

# DATA SHEET

## METAL LOW OHMIC JUMPER

PA series

sizes 0201/ 0402/ 0603/ 0805

RoHS compliant & Halogen free



SCOPE

This specification describes PA0201/0402/0603/0805 series current sensor - low TCR with metal alloy layer.

APPLICATIONS

- Consumer goods
- Computer
- Telecom / Datacom
- Industrial / Power supply
- Alternative Energy
- Car electronics

FEATURES

- AEC-Q200 qualified
- Halogen-free Epoxy
- RoHS compliant
- Reduce environmentally hazardous wastes
- High component and equipment reliability
- Non-forbidden materials used in products/production
- Low resistances applied to current sensing
- Moisture sensitivity level: MSL 1

ORDERING INFORMATION - GLOBAL PART NUMBER

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

**GLOBAL PART NUMBER**

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

**(1) SIZE**

0201 / 0402 / 0603 / 0805

**(2) TOLERANCE**

-

**(3) PACKAGING TYPE**

R = Paper taping reel

**(4) TEMPERATURE COEFFICIENT OF RESISTANCE**

-

**(5) TAPING REEL**

07 = 7 inch dia. Reel  
 7W = 7 inch dia. Reel, (0402 only)  
 47 = 7 inch dia. Reel, (0805 only)

**(6) RESISTANCE VALUE**

0 Ω

**(7) DEFAULT CODE**

Letter L is the system default code for ordering only. <sup>(Note)</sup>

Resistance rule of global part number	
Resistance code rule	Example
0R	0R = 0 Ω
(0 Ω)	

**ORDERING EXAMPLE**

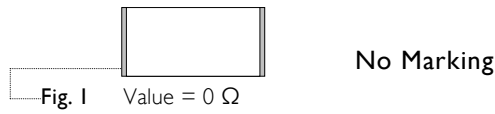
The ordering code for a PA0603 chip resistor, value 0 Ω, supplied in 7-inch tape reel with 5Kpcs quantify is: PA0603-R-070RL.

