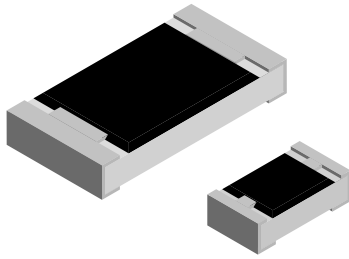


Pulse Proof, High Power Thick Film Chip Resistors



FEATURES

- Excellent pulse load capability
- Enhanced power rating
- Double side printed resistor element
- Protective overglaze
- Pure tin solder contacts on Ni barrier layer provides compatibility with lead (Pb)-free and lead containing soldering processes
- AEC-Q200 qualified, rev. C compliant
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | | | | |
|---|----------------|------------------|-------------------------|---|-------------------------------|------------------|---------------------------|-----------------|
| MODEL | CASE SIZE INCH | CASE SIZE METRIC | POWER RATING P_{70} W | LIMITING ELEMENT VOLTAGE $U_{max. AC/DC}$ | TEMPERATURE COEFFICIENT ppm/K | TOLERANCE % | RESISTANCE RANGE Ω | SERIES |
| CRCW0402-HP e3 | 0402 | RR1005 | 0.125 ⁽¹⁾ | 50 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.010 \Omega, I_{max.} = 3 A$ | | | | | | | | |
| CRCW0603-HP e3 | 0603 | RR1608 | 0.25 | 75 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.008 \Omega, I_{max.} = 5 A$ | | | | | | | | |
| CRCW0805-HP e3 | 0805 | RR2012 | 0.33 | 150 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.005 \Omega, I_{max.} = 6 A$ | | | | | | | | |
| CRCW1206-HP e3 | 1206 | RR3216 | 0.5 | 200 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.005 \Omega, I_{max.} = 10 A$ | | | | | | | | |
| CRCW1210-HP e3 | 1210 | RR3225 | 0.75 | 200 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.004 \Omega, I_{max.} = 12 A$ | | | | | | | | |
| CRCW1218-HP e3 | 1218 | RR3246 | 1.5 | 200 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.004 \Omega, I_{max.} = 20 A$ | | | | | | | | |
| CRCW2010-HP e3 | 2010 | RR5025 | 1.0 | 400 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.005 \Omega, I_{max.} = 12 A$ | | | | | | | | |
| CRCW2512-HP e3 | 2512 | RR6332 | 1.5 | 500 | ± 100 | $\pm 0.5, \pm 1$ | 1 to 1M | E24; E96 E24 |
| | | | | | ± 200 | ± 5 | | |
| Zero-Ohm-Resistor: $R_{max.} = 0.005 \Omega, I_{max.} = 16 A$ | | | | | | | | |

Notes

- 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.
 - Marking: See document "Surface Mount Resistor Marking" (document number 20020).
 - Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.
- ⁽¹⁾ CRCW0402-HP resistors feature a single side printed resistive layer only.

| TECHNICAL SPECIFICATIONS | | | | | | | | | |
|---|-------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| PARAMETER | UNIT | CRCW 0402-HP | CRCW 0603-HP | CRCW 0805-HP | CRCW 1206-HP | CRCW 1210-HP | CRCW 1218-HP | CRCW 2010-HP | CRCW 2512-HP |
| Rated dissipation P_{70} ⁽²⁾ | W | 0.125 | 0.25 | 0.33 | 0.5 | 0.75 | 1.5 | 1.0 | 1.5 |
| Limiting element voltage $U_{max. AC/DC}$ | V | 50 | 75 | 150 | 200 | 200 | 200 | 400 | 500 |
| Insulation voltage $U_{ins.}$ (1 min) | V | > 75 | > 100 | > 200 | > 300 | > 300 | > 300 | > 300 | > 300 |
| Insulation resistance | Ω | > 10^9 | | | | | | | |
| Category temperature range | $^{\circ}C$ | - 55 to + 155 | | | | | | | |
| Weight | mg | 0.65 | 2 | 5.5 | 10 | 18 | 31 | 25.5 | 42 |

Note

- ⁽²⁾ The power dissipation on the resistors generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 155 $^{\circ}C$ is not exceeded.

