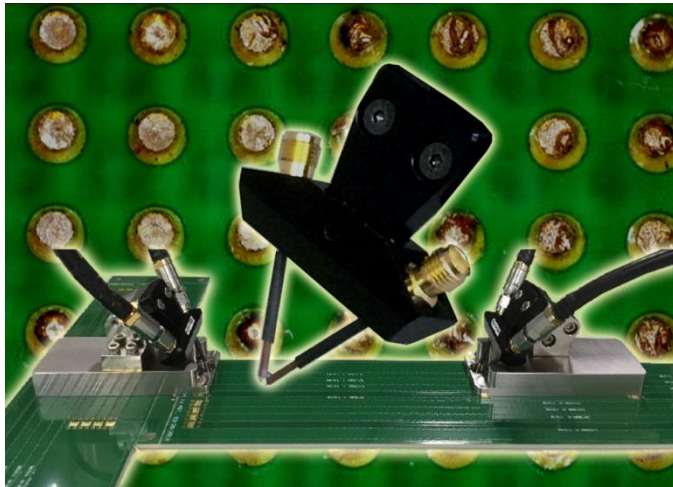


D-Probe

Rugged 20-GHz differential probe (signal-signal only)



Features:

- **High Bandwidth:** DC to 20 GHz
- **Low Insertion Loss:** < 3 dB @ 20 GHz
- **Signal-Signal Only:** Accurate S-parameter and TDR measurements without the need of nearby ground pads
- **Ruggedness:** Strong enough for direct probing of uneven solder bumps
- **High Repeatability:** No moving parts
- **Applications:** Measurements for DDR memory, Flex PCB, and PCB characterization

Overview

D-Probe series is designed for signal integrity and RF testing. Its strong beryllium copper (BeCu) tips are perfect for direct probing of test pads on uneven surfaces, such as solder bumps. With only two signal pins, D-Probe can perform accurate measurements without the need of nearby ground pads. For example, many DDR chips and Flex PCB do not have enough ground pins around their differential signals. In this case, typical GSSG type probes cannot be used.

Recent advancement in 2X-Thru de-embedding methodology makes the D-Probe ideal for signal-integrity measurements. There is no need to perform the 4-port probe-tip calibration that is laborious and time-consuming. A 4-port ECal at the SMA connectors can be done in minutes.

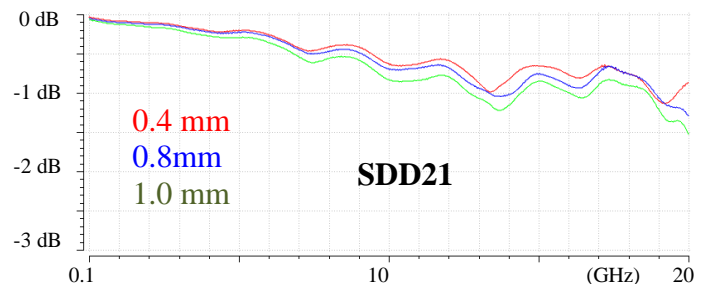
The user experience of D-Probe is similar to that of the microprobe. Precision Positioners TP250 or TP300 allow an engineer to switch between the D-Probe and microprobe easily.

Specifications

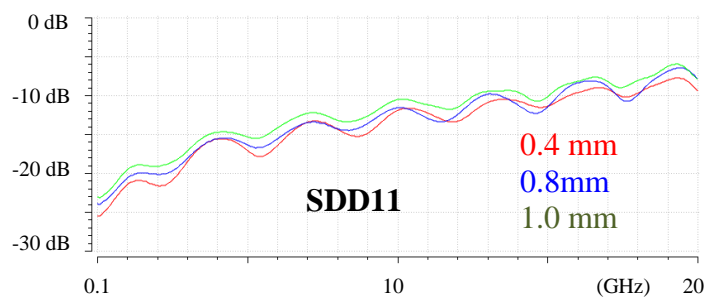
- **Bandwidth:** up to 20 GHz
- **Insertion Loss:** less than 3 dB @ 20 GHz
- **Impedance:** 100±3 Ohm
- **Connector Type:** SMA Female
- **Size:** 51 x 38 x 12 mm (2 x 1.5 x 0.5 in)

