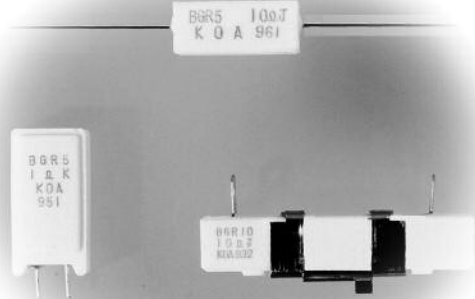


rectangular type wirewound resistors with glass core
 rectangular type wirewound resistors with ceramic core
 rectangular type metal oxide film resistors



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	59.6	73.9	73.5	74.2	73.8
BGR40	40W	—	—	10~390	2.2~9.1	—	—	—	—	—	—	—	—	70.4	70.6	85.0	84.6	85.2	84.8
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	18.6	24.4	27.5	24.6	27.7
BSR20	20W	—	—	430~56k	—	23.3	—	—	—	22.0	—	—	24.0	21.9	22.1	27.9	31.0	28.1	31.3

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	—	±250	+70°C	-40°C to +155°C					
B□R2	2W	250		500											
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	—		—			—				—	—	—	+25°C	
BGR40	40W	—		—			—				—	—	—		

Rated voltage= √Power Rating × Resistance value or Max. working voltage, whichever is lower.
 □ Represents the space to designate product type via character G, W, or S.

ordering information

BWR	3	C	N	100	J
Type	Power Rating	Termination¹ 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	+1%: 3 significant figures + 1 multiplier "R" indicates decimal on values <100Ω +2%, +5%, +10%: 2 significant figures + 1 multiplier "R" indicates decimal on values <10Ω	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.

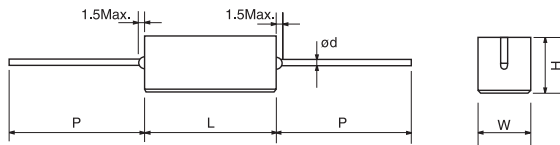
C (SnCu) N, E, S and P styles

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

² No indication on style means S style.

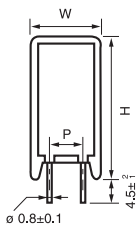
dimensions and construction

S Style

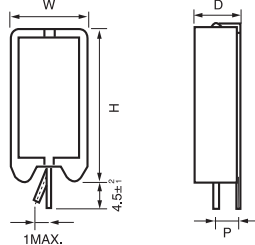


Type	Dimensions millimeters				
	L	W	H	P	D
BWR1	13.0±1.0	5.5±1.0	5.5±1.0	30.0±3.0	0.6±0.1
BWR2, BSR2	18.0±1.5	6.3±1.0	6.3±1.0	35.0±3.0	0.8±0.1
BWR3, BSR3	22.0±1.5	8.0±1.0	8.0±1.0		
BWR5, BSR5		9.5±1.0	9.5±1.0		
BWR7, BSR7	35.0±1.5			12.5±1.2	12.5±1.2
BWR10, BSR10	48.0±1.5				
BWR15, BSR15	63.5±1.5	12.5±1.5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

N Style



E Style

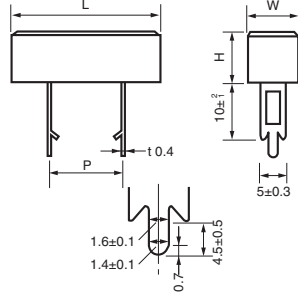


Type	Dimensions millimeters			
	W	D	H	P
BWR2N, BSR2N	11.0±1.0	7.0±1.0	20.5±1.5	5.0 ^{±2} _{±1}
BWR3N, BSR3N	12.0±1.0	8.0±1.0	25.0±1.5	
BWR5N, BSR5N	13.0±1.0	9.0±1.0	25.5±1.5	
BWR7N, BSR7N			38.5±1.5	
BWR10N, BSR10N	16.0±1.0	12.0±1.0	35.0±1.5	7.5 ^{±2} _{±1}
BWR5E, BSR5E	9.5±1.0	9.5±1.0	23.5±1.5	5.0 ^{±2}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

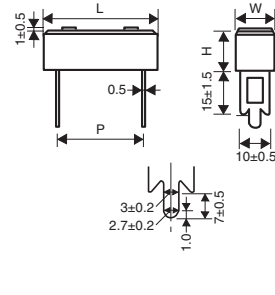
rectangular type wirewound resistors with glass core
 rectangular type wirewound resistors with ceramic core
 rectangular type metal oxide film resistors

dimensions and construction (continued)

