
11500K and 11500L

Test Port Cables

11500K - 1.0 mm

11500L - 1.0 mm

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11500 K/L 1.0 mm Test Port Cables

Introduction

Both the 11500K and the 11500L are test port cables designed specifically for a Keysight Technologies single-sweep network analyzer system. They can also be used with a semi-automatic or automatic probe station.

11500K

The 11500K is a single cable 20.0 cm (7.87 in) long, fitted with 1.0 mm female to 1.0 mm male connectors.

11500L

The 11500L is a single cable 24.8 cm (9.78 in) long, fitted with 1.0 mm female to 1.0 mm male connectors.

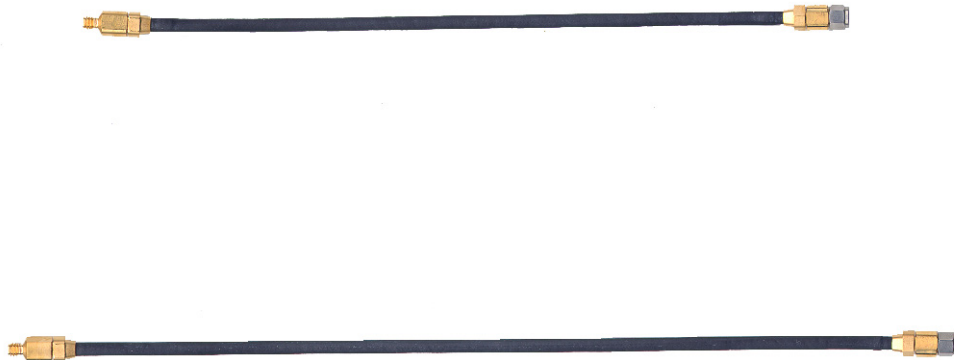


Figure 1 11500K and 11500L Test Port Cables

Operation

Cables will typically last thousands of mild bend cycles. However, one sharp bend can shorten the useful life of the cable, or in the extreme case, cause a failure.

It is strongly recommended that you have an extra cable or cable set on hand as a spare.

NOTE

If the cables must be bent as part of a test setup, leave the cables in the bent position when you disassemble the test setup. This will minimize the number of bending cycles.

Prolonging the Life of Your Cables

To prolong the life of your cables, use the following procedure.

1. Minimize the bending and flexing of the cables. If needed, the cable can bend about its long axis. The larger the bend radius, the smaller the magnitude and phase errors due to bending.
2. Do not straighten the cables when you remove them from the test set. Simply store them in their flexed position.
3. When you next use the cables try to use the existing flexed position. Make as few bending changes as possible, and *do not* completely reverse any bend.
4. The few cm of cable immediately behind the connectors must *always* remain straight. Do not bend the cable near the connectors because the cable connector interface can tolerate very little stress.
5. Do not subject the cables to torque or twisting. Always turn the nut to make a connection and *always* use a back-up wrench.

Connecting Your Cables to Test Sets and Devices

Observe the following precautions when connecting cables to test sets or other devices.

1. Inspect the contact surfaces of the 1.0 mm connectors before use. Look for dirt, nicks and other signs of damage or wear. Magnification is helpful when inspecting connectors, but it is not required and may actually be misleading. Defects and damage that cannot be seen without magnification generally have no effect on electrical or mechanical performance. Magnification is of great use in analyzing the nature and

cause of damage and in cleaning connectors, but it is not required for inspection.

2. When you are preparing a measurement setup, first loosely attach the cables to the test set ports. The cables will then have some freedom of movement while you prepare the rest of the setup. This greatly reduces their torsional stress. Tighten the cable-to-test port connection as the final step in your setup procedure.

NOTE

Only 1.0 mm connectors that meet all the requirements of the IEEE 287 Precision Connector Standard should be mated to these cables. Mating to connectors that do not meet this standard can damage your cable.

Finding More Information

The inspection, counter-rotation, and torquing procedures are explained in detail in the 85059B 1.0 mm calibration kit manual. It can be viewed online by searching for part number 85059-90005 at www.keysight.com. The 85059B calibration kit contains the necessary torque wrenches and materials for cleaning and inspection.

Performance Data

Keysight Technologies guarantees that the performance of your cables will equal or exceed the following specifications at frequencies up to 110 GHz.

Return Loss

Return loss is measured by connecting a 50-ohm fixed load termination (available in the 85059B calibration/verification kit) to the test port cable. Then attach the other end of the test port cable to port one of the network analyzer.

Effects of an Imperfect Load

The effects of an imperfect load are “gated out” using the gating capability of the network analyzer as follows:

1. Set the network analyzer for “time domain - bandpass” operation (refer to the network analyzer’s Help system for more information).
2. Set start at -0.05 ns (-50 ps).
3. Set stop at 0.425 ns.
4. Turn the gating function on.
5. Return to frequency domain, and use 2% smoothing for the tests.

The return loss should be 16 dB minimum for both the 11500K and the 11500L.

Insertion Loss

Insertion loss is measured by terminating the cable with a short (available in the 85059B calibration/verification kit), and then measuring the return loss using 2% smoothing. The values shown on the display represent an out-and-back path for the signal. The signal is measured as twice the insertion loss for the cable. As an example, the measurement value of 3.5 dB would show on the display as 7.0 dB.

The 11500K insertion loss maximum is 3.5 dB and the 11500L insertion loss maximum is 3.8 dB. These numbers do not reflect a back and forth signal.

Requirements and Characteristics

Environmental Requirements

These requirements are necessary for good performance of the 11500K and 11500L cables.

Parameter	Required Values and Ranges
Operating Temperature	0 to 55 °C (32 to 131 °F)
Storage Temperature	−40 to + 75 °C (−40 to + 167 °F)
Altitude	
Operation	<15,000 meters (≈50,000 ft)
Storage	<15,000 meters (≈50,000 ft)
Relative Humidity	Always Non condensing
Operation	0 to 80% (26 °C maximum dry bulb)
Storage	0 to 90%

Supplemental Characteristics

Phase repeatability is measured by terminating the cable with a short (available in the 85059B calibration kit) and then attaching the other end of the test port cable to a port on the network analyzer. With the cable unbent, take a measurement, then bend the cable up and back into the original position, then take the measurement again. The measurement represents an out-and-back path for the signal, and the performance is typical up to 110 GHz.

Table 1 Supplemental Characteristics

Cable	Cable Length		Minimum ¹ Recommended Bend Radius		Normal Use ² Typical Phase Repeatability ³
11500K	20.0 cm	7.87 in	2.5 cm	1.0 in	± 1.0° max
11500L	24.85 cm	9.78 in	2.5 cm	1.0 in	± 1.0° max

1. A minimum bend radius of 25 mm (1 inch) is recommended to prevent degradation of performance and maximize the life of the cable.
2. Normal use is defined as a 38mm (1.5 inch) movement of the end of the cable.
3. As Typical numbers, you should expect the performance of any individual cable to vary somewhat from these average numbers.

Contacting Keysight

Assistance with test and measurement needs and information on finding a local Keysight office are available on the Web at:

www.keysight.com/find/assist.

In any correspondence or telephone conversation, refer to the Keysight product by its model number and full serial number. With this information, the Keysight representative can determine whether your product is still within its warranty period.

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