

# SNA5000A Series Vector Network Analyzer



DS09050\_E04B



SIGLENT TECHNOLOGIES CO.,LTD

# SNA5000A

## 1 General Description

The SIGLENT SNA5000A series of Vector Network Analyzers have a frequency range of 9 kHz to 8.5 GHz and 100 kHz to 26.5 GHz, which support 2/4-port scattering parameter, differential-parameter, and time-domain parameter measurements. The SNA5000A series of VNAs are effective instrumentation for determining the Q-factor, bandwidth, and insertion loss of a filter. They feature impedance conversion, movement of measurement plane, limit testing, ripple test, fixture simulation, and adapter removal/insertion adjustments. The VNAs have five sweep types: Linear-Frequency mode, Log-Frequency mode, Power-Sweep mode, CW-Time mode, and Segment-Sweep mode. The SNA5000A series VNAs also support scattering-parameter correction of SOLT, SOLR, TRL, Response, and Enhanced Response for increased flexibility in R&D and manufacturing applications.

## 2 Features

-  Frequency range: 9 kHz - 8.5 GHz and 100 kHz - 26.5 GHz
-  Frequency resolution: 1 Hz
-  Level resolution: 0.05 dB
-  Range of IFBW: 1 Hz~10 MHz
-  Setting range of output level: -55 dBm ~ +10 dBm
-  Dynamic range: 125 dB
-  Types of calibration: Response calibration, Enhanced Response calibration, Full-one port calibration, Full-two port calibration, Full-three port calibration, Full-four port calibration, TRL calibration
-  Types of measurement: Scattering-parameter measurement, differential-parameter measurement, receiver measurement, time-domain parameter analysis, limit test, ripple test, impedance conversion, fixture simulation, adapter removal/insertion, spectrum analysis frequency offset, scalar mixer measurement, pulse measurement, Material Measurement, Gain Compression measurement, Vector mixer measurement
-  Internal Bias-Tee connections
-  Interface: LAN, USB Device, USB Host (USB-GPIB)
-  Remote control: SCPI/ Labview/ IVI based on USB-TMC / VXI-11 / Socket /Telnet / WebServer
-  12.1-inch touch screen
-  Video output: HDMI

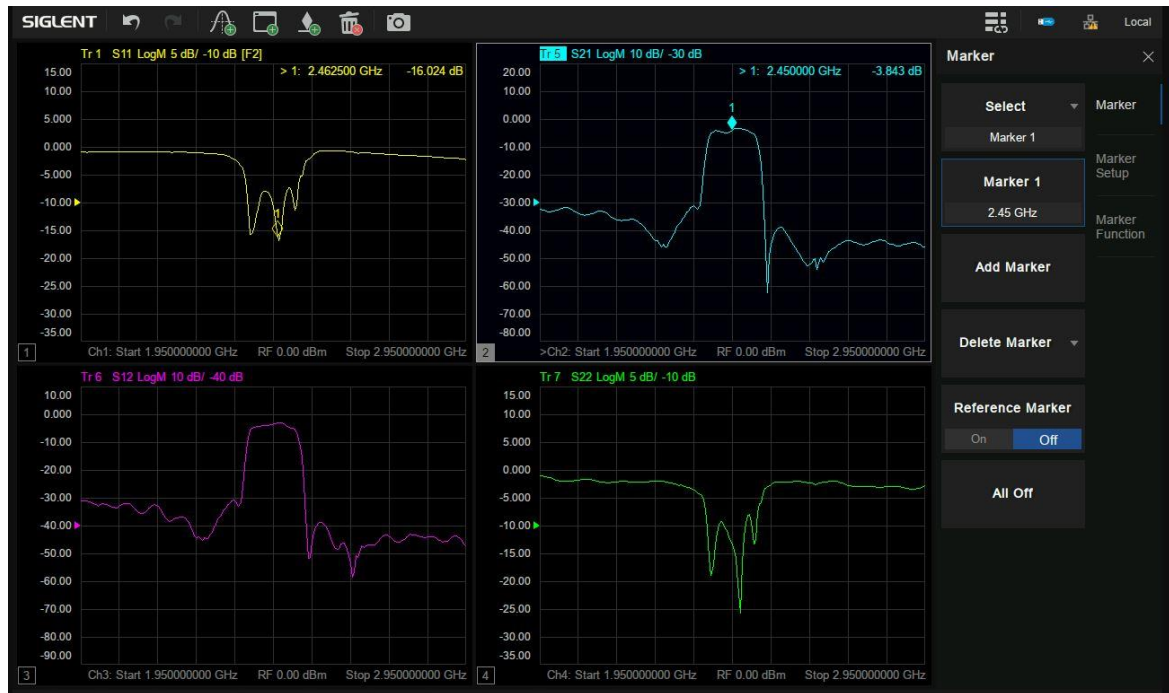


### 3 Models and key specifications

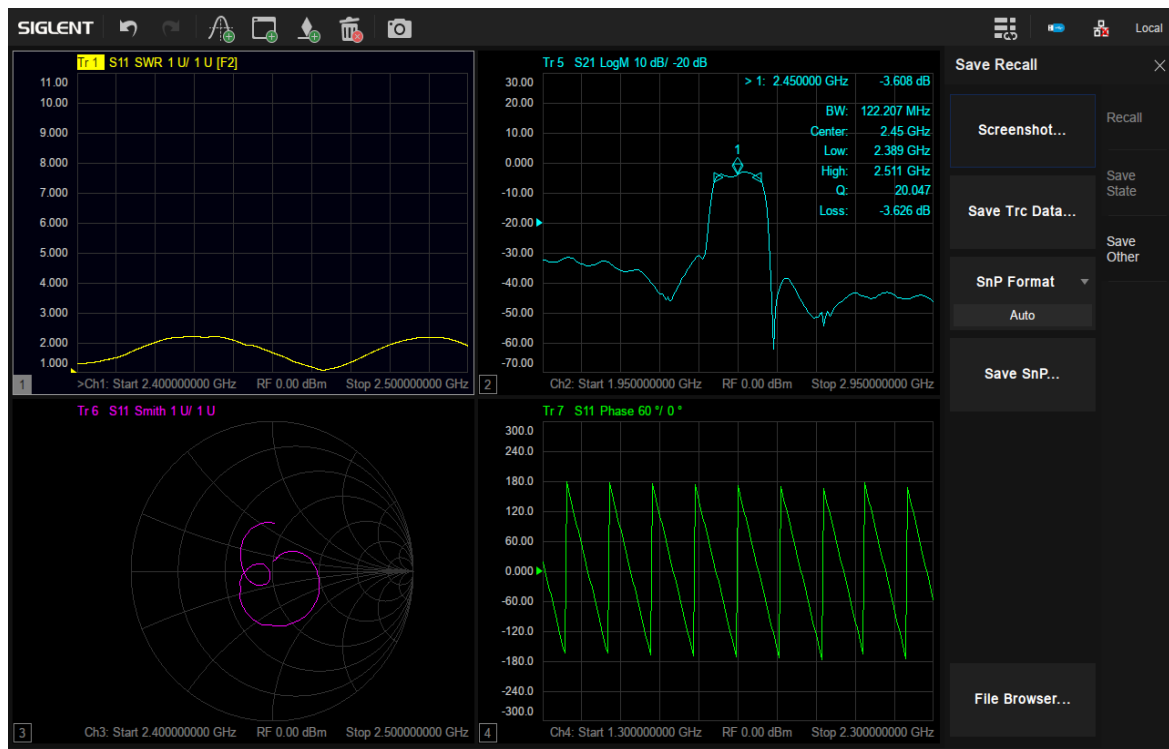
| Model                         | SNA5002A/<br>SNA5004A                                                                                                                                                                                                                                                                                                                                                                                                                   | SNA5012A/<br>SNA5014A | SNA5022A       | SNA5032A       |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|----------------|
| Frequency range               | 9kHz-4.5GHz                                                                                                                                                                                                                                                                                                                                                                                                                             | 9kHz-8.5GHz           | 100kHz-13.5GHz | 100kHz-26.5GHz |
| Ports                         | 2/4                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2/4                   | 2              | 2              |
| Frequency resolution          | 1 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                |                |
| Level resolution              | 0.05 dB                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                |                |
| Range of IFBW                 | 1 Hz~10 MHz                                                                                                                                                                                                                                                                                                                                                                                                                             |                       |                |                |
| Number of points              | 2 to 20,001                                                                                                                                                                                                                                                                                                                                                                                                                             |                       |                |                |
| Setting range of output level | -55 dBm ~ +10 dBm                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |                |                |
| Dynamic range                 | 125 dB                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                |                |
| Types of calibration          | Response calibration, Enhanced Response calibration, Full-one port calibration, Full-two port calibration, Full-three port calibration, Full-four port calibration, TRL calibration                                                                                                                                                                                                                                                     |                       |                |                |
| Types of measurement          | Scattering-parameter measurement, differential-parameter measurement, receiver measurement, time-domain parameter analysis, limit test, ripple test, impedance conversion, fixture simulation, adapter removal/insertion, enhanced time-domain parameter analysis (TDR), spectrum analysis, frequency offset, scalar mixer measurement, pulse measurement, Material Measurement, Gain Compression measurement, Vector mixer measurement |                       |                |                |
| Bias-Tees                     | Support                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                |                |
| Interface                     | LAN, USB Device, USB Host(USB-GPIB)                                                                                                                                                                                                                                                                                                                                                                                                     |                       |                |                |
| Remote control                | SCPI/ Labview/ IVI based on USB-TMC/ VXI-11/ Socket/ Telnet/ WebServer                                                                                                                                                                                                                                                                                                                                                                  |                       |                |                |
| Display                       | 12.1-inch touch screen                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                |                |
| Video output                  | HDMI                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                |                |

## 4 Design Features

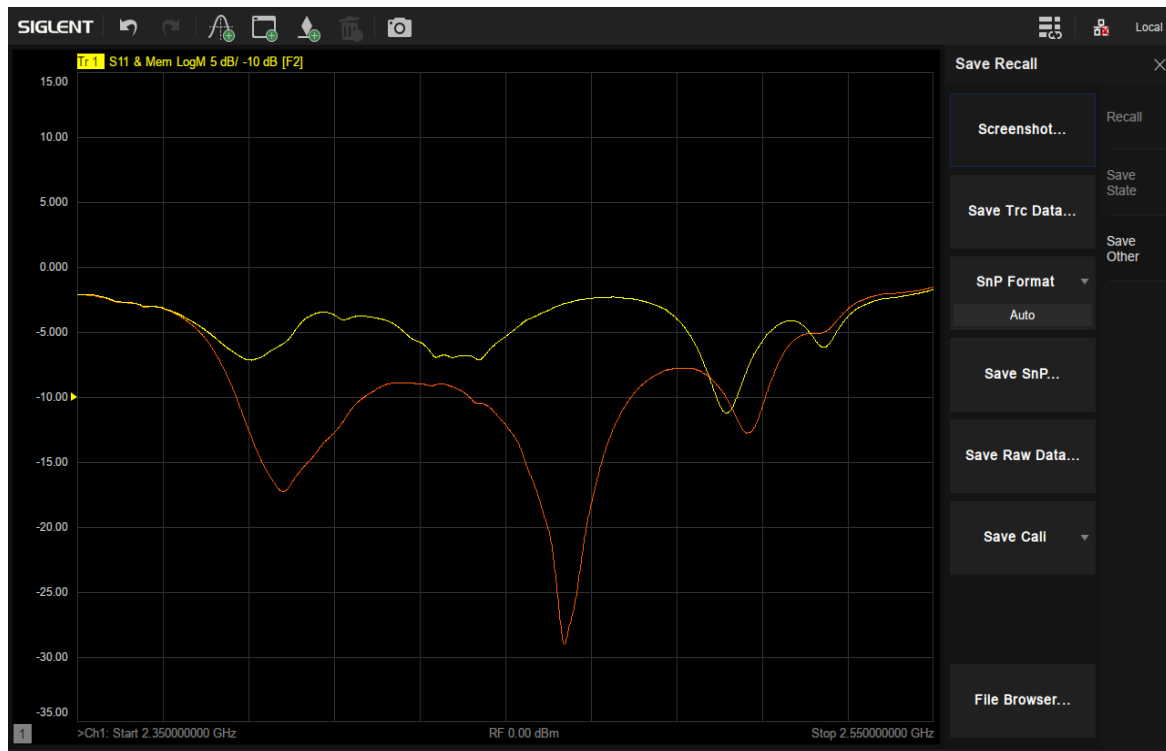
Multi-window display:



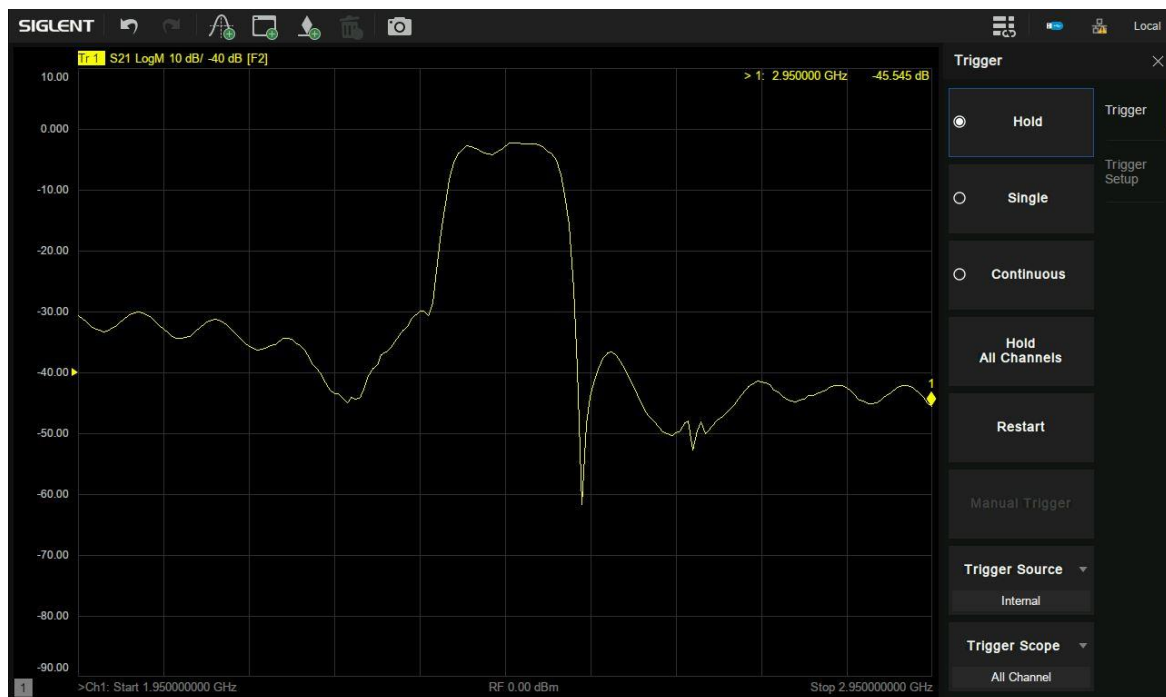
Multi-format display:



Display and compare memory and current data:



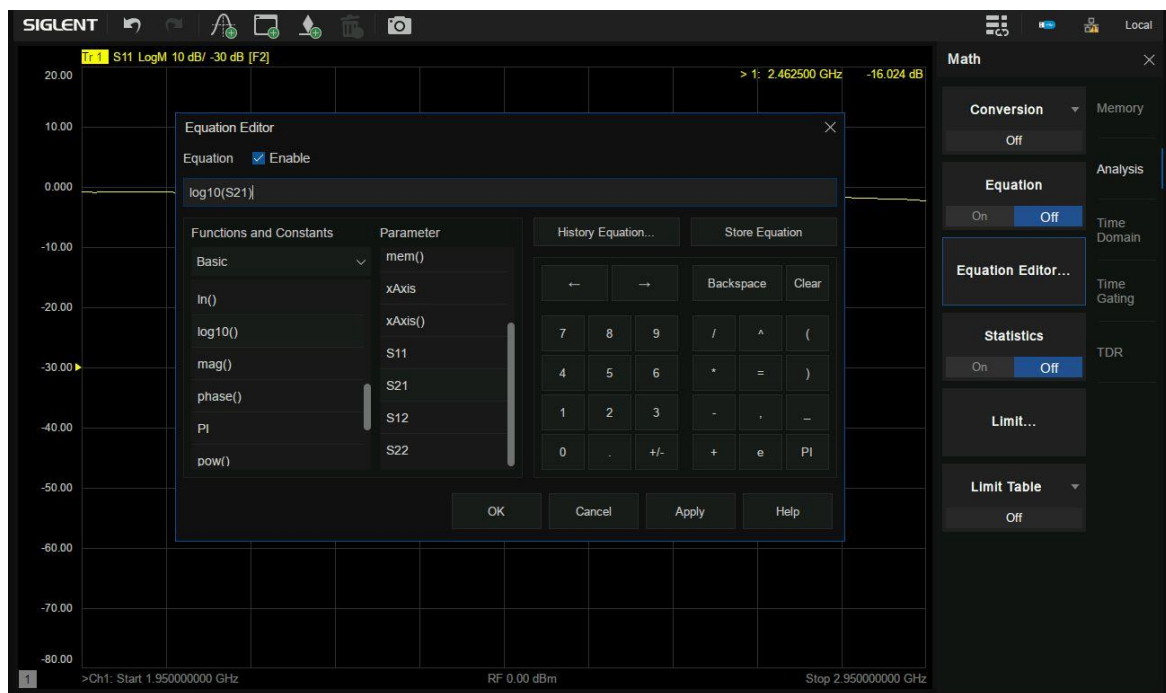
Display data hold:



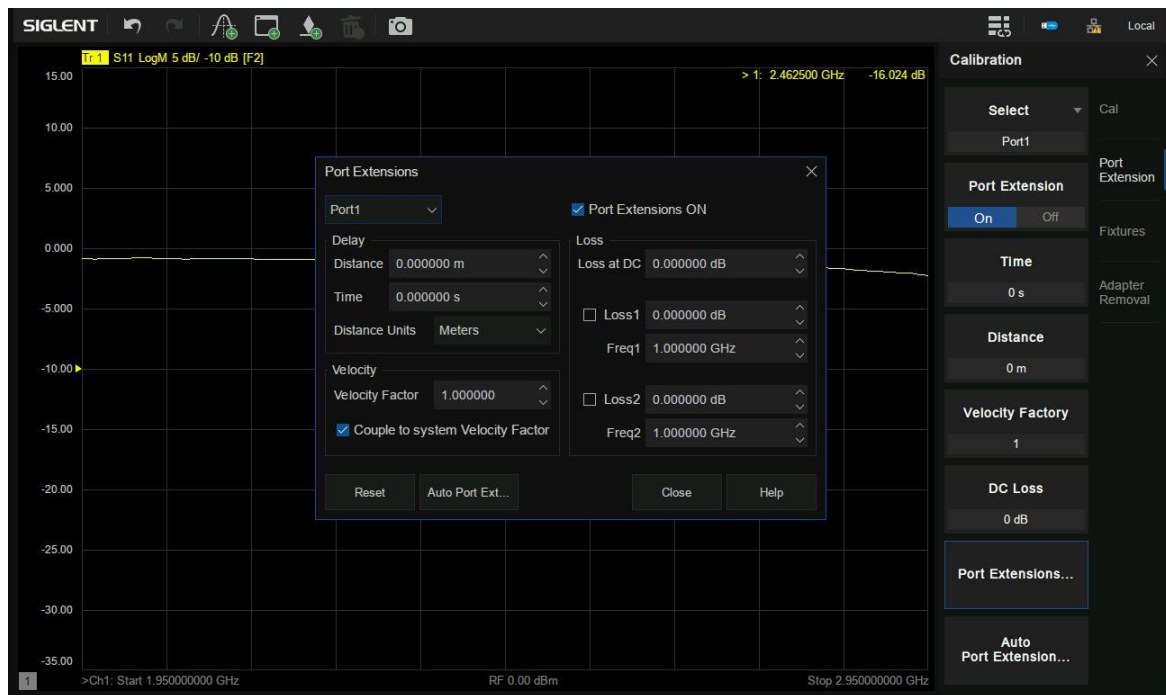
Impedance conversion:



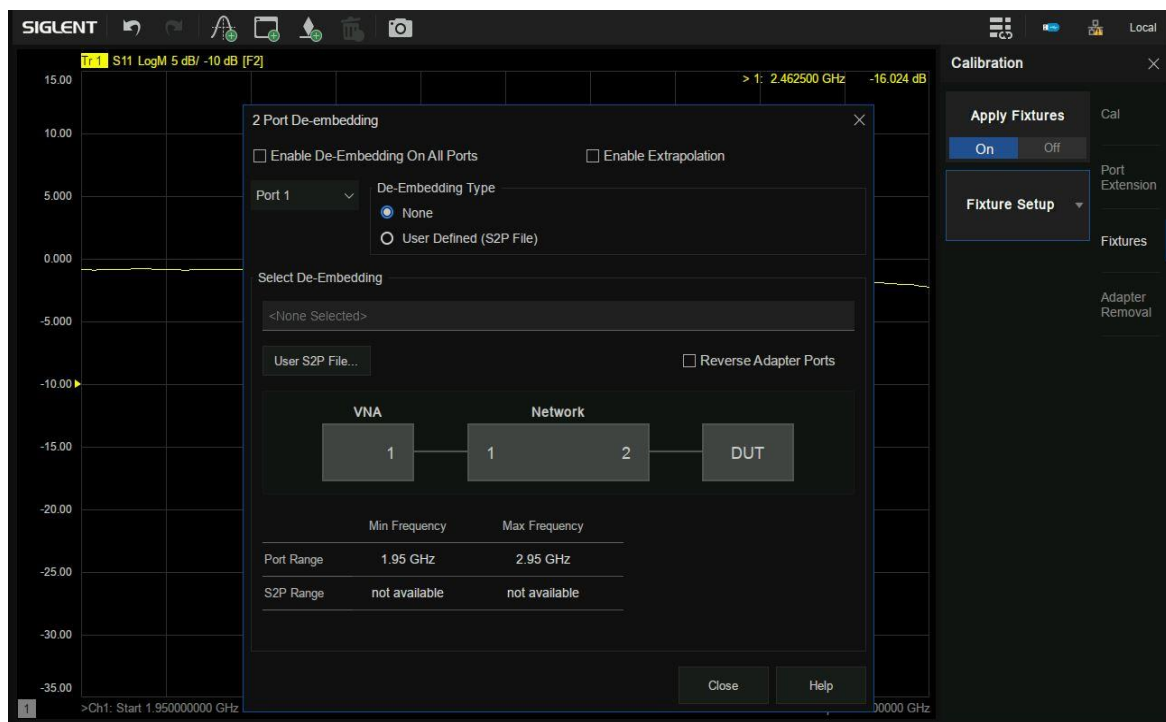
Equation Editor:



## Port Extensions:



## Embedding and De-Embedding:



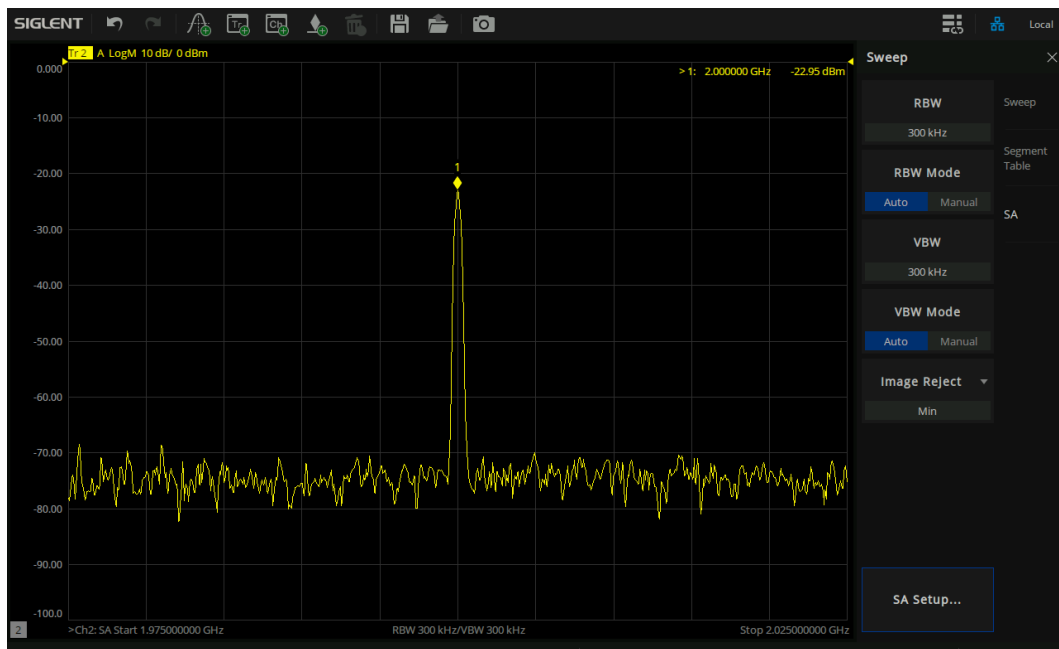
## Time-Domain analysis



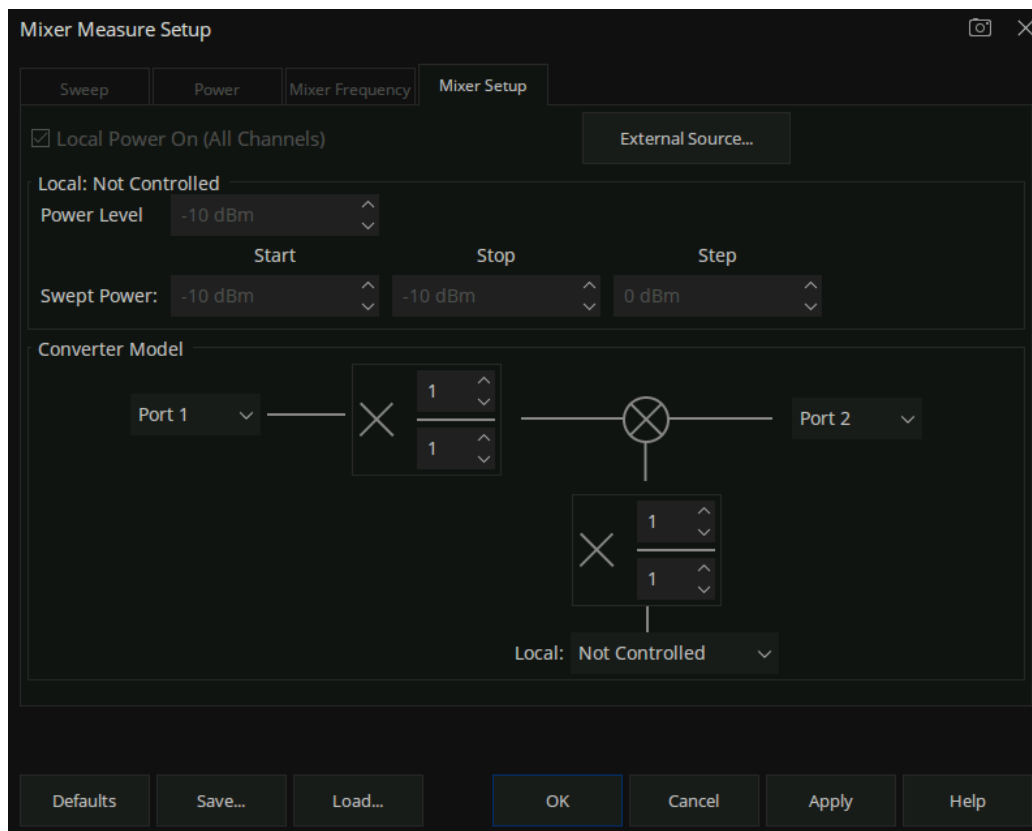
## Enhanced Time-Domain analysis(TDR)



