

**LK-12000 series Ku-Band Ultra Low Noise Amplifiers are specifically designed for satellite earth station receiver front ends 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 90, 80, 70 and 65 K. Noise temperature specifications are guaranteed over the full bandwidth of the LNA and are verified by cold load testing.



#### FEATURES:

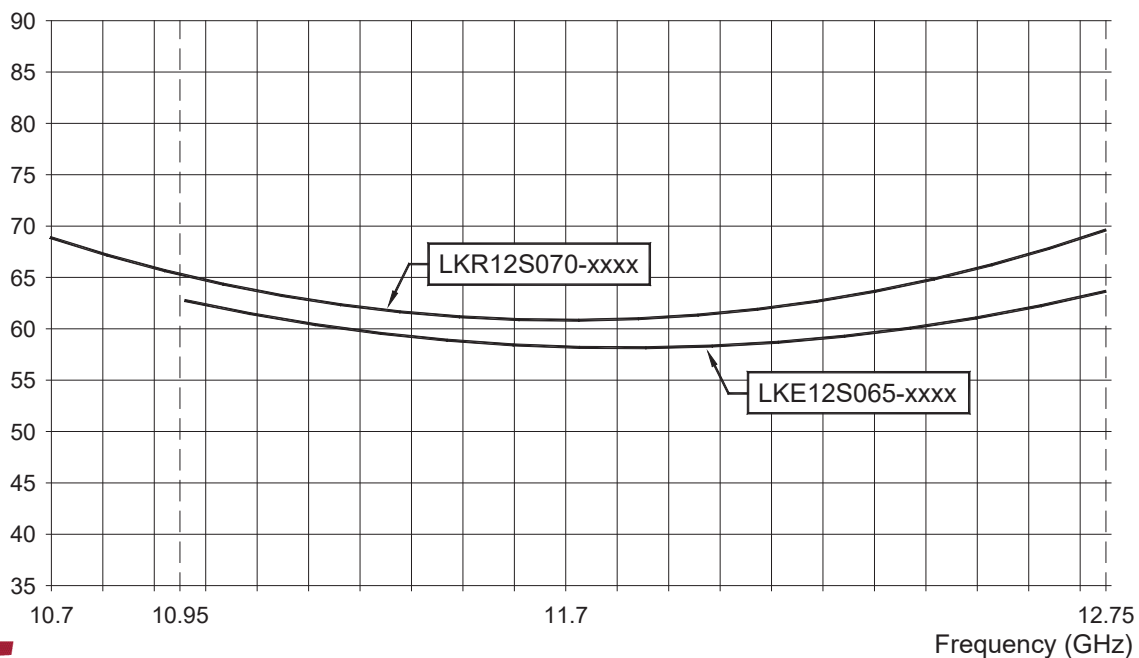
- Noise temperatures to 65 K
- High reliability HEMT design
- Input/output isolators
- Reverse polarity protection
- Wide operating temperature range, -40° C to +70° C
- Form 'C' alarm
- CE certified, RoHS compliant

#### OPTIONS:

- Low gain, 50 dB
- High output power, +20 dBm
- Type N (F) RF output connector
- Universal input ac power supply

Noise Temperature (K)

