

2.4mm VNA Calibration Kits

DATA SHEET / 2Z-057

Models:

7950CK10 – Fixed Load Kit
7950CK11 – Fixed Load Kit Plus Adapters
7950CK20 – Sliding Load Kit

7950CK21 – Sliding Load Kit Plus Adapters
7950CK30 – TRL Kit
7950CK31 – TRL Kit Plus Adapters



2.4mm VNA Calibration Kits

7950CK10/11 SERIES, 7950CK20/21 SERIES AND 7950CK30/31 SERIES

Features

- > 2.4mm Connectors
- > DC to 50 GHz
- > Keysight, Rhode & Schwarz and Anritsu VNAs Supported

Calibration Methods Supported

- > 7950CK10/11 – Fixed Load SOLT (DC–50 GHz)
- > 7950CK20/21 – Sliding Load SOLT (DC–50 GHz)
- > 7950CK30/31 – TRM/TRL/LRL (DC–50 GHz)

The Importance of VNA Calibration

Imperfections exist in even the finest test equipment. If un-corrected these systematic imperfections cause the equipment to yield less accurate measurements. The basis of network analyzer error correction is referred to as “calibration” of which multiple methods exist.

Calibration Methods

SOLT calibration, which uses Short, Open and Load standards, requires precise models of the standards’ electrical performance. Fixed load SOLT uses fixed terminations and is adequate for measuring devices with mid-range reflection coefficients. The lowest return loss is limited by the reflection coefficient of the fixed load standard (typically better than 20 dB return loss*).

The sliding load SOLT kit can accurately measure lower reflection coefficients due to the improved termination performance provided by the sliding load (typically better than 30 dB return loss).

TRL calibration, using Thru, Reflect and Line standards, relies on the characteristic impedance of the air lines (Line). TRL calibration is the most accurate method of measuring devices at low (typically better than 40 dB return loss) and high reflection coefficients. **Refer to specifications on page 3.*

7950CK10/11/20/21 kits are configured for use in performing one-port SOL (Short-Open-Load) response calibrations (a method used for measuring VSWR/ Return Loss), and full two-port SOLT (Short-Open-Load-Thru) calibration (for performing forward and reverse transmission and reflections measurement).

7950CK30/31 TRL/LRL calibration kits contain the components needed to perform TRM, TRL and LRL calibrations. Source match can also be measured using the 6.25cm air line with the short circuit provided.

7950CK11/21/31 kits include three 2.4mm in-series adapters for applications that require female/female, male/male, or male/female connections. A wide range of between-series adapters in 2.4mm to other types and special VNA test port adapters (NMD type) are also available by separate order.

A048A



8799A1



7909A1



7909A2



Recommended Accessories

A048A Digital Connector Gage Kit:

Contains two “thread-on” type, digital gages for measuring female and male contact pin location. They provide an easy and accurate way to measure critical linear interface dimensions of 1.85mm and 2.4mm coaxial connectors.

8799A1 5/16-inch Precision Torque Wrench (8.0 inch lbs):

For proper torquing of 1.85mm, 2.4mm, 2.92mm and 3.5mm connections. Factory preset to 8.0 inch lbs to ensure the precise torque needed for optimum repeatability. Employs a “break” design that makes it impossible to over-torque your connections. These torque wrenches are provided with 7950CK20/21 and 7950CK30/31 kits, and are highly recommended for use with 7950CK10/11 kits.

7909A1 & 7909A2 2.4mm NMD test port adapters:

Precision 2.4mm to NMD2.4mm; DC–50.0 GHz. Saves unnecessary wear and tear on your VNA test ports.

Go to www.maurymw.com/Precision/Adapters.php to see all Maury 2.4mm in-series and between series adapters.

Maury 2.4mm VNA Calibration Kits

Maury precision 2.4mm VNA calibration kits include each of the calibration standards and tools shown in the tables at the right. The 7950CK10/20/30 kits do not include adapters; the 7950CK11/21/31 kits include one each of the in-series adapters shown. Other in-series and between series adapters are sold separately.

Components Included in 7950CK10/11 Kits

QUANTITY	DESCRIPTION	MODEL
1	2.4mm female fixed short circuit	7946A
1	2.4mm male fixed short circuit	7946B
1	2.4mm female open circuit termination	7948A1
1	2.4mm male open circuit termination	7948B1
1	2.4mm female fixed termination	7931A1
1	2.4mm male fixed termination	7931B1
1*	2.4mm female to 2.4mm female adapter	7921A
1*	2.4mm male to 2.4mm male adapter	7921B
1*	2.4mm female to 2.4mm male adapter	7921C
1	Foam-lined wood Instrument case	—

* These adapters are provided in the 7950CK11 kits, but are not included in the 7950CK10 kits.

