

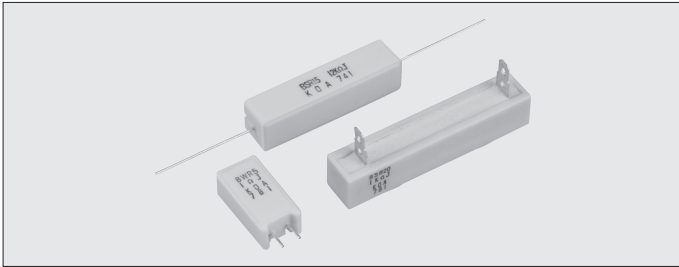
POWER TYPE



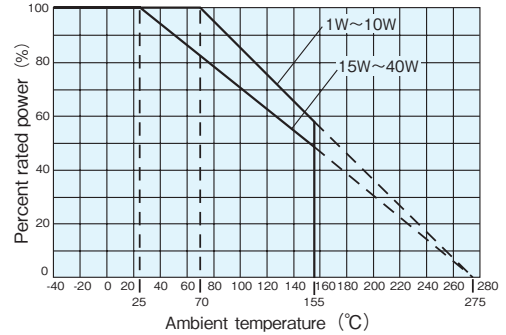
BGR ■ Rectangular Type Wirewound Resistors With Glass Core

BWR ■ Rectangular Type Wirewound Resistors With Ceramic Core

BSR ■ Rectangular Type Metal Oxide Film Resistors



Derating Curve



For resistors operated at an ambient temperature or higher, the power shall be derated in accordance with the above derating curve.

Ratings

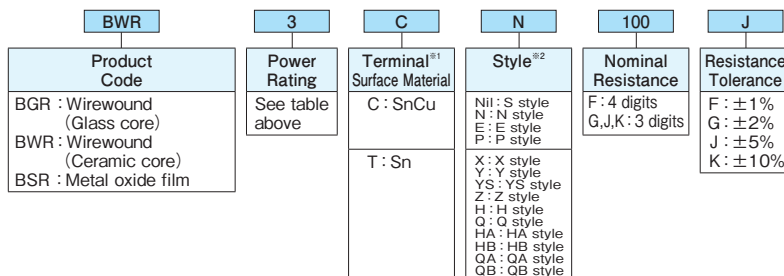
| Type | Power Rating | Resistance Range (Ω) E24 | | | | Style & Weight (g/1pcs) | | | | | | | | | | | | | | |
|-------|--------------|-----------------------------|----------|---------|----------|-------------------------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| | | 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 | — | 6.2 | — | — | — | — | |
| BGR7 | 7W | — | — | 10~390 | 0.39~9.1 | — | — | — | — | 8.2 | 9.1 | 7.8 | 9.1 | — | 7.8 | — | — | — | — | |
| BGR10 | 10W | — | — | 10~390 | 0.39~9.1 | — | — | — | — | 11.0 | 12.4 | 10.4 | 11.4 | 9.9 | 10.7 | 13.6 | — | 14.5 | — | |
| 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 | — | — | 430~51k | — | 5.1 | 7.2 | 5.7 | — | 6.1 | 7.6 | 6.6 | 7.6 | — | 6.2 | — | — | — | — | — |
| BSR7 | 7W | — | — | 430~56k | — | 7.4 | 10.8 | — | — | 8.2 | 9.1 | 7.8 | 9.1 | — | 7.8 | — | — | — | — | — |
| BSR10 | 10W | — | — | 430~75k | — | 10.2 | 15.0 | — | — | 11.0 | 12.4 | 10.4 | 11.4 | 10.9 | 10.7 | 13.7 | — | 14.5 | — | — |
| 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 | Rated Ambient Temperature | Max. Working Voltage (V) | | Max. Overload Voltage (V) | | T.C.R. (×10 ⁻⁶ /K) | | | Operating Temp. Range |
|-------|--------------|---------------------------|--------------------------|---------|---------------------------|-----------|-------------------------------|------|--------------|-----------------------|
| | | | BSR | BGR·BWR | BSR | BGR·BWR | BWR | BSR | BGR | |
| BWR1 | 1W | +70°C | — | E=√P·R | — | E=√P·R·10 | ±100 | ±300 | ±250 | -40°C~+155°C |
| BWR2 | 2W | | 250 | | | | | | | |
| BWR3 | 3W | | 300 | | | | | | | |
| BWR5 | 5W | | 350 | | | | | | | |
| BWR7 | 7W | | 500 | | | | | | | |
| BWR10 | 10W | | 700 | | | | | | | |
| BWR15 | 15W | +25°C | 700 | E=√P·R | 1400 | ±100 | ±300 | ±250 | -40°C~+155°C | |
| BWR20 | 20W | | 750 | | | | | | | |
| BGR30 | 30W | | — | | | | | | | |
| BGR40 | 40W | | — | | | | | | | |

