CryoElec 0.1-12GHz High Linearity 20dB Cryogenic LNA

01/2024

LNA SN#021

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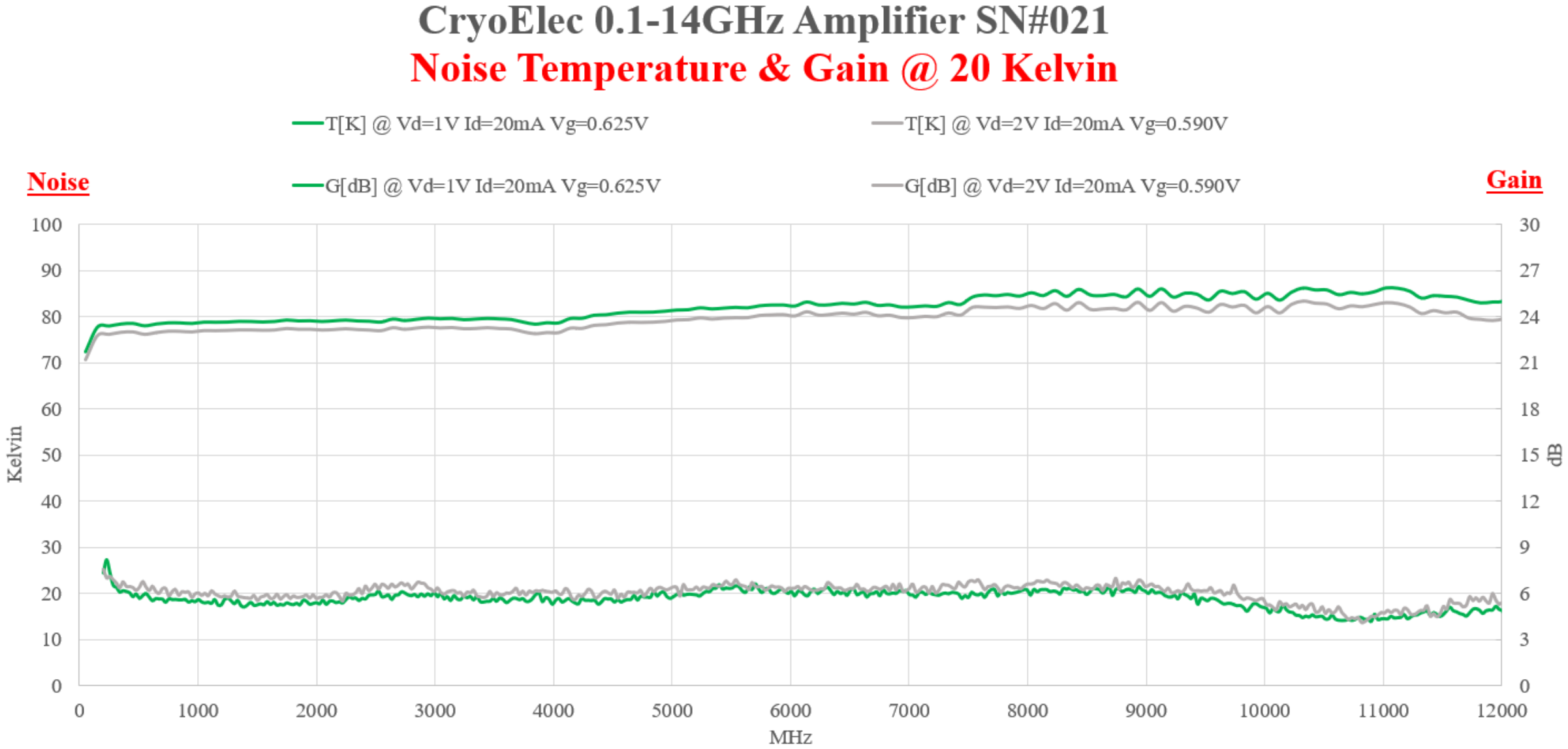
Summary Data

20K Data					
Vd [V]	Id [mA]	Power Consumtption [mW]	Gain[dB] @6GHz	Input P1dB [dBm]	Noise Temp[K] @6GHz
1	10	10	21	-21	22
1	20	20	24.7	-21	19
2	10	20	20.9	-20	24
2	20	40	24	-19	20
2.5	20	50	23.9	-18	24
2.5	40	100	25.8	-15	32

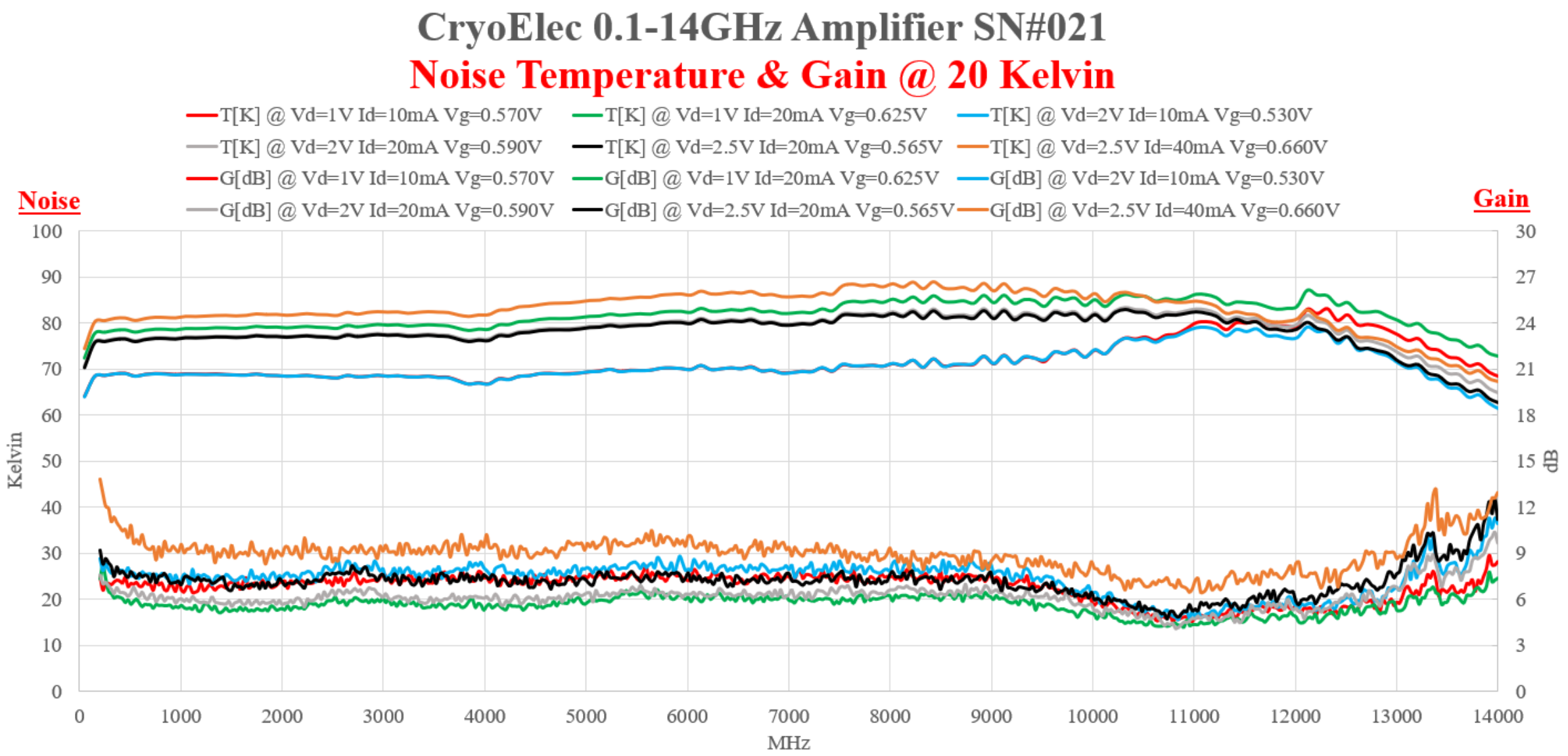
50K Data					
Vd [V]	Id [mA]	Power Consumtption [mW]	Gain[dB] @6GHz	Input P1dB [dBm]	Noise Temp[K] @6GHz
1	10	10	20.95	-21	
1	20	20	24.4	-22	40
2	10	20	21	-21	
2	20	40	24.1	-19	35
2.5	20	50	24	-19	
2.5	40	100	26	-15	

300K Data					
Vd [V]	Id [mA]	Power Consumtption [mW]	Gain[dB] @6GHz	Input P1dB [dBm]	Noise Temp[K] @6GHz
2	20	40	19.2	-15	200
2	40	80	22.1	-14	180
2.5	40	100	22	-14	180

