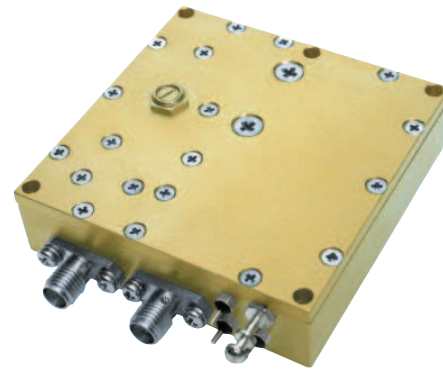


Dielectric Resonator Oscillators



Features

- ◆ Frequencies from 3 GHz to 45 GHz
- ◆ Wide operating temperature
- ◆ Ultra low phase noise
- ◆ Low power consumption
- ◆ Phase lockable to references from 1MHz to 1 GHz
- ◆ Fractional reference multiplication in a single loop
- ◆ Internal reference and dual loop models in low profile housing
- ◆ Low spurious
- ◆ Compact packages

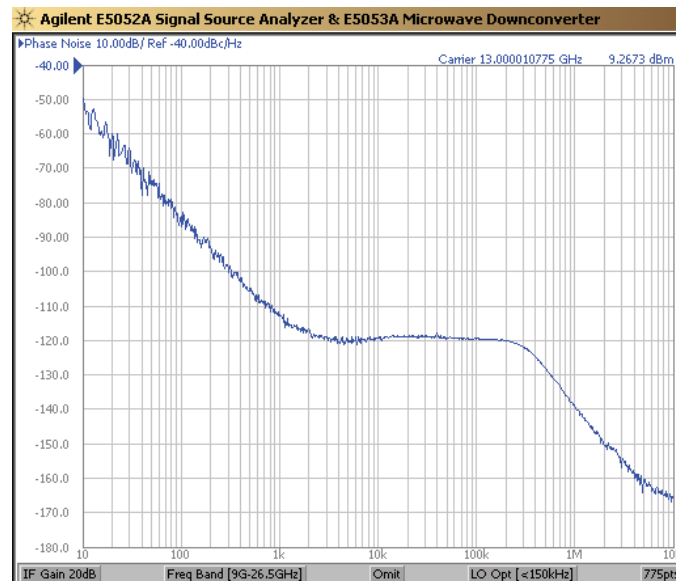
Options

- ◆ High stability internal references
- ◆ Hermetic seal
- ◆ Dual loop models
- ◆ Field replaceable connectors
- ◆ Flush profile tuner
- ◆ -55°C to +85°C operating temperature
- ◆ +8 Vdc operation on some models
- ◆ Pulsed output
- ◆ Dual output models

Description

The Kratos-CTI series of phase locked dielectric resonator oscillators have been designed for use in commercial and military systems where demanding performance, high reliability and cost are critical. This family of products take advantage of the small size, low phase noise and high efficiency offered by fundamental GaAs MESFET and BJT DROs when they are phase locked to an external crystal in the 1 MHz to 1 GHz range.

The single loop model when phase locked to an external 100 MHz crystal provides exceptionally low phase noise, typically -120 dBc/Hz at 10kHz offset at 10 GHz.



In addition, two reference options are available. The first option offers an integrated, high stability internal crystal oscillator in the 100 MHz range in a slim line package.

The second option offers a dual loop design, also in a slim line package. This internal crystal source is phase locked to an external frequency standard between 1 MHz and 1 GHz using digital synthesis techniques and allows the output frequency to be phase locked to an integer or fractional multiple of the reference frequency used. Features such as ultra low phase noise, high power, small size and low cost make Kratos-CTI's PDRO product line the best value on the market today.