Rated voltage = √(Power Rating × Resistance value) or Max. working voltage, whichever is lower.
Please consult with us in advance about custom-made products.

Type Designation

Example



※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.
Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.

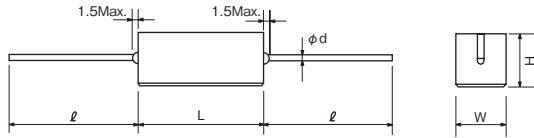
High Power Type Resistors

Features

- High-power resistor.
- Using flame-retardant/insulated ceramic case.
- Excellent in anti-pulse and inrush current.
- Products meet EU-RoHS requirements.

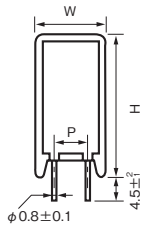
Dimensions

① S Style

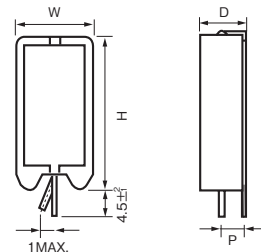


| Type | Dimensions (mm) | | | | |
|-----------------|-----------------|----------|----------|--------------|-------------|
| | L | W | H | $\ell \pm 3$ | $d \pm 0.1$ |
| BWR1C | 13±1.0 | 5.5±1.0 | 5.5±1.0 | 30 | 0.6 |
| BWR2C · BSR2C | 18±1.5 | 6.3±1.0 | 6.3±1.0 | | |
| BWR3C · BSR3C | 22±1.5 | 8.0±1.0 | 8.0±1.0 | 35 | 0.8 |
| BWR5C · BSR5C | | 9.5±1.0 | 9.5±1.0 | | |
| BWR7C · BSR7C | 48±1.5 | | | | |
| BWR10C · BSR10C | | 63.5±1.5 | 12.5±1.5 | | |
| BWR15C · BSR15C | | | | | |
| BWR20C · BSR20C | | | | | |

② N Style

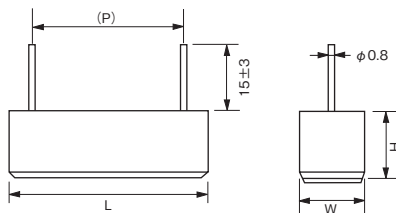


③ E Style



| Type | Dimensions (mm) | | | |
|-------------------|-----------------|-----|-------|-------|
| | W±1 | D±1 | H±1.5 | P±0.1 |
| BWR2CN · BSR2CN | 11 | 7 | 20.5 | 5 |
| BWR3CN · BSR3CN | 12 | 8 | 25 | |
| BWR5CN · BSR5CN | 13 | 9 | 25.5 | |
| BWR7CN · BSR7CN | | | 38.5 | |
| BWR10CN · BSR10CN | 16 | 12 | 35 | 7.5 |
| BWR5CE · BSR5CE | 9.5 | 9.5 | 23.5 | 5 |

④ P Style

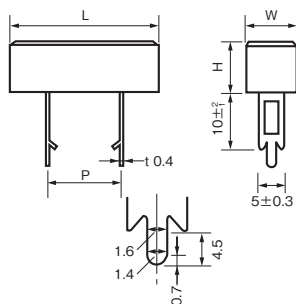


| Type | Dimensions (mm) | | | |
|--------|-----------------|-------|-------|-----|
| | L | W±1.5 | H±1.5 | (P) |
| BWR5CP | 23±1.5 | 9.5 | 9.5 | 20 |

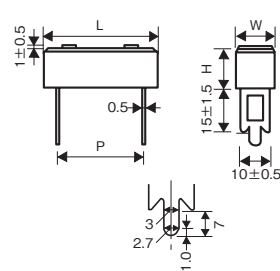
Parenthesized dimensions are for reference.
Please refrain from using these parts as a board-insertion type.
Only soldering doesn't have enough joint strength.
Additional fixation is recommended.