Noise & Gain @ 20 Kelvin



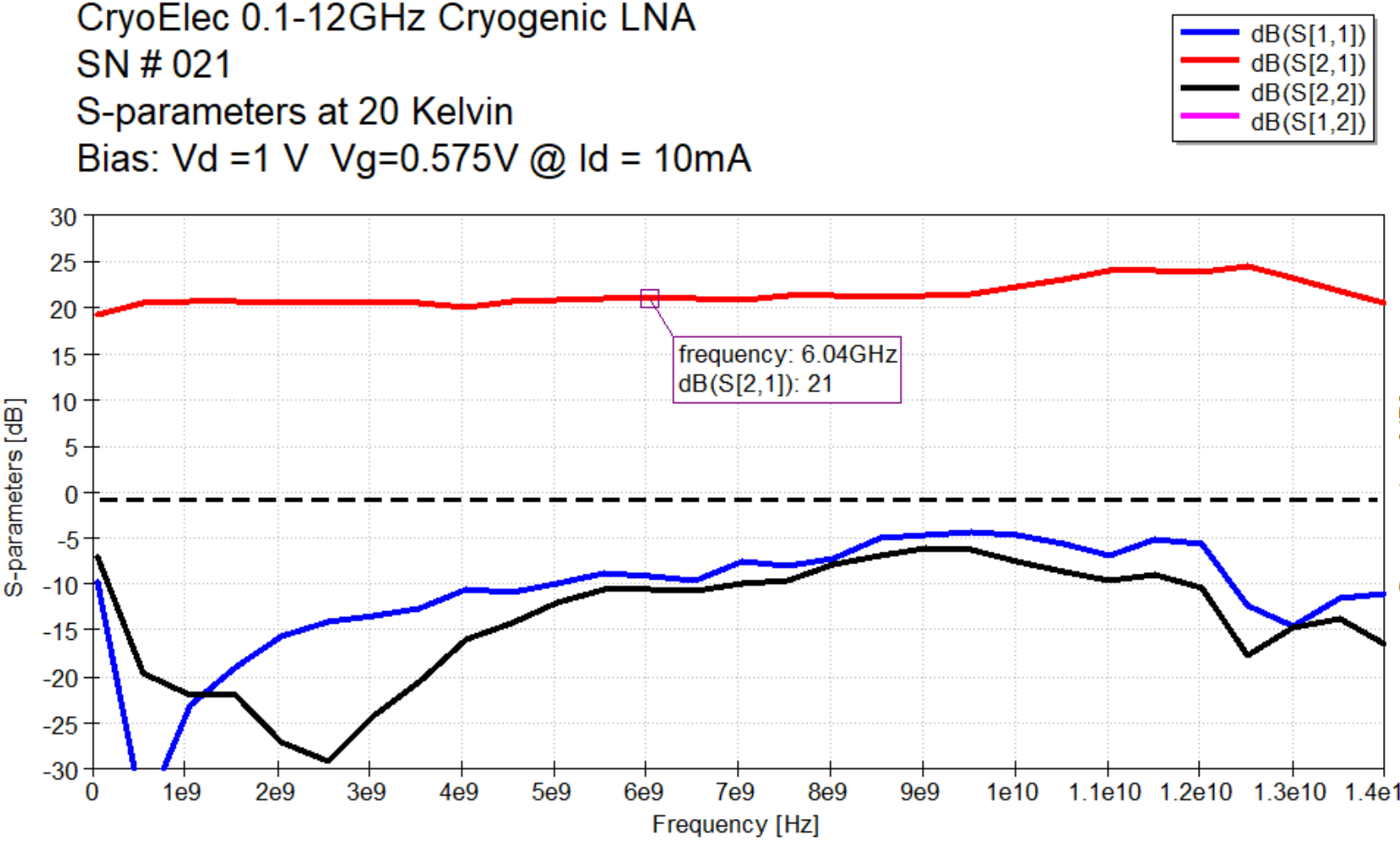
Noise & Gain @ 20 Kelvin

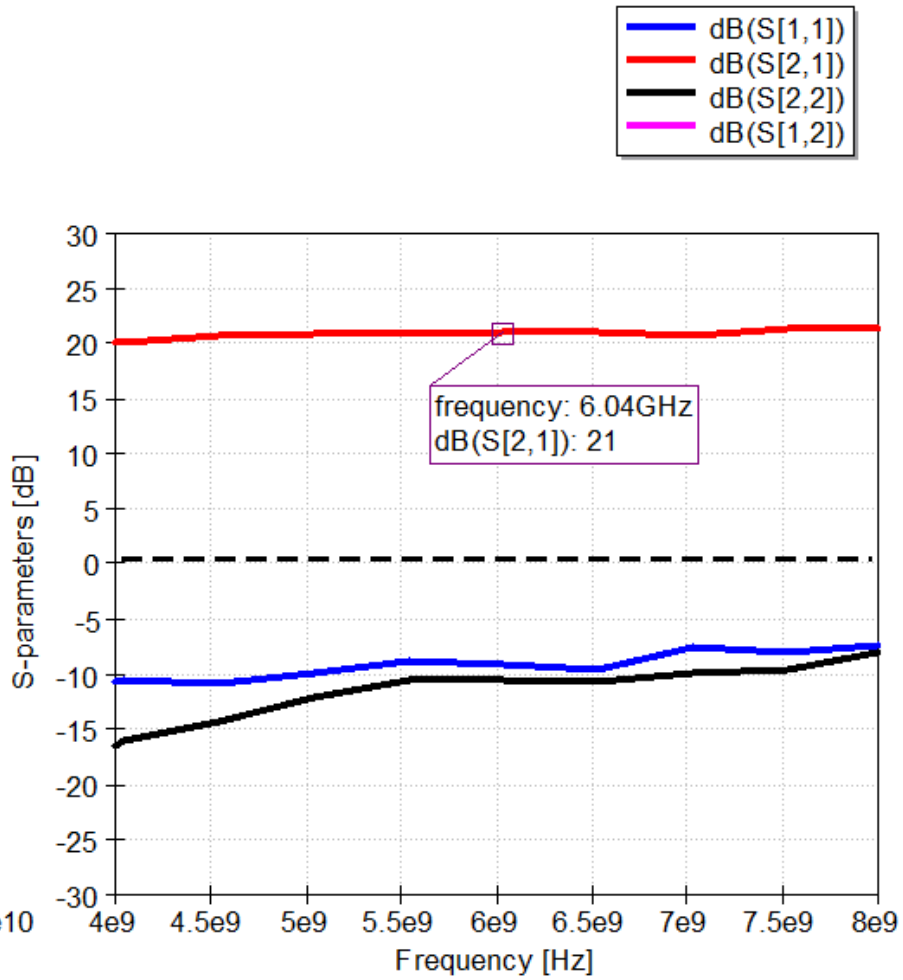


S-parameters and Input P1dB@ 20 Kelvin

Input P1dB: -21dBm (Measured at 6GHz)
@ 1V/10mA (10mW Power Consumption)

CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 20 Kelvin
Bias: Vd =1 V Vg=0.575V @ Id = 10mA

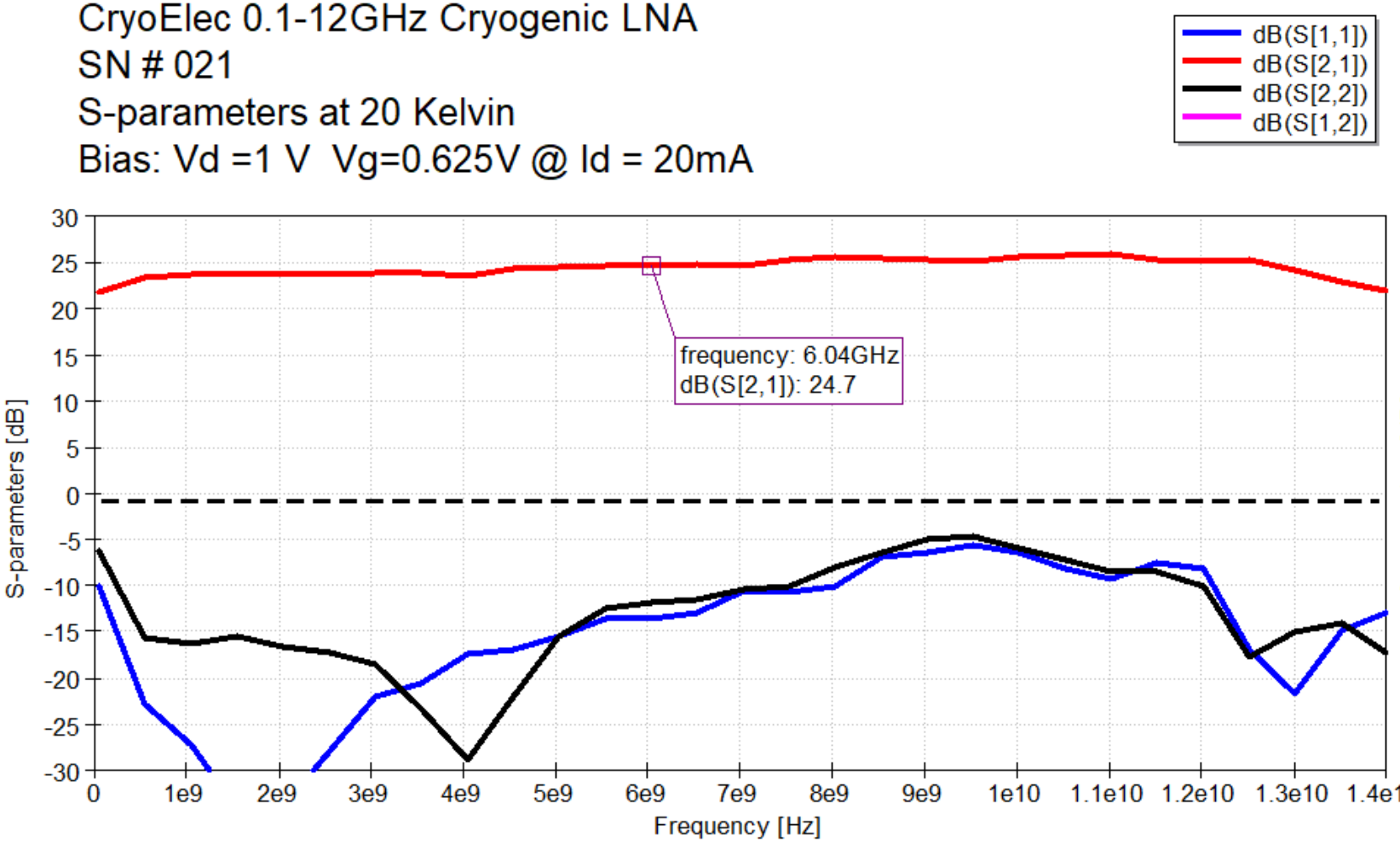


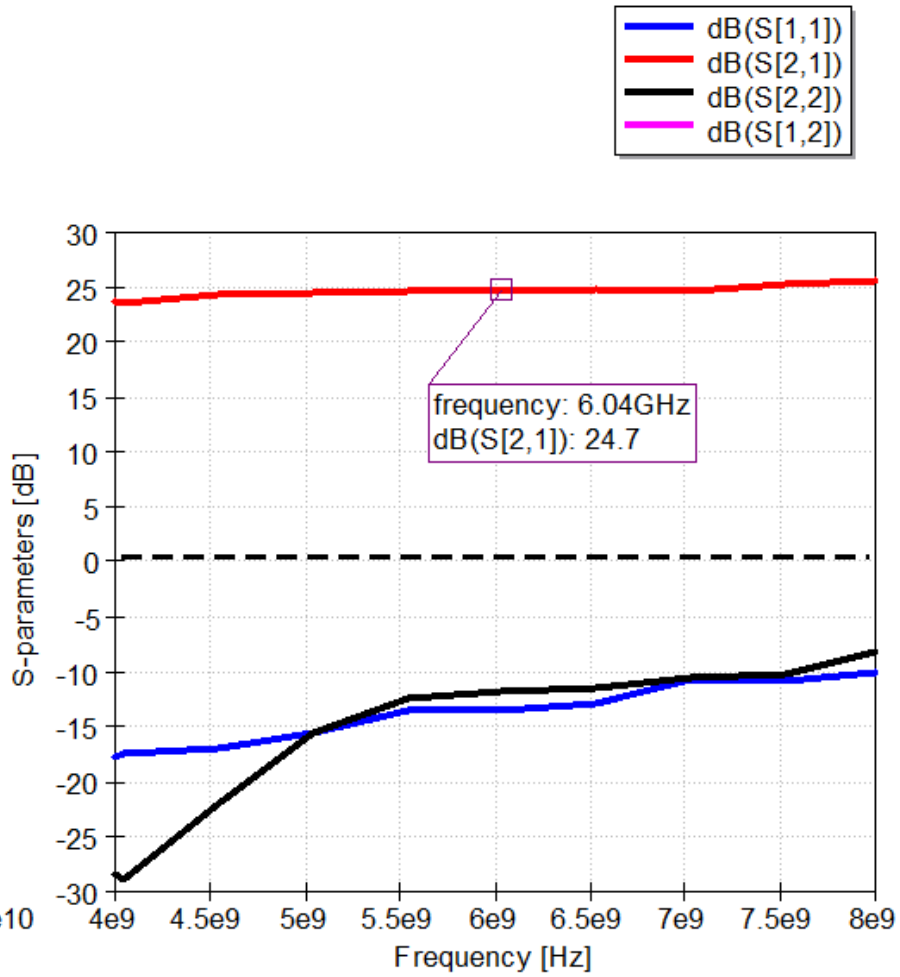


S-parameters and Input P1dB@ 20 Kelvin

Input P1dB: -21dBm (Measured at 6GHz)
@ 1V/20mA (20mW Power Consumption)

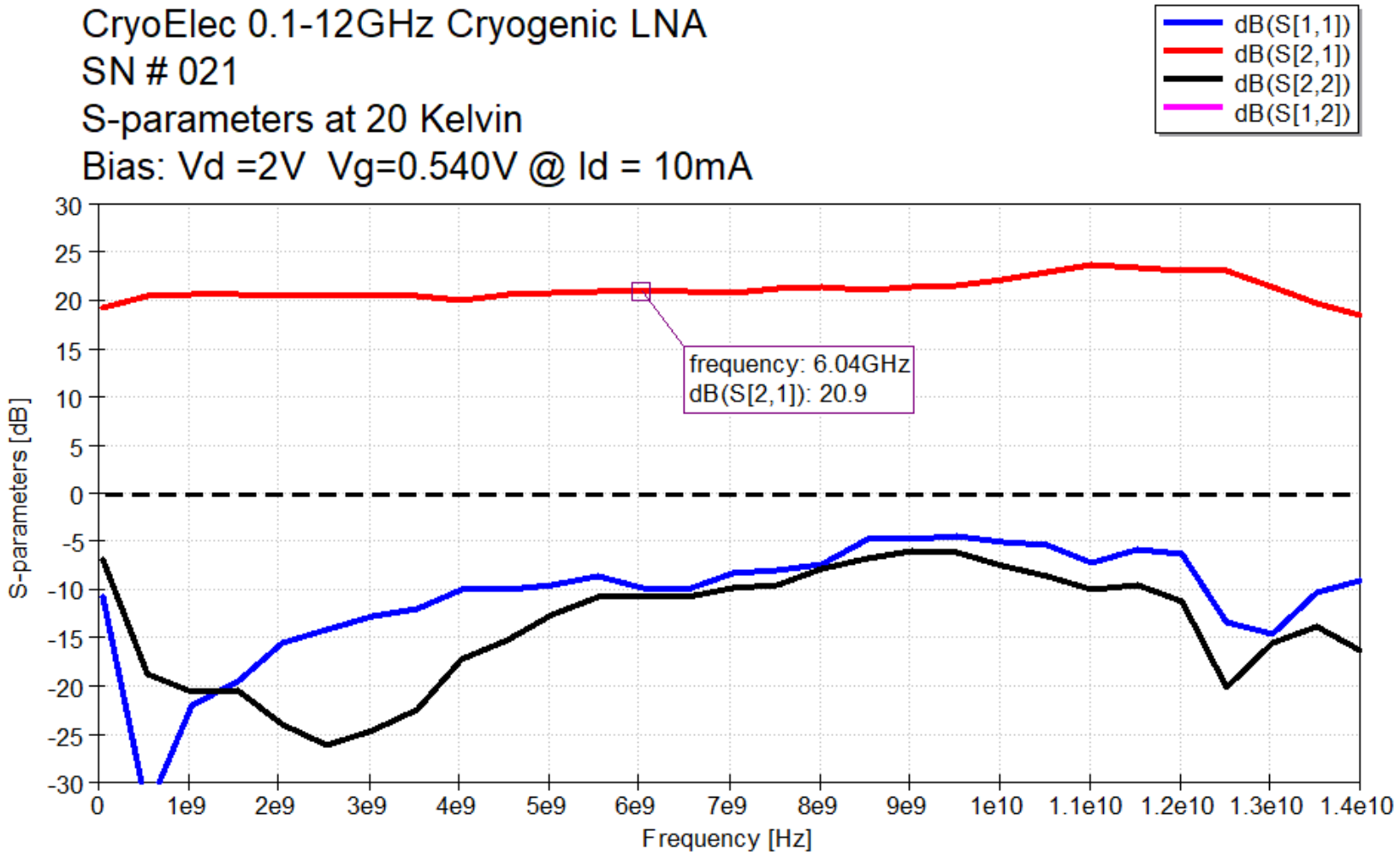
CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 20 Kelvin
Bias: Vd =1 V Vg=0.625V @ Id = 20mA

