Semiconductor Probe

SEMICONDUCTOR PROBE

ECT has a long history on supplying double ended fine pitch probes.

Thanks to our large market exposure on these products at most major semiconductor producers, we are able to gain a lot of expertise from our worldwide customer base. This expertise is reflected in each new probe series to stay a head of the very technical demanding and challenging Semiconductor market.

Please feel free to contact us for further requirements or more information, as we offer some special requirements like ultra-high temperature applications or none magnetic probes for the MEMS market.

The ZIP® Advantage

ECT ZIP® series probes feature a number of innovative designs that provide for superior contact capable of fitting your application needs. Utilizing ECT's patented flat technology, ZIP semiconductor spring probes present a new level of accuracy, scalability, and performance. While conventional round technology restricts longer travel and can have its reliability undermined by its small contact area, ZIP possesses a large internal contact area, resulting in low C-Res, superior bandwidth, and excellent high current behavior. The performance, economy, and application versatility provided by ZIP probes are further enhanced by the use of an external spring. Conventional spring probes rely on contact between the barrel and plunger, which allows for conductivity interference through contamination build up in dirty test environments. By having an external spring and no barrel, ZIP greatly reduces the threat of contamination, thereby reducing cost-of-test and increasing efficiency. ECT has produced flat compliant contacts since 1995. The ZIP series is the culmination of years of experience and development, and reflects the industry's finest semiconductor contacts. With its broad scope of application solutions and special options, the ZIP family of products can satisfy all of your semiconductor test needs. If your spring probes are leaving your tough, high volume challenges unmet, then you don't know ZIP.

Bantam® Series

The Bantam® probe is a high performance spring loaded compliant contact for applications requiring robust, short contact to support fine pitch and high bandwidth production needs. Unlike conventional spring probes, the Bantam has only one internal sliding / wiping contact surface, which provides consistent low resistance levels while maintaining a high level of Z-Axis compliance.

CSP and SPLJ Series

These probes are traditional but state of the art double ended probes ranging from 0.4mm to 1.27mm pitch. On the CSP Series probes we are able to offer a selection of different plating options to optimize contact challenges and maximize probe life. Various length options also provide drop-in replacement capability for most competitor probes.

Mini-Mite™ Series

The SCP or also called Mini-Mite™ probe features a unique single ended design, providing very low, consistent DC resistance. The uniform design allows all three product pitches to be used on the same test height. The single sliding contact cuts the failure mode in half and insures very repeatable results.











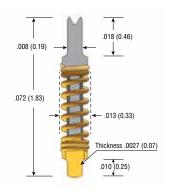
Z0

0.40 mm, 0.50 mm

Ultra HIGH Bandwidth

The ZO Ultra High Bandwidth Series takes advantage of the ZIP® scalable architecture to arrive at an ultra-compact design with 0.50 nH and 0.60 nH inductance tailor made for high frequency testing.

Z0-040



Mechanical

PILCII:	.016 (0.40)
Recommended Travel:	.018 (0.46)
Full Travel:	.020 (0.50)
Test Height:	.059 (1.51)
Mechanical Life*:	200,000 cycles
Operating Temperature:	-55°C to +155°C

Spring Force in oz. (grams)

	Order Code	Test Height
Standard		0.66 (19)
High	- 1	0.96 (27)

Electrical (Static Conditions)

Current Rating DC: 2.5 amps

Average DC Probe Resistance**: <90 mOhms

Self Inductance (Ls): 0.50 nH

Capacitance (Cc): 0.030 pF

Bandwidth @ -1dB: >30.0 GHz

Materials and Finishes

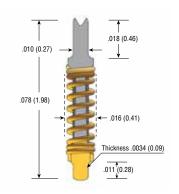
Plunger DUT: HyperCore™

Plunger HIB: BeCu, Gold plated over hard Nickel Spring: Stainless Steel, Gold plated

