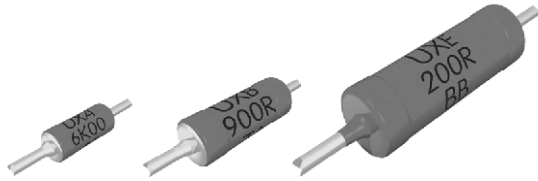


High Precision Thin Film Leaded Resistors



DESCRIPTION

UXA 0204, UXB 0207 and UXE 0414 high precision leaded thin film resistors combine the proven reliability of the professional products with an exceptional level of precision and stability. Therefore they are perfectly suited for applications in the fields of precision test and measuring equipment and particularly for the design of calibration references and standards.

FEATURES

- Superior thin film technology
- Exceptional low TCR: ± 02 ppm/K to ± 10 ppm/K
- Super tight tolerance: ± 0.01 % to ± 0.25 %
- Exceptional overall stability: Class 0.02
- Wide resistance range: 22Ω to $1 \text{ M}\Omega$
- Lead (Pb)-free solder contacts
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compliant to RoHS directive 2002/95/EC



RoHS
COMPLIANT

APPLICATIONS

- Precision test and measuring equipment
- Design of calibration references and standards

METRIC SIZE

| DIN | 0204 | 0207 | 0414 |
|------|------|------|------|
| CECC | A | B | D |

TECHNICAL SPECIFICATIONS

| DESCRIPTION | UXA 0204 | UXB 0207 | UXE 0414 |
|--|---|---------------------------------------|---------------------------------------|
| CECC Size | A | B | D |
| Resistance Range | 22Ω to $221 \text{ k}\Omega$ | 10Ω to $1 \text{ M}\Omega$ | 22Ω to $511 \text{ k}\Omega$ |
| Resistance Tolerance | ± 0.25 %; ± 0.1 %; ± 0.05 %; ± 0.01 % | | ± 0.1 %; ± 0.05 % |
| Temperature Coefficient | ± 10 ppm/K; ± 05 ppm/K; ± 02 ppm/K | | ± 10 ppm/K; ± 05 ppm/K |
| Operation Mode | Precision | | |
| Climatic Category (LCT/UCT/days) | 20/125/56 | | |
| Rated Dissipation: | | | |
| P_{85} | 0.05 W | 0.125 W | 0.25 W |
| P_{70} | 0.1 W | 0.25 W | 0.5 W |
| Operating Voltage, U_{max} , AC/DC | 200 V | 250 V | 300 V |
| Film Temperature | 125 °C | | |
| Max. Resistance Change at P_{70} for Resistance Range, $\Delta R/R$ max., After: | 100Ω to $100 \text{ k}\Omega$ | 100Ω to $250 \text{ k}\Omega$ | 100Ω to $100 \text{ k}\Omega$ |
| 2000 h | ≤ 0.05 % | ≤ 0.05 % | ≤ 0.05 % |
| Max. Resistance Change at P_{85} for Resistance Range, $\Delta R/R$ max., After: | 100Ω to $100 \text{ k}\Omega$ | 100Ω to $250 \text{ k}\Omega$ | 100Ω to $100 \text{ k}\Omega$ |
| 1000 h | ≤ 0.02 % | ≤ 0.02 % | ≤ 0.02 % |
| 8000 h | ≤ 0.04 % | ≤ 0.04 % | ≤ 0.04 % |
| 225 000 h | ≤ 0.12 % | ≤ 0.12 % | ≤ 0.12 % |
| Permissible Voltage Against Ambient : | | | |
| 1 Minute; U_{ins} | 300 V | 500 V | 800 V |
| Continuous | 75 V | 75 V | 75 V |
| Failure Rate: FIT _{observed} | $\leq 0.1 \times 10^{-9}/\text{h}$ | $\leq 0.1 \times 10^{-9}/\text{h}$ | $\leq 0.1 \times 10^{-9}/\text{h}$ |

Note

- 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 lifetime.

