

O-CMRB-0YZXX-XX-X-Freq Precision Ultra Low Phase Noise Multi Frequency OCXO Reference Module (MFRM) in Aluminum Box

The MFRM consists of two Ultra Low Phase Noise (ULPN) OCXO at 10 MHz and 100 MHz. Both are packaged in hermetically sealed metal cans. The unit at 100 MHz is phase/frequency locked to the 10 MHz one. The output of 100 MHz unit is then multiplied integer number of times, up to 10 to achieve a ULPN output signal at from 200 MHz to up to 1,000 MHz (1 GHz). Lower frequency OCXO provides for excellent frequency stability over temperature, including optional double oven (DOCXO), time (aging), supply and load variations, as well as exceptionally low phase noise close to the carrier, and short-term stability (Allan Deviation). 100 MHz OCXO provides for ultra low phase noise on the noise floor, including multiplied outputs.

Features:

- Three frequency outputs 10 MHz, 100 MHz, and 100xN MHz
- Ultra Low Phase Noise
 - -120 dBc/Hz at 1 Hz offset, -148 dBc/Hz at 10 Hz offset for 10 MHz
 - -123 dBc/Hz at 10 Hz offset, -180 dBc/Hz on the floor for 100 MHz
 - -105 dBc/Hz at 10 Hz offset, -160 dBc/Hz at 100 KHz for 1 GHz
- Excellent temperature stability from 2 ppb peak to peak
- Low aging from 0.20 ppb/day
- Excellent short-term stability $ADEV < 1E-12$ at 1 s
- Optional External Reference

Applications:

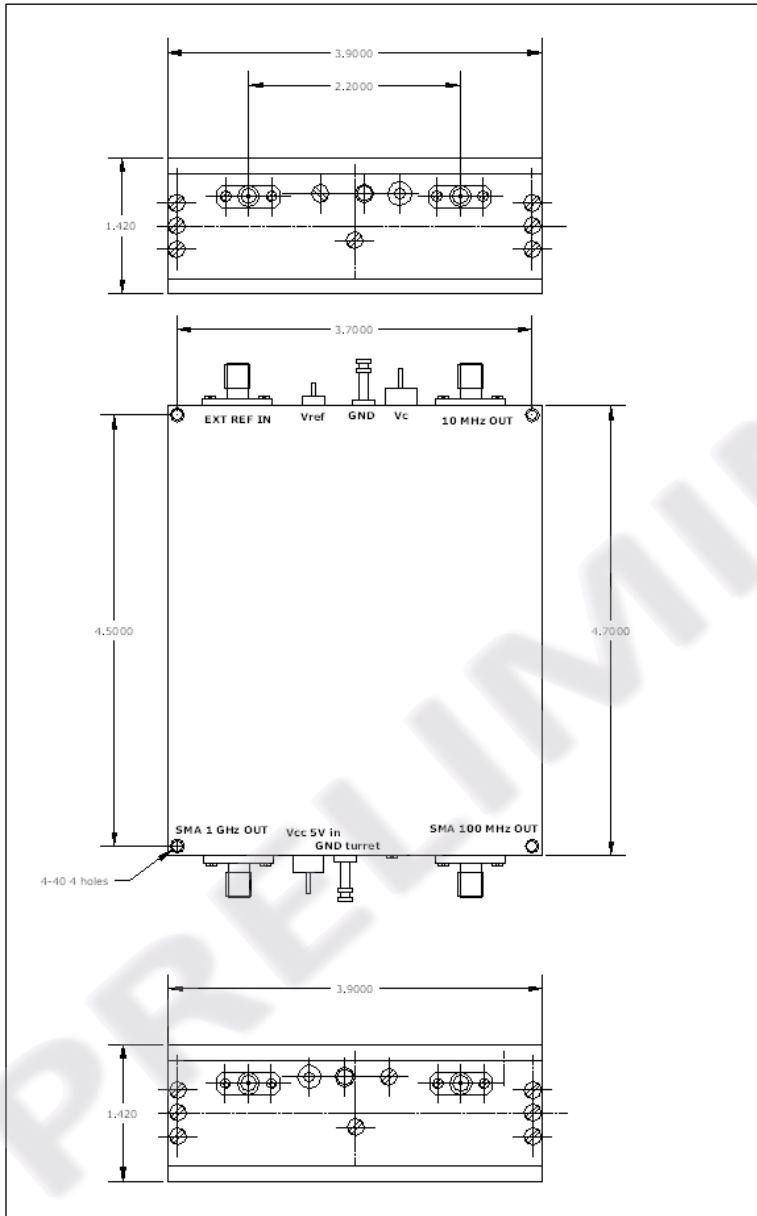
- Instrumentation
- High Performance Synthesizers
- Radar
- Telecommunication Equipment
- COTS/Dual use

Inputs:

- External Reference – SMA Female
- Vcc, Vc, Vref - Feedthroughs
- GND – Turret

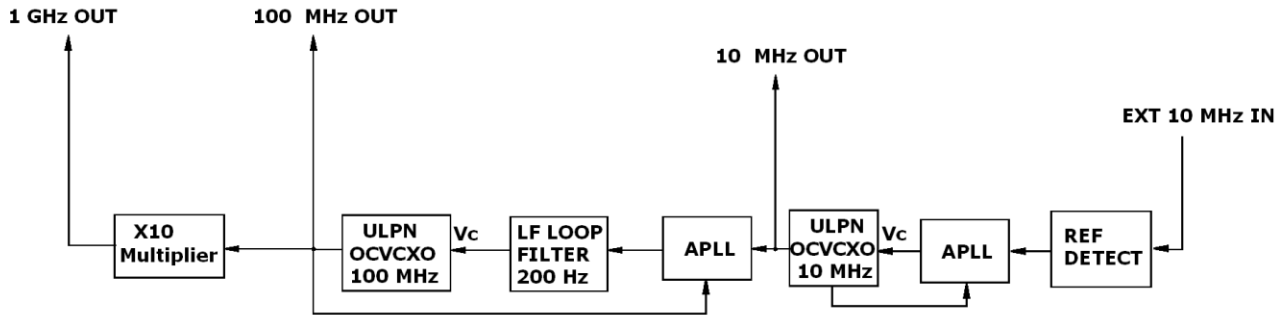
Outputs:

- 10 MHz – SMA Female
- 100 MHz – SMA Female
- 100xN MHz – SMA female



Note:

Output Connectors designation is preliminary and may change. Please consult factory before ordering.



Specifications:

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	V _{cc}	5 V supply	-0.5		5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1		5.5	V	Slope option "P"

Electrical (6)

Frequency	F10			10.000		MHz	
		F100			100.000		
	FXN			100xN			
Frequency stability 7*	ΔF/F	vs. Temp. 4*		±10		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10% V _{cc}	
Aging 7*		per day		5E-10			after 30 days
		per year, first year		1E-7			0.2 ppb/day available
		second year		3E-8			
Allan Deviation 7*		0.1s		5E-13			
		1s		2E-12			
		10s		5E-12			
SSB Phase Noise (achieved after 10 minutes warm-up) 7*, 8*	£(Δf)	1Hz		-120		dBc/Hz	10 MHz output
		10 Hz		-148			
		100 Hz		-157			
		1 KHz		-162			
		10 KHz		-170			
		100 KHz		-172	-170		
		10 Hz		-125	-123	dBc/Hz	100 MHz output
		100 Hz		-135	-132		
		1 KHz		-163	-162		
		10 KHz		-175	-173		
		100 KHz		-180	-179		
		10 Hz		-105		dBc/Hz	1,000 MHz output
		100 Hz		-112			
		1 KHz		-142			
		10 KHz		-158			
		100 KHz		-160	-158		
10 Hz		-122	-120		160 MHz output		
100 Hz		-130	-128				
1 KHz		-160	-158				
10 KHz		-170	-168				
100 KHz		-175	-174				



		10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-120 -130 -160 -173 -175	-119 -126 -156 -170 -173	dBc/Hz	200 MHz output
Retrace 7*		After 30 minutes			±10	ppb	24 Hours off 3*
G-sensitivity 7*		worst direction			±1.0	ppb/G	
Input Voltage	Vcc		4.75	5.0	5.25	V	
Power consumption, Still air	P	steady state, 25°C steady state, -30°C start-up @ -30°C		4.0 6.5 6.5	4.5 7.0	W	Standard Operating Temperature*.
Spectral Purity		Subharmonics Spurious Harmonics		-50 -35	-40 -80 -30	dBc	At 1,000 MHz output Either output
Load	Internally AC-coupled 50 Ohm						All Outputs
Warm-up time	τ	to 0.1ppm accuracy		3	5	minutes	
Output Waveform	Sinewave						
Output Power			+13 +15 +10	+14 +17 +14	+16	dBm	10 MHz 100 MHz 100xN MHz
External Reference		Sine Wave	+7			dBm	
Reference Select function	Automatic						
Control voltage	Vc		0		Vref	V	Available only while unlocked
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation bandwidth	Fm				1	Hz	
Reference Voltage	Vref			4.5		V	
Output Impedance		At Vref pin		100		Ohm	
Pull range		from nominal F	±0.4	±0.6		ppm	
Deviation slope		Monotonic, positive		1.0/Vref		ppm/V	Slope option "P"
Setability	Vc0	@25°C, Fnom.	Vref/2 ± 0.5			V	Slope option "P" 3*

Notes:

- *. For highest operating temperature greater 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*. 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*. If 10MHz is not used it must be terminated into 50 Ohm.
- 6*. All parameters, unless otherwise specified, are at nominal conditions, i.e.: T=25°C, Nominal Vcc & Nominal Load.
- 7*. All parameters are for internal reference only. All stability parameters will be determined by reference. With external reference the phase noise may deteriorate (significantly) at Frequency offsets < 1 KHz
- 8*. For output frequency 100xN, the phase noise typically would be by 20logN higher than the one at 100 MHz, with possible 1 – 2 dB deterioration at higher offset frequencies from the carrier.

Environmental and Mechanical

Operating temp. range	0°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

Creating a Part Number

Q - C MRB 0 YZ XX - P X - X

OCXO
Conventional Power

MFRM in a Box

Supply Voltage

Code	Specification
0	5V ± 5%

Temperature Stability 4*

Code	Specification
17	1x10 ⁻⁷
58	5x10 ⁻⁸
28	2x10 ⁻⁸
18	1x10 ⁻⁸
YZ	Yx10 ^{-Z}

Temperature Range

Code	In 5°C steps
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

Environmental

Code	Specification
L	Contains a level of lead that is in excess of RoHS directive and is not designed for reflow
R	RoHS compliant, not designed for reflow

Option 100xN MHz

Deviation slope

Code	Specification
P	Positive, 0 to Vref



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		

PRELIMINARY

