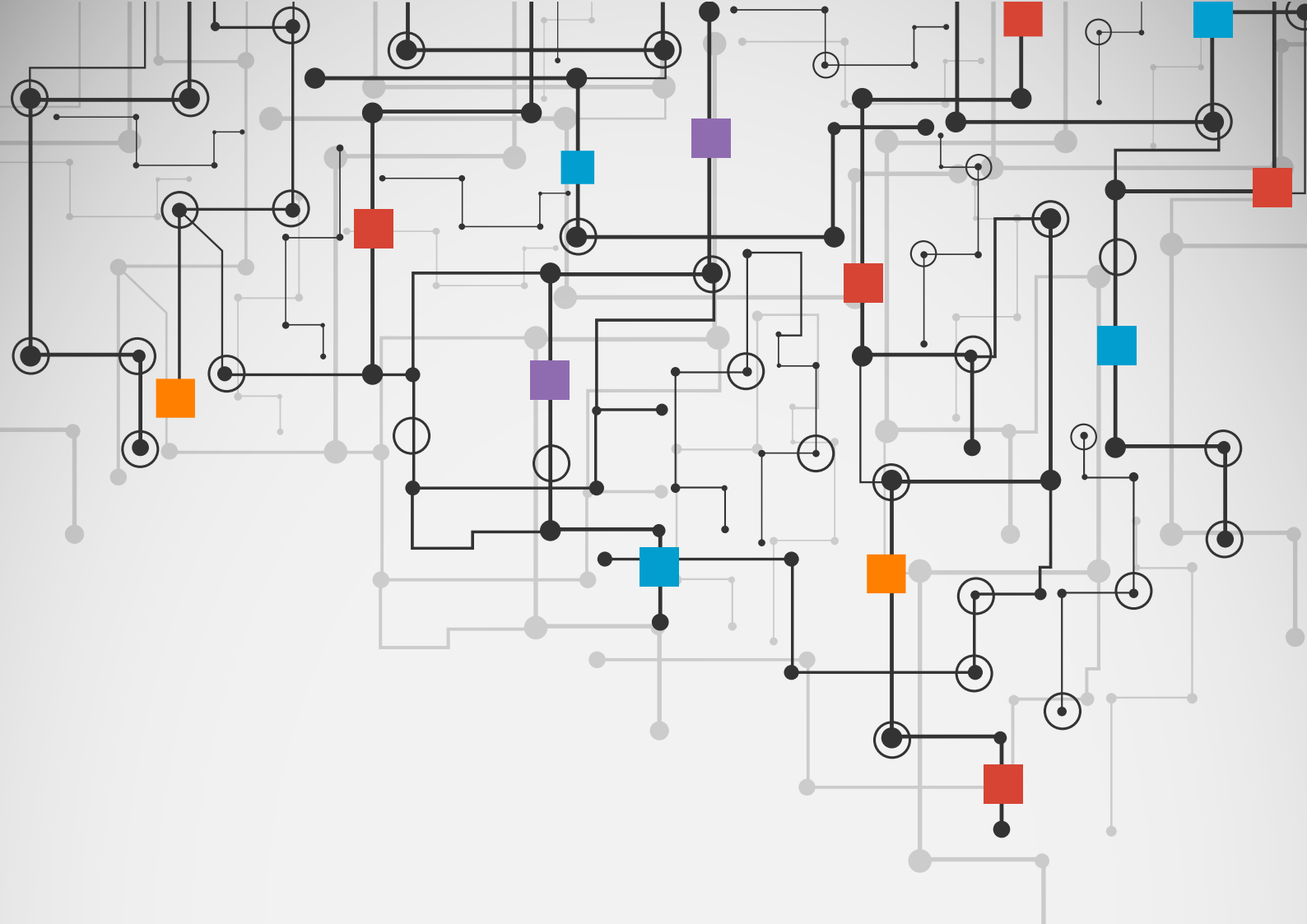




# PRODUCT SELECTION GUIDE



**VITROHM**  
a YAGEO company

**Resistors have a name... VITROHM**

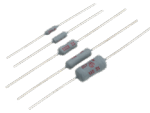
# DECISION TREE

The decision tree gives you an overview of the product portfolio made available by Vitrohm and allows you to select the most suitable resistor for the desired application.

| Main Characteristic | Technology                                    |              | Descrip.                   | Coating        | Series              | Focus Applications* |            |                        |                |                        |
|---------------------|-----------------------------------------------|--------------|----------------------------|----------------|---------------------|---------------------|------------|------------------------|----------------|------------------------|
|                     |                                               |              |                            |                |                     | Automotive          | Industrial | Consumer & Electronics | Power & Energy | Computer & Peripherals |
| SAFETY              | Wirewound                                     | TH           | Ceramic Core               | Coated         | CRF                 | ●                   | ●          | ●                      | ●              | ●                      |
|                     |                                               | SMD          |                            | Moulded        | RWS                 |                     | ●          | ●                      | ●              | ●                      |
| PRECISION           | Wirewound                                     | TH           | Ceramic Core               | Coated         | CRS                 |                     | ●          | ●                      |                | ●                      |
|                     |                                               | SMD          |                            | Moulded        | RWC                 | ●                   | ●          | ●                      |                | ●                      |
|                     | Film                                          | SMD          | Metal Film                 | Coated         | ZCM                 | ●                   |            | ●                      | ●              |                        |
| PULSE               | Wirewound                                     | TH           | Ceramic Core               | Coated         | CRP                 | ●                   | ●          |                        | ●              |                        |
|                     |                                               | SMD          |                            | Moulded        | RWI                 | ●                   | ●          |                        | ●              |                        |
| FUSIBLE             | Wirewound                                     | TH           | Fiberglass                 | Moulded        | BWF                 |                     | ●          | ●                      | ●              | ●                      |
|                     |                                               |              |                            |                | KFF/KTF             |                     | ●          | ●                      | ●              | ●                      |
|                     |                                               |              | Ceramic Core               | Ceramic Case   | RXF                 |                     | ●          | ●                      | ●              | ●                      |
|                     |                                               |              |                            |                | CRT                 |                     | ●          | ●                      | ●              | ●                      |
|                     |                                               | Ceramic Core | Coated                     | RFS            |                     | ●                   | ●          | ●                      | ●              | ●                      |
|                     |                                               |              | SMD                        | Fiberglass     | Moulded             | RWF                 |            | ●                      | ●              | ●                      |
| GENERAL PURPOSE     | Wirewound                                     | TH           | Fiberglass                 | Coated         | KPS/KCS             |                     | ●          |                        | ●              |                        |
|                     |                                               |              | Ceramic Core               |                | RXS                 |                     | ●          | ●                      | ●              | ●                      |
|                     |                                               |              | Fiberglass                 | Moulded        | BWS                 | ●                   | ●          | ●                      | ●              |                        |
|                     | Film                                          | TH           | Metal Oxide                | Coated         | POS                 |                     | ●          |                        | ●              |                        |
|                     |                                               | SMD          | Metal Film                 | Moulded        | RWP                 |                     | ●          | ●                      | ●              |                        |
| HIGH VOLTAGE        | Film                                          | TH           | Metal Glaze                | Coated         | GFV                 |                     | ●          | ●                      |                |                        |
| SHUNT               | EBW<br><small>(Electron Beam Welding)</small> | SMD          | Metal Strip                | Open Frame     | CSx                 | ●                   | ●          |                        | ●              |                        |
|                     | Flat wire                                     | TH           |                            | Ceramic Case   | KNC                 | ●                   | ●          |                        | ●              |                        |
|                     |                                               |              |                            |                | SLR                 |                     | ●          |                        | ●              |                        |
|                     |                                               |              |                            | Open Frame     | KNS                 | ●                   |            | ●                      | ●              |                        |
|                     |                                               |              |                            | LPS            | ●                   | ●                   |            | ●                      |                |                        |
|                     |                                               | SMD          |                            | Moulded        | RWN                 | ●                   |            | ●                      |                |                        |
| POWER               | Wirewound                                     | TH           | Fiberglass                 | Ceramic Case   | KHS/KVS             |                     | ●          |                        | ●              |                        |
|                     |                                               |              | Fiberglass<br>Ceramic Core |                | KWA/KWP/<br>KWV/KWH |                     |            |                        | ●              |                        |
|                     |                                               |              | Ceramic Core               | Aluminium Case | RXH/RXL             |                     |            |                        | ●              |                        |
|                     |                                               |              | Ceramic Core               |                | REA/REB             |                     | ●          |                        | ●              |                        |
|                     | Film                                          | TH           | Metal Glaze                |                |                     |                     | ●          |                        | ●              |                        |
|                     |                                               |              | Metal Oxide                | Ceramic Case   | KWP/<br>KWV/KWH     |                     |            |                        | ●              |                        |
| JUMPER              |                                               | TH           | Wire                       | Moulded        | ZOM                 | ●                   | ●          |                        | ●              |                        |
|                     |                                               | SMD          | Metal Strip                | Open Frame     | CSB                 | ●                   | ●          | ●                      | ●              | ●                      |

\*For more detailed information or other applications, please contact us - [vitrohm.support@yageo.com](mailto:vitrohm.support@yageo.com).

