



**PRODUCT FAQs**

**Q: What is the difference between an X PROBE and a standard probe?**

A: The main difference between, for example, an X75-PRP2509S and a 100-PRP2509S is that the probe tube on the X75 Series is 1.110” long versus 1.000” long for the 100-PRP probe. The added length of the X75 Series is required to form the interconnect housing on the bottom of the probe tube. All other aspects of the probe are the same. The X Series probes when used with standard sockets will sit up approximately .085” higher than a standard series probe in the same socket. This can be useful in special applications where it’s desirable to have the probe sit up higher in a standard socket.

**Q: What is the main advantage of using QA’s X PROBE over conventional probe and sockets?**

A: The X PROBE allows larger more robust probes to be mounted on closer centers. By eliminating the socket from the system, a .100” center probe can be mounted on .075” centers (X75 Series) and a .075” center probe can be mounted on .050” centers (X50 Series).

**Q: Will pointing accuracy be affected when comparing standard probes and sockets to the X PROBE Series?**

A: Pointing accuracy is defined as the maximum radial deviation of a probe tip from the true centerline of a probe’s mounting hole. The total probe-to-target accuracy is dependent upon the “Fixture Offset”, the “Scatter Pattern Offset”, and the “Scatter Pattern Diameter”. When compared to standard probes and sockets, the X PROBE’s pointing accuracy is increased because the “Scatter Pattern Offset” is reduced through the elimination of the socket. For a more in depth description of pointing accuracy see the Applications Note on Pointing Accuracy in QA’s Technical Reference Book.

**Q: What is the difference in average resistance values between the X PROBE and Conventional Probes for both the 250 and 400 stroke series?**

| <b>Average Resistance Values of X PROBE versus Conventional Probes</b> |                     |                   |                     |
|--|---------------------|-------------------|---------------------|
| <i>250 Stroke</i>  |                     | <i>400 Stroke</i> |                     |
| <i>X PROBE</i>   | <i>Conventional</i> | <i>X PROBE</i>    | <i>Conventional</i> |
| X39-PRP25 = 46mΩ   | 050-PTP25 = 19mΩ    | X39-PRP40= 52mΩ   | 050-PTP40 = 34mΩ    |
| X50-PRP25 = 25mΩ   | 075-PRP25 = 16mΩ    | X50-PRP40 = 24mΩ  | 075-PRP40 = 18mΩ    |
| X75-PRP25 = 17mΩ   | 100-PRP25 = 12mΩ    | X75-PRP40 = 14mΩ  | 100-PRP40 = 11mΩ    |

**Q: What is the Termination made of and how long will it last?**

A: The Termination is a hardened (38 HRC) Beryllium Copper with a plating of hard gold over electroless nickel. The Termination must not only provide a good electrical path from the probe to the wire termination but also be able to withstand forces during installation, wire wrapping, and many probe insertions and extractions. The Termination is designed to perform for the life of the fixture under typical test conditions.

**Q: How many times can the same probe be reinstalled on a Termination?**

A: A probe can be reinstalled on a Termination a maximum of 5 times. After this, the probe retention is



reduced to the point where the probe is loose on the interconnect pin. The probe retention indents on the probe are the mechanical features that hold the probe to the Terminations interconnect pin. The probe is designed to be the “wear point” in the system, by replacing the probe, you’ve restored the retention force.

**Q: How many times can a NEW probe be installed on a Termination?**

A: 100 separate new probes were subsequently installed and then removed from a single Termination. The retention force of the probe(s) to Termination was consistent and the Terminations Interconnect pin showed only light plating wear (viewed at 20X). The Termination is designed to last the life of the fixture under normal operating conditions. If damaged, however, the Termination can be replaced.

**Q: How do we wire wrap on the X50 PROBE Series and can more than one wire be wrapped to the post?**

A: The X50 Termination is designed around a .500” long .016” square post. The length of the post allows up to four 30 AWG wires to be wrapped to it. Due to its size, a regular style wrap and the installation of shrink tubing on every other post is recommended. Please request our 050 Wire Wrap Applications Note where a more detailed explanation is given.

