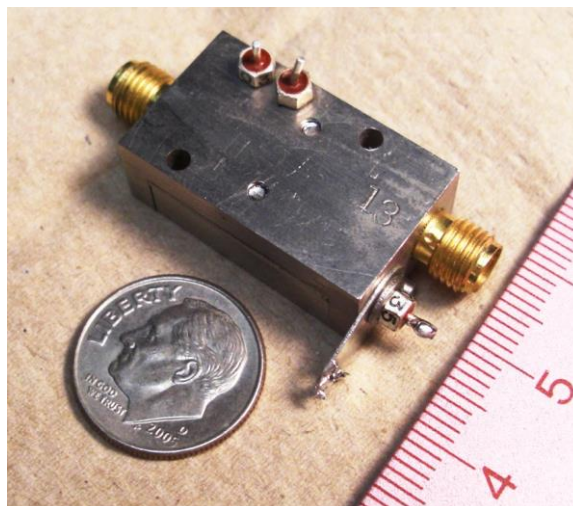


### Features

- Noise as low as 3.4K at 1 GHz
- Gain flat +/-1 dB from 10 MHz to 1 GHz
- Usable over a wide range of DC power from 2mW to 60mW
- Single power supply voltage in the 1.2V to 2.5V range
- Good input and output match from 10 MHz to 2 GHz.
- Operates from below 4K to 350K



### Description

The CITLF2 a SiGe low noise amplifier intended for extremely low noise cryogenic applications. The amplifier utilizes resistive feedback to achieve good input match (S11) and high gain stability. The amplifier is optimum for the frequency range 0.01 to 2 GHz.

It is powered from a single positive DC supply which is optimum at 1.5V but can be reduced to as low as 1.1V for low power dissipation. Application of up to 5V will not damage the amplifier. It is recommended that the power supply for the amplifier be current limited to 100mA. A series resistor may be used. For example 470 ohms to a +5V supply will provide 1.5V, 7.5mA when the amplifier is at 20K. See table and graph later in this data sheet for performance vs bias voltage.

The amplifier offers an optional DC bias tee for an external device connected to the amplifier input. The bias tee is formed by two 20K resistors connected to the input; one can be used as a source of current and one the sense the voltage across the external device. Voltages applied to the bias tee have no effect on amplifier operation. The maximum bias voltage magnitude is 20V.

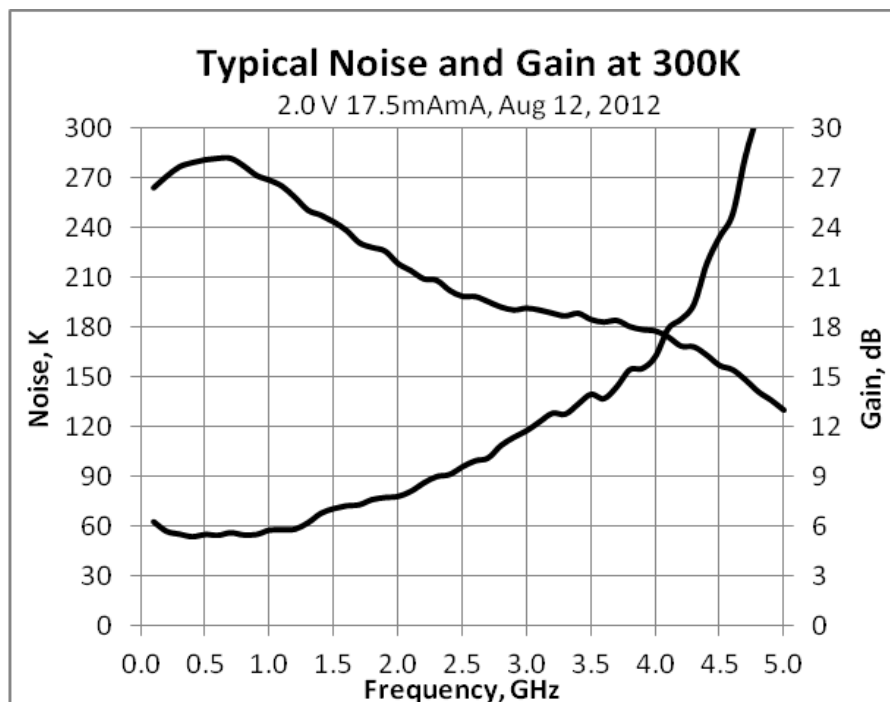
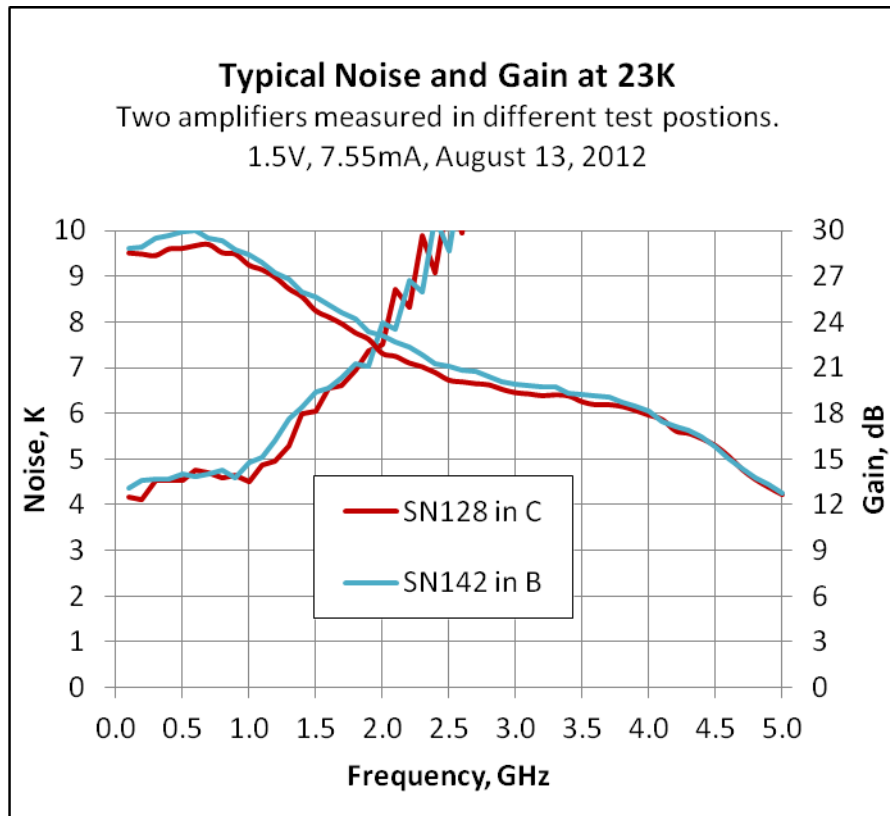
The maximum RF input power to be applied to the amplifiers without damage is +10dBm.

