

## Insulated Precision Wirewound Resistors Axial Leads



In wirewound precision resistors, the RLP series holds a leading position in professional applications whenever an excellent stability of the ohmic value and a correspondingly low temperature coefficient are required at the same time.

The RLP model resistors comply with the most stringent requirements of the CECC 40-201-006 specification. The series consists of 5 models covering the power range from 1 W to 10 W.

Non-inductive versions can be supplied on request by specifying RLP-NI. For higher power dissipations, the use of RH series resistors is recommended.

### FEATURES

- 1 W to 10 W at 25 °C
- According to CECC 40-201-006
- According to MIL-R-26/5C and MIL-R-26/6C
- Excellent stability <math>\pm 0.3\%</math> after 1000 h
- High power up to 10 W at 25 °C
- Low ohmic values 10 m $\Omega$  available
- Low temperature coefficient  $\leq \pm 50$  ppm/°C
- Electrical insulation
- Climatic protection
- Termination = Pure matte tin or Sn/Ag/Cu according to the ohmic value
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

| DIMENSIONS in millimeters |                  |        |                   |                   |         |          |
|---------------------------|------------------|--------|-------------------|-------------------|---------|----------|
| INSULATED                 | SERIES AND STYLE | A MAX. | Ø B MAX.          |                   | E ± 0.1 | WEIGHT g |
|                           |                  |        | R > 0.15 $\Omega$ | R ≤ 0.15 $\Omega$ |         |          |
|                           | <b>RLP1</b>      | 7      | 2.5               | -                 | 0.6     | 0.27     |
|                           | <b>RLP2</b>      | 10.2   | 4.0               | -                 | 0.6     | 0.48     |
|                           | <b>RLP3</b>      | 14     | 5.54              | 6                 | 0.8     | 1.3      |
|                           | <b>RLP6</b>      | 23.82  | 8.71              | 9                 | 0.8     | 3.4      |
|                           | <b>RLP10</b>     | 46.78  | 10.32             | 11                | 0.8     | 8.6      |

| TECHNICAL SPECIFICATIONS                          |                         |  |                               |                                  |                                  |                                 |                                 |
|---|-------------------------|--|-------------------------------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|
| VISHAY SFERNICE SERIES AND STYLE                  |                         |  | RLP1                          | RLP2                             | RLP3                             | RLP6                            | RLP10                           |
| Reference CECC 40-201-006                         |                         |  | A                             | B                                | C                                | D                               | E                               |
| Cross-Reference NF C83-210                        |                         |  | RP8                           | RP7                              | RP4                              | RP5                             | RP6                             |
| Cross-Reference MIL-R-26/5C and MIL-R-26/6C       |                         |  | RW81                          | RW80                             | RW79                             | RW74                            | RW78                            |
| Power Rating, Pr                                  | CECC 40-201-006 Power   | at 25 °C, P <sub>25</sub><br>at 70 °C, P <sub>70</sub> | 1 W<br>0.8 W                  | 1.5 W<br>1.25 W                  | 2.5 W<br>2 W                     | -                               | -                               |
|   | Extended Sfernice Power | at 25 °C, P <sub>25</sub><br>at 70 °C, P <sub>70</sub> | 1 W<br>0.8 W                  | 2 W<br>1.65 W                    | 3 W<br>2.5 W                     | 6 W<br>5 W                      | 10 W<br>8.2 W                   |
| Ohmic Range in Relation to Tolerance              | ± 5 % E24               |  | 0.05 $\Omega$ to 2 k $\Omega$ | 0.025 $\Omega$ to 6.8 k $\Omega$ | 0.01 $\Omega$ to 15 k $\Omega$   | 0.02 $\Omega$ to 59 k $\Omega$  | 0.06 $\Omega$ to 150 k $\Omega$ |
|   | ± 2 % E48               |  | 0.05 $\Omega$ to 2 k $\Omega$ | 0.025 $\Omega$ to 6.8 k $\Omega$ | 0.03 $\Omega$ to 15 k $\Omega$   | 0.02 $\Omega$ to 59 k $\Omega$  | 0.06 $\Omega$ to 150 k $\Omega$ |
|   | ± 1 % E96               |  | 0.05 $\Omega$ to 2 k $\Omega$ | 0.025 $\Omega$ to 6.8 k $\Omega$ | 0.03 $\Omega$ to 15 k $\Omega$   | 0.02 $\Omega$ to 59 k $\Omega$  | 0.06 $\Omega$ to 150 k $\Omega$ |
|   | ± 0.5 % E96             |  | 0.4 $\Omega$ to 2 k $\Omega$  | 0.4 $\Omega$ to 6.8 k $\Omega$   | 0.0499 $\Omega$ to 15 k $\Omega$ | 0.3 $\Omega$ to 59 k $\Omega$   | 0.3 $\Omega$ to 150 k $\Omega$  |
|   | ± 0.1 % E96             | Please consult Vishay Sfernice                         |                               |                                  |                                  |                                 |                                 |
| Qualified Ohmic Value Range CECC 40-201-006       |                         |  | 1 $\Omega$ to 470 $\Omega$    | 0.2 $\Omega$ to 1.78 k $\Omega$  | 0.1 $\Omega$ to 3.57 k $\Omega$  | 0.1 $\Omega$ to 12.1 k $\Omega$ | 0.1 $\Omega$ to 40.2 k $\Omega$ |
| Limiting Element Voltage, U <sub>max.</sub> AC/DC |                         |  | 50 V                          | 120 V                            | 200 V                            | 300 V                           | 720 V                           |
| Critical Resistance                               |                         |  | Out of nominal ohmic range    |                                  |                                  | 17 800 W                        | 51 100 W                        |

