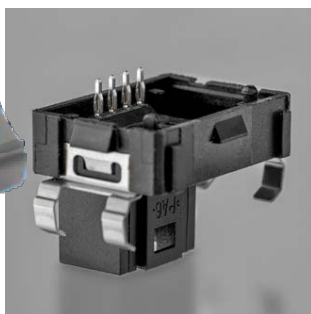


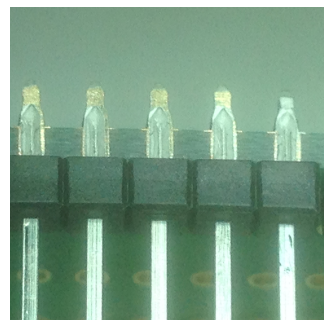
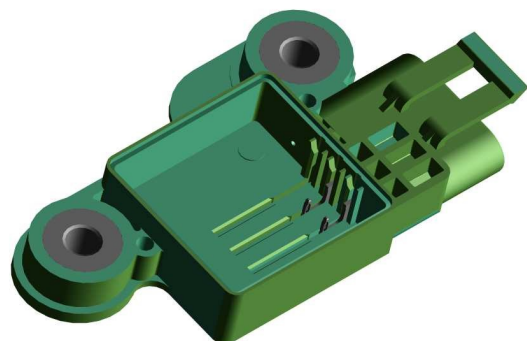
HJBRIGHT®

HUBRIGHT®

汽车电子行业Press-Fit技术
无焊接解决方案



**Automotive Press-Fit Technology
Solderless Solutions**



连接器及堆栈应用
**Connectors and Stacking
Applications**

传感器及控制模块
**Molded Sensor & Control
Modules**

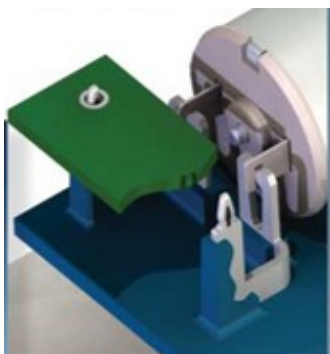
马达及开关控制
**Motor & Flapper
Controls**

总线连接及保险盒
**Bus Bar Interconnects &
Fuse Receptacles**

轮胎压力监控
Tire Pressure Monitors

连接盒
Junction Boxes

引擎及变速器控制
**Engine & Transmission
Controllers**



東莞市華晶電子有限公司

Bright-E Electronic Technology Limited

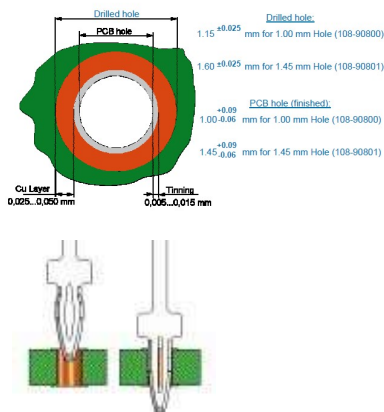
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Information Press-In Technology Multispring PCB hole requirements according EN 60352-5



华晶的Press-fit技术是一种无焊接连接Pin技术。它的设计及测试能够达到汽车电子的各项测试要求（基于IEC, EIA和SAE等国际标准），其中包括振动，机械性能及热冲击（温度高达125℃）测试。

hjbright Press-Fit, Solderless Interconnect Technology is designed and tested to meet standard automotive requirements for vibration, mechanical & thermal shock for temperatures up to 125° C, as defined by the IEC, EIA and SAE.

该技术允许组装端子与印刷电路板（PCB）电镀通孔进行连接，通过这种技术可以实现一种机械式电连接与维护而无需使用焊接技术。 This technology allows for the assembly of a terminal or electrical lead to printed circuit board's (PCB) plated-through hole in such a way that an electrical mechanical connection is created and maintained without the application of solder.

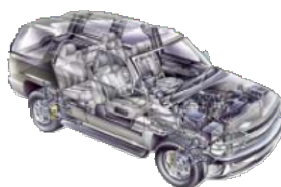
- 无焊接技术设计和测试满足汽车电子要求
Solderless Technology design & tested to meet automotive requirements
- 采用“针眼”设计 Proven “Eye of the Needle” design
- 已通过125℃操作温度的认证, 选用合适的合金材料可满足150℃要求
Qualified to 125° C operational temperatures with optional 150° C alloys available
- 符合IEC, EIA和SAE标准 Requirements defined by IEC, EIA and SAE
- 已经拥有0.64mm与0.8mm两种厚度规格Press-fit的产品设计
Designs available for both .64mm and .80mm thick press-fit sections
- 采用高导电性能材料 High conductive material options
- 兼容各种PCB电镀形式 Compatible with various PCB plating types



规格参数 Press-Fit Sizes and Technology

厚度 Press-Fit Thickness	材料 Alloy Options	导电率 Conductivity (IACS)	PCB板孔 Nominal PCB Hole Size
 .64mm - Thick	磷青铜 Phosphor Bronze 锡黄铜 Tinned Brass	13% to 15% 25% to 30%	* 1.020 mm
 .80mm - Thick	磷青铜 Phosphor Bronze 锡黄铜 Tinned Brass 高导电合金 High Conductivity Alloy	13% to 15% 25% to 30% 75% to 80%	* 1.486 mm

HJBRIGHT®



Press-Fit Technology

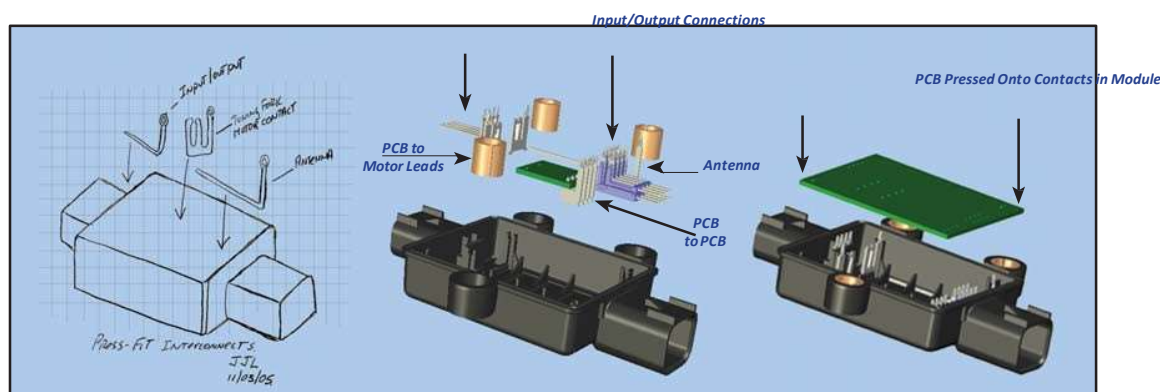
Automotive Products

汽车电子产品

先进的Press-Fit方案 Advanced Engineered Press-Fit Solutions

公司先期工程技术小组与客户协作，共同开发Press-fit应用方案，如：非连续端子、连接组装、以及客户注塑件包装与特殊要求的组装。此外，华晶还致力于产品设计、工程应用、生产制造与自动化研究，帮助客户开发适合于任一特殊应用领域的技术解决方案。

The company's Advanced Engineering team works with customers to develop press-fit solutions for applications such as discrete terminals and connect or assemblies, as well as custom-molded packages and specialized assemblies. In addition, hjbright leverages its expertise in product design, applications engineering, manufacturing and automation to help customers create the proper turnkey solution for any particular application.



