Innovative Service Around the Globe YAGEO

DATA SHEET

METAL OXIDE FILM RESISTORS

General Purpose, Flameproof

RSF Series

±2%, ±5%

1/4W to 5W

RoHS compliant & Halogen Free

YAGEO

Product specification – August 16, 2021 V.0

APPLICATIONS

- All general purpose applications
- Power applications

FEATURES

- Wide resistance range
- High stability
- Flameproof coating equivalent to UL-94V-0
- RoHS compliant and halogen free

ORDERING INFORMATION

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

PART NUMBER

RSF	100	J	T	-	73-	100R
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) SERIES

RSF Series

(2) POWER RATING

-50 = 1/2W	3WS = 3W
1WS = 1W	300 = 3W
100 = 1W	5WS = 5W
2WS = 2W	5SS = 5W
200 = 2W	500 = 5W
3WM = 3W	

(3) TOLERANCE

G = ±2%	J = ±5%

(4) PACKAGING

R = Reel Pack	B = Bulk
T = Box Pack	

(5) TEMPERATURE COEFFICIENT OF RESISTANCE

- = Based on spec.

(6) FORMING

26- = 26mm	FFK = F-form Kink
52- = 52.4mm	FKK = FKK Type
73- = 73mm	FT = FT Type Forming
91- = 91mm	MT = MT Type Forming
M = M-Type Forming	PN = PANAsert
MB = M-form W/flat	AV = AVIsert
F = F Type	FK = FK Type

(7) RESISTANCE VALUE

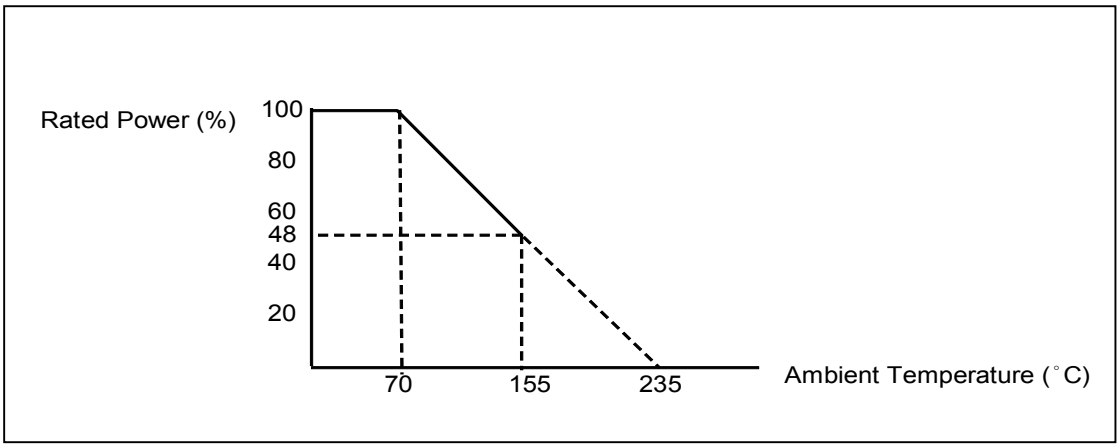
E24 Series
Example:
1R=1Ω, 100R= 100Ω, 1K = 1,000Ω

DIMENSIONS

Unit: mm

Normal	Miniature	L	ψD	H	ψd
RSF-50	RSF1WS	9.0 ± 0.5	3.3 ± 0.3	26 ± 2.0	0.55 ± 0.05
RSF100	RSF2WS	11.5 ± 1.0	4.5 ± 0.5	35 ± 2.0	0.8 ± 0.05
RSF200	RSF3WS	15.5 ± 1.0	5.0 ± 0.5	33 ± 2.0	0.8 ± 0.05
RSF3WM	RSF5SS	17.5 ± 1.0	6.5±1.0	32 ± 2.0	0.8 ± 0.05
RSF300	RSF5WS	24.5 ± 1.0	8.5 ± 1.0	38 ± 2.0	0.8 ± 0.05
RSF500	-	24.5 ± 1.0	8.5 ± 1.0	38 ± 2.0	0.8 ± 0.05

DERATING CURVE



ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	RSF-50	RSF100	RSF200	RSF3WM	RSF300	RSF500
Power Rating at 70 °C	1/2W	1W	2W	3W	3W	5W
Maximum working voltage	250V	350V	350V	450V	500V	750V
Maximum overload voltage	400V	600V	600V	700V	800V	1000V
Voltage Proof on Insulation	350V	500V	500V	500V	500V	500V
Resistance Range	1Ω – 1MΩ for E24 series value					
Operating Temp. Range	- 55°C to +155°C					
Temperature Coefficient	±300ppm/°C					

Note: For resistance value out of above range is by request. Below 10Ω and over 100K(excluded) are using alloy film.

CHARACTERISTICS	RSF1WS	RSF2WS	RSF3WS	RSF5SS	RSF5WS
Power Rating at 70 °C	1W	2W	3W	5W	5W
Maximum working voltage	300V	350V	350V	500V	700V
Maximum overload voltage	500V	600V	600V	800V	900V
Voltage Proof on Insulation	400V	500V	500V	500V	500V
Resistance Range	1Ω – 1MΩ for E24 series value				
Operating Temp. Range	- 55°C to +155°C				
Temperature Coefficient	±300ppm/°C				

Note: For resistance value out of above range is by request. Below 10Ω and over 100K(excluded) are using alloy film.

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%+0.05Ω for normal style ±2%+0.05Ω for miniature style
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 10,000 cycles (1 Sec. on,25 Sec. off)	±2.0%+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	±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

