

FCC TEST REPORT

For

Handheld Rugged Terminal

Model Number: HRT500i

FCC ID: SX3-HRT500I

Report Number : WT158002885

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
		National Digital Electronic Product Testing Center
Site Location	:	NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China
Tel	:	0086-755-86928965
Fax	:	0086-755-86009898-31396
Web	:	www.smq.com.cn
E-mail	:	emcrf@smq.com.cn

TEST REPORT DECLARATION

Applicant : PRADOTEC CORPORATION SDN.BHD. (807780-P)
Address : IRIS Smart Technology Complex, Technology Park Malaysia,
Bukit Jalil, Kuala Lumpur, Malaysia
Manufacturer : OPTIMA KLASIK SDN.BHD. (807783-T)
Address : IRIS Smart Technology Complex, Technology Park Malaysia,
Bukit Jalil, Kuala Lumpur, Malaysia
EUT Description : Handheld Rugged Terminal
Model No : HRT500i
Trade mark : 
Serial Number : /
FCC ID : SX3-HRT500I

Test Standards:

FCC Part 15 15.207, 15.209, 15.247(2014)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 15.207, 15.209 and 15.247.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	 (Chen Silin 陈司林)	Date:	<u>Jun.16.2015</u>
Checked by:	 (Lin Yixiang 林奕翔)	Date:	<u>Jun.16.2015</u>
Approved by:	 (Lin Bin 林斌)	Date:	<u>Jun.16.2015</u>

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
6dB DTS bandwidth measurement	15.247 (a) (2)	Pass
Maximum Peak Conducted Power	15.247 (b) (3)	Pass
Maximum Power Spectral Density Level	15.247 (3)	Pass
Conducted Bandedge and Spurious	15.247 (d)	Pass
Radiated Bandedge and Spurious	15.247 (d) 15.209 15.205	Pass
Conducted emission test for AC power port	15.207	Pass
Antenna Requirment	15.203	Pass

Remark: "N/A" means "Not applicable."

2. GENERAL INFORMATION

2.1. Report information

- 2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.
- 2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 446246 806614 994606(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (VCCI), and the registration number are R-1974(open area test site) , R-1966(semi anechoic chamber),C-2117(mains ports conducted interference measurement) and T-180(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 11177A-1 11177A-2.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

2.3.Measurement Uncertainty

Conducted Emission

9kHz~30MHz 3.5dB

Radiated Emission

30MHz~1000MHz 4.5dB

1GHz~26.5GHz 4.6dB

3. PRODUCT DESCRIPTION

3.1.EUT Description

Description	: Handheld Rugged Terminal
Manufacturer	: OPTIMA KLASIK SDN.BHD. (807783-T)
Model Number	: HRT500i
Operate Frequency	: 2.412GHz~2.462GHz
Antenna Designation	: Chip Antenna 0.0dBi

Remark: This is a derivative report based on original report WT158002883(FCC ID: SX3-HRT700).

HRT500i and HRT500, HRT700 differences are:

1. HRT700 has added on a printer board with different casing outlook
 2. HRT500 and HRT500i don't have a printer
 3. HRT500 and HRT500i have common casing outlook but HRT500i has added on HID module.
- the rest are the same,

All the test data of HRT500i comes from the original test data of HRT500, HRT700.

WLAN :

Table 2 Working Frequency List

Channel	Frequency	Channel	Frequency
1	2412MHz	8	2447MHz
2	2417MHz	9	2452MHz
3	2422MHz	10	2457MHz
4	2427MHz	11	2462MHz
5	2432MHz		
6	2437MHz		
7	2442MHz		

3.2.Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **SX3-HRT500I**, filing to comply with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

3.3. Block Diagram of EUT Configuration



Figure 1 EUT setup

3.4. Operating Condition of EUT

The Radiated spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

Test mode is configured to be with duty cycle >98%

802.11b and 802.11g operate in SISO mode. For SISO conducted measurements, the modes tested in this report will be considered as a worst case mode.

3.5. Directional Antenna Gain

The EUT does NOT support a WIFI MIMO function.
Directional gain need NOT to be considered.

