Innovative Service Around the Globe YAGEO

DATA SHEET

Ultra Precision Thick Film CHIP RESISTORS

RE Series

0.5% , 1%

0402/0603/0805/1206

RoHS Compliant
Halogen Free

Product specification

YAGEO

Phicomp

SCOPE

This specification describes RE 0402/0603/0805/1206 series chip resistors with lead-free terminations made by thick film process.

APPLICATIONS

●All general purpose application

FEATURES

● This product with lead free terminations meet RoHS requirements.
● Halogen Free product and production
● Reducing environmentally hazardous wastes
● High component and equipment reliability
● Saving of PCB space
● Ultra precision tolerance and low TCR

ORDERING INFORMATION - GLOBAL PART NUMBER

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

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

(1) SIZE

0402/0603/0805/1206

(2) TOLERANCE

F = ±1% / D= ±0.5%

(3) PACKAGING TYPE

R = Paper taping reel

(4)TEMPERATURE COEFFICIENT OF RESISTANCE

E = ±50 ppm/℃

(5) TAPING REEL

07 = 7 inch dia. Reel , 10 = 10 inch dia. Reel
13 = 13 inch dia. Reel

(6) RESISTANCE VALUE

10Ω to 1MΩ

(7) Default Code

Letter L is system default code for order only (NOTE)

ORDERING EXAMPLE

The ordering code for a RC0402 0.0625W chip resistor ,value 100KΩ with ±0.5% tolerance, supplied in 7-inch tape reel with 10Kpcs quantify is:
RE0402DRE07100KL.

NOTE

1. All our RSMD 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

RE0402:

No marking

RE0603 / RE0805 / RE1206

5% E-24 series: 3 digits

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

For 0603 ±1% E-24 series, one short bar under marking letter

For further marking information, please see special data sheet “Chip resistors marking”. Marking of RE-Series is same as RC-Series.

CONSTRUCTION

The resistors are constructed on top of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by the resistive glaze. The resistive glaze is covered by a glass material. The composition of the glaze is adjusted to give the approximate required resistance value and laser trimming of this resistive glaze achieves the value inside tolerance. The whole element is covered by a protective overcoat. Size 0603 and bigger is marked with the resistance value on top. Finally, the two external terminations (Ni / matte tin) are added. See fig. 2.

OUTLINES

For dimension see Table 1

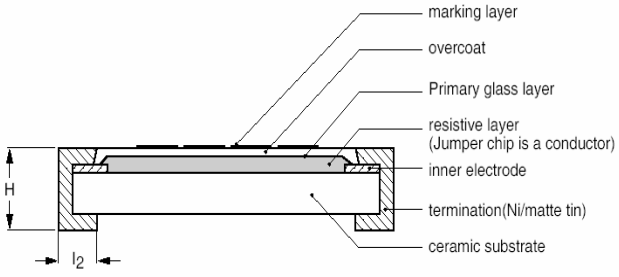

Fig.1 construction

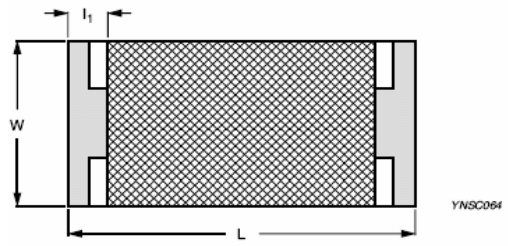

Fig.2 Chip resistor outlines

DIMENSIONS

Table 1

TYPE	RE0402	RE0603	RE0805	RE1206
L (mm)	1.00±0.05	1.60 ±0.10	2.00 ±0.10	3.10 ± 0.10
W (mm)	0.50±0.05	0.80 ±0.10	1.25 ±0.10	1.60 ± 0.10
H (mm)	0.32±0.05	0.45 ±0.10	0.50 ±0.10	0.55 ± 0.10
I1 (mm)	0.20±0.10	0.25 ±0.15	0.35 ±0.20	0.45 ± 0.20
I2 (mm)	0.25±0.10	0.25 ±0.15	0.35 ±0.20	0.40 ± 0.20

ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS	RE0402	RE0603	RE0805	RE1206
Operating Temperature Range	–55℃ to +155℃			
Maximum Working Voltage	50V	50V	150V	200V
Maximum Overload Voltage	100V	100V	300V	400V
Dielectric Withstanding Voltage	100V	100V	300V	500V
Resistance Range	±1% / ±0.5% (E24/E96) 10Ω to 1MΩ			
Temperature Coefficient	±50 ppm/℃			

FOOTPRINT AND SOLDERING PROFILES

For recommended footprint and soldering profiles is same as RC Series, please see the special data sheet “Chip resistors mounting”.

