

DATA SHEET

WIREWOUND RESISTORS

Fusible, Flameproof

FKN Series

$\pm 1\%$, $\pm 5\%$

1/2W to 7W

RoHS compliant & Halogen Free



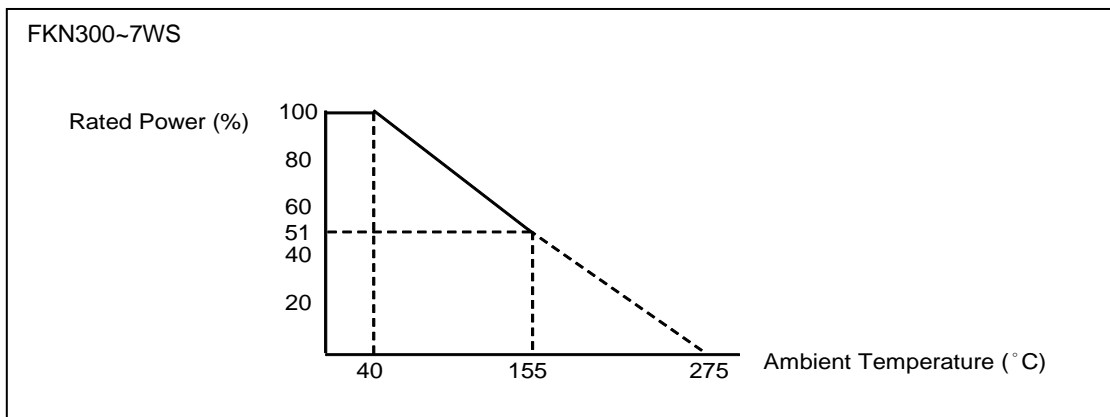
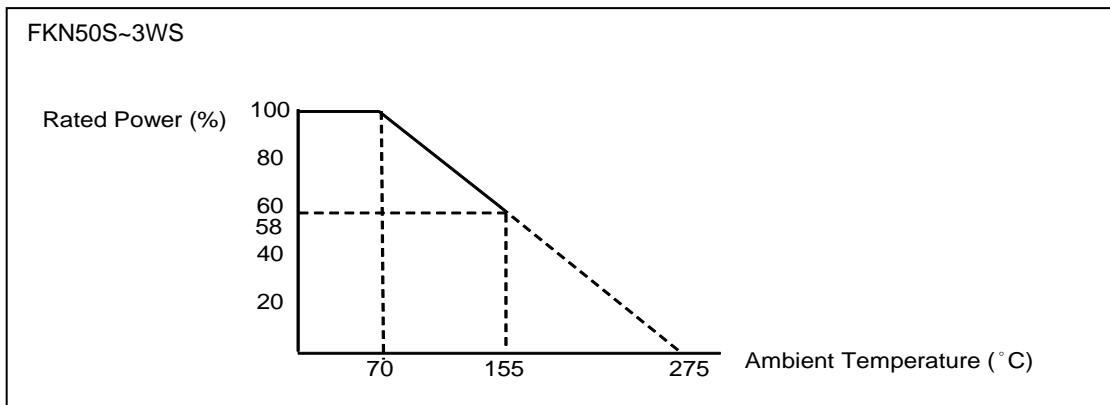
DIMENSIONS

Unit: mm



| Normal | Miniature | L | ψD | H | ψd |
|--------|-----------|----------------|---------------|--------------|-----------------|
| - | FKN50S | 6.3 ± 0.5 | 2.5 ± 0.3 | 28 ± 2.0 | 0.55 ± 0.05 |
| - | FKN1SS | | | | |
| FKN-50 | FKN1WS | 9.0 ± 0.5 | 3.5 ± 0.3 | 26 ± 2.0 | 0.55 ± 0.05 |
| FKN-50 | FKN2SS | | | | |
| FKN100 | FKN2WS | 11.5 ± 1.0 | 4.6 ± 0.5 | 35 ± 2.0 | 0.8 ± 0.05 |
| FKN200 | FKN3WS | 15.5 ± 1.0 | 5.2 ± 0.5 | 33 ± 2.0 | 0.8 ± 0.05 |
| FKN300 | FKN5WS | 17.5 ± 1.0 | 6.5 ± 0.5 | 32 ± 2.0 | 0.8 ± 0.05 |
| FKN400 | | | | | |
| FKN500 | FKN7WS | 24.5 ± 1.0 | 8.5 ± 0.5 | 38 ± 2.0 | 0.8 ± 0.05 |

DERATING CURVE



ELECTRICAL CHARACTERISTICS

| CHARACTERISTICS | FKN-50 | FKN100 | FKN200 | FKN300 | FKN400 | FKN500 |
|-----------------------------|-----------------------|-----------|------------|------------|------------|---------|
| Power Rating at 40°C | | | | 3W | 4W | 5W |
| Power Rating at 70°C | 1/2W | 1W | 2W | | | |
| Resistance Range (±1%) | | 0.5Ω~100Ω | 0.47Ω~150Ω | 0.56Ω~330Ω | 0.56Ω~330Ω | 1Ω~620Ω |
| Resistance Range (±5%) | 0.5Ω~47Ω | 0.5Ω~100Ω | 0.47Ω~150Ω | 0.56Ω~330Ω | 0.56Ω~330Ω | 1Ω~620Ω |
| Voltage Proof on Insulation | 300V | | | | | |
| Maximum working voltage | $\sqrt{(P \times R)}$ | | | | | |
| Operating Temp. Range | - 40°C to + 155°C | | | | | |
| Temperature Coefficient | ±350ppm/°C | | | | | |

| CHARACTERISTICS | FKN50S | FKN1WS | FKN1SS | FKN2WS | FKN2SS | FKN3WS | FKN5WS | FKN7WS |
|-----------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|
| Power Rating at 40 °C | | | | | | | 5W | 7W |
| Power Rating at 70 °C | 1/2W | 1W | 1W | 2W | 2W | 3W | | |
| Resistance Range (±1%) | | 0.47Ω - 100Ω | 0.47Ω - 100Ω | 0.47Ω - 150Ω | 0.47Ω - 150Ω | 0.47Ω - 240Ω | 0.56Ω - 330Ω | 1Ω - 620Ω |
| Resistance Range (±5%) | 2.5Ω~22Ω | 0.47Ω - 100Ω | 0.47Ω - 100Ω | 0.47Ω - 150Ω | 0.47Ω - 150Ω | 0.47Ω - 240Ω | 0.56Ω - 330Ω | 1Ω - 620Ω |
| Voltage Proof on Insulation | 200V | 300V | 300V | 300V | 300V | 300V | 300V | 300V |
| Maximum working voltage | $\sqrt{(P \times R)}$ | | | | | | | |
| Operating Temp. Range | - 40°C to + 155°C | | | | | | | |
| Temperature Coefficient | ±350ppm/°C | | | | | | | |

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

FUSING CHARACTERISTICS

R≤2.0 Ω Fusing time within 60 seconds at 36 times of rated power;
 R>2.0 Ω Fusing time within 60 seconds at 25 times of rated power;
 Fusing residual resistive value at least 100 times rated resistance.

