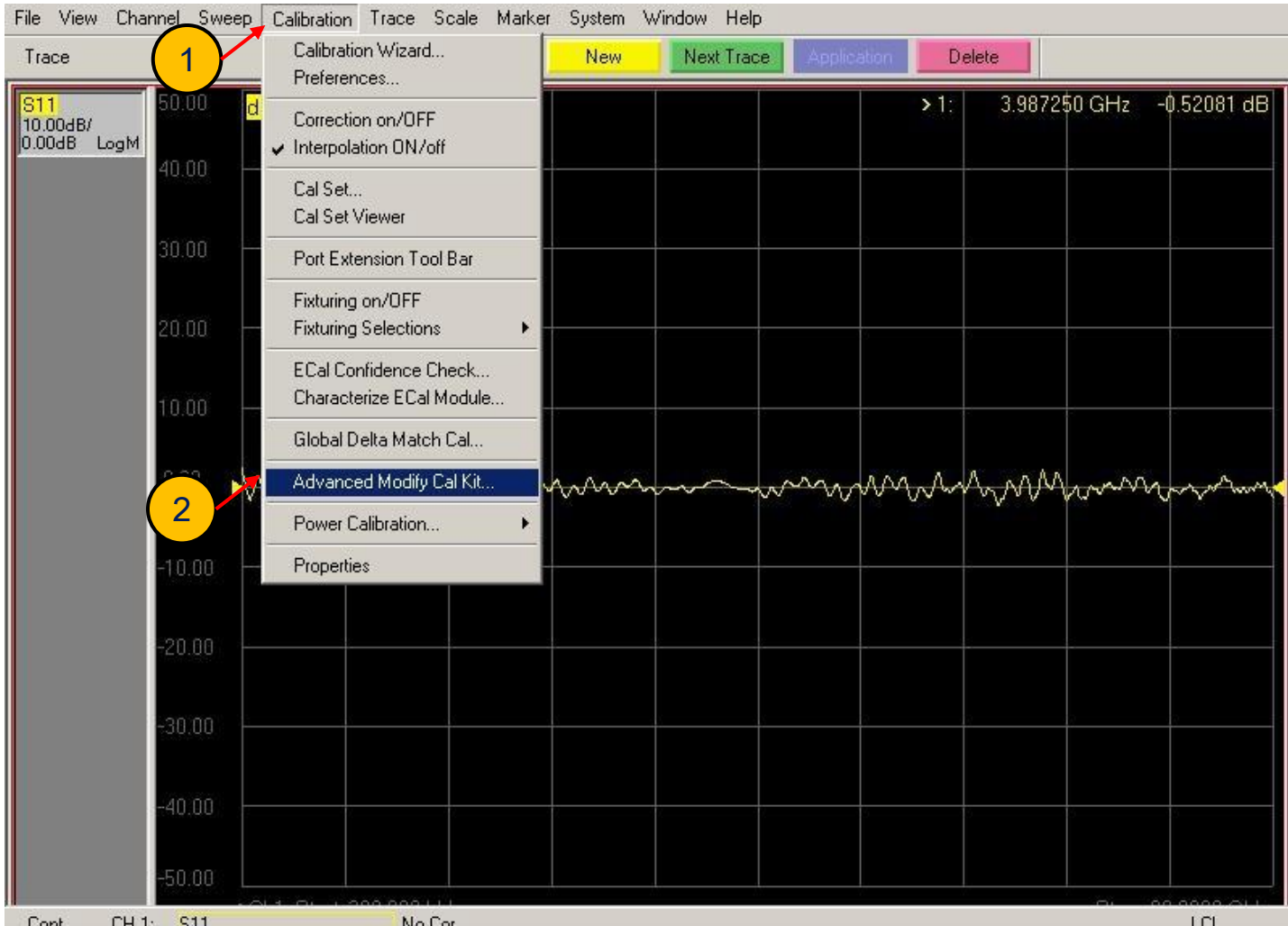


# How to define Keysight PNA Cal Kit for TITAN™ Probes

A Step-by-step example for T26-GSG0150 probes,  
AC-2 calibration substrate and 20 GHz PNA-L Keysight VNA

