



DATA SHEET

CURRENT SENSOR - LOW TCR

AUTOMOTIVE GRADE

PA series

5%, 1%, 0.5%

sizes 0100/0201/0402/0603/0805/1206/2010/2512

RoHS compliant & Halogen free

顺海科技
0755-28100016



SCOPE

This specification describes PA0100 to 2512 series current sensor - low TCR with metal substrate.

APPLICATIONS

- Smart Phone
- Batteries
- Computer
- Telecom / Datacom
- Industrial / Power supply
- Car electronics

FEATURES

- AEC-Q200 qualified
- Halogen-free Epoxy
- Total lead free without RoHS exemption
- 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 X
 (1) (2) (3) (4) (5) (6) (7)



(1) SIZE

0100/0201/0402/0603/0805/1206/2010/2512

(2) TOLERANCE

D = ±0.5%
 F = ±1%
 J = ±5%

(3) PACKAGING TYPE

R = Paper taping reel (PA0100~PA1206)
 K = Embossed taping reel (PA2010/PA2512)

(4) TEMPERATURE COEFFICIENT OF RESISTANCE

E = ± 50ppm/°C
 M = ± 75ppm/°C
 F = ± 100ppm/°C
 L = ± 150ppm/°C
 G = ± 200ppm/°C
 I = ± 300ppm/°C

(5) TAPING REEL

07 / 7W / 77 / 47 / 57 / 87 / 0L / WL / 4L inch dia. Reel and specific rated power Detailed power rating are shown in the Table 2.

(6) RESISTANCE VALUE

0.5 mΩ to 20 mΩ

(7) DEFAULT CODE

Letter L / Z is the system default code for ordering only. ^(Note)
 L is for 0100/0201/0402/0603/0805
 Z is for only 1206/2010/2512

Resistance rule of global part number

| Resistance code rule | Example |
|----------------------|----------------------------|
| 0UX | 0U5=0.0005Ω |
| 0RXXX | 0R001 = 1mΩ 0R02 = 20mΩ |

ORDERING EXAMPLE

The ordering code for a PA0805 0.125W chip resistor,TC50 value 0.01Ω (10mR) with ±1% tolerance, supplied in 7-inch tape reel with 5Kpcs quantify is: PA0805FRE070R01L.

NOTE

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



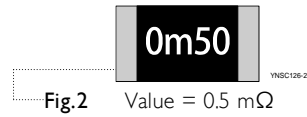
MARKING

PA0100/0201/0402/0603/0805/1206/2010

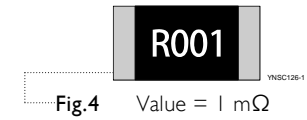


No Marking

PA2512



4 digits
The "m" is used as decimal point; the other 3 digits are significant and the unit is milliohm
PA2512: 0.5mΩ and 0.75mΩ

