



Delivery report CRFL-0408GHz-Receiver

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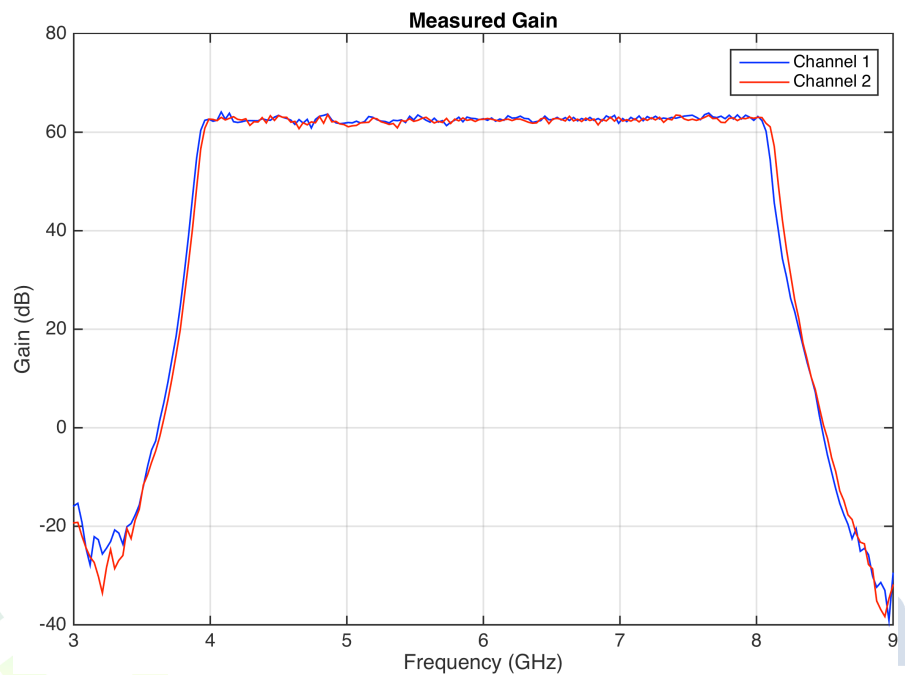
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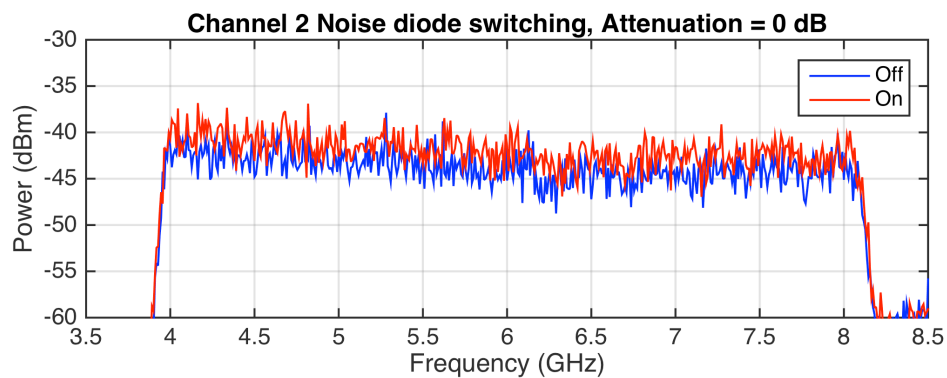
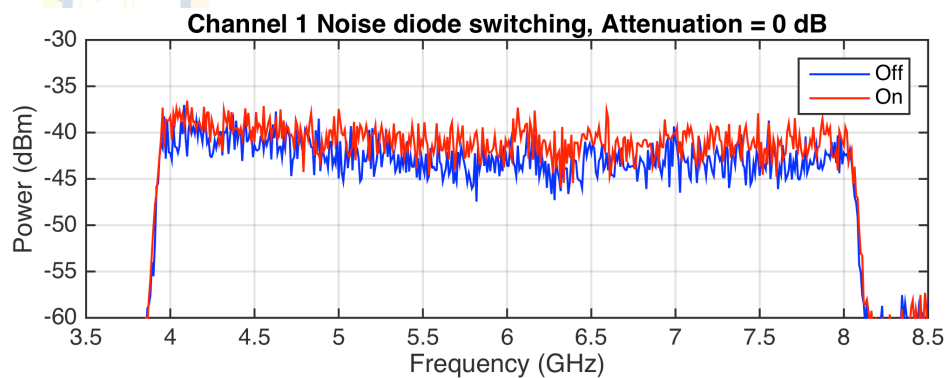
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1. Measurement