**NOTE**

1. All our RChip products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead-Free Process"

MARKING

PA0201



PA0402 / 0603 / 0805



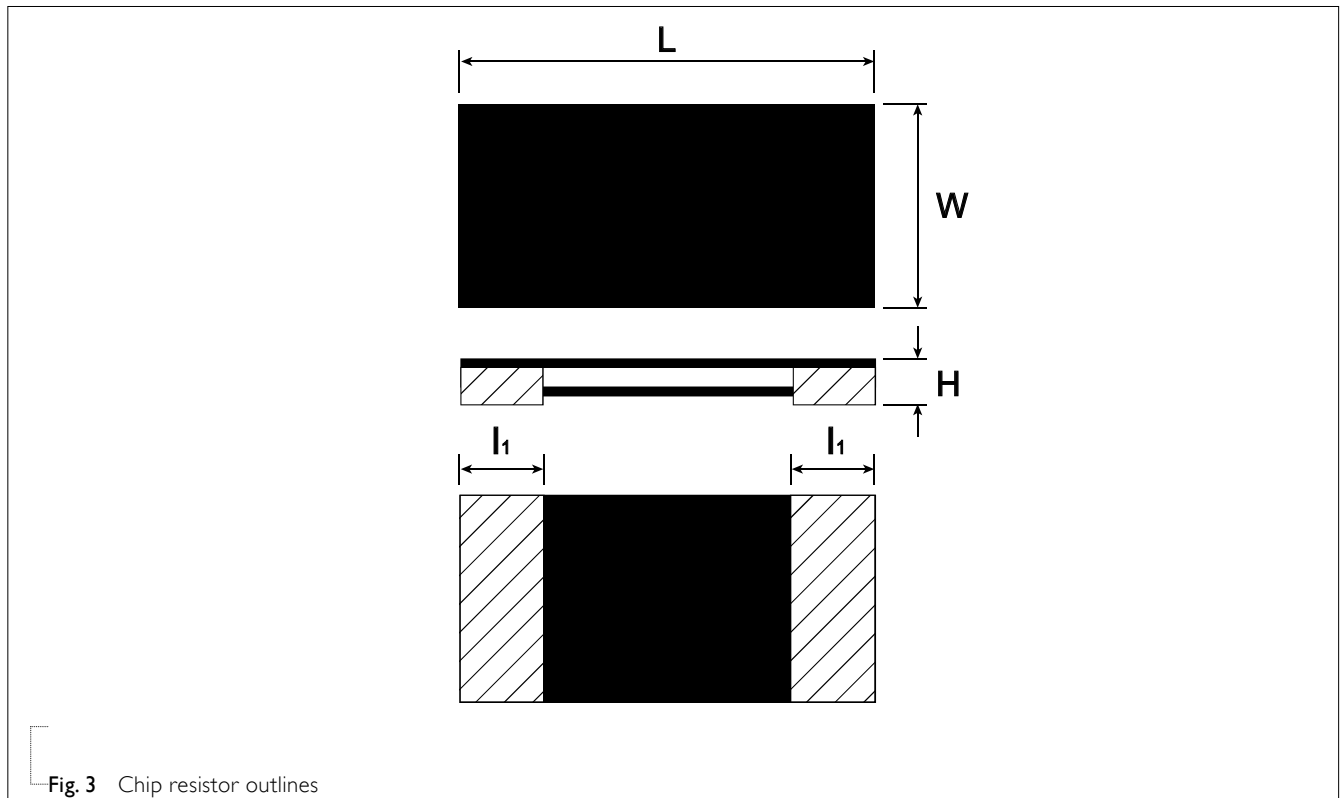
CONSTRUCTION

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. 3.

**Outlines**



**DIMENSION**

Table 1 For outlines, please refer to Fig. 4

TYPE	L (mm)	W (mm)	H (mm)	l <sub>1</sub> (mm)
PA0201	0.60±0.03	0.31±0.04	Max. 0.35	0.15±0.06
PA0402	1.00±0.10	0.55±0.10	Max. 0.35	0.25±0.10
PA0603	1.60±0.20	0.8+0.10/-0.20	0.45±0.15	0.38±0.12
PA0805	2.00±0.15	1.20±0.15	Max. 0.40	0.35±0.25

Note:

1. For relevant physical dimensions, please refer to construction outlines.
2. Please contact with sales offices, distributors and representatives in your region before ordering.

**ELECTRICAL CHARACTERISTICS**

Table 2

		PA0201	PA0402		PA0603	PA0805
Jumper Criteria	Maximum Resistance	<5mΩ	<1mΩ	<0.5mΩ	<0.2mΩ	<0.2mΩ
	Maximum Current	4.5A	11A	20A	23A	50A
Operating Temperature Range		-55°C to +125°C			-55°C to +155°C	

Note: Please contact with sales offices, distributors and representatives in your region before ordering.

**FUNCTIONAL DESCRIPTION**

**OPERATING TEMPERATURE RANGE**

PA0201/ PA0402:-55°C to +125°C

PA0603/ PA0805:-55°C to +155°C

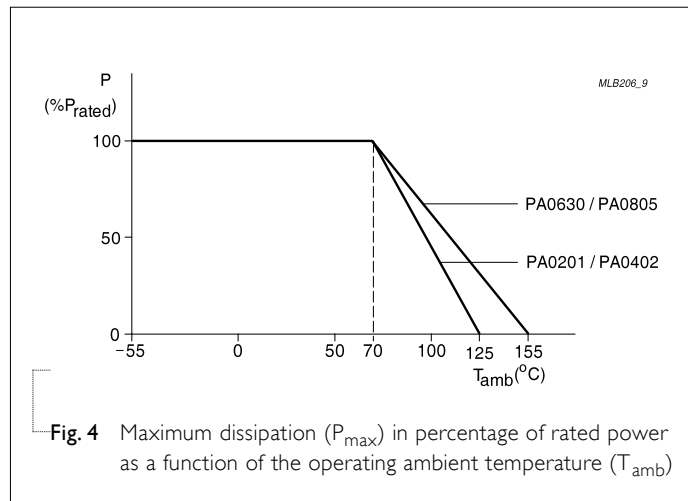


Fig. 4 Maximum dissipation (P<sub>max</sub>) in percentage of rated power as a function of the operating ambient temperature (T<sub>amb</sub>)

