



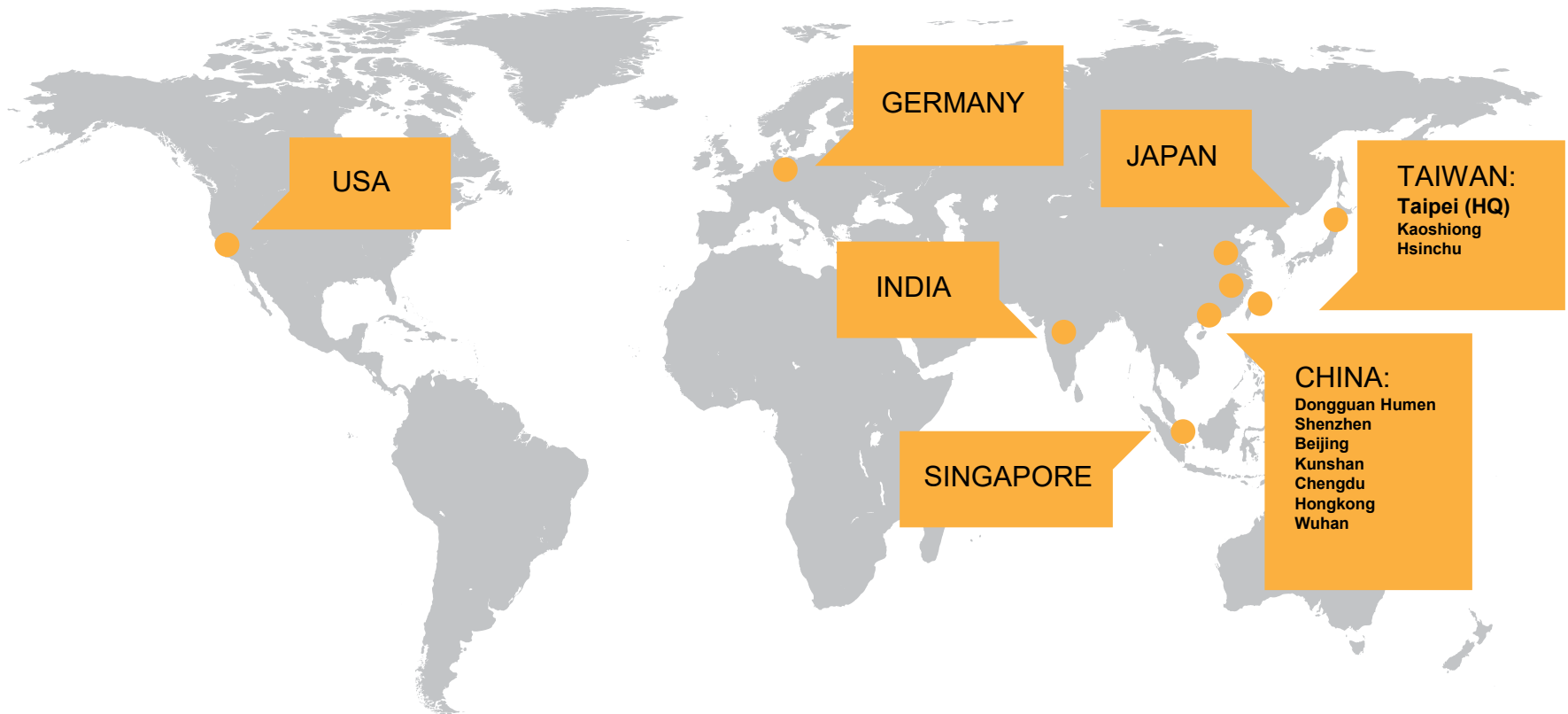
# **Company Introduction**

CCP Contact Probes Co., Ltd.

# History



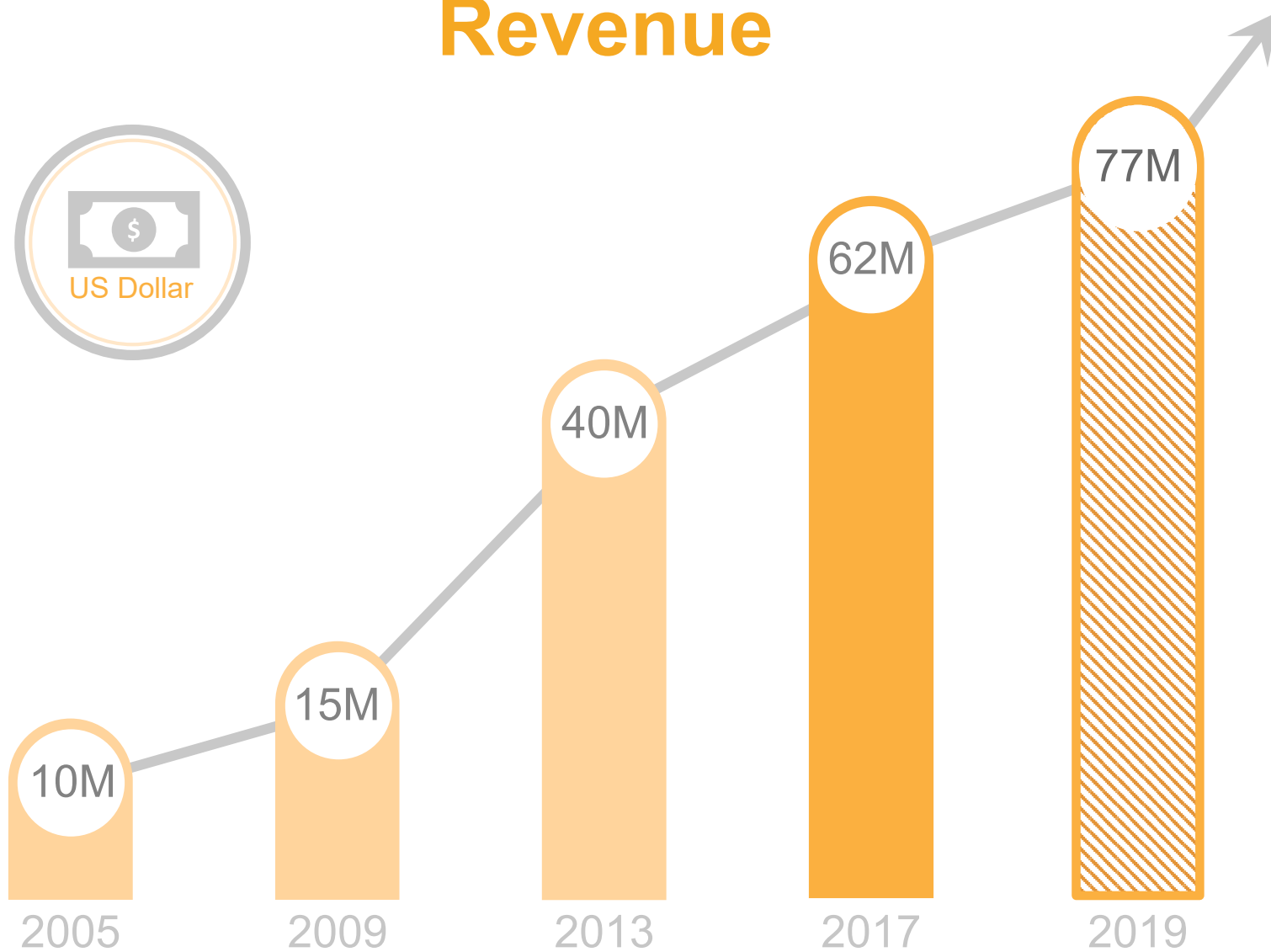
# CCP Group



Selected Customers:



# Revenue

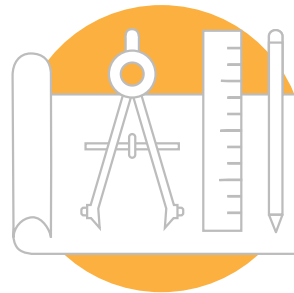


# Staff: R&D Design Service



## Fundamental Research

IC Testing probe Engineer	9
MEMS Team	7
Plating Lab	6
FAE	3
Automation Engineer	4
IC Socket Design	2



## Applied Research

Pin & Connector R&D	15
Testing Lab	2
FAE	2
Sample Team	8
Fixture Team	1
Coating Lab	2

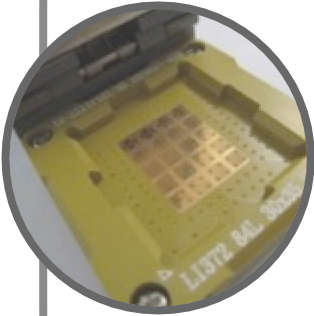
## Project Management

Project Manager	7
Engineer PM	6

# Plating: Comparison

Plating	Testing standard	Au(50u") Layer	AP Layer	APII Layer	Super AP Layer
Color	/	Gold	Silver	Silver	Silver
Nickel release	EN 12472:2005+A1:2009	Nickel-containing process	Nickel-free process	Nickel-free process	Nickel-free process
Plating thickness (micro inch)	XRF	100~170	110-170	270~400	210~400
Impedance (mΩ)	EIA-364-23	< 50	< 50	< 50	< 50
Salt Spray resistance (HR)	EIA-362-26	96	48	96	168
Artificial Sweat resistance (HR)	ISO-3160	96	48	96	168
Surface hardness (HV)	ISO 6507-1:2005	200	400	400	400
Electrolysis resistance time	1mA,5V,Pitch=0.60mm	<1min	10min	15min	60min
Cost	Factor to Gold Plating	1	x0.9	x2	x3

# Product Portfolio



## CCP-Testing

IC Testing Probe  
IC Probe Head  
PCB Testing Probe  
MEMS Probe



## CCP-Connector

1A~13A

Pogo Pin Conn.  
Waterproof Conn.  
Magnetic Conn.



## CCP-Performance

13A~250A

Electronic Vehicle  
High Current Conn.

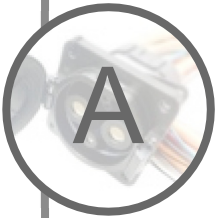
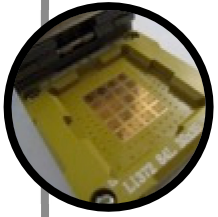


