

# 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	$\pm 5 \times 10^{-11}$ at shipment @ 25C	
Short Term Stability (AVAR)	1s	$8 \times 10^{-11}$
	10s	$3 \times 10^{-11}$
	100s	$8 \times 10^{-12}$
Drift	Day	$5 \times 10^{-12}$
	Month	$5 \times 10^{-11}$
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	$\leq \pm 2 \times 10^{-11}$	
Magnetic field sensitivity, dc ( $\pm 2$ GAUSS)	$< \pm 4 \times 10^{-11}$ /GAUSS	
Frequency Control	$> 5 \times 10^{-9}$ (External trim range: 0V~5V)	
External Trim Range	$\geq 5 \times 10^{-9}$ (0V~5V)	
Size	50.8~50.8~25 (mm3) (65cc)	
Weight	<150gm	
Warranty	24/36 months	
Magnetic Field Sensitivity Atmospheric Pressure Approx MTBF, Stationary	$< 2 \times 10^{-11}$ /Gauss	
	-60m ~ 4000m	$< 1 \times 10^{-13}$ /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)

$5 \times 10^{-10}$  (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

