

Standard Carbon Film Leaded Resistors



FEATURES

- Securely bonded carbon film
- Good moisture resistance ($\Delta R_{\max.} \leq \pm 1.5 \% R$)
- Good long term stability ($\Delta R_{\max.} \leq \pm 1.5 \% R$, for 1000 h)
- Low noise (refer to graph)
- Suitable for general purpose commercial electronics and pulse load applications
- Lead (Pb)-free solder contacts
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Material categorization: For definitions of compliance please see www.vishay.com/doc?999912


RoHS
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

| MODEL | SIZE | POWER RATING P_{70} W | LIMITING ELEMENT VOLTAGE $U_{\max.}$ V_{\equiv} | TOLERANCE $\pm \%$ | RESISTANCE RANGE Ω | E-SERIES |
|---------|------|-------------------------------|---|-----------------------|---------------------------------|----------|
| LCA0207 | 0207 | 0.35 | 300 | 2 5 | 1 to 1M 0.22 to 5.1M | E24 |
| LCA0414 | 0414 | 0.6 | 500 | 2 5 | 1 to 1M 0.22 to 10M | E24 |

Notes

- Coating: Light blue.
- Marking: Color coded. Additional blue color marking after second band.

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | LCA0207 | LCA0414 |
|--|--------------------|----------------|------------|
| Rated dissipation, P_{70} | W | 0.35 | 0.6 |
| Limiting element voltage, $U_{\max.}$ ⁽¹⁾ | V_{\equiv} | ≤ 300 | ≤ 500 |
| Limiting voltage, short-time | V_{\equiv} | 500 | 1000 |
| Insulation voltage, U_{ins} (1 min) | V | > 700 | > 700 |
| Thermal resistance | K/W | ≤ 220 | ≤ 140 |
| Insulation resistance | Ω | $\geq 10^{11}$ | |
| Category temperature range | $^{\circ}\text{C}$ | - 55 to + 155 | |
| Failure rate | $10^{-9}/\text{h}$ | < 10 | |
| Weight | g | 0.21 | 0.68 |

Note

⁽¹⁾ Rated voltage $\sqrt{P \times R}$.

| PART NUMBER AND PRODUCT DESCRIPTION | | | | | | | | | | | | | | | | | |
|---|---|-----------------------------|---|----------------------------|---|---|---|---|------------------------|---|---|---|---------------------------------|---|---|---|---|
| Part Number: LCA0207002401J2500 | | | | | | | | | | | | | | | | | |
| L | C | A | 0 | 2 | 0 | 7 | 0 | 0 | 2 | 4 | 0 | 1 | J | 2 | 5 | 0 | 0 |
| MODEL/SIZE | | VARIANT | | TCR | | VALUE | | | TOLERANCE | | PACKAGING ⁽¹⁾ | | SPECIAL | | | | |
| LCA0207 LCA0414 | | 0 = Neutral | | 0 = Neutral See diagram | | 3 digit value 1 digit multiplier Multiplier 7 = *10 ⁻³ 8 = *10 ⁻² 9 = *10 ⁻¹ 0 = *10 ⁰ 1 = *10 ¹ 2 = *10 ² 3 = *10 ³ 4 = *10 ⁴ 5 = *10 ⁵ 6 = *10 ⁶ | | | G = ± 2 % J = ± 5 % | | 25 = A5 22 = A2 (G53) 21 = A1 D5 = R5 D2 = R2 | | Up to 2 digits 00 = Standard | | | | |
| Product Description: LCA0207 2K4 5 % A5 | | | | | | | | | | | | | | | | | |
| LCA0207 | | 2K4 | | 5 % | | A5 | | | | | | | | | | | |
| MODEL | | RESISTANCE VALUE | | TOLERANCE | | PACKAGING ⁽¹⁾ | | | | | | | | | | | |
| LCA0207 LCA0414 | | 220K = 220 kΩ 10R = 10 Ω | | ± 2 % ± 5 % | | A5, R5 A1, R2 A2 | | | | | | | | | | | |

