TEST REPORT

Reference No......	:	WTS15S0222945E
FCC ID	:	NDZARH343
Applicant.....	:	Precision Enterprise Ltd
Address.....	:	Unit 2504, 25/F, Nanyang Plaza, No. 57, Hung To Road, Kwun Tong, Kowloon, Hong Kong
Manufacturer	:	DONGGUAN PROTRONIC ELECTRONICS LTD.
Address.....	:	Protronic Building, Xiangxi Village, Shipai Town, Dongguan City, Guangdong Province, P.R. China
Product Name.....	:	Wireless Rear View Backup System
Model No.	:	APH043 Rx, ADS043 Rx, ARH343, PKC0BU4 Rx
Standards.....	:	FCC CFR47 Part 15 Section 15.247:2014
Date of Receipt sample	:	Feb.06, 2015
Date of Test	:	Feb.08, 2015~Mar.03, 2015
Date of Issue.....	:	Mar.06, 2015
Test Result.....	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
Conduct Emission	15.207	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

3 Contents

Page

1 COVER PAGE 1

2 TEST SUMMARY 2

3 CONTENTS 3

4 GENERAL INFORMATION 5

4.1 GENERAL DESCRIPTION OF E.U.T. 5
4.2 DETAILS OF E.U.T. 5
4.3 CHANNEL LIST 5
4.4 TEST FACILITY 5
4.5 TEST LOCATION 5

5 EQUIPMENT USED DURING TEST 7

5.1 EQUIPMENTS LIST 7
5.2 MEASUREMENT UNCERTAINTY 8
5.3 TEST EQUIPMENT CALIBRATION 8

6 CONDUCTED EMISSION 9

7 RADIATED SPURIOUS EMISSIONS 10

7.1 EUT OPERATION 10
7.2 TEST SETUP 11
7.3 SPECTRUM ANALYZER SETUP 12
7.4 TEST PROCEDURE 13
7.5 SUMMARY OF TEST RESULTS 14

8 BAND EDGE MEASUREMENT 17

8.1 TEST PROCEDURE 17
8.2 TEST RESULT 18

9 20 DB BANDWIDTH MEASUREMENT 20

9.1 TEST PROCEDURE 20
9.2 TEST RESULT 20

10 MAXIMUM PEAK OUTPUT POWER 22

10.1 TEST PROCEDURE 22
10.2 TEST RESULT 22

11 HOPPING CHANNEL SEPARATION 25

11.1 TEST PROCEDURE 25
11.2 TEST RESULT 25

12 NUMBER OF HOPPING FREQUENCY 28

12.1 TEST PROCEDURE 28
12.2 TEST RESULT 28

13 DWELL TIME 29

13.1 TEST PROCEDURE 29
13.2 TEST RESULT 29

14 ANTENNA REQUIREMENT 31

15 RF EXPOSURE 32

15.1 REQUIREMENTS 32
15.2 THE PROCEDURES / LIMIT 32
15.3 MPE CALCULATION METHOD 33

16 PHOTOGRAPHS – MODEL APH043 RX TEST SETUP 34
16.1 PHOTOGRAPH – RADIATION SPURIOUS EMISSION TEST SETUP 34
17 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS 36
17.1 MODEL APH043 RX EXTERNAL VIEW 36
17.2 MODEL APH043 RX INTERNAL VIEW 39

4 General Information

4.1 General Description of E.U.T.

Product Name:	Wireless Rear View Backup System
Model No.:	APH043 Rx, ADS043 Rx, ARH343, PKC0BU4 Rx
Model Description:	They are different in keys and appearance, the same RF module has been used.
Operation Frequency:	2409.75MHz ~ 2472.75MHz, 19 channels in total
Type of Modulation:	GFSK
The lowest oscillator:	12MHz
Antenna installation:	internal permanent antenna
Antenna Gain:	0.5dBi

4.2 Details of E.U.T.

Technical Data: : DC 8-28V, 200mA

4.3 Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2409.750	2	2413.125	3	2416.500	4	2419.875
5	2423.250	6	2426.625	7	2430.000	8	2433.375
9	2436.750	10	2442.375	11	2445.750	12	2449.125
13	2452.500	14	2455.875	15	2459.250	16	2462.625
17	2466.000	18	2469.375	19	2472.750	20	/

4.4 Test Facility

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

- **IC – Registration No.: 7760A-1**

  Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A-1, July 12, 2012.

- **FCC Test Site 1#– Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

4.5 Test Location

All the tests were performed at:
Waltek Services (Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang

Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.15,2014	Sep.14,2015
2.	LISN	R&S	ENV216	101215	Sep.15,2014	Sep.14,2015
3.	Cable	Top	TYPE16(3.5M)	-	Sep.15,2014	Sep.14,2015
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.15,2014	Sep.14,2015
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.15,2014	Sep.14,2015
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.15,2014	Sep.14,2015
4.	Cable	LARGE	RF300	-	Sep.15,2014	Sep.14,2015
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2014	Sep.14,2015
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2014	Apr.18,2015
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2014	Sep.14,2015
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2014	Apr.18,2015
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2014	Apr.18,2015
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2014	Mar.16,2015
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.10,2014	Apr.09,2015
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Sep.15,2014	Sep.14,2015
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.15,2014	Sep.14,2015
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2014	Sep.14,2015
4	Cable	HUBER+SUHNER	CBL2	525178	Sep.15,2014	Sep.14,2015

RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2014	Sep.14,2015
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2014	Sep.14,2015

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 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.

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	N/A
Remark:	The device is powered by battery, it is not application for this test.

7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: DA 00-705

Test Result: PASS

Measurement Distance: 3m

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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

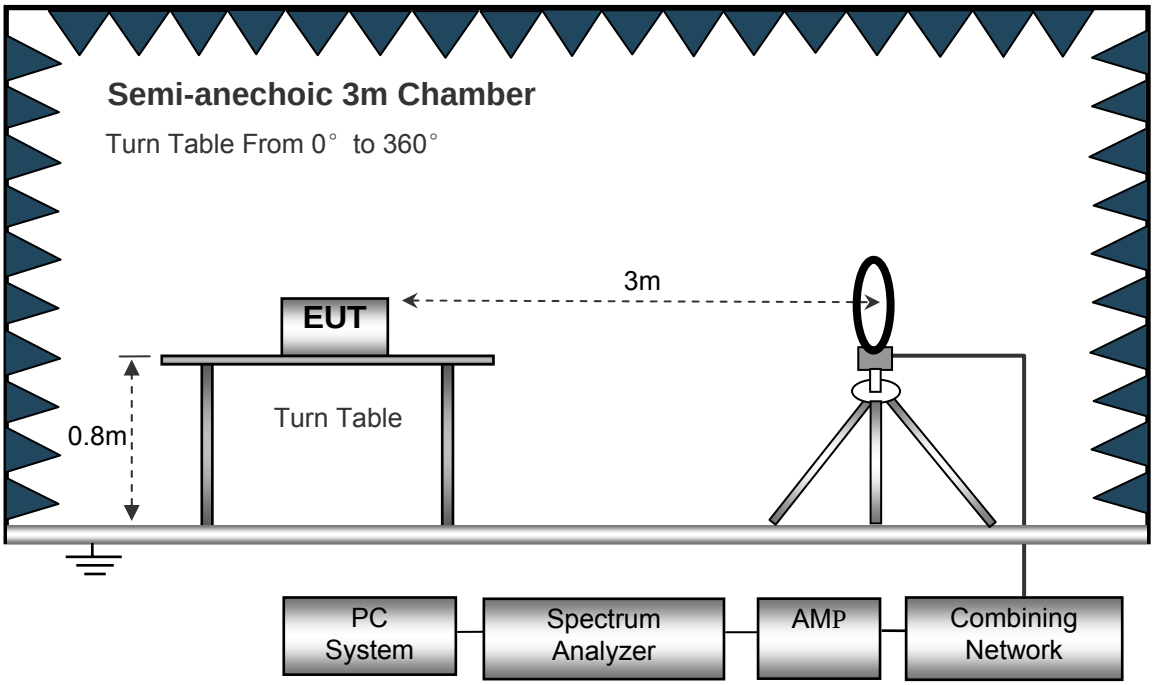
EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

