

FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

Shenzhen 3irobotix Co.,Ltd.

Remote Control

Model Number: RC 200S

Additional Model: RC 200W, RC 200B, RC M7, RC 908T

FCC ID : 2ARNN-RC-200S

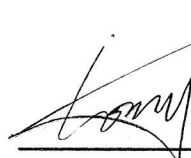
Prepared for:	Shenzhen 3irobotix Co.,Ltd.
	Room501,5th floor,blockA,Hans Innovation Buliding No9018,
	North central Avenue,North Hitech Park, Shenzhen, China
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
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Report Number:	ESTE-R1903019
Date of Test:	Mar. 02 ~ Mar. 06, 2019
Date of Report:	Mar. 07, 2019

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Test Report Verification

Applicant:	Shenzhen 3irobotix Co.,Ltd.		
Address:	Room501,5th floor,blockA,Hans Innovation Buliding No9018,North central Avenue,North Hitech Park, Shenzhen, China		
Manufacturer Address:	Shenzhen 3irobotix Co.,Ltd. Room501,5th floor,blockA,Hans Innovation Buliding No9018,North central Avenue,North Hitech Park, Shenzhen, China		
E.U.T:	Remote Control		
Model Number:	RC 200S		
Additional Model:	RC 200W, RC 200B, RC M7, RC 908T Note: The five models have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, except the different model number.		
Power Supply:	DC 3V		
Test Voltage:	DC 3V		
Trade Name:			Serial No.: -----
Date of Receipt:	Mar. 01, 2019	Date of Test:	Mar. 02 ~ Mar. 06, 2019
Test Specification:	FCC Rules and Regulations Part 15 Subpart C:2018 ANSI C63.10:2013		
Test Result:	The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. Date: Mar. 07, 2019		
Prepared by:	Reviewed by:	Approved by:	
 _____ Ring / Assistant	 _____ Tony / Engineer	 _____ Iceman Hu / Manager	
Other Aspects:	None.		
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.			

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	Remote Control
FCC ID	:	2ARNN-RC-200S
Model Number	:	RC 200S
Operation frequency	:	2407MHz-2437MHz
Number of channel	:	2
Antenna	:	PCB antenna 1dBi gain
Modulation	:	GFSK
Sample Type	:	Prototype production

2. SUMMARY OF TEST

2.1. Summary of test result

Description of Test Item	Standard	Results
Power Line Conducted Emissions	FCC Part 15C: 15.207 ANSI C63.10-2013	N/A
Radiated Emission Test	FCC Part 15C: 15.205 FCC Part 15C: 15.209 FCC Part 15C: 15.249 (a)(d) ANSI C63.10-2013	PASS
20 dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10-2013	PASS
Band Edge Compliance Test	FCC Part 15C: 15.205 FCC Part 15C: 15.209 FCC Part 15C: 15.249 (a)(d) ANSI C63.10-2013	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
N/A is an abbreviation for Not Applicable.		

2.2. Test Facilities

EMC Lab	: Certificated by CNAS, CHINA Registration No.: L5288 Date of registration: November 13, 2017 Certificated by FCC, USA Designation Number: CN1215 Test Firm Registration Number: 722932 Date of registration: November 21, 2017 Certificated by A2LA, USA Registration No.: 4366.01 Date of registration: November 07, 2017 Certificated by Industry Canada CAB identifier No.: CN0035 Date of registration: January 04, 2019 Certificated by VCCI, Japan Registration No.: R-13663; C-14103 Date of registration: July 25, 2017 This Certificate is valid until: July 24, 2020 Certificated by TUV Rheinland, Germany Registration No.: UA 50413872 0001 Date of registration: July 31, 2018 Certificated by TUV/PS, Shenzhen Registration No.: SCN1017 Date of registration: January 27, 2011 Certificated by Intertek ETL SEMKO Registration No.: 2011-RTL-L2-64 Date of registration: April 28, 2011 Certificated by Nemko, Hong Kong Registration No.: 175193 Date of registration: May 4, 2011
Name of Firm	: EST Technology Co., Ltd.
Site Location	: Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	$\pm 3.48\text{dB}$
Uncertainty for spurious emissions test (30MHz-1GHz)	$\pm 4.60\text{ dB(Polarize: H)}$
	$\pm 4.68\text{ dB(Polarize: V)}$
Uncertainty for spurious emissions test (1GHz to 18GHz)	$\pm 4.96\text{dB}$
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

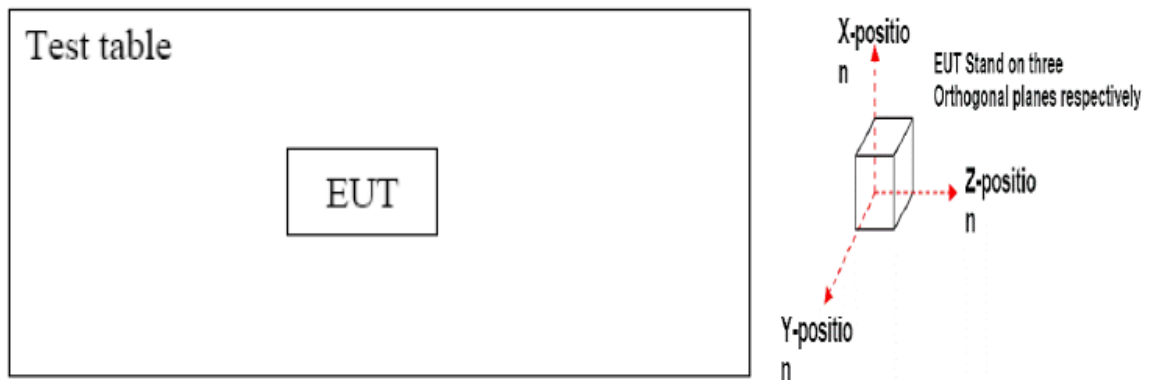
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

2.4. Assistant equipment used for test

2.4.1. N/A

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 or 1.5 meter high above ground. EUT was be set into TX test mode by software.



(EUT: Remote Control)

Note: We test X-axis, Y-axis, and Z-axis,. The Y-axis is the worst mode, so only the worst mode test data was included in the report.

2.6. Test mode

The test software was used to control EUT work in Continuous TX mode, new battery is used during all test

Mode	Frequency	
TX	CH 1	2407 MHz
	CH 2	2437 MHz

2.7. Channel List

Channel No.	Frequency (MHz)
1	2407
2	2437

2.8. Test Equipment

2.8.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	CEPREI	June 15,18	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	101260	CEPREI	June 15,18	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101100	CEPREI	June 15,18	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

2.8.2. For radiated emission test(9 kHz-30MHz)

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	101780	CEPREI	June 15,18	1 Year
Active Loop Antenna	SCHWARZB ECK	FMZB 1519B	1519B-088	N/A	Aug. 01,18	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

2.8.3. For radiated emission test(30-1000MHz)

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	101780	CEPREI	June 15,18	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	CEPREI	June 15,18	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

2.8.4. For radiated emission test(above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna	SCHWARZB ECK	BBHA 9120 D	BBHA912 0D1002	CEPREI	June 18,18	1 Year
Horn Antenna	SCHWARZB ECK	BBHA9170	BBHA917 0242	CEPREI	June 18,18	1Year
Signal Amplifier	SCHWARZB ECK	BBV9718	9718-212	CEPREI	June 15,18	1 Year
Spectrum Analyzer	Rohde &Schwarz	FSV	103173	CEPREI	June 15,18	1 Year
PSA Series Spertrum Analyzer	Agilent	E4447A	MY50180 031	CEPREI	June 15,18	1Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

3. RADIATED EMISSIONS

3.1. Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

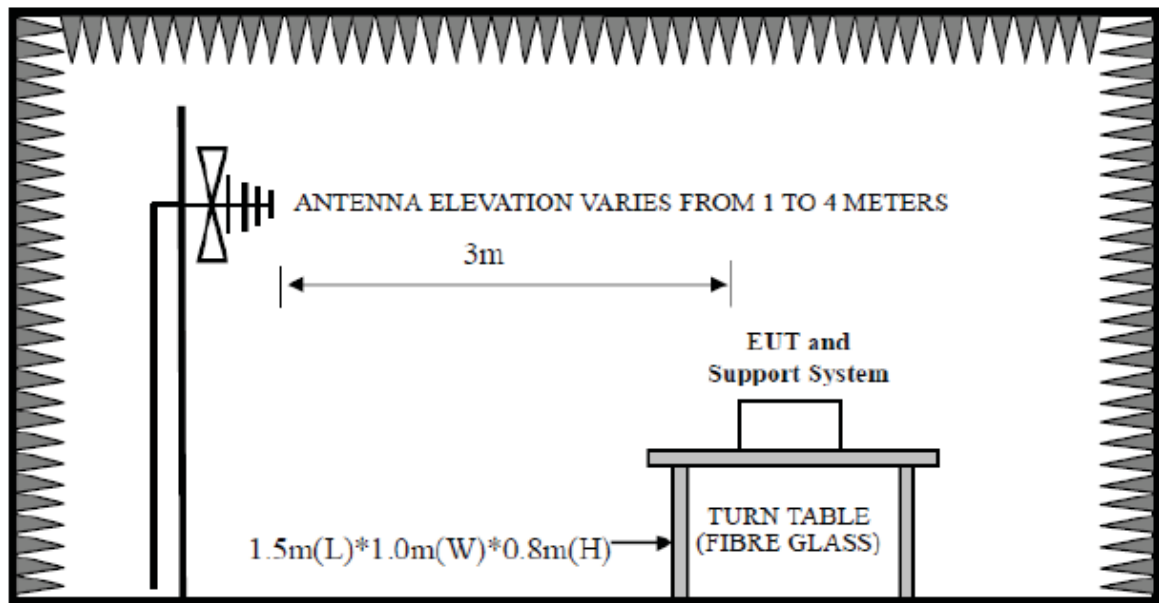
Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

