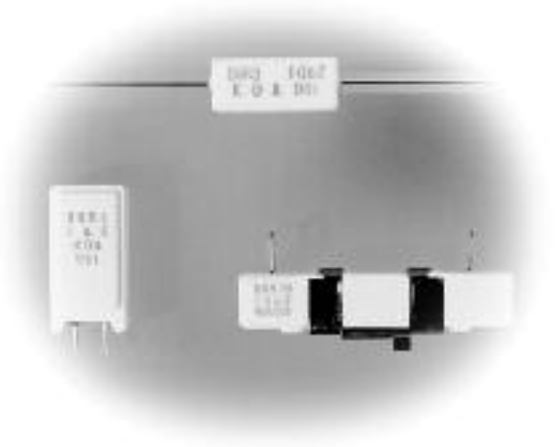
KOA SPEER ELECTRONICS, INC.

BGR, BWR, BSR

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

EU RoHS COMPLIANT

applications and ratings

Type	Power Rating	Resistance Range (Ω) E24				Style & Weight (g/1 piece)													
		F±1%	G±2%	J±5%	K±10%	N	E	X	Y	YS	Z	P	H	Q	S	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	—	3.2	—	—	—	—	—	—	—	—	2.1	—	—	—	—
BWR3	3W	1 - 300	0.22 - 390	0.1 - 390	—	6.0	—	—	—	—	—	—	—	—	3.7	—	—	—	—
BWR5	5W	1 - 300	0.22 - 390	0.1 - 390	—	6.6	5.7	—	—	—	—	5.6	—	—	5.7	—	—	—	—
BWR7	7W	1 - 360	0.22 - 390	0.1 - 390	—	10.0	—	—	—	—	—	—	—	—	7.7	—	—	—	—
BWR10	10W	1 - 390	0.22 - 390	0.1 - 390	—	15.2	—	—	—	—	—	—	—	—	11.3	—	—	—	—
BWR15	15W	1 - 390	0.22 - 390	0.1 - 390	—	—	—	—	—	—	—	—	—	—	18.3	—	—	—	—
BWR20	20W	1 - 390	0.22 - 390	0.1 - 390	—	—	—	—	—	—	—	—	—	—	22.5	—	—	—	—
BGR5	5W	—	—	10 - 390	0.39 - 9.1	—	—	6.5	7.2	6.8	6.5	—	—	—	—	—	—	—	—
BGR7	7W	—	—	10 - 390	0.39 - 9.1	—	—	8.3	9.0	8.5	8.3	—	—	—	—	—	—	—	—
BGR10	10W	—	—	10 - 390	0.39 - 9.1	—	—	11.5	12.0	11.7	12.0	—	10.8	—	—	14.5	—	—	—
BGR15	15W	—	—	10 - 390	0.51 - 9.1	—	—	18.0	—	—	18.5	—	16.5	16.8	—	22.5	25.5	22.8	25.8
BGR20	20W	—	—	10 - 390	0.51 - 9.1	—	—	23.0	—	—	24.0	—	22.0	22.2	—	28.0	31.0	28.2	31.2
BGR30	30W	—	—	10 - 390	2.2 - 9.1	—	—	—	—	—	—	—	59.6	—	—	73.5	83.8	—	—
BGR40	40W	—	—	10 - 390	2.2 - 9.1	—	—	—	—	—	—	—	69.6	—	—	83.5	93.8	—	—
BSR2	2W	—	—	430 - 13k	—	3.2	—	—	—	—	—	—	—	—	2.1	—	—	—	—
BSR3	3W	—	—	430 - 27k	—	6.0	—	—	—	—	—	—	—	—	3.7	—	—	—	—
BSR5	5W	—	—	430 - 39k	—	6.6	5.7	6.5	7.2	6.8	6.5	—	—	—	5.7	—	—	—	—
BSR7	7W	—	—	430 - 56k	—	10.0	—	8.3	9.0	8.5	8.3	—	—	—	7.7	—	—	—	—
BSR10	10W	—	—	430 - 75k	—	15.2	—	11.5	12.0	11.7	12.0	—	10.8	—	11.3	14.5	—	—	—
BSR15	15W	—	—	430 - 56k	—	—	—	18.0	—	—	18.5	—	16.5	—	18.5	22.5	25.5	—	—
BSR20	20W	—	—	430 - 56k	—	—	—	23.0	—	—	24.0	—	22.0	—	22.5	28.0	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				±250		
B□ R7	7W	500		1000						
B□ R10	10W	700		1400						
B□ R15	15W	700		1400					+25°C	
B□ R20	20W	750		1500						
BGR30	30W	—		—		—	—			
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.

