RIGOL

DNA800 Series

Vector Network Analyzer

Data Sheet
DSR04100-1110
2026.06

Product Features

- Frequency Range: 5 kHz to 14 GHz
- Number of Ports: 2
- Frequency resolution 1 Hz
- Max. output power 10 dBm
- High dynamic range: 125 dB (typ.)
- Trace noise: 0.005 dB_{rms}
- IF BW: 1 Hz to 3 MHz
- Compatible with the mechanical calibration kit and the Ecal electronic calibration kit, supporting various calibration types (SOLT, Response Short, Response Open, OSL, Enhanced Response 1 to 2, Response Through)
- Integrates S-parameters, impedance, VSWR, TDA, fixture embedding/de-embedding, antenna test, and etc.
- Portable handle and lightweight design, compact size (265.35 mm × 161.75 mm × 77.38 mm) and weight of 1.9 kg
- 7-inch 1024×600 HD touch screen
- Supports LAN, USB Device, USB Host, HDMI interfaces
- Supports standard SCPI instruction sets
- Supports Web Control for remote operation
- Supports both physical key operation and touch screen operation; allowing you to use externally connected keyboard and mouse to input values

The DNA800 series vector network analyzer provides various calibration methods such as frequency response, single-port, response isolation, enhanced response, full dual-port, and electronic calibration. It supports display formats including log magnitude, linear magnitude, SWR, phase, group delay, Smith chart, and polar chart. Through USB, LAN, and HDMI interfaces, it accurately measures amplitude/frequency, phase/frequency, and group delay characteristics of microwave networks.

While maintaining high-end characteristics in specifications, appearance, display, and software interface, the DNA800 series features compact size, light weight, and low noise for a better user experience. It is widely used in electronics, communications, and microwave fields for R&D and production.

Specifications

pecifications are valid under the following conditions: the instrument is within the calibration period; stored for at least two hours at 0℃ to 40℃ temperature; 60-minute warm-up. Unless otherwise noted, the specifications in the manual include the measurement uncertainty.

- **Typical (typ.):** typical performance, which 80 percent of the measurement results will meet at room temperature (approximately 25℃). The data are not warranted and do not include the measurement uncertainty.
- **Nominal (nom.):** the expected mean or average performance or a designed attribute (such as the 50Ω connector). The data are not warranted and are measured at room temperature (approximately 25℃).
- **Measured (meas.):** an attribute measured during the design phase which can be compared to the expected performance, e.g. the amplitude drift varies with time. The data are not warranted and are measured at room temperature (approximately 25℃).
- **Specification:** guaranteed performance. The Specification includes the limit conditions, which are applicable to all the specifications and characteristics at room temperature (approximately 25℃), unless otherwise noted.

NOTE:
All charts in this manual are the measurement results of multiple instruments at room temperature unless otherwise noted.

Product Model

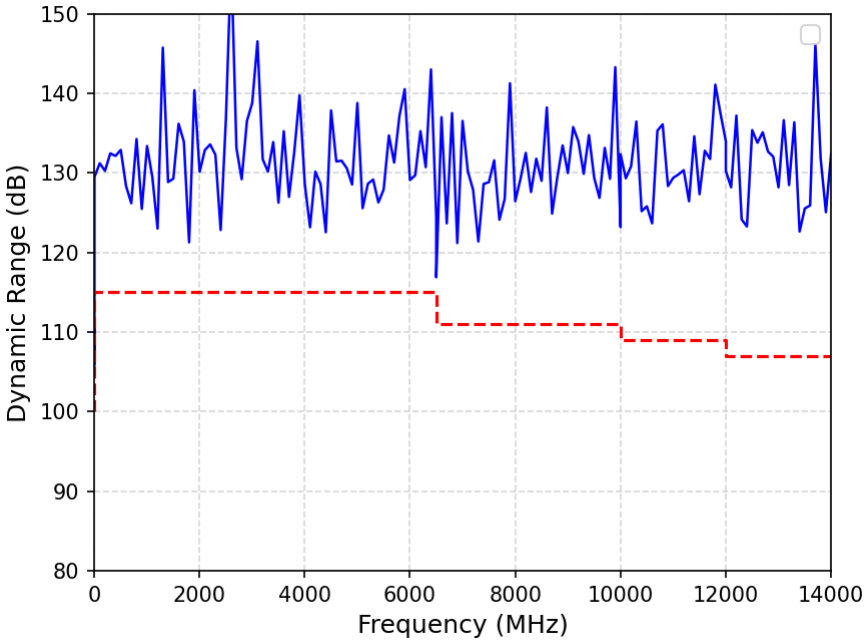
Model	Frequency	Number of Ports
DNA804	5 kHz to 4.5 GHz	2
DNA808	5 kHz to 8.5 GHz	2
DNA814	5 kHz to 14 GHz	2

