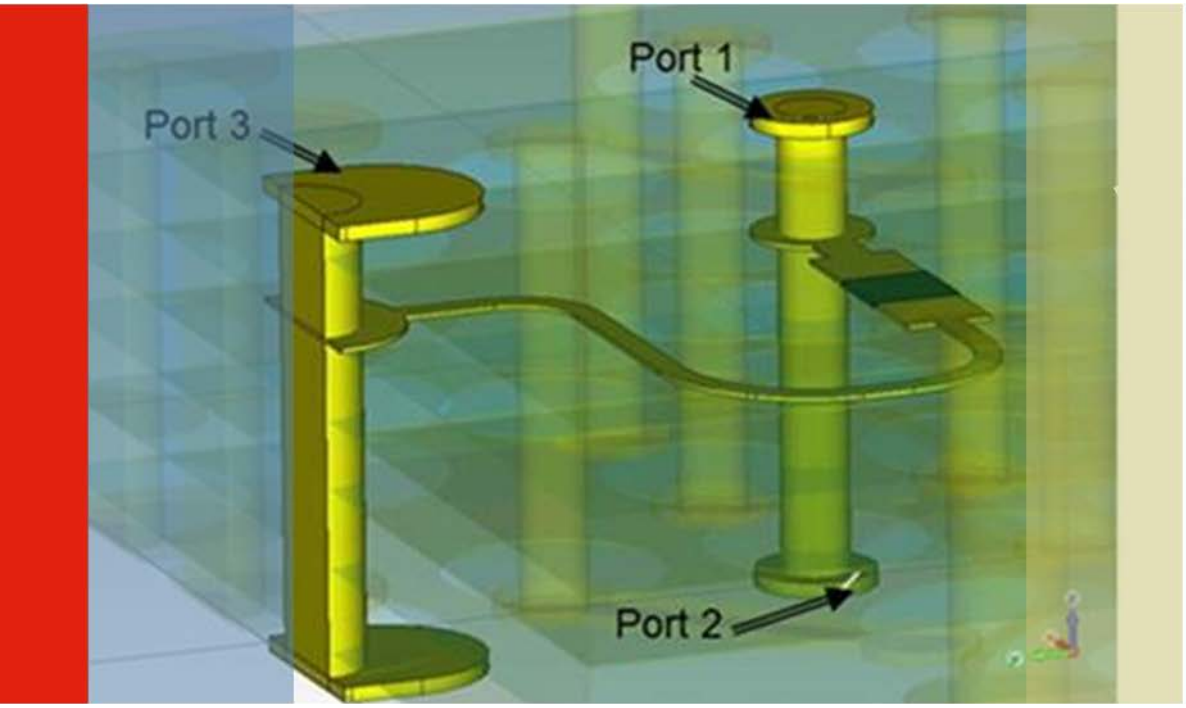
How-to-Guide



P7500 Series Probes Tip Selection, Rework and Soldering Guide

For Use with Memory Component Interposers

Tektronix®

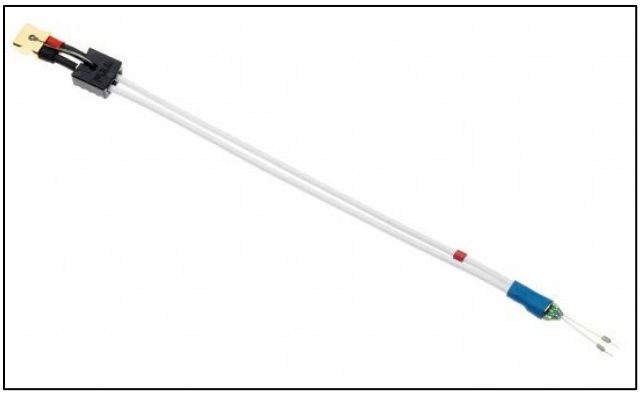
P7500 Series Probe Tip Selection, Rework and Soldering Guide for Use with Memory Component Interposers

Introduction

The Tektronix P7500 Tri-mode Probe is highly recommended for use in Memory interface Debug and Validation applications because the architecture provides several unique capabilities such as:

