SALUKI TECHNOLOGY

SAM-A Modular Spectrum Analyzer

Introduction

The SAM200/260 Modular Spectrum Analyzer is a wide-bandwidth, compact-size microwave spectrum analyzer with a measurement frequency range covering 9kHz to 20GHz/26.5GHz.Featuring a highly integrated RF front-end and an integrated digital processing design, it boasts a SAMll form factor and independent signal processing capability, making it particularly suitable for microwave test system integration and signal monitoring sensor applications.With a maximum real-time bandwidth of 80MHz, it meets the testing requirements of common radio signals such as mobile communications, television, and WiFi. The analog intermediate frequency (IF) output provides users with multiple testing options.The PC host computer can directly obtain measurement results via USB or LAN interfaces, allowing users to conduct flexible secondary development according to their needs.Equipped with multiple measurement modes including swept-frequency spectrum, modulation analysis and identification, and monitoring reception, the product can be widely applied in various fields such as aerospace, microwave communications, satellite navigation, radar detection, electronic reconnaissance and countermeasures, and precision guidance.

Features

- Frequency range：9kHz~20GHz/26.5GHz
- It supports multiple measurement modes such as spectrum analysis, modulation analysis, and receiver mode
- Maximum real-time bandwidth: 80MHz
- Real-time upload of audio demodulated code streams and real-time storage of I/Q data
- The module itself performs signal analysis and processing, and directly uploads measurement results
- I/Q data stream recording, with a maximum bandwidth of 40MHz and a real-time storage depth of up to 512MB
- Powered by a single power supply with a wide voltage range of 8V - 13V
- Supports dual control interfaces of RJ-45 network and USB
- Provides standard PC host computer and SDK

Specifications

Appilcable conditions	Specifications apply under the following conditions: after 30 minutes of warming-up,within a valid calibration period		
Model	SAM200		SAM260
Frequency range	9kHz~20GHz/26.5GHz		
Frequency readout accuracy	±(frequency indication×frequency reference accuracy+1%×span+10%×RBW+0.5×[span/(sweep points-1)]+1Hz)		
Internal frequency reference (10MHz)	Aging Rate	<0.5ppm/year	
	Temperature stability	<0.2ppm (15℃~35℃)	
Resolution bandwidth (RBW)			
Range	1Hz to 10MHz, (step of 1、2、3、5)		
Selectivity(60dB/3dB bandwidth ratio)	RBW≤1MHz	<5:1 Typical	
Accuracy		10% (<5% Typical)	
Video bandwidth (VBW)	1Hz~5MHz		

Displayed average noise level (0dB attenuator, RBW=1Hz)		
Preamp off	9kHz~1MHz <-100dBm 1MHz~20MHz <-105dBm-3×(f/2MHz)dB 20MHz~4.0GHz <-138dBm 4GHz~8GHz <-135dBm 8GHz~14GHz <-134dBm 14GHz~20GHz <-130dBm 20GHz~26.5GHz <-126dBm	
Preamp on	1MHz~20MHz <-138dBm 20MHz~4GHz <-155dBm 4GHz~8GHz <-150dBm 8GHz~14GHz <-155dBm 14GHz~20GHz <-152dBm 20GHz~26.5GHz <-146dBm	
SSB phase noise		
fc=1GHz	Carrier offset 10kHz -95dBc/Hz	
	Carrier offset 1MHz -106dBc/Hz	
Ps:fc=1000MHz, Sample detector, Trace Average≥10		
Sweep time		
Span>0Hz	5ms~3000s	
Span=0Hz	20us~3000s	
mode	Continuous, single	
Trigger		
Trigger	Free, video, external	
External Trig Level	5V/3.3V- TTL	
Amplitude accuracy		
Overall amplitude accuracy	1MHz~13.5GHz:±1.5dB	
	13.5GHz~20GHz:±2.0dB	
	20GHz~26.5GHz:±2.5dB	
Amplitude		
Measurement range fc≥10MHz	Displayed average noise level to +20dBm	
Maximum safe input level	Average continuous power	+27dBm
Maximum DC input voltage	25Vdc	
Input attenuator range	0~30dB, steps of 2 dB	
Spurious and residuals		
IF/Image rejection	70dB/60dB (typical)	
TOI	>30MHz	+13dBm
SHI		+45dBm
Input related spurious	>10MHz	<-60dBc
Residual response		<-85dBm
Inputs/outputs		
RF input connector	2.92mm female (50Ω)	
USB	USB 2.0	
LAN	10/100 Base-T, RJ-45 connector	
Reference in	10MHz, SAM female, input level 0dBm to +10dBm	
Reference out	10MHz, SAM female, output level 0dBm±2dB	
IF output	145MHz, SAM female	
External trigger input	SAM female, 5V/3.3V- TTL (max:±10V,100mA)	
Earphone jack	3.5mm audio demodulation output	
General data		
Weight	1000g maximum	
Core module dimensions	165mm×120mm×32mm	
Optional enclosure dimensions	165mm×120mm×45mm	
Operating temperature	-10℃~50℃	
Storage temperature	-40℃~+70℃	
Power supply	Voltage range	+9VDC~+13VDC
	Current	About 1.7A (+12VDC)