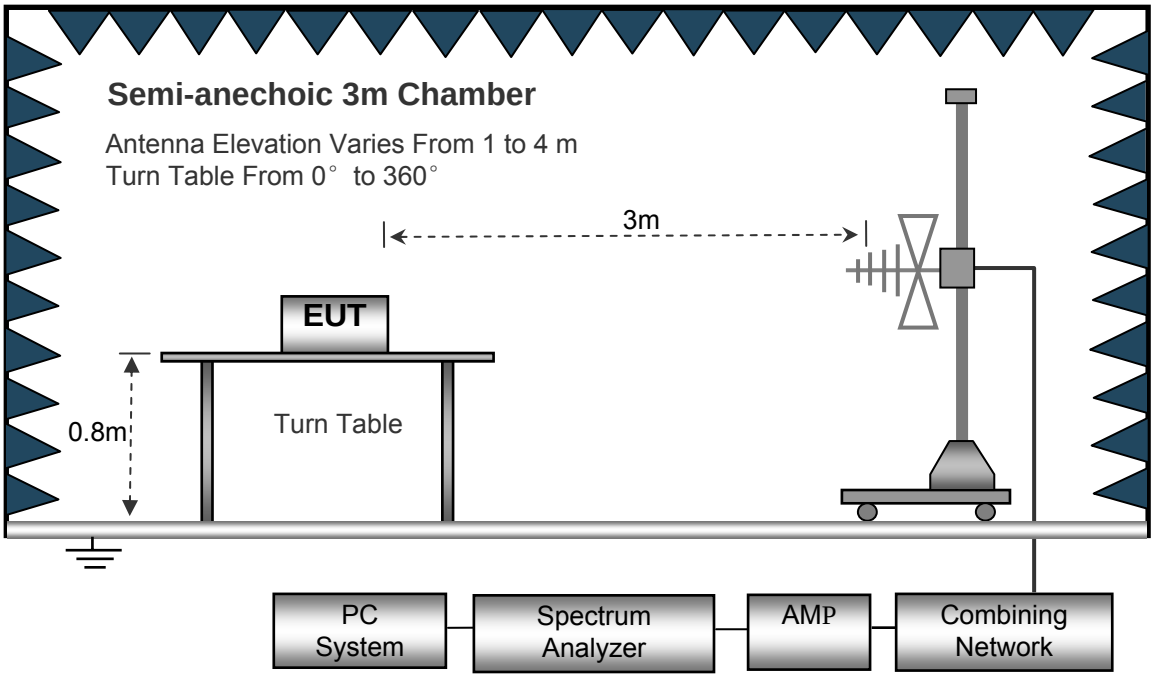
7.2 Test Setup

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

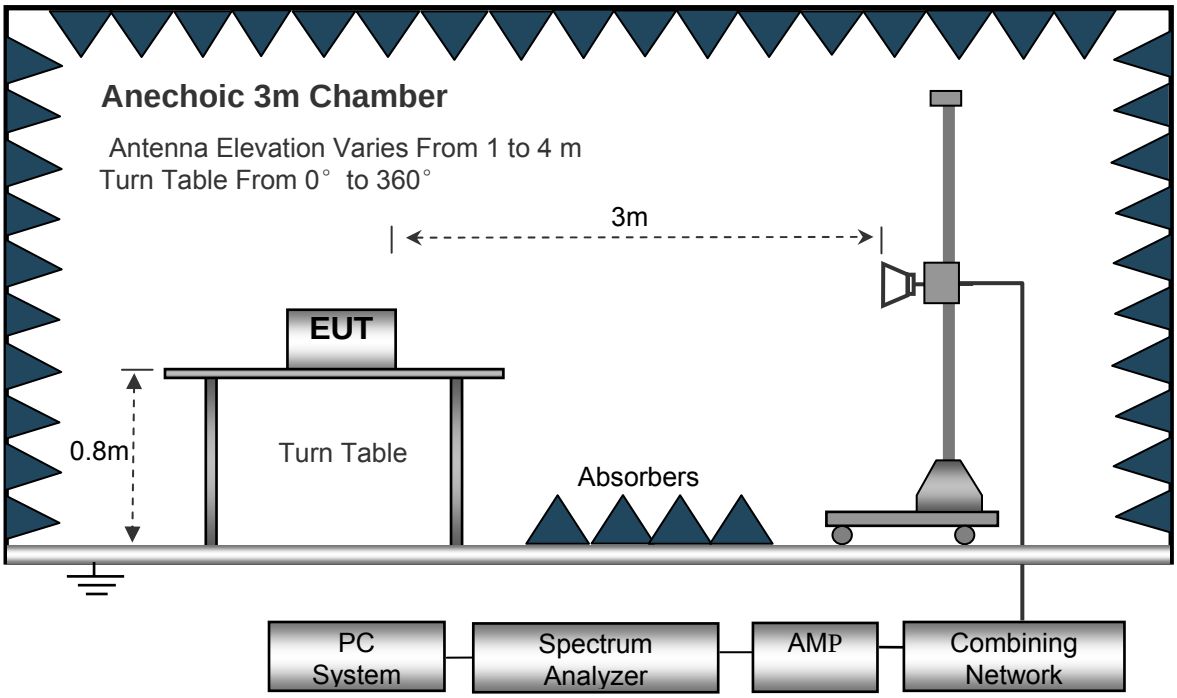
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz

Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

7.4 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. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
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.

7.5 Summary of Test Results

Test Frequency: Below 30MHz

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

Test Frequency: 30MHz ~ 18GHz

Test mode: transmitting mode

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel									
201.56	22.74	PK	148	1.0	H	11.13	33.87	43.50	-9.63
201.56	20.28	PK	120	1.7	V	11.13	31.41	43.50	-12.09
4819.5	53.40	PK	31	1.9	V	-1.06	52.34	74.00	-21.66
4819.5	47.81	Ave	31	1.9	V	-1.06	46.75	54.00	-7.25
7229.25	42.87	PK	151	1.5	H	1.33	44.20	74.00	-29.80
7229.25	40.71	Ave	151	1.5	H	1.33	42.04	54.00	-11.96
2344.32	46.67	PK	55	1.6	V	-13.19	33.48	74.00	-40.52
2344.32	39.72	Ave	55	1.6	V	-13.19	26.53	54.00	-27.47
2373.13	44.89	PK	109	1.8	H	-13.14	31.75	74.00	-42.25
2373.13	37.26	Ave	109	1.8	H	-13.14	24.12	54.00	-29.88
2484.81	42.85	PK	90	1.1	V	-13.08	29.77	74.00	-44.23
2484.81	37.71	Ave	90	1.1	V	-13.08	24.63	54.00	-29.37

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel									
201.56	24.04	PK	20	1.8	H	11.13	35.17	43.50	-8.33
201.56	23.74	PK	284	1.1	V	11.13	34.87	43.50	-8.63
4884.75	54.08	PK	232	1.5	V	-0.62	53.46	74.00	-20.54
4884.75	47.57	Ave	232	1.5	V	-0.62	46.95	54.00	-7.05
7327.13	44.89	PK	198	1.4	H	2.21	47.10	74.00	-26.90
7327.13	41.36	Ave	198	1.4	H	2.21	43.57	54.00	-10.43
2318.47	46.45	PK	203	1.9	V	-13.19	33.26	74.00	-40.74
2318.47	38.82	Ave	203	1.9	V	-13.19	25.63	54.00	-28.37
2359.14	42.77	PK	312	1.8	H	-13.14	29.63	74.00	-44.37
2359.14	37.13	Ave	312	1.8	H	-13.14	23.99	54.00	-30.01
2487.10	42.45	PK	215	1.7	V	-13.08	29.37	74.00	-44.63
2487.10	38.66	Ave	215	1.7	V	-13.08	25.58	54.00	-28.42

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel									
201.56	23.89	PK	274	1.3	H	11.13	35.02	43.50	-8.48
201.56	24.57	PK	343	1.5	V	11.13	35.70	43.50	-7.80
4945.50	54.76	PK	217	1.2	V	-0.24	54.52	74.00	-19.48
4945.50	46.03	Ave	217	1.2	V	-0.24	45.79	54.00	-8.21
7418.25	45.24	PK	30	1.3	H	2.84	48.08	74.00	-25.92
7418.25	38.70	Ave	30	1.3	H	2.84	41.54	54.00	-12.46
2318.09	46.85	PK	14	1.6	V	-13.19	33.66	74.00	-40.34
2318.09	37.10	Ave	14	1.6	V	-13.19	23.91	54.00	-30.09
2382.72	43.86	PK	103	1.6	H	-13.14	30.72	74.00	-43.28
2382.72	38.08	Ave	103	1.6	H	-13.14	24.94	54.00	-29.06
2498.10	43.39	PK	48	1.6	V	-13.08	30.31	74.00	-43.69
2498.10	38.80	Ave	48	1.6	V	-13.08	25.72	54.00	-28.28

Test Frequency :Above 18GHz

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

8 Band Edge Measurement

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	DA 00-705
Test Limit:	Regulation 15.247 (d),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 Mode:	Transmitting and Hopping

