

#### **Company Introduction**

#### **CCP Contact Probes Co., Ltd.**

### **History**

2020 Korea Subsidiary established.

2019 Japan Singapore Sub and India Office established.

2018 Germany Subsidiary established.

2016 Industrial Connector & Crown Spring Connector.

2014 CCP US Subsidiary established.

2012 Set up 100k class clean room production line.

2006 IC Testing

2003 Listed in Taiwan Stock Market (TW.6217).

2002 Pogo Pin Connector

2001 Dongguan CCP Contact Probes Co., Ltd established.

1998 Renamed to CCP Contact Probes Co., Ltd.

1986 ICT Testing

1986 CCP Contact Probes Enterprise Co., Ltd. Established.

### **CCP Contact Probes**



Selected Customers:





### 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

### **Product Portfolio**



### **Product Line:** Testing



IC Package Test

RSCB 104054-54 PSCB 1040515 PAMA QFN 481-646 PD.4

Burn-In Test

High Frequency Test





Memory Test

WLCSP Test

**Battery Test** 







### **Testing:** Probe Design Capability



### Testing: Kelvin Bridge Probe

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



### **Testing:** High Current Probe

#### **Regular Probe**





### **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

(PAR)

Application Feature: Hi-Speed/Hi-Frequency DUT: Bluetooth/GPS/LTE/Wireless IC Packaging: BGA/CSP/QFN/QFP

#### **Pin Definition**

Signal

Ground Ground

 G
 G
 G
 G

 G
 S
 S
 G

 G
 G
 G
 G
 G

#### 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 Clip Pogo Socket

Min Pitch: 0.2 Mechanical Life: 200k

Device Under Test Fine Pitch Connector 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.



### **Testing:** Mirror Process



#### Mirror Process – The Best Probe Protector

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

CCP's Mirror Process

### **Product Line:** Connector



#### Pogo Pin Connector



#### 2 in 1 Tablet Connector



#### Magnetic Connector



#### Waterproof Connector



#### **Connector:** Basic Structure



### **Connector:** Material Option



### **Connector:** 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

### **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.

#### **Bias Tail**

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

#### Ball

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



Pin Length: ≈ 2.5 mm Current: **1** A







Pin Length:  $\approx 3.5 \text{ mm}$ Current: 2 A

Pin Length:  $\approx 4.5 \text{ mm}$ Current: 3~5 A

### **Connector:** Installation



Cap is used for SMT procedure, and it will be removed after being mounted. Plug-in tail is used for higher soldering force on PCB when it's needed.

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

Solder

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



### **Connector:** Installation

#### Board to Board

#### Case to Board

#### Insert-molding

**Double Ended** 







This structure is used to absorb the tolerance inbetween PCBs. The bottom of pin can also be a cosmetic/contact area if necessary.

Pins can be insertmolded for waterproofing requirement.



It's possible to have two movable tips.





#### **Connector:** Magnetic



### Connector: 2 in 1 Laptop

High Frequency Magnetic Matting Desktop Docking





### **Connector:** Waterproof

Sealing



#### **Insert-Molding**

#### **O-Ring**



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

Pitch: Small Waterproof: IPx7 at best Production Complexity: Low Pitch: Large Waterproof: IPx8 at best Production Complexity: High

#### **Connector:** Waterproof Structure



### **Connector:** Customized Solutions



#### **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



Diameter	Current	Durability
3 mm	1A	10,000 compressions
Spring force	Conta	nct resistance
120g ± 20g	200 m $\Omega$ , to customize	e for grounding pin purpose

### **Connector:** High Current Pogo



### **Connector:** 2.54mm Pitch Standard Connector Single Pitch



Product Number	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





 $45g \pm 20g$  100 mΩ, to customize for grounding pin purpose

### **Connector:** Lateral Movement





### Product Line: High Current



**EV** Charging



**EV Inner Ports** 



#### Scooter Battery System



### High Current: Crown Spring

# Female Terminal Copper Alloy with Silver Plating

#### **Crown Spring**

Copper Alloy with Silver Plating Up to 20000 Times Life Cycle

#### **Male Terminal**

Copper Alloy with Silver Plating

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









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









#### Signal Connector





### High Current: Solar Panels & Robotics





Battery Module

High Voltage Power Lock Connector

Current Diversion Connector

High Voltage Power Lock Module



\*Up to 600Amp

### High Current: Comparison

	Structure	Manufa Proc	cturing cess	Manufacture	Durability	LLCR	Current	Cost
		Socket	Contact	ability			Capacity	
Flat Spring		Lathe	Lathe	Good	Poor	Poor	Poor	Good
Crown Spring		Lathe	Stamp	Good	Good	Good	Good	Good
Wire Spring		Lathe	Wire Spring	Poor	E	Excellen	t	Poor
Spring Sets		Lathe	Spring	Poor	Poor	Poor	Poor	Poor

### High Current: Structure & Material

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

### High Current: Standard Dimensions

Curre

Life

Dim

Dim

Dim (Insertion

Dim

Dim (Inner W

(Wid

					STE INTERNATIONAL.	
	China/	Europe St	andard	U	SA Standa	rd
nt (Amp)	15	30	250	2	40	80
stance Ohm)	0.8	0.3	0.1	1	0.5	0.3
Cycles	20,000	20,000	20,000	10,000	10,000	10,000
			Dimer	nsions		
A (mm) th Plug)	3	6	12	1.5	2.8	3.6
B (mm) Hight Plug)	14.5	28.5	30.5	12	24	21
C (mm) Hight Socket)	32	32	42	12.9	18.7	14.6
D (mm) n Socket)	4.8	9.8	15.8	3.1	4.9	6.73
D (mm)	3.1	6.1	12.1	1.65	2.95	3.75

### **Product Line:** High Speed



#### **QSFP 100 Gbps Cables**



#### **OCuLink Cables**



#### Server Cables





### High Speed: QSFP 100Gbps



### High Speed: Slimline SAS 24Gbps



### High Speed: Oculink 16Gbps



### Automation and Mechanical Engineering

#### Inhouse Machinery Construction

Full automation capability



**100% Inspection** Pure Quality

**Clean-Room Production Line** 

### **Manufacturing Capacity**

Pogo Pin Connectors



#### 60 Mio pins / month

**Testing Probes** 

1//

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



# **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**



### Certificate

ISO 9001 ISO 14001 ISO 14064 IATF 16949 IECQ QC080000















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