The amplifier is 20.7mm x 15.9mm x 8.7mm excluding connectors with input SMA at left and output SMA at right as shown above

### Performance Summary

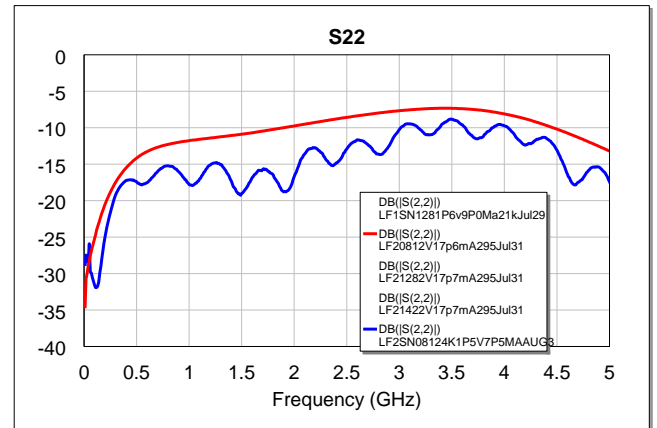
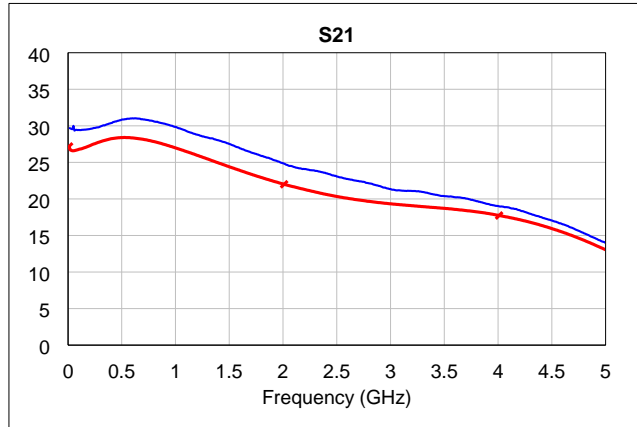
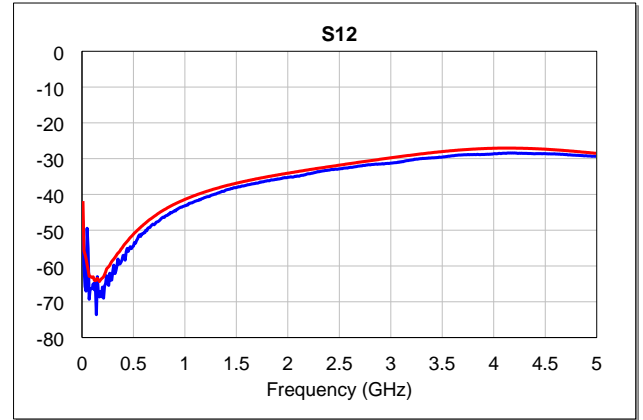
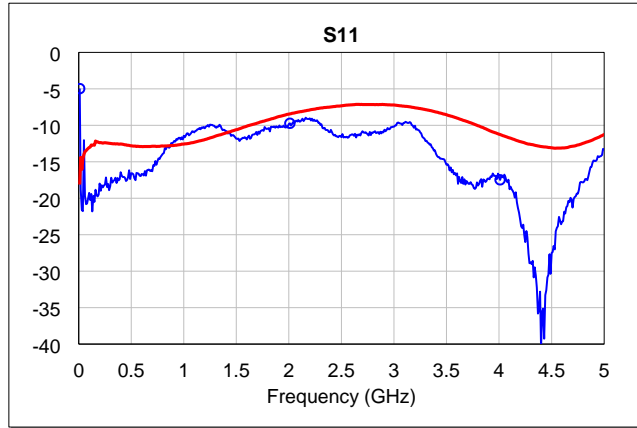
.01 to 1 GHz @ 23K