3.6. Support Equipment List

Table 3 Support Equipment List

Name	Model No	number	Manufacturer
Adaptor for EUT	KSAS0250900300M2	--	Kuantech(Shenzhen)Co.,Ltd

3.7. Test Conditions

Date of test: May 21,2015- Jun.11,2015

Date of EUT Receive: May 21,2015

Temperature: 21-24 °C

Relative Humidity: 48-54%

3.8. Special Accessories

Not available for this EUT intended for grant.

3.9. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 4 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB2603	EMI Test Receiver	Rohde & Schwarz	ESCS30	Dec.19, 2014	1 Year
SB3321	AMN	Rohde & Schwarz	ESH2-Z5	Jan.18, 2015	1 Year
SB2604	AMN	Rohde & Schwarz	ESH3-Z5	Nov.18, 2015	1 Year
----	Radiated Emissions Cable set	HUBER+SUHN ER	---	Jan.19, 2015	1 Year
SB8501/09	EMI Test Receiver	Rohde & Schwarz	ESU40	Mar.19, 2015	1 Year
SB8501/04	Bilog Antenna	Schwarzbeck	VULB9163	Mar.19, 2015	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.19, 2015	1 Year
SB5392/02	Horn Antenna	Amplifier Research	AT4560	May.15, 2015	1 Year
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Oct.09, 2014	2 Years
SB3345	Loop Antenna	Schwarzbeck	FMZB1516	Jan.20, 2015	2 Years
SB3437	Power meter	Rohde & Schwarz	NRVD	Jul.02,2014	1 Year
SB3437/01	Power sensor	Rohde & Schwarz	URV5-Z2	Jul.02,2014	1 Year
SB9721/02	Signal Analyzer	Agilent	N9020A	Jan.05, 2015	1 Year
----	Radiated Emissions Cable set	HUBER+SUHN ER	---	Jan.19, 2015	1 Year
---	Radiated Emissions Cable set	HUBER+SUHN ER	---	Jan.19, 2015	1 Year
SB8501/17	Preamplifier	Rohde & Schwarz	SCU-18	Mar.27, 2015	1 Year
SB8501/16	Preamplifier	Rohde & Schwarz	SCU-26	Mar.27, 2015	1 Year
SB9059	Preamplifier	Rohde & Schwarz	SCU-40	May.12, 2015	1 Year

5. 6DB BANDWIDTH MEASUREMENT

5.1.LIMITS OF 6dB BANDWIDTH MEASUREMENT

CFR 47 (FCC) part 15.247 (a) (2) and 558074 D01 DTS Meas Guidance v03r03

5.2.TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer.

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c)Detector = Peak.
- d)Trace mode = max hold.
- e)Sweep = auto couple.
- f)Allow the trace to stabilize.
- g)Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.TEST SETUP



5.4. Test Data

Table 5 6dB Bandwidth Test Data 802.11b

CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	results
2412	9.995	Pass
2437	9.992	Pass
2462	9.999	Pass