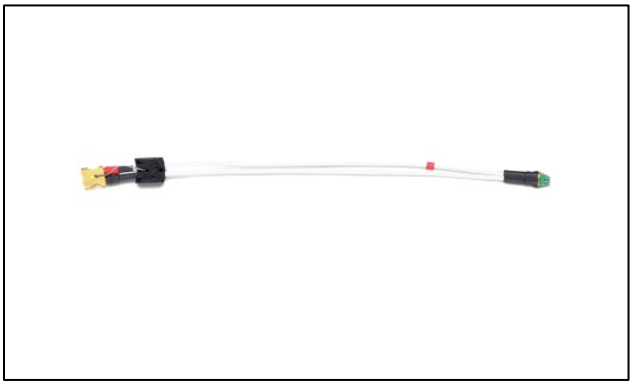
- High Bandwidth up to 25GHz
- Excellent Step response
- High CMRR
- Differential, Single ended, or Common Mode measurements using a single probe

There are 4 different types of solder down tips offering different bandwidths that can be used with the P7500 probes for probing the memory signals.

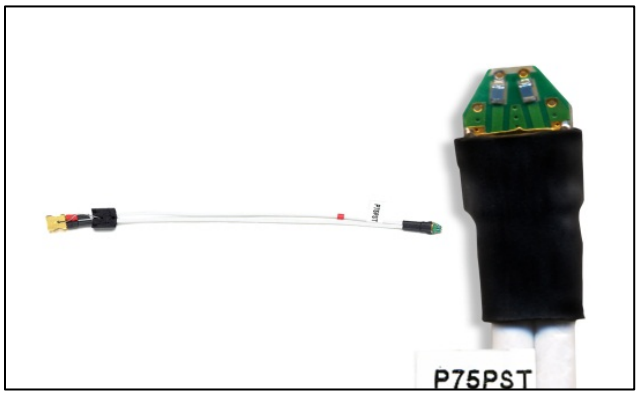


7GHz Bandwidth TriMode extended resistor solder tip.

18GHz Bandwidth TriMode resistor solder tip.



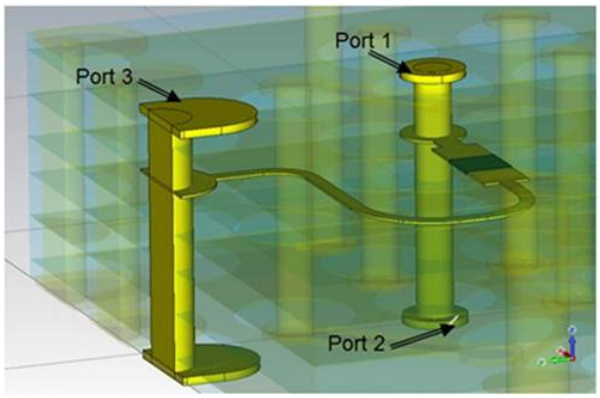
20GHz Bandwidth TriMode long reach solder tip.



25GHz Bandwidth TriMode performance solder tip.

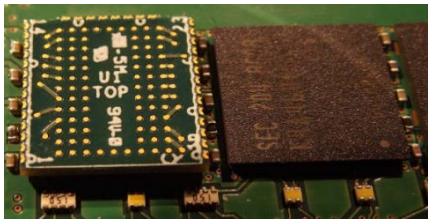
Memory Component Interposers

For maximum signal quality and good frequency response all of the memory component interposers have an embedded tap resistor placed as close as possible to the via carrying the signal inside the interposer. Depending on the Interposer, the tap resistor may be 100Ω or a 175Ω value.

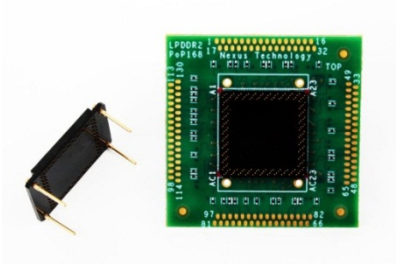


3D model of the Interposer showing the embedded isolation/damping resistor.