# PRODUCT SELECTION GUIDE

|                        | SAFETY                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                              | PRECISION                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                        | PULSE                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | Wirewound                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                              | Wirewound                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                            | Film                                                                                                                                                                                                                                                                                                                                                                                                                   | Wirewound                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                        | TH                                                                                                                                                                                                                                                                                                                                                           | SMD                                                                                                                                                                                                                                                                                                                                          | TH                                                                                                                                                                                                                                                                                                                         | SMD                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                        | TH                                                                                                                                                                                                                | SMD                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Product                |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                        |
|                        | <b>CRF</b>                                                                                                                                                                                                                                                                                                                                                   | <b>RWS</b>                                                                                                                                                                                                                                                                                                                                   | <b>CRS</b>                                                                                                                                                                                                                                                                                                                 | <b>RWC</b>                                                                                                                                                                                                                                                                                                                 | <b>ZCM</b>                                                                                                                                                                                                                                                                                                                                                                                                             | <b>CRP</b>                                                                                                                                                                                                        | <b>RWI</b>                                                                                                                                                                                                                                                                                                                                                                                                                |
| Type                   | CRF110 to CRF500                                                                                                                                                                                                                                                                                                                                             | RWS502                                                                                                                                                                                                                                                                                                                                       | CRS110 to CRS720                                                                                                                                                                                                                                                                                                           | RWC502                                                                                                                                                                                                                                                                                                                     | ZCM102 to ZCM207                                                                                                                                                                                                                                                                                                                                                                                                       | CRP110 to CRP720                                                                                                                                                                                                  | RWI502                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Historical Type        | CRF251-4/8 to CRF257-4/8                                                                                                                                                                                                                                                                                                                                     | RWS5020                                                                                                                                                                                                                                                                                                                                      | CR251-0 to CR259-0                                                                                                                                                                                                                                                                                                         | RWC5020                                                                                                                                                                                                                                                                                                                    | ZC0204 and ZC0207                                                                                                                                                                                                                                                                                                                                                                                                      | CRP251-1 to CRP259-1                                                                                                                                                                                              | RWI5020                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Resistance Range       | 1R up to 470R                                                                                                                                                                                                                                                                                                                                                | 1R up to 100R                                                                                                                                                                                                                                                                                                                                | 0R01 up to 8K2                                                                                                                                                                                                                                                                                                             | 0R01 up to 220R                                                                                                                                                                                                                                                                                                            | 0R16 up to 10M                                                                                                                                                                                                                                                                                                                                                                                                         | 0R1 up to 5K1                                                                                                                                                                                                     | 0R1 up to 220R                                                                                                                                                                                                                                                                                                                                                                                                            |
| Rated Power [W]        | 1,1W up to 5W (P <sub>40</sub> )<br>1W up to 4,5W (P <sub>70</sub> )                                                                                                                                                                                                                                                                                         | 2,2W (P <sub>25</sub> )<br>1,6W (P <sub>70</sub> )                                                                                                                                                                                                                                                                                           | 1,1W up to 7,2W (P <sub>40</sub> )<br>1W up to 6,5W (P <sub>70</sub> )                                                                                                                                                                                                                                                     | 2,2W (P <sub>25</sub> )<br>1,6W (P <sub>70</sub> )                                                                                                                                                                                                                                                                         | 0,2W up to 1W (P <sub>70</sub> )                                                                                                                                                                                                                                                                                                                                                                                       | 1,1W up to 7,2W (P <sub>40</sub> )<br>1W up to 6,5W (P <sub>70</sub> )                                                                                                                                            | 3W (P <sub>25</sub> )<br>2,2W (P <sub>70</sub> )                                                                                                                                                                                                                                                                                                                                                                          |
| T. C [ppm/°C]          | depends on the ohmic value                                                                                                                                                                                                                                                                                                                                   | depends on the ohmic value                                                                                                                                                                                                                                                                                                                   | depends on the ohmic value                                                                                                                                                                                                                                                                                                 | depends on the ohmic value                                                                                                                                                                                                                                                                                                 | depends on the ohmic value                                                                                                                                                                                                                                                                                                                                                                                             | depends on the ohmic value                                                                                                                                                                                        | depends on the ohmic value                                                                                                                                                                                                                                                                                                                                                                                                |
| Tolerance ± [%]        | 5                                                                                                                                                                                                                                                                                                                                                            | 5                                                                                                                                                                                                                                                                                                                                            | 0,5, 1, 2, 5                                                                                                                                                                                                                                                                                                               | 1, 5                                                                                                                                                                                                                                                                                                                       | 0,1 up to 5                                                                                                                                                                                                                                                                                                                                                                                                            | 0,5, 1, 2, 5                                                                                                                                                                                                      | 1, 2, 5                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Load Life ± [%]        | 5                                                                                                                                                                                                                                                                                                                                                            | 3                                                                                                                                                                                                                                                                                                                                            | 5                                                                                                                                                                                                                                                                                                                          | 1                                                                                                                                                                                                                                                                                                                          | 0,05 up to 0,5                                                                                                                                                                                                                                                                                                                                                                                                         | 3                                                                                                                                                                                                                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Temperature Range [°C] | -55... +350                                                                                                                                                                                                                                                                                                                                                  | -55... +200                                                                                                                                                                                                                                                                                                                                  | -55... +350                                                                                                                                                                                                                                                                                                                | -55... +200                                                                                                                                                                                                                                                                                                                | -55... +155                                                                                                                                                                                                                                                                                                                                                                                                            | -55... +350                                                                                                                                                                                                       | -55... +200                                                                                                                                                                                                                                                                                                                                                                                                               |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 9x3</li> <li>• 9,7x4</li> <li>• 14,5x4,5</li> <li>• 12,6x6</li> <li>• 17x6</li> <li>• 18x8,5</li> </ul>                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• 12x5x4,5 (5020)</li> </ul>                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• 9x3</li> <li>• 9,7x4</li> <li>• 14,5x4,5</li> <li>• 12,6x5,5</li> <li>• 15x8,5</li> <li>• 17x5,5</li> <li>• 18x8,5</li> <li>• 22x8,5</li> <li>• 27x8,5</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>• 12x5x4,5 (5020)</li> </ul>                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• 2,2x1,1 (0102)</li> <li>• 3,6x1,4 (0204)</li> <li>• 5,8x2,2 (0207)</li> </ul>                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• 9x3</li> <li>• 9,7x4</li> <li>• 12,6x5,5</li> <li>• 17x5,5</li> <li>• 18x8,5</li> <li>• 27x8,5</li> </ul>                                                                | <ul style="list-style-type: none"> <li>• 12x5x4,5 (5020)</li> </ul>                                                                                                                                                                                                                                                                                                                                                       |
| Packing                | Taped                                                                                                                                                                                                                                                                                                                                                        | Blister                                                                                                                                                                                                                                                                                                                                      | Taped                                                                                                                                                                                                                                                                                                                      | Blister                                                                                                                                                                                                                                                                                                                    | Blister                                                                                                                                                                                                                                                                                                                                                                                                                | Taped                                                                                                                                                                                                             | Blister                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Features               | <ul style="list-style-type: none"> <li>• Precision type</li> <li>• "Z" pre-forming</li> <li>• Other pre-forming available</li> <li>• High pulse load up to 6[kV]</li> <li>• 240[V] fusing application</li> <li>• UL 1412 Certified</li> </ul>                                                                                                                | <ul style="list-style-type: none"> <li>• Suitable for automatic pick and place</li> <li>• All welded construction</li> <li>• Silicon moulding</li> </ul>                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Precision type</li> <li>• Non-inductive type available</li> <li>• "Z" pre-forming</li> <li>• Other pre-forming available</li> </ul>                                                                                                                                               | <ul style="list-style-type: none"> <li>• Suitable for automatic pick and place</li> <li>• All welded construction</li> <li>• Epoxy molding</li> </ul>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Suitable for automatic pick and place</li> <li>• AEC-Q200 qualified</li> <li>• Biased 85/85 (0,25% &lt; M; 2% &gt; 1M)</li> </ul>                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• "Z" pre-forming</li> <li>• Other pre-forming available</li> </ul>                                                                                                        | <ul style="list-style-type: none"> <li>• High pulse load up to 6[kV]</li> </ul>                                                                                                                                                                                                                                                                                                                                           |
| Focus Applications     | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Energy saving lamps</li> <li>• Battery chargers</li> <li>• Fusing Resistor</li> <li>• Electronic energy meters</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controllers</li> <li>• Fans</li> </ul> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Energy saving lamps</li> <li>• Battery chargers</li> <li>• Fusing Resistor</li> <li>• Electronic energy meters</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controllers</li> </ul> | <b>Automotive</b><br><b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controller</li> </ul> <b>Consumer &amp; Electronics:</b> <ul style="list-style-type: none"> <li>• Consumer electronics</li> <li>• Power supply</li> <li>• Televisions</li> </ul> <b>General purpose</b> | <b>Automotive</b><br><b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controller</li> </ul> <b>Consumer &amp; Electronics:</b> <ul style="list-style-type: none"> <li>• Consumer electronics</li> <li>• Power supply</li> <li>• Televisions</li> </ul> <b>General purpose</b> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Electronic energy meter</li> <li>• Power management</li> </ul> <b>Automotive:</b> <ul style="list-style-type: none"> <li>• Drive train/starter</li> <li>• Alternator</li> <li>• DC/DC converter</li> <li>• Panel controls</li> <li>• FHV</li> </ul> <b>Other:</b> <ul style="list-style-type: none"> <li>• Medical electronic equipment</li> </ul> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Electronic energy meter</li> </ul> <b>General purpose</b><br><b>Consumer and Electronics</b><br><b>Industrial</b> | <b>Consumer &amp; Electronics:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Battery chargers</li> <li>• Washing machine control unit</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Inverters &amp; Converters</li> </ul> <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• LED lighting</li> <li>• Control unit</li> </ul> |
| Datasheet              |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                   |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                      |