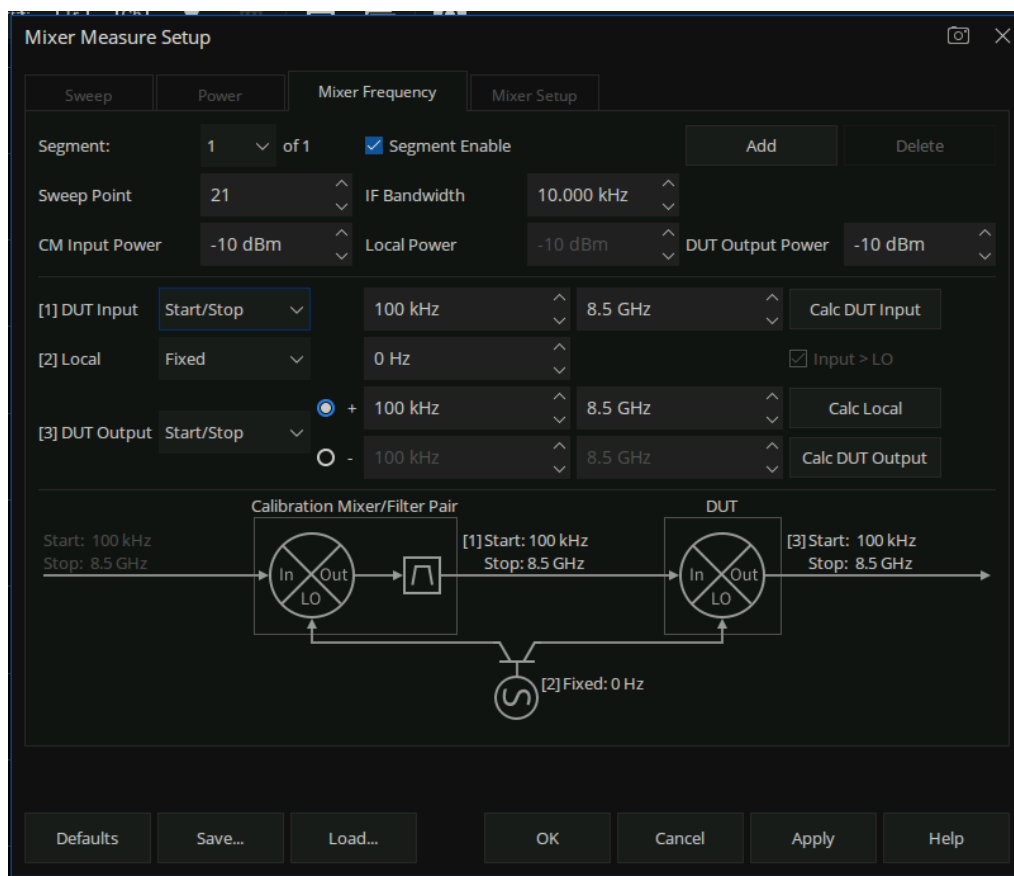
## Spectrum analysis



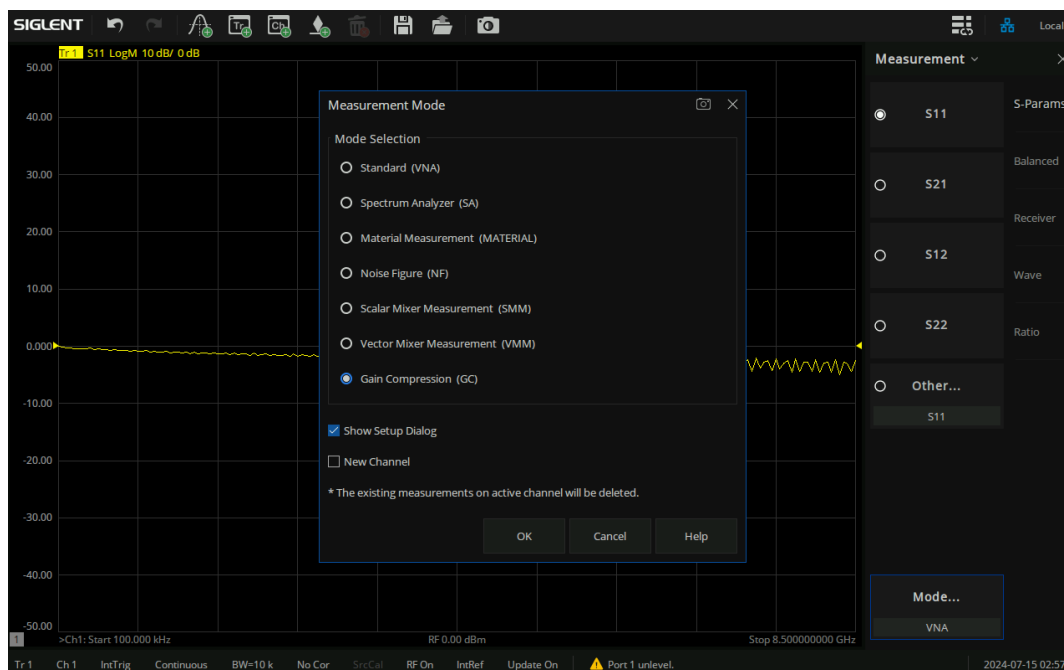
## Scalar mixer measurement



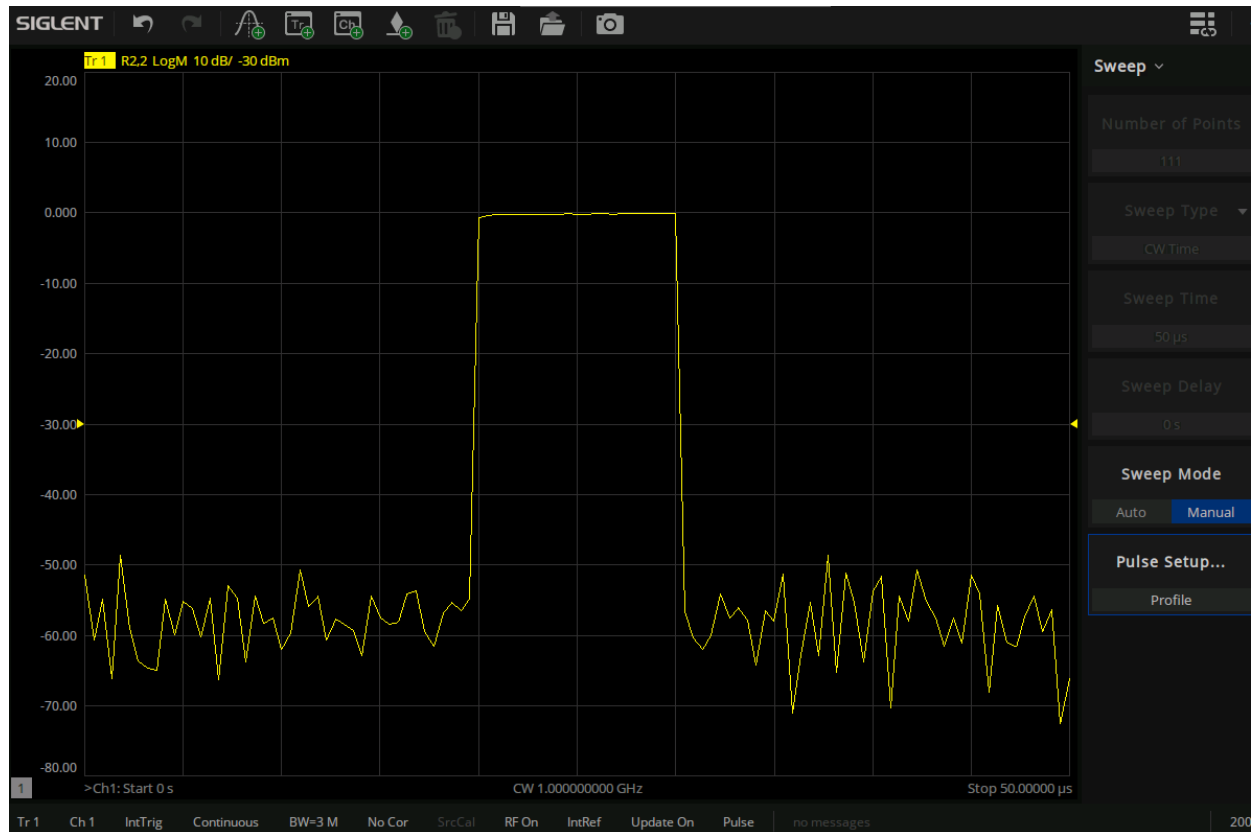
## Vector mixer measurement



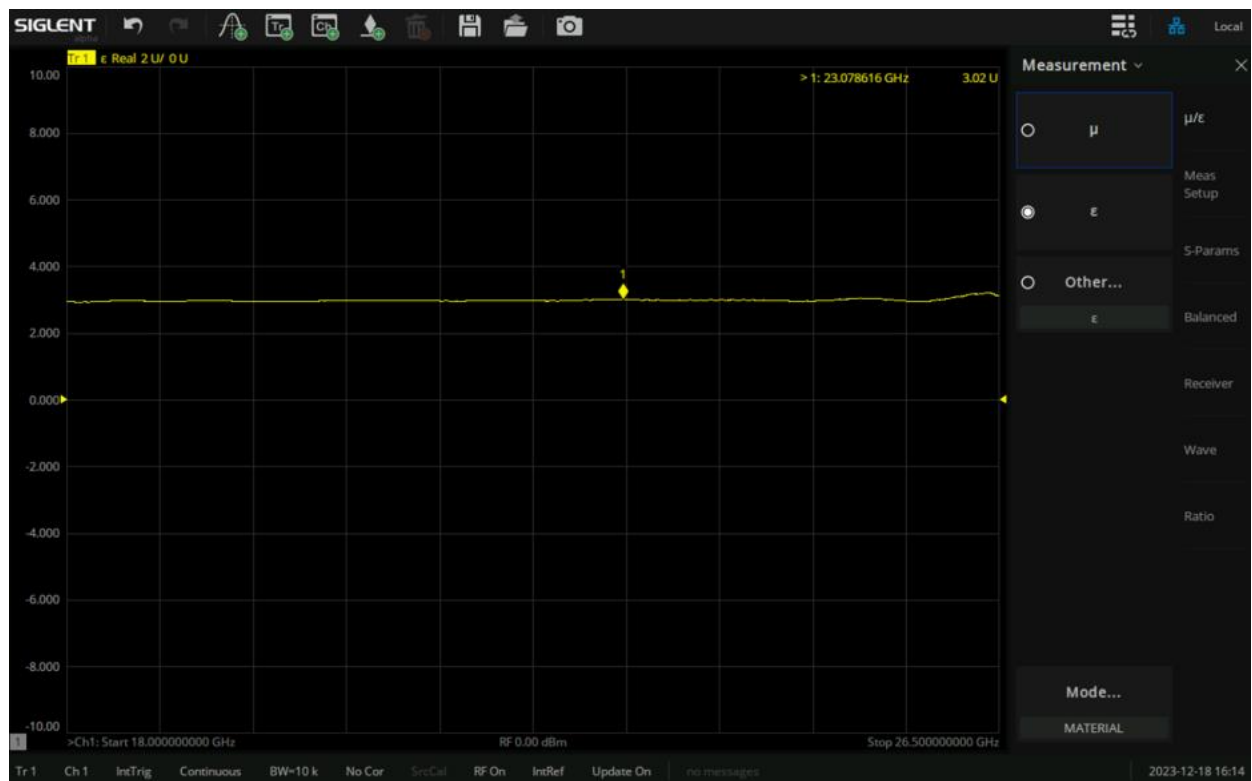
## Gain Compression measurement



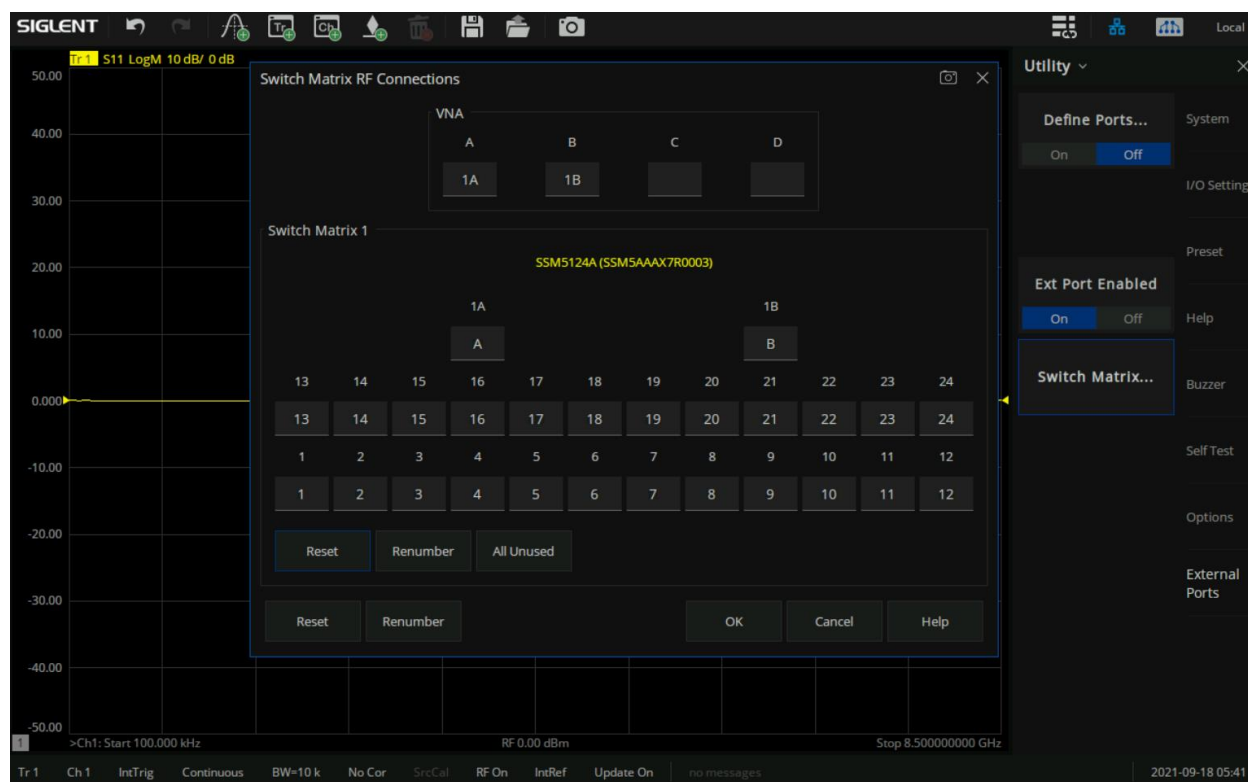
## Pulse Modulation



## Material Measurement



## Switch matrix measurement



## 5 Definitions

Specifications are valid under the following conditions: The instrument is within the calibration period, has been stored between 0 and 40°C for at least 2 hours before use, and has been powered on and warmed up for at least 90 minutes. The specifications include the measurement uncertainty unless otherwise noted.

**Specifications(Spec.):** All products are guaranteed to meet published specifications at room temperature (approximately 25°C), unless otherwise noted.

**Typical(Typ.):** Performance deemed typical implies that 80 percent of the measurement results will meet the typical published performance with a 95th percentile confidence level at room temperature (approximately 25°C). Typical performance is not warranted and does not include measurement uncertainty.

**Nominal:** This value indicates the expected mean or average performance, or an attribute whose performance is by design, such as the 50 Ohm connector.

## 6 Specifications

### 6.1 Dynamic range

#### SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Frequency range | IFBW | Specification(dB) | Typical (dB) |
|-----------------|------|-------------------|--------------|
| 9 kHz-18 kHz    | 10Hz | 85                | 102          |
| 18 kHz-30 kHz   |      | 90                | 105          |
| 30 kHz-100 kHz  |      | 95                | 107          |
| 100 kHz-300 kHz |      | 105               | 117          |
| 300 kHz-500 kHz |      | 120               | 130          |
| 500 kHz-1 MHz   |      | 125               | 136          |
| 1 MHz-5 GHz     |      | 125               | 140          |
| 5 GHz-6.8 GHz   |      | 123               | 133          |
| 6.8 GHz-7.7 GHz |      | 120               | 130          |
| 7.7 GHz-8 GHz   |      | 119               | 129          |
| 8 GHz -8.5 GHz  |      | 117               | 127          |

#### SNA5022A/SNA5032A

| Frequency range | IFBW | Specification(dB) | Typical (dB) |
|-----------------|------|-------------------|--------------|
| 100 kHz-10 MHz  | 10Hz | 115               | 125          |
| 10 MHz-3 GHz    |      | 125               | 135          |
| 3 GHz-9 GHz     |      | 125               | 135          |
| 9 GHz-13.5 GHz  |      | 118               | 125          |
| 13.5 GHz-20 GHz |      | 115               | 125          |
| 20 GHz-26.5 GHz |      | 110               | 120          |

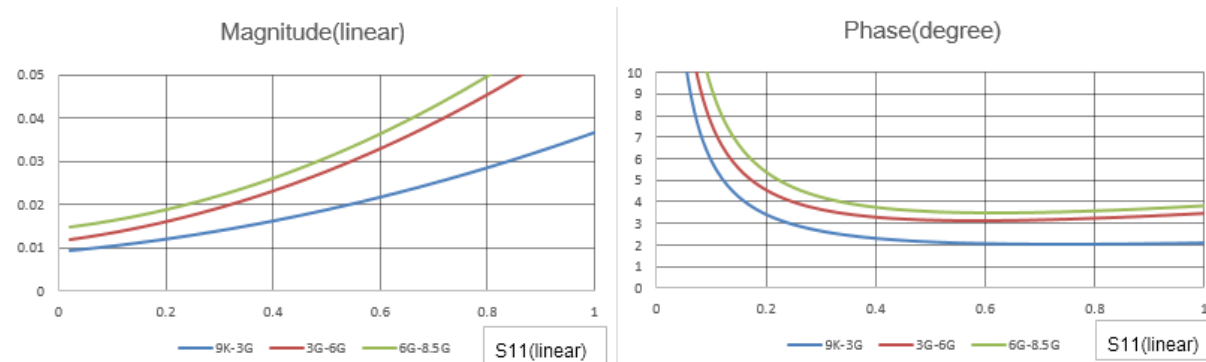
## 6.2 Corrected system performance with calibration kit

User correction: On, system correction: On; Corrected system performance with Keysight 85052D 3.5mm calibration kit, isolation calibration performed. IFBW is 10 Hz, no averaging applied to data, and environmental temperature is 25°C ( $\pm 5^\circ\text{C}$ ), with  $< 1^\circ\text{C}$  deviation from calibration temperature.

