



Orbital 4400X Series X-Band Ext Ref LNB



4400X Series, X-Band Ext Ref LNB with Universal 12-hole gasket input isolator.

MIL Spec MIL-STD-188-164A, 45 dB internal filter

How to order an Orbital 4400X Series X-Band External Reference LNB

Frequencies (GHz):

| LO | Input | Output | Bandwidth |
|-------|----------------|-------------|-----------|
| 6.30S | - 7.25 to 7.75 | .95 to 1.45 | 0.500 |

Bandwidth in MHz

'X' Signifies External Reference

Input Connector
X LNB is WR-112

LNB630S-500X-WN60-G12

Output Connector

F - F, 75 ohm
N - N, 50 ohm
S - SMA, 50 ohm
T - TNC, 50 ohm

Gain

40 - 40 dB
50 - 50 dB
55 - 55 dB
60 - 60 dB

Input Isolator

G12 - Isolator, 12 hole gasketed flange

Orbital Features:

The newly designed Orbital X-Band External Reference LNB comes with an attached input Isolator.

Orbital has standardized on a "Universal" type WR-112 rectangular gasket flange with 12-holes instead of 8. This "Universal" flange can interface to either type of flat flange: 4-hole or 8-hole.

Options include Military Mobile Vibration Mil-Std 810F Chapter 514.5C-1.

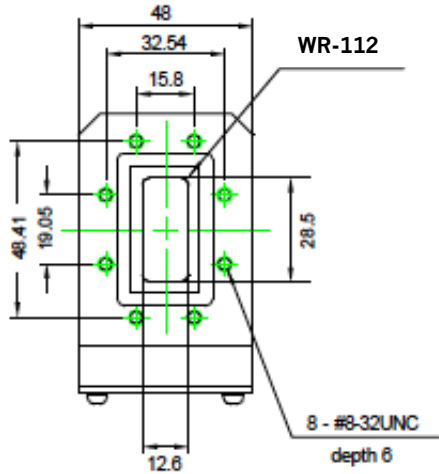
Orbital Specs:

- Image Rejection >60 dB
- P1 dB >15 dBm
- IP3 >25 dBm
- Internal Transmit Rejection >45 dB
- Noise Figure <0.7 dB
- Optional Mil-Std 188-164A for vibrate and shock
- RoHS & REACH compliant

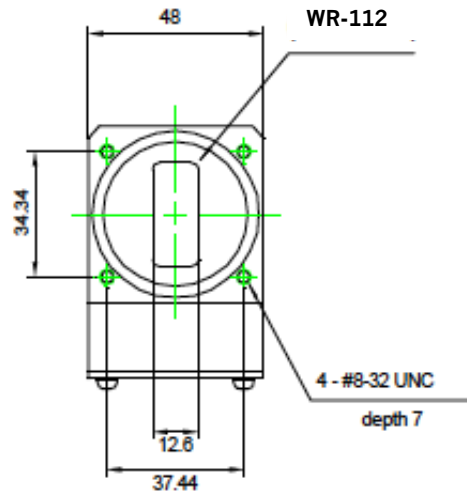
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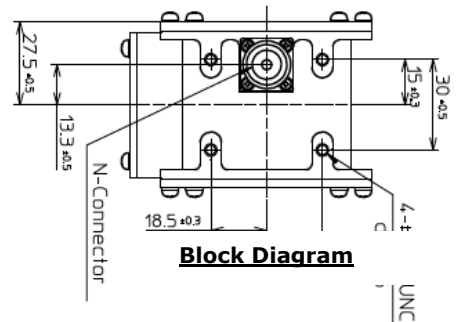
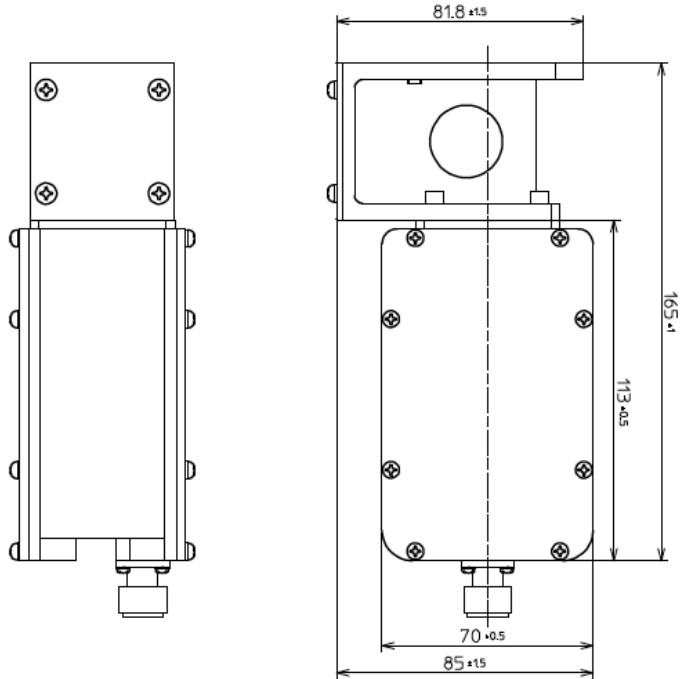
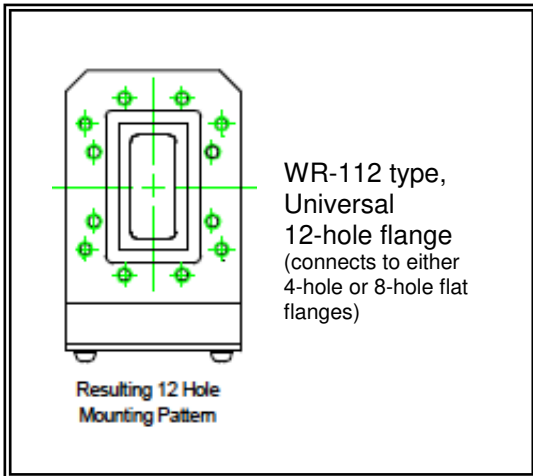
Orbital 4400X Series X-Band Ext Ref LNB Specs



