

DATA SHEET

OVER TEMPERATURE PROTECTOR

Safety
OTP Series

±1%, ±5%

1W AND 2W

RoHS compliant & Halogen Free





APPLICATIONS

- Power
- Alternative energy, power inverter
- Home appliances and office equipment
- Consumer electronics, charger, adapter
- Industrial equipment: pump motor, smart fuse device

FEATURES

- UL1412 qualified
- Safety, over temperature protection under overcurrent conditions
- Excellent anti-surge and pulse withstanding capability
- Customized fusing current & temperature
- RoHS compliant & halogen free

ORDERING INFORMATION

Part number of the over temperature protector resistor are identified by the series, power rating, tolerance, packing, fusing characteristics, forming , resistance value and suffix.

PART NUMBER

<u>OTP</u> (1)	<u>1WS</u> (2)	<u>J</u> (3)	<u>T</u> (4)	<u>A</u> (5)	<u>52-</u> (6)	<u>10R</u> (7)	<u>CM</u> (8)
-------------------	-------------------	-----------------	-----------------	-----------------	-------------------	-------------------	------------------

(1) SERIES NAME

OTP Series

(2) POWER RATING

1WS = 1W

2WS = 2W

(3) TOLERANCE

F = ±1%

J = ±5%

(4) PACKAGING

R = Reel Pack

B = Bulk

T = Box Pack

(5) FUSING CHARACTERISTICS

Please refer to table II

(6) FORMING

52- = 52.4mm

MBP = MBP-Type Forming

73- = 73mm

PN = PANAsert

MB = M-form W/flat

(7) RESISTANCE VALUE

E24 & E96 Series

Example:

1R = 1Ω, 10R = 10Ω, 100R = 100Ω

(8) SUFFIX

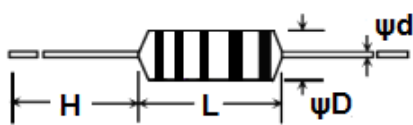
Optional code. required only when resistor is with particular pulse/surge specification.

Example : CM, CN, FB, FE, FF, FD, CR, NT, NR, NP.. etc.

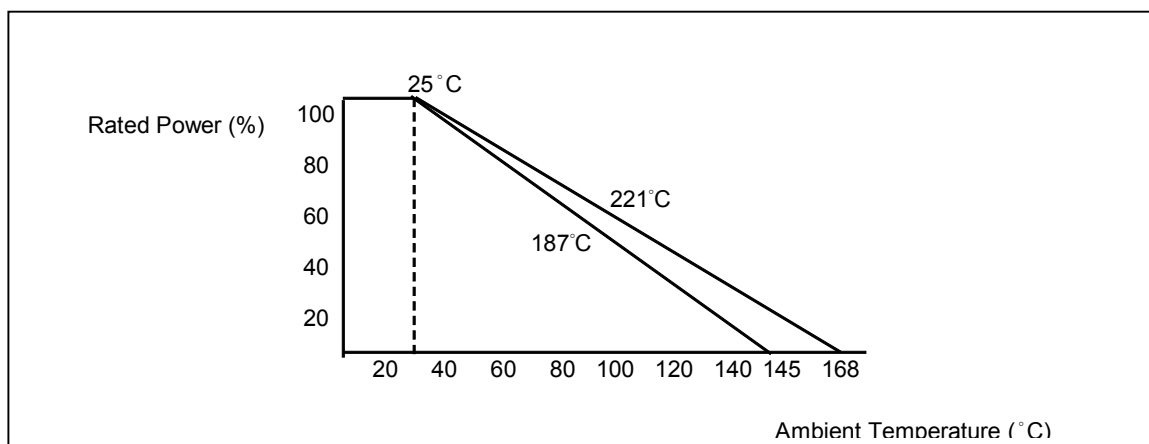
DIMENSIONS

Unit: mm

Miniature	L	ψD	ψd	H
OTP1WS	10.5±1.0	4.2 ± 0.3	0.6±0.05	25 ± 2.0
OTP2WS	10.5±1.0	4.5+ 0.5/-0	0.6±0.05	25 ± 2.0(52- type) 36 ± 2.0(73-type)



