




# Test Report

## FCC ID: 2ALVC-SENSIMAT

## IC: 22637-SENSIMAT

Product Name:	<b>The SENSIMAT for Wheelchairs</b>
Trademark:	
Model Name :	<b>SENSIMAT</b>
Prepared For :	<b>Sensimat Systems Inc.</b>
Address :	910 Rowntree Dairy Rd. Unit 13 Woodbridge, Ontario Canada L4L 5W5
Prepared By :	<b>Shenzhen BCTC Technology Co., Ltd.</b>
Address :	No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	<b>Apr. 05 – Apr. 13, 2017</b>
Date of Report :	<b>Apr. 13, 2017</b>
Report No.:	<b>BCTC-FY170300540E</b>



## CERTIFICATION

**Applicant's name** ..... : **Sensimat Systems Inc.**

**Address** ..... : 910 Rowntree Dairy Rd. Unit 13 Woodbridge, Ontario Canada  
L4L 5W5

**Manufacture's Name** ..... : **OurPCB Tech.Ltd**

**Address** ..... : 3rd Floor, Nanhai Plaza, NO.505 Xinhua Road, Xinhua District  
Shijiazhuang Hebei China, 050057

### Product description

**Product name** ..... : The SENSIMAT for Wheelchairs

**Trademark:**



**Model Name:**

SENSIMAT

FCC Part15.249

RSS-210 Issue 9 August 2016

**Test Standards:**

RSS-Gen Issue 4 November 2014

ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Test Result**.....: **Pass**

**Testing Engineer** :

*Eric Yang*

Eric Yang

**Reviewer  
(Supervisor)** :

*Jade Yang*

Jade Yang

**Approved &  
Authorized  
Signer(Manager)** :





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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.249) , Subpart C RSS-210 Issue 9 August 2016			
Standard Section	Test Item	Judgment	Remark
15.207a RSS-210 2.2/RSS-GEN8.8	Conducted Emission	PASS	
15.209a/15.249a RSS-210 Annex 2 A2.9/RSS-GEN8.9	Fundamental Radiated	PASS	
15.209a/15.249a RSS-210 Annex 2 A2.9/RSS-GEN8.9	Spurious Emission Measurement	PASS	
15.249 RSS-210 A1.1.3	Bandwidth	PASS	
15.205 RSS-210 Annex 2 A2.9	Band Edge Emission	PASS	
15.203 RSS-210	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

### 1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.

Add.:No.101,Yousong Road,Longhua New District, Shenzhen,China

FCC Registration No.:187086

IC Registered No.: 12655A

### 1.2 MEASUREMENT UNCERTAINTY


The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 % .

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	The SENSIMAT for Wheelchairs											
Trade Name												
Model Name	SENSIMAT											
Serial Model	N/A											
Model Difference	N/A											
Product Description	<table border="1"><tr><td>Operation Frequency:</td><td>2402~2480 MHz</td></tr><tr><td>Modulation Type:</td><td>GFSK</td></tr><tr><td>Bit Rate of Transmitter</td><td>2Mbps</td></tr><tr><td>Number Of Channel</td><td>40CH</td></tr><tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr></table>		Operation Frequency:	2402~2480 MHz	Modulation Type:	GFSK	Bit Rate of Transmitter	2Mbps	Number Of Channel	40CH	Antenna Designation:	Please see Note 3.
	Operation Frequency:	2402~2480 MHz										
	Modulation Type:	GFSK										
	Bit Rate of Transmitter	2Mbps										
	Number Of Channel	40CH										
	Antenna Designation:	Please see Note 3.										
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.												
Channel List	Please refer to the Note 2.											
Battery	DC 3.7V											
Connecting I/O Port(s)	Please refer to the User's Manual											
Product SW/HW version	PSW: A1.1 PHW:H1.0											
Radio SW/HW version	RSW: V1.0 RHW:A1.1											
Test SW Version	V1.0											
RF power setting in TEST SW	0dBm											

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2422	21	2442
02	2404	12	2424	22	2444
03	2406	13	2426	23	2446
~	~	~	~	~	~
09	2418	19	2438	39	2478
10	2420	20	2440	40	2480



## 3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	CHIP Antenna	N/A	2	

**2.2 DESCRIPTION OF TEST MODES**

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For Conducted & Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH20
Mode 3	CH40
Mode 4	Normal Link

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) Fully-charged battery is used during the test

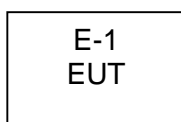
**2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING**

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Frequency	2402 MHz	2440 MHz	2480 MHz
Channel	Low	Middle	High

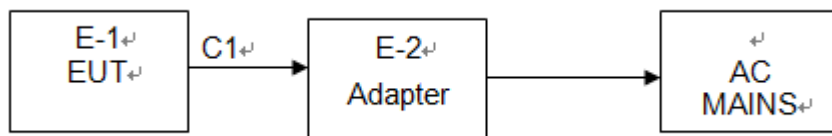
**2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**

Radiated Spurious Emission Test



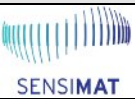


## Conducted Emission Test



## 2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	The SENSIMAT for Wheelchairs		SENSIMAT	N/A	EUT
E-2	Adapter	N/A	A8A-501000	N/A	Input:100-240V~ 50/60Hz 0.2A Output: 5.0V---1000mA

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO	NO	0.8M	USB cable unshielded

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.





## 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45108040	2016.08.27	2017.08.26
2	Test Receiver (9kHz-7GHz)	R&S	ESPI	101318	2016.08.27	2017.08.26
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB 9168	VULB91 68-438	2016.08.27	2017.08.26
4	Horn Antenna (1GHz-18GHz)	SCHWARZBECK	BBHA9120D	1201	2016.09.03	2017.09.03
5	Horn Antenna (14GHz-40GHz)	SCHWARZBECK	BBHA 9170	9170-181	2016.09.03	2017.09.03
6	Amplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	9744-0037	2016.08.27	2017.08.26
7	Amplifier (1GHz-18GHz)	SCHWARZBECK	BBV9718	9718-309	2016.08.27	2017.08.26
8	Amplifier (18GHz-40GHz)	SCHWARZBECK	BBV 9721	9721-205	2016.08.27	2017.08.26
9	Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	00014	2016.09.03	2017.09.03
10	RF cables1 (9kHz-1GHz)	R&S	R203	R20X	2016.08.27	2017.08.26
11	RF cables2 (1GHz-40GHz)	R&S	R204	R21X	2016.08.27	2017.08.26
12	Antenna connector	Florida RF Labs	N/A	RF 01#	2016.08.27	2017.08.26
13	Power Metter	ANRITSU	ML2487A	6K00001568	2016.08.27	2017.08.26
14	Power Sensor (AV)	ANRITSU	ML2491A	030989	2016.08.27	2017.08.26
15	Signal Analyzer 9kHz-26.5GHz	Agilent	N9010A	MY48030494	2016.08.27	2017.08.26
16	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	2016.08.27	2017.08.26
17	D.C. Power Supply	LongWei	PS-305D	010964729	2016.08.27	2017.08.26

### Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESCI	1166.5950K03-1011 65-ha	2016.08.27	2017.08.26
2	LISN	SCHWARZBECK	NSLK8127	8127739	2016.08.27	2017.08.26
3	LISN	R&S	NSLK8126	8126487	2016.08.27	2017.08.26
4	RF cables	R&S	R204	R20X	2016.08.27	2017.08.26
5	Attenuator	R&S	ESH3-Z2	143206	2016.08.27	2017.08.26



### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quas -peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

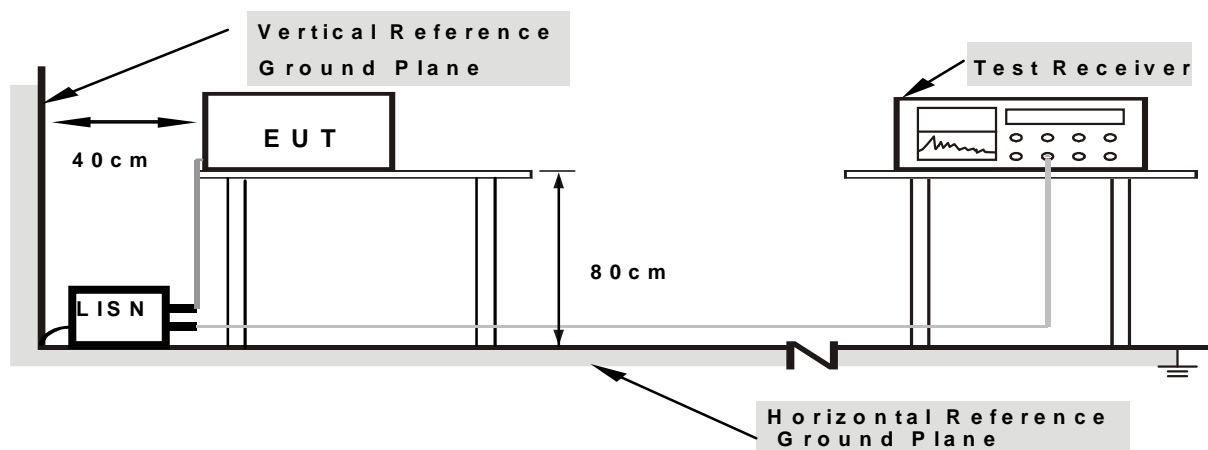
### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.  
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.5 EUT OPERATING CONDITIONS

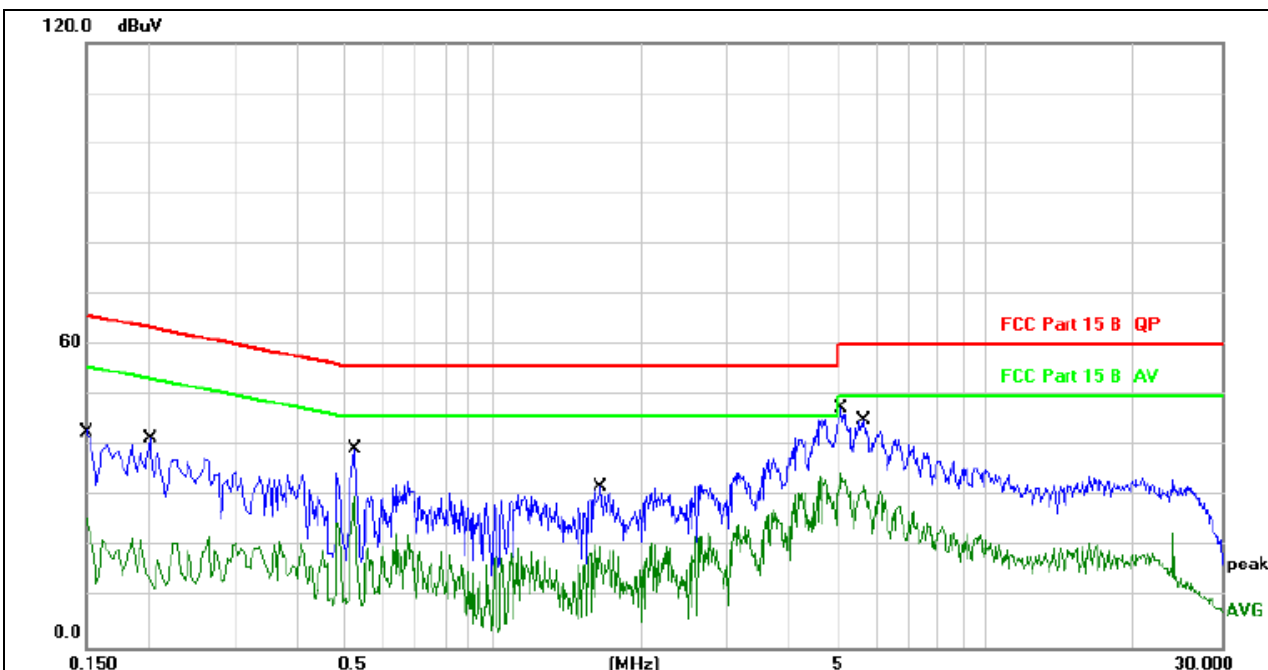
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.



### 3.1.6 TEST RESULTS

Temperature :	25°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	AC120V/60Hz	Test Mode :	Mode 4



