

# 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.

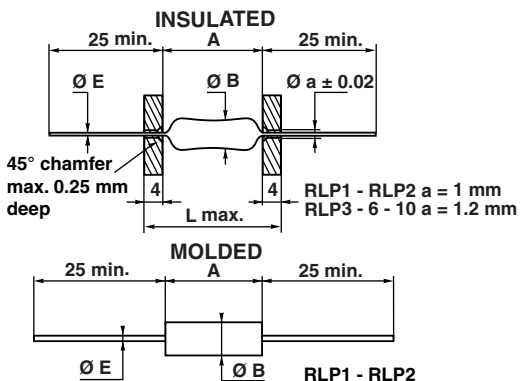
Non-inductive versions can be supplied on request by specifying RLP-NI. For higher power dissipations, the use of RH series resistors is recommended.

## 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 < ± 0.3 % after 1000 h
- High power up to 10 W at 25 °C
- Low ohmic values 10 mΩ available
- Low temperature coefficient ≤ ± 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

|  | SERIES AND STYLE | A MAX. | Ø B MAX.   |            | E ± 0.1 | WEIGHT g |
|------------------------------------------------------------------------------------|------------------|--------|------------|------------|---------|----------|
|                                                                                    |                  |        | R > 0.15 Ω | R ≤ 0.15 Ω |         |          |
|                                                                                    | RLP1             | 7      | 2.5        | -          | 0.6     | 0.27     |
|                                                                                    | RLP2             | 10.2   | 4.0        | -          | 0.6     | 0.48     |
|                                                                                    | RLP3             | 14     | 5.54       | 6          | 0.8     | 1.3      |
|                                                                                    | RLP6             | 23.82  | 8.71       | 9          | 0.8     | 3.4      |
|                                                                                    | RLP10            | 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, $P_{25}$<br>at 70 °C, $P_{70}$ | 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, $P_{25}$<br>at 70 °C, $P_{70}$ | 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 Ω to 2 kΩ                 | 0.025 Ω to 6.8 kΩ | 0.01 Ω to 15 kΩ   | 0.02 Ω to 59 kΩ  | 0.06 Ω to 150 kΩ |
|                                                |                         | ± 2 % E48                                | 0.05 Ω to 2 kΩ                 | 0.025 Ω to 6.8 kΩ | 0.03 Ω to 15 kΩ   | 0.02 Ω to 59 kΩ  | 0.06 Ω to 150 kΩ |
|                                                |                         | ± 1 % E96                                | 0.05 Ω to 2 kΩ                 | 0.025 Ω to 6.8 kΩ | 0.03 Ω to 15 kΩ   | 0.02 Ω to 59 kΩ  | 0.06 Ω to 150 kΩ |
|                                                |                         | ± 0.5 % E96                              | 0.4 Ω to 2 kΩ                  | 0.4 Ω to 6.8 kΩ   | 0.0499 Ω to 15 kΩ | 0.3 Ω to 59 kΩ   | 0.3 Ω to 150 kΩ  |
|                                                |                         | ± 0.1 % E96                              | Please consult Vishay Sfernice |                   |                   |                  |                  |
| Qualified Ohmic Value Range<br>CECC 40-201-006 |                         |                                          | 1 Ω to 470 Ω                   | 0.2 Ω to 1.78 kΩ  | 0.1 Ω to 3.57 kΩ  | 0.1 Ω to 12.1 kΩ | 0.1 Ω to 40.2 kΩ |
| Limiting Element Voltage, $U_{\max}$ . 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<br>(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 $R \geq 1 \text{ G}\Omega$   |
| Dielectric w/s Voltage                  | IEC 60115-1<br>$U_{\text{RMS}} = 500 \text{ V}/60 \text{ s}$                                                                                                                                                         | No flashover or breakdown<br>Leakage current $< 10 \mu\text{A}$         |
| 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 $R \geq 100 \text{ M}\Omega$ |
| 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 $R \geq 1 \text{ G}\Omega$   |