**Q: When installing the Terminations into G10/FR4 we notice that little shavings of metal form around the base of the Termination, what causes this?**

A: The hole diameter in the Back Plate is too small and the Retention Bead(s) is being sheared off during installation. This is a bad situation. These shavings will create shorts between adjacent Terminations. Worst yet, these shavings will “float” and be moved by the vacuum so that the shorts may occur at random making troubleshooting difficult. Making sure that the hole diameter is within the recommended hole sizes for the Termination being installed can prevent this. Do not assume that drilling G10/FR4 or equal with a .038” carbide circuit board drill will result in a .038” diameter hole. Quite often, the drills diameter starts out .0003” undersized and the end hole diameter can be as much as .001” undersized. Spot-check hole diameters with the proper Pin Gauge (PG Tool) while drilling to ensure that the hole diameter stays within tolerance.

**Q: What is the difference between the X75-TW and the revised X75-TWA terminations?**

A: The only difference is that the bead and body diameters of the X75-TWA termination are .0035” smaller than the X75-TW terminations. This allows the Probe Plate to be drilled with a .0545”/.0555” hole compared to the original .0580”/.0590” hole diameter. The X75 probe is .0540” diameter and by installing it in a .0545”/.0555” hole the pointing accuracy is increased while still allowing the termination to be replaced without removing the Probe and Spacer Plates. The Back Plate must be drilled to .0515”/.0525” diameter to accommodate the X75-TWA termination and tools labeled with X75A must be used to install and remove the X75-TWA terminations. The X75A tools can be used with the X75-TW terminations when required.

**FIXTURING FAQs**

**Q: Can the X PROBE be used on existing test platforms?**

A: Yes, the X PROBE is compatible with Agilent, Genrad, Teradyne, and others. Fixture designs have to be able to accommodate the additional plates. In general, the height of the fixture is increased and in the case of Agilent compatible fixtures, wider rails (up to 1” depending on the set height) are required to maintain the depth of the wiring area to accommodate the Personality pins and Alignment plate.

**Q: Can the X PROBE be used with both pneumatic and vacuum fixtures?**

A: Yes, the X PROBE design does not limit the type of fixtures that they can be used on.

**Q: Can standard test probes and sockets be mixed mounted with the X PROBE Series?**

A: Yes, with design considerations standard test probes can be mixed mounted with the X PROBE Series. A standard socket would mount in the Probe plate and clearance holes would have to be drilled in the Optional Spacer and Back plates. In a vacuum fixture a method would have to be designed to maintain the integrity of the vacuum. The best approach is to cut out areas in the plates where the sockets are to be mounted and design inserts with gaskets to accommodate them.

**Q: Can X PROBES be used on closer centers than what is listed?**

A: Yes, the X39 can be mounted .038", the X50 at .0485" and the X75 at .0735". These dimensions are based on the stop diameter of the X PROBE Installation (IT) Tool.

**Q: What type of plate materials can we use for the fixture?**

A: Although not recommended for the Back Plate, acrylics, polycarbonates, and PVC's may be used for the Probe and Optional Spacer Plates. Standard epoxy fiberglass laminates such as G10/FR4 and similar materials are recommended for the Back Plate due to the retention requirements of the Termination pins. The mounting hole sizes listed in the Suggested Fixture Layout drawings are designed for epoxy fiberglass laminates.

**Q: Is the Spacer Plate shown on the "Suggested Fixture Layout" drawings necessary?**

A: No, the *Optional* Spacer Plate is an intermediate support plate that when fixed to the Back Plate adds additional strength. On small to medium sized fixtures this can be replaced with fixture standoffs or flanges. Note that the *Optional* Spacer Plate does help with the alignment of the probe to the Termination during probe installation.

