

# Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

## REMINDERS

- Product information in this catalog is as of October 2008. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or usage of the Products.

Please note that Taiyo Yuden Co., Ltd. shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this catalog or individual specification.

- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.

- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,( automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance.

Do not incorporate the products into any equipment in fields such as aerospace, aviation, nuclear control, submarine system, military, etc. where higher safety and reliability are especially required.

In addition, even electronic components or functional modules that are used for the general electronic equipment, if the equipment or the electric circuit require high safety or reliability function or performances, a sufficient reliability evaluation check for safety shall be performed before commercial shipment and moreover, due consideration to install a protective circuit is strongly recommended at customer's design stage.

- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN' s official sales channel"). It is only applicable to the products purchased from any of TAIYO YUDEN' s official sales channel.

- Please note that Taiyo Yuden Co., Ltd. shall have no responsibility for any controversies or disputes that may occur in connection with a third party's intellectual property rights and other related rights arising from your usage of products in this catalog. Taiyo Yuden Co., Ltd. grants no license for such rights.

### ■ Caution for export

Certain items in this catalog may require specific procedures for export according to "Foreign Exchange and Foreign Trade Control Law" of Japan, "U.S. Export Administration Regulations," and other applicable regulations. Should you have any question or inquiry on this matter, please contact our sales staff.

Should you have any question or inquiry on this matter, please contact our sales staff.

# フェライトビーズインダクタ (リードタイプ) LEADED FERRITE BEADS INDUCTORS



OPERATING TEMP. -25~+85°C

## 特長 FEATURES

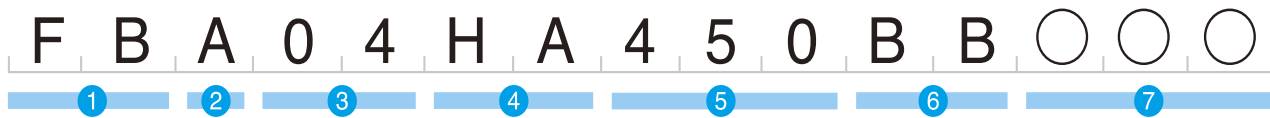
- 損失分の大きなフェライト材料を使用
- 基板への実装が容易
- 用途に合わせた幅広いバリエーション
- Use of high loss ferrite material.
- Easy mounting on PC boards.
- Available in a wide range of values and configurations to suit most applications.

## 用途 APPLICATIONS

- 各種デジタル機器におけるデジタル信号の波形整形、データラインの高周波ノイズ吸収
- Waveform correction of digital signals from digital equipment and absorption of high-frequency noise from data lines.

## 形名表記法 ORDERING CODE

1	2	3	4	5	6
形式	形状	コア寸法 (D寸法) [mm]	材質コード	公称インピーダンス (Ω以上)	リード加工形状 [mm]
FB フェライトビーズインダクタ	A アクシシャルリード R ラジアルリード	03 φ2.5 04 φ3.5 05 5.0 06 6.0 07 7.5	HA 材質によりインピーダンス特性が異なる VA	例 850 85 121 120 03タイプ除く	AB 26.0幅ストレートリードつら折リテーピング BB 32.0幅ストレートリードつら折リテーピング KD 10.0ピッチ コの字形フォーミング単品 KE 12.5ピッチ コの字形フォーミング単品 KF 15.0ピッチ コの字形フォーミング単品 NA 2.5ピッチストレートリード単品 (FBR) ストレートリード単品 (FBA) NB 5.0ピッチリード単品
					SA 2.5ピッチストレートリードテーピング SB 5.0ピッチストレートリードテーピング TB 5.0ピッチストレートリードテーピング UB 5.0ピッチラジアルフォーミングテーピング US 5.0ピッチラジアルフォーミング単品 VB 5.0ピッチ両リードフォーミングテーピング VS 5.0ピッチ両リードフォーミング単品



1	2	3	4	5	6
Type	Configuration	Core Dimensions [mm]	Material code	Nominal Impedance	Lead configuration [mm]
FB Ferrite Beads	A Axial lead R Radial lead	03 φ2.5 04 φ3.5 05 5.0 06 6.0 07 7.5	HA Refer to impedance curves VA for material difference	example 850 85 121 120 Excluding 03Type	AB straight lead (26mm lead space) / ammo BB straight lead (32mm lead space) / ammo KD Formed lead (10mm pitch) / bulk KE Formed lead (12.5mm pitch) / bulk KF Formed lead / bulk (15.0mm pitch) / bulk NA straight lead (2.5mm pitch) / bulk (FBR) straight lead / bulk (FBA) NB Formed lead (crimped) / bulk
					SA Straight lead (FBR05 type) / ammo SB Straight lead (FBR07 type) / ammo TB Straight lead (FBR07 type) / ammo UB Radial lead formed / ammo US Formed lead (crimped) / bulk VB Dual side lead formed (crimped) / ammo VS Formed lead / bulk

外形寸法 EXTERNAL DIMENSIONS



Type	形状 Configurations				Dimensions (mm) (inch)	
	テーピング Taping		単品 Bulk		D	L
	ストレート Straight	フォーミング Formed	ストレート Straight	フォーミング Formed		
FBA 03HA450□-00 03VA450□-00 04HA450□-00 04VA450□-00 04HA600□-00 04VA600□-00 04HA900□-00 04VA900□-00	AB, BB  W:26.52 (1.02, 2.05) P:5.0 (0.197)	VB UB  P:12.7 (0.500)	NA 	KD, KE, KF  F:10, 12.5, 15 (0.39, 0.492, 0.591) VS US F:5.0 (0.197)	2.5±0.2 (0.098±0.008)	4.5±0.3 (0.177±0.012)
	AB, BB  W:26.52 (1.02, 2.05) P:5.0 (0.197)	VB UB  P:12.7 (0.500)	NA 	KD, KE, KF  F:10, 12.5, 15 (0.39, 0.492, 0.591) VS US F:5.0 (0.197)	3.5±0.2 (0.138±0.008)	4.5±0.3 (0.177±0.012)
	AB, BB  W:26.52 (1.02, 2.05) P:5.0 (0.197)	VB  P:12.7 (0.500)	NA 	KD, KE, KF  F:10, 12.5, 15 (0.39, 0.492, 0.591) VS F:5.0 (0.197)	3.5±0.2 (0.138±0.008)	6.0+0.5 -0 (0.236+0.020 -0)
	AB, BB  W:26.52 (1.02, 2.05) P:5.0 (0.197)	VB  P:12.7 (0.500)	NA 	KE, KF  F:12.5, 15 (0.492, 0.591) VS F:5.0 (0.197)	3.5±0.2 (0.138±0.008)	9.0±0.5 (0.354±0.020)
FBR 05VA121□-00 06HA850NA-00 06VA850NA-00 06HA121NA-00 06VA121NA-00 07HA850□-00 07VA850□-00 07HA121□-00 07VA121□-00	—	SA  P:12.7 (0.500)	—	NA  F:2.5 (0.098)	5.0max. (0.197max.)	7.5 (0.295)
	—	—	—	NA  F:2.5 (0.098)	6.0±0.5 (0.236±0.020)	5.0 (0.197)
	—	—	—	—	—	7.0 (0.276)
	—	SB, TB  P:12.7 (0.500)	—	NB  F:5.0 (0.197)	7.5±0.5 (0.295±0.020)	5.5 (0.217)
	—	—	—	—	—	7.5 (0.295)
	—	—	—	—	—	7.5 (0.295)

形名の□にはリード加工形状記号が入ります。 □ Please specify the lead configuration code. Unit : mm (inch)  
 ※リード線径φ寸法は、0.65±0.05mm 但し、FBR07タイプのφd寸法は0.6±0.05mm  
 Note: Lead diameter (φd) shall fall within a range of 0.65mm±0.05mm, FBR05, and FBR07 types however, will have a lead diameter (φd) range of 0.6mm ±0.05mm.

