

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. (Note)

Resistance rule of global part number

Resistance code rule	Example
0R	0R = 0 Ω
(0 Ω)	

ORDERING EXAMPLE

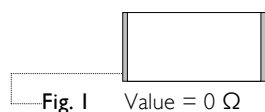
The ordering code for a PA0603 chip resistor, value 0 Ω, supplied in 7-inch tape reel with 5Kpcs quantify is: PA0603-R-070RL.

NOTE

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

MARKING

PA0201



No Marking

PA0402 / 0603 / 0805



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. 3.

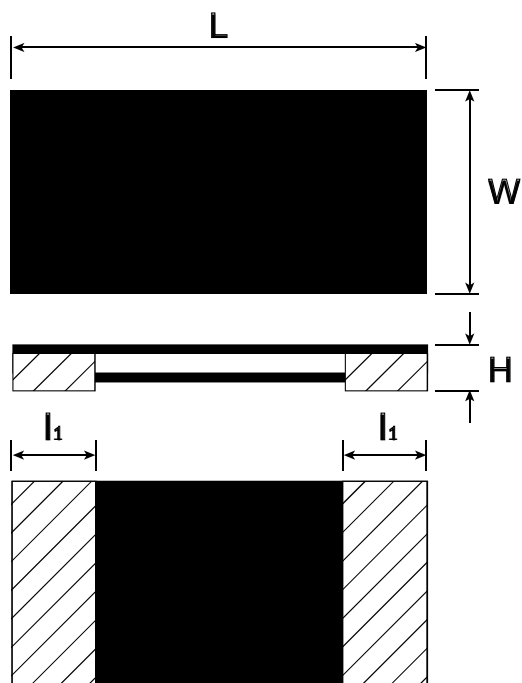
Outlines

Fig. 3 Chip resistor outlines

DIMENSION

Table 1 For outlines, please refer to Fig. 4

TYPE	L (mm)	W (mm)	H (mm)	L ₁ (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