DERATING CURVE



ELECTRICAL CHARACTERISTICS

Table I

CHARACTERISTICS	OTP1WS	OTP2WS
Power Rating at 25 °C	1W	2W
Resistance Range	1Ω~100Ω	1Ω~200Ω
Maximum Working Voltage	$\sqrt{P \times R}$	
Temperature Coefficient	±300ppm/°C (standard) ±5000ppm/°C (NiFe alloy wire types)	

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

FUSING CHARACTERISTICS

Table II

Code	Fusing Current	Functioning Temperature (for ref.)
A	3A	221°C
B	2A	221°C
C	2A	187°C
D	3A	187°C
Short-circuit test Voltage	250V	

TEST AND REQUIRMENTS

TEST	TEST METHOD	PROCEDURE	APPRAISE
Functioning Temperature		Tf-30°C for devices rated until temperature has stabilized. The temperature shall then be increased steadily with a rate of rise between 0.5°C /min to 1°C /min until all specimens have functioned.	Tf-20°C <functioning temperature< Tf+30°C
Short Time Overload	IEC 60115-1 4.13	2 times RCWV for 5 sec. (Not more than maximum Overload Voltage)	±2.0%
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.	>100MΩ
Robustness of Terminations	IEC 60115-1 4.16	Direct load for 60 Sec. in the direction of the terminal leads for 10N	No mechanical damage
Endurance at 25°C	IEC 60115-1 4.25	25±3°C at RCWV(or Umax., whichever less) for 1,000 Hr.(1.5 Hr.on,0.5 Hr. off)	±5%
Surge Voltage Withstanding	IEC 61000-4-5	Apply 1.2/50 μs pulse voltage, for 20 pulses, 60 seconds between each pulse. The designed standard withstanding pulse voltage is minimum 1KV, special voltage is on request.	±5%+0.05Ω

PN	Pulse Voltage
OTP1WSJTC52-1 0RFD	1.8KV

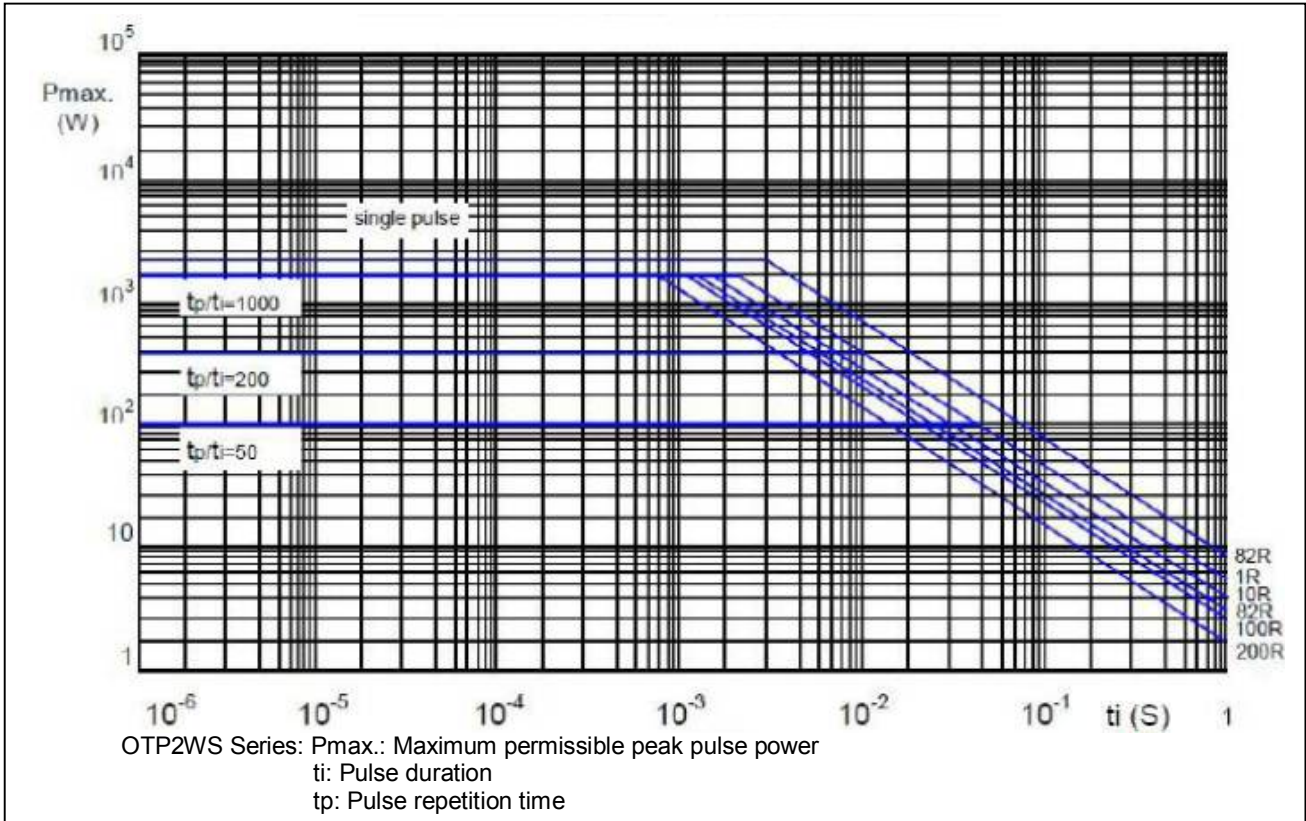
Note:.

