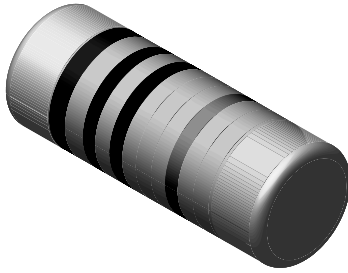


**Metal Film, Cylindrical Resistors**



**FEATURES**

- Stable metal film on high quality ceramic
- Low TC and tight tolerances
- Excellent stability in different environmental conditions
- Force fitted steel caps, tin plated on nickel barrier
- Reliable solderable terminations to facilitate surface mounting

**STANDARD ELECTRICAL SPECIFICATIONS**

| MODEL                          | POWER RATING<br>$P_{70^{\circ}\text{C}}^{1)}$<br>W | LIMITING ELEMENT<br>VOLTAGE MAX <sup>2)</sup><br>$V_{\cong}$ | TEMPERATURE<br>COEFFICIENT<br>ppm/K | TOLERANCE<br>%     | RESISTANCE<br>RANGE<br>$\Omega$        | E-SERIES                         |
|--------------------------------|--|--|-------------------------------------|--------------------|--|----------------------------------|
| SMM0204-MS1                    | 0.25   | 200  | 15                                  | 0.1<br>0.25<br>0.5 | 43R – 221K<br>22R – 221K<br>10R – 221K | 24 – 192<br>24 – 192<br>24 – 192 |
| SMM0204-MS1                    | 0.25   | 200  | 25                                  | 0.1<br>0.25<br>0.5 | 43R – 511K<br>22R – 511K<br>10R – 1M0  | 24 – 192<br>24 – 192<br>24 – 192 |
| SMM0204-MS1                    | 0.25   | 200  | 50                                  | 0.5<br>1           | 10R – 1M0<br>R82 – 10M                 | 24 – 192<br>24 – 96              |
| SMM0204-MS1                    | 0.25   | 200  | 100                                 | 5                  | R22 – 10M                              | 24                               |
| SMM0204HF<br>MS1 <sup>4)</sup> | 0.25   | 200  | 50                                  | 1                  | 10R – 1K0 <sup>3)</sup>                | 96                               |

Zero-Ohm-Resistor: OMM0204-MS1  $R_{\text{max}} = 10\text{m}\Omega$   $I_{\text{max}} = 2\text{A}$

<sup>1)</sup> Power rating depends on the maximum temperature at the solder point, the component placement density and the substrate material

<sup>2)</sup> Rated voltage:  $\sqrt{P \times R}$

<sup>3)</sup> Values below 10  $\Omega$  on request

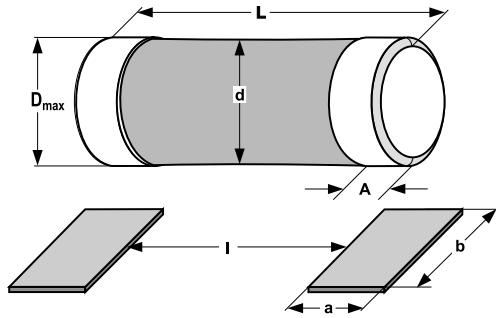
<sup>4)</sup> Low inductive trim for high frequency application

- Further values and tolerances on request
- Coating:  
Light green for TC= 100ppm/K, 50ppm/K and zero ohm resistor  
Pink TC= 25ppm/K  
Violet TC= 15ppm/K  
Beige HF version
- Marking : see appropriate catalog or web page
- Zero ohm resistor has a black band only

**ORDERING INFORMATION**

|                    |               |                              |                      |                                       |
|--------------------|---------------|------------------------------|----------------------|---------------------------------------|
| <b>SMM0204-MS1</b> | <b>50</b>     | <b>562R</b>                  | <b>1%</b>            | <b>B0</b>                             |
| MODEL              | TC<br>ppm / K | RESISTANCE VALUE<br>$\Omega$ | TOLERANCE<br>$\pm$ % | PACKAGING<br>B0-Blistertape 10000 pcs |