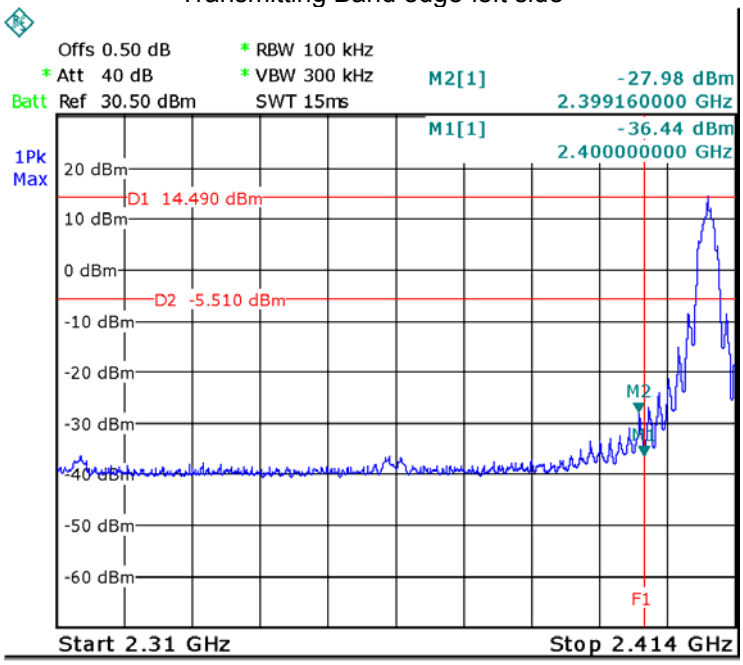
8.1 Test Procedure

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, Sweep = auto
   Detector function = peak, Trace = max hold

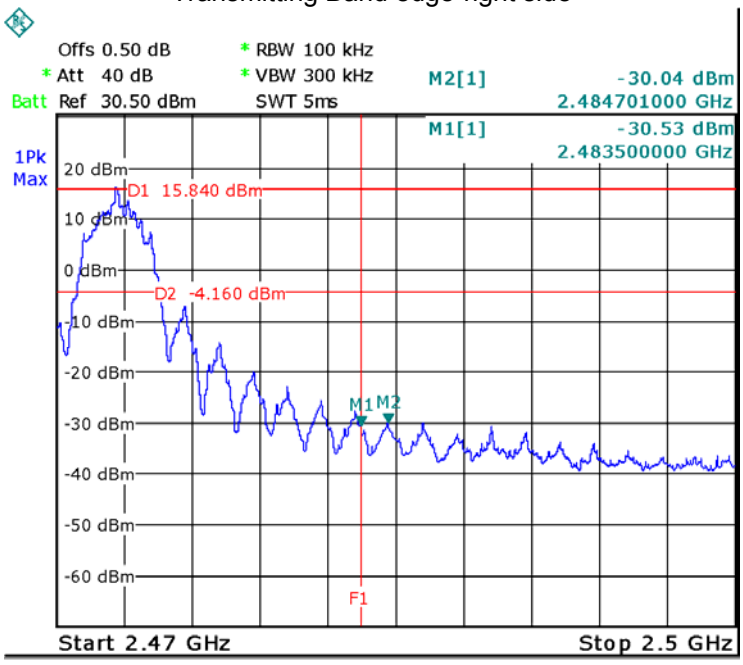
8.2 Test Result

Test plots

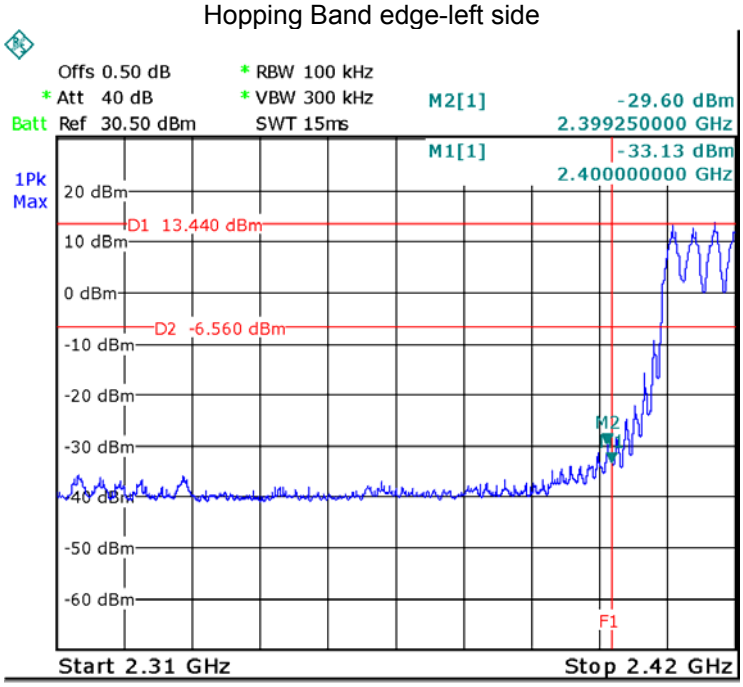
Transmitting Band edge-left side



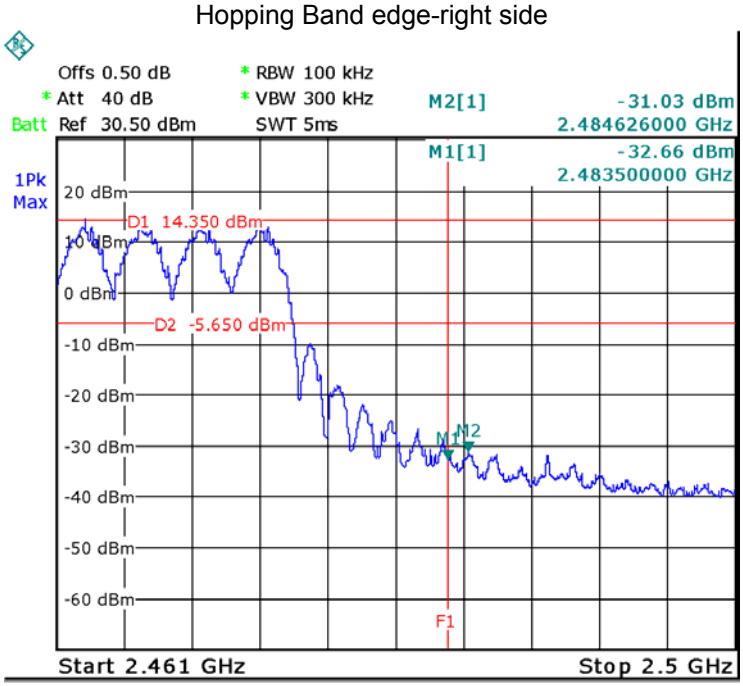
Transmitting Band edge-right side



Hopping Band edge-left side



Hopping Band edge-right side



9 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705

Test Mode: Test in fixing operating frequency at low, Middle, high channel.

9.1 Test Procedure

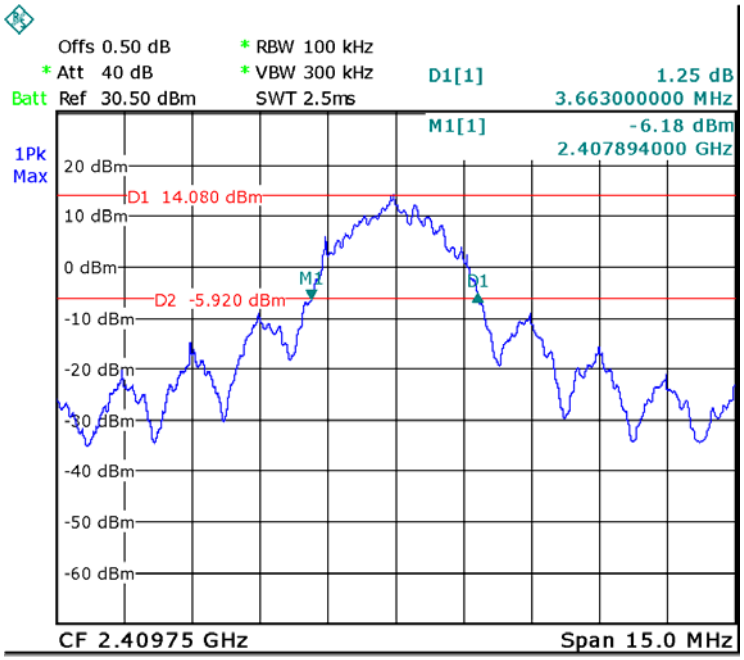
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

