Innovative Service Around the Globe YAGEO

DATA SHEET

CURRENT SENSOR-LOW TCR

PA0603

1%, 5%

size 0603

1mΩ

RoHS Compliant & Halogen Free

YAGEO

Phicomp

Product specification

SCOPE

This specification describes PA0603 current sensor – low TCR chip resistors with lead-free terminations

APPLICATIONS

- Consumer goods
- Consumer
- Telecom / Datacom
- Industrial / Power supply
- Alternative Energy
- Automotive

FEATURES

- Halogen-free Epoxy
- RoHS compliant
  - Reduce environmentally hazardous wastes
  - High component and equipment reliability
  - None forbidden-materials used in products/production
- Low resistances applied to current sensing
- Moisture sensitivity level: MSL 1

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

PA0603	X	X	X	XX	XXXX	L
	(1)	(2)	(3)	(4)	(5)	(6)

(1) TOLERANCE

F = ±1%

J = ±5%

(2) PACKAGING TYPE

R = Paper taping reel

(3)TEMPERATURE COEFFICIENT OF RESISTANCE

P = ±500ppm/℃

(4) TAPING REEL

07 = 7 inch dia. Reel & 0.1W
7W = 7 inch dia. Reel & 0.2W
7T = 7 inch dia. Reel & 0.3W
47 = 7 inch dia. Reel & 0.4W
57 = 7 inch dia. Reel & 0.5W

(5) RESISTANCE VALUE

0R001 (1mR)

(6) DEFAULT CODE

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

ORDERING EXAMPLE

The ordering code for a PA0603 0.5W chip resistor,TC450 value 0.001Ω (1mR) with ±1% tolerance, supplied in 7-inch tape reel with 5Kpcs quantify is:

PA0603FRP570R001L.

NOTE

1. All our R-Chip 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

PA0603:

Fig.1 Value=1mΩ

No Marking

CONSTRUCTION

The resistors are constructed using outstanding TCR level material, which makes Yageo PA resistors excellent for current sensing application in battery charger circuit & DC-DC converter. The composition of the resistive material is adjusted to give the approximate required resistance and is covered with a protective coating. Marking is printed on the top side of the resistor. Finally, the three external terminations (Cu / Ni / matte Tin) are added, as shown in Fig. 2.

OUTLINES

For dimension see Table 1

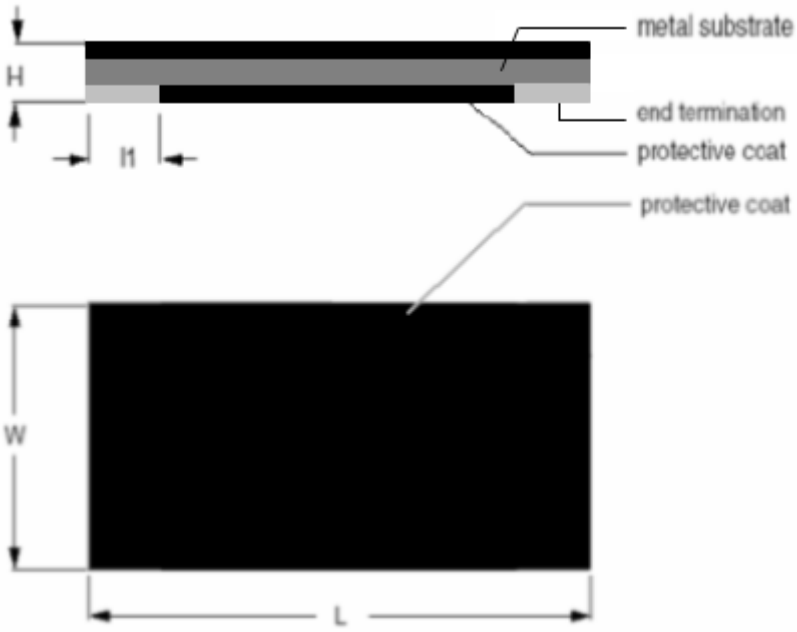

Fig.2 Chip resistor outlines

DIMENSIONS

Table 1

TYPE	PA0603
L (mm)	1.60±0.20
W (mm)	0.80+0.1/-0.2
H (mm)	0.45±0.15
I1 (mm)	0.38±0.12

ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS	PA0603
Operating Temperature Range	–55℃ to +155℃
Maximum Working Voltage	$\sqrt{(P*R)}$
Resistance Range	1mΩ
Temperature Coefficient	±500ppm/℃

PACKING STYLE AND PACKAGING QUANTITY

Table 3

PRODUCT TYPE	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
PA0603	Paper Taping Reel	7" (178 mm)	5,000 Units

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

FUNCTIONAL DESCRIPTION

POWER RATING

PA0603 rated power at 70℃ is 0.1W, 0.2W, 0.3W, 0.4W, 0.5W

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)