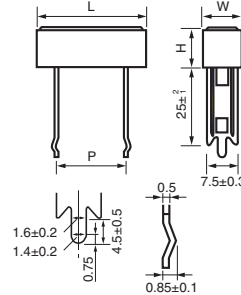
X Style (5W, 10W)



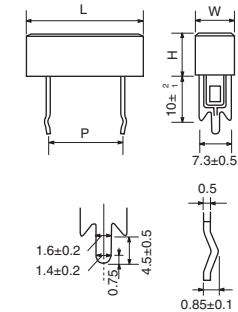
(15W, 20W)



Y Style

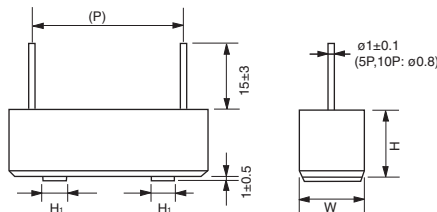


YS Style



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	63.5±1.5		32.5±1.5
BGR20X, BSR20X			47.5±1.5

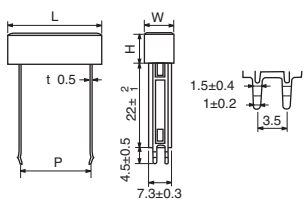
P Style



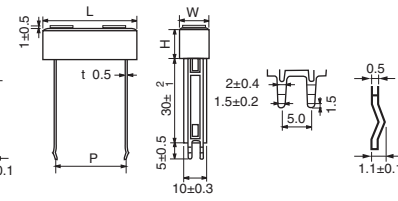
Type	Dimensions millimeters				
	L	W	H	H ₁	(P)
BWR5P	23.0±1.5	9.5±1.5	9.5±1.5	—	20

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)

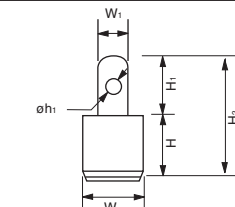
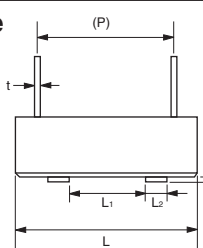


(15W, 20W)

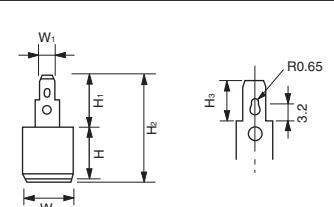
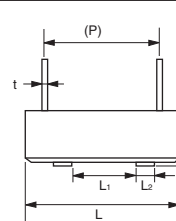


Type	Dimensions millimeters			
	L	W	H	P
BGR5Z, BSR5Z	27.0±1.5	9.5±1.0	9.5±1.0	15.0 ^{+0.5} _{-0.2}
BGR7Z, BSR7Z	35.0±1.5			22.5 ^{+0.5} _{-0.2}
BGR10Z, BSR10Z	48.0±1.5	12.5±1.0	12.5±1.0	35.0 ^{+0.5} _{-0.2}
BGR15Z, BSR15Z	63.5±1.5			32.5 ^{+0.4} _{-0.4}
BGR20Z, BSR20Z				47.5 ^{+0.4} _{-0.6}

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 ^{+0.2} _{-0.2}	16.5 ^{+0.2} _{-0.1}	—	35	0.4	2.0
BGR15H, BSR15H			7.0	12.5±1.2	6	12.5±1.5	7.5 ^{+0.2} _{-0.2}	21.0 ^{+0.2} _{-0.1}		32.5		
BGR20H, BSR20H	63.5±2.0		7.0	12.5±1.2	6	12.5±1.5	7.5 ^{+0.2} _{-0.2}	21.0 ^{+0.2} _{-0.1}		47.5		
BGR30H	75.0±2.5	40.0±1.2	10.0	19.0±1.5	7.5	19.0±1.5	10.0 ^{+0.2} _{-0.2}	30.0 ^{+2.5} _{-1.5}	—	56	0.5	3.0
BGR40H	90.0±2.5		10.0	19.0±1.5	7.5	19.0±1.5	10.0 ^{+0.2} _{-0.2}	30.0 ^{+2.5} _{-1.5}		71		
BGR15Q, BSR15Q	48.0±1.5	25.0±1.0	7.0	12.5±1.2	4.75	12.5±1.5	12.0 ^{+0.2} _{-0.2}	25.0 ^{+0.2} _{-0.1}	6.35	32.5	—	—
BGR20Q, BSR20Q	63.5±2.0		7.0	12.5±1.2	4.75	12.5±1.5	12.0 ^{+0.2} _{-0.2}	25.0 ^{+0.2} _{-0.1}		47.5		

Parenthesized dimensions are for reference.

