RX and RXS SERIES

PERCISION WIRE WOUND RESISTORS

Feature

· Advanced Germany ISABELLENHÜETTE alloy technology
· Excellent overall stability: Class 0.5%
· Very low TCR: up to ±10ppm/K
· Tolerance up to ±0.05%
· Non-inductance winding available under request
· Perfect pulse loading capability
· Compliant to RoHS directive 2011/65/EU
· Compliant to REACH (EC No. 1907/2006)) (last updated: 27/06/2018)

Application

· Current sensor for test and measuring instruments
· Power supply with high reliability
· Components burn-in devices
· Pulse load and in rush current protectors
· Medical equipment
· Military electronics

1. PRODUCT: PRECISION WIRE WOUND RESISTORS

2. PART NUMBER: Part number is identified by the series name, power rating, size code, tolerance, temperature coefficient, packing style and resistance value.

Example：

RX	17	S	F	2	T	1R80
Series Name	**Power rating**	**Size Code**	**Tolerance**	**Temperature Coefficient**	**Packing Style**	**Resistance Value**

(1) Series name: RX SERIES

(2) Power Rating: please see data sheet

(3) Tolerance: W±0.05%; B=±0.1%; C=±0.25%; D=±0.50%; F=±1.0%; J=±5.0%

(4) T.C.R.: 7 = ±5ppm/℃; 6 = ±10ppm/℃; 5 = ±15ppm/℃; 4 = ±20ppm/℃;
3 = ±25ppm/℃; 2 = ±50ppm/℃; 1 = ±100ppm/℃; 0=±250ppm/℃

(5) Packaging Type: B = Bulk/Box; T = Tape on Box Packing
M = M type deforming; F = Vertical deforming

(6) Resistance Value for J tolerance: R47、1R0、100、101、102、333、104……

(7) Resistance Value for tighten tolerance: R470、1R00、10R0、1000、1001、1002

3. COLOR-CODE MARKING:

G(±2.0%), J(±5.0%) and K(±10.0%) tolerance resistors may have 2 bands for significant figures. Tight tolerance resistors have three bands for significant figures. An additional band could indicate temperature coefficient for TCR<=25ppm/℃ is available upon request. One special identification black ring is available upon request.

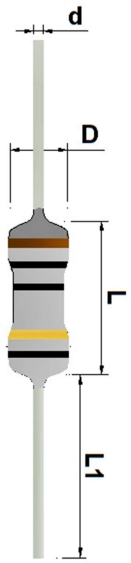
Resistors manufactured for military user may also include a fifth band which indicates component failure rate (reliability); refer to MIL-HDBK-199 for further details.

Digital marking is available upon request.

All coded components will have at least two value bands and a multiplier; other bands are optional

The standard color code per EN 60062:2005 is as follows

COLOR	1st	2nd	Multiple	tolerance	TCR
black	0	0	1		
brown	1	1	10		100ppm/℃
red	2	2	10^2	G(±2.0%)	50ppm/℃
orange	3	3	10^3		15ppm/℃
yellow	4	4	10^4		25ppm/℃
green	5	5	10^5		15ppm/℃
blue	6	6	10^6		10ppm/℃
purple	7	7			5ppm/℃
gray	8	8			
white	9	9			
golden			10^{-1}	J(±5.0%)	
silver			10^{-2}	K(±10%)	



4. ELECTRICAL CHARACTERISTICS

Type	Rated dissipation at 70℃	Resistance range		Dielectric withstanding voltage
Resistance tolerance		B(±0.10%); C(±0.25%); D(±0.5%); F(±1.0%);	F(±1.0%); J(±5.0%);	
Temperature coefficient		±15 ppm/℃; ±20 ppm/℃; ±25 ppm/℃; ±50 ppm/℃	±50 ppm/℃; ±100 ppm/℃; ±250 ppm/℃;	
RX15S	0.50W	1Ω to 1kΩ	0.1Ω to 2.5kΩ	300V
RX16S	1.00W	1Ω to 1kΩ	0.1Ω to 6.8kΩ	300V
RX16	1.00W	1Ω to 1kΩ	0.1Ω to 6.8kΩ	500V
RX17S	2.00W	1Ω to 4.7kΩ	0.1Ω to 12kΩ	500V
RX18S	3.00W	1Ω to 4.7kΩ	0.5Ω to 22kΩ	700V
RX18	3.00W	1Ω to 4.7kΩ	0.5Ω to 38kΩ	700V
RX19S	5.00W	1Ω to 4.7kΩ	1Ω to 38kΩ	700V
RX21-6	6.00W	1Ω to 4.7kΩ	1Ω to 95kΩ	700V
RX21-8	8.00W		1Ω to100kΩ	700V
RX21-10	10.0W		1Ω to 148kΩ	700V
RX21-15	15.0W		1Ω to 47kΩ	700V
RX21-20	20.0W		1Ω to 47kΩ	700V
RX21-30	30.0W		1Ω to 47kΩ	700V

