



# S3302 Series Handheld Spectrum Analyzer Datasheet



Saluki Technology Inc.

**The document applies to the handheld spectrum analyzers of the following models:**

- S3302A handheld spectrum analyzer (9kHz-20GHz).
- S3302B handheld spectrum analyzer (9kHz-26.5GHz).
- S3302C handheld spectrum analyzer (9kHz-32GHz).
- S3302D handheld spectrum analyzer (9kHz-44GHz).

**Standard pack and accessories:**

No.	Item
1	Main Machine
2	Power cord
3	Power adapter
4	Quick start manual
5	USB cable
6	Battery
7	Soft pack bag

**Options of the S3302 series handheld spectrum analyzer in addition to standard accessories:**

Model No.	Description	Note
S3302-01	Programming manual	
S3302-03	Backup battery	
S3302-04	LAN cable	
S3302-05	Micro SD card	
S3302-06	GPS antenna	
S3302-07	USB power measurement function	Need option 08-11
S3302-08	SAV87230 USB power continuous wave power sensor (9kHz - 6GHz)	Need option 07
S3302-09	SAV87231 USB power continuous wave power sensor (10MHz - 18GHz)	Need option 07
S3302-10	SAV87232 USB power continuous wave power sensor (50MHz - 26.5GHz)	Need option 07
S3302-11	SAV87233 USB power continuous wave power sensor (50MHz - 40GHz)	Need option 07
S3302-12	Interference analysis function	Waterfall, RSSI

Model No.	Description	Note
S3302-13	Analog demodulation function	AM/FM/PM demodulation function, used for displaying the spectrum of AM, FM and PM signals and analyzing relevant parameters e.g. carrier power, modulation rate, carrier offset, modulation depth (AM), modulation frequency offset (FM), modulation phase deviation (PM), S/N, modulation distortion and total harmonic distortion of the modulated signal.
S3302-14	Channel scan function	Power measurement for multiple channels or frequency points.
S3302-15	List sweep function	
S3302-16	Zero span IF output	Output the third(3rd.) IF(140.25MHz) or fourth(4th.) IF(31.25MHz) signal
S3302-17	SAV89101A antenna (10kHz - 20MHz)	Need option 21
S3302-18	SAV89101B antenna (20MHz - 200MHz)	Need option 21
S3302-19	SAV89101C antenna (200MHz - 500MHz)	Need option 21
S3302-20	SAV89101D antenna (500MHz - 4GHz)	Need option 21
S3302-21	SAV89401 antenna amplifier (10kHz - 4GHz, N(f))	Need option 17/18/19/20
S3302-22	SAV89901 antenna (1GHz - 18GHz, N(f))	
S3302-23	SAV89901 antenna (18GHz - 40GHz, 2.4mm(f))	

## Preface

Thank you for choosing S3302 handheld spectrum analyzer produced by Saluki Technology Inc.

We devote ourselves to meeting your demands, providing you high-quality measuring instrument and the best after-sales service. We persist with “superior quality and considerate service”, and are committed to offering satisfactory products and service for our clients.

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## Document Authorization

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## Product Quality Assurance

The warranty period of the product is 36 months from the date of delivery. The instrument manufacturer will repair or replace damaged parts according to the actual situation within the warranty period.

## Product Quality Certificate

The product meets the indicator requirements of the document at the time of delivery. Calibration and measurement are completed by the measuring organization with qualifications specified by the state, and relevant data are provided for reference.

## Quality/Settings Management

Research, development, manufacturing and testing of the product comply with the requirements of the quality and environmental management system.

## Contacts

Service Tel: 886.2.2175 2930

Website: [www.salukitec.com](http://www.salukitec.com)

Email: [info@salukitec.com](mailto:info@salukitec.com)

Address: No. 367 Fuxing N Road, Taipei 105, Taiwan (R.O.C.)

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## 1. Overview

Saluki S3302 series handheld spectrum analyzer is a high end handheld instrument, It provides multi-function which includes spectrum analysis, interference analysis, analog demodulation, power measurement, channel scan function, channel power etc. S3302 also provide a easy-to-use functions like occupied bandwidth, adjacent channel power, audio demodulation, noise-carrier ratio measurement. S3302 is equipped with 8.4-inch integrated LCD touch screen improves display clarity and ease of operation. S3302 is a hand-held, small size, light weight, easy to take so it is very suitable for on-site measurement.

Saluki S3302 series handheld spectrum analyzer can be applied to the signal and equipment test in aerospace, microwave and satellite communications, wireless communications, radar surveillance, electronic warfare and electronic surveillance, precision-guided and other industries.

