Innovative Service Around the Globe YAGEO

DATA SHEET

CURRENT SENSOR-LOW TCR

PL series

±5%, ±1%

size 0805

RoHS Compliant & Halogen Free



YAGEO

Product specification – July 21, 2025 V.0

SCOPE

This specification describes PL0805 current sensor – low TCR chip resistors with leadfree terminations.

APPLICATIONS

- NB, Pad, Smartphone
- Consumer

FEATURES

- Halogen-free Epoxy
- PFAS Free
- RoHS compliant
- Reduce environmentally hazardous wastes
- High component and equipment reliability
- None forbidden-materials used in products/production
- Low resistances applied to current sensing
- Moisture sensitivity level: MSL 1
- AEC-Q200 qualified

ORDERING INFORMATION - GLOBAL PART NUMBER

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

GLOBAL PART NUMBER

PL	XXXX	X	X	XX	XXXX	L
	(1)	(2)	(3)	(4)	(5)	(6)

(1) SIZE

0805

(2) TOLERANCE

F = ±1%

J = ±5%

(3) PACKAGING TYPE

R = Paper taping reel

(4) TEMPERATURE COEFFICIENT OF RESISTANCE

F = ±100ppm/°C

(5) TAPING REEL

47 = 7 inch dia. Reel and specific rated power.

Detailed power rating are shown in the Table 2.

(6) RESISTANCE VALUE

1mΩ to 3mΩ

There are 3~5 digits indicated the resistance value. Letter R is decimal point.

Detailed coding rules of resistance are shown in the table of "Resistance rule of global part number".

(7) DEFAULT CODE

Letter L is system default code for order only (Note)

Resistance rule of global part number

Resistance code rule	Example
0RXXX	0R001 = 0.001Ω
0RXXX	0R002 = 0.002Ω
0RXXX	0R003 = 0.003Ω
XUX	1U5 = 0.0015Ω

ORDERING EXAMPLE

The ordering code for a PL0805 0.5W chip resistor, TCR 100, Value 1mΩ with ±1% tolerance, supplied in 7-inch tape reel with 5Kpcs quantify is: **PL0805FRF470R001L.**

NOTE

1. All our R-chip products meet RoHS compliant and Halogen Free. "LFP" of the internal 2D reel label mentions "Lead Free Process".
2. On customized label, "LFP" or specific symbol can be printed.

MARKING

PL0805



No marking

Fig. 1

CONSTRUCTION

The resistors are constructed using outstanding TCR level material, which makes YAGEO PL resistors excellent for current sensing application in battery charger circuit.

The composition of the resistive material is adjusted to give the approximate required resistance and is covered with a protective coating. Finally, the three external terminations (Cu / Ni / matte Tin) are added, as shown in Fig. 2.

OUTLINES

For dimension see Table 1

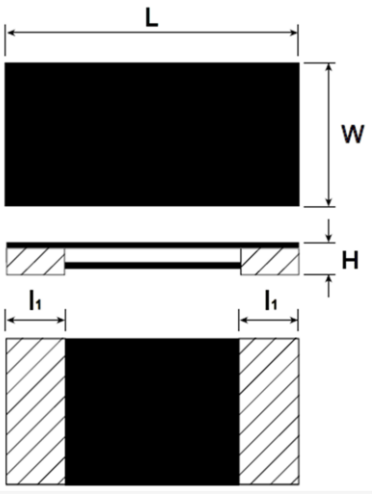


Fig. 2 Chip resistor outlines

DIMENSION

Table 1

TYPE	RESISTANCE RANGE	L (mm)	W (mm)	H (mm)	l_1 (mm)
PL0805P	1mΩ ≤ R < 1.5mΩ	2.00±0.15	1.25±0.15	Max. 0.40	0.70±0.15
	1.5mΩ ≤ R ≤ 3mΩ	2.00±0.15	1.25±0.15	Max. 0.40	0.70±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

TYPE	SIZE(1)	Power Rating(4)@70°C	TOLERANCE(2)	RESISTANCE RANGE(6)	TEMPERATURE COEFFICIENT OF RESISTANCE(4)
		47			
PL	0805	0.5W	±1%(F) ±5%(J)	1mΩ ≦ R ≦ 3mΩ	±100 ppm/°C(F)

NOTE : 1. Global part number (code 7)
2. Global part number (code 9)
3. Global part number (code 10-11)

PACKING STYLE AND PACKAGING QUANTITY

Table 3

PRODUCT TYPE	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
PL0805	Paper Taping Reel	7" (178 mm)	5,000 Units

NOTE:
For carrier tape and reel specification/dimensions, please see the special data sheet "Packing" document

FUNCTIONAL DESCRIPTION

POWER RATING

PL0805 rated power at 70°C is 0.5W

RATED VOLTAGE

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

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

or max. working voltage whichever is less
Where

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

P = Rated power (W)

R = Resistance value (Ω)