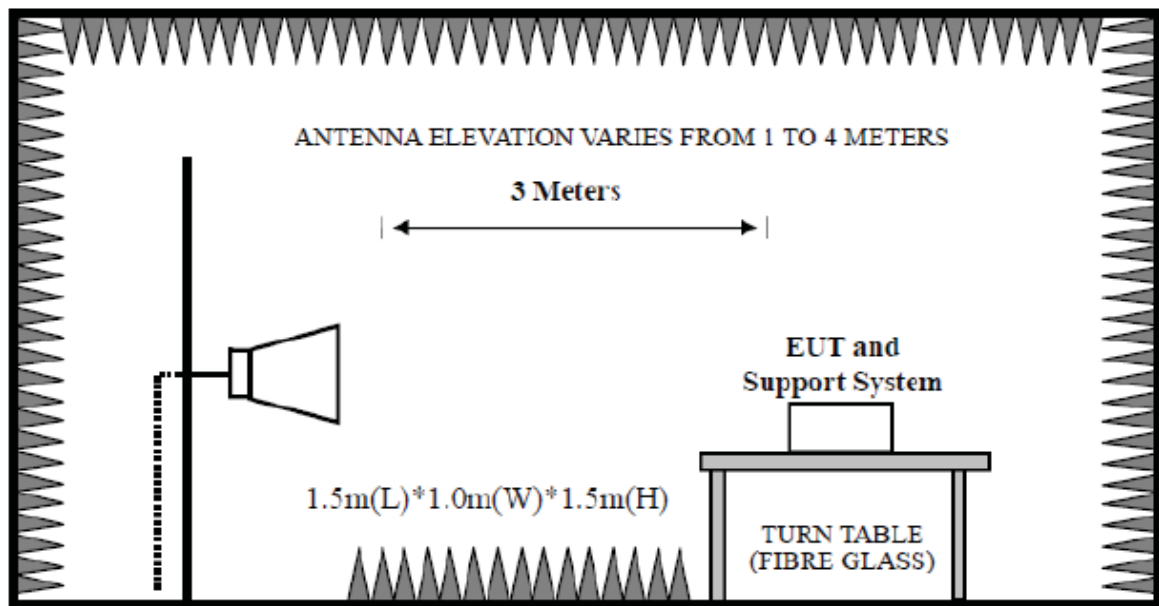
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system

3.2. Block Diagram of Test setup

30~1000MHz



Above 1GHz



3.3. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground for 30~1000MHz test, and which is 1.5 meter high above ground for above 1GHz test. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,

PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10th harmonic (25GHz) are checked.

The EUT position(X.-axis, Y-axis, Z-axis) were checked and worse case was happened in Y-axis position. So Y-axis position was chose for find measurement.

3.4. Test Result

Pass

Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

3.5. Test Data

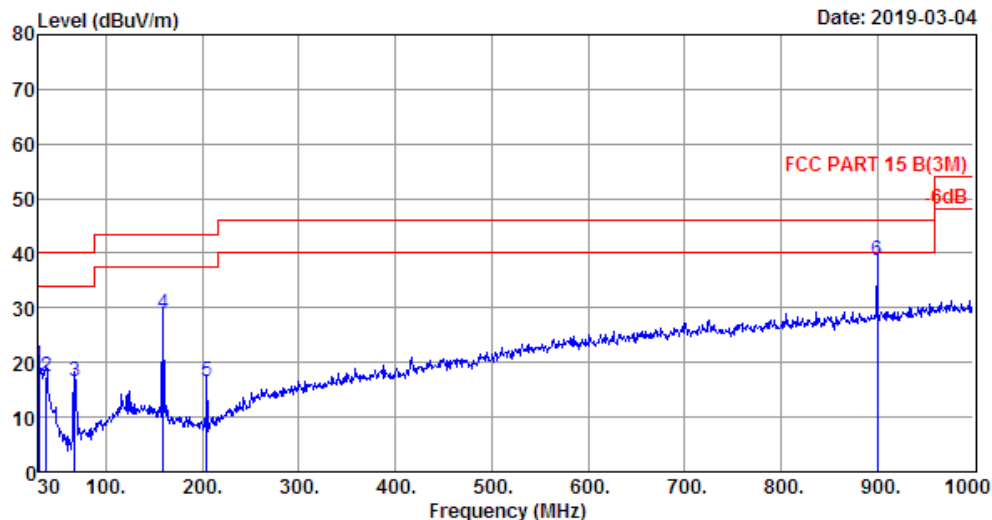
30 MHz – 1000 MHz

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Data: 1 File: \\Emc-966-1\test data\2019\RF\S\san chuan.EM6 (56)

Date: 2019-03-04



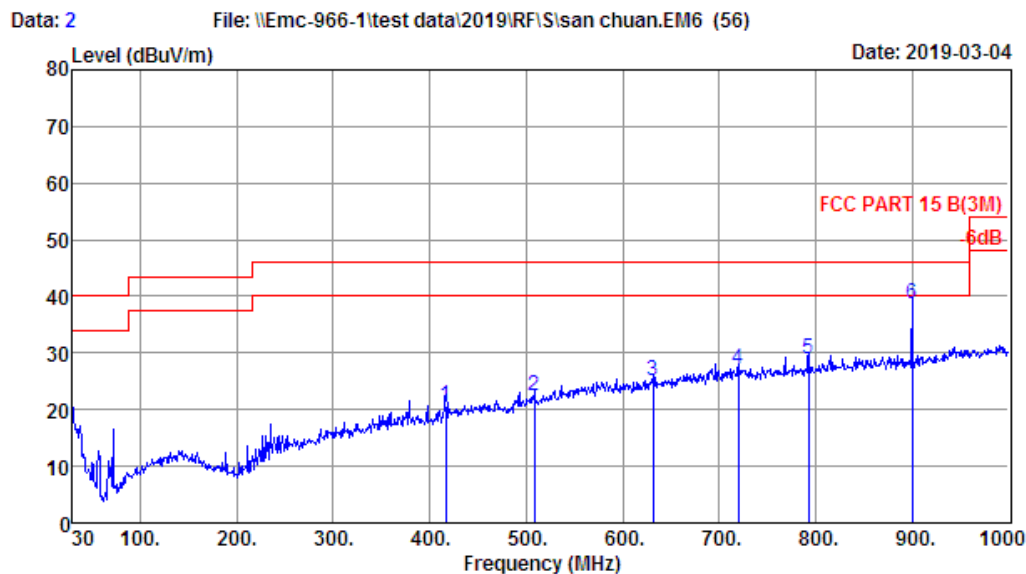
Site no. : 1# 966 Chamber Data no. : 1
 Dis. / Ant. : 3m 37062 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : TX Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.00	18.10	0.31	0.97	19.38	40.00	20.62	QP
2	37.76	14.00	0.41	2.97	17.38	40.00	22.62	QP
3	67.83	5.82	0.68	9.92	16.42	40.00	23.58	QP
4	159.01	11.26	1.36	16.45	29.07	43.50	14.43	QP
5	204.60	8.40	1.51	6.66	16.57	43.50	26.93	QP
6	900.09	23.90	4.05	10.65	38.60	46.00	7.40	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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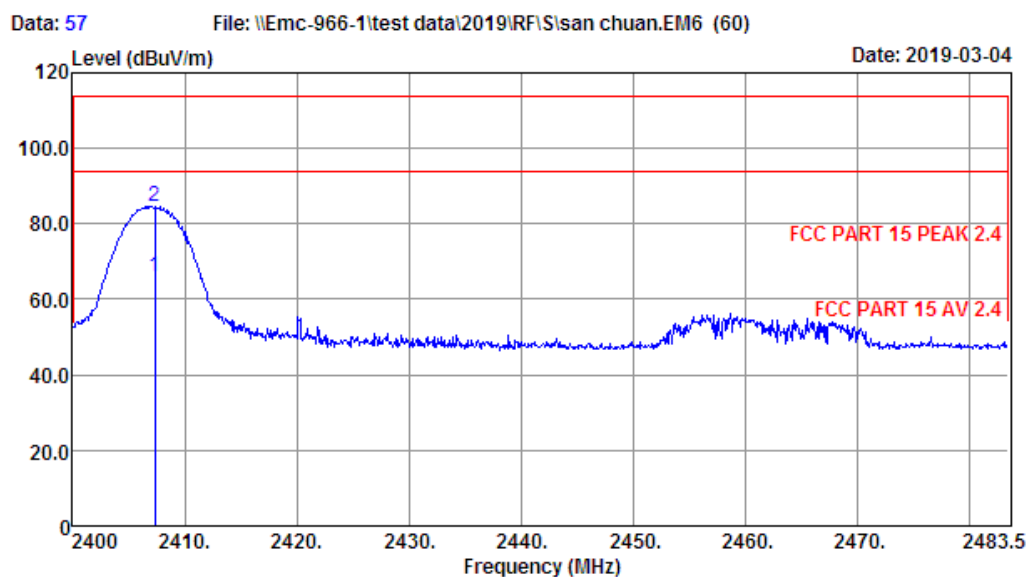
Site no. : 1# 966 Chamber Data no. : 2
 Dis. / Ant. : 3m 37062 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : TX Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	417.03	16.44	2.42	1.79	20.65	46.00	25.35	QP
2	508.21	18.48	2.90	0.94	22.32	46.00	23.68	QP
3	631.40	20.80	3.33	0.96	25.09	46.00	20.91	QP
4	719.67	21.50	3.70	1.97	27.17	46.00	18.83	QP
5	792.42	22.80	3.74	2.47	29.01	46.00	16.99	QP
6	900.09	23.90	4.05	10.87	38.82	46.00	7.18	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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Site no. : 1# 966 Chamber Data no. : 57
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2407MHz

