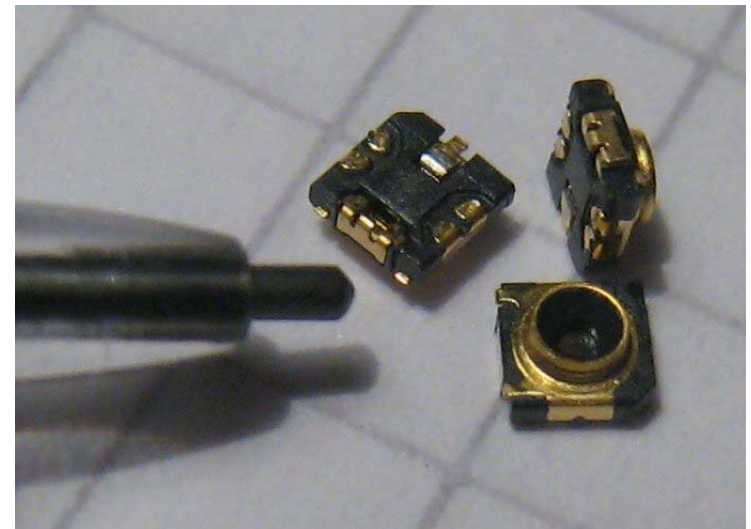


# Pico Switching Coax Connector

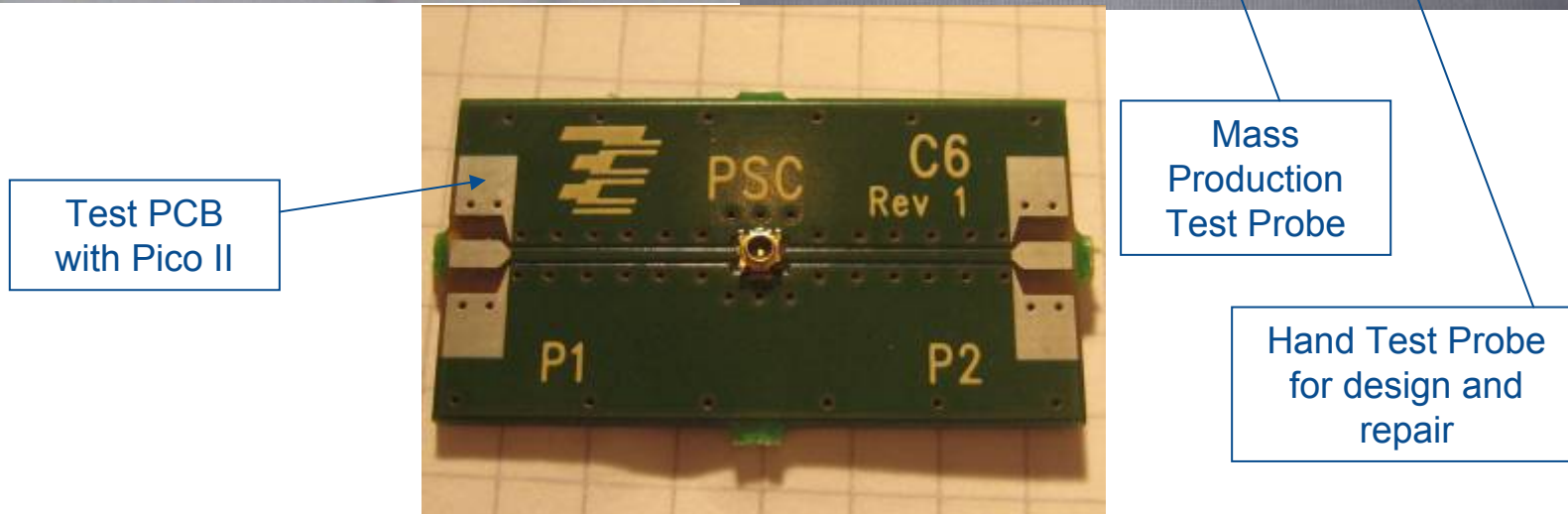
## PICO II

Product presentation



Patrick Duquerroy, November 2009

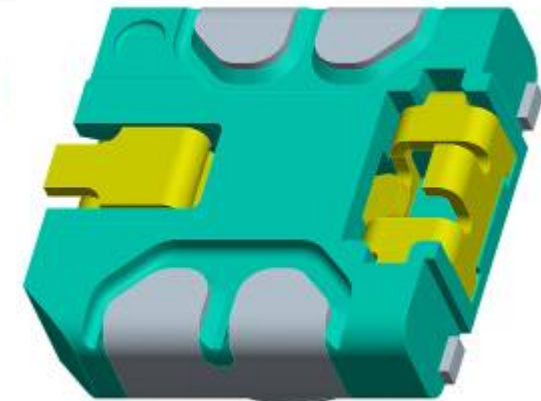
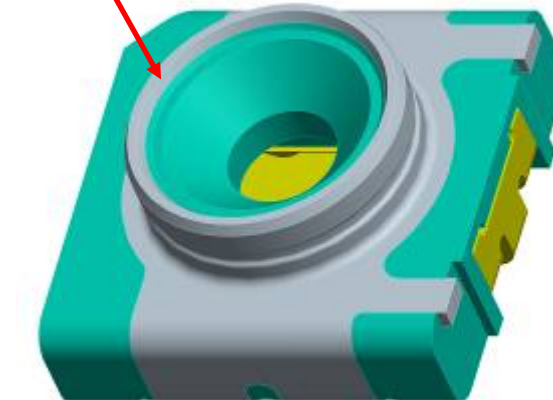
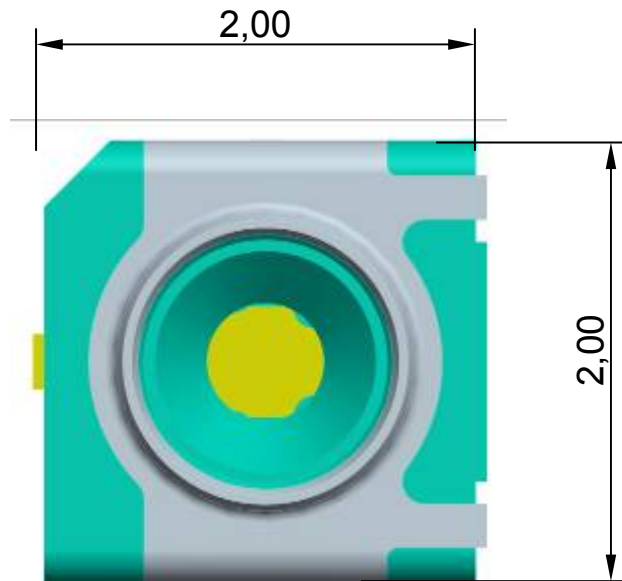
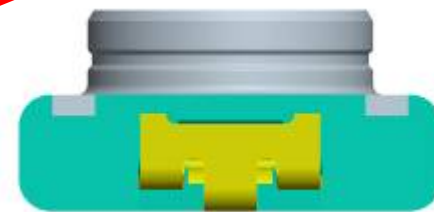
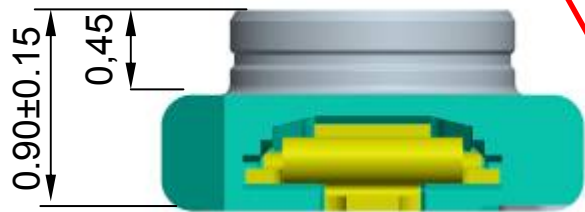
# Let's have a look on TE Pico II System