**PACKING STYLE AND PACKAGING QUANTITY**

Table 3 Packing style and packaging quantity

PACKING STYLE	REEL DIMENSION	PA0201	PA0402	PA0603	PA0805
Paper taping reel (R)	7" (178 mm)	10,000	10,000	5,000	5,000

**PAPER TAPE**

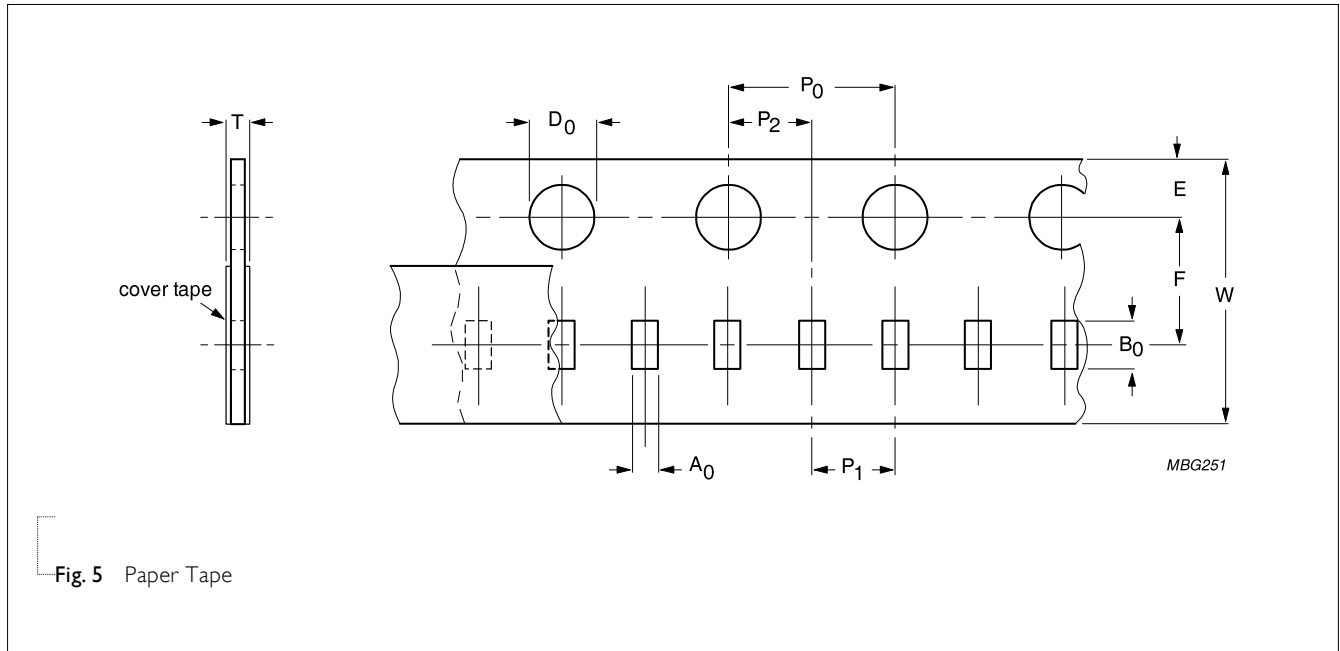


Fig. 5 Paper Tape

Table 4 Dimensions of paper tape for relevant chip resistors size

SIZE	SYMBOL											Unit: mm
	A <sub>0</sub>	B <sub>0</sub>	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	ØD <sub>0</sub>	ØD <sub>1</sub>	T	
