VSA800P Series Spectrum Analysis Module Technical Specification

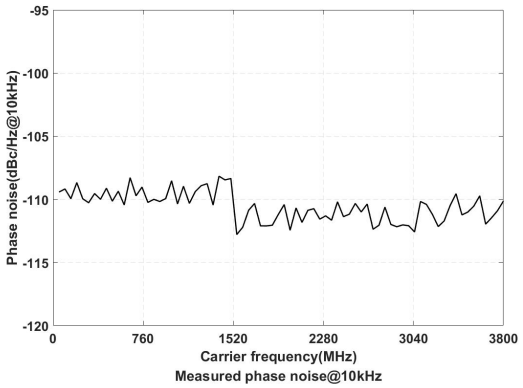
This chapter lists the technical specifications and general technical specifications of the spectrum analyzer. Unless otherwise stated, the technical specifications apply to the following conditions:

- The instrument has been preheated for 30 minutes before use.
- The instrument is in the calibration cycle and has been self-calibrated.

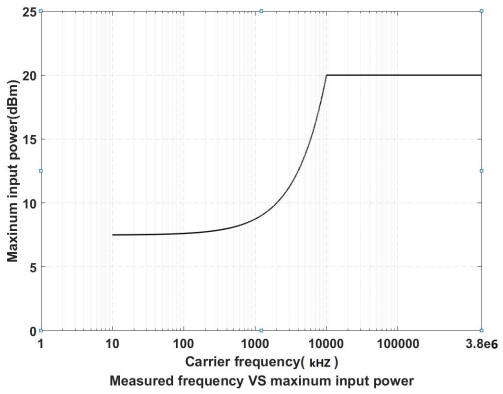
"Typical" and "nominal" for this product are defined as follows

- Typical: Refers to the performance of the product under certain conditions.
- Nominal: Refers to the approximate value under product application process.

Frequency		
Frequency Range	VSA815P(TG)	9 kHz to 1.500000000 GHz
	VSA836P(TG)	9 kHz to 3.600000000 GHz
	VSA880P(TG)	9 kHz to 8.000000000 GHz
Frequency	1 Hz	
Internal Reference Frequency		
Reference Frequency	10 MHz	
Reference Frequency Accuracy	±[(days since last calibrate × freq aging rate) + temperature stability + initial accuracy]	
Initial calibration accuracy	<1 ppm	
Temperature stability	0℃ to 50℃, reference to 25℃ < 0.5 ppm	
Aging rate	<1 ppm/year	
Temperature	0℃ to 50℃, reference to 25℃	
Frequency Reading Accuracy		
Reference frequency	10.000000 MHz	
Reference frequency accuracy	± [(Time since last calibration × frequency aging rate) + temperature stability + initial accuracy]	
Frequency Counter		
Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
Uncertainty	±(frequency indication × reference frequency accuracy + counter resolution)	
Frequency Span		
Range	0 Hz, 100 Hz to maximum frequency of instrument	

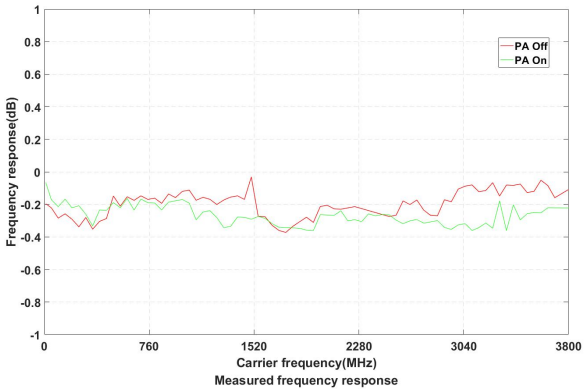
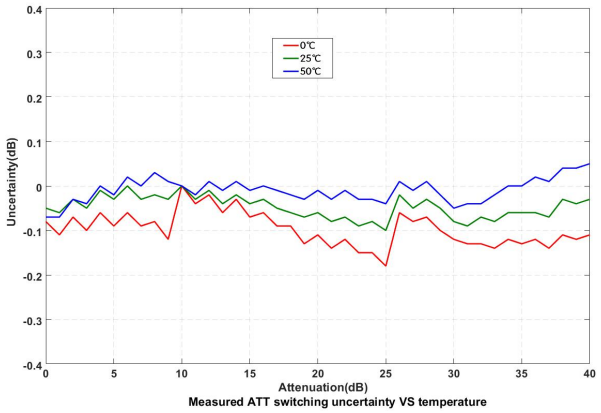
Uncertainty		± span / (number of sweep points - 1)
SSB Phase Noise (20℃ to 30℃,fc=1 GHz)		
Carrier Offset	10 kHz	< -106 dBc/Hz (typical)
	100 kHz	< -104 dBc/Hz (typical)
	1 MHz	< -115dBc/Hz (typical)
		