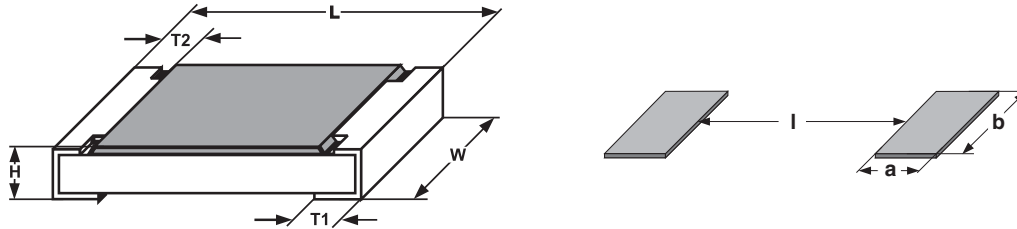


| PART NUMBER AND PRODUCT DESCRIPTION | | | | | | | | | | | | | | | | | |
|--|---|---|---|--|---|--|---|--|---|---|---|---|---|---|---|---|---|
| Part Number: CRCW0603562RFKEAHP ⁽¹⁾ | | | | | | | | | | | | | | | | | |
| C | R | C | W | 0 | 6 | 0 | 3 | 5 | 6 | 2 | R | F | K | E | A | H | P |
| MODEL/SIZE | | VALUE | | TOLERANCE | | TCR | | PACKAGING | | SPECIAL | | | | | | | |
| CRCW0402 CRCW0603 CRCW0805 CRCW1206 CRCW1210 CRCW1218 CRCW2010 CRCW2512 | | R = Decimal K = Thousand M = Million 0000 = Jumper | | D = ± 0.5 % F = ± 1 % J = ± 5 % Z = Jumper | | K = ± 100 ppm/K N = ± 200 ppm/K 0 = Jumper | | EA EB EC ED EE EF EG EH EK | | Up to 2 digits HP = Pulse proof, high power | | | | | | | |
| Product Description: CRCW0603-HP 100 562R 1 % ET1 e3 | | | | | | | | | | | | | | | | | |
| CRCW0603-HP | | 100 | | 562R | | 1 % | | ET1 | | e3 | | | | | | | |
| MODEL | | TCR | | RESISTANCE VALUE | | TOLERANCE | | PACKAGING | | LEAD (Pb)-FREE | | | | | | | |
| CRCW0402-HP CRCW0603-HP CRCW0805-HP CRCW1206-HP CRCW1210-HP CRCW1218-HP CRCW2010-HP CRCW2512-HP | | ± 100 ppm/K ± 200 ppm/K | | 10R = 10 Ω 562R = 562 Ω 10K = 10 kΩ 1M = 1 MΩ 0R0 = Jumper | | ± 0.5 % ± 1 % ± 5 % | | ET1 ET5 ET6 ET7 EF4 EG1 E02 E67 E82 ET9 | | e3 = Pure tin termination finish | | | | | | | |

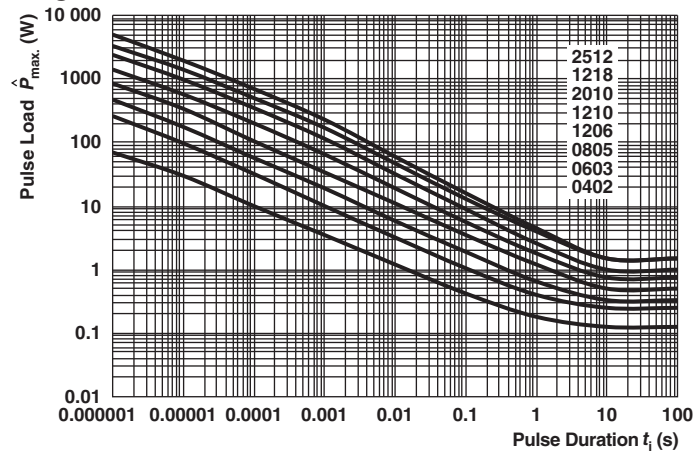
Note

(1) Preferred way for ordering products is by use of the PART NUMBER.