1.1. Gain



1.2. Noise diode switching

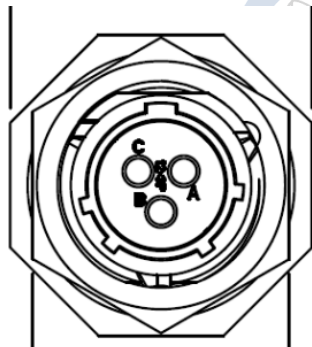


2. Interfaces

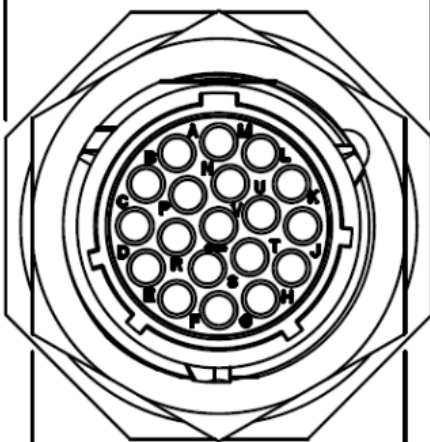
2.1. RF


Position	Connector Type	Orientation
RF input (2X)	N-Type	Female
RF input (2X)	N-Type	Female

2.2. Power

Connector Type	Orientation	Part Number/Pinout	Wire Color
3- pole Circular Panel mount	Male	Amphenol: RT0712-3PNH	
	Pin A	Line	Black
	Pin B	Ground	Yellow/Green
	Pin C	Neutral	Blue
Mains Power Interface	230 VAC @50 Hz Fast blow fuse at 2A (5x20 mm)		
Connector details: http://www.amphenol-sine.com/pdf/datasheet/RT07123PNH-K.pdf			