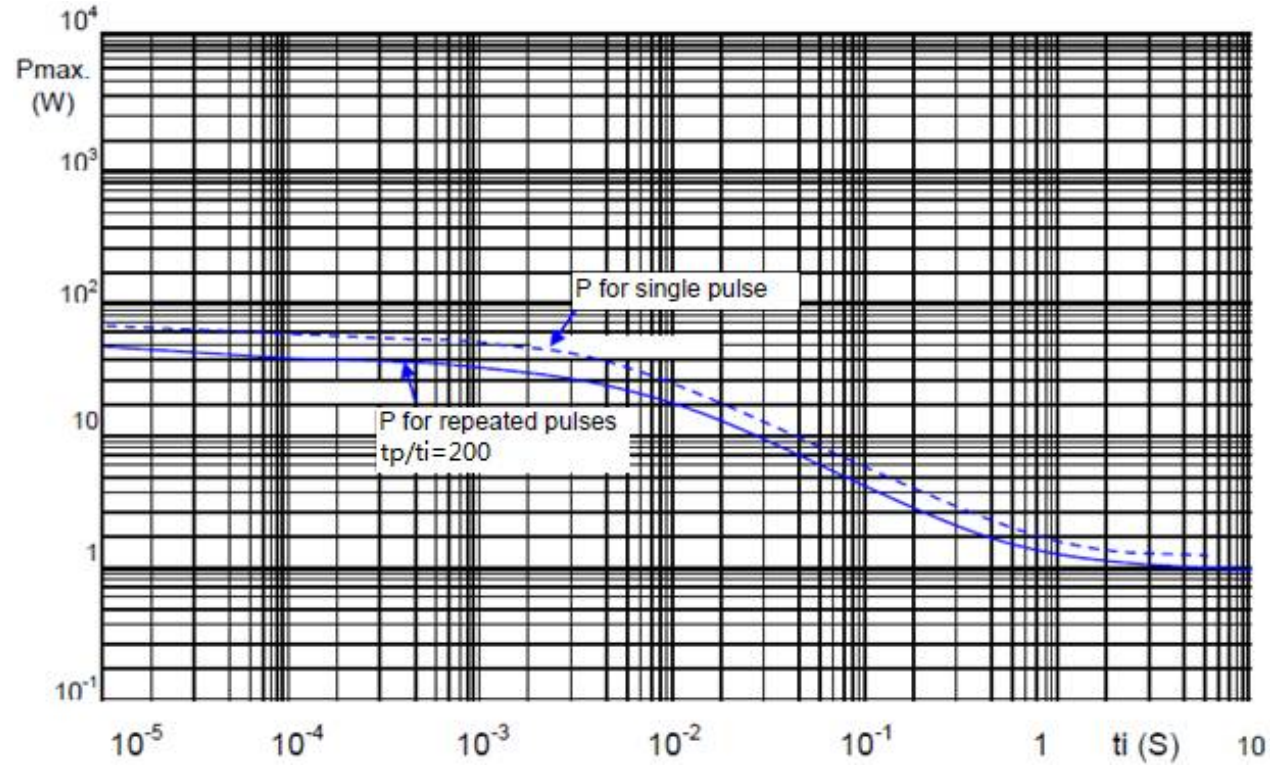
Where

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

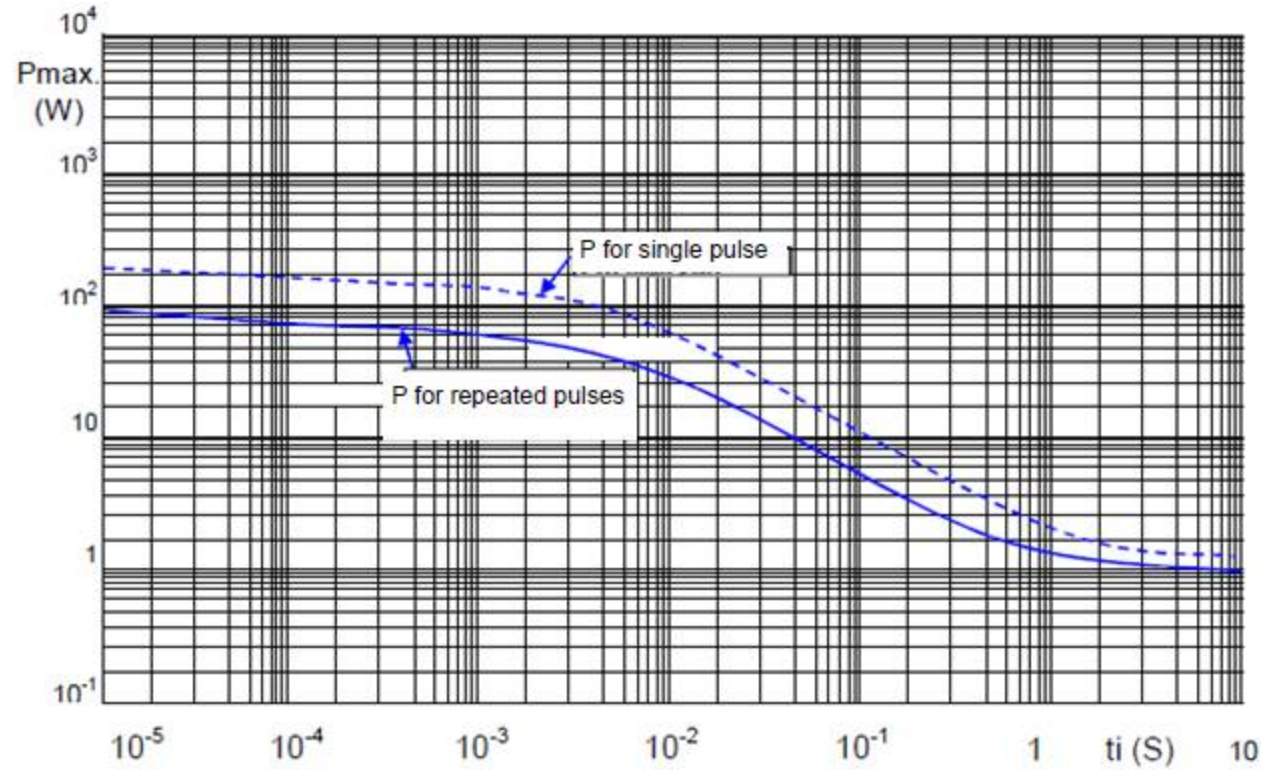
P=Rated power (W)

R=Resistance value (Ω)

