

Keysight 42942A Terminal Adapter, 40 Hz to 110 MHz

Operation and
Service Manual

Notices

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CAUTION

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WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

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1 Installation Guide

Incoming Inspection

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the 42942A has been checked mechanically and electrically. The shipment should contain everything listed in **Table 1-1**. If the contents are incomplete or if there is mechanical damage or defect, notify the nearest Keysight Technologies office. If the shipping container is damaged or the cushioning material shows signs of unusual stress, notify the carrier as well as the Keysight Technologies office. Keep the shipping materials for the carrier's inspection.

Table 1-1

Contents

Description	Part Number	Qty.
42942A Terminal Adapter	-	1
OPEN ¹	04191-85302	1
SHORT ¹	04191-85300	1
LOAD ¹	04291-60043	1
Operation and Service Manual	Option ABA	1
Carrying Case	42942-60011	1

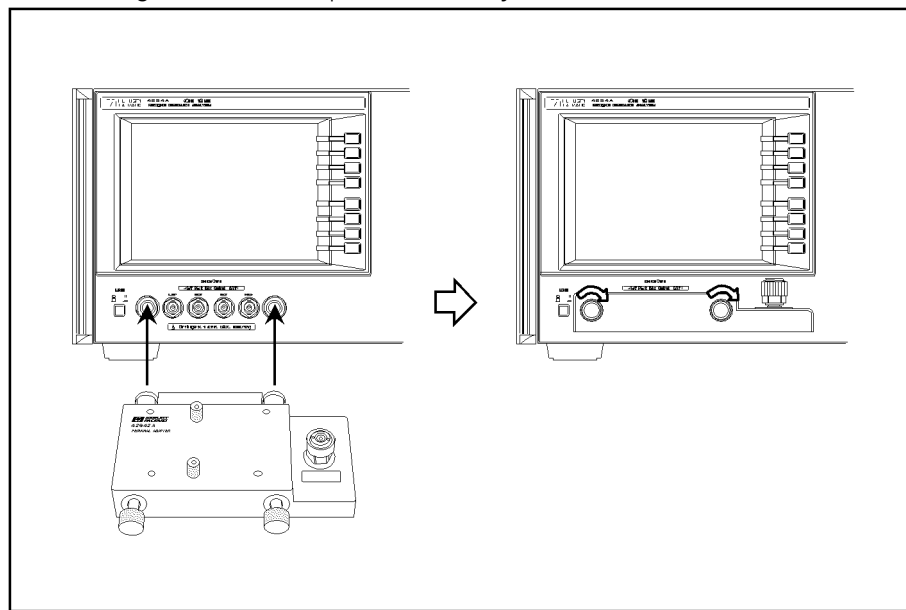
1. Furnished with Option 700.

Connecting the 42942A

Follow the steps below to connect the 42942A to the Impedance Analyzer.

- Step 1. Join the 42942A terminal adapter to the test connectors on the front panel of the Impedance Analyzer by gently matching the four BNC connectors and fastening screws of the adapter with the test connectors and accessory mounting holes of the instrument until they come into complete contact.
- Step 2. Turn the adapter's two fastening screws clockwise at the same time until the fixture is firmly secured to the instrument.

Figure 1-1 Connecting 42942A to Impedance Analyzer



42942aaj0102

Cleaning

Even a tiny amount of dirt on the 7-mm connector of the OUTPUT port would greatly degrade the accuracy of your measurement. Use a lint-free cloth to clean the connector if it gets dirty.

Serial Number

Keysight Technologies uses a ten-character serial number that is stamped on the serial number plate attached to the bottom of the four-terminal pair connection block. The first two characters shows the made-in country, the next three digits are assigned as the serial prefix, and the last five digits are the suffix.

Installation Guide
Serial Number

2 Overview

Product Overview

The 42942A is an adapter equipped with a 7-mm coaxial connector that connects a test fixture furnished with the same type of connector to the Impedance Analyzer.

Figure 2-1 Product Overview



Functions

Figure 2-2 and Figure 2-3 show the names of the 42942A's parts and contents of the option 700, respectively.