Dynamic Range

Measurement condition: 10 Hz IF BW; ambient temperature: 23°C (±3°C), deviation from the calibration temperature less than 1°C Sys

System Dynamic Range [1]		
Frequency Range	Specification	Typical
100 kHz to 10 MHz	100 dB	110 dB
10 MHz to 6.5 GHz	115 dB	125 dB
6.5 GHz to 10 GHz	111 dB	121 dB
10 GHz to 12 GHz	109 dB	119 dB
12 GHz to 14 GHz	107 dB	117 dB

[1] System Dynamic Range = Actual Maximum Power - Receiver Noise Floor at 10 Hz IF BW



System Performance after Error Correction (Calibration)

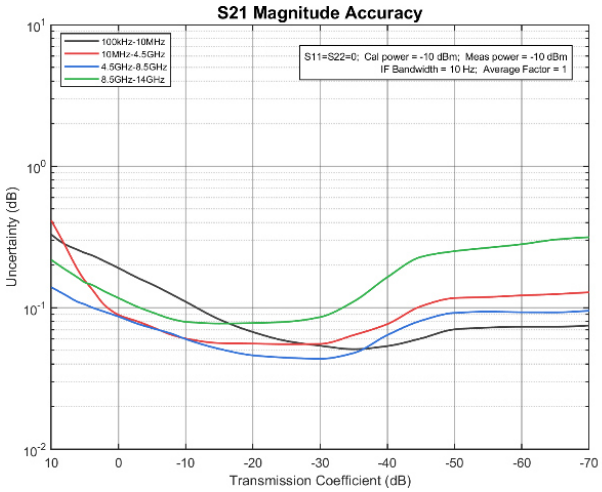
Calibration Error with Mechanical Calibration Kit ECAL100/200[1]					
Frequency Range	Directivity	Load Match	Source Match	Transmission Tracking	Reflection Tracking
5 kHz to 100 kHz	37 dB	32 dB	27 dB	±0.30 dB	±0.30 dB
100 kHz to 10 MHz	47 dB	48 dB	42 dB	±0.06 dB	±0.08 dB
10 MHz to 4.5 GHz	47 dB	42 dB	38 dB	±0.10 dB	±0.08 dB
4.5 GHz to 8.5 GHz	42 dB	35 dB	30 dB	±0.15 dB	±0.10 dB
8.5 GHz to 14 GHz	40 dB	32 dB	30 dB	±0.18 dB	±0.10 dB

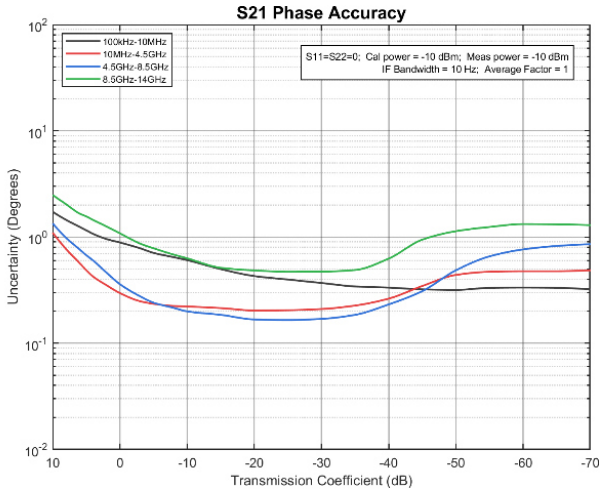
Calibration Error with Mechanical Calibration Kit ECAL300/400 [1]					
Frequency Range	Directivity	Load Match	Source Match	Transmission Tracking	Reflection Tracking
5 kHz to 100 kHz	35 dB	30 dB	25 dB	±0.30 dB	±0.30 dB
100 kHz to 10 MHz	45 dB	45 dB	42 dB	±0.06 dB	±0.10 dB
10 MHz to 4.5 GHz	45 dB	42 dB	35 dB	±0.15 dB	±0.10 dB
4.5 GHz to 8.5 GHz	42 dB	35 dB	30 dB	±0.18 dB	±0.15 dB
8.5 GHz to 14 GHz	40 dB	30 dB	30 dB	±0.22 dB	±0.15 dB

