

DATA SHEET

CARBON FILM RESISTORS

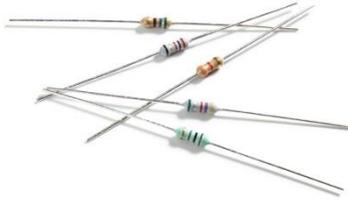
Professional
CF0 series

$\pm 2\%$, $\pm 5\%$

0.4W AND 0.6W

RoHS compliant & Halogen Free





ORDERING INFORMATION

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

APPLICATIONS

- All general purpose applications
- Power applications

FEATURES

- AEC-Q200 qualified
- Wide resistance range
- Miniature & high power rating
- High stability
- PPAP ready (CF0207)
- RoHS compliant & halogen-free

PART NUMBER

CF0 204 J T - 52- 100R
 (1) (2) (3) (4) (5) (6) (7)

(1) SERIES

CF0 Series

(2) POWER RATING

204 = 0.4W

207 = 0.6W

(3) TOLERANCE

G = ±2%

J = ±5%

(4) PACKAGING

R = Reel Pack

B = Bulk

T = Box Pack

(5) TEMPERATURE COEFFICIENT OF RESISTANCE

- = Based on spec , please refer to page 3 table 2 .

(6) FORMING

26- = 26mm

52- = 52.4mm

M = M-Type Forming

MT = MT Type Forming

FT = FT Type Forming

PN = PANAsert

AV = AVIsert

Note:26mm and 52.4mm represent dimension A of the axial type, please refer to the category of AXIAL/REEL TAPE SPECIFICATION for the detail.

(7) RESISTANCE VALUE

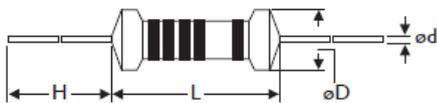
E24 Series

Example:

100R = 100Ω, 10K = 10,000Ω, 1M = 1,000,000Ω

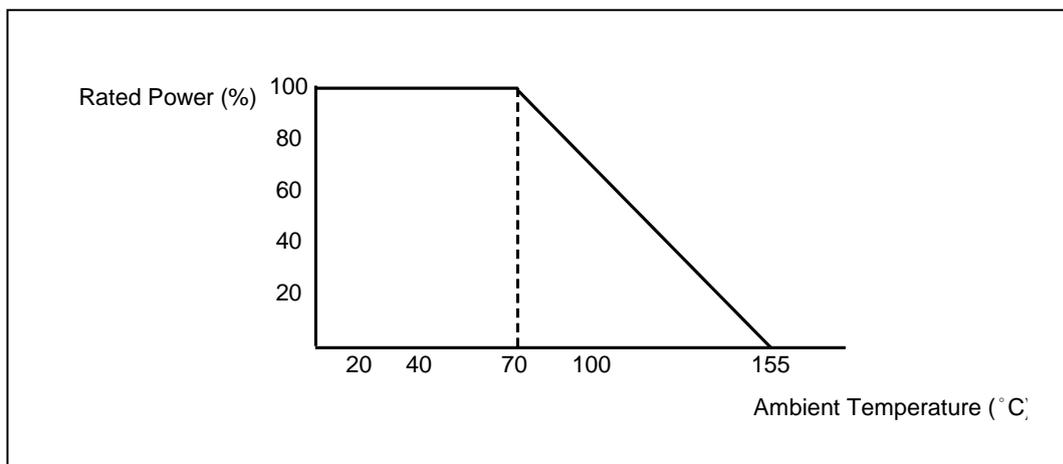
DIMENSIONS

Unit: mm



| Miniature | L | ψD | H | ψd |
|-----------|-----------|-----------|----------|-------------|
| CF0204 | 3.4 ± 0.3 | 1.9 ± 0.2 | 28 ± 2.0 | 0.45 ± 0.05 |
| CF0207 | 6.3 ± 0.5 | 2.4 ± 0.2 | 28 ± 2.0 | 0.55 ± 0.05 |

DERATING CURVE



ELECTRICAL CHARACTERISTICS

TABLE 1

| CHARACTERISTICS | CF0204 | CF0207 |
|-----------------------------|------------------------------|--------|
| Power Rating at 70 °C | 0.4W | 0.6W |
| Maximum Working Voltage | 200V | 300V |
| Maximum Overload Voltage | 400V | 600V |
| Voltage Proof on Insulation | 300V | 500V |
| Resistance Range | 1Ω ~10M for E24 series value | |
| Operating Temp. Range | - 55°C to +155°C | |
| Temperature Coefficient | See table 2 | |