アイテム一覧 PART NUMBERS

形名 Ordering code	EHS (Environmental Hazardous Substances)	インピーダンス Impedance [Ω] min.	インピーダンス測定周波数 Measuring frequency [MHz]		定格電流 Rated current [A] max.	
			材質 Material	材質 Material	材質 Material	材質 Material
			HA	VA	HA	VA
FBA 03△450□-00 04△450□-00 04△600□-00 04△900□-00	RoHS	35.0	50	100	7.0	7.0
	RoHS	45.0	50	100	7.0	7.0
	RoHS	60.0	50	100	7.0	7.0
	RoHS	90.0	50	100	7.0	7.0
FBR 05VA121□-00 06△850NA-00 06△121NA-00 07△850□-00 07△121□-00	RoHS	120.0	—	100	—	7.0
	RoHS	85.0	50	100	7.0	7.0
	RoHS	120.0	50	100	7.0	7.0
	RoHS	85.0	50	100	7.0	7.0
	RoHS	120.0	50	100	7.0	7.0

形名の△には材質記号 (HA,VA)、□にはリード加工形状記号が入ります。  
 △ Please specify material codes (HA,VA) and □ lead configuration code.  
 ※直流抵抗 DC Resistance : 0.01Ωmax、絶縁抵抗 Insulation resistance : 1.0MΩmin

セクションガイド  
Selection Guide

アイテム一覧  
Part Numbers

特性図  
Electrical Characteristics

梱包  
Packaging

信頼性  
Reliability Data

使用上の注意  
Precautions



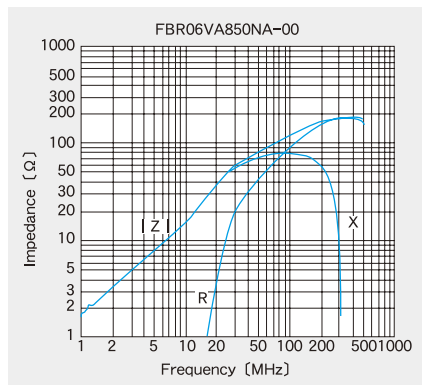
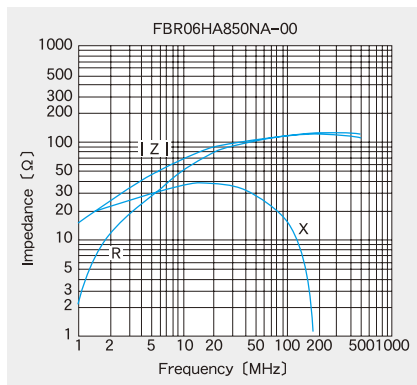
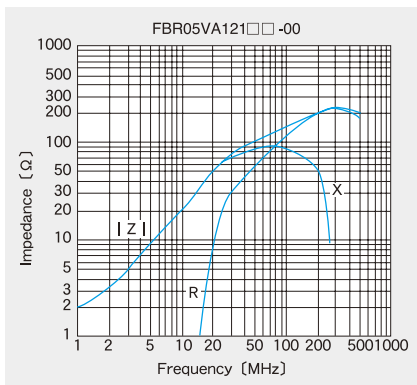
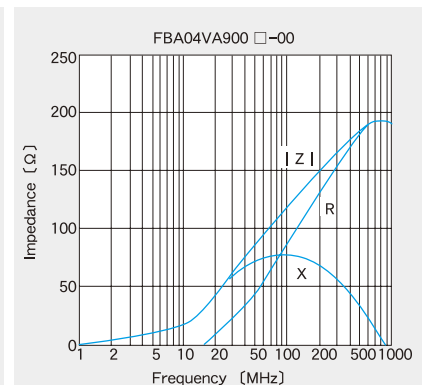
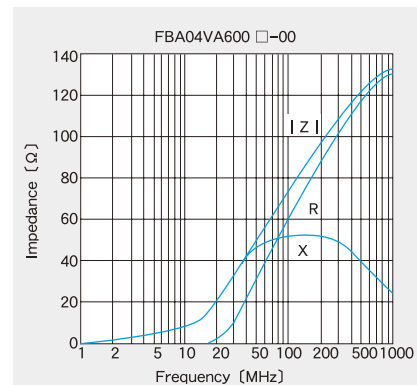
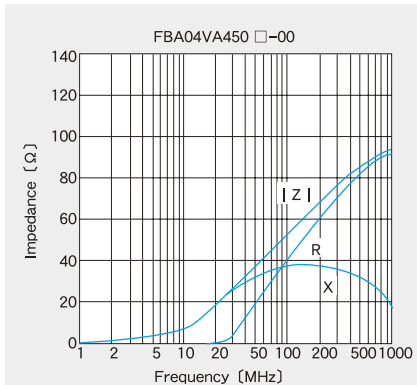
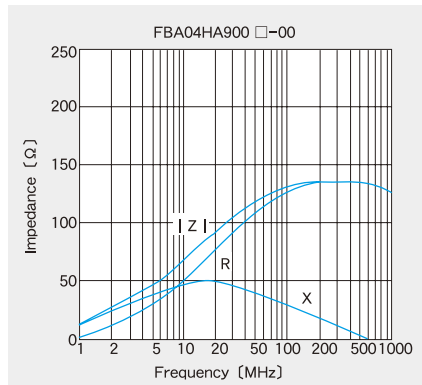
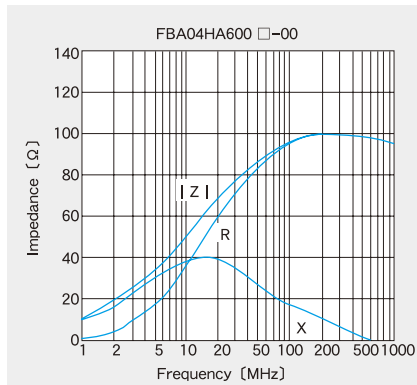
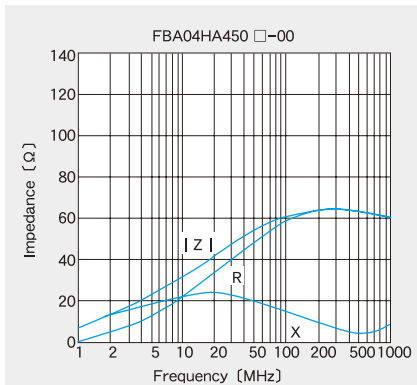
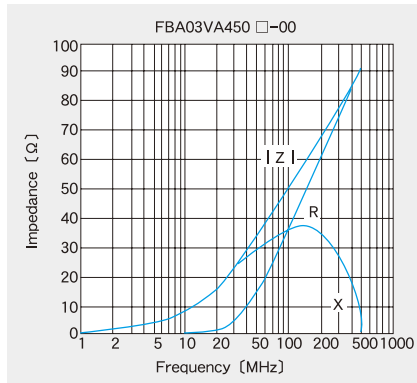
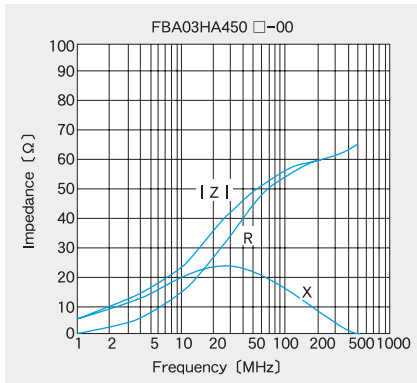
etc

