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S3302 Series Handheld Spectrum Analyzer

Datasheet

Saluki Technology Inc.

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

- S3302SA handheld spectrum analyzer (9kHz-4GHz).
- S3302SB handheld spectrum analyzer (9kHz-6.5GHz).
- S3302SC handheld spectrum analyzer (9kHz-9GHz).
- 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).
- S3302E handheld spectrum analyzer (9kHz-50GHz).
- S3302F handheld spectrum analyzer (9kHz-67GHz).

Standard pack and accessories:

No.	Item
1	Main Machine
2	Power cord
3	Power adapter
4	U disk (manual)
5	USB cable
6	Battery

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

Model No.	Description	Note
S3302-05	Programming manual	
S3302-06	Power adapter	
S3302-07	Rechargeable lithium-ion battery	
S3302-08	CAT5 LAN cable	Point to point, 2m
S3302-09	Micro SD card	Capacity: 8GB
S3302-10	GPS option	GPS Exposed Antenna(BNC), Built-In GPS Module and Software

Model No.	Description	Note
S3302-11	USB power meter option	Provide USB Power Measurement function (Option 12-15 needed)
S3302-12	S87230 USB power continuous wave power sensor (9kHz - 6GHz)	Need option 11
S3302-13	S87231 USB power continuous wave power sensor (10MHz - 18GHz)	Need option 11
S3302-14	S87232 USB power continuous wave power sensor (50MHz - 26.5GHz)	Need option 11
S3302-15	S87233 USB power continuous wave power sensor (50MHz - 40GHz)	Need option 11
S3302-16	Interference analyzer option	Waterfall, RSSI
S3302-17	AM/FM/PM analyzer option	To Realize Modulation Characteristics Analysis of AM/FM/PM Signals.
S3302-18	Channel scanner option	To Realize Signal Power Measurement of Multiple Channels and Frequency.
S3302-19	List sweep option	To Realize Continuous Sweep Measurement of Various Frequency Bands .
S3302-20	Zero span IF output	Output the third(3rd.) IF(140.25MHz) or fourth(4th.) IF(31.25MHz) signal
S3302-21	ZE9080A Directional antenna	9kHz-20MHz, N (f) (need option 25)
S3302-22	ZE9080B Directional antenna	20MHz-200MHz, N (f) (need option 25)
S3302-23	ZE9080C Directional antenna	200MHz-500MHz, N (f) (need option 25)
S3302-24	ZE9080D Directional antenna	500MHz-8GHz, N (f) (need option 25)
S3302-25	S89401 antenna amplifier (10kHz - 4GHz，N(f))	For option 21-24
S3302-26	S89901 Horn antenna (1GHz - 18GHz, N(f))	Do not need amplifier
S3302-27	S89902 Horn antenna (18GHz - 40GHz, 2.92mm(f))	Do not need amplifier
S3302-28	Functional bag	
S3302-29	Backpack	