Residual FM (20℃ to 30℃, RBW = VBW = 1 kHz)		
Residual FM		< 50 Hz (nominal)
Bandwidth		
Resolution Bandwidth(-3dB)		1 Hz to 1 MHz (1-3-5-10 steps by sequence)
RBW accuracy		< 5%, typical
Resolution Filter Shape Factor (60 dB : 3 dB)		< 5 typical
Video Bandwidth (-3 dB)		10 Hz to 3 MHz(1-3-5-10 steps by sequence)
Resolution bandwidth (-6 dB) (EMI)		200 Hz, 9 kHz, 120 kHz, 1 MHz
Amplitude		
Measurement Range		
Range	VSA 815P (TG)	DANL to +10 dBm, 100 kHz~ 10 MHz, Preamp Off DANL to +20 dBm, 10 MHz~ 1.5 GHz, Preamp Off
	VSA 836P (TG)	DANL to +10 dBm, 100 kHz~ 10 MHz, Preamp Off DANL to +20 dBm, 10 MHz~ 3.6 GHz, Preamp Off
	VSA 880P (TG)	DANL to +10 dBm, 100 kHz~ 10 MHz, Preamp Off DANL to +20 dBm, 10 MHz~ 8GHz, Preamp Off
Max Input Level		
Input DC	50V	

Continuous power	Attenuator = 40 dB
	+20 dBm(100 mW)
Max. damage level	+30 dBm(1 W)

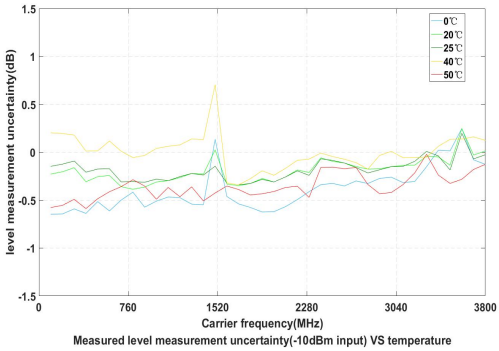


Display Average Noise Level(DANL)			
Frequency		attenuation = 0 dB, RBW = VBW = 100 Hz, sample detector, trace average ≥ 50, 20℃ to 30℃, input impendence = 50 Ω	
Preamp Off	VSA 815P (TG)	9 kHz to 1 MHz	-95 dBm (Typical), <-88 dBm
		1 MHz to 500 MHz	-140 dBm (Typical), <-130 dBm
		500 MHz to 1.5 GHz	-138 dBm (Typical), <-128 dBm
	VSA 836P (TG)	9 kHz to 1 MHz	-95 dBm (Typical), <-88 dBm
		1 MHz to 500 MHz	-140 dBm (Typical), <-130dBm
		500 MHz to 3.6 GHz	-138 dBm (Typical), <-128 dBm
	VSA 880P (TG)	9 kHz to 1 MHz	-95 dBm (Typical), <-88 dBm
		1 MHz to 500 MHz	-140 dBm (Typical), <-130dBm
		500 MHz to 3.6 GHz	-138 dBm (Typical), <-128 dBm
		3.6 GHz to 6 GHz	-134 dBm (Typical), <-124 dBm
		6 GHz to 8 GHz	-129 dBm (Typical), <-119 dBm