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

TABLE 2 TEMPERATURE COEFFICIENT

| TYPE | Temp. Coefficient ppm/°C | | |
|---------------|--------------------------|------------|-----------|
| | Under 100KΩ | 100K ~ 1MΩ | 1M ~ 10MΩ |
| CF0204 CF0207 | - 500 ~+350 | -700~0 | -1500~0 |

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) | ±0.75%+0.05Ω |
| 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. | >1,000MΩ |
| 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) | ±3.0%+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) | ±3.0%+0.05Ω |
| Temperature Cycling | IEC 60115-1 4.19 | -55°C → Room Temp. → +155°C → Room Temp.(5 cycles) | ±1.0%+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 | ±1.0%+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

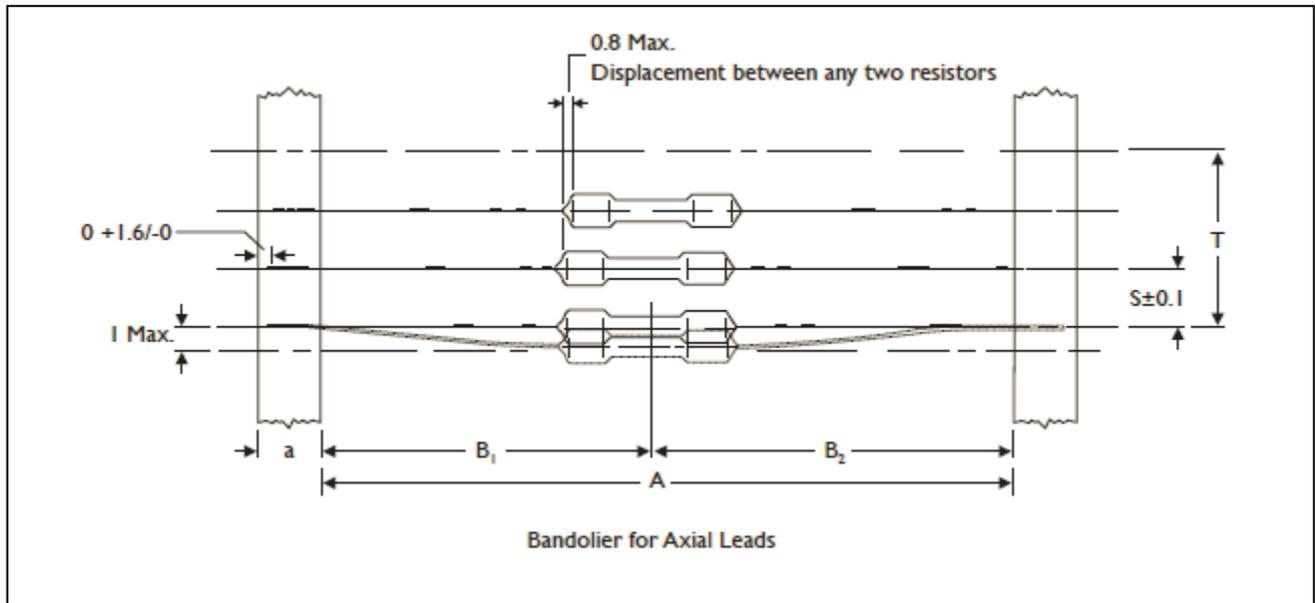
Where

V=Continuous rated DC or
AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)

