

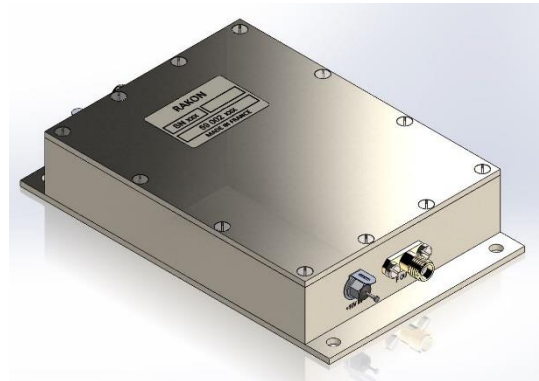
Specific request can be addressed to RAKON hirel@rakon.fr

Product Description

LNO 4800 B3 is a low noise oscillator generating an output signal at 4800 MHz.

It is composed by an OCSO (Oven Controlled SAW Oscillator) at 480 MHz fundamental frequency, followed by a frequency multiplier x10. It can optionally include a PLL to be phase locked on an external 10MHz reference.

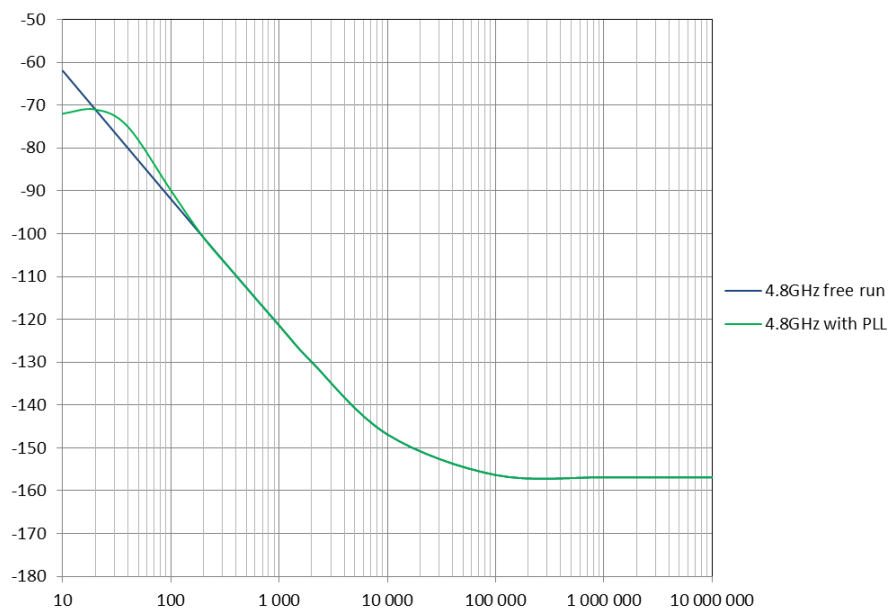
LNO 4800 B3 is designed for routine environment (test equipment, shelter, ground based military equipment ...). It is available in a 120.7mm x 76.2mm x 23.3mm package.



Features

Excellent phase noise performance (typical values) :

- -122 dBc/Hz @ 1 kHz offset
- -147 dBc/Hz @ 10 kHz offset
- -157dBc/Hz noise floor