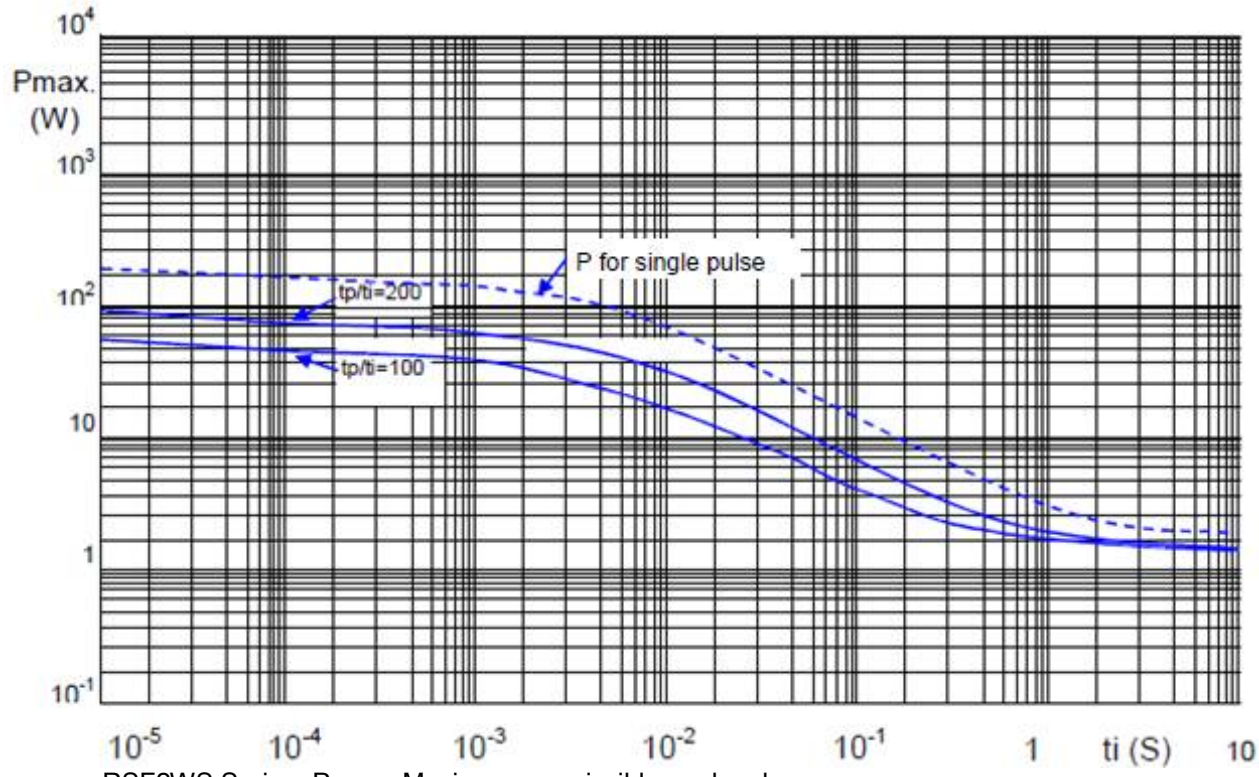
PULSE DIAGRAMS



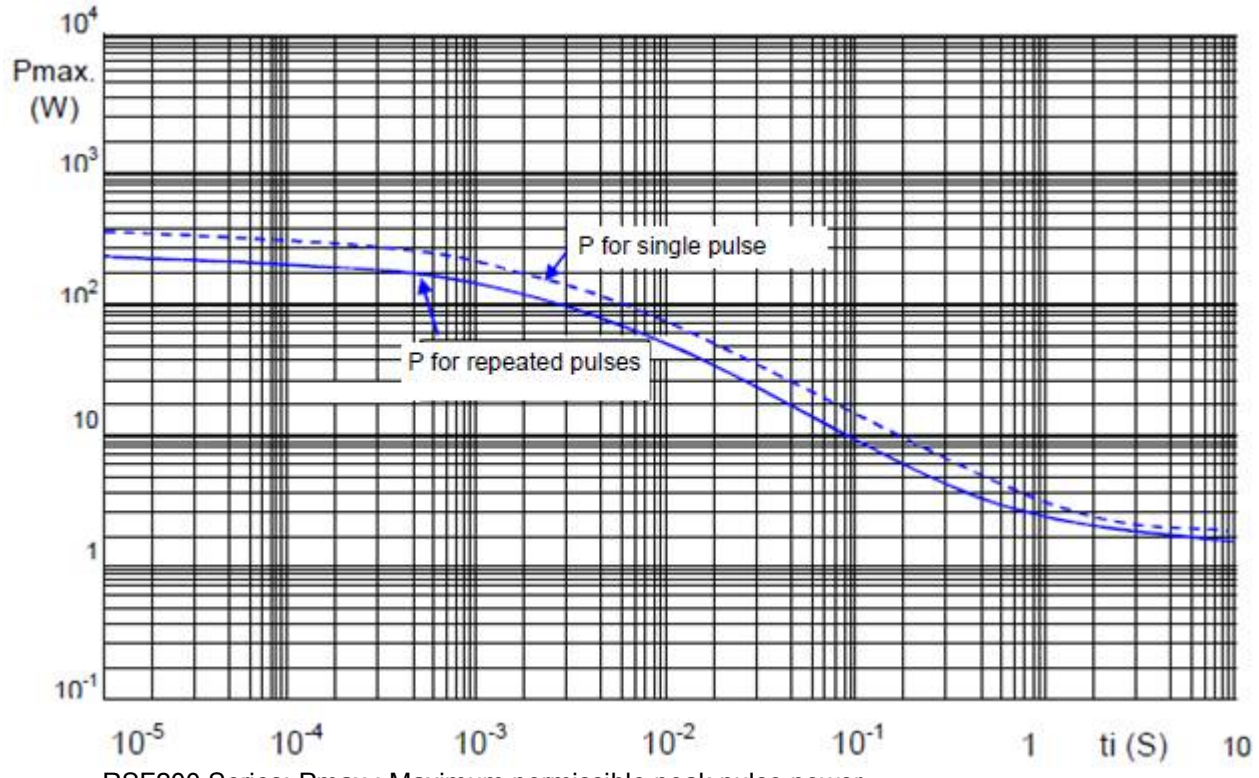
RSF1WS Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration
tp: Pulse repetition time



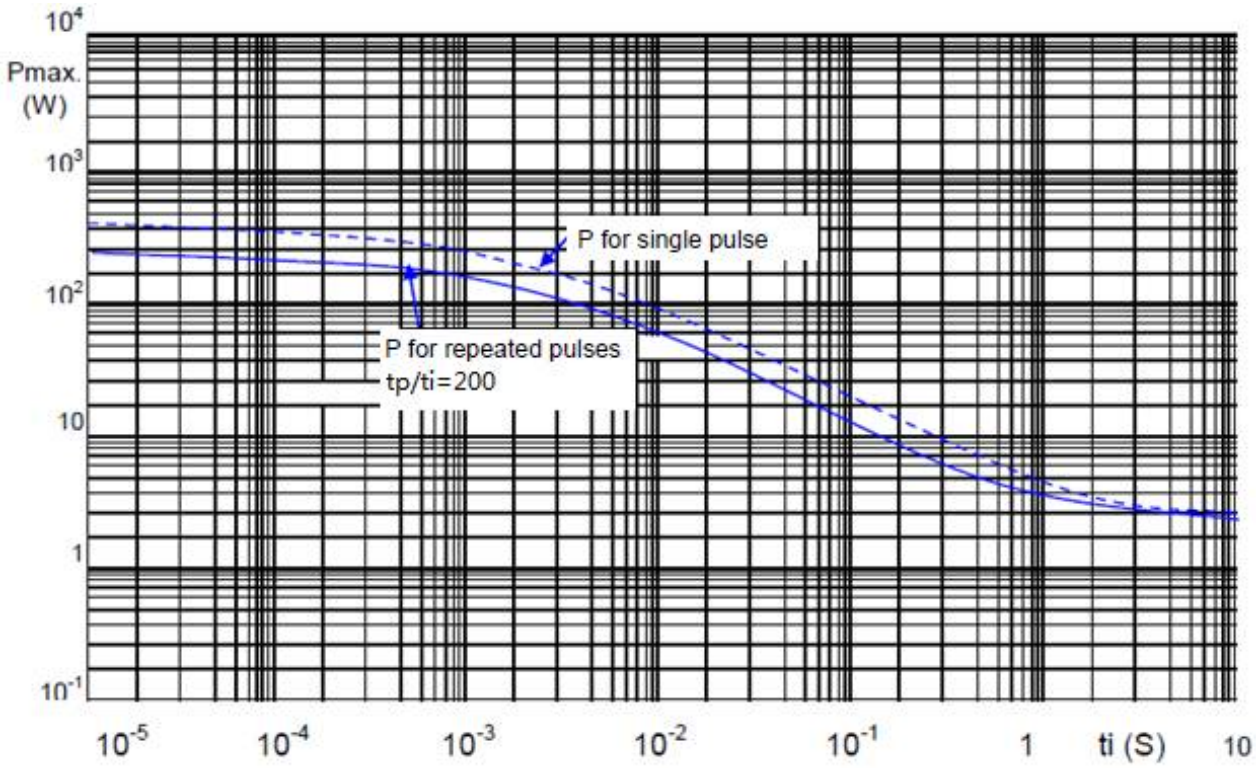
RSF100 Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration



RSF2WS Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration
tp: Pulse repetition time

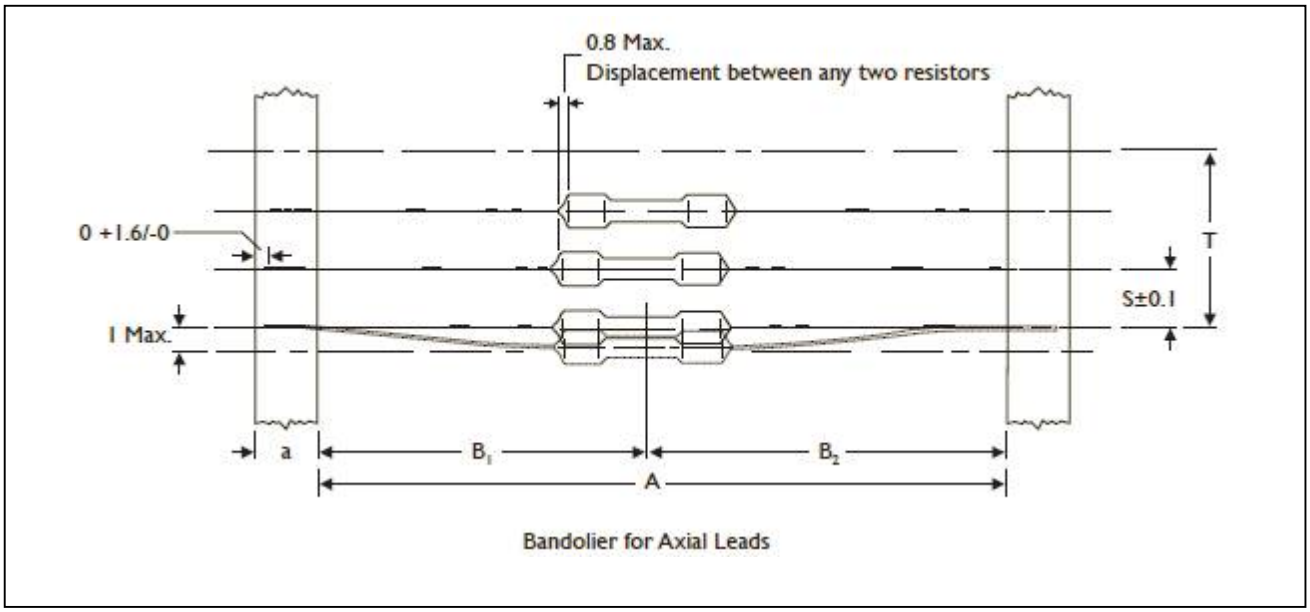


RSF200 Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration



RSF3WS Series: Pmax.: Maximum permissible peak pulse power
ti: Pulse duration
tp: Pulse repetition time

AXIAL / REEL TAPE SPECIFICATION

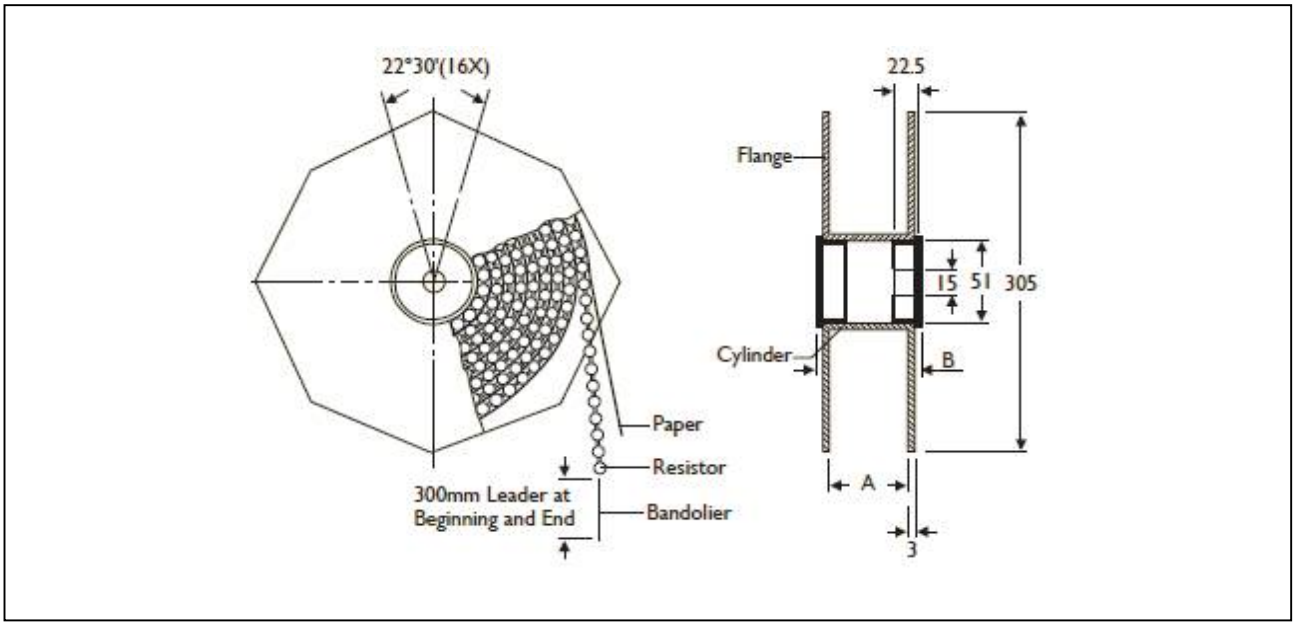


Bandolier for Axial Leads

Unit: mm

Normal	Miniature	a	A	B1-B2 (Max.)	S (spacing)	T (max. deviation of spacing)
RSF-50	RSF1WS	6 ± 0.5	52.4 ± 1.5	1.2	5	1 mm per 10 spacing, 0.5 mm per 5 spacing
RSF100	RSF2WS	6 ± 0.5	73.0 ± 1.5	1.5	5	
			52.4 ± 1.5	1.2		
RSF200	RSF3WS	6 ± 0.5	73.0 ± 1.5	1.5	10	
			52.4 ± 1.5	1.2		
RSF3WM	RSF5SS	6 ± 0.5	73.0 ± 1.5	1.5	10	
RSF300	RSF5WS	6 ± 0.5	91.0 ± 1.5	1.5	10	
RSF500	-	6 ± 0.5	91.0 ± 1.5	1.5	10	