| PACKAGING | | | | | | | |
|-------------|---------------|---|-------------|---------------|--|-------------|---------------|
| MODEL | UNIT | PAPER TAPE ON REEL ACC. TO IEC 60286-3, TYPE I | | | BLISTER TAPE ON REEL ACC. TO IEC 60286-3, TYPE II | | |
| | | QUANTITY | PART NUMBER | PRODUCT DESC. | QUANTITY | PART NUMBER | PRODUCT DESC. |
| CRCW0402-HP | 180 mm/7" | 10 000 | ED | ET7 | | | |
| | 330 mm/13" | 50 000 | EE | EF4 | | | |
| CRCW0603-HP | 180 mm/7" | 5000 | EA | ET1 | | | |
| | 285 mm/11.25" | 10 000 | EB | ET5 | | | |
| | 330 mm/13" | 20 000 | EC | ET6 | | | |
| CRCW0805-HP | 180 mm/7" | 5000 | EA | ET1 | | | |
| | 285 mm/11.25" | 10 000 | EB | ET5 | | | |
| | 330 mm/13" | 20 000 | EC | ET6 | | | |
| CRCW1206-HP | 180 mm/7" | 5000 | EA | ET1 | | | |
| | 285 mm/11.25" | 10 000 | EB | ET5 | | | |
| | 330 mm/13" | 20 000 | EC | ET6 | | | |
| CRCW1210-HP | 180 mm/7" | 5000 | EA | ET1 | | | |
| | 285 mm/11.25" | 10 000 | EB | ET5 | | | |
| | 330 mm/13" | 20 000 | EC | ET6 | | | |
| CRCW1218-HP | 180 mm/7" | | | | 4000 | EK | ET9 |
| CRCW2010-HP | 180 mm/7" | | | | 4000 | EF | E02 |
| CRCW2512-HP | 180 mm/7" | | | | 2000 | EG | E67 |
| | | | | | 4000 | EH | E82 |

