

NETWORKED REAL-TIME SPECTRUM ANALYZER

NXN-400 SERIES
40 GHz

Key facts

- Create your own RF system with limited budget
- Frequency range: 9 kHz to 40 GHz
- 1 GHz DANL: -161 dBm/Hz
- 1 GHz phase noise: -107 dBc/Hz@10 kHz
- Analysis bandwidth: up to 100 MHz
- 1000M/100M Ethernet interface
- Highly compatible API interface
- ARM and X86 processor are supported
- Linux and Windows operating systems are supported

Applications

Standard spectrum sweep



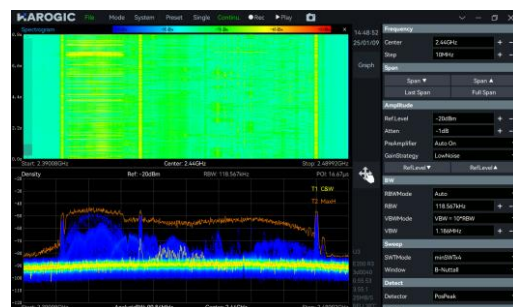
IQ streaming and analysis



Power vs time measurement



Real-time analysis



Specifications*

FREQUENCY

Frequency range	NXN-400 R2		-
	9 kHz-40 GHz		-
Reference clock	Internal or external		
Frequency accuracy	OCXO (std)	<1 ppm, manual correction is available	
	Int. GNSS disciplined OCXO (opt06)	<0.05 ppm, when locked to GNSS	
Aging and temperature stability	OCXO (std.)	<1 ppm/year, <0.15 ppm	
	Int. GNSS disciplined OCXO (opt06)	<1 ppm/year, <0.05 ppm	

SPECTRUM PURITY

SSB phase noise (dBc/Hz)

	NXN-400 R2		-	
Carrier frequency	1 GHz	40 GHz	-	-
1 kHz	-99.0	-78.4	-	-
10 kHz	-107.5	-85.7	-	-
100 kHz	-107.7	-85.1	-	-
1 MHz	-122.7	-100.8	-	-

Residual response (dBm)

spur reject = bypass

RBW =1 kHz

PosPeak detector

	NXN-400 R2		-	
Reference level (R.L.)	0 dBm	-50 dBm	-	-
9 kHz-1 GHz	-72	-103	-	-
1 GHz-3 GHz	-91	-115	-	-
3 GHz-9.5/20 GHz	-85	-105	-	-

Image rejection

spur reject = standard

	NXN-400 R2		-	
9 kHz-33 GHz	> 90 dBc (typ.)		-	
33 GHz-40 GHz	> 58 dBc (typ.)		-	

IF rejection	> 90 dBc; 8.2 GHz~21.75 GHz, > 68 dBc
Local oscillator related spurious	<-65 dBc Center frequency $\pm (N/M)*100$ MHz, N,M = 1,2,3,4,5...

IIP3 / IIP2 (dBm)				
NXN-400 R2				
Carrier frequency	1 GHz	40 GHz	-	-
R.L. = 20 dBm	40.3 / 75.5	31.7 / 88.6	-	-
R.L. = 0 dBm	27.4 / 45.3	10.3 / 86.1	-	-
R.L. = -20 dBm	8.7 / 25.2	4.8 / 66.6	-	-

AMPLITUDE

Max. input power (CW)	23 dBm	90 MHz-40 GHz and the preamplifier is off		
	10 dBm	9 kHz-90 MHz or preamplifier is on		
Max. DC voltage	±10 VDC			
Display range	DANL-23 dBm (typ.)			
Amplitude accuracy	9 kHz-9.5 GHz	±2.0 dB		
	9.5 GHz-40 GHz	±3.0 dB		
IF in-band flatness	±2.0 dB			
Reference level (R.L.)	-50 dBm-23 dBm (typ.)			
RF preamplifiers	automatically turn on or forcibly turn off			
VSWR	90 MHz -16 GHz	<2.0:1		
	16 GHz - 40 GHz	<3.0:1		

Display average noise level (DANL) (dBm/Hz)

RBW=10 kHz

NXN-400 R2				
Reference level	-20 dBm	-50 dBm	-	-
9 kHz	-134	-145	-	-
100 kHz - 88 MHz	-151	-157	-	-
88 MHz - 9.0 GHz	-148	-154	-	-
9.0 GHz - 19 GHz	-153	-158	-	-
19 GHz - 40 GHz	-146	-147	-	-

