SVA1075X
Spectrum Analyzer

Service Manual

DS0703P-E01B

SIGLENT TECHNOLOGIES CO.,LTD

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SIGLENT guarantees this product conforms to the national and industrial standards in China as well as the ISO9001: 2008 standard and the ISO14001: 2004 standard. Other international standard conformance certification is in progress.

General Safety Summary

Carefully read the following safety precautions to avoid any personal injury or damage to the instrument and any products connected to it. To avoid potential hazards, please use the instrument as specified.

Use Proper AC Power Line

Only the power cord designed for the instrument and authorized by local country should be used.

Ground the Instrument

The instrument is grounded through the protective earth conductor of the power line. To avoid electric shock, please make sure the instrument is grounded correctly before connecting its input or output terminals.

Connect the Probe Correctly.

If a probe is used, do not connect the ground lead to high voltage since it has isobaric electric potential as the ground.

Look Over All Terminals' Ratings

To avoid fire or electric shock, please look over all ratings and sign instruction of the instrument. Before connecting the instrument, please read the manual carefully to gain more information about the ratings.

Use Proper Overvoltage Protection

Make sure that no overvoltage (such as that caused by a thunderstorm) can reach the product, or else the operator might be exposed to danger of electrical shock.

Electrostatic Prevention

Operate the instrument in an electrostatic discharge protective area environment to avoid damages induced by static discharge. Always ground both the internal and external conductors of the cable to release static before connecting.

Maintain Proper Ventilation

Inadequate ventilation may cause increasing of the instrument's temperature, which will eventually damage the instrument. So keep well ventilated and inspect the intake and fan regularly.

Avoid Exposed Circuit or Components

Do not touch exposed contacts or components when the power is on.

Do Not Operate Without Covers

Do not operate the instrument with covers or panels removed.

Use Only the Specified Fuse.

Keep Product Surfaces Clean and Dry.

To avoid the influence of dust and/or moisture in the air, please keep the surface of the device clean and dry.

Do Not Operate in Wet Conditions.

In order to avoid short circuiting to the interior of the device or electric shock, please do not operate the instrument in a humid environment.

Do Not Operate in an Explosive Atmosphere.

In order to avoid damage to the device or personal injury, it is important to operate the device away from an explosive atmosphere.

Safety Terms and Symbols

Terms on the product. These terms may appear on the product:

DANGER   Indicates direct injuries or hazards that may happen.

WARNING   Indicates potential injuries or hazards that may happen.

CAUTION   Indicates potential damages to the instrument or other property that may happen.

Symbols on the product. These symbols may appear on the product:

Hazardous   **Protective**   **Warning**   **Earth Chassis**

Voltage   **Ground**   **Ground**

Contents

General Features

General Features

Siglent's SVA1075X spectrum analyzer offers a frequency range of 9 kHz up to 7.5 GHz. With their light weight, small size, and friendly user interface, the SVA1075X presents a bright easy to read display, powerful and reliable automatic measurements, and plenty of impressive features. Applications are many, but include research and development, education, production, maintenance, and many more.

Table 1-1General features

Model	SPAN	RBW	Phase noise	DANL
SVA1075X	9kHz~ 7.5GHz	1 Hz~3 MHz	<-98 dBc/Hz@1 GHz, 10 kHz offset	-165 dBm/Hz

◆ All-Digital IF Technology

◆ Frequency Range from 9 kHz to 7.5 GHz

◆ Up to 7.5 GHz Tracking Generator

◆ Vector Network Analyzer

◆ Distance-to-Fault

◆ Modulation Analysis

◆ Advanced Measurement Kit

◆ EMI Filter and Quasi Peak Detector Kit

◆ 10.1 inch WVGA(1024x600)Display, Multi-Touch Screen

◆ Remote Control via internal Web Browser as well as EasySpectrum, a Windows compatible software tool

Prepare Information

Before initiating performance verification or any adjustments, it is recommended to follow these procedures. The following topics are discussed in this chapter.

● How to perform functional checks

● How to operate four standard interface tests

● How to use the self-calibration routine

● How to recall factory Default settings

For more detailed information about analyzers operation, please refer to the SVA1000X User Manual.

Functional check
1
There are three types of checks used to determine if the spectrum analyzer is operating properly.

Power-on Inspection

The normal operating voltage for SSA3075X Plus spectrum analyzer is in the range of 100-240 VRMS, 50 Hz/ 60 Hz/ 440 Hz.

Please use the power cord provided as accessories to connect the instrument to the power source as shown in the figure below.
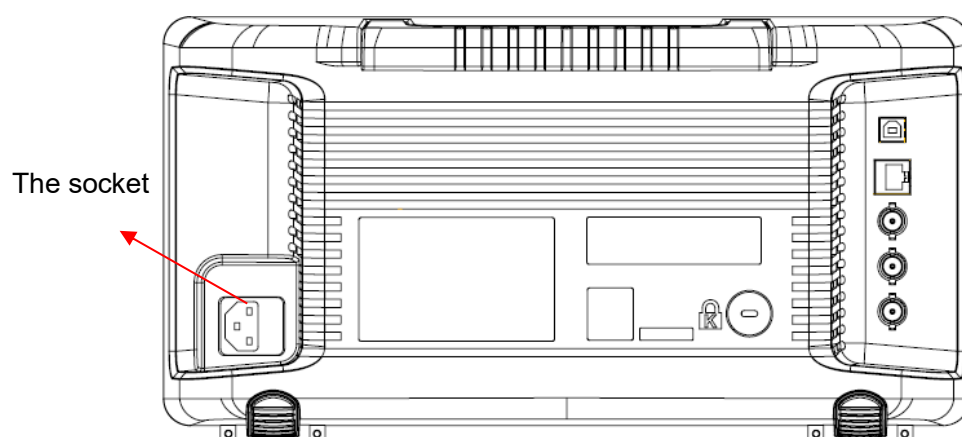
The socket

Figure 1-1 Connect power cord

Note: To avoid electric shock, make sure that the instrument is correctly grounded to the earth before connecting AC power.

Press the power-on button located at the lower left corner of the front panel and

some keys will illuminate for about 6 seconds. Then, the boot screen will appear on the display.

The front panel is shown in the figure below.

Figure 1-2 Front Panel

Figure 1-3 Rear Panel

Interface Test

The SVA1075X spectrum analyzer is designed with four standard interfaces: USB Host, USB Device, LAN and Earphone. Being connected to other instruments via these interfaces enables the analyzer to achieve even more enhanced capabilities. In order to ensure the analyzer is operating properly, it is recommended to first test the interfaces.

USB Host Test

To test if the USB Host interface is working normally.

Tools:

● USB memory device (U disk)

Steps：

1. Insert a U disk into the USB Host interface on the front panel of the spectrum analyzer.

2. An icon shaped like a U disk appears on the upper right of the screen, as shown in figure below. The icon appearance indicates the U disk has been successfully recognized.
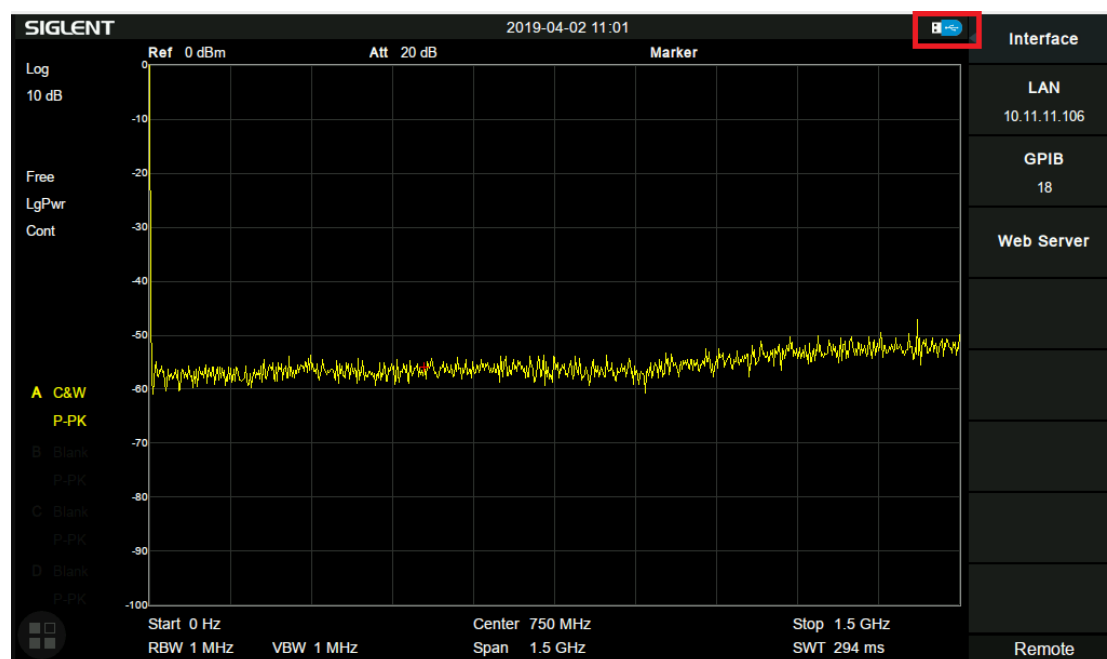

Figure 2-1 USB drive has been properly recognized

USB Device Test

To test if the USB Device interface works normally.

