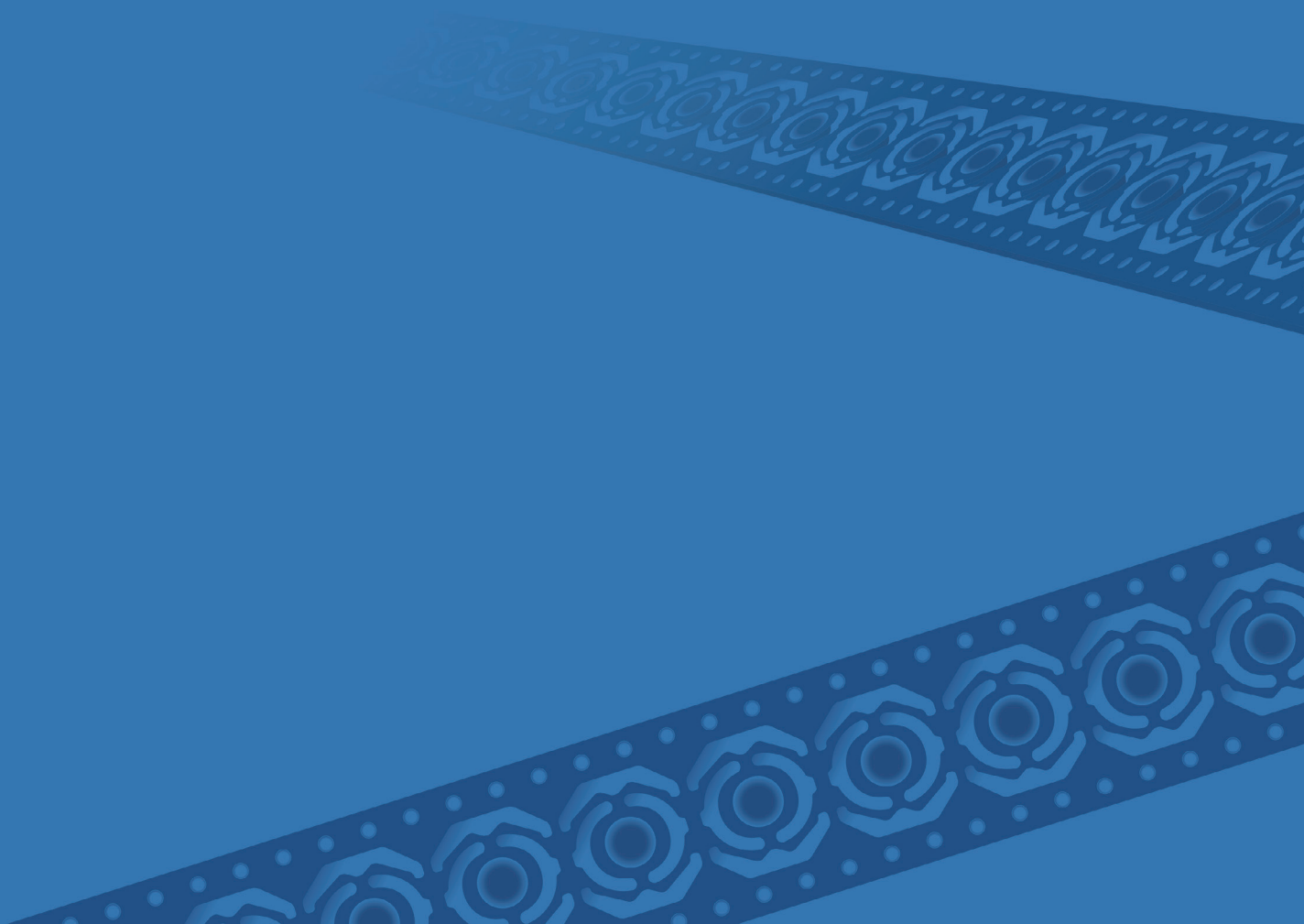


Product Brochure 2022

TPS COMPONENTS

SMARX series



TPS COMPONENTS

SMARX series

The SMARX series achieves further ultra-downsizing and high reliability of surface-mount parts, which are required to be diverse in characteristics, such as high frequency characteristics, heat radiation, and magnetic shielding.

