

DATA SHEET

ARRAY CHIP RESISTORS YC/TC 122 (4Pin/2R)

5%, 1% sizes 2 × 0402

RoHS compliant



YAGEO Phicomp



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SCOPE

This specification describes YC122 (convex) and TC122 (concave) series chip resistor arrays with lead-free terminations made by thick film process.

<u>APPLICATIONS</u>

- Terminal for SDRAM and DDRAM
- Computer applications: laptop computer, desktop computer
- Consume electronic equipment: PDAs, PNDs
- Mobile phone, telecom...

FEATURES

- RoHS compliant
 - Products with lead free terminations meet RoHS requirements
 - Pb-glass contained in electrodes
 - Resistor element and glass are exempted by RoHS
- Reducing environmentally hazardous wastes
- High component and equipment reliability
- Saving of PCB space
- None forbidden-materials used in products/production
- Halogen Free Epoxy

ORDERING INFORMATION - GLOBAL PART NUMBER & 12NC

Both part numbers are identified by the series, size, tolerance, packing type, temperature coefficient, taping reel and resistance value.

YAGEO BRAND ordering code

GLOBAL PART NUMBER (PREFERRED)

SERIES

$${\mathsf{TC}}^{\mathsf{I22}} - {\mathsf{X} \atop (1)} \; {\mathsf{X} \atop (2)} \; {\mathsf{X} \atop (3)} \; {\mathsf{XX} \atop (4)} \; {\mathsf{XXXX} \atop (5)} \; {\mathsf{L} \atop (6)}$$

(I) TOLERANCE

 $F = \pm 1\%$

 $J = \pm 5\%$ (for Jumper ordering, use code of J)

(2) PACKAGING TYPE

R = Paper taping reel

(3) TEMPERATURE COEFFICIENT OF RESISTANCE

- = Base on spec

(4) TAPING REEL

07 = 7 inch dia. Reel

13 = 13 inch dia. Reel

(5) RESISTANCE VALUE

There are 2~4 digits indicated the resistor value. Letter R/K/M is decimal point, no need to mention the last zero after R/K/M, e.g. I K2, not I K20.

Detailed resistance rules show in table of "Resistance rule of global part number".

(6) DEFAULT CODE

Letter L is the system default code for ordering only. (Note)

Resistance rule of global part number

Resistance code rule	Example
OR	0R = Jumper
XRXX (I to 9.76 Ω)	IR = I Ω IR5 = I.5 Ω 9R76 = 9.76 Ω
XXRX (10 to 97.6 Ω)	IOR = IO Ω 97R6 = 97.6 Ω
XXXR (100 to 976 Ω)	100R = 100 Ω
XKXX (1 to 9.76 K Ω)	1K = 1,000 Ω 9K76 = 9760 Ω
XM (Ι ΜΩ)	IM = 1,000,000 Ω

ORDERING EXAMPLE

The ordering code of a YC122 convex chip resistor array, value $1,\!000~\Omega$ with $\pm 5\%$ tolerance, supplied in 7-inch tape reel is: YC122-JR-071KL.

NOTE

- I. All our RSMD products meet RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
- 2. On customized label, "LFP" or specific symbol printed and the optional "L" at the end of GLOBAL PART NUMBER / 12NC can be added (both are on customer request)



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SERIES

PHYCOMP BRAND ordering codes

Both GLOBAL PART NUMBER (preferred) and I2NC (traditional) codes are acceptable to order Phycomp brand products.

GLOBAL PART NUMBER (PREFERRED)

VVV VVVVV I

For detailed information of GLOBAL PART NUMBER and ordering example, please refer to page 2. TC122 series is supplied and ordered by global part number only.

12NC CODE 2250

235	U	XXX	<u>XX</u> XXX L		
(1)		(2	2) (3) (4)		
TYPE/		TOL.	RESISTANCE	PAPER / PE TAPE ON REEL	(units) (2)
2×0402	IN ⁽¹⁾	(%)	RANGE	10,000	50,000
ARV321	2350	±5%	I to I $M\Omega$	013 1xxx	013 12xxx
ARV322	2350	±1%	10 to 1 $M\Omega$	013 2xxxx	013 3xxxx
Jumper	2350	-	0 Ω	013 91001	

- (1) The resistors have a 12-digit ordering code starting with 2350.
- (2) The subsequent 4 or 5 digits indicate the resistor tolerance and packaging.
- (3) The remaining 4 or 3 digits represent the resistance value with the last digit indicating the multiplier as shown in the table of "Last digit of I2NC".
- (4) "L" is optional symbol (Note).

