# Pogo Pin Connectors



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C.C.P. Contact Probes Co., Ltd. is a leading global manufacturer of Contact Probes, Pogo Pins, Testprobes, Springloaded Connectors, and Crown Spring Connectors.

# **ABOUT US**

Introduction

In 1986 we began as a specialized provider of test probes and socket auxiliary solutions and slowly expanded our product portfolio in related industries such as electronic components manufacturing. Among our customers are renowned brands like Apple and Amazon and our products are revered by our customers for their exceptional reliability and superior quality.

Our research and development teams are continuously improving our existing products and bringing new innovations to the market to meet the growing demands of our clients. Since 2001 CCP Contact Probes has been a public traded company listed on the Taiwan Stock Exchange. Today CCP has subsidiaries in the United States, China, Germany, India, Japan and Singapore, meeting the needs of our customers around the world.

#### **Selected Customers**

FOXCONN

Google





**ADVANTEST** 

#### Locations



# **ABOUT US**

**ABOUT US** 

History

Advantages

# History

2019	CCP Japan & Korea Established

2018 CCP Germany, Singapore & India Established

High Current Connector Product Line

2014 CCP USA Established

Listed on Taiwan Stock Market (TW. 6217)

2002 Commercial Connector Product Line

2001 CCP Dongguan Factory Established

1986 CCP Established/ Testing Product Line

# **Company Culture**



Yearly Home Visit



Employee's Children Summer Camp



Tuition Subsidy for Employee's Children



Over 30 Years of Product Development Experience Servicing Industry-leading Clients

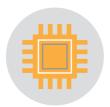


Agile and Flexible Design Process with Self-owned Turning and Plating Factory



A Proven Track-record of Reliability, an Industry Certified Quality Management System, and State-of-the-art Production Equipment

# **Product Lines**



Testing Solutions



Commercial Connector Solutions



High Current Connector Solutions

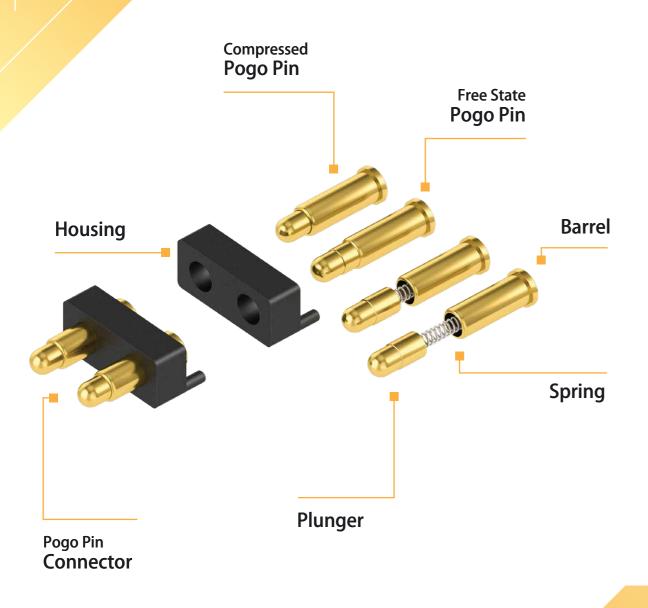


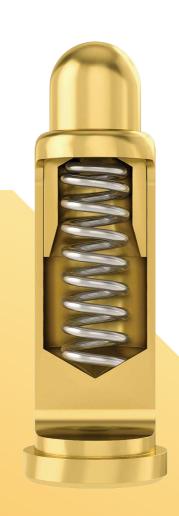
Industrial Connector Solutions

# POGO PIN INTRODUCTION

# WHEN TO USE POGO PINS

**Advantages** 







#### IMPROVED USER EXPERIENCE

Easy to plug-in, no accidental rip off of the cable.



#### STABLE CURRENT FLOW

Different pogo designs maximize the stability of the current flow, by increasing the number of contact points inside the pin.



#### SMALL VOLUMES POSSIBLE

Pogo pins are produced with high precision turning machines and don't require a mold as it is the case for other connectors that are using a stamping process.



#### LIMITED SPACE & HIGH CURRENT

The trend towards miniaturization in the electronics industry is continuing. No other connector has a better space to current ratio as a pogo pin.



#### SIMPLIFY ASSEMBLY AND SAVE COST

The complexity of today's electronics increases the assembly costs and difficulty significantly. Pogo pins not just reduce the manual labor time for inserting cables or pins, they also open up new design and arrangement options for industrial designers and engineers.



#### HIGH TOLERANCE

Small errors in the production often lead to unstable connectors as they are not properly touching the surface of their counterpart. Pogo pins allow extremely high tolerances in the production and thereby decreasing the likelyhood for errors.



#### LONG LIFE-TIME

Pogo pins have a far superior life-time as compared to other connector types as they minimize the mechanical strain on the parts.

## **MATERIALS**

Phosphor Bronze

The current a pogo pin can carry depends largely on 3 factors:



#### **Number of Contact Points**

The ball design maximizes the number of contact points, thereby allowing a higher and more stable flow of current.



#### **Spring Force**

The higher the spring force, the better the plunger is pressed against the wall of the barrel, allowing a stable current flow.



#### Material

Different material types can heavily influence the conductivity of the pin, but also the roughness is imporant to increase the current flow.

## **BACK DRILL**

The drilled plunger creates extra space for the spring and allowing shorter pogo pin designs.



Pin Length: ≈ 2.5 mm Current: 1 A

#### **BIAS TAIL**

The biased tail of the plunger creates a lateral force and better contact.



Pin Length: ≈ 3.5 mm Current: 2 A

## **BALL**

The ball inside stabilizes the contacting areas for a better performance.



Pin Length: ≈ 4.5 mm Current: 3~5 A

## Housing Polyoxyethylen (Standard) PBT Polybutylene terephthalate LCP Liquid-crystal polymers HTN Polyphthalamide PA10T Ball Stainless Steel Plunger Brass (Standard) Beryllium Copper Phosphor Bronze Surface Plating -**Base Plating Barrel** Spring Base Brass (Standard) Stainless Steel Beryllium Copper

## When should you use which surface plating?

Plating	Hardness (HV)	Function	Color
Gold	200	Low resistance	Gold
Super AP	400	Superior corrosion resistance, low electrical resistance	Silver
Nickel	150-200	Low cost, corrosion resistant	Silver
Palladium-Nickel	330-380	Improved signal transmission	Silver
Red Brass (CuSnZn)	600	Replace Nickel	Silver
Palladium Cobalt	450-600	Replace Pd-Ni	Silver
Palladium Cobalt	600-800	Black color requirement	Black

# CCP PLATING TECHNOLOGY

**Industry-Leading Anti-Corrosion** 

# CCP PLATING TECHNOLOGY

**Industry-Leading Anti-Corrosion** 

CCP's Super AP plating is the gold-standard of the industry. Its superior composition makes it extremly resistant to electrolytic corrosion while maintaining a very low resistance. The perfect solution for any kind electrical application.

