Ultra Low Phase Noise Phase-Locked Frequency Reference

Data Sheet 1907A

Rev. A

Phase-Locked Ultra Low Phase Noise 10 MHz Frequency Reference in 19” Rack Mountable Appliance 1U Form Factor

Product Data Sheet

Features

- **Locks to either 10 MHz (or 5 MHz) reference or 1 PPS input**
- **Ultra-Low Phase Noise (ULPN)**
- **Two 10 MHz (or Optional 5 MHz) Outputs**
- **Excellent Holdover in the Absence of REF IN**
- **10 MHz internal SC-cut OCXO**

Applications

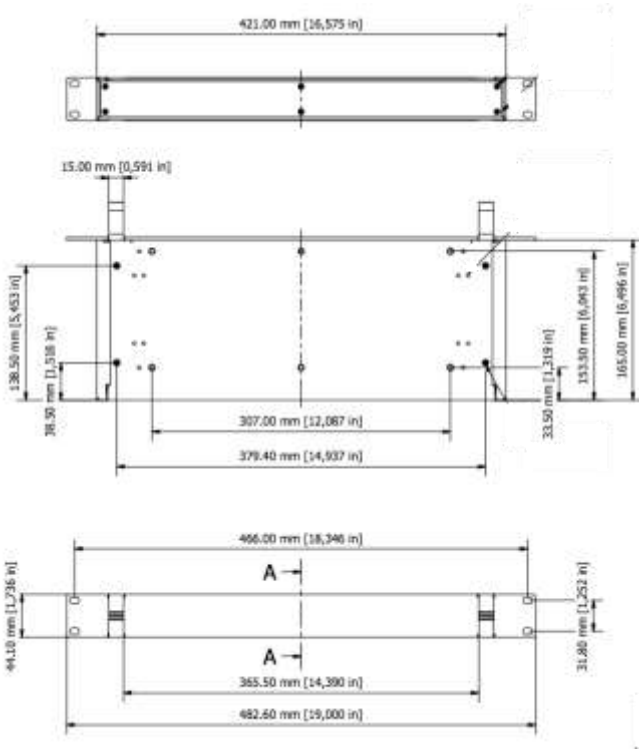
- **5G device testing**
- **Digital AM Radio Stations**
- **Significantly improves Phase Noise of incoming Reference signal**
- **COTS/Dual use**

Inputs

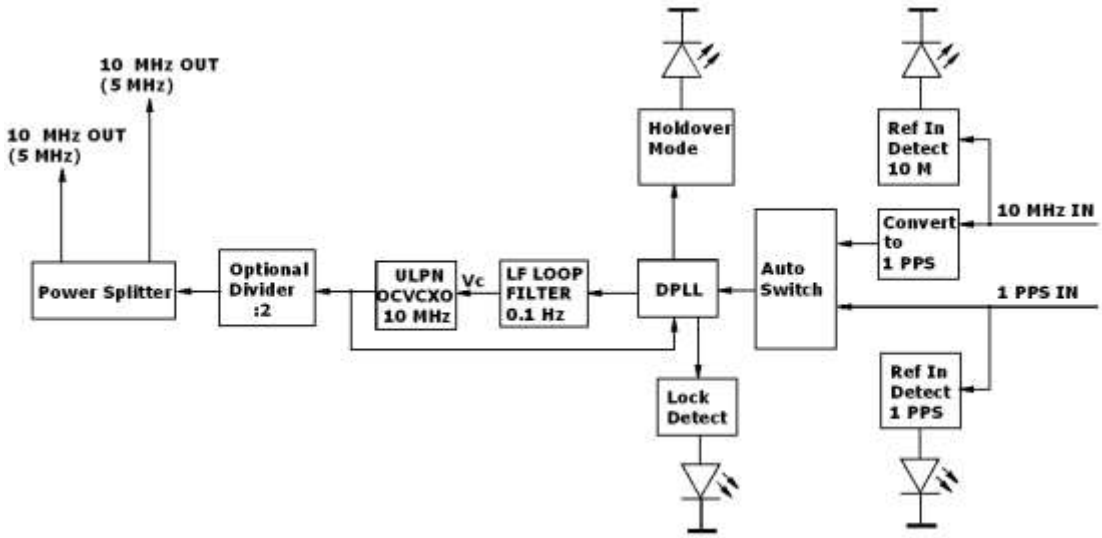
10 MHz (or 5 MHz) IN SMA Female
1 PPS IN SMA Female

