TAITIEN
Our Performance Your Reputation

# Oven Controlled Crystal Oscillator
# NA-10 MHz-2400 series

## 2400 Series-square wave in 25.4x25.4mm DIP package

NA-10M-2400 series oscillators are 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 | | LVTTL | | | |
| | "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 | Refer to Table 1 : Ordering Information |
| | | | -30 ~ +70<br>-40 ~ +85 | | °C | | |
| 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 |



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| | Parameter | Min. | Typ. | Max. | Unit | Test Condition |
|---|---|---|---|---|---|---|
| 2.7. | Phase Noise | | -95 | -90 | dBc/Hz | @ 1Hz (@25°C) |
| | | | -125 | -120 | dBc/Hz | @ 10Hz (@25°C) |
| | | | -140 | -135 | dBc/Hz | @ 100Hz (@25°C) |
| | | | -148 | -145 | dBc/Hz | @ 1KHz (@25°C) |
| | | | -156 | -155 | dBc/Hz | @ 10KHz (@25°C) |
| | | | -158 | -155 | dBc/Hz | @ 100KHz (@25°C) |

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

| | Parameter | Min. | Typ. | Max. | Unit | Test Condition | |
|---|---|---|---|---|---|---|---|
| 3.1. | Tuning Range | | | -0.5 | ppm | VCO @ Min. Voltage | Referenced to frequency at nominal Center 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** | Note 1 |
| | | | +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

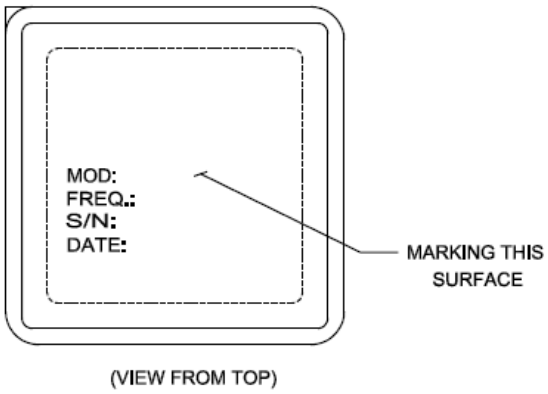
| | Parameter | Reference Std. | Test Condition |
|---|---|---|---|
| 6.1. | Operating Temperature | -40°C to +85°C | Note 2 |
| 6.2. | Storage Temperature | -55°C to +105°C | |
| 6.3. | Humidity | MIL-STD-202, Method 103 Test Condition A | 95% RH @ +40°C,non-condensing,240 hours |
| 6.4. | Vibration (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.

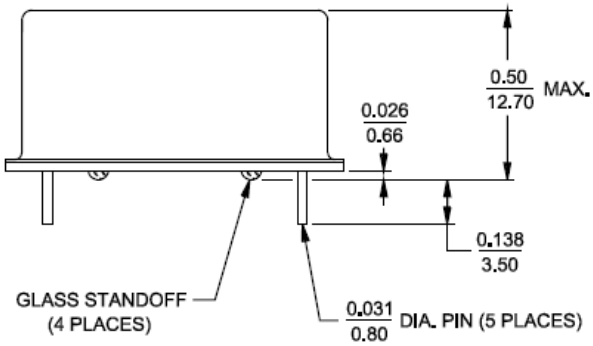
## Table 1 : ORDERING INFORMATION

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

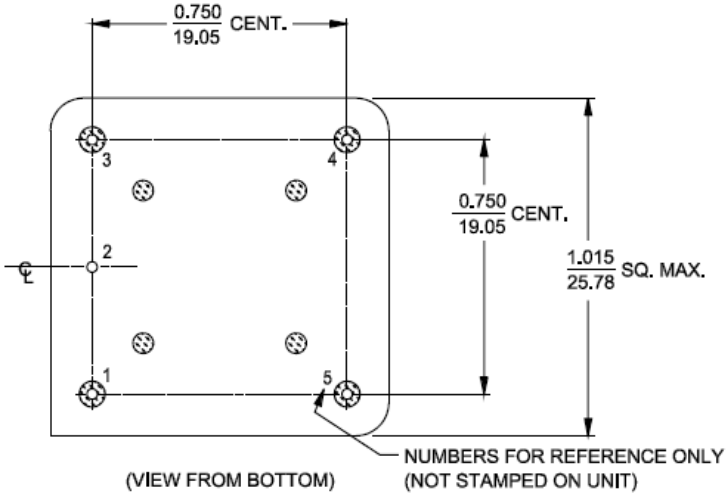
## OUTLINE DRAWING




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




Note:
1. For NA-10M-2400 THRU NA-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)

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