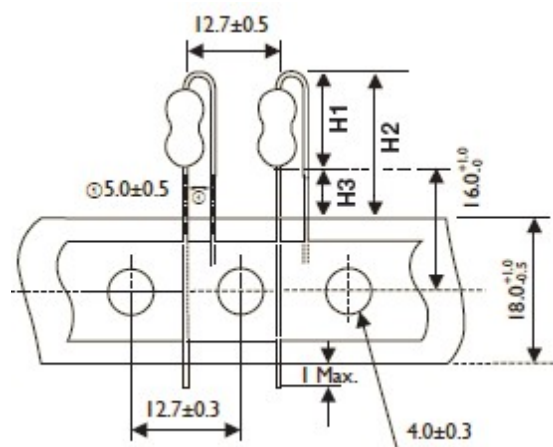
**FORMING****M TYPE**

| TYPE      | DIMENSIONS    |               |                 |              |              | Unit: mm |
|-----------|---------------|---------------|-----------------|--------------|--------------|----------|
| Miniature | L             | $\psi D$      | $\psi d$        | P            | H            |          |
| MF0204    | $3.4 \pm 0.3$ | $1.9 \pm 0.2$ | $0.45 \pm 0.05$ | $6.0 \pm 1$  | $10.0 \pm 1$ |          |
| MF0207    | $6.3 \pm 0.5$ | $2.4 \pm 0.2$ | $0.55 \pm 0.05$ | $10.0 \pm 1$ | $10.0 \pm 1$ |          |

**MB TYPE**

| TYPE      | DIMENSIONS    |               |                 |              |             |             |               | Unit: mm |
|-----------|---------------|---------------|-----------------|--------------|-------------|-------------|---------------|----------|
| Miniature | L             | $\psi D$      | $\psi d$        | P            | H1          | H2          | t             |          |
| MF0207    | $6.3 \pm 0.5$ | $2.4 \pm 0.2$ | $0.55 \pm 0.05$ | $10.0 \pm 1$ | $6.0 \pm 1$ | $5.0 \pm 1$ | $1.2 \pm 0.2$ |          |

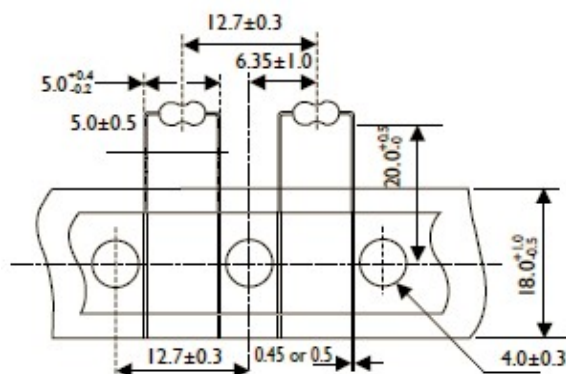
## FT TYPE (Taping Pack)



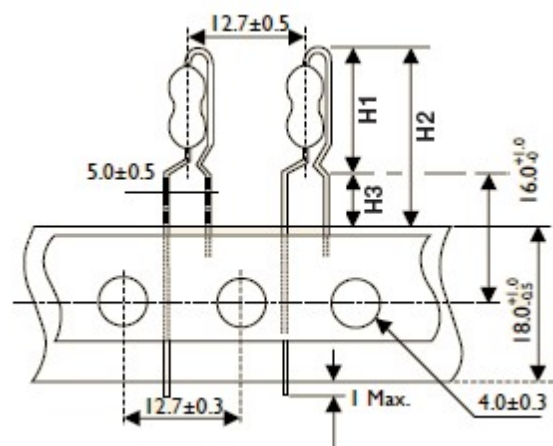
| TYPE      | DIMENSIONS |            |            | Unit: mm |
|-----------|------------|------------|------------|----------|
| Miniature | H1<br>Max. | H2<br>Max. | H3<br>Max. |          |
| MF0207    | 10         | 18.5       | 8.5        |          |

