

# DATA SHEET

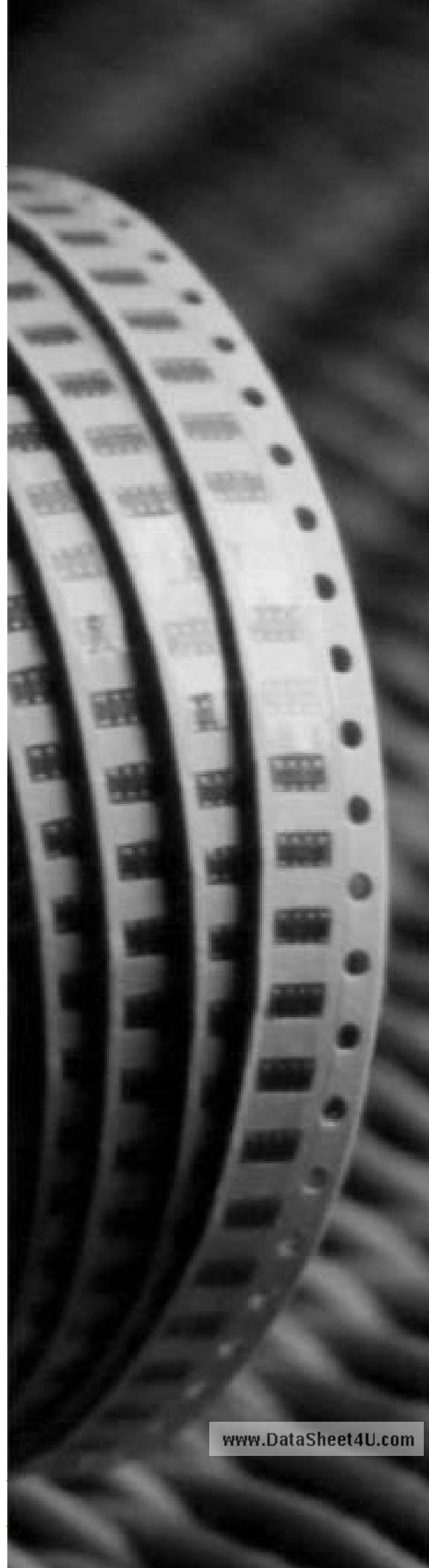
## CHIP RESISTORS ARRAY

YC164 (8Pin/4R)

5%; 1%



Product Specification - Dec. 20, 2002 V.03    Supersedes Date of Jun. 04, 2002



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## SCOPE

This specification describes YC164 series chip resistors made by thick film process.

## ORDERING INFORMATION

Part number is identified by the series, size, tolerance, packing style, temperature coefficient, special type and resistance value.

**YC164 - X X X XX XXXX**  
(1) (2) (3) (4) (5)

### (1) TOLERANCE

F =  $\pm 1\%$

J =  $\pm 5\%$

### (2) PACKAGING TYPE

R = Paper taping reel

### (3) TEMPERATURE CHARACTERISTIC OF RESISTANCE

G =  $\pm 200\text{ppm}/^\circ\text{C}$

- = Base on spec

### (4) SPECIAL TYPE

07 = 7 inch dia. Reel

### (5) RESISTANCE VALUE:

5R6, 56R, 560R, 5K6, 56K, 56M.

