Innovative Service Around the Globe YAGEO

DATA SHEET

CURRENT SENSOR-LOW TCR

PS0612

5%, 1%, 0.5%

0.5mΩ~100mΩ

RoHS Compliant & Halogen Free

YAGEO

Phicomp

Product specification

1. SCOPE

This specification describes PS0612 series current sensor – low TCR chip resistors with lead-free terminations made by metal alloy process.

2. FEATURES

- This product with lead free terminations meet RoHS requirements.
- High component and equipment reliability
- Ultra-low resistance and narrow tolerance can suitable for current detection.

3. PRODUCT APPLICATIONS

- Battery Pack
- Inverter/ Converter (DC-DC/AC-DC/DC-AC)
- Consumer Electrics
- Laptop

4. ORDERING INFORMATION

Part number is identified by the series name, size, tolerance, packaging type, temperature coefficient of resistance, taping reel and resistance value.

PS0612	X	X	X	XX	XXXXX	L
	(1)	(2)	(3)	(4)	(5)	(6)

(1) TOLERANCE

D = ±0.5% (10mΩ & 20mΩ)
F = ±1%
J = ±5%

(2) PACKAGING TYPE

K = Embossed taping reel

(3) TEMPERATURE COEFFICIENT OF RESISTANCE

F=±100ppm/°C
L=±150ppm/°C
G=±200ppm/°C
P=±300ppm/°C

(4) TAPING REEL

07 = 7“ dia. Reel & rated power(1W)

(5) RESISTANCE VALUE

0U5(0.5mΩ)
0R001(1mΩ) ~ 0R1(100mΩ)

(6) DEFAULT CODE

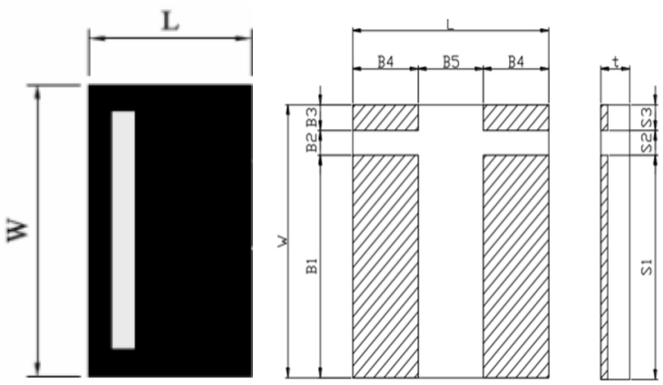
L = Kelvin configuration on standard land pattern for current sensing.

ORDERING EXAMPLE

The ordering code for a PS0612 1W chip resistor, value 0.001Ω with ±1% tolerance, supplied in 7-inch tape reel with 4Kpcs quantifies is: PS0612FKL070R001L.

5. DIMENSIONS

Dimensions (mm)			
L (mm)	1.60+0.15/-0.20	B1 (mm)	2.20±0.20
W (mm)	3.20±0.20	B2 (mm)	0.50±0.20
S1 (mm)	2.20±0.20	B3 (mm)	0.50±0.20
S2 (mm)	0.50±0.20	B4 (mm)	0.45±0.20
S3 (mm)	0.50±0.20	B5 (mm)	0.70±0.20
t (mm)	(0.5~1mΩ) 0.70±0.20 (2~10mΩ) 0.60±0.20 (12~100mΩ) 0.50±0.20		



Top Bottom Side

CONSTRUCTION

The resistors are constructed in high grade materials. Internal metal electrodes are added at each end and connected by a resistive material that is applied to the top surface of metal alloy. See Fig. 1.

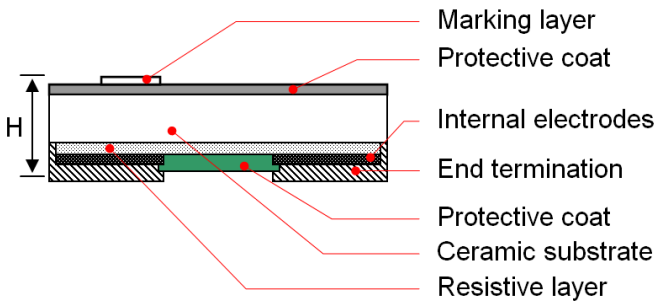


Fig.1 Chip resistor outlines

6. POWER RATING

6.1 ELECTRICAL CHARACTERISTICS

(1) Rated Power at 70°C		1W
(2) Operating Temperature Range	0.5mΩ ~ 10mΩ	–55°C to +150°C
	12mΩ ~ 100mΩ	–55°C to +125°C
(3) Maximum Working Voltage		$\sqrt{(P*R)}$
(4) Tolerance		±1%, ±5%
(5) Temperature Coefficient	0.5mΩ	±300ppm/℃
	1mΩ	±150ppm/℃
	2mΩ ~ 9mΩ 14mΩ ~ 100mΩ	±100ppm/℃
	10mΩ ~ 13mΩ	±200ppm/℃

