



Solutions

TEST REPORT

Report Number: R15147852-E2

Applicant : Stryker Medical
3800 E Central Ave
Portage, MI, 49002-5826, USA

Model : 3009

Contains FCC ID : Z7ALBCA1KU1WA

Contains IC : 4919E-LBCA1KU1WA

EUT Description : ProCuity Hospital Bed

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C: 2024
ISED RSS-247 ISSUE 3: 2023
ISED RSS-GEN ISSUE 5 + A1 +A2:2021

Date Of Issue:
2024-05-02

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-05-01	Initial Issue	Chandler Stanley
V2	2024-05-02	Updated EUT Description, Model Number, Serial Number, and Test Setup/Diagrams	Chandler Stanley

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Stryker Medical
3800 E Central Ave
Portage, MI, 49002-5826, USA

EUT DESCRIPTION: ProCuity Hospital Bed

MODEL: 3009

SERIAL NUMBER: MOBS-2 (Contains bedside room interface board S/N: 2430000042)

SAMPLE RECEIPT DATE: 2024-04-08

DATE TESTED: 2024-04-08 TO 2024-04-09

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C: 2024	See Section 2
ISED RSS-247 Issue 3: 2023	See Section 2
ISED RSS-GEN Issue 5 + A1 + A2: 2021	See Section 2

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released
For UL LLC By:



Prepared By:



Jeff Moser
Operations Manager
Consumer, Medical and IT Segment
UL LLC

Chandler Stanley
Engineer
Consumer, Medical and IT Segment
UL LLC

2. TEST RESULTS SUMMARY

This report contains data provided by the applicant which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

Below is a list of the data/information provided by the customer:

- 1.) Antenna gain and type (see section 6.3)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW		
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW		
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power		
See Comment		Average power	Not Performed.	See Note 1.
15.247 (e)	RSS-247 5.2 (b)	PSD		
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions		
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	See Comment.	See Note 2.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Not Performed	See Note 1.

Note 1: This test report covers the assessment of the radio module installed in a new host under FCC KDB 996369 D04 Module Integration Guide v02 via spot checks to verify continued compliance. It is the responsibility of the end product manufacturer to provide the module reports to show full compliance to the FCC 15.247 and RSS-247 requirements.

Note 2: Radiated spot-checks were performed on worst-case data rates and channels as specified in section 6.5. These scans were found to be compliant.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2020, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, FCC KDB 996369 D04 Module Integration Guide v2, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 3.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, Certificate Number 0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374
<input checked="" type="checkbox"/>	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A.		2180C	

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT, Stryker ProCuity bed series (model 3009) is a powered, adjustable hospital bed that contains a Bluetooth classic and Wi-Fi radio. This report covers the spot-check testing of the Bluetooth classic radio. Refer to section 6.5 for scans performed.

6.2. MAXIMUM OUTPUT POWER

This test report covers the assessment of the radio module installed in a host under FCC KDB 996369 D04 Module Integration Guide v02 via spot checks to verify continued compliance. It is the responsibility of the end product manufacturer to provide the module reports to show full compliance to the FCC 15.247 and RSS-247 requirements.

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

Frequency Range (MHz)	Antenna Gain (dBi)	Antenna Type
2402-2480	3	Flex

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was:

- microprocessor software at Perforce label 300901380925_v02.00.01.001
- radio software at Perforce label 300901380926_v01.00.01.000

6.5. WORST-CASE CONFIGURATION AND MODE

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the worst-case channels based on the original radio module report.

The EUT was tested in its only orientation as declared by the client. All testing was performed in this orientation.

