DATA SHEET

ARRAY CHIP RESISTORS

YC/TC 164 (8Pin/4R)

5%, 1%

sizes 4 × 0603

RoHS compliant

YAGEO

Phicomp

SCOPE

This specification describes YC164 (convex) and TC164 (concave) series chip resistor arrays with lead-free terminations made by thick film process.

APPLICATIONS

- 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)

YC / TC 164 – X X X XX XXXX L
(1) (2) (3) (4) (5) (6)

(1) TOLERANCE

F = ±1%

J = ±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

10 = 10 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.1K2, not 1K20.

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

(6) OPTIONAL CODE

L = optional symbol [(Note)]

Resistance rule of global part number

Resistance code rule	Example
0R	0R = Jumper
XRXX (1 to 9.76 Ω)	1R = 1 Ω 1R5 = 1.5 Ω 9R76 = 9.76 Ω
XXRX (10 to 97.6 Ω)	10R = 10 Ω 97R6 = 97.6 Ω
XXXR (100 to 976 Ω)	100R = 100 Ω
XKXX (1 to 9.76 KΩ)	1K = 1,000 Ω 9K76 = 9760 Ω
XMXX (1 to 9.76 MΩ)	1M = 1,000,000 Ω 9M76= 9,760,000 Ω

ORDERING EXAMPLE

The ordering code of a YC164 convex chip resistor array, value 1,000 Ω with ±5% tolerance, supplied in 7-inch tape reel is: YC164-JR-071K(L).

NOTE

1. 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)

PHYCOMP BRAND ordering codes

Both GLOBAL PART NUMBER (preferred) and 12NC (traditional) codes are acceptable to order Phycomp brand products.

GLOBAL PART NUMBER (PREFERRED)

For detailed information of GLOBAL PART NUMBER and ordering example, please refer to page 2.

12NC CODE

2350   XXX XXXXX L

(1)   (2)   (3)   (4)

TYPE/ 4×0603	START IN [1]	TOL. (%)	RESISTANCE RANGE	PAPER / PE TAPE ON REEL (units) [2]	
				5,000	20,000
ARV241	2350	±5%	1 to 1 MΩ	035 10xxx	035 12xxx
ARV242	2350	±1%	1 to 1 MΩ	025 1xxxx	025 3xxxx
ARC241	2350	±5%	10 to 1 MΩ	034 10xxx	013 3xxxx
ARC242	2350	±1%	10 to 1 MΩ	024 1xxxx	013 3xxxx
Jumper	2350	-	0 Ω	ARV241/YC164 035 91001	-
				ARC241/TC164 034 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 12NC".

(4) "L" is optional symbol [Note].

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

Example:	0.02 Ω	=	0200 or 200
	0.3 Ω	=	3007 or 307
	1 Ω	=	1008 or 108
	33 KΩ	=	3303 or 333
	10 MΩ	=	1006 or 106

ORDERING EXAMPLE

The ordering code of a ARV241 resistor, value 1,000 Ω with ±5% tolerance, supplied in tape of 10,000 units per reel is: 235003510102(L) or YC164-JR-071K(L).
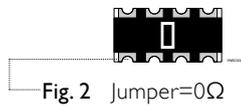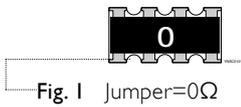
NOTE

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 / 12NC can be added (both are on customer request)
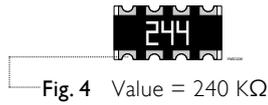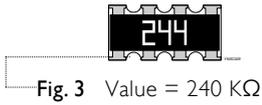
MARKING

YC164   TC164

Fig. 1   Jumper=0Ω

Fig. 2   Jumper=0Ω

1-Digit marking

Fig. 3   Value = 240 KΩ

Fig. 4   Value = 240 KΩ

E-24 series: 3 digits

First two digits for significant figure and 3rd digit for number of zeros

For further marking information, please see special 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 Ni-barrier) are added. See fig.5
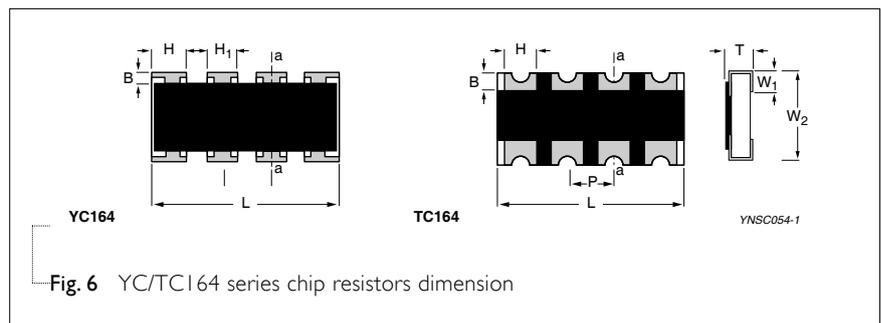
OUTLINES