# PICO II, PN 1551372-1

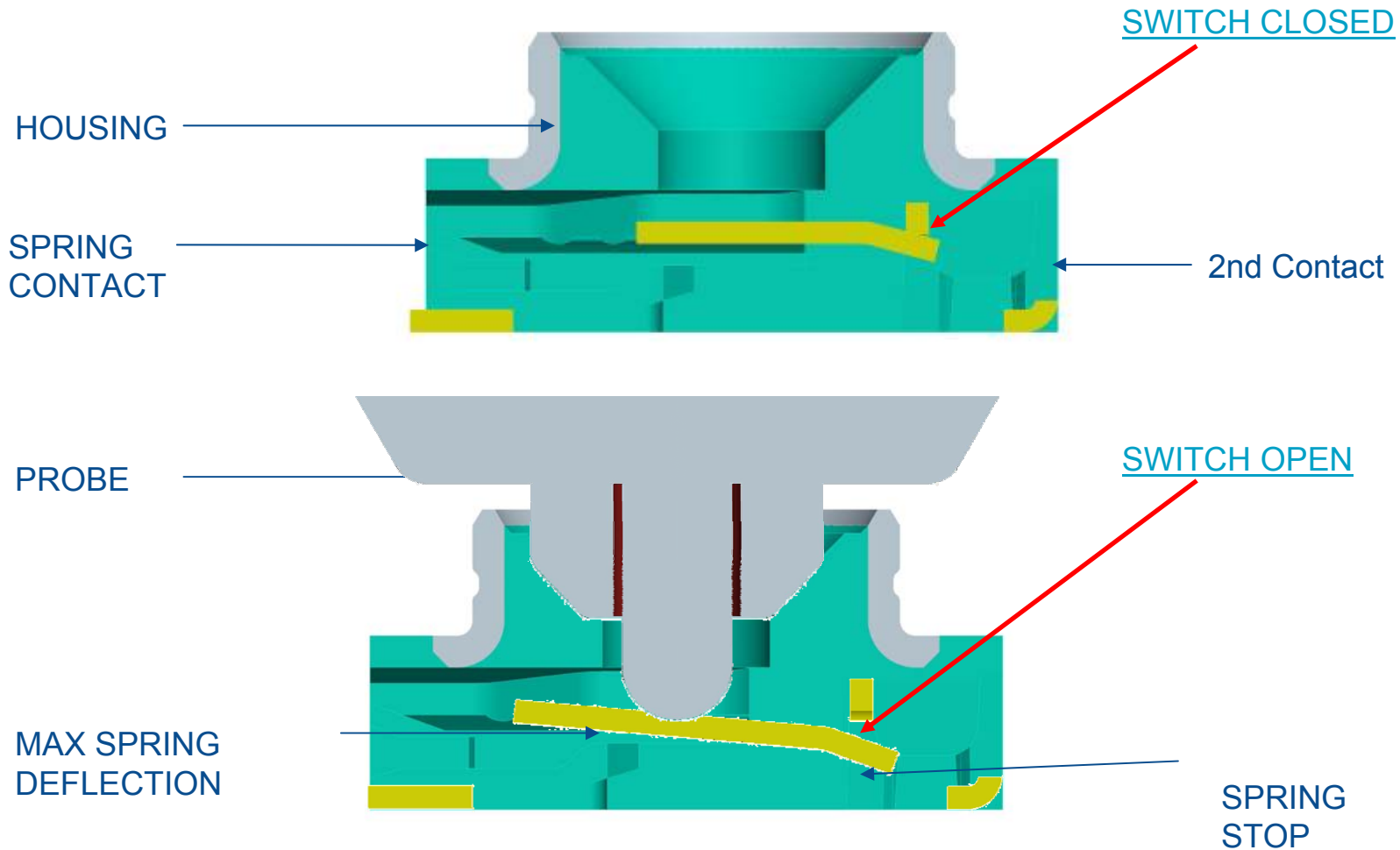


With cylindrical ground connection & snap-in groove



# PICO II, PN 1551372-1

## Switch Concept



# Main Technical Features of PCB switch



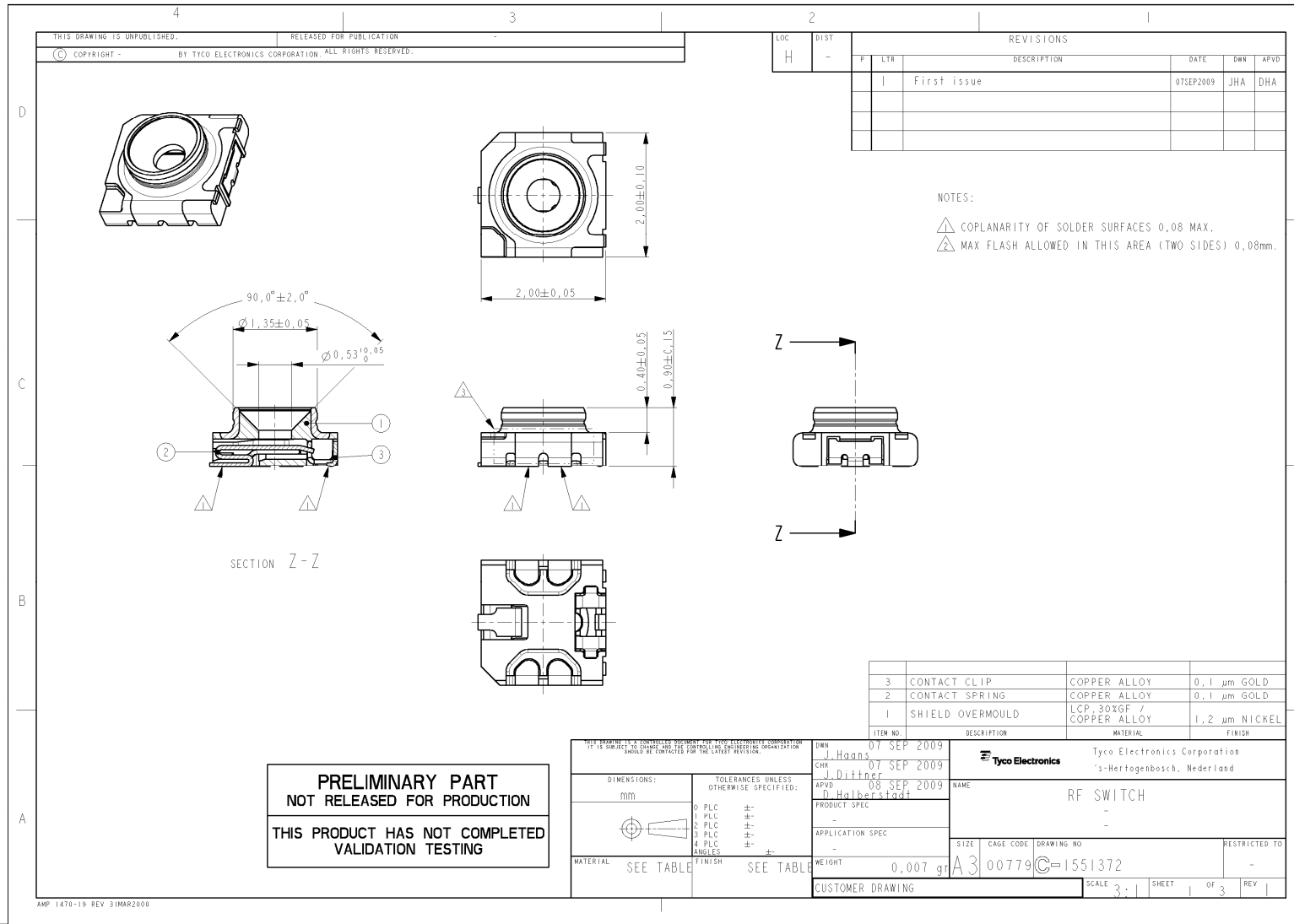
## Mechanical:

- Size: 2 X 2 mm, height 1 mm
- Self alignment  $\pm 0.4$  mm
- Co Planarity 0.08 mm max
- UP to 1 Million cycles for the mass production test probe
- 100 cycles min for the switch (with mass production test probe)
- Suitable for lead free process
- High contact force at switch point

## Electrical:

RF specifications		
Frequency range		DC ... 11 GHz
Impedance		50 ohm $\pm 5$ %
Contact resistance		50 m $\Omega$ max.
Return loss $ \Gamma $	0 ... 3 GHz	20 dB
	3 ... 6 GHz	16 dB
	6 ... 11 GHz	12 dB
Insertion loss (ON state)	0 ... 3 GHz	0.1 dB
	3 ... 6 GHz	0.2 dB
	6 ... 11 GHz	0.5 dB
Isolation (OFF state)	0 ... 3 GHz	20 db
	3 ... 6 GHz	15 dB
	6 ... 11 GHz	10 dB
Durability of the switch min		100 cycles
Durability of the mass production probe		1 Mio cycles

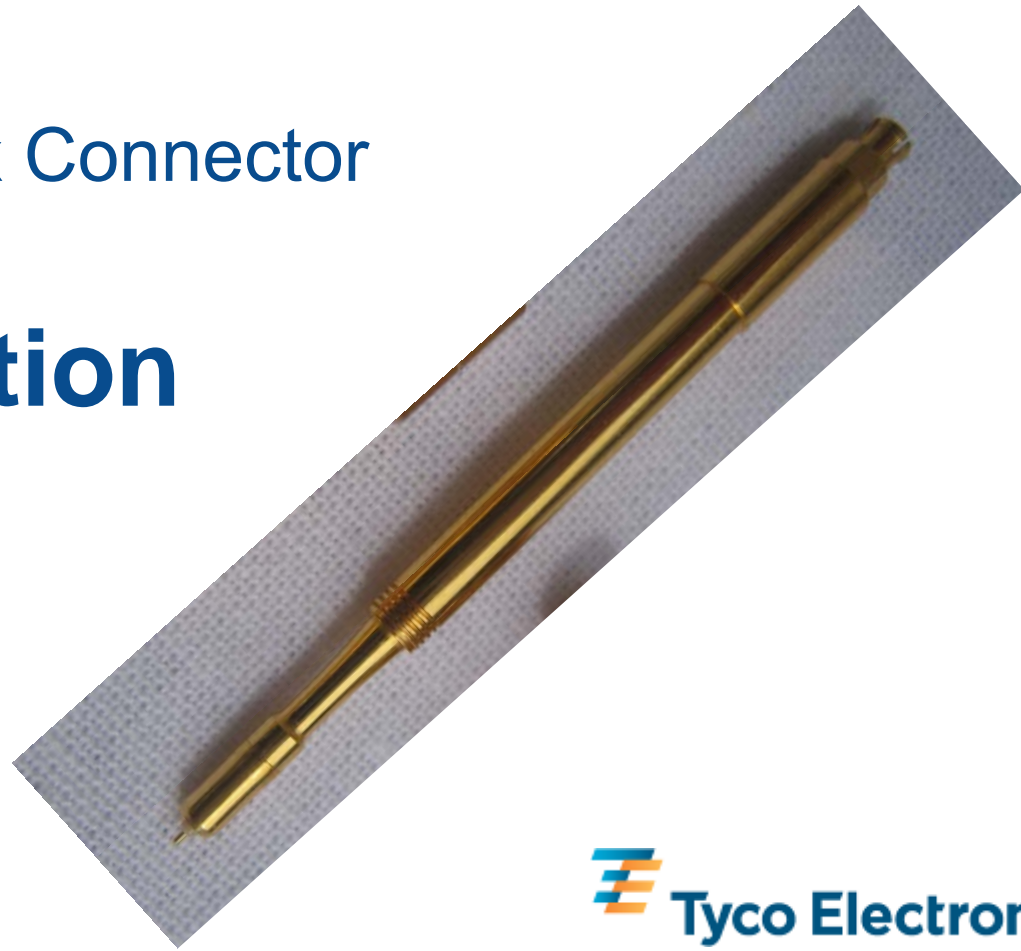
# PICO II, PN 1551372-1





Pico Switching Coax Connector

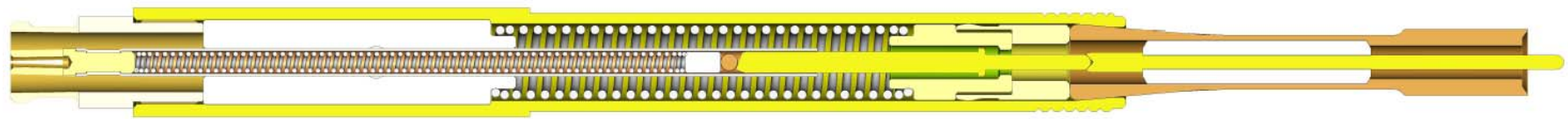
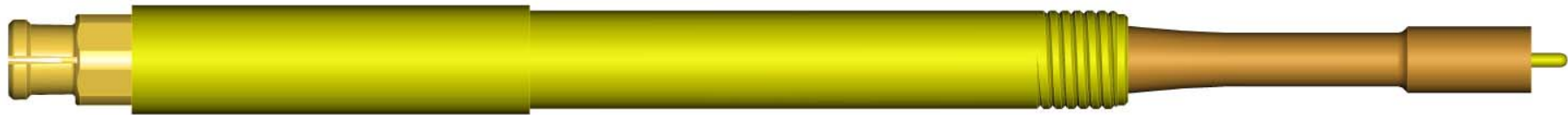
# Mass Production Test Probe



Patrick Duquerroy, July 2009

# Test Probe for Mass Production PN 619361-1

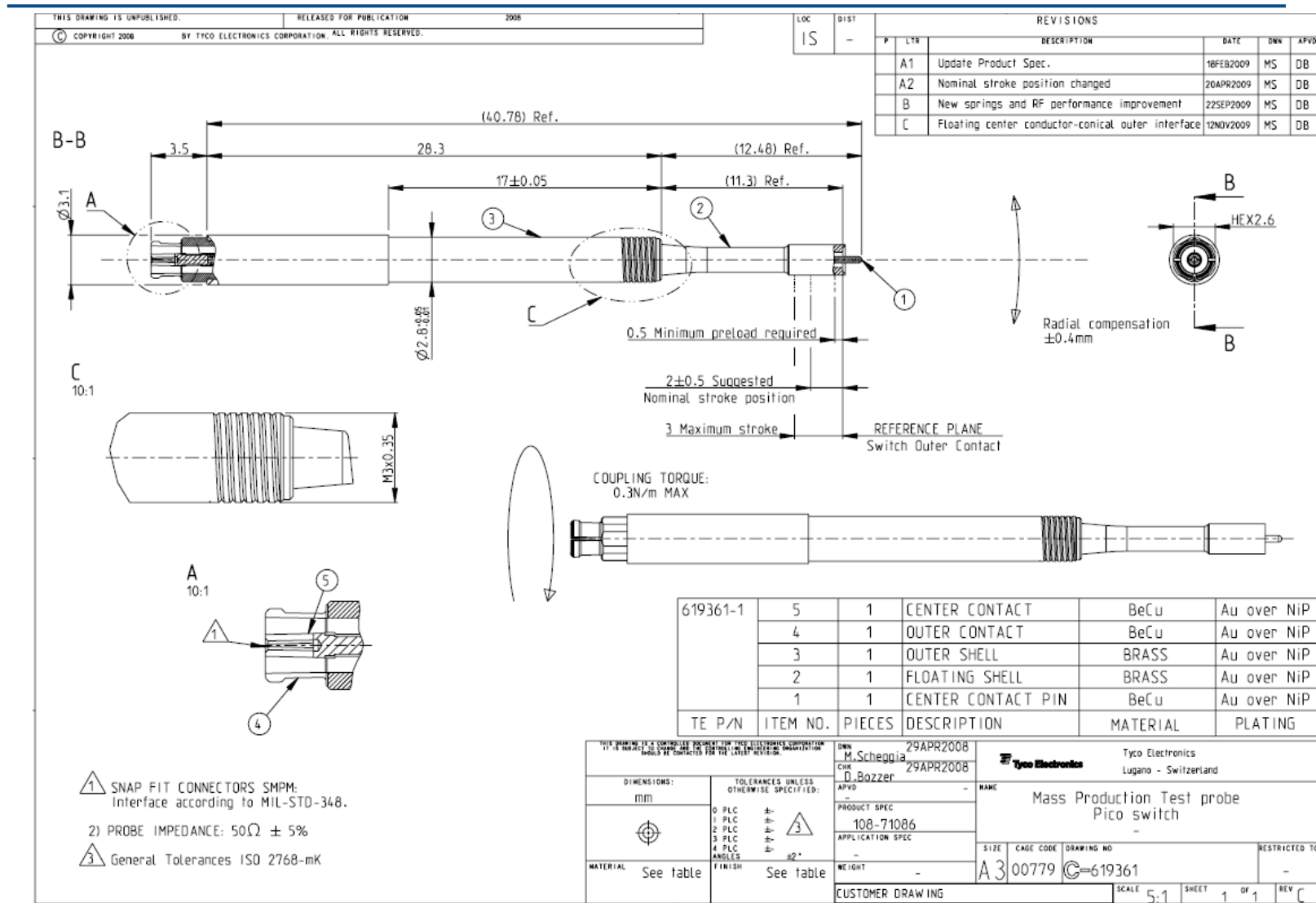
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High precision connector with many specific and polished components to reach long life cycle



