

## BWS Series Datasheet

Insulated Wirewound Resistors | Axial and SMD Version  
Fiberglass core | Bakelite Moulded case

### ORDERING CODE-Example

New SAP Part Nr.:

<b>BWS</b>	<b>110</b>	<b>K</b>	<b>T</b>	<b>-</b>	<b>73-</b>	<b>150R</b>	<b>AA</b>
Serie	* Power rating	Tol. J = ±5% K = ±10%	Pack-Code T = Tape (ammo pack)	TCR - Base on spec.	Forming type 73- Inner Taping dimension ZB- Z version	R Value	Special AA = Standard

Historical VTM Part Nr.:

<b>BW234 - 0</b>	<b>10</b>	<b>T</b>	<b>150R</b>
Type	Tol. ±10% = K	Pack-Code T = Tape (ammo pack)	R Value
<b>RZB4 6720</b>	<b>K</b>	<b>K</b>	<b>- 13 150R</b>
Type	Size	Tol. K = Blister tape reel	TC Reel diam.   R Value

### APPLICATIONS

- Automotive
- Charger
- Alternative Energy
- Power Supply
- Home Appliances
- Industrial

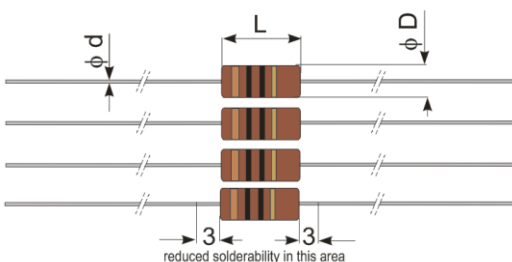
### FEATURES

- Precision Type
- "Z" preforming ; Other preforming available
- High insulation voltage
- RoHS & REACH Compliant

### ELECTRICAL SPECIFICATIONS

Type		BWS110	BWS210
Historical Part Number	AXIAL	BW234-0	BW235-0
	SMD	RZB4	RZB5
Nominal Power Rating	* P <sub>25</sub>	1,1	2,1
	P <sub>70</sub>	0,75	1,5
Resistance Range	[Ω]	OR1 ... 1K2	OR1 ... 2K4
E-Series (preferred)		(Other values upon request) E24 (5%) ; E12 (10%)	
Tolerances	±[%]	J = 5% ; K = 10%	
Temperature Coefficient	±[10 <sup>-6</sup> K <sup>-1</sup> ]	Depends on the value, please check the table below	
Working Temperature Range	[°C]	-55 ... +175	
Thermal Resistance	[KW <sup>-1</sup> ]	140	80
Insulation Resistance IEC60115-1 clause 4.6	[MΩ]	> 10 <sup>4</sup>	
Max. Working Voltage	[V] <sub>RMS</sub>	$\sqrt{P_{70} \times R}$	
Dielectric Withstanding Voltage IEC115-1 clause 4.7 (1[min])	[V] <sub>RMS</sub>	700	1000

### DIMENSIONS [mm]



Type	Historical P/N:	L ±0,2	Ø D ±0,2	Ø d ±0,02
<b>BWS110</b>	BW234 - 0	9,9	3,6	0,8
<b>BWS210</b>	BW235 - 0	14,3	5,7	1,0 *

\* Special lead diameter 0,8mm available

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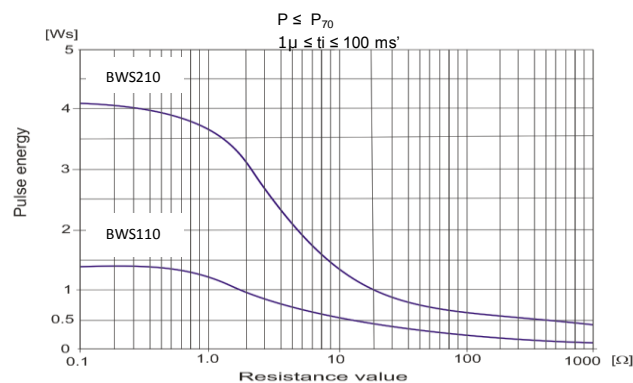
## PERFORMANCE DATE

Type		BWS110	BWS210
Historical Part Number	AXIAL	BW234-0	BW235-0
	SMD	RZB4	RZB5
Derating Linear	[°C]	70...175 (0W)	
Climatic Category		55/175/56	
Failure Rate <i>(Total, <math>\vartheta_o</math>, max, 60[%] cont. lev.)</i>	[ $10^{-9} h^{-1}$ ]	appr. 100 depends on value	
Endurance <i>IEC60115-1 clause 4.25 (<math>P_{70}</math>, @ 70[°C], 1000[h])</i>	±[%]	5,0	
Damp Heat, Steady State <i>IEC60115-1 clause 4.24 (40[°C], 93[% r.h.], 56[d])</i>	±[%]	2,0	
Climatic Sequence <i>IEC60115-1 clause 4.23</i>	±[%]	2,0	
Resistance to Soldering Heat <i>IEC60115-1 clause 4.18 (260<sup>±5</sup>[°C], 10<sup>±1</sup>[s])</i>	±[%]	0,2	
Surge Test <i>IEC61000-4-5</i>	±[%]	2,0	
Terminal Strength	±[%]	1,0	
Terminal Tensile Strength	[N]	40	
Solderability <i>IEC60068-2-20 (245<sup>±5</sup>[°C] 3<sup>±0,5</sup>[s])</i>		Solder bath method (> 95% coverage)	
Marking <i>IEC60062</i>		Color code	