## CCP-Industrial

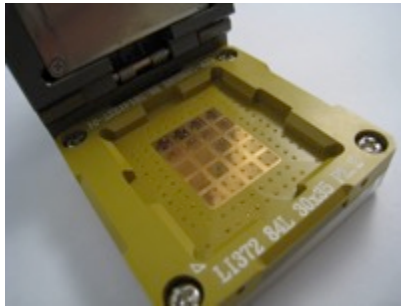
Extreme Environment

Aerospace  
Military  
Transportation  
Space

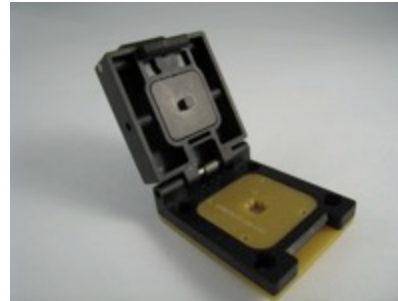
# Product Line: Testing



IC Package Test



Burn-In Test



High Current Probe



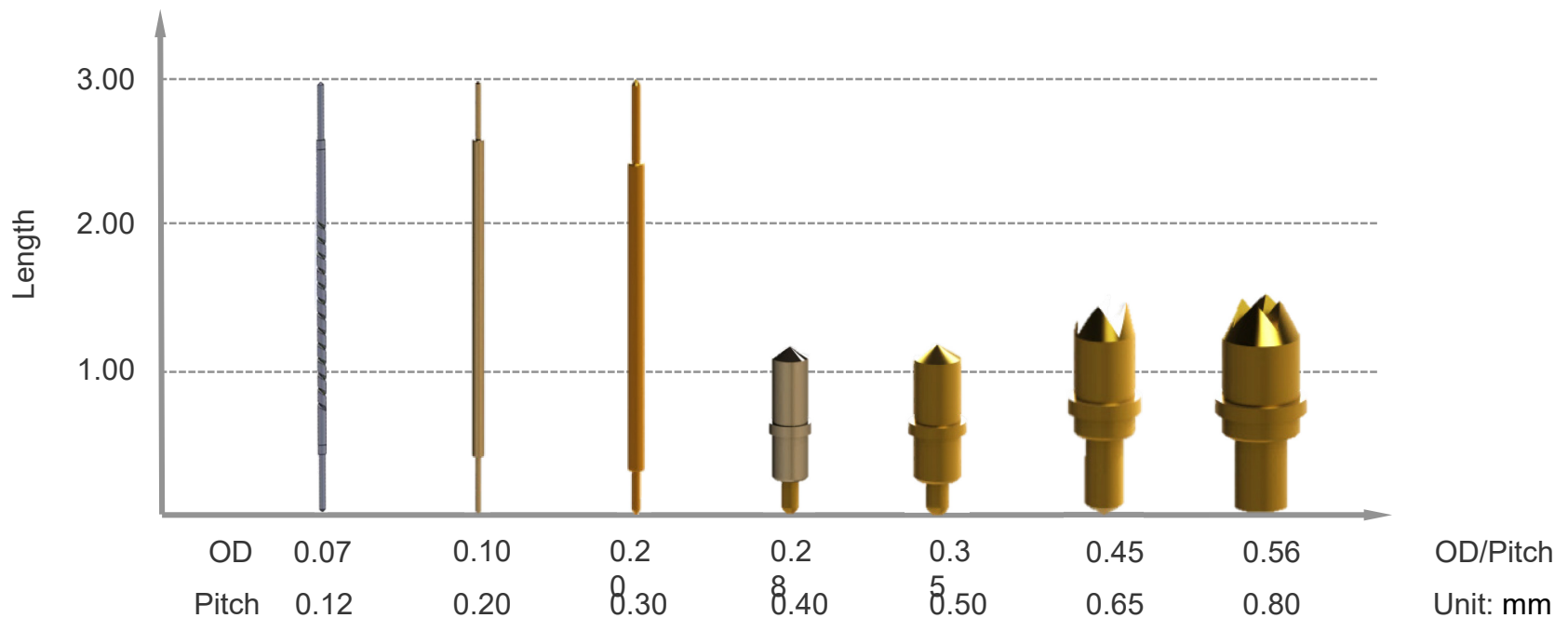
Memory Test



WLCSP Test



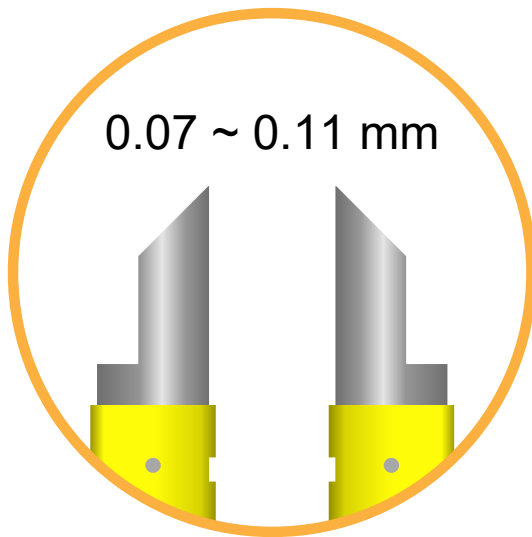
# Testing: Probe Design Capability



# Testing: Kelvin Bridge Probe

Our testing probe can be in Kelvin bridge style to increase the accuracy of probing.

Pin Gap



Tip Type



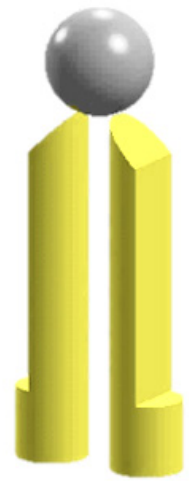
Blade Tip



Ladder Tip



Crown Tip



Half Moon  
Tip

# Testing: High Current Probe

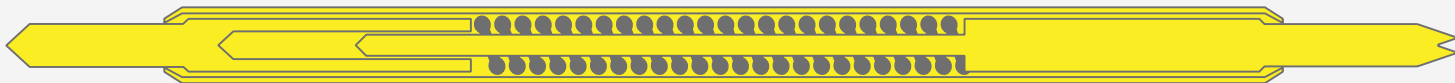
## Regular Probe



### Current Path of Regular Probe



## High Current Probe (Patent: M453149)



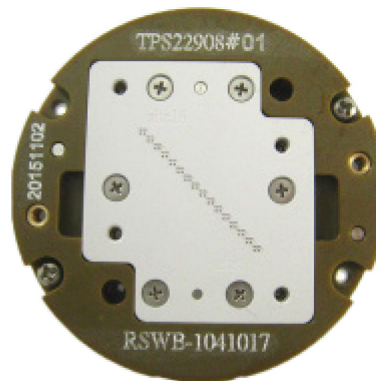
### Current Path of CCP's Patented Probe (5A Current)



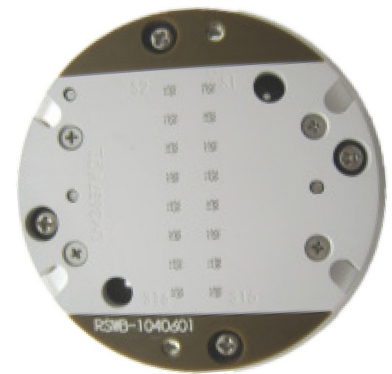
# Testing: WLCSP



36 Balls  
4 Sites  
Pitch 0.4mm



4 Balls  
16 Sites  
Pitch 0.5mm



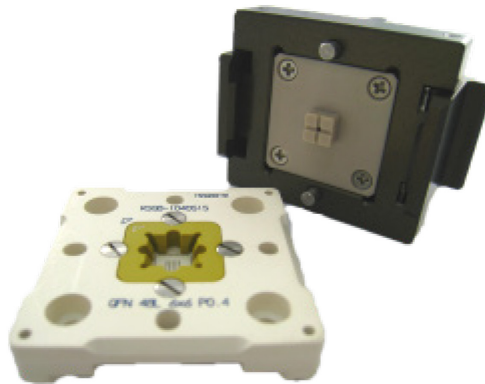
12 Balls  
16 Sites  
Pitch 0.4mm

# Testing: IC Final Test Socket

BGA

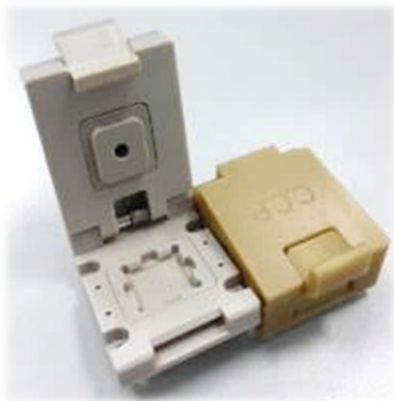
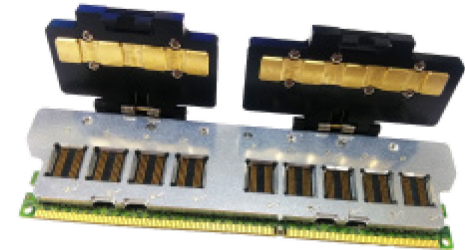


QFN



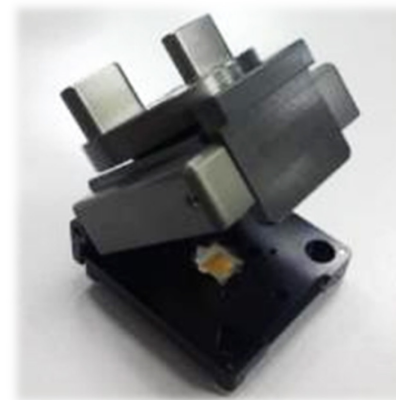
Memory Test

DDR 1~4  
eMCP  
Flash



Clamping Lid

QFN QFP  
<200 pins



Knob Lid

All Kind  
>200 pins

# Testing: Coaxial Socket for RF

## Application

Feature: **Hi-Speed/ Hi-Frequency**

DUT: Bluetooth/ GPS/ LTE/ Wireless IC

Packaging: BGA/ CSP/ QFN/ QFP

## Pin Definition

Ⓢ Signal  
ⓐ Ground



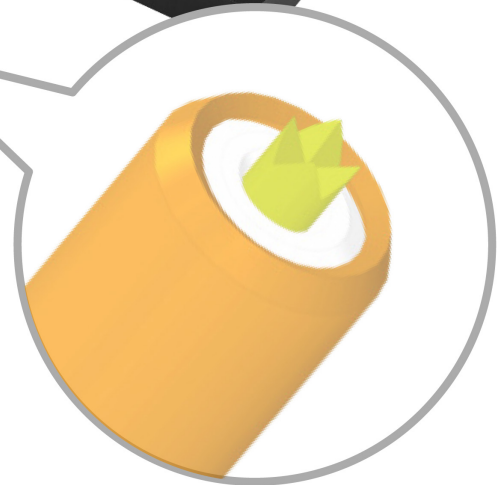
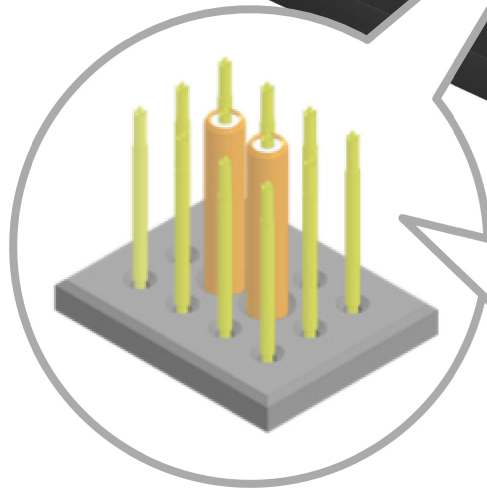
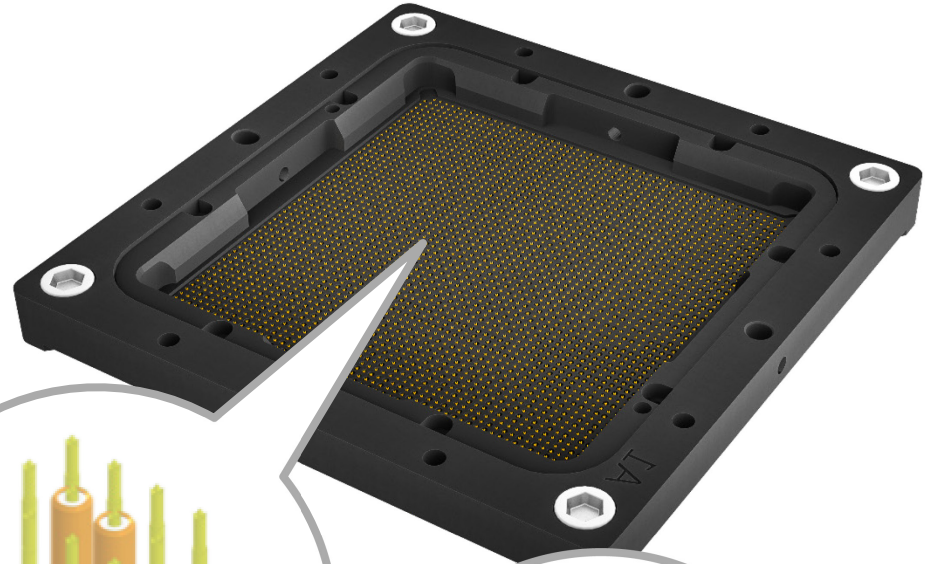
## Spec:

Insertion Loss: **-1dB @ >50 GHz**

Return Loss: **-20dB @ >30 GHz**

Impedance: 50 Ohm

Pitch: 0.65~1.00 mm

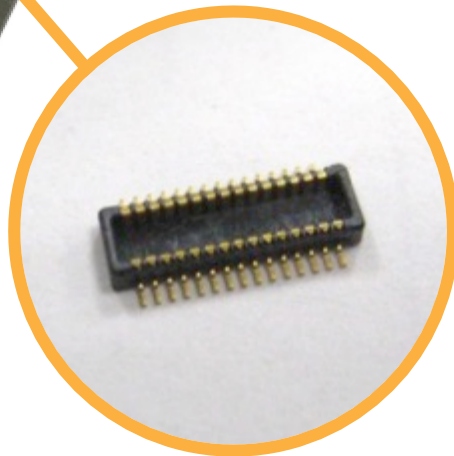


# Testing: Testing Socket

## Dual-Side Pogo Socket

Min Pitch: 0.2

Mechanical Life: 200k

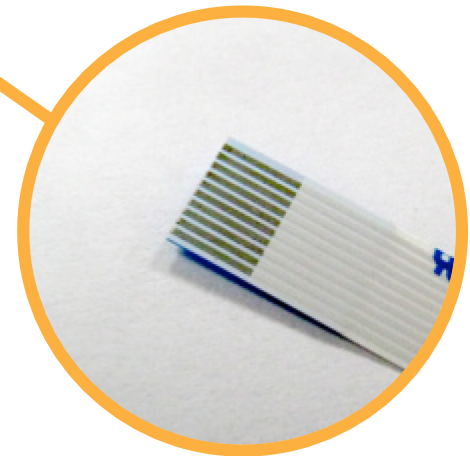
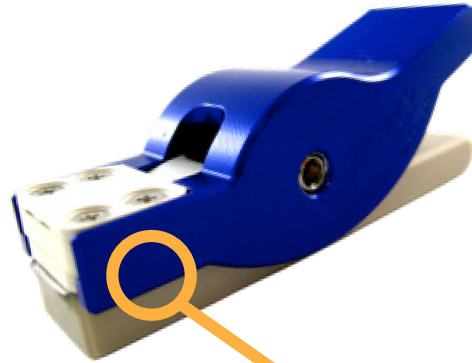


Device Under Test  
Fine Pitch Connector

## Clip Pogo Socket

Min Pitch: 0.2

Mechanical Life: 200k



Device Under Test  
FPC Gold Finger

# Testing: Pogo Tower

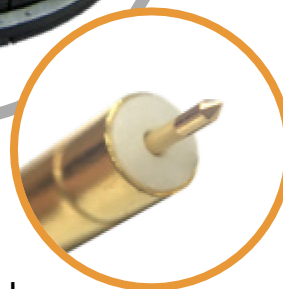
A Pogo tower is used to connect **load board** and **mother board** inside the tester.