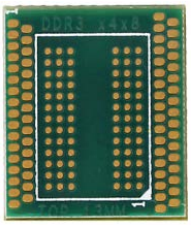
Interposer with different form factors:



Edge interposer



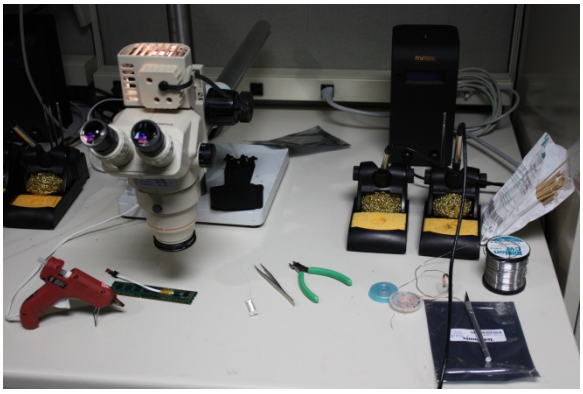
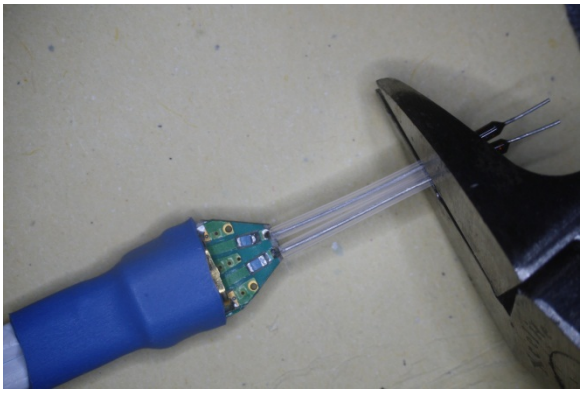
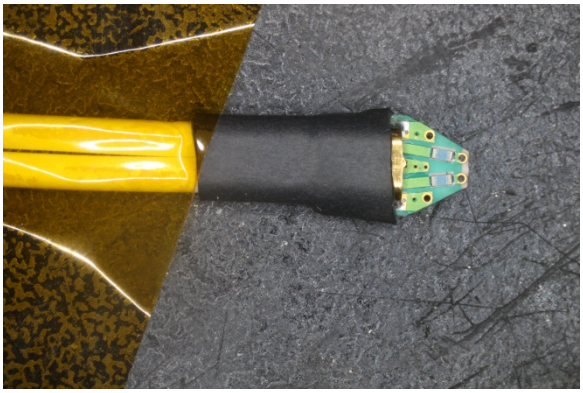
Socketed PoP interposer

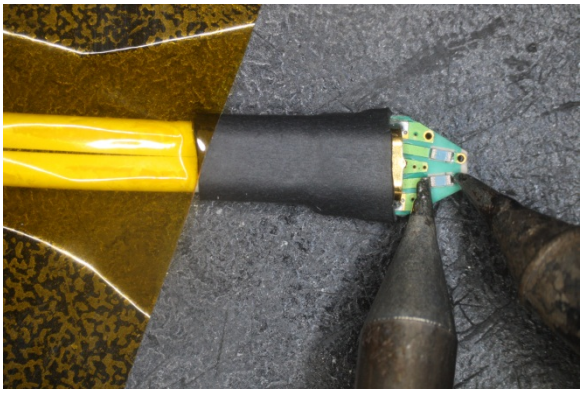
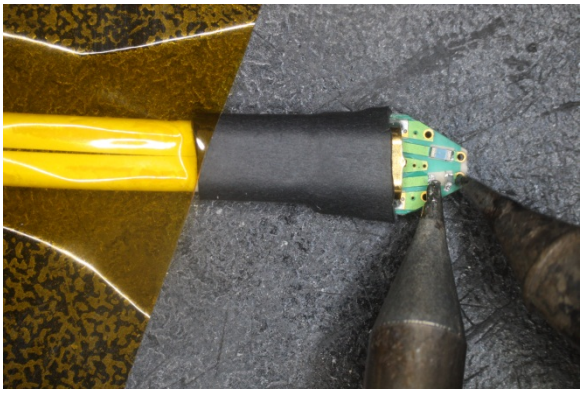
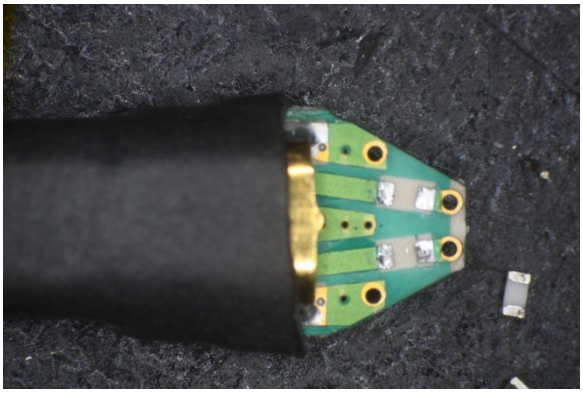
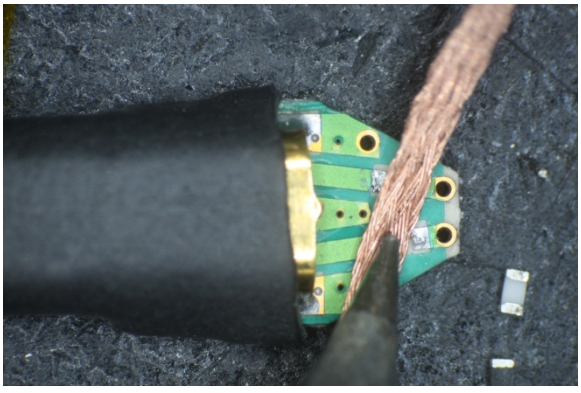


