

Test Report

FCC Part15 Subpart C

Product Name : Electric Wheelchair (Robooter E40)

Model No. : BBR-E40-01

FCC ID : 2A7ORBBER-E40-01

Applicant : SHANGHAI BANGBANG ROBOTICS CO., LTD.


Address : Room 501, Building 3, No. 188 Zhongchen Road,
Songjiang District, Shanghai

Date of Receipt : Mar. 20, 2023

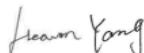
Test Date : Mar. 30, 2023 to Apr. 12, 2023

Issued Date : May 24, 2023


Report No. : SZE23021872A-620E-E1

Tested by : 

(Testing Engineer: Emily Wang)

Reviewed by : 

(EMC Lab Manager: Heaven Yang)

Approved by : 

(Technical Manager: Harry Zhao)

Performed Location : EPINTEK Suzhou Ltd., Suzhou Industrial Park Branch
Building B, No.5 Minsheng Road, Suzhou Industrial Park,
Suzhou, China Tel: +86-512-67997780

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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1. General Information

1.1. EUT Description

Product Name	Electric Wheelchair (Robooter E40)
Brand Name	
Model No.	BBR-E40-01
EUT Voltage	Adapter input: 100-240V AC/ 50-60Hz, 2.2A Max Output:29.4V, 3.0A, 88.2W Electric Wheelchair 24Vdc, 3A 3.3Vdc for Bluetooth module
Frequency Range	2402 ~ 2480 MHz
Channel Number	40
Type of Modulation	V4.0: GFSK
Data Rate	V4.0: 1Mbps, GFSK
Antenna Type	PCB
Peak Antenna Gain	0dBi

1.2. Working Frequency of Each Channel:

Bluetooth Working Frequency of Each Channel: (For V4.0)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz
28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	2480 MHz

1.3. Antenna information

Antenna Manufacturer			
Antenna Delivery	<input checked="" type="checkbox"/> 1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX
Antenna Technology	<input checked="" type="checkbox"/> SISO		
	<input type="checkbox"/> MIMO	<input type="checkbox"/> Basic	
		<input type="checkbox"/> Sectorized antenna systems	
		<input type="checkbox"/> Cross-polarized antennas	
		<input type="checkbox"/> Unequal antenna gains, with equal transmit powers	
		<input type="checkbox"/> Spatial Multiplexing	
		<input type="checkbox"/> CDD	
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole	
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PIFA	
		<input checked="" type="checkbox"/> PCB	
		<input type="checkbox"/> Ceramic Chip Antenna	
		<input type="checkbox"/> Metal plate type F antenna	
		<input type="checkbox"/> FPC	
		<input type="checkbox"/> Cross-polarize Antenna	
Antenna Gain	0dBi		

1.4. Mode of Operation by antenna

Test mode	ANT 1
Transmit-1Mbps(GFSK_BLE)	√

1.5. Power Setting

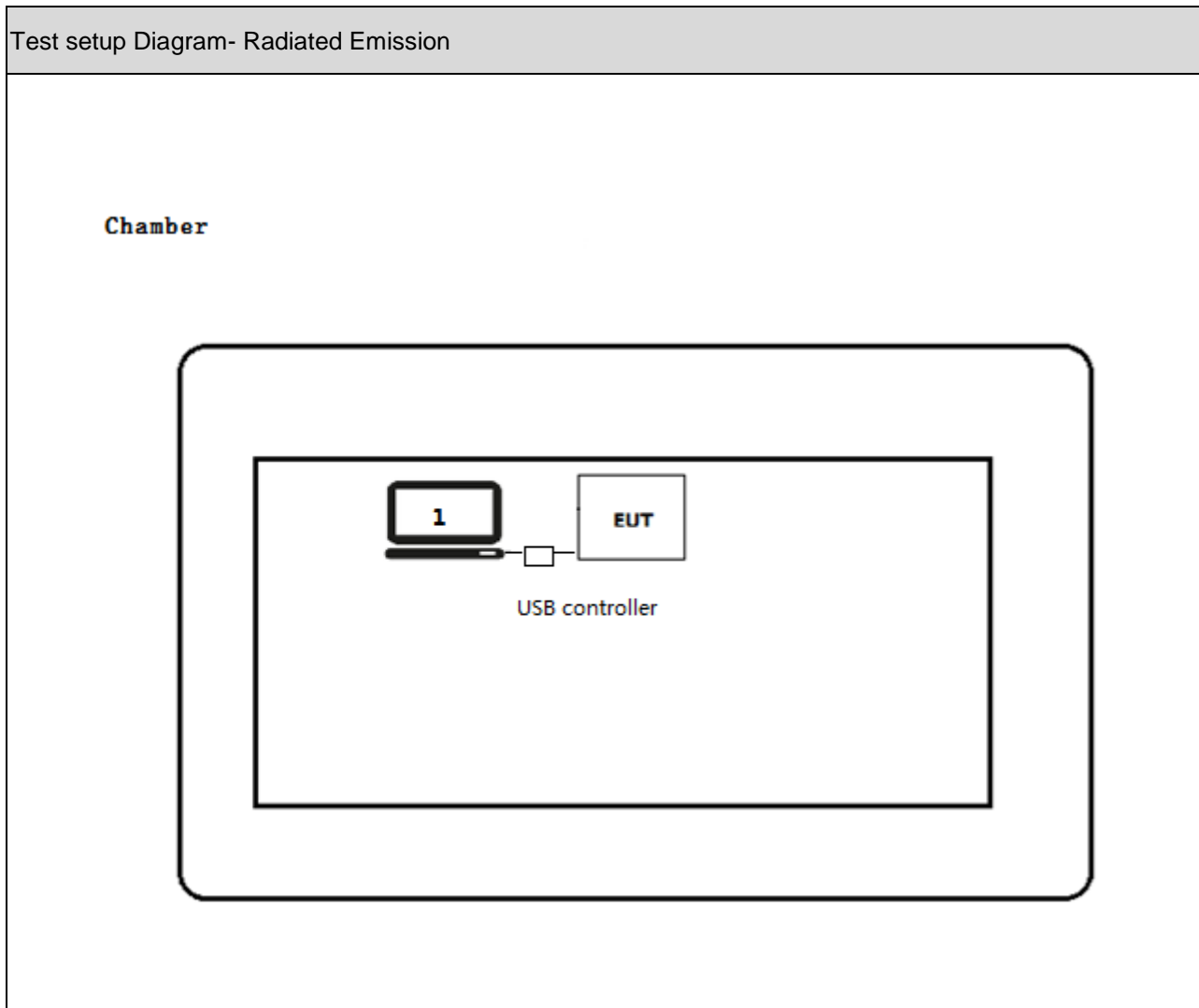
Test Software	nRFgo Studio_v5.3.2	
Antenna technology	SISO	
Test Mode	Test Frequency	Ant 1 Power Setting
Transmit-1Mbps(GFSK_BLE)	2402	N/A
	2442	N/A
	2480	N/A

1.6. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

No.	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	DELL	Vostro 3405	00342-36187-5161 8-AAOEM	Power by internal battery

1.7. Configuration of Tested System



1.8. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Run the software nRFgo Studio_v5.3.2 and set the test mode and channel, then press start to continue for transmitting testing.

1.9. Mode of Operation

See the all test mode shown in this test report and defined as:

Test Mode Listed		
Mode 1: Transmit-1Mbps(GFSK_BLE)		
According to the test items in part 2.1, the following channels may be selected to be the test channel:		
Lowest channel:	Channel 00	2402MHz
Middle channel:	Channel 20	2442MHz
Highest channel:	Channel 39	2480MHz

2. Technical Test

2.1. Summary of Test Result

For FCC rule

Performed Test Item	Normative References	Limit	Result
AC Power Line Conducted Emission	FCC CFR Title 47 Part 15 Subpart C Section 15.207	FCC 15.207	PASS
Emissions in restricted frequency bands	FCC CFR Title 47 Part 15 Subpart C Section 15.209	FCC 15.209	PASS
Fundamental emission output power	FCC CFR Title 47 Part 15 Subpart C Section 15.247(b)(3)	$\leq 30\text{dBm}$	PASS
6dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C Section 15.247(a)(2)	$\geq 500\text{kHz}$	PASS
Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C Section 15.247(e)	$\leq 8\text{dBm}/3\text{kHz}$	PASS
Emissions in non-restricted frequency bands	FCC CFR Title 47 Part 15 Subpart C Section 15.247(d)	$\geq 30\text{dBc}$	PASS
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C 15.247(d)	FCC 15.209	PASS
Antenna Requirement	FCC CFR Title 47 Part 15 Subpart C Section 15.203	FCC 15.203	PASS

2.2. Test Lab Description

The test is performed in the location of:

EPINTEK Suzhou Ltd., Suzhou Industrial Park Branch

Building B, No.5 Minsheng Road, Suzhou Industrial Park, Suzhou, China

Tel: +86-512-67997780

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Designation Number: CN1285

ISED– Recognition Number: CN0106

2.3. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	24
Humidity (%RH)	25-75	56
Barometric pressure (mbar)	860-1060	950-1000

2.4. Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	The maximum measurement uncertainty is evaluated as: Mains: 9kHz~150kHz: 1.70dB 150kHz~30MHz: 2.50dB
Radiated Emission	9kHz~30MHz: 2.29dB Horizontal: 30MHz~300MHz: 3.39 dB 300MHz~1GHz: 3.17 dB 1GHz~18GHz: 4.17 dB 18~40GHz: 4.34 dB Vertical: 30MHz~300MHz: 3.89 dB 300MHz~1GHz: 3.19 dB 1GHz~18GHz: 4.75 dB 18~40GHz: 4.90 dB
RF Antenna Port Conducted Emission	± 1.27dB
Radiated Emission Band Edge	± 4.84dB
Occupied Bandwidth	± 1kHz
Power Spectral Density	± 1.27dB

2.5. Test Equipment

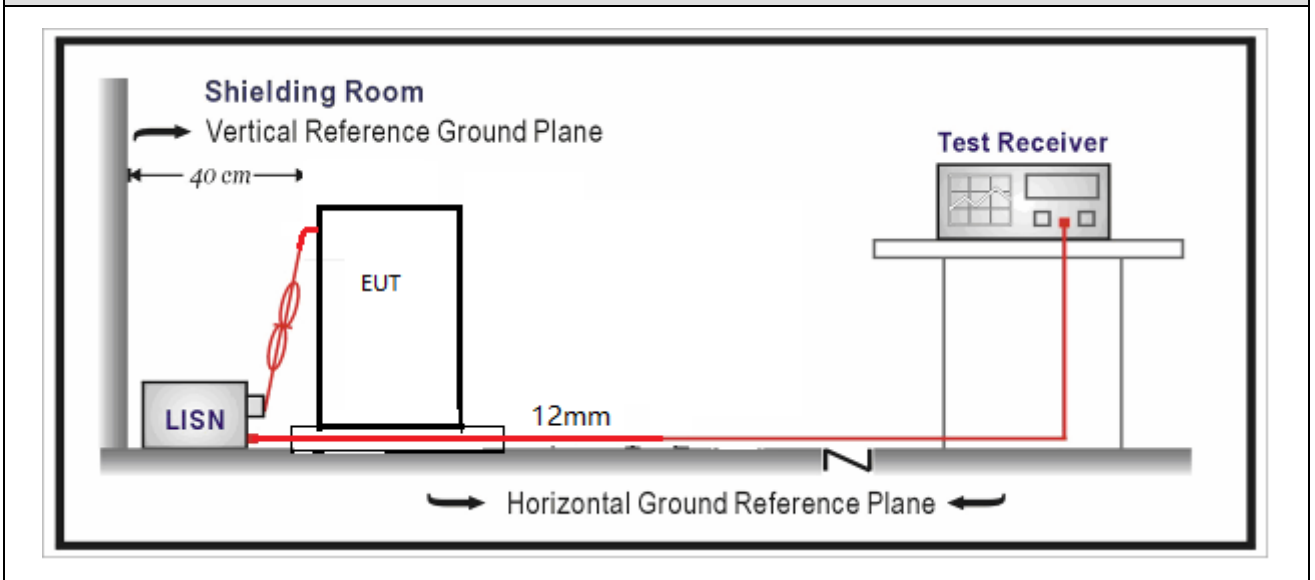
Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
USB Wideband power sensor	Keysight	U2021XA	MY54320002	2023.05.04
USB Wideband power sensor	Keysight	U2021XA	MY55060009	2023.05.04
USB Wideband power sensor	Keysight	U2021XA	MY55240005	2023.05.04
USB Wideband power sensor	Keysight	U2021XA	MY55060008	2023.05.04
USB Modular Simultaneous Sampling Multifunction DAQ Devices	Agilent	U2531A	TW59323513	N/A
MXA Signal Analyzer	Agilent	N9020A	MY51110329	2023.09.20
EMI Receiver	R&S	ESR7	101945	2023.10.29
Broad-Band Horn Antenna	VULB 9168	00837	Schwarzbeck	2023.12.24
Attenuator	TS-2-6dB-1G-A	18072706	SHX-SH	2023.12.24
RF Cable	RE-3-30-1000	EPINE-CABLE03	SKET	2023.10.29
RF Cable	E203950	EPINE-CABLE06	SKET	2023.12.06
Horn Antenna	BBHA 9120D	01938	Schwarzbeck	2023.12.24
Pre Amplifier	LNPA_0118G-45	SK2018063001	SKET	2023.12.06
RF Cable	RE-3-1-18	07202018#2	SKET	2023.10.29
RF Cable	RE-18-1-18	07202018#3	SKET	2023.10.29
Radio frequency control box	MW	MW100-RFCB	N/A	N/A
Power detection box	MW	MW100-PSB	N/A	N/A
EMI Receiver	R&S	ESR3	102971	2023.07.20
Artificial Mains Network	R&S	ENV216	102386	2023.12.06
Wideband Power Meter	Anritsu	ML2485A	0905017	2023.05.04
Power Sensor	Anritsu	MA2411B	0956071	2023.05.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3. AC Power Line Conducted Emission

3.1. Test Setup

AC Power Line Conducted Emission test setup



3.2. Limit

Frequency of Emission (MHz)	Conducted Limit	
	Quasi-peak (dB μ V)	Average(dB μ V)
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

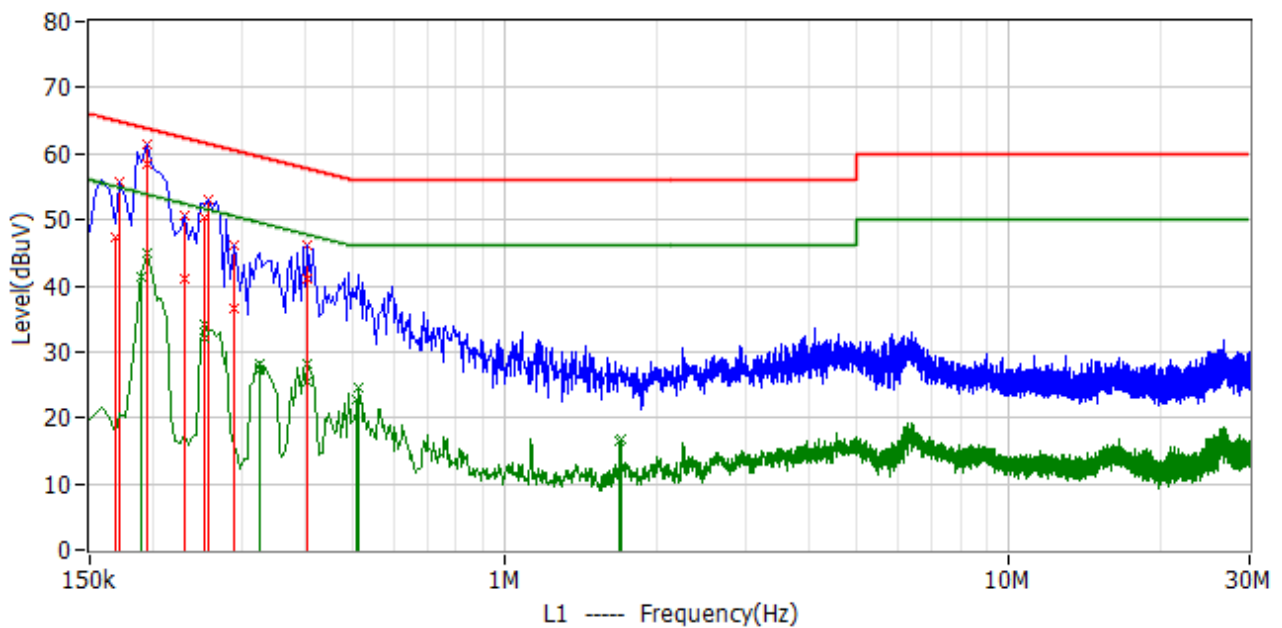
Note 1: The lower limit shall apply at the transition frequencies.
 Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.3. Test Procedure

Test Method			
	References Rule	Chapter	Item
<input checked="" type="checkbox"/>	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
<input checked="" type="checkbox"/>	ANSI C63.4-2014	7	AC power-line conducted emission measurements