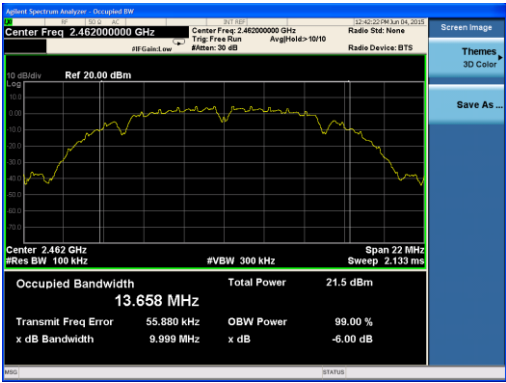
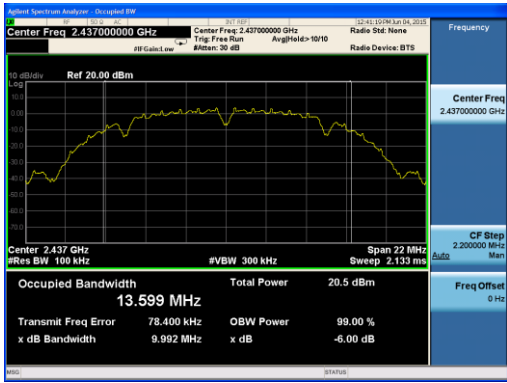
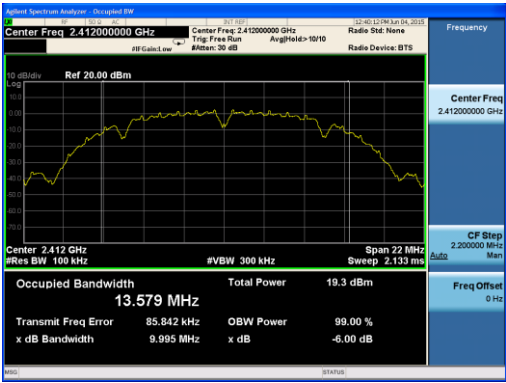
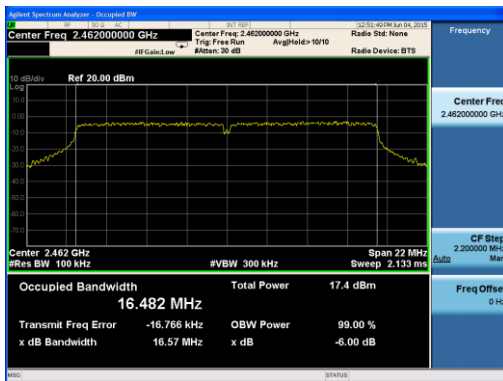
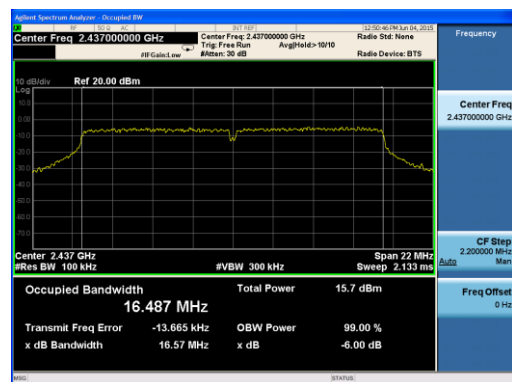
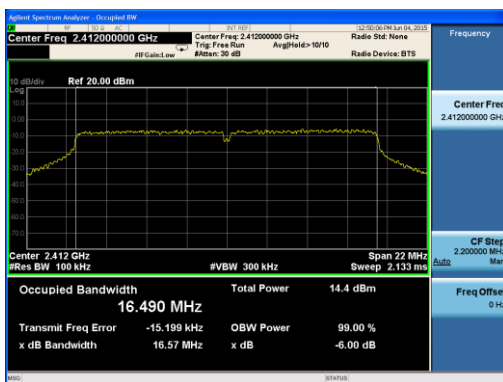


Table 6 6dB Bandwidth Test Data 802.11g

CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	results
2412	16.57	Pass
2437	16.57	Pass
2462	16.57	Pass



6. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

6.1.LIMITS OF Maximum Conducted Output Power Measurement

CFR 47 (FCC) part 15.247 (b) (3) and 558074 D01 DTS Meas Guidance v03r03

6.2.TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer.

a) Set RBW = 1-5% of the OBW, not to exceed 1 MHz..

b) Set VBW $\geq 3 \times$ RBW.

c)Set the span $\geq 1.5 \times$ DTS bandwidth.

d) Number of points in sweep $\geq 2 \times$ span / RBW.

e) Sweep time = auto.

f) Detector = RMS

g)Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges

NOTE:EUT Duty cycle=100%

6.3.TEST DATA

Table 7 Maximum Conducted Output Power Test Data 802.11b

Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
2412	11.76	< 30	Pass
2437	12.92	< 30	Pass
2462	13.82	< 30	Pass

