

FCC RADIO TEST REPORT

FCC ID: 2ADSE171401

Product : Turbo Pets(Rc Racing Pets)

Trade Name : 

Model Name : 171401

Series Model: 171402, 171403, 171404, 171405,
171406, 171407, 171408

Prepared for

HU Global Limited

Flat C07, 8/F., Wing Hing Ind.Bldg., 14Hing Yip St., Kwun Tong, Kln., H.K.

Prepared by

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TESTRESULTCERTIFICATION

Applicant's name..... HU Global Limited

Address.....Flat C07, 8/F., Wing Hing Ind.Bldg., 14Hing Yip St., Kwun Tong,
Kln., H.K.

Manufacture's Name...HU Global Limited

Address.....Flat C07, 8/F., Wing Hing Ind.Bldg., 14Hing Yip St., Kwun Tong,
Kln., H.K.

Product description

Product name.....Turbo Pets(Rc Racing Pets)

Model and/or type

reference..... 171401

Serial Model.....171402, 171403, 171404, 171405, 171406, 171407, 171408

Standards.....FCCPart15.249

Test procedure.....ANSIC63.10-2003

This device described above has been tested by PTS, 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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Date of Test.....

Date (s) of performance of testsDec.20,2014~Jan.06,2015

Date of Issue..... Jan.06,2015

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

Testing Engineer :



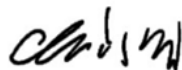
Assistant

Technical Manager :



Supervisor

Authorized Signatory :



Chris Du/Manager

Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207(a)	N/A*
Radiated Emission	15.249(a) 15.209 15.205(a)	PASS
Outside of Band Emission	15.249 (d)	PASS
20dB Bandwidth	15:215(c)	PASS
Antenna Requirement	15.203	PASS


N/A*: Due to this EUT is powered by the battery only, this test item is not applicable.

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General Information

General Description of E.U.T.

Product Name	:Turbo Pets(Rc Racing Pets)
Model No.	: 171401
Serial Model.	: 171402, 171403, 171404, 171405, 171406, 171407, 171408
Brand Name	: 
Model Description	: Series Product
Model Difference:	<p>Animals and remote control shape is different, different rabbits, mice, beetles, cock, snails, ducks, frogs, crabs, size. Sections of color differences, remote control color, different color velvet cloth.</p> <p>According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the outer shape, size, weight, color.</p> <p>Therefore only one model 171401 was tested in this report.</p>
Operation Frequency	:2412MHz ~ 2476MHz,65 channels in total, separated by 1MHz
Type of Modulation	: GFSK
Oscillator	: 12MHz
Antenna installation	: PCB Printed Antenna
Antenna Gain	: 0dBi

Details of E.U.T.

Technical Data

Power Supply:	DC 3V (DC 1.5V*2 batteries)
	The new batteries are used during the measurements

Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2412	17	2429	34	2446	51	2463
1	2413	18	2430	35	2447	52	2464
2	2414	19	2431	36	2448	53	2465
3	2415	20	2432	37	2449	54	2466
4	2416	21	2433	38	2450	55	2467
5	2417	22	2434	39	2451	56	2468
6	2418	23	2435	40	2452	57	2469
7	2419	24	2436	41	2453	58	2470
8	2420	25	2437	42	2454	59	2471
9	2421	26	2438	43	2455	60	2472
10	2422	27	2439	44	2456	61	2473
11	2423	28	2440	45	2457	62	2474
12	2424	29	2441	46	2458	63	2475
13	2425	30	2442	47	2459	64	2476
14	2426	31	2443	48	2460		
15	2427	32	2444	49	2461		
16	2428	33	2445	50	2462		

EUT was tested with Channel: 0 channel (2412MHz) , 32 channel (2444MHz) and 64channel (2476MHz)

Description of Support Units

No.	Equipment	Manufacturer	Model No.	Serial No.
1.	N/A	N/A	N/A	N/A

Test Facility

The test facility has a test site registered with the following organizations:

NTEK Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

Test Location

All the tests were performed at:

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

Equipment Used during Test

Equipments List

Mains Terminal Disturbance Voltage (Conducted Emission)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.17,2014	1 Year
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.17,2014	1 Year
3.	Cable	LARGE	RF300	-	Sep.17,2014	1 Year
3m Semi-anechoic Chamber for Radiation						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.17,2014	1 Year
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.17,2014	1 Year
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Sep.17,2014	1 Year
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.17,2014	1 Year
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Sep.17,2014	1 Year
6	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Sep.17,2014	1 Year
7	Coaxial Cable (above 1GHz)	Top	25MHz-18GHz	EW02014-7	Sep.17,2014	1 Year
8	Horn Antenna	EM	EM-AH-10180	2011071402	Sep.17,2014	1 Year
9	Horn Antenna	SCHWARZBECK	BBHA 9170	335	Sep.17,2014	1 Year
10	Power meter	Anritsu	ML2487A	6K00002472	Sep.17,2014	1 Year
11	Power sensor	Anritsu	MI2491A	0033005	Sep.17,2014	1 Year
12	Spectrum analyzer	R&S	FSU	1166.1660.26	Sep.17,2014	1 Year
13	RF Cable	Micable	C10-01-01-1	100309	Sep.17,2014	1 Year

Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Temperature	± 1 °C
DC Source	$\pm 0.05\%$
Radiated Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Emissions test	3.64dB (150kHz~30MHz)

Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

E.U.T. Operation

Operating Environment:

Temperature: 25°C

Humidity: 51 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation:

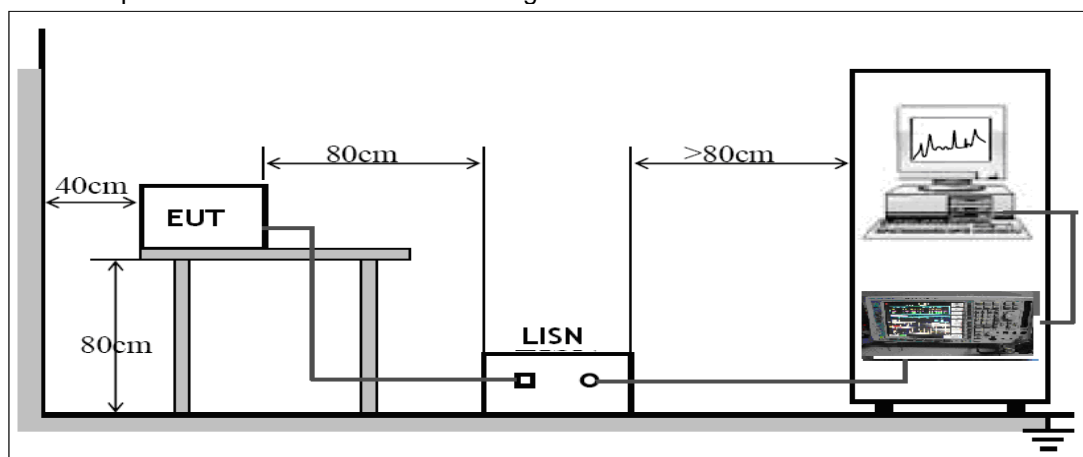
The pre-test was performed in Bluetooth linking, and the data were shown as follow.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

EUT Setup

The EUT was placed on the test table in shielding room.



Conducted Emission Test Result

N/A*:The EUT power by battery at wireless mode.

Radiated Emissions Test

Test Requirement: FCC Part15 Paragraph 15.249

Test Method: ANSI 63.4: 2003

Measurement Distance: 3m

Test Result: PASS

15.249(a)Limit:

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928 MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25 GHz	250	108	2500	68

15.209 Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note: RF Voltage(dBuV)= $20 \log_{10}$ RF Voltage(uV)

EUT Operation :

