Innovative Service Around the Globe YAGEO

DATA SHEET

WIREWOUND RESISTORS

Fusible, Flameproof

FKN Series

±1%, ±5%

1/2W to 7W

RoHS compliant & Halogen Free

YAGEO

Product specification – December 23, 2024 V.6

APPLICATIONS

- Chargers & adapters
- Home appliance
- Lighting
- Safety application

FEATURES

- UL1412 certified
- Fusing time <60S for 25 or 36 times rated power
- Fusible function
- Excellent surge performance, customized surge requirements
- Flameproof coating equivalent to UL-94V-0
- RoHS compliant & halogen-free

ORDERING INFORMATION

Part number of the fusible wire wound resistor are identified by the series, power rating, tolerance, packing, temperature coefficient, forming and resistance value and suffix.

PART NUMBER

FKN	2WS	F	T	F	73-	10R	CL
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(1) SERIES

FKN Series

(2) POWER RATING

50S = 1/2W	2SS = 2W	400 = 4W
-50 = 1/2W	2WS = 2W	5WS = 5W
1SS =1W	200 = 2W	500 = 5W
1WS = 1W	3WS = 3W	7WS = 7W
100 = 1W	300 = 3W	

(3) TOLERANCE

F = ±1% J = ±5%

(4) PACKAGING

R = Reel Pack B = Bulk T = Box Pack

(5) TEMPERATURE COEFFICIENT OF RESISTANCE

- = Based on spec.

(6) FORMING

52- = 52.4mm
63- =63mm
73- = 73mm
91- =91mm
M = M-Type Forming
MB = M-form W/flat
F = F Type
FFK = F-form Kink
FKK = FKK Type
FT = FT Type Forming
PN = PANAsert
AV = AVIsert
ZFH = Surface mount
FK = FK Type

Note:52.4mm, 63mm, 73mm and 91mm represent dimension A of the axial type, please refer to the category of AXIAL/REEL TAPE SPECIFICATION for the detail.

(7) RESISTANCE VALUE

E24 & E96 Series

Example; 1R = 1Ω, 10R = 10Ω, 100R = 100Ω

(8) Suffix

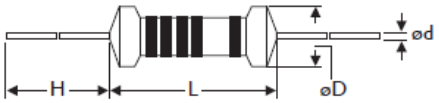
Optional code. required only when resistor is with particular pulse/surge specification.

Example : NE, CM, CN, CU, CY, FB, FC, NS, NM, CR, NL, NJ and etc.

Null = Standard Type.

DIMENSIONS

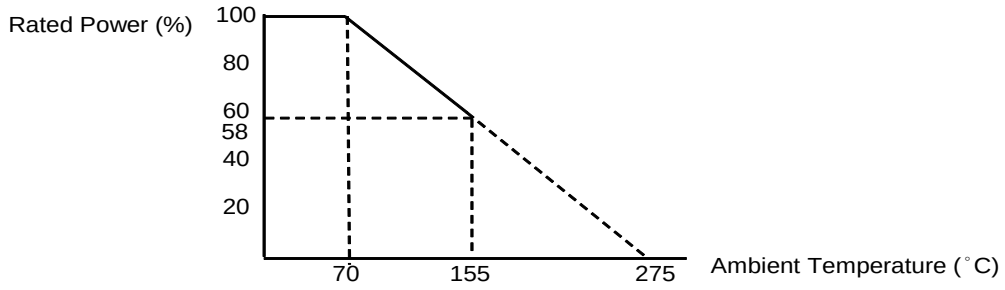
Unit: mm



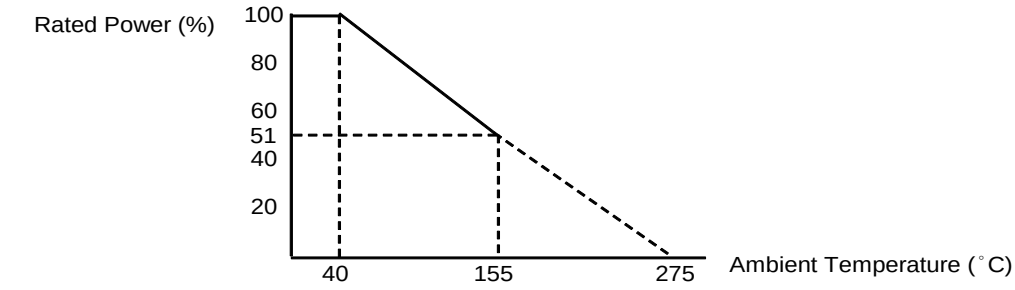
Normal	Miniature	L	ψD	H	ψd
-	FKN50S / FKN1SS	6.3 ± 0.5	2.5 ± 0.3	28 ± 2.0	0.55 ± 0.05
FKN-50	FKN1WS / FKN2SS	9.0 ± 0.5	3.5 ± 0.3	26 ± 2.0	0.55 ± 0.05 0.8±0.05
FKN100	FKN2WS	11.5 ± 1.0	4.6 ± 0.5	35 ± 2.0	0.8 ± 0.05
FKN200	FKN3WS	15.5 ± 1.0	5.2 ± 0.5	33 ± 2.0	0.8 ± 0.05
FKN300 / FKN400	FKN5WS	17.5 ± 1.0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

