



Dynamic Engineers Inc.

2550 Gray Falls Dr., Suite#128, Houston, TX, 77077 USA
TEL: 1-281-870-8822 EMAIL: Sales@DynamicEng.com

LNA9947X-17.7GHz-20.2GHz-A

K-band Waveguide Amplifier

Features and Benefits

- 17.7-20.2GHz Frequency Range
- Gain Flatness $<\pm 1.5\text{dB}$
- Typical N.F. $<2.0\text{dB}$
- High Gain (50dB)
- Typical I/O VSWR $<1.3:1/1.3:1$
- Advance PHEMT Technology
- Reverse Voltage Protection
- MIL-883, MIL45208 construction and reliability
- Painted
- Weatherproofed
- WR-42 Input and Output Flanges



Typical Applications

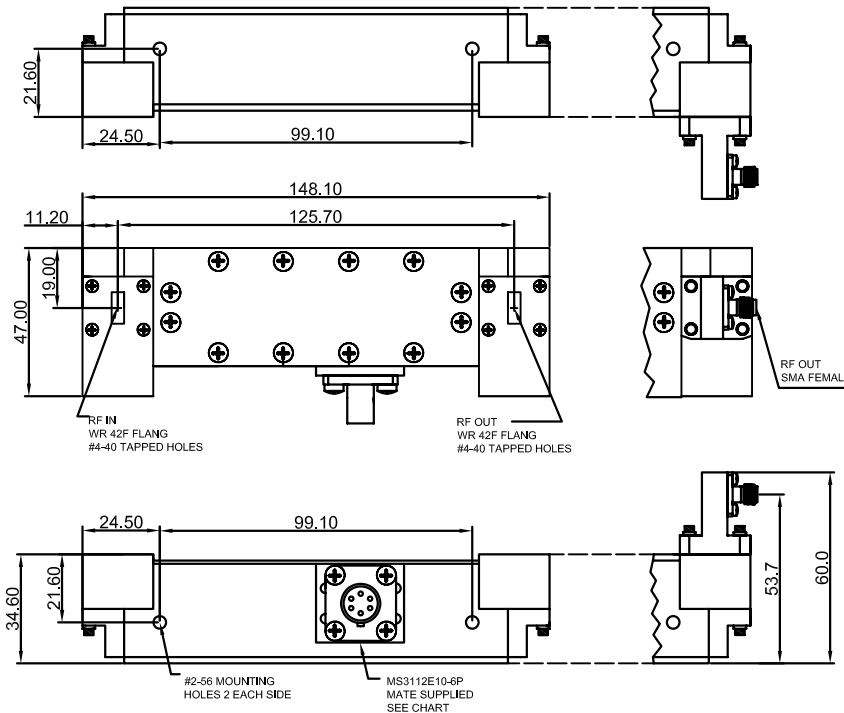
- SATCOM Receiver Front End
- Radar Systems
- Point-to-Point Systems
- Telemetry

Description

The LNA9947X-17.7GHz-20.2GHz-A is a K-Band, high gain, low noise waveguide amplifier with very low input and output return loss. The device is designed for receiving systems for radar, SATCOM and other telecom applications.