Parameter	@1.5V, 7.5mA Bias	@2.5V, 22mA Bias
<b>Noise Temperature</b>	<5K	<4K
<b>Gain =20log S21 </b>	29+/-1.5dB	34+/-2 dB
<b>IRL=-20log S11 </b>	>10	>10
<b>ORL=-20log S22 </b>	>15	>13
<b>Gain Compression, Output P1dB</b>	-14dBm	-4dBm



## Typical S Parameters

Blue at 23K, 1.5V, 7.5mA, Red at 298K, 2.0V, 17.6mA

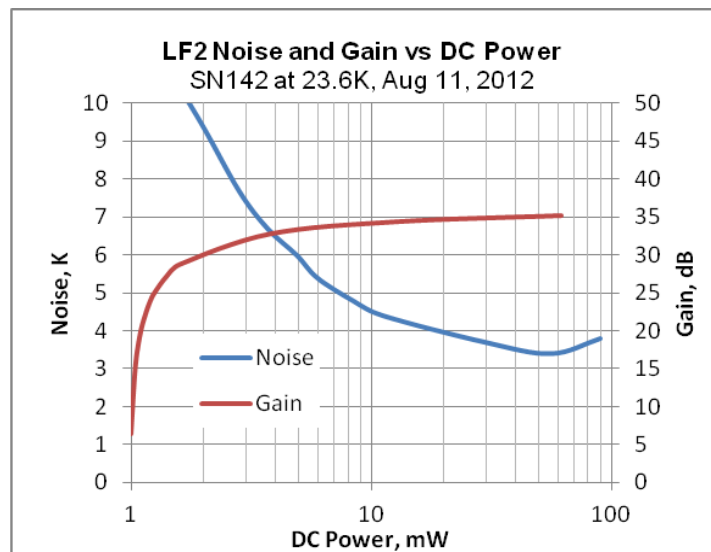


## Performance vs Bias Voltage

At 23K and 1 GHz

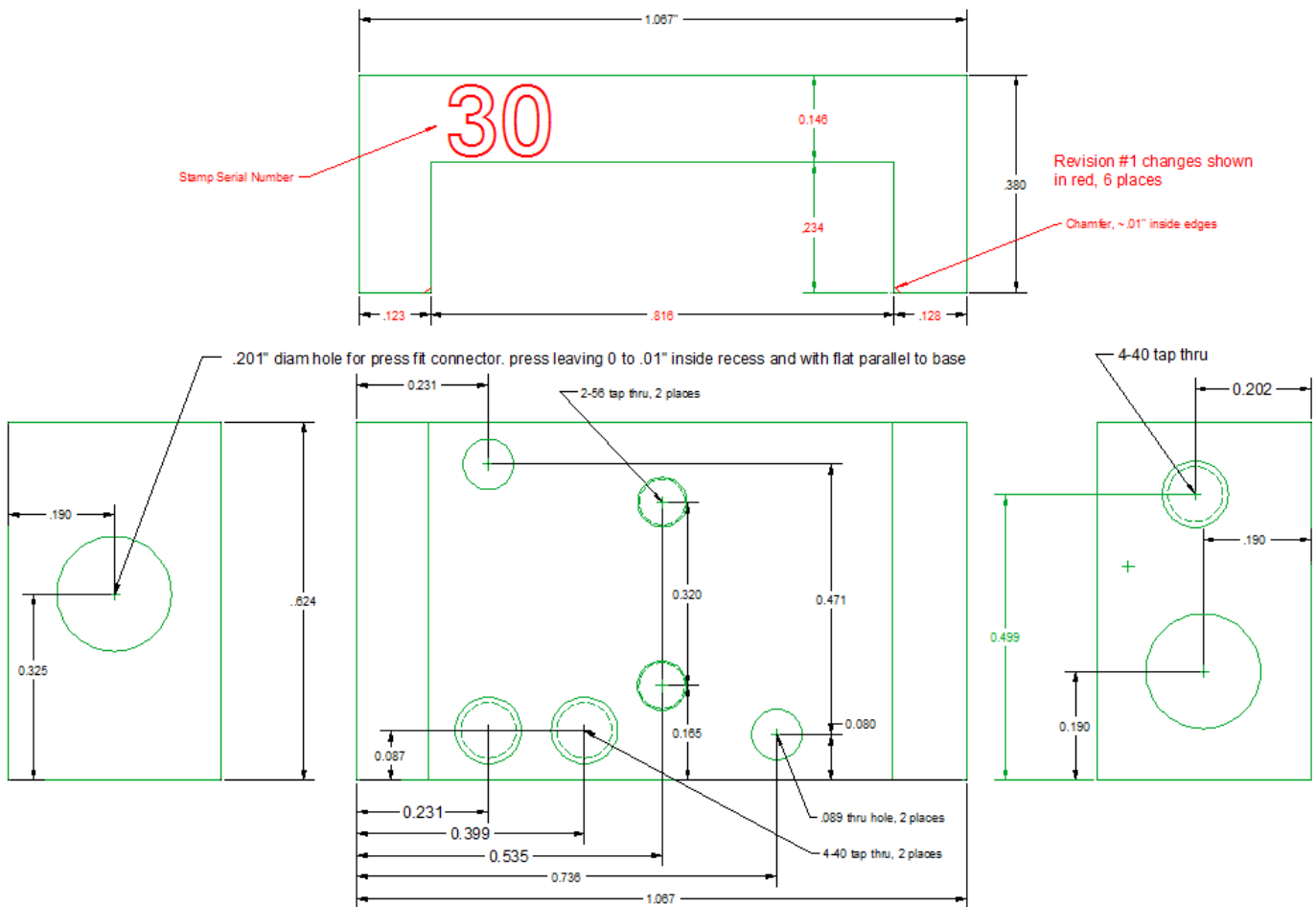
Note the sensitivity of gain to DC bias voltage. At 1.5V bias the slope is 1.6 dB per 0.1 volt bias change. This is a  $\Delta G/\Delta V$  of 5.7% per 1%. A .01% power supply gives a gain stability of .06% or .0026 dB.

Vs	Is, mA	P, mW	T, K	G, dB
