

Technical Data Sheet
Preliminary

ThinkRF R5500

Real-Time Spectrum Analyzer

9 kHz to 8 GHz / 18 GHz / 27 GHz

Featuring

- Real-Time Bandwidth (RTBW) up to 100 MHz
- Spurious Free Dynamic Range (SFDR) up to 100 dBc
- Small form-factor, GigE networked and remote deployable





Specifications

Frequency Range		
Frequency Ranges	9 kHz to 8, 18 or 27 GHz	
Frequency Reference	±1.0 x 10 ⁻⁶ per year ±1.0 x 10 ⁻⁶ per year	Aging Accuracy + aging
Real-time bandwidth (RTBW)	0.1 / 10 / 40 /100 MHz	
100% Probability of Intercept (POI)	≥ 25.552 μs signal duration ≤ 17.360 μs signal duration	For 100% POI For 0% POI
Spurious free dynamic range (SFDR)	60 dBc (typical) 70 dBc (typical) 100 dBc (typical)	100 MHz RTBW 10 / 40 MHz RTBW 0.1 MHz RTBW
Data Acquisition		
A/D Converter Sampling Rate and Resolution	125 MS/s, 14 bit 300 kS/s, 24 bit	10 / 40 / 100 MHz RTBW 0.1 MHz RTBW
FFT lengths	128 to 524288 in powers of 2	
Resolution Bandwidth (RBW)		
Range	0.24 kHz to 976.56 kHz 0.62 Hz to 2543.12 Hz	10 / 40 / 100 MHz RTBW 0.1 MHz RTBW
Windowing	Hanning	
Traces	6	Clear/Write, Trace Average, Max Hold, Min Hold
APIs	Python™ LabVIEW MATLAB® C/C++ SCPI	PyRF RTSA LabVIEW Base Development System for Windows MATLAB® Release 2014b ISO/IEC 14882:2011 IEEE 488.2 - Standard Commands for Programmable Instruments
Record/Playback Preferences	VITA Radio Transport (VRT) Save/Load Settings	VITA-49.0 – 2007 Draft 0.21 Save settings for easy recall
Export Data	CSV	Comma Separated Values
Amplitude		
Amplitude Accuracy 25 °C ± 5 °C	± 2.00 dB typical	50 MHz to 8 GHz
Amplitude Ranges		
Measurement Range	DANL to maximum safe input level	
Attenuator Range	0 to 30 dB in 10 dB steps 0 to 25 dB in 1 dB steps	8 GHz IF Attenuator for 18 and 27 GHz only
Maximum Safe RF Input Level	+10 dBm, 0 V DC	
Sweep Rate		
	28 GHz/s @ 10 kHz RBW	40 MHz IBW
Stream Rate		
	360 Mbit/s	



Specifications (Continued)

Spectral Purity				
SSB Phase noise 25°C ± 5°C		At 1 GHz		Carrier Offset
		-90 dBc/Hz		100 Hz
		-92 dBc/Hz		1 kHz
		-100 dBc/Hz		10 kHz
		-101 dBc/Hz		100 kHz
		-121 dBc/Hz		1 MHz
Display Average Noise Level (DANL) at 25°C ± 5°C				
Frequency	8 GHz (typical)	8 GHz Pre-Amp (typical)	18 GHz (typical)	27 GHz (typical)
100 MHz	-151 dBm/Hz	-164 dBm/Hz	-164 dBm/Hz	-162 dBm/Hz
500 MHz	-151 dBm/Hz	-163 dBm/Hz	-163 dBm/Hz	-162 dBm/Hz
1 GHz	-150 dBm/Hz	-161 dBm/Hz	-161 dBm/Hz	-160 dBm/Hz
2 GHz	-149 dBm/Hz	-152 dBm/Hz	-152 dBm/Hz	-144 dBm/Hz
3 GHz	-145 dBm/Hz	-157 dBm/Hz	-157 dBm/Hz	-157 dBm/Hz
4 GHz	-140 dBm/Hz	-155 dBm/Hz	-155 dBm/Hz	-154 dBm/Hz
5 GHz	-142 dBm/Hz	-149 dBm/Hz	-149 dBm/Hz	-145 dBm/Hz
6 GHz	-134 dBm/Hz	-143 dBm/Hz	-143 dBm/Hz	-143 dBm/Hz
7 GHz	-134 dBm/Hz	-149 dBm/Hz	-149 dBm/Hz	-143 dBm/Hz
8 GHz	-131 dBm/Hz	-163 dBm/Hz	-163 dBm/Hz	-158 dBm/Hz
9 GHz			-162 dBm/Hz	-158 dBm/Hz
10 GHz			-162 dBm/Hz	-157 dBm/Hz
11 GHz			-160 dBm/Hz	-160 dBm/Hz
12 GHz			-158 dBm/Hz	-154 dBm/Hz
13 GHz			-156 dBm/Hz	-146 dBm/Hz
14 GHz			-155 dBm/Hz	-150 dBm/Hz
15 GHz			-159 dBm/Hz	-147 dBm/Hz
16 GHz			-155 dBm/Hz	-150 dBm/Hz
17 GHz			-152 dBm/Hz	-145 dBm/Hz
18 GHz			-149 dBm/Hz	-147 dBm/Hz
19 GHz				-147 dBm/Hz
20 GHz				-151 dBm/Hz
21 GHz				-146 dBm/Hz
22 GHz				-145 dBm/Hz
23 GHz				-149 dBm/Hz
24 GHz				-151 dBm/Hz
25 GHz				-148 dBm/Hz
26 GHz				-143 dBm/Hz
27 GHz				-133 dBm/Hz
Third Order Intercept (TOI) at max gain	+12 dBm, typical		At 1 GHz	
General Specifications				
Recommended PC				
Operating System	Windows 7, 8, 10 (32 or 64)		For best performance, a dedicated PC is recommended	
Minimum RAM Size	4 GB			