| PART NUMBER AND PRODUCT DESCRIPTION UX SERIES | | | | | | | | | | | | | | | | | |
|--|----------------------|--------------------------------------|--|----------------------------|---|---|---|---|---|----------------------------|---|---------------------------------|---|---|---|---|---|
| PART NUMBER: UXB02070F1001AC100 | | | | | | | | | | | | | | | | | |
| U | X | B | 0 | 2 | 0 | 7 | 0 | F | 1 | 0 | 0 | 1 | A | C | 1 | 0 | 0 |
| MODEL/SIZE | VARIANT | | TCR | | VALUE | | | TOLERANCE | | PACKAGING ⁽¹⁾ | | SPECIAL | | | | | |
| UXA0204 UXB0207 UXE0414 | 0 = Neutral | | H = ± 2 ppm/K G = ± 5 ppm/K F = ± 10 ppm/K | | 3 digit value 1 digit multiplier MULTIPLIER 9 = *10 ⁻¹ 2 = *10 ² 0 = *10 ⁰ 3 = *10 ³ 1 = *10 ¹ 4 = *10 ⁴ | | | T = ± 0.01 % A = ± 0.05 % B = ± 0.1 % C = ± 0.25 % | | C1 CU R1 R2 RP | | Up to 2 digits 00 = Standard | | | | | |
| PRODUCT DESCRIPTION: UXB 0207-10 0.05 % C1 1K0 | | | | | | | | | | | | | | | | | |
| UXB | 0207 | 10 | 0.05 % | C1 | 1K0 | | | | | | | | | | | | |
| MODEL | SIZE | TCR | TOLERANCE | PACKAGING ⁽¹⁾ | RESISTANCE VALUE | | | | | | | | | | | | |
| UXA UXB UXE | 0204 0207 0414 | ± 2 ppm/K ± 5 ppm/K ± 10 ppm/K | ± 0.01 % ± 0.05 % ± 0.1 % ± 0.25 % | C1 CU R1 R2 RP | 1K0 = 1.0 kΩ 47K = 47 kΩ 50R5 = 50.5 Ω | | | | | | | | | | | | |

Notes

⁽¹⁾ Please refer to table PACKAGING, see next page

- The PART NUMBER is shown to facilitate the introduction of a unified part numbering system.

DIMENSIONS



| DIMENSIONS - Leaded resistor types, mass and relevant physical dimensions | | | | | | |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|-----------|
| TYPE | D _{max.} (mm) | L _{max.} (mm) | d _{nom.} (mm) | I _{min.} (mm) | M _{min.} (mm) | MASS (mg) |
| UXA 0204 | 1.6 | 3.6 | 0.5 | 29.0 | 5.0 | 125 |
| UXB 0207 | 2.5 | 6.3 | 0.6 | 28.0 | 7.5 | 220 |
| UXE 0414 | 4.0 | 11.9 | 0.8 | 31.0 | 15.0 | 750 |

| SCRIPT MARKING - Printed resistance value and letter coding for TCR and tolerance | | | | |
|---|----------|-------------|-------------|-------------|
| RESISTANCE VALUE | TOL. (%) | LETTER CODE | TCR (ppm/K) | LETTER CODE |
| Clear text code for value | ± 0.25 | C | ± 10 | B |
| | ± 0.1 | B | ± 05 | A |
| | ± 0.05 | A | ± 02 | T |
| | ± 0.01 | T | - | - |

| PACKAGING | | | | |
|-----------|-------------------|------|------------|------|
| MODEL | REEL | | BOX | |
| | BANDOLIER ON REEL | CODE | PIECES/BOX | CODE |
| UXA | 1000 | R1 | 100 | CU |
| | | | 1000 | C1 |
| UXB | 1000 | R1 | 100 | CU |
| | | | 5000 | C1 |
| UXE | 2500 | R2 | 100 | CU |
| | | | 1000 | C1 |

