

DATA SHEET

CHIP RESISTORS

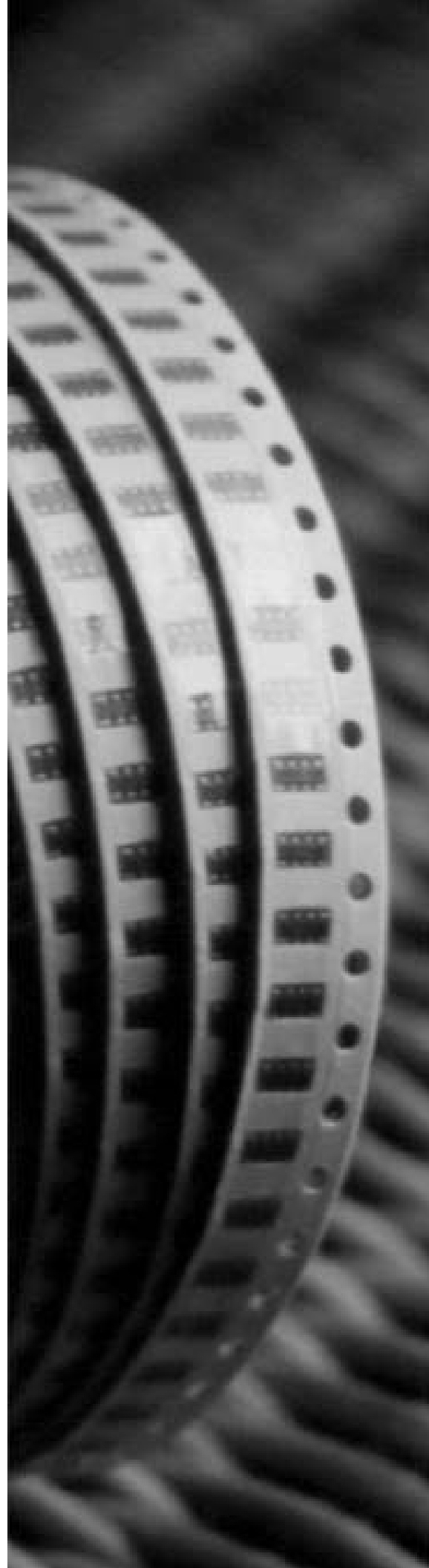
RC1206

5%; 1%



YAGEO

Product Specification - Sep. 19, 2003 V.5 Supersedes Date of Feb. 13, 2003



SCOPE

This specification describes RC 1206 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.

RC1206 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

C = Bulk case

(3) TEMPERATURE CHARACTERISTIC OF RESISTANCE

F = $\pm 100\text{ppm}/^\circ\text{C}$

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

I = $\pm 300\text{ppm}/^\circ\text{C}$

- = Base on spec

(4) SPECIAL TYPE

07 = 7 inch dia. Reel

10 = 10 inch dia. Reel

13 = 13 inch dia. Reel

(5) RESISTANCE VALUE:

5R6, 56R, 560R, 5K6, 56K, 22M.

MARKING

RC1206



E-24 series: 3 digits

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



Both E-24 and E-96 series: 4 digits

First three digits for significant figure and 4th digit for number of zeros

CONSTRUCTION

The resistors are constructed out of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by a resistive paste. The composition of the paste is adjusted to give the approximate required resistance and laser cutting of this resistive layer that achieves tolerance trims the value. The resistive layer is covered with a protective coat and printed with the resistance value. Finally, the two external terminations are added. See fig. 3

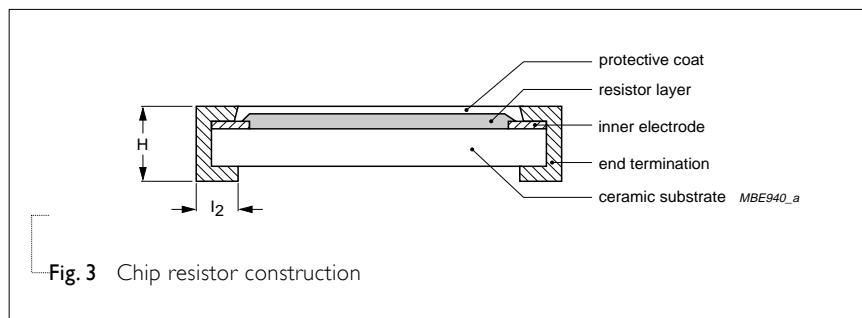


Fig. 3 Chip resistor construction

DIMENSION

Table 1

| TYPE | RC1206 |
|---------------------|-----------|
| L (mm) | 3.10±0.10 |
| W (mm) | 1.60±0.10 |
| H (mm) | 0.55±0.10 |
| l ₁ (mm) | 0.45±0.20 |
| l ₂ (mm) | 0.40±0.20 |

