

Double Oven Controlled Crystal Oscillator NI-10MHz-3000 Series

NI-10M-3000 Series in 36.3x27.2mm DIP package

NI-10M-3000 Series oscillators are designed for applications where exceptional frequency stability and timing is required. The NI-10M-3000 units have both excellent temperature performance and short term stability. These characteristics make the NI-10M-3000 Series an excellent choice for timing applications requiring holdover of < 10 μ S for 24 hours. A choice of quartz resonators offers a variety of performance versus cost options to fit most applications.



RoHS Compliant Standard

ELECTRICAL SPECIFICATIONS

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

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
1.1.	Frequency	10.000000			MHz	
1.2.	Initial Accuracy	-0.1		+0.1	ppm	@ +25 \pm 1 $^{\circ}$ C after turn on power 30 \pm 5 minutes \leq 90 days following date code VCO Input at Center Voltage \pm 0.001V
1.3.	Waveform	Rectangular				
1.4.	Level	HCMOS				
	"1" level	+2.4			V	
	"0" level			+0.3	V	
1.5.	Load		15		pF	
1.6.	Duty cycle	45	50	55	%	@ +1.65V
1.7.	Spurious			-60	dBc	

2. FREQUENCY STABILITY

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
2.1.	Ambient	\pm 0.2, \pm 0.5			ppb	Refer to Table 1 : Ordering Information	
		0 ~ +70 -30 ~ +70			$^{\circ}$ C		
2.2.	Aging					Refer to Table 1 : Ordering Information	
	Daily	\pm 0.1, \pm 0.3			ppb		per day, at time of shipment
	Yearly	\pm 0.1, \pm 0.3			ppb		after 30 days
	10 Years	\pm 20, \pm 50			ppb		
2.3.	Voltage	-0.2		+0.2	ppb	\pm 5% change	
2.4.	Short term			0.007	ppb/s	root Allan variance	
				0.01	ppb/10s		
2.5.	Warm-up	-20		+20	ppb	in 5 minutes @ +25 \pm 1 $^{\circ}$ C referenced to 1 hour	

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
2.6.	Phase Noise			-90	dBc/Hz	@ 1Hz
				-120	dBc/Hz	@ 10Hz
				-138	dBc/Hz	@ 100Hz
				-148	dBc/Hz	@ 1KHz
				-155	dBc/Hz	@ 10KHz
				-158	dBc/Hz	@ 100KHz
2.7.	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

3. ELECTRICAL FREQUENCY ADJUSTMENT (PIN = "VCO INPUT")

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
3.1.	Tuning Range	-0.8		-0.35	ppm	VCO @ Min. Voltage
		+0.35		+0.8	ppm	VCO @ Max. Voltage
3.2.	Control Voltage	0		+2.8	V	Referenced to frequency at nominal Center Voltage
3.3.	Slope	Positive				
3.4.	Center Voltage		+1.4		V	When not connected, VCO INPUT is internally held at this voltage
3.5.	Linearity	-10		+10	%	
3.6.	Input Impedance	50			kΩ	

4. INPUT POWER (PIN = "+VDC")

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
4.1.	Voltage	+3.135	+3.3	+3.465	V	
4.2.	Current			2.5	A	@ turn on
4.3.	Steady State			2.5	W	@ +25°C

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

	Parameter	Min.	Typ.	Max.	Units	Test Condition
5.1.	Voltage	+2.66	+2.8	+2.94	V	Over temperature range in 2.1
5.2.	Load	9			kΩ	
5.3.	Temperature stability	-0.0005		+0.0005	V	

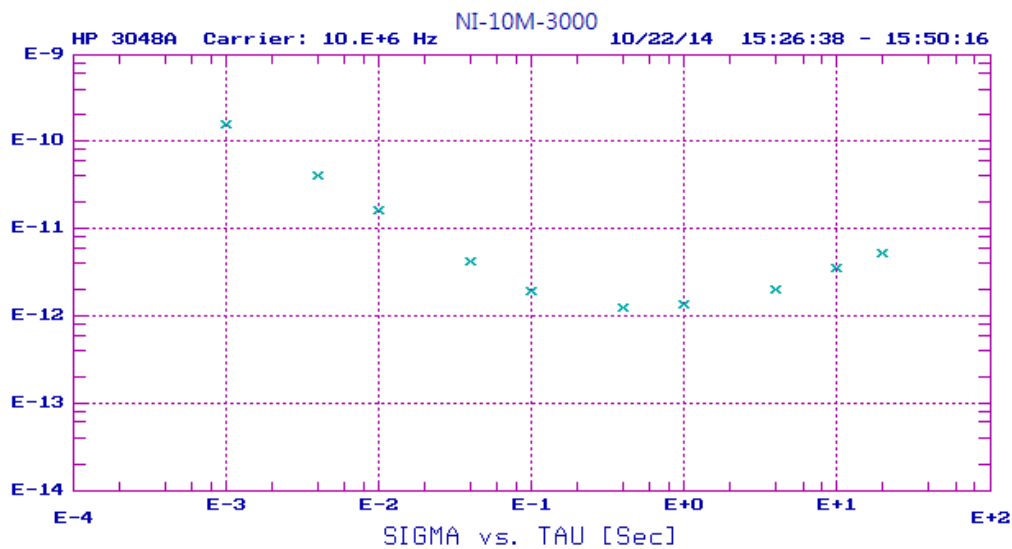
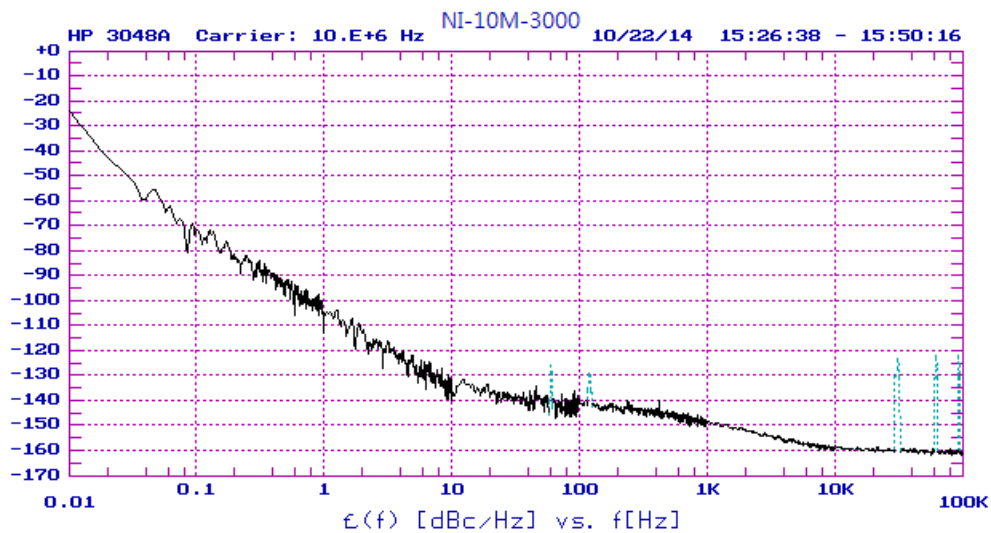
6. ENVIRONMENTAL