Preamp On	VSA 815P (TG)	100 kHz to 1 MHz	-135 dBm (Typical), <-128 dBm
		1 MHz to 500 MHz	-160 dBm (Typical), <-150dBm
		500 MHz to 1.5 GHz	-158 dBm (Typical), <-148 dBm
	VSA 836P (TG)	100 kHz to 1 MHz	-135 dBm (Typical), <-128 dBm
		1 MHz to 500 MHz	-160 dBm (Typical), <-150dBm
		500 MHz to 3.6 GHz	-158 dBm (Typical), <-148 dBm
	VSA 880P (TG)	100 kHz to 1 MHz	-135 dBm (Typical), <-128 dBm
		1 MHz to 500 MHz	-160 dBm (Typical), <-150dBm
		500 MHz to 3.6 GHz	-158 dBm (Typical), <-148 dBm
		3.6 GHz to 6 GHz	-154 dBm (Typical), <-144 dBm
		6 GHz to 8GHz	-149 dBm (Typical), <-139 dBm
Level Display			
Logarithmic level axis	0.01 dB to 1000 dB		
Linear level axis	0 to reference level		
Number of display points	801		
Number of traces	5		
Trace detectors	Positive-peak, negative-peak, normal, sample, RMS, voltage average		
	Quasi-peak(EMI option)		
Trace functions	Clear write, max hold, min hold, average, view, blank, trace math		
Units of level axis	dBm, dBμW, dBpW, dBmV, dBμV, W, V		
Frequency response			
Preamp Off	fc ≥ 9 kHz, attenuation=10 dB, relative to 50 MHz, 20℃ to 30℃		
	＜ 0.7 dB		

Preamp On	fc ≥ 100 kHz, attenuation=10 dB, relative to 50 MHz, 20℃ to 30℃		
	＜ 1.0 dB		
			
Input Attenuation Switching Uncertainty			
Setting range	0 dB to 40 dB, step by 1 dB		
Switching uncertainty	fc= 50 MHz, relative to 10 dB, 20℃ to 30℃		
	＜0.5 dB		
			
Absolute Amplitude Uncertainty			
Uncertainty	fc = 50 MHz, peak detector, preamplifier off, attenuation = 10 dB, input signal level = -10dBm, 20℃ to 30℃		
	＜0.4 dB		
RBW Switching Uncertainty			
Uncertainty	relative to 10 kHz RBW		
	＜0.1 dB		
Reference Level			
Range	-80 dBm to +30 dBm, in 1 dB step		
Resolution	Log	0.01 dB	
	linear scale	4 digits	
Preamplifier			
Gain	VSA	100 kHz to	20 dB (nominal)

	815P (TG)	1.5 GHz	
	VSA 836P (TG)	100 kHz to 3.6GHz	
	VSA 880P (TG)	100 kHz to 8 GHz	
Level Measurement Uncertainty (95% confidence level, S/N > 20 dB, RBW = VBW = 1 kHz, preamplifier off, attenuation = 10 dB)			
Level Measurement Uncertainty		＜0.7 dB	

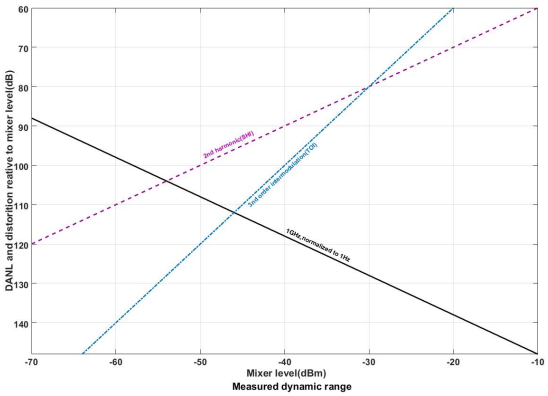


Measured level measurement uncertainty(-10dBm input) VS temperature

RF Input VSWR (attenuation ≥ 10 dB)			
VSWR	VSA815P (TG)	300 kHz to 1.5 GHz	＜1.8 (nominal)
	VSA836P (TG)	300 kHz to 3.6 GHz	
	VSA880P (TG)	300 kHz to 8 GHz	



