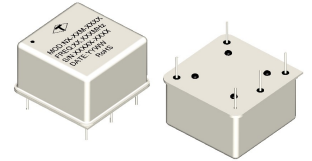


16.384MHz *Ultra Low Power* OCXO

NP-16M384-7000 Series

NP-16M384-7000 Series in 20.6x20.6x11mm package

NP-16M384-7000 series is a 16.384MHz high performance (VC)OCXO offering ultra low power and tight frequency stability down to $\pm 10\text{ppb}$ (-10°C to $+50^{\circ}\text{C}$). The part comes in a hermetically sealed through hole package which makes it suitable for humid environmental conditions.



FEATURES

- **Ultra Low Power Consumption**
- Tight Frequency Stability
- Fast Warm-up Time
- Low Phase Noise

APPLICATIONS

- Under Water Sensor and Network System
- Mining and Seismic Research
- Oil and Gas Exploration
- Test & Measurement
- Battery Powered Portable Communication System

ELECTRICAL SPECIFICATIONS

Test conditions: $V_{DC} = +3.3\text{ V}$; $V_C = +1.4\text{V}$; at $+25 \pm 3^{\circ}\text{C}$ unless otherwise identified

1. OUTPUT (PIN = "R.F. OUTPUT")

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
1.1.	Frequency (Fo)	16.384000			MHz	
1.2.	Initial Accuracy	-0.2		+0.2	ppm	@ $+25 \pm 3^{\circ}\text{C}$ after turn on power 30 minutes $V_{con} = +1.4\text{V}$
1.3.	Waveform	CMOS				
1.4.	Level				V	
	"1" level	2.4				
	"0" level			0.4		
1.5.	Rise/Fall Time			10	nSec.	
1.6.	Duty Cycle	45		55	%	
1.7.	Load	10K Ω /15pF				

2. FREQUENCY STABILITY

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
2.1.	Ambient	±10			ppb	referred to 25°C	±5ppb optional
		0°C ~ +50°C			°C		
2.2.	Aging						
	Daily	-0.5		+0.5	ppb	after 30 days	
	Yearly	-50		+50	ppb		
2.3.	Voltage	-3		+3	ppb	±5% change	
2.4.	Short term		0.07		ppb	root Allan variance for τ=1 sec	
2.5.	Warm-up	-50		+50	ppb	in 60 seconds @ +25 ±3°C	referred to 15 minutes
2.6.	G-Sensitivity (each axis)		±0.2	±0.5	ppb/g		

3. ELECTRICAL FREQUENCY ADJUSTMENT (PIN = "VCON")

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
3.1.	Tuning Range	± 0.4			ppm	Referenced to frequency at nominal Center Voltage	
3.2.	Control Voltage	0		+2.8	V		
3.3.	Slope	Positive					
3.4.	Center Voltage		+1.4		V		
3.5.	Linearity	-10		+10	%		

4. INPUT POWER (PIN = "+V_{DD}")

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
4.1.	Voltage	+3.13	+3.3	+3.47	V		
4.2.	Power Consumption						
	Steady State		55	75	mW	at 25°C	
	During Warm-Up			450			

5. REFERENCE VOLTAGE (PIN = "REFERENCE VOLTAGE")

	Parameter	Min.	Typ.	Max.	Units	Test Condition	
5.1.	Voltage	+2.7	+2.8	+2.9	V		

6. ABSOLUTE MAXIMUM RATINGS

	Parameter	Min.	Typ.	Max.	Units	Test Condition	
6.1.	Input Power(V _{DD})	-0.3		+6.0	V		
6.2.	Control Voltage (VCON)	-1.0		+6.0	V		

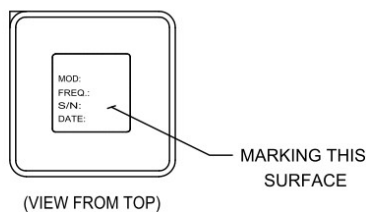
7. ENVIRONMENTAL

	Parameter	Reference Std.	Test Condition
7.1.	Operable Temperature	-40°C to +85°C	Note 1
7.2.	Storage Temperature	-45°C to +90°C	
7.3.	Humidity	MIL-STD-202, Method 103 Test Condition A	95% RH @ +40°C, non-condensing, 240 hours
7.4.	Vibration (non-operating)	MIL-STD-202, Method 201	0.06" Total p-p, 10 to 55 Hz
7.5.	Shock (non-operating)	MIL-STD-202, Method 213, Test Condition J	30g, 11ms, half-sine 1500g, 1ms, half-sine optional
7.6.	Reflow is Forbidden	Hand solder only – not reflow compatible. 260°C 10s (on pin)	

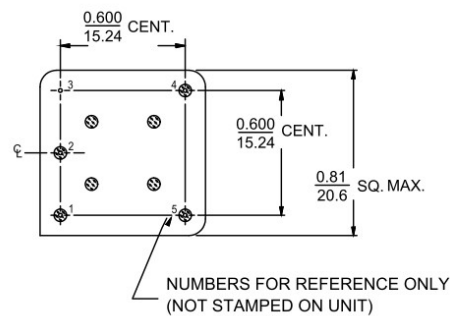
Note 1 : Output maintained over this temperature range. Other requirements of this specification may not be met when operating outside the temperature range in 2.1.

OUTLINE DRAWING

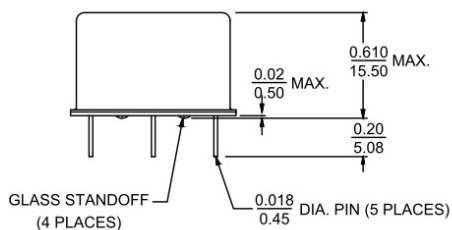
[TOP VIEW]



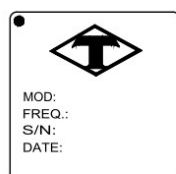
[BOTTOM VIEW]



[SIDE VIEW]



MARKING



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	0 VOLTS & CASE
4	R.F. OUTPUT
5	+VDC

Note 1. If the specification does not specify parameters for either PIN1 or PIN2 then that respective PIN is NOT internally CONNECTED.