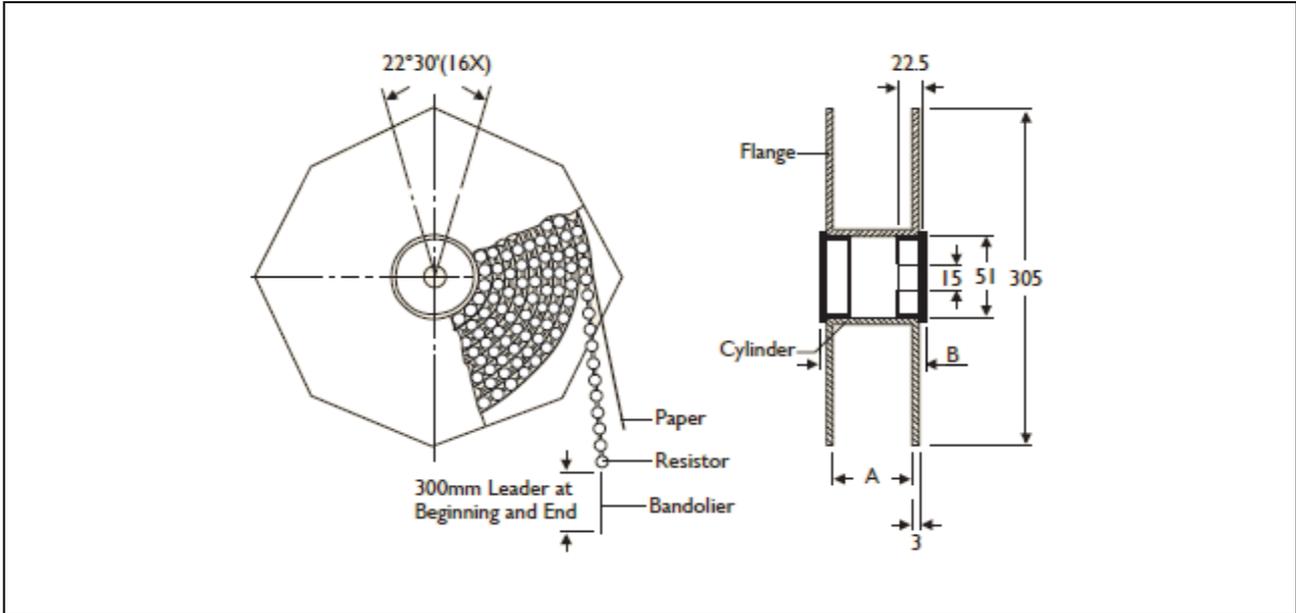
AXIAL / REEL TAPE SPECIFICATION



Unit: mm

| Miniature | a | A | B1-B2 (Max.) | S (spacing) | T (max. deviation of spacing) |
|-----------|---------|------------|--------------|-------------|--|
| CF0204 | 6 ± 0.5 | 52.4 ± 1.5 | 1.2 | 5 | 1 mm per 10 spacing, 0.5 mm per 5 spacing |
| | | 26.0 ± 1.5 | 1 | | |
| CF0207 | 6 ± 0.5 | 52.4 ± 1.5 | 1.2 | 5 | 1 mm per 10 spacing, 0.5 mm per 5 spacing |
| | | 26.0 ± 1.5 | 1 | | |

TAPE ON REEL PACKING

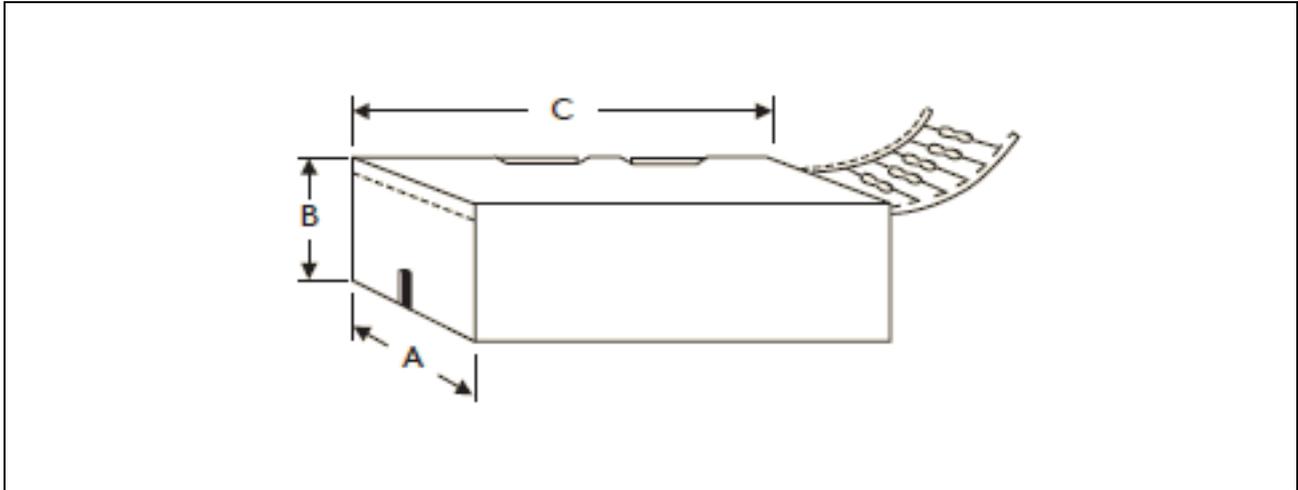


TYPE

Unit: mm/piece

| Miniature | Across Flange(A) | B | Quantity Per Reel |
|-----------|------------------|------|-------------------|
| CF0204 | 66.5 | 75.5 | 5,000 |
| CF0207 | 66.5 | 75.5 | 5,000 |

