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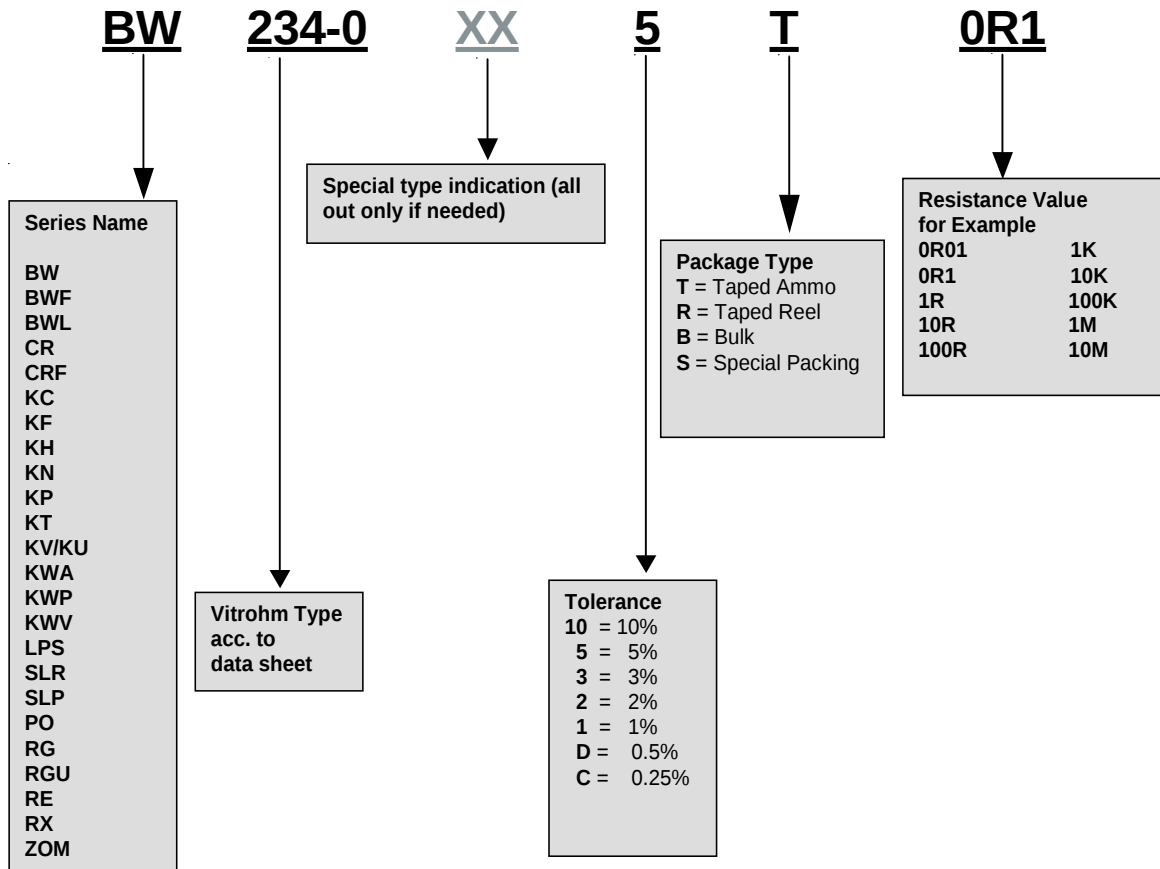
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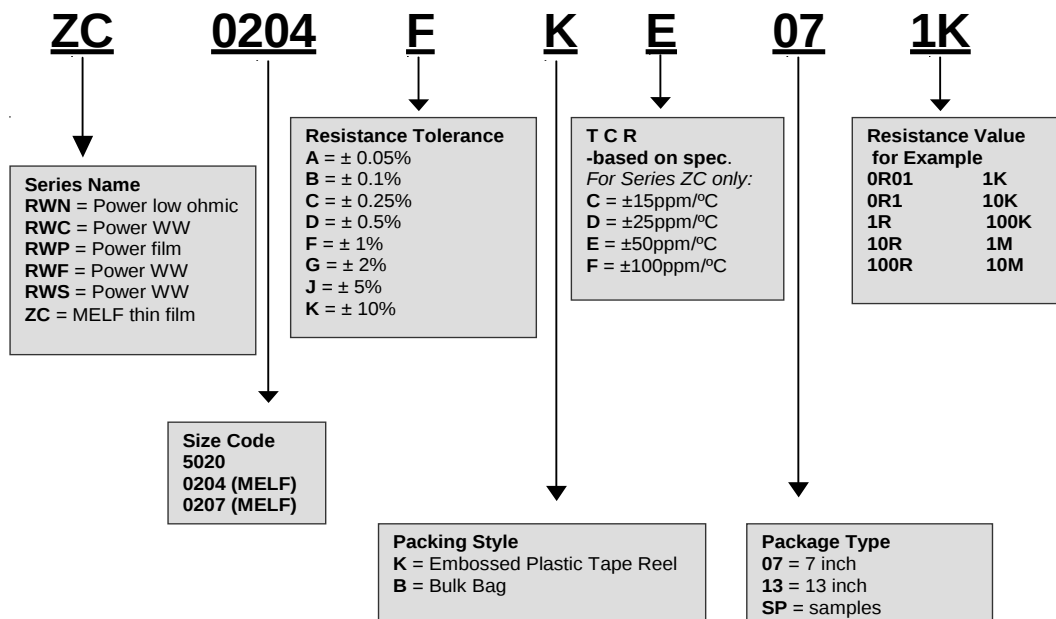
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## Explanation :

## Wirewound &amp; Film Resistor



## SMD Resistors



## Type

Internal Vitrohm-reference for a certain component, normally identical with the ordering-number.  
IEC 115-1 clause 2.2.2

## Series

Collection of types with similar constructional features and comparable technical data.

