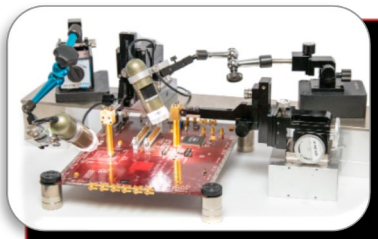
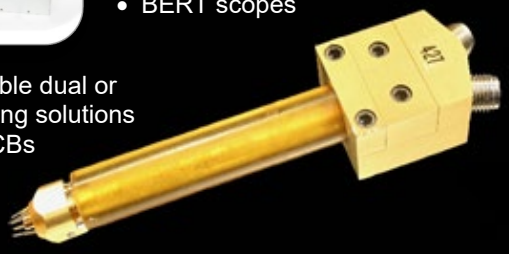
DVT40-1MM 40 GHz Dual Multi-Mode Probe Kit



Instrument Compatibility

- Time Domain Reflectometry (TDR)
- Vector Network Analyzers (VNA)
- Spectrum Analyzers
- BERT scopes

Ask about configurable dual or single desktop probing solutions for large or small PCBs



Variable Pitch (.35 – 1.8mm) probe measures Differential or Single Ended Impedance or S4P 4-port S-parameters to 40GHz

Probe tips plated with 4-6um conductive diamonds to cut through surface oxide

Applications

Time Domain Measurement

Differential (odd mode) or Single Ended (common) mode impedance measurements on PCBs, Cables, Backplanes, Daughter-Cards, and Flex Circuits.

~4.5 ps TDR rise time for high resolution PCB Impedance measurements or Failure Analysis with 20um Fault Isolation.

Frequency Domain Measurement

Use a 4-port VNA to extract differential SDD21/SDD11 return and insertion loss S-Parameters to 40GHz with differential de-embedding applied.

The DVT40 bandwidth is attained by using the optional Ataitec In-Situ De-embedding (ISD)software to de-embed the probe loss from PCB measurements and set the VNA reference plane to the probe tips.

The optional ISB40 40GHz Probe In-Situ board (**Figure 2**) can be used to verify the accuracy of the probe models to 40 GHz.

Key Features and Benefits

- ~4.5ps TDR Rise Time Degradation
- Fully Balanced Differential Signals without Ground Contact ▪ Measure S4p S-parameters to 40GHz with de-embedding applied ▪ Probe tips plated with 4-5um conductive diamond plating for repeatable measurements
- Adaptable to Single Ended Input Impedance for TDR measurements
- Adjustable Signal Probe Pitch (from 350 um to 1.8 mm) ▪ Full Set of Probe Pitch Calibration Accessories
- Conductive Diamond Plated Probe Tips for repeatably reliable measurements

~4.5 ps Differential or Single Ended TDR Probe: A true odd mode balanced multi-mode probe capable of making differential or single ended impedance measurements using any TDR system. With ~4.5 ps TDR rise time (rt), it's an ideal probe for performing PCB Failure Analysis to locate opens as small as 20um. The DVT40 twin-ax cable design is like having two probes in one; a differential and a single-ended probe. Compatible with the fastest TDR instruments from Tektronix, Keysight (Agilent), LeCroy, Rohde & Schwarz and MultiLane.

Accurate Differential S-parameter Measurements to 40 GHz: The optional Ataitec "In-Situ De-embedding" (ISD) Software (ISD01N2) comes with a 60-day license, technical support and the ISB40 40 GHz in-situ board (**Figure 1**). The software creates an S4p differential probe model for the DVT40 probe that uniquely models the two signal conductors in the twin-ax probe cable electrical crosstalk to produce a virtual ground eliminating a need for a physical ground probe. The model is used in a 4-port VNA to de-embed the probe from the PCB measurements, remove probe resonance and set the VNA reference plane at the probe tips for Time Domain measurements. Creating a S4p probe model to 40 GHz only requires three measurements: open_probe.S2p, short_probe.S2p and probe in situ.S4p measurement using the ISB40 40 GHz board and a 4 port VNA. The ISD S4P probe model improves measurement accuracy and extends the measurement bandwidth to 40 GHz.

The DVT40 probe is all you need to characterize Gb/s interconnects in the time or frequency domain: The DVT40-1MM 40 GHz Dual Multi-Mode Probe Kit (**Figure 1**) comes in an elegant wooden box with two DVT40 probes to measure differential Time Domain Reflectometry (TDR) impedance (Z-line) measurements. Once impedance sensitive transmission lines are verified, use the second probe as a receiver to measure SDD21 "thru" bandwidth measurements and return loss (SDD11) S-parameters to verify the differential traces can transmit USB3, PCI/e Gen4, SATA/SAS, 10 G Base-R, FEC, etc. baseband digital standards meet their time and frequency specifications.

