# BA100 Vector Signal Analyzer


## Overview

BA100 is a vector signal analyzer with compact design. With excellent testing performance and measurement sensitivity, BA100 satisfies the testing requirements of the majority of RF signals. BA100 satisfies the needs of general spectrum test, it supports signal demodulation like LTE, FM, Digital Signals. In terms of system integration, PCB version module product is available and API library is provided for secondary development.

## Key Facts

- Frequency range: 9kHz to 6GHz
- Signal demodulation: Digital signal, FM, and LTE
- DANL: -168 dBm @1GHz
- Signal storage depth of 1Gbit for signal capture and analysis
- 10MHz reference in/out, USB interface for control
- Small size (180*50*290mm) and light weight (1.8kg).
- API library is provided for secondary development
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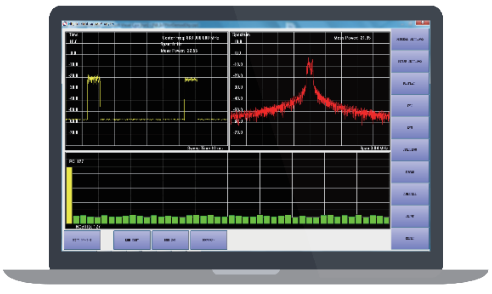
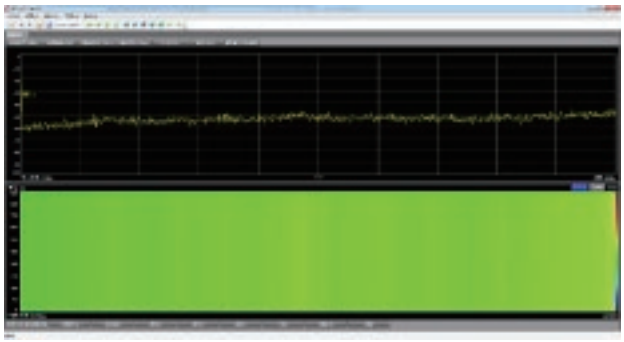


# Functions & Applications

## Main Functions

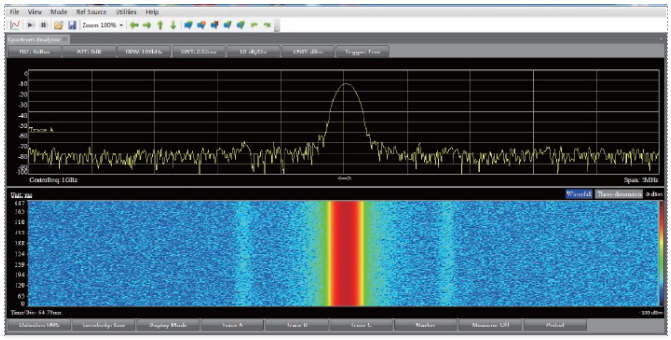
### General Spectrum Analysis

For conventional stable or periodic signals, BA100 provides broadband spectrum testing, including frequency and power measurements.



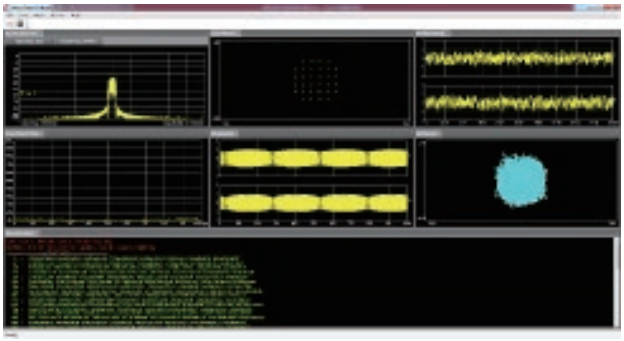
### Waterfall Display

BA100 can display the frequency and amplitude change of the spectrum as a function of time in the form of waterfall display (Spectrogram), making the spectrum change at a glance.



### Digital Signal Demodulation

BA100 supports ASK\PSK\FSK\QAM digital signal demodulation. Provide information such as spectrum, constellation, and EVM.