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

Atmospheric Pressure:1010 mbar

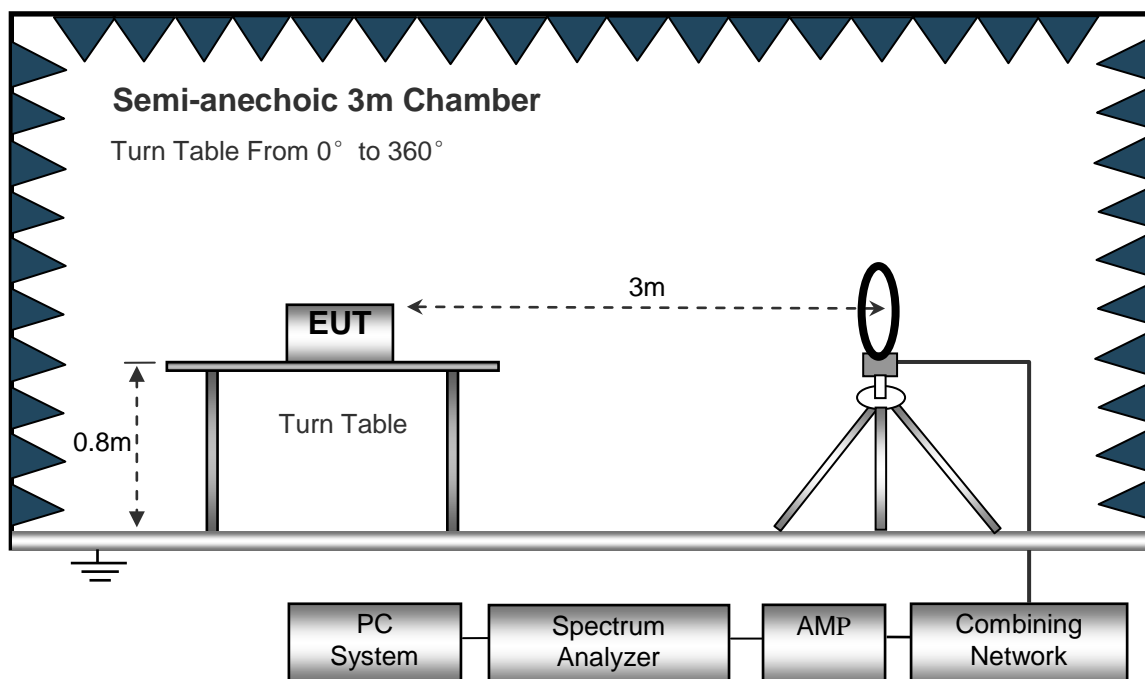
Operation Mode:

The EUT was tested in transmitting mode, and the data were shown as follow.

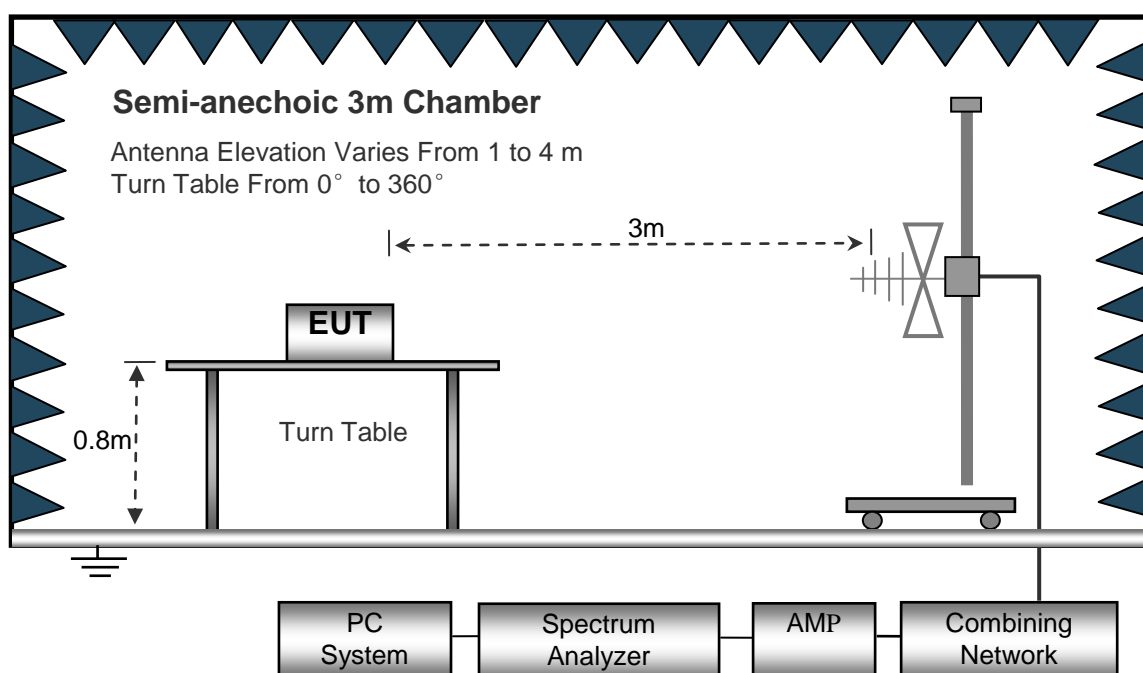
Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.