28



more resistant to Salt Spray

**5**X



more resistant to Artificial Perspiration

**30**X



more resistant to Electrolysis



Nickel-Free

# Comparison of Gold and Super AP Plating:

**GOLD** 





10 Min

0 Min



50 Min

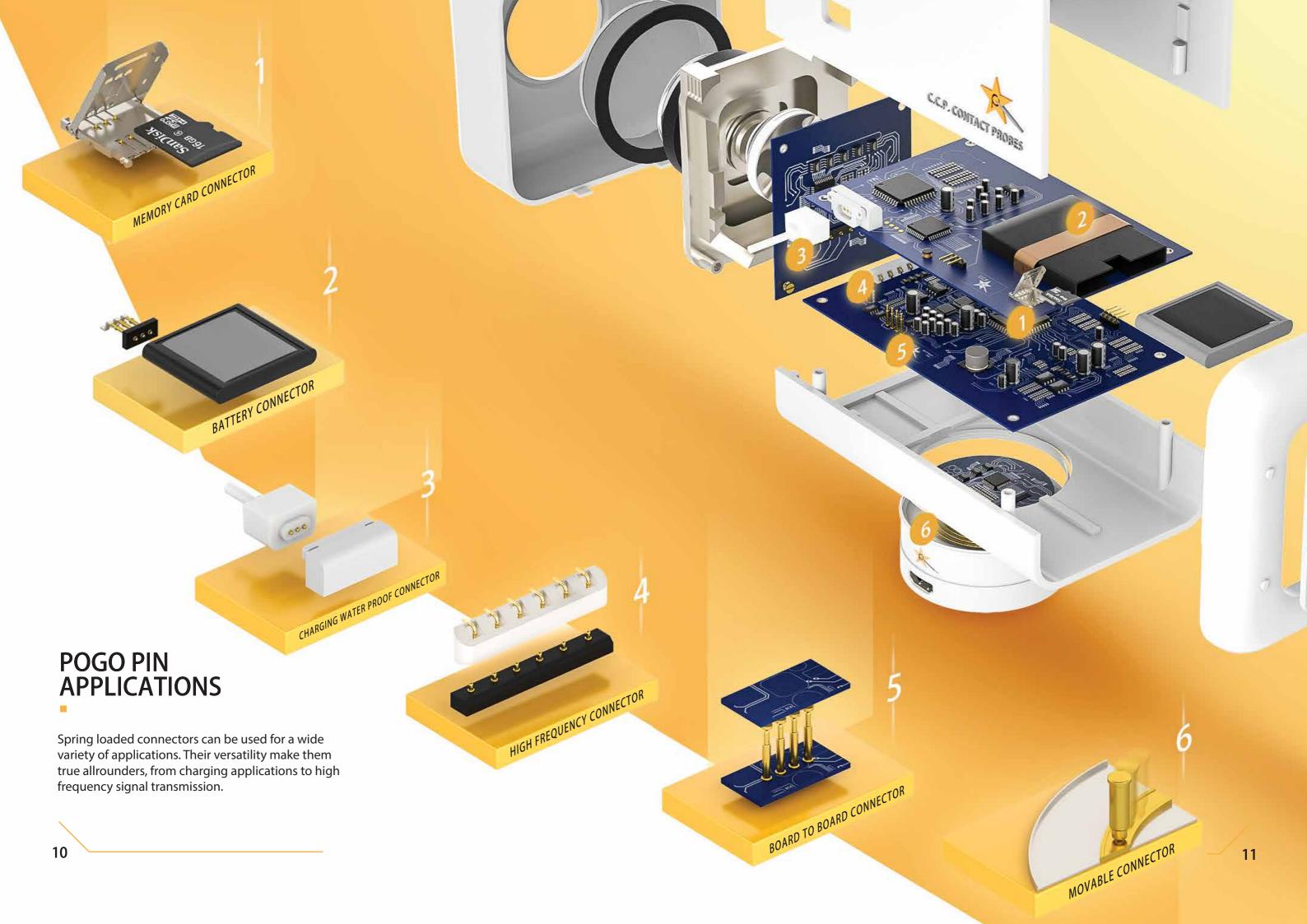
**SUPER AP** 



# Understanding Galvanic Corrosion:

Galvanic corrosion occurs, when two different metals of different nobility get into close contact in the presence of an electrolyte such as water. Dissimilar metals have different electrode potentials which cause one of the metals to act as a cathode and the other as an anode. The resulting current flow is the main cause for the corrosion of the lesser noble (anode) metal. Acid or alkali environments, for example on human skin, can accelerate galvanic corrosion significantly and attack even metals such as gold and plating.

Plating	Testing standard	Au(50u" ) Layer	APII Layer	Super AP Layer
Nickel Release	EN 12472:2005+A1:2009	Nickel-containing process	Nickel-free process	Nickel-free process
Contact Resistance $(m\Omega)$	EIA-364-23	< 50	<50	<50
Salt Spray Resistance (HR)	EIA-362-26	96	96	168
Artificial Sweat Resistance (HR)	ISO-3160	96	96	168
Surface Hardness (HV)	ISO 6507-1:2005	200	400	400
Electrolysis Resistance Time	1mA, 5V, Pitch=0.60mm	<1 Min	15 Min	60 Min



# POGO PIN INDUSTRIES Robotic Arms Docking Stations Rugged Devices Printers MEDICAL CPI Dockings Skin Lasers Inhalation Machines Barcode Scanners Smart Price Tags POS Systems (Point of sale) Credit Card Readers Pregnancy Monitors **ENTERTAINMENT** Smart Toys Game Consoles Audio Equipment HOUSEHOLD Dish Washers **TRANSPORTATION** Home Pods **PERSONAL** Vacuum Cleaners Car Keys Navigation Systems Board Electronics Hair Dryers Air Purifiers Laptops Smartphones E-Cigarettes Smart Watches **SECURITY** Water Cookers Smart Locks Airplane Entertainment Systems **CCTV Cameras** Ear Pods **Smoke Detectors** Cameras **Hearing Aids**

# BALL POINT CONNECTOR



Keeping a stable connection to a moving target can be a challenge, as constant strain on the components can result in degradation of the materials and in worst case to a malfunction.

The Ball-Point Connector solves this problem by a radically new design that offers totally new engineering possibilities and a simplified assembly without cables.



Diameter	Current	Durability
Min 0.6 mm	1A - 5A	Min 10'000 Compressions
Spring Force	Contact Resistance	Travel Distance
145g ± 20g	$30\mathrm{m}\Omega - 100\mathrm{m}\Omega$	Up to 25 km

#### DOES WATER HARM POGO PINS?

CCP's waterproof pogo pin connectors are designed to withstand any long and short term submersion in water. For very challenging environments we recommend our SuperAP Plating which can withstand the effects of Galvanic Corrosion up to 60 times longer.

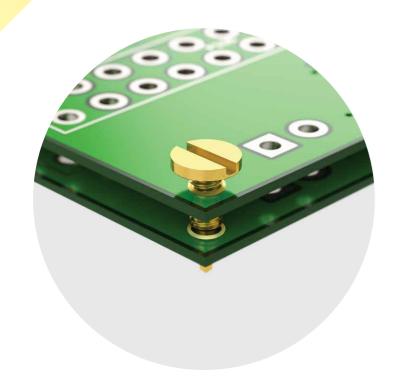
# SCREW PINS

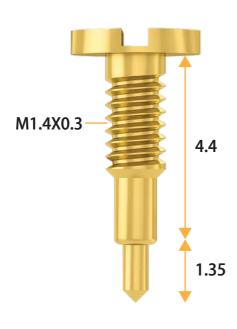
# MAGNETIC CONNECTORS

CCP's Screw Pin design is a smart way to utilize a pogo pin as a connector as well as a mounting part, reducing the assembly cost significantly and opening new design possibilities for industrial engineers.



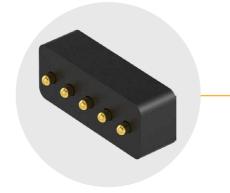
CASE





Diameter	Current	Durability
3 mm	1A	10,000 compressions
Spring Force	Contact Resistance	
120g ± 20g	200 mΩ	



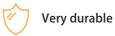








Easy to plug





No accidental breaking



Suitable for high frequency transmission

Assembly Options

Metal injection molded housing Two magnets One magnet to metal

# HIGH CURRENT PINS

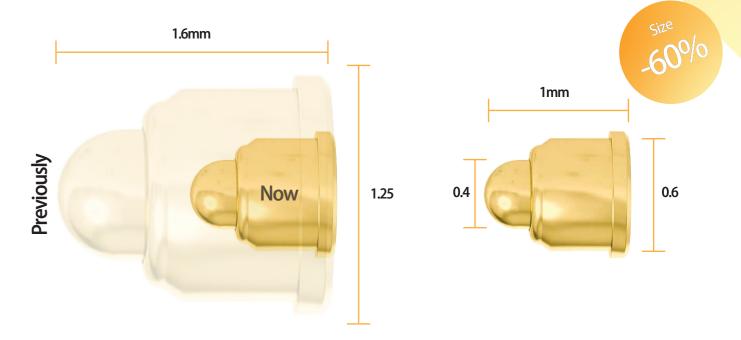
# ULTRA SMALL PINS



Diameter	Current	Durability
2.4 mm	13A	10.000 compressions
Spring Force	Contact Resistance	
120g ± 20g	30 mΩ	

Meet the smallest bias-cut pogo pin on the market today making even the most compact designs possible. The pin is so small, that you could fit over 100 pins on the tip of your finger.





Diameter	Current	Durability
0.6 mm	1A	3,000 compressions
Spring Force	Contact Resistance	
25 g	175 mΩ	

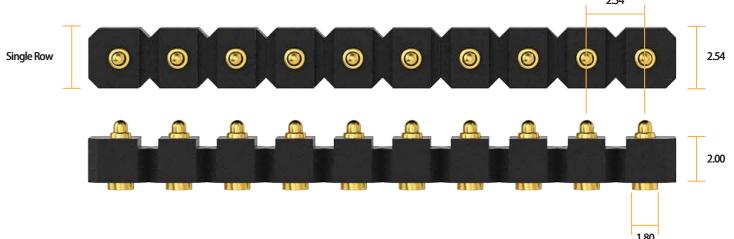
# STANDARD PINS

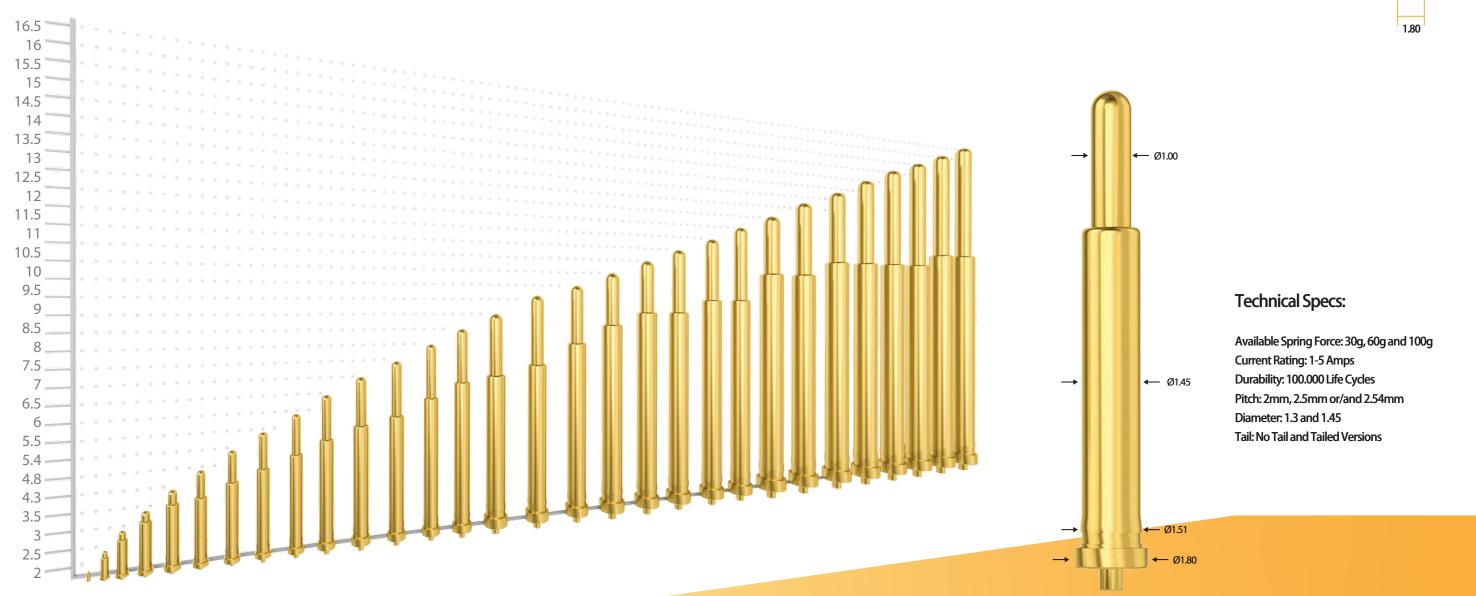
#### 2.54mm Pitch

The Standard Connector Series aims to offer a comprehensive selection of internationally compatible connectors. Its smart design and simple structure makes it very cost effective even at small volumes.

