Innovative Service Around the Globe YAGEO

DATA SHEET

METAL FILM RESISTORS

High Power, Flameproof

FMP Series

±1%, ±5%

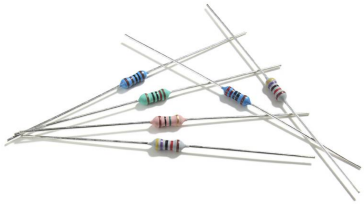
1/2W to 3W

RoHS compliant & Halogen Free

YAGEO

Product specification – August 13, 2021 V.0





APPLICATIONS

- All general purpose applications
- Power applications

FEATURES

- Ultra miniature size
- Wide resistance range
- High power rating
- High stability
- PPAP ready (FMP-50)
- Flameproof coating equivalent to UL94V-0
- RoHS compliant & halogen-free

ORDERING INFORMATION

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

PART NUMBER

FMP	200	F	T	F	73-	100R
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) SERIES

FMP Series

(2) POWER RATING

-50 = 1/2W	3WS = 3W
100 = 1W	300= 3W
200 = 2W	

(3) TOLERANCE

F = ±1%	J = ±5%

(4) PACKAGING

R = Reel Pack	B = Bulk
T = Box Pack	

(5) TEMPERATURE COEFFICIENT OF RESISTANCE

E = ±50ppm/°C	- = Based on spec.
F = ±100ppm/°C	

(6) FORMING

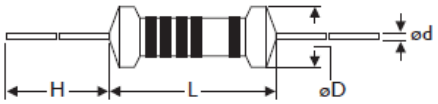
26- = 26mm	FFK = FFK Type Forming
52- = 52.4mm	FKK = FKK Type Forming
52J = 52.4mm, Φd=0.8±0.05mm	FT = FT Type Forming
52E = 52.4mm, Φd=0.70±0.05mm	MT = MTsert
73- = 73mm	PN = PANAsert
M = M Type Forming	AV = AVIsert
F = F Type Forming	
FK = FK Type Forming	

(7) RESISTANCE VALUE

E24 & E96 Series
Example:
100R = 100Ω, 10K = 10,000Ω, 1M = 1,000,000Ω

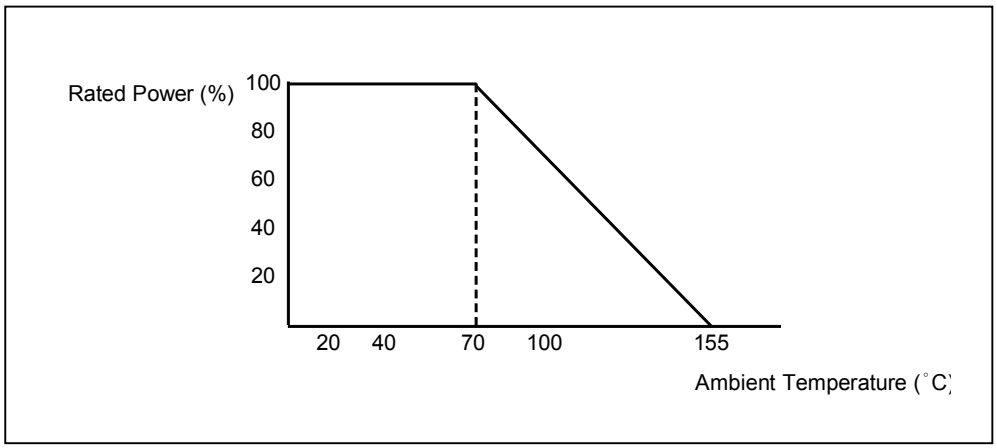
DIMENSIONS

Unit: mm



Ultra Miniature	L	ψD	H	ψd
FMP-50	3.4 ± 0.3	1.9 ± 0.2	28 ± 2.0	0.45 ±0.05
FMP100	6.3 ± 0.5	2.4 ± 0.2	28 ± 2.0	0.55 ±0.05
FMP200	9.0 ± 0.5	3.9 ± 0.3	26 ± 2.0	0.55 ±0.05
FMP3WS	11.5 ± 1.0	4.5 ± 0.5	35 ± 2.0	0.8±0.05
FMP300	15.5± 1.0	5.0 ± 0.5	33 ± 2.0	0.8±0.05

DERATING CURVE



ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	FMP-50	FMP100	FMP200	FMP3WS	FMP300
Power Rating at 70 °C	1/2W	1W	2W	3W	3W
Maximum Working Voltage	200V	350V	500V	500V	750V
Maximum Overload Voltage	400V	600V	700V	700V	1000V
Voltage Proof on Insulation	300V	500V	500V	500V	500V
Resistance Range	1Ω ~ 4M7Ω for E24 & E96 series value				
Operating Temp. Range	- 55°C to +155°C				
Temperature Coefficient	±100ppm/°C , ±50ppm/°C(FMP-50 & FMP100 types, R ≥ 10RΩ)				

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

TEST AND REQUIRMENTS

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)	± 1.0 % + 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 -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)	±2.0%+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)	±2.0%+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	±0.25%+0.05Ω
Accidental Overload Test	IEC 60115-1 4.26	4 times RCWV(or Umax., whichever less) 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

