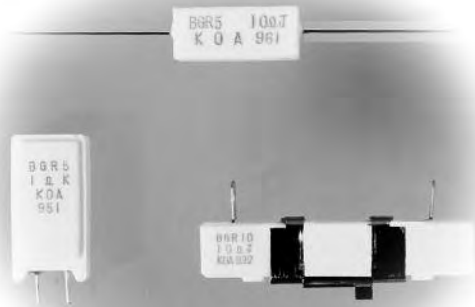


rectangular type wirewound resistors with glass core
 rectangular type wirewound resistors with ceramic core
 rectangular type metal oxide film resistors

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



Leadless resistors

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	—	±300	+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	—		—			—				—	—	±250	+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.

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

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.

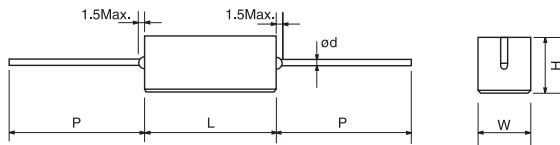
C (SnCu) N, E, S and P styles
T (Sn) X, Y, YS, Z, H and Q styles

² No indication on style means S style.

leaded resistors

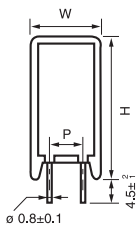
dimensions and construction

S Style

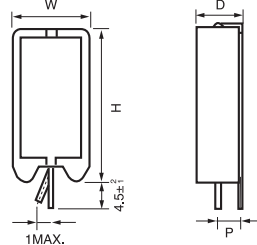


Type	Dimensions millimeters				
	L	W	H	P	D
BWR1	13.0±1.0	5.5±1.0	5.5±1.0	30.0±3.0	0.6±0.1
BWR2, BSR2	18.0±1.5	6.3±1.0	6.3±1.0	35.0±3.0	0.8±0.1
BWR3, BSR3	22.0±1.5	8.0±1.0	8.0±1.0		
BWR5, BSR5		9.5±1.0	9.5±1.0		
BWR7, BSR7	35.0±1.5			12.5±1.2	12.5±1.2
BWR10, BSR10	48.0±1.5	12.5±1.5	12.5±1.5		
BWR15, BSR15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

N Style



E Style

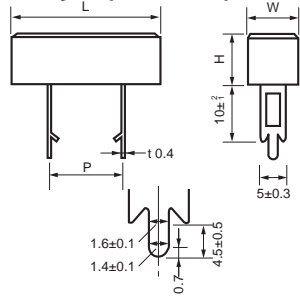


Type	Dimensions millimeters			
	W±1	D±1	H±1.5	P ⁺² ₋₁
BWR2N, BSR2N	11	7	20.5	5
BWR3N, BSR3N	12	8	25	
BWR5N, BSR5N	13	9	25.5	
BWR7N, BSR7N			38.5	
BWR10N, BSR10N	16	12	35	7.5
BWR5E, BSR5E	9.5	9.5	23.5	5

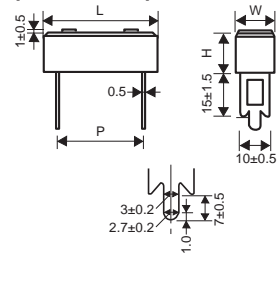
rectangular type wirewound resistors with glass core
 rectangular type wirewound resistors with ceramic core
 rectangular type metal oxide film resistors

dimensions and construction (continued)

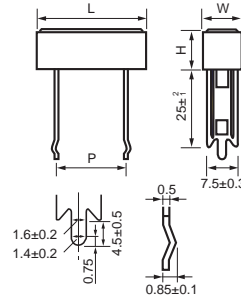
X Style (5W, 10W)



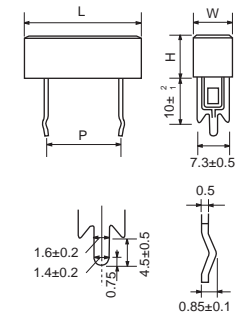
(15W, 20W)