## Style

Industrialized, often internationally standardized, designation with respect to the dimensions of a component, e.g. length/width, diameter/length.  
IEC 115-1 clause 2.2.3

## Dimensions

The accurate mechanical size of a certain type or tabular for a series. If without tolerances, refer to DIN 7168 (coarse).

## Rated Power $P_{70}$

Electrical power defined by current and voltage a resistor can bear continuously. Commonly the value is given for 70°C ambient temperature.  
IEC 115-1 clause 2.2.13

## Resistance range

Data, showing the minimum and maximum resistance value possible for a given type or series.

## Series E of preferred values

Internationally standardized staggering for resistance values within one decade, different E-series vary on the total number of values per decade. The preferred values result (approximated) from

$$E \sqrt{10}^n \quad (n = 1, 2, 3 \dots E)$$

IEC 115-1 clause 2.3.2 and IEC 63

## Tolerances

Here admissible deviation from nominal resistance value at the moment of receiving. Possible resistance changes due to electrical, climatic or mechanical stress are not included in the nominal tolerance.

## Temperature coefficient

A value, determined by materials and styles, indicating the dependency of a resistance value from temperature. Resistance changes caused by temperature coefficient are reversible.  
IEC 115-1 clauses 2.2.20.2 and 4.8.4.2

## Voltage coefficient

A value mainly determined by materials, indicating the dependency between resistance value and applied voltage. The voltage coefficients is negative, resulting resistance changes are reversible.  
IEC 115-1 clauses 2.2.25 and 4.11

## Maximum continuous working voltage

Limit for the voltage applied to a resistor. May not be exceeded, even if other limitations, e.g. rated power, are not reached. If instead of a voltage value the general equation is given, the limiting voltage is only determined by the rated power.  
IEC 115-1 clause 2.2.16

## Thermal resistance

A value influenced by materials and dimensions indicating the selfheating of a resistor by electrical power.

## Insulation voltage

Test voltage applied for one minute between components terminals and sheathing (e.g. surface). The given value does not define continuous isolation.  
IEC 115-1 clause 2.2.17

## Insulation resistance

Electrical resistance between components terminals and sheathing. Given for a certain measuring voltage, e.g. 100 V or 500 V.  
IEC 115-1 clauses 2.2.19 and 4.6

## Climatic category

Defined in IEC 68-1, this statement establishes the lowest and highest test temperature (category temperature) as well as the duration of humidity-testing. Consequently climatic category substitutes according to the CECC- and IEC-approval-systems the former applicability classes of DIN 40040, which were almost impossible to verify by testing.

## Temperature range

Limits for ambient temperature. Components may be used within the stated limits.

IEC 115-1 clause 2.2.9

## Derating

Reduction of electrical power at increased ambient temperature, to avoid excess of maximum surface temperature by selfheating.

IEC 115-1 clause 2.2.24

## Failure rate

Number of statistically possible defects, depending on time and quantity of components. If not stated differently, the given value refers to total-failure under nominal conditions.

## Load life

Relative irreversible resistance change after a certain testing time. Normally related to rated power 70°C ambient temperature and 1000 hours testing.

IEC 115-1 clause 4.25

## Damp heat, steady state

Relative irreversible resistance change after a defined climatic stress.

IEC 115-1 clause 4.24

## Climatic sequence

Relative irreversible resistance change after a defined sequence of climatic stresses.

IEC 115-1 clause 4.23

## Terminal strength

Relative irreversible resistance change after a defined sequence of mechanical stresses to the terminals. Test procedures according to CECC or IEC are standardized in the applicable detailed specification.

## Terminal tensile strength

Limit for the tensile force applied to the terminals.

## Resistance to soldering heat

Relative irreversible resistance change due to soldering. Test procedures according to CECC or IEC are standardized in the applicable detailed specification.

IEC 115-1 clause 4.18

## Current noise

A voltage, having a statistical distribution of frequencies, depending on the DC-current through the resistor. Current-noise-voltage is additional to thermal noise, which depends on materials and styles.

IEC 115-1 clause 4.12

## Non-linearity

A value for possible non-linearity between current through and voltage applied to an ohmic resistor.

## Standards

Here enumeration of norms and standard specifications, nationally or internationally known for a given series of components. If applicable also the CECC-detailed-specification to which the given series has been approved to.

## Packaging units

Quantity packed in a standard packaging unit, method of packing, in cases possibilities of selection.