DERATING CURVE

FKN50S~3WS



FKN300~7WS



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	√(P X R)					
Operating Temp. Range	- 40℃ to + 155℃					
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	√(P X 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)

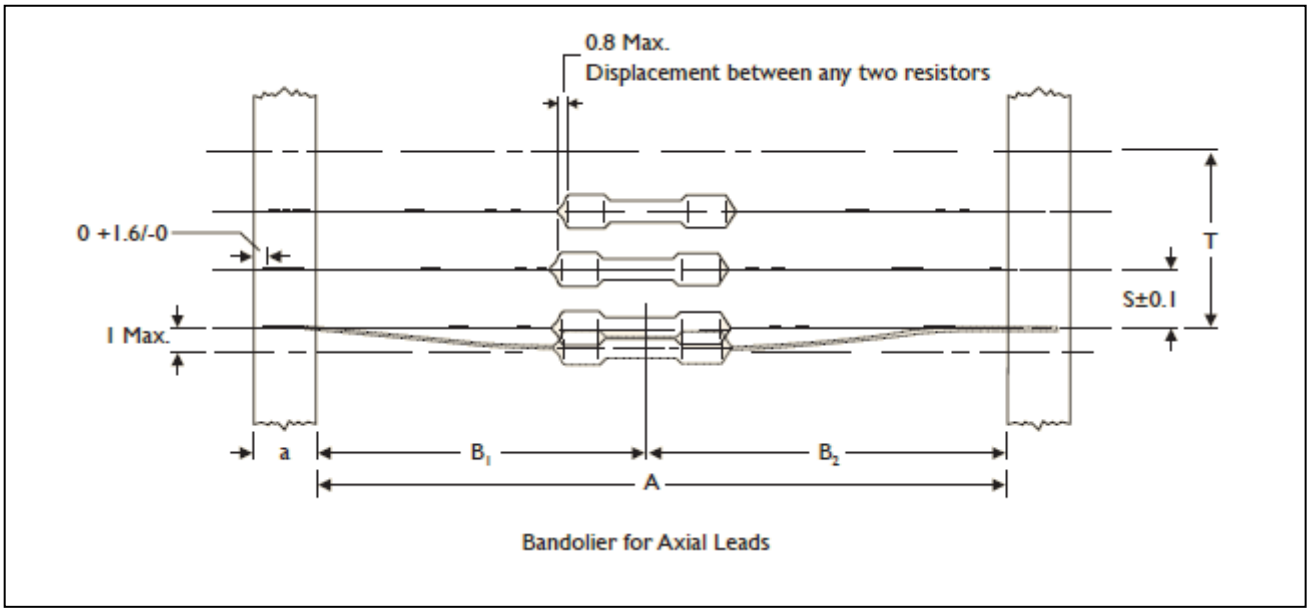
P=Rated power (W)