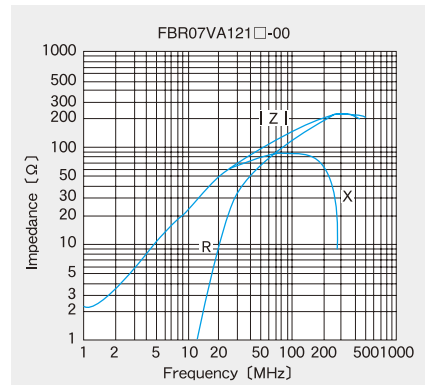
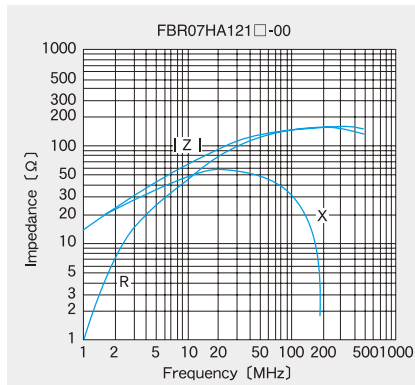
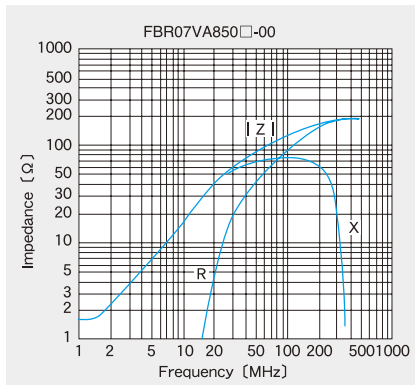
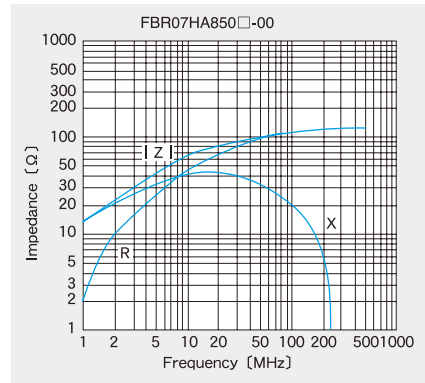
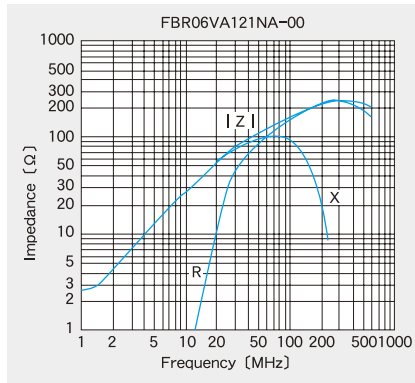
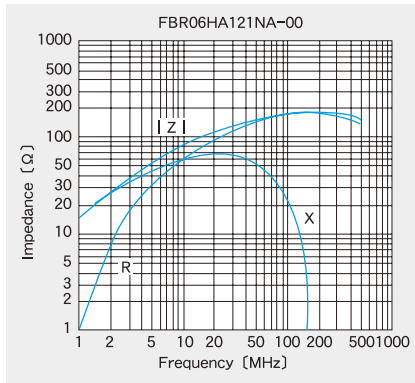
△ 当社カタログをご使用の際は「当社製品に関するお断り」を必ずお読みください。

TAIYO YUDEN 2009

△ Please read the "Notice for TAIYO YUDEN products" before using this catalog.

インピーダンス周波数特性  
IMPEDANCE-Vs-FREQUENCY CHARACTERISTICS





Measured by HP4191A

①最小受注単位数 Minimum Quantity

アキシシャルリード Axial lead (FBA)

Type	リード加工 形状記号 Lead configuration	標準数量 Standard quantity [pcs]	
		袋詰め Bulk	テーピング Taped つづら折り Ammo
FBA03	NA, KD, US	1000	—
	AB, BB	—	2000
	KE, KF, VS	500	—
	UB, VB	—	3000
FBA04	NA, KD, US	1000	—
	KE, KF, VS	500	—
	AB, BB	—	1000
	VB, UB	—	3000

ラジアルリード Radial lead (FBR)

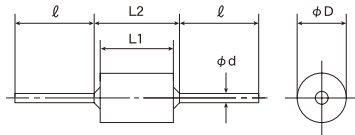
Type	リード加工 形状記号 Lead configuration	標準数量 Standard quantity [pcs]	
		袋詰め Bulk	テーピング Taped つづら折り Ammo
FBR05	NA	1000	—
	SA	—	2000
FBR06	NA	1000	—
FBR07	NB	1000	—
	SB	—	2000

Unit : mm (inch)

②単品寸法 Bulk dimensions

アキシシャルリード Axial lead (FBA)

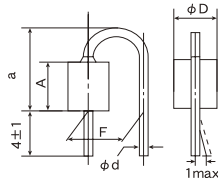
NA形状



Type	寸法 Dimensions [mm] (inch)				
	φD	L1	L2	φd	ℓ
FBA03□450	2.5±0.2 (0.098±0.008)	4.5±0.3 (0.177±0.012)	6.5max. (0.256max.)	0.65±0.05 (0.026±0.002)	18min. (0.709min.)
FBA04□450	3.5±0.2 (0.138±0.008)	4.5±0.3 (0.177±0.012)	6.5max. (0.256max.)		
FBA04□600	3.5±0.2 (0.138±0.008)	6.0 <sup>+0.5</sup> <sub>0</sub> (0.236 <sup>+0.020</sup> <sub>0</sub> )	8.5max. (0.335max.)		
FBA04□900	3.5±0.2 (0.138±0.008)	9.0±0.5 (0.354±0.020)	11.0max. (0.433max.)		

Unit : mm (inch)

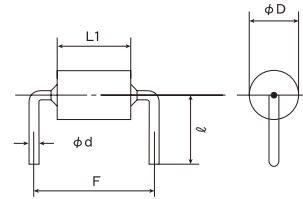
US形状



Type	寸法 Dimensions [mm] (inch)				
	φD	A	a	F	φd
FBA03□450	2.5±0.2 (0.098±0.008)	4.5±0.3 (0.177±0.012)	9.0max. (0.354max.)	5±1 (0.197±0.039)	0.65±0.05 (0.026±0.002)
FBA04□450	3.5±0.2 (0.138±0.008)	4.5±0.3 (0.177±0.012)	9.0max. (0.354max.)		

Unit : mm (inch)

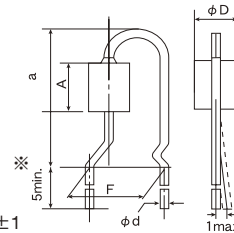
KD/KE/KF 形状



Type	リード加工 形状記号 LEAD SYMBOL	寸法 Dimensions [mm] (inch)				
		φD	F	L1	φd	ℓ
FBA03□450	KD	2.5±0.2 (0.098±0.008)	10.0±1.0 (0.394±0.040)	4.5±0.3 (0.177±0.012)	0.65±0.05 (0.026±0.020)	7±2 (0.276±0.079)
FBA04□450		3.5±0.2 (0.138±0.008)	10.0±1.0 (0.394±0.040)	4.5±0.3 (0.177±0.012)		7.5±2 (0.295±0.079)
FBA04□600		3.5±0.2 (0.138±0.008)	10.0±1.0 (0.394±0.040)	6.0 <sup>+0.5</sup> <sub>0</sub> (0.236 <sup>+0.020</sup> <sub>0</sub> )		7.5±2 (0.295±0.079)
FBA03□450	KE	2.5±0.2 (0.098±0.008)	12.5±1.0 (0.492±0.004)	4.5±0.3 (0.177±0.012)	0.65±0.05 (0.026±0.020)	7±2 (0.276±0.079)
FBA04□450		3.5±0.2 (0.138±0.008)	12.5±1.0 (0.492±0.004)	4.5±0.3 (0.177±0.012)		7.5±2 (0.295±0.079)
FBA04□600		3.5±0.2 (0.138±0.008)	12.5±1.0 (0.492±0.004)	6.0 <sup>+0.5</sup> <sub>0</sub> (0.236 <sup>+0.020</sup> <sub>0</sub> )		7.5±2 (0.295±0.079)
FBA04□900		3.5±0.2 (0.138±0.008)	12.5±1.0 (0.492±0.004)	9.0±0.5 (0.354±0.020)		7.5±2 (0.295±0.079)
FBA03□450	KF	2.5±0.2 (0.098±0.008)	15.0±1.0 (0.591±0.004)	4.5±0.3 (0.177±0.012)	0.65±0.05 (0.026±0.020)	7±2 (0.276±0.079)
FBA04□450		3.5±0.2 (0.138±0.008)	15.0±1.0 (0.591±0.004)	4.5±0.3 (0.177±0.012)		7.5±2 (0.295±0.079)
FBA04□600		3.5±0.2 (0.138±0.008)	15.0±1.0 (0.591±0.004)	6.0 <sup>+0.5</sup> <sub>0</sub> (0.236 <sup>+0.020</sup> <sub>0</sub> )		7.5±2 (0.295±0.079)
FBA04□900		3.5±0.2 (0.138±0.008)	15.0±1.0 (0.591±0.004)	9.0±0.5 (0.354±0.020)		7.5±2 (0.295±0.079)

Unit : mm (inch)