0.5mΩ ~ 10mΩ

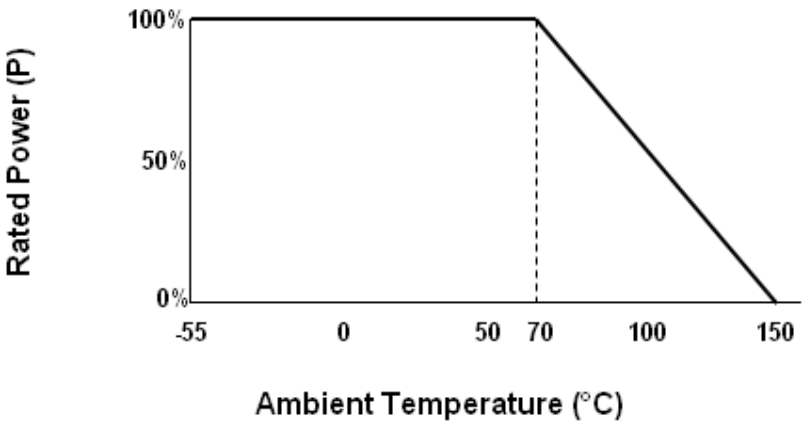


Fig. 2-1 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (Tamb)

12mΩ ~ 100mΩ

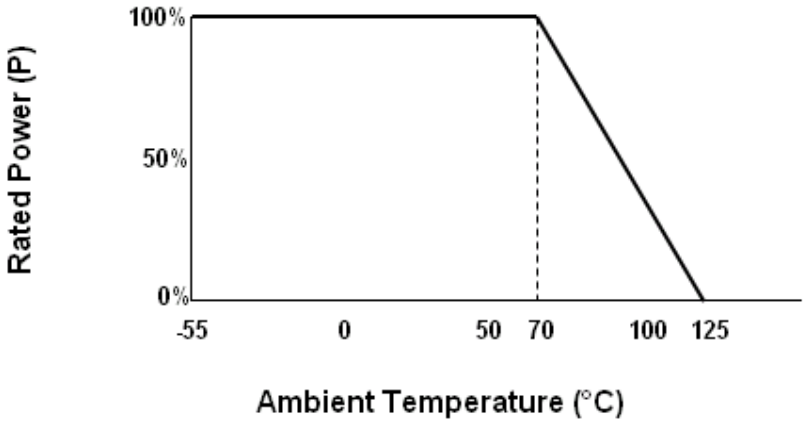


Fig. 2-2 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (Tamb)

6.2 RATED VOLTAGE:

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

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

Where

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

P=Rated power , R=Resistance value

7. MARKING

Bar marking

Fig. 3

8. TESTS AND REQUIREMENTS

TEST	TEST METHOD	PROCEDURE	REQUIREMENT
Life/ Endurance	IEC 60115-1 4.25.1	1,000 hours at 70±5 °C 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 125 °C &150 °C ,unpowered	± (1.0 % + 0.0005Ω)
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 °C / 65 °C 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)
Short time overload	IEC 60115-1 4.13	5 times of rated power at room temperature	± (1% + 0.0005Ω) No visible damage
Board Flex/ Bending	IEC 60068-2-21	Chips mounted on a 90mm glass epoxy resin PCB(FR4) 2 mm bending Bending time: 60±5 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 °C dry heat 2nd step: leadfree solder bath at 245±3 °C Dipping time: 3±0.5 seconds	Well tinned (>95% covered) No visible damage
- Resistance to Soldering Heat	IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 260±5 °C, 10±1seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	± (0.5% + 0.0005Ω) No visible damage

9. PACKING

9.1 TAPING REEL

DIMENSION	Tape Width (mm)	A (mm)	N (mm)	W1 (mm)	W2 (mm)
PS0612	8	178.0 ±5	60.0 ±2	8.4 +1/-0	Max.12.4

