RF Switch

1. SCOPE

This specification covers the requirements for application of the Tyco Electronics* RF Switch.
This connector provides a path for a high frequency signal via a normally closed switch that can be opened by a probe, diverting the signal to the probe. Such a probe is typically applied for production or service testing purposes.

2. REFERENCE DOCUMENTION

108-19355	Product specification RF Switch
501-19143	Qualification test report
CR-2042876	Pico Switching Coax
C-1551372	Pico Switching Coax
C-619361	Pico Switching Coax Production Probe
C-619384	Pico Switching Coax Service Probe

3. NOMENCLATURE

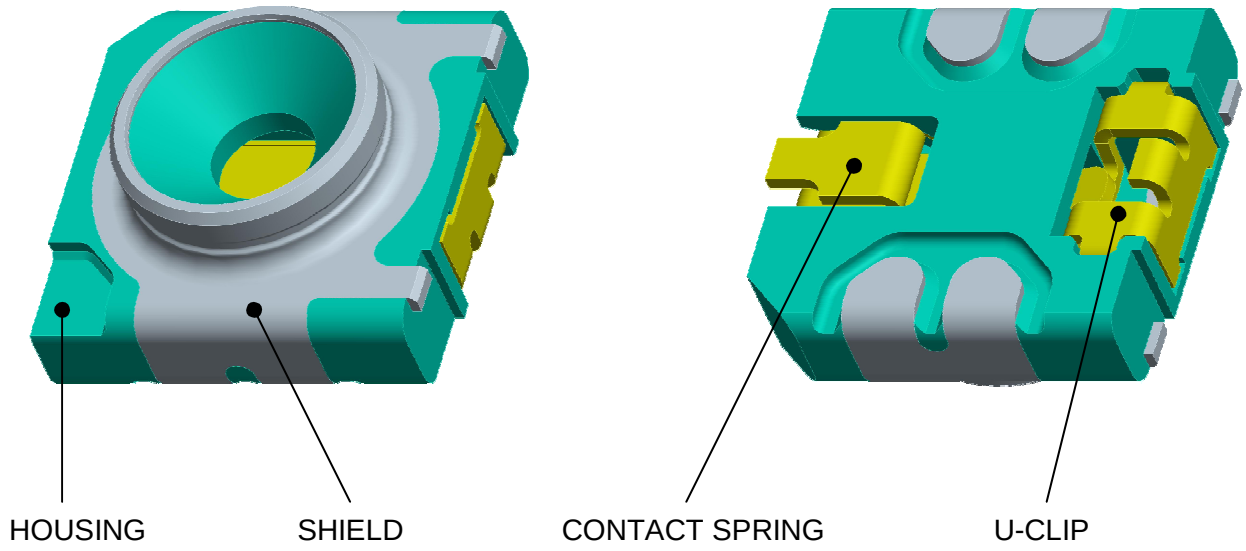

Figure 1 Nomenclature

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4. REQUIREMENTS

4.1 Connector packaging, storage and handling

The connectors are packaged and shipped in boxed reels of embossed tape packaging that conforms to Electronic Industry Association, EIA 481-B. Boxes should remain unopened until ready for use to prevent damage to the tape and to prevent contamination of the contacts.

They should be used on a first-in/first-out base to prevent possible storage contamination that could adversely affect connector performance. A shelf life duration of 12 months can be expected for this product.

4.2 Connector interface

4.2.1 Mating part

The RF Switch is designed to function with the Pico Switching Coax Production Probe or the Pico Switching Coax Service Probe, therefore it shall not be used in any other combination than covered by this application specification and product specification.