**LK-12000 Series Typical Noise vs. Frequency**



Parameter	Notes	Specification
<b>Frequency Range</b>	Band "E" Band "R"	10.95 to 12.75 GHz 10.70 to 12.75 GHz
<b>Gain</b>	Standard LNA LNA with Option 1	60 dB min., 64 dB typical, 66 dB max. 50 dB min., 53 dB typical, 56 dB max.
<b>Gain Flatness</b>		±0.5 dB over the full band ±0.20 dB per 40 MHz
<b>VSWR</b>	Input, standard Output	1.20:1 typical, 1.25:1 max. 1.20:1 typical, 1.50:1 max.
<b>Noise Temperature, System (1)</b>	At +23°C Versus Temperature	See Table 1 See Table 2
<b>Power Output at 1dB compression (P<sub>1dB</sub>)</b>	Standard Option 2	+12 dBm min., +15 dBm typical +20 dBm min., +22 dBm typical
<b>3<sup>rd</sup> Order Output Intercept Point (OIP<sub>3</sub>)</b>	Standard LNA Option 2	+22 dBm min., +25 dBm typical +30 dBm min., +32 dBm typical
<b>Group Delay per 40 MHz</b>	Linear Parabolic Ripple	0.01 ns/MHz 0.001 ns/MHz <sup>2</sup> 0.1 ns peak to peak
<b>AM/PM Conversion</b>		0.05°/dB max., at -5 dBm out
<b>Gain Stability (Constant Temp)</b>	Short term (10 min.) Medium term (24 hrs) Long term (1 week)	±0.1 dB max ±0.2 dB max ±0.5 dB max
<b>Gain Stability vs. Temperature</b>		-0.04 dB per °C
<b>Maximum Input Power</b>	Damage Threshold Desens. Threshold 13.75-14.50 GHz	0 dBm max. -20 dBm max.
<b>Connectors</b>	Input Output, standard Output, Option 7 Power, standard (2)	WR75 Cover Flange SMA Female Type N Female PT02E10-6P-027 (mate supplied)
<b>Power Requirements</b>	Voltage, standard Current, standard Current, with Option 2	12 V min., 15 V typical, 24 V max. 140 mA typical, 210 mA max. 270 mA typical, 330 mA max.
<b>Operating Temperature</b>	T <sub>AMB</sub>	-40°C to +70°C
<b>MTBF (MIL-HDBK-217F)</b>	Ground fixed, +40°C	130,000 hours
(1) Maximum Noise temperature at +23°C at any frequency in the specified band. (2) DC power may be supplied either via the RF output connector (cable powered) or via MS type connector.		

**Table 1 - Part Number/Ordering Information**

	<b>LK</b>	<b>12S</b>	-	□	□	□	□
<b>Frequency Range</b>							
10.95–12.75 GHz .....		E					
10.70–12.75 GHz .....		R					
<b>Noise Temperature</b>							
90 K.....						90	
80 K.....						80	
70 K.....						70	
65 K.....						65	
<b>Gain</b>							
60 dB minimum .....					X		
50 dB minimum .....					1		
<b>Output Power</b>							
+12 dBm .....					X		
+20 dBm .....					2		
<b>Power Configuration</b>							
+12 to +24 Vdc.....					X		
90-265 Vac, 47-63 Hz.....					4		
<b>RF Out Connector</b>							
SMA Female .....					X		
Type N Female .....					7		

**Table 2 - Noise Temperature vs Ambient Tem-**

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

For the case where T<sub>1</sub> = 296 K (+23 °C), the ratio NT<sub>2</sub> /NT<sub>1</sub> is shown in the table below:

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

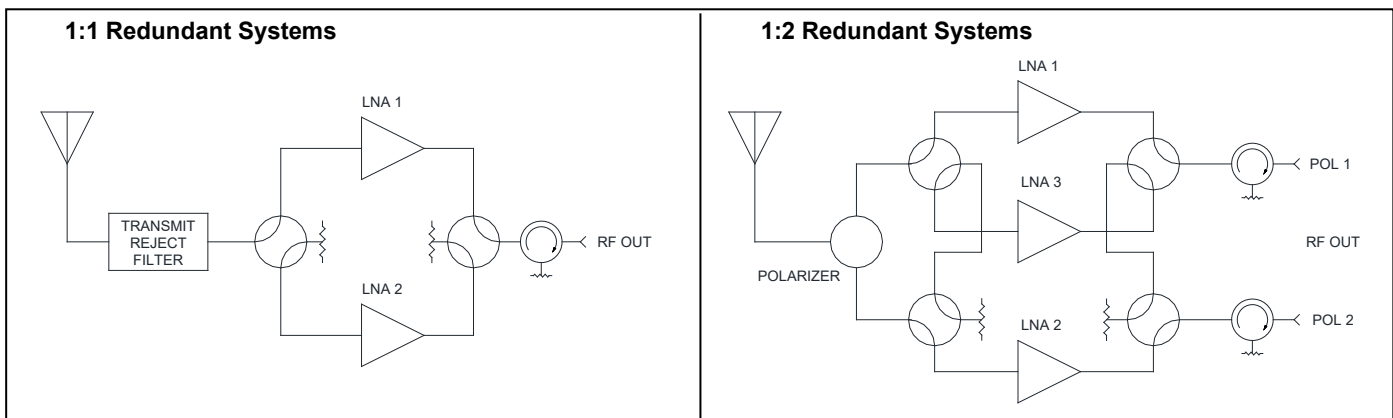
where:

- NT<sub>2</sub> = Noise Temperature at T<sub>2</sub>
- NT<sub>1</sub> = Noise Temperature at T<sub>1</sub>
- T<sub>2</sub> = Temperature 2 in K
- T<sub>1</sub> = Temperature 1 in K  
(K = °C + 273)

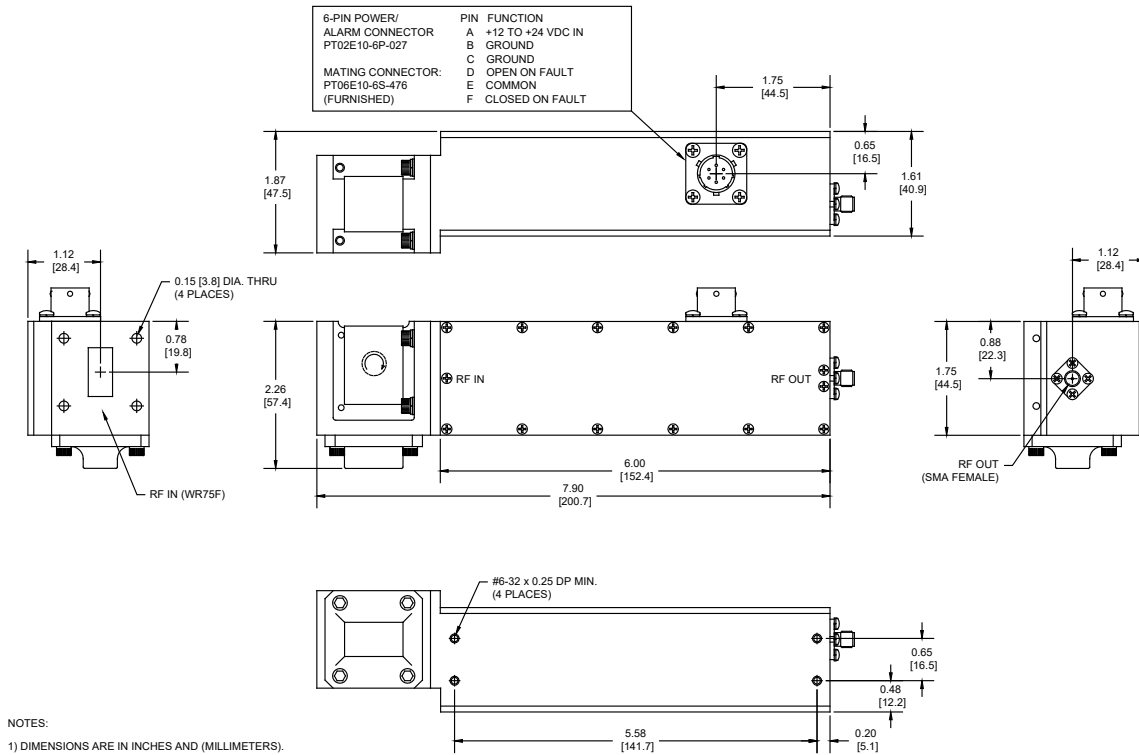
Ambient Temperature T <sub>2</sub> (°C)	Ratio NT <sub>2</sub> /NT <sub>1</sub>
0	0.86
+23	1.00
+40	1.11
+50	1.17
+60	1.24