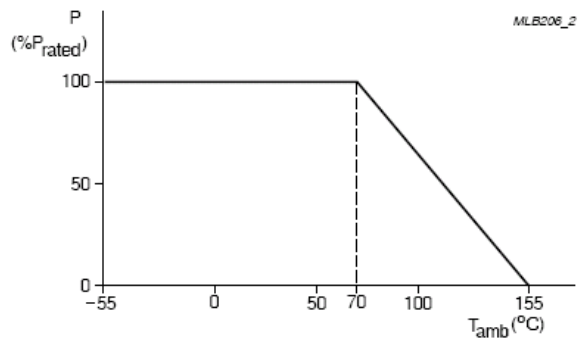

Fig.3 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (Tamb)

FOOTPRINT DIMENSION

Size Footprint	Dimensions Code unit :mm			
PA0603	A	B	C	D
	2.20	0.80	0.70	0.90

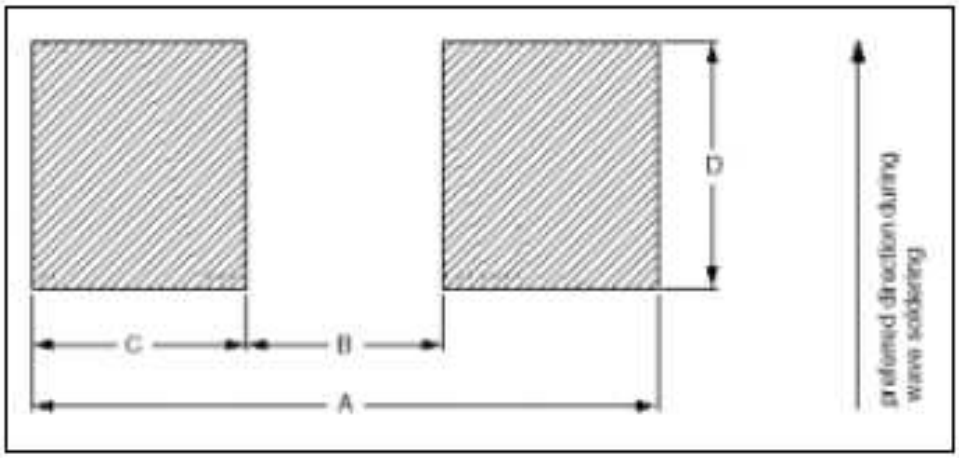

Fig.4 RECOMMENDED FOOTPRINT DIMENSIONS

TESTS AND REQUIREMENTS

TEST	TEST METHOD	PROCEDURE	REQUIREMENT
T.C.R	IEC 60115-1 4.8	At +25/+125 ℃ Formula: $T.C.R = \frac{R2-R1}{R1(t2-t1)} \times 10^6$ (ppm/℃) Where t1=+25 ℃ or specified room temperature t2=+125 ℃ test temperature R1=resistance at room temperature in ohms R2=resistance at test temperature in ohms	Refer to table 2
Life/ Endurance	IEC 60115-1 4.25.1	1,000 hours at 70±5℃ applied RCWV 1.5 hours on, 0.5 hour off, still air required	± (1.0 % + 0.0005Ω)
High Temperature Exposure/ Endurance at upper category temperature	IEC 60068-2-2	1,000 hours at 155±5 ℃, unpowered	± (1.0 % + 0.000 5Ω)
Moisture Resistance	MIL-STD-202 Method 106G	Each temperature / humidity cycle is defined at 8 hours (Method 106G), 3 cycles / 24 hours for 10d. with 25 ℃ / 65 ℃ 95% R.H, without steps 7a & 7b, un-powered Parts mounted on test-boards, without condensation on parts Measurement at 24±2 hours after test conclusion.	± (0.5% + 0.0005Ω)
Thermal Shock	MIL-STD-202 Method 107G	-55/+125 ℃ Note: Number of cycles required is 300. Devices mounted Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	± (0.5% + 0.0005Ω)
Short time overload	IEC 60115-1 4.13	Applied 5 times of rating power 5 seconds at room temperature	± (0.5% + 0.0005Ω) No visible damage
Board Flex/ Bending	IEC 60068-2-21	Chips mounted on a 90mm glass epoxy resin PCB(FR4) 3 mm bending Bending time: 60±1 seconds	± (1.0 % + 0.0005Ω)
Solderability - Wetting	IPC/JEDEC J-STD-002B test B	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/JEDEC J-STD-002B test D	Leadfree solder, 260℃, 30 seconds immersion time	No visible damage
- Resistance to Soldering Heat	IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 260±5℃, 10±1seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	± (0.5% + 0.0005Ω) No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	2016-10-17		- First issue of this specification