To fit the structure of clients' tester, we **customize** the design of our pogo tower.

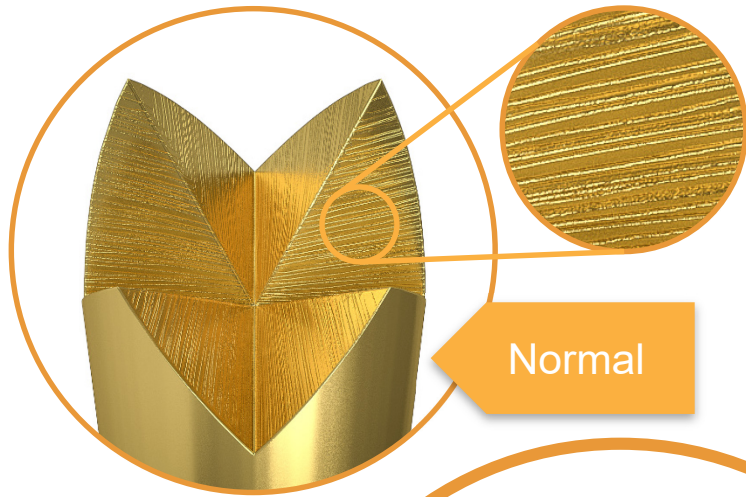


Coaxial probes can be employed for **RF requirement**.

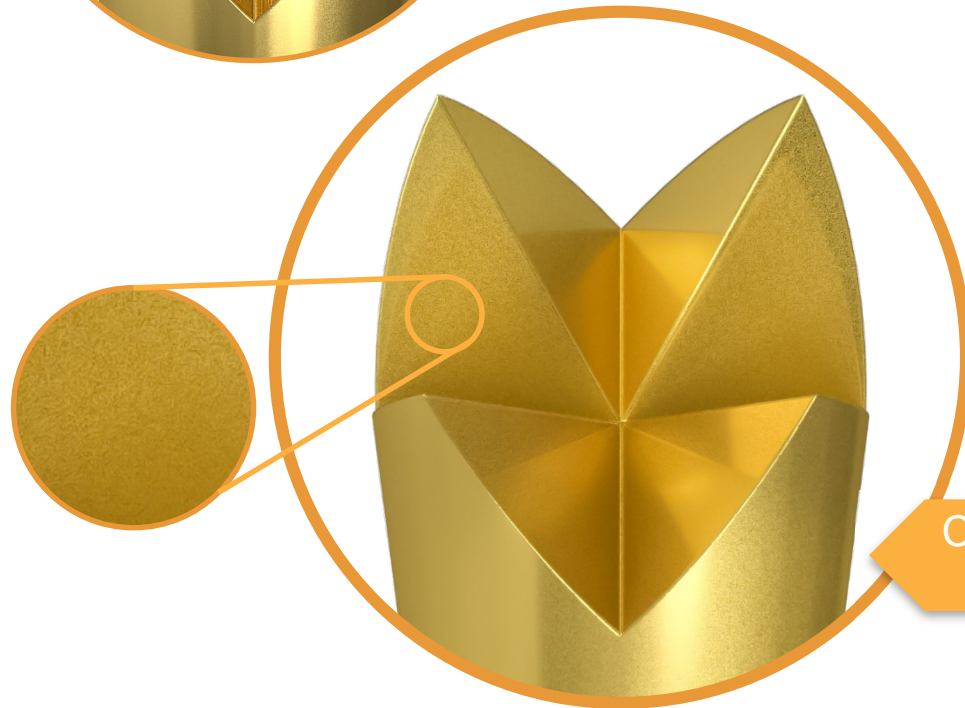


**Wired pogo tower** provides possibility for flexible connecting structure in testers.

# Testing: Mirror Process



Normal



CCP's Mirror Process

## Mirror Process – The Best Probe Protector

- The Mirror Process makes the surface as smooth as a mirror so that solder splashes won't attach to the probe tip. This, in turn, decreases your probe cleaning frequency, as well as machine down time significantly.
- Pin durability increases 1.3~1.5 times as compared to the normal process.

# Product Line: Connector



Pogo Pin Connector



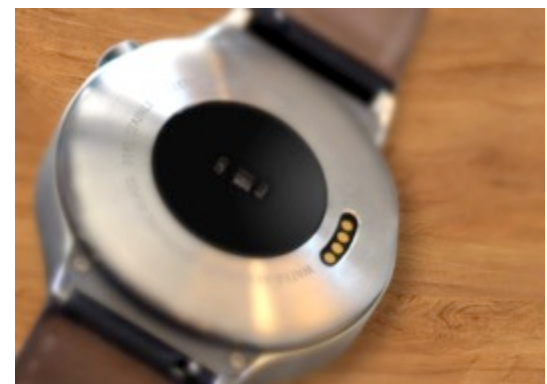
Magnetic Connector



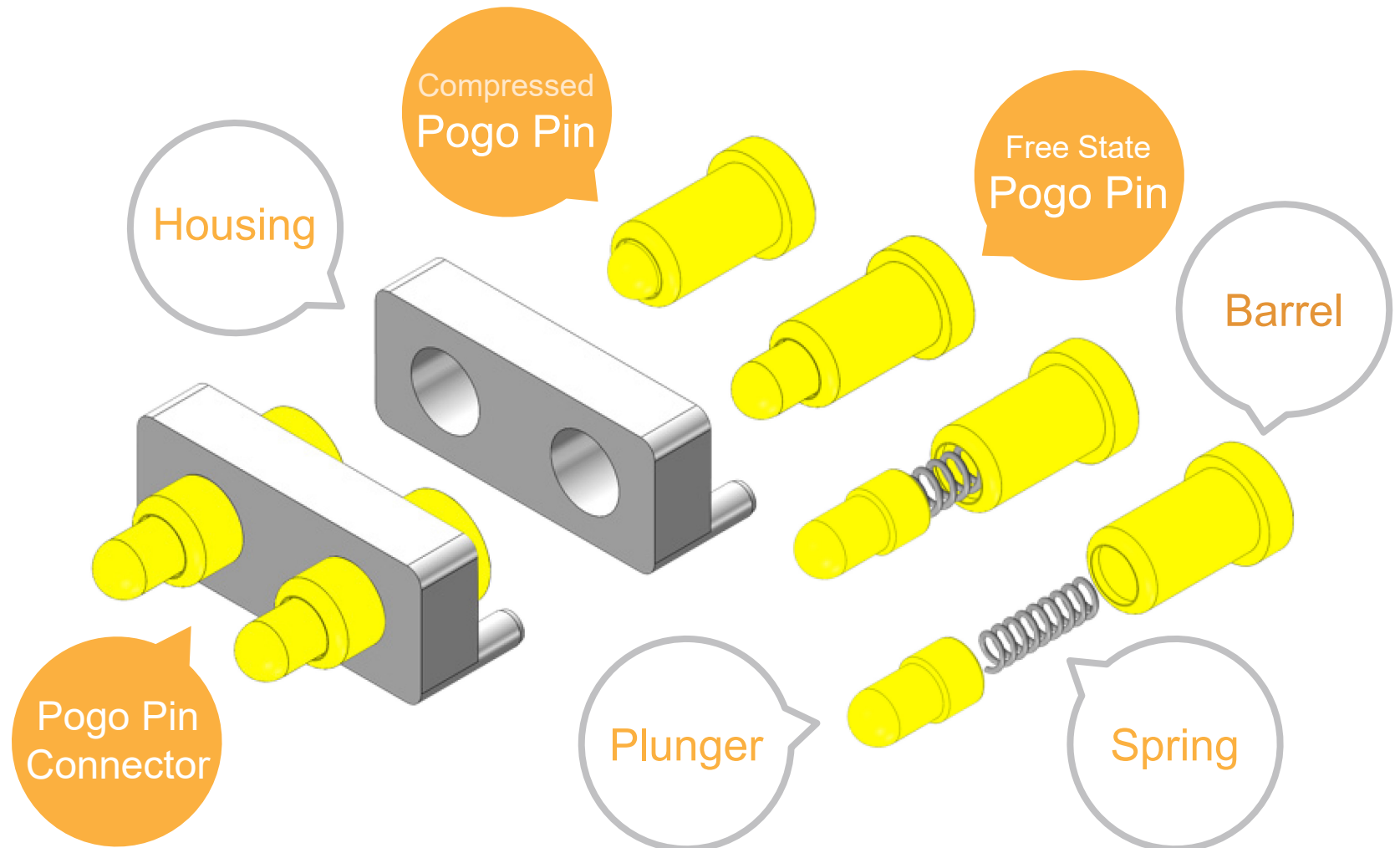
2 in 1 Tablet Connector



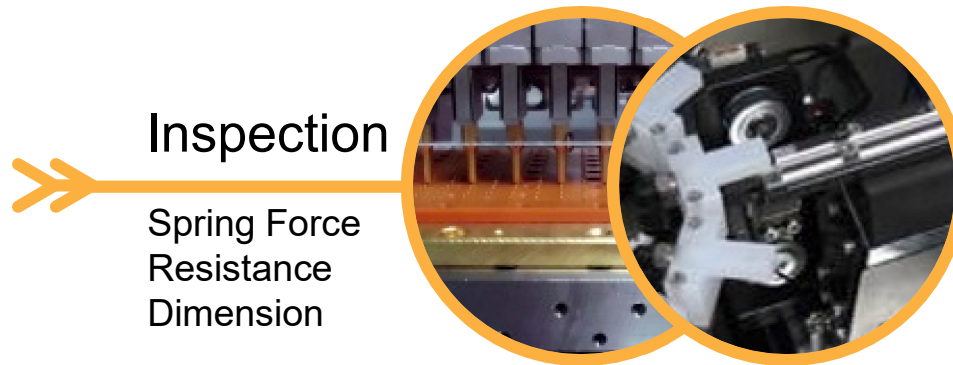
Waterproof Connector



# Connector: Basic Structure



# Connector: Manufacturing



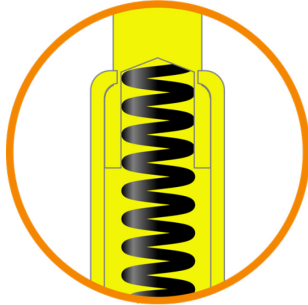
**100% inspection** can be done in automated production line.  
First ever clean room pogo pin production line in industry.



# Connector: Inner Structure

## Back Drill

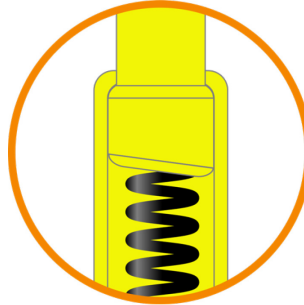
The drilled tail makes extra space for spring and creates a shorter pogo pin.



Pin Length:  $\approx 2.5$  mm  
Current: **1 A**

## Bias Tail

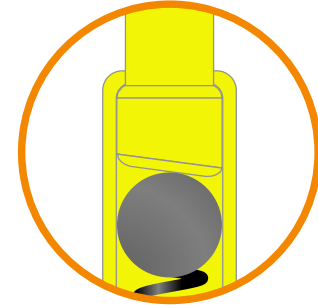
The bias tail of plunger creates lateral force and better contact.



Pin Length:  $\approx 3.5$  mm  
Current: **2 A**

## Ball

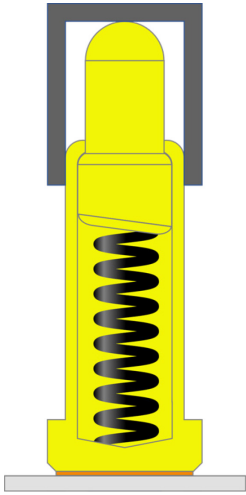
The ball inside stabilizes the contacting areas for a better performance.



Pin Length:  $\approx 4.5$  mm  
Current: **3~5 A**

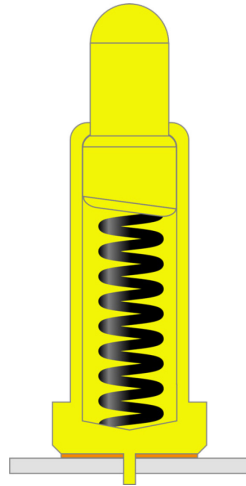
# Connector: Installation

SMT with Cap



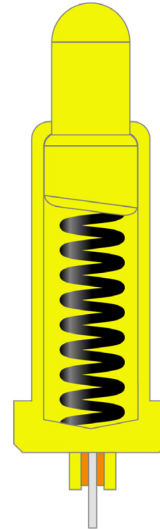
Cap is used for SMT procedure, and it will be removed after being mounted.

