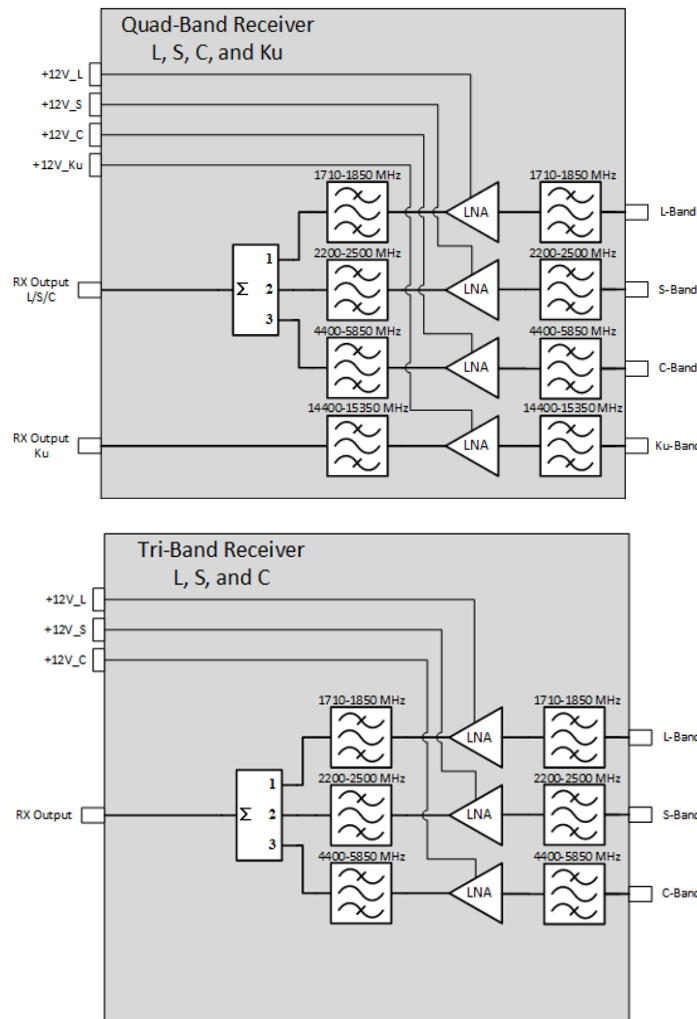




# QLNALK and TLNALC

## Quad-Band and Tri-Band Low Noise Amplifier

3/28/2023



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## SCOPE

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This document describes the performance of the Quad-Band and Tri-Band Low Noise Amplifiers (QLNALK and TLNALC). The QLNALK provides receiver coverage ranging from L-Band to Ku-Band in a single small form factor package. The TLNALC provides coverage ranging from L-Band to C-Band. Both LNAs are rated to 50,000 ft. operating attitude and are environmentally sealed allowing for operation in harsh environments.

## SPECIFICATIONS

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### 1.0 ELECTRICAL INTERFACES

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The electrical interfaces for both the QLNALK and TLNALC are defined in Table 1 and Table 2.

TABLE 1: ELECTRICAL CONNECTOR INTERFACE

Ref. Des.	QLNALK Connector	TLNALC Connector	Function
J1	DJT02H-12-98PN	DJT02H-12-98PN	DC Power
J2	Precision SMA, Female	Cover Plate	Ku-Band Input
J3	Precision SMA, Female	Precision SMA, Female	L-Band Input
J4	Precision SMA, Female	Precision SMA, Female	S-Band Input
J5	Precision SMA, Female	Precision SMA, Female	C-Band Input
J6	Precision SMA, Female	Precision SMA, Female	L, S, C-Band Output
J7	Precision SMA, Female	Cover Plate	Ku-Band Output

TABLE 2: J1 POWER CONNECTOR PINOUT

Pin Number	Signal Name
A	Spare
B	Spare
C	+12V S-Band RTN
D	+12V S-Band
E	+12V L-Band
F	+12V C-Band
G	+12V Ku-Band
H	+12V Ku-Band RTN
J	+12V L-Band RTN
K	+12V C-Band RTN

J1 is a standard MIL-DTL-38999 Series II connector with a 12-98 insert. It can be used with any compatible mate. J1 uses pins, the mate must use sockets.

NOTE: All the return lines are tied to chassis internally.

### 1.1 PRIME POWER

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The nominal input voltage to each band is +12VDC, but will operate from +9VDC to +16VDC. The maximum consumption for any one band is listed in Table 3: Power Consumption per Band. The total maximum power consumption of the QLNALK with all four bands enabled is less than 1.95 W. The total maximum power consumption of the TLNALC with all three bands enabled is less than 1.15 W.

TABLE 3: POWER CONSUMPTION PER BAND

Band Name	Typical Power Consumption	Maximum Power Consumption
L-Band	0.41 W	0.45 W
S-Band	0.41 W	0.45 W
C-Band	0.23 W	0.25 W
Ku-Band	0.70 W	0.80 W

The LNAs for each band have their own dedicated input voltage. Only bands for which the prime power is applied will be operational, all other bands will be disabled.

