

HSO14

The Ground USO HSO14 is a High Stability Oscillator (HSO) specifically designed to meet the stringent requirements of calibration and metrology laboratories, as well as high-performance applications such as master & atomic clocks and ground stations.

This 10^{-11} stability class USO exhibits impressive short-term stability (Allan Standard Deviation, ADEV) of 8×10^{-14} . A superior ADEV of 6×10^{-14} is available on special request. The HSO14 delivers excellent close-in phase noise (e.g., -130 dBc/Hz at 1 Hz offset, 5 MHz). It is a high-performance reference oscillator ideal for scenarios that require exceptionally stable frequency stability, reliable signals and outstanding ADEV performance. It is available in the following frequencies: 5 MHz or 10 MHz.

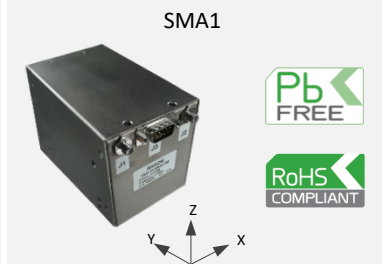
Features

- Frequency: 5 or 10 MHz
- Short-term stability: 8×10^{-14} at 5 and 10 MHz
- Frequency stability: $\pm 5 \times 10^{-11}$ over 0 to +50 °C
- Supply voltage: 24 V
- Ageing: $\pm 5 \times 10^{-11}$ (± 50 ppt) per day

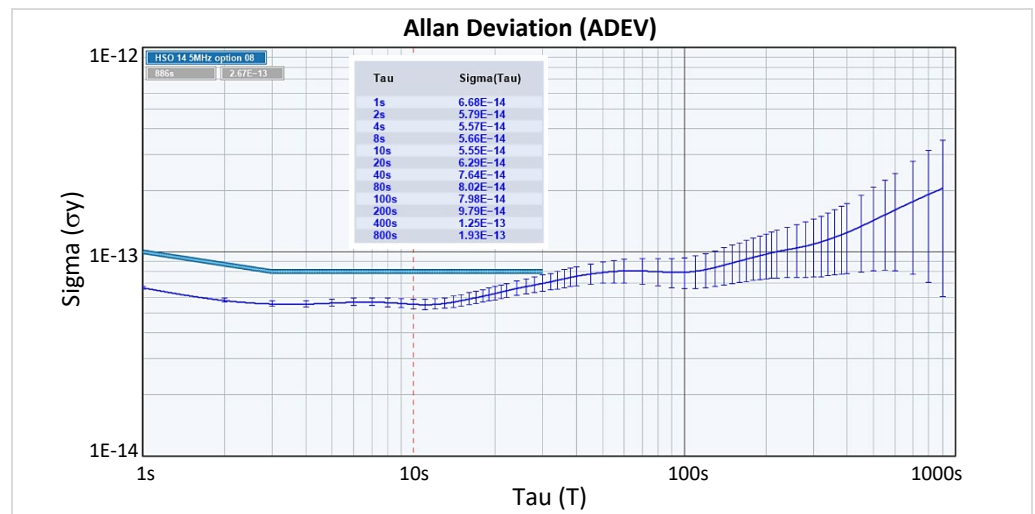
Applications

- Reference oscillator for laboratories
- Reference oscillator for maser and atomic fountains
- Ground stations

