

# Keysight 16047A Test Fixture

Operation and  
Service Manual

# Notices

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# 1 Operation

## Introduction

This chapter provides complete information of the 16047A Test Fixture.

If you have any questions after reviewing this information, please contact your local Keysight Technologies Inc. representative or contact us through our support Website at <http://www.keysight.com/support>.

## Product Description

The 16047A Test Fixture is designed for use with 4 terminal-pair LCR Meters and Impedance Analyzers..

It is a direct attachment,4-terminal pair configuration type test fixture for measurements on both axial and radial lead components. Three contact inserts (labeled 1, 2, and 3 in **Figure 1-1**) are available: (1), for measurements on axial components and (2) and (3), for measurements on radial lead components. These parts number is listed in **Table 1-1**. The dimensions of the contact inserts are given in **Table 1-2**.

Figure 1-1 16047A Test Fixture

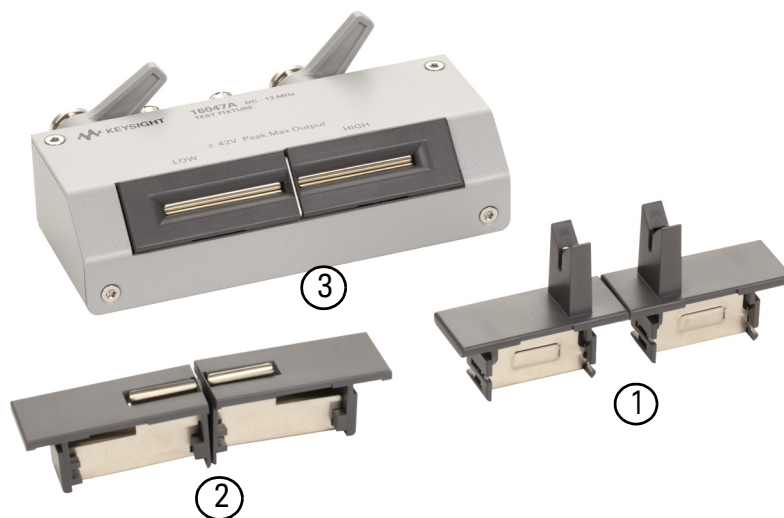


Table 1-1 Parts Number

	<b>Keysight Part No.</b>
1	16061-70022
2	16047-65001
3	16061-70021

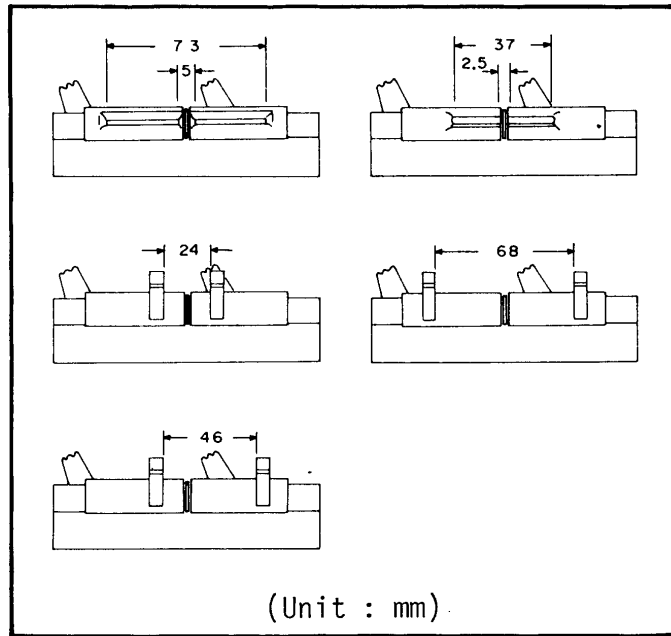
Operation  
Specifications

Specifications

Table 1-2 Specification of the 16047A

Function:	For use with 4 terminal-pair LCR Meters and Impedance Analyzers.
Measurable components:	Axial and radial lead components.
Contact inserts:	Three kinds: one for axial lead components, one for radial lead components, and one for radial short lead components.