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

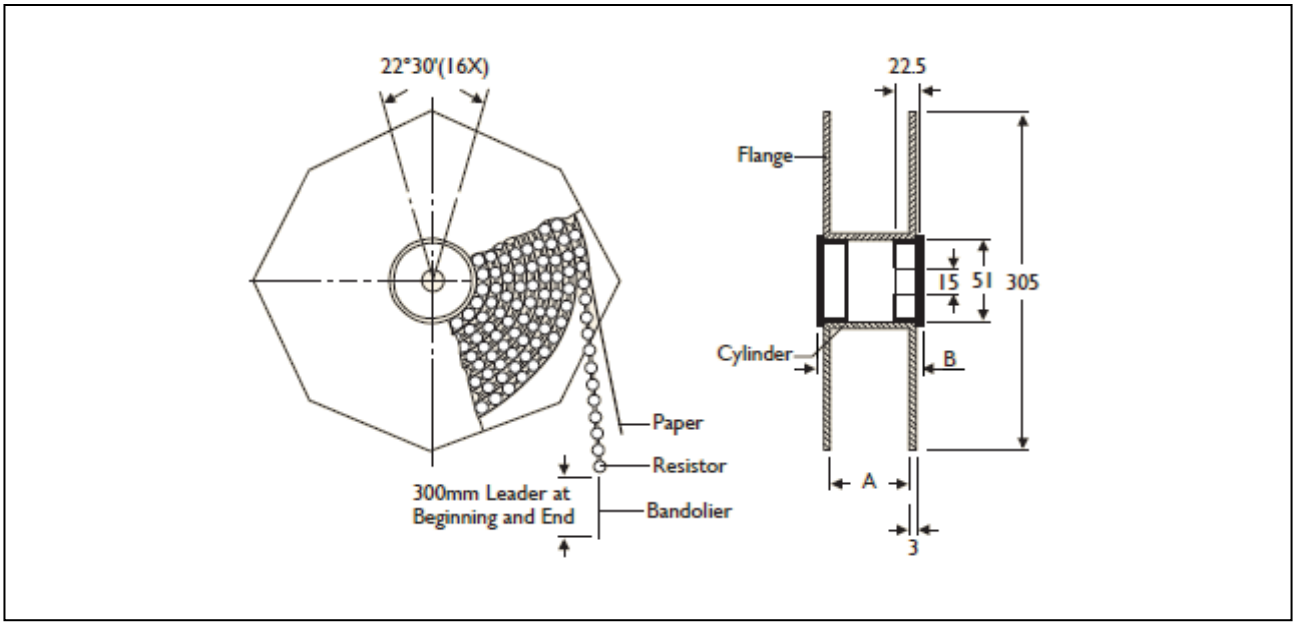


Bandolier for Axial Leads

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 52.4± 1.5	1.5 1.2	10	
FKN300						
FKN400						
FKN500	FKN7WS	6 ± 0.5	91.0± 1.5	1.5	10	