RCWV (Rated Continuous Working Voltage):

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

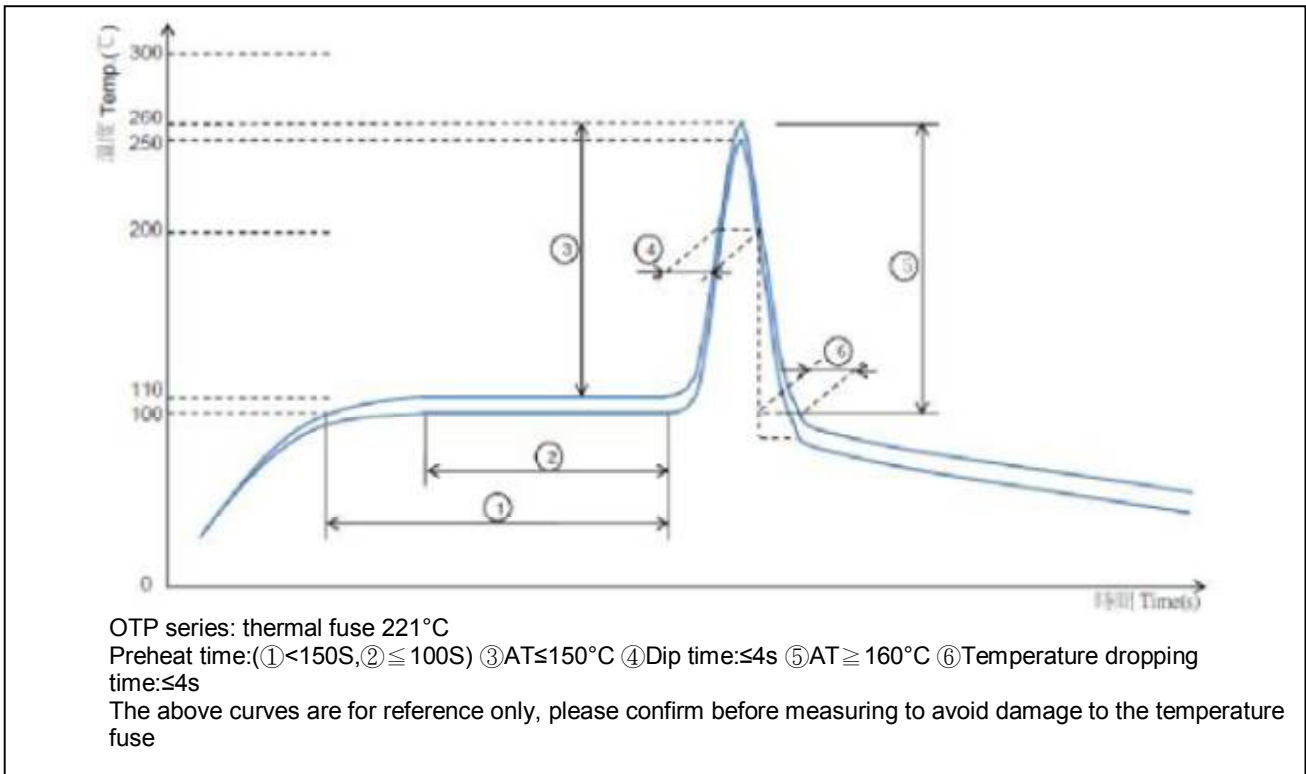
- V=√(P X R)
- or max. working voltage whichever is less
- Where
- V=Continuous rated DC or AC (rms) working voltage (V)
- P=Rated power (W)
- R=Resistance value (Ω)