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

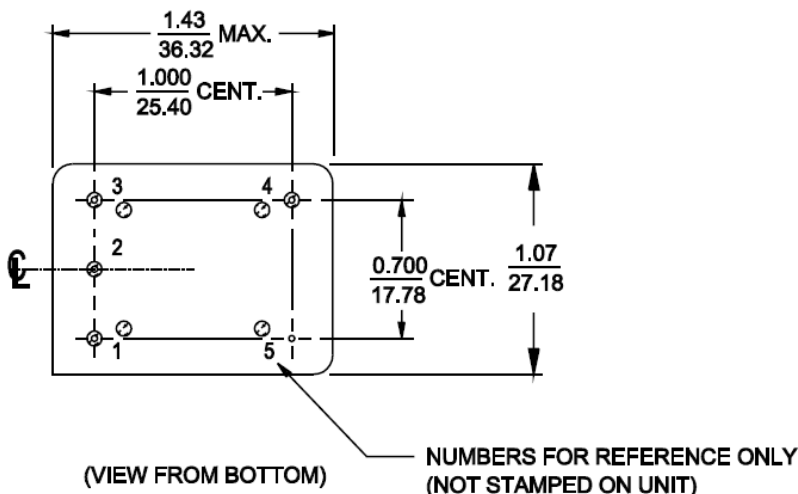
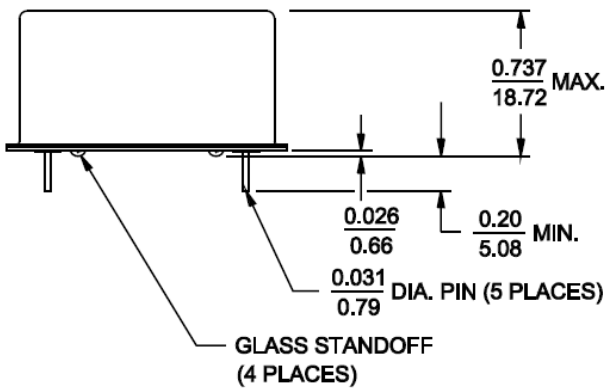
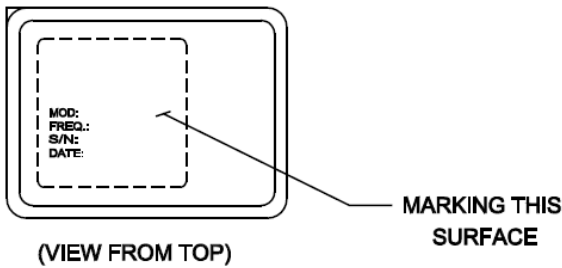
Table 1 : ORDERING INFORMATION

		Aging	
		Aging Performance	
Temp. (°C)	Ambient	±0.1 ppb/Day ±20 ppb/Year ±0.1 ppm/10 Years	±0.3 ppb/Day ±50 ppb/Year ±0.2 ppm/10 Years
		-30°C ~+70°C	±0.5 ppb
±0.2 ppb	NI-10M-3010		NI-10M-3011
0°C~+70°C	±0.5 ppb	NI-10M-3040	NI-10M-3041
	±0.2 ppb	NI-10M-3050	NI-10M-3051

Other specifications may be available upon request.

Phase Noise & Short Term Stability Test Data


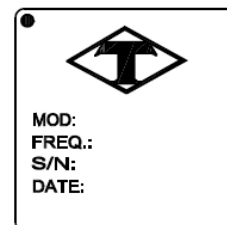
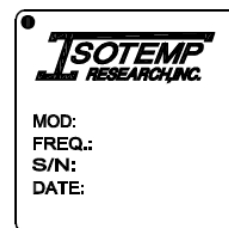
OUTLINE DRAWING



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

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

MARKING



$\frac{\text{INCH}}{\text{mm}}$ (REFERENCE ONLY)