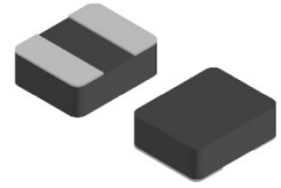


## FEATURES

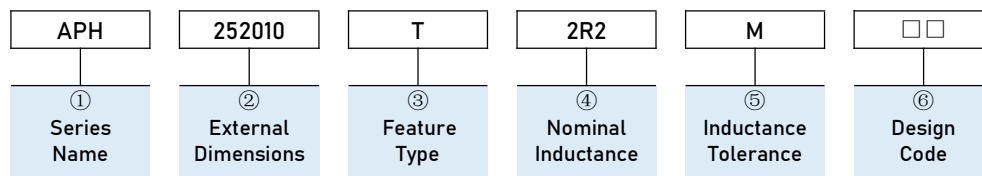
- Metal material for large current and low loss.
- Ultra low buzz noise.
- Metal material for large current and low loss.
- Closed magnetic circuit design reduces leakage.



## APPLICATIONS

- Smart phone, set top box, VR, AR
- SSD, Bluetooth, Wi-Fi module
- Laptops and PCs
- Base stations
- RoHS, REACH Compliance.

## PART NUMBERING



① Series Name	
APH	Molded SMD Power Inductors

② External Dimensions(L×W×H) [mm]	
201208	2.0x1.2x0.8
201610	2.0x1.6x1.0
252010	2.5x2.0x1.0
252012	2.5x2.0x1.2

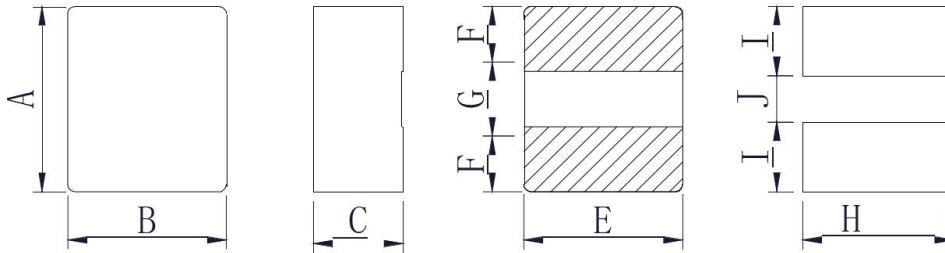
③ Feature Type	
T	Standard

⑤ Inductance tolerance	
Code (example)	Inductance tolerance
M	±20%

④ Nominal inductance	
Code (example)	Nominal inductance [μH]
R47	0.47
2R2	2.2
4R7	4.7

⑥ Design Code	
□□	Standard product is blank

**DIMENSIONS & RECOMMENDED LAND PATTERN**



Recommended Land Pattern

Unit: mm

Series	Dimensions						Recommended Land Pattern		
	A	B	C Max.	E Typ.	F Typ.	G Typ.	H Typ.	I Typ.	J Typ.
APH201208	2.0±0.2	1.2±0.2	0.80	1.2	0.8	0.5	1.4	0.9	0.5
APH201610	2.0±0.2	1.6±0.2	1.00	1.6	0.7	0.6	1.8	0.9	0.5
APH252010	2.5±0.2	2.0±0.2	1.00	2	0.9	0.7	2.1	1.0	0.6
APH252012	2.5±0.2	2.0±0.2	1.20	2	0.9	0.7	2.1	1.0	0.6

**ELECTRICAL CHARACTERISTICS**

● APH201208 Series

Part Number	Inductance	Inductance Tolerance	Saturation Current	Heat Rating Current	DC Resistance	
	@100kHz,1V		Max.	Max.	Max.	Typ.
Units	μH	-	A	A	mΩ	
Symbol	L	-	Isat	Irms	DCR	
APH201208TR47M	0.47	±20%	4.60	2.70	50	34
APH201208T1R0M	1	±20%	3.50	2.40	70	55
APH201208T2R2M	2.2	±20%	2.30	1.50	185	160