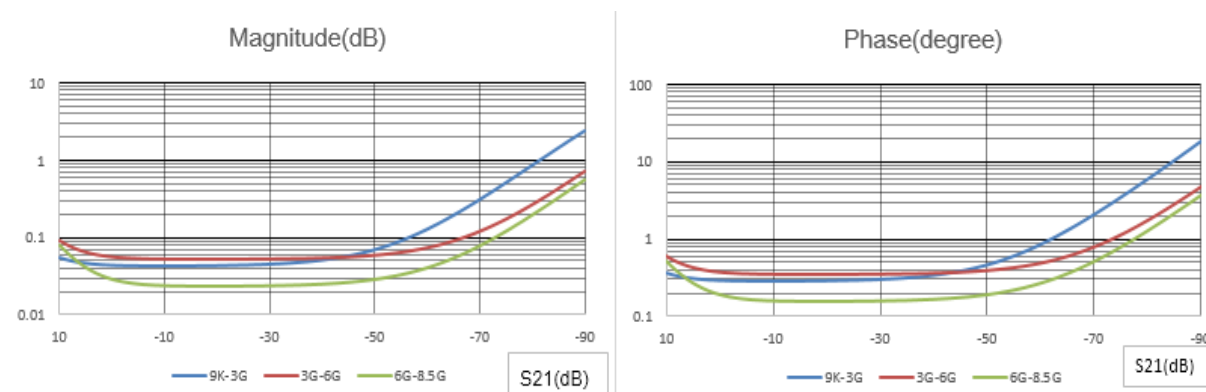
SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Specification (dB)    | 9 kHz-3 GHz | 3 GHz-6 GHz | 6 GHz-8.5 GHz |
|-----------------------|-------------|-------------|---------------|
| Directivity           | 41          | 39          | 37            |
| Source match          | 36          | 30          | 29            |
| Load match            | 41          | 37          | 35            |
| Reflect tracking      | $\pm 0.004$ | $\pm 0.003$ | $\pm 0.004$   |
| Transmission tracking | $\pm 0.06$  | $\pm 0.09$  | $\pm 0.11$    |

Reflection uncertainty (Specification, Power: -10 dBm, IFBW:10 Hz):



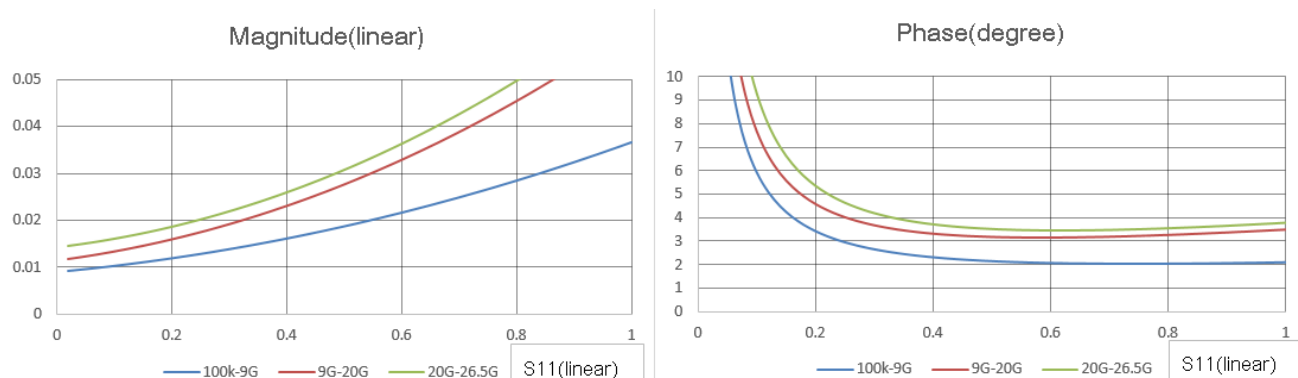
Transmission uncertainty (Specification, Power: -10 dBm, IFBW:10 Hz):



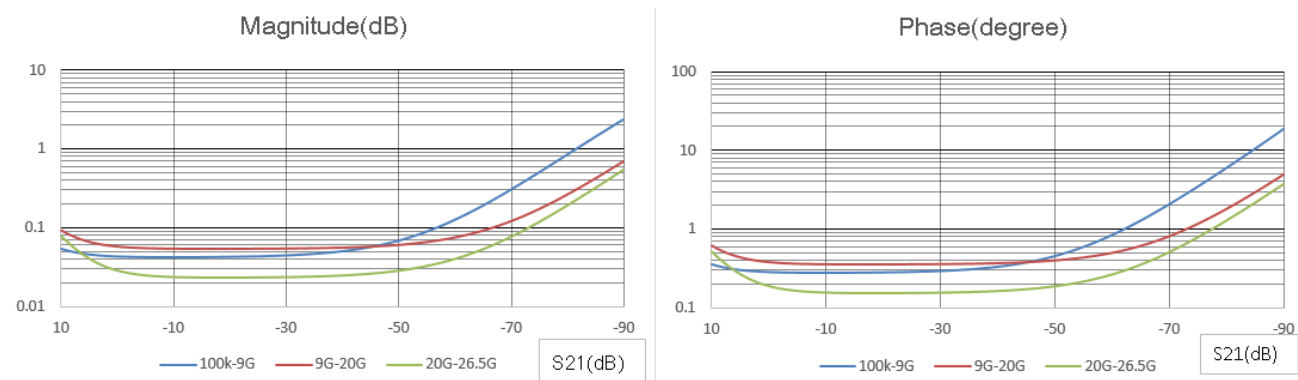
## SNA5022A/SNA5032A

| Specification (dB)    | 100 kHz-9 GHz | 9 GHz-20 GHz | 20 GHz-26.5 GHz |
|-----------------------|---------------|--------------|-----------------|
| Directivity           | 40            | 36           | 35              |
| Source match          | 35            | 29           | 27              |
| Load match            | 39            | 36           | 33              |
| Reflect tracking      | $\pm 0.004$   | $\pm 0.003$  | $\pm 0.01$      |
| Transmission tracking | $\pm 0.06$    | $\pm 0.09$   | $\pm 0.5$       |

### Reflection uncertainty (Specification, Power: -10 dBm, IFBW:10 Hz):



### Transmission uncertainty (Specification, Power: -10 dBm, IFBW:10 Hz):



## 6.3 Uncorrected system performance

User correction: Off, system correction: On; IFBW is 10 Hz, no averaging applied to data.

## SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Specification (dB) | 9 kHz-30 MHz | 30 MHz-3 GHz | 3 GHz-6 GHz | 6 GHz-8.5 GHz |
|--------------------|--------------|--------------|-------------|---------------|
| Directivity        | 22           | 22           | 20          | 16            |
| Source match       | 22           | 22           | 20          | 16            |

|                       |      |      |      |      |
|-----------------------|------|------|------|------|
| Load match            | 6    | 12   | 11   | 10   |
| Reflect tracking      | ±1.0 | ±1.0 | ±1.0 | ±1.0 |
| Transmission tracking | ±1.0 | ±1.0 | ±1.0 | ±1.0 |

#### SNA5022A/SNA5032A

| Specification (dB)    | 100 KHz-1 GHz | 1 GHz-9 GHz | 9 GHz-20 GHz | 20 GHz-26.5 GHz |
|-----------------------|---------------|-------------|--------------|-----------------|
| Directivity           | 20            | 20          | 16           | 13              |
| Source match          | 20            | 20          | 16           | 13              |
| Load match            | 8             | 11          | 7            | 7               |
| Reflect tracking      | ±1.4          | ±1.4        | ±1.0         | ±1.0            |
| Transmission tracking | ±1.4          | ±1.4        | ±1.0         | ±1.0            |

## 6.4 Test port output (Source)

### 6.4.1 Test port output frequency

| Description                             | Specification                                                                           |
|-----------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Frequency range</b>                  |                                                                                         |
| SNA5002A, SNA5004A                      | 9 kHz to 4.5 GHz                                                                        |
| SNA5012A, SNA5014A                      | 9 kHz to 8.5 GHz                                                                        |
| SNA5022A                                | 100 kHz to 13.5 GHz                                                                     |
| SNA5032A                                | 100 kHz to 26.5 GHz                                                                     |
| <b>Frequency resolution<sup>1</sup></b> |                                                                                         |
| 9 KHz – 3.8 GHz                         | 1 Hz                                                                                    |
| 3.8 GHz – 7.8 GHz                       | 2 Hz                                                                                    |
| 7.8 GHz – 13.5 GHz                      | 4 Hz                                                                                    |
| 13.5 GHz – 26.5 GHz                     | 8 Hz                                                                                    |
| <b>CW accuracy</b>                      |                                                                                         |
| Standard                                | $\pm 1.0$ ppm ( $23 \pm 3^{\circ}\text{C}$ )                                            |
| Option: SNA5000-HPR                     | $\pm 0.1$ ppm ( $23 \pm 3^{\circ}\text{C}$ )                                            |
| <b>Source stability</b>                 |                                                                                         |
| Standard                                | $\pm 1.0$ ppm (0 to $40^{\circ}\text{C}$ )<br>$\pm 0.5$ ppm/year, $\pm 3.0$ ppm/20 year |
| Option: SNA5000-HPR                     | $\pm 1$ ppb (0 to $40^{\circ}\text{C}$ )<br>$\pm 50$ ppb/year                           |

<sup>1</sup> Firmware revision V2.13 or later is required.

## 6.4.2 Test port output power

SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Description            | Specification                    | Typical |
|------------------------|----------------------------------|---------|
| Preset power           | 0 dBm                            |         |
| Level accuracy         | $\pm 1.5$ dB@0 dBm <sup>1</sup>  |         |
| <b>Level linearity</b> |                                  |         |
| 9 kHz- 18 kHz          | $\pm 0.75$ dB(-20 dBm to -5 dBm) |         |
| 18 kHz- 30 kHz         | $\pm 0.75$ dB(-20 dBm to 0 dBm)  |         |
| 30 kHz- 70 kHz         | $\pm 0.75$ dB(-20 dBm to 2 dBm)  |         |
| 70 kHz- 100 kHz        | $\pm 0.75$ dB(-20 dBm to 5 dBm)  |         |
| 100 kHz- 300 kHz       | $\pm 0.75$ dB(-20 dBm to 7 dBm)  |         |
| 300 kHz- 4.5 GHz       | $\pm 0.75$ dB(-20 dBm to 10 dBm) |         |
| 4.5 GHz- 6.8 GHz       | $\pm 0.75$ dB(-20 dBm to 8 dBm)  |         |
| 6.8 GHz- 7.7 GHz       | $\pm 0.75$ dB(-20 dBm to 5 dBm)  |         |
| 7.7 GHz- 8 GHz         | $\pm 0.75$ dB(-20 dBm to 4 dBm)  |         |
| 8 GHz- 8.5 GHz         | $\pm 0.75$ dB(-20 dBm to 0 dBm)  |         |
| <b>Range</b>           |                                  |         |
| 9 kHz- 18 kHz          | -55 dBm to -5dBm                 |         |
| 18 kHz- 30 kHz         | -55 dBm to 0 dBm                 |         |
| 30 kHz- 70 kHz         | -55 dBm to 2dBm                  |         |
| 70 kHz- 100 kHz        | -55 dBm to 5dBm                  |         |
| 100 kHz- 300 kHz       | -55 dBm to 7dBm                  |         |
| 300 kHz- 4.5 GHz       | -55 dBm to 10 dBm                |         |
| 4.5 GHz- 6.8 GHz       | -55 dBm to 8 dBm                 |         |
| 6.8 GHz- 7.7 GHz       | -55 dBm to 5 dBm                 |         |
| 7.7 GHz- 8 GHz         | -55 dBm to 4 dBm                 |         |
| 8 GHz- 8.5 GHz         | -55 dBm to 0 dBm                 |         |
| <b>Sweep range</b>     |                                  |         |
| 9 kHz- 18 kHz          | -55 dBm to -5dBm                 |         |
| 18 kHz- 30 kHz         | -55 dBm to 0 dBm                 |         |
| 70 kHz- 100 kHz        | -55 dBm to 2dBm                  |         |
| 30 kHz- 70 kHz         | -55 dBm to 5dBm                  |         |
| 100 kHz- 300 kHz       | -55 dBm to 7dBm                  |         |

|                          |                   |         |
|--------------------------|-------------------|---------|
| 300 kHz- 4.5 GHz         | -55 dBm to 10 dBm |         |
| 4.5 GHz- 6.8 GHz         | -55 dBm to 8 dBm  |         |
| 6.8 GHz- 7.7 GHz         | -55 dBm to 5 dBm  |         |
| 7.7 GHz- 8 GHz           | -55 dBm to 4 dBm  |         |
| 8 GHz- 8.5 GHz           | -55 dBm to 0 dBm  |         |
| <b>Max leveled power</b> |                   |         |
| 9 kHz- 18 kHz            | -5 dBm            | -1 dBm  |
| 18 kHz-30 kHz            | 0 dBm             | 2 dBm   |
| 30 kHz- 70 kHz           | 2 dBm             | 5 dBm   |
| 70 kHz-100 kHz           | 5 dBm             | 7 dBm   |
| 100 kHz-300 kHz          | 7 dBm             | 10 dBm  |
| 300 kHz- 4.5 GHz         | 10 dBm            | 13 dBm  |
| 4.5 GHz- 6.8 GHz         | 8 dBm             | 10 dBm  |
| 6.8 GHz-7.7 GHz          | 5 dBm             | 8 dBm   |
| 7.7 GHz- 8 GHz           | 4 dBm             | 6 dBm   |
| 8 GHz- 8.5 GHz           | 0 dBm             | 4 dBm   |
| <b>Level resolution</b>  |                   | 0.05 dB |

<sup>1</sup> The level accuracy of 9 kHz- 18 kHz is  $\pm 1.5\text{dB}@-5\text{dBm}$