# Create a New Cal Kit



# Insert New One

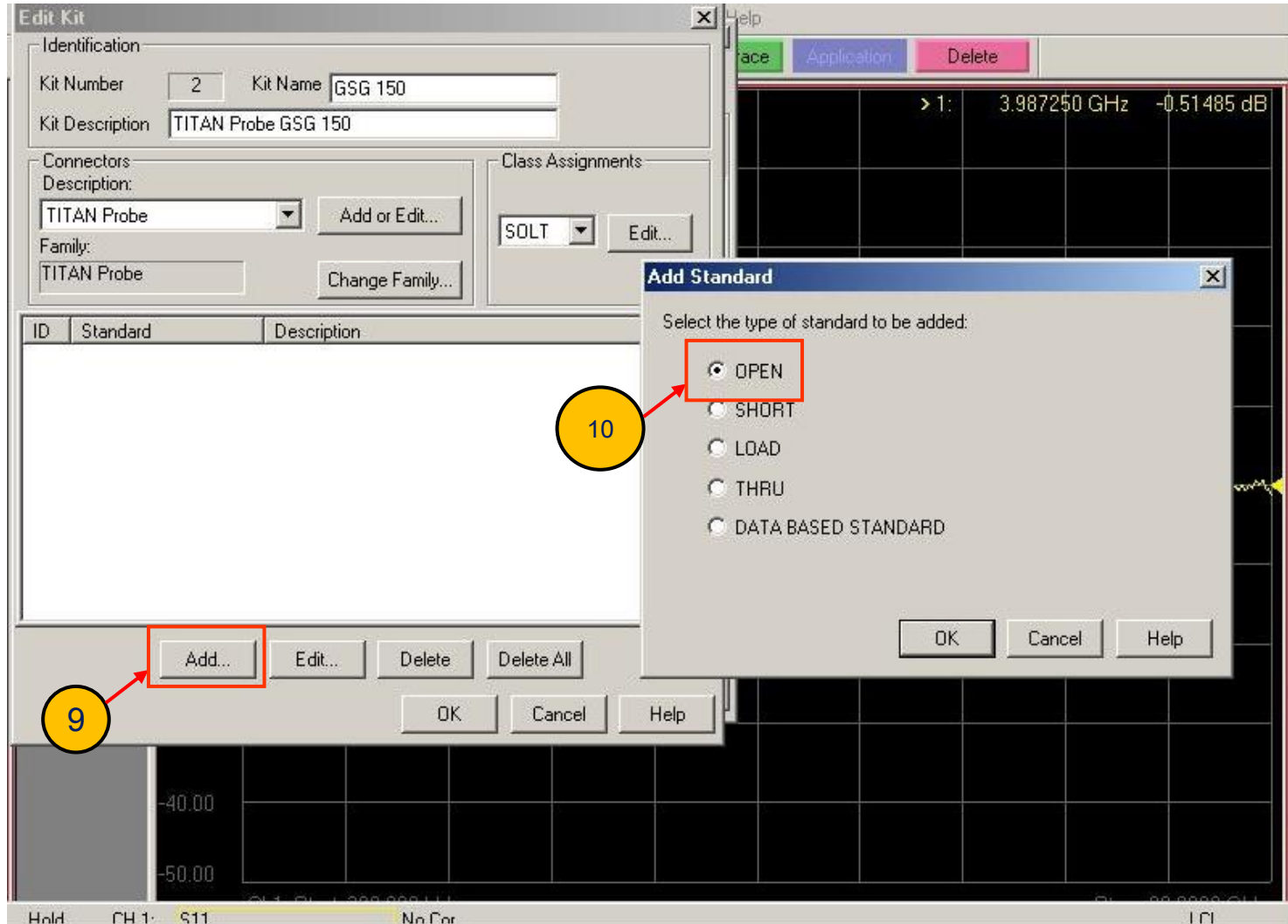
The screenshot shows the 'Edit PNA Cal Kits' window with a list of installed kits. The 'Insert New...' button is highlighted with a red box and a yellow circle labeled '3'. The 'Edit Kit' dialog box is open, showing the 'Identification' section with 'Kit Number' set to 2 and 'Kit Name' and 'Kit Description' fields highlighted with red boxes and a yellow circle labeled '4'. A yellow callout box with the text 'Key in the Kit name and Description' points to these fields.

ID	Kit Name	Description
1	85052B	3.5 GHz sliding load
2	ASP100	
3	GSG 150	FOR ASP 150UM
4	hrf01-03	hrf01-03
5	Probe	TITANGS200-1
6	Titan GS/SG 200	AC3 200
7	AC5-test-Pitch800	Allstron
8	AC5-Pitch800	Allstron-GS/SG
9	AC5	Allstron-GS/SG
10	CS-11	
11	AC-3	TITAN GS/SG
12	AC-3_Pitch100	TITAN-GS/SG
13	100M-700M	100M-700MHz
14	100M to 500M	100M to 500M
15	500M to 3.5G	500M to 3.5G
16	eason	TRL_THRU
17	HSF_SB_SOLT	HSF_SB_SOLT_10G