Calibration Error with Mechanical Calibration Kit 85054D [1]					
Frequency Range	Directivity	Load Match	Source Match	Transmission Tracking	Reflection Tracking
5 kHz to 100 kHz	35 dB	30 dB	25 dB	±0.30 dB	±0.30 dB
100 kHz to 10 MHz	45 dB	45 dB	45 dB	±0.02 dB	±0.04 dB
10 MHz to 4.5 GHz	45 dB	42 dB	35 dB	±0.02 dB	±0.04 dB
4.5 GHz to 8.5 GHz	42 dB	37 dB	34 dB	±0.02 dB	±0.04 dB
8.5 GHz to 14 GHz	40 dB	35 dB	34 dB	±0.02 dB	±0.08 dB

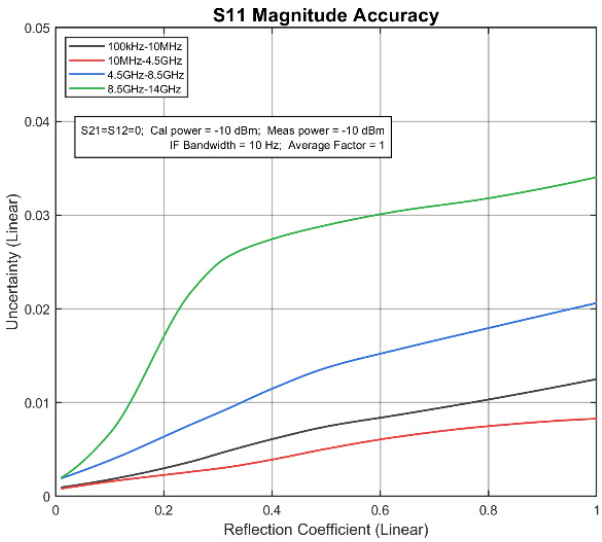
[1] Measurement condition: 10 Hz IF BW; data not averaged; ambient temperature: 23°C (±3°C), deviation from the calibration temperature less than 1°C.

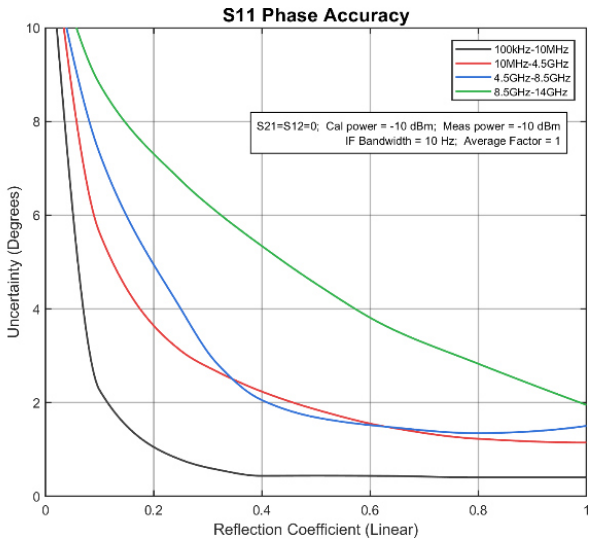
Transmission Uncertainty (Amplitude and Phase)





Reflection Uncertainty (Amplitude and Phase)





System Performance Without Error Correction/Calibration

Uncorrected Error (Specification)					
Frequency Range	Directivity	Load Match	Source Match	Transmission Tracking	Reflection Tracking
5 kHz to 100 kHz	20 dB	12 dB	20 dB	±1.5 dB	±1.5 dB
100 kHz to 10 MHz	25 dB	15 dB	25 dB	±1.5 dB	±1.5 dB
10 MHz to 4.5 GHz	25 dB	15 dB	25 dB	±1.5 dB	±1.5 dB
4.5 GHz to 8.5 GHz	25 dB	15 dB	25 dB	±1.5 dB	±1.5 dB
8.5 GHz to 14 GHz	25 dB	15 dB	25 dB	±1.5 dB	±1.5 dB

Test Port Output

Frequency Characteristics

Frequency Characteristics	
Aging Rate	<1 ppm/year
Temperature Stability	<0.5 ppm 0℃ to 40℃, with the reference 25℃
Initial Calibration Accuracy	1 ppm
Frequency Resolution	1 Hz
Sweep Points	1 to 100,001
IF BW Range	1 Hz to 3 MHz

