

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:

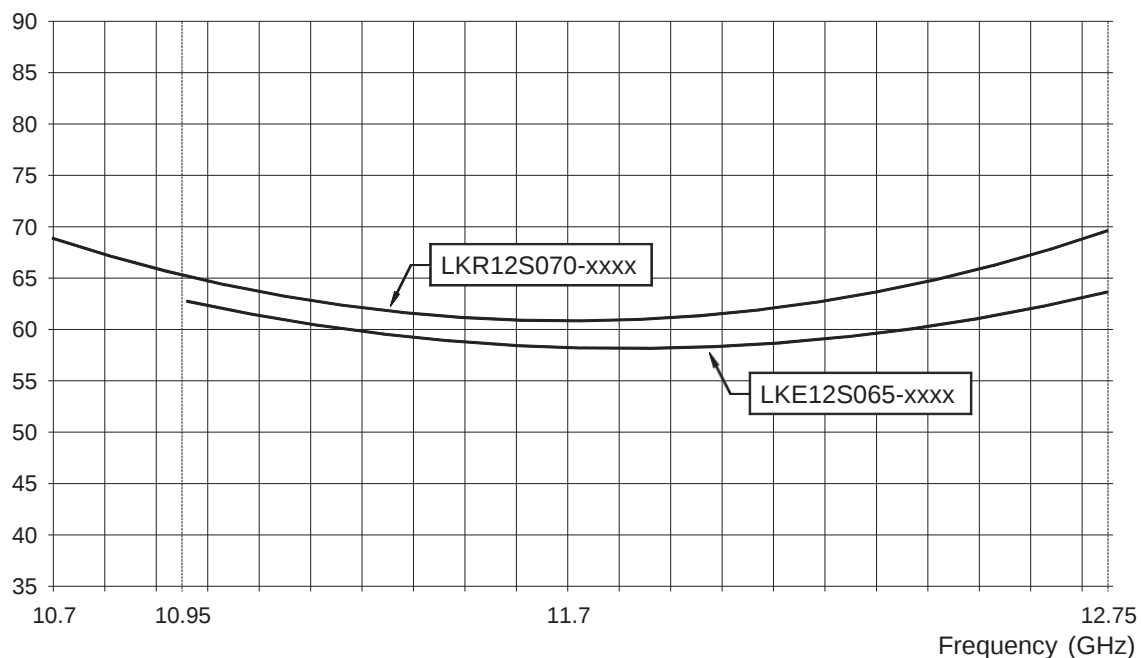
- Noise temperatures to 65 K
- High reliability HEMT design
- Input/output isolators
- Reverse polarity protection
- Wide operating temperature range, -40°C to $+70^{\circ}\text{C}$
- Form 'C' alarm
- CE certified, RoHS compliant

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



Ku-Band Low Noise Amplifiers

Specifications

Parameter	Notes	Specification
Frequency Range	Band "E" Band "R"	10.95 to 12.75 GHz 10.70 to 12.75 GHz
Gain	Standard LNA LNA with Option 1	60 dB min., 64 dB typical, 66 dB max. 50 dB min., 53 dB typical, 56 dB max.
Gain Flatness		±0.5 dB over the full band ±0.20 dB per 40 MHz
VSWR	Input, standard Output	1.20:1 typical, 1.25:1 max. 1.20:1 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 Option 2	+12 dBm min., +15 dBm typical +20 dBm min., +22 dBm typical
3rd Order Output Intercept Point (OIP₃)	Standard LNA Option 2	+22 dBm min., +25 dBm typical +30 dBm min., +32 dBm typical
Group Delay per 40 MHz	Linear Parabolic Ripple	0.01 ns/MHz 0.001 ns/MHz ² 0.1 ns peak to peak
AM/PM Conversion		0.05°/dB max., at -5 dBm out
Gain Stability (Constant Temp)	Short term (10 min.) Medium term (24 hrs) Long term (1 week)	±0.1 dB max ±0.2 dB max ±0.5 dB max
Gain Stability vs. Temperature		-0.04 dB per °C
Maximum Input Power	Damage Threshold Desens. Threshold 13.75-14.50 GHz	0 dBm max. -20 dBm max.
Connectors	Input Output, standard Output, Option 7 Power, standard (2)	WR75 Cover Flange SMA Female Type N Female PT02E10-6P-027 (mate supplied)
Power Requirements	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.
Operating Temperature	T _{AMB}	-40°C to +70°C
MTBF (MIL-HDBK-217F)	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