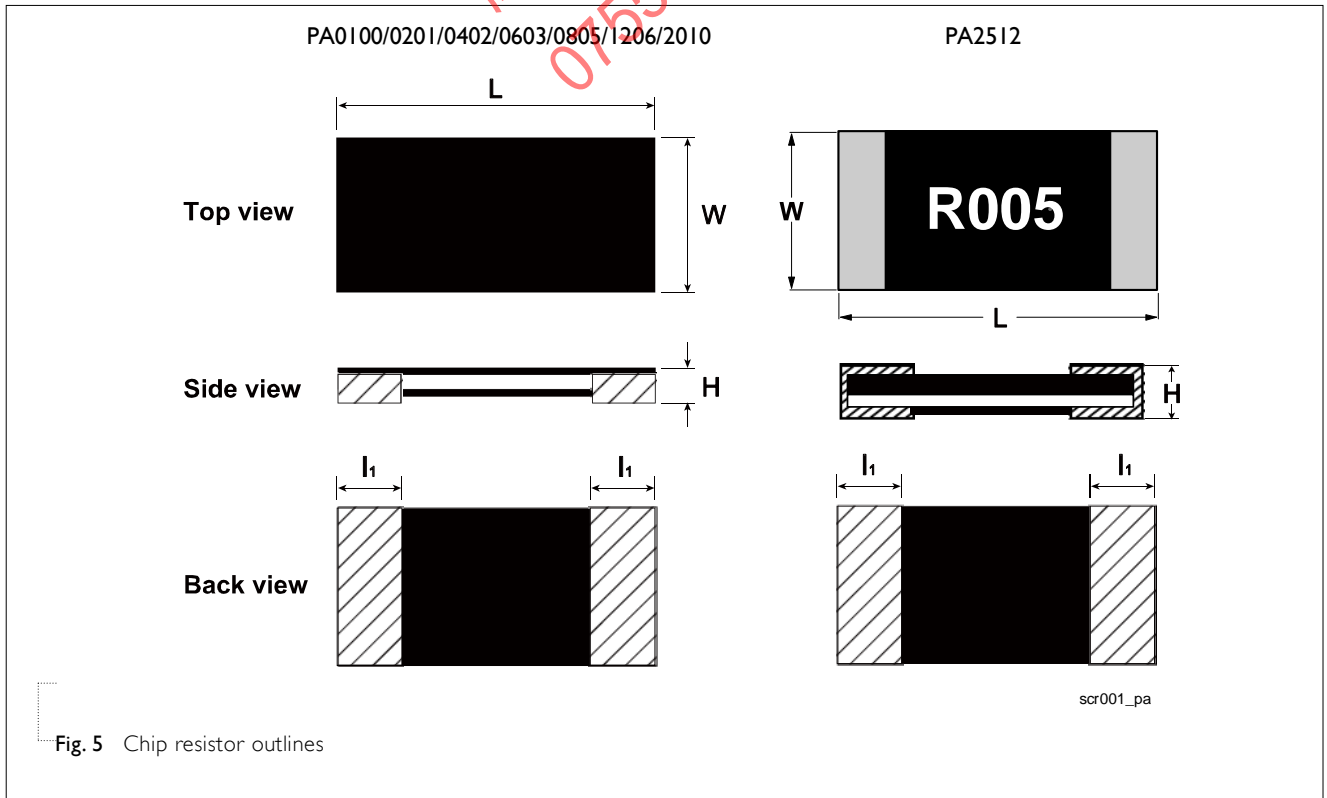


4 digits
The "R" is used as a decimal point; the other 3 digits are significant
PA2512: 1mΩ to 20mΩ

CONSTRUCTION

The resistors are constructed by using outstanding TCR level materials, which make Yageo PA resistors excellent for current sensing application in battery charger circuit & DC-DC converter. The advanced resistive materials are adopted to get the precisely required resistance. Finally, the three materials of external terminations (Cu / Ni / matte Tin) are added, as shown in Fig. 5.

Outlines



DIMENSION

Table I For outlines, please refer to Fig. 5

| TYPE | RESISTANCE RANGE | L (mm) | W (mm) | H (mm) | ll (mm) |
|----------------------|--|-----------------|-----------------|-----------------|-----------------|
| PA0100 | $10\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 0.40 ± 0.03 | 0.20 ± 0.03 | Max. 0.15 | 0.10 ± 0.03 |
| PA0201 | $5\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 0.60 ± 0.03 | 0.31 ± 0.04 | Max. 0.30 | 0.15 ± 0.06 |
| PA0402 | $2\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 1.00 ± 0.10 | 0.55 ± 0.10 | Max. 0.40 | 0.25 ± 0.10 |
| PA0603 | $1\text{m}\Omega$ | 1.60 ± 0.20 | 0.80 ± 0.20 | 0.55 ± 0.15 | 0.38 ± 0.12 |
| | $2\text{m}\Omega$ | 1.60 ± 0.20 | 0.80 ± 0.20 | 0.45 ± 0.15 | 0.38 ± 0.12 |
| | $2.5\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 1.60 ± 0.20 | 0.80 ± 0.20 | 0.30 ± 0.15 | 0.38 ± 0.12 |
| PA0805 | $1\text{m}\Omega$ | 2.03 ± 0.20 | 1.27 ± 0.20 | 0.55 ± 0.15 | 0.60 ± 0.15 |
| | $1.5/ 2\text{m}\Omega$ | 2.03 ± 0.20 | 1.27 ± 0.20 | 0.45 ± 0.15 | 0.50 ± 0.15 |
| | $2.5\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 2.03 ± 0.20 | 1.27 ± 0.20 | 0.30 ± 0.15 | 0.35 ± 0.20 |
| PA1206 (0L/WL/4L) | $1\text{m}\Omega$ | 3.20 ± 0.25 | 1.60 ± 0.25 | 0.50 ± 0.10 | 1.04 ± 0.25 |
| | $2\text{m}\Omega$ | 3.20 ± 0.25 | 1.60 ± 0.25 | 0.45 ± 0.10 | 1.04 ± 0.25 |
| PA1206 (07/7W/47) | $1\text{m}\Omega$ | 3.20 ± 0.25 | 1.60 ± 0.25 | 0.65 ± 0.25 | 0.51 ± 0.25 |
| | $2\text{m}\Omega$ | 3.20 ± 0.25 | 1.60 ± 0.25 | 0.55 ± 0.25 | 0.60 ± 0.25 |
| | $2.5/ 3\text{m}\Omega$ | 3.20 ± 0.25 | 1.60 ± 0.25 | 0.40 ± 0.25 | 0.80 ± 0.30 |
| PA2010 | $4\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 3.20 ± 0.25 | 1.60 ± 0.25 | 0.40 ± 0.25 | 0.60 ± 0.30 |
| | $1\text{m}\Omega \leq R \leq 3\text{m}\Omega$ | 5.08 ± 0.25 | 2.54 ± 0.25 | 0.50 ± 0.25 | 1.40 ± 0.25 |
| PA2512 | $4\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 5.08 ± 0.25 | 2.54 ± 0.25 | 0.40 ± 0.25 | 0.70 ± 0.25 |
| | $0.5\text{m}\Omega \leq R \leq 0.75\text{m}\Omega$ | 6.35 ± 0.25 | 3.18 ± 0.25 | 0.40 ± 0.25 | 2.72 ± 0.25 |
| | $1\text{m}\Omega \leq R \leq 4\text{m}\Omega$ | 6.35 ± 0.25 | 3.18 ± 0.25 | 0.40 ± 0.25 | 2.21 ± 0.25 |
| | $5\text{m}\Omega \leq R \leq 6\text{m}\Omega$ | 6.35 ± 0.25 | 3.18 ± 0.25 | 0.40 ± 0.25 | 1.19 ± 0.25 |
| | $7\text{m}\Omega \leq R \leq 20\text{m}\Omega$ | 6.35 ± 0.25 | 3.18 ± 0.25 | 0.40 ± 0.25 | 0.76 ± 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