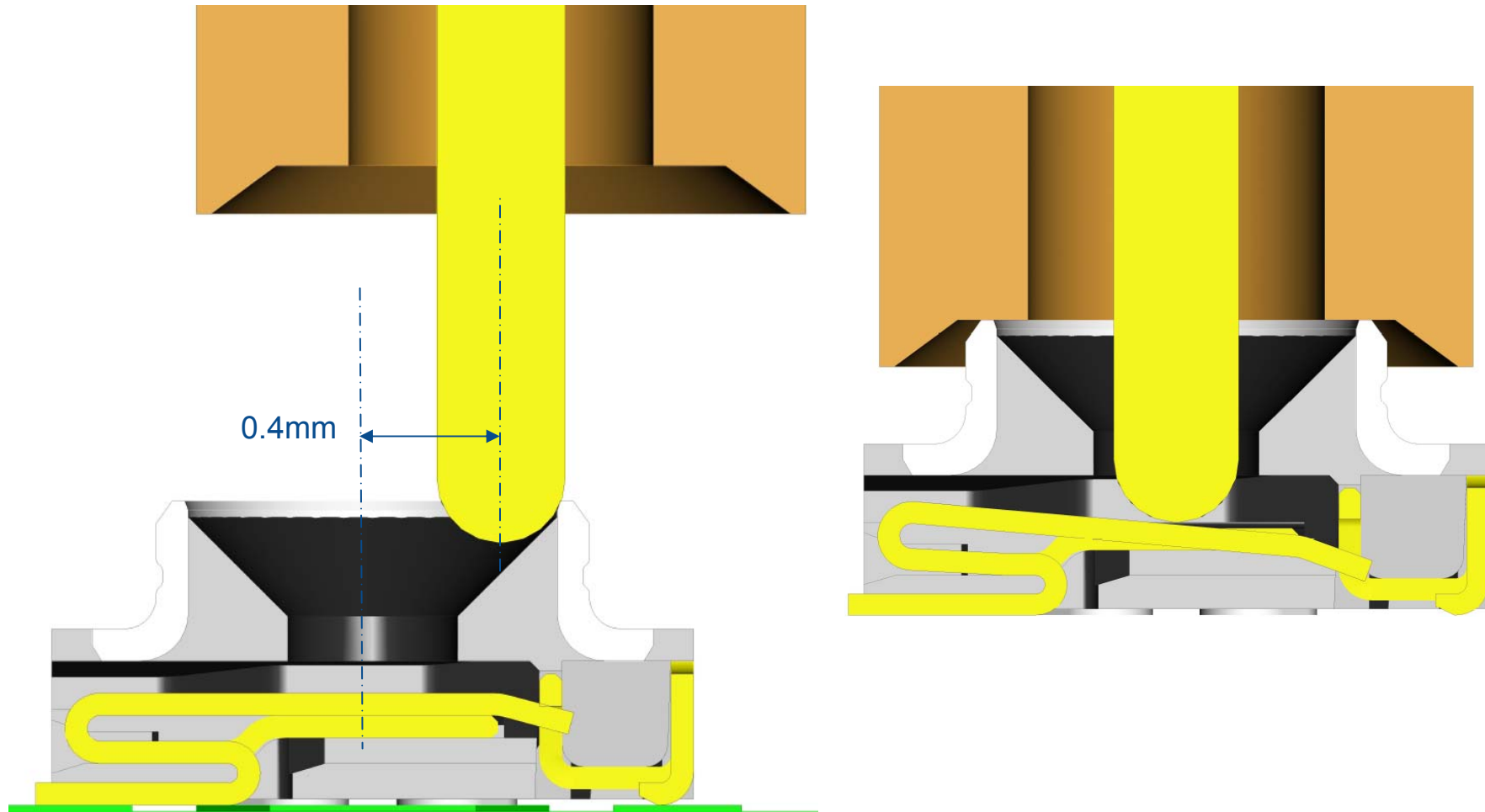
# Test Probe for Mass Production PN 619361-1



# Test Probe for Mass Production PN 619361-1



Self-alignment of +/- 0.40mm in both X- and Y-direction



# Test Probe for Mass Production PN 619361-1

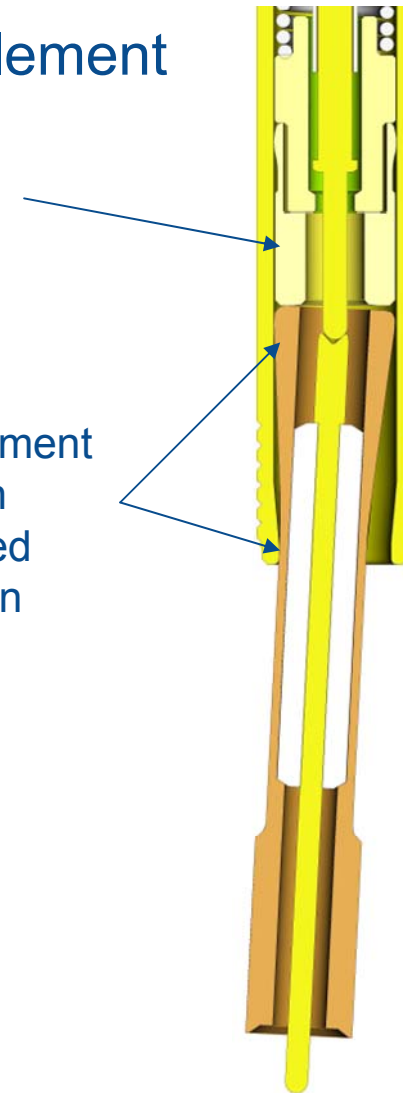


Radial compensation guaranteed with an elbow element

Elbow element pressed by a spiral spring in interface direction



Re – alignment  
in non  
switched  
position

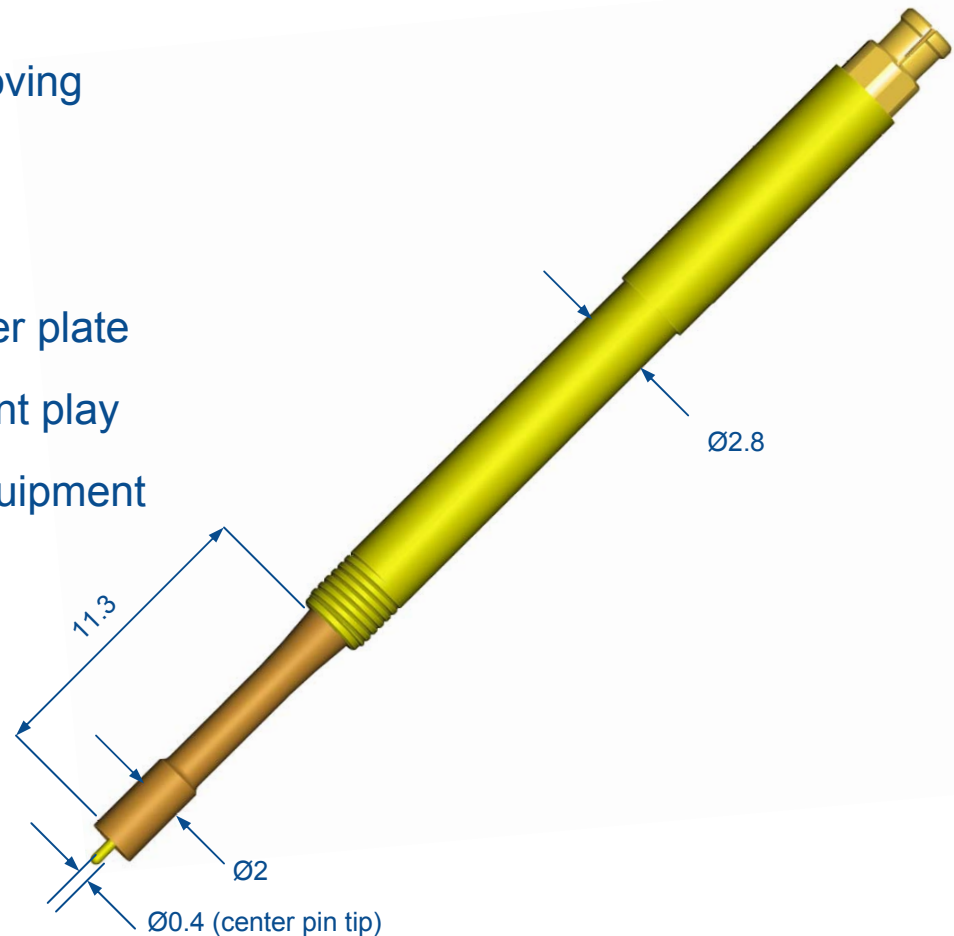


# Production Test Probe PN 619361-1

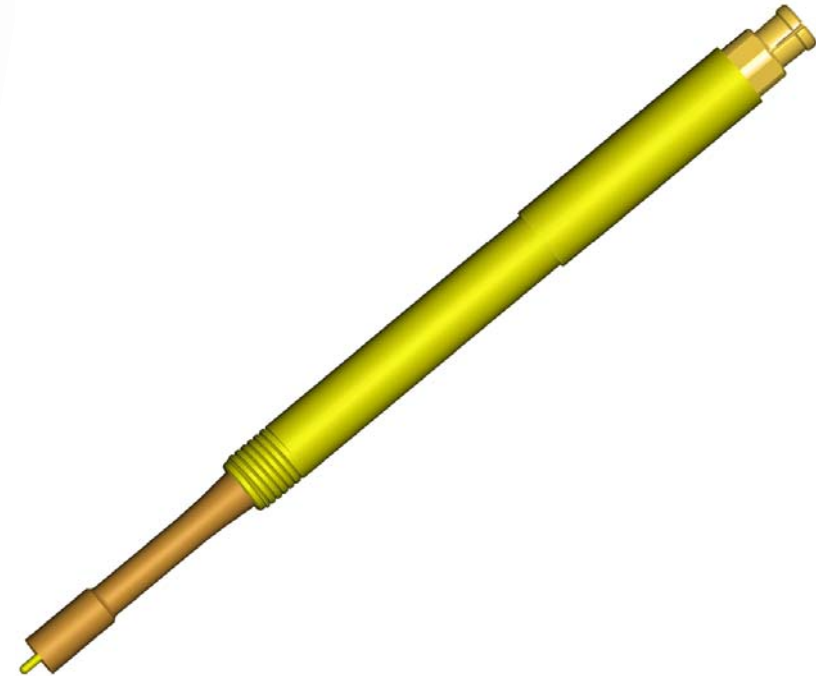
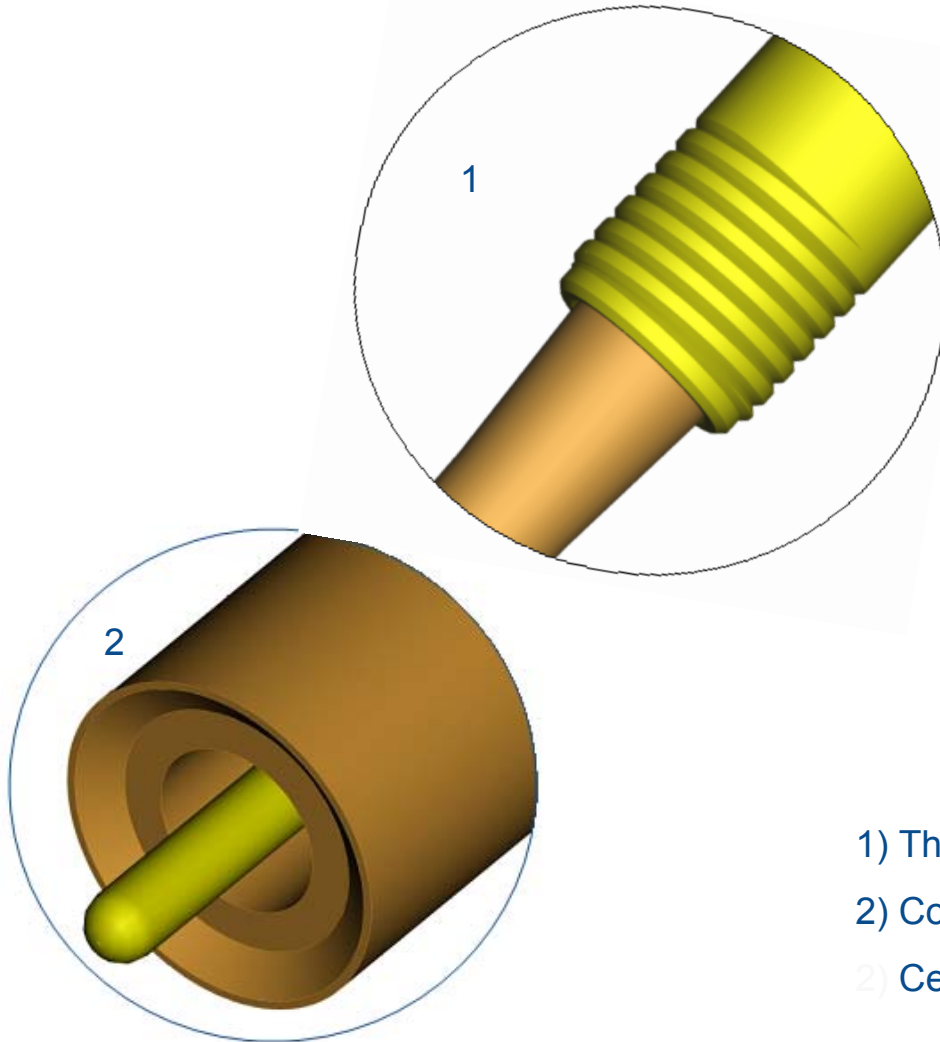
## HIGHLIGHTS (1 of 4)



- Alignment  $\pm 0.40$  mm in X and Y
- Stroke min. 0.5 mm in Z
- Inner and outer conductor individually moving
- Up to 1 Million mating cycles
- Quick probe exchange from top of adapter plate
- Screw mounted in adapter plate to prevent play
- Snap fit connection from probe to test equipment
- Pitch between probes: 3.2 mm min
- Length below adapter plate:  $\sim 12.5$  mm  
(other lengths easily possible)
- Total length:  $\sim 44$  mm