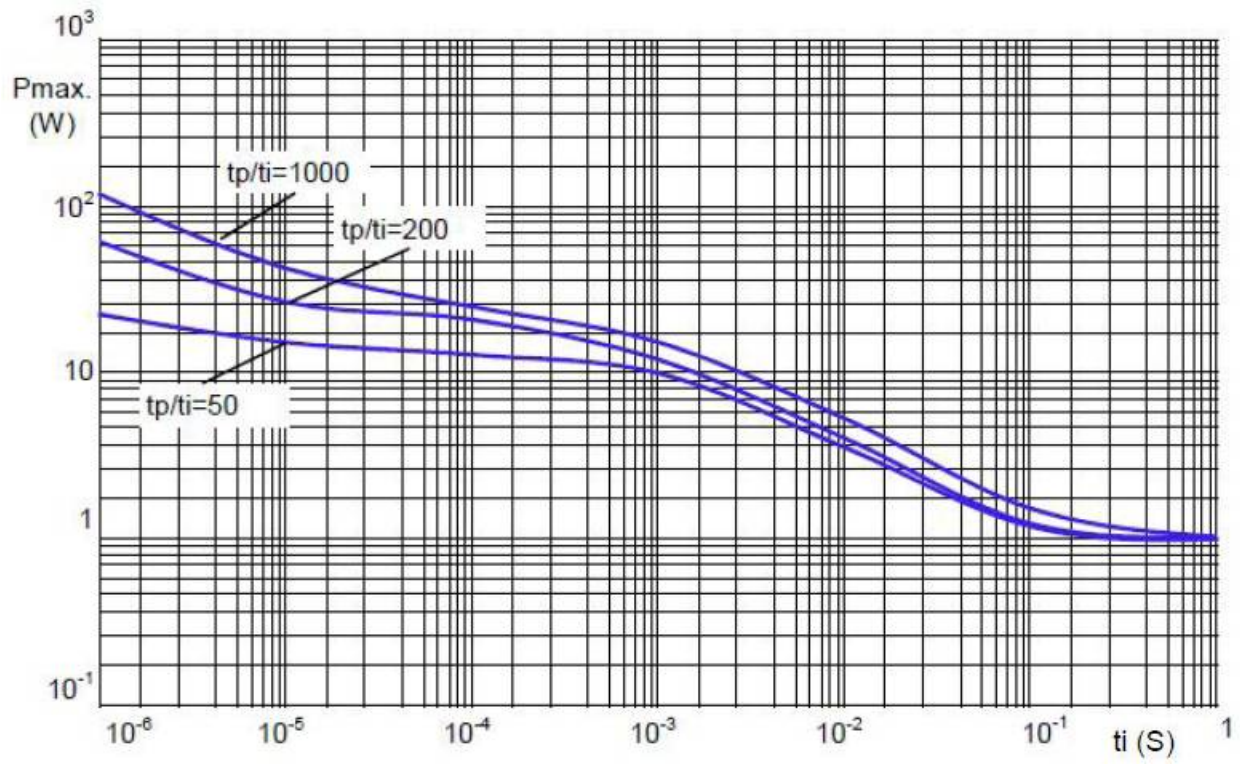
Where

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

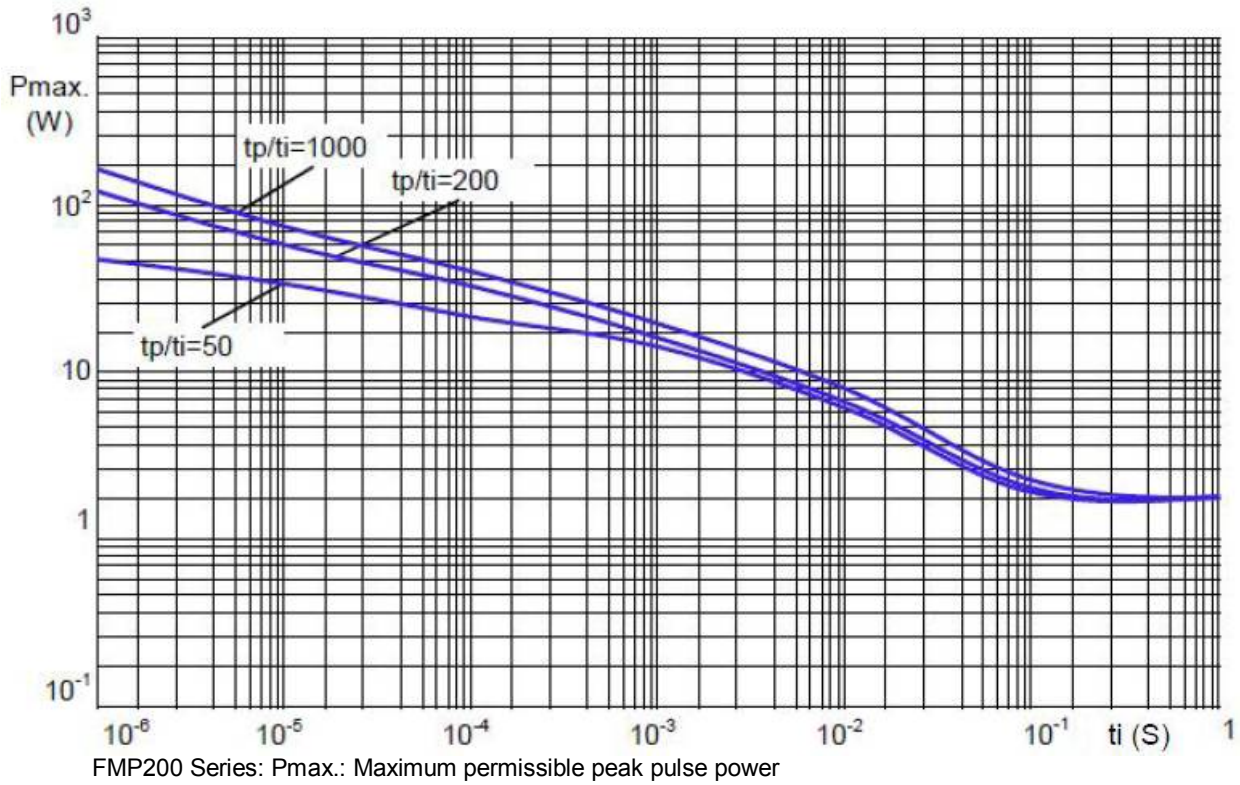
P=Rated power (W)