9.2 Test Result

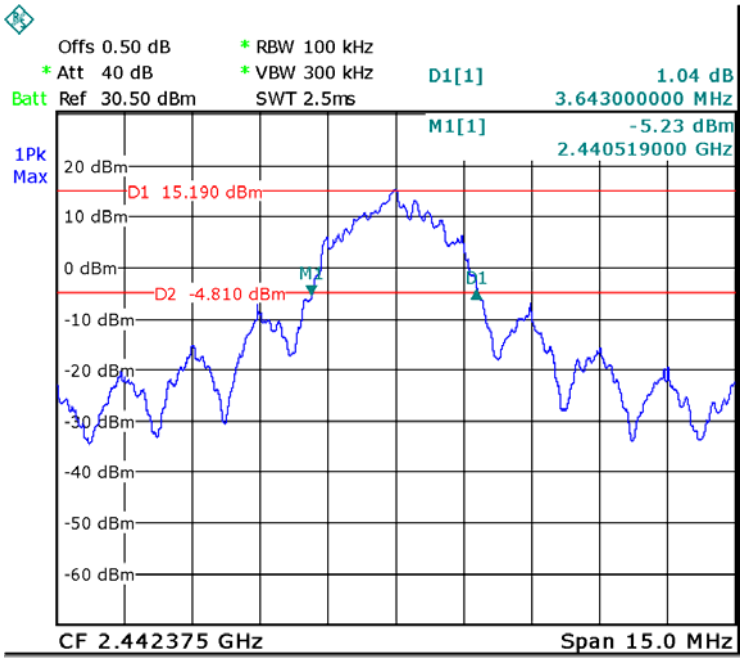
Test Channel	Bandwidth
Low	3.663MHz
Middle	3.643MHz
High	3.653MHz

Test plots

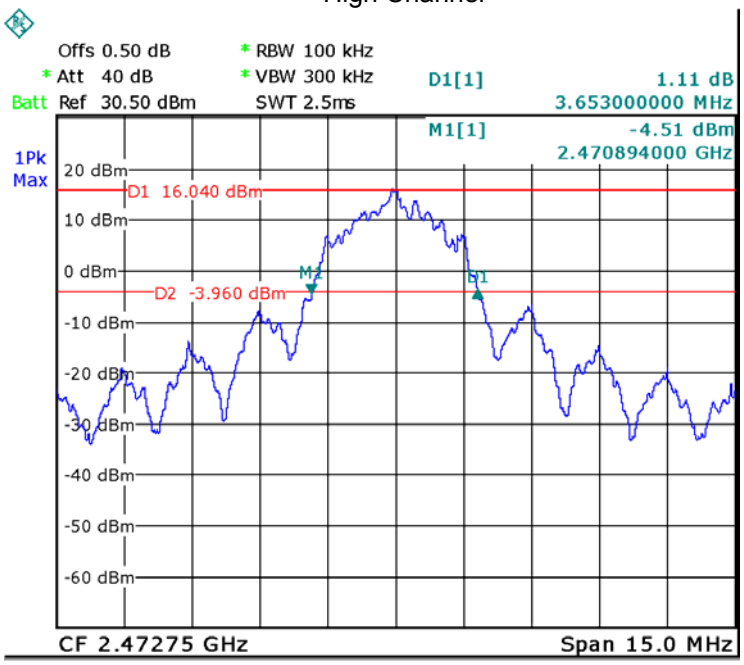
Low Channel



Middle Channel



High Channel



10 Maximum Peak Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	DA 00-705
Test Limit:	Regulation 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result “Number of Hopping Frequency” of this document. The 0.125watts (20.97 dBm) limit applies.
Test mode:	Test in fixing frequency transmitting mode.

10.1 Test Procedure

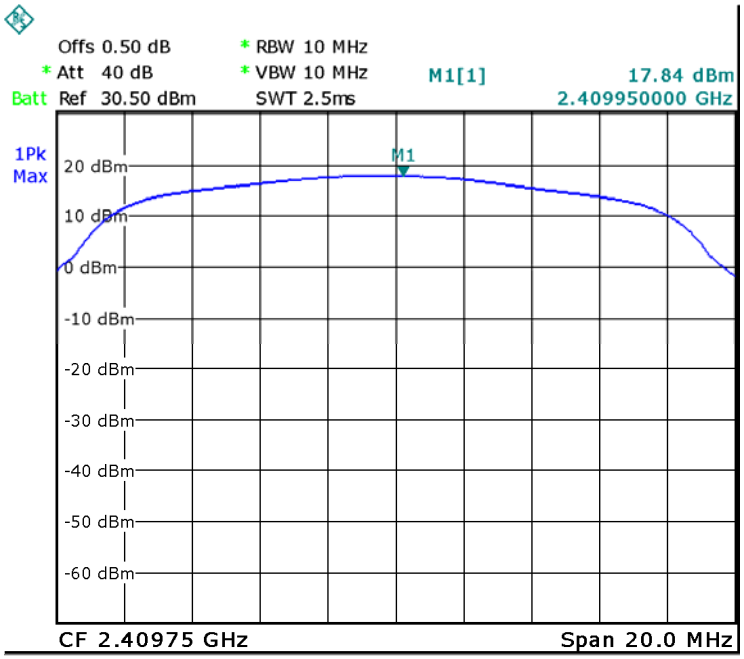
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 10MHz. VBW = 10MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

10.2 Test Result

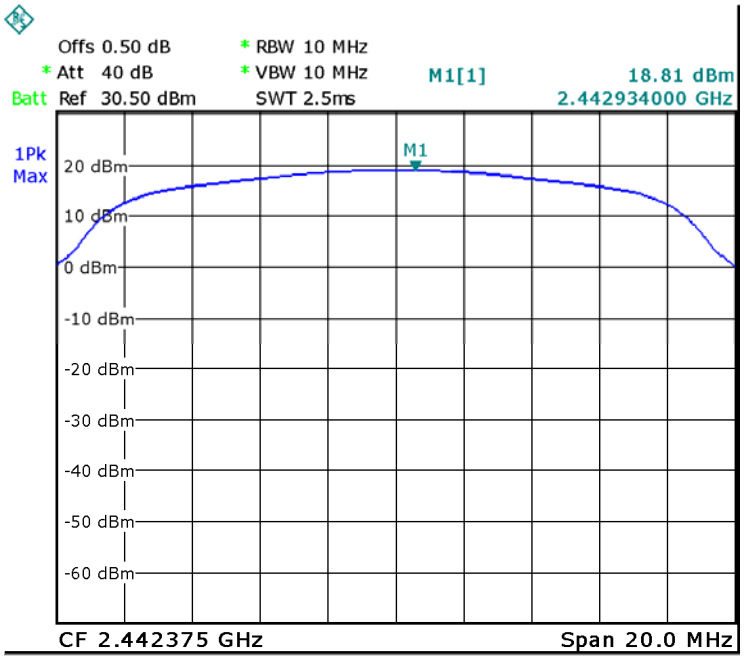
Test Channel	Output Power (dBm)	Limit (dBm)
Low	17.84	20.97
Middle	18.81	20.97
High	19.33	20.97

Test plots

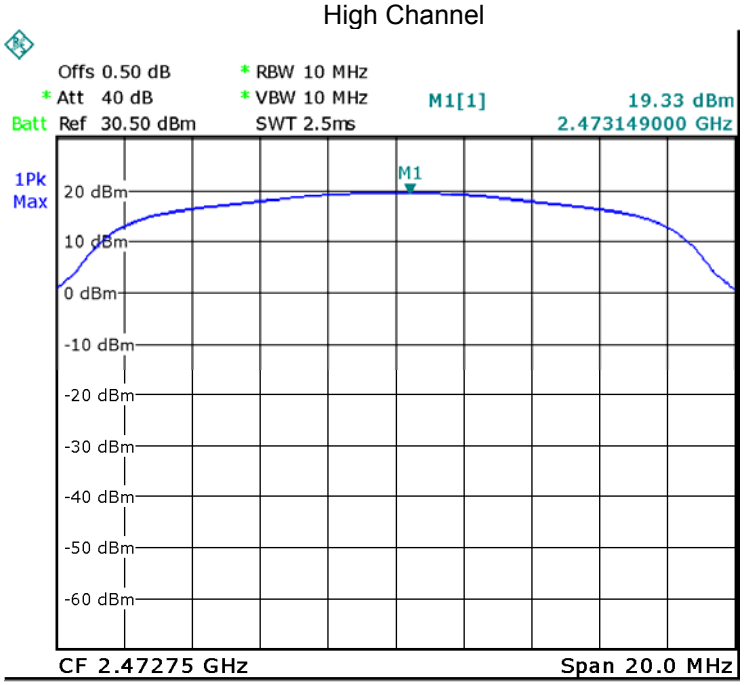
Low Channel



Middle Channel



High Channel



11 Hopping Channel Separation

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705

Test Limit: Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 1W.