4.2.2 Mating directions, misalignment and insertion depth.

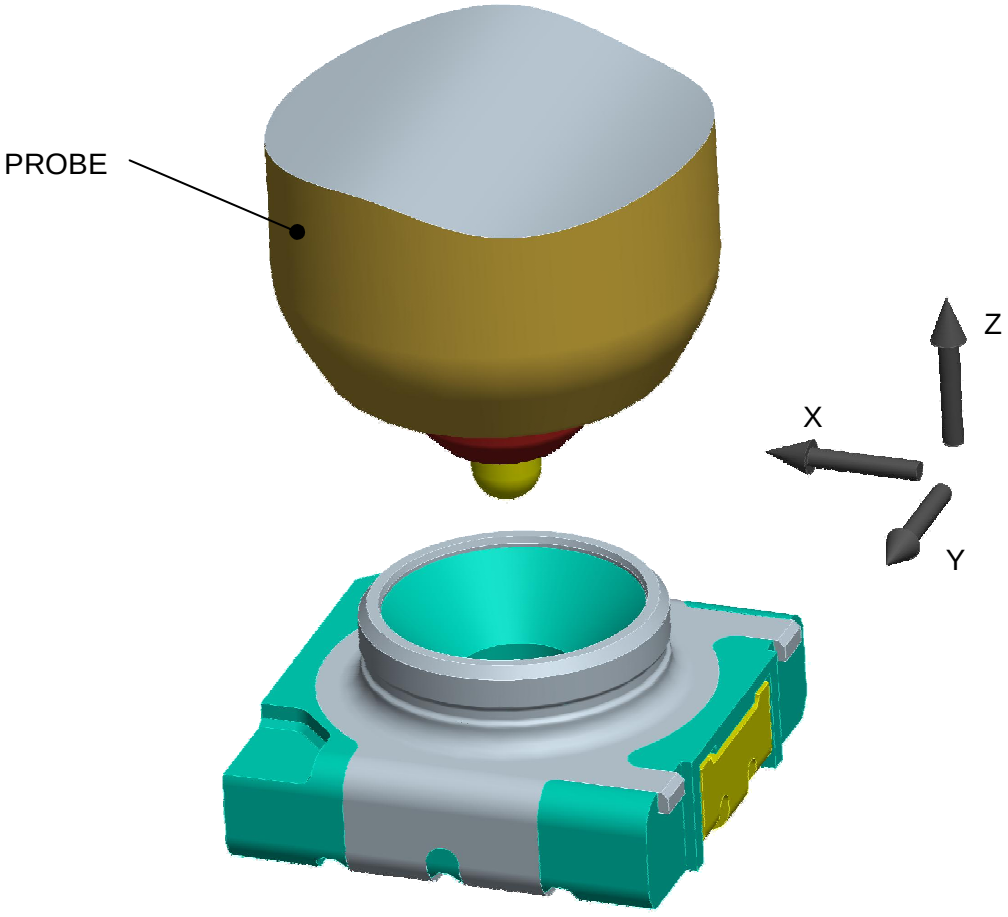

Figure 2 Directions

4.2.2.1 Mating directions

Mating of the probe shall be in the center of the RF-switch and in the –Z direction, as shown in Figure 2. Full mating of parts is required to ensure a good connection and to obtain the best signal transmission performance.

4.2.2.2 Misalignment

Proper alignment is essential to ensure failure free engagement and disengagement of RF-switch and probe.