Max. Output Power

Max. Output Power	
5 kHz to 100 kHz	0 dBm
100 kHz to 10 MHz	5 dBm
10 MHz to 6.5 GHz	10 dBm
6.5 GHz to 10 GHz	6 dBm
10 GHz to 12 GHz	4 dBm
12 GHz to 14 GHz	2 dBm

Power Sweep Range

Power Sweep Range	
5 kHz to 100 kHz	-40 dBm to 0 dBm
100 kHz to 10 MHz	-40 dBm to 5 dBm
10 MHz to 6.5 GHz	-40 dBm to 10 dBm
6.5 GHz to 10 GHz	-40 dBm to 6 dBm
10 GHz to 12 GHz	-40 dBm to 4 dBm
12 GHz to 14 GHz	-40 dBm to 2 dBm

Power Level Accuracy

Power Level Accuracy		
Frequency Range	Specification	Typical
100 kHz to 100 MHz	±1.0 dB	±0.6 dB
100 MHz to 8.5 GHz	±1.0 dB	±0.6 dB
8.5 GHz to 14 GHz	±1.0 dB	±0.6 dB

Power linearity

Power linearity [1]	
100 kHz to 100 MHz	±0.6 dB
100 MHz to 8.5 GHz	±0.6 dB
8.5 GHz to 14 GHz	±0.6 dB

[1] Power linearity is specified relative to -5 dBm in swept mode: -25 dBm ≤ power ≤ 0 dBm.

Power Characteristics

Power Characteristics	
Power Resolution	0.01 dB
Maximum Available Power	10 dBm
Minimum Available Power	-40 dBm

Harmonics & spurious

Harmonics & Spurious [1]	
Second Harmonics	
100 kHz to 4.5 GHz	-20 dBc
4.5 GHz to 8.5 GHz	-20 dBc
8.5 GHz to 14 GHz	-35 dBc
3rd harmonic & sub-harmonic	
100 kHz to 4.5 GHz	-30 dBc
4.5 GHz to 8.5 GHz	-40 dBc
8.5 GHz to 14 GHz	-35 dBc
Spurious (non-harmonics)	
100 kHz to 4.5 GHz	-40 dBc
4.5 GHz to 8.5 GHz	-40 dBc
8.5 GHz to 14 GHz	-40 dBc

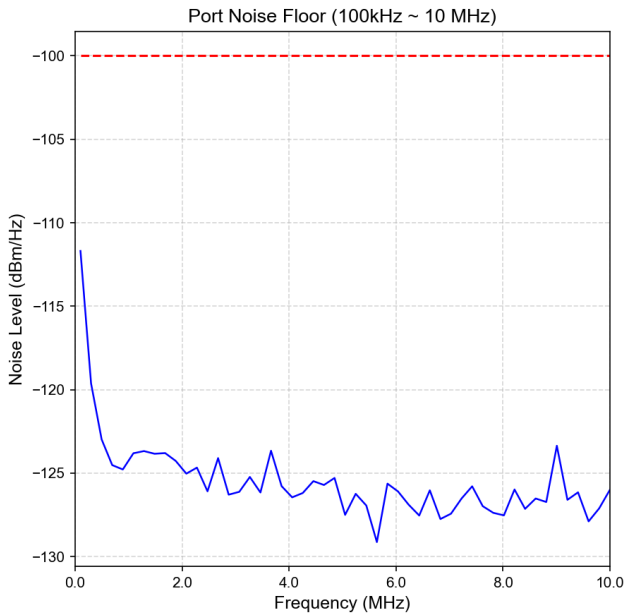
[1] frequency listed is the harmonic frequency, measured at 0 dBm.

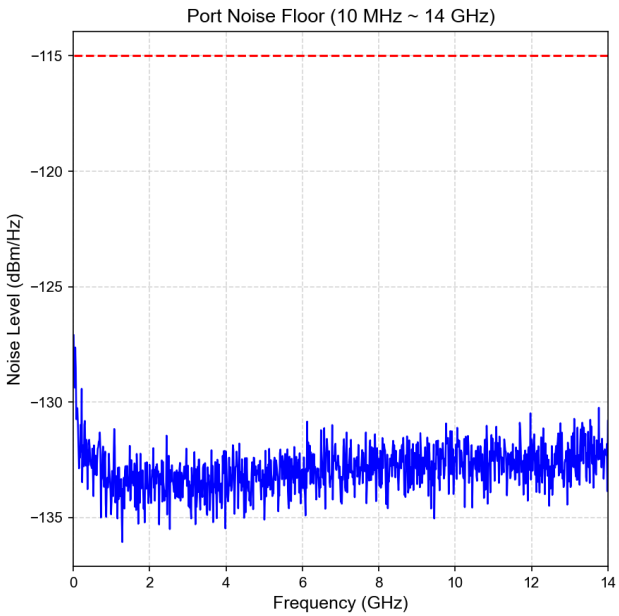
Test Port Input

Noise floor

Test Port Noise Floor [1]		
Frequency Range	Specification	Typical
100 kHz to 10 MHz	-100 dBm	-110 dBm
10 MHz to 14 GHz	-115 dBm	-120 dBm