Notes

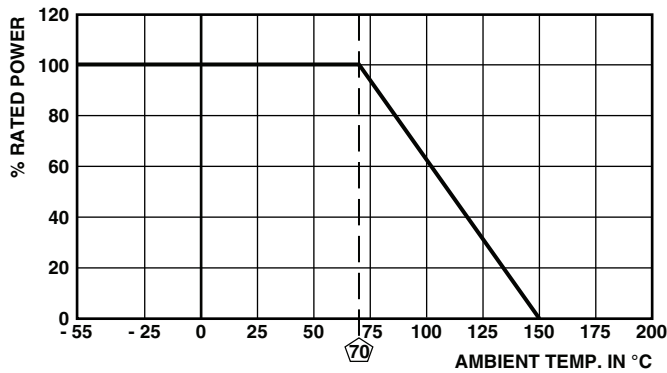
- The PART NUMBER shown above is to facilitate the unified part numbering system for ordering products.
- ⁽¹⁾ Please refer to table PACKAGING.

| PACKAGING | | | | | | |
|-----------|-------------|------|-----------------------------------|--------------|----------|-----------------------------------|
| MODEL | REEL | | | BOX | | |
| | PIECES/REEL | CODE | MIN. ORDER QTY PACKAGING UNITS | PIECES/BOX | CODE | MIN. ORDER QTY PACKAGING UNITS |
| LCA0207 | 5000 | R5 | 1 | 5000 2000 | A5 A2 | 1 |
| LCA0414 | 2000 | R2 | 1 | 1000 | A1 | 1 |

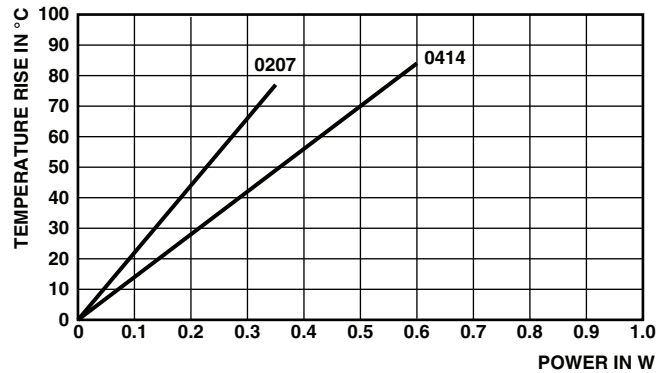
| DIMENSIONS in millimeters | | | | | | |
|---------------------------|-------------------|------------|----------------|--------|-----|------|
| | | | | | | |
| MODEL | D _{max.} | L | L ₁ | B | d | e |
| LCA0207 | 2.4 - 0.3 | 6.1 - 0.5 | 8.1 | 53 ± 1 | 0.6 | 7.5 |
| LCA0414 | 4.2 - 0.5 | 12.2 - 0.7 | 14.2 | 53 ± 1 | 0.8 | 15.0 |

Notes

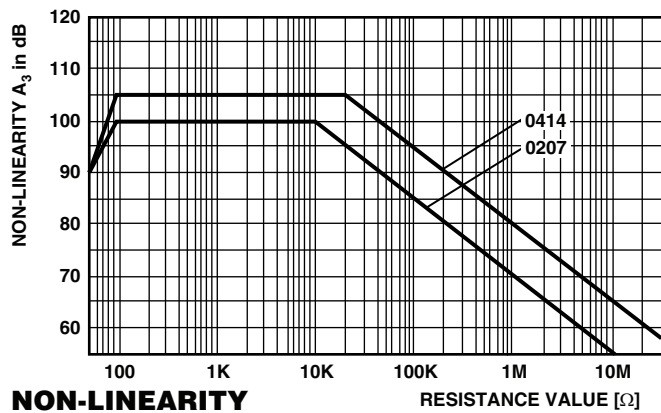
- Taping in according with IEC 60286-1.
- D and L measured in according with IEC 60294.
- d according to IEC 60301.