Plug-in



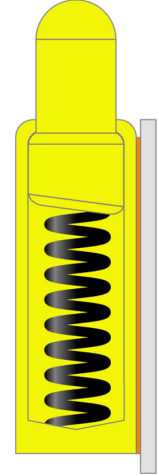
Plug-in tail is used for higher soldering force on PCB when it's needed.

Wired



Wire can be soldered onto a drilled dip for cable module.

Right Angle



Side of square tube can be soldering area for different mechanical structure.



PCB/ Wire



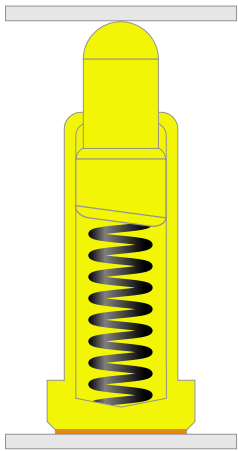
Plastic Cap



Solder

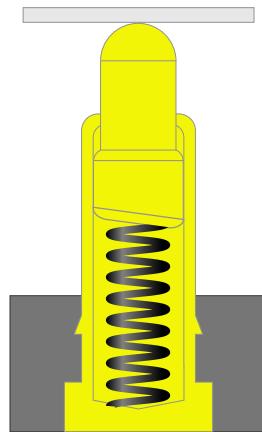
# Connector: Installation

Board to Board



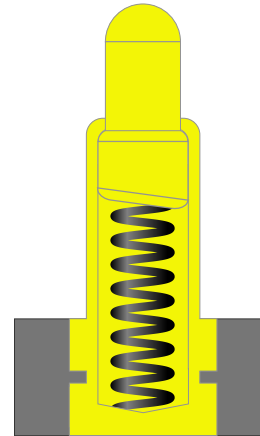
This structure is used to absorb the tolerance in-between PCBs.

Case to Board



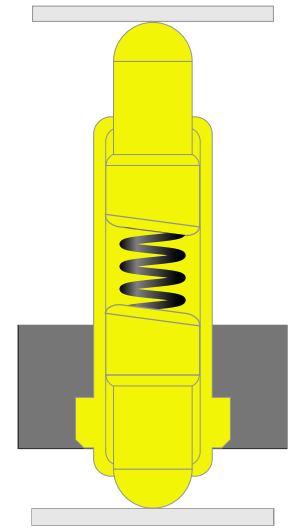
The bottom of pin can also be a cosmetic/contact area if necessary.

Insert-molding



Pins can be insert-molded for waterproofing requirement.

Double Ended



It's possible to have two movable tips.



PCB

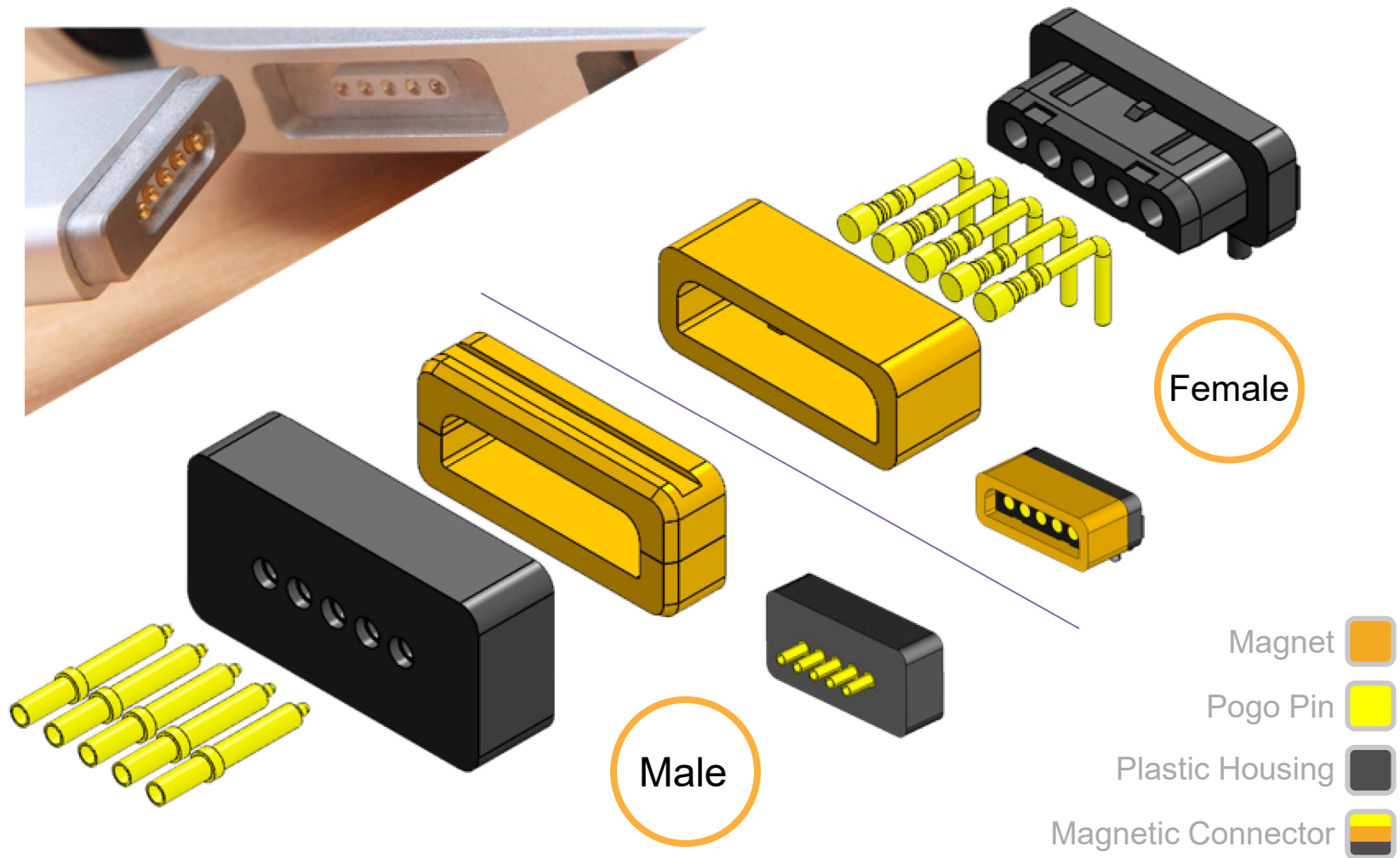


Plastic Housing



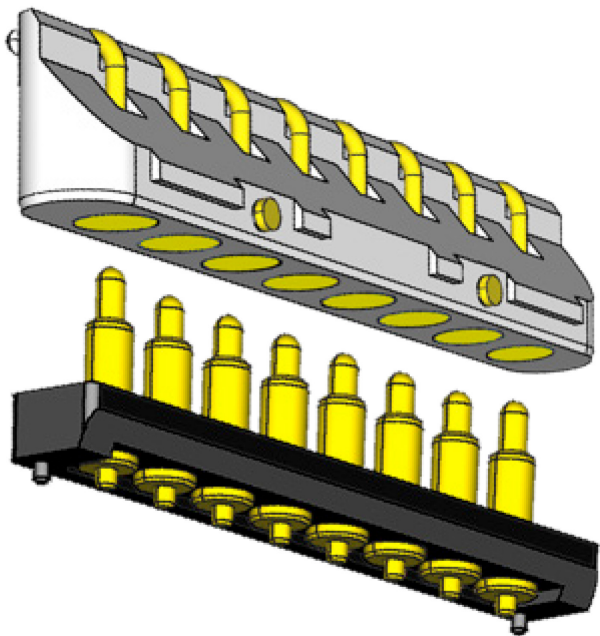
Solder




# Connector: Magnetic



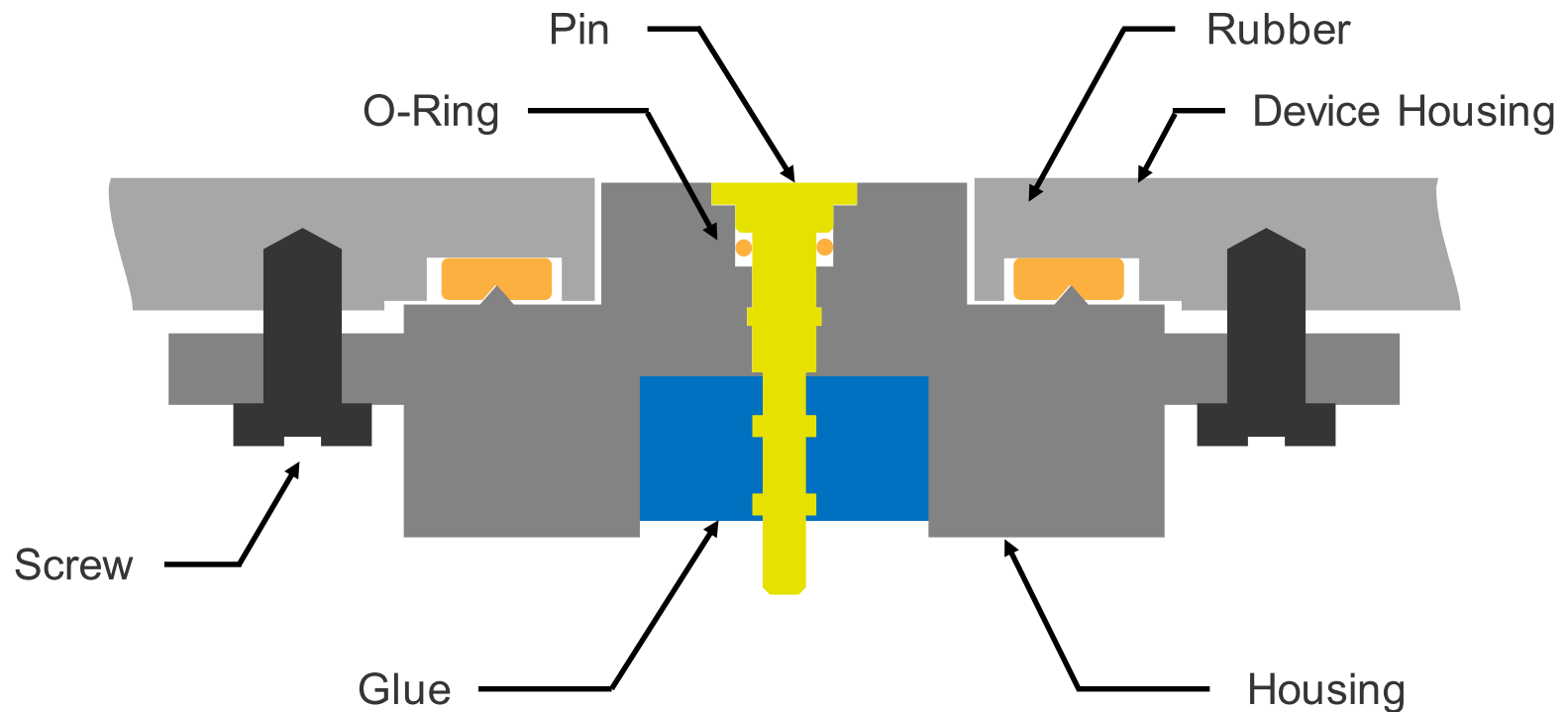
# Connector: 2 in 1 Laptop

High Frequency  
Magnetic Matting  
Desktop Docking



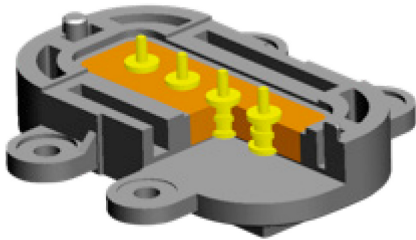
-  Mating Area
-  Tablet Side Female Connector
-  Keyboard Side Male Connector

# Connector: Waterproof



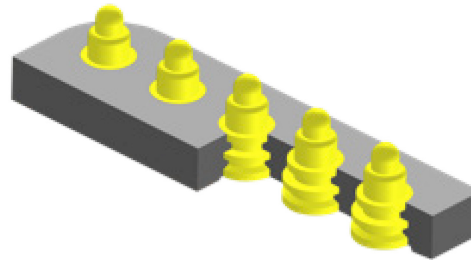
# Connector: Waterproof

## Sealing



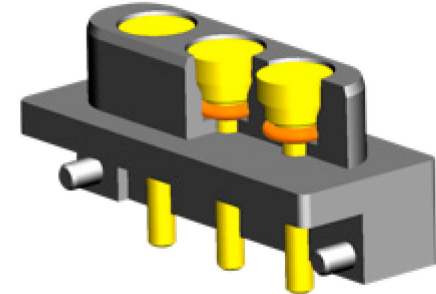
Pitch: Small  
Waterproof: IPx7 at best  
Production Complexity: Low

## Insert-Molding



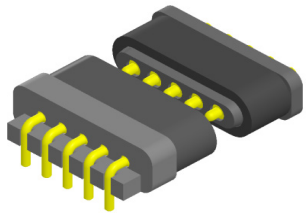
Pitch: Small  
Waterproof: IPx7 at best  
Production Complexity: Low

