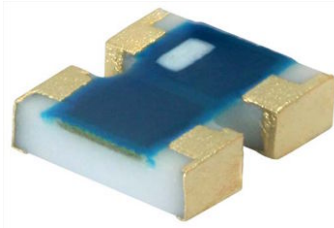


Precision Gold Terminated Thin Film Chip Resistor Array for Conductive Gluing



The ACAS 0606 AT precision resistor array with convex terminations for conductive gluing combines the proven reliability of discrete chip resistors with the advantages of chip resistor arrays. Defined relative tolerance and relative TCR make this product perfectly suited for applications that require stable fixed resistor ratios. The ACAS 0606 AT is available with two equal or two different resistor values.

FEATURES

- Gold terminations for conductive gluing
- Superior moisture resistivity, $|\Delta R/R| < 0.5\%$ (85 °C; 85 % RH; 1000 h)
- Rated dissipation P_{70} up to 125 mW per resistor
- ESD stability 1000 V, human body model
- Relative TCR down to ± 5 ppm/K
- Relative tolerance down to $\pm 0.05\%$
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT

APPLICATIONS

- Precision analog circuits
- Voltage divider
- Feedback circuits
- Signal conditioning
- Hybrid circuits

| TECHNICAL SPECIFICATIONS | |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------|
| DESCRIPTION | ACAS ATAU |
| EIA size | 0606 |
| Metric size | RR 1616M |
| Configuration, isolated | 2 x 0603 |
| Design: | |
| All equal values (AE) | AE |
| Different values (DF) | DF |
| Resistance range | 100 Ω to 150 k Ω ⁽¹⁾ |
| Absolute tolerance | $\pm 0.5\%$; $\pm 0.25\%$ |
| Relative tolerance | $\pm 0.05\%$; $\pm 0.125\%$; $\pm 0.25\%$ |
| Absolute temperature coefficient | ± 25 ppm/K |
| Relative TCR | ± 5 ppm/K; ± 7.5 ppm/K; ± 12.5 ppm/K |
| Max. resistance ratio R_{min}/R_{max} . | 1:20 |
| Rated dissipation: P_{70} | |
| Element | 0.125 W |
| Package | 0.2 W |
| Operating voltage, U_{max} . AC/DC | 75 V |
| Permissible film temperature | 155 °C |
| Operating temperature range | -55 °C to 155 °C |
| Insulation voltage (U_{ins}) against ambient and between integrated resistors, continuous | 75 V |

Note

⁽¹⁾ Resistance values to be selected from E24; E192.

APPLICATION INFORMATION

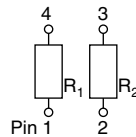
The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature is not exceeded. These resistors do not feature a limited lifetime when operated within the permissible limits.

| MAXIMUM RESISTANCE CHANGE AT RATED POWER | | | |
|------------------------------------------|--------|----------------|----------------|
| DESCRIPTION | | ACAS ATAU | |
| Configuration, isolated | | 2 x 0603 | |
| Operation mode | | Standard | Power |
| Rated power per element, P_{70} | | 0.1 W | 0.125 W |
| Rated power per package, P_{70} | | 0.15 W | 0.2 W |
| Film temperature | | 125 °C | 155 °C |
| Required thermal resistance, R_{th} | | ≤ 550 K/W | ≤ 680 K/W |
| Max. resistance change at P_{70} | | | |
| $\Delta R/R$ max., after: | | | |
| | 1000 h | ± 0.1 % | ± 0.25 % |
| | 8000 h | ± 0.25 % | ± 0.5 % |

Notes

- Figures are given for arrays with equal values, design type AE.
- An appropriate thermal resistance R_{th} has to be realized by adequate gluing connection and board material.