Tools：

● A computer with USB interface that is compatible with running National Instruments NI-MAX software

● A standard USB cable (Type A-B)

● NI-MAX software

Steps：

1. Download and install National Instruments NI MAX software by following the installation instructions provided by National Instruments.

2. Connect the analyzer USB Device port and the computer using an USB cable.

3. Run NI MAX software. Click "Device and interface" at the upper left corner of the NI software interface and immediately displays the "USBTMC" device symbol.
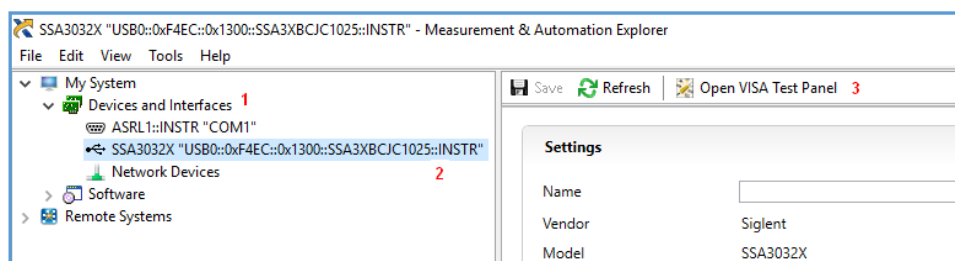
4. Click "Open VISA Test Panel" option button, and then the following Interface will appear. Then click the "Input/Output" option button and click the "Query" option button in order to view the Read operation information.
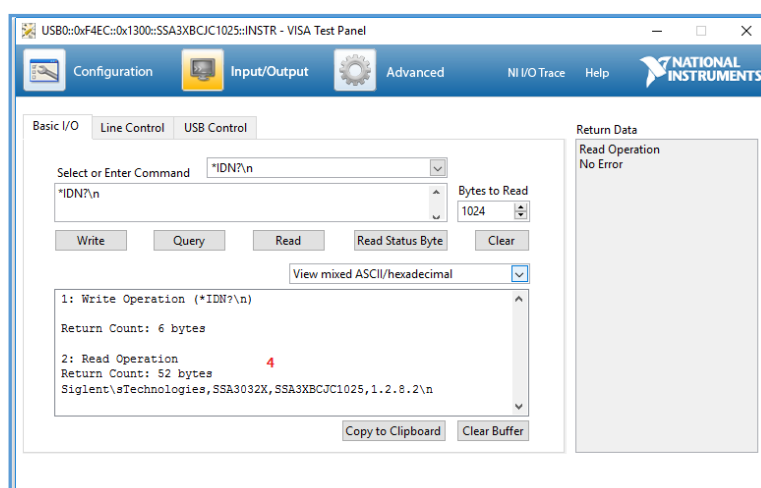
LAN Port Test

Use to test the LAN interface functionality.

Tools：

● A computer with functional LAN interface

● A standard LAN cable

Steps：

1. Connect the spectrum analyzer and the computer using a LAN cable via LAN interface.

2. Press **System** -> **Interface** ->**LAN**, Set IP Config to DHCP, as the figure below shows. The analyzer will set IP Address and Subnet Mask and Gate way automatically in this network.

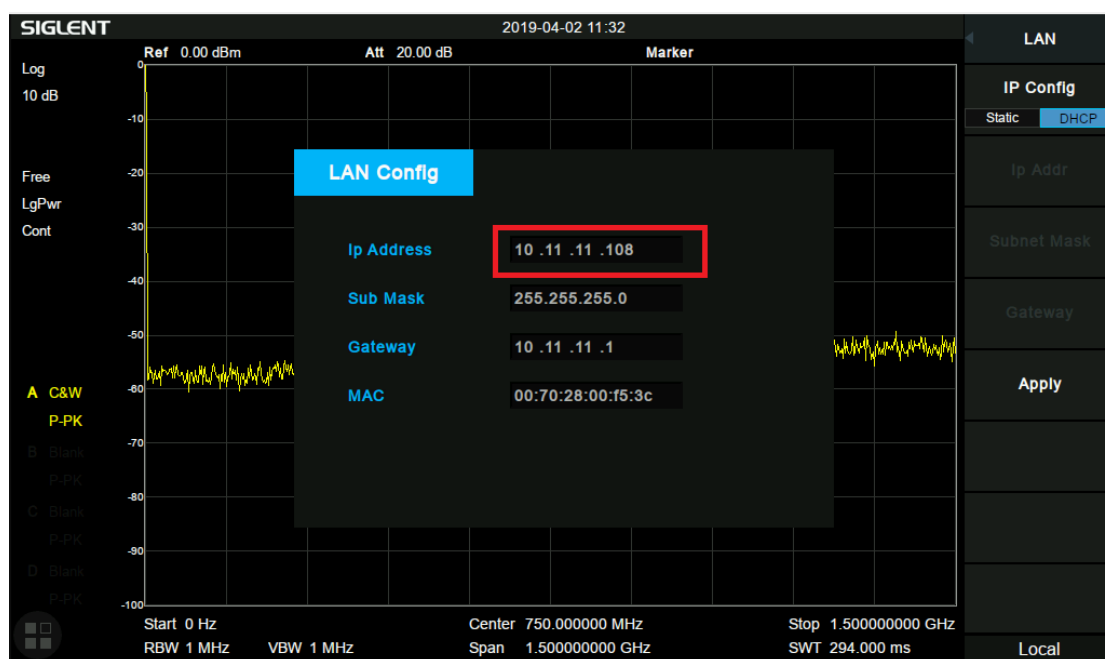   Write down the displayed IP address. It will be used in later steps.
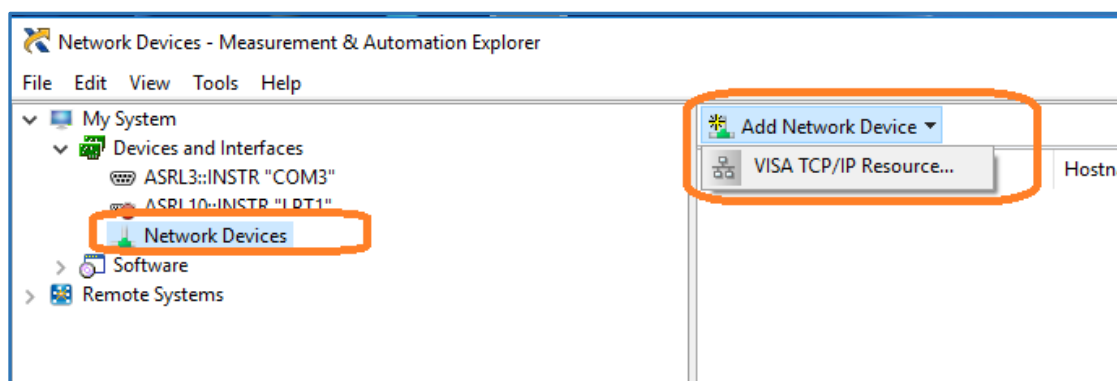

Figure 2-2 IP configuration interface

3. Run NI max software. Click "Device and interfaces" at the upper left corner of the NI software interface, select "Network Devices", Add Network Device, and select VISA TCP/IP Resource as shown:.

4. Select Manual Entry of LAN instrument, select Next, and enter the IP address as shown. Click Finish to establish the connection:

NOTE: Leave the LAN Device Name BLANK or the connection will fail.
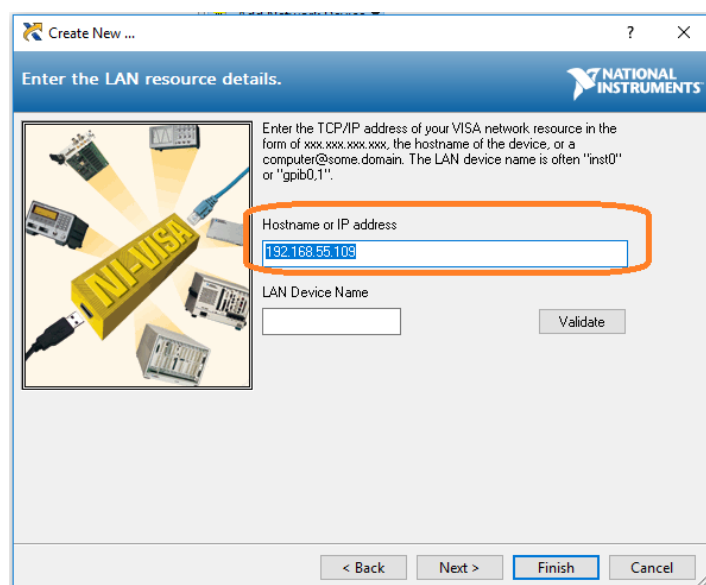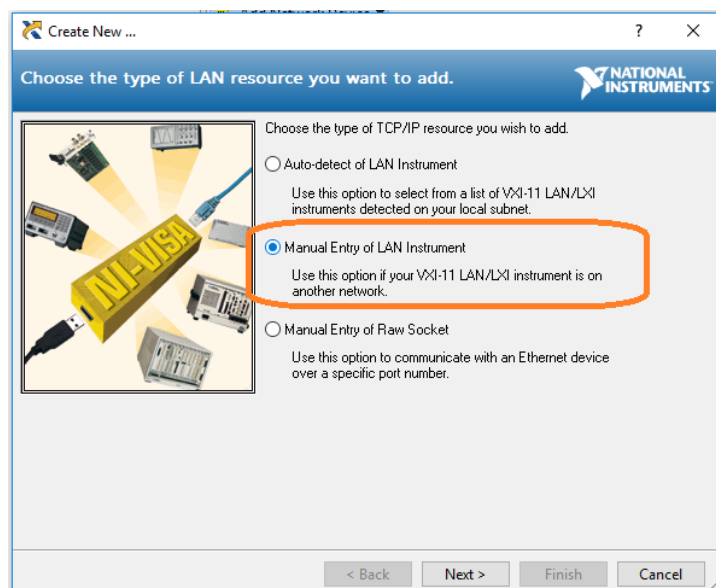
4. After a brief scan, the connection should be shown under Network Devices:

5. Right-click on the product and select Open NI-VISA Test Panel:
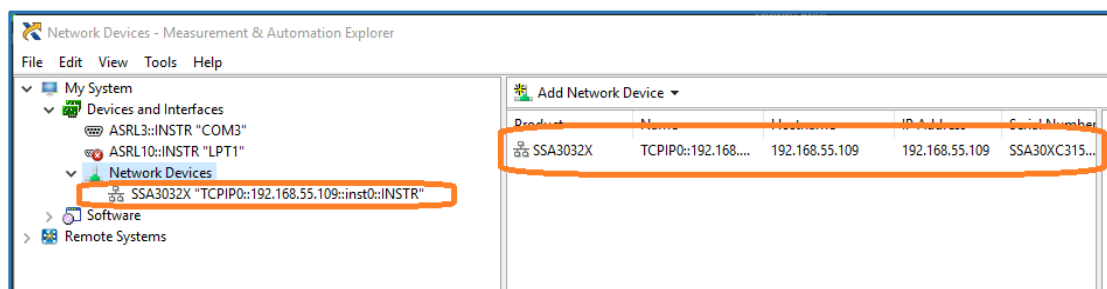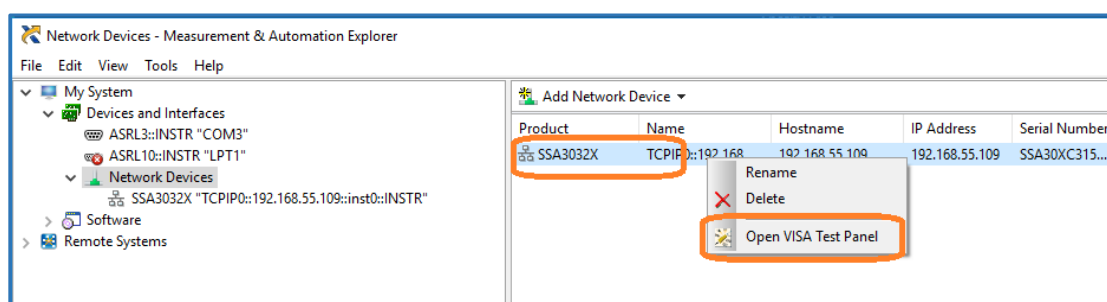

6. Click "Input/Output" option button and click "Query" option button. If everything is correct, you will see the Read operation information returned as shown below.

   NOTE: The *IDN? command (known as the Identification Query) should return the instrument manufacturer, instrument model, serial number, and other identification information.

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Performance Verification Test

This chapter explains testing the spectrum analyzer in order to verify performance specifications. For accurate test results, please let the test equipment and the analyzer warm up 30 minutes before testing.

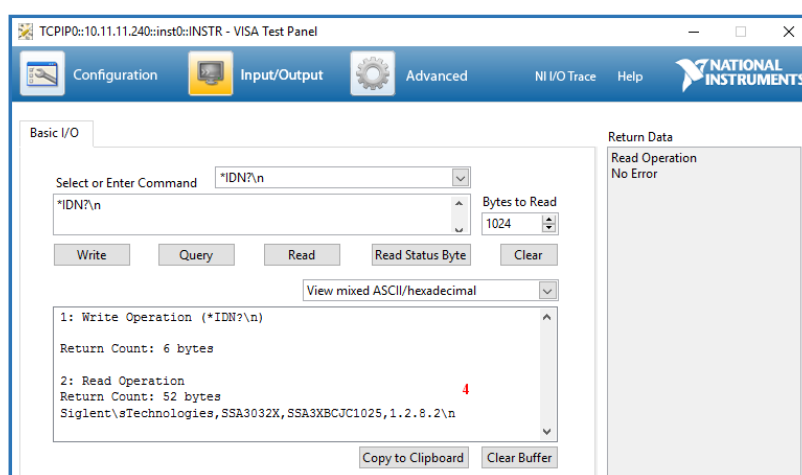Here is the required equipment:

Table 3-1 Test equipment

Equipment	Specification	Qty.	Recommended
RF Generator	9 kHz~20 GHz	2	E8257D
Signal Generator	100MHz	1	SIGLENT SDG6050
Power Meter	18 GHz	1	NRP18A
Frequency Counter	10 MHz	1	SIGLENT SDG6050 With OCXO
Low-pass Filter	Cut-off 50 MHz	1	
Power Divider	12 GHz	1	Mini
SMA-N Cable	>7.5 GHz	3	
N-N Cable	>7.5 GHz	1	
BNC Cable	2 GHz	2	
BNC-SMA Cable	2 GHz	1	

Absolute Amplitude accuracy Test

Specification

Absolute amplitude accuracy	Preamp off	±0.4 dB, input signal -20 dBm
	Preamp on	±0.6 dB, input signal -40 dBm

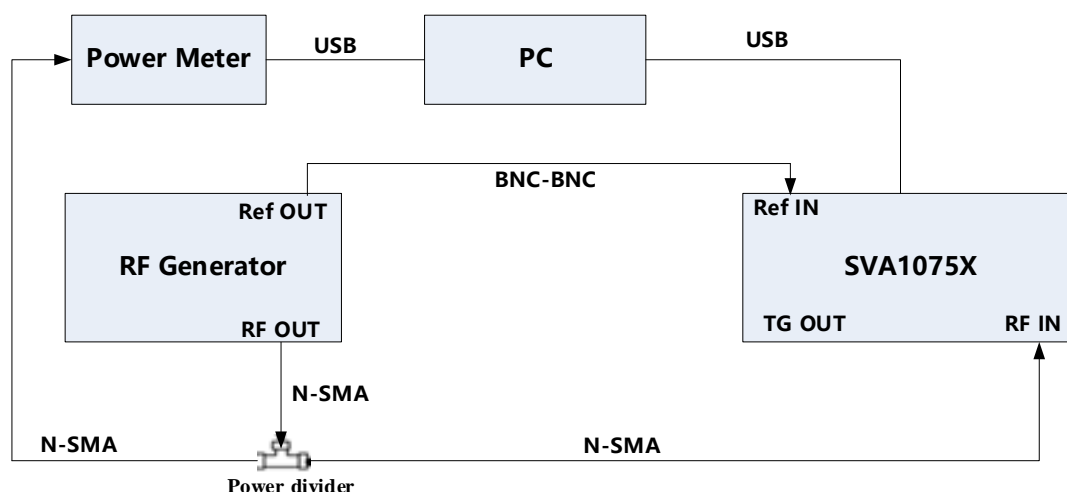20 °C to 30 °C, fc = 50 MHz, RBW = 1 kHz, VBW = 1 kHz, peak detector, attenuation = 20 dB

Figure 3-1 Absolute amplitude accuracy connections

Steps:

1. Connect the spectrum analyzer, signal generator and power meter as in figure 3-1

2. Set the signal generator to output a sine waveform with 50 MHz frequency and -20 dBm amplitude and enable the output

3. Configure the spectrum analyzer:
   (a) Set the center frequency to 50 MHz
   (b) Set the span to 1 MHz
   (c) Set the attenuation to 20 dB
   (d) Set the RBW and VBW to 1 kHz
   (e) Press Trace -> set Avg Times to 10, wait for trace average

4. Record measurement value P1 of the power meter

5. Press Peak to find the maximum value of the spectrum analyzer and record the result P2

6. Absolute amplitude accuracy = P1 – P2

7. Change the preamplifier on and set the output amplitude of the signal generator to -40dBm. Repeat steps 3 to 6 and record the results.

Record:

Preamp off			
Frequency	P1 (Power Meter)	P2 (Spectrum Analyzer)	P1- P2
50 MHz			
Preamp on			
Frequency	P1 (Power Meter)	P2 (Spectrum Analyzer)	P1- P2
50 MHz			

Frequency Response Test

Specification

Preamp off	±0.8 dB	±0.4 dB, typ.
Preamp on	±1.2 dB	±0.6 dB, typ.