#### SNA5022A/SNA5032A

| Description            | Specification                                            | Typical |
|------------------------|----------------------------------------------------------|---------|
| Preset power           | 0 dBm                                                    |         |
| <b>Level accuracy</b>  |                                                          |         |
| 100 kHz - 10 MHz       | $\pm 2.0\text{ dB}@0\text{ dBm}$                         |         |
| 10 MHz - 20 GHz        | $\pm 1.5\text{ dB}@0\text{ dBm}$                         |         |
| 20 GHz- 26.5 GHz       | $\pm 2.0\text{ dB}@0\text{ dBm}$                         |         |
| <b>Level linearity</b> |                                                          |         |
| 100 kHz- 10 MHz        | $\pm 0.75\text{ dB } (-20\text{ dBm to } 10\text{ dBm})$ |         |
| 10 MHz- 3 GHz          | $\pm 0.75\text{ dB } (-20\text{ dBm to } 10\text{ dBm})$ |         |
| 3 GHz- 9 GHz           | $\pm 0.75\text{ dB } (-20\text{ dBm to } 10\text{ dBm})$ |         |
| 9 GHz- 13.5 GHz        | $\pm 1.0\text{ dB } (-20\text{ dBm to } 5\text{ dBm})$   |         |
| 13.5 GHz- 20 GHz       | $\pm 1.0\text{ dB } (-20\text{ dBm to } 5\text{ dBm})$   |         |
| 20 GHz- 26.5 GHz       | $\pm 1.2\text{ dB } (-20\text{ dBm to } 0\text{ dBm})$   |         |

| Range                   |                   |         |
|-------------------------|-------------------|---------|
| 100 kHz- 10 MHz         | -55 dBm to 10 dBm |         |
| 10 MHz- 3 GHz           | -55 dBm to 10 dBm |         |
| 3 GHz- 9 GHz            | -55 dBm to 10 dBm |         |
| 9 GHz- 13.5 GHz         | -55 dBm to 5 dBm  |         |
| 13.5 GHz- 20 GHz        | -55 dBm to 5 dBm  |         |
| 20 GHz- 26.5 GHz        | -55 dBm to 0 dBm  |         |
| Sweep range             |                   |         |
| 100 kHz- 10 MHz         | -55 dBm to 10 dBm |         |
| 10 MHz- 3 GHz           | -55 dBm to 10 dBm |         |
| 3 GHz- 9 GHz            | -55 dBm to 10 dBm |         |
| 9 GHz- 13.5 GHz         | -55 dBm to 5 dBm  |         |
| 13.5 GHz- 20 GHz        | -55 dBm to 5 dBm  |         |
| 20 GHz- 26.5 GHz        | -55 dBm to 0 dBm  |         |
| Max leveled power       |                   |         |
| 100 kHz- 10 MHz         | 10 dBm            | 11 dBm  |
| 10 MHz- 3 GHz           | 10 dBm            | 13 dBm  |
| 3 GHz- 9 GHz            | 10 dBm            | 12 dBm  |
| 9 GHz- 13.5 GHz         | 5 dBm             | 10 dBm  |
| 13.5 GHz- 20 GHz        | 5 dBm             | 10 dBm  |
| 20 GHz- 26.5 GHz        | 0 dBm             | 8 dBm   |
| <b>Power resolution</b> |                   | 0.05 dB |

#### 6.4.3 Test port output signal purity

| Description                          | Specification | Typical  |
|--------------------------------------|---------------|----------|
| <b>2nd or 3rd harmonics (0 dBm)</b>  |               |          |
| 9 kHz to 100 kHz                     |               | <-15 dBc |
| 100 kHz to 26.5 GHz                  |               | <-25 dBc |
| <b>Non-harmonic spurious (0 dBm)</b> |               | <-30 dBc |

## 6.5 Test port input

### 6.5.1 Test port input levels

SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Description                       | Specification             | Typical     |
|-----------------------------------|---------------------------|-------------|
| <b>Max input level</b>            |                           |             |
| 9 kHz-8.5 GHz                     | +10 dBm                   |             |
| <b>Damage input level</b>         |                           |             |
| 9 kHz-8.5 GHz                     | +27 dBm (RF) or 35 V (DC) |             |
| <b>Crosstalk</b>                  |                           |             |
| 9 kHz- 18 kHz                     | -75 dB                    | -96 dB      |
| 18 kHz-50 kHz                     | -90 dB                    | -106 dB     |
| 50 kHz-100 kHz                    | -90 dB                    | -110 dB     |
| 100 kHz-500 kHz                   | -110 dB                   | -120 dB     |
| 500 kHz- 1 MHz                    | -115 dB                   | -130 dB     |
| 1 MHz- 5.8 GHz <sup>2</sup>       | -125 dB                   | -140 dB     |
| 5.8 GHz-8.5 GHz                   | -115 dB                   | -130 dB     |
| <b>Noise floor</b>                |                           |             |
| 9 kHz- 100 kHz                    | -100 dBm/Hz               | -115 dBm/Hz |
| 100 kHz-300 kHz                   | -110 dBm/Hz               | -125 dBm/Hz |
| 300 kHz-500 kHz                   | -115 dBm/Hz               | -130 dBm/Hz |
| 500 kHz- 1 MHz                    | -120 dBm/Hz               | -136 dBm/Hz |
| 1 MHz- 5 GHz <sup>2</sup>         | -125 dBm/Hz               | -140 dBm/Hz |
| 5 GHz-8.5 GHz                     | -120 dBm/Hz               | -135 dBm/Hz |
| <b>Compression level(+10 dBm)</b> |                           |             |
| <b>Magnitude</b>                  |                           |             |
| 9 kHz- 100 kHz                    | 0.3dB                     | 0.09 dB     |
| 100 kHz- 8.5GHz                   | 0.2dB                     | 0.08dB      |
| <b>Phase</b>                      |                           |             |
| 9 kHz- 100 kHz                    | 0.5 deg                   | 0.36 deg    |
| 100 kHz- 8.5GHz                   | 0.5 deg                   | 0.3 deg     |

<sup>2</sup> 467.25MHz and 471.5MHz points do not meet the specs requirement.

## SNA5022A/SNA5032A

| Description                       | Specification             | Typical     |
|-----------------------------------|---------------------------|-------------|
| <b>Max input level</b>            |                           |             |
| 100 kHz-26.5 GHz                  | +10 dBm                   |             |
| <b>Damage input level</b>         |                           |             |
| 100 kHz-26.5 GHz                  | +27 dBm (RF) or 35 V (DC) |             |
| <b>Level accuracy</b>             |                           |             |
| 100 kHz - 10 MHz                  | ±2.5 dB@0 dBm             |             |
| 10 MHz - 20 GHz                   | ±1.5 dB@0 dBm             |             |
| 20 GHz- 26.5 GHz                  | ±2.0 dB@0 dBm             |             |
| <b>Crosstalk</b>                  |                           |             |
| 100 kHz- 10 MHz                   | -100 dB                   | -110 dB     |
| 10 MHz- 3GHz <sup>3</sup>         | -125 dB                   | -140 dB     |
| 3 GHz- 13.5 GHz                   | -120 dB                   | -125 dB     |
| 13.5 GHz- 26.5 GHz                | -105 dB                   | -115 dB     |
| <b>Noise floor</b>                |                           |             |
| 100 kHz- 10 MHz                   | -110 dBm/Hz               | -120 dBm/Hz |
| 10 MHz- 3 GHz <sup>3</sup>        | -122 dBm/Hz               | -132 dBm/Hz |
| 3 GHz- 9 GHz                      | -125 dBm/Hz               | -135 dBm/Hz |
| 9 GHz- 13.5 GHz                   | -125 dBm/Hz               | -135 dBm/Hz |
| 13.5 GHz- 20 GHz                  | -122 dBm/Hz               | -132 dBm/Hz |
| 20 GHz- 26.5 GHz                  | -118 dBm/Hz               | -128 dBm/Hz |
| <b>Compression level(+10 dBm)</b> |                           |             |
| <b>Magnitude</b>                  |                           |             |
| 100 kHz- 13.5 GHz                 | 0.5 dB                    | 0.3 dB      |
| 13.5 GHz- 26.5 GHz                | 1.0 dB                    | 0.5 dB      |
| <b>Phase</b>                      |                           |             |
| 100 kHz- 13.5 GHz                 | 5 deg                     | 1 deg       |
| 13.5 GHz- 26.5 GHz                | 5 deg                     | 1.5 deg     |

<sup>3</sup> 20MHz and 30MHz points do not meet the specs requirement.

### 6.5.2 Trace noise

## SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Description                               | Specification | Typical       |
|-------------------------------------------|---------------|---------------|
| Note:Setting max output power             |               |               |
| <b>Transmission trace noise magnitude</b> |               |               |
| 9 kHz- 50 kHz (IFBW=1 kHz)                | 0.005 dB rms  | 0.0015 dB rms |
| 50 kHz- 1 MHz (IFBW=1 kHz)                | 0.003 dB rms  | 0.0015 dB rms |
| 1 MHz- 8 GHz (IFBW=10 kHz)                | 0.003 dB rms  | 0.0015 dB rms |
| 8 GHz-8.5 GHz(IFBW=10 kHz)                | 0.005 dB rms  | 0.0025 dB rms |
| <b>Reflection trace noise magnitude</b>   |               |               |
| 9 kHz- 50 kHz (IFBW=1 kHz)                | 0.005 dB rms  | 0.0015 dB rms |
| 50 kHz- 1 MHz (IFBW=1 kHz)                | 0.003 dB rms  | 0.0010 dB rms |
| 1 MHz- 8 GHz (IFBW=10 kHz)                | 0.003 dB rms  | 0.0015 dB rms |
| 8 GHz-8.5 GHz(IFBW=10 kHz)                | 0.005 dB rms  | 0.0020 dB rms |
| <b>Transmission trace noise phase</b>     |               |               |
| 9 kHz- 50 kHz (IFBW=1 kHz)                | 0.04 deg rms  | 0.02 deg rms  |
| 50 kHz- 1 MHz (IFBW=1 kHz)                | 0.03 deg rms  | 0.015 deg rms |
| 1 MHz- 8.5 GHz (IFBW=10 kHz)              | 0.05 deg rms  | 0.02 deg rms  |
| <b>Reflection trace noise phase</b>       |               |               |
| 9 kHz- 50 kHz (IFBW=1 kHz)                | 0.03 deg rms  | 0.015 deg rms |
| 50 kHz- 1 MHz (IFBW=1 kHz)                | 0.03 deg rms  | 0.015 deg rms |
| 1 MHz- 8.5 GHz (IFBW=10 kHz)              | 0.05 deg rms  | 0.020 deg rms |

SNA5022A/SNA5032A

| Description                               | Specification | Typical       |
|-------------------------------------------|---------------|---------------|
| Note:Setting max output power             |               |               |
| <b>Transmission trace noise magnitude</b> |               |               |
| 100 kHz- 10 MHz (IFBW=1 kHz)              | 0.009 dB rms  | 0.0015 dB rms |
| 10 MHz- 13.5 GHz (IFBW=10 kHz)            | 0.006 dB rms  | 0.0015 dB rms |
| 13.5 GHz- 26.5 GHz (IFBW=10 kHz)          | 0.015 dB rms  | 0.0025 dB rms |
| <b>Reflection trace noise magnitude</b>   |               |               |
| 100 kHz- 10 MHz (IFBW=1 kHz)              | 0.003 dB rms  | 0.0015 dB rms |
| 10 MHz- 13.5 GHz (IFBW=10 kHz)            | 0.009 dB rms  | 0.0015 dB rms |
| 13.5 GHz- 26.5 GHz (IFBW=10 kHz)          | 0.015 dB rms  | 0.0025 dB rms |
| <b>Transmission trace noise phase</b>     |               |               |

|                                     |              |               |
|-------------------------------------|--------------|---------------|
| 100 kHz- 10 MHz (IFBW=1 kHz)        | 0.05 deg rms | 0.02 deg rms  |
| 10 MHz- 13.5 GHz (IFBW=10 kHz)      | 0.05 deg rms | 0.015 deg rms |
| 13.5 GHz- 20 GHz (IFBW=10 kHz)      | 0.06 deg rms | 0.02 deg rms  |
| 20 GHz- 26.5 GHz (IFBW=10 kHz)      | 0.09 deg rms | 0.05 deg rms  |
| <b>Reflection trace noise phase</b> |              |               |
| 100 kHz- 10 MHz (IFBW=1 kHz)        | 0.03 deg rms | 0.015 deg rms |
| 10 MHz- 13.5 GHz (IFBW=10 kHz)      | 0.05 deg rms | 0.015 deg rms |
| 13.5 GHz- 20 GHz (IFBW=10 kHz)      | 0.07 deg rms | 0.02 deg rms  |
| 20 GHz- 26.5 GHz (IFBW=10 kHz)      | 0.09 deg rms | 0.05 deg rms  |