Test Mode: Test in hopping transmitting operating mode.

11.1 Test Procedure

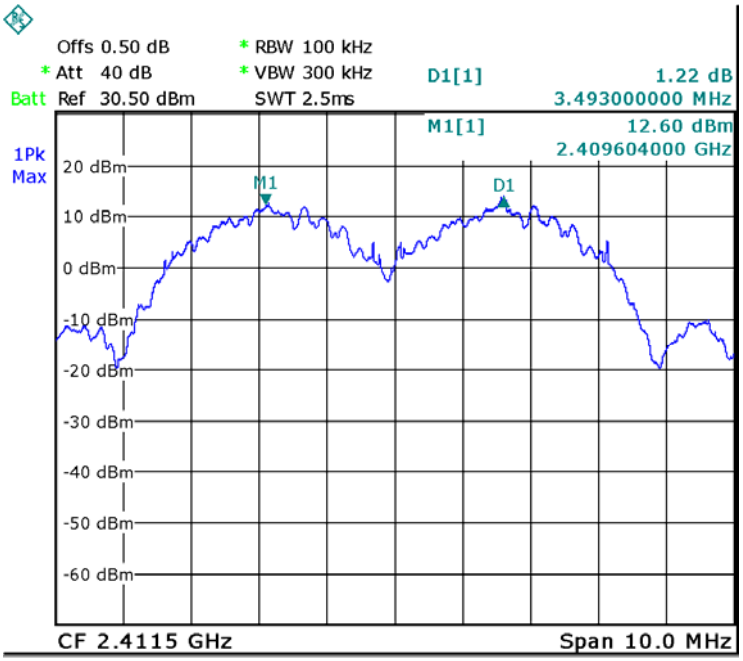
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz , Span = 6.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

11.2 Test Result

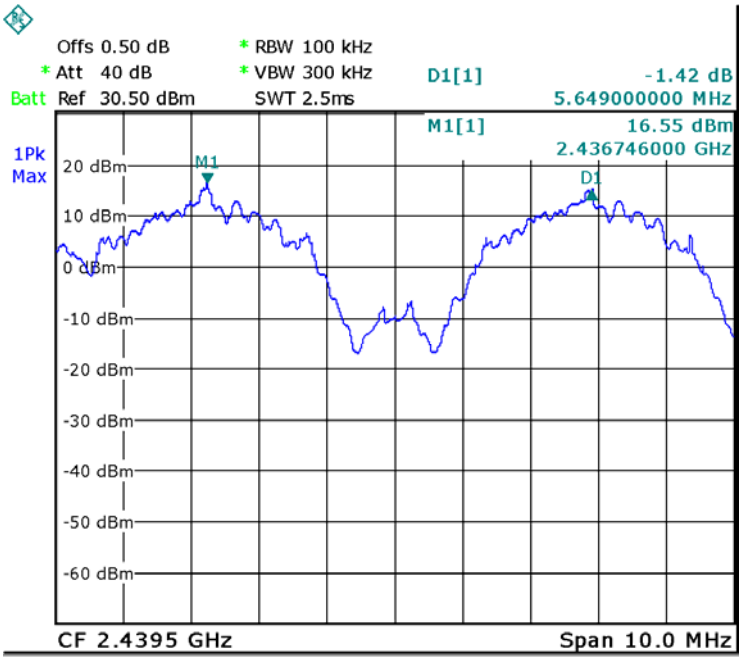
Test Channel	Separation (MHz)	Result
Low	3.493	PASS
Middle	5.649	PASS
High	3.333	PASS

Test plots

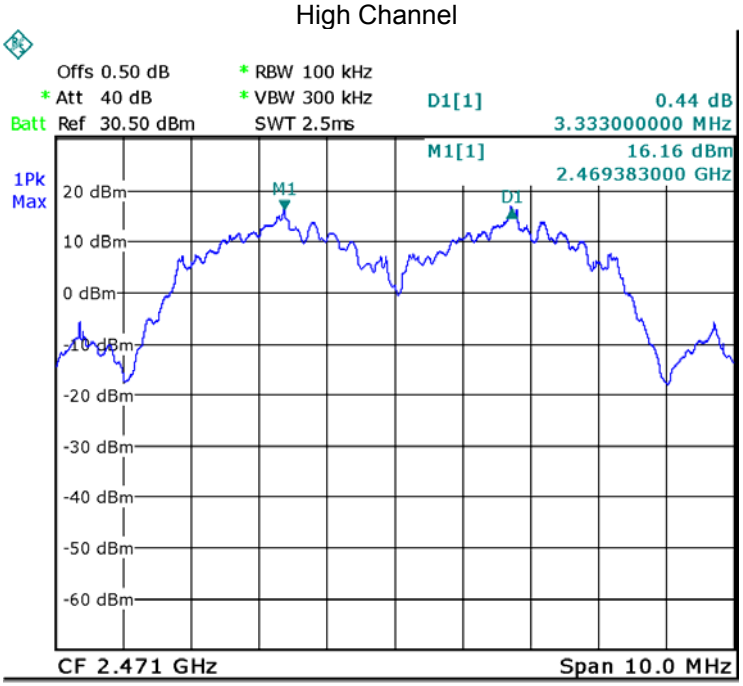
Low Channel



Middle Channel



High Channel



12 Number of Hopping Frequency

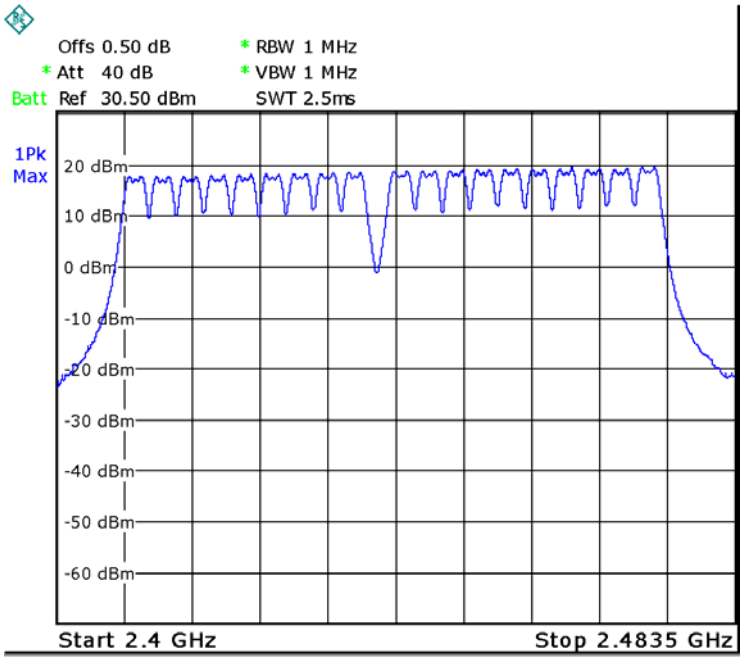
Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	DA 00-705
Test Limit:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode:	Test in hopping transmitting operating mode.

12.1 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 = 1MHz. VBW = 1MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.483.5GHz. Sweep=auto;

12.2 Test Result

Test Plot: 19 Channels in total



13 Dwell Time

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705

Test Limit: Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Mode: Test in hopping transmitting operating mode.

13.1 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 spectrum analyzer span = 0. Centred on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel.
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

13.2 Test Result

The test period: T= 0.4(s) * 19 = 7.6 (s)

So, the Dwell Time can be calculated as follows:

Low channel: Dwell Time =2(times)/21.60(ms)*112(μs)*7.6(s)=0.079(s)

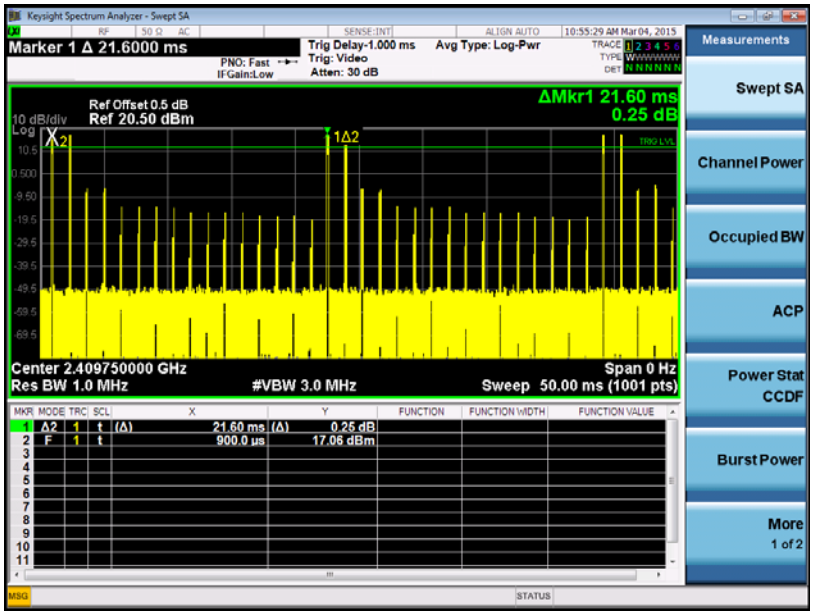
Middle Channel: Dwell Time =2(times)/21.60(ms)*110(μs)*7.6(s)=0.077(s)