Tip Style - DUT B L D R Y

Tip Style	- HIB	
J		

Z0-050



Mechanical

Pitch:	.020 (0.50)
Recommended Travel:	.019 (0.48)
Full Travel:	.022 (0.56)
Test Height:	.059 (1.51)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55°C to +155°C

Spring Force in oz. (grams)

	Order Code	Test Height
Standard		0.65 (18)
High	- 1	1.11 (31)

Electrical (Static Conditions)

Current Rating DC:

Average DC Probe Resistance**:

Self Inductance (Ls):

Capacitance (Cc):

Bandwidth @ -1dB:

2.88 amps

<90 mOhms

0.60 nH

0.03 pF

>40.0 GHz

Materials and Finishes

Plunger DUT: HyperCore™

Plunger HIB: BeCu with proprietary plating Spring: Stainless Steel, Gold plated



Tip Style	- HIB	
J		







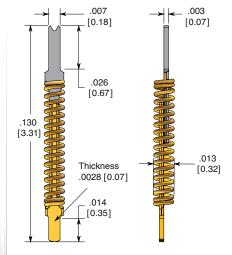


* Life specifications are based on lab results but are dependent on cleaning frequency and the specific customer application, including DUT materials, handler kit, maintenance, etc. ** Contact resistance will increase over time due to solder build-up and wear

Z-040

0.40 mm

Z-040



Mechanical

 Pitch:
 .016 (0.40)

 Recommended Travel:
 .025 (0.64)

 Full Travel:
 .028 (0.71)

 Test Height:
 .105 (2.67)

 Mechanical Life*:

HyperCore DUT plunger: 500,000 cycles
BeCu DUT plunger: 50,000 cycles
Operating Temperature: -55°C to +155°C
Spring Force in oz. (grams): 1.20 (34)

Electrical (Static Conditions)

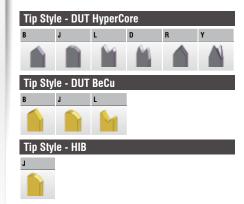
Current Rating DC: 2.0 amps
Average DC Probe Resistance**: <85 mOhms
Self Inductance (Ls): 1.07 nH
Capacitance (Cc): 0.21 pF
Bandwidth @ -1dB: 30.0 GHz

Materials and Finishes

Plunger DUT: HyperCoreTM, BeCu Gold plated
Plunger HIB: BeCu with proprietary plating
Spring: Stainless Steel, Gold plated

HIGH Bandwidth

The ZIP® Z High Bandwidth Series yields the highest and most stable bandwidth for its package size. The high performance provided by these contacts makes the Z series a perfect choice for the most demanding test applications. High Bandwidth probes are available in .4mm and .5mm pitches. The Z series is offered in two DUT-side plunger material choices: HyperCore for high volume production applications and BeCu for burn-in or low volume applications.







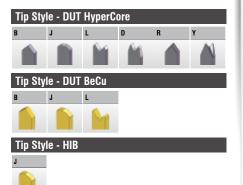


Z-050

0.50 mm

HIGH Bandwidth

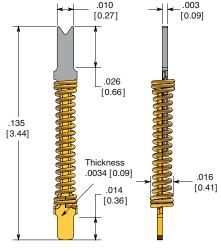
The ZIP® Z High Bandwidth Series yields the highest and most stable bandwidth for its package size. The high performance provided by these contacts makes the Z series a perfect choice for the most demanding test applications. High Bandwidth probes are available in .4mm and .5mm pitches. The Z series is offered in two DUT-side plunger material choices: HyperCore for high volume production applications and BeCu for burn-in or low volume applications.







