AURSINC TinySA Ultra+ ZS406

AURSINC TinySA Ultra+ ZS406 Spectrum Analyzer User Manual

Model: TinySA Ultra+ ZS406

1. Overview

The AURSINC TinySA Ultra+ ZS406 is a compact, handheld spectrum analyzer and signal generator designed for a wide range of frequency analysis and signal generation tasks. Featuring a 4.0-inch touchscreen display and a broad frequency measurement range from 100kHz to 5.4GHz, this device is equipped with hardware version V0.4.6 and enhanced ESD protection for improved durability. It includes a built-in 32GB micro SD card for data storage and sharing.

Image 1.1: The AURSINC TinySA Ultra+ ZS406 Spectrum Analyzer shown with its various accessories, including cables, antenna, and stylus.

2. Key Features

- **Upgraded Hardware:** Features HW V0.4.6 with enhanced ESD protection for increased anti-static level and extended service life.
- **Wide Frequency Range:** Measures 100kHz to 5.4GHz as a spectrum analyzer, with an Ultra mode extending up to 6GHz.
- **Dual Functionality:** Operates as both a spectrum analyzer and a signal generator.
- **Signal Generator Output:** MF/HF/VHF sinus output (100kHz-900MHz), UHF square wave output (800MHz-4.4GHz), and mixing signal output (4.4GHz-5.4GHz).
- **High-Resolution Display:** 4.0-inch 480*320 pixel touchscreen display, showing up to 450 points for comprehensive frequency coverage.
- **Adjustable Filters:** Switchable resolution bandpass filters from 200Hz to 850kHz for precise measurements.

- **Data Storage:** Includes a built-in 32GB micro SD card for on-site data storage and sharing.
- **PC Control:** Compatible with Windows, Linux, and MacOS for data transfer and display synchronization via the TinySA-APP.
- **Calibration:** Built-in calibration signal generator for automatic self-test and low input calibration.

