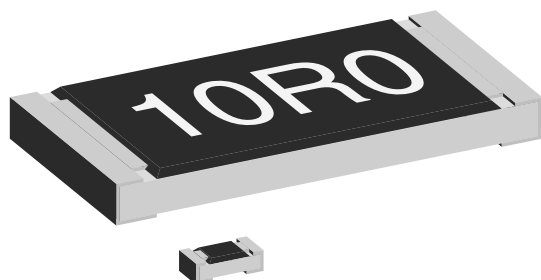


## Automotive, Sulfur Resistant Lead (Pb)-Free Thick Film, Rectangular Chip Resistors



### FEATURES

- Superior resistance against H<sub>2</sub>S-atmosphere
- Stability  $\Delta R/R = 1\%$  for 1000 h at 70 °C
- Metal glaze on high quality ceramic
- Pure tin solder contacts on Ni barrier layer, provides compatibility with lead (Pb)-free and lead containing soldering processes
- AEC-Q200 qualified, rev. C compliant
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

| STANDARD ELECTRICAL SPECIFICATIONS                                                                                          |                |                  |                                                 |                                 |                                                                                                                             |                  |                           |          |
|-----------------------------------------------------------------------------------------------------------------------------|----------------|------------------|-------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------|----------|
| MODEL                                                                                                                       | CASE SIZE INCH | CASE SIZE METRIC | POWER RATING $P_{70\text{ }^{\circ}\text{C}}$ W | LIMITING ELEMENT VOLTAGE MAX. V | TEMPERATURE COEFFICIENT ppm/K                                                                                               | TOLERANCE %      | RESISTANCE RANGE $\Omega$ | SERIES   |
| RCA0402                                                                                                                     | 0402           | RR1005           | 0.063                                           | 50                              | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 1.0M               | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 1.0M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 10 to 10M                 | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 1$          | 1.0 to 9.76               | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
| Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 1.5\text{ A}$ |                |                  |                                                 |                                 |                                                                                                                             |                  |                           |          |
| RCA0603                                                                                                                     | 0603           | RR1608           | 0.10                                            | 75                              | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 10M                 | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 2.0\text{ A}$ |                  |                           |          |
| RCA0805                                                                                                                     | 0805           | RR2012           | 0.125                                           | 150                             | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 10M                 | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 2.5\text{ A}$ |                  |                           |          |
| RCA1206                                                                                                                     | 1206           | RR3216           | 0.25                                            | 200                             | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 10M                 | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 3.5\text{ A}$ |                  |                           |          |
| RCA1210                                                                                                                     | 1210           | RR3225           | 0.5                                             | 200                             | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 1.0M               | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 1.0M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 5.0\text{ A}$ |                  |                           |          |
| RCA1218                                                                                                                     | 1218           | RR3246           | 1.0                                             | 200                             | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 2.2M               | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 100 to 2.2M               | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 2.2M               | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 2.2M               | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 7.0\text{ A}$ |                  |                           |          |
| RCA2010                                                                                                                     | 2010           | RR5025           | 0.75                                            | 400                             | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 10M                 | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 6.0\text{ A}$ |                  |                           |          |
| RCA2512                                                                                                                     | 2512           | RR6332           | 1.0                                             | 500                             | $\pm 50$                                                                                                                    | $\pm 0.5, \pm 1$ | 100 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 0.5$        | 10 to 10M                 | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 100$                                                                                                                   | $\pm 1$          | 1.0 to 10M                | E24; E96 |
|                                                                                                                             |                |                  |                                                 |                                 | $\pm 200$                                                                                                                   | $\pm 5$          | 1.0 to 10M                | E24      |
|                                                                                                                             |                |                  |                                                 |                                 | Zero-Ohm-Resistor: $R_{\text{max.}} = 20\text{ m}\Omega$ , $I_{\text{max.}}$ at $70\text{ }^{\circ}\text{C} = 7.0\text{ A}$ |                  |                           |          |

### Notes

- These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional time.
- Marking: See document "Surface Mount Resistor Marking" (document number 20020).
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

