

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

Product Data Sheet

Features

- Locks to 5 MHz reference or 1 PPS input
- Ultra-Low Phase Noise (ULPN)
- 5 MHz, 100 MHz and 1 GHz Outputs
- Excellent Holdover in the Absence of REF IN
- 10 MHz internal SC-cut OCXO

Applications

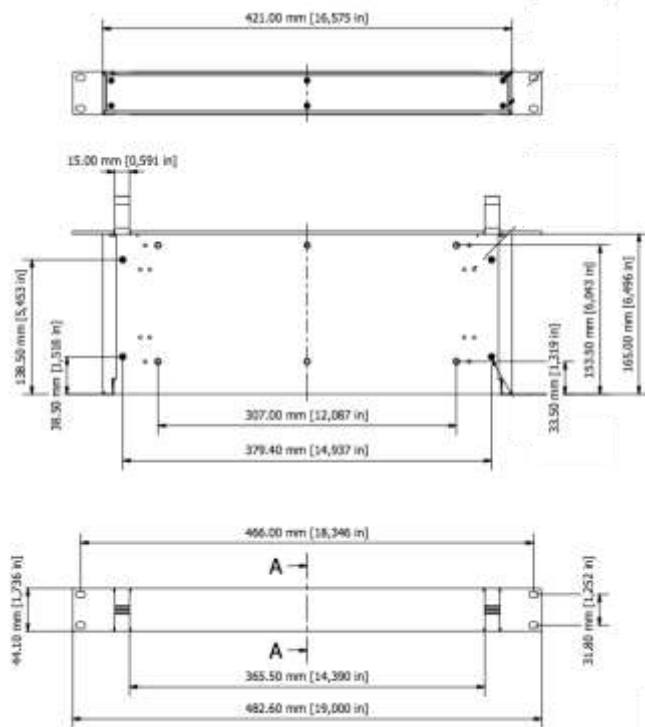
- 5G device testing
- Digital AM Radio Stations
- Significantly improves Phase Noise of incoming Reference signal
- COTS/Dual use

Inputs

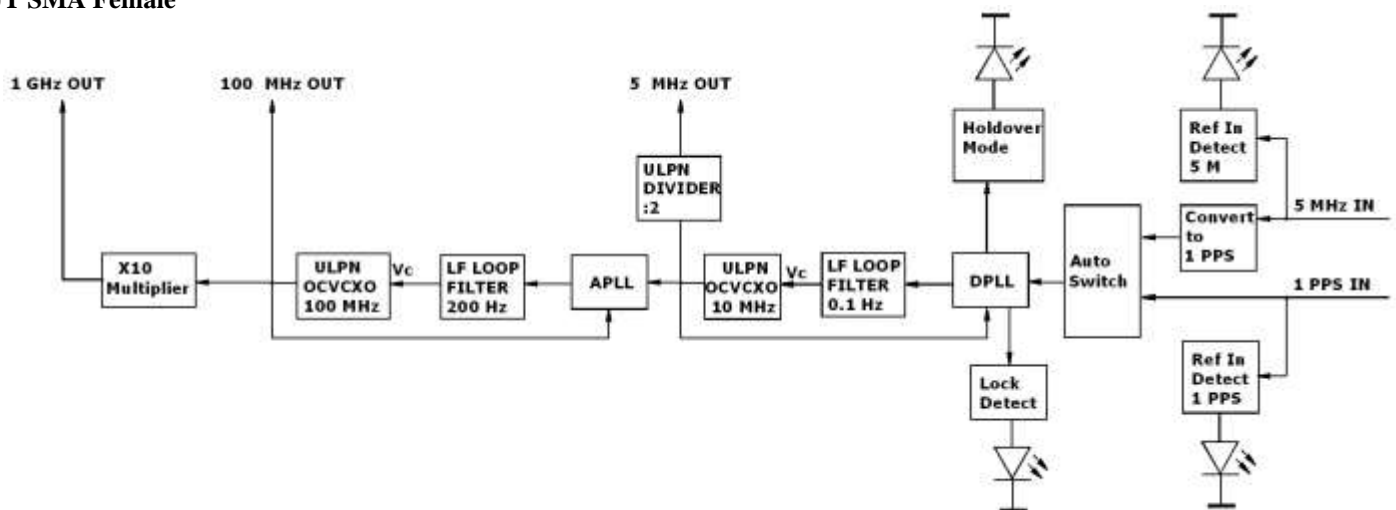
- 5 MHz IN SMA Female
- 1 PPS IN SMA Female