⑤ X Style

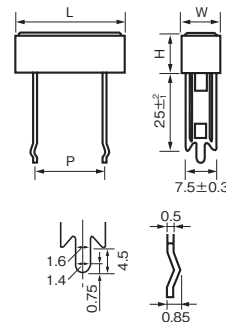
(5W~10W)



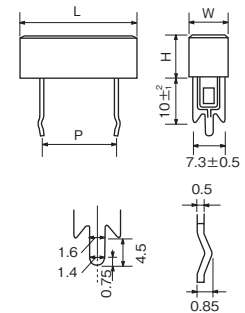
(15W, 20W)



⑥ Y Style



⑦ YS Style



| Type | Dimensions (mm) | | | |
|---|-----------------|-------|-------|-------|
| | L±1.5 | W±1.0 | H±1.0 | P±1.5 |
| BGR5TX · BSR5TX · BGR5TY · BSR5TY · BGR5TYS · BSR5TYS | 27 | 9.5 | 9.5 | 15 |
| BGR7TX · BSR7TX · BGR7TY · BSR7TY · BGR7TYS · BSR7TYS | 35 | | | 22.5 |
| BGR10TX · BSR10TX · BGR10TY · BSR10TY · BGR10TYS · BSR10TYS | 48 | 12.5 | 12.5 | 35 |
| BGR15TX · BSR15TX | | | | 32.5 |
| BGR20TX · BSR20TX | 63.5 | | | 47.5 |

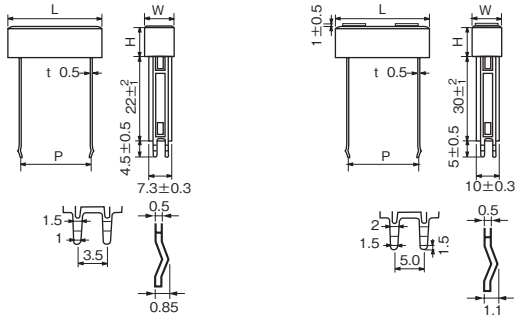
POWER TYPE

■ Dimensions

⑧ Z Style

(5W~10W)

(15W, 20W)



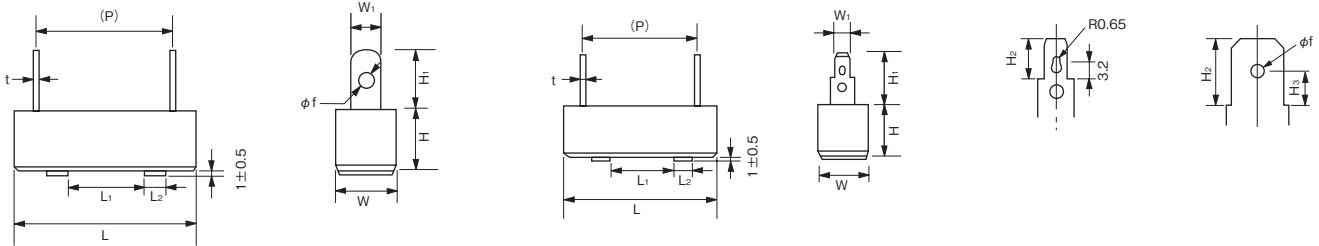
| Type | Dimensions (mm) | | | |
|-----------------|-----------------|-------|-------|--------------------------------------|
| | L±1.5 | W±1.0 | H±1.0 | P |
| BGR5TZ·BSR5TZ | 27 | 9.5 | 9.5 | 15 ^{+0.6} _{-0.2} |
| BGR7TZ·BSR7TZ | 35 | | | 22.5 ^{+0.6} _{-0.2} |
| BGR10TZ·BSR10TZ | 48 | | | 35 ^{+0.6} _{-0.2} |
| BGR15TZ·BSR15TZ | 63.5 | 12.5 | 12.5 | 32.5 ^{+0.4} _{-0.0} |
| BGR20TZ·BSR20TZ | | | | 47.5 ^{+0.4} _{-0.0} |

⑨ H Style

⑩ Q Style

(15W, 20W)

(5W, 7W, 10W, 30W, 40W)