TAPE ON BOX PACKING



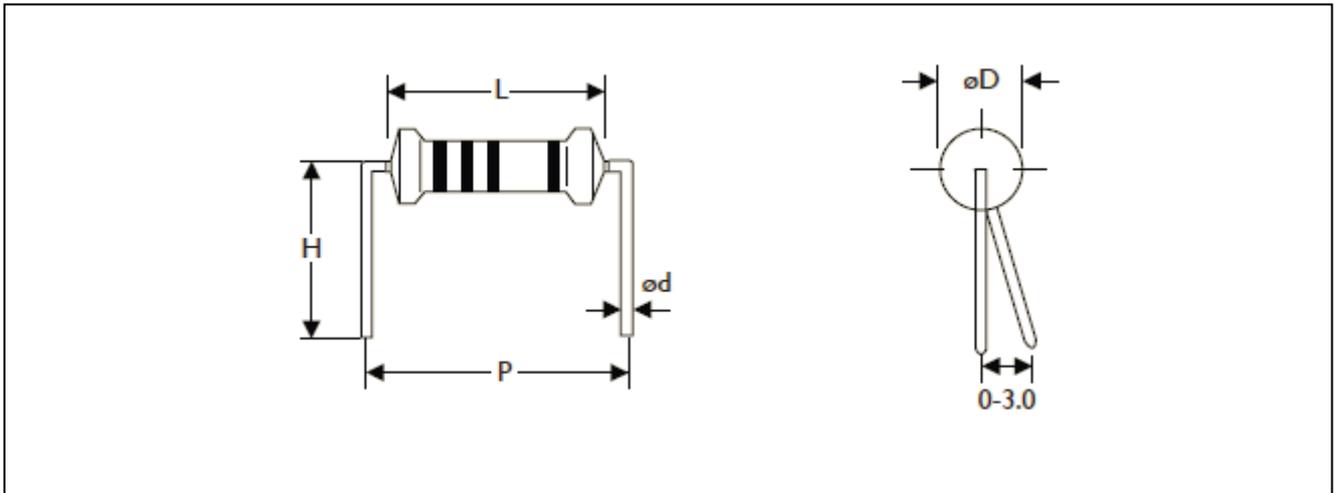
| TYPE | DIMENSIONS | | | Quantity Per Box |
|--------|------------|-----|-----|------------------|
| | A | B | C | |
| CF0204 | 48 | 102 | 255 | 5,000 |
| CF0204 | 81 | 70 | 260 | 5,000 |
| CF0207 | 48 | 102 | 255 | 5,000 |
| CF0207 | 81 | 104 | 260 | 5,000 |

BULK PACKING

| Miniature | Piece/Per Inner Box | Bag/Per Inner Box | Piece Per Bag |
|-----------|---------------------|-------------------|---------------|
| CF0204 | 10,000 | 10 | 1,000 |
| CF0207 | 10,000 | 10 | 1,000 |

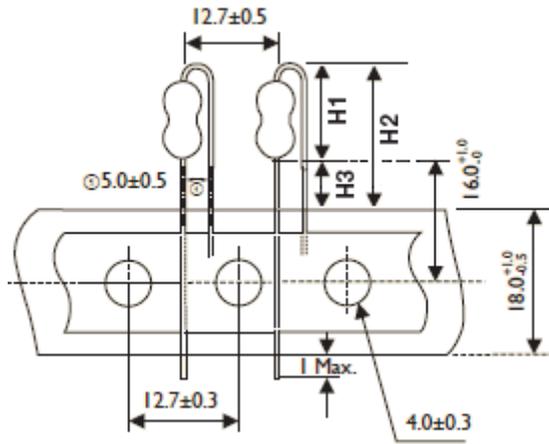
FORMING

M TYPE



| TYPE | DIMENSIONS | | | | | Unit: mm |
|------------------|------------|-----------|-------------|----------|----------|----------|
| | L | ψD | ψd | P | H | |
| Miniature | | | | | | |
| CF0204 | 3.4 ± 0.3 | 1.9 ± 0.2 | 0.45 ± 0.05 | 6.0 ± 1 | 10.0 ± 1 | |
| CF0207 | 6.3 ± 0.5 | 2.4 ± 0.2 | 0.55 ± 0.05 | 10.0 ± 1 | 10.0 ± 1 | |