Figure 2-2

42942A Parts

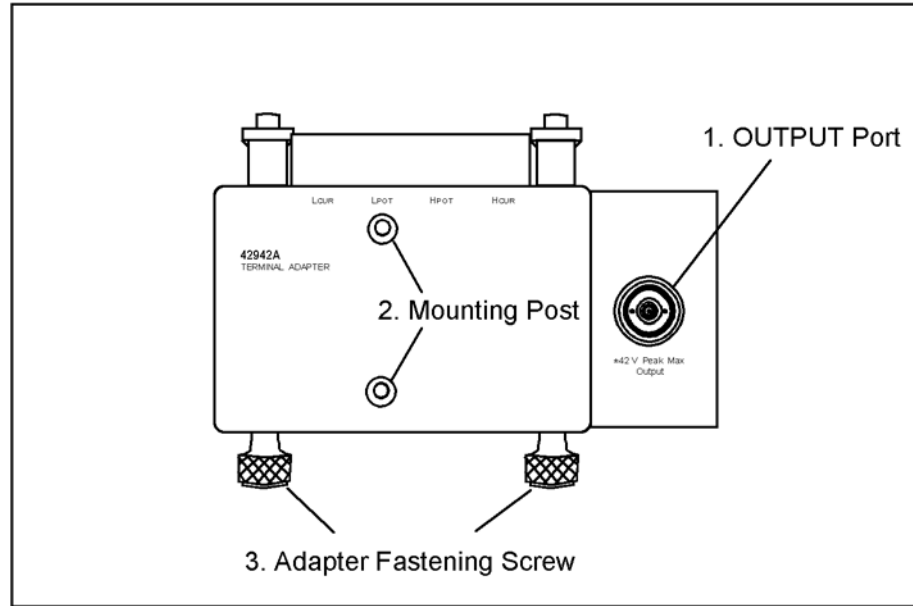


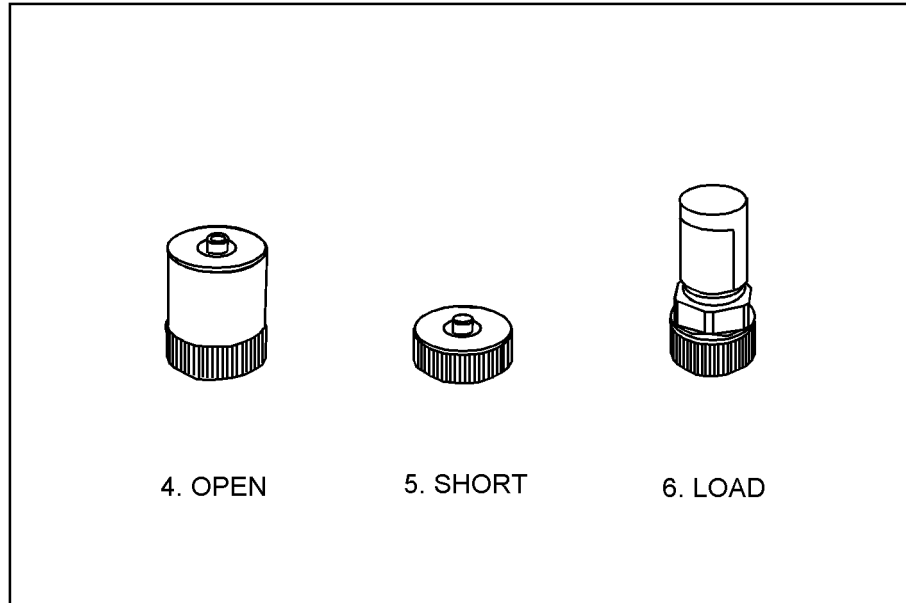
Table 2-1

42942A Function

No.	NAME	FUNCTION
1	OUTPUT Port	Contact for the test fixture furnished with a 7-mm coaxial connector.
2	Mounting Post	Guide and support post for fixture connection.
3	Adapter Fastening Screws	Secures the fixture to the Impedance Analyzer.

Figure 2-3

Option 700 7-mm Open/Short/Load Set



42942aoj0203

Table 2-2

Contents of the Option 700

No.	NAME	FUNCTION
4	OPEN	An open device (OPEN, 0 S) used for the adapter setup.
5	SHORT	A short device (SHORT, 0 Ω) used for the adapter setup.
6	LOAD	A load device (50 Ω) used for the adapter setup.

Overview
Functions

3 Operation

This chapter describes the proper methods for adapter setup of the 42942A, connecting a fixture, and fixture compensation.

Impedance Analyzer Setup

Before beginning measurements, you should perform the adapter setup. The following procedure shows adapter setup for the 42942A. Also refer to the help manual of the Impedance Analyzer for more information on adapter setup.

CAUTION

When handling the 42942A, care must be taken not to give it any mechanical shock, which may damage the adapter. Never give any mechanical shock to the upper face with the 7-mm connector's mouth. Also, do not place the 42942A with the upper face down on a hard surface.

NOTE

If the ambient temperature deviates by more than 5 °C from the temperature in which the adapter setup was done, it is recommended that you perform the adapter setup again in the ambient temperature.

Adapter Setup

Connect the 42942A to the Impedance Analyzer and perform the adapter setup as described below.

1. Power on the Impedance Analyzer. Allow 30 minutes or longer for warm-up.
2. Press the **[Cal]** key to bring up the Calibration Menu.
3. Press the **Adapter []** key to bring up the Adapter Setup Menu. **[]** should indicate current settings.
4. Select **7mm 42942A**. When selected, the softkey label will have a dot beside it.
5. Press the **Adapter Setup** key to bring up the Adapter Setup Menu.