Receiver Mode

Model	SAM200	SAM260
RF characteristics		
Frequency range	9kHz ~20GHz	9kHz ~ 26.5GHz
Panoramic scanning speed	120GHz/s@25kHz	
Amplitude accuracy	±2.0dB	
Noise figure (low noise)	18dB (.typ, 10MHz~20GHz)	18dB (.typ, 10MHz~20GHz) 25dB (.typ, 20GHz~26.5GHz)
TOI	+10dB m (f≥30MHz, Low noise)	
SOI	+45dB m (f≥30MHz, Low noise)	
Image frequency rejection	60dB (.typ)	
IF rejection	70dB	
Residual response	-100dB m (no more than 5points > -110dBm, f≥10MHz)	
IF characteristics		
Real-time bandwidth	80MHz	
IF display bandwidth	10kHz~80MHz	
IF demodulation bandwidth	1.5kHz~40MHz	
Audio demodulation	AM、FM、LSB、USB, and the audio code stream is pushed to the PC	
I/Q data	Maximum bandwidth 5MHz	Maximum bandwidth 40MHz
	Maximum memory depth of 512 MB, I = Q = 2 Bytes, and I/Q data output via LAN interface	

Analog Modulation Analysis

Model		SAM200		SAM260
Frequency range		2MHz~20GHz		2MHz~26.5GHz
AM measurement	Modulation rate	20Hz~100kHz	Accuracy	1Hz, nominal (modulation rate <1kHz) ;<0.1% modulation rate, nominal (modulation rate≥1kHz)
	Depth	5%~95%	Accuracy	±4%, nominal
FM measurement	Modulation rate	20Hz~100kHz	Accuracy	1Hz, nominal (modulation rate <1kHz) ;<0.1% modulation rate, nominal (modulation rate≥1kHz)
	Deviation	500Hz~400kHz	Accuracy	±4%, nominal
Real-Time acquisition of I/Q data	Maximum capture bandwidth of 5MHz			Maximum capture bandwidth of 40MHz
	Maximum memory depth of 512 MB, I = Q = 2 Bytes, and I/Q data output via LAN interface			

Ordering information

Configuration	Designation	Model
Host of spectrum analyzer	9kHz to 20GHz(standard GPSA mode)	SAM200
	9kHz to 26.5GHz(standard GPSA mode)	SAM260
Accessories	CD-ROM (users manual、programming manual、PC host computer software)	
	AC/DC adapter (AC input, +12VDC output)	
	RJ45 ethernet cable	
Options	Receiver mode (80MHz bandwidth)	SAM-B80
	Analog modulation analyzer (AM/FM modulation analysis, I/Q data acquisition)	SAM-AMA
	Digital modulation analyzer	SAM-DMA
	Modulation recognition	SAM-MR
	Near-field probe	ANT01
	Broadwidth omni-directional antenna (300MHz～7.5GHz)	OA750
	Broadwidth directional antenna (600MHz～8GHz)	DA800