TinySA

A Spectrum Analyzer for Under $60?

TinySA

$59.95 at R&L

$7995.00 Cheapest Model

Portable TinySA Spectrum Analyzer,SEESII Upgraded V0.3.1 Handheld Tiny Frequency Analyzer 100kHz to 960MHz MF/HF/VHF UHF Input,Signal Generator with 2.8 inch Touch Screen with ESD Protect Function

Visit the Seesii Store

★★★★½ ∨ | 350 ratings | 40 answered questions

-30% $76⁴⁹

List Price: $109.99 ⓘ

✓prime
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Payment plans
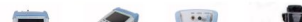1 option from $13.89/mo at example APR of 30% (rates from 10-30% APR)

4 VIDEOS

Rohde & Schwarz FSH18

Rohde & Schwarz FSH18 Model 1145.5850.18 Handheld Spectrum Analyzer. 10 MHz to 18 GHz. 100 Hz to 1 MHz RBW.

🏷$7995.00 ☑ In Stock!

Model: Rohde & Schwarz FSH18   Condition: Reconditioned

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Description | Included Accessories

Spectrum analysis anywhere, anytime on earth and in space

The R&S®FSH is the ideal spectrum analyzer for rapid, high-precision, cost-effective signal investigations. It provides a large number of measurement functions and so can handle anything from the installation or maintenance of a mobile radio base station up to on-site fault location in RF cables to development and service ¿ an extensive range of applications.

- Robust edge protection, stable carrying handle
- Easy operation
- Four hours operating time on battery power
- Storage of up to 256 traces and setups
- Easy data transfer to PC
- High measurement accuracy
- Best RF characteristics in its class

Mouse move on Image to zoom

TinySA

- Similar to the NanoVNA, the TinySA puts capabilities in the hands of hams that were only available to professional RF engineers just a few years ago
- Although not as capable or precise as the professional analyzer the TinySA has capabilities that all hams can use and covers nearly 100% of ham radio requirements for such a device
- Battery Powered, portable

WHAT IS A SPECTRUM ANALYZER?

- A spectrum / signal analyzer measures the magnitude of an input signal versus frequency within the full frequency range of the instrument. The primary use is to measure the power of the spectrum of known and unknown signals.

TinySA Compared to NanoVNA

LOOKALIKE SIBLINGS, NOT TWINS

- NanoVNA is a Vector Network Analyzer
  - It measures reflected and transmitted power
  - Good for measuring SWR of an antenna system
  - Characterizing filters etc.
- TinySA is a Spectrum Analyzer
  - Measures the magnitude of an input signal versus frequency
  - Good for analyzing component signals in a spectrum
  - Measuring harmonics and 3 order modulation products
  - Evaluating transmitter purity

Spectrum Analyzer Uses

- Measure Harmonics
- Evaluate Mixers
- Measure Spectral Purity of Transmitter
  - FCC Part 97
- Search for Interference, noise sources
- TinySA has built-in Signal Generator
  - (not while using spectrum analyzer function)

TinySA Use Examples at tinysa.org

Here are some examples of what the tinySA can do
- Measuring [Harmonics](#)
- Measuring [Spectral Purity](#)
- Measuring [Phase Noise](#)
- Measuring [Third Order Intermodulation](#)
- Measuring [IQ Balance](#)
- Measuring [Spur Free Dynamic Range](#)
- Measuring [Low Frequencies](#)
- Capturing [ISM Transmissions](#)
- Tuning [Sweep Settings](#)
- [Coax Cable Impact](#)
- Measuring [FM deviation](#)
- Measuring [AM modulation](#)
- Measuring [One dB Compression Point](#)
- Adding an [LNA](#)
- Using a Tracking Generator to measure a [Mixer](#)
- Measuring the [Noise Figure of an Amplifier](#)
- [Calibrating the low output level](#)
- Adding the [Listen](#) function
- Using the trace table as a [limit line](#)

Also a Signal Generator

- Low Channel: – Sine Wave - 100kHz to 350MHz
  - Signal level -76dbM - -6dbM
  - Harmonics below -40dB of fundamental
  - Optional AM, narrow FM and wide FM modulation or slow sweep over selectable frequency span
- High Channel: - Square Wave 240MHz to 960MHz
  - Signal level -38dBm to +13dBm
  - Optional narrow FM and wide FM modulation or slow sweep over selectable frequency span

What's in the Box?