FEATURES

1. Mass-production by means of special precision press forming achieves overwhelming cost performance
2. Manufacturing know-how accumulated in the 97 years since our foundation and a track record of manufacturing one billion pieces of OEM products per year
3. IATF 16949-certified quality management and 20 patented technologies
4. Enhancement of stability in the characteristic transmission of high-frequency signals and a significant reduction in transmission loss enables a reduction in the number of parts in use by 40%

Product Structure

TPS COMPONENTS
SMARX series
Reflow
Surface-Mount Parts
Made in JAPAN

Reflow Nut

- Non-Through Hole
- Non-Through Hole, Flat/Protruded End
- Through Hole

Reflow Self-Tapping Nut

- Non-Through Hole
- Non-Through Hole, Flat/Protruded End
- Through Hole

RF Spring Contact

- Ultrasmall HFRO for Horizontal PCB Connect
- HFRO for Horizontal PCB Connect
- HFRO for Vertical PCB Connect

Special Parts

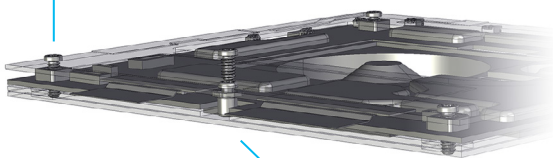
Features
of
Reflow
Nut



Check!

SPECIAL PRECISION PRESS FORMING ACHIEVES OVERWHELMING COST REDUCTION

Reflow Nut, Self-Tapping



Reflow Nut, Non-Through Hole



Special Precision Press Forming Machine



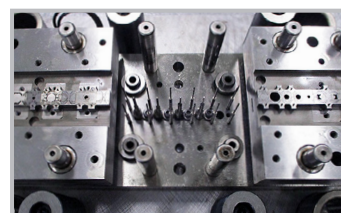
Peel Strength



Weight approx. 10KG



Special Precision Metal Die

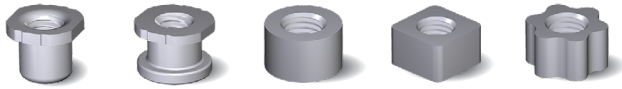


Upper die forming process punch

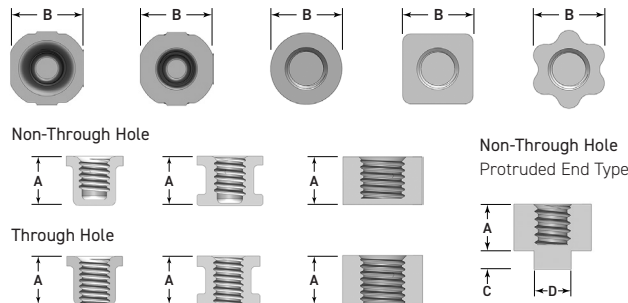


Forming punch / 0.5 mm mechanical pencil lead

Reflow Nut

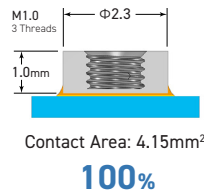


Dimensions

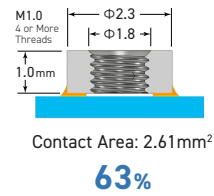


Boasting wide variations and sizes, including the anti-magnetization type and the heat radiation function, the reflow nuts are **compatible with existing products and can smoothly replace them**. With their mounting areas reduced to the minimum, the reflow nuts are free from θ misalignment at the time of mounting. Furthermore, high substrate peel strength and contact reliability are secured.

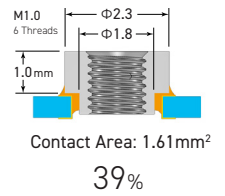
SMARX Non-Through Type



SMARX Through Type










Standard Through Type



The world's first non-through type can secure a wider grounding area than that of the through type, which increases the substrate peeling strength and may reduce the return loss at high frequency. In a grounding connection, the non-through type is expected to increase or stabilize the shielding effect.

All dimensions are in millimeters.

