

SA.22c

Precision Rubidium Oscillator



Features

- Disciplines to a 1PPS input
- Compact form factor for a wide range of applications
- Wide temperature spectrum performance

Benefits

- Low power operation

Applications

- Delivers GSM and UMTS level stability in free run (without need for recalibration)
- Ideal performance levels for CDMA networks
- Stratum 2, or Type II level performance for synchronization for central offices/network nodes

The Microsemi innovative rubidium atomic oscillator, the SA.22c, is the culmination of significant advances in physics miniaturization and integration. The SA.22c's compact form factor, low power consumption, and full-spectrum temperature operation make rubidium performance accessible to a wide range of synchronization applications, from telecom networks to handheld test and measurement devices.

The SA.22c is a board mounted rubidium oscillator with a complete range of output frequencies available to meet the needs of a large set of synchronization applications. The SA.22c can be disciplined to a precision 1PPS reference input (such as GPS) or it can operate by itself as a precision stand-alone reference. The SA.22c's outputs also include a 1PPS.

The SA.22c can communicate through its serial port to provide dynamic frequency control and selection and to enable or disable outputs. The SA.22c can be queried for information such as serial number, operating hours, operating temperature, event history, self-test, and other such performance indicators.

The SA.22c provides highly precise outputs using the inherent stability of the rubidium atom, in a compact form factor. This delivers an excellent value to the market for a wide range of applications.

SA.22c

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Electrical Specifications	
Frequency Outputs*	
Output 1	Derived square wave at 1.544, 2.048, 5, 9.8304, 10, 10.24, 10.29, 13, or 15 MHz (5 V AC MOS)
Output 2	1 PPS
Phase Noise (@10 MHz)	
1 Hz	<-72 dBc/Hz
10 Hz	<-90 dBc/Hz
100 Hz	<-128 dBc/Hz
1 kHz	<-140 dBc/Hz
10 kHz	<-148 dBc/Hz
Stability (Allan Deviation)	
t=1 second	<3E-11
t=10 second	<1E-11
t=100 second	<3E-12
Control Range	
With digital input	±1E-6 with granularity of 1E-12
With analog input	±1.5E-9, 0-5 V into 5 kΩ or optional ±6.5E-9, 0-5 V into 5 kΩ
1PPS Output	
Pulse width	400 ns
Amplitude	VL<0.5 V, VH >4.5 V, 15 pf load
Rise time	10 ns, 15pf load
Warm-up Time	
Time to lock	5 mins (accuracy at lock <5E-8)
Time to <1E-9 @ 25 °C	7.5 minutes
Power Consumption	
Warm-up	18.5 W maximum (-10 °C to +75 °C)
Operating	15 W @ -10 °C, 10 W @ 25 °C, 5 W @ 75 °C baseplate
Voltage Coefficient	
+5 Vdc ±5%	Magnitude (df/f) <2E-11 peak to peak
+15 Vdc ±5%	Magnitude (df/f) <3E-11 peak to peak
Frequency Characteristics	
Jitter	<10 ps RMS
Accuracy at shipment	<±5E-11 (25 °C), typical
Retrace	<±2E-11 (on-off-on: 24 h, 48 h, 12 h @ 25 °C)
Supply Voltage/Current (both required)	
+5 Vdc ±5%	Maximum current <100 mA
+15 Vdc ±5%	Maximum current <1.2 A
Health Monitoring	
ACMOS	Service (J1-12) & Lock (J1-14) status
Serial	RS-232 (J1-13 & 16)

*Contact the manufacturer for information about other frequency outputs.

Application Profiles			
Profile	Monthly Aging Rate dF/F	Tempco	Temperature Range
AP1 ¹	±4E-11	<1E-10	-10 °C to 75 °C
AP2 ²	±5E-11	<3E-10	0 °C to 50 °C
AP2A ³	±3E-10	<2E-10	-10 °C to 75 °C
AP3 ⁴	±3E-10	<3E-9	-10 °C to 75 °C

¹High performance applications

²Tempco of Microsemi LPRO/XPRO

³Ideal for CDMA holdover

⁴GSM/UMTS specifications (<5E-8 over 20 yrs)