Specific fusing characteristic(time VS. power) and surge withstanding capacity on request.

TEST AND REQUIRMENTS

| TEST | TEST METHOD | PROCEDURE | APPRAISE |
|-------------------------------|------------------|--|---|
| Short Time Overload | IEC 60115-1 4.13 | 10 times rated power for 5 sec. | ±2.0%+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 -40°C to +155°C | By Type |
| Insulation Resistance | IEC 60115-1 4.6 | In V-Block for 60 sec. | >100MΩ |
| 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) |
| 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) | ±5.0%+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) | ±5.0%+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 |
| Accidental Overload Test | IEC 60115-1 4.26 | 4 times RCWV for 1 Min. | No evidence of Flaming or arcing |

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)

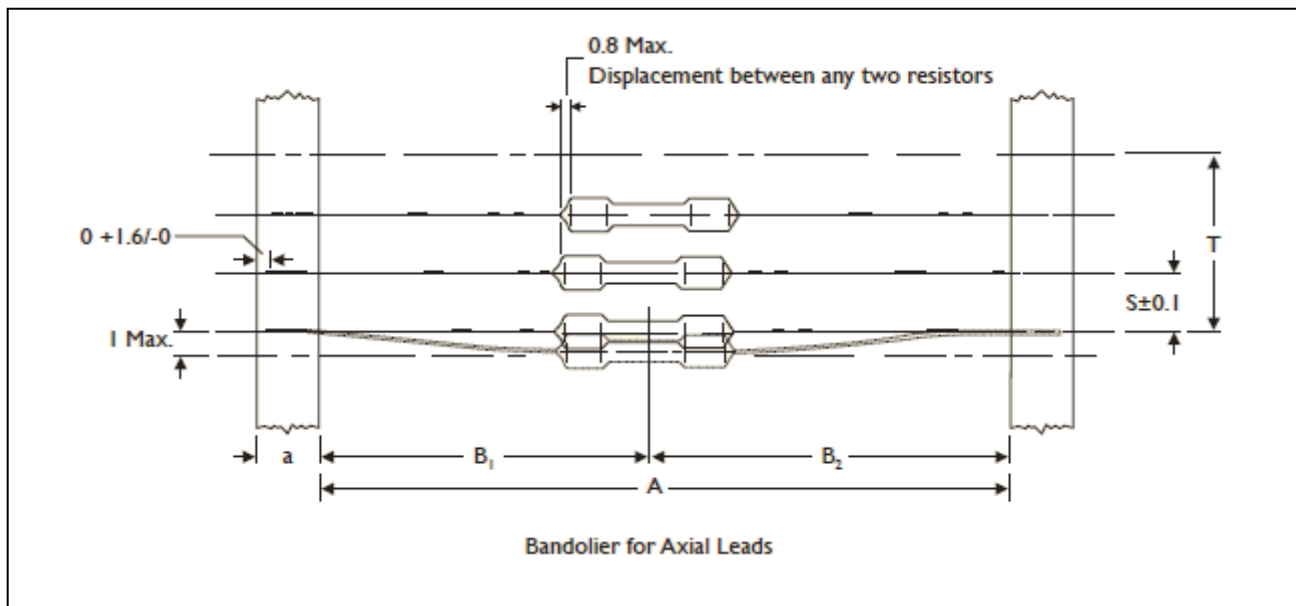
P=Rated power (W)

R=Resistance value (Ω)

1.2/50us PULSE VOLTAGE

| YAGEO PN | 1.2/50us pulse voltage test for a total of 10 pulses, 30 seconds between each pulse |
|-----------------|--|
| FKN50SJT-52-22R | 500V |
| FKN1SSJT-52-22R | 500V |
| FKN1WSJT-52-1R5 | 700V |
| FKN1WSJT-52-6R8 | 1000V |
| FKN1WSJT-52-10R | 800V |
| FKN3WSJT-73-22R | 1800V |

