YAGEO

DATA SHEET

Thick Film Chip Resistor

High Power

RC 2512 2W

(RoHS Compliant)

Pb Free

YAGEO CORPORATION

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SCOPE

This specification describes RC2512 series chip resistors with lead-free terminal made by thick film process.

ORDERING INFORMATION

Part number is identified by the series, size, tolerance, packing style, temperature coefficient, taping reel, resistance value and resistor terminal.

RC2512 X X X 7 W XXXXX L

(1) (2) (3) (4) (5) (6) (7)

(1) TOLERANCE

J = ±5%

F = ±1%

(2) PACKAGING STYLE

K = Embossed taping reel

(3) TEMPERATURE COEFFICIENT OFRESISTANCE

- = Based on spec. (see table 2)

(4) TAPING REEL

7 = 7“ dia. Reel

(5) Power rating

W = 2 x standard power [a]

(6) RESISTANCE VALUE

1R, 10R, 150R

(7) Extra Code

L = Optional (see Note)

MARKING

RC2512

Fig.1 Value = 100Ω

E-24 series: 3 digits for 5%

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

Fig.2 Value = 150Ω

E-24/E-96 series: 4 digits for 1%

First three digits for significant figure and 4rd 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. The resistive layer is covered with a protective coat. Finally, the two external terminations are added. See fig.3

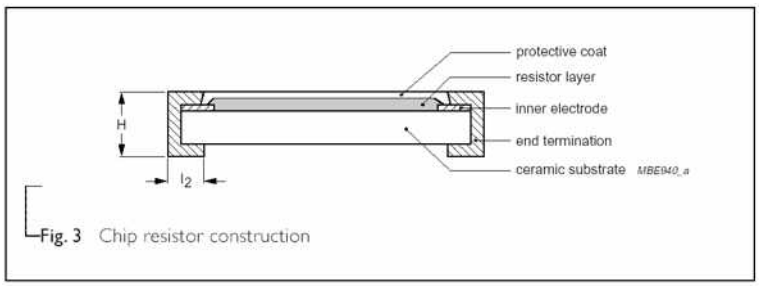


Fig. 3 Chip resistor construction

Note:

1. All our RSMD products are 100% Lead free / RoHS compliant. On our 2D reel label the internal CTC (without L) will be mentioned with additional print "LFP" for : Lead Free Process.
2. On customized label, "LFP" or specific symbol printed and the optional "L" at the end of CTC / 12NC can be added (both are on customer request)
3. Products with lead free terminations meet RoHS requirements.

(Non of the forbidden materials are used in products / production)

The Pb-glass contained in electrodes , resistor element and glass is exempted by RoHS.

* : Standard power for 7" reel is 1 Watt.

DIMENSION

Table 1

TYPE	RC2512
L (mm)	6.35±0.10
W (mm)	3.10±0.15
H (mm)	0.55±0.10
I1 (mm)	0.60±0.20
I2 (mm)	0.50±0.20

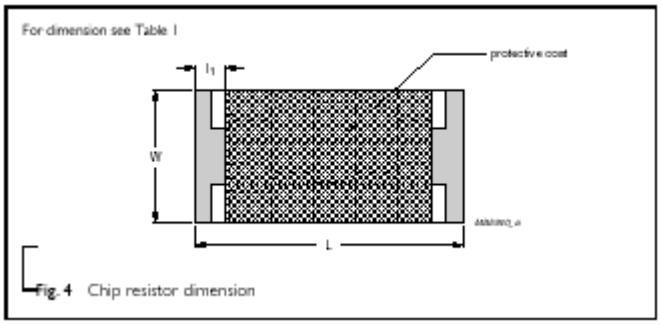


Fig. 4 Chip resistor dimension

POWER RATING

RATED POWER AT 70°C

RC2512 2W

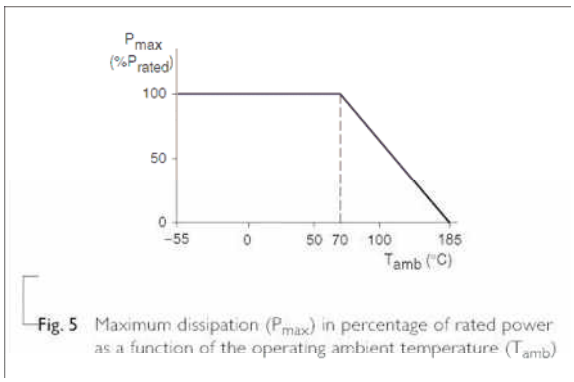


Fig. 5 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS	RC2512 2 W
Operating Temperature Range	–55°C to +185°C
Maximum Working Voltage	200V
Maximum Overload Voltage	400V
Dielectric Withstanding Voltage	500V
Resistance Range	1Ω to 150Ω
	1% (E24/E96)
	5% (E24)
Temperature Coefficient	±200ppm/℃

RATED VOLTAGE:

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

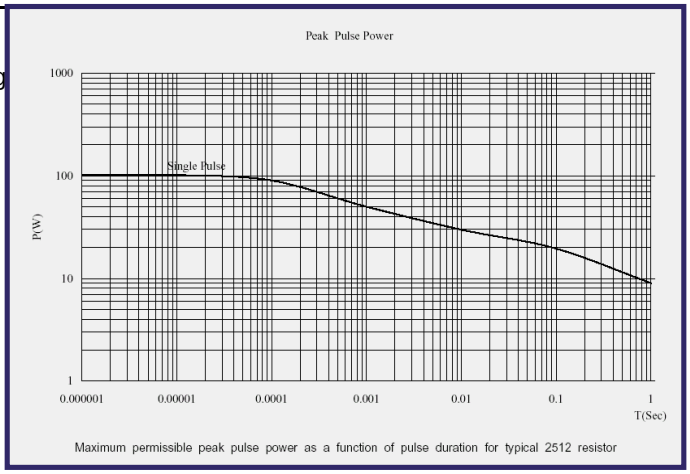
$V=\sqrt{(P*R)}$

Where

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

P=Rated power

R=Resistance value



Maximum permissible peak pulse power as a function of pulse duration for typical 2512 resistor

Table 5 Packing style and packaging quantity.

