

LK-20S000 series Ka-Band Ultra Low Noise Amplifiers are specifically 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 of 120 K to 110 (Frequency Range Dependent). All noise temperature specifications are guaranteed over the full bandwidth of the LNA.



FEATURES:

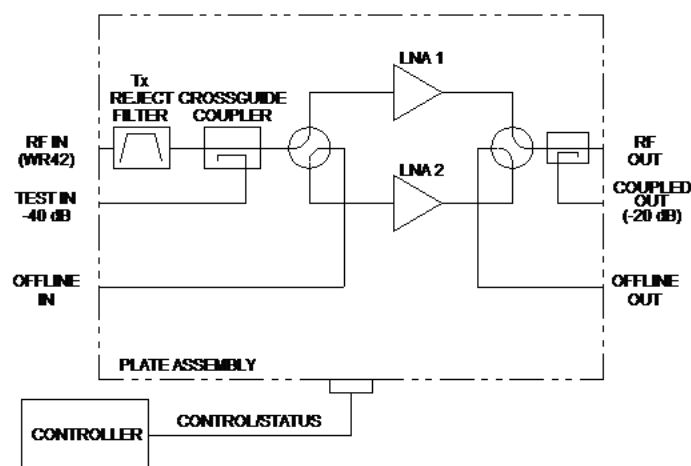
- Wideband coverage
- Noise temperatures to 110 K on select Models
- Temperature Compensated Gain
- High reliability HEMT design
- Input/output isolators
- Reverse polarity protection
- Wide operating temperature range, -40 °C to +70 °C
- Form 'A' alarm

OPTIONS:

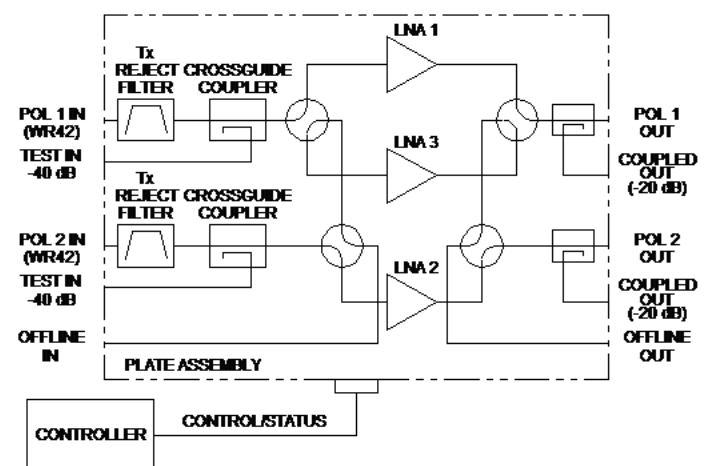
- Gain Levels of 50dB or 60 dB
- High Output power, P_{1 dB} = +20 dBm minimum

Typical Applications

1:1 System



1:2 System



Parameter	Notes	Specification
Frequency Range	Band "A" Band "B" Band "C"	18.2 to 20.2 GHz 20.2 to 21.2 GHz 17.7 to 21.2 GHz
Gain	Standard LNA LNA with Option 1	59 dB min., 65 dB max. 49 dB min., 55 dB max.
Gain Flatness		±1.0 dB over the full band ±0.25 dB per 40 MHz
VSWR	Input Output	1.25:1 typical, 1:30:1 max. 1.40:1 typical, 1:50:1 max.
Noise Temperature, System (1)	At +23°C Versus Temperature	See Table 1 See Table 2
Power Output at 1dB compression (P_{1dB})	Standard LNA LNA with Option 2	+12 dBm min., +14 dBm typical +20 dBm min., +22 dBm typical
3rd Order Output Intercept Point (OIP₃)	Standard LNA LNA with Option 2	+22 dBm min., +24 dBm typical +27 dBm min., +29 dBm typical
Group Delay per 40 MHz	Linear Parabolic Ripple	0.01 ns/MHz 0.001 ns/MHz ² 0.2 ns peak to peak
AM/PM Conversion		0.05°/dB max., at -5 dBm out
Gain Stability (Constant Temperature)	Short term (10 min.) Medium term (24 hrs.) Long term term (1 week)	±0.1 dB typical ±0.2 dB typical ±0.5 dB typical
Gain Stability (Versus Temperature)		5.0 dB typical peak to peak
Maximum Input Power	Damage threshold Desens. Threshold, 27.0-31.0 GHz	0 dBm max. -15 dBm
Connectors	Input Output Powert	WR42 Cover Flange (#4-40 THD holes) SMA Female PT02E-8-4P-027 (mate supplied)
Power Requirements	Voltage Current Voltage (Option 4) (2)	11 VDC min., 28 VDC max. 600 mA 90 VAC min., 265 min. VAC
Operating Temperature	T _{AMB} (Standard) T _{AMB} (Option 4) (2)	-40°C to +70°C -40°C to +60°C

(1) Maximum noise temperature +23 °C at any frequency in the specified band.