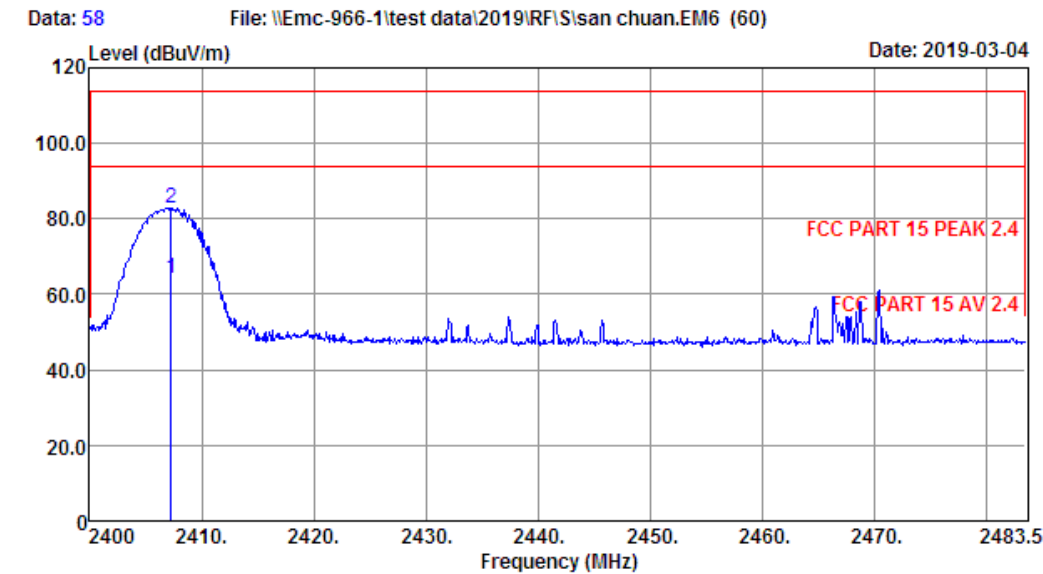
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2407.35	27.39	3.23	34.94	70.39	66.07	94.00	27.93	Average
2	2407.35	27.39	3.23	34.94	88.75	84.43	114.00	29.57	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

RBW is set at 3MHz and VBW is set at 10MHz

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Site no. : 1# 966 Chamber Data no. : 58
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
Engineer : Viking
EUT : Remote Control
Power : DC 3V
M/N : RC 200S
Test Mode : GFSK TX 2407MHz

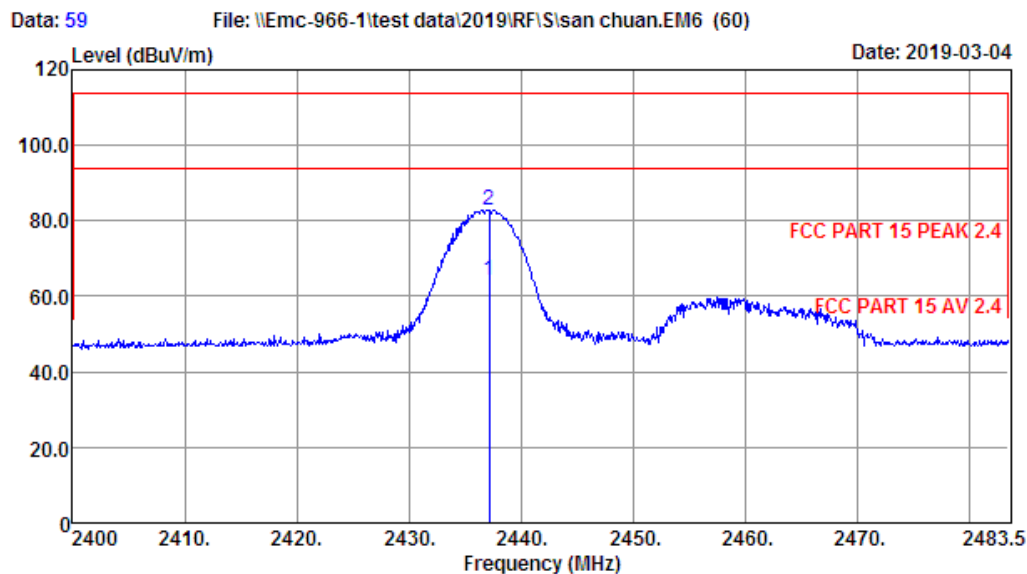
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2407.26	27.39	3.23	34.94	68.60	64.28	94.00	29.72	Average
2	2407.26	27.39	3.23	34.94	86.95	82.63	114.00	31.37	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official
limit are not reported.

RBW is set at 3MHz and VBW is set at 10MHz

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Site no. : 1# 966 Chamber Data no. : 59
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2437MHz

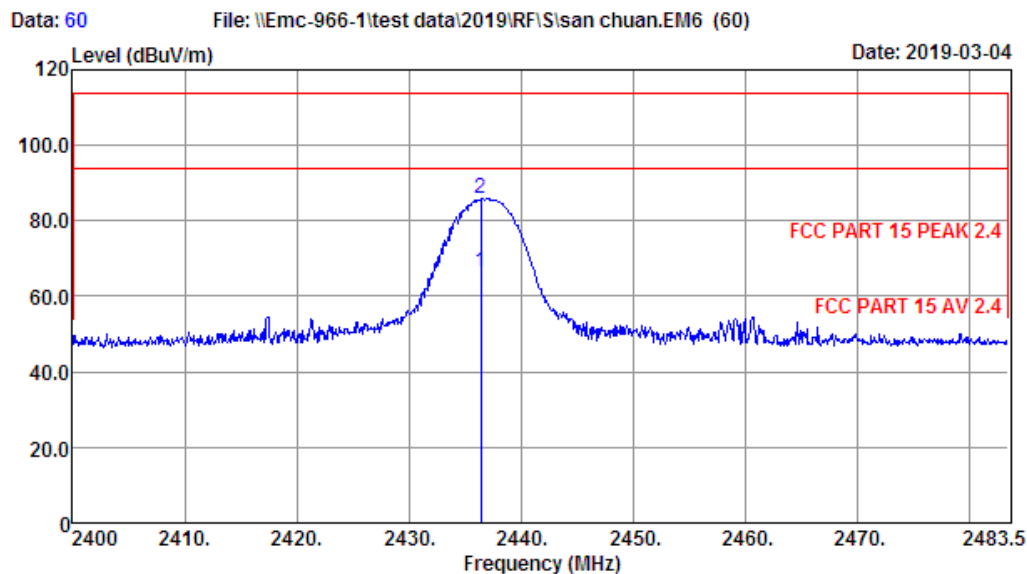
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.16	27.48	3.26	35.07	68.55	64.22	94.00	29.78	Average
2	2437.16	27.48	3.26	35.07	87.08	82.75	114.00	31.25	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

RBW is set at 3MHz and VBW is set at 10MHz

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Site no. : 1# 966 Chamber Data no. : 60
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2437MHz

