

HPTR is a 1 Pulse Per Second (1PPS) timing reference offering the following features:

- It has a very small footprint and consumes only 68 mW of power at 25°C.
- Its stability is better than 0.5 ppb over its entire operating range (temperature and input voltage).
- In each 48 hour period its relative drift (holdover) is less than 150 μ s. This results in less than 25 cm of range error in a typical subsea acoustic navigation application.
- Due to its high stability, long term accuracy can be improved by measuring the frequency offset (after settling) and compensating for this over time.
- For applications where absolute accuracies are required, by connecting an accurate 1PPS reference signal to it (such as GPS), HPTR will first phase lock to the 1PPS reference and then frequency lock to the 1PPS reference. Locking occurs automatically upon detection of a valid and accurate 1PPS reference signal.

Ordering Information

Part Number	310-401-100
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Electrical

Parameter	Condition	Min	Typ	Max	Unit
<i>Outputs</i>					
<i>1PPS (Pin2)</i>					
<i>Frequency</i>					
Nominal Frequency			1		Hz
Offset/ Accuracy	(see Note 1)		±5		ppb
<i>Stability</i>					
Allan deviation	at fixed temperature (see Note 2)		0.05	0.2	ppb
Allan deviation	over operating temperature range (see Note 2)		0.2	0.5	ppb
vs. supply voltage	over operating voltage range			< 0.01	ppb
Retrace	7 days work; 24h off; 24h work	-4		+4	ppb
Aging per year		-100		+100	ppb
<i>Signal</i>					
IO Standard	LVC MOS3.3 (see Note 3)				
Pulse Width		99.8	100	100.2	µs
VOL	IOL = 8 mA			0.4	V
VOH	IOH = -8 mA	2.4			V
<i>10 MHz (Pin4)</i>					
<i>Frequency</i>					
Nominal Frequency			10		MHz
Offset/Accuracy		-100		+100	ppb
<i>Stability</i>					
Allan deviation	0.1s			20	10 ⁻¹²
Allan deviation	1s			30	10 ⁻¹²
vs. temperature	over operating temperature range	-50		+50	ppb
vs. supply voltage	over operating voltage range			<0.01	ppb
Retrace	7 days work; 24h off; 24h work	-4		+4	ppb
Aging per year		-100		+100	ppb
<i>Signal</i>					
IO Standard	LVC MOS3.3				
Duty Cycle		45	50	55	%
VOL	IOL = 8 mA			0.4	V
VOH	IOH = -8 mA	2.4			V
<i>Inputs</i>					
<i>Vin (Pin12)</i>					
Voltage	with respect to GND (Pin15)	2.97	3.3	5.50	V
Operating Power	for temperature range from 35°C to 3°C	52.00		110.00	mW
Operating Power	at 25°C		68.00		mW
Warm-up Power				435	mW
Warm-up Time				90	s
<i>1PPS External Reference (Pin5)</i>					
VIH		2			V
VIL				0.8	V
Pulse Width		20			µs
Accuracy	(see Note 4)	-0.1		+0.1	ppb



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Environmental and Mechanical

Parameter	Condition	Min	Typ	Max	Unit
Operating Temperature range		3		35	°C
Mechanical Shock	MIL-STD-202; 11 ms			30	G
Vibration	MIL-STD-202; to 500 Hz			5	G
Weight				14	g
RoHS	lead-free components and assembly processes used				
Soldering Conditions	10s Max			380	°C

Electrical Connections

Parameter	Condition
Pin2	1PPS - OUTPUT
Pin4	10 MHz - OUTPUT
Pin5	GPS 1PPS - INPUT
Pin12	Vin - INPUT
Pin15	GND - INPUT
All Other Pins	RESERVED - DO NOT connect; leave floating

Absolute Maximum Ratings

Parameter	Condition	Min	Typ	Max	Unit
Input VoltageVin (Pin12)		-0.5		6.3	V
Storage Temperature range		-40		50	°C
Operable Temperature range		-30		50	°C
Power consumption	at 4°C at power ON			479	mW

Notes

Note 1: Typical values are achieved at (1) shipment and (2) after the initial settling time at a given temperature and then locking to reference signal (GPS).

Note 2: Allan Deviation plot is based on a sample of 40 HPTR devices measured at a constant temperature of 23°C. Solid line is the average of 40 devices and dotted lines are the minimum and maximum ranges. Figures quoted in the table above are based on worst case performance up to 1 day averaging time.