● APH201610 Series

Part Number	Inductance	Inductance Tolerance	Saturation Current	Heat Rating Current	DC Resistance	
	@100kHz,1V		Max.	Max.	Max.	Typ.
Units	μH	-	A	A	mΩ	
Symbol	L	-	Isat	Irms	DCR	
APH201610TR22M	0.22	±20%	6.30	5.80	22	16
APH201610TR24M	0.24	±20%	6.30	5.80	22	16
APH201610TR33M	0.33	±20%	6.20	5.30	24	19
APH201610TR47M	0.47	±20%	6.00	5.60	28	22
APH201610TR68M	0.68	±20%	5.50	5.00	34	24
APH201610T1R0M	1	±20%	4.20	4.10	43	38
APH201610T1R5M	1.5	±20%	2.90	2.30	100	90
APH201610T2R2M	2.2	±20%	2.80	2.10	150	135
APH201610T3R3M	3.3	±20%	2.00	1.50	180	162
APH201610T4R7M	4.7	±20%	1.50	1.15	250	229

## ELECTRICAL CHARACTERISTICS

## ● APH252010 Series

Part Number	Inductance	Inductance Tolerance	Saturation Current	Heat Rating Current	DC Resistance	
	@100kHz,1V		Max.	Max.	Max.	Typ.
Units	$\mu$ H	-	A	A	m $\Omega$	
Symbol	L	-	Isat	Irms	DCR	
APH252010TR24M	0.24	$\pm 20\%$	7.80	6.40	21	15.5
APH252010TR33M	0.33	$\pm 20\%$	7.20	6.20	22	16
APH252010TR47M	0.47	$\pm 20\%$	6.50	5.60	23	17
APH252010TR68M	0.68	$\pm 20\%$	5.50	5.00	29	22
APH252010T1R0M	1	$\pm 20\%$	4.80	4.10	33	25
APH252010T1R5M	1.5	$\pm 20\%$	3.90	3.00	55	42
APH252010T2R2M	2.2	$\pm 20\%$	3.00	2.10	70	62
APH252010T3R3M	3.3	$\pm 20\%$	2.50	2.00	100	86
APH252010T4R7M	4.7	$\pm 20\%$	2.00	1.60	160	145

## ● APH252012 Series

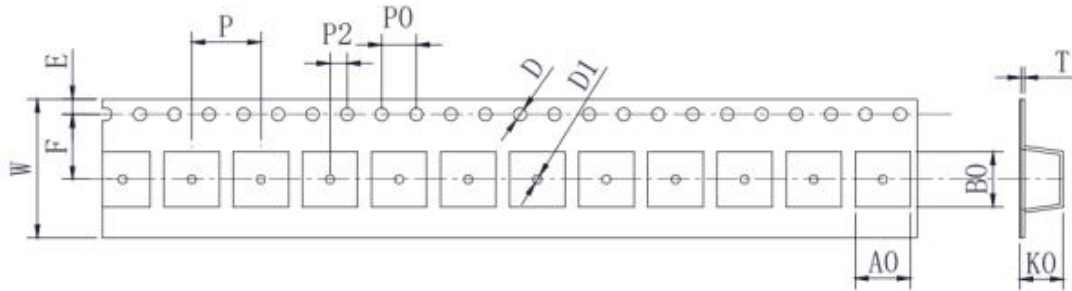
Part Number	Inductance	Inductance Tolerance	Saturation Current	Heat Rating Current	DC Resistance	
	@100kHz,1V		Max.	Max.	Max.	Typ.
Units	$\mu$ H	-	A	A	m $\Omega$	
Symbol	L	-	Isat	Irms	DCR	
APH252012T1R0M	1	$\pm 20\%$	4.30	3.30	42	38
APH252012T2R2M	2.2	$\pm 20\%$	3.30	2.20	75	64