Applications

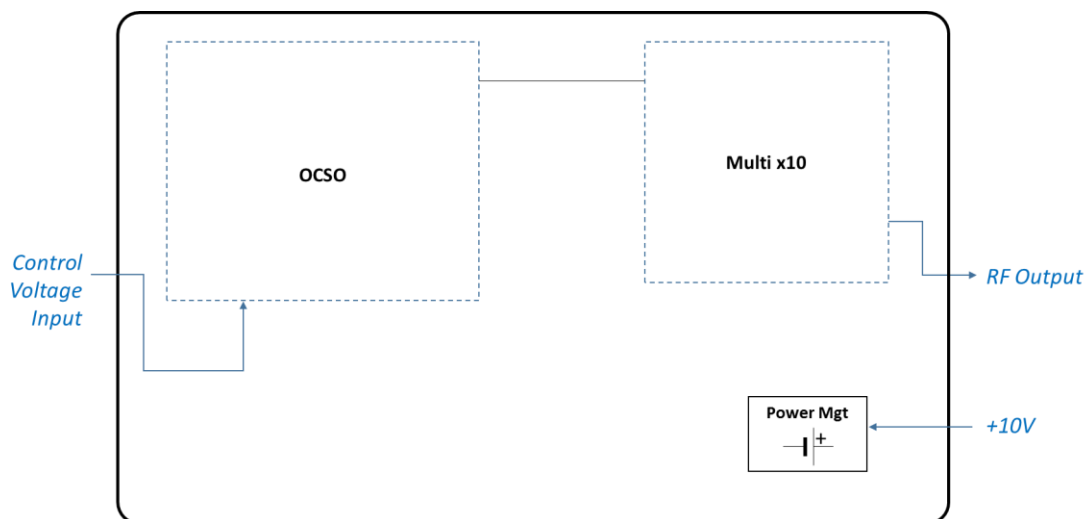
- Instrumentation (test equipment, simulator)
- Ground based military equipment as per MIL-PRF-28800F, Class 3
- Clock for high speed ADC

Technical Description

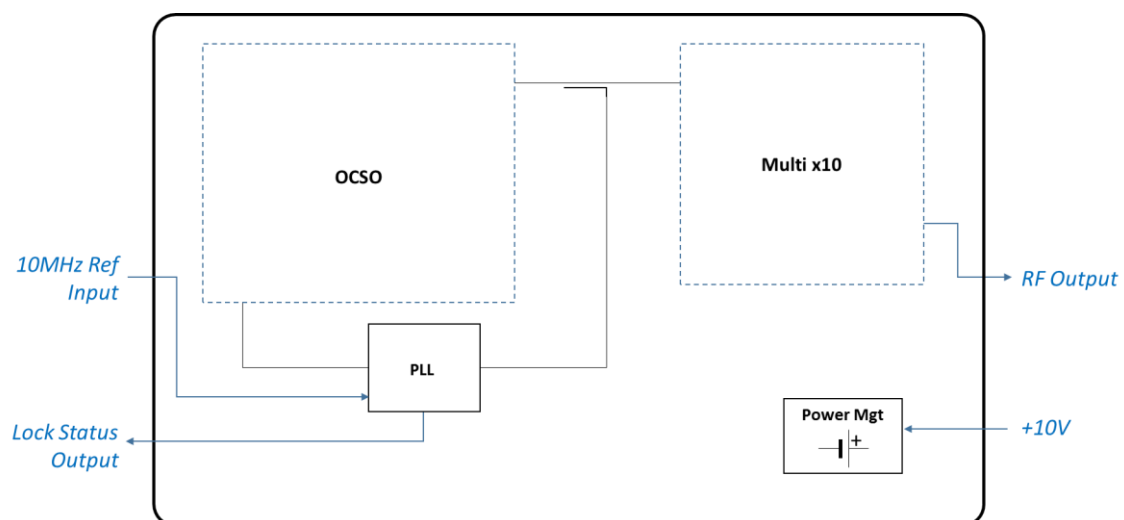
LNO 4800 B3 is available in two different versions :

- Standard version : in this case, it is a VC-OCSO (Voltage Controlled, Oven Controlled SAW Oscillator) that can be used either in free run mode, or controlled by an external DC voltage.
- PLL version : in this case, the unit needs an external 10 MHz reference to operate, and the output signal is phase-locked to this reference.