## Ordering-example

Necessary order processing-details for required components.

|     | E 6 | E 12 | E 24 |
|-----|-----|------|------|
|     | 1.0 | 1.0  | 1.0  |
|     |     |      | 1.1  |
|     |     | 1.2  | 1.2  |
|     |     |      | 1.3  |
| 1.5 | 1.5 | 1.5  | 1.5  |
|     |     |      | 1.6  |
|     |     | 1.8  | 1.8  |
|     |     |      | 2.0  |
| 2.2 | 2.2 | 2.2  | 2.2  |
|     |     |      | 2.4  |
|     |     | 2.7  | 2.7  |
|     |     |      | 3.0  |

|     | E 6 | E 12 | E 24 |
|-----|-----|------|------|
|     | 3.3 | 3.3  | 3.3  |
|     |     |      | 3.6  |
|     |     | 3.9  | 3.9  |
|     |     |      | 4.3  |
| 4.7 | 4.7 | 4.7  | 4.7  |
|     |     |      | 5.1  |
|     |     | 5.6  | 5.6  |
|     |     |      | 6.2  |
| 6.8 | 6.8 | 6.8  | 6.8  |
|     |     |      | 7.5  |
|     |     | 8.2  | 8.2  |
|     |     |      | 9.1  |

| E 48 | E 96 | E 192 | E 48 | E 96 | E 192 | E 48 | E 96 | E 192 | E 48 | E 96 | E 192 | E 48 | E 96 | E 192 |
|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|
| 100  | 100  | 100   | 162  | 162  | 162   | 261  | 261  | 261   | 422  | 422  | 422   | 681  | 681  | 681   |
|      |      | 101   |      |      | 164   |      |      | 264   |      |      | 427   |      |      | 690   |
|      | 102  | 102   |      | 165  | 165   |      | 267  | 267   |      | 432  | 432   |      | 698  | 698   |
|      |      | 104   |      |      | 167   |      |      | 271   |      |      | 437   |      |      | 706   |
| 105  | 105  | 105   | 169  | 169  | 169   | 274  | 274  | 274   | 442  | 442  | 442   | 715  | 715  | 715   |
|      |      | 106   |      |      | 172   |      |      | 277   |      |      | 448   |      |      | 723   |
|      | 107  | 107   |      | 174  | 174   |      | 280  | 280   |      | 453  | 452   |      | 732  | 732   |
|      |      | 109   |      |      | 176   |      |      | 284   |      |      | 459   |      |      | 741   |
| 110  | 110  | 110   | 178  | 178  | 178   | 287  | 287  | 287   | 464  | 464  | 464   | 750  | 750  | 750   |
|      |      | 111   |      |      | 180   |      |      | 291   |      |      | 470   |      |      | 759   |
|      | 113  | 113   |      | 182  | 182   |      | 294  | 294   |      | 475  | 475   |      | 768  | 768   |
|      |      | 114   |      |      | 184   |      |      | 298   |      |      | 481   |      |      | 777   |
| 115  | 115  | 115   | 187  | 187  | 187   | 301  | 301  | 301   | 487  | 487  | 487   | 787  | 787  | 787   |
|      |      | 117   |      |      | 189   |      |      | 305   |      |      | 493   |      |      | 796   |
|      | 118  | 118   |      | 191  | 191   |      | 309  | 309   |      | 499  | 499   |      | 806  | 806   |
|      |      | 120   |      |      | 193   |      |      | 312   |      |      | 505   |      |      | 816   |
| 121  | 121  | 121   | 196  | 196  | 196   | 316  | 316  | 316   | 511  | 511  | 511   | 825  | 825  | 825   |
|      |      | 123   |      |      | 198   |      |      | 320   |      |      | 517   |      |      | 835   |
|      | 124  | 124   |      | 200  | 200   |      | 324  | 324   |      | 523  | 523   |      | 845  | 845   |
|      |      | 126   |      |      | 203   |      |      | 328   |      |      | 530   |      |      | 856   |
| 127  | 127  | 127   | 205  | 205  | 205   | 332  | 332  | 332   | 536  | 536  | 536   | 866  | 866  | 866   |
|      |      | 129   |      |      | 208   |      |      | 336   |      |      | 542   |      |      | 876   |
|      | 130  | 130   |      | 210  | 210   |      | 340  | 340   |      | 549  | 549   |      | 887  | 887   |
|      |      | 132   |      |      | 213   |      |      | 344   |      |      | 556   |      |      | 898   |
| 133  | 133  | 133   | 215  | 215  | 215   | 348  | 348  | 348   | 562  | 562  | 562   | 909  | 909  | 909   |
|      |      | 135   |      |      | 218   |      |      | 352   |      |      | 569   |      |      | 920   |
|      | 137  | 137   |      | 221  | 221   |      | 357  | 357   |      | 576  | 576   |      | 931  | 931   |
|      |      | 138   |      |      | 223   |      |      | 361   |      |      | 583   |      |      | 942   |
| 140  | 140  | 140   | 226  | 226  | 226   | 365  | 365  | 365   | 590  | 590  | 590   | 953  | 953  | 953   |
|      |      | 142   |      |      | 229   |      |      | 370   |      |      | 597   |      |      | 965   |
|      | 143  | 143   |      | 232  | 232   |      | 374  | 374   |      | 604  | 604   |      | 976  | 976   |
|      |      | 145   |      |      | 234   |      |      | 379   |      |      | 612   |      |      | 988   |
| 147  | 147  | 147   | 237  | 237  | 237   | 383  | 383  | 383   | 619  | 619  | 619   |      |      |       |
|      |      | 149   |      |      | 240   |      |      | 388   |      |      | 626   |      |      |       |
|      | 150  | 150   |      | 243  | 243   |      | 392  | 392   |      | 634  | 634   |      |      |       |
|      |      | 152   |      |      | 246   |      |      | 397   |      |      | 642   |      |      |       |
| 154  | 154  | 154   | 249  | 249  | 249   | 402  | 402  | 402   | 649  | 649  | 649   |      |      |       |
|      |      | 156   |      |      | 252   |      |      | 407   |      |      | 657   |      |      |       |
|      | 158  | 158   |      | 255  | 255   |      | 412  | 412   |      | 665  | 665   |      |      |       |
|      |      | 160   |      |      | 258   |      |      | 417   |      |      | 673   |      |      |       |