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Fig 1. DVT40-1MM Multimode Dual Probe Kit

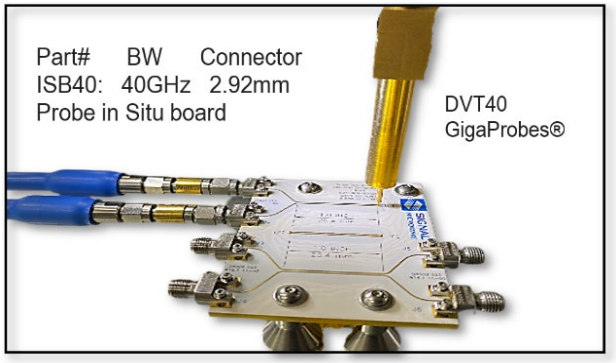

Fig 2. Part # ISB40 40GHz ISD In-situ board: (Optional) is used to verify the ISD probe model accuracy and to make the probe to connector (probe in-situ) measurement required to develop the Ataitec ISD DVT40 S4P Probe Model to 40 GHz.

Probe Kit Contents

2 - 40 GHz Differential Multimode TDR/VNA S-Parameter Probes

- 2.92mm K differential connector assembly in a Y formation
- Gold-plated probe body and differential connector assembly
- Gold/Nickel plated conductive diamond (4-6um) adjustable probe tips

2 - Custom Mount Anodized Adapters connect the DVT40 probe to the end of the probe positioner arm.

2 - Ultem® Hand Mount Adapters designed for GigaProbes DVT40 probes convert the DVT40 to a precise, ergonomic hand probe.

2 - Stainless Steel Tweezers for fine 110mm pitch adjustments

1 - Steel SMA wrench to tighten cables to probes

1 - Pitch setting tool (.8mm, 1mm, 1.27mm)

1 - Desktop Macro-Lens Inspection Station, 5x magnification

1 - 50-ohm Conversion Kit: 2 - 50-ohm caps, 5 - 20-gauge wires and 5 pre-cut shrink-wraps

Characteristics

- Attenuation: 1X
- Connector Type**:** 2.92 mm K
- Connector Only Bandwidth**:** 40 GHz.
- Differential S-S Probe Pitch: .35mm – 1.8mm
- Probe Rise Time: Approximately ~4.5 ps nominal
- *Differential S-parameter Bandwidth: 40GHz after VNA de embedding:
- De-embedding: *Ataitec ISD (ISD01N2**)** generated probe model and ISB40 40GHz differential In Situ measurement board
- Differential Impedance: 100 ohms +/- 6% (nominal)
- Single impedance: 50 ohms +/- 3% (using conversion kit)
- Max Voltage-in: 5.0V

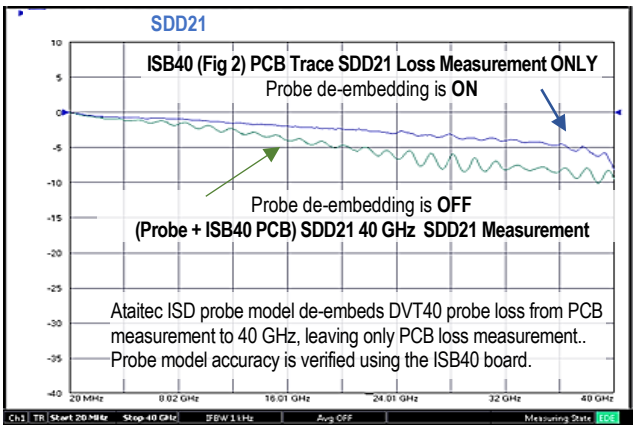

Fig 3. Verifying ISD 40 GHz Ataitec Probe Model Accuracy

Green trace is SDD21 Insertion-loss of the DVT40 probe measuring the differential trace on the ISB40 40 GHz board (Figure 2). VNA de-embedding is OFF.

Blue Trace is the same VNA measurement, but the ISD probe model is loaded in the VNA and de-embedding is turned ON. The same In-situ measurement contains only the PCB loss. The single Probe loss and resonance **is removed.**

Rise Time comparison of the DVT40 GigaProbes® to the GGB 40A Pico Probe, both connected to a 19ps pulse. Discontinuity measurement of the connector assembly shows very little impedance reflection.

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