

features

- High Power Resistors
- Uses flame-retardant insulated ceramic case
- Products with lead-free terminations meet EU RoHS requirements. EU RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.
- Excellent in anti-pulse and in rush current



applications and ratings

Type	Power Rating	Resistance Range (Ω) E24				Style & Weight (g/1 piece)													
		F±1%	G±2%	J±5%	K±10%	S	N	E	P	X	Y	YS	Z	H	Q	HA	HB	QA	QB
BWR1	1W	1~56	0.22~75	0.1~75	—	1.3	—	—	—	—	—	—	—	—	—	—	—	—	—
BWR2	2W	1~160	0.22~200	0.1~200	—	2.1	3.9	—	—	—	—	—	—	—	—	—	—	—	—
BWR3	3W	1~300	0.22~390	0.1~390	—	3.9	5.9	—	—	—	—	—	—	—	—	—	—	—	—
BWR5	5W	1~300	0.22~390	0.1~390	—	5.1	7.2	5.7	5.6	—	—	—	—	—	—	—	—	—	—
BWR7	7W	1~360	0.22~390	0.1~390	—	7.5	10.8	—	—	—	—	—	—	—	—	—	—	—	—
BWR10	10W	1~390	0.22~390	0.1~390	—	10.2	15.0	—	—	—	—	—	—	—	—	—	—	—	—
BWR15	15W	1~390	0.22~390	0.1~390	—	18.8	—	—	—	—	—	—	—	—	—	—	—	—	—
BWR20	20W	1~390	0.22~390	0.1~390	—	23.3	—	—	—	—	—	—	—	—	—	—	—	—	—
BGR5	5W	—	—	10~390	0.39~9.1	—	—	—	—	6.1	7.6	6.6	7.6	—	—	—	—	—	—
BGR7	7W	—	—	10~390	0.39~9.1	—	—	—	—	8.2	9.1	7.8	9.1	—	—	—	—	—	—
BGR10	10W	—	—	10~390	0.39~9.1	—	—	—	—	11.0	12.4	10.4	11.4	9.9	—	13.6	—	—	—
BGR15	15W	—	—	10~390	0.51~9.1	—	—	—	—	18.8	—	—	20.5	18.4	18.6	24.4	27.5	24.6	27.7
BGR20	20W	—	—	10~390	0.51~9.1	—	—	—	—	22.3	—	—	24.0	21.9	22.1	27.9	31.0	28.1	31.3
BGR30	30W	—	—	10~390	2.2~9.1	—	—	—	—	—	—	—	—	59.3	—	73.9	73.5	—	—
BGR40	40W	—	—	10~390	2.2~9.1	—	—	—	—	—	—	—	—	70.4	—	85.0	84.6	—	—
BSR2	2W	—	—	430~13k	—	2.1	3.8	—	—	—	—	—	—	—	—	—	—	—	—
BSR3	3W	—	—	430~27k	—	3.9	5.9	—	—	—	—	—	—	—	—	—	—	—	—
BSR5	5W	—	—	430~39k	—	5.1	7.2	5.7	—	6.1	7.6	6.6	7.6	—	—	—	—	—	—
BSR7	7W	—	—	430~56k	—	7.4	10.8	—	—	8.2	9.1	7.8	9.1	—	—	—	—	—	—
BSR10	10W	—	—	430~75k	—	10.2	15.0	—	—	11.0	12.4	10.4	11.4	10.9	—	13.7	—	—	—
BSR15	15W	—	—	430~56k	—	18.8	—	—	—	18.5	—	—	20.5	18.4	—	24.4	27.5	—	—
BSR20	20W	—	—	430~56k	—	23.3	—	—	—	22.0	—	—	24.0	21.9	—	27.9	31.0	—	—

Type	Power Rating	Max. Working Voltage (V)		Max. Overload Voltage (V)		T.C.R. (x10 ⁻⁶ /K)			Rated Ambient Temperature	Operating Temperature Range
		BSR	BGR,BWR	BSR	BGR,BWR	BWR	BSR	BGR		
BWR1	1W	—	E=√P•R	—	E=√P•R•10	±100	—	—	+70°C	-40°C to +155°C
B□R2	2W	250		500			±300			
B□R3	3W	300		600						
B□R5	5W	350		700						
B□R7	7W	500		1000						
B□R10	10W	700		1400						
B□R15	15W	700		1400						
B□R20	20W	750		1500						
BGR30	30W	—		—		—	—	±250	+25°C	
BGR40	40W	—		—						

Rated voltage= $\sqrt{\text{Power Rating} \times \text{Resistance value}}$ or Max. working voltage, whichever is lower.