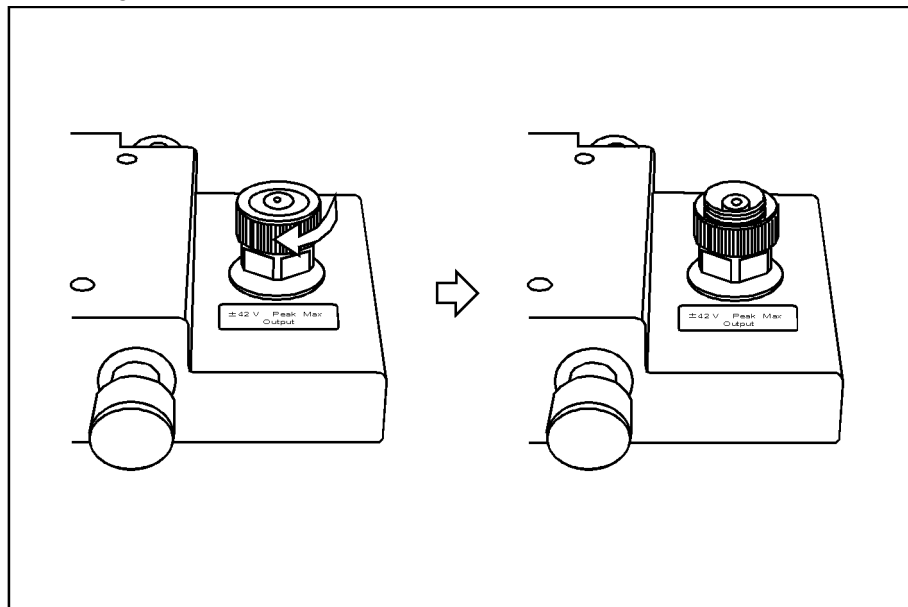
- Turn the 7-mm OUTPUT port connector clockwise until the connector sleeve is fully exposed.

Even a tiny amount of dirt on the 7-mm OUTPUT port connector would greatly degrade the accuracy of your measurement. Keep the connector clean and never touch the mating plane surfaces. Use a lint-free cloth to clean the connector if it gets dirty.

CAUTION

The 7-mm OUTPUT port connector is sensitive to damage and thus requires careful handling. When not used, protect the mating plane surfaces with end caps.

Figure 3-1 Extending Connector Sleeve



42942aaj0301

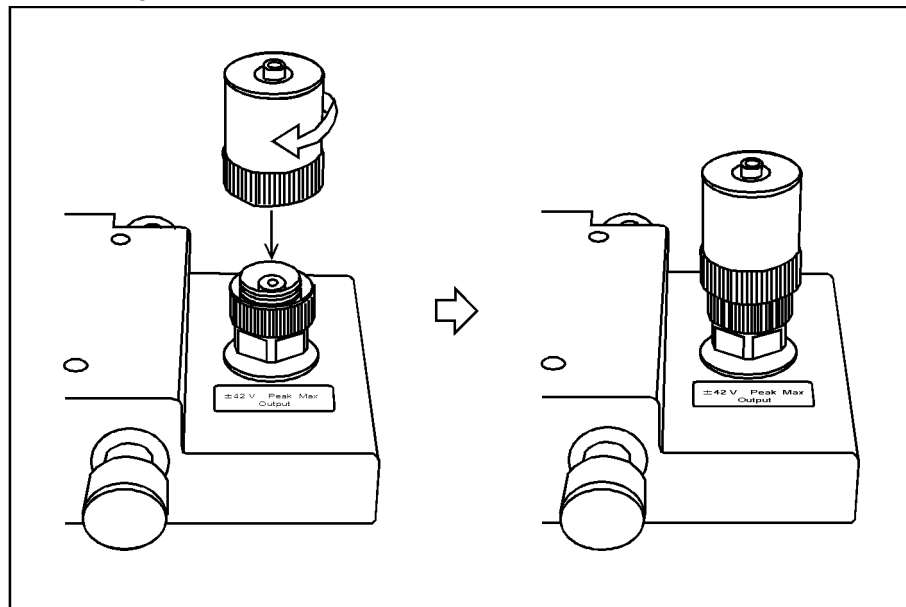
- Connect the OPEN standard to the 7-mm OUTPUT port connector.

CAUTION

Never store the OPEN standard loosely in a box or drawer because this may result in damage to the mating plane surfaces. Do not drop the OPEN standard or give it any strong mechanical shock.

Figure 3-2

Connecting OPEN Standard



8. Press the **Phase [-]** key to start the phase compensation data measurement.

When the phase compensation data measurement is completed, the softkey label changes to **Phase [Done]**. Press the **Save Phase** key.