Outputs

- 5 MHz OUT SMA Female
- 100 MHz OUT SMA Female
- 1 GHz OUT SMA Female



Mechanical Dimensions



Ultra Low Phase Noise Phase-Locked Frequency Reference

Data Sheet 1909A

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							
	F5	5 MHz input		5.000		MHz	
	Fpps	1 PPS input		1		Hz	
5 MHz in	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)	$\Delta F/F$	Over All	± 100			ppb	Includes variation vs. temperature, load, aging 10 years
Allan Deviation		.01s to 1s		5E-12			
Frequency stability	$\Delta F/F$	Locked	Equal to incoming signal				
Holdover	τ	8 hours		20		us	
Recommended MAX Input SSB Phase Noise	$\xi(\Delta f)$	10 Hz			-96	dBc/Hz	5MHz reference
		100 Hz			-126		
		1 KHz			-136		
		10 KHz			-146		
		100 KHz			-146		
Output SSB Phase Noise Improvement Compared to Input Phase Noise adjusted to 5 MHz	$\xi(\Delta f)$	10 Hz		40		dBc/Hz	Cannot improve beyond listed below Output Phase Noise
		100 Hz		50			
		1 KHz		50			
		10 KHz		50			
		100 KHz		50			
Output Frequencies	F5			5.000		MHz	SMA
	F100			100.00			SMA
	F1000			1000.0			SMA
SSB Phase Noise (achieved after 10 minutes warm-up) Noise floor	$\xi(\Delta f)$	0.1 Hz		-90		dBc/Hz	Optional test 5 MHz output
		1 Hz		-120			
		10 Hz		-150			
		100 Hz		-162			
		1 KHz		-165			
		10 KHz		-168			
		100 KHz		-170			
		10 Hz		-125		dBc/Hz	100 MHz output
		100 Hz		-132			
		1 KHz		-163			
		10 KHz		-177			

Ultra Low Phase Noise Phase-Locked Frequency Reference

Data Sheet 1909A

		100 KHz		-180			
		10 Hz		-105		dBc/Hz	1,000 MHz output
		100 Hz		-112			
		1 KHz		-142			
		10 KHz		-158			
		100 KHz		-160			
Power Requirements	P	IEC320 on the back	100 to 250 V AC 50/60 Hz		V AC		
Spectral Purity		Subharmonics Spurious Harmonics		-50 -35	-40 -80 -30	dBc	At 1,000 MHz output Either output
Load	Internally AC-coupled 50 Ohm						All Outputs
Output Waveform	Sinewave						
Output Power			+10 +12 +10	+13 +15 +13		dBm	10 MHz 100 MHz 1,000 MHz
Spectral Purity		Subharmonics Spurious Harmonics		-70 -35	-50 -80 -30	dBc	5 MHz and multiples
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				1		minute	
Lock Detect	Green LED						
Input Detect (either)	Green LED						
Holdover Mode	Yellow LED						

Environmental and Mechanical

Operating temp. range	+10°C to +45°C
------------------------------	----------------



**FREQUENCY
CONTROLS, INC.**

357 Beloit Street, Burlington, WI 53105 U.S.A. Phone 262/763-3591 FAX 262/763-2881

Email: nelsales@nelfc.com www.nelfc.com