| TEMPERATURE COEFFICIENT AND RESISTANCE RANGE | | | | |
|--|-----------|---------------------------------|-----------------|-----------------|
| DESCRIPTION | | RESISTANCE VALUE ⁽¹⁾ | | |
| TCR | TOLERANCE | UXA 0204 | UXB 0207 | UXE 0414 |
| ± 10 ppm/K ⁽²⁾ | ± 0.25 % | 22 Ω to 221 kΩ | 10 Ω to 1 MΩ | - |
| | ± 0.1 % | 43 Ω to 221 kΩ | 10 Ω to 1 MΩ | 22 Ω to 511 kΩ |
| | ± 0.05 % | 100 Ω to 180 kΩ | 24 Ω to 301 kΩ | 100 Ω to 301 kΩ |
| | ± 0.01 % | 200 Ω to 150 kΩ | 24 Ω to 301 kΩ | - |
| ± 05 ppm/K ⁽²⁾ | ± 0.25 % | 47 Ω to 150 kΩ | 10 Ω to 1 MΩ | - |
| | ± 0.1 % | 47 Ω to 150 kΩ | 10 Ω to 1 MΩ | 47 Ω to 301 kΩ |
| | ± 0.05 % | 100 Ω to 150 kΩ | 24 Ω to 221 kΩ | 100 Ω to 301 kΩ |
| | ± 0.01 % | 200 Ω to 150 kΩ | 24 Ω to 221 kΩ | - |
| ± 02 ppm/K ⁽³⁾ | ± 0.25 % | 100 Ω to 100 kΩ | 100 Ω to 150 kΩ | - |
| | ± 0.1 % | 100 Ω to 100 kΩ | 100 Ω to 150 kΩ | - |
| | ± 0.05 % | 150 Ω to 100 kΩ | 150 Ω to 150 kΩ | - |
| | ± 0.01 % | 200 Ω to 100 kΩ | 200 Ω to 150 kΩ | - |

Notes

⁽¹⁾ Resistance values to be selected from the E192 series, for other values please contact the factory

⁽²⁾ TCR 10 and TCR 05 are specified over the temperature range from - 20 °C to + 85 °C

⁽³⁾ TCR 02 is specified over the temperature range from 0 °C to + 60 °C

DESCRIPTION

Production is strictly controlled and follows an extensive set of instructions established for reproducibility. A homogeneous film of metal alloy is deposited on a high grade ceramic body (85 % Al₂O₃) and conditioned to achieve the desired temperature coefficient. Nickel plated steel termination caps are firmly pressed on the metallized rods. Special laser devices are used repeatedly to achieve the target value by slowly and smoothly cutting a helical groove in the resistive layer without damaging the ceramics. A further conditioning is applied in order to stabilise the trimming result. Connecting wires of electrolytic copper plated with pure tin are welded to the termination caps. The resistors are covered by protective coating designed for electrical, mechanical and climatic protection. The terminations receive a final pure tin on nickel plating. Script marking designates the resistance value plus coded TCR and tolerance.

The result of the determined production is verified by an accelerated ageing (burn-in) and extensive testing procedure performed on 100 % of the individual resistors. Only accepted products are stuck directly on the adhesive tapes in accordance with IEC 60286-1.

ASSEMBLY

The resistors are suitable for processing on automatic insertion equipment and cutting and bending machines. Excellent solderability is proven, even after extended storage. They are suitable for automatic soldering using wave or dipping. The encapsulation is resistant to all

cleaning solvents commonly used in the electronics industry, including alcohols, esters and aqueous solutions. The suitability of conformal coatings, if applied, shall be qualified by appropriate means to ensure the long-term stability of the whole system. The resistors are completely lead (Pb)-free, the pure tin plating provides compatibility with lead (Pb)-free and lead-containing soldering processes. The immunity of the plating against tin whisker growth has been proven under extensive testing. All products comply with GADSL ⁽⁴⁾ and the CEFIC-EECA-EICTA ⁽⁵⁾ list of legal restrictions on hazardous substances. This includes full compliance with the following directives:

- 2000/53/EC End of Vehicle Life Directive (ELV) and Annex II (ELVII)
- 2002/95/EC Restriction of the use of Hazardous Substances Directive (RoHS)
- 2002/96/EC Waste Electrical and Electrical Equipment Directive (WEEE)

APPROVALS

Where applicable, the resistors are tested in accordance with CECC 40101-806 which refers to EN 60115-1 and EN 140100.

Vishay BEYSCHLAG has achieved “Approval of Manufacturer” in accordance with IEC QC 001002-3, clause 2. The release certificate for “Technology Approval Schedule” in accordance with CECC 240001 based on IEC QC 001002-3, clause 6 is granted for the Vishay BEYSCHLAG manufacturing process.