SKETCHES



ACAS ATAU

Marking on ACAS ATAU: For types with different resistor values pin 1 is marked.

| DESIGN | |
|--------|-------------|
| TYPE | ACAS ATAU |
| AE | $R_1 = R_2$ |
| DF | $R_1 < R_2$ |



PART NUMBER AND PRODUCT DESCRIPTION

Part Number: ACASN1100A2200P50A

A C A S N 1 1 0 0 A 2 2 0 0 P 5 0 A

| | | | | | | | |
|--------------------|--------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------|
| TYPE ACA | TERMINAL S = Convex square | SIZE N = 0606 | RESISTANCE 3 digit resistance value R_1, R_4 1 digit multiplier MULTIPLIER 9 = $\cdot 10^{-1}$ 0 = $\cdot 10^0$ 1 = $\cdot 10^1$ 2 = $\cdot 10^2$ 3 = $\cdot 10^3$ | ACCURACY GRADE TCR, Tracking, Tolerance and Matching A, E or J | RESISTANCE 3 digit resistance value R_2, R_3 1 digit multiplier MULTIPLIER 9 = $\cdot 10^{-1}$ 0 = $\cdot 10^0$ 1 = $\cdot 10^1$ 2 = $\cdot 10^2$ 3 = $\cdot 10^3$ | PACKAGING P1 P5 | Special 0A = Gold termination |
|--------------------|--------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------|

Product Description: ACAS 0606 110R A 220R ATAU P5

| | | | | | | | |
|---------------------------------|--------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------|
| ACA | S | 0606 | 110R | A | 220R | ATAU | P5 |
| TYPE ACA = Chip Array | TERMINAL S = Convex square | SIZE 0606 | RESISTANCE R_1, R_4 110R = 110 Ω 1K1 = 1.1 k Ω 22K1 = 22.1 k Ω | ACCURACY GRADE TCR, Tracking, Tolerance and Matching A, E or J | RESISTANCE R_2, R_3 220R = 220 Ω 1K1 = 1.1 k Ω 22K1 = 22.1 k Ω | SPECIAL ATAU = Automotive/gold termination | PACKAGING P1 P5 |

Note

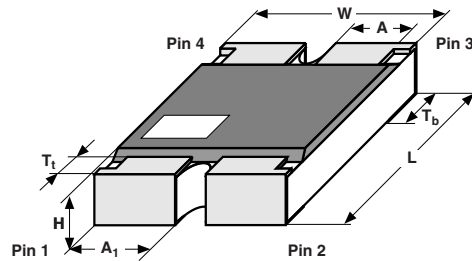
- Products can be ordered using either the PART NUMBER or PRODUCT DESCRIPTION.

TEMPERATURE COEFFICIENT AND RESISTANCE RANGE

| TYPE | ACCURACY GRADE | ABSOLUTE | | RELATIVE | | RESISTANCE RANGE |
|----------------|----------------|----------------|--------------|------------------|--------------|--------------------------------|
| | | TCR | TOLERANCE | TCR | TOLERANCE | |
| ACAS 0606 ATAU | A | ± 25 ppm/K | ± 0.25 % | ± 5 ppm/K | ± 0.05 % | 100 Ω to 150 k Ω |
| | E | ± 25 ppm/K | ± 0.25 % | ± 7.5 ppm/K | ± 0.05 % | 100 Ω to 150 k Ω |
| | J | ± 25 ppm/K | ± 0.25 % | ± 12.5 ppm/K | ± 0.05 % | 100 Ω to 150 k Ω |

PACKAGING

| TYPE | CODE | QUANTITY | PACKAGING STYLE | WIDTH | PITCH | REEL DIAMETER |
|----------------|------|----------|------------------------------------------------------|-------|-------|---------------|
| ACAS 0606 ATAU | P1 | 1000 | Tape and reel cardboard tape acc. IEC 60286-3 Type I | 8 mm | 4 mm | 180 mm/7" |
| | P5 | 5000 | | | | |