# PRODUCT SELECTION GUIDE

|                        | FUSIBLE                                                                                                                                                                                                                                                                                                  |                                                                                                                                                          |                                                                                             |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                              |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | Wirewound                                                                                                                                                                                                                                                                                                |                                                                                                                                                          |                                                                                             |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                              |
|                        | TH                                                                                                                                                                                                                                                                                                       |                                                                                                                                                          |                                                                                             |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                  | SMD                                                                                                                                                                                                                                                                                                                                          |
| Product                |                                                                                                                                                                                                                         |                                                                         |            |                   |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                           |
|                        | BWF                                                                                                                                                                                                                                                                                                      | KFF                                                                                                                                                      | KTF                                                                                         | RXF                                                                                                | CRT                                                                                                                                                                                                                                                                                                                                                                                                                       | RFS                                                                                                                                                                                                                                                                                                                              | RWF                                                                                                                                                                                                                                                                                                                                          |
| Type                   | BWF110 and BWF210                                                                                                                                                                                                                                                                                        | KFF250 to KFF11A                                                                                                                                         | KTF200 to KTF350                                                                            | RXF (Low, Medium and High)                                                                         | CRT100 and CRT200                                                                                                                                                                                                                                                                                                                                                                                                         | RFS110 to RFS500                                                                                                                                                                                                                                                                                                                 | RWF502                                                                                                                                                                                                                                                                                                                                       |
| Historical Type        | BWF236-0 and BWF237-0                                                                                                                                                                                                                                                                                    | KF206-4 to KF218-4                                                                                                                                       | KT212-7 to KT216-7                                                                          | RXF5 to RXF10                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                           | RF0410 to RF0718                                                                                                                                                                                                                                                                                                                 | RWF5020                                                                                                                                                                                                                                                                                                                                      |
| Resistance Range       | 0R1 up to 1K                                                                                                                                                                                                                                                                                             | 0R1 up to 82K                                                                                                                                            | 0R075 up to 47K                                                                             | 1R up to 10K                                                                                       | 1R up to 200R                                                                                                                                                                                                                                                                                                                                                                                                             | 0R47 up to 330R                                                                                                                                                                                                                                                                                                                  | 0R1 up to 1K                                                                                                                                                                                                                                                                                                                                 |
| Rated Power [W]        | 1,1W and 2,1W (P <sub>25</sub> )<br>0,75W and 1,5W (P <sub>70</sub> )                                                                                                                                                                                                                                    | 2,5W up to 11W (P <sub>25</sub> )<br>1,2W up to 6W (P <sub>70</sub> )                                                                                    | 2W up to 3,5W (P <sub>70</sub> )                                                            | 1,6W up to 3,5W (P <sub>25</sub> )                                                                 | 1W and 2W (P <sub>25</sub> )                                                                                                                                                                                                                                                                                                                                                                                              | 1,1W up to 5W (P <sub>40</sub> )<br>1W up to 4,4W (P <sub>70</sub> )                                                                                                                                                                                                                                                             | 2,2W (P <sub>25</sub> )<br>1,6W (P <sub>25</sub> )                                                                                                                                                                                                                                                                                           |
| T. C [ppm/°C]          | depends on the ohmic value                                                                                                                                                                                                                                                                               | depends on the ohmic value                                                                                                                               | depends on the ohmic value                                                                  | 250                                                                                                | depends on the ohmic value                                                                                                                                                                                                                                                                                                                                                                                                | depends on the ohmic value                                                                                                                                                                                                                                                                                                       | depends on the ohmic value                                                                                                                                                                                                                                                                                                                   |
| Tolerance ± [%]        | 5, 10                                                                                                                                                                                                                                                                                                    | 5, 10                                                                                                                                                    | 5, 10                                                                                       | 5, 10                                                                                              | 1, 5                                                                                                                                                                                                                                                                                                                                                                                                                      | 1, 5                                                                                                                                                                                                                                                                                                                             | 5, 10                                                                                                                                                                                                                                                                                                                                        |
| Load Life ± [%]        | 5, 10                                                                                                                                                                                                                                                                                                    | 3                                                                                                                                                        | 3                                                                                           | 5                                                                                                  | 5                                                                                                                                                                                                                                                                                                                                                                                                                         | 5                                                                                                                                                                                                                                                                                                                                | 3                                                                                                                                                                                                                                                                                                                                            |
| Temperature Range [°C] | -55... +175                                                                                                                                                                                                                                                                                              | -55... +150                                                                                                                                              | -55... +150                                                                                 | -25... +125                                                                                        | +187... +221                                                                                                                                                                                                                                                                                                                                                                                                              | -40... +155                                                                                                                                                                                                                                                                                                                      | -55... +200                                                                                                                                                                                                                                                                                                                                  |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 9,9x3,6</li> <li>• 14,3x5,7</li> </ul>                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• 20x7</li> <li>• 25x7</li> <li>• 38x7</li> <li>• 25x9</li> <li>• 38x9</li> <li>• 50x9</li> <li>• 75x9</li> </ul> | <ul style="list-style-type: none"> <li>• 25x9</li> <li>• 38x9</li> <li>• 50x9</li> </ul>    | <ul style="list-style-type: none"> <li>• 25x13x9</li> <li>• 38x13x9</li> <li>• 35x16x12</li> </ul> | <ul style="list-style-type: none"> <li>• 10,5x4,2</li> <li>• 10,5x4,5</li> </ul>                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• 9x3,5</li> <li>• 11,5x4,6</li> <li>• 15,5x5,2</li> <li>• 17,5x6,5</li> </ul>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• 12x5x4,5 (5020)</li> </ul>                                                                                                                                                                                                                                                                          |
| Packing                | Taped                                                                                                                                                                                                                                                                                                    | Bulk                                                                                                                                                     | Bulk                                                                                        | Bulk                                                                                               | Taped                                                                                                                                                                                                                                                                                                                                                                                                                     | Taped                                                                                                                                                                                                                                                                                                                            | Blister                                                                                                                                                                                                                                                                                                                                      |
| Features               | <ul style="list-style-type: none"> <li>• "Z" pre-forming</li> <li>• Other pre-forming available</li> <li>• 240[V] fusing application available upon request</li> <li>• Bakelite molding material, Oil Resistant, Humidity resistant</li> </ul>                                                           | <ul style="list-style-type: none"> <li>• Pulse version available</li> </ul>                                                                              | <ul style="list-style-type: none"> <li>• Pulse version available</li> </ul>                 | <ul style="list-style-type: none"> <li>• Over temperature protector resistor</li> </ul>            | <ul style="list-style-type: none"> <li>• UL1412 qualified</li> <li>• Over temperature protector resistor</li> <li>• withstand up to 2[kV] surge voltage</li> </ul>                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Low-cost fusible type</li> </ul>                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Suitable for automatic pick and place</li> <li>• All welded construction</li> <li>• Silicon molding</li> </ul>                                                                                                                                                                                      |
| Focus Applications     | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Energy saving lamps</li> <li>• Battery chargers</li> <li>• Fusing Resistor</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controllers</li> </ul> | <b>Industrial</b><br><br><b>Consumer &amp; Electronics</b><br><br><b>Power &amp; Energy</b>                                                              | <b>Industrial</b><br><br><b>Consumer &amp; Electronics</b><br><br><b>Power &amp; Energy</b> | <b>Industrial</b><br><br><b>Consumer &amp; Electronics</b><br><br><b>Power &amp; Energy</b>        | <b>Consumer &amp; Electronics:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Battery chargers</li> <li>• Washing machine control unit</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Inverters &amp; Converters</li> </ul> <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• LED lighting</li> <li>• Control unit</li> </ul> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Energy saving lamps</li> <li>• Battery chargers</li> <li>• Fusing Resistor</li> <li>• Power supply</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controllers</li> </ul> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Energy saving lamps</li> <li>• Battery chargers</li> <li>• Fusing Resistor</li> <li>• Electronic energy meters</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controllers</li> </ul> |
| Datasheet              |                                                                                                                                                                                                                       |                                                                       |          |                 |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                         |