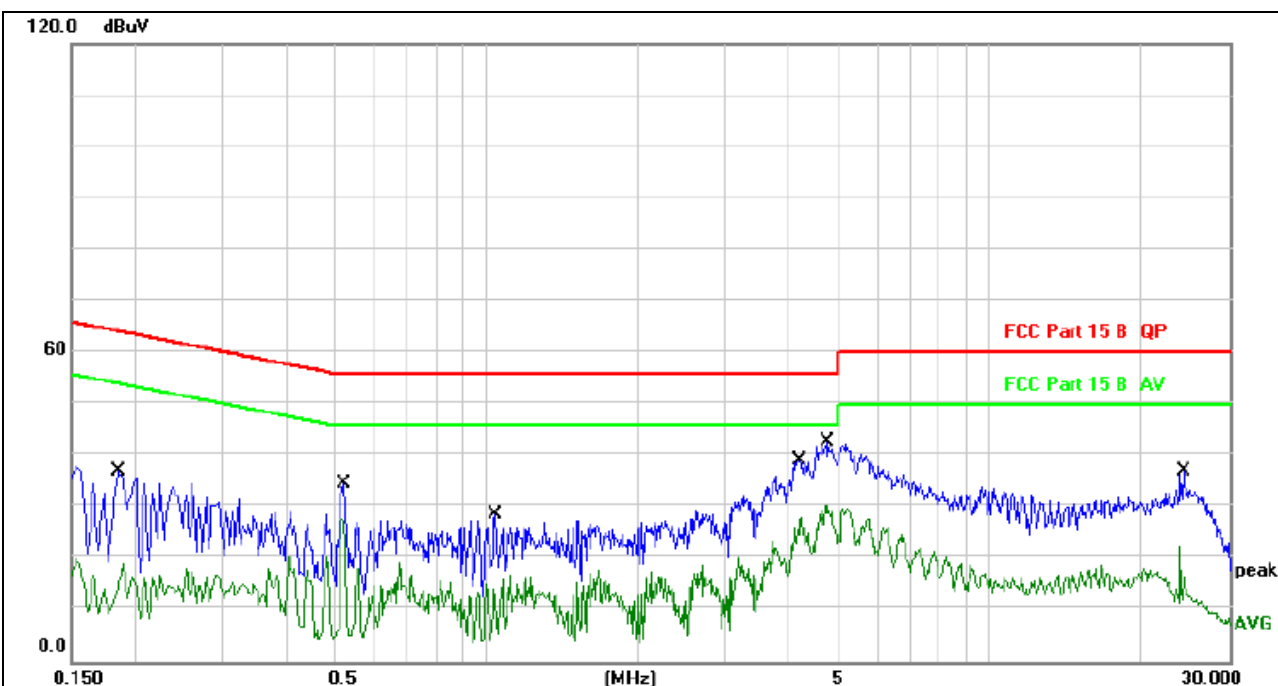
#### Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1524	31.76	9.67	41.43	65.86	-24.43	QP	
2		0.1524	14.32	9.67	23.99	55.86	-31.87	AVG	
3		0.2020	31.77	9.65	41.42	63.52	-22.10	QP	
4		0.2020	7.82	9.65	17.47	53.52	-36.05	AVG	
5		0.5260	29.69	9.68	39.37	56.00	-16.63	QP	
6		0.5260	20.60	9.68	30.28	46.00	-15.72	AVG	
7		1.6580	22.20	9.70	31.90	56.00	-24.10	QP	
8		1.6580	10.72	9.70	20.42	46.00	-25.58	AVG	
9	*	5.1020	37.69	9.74	47.43	60.00	-12.57	QP	
10		5.1020	25.05	9.74	34.79	50.00	-15.21	AVG	
11		5.6579	35.34	9.76	45.10	60.00	-14.90	QP	
12		5.6579	22.40	9.76	32.16	50.00	-17.84	AVG	



Temperature :	25°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	AC120V/60Hz	Test Mode :	Mode 4



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1860	27.26	9.66	36.92	64.21	-27.29	QP	
2		0.1860	9.47	9.66	19.13	54.21	-35.08	AVG	
3		0.5220	24.95	9.68	34.63	56.00	-21.37	QP	
4		0.5220	18.08	9.68	27.76	46.00	-18.24	AVG	
5		1.0460	18.97	9.69	28.66	56.00	-27.34	QP	
6		1.0460	6.34	9.69	16.03	46.00	-29.97	AVG	
7		4.2100	29.31	9.73	39.04	56.00	-16.96	QP	
8		4.2100	18.36	9.73	28.09	46.00	-17.91	AVG	
9	*	4.7660	32.86	9.74	42.60	56.00	-13.40	QP	
10		4.7660	20.85	9.74	30.59	46.00	-15.41	AVG	
11		24.3740	27.25	9.88	37.13	60.00	-22.87	QP	
12		24.3740	12.40	9.88	22.28	50.00	-27.72	AVG	



## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on RSS-GEN, then the RSS-210 limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

#### FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

### 3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.
- For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

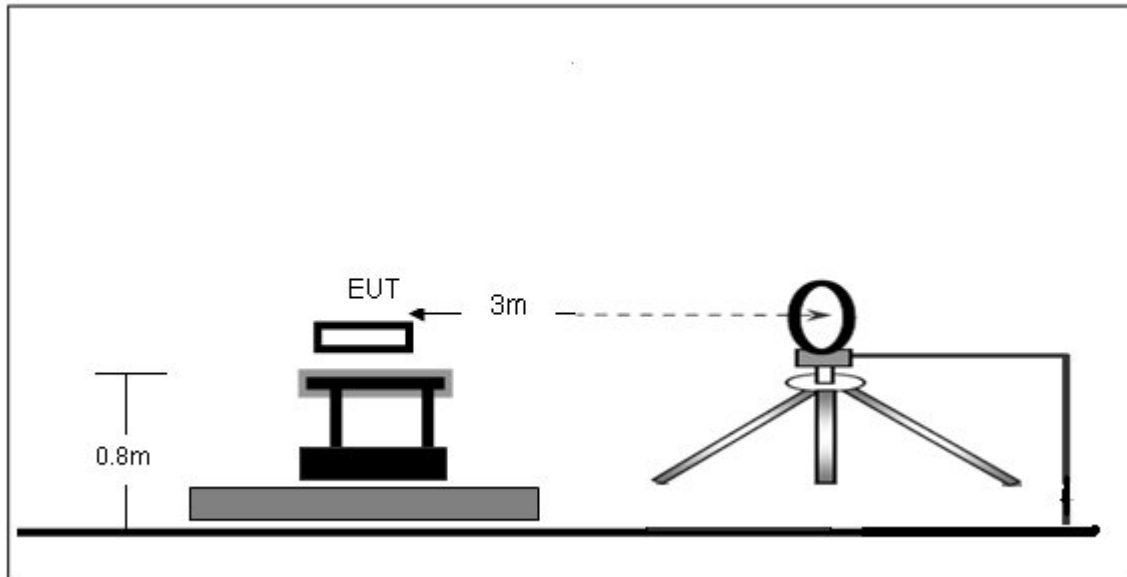
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

