

DATA SHEET

ARRAY CHIP RESISTORS

ARV341
5%
sizes 4 × 0402



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FEATURES

- 4 × 0402 sized resistors in one
- package
- Reduced size of final equipment
- Low assembly costs
- Higher component and equipment reliability.

APPLICATIONS

- Motherboards
- Notebook computers
- Add-on cards
- Mobile phones
- PDAs
- Dual In line Memory Modules (DIMM).

DESCRIPTION

The resistors are constructed on a high grade ceramic body (aluminium oxide). Internal metal electrodes are added at each end and connected by a resistive paste which is applied to the top surface of the substrate. The composition of the paste is adjusted to give the approximate resistance required and the value is trimmed to within tolerance, by laser cutting of this resistive layer.

The resistive layer is covered with a protective coating. Finally, external end terminations are added. For ease of soldering the outer layer of these end terminations is a lead-tin alloy.

QUICK REFERENCE DATA

DESCRIPTION	VALUE
Resistance range	10 Ω to 1 MΩ; E24 series; 0 Ω jumper
Resistance tolerance	±5%
Temperature coefficient	≤200 × 10 ⁻⁶ /K
Absolute maximum at T _{amb} = 70 °C	0.063 W
Maximum permissible voltage	50 V (DC or RMS)
Operating temperature range	−55 to +155 °C
Climatic category (IEC 60068)	55/155/56
Basic specification	IEC 60115-8

ORDERING INFORMATION

Table 1 Ordering code indicating resistor type and packing

TYPE	ORDERING CODE 2350 033
	PAPER TAPE ON REEL
	10000 units
ARV341	11...
Jumper 0 Ω	
ARV341; see note 1	91001

Ordering code (12NC)

- The resistors have a 12-digit ordering code starting with 2350 033.
- The subsequent first digit indicates the resistor type and packing; see Table 1.
- The remaining 3 digits indicate the resistance value:
 - The first 2 digits indicate the resistance value.
 - The last digit indicates the resistance decade in accordance with Table 2.

Table 2 Last digit of 12NC

RESISTANCE	LAST DIGIT
10 to 91 Ω	9
100 to 910 Ω	1
1 to 9.1 kΩ	2
10 to 91 kΩ	3
100 to 910 kΩ	4
1 MΩ	5

ORDERING EXAMPLE

The ordering code of an ARV341 convex type array chip resistor, value 100 Ω, supplied on paper tape of 10 000 units per reel is: 2350 033 11101.

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FUNCTIONAL DESCRIPTION

Product characterization

Standard values of nominal resistance are taken from the E24 series for resistors with a tolerance of $\pm 5\%$. The values of the E24 series are in accordance with "IEC publication 60063".

Limiting values

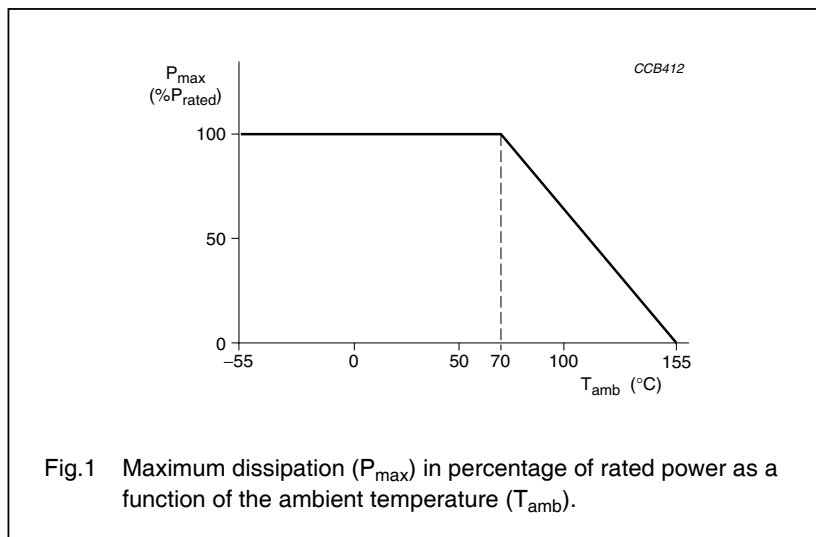
TYPE	LIMITING VOLTAGE ⁽¹⁾ (V)	LIMITING POWER (W)
ARV341	50	0.063

Note

1. This is the maximum voltage that may be continuously applied to the resistor element, see "IEC publication 60115-8".

DERATING

The power that the resistor can dissipate depends on the operating temperature; see Fig.1.



