

1.Scope

This specification applies to Common Mode Choke Coil (PLA10AH□□□□□□2B series).

2.Part Numbering

(Ex.)

$\overset{P}{\text{Product ID}}$ $\overset{L}{\text{Type}}$ $\overset{A}{\text{Applications}}$ $\overset{1}{\text{Structure}}$ $\overset{0}{\text{Safety Standard}}$ $\overset{H}{\text{Inductance}}$ $\overset{2}{\text{Rated Current}}$ $\overset{2}{\text{Winding Mode}}$ $\overset{R}{\text{Lead Dimensions}}$ $\overset{2}{\text{Packaging}}$
 (H : Not certified High Inductance Type) (R : Standard Type) (D : Section Winding Type) (B : Bulk)

3.Rating

Item	Specification
Withstand Voltage (between coils)	2000 V(AC)(1minute) or 2400 V(AC)(1second)
Insulation Resistance(between coils : 500VDC)	100 MΩ min.
Winding Temperature rise	60 °C max. (with Rated Current)
Operating Temperature Range	-25 to +55 °C
Storage Temperature Range	-25 to +85 °C

※Please use in the condition that operating temperature is 115°C max. on operating in the final assembled product.

※Maximum allowable temperature at the surface of coil (ambient temperature + winding temperature rise) is in accordance with each safety standard that final assembled product is applicable to.

Standard type

Part Number	Rated Current (A)	Rated Voltage		Direct Current Resistance (Ω max.)	Inductance L1,L2 (mH min.)	Inductance Difference L1-L2 (mH max.)
		(Vac)	(Vdc)			
PLA10AH2222R2R2B	2.2	300	500	0.11	2.2	0.12
PLA10AH3321R8R2B	1.8	300	500	0.17	3.3	0.15
PLA10AH5321R4R2B	1.4	300	500	0.28	5.3	0.19
PLA10AH1031R0R2B	1.0	300	500	0.52	10	0.26
PLA10AH1330R8R2B	0.8	300	100	0.78	13	0.31
PLA10AH1830R7R2B	0.7	300	100	1.10	18	0.36
PLA10AH2830R6R2B	0.6	300	100	1.60	28	0.43
PLA10AH4130R5R2B	0.5	300	100	2.10	41	0.52

Sectional Winding type

Part Number	Rated Current (A)	Rated Voltage		Direct Current Resistance (Ω max.)	Inductance L1,L2 (mH min.)	Inductance Difference L1-L2 (mH max.)
		(Vac)	(Vdc)			
PLA10AH1222R4D2B	2.4	300	500	0.11	1.2	0.09
PLA10AH2921R7D2B	1.7	300	500	0.21	2.9	0.14
PLA10AH3821R4D2B	1.4	300	500	0.27	3.8	0.16
PLA10AH5921R1D2B	1.1	300	500	0.40	5.9	0.20
PLA10AH7121R0D2B	1.0	300	500	0.51	7.1	0.22
PLA10AH1230R8D2B	0.8	300	100	0.78	12	0.28
PLA10AH1530R7D2B	0.7	300	100	1.1	15	0.32
PLA10AH2030R6D2B	0.6	300	100	1.5	20	0.37
PLA10AH2930R5D2B	0.5	300	100	2.0	29	0.44

4. Appearance, Dimensions and Equivalent Circuit Diagram

See Fig.1 and Fig.2.

5. Marking

5-1.Product

(Ex. PLA10AH2222R2R2B) → 2222R2 Lot No.

- ① Inductance
- ② Rated Current
- ③ Lot No.