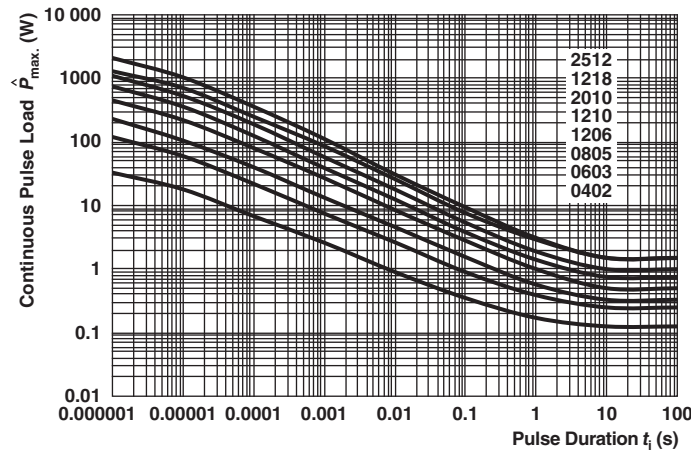
DIMENSIONS in millimeters


| SIZE | | DIMENSIONS | | | | | SOLDER PAD DIMENSIONS | | | | | |
|------|--------|------------|-------------|-------------|------------|------------|-----------------------|-----|-----|----------------|-----|-----|
| | | | | | | | REFLOW SOLDERING | | | WAVE SOLDERING | | |
| INCH | METRIC | L | W | H | T1 | T2 | a | b | l | a | b | l |
| 0402 | 1005 | 1.0 ± 0.05 | 0.5 ± 0.05 | 0.3 ± 0.1 | 0.25 ± 0.1 | 0.2 ± 0.1 | 0.4 | 0.6 | 0.5 | | | |
| 0603 | 1608 | 1.6 ± 0.1 | 0.85 ± 0.1 | 0.45 ± 0.1 | 0.3 ± 0.2 | 0.3 ± 0.2 | 0.5 | 0.9 | 1.0 | 0.9 | 0.9 | 1.0 |
| 0805 | 2012 | 2.0 ± 0.15 | 1.25 ± 0.15 | 0.50 ± 0.1 | 0.4 ± 0.2 | 0.35 ± 0.2 | 0.7 | 1.3 | 1.2 | 0.9 | 1.3 | 1.3 |
| 1206 | 3216 | 3.1 ± 0.2 | 1.6 ± 0.15 | 0.50 ± 0.15 | 0.5 ± 0.2 | 0.45 ± 0.2 | 0.9 | 1.7 | 2.0 | 1.1 | 1.7 | 2.3 |
| 1210 | 3225 | 3.2 ± 0.2 | 2.5 ± 0.2 | 0.6 ± 0.1 | 0.45 ± 0.2 | 0.4 ± 0.2 | 0.9 | 2.5 | 2.0 | 1.1 | 2.5 | 2.2 |
| 1218 | 3246 | 3.1 ± 0.2 | 4.6 ± 0.2 | 0.6 ± 0.1 | 0.45 ± 0.2 | 0.4 ± 0.2 | 1.05 | 4.9 | 1.9 | 1.25 | 4.8 | 1.9 |
| 2010 | 5025 | 5.0 ± 0.15 | 2.5 ± 0.15 | 0.6 ± 0.1 | 0.6 ± 0.2 | 0.6 ± 0.2 | 1.0 | 2.5 | 3.9 | 1.2 | 2.5 | 3.9 |
| 2512 | 6332 | 6.3 ± 0.2 | 3.15 ± 0.15 | 0.6 ± 0.1 | 0.6 ± 0.2 | 0.6 ± 0.2 | 1.0 | 3.2 | 5.2 | 1.2 | 3.2 | 5.2 |

FUNCTIONAL PERFORMANCE
Single Pulse


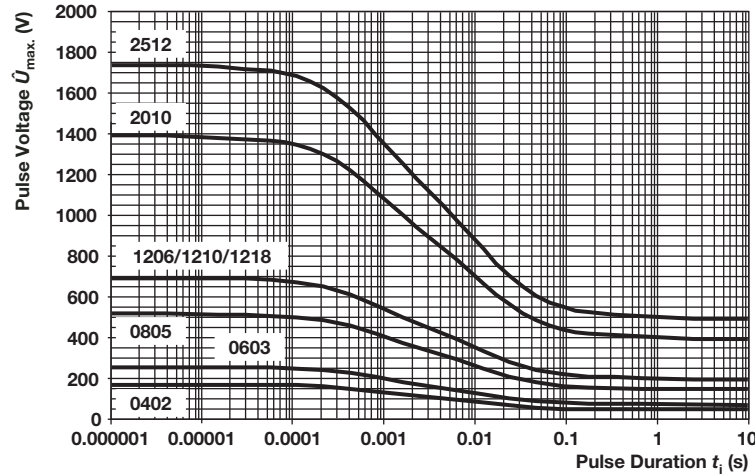
Maximum pulse load, single pulse; applicable if $\bar{P} \rightarrow 0$ and $n < 1000$ and $\hat{U} \leq \hat{U}_{max}$;
for permissible resistance change equivalent to 8000 h operation

Continuous Pulse



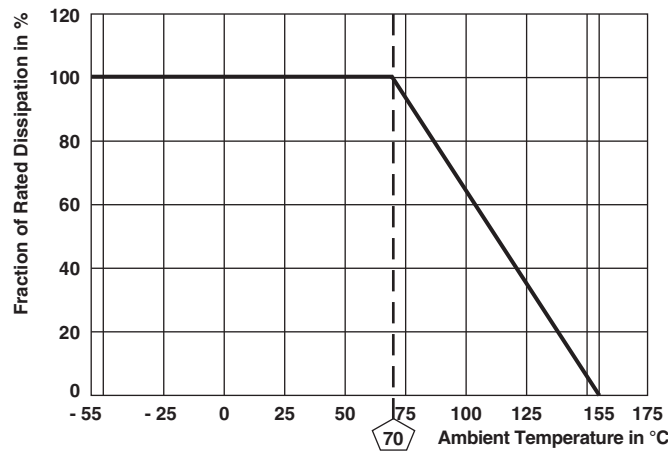
Maximum pulse load, continuous pulses; applicable if $\bar{P} \leq P(\vartheta_{amb})$ and $\hat{U} \leq \hat{U}_{max}$; for permissible resistance change equivalent to 8000 h operation

