北斗邦泰
BDSTAR TIME

-TCA55

Localization / Chip level

Atomic clock

Product profile

The TCA55 is a new type of atomic clock based on the principle of Coherent Population Trapping (CPT), with the advantages of low power consumption, small size and fast startup, etc. The TCA55 is developed and produced by domestic components and process technology, and can guarantee the frequency accuracy of ppb level in the operating range of -40 ℃ ~+85 ℃ . The TCA55 outputs CMOS level 10MHz square wave and 1PPS pulses with short-term stability better than 3E-10/1s, daily drift better than 3E-11, and monthly aging rate better than 5E-10. The TCA55 has an external calibration function, which can be done by external 1PPS signals or external analog voltages. The TCA55 has better reliability and flexibility, such as controlling its output frequency and querying its internal health status. The frequency can be adjusted via the RS-232 serial port or calibrated using an external 1pps signal with a calibration resolution of <1E-12.

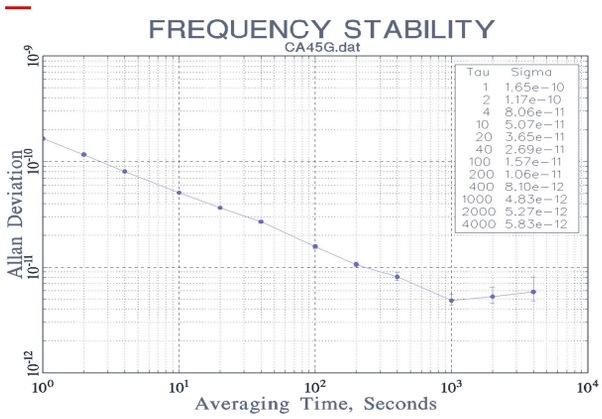
Application area

- Navigation Equipment
- Underwater Sensor network
- Communications Equipment
- Unmanned Submarine
- Instruments and Meters
- Marine geophysical exploration

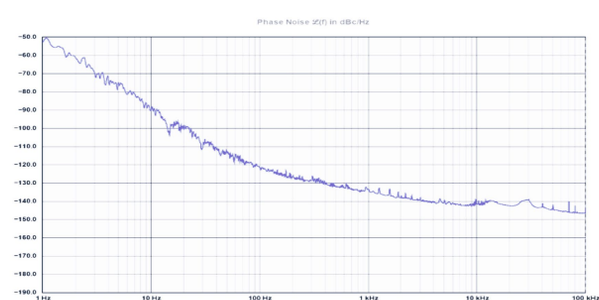
Product features

- Operating temperature range -40°C ~ + 85°C
- The short-term stability is better than the 3E-10 / 1s
- Small size, size of 41×36×17mm
- Room temperature stabilized power consumption <1.5W, maximum power consumption can be set on command
- Lockout time less than 180s at room temperature
- Appearance and installation dimensions compatible with SA.45s
- Output 1 10MHz CMOS square wave
- External 1PPS taming, outputs 1 1PPS signal
- External analog voltage calibration
- Communication, control and inquiry via RS-232

Typical curve



Typical value of the frequency stability: 1s: 1.5×10^{-10} 10s: 5×10^{-11} 100s: 1.5×10^{-11}



Typical values of the phase noise: 1Hz: -50dBc/Hz 10Hz: -85dBc/Hz 100Hz: -120dBc/Hz 1kHz: -135dBc/Hz 10kHz: -140dBc/Hz

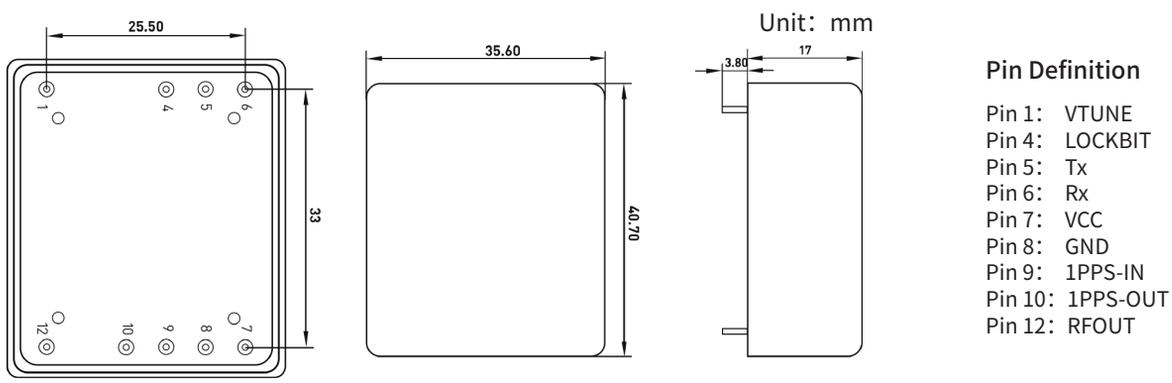
Technical Parameters

-TCA55

Test Item		Technical Indicators	
Output frequency	Condition	10 MHz, 1-way CMOS square wave	
Factory accuracy	After calibration	$\leqslant 5\times10^{-11}$	
Frequency control	Voltage pressure control	0~5V，with the total range of at least $\pm1\times10^{-8}$	
	CNC calibration	Command calibration, coarse resolution 2×10^{-10}，fine resolution<1×10^{-12}	
Locking time	Indoor temperature	$\leqslant$ 180s	
Frequency stability		Standard type	ADEV8
	1s	$\leqslant 3\times10^{-10}$	$\leqslant 8\times10^{-11}$
	10s	$\leqslant 1\times10^{-10}$	$\leqslant 2.5\times10^{-11}$
	100s	$\leqslant 3\times10^{-11}$	$\leqslant 8\times10^{-12}$
Phase noise	1Hz	$\leqslant$ -50dBc/Hz	
	10Hz	$\leqslant$ -80dBc/Hz	
	100Hz	$\leqslant$ -115dBc/Hz	
	1kHz	$\leqslant$ -130dBc/Hz	
	10kHz	$\leqslant$ -140dBc/Hz	
Frequency drift rate		$\leqslant 5\times10^{-11}$/day	FD3: $\leqslant 3\times10^{-11}$/day
Frequency reproducibility	Switch 24h	$\pm5\times10^{-11}$	
Temperature and Frequency Characteristics		$\leqslant 5\times10^{-10}$	
Working temperature	Environmental temperature	-40°C ~+70°C	OT85: -40°C ~+85°C
Storage temperature		-55°C ~+125°C	
Power supply	±5%	+3.3V	
Rate of work	Preheat	$\leqslant$ 10W	
	Steady state(indoor temperature)	$\leqslant$ 1.5W	
External Dimension	Body size	41mm×36mm×17mm	
Weight		＜ 50g	

Technical Parameters

Unit：mm



Pin Definition

Pin 1： VTUNE
Pin 4： LOCKBIT
Pin 5： Tx
Pin 6： Rx
Pin 7： VCC
Pin 8： GND
Pin 9： 1PPS-IN
Pin 10： 1PPS-OUT
Pin 12： RFOUT