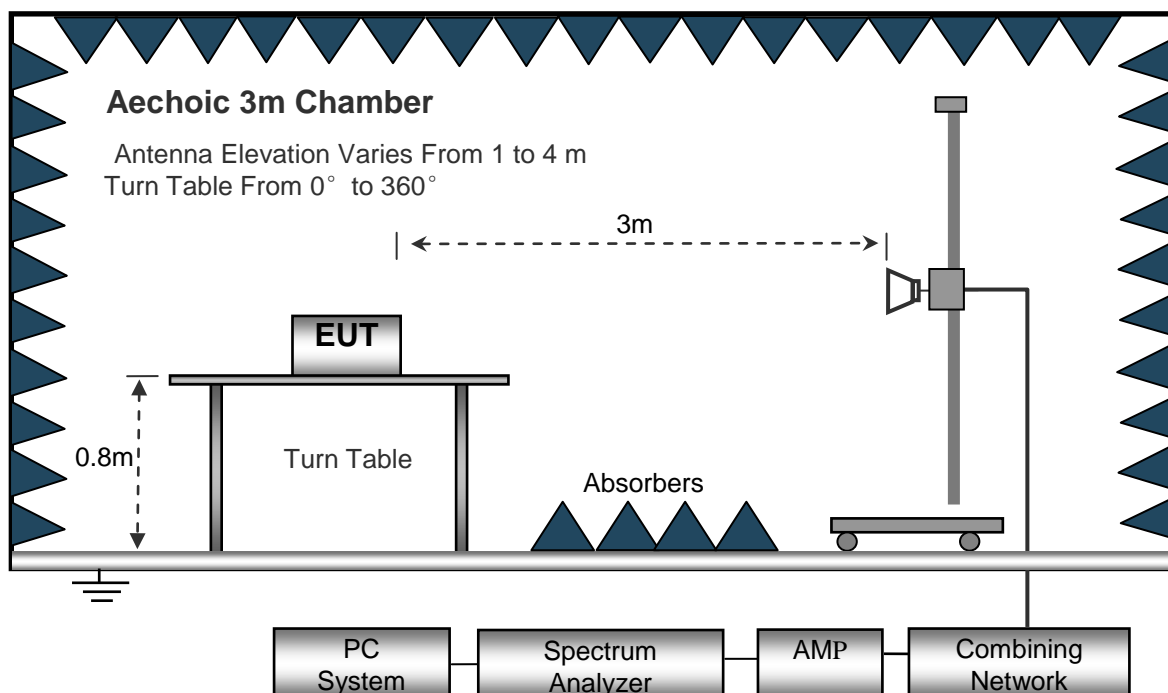
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



Spectrum Analyzer Setup

Below 30MHz

Sweep SpeedAuto
 IF Bandwidth.....10kHz
 Video Bandwidth.....10kHz
 Resolution Bandwidth.....10kHz

30MHz ~ 1GHz

Sweep SpeedAuto
 DetectorPK
 Resolution Bandwidth.....100kHz
 Video Bandwidth.....300kHz

Above 1GHz

Sweep SpeedAuto
 DetectorPK
 Resolution Bandwidth.....1MHz
 Video Bandwidth.....3MHz
 DetectorAve.
 Resolution Bandwidth.....1MHz
 Video Bandwidth.....10Hz

Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

Summary of Test Results

AV = Peak +20Log10(duty cycle) =PK+XX [refer to section 8 for more detail]

Test Frequency :Below 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 18GHz

