



# Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077  
 TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

**DOCXO2020C-series**  
 Very high stability miniature OCXO

## Features and Benefits

Very-high stability up to  $\pm 1 \times 10^{-10}$  at  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$   
 Low aging up to  $\pm 1 \times 10^{-10}$ /day,  $2 \times 10^{-8}$ /year  
 Low noise level at  $-170\text{dBc/Hz}$ , TYP floor  
 About  $5\text{cm}^3$  miniature packaging

## Typical Applications

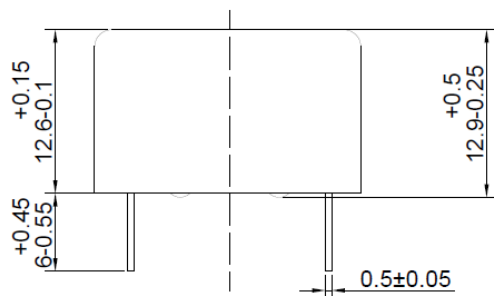
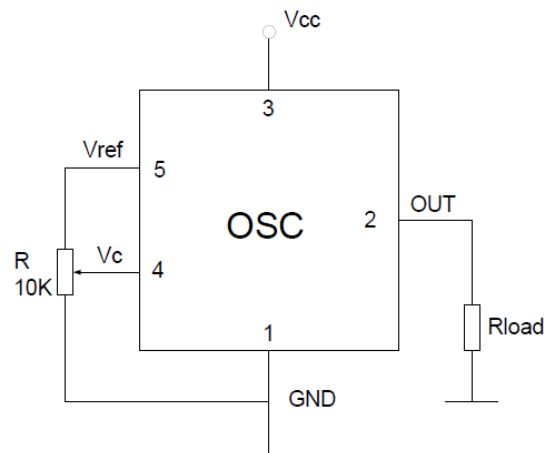
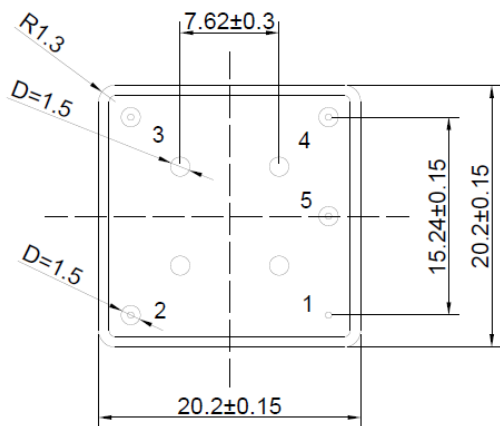
Rubidium Standard Replacement  
 Stratum 2 Clock Systems  
 Instrumentation  
 GPS Receivers

## Description

A new generation of miniature double oven technology taking advantage of proprietary advances in resonator heating processes which allow for a drastic reduction in the oven-control thermal mass structure.

