

Oven Controlled Crystal Oscillators Precision Ultra Low Phase Noise ROCXO-M Series 20-100M-v4

code-v4

Description

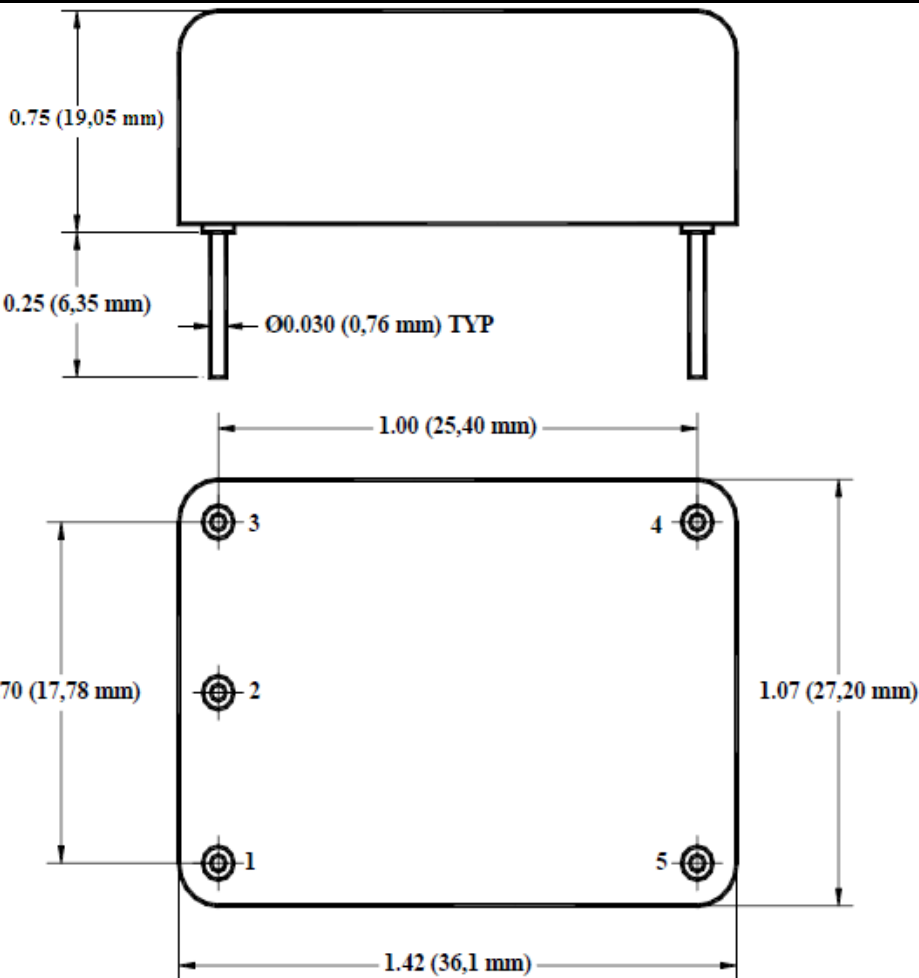
ROCXO-M Series is based on Ultra Low Noise 10MHz reference OCXO and low noise analog multiplier to achieve higher frequencies multiple of 10 MHz

Features

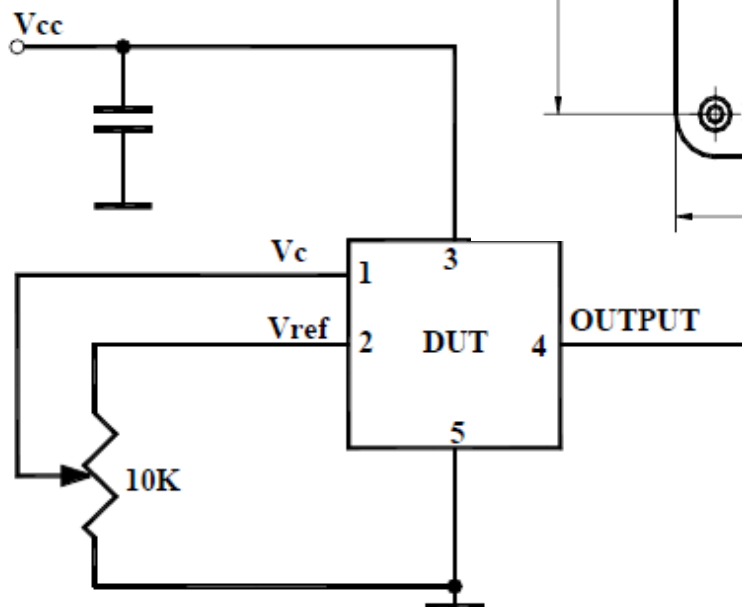
- SC-cut crystal
- High Stability
- Low Aging
- Ultra Low Phase Noise
- Sine Wave or HCMOS/TTL output

