

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

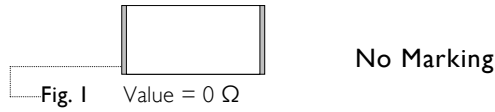
The ordering code for a PA0603 chip resistor, value 0 Ω, supplied in 7-inch tape reel with 5Kpcs quantify is: PA0603-R-070RL.

NOTE

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

MARKING

PA0201



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

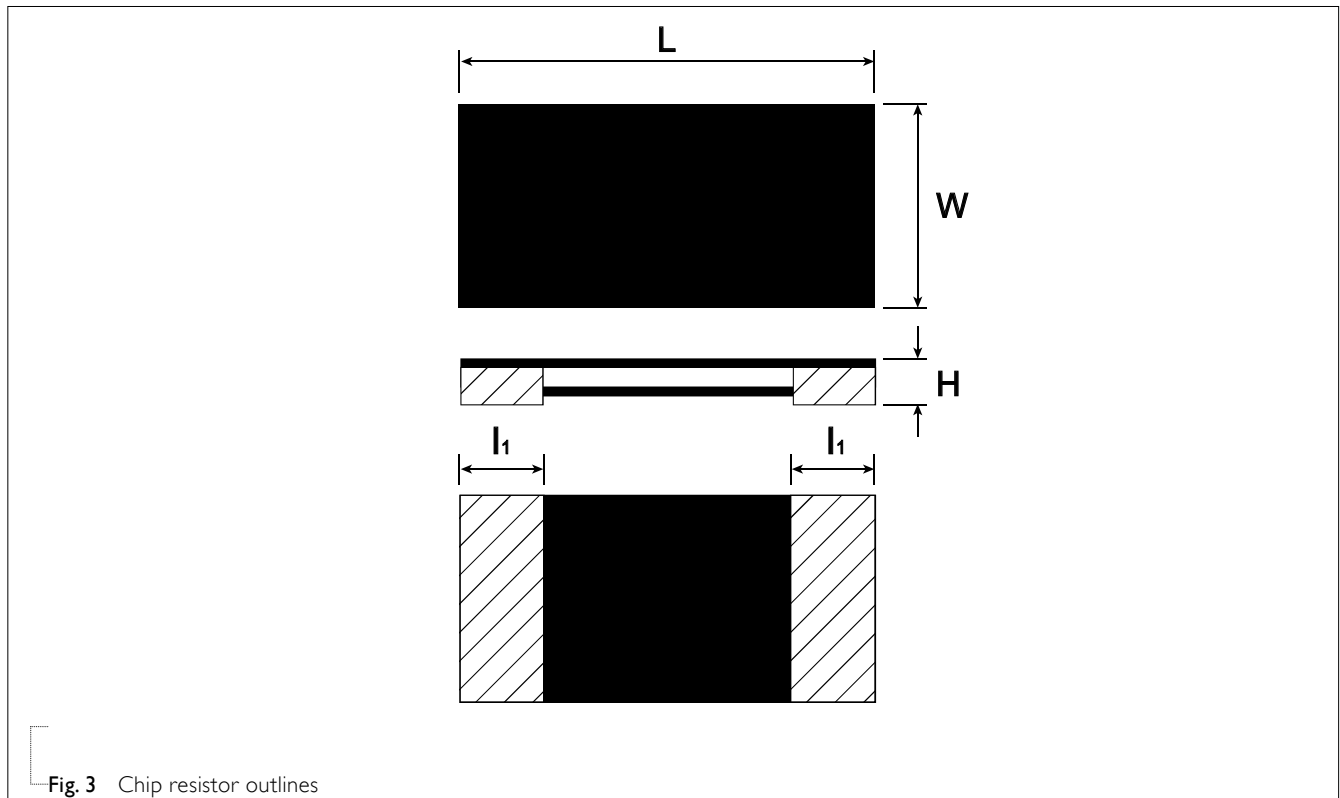


Fig. 3 Chip resistor outlines

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