### 6.5.3 Stability

SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Description      | Specification | Typical       |
|------------------|---------------|---------------|
| <b>Magnitude</b> |               |               |
| 9 kHz- 3 GHz     |               | ± 0.005 dB/°C |
| 3 GHz- 8.5 GHz   |               | ± 0.014 dB/°C |
| <b>Phase</b>     |               |               |
| 9 kHz- 3 GHz     |               | ± 0.1 deg/°C  |
| 3 GHz- 8.5 GHz   |               | ± 0.3 deg/°C  |

SNA5022A/SNA5032A

| Description        | Specification | Typical      |
|--------------------|---------------|--------------|
| <b>Magnitude</b>   |               |              |
| 100 kHz- 13.5 GHz  |               | ± 0.01 dB/°C |
| 13.5 GHz- 26.5 GHz |               | ± 0.05 dB/°C |
| <b>Phase</b>       |               |              |
| 100 kHz- 13.5 GHz  |               | ± 0.1 deg/°C |
| 13.5 GHz- 26.5 GHz |               | ± 0.9 deg/°C |

#### 6.5.4 Dynamic accuracy

SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Description                            | Specification   |
|----------------------------------------|-----------------|
| <b>Relative to -10 dBm input power</b> |                 |
| <b>Magnitude</b>                       |                 |
| 10 dBm                                 | $\pm 1.9$ dB    |
| 0 dBm                                  | $\pm 0.08$ dB   |
| -20 dBm                                | $\pm 0.12$ dB   |
| -30 dBm                                | $\pm 0.19$ dB   |
| -40 dBm                                | $\pm 0.25$ dB   |
| -50 dBm                                | $\pm 0.36$ dB   |
| -60 dBm                                | $\pm 0.49$ dB   |
| -70 dBm                                | $\pm 0.65$ dB   |
| -80 dBm                                | $\pm 0.95$ dB   |
| -90 dBm                                | $\pm 1.65$ dB   |
| -100 dBm                               | $\pm 2.0$ dB    |
| <b>Phase</b>                           |                 |
| 10 dBm                                 | $\pm 15.6$ deg  |
| 0 dBm                                  | $\pm 0.46$ deg  |
| -20 dBm                                | $\pm 0.62$ deg  |
| -30 dBm                                | $\pm 1.19$ deg  |
| -40 dBm                                | $\pm 1.25$ deg  |
| -50 dBm                                | $\pm 2.36$ deg  |
| -60 dBm                                | $\pm 2.49$ deg  |
| -70 dBm                                | $\pm 4.65$ deg  |
| -80 dBm                                | $\pm 6.95$ deg  |
| -90 dBm                                | $\pm 8.35$ deg  |
| -100 dBm                               | $\pm 10.38$ deg |

SNA5022A/SNA5032A

| Description                            | Specification |
|----------------------------------------|---------------|
| <b>Relative to -10 dBm input power</b> |               |
| <b>Magnitude</b>                       |               |
| 10 dBm                                 | $\pm 2.29$ dB |

|              |                 |
|--------------|-----------------|
| 0 dBm        | $\pm 0.09$ dB   |
| -20 dBm      | $\pm 0.13$ dB   |
| -30 dBm      | $\pm 0.19$ dB   |
| -40 dBm      | $\pm 0.27$ dB   |
| -50 dBm      | $\pm 0.39$ dB   |
| -60 dBm      | $\pm 0.59$ dB   |
| -70 dBm      | $\pm 0.85$ dB   |
| -80 dBm      | $\pm 1.95$ dB   |
| -90 dBm      | $\pm 2.35$ dB   |
| -100 dBm     | $\pm 2.5$ dB    |
| <b>Phase</b> |                 |
| 10 dBm       | $\pm 14.5$ deg  |
| 0 dBm        | $\pm 1.45$ deg  |
| -20 dBm      | $\pm 1.85$ deg  |
| -30 dBm      | $\pm 3.99$ deg  |
| -40 dBm      | $\pm 5.27$ deg  |
| -50 dBm      | $\pm 6.39$ deg  |
| -60 dBm      | $\pm 8.59$ deg  |
| -70 dBm      | $\pm 10.85$ deg |
| -80 dBm      | $\pm 11.95$ deg |
| -90 dBm      | $\pm 12.35$ deg |
| -100 dBm     | $\pm 16.5$ deg  |

## 6.6 Pulsed-RF

### 6.6.1 Pulse Modulation On/Off Ratio (dB)

SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Description      | Typical |
|------------------|---------|
| 9 kHz- 4.5 GHz   | 80      |
| 4.5 GHz- 8.5 GHz | 70      |

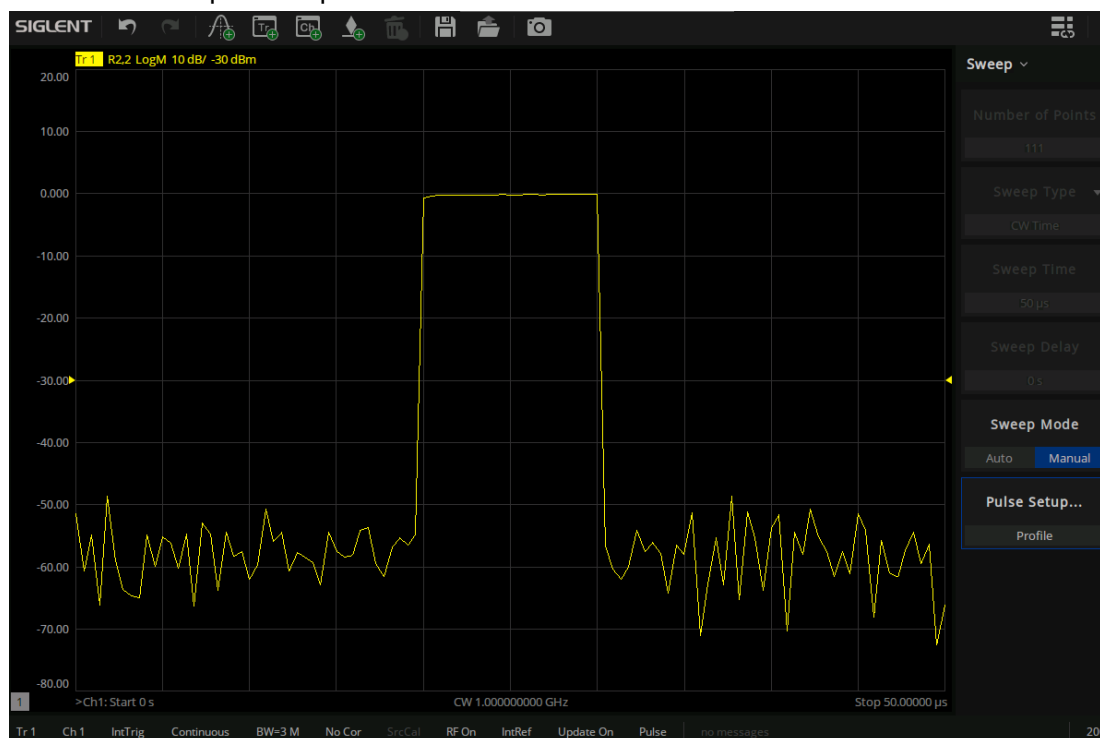
SNA5022A/SNA5032A

| Description       | Typical |
|-------------------|---------|
| 9 kHz- 4.5 GHz    | 80      |
| 4.5 GHz- 26.5 GHz | 70      |

### 6.6.2 Pulse Modulation

| Description          | Typical |
|----------------------|---------|
| Minimum pulse width  | 10 usec |
| Minimum pulse period | 30 usec |
| Maximum pulse period | 26 sec  |

Pulse Modulation Shape Example



## 7 Sweep time

SNA5002A/SNA5012A/SNA5004A/SNA5014A

| Start frequency: 100 kHz, Stop frequency: 8.5 GHz; IFBW: 500 kHz. |        |         |         |          |
|-------------------------------------------------------------------|--------|---------|---------|----------|
| Points                                                            | 201    | 401     | 1601    | 6401     |
| Uncorrected                                                       | 15 ms  | 17 ms   | 35 ms   | 141 ms   |
| 2-port cal                                                        | 30 ms  | 34 ms   | 70 ms   | 282 ms   |
| 4-port cal(8.5GHz)                                                | 60 ms  | 68 ms   | 140 ms  | 564 ms   |
| Start frequency: 100 kHz, Stop frequency: 8.5 GHz; IFBW: 100 kHz. |        |         |         |          |
| Points                                                            | 201    | 401     | 1601    | 6401     |
| Uncorrected                                                       | 17 ms  | 20 ms   | 46 ms   | 185 ms   |
| 2-port cal                                                        | 34 ms  | 40 ms   | 92 ms   | 370 ms   |
| 4-port cal(8.5GHz)                                                | 68 ms  | 80 ms   | 184 ms  | 740 ms   |
| Start frequency: 100 kHz, Stop frequency: 8.5 GHz; IFBW: 10 kHz.  |        |         |         |          |
| Points                                                            | 201    | 401     | 1601    | 6401     |
| Uncorrected                                                       | 33 ms  | 52 ms   | 175 ms  | 698 ms   |
| 2-port cal                                                        | 66 ms  | 104 ms  | 350 ms  | 1396 ms  |
| 4-port cal(8.5GHz)                                                | 132 ms | 208 ms  | 700 ms  | 2792 ms  |
| Start frequency: 100 kHz, Stop frequency: 8.5 GHz; IFBW: 1 kHz.   |        |         |         |          |
| Points                                                            | 201    | 401     | 1601    | 6401     |
| Uncorrected                                                       | 193 ms | 372 ms  | 1452 ms | 5806 ms  |
| 2-port cal                                                        | 386 ms | 744 ms  | 2904 ms | 11612 ms |
| 4-port cal(8.5GHz)                                                | 772 ms | 1488 ms | 5808 ms | 23224 ms |

# SNA5022A/SNA5032A

| Start frequency: 100 kHz, Stop frequency: 26.5GHz; IFBW: 500 kHz. |        |        |         |          |
|-------------------------------------------------------------------|--------|--------|---------|----------|
| Points                                                            | 201    | 401    | 1601    | 6401     |
| Uncorrected                                                       | 30 ms  | 54 ms  | 70 ms   | 229 ms   |
| 2-port cal                                                        | 60 ms  | 108 ms | 140 ms  | 458 ms   |
| Start frequency: 100 kHz, Stop frequency: 26.5GHz; IFBW: 100 kHz. |        |        |         |          |
| Points                                                            | 201    | 401    | 1601    | 6401     |
| Uncorrected                                                       | 31 ms  | 57 ms  | 82 ms   | 275 ms   |
| 2-port cal                                                        | 62 ms  | 114 ms | 164 ms  | 550 ms   |
| Start frequency: 100 kHz, Stop frequency: 26.5GHz; IFBW: 10 kHz.  |        |        |         |          |
| Points                                                            | 201    | 401    | 1601    | 6401     |
| Uncorrected                                                       | 47 ms  | 89 ms  | 209 ms  | 784 ms   |
| 2-port cal                                                        | 94 ms  | 178 ms | 418 ms  | 1568 ms  |
| Start frequency: 100 kHz, Stop frequency: 26.5GHz; IFBW: 1 kHz.   |        |        |         |          |
| Points                                                            | 201    | 401    | 1601    | 6401     |
| Uncorrected                                                       | 208 ms | 409 ms | 1487 ms | 5895 ms  |
| 2-port cal                                                        | 416 ms | 818 ms | 2974 ms | 11790 ms |

