

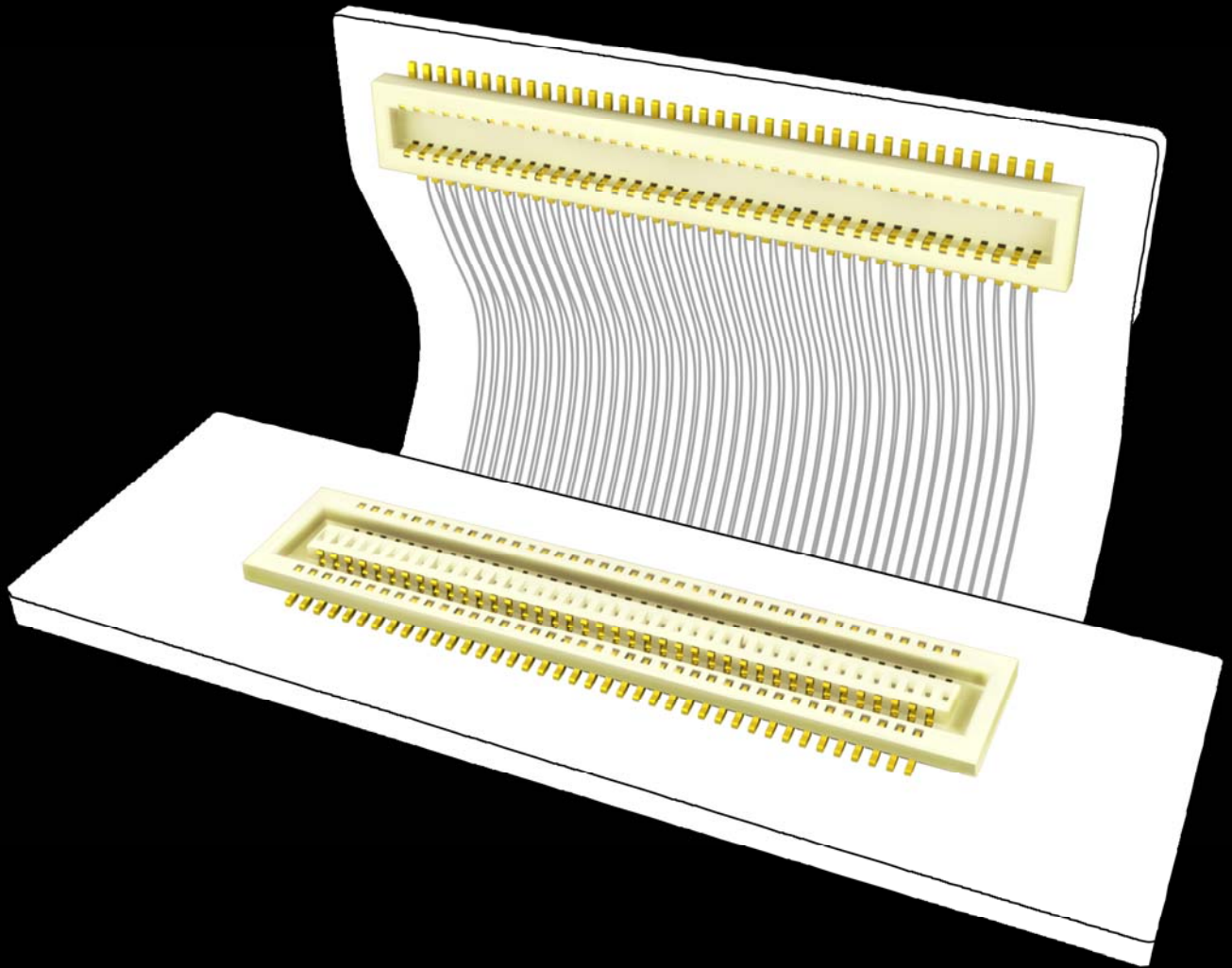
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# BB409 Series

**0.4mm Pitch**

**Mated Height=0.9mm**

P.C BOARD CONN. , SMT, Dual Row, Straight



日 恒 精 工

*SUNCAGEY*

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# 驚異的展現、絕佳的契合、信賴的高精度實現 A product of outstanding, finest and reliable precision.