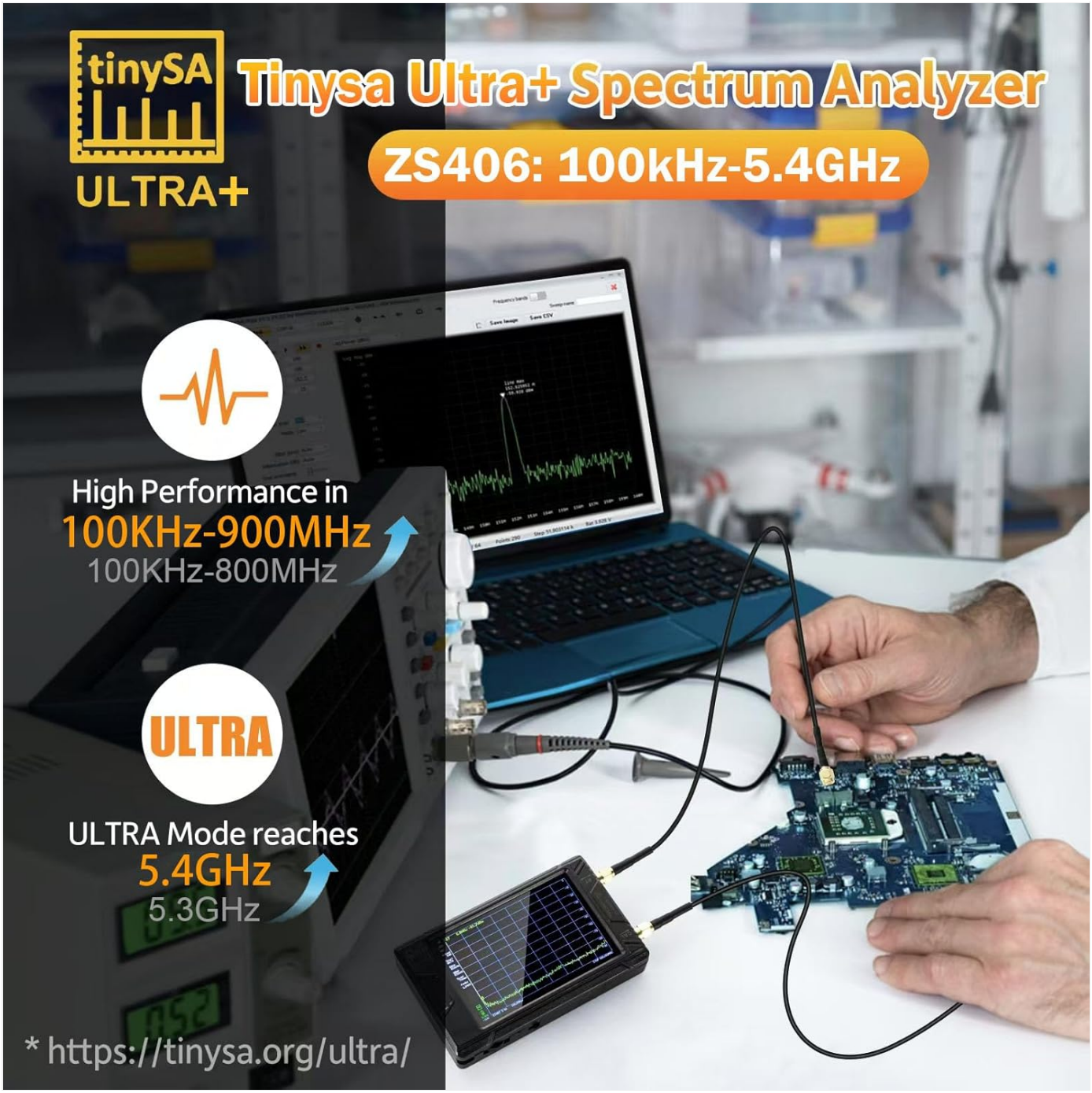


Image 2.1: The TinySA Ultra+ ZS406 demonstrating its high performance in different frequency ranges, including connection to a laptop for analysis.

3. Setup

3.1 Unboxing and Component Identification

Carefully unpack all components from the box. Verify that the following items are present:

- AURSINC TinySA Ultra+ ZS406 Spectrum Analyzer unit
- Handheld antenna

- USB Type-C cable
- Stylus
- 2x RF Coax SMA Male to UHF Female SO-239 Extension Antenna Cables (RG316, 60cm)
- 32GB Micro SD card (pre-installed or included separately)

3.2 Initial Charging

Before first use, ensure the device is fully charged. Connect the TinySA Ultra+ to a standard USB power adapter (not included) using the provided USB Type-C cable. The charging indicator will typically show the charging status.

3.3 Micro SD Card Installation

If the 32GB micro SD card is not pre-installed, locate the SD card slot on the side of the device. Gently insert the micro SD card until it clicks into place. Ensure it is inserted in the correct orientation.

Image 3.1: A detailed view of the TinySA Ultra+ highlighting its 4.0-inch touchscreen, Type-C USB interface, SD card slot (with 32GB card), and standard 3.5mm headphone jack.

3.4 Connecting Antennas and Cables

Depending on your measurement requirements, connect the appropriate antenna or cable to the RF input/output ports. The device includes two RF Coax SMA Male to UHF Female SO-239 extension cables for connecting various UHF antennas or devices.

Image 3.2: An RF Coax SMA Male to UHF Female SO-239 Extension Antenna Cable (RG316) with a length of 60cm, illustrating the connector types.

4. Operating Instructions

4.1 Power On/Off

To power on the device, press and hold the power button located on the side. To power off, press and hold the power button again until the shutdown prompt appears, then confirm.

4.2 Navigating the Interface

The TinySA Ultra+ features a 4.0-inch touchscreen. Use your finger or the provided stylus to interact with the menus and settings. The main screen typically displays the spectrum analysis graph, with various parameters and controls accessible via on-screen buttons.

4.3 Spectrum Analyzer Mode

In Spectrum Analyzer mode, you can:

- **Set Frequency Range:** Adjust the start and stop frequencies to define the measurement window.
- **Adjust Resolution Bandwidth (RBW):** Select an appropriate RBW from 200Hz to 850kHz for desired measurement detail and speed. A narrower RBW provides finer detail but takes longer.
- **Marker Functions:** Use markers to identify specific frequency peaks and measure their amplitude.
- **Save Data:** Utilize the 32GB micro SD card to save measurement data, screenshots, or settings.

5. Signal Generator Function

The TinySA Ultra+ can function as a signal generator, producing various waveforms across different frequency bands.

Image 5.1: The TinySA Ultra+ displaying its signal generator capabilities, including MF/HF/VHF sinus, UHF square wave, and mixing signal outputs.

5.1 Generating Signals

1. Navigate to the Signal Generator mode from the main menu.
2. Select the desired output type:
    - **MF/HF/VHF Sinus:** 100kHz - 900MHz
    - **UHF Square Wave:** 800MHz - 4.4GHz
    - **Mixing Signal:** 4.4GHz - 5.4GHz
3. Set the desired output frequency and amplitude using the on-screen controls.
4. Connect the appropriate cable or antenna to the output port for your application.

5.2 Calibration Signal Generator

The device includes a built-in calibration signal generator. This can be used for automatic self-testing and low input

calibration to ensure measurement accuracy.

6. PC Control and Data Transfer

The TinySA Ultra+ supports PC connectivity for enhanced control, data transfer, and display synchronization. The TinySA-APP software is compatible with Windows, Linux, and MacOS operating systems.