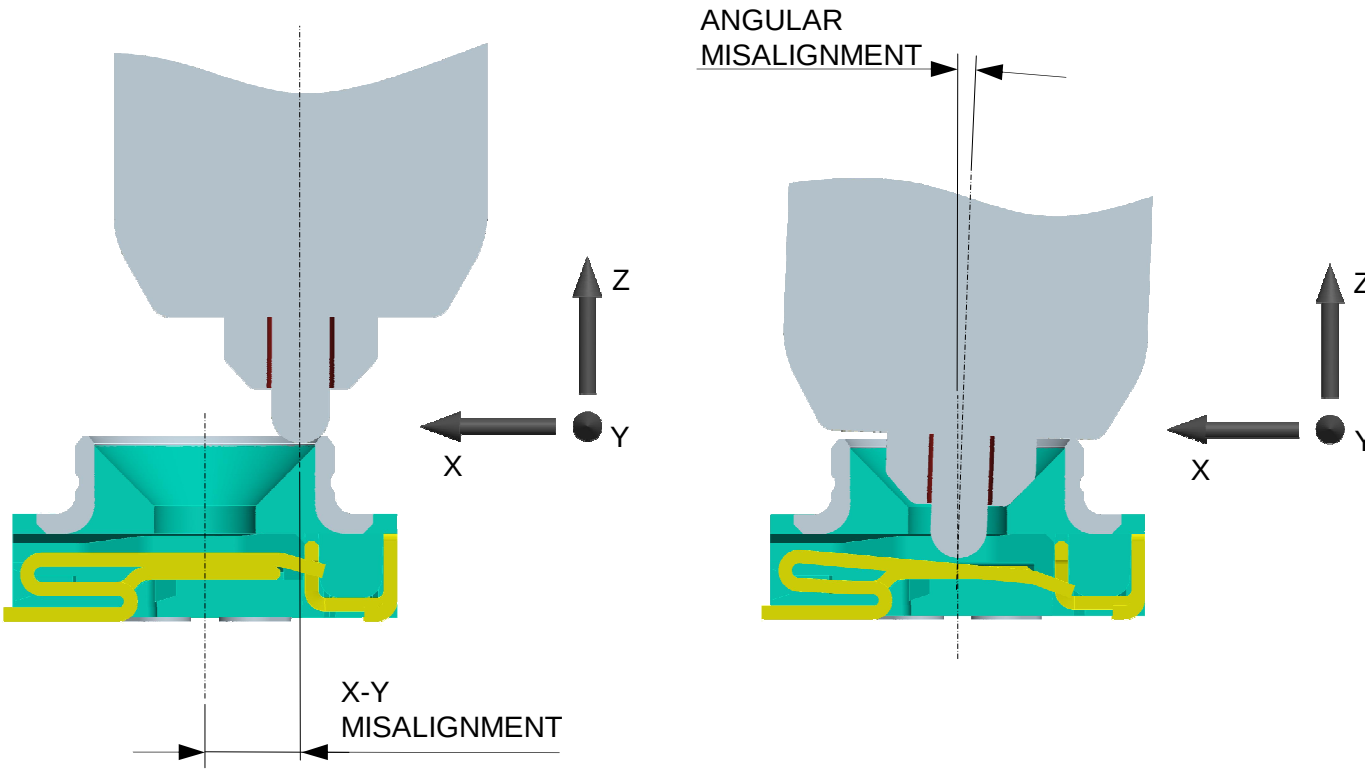

Figure 3 Misalignment

The maximum permitted misalignment of the probe in relation to the RF-switch in the X- and Y-direction is 0,4mm, as shown in Figure 3.

The maximum permitted angular misalignment of the probe in relation to the RF-switch in the YZ- and XZ-plane is 2,1° , as shown in Figure 3.