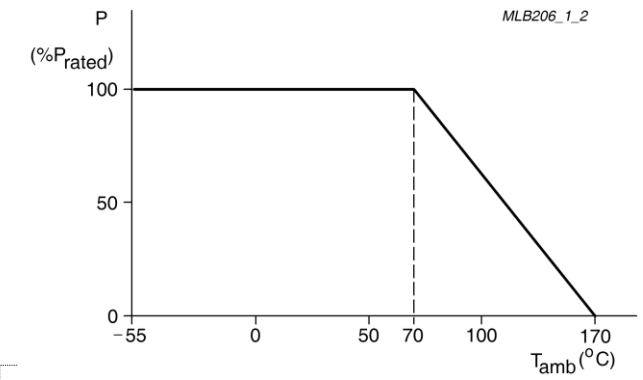


Fig. 3 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature ($T_{amb.}$)

TAPING REEL

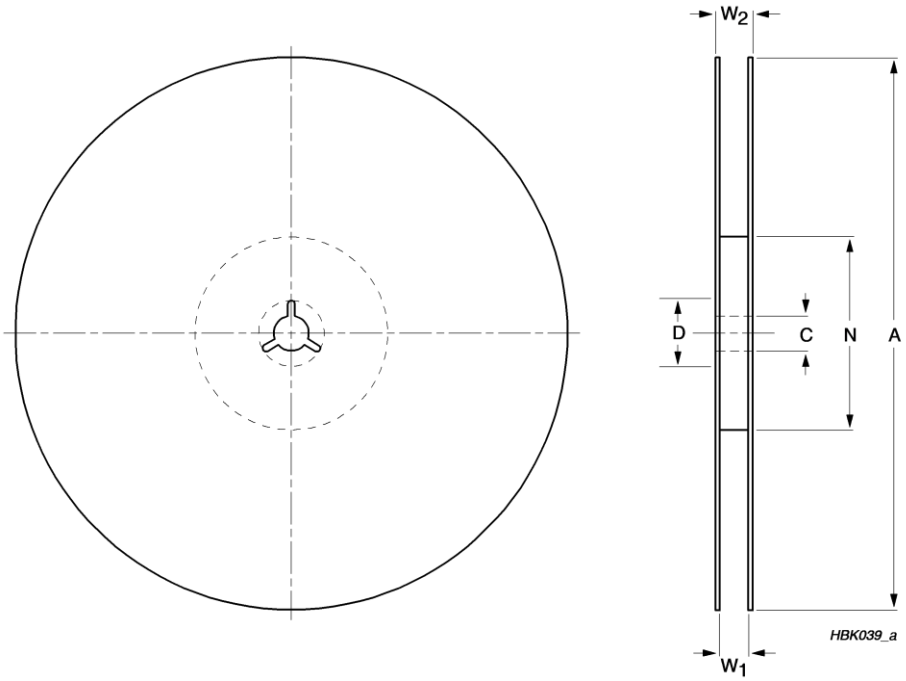


Fig. 4 Reel

Table 4 Reel dimensions; see Fig.5

SIZE	QUANTITY PER REEL	TAPE WIDTH	SYMBOL					Unit: mm
			A	N	C	D	W_1	$W_{2max.}$
0805	5000	8 (Ø178 mm /7")	178 ±1.0	60.0+1/-0	13.50±0.5	21.0±0.8	9.0±0.5	12.4

PAPER/PE TAPE SPECIFICATION

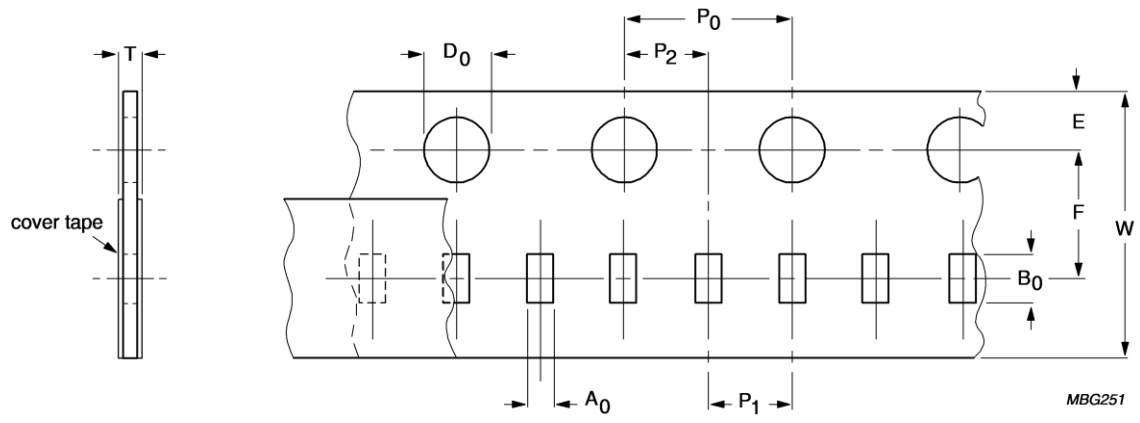


Fig. 5 Paper tape

Table 5 Dimensions of embossed tape for relevant chip resistors size

Unit: mm

SIZE	SYMBOL									
	A_0	B_0	W	E	F	P_0	P_1	P_2	ΦD_0	T
PL0805	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±0.10	0.43±0.10

