

Oven Controlled Crystal Oscillator

NI-10 MHz-2400 series

2400 Series in 36.3x27.2mm DIP package

NI-10M-2400 series oscillators is designed for applications where space is at a premium and good frequency stability is required. The oscillators can be used in many communications applications. 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 15 ±1 minutes ≤ 90 days following date code VCO Input at Center Voltage ±0.001V
1.3.	Waveform	Rectangular				
1.4.	Level	LVTTTL				
	"1" level	+2.6	+3.3		V	
	"0" level			+0.4	V	
1.5.	Load		15		pF	
1.6.	Duty cycle	45	50	55	%	@ +1.65V
1.7.	Rise/fall time			6	ns	10% to 90%
1.8.	Spurious			-60	dBc	

2. FREQUENCY STABILITY

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
2.1.	Ambient	±3, ±5, ±10			ppb	referenced to 25°C
		-30 ~ +70 -40 ~ +85			°C	Refer to Table 1 : Ordering Information
2.2.	Aging	-0.5		+0.5	ppb	per day, at time of shipment
	Daily	-0.5		+0.5	ppb	after 30 days
	Yearly	-50		+50	ppb	
	10 Years	-0.3		+0.3	ppm	
2.3.	Voltage	-0.5		+0.5	ppb	±5% change
2.4.	Short term			0.05	ppb/s	root Allan variance
2.5.	Load	-0.5		+0.5	ppb	±5% change
2.6.	Warm-up	-10		+10	ppb	in 10 minutes @ +25 ±1°C referenced to 1 hour

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
2.7.	Phase Noise		-95	-90	dBc/Hz	@ 1Hz
			-125	-120	dBc/Hz	@ 10Hz
			-140	-135	dBc/Hz	@ 100Hz
			-148	-145	dBc/Hz	@ 1KHz
			-156	-155	dBc/Hz	@ 10KHz
			-158	-155	dBc/Hz	@ 100KHz

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

	Parameter	Min.	Typ.	Max.	Unit	Test Condition
3.1.	Tuning Range			-0.5	ppm	VCO @ Min. Voltage
		+0.5			ppm	VCO @ Max. Voltage
3.2.	Control Voltage	0		+5.0	V	Optional, Refer to Table 1 : Ordering Information
		0		+4.0	V	
3.3.	Slope	Positive				
3.4.	Center Voltage		+2.5		V	Optional, Refer to Table 1 : Ordering Information
			+2.0		V	
3.5.	Linearity	-10		+10	%	
3.6.	Input Impedance	100			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			800	mA	@ turn on
4.3.	Steady State			1.3	W	@ +25°C

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

(Optional Function. Refer to Table 1 : Ordering Information.)

	Parameter	Min.	Typ.	Max.	Units	Test Condition
5.1.	Voltage	+3.8	+4	+4.2	V	Over temperature range in 2.1.
5.2.	Load	9			kΩ	

6. ENVIRONMENTAL

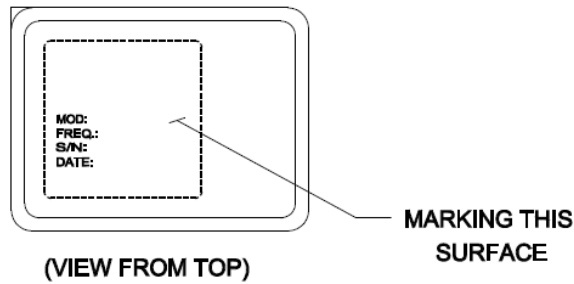
	Parameter	Reference Std.	Test Condition
6.1.	Operating Temperature	-40°C to +85°C	Note 2
6.2.	Storage Temperature	-55°C to +105°C	
6.3.	Humidity	MIL-STD-202, Method 103 Test Condition A	95% RH @ +40°C, non-condensing, 240 hours
6.4.	Vibration (non-operating)	MIL-STD-202, Method 201	0.06" Total p-p, 10 to 55 Hz
6.5.	Shock (non-operating)	MIL-STD-202, Method 213, Test Condition J	30g, 11ms, half-sine

Note 1. When not connected, VCO INPUT is internally held at this voltage.

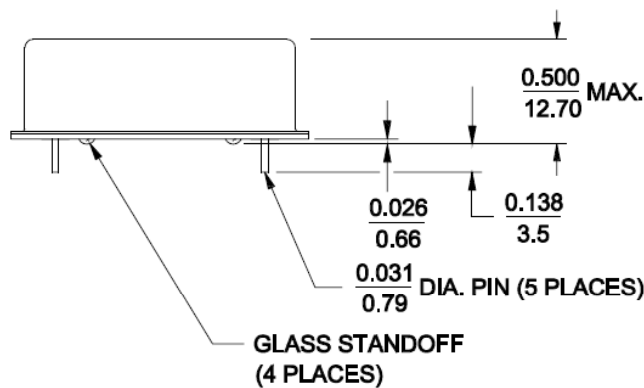
Note 2. Output maintained over this temperature range. Other requirements of this specification may not be met when operating outside the temperature range in 2.1.

Table 1 : ORDERING INFORMATION

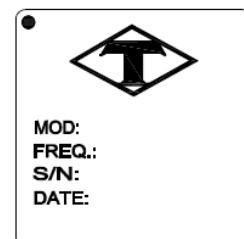
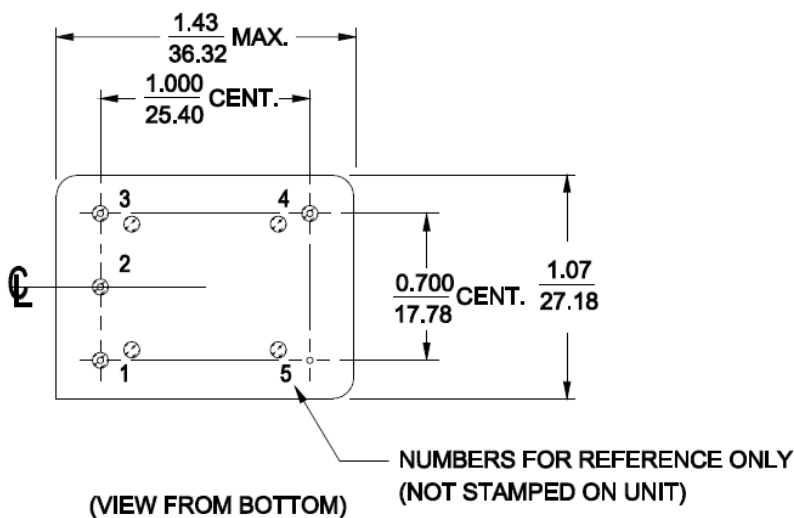
Temp. (°C)	TAITIEN Model No.	ppb	±3	±5	±10	Control Voltage	Reference Voltage
-30~+70			NI-10M-2400	NI-10M-2401	NI-10M-2402	+2.5V	N/A
-40~+85			NI-10M-2403	NI-10M-2404	NI-10M-2405		
-30~+70			NI-10M-2450	NI-10M-2451	NI-10M-2452	+2.0V	+4.0V
-40~+85			NI-10M-2453	NI-10M-2454	NI-10M-2455		

OUTLINE DRAWING


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


Note:

- For NI-10M-2400 THRU NI-10M-2405
NOT internally CONNECTED.



TOLERANCES:
UNLESS OTHERWISE SPECIFIED:
ANGLES: ±1 DEGREE
FRACTIONS: ±1/32 INCH
DECIMALS: .XX±.015, .XXX±.010 INCH
INCH
mm (REFERENCE ONLY)