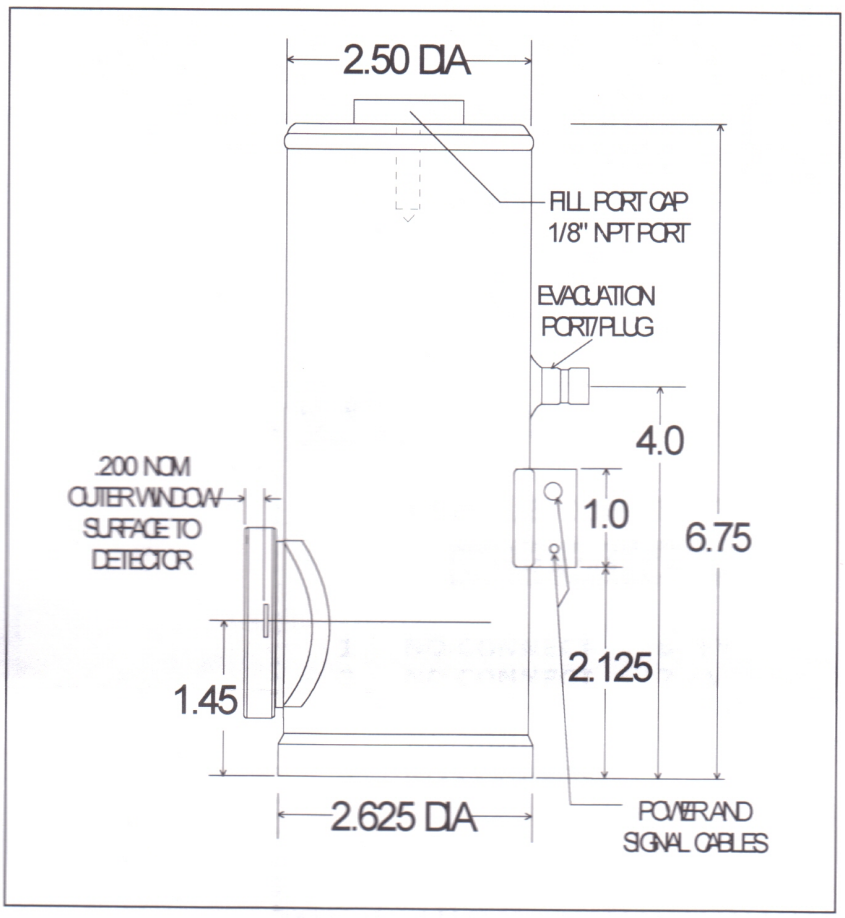
Receiver Modules

IS SERIES CRYOGENIC PHOTODIODE/AMPLIFIER



Part No:
IS-010-E-LN6N
s/n 021509

Application Note

This unit is a high performance cryogenically operated InSb photodiode/amplifier designed for low frequency DC or chopped measurements. The output voltage is proportional to radiation incident on the active area as follows:

$$V_{out} = P_{sig} \times R_f \times R_f$$

where P_{sig} is incident power in watts, R_f is the photodiode responsivity in A/W at the wavelength of interest, and R_f is the amplifier transimpedence gain. This is DC coupled with high gain and extensive care should be taken in shielding the unit from any ambient light during operation. Exposure to room lights may cause amplifier saturation and can lead to failure of the unit

SPECIFICATIONS	
Active Area	1 mm diameter
Spectral Range	1.0 – 5.5 um
Shunt Resistance	3.0 MΩ @ 77K
Shunt Capacitance	500 pF
Photodiode Voc	104mV
Photodiode Isc	7.0uA
Output Offset Voltage	1.4 / 0.14 VDC
NEP / D* @ 77K	5.5×10^{-13} W/Hz$^{1/2}$ / 1.6×10^{11} cm-Hz$^{1/2}$/W
Responsivity @ 5.3 μm	4.3×10^5 / 10^4 V/W @ amp out
Dewar Hold Time	12 hours minimum with liquid N_2
Field of View	60° nominal

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IS SERIES CRYOGENIC PHOTODIODE/AMPLIFIER

Amplifier	**Dual-Gain Transimpedance**
Bandwidth	**DC – 50k Hz**
Connections	**BNC signal coaxial cable with 3 lead shielded power cable.** **Red = +V, Black = -V, White/Shield = ground** ***Note:*** **A DB9 connector is provided on units purchased with optional PS-1 Low Noise Power Supply**

Part No: **LN Series**

(FEMALE CONNECTOR)

