



CITCRYO1-12D

Cryogenic HEMT Low Noise Amplifier

KEY FEATURES

- Very low noise, approximately $<8\text{K}$, over 1 to 12 GHz
- Operates with wide range of DC supply voltage
- Provides usable gain and noise at DC power as low as 10 mW
- Input return loss is $<-10\text{ dB}$ from 4.5-12 GHz

PERFORMANCE FEATURES

- RF frequency
 - 1 to 12 GHz
- Gain
 - $35\text{ dB} \pm 2\text{ dB}$
- Average noise temperature
 - $< 8\text{ Kelvin}$
- Average noise figure
 - 0.11 dB

APPLICATIONS

- ✓ Radio astronomy arrays
- ✓ Satellite and Space Communication
- ✓ Research & development



Description

- The CITCRYO1-12D is a cryogenic, low noise, broadband amplifier. In its standard configuration, it comes with female SMA connectors on the RF-input and output and a 4-pin 2 mm pitch header for the DC. The amplifier requires three separate DC-voltages.

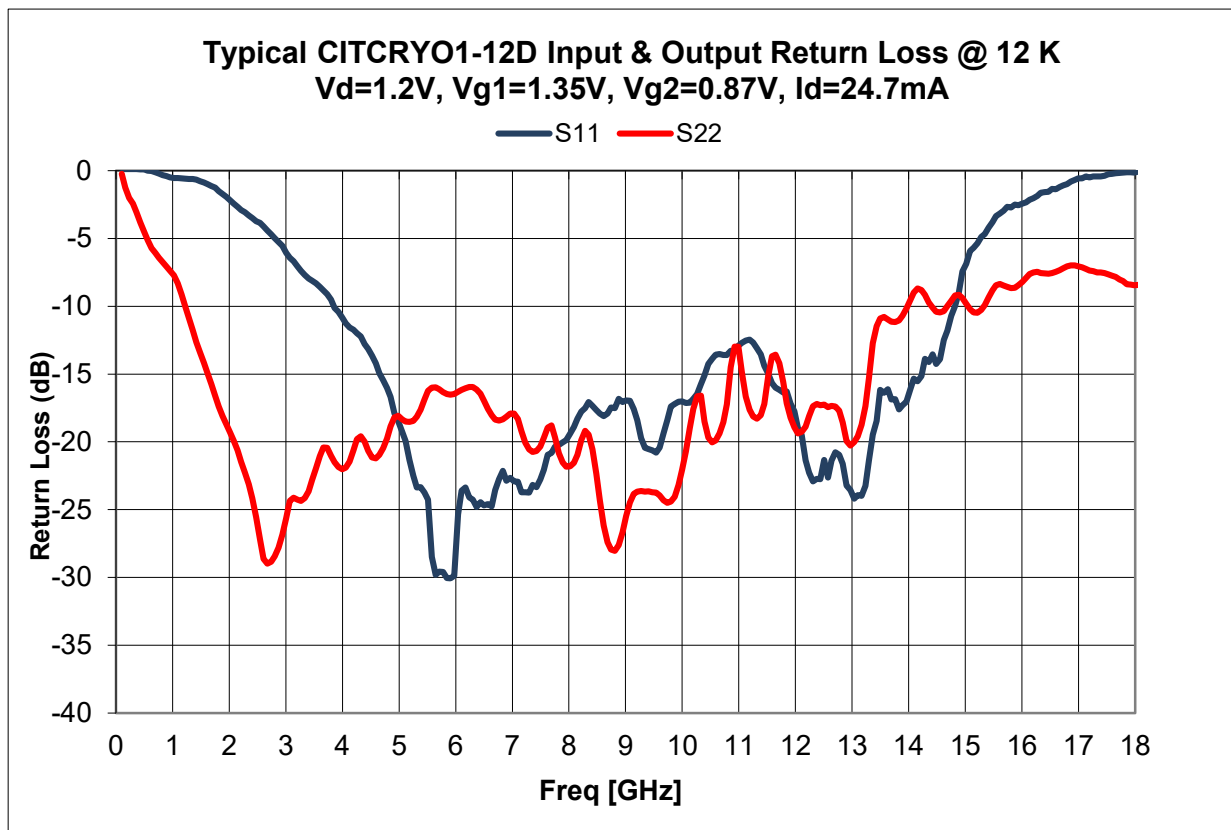
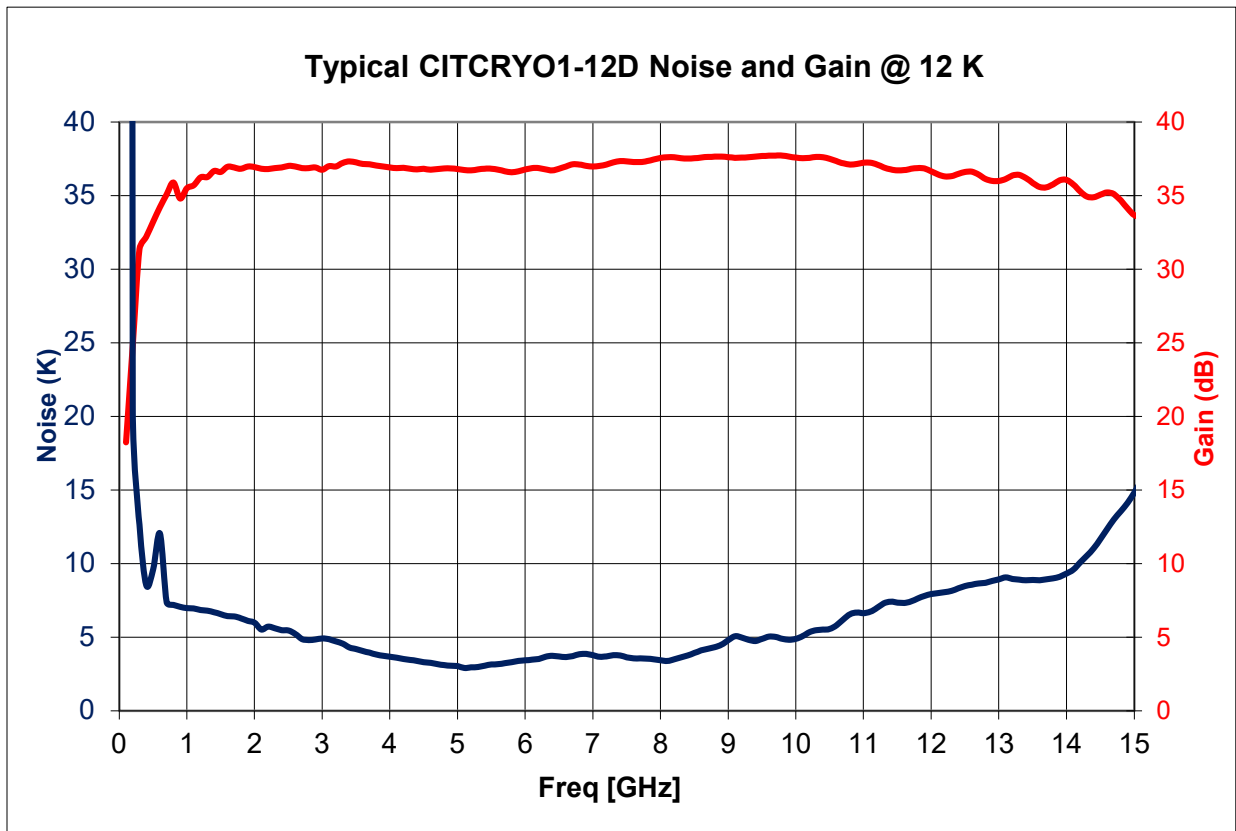
Electrical Specifications @ 12 K

Description	Typical	Minimum	Maximum
RF Frequency		1 GHz	12 GHz
Gain	35 dB	35 dB \pm 2 dB	
Noise Temperature	< 8 K		
IRL (-20log S ₁₁)		< -10 dB (4.5-12 GHz)	
ORL (-20log S ₂₂)		< -15 dB (2-12 GHz)	
Drain Voltage	1.2 V	0.8 V	1.6 V