## MARKING

### YC164



Fig. 1 5% Marking, Value=5.6 $\Omega$

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

Letter R: decimal place

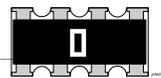


Fig. 2 Jumper=Zero Ohm

Letter 0: Jumper chip (0 ohm)

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## DIMENSION

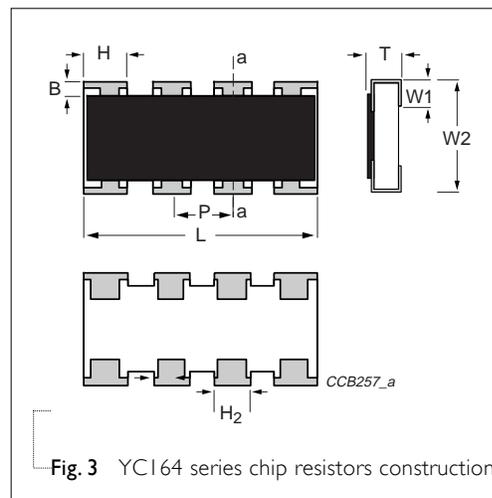


Fig. 3 YC164 series chip resistors construction

Table I

| TYPE                | YC164           |
|---------------------|-----------------|
| B (mm)              | 0.3 $\pm$ 0.15  |
| H (mm)              | 0.65 $\pm$ 0.05 |
| P (mm)              | 0.8 $\pm$ 0.05  |
| L (mm)              | 3.2 $\pm$ 0.15  |
| H <sub>2</sub> (mm) | 0.5 $\pm$ 0.15  |
| T (mm)              | 0.6 $\pm$ 0.1   |
| W <sub>1</sub> (mm) | 0.3 $\pm$ 0.15  |
| W <sub>2</sub> (mm) | 1.6 $\pm$ 0.15  |

## SCHEMATIC

For dimension see Fig. 3 and Table I

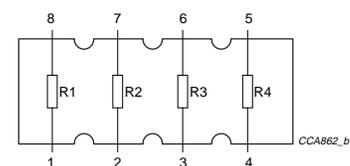
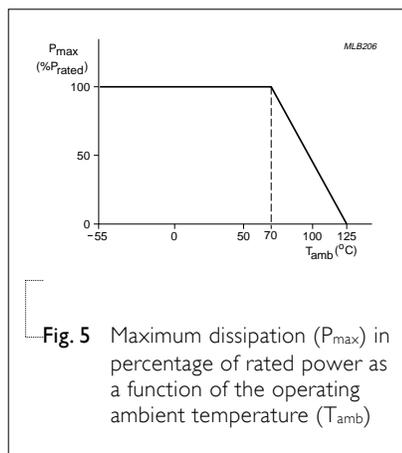


Fig. 4 Equivalent circuit diagram

R1=R2=R3=R4

**POWER RATING**

**RATED POWER AT 70°C,  
YC164=1/16W FOR ELEMENT**

**RATED VOLTAGE:**

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

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

Where

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

P=Rated power (W)

R=Resistance value ( $\Omega$ )

**ELECTRICAL CHARACTERISTICS**

Table 2

| CHARACTERISTICS                 | YC164 1/16W                |
|---------------------------------|----------------------------|
| Operating Temperature Range     | -55°C to +125°C            |
| Maximum Working Voltage         | 50V                        |
| Maximum Overload Voltage        | 100V                       |
| Dielectric Withstanding Voltage | 100V                       |
| Number of Resistors             | 4                          |
| Resistance Range                | 10 $\Omega$ to 1M $\Omega$ |
| Temperature Coefficient         | $\pm 200$ ppm/°C           |

## TAPING REEL

Table 3

| DIMENSION             | YC164    |
|-----------------------|----------|
| Tape Width            | 8mm      |
| ØA (mm)               | 180+0/-3 |
| ØB (mm)               | 60+1/-0  |
| ØC (mm)               | 13.0±0.2 |
| ØD (mm)               | 21±0.8   |
| W (mm)                | 9.0±0.3  |
| T <sub>max</sub> (mm) | 11.4±1   |