D-Probe Part No. Information

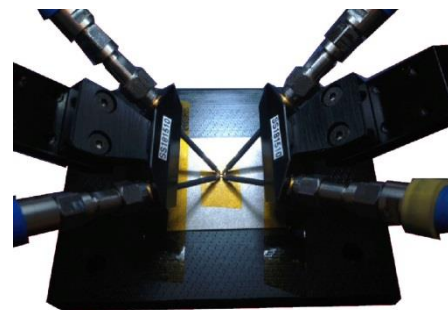
- **DP-SS-201504** – 20 GHz, 0.4 mm/16 mil pitch
- **DP-SS-201505** – 20 GHz, 0.5 mm/20 mil pitch
- **DP-SS-201508** – 20 GHz, 0.8 mm/32 mil pitch
- **DP-SS-201510** – 20 GHz, 1.0 mm/40 mil pitch
- **DP-SS-201512** – 20 GHz, 1.2 mm/48 mil pitch



SDD21 for 0.4/0.8/1.0 mm pitch



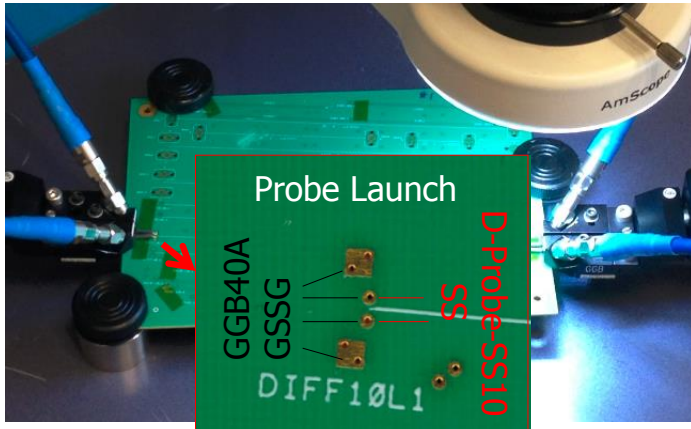
SDD11 for 0.4/0.8/1.0 mm pitch



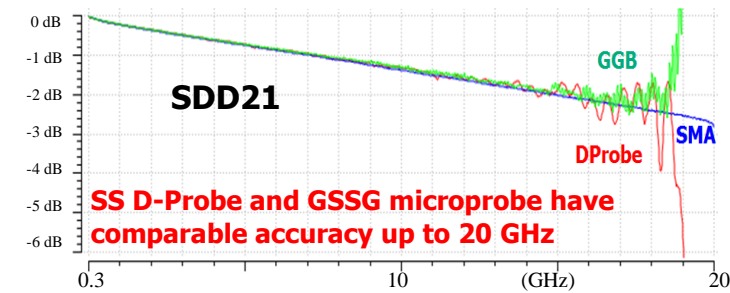
EMStar's Advanced Interconnect Test Tool (AITT-DE) is used to extract the single D-Probe SDD21 and SDD11 from the total S4P of two D-Probes touching at their signal-signal tips.

S-Parameter Measurement

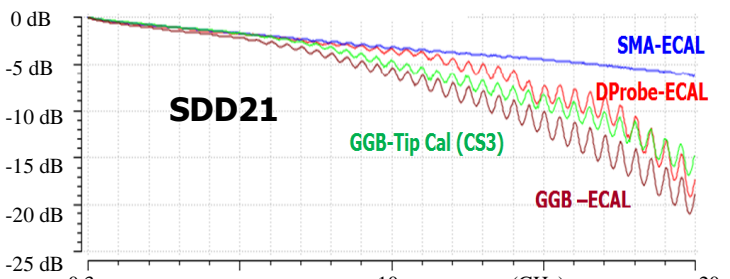
With de-embedding tools, such as EMStar AITT-DE, SS-only D-Probes and GSSG microprobes provide comparable accuracy. Measurement data of a Megtron-6 PCB with various differential striplines and via stubs are used for the comparison among the D-Probes, GGB40A-GSSG probes, and 26-GHz SMA connectors. Special probe launch is designed to allow both D-Probes and GGB microprobes to probe the identical traces.