| SIZE | POWER RATING ⁽⁴⁾ @ 70°C | | | | | | TOLERANCE ⁽²⁾ | RESISTANCE RANGE | TEMPERATURE COEFFICIENT OF RESISTANCE ⁽³⁾ |
|--------------------|------------------------------------|-------------------------|-------|-------------------------|------|----|--------------------------|--|---|
| | 07 0L ⁽⁵⁾ | 7W WL ⁽⁵⁾ | 7T | 47 4L ⁽⁵⁾ | 57 | 87 | | | |
| 0100 | 1/32W | 1/16W | -- | -- | -- | -- | ±1%(F) ±5%(J) | 10mΩ ≤ R ≤ 20mΩ | ±300 ppm/°C(I) |
| 0201 | 1/20W | 1/10W | 3/20W | 1/4W | -- | -- | ±0.5%(D) | 20mΩ | ±150 ppm/°C(L) |
| | | | | | | | ±1%(F) ±5%(J) | 5mΩ ≤ R ≤ 20mΩ | |
| 0402 | 1/16W | 1/8W | 1/6W | 1/4W | 1/3W | -- | ±0.5%(D) | 15mΩ ≤ R ≤ 20mΩ | ±150 ppm/°C(L) |
| | | | | | | | ±1%(F) ±5%(J) | 2mΩ ≤ R ≤ 20mΩ | |
| 0603 | 1/10W | 1/5W | 1/3W | 2/5W | 1/2W | -- | ±0.5%(D) | 10mΩ ≤ R ≤ 20mΩ | 1mΩ ±200 ppm/°C(G) 2/2.5mΩ ±150 ppm/°C(L) 3mΩ ≤ R ≤ 20mΩ ±50 ppm/°C(E), ±75 ppm/°C(M) |
| | | | | | | | ±1%(F) ±5%(J) | 1mΩ ≤ R ≤ 20mΩ | |
| 0805 | 1/8W | 1/4W | -- | 1/2W | -- | 1W | ±0.5%(D) | 10mΩ ≤ R ≤ 20mΩ | 1/1.5mΩ ±150 ppm/°C(L) 2mΩ ≤ R ≤ 20mΩ ±50 ppm/°C(E) |
| | | | | | | | ±1%(F) ±5%(J) | 1mΩ ≤ R ≤ 20mΩ | |
| 1206 (0L/WL/4L) | 1/4W | 1/2W | -- | 1W | -- | -- | ±1%(F) ±5%(J) | 1m / 2mΩ | ±50 ppm/°C(E) |
| 1206 (07/7W/47) | 1/4W | 1/2W | -- | 1W | -- | -- | ±0.5%(D) | 5mΩ ≤ R ≤ 20mΩ | 1/2mΩ ±100 ppm/°C(F) 3mΩ ≤ R ≤ 20mΩ ±50 ppm/°C(E) |
| | | | | | | | ±1%(F) ±5%(J) | 1mΩ ≤ R ≤ 20mΩ | |
| 2010 | 1/2W | 1W | 3/2W | 2W | -- | -- | ±0.5%(D) | 5mΩ ≤ R ≤ 20mΩ (2W: 5mΩ ≤ R ≤ 10mΩ) | ±50 ppm/°C(E) |
| | | | | | | | ±1%(F) ±5%(J) | 1mΩ ≤ R ≤ 20mΩ (2W: 1mΩ ≤ R ≤ 10mΩ) | |
| 2512 | 1W | 2W | -- | -- | -- | -- | ±0.5%(D) | (1W: 0.5mΩ ≤ R ≤ 20mΩ) | 1mΩ ≤ R ≤ 20mΩ ±50 ppm/°C(E) 0.5mΩ ≤ R ≤ 0.75mΩ ±75 ppm/°C(M) |
| | | | | | | | ±1%(F) ±5%(J) | (2W: 0.5mΩ ≤ R ≤ 5mΩ) | |

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Note: 1. Please contact with sales offices, distributors and representatives in your region before ordering.

2. Global part number (code7)
3. Global part number (code9)
4. Global part number (code10-11)
5. 0L/WL/4L are only for PA1206 1m/2mΩ



FUNCTIONAL DESCRIPTION

OPERATING TEMPERATURE RANGE

PA0100 to PA0402 Range: -55°C to +125°C

PA0603/ 0805 Range: -55°C to +155°C

PA1206/ 2010/ 2512 Range: -55°C to +170°C

POWER RATING

Standard rated power at 70°C: For detail power value, please refer to Table 2.