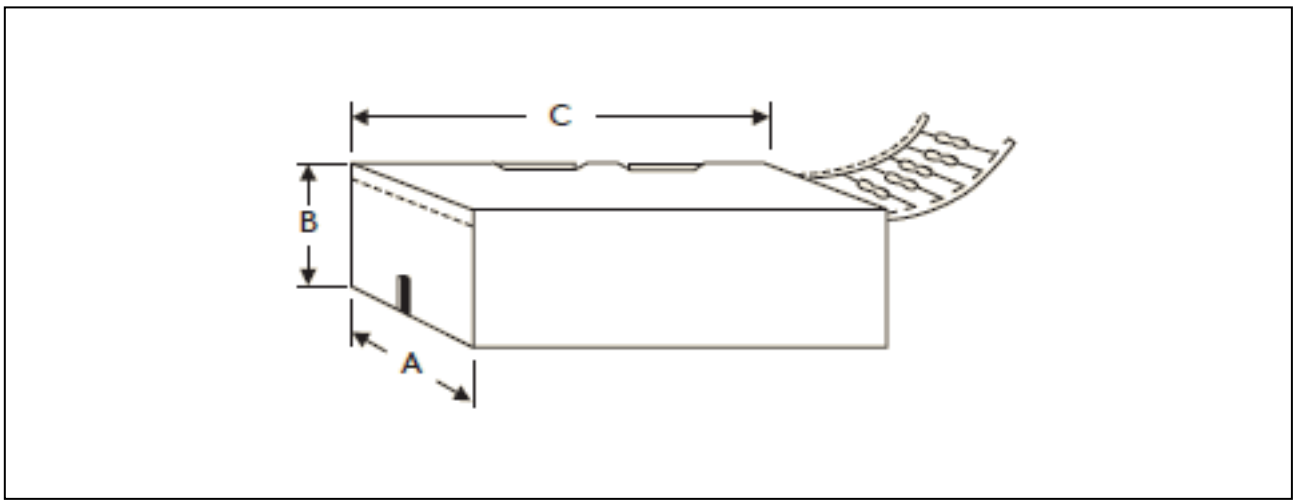
TAPE ON REEL PACKING



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

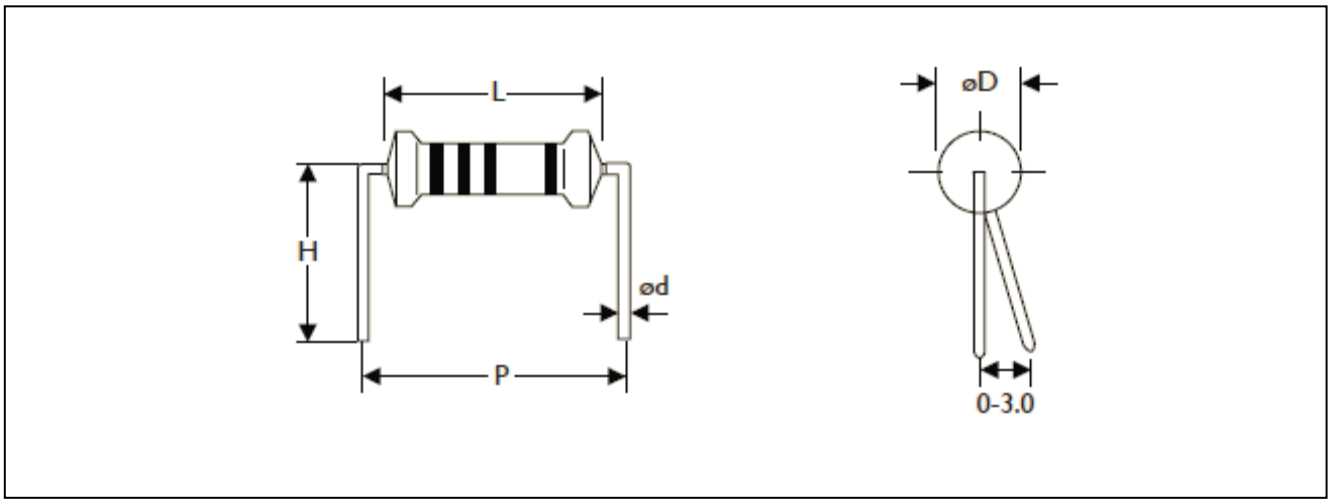
Normal	Miniature	A	B	C	Quantity Per Box
-	FKN50S FKN1SS	48	102	255	5,000
-	FKN50S FKN1SS	81	104	260	5,000
FKN-50	FKN1WS FKN2SS	73	45	255	1,000
FKN100	FKN2WS	81	91	260	1,000
FKN100	FKN2WS	103	78	260	1,000
FKN200	FKN3WS	81	91	260	1,000
FKN200	FKN3WS	103	94	260	1,000
FKN300 FKN400	FKN5WS	81	91	260	500
FKN300 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
FKN500	FKN7WS	500	10	50