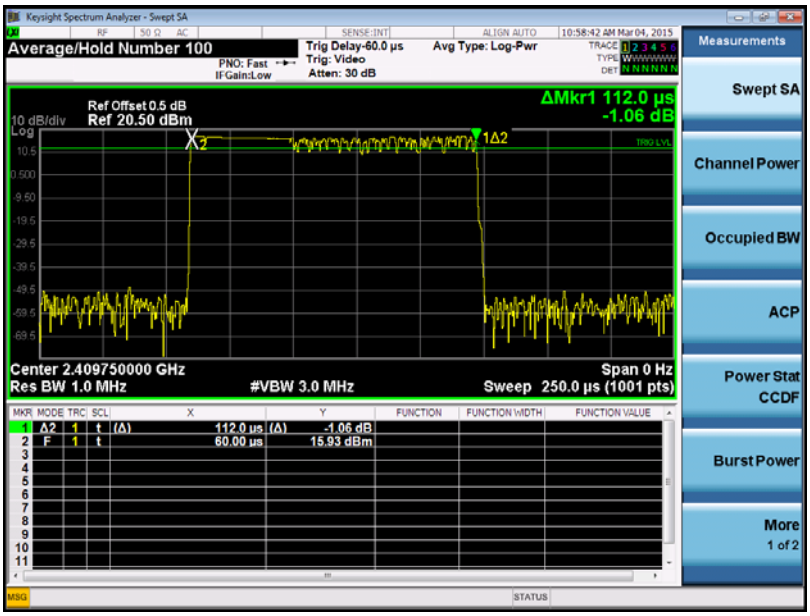
High Channel: Dwell Time =2(times)/21.60(ms)*110(μs)*7.6(s)=0.077(s)

Frequency	Mkr Delta(μs)	Dwell Time(s)	Limits(s)	Result
2409.75MHz	112	0.079	0.400	Pass
2442.375 MHz	110	0.077	0.400	Pass
2472.75MHz	110	0.077	0.400	Pass

Test Plots

Low Channel





Remark: The worst case was recorded.

14 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 an internal permanent antenna (The whorl is non-standard, it only apply to this model), fulfil the requirement of this section.

15 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091

15.1 Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

15.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

15.3 MPE Calculation Method

E (V/m) $= \frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) $= \frac{E^2}{377}$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$\boldsymbol{Pd} = \frac{30 \times P \times G}{377 \times d^2}$$

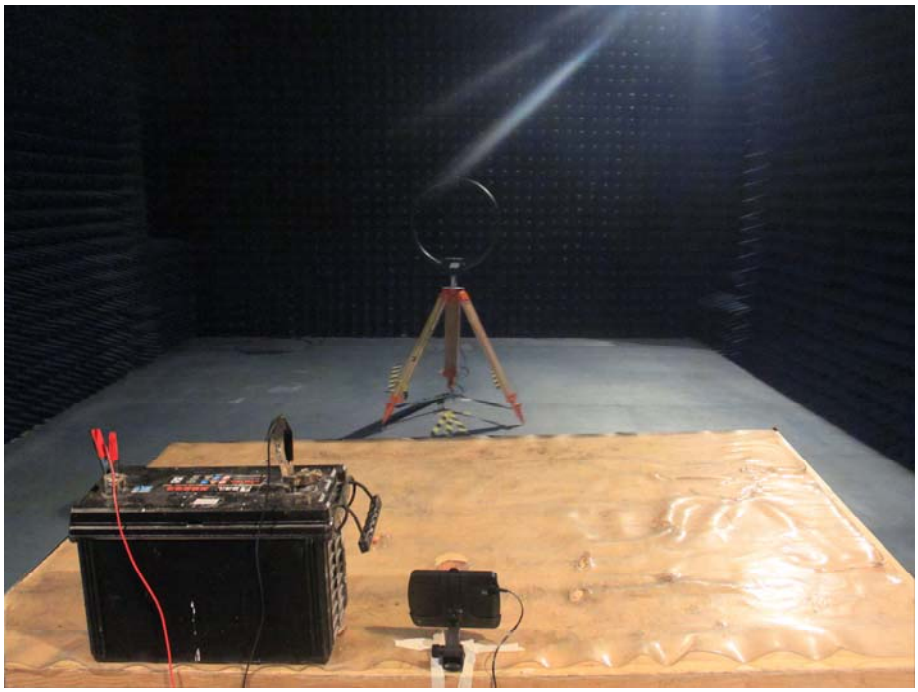
From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
1.12	19.33	85.70	0.019	1

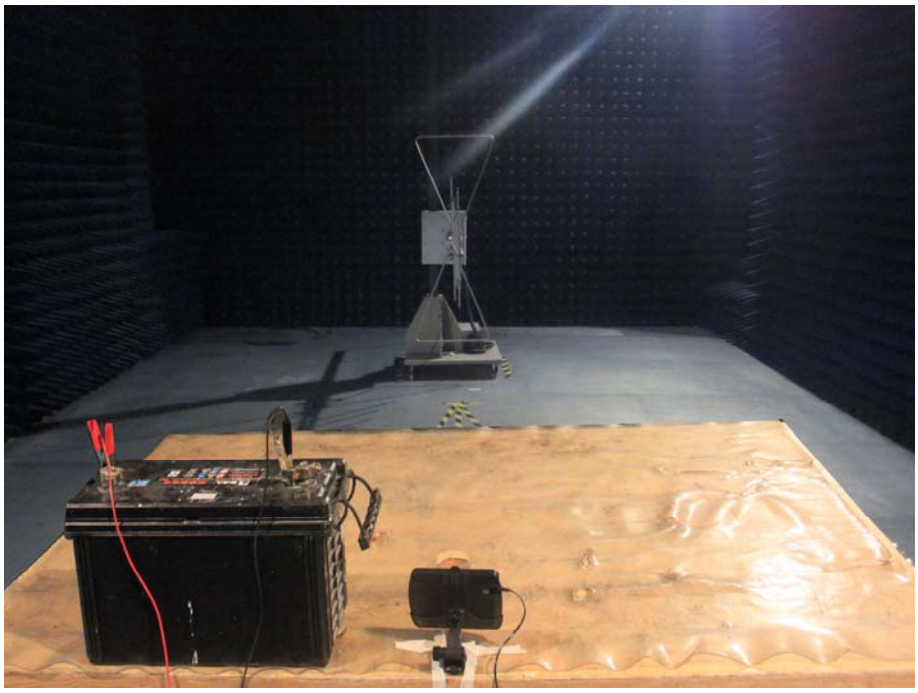
16 Photographs – Model APH043 Rx Test Setup