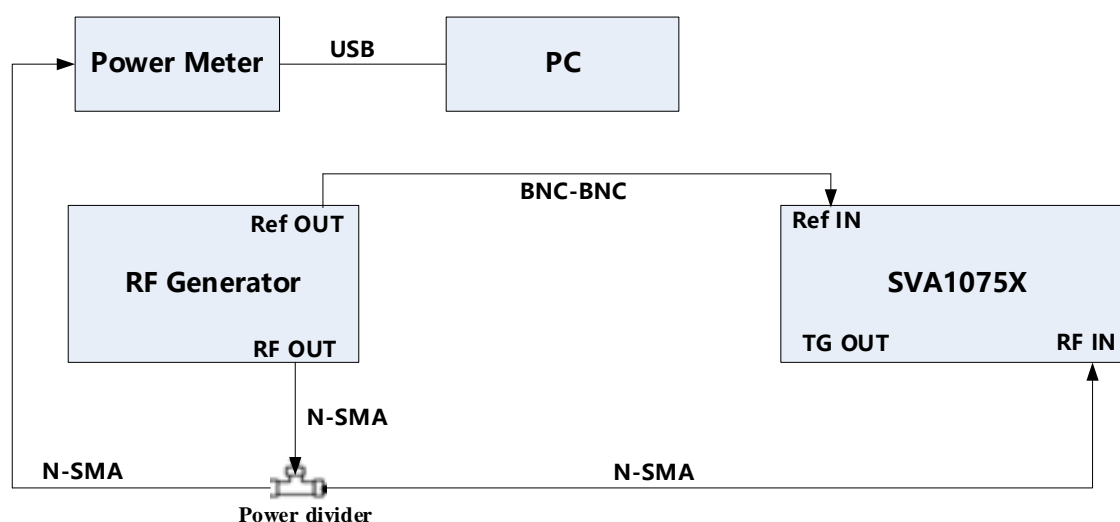20 °C to 30 °C , attenuation = 20 dB, reference frequency 50 MHz

Figure 3-2 Frequency response connections

Steps:

1. Connect the spectrum analyzer, signal generator and power meter as figure 3-2 shows

2. Set the signal generator to output a sine waveform with 50 MHz frequency and -20 dBm amplitude and enable output

3. Read the measurement of the power meter record the result as reference value P1

4. Configure the spectrum analyzer:
   (a) Set the center frequency to 50 MHz
   (b) Set the span to 1 MHz
   (c) Set the attenuation to 20 dB
   (d) Press ⬚Peak⬚ to find the maximum value and record as reference value P2

5. Modify the output frequency of the signal generator at 100 kHz, 1 MHz, 10 MHz, 100 MHz, 1 GHz, 7.5 GHz

6. Read the measurement of the power meter record the result as A1, SYSTEM ERROR = A1 – P1

7. Modify the center frequency of the spectrum analyzer so that it matches the signal generator and find the peak value A2, calculate the GLOBAL ERROR = A2 – P2

8. Frequency response = |GLOBAL ERROR - SYSTEM ERROR|, compare the calculated result with the specification

9. Enable the preamplifier and set the output amplitude of the signal generator to -40dBm. Repeat steps 3 to 8 and record the results.

Record:

Preamp off						
Frequency	P1 (PM)	P2 (SA)				
50 MHz						
Frequency	A1(PM)	A2(SA)	A1 – P1 (System Error)	A2 – P2 (Global Error)	**Frequency Response**	Pass/Fail
100 kHz						
1 MHz						
10 MHz						
100MHz						
1 GHz						
7.5 GHz						

Preamp on						
Frequency	P1 (PM)	P2 (SA)				
50 MHz						
Frequency	A1(PM)	A2(SA)	A1 – P1 (System Error)	A2 – P2 (Global Error)	**Frequency Response**	Pass/Fail
100 kHz						
1 MHz						
10 MHz						
100MHz						
1 GHz						
7.5 GHz						

Display Average Noise Level (DANL) Test

Specification

	Frequency	RBW=1 Hz
Preamp Off	100 kHz ~1 MHz	-105 dBm, -109 dBm (typ.)
	1 MHz~10 MHz	-122 dBm, -126 dBm (typ.)
	10 MHz~200 MHz	-142 dBm, -146 dBm (typ.)
	200 MHz ~1.5 GHz	-142 dBm, -147 dBm (typ.)
	1.5 GHz ~3.2 GHz	-140 dBm, -145 dBm (typ.)
	3.2 GHz ~5.0 GHz	-137 dBm, -143 dBm (typ.)
	5.0 GHz ~6.5 GHz	-136 dBm, -141 dBm (typ.)
	6.5 GHz ~7.5 GHz	-134 dBm, -139 dBm (typ.)
Preamp On	100 kHz ~1 MHz	-133 dBm, -136 dBm (typ.)
	1 MHz~10 MHz	-151 dBm, -154 dBm (typ.)
	10 MHz~200 MHz	-161 dBm, -165 dBm (typ.)
	200 MHz ~1.5 GHz	-159 dBm, -163 dBm (typ.)
	1.5 GHz ~3.2 GHz	-159 dBm, -162 dBm (typ.)
	3.2 GHz ~5.0 GHz	-157 dBm, -161 dBm (typ.)
	5.0 GHz ~6.5 GHz	-157 dBm, -160 dBm (typ.)
	6.5 GHz ~7.5 GHz	-155 dBm, -159 dBm (typ.)

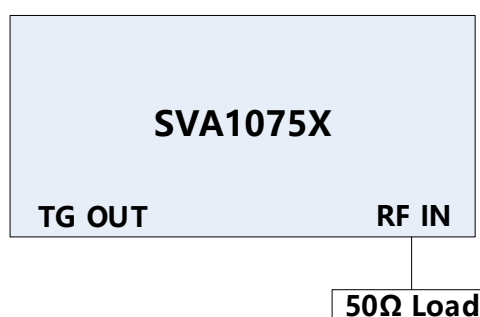20 °C to 30 °C, attenuation = 0 dB, sample detector, trace average >50

Figure 3-3 DANL verification connections

Step:

1. Connect a 50Ω load to the RF IN port of spectrum analyzer as the figure shows

2. Configure the spectrum analyzer:
   (a) Set the start frequency to 100 kHz and the stop frequency to 1MHz
   (b) Set the RBW to 10Hz and VBW to 1Hz
   (c) Set the detect type to Sample

3. Press Trace -> Avg Times and wait for trace average

4. Press Peak to find the maximum noise level of this frequency range, record the marker value N

5. Change the frequency range according to the specification table and set the RBW to suitable value, repeat step 2 to 5 and test other frequency range.

Record:

	Frequency	RBW=1 Hz	Amplitude	Pass/Fail
Preamp Off	500.5 kHz	-105 dBm, -109 dBm (typ.)		
	5.005 MHz	-122 dBm, -126 dBm (typ.)		
	50.005 MHz	-142 dBm, -146 dBm (typ.)		
	500.005 MHz	-142 dBm, -147 dBm (typ.)		
	2.500005 GHz	-140 dBm, -145 dBm (typ.)		
	4.500005 GHz	-137 dBm, -143 dBm (typ.)		
	5.500005 GHz	-136 dBm, -141 dBm (typ.)		
	7.500000 GHz	-134 dBm, -139 dBm (typ.)		
Preamp On	500.5 kHz	-133 dBm, -136 dBm (typ.)		
	5.005 MHz	-151 dBm, -154 dBm (typ.)		
	50.005 MHz	-161 dBm, -165 dBm (typ.)		
	500.005 MHz	-159 dBm, -163 dBm (typ.)		
	2.500005 GHz	-159 dBm, -162 dBm (typ.)		
	4.500005 GHz	-157 dBm, -161 dBm (typ.)		
	5.500005 GHz	-157 dBm, -160 dBm (typ.)		
	7.500000 GHz	-155 dBm, -159 dBm (typ.)		

Phase Noise Test

Specification

Phase noise	<-96 dBc/Hz @10 kHz offset, <-98 dBc/Hz (typ.)
	<-95 dBc/Hz @100 kHz offset,<-97 dBc/Hz (typ.)
	<-112 dBc/Hz @1 MHz offset, <-114 dBc/Hz (typ.)