For dimension see Table 3

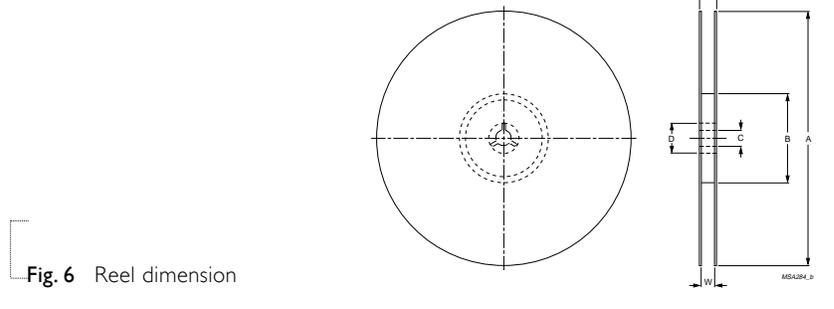


Fig. 6 Reel dimension

## PAPER TAPE SPECIFICATION

Table 4

| DIMENSION             | YC164      |
|-----------------------|------------|
| A (mm)                | 2.0±0.1    |
| B (mm)                | 3.5±0.1    |
| W (mm)                | 8.0±0.2    |
| E (mm)                | 1.75±0.1   |
| F (mm)                | 3.5±0.05   |
| P <sub>0</sub> (mm)   | 4.0±0.1    |
| P <sub>1</sub> (mm)   | 4.0±0.1    |
| P <sub>2</sub> (mm)   | 2.0±0.05   |
| ØD <sub>0</sub> (mm)  | 1.5+0.1/-0 |
| T <sub>max</sub> (mm) | 0.85±0.1   |

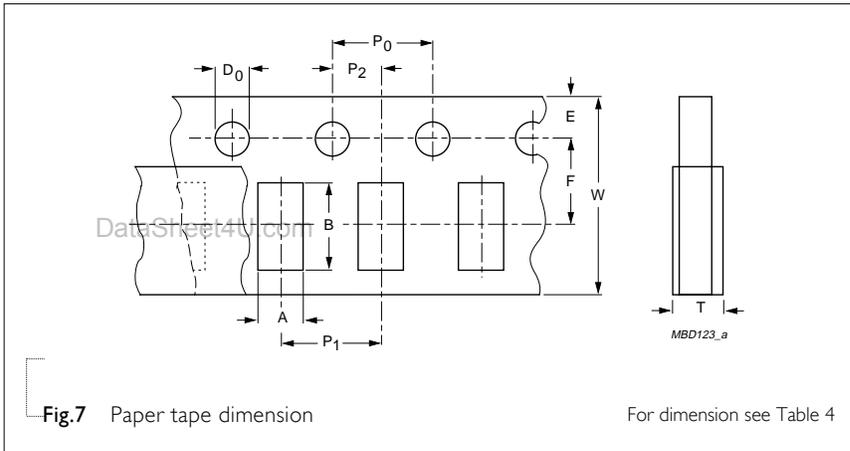


Fig. 7 Paper tape dimension

For dimension see Table 4

## PACKING METHOD

## LEADER/TRAILER TAPE SPECIFICATION

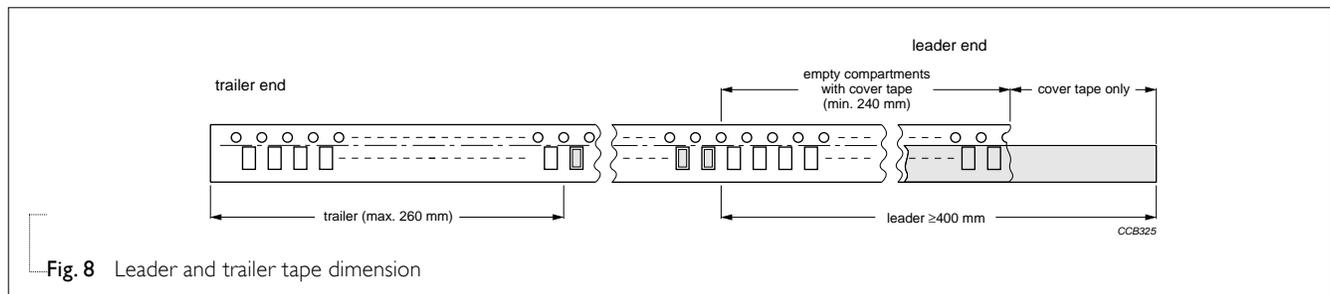


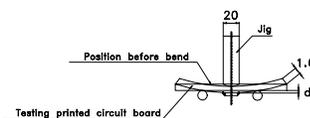
Fig. 8 Leader and trailer tape dimension