FORMING

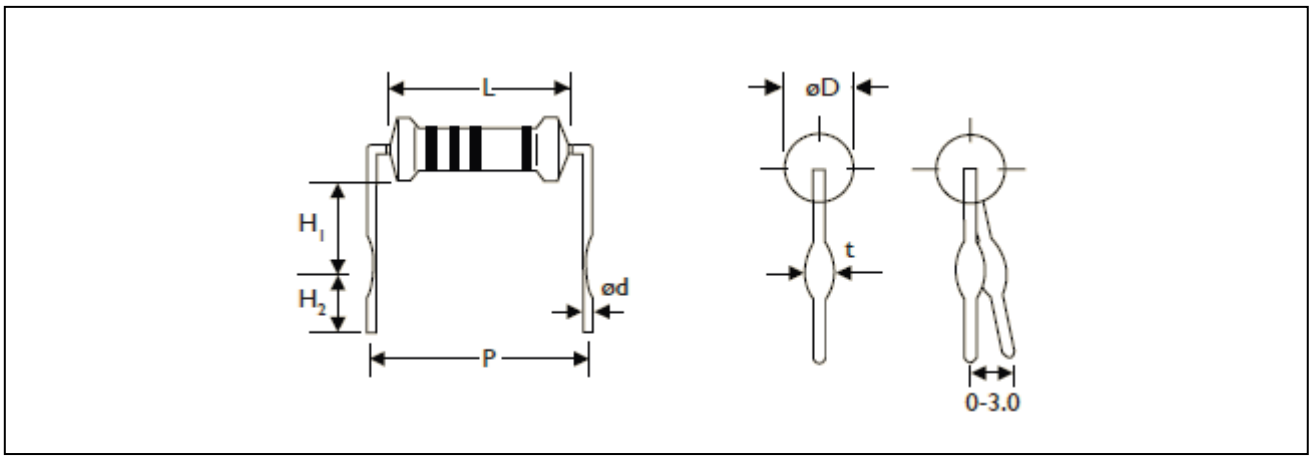
M TYPE



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

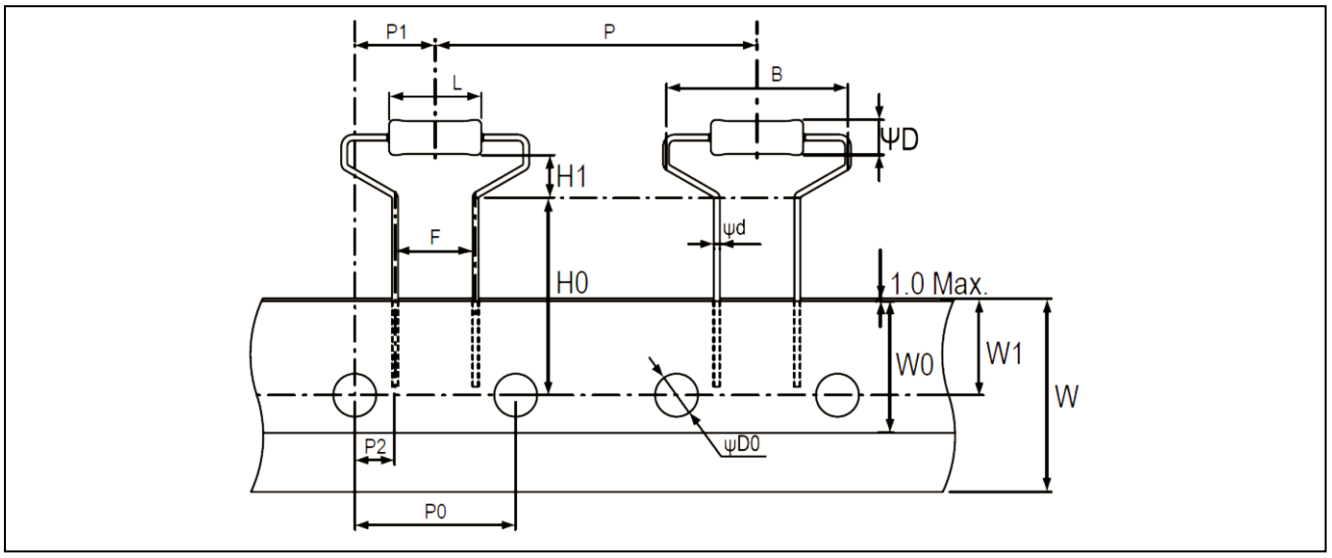
MB TYPE



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

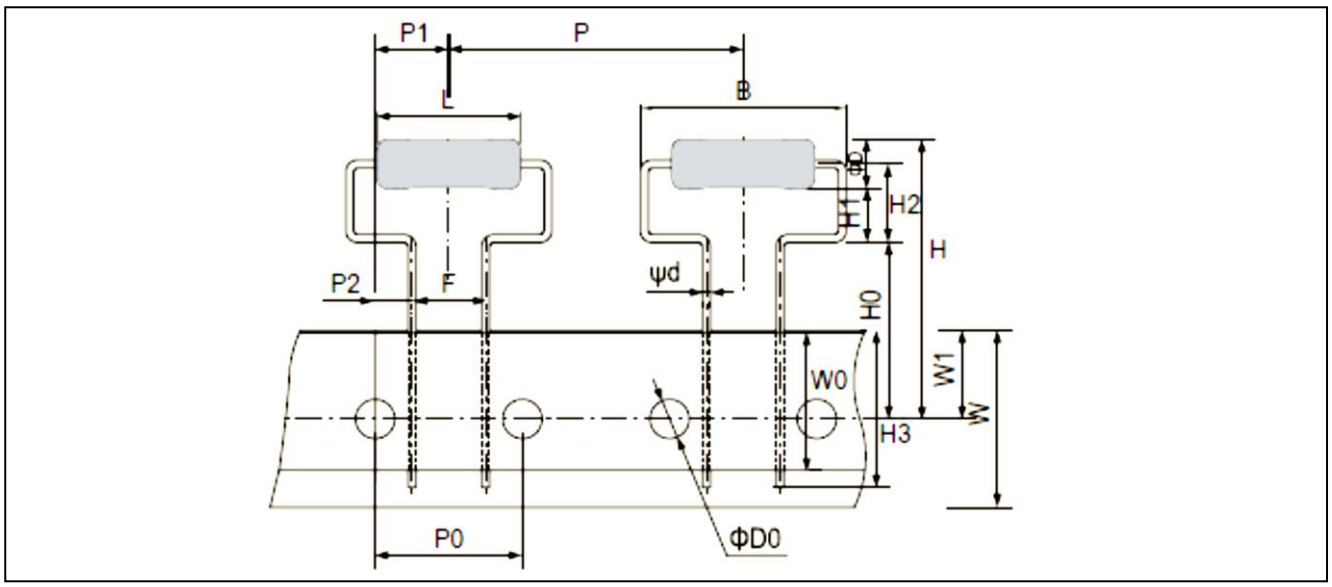
MHA TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	B	H0	HI	P	P0
FKN-50	FKN 1WS FKN 2SS	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
		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	