Z-050



Mechanical

Pitch:	.020 (0.50)
Recommended Travel:	.025 (0.64)
Full Travel:	.030 (0.76)
Test Height:	.110 (2.79)
Mechanical Life*:	

 $\begin{array}{lll} \mbox{HyperCore DUT plunger:} & 500,000 \mbox{ cycles} \\ \mbox{BeCu DUT plunger:} & 50,000 \mbox{ cycles} \\ \mbox{Operating Temperature:} & -55^{\circ}\mbox{C to} +155^{\circ}\mbox{C} \\ \mbox{Spring Force in oz. (grams):} & 1.40 \mbox{ (40)} \end{array}$

Electrical (Static Conditions)

Current Rating DC: 2.8 amps
Average DC Probe Resistance**: <65 mOhms
Self Inductance (Ls): 1.01 nH
Capacitance (Cc): 0.20 pF
Bandwidth @ -1dB: 25.0 GHz

Materials and Finishes

Plunger DUT: HyperCore™, BeCu Gold plated
Plunger HIB: BeCu with proprietary plating
Spring: Stainless Steel, Gold plated

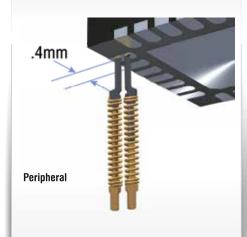


Z - Kelvin

0.40 mm

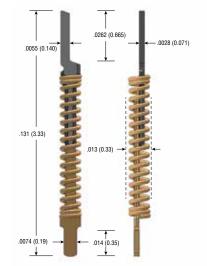
Z-KELVIN

ECT's ZIP® Kelvin .4mm is ideal for voltage sensitive tests on array or peripheral devices requiring milliohm resistance measurements as well as high-power test applications.





Z-040KHJ



Mechanical

Pitch:	.016 (0.40)
Recommended Travel:	.025 (0.64)
Full Travel:	.028 (0.71)
Test Height:	.105 (2.67)
Mechanical Life*:	500,000 cycles
Operating Temperature:	$-55^{\circ}\text{C} \text{ to } +155^{\circ}\text{C}$
Spring Force in oz. (grams):	1.20 (34)

Electrical (Static Conditions)

Current Rating DC: 1.2 amps
Average DC Probe Resistance**: <70 mOhms
Self Inductance (Ls): 1.0 nH
Capacitance (Cc): 0.40 pF
Bandwidth @ -1dB: 7.0 GHz

Materials and Finishes

Plunger DUT: HyperCore™

Plunger HIB: BeCu with proprietary plating Spring: Stainless Steel, Gold plated

Tip Style	- DUT	
K		
Tip Style	- HIB	
J		

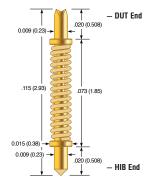




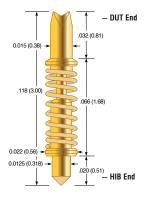
BTM

0.50 mm, 0.75 mm, 1.00 mm

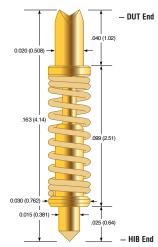
BTM-050



BTM-075



BTM-100



Mechanical

Pitch:	.019 (0.50)
Recommended Travel:	.015 (0.38)
Full Travel:	.020 (0.51)
Test Height:	.098 (2.49)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55° C to $+155^{\circ}$ C
Spring Force in oz. (grams):	1.10 (31)

Electrical (Static Conditions)

Current Rating:	2.5 amps
Average DC Probe Resistance**:	<50 m0hms
Self Inductance (Ls):	0.95 nH
Capacitance (Cc):	0.28 pF
Bandwidth @ -1dB:	23.00 GHz

Materials and Finishes

Barrel:

Plunger: Heat-treated BeCu, Gold plated over

hard Nickel or

Primeguard 1 for NiPd solder or Primeguard 2 for Lead free solder Work-hardened BeCu, Gold plated

over hard Nickel

Spring: Steel alloy, Gold plated over hard Nickel

Mechanical

PILCII:	.030 (0.73)
Recommended Travel:	.015 (0.38)
Full Travel:	.020 (0.51)
Test Height:	.103 (2.62)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55°C to +155°C
Spring Force in oz. (gran	ms): 1.00 (28)

