

# DATA SHEET

## GENERAL PURPOSE CHIP RESISTORS

RC0805  
5%, 1%  
RoHS compliant



**SCOPE**

This specification describes RC0805 series chip resistors with lead-free terminations made by thick film process.

**APPLICATIONS**

- All general purpose application

**FEATURES**

- RoHS compliant
  - Products with lead free terminations meet RoHS requirements
  - Pb-glass contained in electrodes
  - Resistor element and glass are exempted by RoHS
- Reducing environmentally hazardous wastes
- High component and equipment reliability
- Saving of PCB space
- None forbidden-materials used in products/production
- Halogen Free Epoxy

**ORDERING INFORMATION - GLOBAL PART NUMBER & I2NC**

Both part numbers are identified by the series, size, tolerance, packing type, temperature coefficient, taping reel and resistance value.

**YAGEO BRAND ordering code**

**GLOBAL PART NUMBER (PREFERRED)**

**RC0805** **X R - XX XXXX L**  
(1) (2) (3) (4) (5) (6)

**(1) TOLERANCE**

F = ±1%  
 J = ±5% (for Jumper ordering, use code of J)

**(2) PACKAGING TYPE**

R = Paper taping reel

**(3) TEMPERATURE COEFFICIENT OF RESISTANCE**

- = Base on spec

**(4) TAPING REEL**

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

**(5) RESISTANCE VALUE**

There are 2~4 digits indicated the resistor value. Letter R/K/M is decimal point, no need to mention the last zero after R/K/M, e.g.1K2, not 1K20.  
 Detailed resistance rules show in table of "Resistance rule of global part number".

**(6) OPTIONAL CODE**

L = optional symbol (Note)

Resistance rule of global part number	
Resistance code rule	Example
OR	OR = Jumper
XRX	1R = 1 Ω
(1 to 9.76 Ω)	1R5 = 1.5 Ω
	9R76 = 9.76 Ω
XXRX	10R = 10 Ω
(10 to 97.6 Ω)	97R6 = 97.6 Ω
XXXXR	100R = 100 Ω
(100 to 976 Ω)	
XKXX	1K = 1,000 Ω
(1 to 9.76 KΩ)	9K76 = 9760 Ω
XMXX	1M = 1,000,000 Ω
(1 to 9.76 MΩ)	9M76 = 9,760,000 Ω

**ORDERING EXAMPLE**

The ordering code of a RC0805 chip resistor, value 56 Ω with ±1% tolerance, supplied in 7-inch tape reel is: RC0805FR-0756R(L).

**NOTE**

1. All our RSMD products meet RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
2. On customized label, "LFP" or specific symbol printed and the optional "L" at the end of GLOBAL PART NUMBER / I2NC can be added (both are on customer request)

**PHYCOMP BRAND ordering codes**

Both GLOBAL PART NUMBER (preferred) and I2NC (traditional) codes are acceptable to order Phycomp brand products.

**GLOBAL PART NUMBER (PREFERRED)**

For detailed information of GLOBAL PART NUMBER and ordering example, please refer to page 2.

**I2NC CODE**

**2322 / 2350**    **XXX XXXXX L**  
 (1)                      (2)    (3)    (4)

TYPE/ 0805	START IN <sup>(1)</sup>	TOL. (%)	RESISTANCE RANGE	PAPER / PE TAPE ON REEL (units) <sup>(2)</sup>		
				5,000	10,000/not preferred	20,000
RC11	2322	±5%	1 to 10 MΩ	730 61xxx	730 71xxx	730 81xxx
RC12	2322	±1%	1 to 10 MΩ	734 6xxxx	734 7xxxx	734 8xxxx
HRC11	2350	±5%	11 to 22 MΩ	521 10xxx	-	-
Jumper	2322	-	0 Ω	730 91002	730 91003	730 92002

Resistance decade <sup>(3)</sup>	Last digit
0.01 to 0.0976 Ω	0
0.1 to 0.976 Ω	7
1 to 9.76 Ω	8
10 to 97.6 Ω	9
100 to 976 Ω	1
1 to 9.76 KΩ	2
10 to 97.6 KΩ	3
100 to 976 KΩ	4
1 to 9.76 MΩ	5
10 to 97.6 MΩ	6

- (1) The resistors have a 12-digit ordering code starting with 2322 / 2350.
- (2) The subsequent 4 or 5 digits indicate the resistor tolerance and packaging.
- (3) The remaining 4 or 3 digits represent the resistance value with the last digit indicating the multiplier as shown in the table of "Last digit of I2NC".
- (4) "L" is optional symbol <sup>(Note)</sup>.