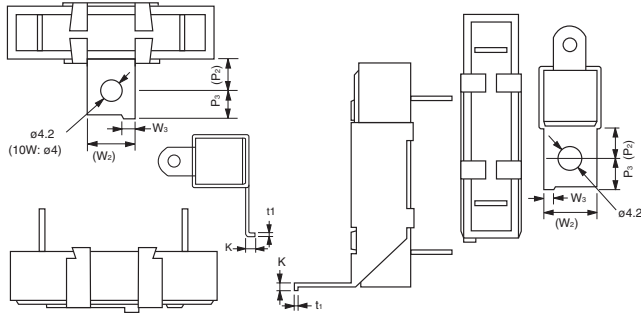
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

11/29/16

dimensions and construction (continued)

HA, QA Style

HB, QB Style

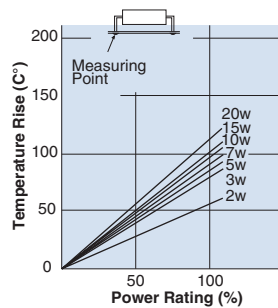
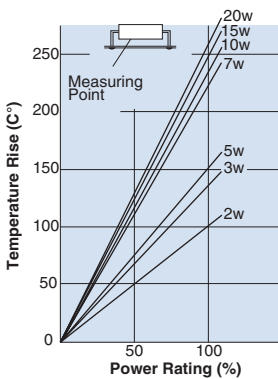


Type	Dimensions millimeters					
	(P ₂)	P ₃	(W ₂)	W ₃	K	t ₁
BGR10HA, BSR10HA	8.0	6.0±1.0	12.0	3.0±0.3	2.8±0.3	0.6
BGR15HA, BSR15HA, BGR15QA BGR15HB, BSR15HB, BGR15QB BSR15QA, BSR15QB						0.8
BGR20HA, BSR20HA, BGR20QA BGR20HB, BSR20HB, BGR20QB BSR20QA, BSR20QB						
BGR30HA, BGR30HB BGR40HA, BGR40HB						

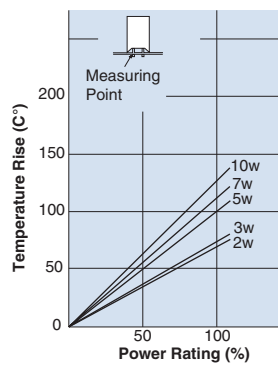
Parenthesized dimensions are for reference.

Derating Curve

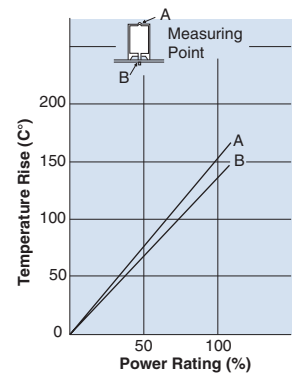
S Style



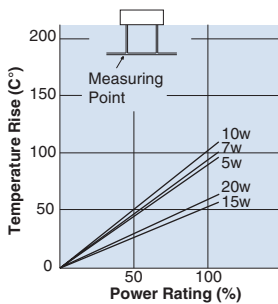
N Style



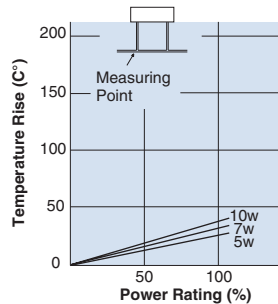
E Style



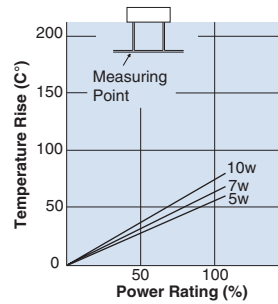
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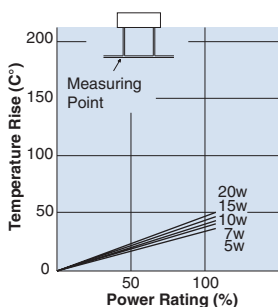
Y Style



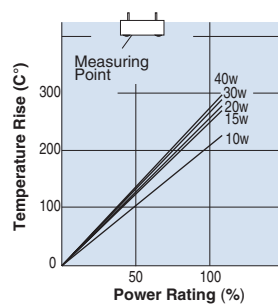
YS Style



Z Style



H, Q 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