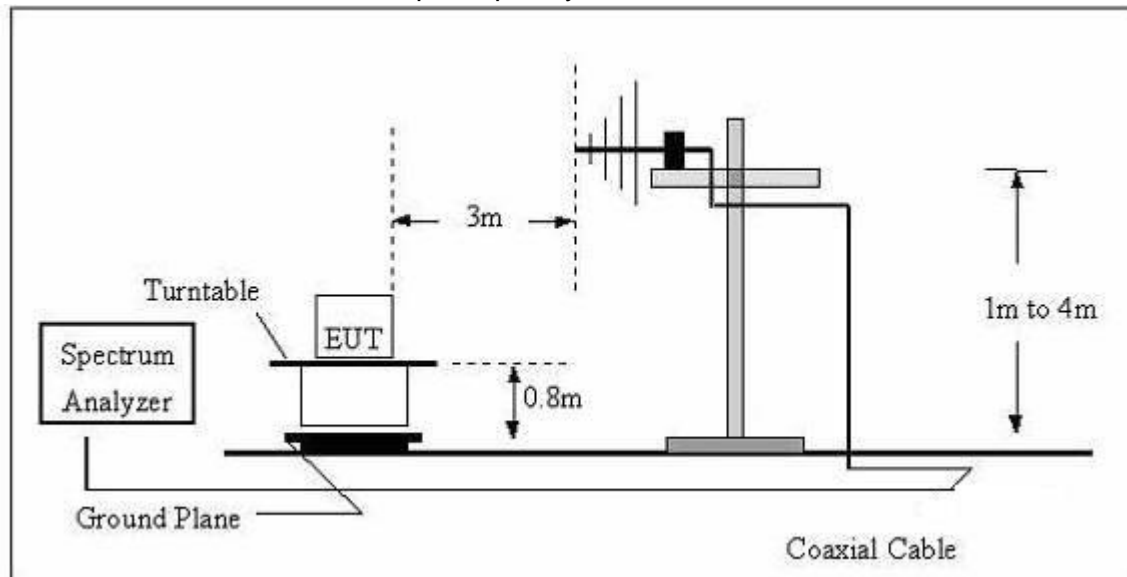


### 3.2.4 TEST SETUP

#### (A) Radiated Emission Test-Up Frequency Below 30MHz

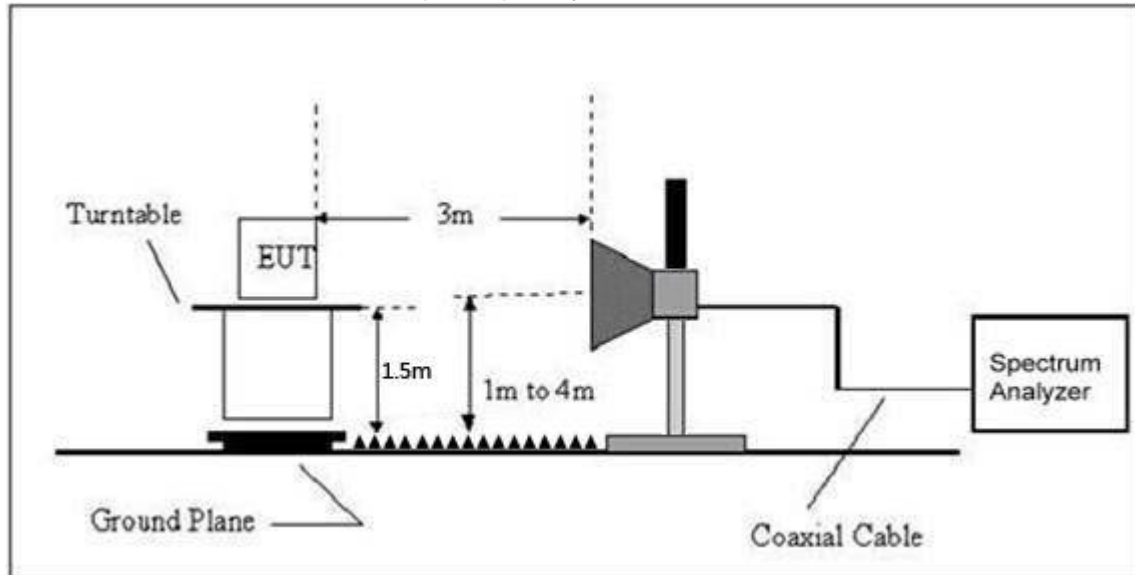


#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



### 3.2.6 TEST RESULTS

Radiated Spurious Emission (Below 30MHz )

EUT :	The SENSIMAT for Wheelchairs	Model Name :	SENSIMAT
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Polarization :	---
Test Voltage :	DC 3.7V		
Test Mode :	Mode 4		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

**NOTE:**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

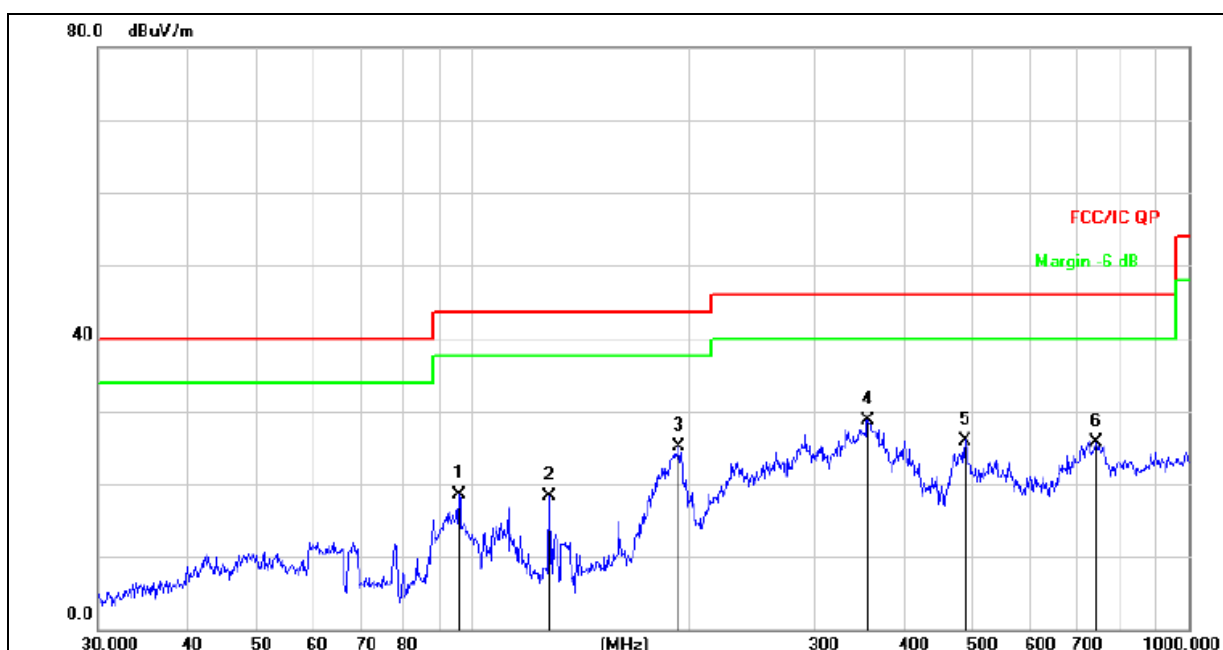
Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



## Radiated Spurious Emission (Between 30MHz – 1GHz)

EUT :	The SENSIMAT for Wheelchairs	Model Name :	SENSIMAT
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 3.7V		
Test Mode : (Worst)	Mode 4		