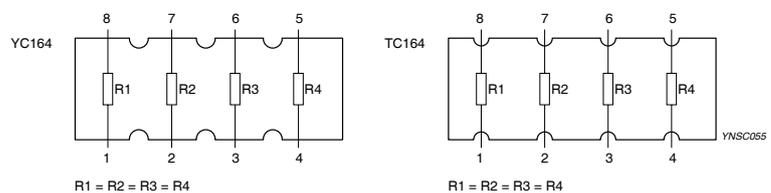Fig. 5   Chip resistor outlines
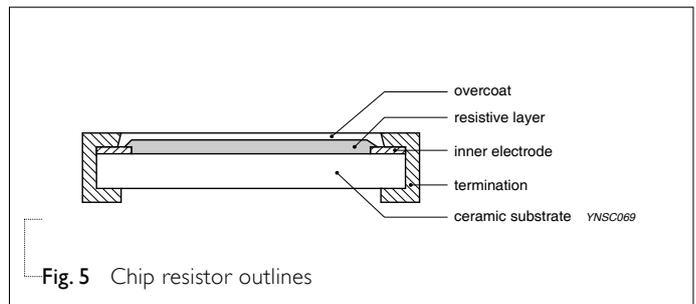
DIMENSIONS

Table 1

TYPE	YC164	TC164
B (mm)	0.30 ±0.15	0.30 ±0.15
H (mm)	0.65 ±0.05	---
H_1 (mm)	0.50 ±0.15	---
P (mm)	0.80 ±0.05	0.80 ±0.05
L (mm)	3.20 ±0.15	3.20 ±0.15
T (mm)	0.60 ±0.10	0.60 ±0.10
W_1 (mm)	0.30 ±0.15	0.30 ±0.15
W_2 (mm)	1.60 ±0.15	1.60 ±0.15

Fig. 6   YC/TC164 series chip resistors dimension

SCHEMATIC

For dimension see Fig. 6 and Table 1

Fig. 7   Equivalent circuit diagram

ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS		YC/TC164 1/16 W
Operating Temperature Range		–55 °C to +155 °C
Maximum Working Voltage		50 V
Maximum Overload Voltage		100 V
Dielectric Withstanding Voltage		100 V
Resistance Range 5% (E24), 1% (E24/E96)	YC164	1 Ω to 1 MΩ
	TC164	10 Ω to 1 MΩ
		Zero Ohm Jumper < 0.05 Ω
Temperature Coefficient		±200 ppm/°C
Jumper Criteria	Rated Current	1.0 A
	Maximum Current	2.0 A

FOOTPRINT AND SOLDERING PROFILES

For recommended footprint and soldering profiles, please see the special 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/TC164	Paper Taping Reel (R)	7" (178 mm)	5,000 units
		10" (254 mm)	10,000 units
		13" (330 mm)	20,000 units

NOTE

1. For paper tape and reel specification/dimensions, please see the special data sheet "Chip resistors packing".

FUNCTIONAL DESCRIPTION

POWER RATING

YC/TC 164 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)
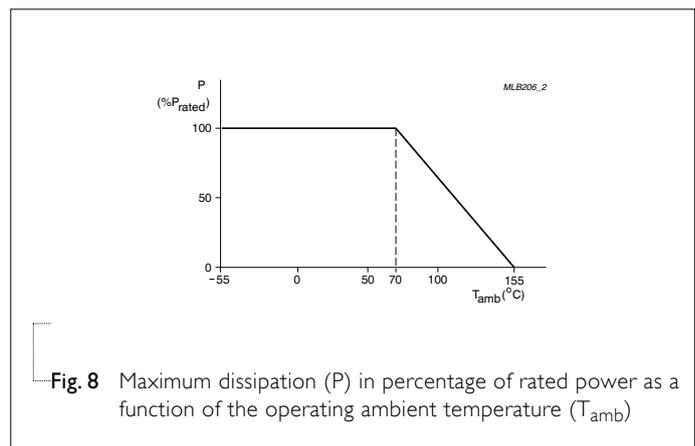
P = Rated power (W)

