Double Oven Controlled Crystal Oscillator
NI-10MHz-3400 Series

NI-10M-3400 Series in 36.3x27.2mm DIP package

NI-10M-3400 Series oscillators are designed for applications where exceptional frequency stability and timing is required. The NI-10M-3400 units have both excellent temperature performance and short term stability. These characteristics make the NI-10M-3400 Series an excellent choice for timing applications requiring holdover of < 10 uS 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 ±1°C
						after turn on power 30 ±5 minutes
						≤ 90 days following date code
						VCO Input at Center Voltage ±0.001V
1.3.	Waveform		Rectangular			
1.4.	Level		HCMOS			
	"1" level	+4.4			V	
	"0" level			+0.3	V	
1.5.	Load		15		pF	
1.6.	Duty cycle	45	50	55	%	@ +2.5V
1.7.	Spurious			-60	dBc	

2. FREQUENCY STABILITY

	Parameter	Min.	Typ.	Max.	Unit	Test Condition	
2.1.	Ambient		±0.2, ±0.5		ppb	Refer to Table 1 : Ordering Information	
			-30 ~ +70 -40 ~ +85		°C		
2.2.	Aging						
	Daily		±0.1, ±0.3		ppb	per day, at time of shipment	Refer to Table 1 : Ordering Information
			±0.1, ±0.3		ppb	after 30 days	
	Yearly		±20, ±50		ppb		
	10 Years		±0.1, ±0.2		ppm		
2.3.	Voltage	-0.2		+0.2	ppb	±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 ±1°C	referenced to 1 hour

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
2.6.	Phase Noise			-90	dBc/Hz	@ 1Hz
				-120	dBc/Hz	@ 10Hz
				-140	dBc/Hz	@ 100Hz
				-150	dBc/Hz	@ 1KHz
				-155	dBc/Hz	@ 10KHz
				-160	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	Referenced to frequency at nominal Center Voltage
		+0.35		+0.8	ppm	VCO @ Max. Voltage	
3.2.	Control Voltage	0		+2.8	V		
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	+4.75	+5.0	+5.25	V	
4.2.	Current			1.75	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	
5.2.	Load	9			kΩ	Over temperature range in 2.1
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

Temp. (°C)	Aging / Ambient	Aging Performance ±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	NI-10M-3400	NI-10M-3401
	±0.2 ppb	NI-10M-3410	NI-10M-3411
-40°C~+85°C	±0.5 ppb	NI-10M-3420	NI-10M-3421
	±0.2 ppb	NI-10M-3430	NI-10M-3431

Other specifications may be available upon request.
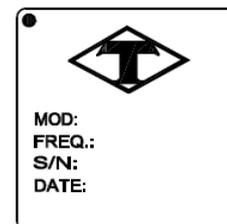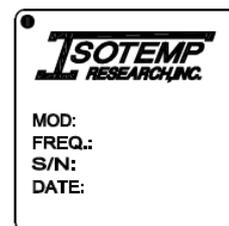
Phase Noise & Short Term Stability Test Data

OUTLINE DRAWING

(VIEW FROM TOP)