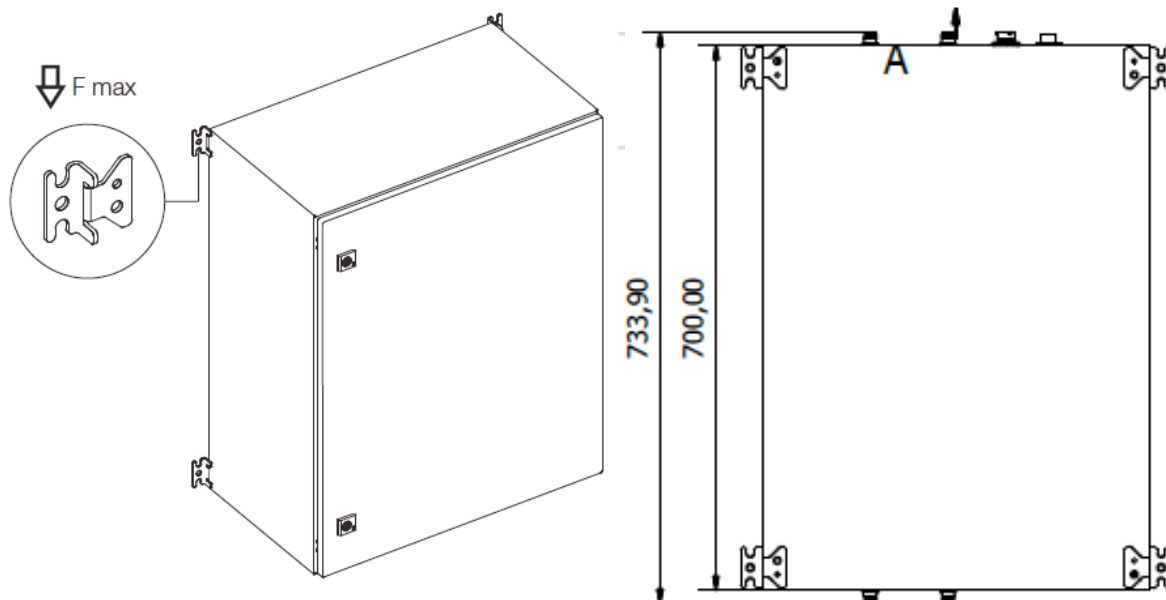
2.3. Data

Connector Type	Orientation	Part Number/Pinout	Wire Color
19- pole Circular Panel mount	Female	Amphenol: RT0716-19SNHK	
	Pin A	Noise diode Temp Sensor (-)	Black
	Pin B	Noise diode Temp Sensor (+)	Red
	Pin C	Base plate Temp Sensor (-)	White
	Pin D	Base plate Temp Sensor (+)	Red
	Pin E	POL 0 LNA: ID_Mon	Green
	Pin F	POL 0 LNA: VD_Mon	Blue
	Pin G	POL 1 LNA: ID_Mon	White
	Pin H	POL 1 LNA: VD_Mon	Brown
	Pin J	Ground	Black

	Pin K	Noise Diode TTL Control (+)	Yellow
	Pin L	Noise Diode TTL Control (-)	Black
	Pin M	Spare wire Twisted pair	Yellow
	Pin N		Red
	Pin P	Spare wire Twisted pair	Blue
	Pin R		Green
	Pin S	Spare wire Twisted pair	Brown
	Pin T		Black
	Pin U	Spare wire Twisted pair	White
	Pin V		Violet

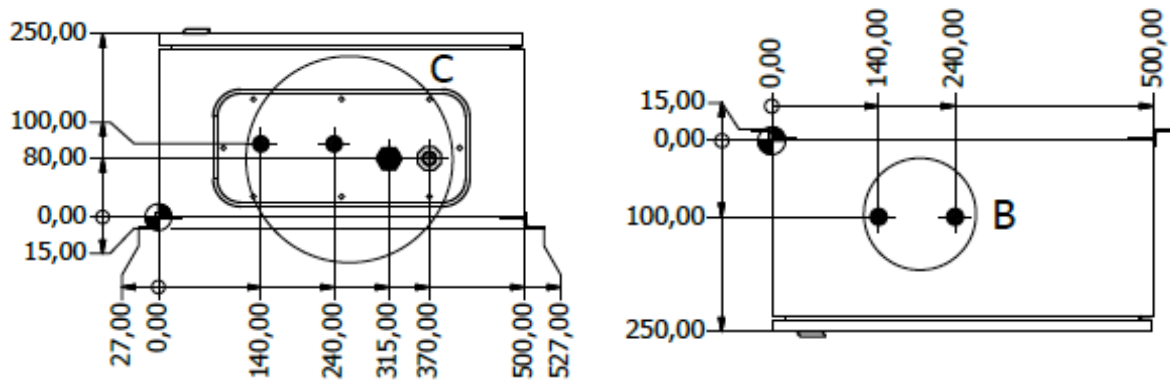
Connector details: <http://www.amphenol-sine.com/pdf/datasheet/RT071619SNH-K.pdf>

3. Receiver outline



- F max = 1500 N.

- Not designed for hanging upside down.