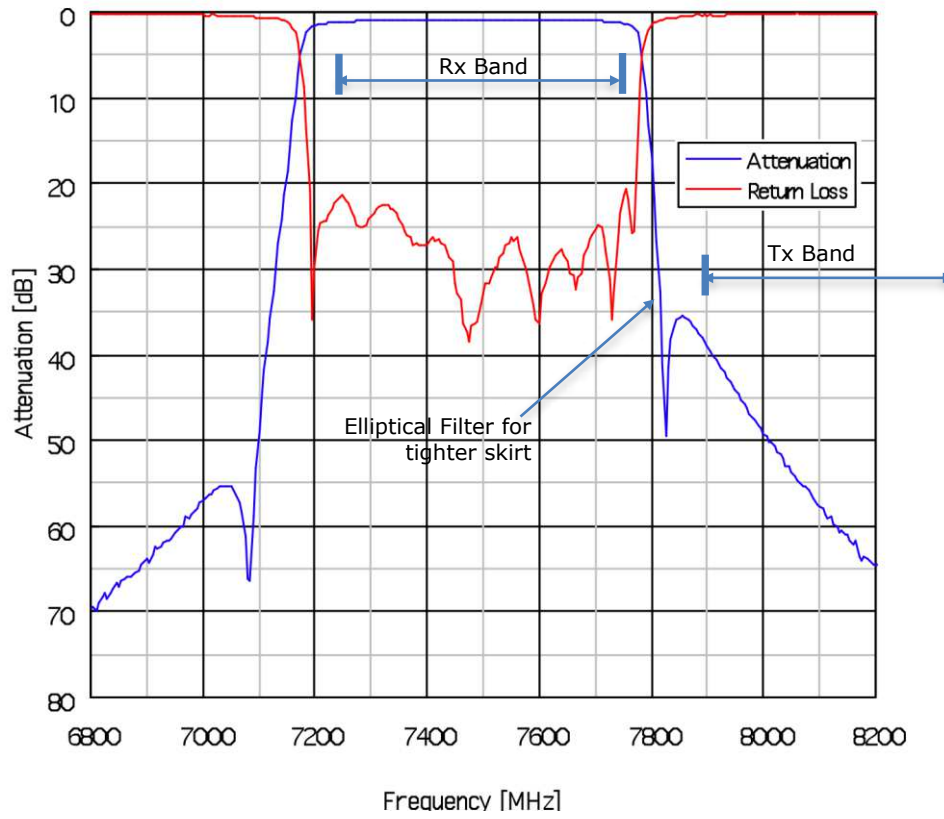
Standard 8 hole flange



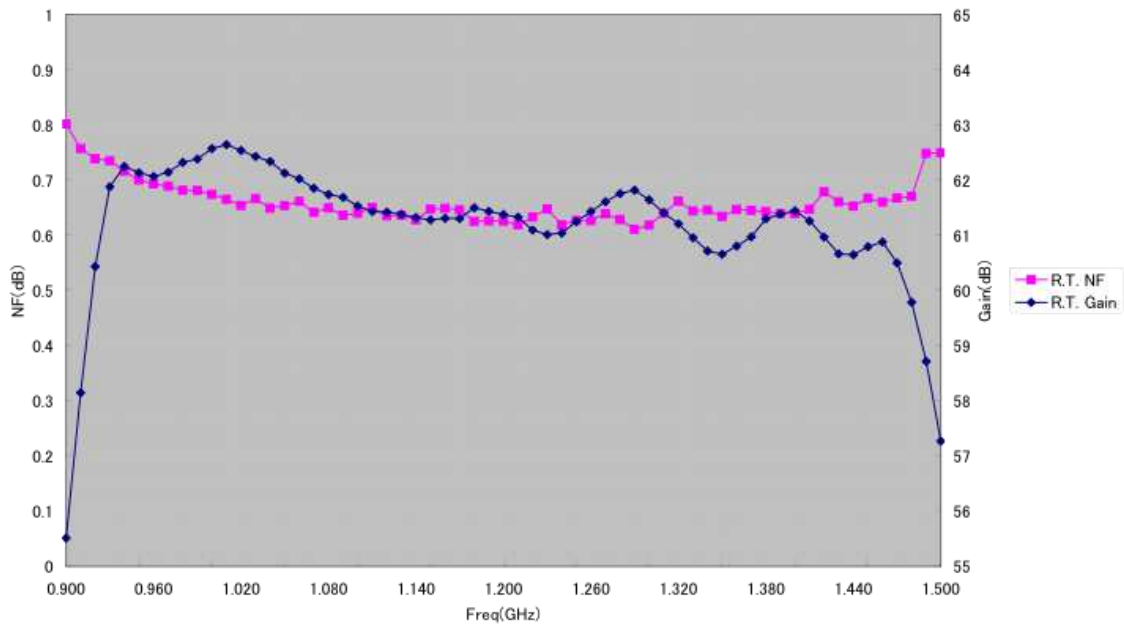
Standard 4 hole flange



| Item | 4400X Series X-Band LNB with Isolator |
|--------|---------------------------------------|
| Size | (L) 165mm x (W) 85mm x (H) 55mm |
| Weight | Approx. 800 g |
| NF | 0.7 dB max. @+23C |
| VSWR | 1.3 : 1 |



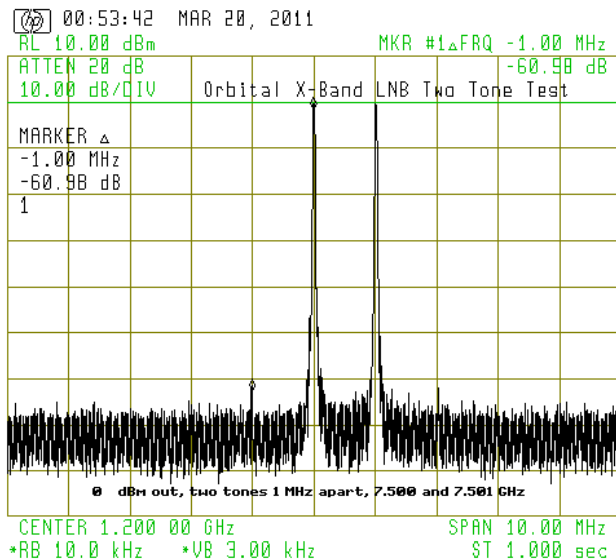
Internal Filter Frequency Response



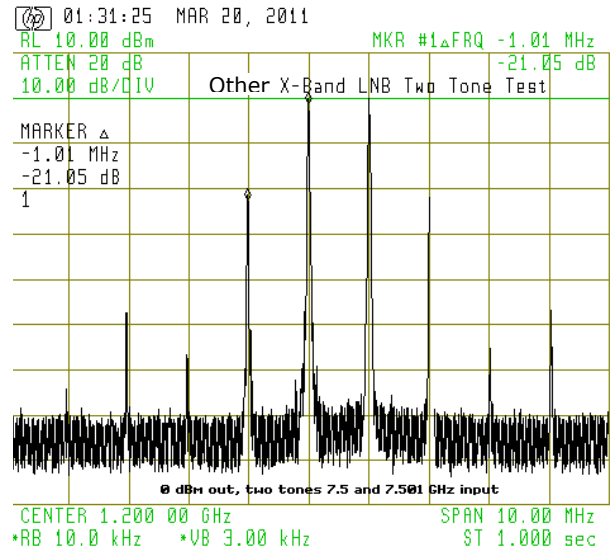
Noise Figure and Gain

Two Tone Test

What it means - The two plots below compare gain linearity for the Orbital design with competitor designs. Two tones at 7.500 GHz and 7.501 GHz are injected into the LNBS to provide 0 dBm out. The first spur in the Orbital design is over -60 dBc down compared to the multiple spurs on the competitive LNB starting at only -20 dB down. Intermodulation (IM) distortion for a given output is reduced in the Orbital LNB while providing higher overall gain, 60 dB minimum for the Orbital LNB.