**STANDARD ELECTRICAL SPECIFICATIONS**

| MODEL | RESISTANCE RANGE<br>$\Omega$ | RATED POWER<br>$P_{25^\circ\text{C}}$<br>W | TOLERANCE<br>$\pm$ %   |
|-------|------------------------------|--|------------------------|
| RLP1  | 0.05 to 2K                   | 1  | 0.1, 0.2, 0.5, 1, 2, 5 |
| RLP2  | 0.025 to 6.8K                | 2  | 0.1, 0.2, 0.5, 1, 2, 5 |
| RLP3  | 0.01 to 15K                  | 3  | 0.1, 0.2, 0.5, 1, 2, 5 |
| RLP6  | 0.02 to 59K                  | 6  | 0.1, 0.2, 0.5, 1, 2, 5 |
| RLP10 | 0.06 to 150K                 | 10   | 0.1, 0.2, 0.5, 1, 2, 5 |

**MECHANICAL SPECIFICATIONS**

|                   |                                |                                   |
|-------------------|--------------------------------|-----------------------------------|
| Series and Style  | RLP1, RLP2                     | RLP3, RLP6, RLP10                 |
| Encapsulant       | High temperature mold compound | High temperature silicone coating |
| Resistive Element | CuNi or NiCr                   |                                   |
| Ceramic Substrate | Alumina or steatite            |                                   |
| Termination       | Pure matte tin or Sn/Ag/Cu     |                                   |

**ENVIRONMENTAL SPECIFICATIONS**

|                                  |                   |
|----------------------------------|-------------------|
| Temperature Range                | -55 °C to +275 °C |
| Climatic Category (LCT/UCT/days) | 55/200/56         |