#### Modular Housing:

Available from 1-20 columns and up to 4 rows.

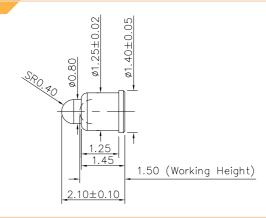




# **SINGLE**

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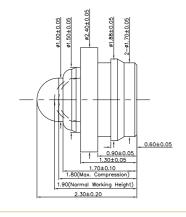




#### PN: H199M2-R

Length: 2.10 mm Working Height: 1.50 mm **Current:** 1 Amp Contact Resistance:  $100 \, m\Omega$ 100g±20% Spring Force:

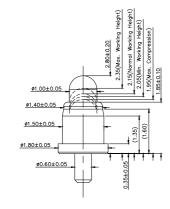




#### PN: P5271FP04

Length: 2.30 mm Working Height: 1.90 mm **Current:** 1 Amp Contact Resistance:  $100\,\text{m}\Omega$ Spring Force: 80g ± 20g

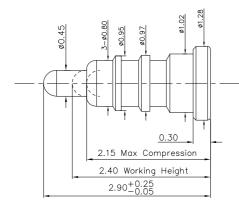




#### PN: P5625MF01-01A000CR

Length: 2.80 mm Working Height: 2.15 mm 1 Amp **Current:** Contact Resistance:  $100 \, \text{m}\Omega$ Spring Force: 40g±15g

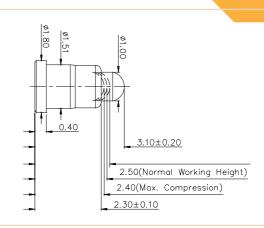




#### PN: P2988FH03

Length: 2.90 mm Working Height: 2.40 mm Current: 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ Spring Force: 60g±20g

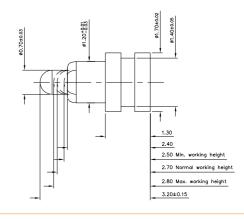




#### PN: P3198FH01

Length: 3.10 mm Working Height: 2.50 mm **Current:** 1 Amp Contact Resistance:  $50 \, m\Omega$ Spring Force: 80g ± 20g

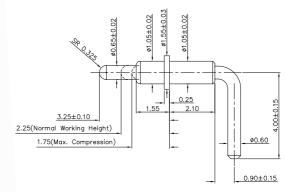




#### PN: P2616FH03

Length: 3.20 mm Working Height: 2.70 mm **Current:** 1.5 Amps Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 80g ± 20g

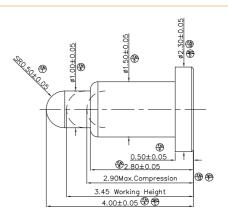




#### PN: P3533BP02

3.25 mm Length: Working Height: 2.25 mm **Current:** 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 80g ± 20g





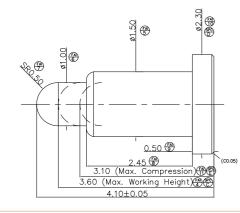
#### PN: P3775FH01

Length: 4.00 mm Working Height: 3.45 mm Current: 1 Amp Contact Resistance:  $200\,\text{m}\Omega$ Spring Force: 45g±10g

# **SINGLE**

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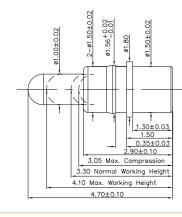




#### PN: P5067FP01-R

Length: 4.10 mm Working Height: 3.60 mm 1 Amp Current: Contact Resistance:  $100 \, \text{m}\Omega$ 100g±20% Spring Force:

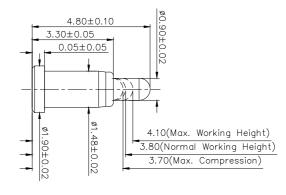




#### PN: P3697PP01

Length: 4.70 mm Working Height: 3.30 mm Current: 1 Amp Contact Resistance:  $100 \, \text{m}\Omega$ Spring Force: 60g±20g

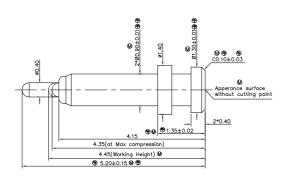




#### PN: P5660MF03-01A000CR

Length: 4.80 mm Working Height: 3.80 mm Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 70g±20g

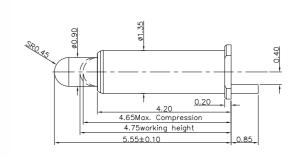




#### PN: P3989FH01

Length: 5.20 mm Working Height: 4.45 mm Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 65g±15%

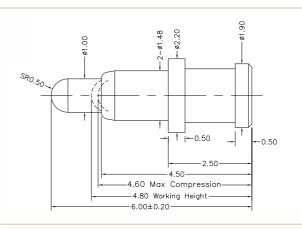




#### PN: P3730SH02

Length: 5.50 mm Working Height: 4.75 mm 5 Amps Current: Contact Resistance:  $50 \, \text{m} \Omega$ **Spring Force:** 100g±20%

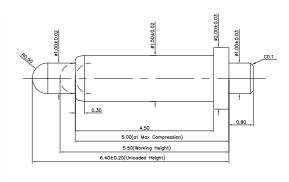




#### PN: P3256FH01

Length: 6.00 mm Working Height: 4.80 mm 1 Amp **Current:** Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 120g ± 20g

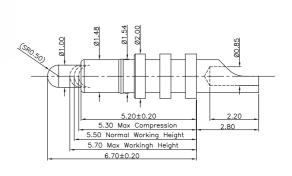




#### PN: H024M0

Length: 6.40 mm Working Height: 5.50 mm Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 100g±20%





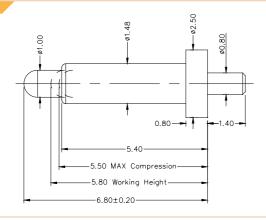
#### PN: P2859SH01

Length: 6.70 mm Working Height: 5.50 mm **Current:** 5 Amps Contact Resistance:  $50 \, \text{m}\Omega$ 110g±20% **Spring Force:** 

## SINGLE PIN

## SINGLE PIN



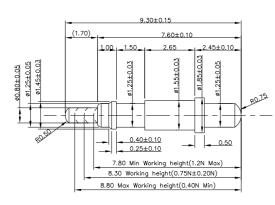


#### PN: P2871PH01

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Length:6.80 mmWorking Height:5.80 mmCurrent:3 AmpsContact Resistance: $50 \text{ m}\Omega$ Spring Force: $110g \pm 20\%$ 

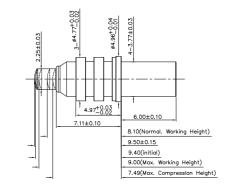




#### PN: P2631PH03

Length:9.30 mmWorking Height:8.30 mmCurrent:2 AmpsContact Resistance: $100 \text{ m}\Omega$ Spring Force: $80g \pm 20g$ 

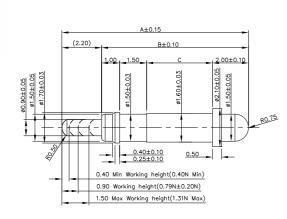




#### PN: P6123PH03

Length:9.50 mmWorking Height:8.10 mmCurrent:5 AmpsContact Resistance:50 mΩSpring Force: $180g \pm 20\%$ 

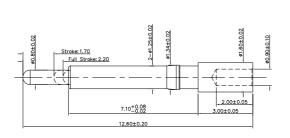




#### PN: P2683PH09

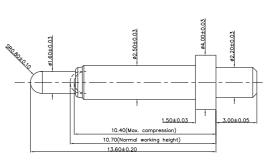
Length:10.05 mmWorking Height:0.90 mmCurrent:2 AmpsContact Resistance:50 mΩSpring Force: $60g \pm 20g$ 





#### PN: P5773PH02



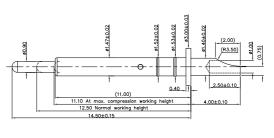


#### PN: P2783PH01

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Length:13.60 mmWorking Height:10.70 mmCurrent:5 AmpsContact Resistance: $50 \text{ m}\Omega$ Spring Force: $90g \pm 20g$ 