R=Resistance value (Ω)

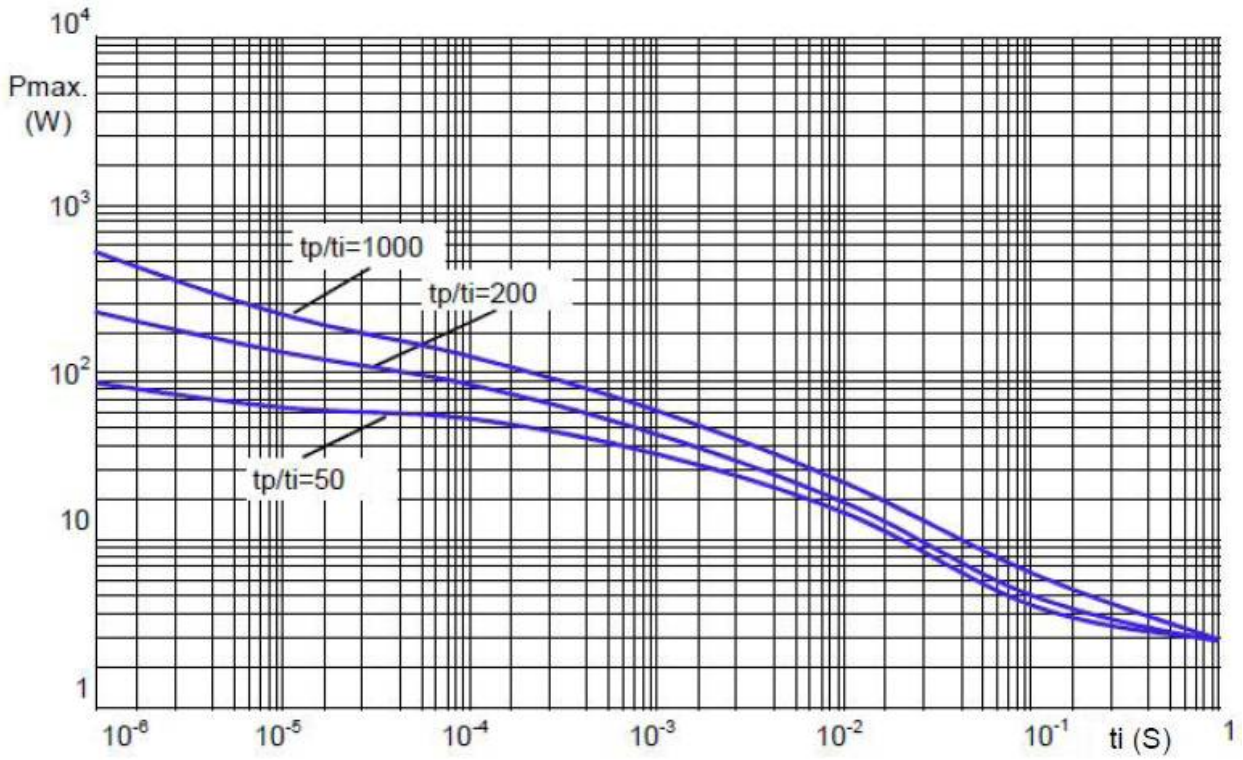
PULSE DIAGRAMS



FMP100 Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration
tp: Pulse repetition time