概念 **Concept** → 设计 **Design** → 制样 **Prototype** → 产品 **Production**

此外，公司还可以利用其全球生产制造资源来满足任一区域生产制造或自动化要求。In addition, the company can leverage its global manufacturing resources to meet any regional manufacturing or automation requirements.

机械和环境测试总结 Summary Results of Mechanical and Environmental Tests

测试项目 Test Item	规格 Acceptance Criteria	测试内容 Testing for:	结果 Result
0.64mm插入力和保持力 .64mm Insertion & Retention Force	97N-最大插入力 97N-Insertion-Max. 20N-最小保持力 20N-Retention-Min.	•PCB板孔径在上限和下限值时的插拔力 Forces in Upper & Lower Limit Hole Sizes	通过 Pass
0.80mm插入力和保持力 .80mm Insertion & Retention Force	178N-最大插入力 178N-Insertion-Max. 62N-最小保持力 62N-Retention-Min.	•PCB板孔径在上限和下限值时的插拔力 Forces in Upper & Lower Limit Hole Sizes	通过 Pass
电镀通孔 PTH Integrity	根据IEC 60352-5 Per IEC 60352-5	•电镀通孔的变形 Deformation of Plated Through Hole	通过 Pass
随机振动 Random Vibration	接触电阻增加值< 3.0 mΩ 根据 IEC, EIA,SAE Increase of Contact Resistance < 3.0 mΩ Per IEC, EIA, SAE	•接触点的移动 Movement of Contact Points	通过 Pass
热冲击 Thermal Shock		•接触点的移动 Movement of Contact Points	通过 Pass
热老化 Thermal Aging		•端子和PCB板的应力释放 Stress Relaxation of Terminal and PCB •氧化膜的生长 Growth of Oxide Film	通过 Pass
温湿度循环 Temp/Humidity Cycle		•氧化膜的生长 Growth of Oxide Film	通过 Pass
混入流动气体 Mixing Flowing Gas		•滚镀影响 Effectiveness of Barrier Plating	通过 Pass

POWERTRAIN SYSTEMS



SAFETY & SECURITY SYSTEMS



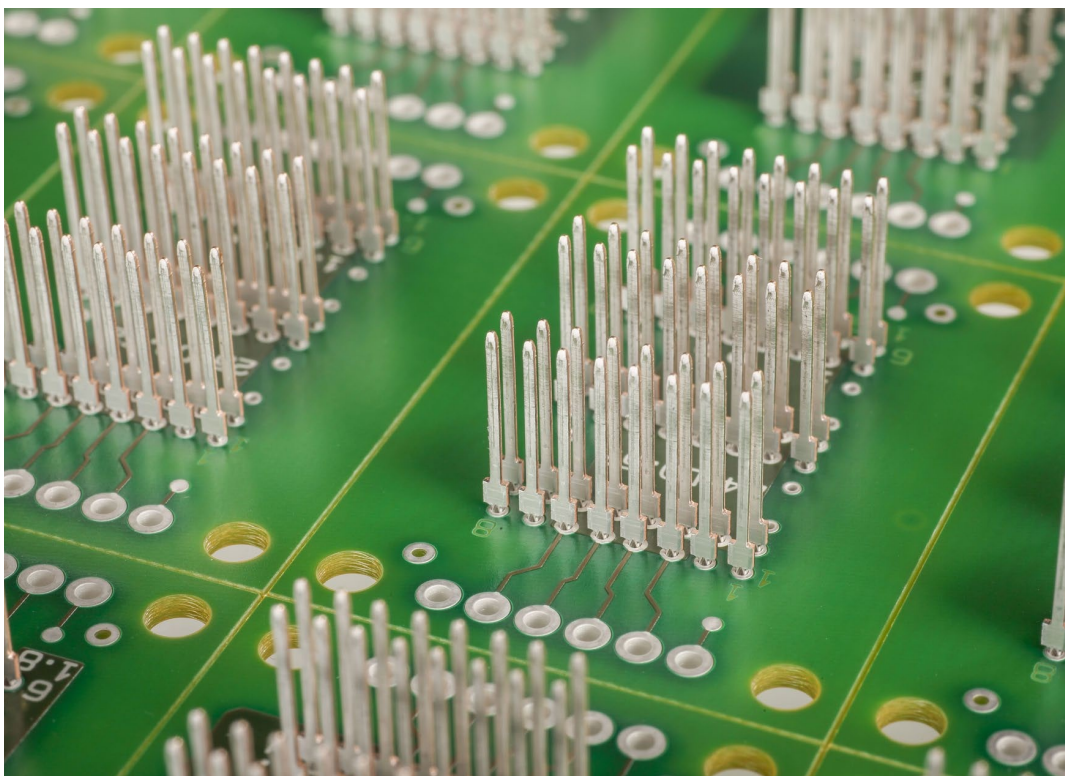
CONVENIENCE



DRIVER INFORMATION



BODY & CHASSIS SYSTEMS



INTRODUCTION

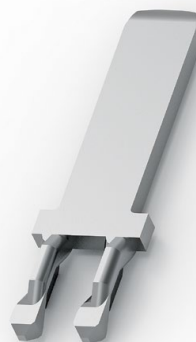
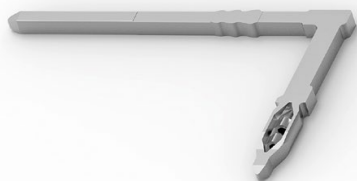
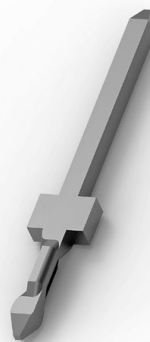
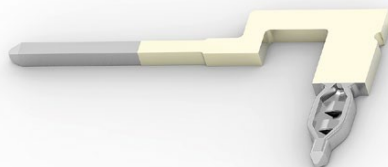
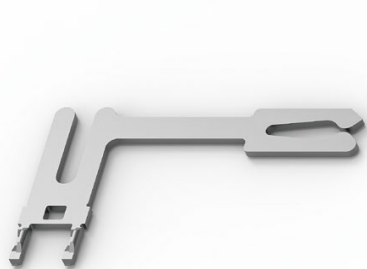
HJBRIGHT offers two distinctive press-fit technologies for automotive applications: ACTION PIN and Multispring which are both compliant pin designs featuring an elastic behavior during the pin insertion into a Printed Circuit Board (PCB).

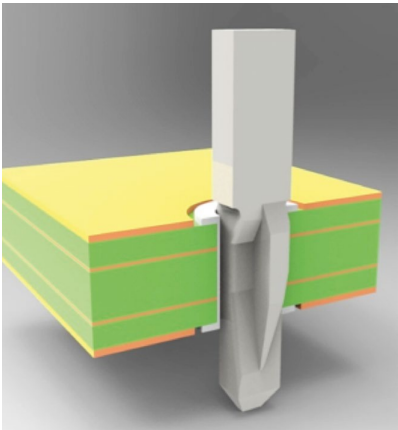
The press-fit zone will deform during insertion into the PCB to enable a reliable electrical and mechanical connection over lifetime. The press-fit pin design meets the standardized blade sizes and interfaces of the automotive industry.