DIMENSIONS
ACAS 0606 ATAU


| DIMENSIONS - chip resistor array, mass and relevant physical dimensions | | | | | | | | |
|-------------------------------------------------------------------------|------------|------------|------------|---------------------|-----------|---------------------|---------------------|-----------|
| TYPE | L (mm) | W (mm) | H (mm) | A ₁ (mm) | A (mm) | T _t (mm) | T _b (mm) | MASS (mg) |
| ACAS 0606 ATAU | 1.5 ± 0.15 | 1.6 ± 0.15 | 0.45 ± 0.1 | 0.6 ± 0.1 | 0.4 ± 0.1 | 0.3 ± 0.15 | 0.4 ± 0.15 | 3.6 |

DESCRIPTION

The ACAS 0606 ATAU series for conductive gluing is derived from the precision ACAS 0606 ATAU series, datasheet number 28770, which is qualified according AEC-Q200. The ACAS 0606 ATAU series for conductive gluing is manufactured identically except the termination. The production of the components 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 substrate using a mask to separate the adjacent resistors and conditioned to achieve the desired temperature coefficient. Specially designed inner contacts are realized on both sides. A special laser is used to achieve the target value by smoothly cutting a meander groove in the resistive layer without damaging the ceramics.

The resistor elements are covered by a protective coating designed for electrical, mechanical and climatic protection. The termination receive a final layer appropriate for conductive gluing.

The result of the determined production is verified by an extensive testing procedure and optical inspection performed on 100 % of the individual chip resistors. Only accepted products are laid directly into the paper tape in accordance with **IEC 60286-3** ⁽³⁾.

RELATED PRODUCTS

Chip resistors for conductive gluing may be used in high temperature applications. For more information please refer to the MC ATAU - Precision datasheet (www.vishay.com/doc?28877).

Notes

- (1) Global Automotive Declarable Substance List, see www.gadsl.org.
- (2) 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 → policy → environmental policy group → chemicals → jig → Joint Industry Guide (JIG-101 Ed 2.0).
- (3) The quoted IEC standards are also released as EN standards with the same number and identical contents.

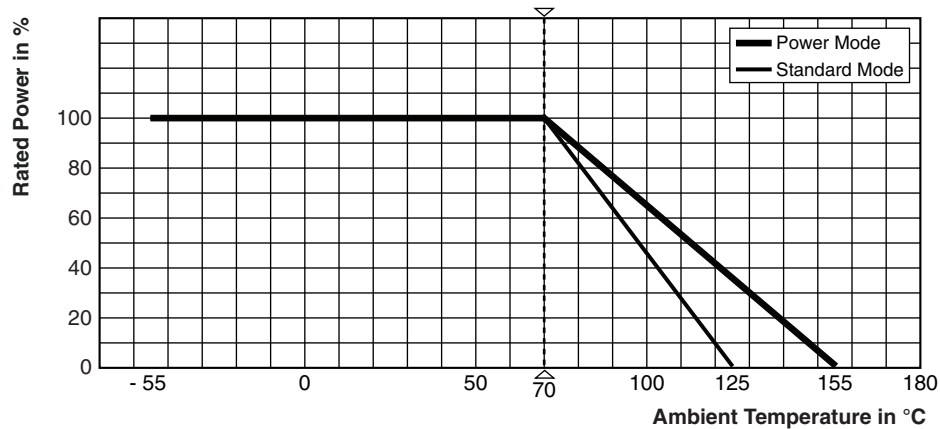
ASSEMBLY

The resistors are suitable for processing on automatic SMD assembly systems. They are suitable for conductive gluing technology. 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 chip arrays are RoHS compliant.

All products comply with the **GADSL** ⁽¹⁾ and the **CEFIC-EECA-EICTA** ⁽²⁾ list of legal restrictions on hazardous substances. This includes full compliance with the following directives:

- 2000/53/EC End of Life Vehicle Directive (ELV) and Annex II (ELV II)
- 2011/65/EU Restriction of the use of Hazardous Substances directive (RoHS)
- 2002/96/EC Waste Electrical and Electronic Equipment Directive (WEEE)

FUNCTIONAL PERFORMANCE


For permissible resistance change please refer to table MAXIMUM RESISTANCE CHANGE AT RATED POWER, above
Derating

TESTS AND REQUIREMENTS

The tests are carried out under standard atmospheric conditions according to **IEC 60068-1** ⁽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 (LCT = - 55 °C/UCT = 125 °C).