※ STAMP

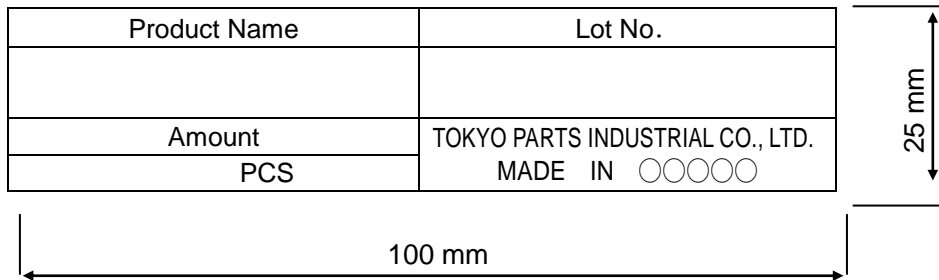
222 2R2 A
 ① ② ③

LOT NO. STAMP MANUFACTURE YEARS CABLE ADDRESS TABLE/ EIAJ RC-1001A,2.3 ITEM

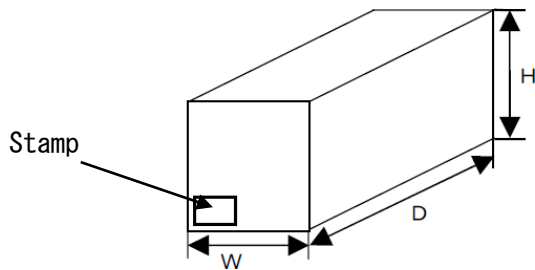


		Month													
		1	2	3	4	5	6	7	8	9	10	11	12		
Year	2017	2021	A	B	C	D	E	F	G	H	J	K	L	M	
	2018	2022	N	P	Q	R	S	T	U	V	W	X	Y	Z	
2019	2023		a	b	c	d	e	f	g	h	i	j	k	l	m
2020	2024		n	o	p	q	r	s	t	u	v	w	x	y	z

5-2. Packaging



6. Specification of Outer Case



Outer Case Dimensions(mm)			Quantity / Box (Pcs)
W	D	H	
385	310	218	1000

※Above outer Case size is typical. It depends on a quantity of an order.

7.Reference test condition

<Unless otherwise specified>
 Temperature : 15 to 35 °C
 Humidity : 25 to 85%(RH)

<In case of doubt>
 Temperature : 20 ± 2 °C
 Humidity : 60 to 70 %(RH)
 Atmospheric Pressure : 86 to 106 kpa

For an AC Voltage, unless otherwise specified, frequency is 50 or 60 Hz, and value of AC Voltage is measured in term of Root-mean-square value.
 (After, the reference test condition is called room condition.)

8.Electrical Performance

NO.	Item	Specification	Test Method												
8-1	Inductance L1,L2 Inductance Difference L1-L2	Inductance shall meet item 3.	Measuring terminal :T1-T2(L1), T3-T4(L2) Measuring Instrument : 4284A or equivalent Frequency : 1kHz Mode : SERIES DC BIAS : OFF <table border="1"> <tr> <td>Inductance (Typical)</td> <td>1mH max</td> <td>more than 1mH to 10mH max.</td> <td>more than 10mH</td> </tr> <tr> <td>Range</td> <td>1000 μH</td> <td>10 mH</td> <td>100 mH</td> </tr> <tr> <td>Measuring Current</td> <td>10 mA</td> <td>1 mA</td> <td>0.1 mA</td> </tr> </table> <p>(Caution) Range shall be fixed when inductance is measured. When using equivalent to 4284A , Measuring Current shall be adjusted on the same value.</p>	Inductance (Typical)	1mH max	more than 1mH to 10mH max.	more than 10mH	Range	1000 μ H	10 mH	100 mH	Measuring Current	10 mA	1 mA	0.1 mA
Inductance (Typical)	1mH max	more than 1mH to 10mH max.	more than 10mH												
Range	1000 μ H	10 mH	100 mH												
Measuring Current	10 mA	1 mA	0.1 mA												
8-2	Direct Current Resistance	Direct Current Resistance shall meet item 3.	Measuring terminal : T1-T2, T3-T4 Ambient Temperature : 20 °C												
8-3	Temperature rise	The surface of coil : 60°C max.	Applying Current : Rated Current												
8-4	Coil humming noise	Coil humming noise is little audible.	Applying Current : Rated Current AC Voltage : 50Hz or 60Hz, sine wave												
8-5	Withstand Voltage	Products shall be no failure.	Measuring terminal : T1/T2-T3/T4 (between coils) Test Voltage : 2000V(AC)(1minute) or 2400V(AC)(1second) Cut-off : 2mA												
8-6	Insulation Resistance	Insulation Resistance shall meet item 3.	Measuring terminal : T1/T2-T3/T4 (between coils) Test Voltage : 500V(DC) Time : 1 minute												