Typical Performance Specifications

| | |
|---------------------------------------|--|
| Frequency Range | 3 GHz to 45 GHz |
| Output Power | +15 dBm standard, up to 1 watt optional |
| Power Variation | +/-2 dBm |
| Output Impedance | 50 ohms |
| Load VSWR | 2:1 |
| Supply Voltage | +8 Vdc, +12 Vdc or +15 Vdc Note: +8 Vdc available only on certain models, consult factory for details |
| Current: | |
| External Reference Models | 280 mA [Note: 160 mA models available, consult factory] |
| Internal Reference Models | 350 mA steady state, 800 mA surge typical |
| Dual Loop Models | 450 mA |
| Spurious | -80 dBc |
| Harmonics | -20 dBc |
| Phase Noise | See tables for specific models |
| Alarm | TTL Hi - Locked |
| Input Frequency Range: | |
| External Reference Models | 1 MHz to 1 GHz |
| Internal Reference Models | Not Applicable |
| Dual Loop Models | 1 MHz to 100 MHz |
| Frequency Stability: | |
| External Reference & Dual Loop Models | Same as reference |
| Internal Reference Models | +/- 2.5 ppm standard, +/- 1 ppm optional |
| Operating Temperature | -40° C to +75° C -55° C to +85° C optional |
| Dimensions | See outline drawings |
| Connections: | |
| RF Output | SMA-F for frequencies to 26 GHz 2.92 mm for frequencies above 26 GHz |
| Reference Input | SMA-F |
| Reference Monitor | SMA-F Note: Internal reference models only |
| Alarm, Supply Voltage | Feed-thru |
| Ground | Solder Lug |

Note: All specifications subject to change without notice.

Typical Phase Noise Performance - External Reference Models

Note: Phase noise measured using 100 MHz low noise crystal reference

| Frequency Offset from Carrier (Hz) | Phase Noise (dBc/Hz) 5 GHz | Phase Noise (dBc/Hz) 10 GHz | Phase Noise (dBc/Hz) 14 GHz | Phase Noise (dBc/Hz) 26 GHz | Phase Noise (dBc/Hz) 45 GHz |
|------------------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 100 | -91 | -85 | -82 | -76 | -72 |
| 1 k | -116 | -110 | -107 | -101 | -97 |
| 10 k | -126 | -120 | -113 | -107 | -103 |
| 100 k | -126 | -120 | -116 | -110 | -106 |
| 1M | -141 | -135 | -131 | -125 | -121 |
| 10 M | -165 | -160 | -156 | -150 | -145 |

Typical Phase Noise Performance - Internal Reference Models

| Frequency Offset from Carrier (Hz) | Phase Noise (dBc/Hz) 5 GHz | Phase Noise (dBc/Hz) 10 GHz | Phase Noise (dBc/Hz) 14 GHz | Phase Noise (dBc/Hz) 26 GHz | Phase Noise (dBc/Hz) 45 GHz |
|------------------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 100 | -80 | -75 | -72 | -66 | -61 |
| 1 k | -111 | -105 | -102 | -96 | -92 |
| 10 k | -126 | -120 | -113 | -107 | -103 |
| 100 k | -126 | -120 | -116 | -110 | -106 |
| 1M | -141 | -135 | -131 | -125 | -121 |
| 10 M | -165 | -160 | -156 | -150 | -145 |

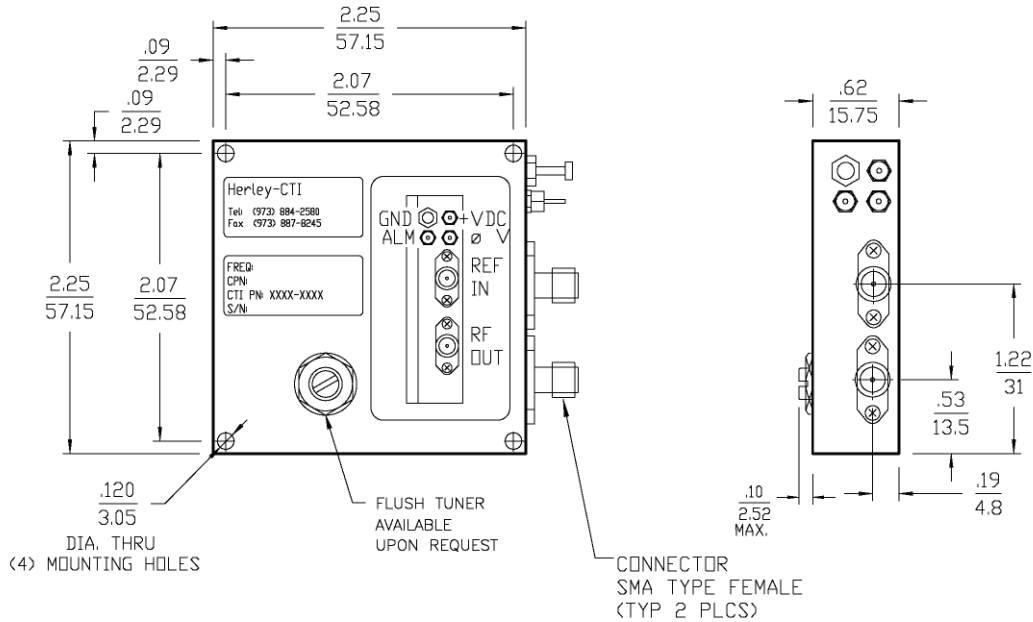
Typical Phase Noise Performance - Dual Loop Models