NOTE: Where possible, it is recommended to only provide power to the active band in order to reduce out-of-band interferers and minimize power consumption.

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## 1.2 RF INPUT

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TABLE 4: RF PERFORMANCE SUMMARY

Band Name	Frequency Range (MHz)	Gain (dB)	NF (dB)	Output P1dB (dBm)	Maximum Input Power (No damage)
L-Band	1710-1850	25 min	4.5 max	+5 min	+10 dBm
S-Band	2200-2500	25 min	4.5 max	+5 min	+10 dBm
C-Band	4400-5850	20 min	4.5 max	+3 min	+10 dBm
Ku-Band (QLNALK only)	14400-15350	20 min	5.5 max	+10 min	+5 dBm

2.0 MECHANICAL INTERFACE

FIGURE 1: QLNALK OUTLINE DRAWING

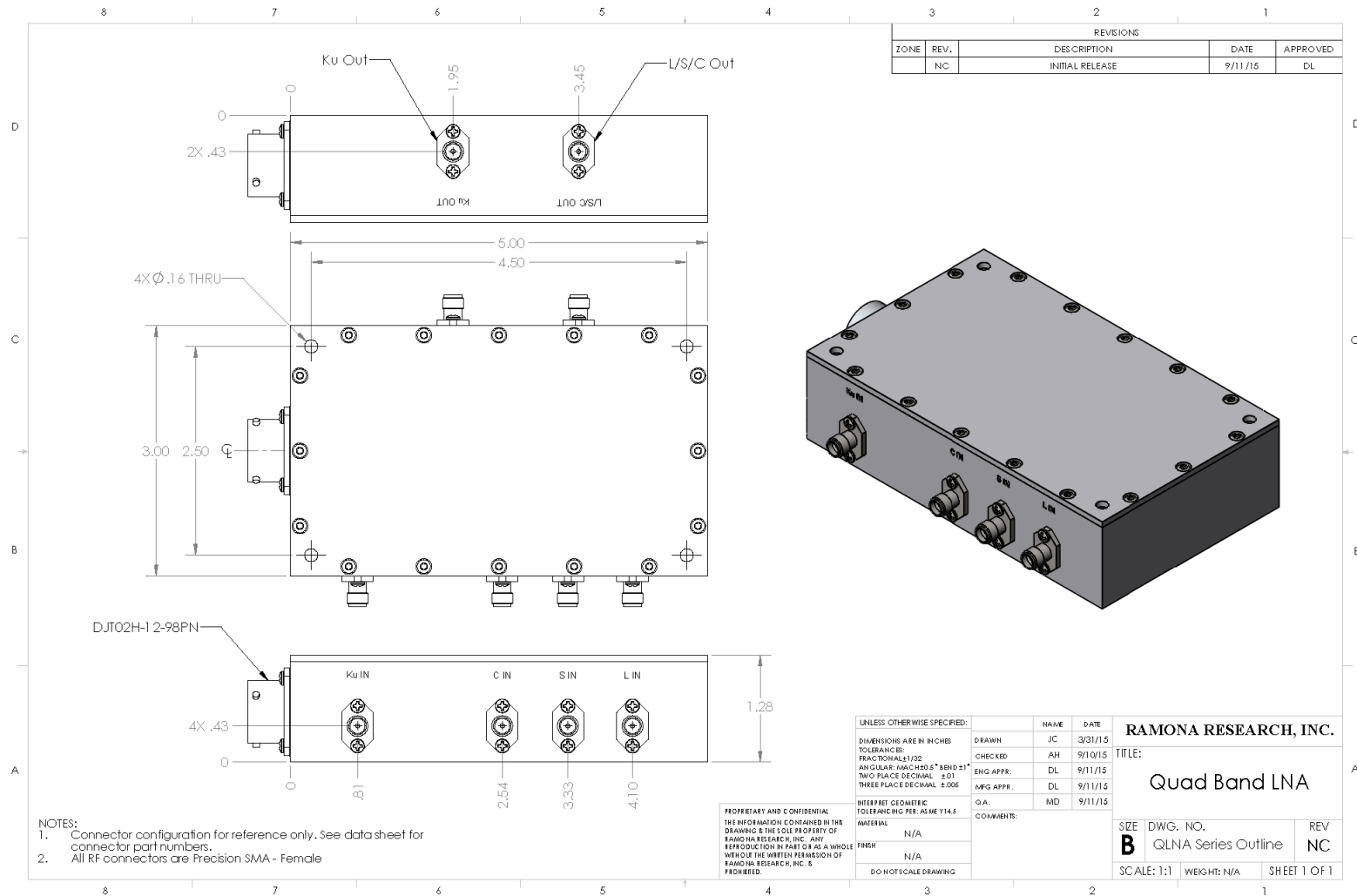
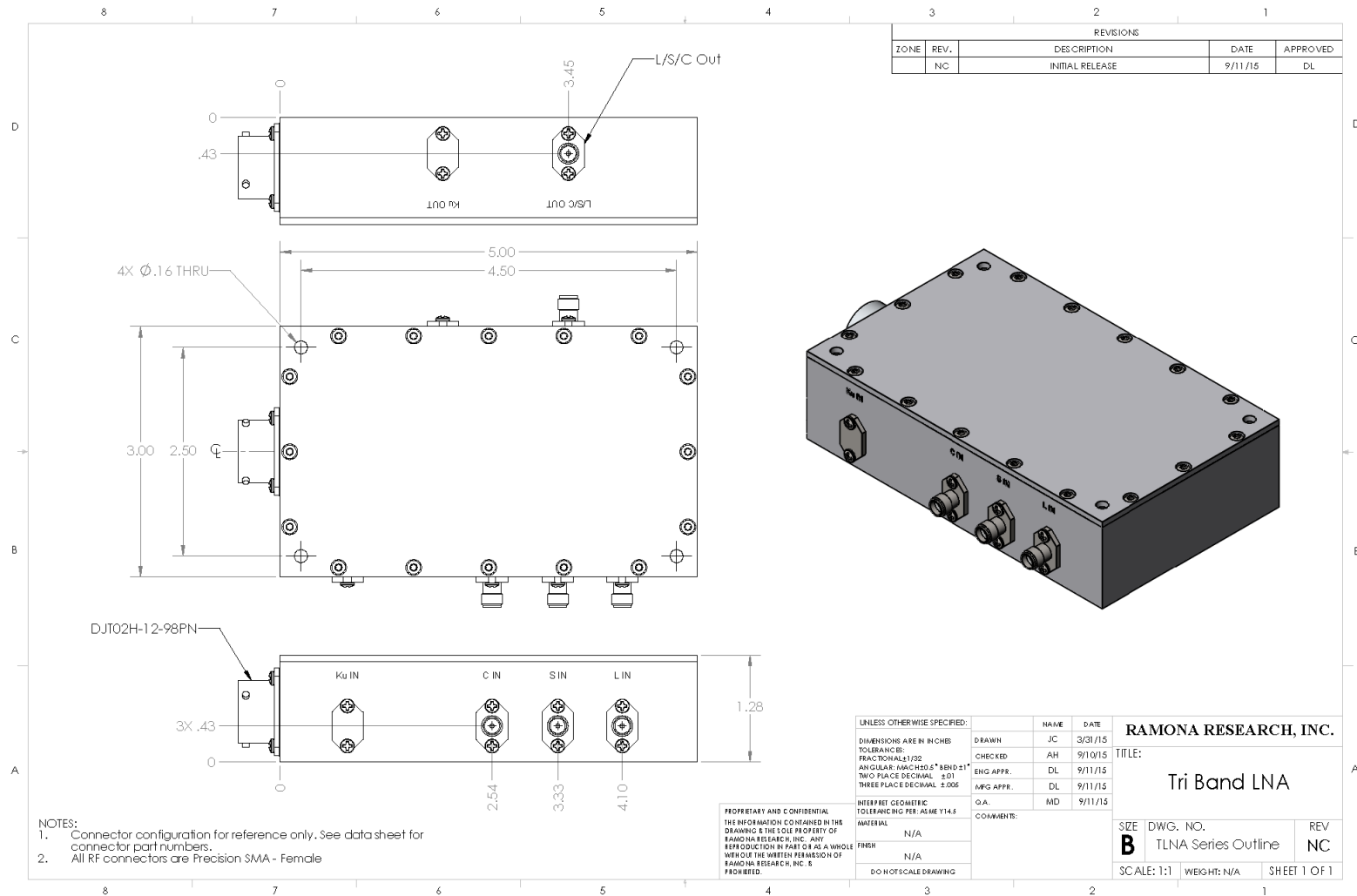