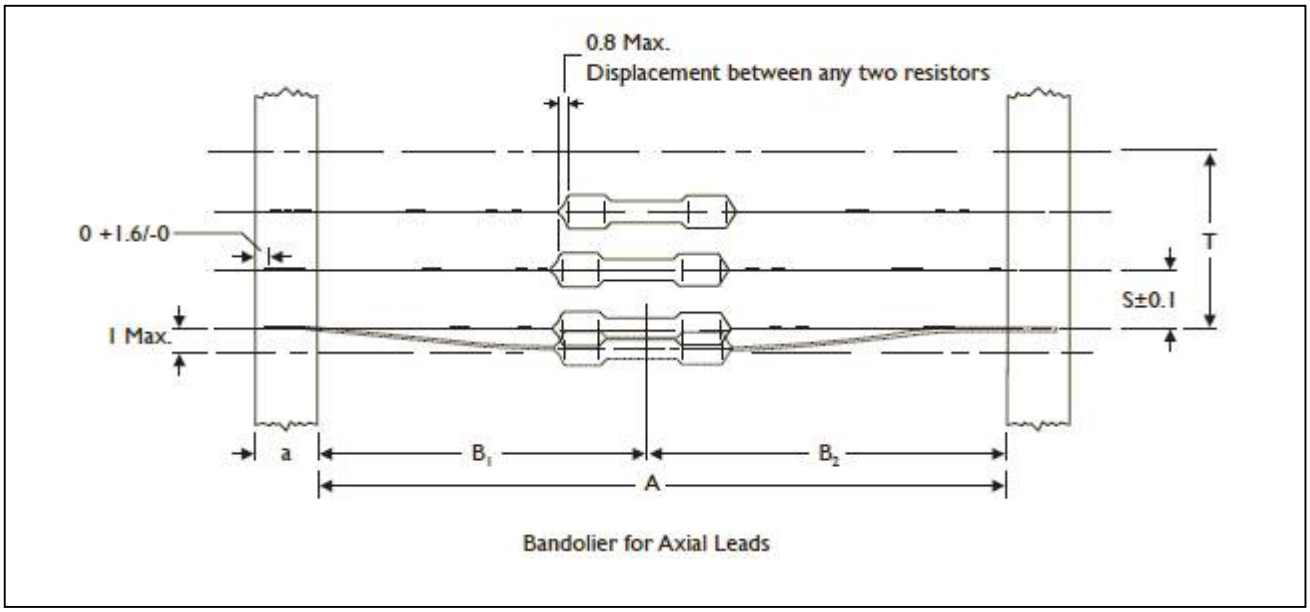


FMP200 Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration
tp: Pulse repetition time



FMP300 Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration
tp: Pulse repetition time

AXIAL / REEL TAPE SPECIFICATION

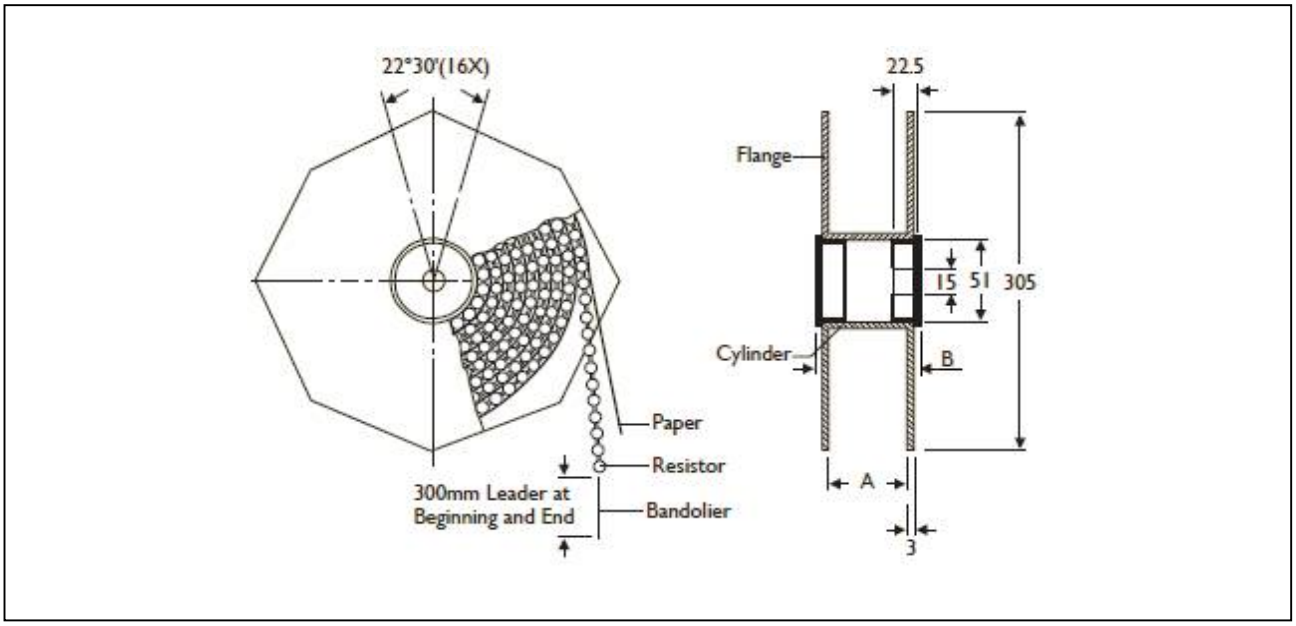


Bandolier for Axial Leads

Unit: mm

Ultra Miniature	a	A	B1-B2 (Max.)	S (spacing)	T (max. deviation of spacing)
FMP-50	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		
FMP100	6 ± 0.5	52.4 ± 1.5	1.2	5	
FMP200 FMP3WS	6 ± 0.5	73.0 ± 1.5	1.5	5	
		52.4 ± 1.5	1.2		
FMP300	6 ± 0.5	73.0 ± 1.5	1.5	5	