VS 形状



※900タイプのみ5±1

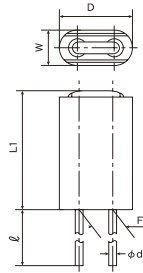
Type	寸法 Dimensions [mm] (inch)				
	φD	A	a	F	φd
FBA03□450	2.5±0.2 (0.098±0.008)	4.5±0.3 (0.177±0.012)	12.5max. (0.492max.)	5±1 (0.197±0.039)	0.65±0.05 (0.026±0.002)
FBA04□450	3.5±0.2 (0.138±0.008)	4.5±0.3 (0.177±0.012)	12.5max. (0.492max.)	5±1 (0.197±0.039)	0.65±0.05 (0.026±0.002)
FBA04□600	3.5±0.2 (0.138±0.008)	6.0 <sup>+0.5</sup> <sub>0</sub> (0.236 <sup>+0.020</sup> <sub>0</sub> )	12.5max. (0.492max.)	5±1 (0.197±0.039)	0.65±0.05 (0.026±0.002)
FBA04□900	3.5±0.2 (0.138±0.008)	9.0±0.5 (0.354±0.020)	16.0max. (0.630max.)	5±1 (0.197±0.039)	0.65±0.05 (0.026±0.002)

Unit : mm (inch)



ラジアルリード Radial lead (FBR)

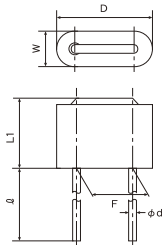
NA形状



Type	寸法 Dimensions [mm] (inch)			
	D	L1	φd	ℓ
FBR05VA121	5.0max. (0.197max.)	9.0max. (0.354max.)	0.65±0.05 (0.026±0.002)	10 <sup>+3</sup> <sub>-5</sub> (0.394 <sup>+0.118</sup> <sub>-0.197</sub> )
FBR06□850	6±0.5 (0.236±0.020)	7.0max. (0.276max.)	0.65±0.05 (0.026±0.002)	10 <sup>+3</sup> <sub>-5</sub> (0.394 <sup>+0.118</sup> <sub>-0.197</sub> )
FBR06□121	6±0.5 (0.236±0.020)	9.0max. (0.354max.)	0.65±0.05 (0.026±0.002)	10 <sup>+3</sup> <sub>-5</sub> (0.394 <sup>+0.118</sup> <sub>-0.197</sub> )
	W	F		
FBR05VA121	2.5max. (0.098max.)	2.5±1 (0.098±0.039)		
FBR06□850	3.0±0.5 (0.118±0.020)	2.5±1 (0.098±0.039)		
FBR06□121	3.0±0.5 (0.118±0.020)	2.5±1 (0.098±0.039)		

Unit : mm (inch)

NB形状

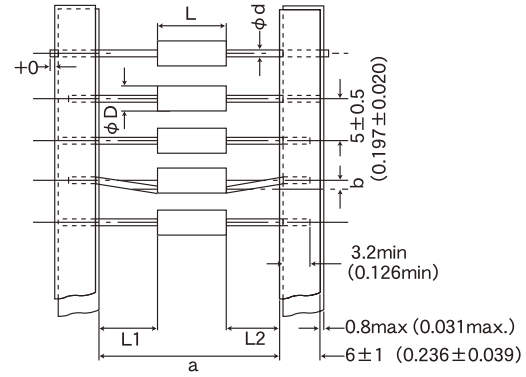


Type	寸法 Dimensions [mm] (inch)			
	D	L1	φd	ℓ
FBR07□850	7.5±0.5 (0.295±0.020)	7.0max.. (0.276max.)	0.6±0.05 (0.024±0.002)	5 <sup>+1</sup> <sub>-2</sub> (0.197 <sup>+0.039</sup> <sub>-0.079</sub> )
FBR07□121	7.5±0.5 (0.295±0.020)	9.0max. (0.354max.)	0.6±0.05 (0.024±0.002)	5 <sup>+1</sup> <sub>-2</sub> (0.197 <sup>+0.039</sup> <sub>-0.079</sub> )
	W	F		
FBR07□850	2.5max. (0.098max.)	5 <sup>+1</sup> <sub>-0.5</sub> (0.197 <sup>+0.039</sup> <sub>-0.020</sub> )		
FBR07□121	2.5max. (0.098max.)	5 <sup>+1</sup> <sub>-0.5</sub> (0.197 <sup>+0.039</sup> <sub>-0.020</sub> )		

Unit : mm (inch)

③テーピング寸法 Taping Dimensions

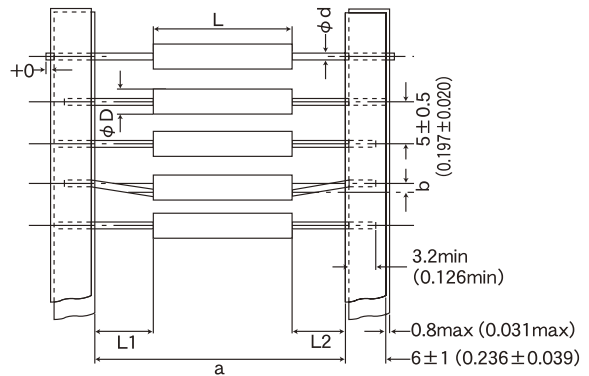
AB (a : 26mm) 形状  
(1.02inch lead space)



Type	寸法 Dimensions						最小挿入ピッチ Minimum insertion pitch
	D	L	a	b	L <sub>1</sub> -L <sub>2</sub>	φd	
FBA03	2.5±0.2 (0.098±0.008)	4.5±0.3 (0.177±0.012)	26 <sup>+1.5</sup> <sub>-0</sub> (1.02 <sup>+0.059</sup> <sub>-0</sub> )	0.8max (0.031max)	1.0max (0.039max)	0.65±0.05 (0.026±0.002)	10.0 (0.394)
FBA04	3.5±0.2 (0.138±0.008)	4.5±0.3 (0.177±0.012)	26 <sup>+1.5</sup> <sub>-0</sub> (1.02 <sup>+0.059</sup> <sub>-0</sub> )	0.8max (0.031max)	1.0max (0.039max)	0.65±0.05 (0.026±0.002)	10.0 (0.394)

Unit : mm (inch)

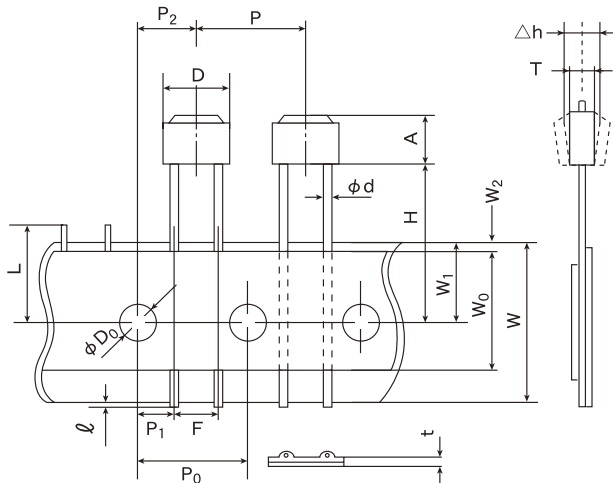
B□ (a : 52mm) 形状  
(2.05 inches lead space)



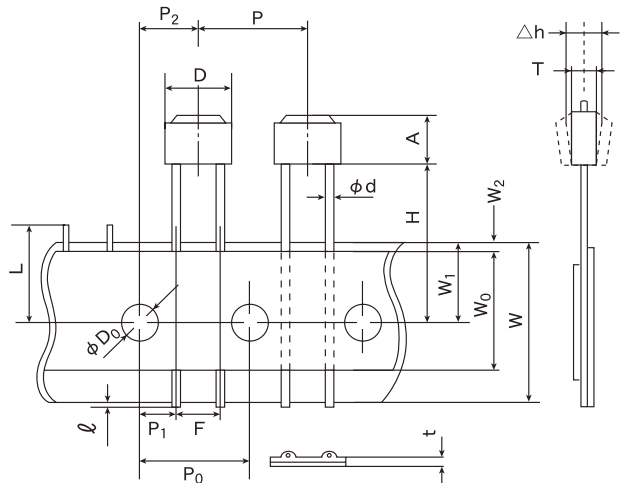
Type	寸法 Dimensions						最小挿入ピッチ Minimum insertion pitch
	D	L	a	b	L <sub>1</sub> -L <sub>2</sub>	φd	
FBA03	2.5±0.2 (0.098±0.008)	4.5±0.3 (0.177±0.012)	52 <sup>+2</sup> <sub>-1</sub> (2.05 <sup>+0.079</sup> <sub>-0.039</sub> )	1.2max (0.047max)	1.0max (0.039max)	0.65±0.05 (0.026±0.002)	10.0 (0.394)
FBA04	3.5±0.2 (0.138±0.008)	4.5±0.3 (0.177±0.012)	52 <sup>+2</sup> <sub>-1</sub> (2.05 <sup>+0.079</sup> <sub>-0.039</sub> )	1.2max (0.047max)	1.0max (0.039max)	0.65±0.05 (0.026±0.002)	10.0 (0.394)