**PERFORMANCE**

| TESTS                                   | CONDITIONS   | REQUIREMENTS<br>( $\Delta R/R$ OR INDICATED PARAMETER)               |
|---|--|--|
| Short Time Overload                     | IEC 60115-1<br>6.25 $P_{R\text{Extended Sfernice Power}}$ or $U = 2 U_{\text{max.}}/5$ s<br>for RLP1, RLP2, RLP3<br>12 $P_{R\text{Extended Sfernice Power}}$ or $U = 2 U_{\text{max.}}/5$ s<br>for RLP6, RLP10 | $\pm$ (0.25 % + 0.05 $\Omega$ )                                      |
| Load Life                               | IEC 60115-1<br>90'/30' cycles<br>1000 h $P_{R\text{Extended Sfernice Power}}$ + 25 °C  | $\pm$ (0.5 % + 0.05 $\Omega$ )<br>Insulation $R \geq 1$ G $\Omega$   |
| Dielectric w/s Voltage                  | IEC 60115-1<br>$U_{\text{RMS}} = 500$ V/60 s   | No flashover or breakdown<br>Leakage current < 10 $\mu$ A            |
| Rapid Change of Temperature             | IEC 60115-1<br>IEC 60068-2-14 Test Na<br>5 cycles (30' at LCT/30' at UCT)<br>-55 °C / +200 °C  | $\pm$ (0.25 % + 0.05 $\Omega$ )                                      |
| Climatic Sequence                       | IEC 60115-1<br>-55 °C / +200 °C/56 days  | $\pm$ (0.5 % + 0.05 $\Omega$ )                                       |
| Humidity (Steady State)                 | IEC 60115-1<br>IEC 60068-2-3 Test Ca<br>95 % HR/40 °C<br>56 days   | $\pm$ (0.5 % + 0.05 $\Omega$ )<br>Insulation $R \geq 100$ M $\Omega$ |
| Shock                                   | IEC 60115-1<br>IEC 60068-2-27 Test Ea<br>50 $g$ 's/half sine/<br>3 times by direction (i.e. 18 shocks)   | $\pm$ (0.25 % + 0.05 $\Omega$ )                                      |
| Vibration                               | IEC 60115-1<br>IEC 60068-2-6 Test Fc<br>10 Hz / 55 Hz  | $\pm$ (0.25 % + 0.05 $\Omega$ )                                      |
| Load Life at Upper Category Temperature | IEC 60115-1<br>90' / 30' cycles<br>1000 h $P_{R\text{Extended Sfernice Power}}$ +200 °C  | $\pm$ (0.5 % + 0.05 $\Omega$ )<br>Insulation $R \geq 1$ G $\Omega$   |



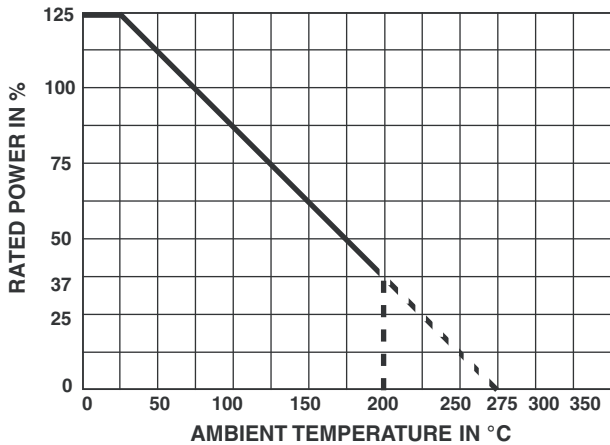
| <b>TEMPERATURE COEFFICIENT</b> in the range -55 °C to +200 °C |                    |
|---|--------------------|
| <b>OHMIC RANGE</b>  | <b>REQUIREMENT</b> |
| < 1 Ω   | ± 100 ppm/°C       |
| 1 Ω to < 10 Ω   | ± 50 ppm/°C        |
| ≥ 10 Ω  | ± 25 ppm/°C        |

**STABILITY AND POWER RATING**

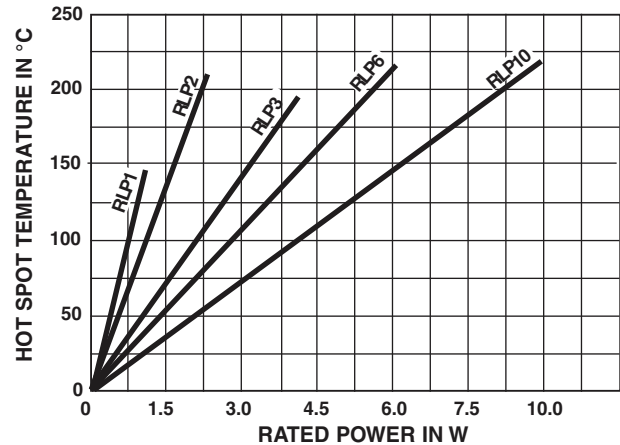
Stability changes slightly according to power rating and ambient temperature. This fact is especially important for users needing a life drift lower than the initial resistance tolerance. Typical drifts, after 2000 h life test made under the 90' / 30' conditions and at an ambient temperature of 25 °C, are:

| <b>OHMIC RANGE</b> | <b>RLP1</b> | <b>RLP2</b> | <b>RLP3</b> | <b>RLP6</b> | <b>RLP10</b> | <b>ΔR %/R %</b> |
|--------------------|-------------|-------------|-------------|-------------|--------------|-----------------|
| Pr                 | 1 W         | 2 W         | 3 W         | 5 W         | 10 W         | 0.3             |
| 0.5 Pr             | 0.5 W       | 1 W         | 1.5 W       | 2.5 W       | 5 W          | 0.15            |