Notes

⁽⁴⁾ Global Automotive Declarable Substance List, see www.gadsl.org

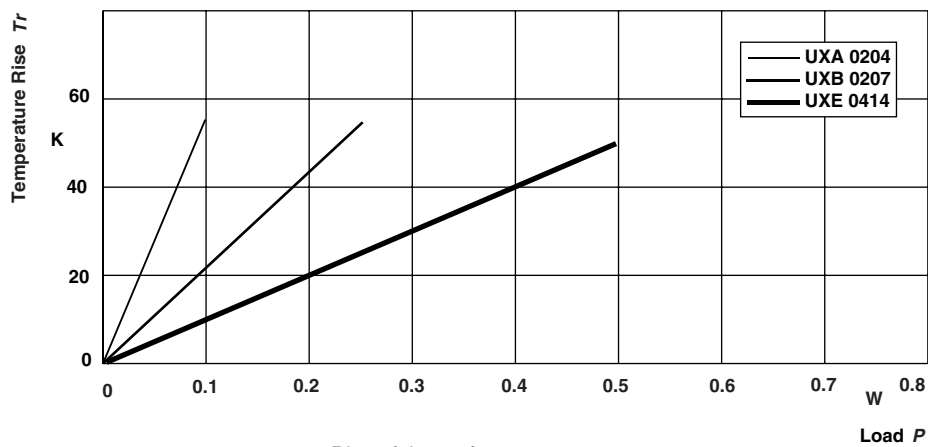
⁽⁵⁾ CEFIC (European Chemical Industry Council), EECA (European Electronic Component Manufacturers Association), EICTA (European trade organisation representing the information and communications technology and consumer electronics), see www.eicta.org/index.php?id=1053&id_article=340

FUNCTIONAL DESCRIPTION



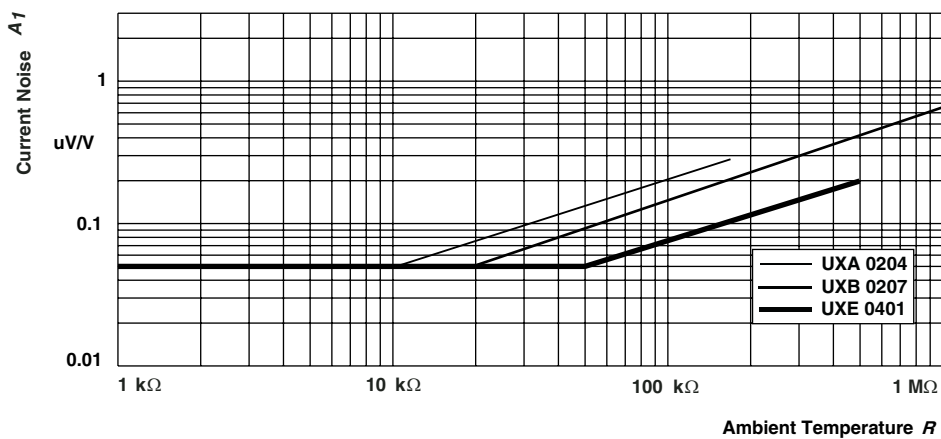
Specification of TCR 02 is valid from 0 °C to 60 °C.

Derating - Precision Operation



Rise of the surface temperature.

Temperature Rise



Current Noise A_1 in accordance with IEC 60195

TESTS AND REQUIREMENTS

Essentially all tests are carried out in accordance with the following specifications:

EN 60115-1, Generic specification (includes tests)

EN 140100, Sectional specification (includes schedule for qualification approval)

CECC 40101-806, Detail specification (includes schedule for conformance inspection)

Most of the components are approved in accordance with the European CECC-system, where applicable. The Test Procedures and Requirements table contains only the most important tests. For the full test schedule refer to the documents listed above. The testing also covers most of the requirements specified by EIA/IS-703 and JIS-C-5202.

The tests are carried out in accordance with IEC 60068-2-xx test method and under standard atmospheric conditions in accordance with IEC 60068-1, 5.3. Climatic category

LCT/UCT/56 (rated temperature range: Lower category temperature, upper category temperature; damp heat, long term, 56 days) is valid.

Unless otherwise specified the following values apply:

Temperature: 15 °C to 35 °C

Relative humidity: 45 % to 75 %

Air pressure: 86 kPa to 106 kPa (860 mbar to 1060 mbar).