### 1. 1. Definitions

#### **Specification (Spec.)**

Specifications describe the performance of parameters within the warranty of the instrument. Product specifications applies under the following conditions:

- 1) Two hours storage at ambient temperature(0-40 °C) followed by 30 minutes warm-up operation
- 2) Specified environmental conditions met
- 3) Instrument is within its calibration cycle.
- 4) The specification listed in the datasheet includes measurement uncertainties.

Data in this document are Spec. unless otherwise noted.

#### **Typical (typ.)**

Typical data is not guaranteed by instrument warranty. It describes additional product performance information that 80 percent of the units exhibit. Typical data only valid at 25 °C. Typical performance does not include measurement uncertainty.

#### **Nominal(nom.)**

Nominal values indicate expected performance, or describe product performance that is useful in the application of the product, but are not covered by the product warranty.

## 2. Specifications

### 2. 1. Frequency & Sweep

#### 2. 1. 1. Frequency Range

Model	Frequency Range (AC Coupled)
S3302A	9kHz - 20GHz
S3302B	9kHz - 26.5GHz
S3302C	9kHz - 32GHz
S3302D	9kHz - 44GHz

#### 2. 1. 2. Frequency Reference

Tuning Resolution	1Hz	
10MHz Reference	Aging Rate	±0.5ppm/Year
	Temp. Stability	± 0.1ppm(-10 - 50 °C)
	Initial Frequency Accuracy	±0.3ppm

#### 2. 1. 3. Frequency Readout Accuracy

Frequency Readout Accuracy	$\pm ( \text{Frequency Readout} \times \text{frequency reference accuracy} + 2\% \times \text{Span} + 10\% \times \text{RWB} )$
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#### 2. 1. 4. Span

Range	0Hz (Zero Span)
	100Hz - Max. Frequency
Uncertainty	± 2.0%

#### 2. 1. 5. Sweep & Triggering

Sweep Mode	Linear, List (Option)	
Sweep Time	Span=0Hz	10us - 600s Uncertainty: ±2%
	Span > 0Hz	Max. 800s
Sweep Point	201, 501, 1001, 2001, 4001	
Trigger	Mode	Free Run, Video, External, slope, delay

#### 2. 1. 6. RBW & VBW

RBW	1Hz - 10MHz (step by 1-3)
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<b>RBW Accuracy</b>	±10% 1kHz - 3MHz ±20% 10MHz
<b>Video Bandwidth</b>	1Hz - 10MHz (step by 1-3)

## 2. 2. Amplitude

### 2. 2. 1. Amplitude Range

<b>Measurement Range</b>	DANL to +30dBm, typ. (>10dB attenuation) DANL to +23dBm, typ. (<10dB attenuation) DANL to +13dBm, typ. (pre-amplifier on)
<b>Attenuator Range</b>	0 - 50dB in 10dB step

### 2. 2. 2. Maximum Input Level

<b>Maximum Safe Input Level</b>	+30dBm, typ. (>10dB attenuation)
	+23dBm, typ. (<10dB attenuation)
	+13dBm, typ. (pre-amplifier on)

### 2. 2. 3. Display Range

<b>Display Type</b>	Linear, logarithm
<b>Scale</b>	0.1 - 20dB/div
<b>Unit</b>	[dBm], [dBmV], [dBuV], [Volt] and [Watt]

### 2. 2. 4. Absolute Amplitude Accuracy

Specifications in this section apply to following settings

- RBW: 10Hz - 1MHz
- Input level: -10dBm to -50dBm
- Auto couple
- Any reference level
- Any scale
- 20° C - 30° C

10MHz - 40GHz	±2.3dB
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### 2. 2. 5. Input Port VSWR

50MHz - 20GHz	<1.5:1
20GHz - 44GHz	<2.0:1

### 2. 2. 6. Reference Level

Logarithm scale	-120dBm - +30dBm, 1dB step
Linear scale	22.36uV - 7.07V, 0.1% step

### 2. 2. 7. Display Scale Fidelity

Scale Fidelity	±1.00dB
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### 2. 2. 8. Trace Detector

Trace Detector	Auto, Normal, positive peak, negative peak, sample, average, RMS
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## 2. 3. Dynamic Range Specifications

### 2. 3. 1. 1dB Gain Compression

- **Settings:** 2 tones, 10MHz tone spacing, 20°C - 30°C

Frequency Range	Specification
50MHz - 4GHz	≥-2dBm
4GHz - 13GHz	≥0dBm
13GHz - 44GHz	≥-3dBm

### 2. 3. 2. DANL

- **Settings:** 50ohm load, RMS detector, average on, 0dB attenuation, 1Hz RBW, 20°C - 30°C

- **Pre-amplifier off:**

Frequency Range	DANL
2MHz - 10MHz	≤-135dBm
10MHz - 2GHz	≤-142dBm
2GHz - 4GHz	≤-138dBm
4GHz - 6GHz	≤-135dBm
6GHz - 20GHz	≤-138dBm
20GHz - 32GHz	≤-135dBm
32GHz - 40GHz	≤-127dBm
40GHz - 44GHz	≤-120dBm

