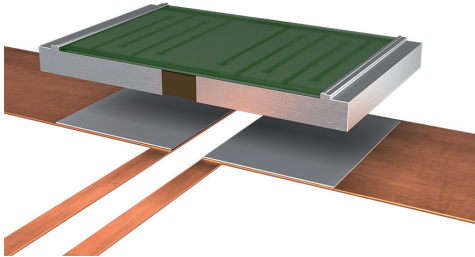




## ISA-PLAN® // PRECISION RESISTORS



### SMP // Size 2010



#### Features

- 3 W power rating at 70 °C
- Constant current up to 24 A (5 mOhm)
- Excellent long-term stability
- High pulse power rating
- Mounting: Reflow-, and IR-soldering
- AEC-Q200 qualified
- RoHS 2011/65/EU compliant



#### Applications

- Current sensor for power hybrid applications
- Control systems for the automotive market
- Power modules
- Frequency converters
- Switch mode power supplies

#### Technical data

|  |                |                                 |
|--|----------------|---------------------------------|
| Resistance values                                | <b>Ohm</b>     | 0.005 to 1 *                    |
| Tolerance  | <b>%</b>       | 0.5 / 1 *                       |
| Temperature coefficient (20-60 °C)               | <b>ppm/K</b>   | <50                             |
| Applicable temperature range                     | <b>°C</b>      | -65 to +170                     |
| Power rating <b>P<sub>110°C</sub></b>            | <b>W</b>       | 2                               |
| Power rating <b>P<sub>70°C</sub></b>             | <b>W</b>       | 3                               |
| Internal heat resistance (R <sub>thi</sub> )     | <b>K/W</b>     | <30                             |
| Dielectric withstanding voltage                  | <b>V AC/DC</b> | 200                             |
| Inductance                                       | <b>nH</b>      | <3                              |
| Stability (at rated power) deviation after 2000h |                | <0.5% (T <sub>k</sub> = 80 °C)  |
| T <sub>k</sub> = Terminal temperature            |                | <1.0% (T <sub>k</sub> = 110 °C) |

\* For detailed information see table on page 3

#### Ordering code

SMP - R005 - 1.0

- ..... Tolerance
- ..... Resistance value [Ohm] / "R" represents decimal point
- ..... Type



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**Recommended solder profile**

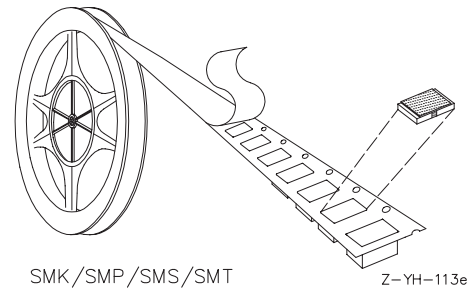
Reflow- and IR-soldering

|             |     |      |     |     |
|-------------|-----|------|-----|-----|
| Temperature | °C  | 260  | 255 | 217 |
| Time        | sec | peak | 40  | 90  |

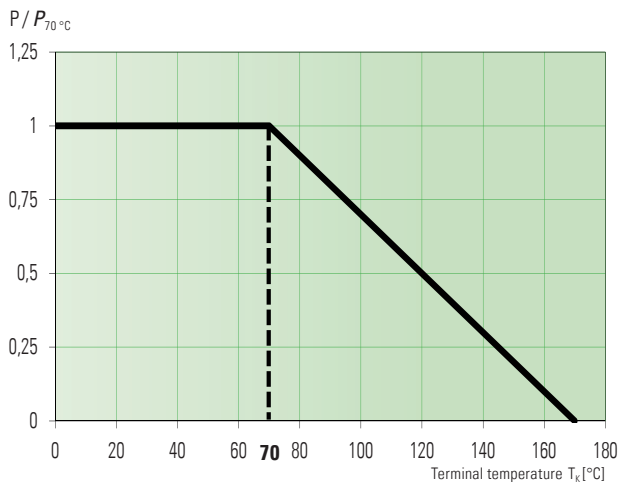
Slight deformations during soldering do not affect technical properties of the component.