□ Represents the space to designate product type via character G, W, or S.

ordering information

New Part #

BWR	3	C	N	100	J
Type	Power Rating	Termination ¹ Material	Style	Nominal Resistance	Tolerance
BGR: Wirewound (glass core) BWR: Wirewound (ceramic core) BSR: Metal oxide film	See table	C: SnCu	Blank: S style ² N: N style E: E style P: P style	F: 4 digits G,J,K: 3 digits	F: ±1% G: ±2% J: ±5% K: ±10%
		T: Sn	X: X style Y: Y style YS: YS style Z: Z style H: H style Q: Q style HA: HA style HB: HB style QA: QA style QB: QB style		

¹ Lead-Free plated terminal symbols.

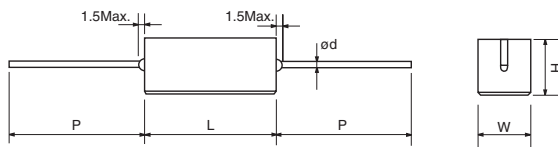
C (SnCu) N, E, S and P styles

T (Sn) X, Y, YS, Z, H and Q styles

² No indication on style means S style.

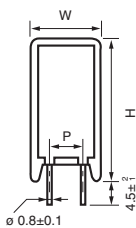
dimensions and construction

S Style

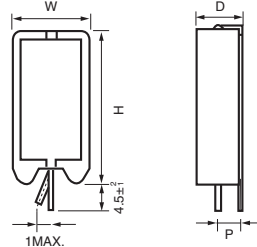


Type	Dimensions millimeters				
	L	W	H	P	D
BWR1	13.0±1.0	5.5±1.0	5.5±1.0	30.0±3.0	0.6±0.1
BWR2, BSR2	18.0±1.5	6.3±1.0	6.3±1.0	35.0±3.0	0.8±0.1
BWR3, BSR3	22.0±1.5	8.0±1.0	8.0±1.0		
BWR5, BSR5		9.5±1.0	9.5±1.0		
BWR7, BSR7	35.0±1.5				
BWR10, BSR10	48.0±1.5				
BWR15, BSR15	12.5±1.2	12.5±1.2			
BWR20, BSR20			63.5±1.5		

N Style



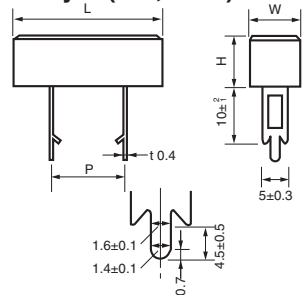
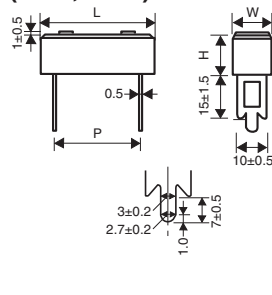
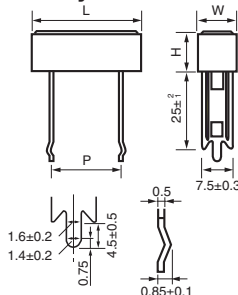
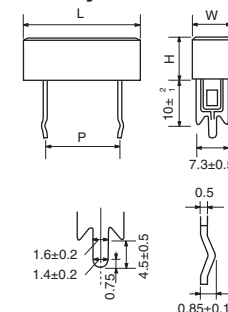
E Style



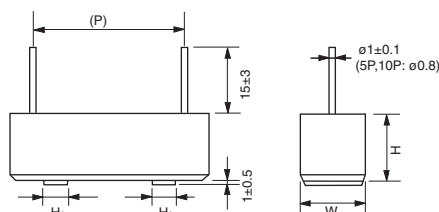
Type	Dimensions millimeters			
Type	W	D	H	P
BWR2N, BSR2N	11.0±1.0	7.0±1.0	20.5±1.5	5.0 ⁺² ₋₁
BWR3N, BSR3N	12.0±1.0	8.0±1.0	25.0±1.5	
BWR5N, BSR5N	13.0±1.0	9.0±1.0	25.5±1.5	
BWR7N, BSR7N			38.5±1.5	
BWR10N, BSR10N	16.0±1.0	12.0±1.0	35.0±1.5	7.5 ⁺² ₋₁
BWR5E, BSR5E	9.5±1.0	9.5±1.0	23.5±1.5	5.0 ⁺² ₋₁

rectangular type wirewound resistors with glass core
 rectangular type wirewound resistors with ceramic core
 rectangular type metal oxide film resistors

dimensions and construction (continued)

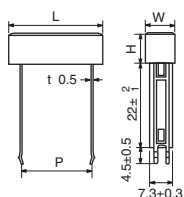
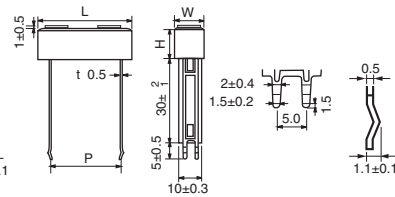
X Style (5W, 10W)