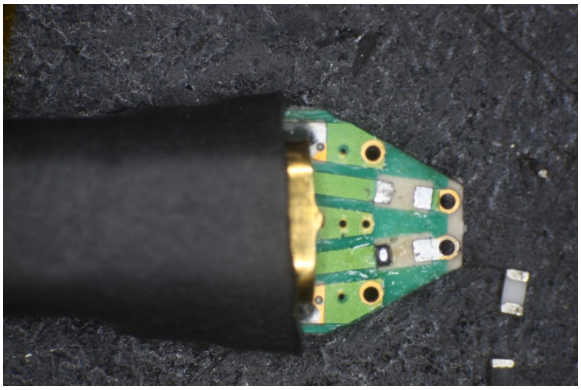
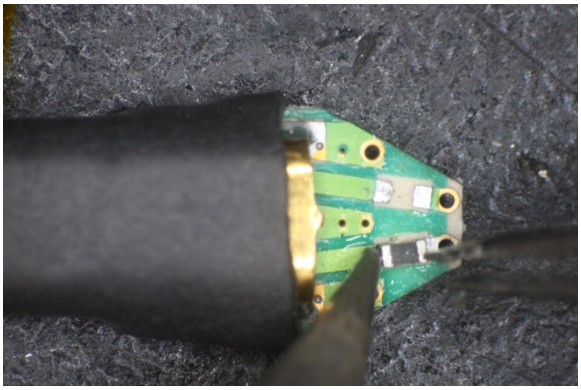
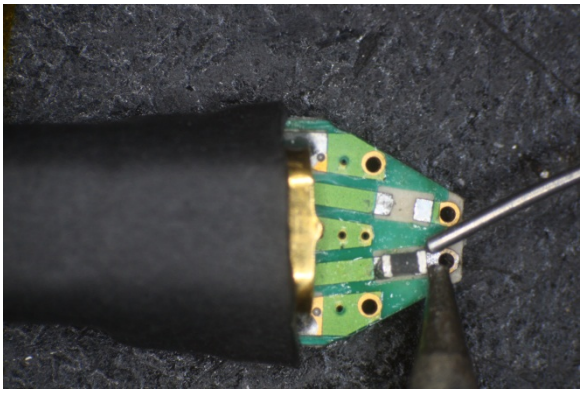
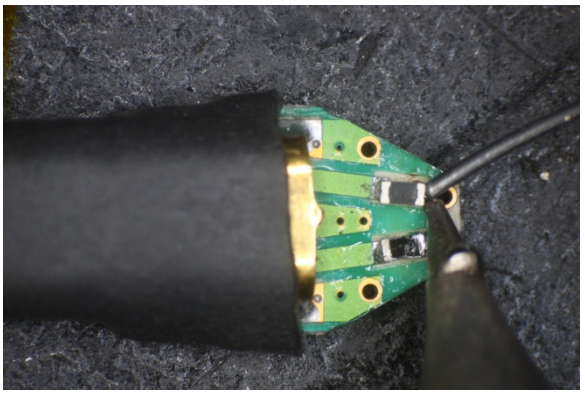
Soldered down interposers