[1] Noise Power is defined as the RMS value of the test transmission coefficient at 10 kHz IF BW, and normalized to 1 Hz.

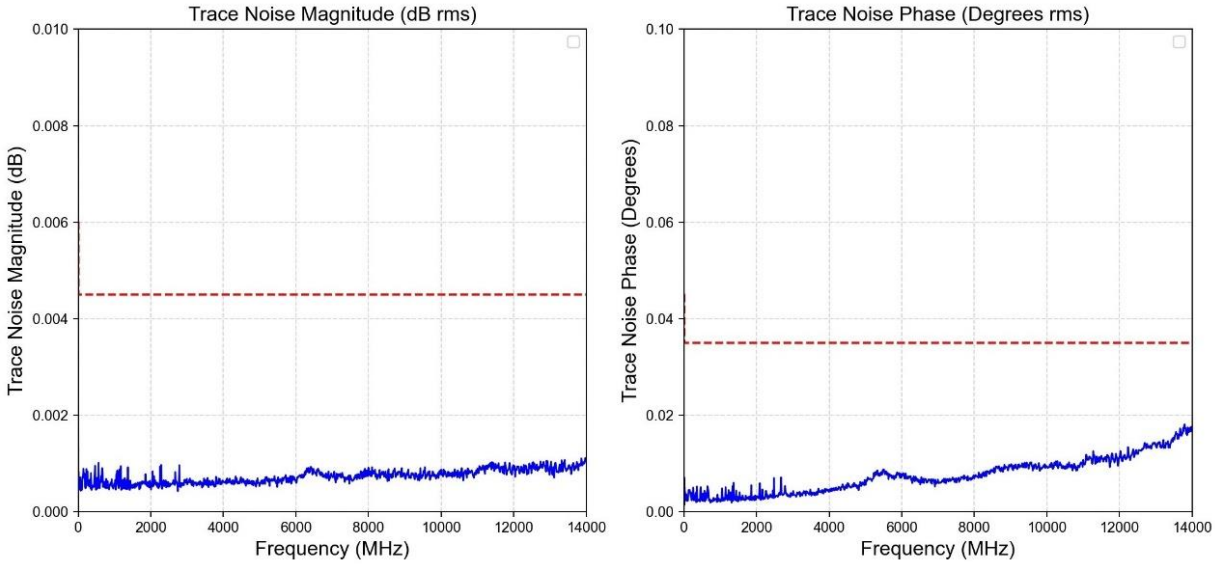




Trace noise

Trace Noise [1]				
Frequency Range	Magnitude		Phase	
	Specification	Typical	Specification	Typical
100 kHz to 10 MHz	0.006 dB_{rms}	0.003 dB_{rms}	0.045 $degree_{rms}$	0.025 $degree_{rms}$
10 MHz to 14 GHz	0.005 dB_{rms}	0.0015 dB_{rms}	0.035 $degree_{rms}$	0.02 $degree_{rms}$

[1] Measured at default power-on level. Trace noise for transmission/reflection: IF bandwidth 1 kHz for signals < 10 MHz; 10 kHz for signals ≥ 10 MHz.