# Add / Edit Connector

The image shows two overlapping software windows. The background window is titled 'Edit Kit' and contains fields for 'Kit Number' (2), 'Kit Name' (GSG 150), and 'Kit Description' (TITAN Probe GSG 150). It also has sections for 'Connectors' and 'Class Assignments'. A red box highlights the 'Add or Edit...' button in the Connectors section, with a yellow circle containing the number 5 pointing to it. Below this is a table with columns 'ID', 'Standard', and 'Description'. At the bottom of the 'Edit Kit' window are buttons for 'Add...', 'Edit...', 'Delete', 'Delete All', 'OK', and 'Cancel'. The foreground window is titled 'Add or Edit Connector' and has fields for 'Connector Family' (TITAN Probe) and 'Description' (TITAN Probe). A yellow callout box with the number 6 points to the 'Connector Family' field, containing the text 'Key in the connector Family.'. A red box highlights the 'Frequency Range' section, which includes 'Min' (0 MHz) and 'Max' (26000 MHz) fields, and a 'Gender' section with radio buttons for 'Male', 'Female', and 'No Gender'. A yellow callout box with the number 7 points to the 'Frequency Range' section, containing the text 'Define the Frequency range and Gender.'. Below this are 'Impedance' (Z0: 50 ohms) and 'Media' (COAX) fields. At the bottom of the 'Add or Edit Connector' window are buttons for 'OK', 'Cancel', 'Apply', and 'Help', with a yellow callout box containing the number 8 pointing to the 'OK' button.

# Add Standard (OPEN)



# Define OPEN Model Parameters

**Edit Kit**

Identification  
Kit Number: 2 Kit Name: GSG 150  
Kit Description: TITAN Probe GSG 150

Connectors  
Description: TITAN Probe  
Family: TITAN Probe

ID	Standard

**Opens**

Identification  
Standard ID: 1 Label: OPEN  
Open Description: TITAN Probe open

Frequency Range  
Min: 0 MHz  
Max: 26000 MHz

Connector: TITAN Probe

Open Characteristics  
C0: 5.3 F(e-15) **C-Open fF** F(e-36)/Hz<sup>2</sup>  
C1: 0 F(e-27)/Hz C3: 0 F(e-45)/Hz<sup>3</sup>

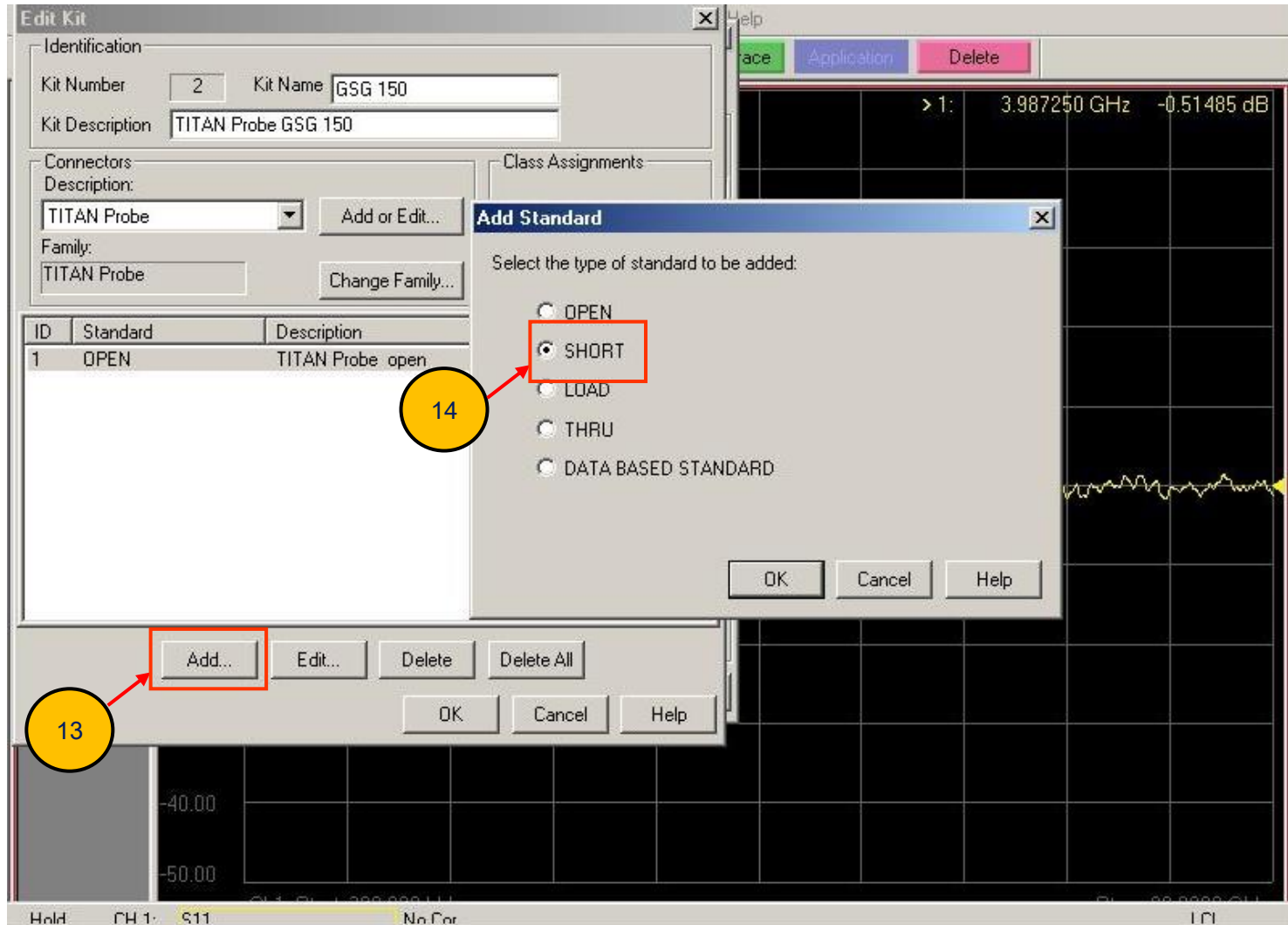
Delay Characteristics  
Delay: 0 pSec Loss: 0 Gohms/s  
Z0: 50 ohms

