8.5 GHz Network Nobe Real-Time Spectrum Analyzer

NXM-80

Product Brochure V1.0

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▌ 9 kHz~8.5 GHz real-time spectrum analyzer

▌ 100 kHz-6.3 GHz analog signal generator (opt.)

▌ 100 MHz analysis bandwidth, 163 GHz/sec spectrum sweep speed

▌ FPGA based digital signal processing

▌ Weight 660 grams, size 167×117×28 mm, power consumption: 13-16 W

▌ 1000M/100M Ethernet interface

▌ Build-in multimode GNSS

▌ Provides 1PPS, latitude and longitude information and timestamp

▌ Highly compatible API interfaces and SAStudio4 GUI

▌ Remote master of ARM and x86 processor are supported

▌ Linux and Windows are supported

▌ Operating temperatures range from - 20 ℃/- 40 ℃ to 65 ℃ (option)

▌ Built-in OCXO (option) or GNSS disciplined OCXO (option)

▌ Built-in 4G data module (option)

HAROGIC   NXM-80
Real-Time Spectrum Analyzer / Receiver

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NXM-80 Technical Specifications * (typical value)

Indicator test basis	Hardware Version: 0	API: 0.55.5	FPGA: 0.55.2	MCU: 0.55.1	SAS4: 1.55.46

Frequency

Frequency Range	9 kHz~8.5 GHz
Initial Frequency Accuracy	<1 ppm, Supporting program manual correction
Reference Clock	Internal or external, program-controlled switching; Internal TCXO aging<1 ppm/year, temperature drift<1 ppm; Internal OCXO (option), temperature drifting≤0.15 ppm
GNSS disciplining	Support disciplining and recalculating of the built-in reference clock by an external GNSS component (option)

Spectrum Purity

SSB Phase Noise	dBc/Hz (with 01 option built-in OCXO)			
Carrier Frequency	500 MHz	1 GHz	3 GHz	8.5 GHz
1 kHz	-114.3	-110.8	-102.7	-93.3
10 kHz	-126.5	-120.0	-110.5	-102.5
100 kHz	-125.1	-120.1	-111.7	-102.4
1 MHz	-134.8	-133.5	-125.0	-117.1

Residual Response Spurious rejection on dBm RBW =1 kHz, positive peak detector	Frequency Range	R.L.=0 dBm	R.L.=-20 dBm	R.L.=-50 dBm
	100 kHz~100 MHz	< -101	< -107	< -127
	100 MHz~6.3 GHz	< -87	< -106	< -115
	6.3 GHz~8.5 GHz	< -83	< -96	< -117

Residual Response Spurious rejection off				
	100 kHz~100 MHz	< -87	< -102	< -123
	100 MHz~6.3 GHz	< -76	< -91	< -113
	6.3 GHz~8.5 GHz	< -81	< -94	< -115

Image Frequency Suppression	>90 dBc (spurious rejection on), >35 dBc (spurious rejection off, typical value)
Local Oscillator Related Spurious	<-65 dBc (Offset Center Frequency +/- (N/M)*125MHz, N/M = 1,2,3,4,5…)

Signal Processing

Analysis Bandwidth	Maximum 100 MHz, Decimate Factor:1
IQ Data	125 MSPS (standard). Support 120MSPS-125MSPS program adjustable (option), 1Hz step Decimate factor: 1,2,4,8,16,32,64, 128,256,512,1024,2048,4096 supported (FPGA)
Storage Depth	The built-in memory depth is 128 MBytes
	Supports continuous and uninterrupted storage when the data generation rate is less than the bus bandwidth, and the storage depth is only limited by the hard disk capacity
External Trigger Response	Maximum response frequency 500 times/sec
Analog IF Output	Not available

Amplitude

Maximum safe input power (CW)	26dBm	30 MHz~8.5 GHz and the preamplifier off (R.L. ≥ 0 dBm)
	10dBm	100 kHz~30 MHz or preamplifier on (R.L. <0 dBm)
Maximum DC Voltage	±15 VDC	
Display Range	DANL~26 dBm	
Amplitude Accuracy	+/- 1.5 dB	
IF in-band spectrum ripple	±1.75 dB (100 MHz analog IF bandwidth)	
Reference level（R.L.）	-50 dBm~23 dBm	
RF Preamplifiers	setting as automatically turn on or forcibly turn off	

VSWR	<1.7:1	30 MHz~8.5 GHz (R.L. ≥ 10 dBm)		
	<2.0:1	30 MHz~8.5 GHz (R.L. ≥ 0 dBm)		
	<2.5:1	30 MHz~8.5 GHz (R.L. ≥ -40 dBm)		

Display Average Noise Level (DANL) dBm/Hz RBW=10kHz RMS detector	Frequency Range	R.L.= 0 dBm (IFGainGrade = 3)	R.L.=-20 dBm (IFGainGrade = 3)	R.L.=-50 dBm (IFGainGrade = 3)
	9 kHz	-113.6	-122.2	-140.5
	1 MHz~100 MHz	-131.5	-137.2	-163.2
	100 MHz~3.0 GHz	-131.7	-149.5	-166.6
	3.0 GHz~6.3 GHz	-134.8	-144.4	-164.6
	6.3 GHz~7.5 GHz	-127.4	-140.1	-161.2
	7.5 GHz~8.5 GHz	-123.8	-137.5	-158.8