## 概述

這是一顆應用於基板對基板間或基板對軟性電路板間的訊號連接用連接器，其間距0.4mm，結合高度0.9mm，為現今全球最小型化的電子連接器。

日慎精工本著日新又新、慎終如始的企業文化，精益求精的研發態度與幾近吹毛求疵的工藝精神，再度的展現於本產品中。

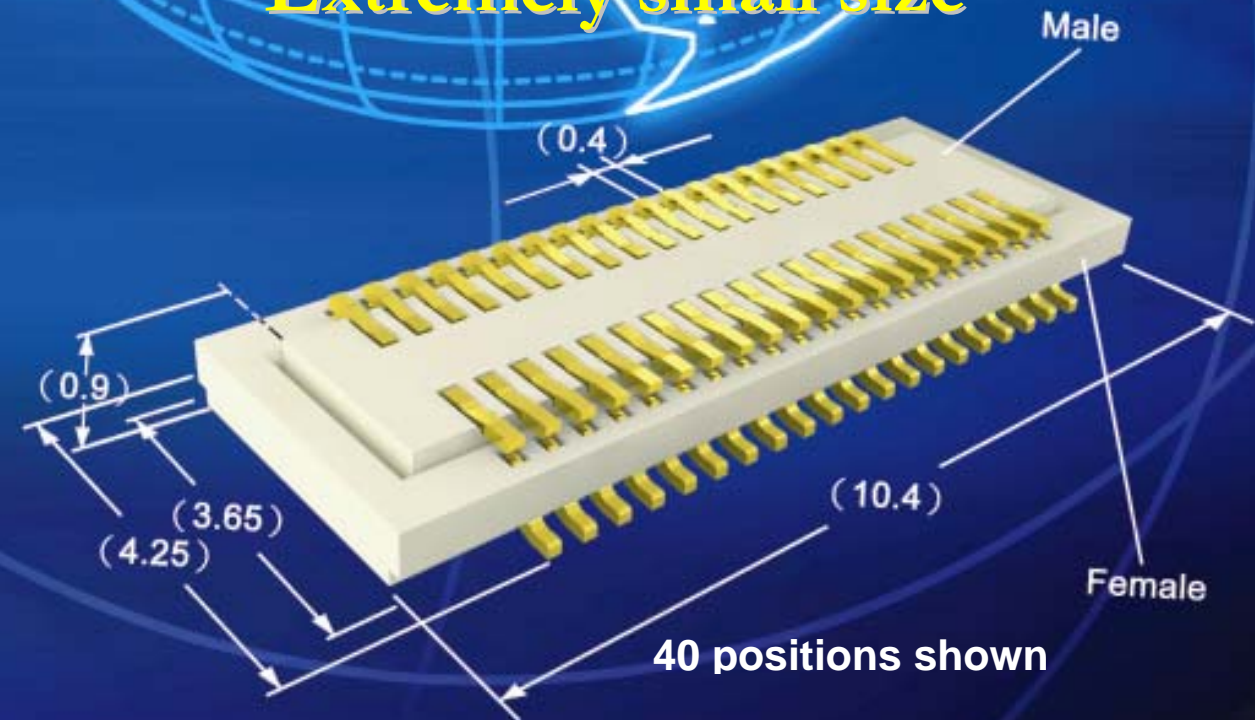
## Introduction

This connector is designed for the purpose of communication and is specifically for the board-to-board and FPC-to-board connections of which the pitch is 0.4mm, and the joining height is merely 0.9mm, being the most outstanding and smallest electronic connector in the world.

As an everlasting research and leading innovation enterprise, SUNCAGEY highlights his censorious character and treasures his customer by presenting this epochal product.

# SUNCAGEY

**Extremely small size**





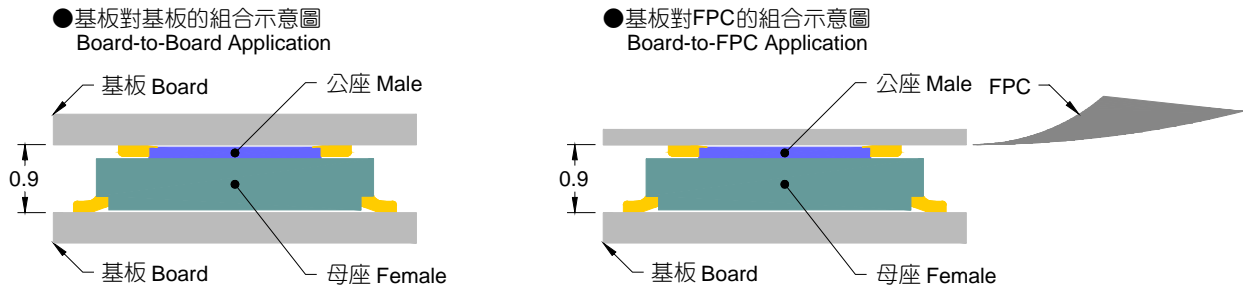
## 特色 FEATURES

### ■ 超薄 Low Profile

在基板對基板或基板對 FPC 結合後，板至板空間為 0.9mm，並在這狹窄空間做大量訊號的完美連接。  
The 0.9mm board-to-board distance makes these connectors ideal for limited space applications.

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超薄-0.9mm基板至基板距離  
Low profile - 0.9mm board-to-board distance



### ■ 規格齊全的訊號接點 Large variety of Number of Contacts

提供 10、12、14 – 80 個接點數供選擇，線路設計時可避免牽就零件規格造成板材的浪費。  
Available with 10、12、14 – 80 contacts.

### ■ 絕佳的組合觸感 Click Sensation

當公座與母座結合時，會發出明顯的卡嗒感覺，即可判別公母座是否已緊密結合。  
Positive click sensation when completely mated confirms correct insertion and connection of all contacts.

### ■ 0.25mm 的有效結合長度 Mating length 0.25mm

公母座結合後其導電端子維持 0.25mm 的對插距離。  
The effective mating length has been extended to ensure that there is some latitude in the mating.

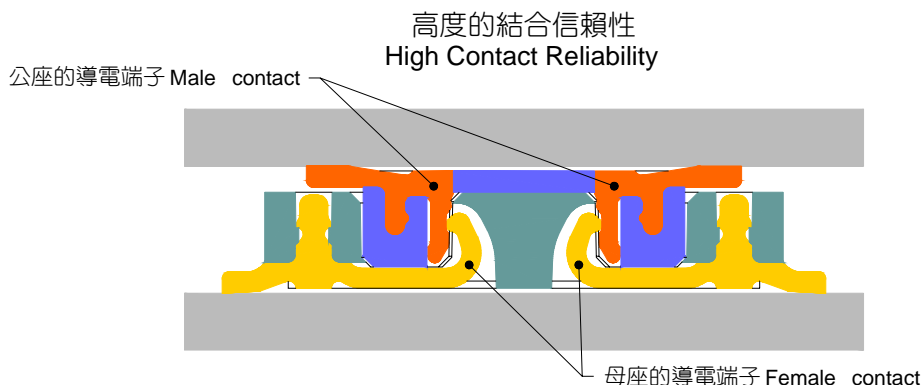
0.25mm 的有效結合長度  
Mating length 0.25mm



### ■ 高度的結合信賴性 High Contact Reliability

儘管是只有 0.9mm 的結合空間，當結合後母座的導電端子依然保持彈力有效的緊緊抓住公座的導電端子，維持完美的電氣連接。

While achieving a low profile of 0.9mm between PCBs, the female contacts maintain reliable spring force Assuring secure electrical contact.