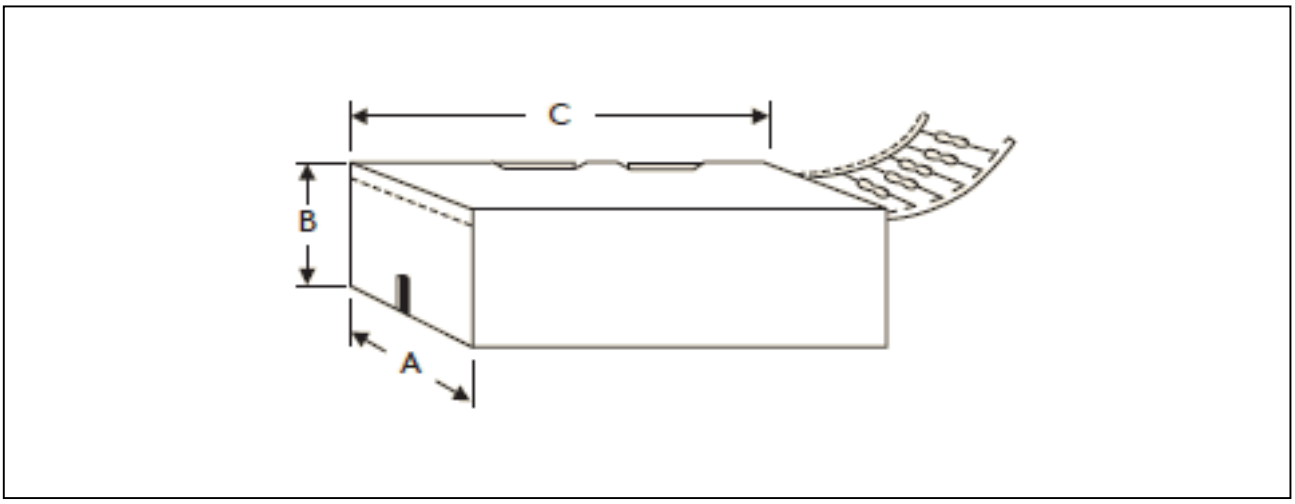
TAPE ON REEL PACKING



TYPE Unit: mm/piece

Normal	Miniature	Across Flange(A)	B	Quantity Per Reel
RSF-50	RSF1WS	66.5	75.5	2,500
RSF100	RSF2WS	87	96	2,000
RSF200	RSF3WS	87	96	1,000
RSF3WM	RSF5SS	87	96	1,000

TAPE ON BOX PACKING



TYPE DIMENSIONS Unit: mm/piece

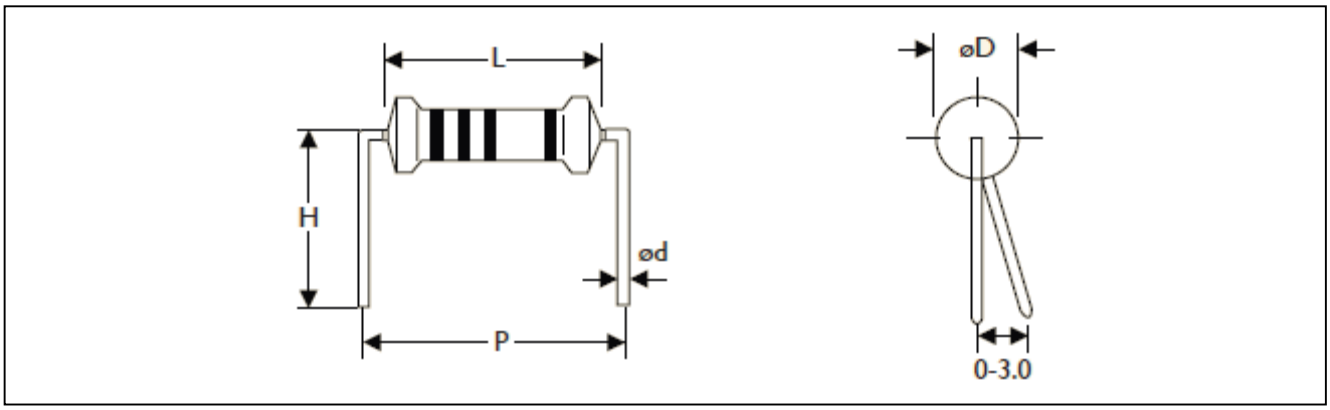
Normal	Miniature	A	B	C	Quantity Per Box
RSF-50	RSF1WS	73	45	258	1,000
RSF100	RSF2WS	81	91	260	1,000
RSF100	RSF2WS	103	78	260	1,000
RSF200	RSF3WS	81	91	260	1,000
RSF200	RSF3WS	103	94	260	1,000
RSF3WM	RSF5SS	103	78	260	500
RSF300	RSF5WS	116	79	255	250
RSF500	-	116	79	255	250

BULK PACKING

Normal	Miniature	Piece/Per Inner Box	Bag/Per Inner Box	Piece Per Bag
RSF-50	RSF1WS	5,000	5	1,000
RSF100	RSF2WS	2,000	4	500
RSF200	RSF3WS	1,000	2	500
RSF3WM	RSF5SS	1,000	2	500
RSF300	RSF5WS	500	10	50
RSF500	-	500	10	50