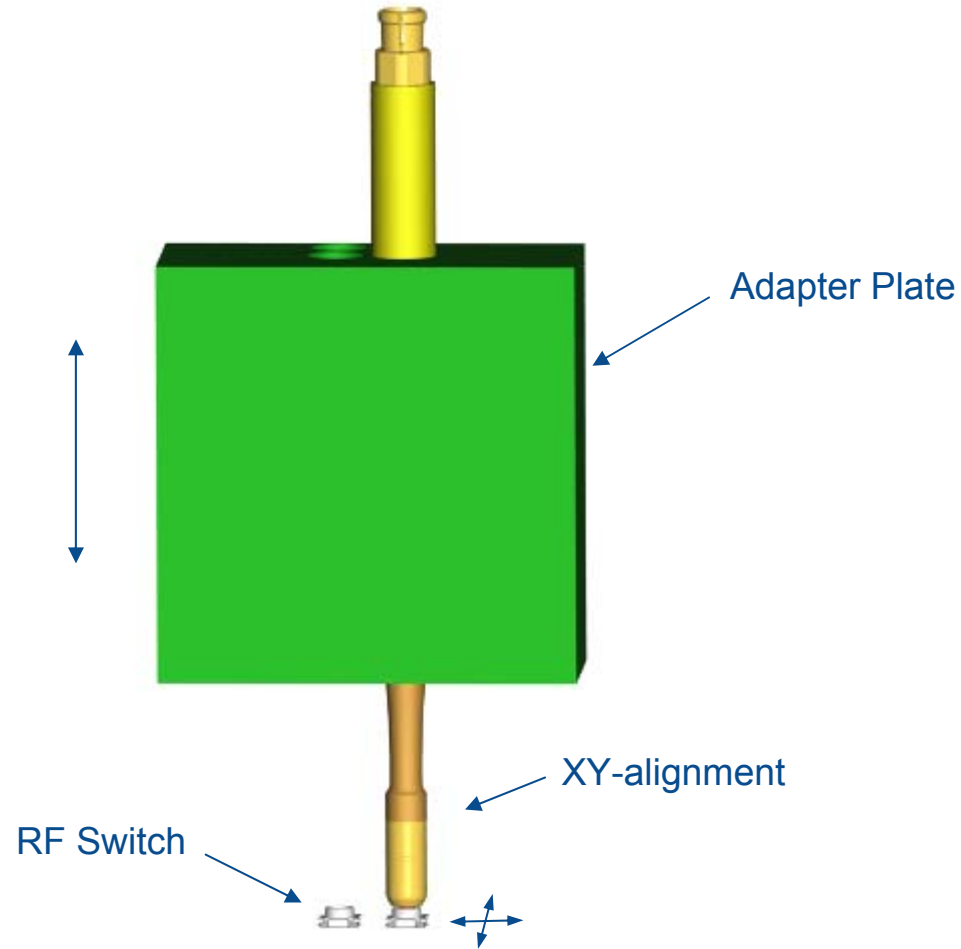
# Production Test Probe PN 619361-1 HIGHLIGHTS (2 of 4)



- 1) Thread for screw mounting in adapter plate
- 2) Cone for XY-alignment
- 2) Center and outer conductor individually spring loaded

# Production Test Probe PN 619361-1 HIGHLIGHTS (3 of 4)

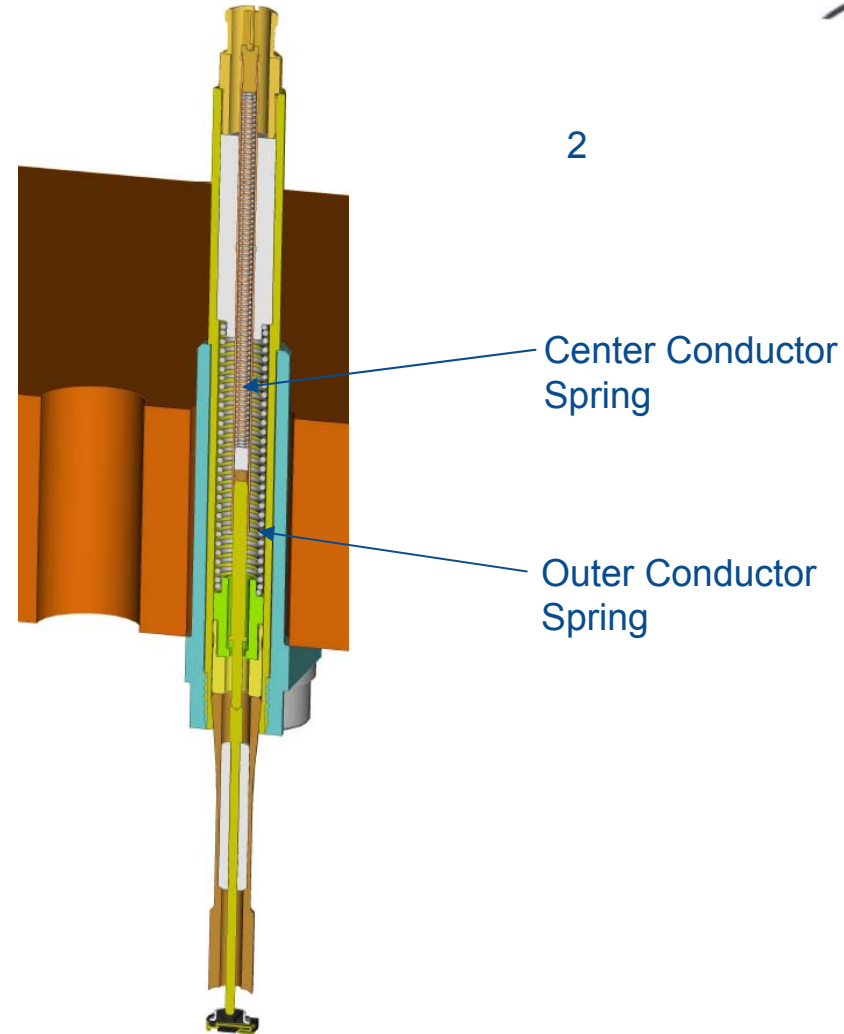
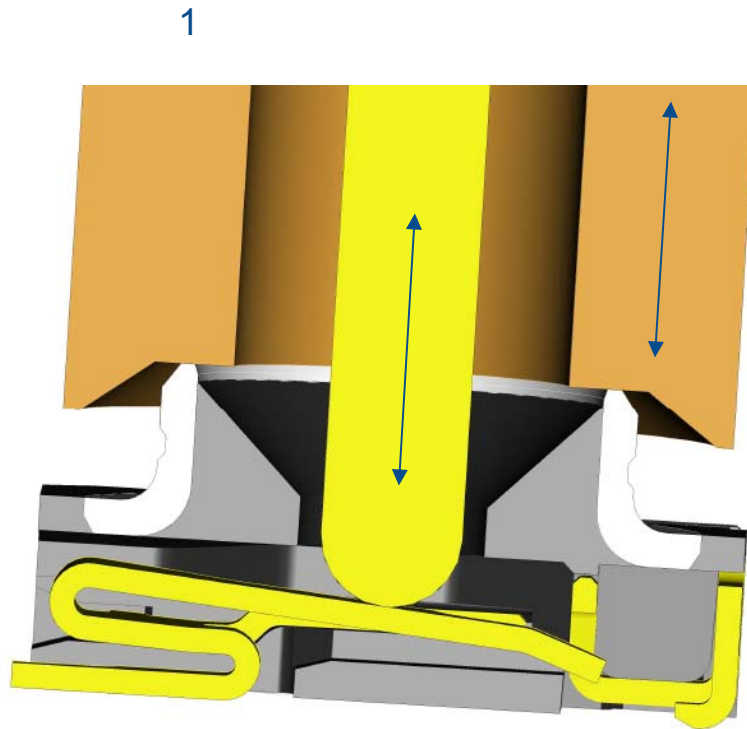
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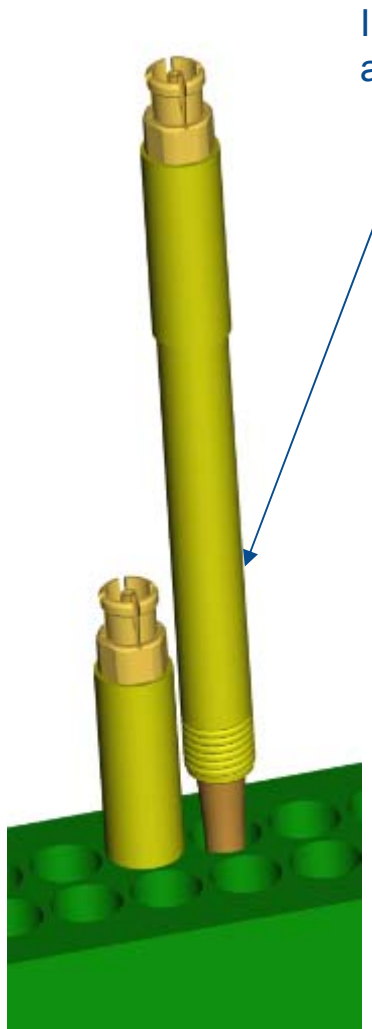
# Production Test Probe PN 619361-1 HIGHLIGHTS (4 of 4)



- 1) Center and outer conductor floating
- 2) Individually spring loaded



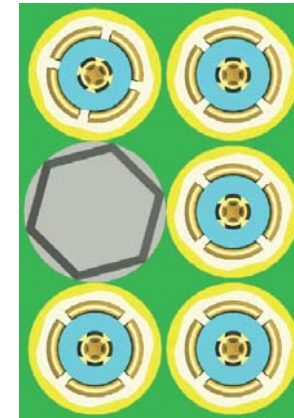
# Example of Test Probe Installation in Test Jig



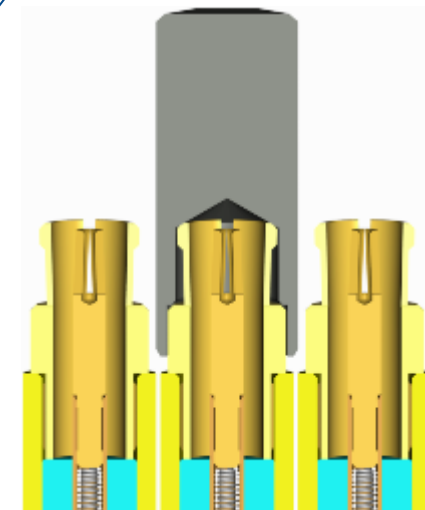
Insert Probe in adapter plate



Pitch 3.2mm x 3.2mm



Screw all Probes up to the mechanical stop, using a special pipe key.

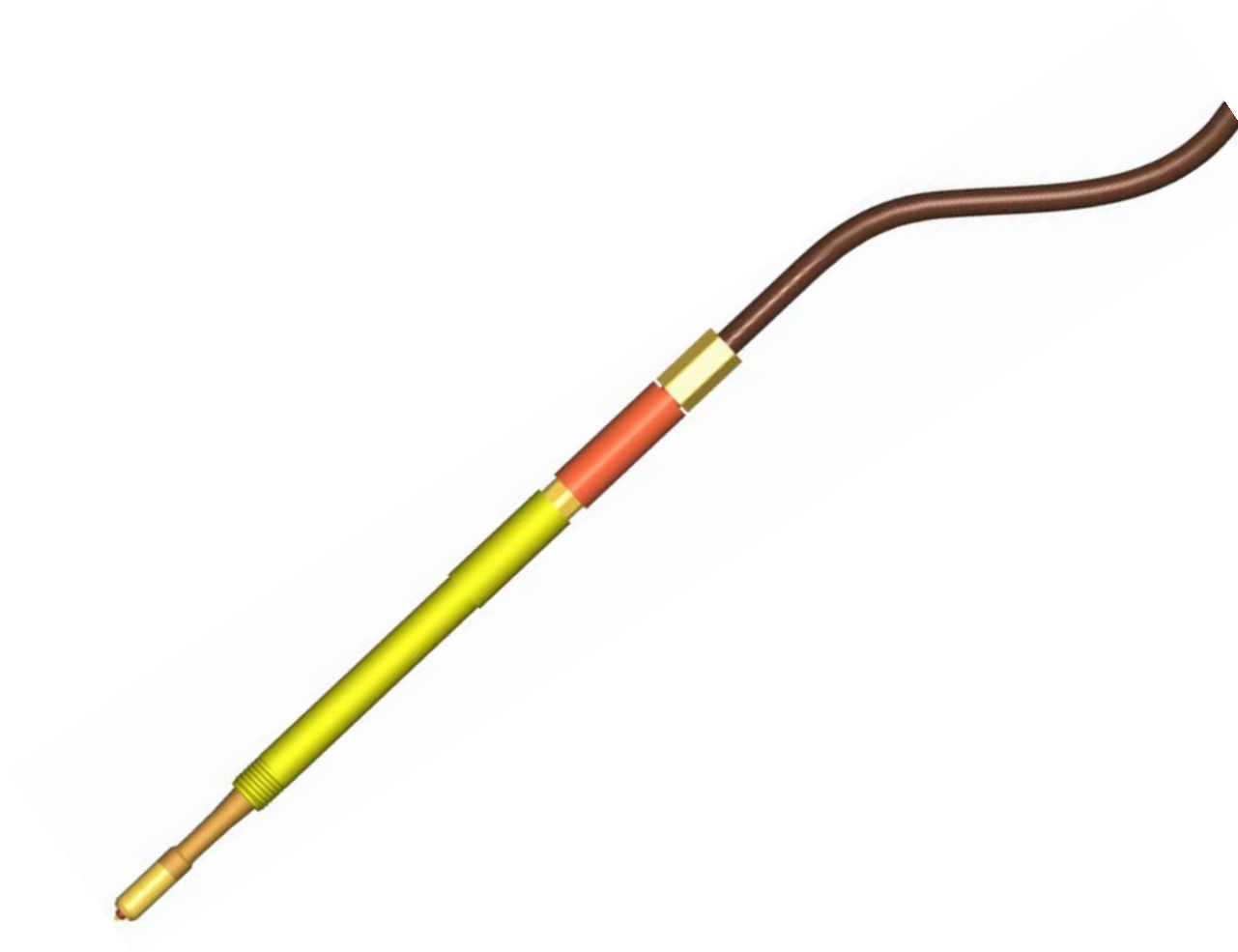




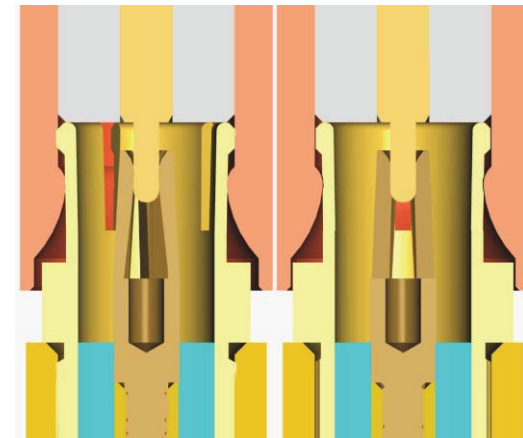
# Connection of cable to the probe



Snap-fit cable connector can be mated / un-mated to probe by special tool or by hand.