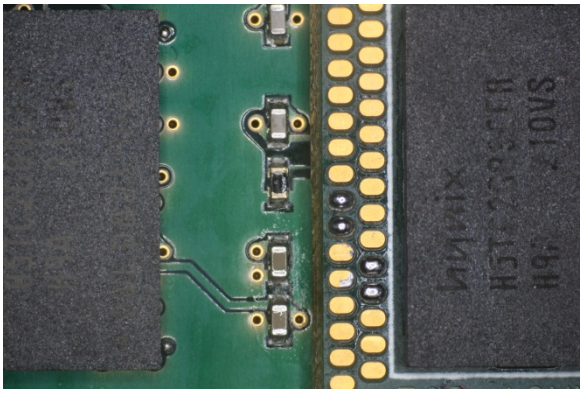
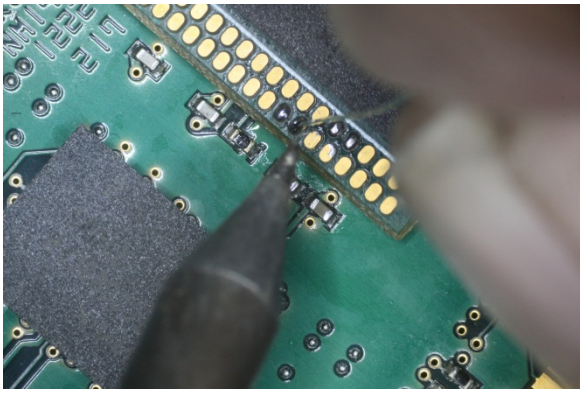
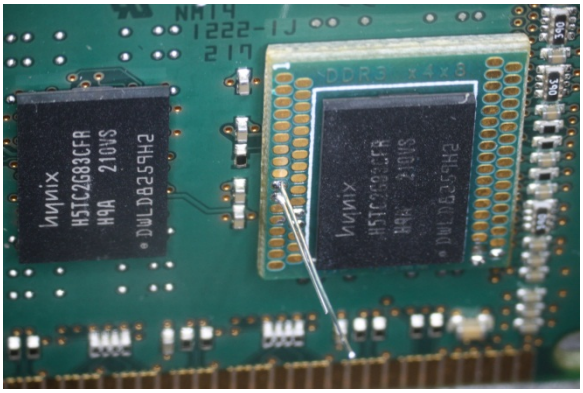
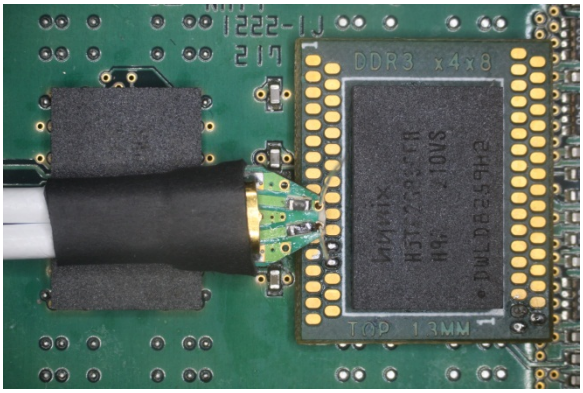
When the high bandwidth solder tips for P7500 are used with the interposers, the probe tips need to be reworked in order to match them to the interposer based on the Interposer tap resistor value and tip resistor. The total resistance for interposer and solder tip should sum to a total of 175Ω.