**TECHNICAL SPECIFICATIONS**

| PARAMETER                                  | UNIT     | RCA0402                | RCA0603 | RCA0805 | RCA1206 | RCA1210 | RCA1218 | RCA2010 | RCA2512 |
|--------------------------------------------|----------|------------------------|---------|---------|---------|---------|---------|---------|---------|
| Rated dissipation $P_{70}$ <sup>(1)</sup>  | W        | 0.063                  | 0.10    | 0.125   | 0.25    | 0.5     | 1.0     | 0.75    | 1.0     |
| Limiting element voltage $U_{max}$ . AC/DC | V        | 50                     | 75      | 150     | 200     | 200     | 200     | 400     | 500     |
| Insulation voltage $U_{ins.}$ (1 min)      | V        | > 75                   | > 100   | > 200   | > 300   | > 300   | > 300   | > 300   | > 300   |
| Insulation resistance                      | $\Omega$ | > $10^9$               |         |         |         |         |         |         |         |
| Category temperature range                 | °C       | - 55 to + 155          |         |         |         |         |         |         |         |
| Failure rate                               | $h^{-1}$ | < $0.1 \times 10^{-9}$ |         |         |         |         |         |         |         |
| Mass                                       | mg       | 0.65                   | 2       | 5.5     | 10      | 16      | 29.5    | 25.5    | 40.5    |

**Note**

<sup>(1)</sup> The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 155 °C is not exceeded.

**PART NUMBER AND PRODUCT DESCRIPTION**Part Number: RCA080510K0FKEA <sup>(2)</sup>

|                                                                                      |   |   |                                                                        |   |   |                                                                 |   |   |                                                                                |   |   |                                                    |   |   |
|--------------------------------------------------------------------------------------|---|---|------------------------------------------------------------------------|---|---|-----------------------------------------------------------------|---|---|--------------------------------------------------------------------------------|---|---|----------------------------------------------------|---|---|
| R                                                                                    | C | A | 0                                                                      | 8 | 0 | 5                                                               | 1 | 0 | K                                                                              | 0 | F | K                                                  | E | A |
| MODEL                                                                                |   |   | VALUE                                                                  |   |   | TOLERANCE                                                       |   |   | TCR                                                                            |   |   | PACKAGING <sup>(3)</sup>                           |   |   |
| RCA0402<br>RCA0603<br>RCA0805<br>RCA1206<br>RCA1210<br>RCA1218<br>RCA2010<br>RCA2512 |   |   | R = Decimal<br>K = Thousand<br>M = Million<br>0000 = 0 $\Omega$ Jumper |   |   | D = $\pm 0.5\%$<br>F = $\pm 1\%$<br>J = $\pm 5\%$<br>Z = Jumper |   |   | H = $\pm 50$ ppm/K<br>K = $\pm 100$ ppm/K<br>N = $\pm 200$ ppm/K<br>S = Jumper |   |   | EA<br>EB<br>EC<br>ED<br>EE<br>EF<br>EG<br>EH<br>EK |   |   |

Product Description: RCA0805 10K 1 % 100 ET1 e3

|                                                                                      |                                                                               |                                       |                                                      |                                                     |                                  |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------|------------------------------------------------------|-----------------------------------------------------|----------------------------------|
| RCA0805                                                                              | 10K                                                                           | 1 %                                   | 100                                                  | ET1                                                 | e3                               |
| MODEL                                                                                | RESISTANCE VALUE                                                              | TOLERANCE                             | TCR                                                  | PACKAGING <sup>(3)</sup>                            | LEAD (Pb)-FREE                   |
| RCA0402<br>RCA0603<br>RCA0805<br>RCA1206<br>RCA1210<br>RCA1218<br>RCA2010<br>RCA2512 | 10R = 10 $\Omega$<br>10K = 10 k $\Omega$<br>1M = 1 M $\Omega$<br>0R0 = Jumper | $\pm 0.5\%$<br>$\pm 1\%$<br>$\pm 5\%$ | $\pm 50$ ppm/K<br>$\pm 100$ ppm/K<br>$\pm 200$ ppm/K | ET1, ET5<br>ET6, ET7<br>EF4, E02<br>E67, E82<br>ET9 | e3 = Pure tin termination finish |