Standard version block diagram



PLL version block diagram



Specifications

1.0 Environmental conditions

| Line | Parameter | Test Condition | Min | Max | Unit |
|------|-----------------------------|--|-----|-----|------|
| 1.1 | Operating temperature range | | 0 | +50 | °C |
| 1.2 | Storage temperature range | | -40 | +85 | °C |
| 1.3 | Shock | As per MIL-PRF-28800F, Class 3, test equipment | | | |
| 1.4 | Random vibration | As per MIL-PRF-28800F, Class 3, test equipment | | | |

2.0 Electrical interface

| Line | Parameter | Test Condition | Operating Range | Absolute Maximum | Unit |
|-------------------------|---------------------------|--|-----------------|------------------|------|
| 2.1 | Supply voltage | Pin 2 | +10 ± 0.2 | 0 to +15 | VDC |
| 2.2 | Load impedance | Pin 3, 50Ω all phases | < 1.3:1 | - | VSWR |
| Standard version | | | | | |
| 2.3 | Control input voltage | Pin 1 | +2 to +8 | -0.3 to +10 | VDC |
| 2.4 | Control input impedance | Pin 1 | > 10 | - | kΩ |
| PLL version | | | | | |
| 2.5 | Reference input frequency | Pin 1 | 10 ± 0.00001 | - | MHz |
| 2.6 | Reference input level | Pin 1, sine wave, 50 Ω source and load | +5 to +10 | < +12 | dBm |
| 2.7 | Lock status | Pin 4 | Open drain | | |

3.0 Performances

| Line | Parameter | Test Condition | Typ. Value | Guaranteed | Unit |
|-------------------------|------------------------------|--|------------|------------|-------|
| 3.1 | Nominal output frequency | Definition | 4800 | | MHz |
| 3.2 | Output power | Sine wave into 50 Ω load | - | +5 ± 2 | dBm |
| 3.3 | Output impedance | At 4800 MHz | - | < 2.0:1 | VSWR |
| Standard version | | | | | |
| 3.4 | Output frequency calibration | Factory calibration @25°C, no control input (free run) | ±0.2 | < ±0.5 | ppm |
| 3.5 | Output frequency stability | All causes (temperature and load) | - | < ±2 | ppm |
| 3.6 | Long term stability | After 30 days of continuous operation | - | < ±1 | ppm |
| | | 1 st year | - | < ±6 | ppm |
| | | 10 years | - | < ±6 | ppm |
| 3.7 | Frequency tuning | For full control input operating range | ±6 | > ±4 | ppm |
| 3.8 | Tuning slope | Positive | 2 | 1.5 to 3 | ppm/V |