## Designation of resistance values according to IEC 62 and MIL:

| resist. value | IEC 62     | MIL 39008 |
|---------------|------------|-----------|
| 0,1 Ohm       | 0R1 (R10)  | -         |
| 1,0 Ohm       | 1R (1R0)   | 1R0       |
| 10 Ohm        | 10R        | 100       |
| 100 Ohm       | 100R (K10) | 101       |
| 1000 Ohm      | 1 K (1K0)  | 102       |
| 10 KOhm       | 10K        | 103       |
| 0,1 MOhm      | 100K (M10) | 104       |
| 1,0 MOhm      | 1M (1M0)   | 105       |
| 10,0 MOhm     | 10M        | 106       |

**4-band colour code**

colour coding of  
resistance values and tolerances

**5-band colour code**

colour coding of  
resistance values and tolerances

| colour  | 1st band=<br>1st digit | 2nd band=<br>2nd digit | 3rd band=<br>multi-<br>plier | 4th band=<br>tole-<br>rance |
|---------|------------------------|------------------------|------------------------------|-----------------------------|
| without | -                      | -                      | -                            | ±20%                        |
| silver  | -                      | -                      | x 0,01 Ω                     | ±10%                        |
| gold    | -                      | -                      | x 0,1 Ω                      | ± 5%                        |
| black   | -                      | 0                      | x 1,0 Ω                      | -                           |
| brown   | 1                      | 1                      | x 10 Ω                       | ± 1%                        |
| red     | 2                      | 2                      | x 100 Ω                      | ± 2%                        |
| orange  | 3                      | 3                      | x 1 kΩ                       | -                           |
| yellow  | 4                      | 4                      | x 10 kΩ                      | -                           |
| green   | 5                      | 5                      | x 100 kΩ                     | -                           |
| blue    | 6                      | 6                      | x 1 MΩ                       | -                           |
| violet  | 7                      | 7                      | x 1 MΩ                       | -                           |
| grey    | 8                      | 8                      |                              | -                           |
| white   | 9                      | 9                      |                              | -                           |

| 1st band=<br>1st digit | 2nd band=<br>2nd digit | 3rd band=<br>3rd digit | 4th band=<br>multi-<br>plier | 5th band<br>tole-<br>rance |
|------------------------|------------------------|------------------------|------------------------------|----------------------------|
| -                      | -                      | -                      | -                            |                            |
| -                      | -                      | -                      | x 0,01 Ω                     |                            |
| -                      | -                      | -                      | x 0,1 Ω                      | ± 5%                       |
| -                      | 0                      | 0                      | x 1,0 Ω                      | -                          |
| 1                      | 1                      | 1                      | x 10 Ω                       | ± 1%                       |
| 2                      | 2                      | 2                      | x 100 Ω                      | ± 2%                       |
| 3                      | 3                      | 3                      | x 1 kΩ                       | -                          |
| 4                      | 4                      | 4                      | x 10 kΩ                      | -                          |
| 5                      | 5                      | 5                      | x 100 kΩ                     | ±0,5%                      |
| 6                      | 6                      | 6                      | x 1 MΩ                       | -                          |
| 7                      | 7                      | 7                      | x 1 MΩ                       | -                          |
| 8                      | 8                      | 8                      |                              | -                          |
| 9                      | 9                      | 9                      |                              | -                          |

:

## Tolerances according to MIL:

| Tolerance | MIL |
|-----------|-----|
| 10 %      | K   |
| 5 %       | J   |
| 2 %       | G   |
| 1 %       | F   |
| 0,5 %     | D   |
| 0,25 %    | C   |
| 0,1 %     | B   |

Designation and coding of  
temperature coeff.:

|     |                     |     |        |
|-----|---------------------|-----|--------|
| 100 | $\frac{10^{-6}}{K}$ | T0  | brown  |
| 50  | "                   | T2  | red    |
| 25  | "                   | T9  | yellow |
| 15  | "                   | T10 | orange |
| 10  | "                   | T13 | blue   |
| 5   | "                   | T16 | violet |
| 2   | "                   | T18 | -      |

### Resistors in the DC-circuit:

R = resistance value [ $\Omega$ ]    I = current [A]  
U = voltage [V]                P = power [W]

$$\begin{array}{lll} R = \frac{U}{I} & I = \frac{U}{R} & U = I \cdot R \\ P = I^2 \cdot R & P = \frac{U^2}{R} & P = U \cdot I \end{array}$$

Resistors in series

$$R_{ges.} = R_1 + R_2 + \dots R_n$$

Resistors in parallel

$$\frac{1}{R_{ges.}} = \frac{1}{R_1} + \frac{1}{R_2} + \dots \frac{1}{R_n}$$

2 resistors in parallel

$$R_{ges.} = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

Voltage divider  $R_1$  in series with  $R_2$

$$\begin{array}{l} U_{ges.} = U_1 + U_2 \\ \frac{U_1}{U_2} = \frac{R_1}{R_2} \end{array}$$

Current splitting  $R_1$  in parallel with  $R_2$

$$\begin{array}{l} I_{ges.} = I_1 + I_2 \\ \frac{I_1}{I_2} = \frac{R_2}{R_1} \end{array}$$

Temperature coefficient for wirewound resistors:

**Series K** Table 1: Temperature coefficient of resistive wires used for series KC, KH, KV, KT, KF  
(Power wirewound resistors of Vitrohm with high pressure crimped contact)

| P <sub>70</sub> | Typ/Type | TK/TC 400 <sup>±50</sup> | TK/TC 0 <sup>+40<br/>-80</sup> | TK/TC 0 <sup>±10</sup> |
|-----------------|----------|--------------------------|--------------------------------|------------------------|
| 1W              | 200      | 0R056 - 0R2              | 0R22 - 300R                    | 330R - 9K1             |
| 2W              | 202      | 0R075 - 0R43             | 0R47 - 620R                    | 680R - 20K             |
| 3W              | 204      | 0R33 - 0R68              | 0R75 - 1K                      | 1K1 - 30K              |
| 4W              | 206      | 0R056 - 0R2              | 0R22 - 300R                    | 330R - 9K1             |
| 5W              | 208      | 0R075 - 0R3              | 0R33 - 470R                    | 510R - 15K             |
| 7W              | 210      | 0R11 - 0R68              | 0R75 - 1K                      | 1K1 - 30K              |
|                 | 212      | 0R075 - 0R3              | 0R33 - 470R                    | 510R - 15K             |
| 9W              | 214      | 0R11 - 0R68              | 0R75 - 1K                      | 1K1 - 30K              |
| 11W             | 216      | 0R15 - 1R                | 1R1 - 1K3                      | 1K5 - 47K              |
| 17W             | 218      | 0R27 - 1R6               | 1R8 - 2K4                      | 2K7 - 82K              |

TC in ppm = 10<sup>-6</sup> K<sup>-1</sup>

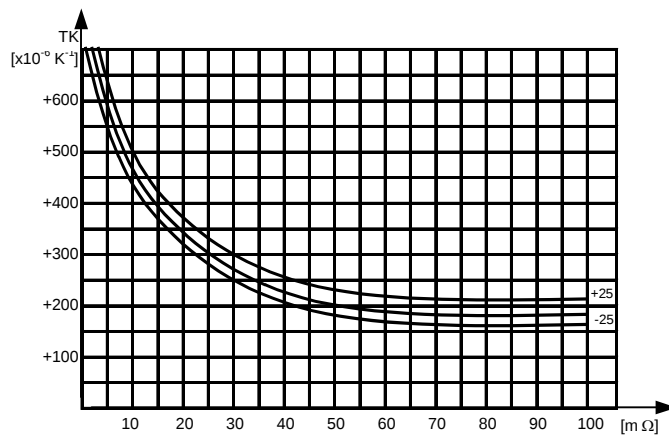
**Series KP** Table 2: Temperature coefficient of resistive wires used for series KP

| P <sub>70</sub> | Type | TC 400 <sup>±50</sup> | TC 0 <sup>+40<br/>-80</sup> | TC 0 <sup>±20</sup> |
|-----------------|------|-----------------------|-----------------------------|---------------------|
| 2 W             | 290  | 0R2 - 0R24            | 0R27 - 560R                 | 620R - 7K5          |
| 4 W             | 292  | 0R3 - 0R39            | 0R32 - 820R                 | 910R - 11K          |
| 5 W             | 294  | 0R47 - 0R62           | 0R68 - 1K3                  | 1K5 - 20K           |
| 6,5W            | 296  | 0R68 - 0R91           | 1R - 1K8                    | 2K - 27K            |
| 8 W             | 298  | 0R91 - 1R2            | 1R3 - 2K4                   | 2K7 - 36K           |

**Series BW / BWF** Table 3: Temperature coefficient of resistive wires used for series BW/BWF

|       |               |           |       |               |           |
|-------|---------------|-----------|-------|---------------|-----------|
| 234-0 | 0R1 ... 0R15  | TK ± 600  | 237-0 | 0R1           | TK ± 1000 |
|       | 0R16 ... 0R62 | TK ± 300  |       | 0R11 ... 0R18 | TK ± 600  |
|       | 0R68 ... 1K2  | TK ± 150  |       | 0R2 ... 0R68  | TK ± 300  |
|       |               |           |       | 0R75 ... 1K   | TK ± 150  |
| 235-0 | 0R1 ... 0R16  | TK ± 1000 | 236-0 | 0R1           | TK ± 1800 |
|       | 0R18 ... 0R68 | TK ± 800  |       | 0R11 ... 0R16 | TK ± 1000 |
|       | 0R75 ... 2K4  | TK ± 400  |       | 0R18 ... 0R68 | TK ± 800  |
|       |               |           |       | 0R75 ... 1K   | TK ± 400  |

Due to mechanical contacts resistive changes of ± 1,5 % are possible. This may influence results of TC-measurments.



**Diagram:** Temperature coefficient of metal-band resistors  
series KN (350-354)

## Pulse capability of resistors:

General information on pulse capability very often need additional explanations and do not always comply with a given application.

Please contact factory or sales office for your special requirements. For dealing with your application we need the following information:

- Pulse shape and repetition rate
- max. peak power
- Pulse duration or time constant
- max. peak voltage
- Resistance value

If already selected:

- Type or series or technology
- or preferred style

The Quality Assurance System of Vitrohm Group meets all requirements of CECC 00114 part 1, Harmonized System of Quality Assessment for Electronic Components (System of Quality Assessment for General Requirements) and meets also the requirements of DIN-ISO 9001:2000.

By this statement the General Management obliges all employees to fulfil their duties in accordance with the Quality Handbook, to assure the quality of all Vitrohm Products to meet the requirements of CECC and other standards.

All technical data given in this catalogue are based on statistical methods using equipments of modern techniques. The data are based on mass production. Therefore, testresults of singular specimens might differ from the average range of series.