* Unless otherwise specified, all values are tested at the following condition:
  Temperature: 21℃ to 25℃; Relative humidity: 45% to 70%;

* Rated Continuous Working Voltage (RCWV) = $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$

* Resistance out of range is available upon request.

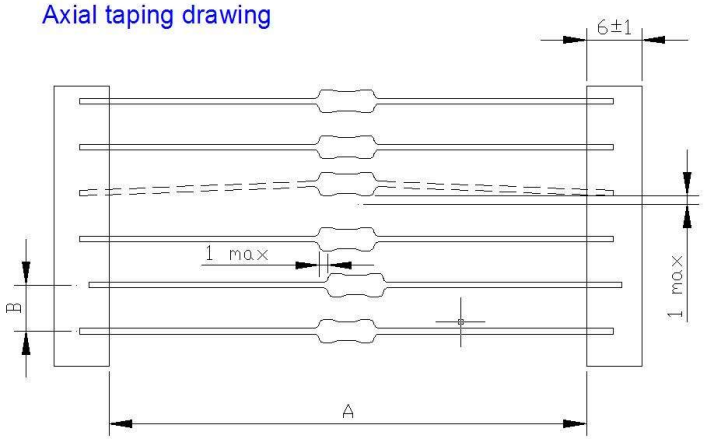
* High insulating requirement is available upon request.

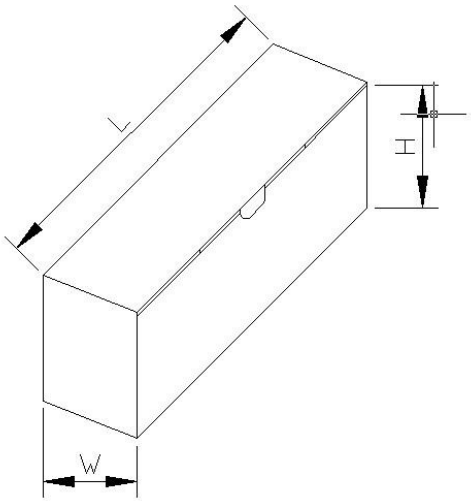
* Non-inductance wound is available on request.

5. Dimension and packing information

Type	L (mm)	D (mm)	d (mm)	Weight (mg)	TAPING		BOX (±10mm)			MPQ
					B (mm)	A (mm)	W (mm)	H (mm)	L (mm)	
RX15S	5.9±0.5	2.5±0.5	0.60±0.5	250	5.0±0.3	52±1.0	75	100	255	5000
RX15	9.0±1.0	3.3±0.5	0.60±0.5	470	5.0±0.3	52±1.0	75	100	255	2500
RX16S	9.0±1.0	3.3±0.5	0.60±0.5	490	5.0±0.3	52±1.0	75	100	255	2500
RX16	11±1.0	4.5±0.8	0.75±0.5	760	5.0±0.5	52±1.0	75	75	255	1000
RX17S	11±1.0	4.5±0.8	0.75±0.5	790	5.0±0.5	52±1.0	75	75	255	1000
RX17	15±1.0	5.5±1.0	0.75±0.5	1320	10±0.5	62±1.0	75	100	255	1000
RX18S	15±1.0	5.5±1.0	0.75±0.5	1380	10±0.5	62±1.0	75	100	255	1000
RX18	17±1.0	6.0±1.0	0.75±0.5	1800	10±0.5	72±3.0	95	1000	255	500
RXP19S	18±1.0	7.0±1.0	0.75±0.5	2300	10±0.5	72±3.0	95	1000	255	500
RX19	24±1.0	8.0±1.0	0.75±0.5	4600	10±0.5	72±3.0	95	1000	255	500
RX21-6W	24±1.0	8.0±1.0	0.75±0.5	4600	10±0.5	72±3.0	95	1000	255	500
RX21-8W	32±1.0	8.5±1.0	0.75±0.5	4600						
RX21-10W	32±1.0	8.5±1.0	0.75±0.5	4600						
RX21-12W	37±1.0	8.5±1.0	0.75±0.5	4600						
RX21-15W	42±1.0	8.5±1.0	0.75±0.5	4600						
RX21-20W	52±1.0	8.5±1.0	0.75±0.5	4600						
RX21-30W	77±1.0	8.5±1.0	0.75±0.5	4600						