R = Resistance value (Ω)

Fig. 8 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

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	1,000 hours at 70±5 °C applied RCWV 1.5 hours on, 0.5 hour off, still air required	±(2%+0.05 Ω) <100 mΩ 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: 155±3 °C	±(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	±(2%+0.05 Ω) <100 mΩ for Jumper
Thermal Shock	MIL-STD-202G-method 107G	-55/+155 °C Note: Number of cycles required is 300. Devices unmounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	±(0.5%+0.05 Ω) for 10 KΩ to 10 MΩ ±(1%+0.05 Ω) for others <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	±(2%+0.05 Ω) <50 mΩ for Jumper No visible damage
Board Flex/ Bending	IEC60115-1 4.33	Device mounted on PCB test board as described, only 1 board bending required 3 mm bending Bending time: 60±5 seconds Ohmic value checked during bending	±(1%+0.05 Ω) <50 mΩ for Jumper No visible damage

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: 1st 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 mΩ for Jumper No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 3	Oct 27, 2008	-	- Change to dual brand datasheet that describes YC/TC164 with RoHS compliant - Description of "Halogen Free Epoxy" added - Define global part number
Version 2	Mar 01, 2005	-	- Test method and procedure updated - TC164, the concave chip resistor arrays combined
Version 1	Apr. 22, 2004	-	- 13'' taping and Jumper added, delete G in ordering code, and test & requirement (Pb free) updated
Version 0	Nov. 10, 2003	-	- First issue of this specification

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Yageo:

  YC164-JR-0756RL TC164-JR-0733RL YC164-JR-072K7L YC164-JR-072KL YC164-JR-07220KL YC122-JR-0715RL YC164-JR-075K6L YC164-JR-071ML YC164-FR-07100RL YC164-JR-07180RL TC164-JR-0722KL YC122-JR-0710RL YC164-JR-07160RL YC122-JR-0722RL YC164-JR-0747KL TC164-JR-07220RL YC164-JR-0722KL YC122-JR-0736RL YC164-JR-07240RL YC164-JR-0751KL YC164-JR-0727RL YC164-JR-07200RL YC164-JR-07300RL YC164-JR-07470RL TC164-JR-0747KL YC164-JR-075K1L YC164-JR-07390RL YC164-JR-0720KL YC164-JR-07510RL TC164-JR-07270RL TC164-JR-073K3L TC164-JR-07330RL YC164-JR-071K8L YC164-JR-07130RL TC164-JR-07470RL YC164-JR-07680RL YC164-JR-071K2L YC164-JR-07560RL TC164-JR-07120RL YC164-JR-0724RL YC164-JR-071K5L YC164-JR-07100KL TC164-JR-074K7L TC164-JR-0751RL YC164-JR-072K4L YC164-JR-0733RL YC164-JR-073K3L YC164-JR-071KL YC164-FR-072K2L YC164-JR-07180KL YC164-FR-0730K1L YC164-FR-071KL YC164-JR-07240KL YC164-JR-072R2L YC164-JR-07330KL YC164-JR-07560KL YC164-JR-0720RL YC164-JR-0718RL YC164-JR-075R6L YC164-JR-10220RL YC164-JR-0711KL YC164-JR-0713KL YC164-JR-0716RL YC164-JR-0762KL YC164-JR-0762RL YC164-FR-07120RL YC164-FR-073K9L YC164-FR-076K04L YC164-FR-071K5L YC164-FR-072K7L YC164-FR-07330RL YC164-FR-074K7L YC164-FR-07150RL YC164-FR-0711KL YC164-FR-07200KL YC164-FR-0742R2L YC164-FR-07120KL YC164-FR-0764R9L YC164-FR-0768KL YC164-FR-07133RL YC164-FR-0743RL YC164-FR-07820RL YC164-FR-0733RL YC164-FR-07390RL YC164-FR-0749K9L YC164-FR-074K99L YC164-FR-07182RL YC164-FR-0715RL YC164-FR-0756R2L YC164-FR-072KL YC164-FR-07470KL YC164-FR-07499RL YC164-FR-07330KL YC164-FR-0739RL YC164-FR-072K4L YC164-FR-0756KL YC164-FR-07249RL YC164-FR-076K8L YC164-FR-075K6L YC164-FR-07470RL