Unit : mm (inch)

SA (F : 2.5mm pitch) 形状  
(0.098 inches)



SB/TB (F : 5mm pitch) 形状  
(0.197 inches)



寸法 Type	記号 Symbol	寸法 Dimensions	記号 Symbol	寸法 Dimensions
FBR05	A	121 : 9.0max. (0.354max.)	W	$18 \begin{smallmatrix} +1.0 \\ -0.5 \end{smallmatrix}$ ( $0.709 \begin{smallmatrix} +0.039 \\ -0.020 \end{smallmatrix}$ )
			W <sub>0</sub>	12.5min. (0.492min.)
	T	2.5max. (0.098max.)	W <sub>1</sub>	$9 \begin{smallmatrix} +0.75 \\ -0.5 \end{smallmatrix}$ ( $0.354 \begin{smallmatrix} +0.039 \\ -0.020 \end{smallmatrix}$ )
	D	5.0max. (0.197max.)	W <sub>2</sub>	3max.※ <sup>2</sup> (0.118max.)
	H	$18.0 \begin{smallmatrix} +2.0 \\ 0 \end{smallmatrix}$ ( $0.709 \begin{smallmatrix} +0.079 \\ 0 \end{smallmatrix}$ )	ℓ	1.0max. (0.039max.)
	P	$12.7 \pm 1.0$ ( $0.500 \pm 0.039$ )	φ D <sub>0</sub>	$4 \pm 0.3$ ( $0.157 \pm 0.012$ )
	P <sub>0</sub>	$12.7 \pm 0.3$ ※ <sup>1</sup> ( $0.500 \pm 0.039$ )	φ d	$0.65 \pm 0.05$ ( $0.026 \pm 0.002$ )
	P <sub>1</sub>	$5.1 \pm 0.7$ ( $0.201 \pm 0.028$ )	L	11.0max. (0.433max.)
	P <sub>2</sub>	$6.35 \pm 1.3$ ( $0.250 \pm 0.051$ )	t	$0.7 \pm 0.2$ ( $0.028 \pm 0.008$ )
	F	$2.5 \begin{smallmatrix} +1.0 \\ -0.5 \end{smallmatrix}$ ( $0.098 \begin{smallmatrix} +0.039 \\ -0.020 \end{smallmatrix}$ )		
△h	$0 \pm 2$ ( $0 \pm 0.079$ )			

Unit : mm (inch)

- ※ 1 20 ピッチにつき、累積誤差± 2mm 以内。
- ※ 2 貼付テープは、台紙よりはみ出さないこと。
- ※ 1 Accumulated error for 20 pitches is ± 2mm.
- ※ 2 Bonding tape must not protrude from the base tape.

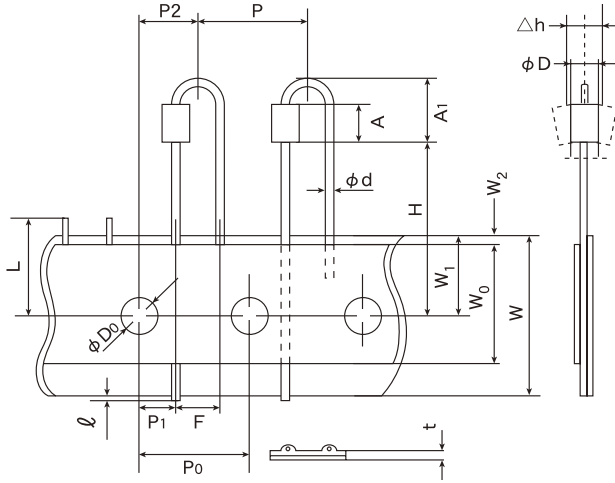
寸法 Type	記号 Symbol	寸法 Dimensions	記号 Symbol	寸法 Dimensions
FBR07	A	121 : 9.0max. (0.354max.) 850 : 7.0max. (0.276max.)	△h	$0 \pm 2$ ( $0 \pm 0.079$ )
			W	$18 \begin{smallmatrix} +1.0 \\ -0.5 \end{smallmatrix}$ ( $0.709 \begin{smallmatrix} +0.039 \\ -0.020 \end{smallmatrix}$ )
	T	2.5max. (0.098max.)	W <sub>0</sub>	12.5min. (0.492min.)
	D	$7.5 \pm 0.5$ ( $0.925 \pm 0.020$ )	W <sub>1</sub>	$9 \begin{smallmatrix} +0.75 \\ -0.5 \end{smallmatrix}$ ( $0.354 \begin{smallmatrix} +0.039 \\ -0.020 \end{smallmatrix}$ )
	H	SB : $18.0 \begin{smallmatrix} +2.0 \\ 0 \end{smallmatrix}$ ( $0.709 \begin{smallmatrix} +0.079 \\ 0 \end{smallmatrix}$ ) TB : $16.0 \pm 0.5$ ( $0.630 \pm 0.020$ )	W <sub>2</sub>	3max.※ <sup>2</sup> (0.118max.)
			ℓ	1.0max. (0.039max.)
	P	$12.7 \pm 1.0$ ( $0.500 \pm 0.039$ )	φ D <sub>0</sub>	$4 \pm 0.3$ ( $0.157 \pm 0.012$ )
	P <sub>0</sub>	$12.7 \pm 0.3$ ※ <sup>1</sup> ( $0.500 \pm 0.012$ )	φ d	$0.6 \pm 0.05$ ( $0.024 \pm 0.002$ )
	P <sub>1</sub>	$3.85 \pm 0.8$ ( $0.152 \pm 0.028$ )	L	11.0max. (0.433max.)
	P <sub>2</sub>	$6.35 \pm 1.3$ ( $0.250 \pm 0.051$ )	t	$0.7 \pm 0.2$ ( $0.028 \pm 0.008$ )
F	$5 \begin{smallmatrix} +1.0 \\ -0.5 \end{smallmatrix}$ ( $0.197 \begin{smallmatrix} +0.039 \\ -0.020 \end{smallmatrix}$ )			

Unit : mm (inch)

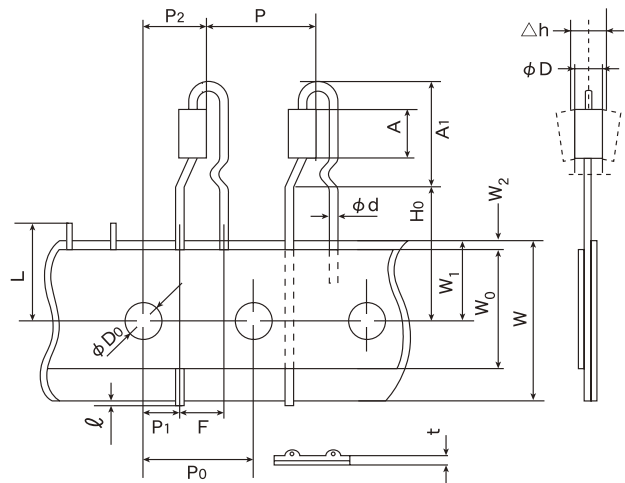
- ※ 1 20 ピッチにつき、累積誤差± 2mm 以内。
- ※ 2 貼付テープは、台紙よりはみ出さないこと。
- ※ 1 Accumulated error for 20 pitches is ± 2mm.
- ※ 2 Bonding tape must not protrude from the base tape.