Model No.	Description	Note
S3302-30	Carrying case	For safety carrying
S3302-31	S89901 antenna handle	Need option 26
S3302-32	S89902 antenna handle	Need option 27
S3302-33	Signal analyzer	To realize the rapid analysis of interference signal, and provide the audio output and IQ Capture.
S3302-34	Field strength option	Provide Pscan, Fscan, MScan etc. Functions
S3302-35	Tracking generator (100kHz - 4GHz)	For S3302SA only
S3302-36	Tracking generator (100kHz - 6.5GHz)	For S3302SB only
S3302-37	Tracking generator (100kHz - 9GHz)	For S3302SC only
S3302-38	Orientation analysis option	Built-In software(need option10, 50 and directional Antenna)
S3302-39	Coverage map option	Built-In software(need option10)
S3302-41	Portable omnidirectional antenna	Frequency range :700MHz - 2.7GHz (for communication bands)
S3302-42	700MHz - 4GHz directional antenna	Active log-periodic antenna
S3302-43	700MHz - 6GHz directional antenna	Active log-periodic antenna
S3302-44	680MHz - 10GHz directional antenna	Active log-periodic antenna
S3302-45	680MHz - 20GHz directional antenna	Active log-periodic antenna
S3302-46	400MHz - 4GHz directional antenna	Active log-periodic antenna
S3302-47	400MHz - 6GHz directional antenna	Active log-periodic antenna
S3302-48	380MHz - 10GHz directional antenna	Active log-periodic antenna
S3302-49	380MHz - 20GHz directional antenna	Active log-periodic antenna
S3302-50	External electric compass	External USB electric compass (need option38)
S3302-51	6GHz omnidirectional antenna (680MHz - 6GHz)	Portable omnidirectional antenna
S3302-52	8GHz omnidirectional antenna (300MHz - 8GHz)	Portable omnidirectional antenna
S3302-53	VHF/UHF portable antenna	Frequency range :140MHz/430MHz
S3302-54	Passive directional antenna (700MHz - 4GHz)	Passive log-periodic antenna

Model No.	Description	Note
S3302-55	Passive directional antenna (700MHz - 6GHz)	Passive log-periodic antenna
S3302-56	Passive directional antenna (680MHz - 10GHz)	Passive log-periodic antenna
S3302-57	Passive directional antenna (680MHz - 18GHz)	Passive log-periodic antenna
S3302-58	Passive directional antenna (680MHz - 25GHz)	Passive log-periodic antenna
S3302-59	Passive directional antenna (680MHz - 35GHz)	Passive log-periodic antenna
S3302-60	N/SMA-JJ RF cable (2m)	N male to SMA male RF coaxial cable, DC-18GHz, Length 2m
S3302-61	N/SMA-JJ RF cable (1m)	N male to SMA male RF coaxial cable, DC-18GHz, Length 1m
S3302-67	ZE9080 Antenna transport box	Used for antenna and amplifier, including option 21, 22, 23, 24, 25

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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Saluki Technology

Document Authorization

The information contained in this document is subject to change without notice. The power to interpret the contents of and terms used in this document rests with Saluki.

Product Quality Assurance

The warranty period of the product is three years 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.

SALUKI TECHNOLOGY

Content

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℃) 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℃. 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)
S3302SA	9kHz - 4GHz
S3302SB	9kHz - 6.5GHz
S3302SC	9kHz - 9GHz
S3302A	9kHz - 20GHz
S3302B	9kHz - 26.5GHz
S3302C	9kHz - 32GHz
S3302D	9kHz - 44GHz
S3302E	9kHz - 50GHz
S3302F	9kHz - 67GHz

2. 1. 2. Frequency Reference

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

2. 1. 3. Frequency Readout Accuracy

Frequency Readout Accuracy	±（Frequency Readout x frequency reference accuracy＋2% x Span＋10% x RWB）

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

2. 2. Amplitude

2. 2. 1. Amplitude Range

Model	**S3302SA/SB/SC/E/F**	**S3302A/B/C/D**
Measurement Range	DANL to +27dBm, typ. (>10dB attenuation)	DANL to +30dBm, typ. (>10dB attenuation)
	DANL to +20dBm, typ. (<10dB attenuation)	DANL to +23dBm, typ. (<10dB attenuation)
	DANL to +10dBm, typ. (pre-amplifier on)	DANL to +13dBm, typ. (pre-amplifier on)
Input Attenuator Range	0 - 30dB in 5dB step	0 - 50dB in 10dB step

2. 2. 2. Maximum Safe Input Level

Model	**S3302SA/SB/SC/E/F**	**S3302A/B/C/D**
Maximum Safe Input Level (CW input)	+27dBm, typ. (≥10dB attenuation)	+30dBm, typ. (≥10dB attenuation)
	+20dBm, typ. (<10dB attenuation)	+23dBm, typ. (<10dB attenuation)
	+10dBm, typ. (pre-amplifier on)	+13dBm, typ. (pre-amplifier on)