The following scans were performed based on the WC data-rates and channels listed in the original module report at default power:

Technology	Test Type	Mode/Data-Rate	Channel (MHz)
Bluetooth	Band Edge	GFSK (1Mbps)	2480
	Harmonics and Spurious Emissions		

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Microsoft	Surface Tablet	NA	NA

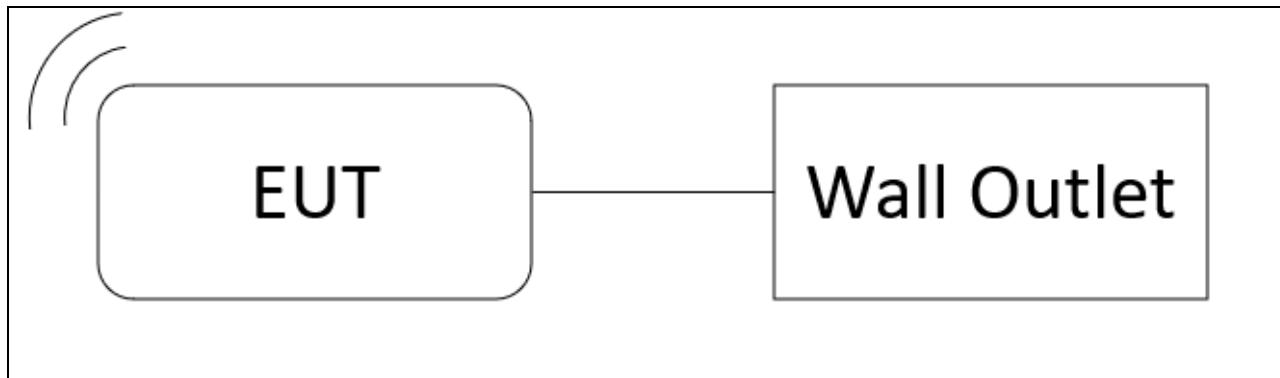
I/O CABLES

N/A

TEST SETUP

For radiated testing, the EUT was connected to a wall outlet. The EUT's PCB containing the Bluetooth radio receives power from the EUT's AC/DC power supply. The support laptop was connected to the EUT prior to testing in order to configure the radio. For final testing, the support laptop was disconnected from the EUT.

SETUP DIAGRAM



7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10-2020 Section 11.6

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1

General Radiated Emissions ANSI C63.10-2020 Subclause 6.3 and 6.6

8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (RTP – Chamber A)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	30-1000 MHz Range				
206210	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2023-05-18	2025-05-18
	Gain-Loss Chains				
SAC C (Hybrid 3m location)	Gain-Loss string for Hybrid antenna at 3m	Various	Various	2023-08-03	2024-08-03
	1-18GHz Range				
88590 (aka AT0068)	Horn Antenna 1-18GHz	ETS-Lindgren	3117	2023-08-07	2024-08-07
Silver Box G/L	Chamber A G/L 1-18GHz			2023-08-25	2024-08-25
	Receiver & Software				
77035 (aka SA0016)	Spectrum Analyzer	Agilent	PXA N9030A	2023-08-03	2024-08-03
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
236492	Temp/Humid/Pressure Meter	Extech	SD700	2023-05-09	2024-05-09
77414 (BRF003)	2.4GHz notch filter, 2W, Fhigh =18GHz	Micro-Tronics	BRM50702	2024-03-12	2025-03-12
77837 (BRF004)	5.5GHz notch filter, 2W, Fhigh =18GHz	Micro-Tronics	BRM50716-01	2024-03-01	2025-03-01