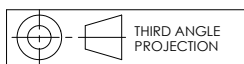
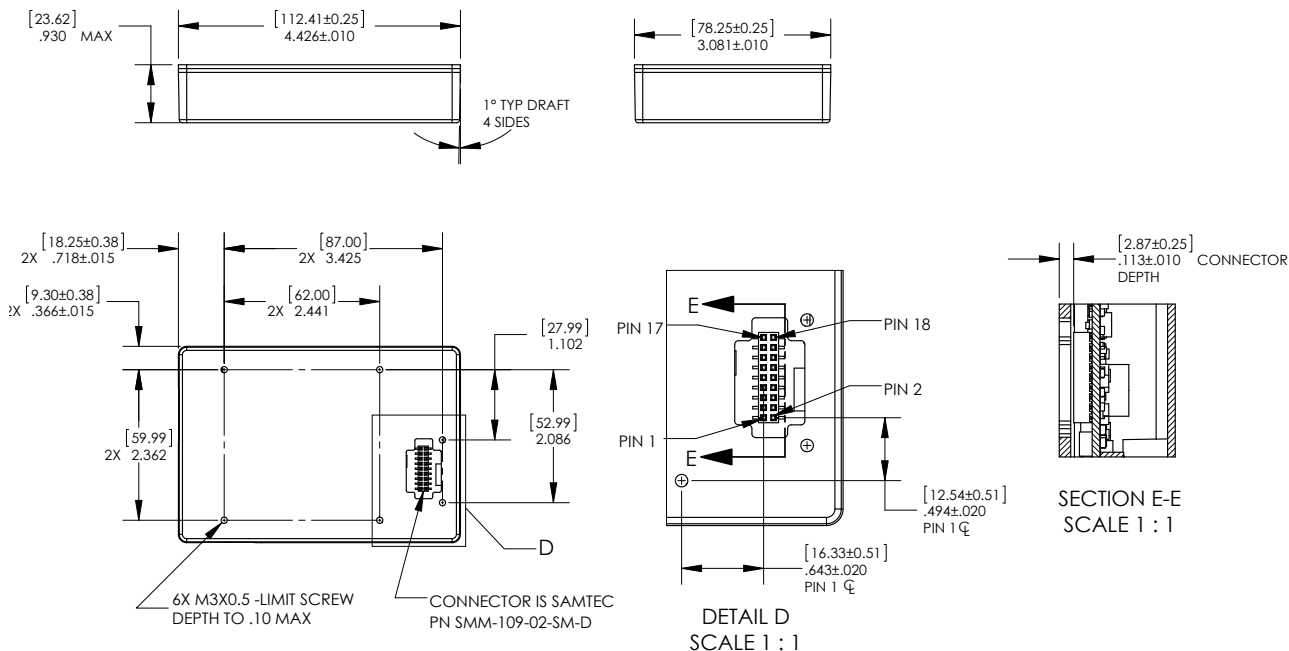
Environmental Specifications	
Radiated emissions	Compliant to FCC part 15, Class B
Operating	
Temperature	-10 °C to +75 °C baseplate
Magnetic field sensitivity	<±6E-11/Gauss (up to ±2 Gauss)
Humidity	GR-63-CORE, Issue 4, April 2012, section 4.1.2: 5-85% RH, operating
Vibration	GR-63-CORE, Issue 4, April 2012, section 4.4.4 & 5.4.2 Opt2: Random Vibration 0.15 grms, unit locked
Storage and Transport	
Temperature	-55 °C to +100 °C
Shock/vibration	GR-63-CORE, Issue 4, April 2012; section 4.4.5 & 5.4.3: Random Vibration 0.78 grms, section 4.3.1 & 5.3.1.1: Packaged Drop from 1000 mm

Physical Specifications	
Weight	< 428.5gm (<15 oz)
Size	23.6 mm H x 78.3 mm W x 112.4 mm L (0.93" H x 3.08" W x 4.43 L)
Volume	207.70 cm ³ (12.7 in ³)

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Mechanical Specifications



DIMENSIONS IN INCHES [MM]
 SCALE 1:2
 TOLERANCES:
 .XX ±.01
 .XXX ±.005

J1 Connector Pinout

Pin Number	Function	Pin Number	Function
1	GND	10	GND
2	+15 VDC PWR-IN	11	GND
3	GND	12	SERVICE
4	+15 VDC PWR-IN	13	DATA IN
5	FREQ CNTRL	14	LOCK
6	+5 VDC PWR-IN	15	1PPS IN
7	1PPS OUT	16	DATA OUT
8	GND	17	NC
9	RF OUT-ACMOS	18	NC



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