**Notes**

<sup>(2)</sup> Preferred way for ordering products is by use of the PART NUMBER

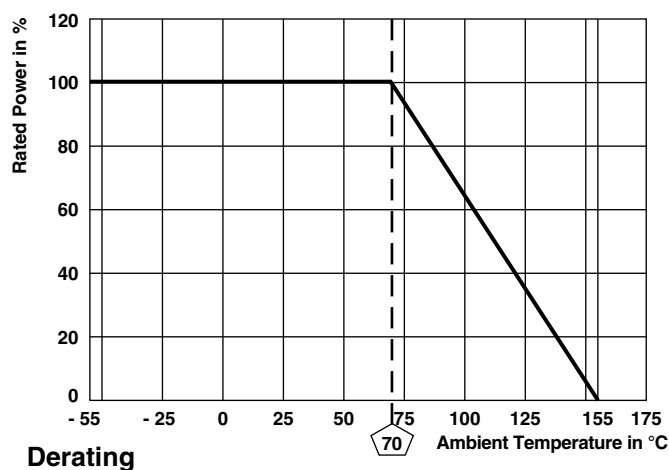
<sup>(3)</sup> Please refer to table PACKAGING, see next page

| PACKAGING |            |               |       |              |                |         |               |         |
|-----------|------------|---------------|-------|--------------|----------------|---------|---------------|---------|
| MODEL     | REEL       |               |       |              |                |         |               |         |
|           | TAPE WIDTH | DIAMETER      | PITCH | PIECES/ REEL | PACKAGING CODE |         |               |         |
|           |            |               |       |              | PART NUMBER    |         | PRODUCT DESC. |         |
|           |            |               |       |              | PAPER          | BLISTER | PAPER         | BLISTER |
| RCA0402   | 8 mm       | 180 mm/7"     | 2 mm  | 10 000       | ED             |         | ET7           |         |
|           |            | 285 mm/11.25" | 2 mm  | 20 000       | EC             |         | ET6           |         |
|           |            | 330 mm/13"    | 2 mm  | 50 000       | EE             |         | EF4           |         |
| RCA0603   | 8 mm       | 180 mm/7"     | 4 mm  | 5000         | EA             |         | ET1           |         |
|           |            | 285 mm/11.25" | 4 mm  | 10 000       | EB             |         | ET5           |         |
|           |            | 330 mm/13"    | 4 mm  | 20 000       | EC             |         | ET6           |         |
| RCA0805   | 8 mm       | 180 mm/7"     | 4 mm  | 5000         | EA             |         | ET1           |         |
|           |            | 285 mm/11.25" | 4 mm  | 10 000       | EB             |         | ET5           |         |
|           |            | 330 mm/13"    | 4 mm  | 20 000       | EC             |         | ET6           |         |
| RCA1206   | 8 mm       | 180 mm/7"     | 4 mm  | 5000         | EA             |         | ET1           |         |
|           |            | 285 mm/11.25" | 4 mm  | 10 000       | EB             |         | ET5           |         |
|           |            | 330 mm/13"    | 4 mm  | 20 000       | EC             |         | ET6           |         |
| RCA1210   | 8 mm       | 180 mm/7"     | 4 mm  | 5000         | EA             |         | ET1           |         |
|           |            | 285 mm/11.25" | 4 mm  | 10 000       | EB             |         | ET5           |         |
|           |            | 330 mm/13"    | 4 mm  | 20 000       | EC             |         | ET6           |         |
| RCA1218   | 12 mm      | 180 mm/7"     | 4 mm  | 4000         |                | EK      |               | ET9     |
| RCA2010   | 12 mm      | 180 mm/7"     | 4 mm  | 4000         |                | EF      |               | E02     |
| RCA2512   | 12 mm      | 180 mm/7"     | 8 mm  | 2000         |                | EG      |               | E67     |
|           |            |               | 4 mm  | 4000         |                | EH      |               | E82     |