FORMING

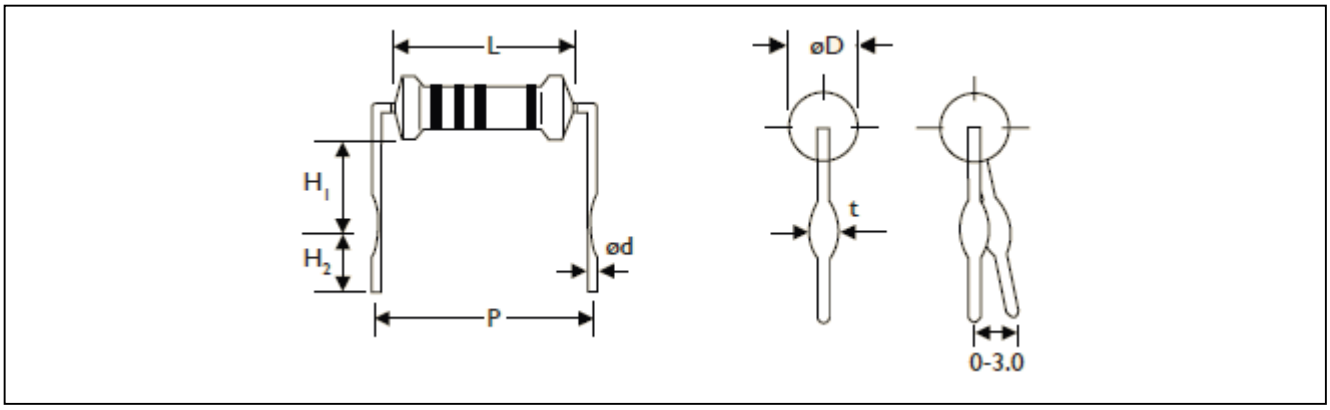
M TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	P	H
RSF-50	RSF1WS	9.0 ± 0.5	3.3± 0.3	0.55 ± 0.05	12.5 ± 1	10.0 ± 1
RSF100	RSF2WS	11.5 ± 1.0	4.5 ± 0.5	0.8 ± 0.05	15.0 ± 1	12.5 ± 1
RSF200	RSF3WS	15.5 ± 1.0	5.0 ± 0.5	0.8 ± 0.05	20.0 ± 1	15.0 ± 1
RSF3WM	RSF5SS	17.5 ± 1.0	6.5 ± 1.0	0.8 ± 0.05	25.0 ± 1	15.0 ± 1
RSF300	RSF5WS	24.5 ± 1.0	8.5 ± 1.0	0.8 ± 0.05	30.0 ± 1	15.0 ± 1

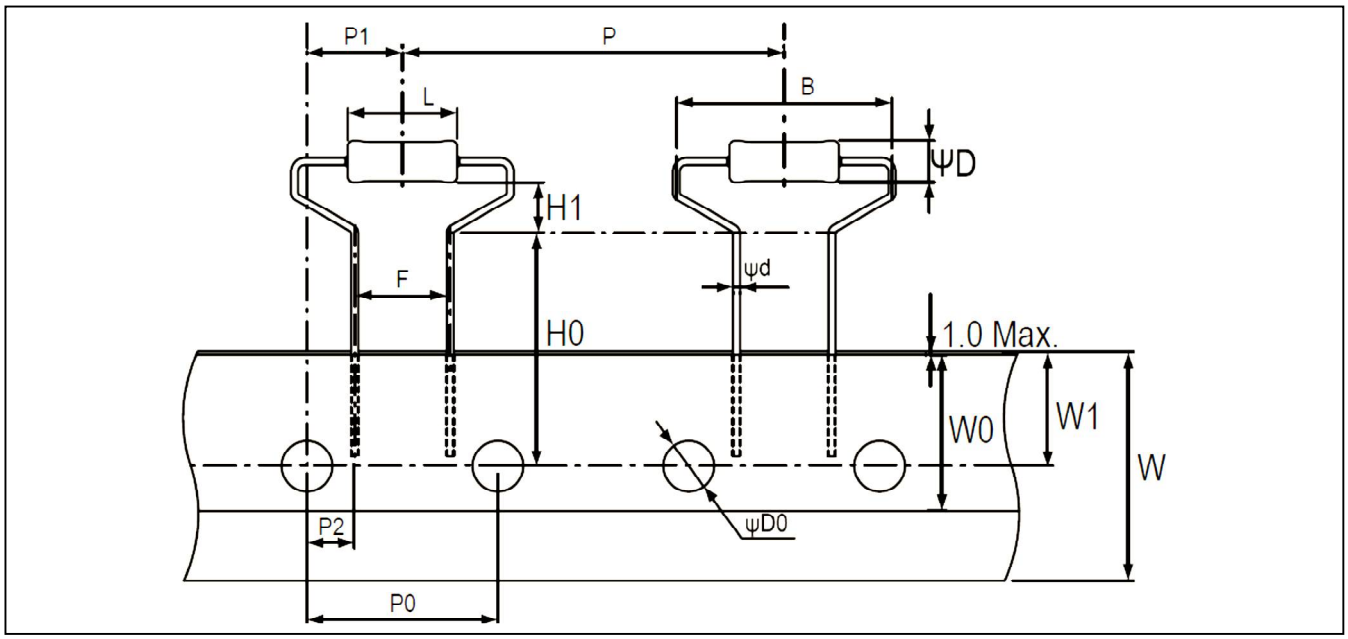
MB TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	P	H1	H2	t
RSF-50	-	9.0 ± 0.5	3.3± 0.3	0.55 ± 0.05	12.5 ± 1	6.0 ± 1	5.0 ± 1	1.2 ± 0.2
-	RSF1WS	9.0 ± 0.5	3.3± 0.3	0.8 ± 0.05	12.5 ± 1	6.0 ± 1	5.0 ± 1	1.4 ± 0.2
RSF100	RSF2WS	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
RSF200	RSF3WS	15.5 ± 1.0	5.0 ± 0.5	0.8 ± 0.05	20.0 ± 1	10.0 ± 1	5.0 ± 1	1.4 ± 0.2
RSF3WM	RSF5SS	17.5 ± 1.0	6.5 ± 1.0	0.8 ± 0.05	25.0 ± 1	10.0 ± 1	5.0 ± 1	1.4 ± 0.2
RSF300	RSF5WS	24.5 ± 1.0	8.5 ± 1.0	0.8 ± 0.05	30.0 ± 1	15.0 ± 1	5.0 ± 1	1.4 ± 0.2
RSF500	-	24.5 ± 1.0	8.5 ± 1.0	0.8 ± 0.05	30.0 ± 1	15.0 ± 1	5.0 ± 1	1.4 ± 0.2

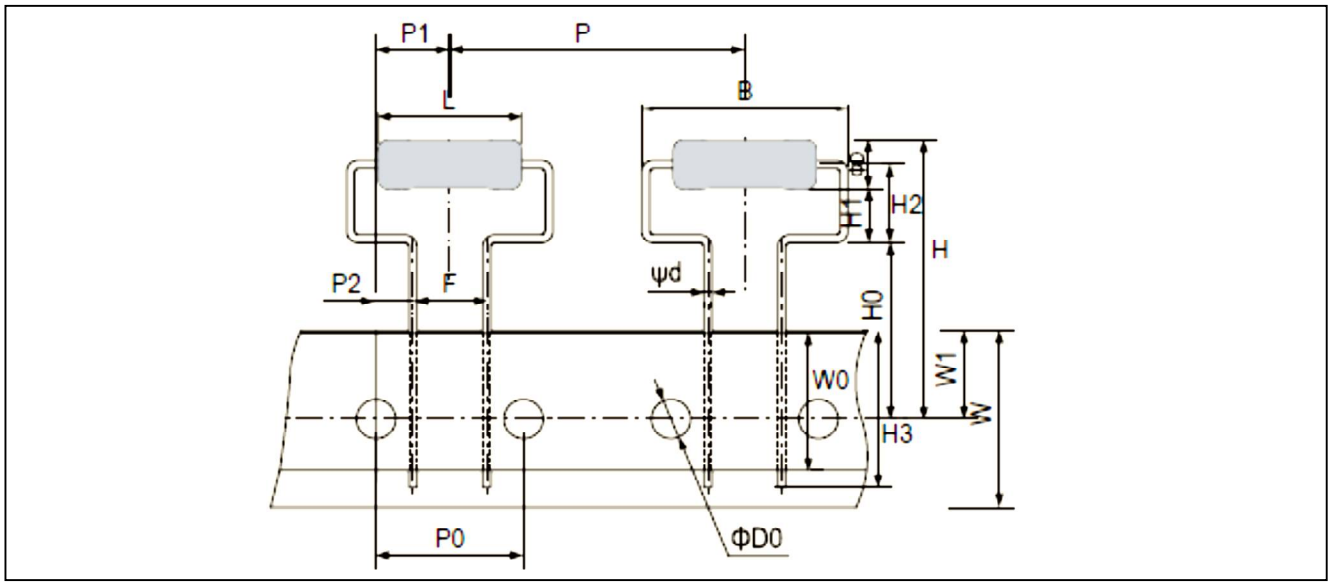
MHA TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	B	H0	HI	P	P0
		9.0±0.5	3.3±0.3	0.55±0.05	17.5Max	19.0±1.0	4.0±1.0	30.0±1.0	15.0±0.3
RSF-50	RSF1WS	**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	