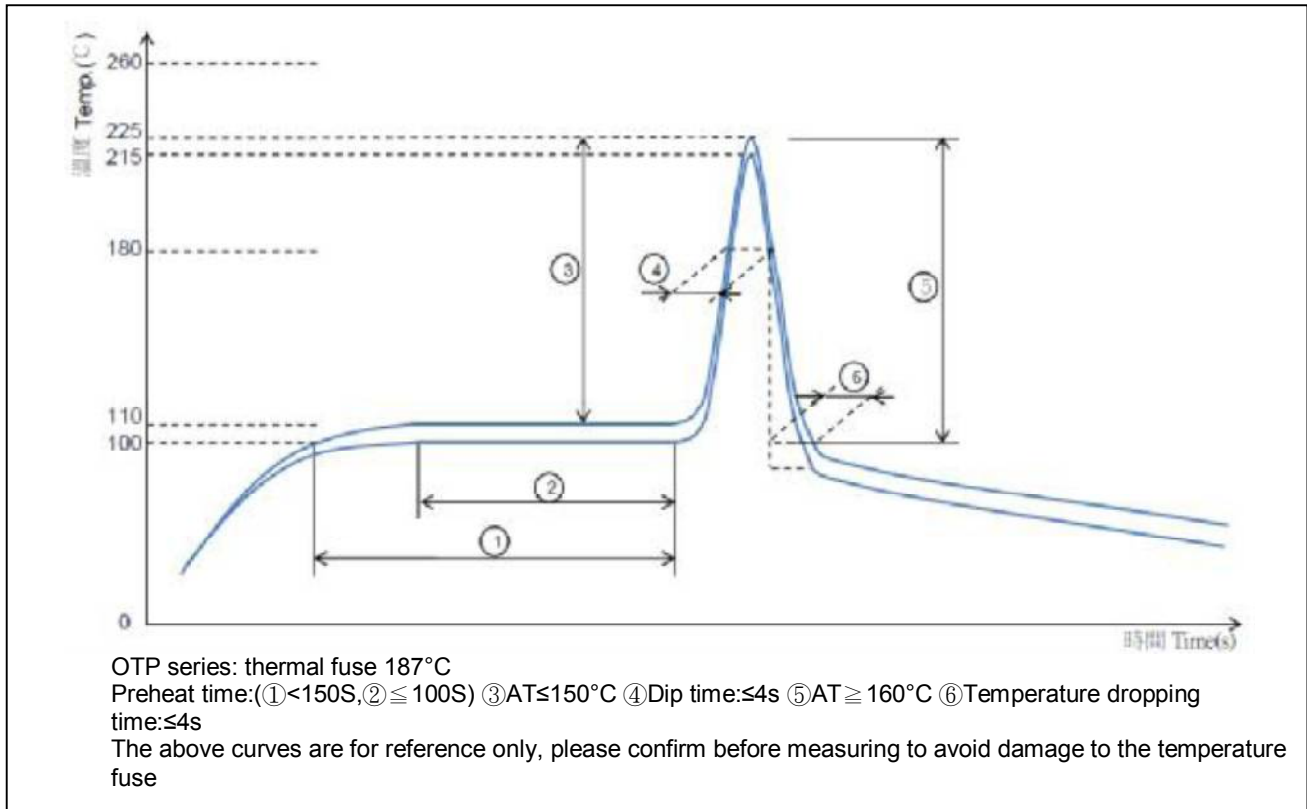
PULSE DIAGRAMS



SOLDERING PROFILE RECOMMENDED

Recommend Humidity conditions

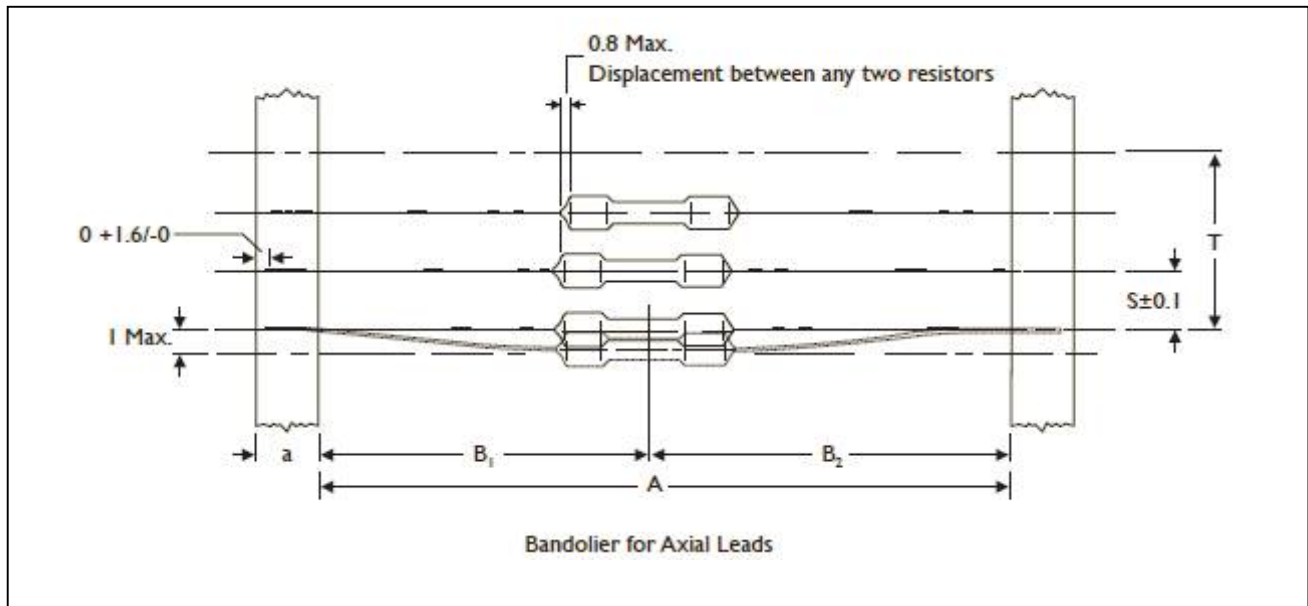