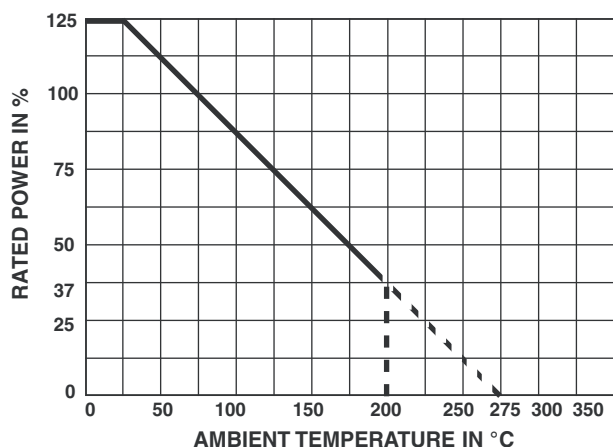
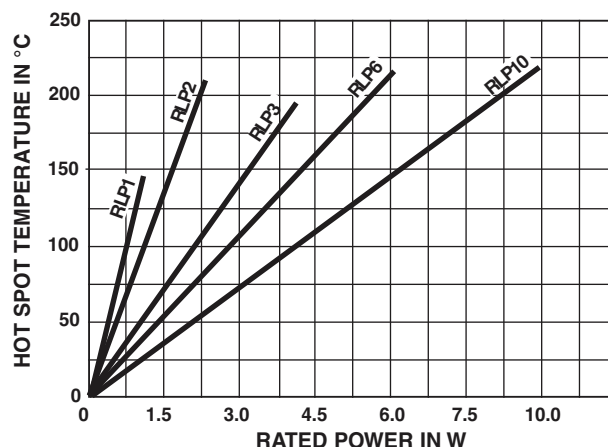
**TEMPERATURE COEFFICIENT** in the range -55 °C to +200 °C

| OHMIC RANGE                 | REQUIREMENT      |
|-----------------------------|------------------|
| < 1 $\Omega$                | $\pm 100$ ppm/°C |
| 1 $\Omega$ to < 10 $\Omega$ | $\pm 50$ ppm/°C  |
| $\geq 10$ $\Omega$          | $\pm 25$ ppm/°C  |

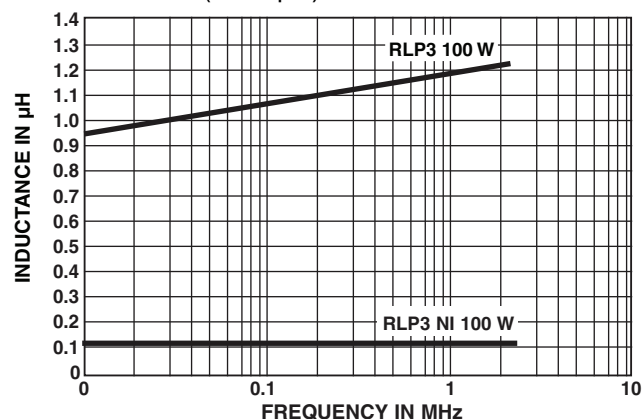
**STABILITY AND POWER RATING**

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:

| OHMIC RANGE | RLP1  | RLP2 | RLP3  | RLP6  | RLP10 | $\Delta R$ %/R % |
|-------------|-------|------|-------|-------|-------|------------------|
| 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  
 Ampopack 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  $\Omega$ , k $\Omega$ ), tolerance (in %), manufacturing date.



### ORDERING INFORMATION

|            |           |              |           |            |
|------------|-----------|--------------|-----------|------------|
| <b>RLP</b> | <b>01</b> | <b>5R500</b> | <b>J</b>  | <b>R15</b> |
| MODEL      | STYLE     | OHMIC VALUE  | TOLERANCE | PACKAGING  |

### GLOBAL PART NUMBER INFORMATION

|                                                                                                                                                                                     |                            |                           |                                                                                                                                                                                                         |  |                                                                       |  |                                                                                                                                                                                                                                                                            |  |                           |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------|--|--|--|--|
| <div><div>R</div><div>L</div><div>P</div><div>0</div><div>6</div><div>1</div><div>5</div><div>0</div><div>R</div><div>0</div><div>J</div><div>B</div><div>0</div><div>0</div></div> |                            |                           |                                                                                                                                                                                                         |  |                                                                       |  |                                                                                                                                                                                                                                                                            |  |                           |  |  |  |  |
| GLOBAL MODEL                                                                                                                                                                        | SIZE                       | OPTION                    | OHMIC VALUE                                                                                                                                                                                             |  | TOLERANCE                                                             |  | PACKAGING                                                                                                                                                                                                                                                                  |  | SPECIAL                   |  |  |  |  |
| RLP                                                                                                                                                                                 | 01<br>02<br>03<br>06<br>10 | N = non inductive winding | The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point.<br><br>680R0 = 680 Ω<br>20301 = 20.3 kΩ<br>88R88 = 88.88 Ω<br>... |  | B = 0.1 %<br>C = 0.25 %<br>D = 0.5 %<br>F = 1 %<br>G = 2 %<br>J = 5 % |  | <b>Standard packaging:</b><br>Size 01 and 02:<br>S14 = bag, 100 pieces<br>size 03:<br>B15 = bulk, 20 pieces<br>size 06 and 10:<br>B25 = box, 50 pieces<br>A20 = ammopack, 500 pieces for RLP1, RLP2, and RLP3<br>R15 = tape and reel, 1000 pieces for RLP1, RLP2, and RLP3 |  | As applicable<br>Ex = MEX |  |  |  |  |



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