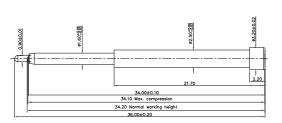




#### PN: P3737SH01

Length: $14.50 \, \text{mm}$ Working Height: $12.50 \, \text{mm}$ Current: $2 \, \text{Amps}$ Contact Resistance: $50 \, \text{m}\Omega$ Spring Force: $100g \pm 20\%$ 





#### PN: P2977FH01

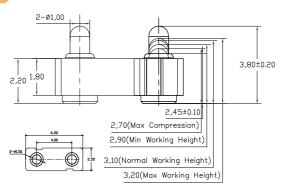
Length:  $36.00 \, \text{mm}$ Working Height:  $34.20 \, \text{mm}$ Current:  $1 \, \text{Amp}$ Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force:  $100g \pm 20\%$ 

26 \_\_\_\_\_\_

## 2 PINS

# **NON STANDARD CONNECTOR**

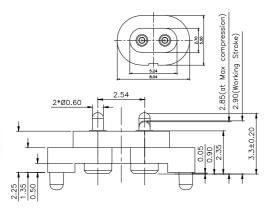
2 PINS



#### PN: F1106AA01-02A400MR

-	
Length:	3.80 mm
Working Height:	3.10 mm
Pitch:	4.00 mm
Current:	1 Amps
Contact Resistance:	$100m\Omega$
Spring Force:	90g±20%

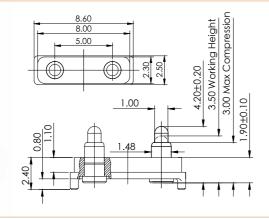




#### PN: P3013MF01-02F254MR

-	
Length:	3.30 mm
Working Height:	2.90 mm
Pitch:	2.54 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	100g±20g

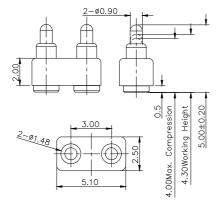




#### PN: F969AA01-02A500MR

_	
Length:	4.20 mm
Working Height:	3.50 mm
Pitch:	5.00 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	100g±20%

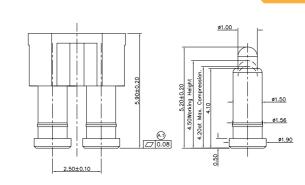




#### PN: P3708MF01-02F300MR

Length:	5.00 mm
Working Height:	4.30 mm
Pitch:	3.00 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	60q±20

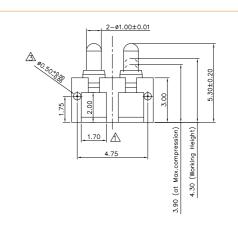




#### PN: F1835AA01-02A250CR

Length: 5.20 mm Working Height: 4.50 mm Pitch: 2.50 mm Current: 1 Amp Contact Resistance:  $100 \, \text{m}\Omega$ Spring Force: 60g ± 20g

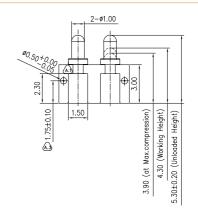




#### PN: H020M0-H02B250R

5.30 mm Length: Working Height: 4.30 mm Pitch: 2.50 mm 2.5 Amps Current: Contact Resistance:  $100 \, \text{m}\Omega$ **Spring Force:** 120g±20%

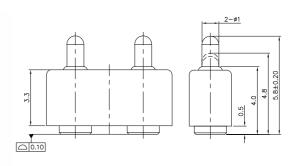




#### PN: H036M0-H02C250R

5.30 mm Length: Working Height: 4.30 mm 2.50 mm Pitch: 1 Amp Current: Contact Resistance:  $50 \, \text{m}\Omega$ 120g±20% Spring Force:





#### PN: N005M4-02A400HR

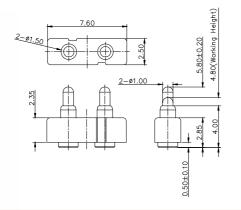
Length: 5.80 mm Working Height: 4.80 mm Pitch: 4.00 mm 1 Amp Current: Contact Resistance:  $50 \, m\Omega$ Spring Force: 110g±20%

## 2 PINS

# **NON STANDARD CONNECTOR**

2 PINS

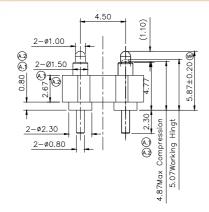




#### PN: N005M4-02C350MR

-	
Length:	5.80 mm
Working Height:	4.80 mm
Pitch:	3.50 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	110g±209

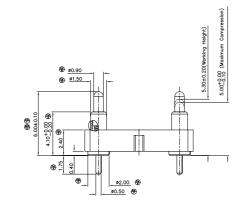




#### PN: P2688MP01-02G450MR

Length:	5.87 mm
Working Height:	5.07 mm
Pitch:	4.50 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	110g±20%

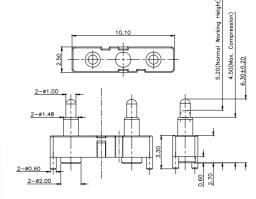




#### PN: P3721MP01-02A762HR

Length:	6.00 mm
Working Height:	5.30 mm
Pitch:	2.54 mm
Current:	2.5 Amps
Contact Resistance:	$30\text{m}\Omega$
Spring Force:	50g±20%

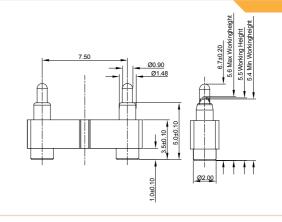




#### PN: P3037MF01-03A300HB

•	
Length:	6.30 mm
Working Height:	5.20 mm
Pitch:	6.00 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	110g±209

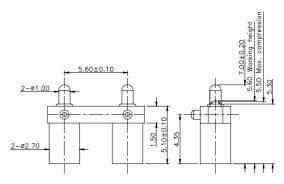




#### PN: F1615AA02-04B250MR

•	
Length:	6.70 mm
Working Height:	5.50 mm
Pitch:	7.50 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	110g±20

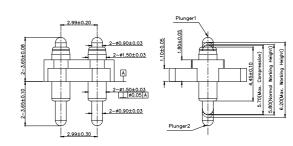




#### PN: P2723MF01-03B280HB

7.00 mm Length: Working Height: 5.60 mm Pitch: 5.60 mm 3 Amps **Current:** Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 130g ± 25%

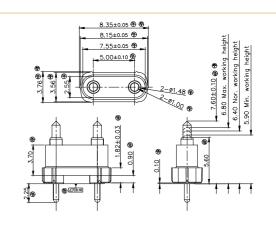




#### PN: P5121MD10-02A324HB

Length: 7.30 mm Working Height: 5.80 mm Pitch: 2.99 mm 2 Amps Current: Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 85g±15g



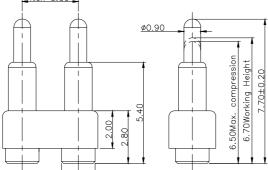


#### PN: P2388MP10-02G500HR

Length: 7.60 mm Working Height: 6.40 mm Pitch: 5.00 mm **Current:** 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 120g ± 20%

## 2 PINS

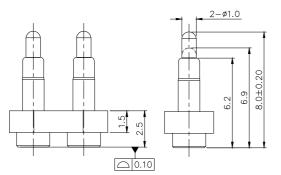
# Pitch 3.00\_



#### PN: F259AA02-02300MR

Length: 7.70 mm Working Height: 6.70 mm Pitch: 3.00 mm 1 Amp Current: Contact Resistance:  $50 \,\text{m}\Omega$ Spring Force: 60g±20%

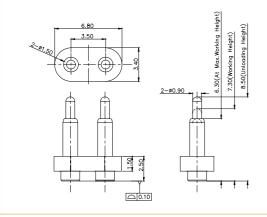




#### PN: N001M2-02D350MR

8.00 mm Length: Working Height: 6.90 mm Pitch: 3.50 mm Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 65g±20%

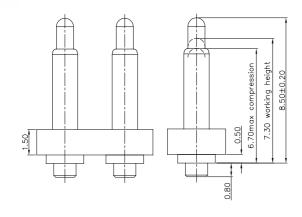




#### PN: H015M1-02D350MR

Length: 8.50 mm Working Height: 7.30 mm 3.50 mm Pitch: Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 100g ± 20g





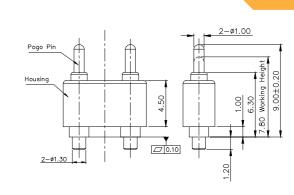
#### PN: P1089AA01-02D350MR

8.50 mm Length: Working Height: 7.30 mm Pitch: 3.50 mm Current: 1.5 Amps Contact Resistance:  $50 \,\text{m}\Omega$ Spring Force: 120g±20%

# **NON STANDARD CONNECTOR**

2 PINS

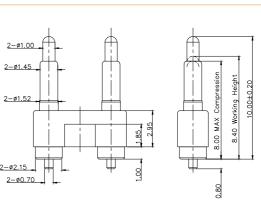




#### PN: N002M10-02B500HR

Length: 9.00 mm Working Height: 7.80 mm Pitch: 5.00 mm 1 Amp **Current:** Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 100g±20g

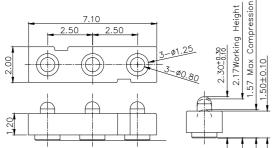




#### PN: P2780MF01-02A508MR

10.00 mm Length: Working Height: 8.40 mm Pitch: 5.08 mm 1 Amp Current: Contact Resistance:  $50 \,\text{m}\Omega$ Spring Force: 100g±20%

