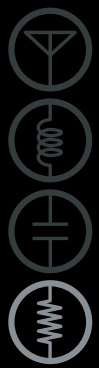
Innovative Service Around the Globe YAGEO

DATA SHEET

CHIP RESISTORS

RC2512

5%; 1%



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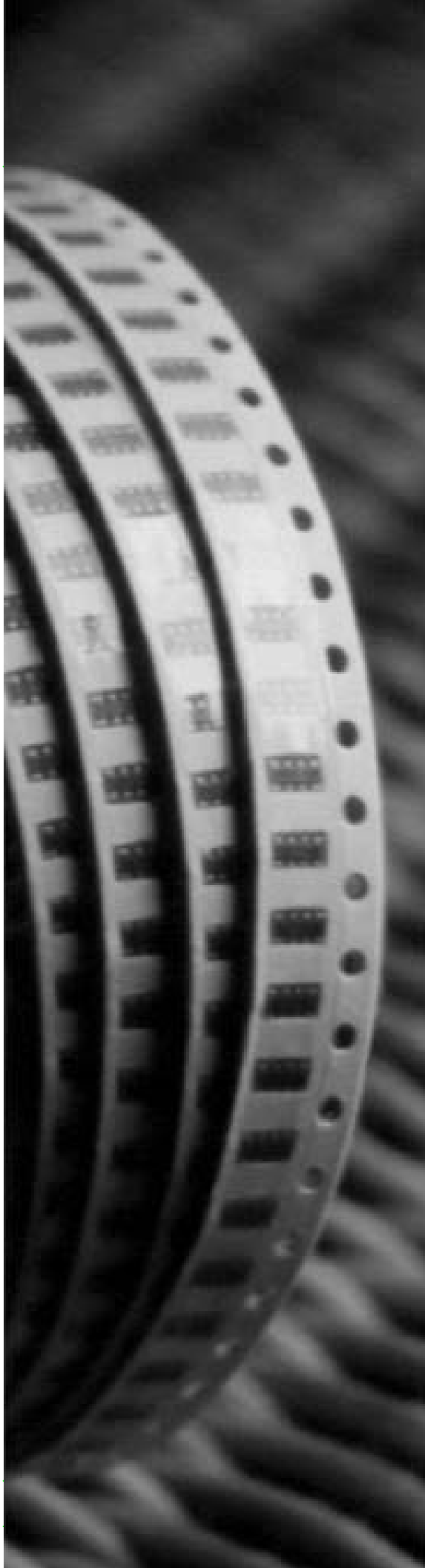
Product Specification – Sep. 30, 2003 V.6 Supersedes Date of Jun. 16, 2003



SCOPE

This specification describes RC2512 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.

RC2512 X X X XX XXXX
(1) (2) (3) (4) (5)

(1) TOLERANCE

F = ±1%
J = ±5%

(2) PACKAGING TYPE

K = Embossed taping reel

(3) TEMPERATURE CHARACTERISTIC OF RESISTANCE

F = ±100ppm/°C
G = ±200ppm/°C
I = ±300ppm/°C
– = Base on spec

(4) SPECIAL TYPE

07 = 7 inch dia. Reel

(5) RESISTANCE VALUE:

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

MARKING

RC2512

Fig. 1 Value=10KΩ

E-24 series: 3 digits

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

Fig. 2 Value=10KΩ

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

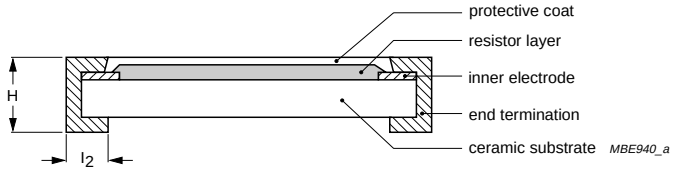


Fig. 3 Chip resistor construction

DIMENSION

Table 1

TYPE	RC2512
L (mm)	6.35±0.10
W (mm)	3.10±0.15
H (mm)	0.55±0.10
I_1 (mm)	0.60±0.20
I_2 (mm)	0.50±0.20