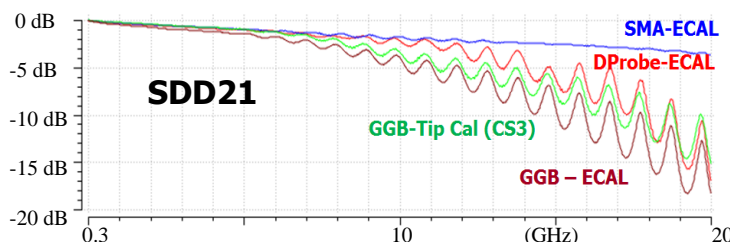
PCB Transmission Line Measurements



De-embedded SDD21: 6" (Total) - 3" (2X-Thru)



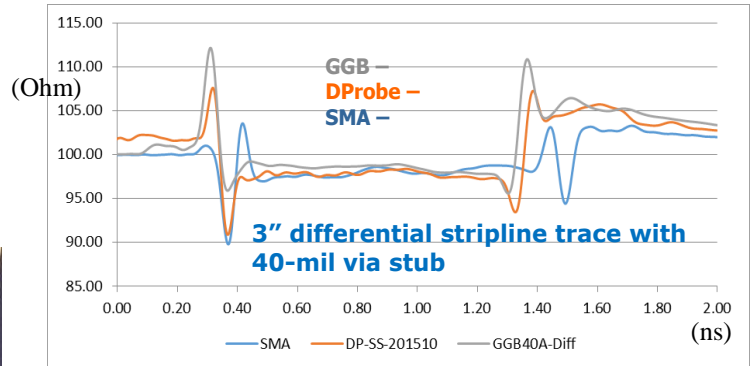
SDD21 of 6" trace with 40-mil via stubs



SDD21 of 3" trace with 40-mil via stubs

TDR Measurement

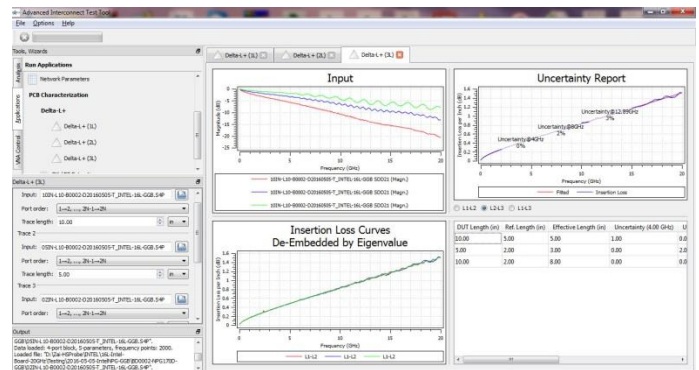
D-Probe is also ideal for TDR measurements that are essential to the development of high-speed CPU, FPGA, and Flex printed circuit boards.



Comparison of TDR measurements

AITT Signal-Integrity Tool

EMStar's Advanced Interconnect Test Tool (AITT) is a user-friendly software that allows engineers to simplify test-fixture designs and perform fast, accurate S-parameter and TDR measurements. AITT is developed by the renowned research team, led by Professor Drewniak and Professor Fan, at Missouri EMC Lab.