## 適用的產品 APPLICATIONS

- 手機、掌上型電腦、筆記型電腦、數位相機、或其它小型化電子產品的基板對基板連接機構。  
Mobile phones, PDA's, Notebook PC's, Digital cameras and other miniature devices.

## 產品編碼 ORDERING INFORMATION

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BB	409	-	xxx	x	-	xx	xxx
1	2		3	4		5	6

1 系列名稱 Series name	BB
2 系列編號 Series number	409
3 接點數量 Number of contacts	010 - 080
4 組合樣式 Assembly style	M - 公座 Male F - 母座 Female
5 包裝方式 Packaging	TA - 帶狀捲式包裝 Embossed Tape TU - 管裝 Tube
6 電鍍方式 Plating	05G - 鎳底鍍 5μ"金 5μ" Gold over Nickel 10G - 鎳底鍍 10μ"金 10μ" Gold over Nickel

## 材質 MATERIAL

### ● 公座 Male

絕緣膠體 Housing :	L.C.P
顏色 Color :	白色 White
耐燃等級(UL94V-0) Flammability Rating (UL94V-0)	
導電端子 Contacts :	黃銅 Brass
電鍍 Plating :	視訂單需求 See Ordering Information

### ● 母座 Female

絕緣膠體 Housing :	L.C.P
顏色 Color :	白色 White
耐燃等級(UL94V-0) Flammability Rating (UL94V-0)	
導電端子 Contacts :	磷青銅 Phosphor Bronze
電鍍 Plating :	視訂單需求 See Ordering Information

## 等級 RATING

最大容許電壓 Operating Voltage	50V AC/DC
最大容許電流 Current Rating	0.3A AC/DC
使用溫度範圍 Operating Temperature	-25°C ~ +85°C (包含電流通過所產生的上昇溫度) (Including terminal temperature rise)