PACKING STYLE AND PACKAGING QUANTITY

Table 3 Packing style and packaging quantity

PACKING STYLE	REEL DIMENSION	RE0402	RE0603	RE0805	RE1206
Paper taping reel	7" (178 mm)	10,000	5,000	5,000	5,000
	10" (254 mm)	20,000	10,000	10,000	10,000
	13" (330 mm)	50,000	20,000	20,000	20,000

NOTE

1. For paper tape and reel specification/dimensions, please see the special data sheet “Chip resistors packing”. (IEC60286-3)

FUNCTIONAL DESCRIPTION

POWER RATING

Each type rated power at 70 ℃:

RE0402=1/16 W; RE0603=1/10W;

RE0805=1/8 W; RE1206=1/4 W

RATED VOLTAGE

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

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

Where

U=Continuous rated DC or AC (rms) working voltage (v)

P=Rated power

R=Resistance value (Ω)

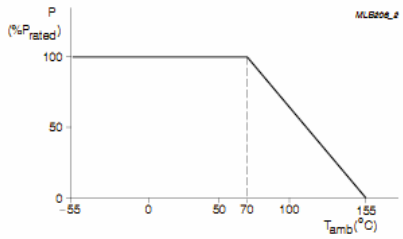

Fig. 3 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

TESTS AND REQUIREMENTS

TEST	TEST METHOD	PROCEDURE	REQUIREMENT
Life/ Endurance	MIL-STD-202G Method 108A IEC 60115-1 4.25.1	At 70±5℃ for 1,000 hours; RCWV applied for 1.5 hours on and 0.5 hour off, still air required	±(3%+0.05Ω)
High Temperature Exposure	MIL-STD-202G Method 108A IEC 60115-1 4.25.3	1,000 hours at 155±5 ℃,unpowered	±(3%+0.05 Ω)
Moisture Resistance	MIL-STD-202G Method 106F IEC 60115-1 4.24.2	Each temperature / humidity cycle is defined at 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25 ℃ / 65 ℃ 95% R.H, without steps 7a & 7b, unpowered Parts mounted on test-boards, without condensation on parts	±(3%+0.05Ω)
Thermal Shock	MIL-STD-202G Method 107G	-55/+125℃ Note Number of cycles required is 300 Devices unmounted Maximum transfer time is 20 seconds Dwell time is 15 minutes. Air - Air	±(1%+0.05Ω)
Short Time Overload	IEC 60115-1 4.13	2.5 times RCWV or maximum overload voltage which is less for 5 seconds at room temperature	±(1%+0.05Ω) No visible damage
Board Flex/ Bending	IEC 60115-1 4.33	Device mounted or as described only 1 board bending required 5 mm bending time: 60±5 seconds	±(1%+0.05Ω) No visible damage
Solderability - Wetting	IPC/JEDECJ-STD-002B test B IEC 60068-2-58	Electrical Test not required Magnification 50X SMD conditions: 1st step: method B, aging 4 hours at 155 ℃ dry heat 2nd step: leadfree solder bath at 245±3 ℃ Dipping time: 3±0.5 seconds	Well tinned (≥95% covered) No visible damage
-Leaching	IPC/JEDECJ-STD-002B test D IEC 60068-2-58	Leadfree solder ,260℃, 30 seconds immersion time	No visible damage
-Resistance to Soldering Heat	MIL-STD-202F Method 210F IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 260 ℃ ±5℃, 10 ±1 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±(1%+0.05Ω) No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	2009-07-07		- First issue of this specification
Version 1	2010-09-07		- Operating Temperature Range Extension