RATED VOLTAGE

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

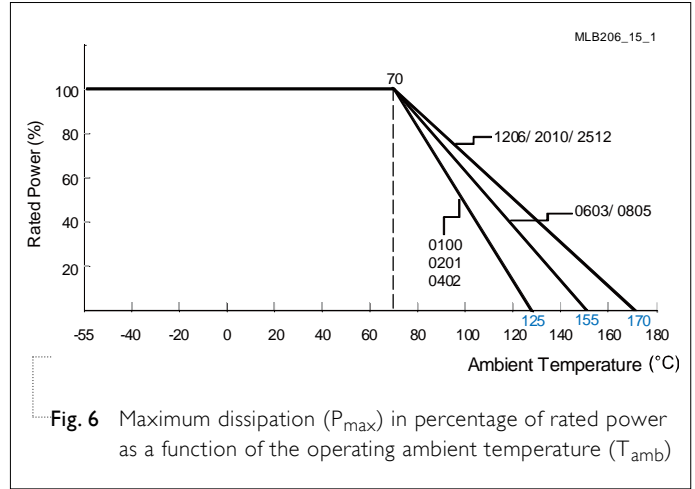
$$V = \sqrt{(P \times R)}$$

Where

V = Continuous rated DC or AC (rms) working voltage (V)

P = Rated power (W)

R = Resistance value (Ω)

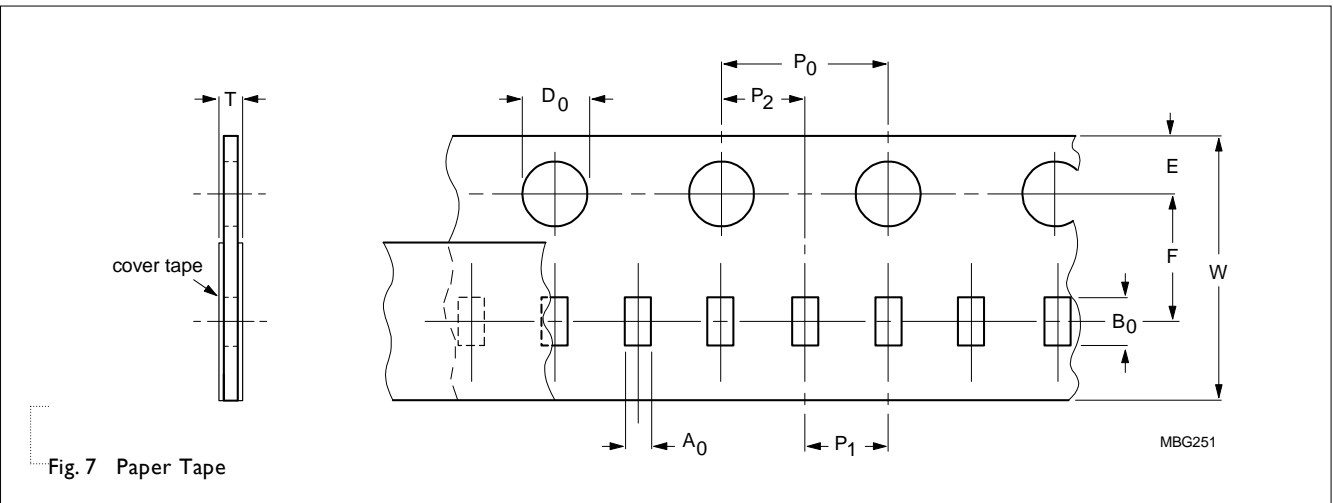


PACKING STYLE AND PACKAGING QUANTITY

Table 3 Packing style and packaging quantity

| PACKING STYLE | REEL DIMENSION | PA0100 | PA0201 | PA0402 | PA0603 | PA0805 | PA1206 | PA2010 | PA2512 |
|--------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Paper Taping Reel (R) | 7" (178 mm) | 20,000 | 10,000 | 10,000 | 5,000 | 5,000 | 4,000 | - | - |
| Embossed Taping Reel (K) | 7" (178 mm) | - | - | - | - | - | - | 4,000 | 4,000 |