	LK	12S				
Frequency Range						
10.95-12.75 GHz	E					
10.70-12.75 GHz	R					
Noise Temperature						
90 K		90				
80 K		80				
70 K		70				
65 K		65				
Gain						
60 dB minimum	X					
50 dB minimum	1					
Output Power						
+12 dBm	X					
+20 dBm	2					
Power Configuration						
+12 to +24 Vdc	X					
90-265 Vac, 47-63 Hz	4					
RF Out Connector						
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,

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

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)

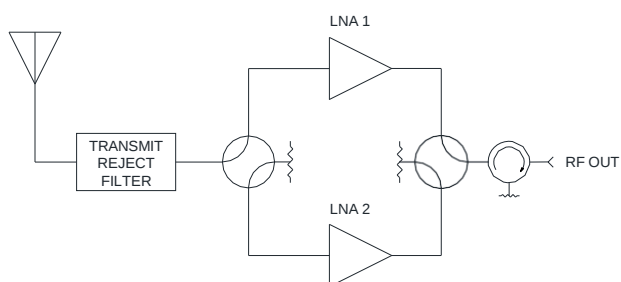
For the case where $T_1 = 296$ K (+23 °C), the ratio NT_2/NT_1 is shown in the table below:

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

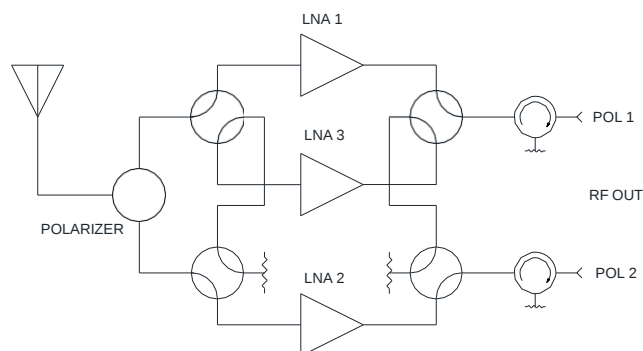
Example: For model LKE12S90-XXXX, $NT_1 = 90$ K at +23 °C; what is NT_2 at +50 °C?
 From the table, NT_2/NT_1 at 50 °C = 1.17: $NT_2 = 1.17 \times (90 \text{ K}) = 105 \text{ K}$ at 50 °C