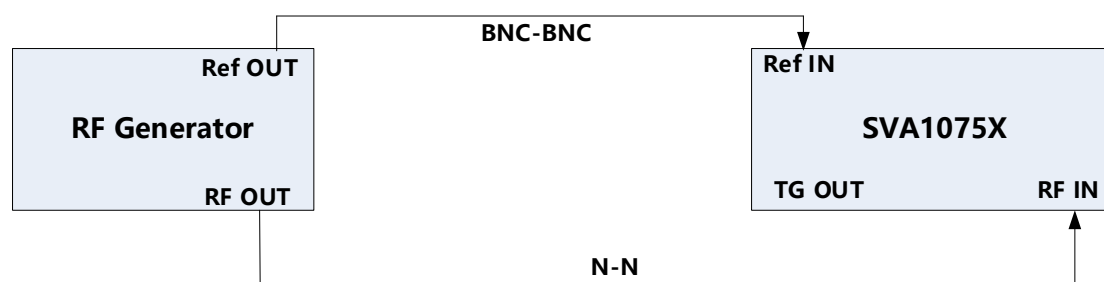20 °C to 30 °C , attenuation = 0 dB, fc = 1 GHz

Figure 3-4 Phase noise verification connections

Step1:
1. Connect the signal generator and spectrum analyzer as figure 3-4 shows

2. Configure the spectrum analyzer:
   (a) Set the center frequency to 1 GHz
   (b) Set the span to 30 kHz
   (c) Set the RBW to 3 kHz
   (d) Set the attenuation = 0 dB
   (e) Set the detect type to Sample

3. Set the signal generator to output a sine waveform with 1000 MHz frequency and -20 dBm amplitude and enable the output

4. Press Trace -> avg Times 100 and wait for trace average

5. Press peak to find the maximum value, record the peak value P1

6. Change marker type to delta and input 10kHz, press Marker Fn -> Noise Marker, record the marker value P2

7. Phase noise = P2 - P1, compare the calculate result with specification

Step2:
1. Connect the signal generator and spectrum analyzer as figure 3-4 shows

2. Configure the spectrum analyzer:
   (a) Set the center frequency to 1 GHz
   (b) Set the span to 220 kHz
   (c) Set the RBW to 10 kHz
   (d) Set the attenuation = 0 dB

(e) Set the detect type to Average

3. Set the signal generator to output a sine waveform with 1000 MHz frequency and -20 dBm amplitude and enable the output

4. Press Trace -> avg Times 100 and wait for trace average

5. Press peak to find the maximum value, record the peak value P1

6. Change marker type to delta and input 100kHz, press Marker Fn -> Noise Marker, record the marker value P2

7. Phase noise = P2 - P1, compare the calculate result with specification

Step3:
1. Connect the signal generator and spectrum analyzer as figure 3-4 shows

2. Configure the spectrum analyzer:
    (a) Set the center frequency to 1 GHz
    (b) Set the span to 3 MHz
    (c) Set the RBW to 30 kHz
    (d) Set the attenuation = 0 dB
    (e) Set the detect type to Average

3. Set the signal generator to output a sine waveform with 1000 MHz frequency and -20 dBm amplitude and enable the output

4. Press Trace -> avg Times 100 and wait for trace average

5. Press peak to find the maximum value, record the peak value P1

6. Change marker type to delta and input 1 MHz, press Marker Fn -> Noise Marker, record the marker value P2

7. Phase noise = P2 - P1, compare the calculate result with specification

Record:

Offset @1 GHz	P1	P2	**P2 - P1**	Pass/Fail
10 kHz				
100 kHz				
1 MHz				

TOI Test

Specification

IIP3	+14 dBm

fc≥50 MHz, two -20 dBm tones at input mixer spaced by 100 kHz, attenuation = 0 dB, preamp off, 20 °C to 30 °C
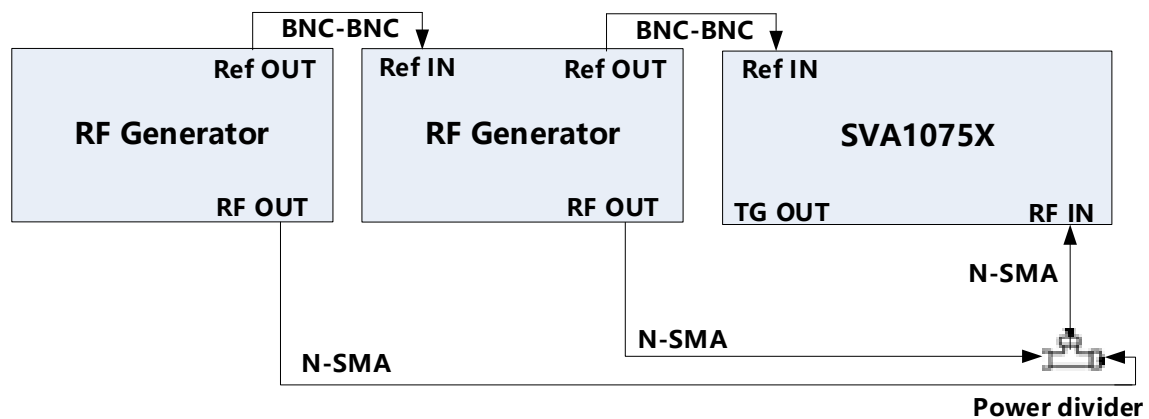

Figure 3-5 TOI verification connections

Step

1. Connect double signal generators to a power divider and the output of the divider to RF IN port of spectrum analyzer

2. Configure the spectrum analyzer:
   (a) Set the center frequency to 1 GHz
   (b) Set the span to 1 MHz
   (c) Set the RBW to 10 kHz
   (d) Set the attenuation = 0 dB

3. Set the signal generator A to output a sine waveform with 1000 MHz frequency and -20 dBm amplitude and enable output

4. Set the signal generator B to output a sine waveform with 1000.1 MHz frequency and -20 dBm amplitude and enable output

5. Press Trace -> avg Times 100, and wait for trace average

6. Press Peak to find the maximum value, then change the marker type to delta and press Next Peak twice, record delta amplitude value DELTA

7. IIP3 = -20dBm – DELTA/2, check if the calculate result ≥ +14 dB

Record:

Offset	DELTA	IIP3	Pass/Fail
999.9 MHz			
1000.2 MHz			

Frequency Accuracy Test

Specification

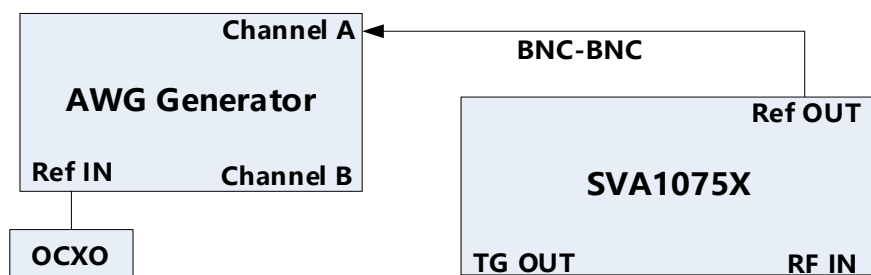| Reference frequency	10.000000 MHz
Initial calibration accuracy	<1 ppm

Figure 3-6 Connecting test instruments for frequency accuracy

Steps:

1. Connect ref out port of the spectrum analyzer to the channel A of the SDG6050, which referenced by an OCXO

2. Set the SDG6050 to frequency counter mode, and set frequency ref to 10.000000 MHz

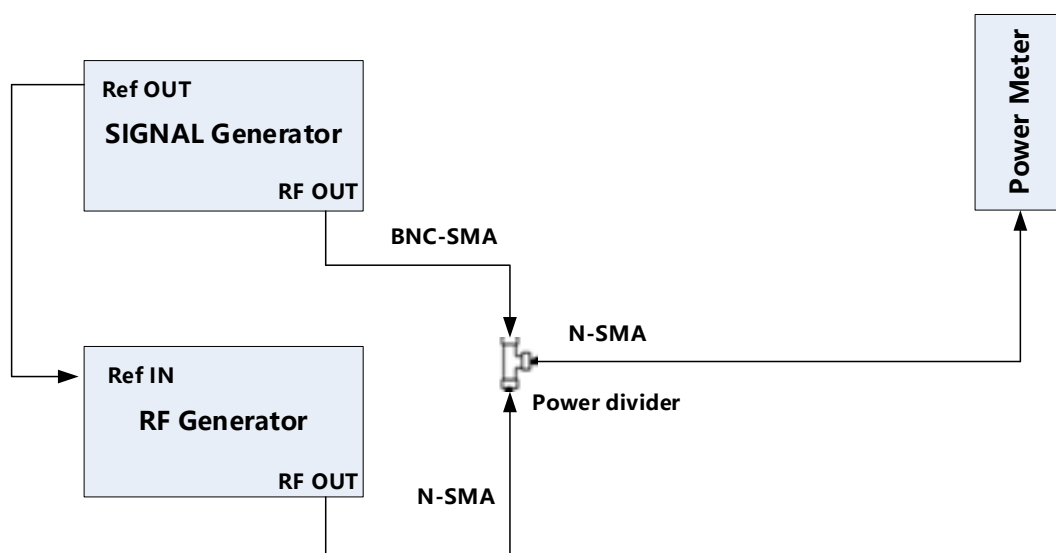3. Check if the frequency deviation ≤ 1 ppm

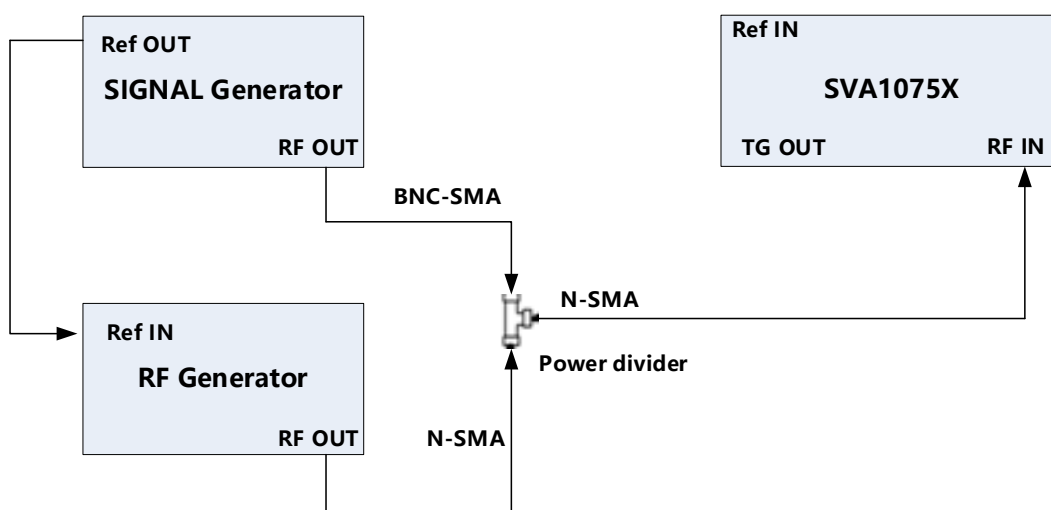## Record:

Frequency	Frequency Deviation	Pass/Fail
10.000000 MHz		

1dB Gain Compression Test

Specification

1dB Gain Compression	>0dBm

20 °C to 30 °C, fc=50MHz , attenuation = 0 dB, preamp off

(a)

(b)

Figure 3-7 connecting test instruments for 1dB Gain Compression Test

Steps:
1. Connect the signal generator, RF generator and power meter as figure 3-7(a) shows

2. Set the output frequency of signal generator 50 MHz and the amplitude to -20 dBm. Set the output frequency of RF generator to 53 MHz and the amplitude to 0 dBm.