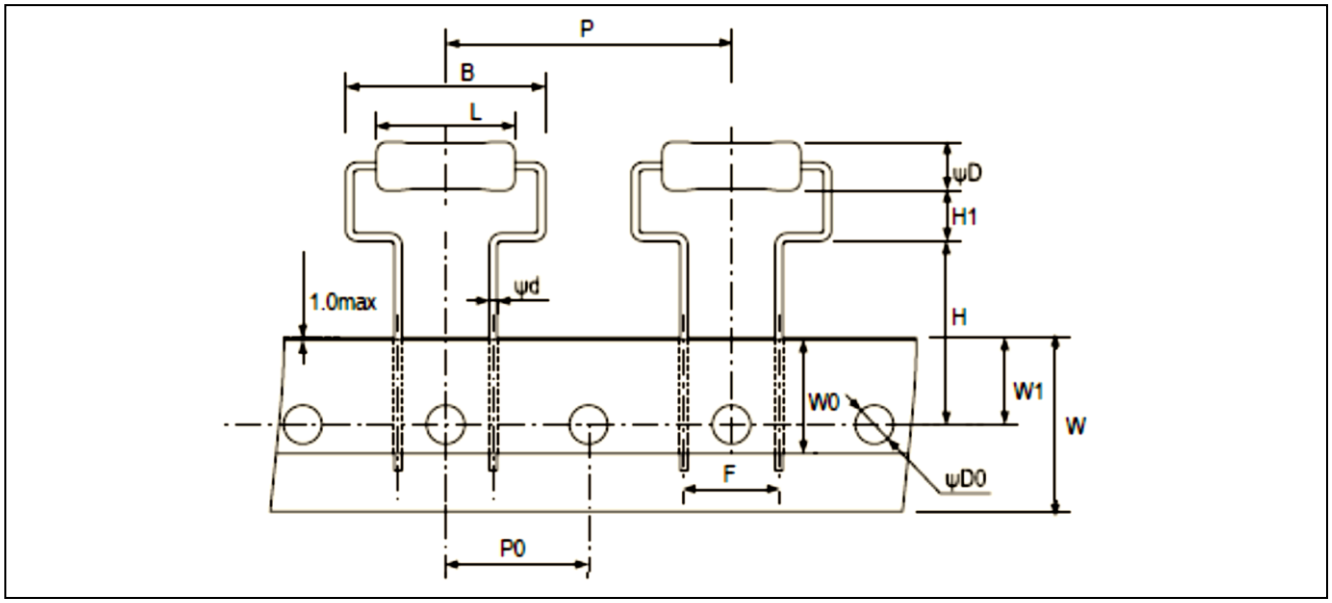
MHB TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	B	H	H0	HI	H2	H3
FKN200	FKN3WS	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.
		P	**P0**	**PI**	**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

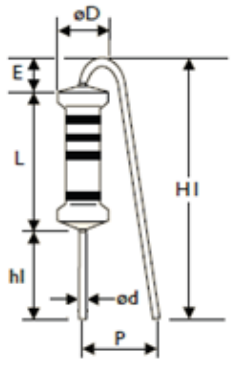
MHC TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	B	H	Hl	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
		F	**W**	**W0**	**W1**	**ΨD0**			
FKN200	FKN3WS	10.0±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.2			

F TYPE



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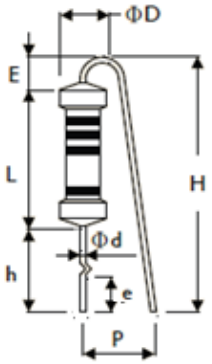

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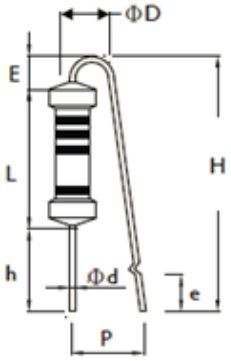

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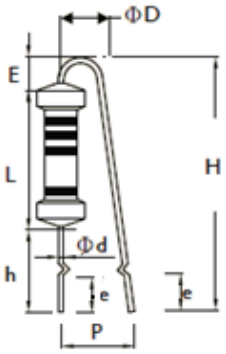
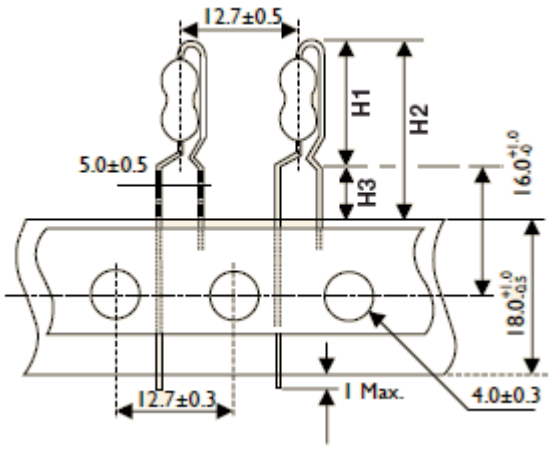