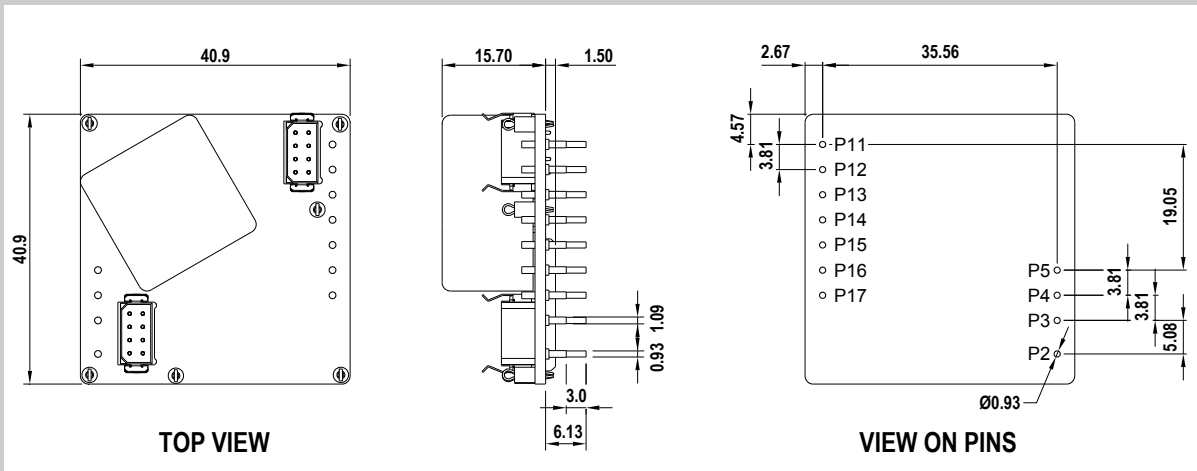
Note 3: The 1PPS signal has a 56R series resistor.

Note 4: The accuracy of the input reference 1PPS has to be 0.1 ppb or better to achieve phase lock within 2 minutes and frequency lock within 2 hours.

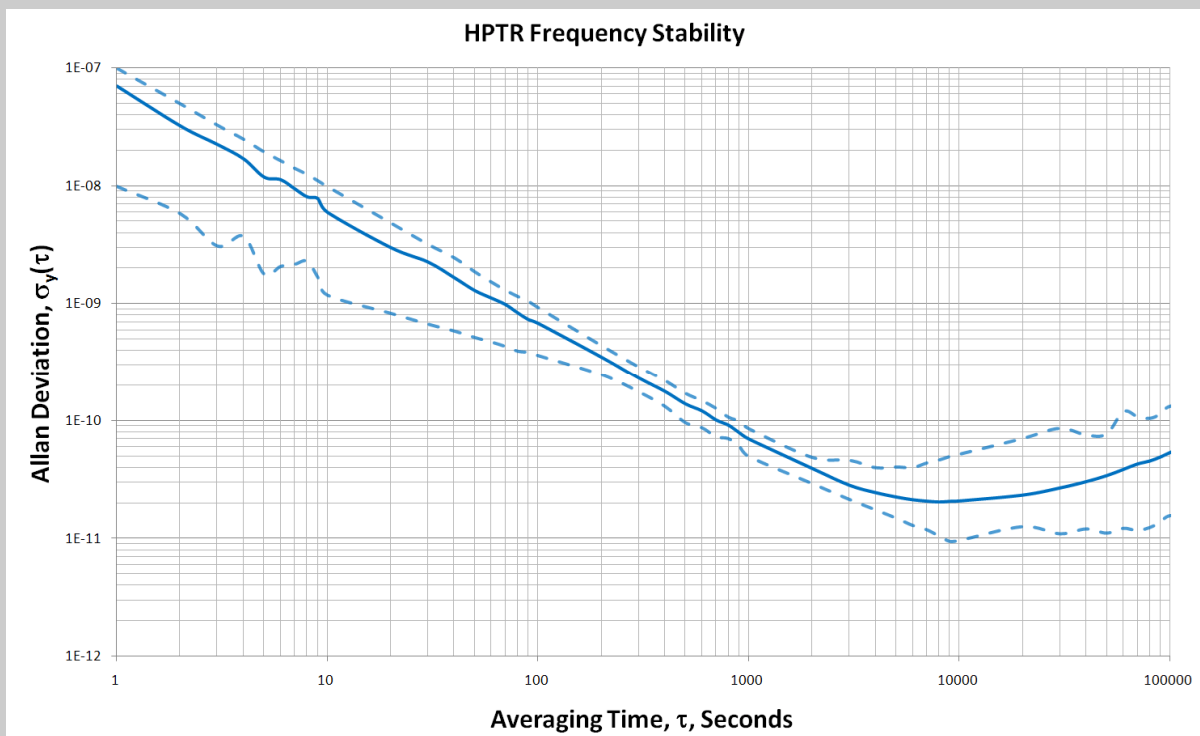


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HPTR Outline



Frequency Stability (see Note 2)



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