For dimension see Table 1

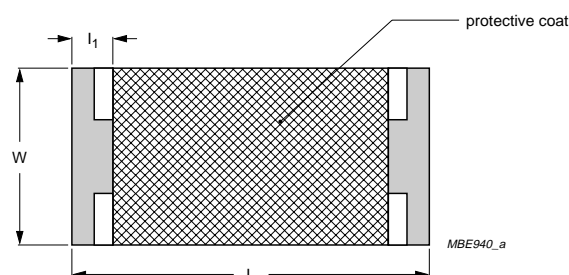


Fig. 4 Chip resistor dimension

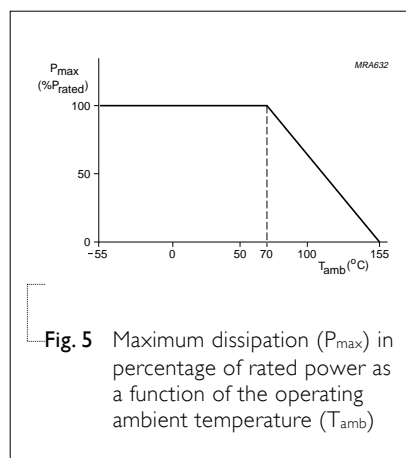
POWER RATING**RATED POWER AT 70°C,
RC1206 1/4W**Fig. 5 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})**ELECTRICAL CHARACTERISTICS**

Table 2

| CHARACTERISTICS | RC1206 1/4 W |
|---------------------------------|---|
| Operating Temperature Range | -55°C to +155°C |
| Maximum Working Voltage | 200V |
| Maximum Overload Voltage | 400V |
| Dielectric Withstanding Voltage | 500V |
| Resistance Range | 1Ω to 22MΩ (E24) 1Ω to 10MΩ (E96) Zero Ohm Jumper<0.05Ω |
| Temperature Coefficient | 10Ω< R ≤10MΩ ±100ppm/°C R≤10Ω; R>10MΩ ±200ppm/°C |
| Jumper Criteria | Rated Current 2.0A Maximum Current 10.0A |

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 (Ω)

TAPING REEL

Table 3

| DIMENSION | RC1206 |
|------------|----------|
| Tape Width | 8mm |
| ØA (mm) | 180+0/-3 |
| ØB (mm) | 60+1/-0 |
| ØC (mm) | 13.0±0.2 |
| W (mm) | 9.0±0.3 |
| T (mm) | 11.4±1 |

For dimension see Table 3

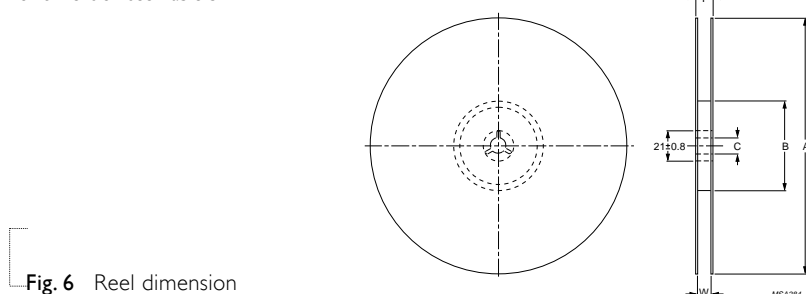


Fig. 6 Reel dimension

PAPER TAPE SPECIFICATION

Table 4

| DIMENSION | RC1206 |
|----------------------|------------|
| A (mm) | 1.90±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 ₀ (mm) | 4.0±0.1 |
| P ₁ (mm) | 4.0±0.05 |
| P ₂ (mm) | 2.0±0.05 |
| ØD ₀ (mm) | 1.5+0.1/-0 |
| T (mm) | 0.85±0.10 |

