

Accessory Brings Two-Port Shunt-Through Impedance Measurement To Scopes

[Picotest.com/s](#) J2161A, two-way wideband active splitter enables the two-port shunt-through impedance measurement on oscilloscopes. Traditionally, this measurement has been performed on vector network analyzers (VNAs) or frequency response analyzers (FRAs). But oscilloscopes, such as the Tektronix series 5 and 6 scopes, offer a software add-on (5/6-PWR software) to enable this measurement in the frequency domain. The two-port measurement is the “Gold Standard” test for power distribution network impedance in the microohm and milliohm region used for power integrity verification.

“It’s clear that the frequency domain is the best domain for many types of measurements,” stated Steve Sandler, CEO of Picotest. “Our comprehensive line of Signal Injectors enables VNAs and FRAs to make power supply and power integrity measurements. But it’s easy to see the sea-change happening right now. Instrument companies are packing more features and capabilities into their scope products and FRA features such as Bode plot, non-invasive stability, PSRR, and two-port impedance measurements are going to be commonplace in scopes. The great thing is that Picotest has the tests covered supporting all these measurements whether they are performed in FRAs or scopes. Our new, recently announced, FRA bundle and the J2161A fully support these new FRA features on the Tektronix Series 5/6 scopes.”

The J2161A supports a typical measurement bandwidth of 100 Hz to 500 MHz and impedances down to 1 m Ω . The bandwidth and impedance level support are scope dependent.

A ground loop exists in the two-port shunt-through configuration. The simplest and most effective method for eliminating a ground loop is to add a wideband, low loss, tightly coupled common-mode transformer to the measurement, such as the Picotest J2102B common-mode transformer. The Picotest J2102B pairs with the J2161A as shown in the measurement setup in the figure. The transformer removes the ground loops associated with VNAs and oscilloscopes which frequently occur in power integrity PDN measurements.

The existence of the ground loops can be hidden and can impact the measurement results dramatically if not accounted for. The J2102B’s frequency response is flat from 1 Hz to over 6 GHz, all while maintaining 50- Ω input impedance for accurate, low-noise measurements. The J2102B supports PDN measurement, component measurement, PSRR testing, and many other applications.

The J2161A is available for \$1995. The J2102B is available in two configurations; one with BNC connectors and one with N connectors. The price of the J2102B-BNC is \$699 and the J2102B-N is \$799. The J2102B is CE certified; the J2161A CE certification is currently in process.

For more information, see the J2161A product [page](#) and the J2102B product [page](#).

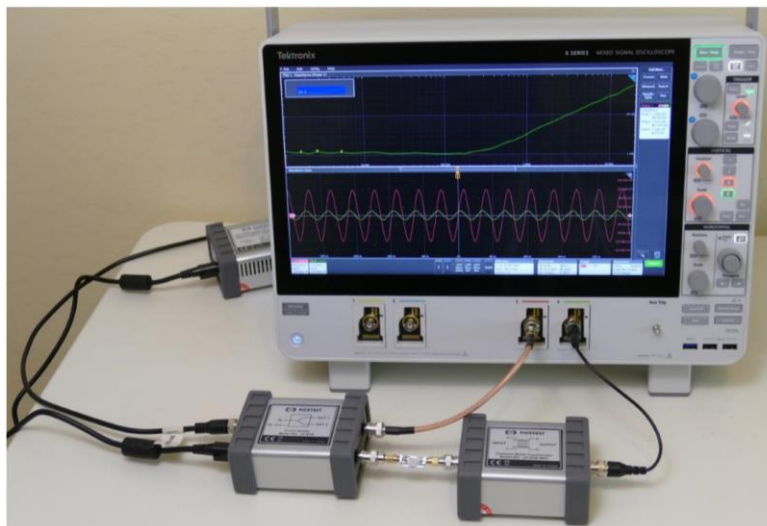


Fig. 1. The J2161A active splitter and the J2102B common-mode transformer combine to enable the two-port shunt-through measurement on oscilloscopes with FRA features. Here a 1-m Ω resistor is measured on the Tektronix series 6 scope.