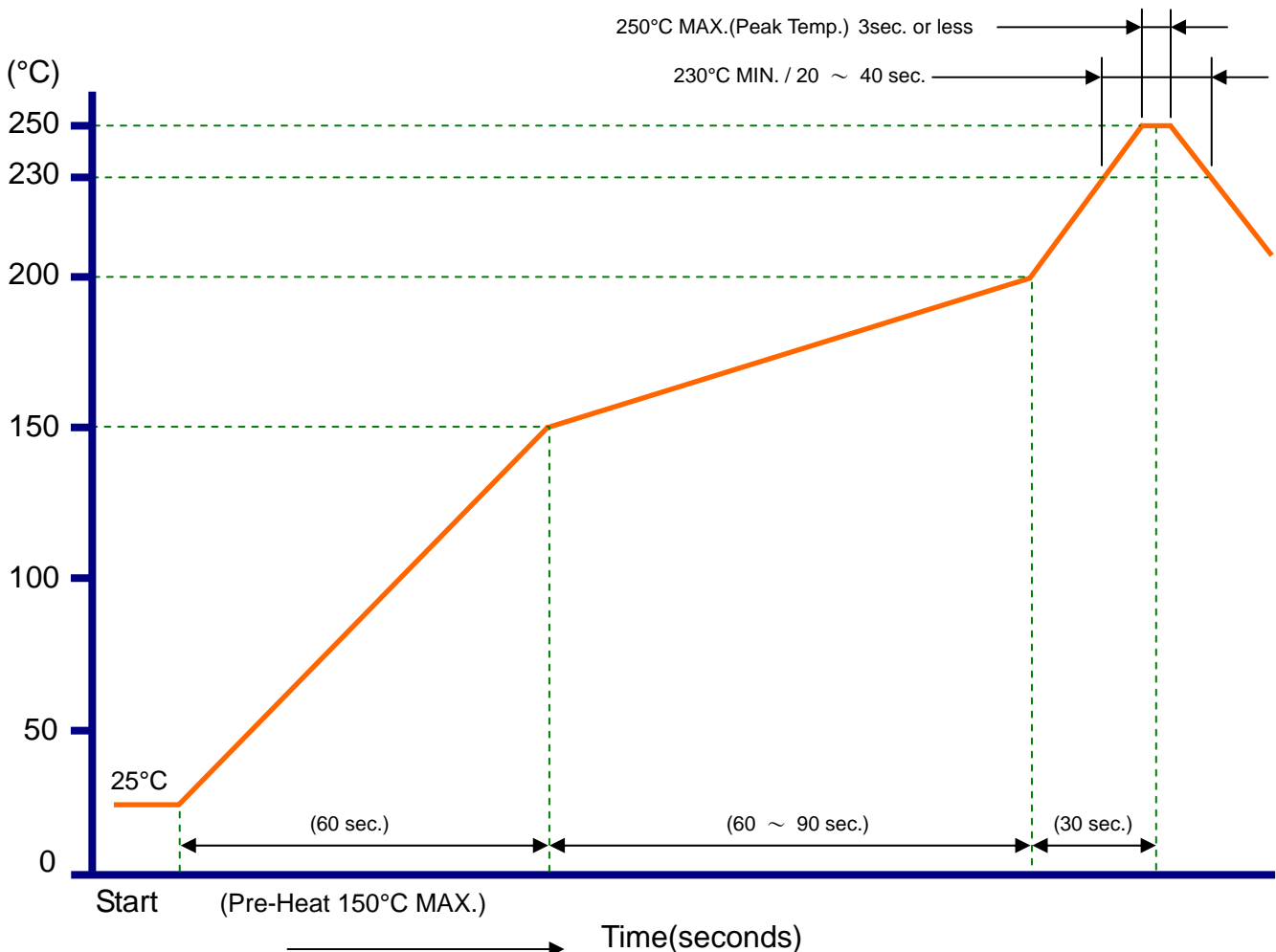
## 性能 PERFORMANCE

項目 ITEM	測試條件 TEST CONDITION	規格 REQUIREMENT	
<b>電氣特性 ELECTRICAL PERFORMANCE</b>			
Contact Resistance	Mate connectors, measure by dry circuit, 20mV Max., 10mA.	90 mΩ MAX.	
Insulation Resistance	Mate connectors; apply 125V DC between adjacent terminal and ground. (MIL-STD-202 Method 302)	100 MΩ MIN.	
Dielectric Strength	Mate connectors; apply 125V AC (rms) for 1 minute between adjacent terminal and ground. (MIL-STD-202 Method 301)	No Breakdown	
<b>機械特性 MECHANICAL PERFORMANCE</b>			
Insertion and Withdrawal Force	Insert and withdraw connectors at the speed rate of 25 ± 3 mm/minute.	Insertion Force	Pos.x 100gf (0.981N) MAX.
		Withdrawal Force	Pos.x 6gf (0.0588N) MIN.
Terminal / Housing Retention Force	Apply axial pull out force at the speed rate of 25 ± 3 mm/minute on the terminal assembled in the housing.	50gf (0.4905N) MIN.	
<b>環境特性及其它性能 ENVIRONMENTAL PERFORMANCE AND OTHERS</b>			
Repeated Insertion/Withdrawal	When mated up to 10 cycles repeatedly by the rate of 10 cycles per minute.	Contact Resistance	100 mΩ MAX.
Temperature Rise	Carrying rated current load. (UL 498)	Temperature rise	30 °C MAX.
Vibration	Amplitude: 1.5mm P-P Sweep time: 10~55~10 Hz in 1 minute Duration: 2 hours in each X.Y.Z. axes  (MIL-STD-202 Method 201)	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
		Discontinuity	1 μ sec. MAX.
Shock	490m/s <sup>2</sup> (50G), 3 strokes in each X.Y.Z. axes. (MIL-STD-202 Method 213)	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
		Discontinuity	1 μ sec. MAX.
Heat Resistance	85 ± 2°C, 96hours (MIL-STD-202 Method 108)	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
Cold Resistance	-40 ± 3°C, 96hours	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
Humidity	Temperature: 60 ± 2°C Relative Humidity: 90~95% Duration: 96 hours  (MIL-STD-202 Method 103)	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
		Dielectric Strength	No Breakdown
		Insulation Resistance	50 MΩ MIN.

## 性能 PERFORMANCE

項目 ITEM	測試條件 TEST CONDITION	規格 REQUIREMENT	
Temperature Cycling	5 cycles of: a) -55°C      30minutes b) +85°C      30minutes	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
Salt Spray	48 ± 4 hours exposure to a salt spray from the 5±1% solution at 35 ± 2 °C	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
SO <sub>2</sub> Gas	24 hours exposure to 50 ± 5ppm. SO <sub>2</sub> gas at 40 ± 2 °C	Appearance	No Damage
		Contact Resistance	100 mΩ MAX.
Solderability	Soldering Time: 3 ± 0.5 sec. Solder Temperature: 230 ± 5 °C	Solder Wetting	95% of immersed area must show No voids, pinholes.
Resistance to Soldering Heat	Refer to <u>INFRARED REFLOW CONDITION</u>	Appearance	No Damage

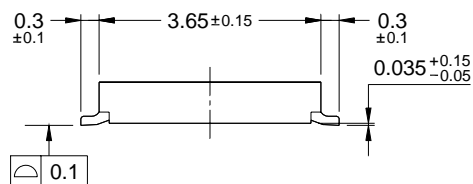
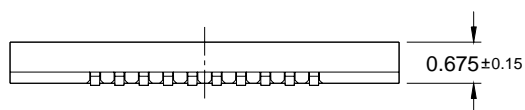
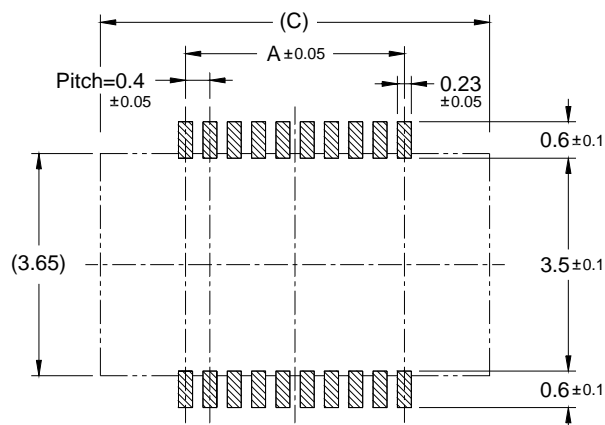
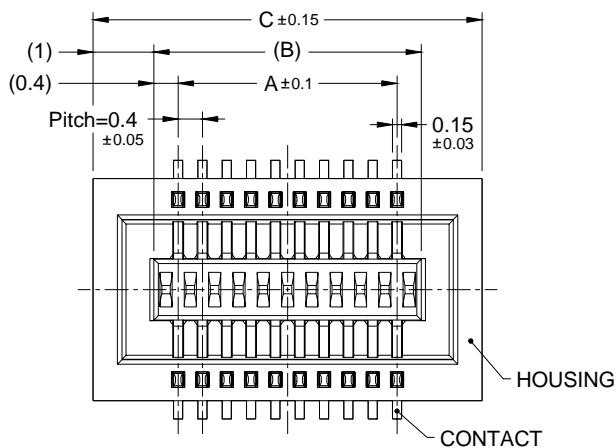
## 紅外線迴焊溫度曲線 INFRARED REFLOW CONDITION