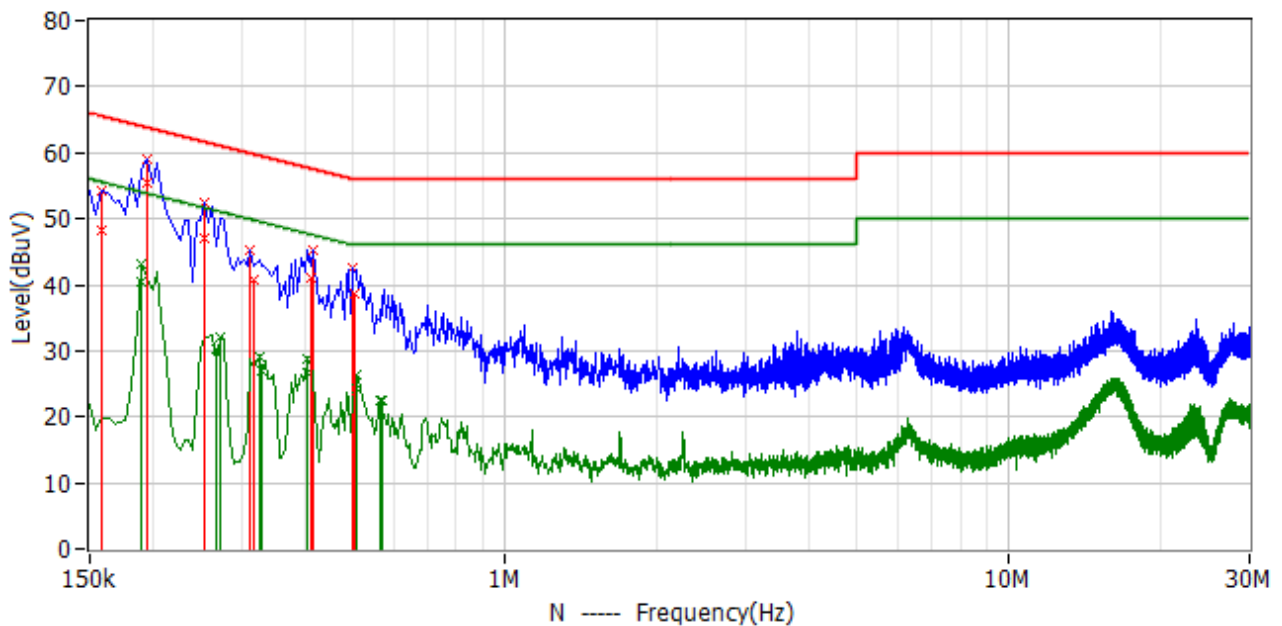
3.4. Test Result

Test Site	Shielding Room	Date of Test	2023.03.30
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	120V/60Hz
Temperature	19°C	Humidity	55%RH
Barometric Pressure	102.9kPa	Test Engineer	Emily
Test Mode	Mode 1: Charging Mode		
Note	Mains terminal disturbance voltage (Test line L)		



No.	Frequency	Limit dBuV	Level dBuV	Margin dB	Factor dB	Detector	Phase
1	168.000kHz	65.1	47.3	-17.8	27.5	19.8	QP
2	195.000kHz	63.8	58.3	-5.5	38.5	19.8	QP
3	231.000kHz	62.4	41.1	-21.3	21.3	19.8	QP
4	253.500kHz	61.6	50.3	-11.3	30.5	19.8	QP
5	289.500kHz	60.5	36.7	-23.8	16.9	19.8	QP
6	406.500kHz	57.7	40.9	-16.8	21.2	19.7	QP
7	190.500kHz	54.0	41.2	-12.8	21.4	19.8	CAV
8	253.500kHz	51.6	32.2	-19.4	12.4	19.8	CAV
9	325.500kHz	49.6	27.2	-22.4	7.4	19.8	CAV
10	406.500kHz	47.7	25.6	-22.1	5.9	19.7	CAV
11	505.500kHz	46.0	22.8	-23.2	3.0	19.8	CAV
12	1.689MHz	46.0	16.6	-29.4	-3.2	19.8	CAV

Test Site	Shielding Room	Date of Test	2023.03.30
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	120V/60Hz
Temperature	19°C	Humidity	55%RH
Barometric Pressure	102.9kPa	Test Engineer	Emily
Test Mode	Mode 1: Charging Mode		
Note	Mains terminal disturbance voltage (Test line N)		

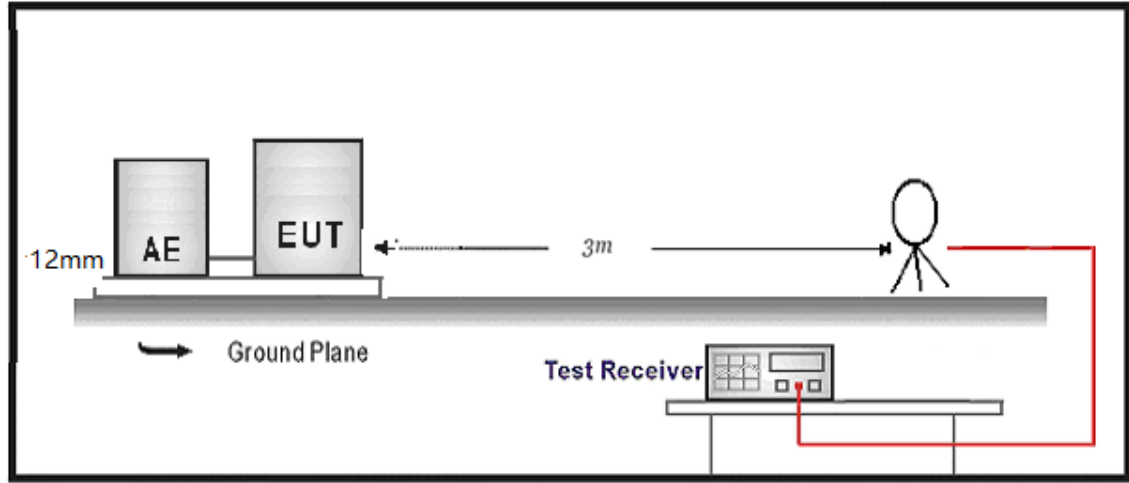


No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Factor dB	Detector	Phase
1	159.000kHz	65.5	48.1	-17.4	28.3	19.8	QP
2	195.000kHz	63.8	55.3	-8.5	35.5	19.8	QP
3	253.500kHz	61.6	47.0	-14.6	27.2	19.8	QP
4	316.500kHz	59.8	40.7	-19.1	20.9	19.8	QP
5	411.000kHz	57.6	40.9	-16.7	21.2	19.7	QP
6	501.000kHz	56.0	38.8	-17.2	19.1	19.7	QP
7	190.500kHz	54.0	40.5	-13.5	20.7	19.8	CAV
8	267.000kHz	51.2	30.2	-21.0	10.4	19.8	CAV
9	330.000kHz	49.5	27.1	-22.4	7.3	19.8	CAV
10	406.500kHz	47.7	26.6	-21.1	6.9	19.7	CAV
11	505.500kHz	46.0	24.4	-21.6	4.7	19.7	CAV
12	564.000kHz	46.0	22.6	-23.4	2.9	19.7	CAV

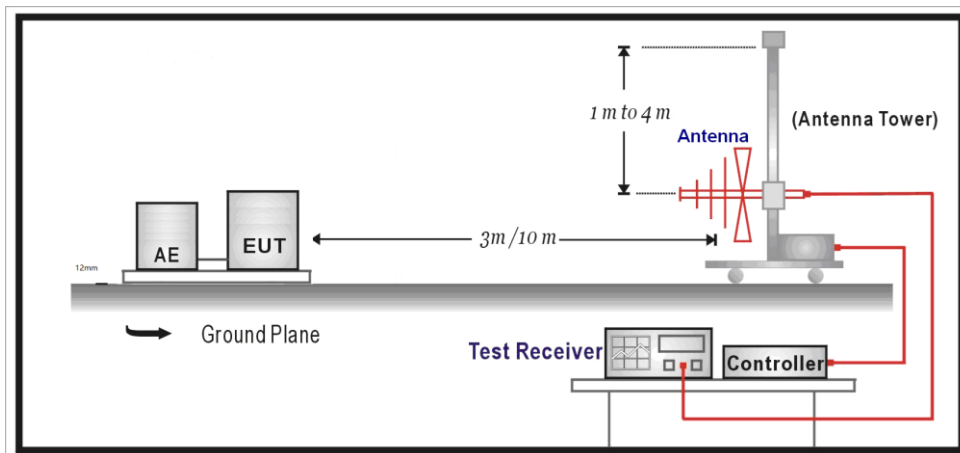
4. Emissions in restricted frequency bands

4.1. Test Setup

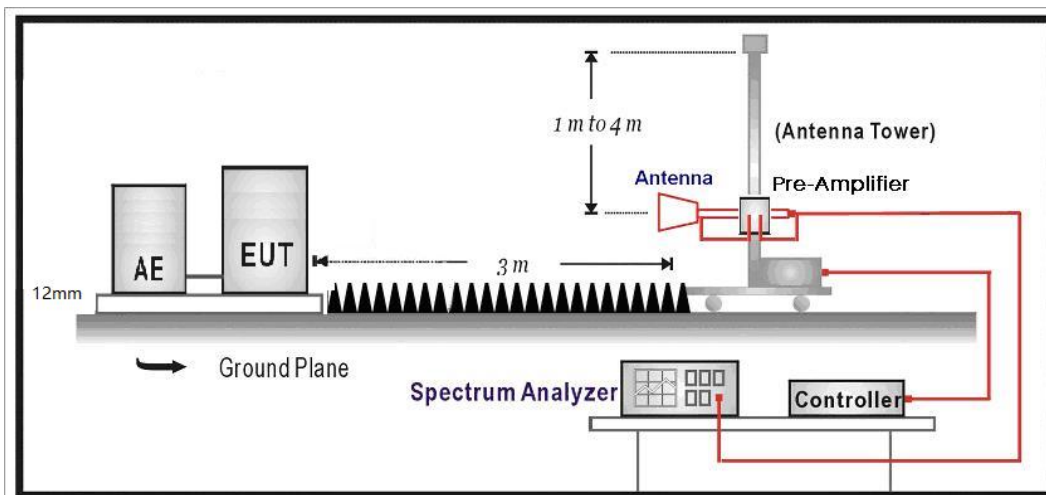
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.2. Limit

For FCC

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

For IC:

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090-0.110	13.36-13.41	1645.5-1646.5	9.0-9.2
2.1735-2.1905	16.42-16.423	1660-1710	9.3-9.5
3.020-3.026	16.69475-16.69525	1718.8-1722.2	10.6-12.7
4.125-4.128	16.80425-16.80475	2200-2300	13.25-13.4
4.17725-4.17775	25.5-25.67	2310-2390	14.47-14.5
4.20725-4.20775	37.5-38.25	2655-2900	15.35-16.2
5.677-5.683	73-74.6	3260-3267	17.7-21.4
6.215-6.218	74.8-75.2	3332-3339	22.01-23.12
6.26775-6.26825	108-138	3345.8-3358	23.6-24.0
6.31175-6.31225	156.52475-156.52525	3500-4400	31.2-31.8
8.291-8.294	156.7-156.9	4500-5150	36.43-36.5
8.362-8.366	240-285	5350-5460	Above 38.6
8.37625-8.38675	322-335.4	7250-7750	
8.41425-8.41475	399.9-410	8025-8500	
12.29-12.293	608-614		
12.51975-12.52025	960-1427		
12.57675-12.57725	1435-1626.5		

Restricted Band Emissions Limit			
Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Field strength ($\text{dB}\mu\text{V}/\text{m}$)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

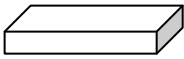
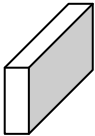
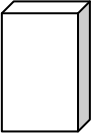

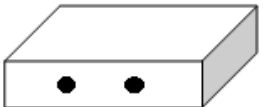

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.3. Test Procedure

Test Method			
	References Rule	Chapter	Description
<input type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
	<input type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
	<input type="checkbox"/> ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

4.4. EUT test Axis definition

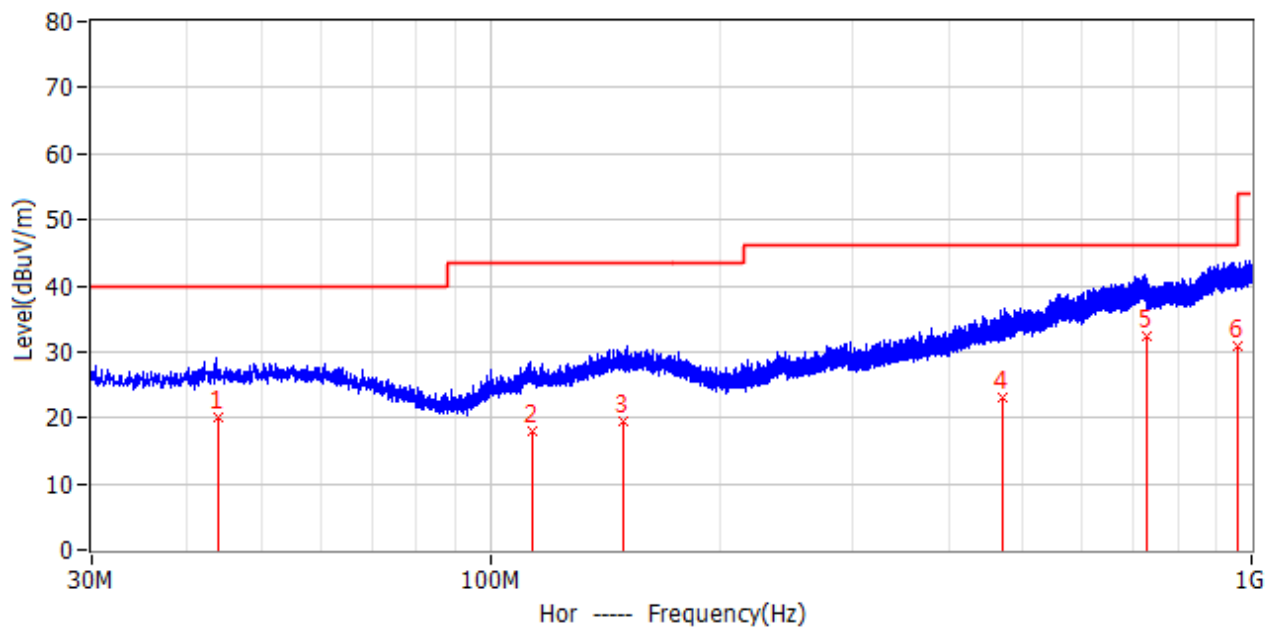
Item	Emissions in restricted frequency bands			
Device Category	<input type="checkbox"/>	Fixed point-to-point		
	<input type="checkbox"/>	Emit multiple directional beams, simultaneously or sequentially		
	<input checked="" type="checkbox"/>	Other cases		
Test mode	Mode 1			
Test method	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input checked="" type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

4.5. Test Result

Note: The amplitude of spurious emissions (9kHz-30MHz & 18GHz-40GHz) which are attenuated more than 20 dB below the limits are not reported.

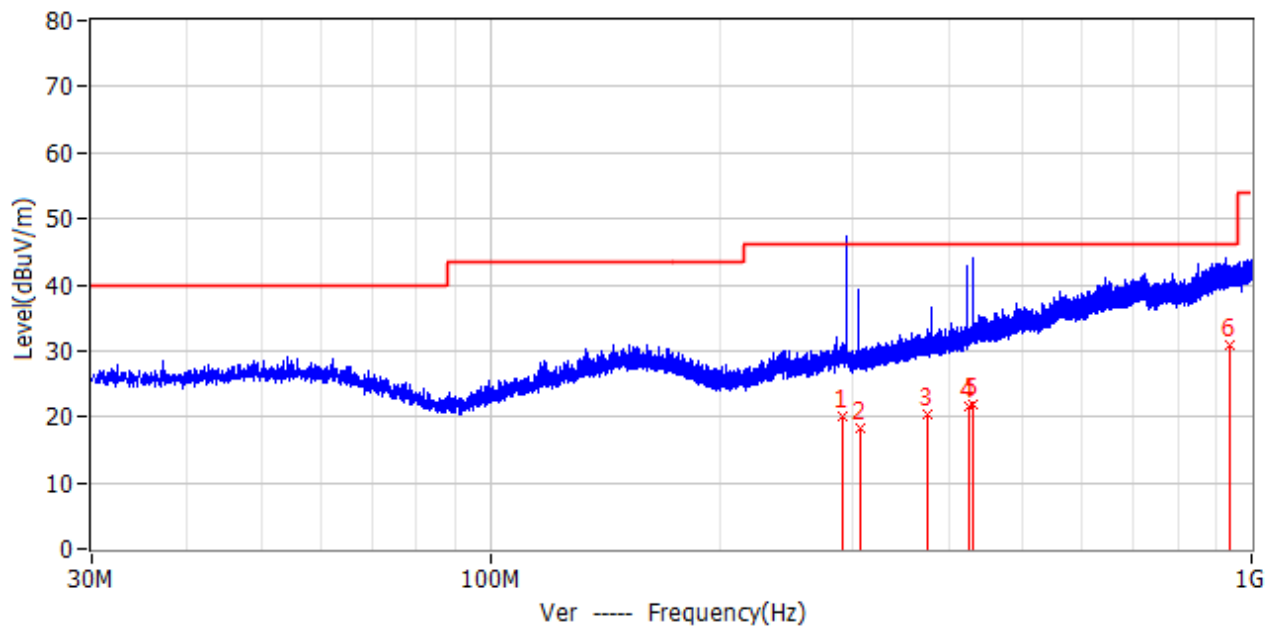
The worst case of Radiated Emission below 1GHz:

Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.03.31
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	120V/60Hz
Temperature	21°C	Humidity	54%RH
Barometric Pressure	102.8kPa	Test Engineer	Emily
Test Mode	Mode 1: Transmit-1Mbps(GFSK_BLE) (Charging Mode)		
Polarity	Horizontal polarization		



