SA1036 series spectrum analyzer

Overview

SA1036 series spectrum analyzer is the new generation instruments of 41st institute. It has the advantages of broad bandwidth, high resolution, high dynamic range, high precision, low phase noise and fast measurement speed. It is manufactured with a lot of new technologies, such as all digital IF, auto spectrum detection and real-time calibration and broadband microwave and millimeter wave integration. It has excellent performance and is adaptive to all environments. The modular and standard design on the one hand improves the producibility, debugging, maintenance and reliability dramatically, on the other hand strengthens the connectivity among the modules. The combination of software and hardware modules forms the series products and makes the upgrade and extension more convenient.

SA1036 can measure the frequency, power .bandwidth and modulation of many type of signals, such as modulated signal, harmonic distortion, stimulus and response, pulsed RF signal and phase noise. It has a wide range of applications as follows: communication, radar, navigation, spectrum management, signal supervision, information security, the research, production test and metrology of electronic devices and components.

SA1036 series spectrum analyzer is a product of independent design and has the full IPR. Many key technologies used in it are innovative in china. SA1036 series spectrum analyzer is the new generation high performance microwave and millimeter wave spectrum analyzer of the 41st institute with the highest performance level in china and the comprehensive performance is among the current international advanced level.

Major characteristics

High performance

- phase noise -108dBc/Hz(typical) carrier1GHz @1kHz offset
- frequency resolution of frequency counter 0.001Hz
- DANL -152dBm (typical)
- 1dB compression point +7dBm
- TOI +17dBm (typical)
- All digital IF design

Flexibility

● Using the continuous sweep of the digital resolution bandwidth filter or FFT. Optimal test speed and sensibility

● 160 digital resolution bandwidth set-ups to realize the optimal combination of sweep bandwidth and resolution bandwidth and optimize the measurement results.

●2dB step attenuator

● Interfaces of IF, video, sweep and trigger output.

● embedded and multi-task system, flexible for the storage, print and share of the measurement results.

● GPIB, USB, LAN, Serial port, easy to establish auto measurement system

● Serial products, multi-option and configurations.

User friendly interface

●Chinese and English operation interface, built-in operation instruction and help menu.

● 8.4 inch LCD,170 degrees visual angle

Adaptability

● auto calibration technology, adaptive to all environments

● power supply adaptive to 110V/220V systems

Specifications

Model	SA1036	SA1036A/SA1036B/ SA1036D/SA1036E/SA1036F/SA1036G
Frequency range	3Hz~40GHz	3Hz~4GHz/8GHz/18GHz/26.5GHz/43GHz/50GHz
10MHz Precise frequency reference	Frequency accuracy: ±(last calibration date ×aging rate+temperature stability+calibration accuracy) Aging rate: $\pm 1'10^{-9}$/day ,$\pm 1'10^{-7}$/year Temperature stability: $\pm 1'10^{-8}$(20℃ ~ 30℃) $\pm 5'10^{-8}$(0℃ ~ 55℃) Frequency accuracy: $\pm 7'10^{-8}$	
Frequency readout accuracy	±(readout ×frequency reference error+0.5%span+5%resolution bandwidth+2Hz+0.5horizontal resolution) Horizontal resolution=span/(sweep points-1),default point is 751 under adaptive state	

Frequency counting accuracy	Marker accuracy ± (frequency read out +frequency reference error+0.100) Delta marker accuracy: ± (delta marker readout× frequency reference error+0.100) Counter resolution : 0.001Hz
Span Continuous and step model	Range: 0Hz(zero span) 100Hz ~40GHz Resolution: 0.001Hz Accuracy: ±(0.2%×span+span/(sweep point number-1))
Sweep time	Range: zero span 1us ~ 6000s Span ≥100Hz 5ms ~ 2000s Accuracy: span ≥ 100Hz(continuous)±0.01%(nomination) Span ≥ 100Hz(step) ±40 %(nomination) Span = 0 Hz ±0.01%(nomination)
trigger	Trigger: free video, power supply, external(front, rear panel) Trigger delay: 1us ~ 500 ms Resolution: 0.1us
Resolution bandwidth	Range: 1Hz ~ 3MHz (10％step)4MHz,5MHz,6MHz,8MHz Accuracy: 1Hz~3MHz ±6% 4MHz~8MHz(< 4GHz) ±20% Selectivity: (–60dB/–3dB): ≥5:1
Video bandwidth	Range : 1Hz ~ 3MHz (10%step),4MHz,5MHz,6MHz,8MHz Accuracy: 1Hz~3MHz ±6% (nomination)
Sideband noise (20degree ~ 30degree,carrier1GHz)	-91dBc/Hz@100Hz,-103dBc/Hz@1kHz,-114dBc/Hz@10kHz,-117dBc/Hz@100kHz, -145dBc/Hz@1MHz,-154dBc/Hz@6MHz,-156dBc/Hz@10MHz
Residual FM	<1Hz×N(N is harmonic number)
Amplitude range	Measurement range: DANL~max safe input signal level Attenuation range : 0 ~ 70dB,2dB step
Max input level	CW(input attenuation ³ 10dB): +30dBm(nomination) Peak pulse power(pulse width<10us,duty cycle<1%,input attenuation>30dB):+50dBm(100W) (nomination) Current voltage: input<±0.2Vdc