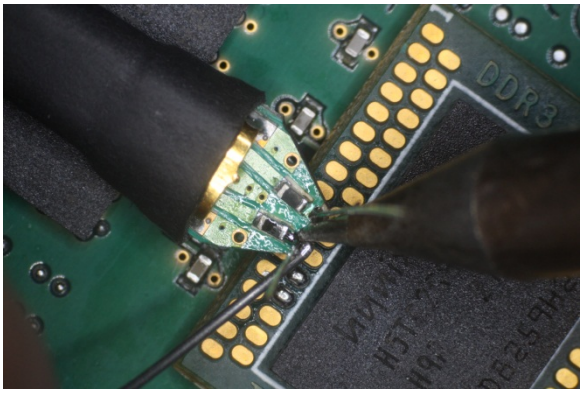
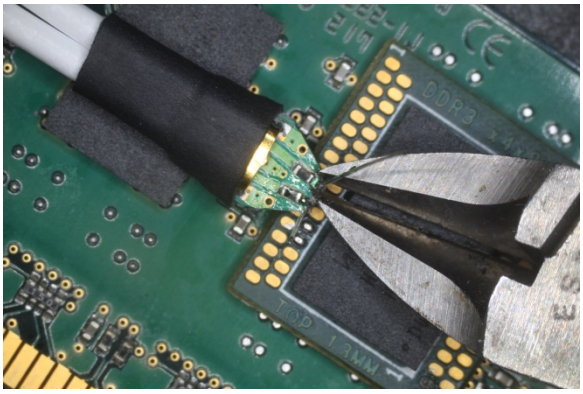
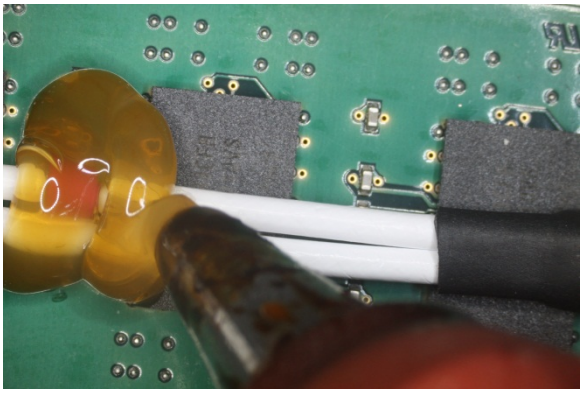
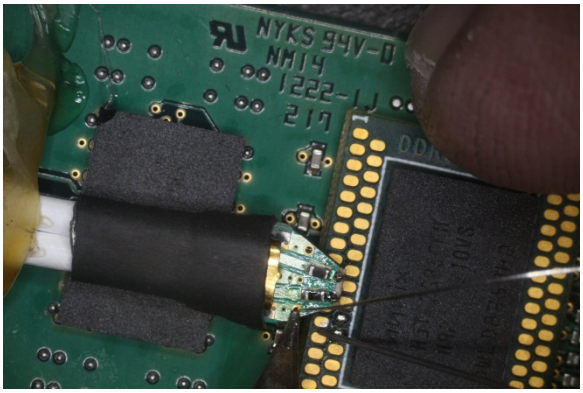
Tip Type	Part Number	Bandwidth	Resistor
TriMode Extended-resistor Solder Tip	P/N 020-2944-xx	7GHz	75Ω on the tip with 100Ω on long extended wire
TriMode resistor Solder Tip	P/N 020-2936-xx	18GHz	75Ω on the tip with 100Ω on short extended wire
TriMode Long reach Solder Tip	P/N P75TLRST	20GHz	175Ω on the tip
TriMode Performance Solder Tip	P/N P75PST	25GHz	175Ω on the tip

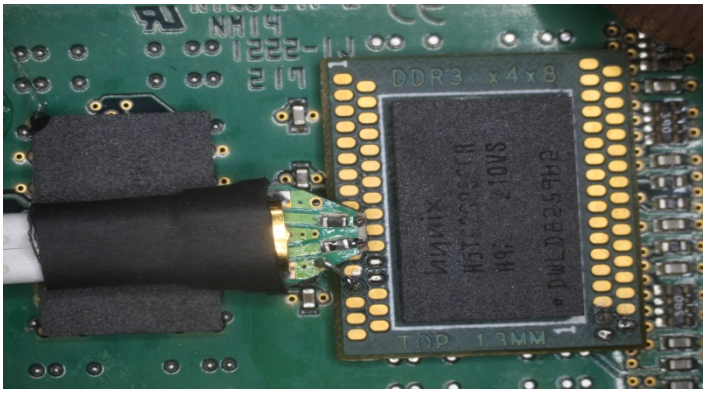
1. Equipment needed for rework. – Microscope with illumination – Wire Cutters – Fine Tip Tweezers – Two Soldering irons with Fine Tips – Lead Free Solder – Solder wick – Hot Glue Gun – Hot Glue – 0402 1% 75Ω and 0Ω Resistors – Anti-Static tape	
2. If a TriMode Extended-resistor Solder Tip or a TriMode resistor Solder tip is used with an interposer, the resistor on the wire can be snipped with the wire cutter making sure to leave some wire for soldering down to the interposer.	
3. For any other combination of the Tip and the interposer the Tip resistors need to be reworked	
4. Tape the Tip securely under the Microscope with some anti-static tape	

5. With two soldering irons apply heat on both sides of the resistor	
6. With the heat applied on both sides of the resistor, lift it off the pads. Make sure that you do not over heat the tip as there are chances of damaging the tip due to delamination or closing the via on the tip with solder.	
7. Repeat the same for the second resistor on the tip.	
8. Now with both the resistors removed from the pads using a solder wick to clean the pads of any extra solder and make them even without applying too much heat.	