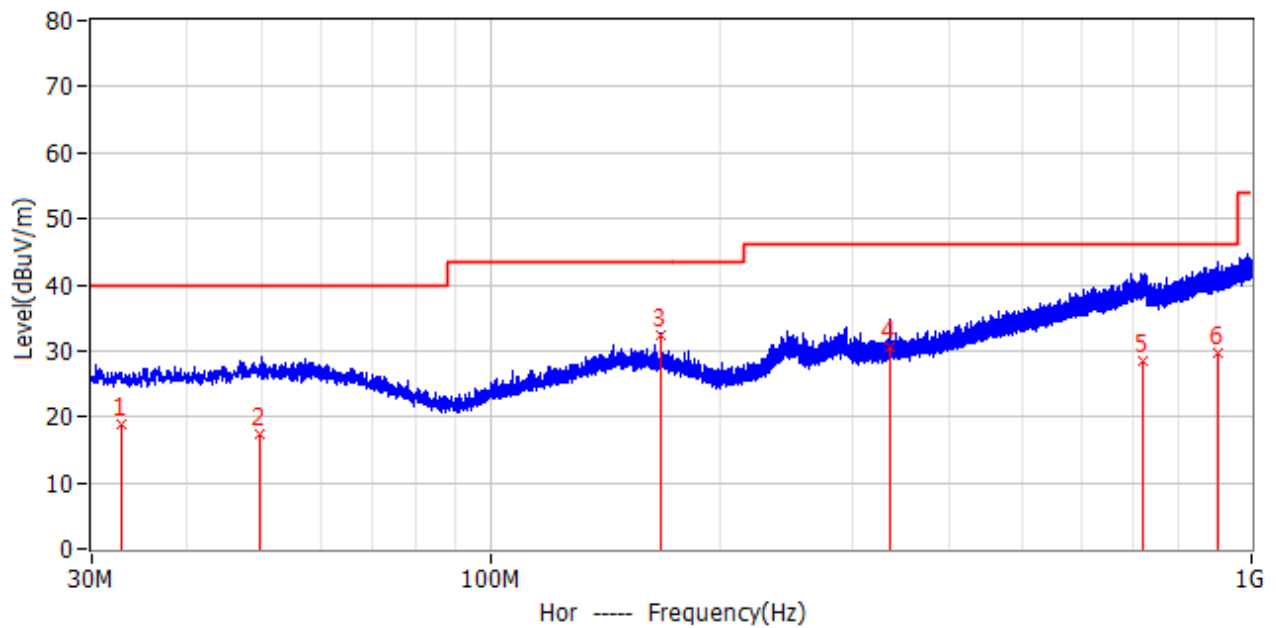
No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1	43.915MHz	40.0	20.0	-20.0	0.1	19.9	QP	Hor	200.0	4.0
2	114.002MHz	43.5	18.0	-25.5	0.6	17.4	QP	Hor	100.0	338.0
3	149.874MHz	43.5	19.4	-24.1	-0.9	20.3	QP	Hor	238.0	0.0
4	471.675MHz	46.0	23.0	-23.0	-2.2	25.2	QP	Hor	200.0	187.0
5	728.209MHz	46.0	32.4	-13.6	2.3	30.1	QP	Hor	200.0	318.0
6	958.440MHz	46.0	30.8	-15.2	-2.3	33.1	QP	Hor	200.0	221.0

Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.03.31
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	120V/60Hz
Temperature	21°C	Humidity	54%RH
Barometric Pressure	102.8kPa	Test Engineer	Emily
Test Mode	Mode 1: Transmit-1Mbps(GFSK_BLE) (Charging Mode)		
Polarity	Vertical polarization		



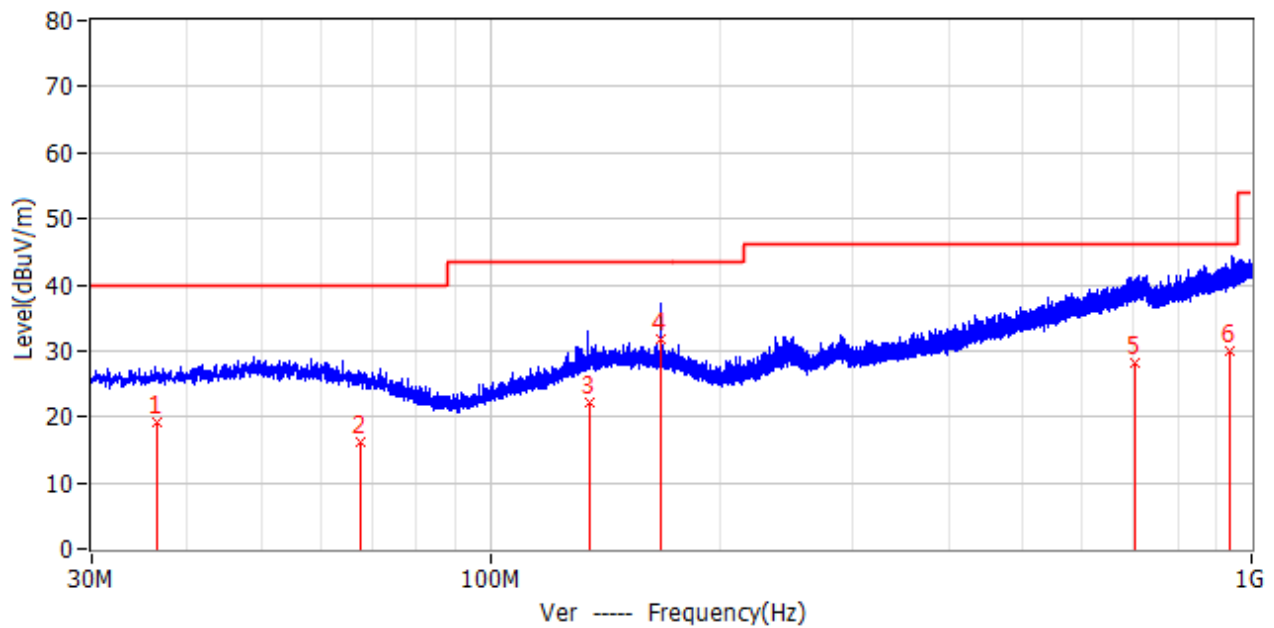
No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1	290.511MHz	46.0	20.0	-26.0	-0.8	20.8	QP	Ver	200.0	43.0
2	305.596MHz	46.0	18.2	-27.8	-2.9	21.1	QP	Ver	100.0	21.0
3	375.896MHz	46.0	20.3	-25.7	-2.6	22.9	QP	Ver	200.0	43.0
4	424.889MHz	46.0	21.7	-24.3	-2.4	24.1	QP	Ver	200.0	43.0
5	429.965MHz	46.0	22.0	-24.0	-2.3	24.3	QP	Ver	100.0	15.0
6	933.624MHz	46.0	30.8	-15.2	-2.3	33.1	QP	Ver	200.0	360.0

Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.03.31
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	By battery
Temperature	21°C	Humidity	54%RH
Barometric Pressure	102.8kPa	Test Engineer	Emily
Test Mode	Mode 2: Transmit-1Mbps(GFSK_BLE) (High Speed Mode)		
Polarity	Horizontal polarization		



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1	32.808MHz	40.0	19.0	-21.0	0.3	18.7	QP	Hor	300.0	78.0
2	49.918MHz	40.0	17.4	-22.6	-2.8	20.2	QP	Hor	300.0	1.0
3	168.007MHz	43.5	32.4	-11.1	12.5	19.9	QP	Hor	200.0	47.0
4	336.028MHz	46.0	30.5	-15.5	8.6	21.9	QP	Hor	100.0	4.0
5	721.916MHz	46.0	28.5	-17.5	-1.5	30.0	QP	Hor	400.0	6.0
6	905.166MHz	46.0	29.6	-16.4	-2.9	32.5	QP	Hor	400.0	300.0

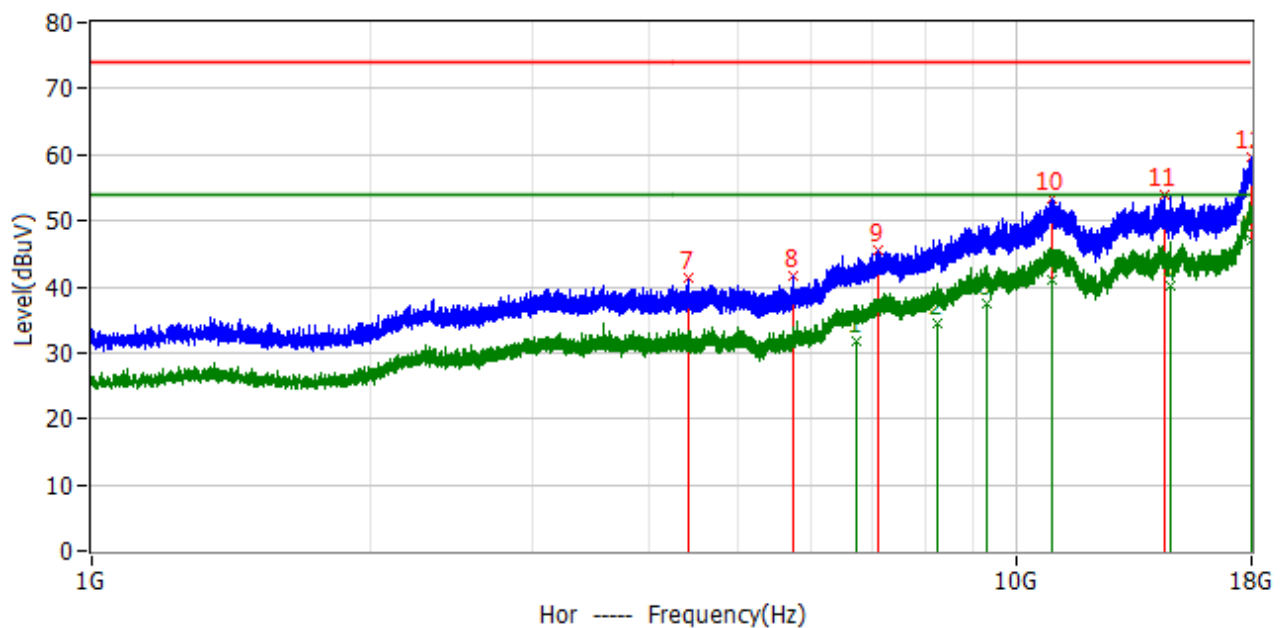
Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.03.31
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	By battery
Temperature	21°C	Humidity	54%RH
Barometric Pressure	102.8kPa	Test Engineer	Emily
Test Mode	Mode 1: Transmit-1Mbps(GFSK_BLE) (High Speed Mode)		
Polarity	Vertical polarization		



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1	36.432MHz	40.0	19.2	-20.8	0.2	19.0	QP	Ver	300.0	167.1
2	67.674MHz	40.0	16.2	-23.8	-2.4	18.6	QP	Ver	399.9	137.1
3	135.110MHz	43.5	22.2	-21.3	2.9	19.3	QP	Ver	99.9	0.1
4	168.029MHz	43.5	31.9	-11.6	12.0	19.9	QP	Ver	99.9	192.1
5	702.240MHz	46.0	28.2	-17.8	-1.6	29.8	QP	Ver	325.9	359.9
6	936.831MHz	46.0	30.1	-15.9	-2.7	32.8	QP	Ver	123.9	124.0

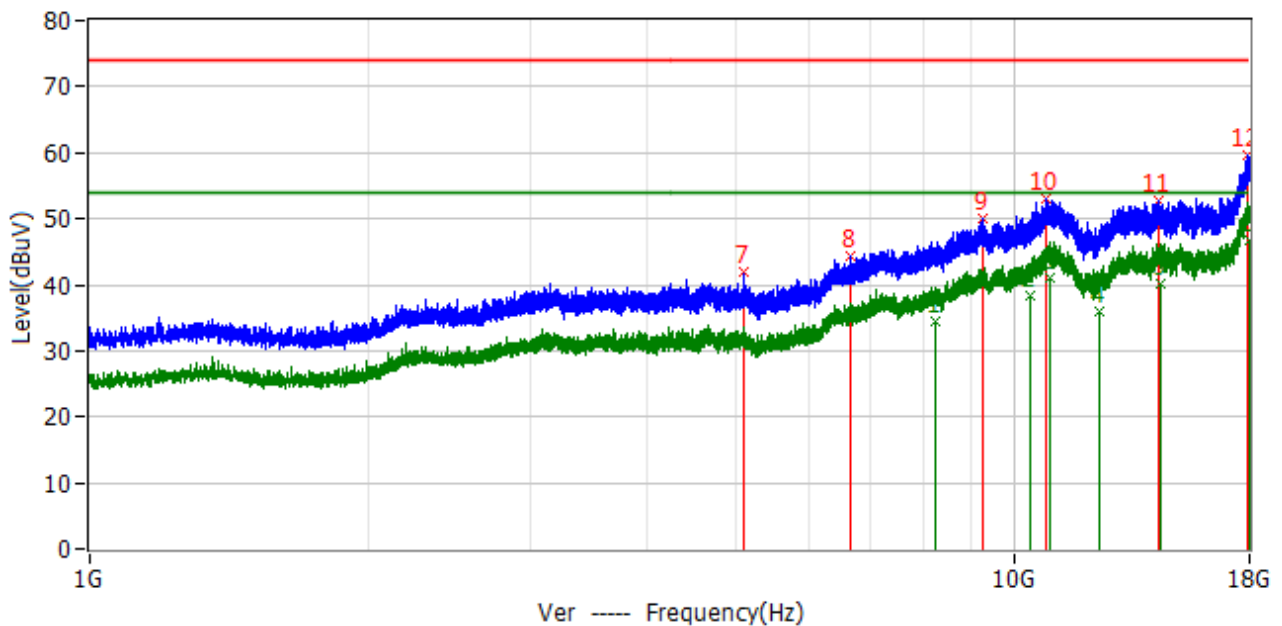
The worst case of Radiated Emission above 1GHz:

Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.04.12
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	120V/60Hz
Temperature	21°C	Humidity	54%RH
Barometric Pressure	102.6kPa	Test Engineer	Emily
Test Mode	Mode 1: Transmit-1Mbps(GFSK_BLE) (Charging Mode)		
Polarity	Horizontal polarization		



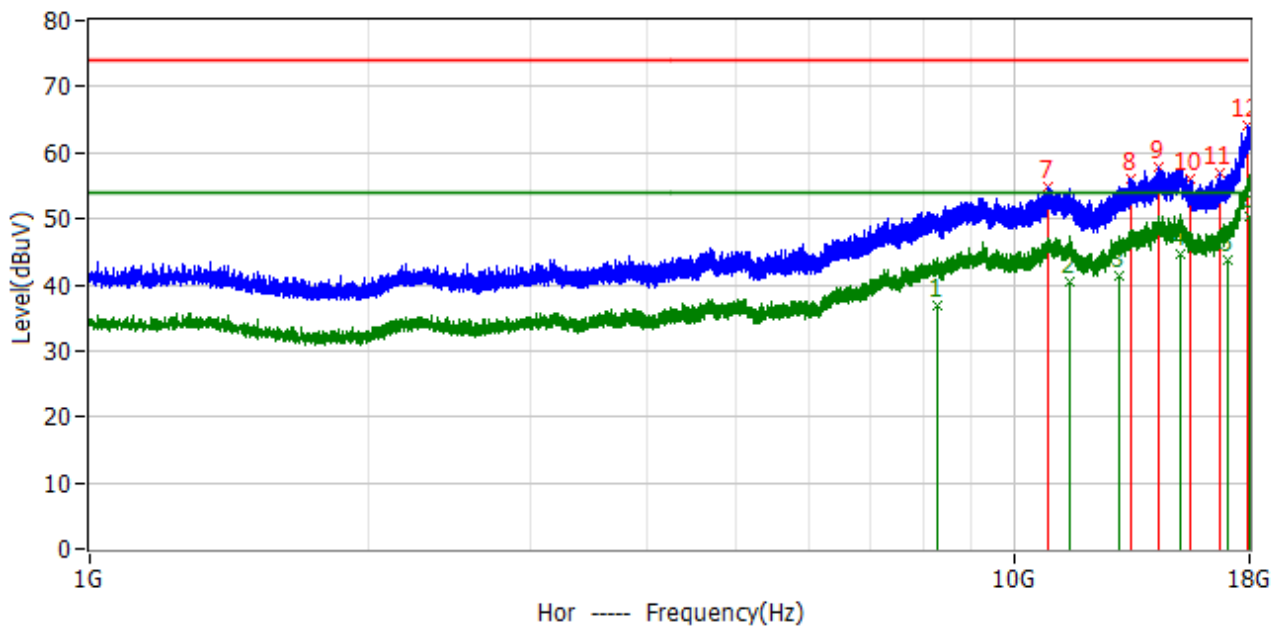
No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Polar	Height cm	Angle deg
1	6.739GHz	54.0	31.7	-22.3	36.2	-4.5	CAV	Hor	100.0	0.0
2	8.241GHz	54.0	34.5	-19.5	35.8	-1.3	CAV	Hor	100.0	52.0
3	9.289GHz	54.0	37.6	-16.4	35.9	1.7	CAV	Hor	100.0	148.0
4	10.942GHz	54.0	41.1	-12.9	37.0	4.1	CAV	Hor	100.0	44.0
5	14.722GHz	54.0	40.2	-13.8	35.0	5.2	CAV	Hor	100.0	257.0
6	17.999GHz	54.0	47.0	-7.0	35.1	11.9	CAV	Hor	100.0	328.0
7*	4.433GHz	74.0	41.2	-32.8	51.1	-9.9	PK	Hor	100.0	0.0
8*	5.744GHz	74.0	41.6	-32.4	49.1	-7.5	PK	Hor	100.0	0.0
9*	7.084GHz	74.0	45.5	-28.5	48.5	-3.0	PK	Hor	100.0	48.0
10*	10.941GHz	74.0	53.4	-20.6	49.3	4.1	PK	Hor	100.0	95.0
11*	14.517GHz	74.0	53.9	-20.1	48.9	5.0	PK	Hor	100.0	0.0
12*	17.997GHz	74.0	59.5	-14.5	47.6	11.9	PK	Hor	100.0	163.0

Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.04.12
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	120V/60Hz
Temperature	21°C	Humidity	54%RH
Barometric Pressure	102.6kPa	Test Engineer	Emily
Test Mode	Mode 1: Transmit-1Mbps(GFSK_BLE) (Charging Mode)		
Polarity	Vertical polarization		



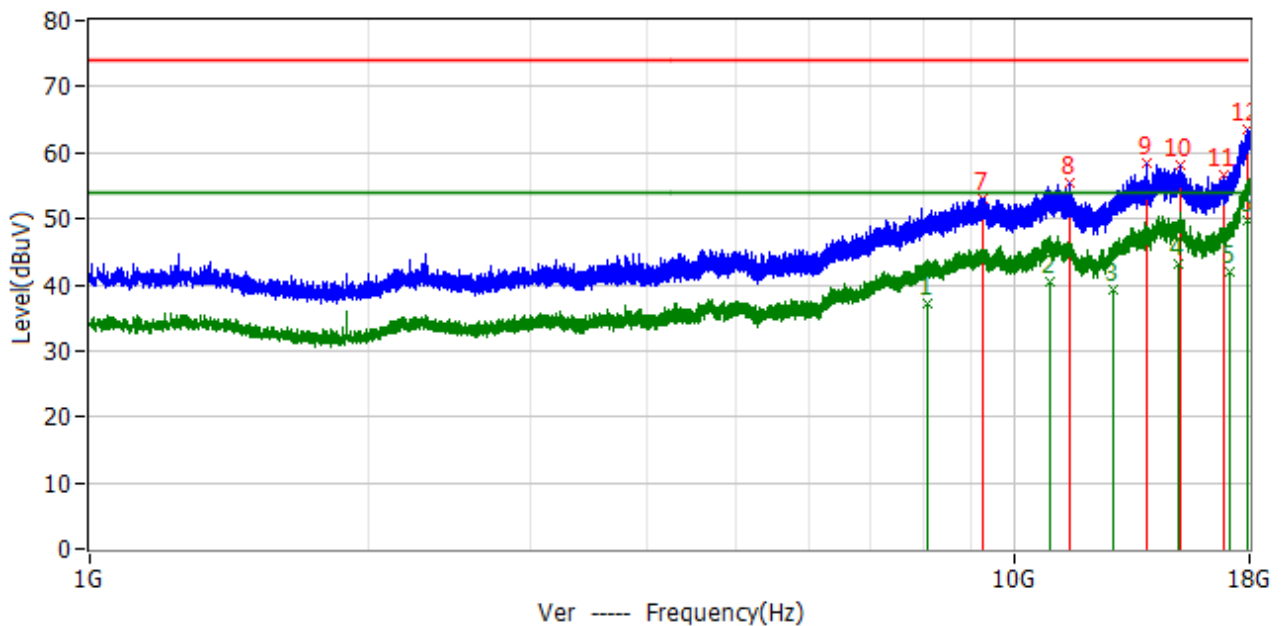
No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Polar	Height cm	Angle deg
1	8.224GHz	54.0	34.5	-19.5	35.8	-1.3	CAV	Ver	100.0	0.0
2	10.420GHz	54.0	38.4	-15.6	35.6	2.8	CAV	Ver	100.0	0.0
3	10.935GHz	54.0	41.0	-13.0	36.9	4.1	CAV	Ver	100.0	0.0
4	12.351GHz	54.0	36.1	-17.9	33.2	2.9	CAV	Ver	100.0	176.0
5	14.390GHz	54.0	40.2	-13.8	35.3	4.9	CAV	Ver	100.0	284.0
6	17.976GHz	54.0	46.7	-7.3	34.9	11.8	CAV	Ver	100.0	191.0
7*	5.096GHz	74.0	41.8	-32.2	50.4	-8.6	PK	Ver	100.0	0.0
8*	6.654GHz	74.0	44.4	-29.6	49.0	-4.6	PK	Ver	100.0	0.0
9*	9.273GHz	74.0	50.1	-23.9	48.4	1.7	PK	Ver	100.0	215.0
10*	10.850GHz	74.0	53.1	-20.9	49.3	3.8	PK	Ver	100.0	0.0
11*	14.323GHz	74.0	52.6	-21.4	47.8	4.8	PK	Ver	100.0	360.0
12*	17.910GHz	74.0	59.5	-14.5	48.3	11.2	PK	Ver	100.0	0.0

Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.04.27
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	By battery
Temperature	19°C	Humidity	51%RH
Barometric Pressure	102.6kPa	Test Engineer	Emily
Test Mode	Mode 2: Transmit-1Mbps(GFSK_BLE)(High Speed Mode)		
Polarity	Horizontal polarization		



No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Polar	Height cm	Angle deg
1	8.260GHz	54.0	36.9	-17.1	35.8	1.1	CAV	Hor	147.0	0.1
2	11.481GHz	54.0	40.5	-13.5	36.9	3.6	CAV	Hor	200.0	19.0
3	13.001GHz	54.0	41.3	-12.7	36.8	4.5	CAV	Hor	200.0	19.0
4	15.185GHz	54.0	44.5	-9.5	37.1	7.4	CAV	Hor	183.0	229.1
5	17.024GHz	54.0	43.8	-10.2	37.0	6.8	CAV	Hor	184.0	0.1
6	17.962GHz	54.0	50.3	-3.7	36.3	14.0	CAV	Hor	200.0	183.0
7*	10.887GHz	74.0	54.9	-19.1	51.8	3.1	PK	Hor	200.0	360.0
8*	13.392GHz	74.0	56.0	-18.0	51.0	5.0	PK	Hor	100.0	302.0
9*	14.365GHz	74.0	57.7	-16.3	50.6	7.1	PK	Hor	194.0	360.0
10*	15.497GHz	74.0	55.9	-18.1	50.3	5.6	PK	Hor	100.0	0.0
11*	16.717GHz	74.0	57.0	-17.0	50.9	6.1	PK	Hor	200.0	74.0
12*	17.951GHz	74.0	64.1	-9.9	50.2	13.9	PK	Hor	166.0	360.0

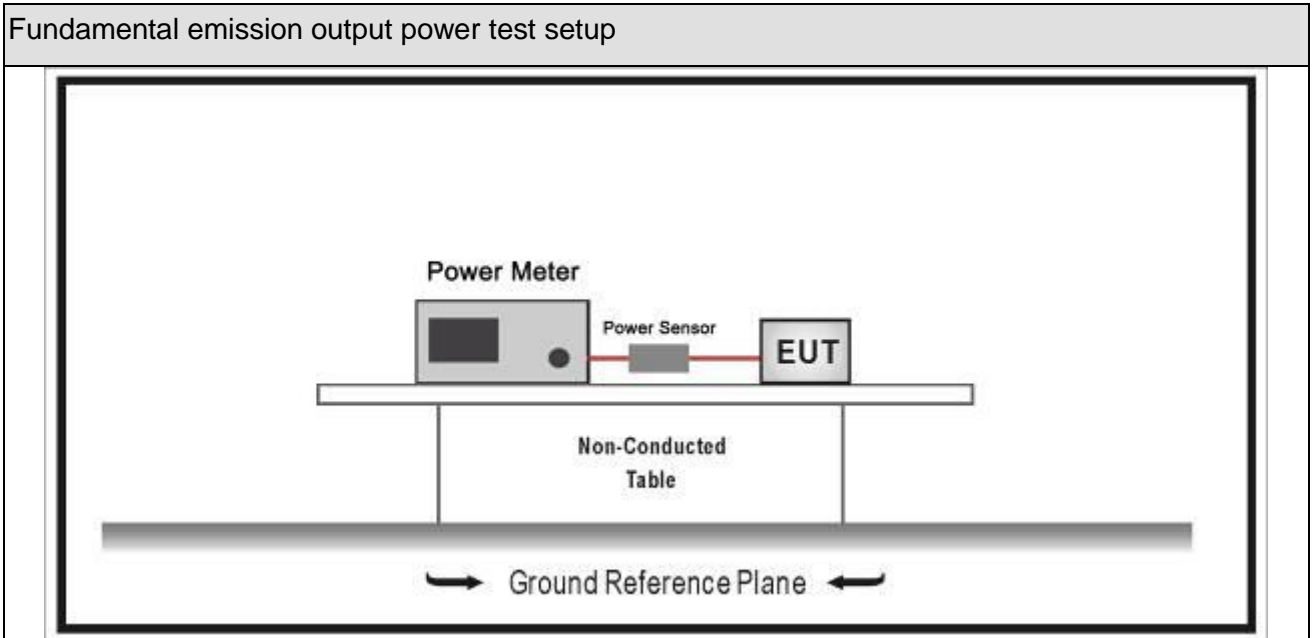
Test Site	3m Semi -Anechoic Chamber 1	Date of Test	2023.04.27
EUT	Electric Wheelchair (Robooter E40)	Test Voltage	By battery
Temperature	19°C	Humidity	51%RH
Barometric Pressure	102.8kPa	Test Engineer	Emily
Test Mode	Mode 2: Transmit-1Mbps(GFSK_BLE) (High Speed Mode)		
Polarity	Vertical polarization		



No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Polar	Height cm	Angle deg
1	8.058GHz	54.0	37.1	-16.9	35.8	1.3	CAV	Ver	200.0	359.9
2	10.933GHz	54.0	40.5	-13.5	37.3	3.2	CAV	Ver	153.9	341.1
3	12.816GHz	54.0	39.4	-14.6	35.1	4.3	CAV	Ver	158.0	0.1
4	15.057GHz	54.0	43.0	-11.0	35.1	7.9	CAV	Ver	200.0	329.1
5	17.143GHz	54.0	41.8	-12.2	34.9	6.9	CAV	Ver	100.0	153.9
6	17.935GHz	54.0	49.6	-4.4	35.9	13.7	CAV	Ver	100.0	170.1
7*	9.278GHz	74.0	53.0	-21.0	50.0	3.0	PK	Ver	158.0	360.0
8*	11.521GHz	74.0	55.4	-18.6	51.8	3.6	PK	Ver	148.0	360.0
9*	13.900GHz	74.0	58.4	-15.6	52.8	5.6	PK	Ver	100.0	333.0
10*	15.159GHz	74.0	58.2	-15.8	50.7	7.5	PK	Ver	200.0	351.0
11*	16.922GHz	74.0	56.5	-17.5	49.8	6.7	PK	Ver	100.0	84.0
12*	17.937GHz	74.0	63.6	-10.4	49.8	13.8	PK	Ver	200.0	40.0

5. Fundamental emission output power

5.1. Test Setup



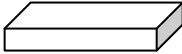
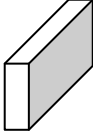




5.2. Limit

Fundamental emission output power Limit		
<input checked="" type="checkbox"/>	$G_{TX} < 6\text{dBi}$	$P_{out} \leq 30\text{dBm}$
<input type="checkbox"/>	$G_{TX} > 6\text{dBi}$	
<input type="checkbox"/>	Non-Fix point-point	$P_{out} \leq 30 - (G_{TX} - 6)$
<input type="checkbox"/>	Fix point-point	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
<input type="checkbox"/>	Point-to-multipoint	$P_{out} \leq 30 - (G_{TX} - 6)$
<input type="checkbox"/>	Overlap Beams	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
<input type="checkbox"/>	Aggregate power transmitted simultaneously on all beams	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
<input type="checkbox"/>	single directional beam	$P_{out} \leq 30 - [(G_{TX} - 6)]/3 + 8\text{dB}$
Note 1 : G_{TX} directional gain of transmitting antennas.		
Note 2 : P_{out} is maximum peak conducted output power .		

5.3. Test Procedure

Fundamental emission output power Test Method						
	References Rule		Chapter	Description		
<input checked="" type="checkbox"/>	ANSI C63.10		11.9	Fundamental emission output power		
	<input type="checkbox"/>	ANSI C63.10		11.9.1	Maximum peak conducted output power	
		<input type="checkbox"/>	ANSI C63.10	11.9.1.1	RBW \geq DTS bandwidth	
		<input type="checkbox"/>	ANSI C63.10	11.9.1.2	Integrated band power method	
		<input type="checkbox"/>	ANSI C63.10	11.9.1.3	PKPM1 Peak power meter method	
	<input checked="" type="checkbox"/>	ANSI C63.10		11.9.2	Maximum conducted (average) output power	
		<input type="checkbox"/>	ANSI C63.10		11.9.2.2	Measurement using a spectrum analyzer (SA)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.2	Method AVGSA-1(Duty cycle \geq 98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle \geq 98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle \leq 98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle \leq 98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-3
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-3A
		<input checked="" type="checkbox"/>	ANSI C63.10		11.9.2.3	Measurement using a power meter (PM)
		<input checked="" type="checkbox"/>	ANSI C63.10	11.9.2.3.1	Method AVGPM	
<input type="checkbox"/>		ANSI C63.10	11.9.2.3.2	Method AVGPM-G		

5.4. EUT test definition

Item	Fundamental emission output power			
Device Category	<input type="checkbox"/>	Fixed point-to-point		
	<input type="checkbox"/>	Emit multiple directional beams, simultaneously or sequentially		
	<input checked="" type="checkbox"/>	Other cases		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

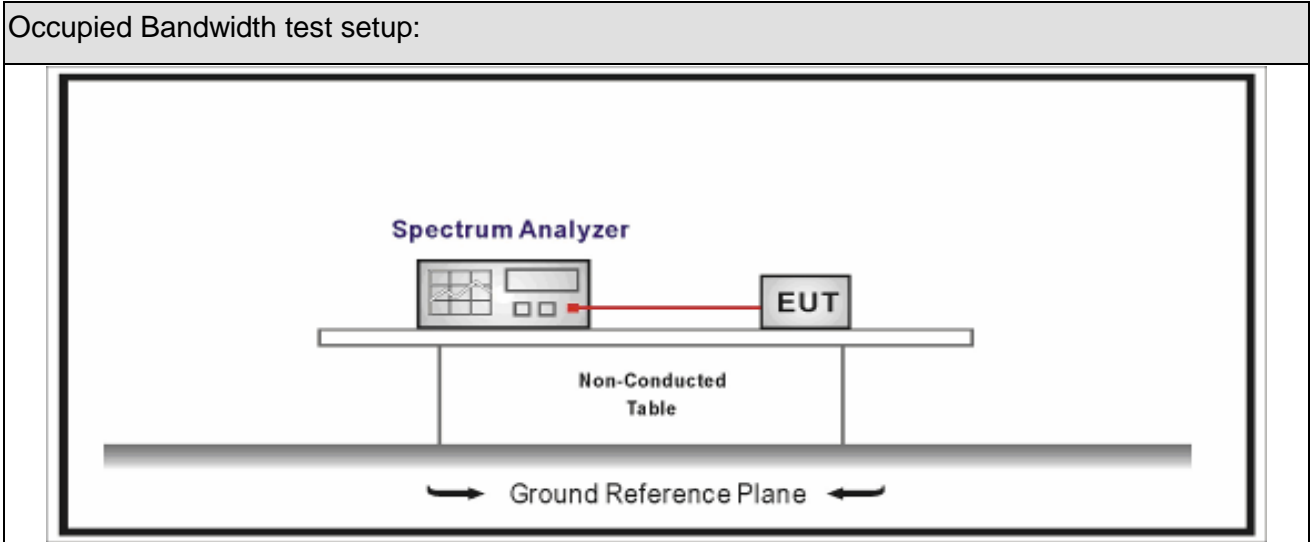
5.5. Test Result

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Test Room 3
Test Date	: 2023.04.12	Test Engineer	: Emily

Mode	Channel	Test Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
Transmit-1Mbps(GFSK_BLE)	00	2402	-12.609	30	Pass
	20	2442	-11.564	30	Pass
	39	2480	-10.863	30	Pass

6. Occupied Bandwidth

6.1. Test Setup



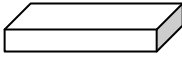
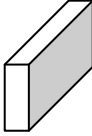

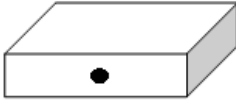
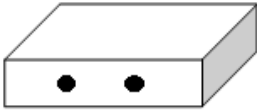

6.2. Limit

Occupied Bandwidth
Systems using digital modulation techniques operate in the 2400-2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz

6.3. Test Procedure

Test Method			
	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.8	DTS bandwidth
	<input type="checkbox"/> ANSI C63.10	11.8.1	Option 1
	<input checked="" type="checkbox"/> ANSI C63.10	11.8.2	Option 2

