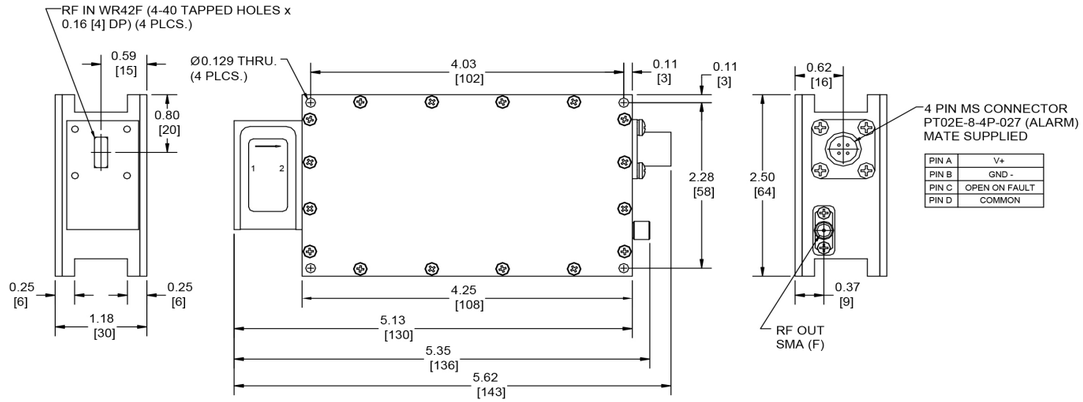
NOTES:
1. DIMENSIONS ARE SHOWN IN INCHES AND [mm].



Other Products

- Solid-State Power Amplifiers and SSPA Systems
- Solid-State Power BUCs and SSPB Systems
- Low Noise Amplifiers and LNA Systems
- Low Noise Block Converters and LNB Systems
- Block Up and Block Down Converters
- Synthesized Converters
- Line Drive Amplifiers
- Power Supply Monitors
- Redundant Control Panels for SSPAs, SSPBs, and LNAs

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GENERAL DYNAMICS
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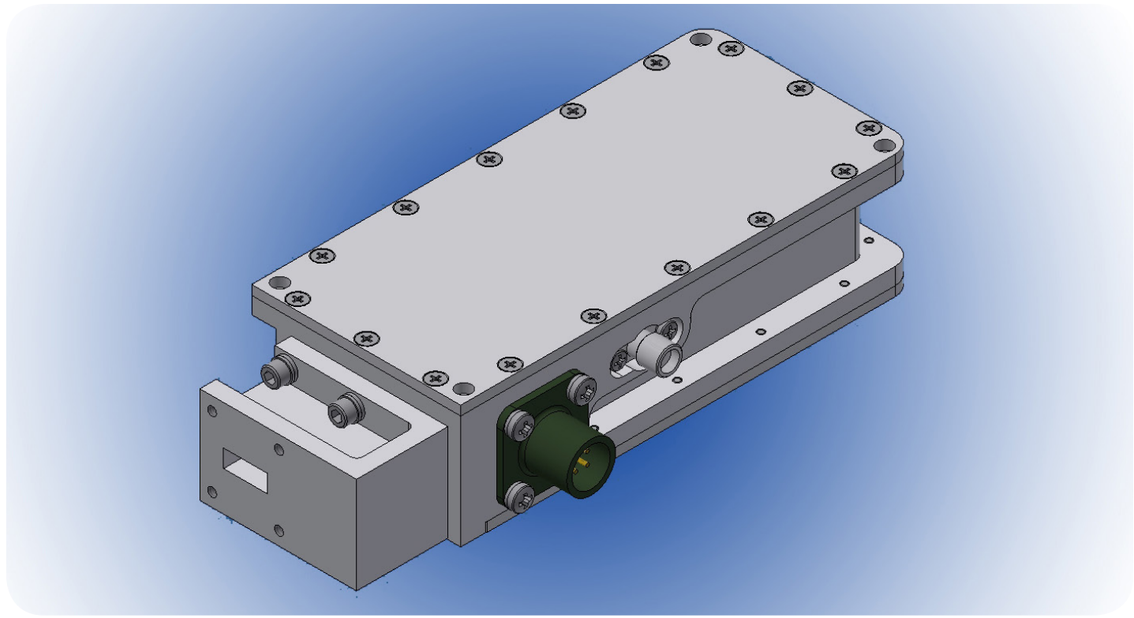
Ka-Band Low Noise Amplifiers

LK-20S000 Series



Wideband coverage

Noise temperatures to 110° K

High reliability HEMT design

Input/output isolators

Reverse polarity protection

Overview

LK-20S000 series Ka-Band Ultra Low Noise Amplifiers are specially designed for satellite earth station and other telecommunications applications. Utilizing state-of-the-art HEMT and GaAs FET technology, these amplifiers have been designed for both fixed and transportable applications. High performance models are available with noise temperatures from 130° K to 110° K. All noise temperature specifications are guaranteed over the full bandwidth of the LNA.