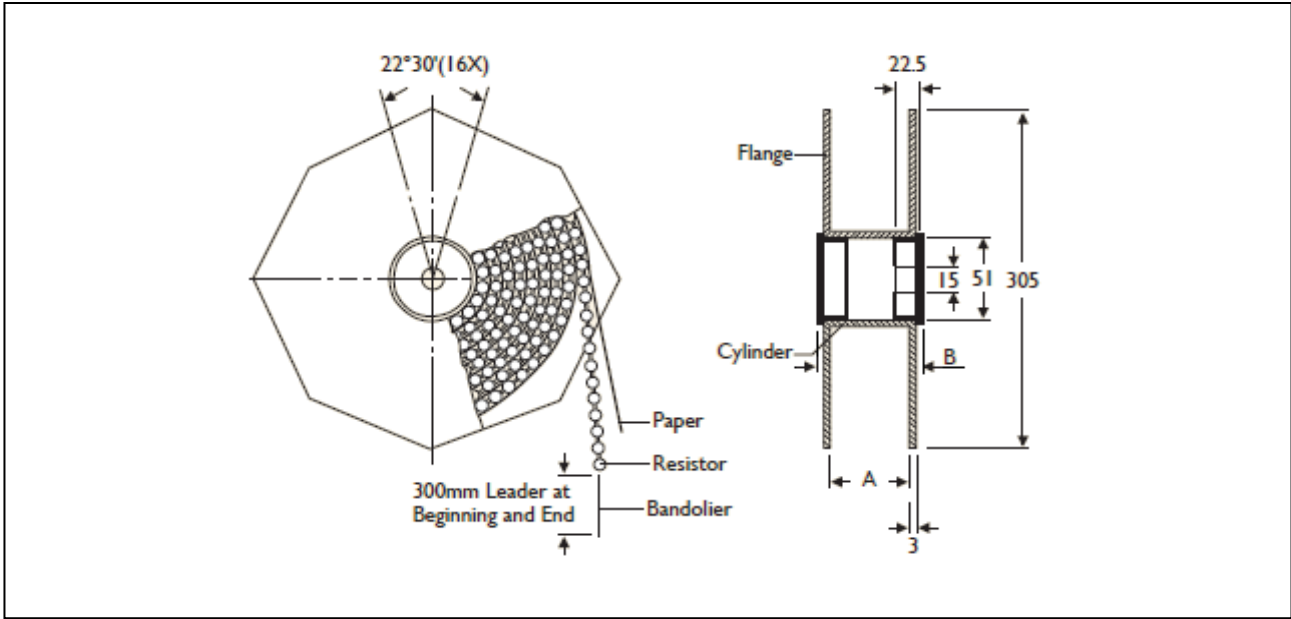
AXIAL / REEL TAPE SPECIFICATION



Unit: mm

| Normal | Miniature | a | A | B1-B2 (Max.) | S (spacing) | T (max. deviation of spacing) |
|--------|------------------|-------------|----------------|--------------|-------------|--|
| - | FKN50S | 6 ± 0.5 | 52.4 ± 1.5 | 1.2 | 5 | 1 mm per 10 spacing, 0.5 mm per 5 spacing |
| | FKN1SS | | 26.0 ± 1.5 | 1.0 | | |
| FKN-50 | FKN1WS | 6 ± 0.5 | 52.4 ± 1.5 | 1.2 | 5 | |
| | FKN2SS | | 63.0 ± 1.5 | 1.5 | | |
| FKN100 | FKN2WS | 6 ± 0.5 | 73.0 ± 1.5 | 1.5 | 5 | |
| | | | 63.0 ± 1.5 | 1.5 | | |
| | | | 52.4 ± 1.5 | 1.2 | | |
| FKN200 | FKN3WS FKN5WS | 6 ± 0.5 | 73.0 ± 1.5 | 1.5 | 10 | |
| FKN300 | | | 52.4 ± 1.5 | 1.2 | | |
| FKN400 | FKN7WS | 6 ± 0.5 | 91.0 ± 1.5 | 1.5 | 10 | |
| FKN500 | | | | | | |

TAPE ON REEL PACKING

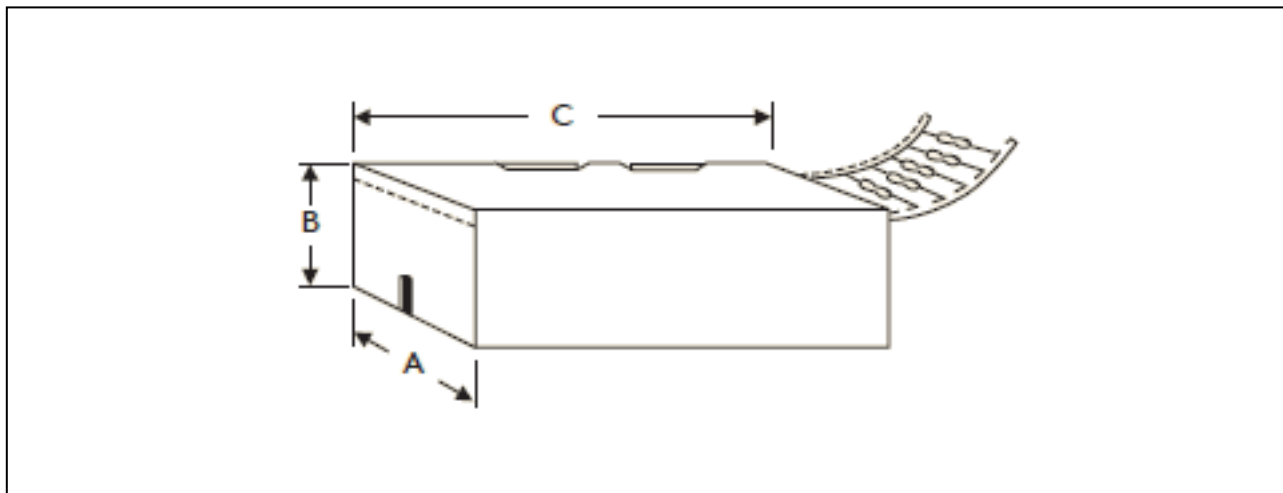


TYPE

Unit: mm/piece

| Normal | Miniature | Across Flange(A) | B | Quantity Per Reel |
|------------------|------------------|------------------|------|-------------------|
| - | FKN50S FKN1SS | 66.5 | 75.5 | 5,000 |
| FKN-50 | FKN1WS FKN2SS | 66.5 | 75.5 | 2,500 |
| FKN100 | FKN2WS | 87 | 96 | 2,000 |
| FKN200 | FKN3WS | 87 | 96 | 1,000 |
| FKN300 FKN400 | FKN5WS | 87 | 96 | 1,000 |