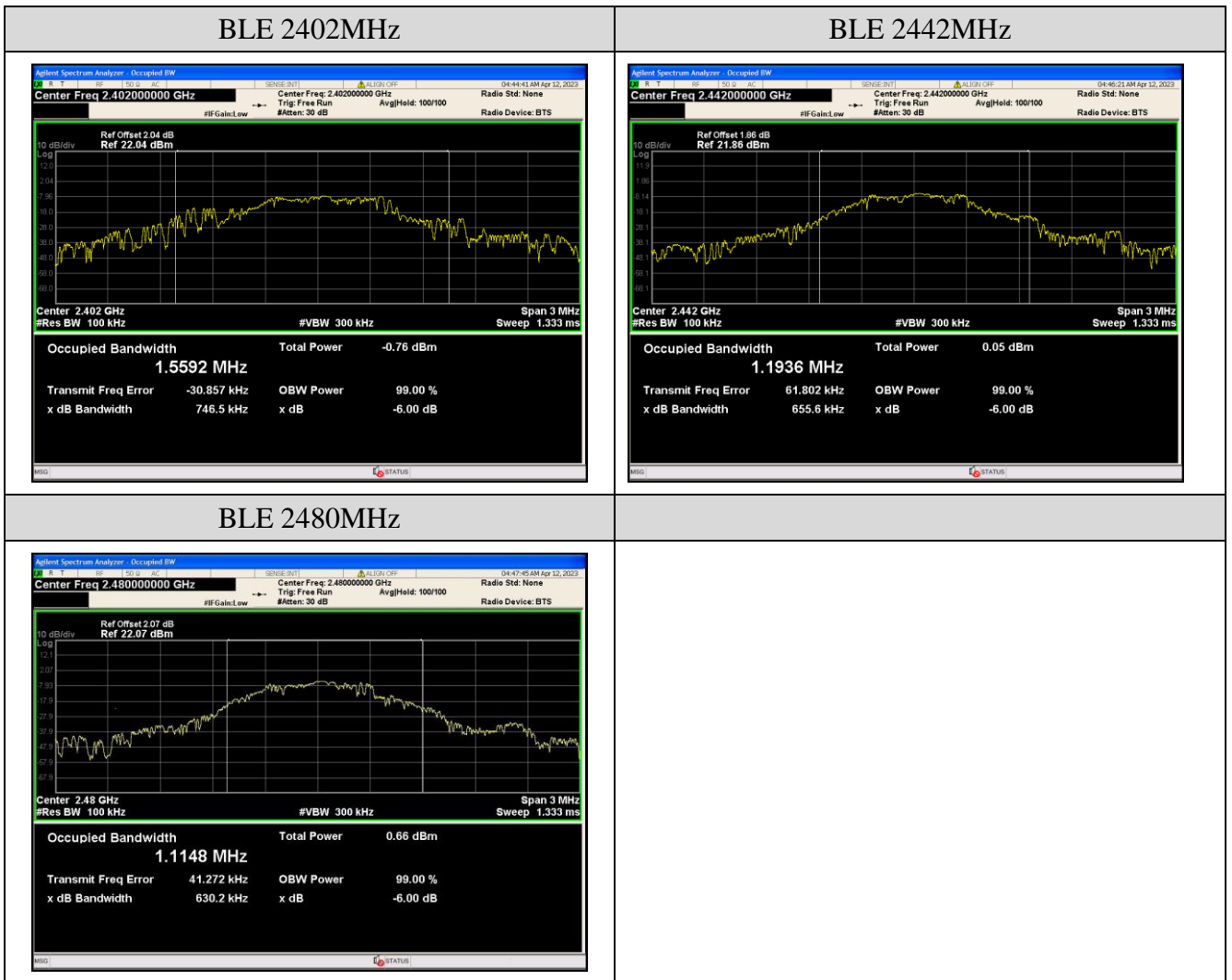
6.4. EUT test definition

Item	Occupied Bandwidth			
Device Category	<input type="checkbox"/>	Fixed point-to-point		
	<input type="checkbox"/>	Emit multiple directional beams, simultaneously or sequentially		
	<input checked="" type="checkbox"/>	Other cases		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

6.5. Test Result

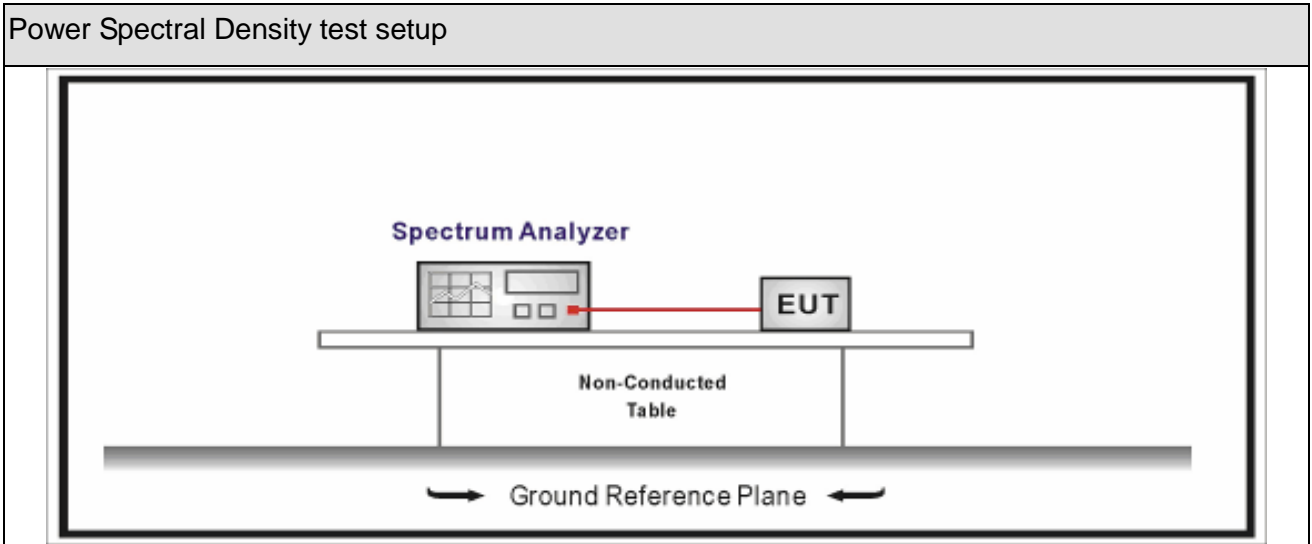
Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Test Room 3
Test Date	: 2023.04.12	Test Engineer	: Emily

Mode	CH.	Test Frequency (MHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
Transmit -1Mbps(GFSK_BLE)	00	2402	746.5	>500	Pass
	20	2442	655.6	>500	Pass
	39	2480	630.2	>500	Pass



7. Power Spectral Density

7.1. Test Setup



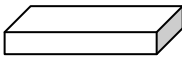
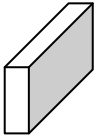
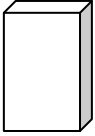
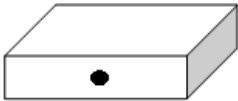

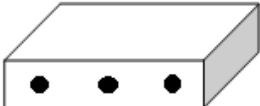
7.2. Limit

Power Spectral Density Limit
Power Spectral Density $\leq 8\text{dBm}/3\text{kHz}$

7.3. Test Procedure

Power Spectral Density Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.10	Maximum power spectral density level in the fundamental emission
<input checked="" type="checkbox"/>	ANSI C63.10	11.10.2	Method PKPSD (peak PSD)
<input type="checkbox"/>	ANSI C63.10	11.10.3	Method AVGPSD-1(Duty cycle $\geq 98\%$)
<input type="checkbox"/>	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle $\geq 98\%$)
<input checked="" type="checkbox"/>	ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle $< 98\%$)
<input type="checkbox"/>	ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle $< 98\%$)
<input type="checkbox"/>	ANSI C63.10	11.10.7	Method AVGPSD-3
<input type="checkbox"/>	ANSI C63.10	11.10.8	Method AVGPSD-3A

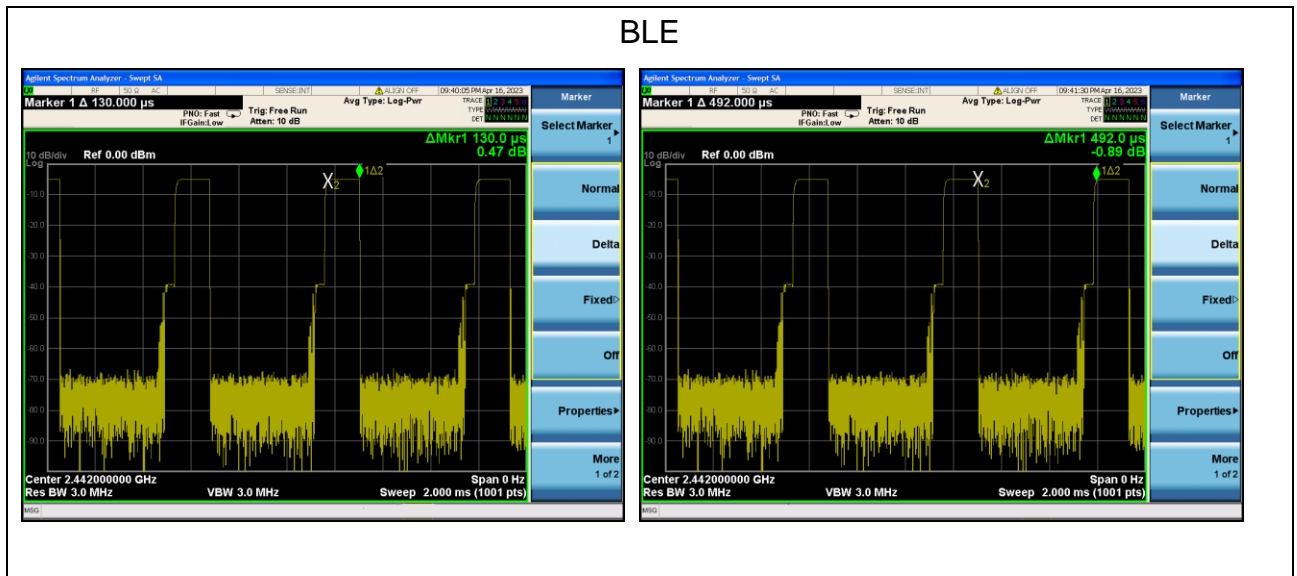
7.4. EUT test definition

Item	Power Spectral Density Test Method			
Device Category	<input type="checkbox"/>	Fixed point-to-point		
	<input type="checkbox"/>	Emit multiple directional beams, simultaneously or sequentially		
	<input checked="" type="checkbox"/>	Other cases		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

7.5. Test Result

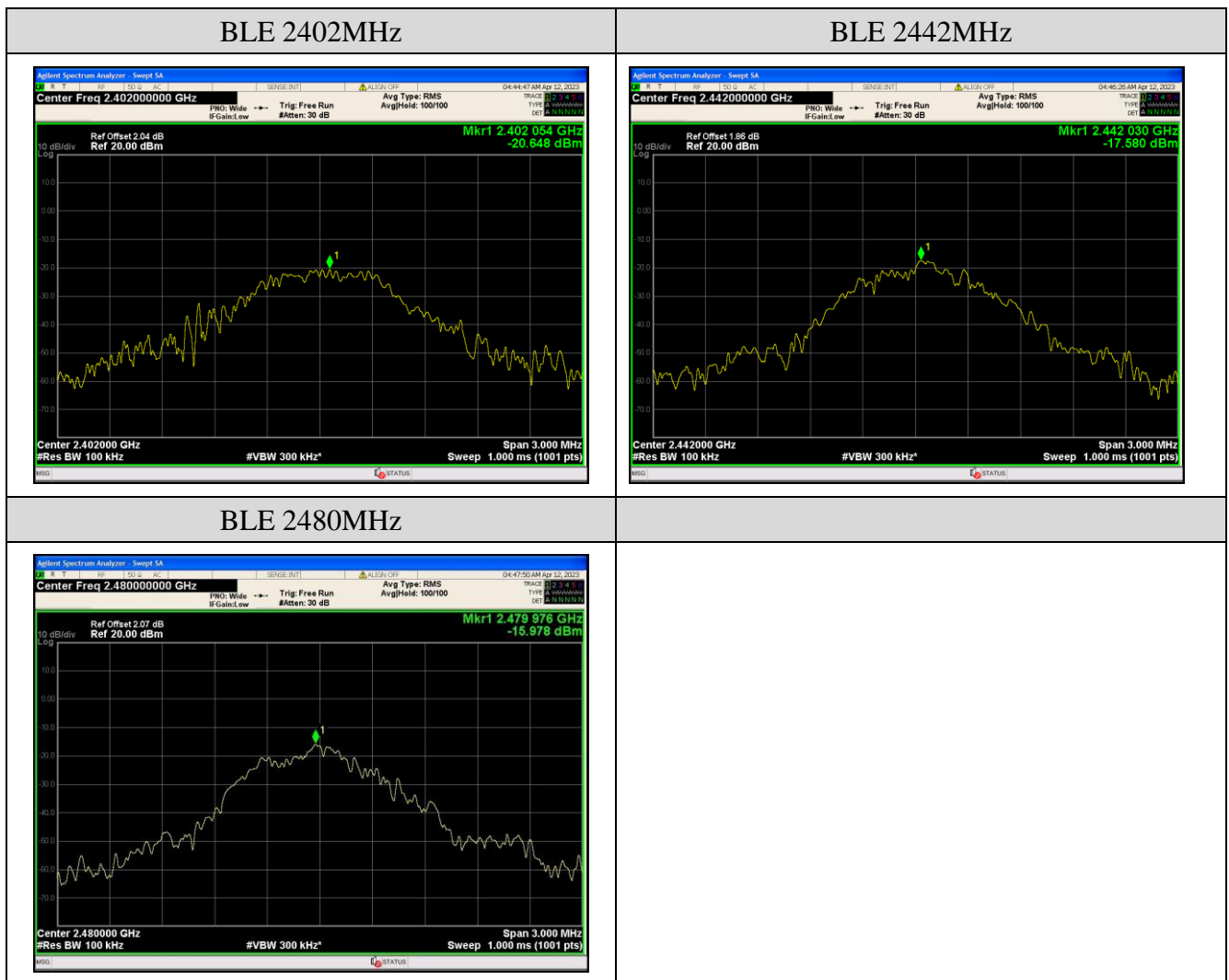
Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Test Room 3
Test Date	: 2023.04.12	Test Engineer	: Emily

Test Mode	Tx On (μs)	Tx Off (μs)	Tx On + Tx Off (μs)	Duty Cycle	Duty factor=10log(1/D)
Transmit -1Mbps(GFSK_BLE)	130	492	622	20.90%	6.799dB



Mode	Channel	Test Frequency (MHz)	Measured PSD (dBm/3kHz)	Final PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
Transmit -1Mbps(GFSK_BLE)	00	2402	-20.648	-13.849	8	Pass
	20	2442	-17.58	-10.781	8	Pass
	39	2480	-15.978	-9.179	8	Pass

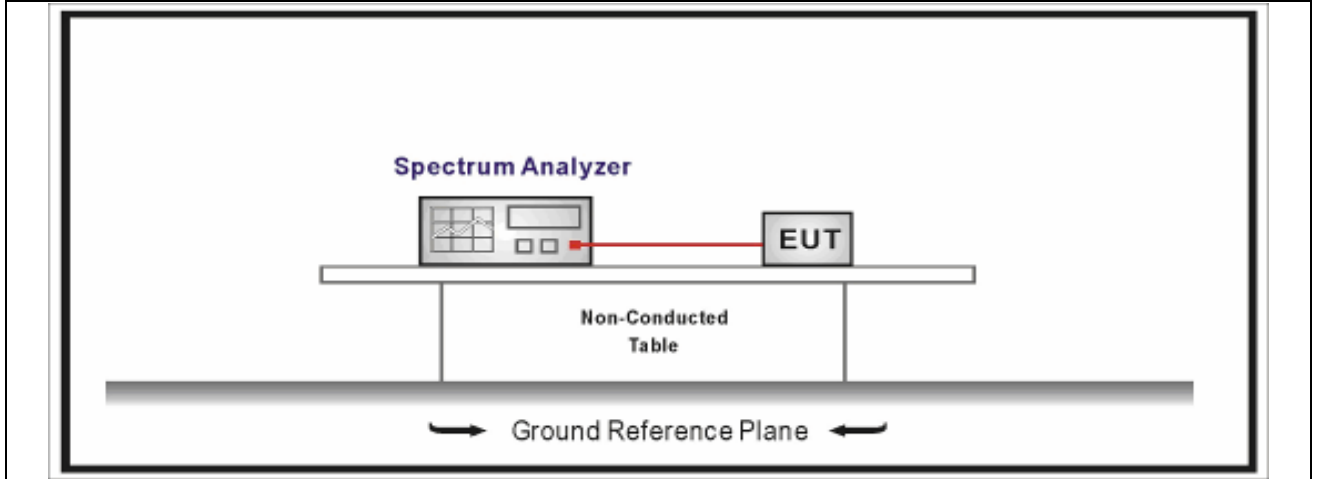
Note: Final PSD = Measured PSD + Duty Factor



8. Emissions in non-restricted frequency bands & Conducted Band Edge

8.1. Test Setup

Emissions in non-restricted frequency bands test setup:



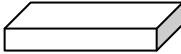
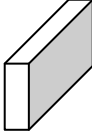




8.2. Limit

Un-Restricted Band Emissions Limit	
RF Output power (Detection methods)	Limit(dB)
RF Output power(Average detector)	30c(Note1)
RF Output power(PK detector)	20c(Note2)
<p>Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).</p> <p>Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).</p>	