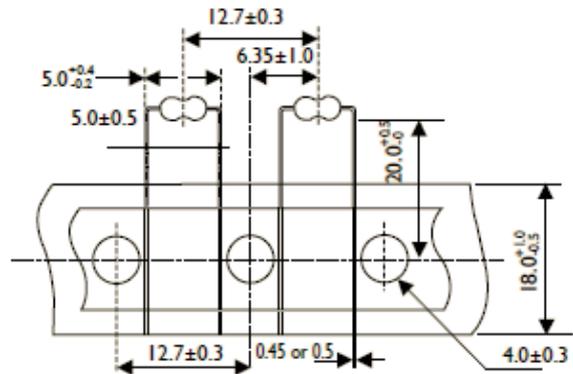
FT TYPE (Taping Pack)



| TYPE | DIMENSIONS | | | Unit: mm |
|------------------|--------------------|--------------------|--------------------|----------|
| Miniature | H1 Max. | H2 Max. | H3 Max. | |
| CF0207 | 10 | 18.5 | 8.5 | |

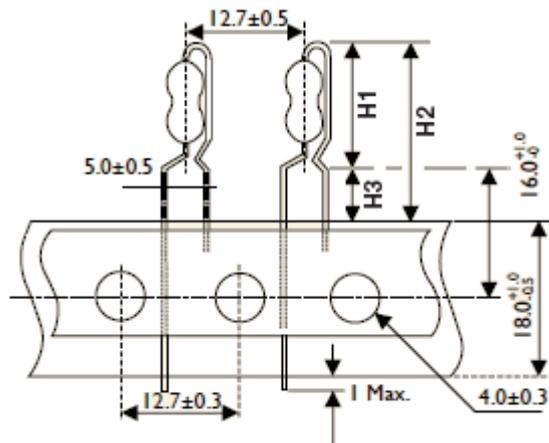
MT TYPE (Taping Pack)

Rated Watts : 0.4W

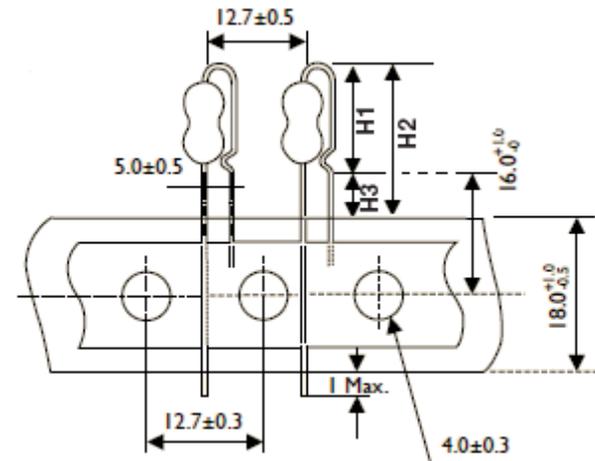


AV TYPE (Taping Pack)

PN TYPE (Taping Pack)

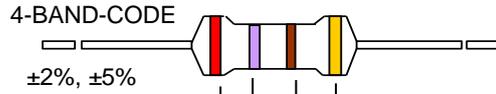


| TYPE | DIMENSIONS | | | Unit: mm |
|------------------|--------------------|--------------------|--------------------|----------|
| Miniature | H1 Max. | H2 Max. | H3 Max. | |
| CF0207 | 13 | 21.5 | 8.5 | |



| TYPE | DIMENSIONS | | | Unit: mm |
|------------------|--------------------|--------------------|--------------------|----------|
| Miniature | H1 Max. | H2 Max. | H3 Max. | |
| CF0207 | 11.5 | 20 | 8.5 | |

MARKING



| COLOR | 1st BAND | 2nd BAND | 3rd BAND | MULTIPLIER | TOLERANCE |
|--------|----------|----------|----------|------------|-------------|
| BLACK | 0 | 0 | 0 | 1Ω | |
| BROWN | 1 | 1 | 1 | 10Ω | |
| RED | 2 | 2 | 2 | 100Ω | ± 2% (G) |
| ORANGE | 3 | 3 | 3 | 1KΩ | |
| YELLOW | 4 | 4 | 4 | 10KΩ | |
| GREEN | 5 | 5 | 5 | 100K | |
| BLUE | 6 | 6 | 6 | 1MΩ | |
| VIOLET | 7 | 7 | 7 | 10MΩ | |
| GREY | 8 | 8 | 8 | 0.001Ω | |
| WHITE | 9 | 9 | 9 | 0.0001Ω | |
| GOLD | | | | 0.1Ω | ± 5 % (J) |
| SILVER | | | | 0.01Ω | |

REVISION HISTORY

| REVISION | DATE | CHANGE NOTIFICATION | DESCRIPTION |
|-----------|--------------|---------------------|--|
| Version 2 | Apr.2, 2024 | - | - Added forming code description for part number |
| Version 1 | Aug.31, 2023 | - | - Update legal disclaimer |
| Version 0 | Aug.2, 2021 | - | - First issue of this specification |

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