RECOMMENDED HAND-SOLDER PARAMETERS

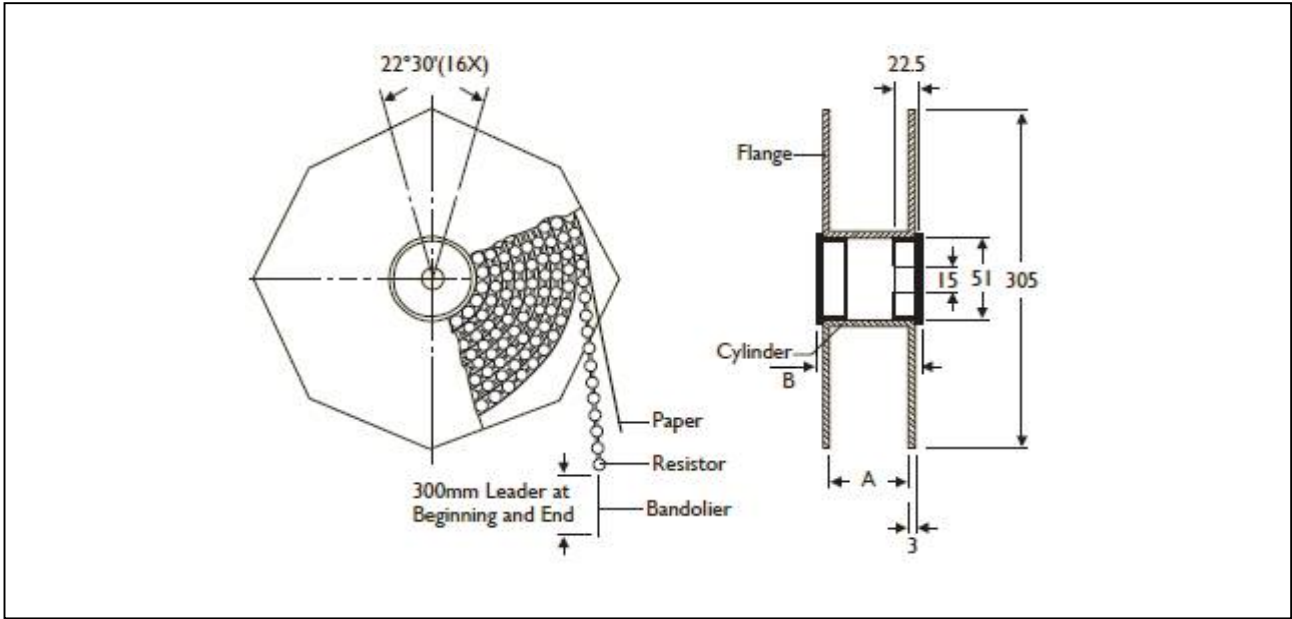
- Solder Iron Temperature: 350°C
- Heating Time: ≤3s
- Distance between solder point and resistor body: >3mm