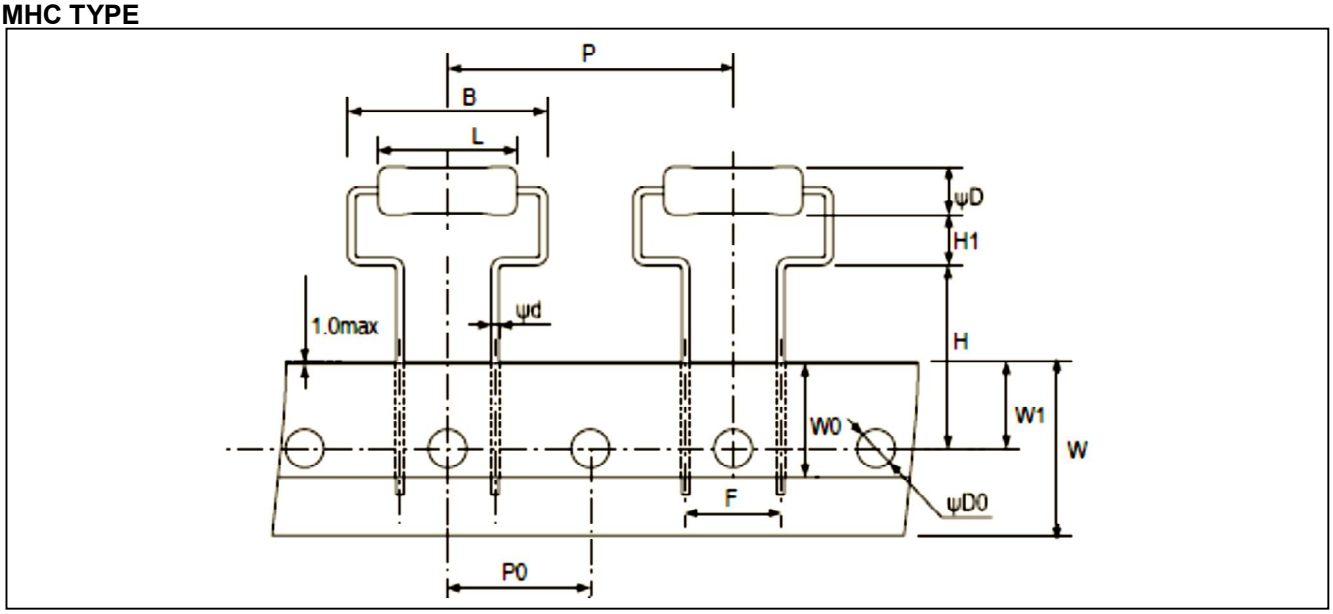
MHB TYPE



TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	B	H	H0	HI	H2	H3
		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.
RSF200	RSF3WS	**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

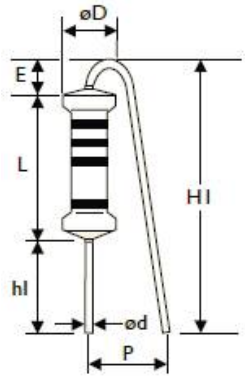
MHC TYPE



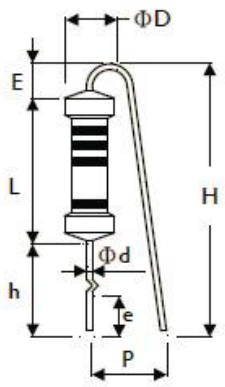
TYPE DIMENSIONS Unit: mm

Normal	Miniature	L	ψD	ψd	B	H	Hl	P	P0
		15.5±1.0	5.0±0.5	0.8±0.05	21.0Max.	19.0±1.0	5.25±1.0	30.0±1.0	15.0±0.3
RSF200	RSF3WS	**F**	**W**	**W0**	**W1**	**ΨD0**			
		10.0±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.2			