16.1 Photograph – Radiation Spurious Emission Test Setup

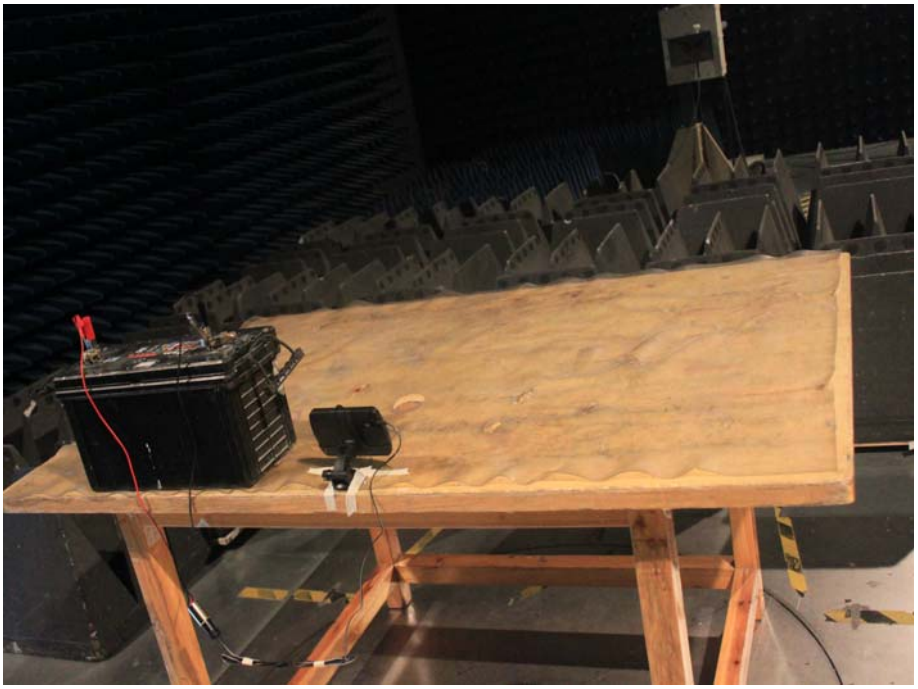
9kHz-30MHz at Test Site 1#



30MHz-1GHz at Test Site 1#



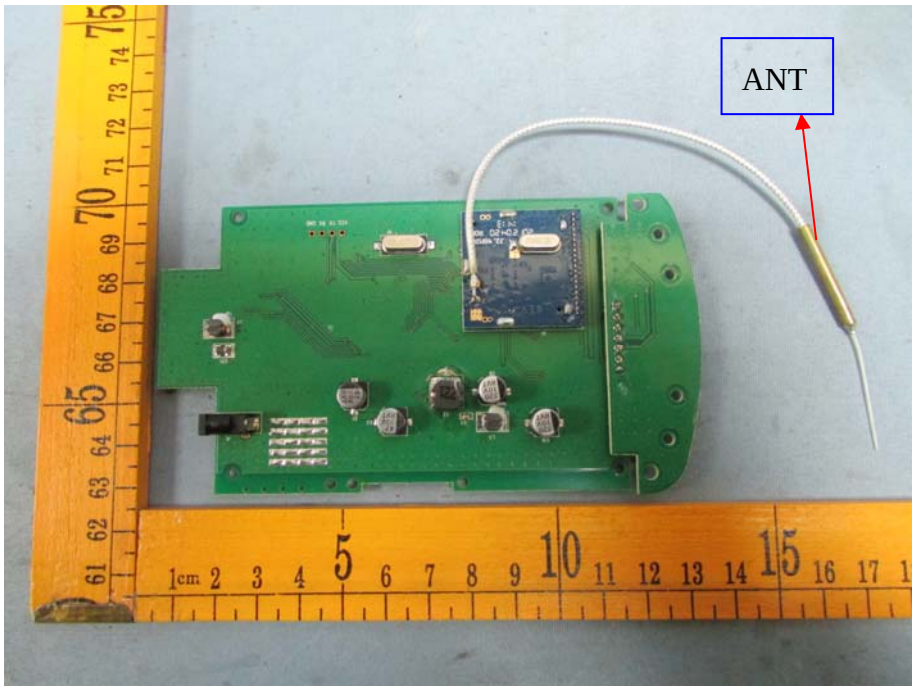
Above 1GHz at Test Site 1#

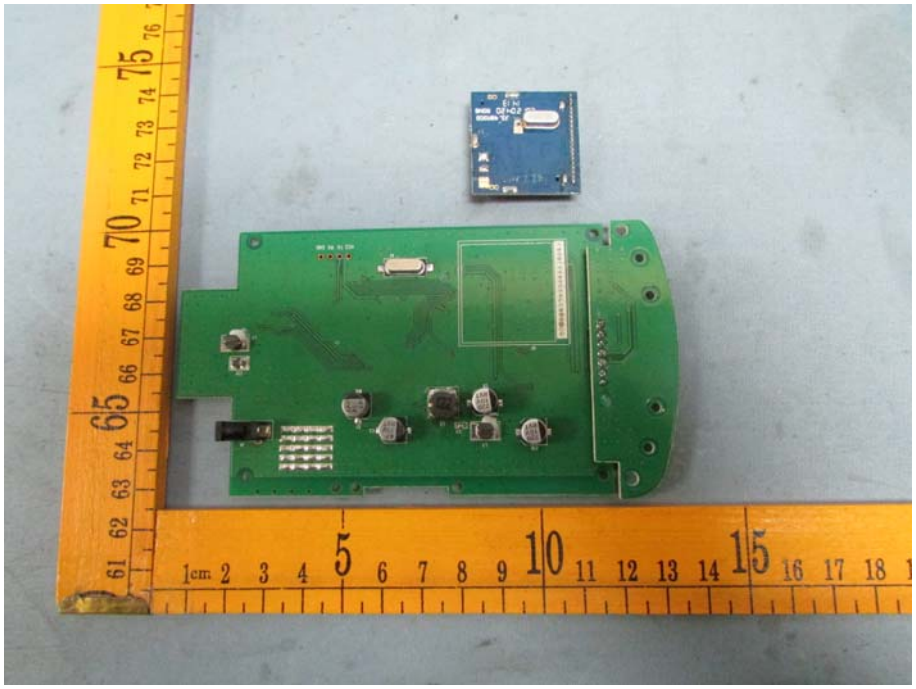


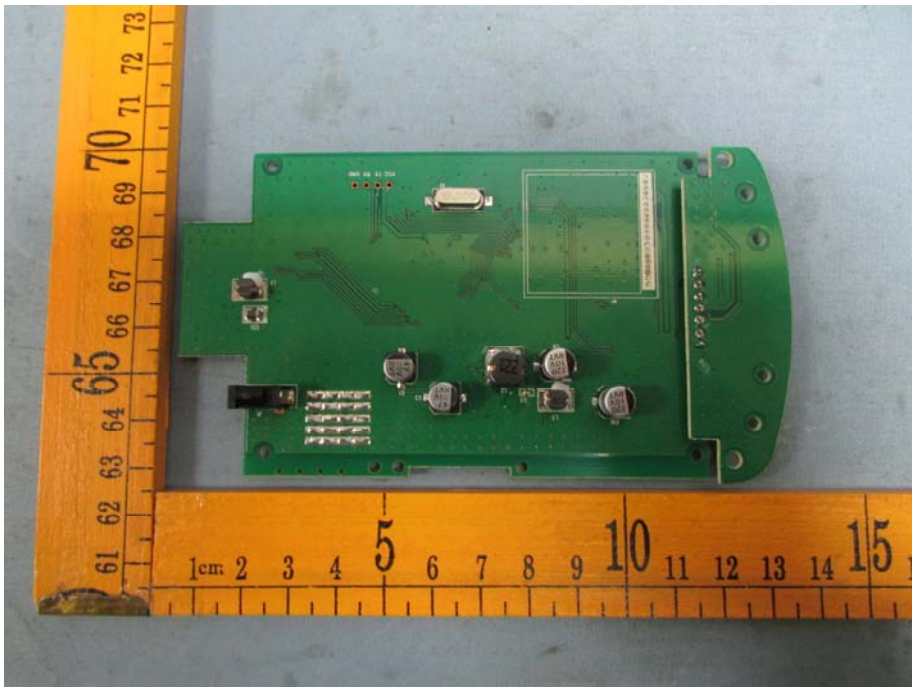
17 Photographs - Constructional Details

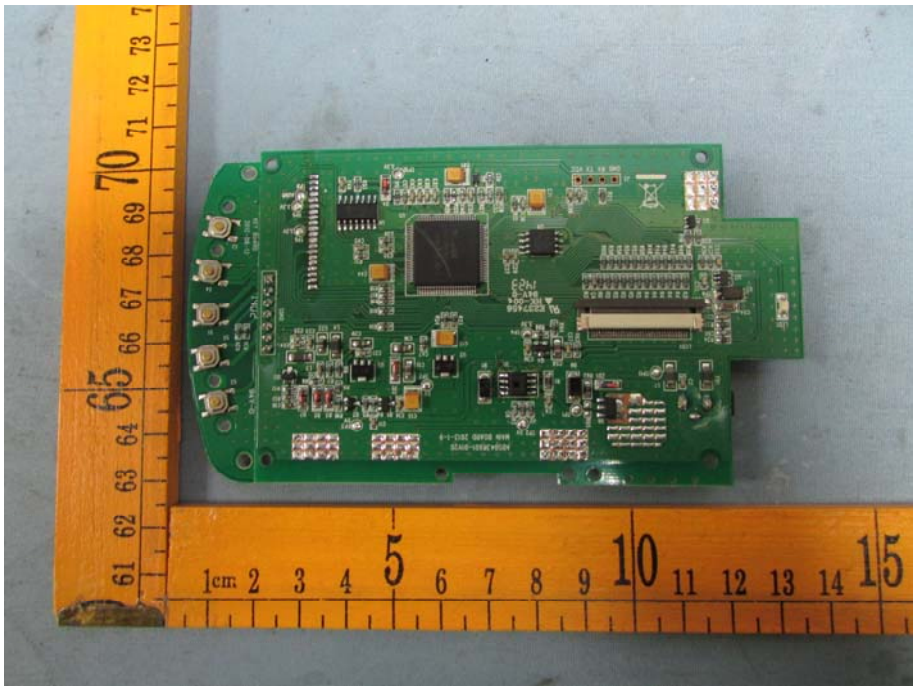