# 母座尺寸 DIMENSIONS / FEMALE

## PCB Layout

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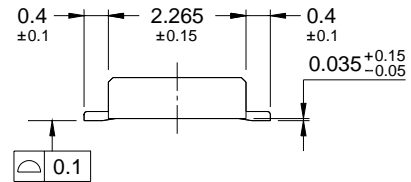
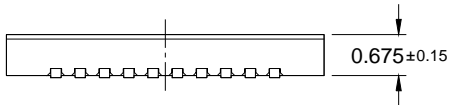
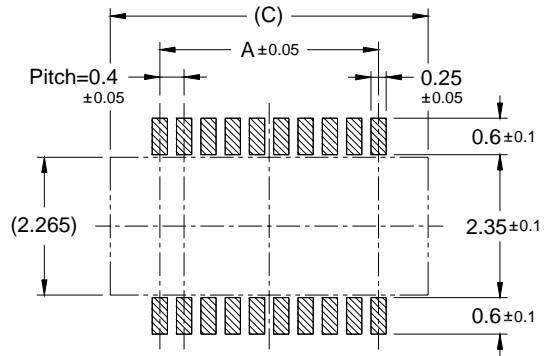
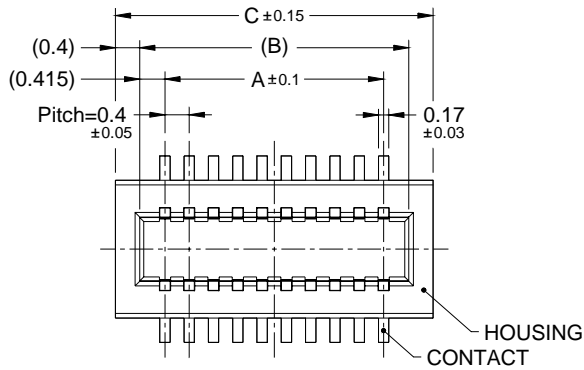
No. of Contacts	Part No.	DIM. A	DIM. B	DIM. C
10	BB409-010F-xxxxx	1.6	2.4	4.4
12	BB409-012F-xxxxx	2.0	2.8	4.8
14	BB409-014F-xxxxx	2.4	3.2	5.2
16	BB409-016F-xxxxx	2.8	3.6	5.6
18	BB409-018F-xxxxx	3.2	4.0	6.0
20	BB409-020F-xxxxx	3.6	4.4	6.4
22	BB409-022F-xxxxx	4.0	4.8	6.8
24	BB409-024F-xxxxx	4.4	5.2	7.2
26	BB409-026F-xxxxx	4.8	5.6	7.6
28	BB409-028F-xxxxx	5.2	6.0	8.0
30	BB409-030F-xxxxx	5.6	6.4	8.4
32	BB409-032F-xxxxx	6.0	6.8	8.8
34	BB409-034F-xxxxx	6.4	7.2	9.2
36	BB409-036F-xxxxx	6.8	7.6	9.6
38	BB409-038F-xxxxx	7.2	8.0	10.0
40	BB409-040F-xxxxx	7.6	8.4	10.4
42	BB409-042F-xxxxx	8.0	8.8	10.8
44	BB409-044F-xxxxx	8.4	9.2	11.2

No. of Contacts	Part No.	DIM. A	DIM. B	DIM. C
46	BB409-046F-xxxxx	8.8	9.6	11.6
48	BB409-048F-xxxxx	9.2	10.0	12.0
50	BB409-050F-xxxxx	9.6	10.4	12.4
52	BB409-052F-xxxxx	10.0	10.8	12.8
54	BB409-054F-xxxxx	10.4	11.2	13.2
56	BB409-056F-xxxxx	10.8	11.6	13.6
58	BB409-058F-xxxxx	11.2	12.0	14.0
60	BB409-060F-xxxxx	11.6	12.4	14.4
62	BB409-062F-xxxxx	12.0	12.8	14.8
64	BB409-064F-xxxxx	12.4	13.2	15.2
66	BB409-066F-xxxxx	12.8	13.6	15.6
68	BB409-068F-xxxxx	13.2	14.0	16.0
70	BB409-070F-xxxxx	13.6	14.4	16.4
72	BB409-072F-xxxxx	14.0	14.8	16.8
74	BB409-074F-xxxxx	14.4	15.2	17.2
76	BB409-076F-xxxxx	14.8	15.6	17.6
78	BB409-078F-xxxxx	15.2	16.0	18.0
80	BB409-080F-xxxxx	15.6	16.4	18.4

# 公座尺寸 DIMENSIONS / MALE

## PCB Layout

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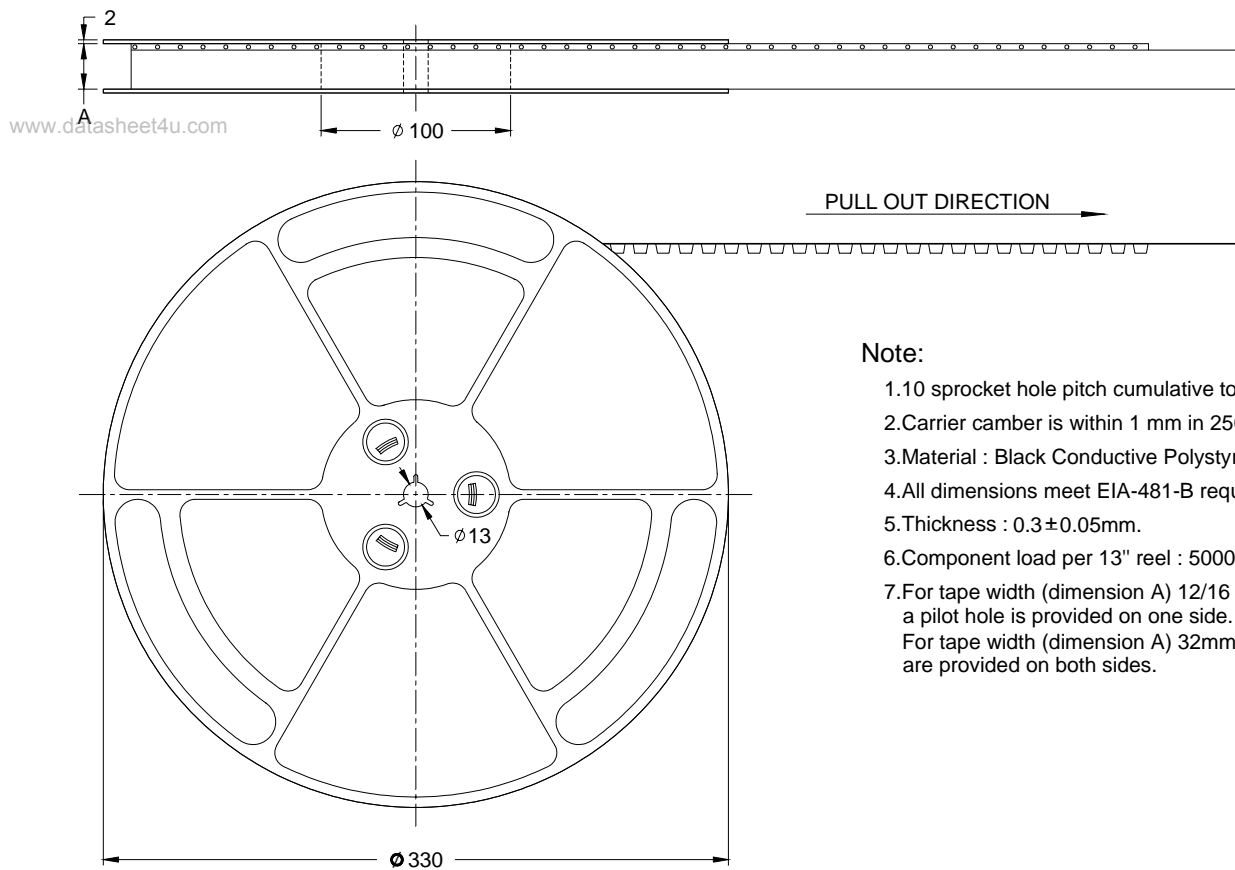