TAPE ON BOX PACKING



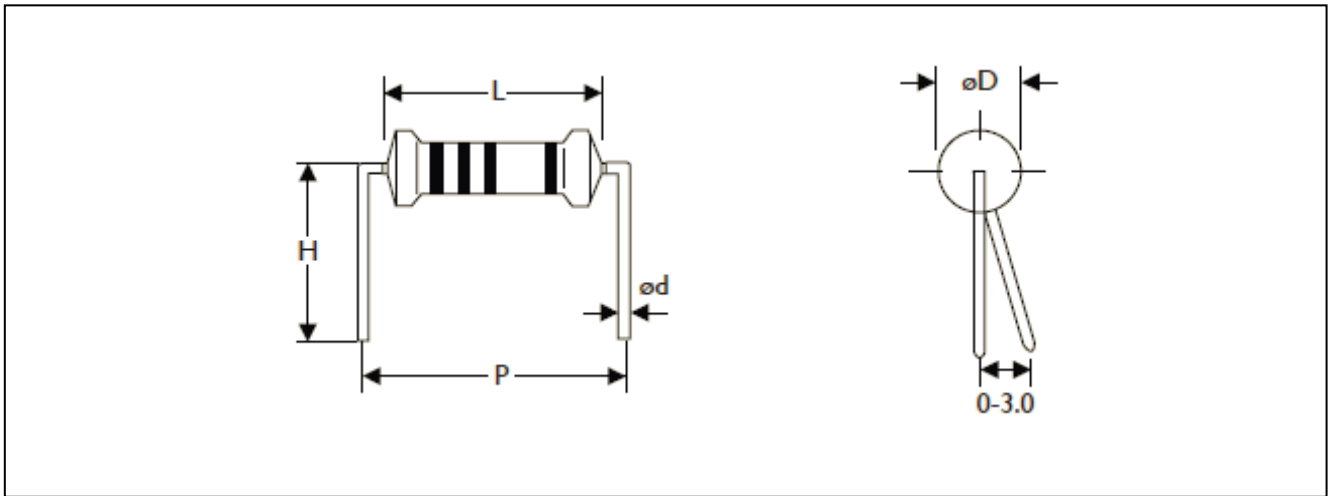
| TYPE | | DIMENSIONS | | | Unit: mm/piece |
|------------------|------------------|------------|-----|-----|------------------|
| Normal | Miniature | A | B | C | Quantity Per Box |
| - | FKN50S FKN1SS | 48 | 102 | 255 | 5,000 |
| - | FKN50S FKN1SS | 81 | 104 | 260 | 5,000 |
| FKN-50 | FKN1WS FKN2SS | 73 | 45 | 255 | 1,000 |
| FKN100 | FKN2WS | 81 | 91 | 260 | 1,000 |
| FKN100 | FKN2WS | 103 | 78 | 260 | 1,000 |
| FKN200 | FKN3WS | 81 | 91 | 260 | 1,000 |
| FKN200 | FKN3WS | 103 | 94 | 260 | 1,000 |
| FKN300 FKN400 | FKN5WS | 81 | 91 | 260 | 500 |
| FKN300 FKN400 | FKN5WS | 103 | 78 | 260 | 500 |
| FKN500 | FKN7WS | 116 | 79 | 255 | 250 |

BULK PACKING

| Normal | Miniature | Piece/Per Inner Box | Bag/Per Inner Box | Piece Per Bag |
|------------------|------------------|---------------------|-------------------|---------------|
| - | FKN50S FKN1SS | 10,000 | 10 | 1,000 |
| FKN-50 | FKN1WS FKN2SS | 5,000 | 5 | 1,000 |
| FKN100 | FKN2WS | 2,000 | 4 | 500 |
| FKN200 | FKN3WS | 1,000 | 2 | 500 |
| FKN300 FKN400 | FKN5WS | 1,000 | 2 | 500 |
| KNP500 | KNP7WS | 500 | 10 | 50 |

