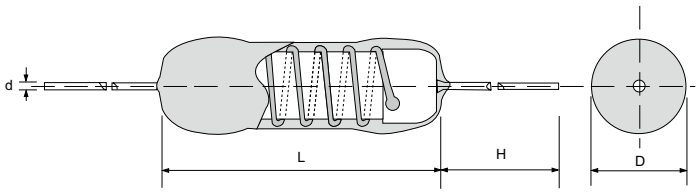
WA MINIATURE SIZE
Wire Wound Resistors

Quality • Reliability
Cost-Down via Innovation.



Specifications Per

• IEC 60115-1, IEC 60115-4

Features

• Flameproof multi-layer coating equivalent to UL 94 V-0
• Flameproof feature equivalent to overload test UL 1412
• Color code per MIL & EIA standards
• Special tin-plated electrolytic copper lead wire
• Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body		Leadwire	
	Length (L, mm)	Diameter (D, mm)	Length (H, mm)	Diameter (d, mm)
WA01S	8.80 ± 1.0	3.2 ± 0.2	28 ± 3.0	0.6 ± 0.03
WA02S	11.0 ± 1.0	4.0 ± 0.5	28 ± 3.0	0.7 ± 0.03
WA03S	13.5 ± 1.0	5.0 ± 0.5	30 ± 3.0	0.8 ± 0.03
WA04S	15.5 ± 1.0	5.5 ± 0.5	30 ± 3.0	0.8 ± 0.03
WA05S / WA06S	19.0 ± 1.0	6.0 ± 0.5	30 ± 3.0	0.8 ± 0.03

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
WA01S	1W	350V	600V	0.1Ω	390Ω	± 2%, ±5%	E-24
WA02S	2W	350V	700V	0.1Ω	449Ω	± 2%, ±5%	E-24
WA03S	3W	350V	700V	0.1Ω	549Ω	± 2%, ±5%	E-24
WA04S	4W	350V	700V	0.1Ω	1KΩ	± 2%, ±5%	E-24
WA05S WA06S	5W / 6W	450V	800V	0.1Ω	1K5Ω	± 2%, ±5%	E-24

Special sizes, values, and specifications not listed available on special order.

PART NUMBER

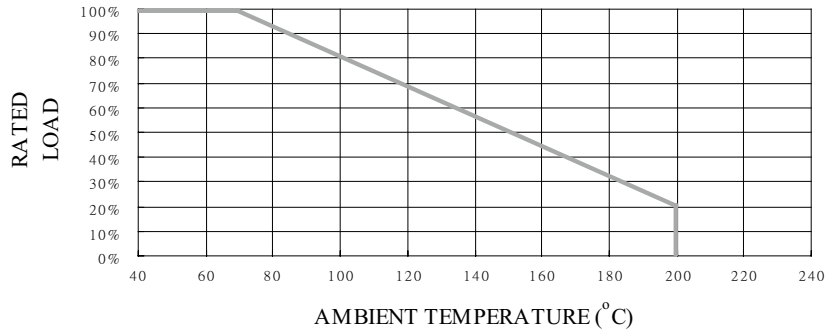
Example: WA03SJ100RTKZTB500

WA03S	J	100R	TKZ	TB500
Type	Tolerance	Resistance	TCR	Packaging
	G (2%) J (5%)	100Ω **4-character code** containing - 3 significant digits 1 letter multiplier OHM MULTIPLIER R = 1 K = 10^3 M = 10^6 G = 10^9	**3-character code** TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.*	**5-character code** TB = Tape Box (pieces per box) WA01S 2K0 = 2,000 WA02S 1K0 = 1,000 WA03S/WA04S WA05S/WA06S 500 = 500

*** For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.**

WA MINIATURE SIZE
Wire Wound Resistors

POWER DERATING CURVE



TECHNICAL SUMMARY

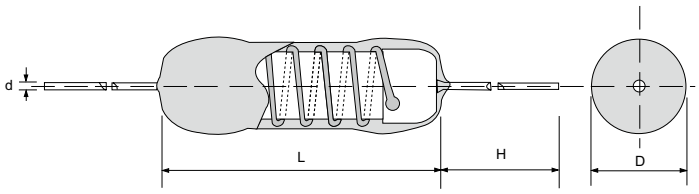
Characteristics	Limits	
Dielectric Withstanding Voltage, VAC or DC	WA01S WA02S / WA03S WA04S / WA05S / WA06S	350 600 1000
Temperature Coefficient, PPM / °C*	Typically ±300	
Operating Temperature Range, °C	-55~+200	
Insulation Resistance, MΩ	10^4	

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**

PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Over Load	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	±1%
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	±5%
Load Life 1,000 hours	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±5%
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Leads immersed till 3mm from the body in (260±5)°C solder for 10±1 seconds	±1%
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	90% Min.
Vibration	**IEC 60115-1 4.22** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 0.75mm and 10 to 500 Hz.	±1%
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 200°C without load	±1%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +155°C 30minutes, 5 cycles	±2%