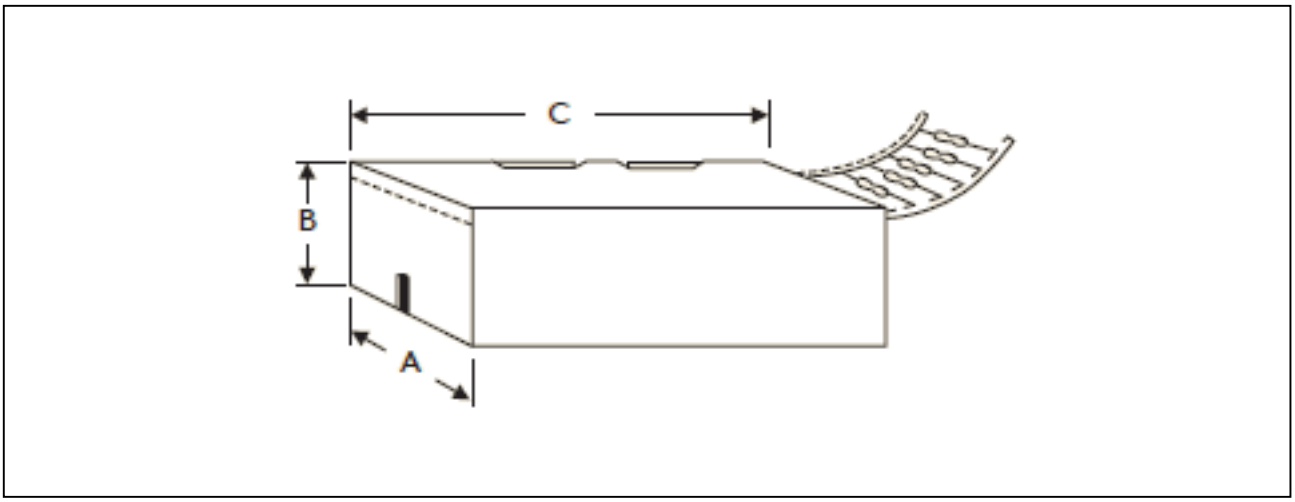
TAPE ON REEL PACKING



TYPE Unit: mm/piece

Ultra Miniature	Across Flange(A)	B	Quantity Per Reel
FMP-50	66.5	75.5	5,000
FMP100	66.5	75.5	5,000
FMP200	66.5	75.5	2,500
FMP3WS	87	96	2,000
FMP300	87	96	1,000

TAPE ON BOX PACKING



TYPE DIMENSIONS Unit: mm/piece

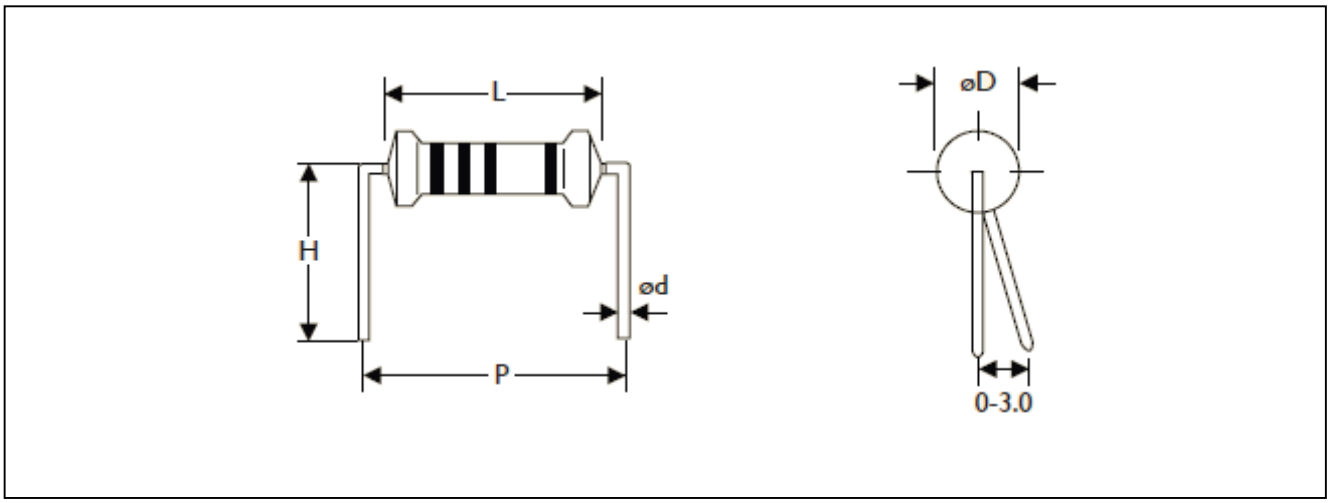
Ultra Miniature	A	B	C	Quantity Per Box
FMP-50	81	70	260	5,000
FMP100	81	104	260	5,000
FMP200	73	45	258	1,000
FMP3WS	103	78	260	1,000
FMP300	103	78	260	1,000

BULK PACKING

Ultra Miniature	Piece/Per Inner Box	Bag/Per Inner Box	Piece Per Bag
FMP-50	10,000	10	1,000
FMP100	10,000	10	1,000
FMP200	5,000	5	1,000
FMP3WS	2,000	4	500
FMP300	1,000	2	500