| Frequency Offset from Carrier (Hz) | Phase Noise (dBc/Hz) 5 GHz | Phase Noise (dBc/Hz) 10 GHz | Phase Noise (dBc/Hz) 14 GHz | Phase Noise (dBc/Hz) 26 GHz | Phase Noise (dBc/Hz) 45 GHz |
|------------------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 100 | -76 | -70 | -67 | -61 | -57 |
| 1 k | -106 | -100 | -97 | -91 | -87 |
| 10 k | -126 | -120 | -113 | -107 | -103 |
| 100 k | -126 | -120 | -116 | -110 | -106 |
| 1M | -141 | -135 | -131 | -125 | -121 |
| 10 M | -165 | -160 | -156 | -150 | -145 |

Note: All specifications subject to change without notice.

Standard Outline Drawing - External Reference

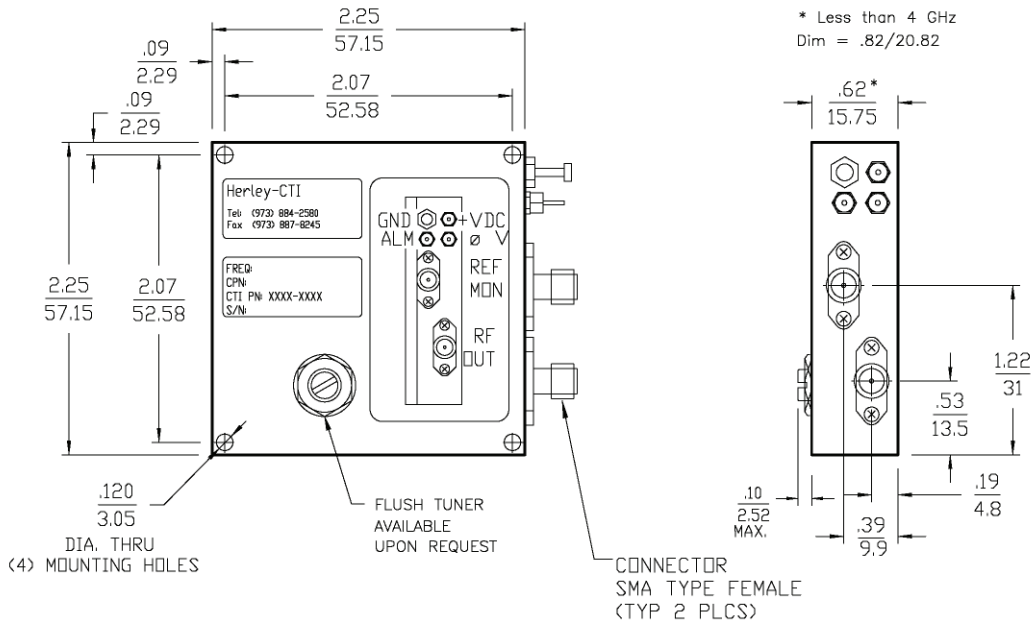
- Note: 1. Available for frequencies from 3 GHz to 18 GHz
 2. For frequencies below 4 GHz height will be 0.82 inches / 20.82 mm



