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G7 Bridge Model 103989 Antenna Compliance with Cellular Module Integration Requirements

1 Document Revision History

Revision	Date	Author	Summary
1	June 3, 2021	Scott Jacobsen	Initial Release
2	Jan 31, 2024	Scott Jacobsen	Update for LARA-R6001D

2 Purpose of this Report

The purpose of this report is to show the radio frequency (RF) exposure compliance of the cellular module integration on G7 Bridge Model 103989

3 Identifiers

3.1 Host Product

Product Name: G7 Bridge

Model: 103989

3.2 Module Identifiers

Module Description	Model	FCC ID	IC ID	Grantee
Cellular	LARA-R6001D	XPYUBX21BE01	8595A-UBX21BE01	u-blox AG

3.3 Antennas

Frequency Band	Vendor	Model	Peak Gain(dBi)	Data Sheet Reference
Cellular	Blackline Safety	PCB Trace	See section 3.5	

3.4 Module Grant Requirements – XPYUBX21BE01

Output power listed is conducted. Single Modular Approval. The module antenna must be installed to meet the RF exposure compliance separation distance of 20 cm. For mobile and fixed operating configurations the antenna gain, including cable loss, must not exceed

3.9dBi at GSM850;

4.5dBi at GSM1900;

9.9dBi at FDD Band 2;

9.5dBi at FDD LTE Band 2;

6.0dBi at FDD LTE Band 4;

10.4dBi at FDD Band 5 and FDD LTE Bands 5 and 26;

10.3dBi at FDD LTE Band 7;

10.2dBi at FDD LTE Band 13;

9.7dBi at FDD LTE Band 12; and

10.8dBi at FDD LTE Band 8;

9.1dBi at TDD LTE Band 38;

8.8dBi at TDD LTE Band 41.

Integration not consistent with these conditions will entail additional testing and authorization process. Co-location of this module with other transmitters that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

Host integrators must be provided with antenna installation instructions and transmitter operating conditions to satisfy RF exposure compliance. Host integrator is responsible for complying with the instructions and requirements for each transmitter they choose to integrate into a host product.

This device supports bandwidth modes of 1.4, 3, 5, 10, 15 and 20 MHz for FDD LTE Bands 2 and 4; bandwidth modes of 5, 10, 15 and 20 MHz for FDD LTE Band 7 and TDD LTE Bands 38 and 41; bandwidth modes of 1.4, 3, 5 and 10 MHz for FDD LTE Bands 5, 12 and 26; bandwidth modes of 5 and 10 MHz for FDD LTE Band 13 and bandwidth modes of 1.4 and 3 MHz for FDD LTE Band 8.

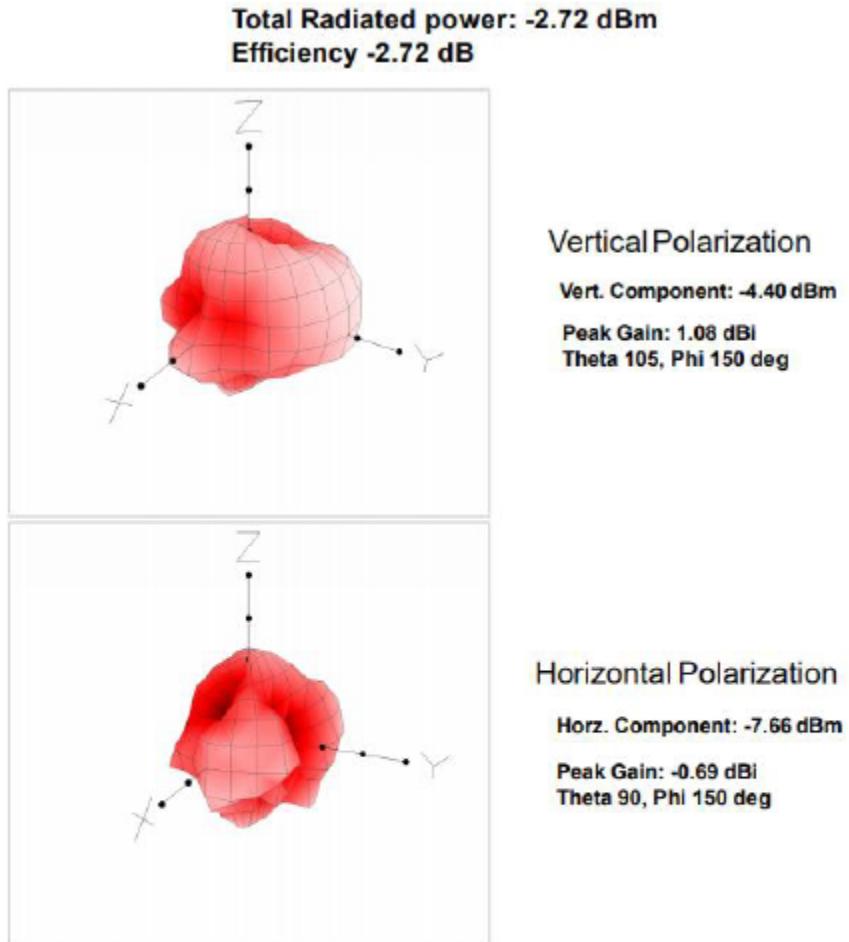
3.5 Comparison of Antenna Gain with Module Requirements