ORDERING EXAMPLE

The ordering code of a ARV321 resistor, value 1,000 Ω with ±5% tolerance, supplied in tape of 10,000 units per reel is: 235001311102(L) or YC122-JR-071KL.

Last digit of 12NC	
Resistance decade ⁽³⁾	Last digit
0.01 to 0.0976 Ω	0
0.1 to 0.976 Ω	7
I to 9.76 Ω	8
10 to 97.6 Ω	9
100 to 976 Ω	1
I to 9.76 KΩ	2
10 to 97.6 KΩ	3
100 to 976 KΩ	4
I to 9.76 MΩ	5
I0 to 97.6 MΩ	6

Example:	0.02 22	=	0200 or 200
	0.3 Ω	=	3007 or 307
	ΙΩ	=	1008 or 108
	33 KΩ	=	3303 or 333
	$10~\text{M}\Omega$	=	1006 or 106

F.,,,,,,,,

NOTE

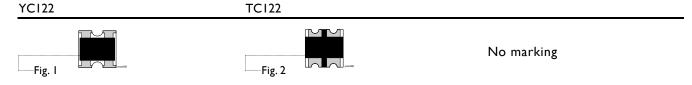
- 1. All our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
- 2. On customized label, "LFP" or specific symbol printed and the optional "L" at the end of GLOBAL PART NUMBER / I2NC can be added (both are on customer request)



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SERIES

<u>MARKING</u>

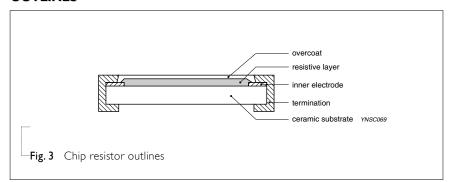


For further marking information, please refer to data sheet "Chip resistors marking".

CONSTRUCTION

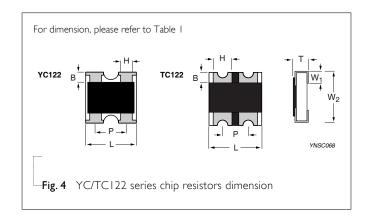
The resistor is constructed on top of a high-grade ceramic body. Internal metal electrodes are added on each end to make the contacts to the thick film resistive element. The composition of the resistive element is a noble metal imbedded into a glass and covered by a second glass to prevent environment influences. The resistor is laser trimmed to the rated resistance value. The resistor is covered with a protective epoxy coat, finally the two external terminations (matte tin on Nibarrier) are added as shown in Fig.3.

OUTLINES

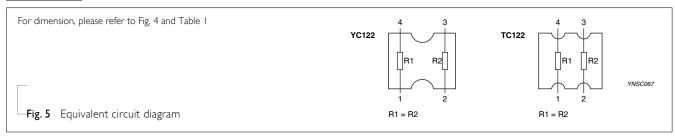


DIMENSIONS

Table I		
TYPE	YC122	TC122
B (mm)	0.20 ±0.10	0.25 ±0.15
H (mm)	0.21 +0.10/-0.05	0.30 ±0.05
P (mm)	0.67 ±0.05	0.50 ±0.05
L (mm)	1.00 ±0.10	1.00 ±0.10
T (mm)	0.30 ±0.10	0.30 ±0.10
W _I (mm)	0.25 ±0.10	0.25 ±0.15
W ₂ (mm)	1.00 ±0.10	1.00 ±0.10



SCHEMATIC





ELECTRICAL CHARACTERISTICS

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Table 2

CHARACTERISTICS		YC122	TC122
Operating Temperature Range	-55	°C to +125 °C	−55 °C to +125 °C
Rated Power		1/16 W	1/16 W
Maximum Working Voltage		50 V	50 V
Maximum Overload Voltage		100 V	100 V
Dielectric Withstanding Voltage		100 V	100 V
Resistance Range	5% (E24) 1% (E24/E96)	Ω to $M\Omega$ Ω to $M\Omega$	0 Ω to MΩ 0 Ω to MΩ
	Jui	mper < 50 m Ω	Jumper $<$ 50 m Ω
Tamparatura Coefficient	I Ω ≤ R < I0 Ω	±250 ppm/°C	1300 (96
Temperature Coefficient	$10 \Omega \le R \le 1 M\Omega$	±200 ppm/°C	±200 ppm/°C
Jumper Criteria	Rated Current	0.5 A	1.0 A
Jumper Criteria	Maximum Current	1.0 A	1.5 A

FOOTPRINT AND SOLDERING **PROFILES**

For recommended footprint and soldering profiles, please refer to data sheet "Chip resistors mounting".

