40 GHz Network Node Real-Time Spectrum Analyzer

Distribution in the UK & Ireland

Lambda

www.lambdaphoto.co.uk

NXN-400

Product Brochure V0.3

2023-10-16

- 9 kHz-40 GHz real-time spectrum analyzer
- Superheterodyne digital receiver architecture, 14 segments pre-selected filter
- 9 kHz~40 GHz typical image suppression >75 dBc, typical IF rejection>75 dBc
- 100 MHz analysis bandwidth with adjustable sampling rate, 291.6 GHz/sec sweep speed
- FPGA based digital signal processing
- Weight 650 grams, size 167×117×28 mm, power consumption: 18 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 °C/-40 °C to 65 °C (option)
- Built-in OCXO (option) or GNSS disciplined OCXO (option)
- Built-in 4G data module (option)

HAROGIC

NXN-400 Technical Specifications * (typical value)

Indicator test basis **Hardware Version: R3** **API：0.55.5** **FPGA：0.55.2** **MCU：0.55.1** **SAS4：4.1.54.46**

Frequency					
Frequency Range	9 kHz~40 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 drift<0.15 ppm				
Spectrum Purity					
SSB Phase Noise	dBc/Hz				
Carrier Frequency	1GHz	3GHz	10GHz	20GHz	40GHz
1 kHz	-95.2	-97.2	-92.6	-86.2	-80.5
10 kHz	-104.2	-101.8	-98.5	-96.5	-86.5
100 kHz	-106.5	-103.6	-99.5	-95.3	-86.3
1 MHz	-120.7	-121.2	-116.4	-111.3	-103.3
10 MHz	-130.8	-134.3	-132.5	-128.1	-123.6
Residual Response Spurious rejection off dBm RBW =1 kHz Positive Peak Detector	Frequency Range	R.L.=0 dBm		R.L.=-20 dBm	
		Spurious rejection off	Spurious rejection on	Spurious rejection off	Spurious rejection on
	9kHz~10GHz	-73	-84	-79	-90
	10GHz~20GHz	-87	-90	-101	-110
	20GHz~30GHz	-74	-88	-92	-107
	30GHz~40GHz	-83	-89	-95	-105
Image Frequency Suppression (Spurious rejection on)	> 60 dBc; refer to technical characteristics for details				
IF rejection (Spurious rejection off)	> 75 dBc; excluding 0.35 GHz~5.6 GHz, > 40 dBc				
IF rejection (Spurious rejection on)	> 80 dBc				
Local Oscillator Related Spurious	<-65 dBc (Offset Center Frequency +/- (N/M)*125 MHz, N,M = 1,2,3,4,5…)				
Input Related Spurious (Spurious rejection on)	<-60 dBc; refer to technical characteristics for details				
Signal Processing					
Analysis Bandwidth	Maximum 100 MHz				
IQ Data	122.88 MSPS, 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	Supporting 307.2 MHz +/-50 MHz				
Amplitude					
Maximum safe input power (CW)	23 dBm	88 MHz~40 GHz			
	10 dBm	100 kHz~88 MHz			
Maximum DC Voltage	+/-12 VDC				

Display Range	DANL~23 dBm		
Amplitude Accuracy	+/- 2.0 dB（9kHz~9GHz）; +/- 3.0 dB (> 9GHz)		
IF in-band spectrum ripple	±1.75 dB (40 MHz analog IF bandwidth); ±2.0 dB (100 MHz analog IF bandwidth)		
Reference level（R.L.）	-50 dBm~23 dBm		
RF Preamplifiers	No pre-amplifier as standard		
Display Average Noise Level (DANL) dBm/Hz RBW=10kHz RMS detector	Frequency Range	R.L.= 0 dBm	R.L.=-20 dBm
	9 kHz	-119	-139
	100 kHz~88 MHz	-131	-149
	88 MHz~9 GHz	-133	-139
	9 GHz~19 GHz	-131	-146
	19 GHz~30 GHz	-127	-144
	30 GHz~40 GHz	-129	-141
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, PosPeak, NegPeak, Local average, Maximum hold, Minimum hold, Average		
Data Chart	SAStudio4 software provides regular spectrum, waterfall chart, and historical trace		
Measurements	Phase noise, Channel power, Occupied bandwidth, X dB bandwidth, Adjacent channel suppression, IM3		
Sweep speed - Standard Spectrum Analysis	219.1 GHz/s	Auto	RBW≥1 MHz, B-Nuttal window, spurious rejection: Bypass
	291.6 GHz/s	Auto	RBW=250 kHz, B-Nuttal window, spurious rejection: Standard
	23.0 GHz/s	Auto	RBW=30 kHz, B-Nuttal window, spurious rejection: Bypass
	863.2 MHz/s	Auto	RBW=1 kHz, B-Nuttal window, spurious rejection: Bypass
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 /second	32.768us
	N = 32，D = 1	3,906,250 times /second	0.512us
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	0.75dB		

General		
Input And Output	Power Supply	Type-C (1) PD （QC3.0）12V 2A or 9V2A
	Data	RJ45 1000Mbps x1, 100Mbps x1
	RF input	2.92mm (F), Input impedance 50 Ω
	External reference clock input	MMCX (F)(1), amplitude≥1.5Vpp，input impedance 330 Ω
	External reference clock output	Integrated in MUXIO，3.3V CMOS, programmable on/off
	External trigger input	MMCX (F)(2)，3.3V CMOS，input: high impedance
	External trigger output	MMCX (F)(3)，3.3V CMOS
	Analog IF Output	MMCX (F)(4), maximum output power – 25 dBm , output impedance 50 Ω
	GNSS antenna	MMCX (F)(5)
	4G module antenna	MMCX (F)(6)
	General USB2.0	Type-C (2)
Power consumption	Peak: 14 W, typical: 12 W	
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)	
Weight and size	Size: 167x117x28 mm, weight:650 g (Including protective case and structural fittings, including connector length)	
Packaging and Accessories	Flash drive * 1, Power adapter * 1, Data cable*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) standard spectrum sweep Spurious suppression on; (4) 100MHz bandwidth and IFGainGrade=4; (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 name	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<0.15pm, increasing the overall power consumption by 0.8 W
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.)