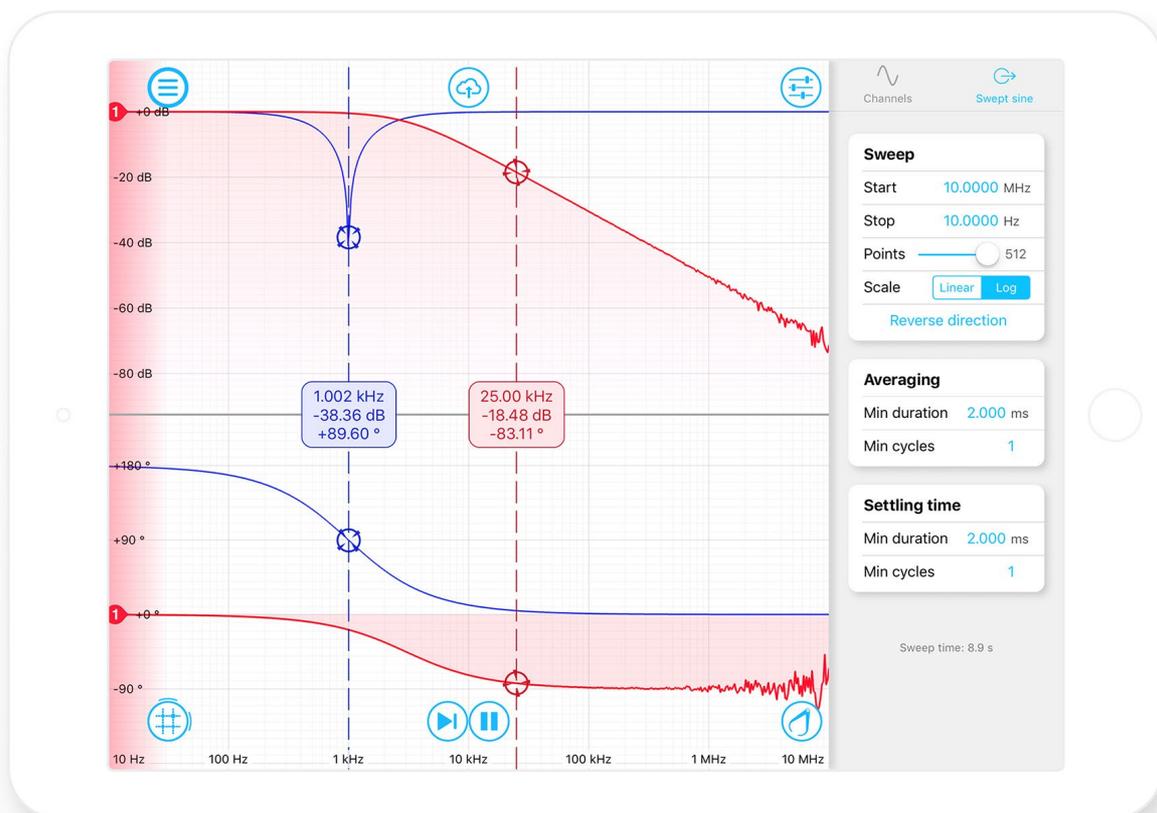




# Frequency Response Analyzer

## Description

Moku:Lab's Frequency Response Analyzer enables you to measure the frequency response of a system in both magnitude and phase using a swept sine output from 10 mHz to 120 MHz. Select from between 32 and 512 points per sweep and configure settling and averaging time to balance total sweep duration and signal-to-noise ratio.



## Features

- Measure the frequency response of a system from 10 mHz up to 120 MHz
- Select between Linear or logarithmic sweep scales
- Probe two systems simultaneously or one system at two points
- Add, subtract, multiply or divide response functions as they are acquired with a dedicated math channel
- Use cursors and markers to accurately measure features in both magnitude and phase
- Precisely adjust settling and averaging time to suit device under test
- Calibrate your measurement to compare systems or compensate for delays



# Specifications

## Source

### Source

Waveform	Sine
Frequency range	10 mHz to 120 MHz
Frequency resolution	3.55 $\mu$ Hz
Sweep type	Linear / Logarithmic
Sweep points	32, 64, 128, 256, 512
Output amplitude range	$\pm 0.5$ mV to $\pm 1$ V into 50 $\Omega$
Output load	50 $\Omega$ / 1 M $\Omega$
Source impedance	50 $\Omega$

## Input

### Input characteristics

Input impedance	50 $\Omega$ / 1 M $\Omega$	
Input coupling	AC / DC	
Input attenuation	0 dB / 20 dB	
Input voltage range	$\pm 0.5$ V into 50 $\Omega$ with 0 dB attenuation $\pm 5$ V into 50 $\Omega$ with 20 dB attenuation	
Input noise	30 nV/ $\sqrt$ Hz above 100 kHz	
Flatness prior to calibration	10 mHz to 100 kHz	< 0.02 dB into 50 $\Omega$ < 0.05 dB into 1 M $\Omega$
	100 kHz to 1 MHz	< 0.02 dB into 50 $\Omega$ < 0.03 dB into 1 M $\Omega$
	1 MHz to 50 MHz	< 0.3 dB into 50 $\Omega$ < 0.7 dB into 1 M $\Omega$
	1 MHz to 120 MHz	< 0.7 dB into 50 $\Omega$ < 2.2 dB into 1 M $\Omega$
Crosstalk	< 80 dB at 50 $\Omega$	
	< 60 dB at 1 M $\Omega$	



## Measurement

### Measurement characteristics

Settling time	Min.	Greater of 1 $\mu$ s or 1 cycle
	Max.	10.0 seconds
Averaging time	Min.	Greater of 1 $\mu$ s or 1 cycle
	Max.	10.0 seconds
Noise-floor <ul style="list-style-type: none"><li>100 ms averaging time</li><li>500 mV<sub>pp</sub> amplitude</li><li>DC coupled input</li></ul>	10 mHz to 100 kHz	-100 dB into 0 dB attenuation -80 dB into 20 dB attenuation
	100 kHz to 1 MHz	-125 dB into 0 dB attenuation -105 dB into 20 dB attenuation
	1 MHz to 50 MHz	-130 dB into 0 dB attenuation -110 dB into 20 dB attenuation
	50 MHz to 120 MHz	-120 dB into 0 dB attenuation -100 dB into 20 dB attenuation
	Calibration	Calibrates magnitude and phase using a reference sweep <sup>1</sup>
Calibrated gain error	<0.05 dB	
Calibrated phase error	< 0.5°	

## Saving Data

### Saving data

File formats	Plain text: records data using a standard *.csv format
	Binary: records data using MathWorks' *.mat format which can be opened using MATLAB
Export modes	SD Card, Dropbox, E-mail and iCloud, My Files (iOS 11)

<sup>1</sup> The calibration feature can be used to isolate the magnitude and phase response of the system under test by compensating for deviations in magnitude and phase caused by delays (e.g., caused by cables) and the frequency response of the Moku:Lab's analog frontend.