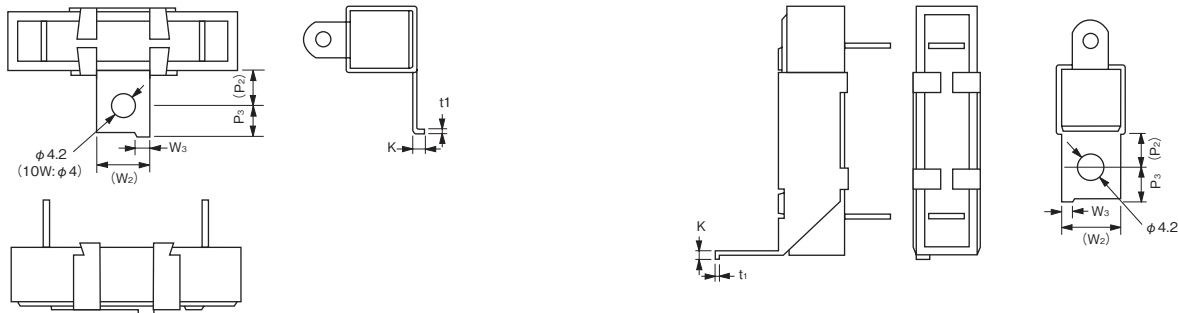


| Type | Dimensions (mm) | | | | | | | | | | | |
|-----------------|-----------------|----------------|----------------|----------|----------------|----------|---------------------|----------------|-------------------|----------|-----|------|
| | L | L ₁ | L ₂ | W | W ₁ | H | H ₁ ±1.0 | H ₂ | (H ₃) | (P) | t | (φf) |
| BGR10TH·BSR10TH | 48±1.5 | 25±1.0 | 4.5 | 9.5±1.0 | 5.0 | 9.5±1.0 | 7.0 | — | — | 35 | 0.4 | 2.0 |
| BGR15TH·BSR15TH | | | 7.0 | 12.5±1.2 | 6.0 | 12.5±1.2 | 8.5 | | | | | |
| BGR20TH·BSR20TH | | | 7.0 | 12.5±1.2 | 6.0 | 12.5±1.2 | 8.5 | | | | | |
| BGR30TH | 75±2.5 | 40±1.2 | 10.0 | 19.0±1.5 | 7.5 | 19.0±1.5 | 11.0 | — | — | 56 | 0.5 | 3.0 |
| BGR40TH | 90±2.5 | | | | | | | | | 71 | | |
| BGR5TQ·BSR5TQ | 27±1.5 | — | — | 9.5±1.0 | 4.75 | 9.5±1.0 | 10.5 | 6.5 | 3.3 | 15.0 | 0.5 | 2.2 |
| BGR7TQ·BSR7TQ | 35±1.5 | — | — | | | | | | | 22.5 | | |
| BGR10TQ·BSR10TQ | 48±1.5 | 25±1.0 | 4.5 | | | | | | | 12.5±1.2 | | |
| BGR15TQ·BSR15TQ | 7.0 | | 12.5±1.2 | 13.0 | 34.5 | | | | | | | |
| BGR20TQ·BSR20TQ | 63.5±2 | | 7.0 | 12.5±1.2 | 13.0 | 49.5 | | | | | | |
| BGR30TQ | 75±2.5 | 40±1.2 | 10.0 | 19.0±1.5 | 6.3 | 19.0±1.5 | 12.0 | 8.0 | 4.1 | 56 | 0.8 | 1.7 |
| BGR40TQ | 90±2.5 | | | | | | | | | 71 | | |

Parenthesized dimensions are for reference.