Test Mode: Low channel (2412 MHz) Transmitting

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.249/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel									
220.36	14.02	PK	221	1.2	H	17.25	31.27	46.00	-14.73
220.36	13.12	PK	205	1.5	V	17.25	27.33	46.00	-18.67
2412.00	97.57	PK	360	1.6	H	-13.02	84.55	114.00	-29.45
2412.00	92.53	Ave	81	1.8	H	-13.02	79.51	94.00	-14.49
2412.00	94.56	PK	347	1.1	V	-13.02	81.54	114.00	-32.46
2412.00	85.98	Ave	81	1.2	V	-13.02	72.96	94.00	-21.04
4824.00	56.32	PK	271	1.2	H	-1.06	55.26	74.00	-18.74
4824.00	44.56	Ave	271	1.2	H	-1.06	43.50	54.00	-10.50
7236.00	45.62	PK	66	1.1	H	1.33	46.95	74.00	-27.05
7236.00	37.85	Ave	66	1.1	H	1.33	39.18	54.00	-14.82
2313.57	45.96	PK	176	2.0	V	-13.19	32.77	74.00	-41.23
2313.57	38.08	Ave	176	2.0	V	-13.19	24.89	54.00	-29.11
2387.226	44.92	PK	103	1.6	H	-13.14	31.78	74.00	-42.22
2387.26	36.41	Ave	103	1.6	H	-13.14	23.27	54.00	-30.73
2486.95	42.66	PK	197	1.7	V	-13.08	29.58	74.00	-44.42
2486.95	38.17	Ave	197	1.7	V	-13.08	25.09	54.00	-28.91

Test Mode: Middle channel (2444 MHz) Transmitting

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.249/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel									
220.36	14.59	PK	219	1.7	H	17.25	31.84	46.00	-14.16
220.36	13.96	PK	223	1.2	V	17.25	31.21	46.00	-14.79
2444.00	98.71	PK	141	1.2	H	-13.05	85.66	114.00	-28.34
2444.00	93.24	Ave	341	1.5	H	-13.05	80.19	94.00	-13.81
2444.00	94.03	PK	354	1.2	V	-13.05	80.98	114.00	-33.02
2444.00	85.06	Ave	92	1.2	V	-13.05	72.01	94.00	-21.99
4888.00	57.06	PK	323	1.3	H	-0.62	56.44	74.00	-17.56
4888.00	45.32	Ave	323	1.3	H	-0.62	44.70	54.00	-9.30
7332.00	44.96	PK	195	1.5	H	2.21	47.17	74.00	-26.83
7332.00	38.05	Ave	195	1.5	H	2.21	40.26	54.00	-13.74
2322.94	46.43	PK	215	1.9	V	-13.19	33.24	74.00	-40.76
2322.94	38.88	Ave	215	1.9	V	-13.19	25.69	54.00	-28.31
2380.45	43.82	PK	262	1.3	H	-13.14	30.68	74.00	-43.32
2380.45	37.17	Ave	262	1.3	H	-13.14	24.03	54.00	-29.97
2499.36	43.75	PK	155	1.4	V	-13.08	30.67	74.00	-43.33
2499.36	38.64	Ave	155	1.4	V	-13.08	25.56	54.00	-28.44

Test Mode: High channel (2476 MHz) Transmitting

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.249/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel									
220.36	13.59	PK	10	1.1	H	17.25	30.84	46.00	-15.16
220.36	12.98	PK	22	1.5	V	17.25	30.23	46.00	-15.77
2476.00	98.16	PK	171	1.0	H	-13.06	85.10	114.00	-28.90
2476.00	93.33	Ave	32	1.4	H	-13.06	80.27	94.00	-13.73
2476.00	96.23	PK	349	1.1	V	-13.06	83.17	114.00	-30.83
2476.00	87.25	Ave	82	1.2	V	-13.06	74.19	94.00	-19.81
4952.00	56.81	PK	17	1.1	H	-0.24	56.57	74.00	-17.43
4952.00	45.72	Ave	17	1.1	H	-0.24	45.48	54.00	-8.52
7428.00	45.84	PK	189	1.1	H	2.84	48.68	74.00	-25.32
7428.00	37.82	Ave	189	1.1	H	2.84	40.66	54.00	-13.34
2312.19	46.57	PK	306	1.7	V	-13.19	33.38	74.00	-40.62
2312.19	37.29	Ave	306	1.7	V	-13.19	24.10	54.00	-29.90
2362.35	44.81	PK	77	1.8	H	-13.14	31.67	74.00	-42.33
2362.35	36.88	Ave	77	1.8	H	-13.14	23.74	54.00	-30.26
2489.85	44.18	PK	259	1.2	V	-13.08	31.10	74.00	-42.90
2489.85	38.73	Ave	259	1.2	V	-13.08	25.65	54.00	-28.35

Test Frequency :From 18GHz to 25GHz

The measurements were more than 20 dB below the limit and not reported.

