

Helping Customers Innovate, Improve & Grow



OX-042

## Features

- Low G-Sensitivity
- Low Phase Noise
- High Stability
- SC-Cut Crystal Standard
- Vectron's Patented (US Patent 6,984,925) QRM Crystal Technology
- Frequency Range: 3 MHz to 20 MHz

## Applications

- Military
- Radar
- Test Equipment
- Frequency Synthesizers
- Position Location
- Satellite Communications

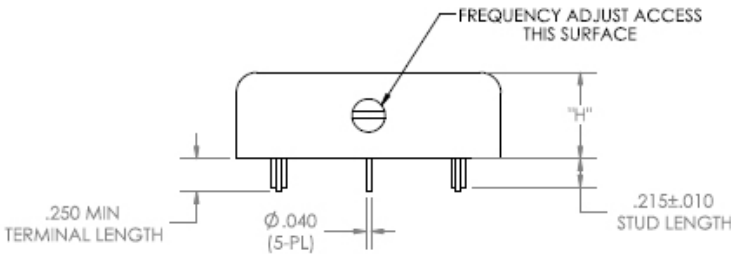
## Performance Specifications

| Parameter                                                | Min  | Typ | Max  | Units   | Condition                                                      |
|----------------------------------------------------------|------|-----|------|---------|----------------------------------------------------------------|
| Available Frequencies                                    |      |     |      |         |                                                                |
| With Standard Crystals                                   | 3    |     | 20   | MHz     |                                                                |
| With QRM Crystals                                        | 8    |     | 15   | MHz     |                                                                |
| G-Sensitivity Performance                                |      |     |      |         |                                                                |
| G Sensitivity w\QRM crystal $\geq 10$ MHz                |      |     | 0.2  | ppb/g   | Degrades to 0.4 ppb/g @ 8 MHz                                  |
| G Sensitivity w\std. crystal $\geq 10$ MHz               |      |     | 2.0  | ppb/g   | Degrades to 4.0 ppb/g @ 3 MHz                                  |
| (No mechanical resonances out to 2KHz)                   |      |     |      |         | G sensitivity specified as Total Gamma                         |
| Frequency Stabilities <sup>1</sup>                       |      |     |      |         |                                                                |
| vs. operating temperature range<br>(referenced to +25°C) | -30  |     | +30  | ppb     | -40... +85°C                                                   |
|                                                          | -25  |     | +25  | ppb     | -40... +70°C                                                   |
|                                                          | -20  |     | +20  | ppb     | -20... +70°C                                                   |
|                                                          | -10  |     | +10  | ppb     | 0... +70°C                                                     |
| Initial Tolerance                                        | -100 |     | +100 | ppb     | at time of shipment, nominal EFC                               |
| vs. supply voltage change                                | -2.0 |     | +2.0 | ppb     | $V_s \pm 5\%$                                                  |
| vs. load change                                          | -2.0 |     | +2.0 | ppb     | Load $\pm 5\%$                                                 |
| vs. aging / daily                                        | -0.3 |     | +0.3 | ppb     | after 72 hours of operation                                    |
| vs. aging / 1 year                                       | -50  |     | +50  | ppb     | after 72 hours of operation                                    |
| vs. aging / year (following years)                       | -30  |     | +30  | ppb     |                                                                |
| Warm-up Time                                             |      |     | 5    | minutes | to $\pm 10$ ppb of final frequency<br>(1 hour reading) @ +25°C |