Example: For model LKE12S90-XXXX, NT<sub>1</sub> = 90 K at +23 °C; what is NT<sub>2</sub> at +50 °C?  
From the table, NT<sub>2</sub> /NT<sub>1</sub> at 50 °C = 1.17: NT<sub>2</sub> = 1.17 x (90 K) = 105 K at 50 °C

**Typical Applications**

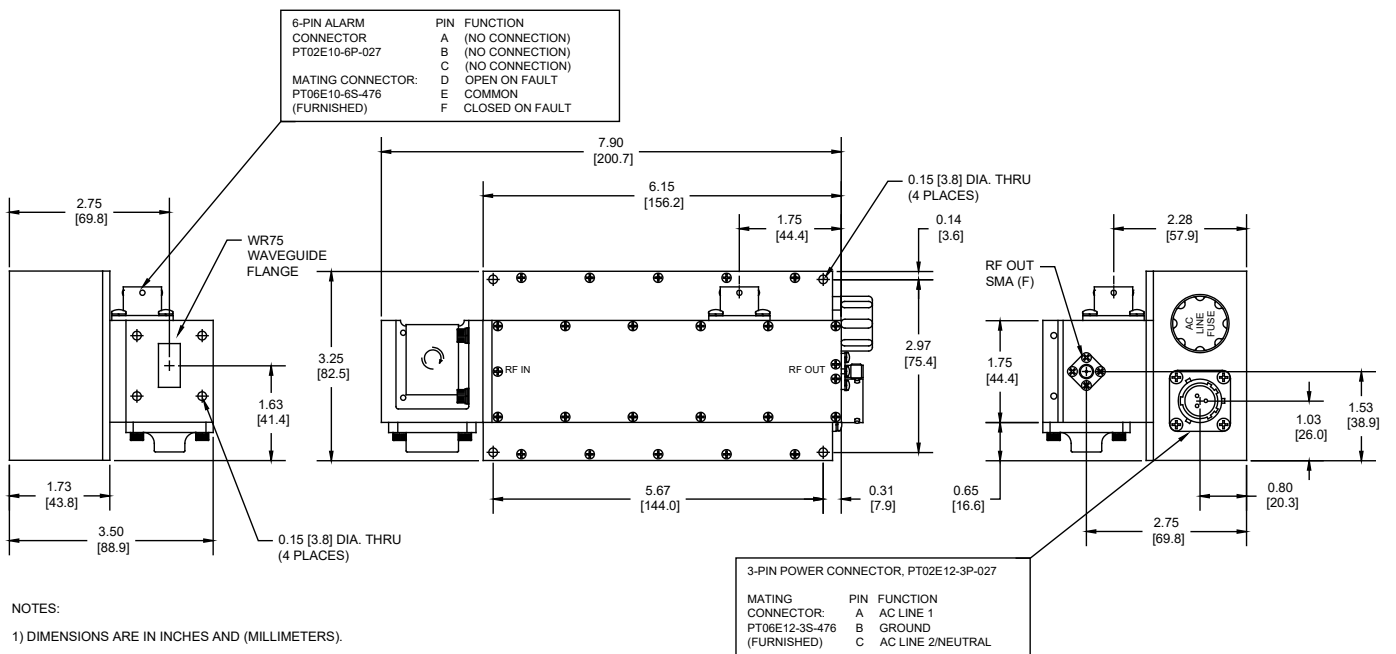


Outline Drawing, Standard LNA



Outline 10386

Outline Drawing, LNA with AC Power Supply



Outline 10813



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For more detailed information, please refer to the corresponding CPI technical description if one has been published, or contact CPI. Specifications may change without notice as a result of additional data or product refinement. Please contact CPI before using this information for system design.

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