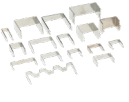
# PRODUCT SELECTION GUIDE

|                        | GENERAL PURPOSE                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                              | HIGH VOLTAGE                                                                                                                                                                |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | Wirewound                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                       | Film                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                              | Film                                                                                                                                                                        |
|                        | TH                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                       | TH                                                                                                                                                                                                                                                                                                                                                                                     | SMD                                                                                                                                                                                                                                                                                                                                                                                                          | TH                                                                                                                                                                          |
| Product                |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                |                                                                                                                                                          |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                           |                                                                                          |
|                        | <b>KCS</b>                                                                                                                                                                                                                                                                                                                                                                                                      | <b>KPS</b>                                                                                                                                                                                                                                                                                                      | <b>BWS</b>                                                                                                                                                                                                                                | <b>RXS</b>                                                                                                                                                                                                                                                                                            | <b>POS</b>                                                                                                                                                                                                                                                                                                                                                                             | <b>RWP</b>                                                                                                                                                                                                                                                                                                                                                                                                   | <b>GFV</b>                                                                                                                                                                  |
| Type                   | KCS100 to KCS300                                                                                                                                                                                                                                                                                                                                                                                                | KPS200 to KPS800<br>(short or long pin)                                                                                                                                                                                                                                                                         | BWS110 and BWS210                                                                                                                                                                                                                         | RXS-60 to RXS700                                                                                                                                                                                                                                                                                      | POS-50 to POS400                                                                                                                                                                                                                                                                                                                                                                       | RWP502                                                                                                                                                                                                                                                                                                                                                                                                       | GFV-25 to GFV300                                                                                                                                                            |
| Historical Type        | KC200-0 to KC204-0                                                                                                                                                                                                                                                                                                                                                                                              | KP290-0/1 to KP298-0/1                                                                                                                                                                                                                                                                                          | BW234-0 and BW235-0                                                                                                                                                                                                                       | RX0207 to RX1026                                                                                                                                                                                                                                                                                      | PO596-0 to PO590-0                                                                                                                                                                                                                                                                                                                                                                     | RWP5020                                                                                                                                                                                                                                                                                                                                                                                                      | GF0207 to GF0616                                                                                                                                                            |
| Resistance Range       | 0R056 up to 30K                                                                                                                                                                                                                                                                                                                                                                                                 | 0R1 up to 36K                                                                                                                                                                                                                                                                                                   | 0R1 up to 2K4                                                                                                                                                                                                                             | 0R01 up to 6K8                                                                                                                                                                                                                                                                                        | 0R1 up to 10M                                                                                                                                                                                                                                                                                                                                                                          | 1R up to 1M                                                                                                                                                                                                                                                                                                                                                                                                  | 100K up to 68M                                                                                                                                                              |
| Rated Power [W]        | 1W up to 3W<br>(P <sub>70</sub> )                                                                                                                                                                                                                                                                                                                                                                               | 2W up to 8W<br>(P <sub>70</sub> )                                                                                                                                                                                                                                                                               | 1,1W and 2,1W (P <sub>25</sub> )<br>0,75W and 1,5W (P <sub>70</sub> )                                                                                                                                                                     | 0,6W up to 7W (P <sub>40</sub> )<br>0,5W up to 6,1W (P <sub>70</sub> )                                                                                                                                                                                                                                | 0,5W up to 4W<br>(P <sub>70</sub> )                                                                                                                                                                                                                                                                                                                                                    | 2,2W (P <sub>25</sub> )<br>1,6W (P <sub>70</sub> )                                                                                                                                                                                                                                                                                                                                                           | 0,25W up to 3W<br>(P <sub>70</sub> )                                                                                                                                        |
| T. C [ppm/°C]          | depends on the ohmic value                                                                                                                                                                                                                                                                                                                                                                                      | depends on the ohmic value                                                                                                                                                                                                                                                                                      | depends on the ohmic value                                                                                                                                                                                                                | depends on the ohmic value                                                                                                                                                                                                                                                                            | ±50 up to ±200                                                                                                                                                                                                                                                                                                                                                                         | 50, 200                                                                                                                                                                                                                                                                                                                                                                                                      | G = 200                                                                                                                                                                     |
| Tolerance ± [%]        | 5, 10                                                                                                                                                                                                                                                                                                                                                                                                           | 5, 10                                                                                                                                                                                                                                                                                                           | 5, 10                                                                                                                                                                                                                                     | 1, 5                                                                                                                                                                                                                                                                                                  | 1, 2, 5                                                                                                                                                                                                                                                                                                                                                                                | 1, 5                                                                                                                                                                                                                                                                                                                                                                                                         | 1, 5                                                                                                                                                                        |
| Load Life ± [%]        | 3                                                                                                                                                                                                                                                                                                                                                                                                               | 3                                                                                                                                                                                                                                                                                                               | 5                                                                                                                                                                                                                                         | 5                                                                                                                                                                                                                                                                                                     | 1,5 and 2                                                                                                                                                                                                                                                                                                                                                                              | 1,5                                                                                                                                                                                                                                                                                                                                                                                                          | 5                                                                                                                                                                           |
| Temperature Range [°C] | -55... +350                                                                                                                                                                                                                                                                                                                                                                                                     | -55... +350                                                                                                                                                                                                                                                                                                     | -55... +175                                                                                                                                                                                                                               | -55... +275                                                                                                                                                                                                                                                                                           | -55... +250                                                                                                                                                                                                                                                                                                                                                                            | -55... +200                                                                                                                                                                                                                                                                                                                                                                                                  | -55... +155                                                                                                                                                                 |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 16x4,5</li> <li>• 24x4,5</li> <li>• 32x4,5</li> </ul>                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• 18x10</li> <li>• 23,3x15</li> <li>• 33,4x25</li> <li>• 43,5x35</li> <li>• 53,7x45</li> </ul>                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• 9,9x3,6</li> <li>• 14,3x5,7</li> </ul>                                                                                                                                                           | <ul style="list-style-type: none"> <li>• 6,8x2,6</li> <li>• 10x3,9</li> <li>• 12,5x5</li> <li>• 13x5,5</li> <li>• 16,5x6</li> <li>• 18,5x7</li> <li>• 26x9</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>• 3,4x1,9</li> <li>• 6,3x2,4</li> <li>• 9,0x3,9</li> <li>• 11,5x4,5</li> <li>• 16,5x6</li> <li>• 20x9</li> </ul>                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• 12x5x4,5 (5020)</li> </ul>                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• 6,3x2,4</li> <li>• 9,0x3,3</li> <li>• 11,5x4,5</li> <li>• 15,5x5</li> </ul>                                                        |
| Packing                | Taped                                                                                                                                                                                                                                                                                                                                                                                                           | Bulk                                                                                                                                                                                                                                                                                                            | Taped                                                                                                                                                                                                                                     | Taped                                                                                                                                                                                                                                                                                                 | Taped                                                                                                                                                                                                                                                                                                                                                                                  | Blister                                                                                                                                                                                                                                                                                                                                                                                                      | Taped                                                                                                                                                                       |
| Features               | <ul style="list-style-type: none"> <li>• Noise suppressor version available</li> <li>• Pulse version available</li> <li>• Pre-forming available</li> </ul>                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Fiberglass core</li> <li>• PCB pluggable style</li> <li>• Pulse version available</li> </ul>                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• "Z" pre-forming</li> <li>• Pre-forming available</li> <li>• High insulation voltage</li> <li>• Fiberglass core</li> </ul>                                                                        | <ul style="list-style-type: none"> <li>• Low-cost type</li> <li>• "Z" pre-forming</li> <li>• Non-inductive type available</li> </ul>                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• High power dissipation 4[W]</li> <li>• Metal Oxide</li> </ul>                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Suitable for automatic pick and place</li> </ul>                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• High voltage</li> <li>• High pulse loading capability</li> <li>• VDE certified</li> </ul>                                          |
| Focus Applications     | <b>Consumer &amp; Electronics:</b> <ul style="list-style-type: none"> <li>• Blenders, Mixers</li> <li>• Toasters</li> </ul> <b>Automotive</b><br><b>Industrial:</b> <ul style="list-style-type: none"> <li>• Homs</li> <li>• Ignition</li> <li>• Instrument gauges</li> </ul> <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Electronic energy meters</li> <li>• Power supplies</li> </ul> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Electronic energy meters</li> <li>• Power supply</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controller</li> </ul> <b>General purpose</b><br><b>Consumer &amp; Electronics</b> | <b>Power &amp; Energy:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Power supplies</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Motor controllers</li> </ul> <b>General purpose</b> | <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Surge protection</li> <li>• Motor controller</li> </ul> <b>Consumer &amp; Electronics:</b> <ul style="list-style-type: none"> <li>• Consumer electronics</li> <li>• Power supply</li> <li>• Televisions</li> </ul> <b>General purpose</b> | <b>Automotive</b><br><b>Computer &amp; Peripherals:</b> <ul style="list-style-type: none"> <li>• X-Ray</li> <li>• Copiers</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Dividers</li> <li>• Power Supplies</li> <li>• Transformers</li> <li>• CRT's</li> </ul> <b>Other:</b> <ul style="list-style-type: none"> <li>• Medical electronic equipment</li> </ul> | <b>Computer &amp; Peripherals:</b> <ul style="list-style-type: none"> <li>• X-Ray</li> <li>• Copiers</li> </ul> <b>Industrial:</b> <ul style="list-style-type: none"> <li>• Multipliers</li> <li>• Dividers</li> <li>• Power Supplies</li> <li>• Transformers</li> <li>• CRT's</li> </ul> <b>Other:</b> <ul style="list-style-type: none"> <li>• Medical electronic equipment</li> <li>• Military</li> </ul> | <b>Consumer &amp; Electronics</b><br><b>Power &amp; Energy Other:</b> <ul style="list-style-type: none"> <li>• Lamp ballast</li> <li>• High humidity environment</li> </ul> |
| Datasheet              |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                              |                                                                                                                                                        |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |                                                                                        |

# PRODUCT SELECTION GUIDE

|                        | SHUNT                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | EBW                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                         |
|                        | SMD                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                     | TH                                                                                                                                                                                                                                                      |
| Product                |                                                                                                                                                                                        |                                                                                                                                                                                          |                                                                                                                                                                                                                   |                                                                                                                                                                                    |                                                                                                                                                                        |                                                                                                                                                                  |                                                                                                                                                                      |
|                        | CSB                                                                                                                                                                                                                                                                     | CSC                                                                                                                                                                                                                                                                       | CSD                                                                                                                                                                                                                                                                                                | CSF                                                                                                                                                                                                                                                                 | CSM                                                                                                                                                                                                                                                       | CST                                                                                                                                                                                                                                                 | CSU                                                                                                                                                                                                                                                     |
| Type                   | CSB251 to CSB593                                                                                                                                                                                                                                                        | CSC402                                                                                                                                                                                                                                                                    | CSD842 to CSD853                                                                                                                                                                                                                                                                                   | CSF363                                                                                                                                                                                                                                                              | CSM381 and CSM452                                                                                                                                                                                                                                         | CST121 and CST272                                                                                                                                                                                                                                   | CSU382                                                                                                                                                                                                                                                  |
| Historical Type        |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                         |
| Resistance Range       | 0R0001 up to 0R01                                                                                                                                                                                                                                                       | 0R0002 up to 0R005                                                                                                                                                                                                                                                        | 0R00005 up to 0R001                                                                                                                                                                                                                                                                                | 0R001 up to 0R01                                                                                                                                                                                                                                                    | 0R001 up to 0R025                                                                                                                                                                                                                                         | 0R0002 up to 0R005                                                                                                                                                                                                                                  | 0R0003 up to 0R002                                                                                                                                                                                                                                      |
| Rated Power [W]        | 1,4W up to 15W<br>(P70)                                                                                                                                                                                                                                                 | up to 12W<br>(P70)                                                                                                                                                                                                                                                        | 36W up to 50W<br>(P70)                                                                                                                                                                                                                                                                             | 3W<br>(P70)                                                                                                                                                                                                                                                         | 2W and 5W<br>(P70)                                                                                                                                                                                                                                        | 7W and 12W<br>(P70)                                                                                                                                                                                                                                 | 6W up to 10W<br>(P70)                                                                                                                                                                                                                                   |
| T. C [ppm/°C]          | depends on the ohmic value                                                                                                                                                                                                                                              | depends on the ohmic value                                                                                                                                                                                                                                                | depends on the ohmic value                                                                                                                                                                                                                                                                         | depends on the ohmic value                                                                                                                                                                                                                                          | depends on the ohmic value                                                                                                                                                                                                                                | depends on the ohmic value                                                                                                                                                                                                                          | depends on the ohmic value                                                                                                                                                                                                                              |
| Tolerance ± [%]        | 1, 3, 5                                                                                                                                                                                                                                                                 | 1, 3, 5                                                                                                                                                                                                                                                                   | 5, 10                                                                                                                                                                                                                                                                                              | 0,5, 1                                                                                                                                                                                                                                                              | 1, 3, 5                                                                                                                                                                                                                                                   | 1, 3, 5                                                                                                                                                                                                                                             | 1, 3, 5                                                                                                                                                                                                                                                 |
| Load Life ± [%]        |                                                                                                                                                                                                                                                                         | 1                                                                                                                                                                                                                                                                         | 1                                                                                                                                                                                                                                                                                                  | 1                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                         |
| Temperature Range [°C] | -55... +170                                                                                                                                                                                                                                                             | -55... +170                                                                                                                                                                                                                                                               | -55... +170                                                                                                                                                                                                                                                                                        | -65... +170                                                                                                                                                                                                                                                         | -55... +170                                                                                                                                                                                                                                               | -55... +170<br>-65... +170                                                                                                                                                                                                                          | -55... +170                                                                                                                                                                                                                                             |
| Size [mm]              | <ul style="list-style-type: none"><li>• 6,35x3,05 (2512)</li><li>• 10x5,2 (3921)</li><li>• 15x7,75 (5931)</li></ul>                                                                                                                                                     | <ul style="list-style-type: none"><li>• 10,1x6,6 (4026)</li></ul>                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>• 84x20 (8420)</li><li>• 85x18 (8518)</li><li>• 85x36 (8536)</li></ul>                                                                                                                                                                                       | <ul style="list-style-type: none"><li>• 9,14x6,5 (3637)</li></ul>                                                                                                                                                                                                   | <ul style="list-style-type: none"><li>• 11,18x3,5 (3812)</li><li>• 11,35x3,5 (4524)</li></ul>                                                                                                                                                             | <ul style="list-style-type: none"><li>• 3,1x1,9 (1216)</li><li>• 6,9x3,6 (2725)</li></ul>                                                                                                                                                           | <ul style="list-style-type: none"><li>• 8,3x5,3</li></ul>                                                                                                                                                                                               |
| Packing                | Blister Tape                                                                                                                                                                                                                                                            | Blister Tape                                                                                                                                                                                                                                                              | Blister Tape                                                                                                                                                                                                                                                                                       | Blister Tape                                                                                                                                                                                                                                                        | Blister Tape                                                                                                                                                                                                                                              | Blister Tape                                                                                                                                                                                                                                        | Vacuum Plastic Bags                                                                                                                                                                                                                                     |
| Features               | <ul style="list-style-type: none"><li>• Suitable for automatic pick and place</li><li>• High conductivity copper terminals</li><li>• Excellent long-term stability</li><li>• Flame resistance</li><li>• Solid metal construction</li><li>• AEC-Q200 certified</li></ul> | <ul style="list-style-type: none"><li>• Suitable for automatic pick and place</li><li>• Heavy copper connection</li><li>• 4-terminals connection</li><li>• Constant current up to 160 amp.</li><li>• Excellent long-term stability</li><li>• AEC-Q200 certified</li></ul> | <ul style="list-style-type: none"><li>• High conductivity copper terminals</li><li>• High current and pulse load capability</li><li>• Custome made shunts available</li><li>• Tinned terminals available on request</li><li>• Excellent long-term stability</li><li>• AEC-Q200 certified</li></ul> | <ul style="list-style-type: none"><li>• Suitable for automatic pick and place</li><li>• 4-terminals connection</li><li>• Solid metal construction</li><li>• Low thermal EMF</li><li>• Excellent frequency response to 50 MHz</li><li>• AEC-Q200 certified</li></ul> | <ul style="list-style-type: none"><li>• Solid metal construction</li><li>• High conductivity copper terminals</li><li>• 2 Watts permanent power</li><li>• Constant current up to 26 amp.</li><li>• Flame resistant</li><li>• AEC-Q200 certified</li></ul> | <ul style="list-style-type: none"><li>• Suitable for automatic pick and place</li><li>• 4-terminals connection</li><li>• Excellent long termo stability</li><li>• Suitable for mounting on DCB/IMS substrate</li><li>• AEC-Q200 certified</li></ul> | <ul style="list-style-type: none"><li>• Constant current up to 100 amp.</li><li>• High conductivity copper terminals</li><li>• Max. solder temperature up to 350°C/30s.</li><li>• Excellent long termo stability</li><li>• AEC-Q200 certified</li></ul> |
| Focus Applications     | Automotive<br><br>Industrial: <ul style="list-style-type: none"><li>• Alternative Energy</li><li>• Power supplies</li></ul> Computer & Peripherals <ul style="list-style-type: none"><li>• Chargers</li></ul>                                                           | Automotive<br><br>Industrial: <ul style="list-style-type: none"><li>• Alternative Energy</li><li>• Power supplies</li></ul> Computer & Peripherals <ul style="list-style-type: none"><li>• Chargers</li></ul>                                                             | Automotive<br><br>Industrial: <ul style="list-style-type: none"><li>• Alternative Energy</li><li>• Power supplies</li></ul> Computer & Peripherals <ul style="list-style-type: none"><li>• Chargers</li></ul>                                                                                      | Automotive<br><br>Industrial<br><br>Consumer & Electronics<br><br>Power & Energy<br><br>Computer & Peripherals                                                                                                                                                      | Automotive<br><br>Power & Energy<br><br>Computer & Peripherals                                                                                                                                                                                            | Automotive<br><br>Industrial<br><br>Power & Energy<br><br>Computer & Peripherals                                                                                                                                                                    | Automotive<br><br>Power & Energy<br><br>Computer & Peripherals                                                                                                                                                                                          |
| Datasheet              |                                                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                 |                                                                                                                                                                                  |                                                                                                                                                                      |                                                                                                                                                                |                                                                                                                                                                    |

