Ultra Low Phase Noise Phase-Locked Frequency Reference

Data Sheet 2309A

Rev. -

Phase-Locked Ultra Low Phase Noise Multioutput Frequency Reference in 19” Rack Mountable Appliance 1U Form Factor

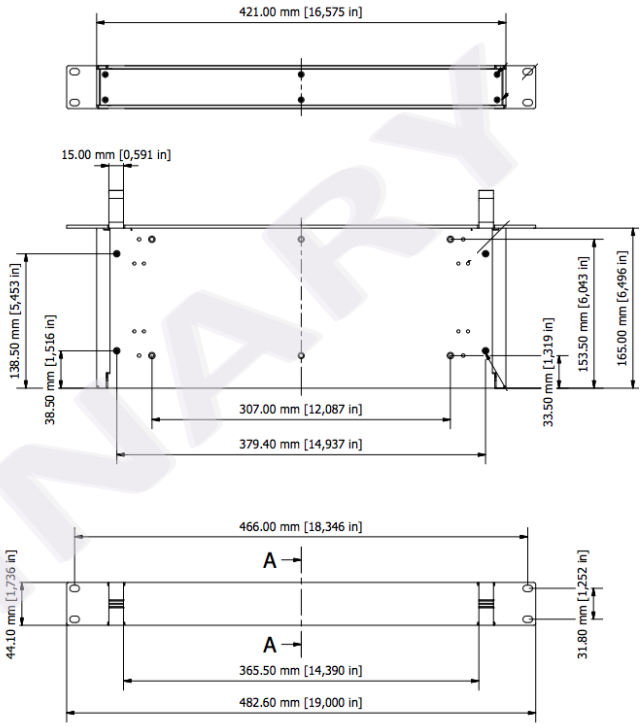
Product Data Sheet

Features

- **Locks to 1 PPS or 10 MHz inputs**
- **Ultra-Low Phase Noise (ULPN)**
- **10 MHz, 160 MHz, and 1 PPS Outputs**
- **10 MHz and 80 MHz internal SC-cut OCXO**

Applications

- **Radar**
- **5G device testing**
- **Instrumentation, Test and Measurement**
- **Mixed Signal System Reference**
- **COTS/Dual use**



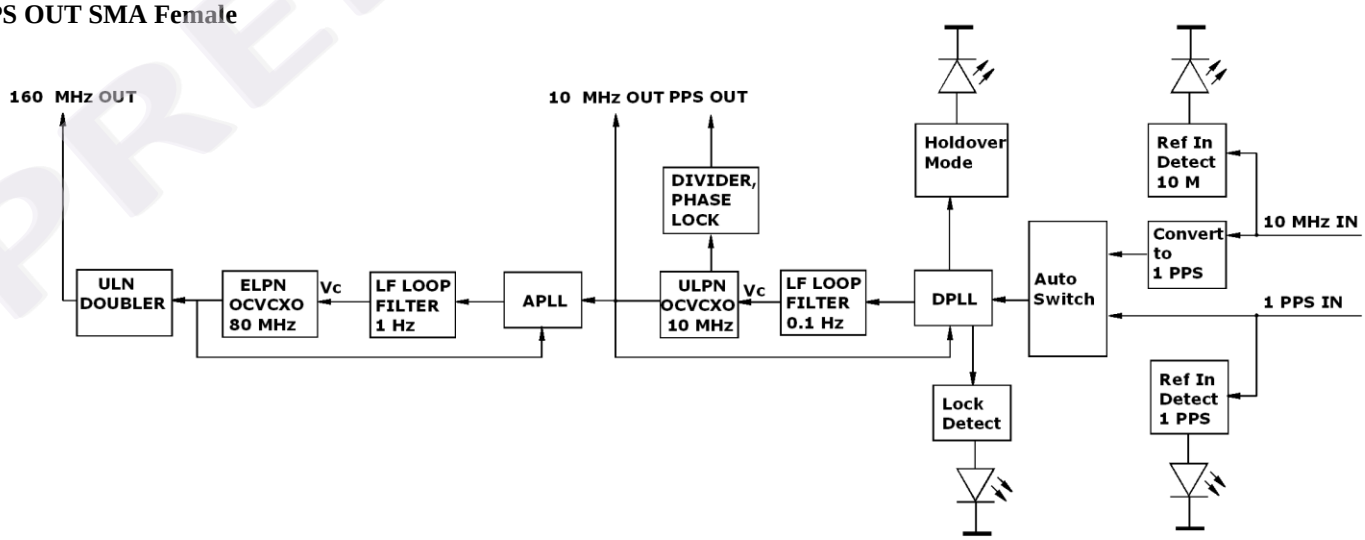
Mechanical Dimensions

Inputs

1 PPS IN on SMA Female
10 MHz on SMA Female

Outputs

160 MHz OUT SMA Female
10 MHz OUT SMA Female
1 PPS OUT SMA Female



NEL FREQUENCY CONTROLS, INC

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Front Panel

Specifications:

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Power supply	Vp		90		260	V AC	
Operating Temp.	To		10		45	°C	
Storage temper.	Ts		0		70	°C	
Electrical							
	Fpps	1 PPS input		1		Hz	
1PPS in	1 PPS	3.3 V LVCMOS or TTL		2.5		V pk-pk	Green LED
		Pulse Width		1		us	
		Load		50		Ohm	AC coupled
10 MHz input		Sine wave 4-24 dBm Square wave	1 1		10 5	V pk-pk	Internally AC coupled 50 Ohm terminated
Frequency Capture Range (APR)	ΔF/F	Over All Conditions	±100			ppb	Includes variation vs. temperature, load, aging 10 years
Allan Deviation		.01s to 1s		1E-12			
Frequency stability	ΔF/F	Locked Holdover	Equal to incoming signal ±5			ppb	Over temperature
Holdover	τ	8 hours		20		us	
Recommended MAX Input SSB Phase Noise	£(Δf)	10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-90 -120 -130 -140 -140	dBc/Hz	10 MHz reference
Output SSB Phase Noise Improvement Compared to Input Phase Noise adjusted to 10 MHz	£(Δf)	10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		30 40 40 40 40		dBc/Hz	Cannot improve beyond listed below Output Phase Noise
Output Frequencies	F10			10.000		MHz	SMA
	F160			160.00			SMA
	PPS			1		Hz	SMA
SSB Phase Noise (achieved after 10 minutes warm-up) Noise floor	£(Δf)	1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-115 -145 -157 -162 -170 -172		dBc/Hz	10 MHz output

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		10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-122 -130 -160 -170 -175	-120 -128 -158 -168 -174		160 MHz output
Output	F160			160.00		MHz	SMA
	F10			10.000			
	1 PPS		Buffered internally				
Power Requirements	P	IEC320 on the back	100 to 250 V AC 50/60 Hz Consumption 20 Watts			V AC	Single AC line fuse
Output Waveform		Sinewave					RF output
Output Power			+13	+15		dBm	160 MHz
			+12	+14			10 MHz
Spectral Purity		Subharmonics Spurious Harmonics		-70 -35	-50 -80 -30	dBc	10 MHz and multiples on 160 MHz Output
Load	Internally AC coupled 50 Ohm (Sinewave)					RF output	
Warm-up time	τ	to lock on 100 ppb input		3	5	minutes	
Lock Time after warm-up					20	minutes	
Lock Detect			Green LED				
Holdover Mode			Green LED				

Environmental and Mechanical

Operating temp. range	+10°C to +45°C
Storage Temp. Range	0°C to +70°C

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