

# Technical Data Sheet

## Bode 500

### Vector Network Analyzer



V 1.0

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Technical data subject to change without notice.



# 1. Signal Source (OUTPUT)

Waveform	Sinusoidal
Frequency range	10 mHz* to 450 MHz
Signal level range	-50 dBm to 16 dBm** 4 mVpp to 8 Vpp (no load) 2 mVpp to 4 Vpp (50 $\Omega$ load)
Source level accuracy	$\pm 0.2$ dB (dc to 100 MHz) $\pm 0.6$ dB (100 MHz to 450 MHz)
Source signal dc offset	Up to 35 kHz: $< 5$ mV or $< 0.2\%$ of Vpp Above 35 kHz: $< 2$ mV
Frequency accuracy after adjustment	$\pm 0.5$ ppm $\pm 0.5 \cdot$ step size
Frequency step size / resolution	3.52 $\mu$ Hz
Frequency stability	$\pm 1$ ppm ( $< 1$ year after adjustment) $\pm 2$ ppm ( $< 3$ years after adjustment)
Source impedance	50 $\Omega$
Return loss	$> 30$ dB, $> 35$ dB typical (dc to 100 MHz) $> 26$ dB, $> 30$ dB typical (100 MHz to 200 MHz) $> 23$ dB, $> 28$ dB typical (200 MHz to 450 MHz)
Spurious signals & harmonics	$< -25$ dBc at full output power (typical)
Maximum reverse signal / power	0.5 W = 5 Vrms ( $\leq 3.3$ Vdc recommended)
Connector type	N

\*...currently limited to 1 Hz. 10 mHz planned in a future software version.

\*\*...linear power derating from 16 dBm to 13 dBm between 100 MHz and 300 MHz, and to 7 dBm at 450 MHz

## 2. Inputs (CH1, CH2)

Frequency range	10 mHz* to 450 MHz
Input impedance (software switchable)	<b>High:</b> 1 M $\Omega$ (ac-coupled) <b>Low:</b> 50 $\Omega$ (dc-coupled)
1 M $\Omega$ input impedance	1 M $\Omega$ $\pm$ 0.5 % (ac-coupled)
Input capacitance	25 pF @ 1 MHz (typical)
50 $\Omega$ input impedance return loss	> 28 dB, > 35 dB typical (dc to 100 MHz) > 23 dB, > 28 dB typical (100 MHz to 450 MHz)
Receiver bandwidth (RBW) software selectable	1 Hz, 3 Hz, 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 5 kHz, 10 kHz, 15 kHz
Input attenuators (software selectable)	0 dB, 20 dB
Full-scale ac input signal	1 Vrms @ 0 dB input attenuator 10 Vrms @ 20 dB input attenuator
Input channel sensitivity (typical)	< 1 $\mu$ Vrms** (@ 0 dB attenuator, 10 Hz RBW)
Maximum dc voltage (1 M $\Omega$ input impedance)	50 V
Maximum dc voltage (50 $\Omega$ input impedance)	7 V
Input channel dynamic range (typical)	> 120 dB (@ 10 Hz RBW)**
Connector type	N

\*...currently limited to 1 Hz. 10 mHz planned in a future software version.

\*\*...from 3 kHz to 100 MHz

### 3. General

Noise floor (S21 measurement) RBW = 10 Hz, P <sub>SOURCE</sub> = 16 dBm Attenuator CH2: 0 dB	1 Hz to 2 kHz: - 120 dB (typical) 3 kHz to 100 MHz: - 130 dB (typical) at 300 MHz: -115 dB (typical) at 450 MHz: -105 dB (typical)
Warm-up time (3 $\tau$ )	84 min*

\*...specifications are valid after device has warmed up and reached a stable temperature

Dimensions (width x height x depth)	26 x 5 x 27.5 cm 10.25 x 2 x 10.85 inch
Weight	2.2 kg / 4.9 lb
Control (and supply) USB connector	USB-C
Control (and supply) Ethernet connector	RJ45
USB host connector	USB-A**
External reference frequency input	BNC**
External trigger input / output	BNC**

\*\*...reserved for future use

### 4. Environmental

Temperature range	Storage Operating For specification	-35...+60 °C / -31...+140 °F +5...+40 °C / +41...+104 °F 23 °C $\pm$ 5 °C / 73 °F $\pm$ 18 °F
Relative humidity	Storage Operating	20...90 %, non-condensing 20...80 %, non-condensing

## 5. PC Requirements for Bode Analyzer Suite

Processor	Intel Core-i Dual-Core (or similar)
Memory (RAM)	2 GB, 4 GB recommended
Graphics resolution	Super VGA (1024 x 768) higher resolution recommended
Graphics card	DirectX 11 with Direct2D support
USB interface	USB 2.0 or higher
Operating system	Windows 10, 11

## 6. Power Requirements

### Wide-range mains power adapter

Line input voltage / frequency / current	100...240 V / 47...63 Hz / < 0.5 A
Output voltage / current / power	18 Vdc / 1.33 A / 24 W

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Maximum power requirement	24 W
Coaxial power socket	+ 9 Vdc...+ 24 Vdc Inner diameter 2.5 mm Outer diameter 5.5 mm
Polarity	Inner conductor...positive
USB-PD demand	20 V @ 1.25 A or 15 V @ 1.75 A
PoE demand	PoE+, class 4

## 7. Absolute Maximum Ratings (device will be destroyed)

Maximum supply voltage	+26 Vdc
Maximum supply reverse voltage	-26 Vdc
Maximum input signal at CH1 or CH2 (low impedance, 50 $\Omega$ )	1 W (= 7 Vrms)
Maximum ac input signal at CH1 or CH2 (high impedance, 1 M $\Omega$ )	40 Vrms (10 mHz to 1 MHz) 15 Vrms (2 MHz to 5 MHz) 10 Vrms (5 MHz to 10 MHz) 7 Vrms (10 MHz to 450 MHz)
Maximum dc input signal at CH1 or CH2 (high impedance, 1 M $\Omega$ )	- 50 V...+ 50 V
Maximum peak value for ac + dc signal (high impedance, 1 M $\Omega$ )	- 60 V...+ 60 V
Maximum return power at the OUTPUT connector	0.5 W (= 5 Vrms)