The ACTION PIN and Multispring press-fit pins can be used in various applications in vehicles from the passenger compartment to the toughest harsh environments including the engine bay area. In addition to the press-fit technology HJBRIGHT Application Tooling also offers the matching application tooling equipment for single-pin insertion and connector seating machines and customers can benefit from one-hand supplier.

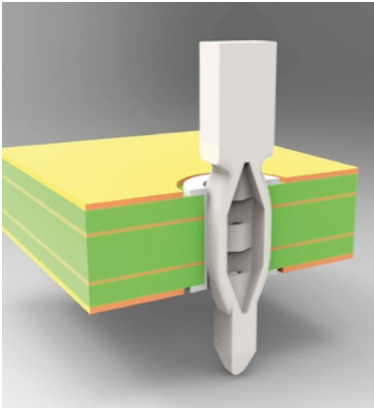
ACTION PIN and Multispring Press-Fit Advantages:

- 1 Reliability – IEC norm shows it is minimum 10 times more reliable than soldering and IDC connections
- 2 Press-fit miniaturization – NanoMultispring
- 3 Fast manufacturing process
- 4 No heat treatment required
- 5 No need for high temperature plastics
- 6 No thermal stress to connector
- 7 No soldering mistakes like bridges bad wetting, flux residuals, cold solder joints, etc.
- 8 Environmental friendly – GREENER





Picture 1:
The pictures show an ACTION PIN press-fit pin (above) and a Multispring press-fit pin (below).



The principle for a press-fit connection is that a contact terminal is pressed into a printed circuit board (PCB). There are two types of press-fit pins; the solid pin having a solid press-in zone and the compliant pin having an elastic press-in zone. In this white paper only the press-fit pin having an elastic press-in zone is described and it is called the press-fit pin.

Press-fit technology from HJBRIGHT Connectivity (HJBRIGHT) was first introduced in the telecom_x0002_munication industry in the 1970s. Later, in 1988, the first press-fit pin from HJBRIGHT Connectivity was introduced in the automotive industry. Today HJBRIGHT Connectivity offers two distinctive press-fit solutions for automotive applications: ACTION PIN and Multispring pin (see picture 1) which are both compliant pin designs featuring an elastic behavior during the pin insertion.

In the following chapters several different press-fit aspects will be described and discussed in terms of functionality, properties, characteristics and applications focused on the automotive industry.

HJBRIGHT' s press-fit solutions in fact are compliant pins featuring an elastic behavior and thus will deform during insertion (significantly reducing stress on the PCB holes compared to solid press-fit pin – which do no more exist in automotive applica_x0002_tions) and sustain a permanent contact normal force when inserted to enable a reliable electrical and mechanical connection over lifetime.

Additionally, high contact normal forces between compliant pin and plated through hole (commonly) generate cold welded interconnections autonomously after the pin insertion; especially, if tin plating is used for at least one of both contact part_x0002_ners (pin/hole). Due to these cold welding processes intermetallic connections are generated leading to excellently low contact resistance values (commonly below 0.1 mOhm / in sub-Milliohm range). Furthermore, the mechanical stability is signifi_x0002_cantly supported.

Press-fit pin and plated through hole (PTH) summarize together to a press-fit system. The functionality of such a system is dependent of the properties / charac_x0002_teristics of both of the components and their interactions.

Materials

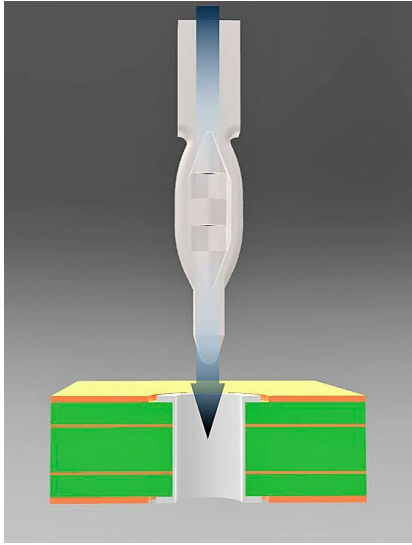
The press-fit pin can be made of different base materials featuring two galvanic layers, the under-plating and the top plating, in a sandwich structure. Picture 2 shows the most common materials and layers used in the automotive industry.

Materials

The press-fit pin can be made of different base materials featuring two galvanic layers, the under-plating and the top plating, in a sandwich structure. Picture 2 shows the most common materials and layers used in the automotive industry.

Picture 2:
Typical materials used for press-fit pins.

Typical materials	
Top plating / finish	<ul style="list-style-type: none">• Pure tin standard thickness (~1µm)• Pure tin flash thickness (~0.3µm)
Under plating	Nickel (~1.5µm)
Base material	<ul style="list-style-type: none">• CuSn4• CuSn6• CuNiSi• CuCrAgFeTiSi



Benefits with press-fit

Press-fit technology is a solder-less termination enabling a permanent electrical and mechanical terminal-to-PCB connection with several distinctive advantages:

- n Fast processing → comparative data: lead time soldering vs. press-fit
- n Use of standard resins instead of cost intensive heat stabilized resins in the header
- n Prevents thermal treatment to the header
- n Flexible application designs with single pin insertion due to freely programmable pin arrays in terms of pin numbers and orientation
- n Stand-alone pin insertion possible
- n Lubrication and flux aid free processing
- n Prevents solder paste printing and pre-heating
- n Environmental friendly
- n No shading-off issues with large header components in post-soldering insertion
- n Prevents soldering defects like bridges, bad wetting, flux residuals, solder balls, spider webs thermal load and cold solder joints

Of course, matching application equipment is needed to manufacture press-fit technology related modules (instead of soldering equipment). Since this is commonly highly flexible and automated the machinery equipment can be used for several different products and applications.

Functions

Functions =

f (properties)

Electrical functions

(desired in brackets)

- Contact resistance (low)

- Current carrying capacity (high)

Mechanical functions (desired)

- Insertion force (low)
- Retention force (high)
- Through hole deformation (low)

Properties

Press-fit pin

properties

- Design/Shape/Size

- Base material

- Plating (type & thickness)

Through hole properties

- Drill diameter

- Copper tube thickness

- Plating

(type & thickness)

- Board material

- Pre-processing (reflow etc.)

Product characteristics and qualification

The overall press-fit product characteristic features several electrical and mechanical functions.

The practical performance in terms of these functions is depending on multiple properties mainly coming from the press-fit pin (and its type of application) and the PCB/PTH.

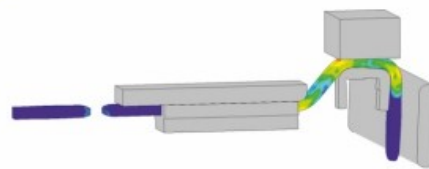
In addition, the insertion process can contribute to the functional results (insertion depth, ins. Velocity).