All details in printed form are legally binding only after written confirmation conforming to §§ 463 and 480 II BGB.

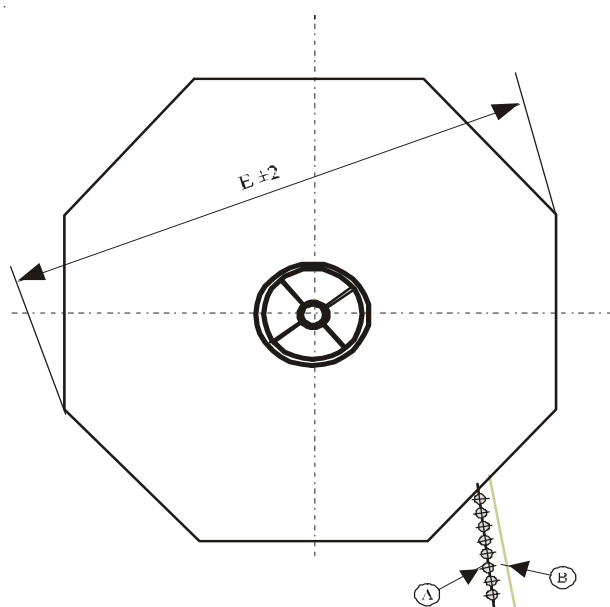
We reserve the right to change products and specifications due to technical development.



## Taping Specification for axial components

| Series | Type     | Style    | L <sub>max</sub> | e | Taping<br>s | g  | Pieces<br>Reel | E     | Pieces<br>Ammo |
|--------|----------|----------|------------------|---|-------------|----|----------------|-------|----------------|
| KC     | 200-0    | 0416     | 18,0             | 6 | 5           | 95 | 2000           | 356   | 1000*          |
|        | 202-0    | 0424     | 26,0             | 6 | 5           | 95 | 2000           | 356   | 1000*          |
|        | 204-0    | 0432     | 33,0             | 6 | 5           | 95 | 2000           | 356   | 1000*          |
| KH     | 206-8    | 7x7x20   | 21,0             | 6 | 10          | 95 | 1000           | 356   | -----          |
|        | 208-8    | 7x7x25   | 26,0             | 6 | 10          | 95 | 1000           | 356   | -----          |
|        | 210-8    | 7x7x38   | 39,0             | 6 | 10          | 95 | 1000           | 356   | -----          |
|        | 212-8    | 10x10x26 | 26,0             | 6 | 10          | 95 | 500            | 356   | -----          |
|        | 214-8    | 10x10x38 | 39,0             | 6 | 10          | 95 | 500            | 356   | -----          |
| BW / F | 234-0    | 0411     | 10,1             | 6 | 5           | 85 | 4000           | 356   | 1000*          |
|        | 235-0    | 0614     | 14,5             | 6 | 10          | 85 | 1000           | 356   | 1000*          |
|        | 236-0    | 0614     | 14,5             | 6 | 10          | 85 | 1000           | 356   | 1000*          |
|        | 237-0    | 0411     | 10,1             | 6 | 5           | 85 | 4000           | 356   | 1000*          |
| BWL    | BWL 0614 | 0614     | 14,5             | 6 | 10          | 85 | 1000           | 356   | 1000*          |
| CR / F | 251-0/4  | 0309     | 9,5              | 6 | 5           | 65 | 5000           | 356   | 1000*          |
|        | 253-0/4  | 0414     | 14,5             | 6 | 10          | 85 | 2000           | 356   | 1000*          |
|        | 254-0/4  | 0612     | 13,5             | 6 | 10          | 85 | 1000           | 356   | 1000*          |
|        | 255-0    | 0915     | 15,0             | 6 | 10          | 85 | 1000           | 356   | 500*           |
|        | 256-0/4  | 0617     | 18,0             | 6 | 10          | 85 | 1000           | 356   | 1000*          |
|        | 257-0/4  | 0918     | 19,0             | 6 | 10          | 85 | 1000           | 356   | 500*           |
|        | 258-0    | 0922     | 23,0             | 6 | 10          | 85 | 1000           | 356   | 500*           |
|        | 259-0    | 0927     | 27,0             | 6 | 10          | 85 | 1000           | 356   | 500*           |
| KN     | 350-8    | 7x7x18   | 19,0             | 6 | 10          | 85 | 1000           | 356   | -----          |
| RG     | 515-0    | 0207     | 6,6              | 6 | 5           | 65 | 5000           | 356   | 1000*          |
|        | 520-0    | 0309     | 8,2              | 6 | 5           | 65 | 5000           | 356   | 1000*          |
| PO     | 590-0    | 0617     | 16,5             | 9 | 10          | 95 | 1000           | 270   | 1000*          |
|        | 591-0    | 0922     | 20,0             | 9 | 10          | 95 | 500            | 270   | 500*           |
|        | 593-0    | 0414     | 12,0             | 6 | 5           | 85 | 2500           | 270   | 1000*          |
|        | 595-0    | 0207     | 6,3              | 6 | 5           | 65 | 5000           | 315   | 2000*          |
| RX     | 0207 W5  | 0207     | 6,2              | 6 | 5           | 65 | -----          | ----- | 5000*          |
|        | 0410 1W  | 0410     | 10,0             | 6 | 5           | 65 | -----          | ----- | 2000*          |
|        | 0515 1W  | 0515     | 15,0             | 6 | 5           | 65 | -----          | ----- | 1000*          |
|        | 0512 3W  | 0512     | 12,0             | 6 | 5           | 65 | -----          | ----- | 1000*          |
|        | 0613 3W  | 0613     | 13,0             | 6 | 10          | 65 | -----          | ----- | 1000*          |
|        | 0516 3W  | 0516     | 15,5             | 6 | 10          | 65 | -----          | ----- | 1000*          |
|        | 0616 3W5 | 0616     | 16,0             | 6 | 10          | 65 | -----          | ----- | 1000*          |
|        | 0716 3W  | 0716     | 16,0             | 6 | 10          | 65 | -----          | ----- | 500*           |
|        | 0716 4W  | 0716     | 16,0             | 6 | 10          | 65 | -----          | ----- | 500*           |
| ZOM    | ZOM0207  | 0207     | 6,6              | 6 | 5           | 65 | 5000           | 356   | 2000*          |