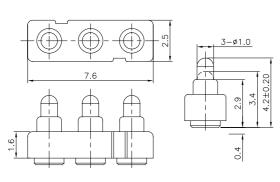
## 3 PINS



#### PN: F1106AA01-02A400MR

•	
Length:	2.30 mm
Working Height:	2.17 mm
Pitch:	2.50 mm
Current:	1 Amp
Contact Resistance:	$100m\Omega$
Spring Force:	80g±20%

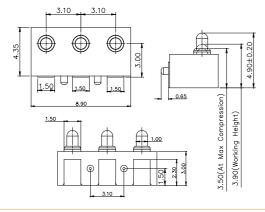




#### PN: N103M5-03G250MR

•	
Length:	4.20 mm
Working Height:	3.40 mm
Pitch:	2.50 mm
Current:	1 Amp
Contact Resistance	: 50 mΩ
Spring Force:	120g±20%

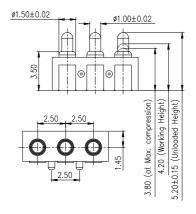




#### PN: H003M7-H03A310R

Length:	4.90 mm
Working Height:	3.90 mm
Pitch:	3.10 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	120g±20%





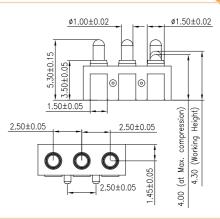
#### PN: H003M1-H03B250RR

Length:	5.20 mm
Working Height:	4.20 mm
Pitch:	2.50 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	120g±209

## **NON STANDARD CONNECTOR**

3 PINS

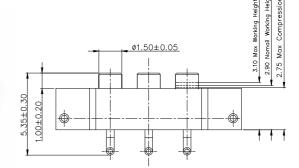




#### PN: H003M3-H03B250R

5.30 mm Length: Working Height: 4.30 mm Pitch: 2.50 mm **Current:** 1 Amps Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 120g±20%

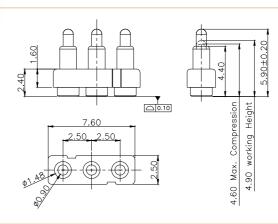




#### PN: P3309MF01-03R250MR

5.30 mm Length: Working Height: 3.10 mm Pitch: 2.50 mm 1 Amp **Current:** Contact Resistance:  $100 \, \text{m}\Omega$ Spring Force: 100g±20%

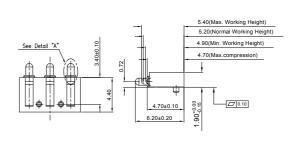




#### PN: F515AA01-03250MR

5.90 mm Length: Working Height: 4.90 mm 2.50 mm Pitch: **Current:** 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ Spring Force: 120g±20%





#### PN: R175AA09-03265HR

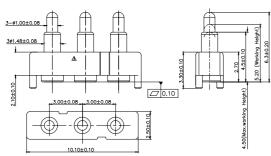
**Spring Force:** 

Length: 6.20 mm Working Height: 5.20 mm Pitch: 4.90 mm **Current:** 2.5 Amps Contact Resistance:  $50 \, \text{m}\Omega$ 

120g±20%

## **3 PINS**





#### PN: H179M0-03A300MR

6.30 mm

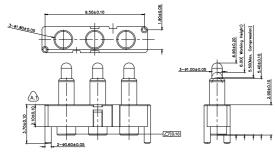
5.20 mm

3.00 mm

110g±20%

1 Amp

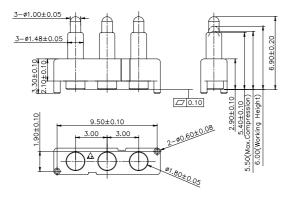
Length: Working Height: Pitch: Current: Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force:



#### PN: F1767AA01-03A300MR

Length: 6.90 mm Working Height: 6.00 mm Pitch: 3.00 mm Current: 1 Amp Contact Resistance:  $50 \, m\Omega$ Spring Force: 100g±20%



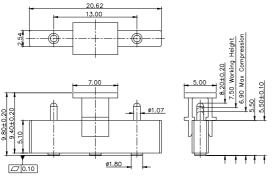


#### PN: N042M4-03A300MR

Length: 6.90 mm Working Height: 6.00 mm Pitch: 3.00 mm **Current:** 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ 

Spring Force: 60g±20g





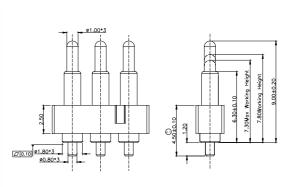
#### PN: F1712AA02-03D650MR

8.20 mm Length: Working Height: 7.50 mm Pitch: 6.50 mm Current: 1 Amp Contact Resistance:  $100\,\text{m}\Omega$ Spring Force: 85g±20%

## **NON STANDARD CONNECTOR**

3 PINS

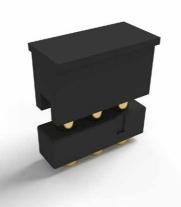


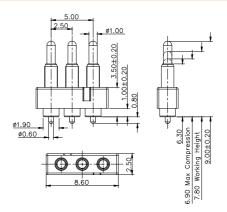


#### PN: P1500AA01-03C250MR

Length:

9.00 mm Working Height: 7.80 mm Pitch: 2.50 mm Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 60g±20%

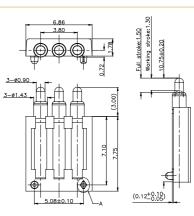




#### PN: P2223MP01-03C250MR

Length: 9.00 mm Working Height: 7.80 mm Pitch: 2.50 mm **Current:** 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ Spring Force: 100g±20%



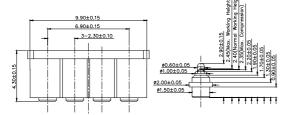


#### PN: R1332AA01-03B190RR

Length: 10.75 mm Working Height: 9.45 mm Pitch: 1.90 mm Current: 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ **Spring Force:** 110g±20%

4 PINS



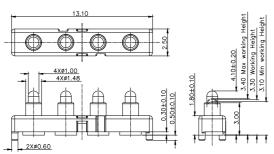


#### PN: P5331MF02-04A230CR

2.90 mm

Length:

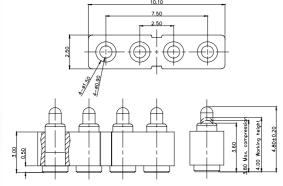
Working Height: 2.40 mm Pitch: 2.30 mm Current: 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 75g±15g



#### PN: F1853AA02-04F300MR

Length: 4.10 mm Working Height: 3.30 mm Pitch: 3.00 mm 1 Amp **Current:** Contact Resistance:  $50 \, m\Omega$ **Spring Force:** 80g ± 20%

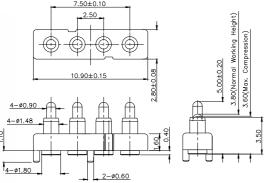




#### PN: P3063MF01-04B250MR

Length: 4.80 mm Working Height: 4.00 mm Pitch: 2.50 mm 2 Amps Current: Contact Resistance:  $50 \,\mathrm{m}\Omega$ Spring Force: 90g ± 20%





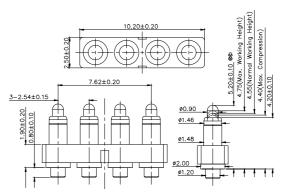
#### PN: P2808MF01-04D250MR

Length: 5.00 mm **Working Height:** 3.80 mm Pitch: 2.50 mm **Current:** 2 Amps Contact Resistance:  $50 \, m\Omega$ 90g ± 20g Spring Force:

## **NON STANDARD CONNECTOR**

4 PINS

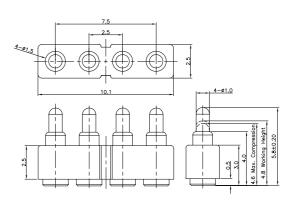




#### PN: P3859MP01-04A254MR

5.20 mm Length: Working Height: 4.55 mm Pitch: 2.54 mm **Current:** 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 55g±10g

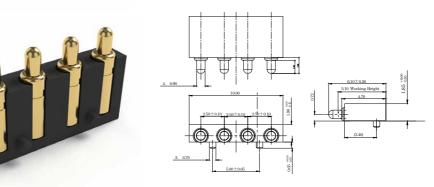




#### PN: N005M4-04B250MR

Length: 5.80 mm **Working Height:** 4.80 mm Pitch: 2.50 mm Current: 1 Amp Contact Resistance:  $50 \,\text{m}\Omega$ **Spring Force:** 110g±20%

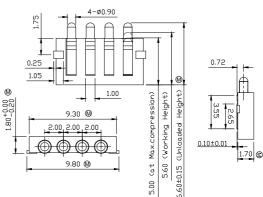




#### PN: R175AA00-04250RR

Length: 6.10 mm **Working Height:** 5.10 mm Pitch: 2.50 mm **Current:** 1 Amp Contact Resistance:  $50 \, m\Omega$ Spring Force: 110g±20%

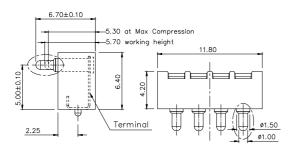




#### PN: H016M0-H04A200R

Length: 6.60 mm **Working Height:** 5.60 mm Pitch: 2.00 mm **Current:** 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 110g±20%

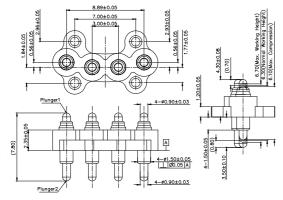
4 PINS



#### PN: R035AA05-04250RR

Length:	6.70 mm
Working Height:	5.70 mm
Pitch:	2.50 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	120g±20%