PA0201	0.38±0.10	0.68±0.10	8.00±0.10	1.75±0.10	3.50±0.10	4.00±0.10	2.00±0.10	2.00±0.10	1.55±0.05	1.50±0.10	0.42±0.10	
PA0402	0.59±0.10	1.20±0.10	8.00±0.10	1.75±0.10	3.50±0.10	4.00±0.10	2.00±0.10	2.00±0.10	1.55±0.05	1.50±0.10	0.45±0.10	
PA0603	1.10±0.10	1.90±0.10	8.00±0.10	1.75±0.10	3.50±0.10	4.00±0.10	4.00±0.10	2.00±0.10	1.55±0.05	1.50±0.10	0.43±0.10	
PA0805	1.62±0.10	2.35±0.10	8.00±0.10	1.75±0.10	3.50±0.10	4.00±0.10	4.00±0.10	2.00±0.10	1.55±0.05	1.50±0.10	0.43±0.10	

**REEL SPECIFICATION**

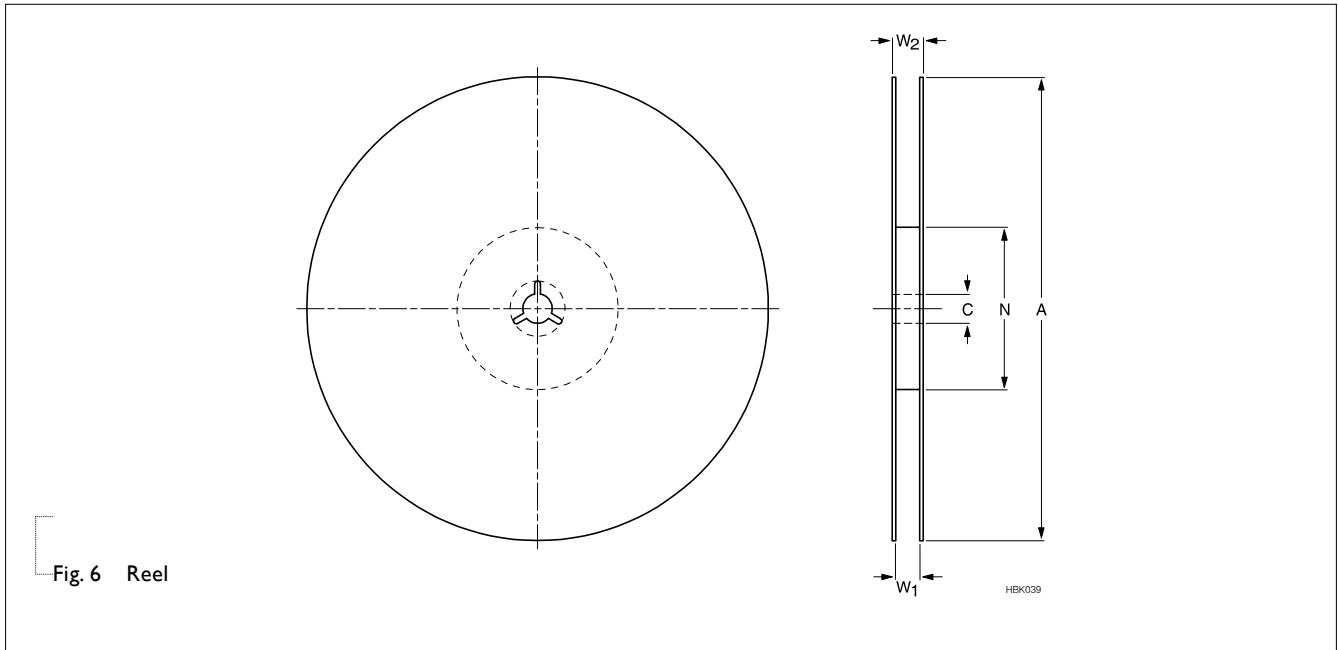
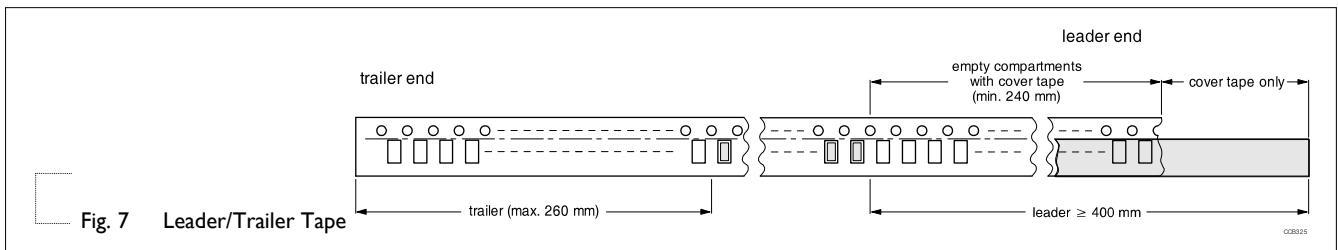


