**Dimensions: [mm]**

- 1.4 ±0.25
- 1.4 ±0.25
- 1.4 ±0.25
- 3.5 ±0.15
- 6.3 ±0.25

**Electrical Properties:**

<table>
<thead>
<tr>
<th>Properties</th>
<th>Test conditions</th>
<th>Value</th>
<th>Unit</th>
<th>Tol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance R</td>
<td>@ 70 °C</td>
<td>0.007</td>
<td>Ω</td>
<td>±1%</td>
</tr>
<tr>
<td>Rated Power P_Rated</td>
<td></td>
<td>1</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Temperature Coefficient of Resistance (min.) TCR</td>
<td></td>
<td>100 ppm/ °C</td>
<td>max.</td>
<td></td>
</tr>
<tr>
<td>Temperature Coefficient of Resistance (max.) TCR</td>
<td></td>
<td>100 ppm/ °C</td>
<td>max.</td>
<td></td>
</tr>
<tr>
<td>Rated Current I_R</td>
<td></td>
<td>12</td>
<td>A</td>
<td>max.</td>
</tr>
<tr>
<td>Rated Voltage U_R</td>
<td></td>
<td>83.7</td>
<td>mV</td>
<td>max.</td>
</tr>
</tbody>
</table>

**General Information:**

- **Resistance Element Type**: Fe - Cr
- **Resistor Technology**: Metal Plate Resistors
- **Operating Temperature**: -55 up to +155 °C
- **Storage Conditions**: (in original packaging) 5 °C - 35 °C; 25 % up to 75 % RH
- **Moisture Sensitivity Level (MSL)**: 1
  - Test conditions of Electrical Properties: +20 °C, 35 % RH if not specified differently
  - FIT according to separate documentation
  - Component conform to REACh and RoHS requirements and standards

**Schematic:**

- Fe - Cr
- Metal Plate Resistors
- WRIS-PSMB Metal Plate Resistors

---

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where failures of the product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik eiSos GmbH & Co KG products are neither designed nor intended for use in areas such as military, aerospace, aviation, nuclear control, automative, transportation (railway-centre, telecommunications control), medical control, ship control, transportation (railway-centre, medical, public institutions network etc). Würth Elektronik eiSos GmbH & Co KG shall not be held responsible about the risk of such usage before the design in usage. In addition, sufficient reliability evaluation checks for usage must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.
### Mechanical Properties:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination plating</td>
<td>Ni/Cu/Ni/Sn</td>
</tr>
<tr>
<td>Adhesive Strength of Termination</td>
<td>60 ± 1 sec; 17.7N</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>5 g for 20 minutes, 12 cycles each of 3 orientations @ 10 - 2000 - 10 Hz</td>
</tr>
<tr>
<td>Resistance to Solder Heat</td>
<td>Solder Temperature 260°C ± 5°C</td>
</tr>
<tr>
<td>Dipping Time</td>
<td>No dipping</td>
</tr>
<tr>
<td>Specific</td>
<td>Refer to Soldering Profile</td>
</tr>
</tbody>
</table>

**Derating Curve:**

- **Area of recommended operation**
- **Ambient temperature (°C):**
  - 70°C
  - 155°C
  - -55°C

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorised for use in equipment where a higher safety standard and reliability standard is especially required or wherein failures of the product are reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover, Würth Elektronik eiSos GmbH & Co. KG products are neither designed nor intended for use in areas such as military, aerospace, atomic control, astrophysics, transportation/ground-based transmission, medical/health, space systems, or any other areas. Würth Elektronik eiSos GmbH & Co. KG must be informed about the intent of such usage before the design or usage. In addition, sufficient reliability evaluation checks for usage must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.
Classification Reflow Soldering Profile:

<table>
<thead>
<tr>
<th>Profile Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat Temperature Min</td>
<td>$T_s^{\text{min}}$ 150 °C</td>
</tr>
<tr>
<td>Preheat Temperature Max</td>
<td>$T_s^{\text{max}}$ 200 °C</td>
</tr>
<tr>
<td>Preheat Time $t_p$ from $T_s^{\text{min}}$ to $T_s^{\text{max}}$</td>
<td>$t_p$ 60 - 120 seconds</td>
</tr>
<tr>
<td>Ramp-up Rate ($T_L$ to $T_P$)</td>
<td>3 °C/second max.</td>
</tr>
<tr>
<td>Liquidous Temperature</td>
<td>$T_L$ 217 °C</td>
</tr>
<tr>
<td>Time $t_L$ maintained above $T_L$</td>
<td>$t_L$ 60 - 150 seconds</td>
</tr>
<tr>
<td>Peak package body temperature</td>
<td>$T_P$ see table below</td>
</tr>
<tr>
<td>Time within 5°C of actual peak temperaure</td>
<td>$t_p$ 20 - 30 seconds</td>
</tr>
<tr>
<td>Ramp-down Rate ($T_L$ to $T_P$)</td>
<td>6 °C/second max.</td>
</tr>
<tr>
<td>Time 25°C to peak temperature</td>
<td>8 minutes max.</td>
</tr>
</tbody>
</table>

