

# P2105A

Data Sheet

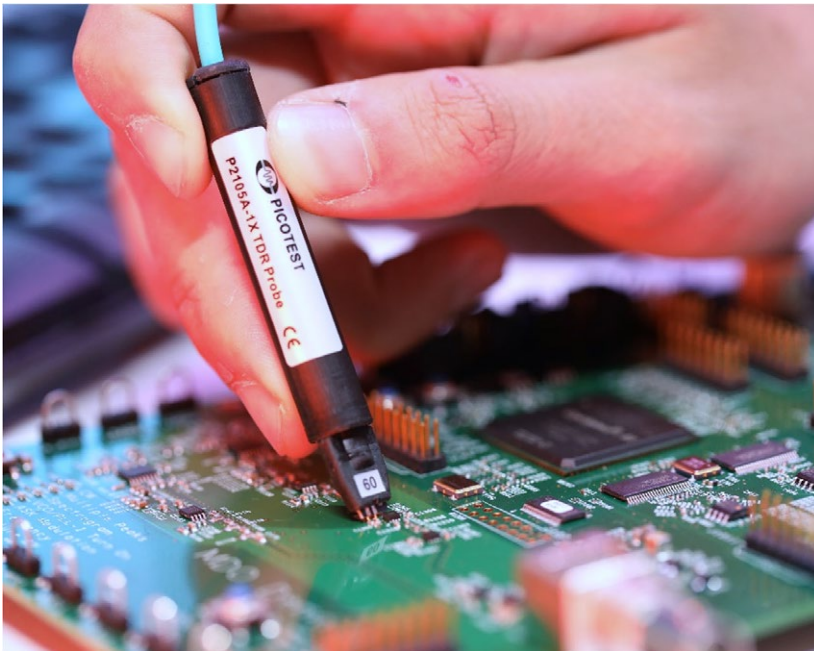
## TDR Probe

PCB Trace and Coupon  
Impedance measurement  
and characterization  
PCB resonances  
TDR Capacitor and  
Inductor measurement  
Clock jitter  
Component validation  
and verification



# TDR Probe

The Picotest P2105A probe is a 50 ohm 1-port transmission line 'Browser' probe for TDR/TDT applications. This precision probe supports a variety of TDR based measurements including coupon and PCB trace impedance. It can also be used to test small values of capacitance and inductance. It has significant advantages in comparison to active probes and other types of passive probes.



The P2105A is referred to as a 'browser' probe for its ability to easily and quickly be moved from point-to-point simply by reseating the probe points. The probe achieves a very low inductance at the tip to mitigate space constraints on a dense PCB, while eliminating the need to add additional SMA connections or other test points necessary for measurements. It is especially useful when testing multiple controlled impedance traces, test coupons, or other PCB structures.

The P2105A is currently available in four fixed pin pitches (31, 40, 50, 60, 70, 100 mil, GSG SMA and other custom spacings with 1X attenuation).

The probe is compatible with all 50 ohm instruments, including the J2154A PerfectPulse® Differential TDR. The probe is designed to work with the traditional single-ended TDR setup. A pair of P2105A probes can be used for differential measurements.

## FEATURES:

- 15GHz Single-Ended Precise High Bandwidth Probe for all Time Domain Reflectometry (TDR) Applications \*
- Compatible with the Picotest J2154A PerfectPulse® TDR
- Fixed pitches available: 31, 40, 50, 60, 70, 100 mils and GSG SMA
- Custom pitch spacings available
- Compatible with all 50 ohm instruments
- Spring pins for easy landing
- Short pins and integrated, but removable, PDN Cable® for low coupling and optimum shielding
- Handheld browser style for repeatable and easy probing; Handle design fits most probe holders
- Slim low-profile housing for comfort and visibility

\* Pitch and calibration dependent

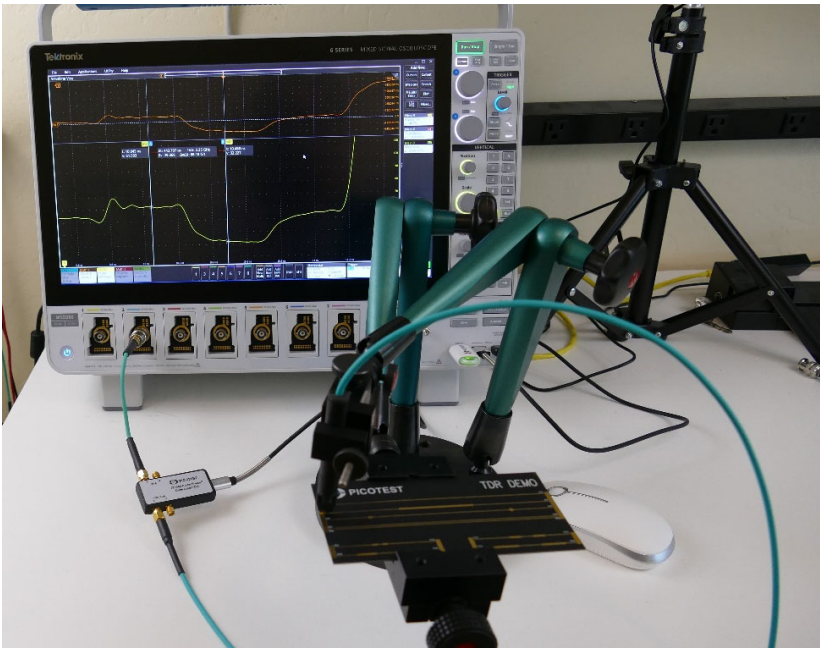
## APPLICATIONS:

- Low-cost PCB coupon tester - Characteristic Impedance PCB traces
- Measure PCB trace length, characteristic impedance, and dielectric constant
- Locate and detect impedance mismatches
- Measure parasitic values of inductance and capacitance such as bond wires, vias, and ESL
- Measure PCB trace path rise/fall time and overshoot/undershoot
- Supports cable and trace loss modeling

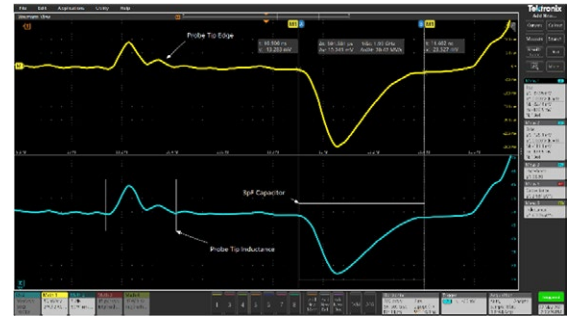
### TDR Measurement Demands New Probe Capabilities

The probe's characteristic impedance is 50Ω. Poor connections between the probe cable and the probe connector or a mismatch between the probe cable and the probe head can result in small parasitic capacitance at the probe tip. This leads to poor frequency response and can add considerable (and erroneous) ringing to the measurement. Since the probe pins are inductive, it is important that the probe not be capacitive to assure that while the measurement is bandwidth limited due to the tip inductance, it will not ring.

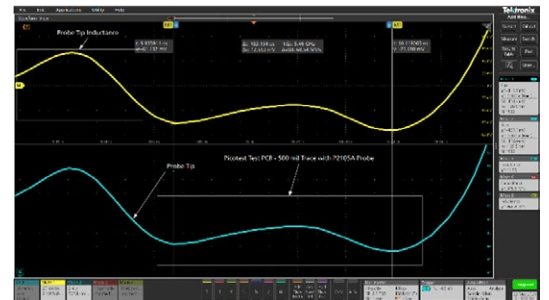
The comfortable and easy to grip probe head is both small and slim so that it fits in confined spots and can be held for long periods of time. Of course, the probe can be used with most probe stand or probe stations when hands-free operation is needed.



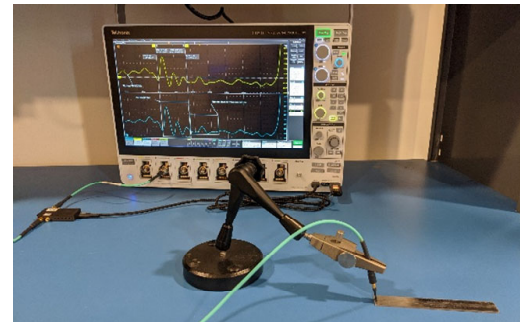
The P2105A TDR probe shown with the Picotest J2154A PerfectPulse Differential TDR makes a powerful and low-cost PCB testing tool. When combined with your oscilloscope, you can probe all types of PCB structures and measure their impedance accurately.



The P2105A can measure very small capacitors and inductors.



Probing results of a PCB trace.



The Picotest P2105A browser probe has a usable bandwidth greater than 15GHz.

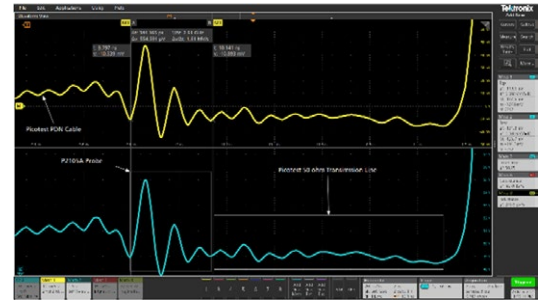
## SPECIFICATIONS

P2105A TDR Probe	
Characteristic	Rating
Bandwidth	DC-15GHz *
Probe Pin Pitch/Spacing	Comes in one of the following: 31mil - 0.79mm 40mil - 1.02mm 50mil - 1.27mm 60 mil - 1.52mm 70 mil - 1.78mm 100mil - 2.54mm GSG SMA Custom pitches available
Impedance Range	Typical 1-port impedance reflection floor -ceiling limits (~100mohms – ~100k ohms). Not probe dependent. See your instrument's manual
Input C:	<1pF
Attenuation	1X, NOT user changeable
Probe Connectors	SMA
Probe Loading Input	50 ohms
Operating Temperature	0 to 45° C (32° F to 104° F) at 80% Relative Humidity
Nominal Length with Cable	1 meter
Maximum Relative Humidity	80% at 31° C max
Usage	Indoor
Altitude	3000 m (9850 feet)
Absolute Maximum Voltage	< 50VAC and 75VDC

\* 15GHz is dependent on the pitch and calibration. Note: The maximum Port Voltage shown is based on the specified maximum tip voltage. Consult your VNA's manual to verify the VNA port voltage is below the ratings of your instrument. Bandwidth calibration dependent.



Caution: To avoid equipment damage and/or severe injuries death or death do not use this probe close to voltages higher than 50 VAC or 75 VDC.



Testing a 50 ohm transmission line.