| DIMENSIONS in millimeters                                                            |        |                                        |             |             |                                       |           |                       |     |     |                |     |     |
|--------------------------------------------------------------------------------------|--------|----------------------------------------|-------------|-------------|---------------------------------------|-----------|-----------------------|-----|-----|----------------|-----|-----|
|  |        |                                        |             |             |                                       |           |                       |     |     |                |     |     |
| SIZE                                                                                 |        | DIMENSIONS                             |             |             |                                       |           | SOLDER PAD DIMENSIONS |     |     |                |     |     |
|                                                                                      |        |                                        |             |             |                                       |           | REFLOW SOLDERING      |     |     | WAVE SOLDERING |     |     |
| INCH                                                                                 | METRIC | L                                      | W           | H           | T1                                    | T2        | a                     | b   | l   | a              | b   | l   |
| 0402                                                                                 | 1005   | 1.0 ± 0.05                             | 0.5 ± 0.05  | 0.35 ± 0.05 | 0.25 ± 0.05                           | 0.2 ± 0.1 | 0.4                   | 0.6 | 0.5 |                |     |     |
| 0603                                                                                 | 1608   | 1.55 <sup>+0.10</sup> <sub>-0.05</sub> | 0.85 ± 0.1  | 0.45 ± 0.05 | 0.3 ± 0.2                             | 0.3 ± 0.2 | 0.5                   | 0.9 | 1.0 | 0.9            | 0.9 | 1.0 |
| 0805                                                                                 | 2012   | 2.0 <sup>+0.20</sup> <sub>-0.10</sub>  | 1.25 ± 0.15 | 0.45 ± 0.05 | 0.3 <sup>+0.20</sup> <sub>-0.10</sub> | 0.3 ± 0.2 | 0.7                   | 1.3 | 1.2 | 0.9            | 1.3 | 1.3 |
| 1206                                                                                 | 3216   | 3.2 <sup>+0.10</sup> <sub>-0.20</sub>  | 1.6 ± 0.15  | 0.55 ± 0.05 | 0.45 ± 0.2                            | 0.4 ± 0.2 | 0.9                   | 1.7 | 2.0 | 1.1            | 1.7 | 2.3 |
| 1210                                                                                 | 3225   | 3.2 ± 0.2                              | 2.5 ± 0.2   | 0.55 ± 0.05 | 0.45 ± 0.2                            | 0.4 ± 0.2 | 0.9                   | 2.5 | 2.0 | 1.1            | 2.5 | 2.2 |
| 1218                                                                                 | 3246   | 3.2 <sup>+0.10</sup> <sub>-0.20</sub>  | 4.6 ± 0.15  | 0.55 ± 0.05 | 0.45 ± 0.2                            | 0.4 ± 0.2 | 1.05                  | 4.9 | 1.9 | 1.25           | 4.8 | 1.9 |
| 2010                                                                                 | 5025   | 5.0 ± 0.15                             | 2.5 ± 0.15  | 0.6 ± 0.1   | 0.6 ± 0.2                             | 0.6 ± 0.2 | 1.0                   | 2.5 | 3.9 | 1.2            | 2.5 | 3.9 |
| 2512                                                                                 | 6332   | 6.3 ± 0.2                              | 3.15 ± 0.15 | 0.6 ± 0.1   | 0.6 ± 0.2                             | 0.6 ± 0.2 | 1.0                   | 3.2 | 5.2 | 1.2            | 3.2 | 5.2 |