DIMENSIONS



| MODEL       | DIMENSIONS [in millimeters] |         |            |                  |                  |
|-------------|-----------------------------|---------|------------|------------------|------------------|
|             | D <sub>max</sub>            | d *     | L          | A <sub>max</sub> | A <sub>min</sub> |
| SMM0204-MS1 | 1.4                         | D -0.15 | 3.6 - 0.15 | 0.85             | 0.5              |

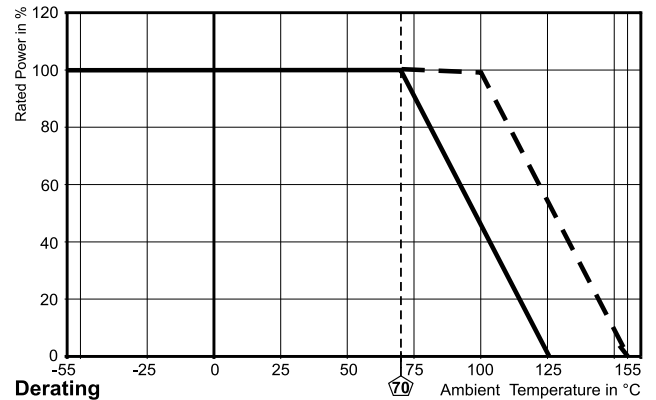
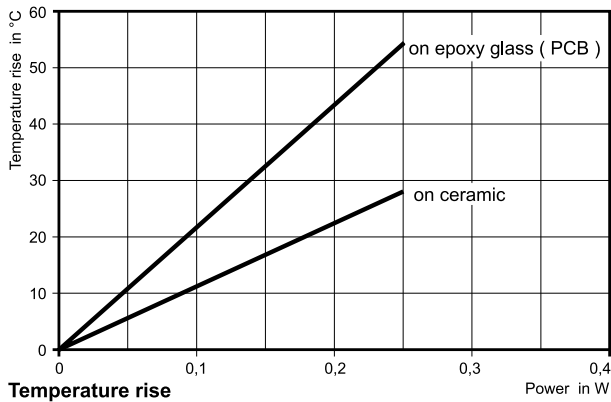
\*d measured in the middle of the resistor