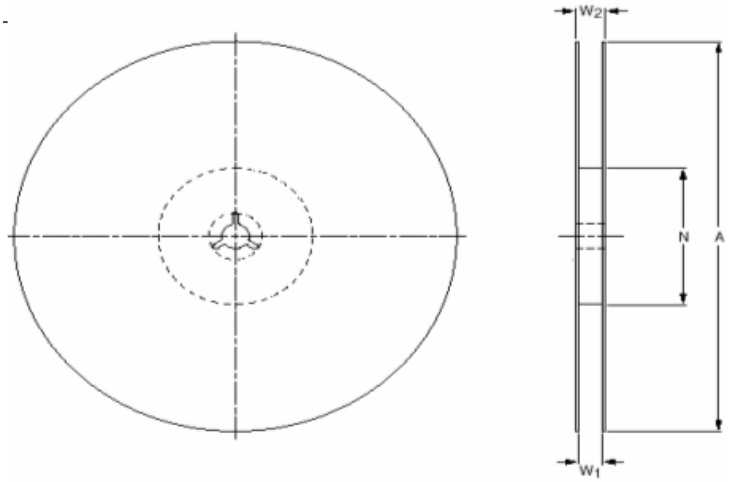


Fig.4 Reel

9.2 EMBOSSED TAPE SPECIFICATIONS

A0 (mm)	B0 (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)
1.91±0.05	3.65±0.05	8.00+0.30/-0.10	1.75±0.10	3.50±0.005	4.00±0.10

P1 (mm)	P2 (mm)	D0 (mm)	T (mm)
4.00±0.10	2.00±0.05	1.5±0.10	0.88±0.05

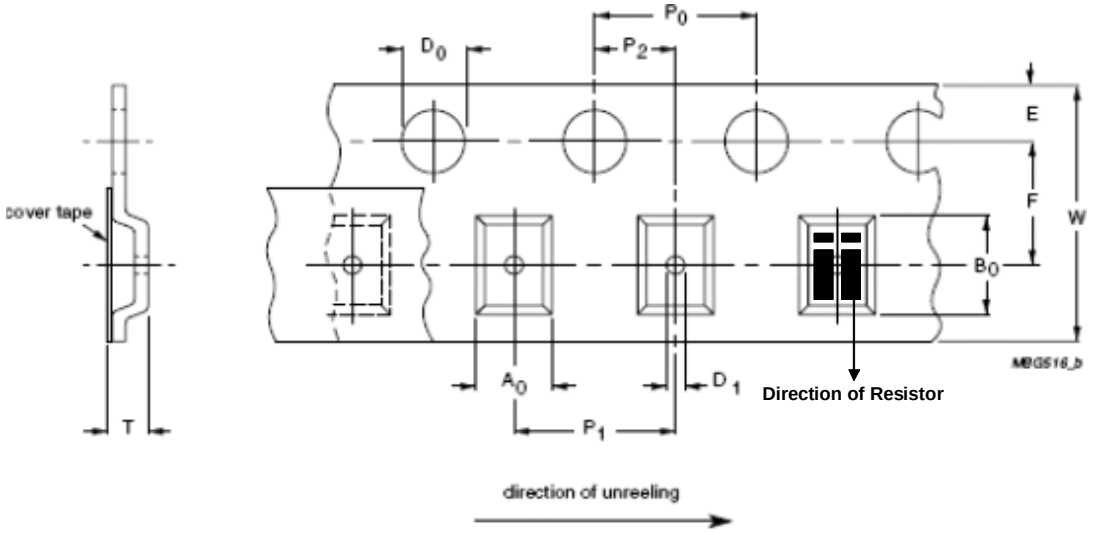


Fig.5 Tape

9.3 PACKING METHOD

PACKING STYLE AND PACKAGING QUATITY

PACKING STYLE	**REEL DIMENSION**	**PS0612**
Embossed Taping Reel	7" (178 mm)	4,000 Units

9.4 FOOTPRINT DIMENSION

Size Footprint	Dimensions Code			unit: mm		
PS0612	a	b	c	d	e	t (um)
	1.0	3.5	0.8	0.38	0.75	105

t : Copper foil minimum thickness of PCB

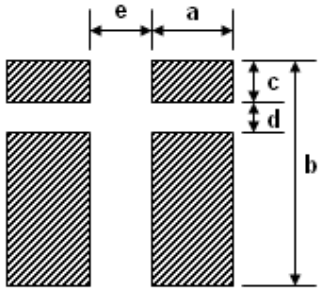


Fig.6 Recommended Footprint Dimensions

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	2015-04-13		- First issue of this specification
Version 1	2017-11-21		- Add 0.5% tol.