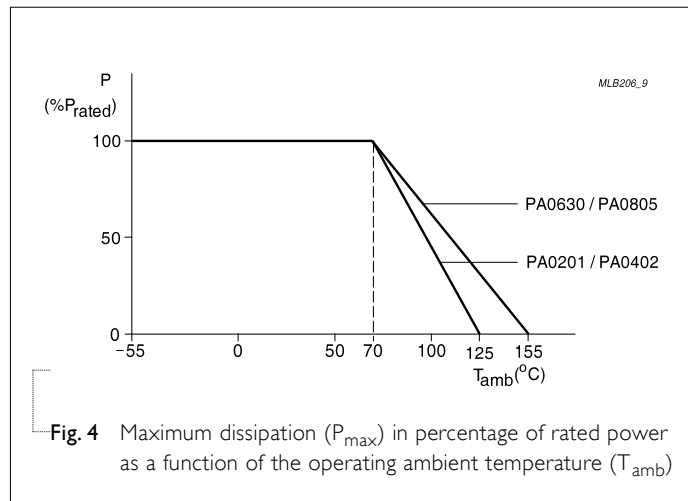


Fig. 4 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

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

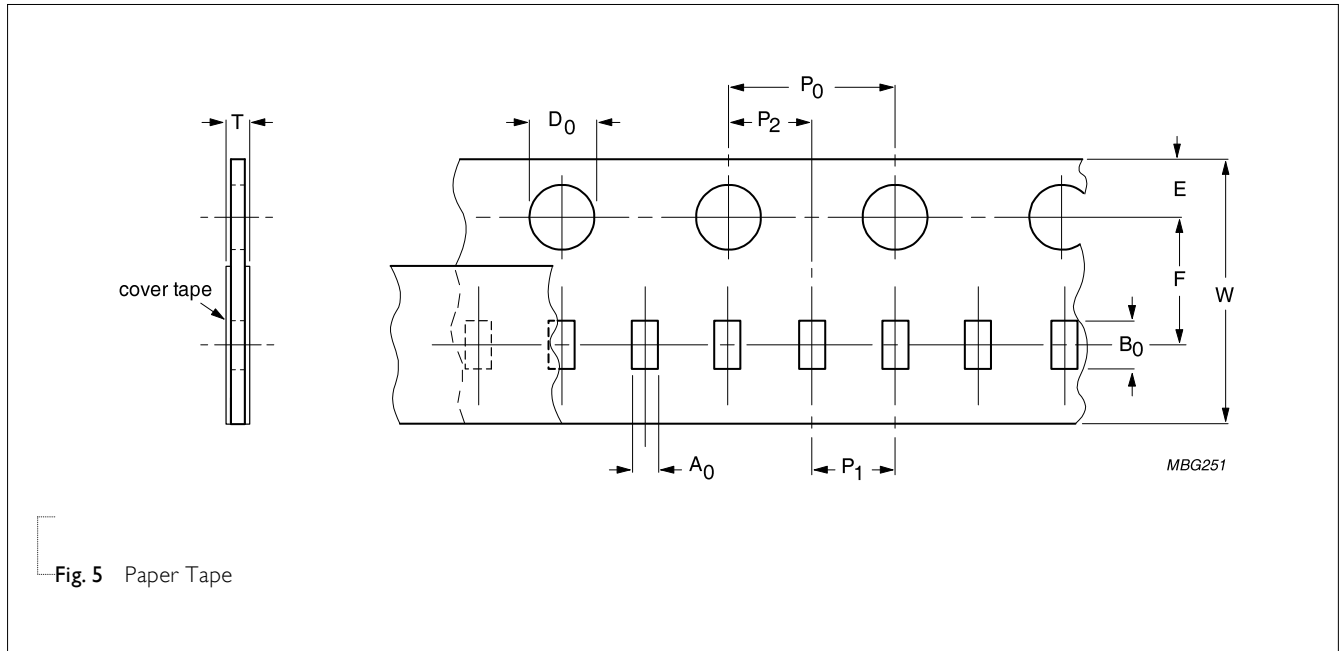


Fig. 5 Paper Tape

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

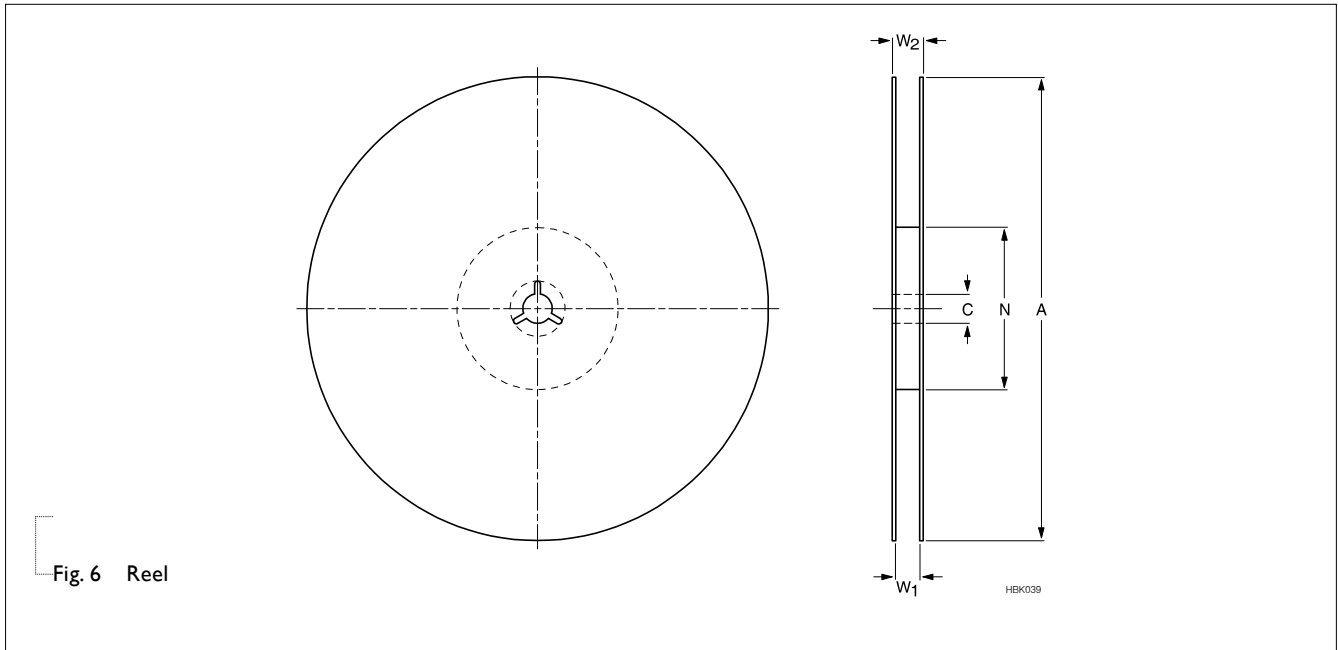
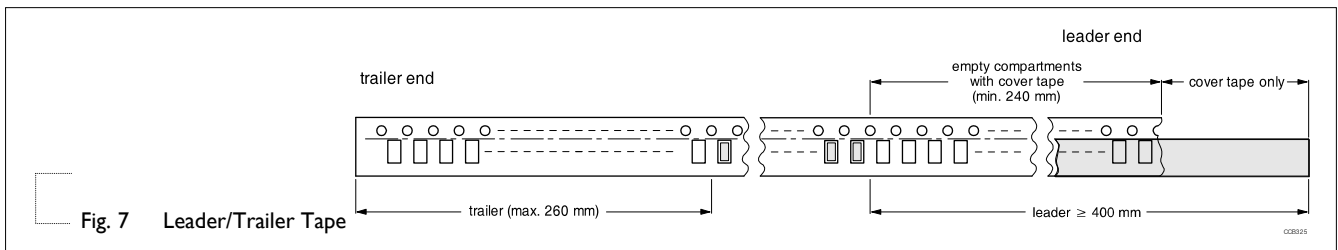


Table 5 Dimensions of reel specification for relevant chip resistors size

| 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" (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