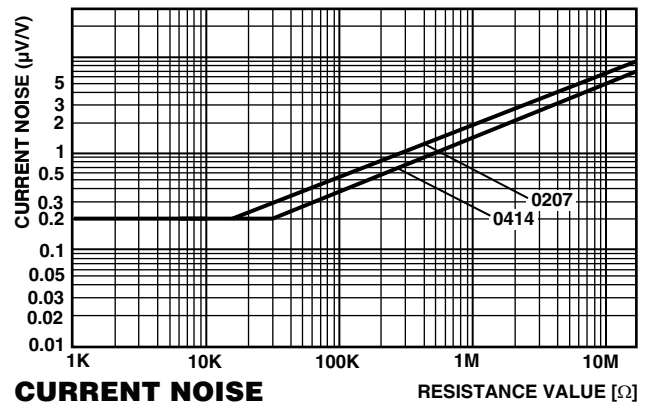
DERATING



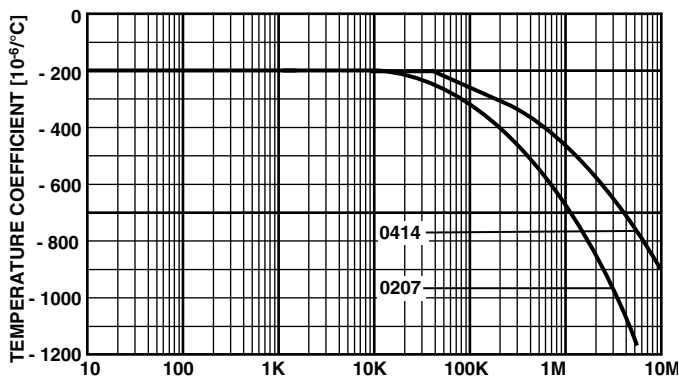
TEMPERATURE RISE



NON-LINEARITY

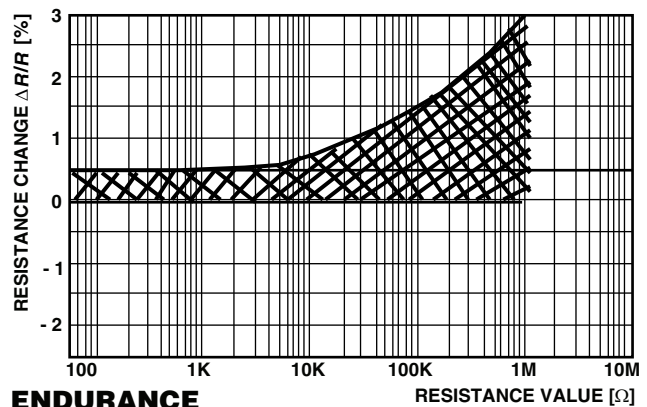


CURRENT NOISE



TEMPERATURE COEFFICIENT

(mean value) between - 25 °C to + 125 °C deviation ± 25 %

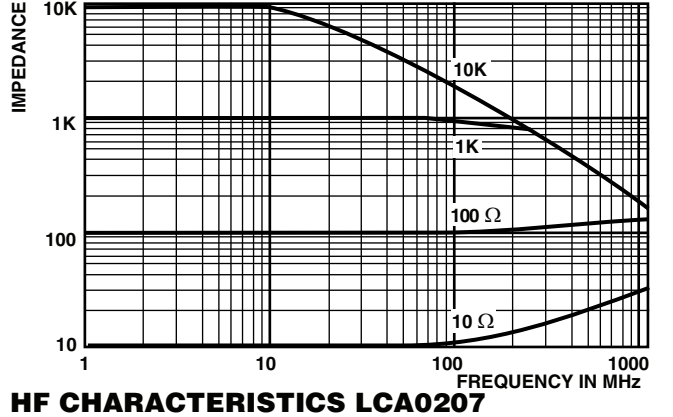