DB-9 PIN OUT

1	NO CONNECT	6	+V
2	NO CONNECT	7	-V
3	NO CONNECT	8	GND
4	NO CONNECT	9	CASE GND
5	NO CONNECT		

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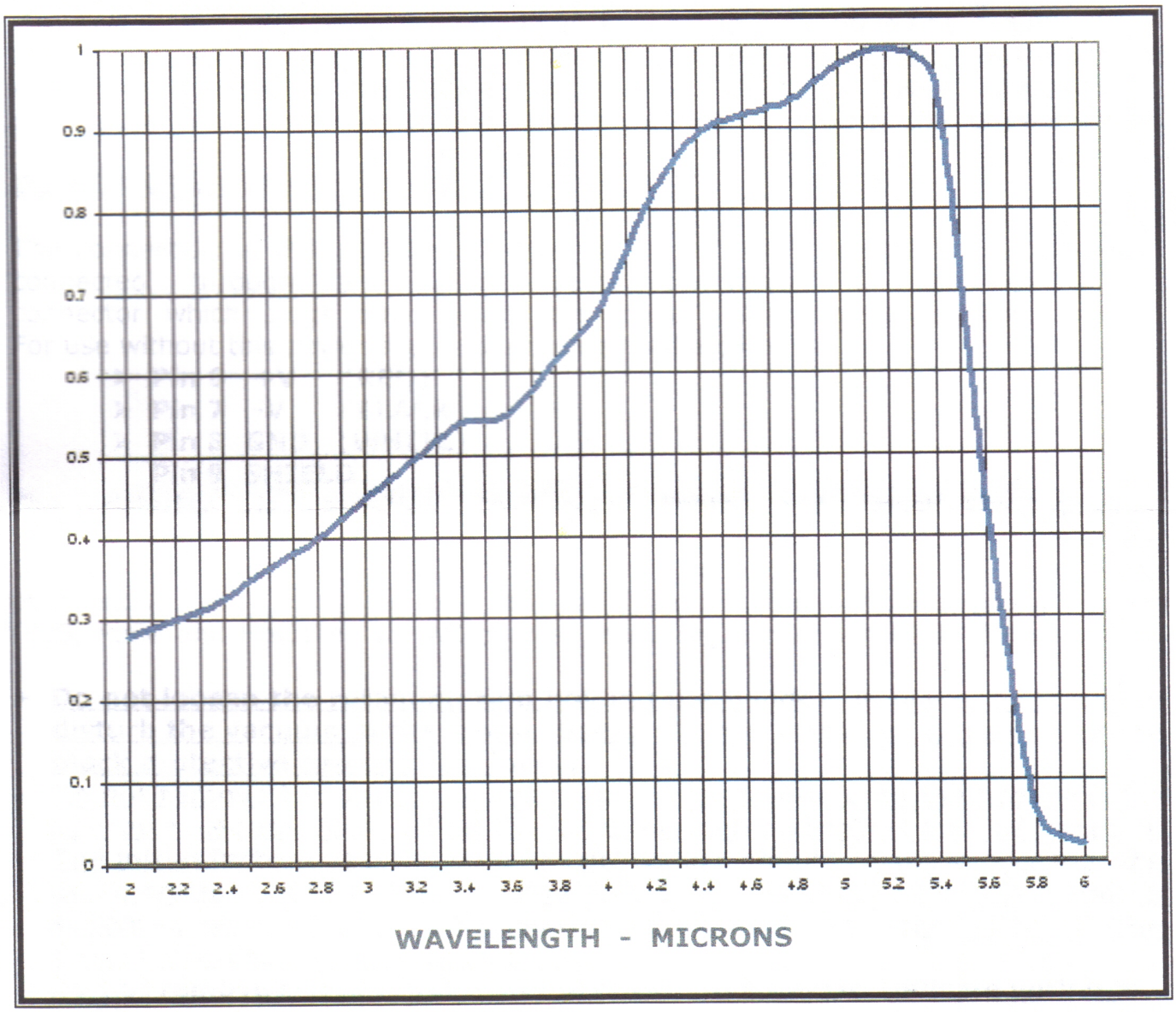
InSb Relative Spectral Response



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L - Series Operating Instructions

This unit is a high performance liquid-nitrogen cooled IR detector / amplifier assembly. Please read these instructions carefully prior to operation.

CAUTION!

Carefully fill the metal dewar with liquid nitrogen using the included fill funnel. Filling too quickly causes the coolant to spurt out the fill port as a geyser. This results in significant cooling of the dewar body from the LN2 vapor. Instead, fill the dewar slowly over a several minute interval to reduce the geyser effect.

DO NOT APPLY POWER WITHOUT THE DETECTOR AT 77K.

The connection to the amplifier's signal output is through a BNC cable. Power is connected through a shielded cable terminated in a 9-pin Dsub connector which plugs directly into the Model PS–1 low noise power supply. For use without this power supply the coding on the cable is:

- **Pin 6 +V (RED)**
- **Pin 7 -V (BLACK)**
- **Pin 8 GND (WHITE)**
- **Pin 9 SHIELD**

The detector is sensitive to room lights and must be shielded anytime the power is on. The photodiode series (silicon, germanium, InGaAs, InAs and InSb) are DC coupled and output saturation can cause overheating and damage to the amplifier. The photoconductor series (PbS, PbSe and HgCdTe) are AC coupled, requiring a chopped beam for operation.

- **Do not loosen the retaining ring holding the window in place, as this may disturb the vacuum in the dewar. Use caution in installing or removing the black protective cap on the window.**
- **Do not remove the vacuum valve plug. Only repump with the proper valve operator, Model VO-1, after the unit has demonstrated loss of vacuum. The initial factory vacuum bakeout procedure should result in >12 months of operation before the repump is needed. Thereafter the repump schedule will depend on the system set-up by the user. Consult the factory for details and suggestions.**
- **Do not remove the backplate on the back of the dewar. Delicate wiring is inside.**

NO USER SERVICEABLE PARTS ARE LOCATED INSIDE THE DEWAR.

OPENING THESE SPACES WILL VOID THE WARRANTY.

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