Electrical (Static Conditions)

Current Rating:	2.9 amps
Average DC Probe Resistance**:	<50 m0hms
Self Inductance (Ls):	0.77 nH
Capacitance (Cc):	0.25 pF
Bandwidth @ -1dB:	15.84 GHz

Materials and Finishes

Plunger: Heat-treated BeCu, Gold plated over

hard Nickel or

Primeguard 1 for NiPd solder or Primeguard 2 for Lead free solder

Barrel: Work-hardened Brass, Gold plated

over hard Nickel

Spring: Steel alloy, Gold plated over hard Nickel

Mechanical

020 (0.75)

Pitch:	.040 (1.00)
Recommended Travel:	.028 (0.71)
Full Travel:	.030 (0.76)
Test Height:	.136 (3.45)
Mechanical Life*:	500,000 cycles
Operating Temperature:	$-55^{\circ}\text{C to } +155^{\circ}\text{C}$
Spring Force in oz. (grams):	1.40 (39)

Electrical (Static Conditions)

Current Rating:	3.5 amps
Average DC Probe Resistance**:	<50 m0hms
Self Inductance (Ls):	1.30 nH
Capacitance (Cc):	0.34 pF
Bandwidth @ -1dB:	10.00 GHz

Materials and Finishes

Barrel:

Plunger: Heat-treated BeCu, Gold plated over

hard Nickel or

Primeguard 1 for NiPd solder or Primeguard 2 for Lead free solder Work-hardened Brass, Gold plated

over hard Nickel

Spring: Steel alloy, Gold plated over hard Nickel

Tip Style - DUT B J L U

Tip Style - HIB

В	J	

Tip Style - DUT B J L Tip Style - HIB B J

Ti	p Style	- DUT		
В		J	L	
(
Ti	Ok.la	LUD		
- 11	p Style	- HIR		
В	p Style	- HIR	L	



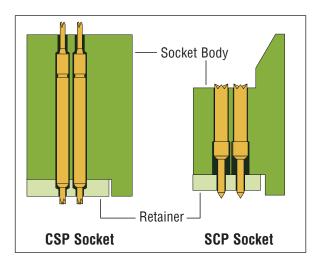


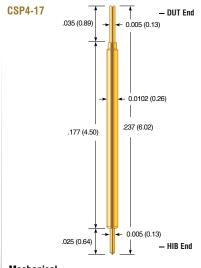
CSP4

0.40 mm

Socket Design Considerations

- CSP series is captured between the socket body and retainer plate, with the barrel fixed in place.
- SCP Socket series is captured between the socket body and retainer plate, with the barrel sliding freely counter bore.
- Counter bore should not be too deep, and enable a minimum amount of preload against interface board.
- Body height and device cavity should be designed to prevent probe from being compressed shorter than test height.





Mechanical

 Pitch:
 .016 (0.40)

 Recommended Travel:
 .020 (0.51)

 Full Travel:
 .025 (0.64)

 Test Height:
 .217 (5.51)

 Mechanical Life*:
 250.000 cycles

 Operating Temperature:
 -55°C to +105°C

 Spring Force in oz. (grams):
 0.85 (24)

Electrical (Static Conditions)

Current Rating: 2.0 amps
Average DC Probe Resistance**: <100 mOhms
Self Inductance (Ls): 1.71 nH
Capacitance (Cc): 0.58 pF
Bandwidth @ -1dB: 6.8 GHz

Materials and Finishes

Spring:

Plunger DUT: Heat-treated Steel or BeCu,
Gold plated over hard Nickel

Plunger HIB: Heat-treated Steel or BeCu,
Gold plated over hard Nickel

Barrel: Work-hardened Phosphorous
Bronze, Gold plated over hard Nickel

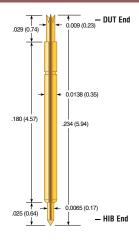
Music Wire, Gold plated

Tip Style - DUT / HIB			
В	L		

CSP5

0.50 mm

CSP5-18



Mechanical

Pitch:	.019 (0.50)
Recommended Travel:	.020 (0.51)
Full Travel:	.025 (0.64)
Test Height:	.214 (5.44)
Mechanical Life*:	500,000 cycles
Operating Temperature:	$-55^{\circ}\text{C} \text{ to } +155^{\circ}\text{C}$
Spring Force in oz. (grams):	0.7 (19.8)

Electrical (Static Conditions)

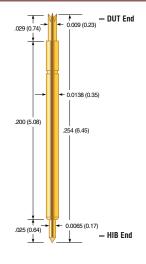
Current Rating:	2 amps
Average DC Probe Resistance**:	<150 m0hms
Self Inductance (Ls):	1.5 nH
Capacitance (Cc):	0.63 pF
Bandwidth @ -1dB:	8.13 GHz

Materials and Finishes

Plunger DUT:	Heat-treated BeCu or Steel,
	Gold plated over hard Nickel or
	Primeguard 1 for NiPd solder or
	Primeguard 2 for Lead free solder
Plunger HIB:	Heat-treated BeCu or Steel,
	Hard Gold over Nickel
Barrel:	Work-hardended Phosphor Bronze,

Gold plated over hard Nickel Spring: Steel alloy, Gold plated

CSP5-20



Mechanical

Pitch:	.019 (0.50)
Recommended Travel:	.020 (0.51)
Full Travel:	.025 (0.64)
Test Height:	.234 (5.94)
Mechanical Life*:	500,000 cycles
Operating Temperature:	$-55^{\circ}\text{C} \text{ to } +155^{\circ}\text{C}$
Spring Force in oz. (grams):	0.7 (19.8)

Electrical (Static Conditions)

Current Rating:	2 amps
Average DC Probe Resistance**:	<150 m0hms
Self Inductance (Ls):	1.65 nH
Capacitance (Cc):	0.69 pF
Bandwidth @ -1dB:	7.4 GHz

Heat-treated BeCu or Steel,

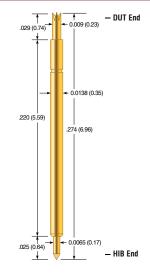
Gold plated over hard Nickel or Primeguard 1 for NiPd solder or

Materials and Finishes

Plunger DUT:

	Primeguard 2 for Lead free solder
Plunger HIB:	Heat-treated BeCu or Steel, Hard Gold over Nickel
Barrel:	Work-hardended Phosphor Bronze Gold plated over hard Nickel
Spring:	Steel alloy, Gold plated

CSP5-22



Mechanical

Pitch:	.019 (0.50)
Recommended Travel:	.020 (0.51)
Full Travel:	.030 (0.76)
Test Height:	.254 (6.45)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55°C to +155°C
Spring Force in oz. (grams):	1.2 (34.9)

Electrical (Static Conditions)

Current Rating:	2 amps
Average DC Probe Resistance**:	<150 m0hms
Self Inductance (Ls):	1.79 nH
Capacitance (Cc):	0.75 pF
Bandwidth @ -1dB:	6.8 GHz

Materials and Finishes

Plunger DUT:	Heat-treated BeCu or Steel,
	Gold plated over hard Nickel or
	Primeguard 1 for NiPd solder or

Primeguard 2 for Lead free solder Plunger HIB: Heat-treated BeCu or Steel,

Hard Gold over Nickel Barrel:

Work-hardended Phosphor Bronze, Gold plated over hard Nickel

Spring: Steel alloy, Gold plated

Tip Style - DUT / HIB



TIP STATE - DOT / LIP			
В	J	L	

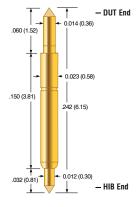
TIP Style - DOT / HIB			
В	J	L	U

* Life specifications are based on lab results but are dependent on cleaning frequency and the specific customer application, including DUT materials, handler kit, maintenance, etc. ** Contact resistance will increase over time due to solder build-up and wear

CSP8

0.80 mm

CSP8-15



Mechanical

Pitch:	.032 (0.80)
Recommended Travel:	.030 (0.76)
Full Travel:	.034 (0.86)
Test Height:	.212 (5.38)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55°C to +155°C
Spring Force in oz (grams):	1.0 (28.3)

Electrical (Static Conditions)

Current Rating:	3 amps
Average DC Probe Resistance**:	<150 m0hms
Self Inductance (Ls):	1.23 n⊦
Capacitance (Cc):	0.65 pF
Bandwidth @ -1dB·	9 23 GH

Materials and Finishes

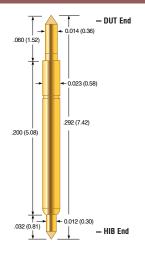
Barrel:

Plunger DUT:	Heat-treated BeCu or Steel,
	Gold plated over hard Nickel or
	Primeguard 1 for NiPd solder or
	Primeguard 2 for Lead free solder
Plunger HIB:	Heat-treated BeCu or Steel,
	Hard Gold over Nickel

Work-hardened Phosphor Bronze, Gold plated over hard Nickel

Steel alloy, Gold plated Spring:

CSP8-20



Mechanical

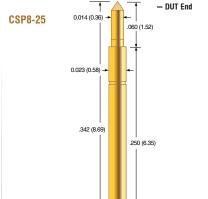
Pitch:	.032 (0.80)
Recommended Travel:	.030 (0.76)
Full Travel:	.035 (0.89)
Test Height:	.262 (6.65)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55°C to $+155^{\circ}\text{C}$
Spring Force in oz. (grams):	1.0 (28.3)

Electrical (Static Conditions)

Current Rating:	3 amps
Average DC Probe Resistance**:	<150 m0hms
Self Inductance (Ls):	1.52 nH
Capacitance (Cc):	0.81 pF
Bandwidth @ -1dB:	7.45 GHz

Materials and Finishes

Plunger DUT:	Heat-treated BeCu or Steel, Gold plated over hard Nickel or Primeguard 1 for NiPd solder or
	Primeguard 2 for Lead free solder
Plunger HIB:	Heat-treated BeCu or Steel, Hard Gold over Nickel
Barrel:	Work-hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Steel alloy, Gold plated



Mechanical

Pitch:	.032 (0.80)
Recommended Travel:	.030 (0.76)
Full Travel:	.040 (1.02)
Test Height:	.312 (7.92)
Mechanical Life*:	500,000 cycles
Operating Temperature:	-55°C to +155°C
Spring Force in oz. (grams):	1.1 (31.2)

.032 (0.81) — HIB End

Electrical (Static Conditions)

Current Rating:	3 amps
Average DC Probe Resistance**:	<150 m0hms
Self Inductance (Ls):	1.81 nH
Capacitance (Cc):	0.96 pF
Bandwidth @ -1dB:	5.25 GHz

Materials and Finishes

Plunger DUT:	Heat-treated BeCu or Steel, Gold plated over hard Nickel or Primeguard 1 for NiPd solder or Primeguard 2 for Lead free solder
Plunger HIB:	Heat-treated BeCu or Steel, Hard Gold over Nickel
Barrel:	Work-hardened Phosphor Bronze, Gold plated over hard Nickel
Spring:	Steel alloy, Gold plated

Tip Style - DUT / HIB			
В	J	L	
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Tip Otyle - DOT / Tilb			
В	J	L	