No. of Contacts	Part No.	DIM. A	DIM. B	DIM. C
10	BB409-010M-xxxxx	1.6	2.43	3.23
12	BB409-012M-xxxxx	2.0	2.83	3.63
14	BB409-014M-xxxxx	2.4	3.23	4.03
16	BB409-016M-xxxxx	2.8	3.63	4.43
18	BB409-018M-xxxxx	3.2	4.03	4.83
20	BB409-020M-xxxxx	3.6	4.43	5.23
22	BB409-022M-xxxxx	4.0	4.83	5.63
24	BB409-024M-xxxxx	4.4	5.23	6.03
26	BB409-026M-xxxxx	4.8	5.63	6.43
28	BB409-028M-xxxxx	5.2	6.03	6.83
30	BB409-030M-xxxxx	5.6	6.43	7.23
32	BB409-032M-xxxxx	6.0	6.83	7.63
34	BB409-034M-xxxxx	6.4	7.23	8.03
36	BB409-036M-xxxxx	6.8	7.63	8.43
38	BB409-038M-xxxxx	7.2	8.03	8.83
40	BB409-040M-xxxxx	7.6	8.43	9.23
42	BB409-042M-xxxxx	8.0	8.83	9.63
44	BB409-044M-xxxxx	8.4	9.23	10.03

No. of Contacts	Part No.	DIM. A	DIM. B	DIM. C
46	BB409-046M-xxxxx	8.8	9.63	10.43
48	BB409-048M-xxxxx	9.2	10.03	10.83
50	BB409-050M-xxxxx	9.6	10.43	11.23
52	BB409-052M-xxxxx	10.0	10.83	11.63
54	BB409-054M-xxxxx	10.4	11.23	12.03
56	BB409-056M-xxxxx	10.8	11.63	12.43
58	BB409-058M-xxxxx	11.2	12.03	12.83
60	BB409-060M-xxxxx	11.6	12.43	13.23
62	BB409-062M-xxxxx	12.0	12.83	13.63
64	BB409-064M-xxxxx	12.4	13.23	14.03
66	BB409-066M-xxxxx	12.8	13.63	14.43
68	BB409-068M-xxxxx	13.2	14.03	14.83
70	BB409-070M-xxxxx	13.6	14.43	15.23
72	BB409-072M-xxxxx	14.0	14.83	15.63
74	BB409-074M-xxxxx	14.4	15.23	16.03
76	BB409-076M-xxxxx	14.8	15.63	16.43
78	BB409-078M-xxxxx	15.2	16.03	16.83
80	BB409-080M-xxxxx	15.6	16.43	17.23

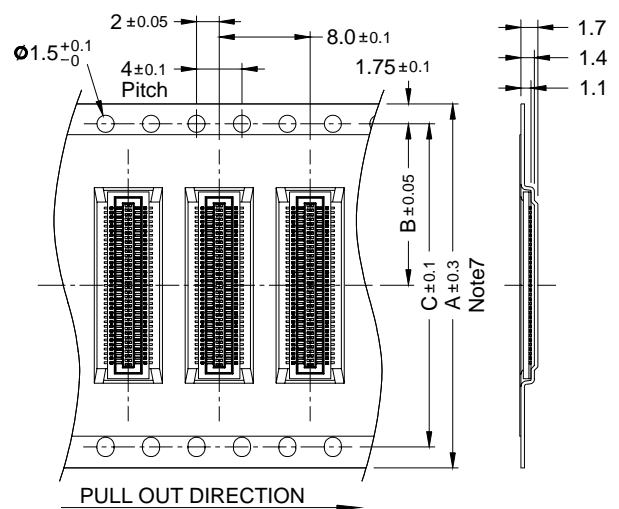
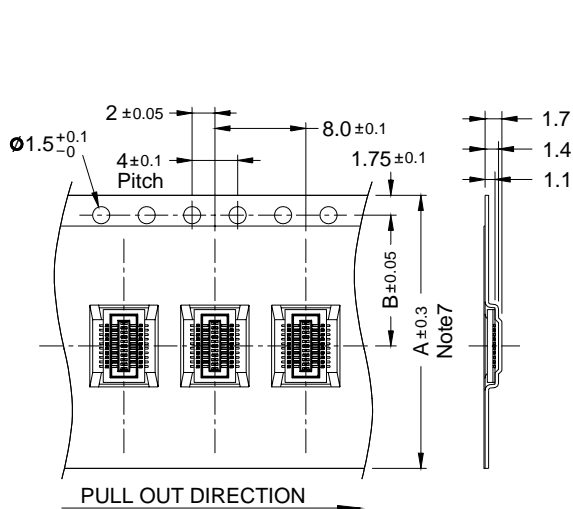