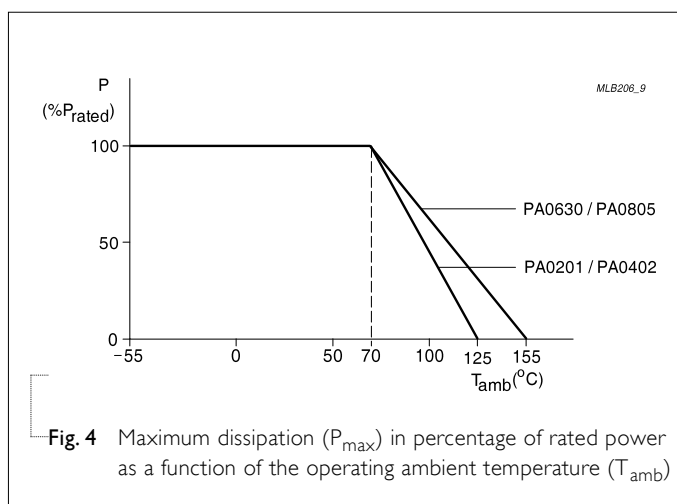


Fig. 4 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

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

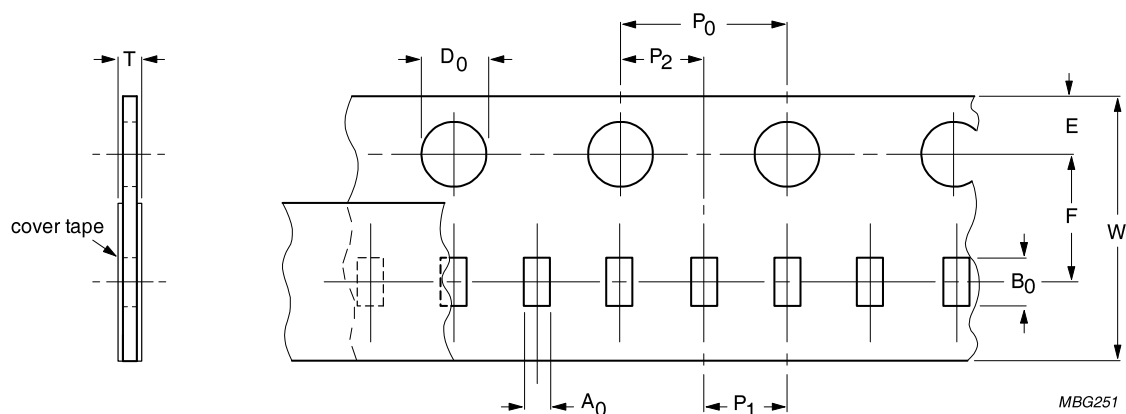


Fig. 5 Paper Tape

Table 4 Dimensions of paper tape for relevant chip resistors size

SIZE	SYMBOL										Unit: mm
	A ₀	B ₀	W	E	F	P ₀	P ₁	P ₂	ØD ₀	ØD ₁	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

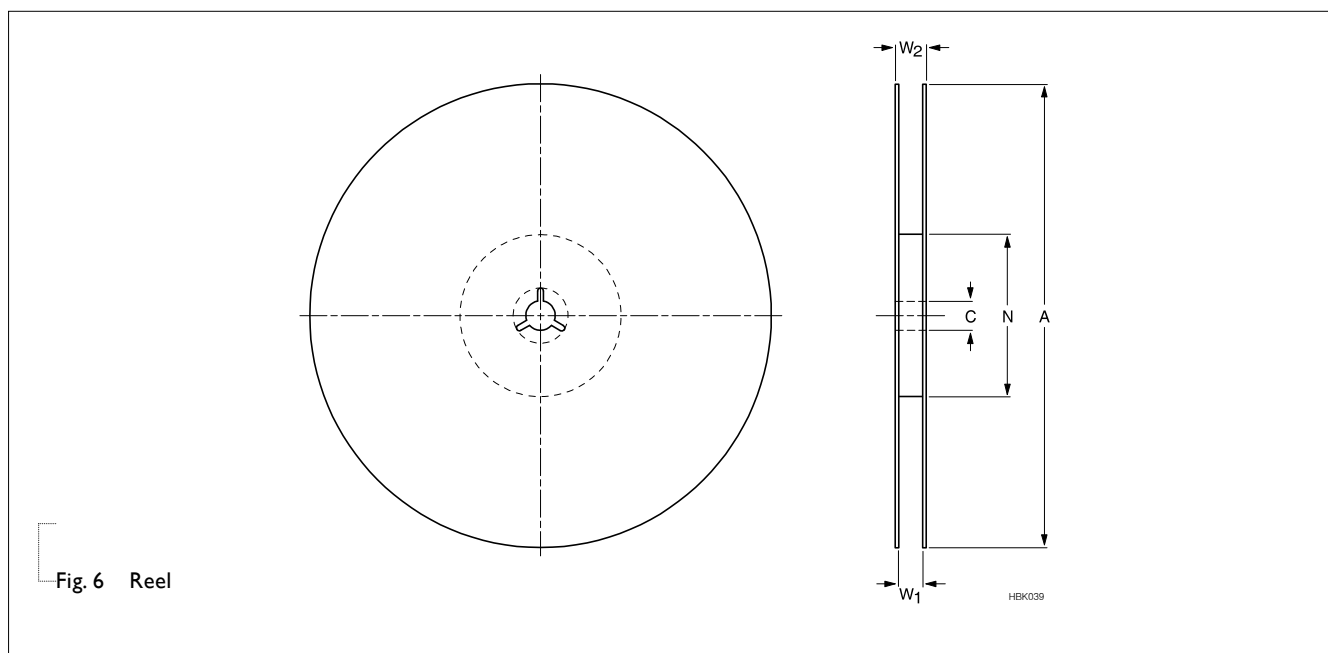
REEL SPECIFICATION


Fig. 6 Reel

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_1	W_2 MAX.	
PA0201	10,000	7" ($\varnothing$ 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" ($\varnothing$ 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" ($\varnothing$ 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" ($\varnothing$ 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	