Y Style

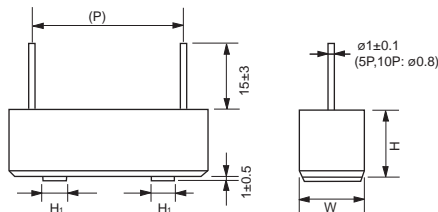


YS Style



Type	Dimensions millimeters			
	L±1.5	W±1.0	H±1.0	P±1.5
BGR5X, BSR5X, BGR5Y, BSR5Y, BGR5YS, BSR5YS	27	9.5	9.5	15
BGR7X, BSR7X, BGR7Y, BSR7Y, BGR7YS, BSR7YS	35			22.5
BGR10X, BSR10X, BGR10Y, BSR10Y, BGR10YS, BSR10YS	48	12.5	12.5	35
BGR15X, BSR15X	63.5			32.5
BGR20X, BSR20X				47.5

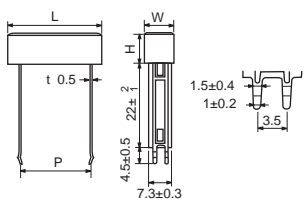
P Style



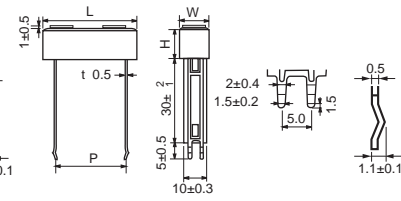
Type	Dimensions millimeters				
	L	W	H	H ₁	(P)
BWR5P	23.0±1.5	9.5±1.5	9.5±1.5	—	20

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)

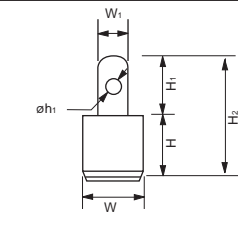
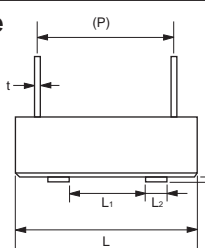


(15W, 20W)

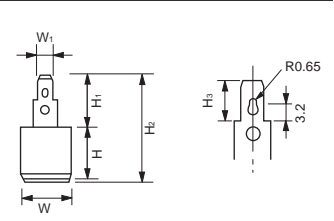
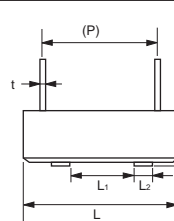


Type	Dimensions millimeters			
	L±1.5	W±1.0	H±1.0	P
BGR5Z, BSR5Z	27	9.5	9.5	15 ⁺⁶ / ₋₂
BGR7Z, BSR7Z	35			22.5 ⁺⁶ / ₋₂
BGR10Z, BSR10Z	48	12.5	12.5	35 ⁺⁶ / ₋₂
BGR15Z, BSR15Z	63.5			32.5 ⁺⁴ / ₋₀
BGR20Z, BSR20Z				47.5 ⁺⁴ / ₋₀

H Style



Q Style



Type	Dimensions millimeters											
	L	L ₁	L ₂	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		
BGR20H, BSR20H			63.5±2.0	7.0	12.5±1.2	6	12.5±1.5	7.5 ⁺² / ₋₀		21.0 ⁺² / ₋₁		
BGR30H	75.0±2.5	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}	—	56	0.5	3.0
BGR40H	90.0±2.5		10.0	19.0±1.5	7.5	19.0±1.5	10.0 ⁺² / ₋₀	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 ⁺² / ₋₀	25.0 ⁺² / ₋₁	6.35	32.5	—	—
BGR20Q, BSR20Q	63.5±2.0									47.5		

Parenthesized dimensions are for reference.

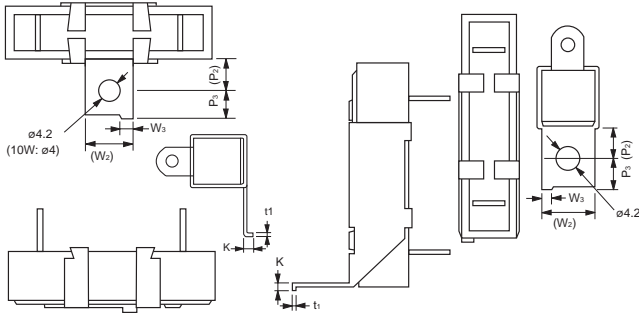
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