refer to IPC/ JEDEC J-STD-020E

Package Classification Reflow Temperature:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Volume mm$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume mm$^3$</td>
<td>&lt;350 350-2000 &gt;2000</td>
</tr>
<tr>
<td></td>
<td>300-2000 245 °C</td>
</tr>
<tr>
<td></td>
<td>260 °C 250 °C</td>
</tr>
<tr>
<td></td>
<td>260 °C 245 °C</td>
</tr>
<tr>
<td></td>
<td>270 °C 255 °C</td>
</tr>
</tbody>
</table>

refer to IPC/ JEDEC J-STD-020E
Cautions and Warnings:

The following conditions apply to all goods within the product series of Metal Plate Resistors of Würth Elektronik eiSos GmbH & Co. KG:

General:

- This electronic component was designed and manufactured for use in general electronic equipment.
- Würth Elektronik must be asked for a written approval following the certain PPAP (level procedure) before incorporating the components into any equipment in the field such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. where higher safety and reliability are especially required and/or if there is the possibility of direct damage or human injury.
- Electronic components that will be used in safety-critical or high-reliability applications, should be pre-evaluated by the customer.
- Direct mechanical impact to the product shall be prevented as material of the body, pins or termination could break or in the worst case it could break.
- Avoid any water or heavy dust on resistor’s surface, which may cause electrical leakage, damage, overheating or corrosion.
- Würth Elektronik products are qualified according to international standards, which are listed in each product reliability report. Würth Elektronik does not warrant any customer qualified product characteristic, beyond Würth Elektronik specifications, for its validity and sustainability over time.

The customer is responsible for the functionality of his or her own products. All technical specifications for standard products also apply to customer specific products.

- The component was designed and manufactured to be used within the datasheet specified values. If the usage and operation conditions specified in the datasheet are not met, the body, pins or termination may be damaged or dissolved.
- Do not apply any kind of flexural or compressive force onto soldered or unsoldered component.
- The reliability are especially required and/or if there is the possibility of direct damage or human injury.
- Surface temperature including self-heating must be kept below the maximum operating temperature.
- Avoid any water or heavy dust on resistors surface, which may cause electrical leakage, damage, overheating or corrosion.

Operating climatic conditions:

- Do not exceed the lower nor the upper specified temperature under no circumstances.
- Be aware that the specified resistance tolerance is only valid at the date of delivery.
- Do not use the resistors under high humidity, high temperature nor under high or low atmospheric pressure which may affect resistors reliability.
- Surface temperature including self-heating must be kept below the maximum operating temperature.
- Avoid any water or heavy dust on resistors surface, which may cause electrical leakage, damage, overheating or corrosion.

Operating load conditions:

- Do not use the resistor with any higher than specified rated dissipation, rated current or rated voltage.
- Violation of the technical product specifications such as exceeding the specified dissipation will void the warranty.
- When the resistors are operated in ambient temperature above the rated temperature, the power rating must be derated according to the derating curve.
- Verification and confirmation of performance characteristics of product, after on-board mounting, is advised.

Design of the PCB:

- The chip resistor shall be located to minimize any possible mechanical stress from deflection or board wrap.
- It is recommended to position the chip resistor in parallel to slits and perforations and as far away from slits, perforations, separation points, screw holes, frames and edges of the PCB to avoid mechanical stress.
- Determine the shape and size of the solder pads to have proper amount of solder on the resistors at the terminations has a direct effect on resistance value and reliability of the resistor. The resistance value after soldering may change depending on the size of land pattern, the wiring pattern or solder amount, make sure the effect of the change of the resistance value before you use it.
- WE provide individual land patterns for each termination in the datasheet.
- Converting the solder fillet may occur with thermal cycling, because of mismatch of coefficients of thermal expansion between the board and the component. Pad size, amount of solder, and amount of heat radiating from the PCB must be designed carefully.
- The parasitic inductance of the chip resistor and the wiring pattern may influence current detection under high frequency usage, make sure the effect before you use it.
- The PCB design (e.g. land pattern design and grounding planes) must be evaluated for each individual circuit to achieve the optimal soldering results.

Mounting:

- Adjust the bottom dead center of the mounting head not to press on the PCB surface to avoid any punctual pressure on component at pick & place.
- When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residues of flux may negatively affect resistor performance and reliability.