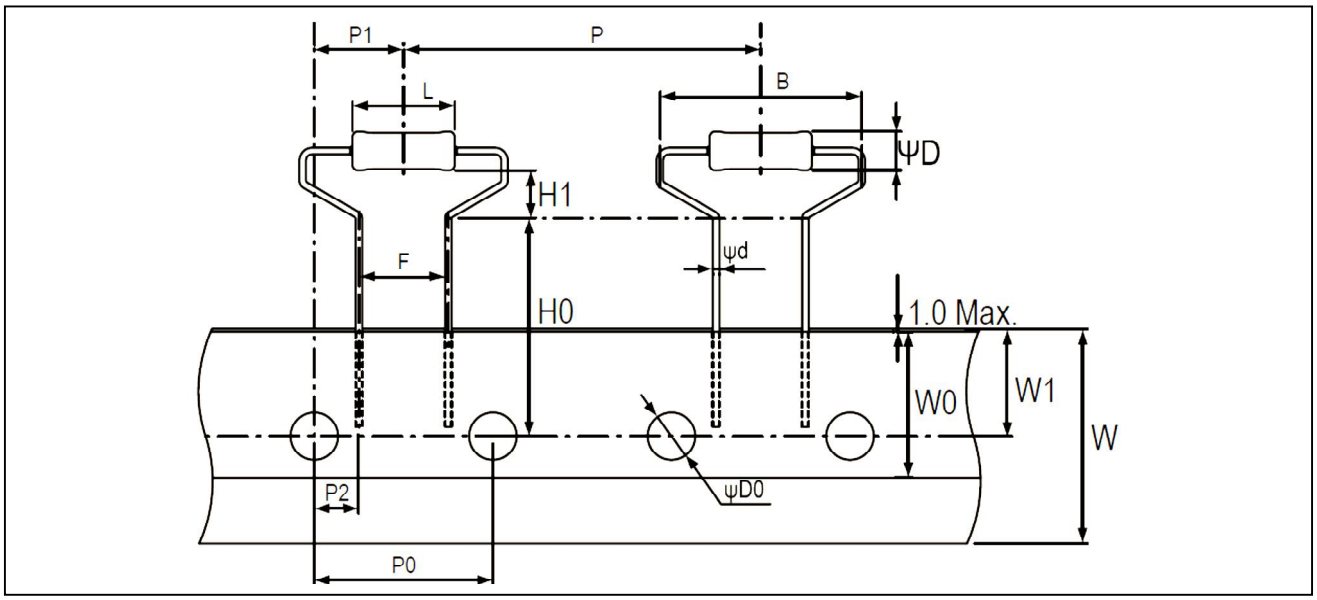
FORMING

M TYPE



TYPE	DIMENSIONS				Unit: mm
Ultra Miniature	**L**	**ψD**	**ψd**	**P**	**H**
FMP-50	3.4± 0.3	1.9 ± 0.2	0.45 ± 0.05	6.0 ± 1	10.0 ±1
FMP100	6.3 ± 0.5	2.4 ± 0.2	0.55 ± 0.05	10.0 ± 1	10.0 ± 1
FMP300	15.5 ± 1.0	5.0± 0.5	0.8 ± 0.05	20.0 ± 1	15.0 ± 1

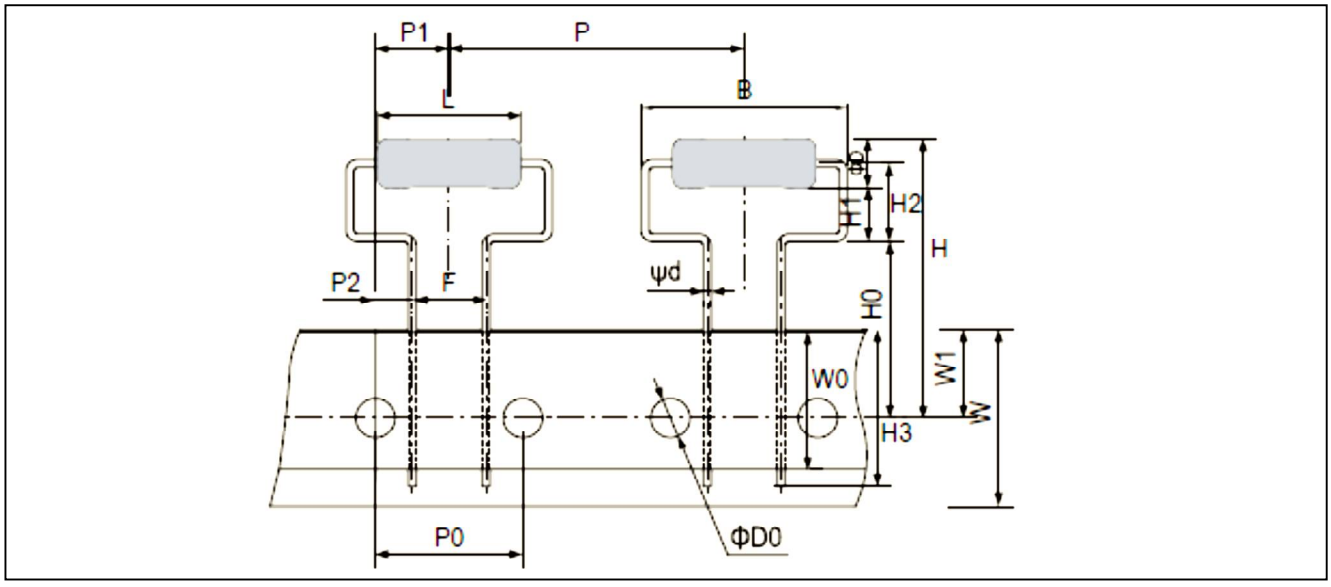
MHA TYPE



TYPE DIMENSIONS Unit: mm

Miniature	L	ψD	ψd	B	H0	HI	P	P0
	9.0±0.5	3.9±0.3	0.55±0.05	17.5Max	19.0±1.0	4.0±1.0	30.0±1.0	15.0±0.3
FMP200	**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	