FIGURE 2: TLNALC OUTLINE DRAWING



## 3.0 ENVIRONMENTAL SPECIFICATION

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### 3.1 OPERATING TEMPERATURE

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The QLNALK and TLNALC operate from -20°C to +85°C case temperature.

### 3.2 NON-OPERATING TEMPERATURE

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The QLNALK and TLNALC are designed to be fully operational following exposure to a non-operational storage temperature of -55°C to +85°C.

### 3.3 MOISTURE

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The QLNALK and TLNALC are designed to meet performance requirements during and after exposure to:

- MIL-STD-810F, Method 507.4 (non-condensing)
- Salt Fog, MIL-STD-810F, Method 9.4
- Immersion, MIL-STD-810F, Method 512.4, Procedure 1

NOTE: Unused connectors must be capped during exposure to moisture.

### 3.4 VIBRATION

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The QLNALK and TLNALC are designed to meet performance requirements during and after exposure to vibrations of 20 g RMS, 3 axes.

### 3.5 SHOCK

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The QLNALK and TLNALC are designed to meet performance requirements during and after exposure to shocks of 100 g, 11 milliseconds, 3 axes.

### 3.6 ACCELERATION

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The QLNALK and TLNALC are designed to meet performance requirements during and after exposure to accelerations of 100 g, 11 milliseconds, 3 axes.