Image 6.1: The TinySA Ultra+ connected to a laptop, demonstrating the PC control feature with the TinySA-APP interface visible on the computer screen.

6.1 Connecting to a Computer

1. Download and install the TinySA-APP software from the official TinySA website (https://tinysa.org/ultra/).
2. Connect the TinySA Ultra+ to your computer using the provided USB Type-C cable.
3. Launch the TinySA-APP. The software should automatically detect and connect to the device.

6.2 Functions via PC Software

- Real-time display of spectrum analysis on your computer screen.
- Control device settings and parameters from the PC interface.
- Transfer saved data and screenshots from the device's SD card to your computer.
- Perform firmware updates (refer to TinySA-APP documentation for specific instructions).

7. Maintenance

7.1 Cleaning

To clean the device, use a soft, dry, lint-free cloth. For stubborn marks, slightly dampen the cloth with water. Avoid using harsh chemicals, solvents, or abrasive cleaners, as these can damage the screen or casing. Ensure no liquid enters the ports.

7.2 Battery Care

To prolong battery life, avoid fully discharging the device frequently. If storing the device for an extended period, charge it to approximately 50% and store it in a cool, dry place. Recharge periodically if stored for very long durations.

7.3 ESD Protection

The TinySA Ultra+ features enhanced ESD protection. However, always handle the device with care and avoid exposing it to excessive static electricity. When connecting cables or antennas, ensure you are properly grounded if working in an environment prone to static discharge.

8. Troubleshooting

- **Device does not power on:**
  - Ensure the battery is charged. Connect to a USB power source and allow it to charge for at least 30 minutes before attempting to power on again.
  - Verify the power button is pressed and held correctly.
- **No signal detected in Spectrum Analyzer mode:**
  - Check if an antenna or signal source is properly connected to the RF input.
  - Verify the frequency range settings are appropriate for the signal you are trying to detect.
  - Ensure the input signal strength is within the device's measurable range.
- **Screen is unresponsive or frozen:**
  - Attempt a soft reset by pressing and holding the power button until the device restarts.
  - Ensure the screen is clean and free of debris. Use the stylus for precise interaction.
- **PC software not connecting:**
  - Ensure the USB cable is securely connected to both the device and the computer.
  - Verify that the TinySA-APP is installed and running.
  - Check your computer's device manager to ensure the TinySA Ultra+ is recognized. You may need to install specific drivers if prompted by the software.

9. Specifications

Feature	Specification
Model	TinySA Ultra+ ZS406
Hardware Version	V0.4.6
Spectrum Analyzer Frequency Range	100kHz - 5.4GHz (Ultra mode up to 6GHz)
Signal Generator Output (Sinus)	100kHz - 900MHz (MF/HF/VHF)
Signal Generator Output (Square Wave)	800MHz - 4.4GHz (UHF)
Signal Generator Output (Mixing)	4.4GHz - 5.4GHz
Display	4.0-inch TFT LCD Touchscreen, 480*320 pixels
Resolution Bandwidth (RBW)	200Hz to 850kHz (Switchable)
Internal Storage	32GB Micro SD Card
Connectivity	USB Type-C, 3.5mm Headphone Jack
ESD Protection	Enhanced
Included Cables	2x RG316 SMA Male to UHF Female SO-239 (60cm)