(2) 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							
	17.7–21.2 GHz C							
Noise Temperature	120 K 120							
	110 K (Frequency A & B only)..... 110							
Gain	60 dB typ. X							
	50 dB typ. 1							
Output Power	+12 dBm min..... X							
	+20 dBm min. 2							
Compensation	Standard (5dB p-p) X							
Power Configuration	+11 to +28 Vdc X							
	90-265 Vac, 47-63 Hz (Consult factory) 4							
Finish Color	Commercial White X							
	Green (Fed Std 595B; #34094 - Consult factory)..... 5							
	Tan (Fed Std 595B; #33303 - Consult factory) 6							

Table 2 - Noise Temperature vs Ambient Temperature

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

For the case where T₁ = 296 K (+23 °C), the ratio NT₂ /NT₁ is shown in the table below:

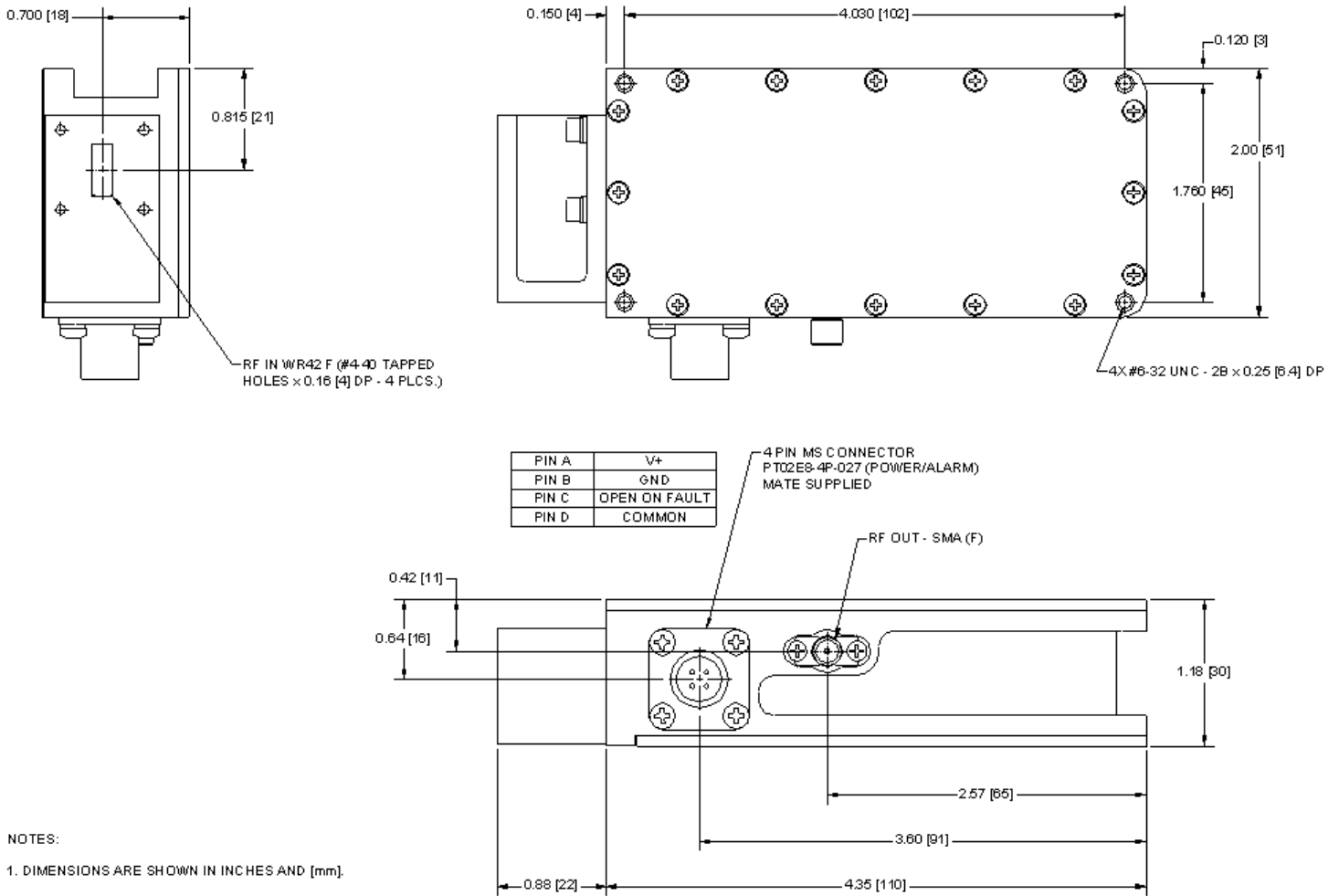
$$NT_2/NT_1 = (T_2/T_1)^{1.8}$$

where:

- NT₂ = Noise Temperature at T₂
- NT₁ = Noise Temperature at T₁
- T₂ = Temperature 2 in K
- T₁ = Temperature 1 in K
(K = °C + 273)

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, NT₁ = 110 K at +23 °C; what is NT₂ at +50 °C?
From the table, NT₂ /NT₁ at 50 °C = 1.17: NT₂ = 1.17 x (110 K) = 128.7 K at 50 °C



Outline 31275