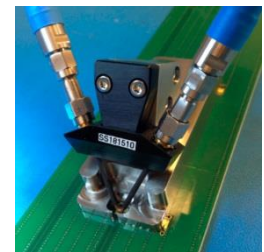


Accessories

- D-Probe Handle (DP-Hand01) for hand probing
- D-Probe Hand Fixture (DP-Hand02)
- TP250 4D (xyzθ) Precision Positioner
- FP160 4D (xyzθ) Flex Positioner
- Dino-Lite Digital Microscope
- Flex Probe Station

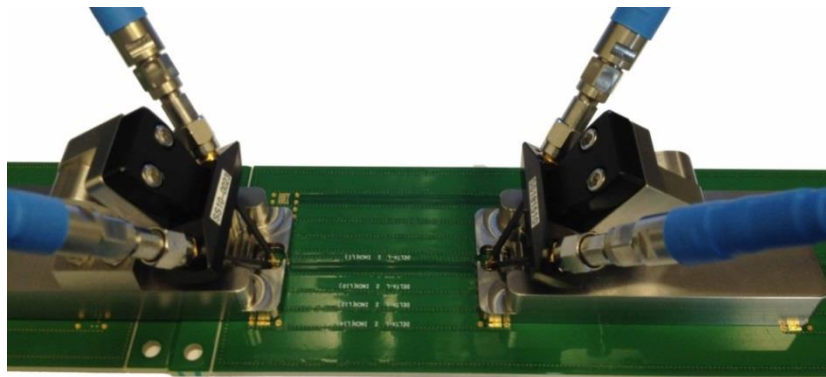


DP-Hand01



DP-Hand02

Excellent Repeatability with DP-Hand02 Handheld Fixture



| L10 | 4 GHz | 8 GHz | 12.89 GHz |
|-------------------|-------|-------|-----------|
| T1 | 0.402 | 0.691 | 1.029 |
| T2 | 0.404 | 0.694 | 1.034 |
| T3 | 0.403 | 0.693 | 1.038 |
| T4 | 0.401 | 0.693 | 1.035 |
| T5 | 0.404 | 0.698 | 1.045 |
| T6 | 0.402 | 0.692 | 1.032 |
| T7 | 0.404 | 0.694 | 1.036 |
| T8 | 0.404 | 0.695 | 1.037 |
| T9 | 0.404 | 0.696 | 1.037 |
| T10 | 0.402 | 0.692 | 1.026 |
| Average | 0.403 | 0.694 | 1.035 |
| Max | 0.404 | 0.698 | 1.045 |
| Min | 0.401 | 0.691 | 1.026 |
| Range | 0.003 | 0.007 | 0.019 |
| σ | 0.001 | 0.002 | 0.005 |
| Average+ σ | 0.406 | 0.700 | 1.051 |

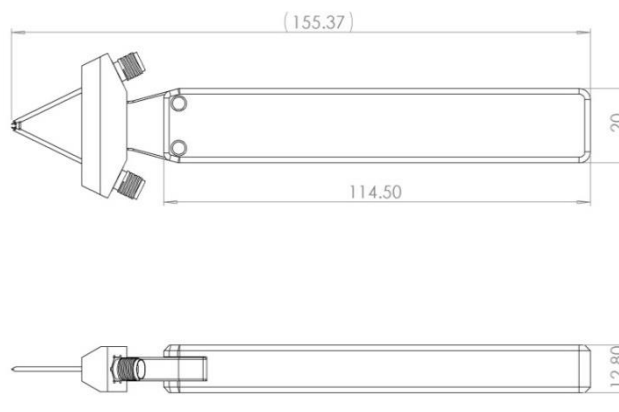
Excellent Repeatability

D-Probe has excellent repeatability with DP-Hand02 fixture allowing constant probe force and launch angle. The left table shows that 10 different tests are performed on the same differential trace. The standard deviation is less than 0.005 dB @ 12.89 GHz.