8.3. Test Procedure

Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement
<input type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

8.4. EUT test Axis definition

Item	Emissions in non-restricted frequency bands			
Device Category	<input type="checkbox"/>	Fixed point-to-point		
	<input type="checkbox"/>	Emit multiple directional beams, simultaneously or sequentially		
	<input checked="" type="checkbox"/>	Other cases		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

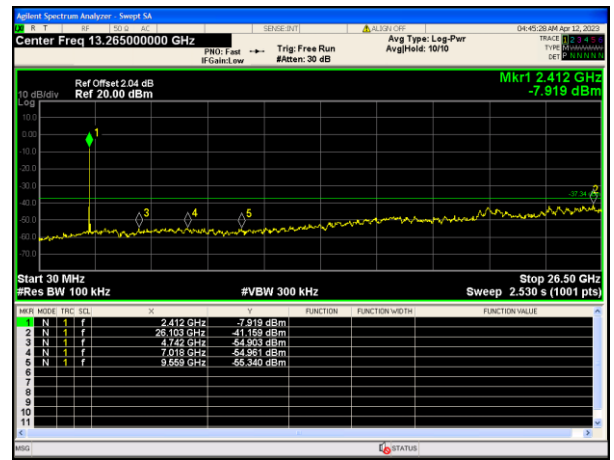
8.5. Test Result

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Test Room 3
Test Date	: 2023.04.12	Test Engineer	: Emily

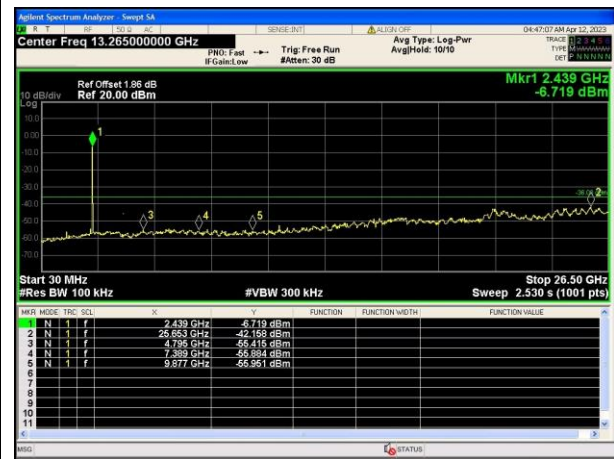
Emissions in non-restricted frequency bands:

Mode	Channel	Frequency (MHz)	Max Value (dBm)	Reference Level (dBm)	Max Value (dBc)	Limit (dBc)	Verdict
Transmit -1Mbps(GFSK_BLE)	00	2402	-41.159	-7.342	-33.817	-30	Pass
	20	2442	-42.158	-6.033	-36.125	-30	Pass
	39	2480	-41.411	-4.920	-36.491	-30	Pass

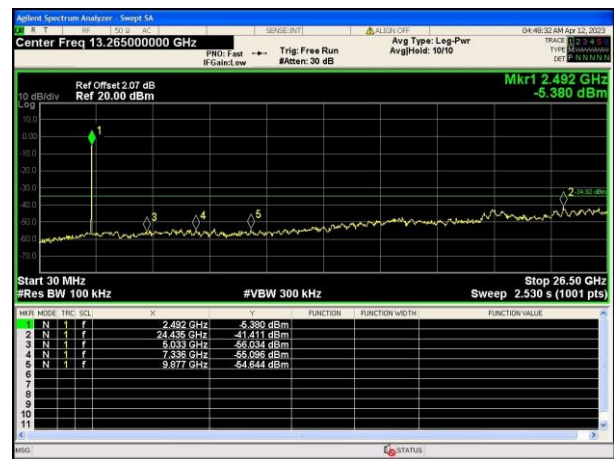
BLE 2402MHz



BLE 2442MHz



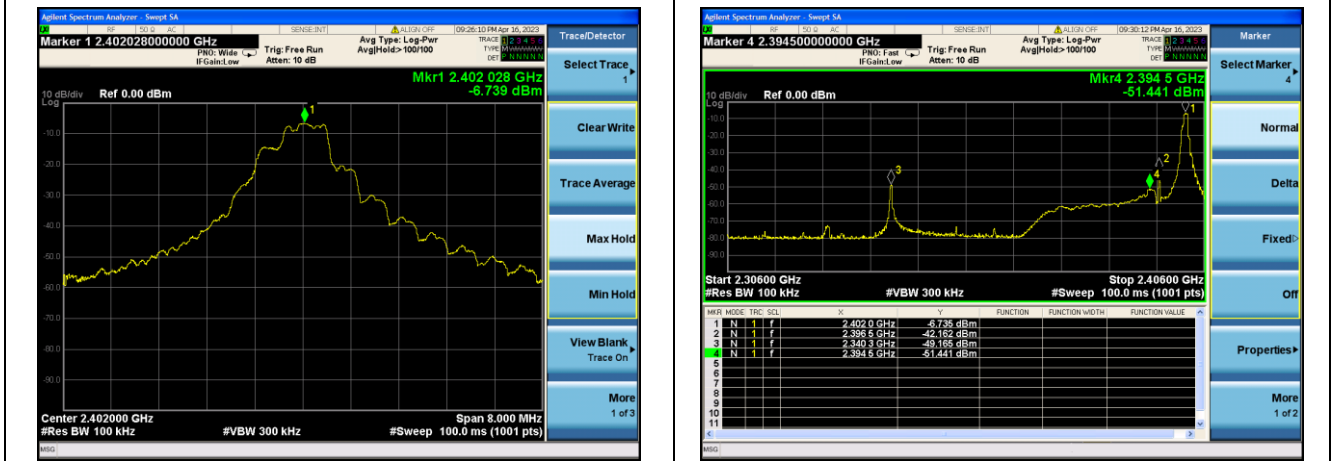
BLE 2480MHz



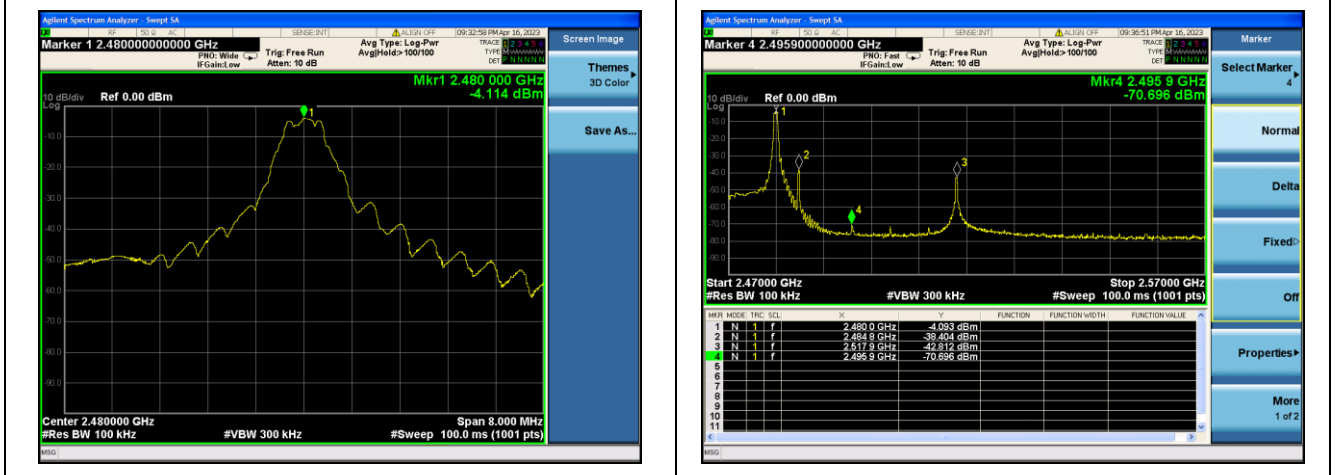
Conducted band edge:

Mode	Channel	Frequency (MHz)	Max Value (dBm)	Reference Level (dBm)	Max Value (dBc)	Limit (dBc)	Verdict
Transmit -1Mbps(GFSK_BLE)	00	2402	-42.162	-6.739	-35.423	-30	Pass
	39	2480	-38.404	-4.114	-34.290	-30	Pass

BLE 2402MHz

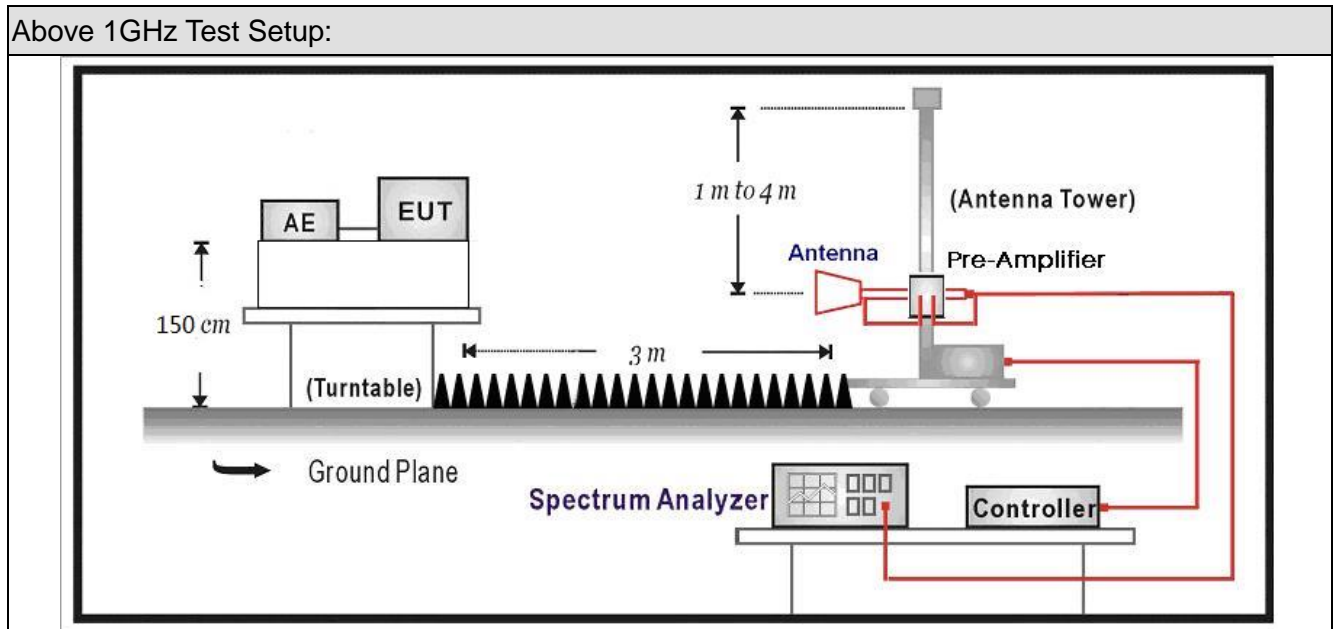


BLE 2480MHz



9. Radiated Emission Band Edge

9.1. Test Setup



9.2. Limit

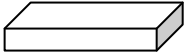
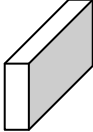
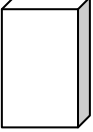



Band edge Limit				
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

9.3. Test Procedure

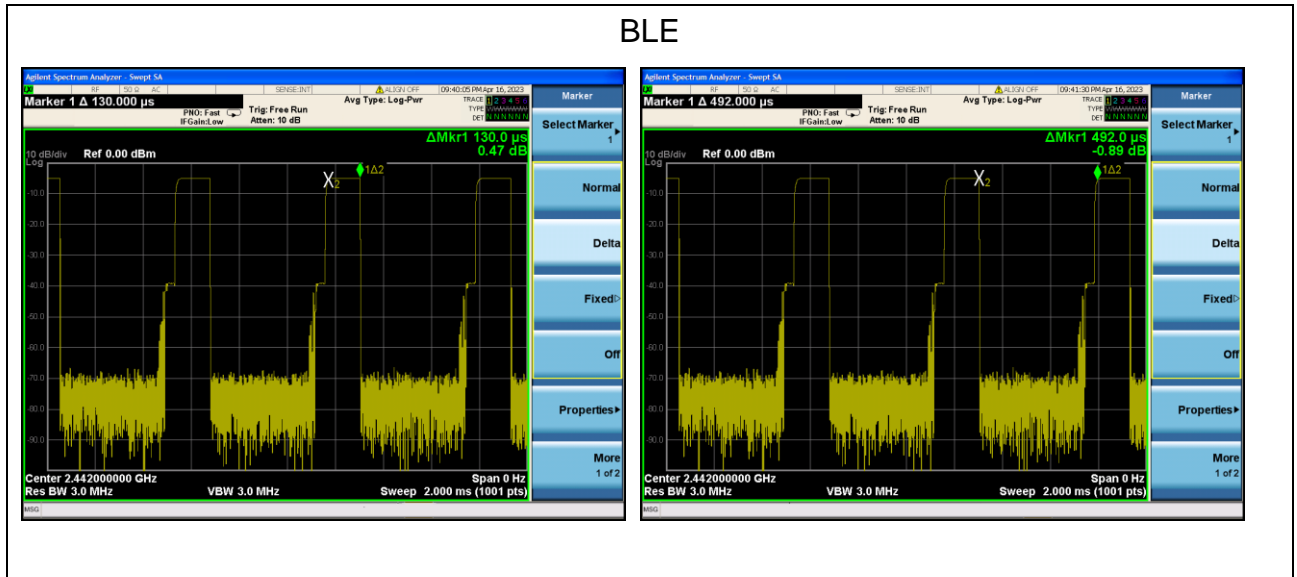
Test Method				
	References	Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10		6.10	Band-edge testing
	<input checked="" type="checkbox"/>	ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	<input type="checkbox"/>	ANSI C63.10	6.10.6	Marker-delta method
<input checked="" type="checkbox"/>	ANSI C63.10		11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/>	ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/>	ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10		6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input type="checkbox"/>	ANSI C63.10		6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10		6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input type="checkbox"/>	ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/>	ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/>	ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/>	ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input checked="" type="checkbox"/>	ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/>	ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

9.4. EUT test definition

Item	Radiated Emission Band Edge			
Device Category	<input type="checkbox"/>	Fixed point-to-point		
	<input type="checkbox"/>	Emit multiple directional beams, simultaneously or sequentially		
	<input checked="" type="checkbox"/>	Other cases		
Test mode	Mode 1			
Test method	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input checked="" type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

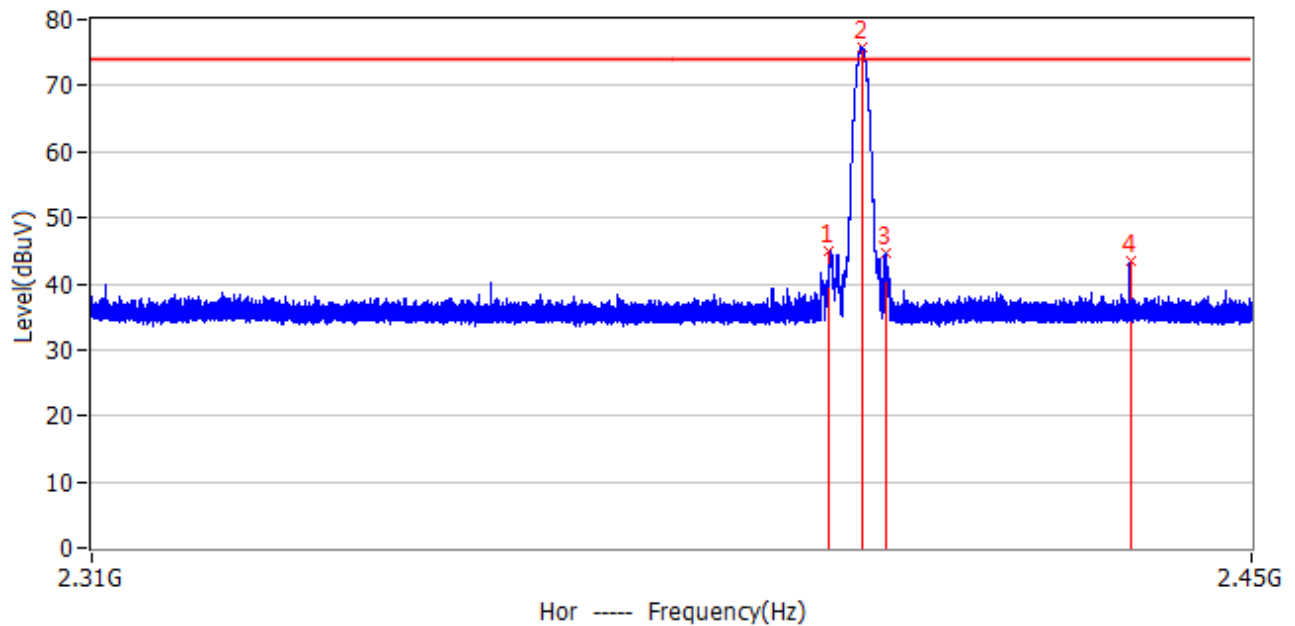
9.5. Duty Cycle

Test Mode	Tx On (µs)	Tx Off (µs)	Tx On + Tx Off (µs)	Reduced VBW (kHz)	Duty Cycle
Transmit -1Mbps(GFSK_BLE)	130	492	622	7.69	20.90%



9.6. Test Result

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Horizontal	Low Frequency	: 2402MHz