Outputs

10 MHz (5 MHz) OUT SMA Female
10 MHz (5 MHz) OUT SMA Female



Mechanical Dimensions



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							
Input	F10	10 MHz input		10.000		MHz	Automatically detects between 5 and 10 MHz input signal
	F5	5 MHz input		5.000		MHz	
	Fpps	1 PPS input		1		Hz	
10 (5) MHz in	F10 (F5)	CMOS	2			V pk-pk	Green LED
		Sine Wave	0		15	dBm	
1PPS in	1 PPS	TTL		2.5		V pk-pk	Green LED, priority if both present
		Pulse Width		1		us	
Frequency Capture Range (APR)	ΔF/F	Over All	±100			ppb	Includes variation vs. temperature, load, aging 10 years
Allan Deviation		.01s to 1s		5E-12			
Frequency stability	ΔF/F	Locked	Equal to incoming signal				
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		40 50 50 50 50		dBc/Hz	Cannot improve beyond listed below Output Phase Noise
Output Frequency	F10			10.000		MHz	SMA
SSB Phase Noise (achieved after 10 minutes warm-up) Noise floor	£(Δf) **10 MHz output**	0.01 0.1 Hz 1 Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-37 -89 -120 -148 -158 -168 -170 -172		dBc/Hz	Grade E
	10 MHz output	1 Hz 10 Hz 100 Hz		-112 -145 -152		dBc/Hz	Grade P

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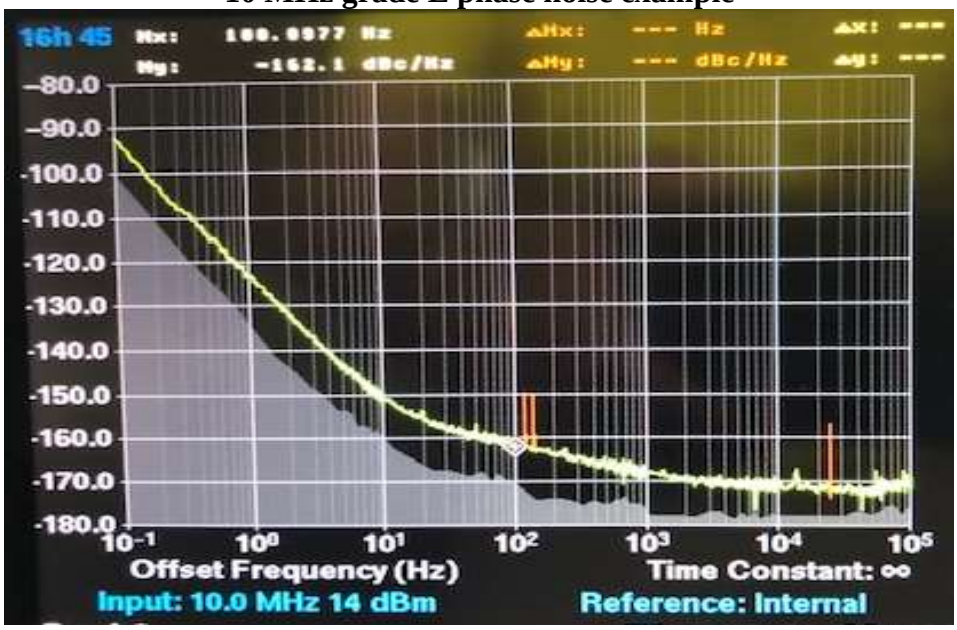
		1 KHz 10 KHz 100 KHz		-163 -168 -170			
	£(Δf) **5 MHz output**	1 Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-125 -153 -162 -165 -168 -170			Option must be specified on PO
Power Requirements	P	IEC320 on the back	100 to 250 V AC 50/60 Hz			V AC	
Load	Internally AC-coupled 50 Ohm						Both Outputs
Output Waveform		Sinewave					
Output Power			+8	+10		dBm	Both Outputs
Spectral Purity		Subharmonics Spurious Harmonics		none -35	 -80 -30	dBc	
Load	Internally AC coupled 50 Ohm (Sinewave) 10K Ohm//15pf (CMOS/TTL)						
Warm-up time	τ	to lock on 100 ppb input		3	5	minutes	
Lock Time after warm-up				10		minutes	
Lock Detect			Green LED				
Input Detect (either)			Green LED				
Holdover Mode			Yellow LED				

Environmental and Mechanical

Operating temp. range	+10°C to +45°C

10 MHz grade E phase noise example



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