Standard Spectrum Analysis

Detector	Positive peak, Negative peak, Sampling, Average, RMS, Max Power
RBW	0.1 Hz~10 MHz
VBW	0.1 Hz~10 MHz
Trace Function	Sample, Positive Peak, Negative Peak, Local average, Maximum hold, Minimum hold, Average
Data Chart	SAStudio4 software provides regular spectrum, waterfall chart, and historical trace

Sweep speed - Standard Spectrum Analysis	163 GHz/s	Auto	RBW≥250 kHz, B-Nuttal window, spurious rejection: Standard
	82.8 GHz/s	Auto	RBW=250 kHz, B-Nuttal window, spurious rejection: Enhanced
	9.9 GHz/s	Auto	RBW=30 kHz, B-Nuttal window, spurious rejection: Enhanced
	452MHz/s	Auto	RBW=1 kHz, B-Nuttal window, spurious rejection: Enhanced

Detection Analysis/Zero Span

Highest Time Resolution	8 ns
Maximum Analysis Bandwidth	100 MHz
Trace Detection	Positive peak, Negative peak, Sampling, Average, RMS, Max Power

Real Time Spectrum Analysis

FFT Analysis	Variable point FFT engine implemented by FPGA. frame rate compression and trace detection are supported. There is strictly no gap and overlap between FFT frames		
	FFT refresh rate=10 ^ 9 ns/(N * D * 8 ns); POI = 2*N*D*8ns N is the number of FFT points (2048, 1024,512,256,128,64,32), and D is the decimate factor (1, 2, 4, 8...)		
	Typical Settings	FFT Refresh Rate	POI
	N = 2048, D = 1	61,035 times/sec	32.768 us
	N = 32, D = 1	3,906,250 times/sec	0.512 us

Real-time Analysis Bandwidth	100 MHz
Window Function	B-Nuttall, FlatTop
RBW	14.73 MHz-3.59 kHz (Flattop window); 7.81 MHz~1.90 kHz (B-Nuttall); 13 grades for each window type
Amplitude Resolution	0.75 dB

General

Input and Output	Power Supply	Type-C (1) PD （QC3.0） 12V 2A or 9V 2A
	Data	RJ45 1000Mbps x1, 100Mbps x1
	RF input	SMA(F)(1), Input impedance 50 Ω

	RF output	SMA(F)(2), Input impedance 50 Ω
	External reference clock input	MCX (F)(1), amplitude≥1.5Vpp， input impedance 330 Ω
	External reference clock output	Not available
	External trigger input	MMCX (F)(1)， 3.3V CMOS， input: high impedance
	External trigger output	MMCX (F)(2)， 3.3V CMOS
	Analog IF Output	Not available
	GNSS antenna	MMCX (F)(3)
	4G module antenna	MMCX (F)(4)
	General USB2.0	Type-C (2)
Power consumption		Peak: 15 W, typical: 11W~15W
Operating Temperature (ambient temperature /core temperature)		0~50 ºC/0~70 ºC (Standard temperature class)
		-20~65 ºC/-20~85 ºC (Extended Temperature Class Option) (plastic enclosure and fan not included)
		-40~65 ºC/-40~85 ºC (Wide Temperature Class Option) (plastic enclosure and fan not included)
Storage Temperature (ambient temperature)		-20~70 ºC (Standard temperature class)
		-40~85 ºC (Extended temperature class and wide temperature options) (plastic enclosure and fan not included)
Size and Weight		1 Size: 167x117x28 mm, weight:660 g (Including protective case and structural fittings, including connector length)
Packaging and Accessories		Flash drive * 1, USB cable * 1, Power adapter * 1

*The typical values of the indicators are applicable for the following conditions: (1) Start up and warm up for 20 minutes; (2) Ambient temperature 25 ℃ (core temperature 50 ℃); (3) Spurious rejection on; (4) 100MHz bandwidth and IFGainGrade=3; (5) The user shall provide the necessary heat dissipation conditions to ensure that the ambient temperature and the core temperature of the equipment are within the rated range at the same time.

Code	Option	Explanation
01	Built-in OCXO reference clock (hardware)	Providing a reference clock with better stability than the standard configuration, with a temperature drift of<0.15 ppm, increasing the overall power consumption by 0.8 W
02	Built-in analog signal generator	100 kHz-6.3 GHz signal generator
03	Variable ADC sample rate	Provides a variable ADC sampling rate, increasing the overall power consumption by 0.3W
05	Build-in GNSS disciplined OCXO reference clock (hardware opt.)	Providing GNSS disciplined reference clock and 1PPS, increasing the overall power consumption by 1.1W.
06	Build-in premium GNSS (hardware opt.)	Providing improved positioning and timing capabilities.
09	Build in 4G data module (hardware opt.)	Providing the physical connection to the 4G connection
20	Extended temperature class (hardware opt.)	- 20~65 ℃/- 20~85 ℃(Extended temperature class opt.)
21	Wide temperature class (hardware opt.)	- 40~65 ℃/- 40~85 ℃(Wide temperature class opt.)

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NXM-80 Product Brochure