17.1 Model APH043 Rx External View

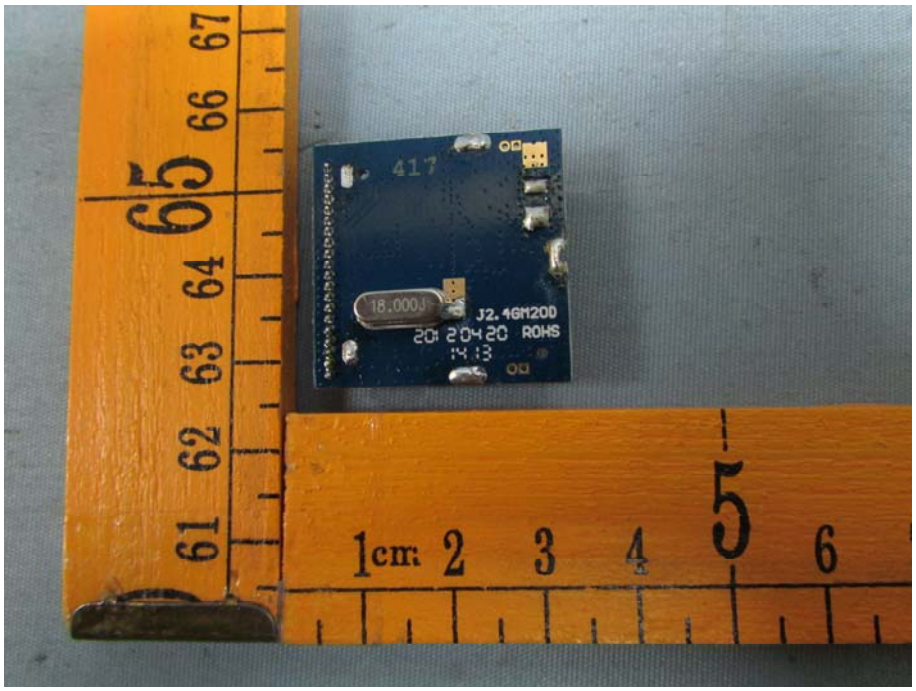
17.2 Model APH043 Rx Internal View

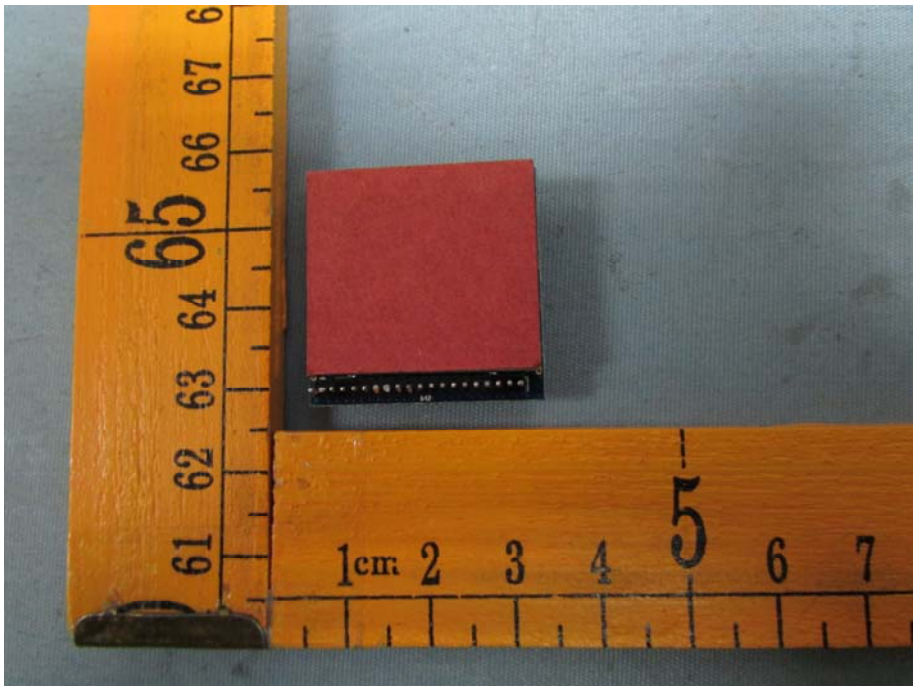

ANT

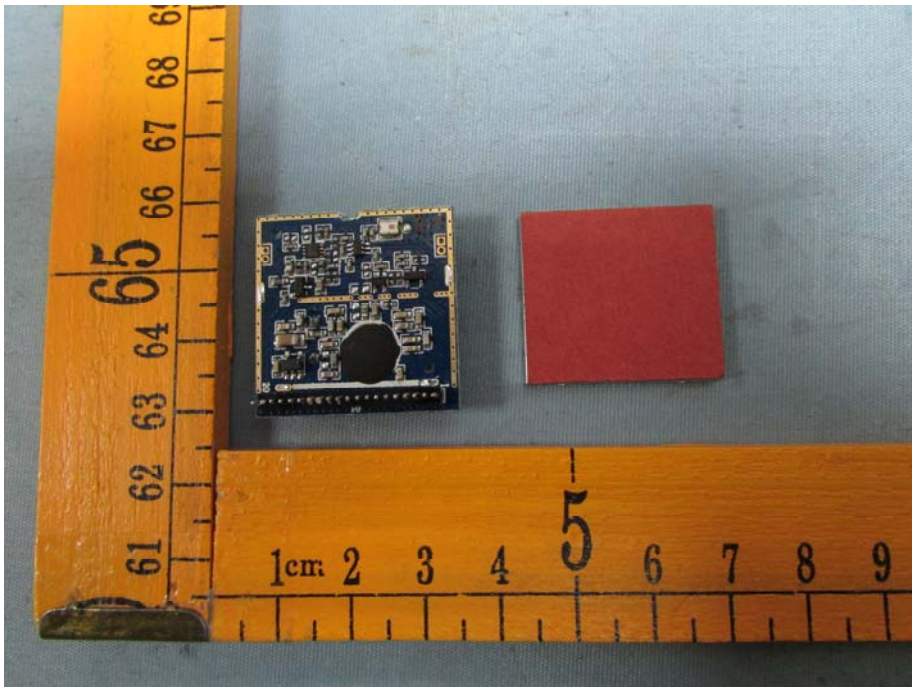


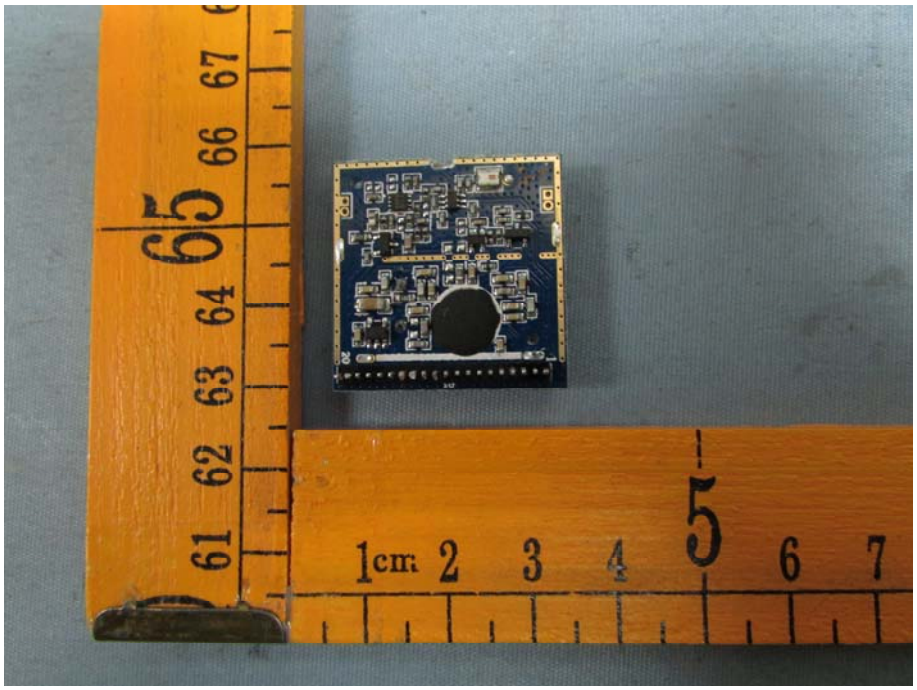





417
18.000J
J2.4GM20D
ROHS
1cm 2 3 4 5 6


1cm 2 3 4 5 6 7





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