PAPER TAPE





EMBOSSED TAPE

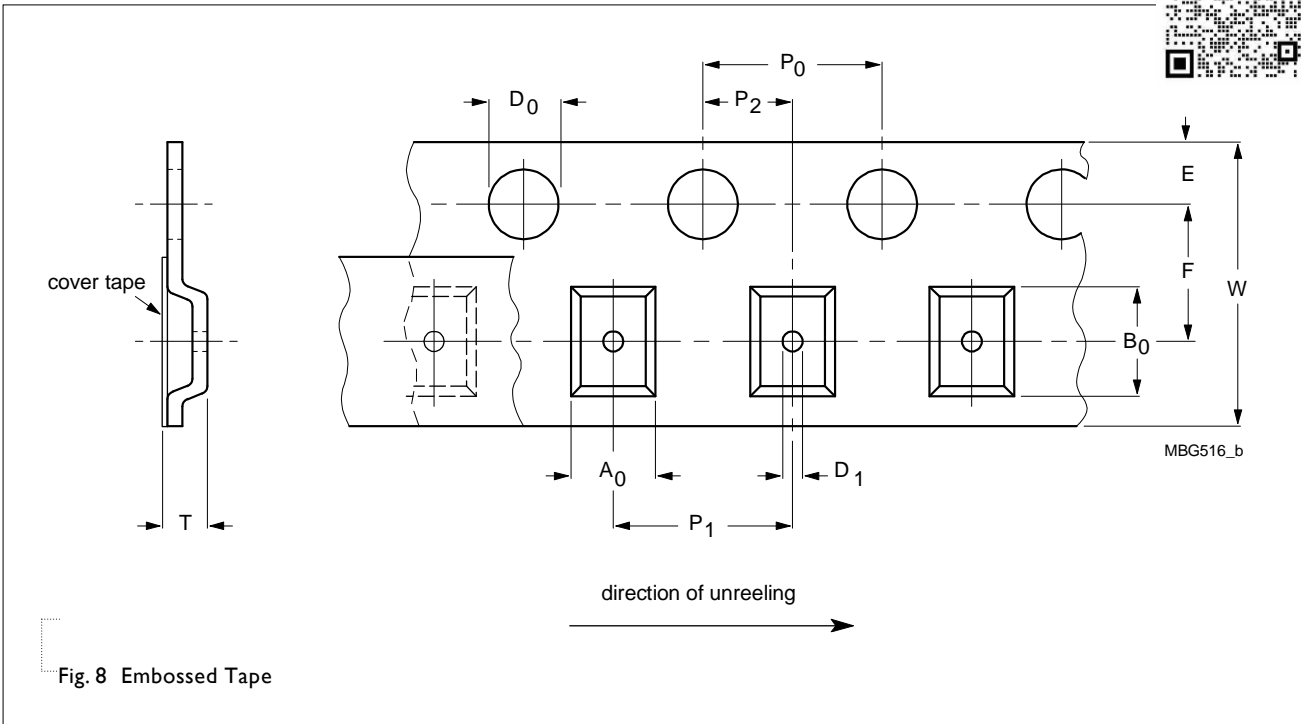


Fig. 8 Embossed Tape

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 | ΦD ₀ | T | |
| PA0100 | 0.24±0.03 | 0.45±0.03 | 8.00±0.20 | 1.75±0.10 | 3.50±0.05 | 4.00±0.05 | 2.00±0.10 | 2.00±0.05 | 1.50±0.10 | 0.31±0.10 | |
| PA0201 | 0.39±0.10 | 0.70±0.10 | 8.00±0.30 | 1.75±0.10 | 3.50±0.10 | 4.00±0.10 | 2.00±0.10 | 2.00±0.10 | 1.55±0.05 | 0.43±0.10 | |
| PA0402 | 0.59±0.10 | 1.10±0.10 | 8.00±0.30 | 1.75±0.10 | 3.50±0.10 | 4.00±0.10 | 2.00±0.10 | 2.00±0.10 | 1.55±0.05 | 0.53±0.10 | |
| PA0603 | 1.08±0.10 | 1.90±0.10 | 8.00±0.30 | 1.75±0.10 | 3.50±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.10 | 1.55±0.05 | 0.60±0.10 | |
| PA0805 | 1.60±0.10 | 2.35±0.10 | 8.00±0.30 | 1.75±0.10 | 3.50±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.10 | 1.55±0.05 | 0.60±0.10 ⁽¹⁾ | |
| | 1.60±0.10 | 2.35±0.10 | 8.00±0.30 | 1.75±0.10 | 3.50±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.10 | 1.55±0.05 | 0.53±0.10 ⁽²⁾ | |
| PA1206 | 1.90±0.10 | 3.50±0.10 | 8.00±0.30 | 1.75±0.10 | 3.50±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.10 | 1.55±0.05 | 0.85±0.15 | |

Note: 1. $1\text{m}\Omega \leq R \leq 2\text{m}\Omega$ ($T = 0.60 \pm 0.10\text{mm}$)
 2. $2.5\text{m}\Omega \leq R \leq 20\text{m}\Omega$ ($T = 0.53 \pm 0.10\text{mm}$)

Table 5 Dimensions of embossed tape for relevant chip resistors size

| SIZE | SYMBOL | | | | | | | | | | Unit: mm |
|--------|----------------|----------------|-----------|-----------|-----------|----------------|----------------|----------------|-----------------|-----------|----------|
| | A ₀ | B ₀ | W | E | F | P ₀ | P ₁ | P ₂ | ΦD ₀ | T | |
| PA2010 | 3.40±0.15 | 6.70±0.15 | 12.0±0.30 | 1.75±0.10 | 5.50±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.10 | 1.55±0.10 | 0.85±0.15 | |
| PA2512 | 3.40±0.15 | 6.70±0.15 | 12.0±0.30 | 1.75±0.10 | 5.50±0.10 | 4.00±0.10 | 4.00±0.10 | 2.00±0.10 | 1.55±0.10 | 0.80±0.15 | |