Dimensions are in Inches/mm, Tol. .xx=+/-0.02, .xxx=+/-0.005

Standard Outline Drawing - Internal Reference

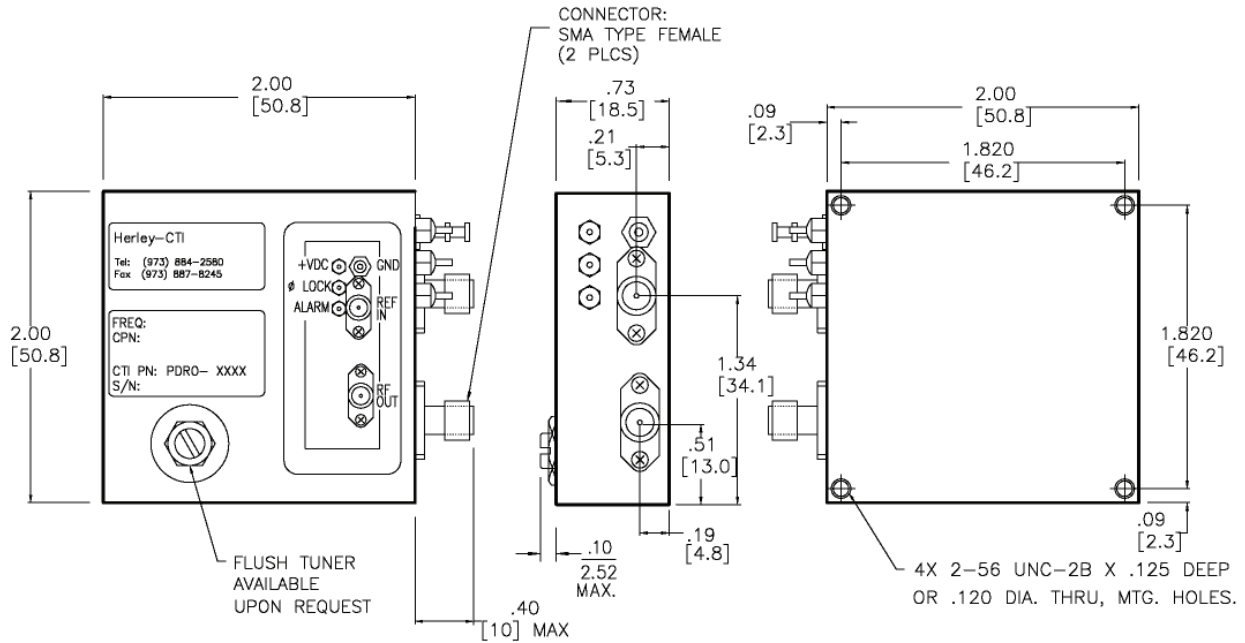
- Note: 1. Available for frequencies from 3 GHz to 18 GHz



Dimensions are in Inches/mm, Tol. .xx=+/-0.02, .xxx=+/-0.005

Small Outline Drawing - External Reference

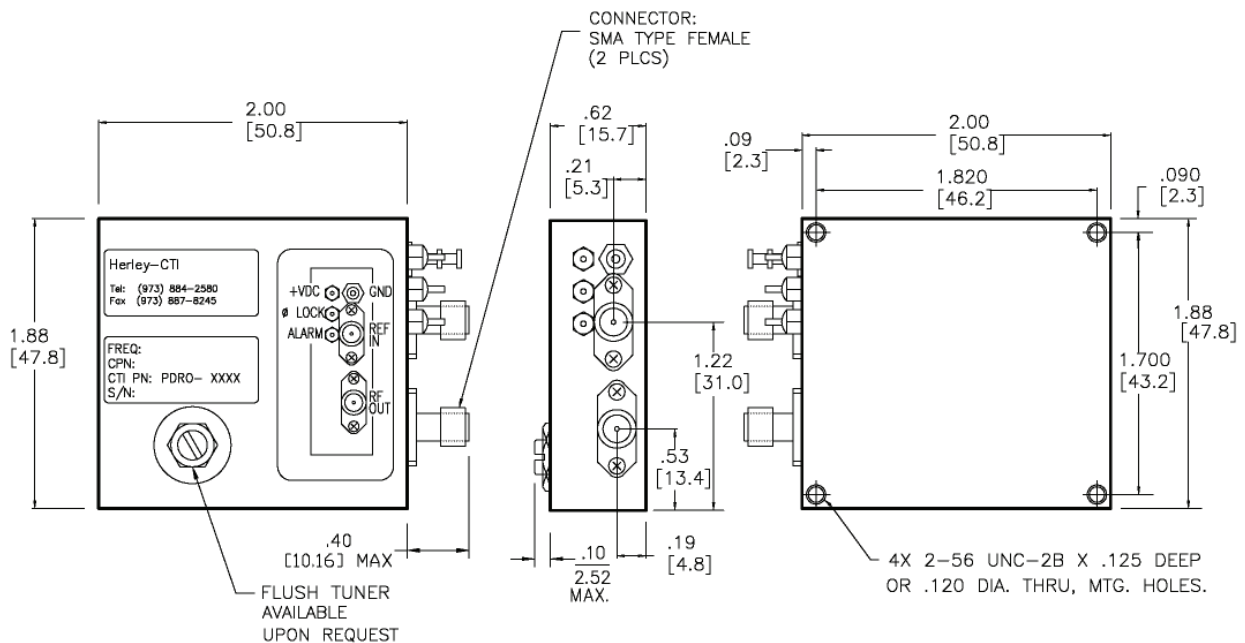
Note: Available for frequencies from 6 GHz to 8 GHz