9. ON TIME AND DUTY CYCLE

LIMITS

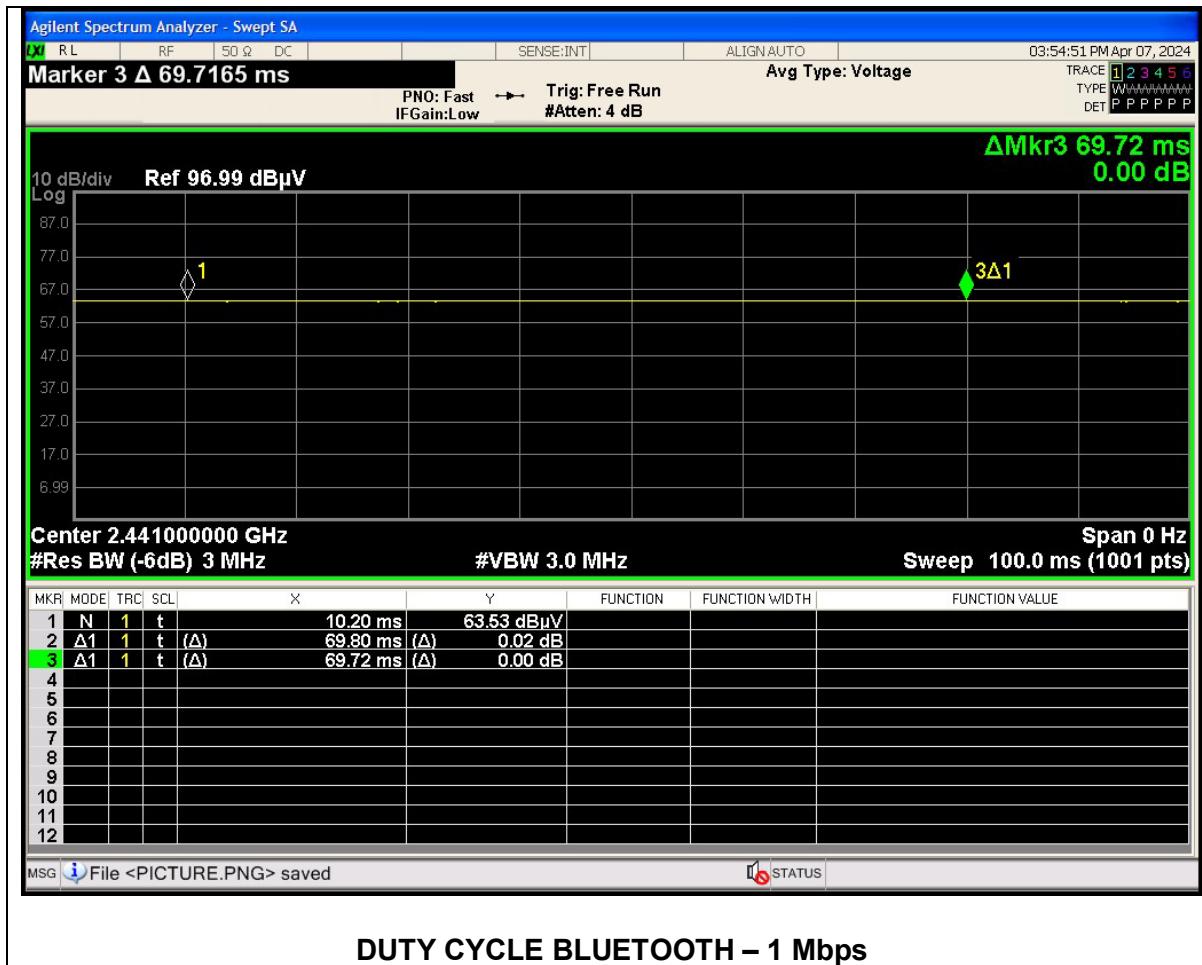
None; for reporting purposes only.

PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
BT - GFSK (1Mbps)	100.000	100.000	1.000	100.00	0.00	0.010



**NOTE: Duty cycle testing was performed from 2024-04-08. The date listed in the plot is incorrect.

10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuA/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3MHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. For Bluetooth, Peak measurements were made with a correction factor based on real world on time. The worst case (on average) dwell time would be the device transmitting DH5 packets (5/1600 s dwell per hop = 3.125ms per channel) and operating on 20 channels device will have max of 2 times on a channel in 100ms. $2 \times 3.125\text{ms} = 6.25\text{ms}$ per 100ms on any channel; $20\log(6.25/100) = -24\text{dB}$.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the worse-case channels and mode as specified in section 6.5.