FOOTPRINT DIMENSION

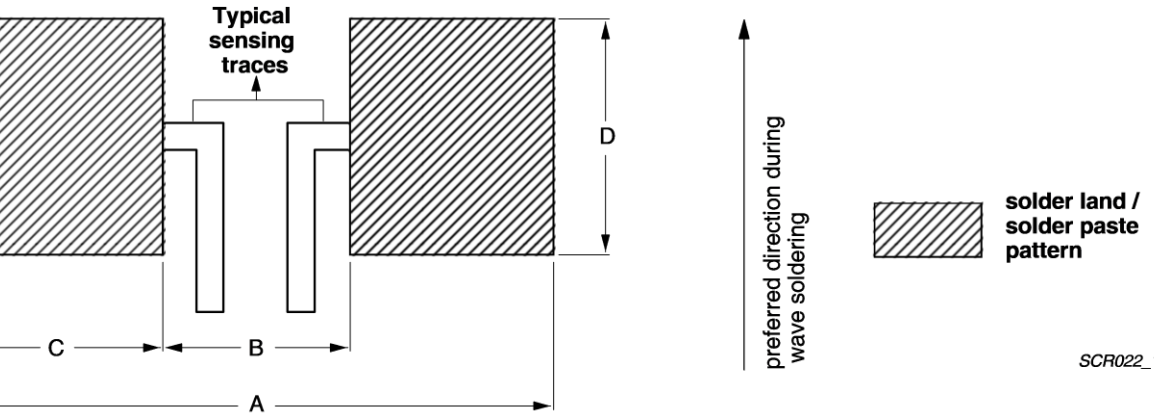


Fig. 6 Recommended footprint dimensions

Table 6 Footprint dimensions

Unit: mm

SIZE	RESISTANCE RANGE	A	B	C	D
PL0805	1mΩ ≦ R < 1.5mΩ	4.10	0.50	1.80	1.44
	1.5mΩ ≦ R ≦ 3mΩ	4.10	0.80	1.65	1.44

TESTS AND REQUIREMENTS

Table 7 Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Short time overload	IEC60115-1 8.1	5 times of rated power for 5 seconds at room temperature	±(0.5%+0.0005Ω)
High Temperature Exposure	MIL-STD-202-Method 108	1,000 hours at 170±3°C, unpowered	±(1.0%+0.0005Ω)
Temperature Cycling	JESD22-A104	-55/+155°C, 1000 cycles Dwell time is 15 minutes. Devices mounted Air – Air.	±(1%+0.0005Ω)
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH 10% of operating power	±(0.5%+0.0005Ω)
Life Endurance	MIL-STD-202-Method 108	1,000 hours at 70±2°C applied rated power 1.5 hours on, 0.5 hour off, still air required	±(1.0%+0.0005Ω)
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	±(0.5%+0.0005Ω)
Vibration	MIL-STD-202 Method 204	5 g's for 20 min., 12 cycles each of 3 orientations Test from 10-2000 Hz.	±(0.5%+0.0005Ω)
Resistance to Soldering Heat	MIL-STD-202-method 210	Specimen passed 3 times reflow temperature at 260°C, with solder	±(0.5%+0.0005Ω) No visible damage
Electrostatic Discharge	AEC-Q200-002	Human Body Model, 1 pos + 1 neg. Discharges 2KV	±(1.0%+0.0005Ω) No visible damage
Solderability	J-STD-002	1) Baking 4 hours@155 °C dry heat, dipping at @245±3 °C for 5±0.5 second 2) Baking 4 hours@155 °C dry heat, dipping at @260±3 °C for 30±0.5 second	Good tinning (≥95% covered); no visual damage.

TEST	TEST METHOD	PROCEDURE	REQUIREMENT
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 glass epoxy resin PCB (FR4), Bending for 2 mm Holding time: Min.60 seconds	±(1.0%+0.0005Ω)
Terminal Strength (SMD)	AEC-Q200-006	Applied a 17.7N (1.8Kg) for 60±1 seconds.	±(1.0%+0.0005Ω) No visible damage
Flame Retardance	AEC-Q200-001	Applied power to increase the surface temp. to 350°C	No flame, no explosion
Temperature Coefficient of Resistance (T.C.R.)	MIL-STD-202 Method 304	At +25/+125°C **Formula:** $T.C.R = \frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6$ (ppm/°C) Where t_1 = +25°C or specified room temperature t_2 = +125°C test temperature R_1 = resistance at reference temperature in ohms R_2 = resistance at test temperature in ohms	Refer to table 2

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 0	Jul. 21, 2025	-	- First issue of this specification

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