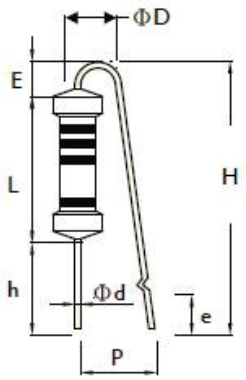
F TYPE



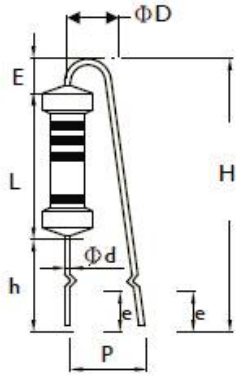
FK TYPE



FFK TYPE



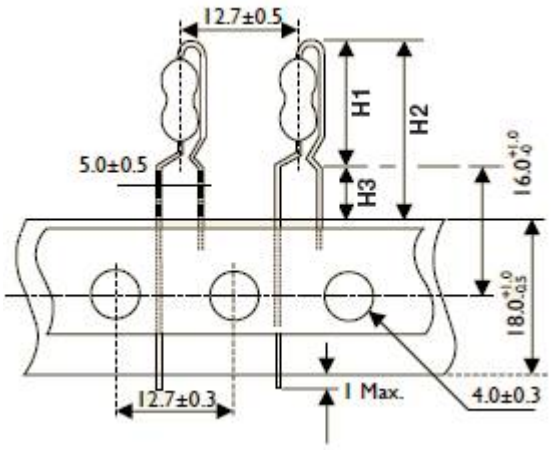
FKK TYPE



TYPE DIMENSIONS Unit: mm

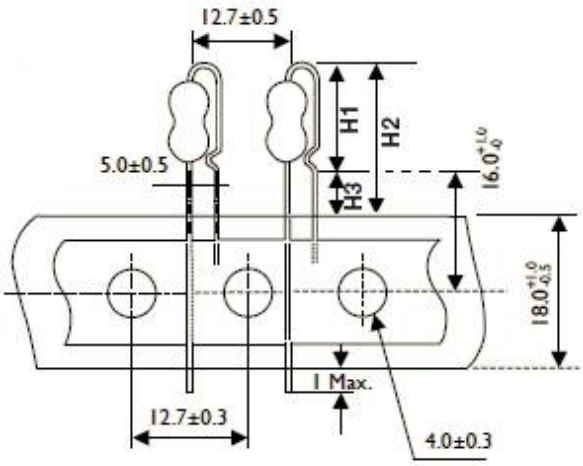
Normal	Miniature	L	ψD	ψd	P	h	H Max.	hl	Hl Max.	E Max.	e
RSF-50	RSF1WS	9.0±0.5	3.3±0.3	0.55±0.05	6±1	8±1	22	5±1	18.5	3.5	3.5±1
RSF100	RSF2WS	11.5±1	4.5±0.5	0.8±0.05	6±1	8±1	24	5±1	20	3.5	3.5±1
RSF200	RSF3WS	15.5±1	5.0±0.5	0.8±0.05	8±1	8±1	28	5± 1	25	3.5	3.5±1

PN TYPE (Taping Pack)



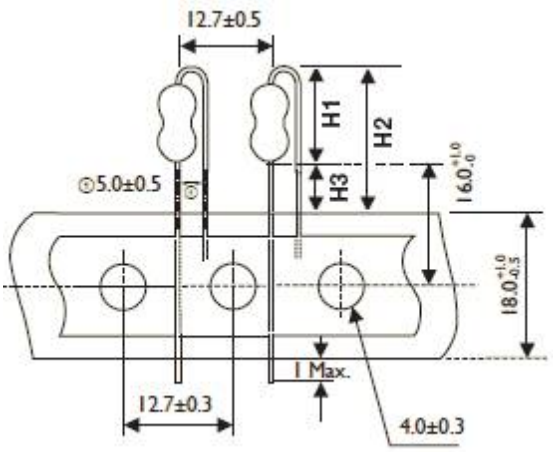
TYPE		DIMENSIONS		Unit: mm
Normal	**Miniature**	**H1 Max.**	**H2 Max.**	**H3 Max.**
RSF-50	RSF1WS	17	25.5	8.5
RSF100	RSF2WS	19	27.5	8.5

AV TYPE (Taping Pack)



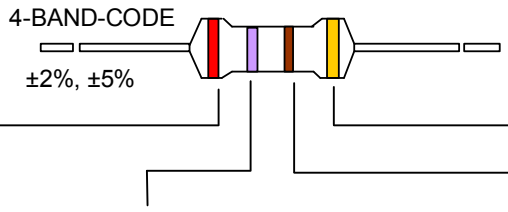
TYPE		DIMENSIONS		Unit: mm
Normal	**Miniature**	**H1 Max.**	**H2 Max.**	**H3 Max.**
RSF-50	RSF1WS	14.5	23	8.5
RSF100	RSF2WS	17.5	26	8.5

FT TYPE (Taping Pack)



TYPE		DIMENSIONS		Unit: mm
Normal	**Miniature**	**H1 Max.**	**H2 Max.**	**H3 Max.**
RSF-50	RSF1WS	13	21.5	8.5
RSF100	RSF2WS	16	24.5	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 0	Aug.16 , 2021	-	- First issue of this specification

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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

YAGEO:

RSF100JB-73-24R RSF100JR-52-220K RSF2WSJR-52-82K RSF1WSJR-52-270R RSF2WSJR-52-22K RSF2WSJR-52-33R RSF1WSJR-52-560R RSF1WSJR-52-680R RSF2WSJR-52-560R RSF3WSJR-73-15R RSF3WSJR-73-27K RSF3WSJR-73-47K RSF1WSJR-52-36R RSF3WSJR-73-22K RSF3WSJR-73-56K RSF3WSJR-73-100K RSF3WSJR-73-100R RSF3WSJR-73-18K RSF3WSJR-73-5K1 RSF1WSJR-52-68R RSF2WSJR-52-3K6 RSF2WSJR-52-51K RSF1WSJR-52-330R RSF2WSJR-52-820R RSF3WSJR-73-12K RSF1WSJR-52-200R RSF1WSJR-52-820R RSF2WSJR-52-18K RSF2WSJR-52-51R RSF1WSJR-52-4K7 RSF2WSJR-52-120R RSF2WSJR-52-27R RSF2WSJR-52-39K RSF3WSJR-73-10K RSF2WSJR-52-150R RSF2WSJR-52-220R RSF2WSJR-52-510R RSF2WSJR-52-4K7 RSF2WSJR-52-68K RSF2WSJR-52-470R RSF2WSJR-52-1K2 RSF2WSJR-52-20K RSF3WSJR-73-6K2 RSF2WSJR-52-5K6 RSF2WSJR-52-82R RSF3WSJR-73-8K2 RSF2WSJR-52-100R RSF2WSJR-52-10K RSF2WSJR-52-6K2 RSF1WSJR-52-47R RSF2WSJR-52-10R RSF3WSJR-73-47R RSF3WSJR-73-680R RSF3WSJR-73-110R RSF1WSJR-52-22R RSF1WSJR-52-39R RSF2WSJR-52-12K RSF3WSJR-73-150R RSF3WSJR-73-4K7 RSF2WSJR-52-27K RSF2WSJR-52-30R RSF2WSJR-52-5K1 RSF3WSJR-73-1K5 RSF3WSJR-73-24R RSF2WSJR-52-270R RSF1WSJR-52-1K5 RSF1WSJR-52-33R RSF3WSJR-73-10R RSF3WSJR-73-20R RSF3WSJR-73-20K RSF3WSJR-73-56R RSF1WSJR-52-220R RSF1WSJR-52-3K3 RSF2WSJR-52-100K RSF2WSJR-52-47R RSF2WSJR-52-24K RSF2WSJR-52-2K RSF2WSJR-52-15K RSF3WSJR-73-5K6 RSF3WSJR-73-7K5 RSF3WSJR-73-15K RSF2WSJR-52-15R RSF2WSJR-52-3K3 RSF2WSJR-52-68R RSF2WSJR-52-180R RSF2WSJR-52-33K RSF2WSJR-52-680R RSF1WSJR-52-51K RSF1WSJR-52-56K RSF1WSJR-52-3K9 RSF1WSJR-52-5K1 RSF1WSJR-52-300R RSF2WSJR-52-91R RSF2WSJR-52-330R RSF3WSJR-73-2K7 RSF2WSJR-52-22R RSF1WSJR-52-15K RSF1WSJR-52-1K6 RSF1WSJR-52-1K8 RSF1WSJR-52-390R