Mechanical Drawing & Pin Connections

Drawing No:MD170008-1



6 PIN POWER/ALARM CONNECTOR	
PIN	MS3112E10-69
A	+11 TO +24 VDC
B	GND
C	GND
D	OPEN ON FAULT
E	COMMON
F	CLOSED ON FAULT

TOLERANCE: $\pm 0.5\text{mm}$

Unit : mm
1mm=0.039inch



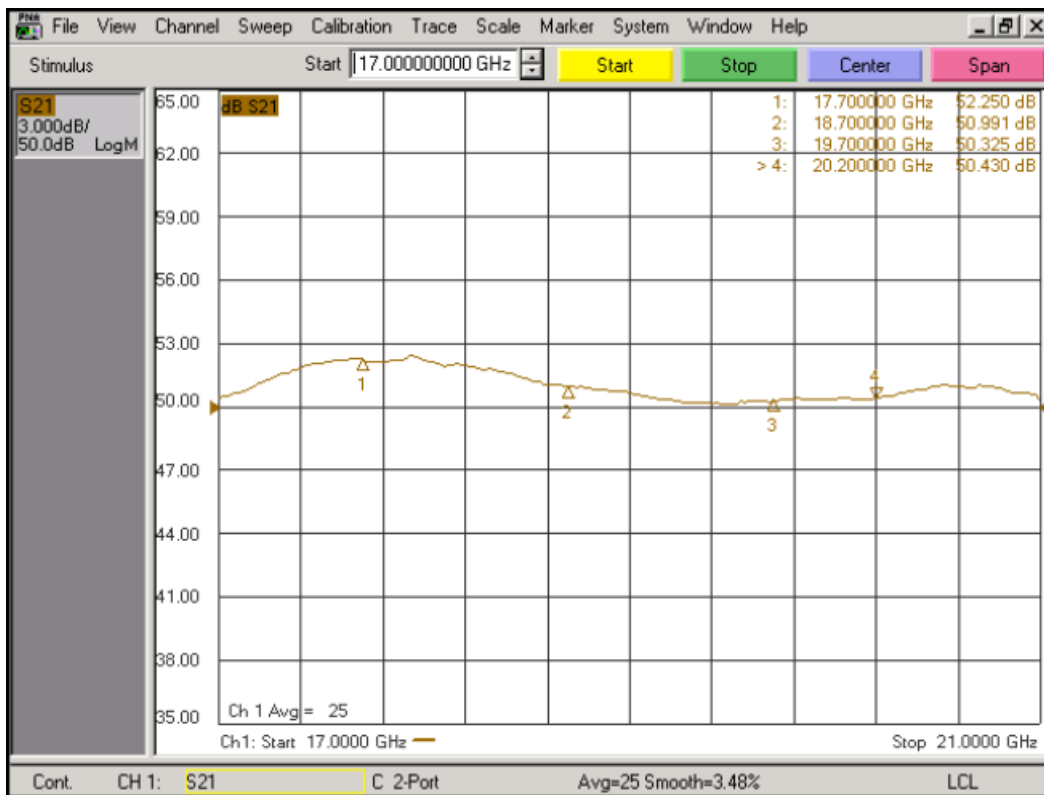
Key Specifications at 23°C

Parameter	Value			Unit	Note
	Min.	Typ.	Max.		
Frequency	17.7		20.2	GHz	Customizable
Gain	50	52	-	dB	Customizable
Gain Flatness	-	±1.5	±1.5	dB	Customizable
In/Out VSWR	-	1.2	1.3	-	Customizable
P@1dB	+8	+12	-	dBm	Customizable
DC Power	+18	-	+18	V@mA	@230 mA
Noise Figure	-	2.0	2.1	dB	@23°C
Outline / Package	-	-	-	-	Custom

Absolute Maximum Ratings

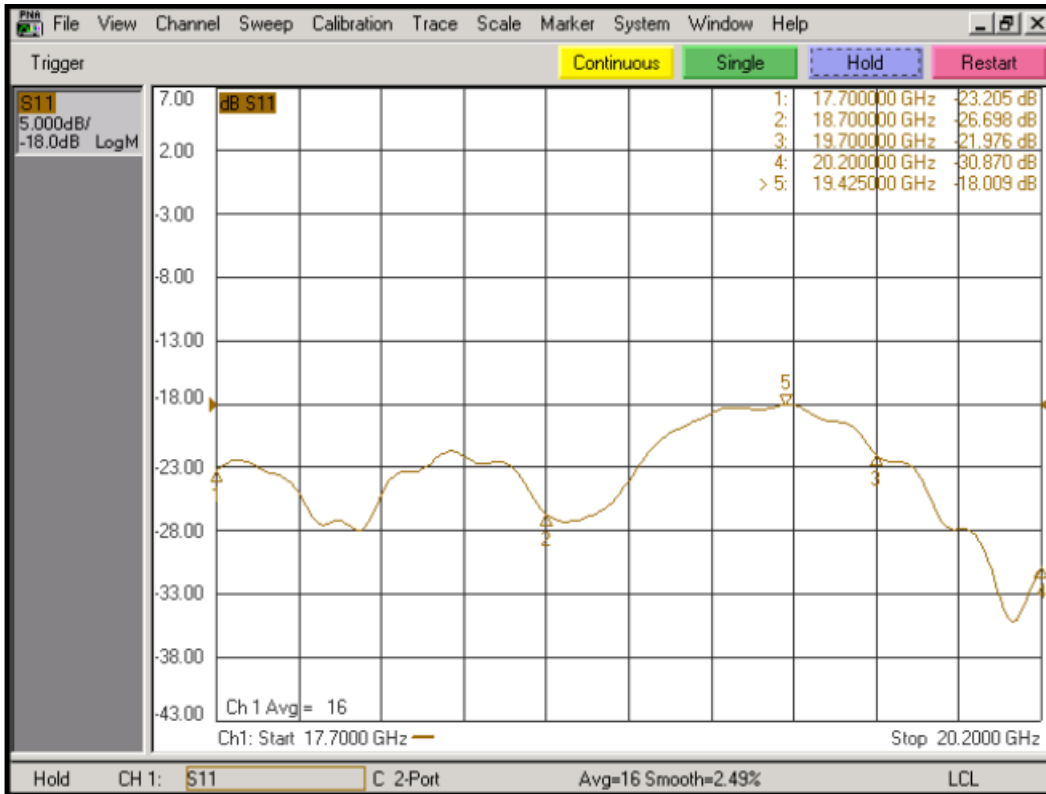
Parameter	Min.	Max.	Unit	Note
Operating Temperature (Case)	-40	+95	°C	95% humidity, non-condensing
Storage Temperature (Case)	-54	+115	°C	95% humidity, non-condensing
RF Input Power	-	+16	dBm	CW
Die Junction Temp (Tj)	-	+150	°C	For GaAs devices
Positive Supply Voltage	-	+16	V	At +V DC Terminal
Negative Voltage	-	-10	V	Reverse Voltage