Requirement	Band	Measured Actual Gain	Frequency
Maximum Gain			
9.7 dBi	FDD LTE Band 12	-3.3 dBi	700 MHz
9.7 dBi	FDD LTE Band 12	-3.5 dBi	707 MHz
9.7 dBi	FDD LTE Band 12	-3.7 dBi	715 MHz
10.2 dBi	FDD LTE Band 13	-3.3 dBi	780 MHz
10.2 dBi	FDD LTE Band 13	-3.3 dBi	784 MHz
3.9 dBi	GSM850	-2.8 dBi	826 MHz
3.9 dBi	GSM850	-3.0 dBi	837 MHz
3.9 dBi	GSM850	-3.1 dBi	847 MHz
10.4 dBi	FDD Band 5 and FDD LTE Bands 5 and 26	-2.8 dBi	826 MHz
10.4 dBi	FDD Band 5 and FDD LTE Bands 5 and 26	-3.0 dBi	837 MHz
10.4 dBi	FDD Band 5 and FDD LTE Bands 5 and 26	-3.1 dBi	847 MHz
10.8 dBi	FDD LTE Band 8	-2.1 dBi	899 MHz
6.0 dBi	FDD LTE Band 4	-0.9 dBi	1710 MHz
6.0 dBi	FDD LTE Band 4	-1.5 dBi	1730 MHz
6.0 dBi	FDD LTE Band 4	-1.8 dBi	1750 MHz

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3.6 Sample Radiation Patterns



File Name: Ant1 high freq2 2110

Tx Power: 0.00 dBm Estimated
Frequency: 2110.00 MHz
Cable Attenuation: 14.10 dB
Notes:

Wed, Mar 31, 2021 7:24 PM
Receive Antenna Gain: 2.15 dBi
Separation: 1.28 m

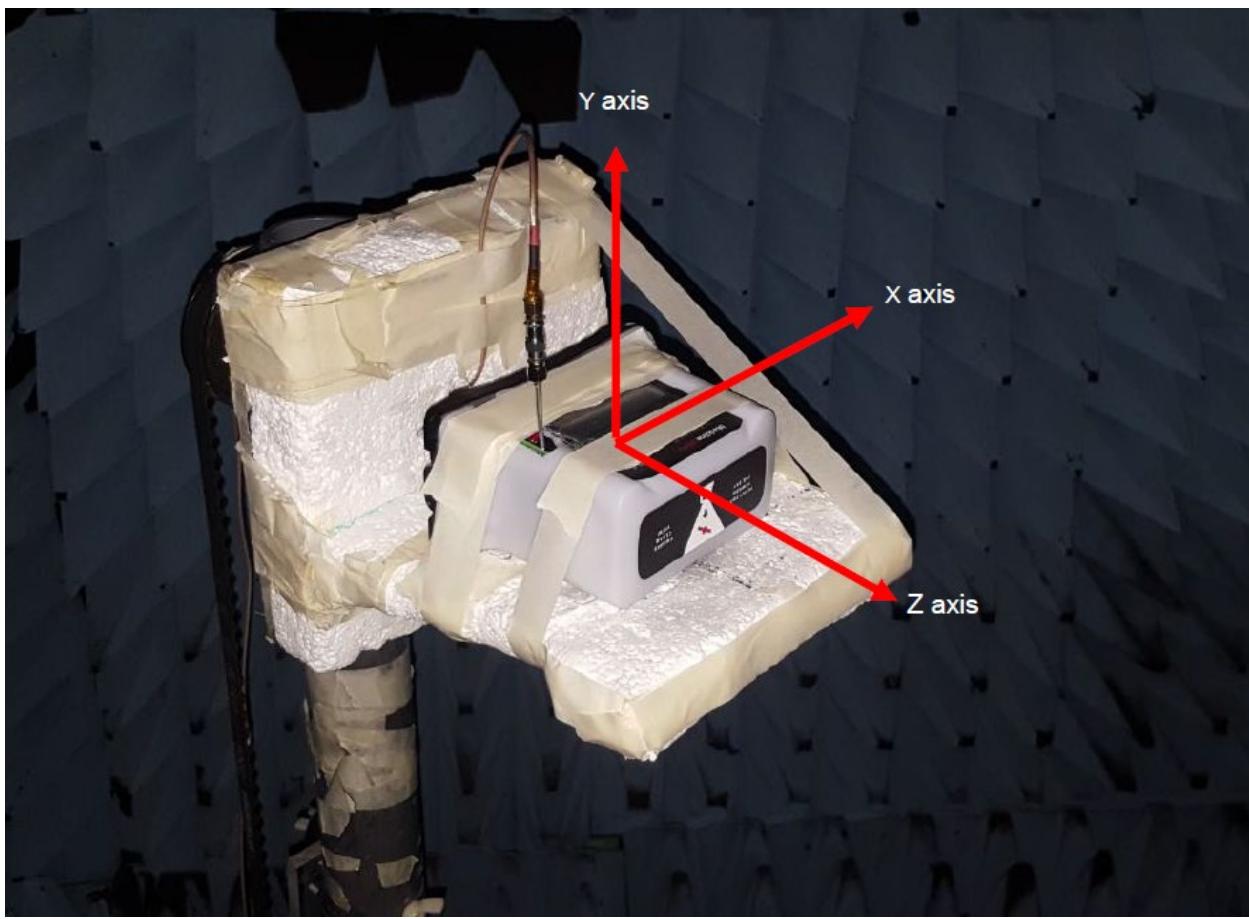
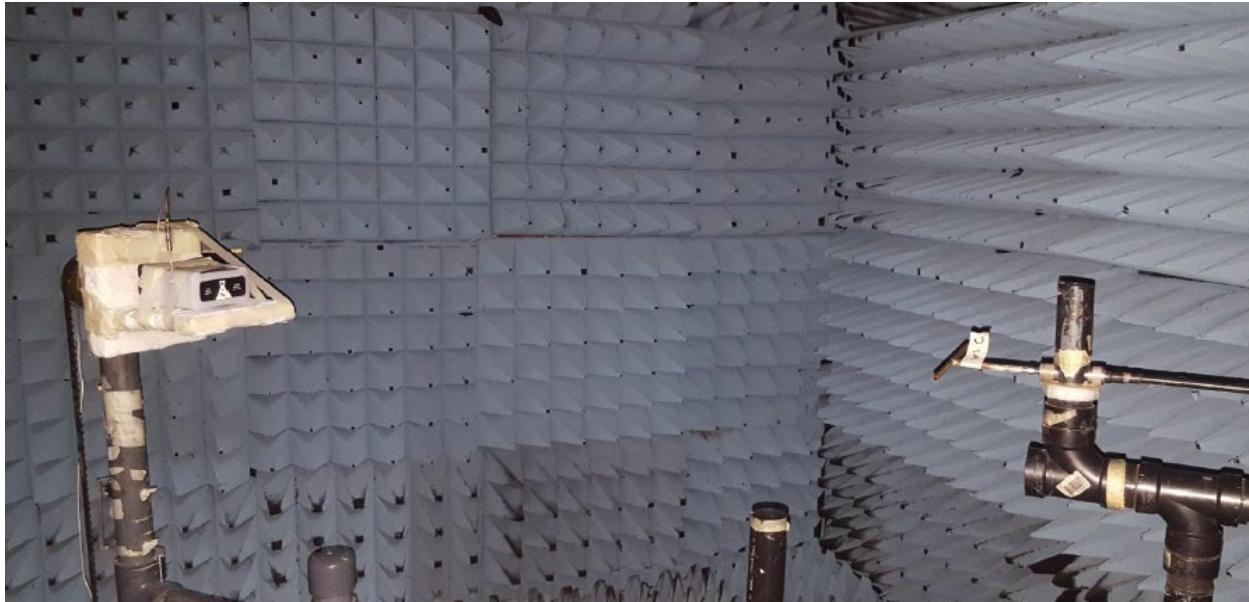
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3.7 Antenna Measurement Assembly



3.8 Test Setup Pictures



4 Statement of Compliance

The gain values found for Blackline cellular antenna in G7 Bridge Model 103989 are below the maximum allowed levels according to module integration requirements.