## RELIABILITY DATA

Items	Requirements	Test Methods and Remarks
Insulation Resistance	$\geq 100M\Omega$	100 V DC between inductor coil and The middle of the top surface of the body for 60 seconds.
Solderability	90% or more of electrode area shall be coated by new solder.	Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at $(245\pm 5)^{\circ}C$ for $(5\pm 1)$ seconds.
Resistance to Soldering Heat	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at $(260\pm 5)^{\circ}C$ for $(10\pm 1)$ seconds.
Adhesion of terminal electrode	Strong bond between the pad and the core, without come off PC board.	Inductors shall be subjected to $(260\pm 5)^{\circ}C$ for $(20\pm 5)$ s Soldering in the base whit 0.3mm solder. And then aplomb electrode way plus tax 10 N for $(10\pm 1)$ seconds.
High temperature	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Temperature is $(+85\pm 2)^{\circ}C$ and keep $(96\pm 2)$ hours.
Low temperature	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Temperature is $(-40\pm 2)^{\circ}C$ and keep $(96\pm 2)$ hours.
Thermal shock	No visible mechanical damage. Inductance change: Within $\pm 10\%$	The test sample shall be placed at $(-40\pm 3)^{\circ}C$ and $(125\pm 2)^{\circ}C$ for $(30\pm 3)$ min, different temperature conversion time is 2~3 minutes. The temperature cycle shall be repeated 32 cycles. Placed at room temperature for 2 hours, within 48 hours of testing.
Temperature characteristic	Inductance change $P_{c-b}, P_{c-d}$ : Within $\pm 20\%$	a: $+20^{\circ}C$ (30~45) min $\rightarrow$ b: $-40^{\circ}C$ (30~45) min $\rightarrow$ c: $+20^{\circ}C$ (30~45) min $\rightarrow$ d: $+125^{\circ}C$ (30~45) min $\rightarrow$ e: $+20^{\circ}C$ (30~45) min $P_{c-b} = L_b - L_c \cdot 100\%$ ; $P_{c-d} = L_d - L_c \cdot 100\%$ Lc Lc
Static Humidity	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Inductors shall be subjected to $(93\pm 3)\%RH$ . at $(60\pm 2)^{\circ}C$ for $(96\pm 2)$ h . Placed at room temperature for 2 hours, within 48 hours of testing.
Life	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Inductors shall be store at $(85\pm 2)^{\circ}C$ for $(1000\pm 24)$ hours with $I_{rms}$ applied. Placed at room temperature for 2 hours, within 48 hours of testing.

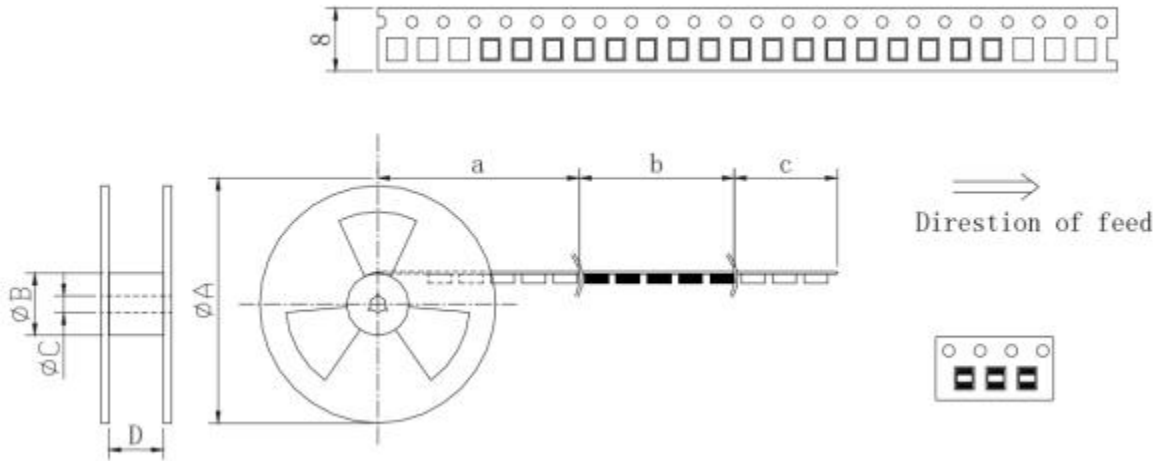
**PACKAGE**

Tape Dimension (Unit:mm)



W	A0	B0	D	D1	E	F	K0	P0	P2	P	T
8±0.3	2.2±0.1	2.7±0.1	1.5±0.1	1.0MIN	1.75±0.1	3.5±0.1	1.15±0.1	4.0±0.3	2.0±0.3	4.0±0.3	0.25±0.05

Direction of feed (Unit:mm)



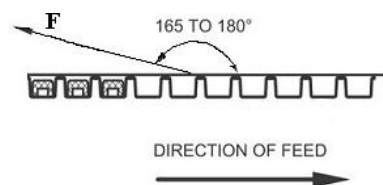
A	B	C	D	a	b	c
178 Typ.	58 Typ.	13 Typ.	8.4 Typ.	Blank portions	Chip cavity	Leader

Packing quantity

Reel(PCS)	Box (PCS)	Carton (PCS)
3000	15000	150000

Peeling required

- F force: 10~130g;
- Peeling speed: 300mm/min±10%;
- Peeling angle: 165°~180°.