TYPE DIMENSIONS Unit: mm

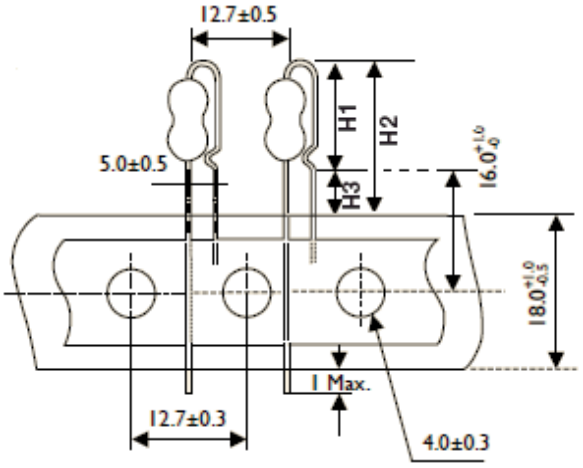
Normal	Miniature	L	ψD	ψd	P	h	H Max.	hl	Hl Max.	E Max.	e
FKN-50	FKN1WS FKN2SS	9.0±0.5	3.5±0.3	0.55±0.05	6±1	8±1	22	5±1	18.5	3.5	3.5±1
FKN100	FKN2WS	11.5±1	4.5±0.5	0.8±0.05	6±1	8±1	24	5±1	20	3.5	3.5±1
FKN200	FKN3WS	15.5±1	5.2±0.5	0.8±0.05	8±1	8±1	28	5± 1	25	3.5	3.5±1

PN TYPE (Taping Pack)



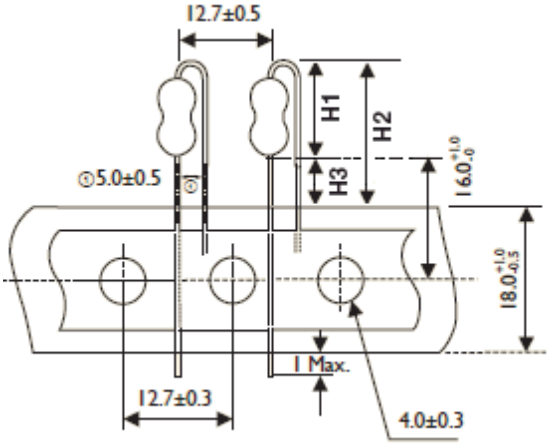
TYPE		DIMENSIONS		Unit: mm
Normal	**Miniature**	**H1 Max.**	**H2 Max.**	**H3 Max.**
-	FKN50S FKN1SS	13	21.5	8.5
FKN-50	FKN1WS FKN2SS	17	25.5	8.5
FKN100	FKN2WS	19	27.5	8.5

AV TYPE (Taping Pack)



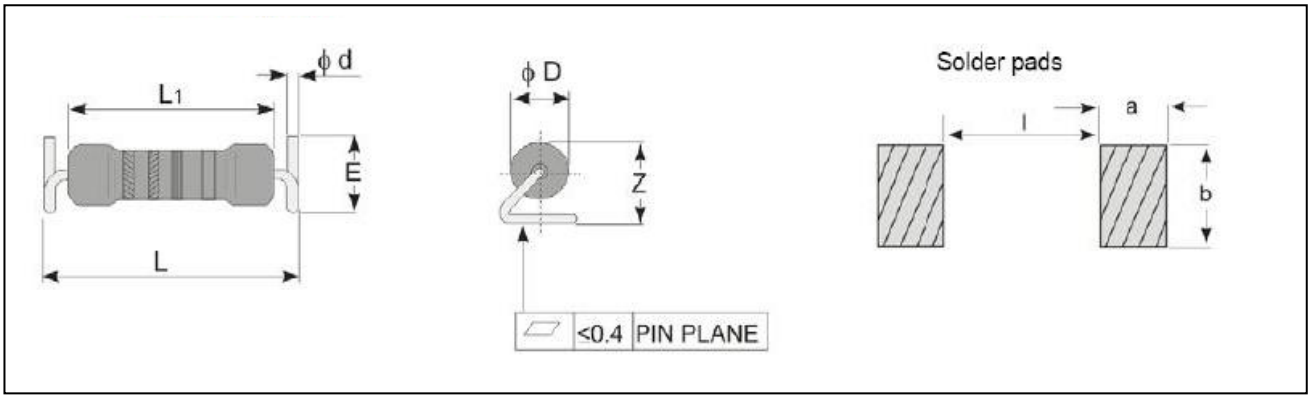
TYPE		DIMENSIONS		Unit: mm
Normal	**Miniature**	**H1 Max.**	**H2 Max.**	**H3 Max.**
-	FKN50S FKN1SS	11.5	20	8.5
FKN-50	FKN1WS FKN2SS	14.5	23	8.5
FKN100	FKN2WS	17.5	26	8.5