Example:

0.02 Ω	=	0200 or 200
0.3 Ω	=	3007 or 307
1 Ω	=	1008 or 108
33 KΩ	=	3303 or 333
10 MΩ	=	1006 or 106

**ORDERING EXAMPLE**

The ordering code of a RC12 resistor, value 56 Ω with ±1% tolerance, supplied in tape of 5,000 units per reel is: 232273465609(L) or RC0805FR-0756R(L).

**NOTE**

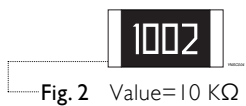
- 1. All our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
- 2. On customized label, "LFP" or specific symbol printed and the optional "L" at the end of GLOBAL PART NUMBER / I2NC can be added (both are on customer request)

**MARKING**

RC0805



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

For further marking information, please see special data sheet “Chip resistors marking”.

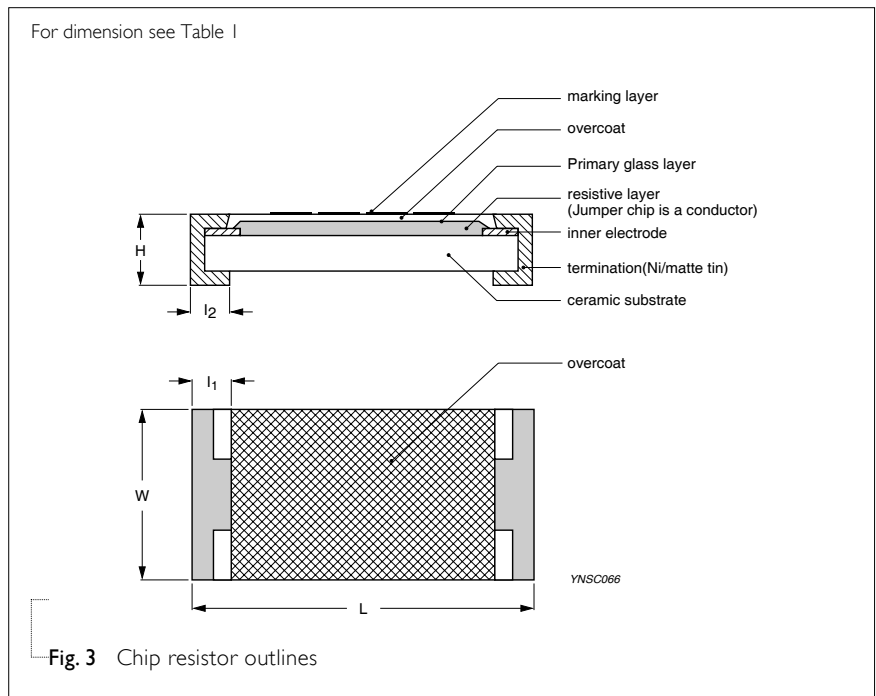
**CONSTRUCTION**

The resistor is constructed on top of a high-grade ceramic body. Internal metal electrodes are added on each end to make the contacts to the thick film resistive element. The composition of the resistive element is a noble metal imbedded into a glass and covered by a second glass to prevent environment influences. The resistor is laser trimmed to the rated resistance value. The resistor is covered with a protective epoxy coat, finally the two external terminations (matte tin on Ni-barrier) are added. See fig.3

**DIMENSIONS**

Table I	
TYPE	RC0805
L (mm)	2.00 ±0.10
W (mm)	1.25 ±0.10
H (mm)	0.50 ±0.10
l <sub>1</sub> (mm)	0.35 ±0.20
l <sub>2</sub> (mm)	0.35 ±0.20

**OUTLINES**



**ELECTRICAL CHARACTERISTICS**

Table 2

CHARACTERISTICS	RC0805 1/8 W	
Operating Temperature Range	-55 °C to +155 °C	
Maximum Working Voltage	150 V	
Maximum Overload Voltage	300 V	
Dielectric Withstanding Voltage	300 V	
Resistance Range	5% (E24)	1 Ω to 22 MΩ
	1% (E24/E96)	1 Ω to 10 MΩ
	Zero Ohm Jumper < 0.05 Ω	
Temperature Coefficient	1 Ω ≤ R ≤ 10 Ω	±200 ppm/°C
	10 MΩ < R ≤ 22 MΩ	±200 ppm/°C
	10 Ω < R ≤ 10 MΩ	±100 ppm/°C
Jumper Criteria	Rated Current	2 A
	Maximum Current	5 A

**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	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
RC0805	Paper Taping Reel (R)	7" (178 mm)	5,000 units
		10" (254 mm)	10,000 units
		13" (330 mm)	20,000 units

**NOTE**

I. For paper tape and reel specification/dimensions, please see the special data sheet “Packing” document.

**FUNCTIONAL DESCRIPTION**

**POWER RATING**

RC0805 rated power at 70°C is 1/8 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 (W)