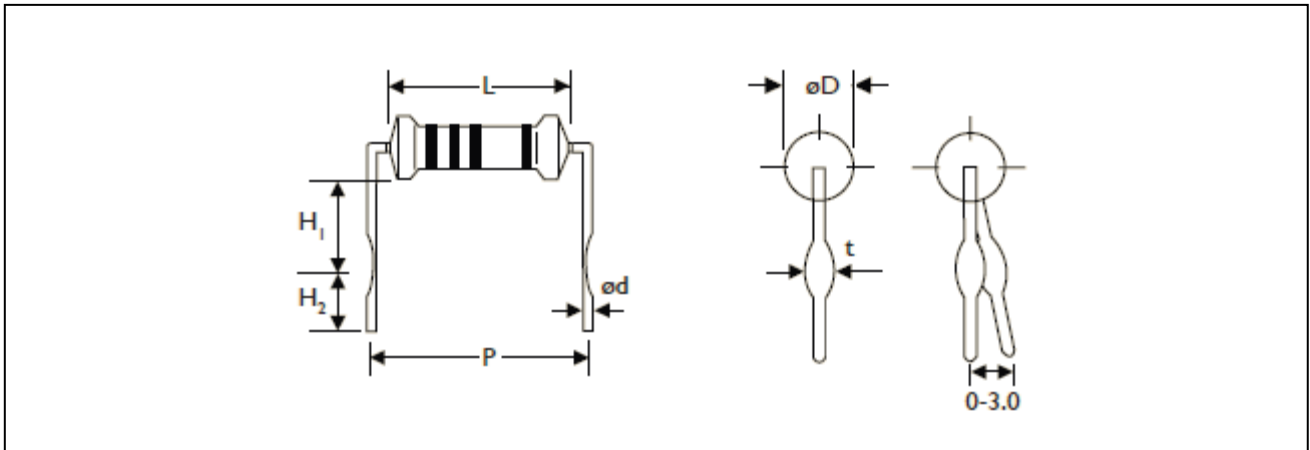
FORMING

M TYPE



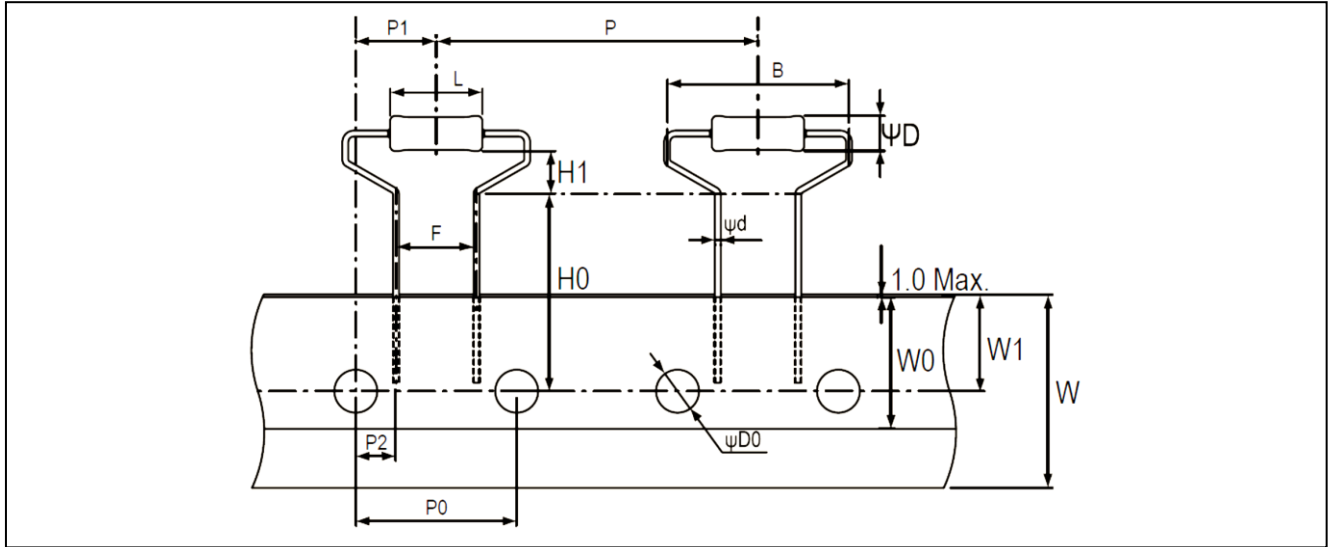
| TYPE | | DIMENSIONS | | | | | Unit: mm |
|------------------|------------------|----------------|---------------|-----------------|--------------|--------------|----------|
| Normal | Miniature | L | ψD | ψd | P | H | |
| - | FKN50S FKN1SS | 6.3 ± 0.5 | 2.5 ± 0.3 | 0.55 ± 0.05 | 10.0 ± 1 | 10.0 ± 1 | |
| FKN-50 | FKN1WS FKN2SS | 9.0 ± 0.5 | 3.5 ± 0.3 | 0.55 ± 0.05 | 12.5 ± 1 | 10.0 ± 1 | |
| FKN100 | FKN2WS | 11.5 ± 1.0 | 4.5 ± 0.5 | 0.8 ± 0.05 | 15.0 ± 1 | 12.5 ± 1 | |
| FKN200 | FKN3WS | 15.5 ± 1.0 | 5.2 ± 0.5 | 0.8 ± 0.05 | 20.0 ± 1 | 15.0 ± 1 | |
| FKN300 FKN400 | FKN5WS | 17.5 ± 1.0 | 6.5 ± 0.5 | 0.8 ± 0.05 | 25.0 ± 1 | 15.0 ± 1 | |

MB TYPE



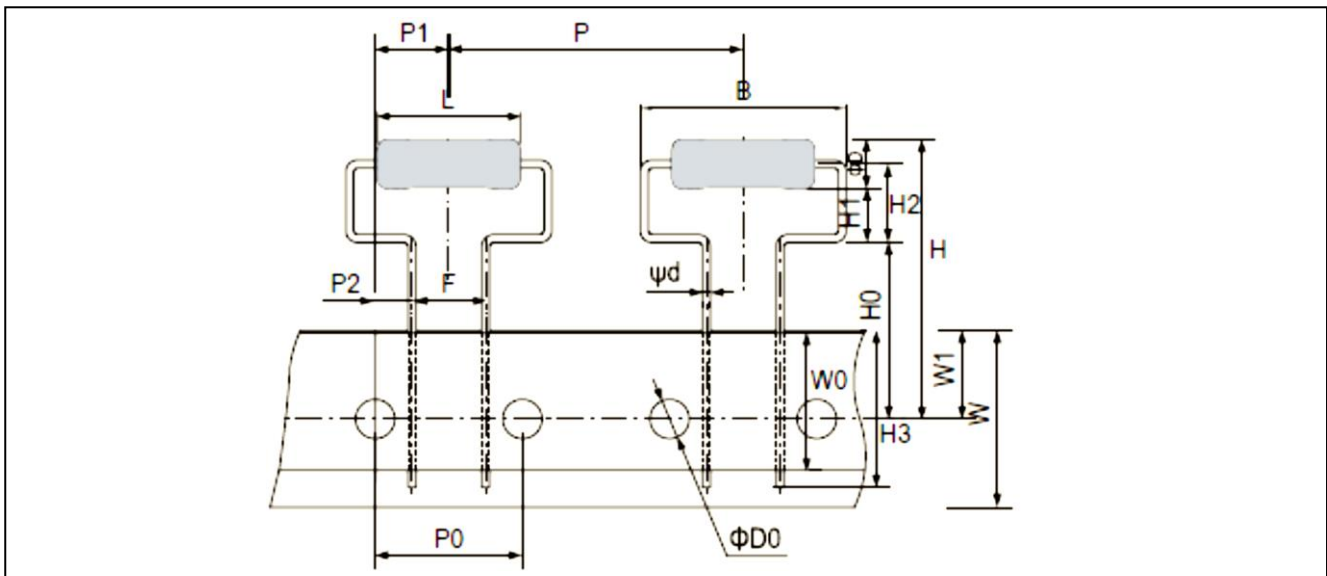
| TYPE | | DIMENSIONS | | | | | | | Unit: mm |
|------------------|------------------|------------|-----------|-------------|----------|----------|---------|-----------|----------|
| Normal | Miniature | L | ψD | ψd | P | H1 | H2 | t | |
| - | FKN50S FKN1SS | 6.3 ± 0.5 | 2.5 ± 0.3 | 0.55 ± 0.05 | 10.0 ± 1 | 6.0 ± 1 | 5.0 ± 1 | 1.2 ± 0.2 | |
| FKN-50 | - | 9.0 ± 0.5 | 3.5 ± 0.3 | 0.55 ± 0.05 | 12.5 ± 1 | 6.0 ± 1 | 5.0 ± 1 | 1.2 ± 0.2 | |
| - | FKN1WS FKN2SS | 9.0 ± 0.5 | 3.5 ± 0.3 | 0.8 ± 0.05 | 12.5 ± 1 | 6.0 ± 1 | 5.0 ± 1 | 1.4 ± 0.2 | |
| FKN100 | FKN2WS | 11.5 ± 1.0 | 4.5 ± 0.5 | 0.8 ± 0.05 | 15.0 ± 1 | 6.0 ± 1 | 5.0 ± 1 | 1.4 ± 0.2 | |
| FKN200 | FKN3WS | 15.5 ± 1.0 | 5.2 ± 0.5 | 0.8 ± 0.05 | 20.0 ± 1 | 10.0 ± 1 | 5.0 ± 1 | 1.4 ± 0.2 | |
| FKN300 FKN400 | FKN5WS | 17.5 ± 1.0 | 6.5 ± 0.5 | 0.8 ± 0.05 | 25.0 ± 1 | 10.0 ± 1 | 5.0 ± 1 | 1.4 ± 0.2 | |