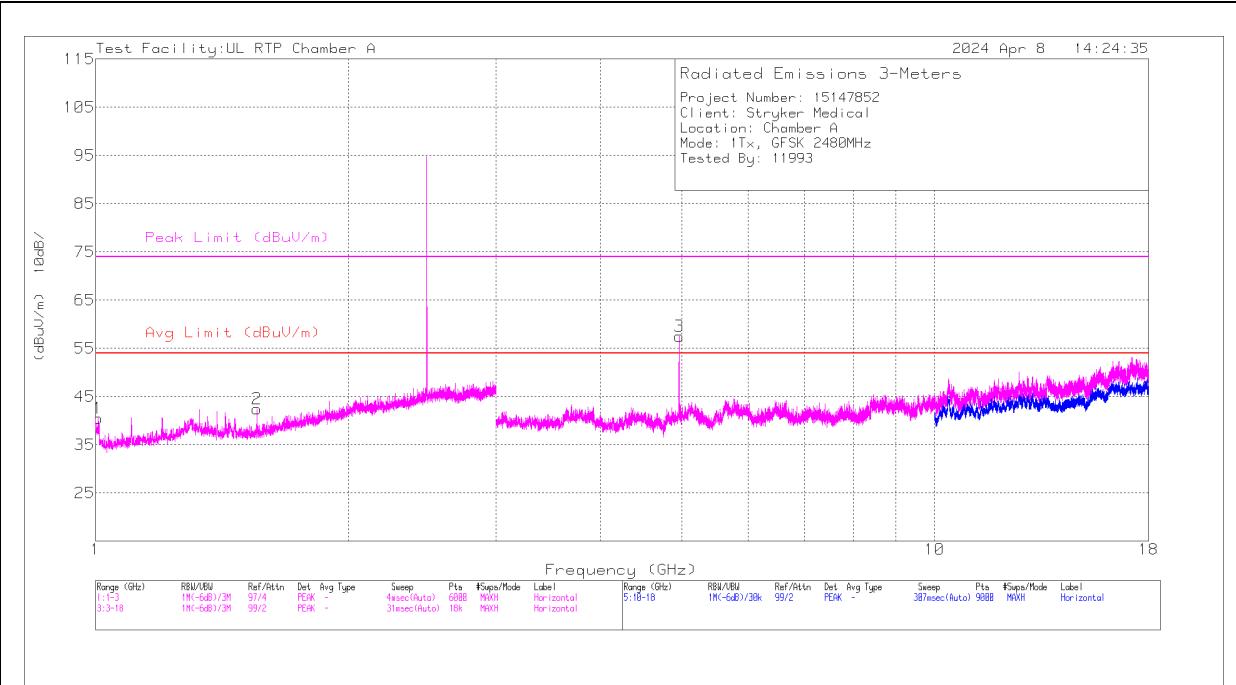
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