Pulse Voltage



Maximum pulse voltage, single and continuous pulses; applicable if $\hat{P} \leq \hat{P}_{max}$; for permissible resistance change equivalent to 8000 h operation

DERATING





| TEST PROCEDURES AND REQUIREMENTS | | | | |
|----------------------------------|-------------------------|--|---|--|
| EN 60115-1 CLAUSE | IEC 60068-2 TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE (ΔR) |
| | | | | STABILITY CLASS 2 OR BETTER |
| | | | Stability for product types: | 1 Ω to 1 M Ω |
| | | | CRCW-HP e3 | |
| 4.5 | - | Resistance | - | $\pm 0.5 \%$, $\pm 1 \%$, $\pm 5 \%$ |
| 4.7 | - | Voltage proof | $U = 1.4 \times U_{ins}$; 60 s | - |
| 4.13 | - | Short time overload | $U = 2.5 \times \sqrt{P_{70} \times R}$ $\leq 2 \times U_{max}$; duration: According to style | $\pm (0.5 \% R + 0.05 \Omega)$ |
| 4.17.2 | 58 (Td) | Solderability | Solder bath method; Sn60Pb40; non-activated flux; (235 \pm 5) $^{\circ}$ C; (2 \pm 0.2) s | Good tinning ($\geq 95 \%$ covered) no visible damage |
| | | | Solder bath method; Sn96.5Ag3Cu0.5; non-activated flux; (245 \pm 5) $^{\circ}$ C; (3 \pm 0.3) s | Good tinning ($\geq 95 \%$ covered) no visible damage |
| 4.8.4.2 | - | Temperature coefficient | (20/- 55/20) $^{\circ}$ C and (20/125/20) $^{\circ}$ C | ± 100 ppm/K, ± 200 ppm/K |
| 4.32 | 21 (UU3) | Shear (adhesion) | RR 1608 and smaller: 9 N RR 2012 and larger: 45 N | No visible damage |
| 4.33 | 21 (UU1) | Substrate bending | Depth 2 mm; 3 times | No visible damage, no open circuit in bent position $\pm (0.25 \% R + 0.05 \Omega)$ |
| 4.19 | 14 (Na) | Rapid change of temperature | 30 min. at - 55 $^{\circ}$ C; 30 min at 125 $^{\circ}$ C 5 cycles 1000 cycles | $\pm (0.5 \% R + 0.05 \Omega)$ $\pm (1 \% R + 0.05 \Omega)$ |
| 4.23 | - | Dry heat | - | $\pm (2 \% R + 0.1 \Omega)$ |
| 4.23.2 | 2 (Ba) | Damp heat, cyclic | 125 $^{\circ}$ C; 16 h | |
| 4.23.3 | 30 (Db) | cold | 55 $^{\circ}$ C; $\geq 90 \%$ RH; 24 h; 1 cycle | |
| 4.23.4 | 1 (Aa) | Low air pressure | - 55 $^{\circ}$ C; 2 h | |
| 4.23.5 | 13 (M) | - | 1 kPa; (25 \pm 10) $^{\circ}$ C; 1 h | |
| 4.23.6 | 30 (Db) | Damp heat, cyclic | 55 $^{\circ}$ C; $\geq 90 \%$ RH; 24 h; 5 cycle | |
| 4.23.7 | - | D.C. load | $U = \sqrt{P_{70} \times R}$ | |
| 4.25.1 | - | Endurance at 70 $^{\circ}$ C | $U = \sqrt{P_{70} \times R} \leq U_{max}$. 1.5 h on; 0.5 h off; 70 $^{\circ}$ C; 1000 h 70 $^{\circ}$ C; 8000 h | $\pm (2 \% R + 0.1 \Omega)$ $\pm (4 \% R + 0.1 \Omega)$ |
| 4.18.2 | 58 (Td) | Resistance to soldering heat | Solder bath method; (260 \pm 5) $^{\circ}$ C; (10 \pm 1) s | $\pm (0.5 \% R + 0.05 \Omega)$ |
| 4.35 | - | Flammability, needle flame test | IEC 60695-15-5; 10 s | No burning after 30 s |
| 4.24 | 78 (Cab) | Damp heat, steady state | (40 \pm 2) $^{\circ}$ C; (93 \pm 3) % RH; 56 days | $\pm (1 \% R + 0.05 \Omega)$ |
| 4.25.3 | - | Endurance at upper category temperature | 155 $^{\circ}$ C; 1000 h | $\pm (2 \% R + 0.1 \Omega)$ |
| 4.40 | - | Electrostatic discharge (human body model) | IEC 61340-3-1; 3 positive and 3 negative discharges; ESD voltage according to size | $\pm (1 \% R + 0.05 \Omega)$ |
| 4.29 | 45 (XA) | Component solvent resistance | Isopropyl alcohol; 50 $^{\circ}$ C; method 2 | No visible damage |
| 4.30 | 45 (XA) | Solvent resistance of marking | Isopropyl alcohol; 50 $^{\circ}$ C; method 1; toothbrush | Marking legible, no visible damage |
| 4.22 | 6 (Fc) | Vibration, endurance by sweeping | f = 10 Hz to 2000 Hz; x, y, z \leq 1.5 mm; A \leq 200 m/s ² ; 10 sweeps per axis | $\pm (0.5 \% R + 0.05 \Omega)$ |
| 4.37 | - | Periodic electric overload | $U = \sqrt{15 \times P_{70} \times R} \leq 2 \times U_{max}$. 0.1 s "ON"; 2.5 s "OFF"; 1000 cycles | $\pm (1 \% R + 0.05 \Omega)$ |
| 4.27 | - | Single pulse high voltage overload, 10 μ s/700 μ s | $\dot{U} = 10 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max}$. 10 pulses | $\pm (1 \% R + 0.05 \Omega)$ |