R=Resistance value (Ω)

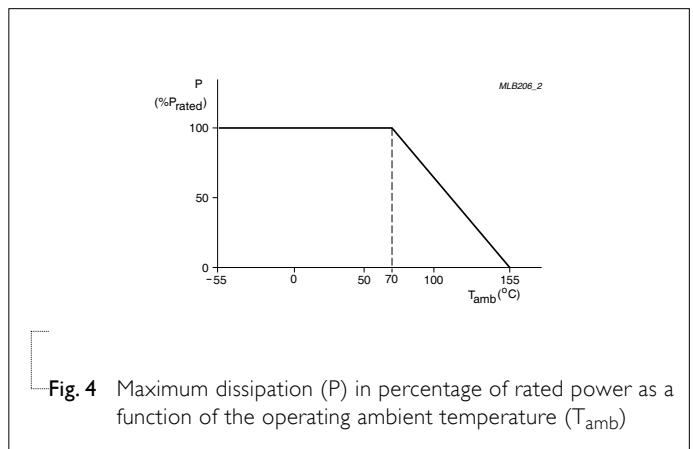


Fig. 4 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T<sub>amb</sub>)

**TESTS AND REQUIREMENTS**
**Table 4** Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Life/ Operational Life/ Endurance	MIL-STD-202G-method 108A	1,000 hours at 70±5 °C applied RCWV	±(2%+0.05 Ω)
	IEC 60115-1 4.25.1	1.5 hours on, 0.5 hour off, still air required	<100 mΩ for Jumper
	JIS C 5202-7.10		
High Temperature Exposure/ Endurance at upper category temperature	MIL-STD-202G-method 108A	1,000 hours at maximum operating temperature	±(1%+0.05 Ω)
	IEC 60115-1 4.25.3	depending on specification, unpowered	<50 mΩ for Jumper
	JIS C 5202-7.11	No direct impingement of forced air to the parts Tolerances: 125±3 °C	
Moisture Resistance	MIL-STD-202G-method 106F	Each temperature / humidity cycle is defined at 8	±(2%+0.05 Ω)
	IEC 60115-1 4.24.2	hours (method 106F), 3 cycles / 24 hours for 10d	<100 mΩ for Jumper
		with 25 °C / 65 °C 95% R.H, without steps 7a & 7b, unpowered Parts mounted on test-boards, without condensation on parts Measurement at 24±2 hours after test conclusion	
Thermal Shock	MIL-STD-202G-method 107G	-55/+125 °C	±(0.5%+0.05 Ω) for 10 KΩ to
		Note: Number of cycles required is 300. Devices	10 MΩ
		unmounted	±(1%+0.05 Ω) for others
		Maximum transfer time is 20 seconds. Dwell time	<50 mΩ for Jumper
		is 15 minutes. Air – Air	
Short time overload	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage	±(2%+0.05 Ω)
	IEC60115-1 4.13	whichever is less for 5 sec at room temperature	<50 mΩ for Jumper No visible damage
Board Flex/ Bending	IEC60115-1 4.33	Device mounted on PCB test board as described,	±(1%+0.05 Ω)
		only 1 board bending required	<50 mΩ for Jumper
		3 mm bending	No visible damage
		Bending time: 60±5 seconds	
		Ohmic value checked during bending	

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
<b>Solderability</b> - Wetting	IPC/JEDECJ-STD-002B test B IEC 60068-2-58	Electrical Test not required Magnification 50X SMD conditions: 1 <sup>st</sup> step: method B, aging 4 hours at 155 °C dry heat 2 <sup>nd</sup> step: leadfree solder bath at 245±3 °C 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 °C, 30 seconds immersion time	No visible damage
- Resistance to Soldering Heat	MIL-STD-202G-method 210F IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 270 °C, 10 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±(1%+0.05 Ω) <50 mΩ for Jumper No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 3	Jul 15, 2008	-	<ul style="list-style-type: none"> <li>- Change to dual brand datasheet that describe RC0805 with RoHS compliant</li> <li>- Description of "Halogen Free Epoxy" added</li> <li>- Define global part number</li> </ul>
Version 2	Sep 03, 2004	-	<ul style="list-style-type: none"> <li>- New datasheet for 0805 thick film 1% and 5% with lead-free terminations</li> <li>- Replace the 0805 part of pdf files: RC01_I1_21_31_5, RC02_I2_22_32_10, and HRC1_I_5_4</li> <li>- Test method and procedure updated</li> <li>- PE tape added (paper tape will be replaced by PE tape)</li> <li>- High ohmic products combined into standard products.</li> </ul>

*“ Yageo reserves all the rights for revising the content of this datasheet without further notification, as long as the products itself are unchanged. Any product change will be announced by PCN.”*