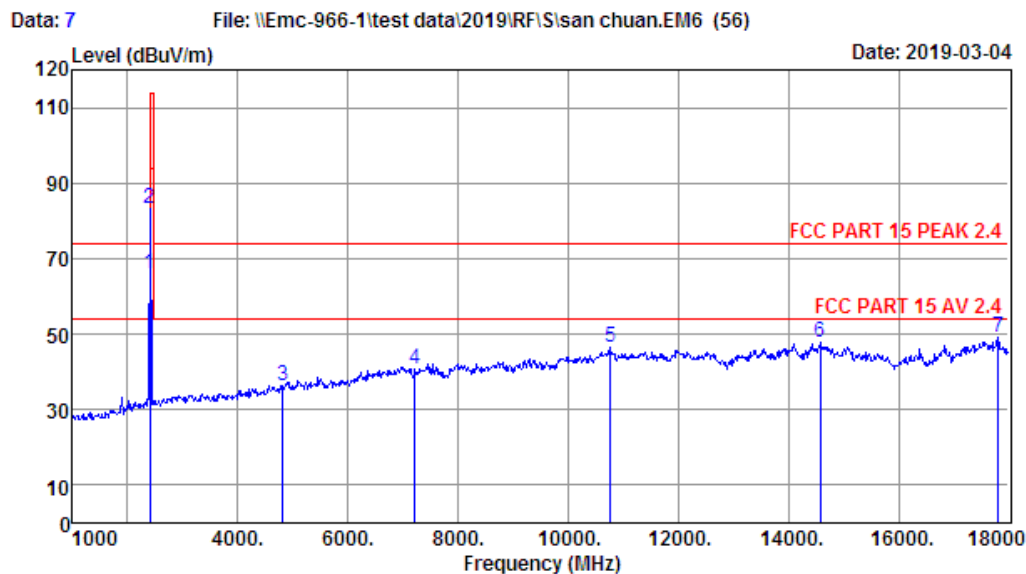
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2436.41	27.43	3.24	35.07	70.87	66.47	94.00	27.53	Average
2	2436.41	27.43	3.24	35.07	90.11	85.71	114.00	28.29	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

RBW is set at 3MHz and VBW is set at 10MHz

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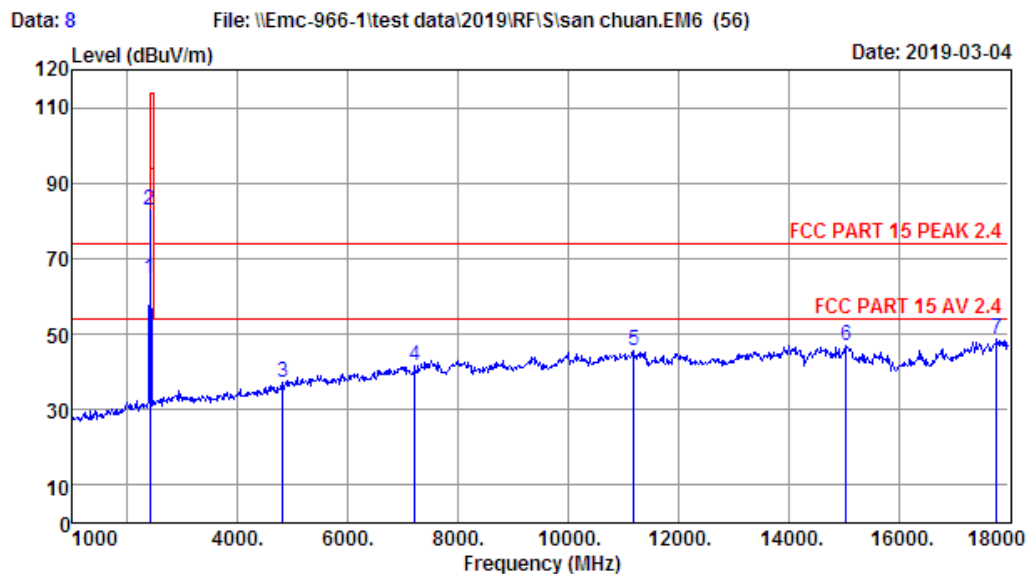
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 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2407MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2407.00	27.39	3.23	34.94	70.08	65.76	94.00	28.24	Average
2	2407.00	27.39	3.23	34.94	87.66	83.34	114.00	30.66	Peak
3	4814.00	32.06	4.67	35.08	34.45	36.10	74.00	37.90	Peak
4	7221.00	36.59	6.01	33.45	31.39	40.54	74.00	33.46	Peak
5	10775.00	39.63	8.85	33.75	31.78	46.51	74.00	27.49	Peak
6	14583.00	41.05	10.28	33.58	30.05	47.80	74.00	26.20	Peak
7	17813.00	44.21	12.23	31.17	23.83	49.10	74.00	24.90	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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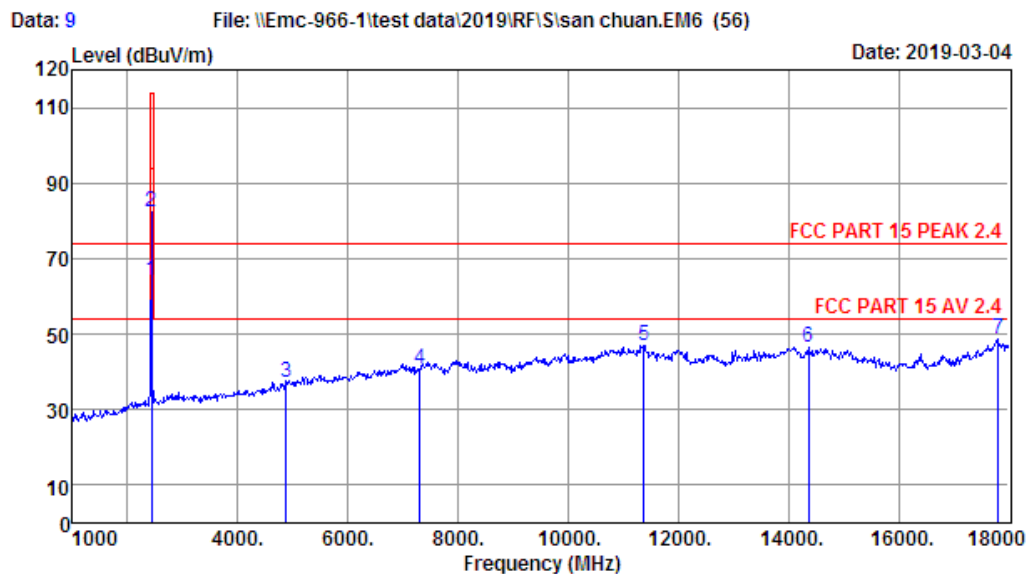
Site no. : 1# 966 Chamber Data no. : 8
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 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2407MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2407.00	27.39	3.23	34.94	68.93	64.61	94.00	29.39	Average
2	2407.00	27.39	3.23	34.94	87.33	83.01	114.00	30.99	Peak
3	4814.00	32.06	4.67	35.08	35.53	37.18	74.00	36.82	Peak
4	7221.00	36.59	6.01	33.45	32.63	41.78	74.00	32.22	Peak
5	11200.00	39.98	8.43	33.10	30.48	45.79	74.00	28.21	Peak
6	15042.00	40.24	10.79	33.34	29.21	46.90	74.00	27.10	Peak
7	17779.00	44.12	12.16	31.15	23.60	48.73	74.00	25.27	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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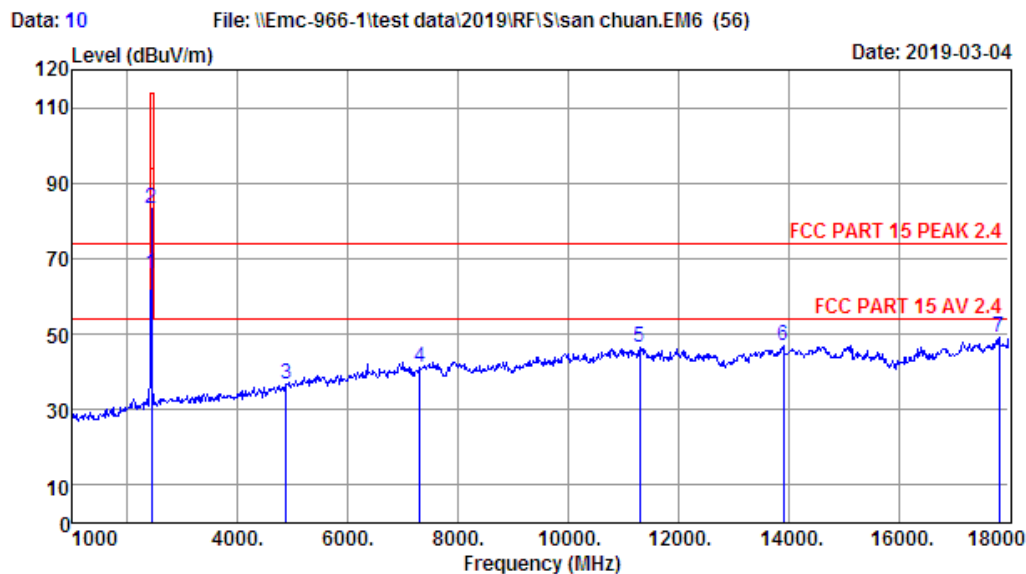
Site no. : 1# 966 Chamber Data no. : 9
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2437MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	27.48	3.26	35.07	68.46	64.13	94.00	29.87	Average
2	2437.00	27.48	3.26	35.07	86.51	82.18	114.00	31.82	Peak
3	4874.00	32.18	4.73	35.14	35.31	37.08	74.00	36.92	Peak
4	7311.00	36.78	6.09	33.31	30.96	40.52	74.00	33.48	Peak
5	11370.00	40.05	8.30	32.78	31.48	47.05	74.00	26.95	Peak
6	14362.00	41.34	10.18	33.34	28.50	46.68	74.00	27.32	Peak
7	17813.00	44.21	12.23	31.17	23.65	48.92	74.00	25.08	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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Site no. : 1# 966 Chamber Data no. : 10
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2437MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2437.00	27.48	3.26	35.07	70.22	65.89	94.00	28.11	Average
2	2437.00	27.48	3.26	35.07	87.76	83.43	114.00	30.57	Peak
3	4874.00	32.18	4.73	35.14	34.80	36.57	74.00	37.43	Peak
4	7311.00	36.78	6.09	33.31	31.82	41.38	74.00	32.62	Peak
5	11302.00	40.02	8.35	32.90	31.10	46.57	74.00	27.43	Peak
6	13903.00	41.62	10.11	32.81	28.01	46.93	74.00	27.07	Peak
7	17830.00	44.25	12.27	31.21	23.76	49.07	74.00	24.93	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