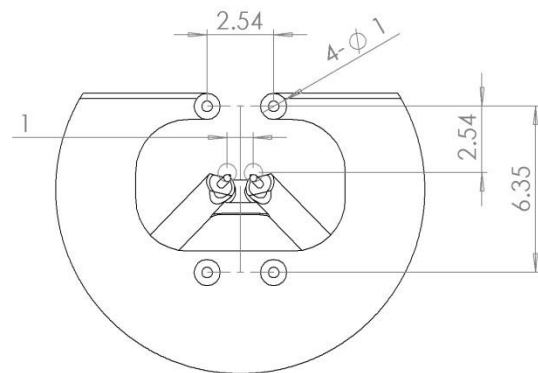
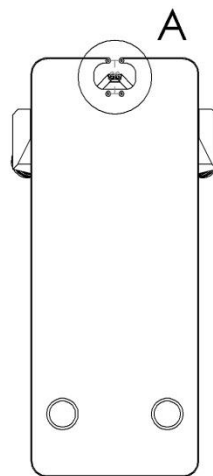
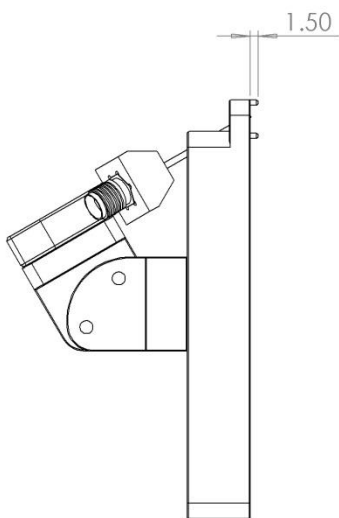
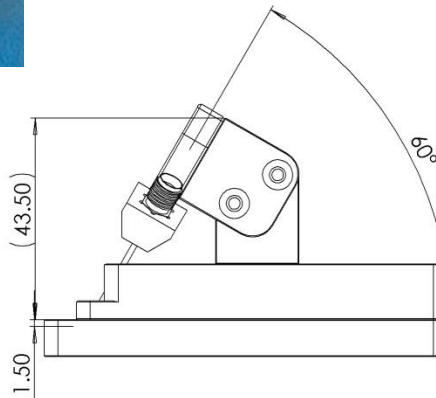
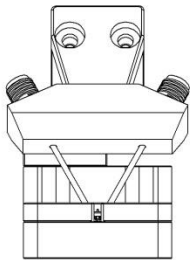
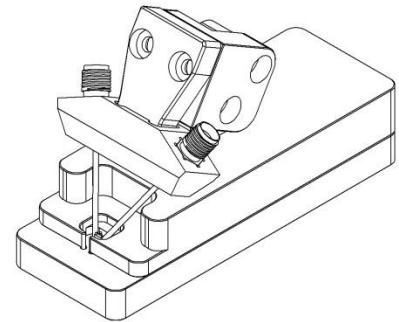
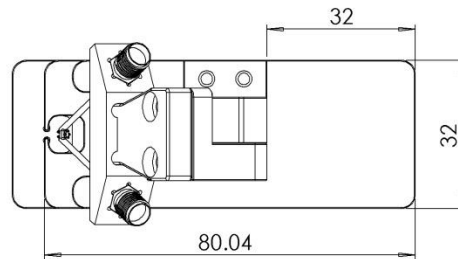
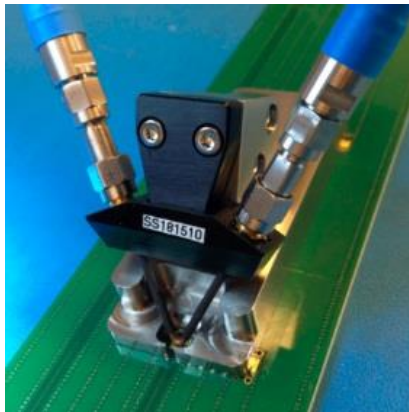
About PacketMicro

PacketMicro, based in Silicon Valley, provides a wide range of rugged gigahertz probes, probe positioners and stations, flexible RF cables, and microscopes for bench-top testing. PacketMicro customers include many Fortune 100 companies. For more information, please visit www.packetmicro.com.

DP-Hand01 Dimensions (mm)



DP-Hand02 Dimensions (mm)



Notes:

- DP-Hand02 fixture is designed to allow 1-mm pitch D-Probe to probe the unified probing pad proposed by Intel.
- User should refer to the Intel document for the detail probing pad footprint in PCB layout design.