

O-CDFEXYZXX-X-X-10MHz/100MHz Precision Ultra Low Phase Noise Dual Frequency OCXO Reference Module (DFRM)

The DFRM consists of 2 Ultra Low Phase Noise OCXO at 10 MHz and 100 MHz. The module is packaged in a very small hermetically sealed metal can (“Europack”) 36x27x25 mm. The unit at 100 MHz is phase/frequency locked to the 10 MHz one. (The module also provides capability of locking 100 MHz OCXO to the external reference 5*). Lower frequency OCXO provides for excellent frequency stability over temperature, time (aging), supply and load variations, as well as exceptionally low phase noise close to the carrier, and short-term stability (Allan Variance). 100 MHz OCXO provides for ultra low phase noise on the noise floor and high output power.

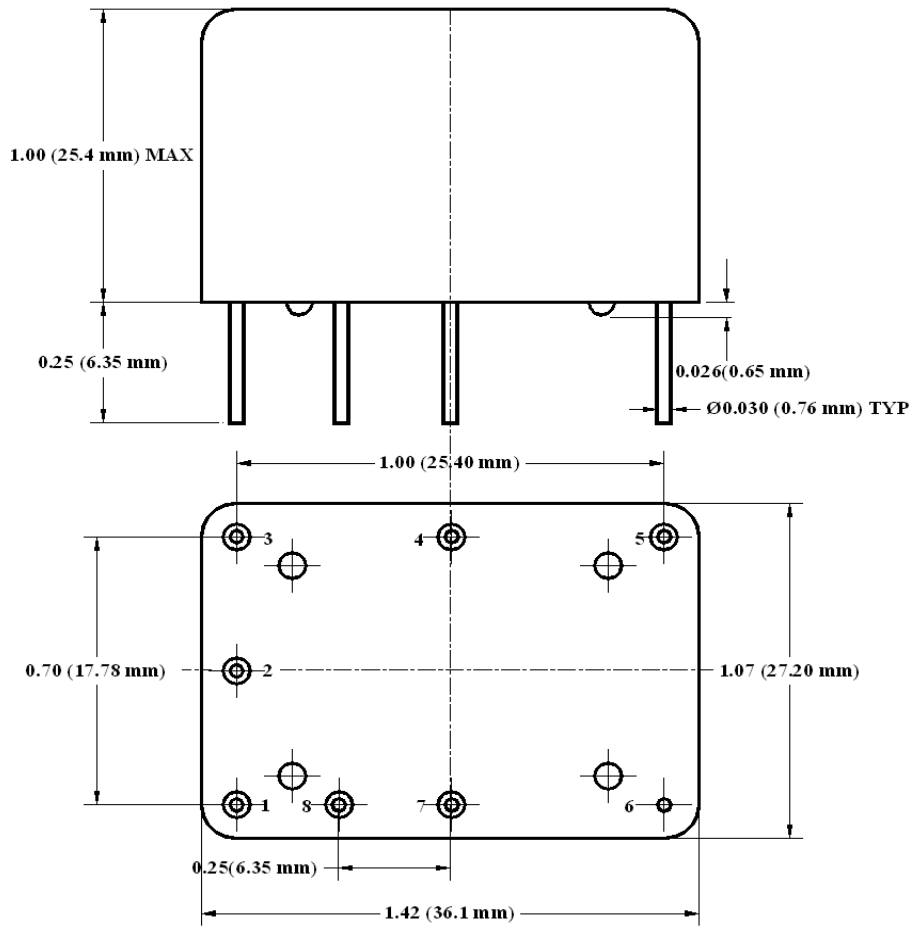
Features:

- Two frequency outputs 10.000 MHz and 100.000 MHz
- Ultra Low Phase Noise
 - -115 dBc/Hz at 1 Hz offset, -145 dBc/Hz at 10 Hz offset for 10 MHz
 - -123 dBc/Hz at 10 Hz offset, to -180 dBc/Hz at 100KHz for 100 MHz
- Excellent temperature stability from ± 2 ppb
- Low aging from 0.25 ppb/day
- Excellent short term stability $ADEV < 1E-12$ at 1 s
- Very small, hermetically sealed package

Applications:

- Instrumentation
- High Performance Synthesizers
- Radar
- Telecommunication Equipment





PINOUT:
 Pin#1 – Vc10; Pin#2 – Vref;
 Pin#3 – Vcc;
 Pin#4 – RF OUT 10 MHz
 Pin#5 – RF OUT 100 MHz
 Pin#6 – GND; Pin#7 – EXT REF IN
 Pin#8 – REF Select

PREL



Specifications:

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	Vcc	5 V supply	-0.5		5.5	V	
Storage temper.	Ts		-50		90	°C	
Control Voltage	Vc		-1		5.5	V	Slope option "P" Slope option "L"
			-1		11		

Electrical (6)