## O-Ring



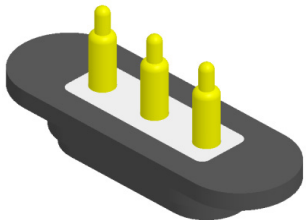
Pitch: Large  
Waterproof: IPx8 at best  
Production Complexity: High

# Connector: Customized



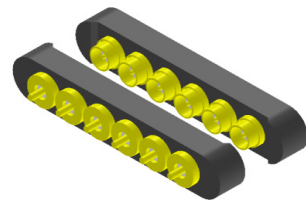
## Magnetic Modules

Easy attachable and detachable connectors used for different applications



## Rugged Modules

Able to achieve IP67 rating and to operate under extreme environments

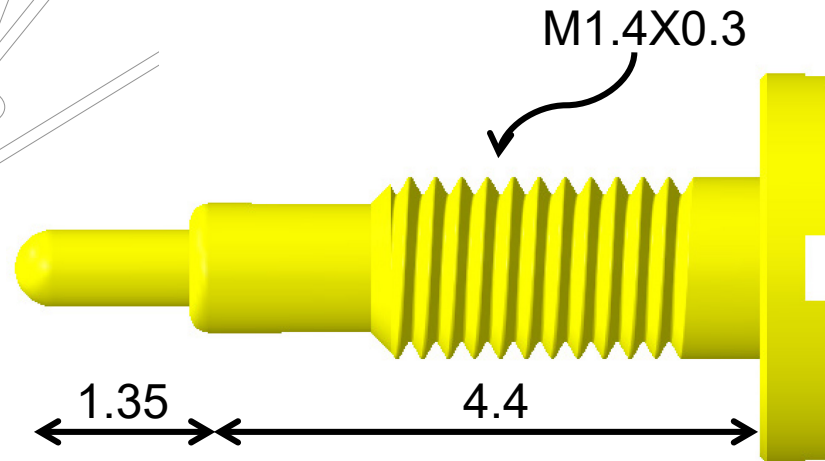
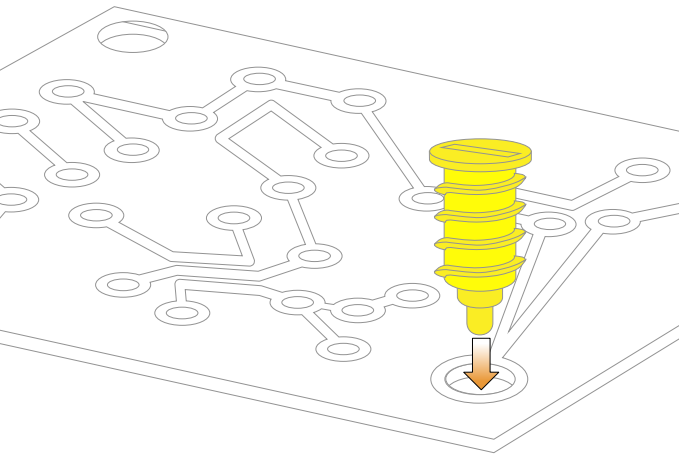


## Shielded Modules

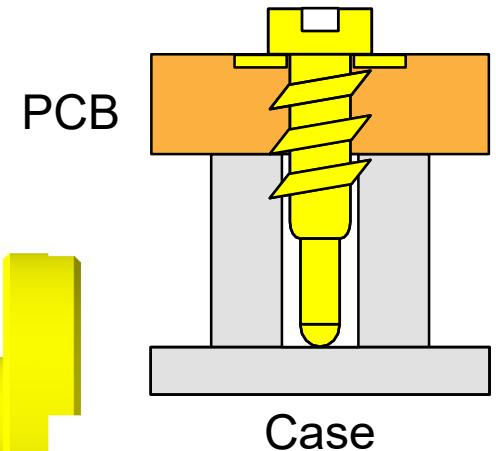
Shielded design for high speed signal transmission



# Connector: Pogo Screw Pin

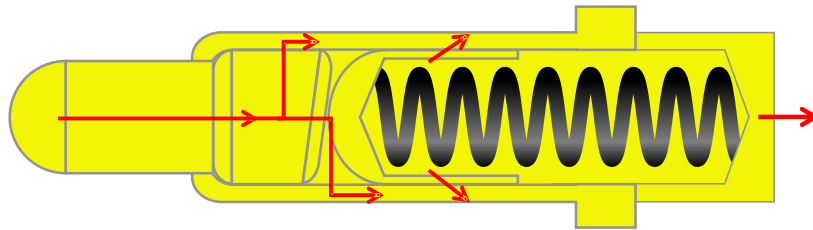


Grounding Purpose



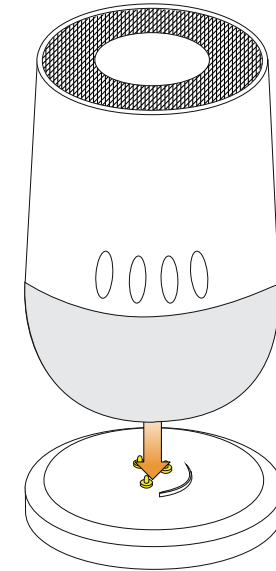
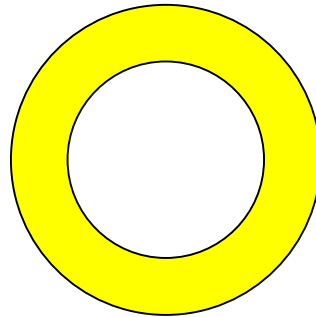
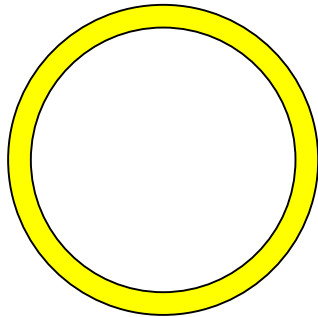
Diameter	Current	Durability
3 mm	1A	10,000 compressions
Spring force	Contact resistance	
120g $\pm$ 20g	200 M Ohm, to customize for grounding pin purpose	

# Connector: High Current Pogo



Normal Design

High Current Design

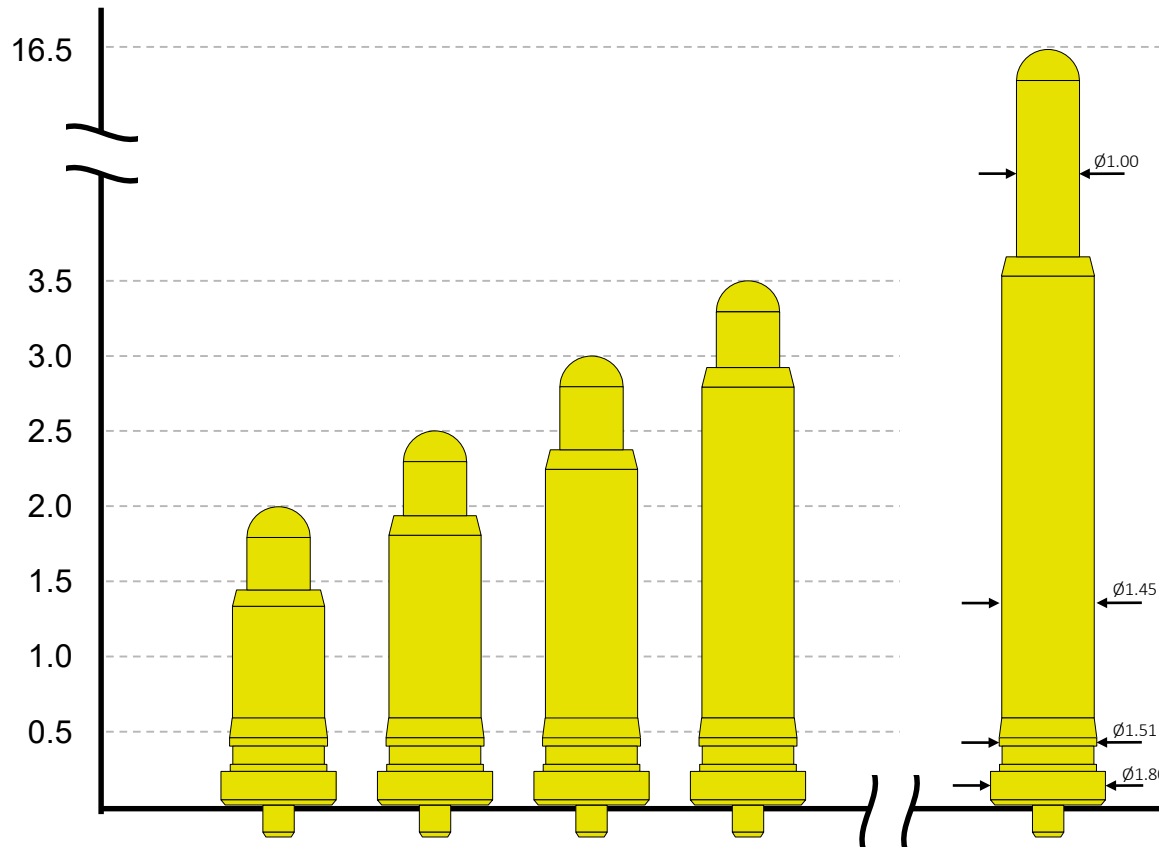


Application:  
Any kind of high current transfer request

Diameter	Current	Durability
2.4 mm	<b>13A</b>	10,000 compressions
Spring force	Contact resistance	
120g $\pm$ 20g	30 m $\Omega$	