Dimensions are in Inches/mm, Tol. .xx=+/- .02, .xxx=+/- .005

Miniature Outline Drawing - External Reference

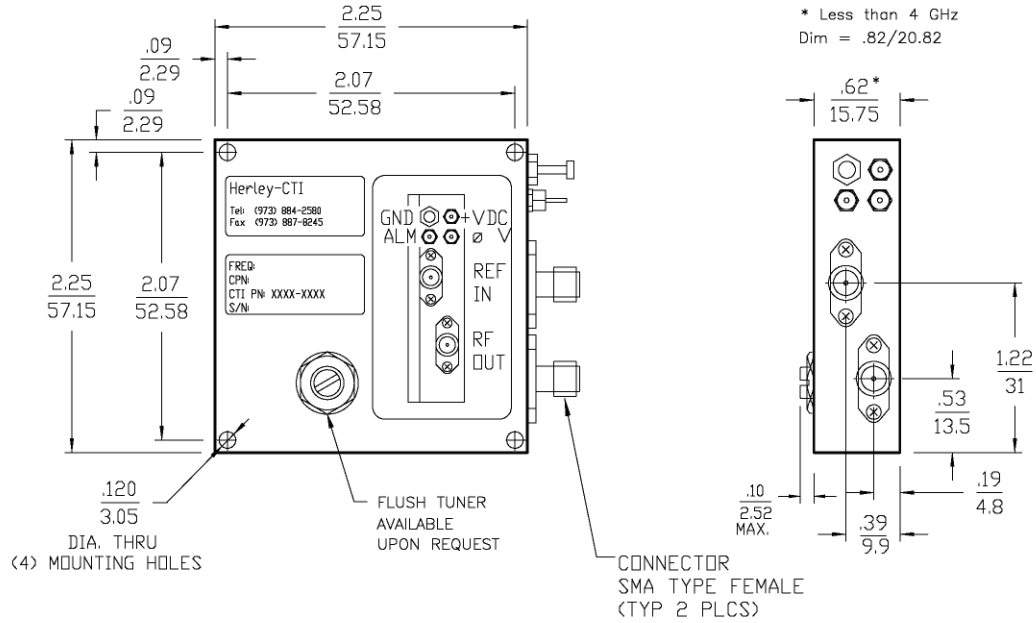
Note: Available for frequencies from 8 GHz to 18 GHz



Dimensions are in Inches/mm, Tol. .xx=+/- .02, .xxx=+/- .005

Dual Loop Outline Drawing - External Reference

- Note: 1. Available for frequencies from 3 GHz to 18 GHz
 2. For frequencies below 4 GHz height will be 0.82 inches / 20.82 mm



Dimensions are in Inches/mm, Tol. .xx=+/-0.02, .xxx=+/-0.005

Outline Drawing for frequencies above 18 GHz to 45 GHz

- Note: Output connector will be 2.92 mm female for frequencies above 26 GHz
 For internal reference models Ref In connector becomes Ref Mon.

