

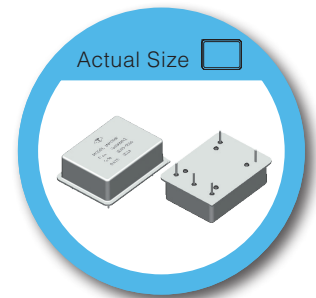
# Double Oven Controlled Crystal Oscillator NI-10MHz-3500 Series

## FEATURES

- Design for application of exceptional frequency stability and timing
- Aging Performance
- $\pm 0.05$  ppb/Day
- $\pm 10$  ppb/Year
- $\pm 0.05$  ppb/10 Years

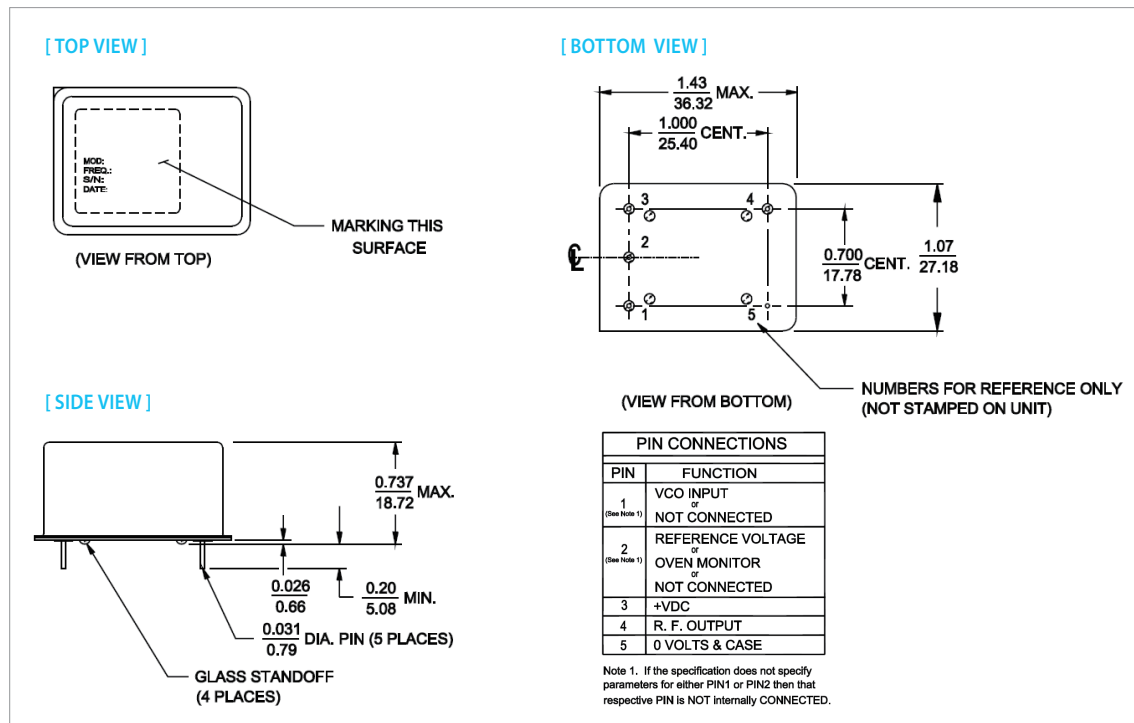
## TYPICAL APPLICATION

- Instrument Reference
- Data Communication
- Test & Measurement
- Telecom Systems
- GPS



RoHS Compliant

## DIMENSION (mm)



## ELECTRICAL SPECIFICATION

### OUTPUT (PIN = “R.F. OUTPUT”)

Parameter	Min.	Typ.	Max.	Unit	Test Condition
Frequency	10.000000			MHz	
Initial Accuracy	-0.1		+0.1	ppm	@ +25 ±1°C
					after turn on power 30 ±5 minutes
					≤ 90 days following date code
					VCO Input at Center Voltage ±0.001V
Waveform	Rectangular				
Level	CMOS				
“1” level	+2.4			V	
“0” level			+0.3	V	
Load		15		pF	
Duty cycle	45	50	55	%	@ +2.5V
Spurious			-60	dBc	