WA
Wire Wound Resistors



Specifications Per

• IEC 60115-1, IEC 60115-4

Features

• Flameproof multi-layer coating equivalent to UL 94 V-0
• Flameproof feature equivalent to overload test UL 1412
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• Special tin-plated electrolytic copper lead wire
• Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body		Leadwire	
	Length (L, mm)	Diameter (D, mm)	Length (H, mm)	Diameter (d, mm)
WA051	8.80 ± 1.0	3.2 ± 0.2	28 ± 3.0	0.6 ± 0.03
WA01	11.0 ± 1.0	4.0 ± 0.5	28 ± 3.0	0.7 ± 0.03
WA02	13.5 ± 1.0	5.0 ± 0.5	30 ± 3.0	0.8 ± 0.03
WA03	15.5 ± 1.0	5.5 ± 0.5	30 ± 3.0	0.8 ± 0.03
WA04/WA05	19.0 ± 1.0	6.0 ± 0.5	30 ± 3.0	0.8 ± 0.03
WA06	24.0 ± 1.0	8.0 ± 0.5	30 ± 3.0	0.8 ± 0.03
WA07/WA08	31.5 ± 1.0	8.0 ± 0.5	30 ± 3.0	0.8 ± 0.03

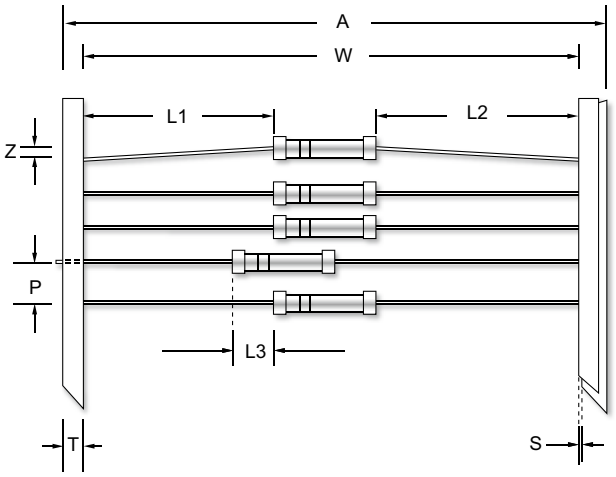
GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance
WA051	1/2W	350V	600V	0.1Ω	390Ω	±2%, ±5%
WA01	1W	350V	600V	0.1Ω	449Ω	±2%, ±5%
WA02	2W	350V	700V	0.1Ω	549Ω	±2%, ±5%
WA03	3W	350V	700V	0.1Ω	1KΩ	±2%, ±5%
WA04/WA05	4W / 5W	450V	800V	0.1Ω	1K5Ω	±2%, ±5%
WA06	6W	500V	1000V	0.1Ω	3K3Ω	±2%, ±5%
WA07/WA08	7W / 8W	600V	1200V	0.1Ω	3K3Ω	±2%, ±5%

Special sizes, values, and specifications not listed available on special order.

WA
Wire Wound Resistors

TAPING/PACKING SPECIFICATIONS



Unit (mm)

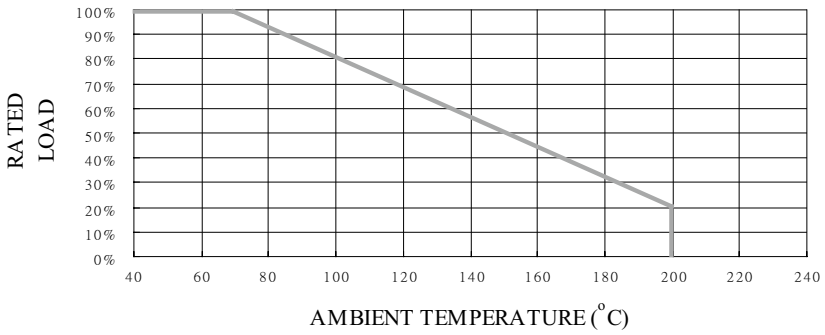
Type	A Max.	L1-L2 (Max.)	L3 (Max.)	P ±0.5	S (Max.)	T ±0.5	W ±1.5	Z (Max.)
WA051	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
WA01	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
WA02	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
WA03	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
WA04/WA05	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
WA06	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
WA07/WA08	97	±1.5	1.0	10.0	0.8	6.0	83.0	1.2

TECHNICAL SPECIFICATIONS

Characteristics	Limits	
Dielectric Withstanding Voltage, VAC or DC	WA051 WA01 / WA02 WA03 / WA04 / WA05 / WA06 / WA07 / WA08	350 600 1000
Temperature Coefficient 1/2W to 8W, PPM / °C*	±100, ±300	
Operating Temperature Range, °C	-55~+200	
Insulation Resistance, MΩ	10^4	

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**

POWER DERATING CURVE



PART NUMBER

Example: WA051J100RTKZTB2K0

WA051	J	100R	TKZ	TB2K0
Type	Tolerance	Resistance	TCR	Packaging
	G (2%) J (5%)	100Ω **4-character code** containing - 3 significant digits 1 letter multiplier OHM MULTIPLIER R = 1 K = 10^3 M = 10^6 G = 10^9	**3-character code** TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.*	**5-character code** TB = Tape Box (pieces per box) WA051 2K0 = 2,000 WA01 1K0 = 1,000 WA02/WA03/ WA04/WA05 500 = 500 WA06/WA07 WA08 250 = 250

*** For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.**

WA
Wire Wound Resistors

PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Over Load	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	±1%
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	±5%
Load Life 1,000 hours	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±5%
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Leads immersed till 3mm from the body in (260±5)°C solder for 10±1 seconds	±1%
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	90% Min.
Vibration	**IEC 60115 4.22** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 0.75mm and 10 to 500 Hz.	±1%
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 200°C without load	±1%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +155°C 30minutes, 5 cycles	±2%