1dB gain Compression point (dual tone,mixer input level)	20MHz~200MHz 0dBm 200MHz~4GHz +3dBm 4GHz~8GHz +3dBm 8GHz~26.5GHz -2dBm 26.5GHz~50GHz 0dBm
DANL (input loaded,sample or average detection, video average,log,20degree~30degree)	10MHz~50MHz -142dBm 50MHz~1GHz -152dBm 1GHz~2GHz -151dBm 2GHz~3GHz -150dBm 3GHz~4GHz -147dBm 4GHz~8GHz -152dBm 8GHz~16GHz -145dBm 16GHz~20GHz -140dBm 20GHz~26.5GHz -138dBm 26.5GHz~40GHz -129dBm 40GHz~50GHz -127dBm
Display	Log scale: 0.1dB~1dB/div 0.1dBstep,1~20/div 1dB step(10divs) Linear scale: 10 divs Scale units: dBm, dBmV, dBμV, V, W
Frequency response (10dBattenuation,20degree~30degree, Auto preselector)	3Hz~4GHz ±1.0 dB 4GHZ~8GHz ±1.8dB 8GHz~22GHz ±2.8dB 22GHz~26.5GHz ±3.0dB 26.5GHz~50GHz ±3.5dB
Absolute magnitude accuracy	(10dB attenuation,10Hz£ RBW£1MHz,input signal -10~-50dBm, auto coupling,any reference level,any scale) 300MHz ±0.24dB All frequencies ±(0.24Db+frequency response)
Input VSWR (input attenuation≥8dB)	50MHz~3GHz < 1.5:1

	3GHz~18GHz < 1.7:1 18GHz~26.5GHz < 1.9:1 26.5GHz□40GHz < 1.9:1 40GHz□50GHz <2.0:1
Resolution bandwidth Conversion uncertainty	1Hz□1MHz £ ± 0.2dB 1.1MHz□3MHz £ ± 0.3dB 4 5 6 8MHz £ 1.0dB
Reference level range	Log scale –170 dBm □ +30 dBm , 0.01 dB step Linear scale 707 pV □ 7.07 V , 0.1% step
Fidelity of display scale	Input mixer level £-20dBm ±0.07dB -20dBm<input mixer level <-10dBm ±0.13dB
Second harmonic distortion	10MHz□2.0GHz(mixer level -40dBm) -82dBc 2.0GHz□4.0GHz(mixer level -10dBm) -94dBc 4.0GHz□13.25GHz(mixer level -10dBm) -96dBc 13.25GHz□25GHz(mixer level -10dBm) -100dBc
TOI distortion(mixer level -30dBm,dual tone frequency interval>15kHz,20□30degree)	10MHz□4.0GHz <-88dBc 4.0GHz□8.0GHz <-92dBc 8.0GHz□50GHz <-84dBc
Trace detection models	Standard ,sample, positive peak, negative peak, average, effective value
Temperature range	Operation range 0□+50 degree Storage range -40□+70 degree
Memory capacity	Internal 1GB External USB mobile storage equipment
dimensions	depth x width x height = 500 x 426 x 177 (mm)

weight	Net weight about 22kg Gross weight about 26kg
Input connector	SA1036/SA1036F/G:2.4mm(male),impedance 50ohm SA1036A/B/C/D:N type(female),impedance50ohm