- **Pre-amplifier On**

Frequency Range	DANL
2MHz - 10MHz	≤-150dBm

Frequency Range	DANL
10MHz - 2GHz	≤ -157dBm
2GHz - 4GHz	≤ -157dBm
4GHz - 6GHz	≤ -152dBm
6GHz - 20GHz	≤ -157dBm
20GHz - 32GHz	≤ -154dBm
32GHz - 40GHz	≤ -148dBm
40GHz - 44GHz	≤ -140dBm

## 2. 4. Residues, Harmonics, TOI, Phase Noise

### 2. 4. 1. Residual Response

- **Settings:** Input terminated and 0 dB attenuation
- **Pre-amplifier On**

10MHz - 20GHz	≤ -100dBm
20GHz - 44GHz	≤ -95dBm

- **Pre-amplifier Off**

10MHz - 13GHz	≤ -90dBm
13GHz - 20GHz	≤ -85dBm
20GHz - 44GHz	≤ -80dBm

### 2. 4. 2. Image Response

- **Settings:** -20dBm Mixer Level

Turned Frequency (f)	Response
10MHz-20GHz	≤ -65dBc
20GHz - 44GHz	≤ -60dBc

### 2. 4. 3. Second Harmonic Distortion

- **Settings:** attenuation 0dB; input level: -30dBm

Second Harmonic Distortion	<60dBc
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#### 2. 4. 4. Third Order Intermodulation Distortion

- **Settings:** two tones, -25dBm, 100kHz tone spacing, 20°C - 30°C; pre-amplifier off.

Frequency Range	TOI (Nom.)
50MHz - 4GHz	≥+7dBm
4GHz - 13GHz	≥+6dBm
13GHz - 44GHz	≥+6dBm

#### 2. 4. 5. Phase Noise

- **Settings:** CF=1GHz

Frequency Offset	Phase Noise
10kHz offset	≤ -102dBc/Hz
100kHz offset	≤ -106dBc/Hz
10MHz offset	≤ -111dBc/Hz
10MHz offset	≤ -123dBc/Hz

#### 2. 5. Settings

<b>No. of Markers</b>	6
<b>Marker Functions</b>	Normal, Delta, Noise Marker, Counter
<b>Peak Function</b>	Peak search, Next peak, next peak left, next peak right, Max Value, Min Value, Peak track
<b>No. of Traces</b>	3
<b>Limit Function</b>	User can create/edit/save/recall the limit line and the instrument beeping when the trace breaks the limit line.
<b>Trace Operation</b>	clear/write, Max Hold, Min Hold

#### 2. 6. Interfaces

Interface Description	Interface Type	
RF input port	S3302A	N type (F)
	S3302B	N type (F)
	S3302C	2.4mm (M)
	S3302D	2.4mm (M)
Ref in/out port	BNC(f)	Reference 10MHz signal Input/Output
IF output port	BNC(f)	Output third/fourth IF under zero span (Option)

Interface Description	Interface Type	
Trigger input port	BNC(f)	TTL, External rising edge trigger or falling edge trigger. Trigger level -5V to +5V
GPS antenna port	BNC(f)	Can be used to connect the GPS antenna
Communication Port	Mini USB	Can be used to connect a PC for data transmission or program control (SCPI supported)
	USB type A x 2	For USB storage device or USB power sensor
	LAN 10/100Mbps	Can be used to connect to a PC for data transmission or program control (SCPI supported)
	SD Card Slot	SD card for data storage
	Headset 3.5mm port	For audio output of FM/AM demodulation
Power Interface	-	Can be used to power up S3302 or charge the batteries

## 2.7. General

Power Supply	Adapter Input	100V - 240V, 50/60Hz AC
	Adapter Output	15.0V, 3A - 4.0A DC
	Battery voltage (Nom.)	10.8V
	Battery Capacity (Nom.)	7000mAh
Power Consumption	Max. 30W	
Battery Life	3.5h (typical) Mode dependent	
Storage Capacity	8GB SD card	
Display	8.4" LCD Touch Screen	
Operation Temperature	-10°C - +50°C	
Storage Temperature	-40°C - +70°C	
Weight	<5Kg (battery not included)	
Warranty	36 months	
Dimension	LxWxH = 338mm x 218mm x 100mm	

## 2.8. Compliant

### 2.8.1. CE



- EMC

Complies with the requirements of the **EC EMC** directives.

Test Standards:EN 61326

- Safety

Complies with **EC LVD** Directive.

Test Standard:**EN61010-1**

### 2. 8. 2. ISO



- Manufacturing

This instrument is manufactured in an ISO-9001 registered facility

- End of Document -