For testing the components are mounted on a test board in accordance with IEC 60115-1, 4.31 unless otherwise specified.

In the Test Procedures and Requirements table only the tests and requirements are listed with reference to the relevant clauses of IEC 60115-1 and IEC 60068-2-xx test method. A short description of the test procedure is also given.

| TEST PROCEDURES AND REQUIREMENTS | | | | | | |
|----------------------------------|----------------------------|---|--|--|--|--|
| IEC 60115-1 CLAUSE | IEC 60068-2-xx TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE (ΔR) | | |
| | | | Stability for product types: | | | |
| | | | UXA 0204 | 100 Ω to 100 k Ω | 22 Ω to < 100 Ω ; > 100 k Ω to 221 k Ω | - |
| | | | UXB 0207 | 100 Ω to 250 k Ω | 40.2 Ω to < 100 Ω ; > 250 k Ω to 301 k Ω | 10 Ω to < 40.2 Ω ; > 301 k Ω to 1 M Ω |
| | | | UXE 0414 | 100 Ω to 100 k Ω | 22 Ω to < 100 Ω ; > 100 k Ω to 511 k Ω | - |
| 4.5 | - | Resistance ($\Delta R/R$) | | $\pm 0.25\%$; $\pm 0.1\%$; $\pm 0.05\%$; $\pm 0.01\%$ | | |
| 4.8 | - | Temperature coefficient | At 20/LCT/20 °C and 20/UCT/20 °C | ± 10 ppm/K; ± 05 ppm/K; ± 02 ppm/K | | |
| 4.25.1 | - | Endurance | Room temperature; $U = \sqrt{P_{70} \times R}$ or $U = U_{max.}$; 1.5 h ON; 0.5 h OFF 70 °C; 2000 h 85 °C; 1000 h 85 °C; 8000 h | $\pm (0.05\% R + 0.01 \Omega)$ $\pm (0.02\% R + 0.01 \Omega)$ $\pm (0.04\% R + 0.01 \Omega)$ | $\pm (0.05\% R + 0.01 \Omega)$ $\pm (0.03\% R + 0.01 \Omega)$ $\pm (0.06\% R + 0.01 \Omega)$ | $\pm (0.05\% R + 0.01 \Omega)$ $\pm (0.04\% R + 0.01 \Omega)$ $\pm (0.08\% R + 0.01 \Omega)$ |
| 4.25.3 | - | Endurance at upper category temperature | 125 °C; 1000 h | $\pm (0.04\% R + 0.01 \Omega)$ | $\pm (0.06\% R + 0.01 \Omega)$ | $\pm (0.08\% R + 0.01 \Omega)$ |
| 4.24 | 78 (Cab) | Damp heat, steady state | (40 \pm 2) °C; 56 days; (93 \pm 3) % RH | $\pm (0.04\% R + 0.01 \Omega)$ | $\pm (0.05\% R + 0.01 \Omega)$ | $\pm (0.06\% R + 0.01 \Omega)$ |