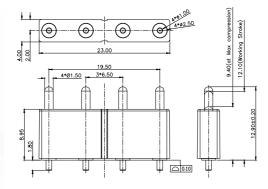




#### PN: P5751MD01-04A300HB

-	
Length:	7.80 mm
Working Height:	6.30 mm
Pitch:	3.00 mm
Current:	1 Amp
Contact Resistance:	$30m\Omega$
Spring Force:	85g±15g





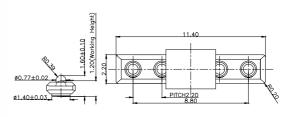
#### PN: P3136MP01-04B650MR

Length:	12.90 mm
Working Height:	12.10 mm
Pitch:	6.50 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	105g±20g

# **NON STANDARD CONNECTOR**

**5 PINS** 

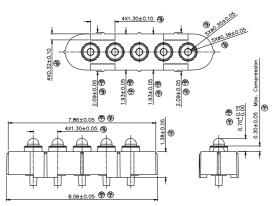




#### PN: F254AA01-05220MR

Length: 1.60 mm Working Height: 1.20 mm Pitch: 2.20 mm **Current:** 1 Amp Contact Resistance:  $100\,\text{m}\Omega$ Spring Force: 60g ± 20g

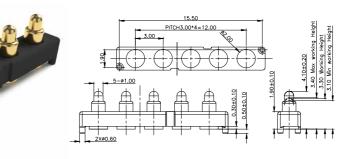




#### PN: P2288MP02-05A130HR

Length: 2.08 mm Working Height: 1.68 mm Pitch: 1.30 mm **Current:** 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 100g ± 20g

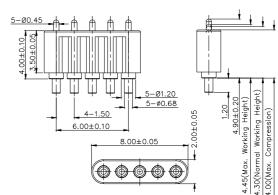




#### PN: F1853AA01-05H300MR

Length: 4.10 mm Working Height: 3.30 mm Pitch: 3.00 mm **Current:** 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ **Spring Force:** 80g ± 20%





#### PN: P3710MP01-05A150HB

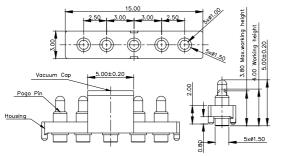
4.90 mm Length: 4.30 mm Working Height: Pitch: 1.50 mm **Current:** 2 Amps Contact Resistance:  $50\,\text{m}\Omega$ **Spring Force:** 110g±20%

**5 PINS** 

## **NON STANDARD CONNECTOR**

5 PINS

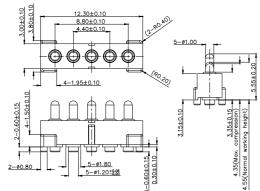




#### PN: F1371AA01-05A250MR

-	
Length:	5.00 mm
Working Height:	4.00 mm
Pitch:	2.50 mm
Current:	1 Amp
Contact Resistance:	$100m\Omega$
Spring Force:	80g±20g



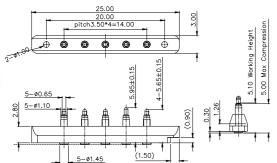


#### PN: P2761MP01-05E220MR

Length: 5.55 mm Working Height: 4.55 mm Pitch: 2.20 mm 1 Amp **Current:** Contact Resistance:  $50 \, \text{m}\Omega$ 

**Spring Force:** 80g ± 20g

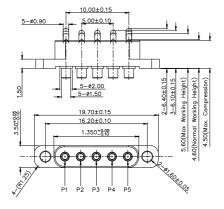




#### PN: P5362MF01-05A350MR

Length: 5.65 / 5.95 mm Working Height: 5.10 mm Pitch: 3.50 mm 2 Amps Current: Contact Resistance:  $50\,\text{m}\Omega$ 70g±20g Spring Force:

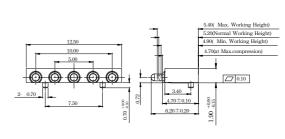




#### PN: P2673MF02-05R250HT

Length:	6.10/6.41 mm
Working Height:	4.60 mm
Pitch:	2.50 mm
Current:	2 Amps
Contact Resistance:	$50m\Omega$
Spring Force:	150g±20%

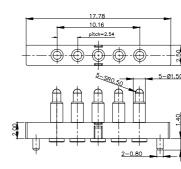


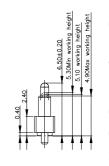


#### PN: R175AA05-05250RR

Length: 6.20 mm Working Height: 5.20 mm Pitch: 2.50 mm Current: 2 Amps Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 120g±20%



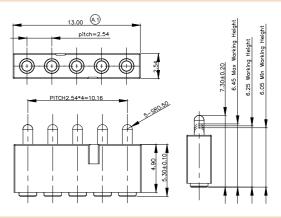




#### PN: P2037MF01-05J254MR

Length: 6.50 mm Working Height: 5.10 mm Pitch: 2.54 mm 2 Amps **Current:** Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 90g±20%

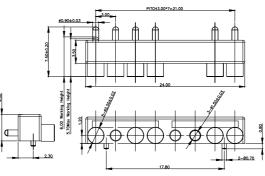




#### PN: P2315MF01-05L254MR

Length: 7.30 mm Working Height: 6.25 mm Pitch: 2.54 mm 5 Amps Current: Contact Resistance:  $20 \, m\Omega$ **Spring Force:** 80g±20%



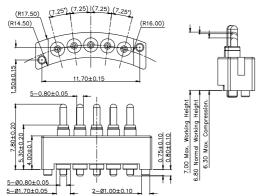


#### PN: F1601AA05-08G300HB

7.50 mm Length: Working Height: 6.00 mm 3.00 mm Pitch: Current: 2 Amps Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 120g±20%

**5 PINS** 

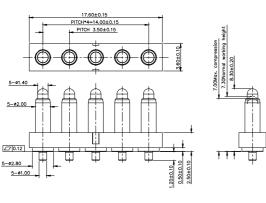




#### PN: P2698MP03-05A202MR

Length: 7.80 mm Working Height: 6.80 mm 2.02 mm Pitch: **Current:** 2 Amps Spring Force: 30g±10g

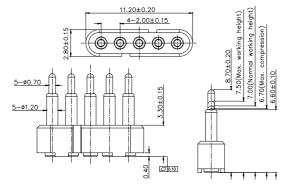




#### PN: P2811MP01-05E350MR

8.30 mm Length: Working Height: 7.30 mm Pitch: 3.50 mm Current: 3 Amps Contact Resistance:  $50 \, \text{m}\Omega$ 95g ± 20g Spring Force:

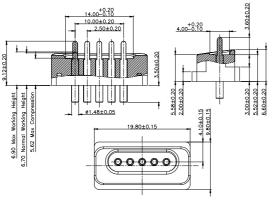




#### PN: P6287MF02-05A200MR

Length: 8.70 mm Working Height: 7.00 mm Pitch: 2.00 mm Current: 3~5 Amps Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 120g±20%





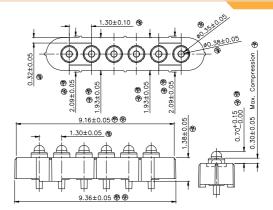
#### PN: P3117MF01-05U250HT

Length: 9.12 mm Working Height: 6.70 mm Pitch: 2.50 mm **Current:** 1 Amp Spring Force: 100g ± 20g

## **NON STANDARD CONNECTOR**

6 PINS

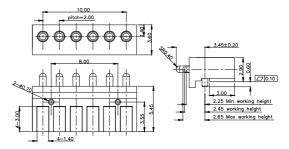




#### PN: P2288MP02-06B130HR

Length: 2.08 mm Working Height: 1.68 mm 1.30 mm Pitch: **Current:** 1 Amp Contact Resistance:  $100 \,\mathrm{m}\Omega$ **Spring Force:** 50g ± 20g

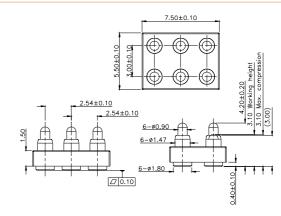




#### PN: P2526MR01-06F200HR

3.45 mm Length: Working Height: 2.45 mm Pitch: 2.00 mm Current: 2 Amps Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 70g±20%

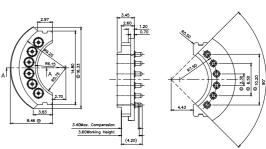




#### PN: P3004MF01-06A300HR

Length: 4.20 mm Working Height: 3.10 mm Pitch: 2.54 mm **Current:** 1 Amp Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 80g±20%





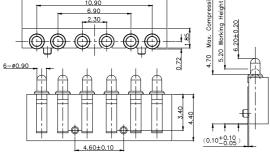
#### PN: P2106MP01-06B230HR

Length: 4.20 mm Working Height: 3.60 mm Pitch: 1.85 mm **Current:** 1 Amp

Contact Resistance:  $50 \, \text{m}\Omega$ 

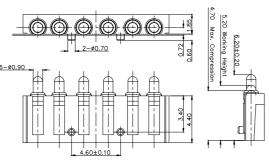
**Spring Force:** 90g±20%

## 6 PINS



#### PN: R175AA05-06B200RR

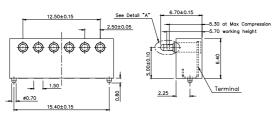
6.20 mm Length: Working Height: 5.20 mm Pitch: 2.30 mm 1.5 Amps Current: Contact Resistance:  $50 \, \text{m}\Omega$ 120g±20% **Spring Force:** 