		Type	Thread Code	Thread Size	Dimensions								Parts Number		
						A	B	C	D						
METRIC	Non-Through Hole		Upper Flange Type	M1.0	0.25		1.5	2.0	2.5	3.0	2.6			SMAR-N10F1	
			M1.2	0.25		1.5	2.0	2.5	3.0	2.8			SMAR-N12F1		
			M1.4	0.30		1.5	2.0	2.5	3.0	3.0			SMAR-N14F1		
			M1.6	0.35			2.0	2.5	3.0	3.2			SMAR-N16F1		
			M2.0	0.40			2.0	2.5	3.0	3.6			SMAR-N20F1		
			Upper/Lower Flange Type	M1.0	0.25		1.5	2.0	2.5	3.0	2.6			SMAR-N10E1	
			M1.2	0.25		1.5	2.0	2.5	3.0	2.8			SMAR-N12E1		
			M1.4	0.30		1.5	2.0	2.5	3.0	3.0			SMAR-N14E1		
			M1.6	0.35			2.0	2.5	3.0	3.2			SMAR-N16E1		
			M2.0	0.40			2.0	2.5	3.0	3.6			SMAR-N20E1		
			Flat End Type	M1.0	0.25	1.0	1.5	2.0	2.5		2.3			SMAR-N10H1	
			M1.2	0.25	1.0	1.5	2.0	2.5		2.5			SMAR-N12H1		
			M1.4	0.30		1.5	2.0	2.5		2.7			SMAR-N14H1		
			M1.6	0.35		1.5	2.0	2.5		2.9			SMAR-N16H1		
			M2.0	0.40		1.5	2.0	2.5		3.3			SMAR-N20H1		
			Protruded End Type	M1.0	0.25	1.0	1.5	2.0	2.5		2.3	0.6	0.9	SMAR-N10HT	
			M1.2	0.25	1.0	1.5	2.0	2.5		2.5	0.6	1.1	SMAR-N12HT		
			M1.4	0.30		1.5	2.0	2.5		2.7	0.6	1.3	SMAR-N14HT		
			M1.6	0.35		1.5	2.0	2.5		2.9	0.6	1.6	SMAR-N16HT		
			M2.0	0.40		1.5	2.0	2.5		3.3	0.6	1.9	SMAR-N20HT		
		Through Hole		Upper Flange Type	M1.0	0.25		1.5	2.0	2.5	3.0	2.6			SMAR-N10F0
				M1.2	0.25		1.5	2.0	2.5	3.0	2.8			SMAR-N12F0	
				M1.4	0.30		1.5	2.0	2.5	3.0	3.0			SMAR-N14F0	
				M1.6	0.35		1.5	2.0	2.5	3.0	3.2			SMAR-N16F0	
	M2.0			0.40			2.0	2.5	3.0	3.6			SMAR-N20F0		
			Upper/Lower Flange Type	M1.0	0.25		1.5	2.0	2.5	3.0	2.6			SMAR-N10E0	
			M1.2	0.25		1.5	2.0	2.5	3.0	2.8			SMAR-N12E0		
			M1.4	0.30		1.5	2.0	2.5	3.0	3.0			SMAR-N14E0		
			M1.6	0.35		1.5	2.0	2.5	3.0	3.2			SMAR-N16E0		
			M2.0	0.40			2.0	2.5	3.0	3.6			SMAR-N20E0		
	Flat End Type		M1.0	0.25	1.0	1.5	2.0			2.3			SMAR-N10H0		
	M1.2		0.25	1.0	1.5	2.0			2.5			SMAR-N12H0			
	M1.4		0.30		1.5	2.0			2.7			SMAR-N14H0			
	M1.6		0.35		1.5	2.0			2.9			SMAR-N16H0			
	M2.0		0.40		1.5	2.0			3.3			SMAR-N20H0			







INCH	Non-Through Hole	Upper Flange Type	No.0-80	0.3175		2.0	2.5	3.0	3.0			SMAR-NF0F1
			No.2-56	0.4536		2.0	2.5	3.0	3.5			SMAR-NC2F1
			No.4-40	0.6350			2.5	3.0	4.1			SMAR-NC4F1
			No.6-32	0.7938				3.0	4.6			SMAR-NC6F1
		Upper/Lower Flange Type	No.8-32	0.7938				3.0	5.3			SMAR-NC8F1
			No.0-80	0.3175		2.0	2.5	3.0	3.0			SMAR-NF0E1
			No.2-56	0.4536		2.0	2.5	3.0	3.5			SMAR-NC2E1
			No.4-40	0.6350			2.5	3.0	4.1			SMAR-NC4E1
			No.6-32	0.7938				3.0	4.6			SMAR-NC6E1
			No.8-32	0.7938				3.0	5.3			SMAR-NC8E1
		Flat End Type	No.0-80	0.3175	1.5	2.0			2.7			SMAR-NF0H1
			No.2-56	0.4536		2.0			3.2			SMAR-NC2H1
		Protuded End Type	No.0-80	0.3175	1.5	2.0			2.7	0.6	1.2	SMAR-NF0HT
			No.2-56	0.4536		2.0			3.2	0.6	1.7	SMAR-NC2HT
	Through Hole	Upper Flange Type	No.0-80	0.3175	1.5	2.0	2.5	3.0	3.0			SMAR-NF0F0
			No.2-56	0.4536		2.0	2.5	3.0	3.5			SMAR-NC2F0
			No.4-40	0.6350			2.5	3.0	4.1			SMAR-NC4F0
			No.6-32	0.7938				3.0	4.6			SMAR-NC6F0
		Upper/Lower Flange Type	No.8-32	0.7938				3.0	5.3			SMAR-NC8F0
			No.0-80	0.3175	1.5	2.0	2.5	3.0	3.0			SMAR-NF0E0
			No.2-56	0.4536		2.0	2.5	3.0	3.5			SMAR-NC2E0
			No.4-40	0.6350			2.5	3.0	4.1			SMAR-NC4E0
			No.6-32	0.7938				3.0	4.6			SMAR-NC6E0
			No.8-32	0.7938				3.0	5.3			SMAR-NC8E0
		Flat End Type	No.0-80	0.3175	1.5	2.0			2.7			SMAR-NF0H0
			No.2-56	0.4536		2.0			3.2			SMAR-NC2H0