Temperature stability

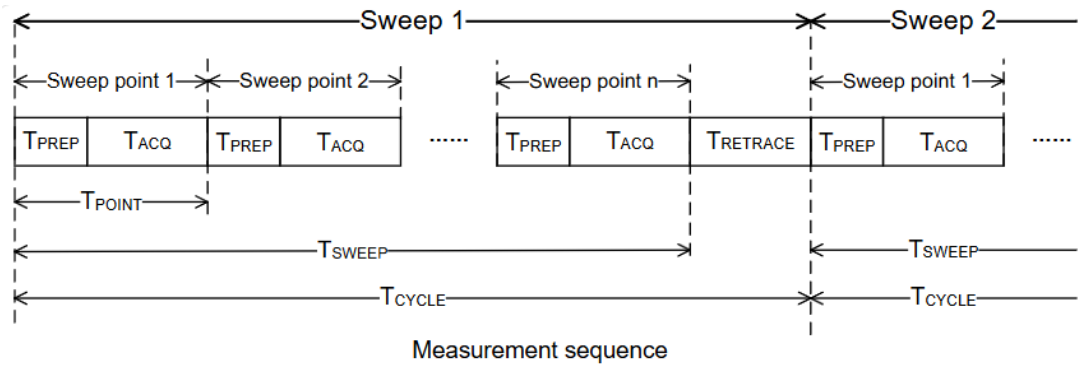
Temperature Stability (Typical)		
Frequency Range	Magnitude	Phase
5 kHz to 100 kHz	0.03 dB/°C	0.2 degree/°C
100 kHz to 4.5 GHz	0.02 dB/°C	0.1 degree/°C
4.5 GHz to 14 GHz	0.03 dB/°C	0.35 degree/°C

Damage Input Level

Damage Input Level	
Damage Input Level	+25 dBm or ±35 VDC

Meas Time

Sweep time (1 GHz center frequency, 200 MHz span, 201 sweep points, measurement parameter S11)		
	IFBW	Time
Time per sweep (TSWEEP)	1 MHz	11.20 ms
	500 kHz	11.25 ms
Sweep cycle time (TCYCLE)	1 MHz	11.20 ms
	500 kHz	11.25 ms
Preparation time per point (TPREP)	/	50 µs
Acquisition time per point (TACQ)	1 MHz	3.5 µs
	500 kHz	5.3 µs
Total time per point (TPOINT)	1 MHz	53.5 µs
	500 kHz	55.3 µs



Measurement sequence

- **T_{SWEEP}**: Time required for one sweep
- **T_{CYCLE}**: Sweep cycle time (T_{CYCLE} = T_{SWEEP} + $T_{RETRACE}$)
- **T_{PREP}**: Preparation time required to set up the internal hardware components
- **T_{ACQ}**: Data acquisition time (T_{ACQ} = Filter settling time + Detector time)
- **T_{POINT}**: Total time for one sweep point
- **$T_{RETRACE}$**: Time between two sweeps

Sweep time

Frequency Range		IFBW	201 points	401 points	1601 points
10 MHz to 4.5 GHz	Not Calibrated	1 MHz	12.52 ms	22.93 ms	85.40 ms
		500 kHz	12.52 ms	22.94 ms	85.40 ms
		100 kHz	12.56 ms	22.98 ms	85.46 ms
		1 kHz	202 ms	402 ms	1599 ms
10 MHz to 4.5 GHz	Dual-port Calibration	1 MHz	25.11 ms	45.81 ms	170.77ms
		500 kHz	25.00 ms	45.82 ms	170.78 ms
		100 kHz	25.10 ms	45.93 ms	170.90 ms
		1 kHz	407 ms	806 ms	3198 ms
10 MHz to 8.5 GHz	Not Calibrated	1 MHz	13.06 ms	23.48 ms	86.00 ms
		500 kHz	13.07 ms	23.49 ms	86.02 ms
		100 kHz	13.13 ms	23.54 ms	86.08 ms
		1 kHz	203 ms	402 ms	1599 ms
10 MHz to 8.5 GHz	Dual-port Calibration	1 MHz	25.44 ms	46.28 ms	171.28 ms
		500 kHz	25.47 ms	46.29 ms	171.3 ms
		100 kHz	25.59 ms	46.41 ms	171.4 ms
		1 kHz	405 ms	804.7 ms	3199 ms
10 MHz to 14 GHz	Not Calibrated	1 MHz	14.03 ms	24.44 ms	87.02 ms
		500 kHz	14.04 ms	24.46 ms	87.03 ms
		100 kHz	14.12 ms	24.53 ms	87.13 ms
		1 kHz	204 ms	403 ms	1600 ms
10 MHz to 14 GHz	Dual-port Calibration	1 MHz	26.50 ms	47.32 ms	172.4 ms
		500 kHz	26.52 ms	47.33 ms	172.43 ms
		100 kHz	26.68 ms	47.5 ms	172.58 ms
		1 kHz	406.8 ms	805.8 ms	3212 ms

Input/Output

RF Test Port Input

RF Test Port Input (on the front panel)	
Frequency Range	5 kHz to 14 GHz
Number of Ports	2
Input Impedance	50 Ω (nom.)
Connector Type	N-type Female