2. 2. 3. Display Range

Display Type	Linear, logarithm
Display Scale	Logarithm scale: 0.1-10dB per scale, 0.1dB step minimum (10-scale display)
	Linear scale: 10 scale display
Unit	V, A, W, dBm, dBW, dBV, dBmV, dBuV, dBA, dBmA, dBuA

2. 2. 4. Absolute Amplitude Accuracy

Specifications in this section apply to following settings

- RBW: 10Hz - 1MHz, Input level: 0 to -50dBm, all settings are auto couple, 20℃- 30℃,30 minutes of preheating

10MHz - 13GHz	±1.8dB
13GHz - 40GHz	±2.3dB
40GHz - 50GHz	±2.7dB
50GHz - 67GHz	±3.0dB

2. 2. 5. Input Port VSWR

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

2. 2. 6. Reference Level

Logarithm scale	-120dBm to +30dBm, 1dB step
Linear scale	22.36uV - 7.07V, 0.1% step
Conversion Uncertainty	±1.20dB (reference level 0dBm to -60dBm)

2. 2. 7. Display Scale Fidelity

Scale Fidelity	±1.00dB

2. 2. 8. Trace Detector

Trace Detector	Auto, Normal, positive peak, negative peak, sample, average, RMS

2. 3. Dynamic Range Specifications

2. 3. 1. 1dB Gain Compression

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

S3302SA/SB/SC	
50MHz - 9GHz	≥+2dBm
S3302A/B/C/D	
50MHz - 4GHz	≥-2dBm
4GHz - 13GHz	≥-3dBm
13GHz - 44GHz	≥-3dBm

2. 3. 2. DANL

- **Settings:** 50ohm load, 0dB attenuation, 1Hz RBW, average detector mode, logarithmic Video Type, RBW normalization to 1Hz,

20℃- 30℃, tracking generator off

- **Pre-amplifier Off**

S3302SA/SB/SC	
10MHz - 3GHz	≤-140dBm
3GHz - 9GHz	≤-138dBm
S3302A/B/C/D	
10MHz - 20GHz	≤-138dBm
20GHz - 32GHz	≤-135dBm
32GHz - 40GHz	≤-127dBm
40GHz - 44GHz	≤-120dBm
S3302E/F	
10MHz - 20GHz	≤-136dBm
20GHz - 32GHz	≤-135dBm
32GHz - 40GHz	≤-130dBm
40GHz - 46GHz	≤-121dBm
46GHz - 60GHz	≤-116dBm
60GHz - 67GHz	≤-102dBm

- **Pre-amplifier On**

S3302SA/SB/SC	
10MHz - 3GHz	≤-160dBm
3GHz - 9GHz	≤-157dBm
S3302A/B/C/D	
10MHz - 20GHz	≤-157dBm
20GHz - 32GHz	≤-154dBm
32GHz - 40GHz	≤-148dBm
40GHz - 44GHz	≤-140dBm
S3302E/F	

10MHz - 32GHz	⩽-154dBm
32GHz - 40GHz	⩽-148dBm
40GHz - 46GHz	⩽-143dBm
46GHz - 60GHz	⩽-135dBm
60GHz - 67GHz	⩽-123dBm

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

2. 4. 1. Residual Response

- **Settings:** RF input match, 0 dB attenuation, tracking generator off
- **Pre-amplifier On**

S3302SA/SB/SC	
10MHz - 9GHz (Exceptional frequency: 3.2GHz)	⩽-95dBm
S3302A/B/C/D	
10MHz - 32GHz (Exceptional frequency: 3.2GHz)	⩽-100dBm
32GHz - 44GHz	⩽-95dBm

- **Pre-amplifier Off**

S3302SA/SB/SC	
10MHz - 9GHz (Exceptional frequency: 3.2GHz)	⩽-82dBm
S3302A/B/C/D	
10MHz - 13GHz (Exceptional frequency: 3.2GHz)	⩽-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	S3302SA/SB/SC/E/F	S3302A/B/C/D
	< -65dBc	< -60dBc

2. 4. 4. Third Order Intermodulation Distortion

- **Settings:** two tones, -15dBm, 100kHz tone spacing, 20℃ - 30℃; pre-amplifer off.