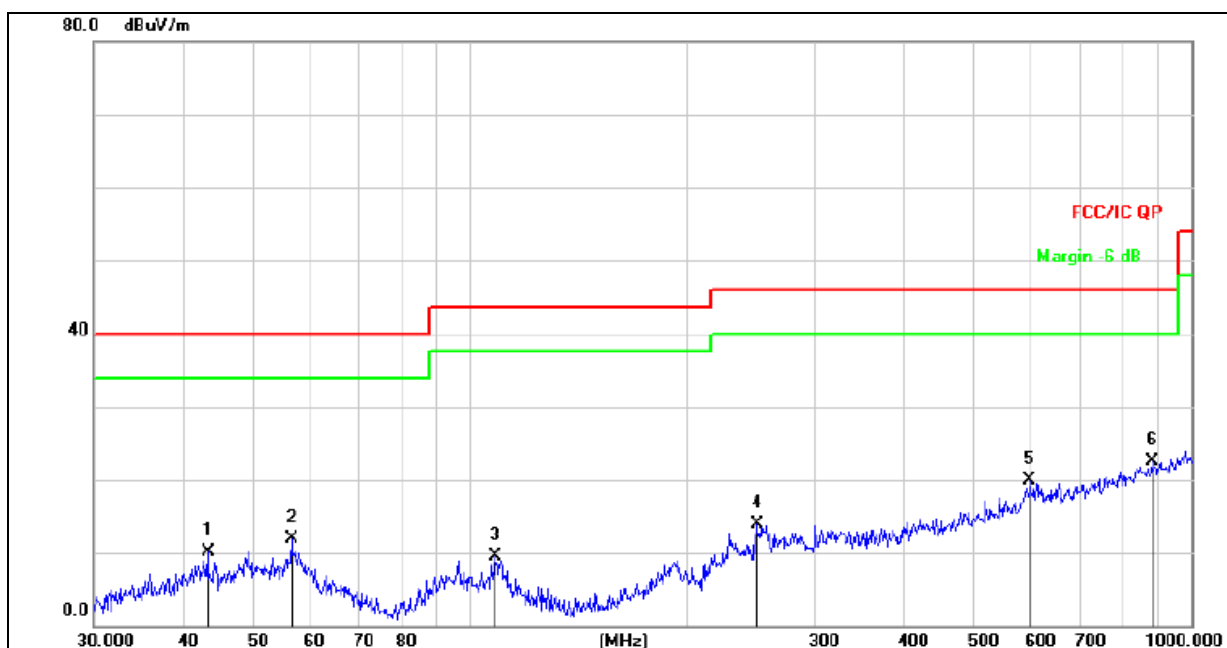
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		95.7622	35.53	-17.10	18.43	43.50	-25.07	QP
2		128.1129	37.65	-19.39	18.26	43.50	-25.24	QP
3		194.4533	41.19	-16.11	25.08	43.50	-18.42	QP
4	*	356.6757	39.12	-10.38	28.74	46.00	-17.26	QP
5		487.3150	33.52	-7.52	26.00	46.00	-20.00	QP
6		742.2586	27.61	-1.96	25.65	46.00	-20.35	QP



EUT :	The SENSIMAT for Wheelchairs	Model Name :	SENSIMAT
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 3.7V		
Test Mode : (Worst)	Mode 4		



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	43.2017	25.02	-14.92	10.10	40.00	-29.90	QP
2	56.3947	27.34	-15.49	11.85	40.00	-28.15	QP
3	108.2667	25.81	-16.36	9.45	43.50	-34.05	QP
4	249.4250	27.71	-13.79	13.92	46.00	-32.08	QP
5	597.2233	24.42	-4.57	19.85	46.00	-26.15	QP
6 *	881.4067	22.06	0.41	22.47	46.00	-23.53	QP



# Radiated Spurious Emission ( 1GHz to 10<sup>th</sup> harmonics)

## GFSK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel 2402MHz									
V	2402.00	110.69	38.06	7.42	20.15	100.20	114.00	-13.80	PK
V	2402.00	88.45	38.06	7.42	20.15	77.96	94.00	-16.04	AV
V	4804.00	57.82	38.53	7.78	23.25	50.32	74.00	-23.68	PK
V	4804.00	42.43	38.53	7.78	23.25	34.93	54.00	-19.07	AV
V	16130.00	51.32	38.75	10.36	26.57	49.50	74.00	-24.50	PK
H	2402.00	111.34	38.06	7.42	20.15	100.85	114.00	-13.15	PK
H	2402.00	90.47	38.06	7.42	20.15	79.98	94.00	-14.02	AV
H	4804.00	58.72	38.53	7.78	23.25	51.22	74.00	-22.78	PK
H	4804.00	44.11	38.53	7.78	23.25	36.61	54.00	-17.39	AV
H	16130.00	52.35	38.75	10.36	26.57	50.53	74.00	-23.47	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel 2440MHz									
V	2440.00	109.06	38.11	7.42	20.36	98.73	114.00	-15.27	PK
V	2440.00	83.41	38.11	7.42	20.36	73.08	94.00	-20.92	AV
V	4880.00	59.53	38.65	7.78	23.61	52.27	74.00	-21.73	PK
V	4880.00	42.85	38.65	7.78	23.61	35.59	54.00	-18.41	AV
V	16130.00	50.11	38.75	10.36	26.57	48.29	74.00	-25.71	PK
H	2440.00	108.57	38.11	7.42	20.36	98.24	114.00	-15.76	PK
H	2440.00	81.23	38.11	7.42	20.36	70.90	94.00	-23.10	AV
H	4880.00	63.52	38.65	7.78	23.61	56.26	74.00	-17.74	PK
H	4880.00	45.65	38.65	7.78	23.61	38.39	54.00	-15.61	AV
H	16130.00	49.96	38.75	10.36	26.57	48.14	74.00	-25.86	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel 2480MHz									
V	2480.00	112.74	38.17	7.42	20.51	102.50	114.00	-11.50	PK
V	2480.00	88.28	38.17	7.42	20.51	78.04	94.00	-15.96	AV
V	4960.00	56.82	38.69	7.78	23.83	49.74	74.00	-24.26	PK
V	4960.00	43.45	38.69	7.78	23.83	36.37	54.00	-17.63	AV
V	16130.00	49.27	38.75	10.36	26.57	47.45	74.00	-26.55	PK
H	2480.00	110.52	38.17	7.42	20.51	100.28	114.00	-13.72	PK
H	2480.00	90.06	38.17	7.42	20.51	79.82	94.00	-14.18	AV
H	4960.00	59.12	38.69	7.78	23.83	52.04	74.00	-21.96	PK
H	4960.00	43.42	38.69	7.78	23.83	36.34	54.00	-17.66	AV
H	16130.00	50.33	38.75	10.36	26.57	48.51	74.00	-25.49	PK

### Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



## 4. BANDWIDTH TEST

### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.249) , Subpart C RSS-210 A1.1.3				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.249/RSS-210	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100KHz
VB	$\geq$ RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

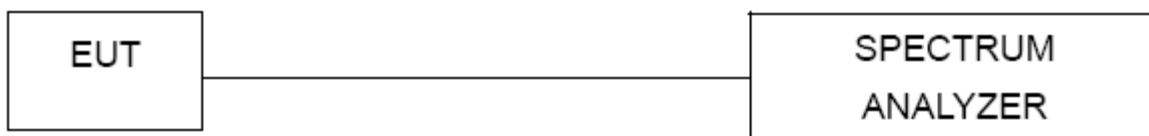
#### 4.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW $\geq$  RBW, Sweep time = Auto.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