AXIAL / REEL TAPE SPECIFICATION



Miniature	a	A	B1-B2 (Max.)	S (spacing)	T (max. deviation of spacing)
OTP1WS	6 ± 0.5	52.4 ± 1.5	1.2	5	1 mm per 10 spacing, 0.5 mm per 5 spacing
OTP2WS	6 ± 0.5	73.0 ± 1.5 52.4 ± 1.5	1.5 1.2	5	

TAPE ON REEL PACKING

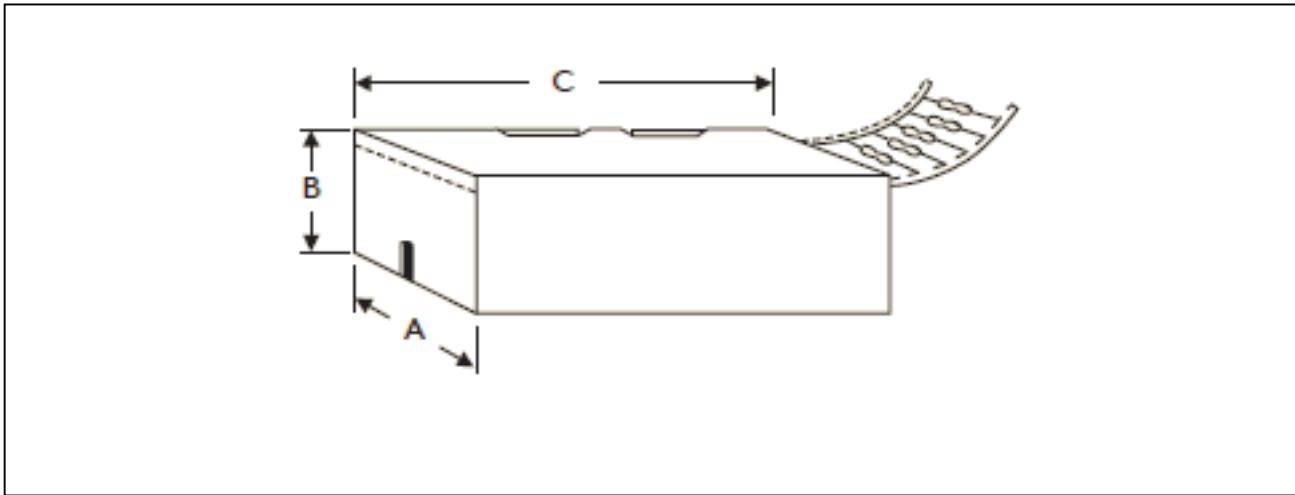


TYPE

Unit: mm/piece

Miniature	Across Flange(A)	B	Quantity Per Reel
OTP1WS	66.5	75.5	2,500
OTP2WS	66.5	75.5	2,000
OTP2WS	87	96	2,000

TAPE ON BOX PACKING



TYPE	DIMENSIONS			Quantity Per Box
	A	B	C	
OTP1WS	81	91	260	1,000
OTP2WS	81	91	260	1,000
OTP2WS	103	78	260	1,000