10 MHz Reference Clock Connector

10 MHz reference output (rear panel)	
Frequency	10 MHz (fixed)
Output Level	+3 dBm to +10 dBm, +7 dBm (typ.)
Output Impedance	50 Ω (nom.)
Connector Type	BNC (F)

10 MHz reference input (rear panel)	
Frequency	10 MHz ±2 ppm
Input Level	0 dBm to +10 dBm
Input Impedance	50 Ω (nom.)
Connector Type	BNC (F)

Ext Trigger I/O

Trigger input/output (rear panel)	
Input Impedance	≥1 kΩ (nom.)
Input Level	3.3 V TTL Level
Output Impedance	50 Ω (nom.)
Output Level	3.3 V TTL Level
Connector Type	BNC (F)

Communication Interface

Communication Interface	
USB DEVICE	USB 2.0, 1 on the rear panel
USB HOST	USB 2.0, 1 on the front panel
HDMI	1 on the rear panel, HDMI 1.4, A plug
LAN	1 on the rear panel, 10/100 Base-T

General specifications

Display

Display	
LCD	7-inch capacitive multi-touch screen, gesture enabled operation
Display Resolution	1024*600

Power Supply

Power Supply	
Power interface	Type-C interface
Power Supply	DC 20 V, 5 A
Power Consumption	50 W

Processor System

Operating System		
Operating System		Linux
Mass Memory	Internal Storage	32 GB
	External Storage	USB storage device (not supplied)

Working Environment

Environment		
Temperature Range	Operating	0℃ to 40℃
	Storage	-20℃ to 60℃
Humidity Range	Operating	0℃ to 30℃: ≤95% RH 30℃ to 40℃: ≤75% RH
	Non-Operating	Below +40°C: 5% to 90%, without condensation +40°C to +60°C: 5% to 80%, without condensation
Altitude	Operating Height	Below 2000 m (6561.68 feet)

Regulations

Electromagnetic Compatibility and Safety		
Electromagnetic Compatibility (EMC)	Anti-interference conforms to specifications in EMC Directive 2014/30/EU;	
	EMC RF and emission limits conforms to CISPR11/EN 55011, Group 1, Class A	
	IEC61000-4-2:2008/EN61000-4-2	±4.0 kV (contact discharge), ±8.0 kV (air discharge)

Electromagnetic Compatibility and Safety		
	IEC61000-4-3:2002/EN61000-4-3	3 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 2 GHz); 1 V/m (2.0 GHz to 2.7 GHz)
	IEC61000-4-4:2004/EN61000-4-4	1 kV power line
	IEC61000-4-5:2001/EN61000-4-5	0.5 kV (phase-to-neutral voltage); 1 kV (phase-to-earth voltage); 1 kV (neutral-to-earth voltage)
	IEC61000-4-6:2003/EN61000-4-6	3 V, 0.15 MHz-80 MHz
	IEC61000-4-11:2004/EN 61000-4-11	Voltage dip: 0% UT during half cycle, 0% UT during 1 cycle, 70% UT during 25 cycles Short interruption: 0% UT during 250 cycles
Safety	EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 no. 61010-1	
Environment	Samples of this product have been type tested in accordance with RIGOL's reliability test regulations and verified to be robust against the environmental stresses of storage, transportation, and end-use; those stresses include, but are not limited to, temperature, humidity, shock, and vibration.The test methods are compliant with standards specified in GB/T65872 Class 2 and MIL-PRF-28800F Class 3.	

Mechanical Dimensions

Mechanical Dimensions		
Dimensions (W x H x D)	265.35 mm × 161.75 mm × 77.38 mm	
Weight	Mechanical Calibration Kit Excluded	Without packaging: < 1.9 kg With packaging: < 2.9 kg (6.4 lb)

Warranty and Calibration Interval

Warranty and Calibration	
Recommended Calibration Interval	18 months
Warranty	Three years for the mainframe, excluding accessories.