Buttons: Clear, OK, Cancel, Apply, Help

Background: Spectrum Analyzer showing a peak at 3.987250 GHz, -0.51485 dB.



# Add Standard (SHORT)



# Define SHORT model parameters

**Edit Kit**

Identification  
Kit Number: 2 Kit Name: GSG 150  
Kit Description: TITAN Probe GSG 150

Connectors  
Description: TITAN Probe  
Family: TITAN Probe

ID	Standard	Description
1	OPEN	TITAN Probe open
2	SHORT	TITAN Probe short

**Shorts**

Identification  
Standard ID: 2 Label: SHORT  
Short Description: TITAN Probe short

Frequency Range  
Min: 0 MHz  
Max: 26000 MHz

Connector: TITAN Probe

Short Characteristics  
L0: 12.3 H(e-12) **L-Short pH** H(e-33)/Hz<sup>2</sup>  
L1: 0 H(e-24)/Hz L3: 0 H(e-42)/Hz<sup>3</sup>

Delay Characteristics  
Delay: 0 pSec Loss: 0 Gohms/s  
Z0: 50 ohms

Buttons: Add... Edit... Delete... OK



# Add Standard (LOAD)

The screenshot displays the 'Edit Kit' window and an 'Add Standard' dialog box. The 'Edit Kit' window shows the following information:

- Identification: Kit Number 2, Kit Name GSG 150, Kit Description TITAN Probe GSG 150
- Connectors: Description: TITAN Probe, Family: TITAN Probe
- Table:

ID	Standard	Description
1	OPEN	TITAN Probe
2	SHORT	TITAN Probe

The 'Add Standard' dialog box prompts the user to 'Select the type of standard to be added:' with the following options:

- OPEN
- SHORT
- LOAD
- THRU
- DATA BASED STANDARD

The 'LOAD' option is selected and highlighted with a red box. A yellow circle with the number 18 points to the 'LOAD' option. Another yellow circle with the number 17 points to the 'Add...' button in the 'Edit Kit' window. The background shows a graph with a signal trace and a frequency of 3.987250 GHz.

# Define LOAD Model Parameters

**Edit Kit**

Identification  
Kit Number: 2 Kit Name: GSG 150  
Kit Description: TITAN Probe GSG 150

Connectors  
Description: TITAN Probe  
Family: TITAN Probe

ID	Standard	Description
1	OPEN	TITAN Probe open
2	SHORT	TITAN Probe short

**Loads**

Identification  
Standard ID: 3 Label: LOAD  
Load Description: TITAN Probe load

Frequency Range  
Min: 0 MHz  
Max: 26000 MHz

Load Type  
 Fixed Load  Sliding Load  Arbitrary Impedance  Offset Load

Delay Characteristics  
Delay: 0.003 pSec  
Z0: 500 ohms

Complex Impedance  
Real: 50  
Imag: 0

L-Term pH/495 Gohms/s

Offset Load Definition  
First Offset Standard: [dropdown]  
Second Offset Standard: [dropdown]  
Load Standard: OPEN

Buttons: Clear, OK, Cancel, Apply, Help

6 objects

# Add Standard (THRU / LINE)

The screenshot shows the 'Edit Kit' dialog box with the following fields:

- Kit Number: 2
- Kit Name: GSG 150
- Kit Description: TITAN Probe GSG 150
- Connectors: Description: TITAN Probe
- Family: TITAN Probe

The 'Add Standard' dialog box is overlaid, showing the following options:

- OPEN
- SHORT
- LOAD
- THRU
- DATA BASED STANDARD

Buttons in the 'Add Standard' dialog: OK, Cancel, Help.