* We can also develop parts in original shapes.

Reflow Self-Tapping Nut

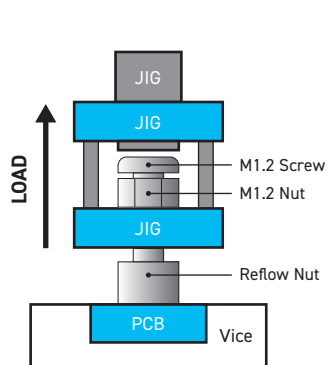
As with the reflow nuts, the reflow self-tapping nuts have wide variations and sizes and prevent fine metal chips generated during tapping from being scattered and nuts from turning during tapping.

All dimensions are in millimeters.

Type			Hole Size	Dimensions							Parts Number	
				A			B	C	D			
Non-Through Hole		Upper Flange Type	0.8		1.5	2.0	2.5	3.0	2.6			SMAR-S08F
			1.0		1.5	2.0	2.5	3.0	2.8			SMAR-S10F
			1.2		1.5	2.0	2.5	3.0	3.0			SMAR-S12F
			1.4		1.5	2.0	2.5	3.0	3.2			SMAR-S14F
Through Hole			1.6		1.5	2.0	2.5	3.0	3.5			SMAR-S16F
			1.8			2.0	2.5	3.0	3.6			SMAR-S18F
			2.2				2.5	3.0	4.1			SMAR-S22F
			2.8					3.0	4.6			SMAR-S28F
		3.4					3.0	5.3			SMAR-S34F	
Non-Through Hole		Upper/Lower Flange Type	0.8		1.5	2.0	2.5	3.0	2.6			SMAR-S08E
			1.0		1.5	2.0	2.5	3.0	2.8			SMAR-S10E
			1.2		1.5	2.0	2.5	3.0	3.0			SMAR-S12E
			1.4		1.5	2.0	2.5	3.0	3.2			SMAR-S14E
Through Hole			1.6		1.5	2.0	2.5	3.0	3.5			SMAR-S16E
			1.8			2.0	2.5	3.0	3.6			SMAR-S18E
			2.2				2.5	3.0	4.1			SMAR-S22E
			2.8					3.0	4.6			SMAR-S28E
		3.4					3.0	5.3			SMAR-S34E	
Non-Through Hole		Flat End Type	0.8	1.0	1.5	2.0			2.3			SMAR-S08H1
			1.0	1.0	1.5	2.0			2.5			SMAR-S10H1
			1.2		1.5	2.0			2.7			SMAR-S12H1
			1.4		1.5	2.0			2.9			SMAR-S14H1
			1.6		1.5	2.0			3.2			SMAR-S16H1
			1.8			2.0			3.3			SMAR-S18H1
		Protruded End Type	0.8	1.0	1.5	2.0			2.3	0.6	0.9	SMAR-S08HT
			1.0	1.0	1.5	2.0			2.5	0.6	1.1	SMAR-S10HT
			1.2		1.5	2.0			2.7	0.6	1.3	SMAR-S12HT
			1.4		1.5	2.0			2.9	0.6	1.6	SMAR-S14HT
			1.6		1.5	2.0			3.2	0.6	1.7	SMAR-S16HT
			1.8			2.0			3.3	0.6	1.9	SMAR-S18HT

Technical Data

Test of Peel Strength in Vertical Direction



Test Results

Test Sample		Measurement Results (N)
Competitive Products	Through Hole, Protruded End, with Holes on PCB	213.5
SMARX Products	Through Hole, with Holes on PCB	214.8
	Non-Through Hole	255.3

Delivery Format

- 1 Packing with embossed carrier tape that enables automatic mounting
- 2 Reflow nut and self-tapping nut
 - Through hole type can be attached with Kapton tape.
 - Non-through hole type does not need to be attached with Kapton tape.
- 3 The size of reel for packaging use is $\Phi 380$ mm
 - The number of products that can be packed by a single reel varies from product to product. Contact us.