Dimensions of Test Fixture Contacts:



Frequency:	$\leq 13$ MHz
Maximum Voltage:	$\pm 40$ V peak max. (AC+DC)
Dimensions of test fixture:	124 (W) ' 31 (D) ' 62 (H) mm
Weight:	205 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

Operation  
Typical Characteristics

Typical Characteristics

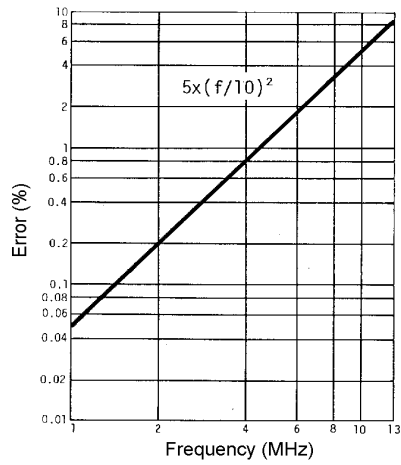
Table 1-3 Typical characteristics

Incremental Error at $f \leq 1$ MHz	
Parameter reading error	Offset Value for D
$\pm 5 \times \left(\frac{f}{10}\right)^2$	$\pm 0.02 \times \left(\frac{f}{10}\right)^2$

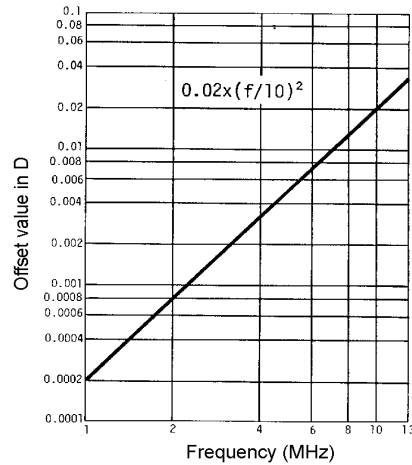
**NOTE**

f is the measurement frequency in MHz. The incremental errors calculated from the equation in the table for measurements at frequencies above 1 MHz are additive.

Figure 1-2 Incremental error at frequency above 1 MHz



Parameter reading error vs frequency



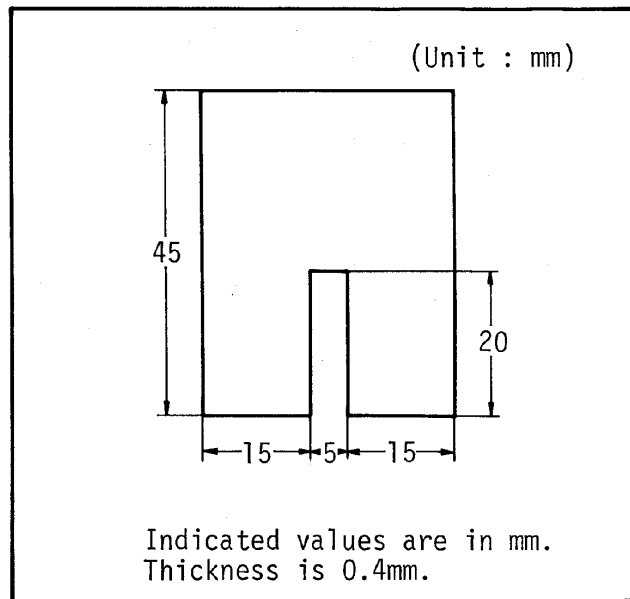
Offset value in D vs frequency



### Compensation for Fixture Residual Impedance Error

The 16047A has inherent stray capacitance, residual inductance, and residual resistance that affect the accuracy of measured values. To compensate for, or negate, these residuals to minimize measurement error, the instrument's Open/Short compensation procedure should be performed. The procedure is given in the instrument's operating manual. For SHORT compensation a low impedance copper or phosphor bronze shorting bar such as the one shown in **Figure 1-3** is recommended.