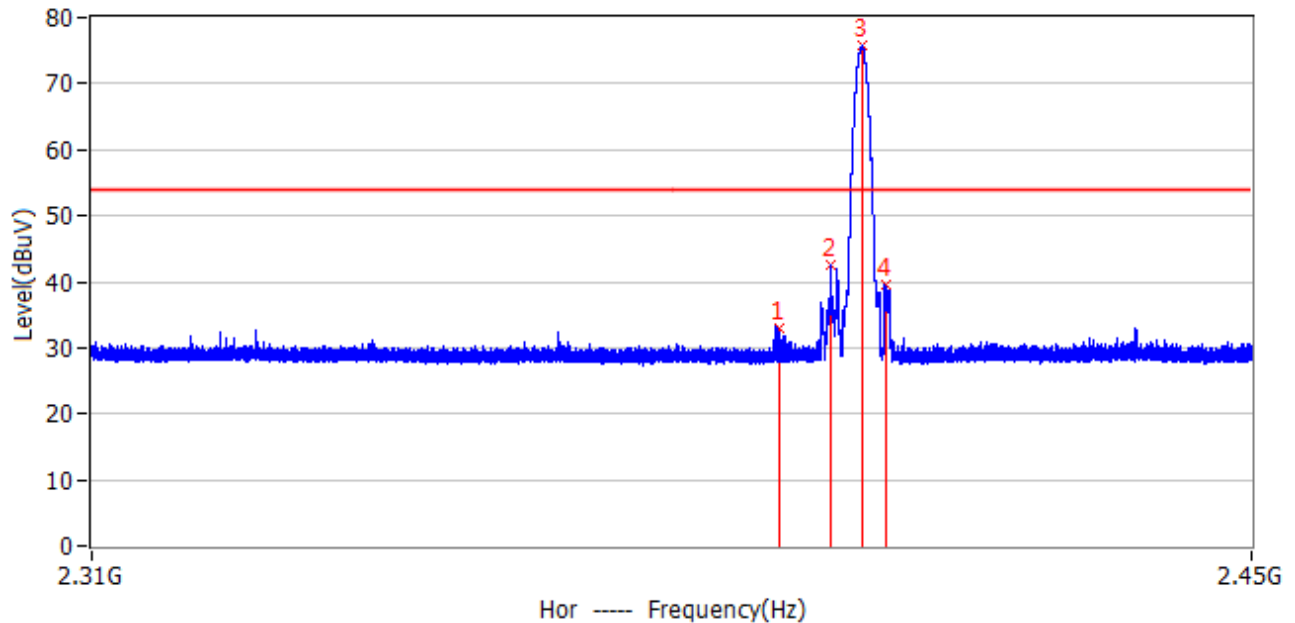


No.	Frequency (GHz)	Limit (dB μ V/m)	Level (dB μ V/m)	Delta dB	Factor dB	Detector	Polar
1	2.398GHz	74.0	45.0	-29.0	-17.7	PK	Hor
2	2.402GHz	N/A	75.8	N/A	-17.7	PK	Hor
3	2.405GHz	74.0	44.7	-29.3	-17.7	PK	Hor
4	2.435GHz	74.0	43.3	-30.7	-17.7	PK	Hor

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Horizontal	Low Frequency	: 2402MHz

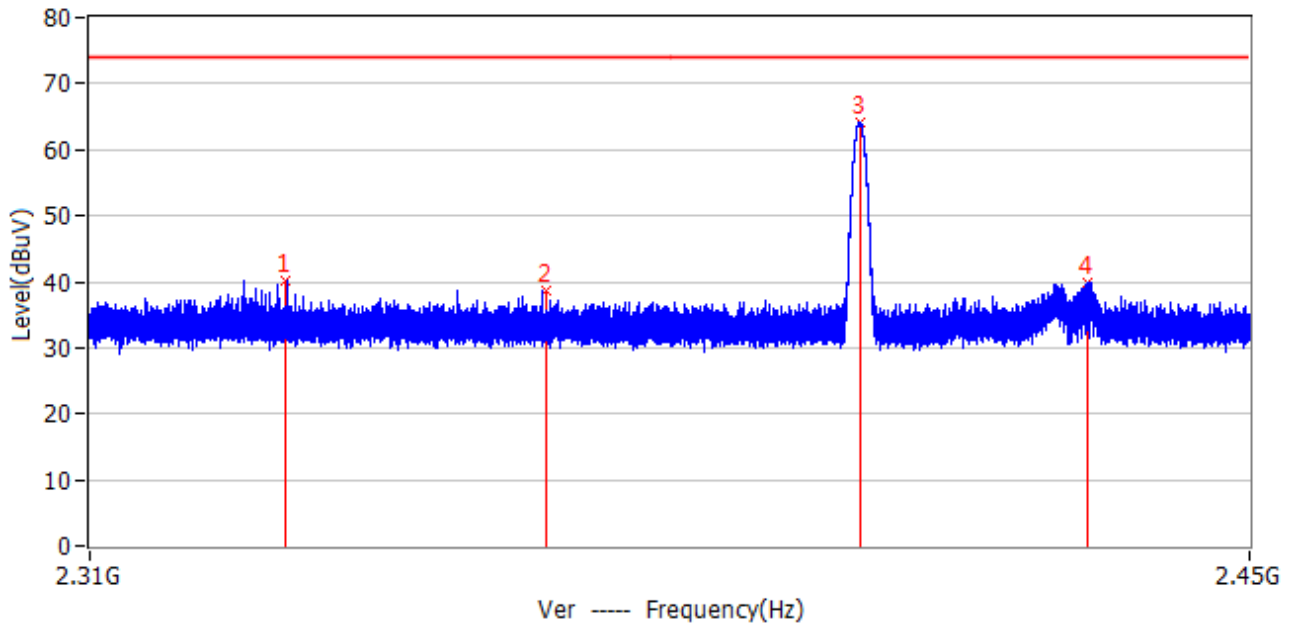


No.	Frequency (GHz)	Limit (dB μ V/m)	Level (dB μ V/m)	Delta dB	Factor dB	Detector	Polar
1	2.392GHz	54.0	33.1	-20.9	-17.7	AV	Hor
2	2.398GHz	54.0	42.6	-11.4	-17.7	AV	Hor
3	2.402GHz	N/A	75.8	N/A	-17.7	AV	Hor
4	2.405GHz	54.0	39.6	-14.4	-17.7	AV	Hor

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Vertical	Low Frequency	: 2402MHz

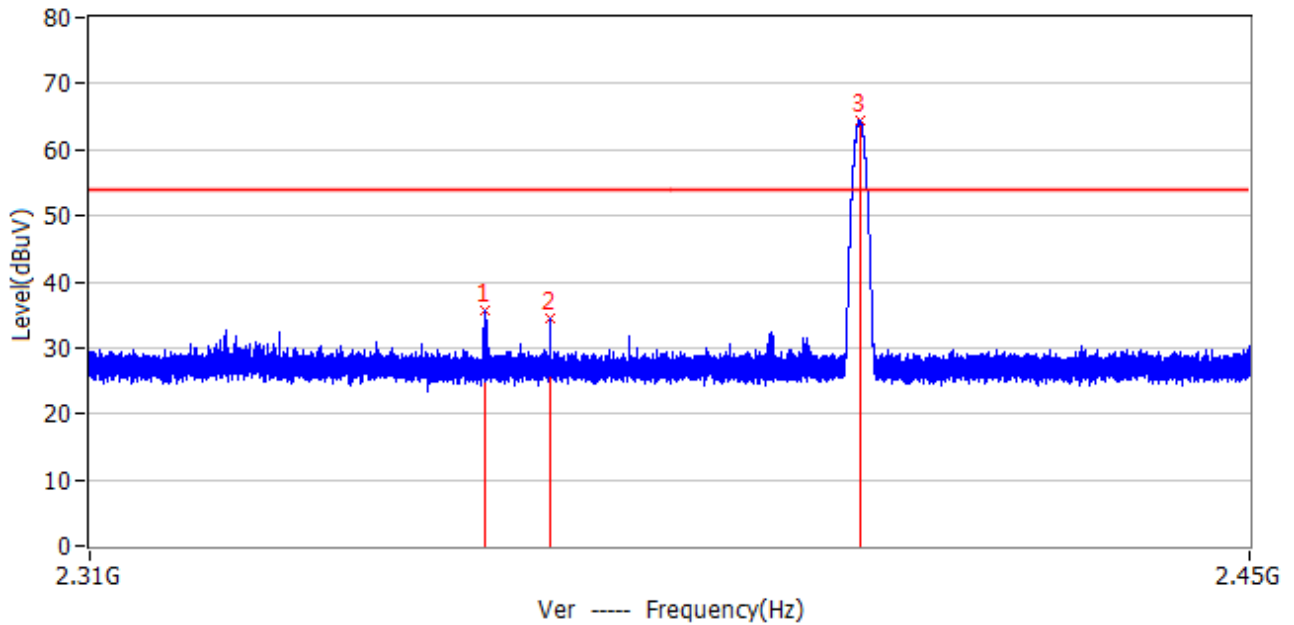


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.333GHz	74.0	40.2	-33.8	-17.6	PK	Ver
2	2.364GHz	74.0	38.8	-35.2	-17.6	PK	Ver
3	2.402GHz	N/A	64.2	N/A	-17.7	PK	Ver
4	2.430GHz	74.0	39.8	-34.2	-17.7	PK	Ver

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Vertical	Low Frequency	: 2402MHz

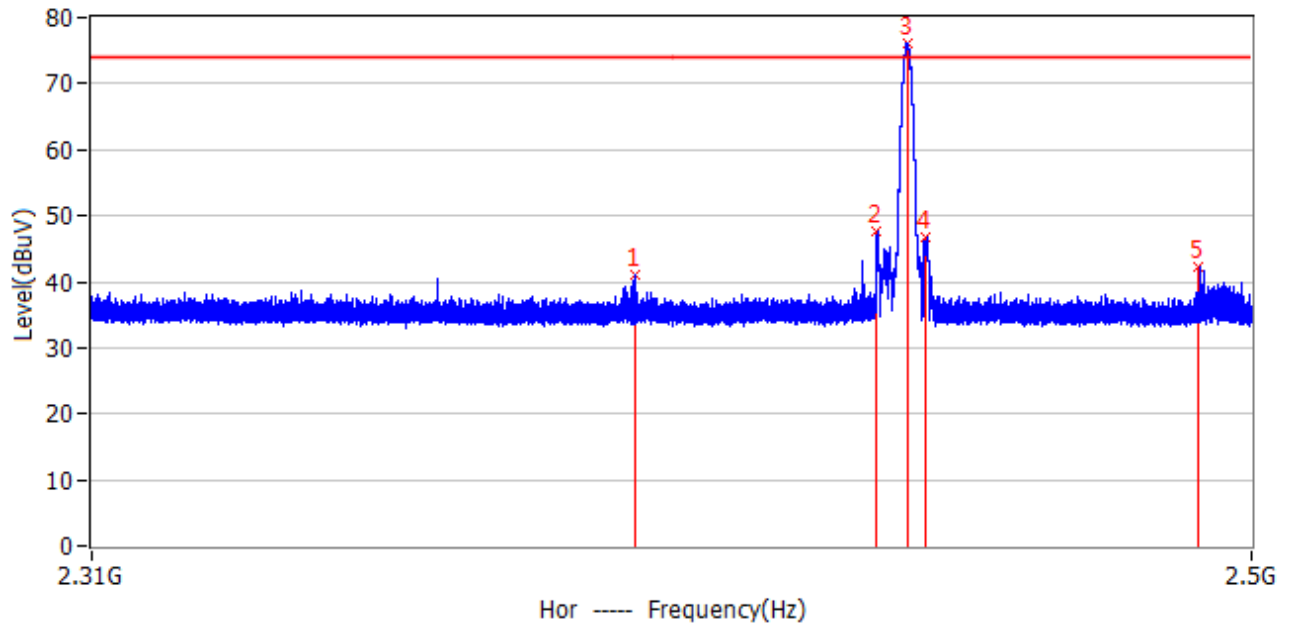


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.357GHz	54.0	35.8	-18.2	-17.6	AV	Ver
2	2.365GHz	54.0	34.4	-19.6	-17.6	AV	Ver
3	2.402GHz	N/A	64.4	N/A	-17.7	AV	Ver

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Horizontal	Middle Frequency	: 2442MHz

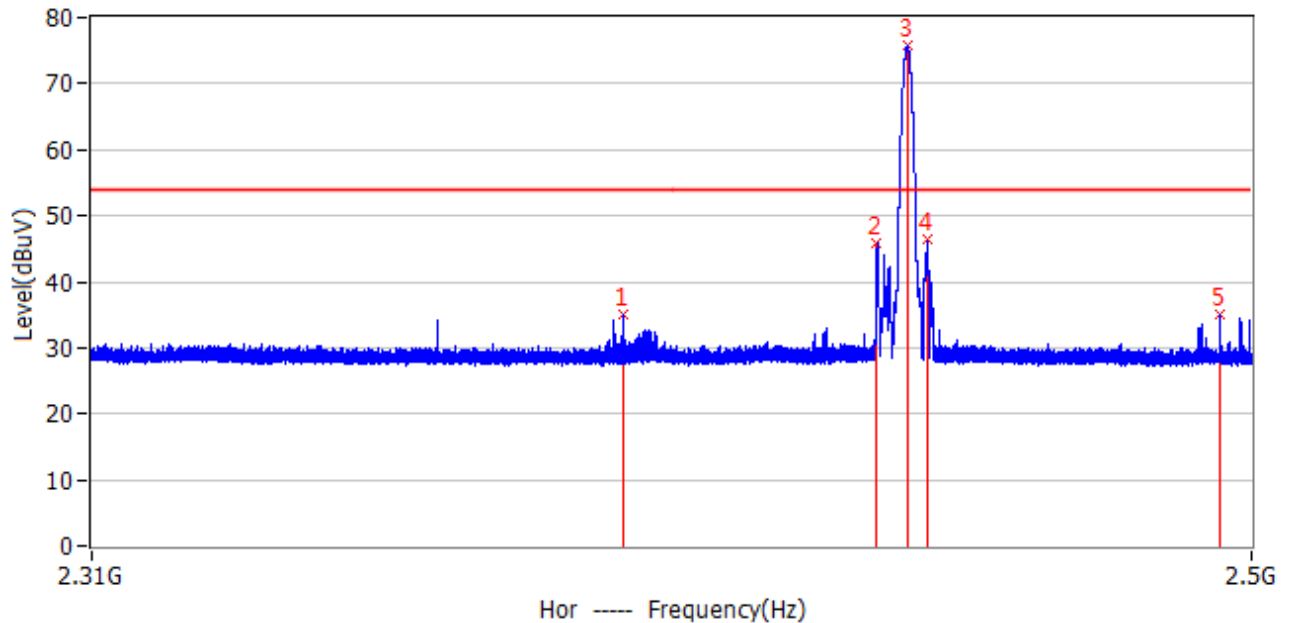


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.397GHz	74.0	41.1	-32.9	-17.7	PK	Hor
2	2.437GHz	74.0	47.7	-26.3	-17.7	PK	Hor
3	2.442GHz	N/A	76.0	N/A	-17.7	PK	Hor
4	2.445GHz	74.0	46.7	-27.3	-17.7	PK	Hor
5	2.491GHz	74.0	42.2	-31.8	-17.6	PK	Hor

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Horizontal	Middle Frequency	: 2442MHz

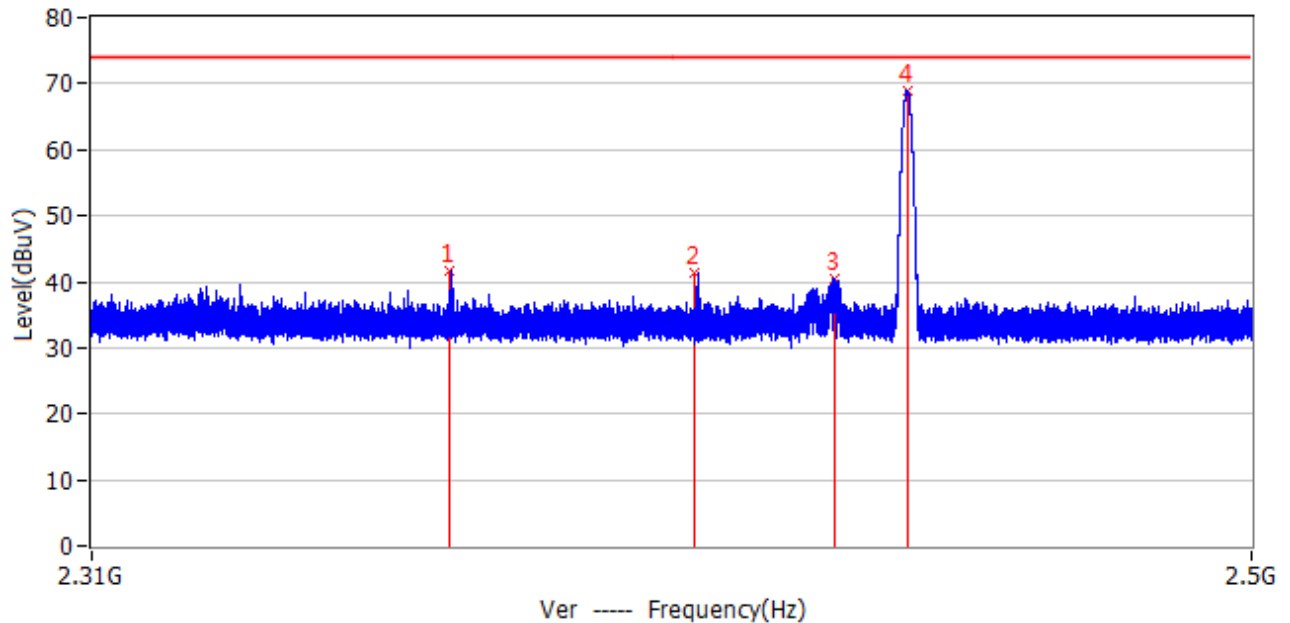


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.395GHz	54.0	35.0	-19.0	-17.7	AV	Hor
2	2.437GHz	54.0	45.8	-8.2	-17.7	AV	Hor
3	2.442GHz	N/A	75.9	N/A	-17.7	AV	Hor
4	2.445GHz	54.0	46.3	-7.7	-17.7	AV	Hor
5	2.495GHz	54.0	35.0	-19.0	-17.6	AV	Hor