## TEMPERATURE COEFFICIENT

New P/Nr. Type	Historical P/Nr:	Temperature Coefficient ( ppm K-1 )					
		TC ±1000	TC ±800	TC ±600	TC ±400	TC ±300	TC ±150
BWS110	BW234 – 0	—	—	OR1 ... OR15	—	OR16 ... OR62	OR68 ... 1K2
BWS210	BW235 – 0	OR1 ... OR16	OR18 ... OR68	—	OR75 ... 2K4	—	—

## PULSE PERFORMANCE

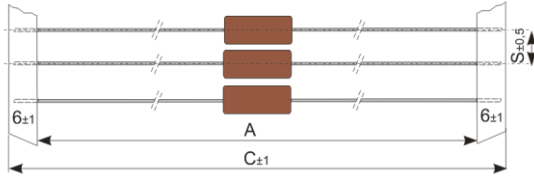


The curves are expressing the range, where no substantial effects are caused of recurrent pulses.  
A single pulse with a 3 – 5 times higher value will cause the destruction of the resistor

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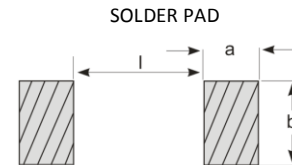
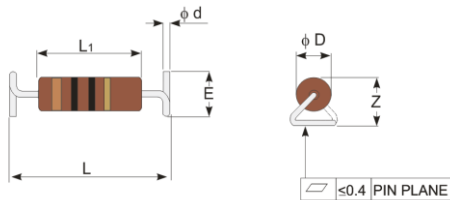
### PACKAGING

The standard packaging for BWS in axial type is taped, dimensions below.

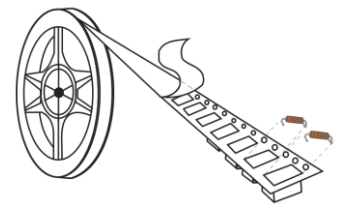
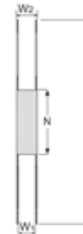
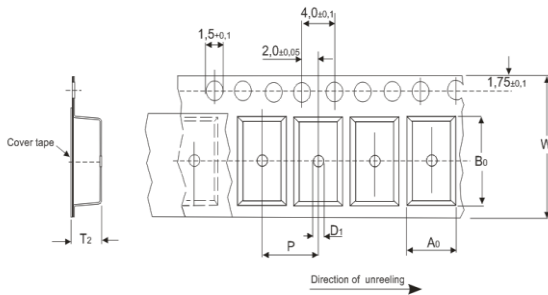


Type	Historical P/N:	Pack Code	Pieces	Forming Type (Inner Taping dim.)	A	C	S
BWS110	BW234 - 0	T = Taped	1000	73-	73	85	5
BWS210	BW235 - 0	Ammo pack	1000		73	85	10

### SMD LEAD CONFIGURATIONS



Type	Historical P/N	Size	L	$L_1 \pm 0,2$	$\phi D \pm 0,2$	$\phi d \pm 0,02$	E	Z max	l	a	b
BWS110	RZB4	6720	$17,0 \pm 1,0$	9,9	3,6	0,8	$5,0 \pm 0,5$	7,5	14	10	10
BWS210	RZB5	8424	$20,9 \pm 1,0$	14,3	5,7	1,0		8,0	16		



Type	A0	B0	W	D1	P	T2
BWS110	5,7	16,7	24	2,0	8	7,6
BWS210	6,0	21,4	32	2,0	12	8,1

Type	W1	W2	N	A
BWS110	25,4	29,5	90	330
BWS210	33,4	37,4	100	380

Type	Packaging	Pieces
BWS110	13(inch) Blister tape	1000
BWS210	15(inch) Blister tape	

### Ordering Code for SMD :





BWS	110	J	K	-	ZB-	150R	AA
Serie	* Power rating	Tol. J = $\pm 5\%$ K = $\pm 10\%$	Pack-Code K = Blister Tape Reel	TCR - Base on spec.	Forming type ZB- Z version	R Value	Special AA = Standard

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## ALTERNATIVE LEAD CONFIGURATIONS

This type BWS is also available in a different pre-forming, as shown below, other's upon request.

### THOUGH HOLE VERSION

			
<p>Axial Goal Post (AG-)</p>	<p>Axial Goal Post Kink (AK-)</p>	<p>Radial (RD-)</p>	<p>Radial 2 Kink (RK-)</p>