Figure 1-3 Shorting-bar dimensions



Operation  
Compensation for Fixture Residual Impedance Error

## 2 Service

### Maintenance

The internal wiring of the 16047A is shown in **Figure 2-1**. Due to the non-RoHS conversion, there are two repair/replacement solution provided to fit two different generation of 16047A. The details of the replacement/repair is stated in **“For non-RoHS 16047A (Serial Prefix: MY/SG441)” on page 12** and **“For RoHS 16047A (Serial Prefix: MY/SG442 and above)” on page 16**. Do not disassemble any further than shown in exploded view (for parts identification). 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 2-1** and table **Table 2-2**. If a faulty part is located in an assembly that cannot be disassembled, order the next higher assembly or return the whole device to the nearest Keysight Technologies Sales/Service Office for repair or replacement.

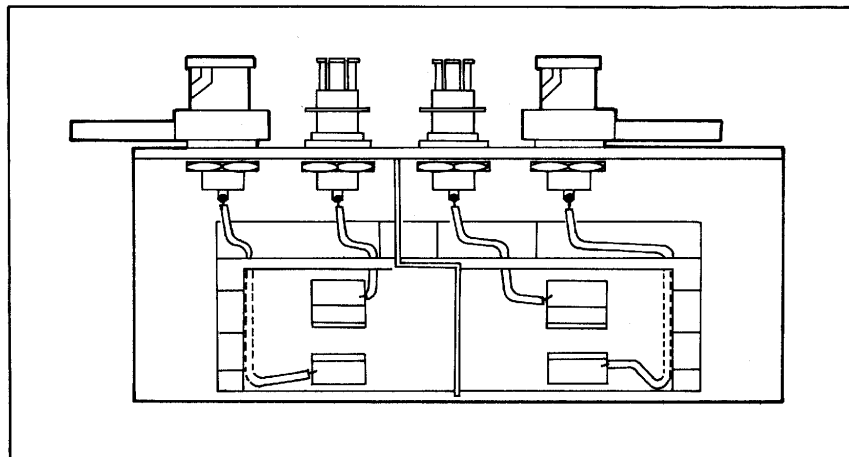
Serial number for non-RoHS 16047A:

MY44100001-MY44199999/SG44100001-SG44199999

Serial number for RoHS 16047A:

MY44200001-MY44299999/SG44200001-SG44299999 and above

Figure 2-1 Internal Wiring of 16047A

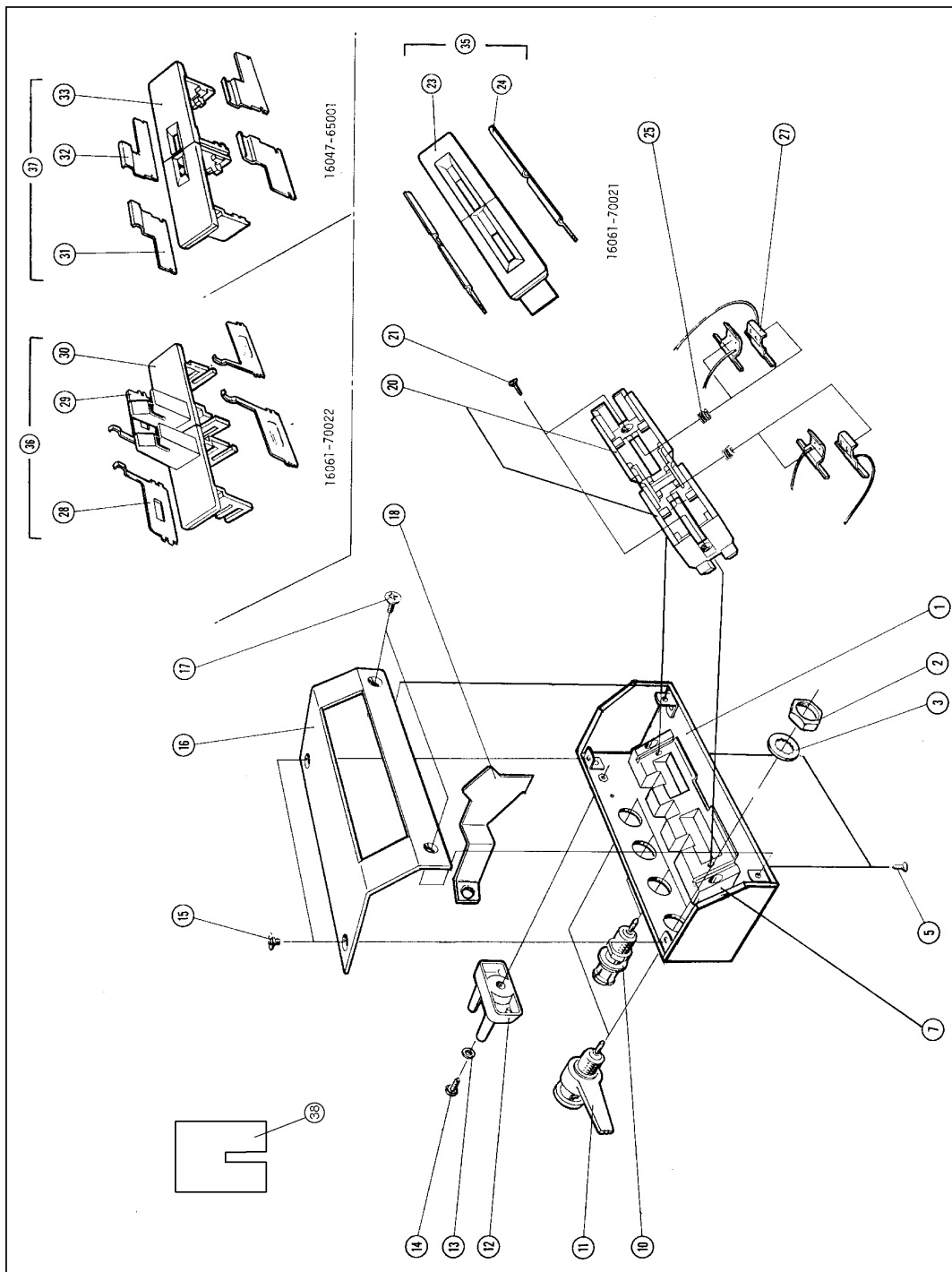


Service  
Maintenance

For non-RoHS 16047A (Serial Prefix: MY/SG441)

The supported parts and their respective RoHS compliant replacement parts are shown in **Figure 2-2**. RoHS conversion involves with design and dimension change which result in the RoHS support part backward incompatible with non-RoHS 16047A. Special handling is needed while using the RoHS replacement part on non-RoHS 16047A. The original support part number is replaced by the “RoHS Compliant Replacement Part” in **Table 2-1**.

Figure 2-2 Parts Identification



Service  
Maintenance

Table 2-1

Replaceable Parts List

Reference	Keysight Non-RoHS Part No	QTY	Description	RoHS Compliant Replacement Part No	QTY
1	16047-04013	1	COVER-BOTTOM	16047-04043	1
2	2950-0043	4	NUT	2950-0043	4
3	2190-0016	4	WASHER	2190-0016	4
5	0515-1467	2	SCREW	0515-5520	2
7	16061-50022	1	BASE	16061-50022	1
10	16047-60016	2	CONNECTOR-BNC	5012-8628	2
11	16012-7122	2	CONNECTOR-BNC	5012-8617	2
12	16047-40000	1	STOPPER	Not used	-
13	2190-0206	1	WASHER	Not used	-
14	0515-1550	1	SCREW	Not Used	-
15	0515-0914	2	SCREW	0515-1227	2
16	16047-04011	1	COVER-TOP	16047-04041	1
17	0515-0914	2	SCREW	0515-1227	2
18	16047-00618	1	SHIELD PLATE	16047-00618	1
20	16061-50024	2	SOCKET	16061-50024	2
21	0515-1467	2	SCREW	0515-5520	2
23	16061-50031	2	SOCKET-RADIAL	16061-50031	2
24	16061-10031	4	CONTACT-RADIAL	16061-10031	4
25	1460-0343	4	SPRING	1460-0343	4
27	16061-10026	4	CONTACT	16061-10026	4
28	16061-10033	2	CONTACT AXIAL	16061-10033	2
29	16061-10032	2	CONTACT AXIAL	16061-10032	2
30	16061-50032	2	SOCKET-AXIAL	16061-50032	2
31	16047-00604	2	CONTACT	16047-00604	2
32	16047-00605	2	CONTACT	16047-00605	2
33	16047-40001	2	SOCKET	16047-40001	2