3. Enable the output of signal generator and disable the output of RF generator. Observe the measurement value of the power meter. Adjust the output amplitude of signal generator until the reading of the power meter becomes -20 dBm.

4. Enable the output of RF generator and disable the output of signal generator. Observe the measurement value of the power meter. Adjust the output amplitude of RF generator until the reading of the power meter becomes 0 dBm.

5. Disconnect the power divider and power meter and connect the power divider with spectrum analyzer, as shown in Figure 3-7(b).

6. Enable the output of signal generator and disable the output of RF generator.

7. Configure the spectrum analyzer:
   a) Set the center frequency to 50 MHz.
   b) Set the span to 100 kHz.
   c) Set the reference level to -20 dBm.
   d) Set the input attenuation to 0 dB.
   e) Set the resolution bandwidth to 1 kHz.
   f) Set the sweep time to auto and the auto sweep time to accuracy.

8. Press Peak to find the maximum value and record as reference value P1.

9. Enable the output of signal generator and the output of RF generator, find the peak value P2.

Record:

P1	P2	P1 – P2

Second Harmonic Distortion Test

Specification

Second Harmonic Distortion Test	<-65dBc

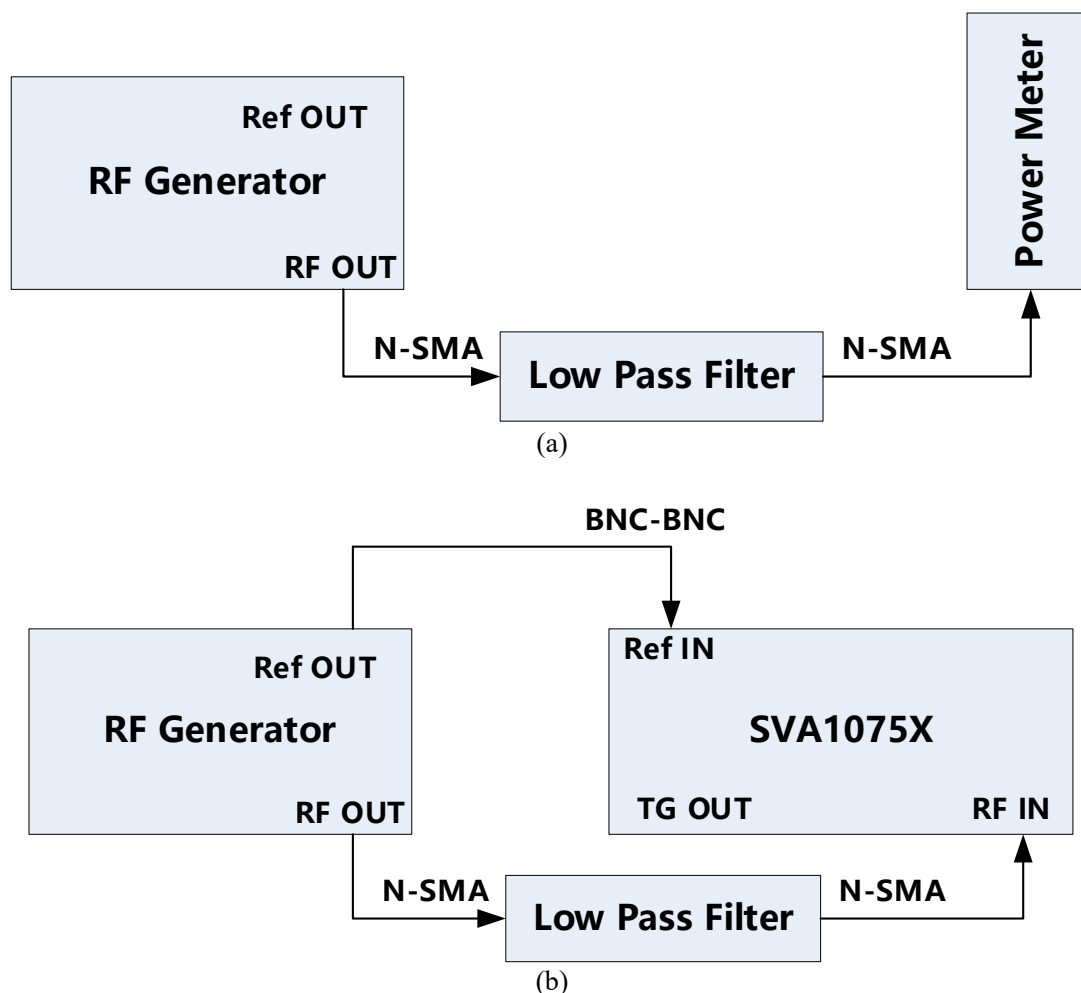20 °C to 30 °C, fc=50MHz , attenuation = 0 dB, preamp off, mixer level=-30dBm

Figure 3-8 connecting test instruments for Second Harmonic Distortion Test

Steps:

1. Connect the RF generator, 50MHz low pass filter and power meter as figure 3-8(a) shows

2. Set the output frequency of the RF generator to 50 MHz and the amplitude to -30 dBm. Observe the measurement value of the power meter. Adjust the output amplitude of RF generator until the reading of the power meter becomes -30 dBm.

3. Connect the RF generator, 50MHz low pass filter and spectrum analyzer as figure 3-8(b) shows. Enable the output of RF generator.

4. Configure the spectrum analyzer:
   a) Set the center frequency to 50 MHz.
   b) Set the span to 10 kHz.
   d) Set the reference level to -30 dBm.
   e) Set the input attenuation to 0 dB.
   f) Set the resolution bandwidth to 300 Hz.
   g) Set the video bandwidth to 10 Hz.
   h) Set the sweep time to auto and the auto sweep time to accuracy.

5. Press ⬚Peak⬚ to find the maximum value P1. Then, Set the center frequency to 100 MHz, Press ⬚Peak⬚ to find the maximum value P2.

Record:

P1	P2	P1 – P2

Input Attenuation Error Test

Specification

Input Attenuation Error Test	$<\pm0.5dB$

20 °C to 30 °C, fc=50MHz , preamp off, mixer level=-30dBm
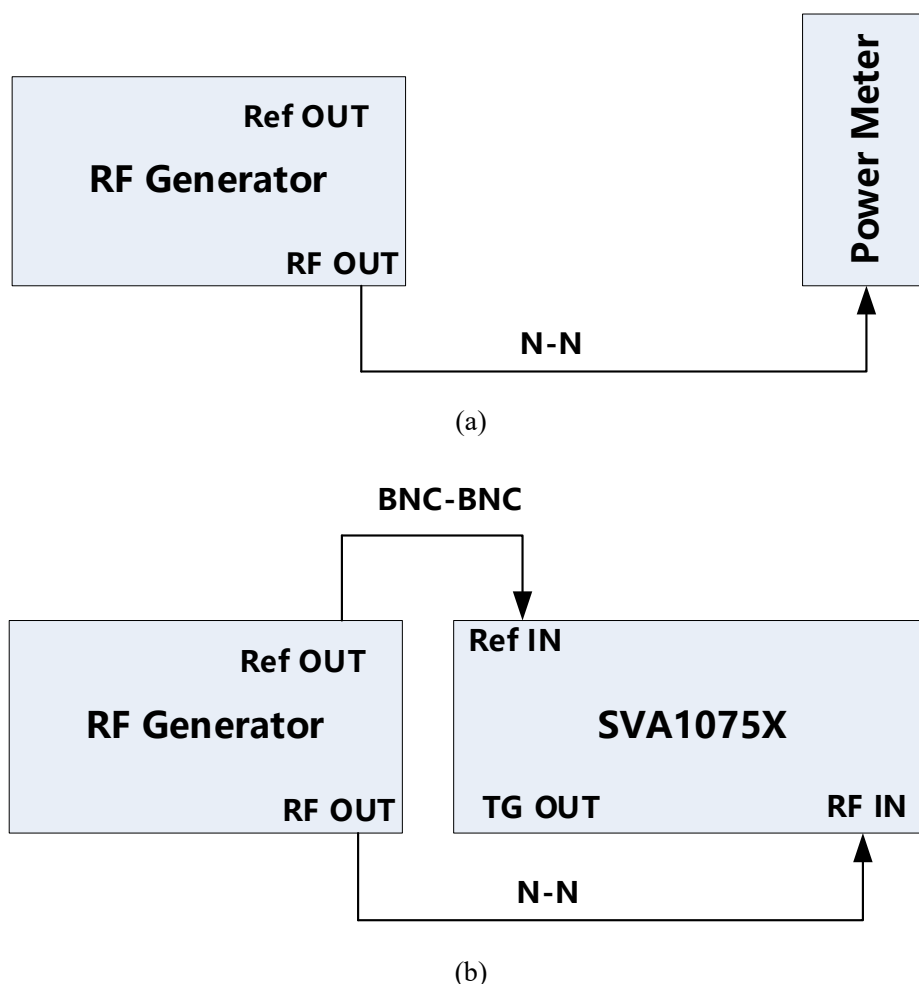