Orbital LNB



Competitor LNB

How it works - The LNB has to amplify the multiple signals from the satellite by a factor of a million (60 dB) without adding significant noise (noise figure), but also to perform this conversion without adding distortion. The above graphs represent the comparative levels of distortion between the Orbital design and competitive designs. Basically, if you put two signals into the LNB, you should get two signals, and only two signals, out. You can imagine the mess using a poor quality LNB when you amplify and convert the dozens or even hundreds of signals from the satellite.

What it shows - While an LNB would never be operated at 0 dBm output level, the test and design represent the linear conversion quality of each LNB and the P1 dB compression point. The Two Tone tests are proxies for the quality of conversion that is absolutely necessary for low bit error rate satellite transmissions. LNB non-linearity starts at much lower levels than 0 dBm output, and the 2 tone test is the best method of comparing the quality of design and manufacture of LNBS. The ultimate benefit to the end user is lower noise figure, higher conversion gain, and most importantly, lower bit error rate for their digital transmissions.

ELECTRICAL SPECIFICATIONS

| Item | Spec (with Isolator) | |
|--|---|--|
| RF Input Frequency | 7.25 to 7.75GHz | |
| IF Output Frequency | 950 to 1450MHz | |
| Local Frequency | 6.3GHz | |
| Local Frequency Stability | Phase locked to external 10MHz reference | |
| 10MHz Reference | Insertion | Multiplexed onto the IF coaxial connector |
| | Input Level | -5 to +5dBm |
| | Phase Noise | -135dBc/Hz max. @100Hz -148dBc/Hz max. @1KHz -152dBc/Hz max. @10KHz -155dBc/Hz max. @100KHz |
| LO Phase Noise | -65dBc/Hz max. @100Hz -75dBc/Hz max. @1KHz -85dBc/Hz max. @10KHz -95dBc/Hz max. @100KHz -105dBc/Hz max. @1MHz | |
| LO Leakage | Virtually eliminated | |
| Noise Figure | 0.7dB typ. @+23°C | |
| Gain | 62dB±4dB over temperature and frequency | |
| Gain Flatness | ±2.0dB max over frequency | |
| Gain Stability | ±1.0dB max over a 24hr period, at +25°C | |
| Input VSWR | 1.3:1 max. | |
| Output VSWR | 2.0:1 max. | |
| Attenuation (in Tx band, 7.9 to 8.4 GHz) | 45 dB | |
| Image Rejection | -60dBc max. | |
| P1dB Compression point | +15dBm min. | |
| Signal Independent Spurious | -60dBm max. @Rx-band | |
| Signal Related Spurious | -65dBc max. @0dBm output, Rx-band | |
| Desense level | -20dBm, 7.9-8.4GHz at no more than 0.1dB of noise figure degradation | |
| Overdrive | -20dBm @Non-damaging | |
| Input DC Power | +15 to +24VDC, 410mA Multiplexed on a single coaxial connector with the IF and 10MHz reference signal. | |
| Input Interface | WR-112 waveguide, 12-hole flange | |
| Output Interface | 50Ω, N-type female coaxial connector | |

MECHANICAL SPECIFICATIONS

| | |
|--------|--|
| Size | (L) 165mm x (W) 85mm x (H) 55mm 6.5 x 3.4 x 2.2 inches |
| Weight | approx. 800g 1.8 lbs |
| Color | White Munsell N9.5 semigloss standard. Optional colors include: MIL-STD-595-33303, 33446, 34094. Other colors available |

ENVIRONMENTAL SPECIFICATIONS

| | |
|------------------------------------|--|
| Operating Temperature | -40°C to +60°C |
| Operating Altitude | 10,000 ft ASL |
| Operating Relative Humidity | 100%, condensing |
| Non-operating Temperature | -50°C to +70°C |
| F Shock | 20g, 11ms, half sine |
| Vibration | MIL-STD-810E, method 514-4 |
| MTBF | >125,000 hours |
| Optional Military Mobile Vibration | Mil-Spec 810F chapter 514.5C-1, & temp range of -30 to +70°C |
| Compliances | RoHS & REACH |

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