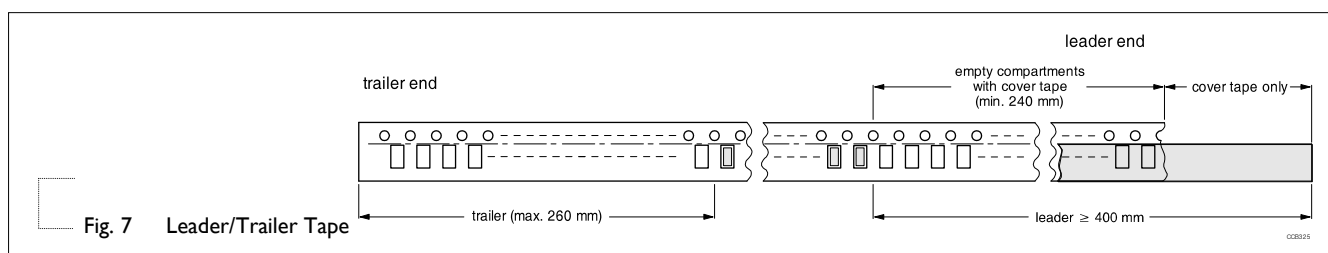
LEADER/TRAILER TAPE SPECIFICATION


Fig. 7 Leader/Trailer Tape

FOOTPRINT AND SOLDERING PROFILES

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

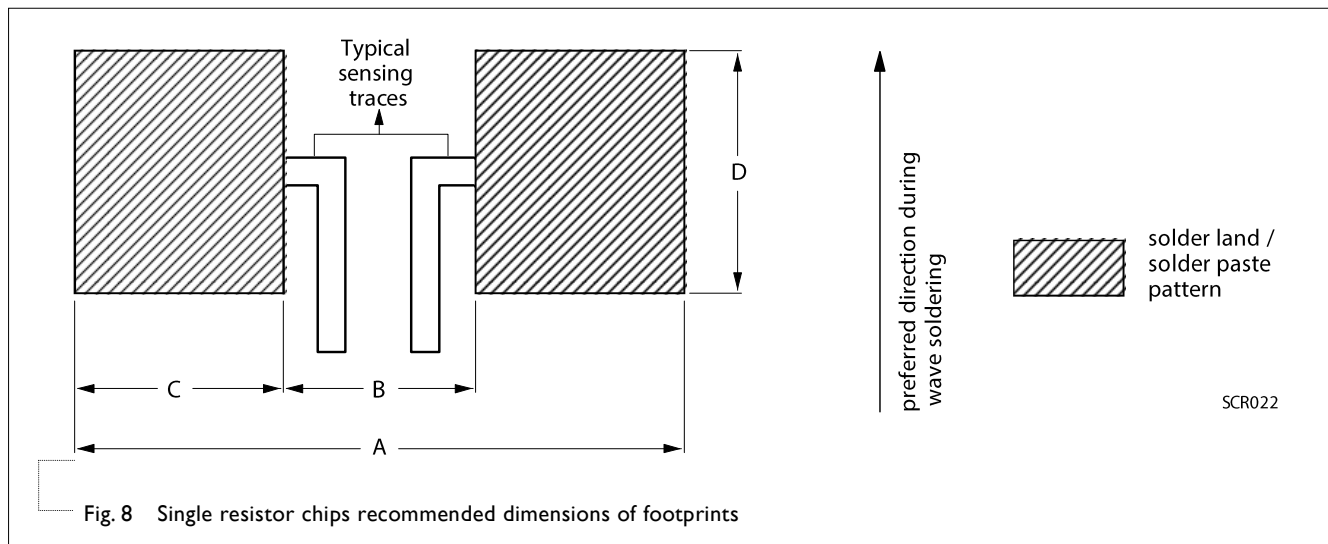
FOOTPRINT

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
		0603/ 0805: 155±5°C	< 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
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Version 0	Oct. 05, 2018	-	- Metal low ohmic jumper - PA series
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