## Mechanical Drawing & Pin Connections

Drawing No: **MD140069-5**



### Pin Connections

Pin	Signal
1	GND
2	RF Out
3	+V Supply
4	Electrical tuning
5	Reference voltage

Unit : mm  
 1mm=0.0394inch



**Specifications**

General Specifications								
Parameter	Sym	Condition	Value			Unit	Note	
			Min.	Typ.	Max			
Frequency Range	F <sub>0</sub>		5		100	MHz		
RF Output								
HCMOS (TTL) option	Load		10		15	kOhm pF	For 10 MHz operational frequency	
	H-level voltage	V <sub>H</sub>	V <sub>cc</sub> =5 or 12V V <sub>cc</sub> =3.3V	3.8 2.4		V		
	L-level voltage	V <sub>L</sub>			0.4	V		
	Duty Cycle			45		55	%	
	Rise / Fall Time					10	ns	For 10 MHz operational frequency
Sine-wave option	Level	L	+6	+8	+10	dBm		
	Load	R <sub>L</sub>			50	Ohm		
	Harmonics level				-30	dBc		
Sub-harmonics level		Operational frequency < 30 MHz Operational frequency ≥ 30 MHz		None -	- -40	dBc	Frequency multiplier is used	
Frequency Control*								
Control Voltage Range	V <sub>c</sub>		0		4.2	V	Tuning slope - positive	
Tuning Range			±0.5	±1.0		ppm		
Reference voltage	V <sub>ref</sub>	V <sub>cc</sub> =5V V <sub>cc</sub> =3.3V	4.1 2.7	4.2 2.8	4.3 2.9	V		
Frequency Stability								
Vs. temperature		-30°C to +70°C, ref 25°C			±0.1	ppb	See chart below	
Vs. supply voltage		Ref V <sub>cc</sub> typ.			±0.2	ppb		
Power Supply								
Voltage	V <sub>cc</sub>		4.75	5.0	5.25	V	3.3V supply available	
Power Consumption		Warm-up state Steady state, +25°C		1.0	4 1.2	W W		
Warm-up time	t <sub>up</sub>	to Δf/f = 1e-7 at +25°C			90	sec	Ref to frequency after 30 min	
SSB Phase Noise		1 Hz	-103	-95		dBc/Hz	For 10 MHz operational frequency	
		10 Hz	-132	-125				
		100 Hz	-155	-145				
		1 kHz	-165	-155				
		10 kHz	-169	-163				
		100 kHz	-170	-167				
Allan variance		1s	5			e-12		
Aging	Per day	After 30 days of operation	±0.2			ppb	For 10 MHz See chart below	
	First year		±20			ppb		



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Environmental, mechanical conditions.	
<b>Operating temperature range</b>	See chart below
<b>Storage temperature range</b>	-60°C to +90°C
<b>Humidity</b>	Hermetically sealed
<b>Mechanical Shock</b>	Per MIL-STD-202, 30G half sine pulse, 11ms
<b>Vibration</b>	Per MIL-STD-202, 5G swept sine 10 to 500Hz
<b>Soldering Conditions</b>	Hand solder only – not reflow compatible 260°C 10s (on pins)
<b>Washing Conditions</b>	Washing with water or alcohol based detergent allowed only with final enough drying stage

\* No frequency control option – on customer requirement

### Ordering Code

DOCXO2020C	-	2	3	4	2	1	-	10 MHz
		1	2	3	4	5		

For example, DOCXO2020C-23421-10MHz denotes the DOCXO has the following specifications:

Temperature Range	-10°C to +60°C
Stability Over Temperature	±0.3ppb
Aging per day / year	1.0ppb / 0.1ppm
Supply Voltage	3.3V ±10%
Output	HCMOS
Frequency	10MHz

1	Temperature Range
Code	Specification
1	0°C..+50°C
2	-10°C..+60°C
3	0°C..+70°C
4	-20°C..+70°C
5	-30°C..+70°C
6	-40°C..+80°C

2	Stability Over Temperature	
Code	Specification	Available temperature range code
1	±0.1ppb	1, 2, 3, 4, 5,6
2	±0.2ppb	1, 2, 3, 4, 5, 6
3	±0.3ppb	1, 2, 3, 4, 5, 6
4	±0.5ppb	1, 2, 3, 4, 5, 6
5	±1.0ppb	1, 2, 3, 4, 5, 6
6	±2.0ppb	1, 2, 3, 4, 5, 6

3	Aging per day/year, ppb/ppm
Code	Specification
1	0.2/0.02
2	0.3/0.03
3	0.5/0.05
4	1.0/0.10
5	1.5/0.15
6	2.0/0.20
7	3.0/0.30

4	Supply voltage
Code	Specification
1	+5V ±5%
2	+3.3V ±10%

5	Output
Code	Specification
1	HCMOS
2	Sine wave + 6 dBm min

\*for 10 MHz operational frequency

Deviations of the parameters may be possible on Customer's requirements

Please contact Dynamic Engineers Inc. for further details.