Innovative Service Around the Globe YAGEO

DATA SHEET

THIN FILM CHIP RESISTORS AUTOMOTIVE GRADE

RP series- Wide Terminal

0.1% TO 1%, TC25 TO TC50

sizes 0612

RoHS compliant



YAGEO

Product specification – May 5, 2025 V.0

SCOPE

This specification describes RP0612 high precision-high stability chip resistors made by thin film process.

APPLICATIONS

- Automotive electronics
- Industrial and medical equipment
- Test and measuring equipment
- Telecommunications

FEATURES

- AEC-Q200 qualified
- Pb free without RoHS exemption
- Halogen free epoxy
- Superior resistance against sulfur containing surroundings
- Moisture sensitivity level: MSL 1
- Environmental hazards reduction
- Non-forbidden materials used in products/production

ORDERING INFORMATION - GLOBAL PART NUMBER

Part number is identified by the series name, size, tolerance, packaging type, temperature coefficient, taping reel and resistance value.

GLOBAL PART NUMBER

RP	XXXX	X	X	X	XX	XXXXX	L
	(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) SIZE

0612

(2) TOLERANCE

B = ± 0.1%

C = ± 0.25%

D = ± 0.5%

F = ± 1%

(3) PACKAGING TYPE

K = Embossed taping reel

(4) TEMPERATURE COEFFICIENT OF RESISTANCE

D = ± 25 ppm/°C

E = ± 50 ppm/°C

(5) TAPING REEL

07 inch dia. Reel and specific rated power

Detailed power rating are shown in the Table 2.

(6) RESISTANCE VALUE

There are 2~4 digits indicated the resistor value.

Letter R/K is decimal point

Example: 100R = 100Ω

1K = 1,000Ω

(7) DEFAULT CODE

Letter L is the system default code for ordering only. (NOTE)

ORDERING EXAMPLE

The ordering code of a RP0612 1W chip resistor, TCR 25 value 100Ω with ± 0.1% tolerance, supplied in 7-inch tape reel is: RP0612BKD07100RL.

NOTE

1. All our Rchip products meet RoHS compliant and Halogen Free. "LFP" of the internal 2D reel label mentions "Lead Free Process".
2. On customized label, "LFP" or specific symbol can be printed.

MARKING

RP0612



Fig. 1

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 connected by a resistive layer.
This resistive layer is trimmed to its nominal value and on both ends a contact is made which will guarantee optimum solderability. This is achieved by applying several layers and for ease of soldering the outer layer consists of Ni/matte tin.
Adding a special protective layer, passivation coating, on this series to enhance moisture resistance of the environment.

OUTLINES

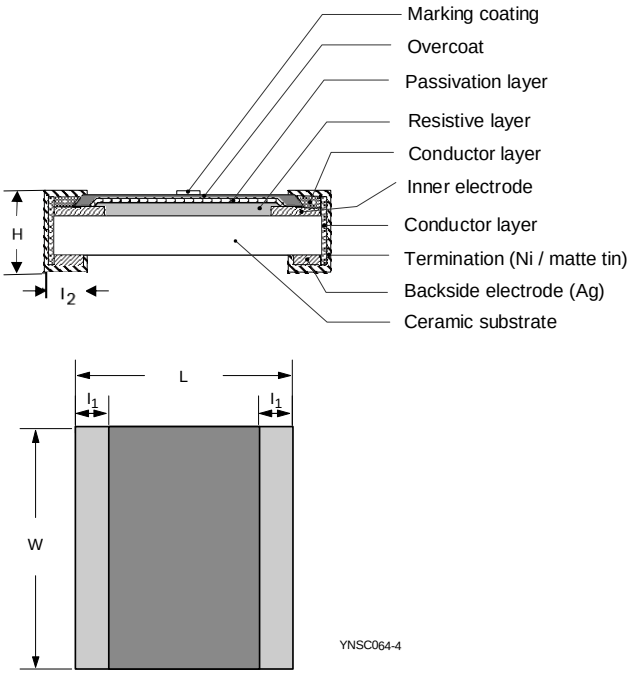


Fig. 2 Chip resistor outlines

DIMENSIONS

Table 1

TYPE	L (mm)	W (mm)	H (mm)	I_1 (mm)	I_2 (mm)
RP0612	1.60 ±0.20	3.2 +0.40/-0.20	0.45 +0.15/-0.10	0.30 ±0.20	0.35 ±0.20

