DVT30-1MM 20 GHz Multi-Mode Two Probe Kit

Features

- True Odd Multi-Mode TDR/VNA Probe
- Each probe measures both Single-Ended and Differential Impedances.
- Fully Balanced Differential Signals w/out Ground Contact
- Probe can be converted to a single-ended input impedance.
- Adjustable Probe Pitch from 0.35 mm to 1.8 mm
- Probe Tip diameter: 0.254 mm
- Gold-plated Conductive Diamond non-oxidizing probe tips, improve the reliability of measurements with a probe force <10 grams at any angle.

Electrical Characteristics

- Attenuation: 1X
- Probe Rise Time: 27 ps
- Bandwidth: 20 GHz
- Variable Probe Pitch: .35 mm – 1.8 mm (signal tip to signal tip)
- Connector Type: SMA
- TDR Launch Discontinuity: <20mv
- Impedance: 100 Ω +/-6% differential, 50 Ω +/-3% common mode

Note: Numeric values shown are nominal

Mechanical Characteristics

- Rugged Brass/Gold-plated Probe Tips
- Conductive diamond-plated probe tips
- Fixed Pitch Signal to Signal Probe Tips
- No Ground Pin Required
- Adapters included to mount on Probe Positioners
- Differential S-S Probe Pitch: .35mm – 1.8mm

Applications

(TDR) Measurements: Single-Ended or Differential Impedance Testing of IC Package, Cable, PCB or Backplanes

Failure Analysis: Locate opens and shorts in Printed Circuit Boards(PCBs)

(VNA) Measurements: Differential SDD21/SDD11 S-parameters up to 20GHz bandwidth on cables or differential PCB traces

DVT30-1MM GigaProbes® (Pat. Pend.) use a multi-mode balanced differential cable that is a true odd mode Differential which can be converted to a Single Ended probe to capture ODD/EVEN impedance profiles and S-parameters. With a typical differential launch discontinuity of <20 mv and a fall-time of 27 ps, the probe masks only ~ 0.5 mm of the device under test.

The DVT30 probe has Ultem grips for comfortable hand probing and is easily attached to most probe station micro-manipulators with the provided GPMMA Probe Adapters.

The Signal-to-Signal pitch can be set to a fixed 0.8 mm, 1.0 mm or 1.27 mm using the Pitch Calibration tool and other tools included in the kit.

Conductive Diamond plating technology places 100s of sharp conductive diamonds in a nickel/gold matrix onto the probe tips. The diamonds do not corrode and will break through any surface oxide when probing at any angle with a probing force of <10 grams, creating a temporary connection that is comparable to that of lead solder.

The DVT30-1MM dual probe kit with 4 cables and many adapters is like having 4 probes in one kit and is compatible with most 20 GHz – 30 GHz TDR systems such as the LeCroy, Tektronix, and Keysight/Agilent, R&S and Multi-lane TDR instruments.

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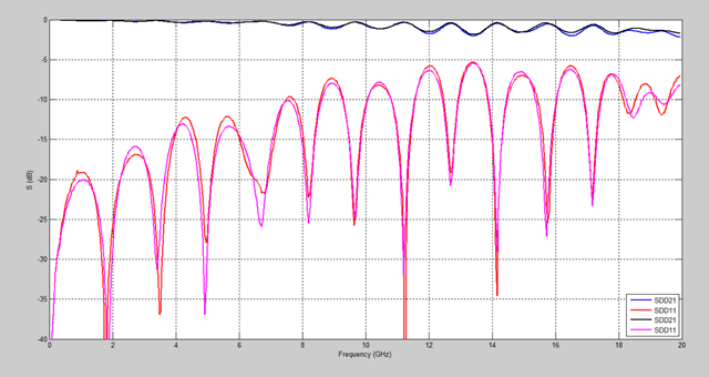
Differential SDD21/SDD11 S-Parameter Measurements



The DVT30 probe can measure up to a 20 GHz differential bandwidth. The measurement contains only the SDD21/11 S-parameters which are used to make measurements on differential traces. The probe de-embedding S4p probe model is created using the optional ISB40-002 Probe De-Embedding Kit. This ISD S4p 20 GHz probe model is used by the VNA to de-embed the probe loss from the differential trace measurement

Building a Differential/Single-Ended Impedance Probe Measurement System

Most TDR probing projects require measuring both true Differential and Single-Ended impedances to probe a variety of test pads' pitches.

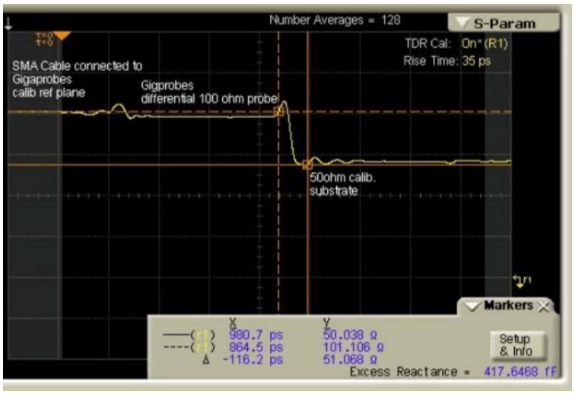
The DVT30-1MM Probe Kit contains two DVT30 multi-mode variable pitch probes for probing pitches from .35 mm to 1.85 mm. Each probe can measure Single-Ended or true differential impedances.

Attach a probe to the DVT-FP60 probe positioner arm and cable the probe to your TDR. Use the DVT-FP60 XYZ controls aided by the DVT-CS-3 USB camera system to view the placement of probe tips onto the test pads.

