

J2154A PerfectPulse®

Differential TDR Data Sheet

Differential TDR

Fast Edge Signal Generator

TDR – Time Domain Reflectometry

Cable/Connector Tester

PCB/Coupon/Trace/Impedance Tester

Probe Calibration

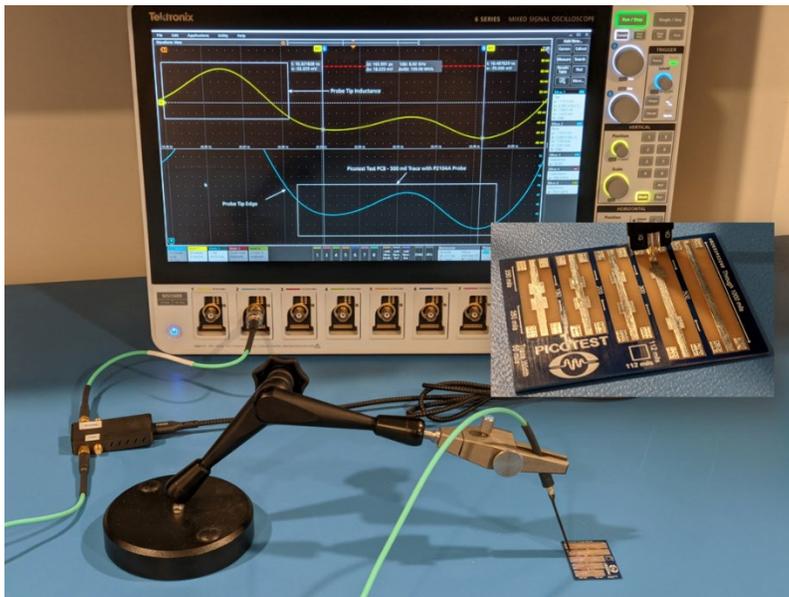
Single or Differential Operation

Fast edge generation for DSP correction



J2154A PerfectPulse® Differential TDR

The J2154A is a low-cost single or differential TDR. The internal PerfectPulse signal generator provides a square $\sim 35\text{ps}$ edge pulse in a pocket sized, self-contained package, requiring only a USB power source. The negative 250mV, 50 Ω output signal is very square, without overshoot or undershoot, making it perfect for verifying instrument and probe rise/fall times, as well as verifying signal path rise/fall time and undershoot/overshoot. The internal 10GHz+ power splitter allows the signal generator to be used as a reflectometer (TDR/TDT) for measuring PCB coupons, cable, and PCB trace impedance, verifying cable crimps, measuring trace and cable lengths, dielectric constant, and many other applications. It also allows the measurement of transfer functions, such as oscilloscope probes, and insertion loss (S21).



The J2154A TDR works with the Picotest browser probes.

Characteristics

A TDR/TDT is generally a large, expensive instrument that includes a high-speed edge pulse and a sampling oscilloscope. The TDR/TDT is used to measure dielectric constants, PCB coupons, PCB signal traces, interconnects and cables using reflected waves. TDT offers similar capabilities, using transmission measurements rather than reflected measurements. PerfectPulse is a low-cost, pocket sized pulse generator and together with the internal resistive power divider and a real time oscilloscope can be used to make these measurements.

FEATURES:

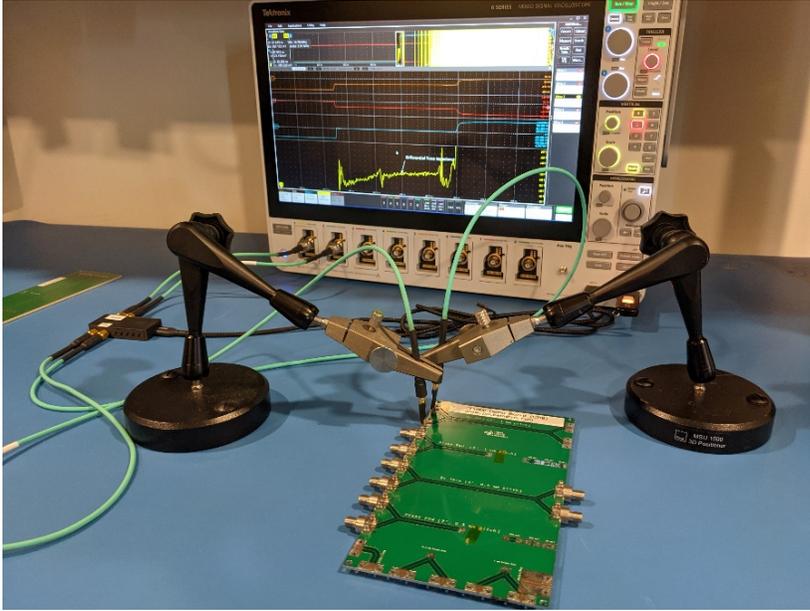
- Low Skew Differential TDR – Time Domain Reflectometry
- Low cost TDR in a portable USB or battery powered package
- Precise, 10.5GHz Fast Edge Generation
- Compatible with 50 Ω probes - Works with the Picotest P2105A, and P2104A-1X probes
- All applications requiring a fast, precise voltage edge

APPLICATIONS:

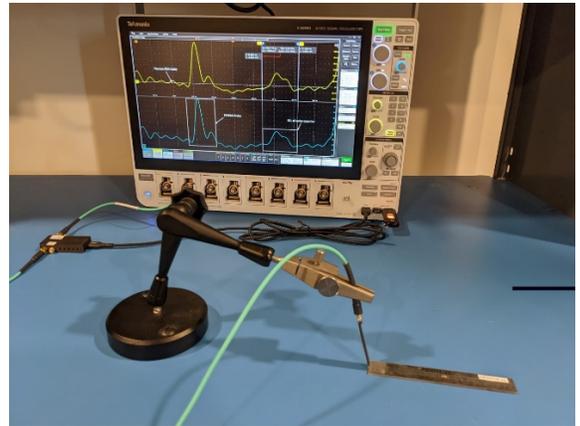
- Low cost PCB coupon tester - Characteristic Impedance PCB traces
- Measure cable and PCB trace length, characteristic impedance, and dielectric constant
- Locate and detect impedance mismatches
- Measure parasitic values of inductance and capacitance such as bond wires, vias, and ESL
- Verify the integrity cable crimps and connector launches
- Measure PCB trace path rise/fall time and overshoot/undershoot
- Supports cable and trace loss modeling
- Troubleshoot clock jitter and crosstalk
- Measure microwave filters
- Test the frequency bandwidth, rise/fall time, and flatness of lab instruments and probes

The USB powered J2154A connects directly to just about any oscilloscope

Sample Application – Measuring Trace Impedance Changes



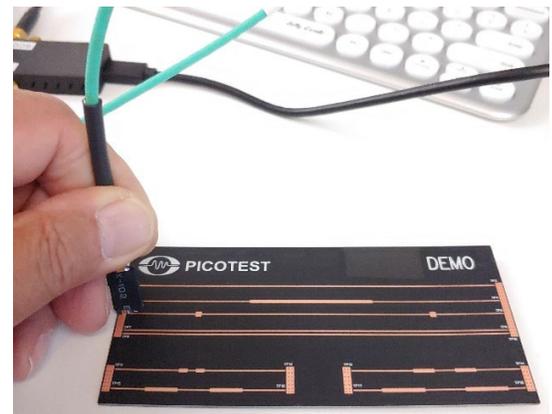
Technical Specifications		
Characteristic	Typical	Units
Typical rise/fall time	30	ps
Flatness	3dB at 10.5GHz 0.1dB (typ.) at 2GHz	dB
Output Voltage	0 - -250	mV
Output Impedance	50	Ω



The J2154A and P2104A PDN probe are used to measure series inductance of an AC coupling capacitor.



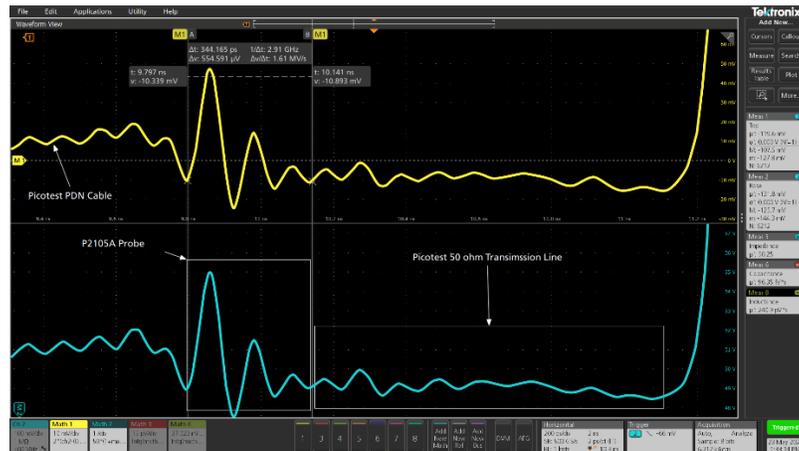
Using the low-cost J2154A, along with the Picotest P2105A TDR probe for injection, you can test PCB coupon impedance. This image shows the change from 47 to 51 Ohms.



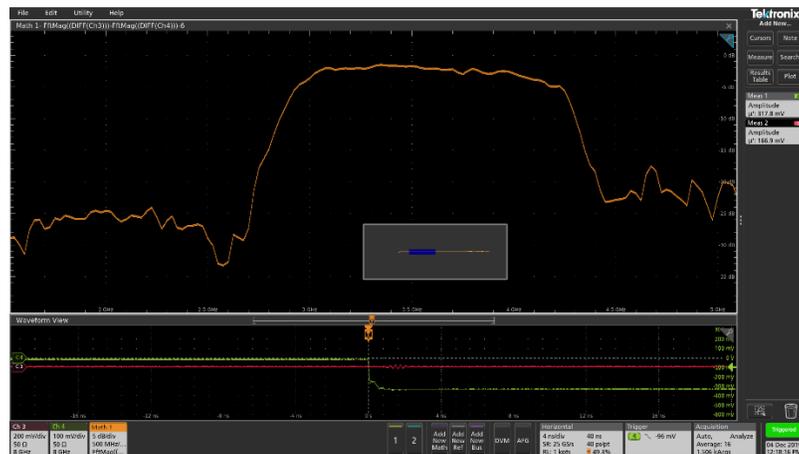
The J2154A includes a Demo test board with single and differential trances.

Sample Application – Measuring Probes and VNA Filter Bandwidth

The output signal of the J2154A is connected to the Picotest P2104A 1-Port probe or the P2105A TDR probe. The probe is used to INJECT and READ the TDR signal.



Using the TDR, the PCB trace impedance and including the probe tip inductance is shown.



The J2154A can be used to turn your oscilloscope into a Vector Network Analyzer (VNA). Here the response and bandwidth of a 3.6GHz filter is shown.

For more information on Picotest products, applications, or services, please contact Picotest:
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