Buttons in the 'Edit Kit' dialog: Add..., Edit..., Delete, Delete All, OK, Cancel, Help.

Table in the 'Edit Kit' dialog:

ID	Standard	Description
1	OPEN	TITAN Probe
2	SHORT	TITAN Probe

Background plot: Frequency 3.987250 GHz, Amplitude -0.51485 dB.

# Define THRU / LINE Model Parameters

**Edit Kit**

Identification  
Kit Number: 2    Kit Name: GSG 150  
Kit Description: TITAN Probe GSG 150

Connectors  
Description: TITAN Probe  
Family: TITAN Probe

ID	Standard	Description
1	OPEN	TITAN Probe open
2	SHORT	TITAN Probe short
3	LOAD	TITAN Probe load

**Thru/Line/Adapter**

Identification  
Standard ID: 4    Label: THRU  
Thru Description: Insertable thru standard

Frequency Range  
Min: 0 MHz  
Max: 26000 MHz

Delay Characteristics  
Delay: 1.10 pSec    Loss: 0 Gohms/s  
Z0: 50 ohms

Connectors  
Port: TITAN Probe    Port: TITAN Probe

Buttons: Add... Edit... Delete... OK Clear OK Cancel Apply Help

CH 1: S11    No Cor    LCL

# THRU / LINE Delay for AC2, AC3 and AC5 Substrates

AC2	Electrical length of line, ps	
	Thru	1.10
	Line 1 (0309)	3.00
	Line 2 (0509)	6.50
	Line 3 (0709)	13.00
	Line 4 (1309)	25.50
	Line 5 (0101)	38.50

AC3	Electrical length of line, ps	
	Thru	1.10
	Line 1 (0110)	3.00
	Line 2 (0310)	6.50
	Line 3 (0510)	13.00
	Line 4 (1110)	25.50
	Line 5 (0101)	38.50

AC5	Electrical length of line, ps	
	Thru	5
	Line 1 (0109)	26
	Line 2 (0309)	42
	Line 3 (1009)	47

# Class Assignment for Standards

Standard class	Standard numbers	Standard Type
S <sub>11</sub> A	1	OPEN
S <sub>11</sub> B	2	SHORT
S <sub>11</sub> C	3	LOAD
S <sub>22</sub> A	1	OPSN
S <sub>22</sub> B	2	SHORT
S <sub>22</sub> C	3	LOAD
FORWARD TRANSMISSION	4	THRU
FORWARD MATCH	4	THRU
REVERSE TRANSMISSION	4	THRU
REVERSE MATCH	4	THRU
ISOLATION	-	OMMNIT



# Start the SOLT Calibration

1

2

Calibration Wizard: Begin Calibration

- SmartCal (GUIDED Calibration): Use Mechanical Standards
- UNGUIDED Calibration (Response, 1-port, 2-port): Use Mechanical Standards
- Use Electronic Calibration (ECal)

Select calibration preference.  
Not sure about preferences?  
Assistance is available in the online Help.

Save this choice and don't show this page next time.