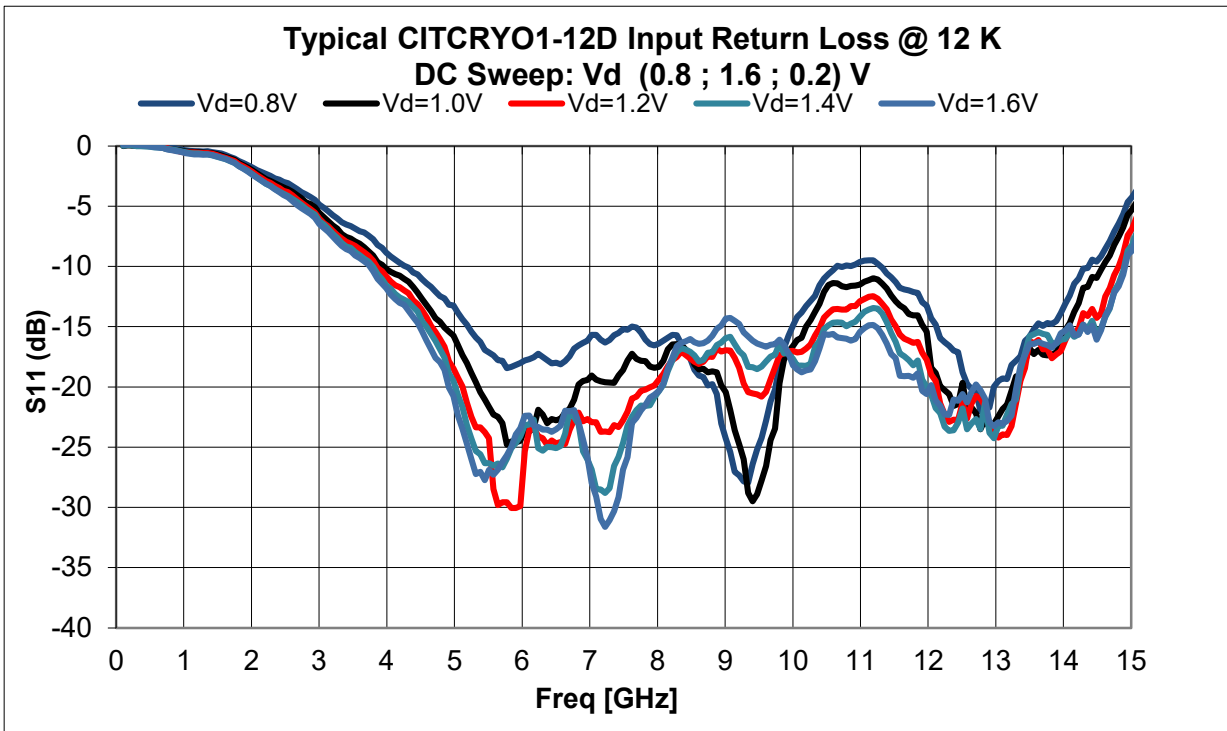
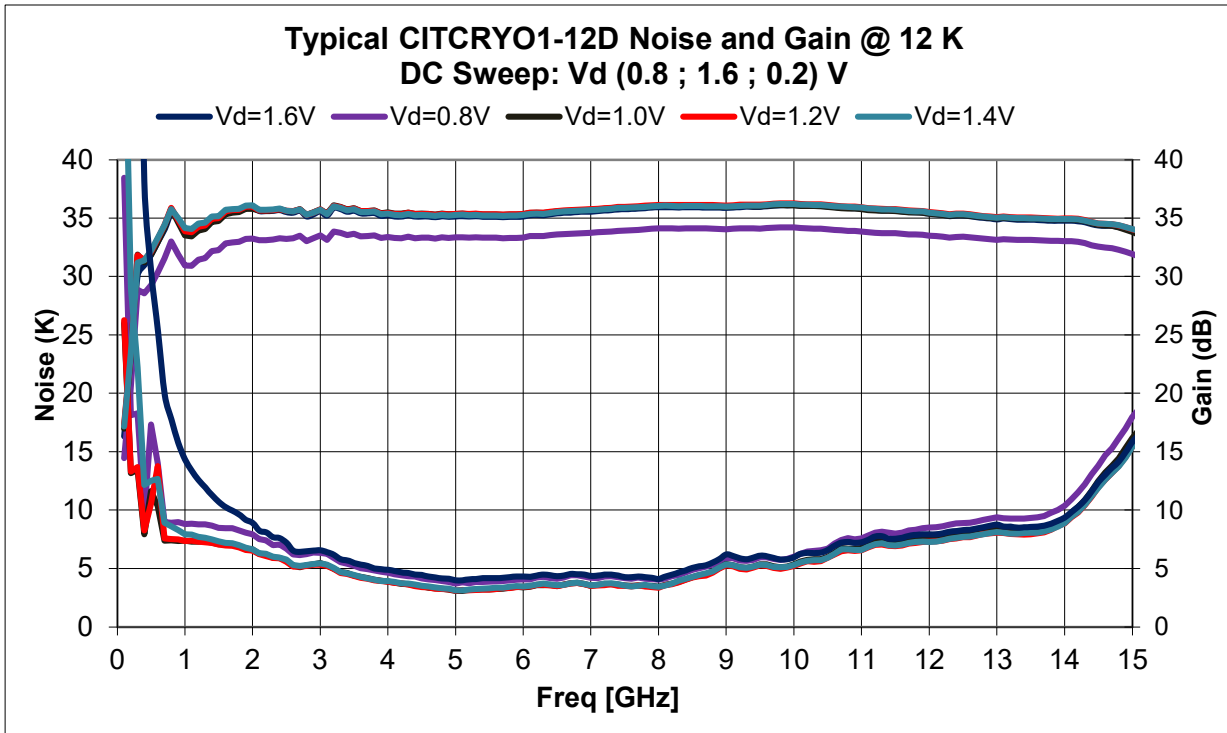
Electrical Specifications @ 300 K