Applications

- Telecommunication Systems
- Data Communications
- GPS
- Instrumentation



Units: Inch (mm)
Not to scale



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Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	V _{cc}	12 V supply 5 V supply	-0.5 -0.5		13.0 5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1 -5		5.5 5	V	Slope option "P" Slope option "N"
Electrical							
Frequency	F		20		100	MHz	
Frequency stability	$\Delta F/F$	vs. Temp. 4*		±10		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10%V _{cc}	
Aging		per day per year, first year second year		5E-10 1E-7 3E-8			after 30 days 5E-8 available
Allan Variance		0.1s to 10s		1E-12			
SSB Phase Noise (achieved after 10 minutes warm-up)		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-141 -140 -155 -162 -170 -172	dBc/Hz	Standard version, option L
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-112 -145 -155 -165 -170 -172		
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-115 -146 -158 -165 -170 -172		Ultimate version, option U 2*
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*
G-sensitivity		worst direction			±1.0	ppb/G	
Input Voltage	V _{cc}		4.75 11.4	5.0 12.0	5.25 12.6	V	See chart below to specify
Power consumption, Still air	P	steady state, 25°C steady state, -30°C start-up @ -30°C		1.0 1.7 2.5	1.4 3.2	W	Standard Operating Temperature*
Spectral Purity		Sub harmonics Spurious Harmonics/Sine		-50 -35	-80 -30	dBc	
Load		10KOhm/15pF (HCMOS/TTL), AC-coupled 50 Ohm (Sine-wave)					Output Code T Output Code S
Warm-up time	τ	to 0.1ppm accuracy		3	5	minutes	
Output Waveform		HCMOS/TTL compatible or Sinewave					

All parameters for 10 MHz

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Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Output Power			+10	+13		dBm	Output Code S
Logic 1 (CMOS)	Voh		0.7 Vref			V	Output Code T
Logic 0 (CMOS)	Vol				0.1 Vref	V	Output Code T
Control voltage	Vc		0 -4.0 0		Vref 4.0 10.0	V	Slope option "P" Slope option "N" Slope option "L"
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation	Fm		150			Hz	
bandwidth							
Reference Voltage	Vref	Vcc = 12V Vcc = 5V		5 or 4.5 4.5		V	N/A with slope options "N" and "L"
Output Impedance		At Vref pin		100		Ohm	
Pull range		from nominal F	±0.3 ±0.4	±0.5 ±0.6		ppm	Slope option "P" Slope option "N" or "L"
Deviation slope		Monotonic, positive Monotonic, negative Monotonic, positive		1.0/Vref -0.13 0.12		ppm/V	Slope option "P" Slope option "N" Slope option "L"
Setability	Vc0	@25°C, Fnom. No internal bias for slope option "L"	Vref/2 ± 0.5 0 ± 0.5 5 ± 0.5			V	Slope option "P" 3* Slope option "N" Slope option "L"

Notes:

*. For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.

2*. It is recommended to specify Slope option "N" for Ultimate Phase noise performance. For recommended phase noise test, contact factory. It's assumed that phase noise test is performed under static conditions (no vibration), in still air, and care is taken for minimizing EMI.

3*. Longer storage time, especially at low temperatures, may affect both retrace and setability parameters. It may \ require few days on power for re-stabilization.

4*. Temperature stability is specified in total peak to peak frequency excursion over entire operating range, not in ± from RT measurement. Over-specifying may cause cost increase.

Environmental and Mechanical	
Operating temp. range	-30°C to 70°C Standard, Other options – see chart below
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G to 2000 Hz
Soldering Conditions	260°C for 10s Max leads only
Electrical Connections	
Pin Out	Pin #1- Vc ; Pin#2 – Vref; Pin #3 – Vcc; Pin #4- Output ; Pin #5- GND;

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Creating a Part Number

ROC XO - M - X X YZ XX - X - X - XX - R - XXM - v4

Height code per dwg

Supply Voltage

Code	Specification
0	5V ± 5%
F	12V ± 5%

Output

Code	Specification
T	CMOS/TTL
S	Sinewave

Temperature Stability 4*

Code	Specification
17	1x10 ⁻⁷
58	5x10 ⁻⁸
28	2x10 ⁻⁸
18	1x10 ⁻⁸
YZ	Yx10 ⁻²

Temperature Range

Code	In 5°C steps 6*
First letter	Lowest temperature from A = -40°C
Second letter	Highest temperature to Z = 85°C
Examples	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

Frequency 20-100MHz

Environmental

Code	Specification
R	RoHS compliant, not designed for reflow

Aging

Insert Value per day times 1E-10

Examples	
5	5E-10 = 0.5 ppb/day
10	1E-9 = 1 ppb/day

Phase Noise (See Table)

Code	Specification
L	Standard
P	Premium
U	Ultimate 5*

5*Consult factory on "U" code phase noise

Deviation slope

Code	Specification
P	Positive, 0 to Vref
N	Negative, -4 to 4V
L	Positive, 0 to 10 V

Not all combinations are available. Consult Factory

6*Temperature Code Table

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

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Specifications may be subject to change

01/14/10

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