

# Rubidium Oscillator – Sub Miniature Atomic Clock (SMAC)

- Compact rubidium oscillator for a wide range of applications
- OCXO form factor and pin out
- Low power operation
- Ageing  $5 \times 10^{-10}$ /year



Actual size

The E10-MRX rubidium oscillator is a sub miniature atomic clock exhibits normal rubidium oscillator performance in a 65cc OCXO style package.

This rubidium oscillator has 100x less drift than OCXO's.

With short term stability of  $8 \times 10^{-12}/s$  @ 100s this rubidium oscillator provides significant improvements in performance over.

## Features

- 10MHz output
- 2" x 2" x 1" form factor
- -95dBc/Hz @10Hz
- $5 \times 10^{-11}$  accuracy
- $8 \times 10^{-12}/s$  @100s

## Benefits

- Atomic accuracy
- Low power consumption
- 100x less drift than OCXOs

## Applications

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

## Specification

Outputs	10MHz Sine, 7~13dBm (HCOMS option)	
Harmonics	<-40dBc	
Accuracy	±5x10 <sup>-11</sup> at shipment @ 25C	
Short Term Stability (AVAR)	1s	8x10 <sup>-11</sup>
	10s	3x10 <sup>-11</sup>
	100s	8x10 <sup>-12</sup>
Drift	Day	5x10 <sup>-12</sup>
	Month	5x10 <sup>-11</sup>
Phase to Noise (SSB)	1Hz	-67dBc/Hz
	10Hz	-95dBc/Hz
	100Hz	-127dBc/Hz
	1kHz	-140dBc/Hz
Input Power	6W at 12V @ 25°C, Max 1.2A	
Input Voltage Range	+12V~+18Vdc	
Warm Time	5 minutes to lock @ 25C	
Retrace	≤±2x10 <sup>-11</sup>	
Magnetic field sensitivity, dc (±2 GAUSS)	<±4x10 <sup>-11</sup> /GAUSS	
Frequency Control	>5x10 <sup>-9</sup> (External trim range: 0V~5V)	
External Trim Range	≥5x10 <sup>-9</sup> (0V~5V)	
Size	50.8~50.8~25 (mm3) (65cc)	
Weight	<150gm	
Warranty	24/36 months	
Magnetic Field Sensitivity Atmospheric Pressure Approx MTBF, Stationary	<2x10 <sup>-11</sup> /Gauss	
	-60m ~ 4000m <1x10 <sup>-13</sup> /mbar	
	100,000 hours	
Mechanical	51 x 51 x 25mm (2 x 2 x 1")	

## Connector Interface

5 Pins match standard OCXO configurations  
 Pin 1: Input frequency control  
 Pin 2: Lock monitor  
 Pin 3: Output signal  
 Pin 4: Ground (signal & supply)  
 Pin 5: Input supply (+)

## Environmental Specification

Operating Temp Range	-20°C~+50°C Typical: -30~+65°C
Base Plate Temp	-30°C~+85°C
Case Temperature	<45°C (after 1 hour, ambient temp 25°C. No ventilation)
Temperature Coefficient (ambient)	5x10 <sup>-10</sup> (0~50°C)
Storage Temp	-55°C~+85°C
MTBF	100,000 hours
Environmental health	RoHS
Shock / Vibration	GR-CORE-63, 4.5.2/4, locked to 1.0g
EMI	Compliant to FCC Part 15 Class B

## Outline Dimensions