Typical Applications

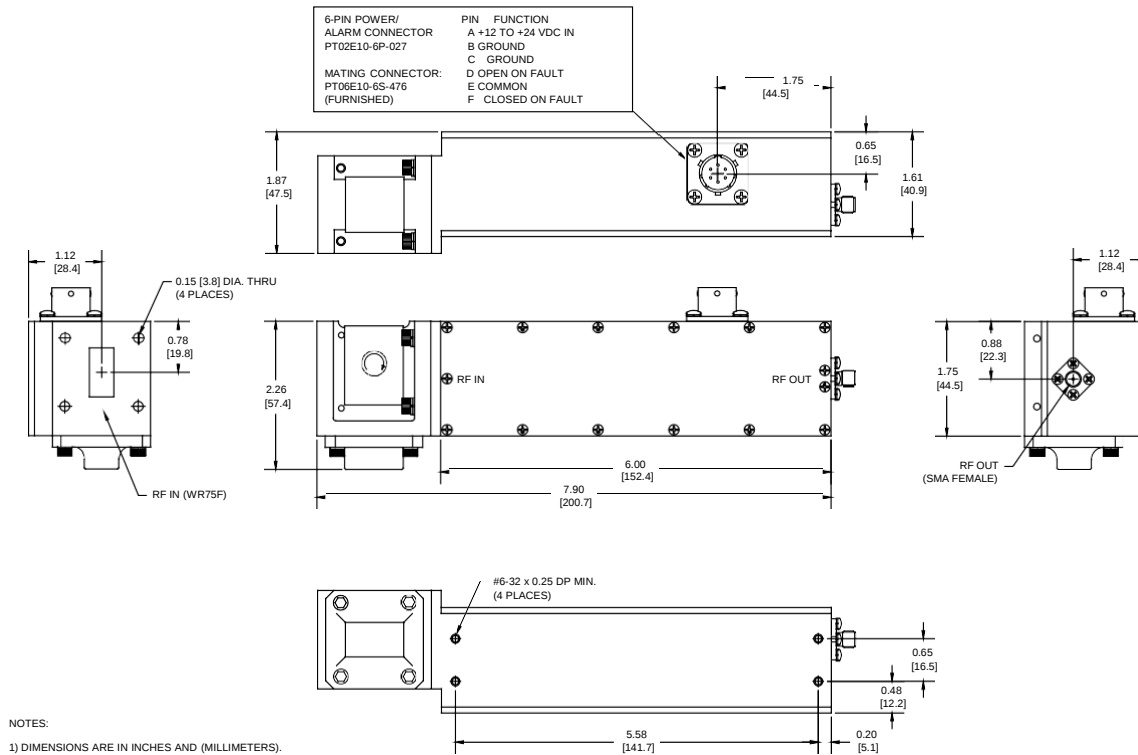
1:1 Redundant Systems



1:2 Redundant Systems

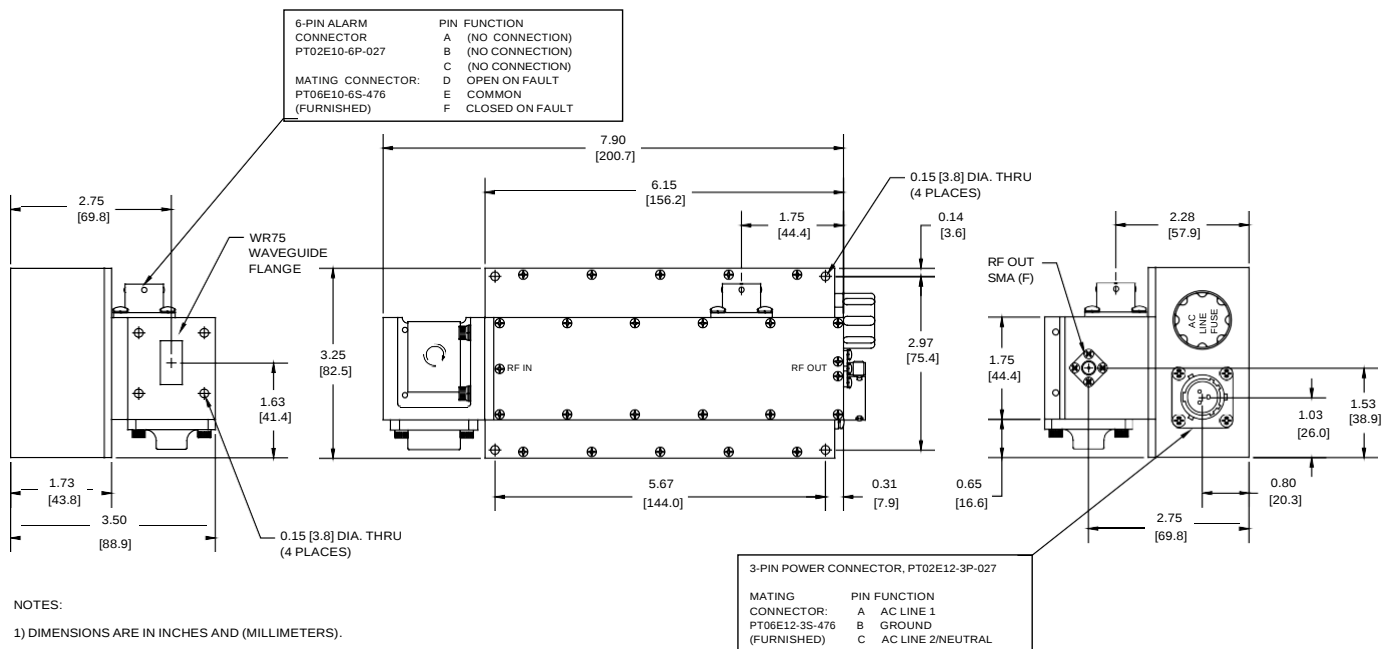


Outline Drawing, Standard LNA



Outline 10386

Outline Drawing, LNA with AC Power Supply



Outline 10813

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