**Tape and reel information**

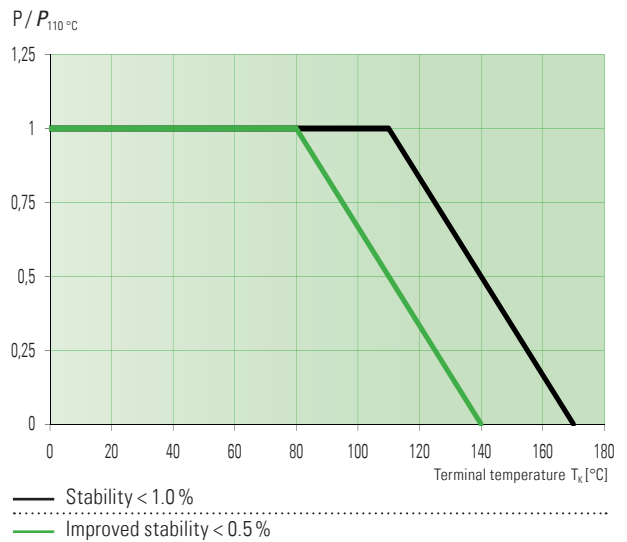
|                  |                |        |  |
|------------------|----------------|--------|--|
| Specification    | DIN EN 60286-3 |        |  |
| Tape width       | mm             | 12     |  |
| Reel size        | inch           | 13     |  |
| Parts per reel   | pcs            | 10,000 |  |
| Packaging weight | g              | 453    |  |



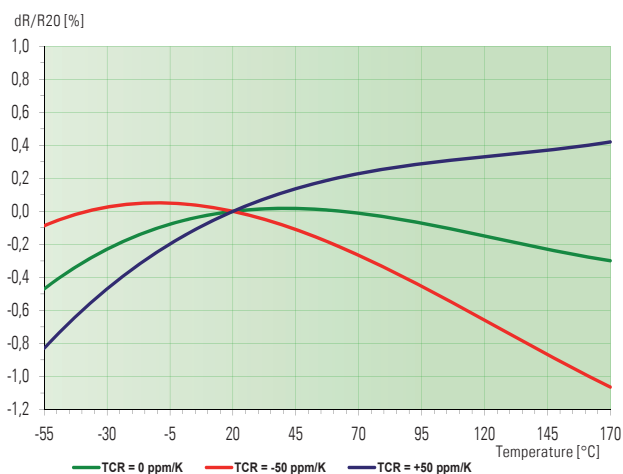
**Power derating curve at 70 °C**



**Power derating curve**



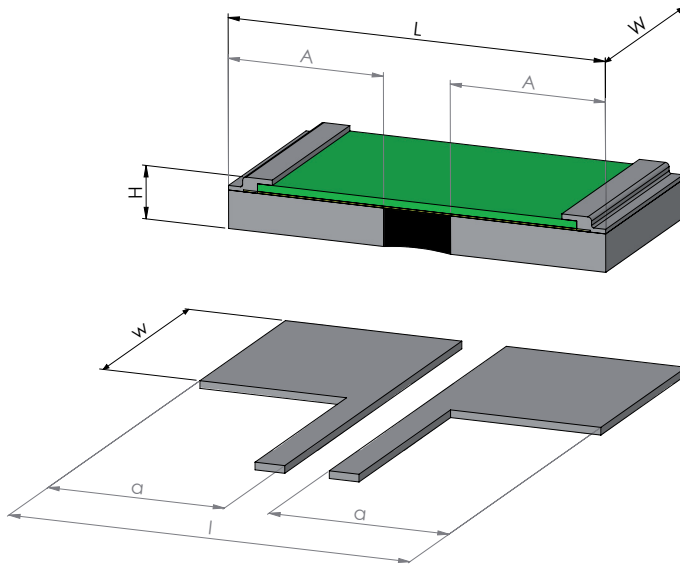
**Temperature dependence of the electrical resistance of SMP resistors**





SMP // Size 2010

**Mechanical dimensions and pcb-layout proposal (Reflow-soldering) [mm]**



| type: | L          | W          | A      | H         |
|-------|------------|------------|--------|-----------|
| SMP   | 5.08 ± 0.1 | 2.54 ± 0.1 | (2.14) | 0.7 ± 0.2 |

| solder pad type: | l   | w   | a   |
|------------------|-----|-----|-----|
| SMP              | 5.4 | 2.8 | 2.4 |

**Available resistance values and tolerances\***

| Resistance values | Tolerance |     |
|-------------------|-----------|-----|
|                   | 0.5       | 1.0 |
| R005              |           | ✓   |
| R010              |           | ✓   |
| R015              |           | ✓   |
| R018              |           | ✓   |
| R020              | ✓         | ✓   |
| R022              |           | ✓   |
| R025              |           | ✓   |
| R027              |           | ✓   |
| R033              | ✓         | ✓   |
| R039              |           | ✓   |
| R047              |           | ✓   |
| R050              |           | ✓   |