Table 5 Dimensions of reel specification for relevant chip resistors size

SIZE	QUANTITY PER REEL	REEL SIZE		SYMBOL					Unit: mm
		8 mm TAPE WIDE		A	N	C	D	W <sub>1</sub>	W <sub>2</sub> MAX.
PA0201	10,000	7" (Ø 178 mm)		178.0± 1.0	60.0+1/-0	13.5± 0.5	21.0± 0.8	9.0± 0.5	12.0± 0.2
PA0402	10,000	7" (Ø 178 mm)		178.0± 1.0	60.0+1/-0	13.5± 0.5	21.0± 0.8	9.0± 0.5	12.0± 0.2
PA0603	5,000	7" (Ø 178 mm)		178.0± 1.0	60.0+1/-0	13.5± 0.5	21.0± 0.8	9.0± 0.5	12.0± 0.2
PA0805	5,000	7" (Ø 178 mm)		178.0± 1.0	60.0+1/-0	13.5± 0.5	21.0± 0.8	9.0± 0.5	12.0± 0.2

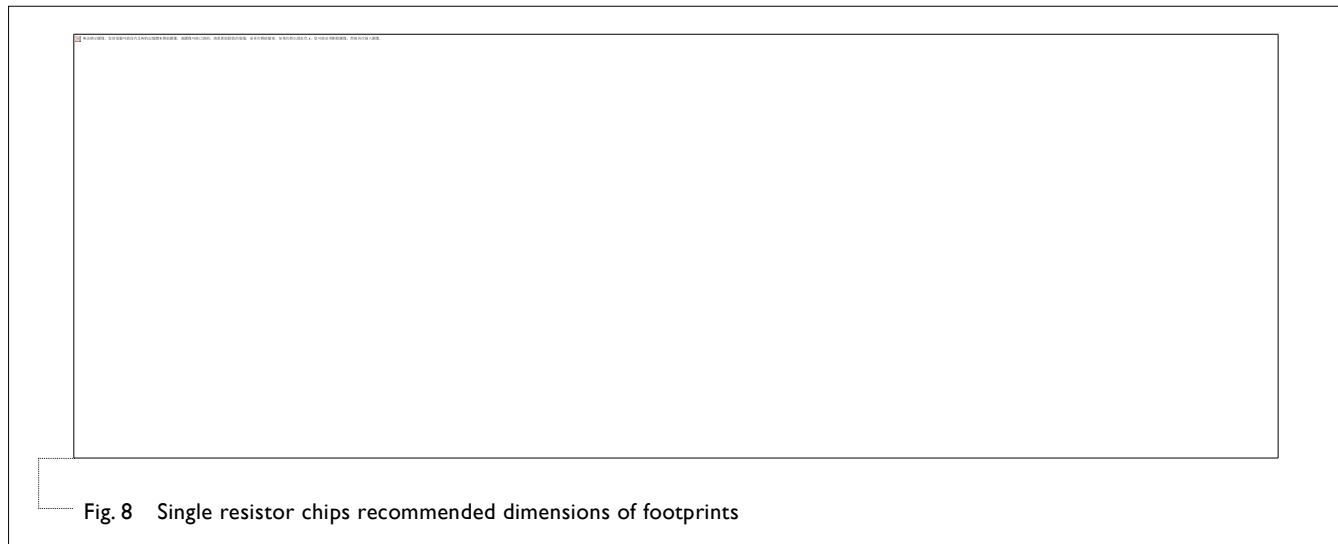
**LEADER/TRAILER TAPE SPECIFICATION**



**FOOTPRINT AND SOLDERING PROFILES**

For recommended soldering profiles, please refer to data sheet “Chip resistors mounting”.