Frequency Range	S3302SA/SB/SC
50MHz - 9GHz	≥+10dBm

Frequency Range	S3302A/B/C/D
50MHz - 4GHz	≥+7dBm
4GHz - 13GHz	≥+6dBm
13GHz - 44GHz	≥+6dBm

2. 4. 5. SSB Phase Noise

- Settings: CF=1GHz, 20℃ - 30℃

Frequency Offset	S3302SA/SB/SC	S3302A/B/C/D/E/F
10kHz offset	≤ -108dBc/Hz	≤ -102dBc/Hz
100kHz offset	≤ -112dBc/Hz	≤ -106dBc/Hz
1MHz offset	≤ -118dBc/Hz	≤ -111dBc/Hz
10MHz offset	≤ -129dBc/Hz	≤ -123dBc/Hz

2. 5. Tracking Generator (Option)

Frequency range	S3302SA: 9 kHz - 4 GHz S3302SB: 9kHz - 6.5GHz S3302SC: 9kHz - 9GHz
Amplitude range	0 dBm to -40dBm
Minimum Amplitude step	0.1dB
Amplitude accuracy	±2.50dB （Frequency Range 10MHz-9GHz, Amplitude Range0dBm to -40dBm ,20℃ - 30℃）
Sideband noise	≤-90dBc/Hz@10kHz frequency offset

(1GHz frequency point, 0dBm output)	≤-95dBc/Hz@100kHz frequency offset ≤-110dBc/Hz@1MHz frequency offset

2. 6. Settings

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

2. 7. Interfaces

Interface Description	**Interface Type**	
RF input port	S3302SA	N type (f)
	S3302SB	N type (f)
	S3302SC	N type (f)
	S3302A	N type (f)
	S3302B	N type (f)
	S3302C	2.4mm (m)
	S3302D	2.4mm (m)
	S3302E	1.85mm (m)
	S3302F	1.85mm (m)
RF output port	N type (f)	S3302SA/SB/SC tacking generator option
Ref in/out port	BNC(f)	Reference 10MHz signal Input/Output
IF output port	BNC(f)	Output third/fourth IF under zero span (Option)
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

Interface Description	Interface Type	
		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

2. 8. General

Power Supply	Adapter Input	100V - 240V, 50/60Hz AC
	Adapter Output	15.0V, 4A DC
	Battery voltage (Nom.)	10.8V
	Battery Capacity (Nom.)	7800mAh
Power Consumption	S3302SA/SB/SC: ≤25W, S3302A/B/C/D: ≤30W, S3302E/F: ≤38W	
Battery Life (typ.)	S3302SA/SB/SC: 3hrs, S3302A/B/C/D: 2.5hrs, S3302E/F: 2hrs	
Storage Capacity	8GB SD card	
Display	8.4" LCD Touch Screen	
Operation Temperature	-10℃ - +50℃ (Operating temperature range of power supply by battery: 0℃ to +45℃)	
Storage Temperature	-40℃ - +70℃ （Storage temperature range of battery: -20℃ to +60℃）	
Weight (excluding battery)	S3302SA/SB/SC: ≤4.5kg, S3302A/B/C/D: ≤5kg, S3302E/F: ≤5.3kg	
Warranty	3 years	
Dimension	LxWxH = 314mm x 218mm x 91mm (excluding handle, stand) LxWxH = 338mm x 218mm x 100mm (including handle, stand)	

2. 9. Compliant

2. 9. 1. CE

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. 9. 2. ISO

- Manufacturing

This instrument is manufactured in an ISO-9001 registered facility

- End of Document -