

SA.31m & SA.33m

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) UMTS timing (without GPS or calibration)
- Holdover for CDMA and WiMAX base stations
- Holdover and 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 miniature atomic clock technology the SA.3Xm family is suitable for applications requiring compact design, low power consumption, excellent 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 of a small ovenized crystal oscillator (OCXO), measuring 51mm X 51mm (2" X 2") and standing at a mere 18mm (0.7").

It consumes little power and has wide-spectrum temperature operation. This makes it accessible to a wide 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). It can be used as an independent timing source for base stations, and enable transition from costly TDM backhaul transport to economic and efficient Ethernet transport.

SA.33m

The SA.33m replaces existing Rubidium technologies, applicable for long holdover applications leading to lower cost of ownership.

It is suitable for replacing existing rubidium clocks in long holdover applications, such as CDMA.



SA.3Xm Miniature Atomic Clock

SA.31m and SA.33m Performance Specifications

ELECTRONIC

- Output Frequency/Waveform: 10 MHz
3.3 volt CMOS square wave
VL<0.5V, VH>2.7V (15pf load)
- Logic Level: VL<0.5V, VH>2.7V (15pf load)
- Rise/Fail Time: <10ns
- Duty Cycle: 50%+/-10%
- Phase Noise (SSB)
 - 1 Hz <-67 dBc/Hz
 - 10 Hz <-85 dBc/Hz
 - 100 Hz <-114 dBc/Hz
 - 1 kHz <-130 dBc/Hz
 - 10 kHz <-140 dBc/Hz
- Spurious:
 - Non-Harmonic: <-85 dBc
- Short Term Stability (Allan deviation):
 - t=1 second <3E-11
 - t=10 second <1.6E-11
 - t=100 second <8E-12
- Accuracy at shipment: <±5E-11 (25°C)
- Retrace: <±2E-11(on-off-on: 24hr, 48hr, 12hr @25°C)
- Control range:
 - With digital input: ±1E-6 with granularity of 1E-12.
 - With analog input: ±1.5E-9, 0-5 V into 5 k ohms
- Warm-up time: time to <1E-9 @25C: <7.5 mins
- Supply voltage/current: +5 Vdc ±0.1Vdc, 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 ±0.1Vdc: Magnitude (df/f) <2E-11 peak
- Radiated Emissions: Compliant to FCC part 15, Class B
- Test / status:
 - Built-in self-test (BIST)
 - 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.31m	SA.33m
Daily*	±4E-11	±2.5E-11
Monthly*	±3E-10	±1E-10
Yearly	±1.5E-9	±1E-9

- Temperature Coefficient (+ve / -ve): (SA.33m only)

Type	SA.31m	SA.33m
0 to +70°C	<7E-10	<7E-11
-10 to +75°C	<1E-9	<1E-10

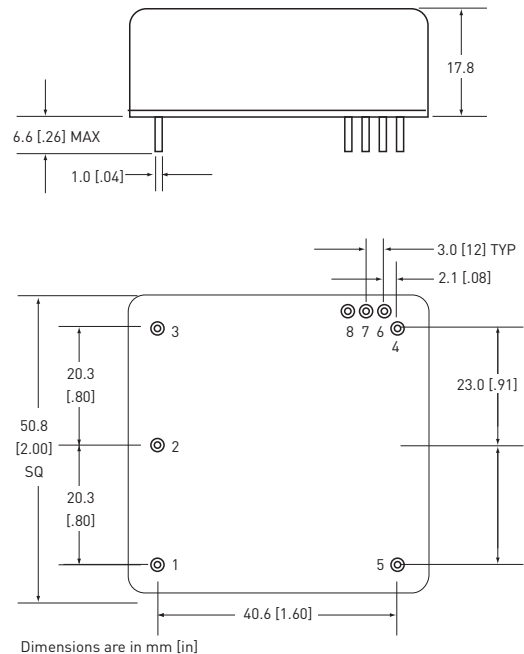
- Time drift in a 24-hr period (SA.33m only): <7µs over 0 to +60°C
- MTBF: Per Telcordia 332, issue 1:
 - ±300,000 hrs @ 40°C (Ground, fixed, uncontrolled, GF)
 - ±500,000 hrs @ 40°C (Ground, fixed, controlled, GB)
- Connector: 5 Pins match standard OCXO configurations
 - Pin 1: Input frequency control
 - Pin 2: Not connected
 - Pin 3: Output signal
 - Pin 4: Ground (signal & supply)
 - Pin 5: Input supply (+)
- Three additional pins (3) 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: R-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 @5-100Hz
- 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 1.5g

PHYSICAL

- Weight: <85gm (<3oz)
- Size: 18mm (0.7")H X 51mm (2.0")W X 51mm (2.0")L
- Volume: <46cm3 (<2.8in3)



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