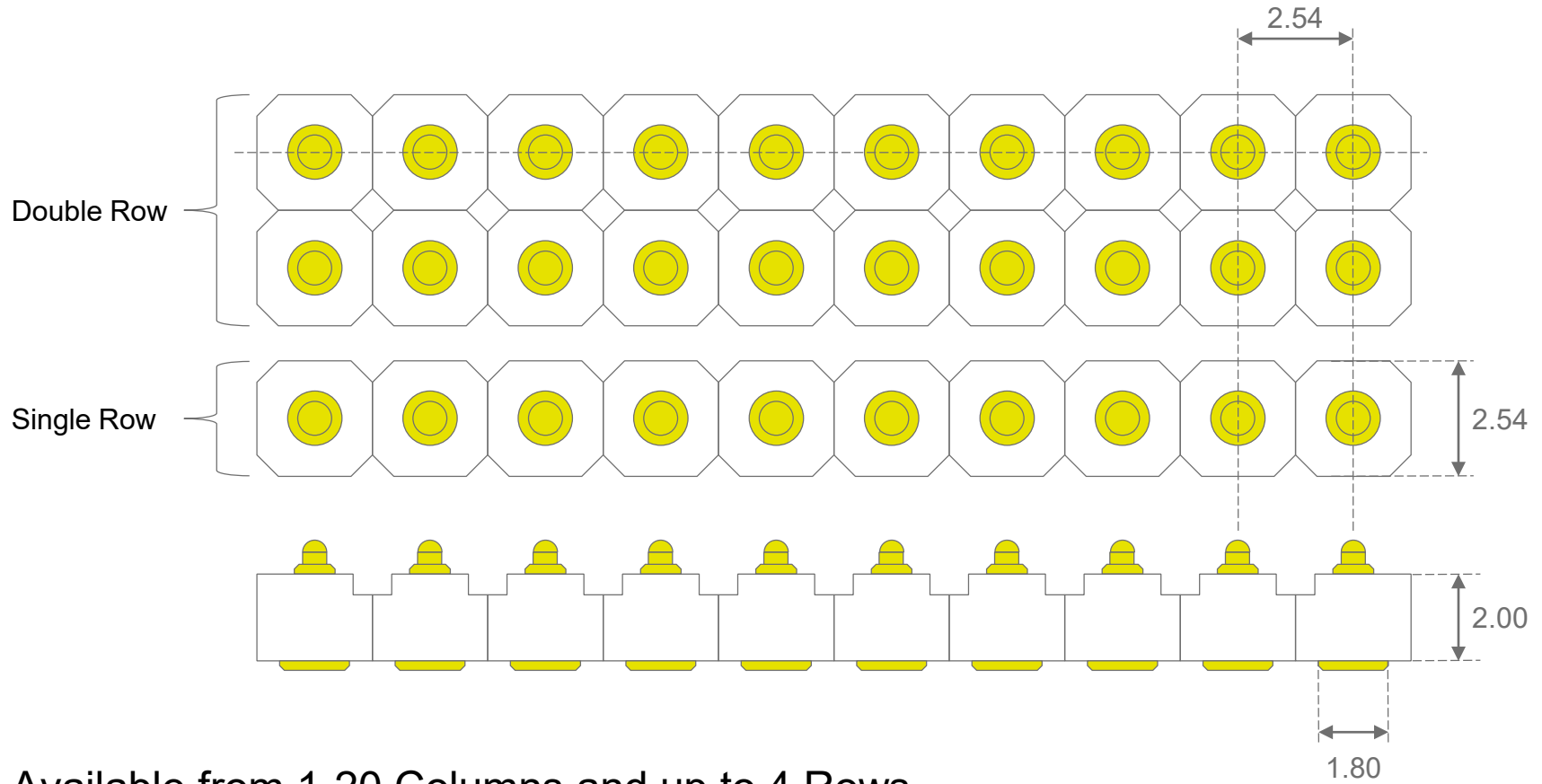
# Connector: 2.54mm Pitch Standard

## Connector Single Pitch



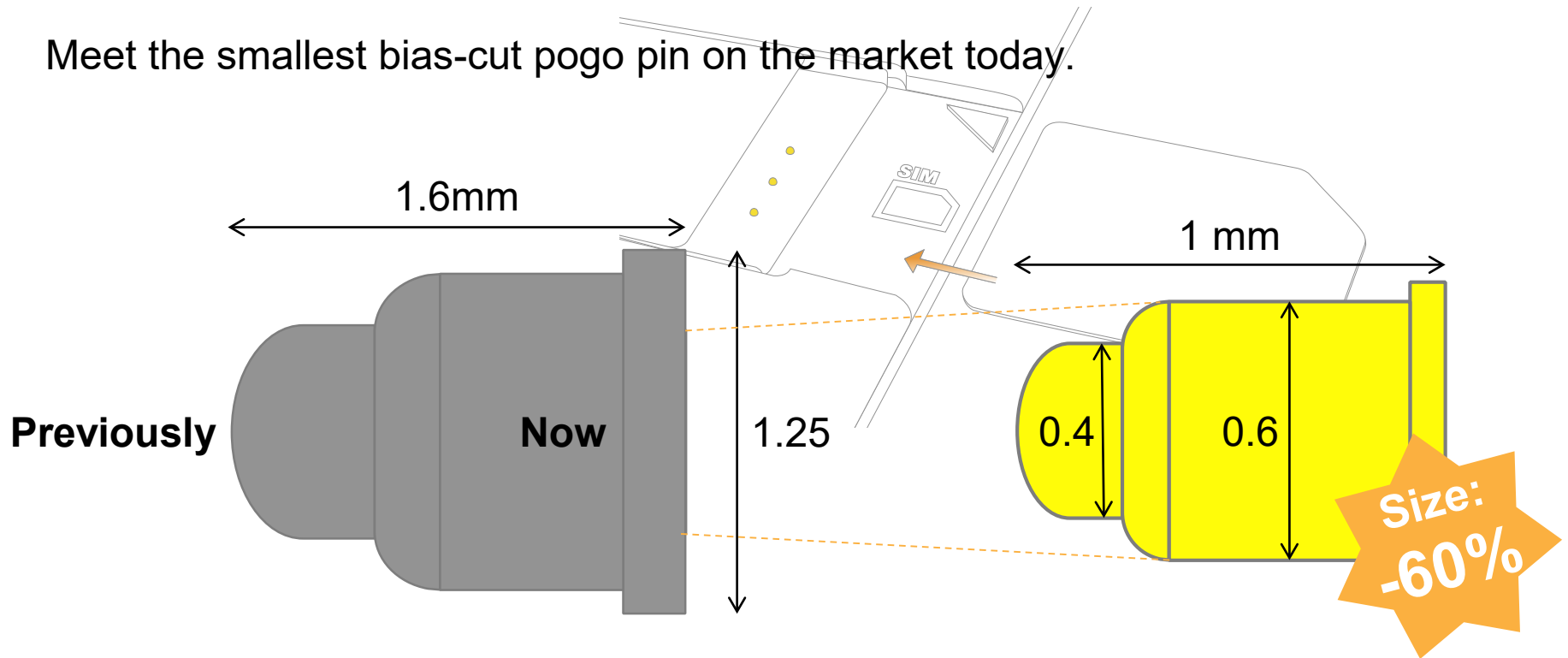
PN	Full Hight	Working Hight	Max Compression
P5200FP01	2.0	1.5	1.4
P5200FP02	2.5	2.0	1.8
P5200FP03	3.0	2.5	2.3
P5200FP04	3.5	3.0	2.8
P5200FH05	4.0	3.5	3.3
P5200FP07	4.5	4.0	3.8
P5200FP09	5.0	4.5	4.3
P5200FP11	5.5	5.0	4.8
P5200FP13	6.0	5.5	5.3
P5200FH15	6.5	6.0	5.8
P5200FP17	7.0	6.5	6.3
P5200FP19	7.5	7.0	6.8
P5200FP21	8.0	7.5	7.3
P5200FP23	8.5	8.0	7.8
P5200FH25	9.0	8.5	8.3
P5200FP27	9.5	9.0	8.8
P5200FP29	10.0	9.5	9.3
P5200FP31	10.5	10.0	9.5
P5200FP33	11.5	10.5	10.0
P5200FH35	12.5	11.0	10.5
P5200FP37	13.0	11.5	11.0
P5200FP39	13.5	12.0	11.5
P5200FP51	14.0	12.5	12.0
P5200FP53	14.5	13.0	12.5
P5200FH55	15.0	13.5	13.0
P5200FP57	15.5	14.0	13.5
P5200FP59	16.0	14.5	14.0
P5200FP61	16.5	15.0	14.5

# Connector: 2.54mm Pitch Standard Housing



# Connector: Ultra Short Pin

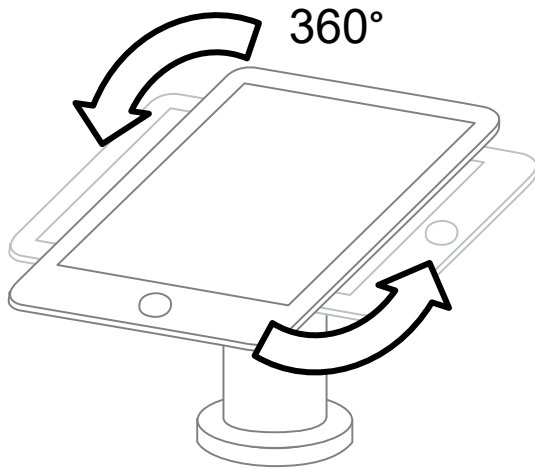
Meet the smallest bias-cut pogo pin on the market today.



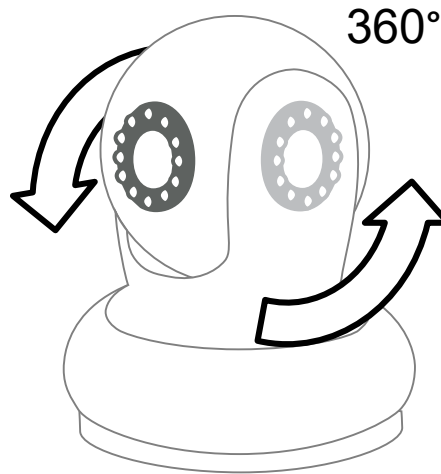
Diameter	Current	Durability
0.6 mm	1A	600 compressions
Spring force	Contact resistance	
145g $\pm$ 20g	100 mOhm, to customize for grounding pin purpose	