UB 形状



VB 形状



寸法 Type	記号 Symbol	寸法 Dimensions	記号 Symbol	寸法 Dimensions
FBA03 □ 450 FBA04 □ 450	A	4.5 ± 0.3 (0.177 ± 0.012)	△ h	0 ± 2 (0 ± 0.079)
	A <sub>1</sub>	9.0max. (0.354max.)	W	18 <sup>+1.0</sup> <sub>-0.5</sub> (0.709 <sup>+0.039</sup> <sub>-0.020</sub> )
	φ D	03 : 2.7max. (0.106max.) 04 : 3.7max. (0.146max.)	W <sub>0</sub>	12.5min. (0.492min.)
			W <sub>1</sub>	9 <sup>+0.75</sup> <sub>-0.5</sub> (0.354 <sup>+0.039</sup> <sub>-0.020</sub> )
	H	20.0 <sup>+0.5</sup> <sub>-1.0</sub> (0.787 <sup>+0.020</sup> <sub>-0.039</sub> )	W <sub>2</sub>	3.0max.*2 (0.118max.)
	P	12.7 ± 1.0 (0.500 ± 0.039)	ℓ	1.0max. (0.039max.)
	P <sub>0</sub>	12.7 ± 0.3*1 (0.500 ± 0.012)	φ D <sub>0</sub>	4.0 ± 0.3 (0.157 ± 0.012)
	P <sub>1</sub>	3.85 ± 0.8 (0.152 ± 0.032)	φ d	0.65 ± 0.05 (0.026 ± 0.002)
	P <sub>2</sub>	6.35 ± 1.3 (0.250 ± 0.051)	L	11.0max. (0.433max.)
	F	5.0 ± 1.0 (0.197 ± 0.039)	t	0.7 ± 0.2 (0.028 ± 0.008)

Unit : mm (inch)

- ※ 1 20 ピッチにつき、累積誤差 ± 2mm 以内。
- ※ 2 貼付テープは、台紙よりはみ出さないこと。
- ※ 1 Accumulated error for 20 pitches is ± 2mm.
- ※ 2 Bonding tape must not protrude from the base tape.

寸法 Type	記号 Symbol	寸法 Dimensions	記号 Symbol	寸法 Dimensions
FBA03 □ 450 FBA04 □ 450 FBA04 □ 600 FBA04 □ 900	A	450: 4.5 ± 0.3 (0.177 ± 0.012)	F	5.0 ± 1.0 (0.197 ± 0.039)
		600: 6.0 <sup>+0.5</sup> <sub>-0</sub> (0.236 <sup>+0.020</sup> <sub>-0</sub> )	△ h	0 ± 2 (0 ± 0.079)
		900: 9.0 ± 0.5 (0.354 ± 0.020)	W	18 <sup>+1.0</sup> <sub>-0.5</sub> (0.709 <sup>+0.039</sup> <sub>-0.020</sub> )
	A <sub>1</sub>	450: 12.5max. (0.492max.)	W <sub>0</sub>	12.5min. (0.492min.)
		900: 16.0max. (0.630max.)	W <sub>1</sub>	9 <sup>+0.75</sup> <sub>-0.5</sub> (0.354 <sup>+0.039</sup> <sub>-0.020</sub> )
	φ D	3.7max. (0.146max.)	W <sub>2</sub>	3.0max.*2 (0.118max.)
	H <sub>0</sub>	16.0 ± 0.5 (0.650 ± 0.020)	ℓ	1.0max. (0.039max.)
	P	12.7 ± 1.0 (0.500 ± 0.039)	φ D <sub>0</sub>	4.0 ± 0.3 (0.157 ± 0.012)
	P <sub>0</sub>	12.7 ± 0.3*1 (0.500 ± 0.012)	φ d	0.65 ± 0.05 (0.026 ± 0.002)
	P <sub>1</sub>	3.85 ± 0.8 (0.152 ± 0.032)	L	11.0max. (0.433max.)
P <sub>2</sub>	6.35 ± 1.3 (0.250 ± 0.051)	t	0.7 ± 0.2 (0.028 ± 0.008)	

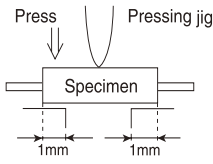
Unit : mm (inch)

- ※ 1 20 ピッチにつき、累積誤差 ± 2mm 以内。
- ※ 2 貼付テープは、台紙よりはみ出さないこと。
- ※ 1 Accumulated error for 20 pitches is ± 2mm.
- ※ 2 Bonding tape must not protrude from the base tape.



Item	Specified Value						Test Method and Remarks												
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type													
6.Q	Within the specified tolerance	/	/				FA・CA : Measuring equipment : LCR meter (HP4285A+HP42851A or its equivalent) Measuring frequency : Specified frequency  LHL□□□ (except LHLP) : Measuring equipment : LCR meter (HP4285A+HP42851A or its equivalent) LCR meter (HP4262A) or its equivalent (at 1kHz) Measuring frequency : Specified frequency												
7.DC Resistance	Within the specified tolerance						FA・CA : Measuring equipment : low ohmmeter (A&D AD5812 or its equivalent)  LHL□□□・FB・FL : Measuring equipment : DC ohmmeter												
8.Self resonance frequency	Within the specified tolerance	/	/				FA・CA : Measuring equipment : Network analyzer (Anritsu MS620J or its equivalent)  LHL□□□ (except LHLP) : Measuring equipment : (HP4191A, 4192A) its equivalent												
9.Temperature characteristic	△L/L : Within±5%	/	△L/L : Within±7% (except LHLP16 : Within±20%)				FA・CA : Change of maximum inductance deviation in step 1to5 <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>step</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>-25 (Minimum operating temperature)</td> </tr> <tr> <td>3</td> <td>20 (Standard temperature)</td> </tr> <tr> <td>4</td> <td>+85 (Maximum operating temperature)</td> </tr> <tr> <td>5</td> <td>20</td> </tr> </tbody> </table> LHL□□□ Change of maximum inductance deviation in step 1to5 Temperature at step 1 : 20°C Temperature at step 2 : Minimum operating temperature Temperature at step 3 : 20°C (Standard temperature) Temperature at step 4 : Maximum operating temperature Temperature at step 5 : 20°C	step	Temperature (°C)	1	20	2	-25 (Minimum operating temperature)	3	20 (Standard temperature)	4	+85 (Maximum operating temperature)	5	20
step	Temperature (°C)																		
1	20																		
2	-25 (Minimum operating temperature)																		
3	20 (Standard temperature)																		
4	+85 (Maximum operating temperature)																		
5	20																		