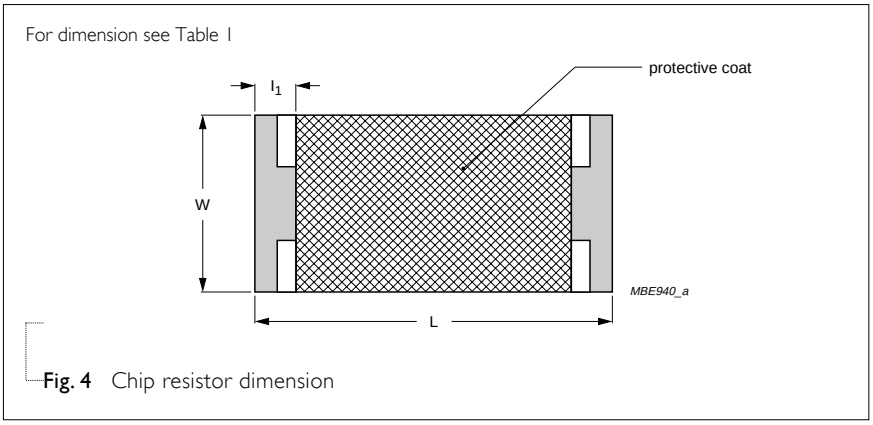


Fig. 4 Chip resistor dimension

POWER RATING

RATED POWER AT 70°C, RC2512 1W

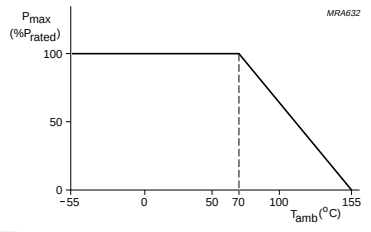


Fig. 5 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

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)

ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS		RC2512 1W
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

TAPING REEL

Table 3

DIMENSION	RC2512
Tape Width	12mm
ØA (mm)	180+0/–3
ØB (mm)	60+1/–0
ØC (mm)	13.0±0.2
W (mm)	13.0±0.3
T (mm)	15.4±1

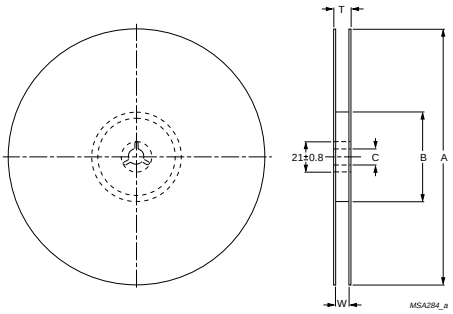


Fig. 6 Reel dimension

EMBOSSED TAPE SPECIFICATION

Table 4

DIMENSION	RC2512
A (mm)	3.5±0.2
B (mm)	6.7±0.2
W (mm)	12±0.3
E (mm)	1.75±0.1
F (mm)	5.5±0.05
P_0 (mm)	4.0±0.1
P_1 (mm)	4.0±0.1
P_2 (mm)	2.0±0.05
ØD_0 (mm)	1.5+0.1/–0
ØD_1 (mm)	1.5+0.25/–0
T (mm)	1.0±0.1

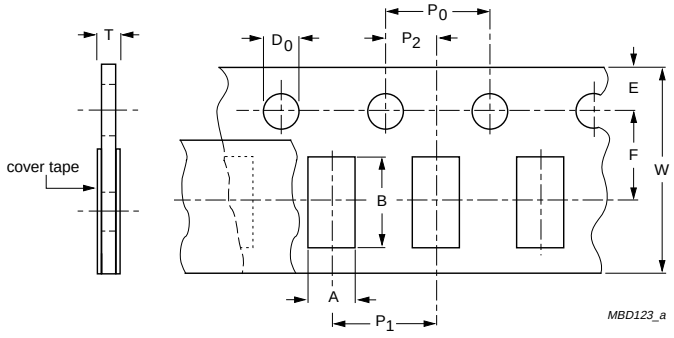


Fig. 7 Embossed tape dimension

For dimension see Table 4

PACKING METHOD

LEADER/TRAILER TAPE SPECIFICATION

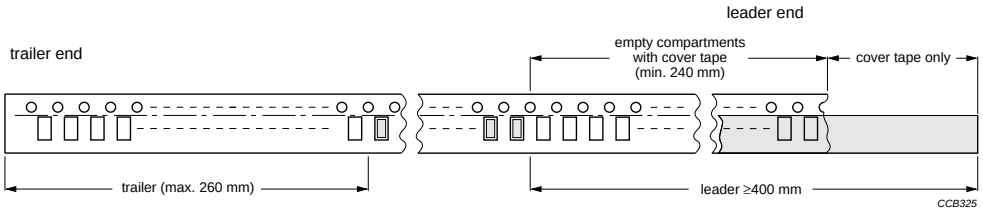
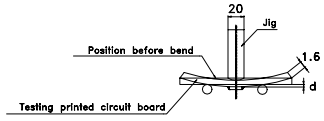