⑪ HA · QA Style

⑫ HB · QB Style

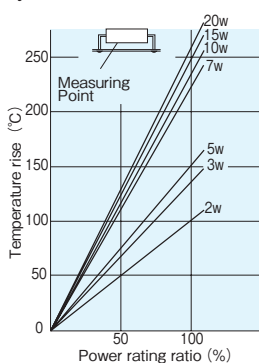


| Type | Dimensions (mm) | | | | | |
|-------------------------------------|-------------------|-------------------|-------------------|---------------------|-------|----------------|
| | (P ₂) | P ₃ ±1 | (W ₂) | W ₃ ±0.3 | K±0.3 | t _t |
| BGR10THA·BSR10THA·BGR10TQA·BSR10TQA | 8.0 | 6 | 12 | 3.0 | 2.8 | 0.6 |
| BGR15THA·BSR15THA·BGR15TQA·BSR15TQA | | | | | 3.0 | |
| BGR15THB·BSR15THB·BGR15TQB·BSR15TQB | | | | | | |
| BGR20THA·BSR20THA·BGR20TQA·BSR20TQA | 10 | 8 | 18 | 3.0 | 3.0 | 0.8 |
| BGR20THB·BSR20THB·BGR20TQB·BSR20TQB | | | | | | |
| BGR30THA·BGR30TQA | | | | | | |
| BGR30THB·BGR30TQB | 10 | 8 | 18 | 3.0 | 3.0 | 0.8 |
| BGR40THA·BGR40TQA | | | | | | |
| BGR40THB·BGR40TQB | | | | | | |

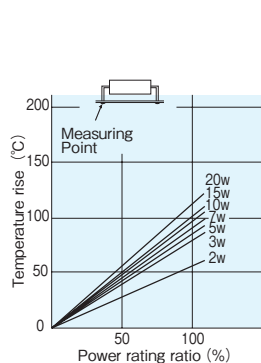
Parenthesized dimensions are for reference.

Temperature Rise (Ref.)

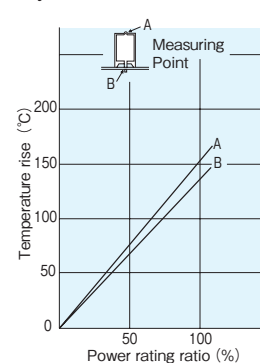
① S Style



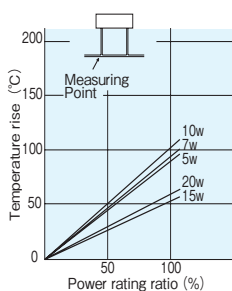
② N Style



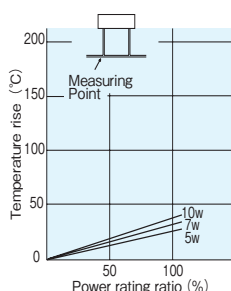
③ E Style



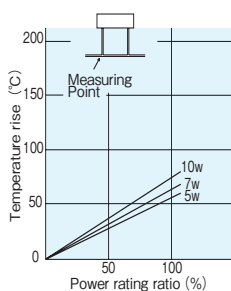
④ X Style



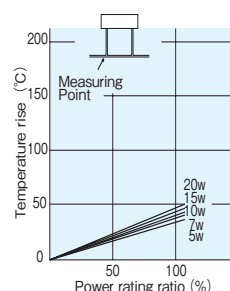
⑤ Y Style



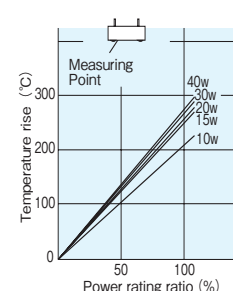
⑥ YS Style



⑦ Z Style



⑧ H, Q Style



Performance

| Test Items | Performance Requirements $\Delta R \pm \%$ | | Test Methods |
|------------------------------|---|--------------------------------------|---|
| | Limit | Typical | |
| Resistance | Within specified tolerance | — | 25°C |
| T.C.R. | Within specified T.C.R. | — | +25°C/-55°C and +25°C/+125°C |
| Resistance to soldering heat | 1 : BWR, BSR 2 : BGR | 0.8 : BWR 1.7 : BGR 0.9 : BSR | 350°C ± 10°C, 3.5s |
| Moisture resistance | 3 : BWR, BGR 5 : BSR | 2.4 : BWR 2.55 : BGR 4.5 : BSR | Power rating × 1/10, 40°C, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle |
| Endurance at 25°C or 70°C | 3 : BWR 5 : BGR, BSR | 2.4 : BWR 4.25 : BGR 4.5 : BSR | 25°C or 70°C, rated voltage, 1000h, 1.5h ON/0.5h OFF cycle |

Precautions for Use

- The products attached by ionic impurities negatively affects their moisture resistance, corrosion resistance, etc. Please pay careful attention to products handling as well as storage, mounting conditions and environment.
- When the pulse including surge is impressed to the resistor, it may cause disconnection. Please confirm us about the conditions for use in advance.
- In case of using them for an AC circuit, abnormal phenomena like oscillation etc. occasionally happen as they have an inductance or a parasitic capacitance because of their wiring structures. Use them by taking the dispersion of constants of other components into the consideration.