9.Mechanical Performance

NO.	Item	Specification	Test Method
9-1	Appearance and Dimensions	There shall not be a conspicuous dirt, crack, and so on. Dimensions shall be as shown in Fig.1 and Fig.2.	Visual Inspection Measured with slide calipers
9-2	Terminal Strength	The Terminal shall not be damaged. (Cutting of lead wire, missing of terminal etc.)	The body of product shall be fixed, and the force of 9.8N shall be applied gradually and sustained for 5 seconds to each terminal in axial direction of the terminal.
9-3	Solderability	Along the circumference of terminal shall be covered with new solder at least 90%.	Flux : Ethanol solution of rosin,25(wt)% Pre-heat : 150°C \pm 10°C, 60s to 90s Solder : Sn-3.0Ag-0.5Cu Solder Temperature : 240 \pm 3 °C Immersion Time : 3 \pm 1 s Immersion Depth : 3.6 \pm 0.8 mm from the root of terminal

No.	Item	Specification	Test Method	
9-4	Resistance to soldering heat (In the case of solder bath)	Products shall meet Table 1.. <u>Table 1</u>	Flux : Ethanol solution of rosin,25(wt)% Pre-heat : 150°C ± 10°C, 60s to 90s Solder : Sn-3.0Ag-0.5Cu Solder Temperature : 270 ± 5 °C Immersion Time : 10 ± 1 s Immersion Depth : 3.6 ± 0.8 mm from the root of terminal Then measured after exposure in the room condition for 4 to 24 hours. Tip Temperature : 380 ± 10 °C Time : 3s (+1s,-0s) Then measured after exposure in the room condition for 4 to 24 hours Vibration Frequency : 10 to 55 to Hz / for 1 minute Amplitude : 1.5 mm Time and direction : A period of 2 hours in each of 3 mutually perpendicular directions. (Total 6 hours) Maximum Acceleration : 981 m / s ² Normal Duration : 6 ms Wave form : Half-sine wave Velocity Change : 3.75 m / s Direction : along the three mutually perpendicular axes of the product Times : each direction (total 6 times)	
		Appearance		No damage
		Inductance Change		within ± 10%
		Insulation Resistance		100 MΩ min.
9-5	Resistance to soldering heat (In the case of soldering iron)	Withstand Voltage	Products shall be no failure.	
9-6	Vibration			
9-7	Shock			

10.Environmental Performance

No.	Item	Specification	Test Method
10-1	Temperature Cycle	Products shall meet Table 1.	1 cycle : step 1 : -25 °C(+0°C, -3°C) / 30minutes step 2 : Ordinary temp. / 3 minutes max. step 3 : +85 °C(+3°C, -0°C) / 30minutes step 4 : Ordinary temp. / 3 minutes max. Total of 10 cycles Then measured after exposure in the room condition for 4 to 24 hours.
10-2	Humidity		Temperature : 40 ± 2 °C Humidity : 90 to 95 %(RH) Time : 1000 h (+24h,-0h) Then measured after exposure in the room condition for 4 to 24 hours.
10-3	Cold Resistance		Temperature : -40 ± 2 °C Time : 1000 h (+24h,-0h) Then measured after exposure in the room condition for 4 to 24 hours.
10-4	Heat Resistance		Temperature : 85 ± 2 °C Time : 1000 h (+24h,-0h) Then measured after exposure in the room condition for 4 to 24 hours.
10-5	Heat Life①		Temperature : 85 ± 2 °C Test Voltage : 500 V(AC) Time : 1000 h (+24h,-0h) Then measured after exposure in the room condition for 4 to 24 hours.
10-6	Heat Life②		Temperature : 85 ± 2 °C Test Voltage : Rated Voltage (DC) Time : 1000 h (+24h,-0h) Then measured after exposure in the room condition for 4 to 24 hours.