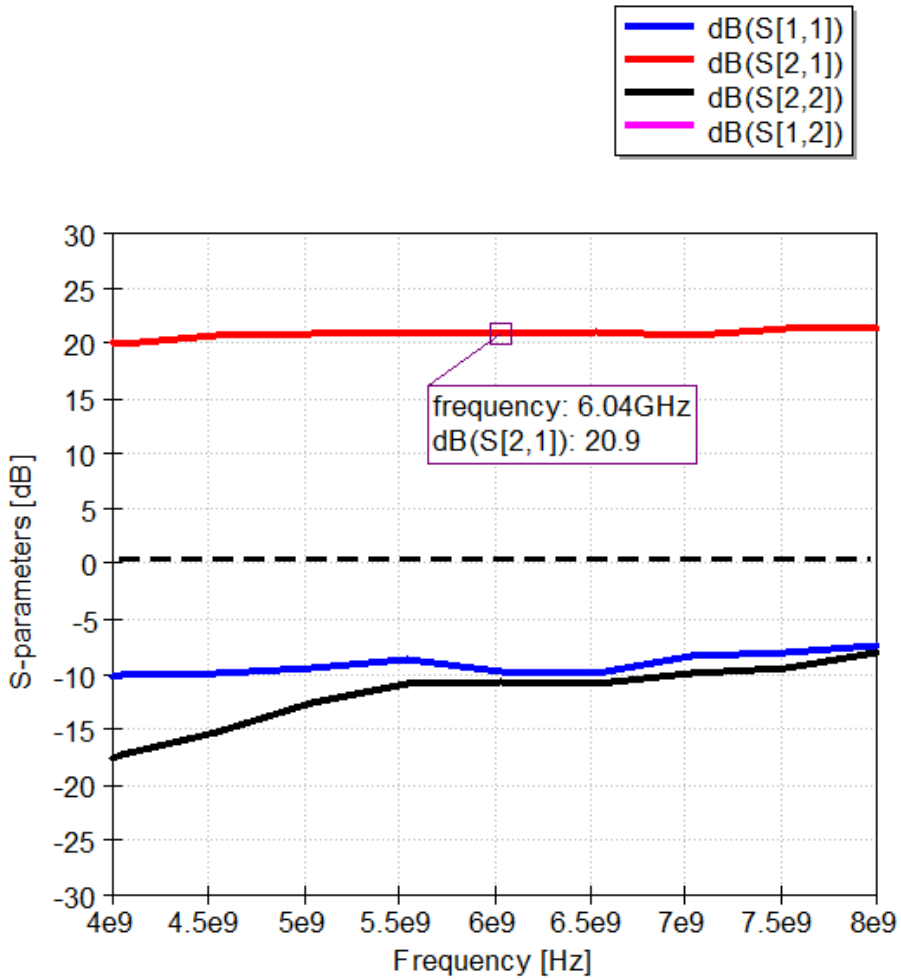




S-parameters and Input P1dB@ 20 Kelvin

Input P1dB: -20dBm (Measured at 6GHz)
@ 2V/10mA (20mW Power Consumption)

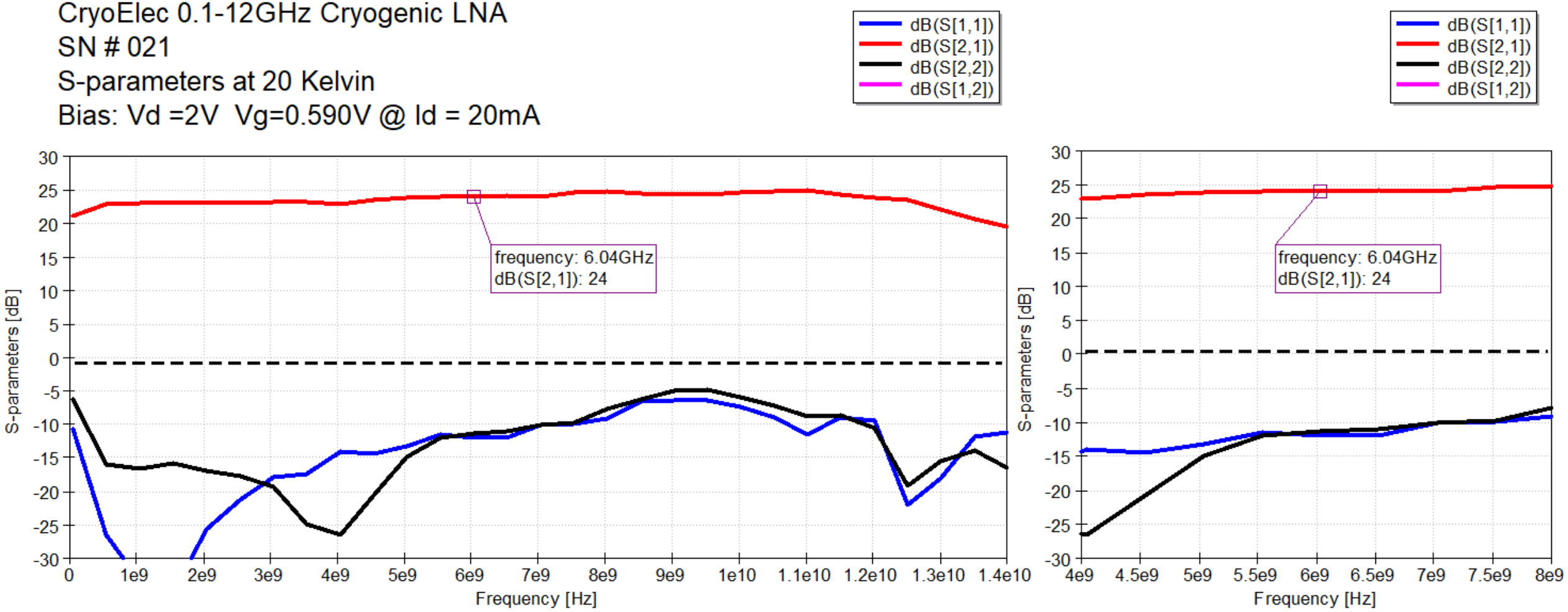




S-parameters and Input P1dB@ 20 Kelvin

Input P1dB: -19dBm (Measured at 6GHz)
@ 2V/20mA (40mW Power Consumption)

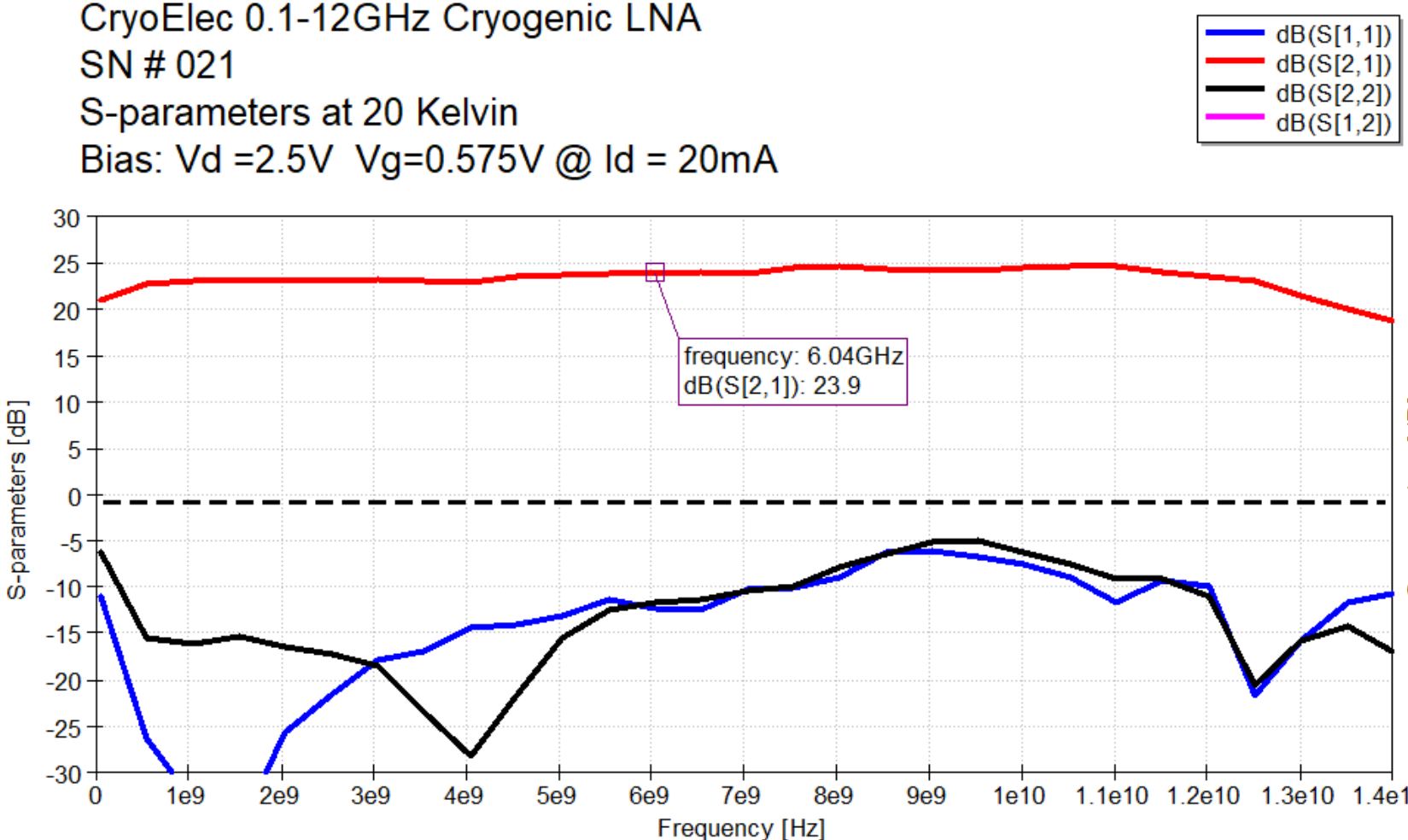
CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 20 Kelvin
Bias: Vd =2V Vg=0.590V @ Id = 20mA