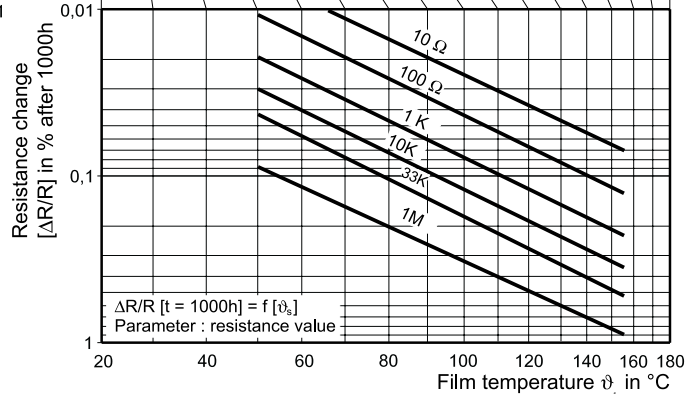
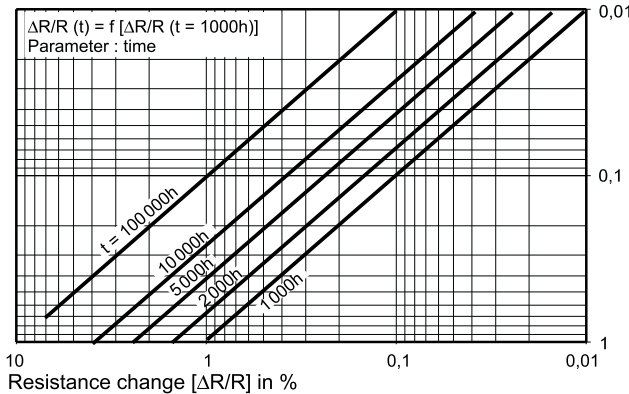
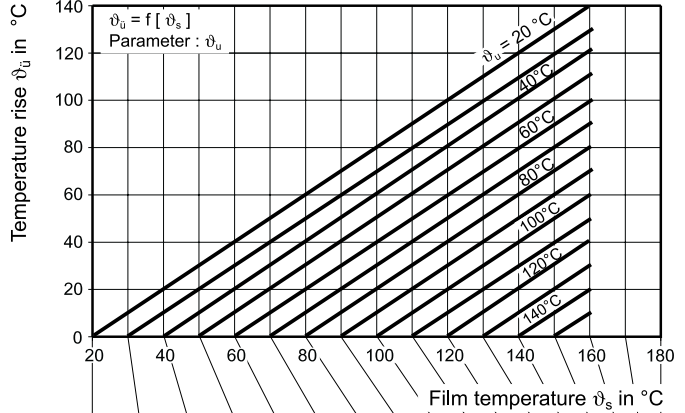
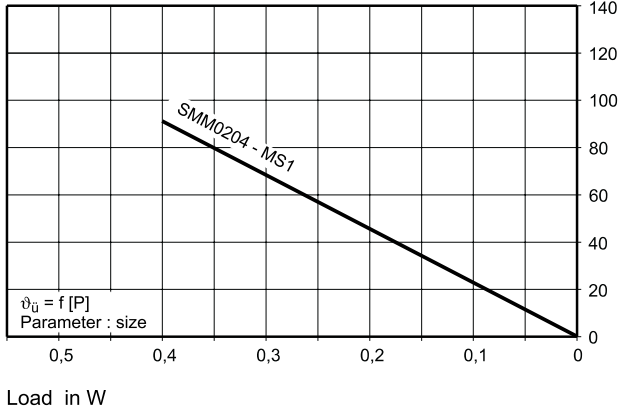
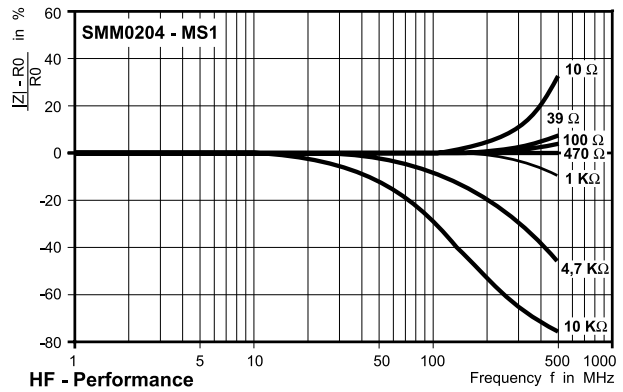
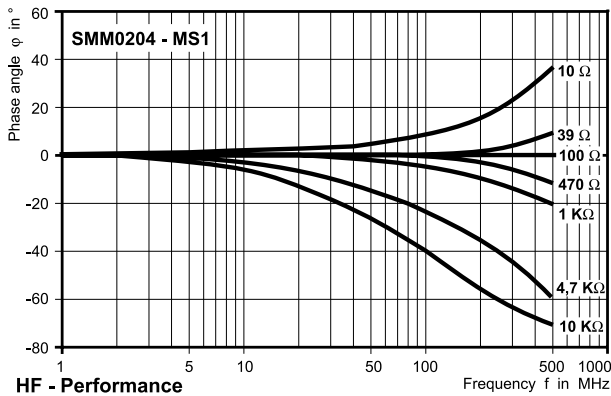
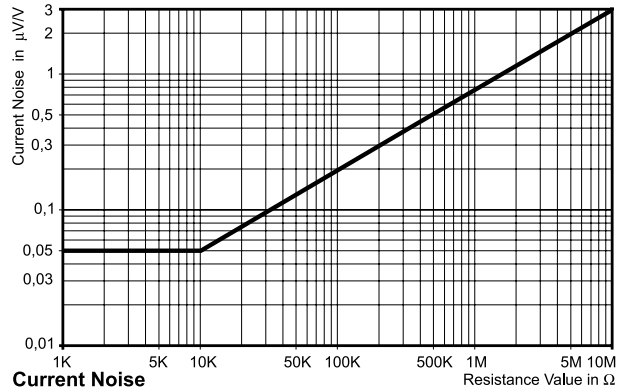
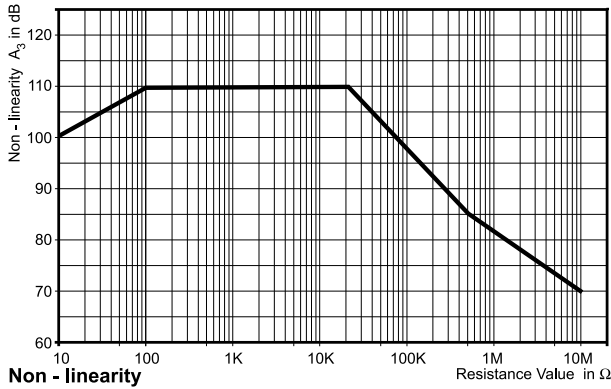
| MODEL       | SOLDER PAD DIMENSIONS [in millimeters] |     |     |                |     |     |
|-------------|--|-----|-----|----------------|-----|-----|
|             | REFLOW SOLDERING                       |     |     | WAVE SOLDERING |     |     |
|             | a                                      | b   | l   | a              | b   | l   |
| SMM0204-MS1 | 1.0                                    | 1.6 | 2.2 | 1.2            | 1.6 | 2.2 |