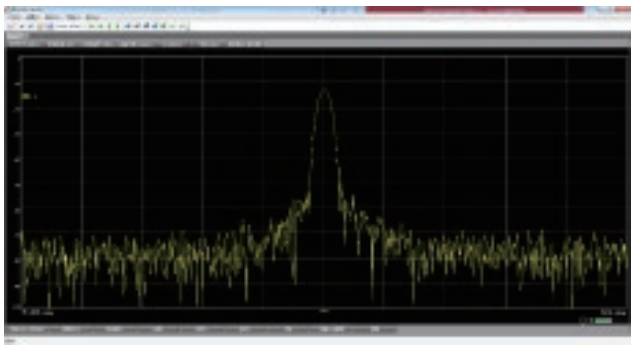


### LTE Signal Demodulation

BA100 provides TDD-LTE and FDD-LTE downlink signal demodulation. Obtain spectrum records, time-frequency resource mapping, constellation, channel decoding, EVM, etc.

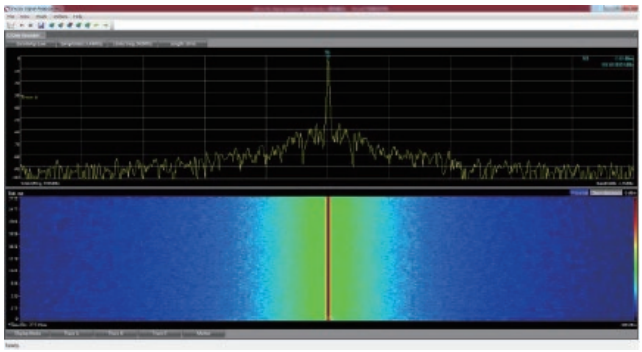
### FM Demodulation

BA100 provides FM demodulation. The demodulated audio data can be stored in computer.



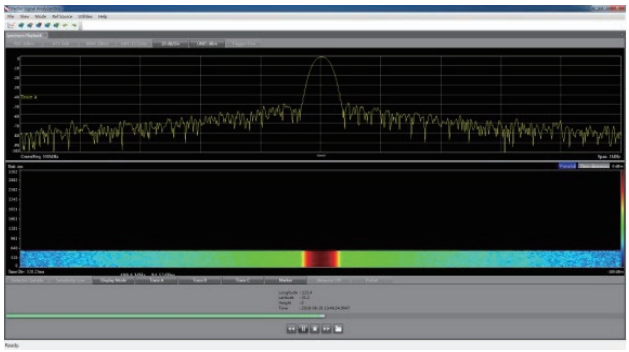
**IQ Data Recorder**

BA100 can store IQ data and save it to computer (.txt format) for later data playback and analysis.



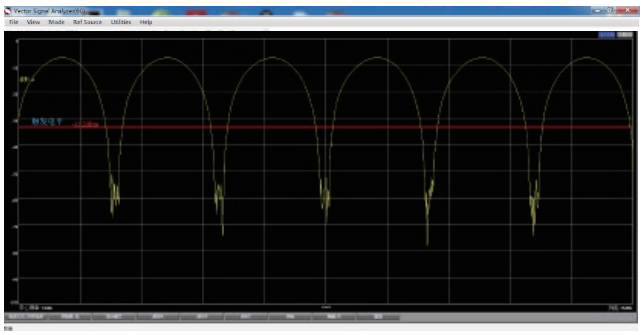
**Spectrum Playback**

IQ data and spectrum data (recorded by BA100) can be played back in BA100 software.



**Zero Span Mode**

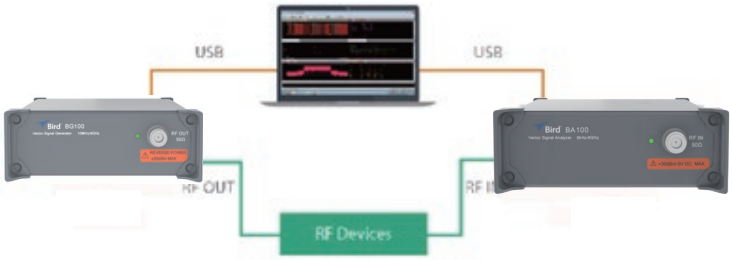
When analyzing the time domain characteristics of signal, user can set the span of instrument to 0 and enter zero span mode (like the oscilloscope). Video trigger can be used in this mode.