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)

| TEST PROCEDURES AND REQUIREMENTS | | | | |
|----------------------------------|----------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| EN 60115-1 CLAUSE | IEC 60068-2 ⁽¹⁾ TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE ⁽²⁾ (ΔR) |
| | | | Stability for product types: ACAS 0606 ATAU | 100 Ω to 150 kΩ |
| 4.5 | - | Resistance | - | $\pm 0.5 \% R$; $\pm 0.25 \% R$ |
| 4.8.4.2 | - | Temperature coefficient | At (20/- 55/ 20) °C and (20/125/20) °C | ± 50 ppm/K; ± 25 ppm/K |
| 4.25.1 | - | Endurance at 70 °C: Standard operation mode | $U = \sqrt{P_{70} \times R}$ or $U = U_{max.}$ 1.5 h on; 0.5 h off; whichever is less severe 1000 h: Absolute Relative 8000 h: Absolute Relative | $\pm (0.1 \% R + 0.05 \Omega)$ $\pm (0.05 \% R + 0.05 \Omega)$ $\pm (0.25 \% R + 0.05 \Omega)$ $\pm (0.125 \% R + 0.05 \Omega)$ |
| | | Endurance at 70 °C: Power operation mode | $U = \sqrt{P_{70} \times R}$ or $U = U_{max.}$ 1.5 h on; 0.5 h off; whichever is less severe 1000 h: Absolute Relative 8000 h: Absolute Relative | $\pm (0.25 \% R + 0.05 \Omega)$ $\pm (0.125 \% R + 0.05 \Omega)$ $\pm (0.5 \% R + 0.05 \Omega)$ $\pm (0.25 \% R + 0.05 \Omega)$ |



| TEST PROCEDURES AND REQUIREMENTS | | | | |
|----------------------------------|-----------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 60115-1 CLAUSE | IEC 60068-2 (1) TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE (2) (ΔR) |
| | | | Stability for product types: | |
| | | | ACAS 0606 ATAU | 100 Ω to 150 kΩ |
| 4.25.3 | - | Endurance at upper category temperature | 125 °C; 1000 h: Absolute Relative 125 °C; 8000 h: Absolute Relative 155 °C; 1000 h: Absolute Relative | $\pm (0.25 \% R + 0.05 \Omega)$ $\pm (0.125 \% R + 0.05 \Omega)$ $\pm (0.5 \% R + 0.05 \Omega)$ $\pm (0.25 \% R + 0.05 \Omega)$ $\pm (0.4 \% R + 0.05 \Omega)$ $\pm (0.2 \% R + 0.05 \Omega)$ |
| 4.24 | 78 (Cab) | Damp heat, steady state | (40 \pm 2) °C; 56 days; (93 \pm 3) % RH | $\pm (0.25 \% R + 0.05 \Omega)$ |
| 4.39 | 67 (Cy) | Damp heat, steady state, accelerated | (85 \pm 2) °C (85 \pm 5) % RH $U = 0.1 \times \sqrt{P_{70}} \times R$ $\leq 100 \text{ V}$; 1000 h | $\pm (0.5 \% R + 0.05 \Omega)$ |
| 4.13 | - | Short time overload: Standard operation mode (3) | $U = 2.5 \times \sqrt{P_{70}} \times R$ or $U = 2 \times U_{max.}$; whichever is less severe; 5 s | $\pm (0.1 \% R + 0.01 \Omega)$ no visible damage |
| 4.40 | - | Electrostatic discharge (human body model) (3) | IEC 61340-3-1; 3 pos. + 3 neg. (equivalent to MIL-STD-883, Method 3015); 1000 V | $\pm (0.5 \% R + 0.05 \Omega)$ |

Notes

- (1) The quoted IEC standards are also released as EN standards with the same number and identical contents.
- (2) Figures are given for arrays with equal values, design type AE.
- (3) For a single element.



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