| TECHNICAL SPECIFICATIONS               |                         |                      |
|--|-------------------------|----------------------|
| PARAMETER                              | UNIT                    | SMM0204 – MS1        |
| Rated Dissipation at 70°C              | W                       | 0.25                 |
| Limiting Element Voltage <sup>2)</sup> | V <sub>≅</sub>          | 200                  |
| Insulation Voltage (1 min)             | V <sub>dc/ac peak</sub> | > 300                |
| Thermal Resistance <sup>1)</sup>       | K/W                     | ≤ 220                |
| Insulation Resistance                  | Ω                       | ≥ 10 <sup>10</sup>   |
| Category Temperature Range             | °C                      | - 55 / + 125 (+ 155) |
| Failure Rate                           | 10 <sup>-9</sup> /h     | < 1                  |
| Weight / 1000pcs                       | g                       | 18                   |

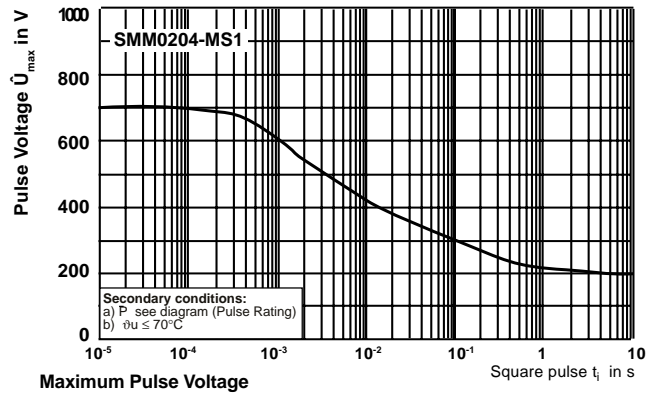
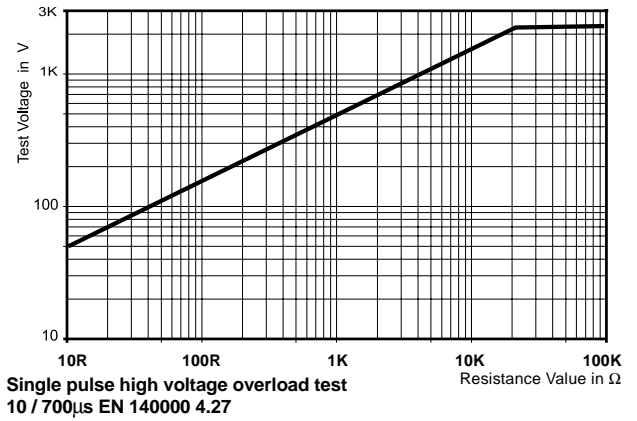
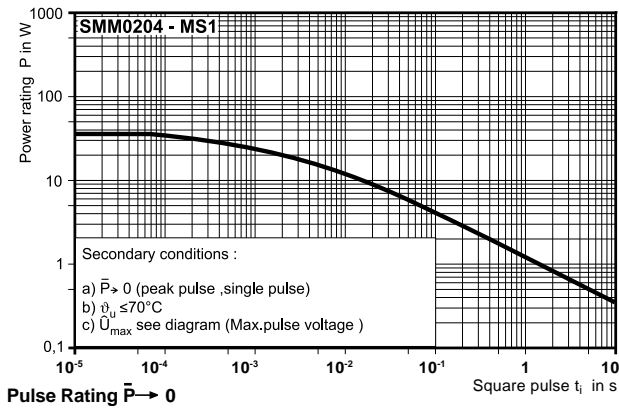
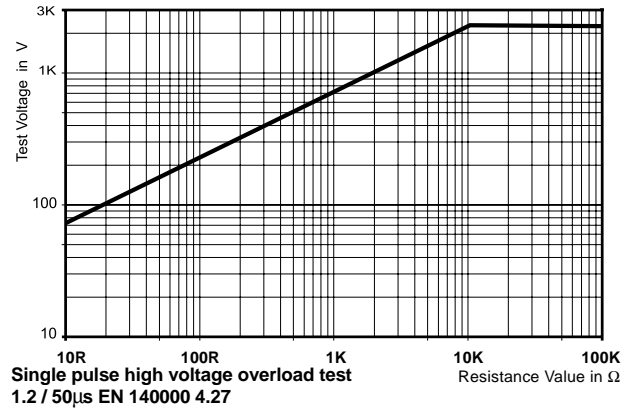
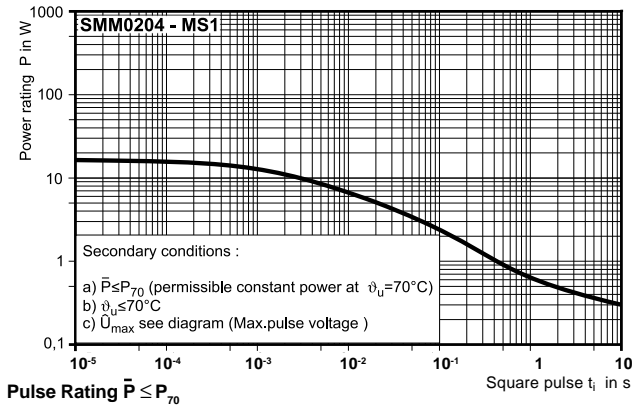
<sup>1)</sup> Based on measurements on test board acc. to EN 140000