**Q: Should the Optional Spacer Plate be drilled larger than the recommended minimum hole size?**

A: In large fixtures where the alignment of holes between the three plates is difficult to maintain, it is recommended that the holes in the *Optional* Spacer Plate be enlarged to accommodate any misalignment, as the size of these holes is not crucial to the X PROBE assembly. The holes in the *Optional* Spacer Plate act as a guide for the X PROBE Interconnect Receptacle onto the Termination pin. If a relieved hole is desired on the *Optional* Spacer Plate it is recommended that the oversized hole be on the top surface versus the bottom as this additionally guides the probe.

**Q: Can the Probe Plate holes be relieved on the bottom side in order to help maintain hole accuracy when drilling?**

A: Yes, the purpose of the .500" thick Probe Plate that is shown on our Suggested Fixture Layout drawings is to support the probe and guide it to the intended target. The backside or bottom of this plate can be drilled oversized to reduce the top-hole depth. A .250" engagement is sufficient.

**Q: How is the distance from the Probe Plate to the tip of the probe adjusted for the various heights of components on my PCB?**

A: The height of the probe is controlled by the set height of the Termination. Our IT-X50 set .XXX and IT-X75A set .XXX installation tools can be used to set the Termination between .000 and .140" off the surface of the Back Plate. Note that the set height of conventional fixtures is calculated from the Probe Plate where as the set height of an X PROBE fixture is from the Back Plate (see Suggested Fixture Layout drawings).

**Q: How are additional probes and Terminations added to a completed fixture?**

A: Because the X PROBE system relies on accurately drilled and aligned holes, the recommended approach is to remove all of the probes and plates. The new hole locations must be accurately registered from the original reference points so that the probe and Termination will align during assembly.

**Q: How are the Terminations replaced?**

A: If a Termination gets broken during fixture assembly, the Termination can be driven out with our ET-X39, X50 and X75A extraction tools. If there is enough room around the top of the Termination, pliers or similar tools can be used to pull the Termination out from the top. In order to replace a Termination in a completely assembled fixture our ET-X39-EXT, ET-X50-EXT & ET-X75A-EXT tools must be used. These tools are designed to remove and replace a Termination with the Probe Plate, and Optional Spacer Plate in place (see apps note).

**Q: How much weight will be added to a fixture designed around the X PROBE?**

A: Approximately 20 lbs for an average sized fixture. An X PROBE fixture requires a Top Plate (Support Plate), Probe Plate, Optional Spacer Plate, and Back Plate while the conventional fixture has a Top Plate and Probe Plate (Socket Mounting Plate).

**Q: When comparing the prices of two identical test fixtures, one built with standard probes and the other with X PROBES, how do their costs compare?**

A: It depends!!

The purpose of a Socketless probe is to put a larger probe on closer centers. Meaning, X PROBE Socketless Technology was developed for fixtures requiring larger quantities 75 mil centers, 50 mil centers, and 39 mil center probes than 100 mil center probes.

Please keep in mind QA does not build fixtures! QA manufactures test probes in service & support of the in-circuit test industry. The following is for use as a guideline to determine if X PROBE Technology should be considered for your fixture.

A best guesstimate comparing conventional probe costs to X PROBE costs would be...

If a fixture is predominately 100 mil centers, the cost using X PROBE Socketless Technology would be greater than a conventional 100 center mil probe fixture.

If a fixture is predominately 75 mil centers, the cost using X PROBE Socketless Technology could be equal to or less than a 75 mil center conventional probe fixture.

If a fixture is predominately 50 mil centers, the cost using X PROBE Socketless Technology could be equal to or less than a conventional 50 mil center probe and socket fixture.

If a fixture is predominately 39 mil centers, the cost using X PROBE Socketless Technology should be less than a conventional 39 mil center probe and socket fixture.

But QA does not build fixtures, only a fixture house can determine actual fixture costs / pricing.