



Small and Wide-Temperature Rubidium atomic clock

Product profile

The TRW70 is a wide temperature Rubidium clock that can adapt to $-50^{\circ}\text{C} \sim +95^{\circ}\text{C}$, small size, high reliability, high performance, excellent frequency stability and phase noise, internal integration of 1PPS timing and 1PPS output, and provides an additional 10MHz square wave signal output and external 10MHz signal calibration function, can use cesium clock and hydrogen clock signal as standard for fast automatic calibration of TRW70 frequency. It integrates a highly intelligent digital control system to meet a variety of customized needs of customers, and can fully monitor the health status, with intelligent learning function, allowing users to use atomic clocks more easily and flexibly. All signals of the TRW70 are integrated in a DSUB9 connector, making it more suitable for installations in confined spaces. the TRW70 can also be used as a 10 MHz frequency comparator with an integrated standard.

Application area



Navigation equipment



Military weapons and equipment



Communications equipment



Wireless base station



Instrumentation

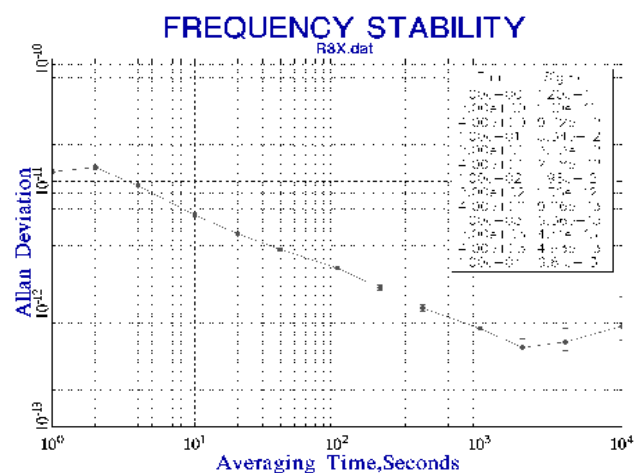


Aerospace

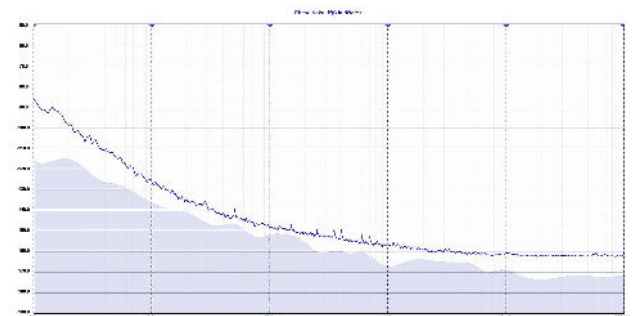
Product features

- It can work normally within $-50^{\circ}\text{C} \sim +95^{\circ}\text{C}$ range
- Small volume $76\text{mm} \times 76\text{mm} \times 18\text{mm}$
- The short-term stability is better than $3\text{E}-11 / 1\text{s}$
- Room temperature stable power $\leq 13\text{W}$
- Low-phase noise, with typical values $-120\text{dBc}/\text{Hz}@10\text{Hz}$
- 1 PPS timing and 10 MHz calibration

Typical curve



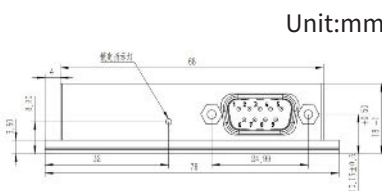
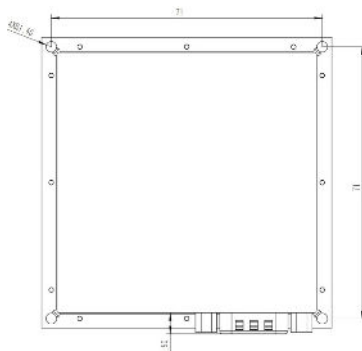
Typical value of the frequency stability:	100ms: 2.5×10^{-12}	1s: 1.2×10^{-11}
	10s: 5.5×10^{-12}	100s: 2.0×10^{-12}
	1000s: 6.3×10^{-13}	



Typical values of the phase noise:	1Hz: $-80\text{dBc}/\text{Hz}$	10Hz: $-120\text{dBc}/\text{Hz}$
	100Hz: $-147\text{dBc}/\text{Hz}$	1kHz: $-157\text{dBc}/\text{Hz}$
	10kHz: $-162\text{dBc}/\text{Hz}$	

Test Item		Technical Indicators			
Output frequency	Condition	10 MHz, 1-way sine wave (50Ω, ≥ 7dBm) and a 1-way 3 VTTL square wave			
Factory accuracy		≤ 5×10 ⁻¹¹			
Frequency control	Voltage pressure control	0~5V, with the total range of at least ±5×10 ⁹			
	Instruction adjustment	Coarse adjustment of at least ±1×10 ⁶ , Fine adjustment range of at least ±1.5×10 ⁹ , The resolution is better than 1×10 ⁻¹²			
Locking time	Indoor temperature	≤ 5min			
Frequency stability	1s	≤ 3×10 ⁻¹¹			
	10s	≤ 1×10 ⁻¹¹			
	100s	≤ 3×10 ⁻¹²			
Phase noise	1Hz	≤ -80dBc/Hz			
	10Hz	≤ -115dBc/Hz			
	100Hz	≤ -145dBc/Hz			
	1kHz	≤ -150dBc/Hz			
	10kHz	≤ -155dBc/Hz			
Frequency drift rate	/Day	±2×10 ⁻¹¹	FD12: ±1.2×10 ⁻¹¹	FD5: ±5×10 ⁻¹²	FD2: ±2×10 ⁻¹²
Frequency reproducibility	Switch 24h	±2×10 ⁻¹¹			
Temperature and Frequency Characteristics		≤ 5×10 ⁻¹⁰	TC3: ≤ 3×10 ⁻¹⁰	TC1: ≤ 1×10 ⁻¹⁰	TC0.5: ≤ 5×10 ⁻¹¹
Harmonic And Clutter		harmonic ≤ -30dBc, clutter ≤ -70dBc			
Working temperature	Bottom plate temperature	-40°C ~+85°C	OT90: -45°C ~+90°C	OT95: -50°C ~+95°C	
Storage temperature		-50°C ~+95°C			
Power supply	±4%	+12V~+15V			
Rate of work	Preheat	≤ 22.5W			
	Steady state (+25°C)	≤ 13W			
External Dimension	Body size	68mm×68mm×18mm			
	Bottom plate size	76mm×76mm			
1PPS input		+3V~+5V TTL, Judder<300ns, Pulse width > 100ns			
1PPS output		Rising edge / Falling edge: ≤ 10ns, Pulse width: 1us~999ms,			
Taming accuracy	After 24h of synchronization	Taming jet lag: ±50ns, Time-keeping accuracy: ≤ 1us@24h, Frequency accuracy: ≤ 1×10 ⁻¹² @24h			

External Dimension



Unit:mm

Pin Definition:

- 1: Ground
- 2:1 PPS-IN
- 3: RS232-TX
- 4: RS232-RX
- 5: Lock indication
- 6: Power supply
- 7:1 PPS-OUT
- 8:10M, sine wave output
- 9:10M square wave output / frequency pressure