## Typical Application

**Laboratory RF test**

BA100 vector signal analyzer can perform RF testing in the laboratory. BA100 combines BG100 vector signal source can test intermodulation distortion of amplifiers, mixers, and receivers. This system can also test antennas, amplifiers, and attenuators' performance such as bandwidth, frequency response, and gain.



**RF & Microwave Teaching Application**

BA100 vector signal analyzer, combine with BG100 vector signal source, enables a demonstration of the testing of RF microwave devices. It reduces the complexity of RF microwave professional teaching and meets the teaching needs of telecom and electronic engineering related majors.

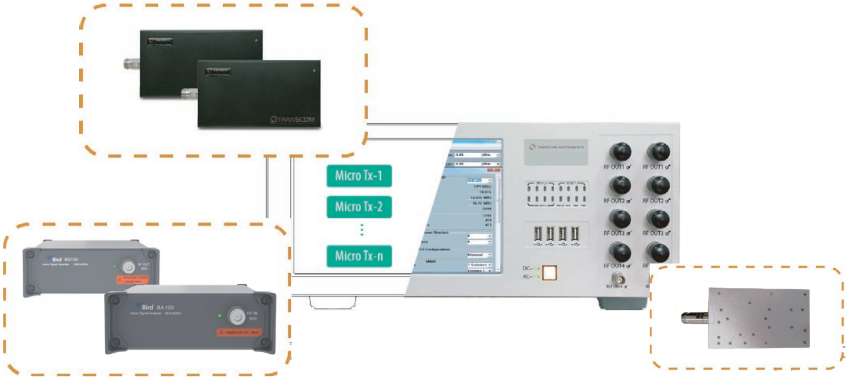

# Innovative Features

**Compact Size & Fast Deployment**

BA100 is compact and easy to set up. User can easily carry to field and quickly build the test environment.


**System Integration & Secondary Development**

BA100 vector signal analyzer has a small size, superior specifications, comprehensive telecommunication & general demodulation support, and an open API interface. It also offers three different product models: full-size USB module, small-size USB module and PCB module. Thus, BA100 can meet the system integration needs of different users.



# Control Elements

# Specifications

| | | |
|---|---|---|
| **Function** | | |
| Sensitivity | Low, Medium and High | |
| Demodulator | Digital signals, FM, and LTE (AM, GSM, WCDMA, and NB-IoT will be supported in the future) | |
| **Frequency** | | |
| Frequency Range | 9kHz to 6GHz | |
| Frequency Reference | Aging rate: ±1ppm | |
| Frequency Readout Accuracy | ±( readout frequency * Frequency Reference + RBW mid-value + 0.5 * horizontal resolutionF ) | |
| Frequency Span Accuracy | ±1% | |
| Sweep Time | 1.1ms to 1600s<br>2.69ms to 1600s, zero span | |
| **Resolution bandwidth** | | |
| RBW Range | 10Hz to 5MHz, (1-2-3-5-10 Sequence) | |
| RBW Accuracy | RBW ⩾ 1MHz, ±10%<br>RBW ＜ 1MHz,±2% | |
| **Amplitude** | | |
| Measuring Range | Display average noise level to +20dBm | |
| Input Attenuator Range | 0-30dB, 1dB Step | |
| Maximum Safe Input Level | Sensitivity: +30dBm (Low) | |
| | Sensitivity: 0dBm (Medium) | |
| | Sensitivity: -20dBm (High) | |
| Reference Level Range | -140 dBm to +20dBm | |
| | -190dBm to +70dBm (Ref level offset: ON) | |
| Amplitude Accuracy | ±1.5dB (ATT set to 0 dB, input signal: -5 to -30 dBm; detector set to Positive,Sensitivity set to Low; RBW auto-coupled ,all other settingsauto-coupled, 23±5℃ , half hour warm-up required) | |
| RBW Switching Uncertainty | ±0.3dB | |
| Input Attenuator Uncertainty | ±0.6dB | |
| Accuracy of Reference Level | Reference level: ⩾ -60dBm, ±0.8dB | |
| Display Average Noise Level (DANL) @1GHz | Input Terminated,Detector set to Positive,Trace Average set to 1000,Span set to 50kHz,Ref set to -100dBm,all other settings auto-coupled, 23±5°C . normalized to 1 Hz RBW | |
| | Sensitivity: Low | -131dBm/Hz (typically -133dBm/Hz) |
| | Sensitivity: Medium | -149dBm/Hz (typically -151dBm/Hz) |
| | Sensitivity: High | -166dBm/Hz (typically -168dBm/Hz) |
| Residual Response | -75dBm | |
| Input-Related Response | 9kHz to 700MHz<br>700MHz to 900MHz<br>900MHz to 1.3GHz<br>1.3GHz to 2.2GHz<br>2.2GHz to 2.7GHz<br>2.7GHz to 2.9GHz<br>2.9GHz to 3.3GHz<br>3.3GHz to 6GHz | <-70dBc<br><-46dBc<br><-42dBc<br><-46dBc<br><-53dBc<br><-42dBc<br><-38dBc<br><-53dBc |