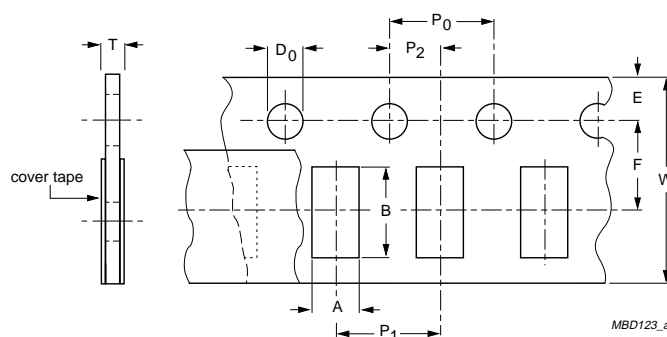


Fig. 7 Paper tape dimension

For dimension see Table 4

PACKING METHOD

LEADER/TRAILER TAPE SPECIFICATION

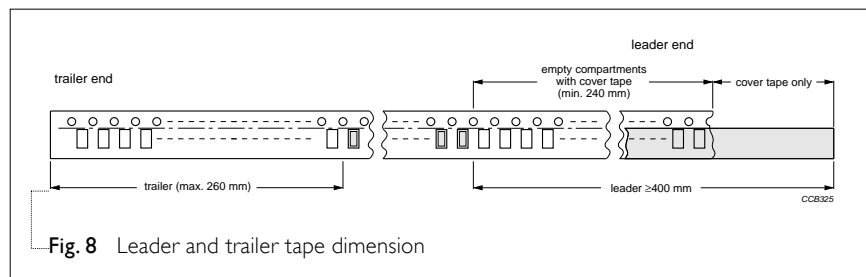


Fig. 8 Leader and trailer tape dimension

BULK CASSETTE

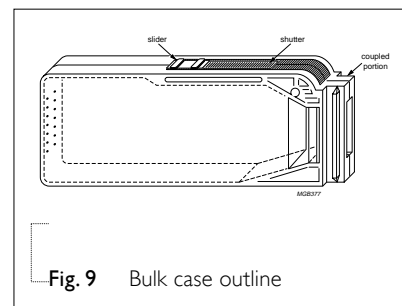


Fig. 9 Bulk case outline

Table 5 Packing style and packaging quantity

| PACKING STYLE | REEL DIMENSION | RC1206 |
|-----------------------|----------------|--------|
| Paper Taping Reel (R) | 7" (178 mm) | 5,000 |
| | 10" (254 mm) | 10,000 |
| | 13" (330 mm) | 20,000 |
| Bulk Cassette (C) | | 10,000 |

| TYPE | TEST METHOD | ACCEPTANCE STANDARD | | | | |
|--|--|--|------|--------|--------------|---------|
| Temperature Coefficient of Resistance (T.C.R.) | <div>Measure resistance at +25°C or specified room temperature as R₁, then measure at -55°C or +155°C respectively as R₂. Determine the temperature coefficient of resistance from the following formula:</div> <div>Formula<div>$T.C.R. = \frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/°C)}$<p>Where t₁=+25°C or specified room temperature t₂=-55°C or +155°C test temperature R₁=resistance at reference temperature in ohms R₂=resistance at test temperature in ohms</p></div></div> <div>Refer to table 2</div> | | | | | |
| Thermal Shock | <div>At -55±3°C for 2 minutes and at +155±2°C for 2 minutes as one cycle. After 5 cycles, the specimen shall be stabilized at room temp. Measure the resistance to determine ΔR/R(%) after one more hour.</div> | ±(0.5%+0.05Ω) | | | | |
| Low Temperature Operation | <div>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. Measure the resistance to determine ΔR/R(%).</div> | ±(0.5%+0.05Ω) for 1% tol . ±(1.0%+0.05Ω) for 5% tol. No visible damage | | | | |
| Short Time Overload | <div>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. Measure the resistance to determine ΔR/R(%).</div> | ±(1.0%+0.05Ω) No visible damage | | | | |
| Insulation Resistance | <div>Place the specimen in the jig and apply a rated continues overload voltage (R.C.O.V) for one minute as shown. Measure the insulation resistance.</div> | <table><tr><td>Type</td><td>RC1206</td></tr><tr><td>Voltage (DC)</td><td>400V</td></tr></table> ≥10,000MΩ | Type | RC1206 | Voltage (DC) | 400V |
| Type | RC1206 | | | | | |
| Voltage (DC) | 400V | | | | | |
| Dielectric Withstand Voltage | <div>Place the specimen in the jig and apply a specified value continuous overload voltage as shown for one minute.</div> | <table><tr><td>Type</td><td>RC1206</td></tr><tr><td>Voltage (AC)</td><td>500Vrms</td></tr></table> Breakdown voltage> specification and without open/short | Type | RC1206 | Voltage (AC) | 500Vrms |
| Type | RC1206 | | | | | |
| Voltage (AC) | 500Vrms | | | | | |
| Resistance To Soldering Heat | <div>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. Measure the resistance to determine ΔR/R(%).</div> | ±(0.5%+0.05Ω) for 1% tol. ±(1.0%+0.05Ω) for 5% tol. No visible damage | | | | |

