



SA.31m, SA.33m & SA.35m

Miniature Atomic Clock

KEY FEATURES

- High precision atomic clock
- Small form factor (smaller than most OCXOs)
- Standard quartz oscillator pinouts
- Low power consumption

APPLICATIONS

- Stand-alone (free-run) stable frequency source (for UMTS or LTE)
- Extended holdover for CDMA and WiMAX base stations
- Stability for various other communication and transmission applications

The SA.3Xm marks a major step forward in the evolution of rubidium atomic clocks. Based on a new generation of atomic clock technology, the SA.3Xm family has a completely new physics package that enables unprecedented miniaturization possible in a rubidium clock. It is suitable for applications requiring compact design, low power consumption, extended aging and precision in an economical and easily adaptable package.

SMALLEST COMMERCIALY AVAILABLE RUBIDIUM CLOCK

Symmetricom has leveraged significant advances in physics miniaturization and integration to design the world's first commercially available miniature atomic clock. The SA.3Xm has the physical dimensions and packaging of a small ovenized crystal oscillator (OCXO), measuring 51 mm X 51 mm (2" X 2") and standing at a mere 18 mm (0.7"). It consumes less power and has wide-spectrum temperature operation. This makes it accessible to a range of timing and synchronization applications, from telecom networks to test and measurement devices.

SA.31m

The SA.31m is targeted for applications where an economical solution for frequency stability is required, such as UMTS (WCDMA) or LTE. It can be used as an independent frequency source for base stations, and enable transition from costly TDM Backhaul transport to economic and efficient Ethernet transport.

SA.33m

The SA.33m may be deployed in existing rubidium applications, such as extended holdover (for CDMA / CDMA 2000 or WiMAX).

SA.35m

The SA.35m is the premium grade of the entire SA.3Xm family. It has better aging, tempco and stability performance amongst all the versions of the family. It is ideally suited for specific holdover and test and measurement applications. Economical for its performance level, the SA.35m delivers premium performance at a reasonable price.



SA.3Xm Miniature Atomic Clock

Performance Specifications

ELECTRONIC

- Output Frequency/Waveform: 10 MHz
3.3 volt AC CMOS square wave
- Logic Level: VL<0.5V, VH>2.7V (15pf load)
- Rise/Fall Time: <10 ns
- Duty Cycle: 50%+/-10%
- Phase Noise (SSB)

	SA.35m / SA.33m	SA.31m
1Hz	<-70 dBc/Hz	<-65 dBc/Hz
10Hz	<-87 dBc/Hz	<-85 dBc/Hz
100Hz	<-114 dBc/Hz	<-112 dBc/Hz
1kHz	<-130 dBc/Hz	<-130 dBc/Hz
10kHz	<-140 dBc/Hz	<-140 dBc/Hz
- Spurious:

	SA.35m	SA.33m	SA.31m
Non-Harmonic:			<-85 dBc
- Temperature Coefficient [peak to peak]:

	SA.35m	SA.33m	SA.31m
(0 C° to 70° C)	≤7E-11	≤1E-10	≤7E-10
(-10° C to 75° C)	≤1E-10	≤1.5E-10	≤1E-9
- Accuracy at shipment: <±5E-11 [25° C]
- Retrace: <±5E-11 [on-off-on: 24hr, 48hr, 12hr @25° C]
- Control range:
 - With analog input: ±1.5E-9, 0-5 V into 5 k ohms
 - With digital input: ±1E-6 (with resolution ±1E-12)
- Warm-up time: time to <1E-9 @25° C: <7.5 min (if mounted on the developer's kit heat sink: ≤9 min)
- Supply voltage/current: +5 Vdc ±0.1 Vdc, Max. current <2.8 Amps
- Power consumption: Warm-up: 14W max (-10° C to +75° C); Operating: 8W @ -10° C, 5W @ 25° C, 5W @ 75° C baseplate
- Voltage coefficient: +5 Vdc ±0.1 Vdc: Magnitude (df/f) <2E-11 peak-to-peak
- Radiated Emissions: Compliant to FCC part 15, Class B, if mounted properly to the host PCB
- Test / status:
 - Built-in self-test (BITE)
 - ACMOS: Service / fault-unlock
 - Serial Port: Symmetricom specific serial port protocol for status and control
- Aging: (After 1 day & 1 month of operation respectively)