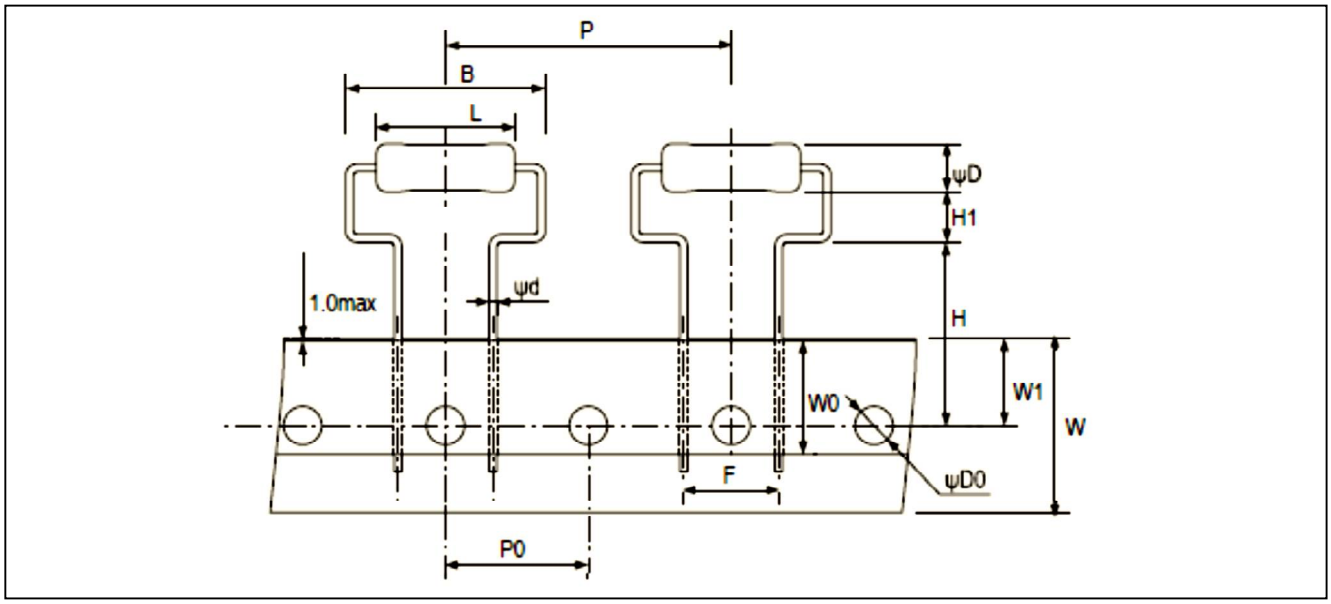
MHB TYPE



TYPE DIMENSIONS Unit: mm

Miniature	L	ψD	ψd	B	H	H0	HI	H2	H3
	15.5±1.0	5.0±0.5	0.8±0.05	21.0Max.	30Max.	18.0±1.0	5.5(Ref.)	8.0±1.5	16Max.
FMP300	**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

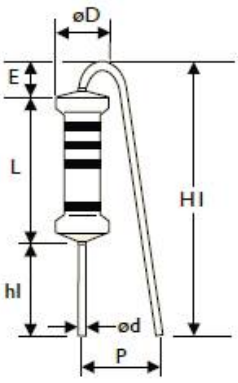
MHC TYPE



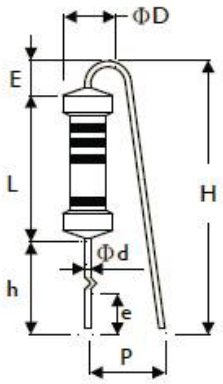
TYPE DIMENSIONS Unit: mm

Miniature	L	ψD	ψd	B	H	Hl	P	P0
	15.5±1.0	5.0±0.5	0.8±0.05	21.0Max.	19.0±1.0	5.25±1.0	30.0±1.0	15.0±0.3
FMP300	**F**	**W**	**W0**	**W1**	**ΨD0**			
	10.0±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.2			

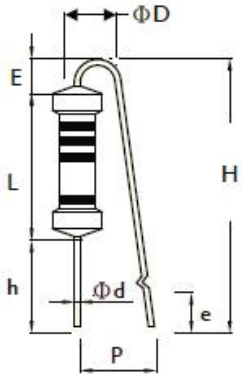
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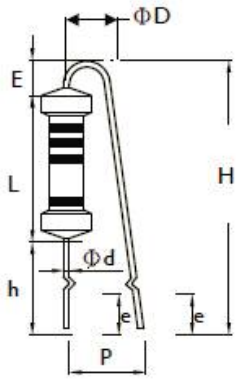
FK TYPE