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MECHANICAL DATA

Mass per 100 units

TYPE	MASS (g)
ARV341	0.30

Marking

3-DIGIT MARKING

For values of 10 Ω or greater the first 2 digits apply to the resistance value and the third indicates the number of zeros to follow.

Example

MARKING	RESISTANCE
120	12 Ω
124	120 kΩ
0	jumper

PACKAGE MARKING

The packing is marked and includes resistance value, tolerance, catalogue number, quantity, production period, batch number and source code.

Outlines

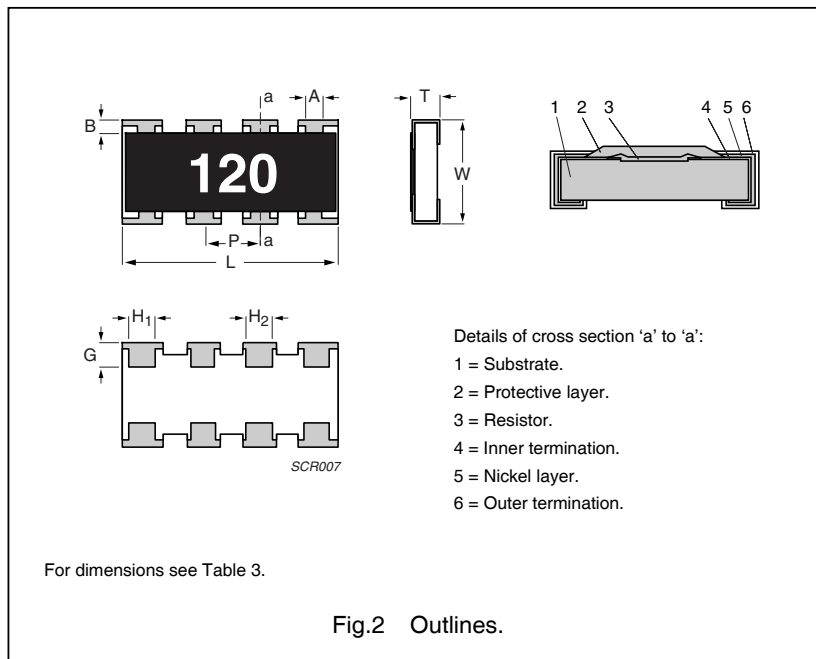


Table 3 Physical dimensions; see Fig.2

SYMBOL	VALUE	TOL.	UNIT
L	2.00	±0.10	mm
W	1.00	±0.10	mm
T	0.45	±0.10	mm
A	0.20	±0.10	mm
B	0.20	±0.15	mm
P	0.50	±0.10	mm
G	0.30	±0.15	mm
H ₁	0.30	±0.10	mm
H ₂	0.20	±0.10	mm

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TEST AND REQUIREMENTS

Essentially all tests are carried out in accordance with the schedule of "IEC publication 60115-8", category 55/155/56 (rated temperature range –55 to +155 °C; damp heat, long term, 56 days). The testing also covers the requirements specified by EIA, EIAJ and JIS.

The tests are carried out in accordance with IEC publication 60068, "Recommended basic climatic and mechanical robustness

testing procedure for electronic components" and under standard atmospheric conditions according to "IEC 60068-1", subclause 5.3.

Unless otherwise specified the following values apply:

Temperature: 15 °C to 35 °C

Relative humidity: 25% to 75%

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

In Table 4 the tests and requirements are listed with reference to the relevant clauses of "IEC publications 60115-8 and 60068", a short description of the test procedure is also given. In some instances deviations from the IEC recommendations were necessary for our method of specifying.

All soldering tests are performed with mildly activated flux.

Table 4 Test procedures and requirements

IEC 60115-8 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
Tests in accordance with the schedule of IEC publication 60115-8				
4.4.1		visual examination		no holes; clean surface; no damage
4.17	20 (Ta)	solderability	unmounted chips completely immersed for 2 ±0.5 s in a solder bath at 235 ±2 °C	good tinning (≥95% covered); no visible damage
4.18	20 (Tb)	resistance to soldering heat	unmounted chips: 10 ±1 s; 260 ±5 °C	no visible damage ΔR/R max.: ±(1% + 0.05 Ω)
4.29	45 (Xa)	component solvent resistance	isopropyl alcohol or H ₂ O followed by brushing in accordance with "MIL 202 F"	no visible damage
4.5		resistance	applied voltage (+0/–10%): R < 10 Ω: 0.1 V 10 Ω ≤ R < 100 Ω: 0.3 V 100 Ω ≤ R < 1 kΩ: 1 V 1 kΩ ≤ R < 10 kΩ: 3 V 10 kΩ ≤ R < 100 kΩ: 10 V 100 kΩ ≤ R < 1 MΩ: 25 V	R – R _{nom} : max. ±5%
4.7		voltage proof on insulation	maximum voltage (RMS) during 1 minute, metal block method	no breakdown or flashover
4.13		short time overload	room temperature; P = 6.25 × P _n ; 5 s (V ≤ 2 × V _{max})	ΔR/R max.: ±(2% + 0.05Ω)
4.33		bending	resistors mounted on a 90 mm glass epoxy resin PCB (FR4); bending: 5 mm	no visible damage ΔR/R max.: ±(1% + 0.05 Ω)

