

## 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

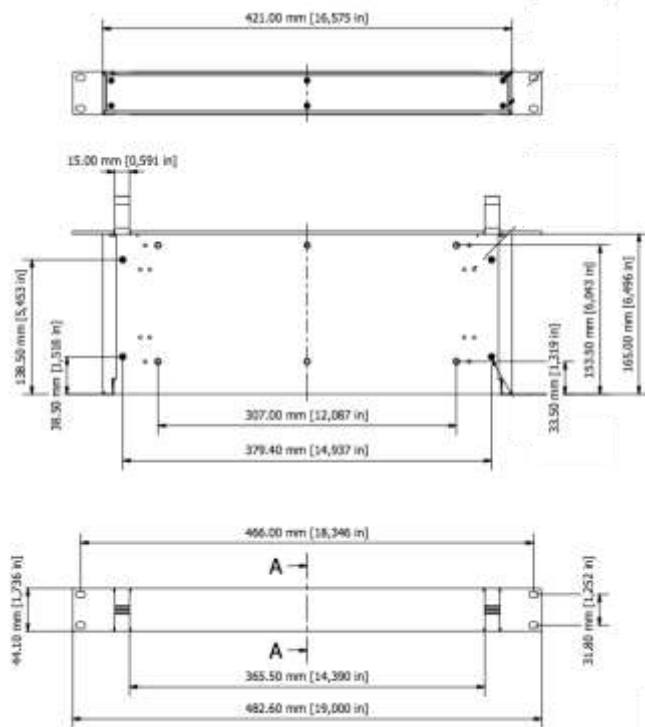
- 5G device testing
- Digital AM Radio Stations
- Significantly improves Phase Noise of incoming Reference signal
- COTS/Dual use

#### Inputs

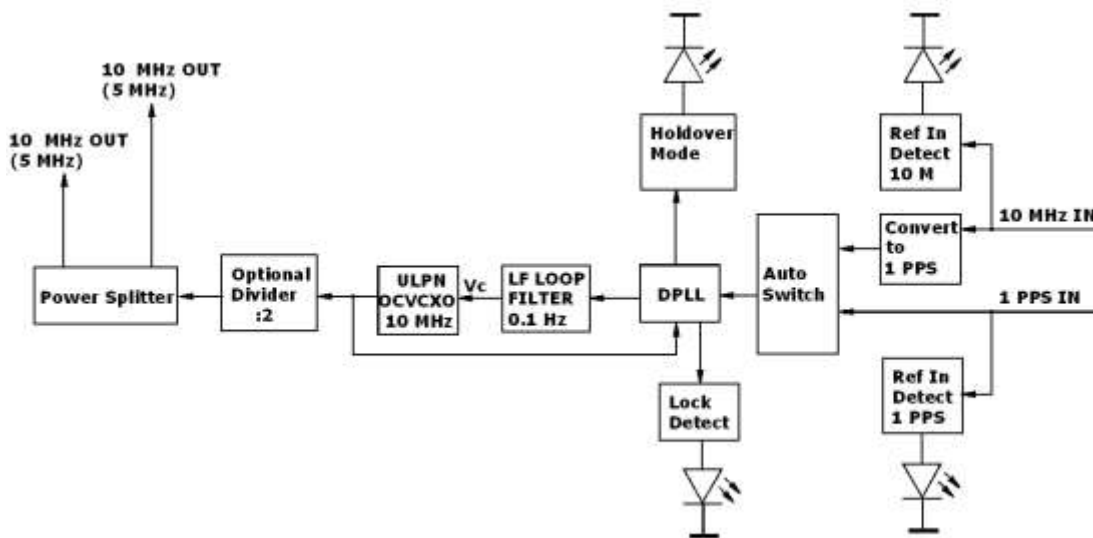
10 MHz (or 5 MHz) IN SMA Female  
1 PPS IN SMA Female

#### Outputs

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



Mechanical Dimensions



# Ultra Low Phase Noise Phase-Locked Frequency Reference

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## Front Panel



## Specifications:

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
<b>Absolute Maximum Ratings</b>							
Power supply	Vp		90		260	V AC	
Operating Temp.	To		10		45	°C	
Storage temper.	Ts		0		70	°C	
<b>Electrical</b>							
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)	$\Delta F/F$	Over All	$\pm 100$			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	$\tau$	8 hours		20		us	
Recommended MAX Input SSB Phase Noise	$\xi(\Delta f)$	10 Hz			-90	dBc/Hz	10 MHz reference
		100 Hz			-120		
		1 KHz			-130		
		10 KHz			-140		
		100 KHz			-140		
Output SSB Phase Noise Improvement Compared to Input Phase Noise adjusted to 10 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 Frequency	F10			10.000		MHz	SMA
SSB Phase Noise (achieved after 10 minutes warm-up) Noise floor	$\xi(\Delta f)$	0.01		-37		dBc/Hz	Grade E
		10		-89			
		1 MHz		-120			
		10 Hz output		-148			
		100 Hz		-158			
		1 KHz		-168			
		10 KHz		-170			
100 KHz		-172					
10 MHz output	$\xi(\Delta f)$	1 Hz		-112		dBc/Hz	Grade P
		10 Hz		-145			
		100 Hz		-152			

# Ultra Low Phase Noise Phase-Locked Frequency Reference

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		1 KHz 10 KHz 100 KHz		-163 -168 -170			
	$f(\Delta f)$ 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
<b>Power Requirements</b>	P	IEC320 on the back	100 to 250 V AC	50/60 Hz		V AC	
<b>Load</b>		Internally AC-coupled 50 Ohm					Both Outputs
<b>Output Waveform</b>		Sinewave					
<b>Output Power</b>			+8	+10		dBm	Both Outputs
<b>Spectral Purity</b>		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc	
<b>Load</b>		Internally AC coupled 50 Ohm (Sinewave) 10K Ohm//15pf (CMOS/TTL)					
<b>Warm-up time</b>	$\tau$	to lock on 100 ppb input		3	5	minutes	
<b>Lock Time after warm-up</b>				10		minutes	
<b>Lock Detect</b>			Green LED				
<b>Input Detect (either)</b>			Green LED				
<b>Holdover Mode</b>			Yellow LED				

### Environmental and Mechanical

<b>Operating temp. range</b>	+10°C to +45°C
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### 10 MHz grade E phase noise example