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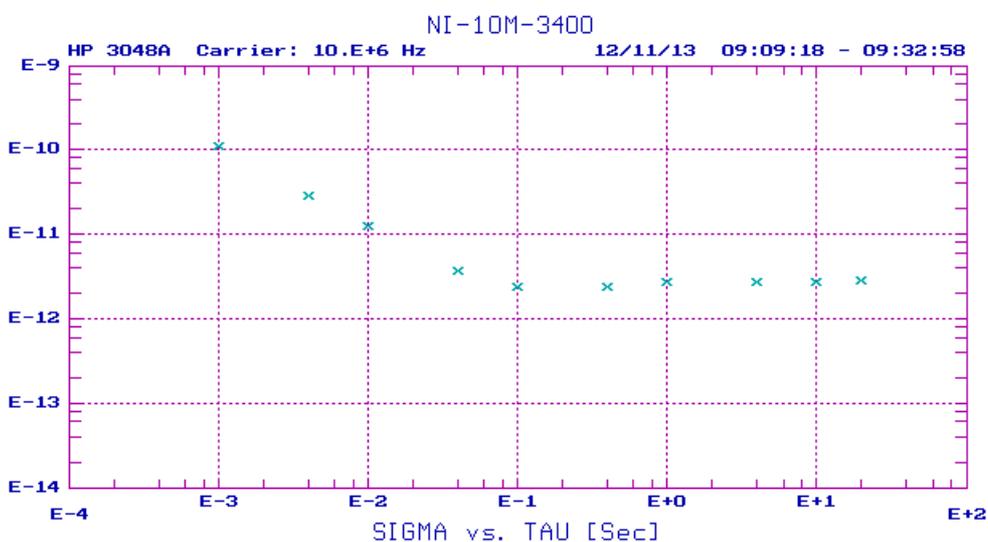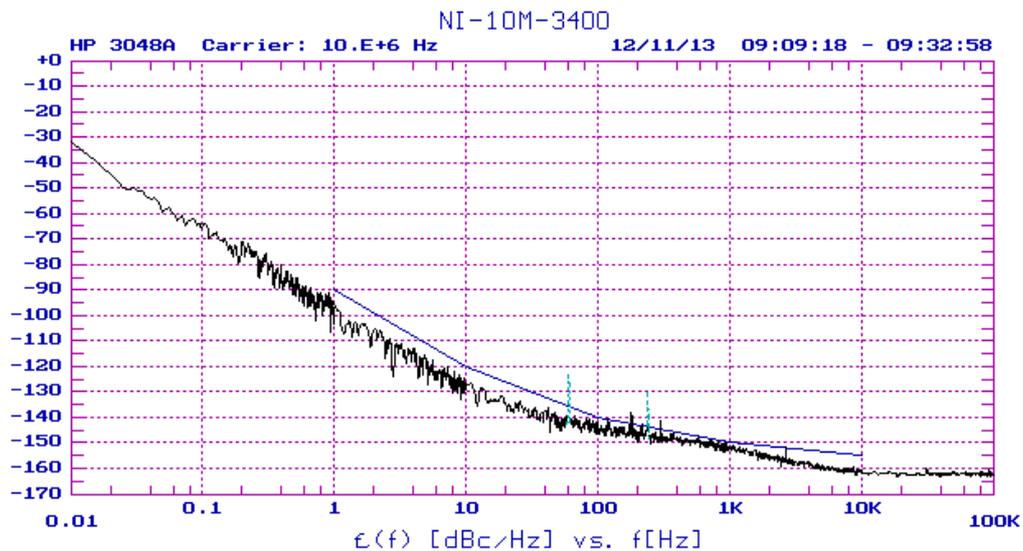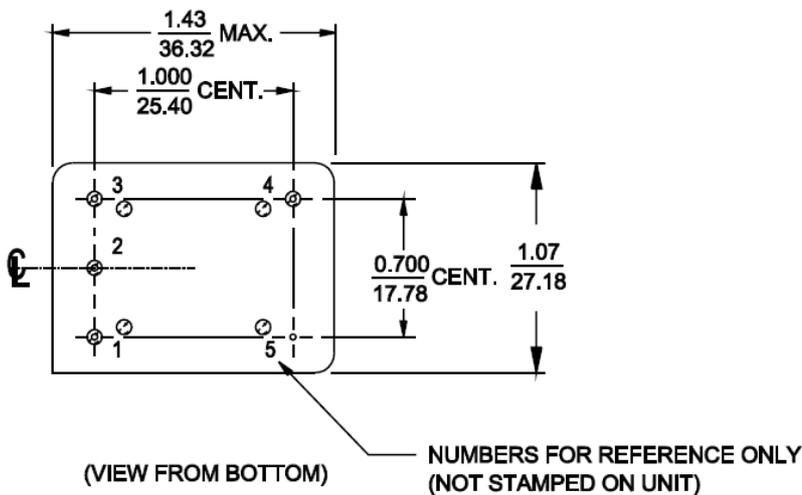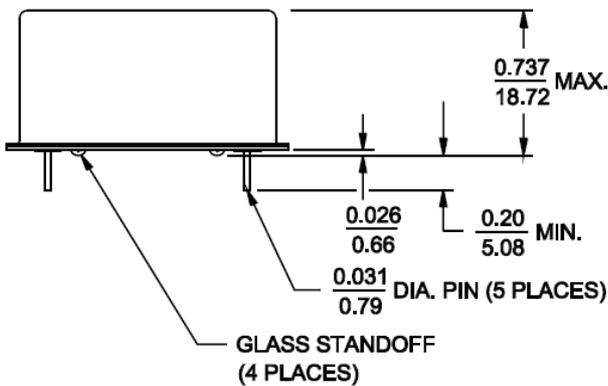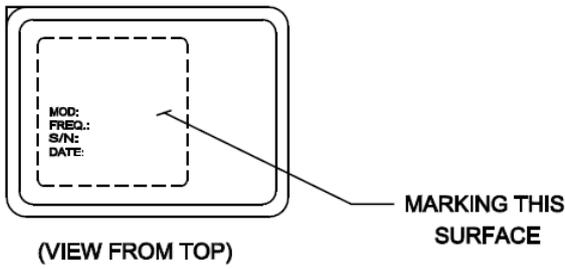
PIN CONNECTIONS	
PIN	**FUNCTION**
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or OVEN MONITOR or NOT CONNECTED
3	+VDC
4	R. F. OUTPUT
5	0 VOLTS & CASE

$\frac{0.737}{18.72}$ MAX.

$\frac{0.026}{0.66}$ $\frac{0.20}{5.08}$ MIN.

$\frac{0.031}{0.79}$ DIA. PIN (5 PLACES)

GLASS STANDOFF (4 PLACES)

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

$\frac{1.43}{36.32}$ MAX.

$\frac{1.000}{25.40}$ CENT.

$\frac{0.700}{17.78}$ CENT. $\frac{1.07}{27.18}$

(VIEW FROM BOTTOM)

NUMBERS FOR REFERENCE ONLY (NOT STAMPED ON UNIT)

MARKING

ISOTEMP RESEARCH,INC.

MOD:
FREQ.:
S/N:
DATE:

MOD:
FREQ.:
S/N:
DATE:

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