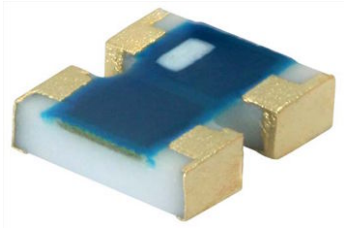


Precision Gold Terminated Thin Film Chip Resistor Array for Conductive Gluing



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

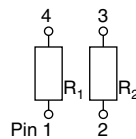
The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature is not exceeded. These resistors do not feature a limited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

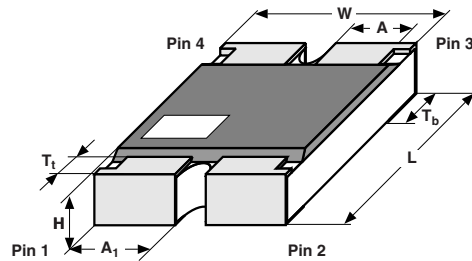
- Products can be ordered using either the PART NUMBER or PRODUCT DESCRIPTION.

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

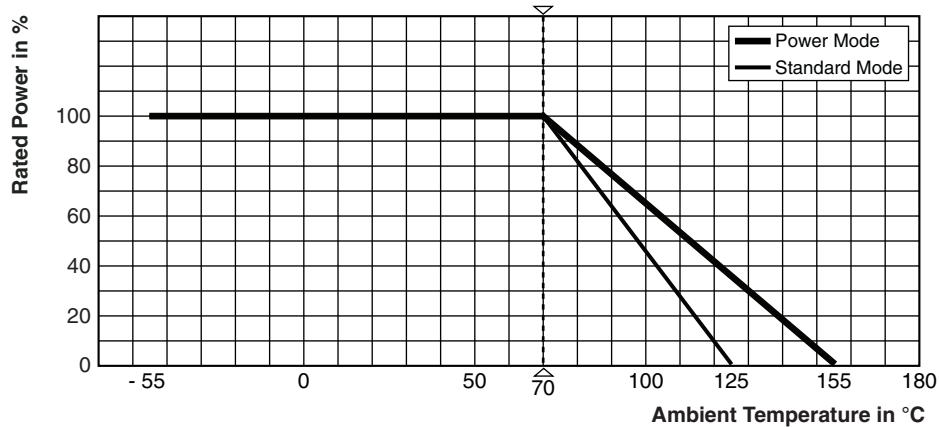
The resistors are suitable for processing on automatic SMD assembly systems. They are suitable for conductive gluing technology. The encapsulation is resistant to all cleaning solvents commonly used in the electronics industry, including alcohols, esters and aqueous solutions.

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	-	± 0.5 % R; ± 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	± (0.1 % R + 0.05 Ω) ± (0.05 % R + 0.05 Ω) ± (0.25 % R + 0.05 Ω) ± (0.125 % R + 0.05 Ω)
		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	± (0.25 % R + 0.05 Ω) ± (0.125 % R + 0.05 Ω) ± (0.5 % R + 0.05 Ω) ± (0.25 % R + 0.05 Ω)



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.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.