# PRODUCT SELECTION GUIDE

|                        | SHUNT                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                       |                                                                                                                                                                    |                                                                                                                                                                                                                           | POWER                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                        |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | Flat Wire                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                       |                                                                                                                                                                    |                                                                                                                                                                                                                           | Wirewound                                                                                                                                                                                                                              |                                                                                                                                                                                                                                        |
|                        | TH                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                       |                                                                                                                                                                    | SMD                                                                                                                                                                                                                       | TH                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                        |
|                        |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                       |                                                                                                                                                                    |                                                                                                                                                                                                                           |                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                        |
| Product                |                                                                                                    |                                                                                                                                                                                                                            |                                                                                                                      |                                                                                   |                                                                                                                                        |                                                                                                                                                     |                                                                                                                                                     |
|                        | KNC                                                                                                                                                                                 | SLR                                                                                                                                                                                                                                                                                                         | KNS                                                                                                                                                                                                   | LPS                                                                                                                                                                | RWN                                                                                                                                                                                                                       | KHS                                                                                                                                                                                                                                    | KVS                                                                                                                                                                                                                                    |
| Type                   | KNC500 to KNC10A                                                                                                                                                                    | SLR200 to SLR10A                                                                                                                                                                                                                                                                                            | KNS100 TO KNS300                                                                                                                                                                                      | LPS-RP, LPS-RL and LPS-RH                                                                                                                                          | RWN502                                                                                                                                                                                                                    | KHS400 to KHS17A                                                                                                                                                                                                                       | KVS400 to KVS17A                                                                                                                                                                                                                       |
| Historical Type        | KN350-8 to KN354-8                                                                                                                                                                  | SLR2 to SLR10                                                                                                                                                                                                                                                                                               | KN350-0xx to KN353-0xx                                                                                                                                                                                | LPS355-0 to LPS359-xxx                                                                                                                                             | RWN5020                                                                                                                                                                                                                   | KH206-8 to KH218-8                                                                                                                                                                                                                     | KV206-3 to KV218-3                                                                                                                                                                                                                     |
| Resistance Range       | 0R003 up to 0R1                                                                                                                                                                     | 0R01 up to 3R3                                                                                                                                                                                                                                                                                              | 0R003 up to 0R12                                                                                                                                                                                      | 0R001 up to 0R068                                                                                                                                                  | 0R002 up to 0R05                                                                                                                                                                                                          | 0R051 up to 82K                                                                                                                                                                                                                        | 0R051 up to 82K                                                                                                                                                                                                                        |
| Rated Power [W]        | 4,5W up to 10W (P70)                                                                                                                                                                | 2W up to 10W (P70)                                                                                                                                                                                                                                                                                          | 1W up to 3W (P70)                                                                                                                                                                                     | depends on the value                                                                                                                                               | 2,2W (P25)<br>1,6W (P70)                                                                                                                                                                                                  | 4W up to 17W (P70)                                                                                                                                                                                                                     | 4W up to 17W (P70)                                                                                                                                                                                                                     |
| T. C [ppm/°C]          | depends on the ohmic value                                                                                                                                                          | 250                                                                                                                                                                                                                                                                                                         | depends on the ohmic value                                                                                                                                                                            | -80... +40<br>others upon request                                                                                                                                  | depends on the ohmic value                                                                                                                                                                                                | depends on the ohmic value                                                                                                                                                                                                             | depends on the ohmic value                                                                                                                                                                                                             |
| Tolerance ± [%]        | 1, 2, 3, 5                                                                                                                                                                          | 5, 10                                                                                                                                                                                                                                                                                                       | 1, 2, 3, 5                                                                                                                                                                                            | 5<br>others upon request                                                                                                                                           | 1, 5                                                                                                                                                                                                                      | 5, 10                                                                                                                                                                                                                                  | 5, 10                                                                                                                                                                                                                                  |
| Load Life ± [%]        | 3                                                                                                                                                                                   | 5                                                                                                                                                                                                                                                                                                           | 3                                                                                                                                                                                                     | 3                                                                                                                                                                  | 1                                                                                                                                                                                                                         | 3                                                                                                                                                                                                                                      | 3                                                                                                                                                                                                                                      |
| Temperature Range [°C] | -55... +250                                                                                                                                                                         | -25... +155                                                                                                                                                                                                                                                                                                 | -55... +300                                                                                                                                                                                           | -55... +300                                                                                                                                                        | -55 ... +200                                                                                                                                                                                                              | -55... +350                                                                                                                                                                                                                            | -55... +350                                                                                                                                                                                                                            |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 18x6,4</li> <li>• 25x6,4</li> <li>• 38x6,4</li> <li>• 25x9</li> <li>• 38x9</li> </ul>                                                      | <ul style="list-style-type: none"> <li>• 13x8x5</li> <li>• 13x13x5</li> <li>• 14x18x5</li> <li>• 26x10x5</li> <li>• 26x13x5</li> <li>• 26x18x5</li> <li>• 26x19x5,5</li> <li>• 26x20x5</li> </ul>                                                                                                           | <ul style="list-style-type: none"> <li>• 6,5x16</li> <li>• 8x21</li> <li>• 10,5x16</li> <li>• 17x16</li> <li>• 14,5x21</li> <li>• 12x26</li> <li>• 20x16</li> <li>• 18x21</li> <li>• 15x26</li> </ul> | Customized product                                                                                                                                                 | <ul style="list-style-type: none"> <li>• 12x5x4,5 (5020)</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>• 20x6,4</li> <li>• 25x6,4</li> <li>• 38x6,4</li> <li>• 25x9</li> <li>• 38x9</li> <li>• 50x9</li> <li>• 75x9</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>• 20x7</li> <li>• 25x7</li> <li>• 38x7</li> <li>• 25x9</li> <li>• 38x9</li> <li>• 50x9</li> <li>• 75x9</li> </ul>                                                                               |
| Packing                | Taped and Bulk                                                                                                                                                                      | Bulk                                                                                                                                                                                                                                                                                                        | Bulk                                                                                                                                                                                                  | Vacuum                                                                                                                                                             | Blister                                                                                                                                                                                                                   | Bulk / Taped                                                                                                                                                                                                                           | Bulk                                                                                                                                                                                                                                   |
| Features               | <ul style="list-style-type: none"> <li>• All welded construction</li> <li>• Very low inductance</li> <li>• High power to size ratio</li> <li>• Superior surge capability</li> </ul> | <ul style="list-style-type: none"> <li>• All welded construction</li> <li>• Very low inductance</li> <li>• Excellent frequency response</li> </ul>                                                                                                                                                          | <ul style="list-style-type: none"> <li>• All welded construction</li> <li>• Very low inductance</li> <li>• Open frame design</li> <li>• Solderable terminals</li> <li>• AEC-Q200 certified</li> </ul> | <ul style="list-style-type: none"> <li>• Very low inductance</li> <li>• Open frame design</li> <li>• Solderable terminals</li> <li>• AEC-Q200 certified</li> </ul> | <ul style="list-style-type: none"> <li>• Suitable for automatic pick and place</li> <li>• All welded construction</li> <li>• Non-inductive style</li> <li>• Small package size</li> <li>• Molded encapsulation</li> </ul> | <ul style="list-style-type: none"> <li>• Pulse version available</li> <li>• Other preforming available</li> </ul>                                                                                                                      | <ul style="list-style-type: none"> <li>• Pulse version available</li> <li>• Other preforming available</li> </ul>                                                                                                                      |
| Focus Applications     | Automotive<br><br>Industrial<br><br>Consumer & Electronics<br><br>Power & Energy<br><br>Computer & Peripherals                                                                      | Industrial <ul style="list-style-type: none"> <li>• Switch controls</li> <li>• Power supplies</li> <li>• Fans</li> </ul> Automotive <ul style="list-style-type: none"> <li>• Air bags</li> <li>• DC/DC converters</li> </ul> Power & Energy <ul style="list-style-type: none"> <li>• Wind energy</li> </ul> | Automotive<br><br>Industrial<br><br>Power & Energy <ul style="list-style-type: none"> <li>• Alternative Energy</li> </ul>                                                                             | Automotive<br><br>Industrial<br><br>Consumer & Electronics<br><br>Power & Energy<br><br>Computer & Peripherals                                                     | Automotive<br><br>Industrial<br><br>Consumer & Electronics<br><br>Power & Energy<br><br>Computer & Peripherals                                                                                                            | Industrial <ul style="list-style-type: none"> <li>• Capacitor charging</li> <li>• Ultrasonic cleaning machines</li> <li>• Ultrasonic plastic welding machines</li> </ul> Consumer & Electronics<br><br>Other:<br>Maritime applications | Industrial <ul style="list-style-type: none"> <li>• Capacitor charging</li> <li>• Ultrasonic cleaning machines</li> <li>• Ultrasonic plastic welding machines</li> </ul> Consumer & Electronics<br><br>Other:<br>Maritime applications |
| Datasheet              |                                                                                                  |                                                                                                                                                                                                                          |                                                                                                                    |                                                                                 |                                                                                                                                      |                                                                                                                                                   |                                                                                                                                                   |