All tests are carried out in accordance with the following specifications:

- EN 60115-1, generic specification
- EN 140400, sectional specification
- EN 140401-802, detail specification
- IEC 60068-2, environmental test procedures

Packaging of components is done in paper or blister tapes according to IEC 60286-3.



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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.

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Благодаря этому наша компания предлагает к поставке практически не ограниченный ассортимент компонентов как оптовыми, мелкооптовыми партиями, так и в розницу.

Наличие собственной эффективной системы логистики обеспечивает надежную поставку продукции по конкурентным ценам в точно указанные сроки.

Срок поставки со стоков в **Европе и Америке – от 3 до 14 дней.**

Срок поставки из **Азии – от 10 дней.**

Благодаря развитой сети поставщиков, помогаем в поиске и приобретении экзотичных или снятых с производства компонентов.

Предоставляем спец цены на элементы для создания инженерных сэмплов.

Упорный труд, качественный результат дают нам право быть уверенными в себе и надежными для наших клиентов.

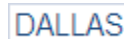
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- Гарантия качества поставляемой продукции
- Широкий ассортимент
- Минимальные сроки поставок
- Техническая поддержка
- Подбор комплектации
- Индивидуальный подход
- Гибкое ценообразование

Наша организация особенно сильна в поставках модулей, микросхем, пассивных компонентов, ксайленсах (XC), EPF, EPM и силовой электроники.

Большой выбор предлагаемой продукции, различные виды оплаты и доставки, позволят Вам сэкономить время и получить максимум выгоды от сотрудничества с нами!

Перечень производителей, продукцию которых мы поставляем на российский рынок



С удовольствием будем прорабатывать для Вас поставки всех необходимых компонентов по текущим запросам для скорейшего выявления групп элементов, по которым сотрудничество именно с нашей компанией будет для Вас максимально выгодным!

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«Трейд Электроникс»

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