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

NOTE: For embossed tape and reel specification/dimensions, please see the special data sheet “Packing” document.

TEST and REQUIREMENTS

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Temperature Coefficient of Resistance (T.C.R.)	MIL-STD-202F-method 304; JIS C 5202-4.8	At +25/–55 °C and +25/+125 °C **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 +125 °C test temperature R_1=resistance at reference temperature in ohms R_2=resistance at test temperature in ohms	See table 2
Thermal Shock	MIL-STD-202F-method 107G; IEC 60115-1 4.19	At –65 (+0/–10) °C for 2 minutes and at +155 (+10/–0) °C for 2 minutes; 25 cycles	±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol.
Low Temperature Operation	MIL-R-55342D-Para 4.7.4	At –65 (+0/–5) °C for 1 hour; RCWV applied for 45 (+5/–0) minutes	±(0.5%+0.05 Ω) for 1% tol . ±(1.0%+0.05 Ω) for 5% tol. No visible damage
Short Time Overload	MIL-R-55342D-Para 4.7.5; IEC 60115-1 4.13	2.5 × RCWV applied for 5 seconds at room temperature	±(2.0%+0.05 Ω) for 1% tol. ±(3.0%+0.05 Ω) for 5% tol. No visible damage
Insulation Resistance	MIL-STD-202F-method 302; IEC 60115-1 4.6.1.1		≥10 GΩ
Dielectric Withstand Voltage	MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1	Maximun voltage (V_{rms}) applied for 1 minute **Type** RC2512 **Voltage (AC)** 500Vrms	No breakdown or flashover
Resistance to Soldering Heat	MIL-STD-202F-method 210C; IEC 60115-1 4.18	Unmounted chips; 260 ±5 °C for 10 ±1 seconds	±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage
Life	MIL-STD-202F-method 108A; IEC 60115-1 4.25.1	At 70±2 °C for 1,000 hours; RCWV applied for 1.5 hours on and 0.5 hour off	±(2%+0.05 Ω) for 1% tol. ±(3%+0.05 Ω) for 5% tol.

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Solderability	MIL-STD-202F-method 208A; IEC 60115-1 4.17	Solder bath at 245±3 °C Dipping time: 2±0.5 seconds	Well tinned (≥95% covered) No visible damage
Bending Strength	JIS C 5202.6.14; IEC 60115-1 4.15	Resistors mounted on a 90 mm glass epoxy resin PCB (FR4) Bending: 5 mm	±(1.0%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage
Resistance to Solvent	MIL-STD-202F-method 215; IEC 60115-1 4.29	Isopropylalcohol (C_3H_7OH) or dichloromethane (CH_2Cl_2) followed by brushing	No smeared
Leaching	EIA/IS 4.13B; IEC 60115-8 4.18	Solder bath at 260±5 °C Dipping time: 30±1 seconds	No visible damage
Moisture Resistance Heat	MIL-STD-202F-method 106F; IEC 60115-1 4.24.2	42 cycles; total 1,000 hours Shown as figure 9	±(0.5%+0.05Ω) for 1% tol. ±(2.0%+0.05Ω) for 5% tol. No visible damage

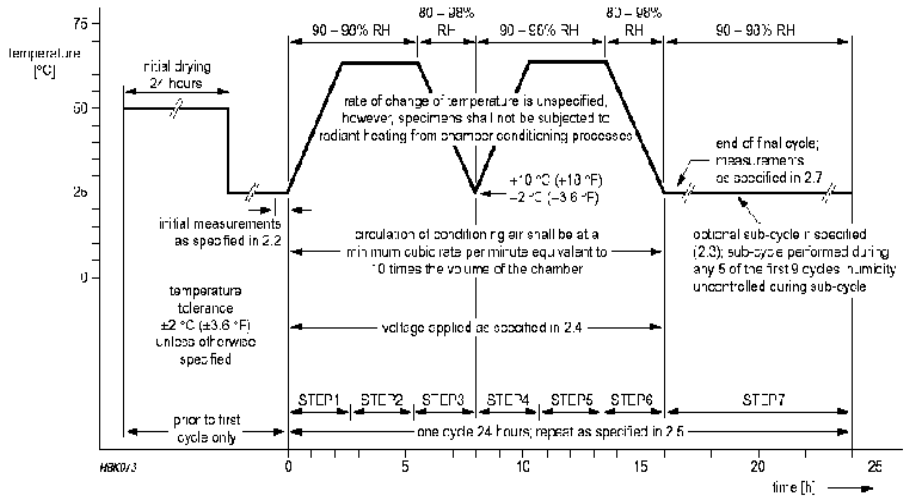


Fig. 9 Moisture resistance test requirements

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	2006-05-08		- First issue of this specification
Version 1	2006-10-03		- Add Pulse loading chart