# PRODUCT SELECTION GUIDE

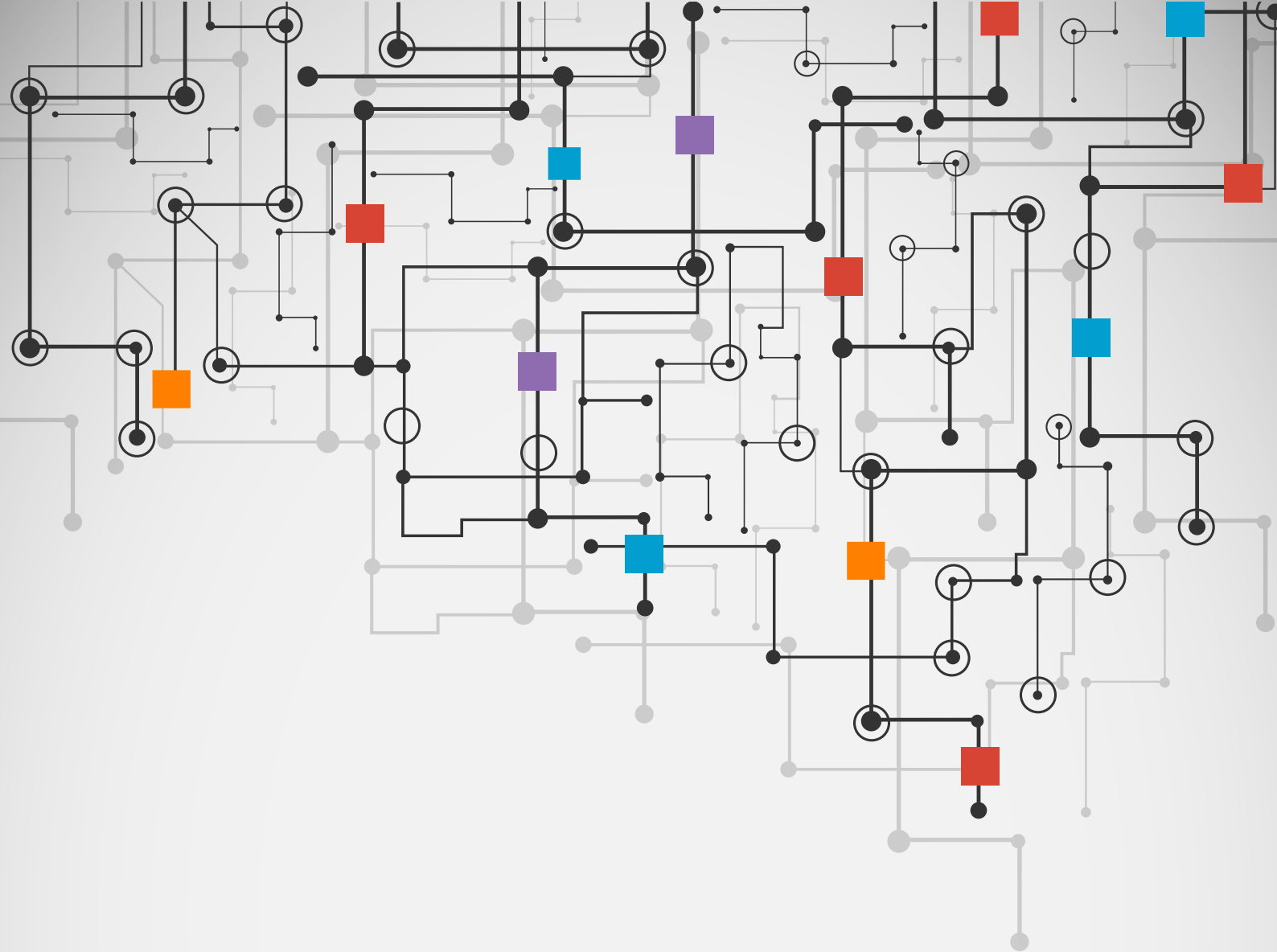
| POWER                  |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                   |                                                                                                                                                          |                                                                                                                                                             |                                                                                                                                                             |                                                                                                                                                                          |                                                                                                                                                                                                                  |                                                                                                                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wirewound              |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                   |                                                                                                                                                          |                                                                                                                                                             |                                                                                                                                                             |                                                                                                                                                                          |                                                                                                                                                                                                                  |                                                                                                                                                                                                                  |
| TH                     |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                   |                                                                                                                                                          |                                                                                                                                                             |                                                                                                                                                             |                                                                                                                                                                          |                                                                                                                                                                                                                  |                                                                                                                                                                                                                  |
| Product                |                                                                                                                                                                                                                     |                                                                                                                  |                                                                        |                                                                                                                                                             |                                                                                                                                                             |                                                                                       |                                                                                                                                                                                                                  |                                                                                                                                                                                                                  |
|                        | KWA                                                                                                                                                                                                                                                                                                  | KWP                                                                                                                                                                                               |                                                                                                                                                          | KVV                                                                                                                                                         |                                                                                                                                                             |                                                                                                                                                                          | KWH                                                                                                                                                                                                              |                                                                                                                                                                                                                  |
| Type                   | KWA15A to KWA40A                                                                                                                                                                                                                                                                                     | KWP370 to KWP20A<br>Fiberglass core                                                                                                                                                               | KWP300 to KWP20A<br>Ceramic Core                                                                                                                         | KVV200 to KVV10A<br>Ceramic Core                                                                                                                            | KVV200 to KVV10A<br>Non-inductive                                                                                                                           | KVV200 to KVV10A<br>Fiberglass core                                                                                                                                      | KWH160 to KWH40A<br>Ceramic Core                                                                                                                                                                                 | KWH160 to KWH40A<br>Non-Inductive                                                                                                                                                                                |
| Historical Type        | KWA15 to KWA40                                                                                                                                                                                                                                                                                       | KWP330-x to KWP338-x                                                                                                                                                                              | KWP330-0 to KWP339-0                                                                                                                                     | KVV302-0 to KVV310-0                                                                                                                                        | KVV302-2 to KVV310-2                                                                                                                                        | KVV302-3 to KVV310-3                                                                                                                                                     | KWH01 to KWH40                                                                                                                                                                                                   | KWH01002 to KWH40002                                                                                                                                                                                             |
| Resistance Range       | 0R51 up to 10K                                                                                                                                                                                                                                                                                       | 0R2 up to 10K                                                                                                                                                                                     | 0R3 up to 750R                                                                                                                                           | 0R03 up to 510R                                                                                                                                             | 0R08 up to 100R                                                                                                                                             | 0R1 up to 16K                                                                                                                                                            | 0R015 up to 1K                                                                                                                                                                                                   | 0R033 up to 160R                                                                                                                                                                                                 |
| Rated Power [W]        | 15W up to 40W<br>(P <sub>70</sub> )                                                                                                                                                                                                                                                                  | 3W up to 20W (P <sub>25</sub> )<br>2,5W up to 16,4W (P <sub>70</sub> )                                                                                                                            | 3,7W up to 20W (P <sub>25</sub> )<br>3,4W up to 18W (P <sub>40</sub> )                                                                                   | 2W up to 10W<br>(P <sub>70</sub> )                                                                                                                          | 2W up to 10W<br>(P <sub>70</sub> )                                                                                                                          | 2W up to 10W<br>(P <sub>70</sub> )                                                                                                                                       | 1,6W up to 40W (P <sub>25</sub> )<br>1W up to 26,2W (P <sub>70</sub> )                                                                                                                                           | 1,6W up to 40W (P <sub>25</sub> )<br>1W up to 26,2W (P <sub>70</sub> )                                                                                                                                           |
| T. C [ppm/°C]          | 250                                                                                                                                                                                                                                                                                                  | -80 to +500                                                                                                                                                                                       | 300                                                                                                                                                      | 300                                                                                                                                                         | 300                                                                                                                                                         | -80 to +500                                                                                                                                                              | 300                                                                                                                                                                                                              | 300                                                                                                                                                                                                              |
| Tolerance ± [%]        | 5, 10                                                                                                                                                                                                                                                                                                | 5, 10                                                                                                                                                                                             | 5, 10                                                                                                                                                    | 5                                                                                                                                                           | 5                                                                                                                                                           | 5                                                                                                                                                                        | 5                                                                                                                                                                                                                | 5                                                                                                                                                                                                                |
| Load Life ± [%]        | 5                                                                                                                                                                                                                                                                                                    | 3                                                                                                                                                                                                 | 5                                                                                                                                                        | 5                                                                                                                                                           | 5                                                                                                                                                           | 3                                                                                                                                                                        | 5                                                                                                                                                                                                                | 5                                                                                                                                                                                                                |
| Temperature Range [°C] | -55... +350                                                                                                                                                                                                                                                                                          | -55... +275                                                                                                                                                                                       | -55... +155                                                                                                                                              | -55... +155                                                                                                                                                 | -55... +155                                                                                                                                                 | -55... +275                                                                                                                                                              | -55... +155                                                                                                                                                                                                      | -55... +155                                                                                                                                                                                                      |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 48x13</li> <li>• 63,5x13</li> <li>• 75x19</li> <li>• 90x19</li> </ul>                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>• 23x10</li> <li>• 25x10</li> <li>• 28x10</li> <li>• 35x10</li> <li>• 35x10</li> <li>• 43x10</li> <li>• 48x10</li> <li>• 50x13</li> <li>• 65x13</li> </ul> | <ul style="list-style-type: none"> <li>• 24x9</li> <li>• 28x10</li> <li>• 35x10</li> <li>• 48x9,5</li> <li>• 48x12,5</li> <li>• 63x12,5</li> </ul>       | <ul style="list-style-type: none"> <li>• 20x11x7</li> <li>• 25x12x8</li> <li>• 25x13x9</li> <li>• 39x13x9</li> <li>• 35x16x12</li> <li>• 51x13x9</li> </ul> | <ul style="list-style-type: none"> <li>• 20x11x7</li> <li>• 25x12x8</li> <li>• 25x13x9</li> <li>• 39x13x9</li> <li>• 35x16x12</li> <li>• 51x13x9</li> </ul> | <ul style="list-style-type: none"> <li>• 20,5x11x7</li> <li>• 25x12x8</li> <li>• 26x13x9</li> <li>• 39x13x9,5</li> <li>• 35x16x12</li> <li>• 51x13x9,5</li> </ul>        | <ul style="list-style-type: none"> <li>• 13x5,5x5,5</li> <li>• 22x8x8</li> <li>• 35x9,5x9</li> <li>• 48x9,5x9</li> <li>• 48x12,5x12,5</li> <li>• 60x12,5x12,5</li> <li>• 77x18x17</li> <li>• 90x19x18</li> </ul> | <ul style="list-style-type: none"> <li>• 13x5,5x5,5</li> <li>• 22x8x8</li> <li>• 35x9,5x9</li> <li>• 48x9,5x9</li> <li>• 48x12,5x12,5</li> <li>• 60x12,5x12,5</li> <li>• 77x18x17</li> <li>• 90x19x18</li> </ul> |
| Packing                | Bulk                                                                                                                                                                                                                                                                                                 | Bulk                                                                                                                                                                                              | Bulk                                                                                                                                                     | Bulk                                                                                                                                                        | Bulk                                                                                                                                                        | Bulk                                                                                                                                                                     | Bulk                                                                                                                                                                                                             | Bulk                                                                                                                                                                                                             |
| Features               | <ul style="list-style-type: none"> <li>• High pulse capability version available</li> <li>• Chassis mounted</li> <li>• AMP connection</li> </ul>                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Pulse version available</li> <li>• PCB pluggable style</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>• Pulse version available</li> <li>• PCB pluggable style</li> </ul>                                               | <ul style="list-style-type: none"> <li>• Ceramic core</li> <li>• Board space saving</li> <li>• High power to size ratio</li> </ul>                          | <ul style="list-style-type: none"> <li>• Non-inductive style</li> <li>• Board space saving</li> <li>• High power to size ratio</li> </ul>                   | <ul style="list-style-type: none"> <li>• Fiberglass core</li> <li>• Pulse version available</li> <li>• Board space saving</li> <li>• High power to size ratio</li> </ul> | <ul style="list-style-type: none"> <li>• Ceramic core</li> <li>• Board space saving</li> <li>• High power to size ratio</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>• Non-inductive style</li> <li>• Board space saving</li> <li>• High power to size ratio</li> </ul>                                                                        |
| Focus Applications     | <b>Automotive</b> <ul style="list-style-type: none"> <li>• Electrical cars</li> <li>• Voltage drop solution</li> <li>• Motor controls</li> </ul> <b>Industrial</b> <ul style="list-style-type: none"> <li>• Load resistors</li> <li>• Inrush current limiter</li> <li>• Motor controllers</li> </ul> | <b>Industrial</b> <ul style="list-style-type: none"> <li>• Power supply</li> <li>• Motor controllers</li> <li>• Inrush and surge applications</li> </ul>                                          | <b>Industrial</b> <ul style="list-style-type: none"> <li>• Power supply</li> <li>• Motor controllers</li> <li>• Inrush and surge applications</li> </ul> | <b>Industrial</b><br><b>Consumer &amp; Electronics</b><br><b>Power &amp; Energy</b>                                                                         | <b>Industrial</b><br><b>Consumer &amp; Electronics</b><br><b>Power &amp; Energy</b>                                                                         | <b>Industrial</b><br><b>Consumer &amp; Electronics</b><br><b>Power &amp; Energy</b>                                                                                      | <b>Automotive</b><br><b>Industrial</b><br><b>Consumer &amp; Electronics</b><br><b>Power &amp; Energy</b>                                                                                                         | <b>Automotive</b><br><b>Industrial</b><br><b>Consumer &amp; Electronics</b><br><b>Power &amp; Energy</b>                                                                                                         |
| Datasheet              |                                                                                                                                                                                                                   |                                                                                                                |                                                                       |                                                                          |                                                                          |                                                                                     |                                                                                                                             |                                                                                                                             |