Mounting on Substrate

The recommended substrate foot pattern, numerical aperture of metal mask, and tightening torque vary from product to product. Contact us.

Part Number Designation

SMAR-N10HT1500

a b c d e f g

a: Series Name

SMARX

b: Products Category

N: Nut

S: Spacer

(Self Tapping)

c: Nut/Spacer Hole Size

Nut

10: M1.0 0F: No.0-80UNF

12: M1.2 2C: No.2-56UNC

14: M1.4 4C: No.4-40UNC

16: M1.6 6C: No.6-32UNC

20: M2.0 8C: No.8-32UNC

Self Tapping

08: Hole size 0.8mm

10: Hole size 1.0mm

12: Hole size 1.2mm

14: Hole size 1.4mm

18: Hole size 1.8mm

d: Type

E: Press Working Upper/Lower Flange

F: Press Working Upper Flange

H: Half-Cut-Off

e: Hole Type

0: Through Hole 1: Non-Through Hole

T: Non-Through Hole Protruded End

f: Height

10: 1.0mm 25: 2.5mm

15: 1.5mm 30: 3.0mm

20: 2.0mm

g: Material and Finish Specification

Reflow RF Spring Contact

Compatible with High Frequency (up to 10 GHz)

The characteristics of springs manufactured by the special precision press technology exhibit high stability and reliability, and the performances of those springs are testified by their track records accumulated over many years. Furthermore, the internal structures of the springs designed by leveraging a number of patented technologies significantly reduce the transmission loss of high-frequency signals due to the stabilization of the characteristic impedance at high frequency. Thus, it has become possible to reduce the number of parts in use by 40%.

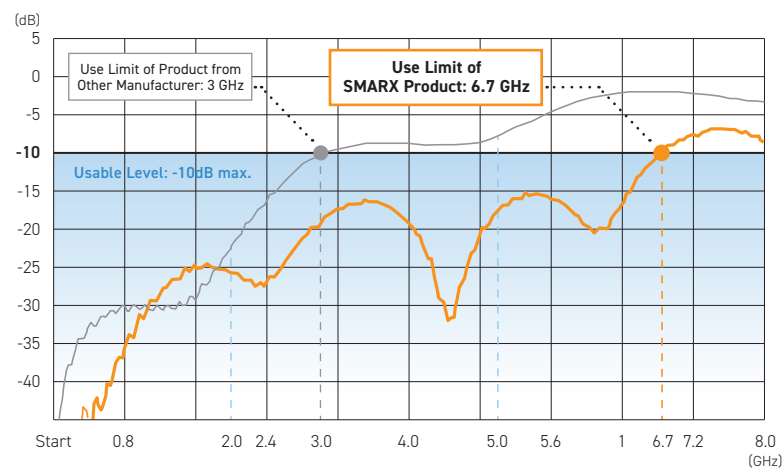
Application

Smartphones, parts related to connected car DCM, smart watches, digital wireless devices, space products, transmission parts of high-frequency signals at up to 10 GHz, antenna-related parts, etc.

Features of RF Spring Contacts

THROUGH STABILIZATION OF CHARACTERISTIC IMPEDANCE AT HIGH FREQUENCY, WE HAVE SUCCEEDED IN SIGNIFICANTLY REDUCING THE TRANSMISSION LOSS OF HIGH-FREQUENCY SIGNALS

Comparison of High-Frequency Signal Transmission Loss Between SMARX Series and Product from Other Manufacturers



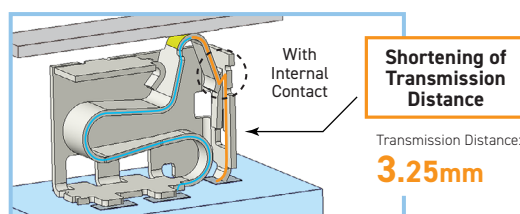
Features of RF Spring Contact

Our own internal contact, for which we acquired a patent, reduces the transmission loss of high-frequency signals and makes it possible to obtain **stable high frequency characteristics**. The contact can **reduce the power consumption** as well and, in a grounding circuit, **improves the shielding characteristics**.