18000MHz – 25000MHz

Pass

Note: The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

4. 20 DB BANDWIDTH

4.1. Test Procedure

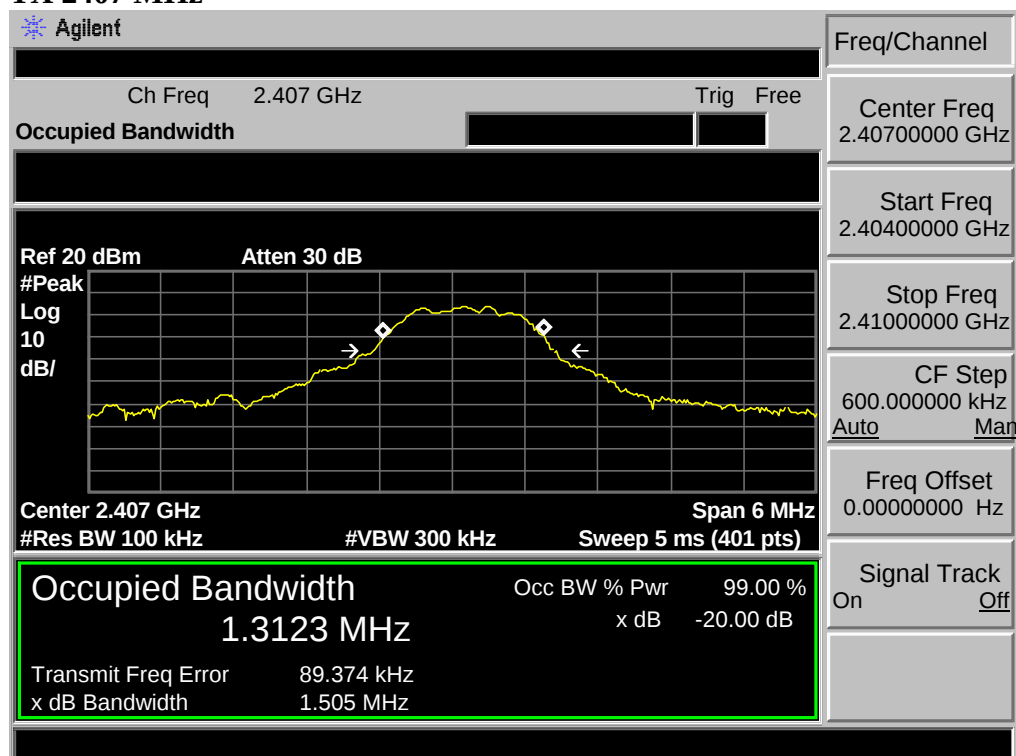
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.2. Test Result

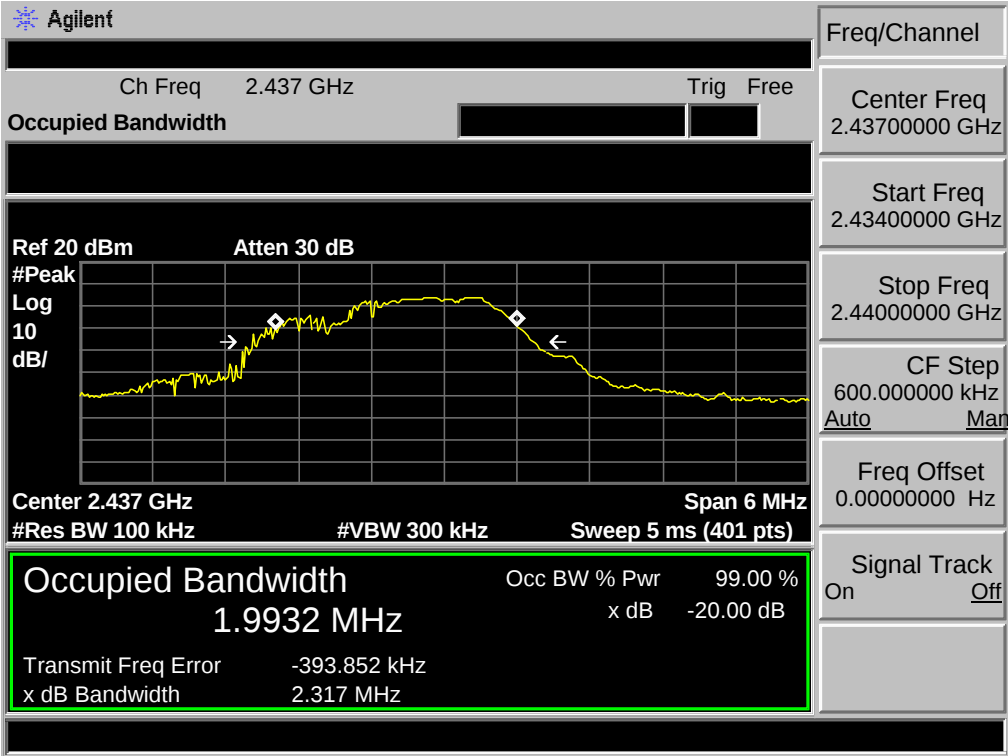
EUT: Remote Control				
M/N: RC 200S				
Test date: 2019-03-05		Test site: RF site	Tested by: Viking	
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
TX	2407	1.505	/	PASS
TX	2437	2.317	/	PASS

4.3. Test Data

TX 2407 MHz

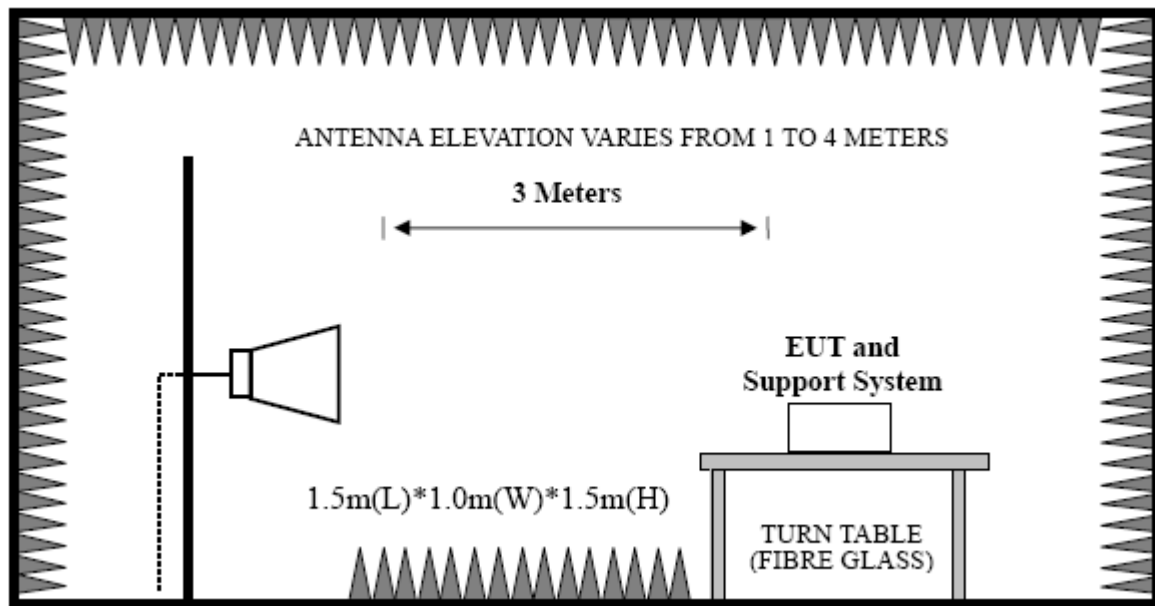


TX 2437 MHz



5. BAND EDGE COMPLIANCE

5.1. Block Diagram of Test setup



5.2. Test Procedure

EUT was placed on a turn table, which is 1.5 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of emissions

Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto.

AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto .

The EUT position(X.-axis, Y-axis, Z-axis) were checked and worse case was happened in Y-axis position. So Y-axis position was chose for find measurement.

5.3. Test Result

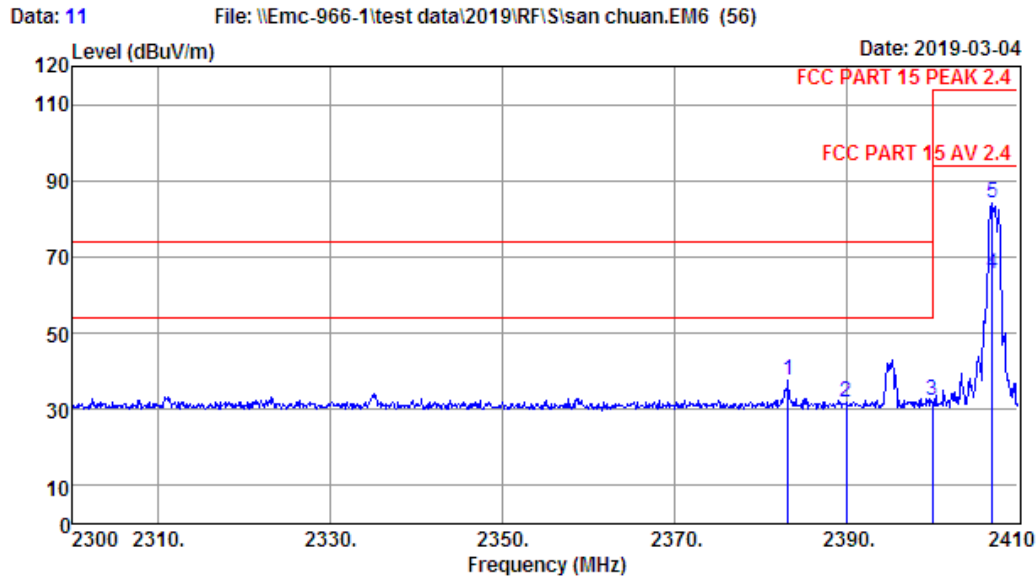
Pass.

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

5.4. Test Data

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Site no. : 1# 966 Chamber Data no. : 11
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4';Humi:50%;Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2407MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2383.27	27.31	3.20	34.87	41.82	37.46	74.00	36.54	Peak
2	2390.00	27.35	3.21	34.87	36.25	31.94	74.00	42.06	Peak
3	2400.00	27.35	3.21	34.94	36.91	32.53	74.00	41.47	Peak
4	2407.03	27.39	3.23	34.94	70.05	65.73	94.00	28.27	Average
5	2407.03	27.39	3.23	34.94	88.27	83.95	114.00	30.05	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

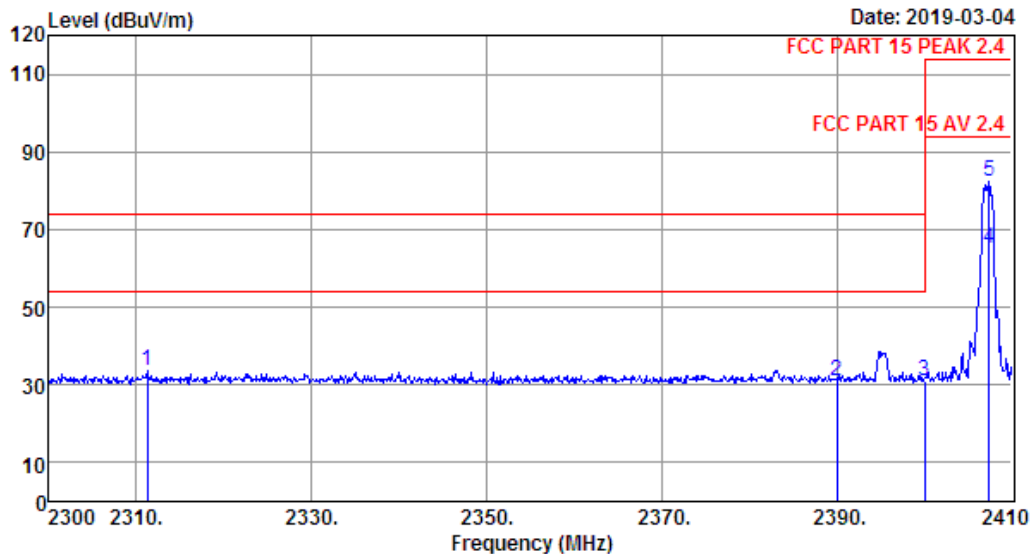
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Data: 12

File: \\Emc-966-1\\test data\\2019\\RF\\S\\san chuan.EM6 (56)

Date: 2019-03-04



Site no. : 1# 966 Chamber Data no. : 12
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4'; Humi:50%; Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2407MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2311.22	27.14	3.13	34.60	38.07	33.74	74.00	40.26	Peak
2	2390.00	27.35	3.21	34.87	35.41	31.10	74.00	42.90	Peak
3	2400.00	27.35	3.21	34.94	35.50	31.12	74.00	42.88	Peak
4	2407.36	27.39	3.23	34.94	69.22	64.90	94.00	29.10	Average
5	2407.36	27.39	3.23	34.94	86.73	82.41	114.00	31.59	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

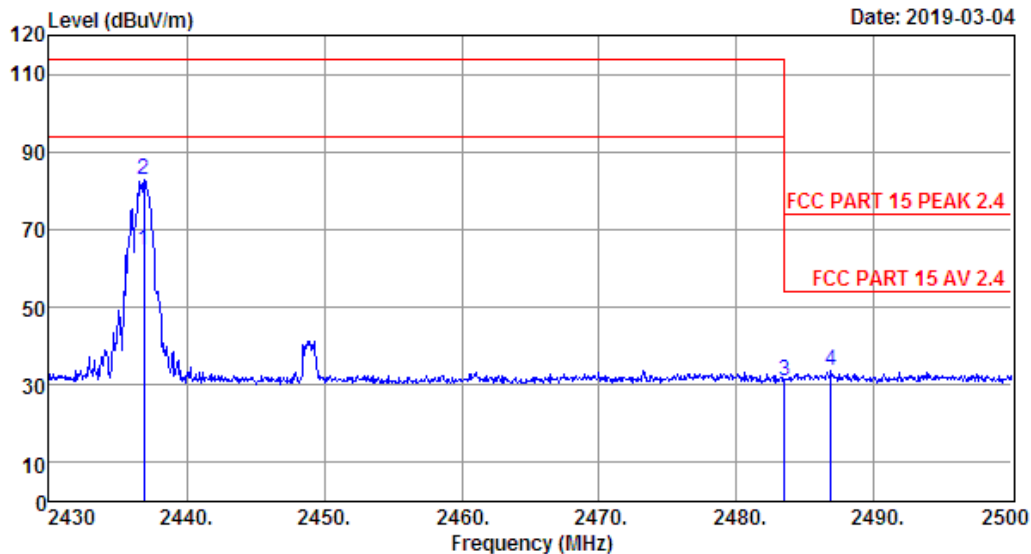
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Data: 13

File: \\Emc-966-1\\test data\\2019\\RF\\S\\san chuan.EM6 (56)

Date: 2019-03-04



Site no. : 1# 966 Chamber Data no. : 13
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4'; Humi:50%; Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2437MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2436.93	27.48	3.26	35.07	68.98	64.65	94.00	29.35	Average
2	2436.93	27.48	3.26	35.07	87.13	82.80	114.00	31.20	Peak
3	2483.50	27.56	3.29	35.21	35.33	30.97	74.00	43.03	Peak
4	2486.84	27.56	3.29	35.21	38.16	33.80	74.00	40.20	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