STANDARD SPECTRUM ANALYSIS

Detector	PosPeak, NegPeak, Sample, Average, RMS, MaxPower
RBW	0.1 Hz-10 MHz
VBW	0.1 Hz-10 MHz
Data chart	SASstudio4 software provides spectrum, waterfall chart, and historical trace
Measurements	Channel power, OBW, X dB bandwidth, Adjacent channel power ratio, IM3

Sweep speed	NXN-400 R2	-
RBW \geq 1 MHz FPGA Spur Reject = Standard	about 306 GHz/s	-
RBW = 250 kHz FPGA Spur Reject = Standard	about 317 GHz/s	-
RBW = 30 kHz FPGA Spur Reject = Standard	about 21.7 GHz/s	-
RBW = 1 kHz CPU Spur Reject = Standard	about 1.6 GHz/s	-

IQ RECORDING

Burst recording bandwidth	Maximum: 100 MHz The built-in memory depth is 128 Mbytes
Continuous recording bandwidth	Maximum: 6.25 MHz Limited by the bandwidth of USB interface and hard disk. The storage depth is limited by the hard disk capacity
IQ sample rate	125MSPS, decimate factor: 1,2,4,8,32,64,128,256,512,1024,2048,4096 supported (FPGA)
External trigger response	Maximum response frequency 500 times/sec

DETECTION ANALYSIS/ZERO SPAN

Lowest time resolution	8 ns
Max. analysis bandwidth	100 MHz
Detector	PosPeak, NegPeak, Sample, Average, RMS, MaxPower

REAL TIME SPECTRUM ANALYSIS

FFT analysis	FFT engine is implemented in FPGA. Frame compression and trace detection are supported. No missing samples between FFT frames		
	FFT frame update rate= 10^9 ns/(N * D * 8 ns); POI = N * D * 8 ns N for FFT points (2048,1024,512,256,128,64,32) D for decimate factor (1, 2, 4, 8...)		
	Typical settings	FFT refresh rate	POI
	N = 2048, D = 1	61,035 times/sec	16.384 us
	N = 32, D = 1	3,906,250 times/sec	0.256 us
Max. analysis bandwidth	100 MHz		
Window function	B-Nuttall, Flat-top, LowSideLobe		
RBW	14.73 MHz-3.59 kHz (Flat-top) 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, dedicated power supply port. Acceptable voltage range: 9 to 12 V (ripple < 0.2 Vpp). Device will fetch up to 2 A current from this port
Data interface	RJ45 1000 Mbps x1, 100 Mbps x1
RF input	2.92 mm (F), Input impedance 50 Ω
Reference input	MMCX (F), amplitude ≥ 1.5 Vpp, input impedance is about 300 Ω
Reference output	Integrated in MUXIO, 3.3 V CMOS, programmable on/off
External trigger input	MMCX (F), 3.3V CMOS, input: high impedance
External trigger output	MMCX (F), 3.3 V CMOS
Analog IF output	MMCX (F), maximum output power -25dBm, output impedance 50 Ω Supporting, 307.2 MHz \pm 50 MHz

GNSS antenna		MMCX (F)
General USB2.0		Type-C
Power consumption		13-16 W
Size (D * W * H) and weight	NXN-400 R2	-
	167 x117 x30 mm and about 660 g	-
GNSS synchronization	Internal GNSS	+/- 100 ns
	Internal GNSS (opt05)	+/- 75 ns
	Internal GNSS (opt06)	+/- 50 ns
System requirements	Linux	aarch64, x64
	Windows	x64
Operating temperature (ambient)	T0 class (std.)	0-50 °C
	T1 class (opt40)	-20-65 °C
Storage temperature (ambient)	T0 class (std.)	-20-70 °C
	T1 class (opt40)	-40-85 °C
Packaging and accessories	Flash disk * 1, USB cable * 1, Power adapter * 1	

*Specification applies under the following conditions:

- (1) Start up and warm up for 10 minutes;
- (2) Ambient temperature 25 °C (core temperature 50 °C);
- (3) Stand spectrum analysis mode-spurious rejection enhance on;
- (4) Necessary heat dissipation is provided to ensure the ambient and core temperature within the rated range at the same time.

OPTIONS

Code		
05	Internal high precision GNSS	built-in hardware
06	Build-in GNSS disciplined OCXO reference clock	built-in hardware
34	External omnidirectional antenna, 400-8000MHz, Gain<2dBi	accessory
40	T1 temperature class	built-in hardware
71	Basic digital modulation analysis	software
72	Pulse signal measurement	software

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