Components Included in 7950CK20/21 Kits

QUANTITY	DESCRIPTION	MODEL
1	2.4mm female fixed short circuit	7946A
1	2.4mm male fixed short circuit	7946B
1	2.4mm female open circuit termination	7948A1
1	2.4mm male open circuit termination	7948B1
1	2.4mm female fixed termination	7931A1
1	2.4mm male fixed termination	7931B1
1*	2.4mm female to 2.4mm female adapter	7921A
1*	2.4mm male to 2.4mm male adapter	7921B
1*	2.4mm female to 2.4mm male adapter	7921C
1	2.4mm female sliding termination	7935A
1	2.4mm male sliding termination	7935B
1	Pin depth adjusting tool	8777S02
1	5/16-inch torque wrench — 8 in. lbs.	8799A1
1	5/16-inch double end wrench	8770Z6
1	Foam-lined wood Instrument case	—

* These adapters are provided in the 7950CK21 kits, but are not included in the 7950CK20 kits.

Components Included in 7950CK30/31 Kits

QUANTITY	DESCRIPTION	MODEL
1	2.4mm female fixed short circuit	7946A
1	2.4mm male fixed short circuit	7946B
1	2.4mm female fixed termination	7931A1
1	2.4mm male fixed termination	7931B1
1*	2.4mm female to 2.4mm female adapter	7921A
1*	2.4mm male to 2.4mm male adapter	7921B
1*	2.4mm female to 2.4mm male adapter	7921C
1	2.4mm female to male air line (1.25cm)	7943S1.25
1	2.4mm female to male air line (1.50cm)	7943S1.50
1	2.4mm female to male air line (6.25cm)	7943S6.25
1	5/16-inch torque wrench — 8 in. lbs.	8799A1
1	3/16-inch double end wrench	7960Z1
1	5/16-inch double end wrench	8770Z6
1	Foam-lined wood Instrument case	—

* These adapters are provided in the 7950CK31 kits, but are not included in the 7950CK30 kits.

7950CK10



7950CK11



7950CK20



7950CK21



7950CK30



7950CK31



COMPONENT SPECIFICATIONS



Air Lines – Models 7943S1.25, 7943S1.50 & 7943S6.25

Frequency Range -- DC to 50.0 GHz

Electrical Length:

7943S1.25 -- 1.25cm

7943S1.50 -- 1.50cm

7943S6.25 -- 6.25cm

Electrical Length Accuracy -- 0.0025cm

Minimum Return Loss (excluding connector interface) -- 48 dB

Nominal Impedance -- 50 ohm



Sliding Terminations – Models 7935A & 7935B

Frequency Range (Terminating Element) -- 4.0 to 50.0 GHz

Maximum VSWR (Terminating Element):

4.0 to 10.0 GHz -- 1.10

10.0 to 50.0 GHz -- 1.05

Power Handling -- 0.5 watt CW, 0.5 kW peak

Nominal Impedance -- 50 ohm

Air Line Accuracy (4.0–50.0 GHz) -- 44 dB (Min) (equivalent return loss of air line impedance)



Fixed Terminations – Models 7931A1 & 7931B1

Frequency Range -- DC to 50.0 GHz

Maximum VSWR:

DC to 4.0 GHz -- 1.016

4.0 to 50.0 GHz -- 1.15

Power Handling -- 0.5 watt CW, 0.25 kW peak

Nominal Impedance -- 50 ohm



Open Circuits – Models 7948A1 & 7948B1

Frequency Range -- DC to 50.0 GHz

Minimum Reflection Coefficient -- 0.98

Phase Accuracy -- ± 2.0 degrees

Nominal Impedance -- 50 ohm



Fixed Shorts – Models 7946A & 7946B

Frequency Range -- DC to 50.0 GHz

Minimum Reflection Coefficient -- 0.98

Phase Accuracy -- ± 2.0 degrees

Nominal Impedance -- 50 ohm



Precision 2.4mm Adapters – Models 7921A/B/C

Frequency Range -- DC to 50.0 GHz

Maximum VSWR:

DC to 26.5 GHz -- 1.06

26.5 to 40.0 GHz -- 1.10

40.0 to 50.0 GHz -- 1.15

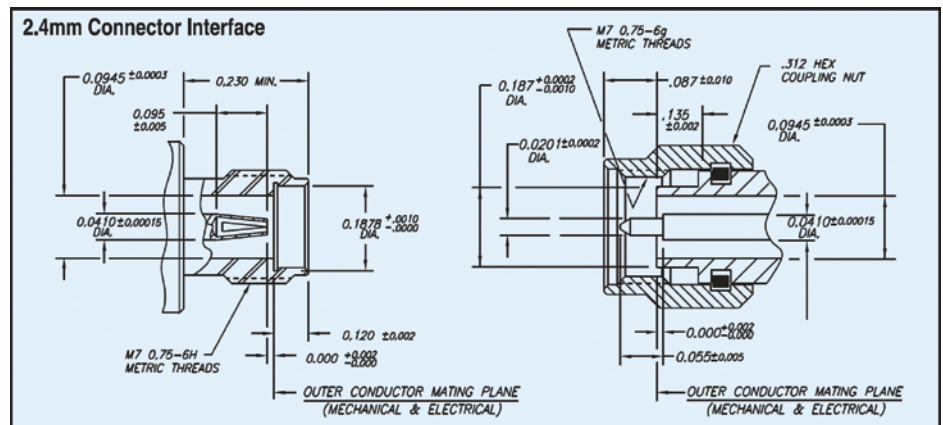
Nominal Impedance -- 50 ohm

(Note: These adapters are included in the 7950CK11/21/31 kits, but are not included in the 7950CK10/20/30 kits.)