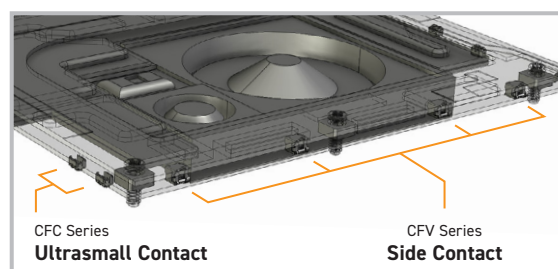
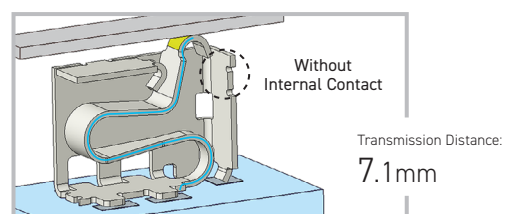
With its very little manufacturing variation among products and high reliability, the contact also contributes to shortening of the development period.

High-Frequency Signal Transmission Distance

Contact Type Compatible with High Frequency



Product from Other Manufacturer



Patent



Ultrasmall Reflow RF Spring Contact

For Horizontal
PCB Connection

Compatible with High Frequency (up to 10 GHz)

Design with the mounting area minimized to the limit (1.2 mm x 1.2 mm; world's smallest size)

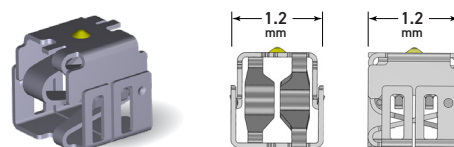
Having achieved a wide range of motion, the ultrasmall reflow RF spring has a structure that is also highly resistant to external forces due to its shape. With our own patented internal contact employed, the spring reduces the transmission loss of high-frequency signals and improves the shielding characteristics in a grounding connection as well.

CFC series

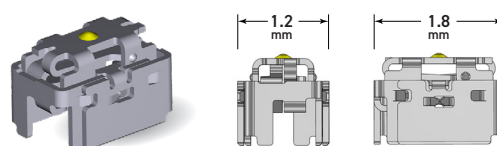
All dimensions are in millimeters.

Wide	Length	Height	Working Area	Parts Number
1.2	1.2	0.75	0.5~0.75	SMAR-CFC05xxxA
1.2	1.2	1.0	0.7~1.0	SMAR-CFC07xxxA
1.2	1.2	1.3	0.9~1.3	SMAR-CFC09xxxA
1.2	1.2	1.5	1.1~1.5	SMAR-CFC11xxxA
1.2	1.2	1.7	1.3~1.7	SMAR-CFC13xxxA
1.2	1.2	1.9	1.5~1.9	SMAR-CFC15xxxA
1.2	1.8	0.75	0.45~0.75	SMAR-CFC04xxxB
1.2	1.8	1.0	0.7~1.0	SMAR-CFC07xxxB
1.2	1.8	1.2	0.9~1.2	SMAR-CFC09xxxB
1.2	1.8	1.4	1.1~1.4	SMAR-CFC11xxxB
1.2	1.8	1.6	1.3~1.6	SMAR-CFC13xxxB
1.2	1.8	1.8	1.5~1.8	SMAR-CFC15xxxB
1.2	1.8	2.0	1.7~2.0	SMAR-CFC17xxxB

Type A Ultrasmall



Type B Ultrasmall High Rigidity

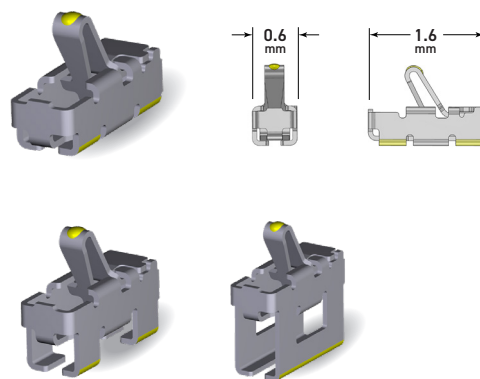


CFS series

Slim Type

All dimensions are in millimeters.