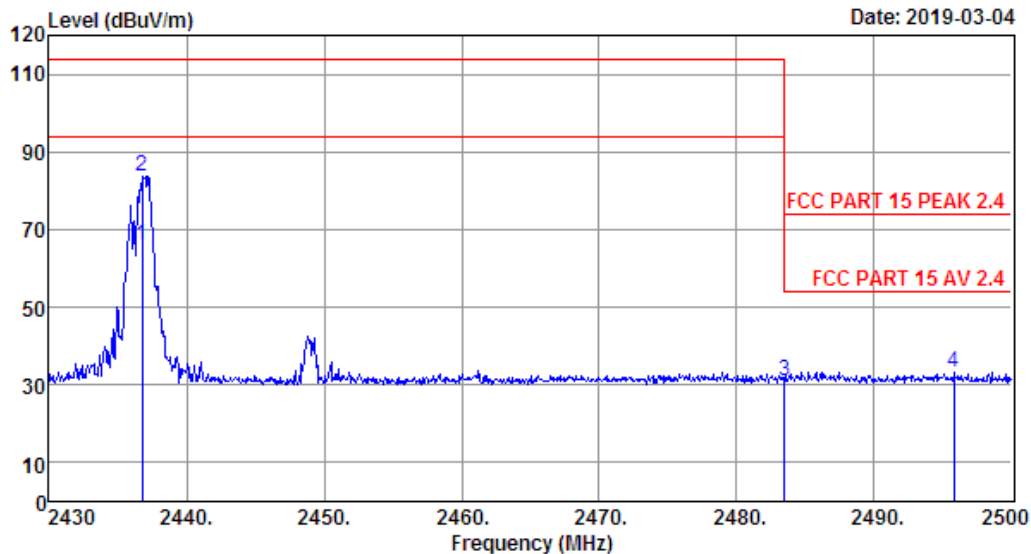
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Data: 14

File: \\Emc-966-1\\test data\\2019\\RF\\S\\san chuan.EM6 (56)

Date: 2019-03-04



Site no. : 1# 966 Chamber Data no. : 14
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.4'; Humi:50%; Press:101.52kPa
 Engineer : Viking
 EUT : Remote Control
 Power : DC 3V
 M/N : RC 200S
 Test Mode : GFSK TX 2437MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2436.79	27.48	3.26	35.07	70.21	65.88	94.00	28.12	Average
2	2436.79	27.48	3.26	35.07	88.20	83.87	114.00	30.13	Peak
3	2483.50	27.56	3.29	35.21	35.27	30.91	74.00	43.09	Peak
4	2495.80	27.60	3.30	35.27	37.78	33.41	74.00	40.59	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

6. ANTENNA REQUIREMENTS

6.1. Limit

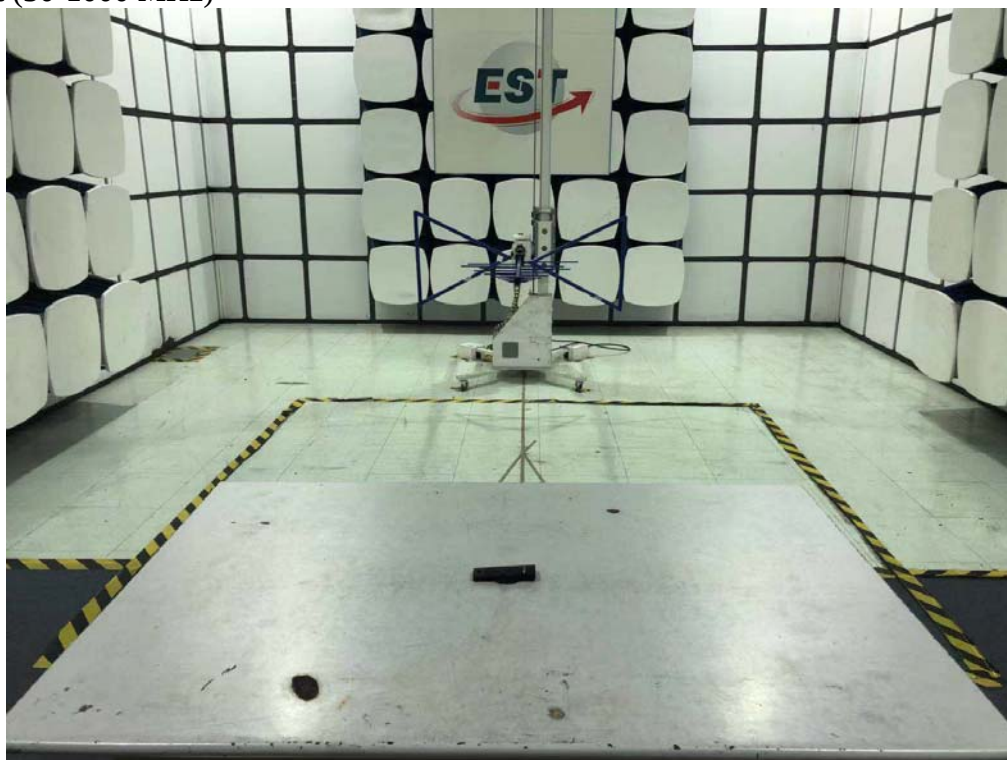
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.2. Result

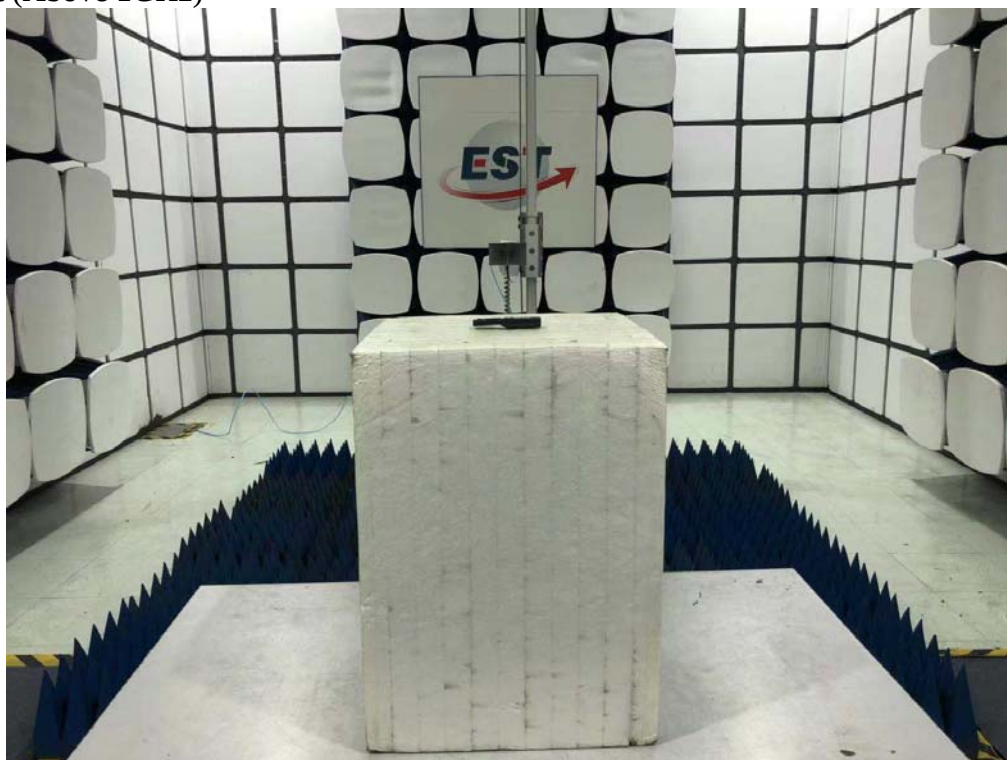
The antennas used for this product are PCB Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 1dBi.

7. TESTSETUP PHOTO

Radiated Test (30-1000 MHz)



Radiated Test (Above 1GHz)