1.05	1.00	1.1	12.3	6.4
1.10	1.74	1.9	9.6	15.1
1.15	2.45	2.8	7.7	19.2
1.20	3.09	3.7	6.7	21.5
1.25	3.92	4.9	6.0	23.8
1.30	4.59	6.0	5.4	25.1
1.40	5.99	8.4	4.8	27.2
1.50	7.49	11.2	4.4	28.8
2.00	14.89	29.8	3.7	32.8
2.50	22.34	55.9	3.4	34.4
3.00	29.88	89.6	3.8	35.2



# Chassis Drawing

Dimensions in inches

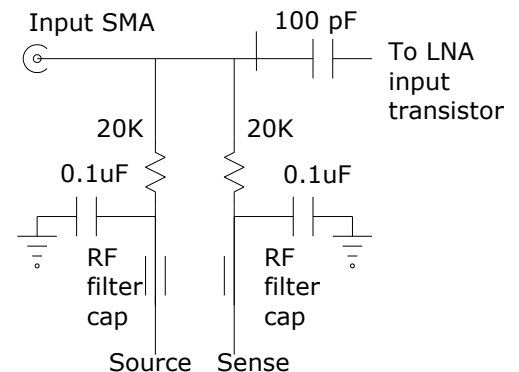


Material: Nickel-plated brass

0.1uF

**Use care to not bend (and break) the DC bias pin when tightening the output SMA connector.**

**Bias Schematic** at right. To order an amplifier with 5000 ohm bias resistors add -5K to model number. This will increase noise temperature by 0.6K.



## Contact Information

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