11. ⚠ Caution

11-1. Rated Current

Operating Current should not exceed the rated value.
 Even if operating current is under the rated value, adequate ventilation is required to avoid excessive heat generated within the product (common mode choke coil) and from surrounding heat sources.
 If exceeding these conditions, excessive heat may cause fumes or permanent damage to the product (common mode choke coil).

Please ensure that the product (common mode choke coil) is evaluated and confirmed against the specification when it is mounted in your final assembled product.

Winding temperature should be less than 115°C.

Maximum allowable temperature at the surface of coil (ambient temperature + winding temperature rise) is in accordance with each safety standard that final assembled products applicable to.

When the temperature at winding exceeds maximum allowable temperature of safety standard, the rated current should be derated.

11-2. Surge current

Surge current should not exceed 10 times rated current within 1/4 cycle of 50/60Hz commercial power line.
 Excessive surge current or excessively repeated surge current (with interval between surge : less than 10 seconds) may cause fumes or permanent damage to the product (common mode choke coil).

11-3. Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment (2) Aerospace equipment (3) Undersea equipment
- (4) Power plant control equipment (5) Medical equipment
- (6) Transportation equipment (vehicles, trains, ships, etc.)
- (7) Traffic signal equipment (8) Disaster prevention / crime prevention equipment
- (9) Data-processing equipment
- (10) Application of similar complexity and/or reliability requirements to the applications listed in the above

11-4. Fail-safe

Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

12. Notice

12-1. Magnetic flux leakage

Common Mode Choke Coils generate small amounts magnetic flux leakage that may adversely affect equipment operation according to components arrangement.

Testing should be completed by your final assembly product to ensure equipment performance is not effected.

12-2. Coil humming noise

Magnetic flux generated between the choke coil windings creates repulsive power between the coil windings. This repulsive power causes the coil winding to vibrate and create a humming noise.

The amount of hum produced by the coil windings is proportionate to the amount of harmonic distortion generated by the operating current.

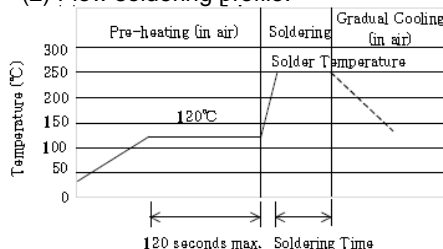
This does not influence the electrical performance of the coils, but it should be considered and tested in actual circuit application.

12-3. Soldering conditions

(1) Flux, Solder

- Rosin-based flux should be used.
 Do not use strong acidic flux with halide content exceeding 0.2(wt)% (chlorine conversion value).
- Use Sn-3.0Ag-0.5Cu solder.

(2) Flow soldering profile.



< Limited soldering profile >

Solder Temperature	Soldering Time	Cycle of flow
265°C ± 3°C	5 s	2 cycles

< Standard soldering profile >

Solder Temperature	Soldering Time
250°C ± 2 °C	4 ~ 6 s

(3)Solder iron

Tip temperature : 350°C max.

Solder Time : 3(+1,-0)s

Times : 2 times max.

12-4.Cleaning

Avoid cleaning product due to non-waterproof construction.

12-5.Storage and Handling conditions

(1)Storage period

Use the products within 12 months after delivered.

Solderability should be checked if this period is exceeded.

(2)Storage condition

- Storage temperature : -10 to +40°C

Relative humidity : 30 to 70%

Products should be stored without sudden changes in temperature and humidity.

Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidation of lead terminals resulting in poor solderability or corrosion of windings.

- Products should be stored on the palette for prevention of the influence from humidity, dust and so on.
- Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.

(3)Handling conditions

Care should be taken when transporting or handling products to avoid excessive vibration or mechanical shock.