Service  
Maintenance

Table 2-1

Replaceable Parts List

<b>Reference</b>	<b>Keysight Non-RoHS Part No</b>	<b>QTY</b>	<b>Description</b>	<b>RoHS Compliant Replacement Part No</b>	<b>QTY</b>
35	16061-70021	2	SOCKET ASSEMBLY (23 and 24)	16061-70021	2
36	16061-70022	2	SOCKET ASSEMBLY (28, 29 and 30)	16061-70022	2
37	16047-65001	2	SOCKET ASSEMBLY (31, 32 and 33)	16047-65001	2
38	5000-4226	1	Short Bar <sup>a</sup>	16047-00640	1

a. This short bar is not included in 16047A. It is prepared as option of 16047A. Option number is 16047A-701.

For RoHS 16047A (Serial Prefix: MY/SG442 and above)

**Figure 2-3** shows the support parts for RoHS compliance 16047A Test Fixture for Axial and Radial Lead Components. All the listed items are changed at RoHS conversion. 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.

Figure 2-3 Parts Identification for RoHS 16047A

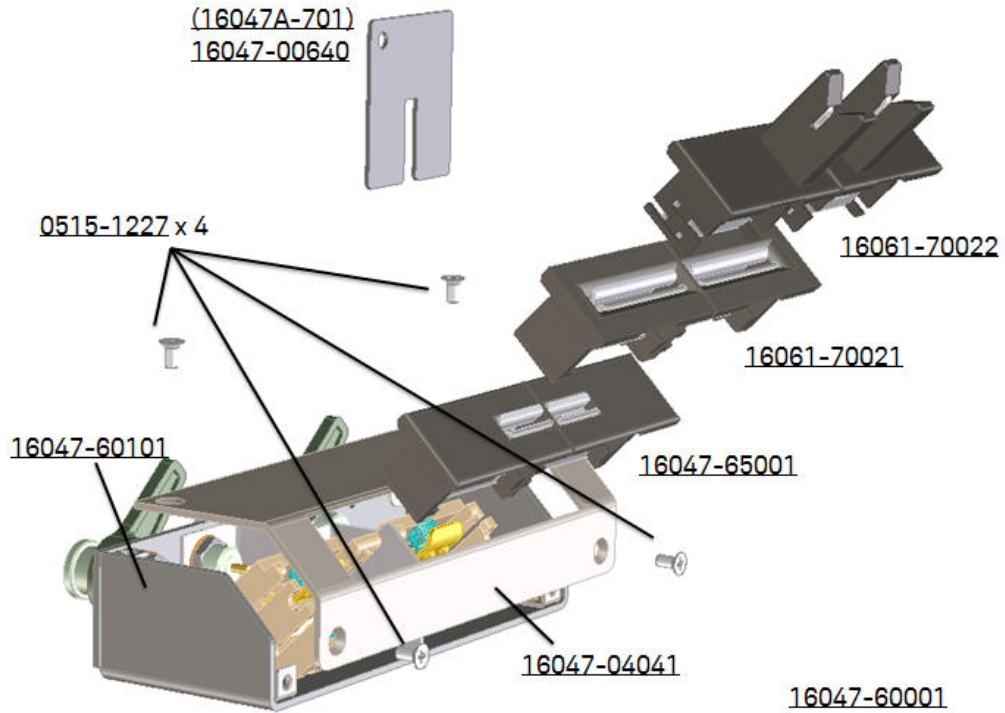


Table 2-2 Support parts for RoHS compliance 16047A

Reference	Keysight RoHS Part No	QTY	Description
15	0515-1227	2	SCREW
16	16047-04041	1	COVER-TOP
17	0515-1227	2	SCREW
35	16061-70021	2	SOCKET ASSEMBLY (23 and 24)
36	16061-70022	2	SOCKET ASSEMBLY (28, 29 and 30)
37	16047-65001	2	SOCKET ASSEMBLY (31, 32 and 33)
38	16047-00640	1	Short Bar <sup>a</sup>

a. This short bar is not included in 16047A. It is prepared as option of 16047A. Option number is 16047A-701.





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