#### 4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



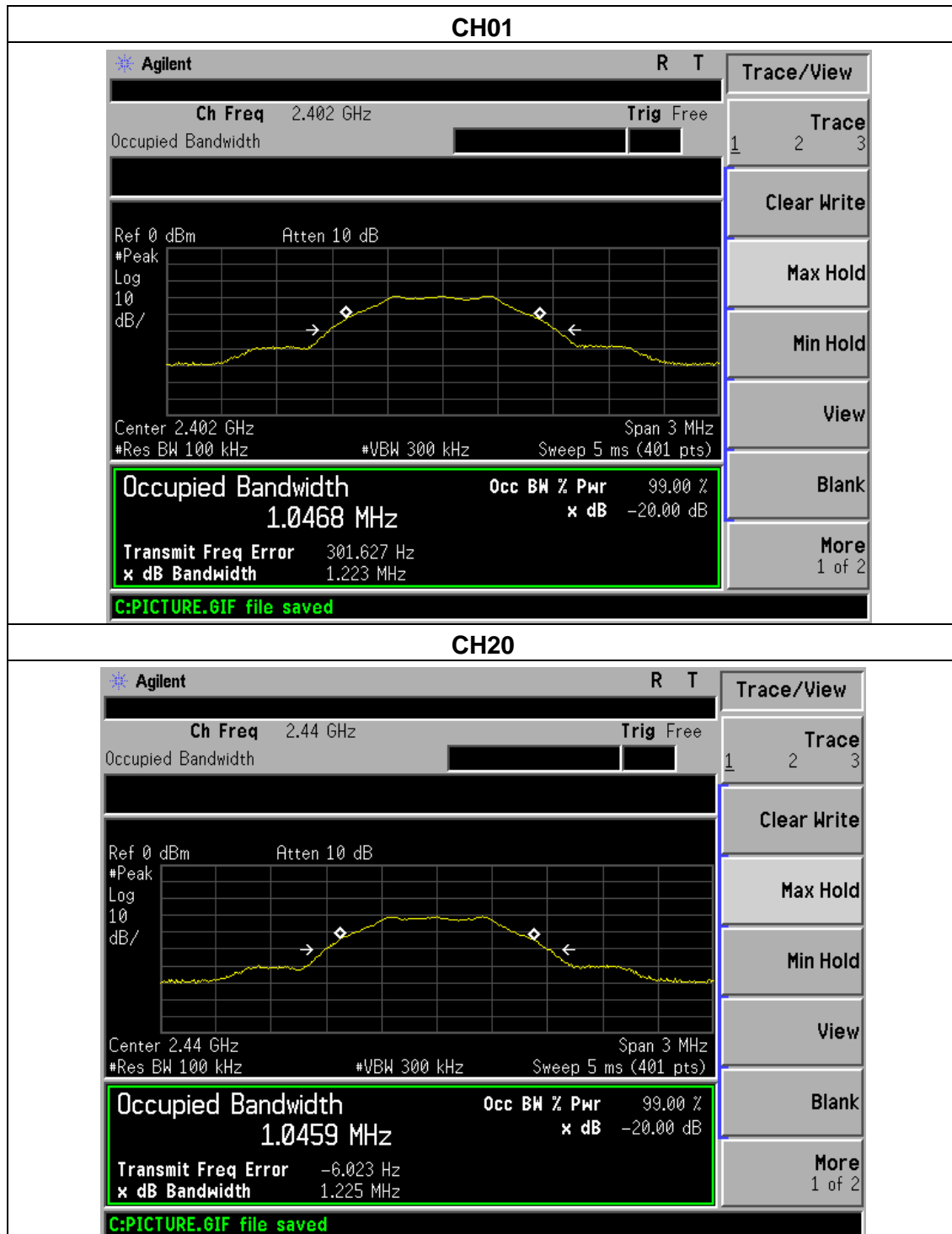
#### 4.1.5 TEST RESULTS

EUT :	The SENSIMAT for Wheelchairs	Model Name :	SENSIMAT
Temperature :	25 °C	Relative Humidity :	55%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH01 / CH20 /CH40		

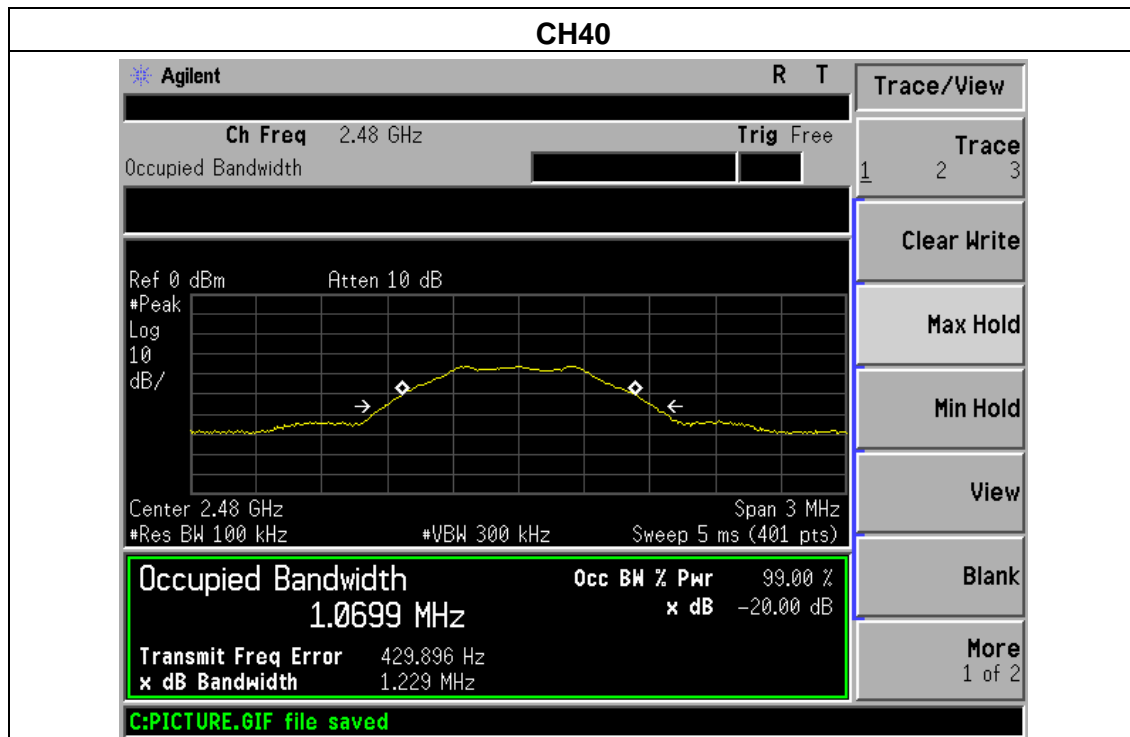
	Frequency	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
GFSK	2402 MHz	1.223	1.0468	PASS
	2440 MHz	1.225	1.0459	PASS
	2480 MHz	1.229	1.0699	PASS



## GPSK









## 5. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported



## 5.1 DEVIATION FROM STANDARD

No deviation.

