

Chip Scale Atomic Clock(CT45)

Description

The CT45 chip atomic clock is a miniature atomic clock based on the Coherent Population Trapping (CPT) principle and MEMS technology, which outputs an accurate and stable 10MHz standard frequency signal and 1PPS pulse signal. The installation size of CT45 chip atomic clock is compatible with SA.45s chip clock, and can work in time-frequency boards and modules. It has UART frequency calibration interface and external electrical tuning interface.

Feature

- Compact Design;
- Compatible with SA.45s;
- Low Consumption up to 130mW;
- Input 1PPS sync and 10MHz output;
- Optional Output

from 10MHz, 16.384MHz, 20MHz and 24.576MHz.

Application Filed

- Timing Board and Module
- Telecommunication System
- Power Grid
- Positioning System



Technical Parameter

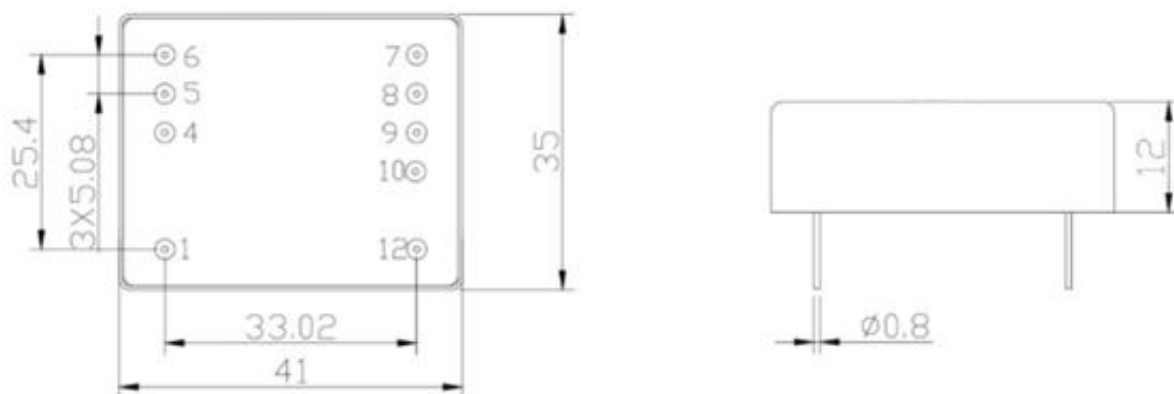
Output Signal Feature			
Serial	Item		Parameter
1	Output Frequency		10MHz (Optional for 16.384MHz,20MHz and 24.576MHz)
2	Wave Type		Square
3	Electrical Level		3.3V
4	Phase Noise (SSB)	10Hz	$\leq -80\text{dBc/Hz}$
		100Hz	$\leq -113\text{dBc/Hz}$
		1kHz	$\leq -125\text{dBc/Hz}$
		10kHz	$\leq -135\text{dBc/Hz}$
Output 1PPS feature			
Serial	Item		Parameter
1	Amplitude		$3.3\text{V} \pm 0.2\text{V}$
2	Pulse Width		$> 1 \mu\text{s}$
3	Rising Time		$< 10 \text{ ns}$
Frequency Feature			
Serial	Item		Parameter
1	Relative Error		$\leq \pm 5.0\text{E-}11$
2	Frequency Stability (Allan)	$\delta y(1\text{s})$	$\leq 3.0\text{E-}10$
		$\delta y(10\text{s})$	$\leq 1.0\text{E-}10$
		$\delta y(100\text{s})$	$\leq 3.0\text{E-}11$
3	Drift (Power-on 1d)		$\leq 3.0\text{E-}11/\text{d}$
4	Temperature Feature($-10^{\circ}\text{C} \sim +70^{\circ}\text{C}$)		$\leq 1.0\text{E-}9$
5	Power-on Feature	Lock Time	$\leq 4 \text{ mins}$
6	Frequency Adjustment	Range	$\geq \pm 2\text{E-}8$
		Ratio	$\leq 1\text{E-}12$
7	Frequency Error (Tamed 2h)		$\leq \pm 1.0\text{E-}12/\text{d}$

Technical Parameter

Sync and Holdover Performance			
Serial	Item	Parameter	
1	1PPS Sync Error	$\leq 50\text{ns}$	
2	Holdover (1d @ Tamed 1d)	$\leq 5\mu\text{s}$	
Power and Consumption			
Serial	Item	Parameter	
1	Voltage	$+3.2\text{Vdc} \sim +3.4\text{Vdc}$	
2	Start Consumption	$\leq 200\text{mW}$	
3	Rated Consumption (Normal Temperature)	$\leq 130\text{mW}$	
Status Indicator			
Serial	Item	Parameter	
1	Status	Lock	$0\text{V} \sim 0.4\text{V}$
		Unlock	$2.2\text{V} \sim 3.4\text{V}$
Physical Parameter			
Serial	Item	Parameter	
1	Weight	$\leq 40\text{g}$	
Environment Feature			
Serial	Item	Parameter	
1	Working Temperature	$-10^{\circ}\text{C} \sim +70^{\circ}\text{C}$	
2	Storage Temperature	$-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$	
3	Magnetism	$\leq 2\text{ Gauss}$	
Reliability			
Serial	Item	Parameter	
1	MTBF	$\geq 100000\text{h}$	

Dimension

$(41 \pm 0.5) \text{ mm} \times (35 \pm 0.5) \text{ mm} \times (12 \pm 0.5) \text{ mm}$.



Pin Definition

Serial	Function	Description
1	EFC	External Port for adjustment
4	Lock Indicator	3.3V, low=lock
5	TXD	UART TX (LvTTL)
6	RXD	UART RX (LvTTL)
7	+3.3V	Power Supply+
8	GND	Power Supply-
9	1PPS Input	Reference 1PPS input
10	1PPS Output	1PPS Output
12	10M Output	10M Output