# PRODUCT SELECTION GUIDE

|                        | POWER                                                                                                                                                                                                            |                                                                                                                                                                                                        |                                                                                                                                                                                                                  |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                |                                                                                                                                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | Film                                                                                                                                                                                                             |                                                                                                                                                                                                        |                                                                                                                                                                                                                  | Wirewound                                                                                                                                                                                                                            |                                                                                                                                                                                                                |                                                                                                                                                                                                                |                                                                                                                                                                                                                |
|                        | TH                                                                                                                                                                                                               |                                                                                                                                                                                                        |                                                                                                                                                                                                                  | TH                                                                                                                                                                                                                                   |                                                                                                                                                                                                                |                                                                                                                                                                                                                |                                                                                                                                                                                                                |
| Product                |                                                                                                                                 |                                                                                                                       |                                                                                                                                 |                                                                                                                                                   |                                                                                                                                                                                                                |                                                                                                                                                                                                                |                                                                                                                                                                                                                |
|                        | KWP                                                                                                                                                                                                              | KWV                                                                                                                                                                                                    | KWH                                                                                                                                                                                                              | RXH                                                                                                                                                                                                                                  |                                                                                                                                                                                                                |                                                                                                                                                                                                                |                                                                                                                                                                                                                |
| Type                   | KWP300 to KWP10A Metaloxide                                                                                                                                                                                      | KWV200 to KWV10A Metaloxide                                                                                                                                                                            | KWH160 to KWH40A Metaloxide                                                                                                                                                                                      | RXH40A to RXH50B                                                                                                                                                                                                                     | RXH60B to RXH18C                                                                                                                                                                                               | RXH20C                                                                                                                                                                                                         | RXH30C                                                                                                                                                                                                         |
| Historical Type        | KWP330-X03 to KWP336-X03                                                                                                                                                                                         | KWV302-303 to KWV310-303                                                                                                                                                                               | KWH01003 to KWH40003                                                                                                                                                                                             | RXLG40 to RXLG500                                                                                                                                                                                                                    | RXLG600 to RXLG1800                                                                                                                                                                                            | RXLG2000                                                                                                                                                                                                       | RXLG3000                                                                                                                                                                                                       |
| Resistance Range       | 390R up to 100K                                                                                                                                                                                                  | 390R up to 100K                                                                                                                                                                                        | 30R up to 1M                                                                                                                                                                                                     | 0R5 up to 6K2                                                                                                                                                                                                                        | 0R1 up to 150R                                                                                                                                                                                                 | 1R5                                                                                                                                                                                                            | 1R5                                                                                                                                                                                                            |
| Rated Power [W]        | 3W up to 10W (P <sub>25</sub> )<br>2,5W up to 8,2W (P <sub>70</sub> )                                                                                                                                            | 2W up to 10W (P <sub>70</sub> )                                                                                                                                                                        | 1,6W up to 40W (P <sub>25</sub> )<br>1W up to 26,2W (P <sub>70</sub> )                                                                                                                                           | 40W to 500W (P <sub>25</sub> )                                                                                                                                                                                                       | 600W to 1800W (P <sub>70</sub> )                                                                                                                                                                               | 2000W (P <sub>70</sub> )                                                                                                                                                                                       | 3000W (P <sub>70</sub> )                                                                                                                                                                                       |
| T. C [ppm/°C]          | 250                                                                                                                                                                                                              | 250                                                                                                                                                                                                    | 300                                                                                                                                                                                                              | 260                                                                                                                                                                                                                                  | 400                                                                                                                                                                                                            | 400                                                                                                                                                                                                            | 400                                                                                                                                                                                                            |
| Tolerance ± [%]        | 5                                                                                                                                                                                                                | 2, 5                                                                                                                                                                                                   | 5                                                                                                                                                                                                                | 5, 10                                                                                                                                                                                                                                | 5, 10                                                                                                                                                                                                          | 5                                                                                                                                                                                                              | 5                                                                                                                                                                                                              |
| Load Life ± [%]        | 5                                                                                                                                                                                                                | 5                                                                                                                                                                                                      | 5                                                                                                                                                                                                                | 5                                                                                                                                                                                                                                    | 5                                                                                                                                                                                                              | 5                                                                                                                                                                                                              | 5                                                                                                                                                                                                              |
| Temperature Range [°C] | -55... +235                                                                                                                                                                                                      | -55... +235                                                                                                                                                                                            | -55... +155                                                                                                                                                                                                      | -40... +300                                                                                                                                                                                                                          | -40... +300                                                                                                                                                                                                    | -20... +300                                                                                                                                                                                                    | -20... +300                                                                                                                                                                                                    |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 23x9,8x10</li> <li>• 25x9,8x12,5</li> <li>• 28x9,8x15</li> <li>• 35x9,8x22,5</li> <li>• 43x9,8x32,5</li> <li>• 48x9,8x35</li> </ul>                                     | <ul style="list-style-type: none"> <li>• 20,5x11x7</li> <li>• 25x12x8</li> <li>• 26x13x9</li> <li>• 39x13x9,5</li> <li>• 35x16x12</li> <li>• 51x13x9,5</li> </ul>                                      | <ul style="list-style-type: none"> <li>• 13x5,5x5,5</li> <li>• 22x8x8</li> <li>• 35x9,5x9</li> <li>• 48x9,5x9</li> <li>• 48x12,5x12,5</li> <li>• 60x12,5x12,5</li> <li>• 77x18x17</li> <li>• 90x19x18</li> </ul> | <ul style="list-style-type: none"> <li>• 95x40x20</li> <li>• 118x40x20</li> <li>• 150x40x20</li> <li>• 190x40x20</li> <li>• 215x40x20</li> <li>• 165x60x30</li> <li>• 215x60x30</li> <li>• 265x60x30</li> <li>• 335x60x30</li> </ul> | <ul style="list-style-type: none"> <li>• 355x61x59</li> <li>• 350x107x50</li> <li>• 400x107x50</li> <li>• 450x107x50</li> <li>• 485x107x50</li> <li>• 500x107x50</li> </ul>                                    | <ul style="list-style-type: none"> <li>• 397x365x182</li> </ul>                                                                                                                                                | <ul style="list-style-type: none"> <li>• 795x304x141,5</li> </ul>                                                                                                                                              |
| Packing                | Bulk                                                                                                                                                                                                             | Bulk                                                                                                                                                                                                   | Bulk                                                                                                                                                                                                             | Bulk                                                                                                                                                                                                                                 | Bulk                                                                                                                                                                                                           | Bulk                                                                                                                                                                                                           | Bulk                                                                                                                                                                                                           |
| Features               | <ul style="list-style-type: none"> <li>• Pulse version available</li> <li>• PCB pluggable style</li> </ul>                                                                                                       | <ul style="list-style-type: none"> <li>• Heat and flame resistant</li> <li>• Insulated</li> <li>• High resistance value</li> <li>• High power vs compact size</li> <li>• Board space saving</li> </ul> | <ul style="list-style-type: none"> <li>• Heat and flame resistant</li> <li>• Insulated</li> <li>• High resistance value</li> <li>• High power vs compact size</li> </ul>                                         | <ul style="list-style-type: none"> <li>• Heat and mechanical shock protected</li> <li>• Aluminium house brake resistor</li> <li>• Other ohmic values available upon request</li> </ul>                                               | <ul style="list-style-type: none"> <li>• Heat and mechanical shock protected</li> <li>• Aluminium house brake resistor</li> <li>• High voltage</li> <li>• Other ohmic values available upon request</li> </ul> | <ul style="list-style-type: none"> <li>• Heat and mechanical shock protected</li> <li>• Aluminium house brake resistor</li> <li>• High voltage</li> <li>• Other ohmic values available upon request</li> </ul> | <ul style="list-style-type: none"> <li>• Heat and mechanical shock protected</li> <li>• Aluminium house brake resistor</li> <li>• High voltage</li> <li>• Other ohmic values available upon request</li> </ul> |
| Focus Applications     | Automotive<br><br>Industrial <ul style="list-style-type: none"> <li>• Power supply</li> <li>• Motor controllers</li> <li>• Inrush and surge applications</li> </ul> Consumer & Electronics<br><br>Power & Energy | Automotive<br><br>Industrial<br><br>Consumer & Electronics<br><br>Power & Energy                                                                                                                       | Automotive<br><br>Industrial<br><br>Consumer & Electronics<br><br>Power & Energy                                                                                                                                 | Industrial<br><br>Power & Energy                                                                                                                                                                                                     | Industrial<br><br>Power & Energy                                                                                                                                                                               | Industrial<br><br>Power & Energy                                                                                                                                                                               | Industrial<br><br>Power & Energy                                                                                                                                                                               |
| Datasheet              |                                                                                                                               |                                                                                                                     |                                                                                                                               |                                                                                                                                                   |                                                                                                                           |                                                                                                                           |                                                                                                                           |