The relation between properties and functions is highly interactive in that manner that certain singular properties may affect certain or even all functions up to certain degrees; with some of them being shifted counter-wise. Also, single functions can depend on multiple properties and their interactions.

Since it is generally not possible to change or shift single functions independently the overall performance is to be considered when discussing single properties. The interactive correlation can require a prioritizing of a major function. If so, this should be done in thorough respect of the application and final product needs

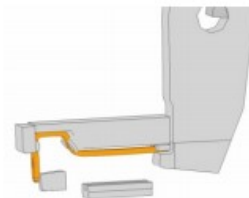


Operation principles:



1 Single pins are separated from wire

2 Pins are bent



3 Pins are transferred to insertion zone

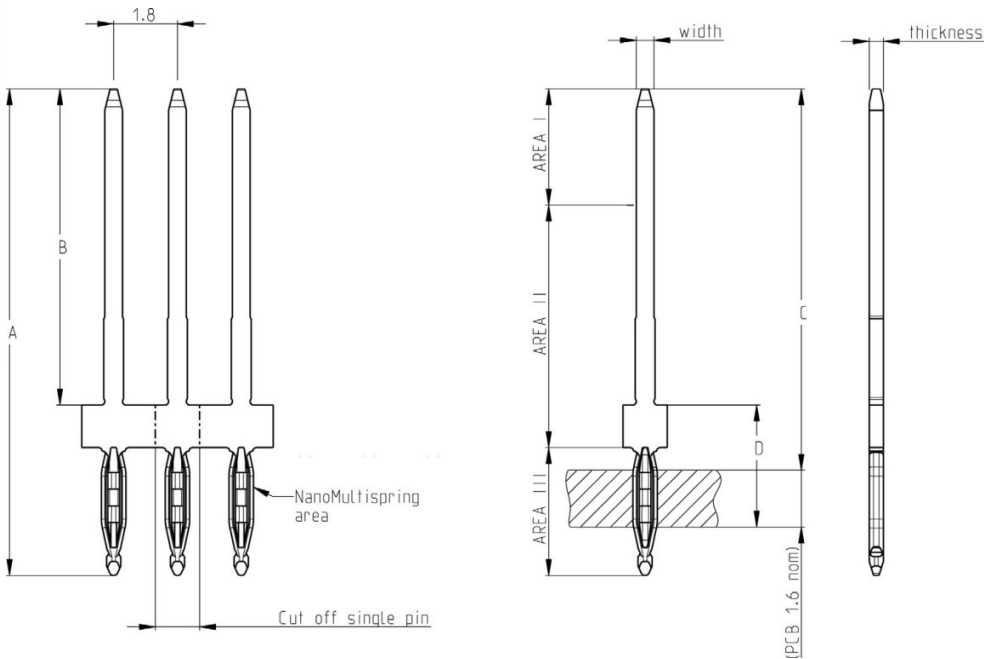


4 Pins are inserted into PCB or plastic connector

ACTION PIN Press-Fit Pin for MQS and TH Contacts



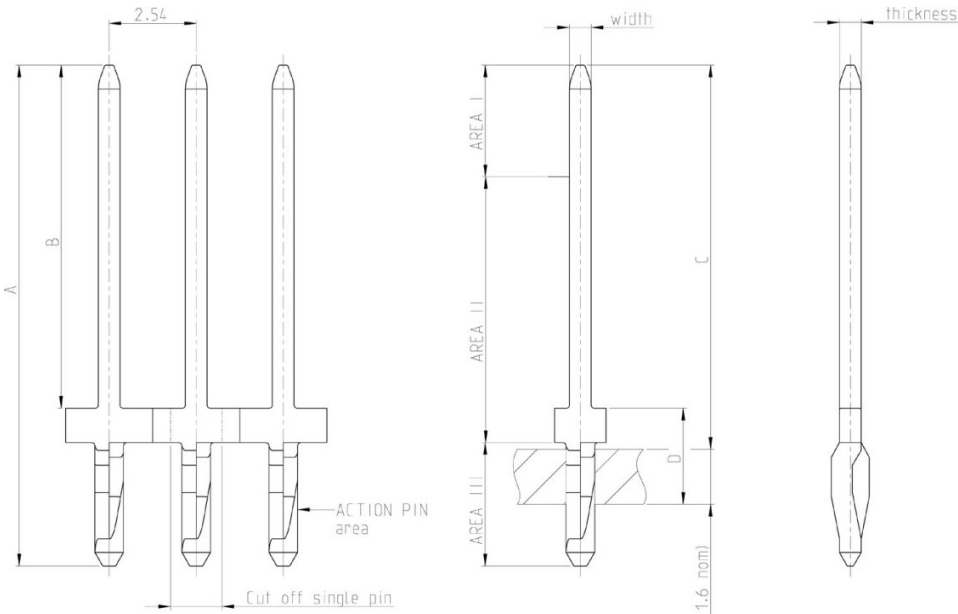
Technical Features
Press-fit zone
NanoMultispring
Material thickness
0.4 mm
Total Temperature Range
-40 ° C ... +125 ° C
Insertion Force
Max 90 N
Push-out Force
Min 20 N
Current Carrying Capacity
up to 5 Ampere
(@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F180-050X040-0890-TW	1.80	0.50X0.40	13.70	8.90	12.25	3.40	Sn
F180-050X040-0800-TW	1.80	0.50X0.40	12.80	8.00	11.35	3.40	Sn



Technical Features
Press-fit zone
ACTION PIN
Material thickness
0.6 mm
Total Temperature Range
-40 ° C ... +125 ° C
Insertion Force
Max 180 N
Push-out Force
Min 50 N
Current Carrying Capacity
up to 5 Ampere
(@ 80 ° C ambient temperature)

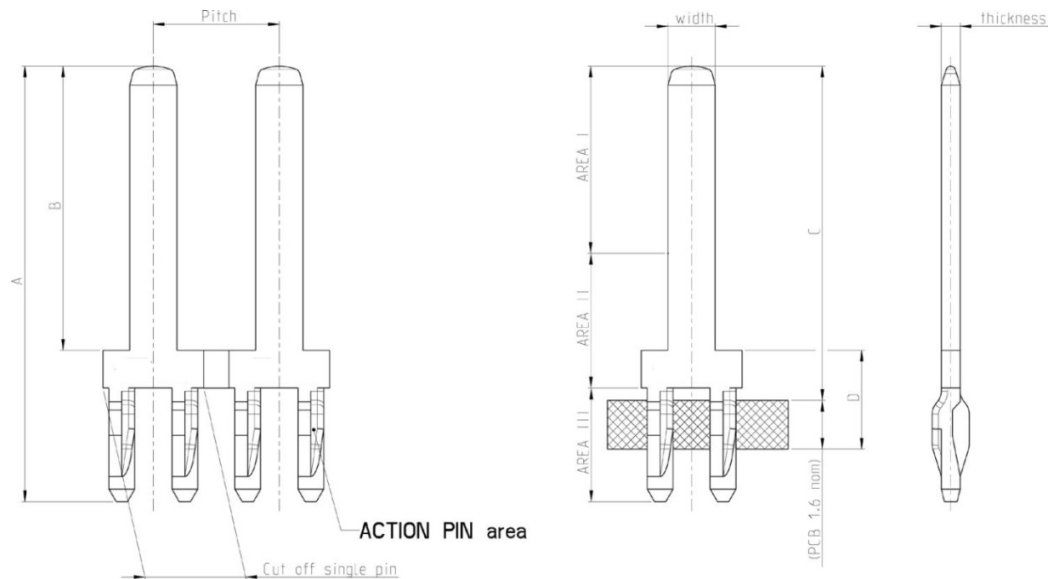


P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F254-063X063-0705-TW	2.54	0.63X0.63	11.65	7.05	8.25	2.80	Sn
F254-063X063-0880-TW	2.54	0.63X0.63	13.40	8.80	10.00	2.80	Sn