Description	Typical	Minimum	Maximum
RF Frequency		1 GHz	12 GHz
Gain	35 dB	35 dB \pm 2 dB	
Noise Temperature	80 K		
IRL (-20log S ₁₁)		< -10 dB (4.5-12 GHz)	
ORL (-20log S ₂₂)		< -15 dB (2-12 GHz)	
DC Voltage	1.8 V	0.8 V	1.6 V

Typical Test Results – Optimum DC Bias @ 12 K

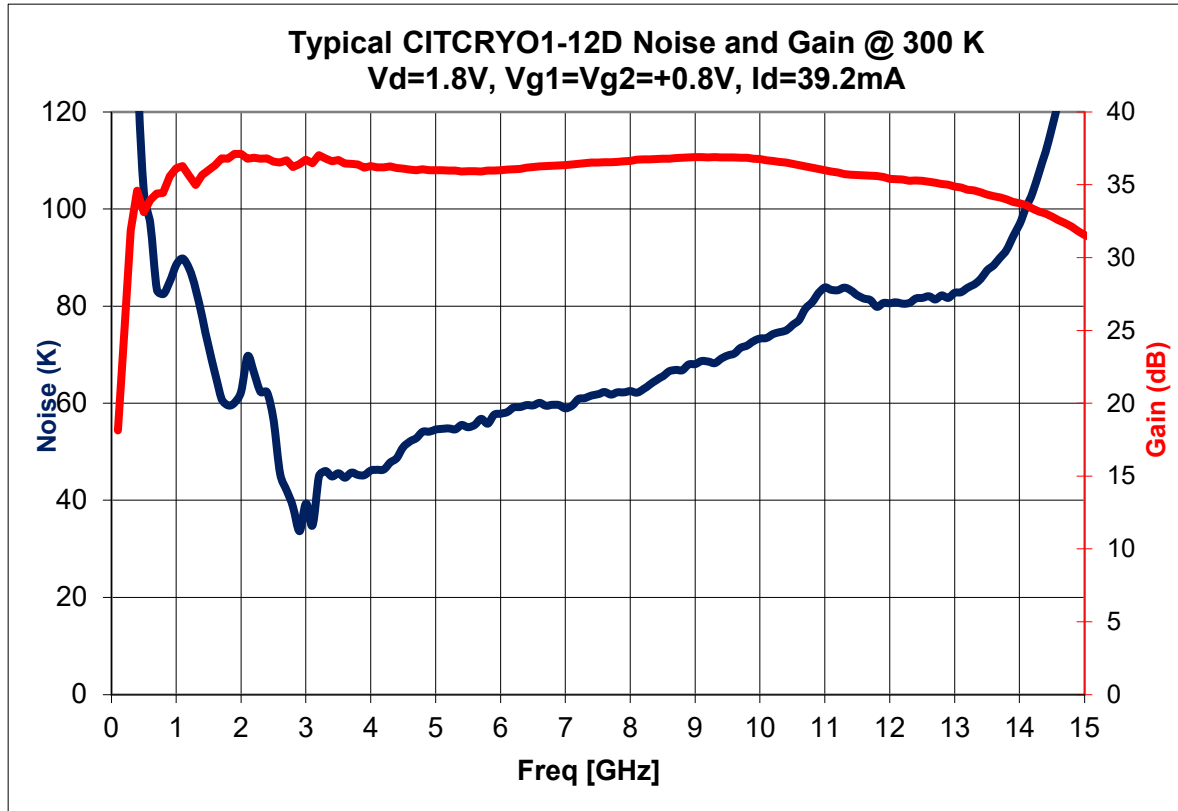


Typical Test Results – DC Bias Sweep @ 12 K

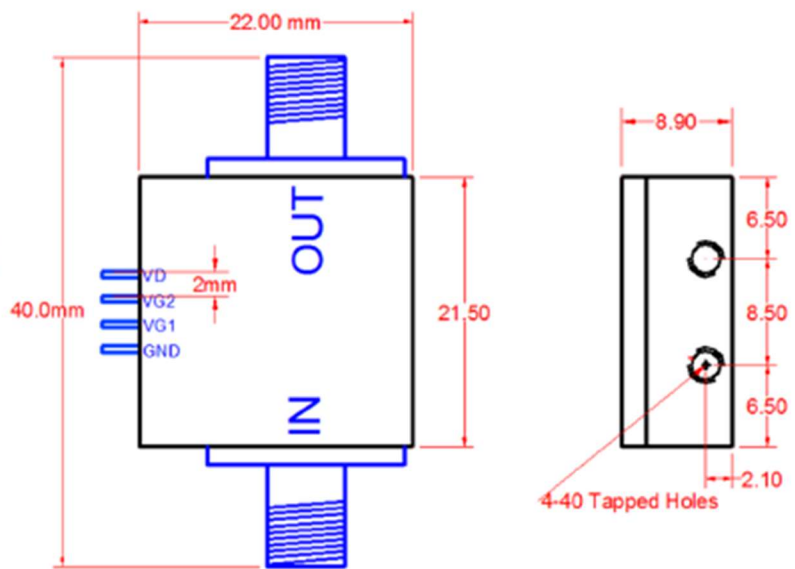


Vd (V)	Vg1 (V)	Vg2 (V)	Id (mA)
0.8	1.27	1.18	19.4
1.0	1.43	1.15	24.6
1.2	1.35	0.87	24.7
1.4	1.42	0.58	25.9
1.6	1.36	0.34	27.0

Typical Test Results – Optimum DC Bias @ 300 K



CAD Housing Drawing



*Dimensions are in mm

Product Care and Maintenance

- Use care to not bend (and break) the DC bias pin when tightening the output SMA connector.
- The amplifier should not be connected to the power supply when connecting the input connector.
- Set the power of Port 1 in your VNA to be less than -45 dB when testing the amplifier. Otherwise, the amplifier may saturate, and the data obtained will be incorrect.
- Do not attempt to open the amplifier.
- Electrostatic discharge may damage the amplifier

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