MHA TYPE



| TYPE | | DIMENSIONS | | | | | | | | Unit: mm |
|---------------|--------------------|------------|-----------|-----------|----------|-----------|-----------|------------|-----------|----------|
| Normal | Miniature | L | ψD | ψd | B | H0 | H1 | P | P0 | |
| | | 9.0±0.5 | 3.5±0.3 | 0.55±0.05 | 17.5Max | 19.0±1.0 | 4.0±1.0 | 30.0±1.0 | 15.0±0.3 | |
| FKN-50 | FKN 1WS FKN 2SS | P1 | P2 | F | W | W0 | W1 | ψD0 | | |
| | | 7.5±1.0 | 3.75±0.5 | 7.5±0.5 | 18.0±0.5 | 5.0Min | 9.0±0.5 | 4.0±0.2 | | |

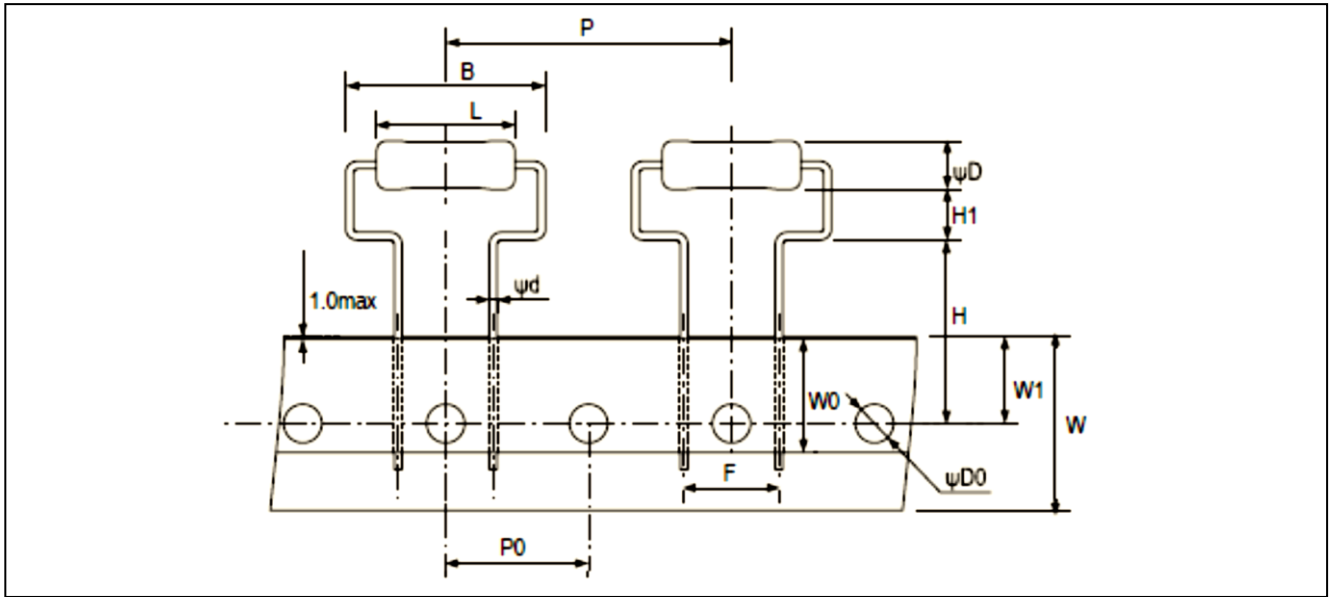
MHB TYPE



| TYPE | | DIMENSIONS | | | | | | | | | Unit: mm |
|---------------|------------------|------------|-----------|-----------|-----------|----------|-----------|-----------|-----------|------------|----------|
| Normal | Miniature | L | ψD | ψd | B | H | H0 | H1 | H2 | H3 | |
| | | 15.5±1.0 | 5.2±0.5 | 0.8±0.05 | 21.0Max. | 30Max. | 18.0±1.0 | 5.5(Ref.) | 8.0±1.5 | 16Max. | |
| FKN200 | FKN3WS | P | P0 | P1 | P2 | F | W | W0 | W1 | ψD0 | |
| | | 30.0±1.0 | 15.0±0.3 | 7.5±1.0 | 3.75±0.8 | 7.5±0.5 | 18.0±0.5 | 5.0Min. | 9.0±0.5 | 4.0±0.3 | |



MHC TYPE



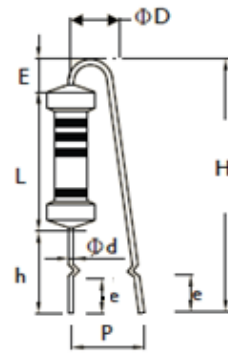
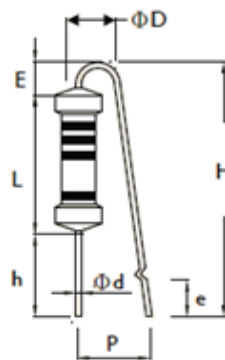
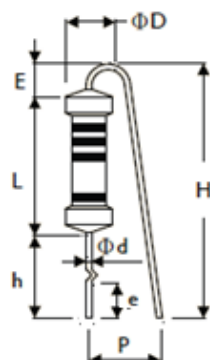
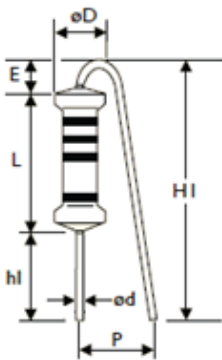
| TYPE | | DIMENSIONS | | | | | | | | Unit: mm |
|---------------|------------------|------------|-----------|-----------|-----------|------------|-----------|----------|-----------|----------|
| Normal | Miniature | L | ψD | ψd | B | H | H1 | P | P0 | |
| | | 15.5±1.0 | 5.2±0.5 | 0.8±0.05 | 21.0Max. | 19.0±1.0 | 5.25±1.0 | 30.0±1.0 | 15.0±0.3 | |
| FKN200 | FKN3WS | F | W | W0 | W1 | ψD0 | | | | |
| | | 10.0±0.5 | 18.0±0.5 | 5.0Min. | 9.0±0.5 | 4.0±0.2 | | | | |