Specifications (Continued)

Minimum Free Hard Disk Space	2 GB	
Ethernet Port	1 GigE	
Display Resolution	1920 x 1080	
Status Indicators	PLL Lock / 10 MHz reference clock status Ethernet Link and Activity Status CPU and Power Status	
Connectors		
RF In	SMA female, 50 Ω	
10 MHz Reference In and Out	SMA female, 50 Ω	0 or 35 MHz
Analog I and Q Out	SMA female, 50 Ω	
HIF Out	SMA female, 50 Ω	
10/100/1000 Ethernet	RJ45	
USB Console	mini-USB	
GPIO	25-pin male D-Subminiature	
Coaxial Power	Type A: 5.5 mm OD, 2.5 mm ID	
Power		
Physical Power Supply	+12V DC	
Power Consumption	18W	
Physical		
Operating Temperature Range	0°C to +50°C	
Storage Temperature Range	-40°C to +85°C	
Warm up time	30 minutes after connecting to the PC with the S240 Software	
Size	269 x 173 x 61 mm (10.58 x 6.81 x 2.40 inches)	with mounting feet (shipped installed on unit)
	269 x 173 x 55 mm (10.58 x 6.81 x 2.15 inches)	without mounting feet
Weight	2.7 kg (6 lbs.)	
Regulatory Compliance		
Security	Kensington Security Slot	Located on back end-plate
RoHS Compliance	RoHS/RoHS 2	
Marks	CE	European Union
EMC Directive 2014/30/EU	EN 61326-1:2013	Electromagnetic Compatibility
Low Voltage Directive 2006/95/EC	EN 61010-1:2010 Class 1	Safety
Ordering Information		
8 GHz RTSA	R5500-408	9 kHz to 8 GHz, RTBW up to 100 MHz
18 GHz RTSA	R5500-418	9 kHz to 18 GHz, RTBW up to 100 MHz
27 GHz RTSA	R5500-427	9 kHz to 27 GHz, RTBW up to 100 MHz
8 GHz Preamp	R5500-408-P	8 GHz spectrum analyzer with 100 kHz to 100 MHz RTBW with pre-amp and additional preselect filtering. Applicable only to the R5500-408.
80 MHz and 160 MHz RTBW Support	R5500-xxx-WBIQ **	External support for 80 MHz Super-Heterodyne and 160 MHz Zero-IF RTBW. The RTBW of 160 MHz is intended for IQ out only. The internal digitizer remains at 125 MSa/s.
Software Included	ThinkRF S240 Real-Time Spectrum Analysis Software	
Rack Shelf	R5500-RACK-SHELF	19" rack shelf supports two horizontally mounted R5500s

** xxx = 408, 418 or 427 for 8 GHz, 18 GHz, or 27 GHz models respectively



About ThinkRF

ThinkRF enables the cost-effective research, testing and monitoring of all wireless devices by delivering high performance Real-Time Spectrum Analyzers to customers across industries. Using patented software-defined radio technologies, the ThinkRF Real-Time Spectrum Analyzer solutions provide the performance, versatility and portability needed for aerospace & defense firms, manufacturers, spectrum regulators, wireless service providers and OEMs & system integrators.

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