< Back Next > Cancel Help

S11 10.00dB/0.00dB LogM

> 1: 3.987250 GHz -0.52111 dB

>Ch1: Start 300.000 kHz

Cont. CH 1: S11 No Cor

S11 10.00dB/0.00dB LogM

dB S11

> 1: 3.987250 GHz -0.51648 dB

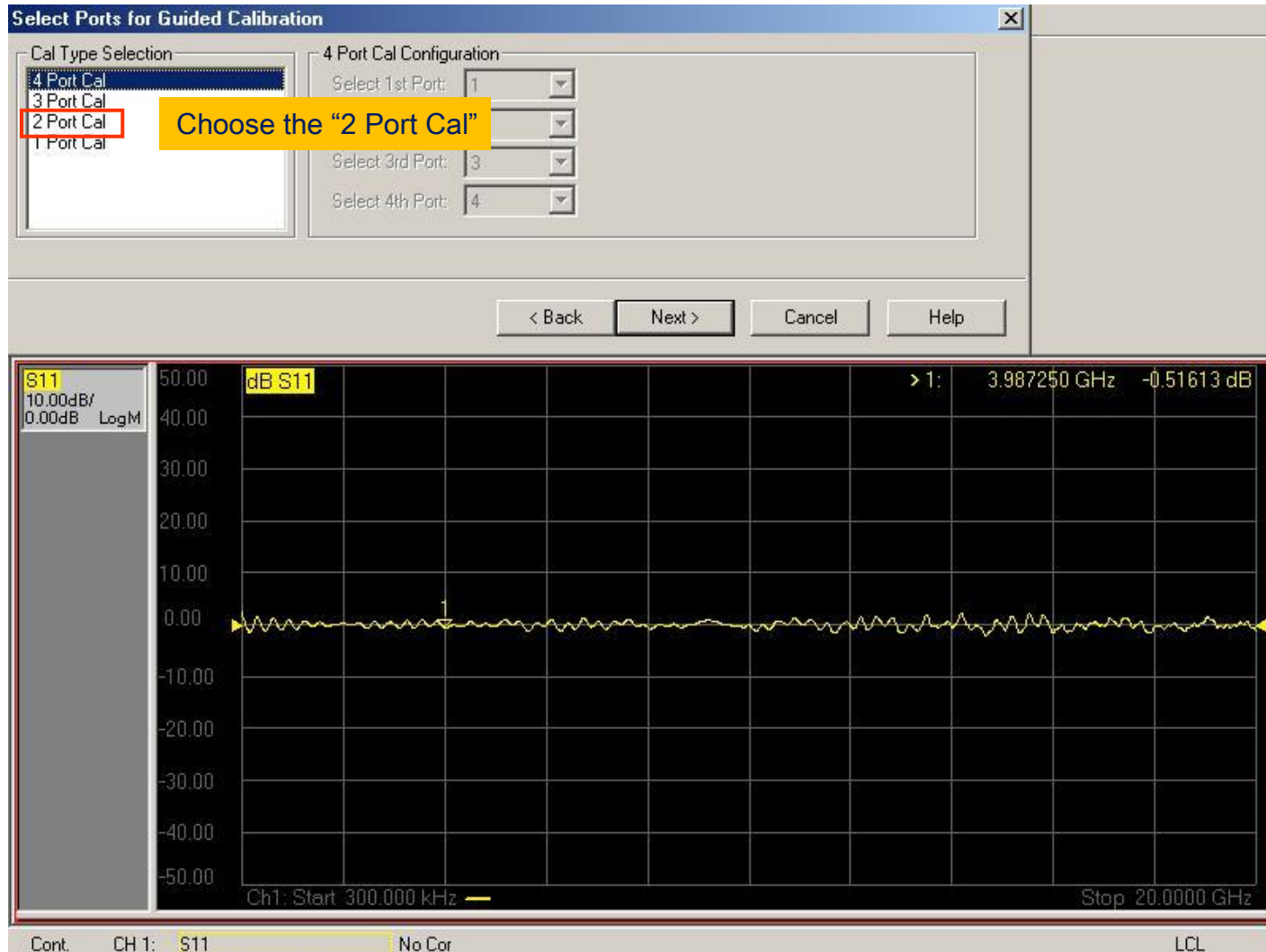
Ch1: Start 300.000 kHz

Stop 20.0000 GHz

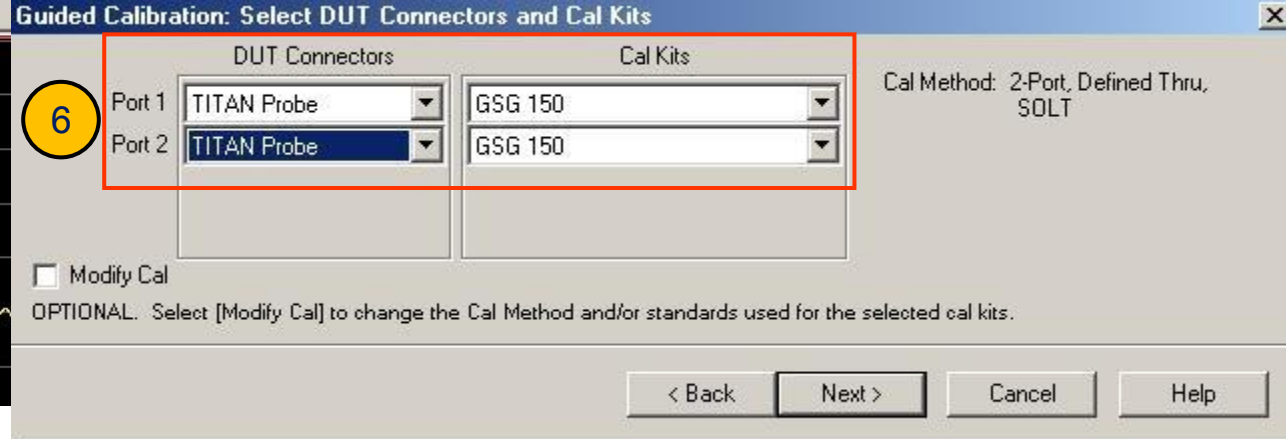
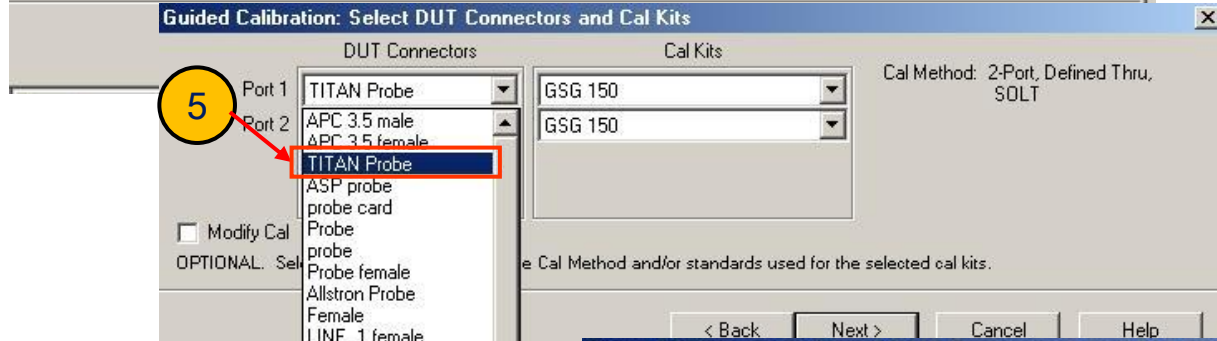
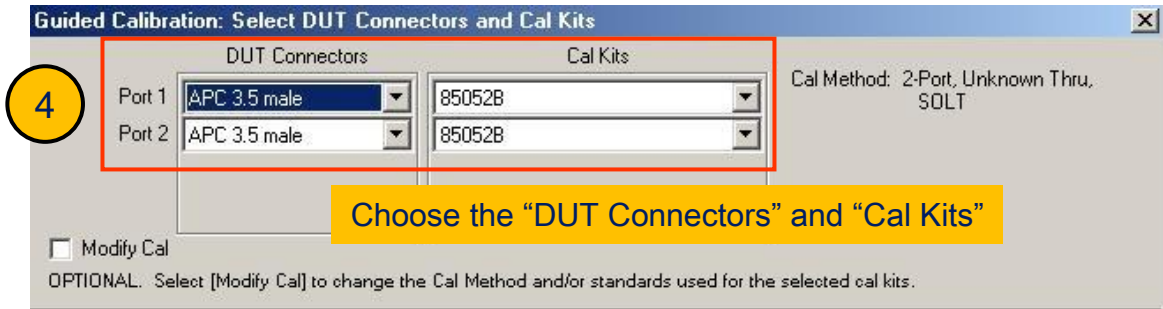
Cont. CH 1: S11 No Cor LCL