4.2.2.3 Insertion depth

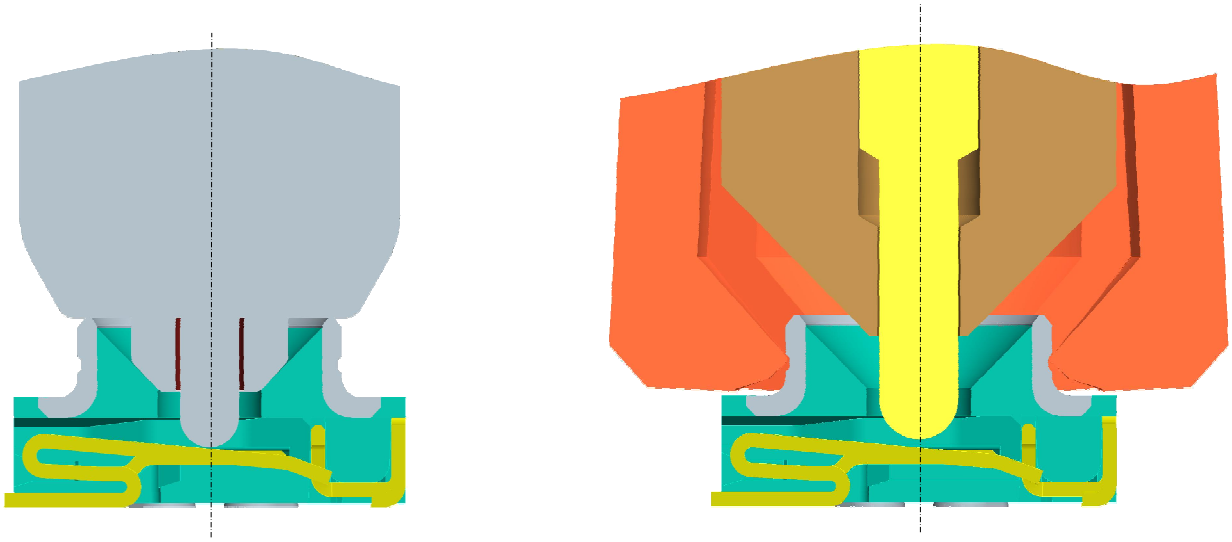

Figure 4 Insertion depth

The insertion depth of the production probe is determined by mating the top face of the shield and the face of the probe, as shown in Figure 4.

The insertion depth of the service probe is determined by snapping the fingers of the probe on the outer rim of the shield as shown in Figure 4.

4.3 Mechanical stability

The construction in the application shall provide mechanical stability in order to comply with the requirements specified in paragraph 4.2.1 and 4.2.2.This must avoid unacceptable force load on the connectors as well as on the pc board connection.

4.4 Abuse and misuse

The construction in the application shall assure that abuse and misuse will not lead to damage on the RF-switch and probe.

4.5 Printed Circuit Board

4.5.1 Lay out

The PCB solder pad layout shall be as specified on customer drawing.
For other components on the PCB a min. clearance as specified on the customer drawing should be taken into account.

As the routing of the layers and subsequent layers below the switch can affect the RF behavior of the switch, no other components or copper tracks as shown on the customer drawing should be designed between connector and PCB.

4.5.2 Solderability

Plated parts on the PCB shall be solderable as defined in Tyco specification 109-11-2. Additional information on solderability and soldering variables can be found in Tyco Electronics AMP Corporate Bulletin 52. Solder paste height shall be 0,1mm max.

4.6 Component positioning

The connectors are pre-positioned in the EIA packaging to accommodate robotic pick & place (see the customer drawing).
It is preferred to place the connector directly from the embossed tape onto the PCB without storage between, to avoid mechanical deformation and absorbance of dust and/or moisture.

4.7 Soldering proces

Connectors shall be surface mount soldered with Hot Air or Infra Red soldering method within the time/temperature curve as specified in Figure 5.