10.1. TRANSMITTER ABOVE 1 GHz

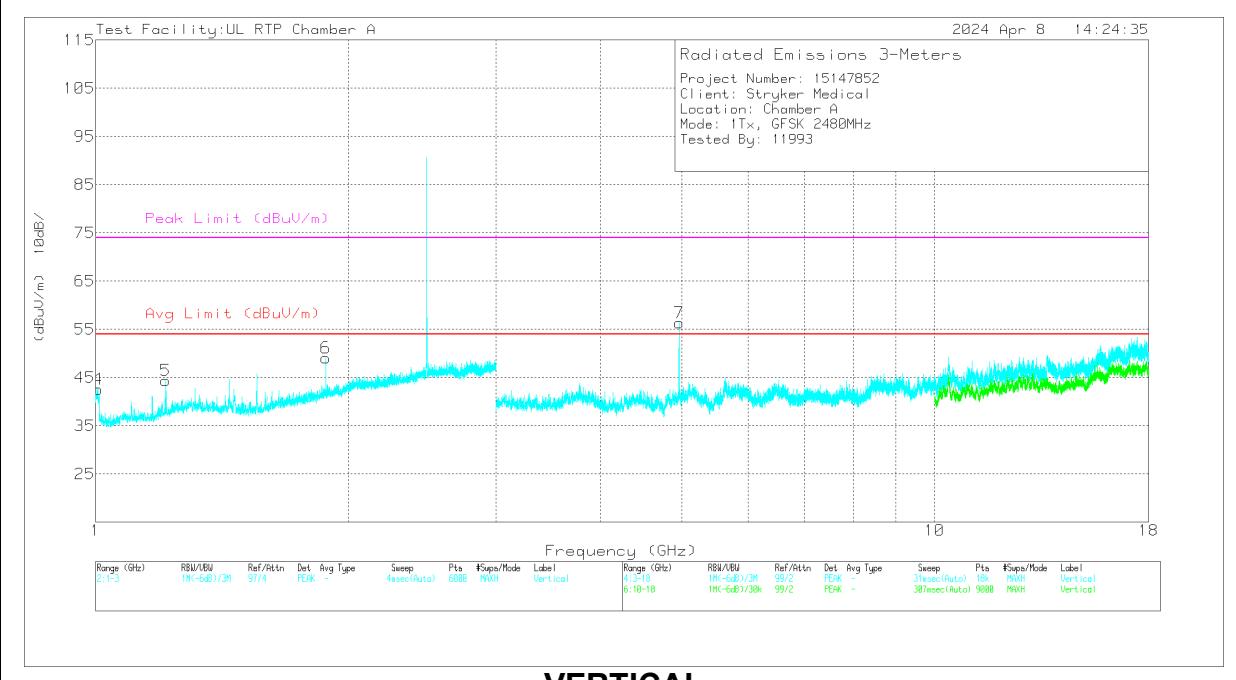
10.1.1. TX ABOVE 1 GHz GFSK 1Mbps MODE IN THE 2.4 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn (dB)	Chamber A Port 7 (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 1.006668	31.83	Pk	26.7	-18	0	40.53	54	-13.47	74	-33.47	0-360	199	H
2	*** 1.55676	32.33	Pk	27.7	-17.6	0	42.43	54	-11.57	74	-31.57	0-360	199	H
4	*** 1.006668	33.93	Pk	26.7	-18	0	42.63	54	-11.37	74	-31.37	0-360	200	V
5	*** 1.211369	34.45	Pk	27.8	-17.9	0	44.35	54	-9.65	74	-29.65	0-360	200	V
6	1.881481	36.02	Pk	30.5	-17.4	0	49.12	-	-	-	-	0-360	299	V
3	*** 4.959585	62.58	PK2	34.3	-35.1	0	61.78	-	-	74	-12.22	29	309	H
	*** 4.959585	62.58	PK2	34.3	-35.1	-24	37.78	54	-16.22	-	-	29	309	H
7	*** 4.959761	58.7	PK2	34.3	-35.1	0	57.9	-	-	74	-16.1	33	299	V
	*** 4.959761	58.7	PK2	34.3	-35.1	-24	33.9	54	-20.1	-	-	33	299	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