\*Standard



- A taped resistors
- B intermediate paper
- C inner reel width  $g+5$
- D outer reel width  $g+10$
- E maximum reel diameter

$L_{\text{máx.}}$  Body length

$k$   $L_{\text{máx.}} + 1,4$  ( $k$  concentric between the tapes)

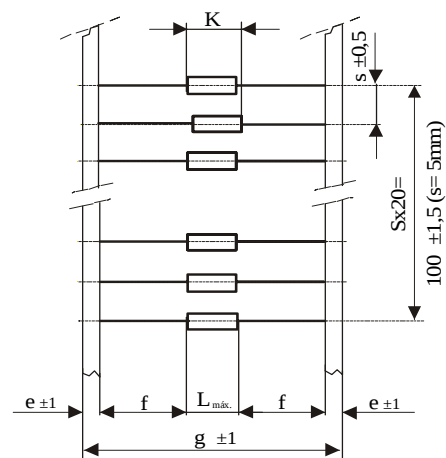
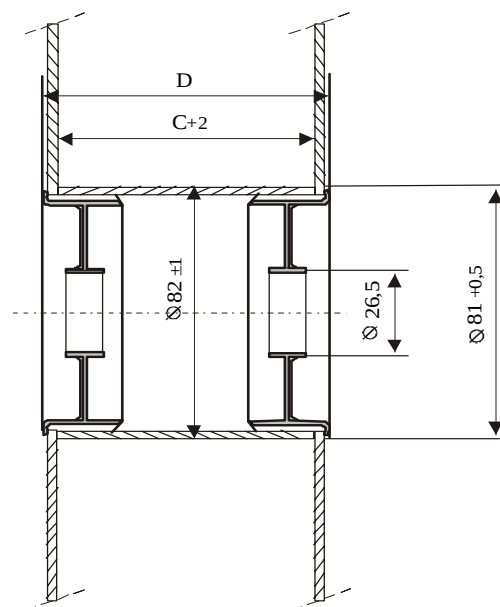
$f$   $\geq 20$  mm