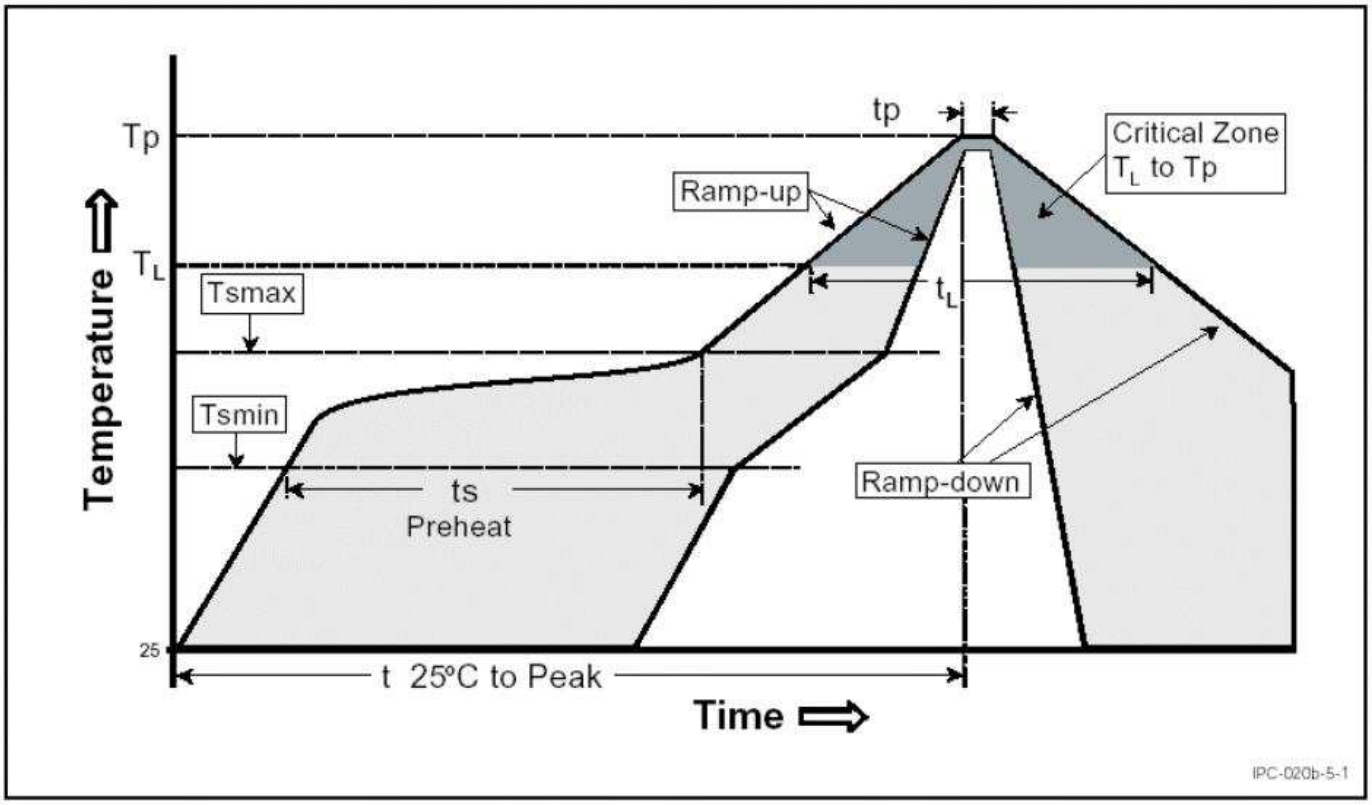

Figure 5 Temperature profile for reflow soldering

Profile feature	PB-Free Assembly Small Body
Average ramp-up rate (T_L to T_P)	3°C / second max.
Preheat - Temperature Min ($T_{S\ min}$) - Temperature Max ($T_{s\ max}$) - Time (min to max) (t_s)	 150°C 200°C 60 – 180 seconds
$T_{S\ max}$ to T_L - ramp-up rate	 3°C / second max.
Preheat - Temperature Min (T_L) - Time (t_L)	 217°C 60 – 150 seconds
Peak temperature (T_P)	260°C 0/-5°C
Time within 5°C of actual Peak temperature (t_P)	20 – 40 seconds
Ramp-down rate	6°C / second max.
Time 25°C to Peak temperature	480 sec max.

Note: All temperatures refer to topside of package, measured on the package body surface.

4.8 Hand soldering during removal and replacement

4.8.1 Connector removal from PCB

For removal of the connectors from the PCB manual hot gas soldering method shall be used. Damage to the removed connector is allowed. Solder conditions shall be as follows:

Max. air temperature	300°C
Max. air velocity	10m/s
Max. exposure time	30s

4.8.2 Connector replacement on PCB

Manual soldering iron method shall be used to solder the replacing connector to the PCB. Damage to the replacing connector is not allowed. Care shall be taken not to melt the connector housing. Solder conditions shall be as follows:

Tip diameter	Selected to fit application
Max. tip temperature when iron is removed from heater	370°C
Max. tip temperature when applied to connector solder leg	250°C max.
Antistatic protection	Required
Max. exposure time	3s

4.9 Visual examination

4.9.1 Contact damage

In the final product, the contact spring and u-clip shall not be deformed and their plating shall not be scratched by tools, collisions or any other cause during the placing, soldering and assembly process.

4.9.2 Solder connection

All solder legs shall be properly soldered on the appropriate PCB pads, and shall not show any cracks in their solder joints.
The criteria mentioned in Tyco Workmanship specification 101-21 must be fulfilled.