- TinySA
- Antenna
- USB Cable
- 30cm ALSR100 SMA cables x2
- SMA-SMA barrel connector x1
- Lanyard and touch plectrum x1

TinySA - Main Specifications

- Range - 100kHz to 350 MHz
  - 240 MHz to 960 MHz with reduced precision
- Manually selectable resolution filters of 3, 10, 30, 100, 300, 600kHz. Automatic selection of one of the 57 resolution filters.
- User Interface
  - Display resolution 320*240 pixels
  - Screen diagonal 2.8"
  - 16 bits per RGB pixels
  - Resistive touch control
  - Jog switch control
  - USB serial port control
  - Optional TTL USART port on the internal PCB
  - Linear power supply to avoid switching noise.
- Many more at - https://tinysa.org/wiki/pmwiki.php?n=Main.Specification

Limitations

As the internal components of the tinySA where selected with a careful balance between performance and cost there are certain limitations that experienced users of much more expensive spectrum analyzers must be aware of:

- The internal phase noise sets a clear lower limit for phase noise measurements.
- **The minimum resolution bandwidth of 2.4kHz makes it impossible to see more spectral detail**
- The high input (240MHz to 960MHz) has very limited image suppression and only one level optional built in attenuator which makes it difficult to interpret complex signals.
- The high input optional input attenuator is frequency dependent and varies between 25dB and 40dB
- **At lower resolution bandwidths (below 30kHz) the measurement time per point starts to increase due to the resolution filter implementation.** Careful use of the FAST sweeping mode may reduce this time increase
- The performance limitations of the shielding and the filters may lead to certain images and spurs being visible but certain functions like spur suppression and switching to below IF may help detect and/or reduce these spurs and images
- Below 0.1MHz the sensitivity starts to reduce.
- Below 1MHz it is recommended to disable the AGC and possibly enable the LNA to get best measurement quality
- **When using the supplied telescopic antenna or a low RBW one should be aware of the radiation from the tinySA MCU on 48MHz and its harmonics.** See the **FAQ**
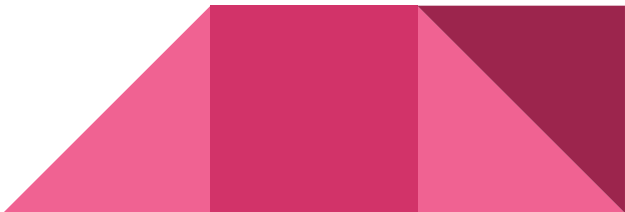
New - TinySA Ultra

- New in last few months
- $129.95 at R&L Electronics
- 4 Inch Display
- 800MHz Standard, 6 GHz with Ultra Mode Enabled
- Better Resolution

Where to Buy

- Many Chinese Clones - reverse engineered
- Should only buy from official resellers

Safe places to buy an original tinySA

- **Zeenko store on Alibaba.com**. Other sellers on Alibaba may sell bad clones. For other payment methods, such as Paypal, hit the "chat now" button and Maggie from the Zeenko store will help you. At the right top of the browser window there should be "my messages" where you will have a better overview of your messages
- **Zeenko store on AliExpress**. This is the factory store, guaranteed to deliver genuine tinySA. Other sellers on aliexpress may sell bad clones. To be sure you get a good product only buy from Zeenko store on AliExpress.
- **R&L Electronics** in the USA. When the tinySA is listed as "out of stock" R&L can still take you order and only charge your credit card when the product is available again (which should be in a few weeks).
- **Eleshop** in Europe
- **Switch Science** in Japan
- **Taobao** in China
- **1688** in China
- **Mirfield Electronics** in the UK.
- SeeSii store on Amazon

If the tinySA is listed as Pre-order it means there is currently no stock but a next batch of tinySA is being manufactured and as soon as these are available (usually within one month) the pre-ordered products will be shipped in order sequence.

More Information

- TinySA Home Page and Wiki - https://tinysa.org/
- One of originators - https://www.youtube.com/@ErikKaashoek
  - He has many instructional Videos including Introduction and First Use
- IMSAI Guy Playlist on YouTube:
  https://www.youtube.com/playlist?list=PLXDK0MeyK4ZgnYyh1INCSv_IhteEs4Tkt