(a)

(b)

Figure 3-9 connecting test instruments for Input Attenuation Error Test

Steps:

1. Connect the RF generator and power meter as figure 3-9(a) shows

2. Set the output frequency of the RF generator to 50 MHz and the amplitude to -30 dBm. Observe the measurement value of the power meter. Adjust the output amplitude of RF generator until the reading of the power meter becomes -30 dBm. Read the output amplitude from RF generator, record it as P_{-30}.

3. Adjust the output amplitude of RF generator until the reading of the power meter becomes -25, -20, -15, -10, -5, 0, 5, 10, 15, 20dBm respectively. Record these values as P_{-25}, P_{-20}, P_{-15}, P_{-10}, P_{-5}, P_0, P_5, P_{10}, P_{15}, P_{20}.

4. Connect the RF generator and spectrum analyzer as figure 3-2(b) shows

5. Set the output frequency of the RF generator to 50 MHz and the amplitude to P_{-10}.

6. Configure the spectrum analyzer:
   a) Set the center frequency to 50 MHz.
   b) Set the span to 10 kHz.
   c) Set the reference level to 0 dBm.
   d) Set the input attenuation to 20 dB.
   e) Set the resolution bandwidth to 1 kHz and the video bandwidth to 10 Hz.
   f) Set the sweep time to auto and the auto sweep time to accuracy.

7. Press Peak to find the maximum value P(ATT=20dB). Record ΔP(ATT=20dB)=P(ATT=20dB)+10dBm as reference value.

8. Change the output amplitude of the RF generator to P_{-30}. Set the input attenuation of the spectrum analyzer to 0dB. Press Peak to find the maximum value P(ATT=0dB). Record ΔP(ATT=0dB)=P(ATT=0dB)+30dBm.

9. Repeat the step 8, record the value

   ΔP(ATT=5dB)=P(ATT=5dB)+25dBm,
   ΔP(ATT=10dB)=P(ATT=10dB)+20dBm,
   ΔP(ATT=15dB)=P(ATT=15dB)+15dBm,
   ΔP(ATT=25dB)=P(ATT=25dB)+5dBm,
   ΔP(ATT=30dB)=P(ATT=30dB),
   ΔP(ATT=35dB)=P(ATT=25dB)-5dBm,
   ΔP(ATT=40dB)=P(ATT=25dB)-10dBm,
   ΔP(ATT=45dB)=P(ATT=25dB)-15dBm,
   ΔP(ATT=50dB)=P(ATT=25dB)-20dBm.

   Error(ATT=0dB)= ΔP(ATT=0dB)- ΔP(ATT=20dB),
   Error(ATT=5dB)= ΔP(ATT=5dB)- ΔP(ATT=20dB),
   Error(ATT=10dB)= ΔP(ATT=10dB)- ΔP(ATT=20dB),
   Error(ATT=15dB)= ΔP(ATT=15dB)- ΔP(ATT=20dB),
   Error(ATT=25dB)= ΔP(ATT=25dB)- ΔP(ATT=20dB),
   Error(ATT=30dB)= ΔP(ATT=30dB)- ΔP(ATT=20dB),
   Error(ATT=35dB)= ΔP(ATT=35dB)- ΔP(ATT=20dB),
   Error(ATT=40dB)= ΔP(ATT=40dB)- ΔP(ATT=20dB),
   Error(ATT=45dB)= ΔP(ATT=45dB)- ΔP(ATT=20dB),
   Error(ATT=50dB)= ΔP(ATT=50dB)- ΔP(ATT=20dB).

Record:

	$P_{0\sim-30}$	ATT	P(ATT=0~30dB)	Error
P_{-30}		0		
P_{-25}		5		
P_{-20}		10		
P_{-15}		15		
P_{-10}		20		——

P_{-5}		25		
P_0		30		
P_5		35		
P_{10}		40		
P_{15}		45		
P_{20}		50		

Tracking Generator (TG) Test

Specification

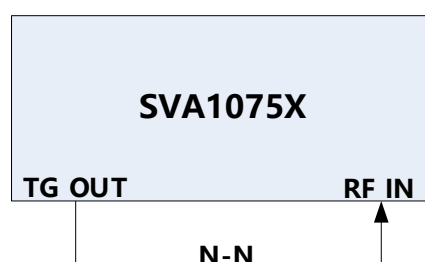| Frequency range	100 kHz ~7.5 GHz
Output level	-40 dBm ~ 0 dBm
Output flatness	+/-3 dB

Figure 3-10 Connecting test instruments for TG Output

Steps:
1. Connect RF IN port and TG OUT port by a N-N cable as figure 3-10 shows

2. Configure the spectrum analyzer:
   (a) Open the TG mode
   (b) Set the span to full span
   (c) Set the Ref level to 0 dB
   (d) Set the RBW and VBW to Auto

3. Press ⬚Peak⬚ to find the maximum value of the TG output, record the maximum value P1, check if P1 < TG level + 3dB

4. Press ⬚Peak⬚ -> Search config -> Peak type ->min, to find the minimum value of the TG output, record the maximum value P2, check if P2 >TG level - 3dB

Record:

TG level	P1	P1-TG level	Pass/Fail
0 dBm			
-10 dBm			
-20 dBm			
-40 dBm			
TG level	P2	P2-TG level	Pass/Fail
0 dBm			
-10 dBm			
-20 dBm			
-40 dBm			

Assembly Procedures

This chapter describes how to remove the major modules from the SSA3075X-R spectrum analyzer. To install the removed modules or replace new modules, please follow the corresponding operating steps in reverse order.

This chapter includes the following topics:

● **Security Consideration** which describes security information needed to consider while operating.

● **List of Modules** in which the modules to remove are listed.

● **Required Tools** which describes the tools needed to perform the procedures.

● **Disassembly Procedures** which describes in detail how to remove and install the modules.

Security Consideration

Only qualified personnel should perform the disassembly procedures. Whenever possible, disconnect the power before you begin to remove or replace the modules. Otherwise, possible personal injuries or damages to the components may occur.

Avoid Electrical Shock Hazardous voltages exist on the LCD module and power supply module. To avoid electrical shock, first disconnect the power cord from the analyzers and then wait at least three minutes for the capacitors in the analyzers to discharge before you begin disassembly.

Preventing ESD Electrostatic discharge (ESD) can damage electronic components. When doing any of the procedures in this chapter, use proper ESD precautions. As a minimum, place the analyzers on a properly grounded ESD mat and wear a properly grounded ESD strap.

List of Modules

The following removable modules are listed in the order of performing disassembly procedures.

Table 4-1 List of modules

Number of Module	Module
1	Rear Panel
2	Front-Panel
3	Rear Metal Cover
4	Front Metal Cover
5	Power Supply Module
6	Main Boards
8	Keyboard Module
9	Display Module

Required Tools

Use these tools to remove or replace the modules in the analyzers:

● Multifunctional screwdriver

● Antistatic gloves

● Custom screw hexagonal nut tool or long nose pliers

Disassembly Procedures

This section describes how to remove and install the modules listed above in the spectrum analyzer in detail. Complete disassembly will be best achieved through the following operating steps.

Removing the Rear Panel

Figure 4-1 Removing the Rear Panel Screws

Removal steps:

1. Remove each rear panel screws as shown in figures above.

2. Press the place of the front panel as the arrows point in the first figure and remove the rear panel from the machine.

To install the rear metal cover, please perform these steps in reverse order.

Removing the Front Panel

Figure 4-2 Removing the front panel

Removal steps：

1. Place the analyzer face down on a soft surface such as an anti-static mat.

2. Remove the six screws located on the rear panel. In this same position, remove the four screws located on the standing legs..

