# 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

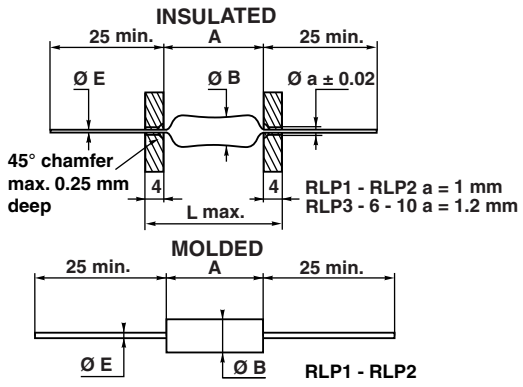
- 1 W to 10 W at 25 °C
- According to CECC 40-201-006
- According to MIL-R-26/5C and MIL-R-26/6C
- Excellent stability < ± 0.3 % after 1000 h
- High power up to 10 W at 25 °C
- Low ohmic values 10 mΩ available
- Low temperature coefficient ≤ ± 50 ppm/°C
- Electrical insulation
- Climatic protection
- 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

Pb-free

e1

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 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 |



For technical questions, contact: sferfixedresistors@vishay.com

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## STANDARD ELECTRICAL SPECIFICATIONS

| MODEL | RESISTANCE RANGE Ω | RATED POWER $P_{25\ °C}$ W | TOLERANCE ± % |
|---|---|---|---|
| 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 (Δ*R*/*R* OR INDICATED PARAMETER) |
|---|---|---|
| Short Time Overload | IEC 60115-1<br>6.25 $Pr_{Extended\ Sfernice\ Power}$ or $U = 2\ U_{max.}/5$ s<br>for RLP1, RLP2, RLP3<br>12 $Pr_{Extended\ Sfernice\ Power}$ or $U = 2\ U_{max.}/5$ s<br>for RLP6, RLP10 | ± (0.25 % + 0.05 Ω) |
| Load Life | IEC 60115-1<br>90'/30' cycles<br>1000 h $Pr_{Extended\ Sfernice\ Power}$ + 25 °C | ± (0.5 % + 0.05 Ω)<br>Insulation $R \geq 1$ GΩ |
| Dielectric w/s Voltage | IEC 60115-1<br>$U_{RMS}$ = 500 V/60 s | No flashover or breakdown<br>Leakage current < 10 µA |
| 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 | ± (0.25 % + 0.05 Ω) |
| Climatic Sequence | IEC 60115-1<br>-55 °C / +200 °C/56 days | ± (0.5 % + 0.05 Ω) |
| Humidity (Steady State) | IEC 60115-1<br>IEC 60068-2-3 Test Ca<br>95 % HR/40 °C<br>56 days | ± (0.5 % + 0.05 Ω)<br>Insulation $R \geq 100$ MΩ |
| 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) | ± (0.25 % + 0.05 Ω) |
| Vibration | IEC 60115-1<br>IEC 60068-2-6 Test Fc<br>10 Hz / 55 Hz | ± (0.25 % + 0.05 Ω) |
| Load Life at Upper Category Temperature | IEC 60115-1<br>90' / 30' cycles<br>1000 h $Pr_{Extended\ Sfernice\ Power}$ +200 °C | ± (0.5 % + 0.05 Ω)<br>Insulation $R \geq 1$ GΩ |


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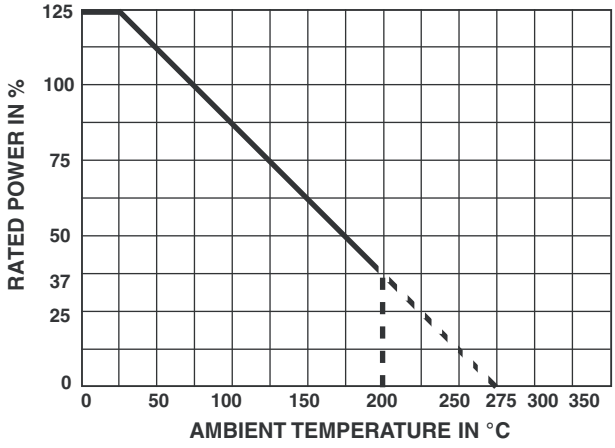
| **TEMPERATURE COEFFICIENT** in the range -55 °C to +200 °C | |
|---|---|
| **OHMIC RANGE** | **REQUIREMENT** |
| < 1 Ω | ± 100 ppm/°C |
| 1 Ω to < 10 Ω | ± 50 ppm/°C |
| ≥ 10 Ω | ± 25 ppm/°C |

## STABILITY AND POWER RATING

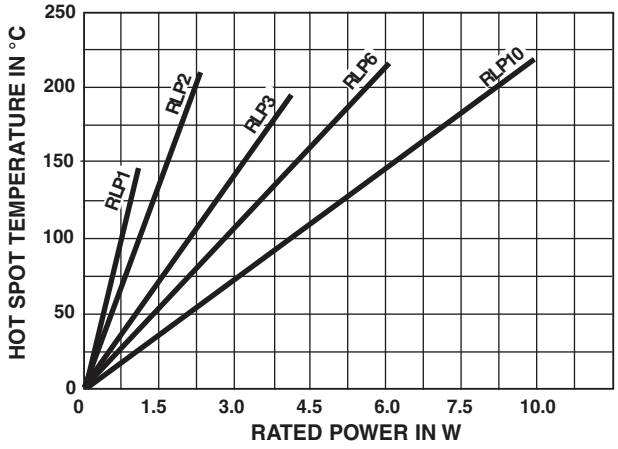
Stability changes slightly according to power rating and ambient temperature. This fact is especially important for users needing a life drift lower than the initial resistance tolerance. Typical drifts, after 2000 h life test made under the 90' / 30' conditions and at an ambient temperature of 25 °C,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

| 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



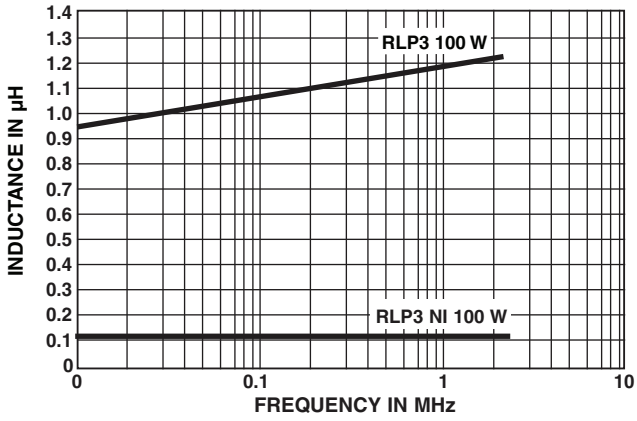

## TEMPERATURE RISE




## 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<br>Ammopack of 500 units for RLP1, RLP2, RLP3<br>Bag of 100 units for RLP1, RLP2<br>Blister of 20 units for RLP3<br>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.



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## ORDERING INFORMATION

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

## GLOBAL PART NUMBER INFORMATION

| R | L | P | 0 | 6 | 1 | 5 | 0 | R | 0 | J | B | 0 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| 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** = 0.2 %<br>**D** = 0.5 %<br>**F** = 1 %<br>**G** = 2 %<br>**J** = 5 % | **Standard packaging:**<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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