Wide	Length	Height	Working Area	Parts Number
0.6	1.6	1.15	0.55~1.15	SMAR-CFS05xxxA
0.6	1.6	1.35	0.8~1.35	SMAR-CFS08xxxA
0.6	1.6	1.75	1.2~1.75	SMAR-CFS12xxxA
0.6	1.6	2.15	1.6~2.15	SMAR-CFS16xxxA
0.6	1.6	2.55	2.0~2.55	SMAR-CFS20xxxA

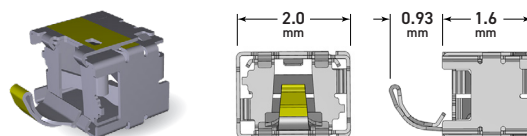


CFV series

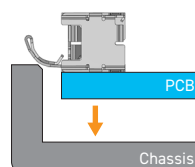
Horizontal Type

All dimensions are in millimeters.

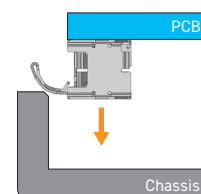
Wide	Length	Height	Working Area	Parts Number
2.0	1.6	1.5	0.35~0.93	SMAR-CFV03xxxN
2.0	1.6	1.5	0.35~0.93	SMAR-CFV03xxxR



Normal Type



Reverse Type



Reflow RF Spring Contact

For Horizontal
PCB Connection

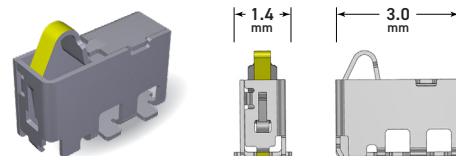
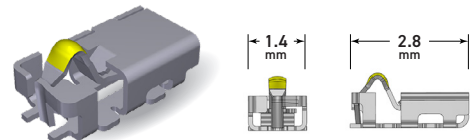
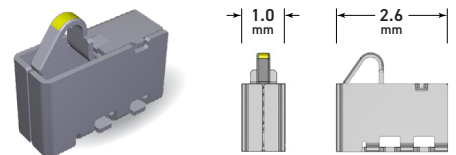
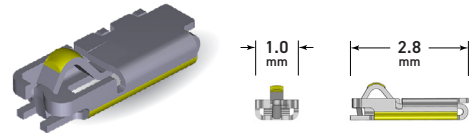
Compatible with High Frequency (up to 10 GHz)

We offer 18 types of spring contacts with various shapes and wide ranges of motion, whose product sizes range from H0.8 mm x W1.0 mm to H3.8 mm x W1.4 mm. The spring contacts are **compatible with existing products and can smoothly replace them**. This series, also incorporated with our own patented internal contact, reduces the transmission loss of high-frequency signals. In a grounding connection as well, the series improves the shielding characteristics and may reduce the number of parts in use by about 40%.

CFO series

All dimensions are in millimeters.

Wide	Length	Height	Working Area	Parts Number
1.0	2.8	0.8	0.5~0.8	SMAR-CF005xxxB
1.0	2.8	1.0	0.7~1.0	SMAR-CF007xxxB
1.0	2.8	1.3	0.9~1.3	SMAR-CF009xxxB
1.0	2.6	1.9	1.2~1.9	SMAR-CF012xxxB
1.0	2.6	2.3	1.6~2.3	SMAR-CF016xxxB
1.0	2.6	2.8	2.1~2.8	SMAR-CF021xxxB
1.0	2.6	3.3	2.6~3.3	SMAR-CF026xxxB
1.0	2.6	3.8	3.1~3.8	SMAR-CF031xxxB
1.4	2.8	0.8	0.5~0.8	SMAR-CF005xxxA
1.4	2.8	1.0	0.7~1.0	SMAR-CF007xxxA
1.4	2.8	1.3	0.9~1.3	SMAR-CF009xxxA
1.4	2.8	1.5	1.05~1.5	SMAR-CF010xxxA
1.4	2.8	1.7	1.25~1.7	SMAR-CF012xxxA
1.4	3.0	2.55	1.9~2.55	SMAR-CF019xxxA
1.4	3.0	2.9	2.3~2.9	SMAR-CF023xxxA
1.4	3.0	3.5	2.7~3.5	SMAR-CF027xxxA
1.4	3.0	3.5	2.9~3.5	SMAR-CF029xxxA

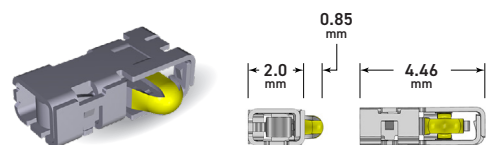


CFW series

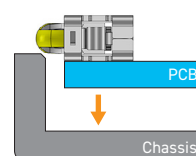
Horizontal Type

All dimensions are in millimeters.