3. Lift the rear panel up and off carefully.

To install the rear panel, please follow these same steps in reverse order.
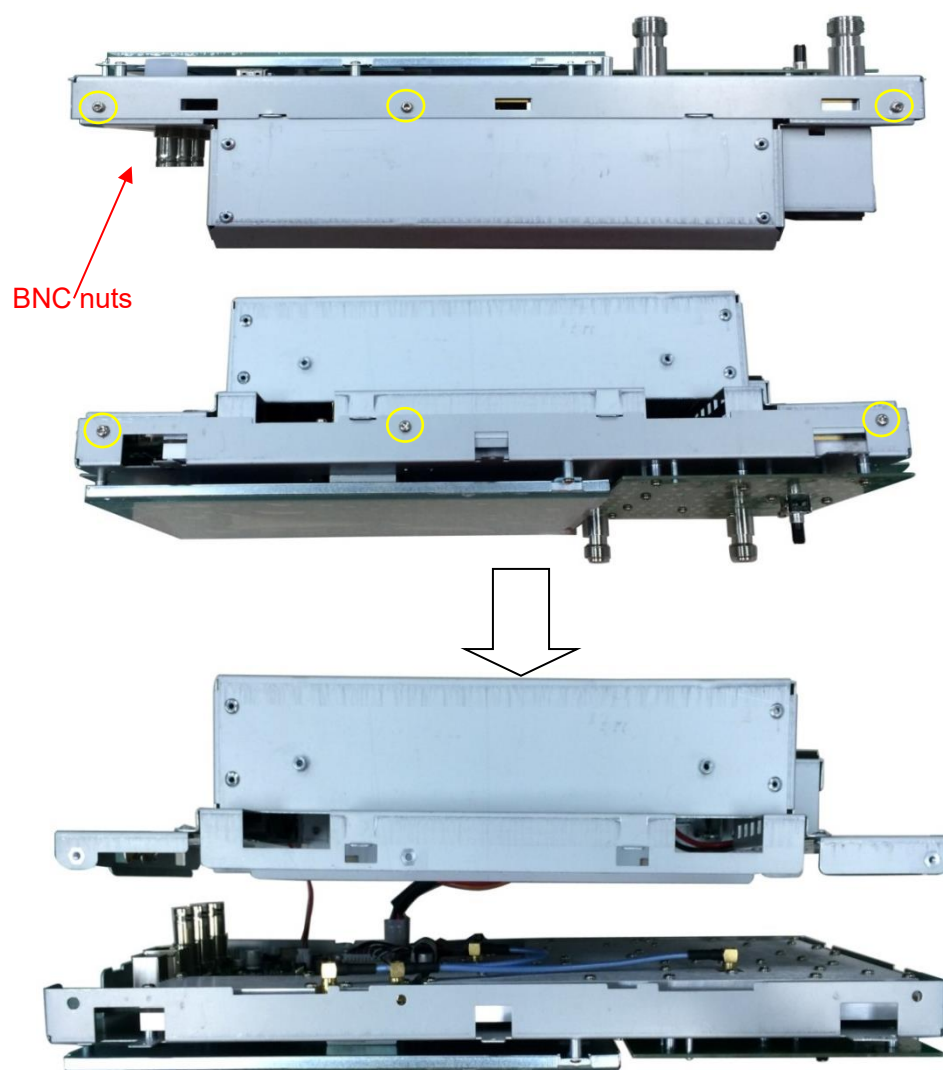
Removing the Rear Metal Cover

BNC nuts

Figure 4-3 Removing the rear metal cover

Removal steps：

1. Place the analyzer down on a soft surface such as an anti-static mat.

2. Remove the screws located on the rear metal cover.

3. Remove three nuts from the Back BNC terminal.

4. Disconnect the power cable and fan cable connected to the main board module from the power supply module.

5. The edge of the rear metal cover is sharp, please lift the rear metal cover up and off carefully to avoid personal injury.

To install the rear metal cover, please perform these steps in reverse order.

Removing the Main Board, Channel Board
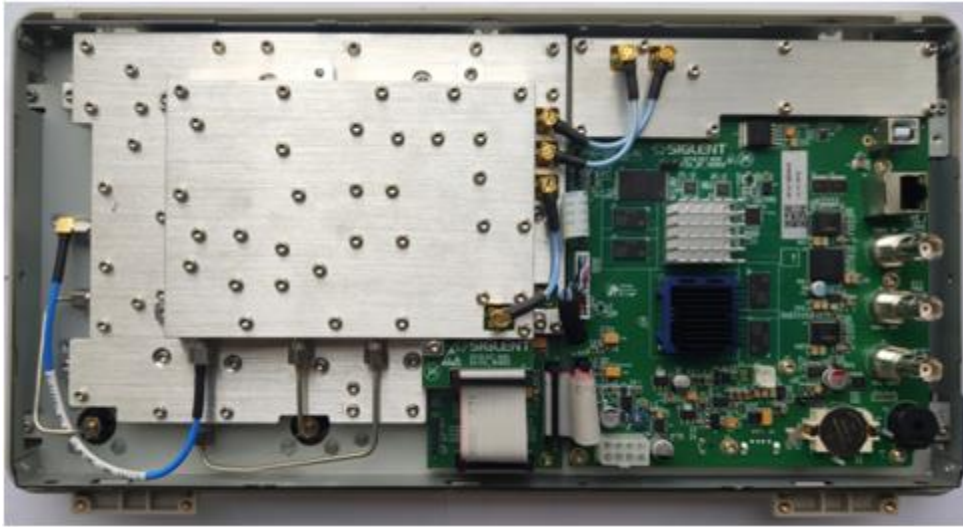
Figure 4-4 View of front panel subassembly with main board

Removal steps:

1. Place the analyzer back side down on a soft surface such as an anti-static mat.

2. Remove the screws located on the metal shelf and each board.

3. Remove the RF board, TG board, Digital board from the metal shelf.

To install the front panel, please perform these steps in reverse order.
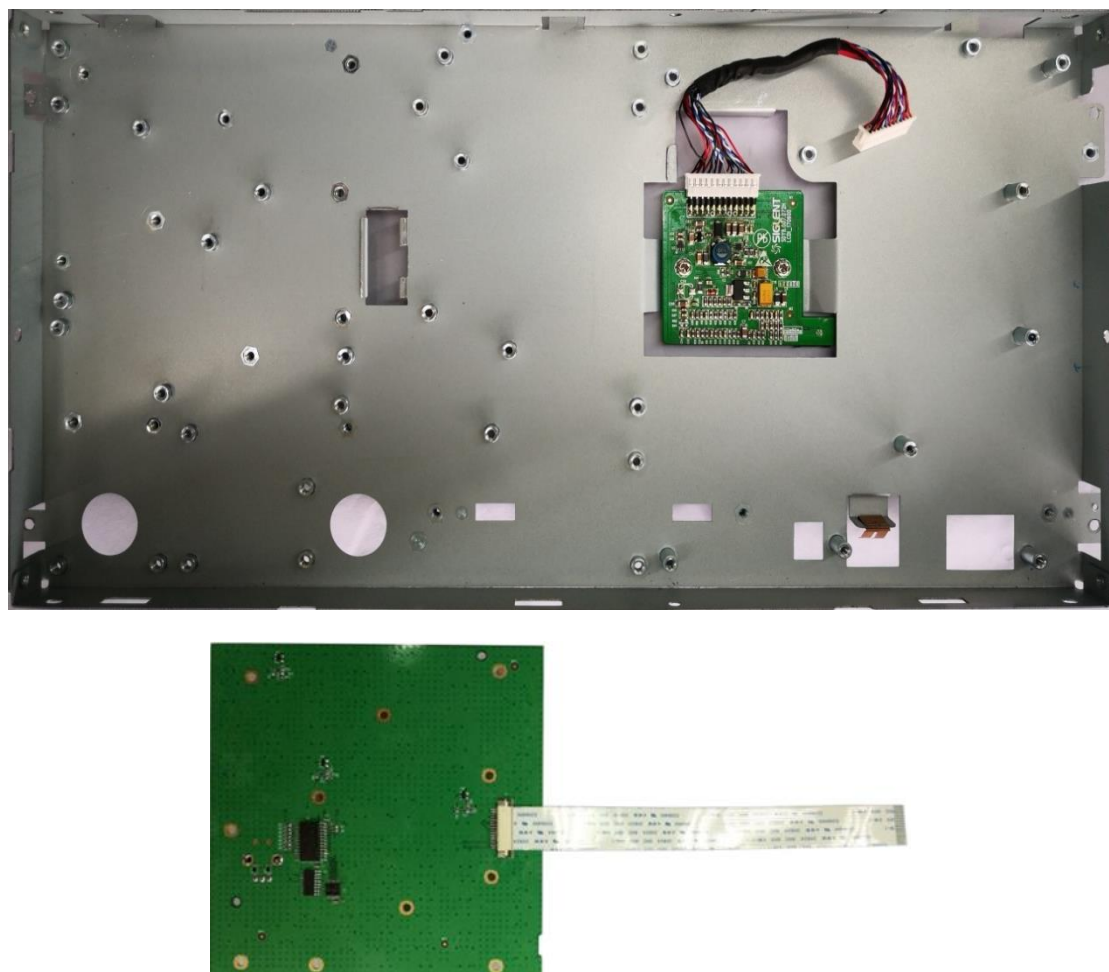
Removing the LCD, Keyboard

Figure 4-5 Removing the LCD and keyboard

Removal steps:

1. Remove the silicone keypad.
2. Remove the four screws located on the edge of the display module.
3. Remove the six screws located on the channel board.
4. Remove the seven screws located on the keyboard.
5. Disconnect the cable that connected the keyboard and the channel board.
6. Separate the modules carefully.

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About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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