Distortion	
Second harmonic distortion	fc ≥ 50 MHz, signal input -20 dBm, attenuation = 10 dB
	＞ +45 dBm

Third-order intermodulation	fc ≥ 50 MHz, two -20 dBm tones at input mixer spaced by 200 kHz, attenuation = 0 dB	
	＞ +14 dBm(Typical)	
1 dB Gain Compression		
1dB compression of input mixer (P1dB)	fc ≥ 50 MHz, attenuation = 0 dB	
	＞ -2dBm(nominal)	
		
Spurious Response		
Residual response	connect 50 Ω load at input port, 0 dB input attenuation, 20℃ to 30℃	
	<-90 dBm, typical	
Intermediate frequency	＜ -60 dBm	
System related sidebands	referenced to local oscillators, referenced to A/D conversion, referenced to subharmonic of first LO, referenced to harmonic of first LO	
	＜ -60 dBc	
Input related spurious	-30 dBm signal at input mixer	
	＜ -80 dBm	
Sweep		
Sweep Time	Span≥ 100 Hz: 10 ms to 3000 s Zero Span: 33.33 μs to 3000 s	
Sweep time uncertainty	Span≥ 100 Hz :5%(Nominal) Zero Span(weep time setting value >1 ms): 5%(Nominal)	
Sweep Mode	Continuous, Single	
Trigger		
Trigger Source	Free, Video	
Tracking Generator (Option)		
Tracking Generator Output		
Frequency Range	VSA815P (TG)	100 kHz to 1.5 GHz

	VSA836P (TG)	100 kHz to 3.6 GHz
	VSA880P (TG)	100 kHz to 8.0 GHz
Output power	-40 dBm to 0 dBm	
Output power	1 dB	
Output flatness	Relative to 50 MHz	
	±3 dB(nominal)	
Tracking generator spurious	Harmonic spurious: -20 dBc(typical) (Tracking generator output power = -10 dBm)； Non-harmonic spurious: -20 dBc(typical) (Tracking generator output power = -10 dBm)；	
Tracking generator to input	-60 dBm (Tracking generator output power = 0 dBm)	
Input/Output		
Front panel connector		
RF input	Impedance	50 Ω(nominal)
	Connector	SMA female
Tracking generator output	Impedance	50 Ω(nominal)
	Connector	SMA female
Internal/External Reference		
Internal reference	Frequency	10 MHz
	Output level	+3 dBm to +10 dBm，+8 dBm (typical)
	Impedance	50 Ω(nominal)
	Connector	SMA female
External reference	Frequency	10 MHz ± 5 ppm
	Output level	0 dBm to + 10 dBm
	Impedance	50 Ω(nominal)
	Connector	SMA female
Communication port		
USB Device		
USB Device	Connector	B plug
	Protocol	2.0 version

LAN		10/100Base, RJ-45
General technical specification		
Large capacity storage		
Large capacity storage		Flash drive (internal storage 50MB)
Power Supply		
Input voltage range, DC 100 V to 240 V		9V-12V
Power Consumption		<12W, 50 Hz to 60 Hz
Environment		
Temperature	Working temperature	0 ℃ to 50 ℃
	Storage temperature	-20 ℃ to 70 ℃
Humidity	0℃ to 30℃	≤ 95% relative humidity
	30℃ to 40℃	≤ 75% relative humidity
Altitude	Operating height	Up to 3000m
Appearance		
Dimension		162mm(D)*119mm(W)*27.5mm(H)
Weight		Approx. 0.7kg
Calibration interval time		
Calibration interval time		18 months

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