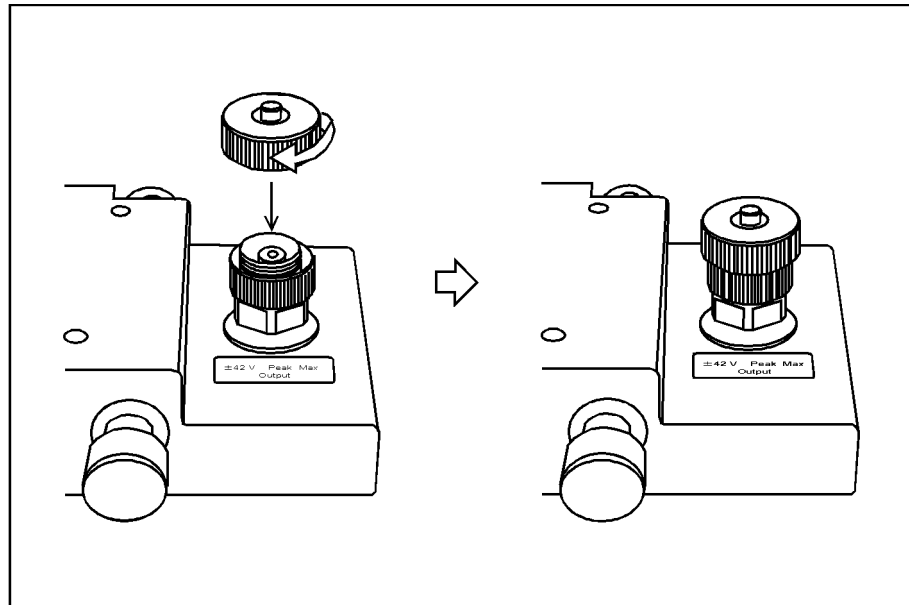
9. Press the **Open [-]** key to start the open data measurement. When the open data measurement is completed, the softkey label changes to **Open [Done]**.
10. Remove the OPEN standard and connect the SHORT standard to the 7-mm OUTPUT port connector.

CAUTION

Never store the SHORT standard loosely in a box or drawer because this may result in damage to the mating plane surfaces. Do not drop the SHORT standard or give it any strong mechanical shock.

Figure 3-3

Connecting SHORT Standard



42942aaj0303

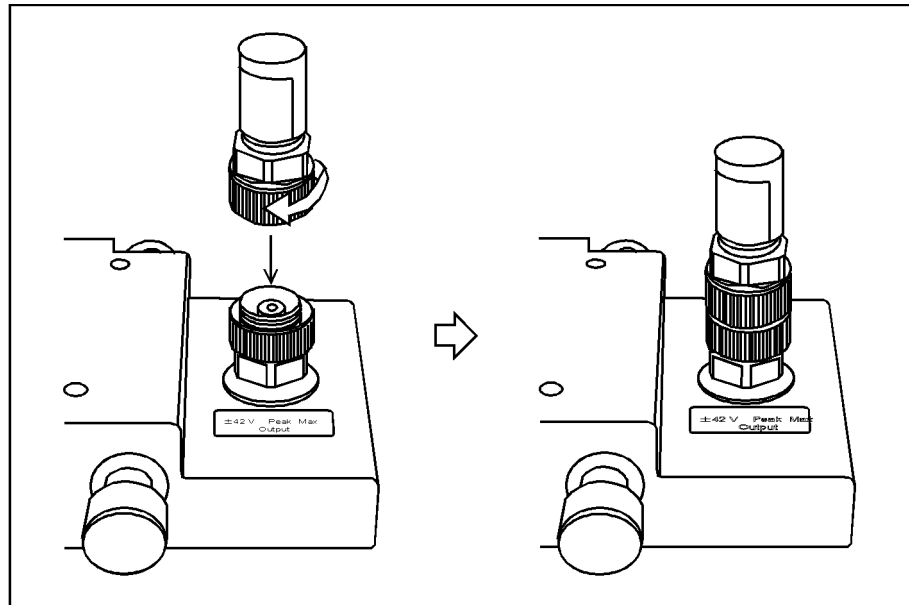
11. Press the **Short [-]** key to start the short data measurement. When the short data measurement is completed, the softkey label changes to **Short [Done]**.
12. Remove the SHORT standard from the 7-mm OUTPUT port connector of the 42942A. Then connect the LOAD standard to the 7-mm port.

CAUTION

Never store the LOAD standard loosely in a box or drawer because this may result in damage to the mating plane surfaces. Do not drop the LOAD standard or give it any strong mechanical shock. When not used, protect the mating plane surfaces with end caps.

Figure 3-4

Connecting LOAD Standard



42942aaj0304

13. Press the **Load [-]** key to start the load data measurement. When the load data measurement is completed, the softkey label changes to **Load [Done]**.