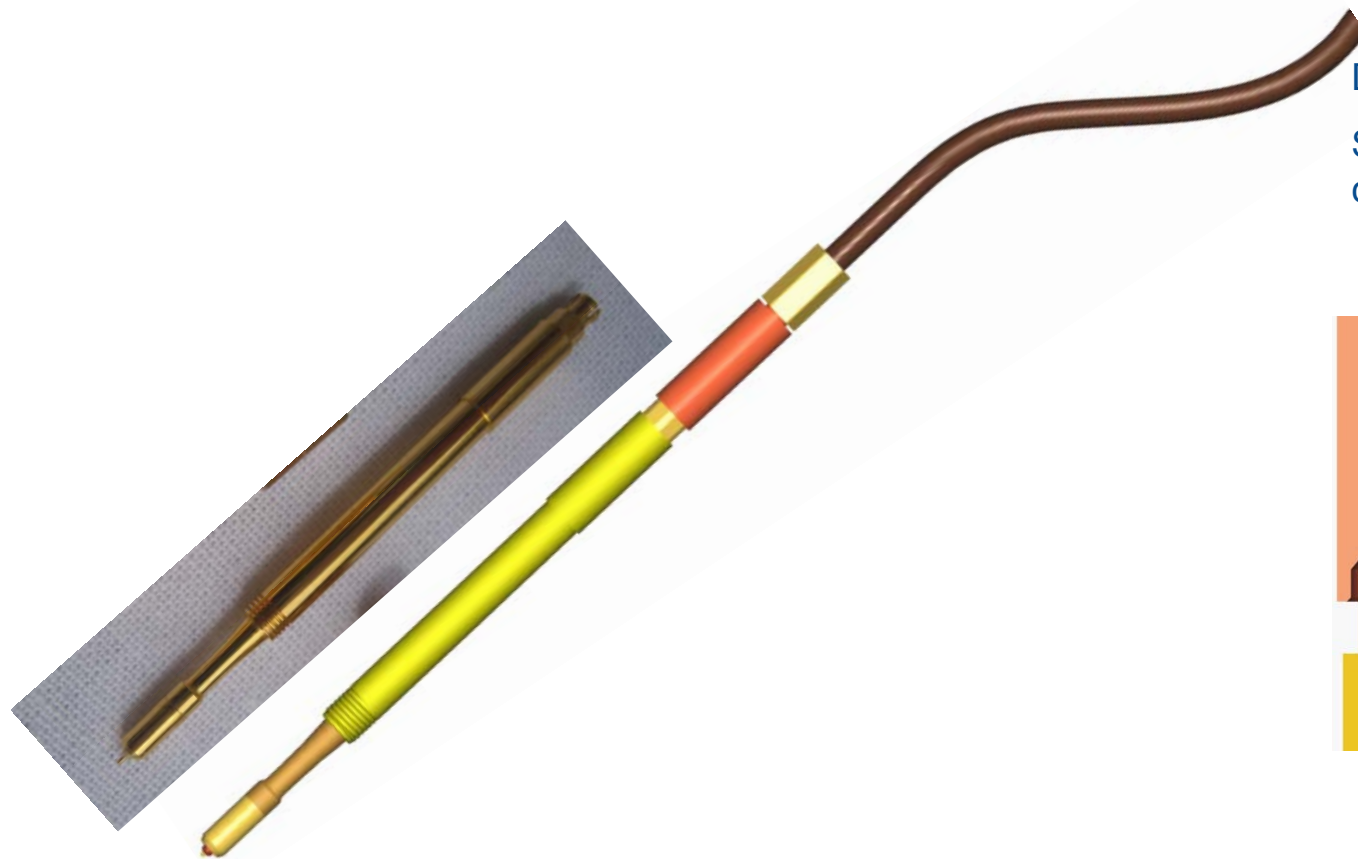
Detail of coupling:  
Snap fit male/female  
connectors



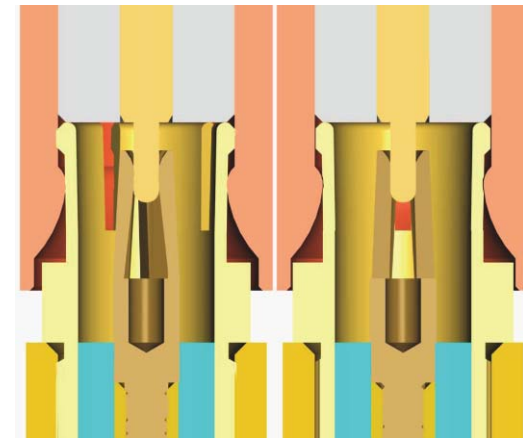
# Connection of cable to the probe



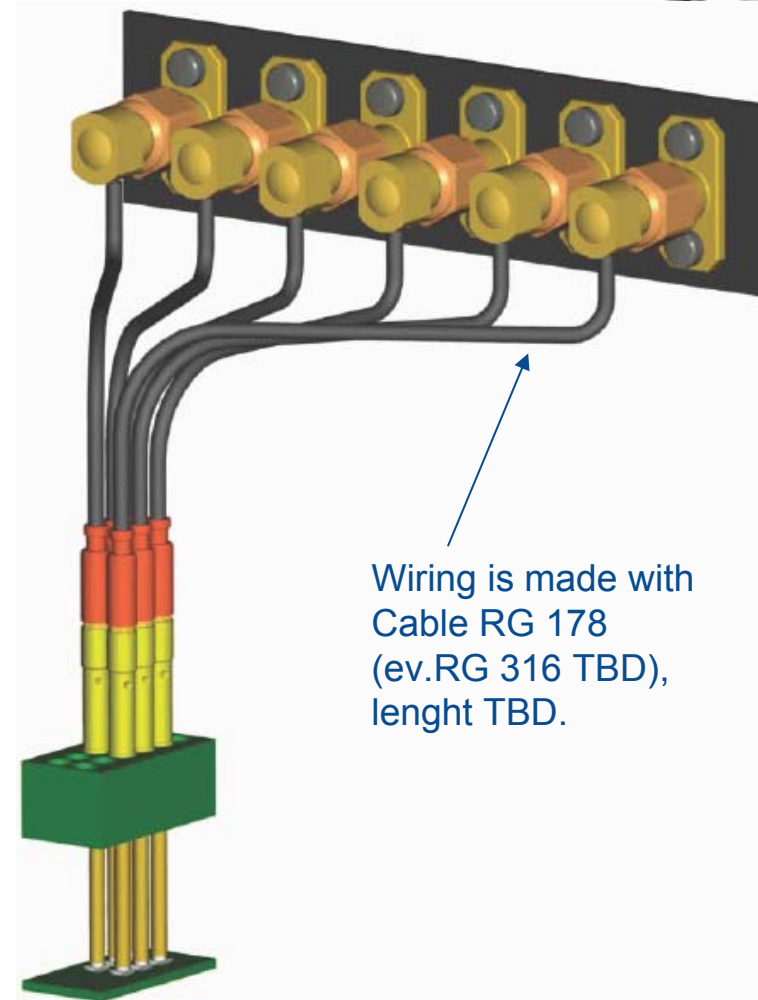
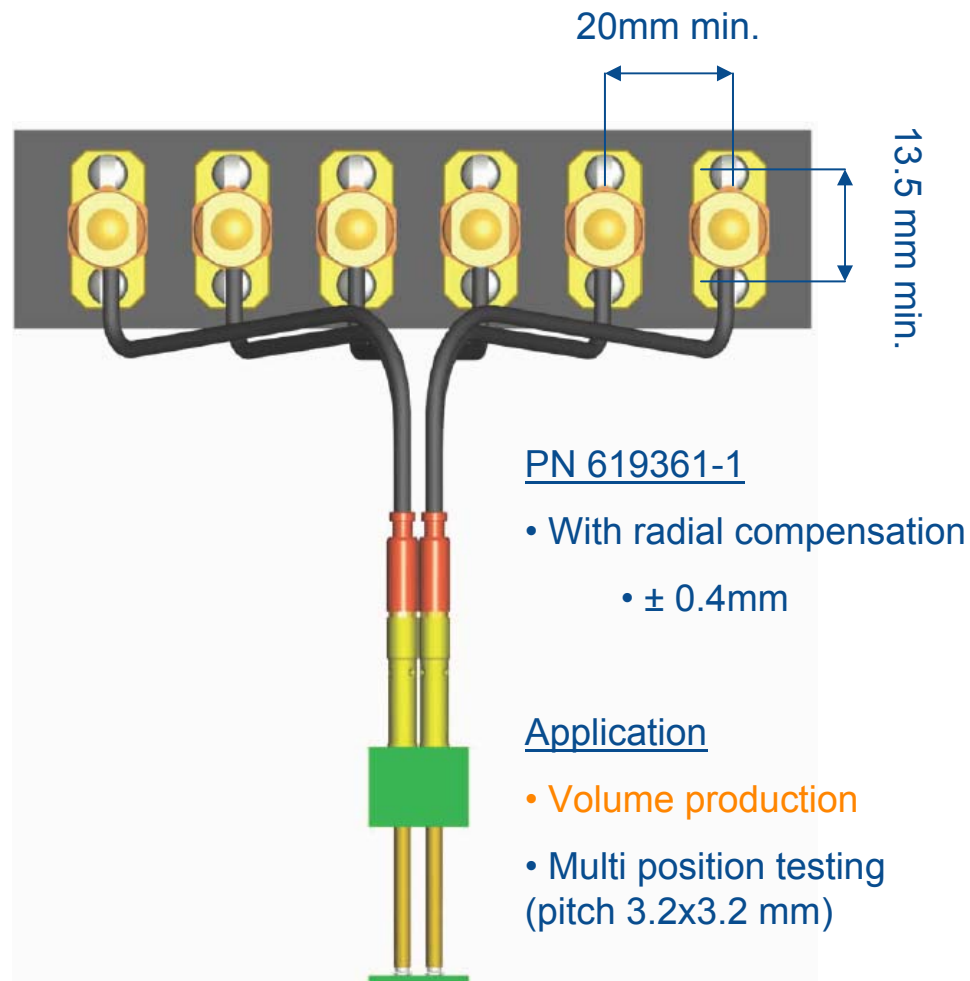
Snap-fit cable connector can be mated / un-mated to probe by special tool or by hand.