Frequency	F10			10.000		MHz	Pin4		
	F100			100.000			Pin5		
Frequency stability	$\Delta F/F$	vs. Temp. 4*		± 20		ppb	See chart below		
		vs. Supply		0.2	0.3	ppb/10%Vcc			
Aging		per day per year, first year second year		5E-10 5E-8 2E-8			after 30 days 5*		
Allan Deviation		0.1s		5E-13			5*		
		1s		2E-12					
		10s		5E-12					
SSB Phase Noise (achieved after 10 minutes warm-up)	$\mathcal{L}(\Delta f)$	1Hz				-115	dBc/Hz	10 MHz output 5*	
		10 Hz				-145			
		100 Hz				-157			
		1 KHz				-162			
		10 KHz				-170			
		100 KHz				-172			
			1Hz		-125		-90	dBc/Hz	100 MHz output, Grade "U" 5*
			10 Hz				-123		
			100 Hz				-130		
			1 KHz				-160		
			10 KHz				-172		
			100 KHz				-180		
Retrace		After 30 minutes				± 10	ppb	24 Hours off 3*	
G-sensitivity		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		2.2	2.5		W		
		steady state, -30°C		4.5	6.0				
		start-up @ -30°C		5.0	6.0				
Spectral Purity		Subharmonics		-80	-70		dBc	At 100 MHz output	
		Spurious			-80				
		Harmonics		-35	-30			Either output	
Load	Internally AC-coupled 50 Ohm both outputs								
Warm-up time	τ	to 0.1ppm accuracy		3	5		minutes		
Output Waveform	Sinewave								
Output Power			+10	+13			dBm	Both Outputs	
Control voltage	Vc		0		Vref		V	Slope option "P"	
			0		10.0			Slope option "L"	
Input impedance	Zin	At Vc pin	10				KOhm		
Modulation bandwidth	Fm		DC		1		KHz		
Reference Voltage	Vref			4.5			V		
Output Impedance		At Vref pin		100			Ohm		
Pull range		from nominal F	± 0.3	± 0.5			ppm	Slope option "P"	
			± 0.4	± 0.6				Slope option "L"	
Deviation slope		Monotonic, positive		0.22			ppm/V	Slope option "P"	
				0.12				Slope option "L"	



Setability	Vc0	@25°C, Fnom. No internal bias for slope option "L"	Vref/2 ± 0.5 5 ± 0.5	V	Slope option "P" 3* Slope option "L"
External Reference		Sine Wave	+7	dBm	5*
Reference Select function		Floating Logic "0" (GND)	Internal Reference External reference		Pin8 5*

Notes:

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*. Temperature stability is specified as ± vs. frequency at 25°C.

5*. It is highly recommended (in case external reference must be used) for better performance, instead of switching to external reference, using an external PLL and lock internal 10 MHz reference to external reference with very narrow (< 1 Hz) loop bandwidth. In case of using external reference, the performance will be determined by its quality.

6. All parameters, unless otherwise specified, are at nominal conditions, i.e.: T=25°C, Nominal Vcc & Nominal

Load.

Environmental and Mechanical

Operating temp. range	-30°C to 70°C MAX, 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- RF OUT 10 MHz ; Pin #5- RF OUT 100 MHz; Pin# 6 – GND, Pin#7 – EXT REF; Pin#8 – REF Select
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Creating a Part Number

Q - C DF E 0 YZ XX - X - X - 10MHz/100MHz

OCXO
Conventional Power
 DFRM
 Europack

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 8*
First letter	Lowest temperature from A = -40°C
Second letter	Highest temperature to W = 70°C
Examples	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

Not all combinations available, consult factory

8*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		

Environmental

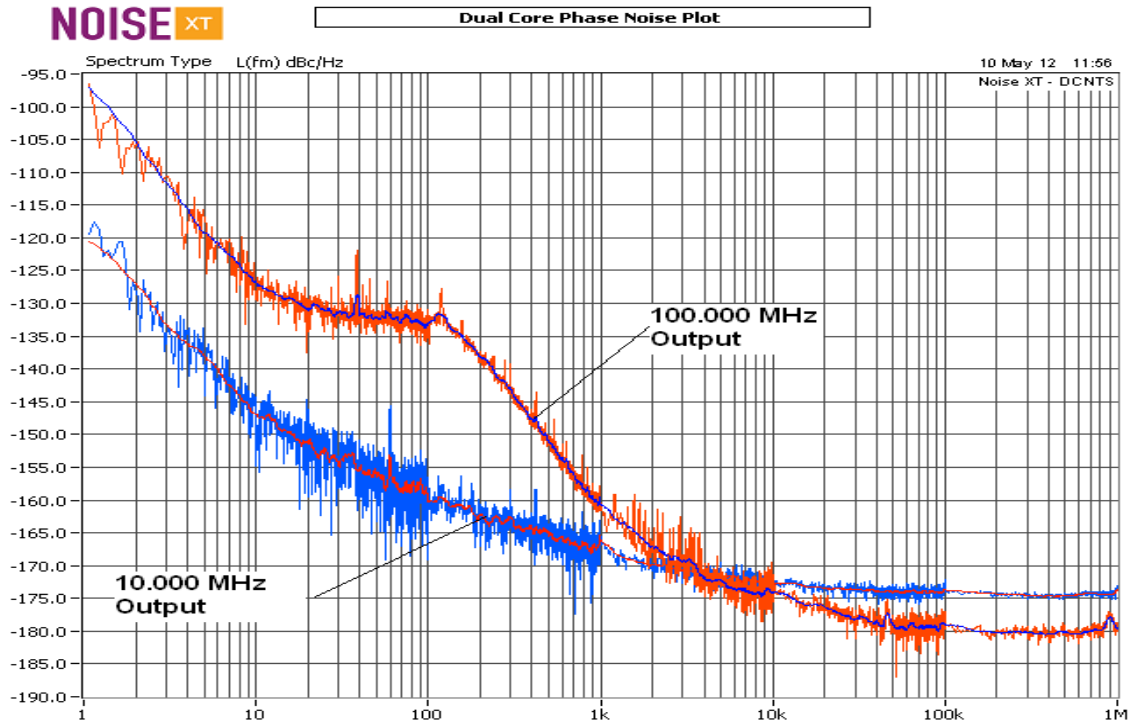
Code	Specification
L	Contains a level of lead that is in excess of RoHS directive and is not designed for reflow
R	RoHS compliant, not designed for reflow

Deviation slope

Code	Specification
P	Positive, 0 to Vref
L	Positive, 0 to 10 V



Grade "U" Phase Noise



PRELIMINARY