Axial taping drawing

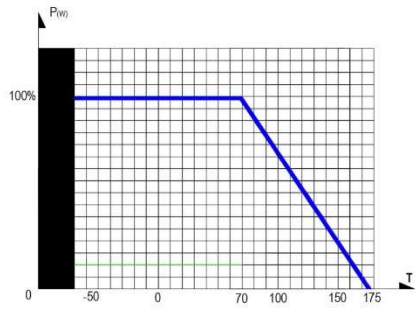


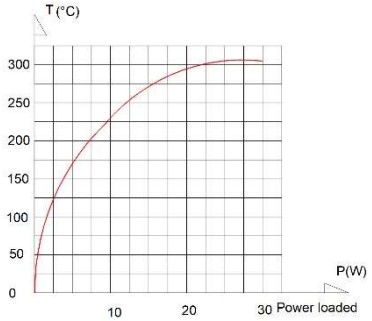


6. Derating curve and temperature rising curve

The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature is not exceeded. These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime.

For resistors working at an ambiance temperature of 70℃ or above, the power rating shall be derated in accordance with the following curve.





Temperature rising curve

7. ENVIRONMENTAL CHARACTERISTICS

(1) Insulation Resistance

IEC 60115-1, 4.6: in V-block for 60 seconds, the test resistance should be high than 10,000 M Ohm.

(2) Dielectric Withstanding Voltage

IEC 60115-1 4.7: Place resistors in V-block for 60 Seconds, no breakdown or flashover.

(3) Temperature Coefficient Test

IEC 60115-1, 4.8: Test of resistors at room temperature and 60°C or 100°C on request above room temperature. Then measure the resistance. The Temperature Coefficient is calculated by the following equation and its value should be within the range requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature
R_0 = Resistance value at the room temperature
t = the 2nd testing temperature
t_0 = Room temperature

(4) Short Time Over Load Test

IEC60115-1 4.13: At 10 times rated voltage or 2 times the maximum working voltage whichever is lower for 5 seconds, the resistor should be free from defects. The change of the resistance value should be within ±(0.25%+0.05 Ω) as compared with the value before the test.

(5) Solderability

IEC 60115-1, 4.17: 235±5°C for 3±0.5 Seconds, there are at least 95% solder coverage on the termination.

(6) Resistance to soldering heat:

IEC 60115-1, 4.18: 260±3°C for 10±1 Seconds, immersed to a point 3±0.5mm from the body. The change of the resistance value should be within ±(0.25%+0.05 Ω) as compared with the value before the test.

(7) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to +155°C to Room Temp. (5 cycles). The change of the resistance value shall be within ±(0.25%+0.05 Ω) for tight tolerance and ±(5.0%+0.05 Ω) for normal tolerance as compared with the value before the test.

(8) 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 the maximum working voltage whichever is lower. The change of the resistance value should be within ±(0.50%+0.05 Ω) for tight tolerance and ±(5.0%+0.05 Ω) for normal tolerance as compared with the value before the test.

(9) Load Life Test

IEC 60115-1, 4.25: 70±2°C at RCWV or the maximum working voltage whichever is lower for 1,000+48/-0 Hr. (1.5Hr. on, 0.5Hr. off). The resistors shall be arranged not much effected mutually by the temperature of others and the excessive ventilation shall not be performed. The change of the resistance value should be within ±(0.50%+0.05 Ω) for tight tolerance and ±(5.0%+0.05 Ω) for normal tolerance as compared with the value before the test.

(10) Accidental Overload Test

IEC 60115-1, 4.26: 4 times RCWV for 1 Minute. No evidence of flaming or arcing

(11) Resistance to Solvent

IEC 60115-1, 4.30: IPA for 5±0.5 Min. with ultrasonic. No deterioration of coating and color code occurred.

(12) High voltage high pulse overload

Apply 10 pulses with 10 times rated voltage to the resistor, the pulses parameter is 10μs/700μs. The change of the resistance shall be within ± (0.50%+0.05Ω) for tight tolerance and ±(5.0%+0.05 Ω) for normal tolerance as compared with the value before the load.

Disclaimer

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

Thunder Precision Resistors makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product to the maximum extent permitted by applicable law.