## 5.2 TEST SETUP

## 5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

## 5.4 TEST RESULTS

Temperature :	25 °C	Relative Humidity :	55%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH01/ CH40		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission evel (dBuV/m)	Limits (dBuV/m)		Result
						PK	PK	AV	
Low Channel 2402MHz									
H	2390.00	56.64	38.06	7.42	20.15	46.15	74.00	54.00	PASS
H	2400.00	61.02	38.06	7.42	20.15	50.53	74.00	54.00	PASS
V	2390.00	57.07	38.06	7.42	20.15	46.58	74.00	54.00	PASS
V	2400.00	60.33	38.06	7.42	20.15	49.84	74.00	54.00	PASS
High Channel 2480MHz									
H	2483.50	57.24	38.17	7.42	20.51	47.00	74.00	54.00	PASS
H	2483.50	59.97	38.17	7.42	20.51	49.73	74.00	54.00	PASS
V	2485.50	58.46	38.2	7.45	20.54	48.25	74.00	54.00	PASS
V	2485.50	60.41	38.2	7.45	20.54	50.20	74.00	54.00	PASS

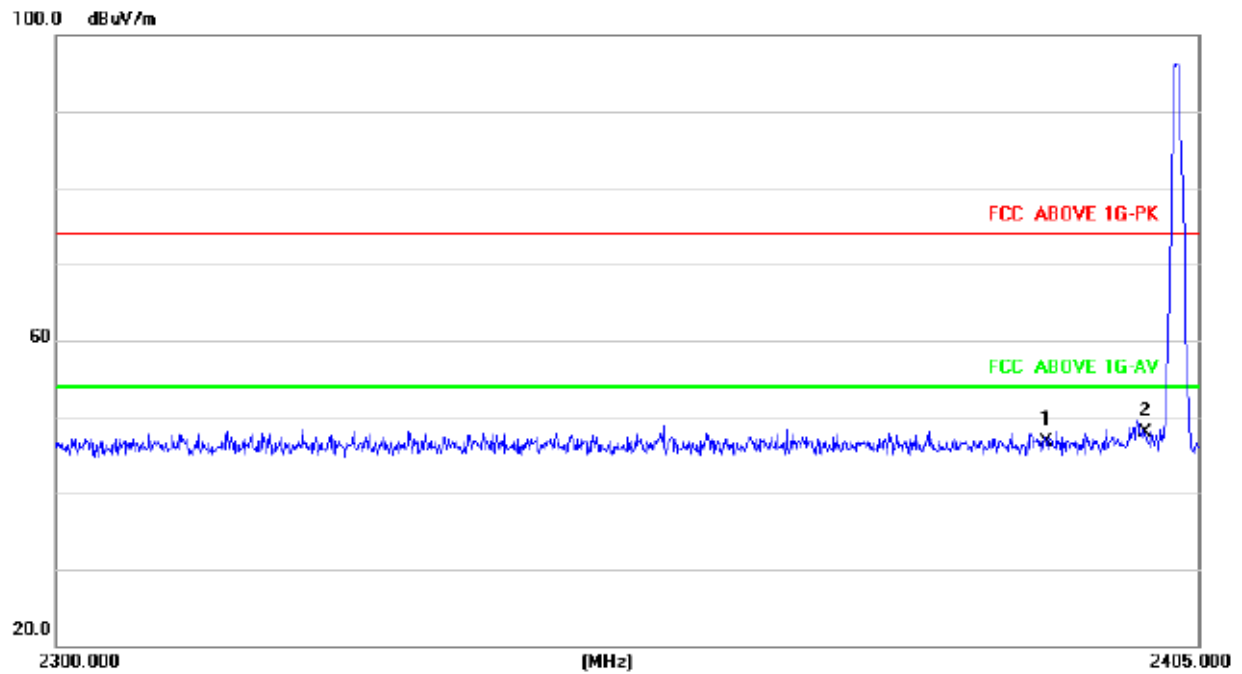
### Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