Type	SA.35m / SA.33m	SA.31m
Daily*	±2.5E-11	±4E-11
Monthly*	±1E-10	±3E-10
Yearly	±1E-9	±1.5E-9
- Short Term Stability (Allan deviation)

Type	SA.35m / SA.33m	SA.31m
t=1s	≤3E-11	≤5E-11
t=10s	≤1.6E-11	≤2.5E-11
t=100s	≤8E-12	≤1E-11
- Time drift in a 24-hr period (SA.33m & SA.35m only): <7µs over 0 to +60° C
- MTBF:
 - Per MIL-HDBK-217F:
 - ≥20 years @ 40° C [Ground, fixed, uncontrolled, GF]
 - ≥17 years @ 40° C [Ground, fixed, controlled, GB]
 - Per Telcorida SSR 332, Issue 1:
 - ≥20 years @ 40° C [Ground, fixed, uncontrolled]

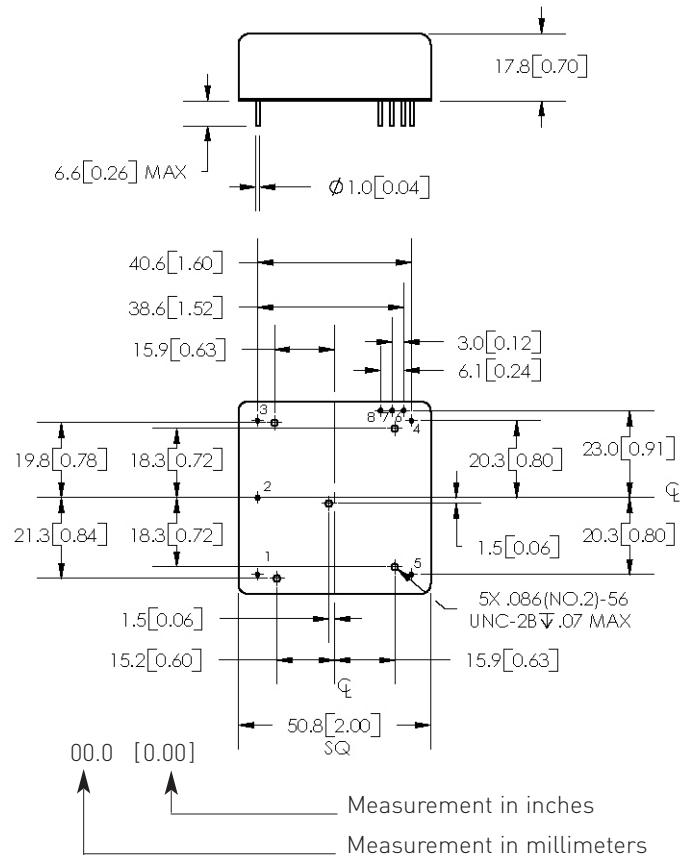
- Connector: 5 Pins match standard OXC0 configurations
 - Pin 1: Input frequency control
 - * Pin 2: Baseplate (connect to GND externally)
 - Pin 3: Output signal
 - * Pin 4: Ground (signal & supply)
 - Pin 5: Input supply (+)
- * Pin 2 & Pin 4 are not connected internally
- Three [3] additional pins for added functionality:
 - Pin 6: BITE
 - Pin 7: RS232 transmit (Tx)
 - Pin 8: RS232 receive (Rx)

ENVIRONMENTAL

- Operating temperature: -10° C to +75° C base-plate
- Magnetic field sensitivity: <±7E-11/Gauss (up to ±2 Gauss)
- Humidity: GR-CORE-63, issue 2, April 2002, section 4.1.2, ≤ 90%, RH non-condensing
- Vibration (operating): GR-CORE-63, issue 2, April 2002, section 4.4.3 and 5.4.2, locked to 1.0 g peak sine @5-100 Hz
- Storage & transport (non operating):
 - Temperature: -55° C to +100° C
 - Shock & vibration: GR-CORE-63, issue 2, April 2002, section 4.4.4 and 5.4.3, curve 1 of Fig 4-3, up to 1.5 g

PHYSICAL

- Weight: <85 gm (<3 oz)
- Size: 18 mm [0.7"] H X 51 mm [2.0"] W X 51 mm [2.0"] L
- Volume: <46.5 cm³ (< 2.8 in³)



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