REEL SPECIFICATION

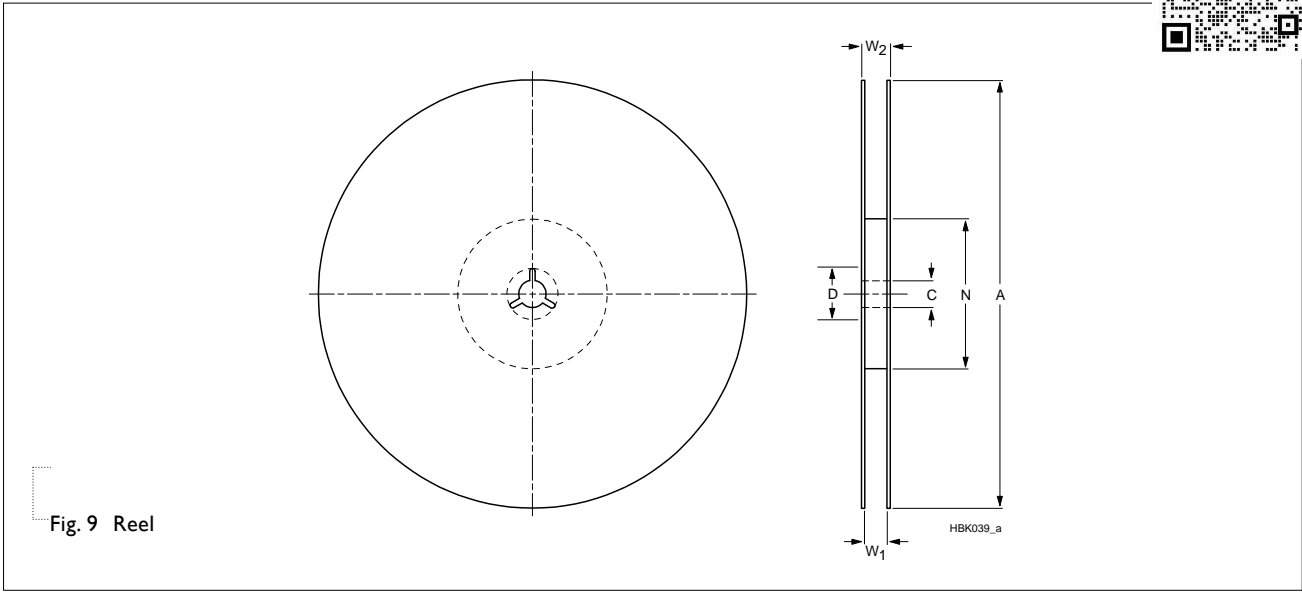
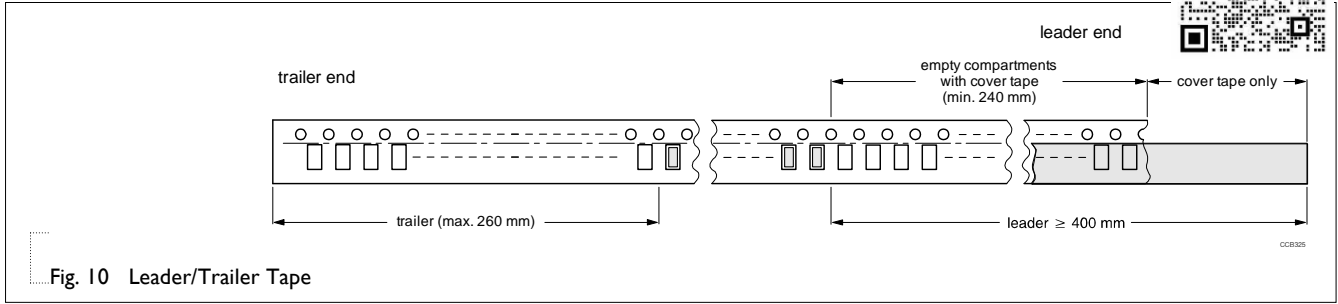


Table 6 Dimensions of reel specification for relevant chip resistors size

| SIZE | QUANTITY PER REEL | REEL SIZE | | REEL SIZE | | SYMBOL | | | |
|--------|-------------------|----------------|----------------|--------------|-----------|-----------|----------|----------------|--|
| | | 8mm TAPE WIDE | 12mm TAPE WIDE | A | N | C | D | W ₁ | |
| PA0100 | 20,000 | 7" (Φ178mm) | - | 180.0+0/-3.0 | 60.0+1/-0 | 13.00±0.2 | 21.0±0.8 | 9.0±0.3 | |
| PA0201 | 10,000 | 7" (Φ178mm) | - | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 9.0±0.5 | |
| PA0402 | 10,000 | 7" (Φ178mm) | - | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 9.0±0.5 | |
| PA0603 | 5,000 | 7" (Φ178mm) | - | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 9.0±0.5 | |
| PA0805 | 5,000 | 7" (Φ178mm) | - | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 9.0±0.5 | |
| PA1206 | 4,000 | 7" (Φ178mm) | - | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 9.0±0.5 | |
| PA2010 | 4,000 | - | 7" (Φ178mm) | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 13.6±0.5 | |
| PA2512 | 4,000 | - | 7" (Φ178mm) | 178.0±1.0 | 60.0+1/-0 | 13.50±0.5 | 21.0±0.8 | 13.6±0.5 | |