| TEST PROCEDURES AND REQUIREMENTS | | | | | | |
|----------------------------------|-------------------------------|------------------------------|--|--|---|--|
| IEC 60115-1 CLAUSE | IEC 60068-2-xx TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE (ΔR) | | |
| | | | Stability for product types: | | | |
| | | | UXA 0204 | 100 Ω to 100 k Ω | 22 Ω to < 100 Ω ; > 100 k Ω to 221 k Ω | - |
| | | | UXB 0207 | 100 Ω to 250 k Ω | 40.2 Ω to < 100 Ω ; > 250 k Ω to 301 k Ω | 10 Ω to < 40.2 Ω ; > 301 k Ω to 1 M Ω |
| | | | UXE 0414 | 100 Ω to 100 k Ω | 22 Ω to < 100 Ω ; > 100 k Ω to 511 k Ω | - |
| 4.23 | | Climatic sequence: | | | | |
| 4.23.2 | 2 (Ba) | Dry heat | 125 $^{\circ}$ C; 16 h | | | |
| 4.23.3 | 30 (Db) | Damp heat, cyclic | 55 $^{\circ}$ C; 24 h; 90 % to 100 % RH; 1 cycle | | | |
| 4.23.4 | 1 (Aa) | Cold | - 55 $^{\circ}$ C; 2 h | | | |
| 4.23.5 | 13 (M) | Low air pressure | 8.5 kPa; 2 h; 15 $^{\circ}$ C to 35 $^{\circ}$ C | | | |
| 4.23.6 | 30 (Db) | Damp heat, cyclic | 55 $^{\circ}$ C; 5 days; 95 % to 100 % RH; 5 cycles | \pm (0.04 % R + 0.01 Ω) no visible damage | \pm (0.05 % R + 0.01 Ω) no visible damage | \pm (0.06 % R + 0.01 Ω) no visible damage |
| 4.13 | - | Short time overload | Room temperature; $U = 2.5 \times \sqrt{P_{70} \times R}$ or $U = 2 \times U_{max}$; 5 s | \pm (0.01 % R + 0.01 Ω) no visible damage | \pm (0.01 % R + 0.01 Ω) no visible damage | \pm (0.02 % R + 0.01 Ω) no visible damage |
| 4.19 | 14 (Na) | Rapid change of temperature | 30 min at LCT = - 55 $^{\circ}$ C 30 min at UCT = 125 $^{\circ}$ C 5 cycles | \pm (0.01 % R + 0.01 Ω) no visible damage | \pm (0.01 % R + 0.01 Ω) no visible damage | \pm (0.02 % R + 0.01 Ω) no visible damage |
| 4.29 | 45 (XA) | Component solvent resistance | Isopropyl alcohol + 23 $^{\circ}$ C; toothbrush method | Marking legible; no visible damage | | |
| 4.18.2 | 20 (Tb) | Resistance to soldering heat | Unmounted components; (260 \pm 3) $^{\circ}$ C; (10 \pm 1) s | \pm (0.01 % R + 0.01 Ω) no visible damage | \pm (0.01 % R + 0.01 Ω) no visible damage | \pm (0.02 % R + 0.01 Ω) no visible damage |
| 4.17 | 20 (Ta) | Solderability | + 235 $^{\circ}$ C; 2 s solder bath method SnPb40 + 245 $^{\circ}$ C; 3 s solder bath method SnAg3Cu0.5 | Good tinning (\geq 95 % coverage, no visible damage) | | |
| 4.22 | 6 (B4) | Vibration | 6 h; 10 Hz to 2000 Hz 1.5 mm or 196 m/s ² | \pm (0.01 % R + 0.01 Ω) | \pm (0.01 % R + 0.01 Ω) | \pm (0.02 % R + 0.01 Ω) |
| 4.16 | 21 (Ua) 21 (Ub) 21 (Uc) | Robustness of terminations | Tensile, bending and torsion | \pm (0.01 % R + 0.01 Ω) | \pm (0.01 % R + 0.01 Ω) | \pm (0.02 % R + 0.01 Ω) |
| 4.7 | - | Voltage proof | $U_{RMS} = U_{ins}$; 60 s | No flashover or breakdown | | |

12NC INFORMATION FOR HISTORICAL CODING REFERENCE

- The resistors have a 12-digit Part Number starting with 2312.
- The subsequent 4 digits indicate the resistor type, specification and packaging; see the 12NC Part Number table.
- The remaining 4 digits indicate the resistance value:
 - The first 3 digits indicate the resistance value.
 - The last digit indicates the resistance decade in accordance with the 12NC Indicating Resistance Decade table.

Last Digit of 12NC Indicating Resistance Decade

| RESISTANCE DECADE | LAST DIGIT |
|-------------------|------------|
| 10 Ω to 99.9 Ω | 9 |
| 100 Ω to 999 Ω | 1 |
| 1 kΩ to 9.99 kΩ | 2 |
| 10 kΩ to 99.9 kΩ | 3 |
| 100 kΩ to 999 kΩ | 4 |

12NC Example

The Part Number of a UXA 0204 resistor, value 47 kΩ and TCR 10 with ± 0.1 % tolerance, supplied on bandolier in a box of 1000 units is: 2312 662 34703.