- Low gain, 50 dB typical
- High Output power, P1 dB = +20 dBm minimum
- Excellent guaranteed gain stability due to built-in
- Temperature compensation circuit (test data provided) Universal input AC power supply

Parameter	Notes	Min	Nom./Typ.†	Max.	Units
Frequency	Band "A" Band "B"	18.2 20.2		20.2 21.2	GHz GHz
Gain	Standard Option 1	57 47	60 50	63 53	dB dB
Gain Flatness	Full band Per 40 MHz			±1.0 ±0.2	dB dB
VSWR	Input Output		1.25 1.40	1.30 1.50	:1 :1
Noise Temperature[A]	At +23 °C Versus temperature		 See Table 2	See Table 1	
Power Output at 1 dB compression (P_1 dB)	Standard Option 2	+12 +20	+14 +22		dBm dBm
3rd Order Output Intercept Point, OIP_3	Standard Option 2	+22 +28	+24 +30		dBm dBm
Group Delay per 40 MHz	Linear Parabolic Ripple			0.01 0.001 0.1	ns/MHz ns/MHz² ns p-p
AM/PM Conversion	-5 dBm Output			0.05	°/dB
Gain Stability (Constant Temp.)	Short term (10 min) Medium term (24 hrs) Long term (1 week)		±0.1 ±0.2 ±0.5		dB dB dB
Gain Stability	Versus temperature (Standard) Improved stability (Option 3) over operational temp range		-0.06	 2.0	dB per °C dB pk-pk
Maximum Input Power	Damage threshold Desens. threshold 29.0–31.0 GHz			0 -25	dBm dBm
Connectors	Input Output Power		WR42 Cover Flange (#4-40 THD holes) SMA Female PT02E-8-4P-027 (mate supplied)		
Power Requirements	Voltage (Standard) Current, @ P_1 dB (Standard) Current, @ P_1 dB (Option 1) Current, @ P_1 dB (Option 2) Voltage (Option 4)[B]	11 90	15	24 600 400 600 265	Vdc mA mA mA Vac
Operating Temperature	T_{AMB} (Standard) T_{AMB} (Option 4)[B]	-40 -40		+70 +60	°C °C

†When there is only one value on a line, the Nom./Typ. column is a nominal value; otherwise it is a typical value. Typical values are intended to illustrate typical performance, but are not guaranteed.

[A] Maximum noise temperature at +23 °C at any frequency in the specified band.

[B] Consult factory for AC power option.

Table 1 – Part Number/Ordering Information

LK□20S□□-□□□□□

Frequency Range	18.2–20.2 GHz	A
	20.2–21.2 GHz	B
Noise Temperature	130 K	130
	120 K	120
	110 K	110
Gain	60 dB typ.	X
	50 dB typ.	1
Output Power	+12 dBm min.	X
	+20 dBm min.	2
Compensation	Standard	X
	Temperature Compensation	3
Power Configuration	+11 to +24 Vdc	X
	90-265 Vac, 47-63 Hz (Consult factory)	4
Finish Color	Commercial White	X
	Green (Fed Std 595B; #34094)	5
	Tan (Fed Std 595B; #33303)	6

Table 2 – Noise Temperature vs. Ambient Temperature

Noise temperature vs. ambient temperature can be found from the equation,

$$NT_2/NT_1 = (T_2/T_1)^{1.8}$$

where:

NT_2 = Noise Temperature at T_2
NT_1 = Noise Temperature at T_1
T_2 = Temperature 2 in K
T_1 = Temperature 1 in K (K = °C + 273)

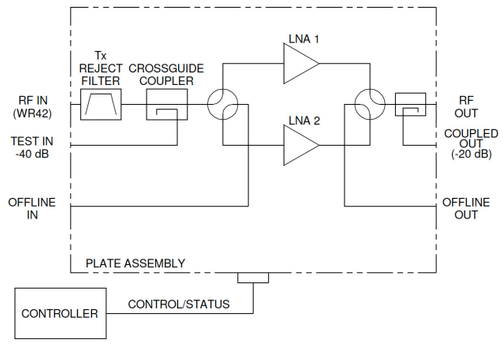
For the case where T_1 = 296 K (+23 °C), the ratio NT_2/NT_1 is shown in the table below:

Ambient Temperature T_2 (°C)	Ratio NT_2/NT_1
0	0.86
+23	1.00
+40	1.11
+50	1.17
+60	1.24

Example: For model LKB20S110-XXXXX, NT_1 = 110 K at +23 °C; what is NT_2 at +50 °C?
From the table, NT_2/NT_1 at 50 °C = 1.17: NT_2 = 1.17 x (110 K) = 128.7 K at 50 °C

Typical Applications

1:1 System



1:2 System