



Maury Microwave

User Guide

BNC (50 Ohm)

Coaxial Calibration Kit

Model: 8550CK10



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Warranty

Maury Microwave hardware products are warranted against defects in materials and workmanship for a period of one year from date of shipment. During the warranty period, Maury Microwave will, at its option, either repair or replace products which prove to be defective.

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For warranty service or repair, all products must be returned to Maury Microwave and must be issued a return authorization number by Maury prior to shipment. Buyer shall prepay shipping charges to Maury. Obligation is limited to the original Buyer.

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General Information

Calibration Kit Description

This series of BNC 50 ohm coaxial calibration kits is designed to provide accurate calibrations of network analyzers in the DC to 2.0 GHz range. However, these kits can be used at higher frequencies up to 10 GHz. Each of these kits includes all the necessary calibration standards and associated hardware needed for the accurate calibration of most network analyzers.

See the following *Calibration Kit Contents* section for information on included components and available kit options:

*Refer to Maury Microwave data sheet 2Z-069 (available on our website)
for further specifications on the Maury Microwave Models: 8550CK10 coaxial calibration kits.*

NOTE: This document, calibration constants software, and data sheet can be downloaded from our website:
maurymw.com

NOTE: Legacy analyzer software is not on our website but is available for purchase.

Maintenance

This calibration kit is relatively maintenance free if the components are handled with the same care that is appropriate to all precision equipment. As with any precision component, proper care should be taken to assure clean mating surfaces, correct alignment when mating, and proper torquing of connectors or waveguide coupling screws. To help maintain the integrity of the components in this kit, routine visual inspection and cleaning of mating surfaces is recommended. Failure to do so may result in degraded repeatability and accuracy, as well as damage any mated devices.

Calibration

To maintain verification that a calibration kit is performing to traceable specifications, we recommend that all kits be periodically returned to Maury Microwave for calibration. The typical calibration cycle is one year, although actual need may vary depending on usage.

Supporting Test Port Adapters

When configuring a test setup, be sure that damaging stresses are not applied to the connectors on the test set. This is particularly critical when the attached components are heavy or long. Always properly support the test port adapters being used.

Electrostatic Discharge Precautions

Protection against electrostatic discharge (ESD) is essential while inspecting, cleaning, or making connections to connectors attached to a static-sensitive circuit, such as those found inside test sets.

When handling the connectors on the test set, be aware that you are coming in contact with exposed center conductors that are connected directly to the static-sensitive internal circuits of the network analyzer. Make sure that you and your equipment are well-grounded before inspecting, cleaning, or making connections to test set ports. Standard ESD precautions, such as the use of grounded wrist straps and grounded antistatic mats, are recommended.

Connector Description

All calibration standards and adapters in this series of kits utilize the Maury Microwave Precision BNC 50 Ohm Connector, which is compliant with MIL-C-39012 specifications.

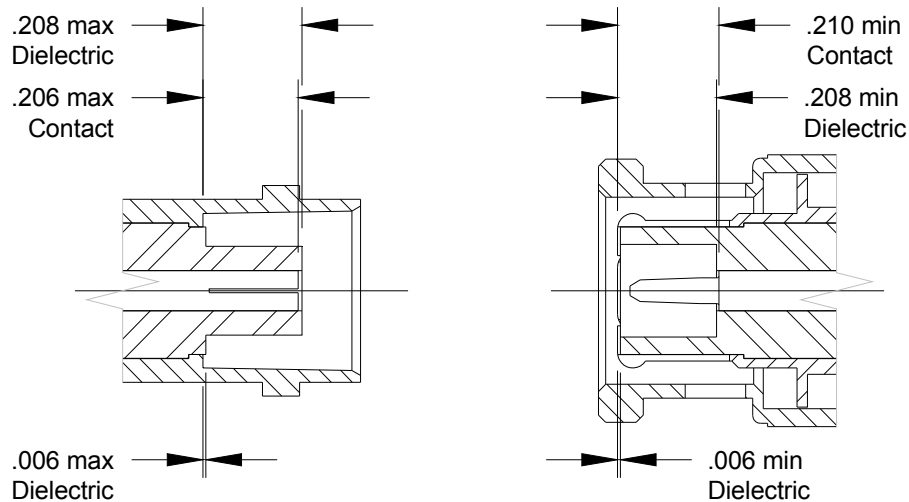


Figure 1. BNC Connector Interfaces

Connector Care

Precision connectors must be handled carefully if accurate calibrations and measurements are to be obtained. All connectors should be inspected prior to each use. For optimum measurement results, all interfaces should be visually inspected under magnification and cleaned on a regular basis. Proper connector contact pin depths should also be verified through regular inspections using a connector gage, such as the Maury Microwave A012A connector gage kit, to insure that the connectors on both calibration devices and devices under test (DUTs) have contact pin depths within recommended tolerances. See Figure 1 above for proper pin and dielectric depth specifications for the BNC connector.

Care should be used whenever aligning connectors. Tighten connector coupling nuts using an appropriate torque wrench while holding the opposing connector with an open-end wrench.

When disconnecting devices, take care not to rock or bend any of the connections. Disconnect devices by disengaging the coupling nuts and gently pulling the connectors apart in a straight line.

Always use protective covers on all connectors when devices are not in use.

Should a connector become damaged, it should be repaired before it is used any further or replaced immediately. A damaged connector can damage other mated connectors.