KOA SPEER ELECTRONICS, INC.

BGR, BWR, BSR

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

ordering information

New Part #

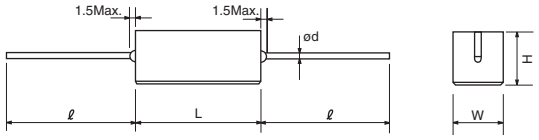
BWR	3	C	N	100	J
Type	**Power Rating**	**Termination[1] Material**	**Style[2]**	**Nominal Resistance**	**Tolerance**
BGR: Wirewound (glass core) BWR: Wirewound (ceramic core) BSR: Metal oxide film	See table	C: SnCu T: Sn	C Nil: S style N: N style E: E style P: P style T X: X style Y: Y style YS: YS style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

[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.

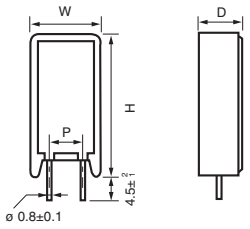
dimensions and construction

S Style

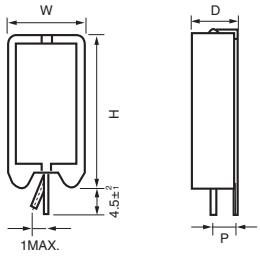


Type	Dimensions *millimeters* L	W	H	R	D
B□R1	13.0±1.0	5.5±1.0	5.5±1.0	30.0±3.0	0.6±0.1
B□R2	18.0±1.5	6.3±1.0	6.3±1.0	35.0±3.0	0.8±0.1
B□R3	22.0±1.5	8.0±1.0	8.0±1.0		
B□R5		9.5±1.0	9.5±1.0		
B□R7	35.0±1.5				
B□R10	48.0±1.5				
B□R10		12.5±1.2	12.5±1.2		
B□R10	63.5±1.5	12.5±1.5	12.5±1.5		

N Style

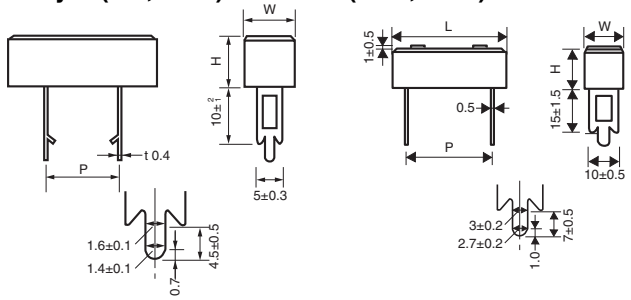


E Style

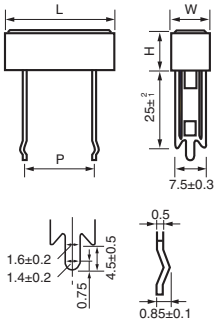


Type	Dimensions *millimeters* W	D	H	P
B□R2N	11.0±1.0	7.0±1.0	20.5±1.5	5.0 +2 -1
B□R3N	12.0±1.0	8.0±1.0	25.0±1.5	
B□R5N	13.0±1.0	9.0±1.0	25.5±1.5	
B□R7N			38.5±1.5	
B□R10N	16.0±1.0	12.0±1.0	35.0±1.5	7.5 +2 -1
B□R5E	9.5±1.0	9.5±1.0	23.5±1.5	5.0 +2 -1

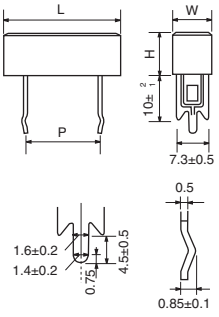
X Style (5W, 10W) (15W, 20W)



Y Style



YS Style



Type	Dimensions *millimeters* L	W, H	P
B□R5X, B□R5Y, B□R5YS	27.0±1.5	9.5±1.0	15.0±1.5
B□R7X, B□R7Y, B□R7YS	35.0±1.5		22.5±1.5
B□R10X, B□R10Y, B□R10YS	48.0±1.5		35.0±1.5
B□R15X		12.5±1.0	32.5±1.5
B□R20X	63.5±1.5		47.5±1.5

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

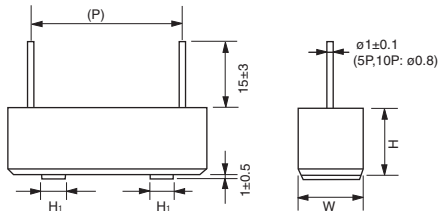
KOA SPEER ELECTRONICS, INC.