# PRODUCT SELECTION GUIDE

|                        | POWER                                                                                                                                             |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                    |                                                                                                                                                                     | JUMPER                                                                                                                                                                                           |                                                                                                                    |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                        | Wirewound                                                                                                                                         |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                    |                                                                                                                                                                     |                                                                                                                                                                                                  |                                                                                                                    |
|                        | TH                                                                                                                                                |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                    |                                                                                                                                                                     | TH                                                                                                                                                                                               | SMD                                                                                                                |
| Product                |                                                                  |                                                                                                                                                                     |                                                                                                                   |                                                                                    |                                                                                                                |                                 |
|                        | RXL                                                                                                                                               | REA                                                                                                                                                                                                                                                  | REB                                                                                                                                                                                                | BRU                                                                                                                                                                 | ZOM                                                                                                                                                                                              | CSB                                                                                                                |
| Type                   | RXL60A to RXL12B                                                                                                                                  | REA750 to REA25B                                                                                                                                                                                                                                     | REB75A to REB50B                                                                                                                                                                                   | BRU20C to BRU20D                                                                                                                                                    | ZOM065                                                                                                                                                                                           | CSB120                                                                                                             |
| Historical Type        | RXL60 to RXL120                                                                                                                                   | RE605 to RE650N                                                                                                                                                                                                                                      |                                                                                                                                                                                                    | BRU2KW to BRU20KW                                                                                                                                                   | ZOM0207                                                                                                                                                                                          | ZO1206                                                                                                             |
| Resistance Range       | 1R up to 10K                                                                                                                                      | 0R1 up to 30K                                                                                                                                                                                                                                        | 0R01 up to 82K                                                                                                                                                                                     | 0R4 up to 1K                                                                                                                                                        | 1R up to 10K                                                                                                                                                                                     | 0R                                                                                                                 |
| Rated Power [W]        | 60W up to 120W (P <sub>70</sub> )                                                                                                                 | 7,5W up to 250W (P <sub>25</sub> )                                                                                                                                                                                                                   | 75W up to 500W (P <sub>25</sub> )                                                                                                                                                                  | 2,4W up to 20W (P <sub>40</sub> )                                                                                                                                   | N/A                                                                                                                                                                                              | N/A                                                                                                                |
| T. C [ppm/°C]          | 200                                                                                                                                               | depends on the ohmic value                                                                                                                                                                                                                           | depends on the ohmic value                                                                                                                                                                         | depends on the ohmic value                                                                                                                                          | N/A                                                                                                                                                                                              | N/A                                                                                                                |
| Tolerance ± [%]        | 5, 10                                                                                                                                             | 0,25, 0,5, 1, 5, 10                                                                                                                                                                                                                                  | 1, 2, 5, 10                                                                                                                                                                                        | 5, 10<br>(for values below 1R only tol. 10%)                                                                                                                        | N/A                                                                                                                                                                                              | N/A                                                                                                                |
| Load Life ± [%]        | 3                                                                                                                                                 | 5                                                                                                                                                                                                                                                    | 5                                                                                                                                                                                                  | N/A                                                                                                                                                                 | N/A                                                                                                                                                                                              | N/A                                                                                                                |
| Temperature Range [°C] | -40... +300                                                                                                                                       | -55... +250                                                                                                                                                                                                                                          | -55... +275                                                                                                                                                                                        | -55... +220                                                                                                                                                         | -55... +175                                                                                                                                                                                      | N/A                                                                                                                |
| Size [mm]              | <ul style="list-style-type: none"> <li>• 100x30x13</li> <li>• 150x34x21</li> <li>• 182x42x21</li> </ul>                                           | <ul style="list-style-type: none"> <li>• 15,2x12,5x8,5</li> <li>• 19x15,9x10,7</li> <li>• 27x19,8x14</li> <li>• 50x21,4x16</li> <li>• 89x57,2x46</li> <li>• 114x64x54</li> </ul>                                                                     | <ul style="list-style-type: none"> <li>• 65,5x27x26</li> <li>• 98x27x26</li> <li>• 130x27x26</li> <li>• 92x46,5x45</li> <li>• 112x46,5x45</li> <li>• 130x46,5x45</li> <li>• 204x46,5x45</li> </ul> | <ul style="list-style-type: none"> <li>• 251x500x147</li> <li>• 381x500x161</li> <li>• 341x600x172</li> <li>• 410,5x685x172</li> <li>• 410,5x685x344</li> </ul>     | <ul style="list-style-type: none"> <li>• 6,4x2,3x0,65</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>• 33X16</li> </ul>                                                          |
| Packing                | Bulk                                                                                                                                              | Bulk                                                                                                                                                                                                                                                 | Bulk                                                                                                                                                                                               | Bulk                                                                                                                                                                | Taped                                                                                                                                                                                            | Blister                                                                                                            |
| Features               | <ul style="list-style-type: none"> <li>• Chassis mounting</li> <li>• Excellent heat resistance</li> <li>• Compact size vs power rating</li> </ul> | <ul style="list-style-type: none"> <li>• Aluminium housing with excellent heat dissipation</li> <li>• Mount on chassis to utilize heat-sink effect</li> <li>• Excellent ratio power vs dimension</li> <li>• Non-inductive style available</li> </ul> | <ul style="list-style-type: none"> <li>• High insulating capacity</li> <li>• High power rating with small size</li> </ul>                                                                          | <ul style="list-style-type: none"> <li>• Heat-protector</li> <li>• High Voltage capability</li> <li>• Brake Resistor</li> <li>• RoHs and REACH Compliant</li> </ul> | <ul style="list-style-type: none"> <li>• High insulation voltage</li> <li>• Tape and reel packing</li> <li>• Compatible for automatic insertion</li> <li>• RoHS &amp; REACH Compliant</li> </ul> | <ul style="list-style-type: none"> <li>• Automatic pick and place</li> <li>• RoHs &amp; REACH Compliant</li> </ul> |
| Focus Applications     | Automotive<br>Industrial<br>Consumer & Electronics<br>Power & Energy                                                                              | Automotive<br>Industrial<br>Consumer & Electronics<br>Power & Energy                                                                                                                                                                                 | Automotive<br>Industrial<br>Power & Energy                                                                                                                                                         | Industrial<br>Power & Energy                                                                                                                                        | Automotive<br>Industrial<br>Power & Energy                                                                                                                                                       | Automotive<br>Industrial<br>Power & Energy                                                                         |
| Datasheet              |                                                                |                                                                                                                                                                   |                                                                                                                 |                                                                                  |                                                                                                             |                               |



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