Outside of Band Emission

Test Requirement: 15.249(d):Emissions radiated outside of the specified frequency bands, except for harmonics, shall beattenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test Method: ANSI C63.4:2003

Test Mode: Transmitting

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. 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.
3. 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.
4. 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.

5. Repeat above procedures until all measured frequencies were complete.

Test Result

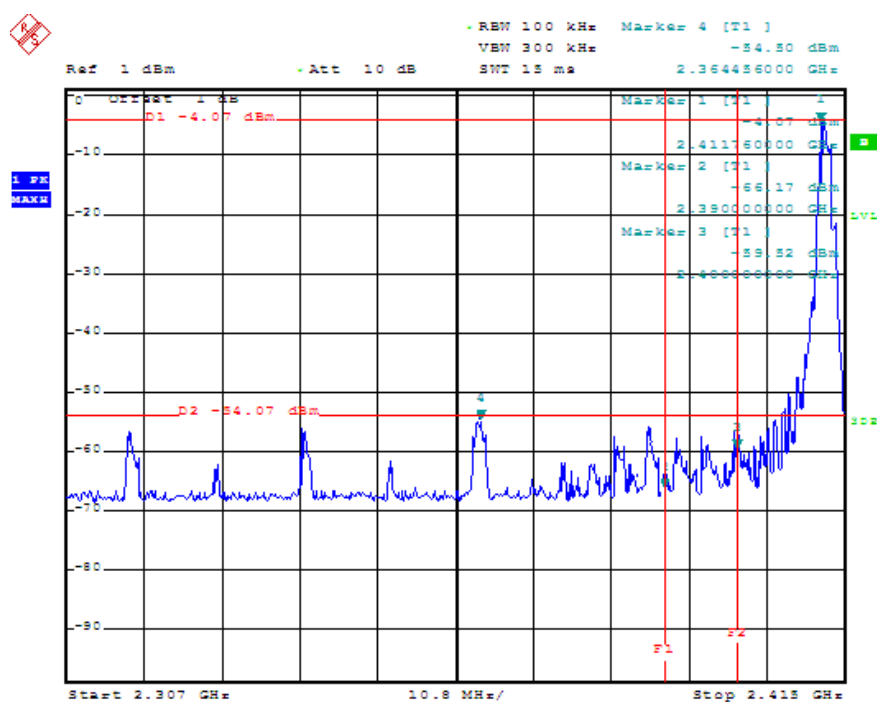
Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.249/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
2400.00	57.84	PK	184	1.1	V	-13.19	44.65	74.00	-29.35
2400.00	48.02	Ave	184	1.1	V	-13.19	34.83	54.00	-19.17
2400.00	56.26	PK	203	1.1	H	-13.14	43.12	74.00	-30.88
2400.00	47.05	Ave	203	1.1	H	-13.14	33.91	54.00	-20.09
2483.50	60.28	PK	138	1.1	V	-13.19	47.09	74.00	-26.91
2483.50	50.16	Ave	138	1.1	V	-13.19	36.97	54.00	-17.03
2483.50	58.16	PK	296	1.5	H	-13.14	45.02	74.00	-28.98
2483.50	48.26	Ave	296	1.5	H	-13.14	35.12	54.00	-18.88

Frequency (MHz)	Delta Peak to Band Emission (dBc)
2400	50 (note)
2483.5	50 (note)