# Start the SOLT Calibration

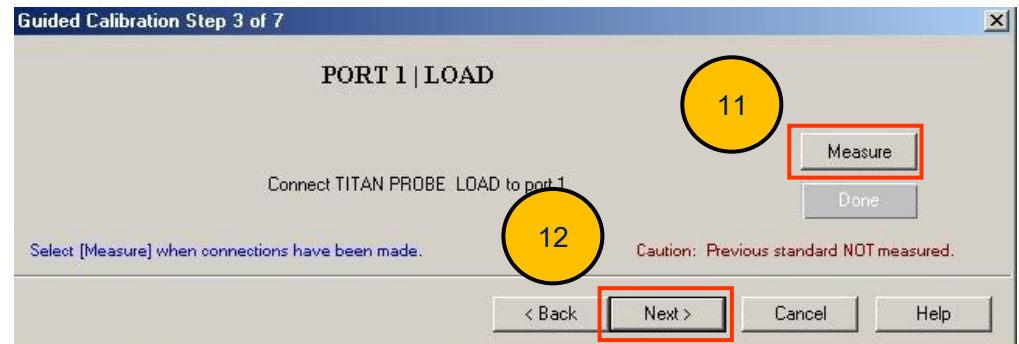
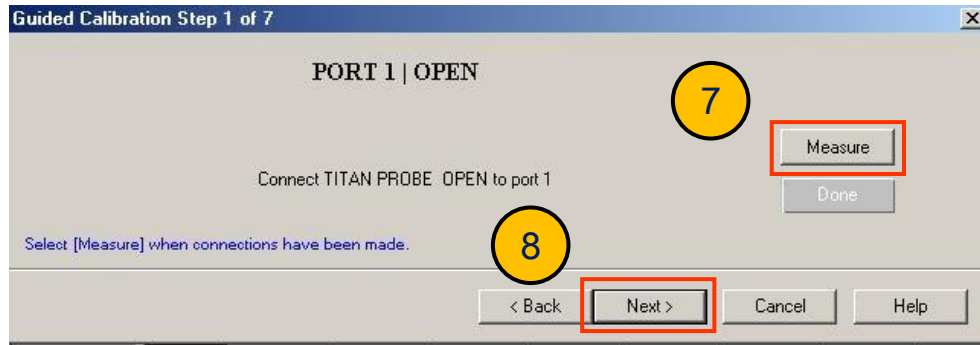
3



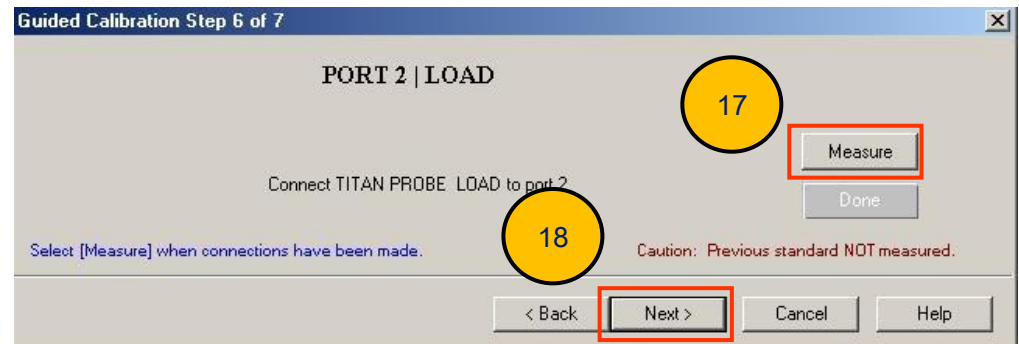
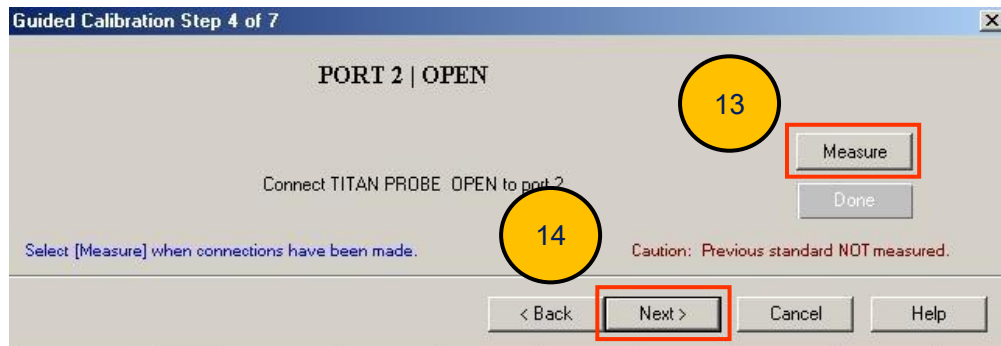
# Start the SOLT Calibration



# Start the SOLT Calibration



# Start the SOLT Calibration



# Start the SOLT Calibration

**Guided Calibration Step 7 of 7**

PORT 1 | THRU | PORT 2

19

Connect INSERTABLE THRU STANDARD between port 1 and port 2

Select [Measure] when connections have been made. Caution: Previous standard NOT measured.

Measure  
Done

< Back   Next >   Cancel   Help

<b>S11</b> 10.00dB/ 0.00dB   LogM	50.00
<b>S12</b> 10.00dB/ 0.00dB   LogM	40.00
<b>S21</b> 10.00dB/ 0.00dB   LogM	30.00
<b>S22</b> 10.00dB/ 0.00dB   LogM	20.00
	10.00
	0.00
	-10.00
	-20.00
	-30.00
	-40.00
	-50.00

dB S22 Calibration Window

CAL: Start 300.000 kHz   Stop 20.0000 GHz

Cont.   CAL 1: S22   No Cor   LCL



**Thank you**

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