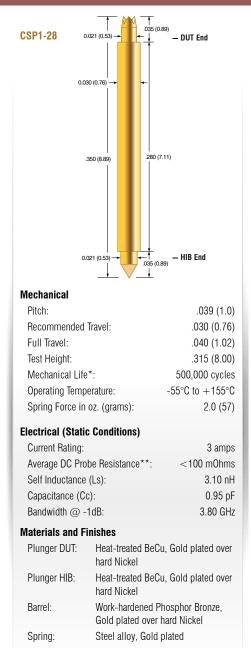
Tip Style - DUT / HIB				
	В	J	L	

Tip Style - DUT / HIB			
В	J	L	



CSP₁

1.0 mm



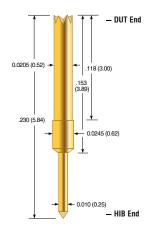
Tip Style - DUT / HIB			
В	L		





0.80 mm, 1.00 mm, 1.27 mm

SCP-080



Mechanical

Pitch:	.032 (0.80)
Recommended Travel:	.030 (0.76)
Full Travel:	.035 (0.89)
Test Height:	.200 (5.08)
Mechanical Life*:	1,000,000 cycles
Operating Temperature:	-55°C to +155°C
Spring Force in oz. (grams):	1.50 (42.5)

Electrical (Static Conditions)

Current Rating:	5 amps
Average DC Probe Resistance**:	<50 m0hms
Self Inductance (Ls):	1.27 nH
Capacitance (Cc):	0.12 pF
Bandwidth @ -1dB:	6.0 GHz

Materials and Finishes

Plunger: Heat-treated BeCu, Gold plated over

hard Nickel

Barrel: Work-hardened BeCu, Gold plated

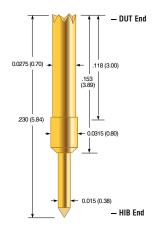
over hard Nickel

Steel alloy, Gold plated Spring:

Tip Style - DUT

	M	W S	*	
Tip	Style -	HIB		
В	J			

SCP-100



Mechanical

Pitch:	.039 (1.00)
Recommended Travel:	.030 (0.76)
Full Travel:	.035 (0.89)
Test Height:	.200 (5.08)
Mechanical Life*:	1,000,000 cycles
Operating Temperature:	-55°C to $+155^{\circ}\text{C}$
Spring Force in oz. (grams):	1.50 (42.5)

Electrical (Static Conditions)

Current Rating:	7 amps
Average DC Probe Resistance**:	<50 m0hms
Self Inductance (Ls):	1.40 nH
Capacitance (Cc):	0.66 pF
Bandwidth @ -1dB·	6 70 GHz

Materials and Finishes

Plunger: Heat-treated BeCu, Gold plated over

hard Nickel

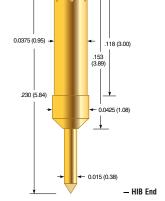
Work-hardened BeCu, Gold plated Barrel:

over hard Nickel

Steel alloy, Gold plated Spring:

Tip Style - DUT Tip Style - HIB

SCP-127 — DUT End



Mechanical

Pitch:	.050 (1.27)
Recommended Travel:	.030 (0.76)
Full Travel:	.035 (0.89)
Test Height:	.200 (5.08)
Mechanical Life*:	1,000,000 cycles
Operating Temperature:	-55°C to +155°C
Spring Force in oz. (grams):	1.50 (42.5)

Electrical (Static Conditions)

Current Rating:	9 amps
Average DC Probe Resistance**:	<50 m0hms
Self Inductance (Ls):	1.40 nH
Capacitance (Cc):	0.79 pF
Bandwidth @ -1dB:	7.6 GHz

Materials and Finishes

Plunger:	Heat-treated BeCu,	Gold plated over

hard Nickel

Barrel: Work-hardened BeCu, Gold plated

over hard Nickel

Steel alloy, Gold plated Spring:

Tip Style - DUT

Tip Style - HIB				
J				
	- HIB	- HIB		