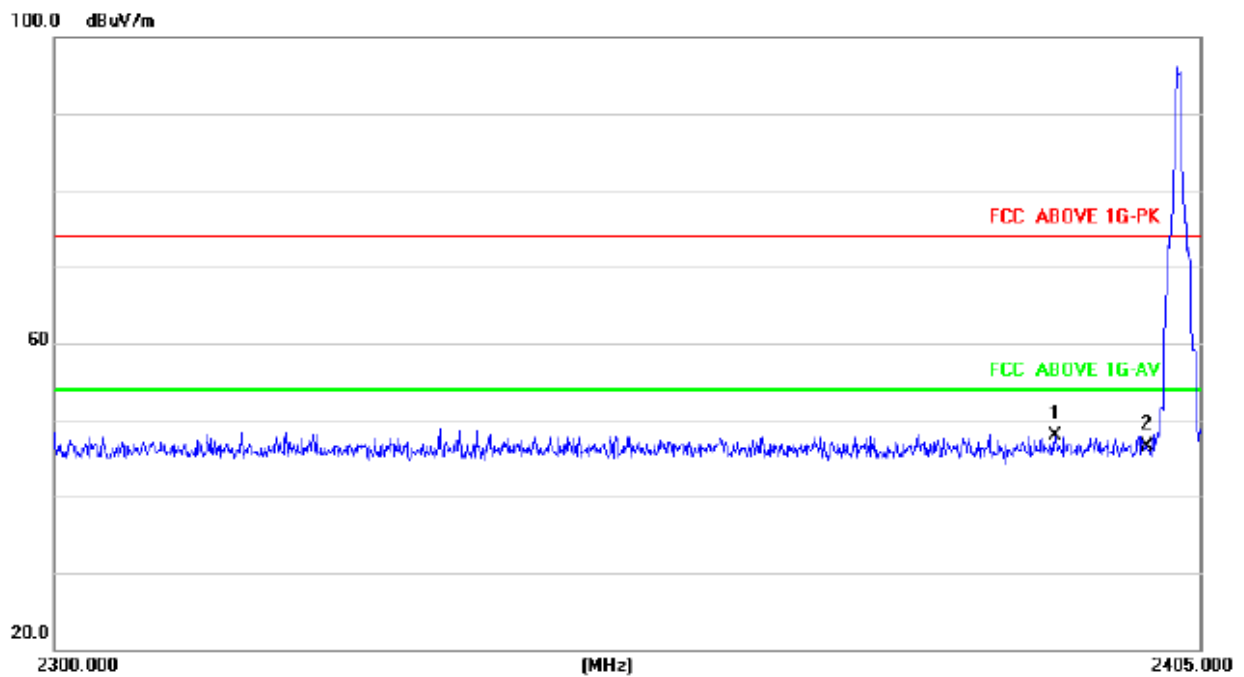


GFSK

2402MHz Horizontal

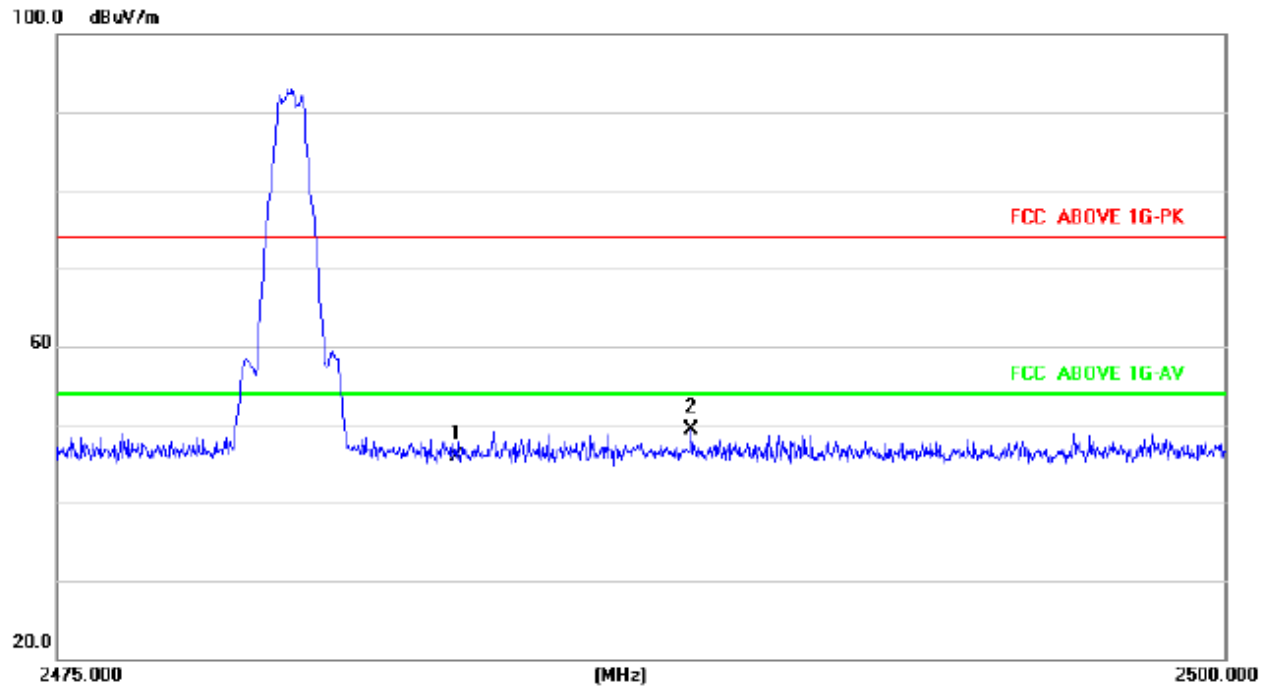


2402MHz Vertical

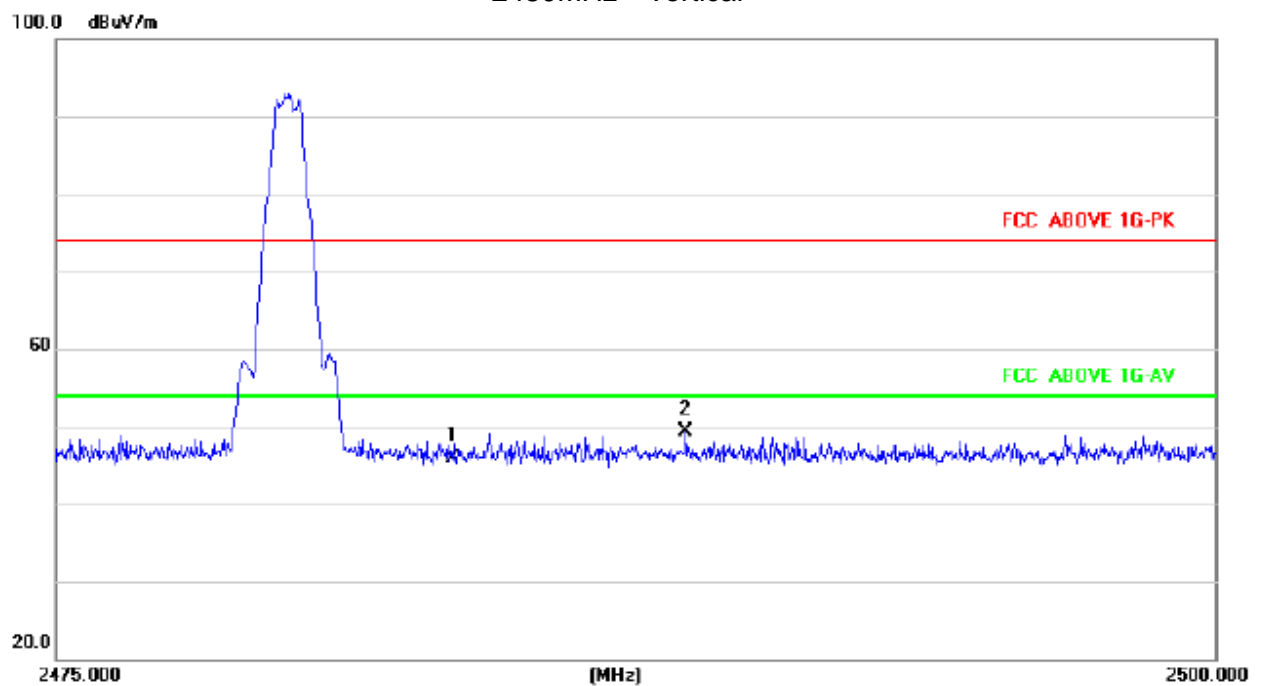




2480MHz Horizontal



2480MHz Vertical





## **6. ANTENNA REQUIREMENT**

### **6.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 15.203: 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.

### **6.2 EUT ANTENNA**

The EUT antenna is Internal CHIP Antenna. It complies with the standard requirement.

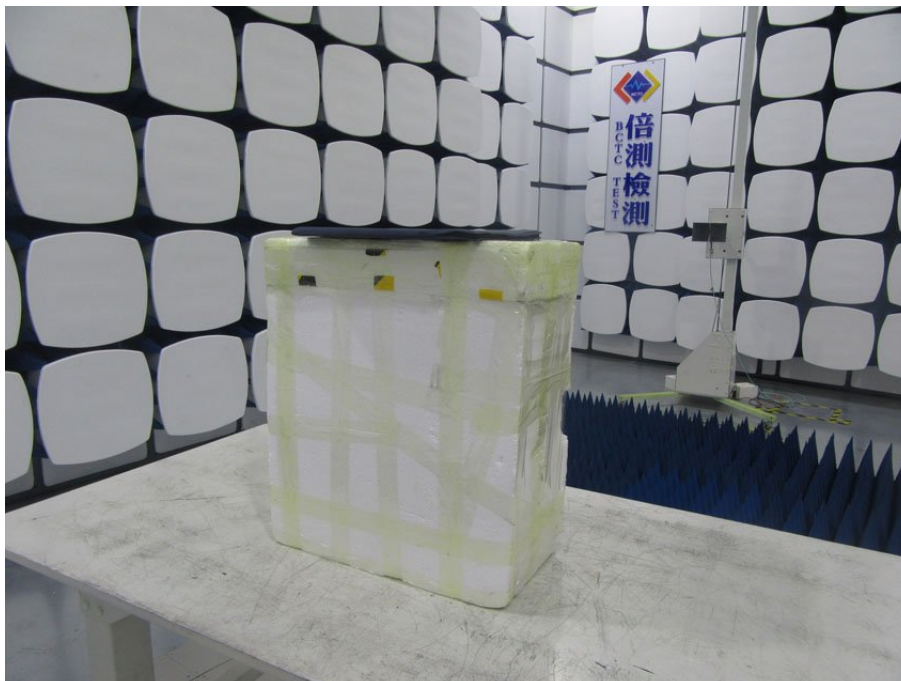


## 7. EUT TEST PHOTO

### Conducted Measurement Photos



### Radiated Measurement Photos







## 8. PHOTOS OF THE EUT



\*\*\*\*\* END OF REPORT \*\*\*\*\*