**POWER RATING**



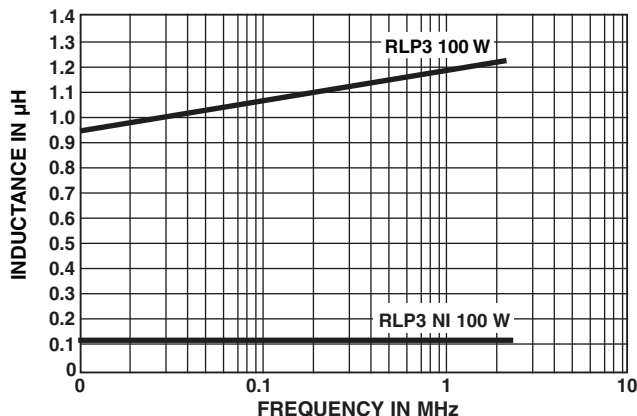
**TEMPERATURE RISE**



**NON INDUCTIVE WINDING (NI)**

Non inductive (Ayrton Perry) winding available. Please consult Vishay Sfernice.

**INDUCTANCE** (Example)



**PACKAGING** (see datasheet 50032 and 50033)

- Reel of 1000 units for RLP1, RLP2, RLP3
- Ammopack of 500 units for RLP1, RLP2, RLP3
- Bag of 100 units for RLP1, RLP2
- Blister of 20 units for RLP3
- Box of 50 units for RLP6, RLP10

**MARKING**

Vishay Sfernice trademark, series, style, CECC style (if applicable) nominal resistance (in Ω, kΩ), tolerance (in %), manufacturing date.



| ORDERING INFORMATION |       |             |           |           |
|----------------------|-------|-------------|-----------|-----------|
| RLP                  | 01    | 5R500       | J         | R15       |
| MODEL                | STYLE | OHMIC VALUE | TOLERANCE | PACKAGING |

| GLOBAL PART NUMBER INFORMATION   |                            |                           |   |  |   |                                  |
|--|----------------------------|---------------------------|---|--|---|----------------------------------|
| <div style="display: flex; justify-content: space-around; font-weight: bold; font-size: 1.2em;"> <span>R</span><span>L</span><span>P</span><span>0</span><span>6</span><span>1</span><span>5</span><span>0</span><span>R</span><span>0</span><span>J</span><span>B</span><span>0</span><span>0</span> </div> |                            |                           |   |  |   |                                  |
| GLOBAL MODEL   | SIZE                       | OPTION                    | OHMIC VALUE   | TOLERANCE  | PACKAGING   | SPECIAL                          |
| RLP  | 01<br>02<br>03<br>06<br>10 | N = non inductive winding | <p>The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point.</p> <p><b>680R0</b> = 680 Ω<br/> <b>20301</b> = 20.3 kΩ<br/> <b>88R88</b> = 88.88 Ω<br/>           ...</p> | <b>B</b> = 0.1 %<br><b>C</b> = 0.2 %<br><b>D</b> = 0.5 %<br><b>F</b> = 1 %<br><b>G</b> = 2 %<br><b>J</b> = 5 % | <b>Standard packaging:</b><br>Size 01 and 02:<br><b>S14</b> = bag, 100 pieces<br>size 03:<br><b>B15</b> = bulk, 20 pieces<br>size 06 and 10:<br><b>B25</b> = box, 50 pieces<br><b>A20</b> = ammopack,<br>500 pieces for RLP1,<br>RLP2, and RLP3<br><b>R15</b> = tape and reel,<br>1000 pieces for RLP1,<br>RLP2, and RLP3 | As applicable<br><b>Ex</b> = MEX |



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