

Verification Kits

DATA SHEET / 2Z-077

Models:

7950CK60	2650CK60
8770CK60	8850CK60
8050CK60	



Verification Kits

The Importance of VNA Calibration Validation

VNA calibration is performed to correct for the systematic imperfections which existing in all network analyzers and allow for users to shift the reference plane from the instrument test ports to a user-defined reference plane. However, how can one be sure that the calibration performed will result in accurate measurements?

Validation is by far the most important step in a measurement process. Conventional validation techniques rely on an estimate of the residual errors after a calibration, source match, directivity and tracking, and are typically evaluated by measuring peak-to-peak ripple through a TDR method. These techniques rely on an airline as the validation standard, and the accuracy of the validation can be severely impacted by how well the airline has been machined and handled.

Maury's new line of Verification Kits allows for a more thorough and definitive validation.

VNA Validation Methods

Maury Verification Kits consist of the following verification standards and allow for 1-port and 2-port calibration validation for well-matched and mismatched DUTs:

- > Loads (Male and Female)
- > Offset Short (Male and Female)
- > Beaded Airline (Male to Female)
- > Beaded Mismatch (Male to Female)

These standard can be used to validate the calibration using one of the following methods:

Method 1- S parameters comparison of User-Characterized and Factory-Characterized Verification Standards

This method involves a user measuring pre-characterized verification devices with similar performances to their own device; i.e. using a short as a validation of a high-reflection single-port device, or an airline for well-matched low-loss devices. The measurement data is then compared to the factory-measured data and the user determines whether the calibration is valid or not, based on experience or general guidelines. There is no clear pass-fail criteria that quantifies whether a calibration is sufficiently accurate to proceed to device measurement, or whether a calibration needs to be repeated.

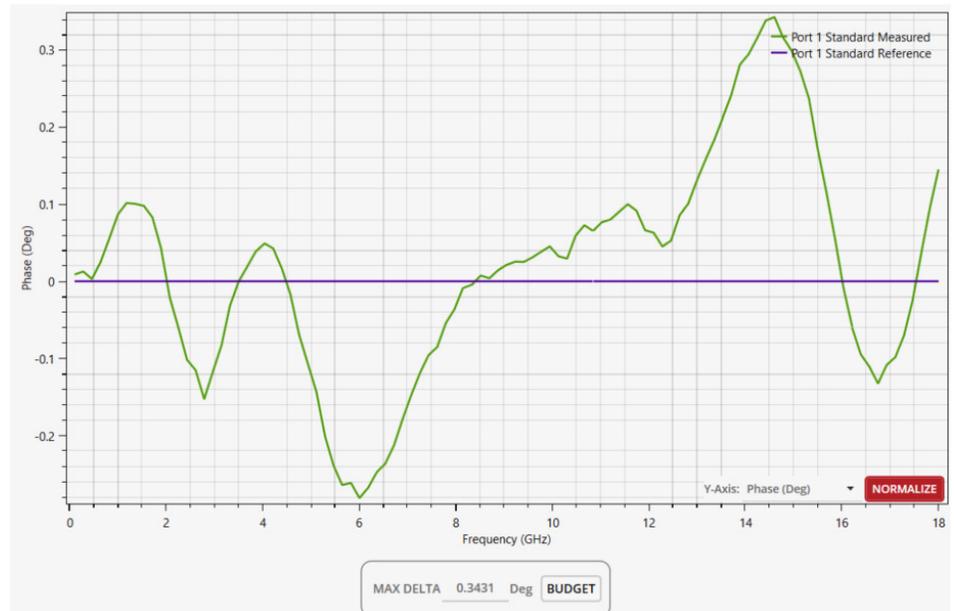


Figure 1. Normalized phase response between user-measured and factory-measured standard

Method 2 – S-parameters Comparison of User-Characterized and Factory-Characterized Verification Standards including Measured Uncertainty Boundaries

It is possible to define clear pass-fail criteria based on the use of uncertainty boundaries. When the uncertainty boundaries measured on a verification device by the user overlaps the uncertainty boundaries measured on the same verification device at the factory, it is defined as an accurate calibration. If the boundaries do not overlap, then recalibration is recommended. Maury offers a VNA Calibration and Measurement software suite, Insight, which among other things automates this process by guiding users through the calibration validation and clearly identifies whether the calibration can be used or must be repeated. For more information on Insight, please visit maurymw.com.