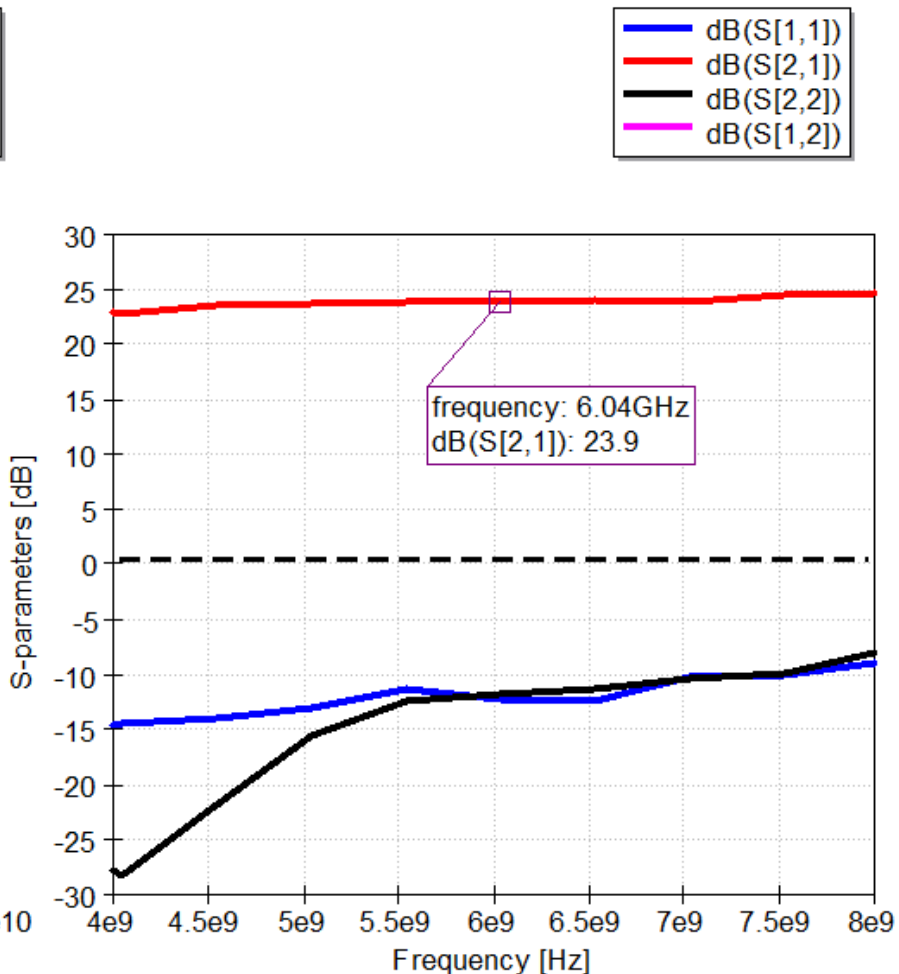


S-parameters and Input P1dB@ 20 Kelvin

Input P1dB: -18dBm (Measured at 6GHz)
@ 2.5V/20mA (50mW Power Consumption)

CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 20 Kelvin
Bias: Vd =2.5V Vg=0.575V @ Id = 20mA

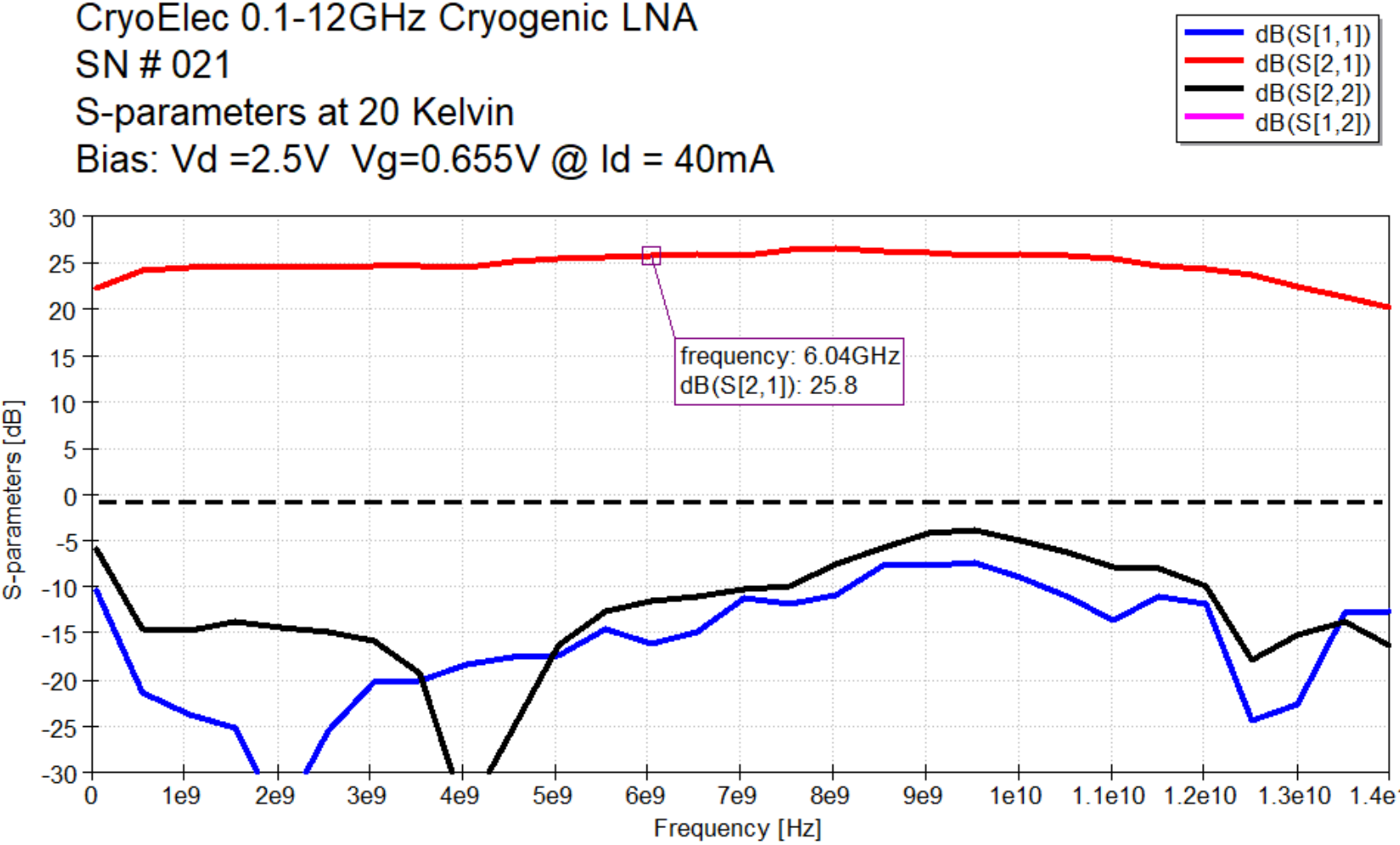


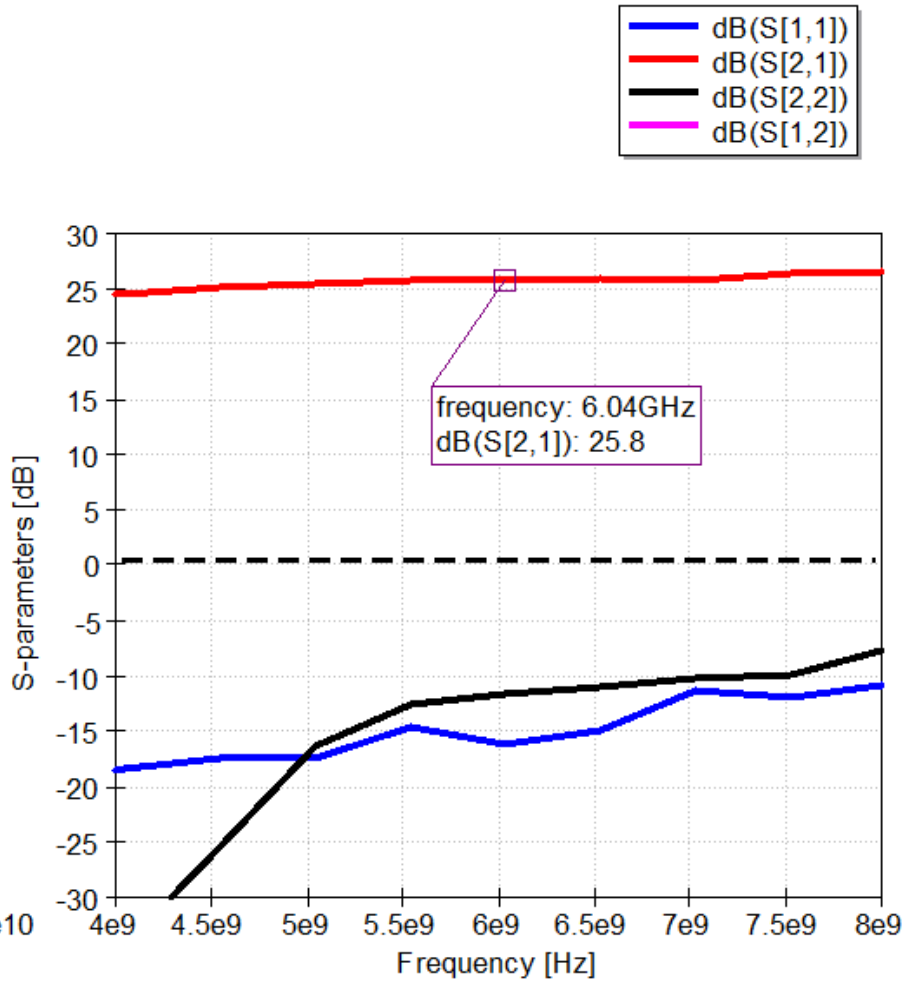


S-parameters and Input P1dB@ 20 Kelvin

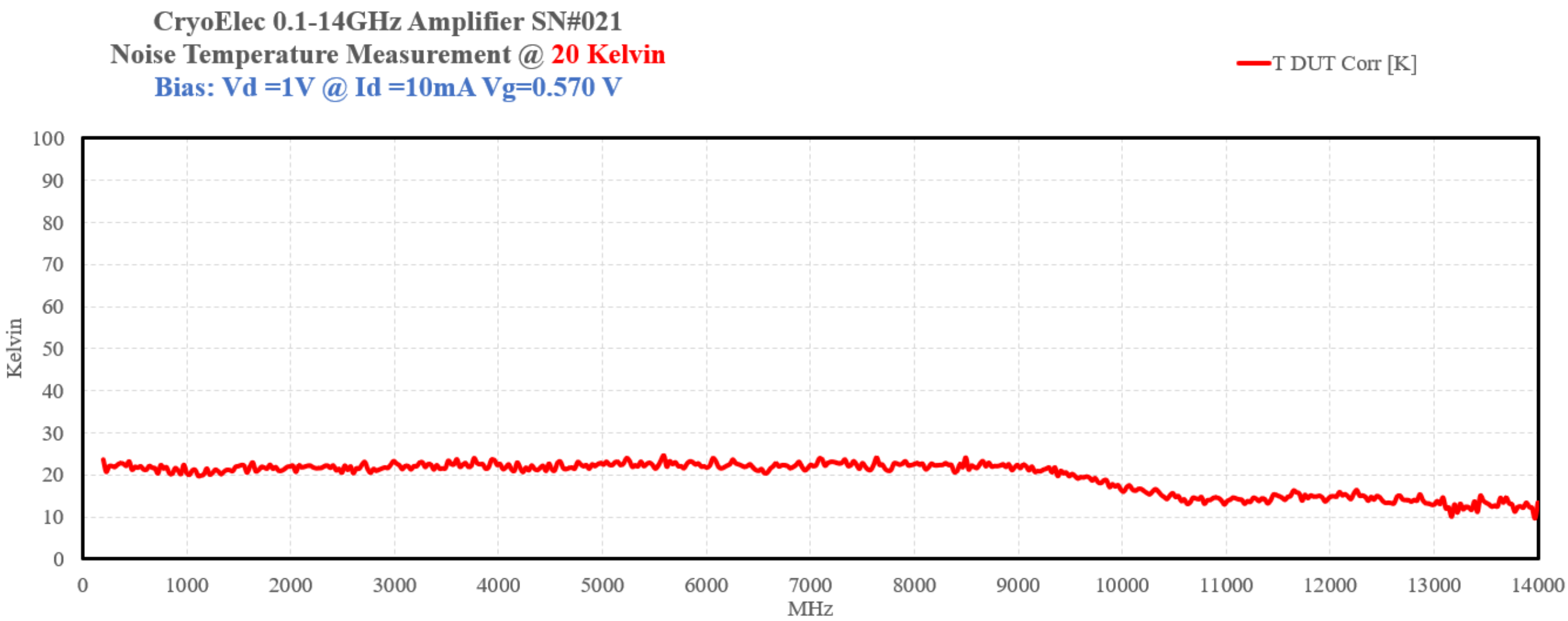
Input P1dB: -15dBm (Measured at 6GHz)
@ 2.5V/40mA (100mW Power Consumption)

CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 20 Kelvin
Bias: Vd =2.5V Vg=0.655V @ Id = 40mA

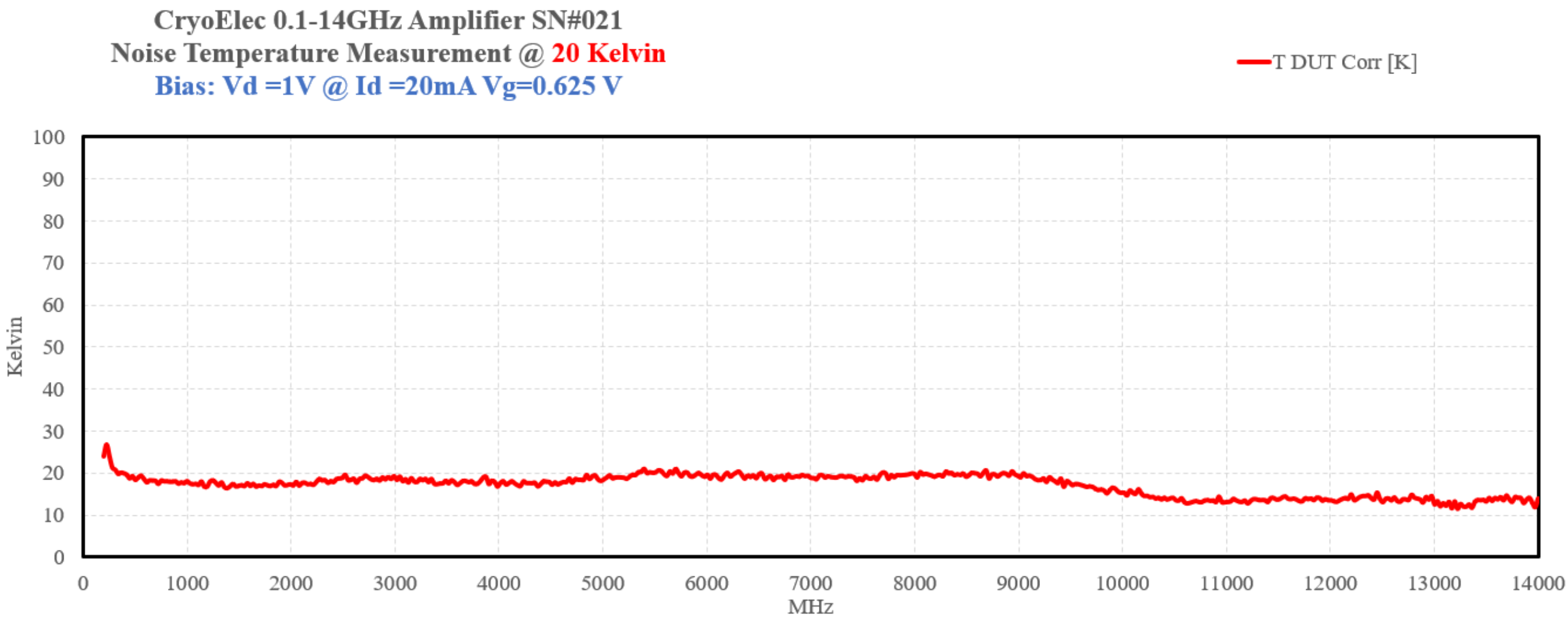




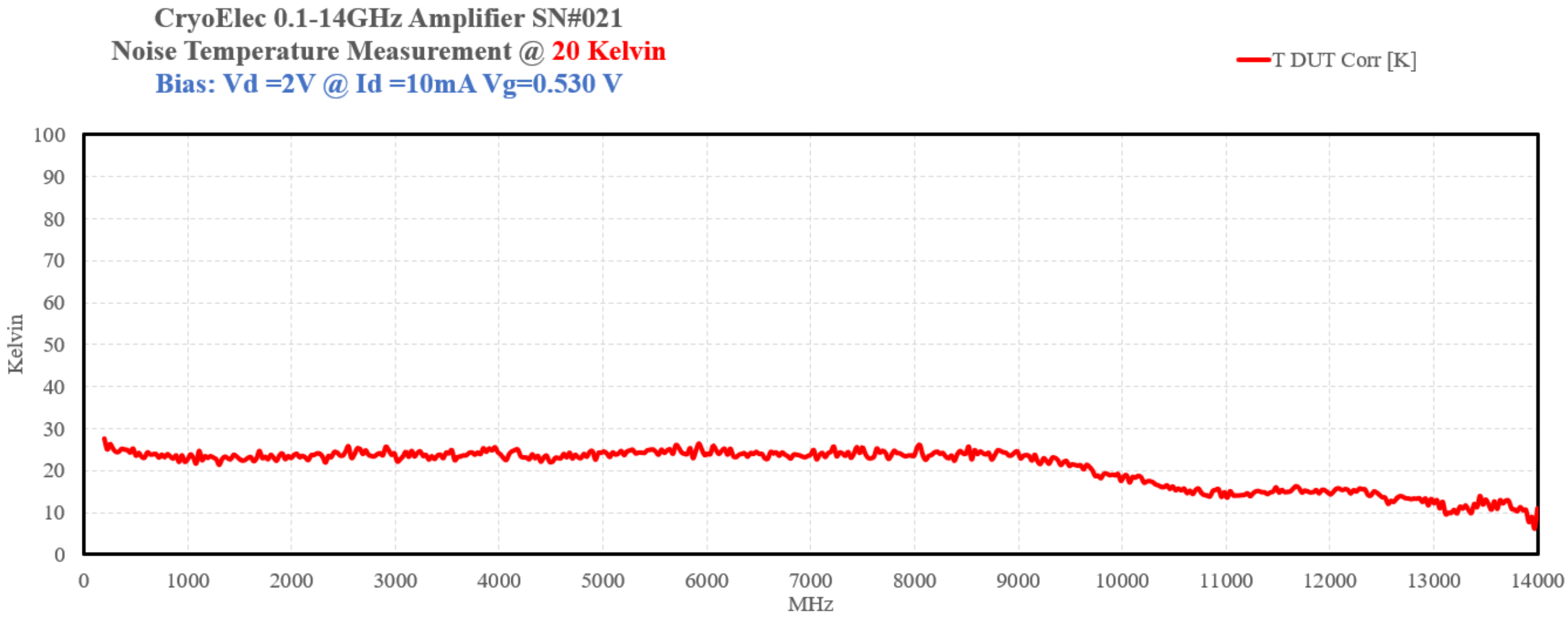
Noise Temperature @ 20 Kelvin



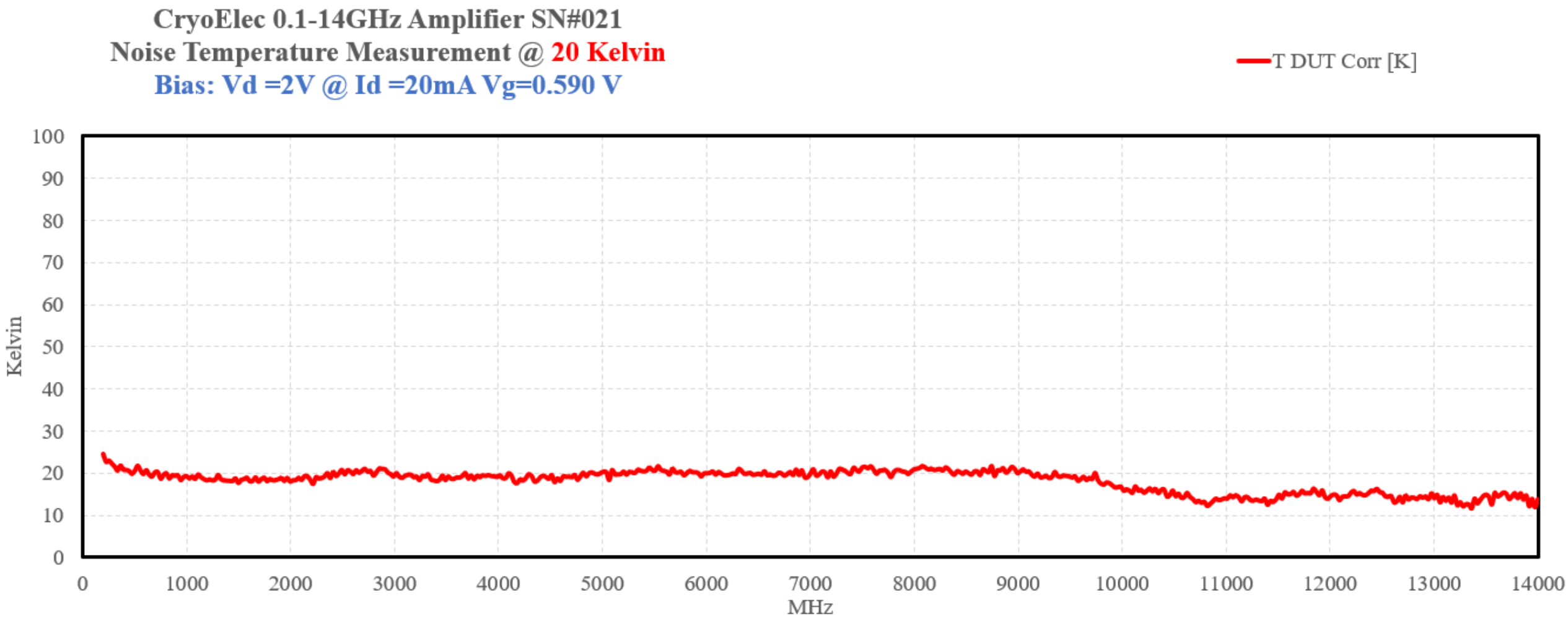
Noise Temperature @ 20 Kelvin



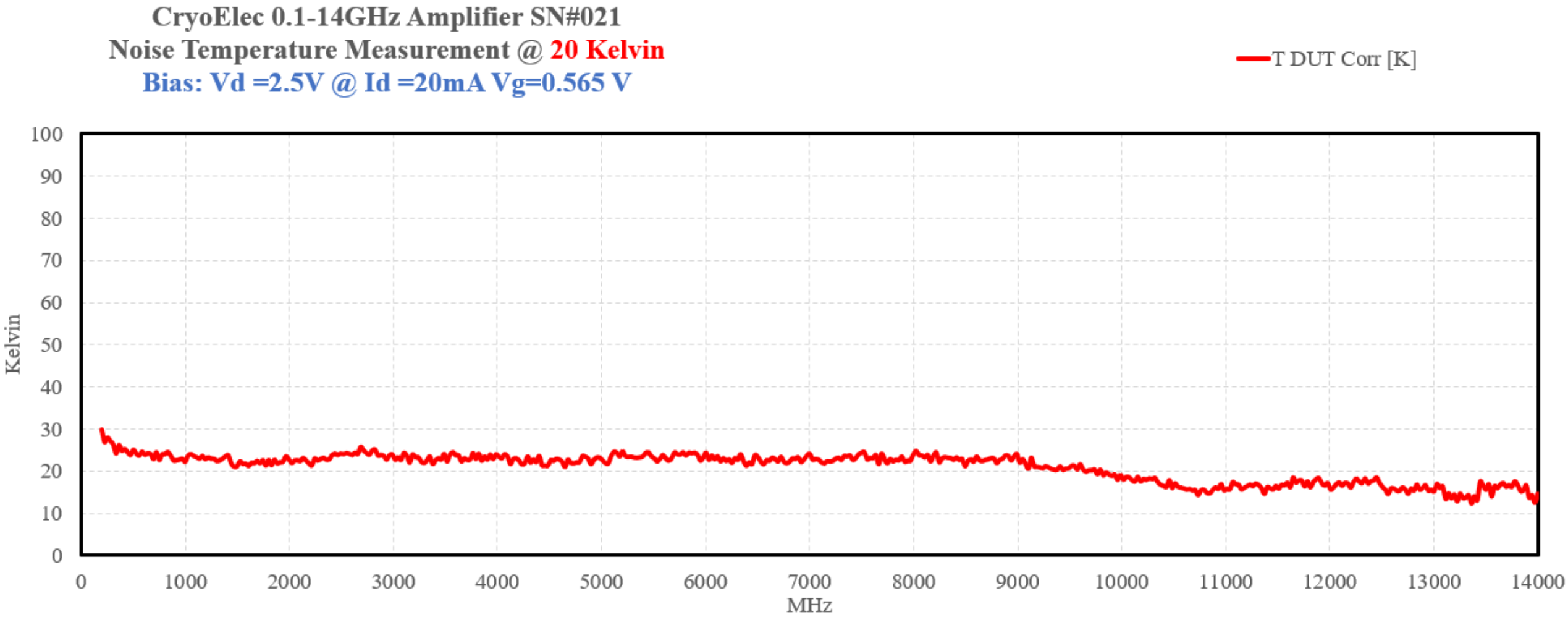
Noise Temperature @ 20 Kelvin



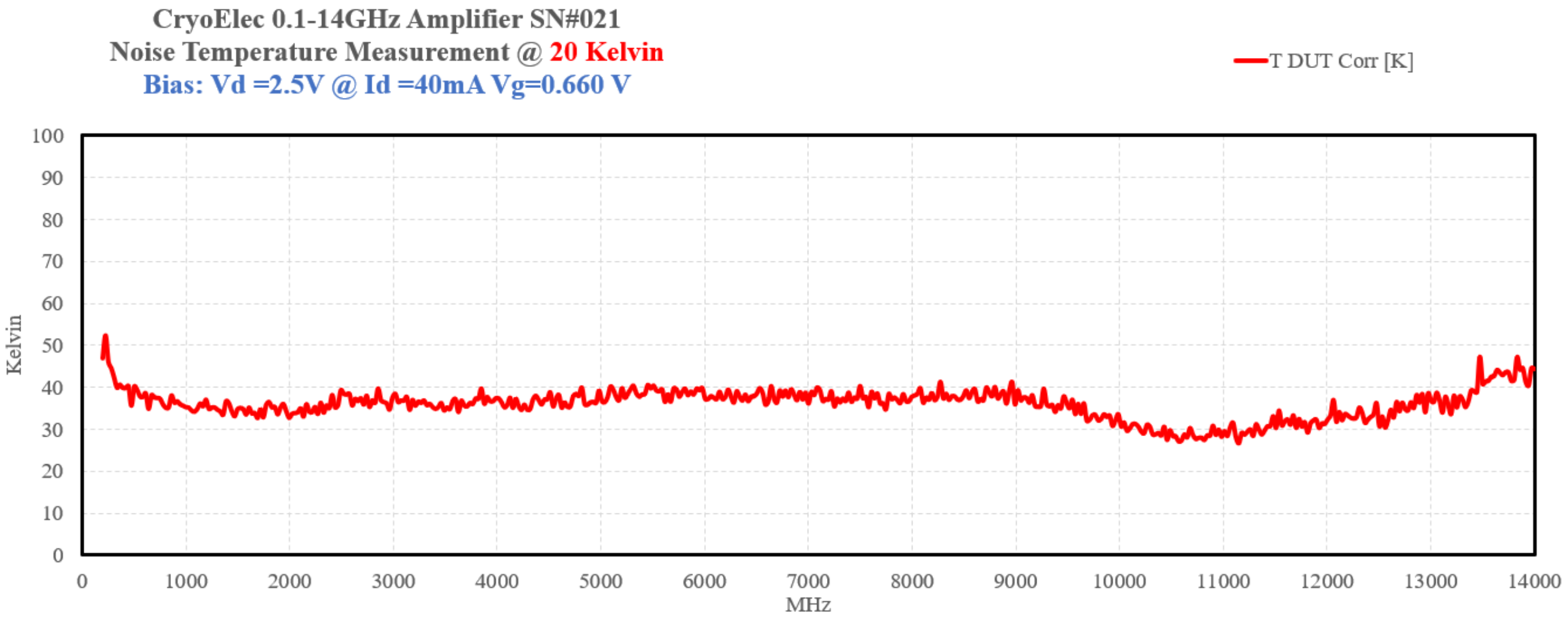
Noise Temperature @ 20 Kelvin



Noise Temperature @ 20 Kelvin