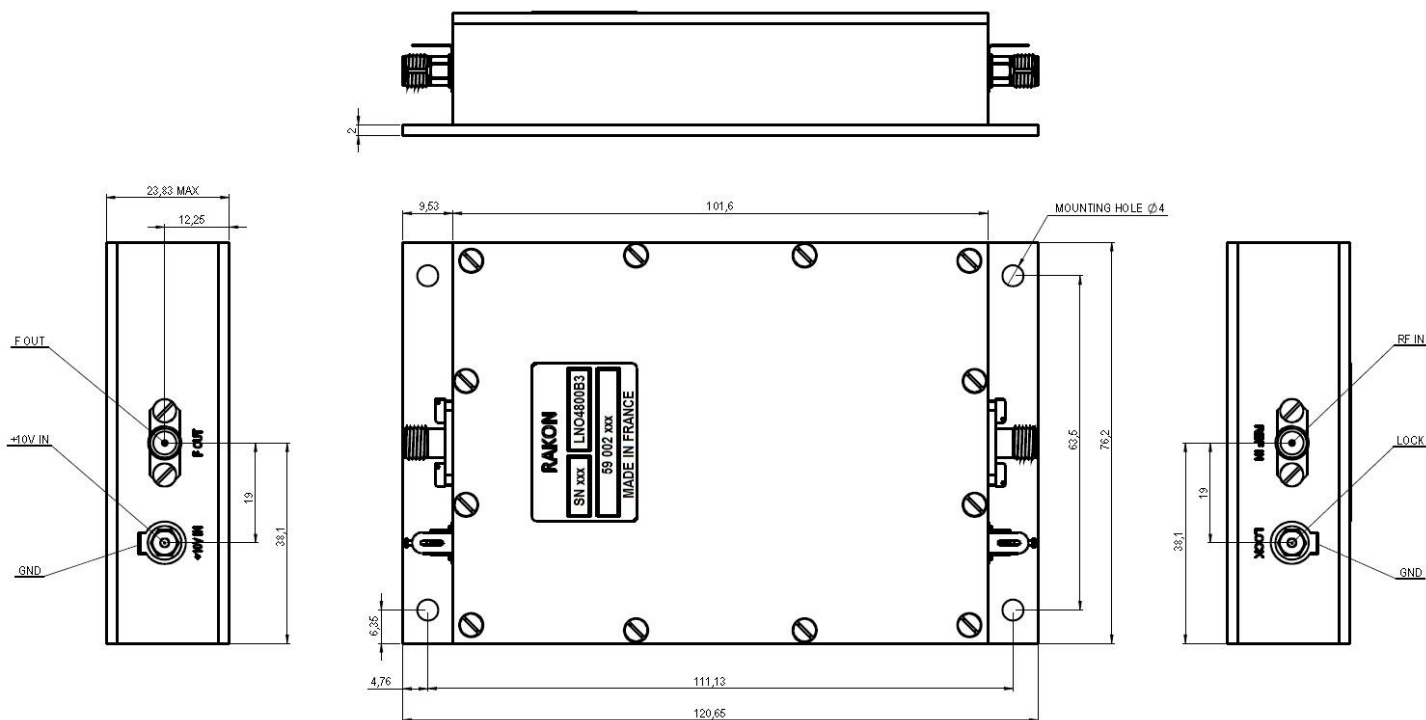
| | | | | | |
|--------------------|--------------------------------|---|-----|-------|---------|
| 3.9 | Steady state power consumption | @25 °C (calm air) | 4.5 | < 6 | W |
| 3.10 | Warm-up power consumption | | 9 | < 9.5 | W |
| 3.11 | Warm-up time | ±1 ppm with reference to frequency reached after 1 hour of continuous operation | - | < 5 | minutes |
| PLL version | | | | | |
| 3.12 | Loop bandwidth | Internal | 40 | < 50 | Hz |
| 3.13 | Steady state power consumption | @25 °C (calm air) | 5 | < 6.5 | W |
| 3.14 | Warm-up power consumption | | 9.5 | < 10 | W |
| 3.15 | Warm-up time | Lock status ON | - | < 2 | minutes |

4.0 Single side band phase noise (PN)

| Line | Parameter | Test Condition | Typ. Value | Guaranteed | Unit |
|------|----------------------------------|---|------------|------------|--------|
| 4.1 | PN power density @ 1 kHz offset | Static conditions, at 25°C (guaranteed values on full temperature range) | -122 | < -119 | dBc/Hz |
| 4.2 | PN power density @ 10 kHz offset | | -147 | < -144 | dBc/Hz |
| 4.3 | PN power density @ 1 MHz offset | | -157 | < -154 | dBc/Hz |
| 4.4 | Harmonic distortion | Sub-harmonics, 2 nd and 3 rd harmonics | -50 | < -40 | dBc |
| 4.5 | Spurious | Other than harmonic distortion | -90 | < -80 | dBc |
| 4.6 | Full offset range jitter | From 10 Hz to 100 MHz | 150 | < 200 | fs |
| 4.7 | Broadband jitter | From 10 kHz to 40 MHz | 5 | < 10 | fs |

5.0 Mechanical features

Outline in mm, nominal values (general tolerances : ± 0.15 mm).



6.0 Pin description

| Line | Name | Type | Description |
|------|---------|-----------|--|
| 6.1 | REF IN | SMA jack | <u>Standard version</u> : DC control voltage input <u>PLL version</u> : 10 MHz reference input |
| 6.2 | F OUT | SMA jack | 4800 MHz output signal |
| 6.3 | +10V IN | Feed-thru | Power supply (+) |
| 6.4 | GND | Lug | Mechanical and electrical ground (-) |
| 6.5 | LOCK | Feed-thru | <u>Standard version</u> : not used <u>PLL version</u> : Lock status Lock OFF -> '0' Lock ON -> 'HiZ', pull-up limited to 3.6V |
| 6.6 | GND | Lug | Mechanical and electrical ground (-) |