# Connector: Lateral Movement

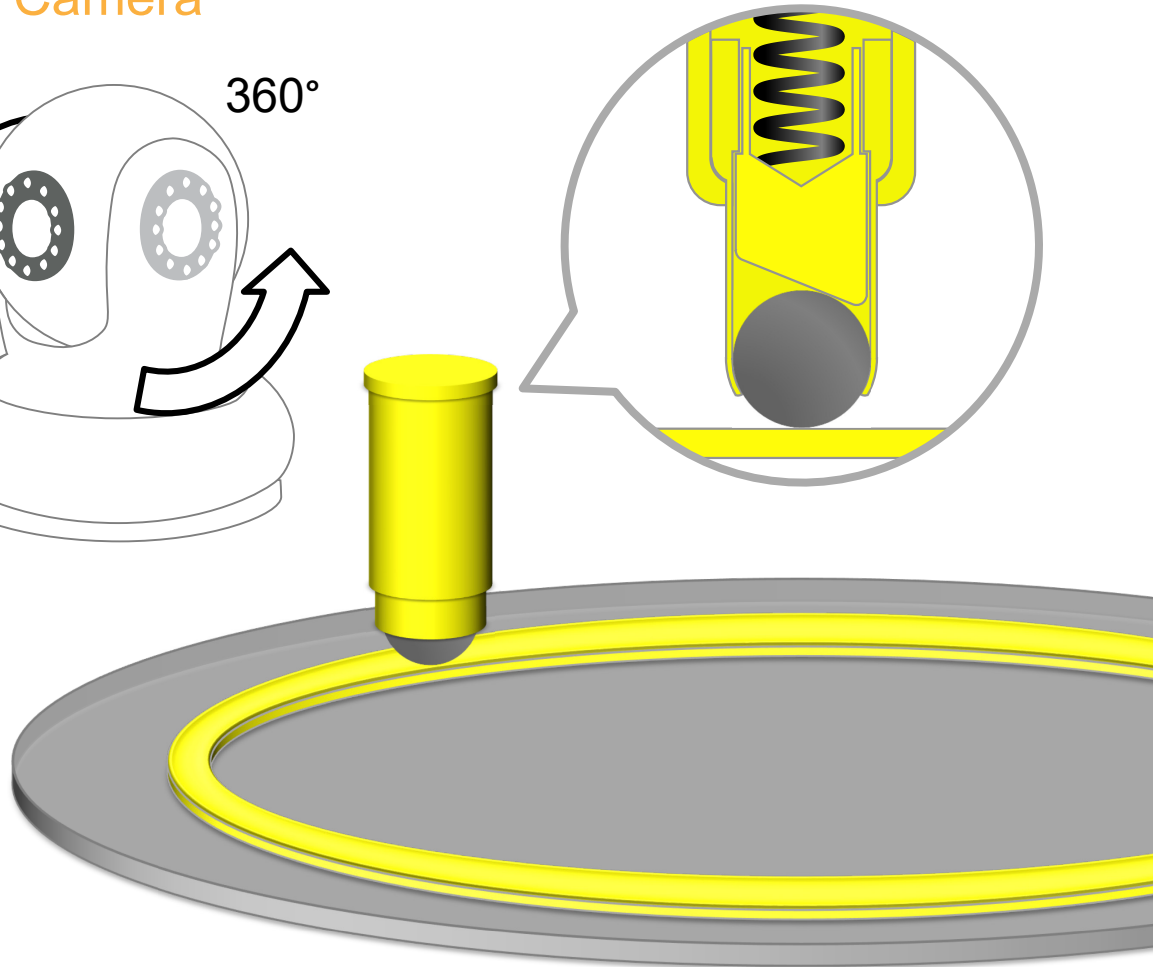
Product Display



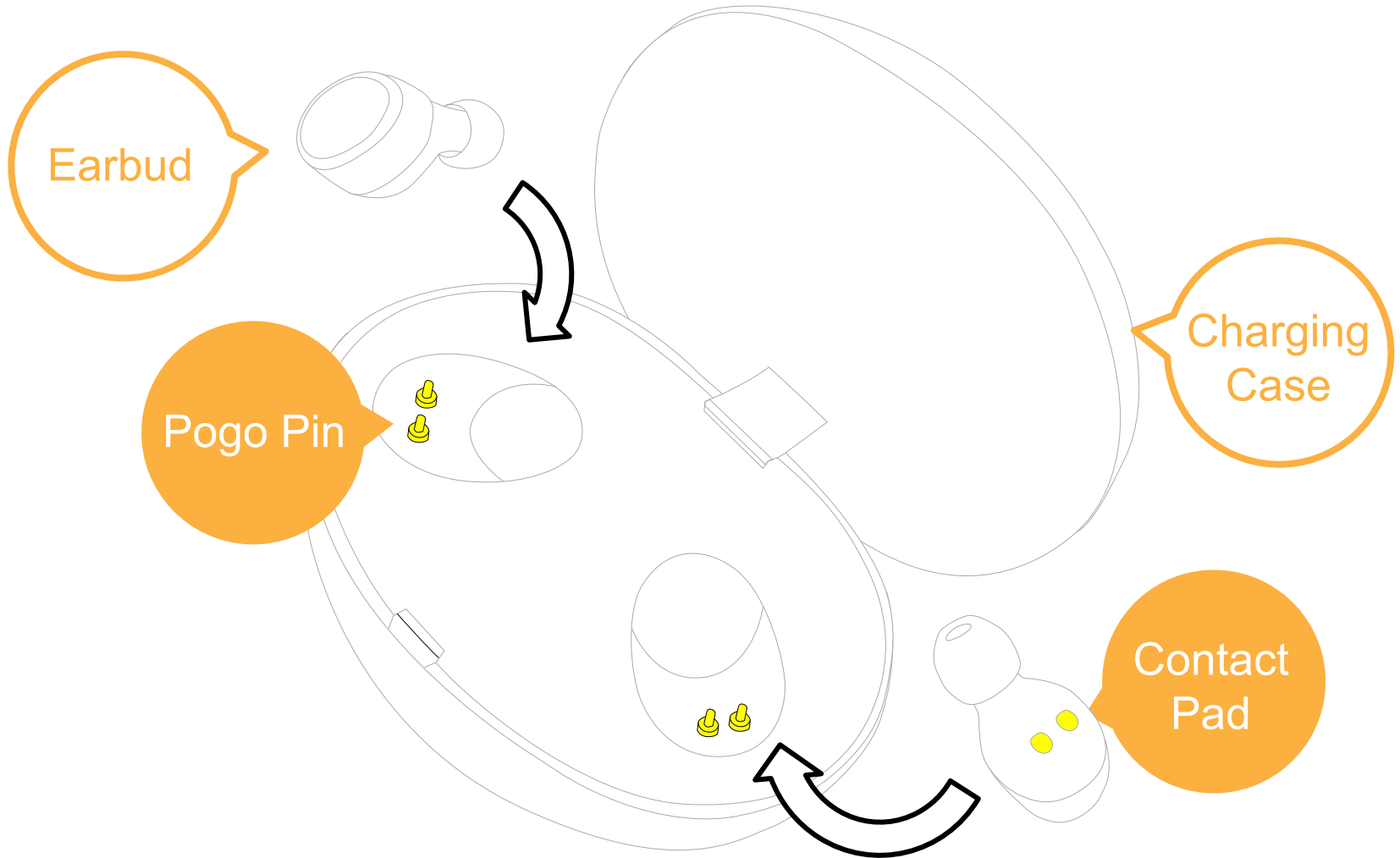
Camera



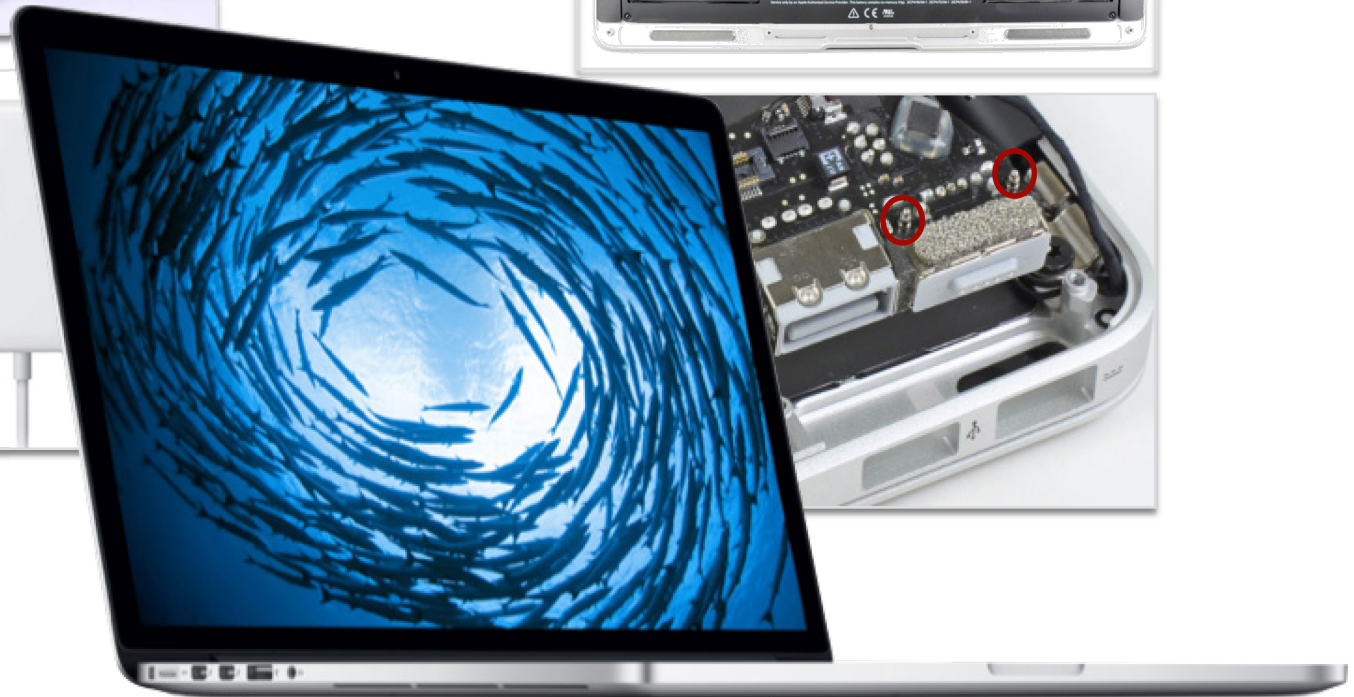
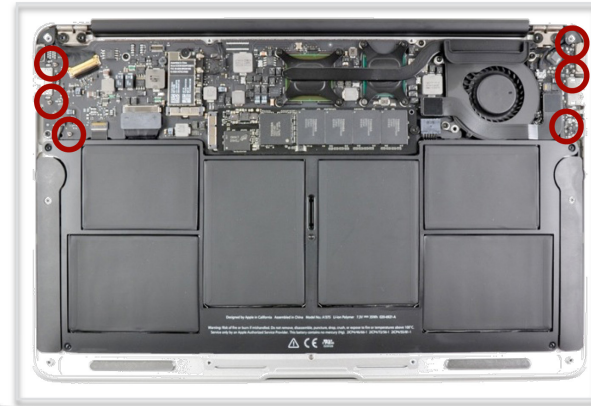
**Compression:** 10'000 times  
**Lateral Movement:** 25'000'000 mm  
**Resistance:** 100 mOhm  
**Current:** 3 A



# Connector: Wireless Earbuds



# Connector: Computer



# Product Line: New Energy



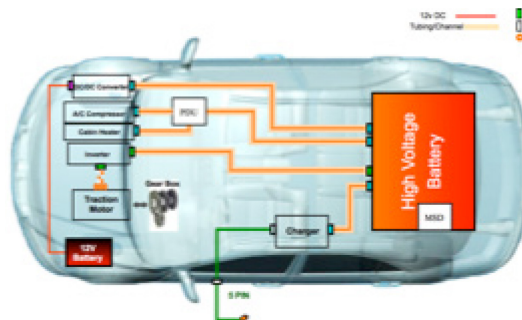
## EV Charging



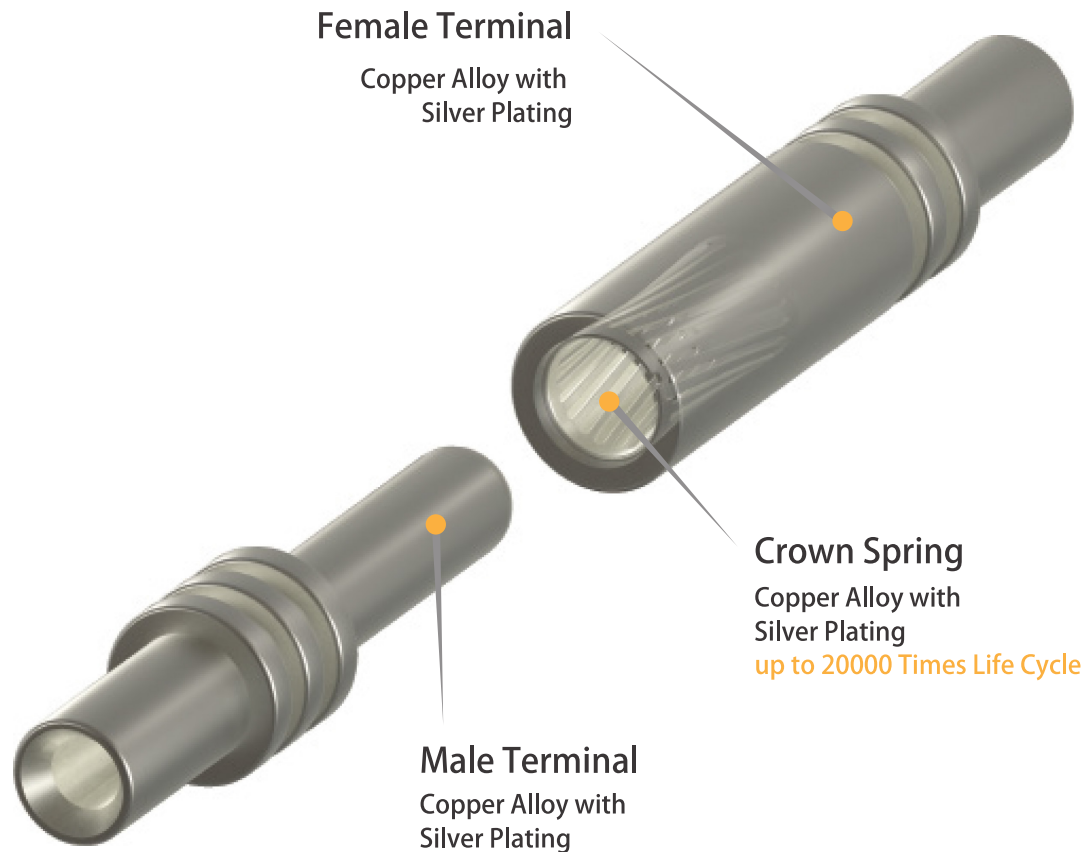
## Scooter Battery System



## EV Inner Ports



# Product Line: Performance



**Patent No:**  
**MP1703244**  
**MU1703245**

# High Current: Applications



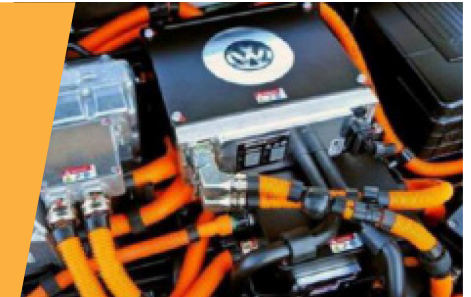
## Charging module

EV car charging solutions  
EV moped battery solutions



## Signal connector

Single plug connector  
Multiple plug connector  
Push-pull connector

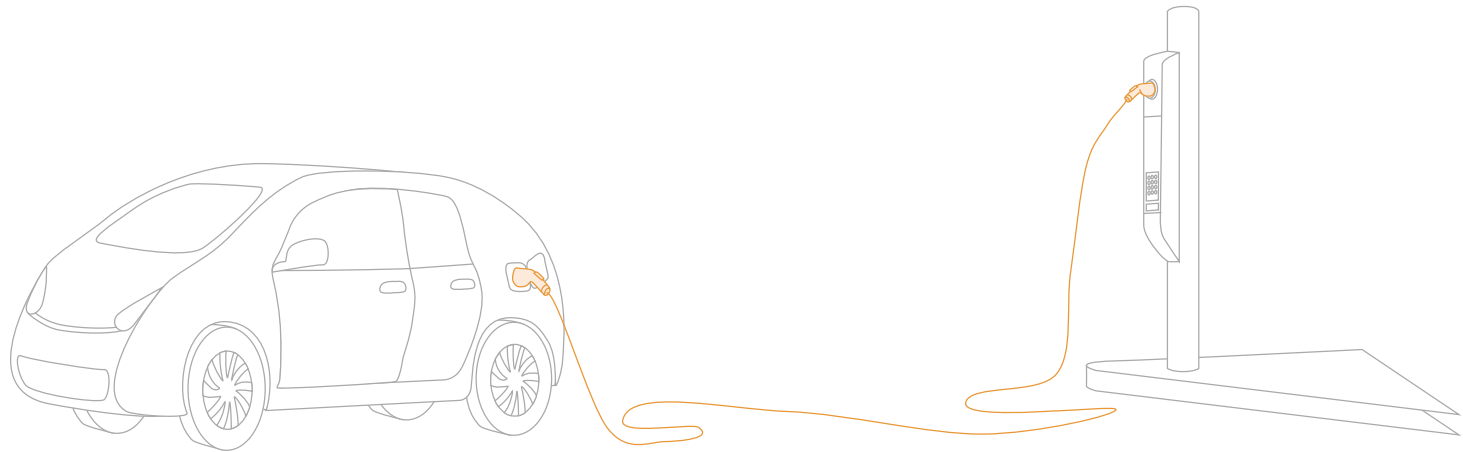


## High voltage connector

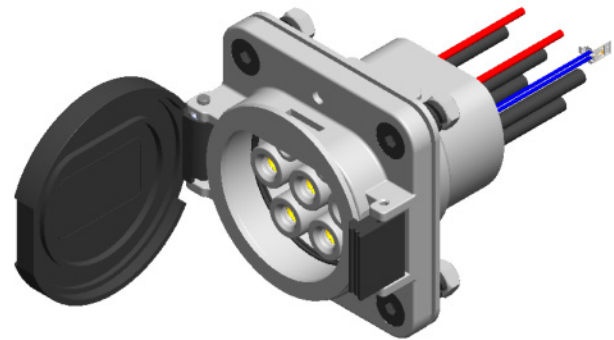
Single plug connector  
Multiple plug connector  
Push-pull connector