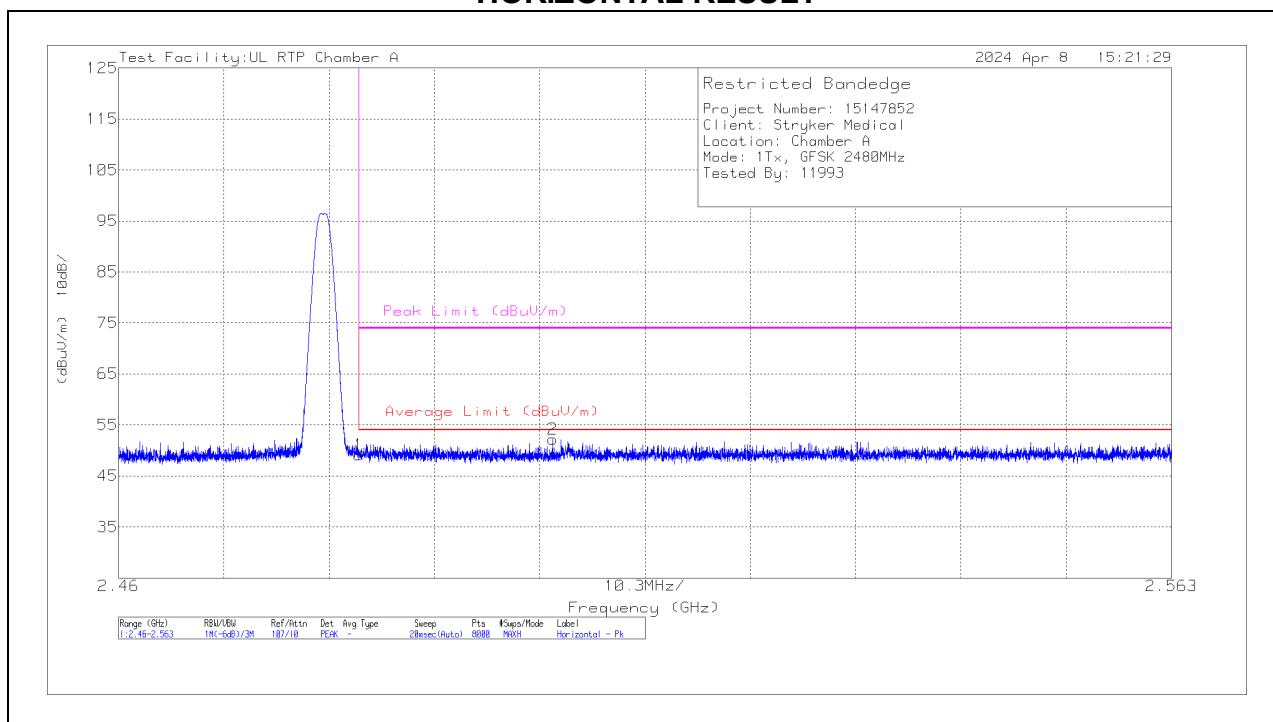
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

BANDEDGE (HIGH CHANNEL RESULTS)