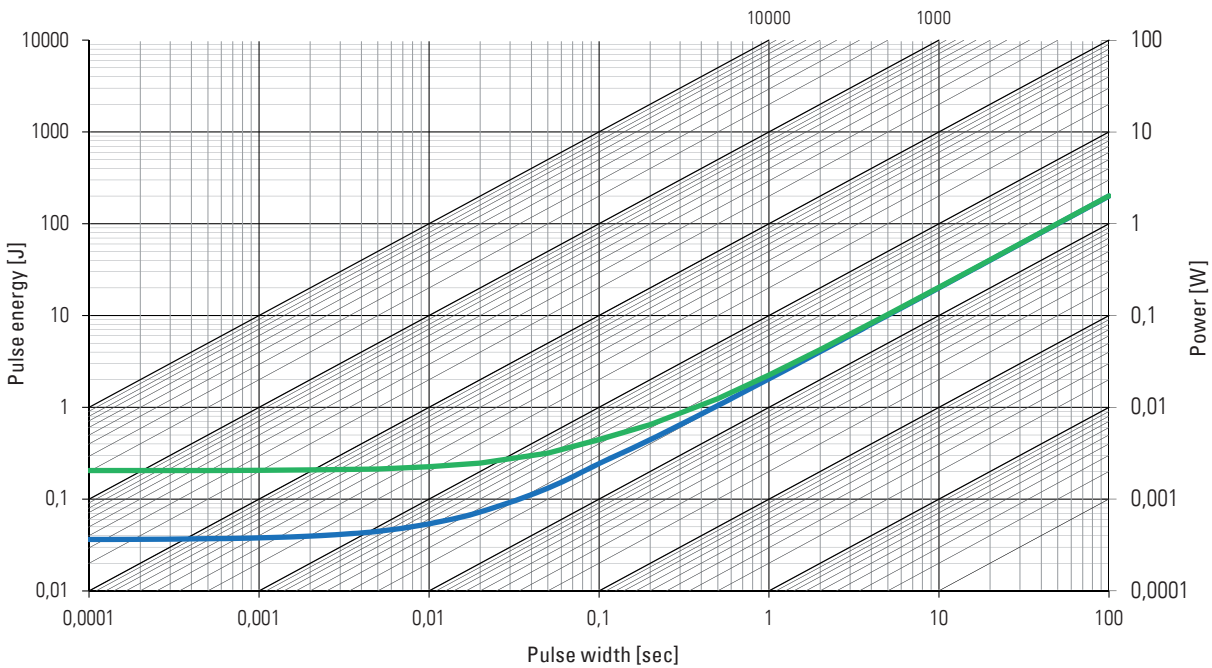
| Resistance values | Tolerance |     |
|-------------------|-----------|-----|
|                   | 0.5       | 1.0 |
| R068              |           | ✓   |
| R082              |           | ✓   |
| R100              |           | ✓   |
| R150              |           | ✓   |
| R160              |           | ✓   |
| R180              |           | ✓   |
| R200              | ✓         | ✓   |
| R330              |           | ✓   |
| R390              |           | ✓   |
| R470              |           | ✓   |
| R500              |           | ✓   |
| 1R00              | ✓         | ✓   |

\* Further values and tolerances on request  
 ✓ = available



SMP // Size 2010

Maximum pulse energy respectively pulse power for permanent operation



— This curve is only valid for the resistance value R005  
 — This curve is only valid for the resistance value 1R00

Specification

| Parameters                            | Test conditions                           | Specified values |
|---------------------------------------|---|------------------|
| Temperature Cycling                   | 2000 cycles (-55 °C to +150 °C)           | ±0.5%            |
| Low Temperature Storage and Operation | -65 °C for 250 h                          | ±0.1%            |
| Resistance to Soldering Heat          | 260 °C for 10 sec / 8h steam aging        | ±0.3%            |
| Moisture Resistance                   | MIL-STD-202 method 106                    | ±0.2%            |
| Mechanical Shock                      | 100 g, 6 ms half sine                     | ±0.1%            |
| Vibration, High Frequency             | 10 g, 10-2000 Hz, 24 h each axis          | ±0.1%            |
| Operational Life                      | 2000 h, T <sub>k</sub> max at rated power | ±1.0%            |
| High Temperature Exposure             | 2000 h / 170 °C                           | ±1.0%            |
| Bias Humidity                         | +85 °C, 85 r.F., 1000 h                   | ±0.5%            |

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