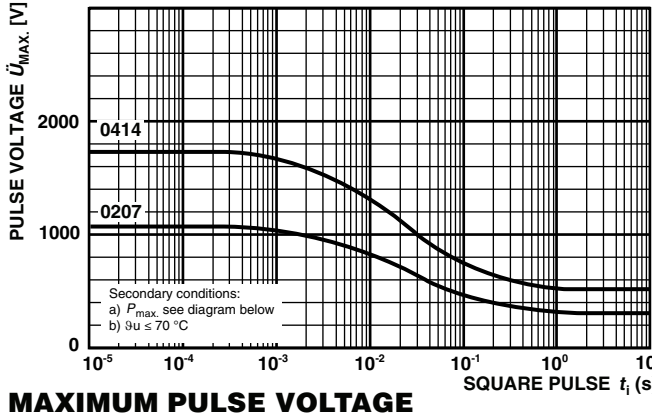
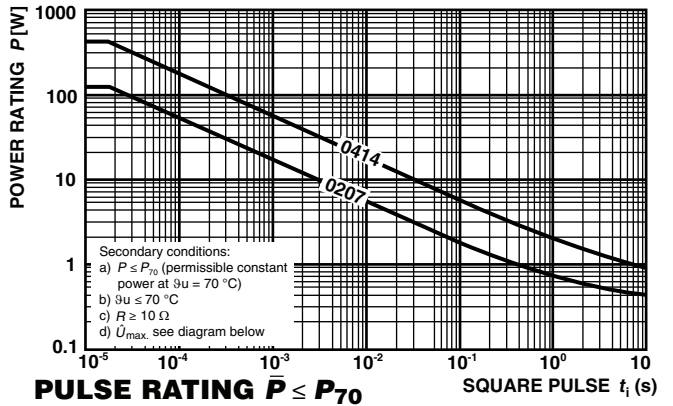
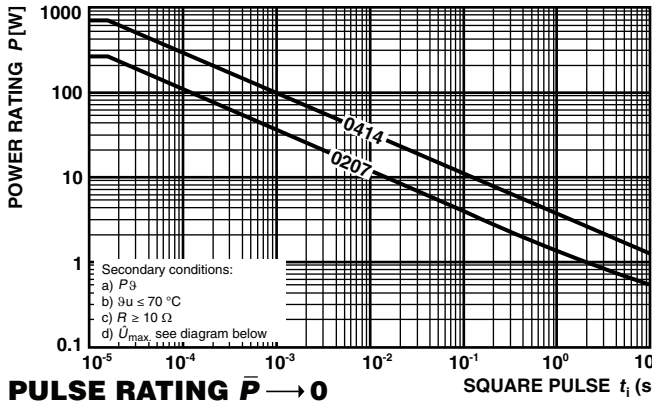
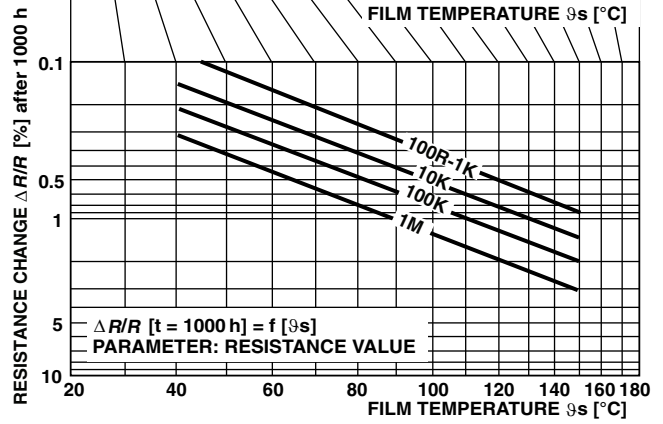
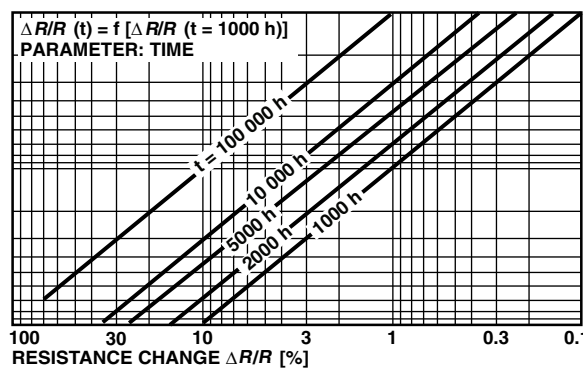
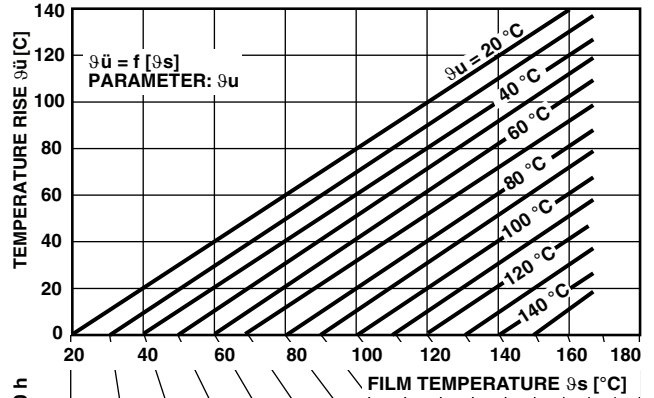
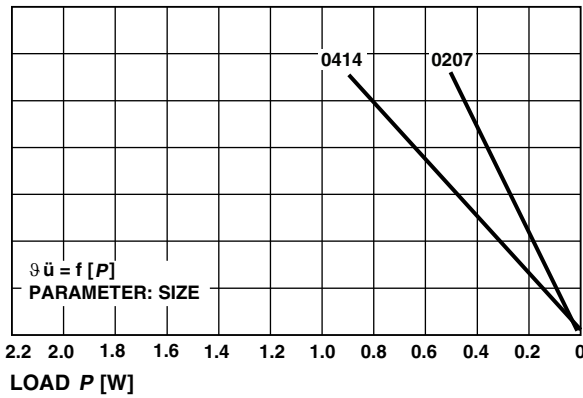