12-6.Other

Please do not proceed productsd secondary, like processing of lead or pouring a resin

13. Country of origin, Production Plant

MADE IN CHINA

[SHANTOU SPECIAL ECONOMIC ZONE TOKYO PARTS CO.,LTD:6/F, 8TH Building, Longhu Processing Disteict, SHANTOU SEZ, Guangdong, China.]

14.  Note

14-1.Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.

14-2.You are requested not to use our product deviating from the agreed specifications.

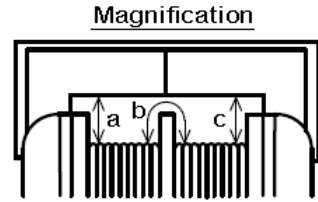
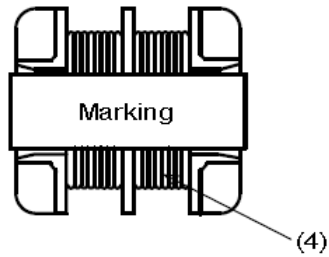
14-3.Please return one duplicate of this product specification to us with your signature to acknowledge your receipt. If the duplicate is not returned by two month after issued date, the product specification will be deemed to have been received by you.

14-4.We consider it not appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.

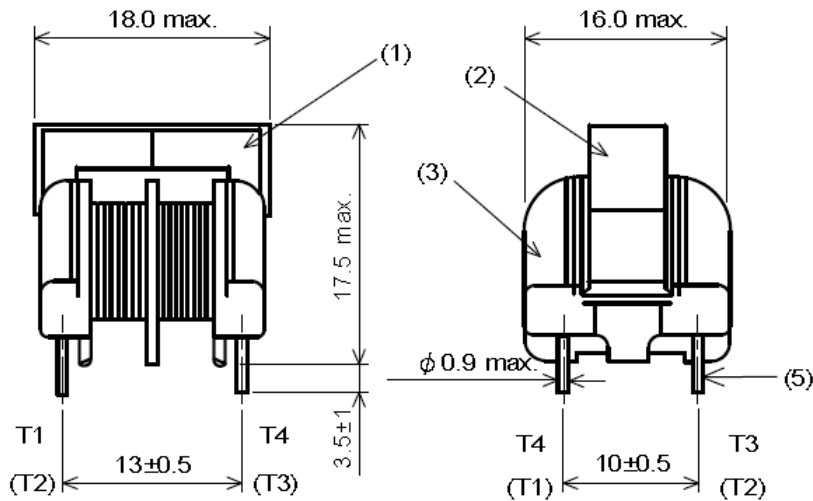
Fig. 1

PLA10A Appearance and Dimensions
(Standard Type)

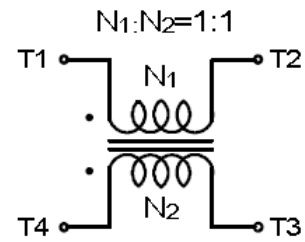
Method to unite Core and Bobbin : Varnish



Spacing through air (a+c) : 3.2 min.
 (a) : 1.0 min.
 (c) : 1.0 min.
 Spacing over surface (b) : 3.2 min.



Equivalent Circuit Diagram



Bobbin thickness : 0.5 min.

(in mm)

■ Unit Weight (Typical value)