Ordering Information and Warranty

Ordering Information

	Description	Order No.
Model	5 kHz to 4.5 GHz, 2 ports	DNA804
	5 kHz to 8.5 GHz, 2 ports	DNA808
	5 kHz to 14 GHz, 2 ports	DNA814
Standard Accessory	Power adapter compliant with local standards	-
Measurement Application Option	TDA (Time-Domain Analysis)	DNA-TDA10
	DTF (Distance to Fault)	DNA-DTF10
Optional Accessories	Electronic Calibration Kit, 100 kHz to 4.5 GHz, 2-port, 50 Ω, N-type (F)	ECAL304-NF2
	Electronic Calibration Kit, 100 kHz to 9 GHz, 2-port, 50 Ω, N-type (F)	ECAL309-NF2
	Electronic Calibration Kit, 100 kHz to 14 GHz, 2-port, 50 Ω, N-type (F)	ECAL314-NF2
	Electronic Calibration Kit, 100 kHz to 4.5 GHz, 2-port, SMA-type (F)	ECAL304-SF2
	Electronic Calibration Kit, 100 kHz to 9 GHz, 2-port, SMA-type (F)	ECAL309-SF2
	Electronic Calibration Kit, 100 kHz to 14 GHz, 2-port, SMA-type (F)	ECAL314-SF2
	Electronic Calibration Kit, DC to 4.5 GHz, 2-port, 50 Ω, N-type (F)	ECAL404-NF2
	Electronic Calibration Kit, DC to 9 GHz, 2-port, 50 Ω, N-type (F)	ECAL409-NF2
	Electronic Calibration Kit, DC to 14 GHz, 2-port, 50 Ω, N-type (F)	ECAL414-NF2
	Electronic Calibration Kit, DC to 4.5 GHz, 2-port, SMA-type (F)	ECAL404-SF2
	Electronic Calibration Kit, DC to 9 GHz, 2-port, SMA-type (F)	ECAL409-SF2
	Electronic Calibration Kit, DC to 14 GHz, 2-port, SMA-type (F)	ECAL414-SF2
	Mechanical calibration kit	Refer to Mechanical CalibrationKits Datasheet
	RF Cable	Refer to RF-Cable Datasheet

NOTE:
For all the mainframes, accessories, and options, please contact the local office of RIGOL .

Warranty Period

Three-year warranty on the main unit; accessories excluded.

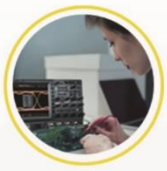
Boost Smart World and Technology Innovation

Industrial Intelligent Manufacturing

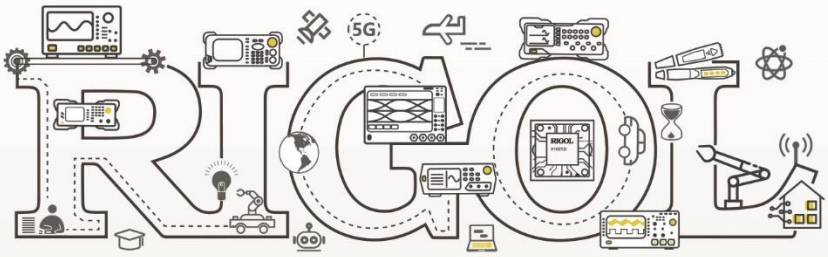




Semiconductors



Education& Research





Communication

System Integration





New Energy

- Cellular-5G/WIFI
- UWB/RFID/ ZIGBEE
- Digital Bus/Ethernet
- Optical Communication

- Digital/Analog/RF Chip
- Memory and MCU Chip
- Third-Generation Semiconductor
- Solar Photovoltaic Cells

- New Energy Automobile
- PV/Inverter
- Power Test
- Automotive Electronics

Provide Testing and Measuring Products and Solutions for Industry Customers

HEADQUARTER

RIGOL TECHNOLOGIES CO., LTD.
No.8 Keling Road, New District,
Suzhou,JiangSu, P.R.China
Tel: +86-400620002
Email: info-cn@rigol.com

EUROPE

RIGOL TECHNOLOGIES EU GmbH
Friedrichshafener Str. 5c
82205 Gilching
Germany
Tel: +49-(0)8105-27292-22
Email: johannes.kroiher@rigol.com

NORTH AMERICA

RIGOL TECHNOLOGIES, USA INC.
10220 SW Nimbus Ave.
Suite K-7
Portland, OR 97223
Tel: +1-877-4-**RIGOL**-1
Email: sales@rigol.com

JAPAN

RIGOL JAPAN CO., LTD.
5F,3-45-6,Minamiotsuka, Toshima-Ku,
Tokyo,170-0005,Japan
Tel: +81-3-6262-8932
Fax: +81-3-6262-8933
Email: info.jp@rigol.com

KOREA

RIGOL KOREA CO,. LTD.
5F, 222, Gonghang-daero,
Gangseo-gu, Seoul, Republic of Korea
Tel: +82-2-6953-4466
Fax: +82-2-6953-4422
Email: info.kr@rigol.com

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Email: info.int@rigol.com

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