PACKING STYLE AND PACKAGING QUANTITY

Table 3 Packing style and packaging quantity

PRODUCT TYPE	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
YC/TC122	Paper Taping Reel (R)	7" (178 mm)	10,000 units
		13" (330 mm)	50,000 units

NOTE

FUNCTIONAL DESCRIPTION

POWER RATING

YC/TC 122 rated power at 70 °C is 1/16 W

RATED VOLTAGE

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V = \sqrt{(P \times R)}$$

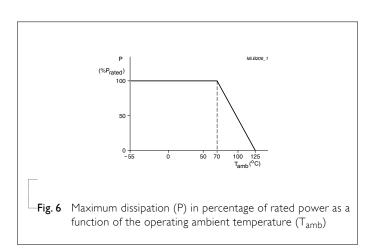
or max. working voltage whichever is less

Where

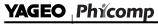
V=Continuous rated DC or AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)



^{1.} For paper tape and reel specification/dimensions, please refer to data sheet "Chip resistors packing".

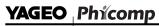


Chip Resistor Surface Mount YC/TC SERIES 122 (RoHS Compliant)

TESTS AND REQUIREMENTS

Table 4 Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Life/ Operational Life/ Endurance	MIL-STD-202G-method 108A IEC 60115-1 4.25.1 JIS C 5202-7.10	I,000 hours at 70±5 °C applied RCWV I.5 hours on, 0.5 hour off, still air required	$\pm (2\% + 0.05 \ \Omega)$ <100 m Ω for Jumper
High Temperature Exposure/ Endurance at Upper Category Temperature	MIL-STD-202G-method 108A IEC 60115-1 4.25.3 JIS C 5202-7.11	1,000 hours at maximum operating temperature depending on specification, unpowered No direct impingement of forced air to the parts Tolerances: 125±3 °C	\pm (1%+0.05 Ω) <50 mΩ for Jumper
Moisture Resistance	MIL-STD-202G-method 106F IEC 60115-1 4.24.2	Each temperature / humidity cycle is defined at 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25 °C / 65 °C 95% R.H, without steps 7a & 7b, unpowered Parts mounted on test-boards, without condensation on parts Measurement at 24±2 hours after test conclusion	$\pm (2\% + 0.05~\Omega)$ < 100 m Ω for Jumper
Thermal Shock	MIL-STD-202G-method 107G	-55/+125 °C Note: Number of cycles required is 300. Devices unmounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	\pm (1%+0.05 Ω) <50 mΩ for Jumper
Short Time Overload	MIL-R-55342D-para 4.7.5 IEC60115-1 4.13	2.5 times RCWV or maximum overload voltage whichever is less for 5 sec at room temperature	$\pm (2\% + 0.05 \ \Omega)$ <50 m Ω for Jumper No visible damage
Board Flex/ Bending	IEC60115-1 4.33	Device mounted on PCB test board as described, only I board bending required 3 mm bending Bending time: 60±5 seconds Ohmic value checked during bending	\pm (1%+0.05 Ω) <50 m Ω for Jumper No visible damage



Chip Resistor Surface Mount YC/TC SERIES 122 (RoHS Compliant)

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Solderability - Wetting	IPC/JEDECJ-STD-002B test B IEC 60068-2-58	Electrical Test not required Magnification 50X SMD conditions: Ist step: method B, aging 4 hours at 155 °C dry heat 2nd step: leadfree solder bath at 245±3 °C Dipping time: 3±0.5 seconds	Well tinned (≥95% covered) No visible damage
- Leaching	IPC/JEDECJ-STD-002B test D IEC 60068-2-58	Leadfree solder, 260 °C, 30 seconds immersion time	No visible damage
- Resistance to Soldering Heat	MIL-STD-202G-method 210F IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 270 °C, 10 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	$\pm (1\% + 0.05 \ \Omega)$ <50 m Ω for Jumper No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 3	Oct 20, 2011	-	- T.C.R. range updated
Version 2	Sep 16, 2008	-	 Change to dual brand datasheet that describes YC/TC122 with RoHS compliant
			- Range extended to size TC122 (concave)
			- Description of "Halogen Free Epoxy" added
			- Define global part number
Version I	Dec 21, 2004	-	- Test method and procedure updated
Version 0	Nov. 10, 2003	-	- First issue of this specification

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YC122-FR-07200RL



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