### FREQUENCY STABILITY

Parameter	Min.	Typ.	Max.	Unit	Test Condition
Ambient	±0.05, ±0.1, ±0.2, ±0.5			ppb	Refer to Table 1 : Ordering Information
		-10 ~ +70 -40 ~ +85		°C	
Aging					Refer to Table 1 : Ordering Information
Daily	±0.05, ±0.1, ±0.2		ppb	after 30 days	
Yearly	±10, ±20, ±40		ppb		
10 Years	±50, ±100, ±200		ppb		
Voltage	-0.1		+0.1	ppb	±5% change
Short term			0.005	ppb/s	root Allan variance
			0.01	ppb/10s	
Warm-up	-20		+20	ppb	in 5 minutes @ +25 ±1°C referenced to 1 hour
Phase Noise			-90	dBc/Hz	@ 1Hz
			-120	dBc/Hz	@ 10Hz
			-135	dBc/Hz	@ 100Hz
			-145	dBc/Hz	@ 1KHz
			-155	dBc/Hz	@ 10KHz
Retrace	-5		+5	ppb	After 60 minutes from turn on, following 24 hours minimum on time, and 24 hours maximum off time. At constant temperature and voltage. Referenced to frequency at off time

### ELECTRICAL FREQUENCY ADJUSTMENT (PIN = “VCO INPUT”)

Parameter	Min.	Typ.	Max.	Unit	Test Condition
Tuning Range	-0.25		-0.15	ppm	VCO @ Min. Voltage
	+0.15		+0.25	ppm	VCO @ Max. Voltage
Control Voltage	0		+2.8	V	Referenced to frequency at nominal Center Voltage
Slope	Positive				
Center Voltage		+1.4		V	When not connected, VCO INPUT is internally held at this voltage
Linearity	-10		+10	%	
Input Impedance	50			kΩ	

**INPUT POWER (PIN = "+VDC")**

Parameter	Min.	Typ.	Max.	Unit	Test Condition
Voltage	+4.75	+5.0	+5.25	V	
Current					
Steady State			2.5	W	@ +25°C
During Warm-Up			1.75	A	@ turn on

**REFERENCE VOLTAGE (PIN = "REFERENCE VOLTAGE")**

Parameter	Min.	Typ.	Max.	Units	Test Condition
Voltage	+2.716	+2.8	+2.884	V	Over temperature range in 2.1
Load	9			kΩ	
Temperature stability	-0.5		+0.5	mV	

**ENVIRONMENTAL**

Parameter	Reference Std.	Test Condition
Storage Temperature	-40°C to +85°C	
Vibration (non-operating)	MIL-STD-202, Method 201	0.06" Total p-p, 10 to 55 Hz
Shock (non-operating)	MIL-STD-202, Method 213, Test Condition J	30g, 11ms, half-sine

**Table 1 : ORDERING INFORMATION**

Temp. (°C)	Aging Ambient	Aging Performance		
		±0.05 ppb/Day ±10 ppb/Year ±50 ppb/10 Years	±0.1 ppb/Day ±20 ppb/Year ±100 ppb/10 Years	±0.2 ppb/Day ±40 ppb/Year ±200 ppb/10 Years
-40°C ~ +85°C	±0.1 ppb	NI-10M-3500	NI-10M-3501	NI-10M-3502
	±0.2 ppb	NI-10M-3510	NI-10M-3511	NI-10M-3512
	±0.3 ppb	NI-10M-3520	NI-10M-3521	NI-10M-3522
	±0.5 ppb	NI-10M-3530	NI-10M-3531	NI-10M-3532
-10°C ~ +70°C	±0.05 ppb	NI-10M-3550	NI-10M-3551	NI-10M-3552
	±0.1 ppb	NI-10M-3560	NI-10M-3561	NI-10M-3562
	±0.2 ppb	NI-10M-3570	NI-10M-3571	NI-10M-3572
	±0.3 ppb	NI-10M-3580	NI-10M-3581	NI-10M-3582

Other specifications may be available upon request.

## Phase Noise & Short Term Stability Test Data