Item	Specified Value						Test Method and Remarks																					
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type																						
10. Terminal strength : tensile force	No abnormality such as cut lead, or looseness.			No abnormality such as cut lead, or looseness.	No abnormality such as cut lead, or looseness.		FA・CA : Apply the stated tensile force progressively in the direction to draw terminal. <table border="1"> <tr> <th>force (N)</th> <th>duration (S)</th> </tr> <tr> <td>25</td> <td>5</td> </tr> </table> LHL□□□ : Apply the stated tensile force progressively in the direction to draw terminal. <table border="1"> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>force (N)</th> <th>duration(S)</th> </tr> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>5</td> <td rowspan="3">30±5</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>10</td> </tr> <tr> <td><math>0.8 &lt; \phi d \leq 1.2</math></td> <td>25</td> </tr> </table> FBA/FBR : A bead shall be fixed and static loaded 20±1N (2.0±0.1 kgf) in axial direction of lead wire in 10±1 seconds. FL05R□ : Fix the component in the direction to draw terminal, and gradually apply the tensile force of 4.9 N.	force (N)	duration (S)	25	5	Nominal wire diameter tensile $\phi d$ (mm)	force (N)	duration(S)	$0.3 < \phi d \leq 0.5$	5	30±5	$0.5 < \phi d \leq 0.8$	10	$0.8 < \phi d \leq 1.2$	25							
force (N)	duration (S)																											
25	5																											
Nominal wire diameter tensile $\phi d$ (mm)	force (N)	duration(S)																										
$0.3 < \phi d \leq 0.5$	5	30±5																										
$0.5 < \phi d \leq 0.8$	10																											
$0.8 < \phi d \leq 1.2$	25																											
11. Over current	/			There shall be no scorch or short of wire. LHLC08, LHLC10: There shall be no firing.			LHL□□□ : Measuring current : Rated current × 2 Duration : 5min. Number of measuring : one time																					
12. Terminal strength : bending	No abnormality such as cut lead, or looseness.						FA・CA : Suspend a mass at the end the terminal, incline the body though angel of 90 and return it to initial position. This operation is done over a period of 2-3 sec. Then second bend in the opposite direction shall be made. Number of bends : Two times. <table border="1"> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>Bending force (N)</th> <th>Mass reference weight (kg)</th> </tr> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>5</td> <td>0.50</td> </tr> </table> LH・FB : Suspend a mass at the end the terminal, incline the body though angel of 90 and return it to initial position. This operation is done over a period of 2-3 sec. Then second bend in the opposite direction shall be made. Number of bends : Two times. <table border="1"> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>Bending force (N)</th> <th>Mass reference weight (kg)</th> </tr> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>5</td> <td>0.5</td> </tr> <tr> <td><math>0.8 &lt; \phi d \leq 1.2</math></td> <td>10</td> <td>1.0</td> </tr> </table>	Nominal wire diameter tensile $\phi d$ (mm)	Bending force (N)	Mass reference weight (kg)	$0.3 < \phi d \leq 0.5$	2.5	0.25	$0.5 < \phi d \leq 0.8$	5	0.50	Nominal wire diameter tensile $\phi d$ (mm)	Bending force (N)	Mass reference weight (kg)	$0.3 < \phi d \leq 0.5$	2.5	0.25	$0.5 < \phi d \leq 0.8$	5	0.5	$0.8 < \phi d \leq 1.2$	10	1.0
Nominal wire diameter tensile $\phi d$ (mm)	Bending force (N)	Mass reference weight (kg)																										
$0.3 < \phi d \leq 0.5$	2.5	0.25																										
$0.5 < \phi d \leq 0.8$	5	0.50																										
Nominal wire diameter tensile $\phi d$ (mm)	Bending force (N)	Mass reference weight (kg)																										
$0.3 < \phi d \leq 0.5$	2.5	0.25																										
$0.5 < \phi d \leq 0.8$	5	0.5																										
$0.8 < \phi d \leq 1.2$	10	1.0																										
13. Insulation resistence : between the terminals and body	/			100M $\Omega$ min.			LHL□□□ : Applied voltage : 500 VDC Duration : 60 sec.																					
14. Insulation resistance : between terminals and core	/			1M $\Omega$ min. (Other than material code MA)			FBA・FBR : Applied voltage : 100 VDC Duration : 60±5 sec.																					
15. Withstanding : between the terminals and body	/			No abnormality such as insulation damage			LHL□□□ : Accoding to JIS C5102. 7. 1. 3 (C) Metal global method Applied voltage : 500 VDC Duration : 60 sec.																					

Item	Specified Value						Test Method and Remarks
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type	
16.DC bias characteristic	ΔL/L : Within -10%						FA・CA : Measure inductance with application of rated current using LCR meter to compare it with the initial value.
17.Body strength	No abnormality as damage.			No abnormality such as cracks on body.			FA02 : Applied force : 30N Duration : 10 sec. Speed : Shall attain to specified force in 2 sec.  CAL45 : Applied force : 50N Duration : 10 sec. Speed : Shall attain to specified force in 2 sec.  FBA : Applied force : 50±3N Duration : 30±1 sec.  
18.Resistance to vibration	ΔL/L : Within±5% Q : 30min.	ΔL/L : Within±5%	Appearance : No abnormality ΔL/L : Within±5% Q change : Within±30% (LHLP : only ΔL/L)	Appearance : No abnormality Impedance change : Within±20%			FA・CA : Directions : 2 hrs each in X, Y and Z directions total : 6hrs. Frequency range : 10 to 55 to 10Hz(1min.) Amplitude : 1.5mm Mounting method : Soldering onto printed board. Recovery : At least 1hr of recovery under the standard condition after the test, followed by the measurement within 2hrs.  LHL□□□・FB : Directions : 2 hrs each in X, Y and Z directions total : 6hrs. Frequency range : 10 to 55 to 10Hz(1min.) Amplitude : 1.5mm (But don't exceed acceleration 196m/s (two power) Mounting method : Soldering onto printed board.

Item	Specified Value						Test Method and Remarks
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type	
19. Resistance to shock	No significant abnormality in appearance						FA・CA : Drop test Impact material : concrete or vinyl tile Height : 1m Total number of drops : 10 times
20. Solderability	At least 75% of terminal electrode is covered by new solder.	At least 75% of lead circumference is covered by new solder.	At least 90% of lead circumference is covered by new solder.	At least 75% of lead circumference is covered by new solder.			FA・CA : Solder temperature : 230±5°C Duration : 2±0.5 sec.  LHL□□□ : Solder temperature : 235±5°C Duration : 2±0.5 sec. Immersion depth : Up to 1.5mm from bottom of case.  FB : Solder temperature : 230±5°C Duration : 3±1 sec. Immersion depth : Up to 1.5mm from terminal root.  FL05R□ : Solder temperature : 230±5°C Duration : 2±0.5 sec. Immersion depth : Up to 2~2.5mm from terminal root.  FL06BT : Solder temperature : 230±5°C Duration : 3±1 sec. Immersion depth : Up to 0.5~1.0mm from terminal root.

Item	Specified Value						Test Method and Remarks
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type	
21. Resistance to soldering heat	No significant abnormality in appearance	No significant abnormality in appearance Inductance change : Within ±5% Q change : Within ±30% (LHLP : only ΔL/L)	No significant abnormality in appearance Impedance change : Within ±20%	Refer to individual specification	No significant abnormality in appearance Impedance change : Within ±20%	<p>FA・CA :</p> <p>Solder temperature : 260±5°C (CP02・LA02) 270±5°C (LA03・LA04・LA45)</p> <p>Duration : 5±0.5 sec. One time</p> <p>Immersion conditions : Inserted into substrate with t = 1.6mm</p> <p>Recovery : At least 1hr of recovery under the standard condition after the test, followed by the measurement within 2hrs.</p> <p>LHL□□□ :</p> <p>Solder bath method</p> <p>Solder temperature : 260±5°C</p> <p>Duration : 10±1 sec. : Up to 1.5mm from bottom of case.</p> <p>Manual soldering</p> <p>Solder temperature : 350±10°C (At the tip of soldering iron)</p> <p>Duration : 5±1 sec. : Up to 1.5mm from bottom of case.</p> <p>Caution : No excessive pressing shall be applied to terminal</p> <p>Recovery : 4 to 24hrs of recovery under the standard condition after the test.</p> <p>FB :</p> <p>Solder bath method</p> <p>Condition 1</p> <p>Solder temperature : 260±5°C</p> <p>Duration : 10±1 sec.</p> <p>Immersion depth : Up to 1.5mm from terminal root.</p> <p>Condition 2</p> <p>Solder temperature : 350±5°C</p> <p>Duration : 3±1 sec.</p> <p>Immersion depth : Up to 1.5mm from terminal root.</p> <p>Recovery : 3hrs of recovery under the standard condition after the test.</p> <p>FL :</p> <p>Solder condition : 260±5°C 10±1 sec.</p> <p>Immersion depth : Up to 0.5 to 1.0mm from terminal root.</p> <p>Recovery : 3hrs of recovery under the standard condition after the test.</p>	