## Performance Specifications

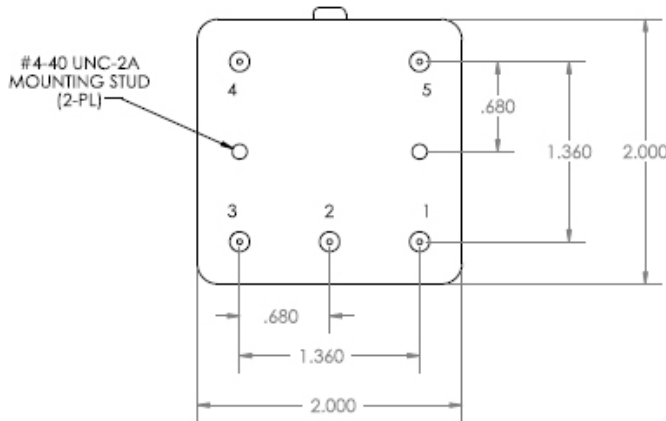
| Parameter                                                                       | Min                                                                               | Typ  | Max        | Units          | Condition                              |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------------|----------------|----------------------------------------|
| <b>Supply Voltage (Vs)</b>                                                      |                                                                                   |      |            |                |                                        |
| Supply voltage (Standard-Opt A)                                                 | 14.25                                                                             | 15.0 | 15.75      | VDC            | 18 & 24 VDC options available          |
| Supply voltage (Standard-Opt B)                                                 | 11.4                                                                              | 12.0 | 12.6       | VDC            | 18 & 24 VDC options available          |
| Oven Power Consumption                                                          |                                                                                   |      | 6.0<br>3.0 | Watts<br>Watts | during warm-up<br>steady state @ +25°C |
| <b>RF Output</b>                                                                |                                                                                   |      |            |                |                                        |
| Signal                                                                          | Sinewave                                                                          |      |            |                |                                        |
| Load                                                                            |                                                                                   | 50   |            | ohm            |                                        |
| Output Power                                                                    | +7.0                                                                              |      |            | dBm            | 50 ohm load                            |
| Harmonics                                                                       |                                                                                   |      | -30        | dBc            | 50 ohm load                            |
| <b>Frequency Tuning (Internal Mechanical)</b>                                   |                                                                                   |      |            |                |                                        |
| Tuning Range                                                                    | ±0.75                                                                             | ±1.0 | ±2.0       | ppm            | Internal mechanical                    |
| <b>Frequency Tuning (EFC - optional)</b>                                        |                                                                                   |      |            |                |                                        |
| Tuning Range                                                                    | ±0.2                                                                              | ±0.5 | ±1.0       | ppm            | Electronic frequency control           |
| Linearity                                                                       |                                                                                   |      | 20         | %              |                                        |
| Tuning Slope                                                                    | Positive                                                                          |      |            |                |                                        |
| Control Voltage Range                                                           | 0.0                                                                               | 2.5  | 5.0        | VDC            |                                        |
| <b>Additional Parameters<sup>1</sup></b>                                        |                                                                                   |      |            |                |                                        |
| Phase Noise <sup>3</sup> (@5 MHZ)<br>(under static conditions - no vibration)   |                                                                                   | -115 | -105       | dBc/Hz         | 1 Hz                                   |
|                                                                                 |                                                                                   | -140 | -137       | dBc/Hz         | 10 Hz                                  |
|                                                                                 |                                                                                   | -155 | -152       | dBc/Hz         | 100 Hz                                 |
|                                                                                 |                                                                                   | -166 | -163       | dBc/Hz         | 1 KHz                                  |
|                                                                                 |                                                                                   | -168 | -165       | dBc/Hz         | 10 KHz                                 |
| Phase Noise <sup>3</sup> (@ 10 MHZ)<br>(under static conditions - no vibration) |                                                                                   | -100 | -95        | dBc/Hz         | 1 Hz                                   |
|                                                                                 |                                                                                   | -133 | -127       | dBc/Hz         | 10 Hz                                  |
|                                                                                 |                                                                                   | -155 | -152       | dBc/Hz         | 100 Hz                                 |
|                                                                                 |                                                                                   | -166 | -163       | dBc/Hz         | 1 KHz                                  |
|                                                                                 |                                                                                   | -168 | -165       | dBc/Hz         | 10 KHz                                 |
| Weight                                                                          |                                                                                   |      | 100        | g              |                                        |
| <b>Absolute Maximum Ratings</b>                                                 |                                                                                   |      |            |                |                                        |
| Supply voltage (Vs)                                                             |                                                                                   |      | 28         | VDC            |                                        |
| Output Load                                                                     | short                                                                             |      | open       | ohm            |                                        |
| Operable temperature range                                                      | -55                                                                               |      | +85        | °C             |                                        |
| Storage temperature range                                                       | -55                                                                               |      | +125       | °C             |                                        |
| <b>Environmental Specifications</b>                                             |                                                                                   |      |            |                |                                        |
| Shock - operating                                                               | Mil-STD-202, Method 213, Condition J, 30G, 11 ms half-sine impulse                |      |            |                |                                        |
| Shock - endurance                                                               | Mil-STD-202, Method 213, Condition C, 100G, 11 ms half-sine impulse               |      |            |                |                                        |
| Sine Vibration - operating                                                      | Mil-STD-202, Method 204, Condition C, 10 G to 2 kHz                               |      |            |                |                                        |
| Sine Vibration - endurance                                                      | Mil-STD-202, Method 204, Condition D, 20 G to 2 kHz                               |      |            |                |                                        |
| Random Vibration - operating                                                    | Mil-STD-202, Method 214, Condition C, 10.7 Grms to 2 kHz                          |      |            |                |                                        |
| Random Vibration - endurance                                                    | Mil-STD-202, Method 214, Condition H, 34 Grms to 2 kHz                            |      |            |                |                                        |
| Seal                                                                            | Mil-STD-202, Method 112, Condition D (not applicable to units with SMA connector) |      |            |                |                                        |

# Outline Drawing / Enclosure

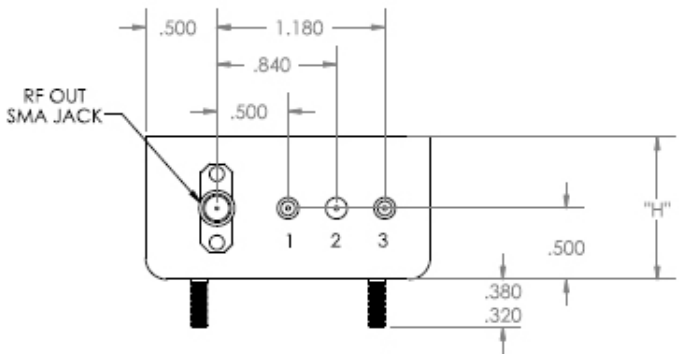


Dimensions in inches

| Type A |                |  |
|--------|----------------|--|
| Code   | Height "H" max |  |
| 0      | 1.04           |  |
| 1      | 0.80           |  |