F TYPE

FK TYPE

FFK TYPE

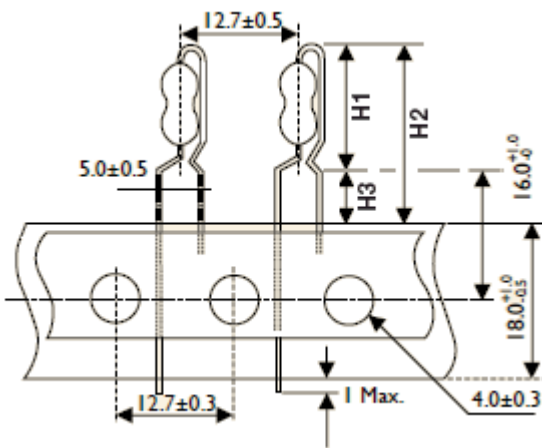
FKK TYPE



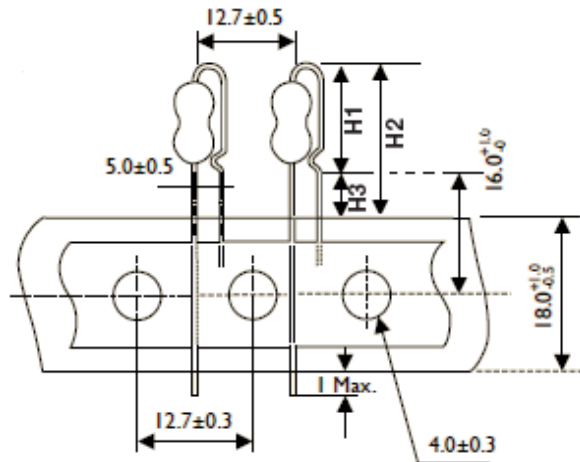
| TYPE | | DIMENSIONS | | | | | | | | | | | Unit: mm |
|---------------|------------------|------------|-----------|-----------|----------|----------|---------------|-----------|----------------|---------------|----------|--|----------|
| Normal | Miniature | L | ψD | ψd | P | h | H Max. | h1 | H1 Max. | E Max. | e | | |
| FKN-50 | FKN1WS FKN2SS | 9.0±0.5 | 3.5±0.3 | 0.55±0.05 | 6±1 | 8±1 | 22 | 5±1 | 18.5 | 3.5 | 3.5±1 | | |
| FKN100 | FKN2WS | 11.5±1 | 4.5±0.5 | 0.8±0.05 | 6±1 | 8±1 | 24 | 5±1 | 20 | 3.5 | 3.5±1 | | |
| FKN200 | FKN3WS | 15.5±1 | 5.2±0.5 | 0.8±0.05 | 8±1 | 8±1 | 28 | 5±1 | 25 | 3.5 | 3.5±1 | | |



PN TYPE (Taping Pack)



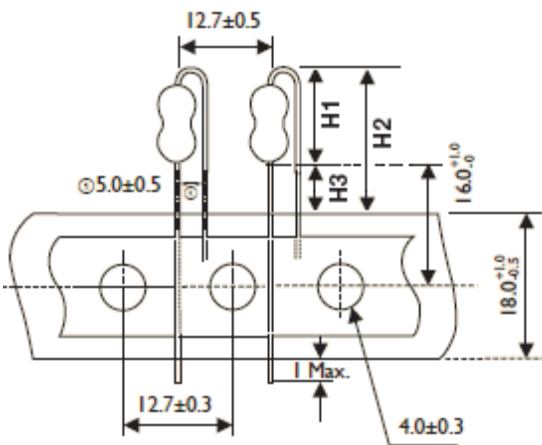
AV TYPE (Taping Pack)



| TYPE | | DIMENSIONS | | | Unit: mm |
|--------|------------------|------------|---------|---------|----------|
| Normal | Miniature | H1 Max. | H2 Max. | H3 Max. | |
| - | FKN50S FKN1SS | 13 | 21.5 | 8.5 | |
| FKN-50 | FKN1WS FKN2SS | 17 | 25.5 | 8.5 | |
| FKN100 | FKN2WS | 19 | 27.5 | 8.5 | |

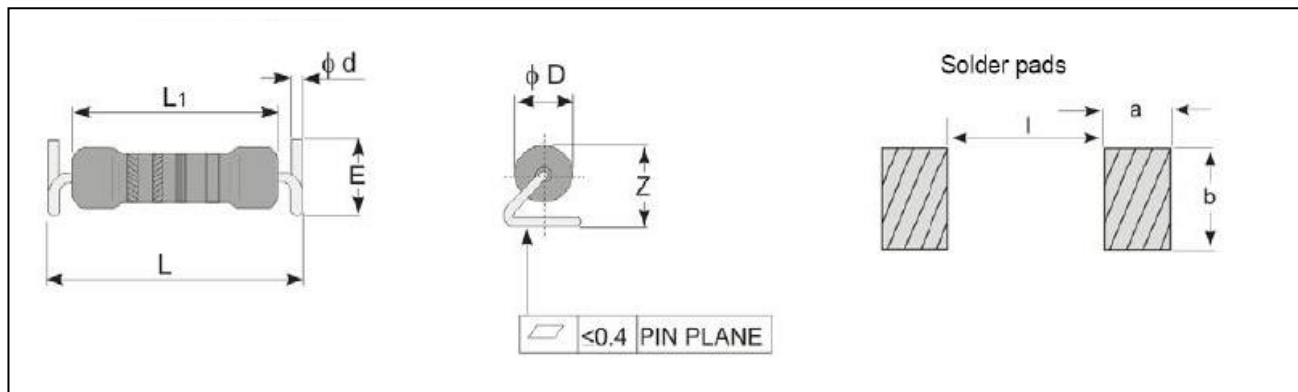
| TYPE | | DIMENSIONS | | | Unit: mm |
|--------|------------------|------------|---------|---------|----------|
| Normal | Miniature | H1 Max. | H2 Max. | H3 Max. | |
| - | FKN50S FKN1SS | 11.5 | 20 | 8.5 | |
| FKN-50 | FKN1WS FKN2SS | 14.5 | 23 | 8.5 | |
| FKN100 | FKN2WS | 17.5 | 26 | 8.5 | |

FT TYPE (Taping Pack)