HORIZONTAL RESULT



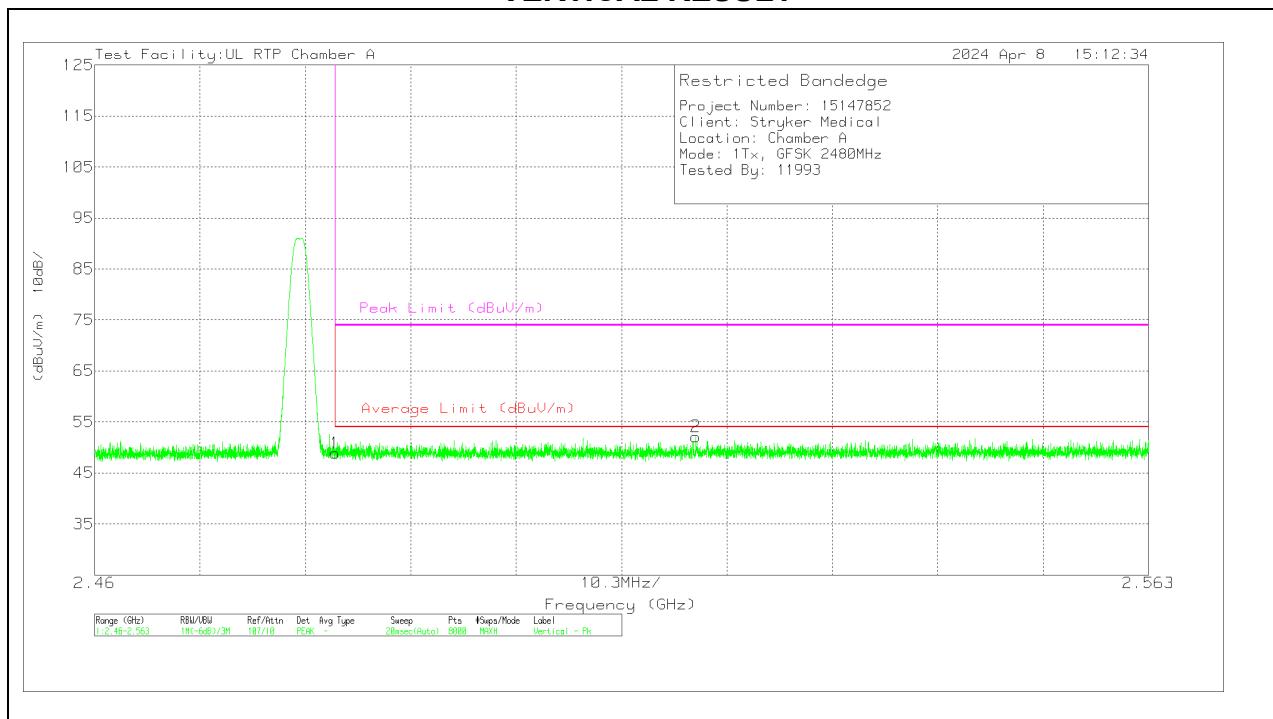
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn (dB)	Chamber A Port 7 (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.4835	33.64	Pk	32.5	-17	0	49.14	-	-	74	-24.86	258	141	H
	* ** 2.4835	33.64	Pk	32.5	-17	-24	25.14	54	-28.86	-	-	258	141	H
2	** 2.502443	36.62	Pk	32.4	-16.8	0	52.22	-	-	74	-21.78	258	141	H
	** 2.502443	36.62	Pk	32.4	-16.8	-24	28.22	54	-25.78	-	-	258	141	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

VERTICAL RESULT



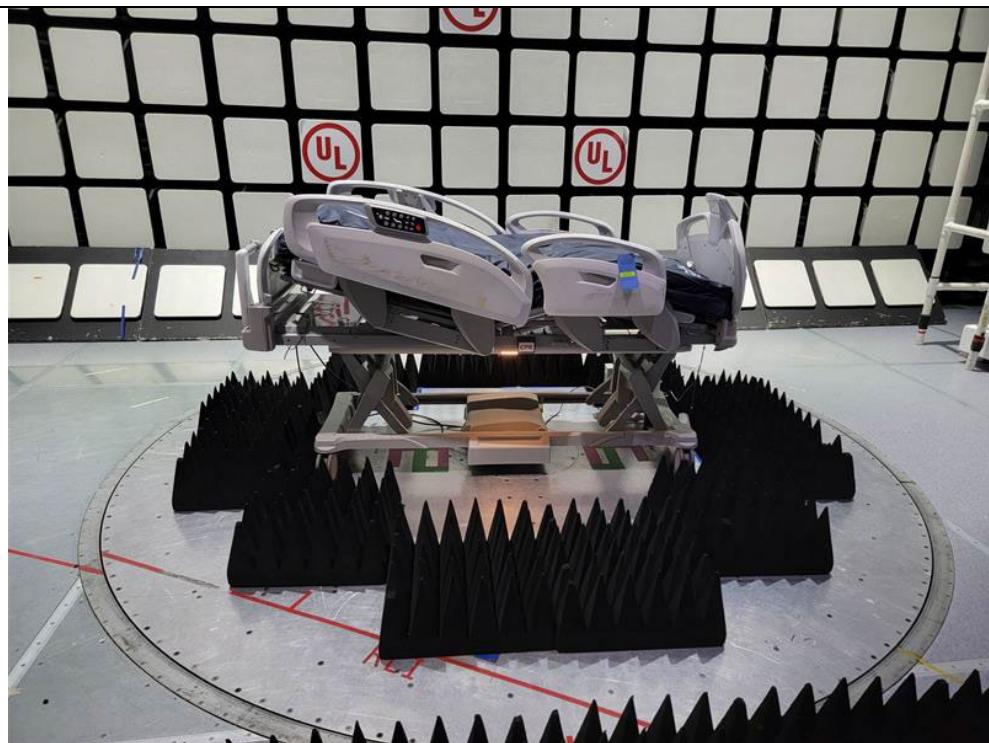
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn (dB)	Chamber A Port 7 (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* *** 2.4835	33.4	Pk	32.5	-17	0	48.9	-	-	74	-25.1	11	287	V
	* *** 2.4835	33.4	Pk	32.5	-17	-24	24.9	54	-29.1	-	-	11	287	V
2	** 2.518732	36.34	Pk	32.5	-16.7	0	52.14	-	-	74	-21.86	11	287	V
	** 2.518732	36.34	Pk	32.5	-16.7	-24	28.14	54	-25.86	-	-	11	287	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