| 12NC PART NUMBER - Resistor type and packaging | | | | | | | |
|--|------------|------------|------------------|------------------|-------------------|-------------------|-------------------|
| DESCRIPTION | | | 2312 | | | | |
| | | | BANDOLIER IN BOX | BANDOLIER IN BOX | BANDOLIER ON REEL | BANDOLIER ON REEL | BANDOLIER ON REEL |
| TYPE | TCR | TOL. | CU 100 units | C1 1000 units | R1 1000 units | R2 2500 units | RP 5000 units |
| UXA 0204 | ± 10 ppm/K | ± 0.25 % | 562 2.... | 662 2.... | 462 2.... | - | - |
| | | ± 0.1 % | 562 3.... | 662 3.... | 462 3.... | - | - |
| | | ± 0.05 % | 562 4.... | 662 4.... | 462 4.... | - | - |
| | | ± 0.01 % | 562 7.... | 662 7.... | 462 7.... | - | - |
| | | (1) | 562 91... | 662 91... | 462 91... | - | - |
| | ± 05 ppm/K | ± 0.25 % | 563 2.... | 663 2.... | 463 2.... | - | - |
| | | ± 0.1 % | 563 3.... | 663 3.... | 463 3.... | - | - |
| | | ± 0.05 % | 563 4.... | 663 4.... | 463 4.... | - | - |
| | | ± 0.01 % | 563 7.... | 663 7.... | 463 7.... | - | - |
| | | (1) | 563 91... | 663 91... | 463 91... | - | - |
| | ± 02 ppm/K | ± 0.25 % | 564 2.... | 664 2.... | 464 2.... | - | - |
| | | ± 0.1 % | 564 3.... | 664 3.... | 464 3.... | - | - |
| | | ± 0.05 % | 564 4.... | 664 4.... | 464 4.... | - | - |
| | | ± 0.01 % | 564 7.... | 664 7.... | 464 7.... | - | - |
| | | (1) | 564 91... | 664 91... | 464 91... | - | - |
| | UXB 0207 | ± 10 ppm/K | ± 0.25 % | 572 2.... | 672 2.... | 472 2.... | - |
| ± 0.1 % | | | 572 3.... | 672 3.... | 472 3.... | - | 577 3.... |
| ± 0.05 % | | | 572 4.... | 672 4.... | 472 4.... | - | 577 4.... |
| ± 0.01 % | | | 572 7.... | 672 7.... | 472 7.... | - | 577 7.... |
| (1) | | | 572 91... | 672 91... | 472 91... | - | 577 91... |
| ± 05 ppm/K | | ± 0.25 % | 573 2.... | 673 2.... | 473 2.... | - | 578 2.... |
| | | ± 0.1 % | 573 3.... | 673 3.... | 473 3.... | - | 578 3.... |
| | | ± 0.05 % | 573 4.... | 673 4.... | 473 4.... | - | 578 4.... |
| | | ± 0.01 % | 573 7.... | 673 7.... | 473 7.... | - | 578 7.... |
| | | (1) | 573 91... | 673 91.... | 473 91... | - | 578 91... |
| ± 02 ppm/K | | ± 0.25 % | 574 2.... | 674 2.... | 474 2.... | - | 579 2.... |
| | | ± 0.1 % | 574 3.... | 674 3.... | 474 3.... | - | 579 3.... |
| | | ± 0.05 % | 574 4.... | 674 4.... | 474 4.... | - | 579 4.... |
| | | ± 0.01 % | 574 7.... | 674 7.... | 474 7.... | - | 579 7.... |
| | | (1) | 574 91... | 674 91... | 474 91... | - | 579 91... |
| UXE 0414 | | ± 10 ppm/K | ± 0.1 % | 592 3.... | 692 3.... | - | 597 3.... |
| | ± 0.05 % | | 592 4.... | 692 4.... | - | 597 4.... | - |
| | (1) | | 592 91... | 692 91... | - | 597 91... | - |
| | ± 05 ppm/K | ± 0.1 % | 593 3.... | 693 3.... | - | 598 3.... | - |
| | | ± 0.05 % | 593 4.... | 693 4.... | - | 598 4.... | - |
| | | (1) | 593 91... | 693 91... | - | 598 91... | - |

Note

(1) Readable 12NC coding of resistance values is restricted to values with three significant digits. For resistance values with more than three significant digits, a non readable sequential number will be issued by the factory for each requested combination of resistance value and tolerance.



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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.



Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

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