#### PN: R175AA08-06B200RR

6.20 mm Length: Working Height: 5.20 mm Pitch: 2.30 mm Current: 2 Amps Contact Resistance:  $50 \, m\Omega$ **Spring Force:** 120g±20%

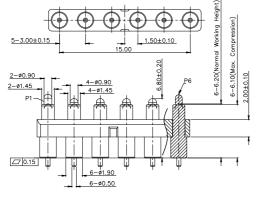




#### PN: R035AA06-06250RR

Length: 6.70 mm Working Height: 5.70 mm Pitch: 2.50 mm **Current:** 1 Amp Contact Resistance:  $50\,\text{m}\Omega$ Spring Force: 120g ± 20%





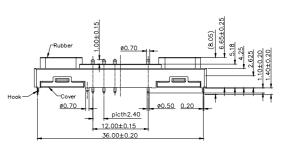
#### PN: P3588MP02-06B300MR

Length: 6.80/7.30 mm Working Height: 6.20 mm Pitch: 3.00 mm Current: 2 Amps Contact Resistance:  $50 \, m\Omega$ Spring Force: 110g±20%

## **NON STANDARD CONNECTOR**

6 PINS

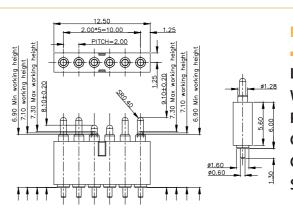




#### PN: P2197MP01-06C240MR

7.28 mm Length: **Working Height:** 6.48 mm Pitch: 2.40 mm Current: 2 Amps Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 90g±20%

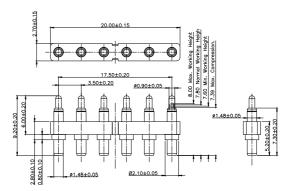




#### PN: P2294MP01-06E200MR

8.10/9.10 mm Length: Working Height: 7.10 mm Pitch: 2.00 mm **Current:** 2 Amps Contact Resistance:  $50\,\text{m}\Omega$ Spring Force: 70g±20%



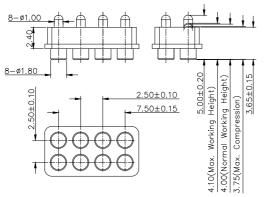


#### PN: P3783MP01-06L350MR

Length: 9.20 mm **Working Height:** 7.80 mm Pitch: 3.50 mm 5 Amps **Current:** Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 100g±20g

8 PINS





#### PN: P3728MF01-08P250HR

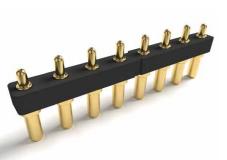
Length: 5.00 mm

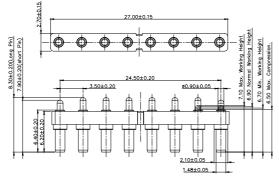
Working Height: 4.00 mm

Pitch: 2.50 mm

Current: 1 Amp

Contact Resistance:  $50 \text{ m}\Omega$ Spring Force:  $80\text{g}\pm20\text{g}$ 

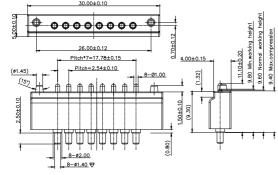




#### PN: P2613MP01-08E350MR

Length: $7.90/8.30 \, \text{mm}$ Working Height: $6.90 \, \text{mm}$ Pitch: $3.50 \, \text{mm}$ Current: $2 \, \text{Amps}$ Contact Resistance: $50 \, \text{m} \Omega$ Spring Force: $110g \pm 20g$ 





#### PN: P1933AA01-08C254HT

Length: 11.10 mm

Working Height: 9.60 mm

Pitch: 2.54 mm

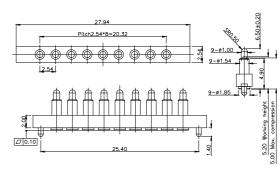
Current: 2 Amps

Contact Resistance:  $50 \text{ m}\Omega$ Spring Force:  $120g \pm 20\%$ 

# NON STANDARD CONNECTOR

9-12 PINS

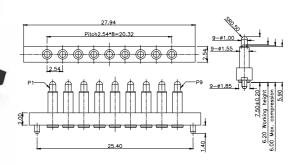




#### PN: P2839MF01-09F254MR

Length: $6.50 \, \text{mm}$ Working Height: $5.20 \, \text{mm}$ Pitch: $2.54 \, \text{mm}$ Current: $1 \, \text{Amp}$ Contact Resistance: $50 \, \text{m} \Omega$ Spring Force: $100g \pm 20\%$ 





#### PN: P2879MF01-09F254MR

Length: 7.50 mm

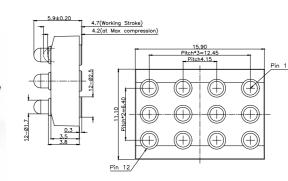
Working Height: 6.20 mm

Pitch: 2.54 mm

Current: 1 Amp

Contact Resistance:  $50 \text{ m}\Omega$ Spring Force:  $1000 \pm 20\%$ 





#### PN: P2976MF01-12A415HR

Length: 5.90 mm

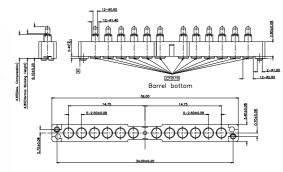
Working Height: 4.70 mm

Pitch: 3.20 mm

Current: 2 Amps

Contact Resistance:  $50 \text{ m}\Omega$ Spring Force:  $110g \pm 20g$ 





#### PN: P3303MF01-12A250MR

Length: 6.10 mm

Working Height: 4.80 mm

Pitch: 2.50 mm

Current: 1 Amp

Contact Resistance:  $100 \text{ m}\Omega$ Spring Force:  $60g \pm 20g$ 

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12-18 PINS

# PIN #12 PIN

#### PN: P1179AA17-13B210HR

Length: $7.50/7.70 \, \text{mm}$ Working Height:6.60Pitch: $1.05 \, \text{mm}$ Current: $2 \, \text{Amps}$ Contact Resistance: $50 \, \text{m} \Omega$ Spring Force: $140g \pm 20\%$ 



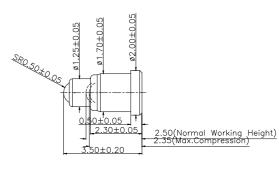
# 24.00 24.00 25.20 25

#### PN: P3673MF01-18A250MR

Length:  $7.50/8.20 \, \text{mm}$ Working Height:  $6.60 \, \text{mm}$ Pitch:  $2.50 \, \text{mm}$ Current:  $1 \, \text{Amp}$ Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force:  $130g \pm 20g$ 

# BALL POINT CONNECTOR

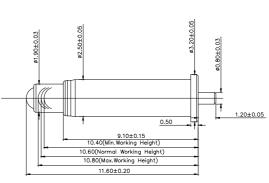




#### PN: P5079FP01

Length: $3.50 \, \text{mm}$ Working Height: $2.50 \, \text{mm}$ Current: $2 \, \text{Amps}$ Contact Resistance: $100 \, \text{m}\Omega$ Spring Force: $60g \pm 15g$ Durability:2,000

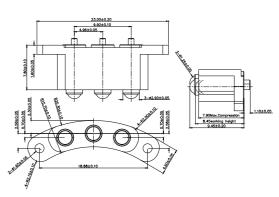




#### PN: P6353PP02

Length: $11.60 \, \text{mm}$ Working Height: $10.60 \, \text{mm}$ Current: $2 \, \text{Amps}$ Contact Resistance: $50 \, \text{m}\Omega$ Spring Force: $90g \pm 20g$ Durability:10,000





#### PN: P5982MP05-03C500HR

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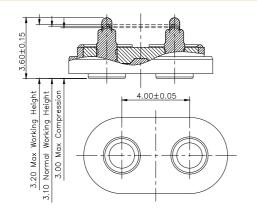
Length:9.45 mmWorking Height:8.45 mmPitch:4.96 mmCurrent:1 AmpContact Resistance: $100 \text{ m}\Omega$ Spring Force: $60g \pm 15g$ Durability:200,000

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# WATERPROOF **CONNECTOR**

# WATERPROOF **CONNECTOR**





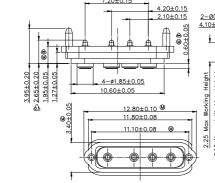
#### PN: P5562MP01-02B400HB

Length:	3.60 mm
Working Height:	3.10 mm
Pitch:	4.00 mm
Current:	1 Amps
Contact Resistance:	$100m\Omega$
Spring Force:	80g±20g
IP Factor:	IPX8

#### PN: P2859MS01-02B164HT

_	
Length:	9.60 mm
Working Height:	9.50 mm
Pitch:	16.40 mm
Current:	5 Amps
Contact Resistance:	$50m\Omega$
Spring Force:	110g±20%
IP Factor:	IPX7



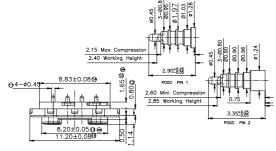


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#### PN: P5320MF01-04A210HT

Length:	2.65 mm
Working Height:	2.15 mm
Pitch:	2.10 mm
Current:	1.5 Amps
Contact Resistance:	$50m\Omega$
Spring Force:	80g±20g
IP Factor:	IPX7

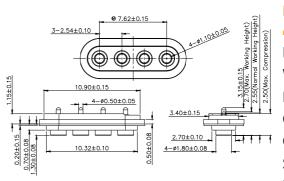




#### PN: P2988MM03-04C180HB

_	
Length:	2.90/3.35 mm
Working Height:	2.40/2.85 mm
Pitch:	1.80 mm
Current:	1 Amp
Contact Resistance:	$50m\Omega$
Spring Force:	60g±20g