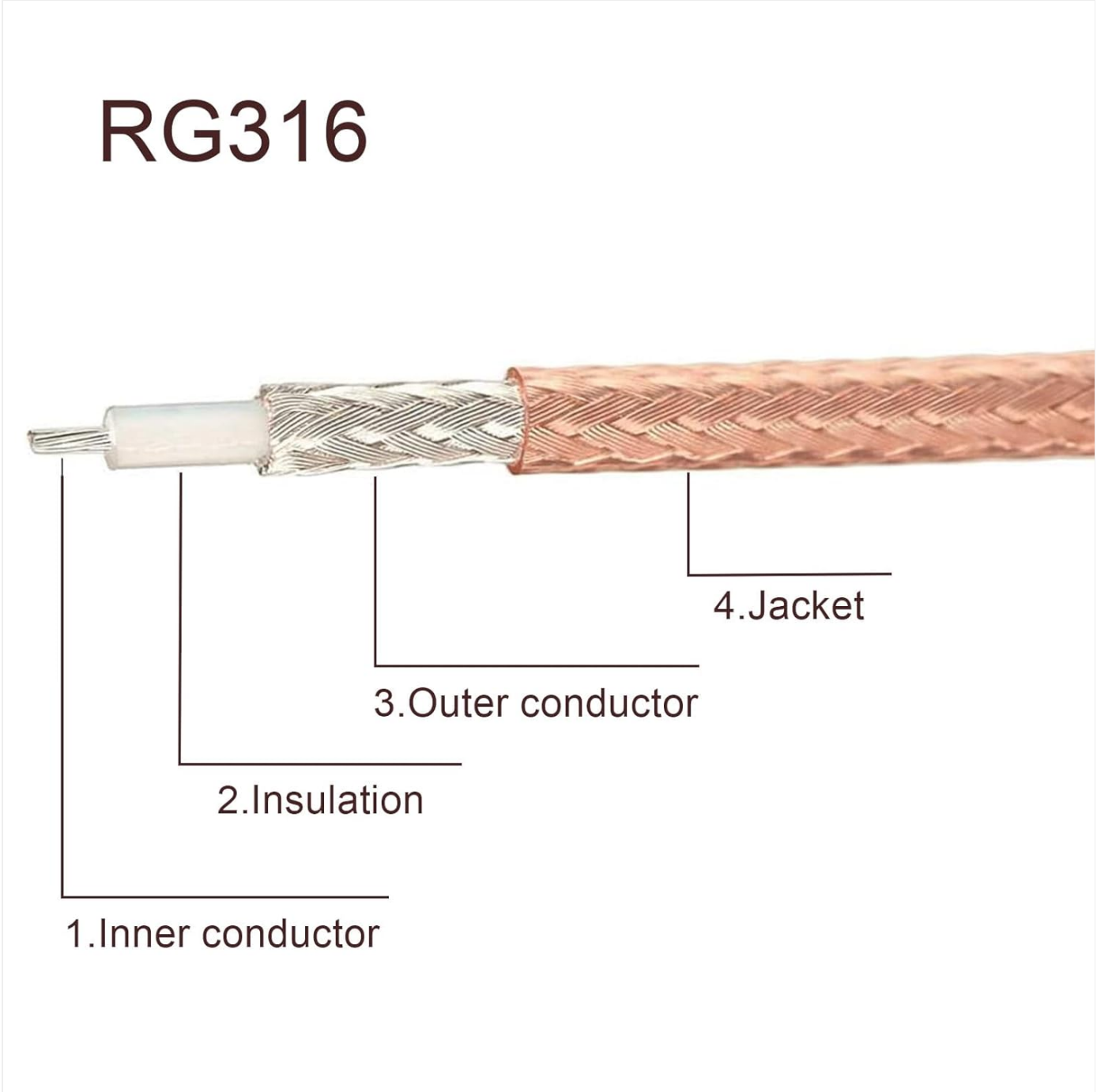
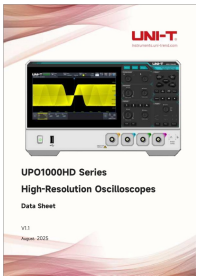
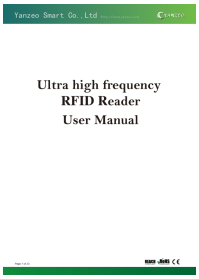


Image 9.1: Diagram illustrating the internal construction of an RG316 coaxial cable, showing the inner conductor, insulation, outer conductor, and jacket.

10. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or visit the official AURSINC website. If you encounter any issues not covered in this manual, please contact AURSINC customer support for assistance.

Related Documents - TinySA Ultra+ ZS406

	[NanoVNA Resources: Firmware, Software, and User Guides] Find essential resources for the NanoVNA, including firmware downloads, VNA-QT software, NanoVNA-Saver, and user guides. Access the latest updates and community information.
	[tinySA Spectrum Analyzer Specifications and Features] Detailed technical specifications for the tinySA spectrum analyzer, covering user interface, input/output modes, reference generator, and battery performance. Features include 100kHz-960MHz range and a 2.8-inch screen.
	[UNI-T UPO1000HD Series High-Resolution Oscilloscopes Data Sheet] Comprehensive data sheet for the UNI-T UPO1000HD Series High-Resolution Oscilloscopes, detailing product features, technical specifications, performance characteristics, application scopes, and available accessories. Covers bandwidth, sampling rates, memory depth, advanced triggering, multiple instrument functions, and connectivity options.
	[Yanzeo Ultra High Frequency RFID Reader User Manual] User manual for the Yanzeo Ultra High Frequency RFID Reader, detailing its parameters, applications, wiring, installation, and software operation.
	[Anatel TOC600 Online Analyzer Operator Manual - Hach Ultra] Comprehensive operator manual for the Hach Ultra Anatel TOC600 Online Analyzer. Covers installation, setup, operation, maintenance, calibration, validation, troubleshooting, and safety guidelines for accurate Total Organic Carbon analysis.
	[NanoVNA Resources: Firmware, Software, and User Guides] Find essential resources for the NanoVNA, including firmware downloads, VNA-QT software, NanoVNA-Saver, and user guides. Access the latest updates and community information.