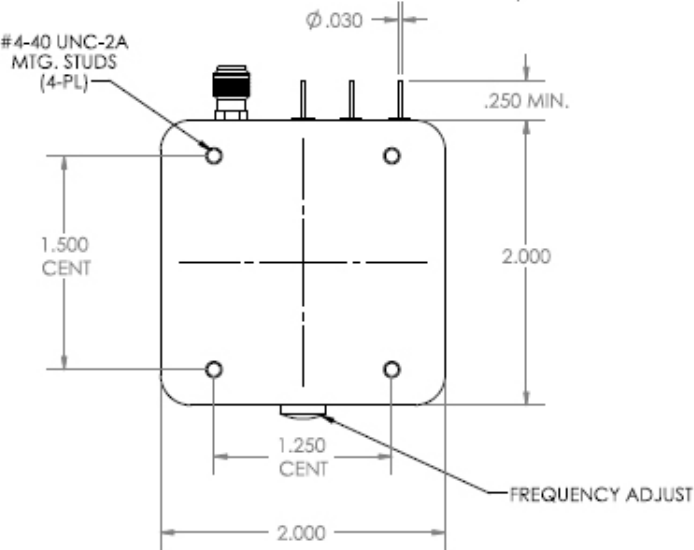


| Pin Connections |                                               |
|-----------------|-----------------------------------------------|
| 1               | Electronic Frequency Control (EFC) (optional) |
| 2               | No Connection                                 |
| 3               | RF Output                                     |
| 4               | Ground (Case)                                 |
| 5               | Supply Voltage Input (Vs)                     |
|                 |                                               |
|                 |                                               |



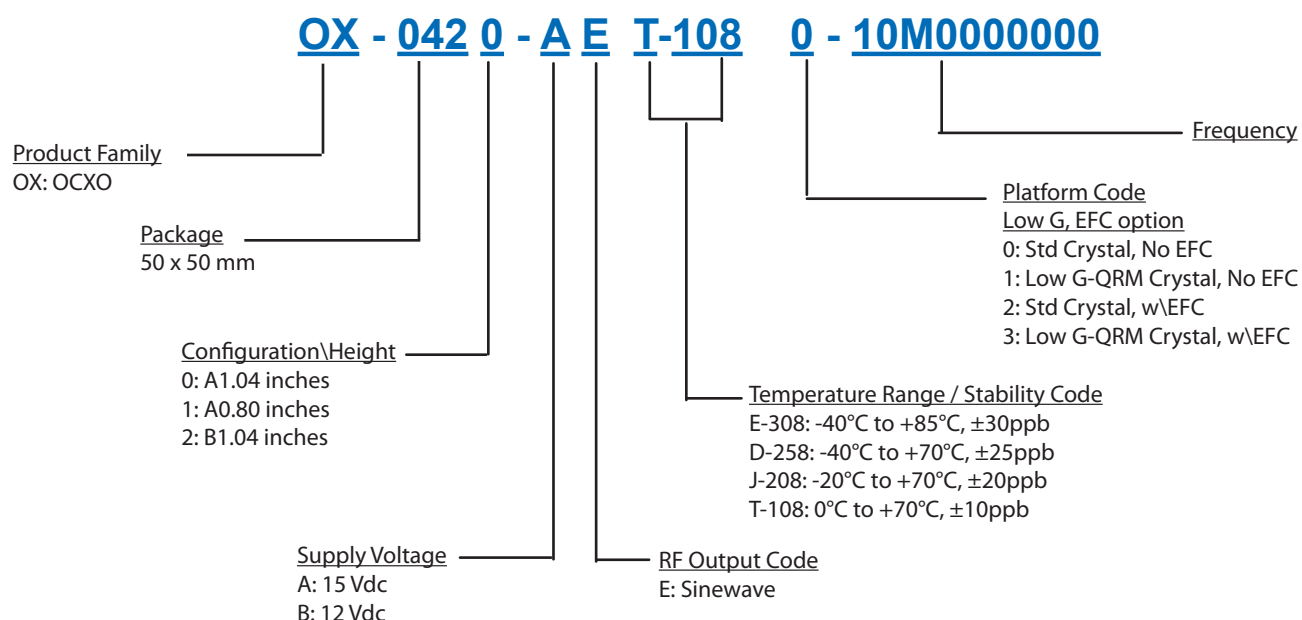
Dimensions in inches

| Type B |                |  |
|--------|----------------|--|
| Code   | Height "H" max |  |
| 2      | 1.04           |  |
|        |                |  |



| Pin Connections |                                               |
|-----------------|-----------------------------------------------|
| 1               | Supply Voltage Input (Vs)                     |
| 2               | Ground (Case)                                 |
| 3               | Electronic Frequency Control (EFC) (optional) |
|                 |                                               |
|                 |                                               |

## Ordering Information



### Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

## For Additional Information, Please Contact

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