ACTION PIN Press-Fit Pin for MQS and TH Contacts



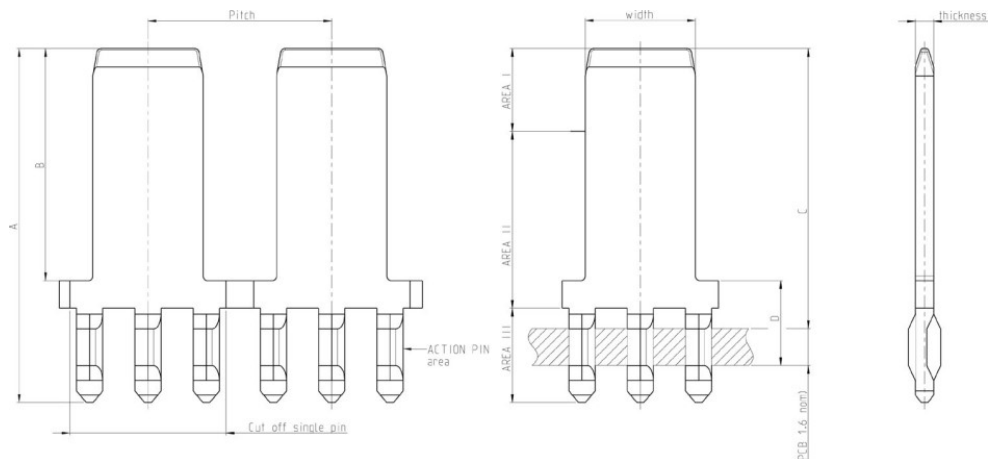
Technical Features
 Press-fit zone
 ACTION PIN
 Material thickness
 0.6 mm \0.8mm
 Total Temperature Range
 -40 ° C ... +125 ° C
 Insertion Force
 Max 400 N
 Push-out Force
 Min 80N
 Current Carrying Capacity
 up to 24 Ampere
 (@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F400-150X060-0900-TW	4.00	1.50X0.60	13.80	9.00	10.50	3.10	Sn
F500-280X080-0940-TW	5.00	2.80X0.80	14.90	9.40	11.30	3.50	Sn
F508-280X060-0790-TW	5.08	2.80X0.60	13.40	7.90	10.00	3.70	Sn
F540-280X080-1075-TW	5.40	2.80X0.80	18.50	10.75	13.50	5.15	Sn



Technical Features
 Press-fit zone
 ACTION PIN
 Material thickness
 0.8mm
 Total Temperature Range
 -40 ° C ... +125 ° C
 Insertion Force
 Max 600 N
 Push-out Force
 Min 120N
 Current Carrying Capacity
 up to 36 Ampere
 (@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F800-480X080-1239-TW	8.00	4.80X0.80	17.60	12.39	14.40	3.70	Sn
F880-630X080-1075-TW	8.80	6.30X0.80	18.50	10.75	13.50	4.35	Sn
FA10-630X080-1605-TW	10.00	6.30X0.80	23.85	16.05	19.85	5.40	Sn

ACTION PIN Press-Fit Pin for MQS and TH Contacts



Technical Features

Press-fit zone

ACTION PIN

Material thickness

0.6 mm

Total Temperature Range

-65 ° C ... +125 ° C

Insertion Force

Max 180 N

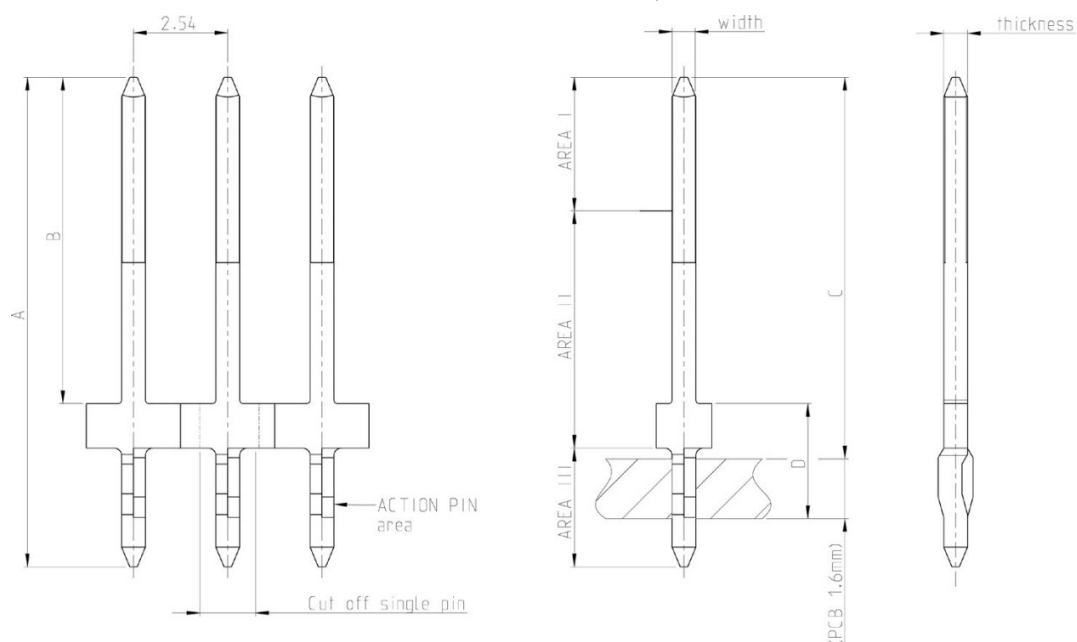
Push-out Force

Min 50 N

Current Carrying Capacity

up to 5 Ampere

(@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F254-064X064-0705-TW	2.54	0.64X0.64	11.45	7.05	8.25	3.10	Sn
F254-064X064-1080-TW	2.54	0.64X0.64	15.20	10.80	12.00	3.10	Sn