Fig. 8 Leader and trailer tape dimension

Table 5 Packing style and packaging quantity

PACKING STYLE	REEL DIMENSION	RC2512
Embossed Taping Reel (K)	7" (178 mm)	4,000

TYPE	TEST METHOD	ACCEPTANCE STANDARD
Temperature Coefficient of Resistance (T.C.R.)	Measure resistance at +25°C or specified room temperature as R_1, then measure at –55°C or +155°C respectively as R_2. Determine the temperature coefficient of resistance from the following formula: **Formula** $T.C.R. = \frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6$ (ppm/°C) Where t_1=+25°C or specified room temperature t_2=–55°C or +155°C test temperature R_1=resistance at reference temperature in ohms R_2=resistance at test temperature in ohms	Refer to table 2
Thermal Shock	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.	±(0.5%+0.05Ω)
Low Temperature Operation	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. Have15 (+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(%).	±(0.5%+0.05Ω) for 1% tol . ±(1.0%+0.05Ω) for 5% tol. No visible damage
Short Time Overload	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(%).	±(1.0%+0.05Ω) No visible damage
Insulation Resistance	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. **Type** RC2512 **Voltage (DC)** 400V	≥10,000MΩ
Dielectric Withstand Voltage	Place the specimen in the jig and apply a specified value continuous overload voltage as shown for one minute. **Type** RC2512 **Voltage (AC)** 500Vrms	Breakdown voltage> specification and without open/short
Resistance To Soldering Heat	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(%).	±(0.5%+0.05Ω) 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 10. 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 $\Delta R/R(\%)$.	±(0.5%+0.05Ω) for 1% tol. ±(2.0%+0.05Ω) for 5% tol. No visible damage
Life	Place the specimen in the oven at 70±2°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 $\Delta R/R(\%)$.	±(1%+0.05Ω) for 1% tol. ±(3%+0.05Ω) for 5% tol. No visible damage
Solderability	Immerse the specimen in the solder pot at 235±5°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 9. Slowly apply the force till the board is bent for 5±1 sec. Measure the $\Delta R/R(\%)$ at this position. Type RC2512 Bent Distance (d) 2mm  **Fig. 9** Principle of the bending test	±(1.0%+0.05Ω) for 1% tol. ±(1.0%+0.05Ω) for 5% tol. No visible damage

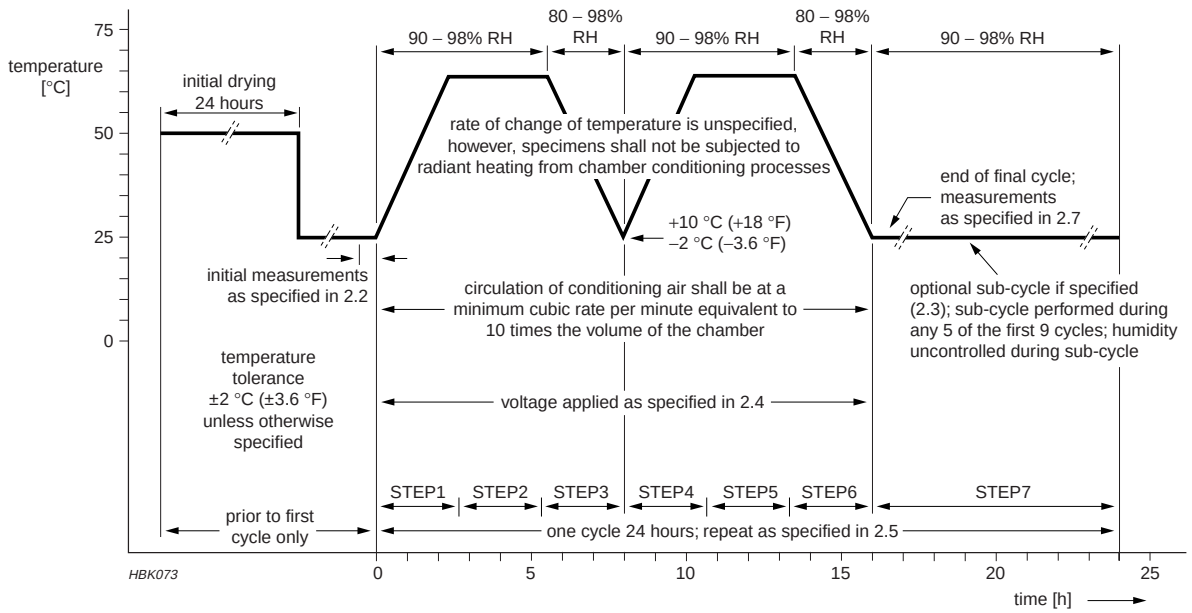


Fig. 10 Conditions by change of temperature