Calibration Kit Contents**Standard Components – 8550CK10**

1 ea	Short, female	361N2
1 ea	Short, male	361P2
1 ea	Open, female	371N2
1 ea	Open, male	371P2
1 ea	Fixed Termination, female	351A2
1 ea	Fixed Termination, male	351B2
1 ea	Case Assembly	

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Standard Definitions

Anritsu Network Analyzers

Table 1. Male Standard Definitions for Anritsu

BNC Male Open Device	
C0	62.0 e-15
C1	450.0 e-27
C2	235.0 e-36
C3	-10.0 e-45
Offset Length	2.403 cm
Serial Number	00000

BNC Male Short Device	
Offset Length	2.527 cm
Serial Number	00000

Table 2. Female Standard Definitions for Anritsu

BNC Female Open Device	
C0	57.0 e-15
C1	1350.0 e-27
C2	275.0 e-36
C3	-35.0 e-45
Offset Length	1.686 cm
Serial Number	00000

BNC Female Short Device	
Offset Length	1.805 cm
Serial Number	00000

For specific loading instructions, see **Anritsu loading instructions**, which can be downloaded from our website: maurymw.com.

Keysight Network Analyzers

Table 3. Standard Definitions for Keysight

Type	Standard (1) Description	C0 x10 ⁻¹⁵ F		C1 x10 ⁻²⁷ F/Hz		C2 x10 ⁻³⁶ F/Hz ²		C3 x10 ⁻⁴⁵ F/Hz ³		Fixed or Sliding (2)	Offset			Frequency GHz		Coax or W/G	Standard Label
		L0 x10 ⁻¹² H	L1 x10 ⁻²⁴ H/Hz	L2 x10 ⁻³³ H/Hz ²	L3 x10 ⁻⁴² H/Hz ³	Delay ps	Z ₀ (3) Ω	Loss (4) GΩ/s	Min		Max						
Short	361N2 Female Short										60.208	50	1.5	0	999	Coax	361N2
Open	371N2 Female Open	57.0	1350.0	275.0	-35.0						56.239	50	1.5	0	999	Coax	371N2
Load	351A() Broadband Female Load								Fixed		0	50	0	0	999	Coax	351A() BB
Thru	Thru (0 cm)										0	50	0	0	999	Coax	Thru (5)
Short	361P2 Male Short										84.291	50	1.5	0	999	Coax	361P2
Open	371P2 Male Open	62.0	450.0	235.0	-10.0						80.159	50	1.5	0	999	Coax	371P2
Load	351B() Broadband Male Load								Fixed		0	50	0	0	999	Coax	351B() BB

(1) Open, short, load, delay/thru, or arbitrary impedance.

(2) Load or arbitrary impedance only.

(3) Z₀ normalized.

(4) Skin loss factor, normalized at 1 GHz.

(5) Test ports connected directly

For specific loading instructions, see **Keysight loading instructions**, which can be downloaded from our website: maurymw.com

Rohde & Schwarz Network Analyzers

Table 4. Standard Definitions for Rohde & Schwarz

Short (M) Label = 361P2 Min Freq = 0 Hz Max Freq = 10.0 GHz Length = 25.270 mm Loss = 0.021964 dB/ $\sqrt{\text{GHz}}$	Through (MF) Label = 0 cm Thru Min Freq = 0 Hz Max Freq = 10.0 GHz Length = 0 mm Loss = 0 dB/ $\sqrt{\text{GHz}}$
Short (F) Label = 361N2 Min Freq = 0 Hz Max Freq = 10.0 GHz Length = 18.050 mm Loss = 0.015689 dB/ $\sqrt{\text{GHz}}$	Match (M) Label = 351B2 Min Freq = 0 Hz Max Freq = 10.0 GHz
Open (M) Label = 371P2 Min Freq = 0 Hz Max Freq = 10.0 GHz Length = 24.031 mm Loss = 0.020888 dB/ $\sqrt{\text{GHz}}$ C0 = 62.0 fF C1 = 0.45 fF/GHz C2 = 0.235 fF/GHz ² C3 = -0.01 fF/GHz ³	Match (F) Label = 351A2 Min Freq = 0 Hz Max Freq = 10.0 GHz
Open (F) Label = 371N2 Min Freq = 0 Hz Max Freq = 10.0 GHz Length = 16.86 mm Loss = 0.0146546 dB/ $\sqrt{\text{GHz}}$ C0 = 57.0 fF C1 = 1.35 fF/GHz C2 = 0.275 fF/GHz ² C3 = -0.035 fF/GHz ³	Sliding Match (M) Label = Sliding (m) Min Freq = 2.0 GHz Max Freq = 10.0 GHz
	Sliding Match (F) Label = Sliding (f) Min Freq = 2.0 GHz Max Freq = 10.0 GHz

For specific loading instructions, see **Rohde & Schwarz loading instructions**, which can be downloaded from our website: maurymw.com.

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Data Sheet Resources

2Z-069 – Precision Calibration Kits – BNC Coaxial Connectors Vector Network Analyzers
<http://maurymw.com/pdf/datasheets/2Z-069.pdf>

2Y-009 – Connector Gage Kit – Precision TNC / BNC Connectors
<http://maurymw.com/pdf/datasheets/2Y-009.pdf>

2Z-001A – Test Port Cable / Adapter Kits
<http://maurymw.com/pdf/datasheets/2Z-001A.pdf>

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Web Resources

Maury Calibration Kits
http://maurymw.com/Precision/VNA_Cal_Kits.php

Maury Precision Coaxial and Waveguide-to-Coaxial Adapters
http://maurymw.com/Finder/Adapter_Finder.php

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