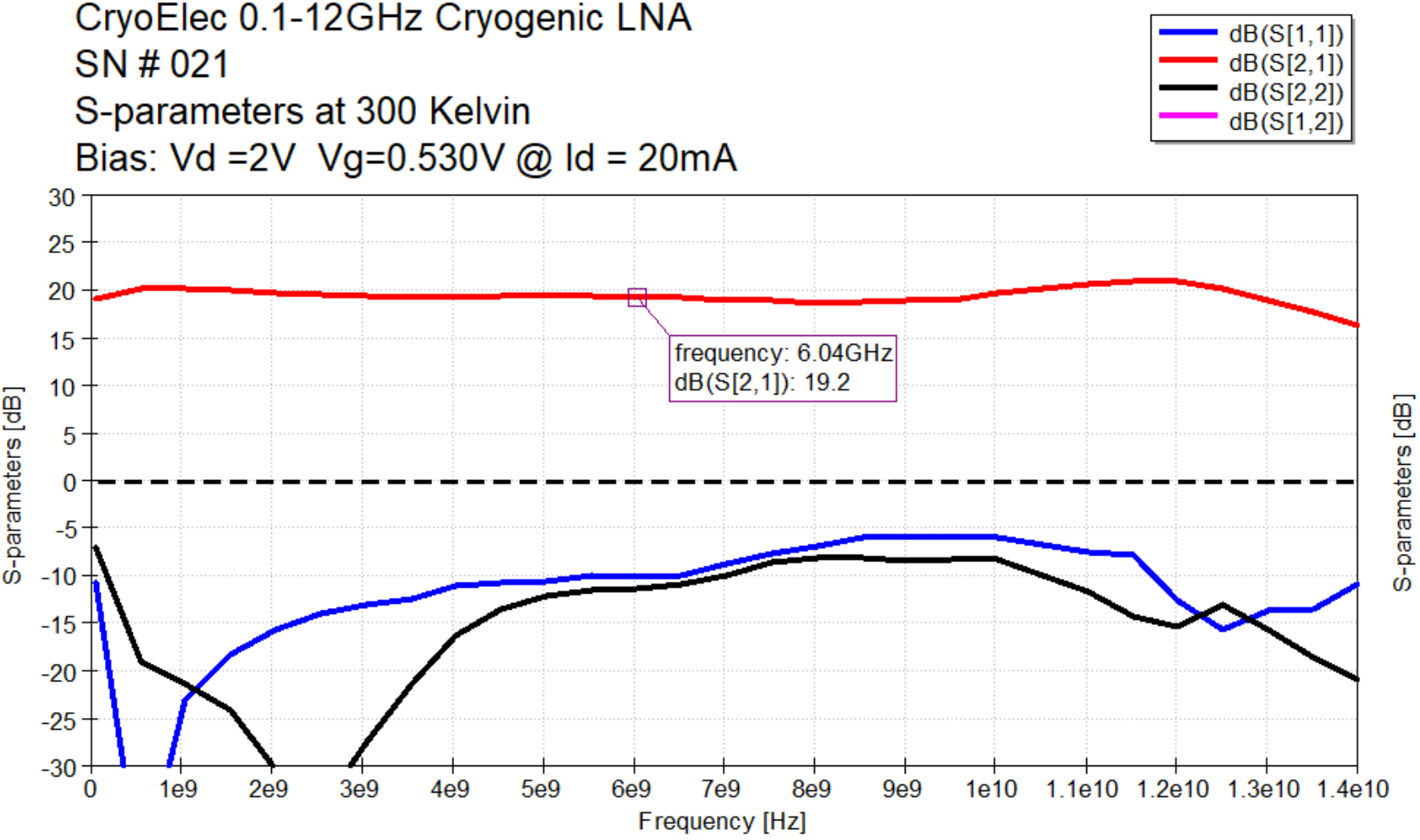
Noise Temperature @ 20 Kelvin

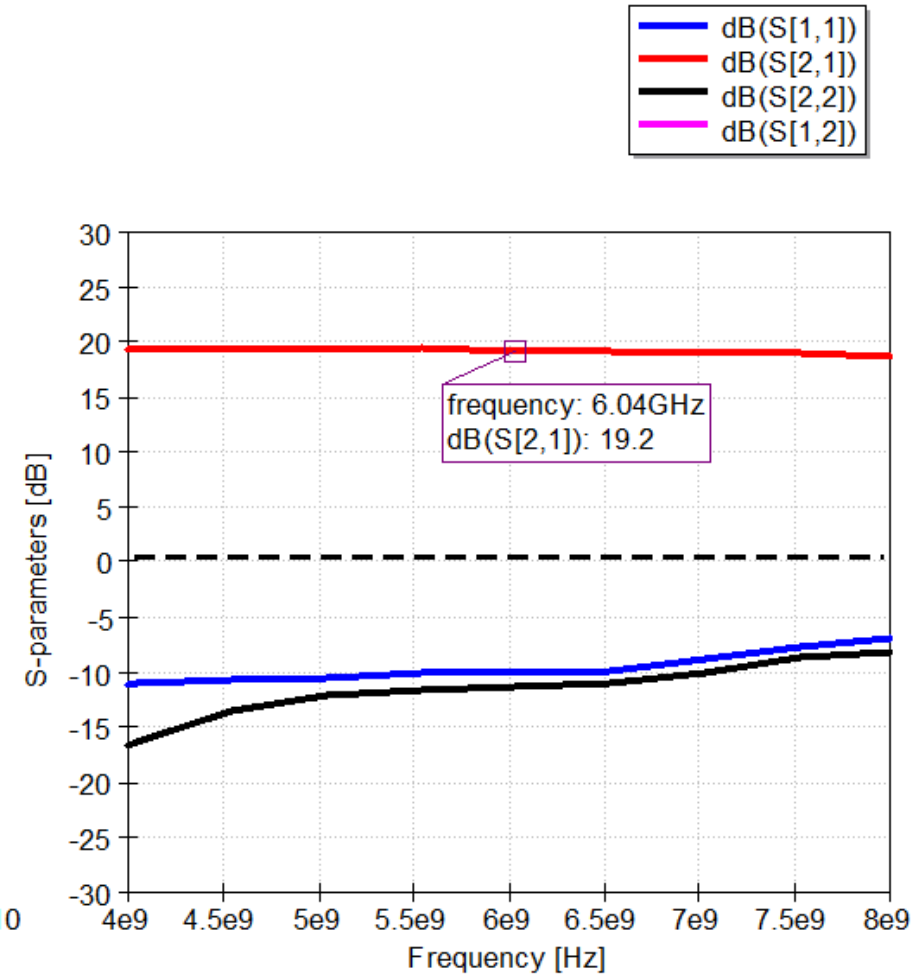


S-parameters and Input P1dB@ 300 Kelvin

Input P1dB: -15dBm (Measured at 6GHz)
@ 2V/20mA (40mW Power Consumption)

CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 300 Kelvin
Bias: Vd =2V Vg=0.530V @ Id = 20mA





S-parameters and Input P1dB@ 300 Kelvin

Input P1dB: -14dBm (Measured at 6GHz)
@ 2V/40mA (80mW Power Consumption)