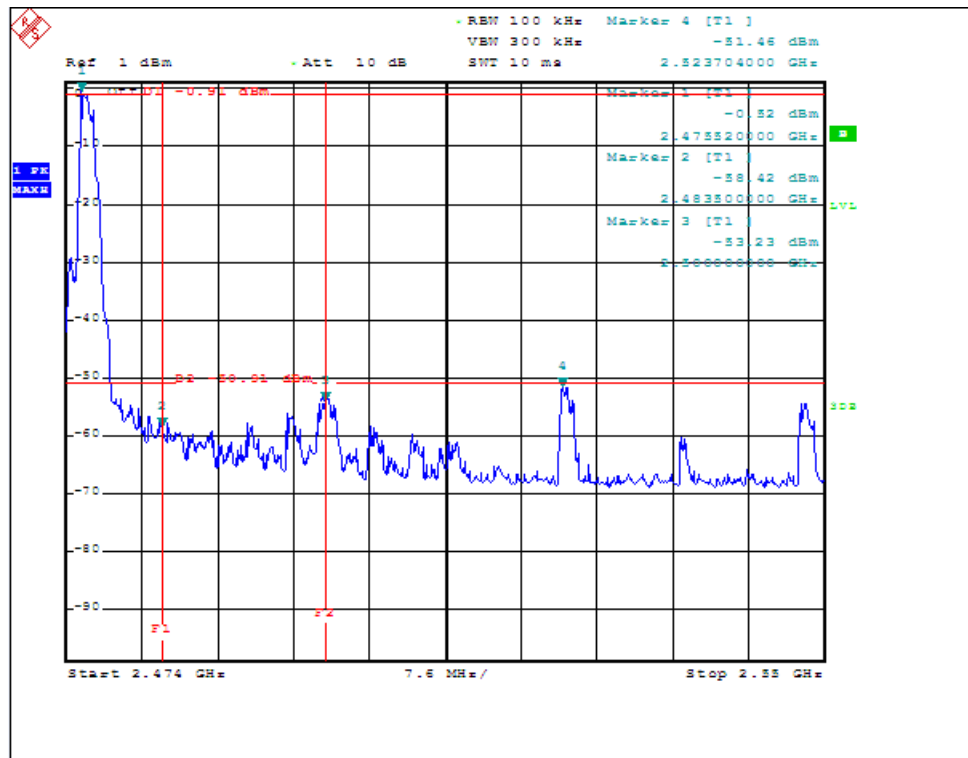
Note: The delta peak to band emission compliance with 15.209 in the radiation test.

Test plots

Left band



Right band



20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215(c)

Test Method: ANSI C63.4:2003

Test Mode: Transmitting

Test Procedure

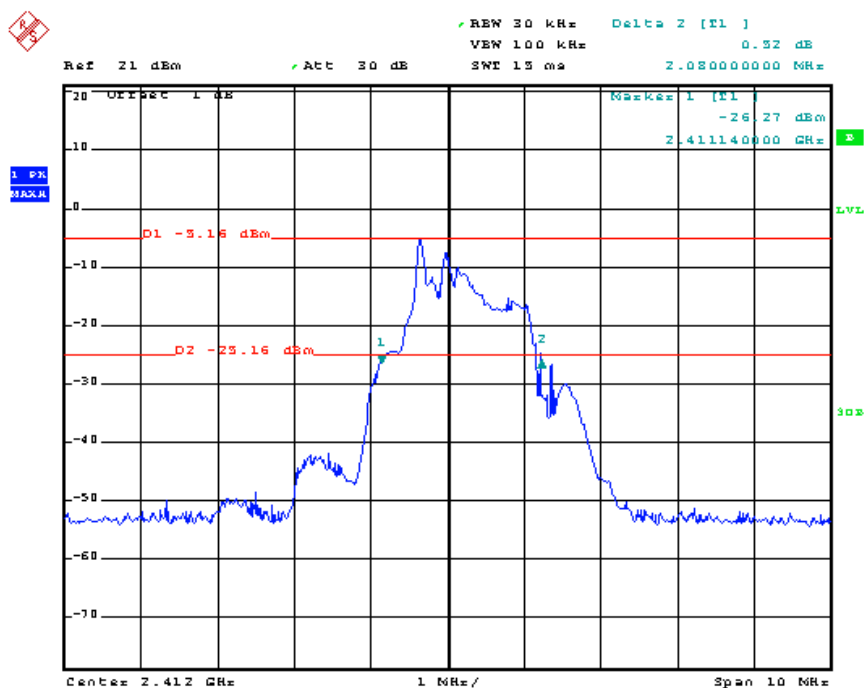
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