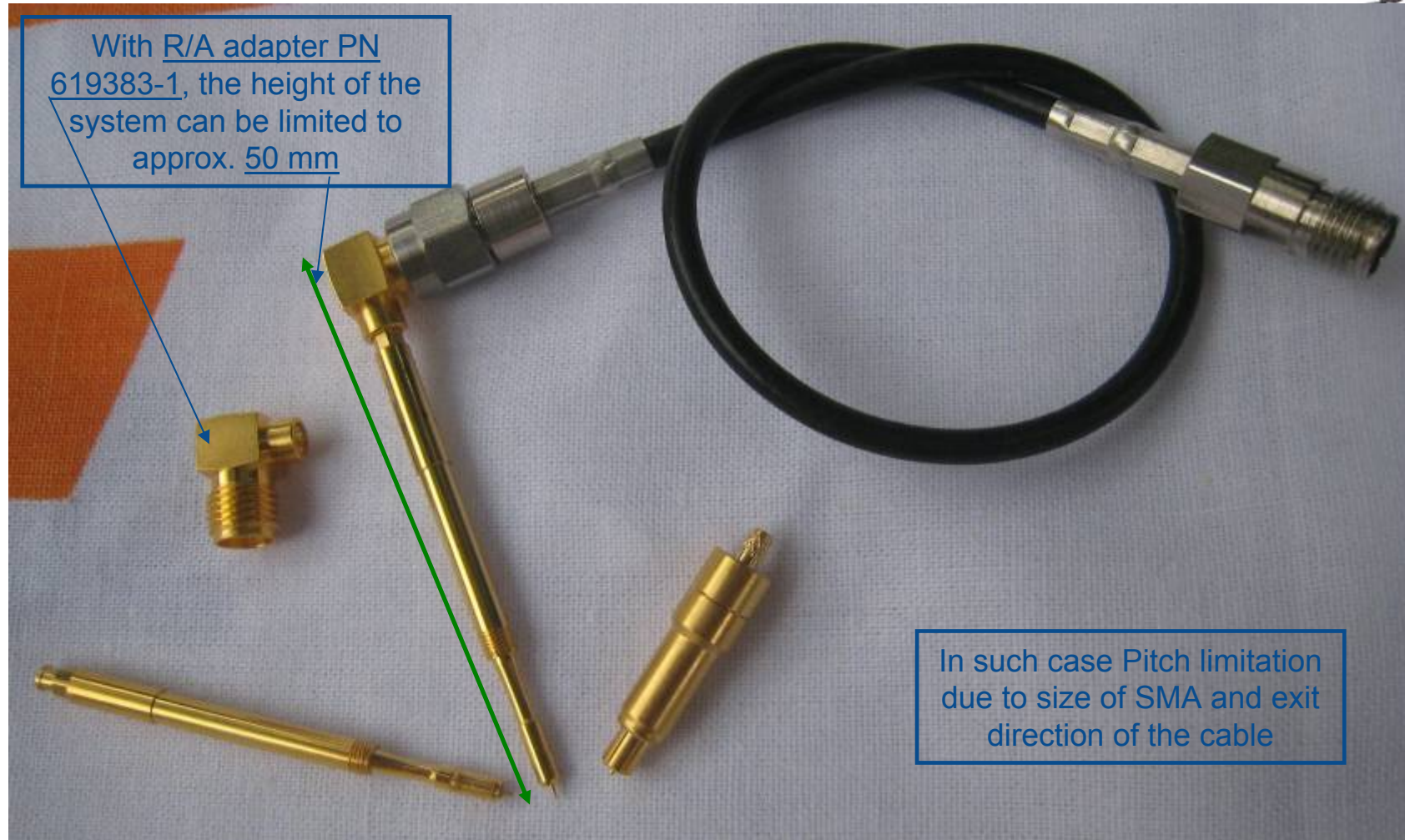
Detail of coupling:  
Snap fit male/female  
connectors



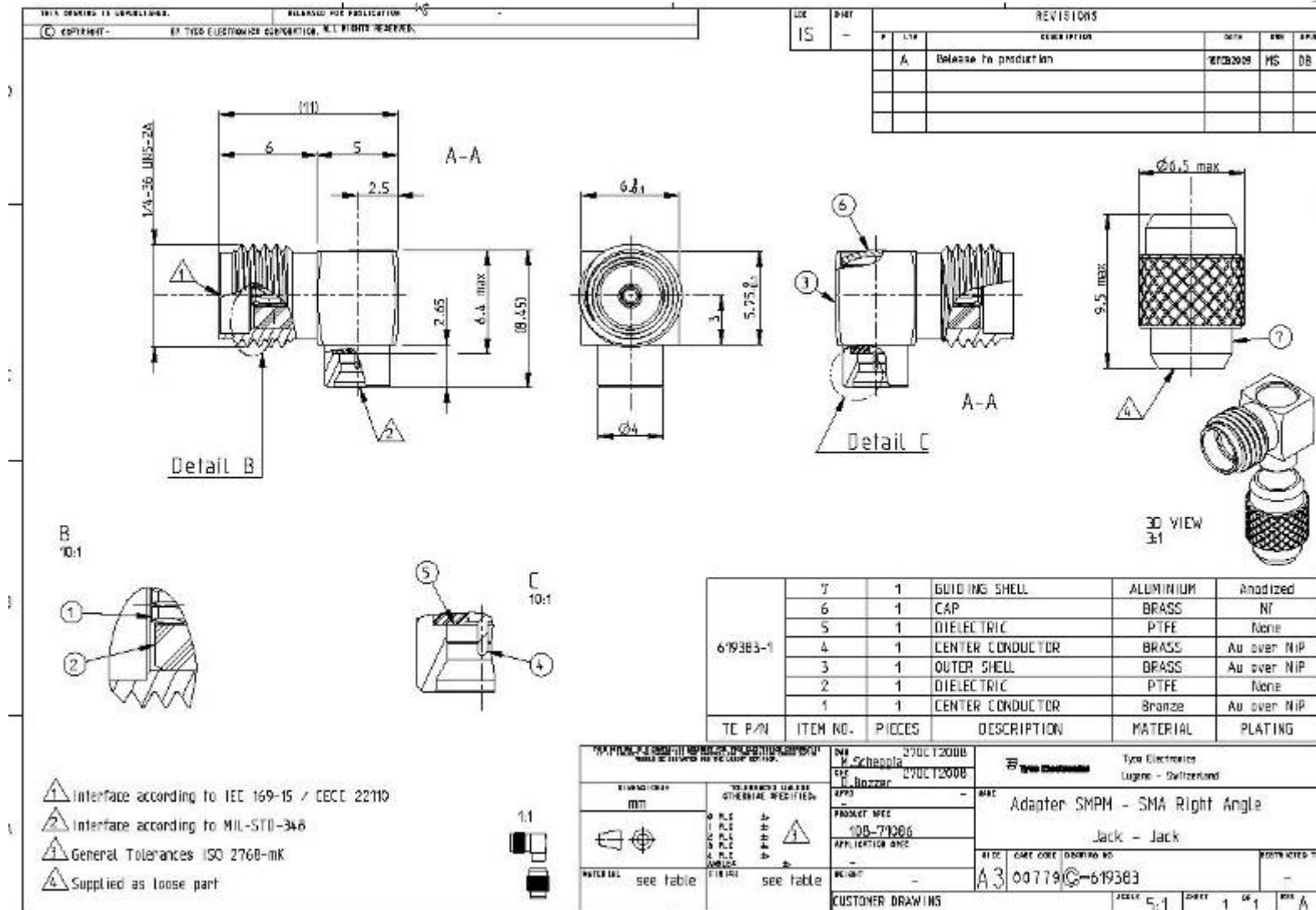
# Example of Test Probe Installation in Test Jig



# Example of Test Probe Installation in Test Jig with R/A adapter PN 619384-1



# R/A Adapter Mass Prod test probe to SMA Jack

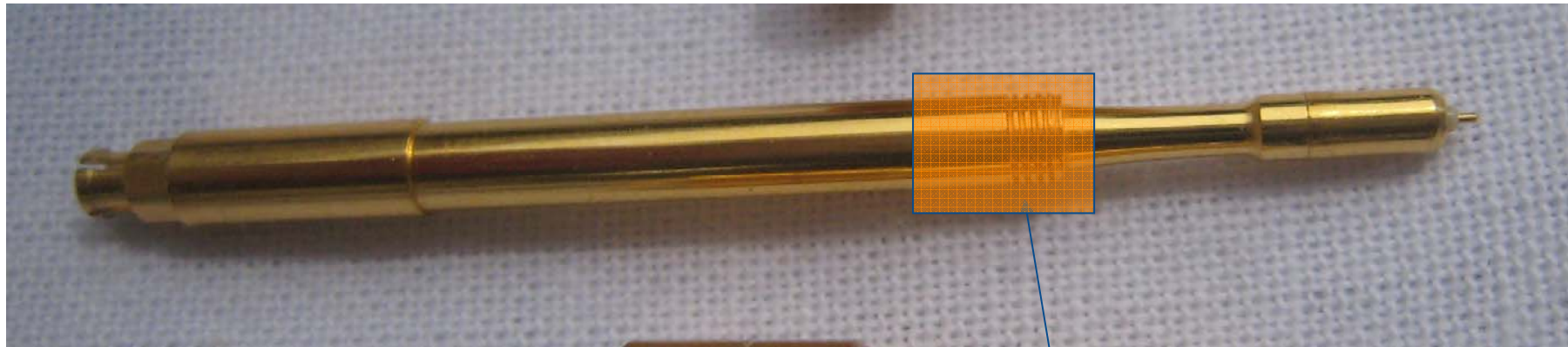


# Mass Production Test Probe with Integrated Attenuator

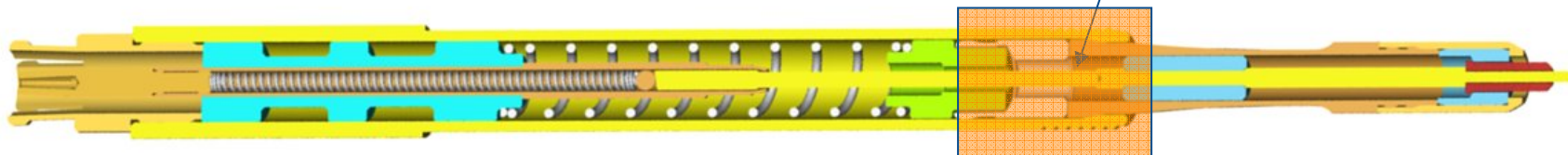


**NEW CONCEPT**

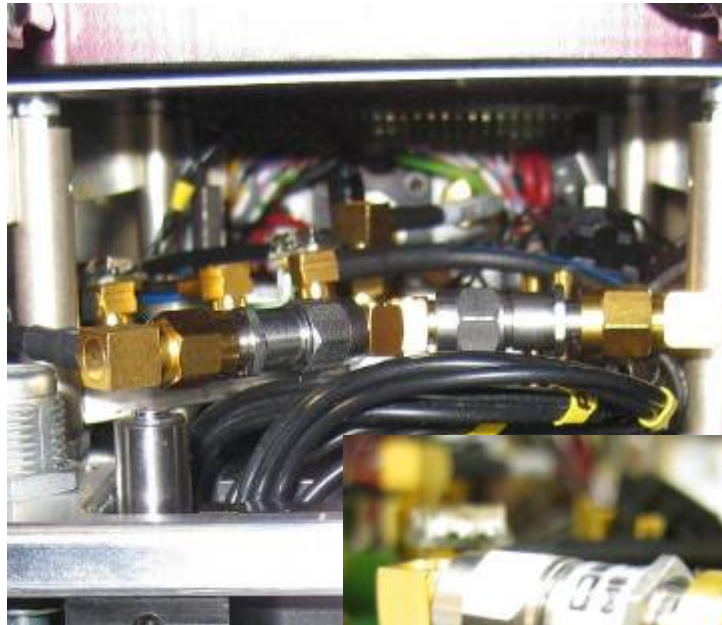
Test Probe is like PN 619361-1 but with integrated attenuator (various values available). This will provide better signal measurement and space / weight saving on the probe system in the test jig.