Technical Features

Press-fit zone

ACTION PIN

Material thickness

0.6 mm \ 0.8mm

Total Temperature Range

-40 ° C ... +125 ° C

Insertion Force

Max 180 N

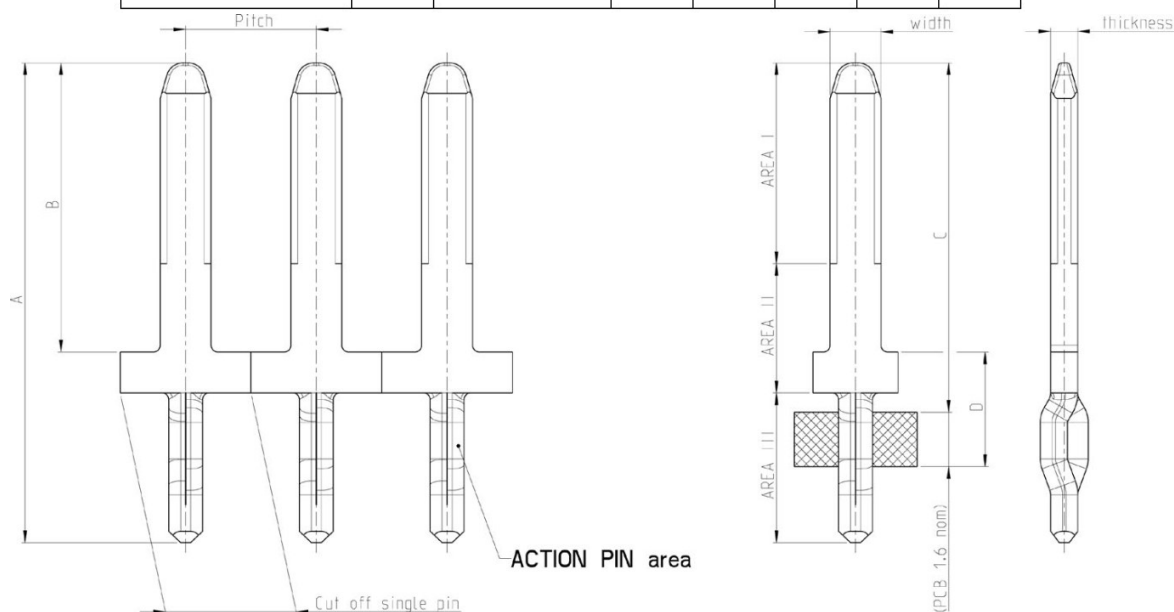
Push-out Force

Min 50 N

Current Carrying Capacity

up to 5 Ampere

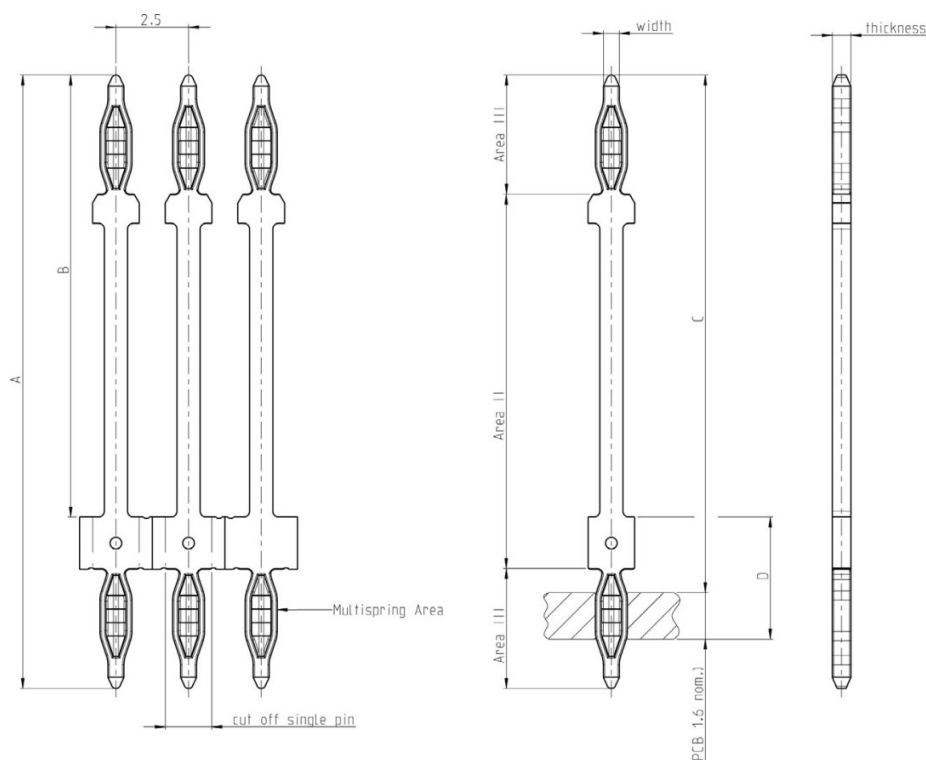
(@ 80 ° C ambient temperature)



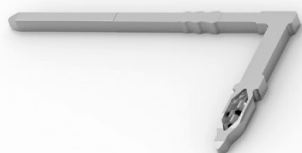
P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F254-100X060-1260-TW	2.54	1.00X0.60	17.20	12.60	13.80	2.80	Sn
F254-120X060-1220-TW	2.54	1.20X0.60	17.00	12.20	13.60	3.00	Sn
F280-150X060-1030-TW	2.80	1.50X0.60	16.90	10.30	14.75	4.45	Sn
F385-150X080-0850-TW	3.85	1.50X0.80	14.10	8.50	10.20	3.30	Sn



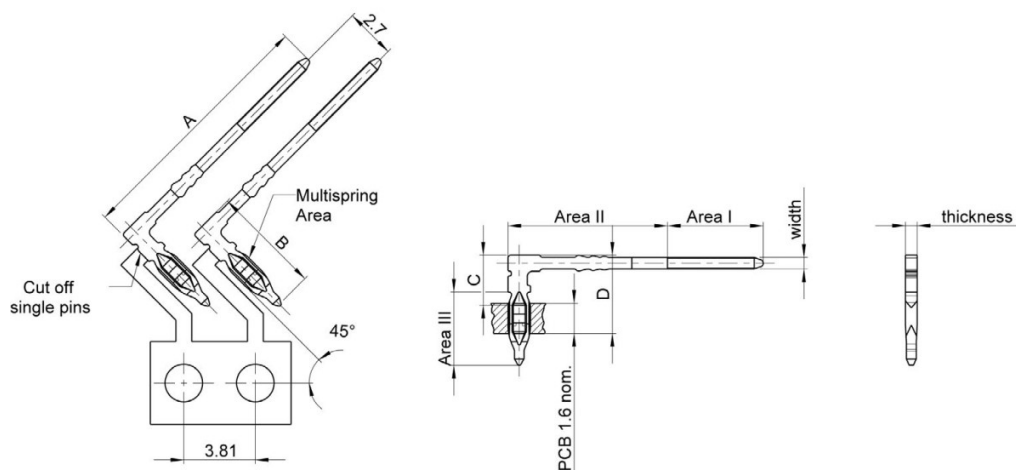
Technical Features
 Press-fit zone
ACTION PIN
 Material thickness
 0.6 mm
 Total Temperature Range
 -40 ° C ... +130 ° C
 Insertion Force
 Max 150 N
 Push-out Force
 Min 30 N
 Current Carrying Capacity
 up to 12 Ampere
 (@ 80 ° C ambient temperature)



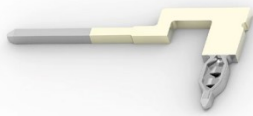
P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F250-064X064-1520-TW	2.50	0.64X0.64	21.10	15.20	17.80	4.20	Sn