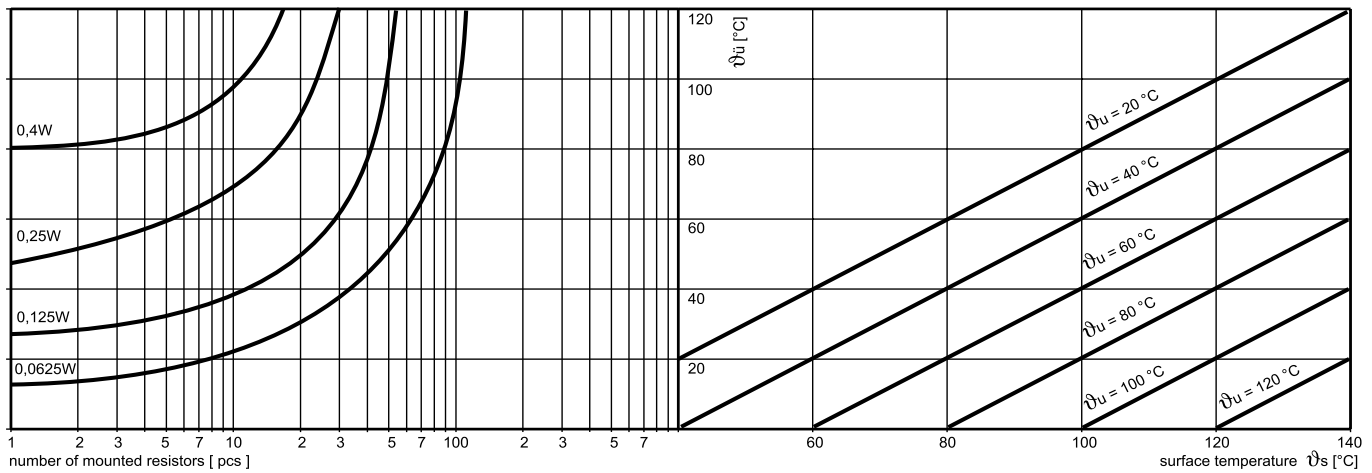
<sup>2)</sup> Rated voltage:  $\sqrt{P \times R}$





Stability nomogram typical values ( for handling see general explanations )





| PACKAGING     |                   |          |               |      |                       |      |                            |      |
|---------------|-------------------|----------|---------------|------|-----------------------|------|----------------------------|------|
| MODEL         | REEL              |          |               |      | BULK                  |      |                            |      |
|               | TAPE WIDTH        | DIAMETER | PIECES / REEL | CODE | BULK FEEDING MAGAZINE |      | LOOSE IN PLASTIC CONTAINER |      |
|               |                   |          |               |      | PIECES                | CODE | PIECES                     | CODE |
| SMM0204-MS1   | 8mm<br>Blisertape | 180mm    | 1000          | B1   | 3000                  | M3   | 1000                       | L1   |
| SMM0204HF-MS1 |                   | 180mm    | 2500          | BE   |                       |      |                            |      |
| OMM0204-MS1   |                   | 180mm    | 3000          | B3   |                       |      |                            |      |
|               |                   | 330mm    | 10000         | B0   |                       |      | 5000                       | L5   |



| PERFORMANCE   |  |                            |
|---|--|----------------------------|
| TEST  | CONDITIONS OF TEST   | TEST RESULTS <sup>1)</sup> |
| Endurance Test at 70°C<br>IEC 60115-1 4.25.1                    | 1000 hours at 70°C 1.5 hours "ON" 0.5 hours "OFF"  | ≤ ± 0.25 %                 |
| Endurance at UCT<br>IEC 60115-1 4.25.3                          | 1000 hours at 125°C without load   | ≤ ± 0.25 %                 |
| Overload Test<br>IEC 60115-1 4.13                               | Short time overload for 2 seconds<br>2.5 x rated voltage or ≤ 2 x limiting element voltage | ≤ ± 0.05 %                 |
| Thermal Shock<br>IEC 60115-1 4.19 IEC 60068-2-14                | Rapid change between upper and lower category temperature                                  | ≤ ± 0.05 %                 |
| Damp Heat Steady State<br>IEC 60115-1 4.24 IEC 60068-2-3        | 56 days at 40°C and 93% relative humidity  | ≤ ± 0.25 %                 |
| Resistance to Soldering Heat<br>IEC 60115-1 4.18 IEC 60068-2-20 | 10 seconds at 260°C solder bath temperature  | ≤ ± 0.05 %                 |

<sup>1)</sup> for a resistance range from 10Ω to 332KΩ

| APPLICABLE SPECIFICATIONS  |
|--|
| <ul style="list-style-type: none"><li>• CECC40000 / 40400 / 40401-803</li><li>• EN140400 / IEC 60115 – 1</li></ul> |