14. Press the **Save Impedance** key.

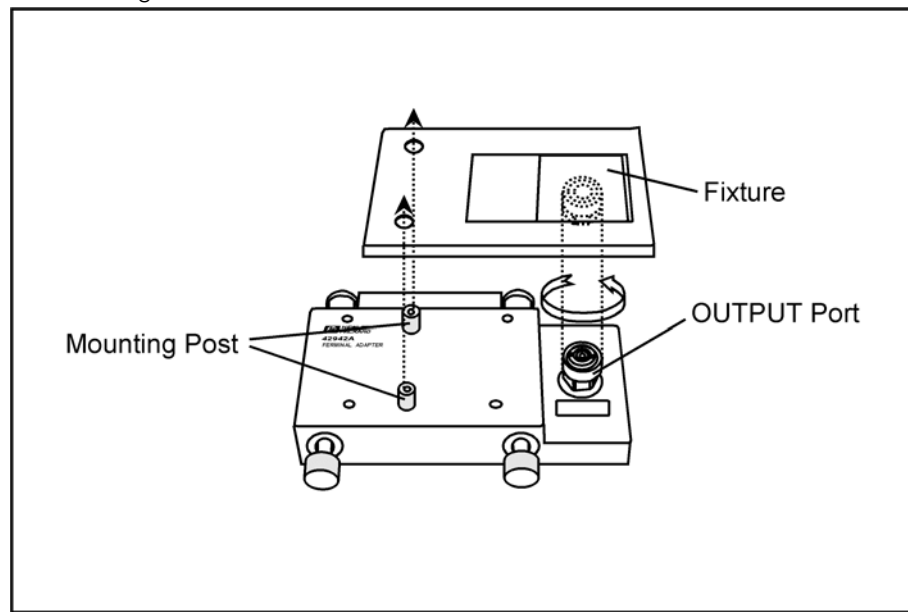
Connecting Test Fixture

After the adapter setup, you can connect the test fixture to the terminal adapter. Refer to the manual that came with the fixture for the connection procedure. The connection procedure shown below is common to most fixtures.

1. Turn the 7-mm OUTPUT port connector on the terminal adapter counterclockwise until the connector sleeve is fully retracted.
2. Join the test fixture to the terminal adapter by keying the mounting posts and the OUTPUT port of the adapter.
3. Turn the 7-mm OUTPUT port connector on the terminal adapter counterclockwise to secure it to the connector on the lower side of the test fixture.

Figure 3-5

Connecting Test Fixture



42942aoe0305

Fixture Compensation

To compensate for any residual impedance and admittance existing in the test fixture, perform fixture compensation. The fixture compensation requires measurements with the 42942A for open and short compensation data. Generally, there is no need to perform load compensation. For more information on fixture compensation, refer to the *Impedance Analyzer Help Manual*.

NOTE

Electrical length is noted on the test fixture and its furnished manual. There is no need to set the electrical length in the Impedance Analyzer when using the 42942A. The OPEN/SHORT compensation could eliminate the error.

Performing Open Compensation

The following procedure is for measurement of the open compensation data.

1. Be sure that the fixture is open, without any connection between the measurement terminals.
2. Press the **[Cal]** key to bring up the Calibration Menu.
3. Press the **Fixture Comp** key to bring up the Fixture Compensation Menu.
4. Press the **Open ()** key to start the OPEN compensation data measurement. **()** should indicate the defined Open value. When the OPEN compensation data measurement is completed, the softkey label **Open [OFF]** (if it is off) changes to **Open [ON]**.

Performing Short Compensation

The following procedure is for measurement of the short compensation data.

1. Put the terminal of the test fixture into the SHORT state. For more information on shorting methods, refer to the manual that came with the fixture.
2. Press the **Short ()** key to start the SHORT compensation data measurement. **()** should indicate the defined Short value. When the SHORT compensation data measurement is completed, the softkey label **Short [OFF]** (if it is off) changes to **Short [ON]**.

Performing Load Compensation

Generally, there is no need to perform load compensation. If you have any standard device or you need to keep consistency in measured data, perform the load compensation by using the device. When you perform load compensation, set the load value of the device to the instrument.

The following procedure is for the measurement of the load compensation data.