8. PHOTO OF EUT

External Photos
M/N: RC 200S



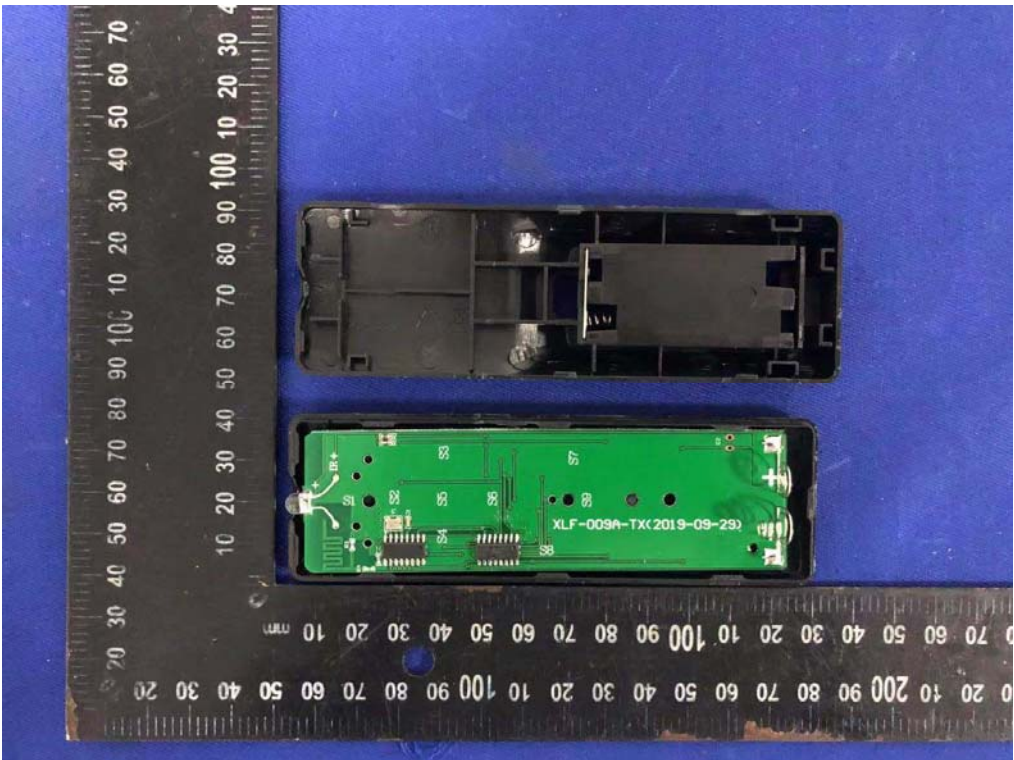
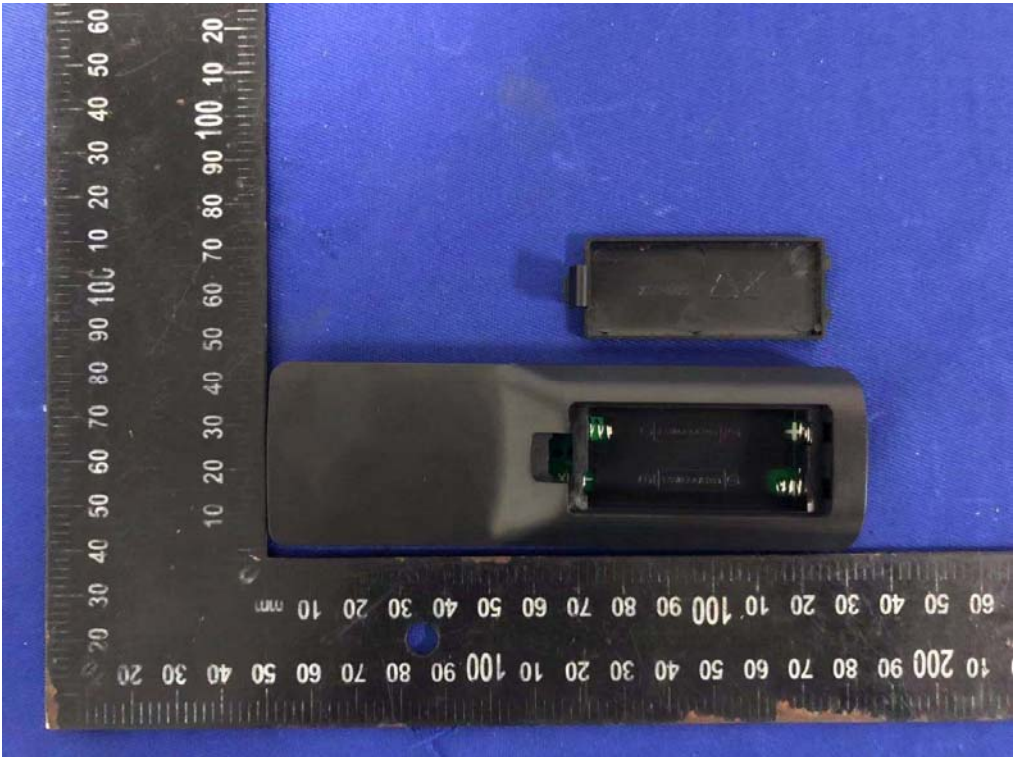
External Photos
M/N:RC 200S



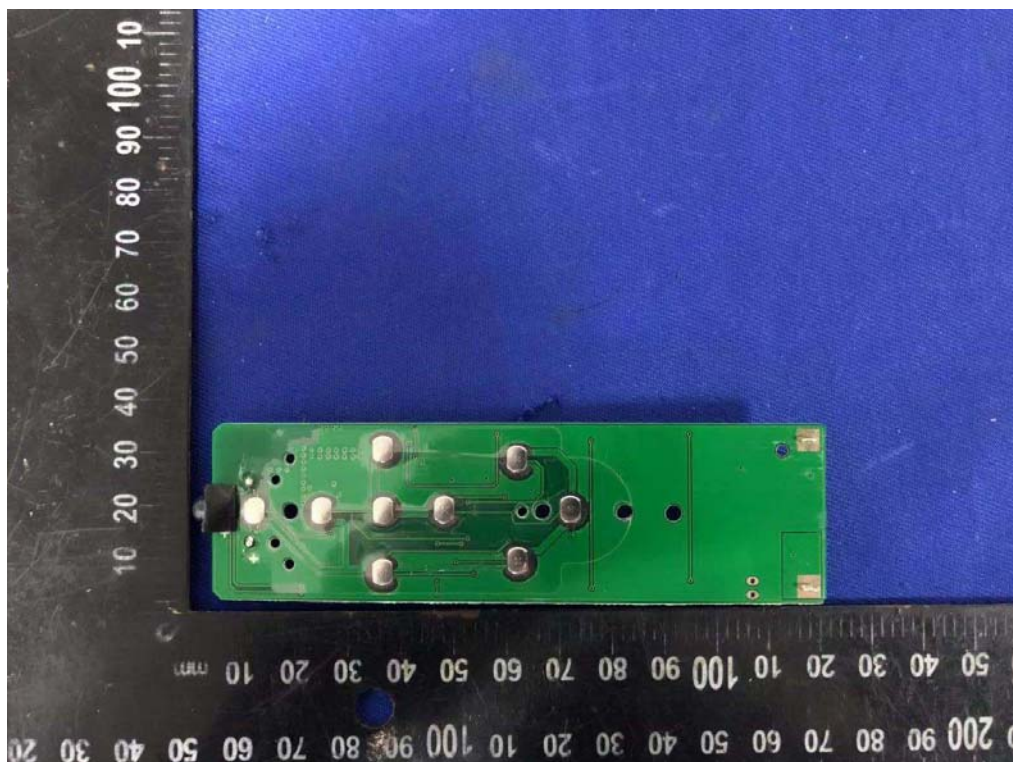
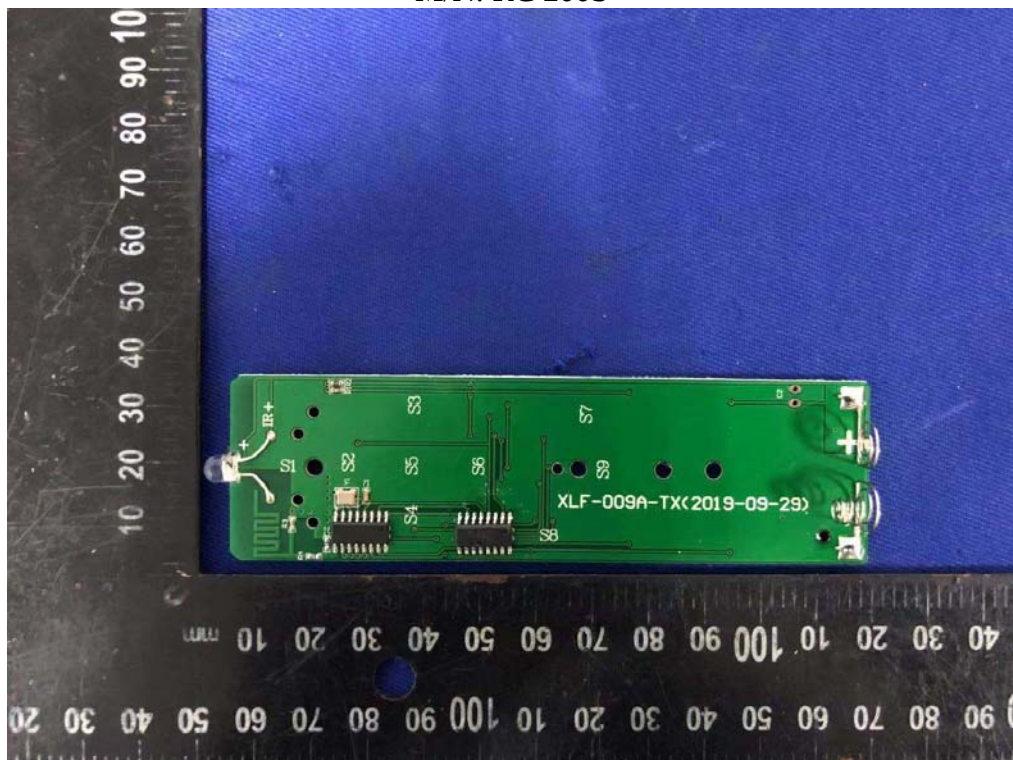
External Photos
M/N: RC 200S



Internal Photos
M/N: RC 200S



Internal Photos
M/N: RC 200S



Internal Photos
M/N: RC 200S

Antenna