Also recommended are the DVT-SM-Holders used to secure the DUT from moving when probing.

(On right) Desktop TDR Probing system included the DVT30 multi-mode probes, DV-FP60 probe positioner and DVT-CS-3 Camera system.

Differential/Single-Ended Impedance Measurements



The DVT30 can make both true differential and single-ended impedance measurements with the same probe.

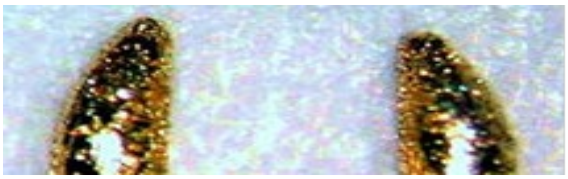
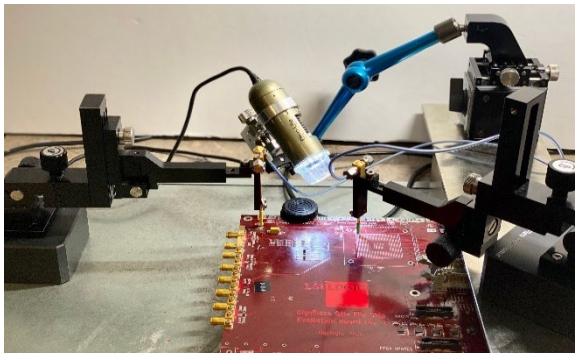


Fig 4. Closeup of Gold-Plated Conductive Diamond Probe Tips with hundreds of sharp, non-oxidizing, diamonds to break through surface oxide when probing and create a reliable connection that's better than lead solder.



Probe Kit Contents

Attractive and durable box for storing probes, tools and accessories

2 – DVT30-1 probes convertible to Single-Ended or Differential Impedances

1 – GPMMA for attaching the probe to a standard micro-positioner

1 – Stainless Steel 110 mm tweezer for fine pitch probe adjustments

1 – Desktop 5X Macro-Lens Inspection Station • 4 – Right Angle SMA Elbows for easy routing of cables

1 – Model 10 SMA wrench (Pat. Pend.) with Quick Calibrator Holes

2 – Handheld Probe Ultem Sleeve Adapters to prevent probe damage

1 – 50 Ω Probe Conversion kit • 4 – 17" (43.2 cm) 24 GHz cables • 4 – Right Angle SMA Elbows for easy routing of cables

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Probe System Components

DVT30-1MM Dual Multi-Mode Probe Kit

20 GHz/27 ps Dual Probe Differential Multi-Mode TDR and S-Parameters Probe kit. Contains two variable pitch conductive diamond plated DVT30 differential probes convertible to 50 ohms. Includes pitch setting tools and four 17-inch 25 GHz cables.

DVT-FP60 Probe Positioner

Rigid arm probe manipulator with XYZ pitch 40 TPI controls & magnetic base. Recommended for probing with DVT30 GigaProbes.

DVT-CS-3 Camera System

The Camera System is used for the accurate placement of probe tips on the test pads, probe tip planarization and calibration.

DVT-SM Holders

Stackable Magnetic PCB Holders to secure the corners of a PCB to keep it from moving while probing. You can also remove a segment from two of the holders and place them under the PCB near where it will be probed to keep the board from bowing (At least 6 holders recommended).

DVT-FP100 Magnetic Bases

DVT-FP100-1IN, DVT-FP100-1.5IN and DVT-FP100-2IN Stackable 1", 1.5" and 2" magnetic blocks used to raise the probe and camera positioners to clear the test board.

DVT-PB100-24 Probe Bridge

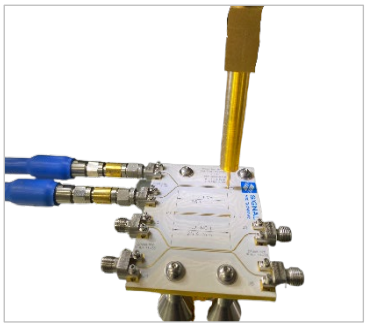
Versatile bridge with magnetic base for probing applications. Extends the probe reach to enable probing of larger boards.

ISB40-002 Probe De-embedding Kit

The ISB40-002 Probe De-embedding Kit includes these two items:

- **Ataitec In-Situ De-embedding (ISD) software.** 6-month license, free technical support, and software upgrades. The kit is used to create true differential probe models for the DVT30 probe.
- **ISB40 ISD In-situ board**. (On right) The In-situ "thru" measurement from the board is used to create the ISD probe model and to verify probe model accuracy.
  - 40 GHz differential trace with 2.92 mm 40 GHz RF connectors. Using cables, directly connect the VNA to this trace that has a known loss characteristic to 40 GHz. Make a new measurement from this trace and compare the two measurements to verify if they correlate.
  - This measurement is used to quickly locate bad or marginal RF cables and any front panel setting that can cause measurement errors.

ISB40 ISD In-situ board



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Benefits of De-embedding

- Wide variable pitch (.35 mm- 1.8 mm) measurement to 20 GHz
- Make real-time Insertion-Loss measurements by de-embedding probe loss from PCB measurements
- Differential (SDD21/SDD22) S-parameter measurements do not require a physical ground
- VNA measurement reference plane is moved to the probe tips
- Reduces internal resonance after de embedding is applied

Online Application Demos

Converting DVT30 to Single Ended
https://youtu.be/obHCLaX7ViE

DVT30-1MM probe kit demo
https://youtu.be/zIwIsRVTBZQ