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

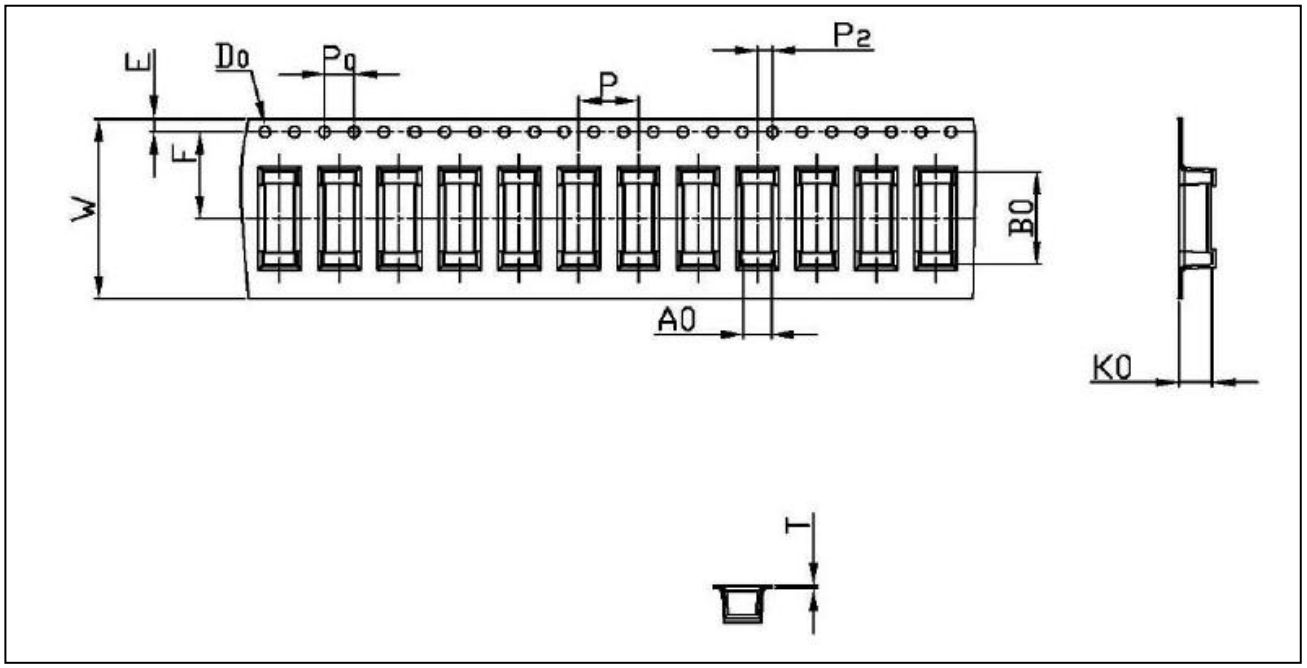
ZFH TYPE



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

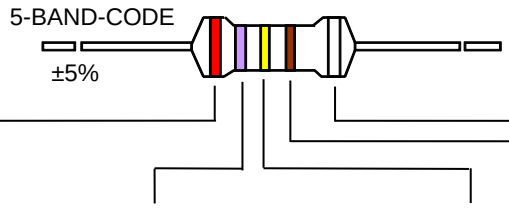
Packaging for ZFH TYPE



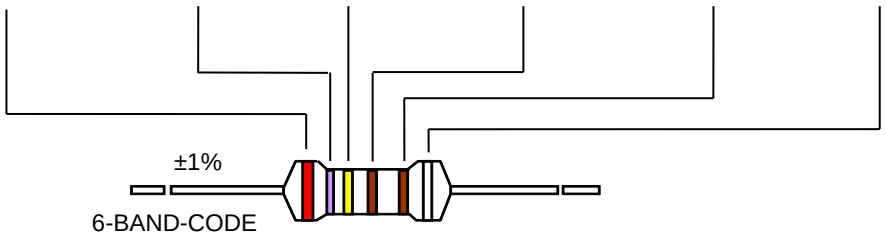
TYPE DIMENSIONS Unit:mm

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 6	Dec.20, 2024	-	- Revised series name in bulk packing
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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