(15W, 20W)

Y Style

YS Style


Type	Dimensions millimeters		
	L	W, H	P
BGR5X, BSR5X, BGR5Y, BSR5Y, BGR5YS, BSR5YS	27.0±1.5	9.5±1.0	15.0±1.5
BGR7X, BSR7X, BGR7Y, BSR7Y, BGR7YS, BSR7YS	35.0±1.5		22.5±1.5
BGR10X, BSR10X, BGR10Y, BSR10Y, BGR10YS, BSR10YS	48.0±1.5	12.5±1.0	35.0±1.5
BGR15X, BSR15X			32.5±1.5
BGR20X, BSR20X	63.5±1.5		47.5±1.5

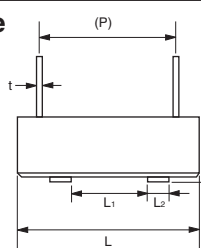
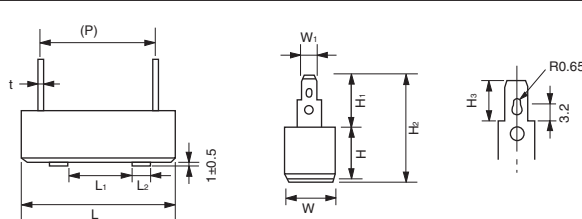
P Style


Type	Dimensions millimeters				
	L	W	H	H ₁	(P)
BWR5P	23.0±1.5	9.5±1.5	9.5±1.5	—	20

Parenthesized dimensions are for reference.
 Please refrain from using these parts as a board-insertion type.
 * Soldering only does not allow enough joint strength.
 Additional fixation is recommended.

Z Style (5W, 10W)

(15W, 20W)


Type	Dimensions millimeters			
	L	W	H	P
BGR5Z, BSR5Z	27.0±1.5	9.5±1.0	9.5±1.0	15.0 ⁺⁵ ₋₂
BGR7Z, BSR7Z	35.0±1.5			22.5 ⁺⁵ ₋₂
BGR10Z, BSR10Z	48.0±1.5	12.5±1.0	12.5±1.0	35.0 ⁺⁵ ₋₂
BGR15Z, BSR15Z				32.5 ⁺⁴ ₋₀
BGR20Z, BSR20Z	63.5±1.5			47.5 ⁺⁴ ₋₀

H Style

Q Style


Type	Dimensions millimeters											
	L	L ₁	L ₁	W	W ₁	H	H ₁	H ₂	H ₃	(P)	t	øh ₁
BGR10H, BSR10H	48.0±1.5	25.0±1.0	4.5	9.5±1.0	5	9.5±1.0	6.0 ⁺² ₋₀	16.5 ⁺² ₋₁	—	35	0.4	2.0
BGR15H, BSR15H			7.0	12.5±1.2	6	12.5±1.5	7.5 ⁺² ₋₀	21.0 ⁺² ₋₁		32.5	0.5	2.5
BGR20H, BSR20H	63.5±2.0	40.0±1.2	10.0	19.0±1.5	7.5	19.0±1.5	10.0 ⁺² ₋₀	30.0 ^{+2.5} _{-1.5}		47.5		3.0
BGR30H	75.0±2.5									56		
BGR40H	90.0±2.5									71		
BGR15Q	48.0±1.5	25.0±1.0	7.0	12.5±1.2	4.75	12.5±1.5	12.0 ⁺² ₋₀	25.0 ⁺² ₋₁	6.35	32.5	—	
BGR20Q	63.5±2.0									47.5		

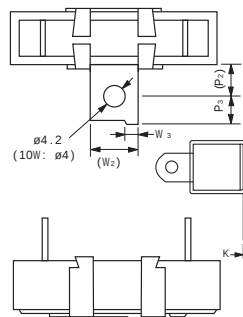
Parenthesized dimensions are for reference.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

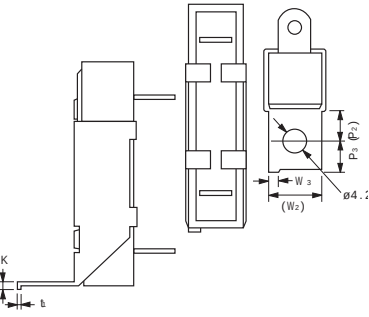
11/11/15

dimensions and construction (continued)