## 8 Enhanced Time Domain Analysis with TDR (SNA5000-TDR)

| Description                                                                 | SNA5002/4A    | SNA5012/4A | SNA5022A     | SNA5032A  |
|-----------------------------------------------------------------------------|---------------|------------|--------------|-----------|
| Bandwidth                                                                   | 4.5 GHz       | 8.5 GHz    | 13.5 GHz     | 26.5 GHz  |
| Input Impedance                                                             | 50 Ohm        |            |              |           |
| DC damage Level<br>at test port                                             | 35 V          |            |              |           |
| Maximum test port input<br>voltage (Hot TDR Mode)                           | 1.5Vpp        |            |              |           |
| TDR stimulus                                                                | Step, Impulse |            |              |           |
| TDR step amplitude                                                          | 1 mV to 5 V   |            |              |           |
| TDR step rise time<br>(min) (10% to 90%)                                    | 99.1 ps       | 52.5 ps    | 33.1 ps      | 16.9 ps   |
| TDR step response<br>resolution in free space<br>(min) ( $\epsilon_r = 1$ ) | 14.9 mm       | 7.9 mm     | 5 mm         | 2.5 mm    |
| TDR impulse width (min)                                                     | 134.1 ps      | 71.0 ps    | 44.7 ps      | 22.8 ps   |
| DUT length (max)                                                            | 13.8 $\mu$ s  |            | 1.25 $\mu$ s |           |
| Eye diagram data rate (max)                                                 | 3.6 Gb/s      | 6.8 Gb/s   | 10.8 Gb/s    | 21.2 Gb/s |

## 9 General information

| Description                                                                   | Characteristics                                                                                                                                        |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operating environment</b>                                                  |                                                                                                                                                        |
| Temperature                                                                   | 0 to 40 °C                                                                                                                                             |
| Humidity                                                                      | Type tested at 20 to 80%, wet bulb temperature < 29 °C (non-condensing)                                                                                |
| Altitude                                                                      | 0 to 3000 m                                                                                                                                            |
| <b>Non-operating storage environment</b>                                      |                                                                                                                                                        |
| Temperature                                                                   | -20 °C to 60 °C                                                                                                                                        |
| Humidity                                                                      | Type tested at 20 to 90%, wet bulb temperature < 40 °C (non-condensing)                                                                                |
| Altitude                                                                      | 0 to 15000 m                                                                                                                                           |
| Size                                                                          | W×H×D=378×284×126 mm                                                                                                                                   |
| Weight                                                                        | 2-port: 5.5 kg;<br>4-port or SNA5032A/SNA5022A: 7.5 kg                                                                                                 |
| <b>EMC</b>                                                                    |                                                                                                                                                        |
| Conducted disturbance: CISPR 11/EN 55011                                      | CLASS A group 1, 150 kHz - 30 MHz                                                                                                                      |
| Radiated disturbance: CISPR 11/EN 55011                                       | CLASS A group 1, 30 MHz -1 GHz                                                                                                                         |
| Electrostatic discharge(ESD):<br>IEC61000-4-2/EN61000-4-2                     | 4.0 kV (contact), 8.0 kV (air)                                                                                                                         |
| Radio-frequency electromagnetic field Immunity:<br>IEC 61000-4-3/EN 61000-4-3 | 10 V/m (80 MHz to 1 GHz);<br>3 V/m (1.4 GHz to 2 GHz);<br>1 V/m (2.0 GHz to 2.7 GHz)                                                                   |
| Electrical fast transients (EFT):<br>IEC 61000-4-4/EN 61000-4-4               | 2 kV (AC power ports)                                                                                                                                  |
| Surges: IEC 61000-4-5/EN 61000-4-5                                            | 1 kV (Line to line) ; 2 kV (Line to ground)                                                                                                            |
| Radio-frequency continuous conducted Immunity: IEC 61000-4-6/EN 61000-4-6     | 3 V, 0.15-80 MHz                                                                                                                                       |
| Voltage dips and interruptions:<br>IEC 61000-4-11/EN 61000-4-11               | Voltage dips:<br>0% UT during 1 cycle;<br>40% UT during 10/12 cycles;<br>70% UT during 25/30 cycles;<br>Voltage interruptions: 0% UT during 250 cycles |
| <b>Safety</b>                                                                 |                                                                                                                                                        |
| UL 61010-1:2012/R: 2018-11; CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11.        |                                                                                                                                                        |

UL 61010-2-030:2018; CAN/CSA-C22.2 No. 61010-2-030:2018.

## 10 Front panel information

| Description        | Characteristics                                                                                                        |
|--------------------|------------------------------------------------------------------------------------------------------------------------|
| RF connectors      | Type-N, female, 50 $\Omega$ (SNA5002A/SNA5012A/SNA5004A/SNA5014A)<br>3.5mm NMD (male), 50 $\Omega$ (SNA5032A/SNA5022A) |
| Damage level       | +27 dBm or $\pm 35$ VDC                                                                                                |
| Display Resolution | 12.1 inch TFT color LCD with touch screen ; WXGA (1280 x 800)                                                          |
| USB interface      | USB-A 2.0                                                                                                              |

## 11 Rear panel information

| Description                                   | Characteristics                   |
|-----------------------------------------------|-----------------------------------|
| <b>Ext trigger input connector</b>            |                                   |
| Type                                          | BNC, female                       |
| Input level                                   | 5V TTL                            |
| <b>Ext trigger output connector</b>           |                                   |
| Type                                          | BNC, female                       |
| Max output current                            | 20 mA                             |
| Output level                                  | 3.3V TTL                          |
| <b>Ext ref-signal input connector</b>         |                                   |
| Type                                          | BNC, female                       |
| Input frequency                               | 10 MHz $\pm 10$ ppm               |
| Input level                                   | -3 dBm to +10 dBm                 |
| Input impedance                               | 50 $\Omega$                       |
| <b>Int ref-signal output connector</b>        |                                   |
| Type                                          | BNC, female                       |
| Output frequency                              | 10 MHz $\pm 5$ ppm                |
| Signal type                                   | Sinewave                          |
| Output level                                  | 0 dBm $\pm 3$ dB into 50 $\Omega$ |
| Output impedance                              | 50 $\Omega$                       |
| <b>Bias tee input connector</b>               |                                   |
| Type                                          | BNC, female                       |
| Max voltage                                   | $\pm 35$ VDC                      |
| Max current (no degradation RF specification) | $\pm 300$ mA                      |
| Max current (damage level)                    | 500 mA                            |
| Video output                                  | HDMI                              |

|                               |                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------|
| <b>USB (USBTMC) interface</b> | USB-B 2.0                                                                           |
| <b>LAN</b>                    | 10/100 BaseT Ethernet                                                               |
| <b>Power</b>                  | 100~240 Vrms 50/60 Hz<br>100~120 Vrms 400 Hz                                        |
| <b>Power consumption</b>      | 2-port: 50 W (typical), 4-port: 70 W (typical)<br>SNA5032A/SNA5022A: 85 W (typical) |

## 12 Ordering Information

| Items                       | Description                                                                                                               | Order number |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Products</b>             | 2 ports, 4.5G Vector Network Analyzer                                                                                     | SNA5002A     |
|                             | 2 ports, 8.5G Vector Network Analyzer                                                                                     | SNA5012A     |
|                             | 4 ports, 4.5G Vector Network Analyzer                                                                                     | SNA5004A     |
|                             | 4 ports, 8.5G Vector Network Analyzer                                                                                     | SNA5014A     |
|                             | 2 ports, 13.5G Vector Network Analyzer                                                                                    | SNA5022A     |
|                             | 2 ports, 26.5G Vector Network Analyzer                                                                                    | SNA5032A     |
| <b>Standard Accessories</b> | 1 x Quick-start, 1 x Power-cable, 1 x USB-cable, 1 x calibration-certificate,<br>1 x Wireless mouse, 1 x Protective Cover |              |
| <b>Optional Accessories</b> | High-performance reference source                                                                                         | SNA5000-HPR  |
|                             | Time-Domain analysis                                                                                                      | SNA5000-TDA  |
|                             | Enhanced Time-Domain analysis                                                                                             | SNA5000-TDR  |
|                             | Spectrum analysis                                                                                                         | SNA5000-SA   |
|                             | Scalar mixer measurement                                                                                                  | SNA5000-SMM  |
|                             | Performance Tests                                                                                                         | SNA5000-PV   |
|                             | Pulse measurement                                                                                                         | SNA5000-PM   |
|                             | Material Measurement                                                                                                      | SNA5000-MT   |
|                             | Gain Compression measurement                                                                                              | SNA5000-GC   |
|                             | Vector mixer measurement                                                                                                  | SNA5000-VMM  |
|                             | SEM5000A series electronic calibrators                                                                                    | SEM5000A     |
|                             | N-type, Male, 50Ω Calibration Kit, 0-4.5GHz                                                                               | F503ME       |
|                             | N-type, Female, 50Ω Calibration Kit, 0-4.5GHz                                                                             | F503FE       |
|                             | N-type, Male, 50Ω Calibration Kit, 0-9GHz                                                                                 | F504MS       |
|                             | N-type, Female, 50Ω Calibration Kit, 0-9GHz                                                                               | F504FS       |
|                             | N-type, Male, 50Ω Calibration Kit, 0-9GHz                                                                                 | Y504MS       |
|                             | N-type, Female, 50Ω Calibration Kit, 0-9GHz                                                                               | Y504FS       |

|                                                         |                   |
|---------------------------------------------------------|-------------------|
| N-type, Male and Female, 50Ω Calibration Kit,0-9GHz     | F504TS            |
| N-type, Male and Female, 50Ω Calibration Kit,0-18GHz    | F505TS            |
| 3.5 mm, Male, 50Ω Calibration Kit, 0-4.5GHz             | F603ME            |
| 3.5 mm, Female, 50Ω Calibration Kit, 0-4.5GHz           | F603FE            |
| 3.5 mm, Male, 50Ω Calibration Kit, 0-9GH                | F604MS            |
| 3.5 mm, Female, 50Ω Calibration Kit, 0-9GHz             | F604FS            |
| 3.5 mm, Male and Female, 50Ω Calibration Kit, 0-9GHz    | F604TS            |
| 3.5 mm, Male, 50Ω Calibration Kit, 0-26.5GHz            | Y606MS            |
| 3.5 mm, Female, 50Ω Calibration Kit, 0-26.5GHz          | Y606FS            |
| 3.5 mm, Female, 50Ω Calibration Kit, 0-26.5GHz          | F606FS            |
| 3.5 mm, Male and Female, 50Ω Calibration Kit, 0-26.5GHz | F606TS            |
| 50Ω Waveguide calibration kit, 18-26.5GHz               | KWR42A            |
| N(M)-SMA(F) RF Cable DC~6 GHz,1000 mm                   | S06-NMSF-1M       |
| N(M)-SMA(F) RF Cable DC~18 GHz,1000 mm                  | S18-NMSF-1M       |
| 2.9 mm(M)- 2.9 mm (F) RF Cable DC~40 GHz,1000 mm        | S40-29M29F-1M     |
| N(M)-SMA(M) RF Cable DC~18 GHz,1000 mm                  | N-SMA-18L         |
| N(M)-N(M) RF Cable DC~18 GHz,1000 mm                    | N-N-18L           |
| SMA(M)-SMA(M) RF Cable DC~18 GHz,1000 mm                | SMA-SMA-18L       |
| SMA(M)-SMA(M) RF Cable DC~26.5 GHz,1000 mm              | SMA-SMA-26L       |
| SMA(F)-SMA(M) RF Cable DC~26.5 GHz,1000 mm              | SMAF-SMA-26L      |
| NMD 3.5 female-NMD 3.5 Male DC-26.5 GHz,635 mm          | V26-N35MN35F-25IN |
| NMD 3.5 female-APC 3.5 female DC-26.5 GHz,635 mm        | V26-N35FA35F-25IN |
| USB-GPIB Adapter                                        | USB-GPIB          |
| RF demonstration board                                  | SNA-TB01          |
| Adjustable Differential TDR probe DC-18 GHz             | ADP-18            |
| Adjustable Differential TDR probe DC-26.5 GHz           | ADP-26            |
| Adjustable Single-end TDR probe DC-18 GHz               | ASP-18            |
| Adjustable Single-end TDR probe DC-26.5 GHz             | ASP-26            |



## 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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