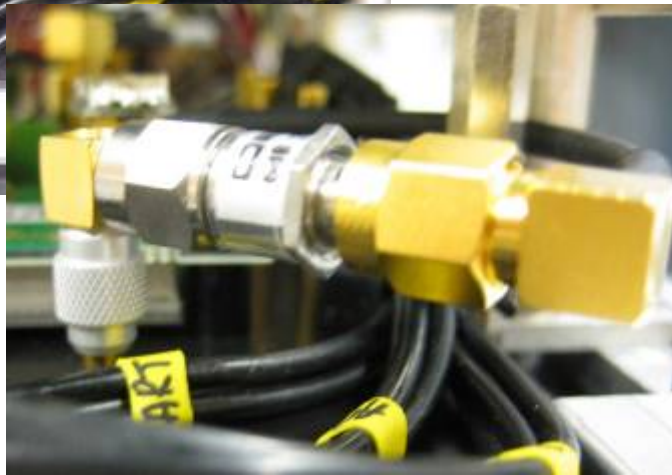
Zone of Attenuator position



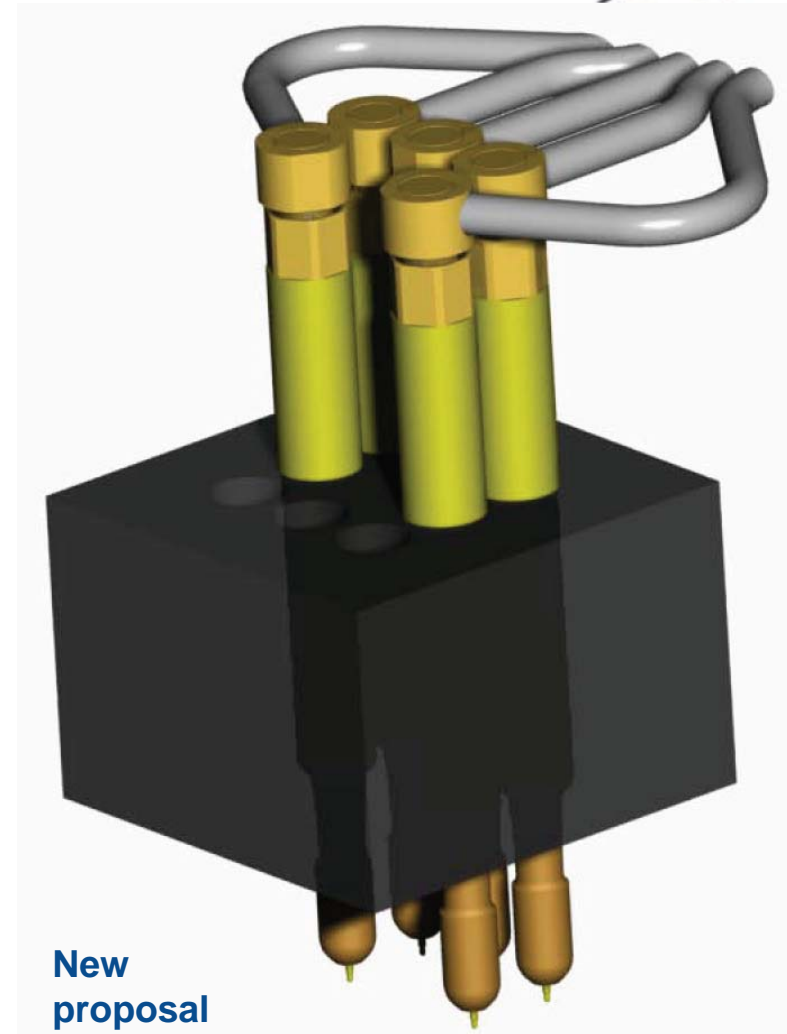
# Present Test Jig and new proposal



Present solution  
example using  
R/A cable  
connection

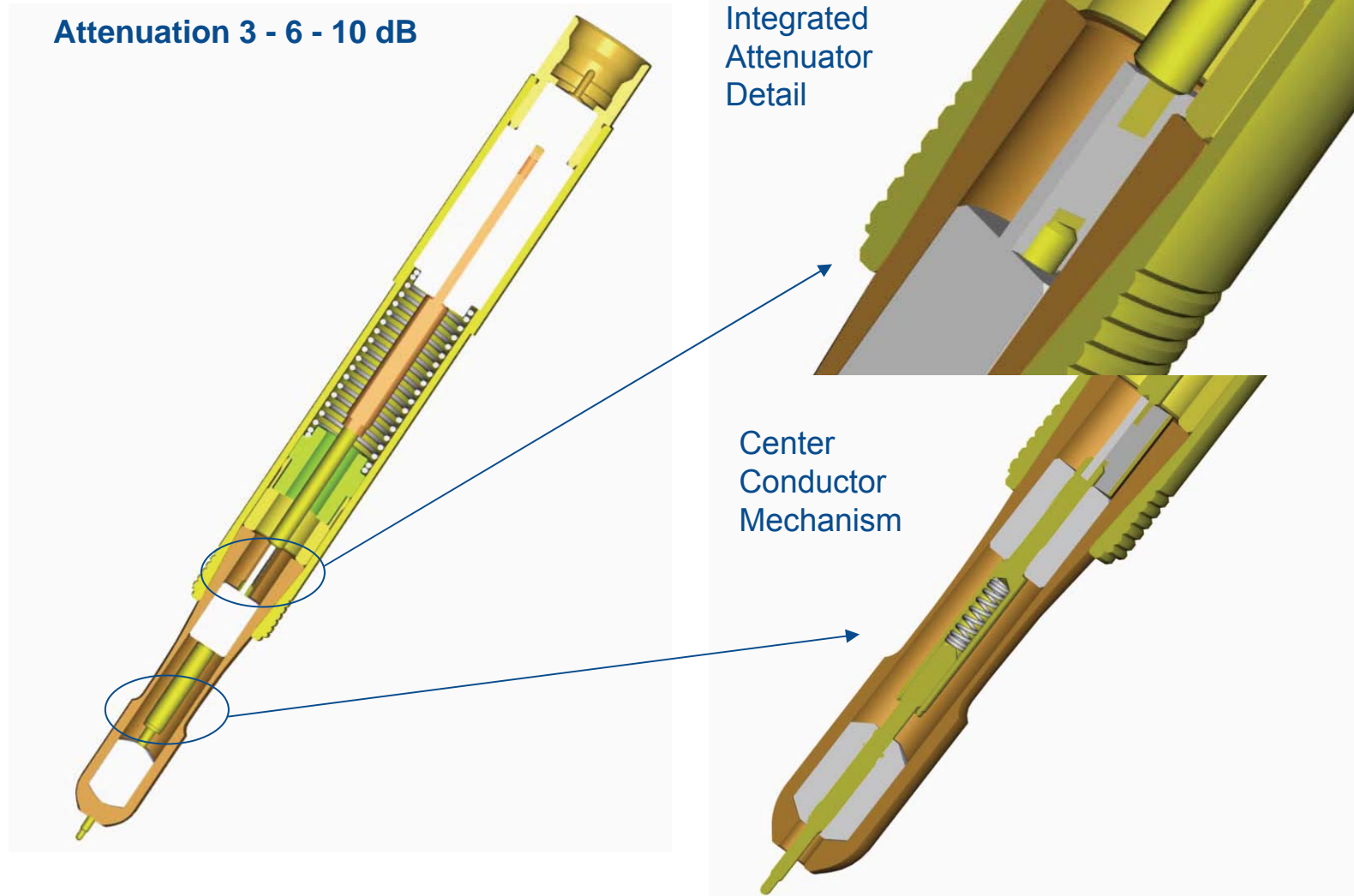


Overall dimensions reduced to guarantee 5 mm x 5mm pitch with better overall performance



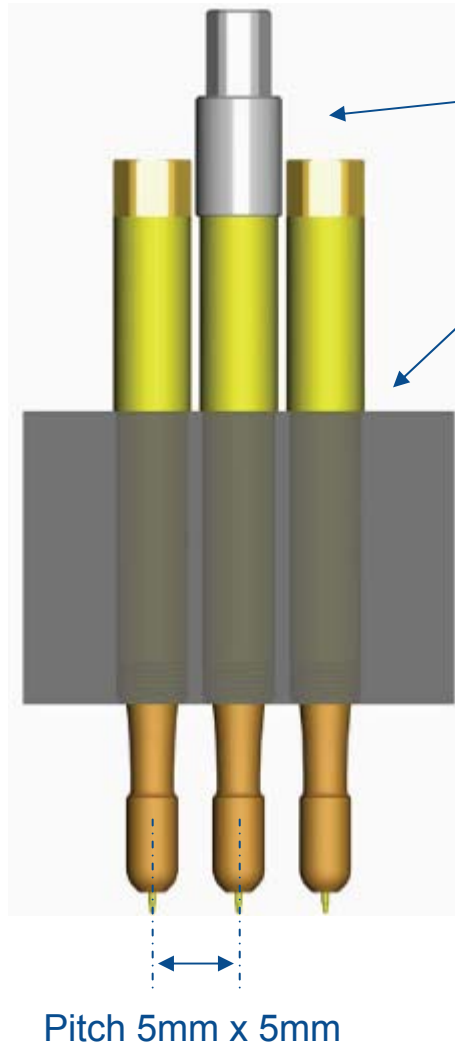
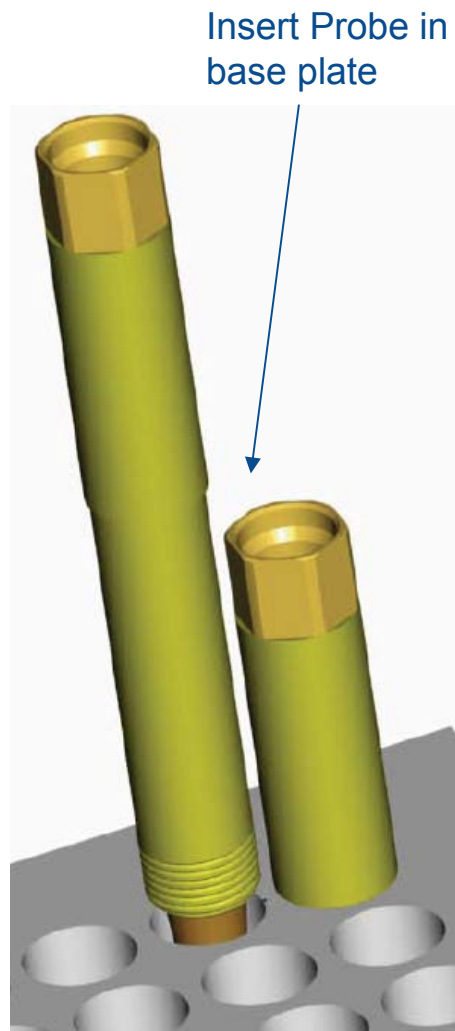
New  
proposal

# Project overview

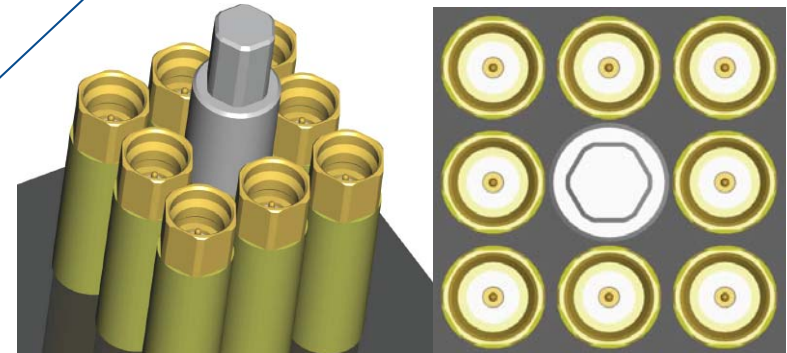




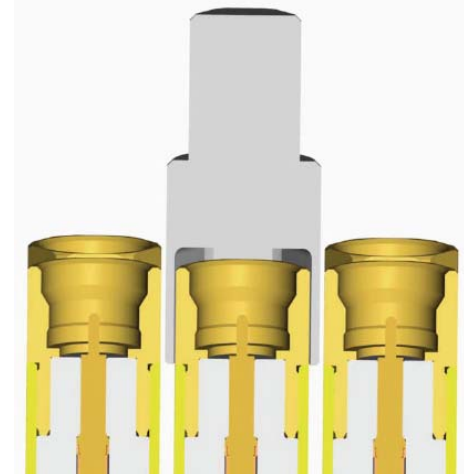
# Installation of Probes



Screw all Probes up to the mechanical stop, using a special pipe key.



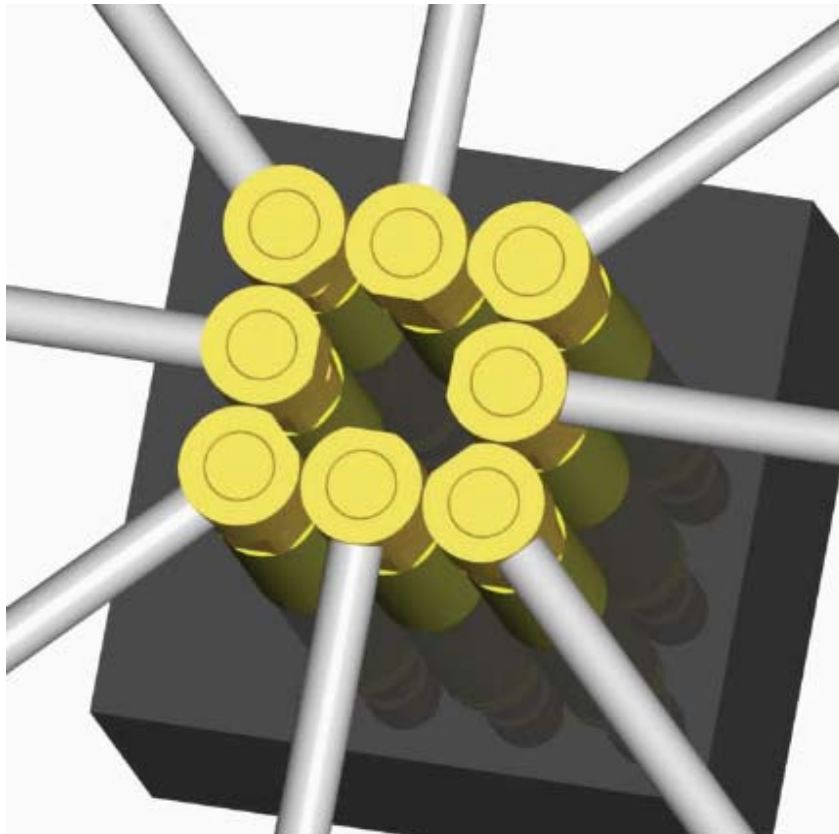
Target: Max  $\text{\O}4.5\text{mm}$



# Probe cable connection



Connection: snap fit interface

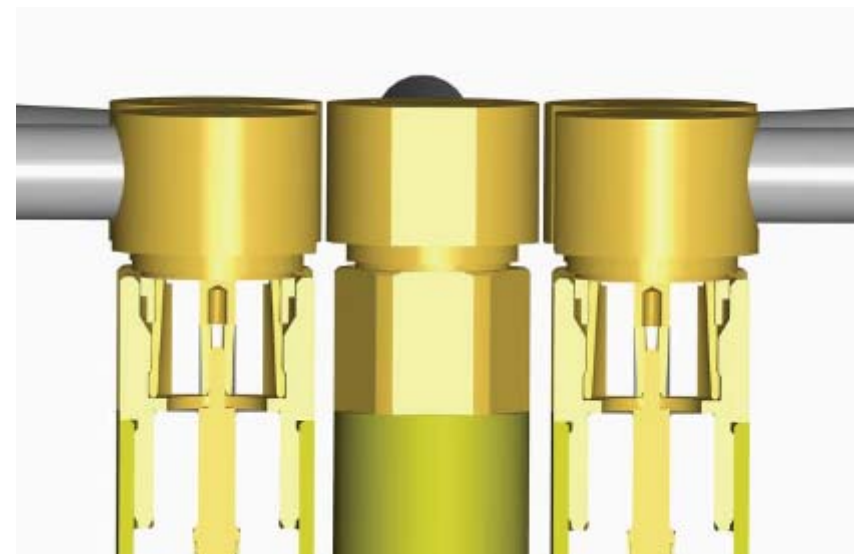


TE new concept mass production test probes could be placed at 5mm x 5mm pitch, only limitation is in a three rows scheme, you can use only 8 probes like shown.