Technical Features
 Press-fit zone
ACTION PIN
 Material thickness
 0.6 mm
 Total Temperature Range
 -40 ° C ... +130 ° C
 Insertion Force
 Max 150 N
 Push-out Force
 Min 30 N
 Current Carrying Capacity
 up to 12 Ampere
 (@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F270-063X063-0594-TW	2.70	0.63X0.63	13.60	5.94	2.64	4.17	Sn



Technical Features

Press-fit zone

ACTION PIN

Material thickness

0.6 mm

Total Temperature Range

-40 ° C ... +130° C

Insertion Force

Max 150 N

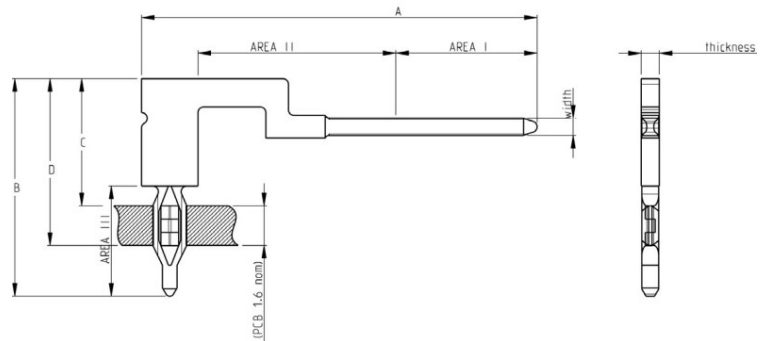
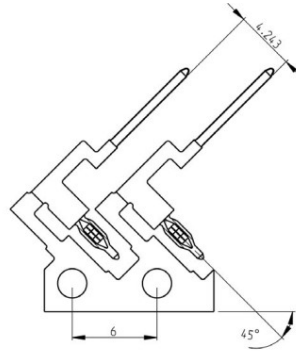
Push-out Force

Min 30 N

Current Carrying Capacity

up to 12 Ampere

(@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F424-062X064-0770-TW	4.24	0.62X0.64	14.00	7.70	4.40	6.00	Sn



Technical Features

Press-fit zone

ACTION PIN

Material thickness

0.6 mm

Total Temperature Range

-40 ° C ... +130° C

Insertion Force

Max 600 N

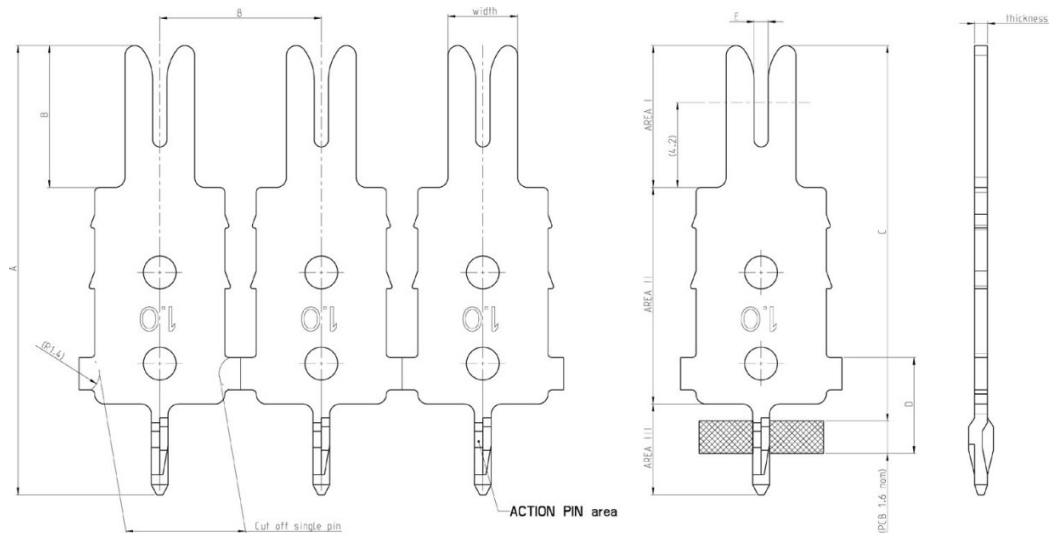
Push-out Force

Min 120 N

Current Carrying Capacity

up to 5 Ampere

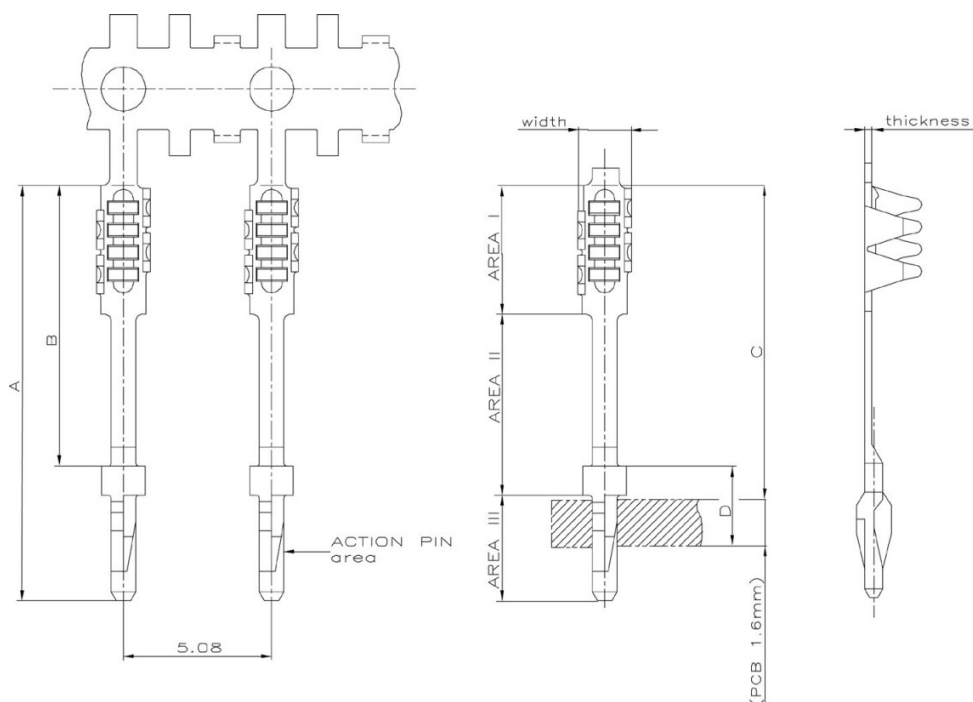
(@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F800-345X064-0700-TW	8.00	3.45X0.64	22.20	7.00	18.50	4.70	Sn