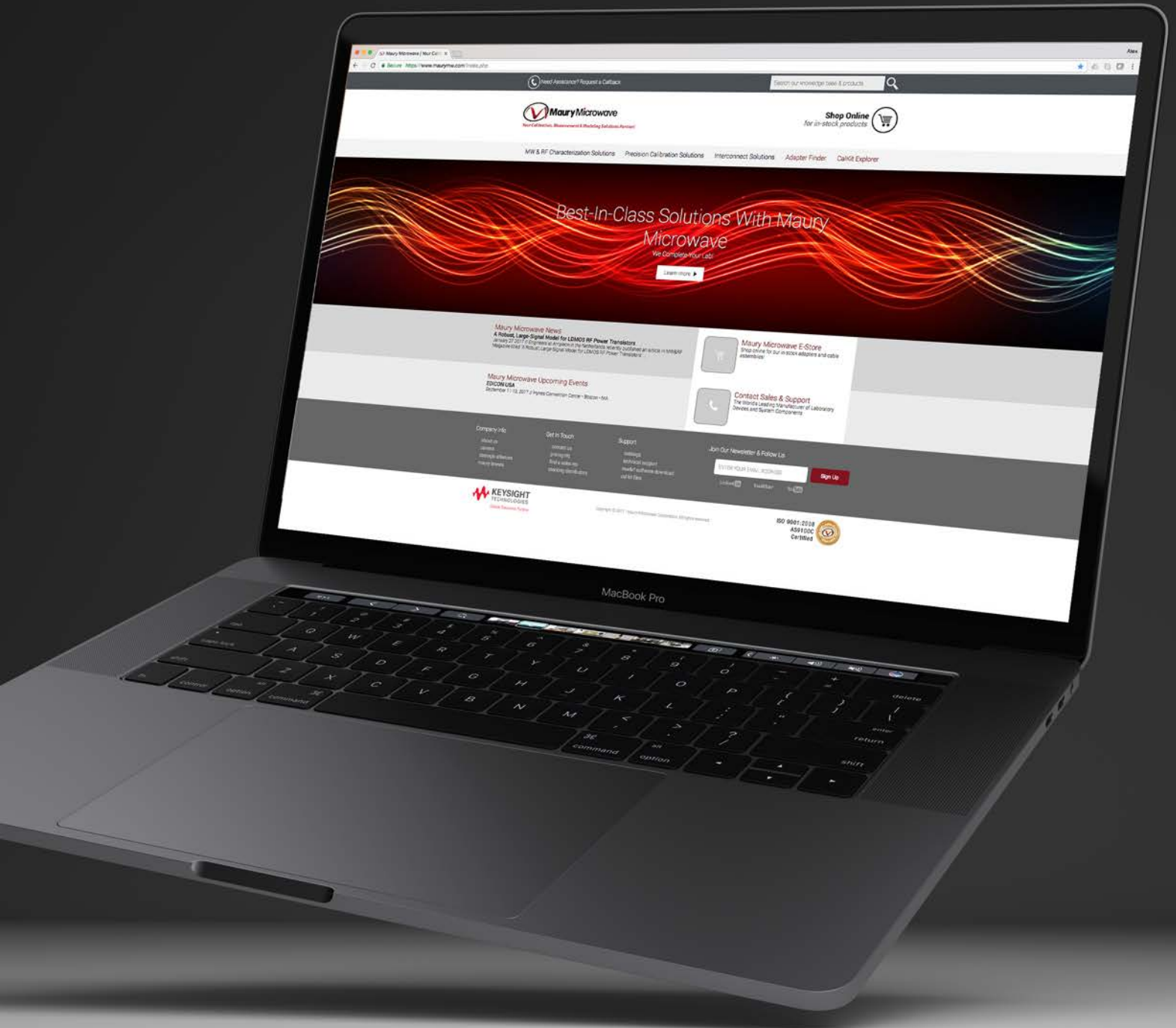
Connector Description

The precision 2.4mm connectors on the components in these kits are miniature, instrument grade, air-interface connectors that operate mode free up to 50 GHz, and comply with IEEE standard 287 general precision connector, instrument grade GPC2.4.

For detailed interface specifications please refer to Maury data sheet 5E-064.



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