BGR, BWR, BSR

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

dimensions and construction (continued)

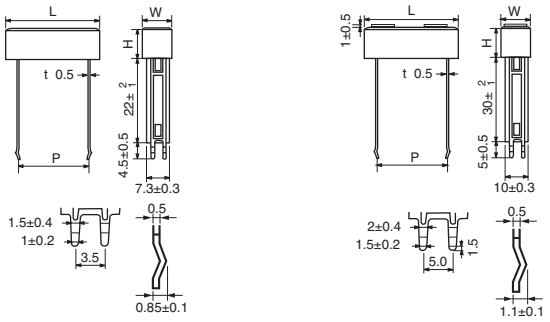
P Style



Type	Dimensions *millimeters* L	W	H	H_1	(P)
B□R5P	23.0±1.5	9.5±1.5	9.5±1.5	—	20
B□R10P	48.0±1.5	9.5±1.5	9.5±1.5	6.5±0.5	44
B□R15P	48.0±1.5	12.5±1.5	12.5±1.5	7.0±0.5	44
B□R30P	75.0±2.5	19.0±1.5	19.0±1.5	10.0±0.5	67

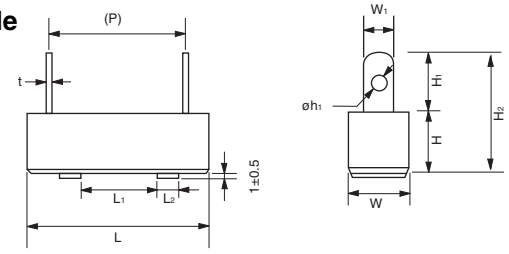
Parenthesized dimensions are for reference.
Please refrain from using these parts as a board-insertion type.
* Soldering only does not allow enough joint strength.
Additional fixation is recommended.

Z Style (5W, 10W) (15W, 20W)

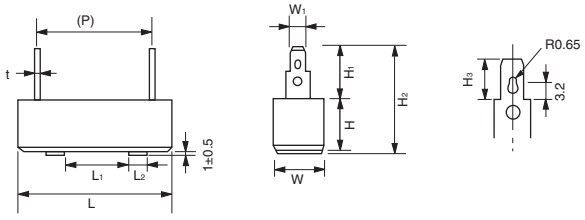


Type	Dimensions *millimeters* L	W, H	P
B□R5Z	27.0±1.5	9.5±1.0	15.0^{+6}_{-2}
B□R7Z	35.0±1.5		22.5^{+6}_{-2}
B□R10Z	48.0±1.5		35.0^{+6}_{-2}
B□R15Z		12.5±1.0	32.5^{+4}_{-0}
B□R20Z	63.5±1.5		47.5^{+4}_{-0}

H Style



Q Style

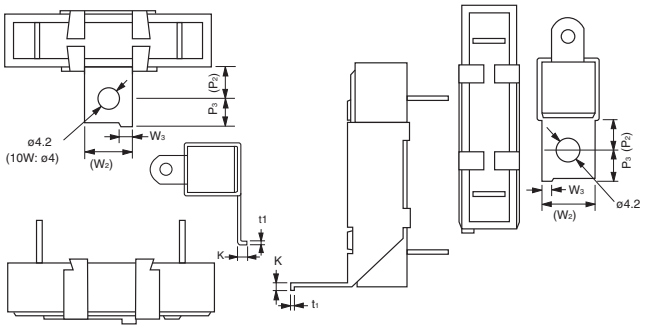


Type	Dimensions *millimeters* L	L_1	L_1	W	W_1	H	H_1	H_2	H_3	(P)	t	øh1
B□R10H	48.0±1.5	25.0±1.0	4.5	9.5±1.0	5	9.5±1.0	6.0^{+2}_{-0}	16.5^{+2}_{-1}	—	35	0.4	2.0
B□R15H			7.0	12.5±1.2	6	12.5±1.5	7.5^{+2}_{-0}	21.0^{+2}_{-1}		32.5	0.5	2.5
B□R20H	63.5±2.0									47.5		
B□R30H	75.0±2.5	40.0±1.2	10.0	19.0±1.5	7.5	19.0±1.5	10.0^{+2}_{-0}	$30.0^{+2.5}_{-1.5}$		56		3.0
B□R40H	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.