Table 5 Packing style and packaging quantity

| PACKING STYLE         | REEL DIMENSION | YC164 |
|-----------------------|----------------|-------|
| Paper Taping Reel (R) | 7" (178 mm)    | 5,000 |

| TYPE  | TEST METHOD  | Formula  | ACCEPTANCE STANDARD                |       |         |      |   |
|---|--|--|------------------------------------|-------|---------|------|---|
| <b>Temperature Coefficient of Resistance (T.C.R.)</b> | Measure resistance at +25°C or specified room temperature as R <sub>1</sub> , then measure at -55°C or +125°C respectively as R <sub>2</sub> . Determine the temperature coefficient of resistance from the following formula:   | $T.C.R. = \frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/}^\circ\text{C)}$ Where<br>t <sub>1</sub> =+25°C or specified room temperature<br>t <sub>2</sub> =-55°C or +125°C test temperature<br>R <sub>1</sub> =resistance at reference temperature in ohms<br>R <sub>2</sub> =resistance at test temperature in ohms | Refer to table 2                   |       |         |      |   |
| <b>Thermal Shock</b>                                  | At -55±3°C for 2 minutes and at +125±2°C for 2 minutes as one cycle. After 5 cycles, the specimen shall be stabilized at room temp.<br>Measure the resistance to determine ΔR/R(%) after one more hour.  |  | ±(1%+0.05Ω)                        |       |         |      |   |
| <b>Low Temperature Operation</b>                      | Place the specimen in a test chamber maintained at -65 (+0/-5)°C. After one hour stabilization at this temperature, full rated working voltage shall be applied for 45 (+5/-0) minutes. Have 15 (+5/-0) minutes after remove the voltage, the specimen shall be removed from the chamber and stabilized at room temperature for 24 hrs.<br>Measure the resistance to determine ΔR/R(%) |  | ±(1.0%+0.05Ω)<br>No visible damage |       |         |      |   |
| <b>Short Time Overload</b>                            | Apply 2.5 times of rated voltage but not exceeding the maximum overload voltage for 5 seconds. Have the specimen stabilized at room temperature for 30 minutes minimum.<br>Measure the resistance to determine ΔR/R(%)   |  | ±(2.0%+0.05Ω)<br>No visible damage |       |         |      |   |
| <b>Insulation Resistance</b>                          | Place the specimen in the jig and apply a rated continues overload voltage (R.C.O.V) for one minute as shown.<br>Measure the insulation resistance.  | <table border="1"> <tr> <td>Type</td> <td>YC164</td> </tr> <tr> <td>Voltage</td> <td>100V</td> </tr> </table>  | Type                               | YC164 | Voltage | 100V | ≥10,000MΩ   |
| Type  | YC164  |  |                                    |       |         |      |   |
| Voltage   | 100V   |  |                                    |       |         |      |   |
| <b>Dielectric Withstand Voltage</b>                   | Place the specimen in the jig and apply a specified value continuous overload voltage as shown for one minute.   | <table border="1"> <tr> <td>Type</td> <td>YC164</td> </tr> <tr> <td>Voltage</td> <td>100V</td> </tr> </table>  | Type                               | YC164 | Voltage | 100V | Breakdown voltage> specification and without open/short |
| Type  | YC164  |  |                                    |       |         |      |   |
| Voltage   | 100V   |  |                                    |       |         |      |   |
| <b>Resistance To Soldering Heat</b>                   | Immerse the specimen in the solder pot at 260±5°C. for 10±1 seconds. Have the specimen stabilized at room temperature for 30 minutes minimum.<br>Measure the resistance to determine ΔR/R(%)   |  | ±(1.0%+0.05Ω)<br>No visible damage |       |         |      |   |