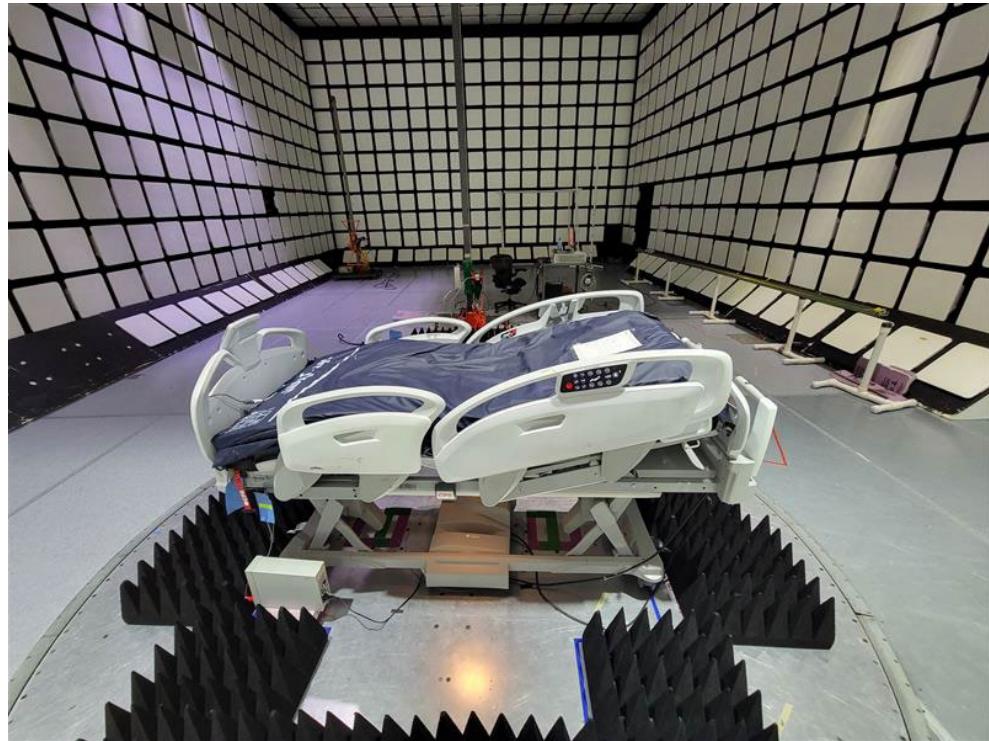
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

11. SETUP PHOTOS



RADIATED ABOVE 1GHz TX FRONT



RADIATED ABOVE 1GHz TX BACK

END OF TEST REPORT