7.2 g

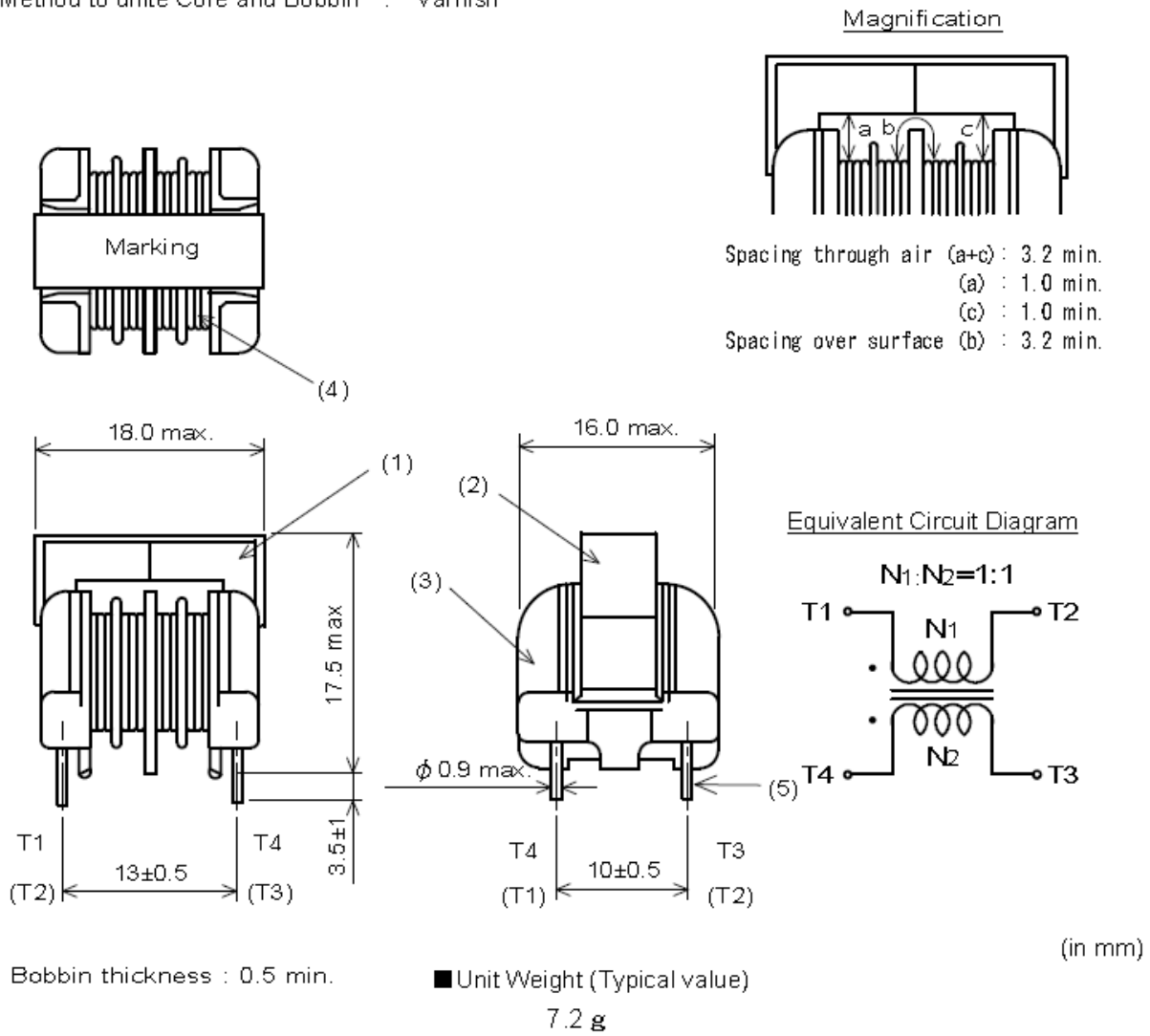
Material

NO.	Item	Material
(1)	Core	Ferrite
(2)	Spring	SUS301
(3)	Bobbin	Phenolic(PF) : PM-8315,UL94V-0
		Phenolic(PF) : PM-9820,UL94V-0
		Phenolic(PF) : PM-9823,UL94V-0
(4)	Coil	Polyurethane Enameled Copper Wire 2UEW
(5)	Terminal	Solder coated CP wire (Sn-5Cu)

Fig. 2

PLA10A Appearance and Dimensions
(Sectional Winding Type)

Method to unite Core and Bobbin : Varnish



Material

NO.	Item	Material
(1)	Core	Ferrite
(2)	Spring	SUS301
(3)	Bobbin	Phenolic(PF) : PM-8315、UL94V-0
		Phenolic(PF) : PM-9820,UL94V-0
		Phenolic(PF) : PM-9823,UL94V-0
(4)	Coil	Polyurethane Enameled Copper Wire 2UEW
(5)	Terminal	Solder coated CP wire (Sn-5Cu)