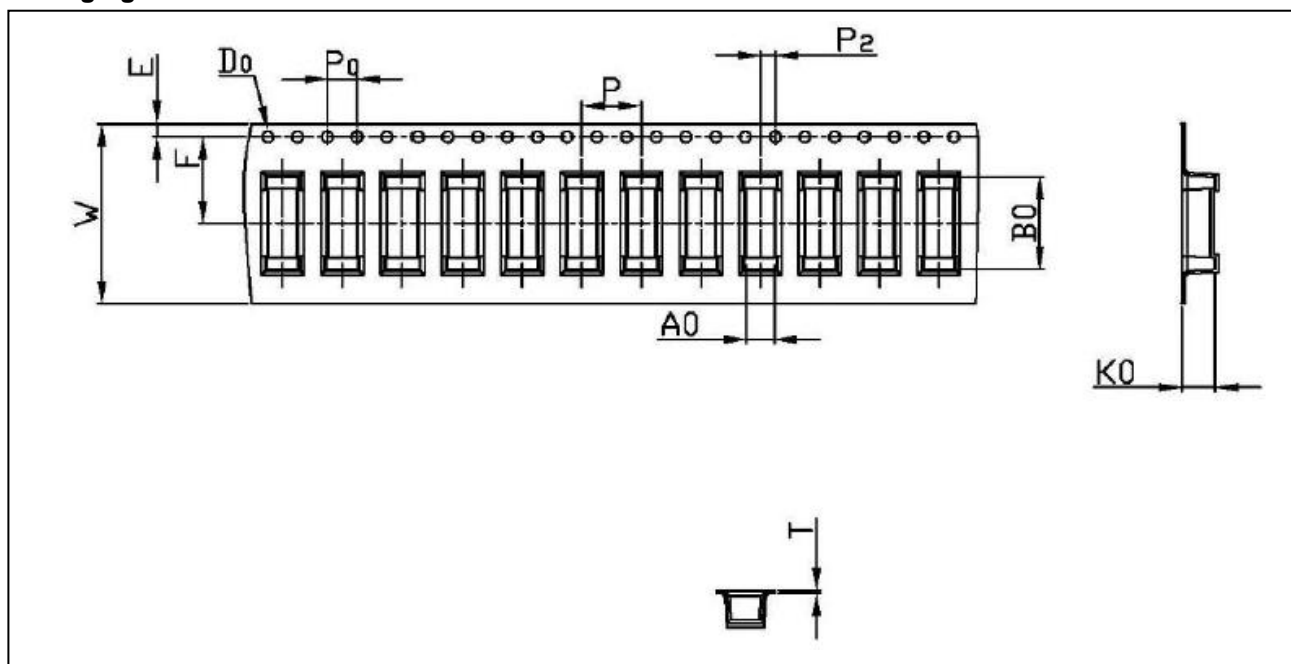
| TYPE | | DIMENSIONS | | | Unit: mm |
|--------|------------------|------------|---------|---------|----------|
| Normal | Miniature | H1 Max. | H2 Max. | H3 Max. | |
| - | FKN50S FKN1SS | 10 | 18.5 | 8.5 | |
| FKN-50 | FKN1WS FKN2SS | 13 | 21.5 | 8.5 | |
| FKN100 | FKN2WS | 16 | 24.5 | 8.5 | |

ZFH TYPE



| TYPE | | DIMENSIONS | | | | | | | | | Unit:mm |
|--------|------------------|------------|---------|----------|-----------|---------|--------|---------|---------|---------|---------|
| Normal | Miniature | L | L1 | ψD | ψd | E | Z Max. | l(ref.) | a(ref.) | b(ref.) | |
| - | FKN50S FKN1SS | 8.0±0.5 | 6.3±0.5 | 2.5±0.3 | 0.55±0.05 | 3.2±0.3 | 3.6 | 6 | 3 | 4 | |
| FKN-50 | FKN1WS FKN2SS | 11±0.5 | 9.0±0.5 | 3.5±0.3 | 0.55±0.05 | 4.2±0.3 | 4.3 | 9 | 3 | 5 | |

Packaging for ZFH TYPE

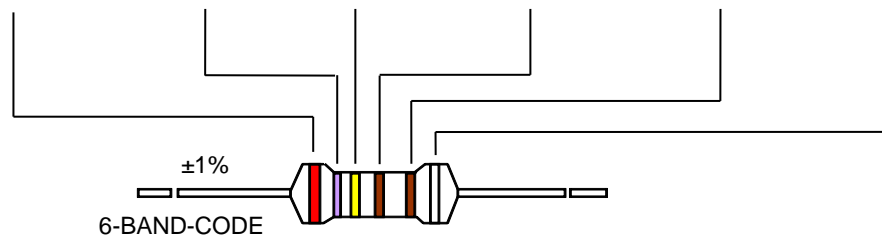


| TYPE | | DIMENSIONS | | | | | | | | | | | Unit:mm |
|--------|------------------|------------|---------|----------|----------|---------|----------|----------|---------|-------|-------|----------|---------|
| Normal | Miniature | W | A0 | B0 | K0 | P | F | E | D0 | P0 | P2 | T | |
| - | FKN50S FKN1SS | 16.0±0.3 | 2.9±0.1 | 8.7±0.1 | 3.75±0.1 | 8.0±0.1 | 7.5±0.1 | 1.75±0.1 | 1.5±0.1 | 4±0.1 | 2±0.1 | 0.35±0.1 | |
| FKN-50 | FKN1WS FKN2SS | 24.0±0.3 | 3.8±0.1 | 12.3±0.1 | 4.5±0.1 | 8.0±0.1 | 11.5±0.1 | 1.75±0.1 | 1.5±0.1 | 4±0.1 | 2±0.1 | 0.40±0.1 | |

MARKING



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



REVISION HISTORY

| REVISION | DATE | CHANGE NOTIFICATION | DESCRIPTION |
|-----------|--------------|---------------------|--|
| Version 5 | Apr.2, 2024 | - | - Added forming code description for part number |
| Version 4 | Mar.27, 2024 | - | - Remove M type of FKN500&FKN7WS |
| Version 3 | Nov.14, 2023 | - | - Remove MB type of FKN500&FKN7WS |
| Version 2 | Aug.31, 2023 | - | - Update legal disclaimer and footer version numbers |
| Version 1 | Nov.01, 2022 | - | - Revised the resistance value example |
| Version 0 | Aug.16, 2021 | - | - First issue of this specification |

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