Typical Measured Data – Gain

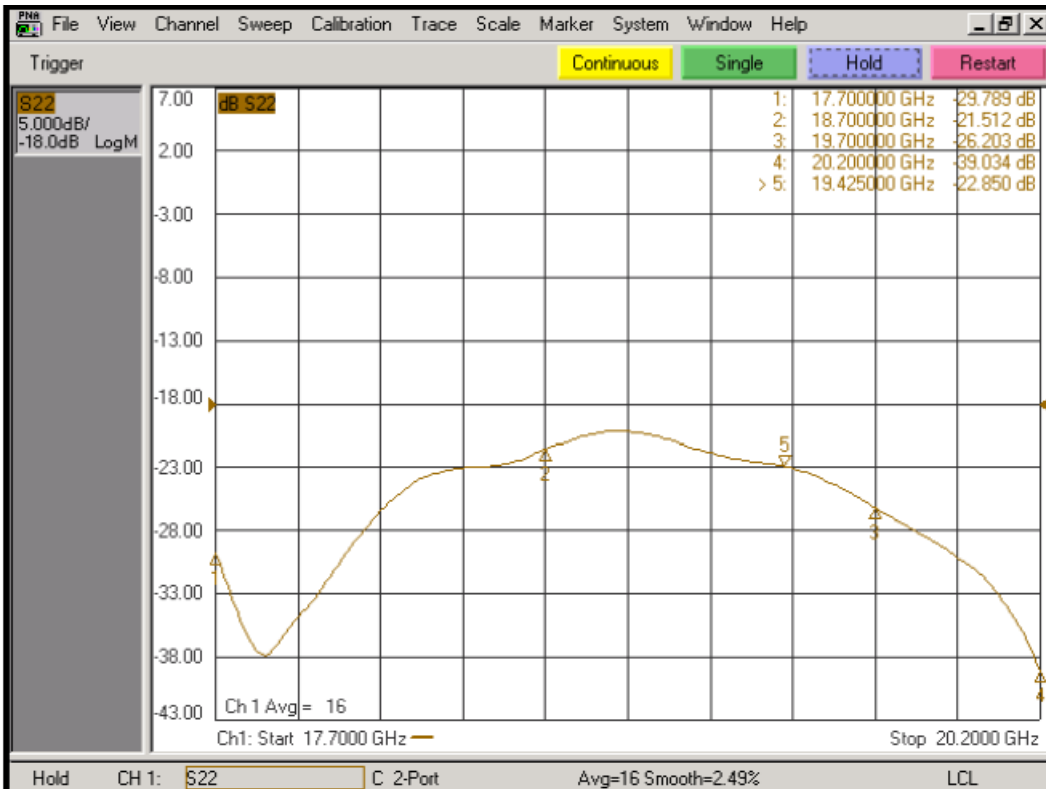




Typical Measured Data – Input Return Loss

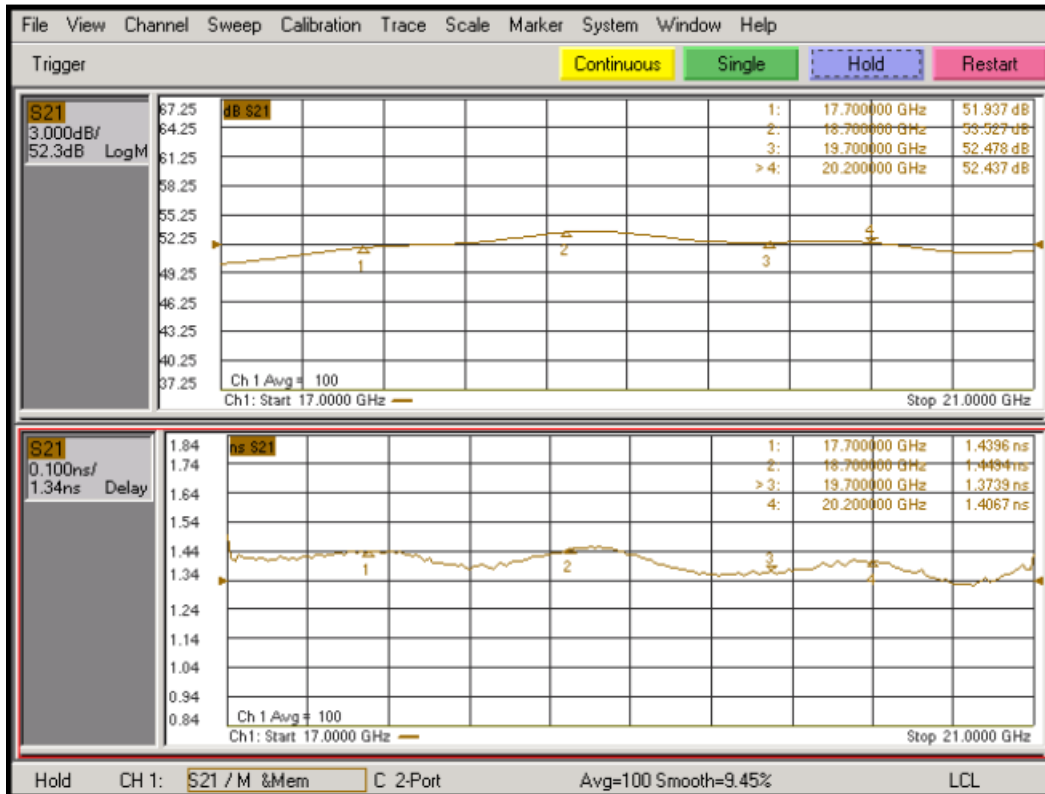


Typical Measured Data – Output Return Loss





Typical Measured Data – Gain and Group Delay



*****Important*** - must use heat sink if case temperature exceeds 50°C**

Specifications at +23°C			
Frequency (nom.):	17.7 - 20.2 GHz	Output Power @ 1 dB Compr. Pt. (min)	+8 dBm
Gain (Min):	50 dB	DC Power Voltage (nom):	+18V to +24V
Gain Stability @ const temp. (max)		Current (max):	230 mA
Short term (10 min)	±0.1 dB	DC Measured Current @ Max Voltage of 24V:	152mA
Medium term (24 hrs)	±0.2 dB		
Long term (1 week)	±0.5 dB		
Gain stability vs. temp. (max)	-0.05 dB/°C	Third-order Intercept point IP3 (min.)	18 Measured +22 dBm
Gain Flatness (max.) full band	±1.5 dB	Noise Figure (Max.):	2.1 dB
Gain Flatness (max.) in 40 MHz	±0.2 dB	Outline W/G (box):	WGA1008OD
VSWR Input (max.)	1.30:1	Outline LNA (SMA con.):	
VSWR Output (max.) in linear: @ impedance Z ₀	1.30:1	AM/PM conversion for -5 dBm out power (max.)	0.05 deg./dB
Input Power w/o damage (max.)	0 dBm	Group delay in any 40 MHz band	
Group delay in any 40MHz band Linear (max.), ns/MHz	0.01	Ripple (max.), ns p-p:	0.1
Parabolic (max.), ns/MHz	0.001		

Note: Test data taken with case temperature of +23°C

Frequency (GHz)	Gain (dB)	VSWR		Noise Figure (dB)	P1dB compr. (+dBm)	Group delay lin. Ns
		In	Out			
17.7	52.6	1.15	1.06	1.62	12	1.73
18.7	51.4	1.10	1.17	1.73	12	1.63
19.7	50.7	1.17	1.11	1.90	12	1.58
20.2	50.9	1.08	1.15	2.00	12	1.60