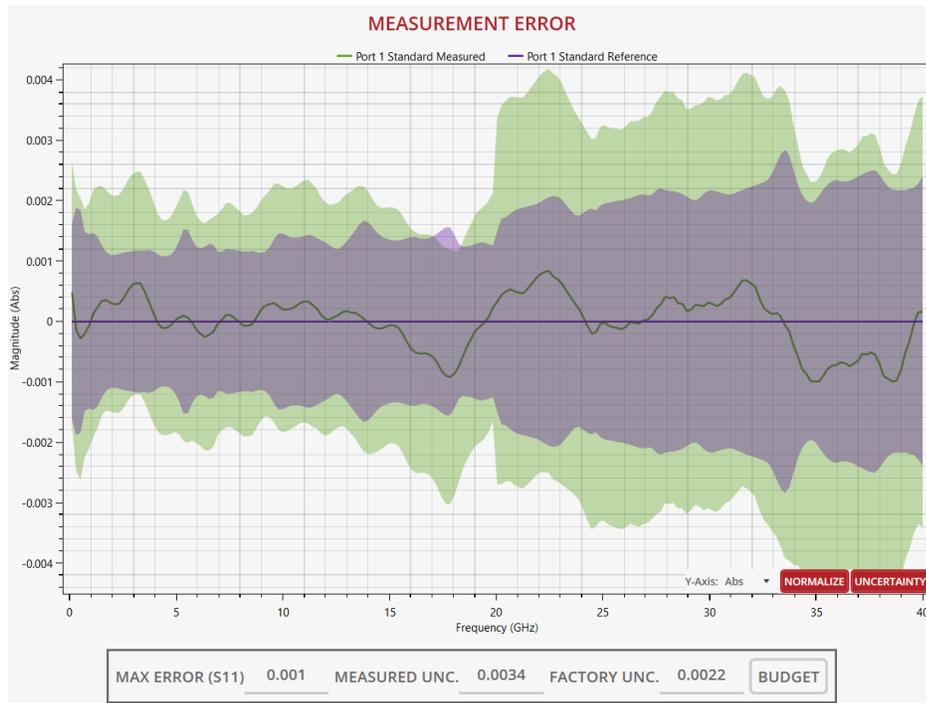


Figure 2. Normalized amplitude response between user-characterized and factory-characterized standard including uncertainty boundaries.

Recommended Accessories

Insight Calibration and Measurement Software:

Insight is the industry's first commercial software suite designed to empower VNA users and help them make better decisions by quantifying measurement uncertainty. Insight is an agnostic software tool compatible with most commercial VNAs and represents a paradigm shift in the way users approach VNA calibration, validation, measurement, visualization and analysis. More information regarding Insight can be found in data sheet [4T-023](#).

VNA Calibration Kits:

Maury offers coaxial VNA calibration kits up to 67.0 GHz and waveguide calibration kits up to 50.0 GHz in standard connector and waveguide sizes. Coaxial 2.4mm, 2.92mm, 3.5mm, 7mm and Type N calibration kits are available as fixed-load SOLT kits with either standard polynomial equations or characterized device (CD) with individually characterized standards. More information can be found in data sheets [2Z-056 \(1.85mm\)](#), [2Z-072 \(2.4mm\)](#), [2Z-073 \(2.92mm\)](#), [2Z-074 \(3.5mm\)](#), [2Z-075 \(7mm\)](#), and [2Z-076 \(Type N\)](#), [2Z-062 \(TNC\)](#), [2Z-069 \(BNC\)](#) and [3H-081 \(WR284 Through WR22\)](#).

Available Models

Model	Connector	Frequency (GHz)	Included Verification Standards					
			Load (male)	Load (female)	Offset Short (male)	Offset Short (female)	Beaded Airline	Mismatch Airline
7950CK60	2.4mm	0.05-50.0	7931B2	7913A2	7946D2	7946C2	7942C	7942C25
8770CK60	2.92mm	0.05-40.0	8775B4	8775A4	8772A2	8771A2	8776C	8776C25
8050CK60	3.5mm	0.05-26.5	8031B6	8031A6	8047A6	8046A6	8042C1	8042C25
2650CK60	7mm	0.05-18.0	2610F1		2649A1		2603F1	2603F75
8850CK60	Type N	0.05-18.0	2510F2	2510E2	8807A2	8806A2	2503H	2503H75

