

LNMO

ULTRA-HIGH-PERFORMANCE, SPACE-QUALIFIED MASTER CRYSTAL OSCILLATOR



The LNMO is a cost-effective, very high spectral purity master crystal oscillator. It's designed with long- lifetime, high-reliability technology for advanced space applications.

Key Features

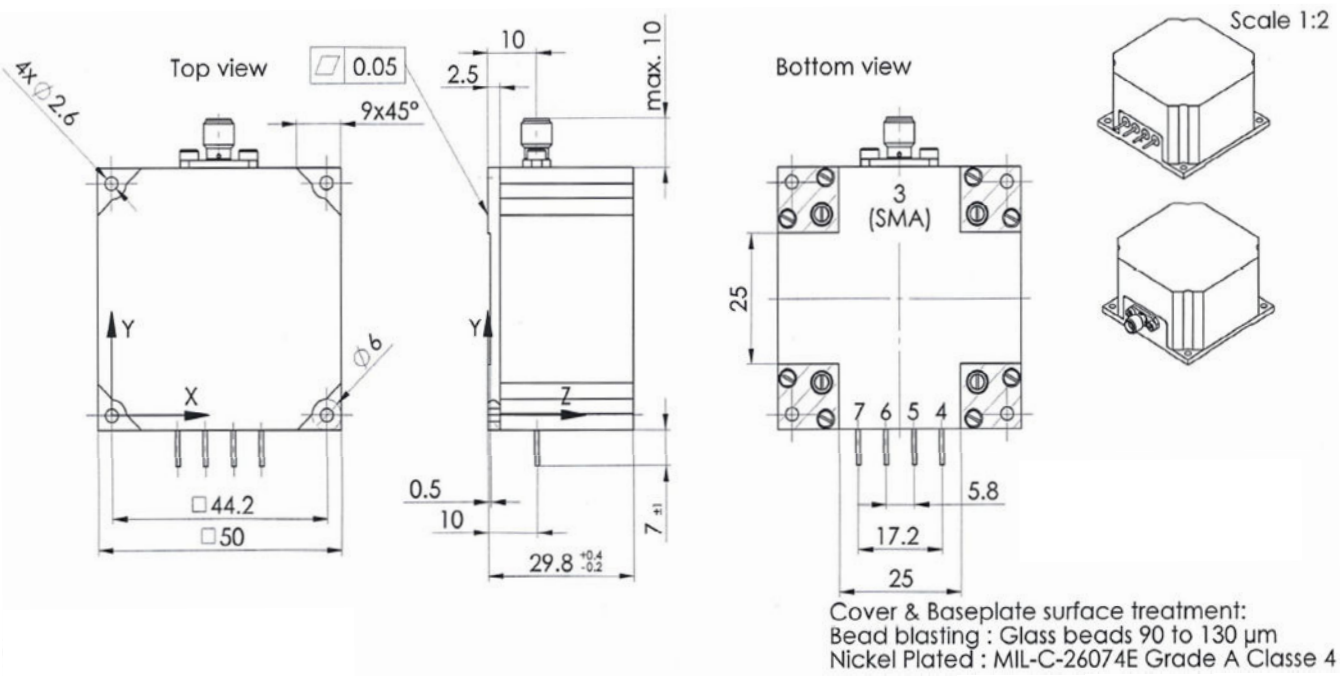
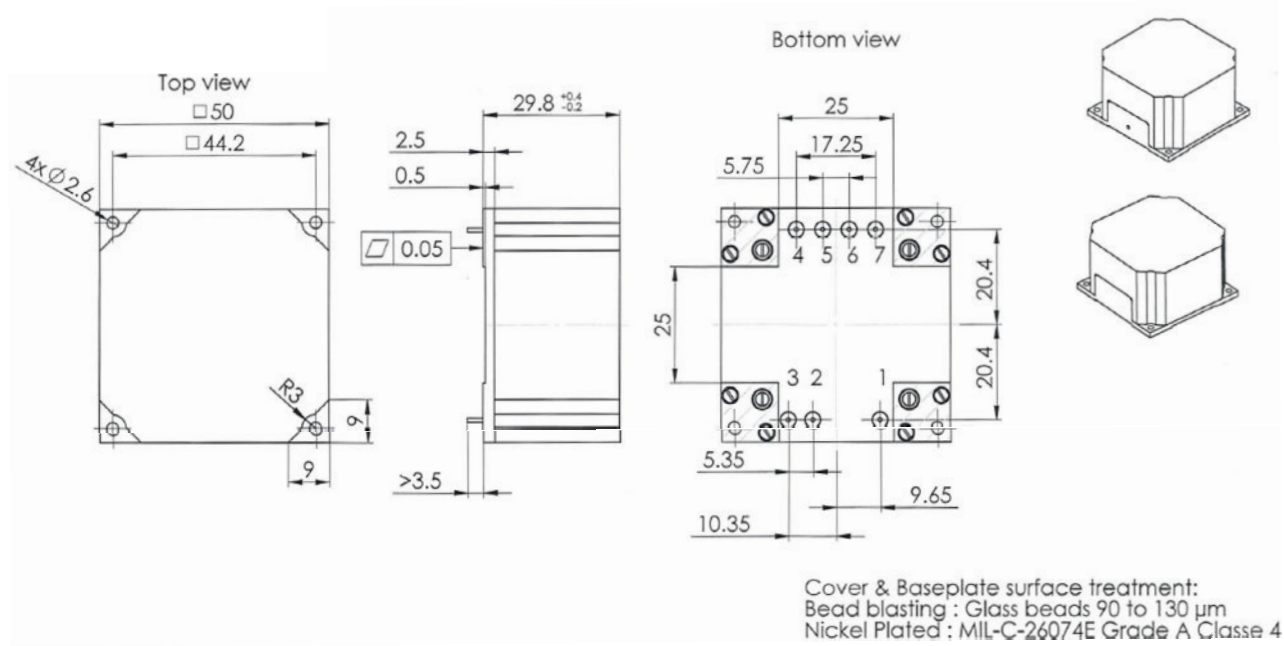
- Very small mass and volume
- Low noise
- Low power consumption
- Low temperature sensitivity
- Excellent short and long term stability
- Fast warm-up
- Wide operating temperature
- Pre-adjusted frequency and/or voltage controlled
- Frequency Range: 5MHz to 40MHz
- Supply voltage: 12V or 15V
- Rad tolerant up to 100krad