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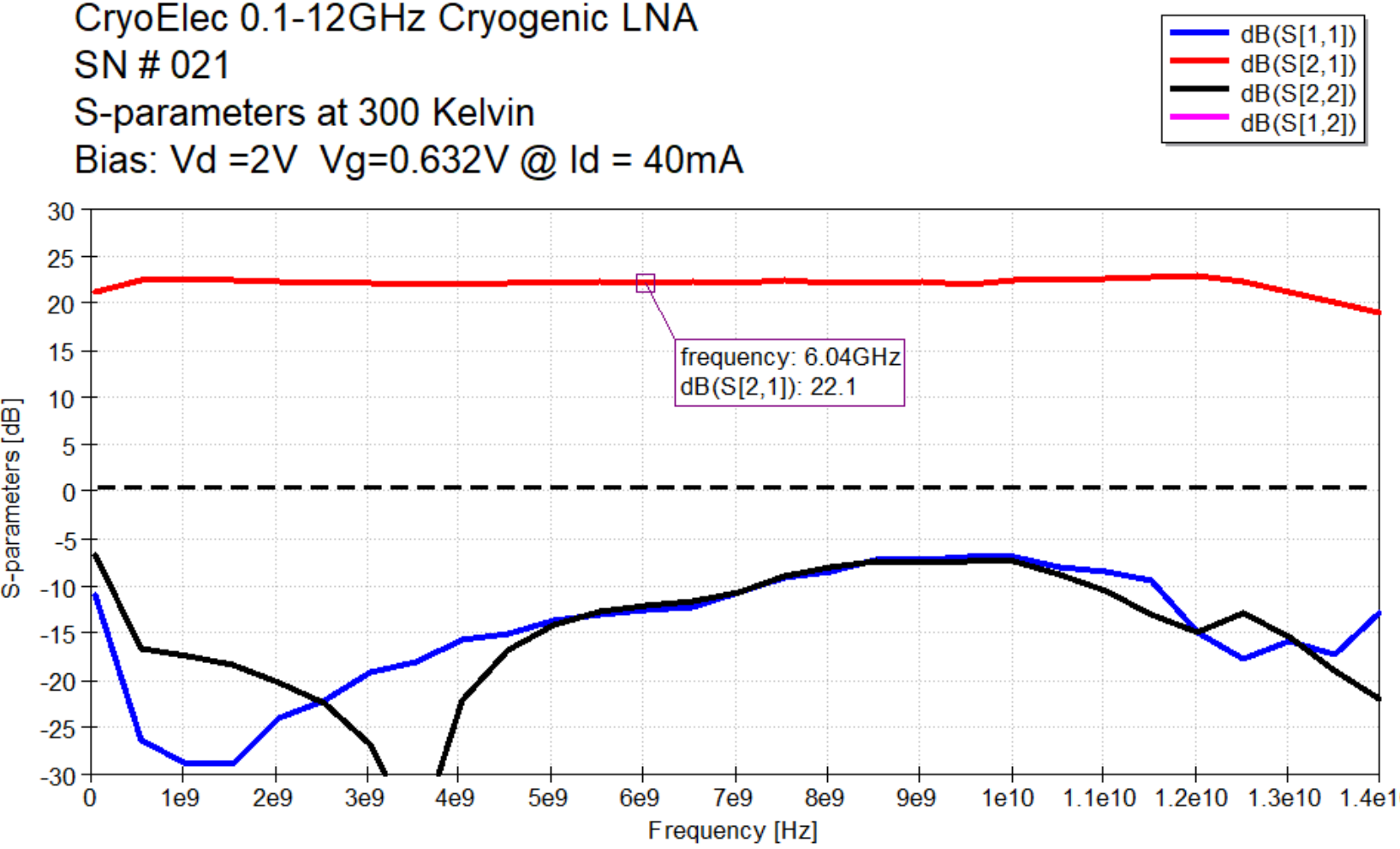
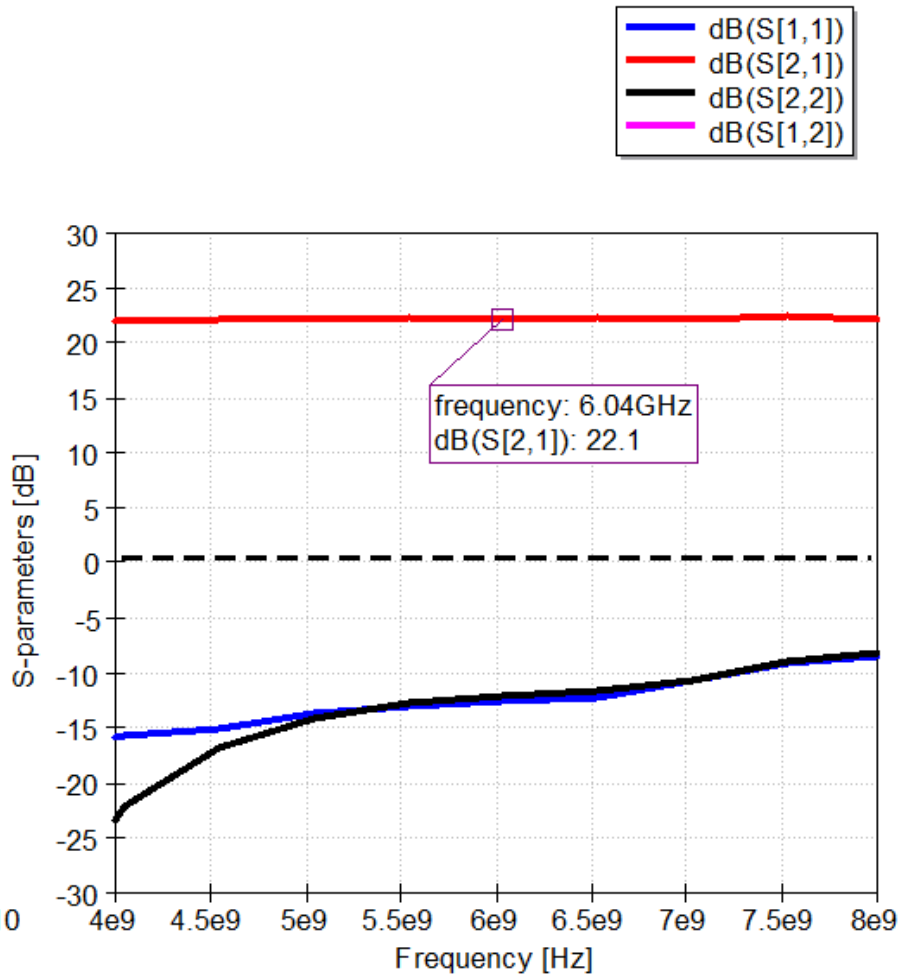
SN # 021
S-parameters at 300 Kelvin
Bias: Vd =2V Vg=0.632V @ Id = 40mA

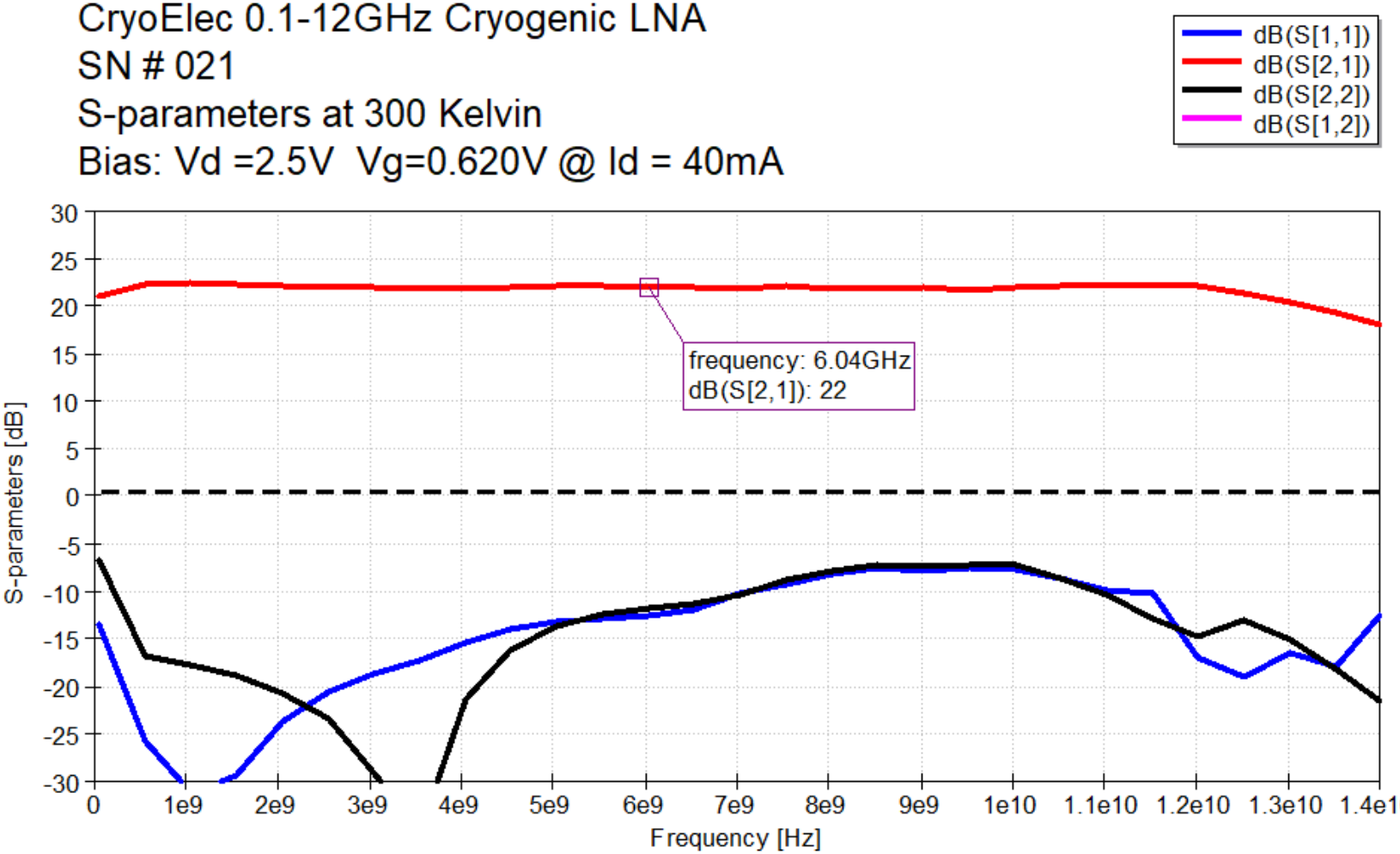


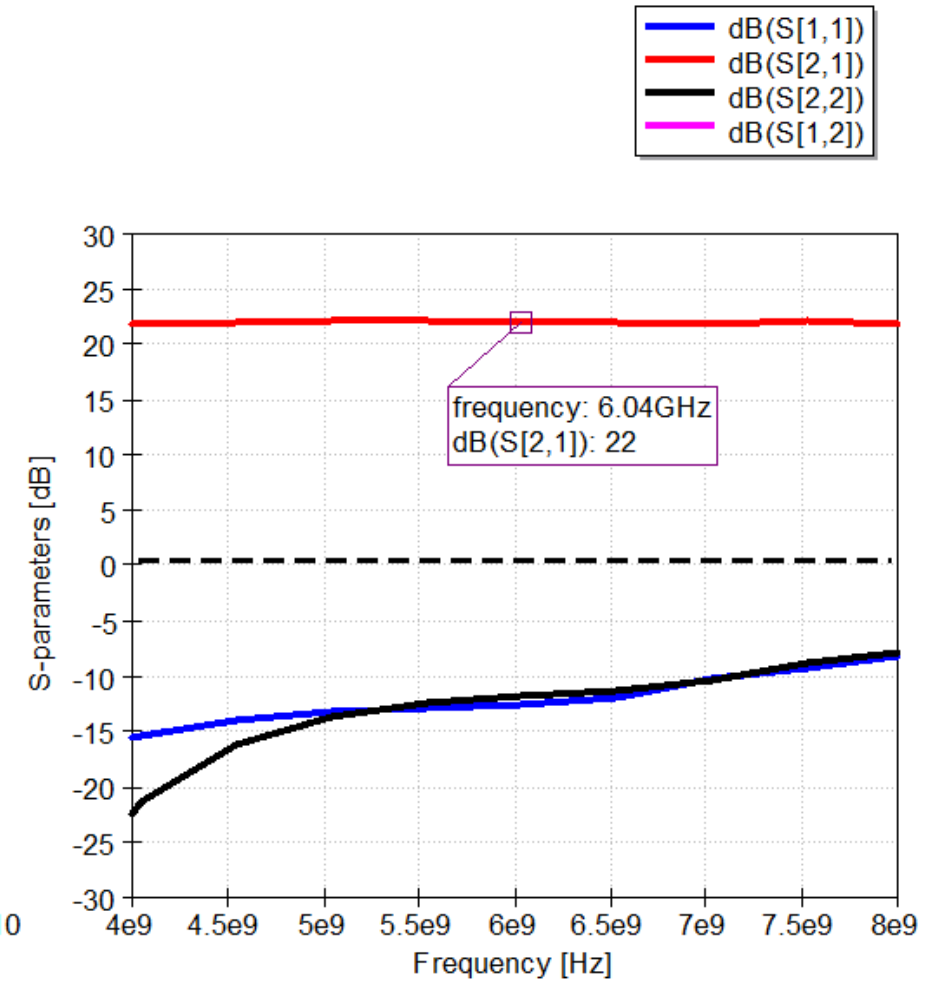


S-parameters and Input P1dB@ 300 Kelvin

Input P1dB: -14dBm (Measured at 6GHz)
@ 2.5V/40mA (100mW Power Consumption)

