

# 2-Port Shunt-Through Measurement on an Oscilloscope

## J2161A Active Splitter and J2102B Ground Loop Breaker

### The 2-port shunt-through impedance measurement is the key to testing low impedance components and PDNs

The 2-port shunt-through measurement is accepted as the gold standard for measuring low impedance levels while supporting measurement at very high frequencies. These capabilities make it ideal for measuring power distribution networks, as well as component test. Now you can perform this measurement on the various oscilloscopes that have FRA features including the Tektronix Series 5/6 oscilloscopes. The impedance measurement is enabled by the Picotest J2161A Active Splitter, allowing you to measure low impedances down to 1mohm and over a frequency bandwidth from below 100Hz to more than 500MHz (Scope and generator dependent).

Unfortunately, this measurement technique includes an undesirable ground loop. Left uncorrected, the ground loop introduces significant errors when measuring low impedance levels. The Picotest J2102B coaxial transformer or J2113A semi-floating differential amplifier are designed to minimize the effects of this ground loop.

#### J2161A Active Splitter

The J2161A is a solid-state wideband active signal splitter. It uses the scope built-in signal generator or an external signal generator to enable the 2-port measurement. The measurement can be performed using optional oscilloscope software for component and PDN impedance measurements.

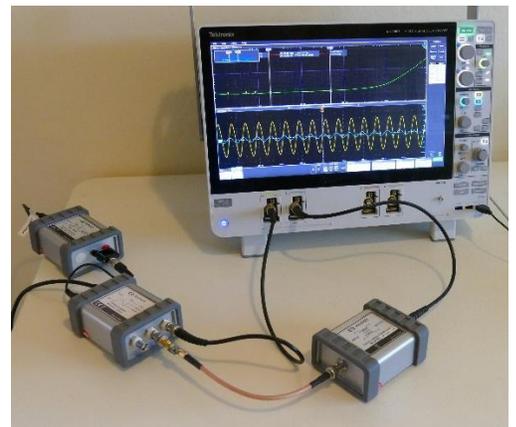


#### J2102B-BNC & J2102B-N Common Mode Transformer

The simplest and lowest cost method for eliminating a ground loop is to add a wideband common mode transformer to the measurement, such as the Picotest J2102B Common Mode Transformer. The J2102B-BNC has BNC connectors and the J2102B-N has N connectors.



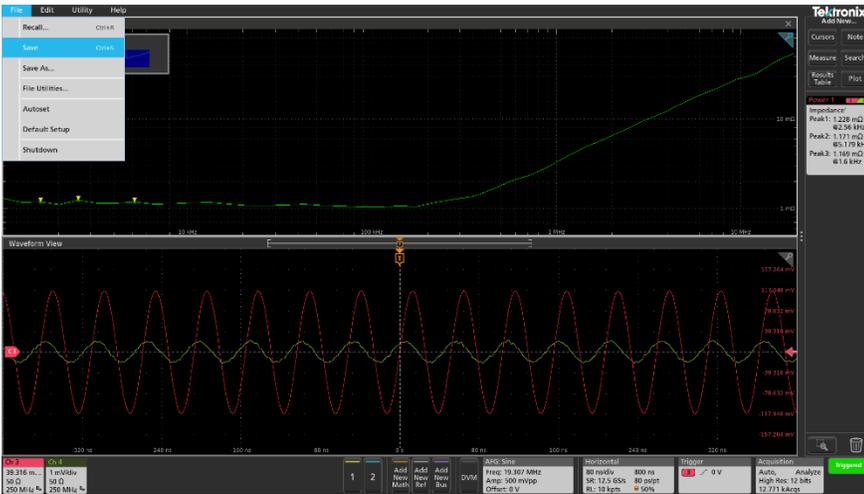
- J2161A/J2102B enables Gold-Standard 2-port shunt-through Power Distribution Network Impedance measurement on oscilloscopes
- 100Hz – 500MHz typical measurement bandwidth
- Impedances down to 1mohm
- The Picotest J2102B Common Mode Transformer and J2113A Differential Amplifier are used to attenuate the ground loop effects in all commercial VNAs, oscilloscopes, and spectrum analyzers



2-Port Shunt-Through test set up using the Tektronix Series 6 oscilloscope, J2161A and J2102B.



## 2-Port Shunt-Through Measurement on Oscilloscopes



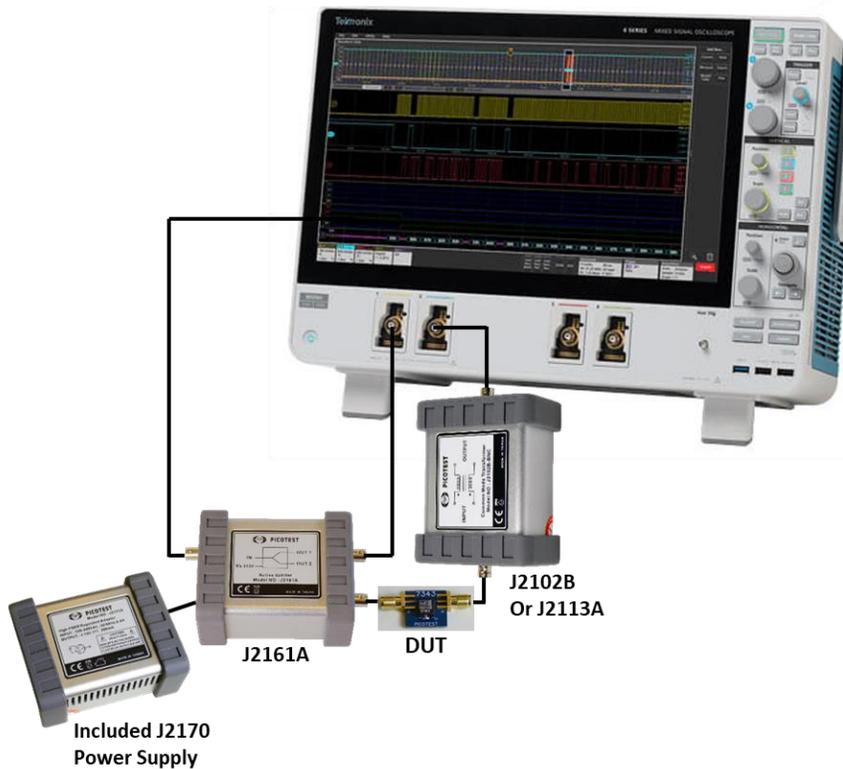
A known 1 mΩ resistor measured using 2-port shunt-through impedance measurements using the Tektronix Series 6 scope. The J2102B removes the ground loop error in 2-port shunt-through impedance measurements.

To learn how this solution can address your specific needs please contact Picotest:

877-914-7426

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Measurement set up to test ultra-low impedance in the 2-port shunt-through configuration using oscilloscopes and the Picotest J2102B/J2113A ground loop breaker solutions.

Picotest provides products that are designed to simplify measurements while providing the ultimate resolution and fidelity.

This information is subject to change without notice.

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