Wiring is made with Cable RG 316 e.g. length and final connection TBD.

Detail of coupling:

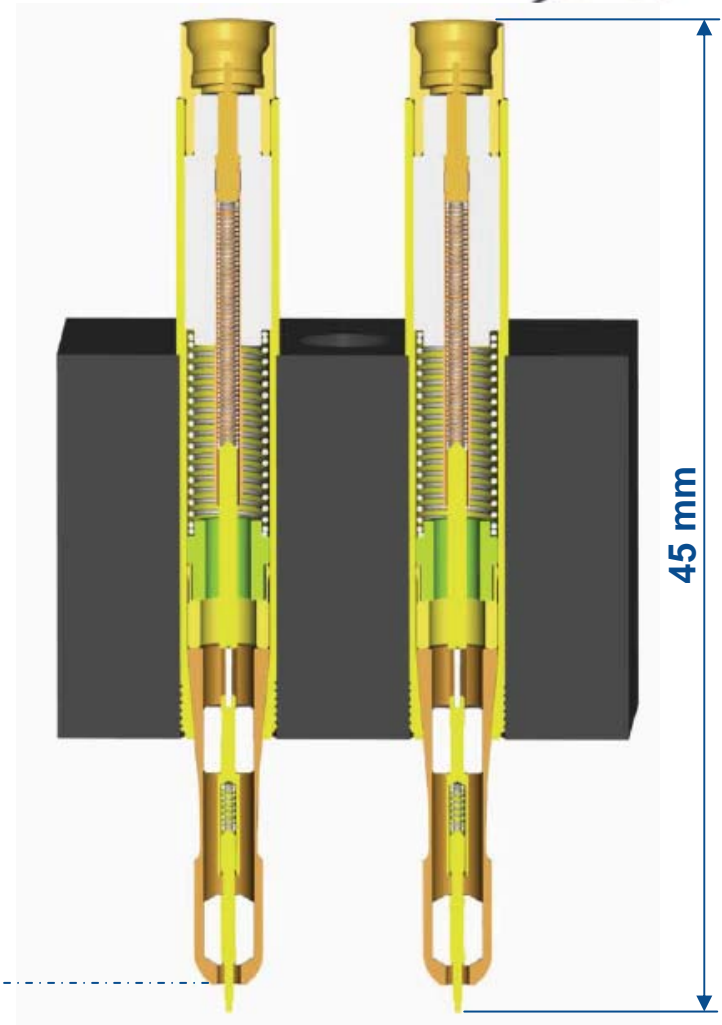
Snap fit male/female SMP  
as per MIL-STD-348A



# Mechanical characteristics



Total length 45mm  
and  
1 Mio Cycles  
Same of 619361  
actual probe



Stroke  $2 \pm 0.5$  mm

Radial compensation  $\pm 0.4$ mm

# Test Probe with Integrated attenuator



- Electrical Target:
  - 0 - 3 GHz present solution -10 dB,
  - 0 - 3 GHz new concept (6 or more dB attenuation) -20db.
- Other mechanical and environmental performances same as present probe 619361.
- Pitch set at 5 mm min, with 8 connections together



Pico Switching Coax Connector

# Snap-on Test Probe for Engineering & Repair Centers



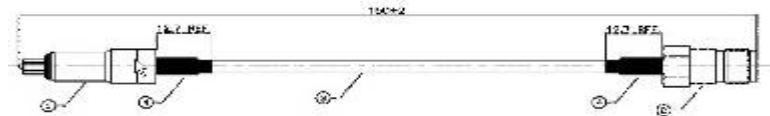
Patrick Duquerroy, July 2009

# Test Probe for Engineering and Repair

## PN 619383-1



- Mating force: 40 N max
- Unmating force: 10 N min
- Mating position: 360°
- Mating cycle: 500 min for the probe  
(limited to 30 for the switch)
- Return Loss: -15 dB: Dc - 3GHz
  - 13 dB: >3GHz – 6 GHz
  - 8 dB: >6GHz – 11 GHz
- For Cable attachment (crimp) RG 178)
- Complete cable assy available upon request.

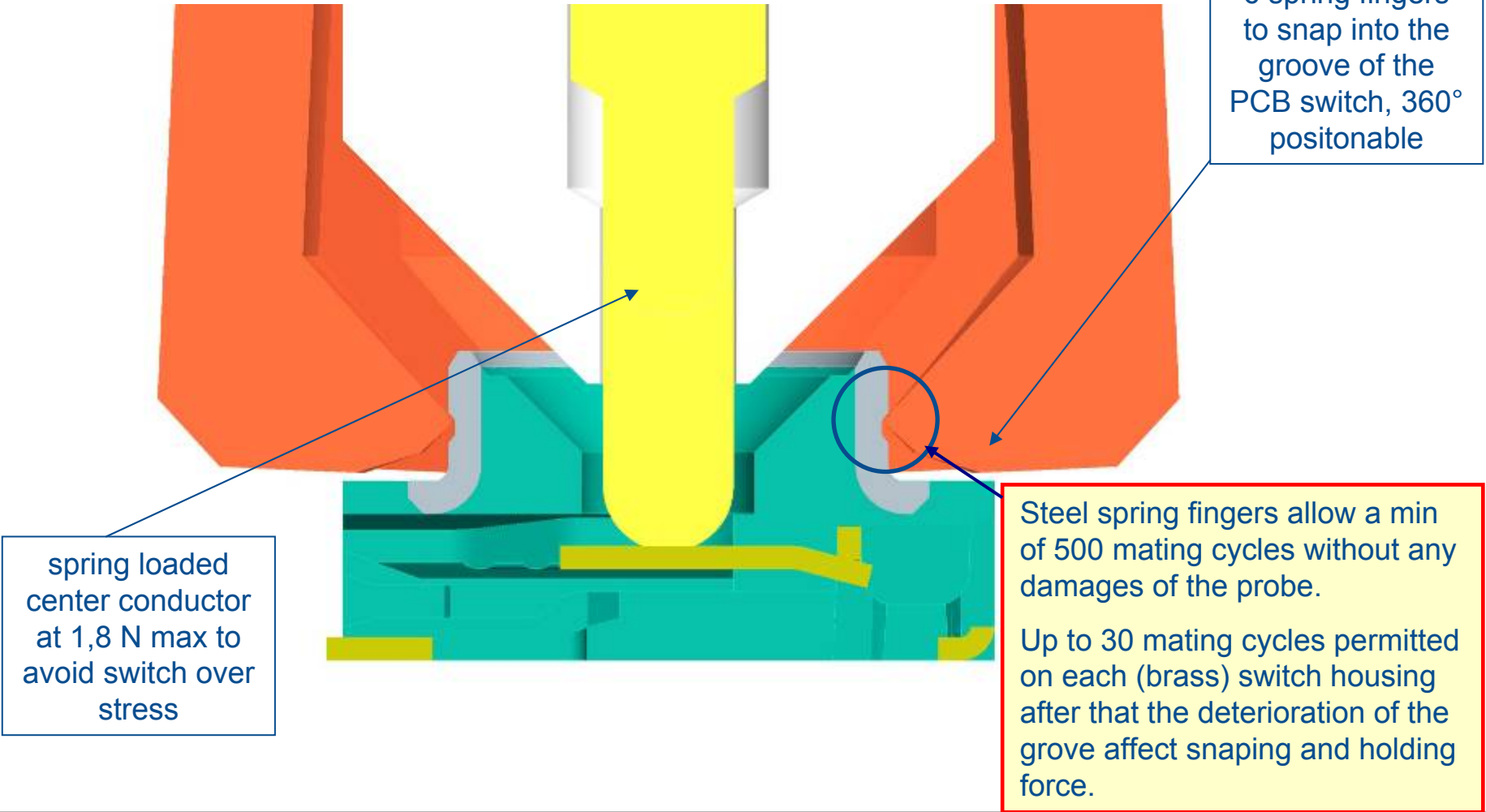


# Test Probe for Engineering and Repair

## PN 619383-1

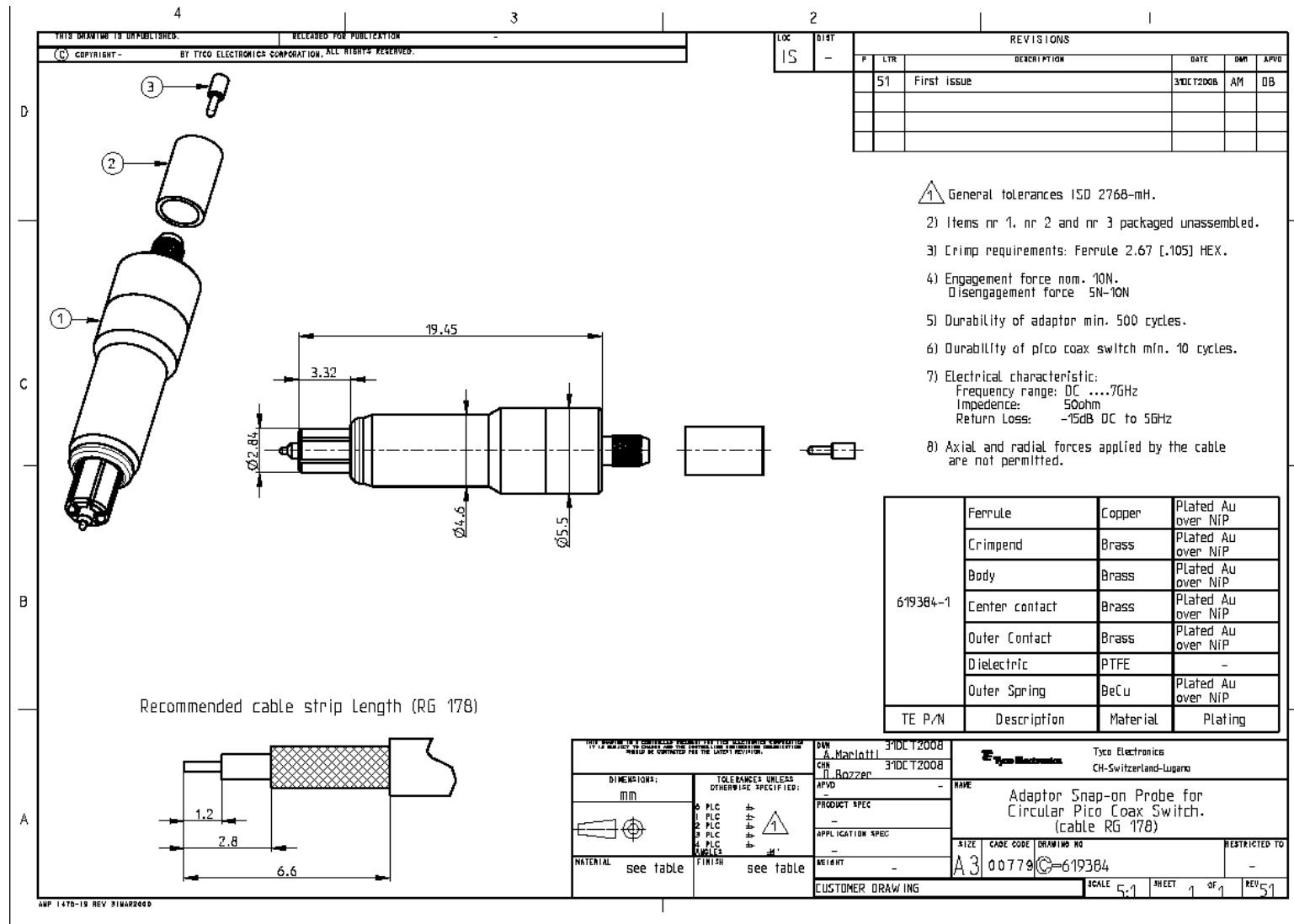


### SNAP-ON HAND TEST PROBE



# Test Probe for Engineering and Repair

## PN 619383-1





# TE Pico II Switching Coax System

**Any Question, let us talk!**

**THANK YOU!**



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Bowen Yu (China): [bowen.yu@tycoelectronics.com](mailto:bowen.yu@tycoelectronics.com)

**AME:** Claude de Lorraine: [cdelorraine@tycoelectronics.com](mailto:cdelorraine@tycoelectronics.com)