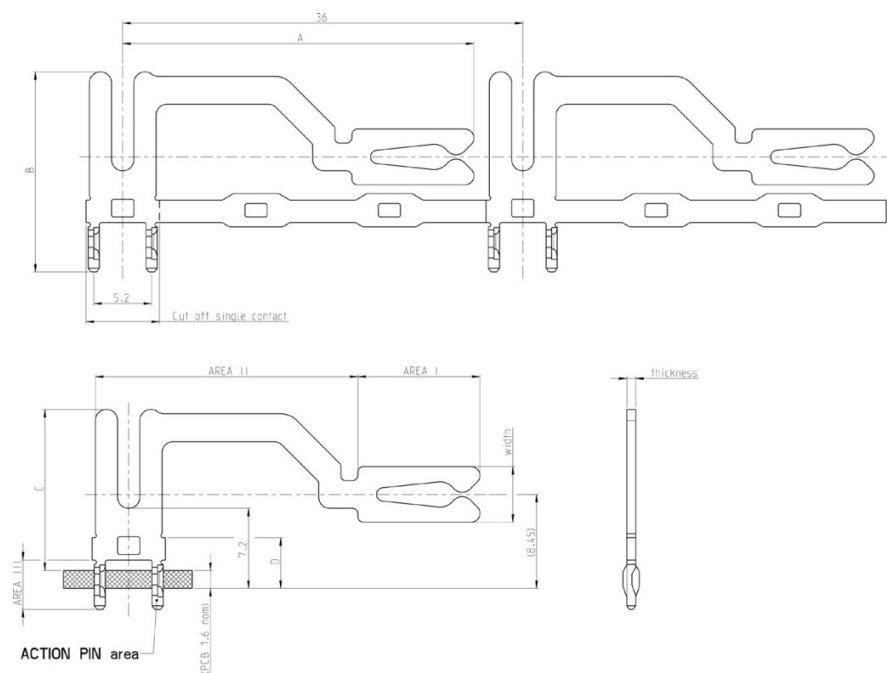
Technical Features
 Press-fit zone
 ACTION PIN
 Material thickness
 0.6 mm
 Total Temperature Range
 -40 ° C ... +120° C
 Insertion Force
 Max 180 N
 Push-out Force
 Min 50 N
 Current Carrying Capacity
 up to 0.5 Ampere
 (@ 80 ° C ambient temperature)



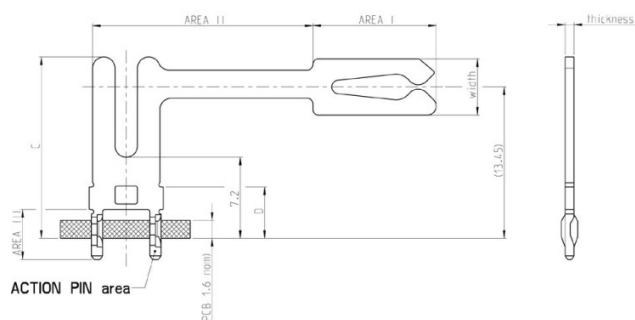
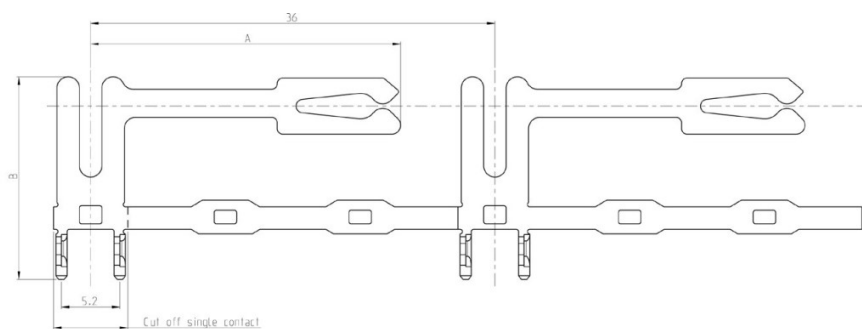
P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
F508-183X025-0950-TW	5.08	1.83X0.25	14.20	9.50	10.75	2.80	Sn



Technical Features
 Press-fit zone
 ACTION PIN
 Material thickness
 0.8 mm
 Total Temperature Range
 -40 ° C ... +130° C
 Insertion Force
 Max 400 N
 Push-out Force
 Min 80 N
 Current Carrying Capacity
 up to 24 Ampere
 (@ 80 ° C ambient temperature)



P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
FA36-500X080-1800-TW	36.00	5.00X0.80	31.60	18.00	14.50	4.55	Sn

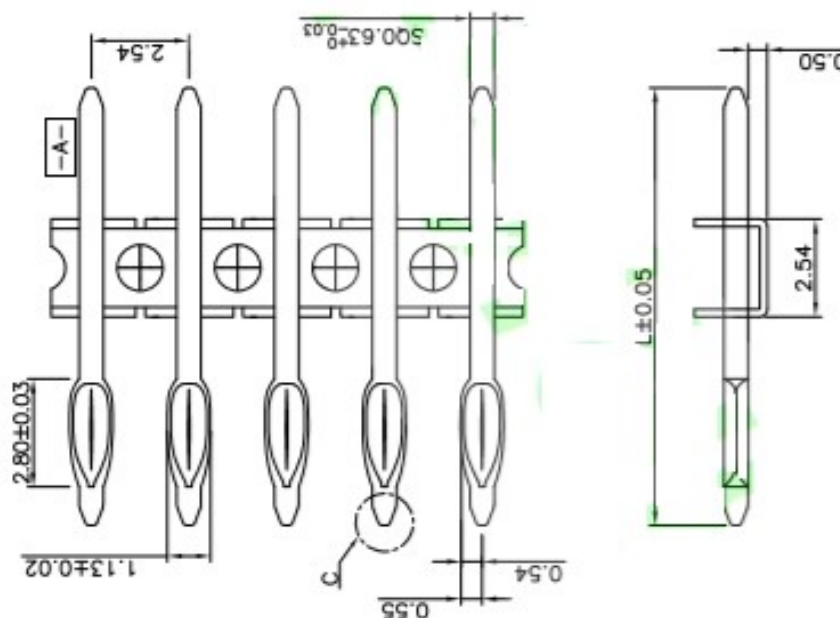


up to 24 Ampere
(@ 80 ° C ambient temperature)

P/N	Pitch (mm)	Width x Thickness (mm)	Dimensions (mm)				Finish
			A	B	C	D	
FA36-500X080-1800-TW	36.00	5.00X0.80	27.60	18.00	14.50	4.55	Sn



(@ 80 ° C ambient temperature)



- Total lenght

Automatic pressing equipment

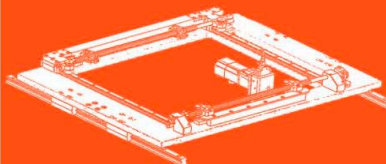


HIGH-VOLUME PRODUCTION

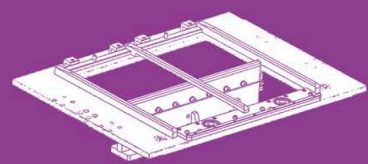
- 7.000 - 8.000 PINS PER HOUR (SINGLE HEAD)
- UP TO 15.000 PINS (DOUBLE HEAD)

High precision guide system controlled by servo motors.
Supervised by PC.
Programmable insertion height.
Easy interchangeable tooling for different kind of pins.

UNIVERSAL FIXTURE 400X400 FOR PCB INCL. ANVIL 10/20 MM STROKE



Y TABLE FOR ADAPTING FIXTURES (FOR PLASTIC CONNECTORS)



**CAN BE INSTALLED
SEPARATELY
OR INLINE**