HA, QA Style



HB, QB Style

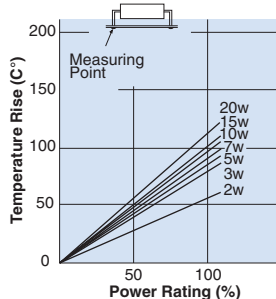
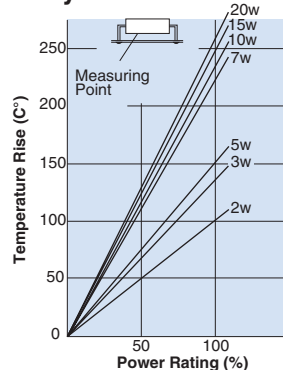


Type	Dimensions millimeters					
	(P ₂)	P ₃	(W ₂)	W ₃	K	t ₁
BGR10HA, BSR10HA	8.0	6.0±1.0	12.0	3.0±0.3	2.8±0.3	0.6
BGR15HA, BSR15HA, BGR15QA						0.8
BGR15HB, BSR15HB, BGR15QB						
BGR20HA, BSR20HA, BGR20QA						
BGR20HB, BSR20HB, BGR20QB	10.0	8.0±1.0	18.0	3.0±0.3	3.0±0.3	0.8
BGR30HA, BGR30HB						
BGR40HA, BGR40HB						

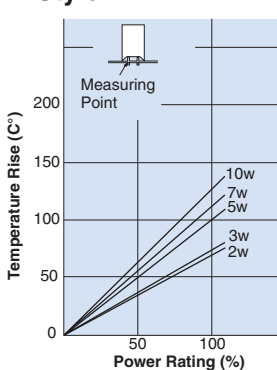
Parenthesized dimensions are for reference.

Derating Curve

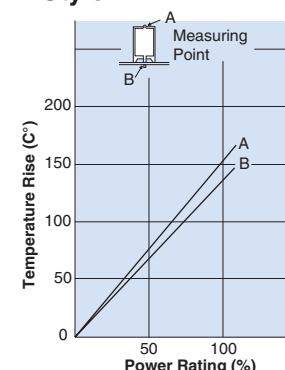
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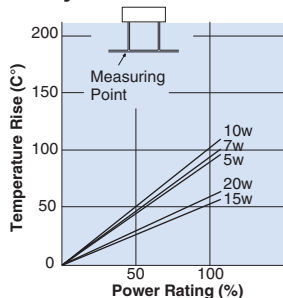
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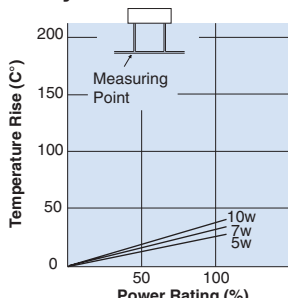
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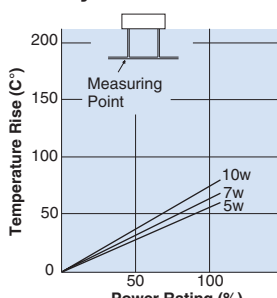
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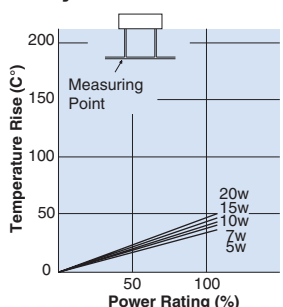
Y Style



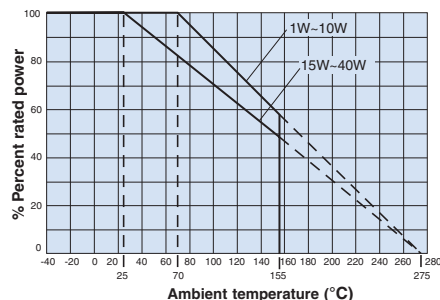
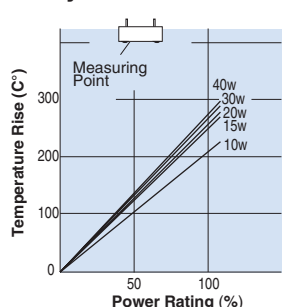
YS Style



Z Style



H Style



environmental applications

Performance Characteristics

Parameter	Requirement $\Delta R \pm\%$		Test Method
	Limit	Typical	
Resistance	Within regulated tolerance	—	25°C
T.C.R.	Within specified T.C.R.	—	+25°C/-55°C and +25°C/+125°C
Resistance to Solder Heat	1%: BWR, BSR 2%: BGR	0.8%: BWR 1.7%: BGR 0.9%: BSR	350°C $\pm$ 10°C for 3.5 seconds
Moisture Resistance	3%: BWR, BGR 5%: BSR	2.4%: BWR 2.55%: BGR 4.5%: BSR	Power rating x 1/10, 40°C, 90 - 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Endurance @ 70°C	3%: BWR 5%: BGR, BSR	2.4%: BWR 4.25%: BGR 4.5%: BSR	Rated voltage, 70°C, 1000 hours, 1.5 hours ON/ 0.5 hours OFF cycle