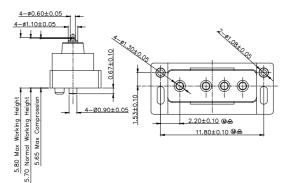




#### PN: P5875MF01-04A250HT

•	
Length:	3.15 mm
Working Height:	2.55 mm
Pitch:	2.54 mm
Current:	1 Amp
Contact Resistance:	$50\text{m}\Omega$
Spring Force:	75g±20g
IP Factor:	IPX7

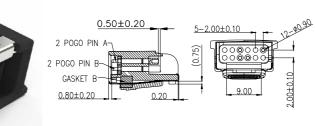




#### PN: P3613MP05-04A210MR

	-	
)	Length:	6.13 mm
-	Working Height:	5.70 mm
	Pitch:	2.10 mm
	Current:	1 Amp
	Contact Resistance:	$50m\Omega$
	Spring Force:	50g±15g

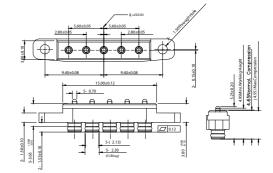




#### PN: F047AA00-04200ST

Length: 18.00 mm Working Height: 17.50 mm Pitch: 2.0 mm 1 Amp Current: Contact Resistance:  $100\,\text{m}\Omega$ **Spring Force:** 80g±20%





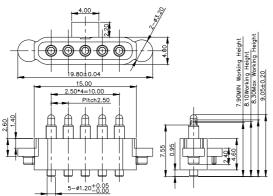
#### PN: P2352MF01-05A280HT

Length: 5.25 mm Working Height: 4.95 mm Pitch: 2.80 mm 2 Amps Current: Contact Resistance:  $50 \, \text{m}\Omega$ **Spring Force:** 95g±20%

# WATERPROOF CONNECTOR

# MAGNETIC CONNECTOR



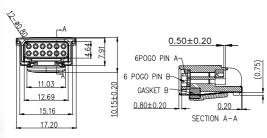


#### PN: P3608MP01-05A250MR

•

Length:	9.05 mm
Working Height:	8.10 mm
Pitch:	2.50 mm
Current:	2 Amps
Contact Resistance:	$50m\Omega$
Spring Force:	90g±20%
IP Factor:	IPX7
. 3	•





#### PN: F047AA00-12200ST

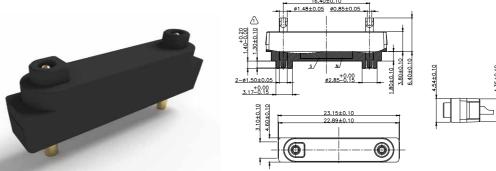
Length: 18.00 mm

Working Height: 17.50 mm

Pitch: 2.0 mm

Current: 1 Amp

Contact Resistance:  $100 \text{ m}\Omega$ Spring Force:  $80g \pm 20\%$ 



#### PN: P2859MS01-02B164HT

Length: 9.60 mm

Working Height: 9.50 mm

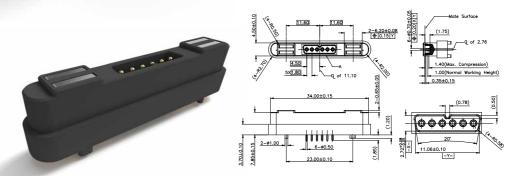
Pitch 16.40 mm

Current: 5 Amps

Contact Resistance: 50 mΩ

Spring Force: 110g±20%

IP Factor: IPX7



#### PN: P2578MP01-06C180HT

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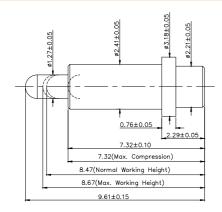
Length:9.70 mmWorking Height:8.70 mmPitch1.80 mmCurrent:3 AmpsContact Resistance: $50 \text{ m}\Omega$ Spring Force: $70g \pm 20g$ 

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# **HIGH CURRENT CONNECTOR**

# **DOUBLE ENDED**

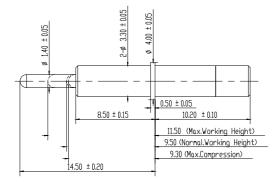




#### PN: P5650FH01

Length: 9.61 mm Working Height: 8.47 mm Current: 9 Amps Contact Resistance:  $30 \, \text{m}\Omega$ Spring Force: 100g±20%

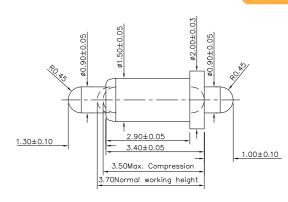




#### PN: P07408PH1

Length: 14.50 mm Working Height: 9.50 mm **Current:** 12 Amps Contact Resistance:  $50\,\text{m}\Omega$ 150g±20% Spring Force:

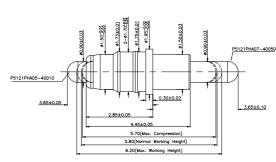




#### PN: P2573DP01

Length: 5.70 mm Working Height: 3.70 mm **Current:** 1 Amp Contact Resistance:  $100\,\text{m}\Omega$ 100g±20% Spring Force:

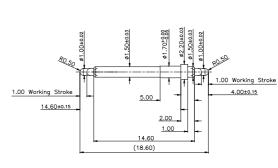




#### PN: P5650FH01

Length: 7.30 mm Working Height: 5.80 mm **Current:** 2 Amps Contact Resistance:  $30\,\text{m}\Omega$ Spring Force: 85g±15g





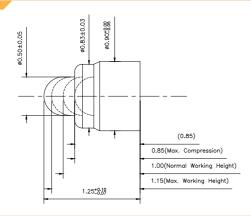
#### PN: D406AA01

Length: 18.60 mm Working Height: 16.60 mm **Current:** 1 Amp Contact Resistance:  $100\,\text{m}\Omega$ Spring Force: 60 g ± 20%

# ULTRA SMALL PIN

# SCREW PIN

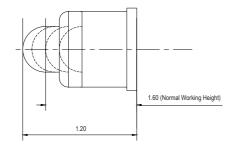




#### PN: P6925FP03

Length: 1.25 mm Working Height: 1.00 mm Current: 300m Amp Contact Resistance:  $100\,\text{m}\Omega$ Spring Force: 35g±20%

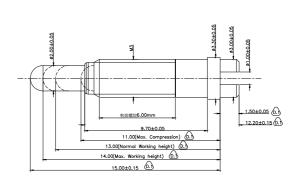




#### PN: F254AA01

Length: 1.60 mm Working Height: 1.20 mm **Current:** 300m Amp Contact Resistance:  $100\,\text{m}\Omega$ Spring Force: 40g±20%





#### PN: P07417PH1

Length: 15.00 mm Working Height: 13.00 mm 1 Amps Current: Contact Resistance:  $50 \, \text{m}\Omega$ Spring Force: 250g±20%

# QUALITY MANAGEMENT

# **Testing Items**

#### **Environmental**

- Waterproof
- Humidity Test
- Salt Spray
- Thermal Impact
- Resistance to Solder Heat
- Vibration

#### Mechanical

- Retention Force
- Life Cycle
- Vibration
- Mechanical Shock

#### **Electrical**

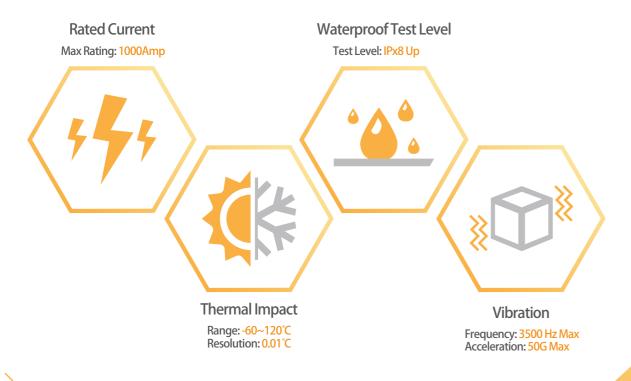
- Contact Resistance
- Insulation
- HIPOT
- Rated Current

#### Other

- Drop
- Soldering Side Force

- Solderability

# **Testing Equipment**



## ISO 9001: 2015

**Quality Management Systems** 

#### ISO 14001: 2015

**Environmental Management Systems** 

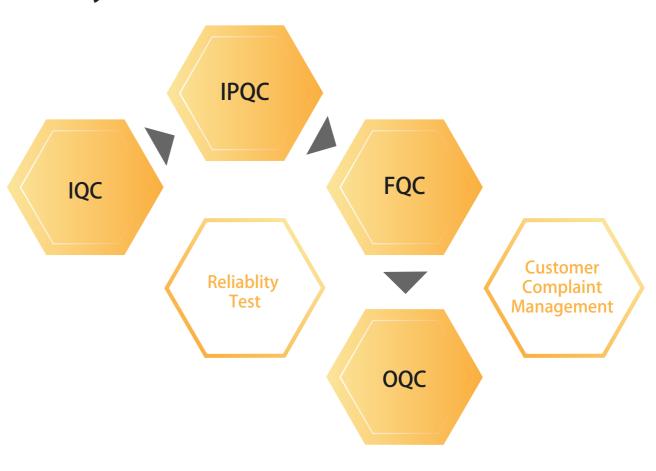
#### IATF 16949: 2016

**Automotive Quality Management Systems** 

#### QC 080000

Hazardous Substance Process Management

# **Quality Assurance**





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