# High Current: EV Car Charging

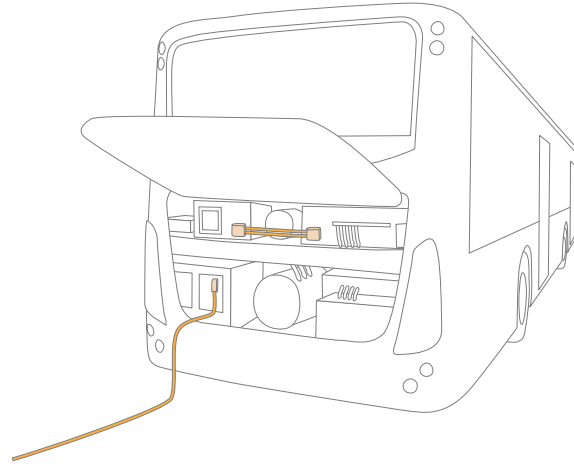
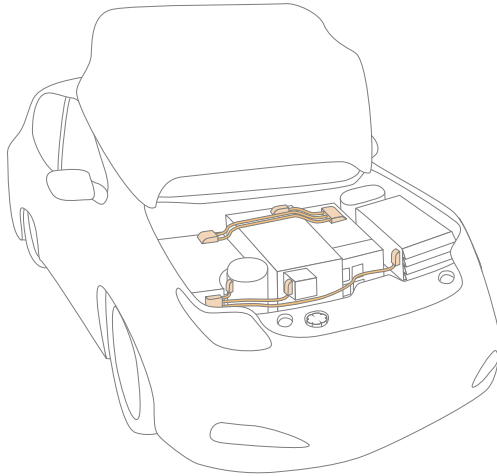


DC/AC Charging Gun

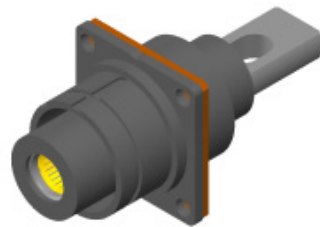


AC/DC Charging Socket

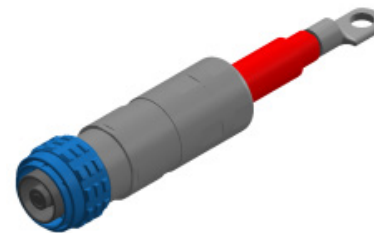
# High Current: EV Car Connections



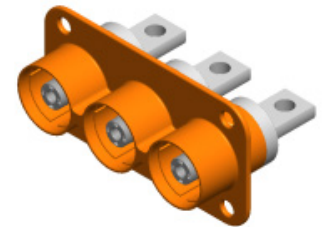
High Voltage  
Power Lock Connector



Signal Connector

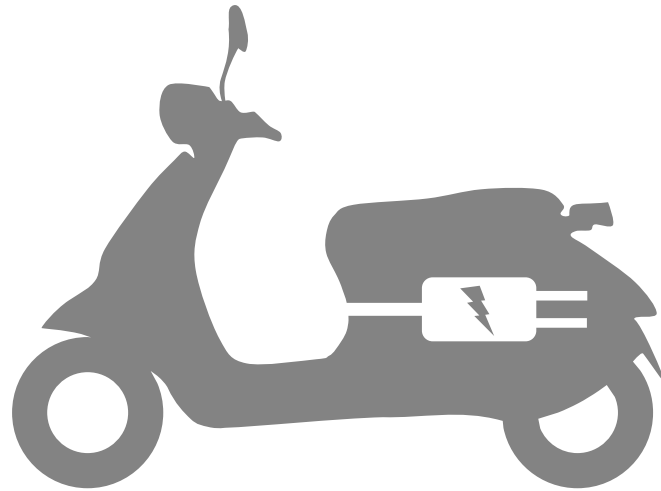


Push-Pull Connector

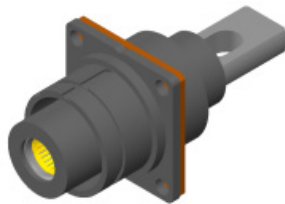


High Voltage  
Power Lock Module

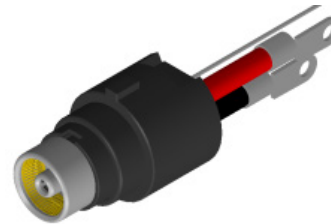
# High Current: EV Scooter Solutions



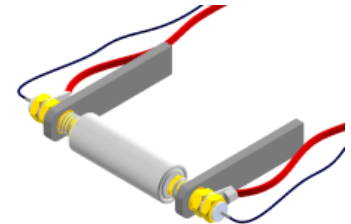
Battery Module



Signal Connector

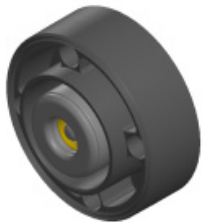
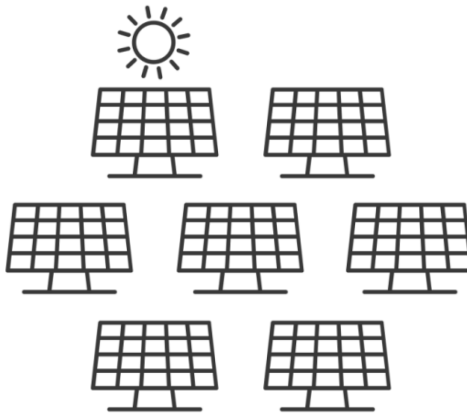


Battery Charging  
Solution



Battery Testing  
Solution

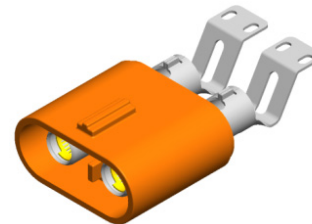
# High Current: Solar Panels and Robotics



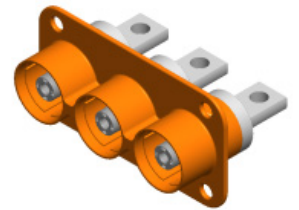
Battery Module



High Voltage  
Power Lock Connector

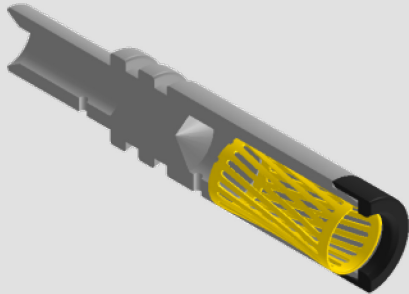


Current Diversion  
Connector

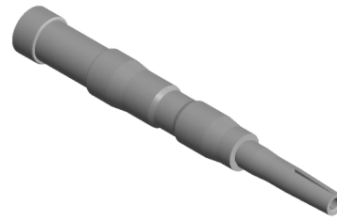


High Voltage  
Power Lock Module

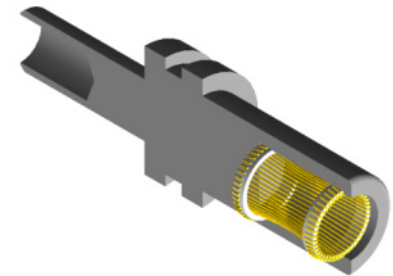
# High Current: Comparison



Crown Spring



Flat Spring







Wire Spring

Life cycles	<div><div></div><div></div><div></div><div></div><div></div></div> 20k	<div><div></div><div></div><div></div><div></div><div></div></div> 10k	<div><div></div><div></div><div></div><div></div><div></div></div> 10k
Cost	<div><div></div><div></div><div></div><div></div><div></div></div> 1	<div><div></div><div></div><div></div><div></div><div></div></div> 1	<div><div></div><div></div><div></div><div></div><div></div></div> 1.5
Current	<div><div></div><div></div><div></div><div></div><div></div></div> 400A*	<div><div></div><div></div><div></div><div></div><div></div></div> 100A	<div><div></div><div></div><div></div><div></div><div></div></div> 300A
Temp.	<div><div></div><div></div><div></div><div></div><div></div></div> 35	<div><div></div><div></div><div></div><div></div><div></div></div> 80	<div><div></div><div></div><div></div><div></div><div></div></div> 40

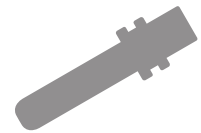
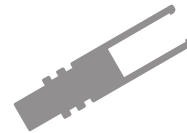
\*Up to 600Amp

CCP – Product Line: Performance

# High Current: Comparison

Structure		Manufacturing Process		Manufacture ability	Durability	LLCR	Current Capacity	Cost
		Socket	Contact					
Flat Spring		Lathe	Lathe	Good	Poor	Poor	Poor	Good
Crown Spring		Lathe	Stamp	Good	Good	Good	Good	Good
Wire Spring		Lathe	Wire Spring	Poor	Excellent			Poor
Spring Sets		Lathe	Spring	Poor	Poor	Poor	Poor	Poor

# High Current: Applications



	Crownspring	Socket	Plug
Material	BeCu	Cu Alloy or Ag	
Process	Stamping	Turning by Lathe	
Plating	Gold Plating (Ag, Au, Ni..)		
Interface	Tail with Screw or Crimping tail or others		
Head	Insulator Cap		
Remark	Tail with Screw or Crimping tail or others		

# High Current: Standard Dimensions

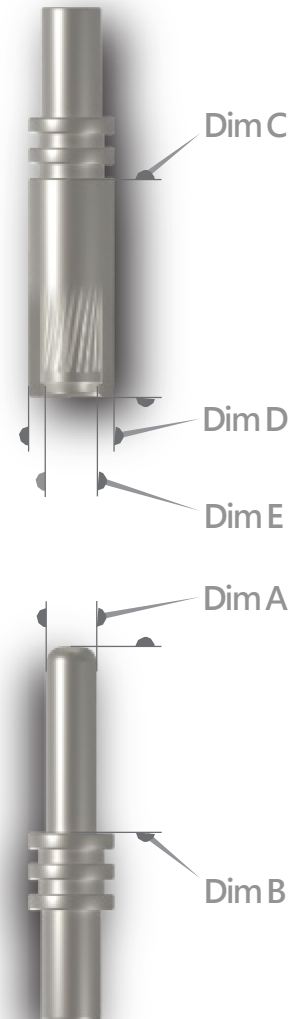


China/ Europe Standard



USA Standard

Current (Amp)	15	30	250	2	40	80
Resistance (mOhm)	0.8	0.3	0.1	1	0.5	0.3
Life Cycles	20,000	20,000	20,000	10,000	10,000	10,000
	Dimensions					
Dim A (mm) (Width Plug)	3	6	12	1.5	2.8	3.6
Dim B (mm) (Insertion Height Plug)	14.5	28.5	30.5	12	24	21
Dim C (mm) (Insertion Height Socket)	32	32	42	12.9	18.7	14.6
Dim D (mm) (Width Socket)	4.8	9.8	15.8	3.1	4.9	6.73
Dim D (mm) (Inner Width Socket)	3.1	6.1	12.1	1.65	2.95	3.75



# Product Line: Industrial



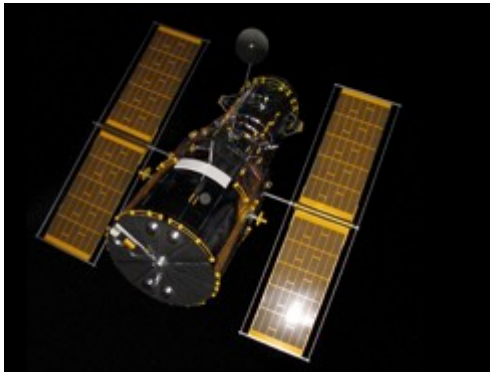
Transportation



Military



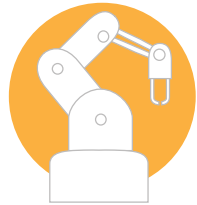
Aerospace



# Automation and Mechanical Engineering

**Inhouse Machinery Construction**

Full automation capability



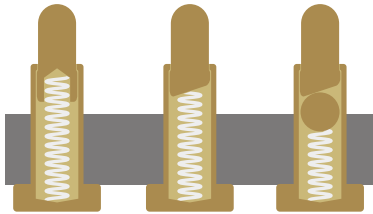
**100% Inspection**

Pure Quality

**Clean-Room Production Line**

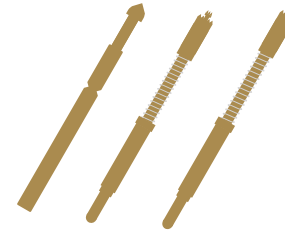
# Product Line: Capacity

Pogo Pin Connectors



60 Mio pins / month

Testing Probes



2 Mio pins / month



# Quality Management

## Quality System

**ISO 9001: 2015**  
Quality Management Systems

**ISO 14001: 2015**  
Environmental Management System

**IATF 16949: 2016**  
Automotive Quality Management System

**QC 080000**  
Hazardous Substance Process Management

# Quality Assurance



# Verification Ability

## Testing Items

### Environmental

Waterproof

Humidity Test

Salt Spray

Thermal Impact

Resist. to Solder Heat

Vibration

### Electrical

Contact Resistance

Insulation

HIPOT

Rated Current

### Mechanical

Retention Force

Life Cycle

Vibration

Mechanical Shock

### Other

Drop

Soldering Side Force

Solderability

# Testing Equipment

Rated Current  
Max Rating : 1000Amp



Waterproof  
Test Level : IPX7 Up



Thermal Impact  
Range : -60~120°C  
Resolution : 0.01°C



Vibration  
Frequency : 3500Hz max.  
Acceleration : 50G max.



# Certificate



ISO 9001

ISO 14001

ISO 14064

IATF 16949

IECQ QC080000