11/05/18

dimensions and construction (continued)

HA, QA Style

HB, QB Style



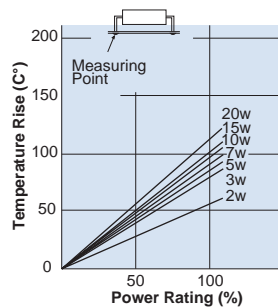
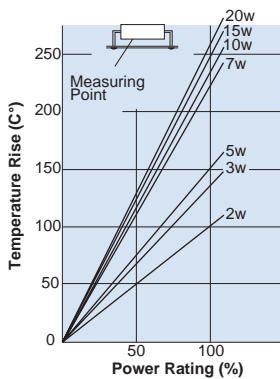
Type	Dimensions millimeters					t ₁
	(P ₂)	P ₃	(W ₂)	W ₃	K	
BGR10HA, BSR10HA	8.0	6.0±1.0	12.0	3.0±0.3	2.8±0.3	0.6
BGR15HA, BSR15HA, BGR15QA BGR15HB, BSR15HB, BGR15QB BSR15QA, BSR15QB						0.8
BGR20HA, BSR20HA, BGR20QA BGR20HB, BSR20HB, BGR20QB BSR20QA, BSR20QB						0.8
BGR30HA, BGR30HB BGR40HA, BGR40HB						0.8
	10.0	8.0±1.0	18.0	3.0±0.3	3.0±0.3	

Parenthesized dimensions are for reference.

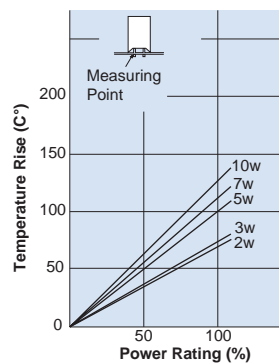
leaded resistors

Derating Curve

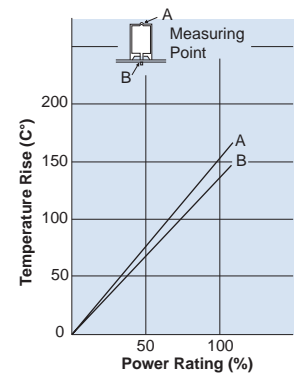
S Style



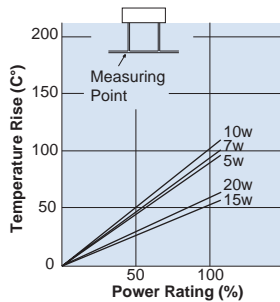
N Style



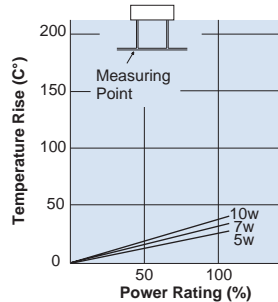
E Style



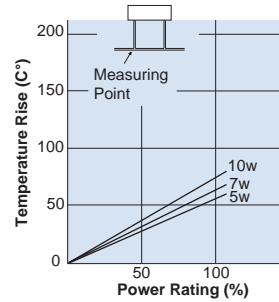
X Style



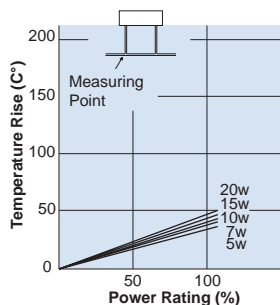
Y Style



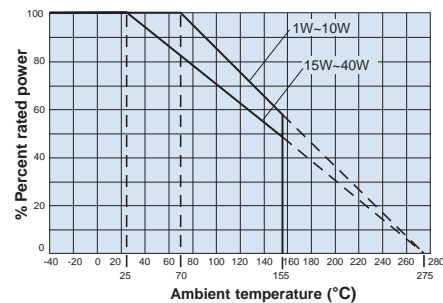
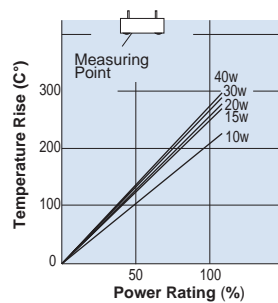
YS Style



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