LEADER/TRAILER TAPE SPECIFICATION



FOOTPRINT AND SOLDERING PROFILES

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

FOOTPRINT

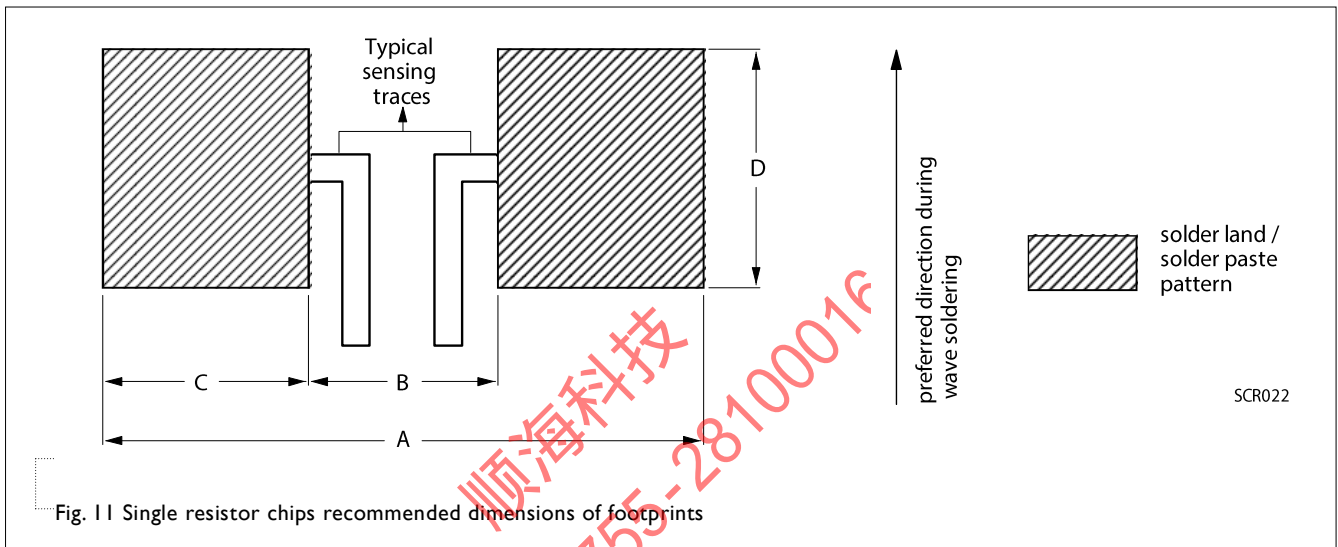


Table 7 Footprint dimensions

Unit: mm

| TYPE | RESISTANCE RANGE | A | B | C | D |
|----------------------|------------------------------------|---------|----------|----------|---------|
| PA0100 | $10m\Omega \leq R \leq 20m\Omega$ | 0.5~0.8 | 0.16~0.2 | 0.17~0.3 | 0.2~0.4 |
| PA0201 | $5m\Omega \leq R \leq 20m\Omega$ | 1.00 | 0.30 | 0.35 | 0.40 |
| PA0402 | $2m\Omega \leq R \leq 20m\Omega$ | 2.00 | 0.40 | 0.80 | 0.60 |
| PA0603 | 1mΩ | 2.20 | 0.80 | 0.70 | 0.90 |
| | $1m\Omega < R \leq 20m\Omega$ | 2.20 | 0.80 | 0.70 | 0.90 |
| PA0805 | 1mΩ | 4.10 | 0.50 | 1.80 | 1.44 |
| | $1.5m\Omega \leq R \leq 20m\Omega$ | 4.60 | 1.00 | 1.80 | 1.44 |
| PA1206 (0L/WL/4L) | 1mΩ / 2mΩ | 3.90 | 0.90 | 1.50 | 1.78 |
| | 1mΩ / 2mΩ | 4.20 | 1.00 | 1.60 | 1.84 |
| PA1206 (07/7W/47) | 2.5mΩ / 3mΩ | 4.80 | 1.00 | 1.90 | 1.84 |
| | $4m\Omega \leq R \leq 20m\Omega$ | 4.80 | 1.20 | 1.80 | 1.84 |
| PA2010 | $1m\Omega \leq R \leq 3m\Omega$ | 6.00 | 1.60 | 2.30 | 3.00 |
| | $4m\Omega \leq R \leq 20m\Omega$ | 6.00 | 3.50 | 1.25 | 3.00 |
| PA2512 | $0.5m\Omega \leq R \leq 1m\Omega$ | 7.36 | 0.50 | 3.43 | 3.68 |
| | $1m\Omega \leq R \leq 4m\Omega$ | 7.37 | 1.27 | 3.05 | 3.68 |
| | $5m\Omega \leq R \leq 6m\Omega$ | 7.40 | 3.18 | 2.11 | 3.68 |
| | $7m\Omega \leq R \leq 20m\Omega$ | 7.36 | 4.06 | 1.65 | 3.68 |