ELECTRICAL CHARACTERISTICS

Table 2

TYPE	Operating Temperature Range	Power Rating@70°C (3) 07	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/°C)(2)	Resistance Range (E-24/E-96 series)(Ω) & Tolerance(1) ±0.1% (B)	±0.25% (C)	±0.5% (D)	±1% (F)	Unit weight (mg/pcs)
RP0612	–55 °C to +155 °C	1 W	150 V	300 V	±50 (E) ±25 (D)		10 ≤ R ≤ 1K			8.512

NOTE : 1. Global part number (code 7)
2. Global part number (code 9)
3. Global part number (code 10-11)

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	PATKING STYLE	REEL DIMENSION	QUANTITY PER REEL
RP0612	Embossed taping reel	7" (178 mm)	5,000 Units

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

FUNCTIONAL DESCRIPTION

OPERATING TEMPERATURE RANGE

Range: –55 °C to +155 °C

POWER RATING

Each type rated power at 70 °C:
RP0612 =1 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

R = Resistance value (Ω)

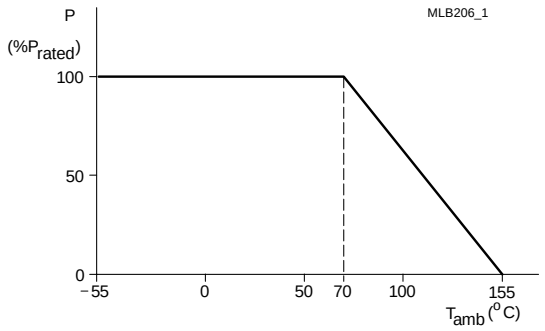


Fig. 3 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

TESTS AND REQUIREMENTS

Table 4 Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Short Time Overload	IEC60115-1 4.13	2.5 times of rated voltage or maximum overload voltage, the less of the above, for 5 sec at room temperature	±(0.05%+0.05Ω)
High Temperature Exposure	AEC-Q200 Test 3 MIL-STD-202 Method 108	1,000 hours at Tamb = 155 °C, unpowered	±(0.3%+0.05Ω)
Biased Humidity	AEC-Q200 Test 7 MIL-STD-202 Method 103	1,000 hours; 85 °C / 85% RH 10% of operating power Measurement at 24±4 hours after test conclusion	±(0.3%+0.05Ω)
Life	AEC-Q200 Test 8 MIL-STD-202 Method 108	1,000 hours at 70±5 °C, with the rated voltage or maximum working voltage applied (whichever is lesser), 1.5 hours on, 0.5 hour off, still air required.	±(0.1%+0.05Ω)
Resistance to Soldering Heat	AEC-Q200 Test 15 MIL-STD-202 Method 210	Specimen passed 3 times reflow temperature at 260°C, with solder	±(0.05%+0.05Ω)
Temperature Cycling	AEC-Q200 Test 4 JESD22-A104	1,000 cycles, -55/+155°C for 1 cycle per 30 minutes	±(0.3%+0.05Ω) No visible damage
Solderability Wetting	AEC-Q200 Test 18 J-STD-002	(1) Baking 4 hours at 155°C dry heat, dipping at 245± 3°C for 5± 0.5 seconds. (2) Baking 4 hours at 155°C dry heat, dipping at 260± 3°C for 30± 0.5 seconds.	Well tinned (>95% covered) No visible damage
Board Flex / Bending	AEC-Q200 Test 21 AEC-Q200-005	Chips mounted on a glass epoxy resin PCB (FR4) Bending for 0612 : 2mm Holding time: minimum 60 second	±(0.1%+0.05Ω)
Temperature Coefficient of Resistance (T.C.R.)	IEC 60115-1 4.8	At +25/–55 °C and +25/+125°C Formula: $T.C.R = \frac{R2 - R1}{R1(t2 - t1)} \times 10^6 (ppm/°C)$ Where t1 = +25 °C or specified room temperature t2 = –55 °C or +125 °C test temperature R1 = resistance at reference temperature in ohms R2 = resistance at test temperature in ohms	Refer to table 2
Flower of Sulfur	ASTM-B-809-95* * Modified	Sulfur 750 hours, 105°C, unpowered.	±(2.0%+0.05Ω)

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	May 5, 2025	-	- First issue of this specification

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