## MT TYPE (Taping Pack)

Rated Watts : 0.4W

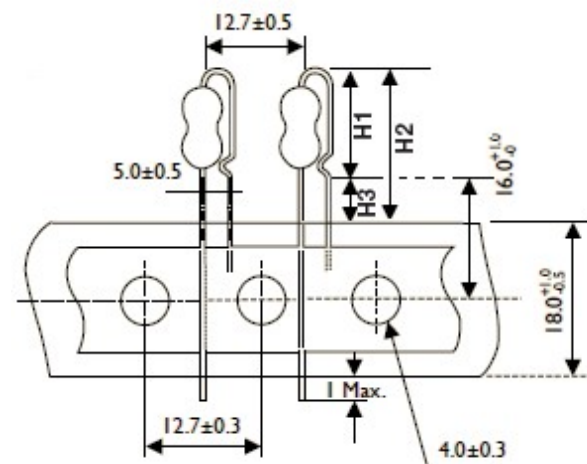


## PN TYPE (Taping Pack)

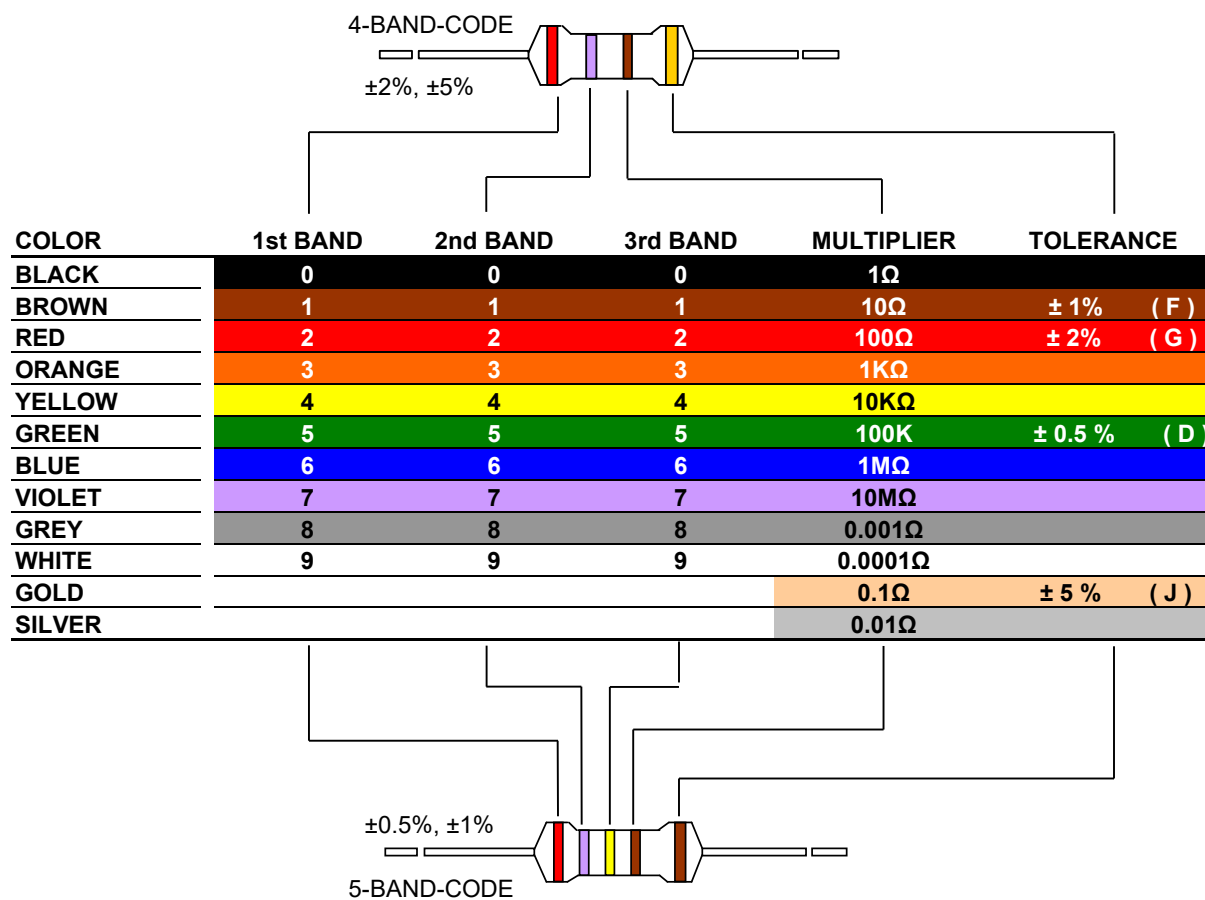


| TYPE      | DIMENSIONS |            |            | Unit: mm |
|-----------|------------|------------|------------|----------|
| Miniature | H1<br>Max. | H2<br>Max. | H3<br>Max. |          |
| MF0207    | 13         | 21.5       | 8.5        |          |

## AV TYPE (Taping Pack)



| TYPE      | DIMENSIONS |            |            | Unit: mm |
|-----------|------------|------------|------------|----------|
| Miniature | H1<br>Max. | H2<br>Max. | H3<br>Max. |          |
| MF0207    | 11.5       | 20         | 8.5        |          |

**MARKING**

**REVISION HISTORY**

| REVISION  | DATE        | CHANGE NOTIFICATION | DESCRIPTION                                                                                 |
|-----------|-------------|---------------------|---------------------------------------------------------------------------------------------|
| Version 0 | Aug.2, 2021 | -                   | - First issue of this specification                                                         |
| Version 1 | Mar.1, 2022 |                     | -1. Updated power rating on second page<br>-2. Independent electrical characteristics of 0R |

*“ Yageo reserves all the rights for revising the content of this datasheet without further notification, as long as the products itse lf are unchanged. Any product change will be announced by PCN.”*

## LEGAL DISCLAIMER

YAGEO, its distributors and agents (collectively, "YAGEO"), hereby disclaims any and all liabilities for any errors, inaccuracies or incompleteness contained in any product related information, including but not limited to product specifications, datasheets, pictures and/or graphics. YAGEO may make changes, modifications and/or improvements to product related information at any time and without notice.

YAGEO makes no representation, warranty, and/or guarantee about the fitness of its products for any particular purpose or the continuing production of any of its products. To the maximum extent permitted by law, YAGEO disclaims (i) any and all liability arising out of the application or use of any YAGEO product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for a particular purpose, non-infringement and merchantability.

YAGEO products are designed for general purpose applications under normal operation and usage conditions. Please contact YAGEO for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property: Aerospace equipment (artificial satellite, rocket, etc.), Atomic energy-related equipment, Aviation equipment, Disaster prevention equipment, crime prevention equipment, Electric heating apparatus, burning equipment, Highly public information network equipment, data-processing equipment, Medical devices, Military equipment, Power generation control equipment, Safety equipment, Traffic signal equipment, Transportation equipment and Undersea equipment, or for any other application or use in which the failure of YAGEO products could result in personal injury or death, or serious property damage. Particularly **YAGEO Corporation and its affiliates do not recommend the use of commercial, automotive, and/or COTS grade products for high reliability applications or manned space flight.**

Information provided here is intended to indicate product specifications only. YAGEO reserves all the rights for revising this content without further notification, as long as products are unchanged. Any product change will be announced by PCN.