7950CK60



8770CK60



8050CK60



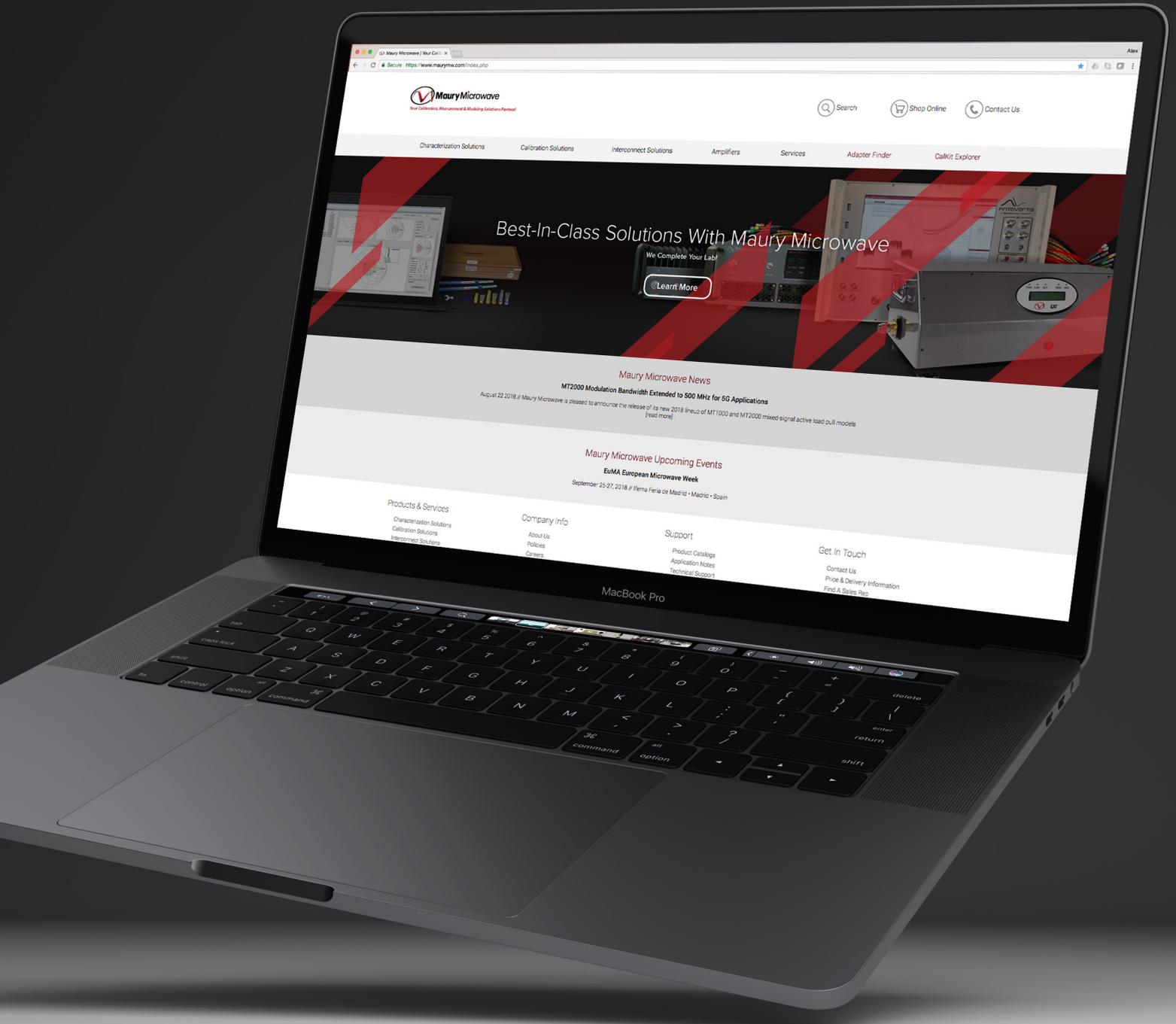
2650CK60



8850CK60



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www.maurymw.com



CONTACT US:

W / maurymw.com

E / maury@maurymw.com

P / +1-909-987-4715

F / +1-909-987-1112

2900 Inland Empire Blvd

Ontario, CA 91764