Applications

- LEO, MEO, GEO, Deep Space
- Earth Orbit / Altimeter
- SAR
- GNSS
- Telecommunications (civil & defense)
- Science

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LNMO external dimensions (2 versions available)



Technical Specifications

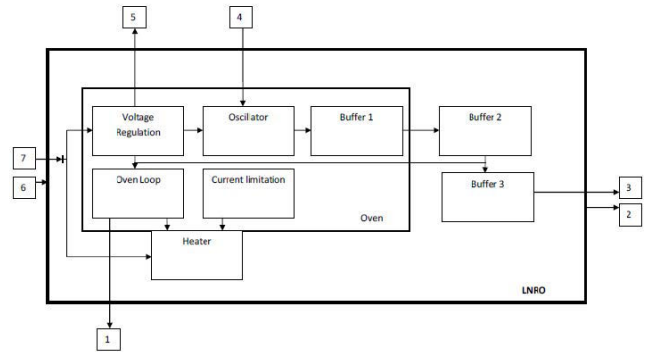
Parameter	Value		
Dimensions	50x50x30 mm		
Output signal frequency	10 MHz*		
Frequency long term stability, 1st year	< ±3x10 ⁻⁸ / year		
Average ageing per day after 1 month	< ±1x10 ⁻¹⁰ / day		
Frequency long term stability, years after	< ±1x10 ⁻⁸ / year		
Frequency short term stability	< 1x10 ⁻¹² (0.1-10 s)		
Frequency stability over full temp. range	< ± 1x10 ⁻⁹		
Pressure sensitivity vacuum to atmosphere (thermal effect)	< ±5 x 10 ⁻⁸ @25°C		
Frequency adjustment	> ± 2.5 Hz		
SSB phase noise @10MHz [dBc/Hz]	ULN	LN	Standard
1 Hz	< -107	< -105	< -100
10 Hz	< -140*	< -135*	< -130*
100 Hz	< -150*	< -145	< -140
1000 Hz	< -160	< -155	< -150
10000 Hz	< -165	< -163	< -160
	* Subject to export control (end user statement required)		
Output signal level	7 dBm ± 1 Up to 10 dBm on request		
Output impedance	50 Ω ± 10%		
Harmonics	-40 dBc		
Spurious signals	-120 dBc		
Power consumption during warm-up	Standard 4W	Fast 6W	
Nominal power consumption	1.5 W		
Maximum power consumption in operation	2.5 W		
Volume	< 75 cm³		
Power supply	12 V	15V	
Warm-up time	Standard	Fast	
(accuracy < ±2x10 ⁻⁸ at 25°C)	10 minutes	5 minutes	
Mass	100 gr		
Connection: Power, RF Output, Control voltage, Ref Voltage, TM	7 solderable pins or 5 solderable pins +SMA		
Mechanical interface Mechanical fixation	flat base plate 4 x M2 screw		
Max. base plate operating temperature	70 °C	60°C	50°C
Min. base plate operating temperature	-30°C	-20°C	0°C
Storage temperature	-40 to 85 °C		
First natural resonance	> 800 Hz		
Random Vibration tested, with axis perpendicular to the mounting plane.	20 - 100 Hz 100- 500 Hz 500- 2000 Hz	+9dB/oct 1 (1.5) g²/Hz** -6 dB/oct	
Duration	60 (180) sec/axis**		
Sinusoidal vibration	5 - 20 Hz 20 - 100 Hz	11 mm 0-peak 25 g	
Sweep rate	2(1) oct/min.**		
Life time / MTBF	15 years/9 Mio hrs		
Shock	100Hz 270Hz 2000Hz 10000Hz	50g 350g 2500g 2500g	

* Other frequencies (5 MHz to 15 MHz) and related specifications available upon request.

** Values in brackets only applicable for qualification testing

*** Screw length not to exceed 5 mm length within case

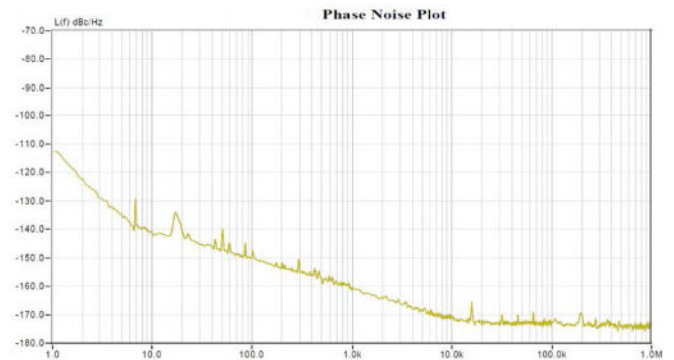
FUNCTIONAL BLOCK DIAGRAM OF THE LNMO



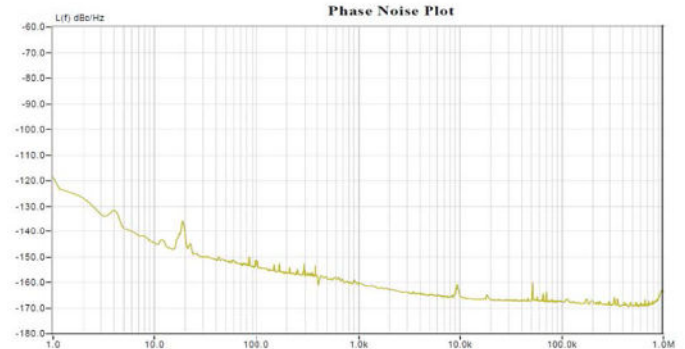
1. Optional telemetry output
2. RF GND output
3. RF output
4. Control voltage input
5. Voltage reference output
6. Supply GND input
7. Supply Voltage input

Typical LNMO Phase Noise

LNMO Phase noise at 10MHz



LNMO Phase noise at 5 MHz



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