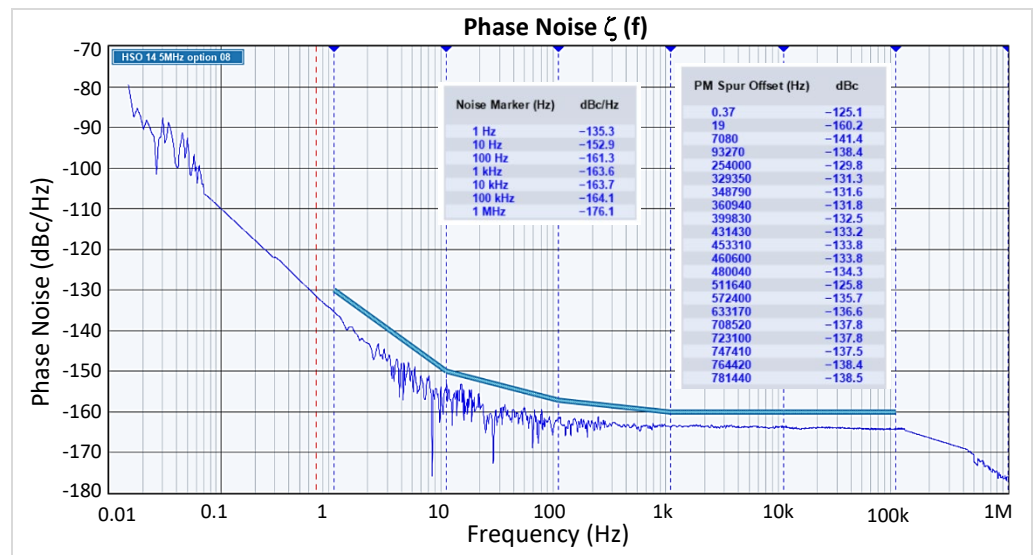
73 x 135 x 84 mm



Allan Deviation (ADEV) at 5 MHz



Phase Noise ζ (f) at 5 MHz



1. Environmental Conditions

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Operating temperature	0	25	50	°C	Max. 1 °C/hour
Non-operating temperature	-5	25	55	°C	-
Storage temperature	0	-	60	°C	-
Frequency stability after mechanical shocks	-	-	±10	ppb	Half sine 30 g / 11 ms
Frequency stability after sine vibrations	-	-	±5	ppb	10 – 500Hz 10 g acceleration

2. Performance Data

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency (Fn)	-	5, 10	-	MHz	-
Relative pulling frequency range	±50 ±20	-	±100 -	ppb	With internal potentiometer Frequency tuning with Vc input from 0 to 10 V
Power supply	Steady state Warm-up	2.4 -	3 10	W	Typical 25 °C Achieving 15 minutes after startup @ 25 °C
Frequency warm-up time	- 1	-	15 28	mn day	For frequency in the range Fn ± 1 ppm @25 °C For full performance
Frequency stability vs. temperature	-	-	±50	ppt	-
Frequency variation vs. supply voltage (Vcc)	-	-	±10	ppt	Vcc ± 1 % at 25 °C
Frequency variation vs. load	-	-	±20	ppt	At ±10%
Ageing	-	-	±50	ppt/day	After a minimum of 21 days of continuous operation
	-	-	±1.5	ppb/month	
	-	-	±10	ppb/year	
	-	-	±50	ppb/10 years	According to the MIL-PRF-55310 version C
<i>g</i> -sensitivity ¹	-	-	±1	ppb/g	Quadratic sum
Output level	7	8	9	dBm	Output waveform: Sinewave
Harmonics	-	-	-40	dBc	From DC to 10xFn
Spurious	-	-	-80	dBc	From 100 Hz to 3 GHz @25 °C

3. Electrical Interface

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Power supply	21.60	24	26.40	V	24 V
Load impedance	47.5	50	52.5	Ω	-
Reference voltage (V _{REF})	-	8	-	V	Output current: 0 to 1 mA max.