CryoElec 0.1-12GHz Cryogenic LNA
SN # 021
S-parameters at 300 Kelvin
Bias: Vd =2.5V Vg=0.620V @ Id = 40mA





Key Features of the LNA

- Flat Gain on the 0.1-12GHz Bandwidth
- High linearity cryogenic LNA with an input P1dB of about -20dBm at 20mW power consumption
- (Higher P1dB at higher bias voltage/current)
- Input IP3 is at least 10dB higher than the P1dB point
- LNA useable on the entire wide bandwidth: 0.05-14GHz
- LNA can be used at wide range of temperatures: from 300K down to 4 Kelvin
- LNA is impedance matched at the input and output: |S11| and |S22| are both < -10dB over the band
- The LNA is unconditionally stable on the 0.1-14GHz band
- No Negative gate voltages is required, only 2 x constant positive bias voltages needed (Vd and Vg)
- ESD Robust design
- RFI (Radio Frequency Interference) tight chassis
- Field replaceable Input and Output SMA connectors
- Compact and light weight Aluminum Package: 1x0.5x0.3in

Maximum Ratings

- Maximum input / Output signal power: +13dBm
- Maximum DC Bias Voltages: +5V
- Maximum Storage and Operating Temperature: 140 C / 280 F
- Maximum torque on SMA connectors: 5 in–lb (56 N-cm)

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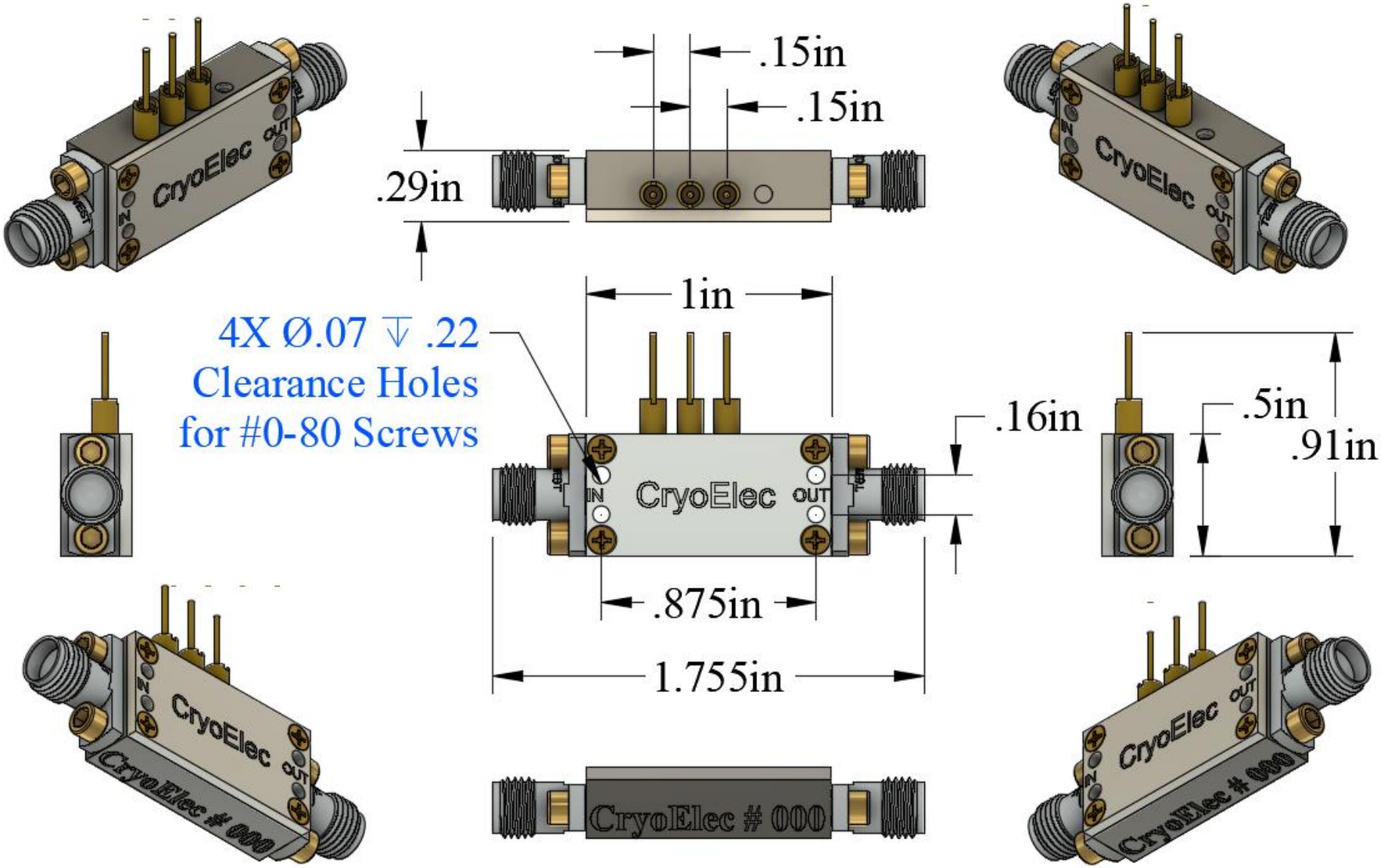
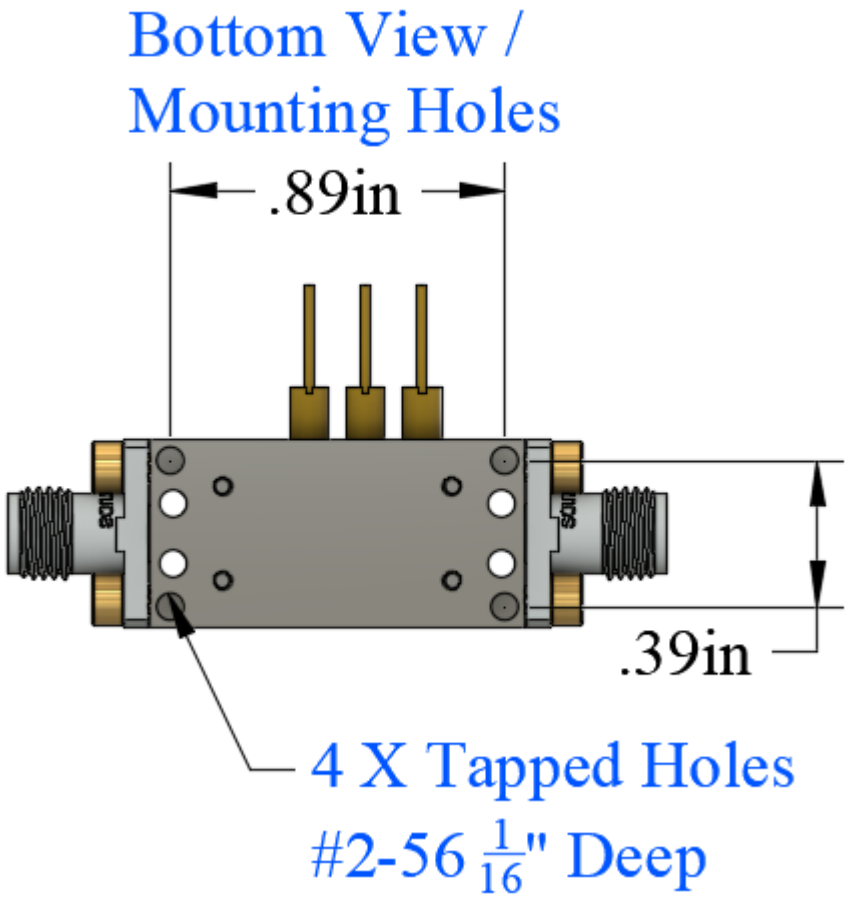
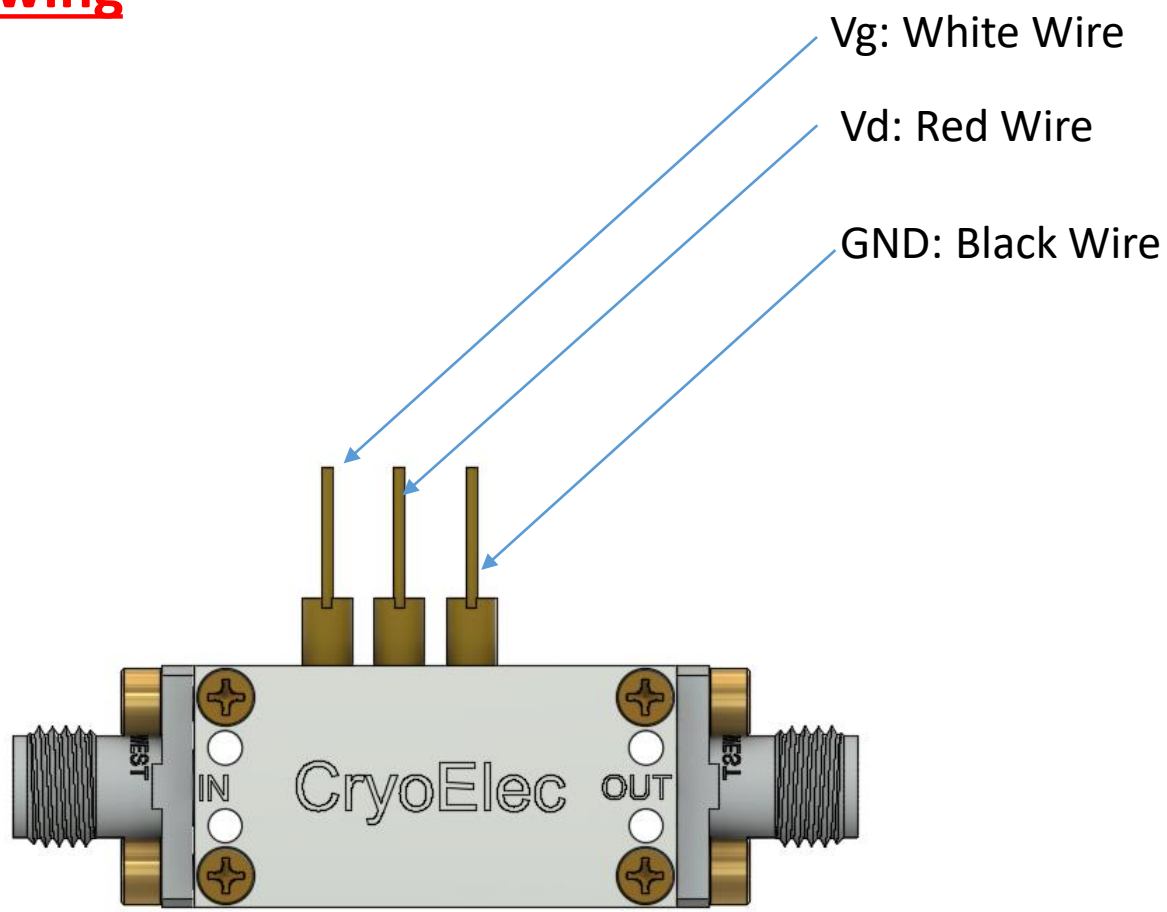
Mechanical Drawing



Mechanical Drawing





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