FFK TYPE



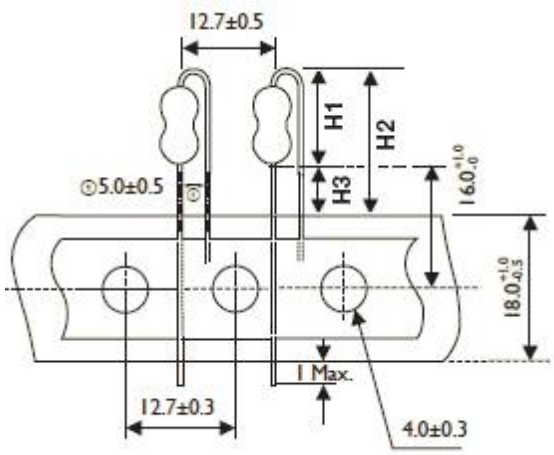
FKK TYPE



TYPE DIMENSIONS Unit: mm

Ultra Miniature	L	ψD	ψd	P	h	H Max.	hl	Hl Max.	E Max.	e
FMP300	15.5±1	5.0±0.5	0.8±0.05	8±1	8±1	28	5± 1	25	3.5	3.5±1

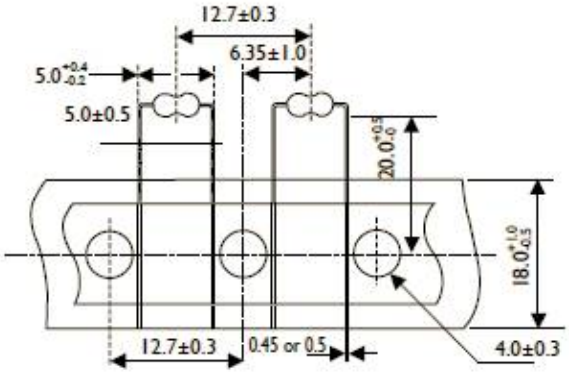
FT TYPE (Taping Pack)



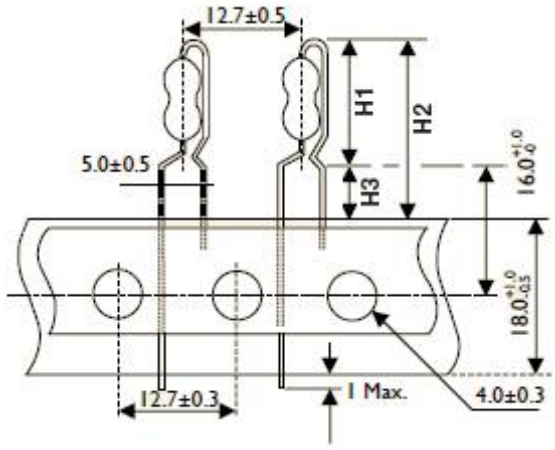
TYPE	DIMENSIONS		Unit: mm
Ultra Miniature	**H1 Max.**	**H2 Max.**	**H3 Max.**
FMP100	10	18.5	8.5
FMP200	13	21.5	8.5
FMP3WS	16	24.5	8.5

MT TYPE (Taping Pack)

Rated Watts : 0.5W

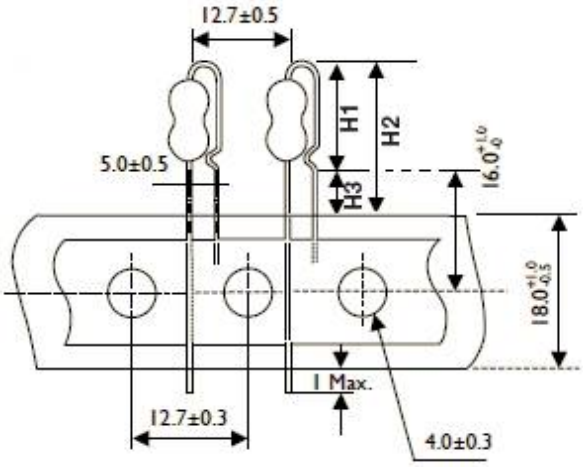


PN TYPE (Taping Pack)



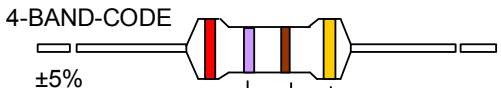
TYPE	DIMENSIONS		Unit: mm
Ultra Miniature	**H1 Max.**	**H2 Max.**	**H3 Max.**
FMP100	13	21.5	8.5
FMP200	17	25.5	8.5
FMP3WS	19	27.5	8.5

AV TYPE (Taping Pack)

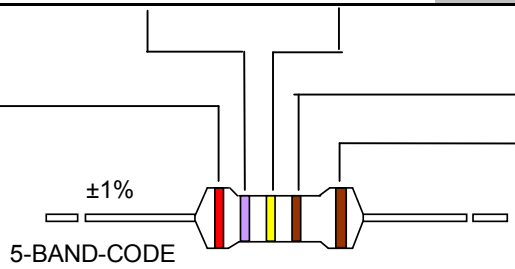


TYPE	DIMENSIONS		Unit: mm
Ultra Miniature	**H1 Max.**	**H2 Max.**	**H3 Max.**
FMP100	11.5	20	8.5
FMP200	14.5	23	8.5
FMP3WS	17.5	26	8.5

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	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 0	Aug.2, 2021	-	- First issue of this specification

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