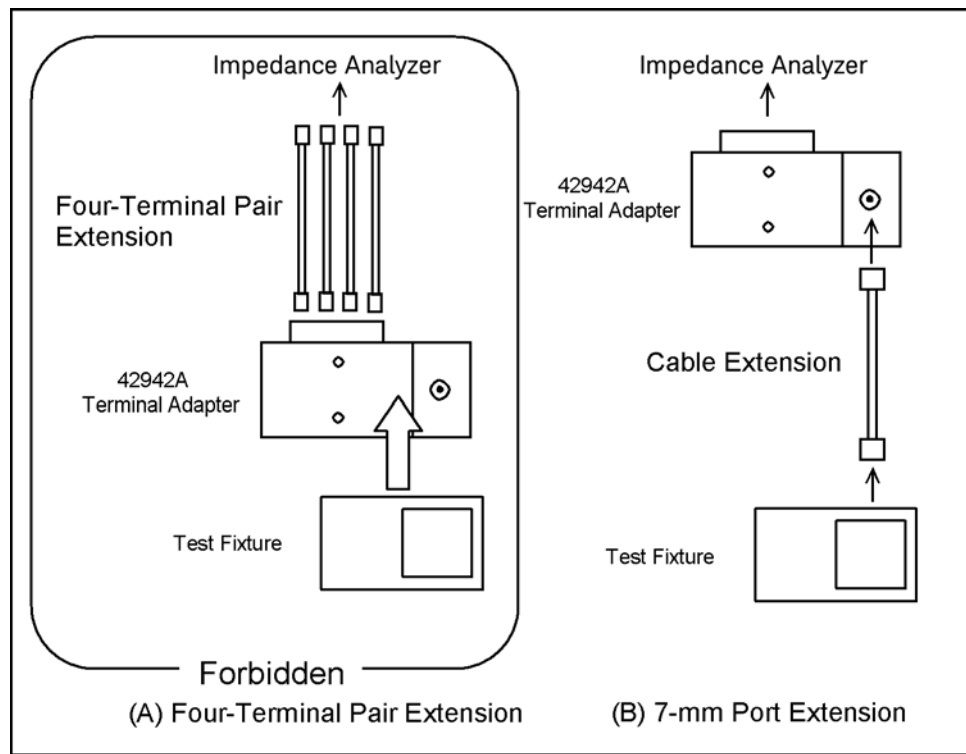
1. Define the load value by pressing **Define Value**.
2. Connect the load device to the terminal of the test fixture. For more information on connecting methods, refer to the manual that came with the fixture.
3. Press the **Load ()** key to start the LOAD compensation data measurement. **()** should indicate defined Load value. When the LOAD compensation data measurement is completed, the softkey label **Load [OFF]** (if it is off) changes to **Load [ON]**.

Fixture Extension

The 42942A is designed to connect directly to the Impedance Analyzer. Thus, the measurement point on the four-terminal pair cannot be extended by using four extension cables as shown in **Figure 3-6 (A)**. The 42942A must be directly connected to the Impedance Analyzer as shown in **Figure 3-6 (B)**. For fixture extension, use a coaxial cable connected to the 7-mm OUTPUT port on the 42942A. Note that the 42942A's specified accuracy will no longer be assured with this extension. For calibration of the extended fixture, refer to the *Impedance Analyzer Help Manual*.

Figure 3-6

Fixture Extension



42942ace0306

Operation
Fixture Extension

4 Specifications

This chapter provides specifications of the 42942A test fixture.

Specifications

Applicable Instruments	Impedance Analyzer	
Frequency	20 Hz to 120 MHz	
Maximum Voltage	±42 V peak max. (AC+DC)	
Operating Environment	temp.	0 °C to +40 °C
	humidity	15% to 95% RH (@ wet bulb temp. <40 °C)
Non-operating Environment	temp.	-40 °C to +70 °C
	humidity	≤ 90 % RH (@ wet bulb temp. <65 °C)
Dimensions	300 (W) × 100 (H) × 280 (D) mm (includes carrying case)	
Weight	2300 g (42942A body 800 g)	
Safety Standards	EN61010-1:1993 +A2:1995 IEC61010-1:1990 +A1:1992 +A2:1995 CSA C22.2 No.1010.1:1992 INSTALLATION CATEGORY I POLLUTION DEGREE 2 INDOOR USE	

For more information on impedance measurement accuracy at the 3.5-mm port and additional error factor, refer to the *Impedance Analyzer Help Manual*.

Specifications
Specifications

5 Service

This chapter provides information on servicing and proper maintenance.

Maintenance

An exploded view of the 42942A of RoHS and non-RoHS compliance for parts identification is shown in **Figure 5-1** and **Figure 5-2**. Due to limited availability of RoHS compliance station and technical difficulties in RoHS soldering, only parts and support level that do not require RoHS soldering are supported. Do not disassemble any further than shown. Maintenance consists principally of cleaning contacts and replacing worn or damaged parts. Take special care when cleaning contacts.

To order parts, use the Keysight Technologies part numbers listed in **Table 5-1** and **Table 5-2**. If a faulty part is located in an assembly that cannot be disassembled, order the next higher assembly or return the fixture to the nearest Keysight Technologies Sales/Service Office for repair or replacement.