# 母座 TAPE & REEL 尺寸 TAPE & REEL DIMENSIONS / FEMALE



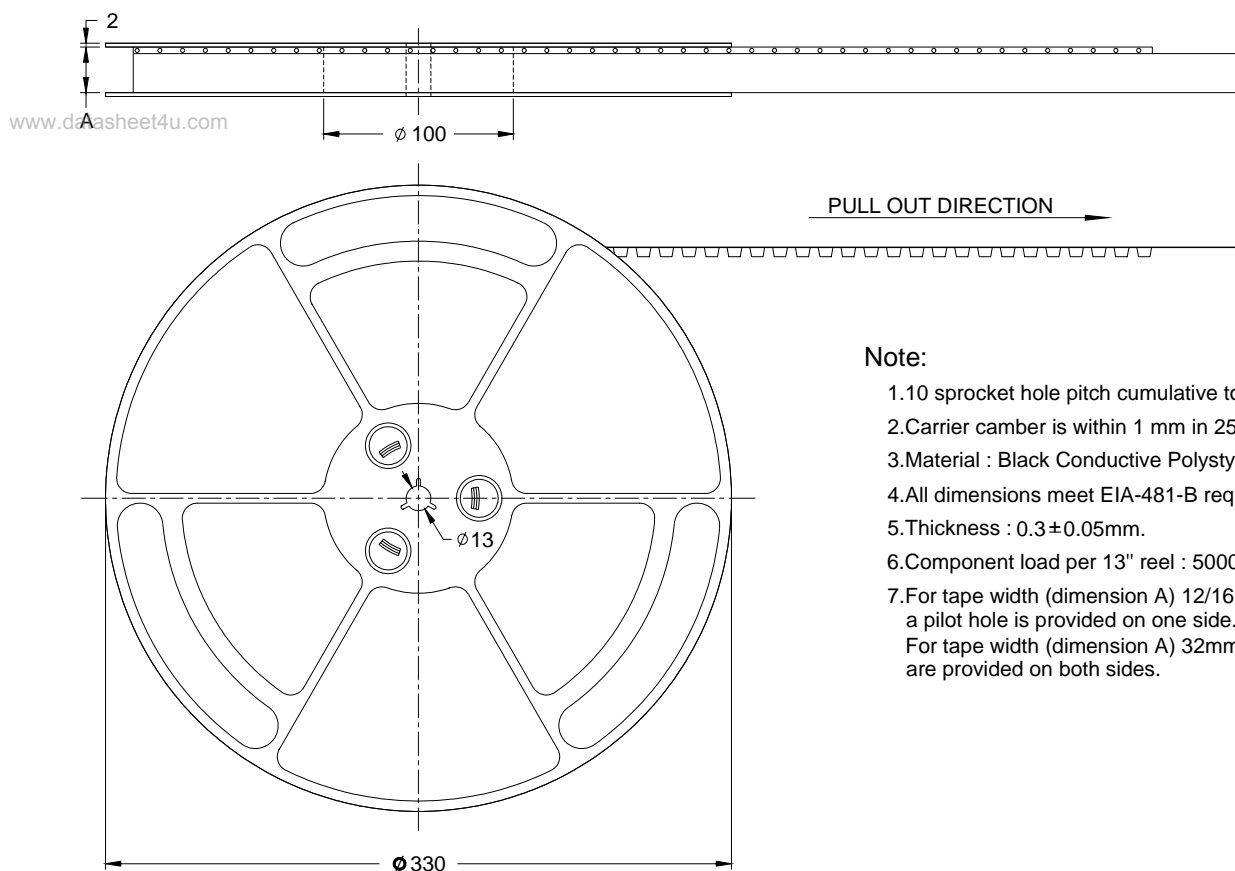
## Note:

- 1.10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ .
- 2.Carrier camber is within 1 mm in 250mm.
- 3.Material : Black Conductive Polystyrene Alloy
- 4.All dimensions meet EIA-481-B requirements.
- 5.Thickness :  $0.3 \pm 0.05$ mm.
- 6.Component load per 13" reel : 5000pcs.
- 7.For tape width (dimension A) 12/16 and 24mm a pilot hole is provided on one side.  
For tape width (dimension A) 32mm pilot holes are provided on both sides.