Item	Specified Value						Test Method and Remarks																																													
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type																																														
22. Resistance to solvent	Please avoid the ultrasonic cleaning of this product.			No significant abnormality in appearance Impedance change : Within ±20%			FB : Solvent temperature : 20~25°C Duration : 30±5 sec. Solvent type : Acetone, trichloroethylene Recovery : 3hrs of recovery under the standard condition after the test.																																													
23. Thermal shock	ΔL/L : Within ±10% Q : 30min.	ΔL/L : Within ±10%	Appearance : No abnormality Inductance change : Within ±10% Q change : Within ±30% (LHLP : only ΔL/L)	Appearance : No abnormality Impedance change : Within ±20%	Refer to individual specification	Appearance : No abnormality Impedance change : Within ±20%	FA・CA : Conditions for 1 cycle <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25<sup>+0</sup><sub>-3</sub></td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>+85<sup>+2</sup><sub>-0</sub></td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>Within 3</td> </tr> </tbody> </table> Number of cycles : 5 cycles Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs.  LHL□□□・FB : According to JIS C0025 Conditions for 1 cycle <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Minimum operating temperature<sup>+0</sup><sub>-3</sub></td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>Maximum operating temperature<sup>+2</sup><sub>-0</sub></td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>Within 3</td> </tr> </tbody> </table> Number of cycles : 10 cycles (LHL□□□) : 5 cycles (FBA, FBR) Recovery : 4 to 24hrs of recovery under the standard condition after the removal from the test chamber. (LHL□□□) : 3hrs of recovery under the standard condition after the removal from the test chamber. (FBA, FBR)  FL : According to JIS C0025 Conditions for 1 cycle <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25<sup>+0</sup><sub>-3</sub></td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>+85<sup>+2</sup><sub>-0</sub></td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>Within 3</td> </tr> </tbody> </table> Number of cycles : 10 cycles Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber.	Step	Temperature (°C)	Duration (min)	1	-25 <sup>+0</sup> <sub>-3</sub>	30±3	2	Room temperature	Within 3	3	+85 <sup>+2</sup> <sub>-0</sub>	30±3	4	Room temperature	Within 3	Step	Temperature (°C)	Duration (min)	1	Minimum operating temperature <sup>+0</sup> <sub>-3</sub>	30±3	2	Room temperature	Within 3	3	Maximum operating temperature <sup>+2</sup> <sub>-0</sub>	30±3	4	Room temperature	Within 3	Step	Temperature (°C)	Duration (min)	1	-25 <sup>+0</sup> <sub>-3</sub>	30±3	2	Room temperature	Within 3	3	+85 <sup>+2</sup> <sub>-0</sub>	30±3	4	Room temperature	Within 3
Step	Temperature (°C)	Duration (min)																																																		
1	-25 <sup>+0</sup> <sub>-3</sub>	30±3																																																		
2	Room temperature	Within 3																																																		
3	+85 <sup>+2</sup> <sub>-0</sub>	30±3																																																		
4	Room temperature	Within 3																																																		
Step	Temperature (°C)	Duration (min)																																																		
1	Minimum operating temperature <sup>+0</sup> <sub>-3</sub>	30±3																																																		
2	Room temperature	Within 3																																																		
3	Maximum operating temperature <sup>+2</sup> <sub>-0</sub>	30±3																																																		
4	Room temperature	Within 3																																																		
Step	Temperature (°C)	Duration (min)																																																		
1	-25 <sup>+0</sup> <sub>-3</sub>	30±3																																																		
2	Room temperature	Within 3																																																		
3	+85 <sup>+2</sup> <sub>-0</sub>	30±3																																																		
4	Room temperature	Within 3																																																		

Item	Specified Value						Test Method and Remarks
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type	
24. Damp heat	△L/L : Within ±10% Q : 30min.	△L/L : Within ±10%		Appearance : No abnormality Impedance change : Within ±20%			FA・CA : Temperature : 40±2°C Humidity : 90~95%RH Duration : 1000 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs. FB : Temperature : 60±2°C Humidity : 90~95%RH Duration : 1000 hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber.
25. Loading under damp heat	△L/L : Within ±10% Q : 30min.	△L/L : Within ±10%	Appearance : No abnormality Inductance change : Within ±10% Q change : Within ±30% (LHLP : only △L/L)		Refer to individual specification	Appearance : No abnormality Impedance change : Within ±20%	FA・CA : Temperature : 40±2°C Humidity : 90~95%RH Duration : 1000 hrs Applied current : Rated current Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs.  LHL□□□ : Temperature : 40±2°C Humidity : 90~95%RH Duration : 1000±24 hrs Applied current : Rated current Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber.  FL : Temperature : 60±3°C Humidity : 90~95%RH Duration : 500 (+12, -0) hrs Applied current : Rated current Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber.
26. Loading at high temperature	△L/L : Within ±10% Q : 30min.	△L/L : Within ±10%					FA・CA : Temperature : 85±2°C Duration : 1000 hrs Applied current : Rated current Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs.

Item	Specified Value						Test Method and Remarks
	FA02 Type	CAL45 Type	LHL□□□	FBA/FBR	FL05□ Type	FL06BT Type	
27.Low temperature life test	△L/L : Within±10% Q : 30min.	△L/L : Within±10%	Appearance : No abnormality Inductance change : Within±10% Q change : Within±30% (LHLP : only △L/L)		Refer to individual specification	Appearance : No abnormality Impedance change : Within±20%	FA・CA : Temperature : -25±2°C Duration : 1000 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs.  LHL□□□ : Temperature : -40±3°C Duration : 1000±24 hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test cfamber.  FL : Temperature : -40±3°C Duration : 500 (+12, -0) hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test cfamber.
28.High temperature life test			Appearance : No abnormality Inductance change : Within±10% Q change : Within±30%		Refer to individual specification	Appearance : No abnormality Impedance change : Within±20%	LHL□□□ : Temperature : 105±3°C Duration : 1000±24 hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test cfamber.  FL : Temperature : 85±3°C Duration : 500 (+12, -0) hrs Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test cfamber.

# PRECAUTIONS

FA Type, CAL Type, LH Type, FB Type, FL Type

Stages	Precautions	Technical considerations
1.Circuit Design	<p>Operating environment,</p> <p>1.The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.</p>	
2.PCB Design	<p>Design</p> <p>1.Please design insertion pitches of a base in the pitches that fitted a terminal interval.</p>	<p>1.When Inductors are mounted onto a PC board, hole dimensions on the board should match the lead pitch of the component, if not, it will cause breakage of the terminals or cracking of terminal roots covered with resin as excess stress travels through the terminal legs.</p>
3.Considerations for automatic placement	<p>Adjustment of mounting machine</p> <p>1.Excessive impact load should not be imposed on the products when mounting onto the PC boards.</p> <p>2.Mounting and soldering conditions should be checked beforehand.</p>	<p>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</p>
4.Soldering	<p>Wave soldering</p> <p>1.Please refer to the specifications in the catalog for a wave soldering.</p> <p>2.Do not immerse the entire Inductors in the flux during the soldering operation.</p> <p>Lead free soldering</p> <p>1.When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to soldering heat, soldering etc sufficiently.</p> <p>Recommended conditions for using a soldering iron:</p> <p>Put the soldering iron on the land-pattern.</p> <p>Soldering iron's temperature - Below 350 °C</p> <p>Duration - 3 seconds or less</p> <p>The soldering iron should not directly touch the inductor.</p> <p>◆Reflow soldering</p> <p>1.As for reflow soldering, please contact our sales staff.</p>	<p>1.If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p>
5.Cleaning	<p>Cleaning conditions</p> <p>1.CP Type, LA type, CAL type, LH type</p> <p>Please do not do cleaning by a supersonic wave.</p>	<p>CP Type, LA type, CAL type, LH type</p> <p>1.If washing by supersonic waves, supersonic waves may deform products.</p>
6.Handling	<p>Handling</p> <p>1.Keep the inductors away from all magnets and magnetic objects.</p> <p>Mechanical considerations</p> <p>1.Please do not give the inductors any excessive mechanical shocks.</p> <p>2.LH type</p> <p>If inductors are dropped onto the floor or a hard surface they should not be used.</p> <p>Packing</p> <p>1.Please do not give the inductors any excessive mechanical shocks.</p> <p>In loading, please pay attention to handling indication mentioned in a packing box (a loading direction / number of maximum loading / fragile item).</p>	<p>1.There is a case that a characteristic varies with magnetic influence.</p> <p>1.There is a case to be damaged by a mechanical shock.</p> <p>2.LH type</p> <p>There is a case to be broken by a fall.</p> <p>1.There is a case that a lead route turns at by a fall or an excessive shock.</p>
7.Storage conditions	<p>Storage</p> <p>1.To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled..</p> <p>•Recommended conditions</p> <p>Ambient temperature      0~40°C</p> <p>Humidity                      Below 70 % RH</p> <p>The ambient temperature must be kept below 30°C. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, inductors should be used within one year from the time of delivery.</p> <p>In case of storage over 6 months, solderability shall be checked before actual usage.</p>	<p>1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.</p>