| TYPE | TEST METHOD | ACCEPTANCE STANDARD |
|----------------------------|---|---|
| Moisture Resistance | 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 11. The total length of test is 1,000 hours. Have the specimen stabilized at room temperature for 24 hours after testing. Measure the resistance to determine $\Delta R/R(\%)$. | $\pm(0.5\%+0.05\Omega)$ for 1% tol. $\pm(1.5\%+0.05\Omega)$ for 5% tol. No visible damage |
| Life | 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. Measure the $\Delta R/R(\%)$. | $\pm(1\%+0.05\Omega)$ for 1% tol. $\pm(1.5\%+0.05\Omega)$ for 5% tol. No visible damage |
| Solderability | Immerse the specimen in the solder pot at $235\pm 5^{\circ}\text{C}$ for 2 sec. | At least 95% solder coverage on the termination. |
| Bending Strength | Mount the specimen on a test board as shown in the figure 10. Slowly apply the force till the board is bent for 5 ± 1 sec. Measure the $\Delta R/R(\%)$ at this position. | $\pm(1.0\%+0.05\Omega)$ for 1% tol. $\pm(1.0\%+0.05\Omega)$ for 5% tol. No visible damage |

| | |
|-------------------|--------|
| Type | RC1206 |
| Bent Distance (d) | 5mm |

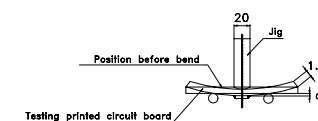


Fig. 10 Principle of the bending test

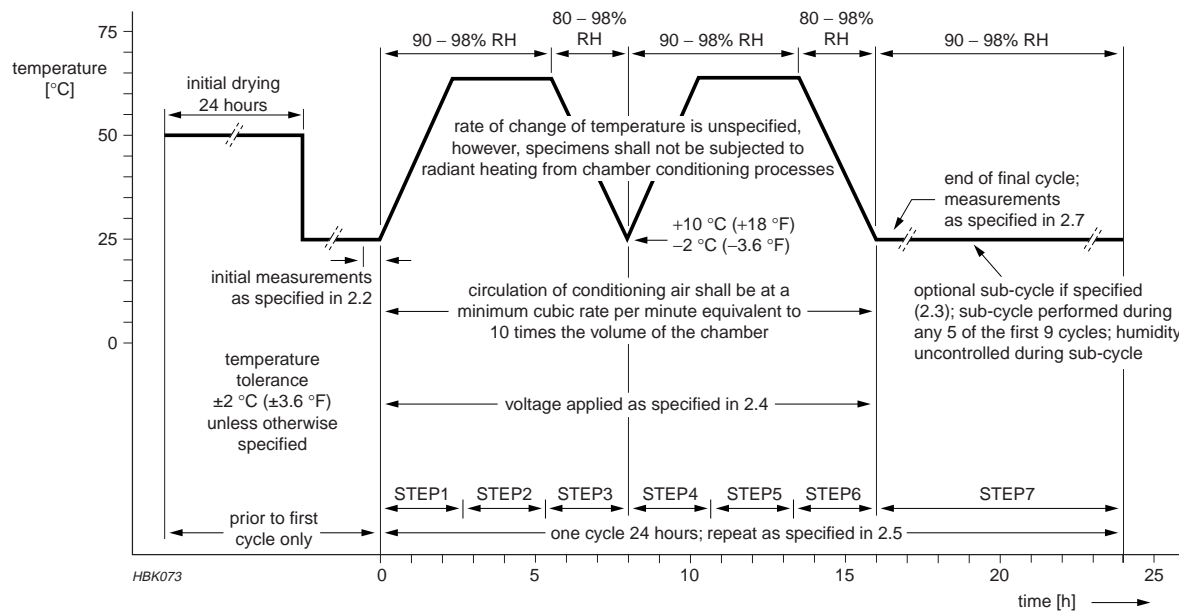


Fig. 11 Conditions by change of temperature