Figure 5-1 Replaceable Parts (part 1 of 2)

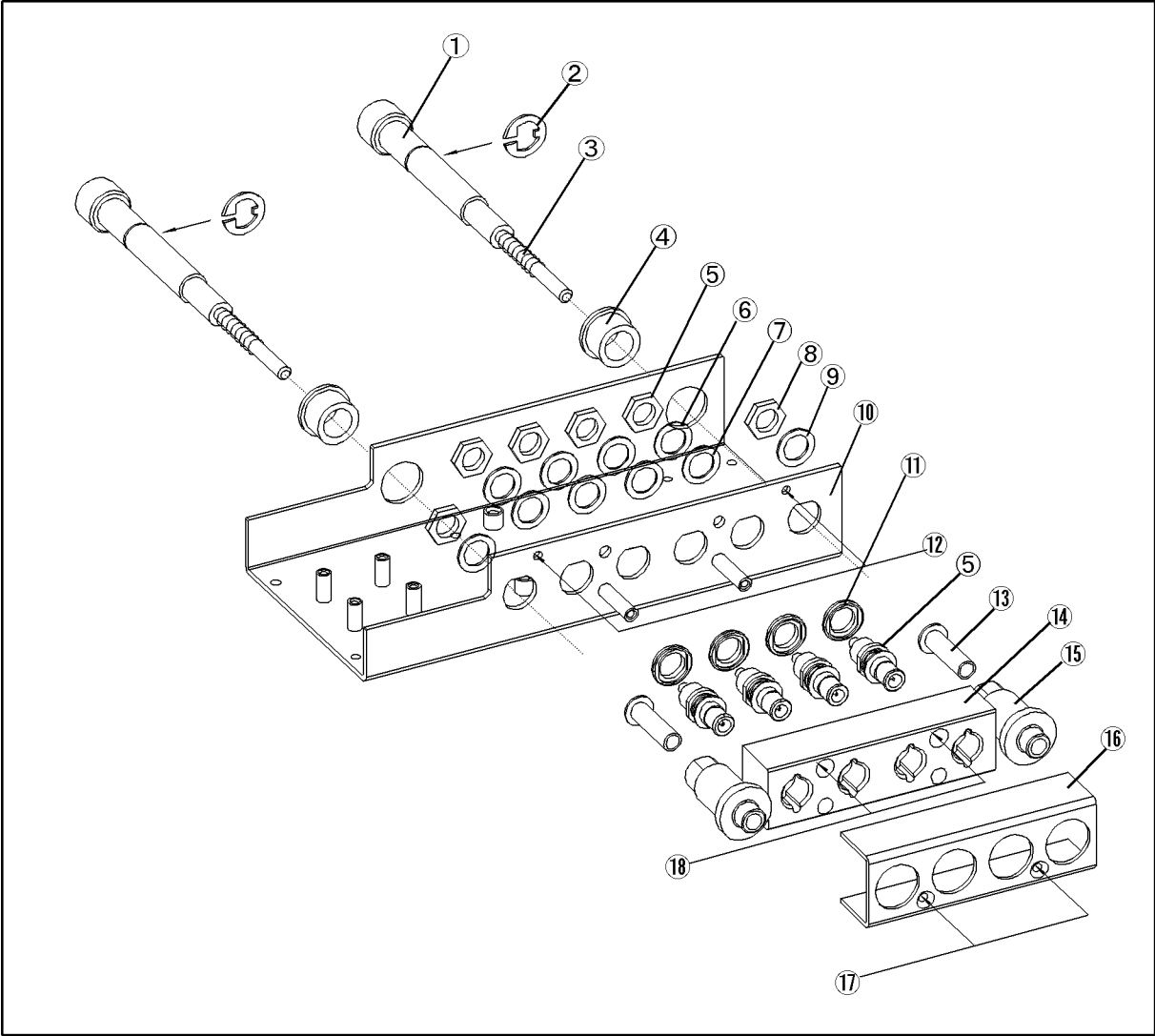


Table 5-1

Replaceable Parts (part 1 of 2)

Reference Designator	Part No.	RoHS Compliant Replacement Part No.	Qty.	Description
1	42942-24007	42942-24007	2	SHAFT
2	0510-0083	0510-0083	2	RTNR-R
3	1460-2615	1460-2615	2	SPRING
4	42941-40002	42941-40002	2	BUSHING
5	1253-0476	5012-8630	4	ADPT BNC-SMB
6	3050-0067	3050-0067	4	WSHR-FL MTLC
7	3050-0789	3050-0789	4	WSHR-FL NM
8	2950-0054	2950-0054	2	TNUT-HEX-DBL-CHAM
9	2190-0054	2190-0054	2	WSHR-LK INTL
10	42942-00602	42942-00602	1	COVER BOTTOM
11	16047-40002	16047-40002	4	INSULATOR
12	0515-0914	0515-1946	2	SCR-MACH M3X0.5
13	42941-25002	42941-25002	2	SLEEVE
14	42942-25006	42942-25006	1	BNC-GUIDE
15	42941-24003	42941-24003	2	GUIDE
16	42942-00603	42942-00603	1	COVER
17	0515-0914	0515-1946	2	SCR-MACH M3X0.5
18	0515-1551	0515-0372	2	SCR M3-L 10 P-H

Figure 5-2 Replaceable Parts (part 2 of 2)