ENDURANCE

at upper category temperature, 155 °C 1000 h



STABILITY NOMOGRAM, TYPICAL VALUES (For handling see General Information)





| PERFORMANCE CHARACTERISTICS | | |
|---|--|--|
| TEST | CONDITIONS OF TEST | REQUIREMENTS ($\Delta R/R$) ⁽¹⁾ |
| Endurance test at 70 °C IEC 60115-1, 4.25.1 | 1000 h at 70 °C, 1.5 h ON, 0.5 h OFF 8000 h at 70 °C, 1.5. h ON, 0.5 h OFF | $\leq \pm 1.5 \%$ $\leq \pm 4.0 \%$ |
| Endurance at UCT IEC 60115-1, 4.25.3 | 1000 h at 155 °C without load 8000 h at 155 °C without load | $\leq \pm 3.0 \%$ $\leq \pm 8.0 \%$ |
| Overload test IEC 60115-1, 4.13 | 2.5 x rated power or twice the limiting element voltage, 2 s for size 0207; 5 s for size 0414 | $\leq \pm 0.5 \%$ |
| Thermal shock IEC 60115-1, 4.19 | Rapid change between upper and lower category temperature | $\leq \pm 0.25 \%$ |
| Climatic sequence IEC 60115-1, 4.23 | Dry heat, damp heat cyclic, cold, low air pressure | $\leq \pm 1.5 \%$ |
| Damp heat steady state IEC 60115, 4.24 | 56 days; 40 °C; 90 % to 95 % RH; loaded with 0.01 P_{70} | $\leq \pm 1.5 \%$ |
| Resistance to soldering heat IEC 60115-1, 4.18 | 10 s at 260 °C solder bath temperature | $\leq \pm 0.25 \%$ |
| Robustness of terminations IEC 60115-1, 4.16 | Tensile, bending and torsion | $\leq \pm 0.25 \%$ |
| Vibration IEC 60115-1, 4.22 | Frequency 10 Hz to 500 Hz; displacement 1.5 mm or acceleration 10 g; three directions; 6 h | $\leq \pm 0.25 \%$ |

Note

⁽¹⁾ For ohmic values between 10 Ω and 1 M Ω .

| APPLICABLE SPECIFICATIONS |
|---|
| <ul style="list-style-type: none"> • CECC 40101-806 • EN 140100; EN 60115-1 |



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