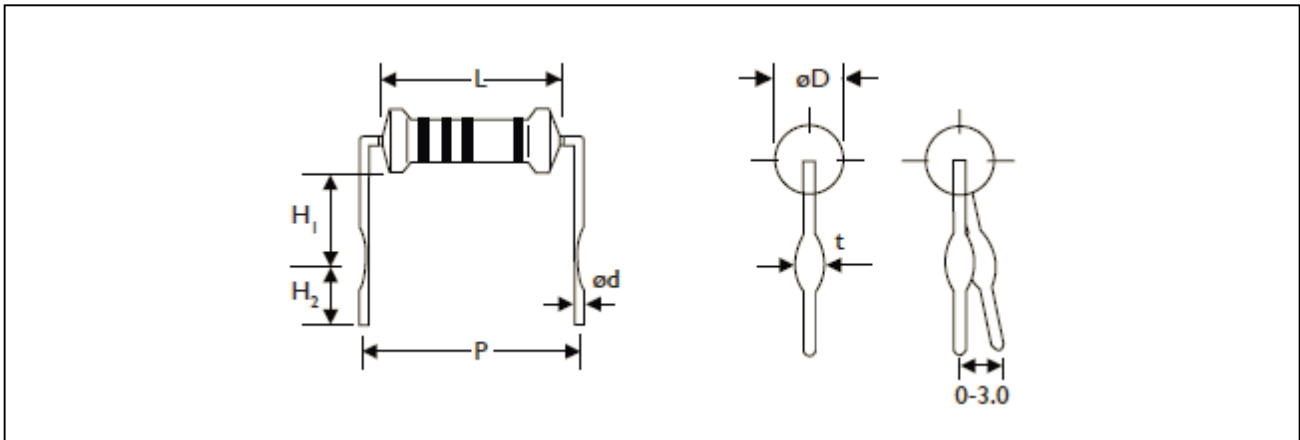
Unit: mm/piece

BULK PACKING

Miniature	Piece/Per Inner Box	Bag/Per Inner Box	Piece Per Bag
OTP1WS	2,000	4	500
OTP2WS	2,000	4	500