TESTS AND REQUIREMENTS

Table 8 Test condition, procedure and requirements

| TEST | TEST METHOD | PROCEDURE | REQUIREMENT |
|---|---|---|--|
| Short time overload | IEC60115-1 4.13 | 5 times of rated power for 5 seconds at room temperature | 0100 : $\pm(2.0\%+0.0005\Omega)$ 0201~2010 : $\pm(1.0\%+0.0005\Omega)$ 2512 : $\pm(0.5\%+0.0005\Omega)$ No visible damage |
| High Temperature Exposure/ Endurance at Upper Category Temperature | MIL-STD-202G-Method 108 | 1,000 hours at maximum operating temperature depending on specification, unpowered No direct impingement of forced air to the parts Tolerances: 0100/0201/0402: $125\pm 3^{\circ}\text{C}$ 0603/0805: $155\pm 3^{\circ}\text{C}$ 1206/2010/2512: $170\pm 3^{\circ}\text{C}$ | 0100 : $\pm(3.0\%+0.0005\Omega)$ Others : $\pm(1.0\%+0.0005\Omega)$ |
| Temperature Cycling | JESD22-A104 | 1,000 cycles, $-55/+125^{\circ}\text{C}$ for 1 cycle per hour | Others : $\pm(1.0\%+0.0005\Omega)$ 2512 : $\pm(0.5\%+0.0005\Omega)$ |
| Moisture Resistance | MIL-STD-202G-Method 106 | Each temperature / humidity cycle is defined at 8 hours (method 106F), 3 cycles / 24 hours for 10d with $25^{\circ}\text{C} / 65^{\circ}\text{C}$ 95% R.H, without steps 7a & 7b, unpowered | 0100 : $\pm(3.0\%+0.0005\Omega)$ Others : $\pm(0.5\%+0.0005\Omega)$ |
| Biased Humidity | MIL-STD-202 Method 103 | 1,000 hours: $85^{\circ}\text{C} / 85\% \text{RH}$ 10% of operating power | 0100 : $\pm(3.0\%+0.0005\Omega)$ 0201~2010 : $\pm(1.0\%+0.0005\Omega)$ 2512 : $\pm(0.5\%+0.0005\Omega)$ |
| Operational Life/ Endurance | MIL-STD-202G-Method 108 IEC 60115-1 4.25.1 | 1,000 hours at $125\pm 3^{\circ}\text{C}$, de-rated power applied for 1.5 hours on, 0.5 hour off, still-air required 1,000 hours at $70\pm 2^{\circ}\text{C}$ applied rated power 1.5 hours on, 0.5 hour off, still air required | 0100 : $\pm(3.0\%+0.0005\Omega)$ others : $\pm(1.0\%+0.0005\Omega)$ |
| Resistance to Solvents | MIL-STD-202 Method 215 | Immerse in isopropyl alcohol for 5 min with ultrasonic at room temperature | No visible damage |
| Mechanical Shock | MIL-STD-202 Method 213 | Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen. Peak value: 100 g's Duration: 6 ms Velocity change: 12.3 ft/s Waveform: Half sine | 0100 : $\pm(1.0\%+0.0005\Omega)$ Others : $\pm(0.5\%+0.0005\Omega)$ |
| Vibration | MIL-STD-202 Method 204 | 5 g's for 20 min., 12 cycles each of 3 orientations Test from 10-2000 Hz. | 0100 : $\pm(1.0\%+0.0005\Omega)$ Others : $\pm(0.5\%+0.0005\Omega)$ |
| Resistance to Soldering Heat | MIL-STD-202G-method 210 | Condition B, no pre-heat of samples Leadfree solder, 260°C , 10 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol | 0100 : $\pm(1.0\%+0.0005\Omega)$ Others : $\pm(0.5\%+0.0005\Omega)$ No visible damage |

| TEST | TEST METHOD | PROCEDURE | REQUIREMENT |
|--|------------------------|--|---|
| Thermal Shock | MIL-STD-202 Method 107 | -55/+125°C, Number of cycles is 300. Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air -Air | Others :±(1.0%+0.0005Ω) 2512 : ± (0.5%+0.0005Ω) No visible damage |
| Electrostatic Discharge | AEC-Q200-002 | Human Body Model, 1 pos + 1 neg. 0805/ 1206/ 2010/ 2512 : 2KV 0402/ 0603 : 1KV 0100/ 0201: 500V | ±(1.0%+0.0005Ω) No visible damage |
| Solderability - Wetting | J-STD-002 | 0201 to 2512 : (a) Method B, aging 4 hours at 155°C dry heat, dipping at 235±3°C for 5±0.5 seconds. (b) Method B, steam aging 8 hours, dipping at 215±3°C for 5±0.5 seconds. (c) Method D, steam aging 8 hours, dipping at 260±3 °C for 30±0.5 seconds. 0100 : 1st step: Method B, aging 4 hours at 155°C dry heat. 2nd step: Lead-free solder bath at 245±3°C, dipping at 245±3°C for 3±0.5 seconds | Well tinned (>95% covered) No visible damage |
| Flammability | UL94 | Try to inflame a specimen by a needle flame | No ignition of specimen;V-0 |
| Board Flex / Bending | AEC-Q200-005 | Chips mounted on a 90mm glass epoxy resin PCB (FR4), Bending for 0100: 5mm 0201: 3mm 0402 and above: 2mm Holding time: Min.60 seconds | ±(1.0%+0.0005Ω) |
| Terminal Strength (SMD) | AEC-Q200-006 | Applied 0100: 1N 0201: 3N 0402: 5N 0603/0805/1206/2010/2512: 17.7N for 60±1 seconds. | ±(1.0%+0.0005Ω) No visible damage |
| Flame Retardance | AEC-Q200-001 | Apply voltage to increase the surface temp to 350 °C | No flame, no explosion |
| Temperature Coefficient of Resistance (T.C.R.) | IEC 60115-1 4.8 | 0100~2010 at +25/+125 °C 2512 at +25/+150°C Formula: $T.C.R = \frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/°C)}$ Where t1 =+25 °C or specified room temperature 0100~2010: t2 =+125 °C test temperature 2512 : t2 =+150°C test temperature R1=resistance at reference temperature in ohms R2=resistance at test temperature in ohms | Refer to table 2 |



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REVISION HISTORY

| REVISION | DATE | CHANGE NOTIFICATION | DESCRIPTION |
|-----------|---------------|---------------------|---|
| Version 2 | Aug. 06, 2021 | - | - Add size of PA2512 and PA1206(0L/WL/4L) |
| Version 1 | Jun. 10, 2021 | - | - Add size of PA0100 and tol. $\pm 0.5\%$ for 0201/0402/0603/2010 |
| Version 0 | May. 07, 2020 | - | - New datasheet for automotive grade current sensor – PA0201/0402/0603/0805/1206/2010 series. |

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