Test Result

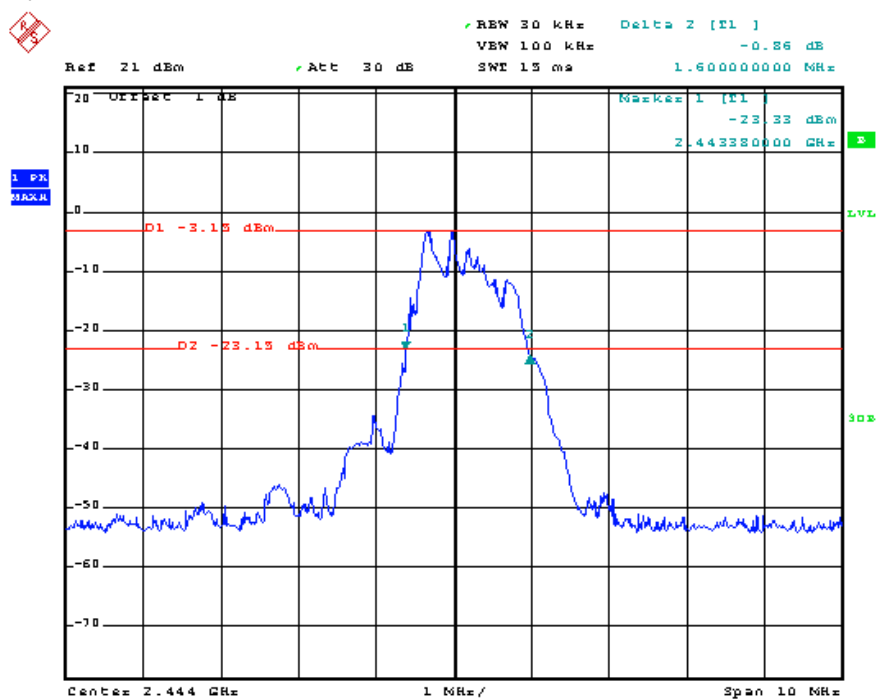
Test Channel	20 dB Bandwidth (MHz)
low	2.08MHz
Middle	1.60 MHz
high	1.68 MHz

Test plots

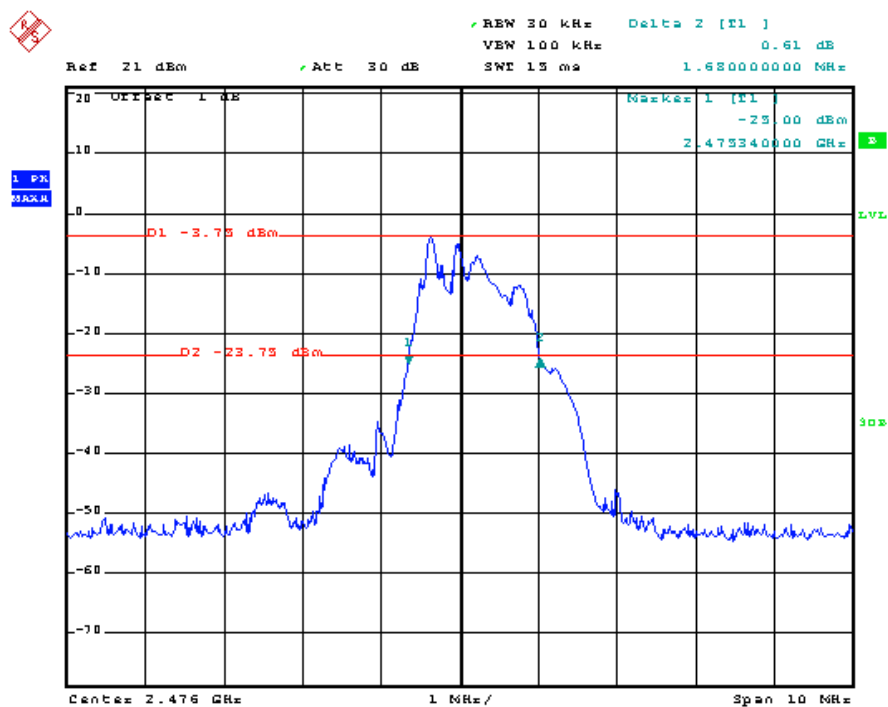
Low Channel



Middle Channel



High Channel



Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a PCB printed antenna, fulfill the requirement of this section.

===== End of Test Report =====