**FUNCTIONAL PERFORMANCE**

| <b>PERFORMANCE IN SULFUR-CONTAINING AMBIANCE</b> |                                                                                                                          |                                                                                                                          |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| TEST NAME                                        | HUMID SULFUR VAPOR TEST                                                                                                  | HUMID SULFUR VAPOR TEST (Accelerated)                                                                                    |
| Reference specification                          | ASTM B809-95                                                                                                             | ASTM B809-95 accelerated conditions                                                                                      |
| Test conditions (temperature, humidity)          | 60 °C ± 2 °C<br>85 % ± 4 % RH                                                                                            | 90 °C ± 2 °C<br>74 % ± 7 % RH                                                                                            |
| Aggressive agent                                 | Sulfur (saturated vapor)                                                                                                 | Sulfur (saturated vapor)                                                                                                 |
| Failure criteria in VI under magnification       | No silver sulfide growth at the interface between termination and protective overcoat.<br>No signs of mechanical damage. | No silver sulfide growth at the interface between termination and protective overcoat.<br>No signs of mechanical damage. |
| Failure criteria in electrical test              | $\leq (\pm 1 \% R + 0.05 \Omega)$                                                                                        | $\leq (\pm 1 \% R + 0.05 \Omega)$                                                                                        |
| Time before failure                              | 8000 h                                                                                                                   | 1000 h                                                                                                                   |



| TEST PROCEDURES AND REQUIREMENTS |                            |                                         |                                                                                                  |                                                                 |                                |
|----------------------------------|----------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------|
| EN 60115-1<br>CLAUSE             | IEC 60068-2<br>TEST METHOD | TEST                                    | PROCEDURE                                                                                        | REQUIREMENTS<br>PERMISSIBLE CHANGE ( $\Delta R$ )               |                                |
|                                  |                            |                                         |                                                                                                  | SIZE 0402                                                       | SIZE 0603 TO 2512              |
|                                  |                            |                                         |                                                                                                  | STABILITY CLASS 2 OR BETTER                                     |                                |
|                                  |                            |                                         |                                                                                                  | 1 $\Omega$ to 10 M $\Omega$                                     |                                |
| 4.5                              | -                          | Resistance                              | -                                                                                                | 0.5 %, $\pm 1$ %, $\pm 5$ %                                     |                                |
| 4.8.4.2                          | -                          | Temperature coefficient                 | (20/- 55/20) °C and (20/125/20) °C                                                               | $\pm 50$ ppm/K, $\pm 100$ ppm/K, $\pm 200$ ppm/K                |                                |
| 4.13                             | -                          | Short time overload                     | $U = 2.5 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$ ;<br>duration: According to style | $\pm (0.25 \% R + 0.05 \Omega)$                                 |                                |
| 4.19                             | 14 (Na)                    | Rapid change of temperature             | 30 min. at - 55 °C;<br>30 min. at 125 °C<br>5 cycles<br>1000 cycles                              | $\pm (0.25 \% R + 0.05 \Omega)$<br>$\pm (1 \% R + 0.05 \Omega)$ |                                |
| 4.25.1                           | -                          | Endurance at 70 °C                      | $U = \sqrt{P_{70} \times R} \leq U_{max.}$ ;<br>1.5 h on; 0.5 h off;<br>70 °C, 1000 h            | $\pm (1 \% R + 0.05 \Omega)$                                    | $\pm (0.5 \% R + 0.05 \Omega)$ |
| 4.18.2                           | 58 (Td)                    | Resistance to soldering heat            | Solder bath method<br>(260 $\pm$ 5) °C<br>(10 $\pm$ 1) s                                         | $\pm (0.25 \% R + 0.05 \Omega)$                                 |                                |
| 4.24                             | 78 (Cab)                   | Damp heat, steady state                 | (40 $\pm$ 2) °C;<br>(93 $\pm$ 3) % RH;<br>56 days                                                | $\pm (1 \% R + 0.05 \Omega)$                                    | $\pm (0.5 \% R + 0.05 \Omega)$ |
| 4.25.3                           | -                          | Endurance at upper category temperature | 155 °C, 1000 h                                                                                   | $\pm (0.5 \% R + 0.05 \Omega)$                                  |                                |

All tests are carried out in accordance with the following specifications:

- EN 60115-1, generic specification
- EN 140400, sectional specification
- EN 140401-802, detail specification
- AEC-Q200, automotive specification
- IEC 60068-2, environmental test procedures
- ASTM B 809-95, standard test method for porosity in metallic coatings by humid sulfur.

Packaging of components is done in paper or blister tapes according to IEC 60286-3.



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## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**