$g$  taped width

$s$  step size

$e$  taped width

standard taping acc. to IEC 60286-1



# Ceramic Metal Plate Resistors

## Low value , low inductance

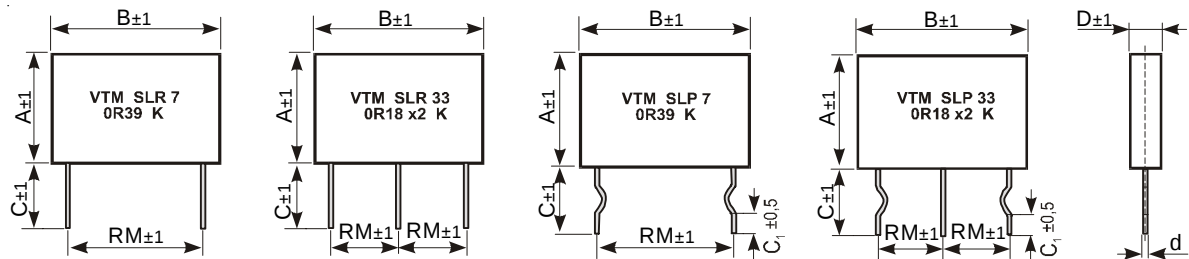


### Specifications

| Type                                                                                       |                                      | SLR2<br>SLP2                          | SLR3<br>SLP3 | SLR5<br>SLP5 | SLR5B<br>SLP5B | SLR7<br>SLP7 | SLR7B<br>SLP7B | SLR10<br>SLP10 | SLR10A<br>SLP10A | SLR22B<br>SLP22B | SLR33<br>SLP33 | SLR33B<br>SLP33B | SLR55<br>SLP55 |
|--------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------|--------------|--------------|----------------|--------------|----------------|----------------|------------------|------------------|----------------|------------------|----------------|
| Power rating $P_{70}$                                                                      | W                                    | see next page                         |              |              |                |              |                |                |                  |                  |                |                  |                |
| Resistance range                                                                           | $\Omega$                             | see next page                         |              |              |                |              |                |                |                  |                  |                |                  |                |
| Tolerances                                                                                 | %                                    | 10% (K) standard<br>5% (J) on request |              |              |                |              |                |                |                  |                  |                |                  |                |
| Temperature coefficient                                                                    | $10^{-6} \text{K}^{-1}$              | $\pm 250$                             |              |              |                |              |                |                |                  |                  |                |                  |                |
| max. cont. work. voltage                                                                   | $V_{\text{RMS}}$                     | $\sqrt{P_{70} \cdot R}$               |              |              |                |              |                |                |                  |                  |                |                  |                |
| Insulation voltage                                                                         | $V_{\text{RMS}}$                     | > 700 V                               |              |              |                |              |                |                |                  |                  |                |                  |                |
| Insulation resistance                                                                      | $\Omega$                             | $\geq 1 \text{G}$                     |              |              |                |              |                |                |                  |                  |                |                  |                |
| Derating linear                                                                            | $^{\circ}\text{C}$                   | 70 ... 200                            |              |              |                |              |                |                |                  |                  |                |                  |                |
| Climatic category                                                                          |                                      | 25 / 200 / 21                         |              |              |                |              |                |                |                  |                  |                |                  |                |
| Temperature range                                                                          | $^{\circ}\text{C}$                   | - 25 ~ 200                            |              |              |                |              |                |                |                  |                  |                |                  |                |
| Short time overload                                                                        | $\left[\frac{\Delta R}{R}\right] \%$ | $\pm ( 1\% R + 0.05\Omega )$          |              |              |                |              |                |                |                  |                  |                |                  |                |
| Load Life $P_{70^{\circ}\text{C}}$ (70 $^{\circ}\text{C}$ 1000h,<br>1.5h "ON", 0.5h "OFF") | $\left[\frac{\Delta R}{R}\right] \%$ | $\pm ( 5\% R + 0.1\Omega )$           |              |              |                |              |                |                |                  |                  |                |                  |                |
| Damp heat, steady state<br>(40 $^{\circ}\text{C}$ , 95% r.h., 21d)                         | $\left[\frac{\Delta R}{R}\right] \%$ | $\pm ( 5\% R + 0.1\Omega )$           |              |              |                |              |                |                |                  |                  |                |                  |                |
| Terminal tensile strength                                                                  | $\left[\frac{\Delta R}{R}\right] \%$ | $\pm ( 1\% R + 0.05\Omega )$          |              |              |                |              |                |                |                  |                  |                |                  |                |
| Resistance to soldering heat<br>(350 $^{\circ}\text{C}$ , 3.5s)                            |                                      | $\pm ( 1\% R + 0.05\Omega ) .$        |              |              |                |              |                |                |                  |                  |                |                  |                |
| Solderability<br>IEC 60068-2-20<br>260 $^{\circ}\text{C}$ , Solder bath                    | s                                    | $2 \pm 0.5$                           |              |              |                |              |                |                |                  |                  |                |                  |                |
| Marking                                                                                    |                                      | printed in clear                      |              |              |                |              |                |                |                  |                  |                |                  |                |

Ordering example:      SLR2                      10                      B                      0R1  
                                          Type                      Tolerance                      Pack.-Code                      R-Value

Dimensions in mm:



| Type            | Rated power<br>$P_{70^{\circ}\text{C}}$ | Resistance range |           | Dimensions (mm) |    |       |       |                |     |     |    | Packaging    |     |
|-----------------|-----------------------------------------|------------------|-----------|-----------------|----|-------|-------|----------------|-----|-----|----|--------------|-----|
|                 |                                         | Min.             | Max.      | A               | B  | C     | C     | C <sub>1</sub> | D   | d   | RM | Pieces / Box |     |
|                 |                                         |                  |           |                 |    | (SLR) | (SLP) | (SLP)          |     |     |    | SLR          | SLP |
| SLR2 / SLP2     | 2                                       | 0R1              | 0R68      | 8               | 13 | 12    | 10    | 4              | 5   | 0.6 | 9  | 270          | 290 |
| SLR3 / SLP3     | 3                                       | 0R05             | 1R        | 13              | 13 | 12    | 10    | 4              | 5   | 0.6 | 8  | 210          | 230 |
| SLR5 / SLP5     | 5                                       | 0R05             | 3R3       | 18              | 14 | 12    | 10    | 4              | 5   | 0.6 | 10 | 170          | 190 |
| SLR5B / SLP5B   | 5                                       | 0R05             | 3R3       | 10              | 26 | 12    | 10    | 4              | 5   | 0.8 | 20 | 160          | 170 |
| SLR7 / SLP7     | 7                                       | 0R05             | 3R3       | 18              | 26 | 12    | 10    | 4              | 5   | 0.8 | 20 | 100          | 110 |
| SLR7B / SLP7B   | 7                                       | 0R05             | 3R3       | 13              | 26 | 12    | 10    | 4              | 5   | 0.8 | 20 | 120          | 130 |
| SLR10 / SLP10   | 10                                      | 0R05             | 3R3       | 20              | 26 | 12    | 10    | 4              | 5   | 0.8 | 20 | 100          | 100 |
| SLR10A / SLP10A | 10                                      | 0R05             | 3R3       | 19              | 26 | 12    | 10    | 4              | 5.5 | 0.8 | 20 | 80           | 90  |
| SLR22B / SLP22B | 2+2                                     | 0R1+0R1          | 0R33+0R33 | 10              | 26 | 12    | 10    | 4              | 5   | 0.8 | 10 | 160          | 170 |
| SLR33 / SLP33   | 3+3                                     | 0R1+0R1          | 0R5+0R5   | 18              | 26 | 12    | 10    | 4              | 5   | 0.8 | 10 | 100          | 100 |
| SLR33B / SLP33B | 3+3                                     | 0R1+0R1          | 0R5+0R5   | 13              | 26 | 12    | 10    | 4              | 5   | 0.8 | 10 | 130          | 130 |
| SLR55 / SLP55   | 5+5                                     | 0R1+0R1          | 1R8+1R8   | 20              | 26 | 12    | 10    | 4              | 5   | 0.8 | 10 | 100          | 100 |

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