9. After the pads are clear of older solder, apply new solder to one of the pads	
10. With a fine tweezers hold the resistor over the pad with lead and apply head	
11. Heat and apply solder to the other pad to solder resistor to both the pads on the tip	
12. Repeat the same steps to the other resistor to complete the tip rework	

13. To solder the tips to the Interposer, put some solder on the pads of interest	
14. Take a short piece of whisker wire that fits the solder tip hole and heat the solder on the pad and hold it in the center	
15. Repeat the same to the other pad so that there are two wires soldered to the pads.	
16. Thread the two wires through the holes on the tip from the bottom and slightly bend them to hold the tip in place	

17. Solder both the wires to the tip	
18. Remove the excess wire using a wire cutter	
19. Using a hot glue gun apply glue a point that is a little further away from the head and allow it to cool down. This glue now provides retention to the tip. Alternatively, apply non-conductive tape to hold the tip in place.	
20. If a ground is needed (required for single-ended signals, optional for differential signals), insert a whisker wire though one of the ground holes on the probe tip, and apply solder to this junction to hold it in place.	

21. Cut the wire to the required length and bend it so that it is positioned about the Ground pad and solder it.	

Interposer	Embedded Resistor in Interposer	Resistor value on the Tip after Rework
DDR4 78 Ball		
NEX-DDR4MCI78SCDSA	100Ω	75Ω
NEX-DR4MCI78SCDWA	100Ω	75Ω
NEX-DDR4MCI78SCDSD	100Ω	75Ω
NEX-DR4MCI78SCDWD	100Ω	75Ω
NEX-DDR4MP78BSC	100Ω	75Ω
NEX-DDR4MP78BSCSK	100Ω	75Ω
DDR4 96 Ball		
NEX-DDR4MCI96SCDSA	100Ω	75Ω
NEX-DR4MCI96SCDWA	100Ω	75Ω
NEX-DDR4MCI96SCDSD	100Ω	75Ω
NEX-DR4MCI96SCDWD	100Ω	75Ω
NEX-DDR4MP96BSC	100Ω	75Ω
NEX-DDR4MP96BSCSK	100Ω	75Ω
DDR4 144 Ball		
NEX-DDR4MP144BSC(SK)	175Ω	0Ω
NEX-DDR4MCI144SCDAD	175Ω	0Ω
NEX-DDR4MCI144SCDDH	175Ω	0Ω
NEX-DDR4MCI144SCDDL	175Ω	0Ω

Interposer	Embedded Resistor in Interposer	Resistor value on the Tip after Rework
DDR3 78 Ball		
NEX-DDR3MP78BSC	100Ω	75Ω
NEX-DDR3MP78BSCSK	100Ω	75Ω
NEX-DDR3MCI78SCDS	100Ω	75Ω
NEX-DDR3MCI78SCDSA	175Ω	0Ω
NEX-DDR3MCI78SCDSD	175Ω	0Ω
DDR3 96 Ball		
NEX-DDR3MP96BSC	100Ω	75Ω
NEX-DDR3MP96BSCSK	100Ω	75Ω
NEX-DDR3MCI96SCDS	100Ω	75Ω
NEX-DDR3MCI96SCDSA	175Ω	0Ω
NEX-DDR3MCI96SCDSD	175Ω	0Ω
LPDDR3 216 Ball		
NEX-LPDDR3PoP216SC	100Ω	75Ω
NEX-LPDDR3PoP216SCSK	100Ω	75Ω
LPDDR2 216 Ball		
NEX-LPDDR2PoP216SC	100Ω	75Ω
NEX-LPDDR2PoP216SCSK	100Ω	75Ω
LPDDR2 240 Ball		
NEX-LPDDR2PoP240SC	100Ω	75Ω
NEX-LPDDR2PoP240SCSK	100Ω	75Ω
LPDDR2 168 Ball		
NEX-LPDDR2PoP168SC	100Ω	75Ω
NEX-LPDDR2PoP168SCSK	100Ω	75Ω
LPDDR2 136 Ball		
NEX-LPDDR2PoP136SC	100Ω	75Ω
NEX-LPDDR2PoP136SCSK	100Ω	75Ω

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