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Vertical	Middle Frequency	: 2442MHz

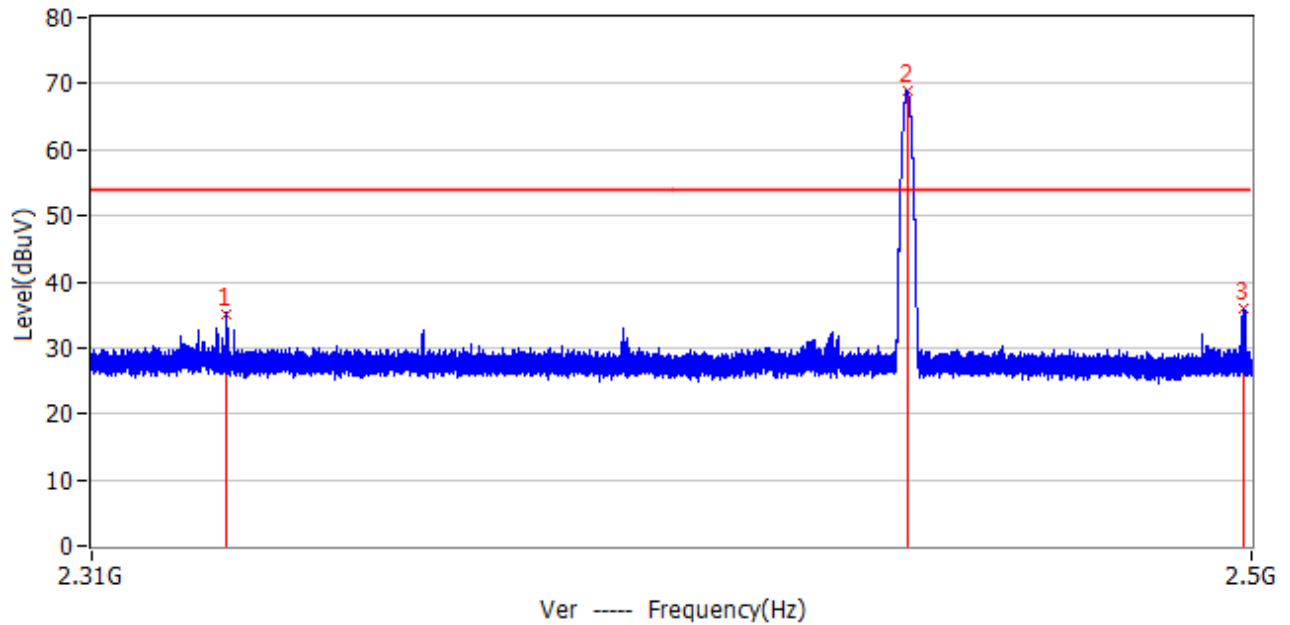


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.367GHz	74.0	41.7	-32.3	-17.7	PK	Ver
2	2.407GHz	74.0	41.3	-32.7	-17.7	PK	Ver
3	2.430GHz	74.0	40.4	-33.6	-17.7	PK	Ver
4	2.442GHz	N/A	69.0	N/A	-17.7	PK	Ver

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Vertical	Middle Frequency	: 2442MHz

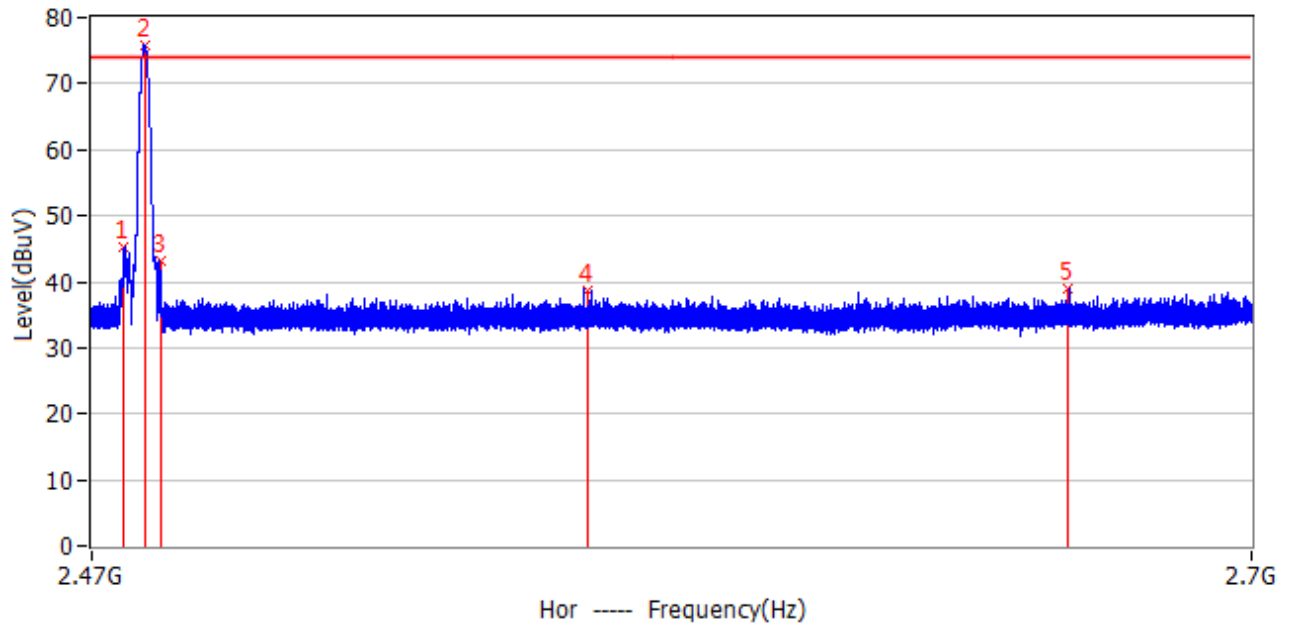


No.	Frequency (GHz)	Limit (dBμV/m)	Level (dBμV/m)	Delta dB	Factor dB	Detector	Polar
1	2.331GHz	54.0	35.2	-18.8	-17.6	AV	Ver
2	2.442GHz	N/A	69.0	N/A	-17.7	AV	Ver
3	2.499GHz	54.0	36.0	-18.0	-17.5	AV	Ver

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Horizontal	High Frequency	: 2480MHz

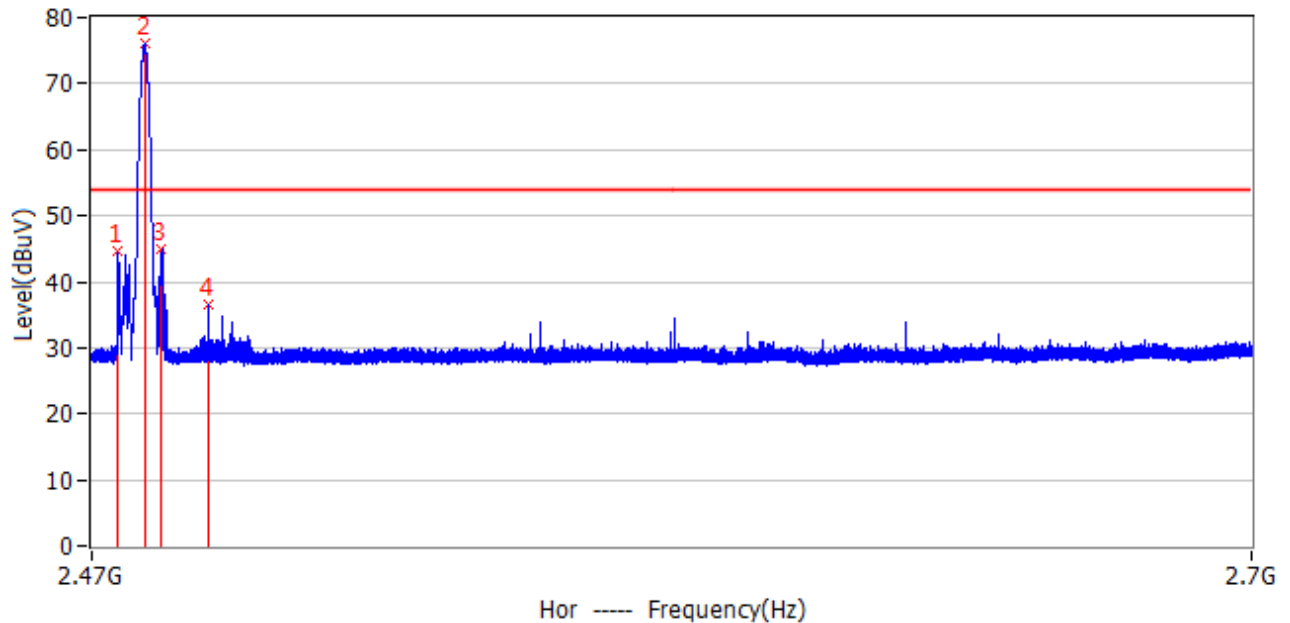


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.476GHz	74.0	45.3	-28.7	-17.6	PK	Hor
2	2.480GHz	N/A	75.9	N/A	-17.6	PK	Hor
3	2.483GHz	74.0	43.0	-31.0	-17.6	PK	Hor
4	2.566GHz	74.0	38.7	-35.3	-17.3	PK	Hor
5	2.662GHz	74.0	39.1	-34.9	-16.8	PK	Hor

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Horizontal	High Frequency	: 2480MHz

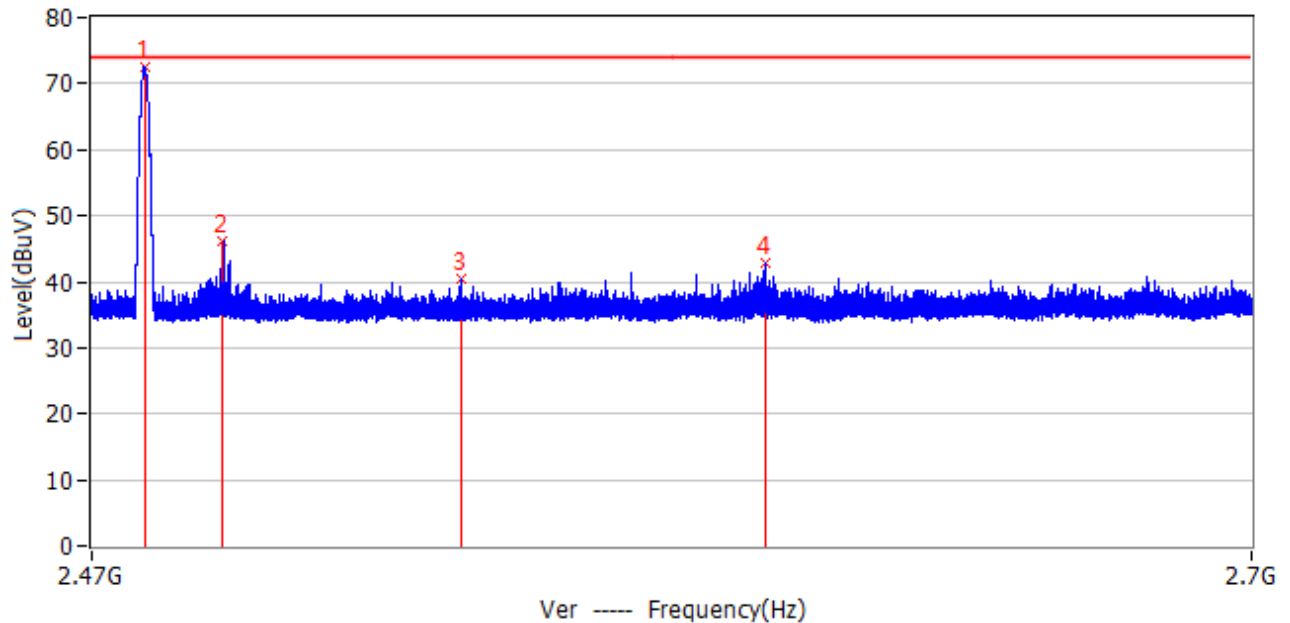


No.	Frequency (GHz)	Limit (dBμV/m)	Level (dBμV/m)	Delta dB	Factor dB	Detector	Polar
1	2.475GHz	54.0	44.5	-9.5	-17.6	AV	Hor
2	2.480GHz	N/A	76.0	N/A	-17.6	AV	Hor
3	2.483GHz	54.0	45.0	-9.0	-17.6	AV	Hor
4	2.492GHz	54.0	36.6	-17.4	-17.6	AV	Hor

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Vertical	High Frequency	: 2480MHz

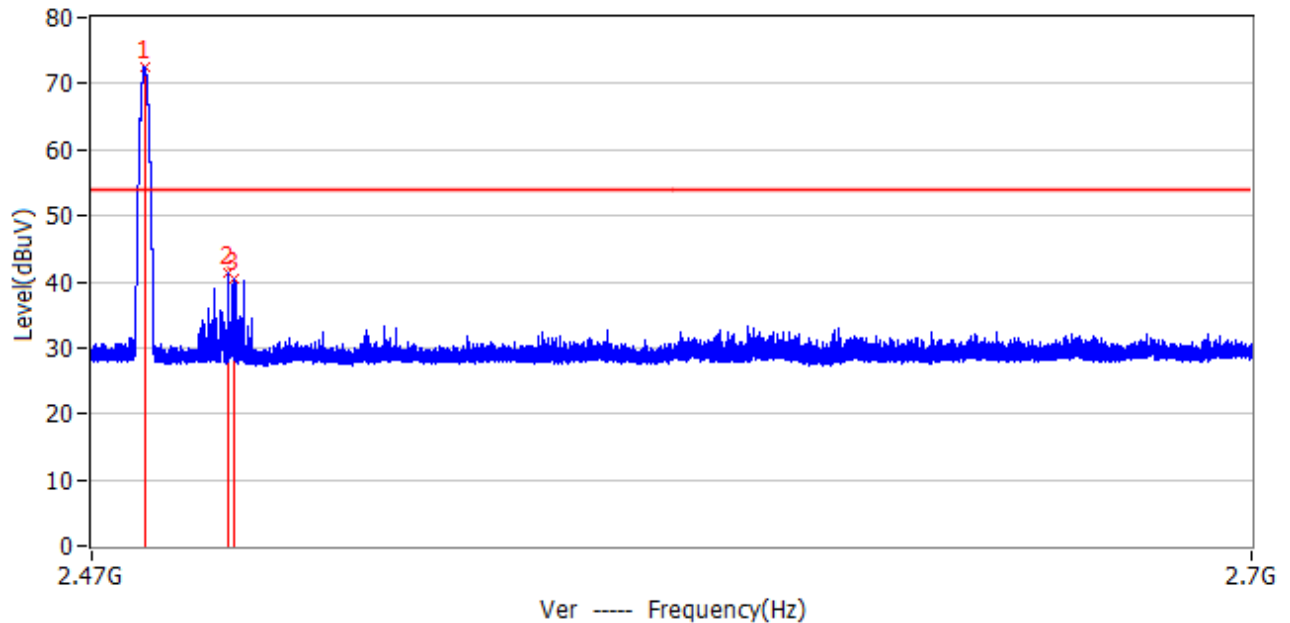


No.	Frequency (GHz)	Limit (dBuV/m)	Level (dBuV/m)	Delta dB	Factor dB	Detector	Polar
1	2.480GHz	N/A	72.5	N/A	-17.6	PK	Ver
2	2.495GHz	74.0	46.1	-27.9	-17.6	PK	Ver
3	2.541GHz	74.0	40.3	-33.7	-17.4	PK	Ver
4	2.601GHz	74.0	42.7	-31.3	-17.2	PK	Ver

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

Product Name	: Electric Wheelchair (Robooter E40)	Power	: DC 3.3V
Test Mode	: Mode 1: Transmit-1Mbps(GFSK_BLE)	Test Site	: Chamber
Test Date	: 2023.04.12	Test Engineer	: Emily
Polarization	: Vertical	High Frequency	: 2480MHz



No.	Frequency (GHz)	Limit (dBμV/m)	Level (dBμV/m)	Delta dB	Factor dB	Detector	Polar
1	2.480GHz	N/A	72.5	N/A	-17.6	AV	Ver
2	2.496GHz	54.0	41.4	-12.6	-17.6	AV	Ver
3	2.497GHz	54.0	40.4	-13.6	-17.5	AV	Ver

Note: Level = Reading Level + Factor

Factor = Antenna factor + Cable Loss

10. Antenna Requirement

10.1. Limit

Antenna Requirement Limit	
<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</p>	

10.2. Antenna Connector Construction

Antenna Connector Construction	
<input checked="" type="checkbox"/>	The use of a permanently attached antenna
<input type="checkbox"/>	The antenna use of a unique coupling to the intentional radiator
<input type="checkbox"/>	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document "Internal Photograph" to show the antenna connector.	

_____ The End _____