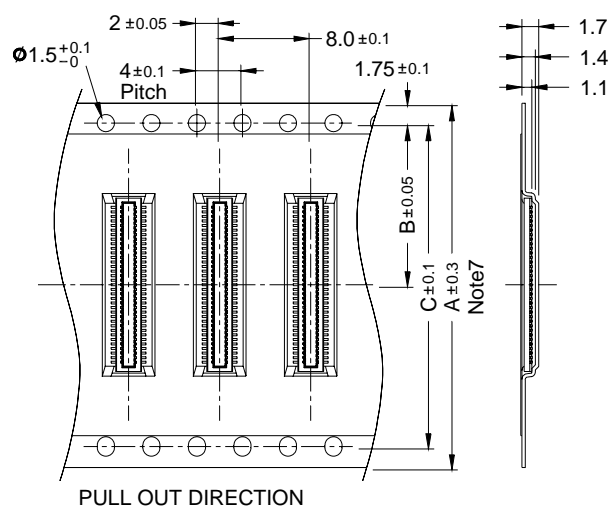
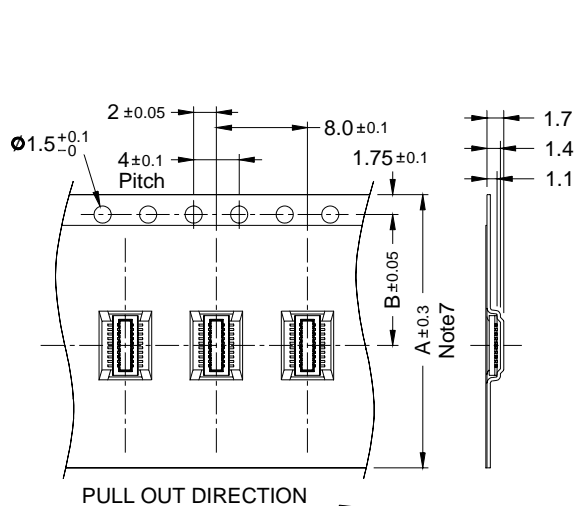
No. of Contacts	Part No.	DIM.A	DIM.B	DIM.C
10 → 12	BB409-010F-TAxxx → BB409-012F-TAxxx	12	5.5	-----
14 → 32	BB409-014F-TAxxx → BB409-032F-TAxxx	16	7.5	-----
34 → 68	BB409-034F-TAxxx → BB409-068F-TAxxx	24	11.5	-----
70 → 80	BB409-070F-TAxxx → BB409-080F-TAxxx	32	14.2	28.4

# 公座 TAPE & REEL 尺寸 TAPE & REEL DIMENSIONS / MALE



### Note:

1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ .
2. Carrier camber is within 1 mm in 250mm.
3. Material : Black Conductive Polystyrene Alloy
4. All dimensions meet EIA-481-B requirements.
5. Thickness :  $0.3 \pm 0.05$ mm.
6. Component load per 13" reel : 5000pcs.
7. For tape width (dimension A) 12/16 and 24mm a pilot hole is provided on one side.  
For tape width (dimension A) 32mm pilot holes are provided on both sides.



No. of Contacts	Part No.	DIM.A	DIM.B	DIM.C
10 → 12	BB409-010M-TAxxx → BB409-012M-TAxxx	12	5.5	----
14 → 32	BB409-014M-TAxxx → BB409-032M-TAxxx	16	7.5	----
34 → 68	BB409-034M-TAxxx → BB409-068M-TAxxx	24	11.5	----
70 → 80	BB409-070M-TAxxx → BB409-080M-TAxxx	32	14.2	28.4

# 操作注意事項 INSTRUCTION UPON USAGE

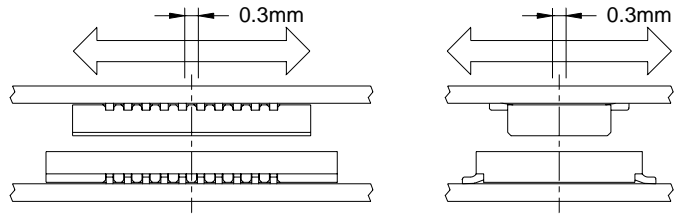
■ 結合 步驟一

將連接器在保持相互平行下置放，容許偏差於0.3mm以內。

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■ Joining Step 1

To place the parts in parallel position, the tolerance is within 0.3mm.

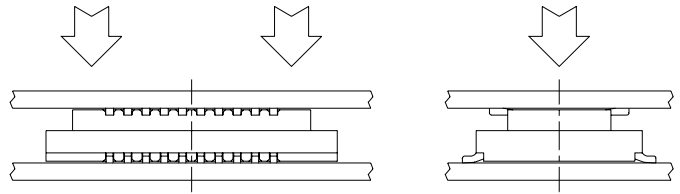


■ 結合 步驟二

均衡按下，直到感覺力量受阻。

■ Joining Step 2

To press the overlying part balanced into the underlined, then it resists.

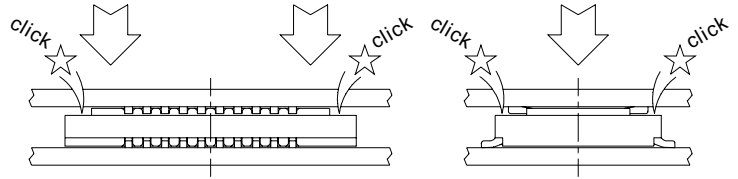


■ 結合 步驟三

再持續施壓直到越過阻力，並有"卡嗒"感覺即表示已充分結合。

■ Joining Step 3

To continuing the press movement tills the resistance overcome, a prominent sound of interlock indicates the joining is complete.

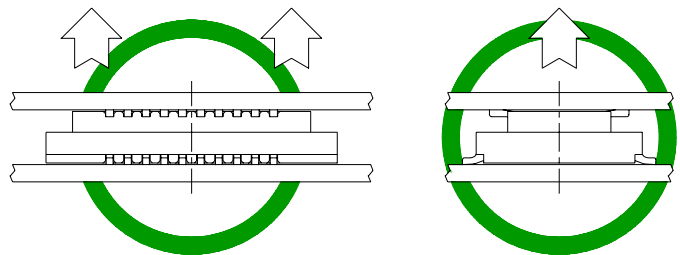


■ 拔出

請保持平行拔出。

■ Pullout

The pullout force should react highly balance.

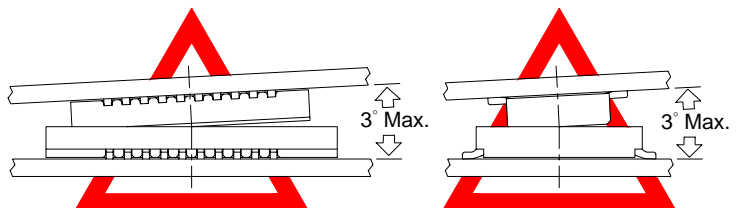


■ 警告!!

在結合或拔出時如傾斜角度超過 3°，將有造成零件損壞的可能。

■ Warning!!

In case the inclined angle between two parts exceeds 3°, the components could be damaged.





# 結合尺寸圖 MATED DRAWING

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