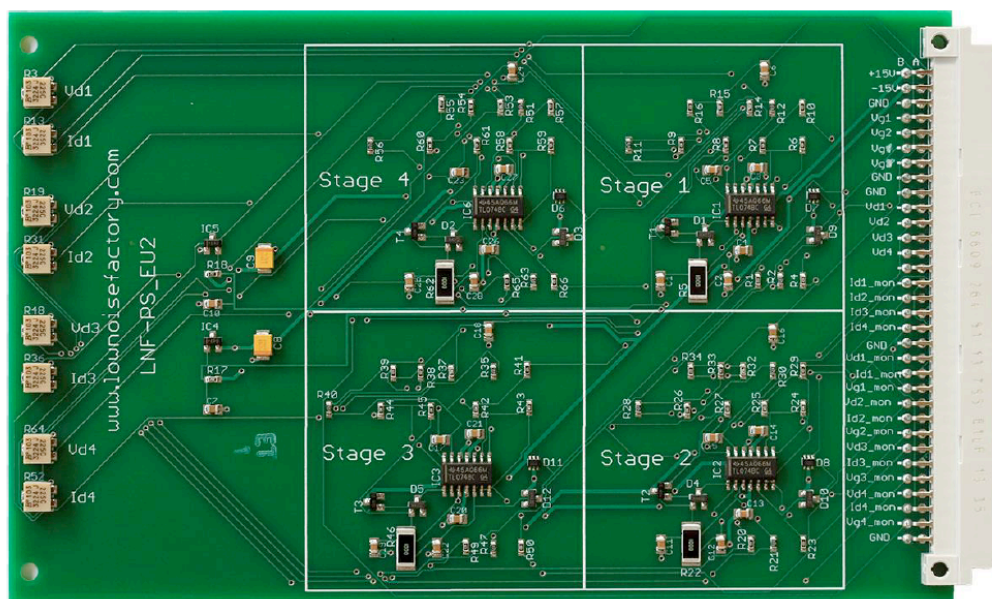
4. Receiver configuration

The CRFL-0408GHz-receiver is configured to receive to independent channels over 4 to 8 GHz bandwidth. The over all receiver gain is 62 dB on each channel, achieved using two amplifiers. A calibration noise signal is injected before the first stage amplifier, which can be switched On/Off using 5V control signal. The base plate of the receiver as well as the noise diode is temperature stabilised using Carel PID controller.

4.1. 1st stage LNA

The bias voltage and current of the first stage LNA can be modified using the potentiometers on the LNA bias card. The bias card supports four LNAs but only two are used in the current system. The VD1, ID1 is used for channel 1 and VD2, ID2 is used for channel 2.

Please note the location of the potentiometer and the orientation of the bias card in the receiver cabinate.



Parameter	Value	Read out value
Drain voltage, VD	1.25 V	1.25
Drain current, ID	45 mA	4.5 (Note the scaling factor)

The current read out for the first stage LNA at the data connector Pin E and G has scaling factor as described in table above.

The LNA data can be found at,

http://www.lownoisefactory.com/datasheets/LNF-LNR4_8C_sn546Z.pdf

http://www.lownoisefactory.com/datasheets/LNF-LNR4_8C_sn517Z.pdf

4.2. 2nd stage LNA

Second stage LNA uses fixed bias of 15V@100mA.

Parameter	Voltage	Current
2nd stage LNA	15 V	100 mA

4.3. Noise diode control

A calibration noise signal is injected in both the channels before the first stage amplifier. The noise signal can be turned On/Off using a 5 V signal between Pin K and Pin L of the data connector. Please observe correct polarity of the control signal.

Parameter	Voltage	Current
Noise diode	15 V	6 mA

4.4. PID control

Two independent PID control loops are used to set the temperature of the base plate and the noise diode using Carel PID controller.

- a. The current PID set points are,
 - i. Noise diode = 27 C.
 - ii. Base plate = 23 C.
 - iii. Set point 1 refers to noise diode.
 - iv. Set point 2 refers to base plate.
- b. In order to achieve best thermal stabilisation, the proportional, integral and differential parameters of the control loop may need modification over time.
- c. The control parameters can be modified using the Carel front panel or using serial communication (not configured), please refer to product documentation for more details <http://www.carel.com/product/ir33-universale>

5. Operating procedure

- The receiver contains devices sensitive to electrostatic discharge, extreme caution is recommended while handling the instrument.
- The receiver contains, high voltage supply, and any tuning/optimisation/maintenance work should be performed by qualified personnel only.
- The instrument is fully operational and setup to be operational simply by connecting the 240 VAC@50Hz. However, before installing the receiver on the telescope, a laboratory check is essential.

- Prepare the power and data cable using the connectors delivered with the receiver.
- Connect the power and data cable, make sure that the platform is properly grounded.
- Terminate the RF inputs and outputs are terminated to 50 ohm load.
- Turn on the receiver power.
- Monitor the LNA bias voltage and current and make sure that they are at nominal level, adjust the Bias voltage and current using the potentiometers is needed.
- In order to test the noise diode switching, connect the receiver output to a Spectrum Analyser, apply 5 VDC between the TTL control pins.
- The PID set points can be modified using the control panel on the Carel ir33 unit. Please refer to the instruction manual.