| | |
|---|---|
| Second Harmonic Distortion | 1.6GHz: 70dBc |
| Third-Order Intercept (TOI) | +15dBm (-10dBm tones, 1MHz apart, Sensitivityset to low,Ref set to -10 dBm) |
| P1dB | +5dBm (nominal) |
| Phase Noise @1GHz | -95dBc/Hz, @10kHz (typically -98dBc/Hz)<br>-123dBc/Hz, @1MHz (typically -125dBc/Hz) |
| **Storage** | |
| Maximum storage depth | 1Gbit |
| Data format | I/Q two-way, 16bit |
| **General** | |
| OS for Software | Windows 10, Windows 7 |
| Power Supply Current | 2A MAX |
| Connect interface | RF output: N-type, 50 Ω<br>PC connect：USB type-C<br>Power connect: DC12V |
| Temperature | Opearting： 0° C to 50° C<br>Storage： -20° C to 70° C |
| Dimension and weight | 180×50×290(mm), 1.8kg |

**Technical specifications**

This technical specifications include the influence of probability distribution, measurement uncertainty and environmental factors on the instrument performance. It guarantee the performance under the following conditions.

· The instrument is ON and warmed up for 30min.
· The instrument internal reference signal is applied.

Testing temperature is 23±5 ℃, unless other specific condition applied.

**Typical value**

Additional description does not cover all performance information of the product guarantee. Unless otherwise specified, the typical value refers to the indicator or technical specification with which more than 80% of products comply under 23 ± 5 ℃. The measurement uncertainty is excluded. A6 should be within the calibration period.

**Nominal value**

The nominal value refers to the characteristic description or design range. It is not tested or covered by the product. A6 should be within the calibration period.

# Ordering List

| Model | Description |
|---|---|
| BA100 | Vector Signal Analyzer (9kHz to 6GHz) |
| **Accessories Model** | **Description** |
| MRX-AS001 | Power adapter |
| MRX-AS004 | USB cable |
| MRX-S003 | Spectrum playback software |
| MRX-S004 | Spectrum analysis, waterfall display and FM demodulation |
| **Options** | |
| MRX-S002 | IQ signal capture license |
| MRX-S005 | TDD-LTE demodulation license |
| MRX-S006 | General digital signal demodulation license |
| MRX-S007 | Ref IN/OUT Option |
| MRX-S008 | FDD-LTE demodulation license |
| MRX-S006 | Digital demodulation license |
| MRX-AS006 | Universal power adapter |
| MRX-AS010 | 700MHz-2700MHz Omni-directional antenna |
| MRX-AS011 | 700MHz-6000MHz Omni-directional antenna |
| MRX-AS012 | 700MHz-4000MHz Omni-directional antenna |
| MRX-AS020 | Main control platform (i5/4G/256G) (support customize) |

# EXECUTIVE PARTNER

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