## RECOMMENDED SOLDERING PROFILE

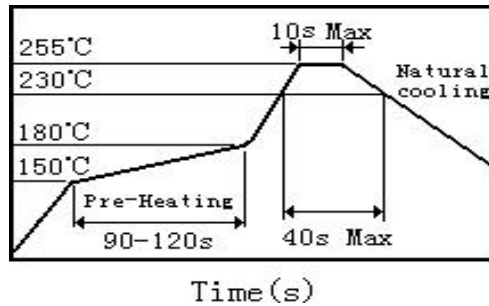
Applicable soldering process to the products is reflow soldering.

### Soldering Materials

(1) Solder: Sn-3.0Ag-0.5Cu

(2) Flux: Use rosin-based flux, but not strongly acidic flux (with chlorine exceeding 0.2 wt%). Do not use water-soluble flux.

### Soldering Profile



### Soldering Iron

Reworking with electric soldering iron must preheating at 150°C for 1 minute is required, and do not directly touch the core with the tip of the soldering iron. The reworking soldering conditions are as follows:

- \*Temperature of soldering iron tip: 350°C;
- \*Soldering iron power output: ≤30W;
- \*Diameter of soldering iron end: ≤1.0mm;
- \*Soldering time: <3 s

## CLEANING

**\*The following conditions should be observed when cleaning the products:**

\*Cleaning Temperature: 60°C max. (40°C max. for alcohol cleaning agents)

Ultrasonic:

Output: 20 W/L max.

Duration: 5 min max.

Frequency: 28 to 40kHz

Avoid the resonance between PCB and mounted products when it is cleaning.

## Storage Methods

### Storage Period

To maintain the solderability of terminal electrodes and to keep the packing material in good condition, product should be used within 6 months from the time of delivery. And the solderability of products electrodes may decrease as time passes, so in case of storage over 6 months, solderability shall be checked before actual usage.

### Storage Conditions

Store products in a warehouse in compliance with the following condition:

(Temperature): Inductors (product with taping) -10 to +40°C;  
Inductors body -40 to +85°C.

(Humidity): 30~70%RH.

- \*Do not subject products to rapid changes in temperature and humidity.
- \*Do not store the products in chemical atmosphere such as one containing sulfurous acid gas or alkaline gas, that will causes poor solderability and corrosion of inductors.
- \*Do not store products in bulk packaging to prevent collision among inductors which causes core chipping and wire breakage.
- \*Store products on pallets to protect from humidity, dust, etc.
- \*Avoid heat shock, vibration, direct sunlight, etc.

## Precautions For Use

- \*Our products are designed and promoted for use in general electronic devices such as audio-equipment, office automation equipment, household appliance and information service.
- \*In case of using the product for the purpose other than general electronics devices, we shall not be held liable for any dysfunctions in or damage to the equipment with which the product is used.
- \*Our specification limits the quality of the component as a single unit. Please ensure the component is thoroughly evaluated in your application circuit.
- \*Do not apply excessive vibration or mechanical shock to products.
- \*Donot touch wire with sharp objects such as tweezers to prevent wire breakage.
- \*Do not apply excessive stress to products mounted on boards to prevent core breakage.

Note:

**This series product is not applies in automotive or related products. Otherwise, we will shall not bear than the resulting all the problems of quality and responsibility.**

Please be sure to request approval specifications that provide further details of the products. Kindly not that the content of these specifications are subject to change or may be discontinued without prior notice. This product may not be designed/used in medical or high risk applications without APV approval.

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[HCR15JTRF](#) [NIN-HCR33JTRF](#) [NIN-HDR22JTRF](#) [NIN-HDR82JTRF](#) [NIN-HK2N7STRF](#) [NIN-PA150KTR370F](#) [NIN-PB100KTR550F](#)