| TYPE                       | TEST METHOD   | ACCEPTANCE STANDARD  |
|----------------------------|---|--|
| <b>Moisture Resistance</b> | Place the specimen in the test chamber and subject to 42 damp heat cycles. Each one of which consists of the steps 1 to 7 as figure 10. The total length of test is 1,000 hours. Have the specimen stabilized at room temperature for 24 hours after testing.<br>Measure the resistance to determine $\Delta R/R(\%)$ . | $\pm(2.0\%+0.05\Omega)$<br>No visible damage               |
| <b>Life</b>                | Place the specimen in the oven at $70\pm 2^\circ\text{C}$ . Apply the rated voltage to the specimen at the 1.5 hours on and 0.5 hour off cycle. The total length of test is 1,000 hours. Have the specimen stabilized at room temperature for one hour minimum after testing.<br>Measure the $\Delta R/R(\%)$ .         | $\pm(3\%+0.1\Omega)$ for 5% tolerance<br>No visible damage |
| <b>Solderability</b>       | Immerse the specimen in the solder pot at $230\pm 5^\circ\text{C}$ for 5 sec.   | At least 95% solder coverage on the termination            |
| <b>Bending Strength</b>    | Mount the specimen on a test board as shown in the figure 9. Slowly apply the force till the board is bent for $5\pm 1$ sec.<br>Measure the $\Delta R/R(\%)$ at this position.  | $\pm(1.0\%+0.05\Omega)$<br>No visible damage               |



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Fig. 9 Principle of the bending test

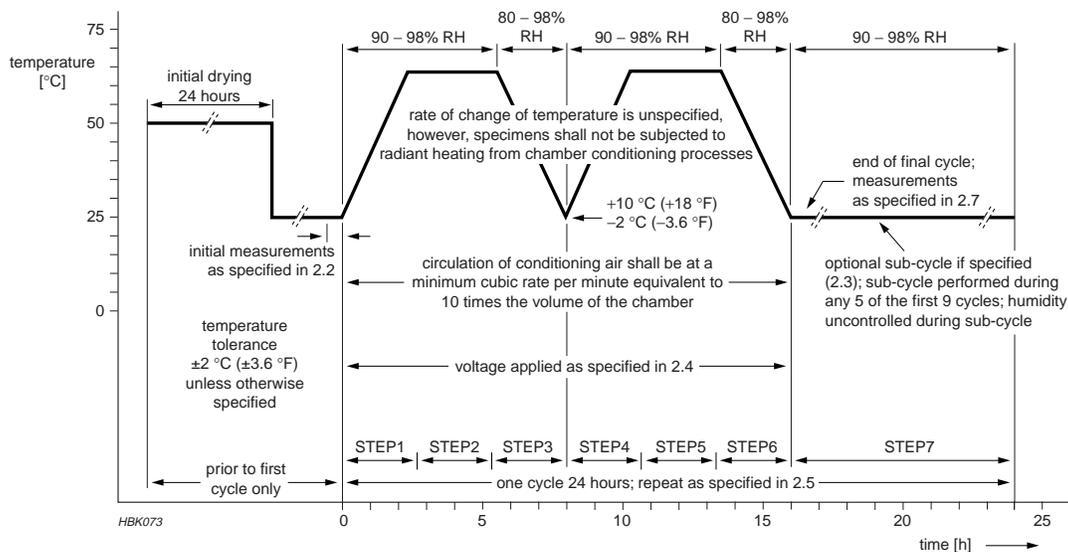


Fig. 10 Conditions by change of temperature