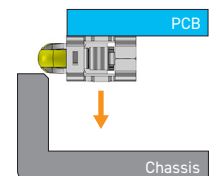
Wide	Length	Height	Working Area	Parts Number
4.46	2.0	1.3	0.05~0.85	SMAR-CFW01xxxA



Normal Type



Reverse Type



Reflow Special Parts

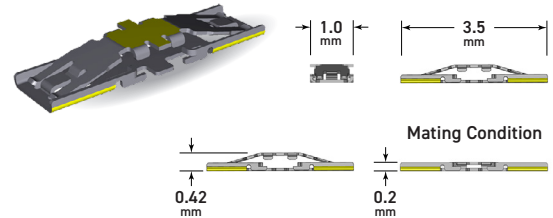
Ultralow Contacts, Low-Load Type

This is a special model series with a product height of as low as 0.42 mm or above and a movable width of 0.22 mm. In a ground connection in a very narrow space between the LCD rear face and the housing in a smartphone, this type exhibits a high contact reliability and has a structure with an extremely high resistance against external force.

CSL series

All dimensions are in millimeters.

Wide	Length	Height	Working Area	Parts Number
1.0	3.5	0.42	0.2~0.42	SMAR-CSL02xxxB
1.0	3.5	0.52	0.3~0.52	SMAR-CSL03xxxB
1.2	3.5	0.42	0.2~0.42	SMAR-CSL02xxxA
1.2	3.5	0.52	0.3~0.52	SMAR-CSL03xxxA



RF Spring Contacts and Reflow Nuts for Use on On-Board Devices

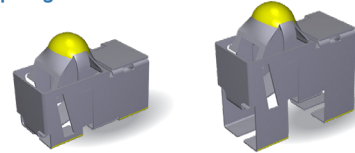
Surface mount parts for use on on-board devices are required to comply with strict environmental tests. Among them, high contact reliability is required in the vibration impulse test and thermal shock test. The SMARX series, which exhibits excellent high-frequency signal transmission characteristics in on-board digital communication, is now drawing a lot of attention.

CFA series

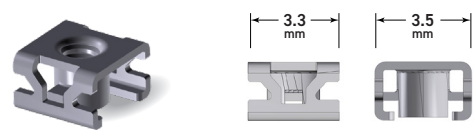
All dimensions are in millimeters.

Wide	Length	Height	Working Area	Parts Number
3.6	7.7	6	3.9~6	SMAR-CFA39xxxA
3.6	7.7	8	5.9~8	SMAR-CFA59xxxA

RF Spring Contact

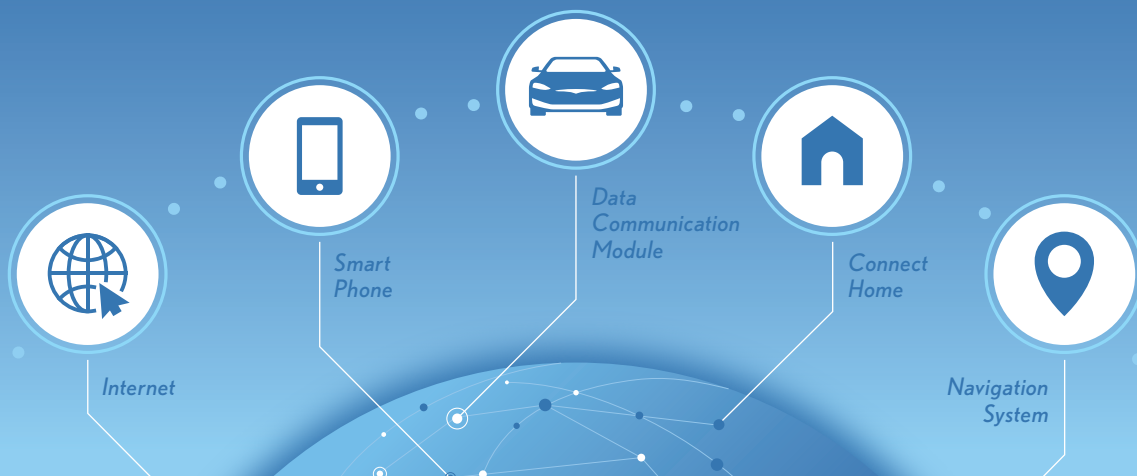


Shock-Absorbing Reflow Nut



Connect to the Future

TPS COMPONENTS Applications Reflow Nut & RF Spring Contact



Distributor: T·P·S·Creations Co., Ltd.

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Manufacturer: Total Precision Systems Co., Ltd. Nagano Factory

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