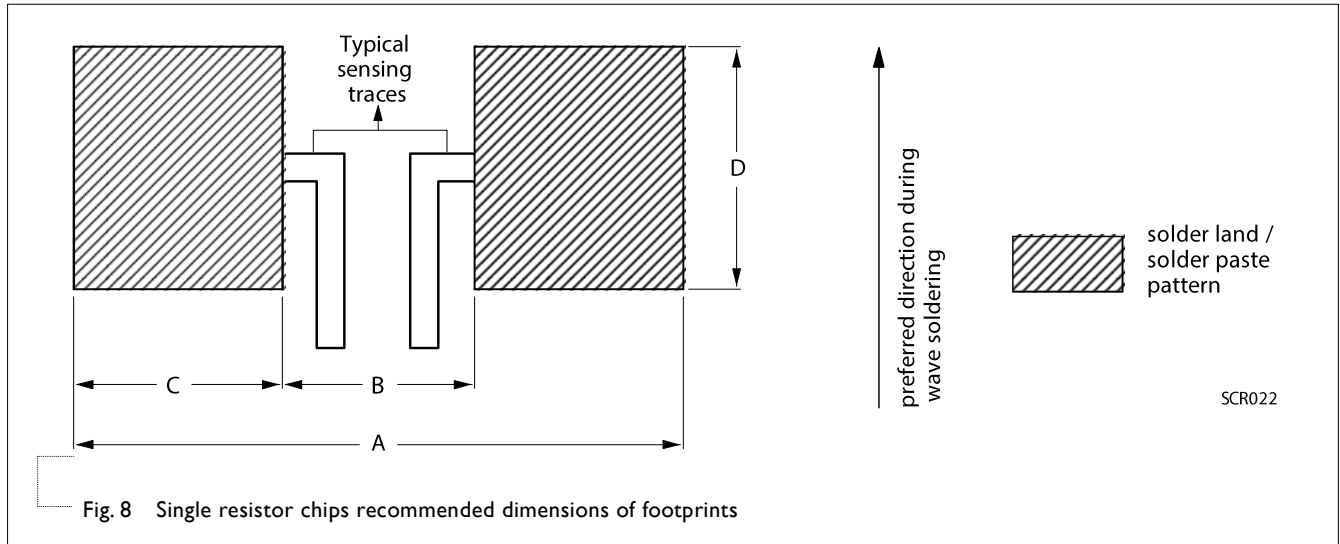


Table 6 Footprint dimensions

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 | Well tinned |
| | | 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 | (>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 | 0201: < 5mΩ |
| | | Lead free solder, 260±5°C, 10±1 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol | 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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