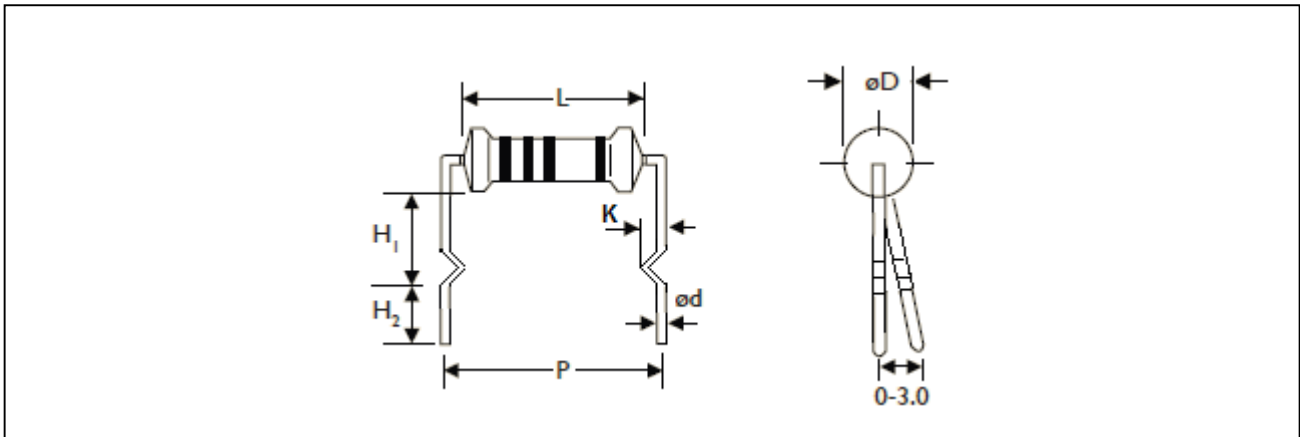
FORMING

MB TYPE



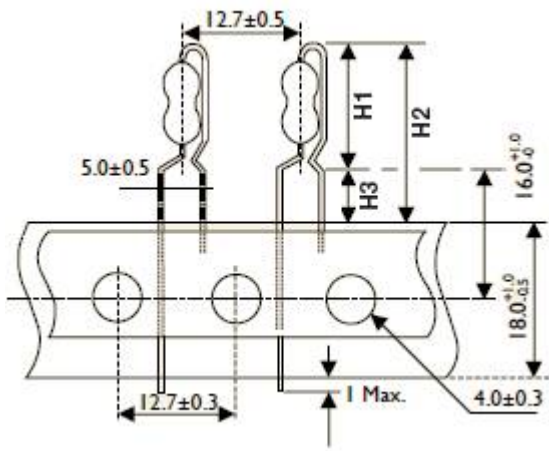
TYPE	DIMENSIONS							Unit: mm
	L	ψD	ψd	P	H1	H2	t	
OTP1WS	10.5 ± 1.0	4.2 ± 0.3	0.6 ± 0.05	12.5 ± 1.0	6.0 ± 1.0	5.0 ± 1.0	1.2 ± 0.2	

MBP TYPE



TYPE	DIMENSIONS							Unit: mm
	L	ψD	ψd	P	H1	H2	K	
OTP2WS	10.5 ± 1.0	$4.5 \pm 0.5/-0$	0.6 ± 0.05	17.5 ± 1.0	6.0 ± 1.0	3.2 ± 0.4	1.6 ± 0.2	

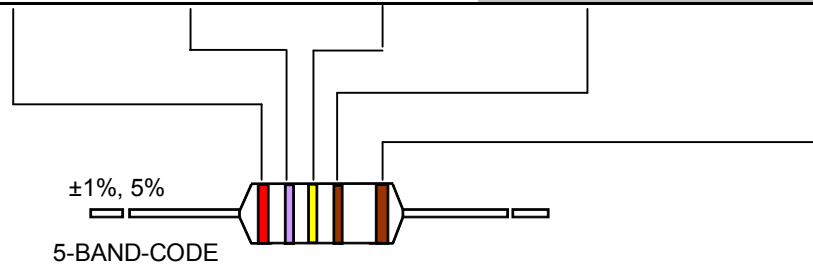
PN TYPE (aping Pack)



TYPE	DIMENSIONS			Unit: mm
	H1 Max.	H2 Max.	H3 Max.	
Miniature				
OTP2WS	19	27.5	8.5	

MARKING

COLOR	1st BAND	2nd BAND	MULTIPLIER	TOLERANCE	PROTECTOR CHARACTERISTICS
BLACK	0	0	1Ω		Code A
BROWN	1	1	10Ω	± 1% (F)	Code B
RED	2	2	100Ω		Code C
ORANGE	3	3	1KΩ		Code D
YELLOW	4	4	10KΩ		
GREEN	5	5	100K		
BLUE	6	6	1MΩ		
VIOLET	7	7	10MΩ		
GREY	8	8	0.001Ω		
WHITE	9	9	0.0001Ω		
GOLD			0.1Ω	± 5% (J)	
SILVER			0.01Ω		



REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	Aug.11, 2021	-	- First issue of this specification

“ Yageo reserves all the rights for revising the content of this datasheet without further notification, as long as the products itse lf are unchanged. Any product change will be announced by PCN.”

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 statements regarding the suitability of products for certain types of applications are based on Yageo's knowledge of typical operating conditions for such types of applications in a generic nature. Such statements are neither binding statements of Yageo nor intended to constitute any warranty concerning the suitability for a specific customer application or use. They are intended for use only by customers with requisite knowledge and experience for determining whether Yageo products are the correct products for their application or use. In addition, unpredictable and isolated cases of product failure may still occur, therefore, customer application or use of Yageo products which requires higher degree of reliability or safety, shall employ additional protective safeguard measures to ensure that product failure would not result in personal injury or property damage.

Yageo products are not designed for application or use in medical, life-saving, or life-sustaining devices or for any other application or use in which the failure of Yageo products could result in personal injury or death. Customers using or selling Yageo products not expressly indicated for above-mentioned purposes shall do so at their own risk and agree to fully indemnify Yageo and hold Yageo harmless.

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.