

K-Band LNB

TSA-211109

INTRODUCTION

This LNB is a standard unit designed to meet requirements for a Ka-band low noise block-converter (LNB) with a typical noise figure of 1.5dB at room temperature. Its input is in the band 20.2 to 21.2 GHz range. The block-converter translates the signal to L-band in the 1-2 GHz range.

The input signal enters the unit through the WR-42 waveguide port. The first major element is an ultra-low-noise amplifier. The low noise amplifier is designed with extreme care, so as to present the minimum noise figure at the specified frequency. In addition, the design of the low noise amplifier is such to guarantee stability and the best input match. Finally, a special design assures that added insertion losses for the waveguide transition are minimized by selecting the proper materials and configuration so as to keep noise figure at a minimum. After the low noise amplifier, a filter inserted before the mixer is used to reject image frequencies and also improve rejection of LO leakage towards the input RF port. IF amplification and an adjustable attenuation bring the signal to appropriate level to achieve the nominal gain requirement. The signal exits the unit through the coaxial connector.

The SMA connector also provides DC input to the unit, as well as, a 10 MHz reference signal input, which is used in the local oscillator phase locked loop.

Phase noise performance of the units is $-62 \text{ dBc} / \text{Hz} @ 100 \text{ Hz}$ Offset at 19.2 GHz.



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SPECIFICATION

Parameter Description	Conditions	Value	Parameter Description	Conditions	Value
Input Freq. Range	Downstream	20.200 to 21.200 GHz	Reference Clock Input Level	25C	0+/-3dBm
Input Power	1.5:1 Source VSWR	-90 to -25dBm	Reference Clock Waveform	50 Ohm load	Sinusoidal
Maximum Input Power	Downstream	10dBm	Reference Clock Phase Noise	10Hz Offset	-120dBc/Hz
Input Instantaneous Bandwidth	Downstream	250MHz max.		100Hz Offset	-145dBc/Hz
Output Frequency Range	Fixed LO, Low side	1.5+/-0.5 GHz		1KHz Offset	-165dBc/Hz
Output Power, OP1dB	1.5:1 Load VSWR	13 dBm min.	Input Voltage	Multiplexed on RF Input Coax	+12 to +15 VDC
Conversion Gain	Step Attn selectable	40, 50 or 60 dB	Input Current	Steady State	400mA max.
Spectrum Inversion	Receive	None	Output Connector	MIL-PRF-39012	SMA-F
VSWR Input	N/A	1.5:1	Input Interface	Waveguide Facing Mounting Surface	WR42
VSWR Output	N/A	1.7:1	Size	Excluding connectors	5.0"x2.5"x0.90" (lxwxh)
Noise Figure	+60 C	1.9 dB max.	Weight	Aluminum Chassis, 6061-T6	1.0 lbs max.
Gain Variation	Over any 120MHz IF bandwidth	2.0dBp-p	Finish	Body	Electroless Nickel
Gain Variation with Temperature	-30 to +60C	+/-2.0dB		Mounting Surface	Chem. Film
OIP3	Linear gain, -5dBm output	20dBm		Waveguide Flange surface	Chem. Film
Group Delay	25C	1nS	Operating Temperature	Consistent with iConnex e850mp	-30 to +60C
In-Band Spurious @ IF port	</=2.1GHz, >/=1.1GHz, -5dBm OUT	-50dBc min.	Altitude	Operational (eg. e850mp)	10,000 feet
Out of Band Spurious @ IF port	</=1.1GHz, >/=2.1GHz, -5dBm OUT	-65dBc min.		Non-operational (eg. e850mp)	30,000 feet
LO Leakage @ RF port	19.2GHz	-70 dBm max.	Relative Humidity	Non-condensing (eg. e850mp)	92% max.
LO Frequency	Fixed LO, Low side	19.200 GHz	Shock	Mil-STD-810E	10g, 11ms Half Sine
Phase Noise	10Hz Offset	-32dBc/Hz			
	100Hz Offset	-62dBc/Hz			
	1KHz Offset	-72dBc/Hz			
	10KHz Offset	-82dBc/Hz			
	100KHz Offset	-92dBc/Hz			
	1MHz Offset	-102dBc/Hz			
	10MHz Offset	-112dBc/Hz			
Reference Clock Input Freq.	Multiplexed on RF Output Coax	10.00000 MHz			