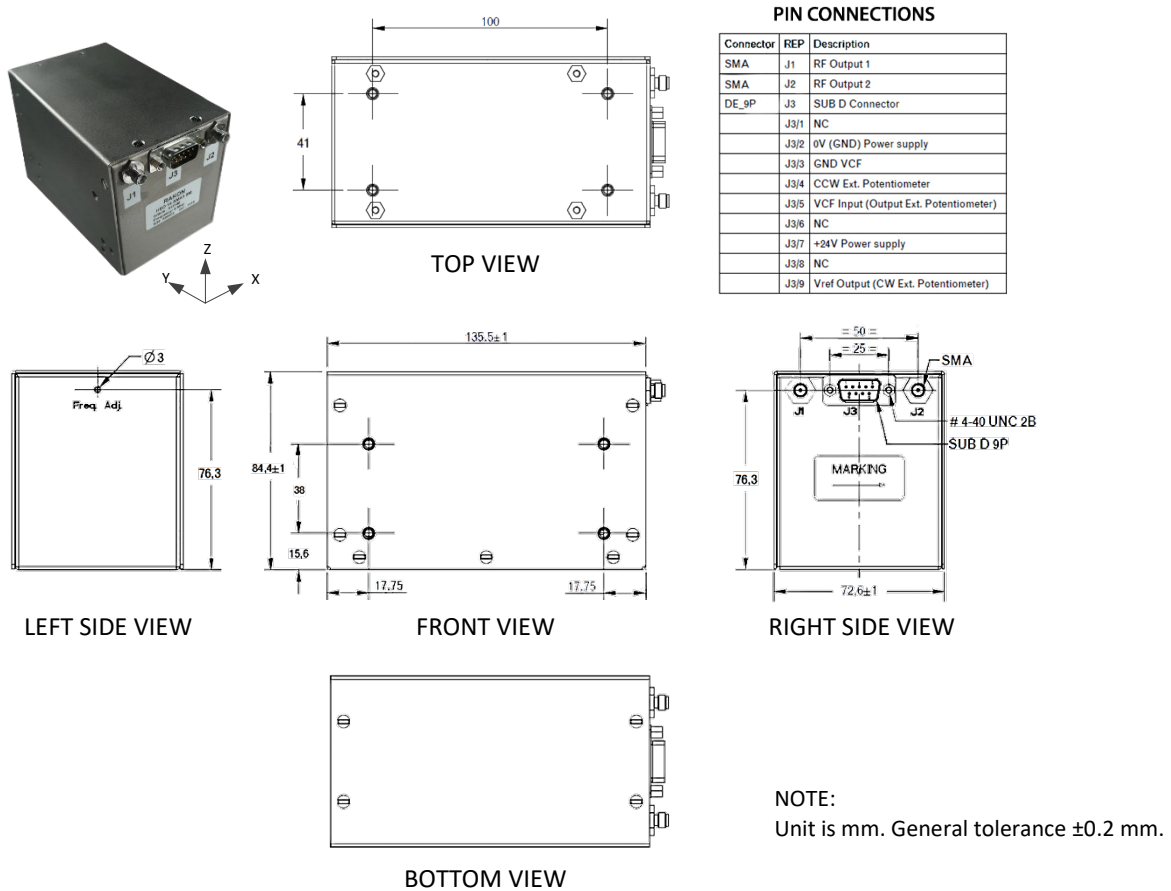
4. Short-term Stability Options and Phase Noise

ADEV Option	Remarks	Tau=1s	Tau=3 –30s	Frequency	1Hz	10Hz	100Hz	1kHz	10kHz
08	ADEV = 08E-14	1E-13	08E-14	5 MHz 10 MHz	-130 -123	-150 -141	-157 -143	-160 -143	-160 -143
10	ADEV = 10E-14	10E-14		5 MHz 10 MHz	-128 -121	-148 -141	-155 -143	-160 -143	-160 -143
15	ADEV = 15E-14	15E-14		5 MHz 10 MHz	-	-	-	-	-
20	ADEV = 20E-14	20E-14		5 MHz 10 MHz	-	-	-	-	-
25	ADEV = 25E-14	25E-14		5 MHz 10 MHz	-	-	-	-	-

¹ Measurement according to MIL-PRF-55310, method 2g tip over.

5. Model Outline and Pin Connections

Parameter	Remarks
Package size	73 x 135 x 84 mm. SMA1 (SMA + DE-9P) package
Net weight	1100 g typ.
STEP file	HSO14 3D model To open or view the STP file, you will need to import it into one of the following software programs: Autodesk Fusion 360, CATIA, SolidWorks, Solid Edge, TurboCAD, Kubotek KeyCreator, FreeCAD, ABViewer, ShareCAD, or eMachineShop.



6. Ordering Part Example