**FOOTPRINT**



**Table 6** Footprint dimensions

	Unit: mm			
SIZE	A	B	C	D
PA0201	1.0	0.3	0.35	0.4
PA0402	2.0	0.4	0.8	0.6
PA0603	2.2	0.8	0.7	0.9
PA0805	3.4	0.8	1.3	1.3

**TESTS AND REQUIREMENTS**
**Table 7 Test condition, procedure and requirements**

TEST	TEST METHOD	PROCEDURE	REQUIREMENT
Life/ Endurance	MIL-STD-202 Method 108	1,000 hours at 70±2°C applied RCWV	0201: < 5mΩ
	IEC 60115-1 4.25.1	1.5 hours on, 0.5 hour off, still air required	0402: < 1mΩ
			< 0.5mΩ
			0603: < 0.2mΩ
0805: < 0.2mΩ			
High Temperature Exposure/ Endurance at upper category temperature	MIL-STD-202 Method 108	1,000 hours, unpowered at	0201: < 5mΩ
	IEC 60115-1 4.25.3	0201/ 0402: 125±5°C	0402: < 1mΩ
			< 0.5mΩ
			0603: < 0.2mΩ
0805: < 0.2mΩ			
Moisture Resistance	MIL-STD-202 Method 106	Each temperature / humidity cycle is defined at 8 hours (Method 106G), 3 cycles / 24 hours for 10d. with 25 °C / 65 °C 95% R.H, without steps 7a & 7b, un-powered Parts mounted on test board, without condensation on parts Measurement at 24±2 hours after test conclusion.	0201: < 5mΩ
			0402: < 1mΩ
			< 0.5mΩ
			0603: < 0.2mΩ
0805: < 0.2mΩ			
No visible damage			
Thermal Shock	MIL-STD-202 Method 107	-55/+125°C Note: Number of cycles required is 300. Parts mounted on test board. Maximum transfer time is 20 seconds. Dwell time is 15 minutes.	0201: < 5mΩ
			0402: < 1mΩ
			< 0.5mΩ
			0603: < 0.2mΩ
0805: < 0.2mΩ			
Short time overload	IEC 60115-1 4.13	5 times rated power for 5 seconds.	0201: < 5mΩ
			0402: < 1mΩ
			< 0.5mΩ
			0603: < 0.2mΩ
0805: < 0.2mΩ			
No visible damage			
Board Flex/ Bending	IEC 60115-1 4.33	Device mounted on PCB test board as described, only 1 board bending required Bending for 0201: 3 mm 0402 and above: 2mm Bending time: 60±1 seconds Ohmic value checked during bending	0201: < 5mΩ
			0402: < 1mΩ
			< 0.5mΩ
			0603: < 0.2mΩ
0805: < 0.2mΩ			



TEST	TEST METHOD	PROCEDURE	REQUIREMENT
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°C dry heat 2nd step: lead free solder bath at 245±3°C Dipping time: 3±0.5 seconds	Well tinned ( >95% covered) No visible damage
- Leaching	IPC/JEDEC J-STD-002B test D	Lead free solder, 260°C, 30 seconds immersion time	No visible damage
- Resistance to Soldering Heat	MIL-STD-202 Method 210 IEC 60115-1 4.18	Condition B, no pre-heat of samples Lead free solder, 260±5°C, 10±1 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	0201: < 5mΩ 0402: < 1mΩ < 0.5mΩ 0603: < 0.2mΩ 0805: < 0.2mΩ No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	Oct. 05, 2018	-	- Metal low ohmic jumper - PA series

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