- When the resistors are operated in ambient temperature above the rated temperature, the power rating must be derated according to the derating curve.
- When the resistors are operated in ambient temperature above the rated temperature, the power rating must be derated according to the derating curve.
- When the resistors are operated in ambient temperature above the rated temperature, the power rating must be derated according to the derating curve.
- When the resistors are operated in ambient temperature above the rated temperature, the power rating must be derated according to the derating curve.
- When the resistors are operated in ambient temperature above the rated temperature, the power rating must be derated according to the derating curve.
The reflow soldering method must be used.
- Be careful when pick up the resistors with tweezers, there may be a case that the overcoat and / or the body can chip.
- Provide sufficient close up dimension, preventive maintenance and replacement of the centering jaw to avoid a crack when it is worn out.
- The resistor temperature could exceed 155°C depending on the wiring pattern, heat dissipation form surrounding, etc., which is not necessarily relevantly related to the rated dissipation. In advance, make sure that heat dissipation of resistor does not damage the pcb and any surrounding components.
- Provide support from the bottom side of the PCB by a support pin for minimizing the impact energy from the mounting head.
- In case of manual soldering, soldering tip shall not touch the product when install manually.

Alternative Characteristics:
- If transient overloads such as power pulse or voltage / current surges are applied to resistor products, performance and reliability may be degraded.
- Pay attention to discharges between terminations (arc-over) when high voltages are applied.

Soldering:
- The solder profile must comply with the Würth Elektronik technical soldering specification. All other profiles will void the warranty.
- All other soldering methods are at the customer’s own risk.
- Strong forces which may affect the coplanarity of the component’s electrical connection with the PCB (i.e. pins), can damage the part, resulting in void of the warranty.
- Customer needs to ensure that the applied solder paste, the paste thickness and solder conditions are applicable to guarantee a sufficient solder result according to the relevant criteria of IPC-A-610.
- Excessive amount of solder may lead to higher tensile force and chip cracking. Insufficient amount of solder may detach the resistor due to defect contacts.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide support from the bottom side of the PCB by a support pin for minimizing the impact energy from the mounting head.
- The resistor temperature could exceed 155°C depending on the wiring pattern, heat dissipation from surrounding, etc., which is not necessarily relevantly related to the rated dissipation. In advance, make sure that heat dissipation of resistor does not damage the pcb and any surrounding components.
- Provide support from the bottom side of the PCB by a support pin for minimizing the impact energy from the mounting head.
- In case of manual soldering, soldering tip shall not touch the product when install manually.

Cleaning and Washing:
- For reflow soldering, two times limitation is recommended.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Excessive amount of solder may lead to higher tensile force and chip cracking. Insufficient amount of solder may detach the resistor due to defect contacts.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
- Do not use excessive nor insufficient flux.
- Provide enough washing when water-soluble flux is used.
Important Notes

The following conditions apply to all goods within the product range of Würth Elektronik eiSos GmbH & Co. KG:

1. General Customer Responsibility

Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact it is up to the customer to evaluate, where appropriate to investigate and decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not.

2. Customer Responsibility related to Specific, in particular Safety-Relevant Applications

It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications.

In certain customer applications requiring a very high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component. Therefore, customer is cautioned to verify that data sheets are current before placing orders. The current data sheets can be downloaded at www.we-online.com.

3. Best Care and Attention

Any product-specific notes, cautions and warnings must be strictly observed. Any disregard will result in the loss of warranty.

4. Customer Support for Product Specifications

Some products within the product range may contain substances which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case the field sales engineer or the internal sales person in charge should be contacted. The basic responsibility of the customer regarding the PCN, the field sales engineer or the internal sales person in charge remains unaffected.

Product Change Notification (PCN) according to the JEDEC-Standard inform about minor and major changes. In case of further queries due to constant product improvement product specifications may change from time to time. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this we cannot guarantee that all products within our product range will always be available. Therefore it needs to be verified with the field sales engineer or the internal sales person in charge about the current product availability expectancy before or when the product for application design or disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

7. Property Rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG. Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

8. General Terms and Conditions

Unless otherwise agreed in individual contracts, all orders are subject to the current version of the "General Terms and Conditions of Würth Elektronik eiSos Group", last version available at www.we-online.com.

WRIS-PSMB Metal Plate Resistors

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where a failure of the product is reasonably expected to cause serious personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik eiSos GmbH & Co. KG products are neither designed nor intended for use in areas such as military, aerospace, nuclear, power control, automation, automotive control, telecommunication equipment, FM, TV, radio, control, communication, navigation, data processing, medical, public information networks etc. Würth Elektronik eiSos GmbH & Co. KG shall inform the client of such usage before the design or usage. In addition, sufficient reliability evaluation checks for usage must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.