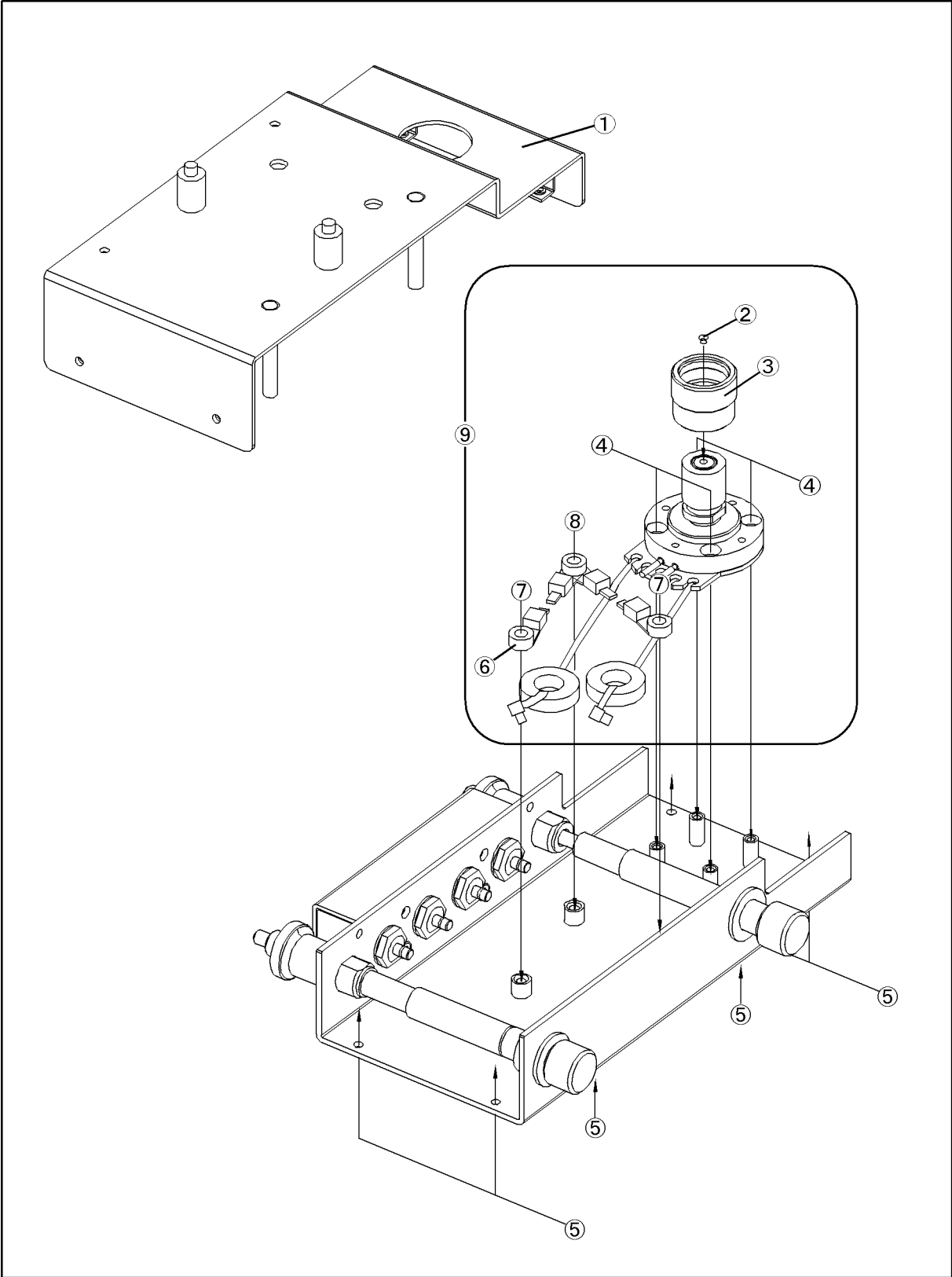


Table 5-2

Replaceable Parts (part 2 of 2)

Reference Designator	Part No.	RoHS Compliant Replacement Part No.	Qty.	Description
1	42942-00601	42942-00601	1	COVER TOP
2	1250-0907	1250-0907	1	CONTACT CENTER
3	1250-1466	1250-1466	1	CONN-RF 7mm
4	0515-1550	0515-0372	4	SCR M3-L 8 P-H
5	0515-0914	0515-1946	6	SCR-MACH M3X0.5
6	1400-0719	1400-3284	4	CABLE TIE
7	0515-1719	0515-0382	2	SCR M4X10
	3050-0893	3050-0893	2	WSHR-FL
8	0515-1718	0515-0383	1	SCR M4X12
	3050-0893	3050-0893	1	WSHR-FL
9	42942-60001	42942-60001	1	7mm ASSY (exclude 4.6.7.8)

Service
Maintenance

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