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IEC 60115-8 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.19	14 (Na)	rapid change of temperature	30 minutes at LCT and 30 minutes at UCT; 5 cycles	no visible damage $\Delta R/R \text{ max.: } \pm(1\% + 0.05 \Omega)$
4.24.2	3 (Ca)	damp heat (steady state)	56 days; $40 \pm 2^\circ\text{C}$; $93 \pm 2/-3\%$ RH; loaded with $0.01 P_n$	$\Delta R/R \text{ max.: } \pm(2\% + 0.05 \Omega)$
4.25.1		endurance	1000 hours $+48/-0$ hours; $70 \pm 2^\circ\text{C}$; loaded with P_n or V_{max} ; 1.5 hours on and 0.5 hours off	$\Delta R/R \text{ max.: } \pm(3\% + 0.1 \Omega)$
4.23.2	27 (Ba)	endurance at upper category temperature	1000 hours $+48/-0$ hours; 125°C ; no load	$\Delta R/R \text{ max.: } \pm(3\% + 0.1 \Omega)$
4.8.4.2		temperature coefficient	at $20/\text{LCT}/20^\circ\text{C}$ and $20/\text{UCT}/20^\circ\text{C}$:	$\leq \pm 200 \times 10^{-6}/\text{K}$
Other tests in accordance with IEC 60115 clauses and IEC 60068 test method				
4.17	20 (Ta)	solderability (after ageing)	8 hours steam or 16 hours at 155°C ; unmounted chips completely immersed for 2 ± 0.5 s in a solder bath at $235 \pm 2^\circ\text{C}$	good tinning ($\geq 95\%$ covered); no damage
4.6.1.1		insulation resistance	50 V (DC) after 1 minute, metal block method: 10 V	$R_{\text{ins min.: } 10^4 \text{ M}\Omega}$
4.12		noise	IEC publication 60195 (measured with Quantech-equipment) $R \leq 100 \Omega$ $100 \Omega < R \leq 1 \text{ k}\Omega$ $1 \text{ k}\Omega < R \leq 10 \text{ k}\Omega$ $10 \text{ k}\Omega < R \leq 100 \text{ k}\Omega$ $100 \text{ k}\Omega < R \leq 1 \text{ M}\Omega$	max. $0.316 \mu\text{V/V}$ (-10 dB) max. $1 \mu\text{V/V}$ (0 dB) max. $3 \mu\text{V/V}$ (9.54 dB) max. $6 \mu\text{V/V}$ (15.56 dB) max. $10 \mu\text{V/V}$ (20 dB)
Other applicable tests				
(JIS) C 5202 7.9		resistance to damp heat (steady state)	1000 hours $+48/-0$ hours; $40 \pm 2^\circ\text{C}$; $93 \pm 2/-3\%$ RH; loaded with P_n or V_{max} ; 1.5 hours on and 0.5 hours off	$\Delta R/R \text{ max.: } \pm(3\% + 0.1 \Omega)$
EIA 575 3.13		leaching	unmounted chips 60 ± 1 s; $260 \pm 5^\circ\text{C}$	good tinning; no leaching
EIA/IS 703 4.5		load humidity	1000 hours $+48/-0$ hours; $85 \pm 2^\circ\text{C}$; $85 \pm 5\%$ RH; loaded with $0.01 P_n$ or V_{max}	$\Delta R/R \text{ max.: } \pm(3\% + 0.1 \Omega)$

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Revision	Date	Change Notification	Description
Rev.4	2001 Apr 17	-	<ul style="list-style-type: none">- Converted to Phycomp brand- Quick Reference data: TC corrected from $\leq \pm 300$ into $\leq \pm 200 \times 10.6/K$- Table 4: 4.8.4.2 requirements corrected from $\leq \pm 300$ into $\leq \pm 200 \times 10.6/K$
Rev.5	2003 Jul 28	-	<ul style="list-style-type: none">- Updated company logo- Marking code and test condition revised- Operating temperature range upgraded to 155 °C
Rev.6	2003 Dec 03	EBR-0176-03001/PRC	<ul style="list-style-type: none">- 5 000 units packing phased out on Mar. 01, 2003