HA, QA Style

HB, QB Style



Type	Dimensions *millimeters* (P_2)	P_3	(W_2)	W_3	K	t_1
B□R10HA	8.0	6.0±1.0	12.0	3.0±0.3	2.8±0.3	0.6
B□R15HA, B□R15QA B□R15HB, B□R15QB						0.8
B□R20HA, B□R20QA B□R20HB, B□R20QB						
B□R30HA, B□R30HB	10.0	8.0±1.0	18.0	3.0±0.3	3.0±0.3	
B□R40HA, B□R40HB						

Parenthesized dimensions are for reference.

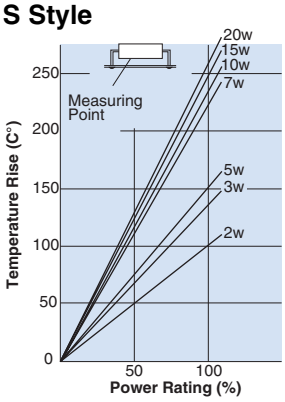
□ Represents the space to designate product type via character G, W, or S.

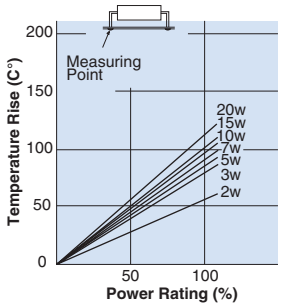
12/30/10

dimensions and construction (continued)

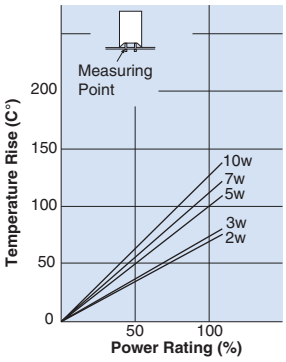
Derating Curve

S Style

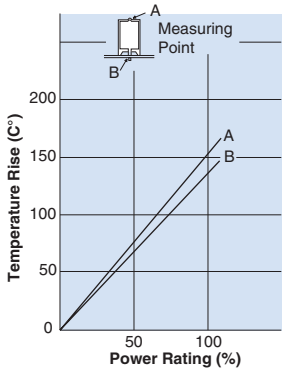




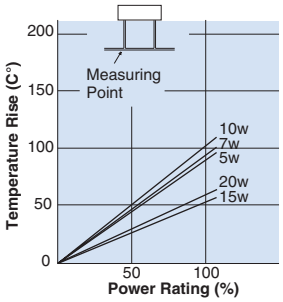
N Style



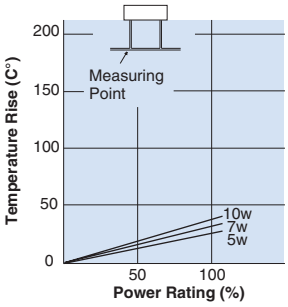
E Style



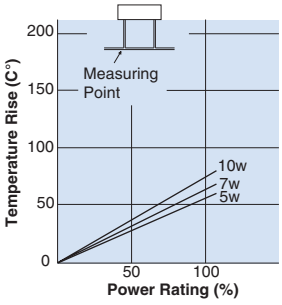
X Style



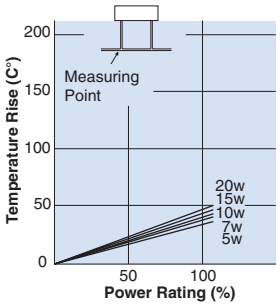
Y Style



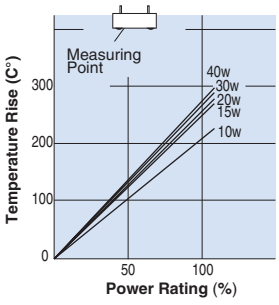
YS Style

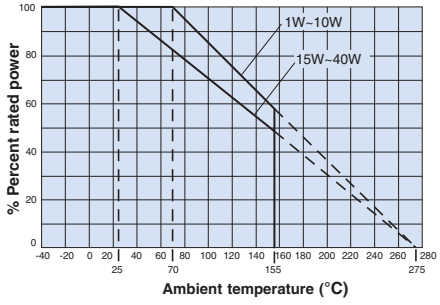


Z Style



H Style





environmental applications

Performance Characteristics

Parameter	Requirement Δ R ±% Limit	Typical	Test Method
Resistance	Within regulated tolerance	—	25°C
T.C.R.	Within specified T.C.R.	—	+25°C/-55°C and +25°C/+155°C
Resistance to Solder Heat	1%: BWR, BSR 2%: BGR	0.8%: BWR 1.7%: BGR 0.9%: BSR	350°C ± 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

1/30/11