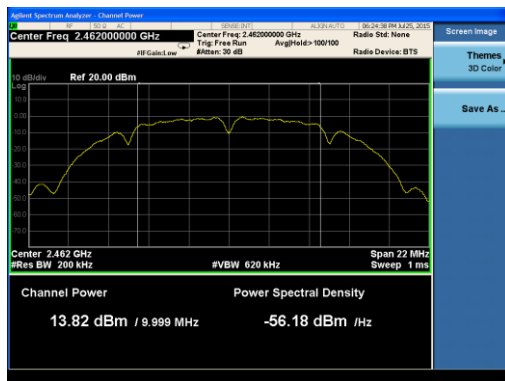
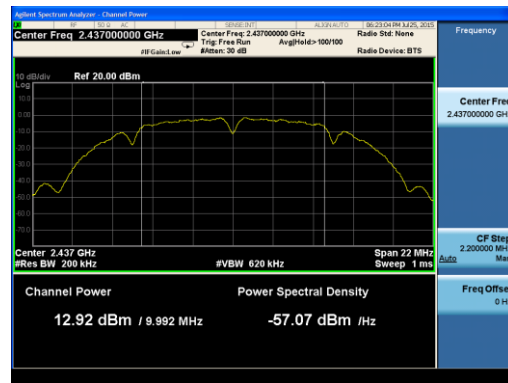
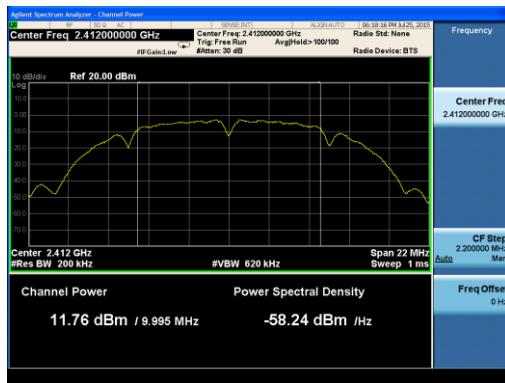
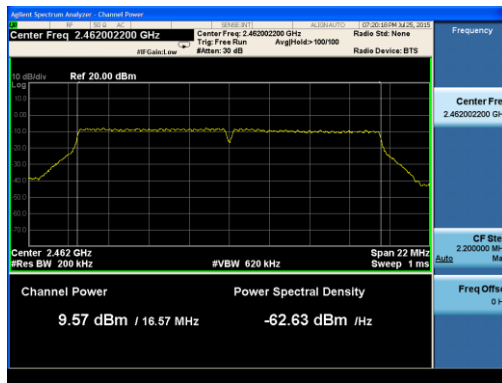
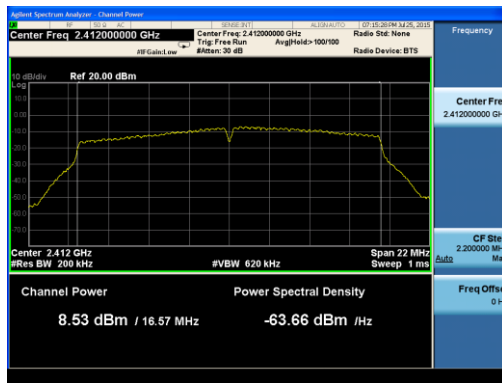


Table 8 Maximum Conducted Output Power Test Data 802.11g

Center Freq.[MHz]	Meas. Level (Cond.) [dBm]	Limit [dBm]	Result
2412	8.53	< 30	Pass
2437	9.65	< 30	Pass
2462	9.57	< 30	Pass



7. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT

7.1.LIMITS OF Maximum Power Spectral Density Level Measurement

CFR 47 (FCC) part 15.247 (e) and 558074 D01 DTS Meas Guidance v03r03

7.2.TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer.

a)Set analyzer center frequency to DTS channel center frequency.

b)Set the span to 1.5 times the DTS bandwidth.

c)Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.

d)Set the VBW $\geq 3 \times \text{RBW}$.

e)Detector = power averaging (RMS) or sample detector

f)Sweep time = auto couple.

g)Allow trace to fully stabilize.

h)Use the peak marker function to determine the maximum amplitude level within the RBW.

i)If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

NOTE:EUT Duty cycle=100%

7.3.TEST DATA

Table 9 Maximum Power Spectral Density Level Test Data 802.11b

Center Freq.[MHz]	PSD [dBm]	Limit [dBm/3KHz]	Result
2412	1.065	8	Pass
2437	2.309	8	Pass
2462	3.332	8	Pass

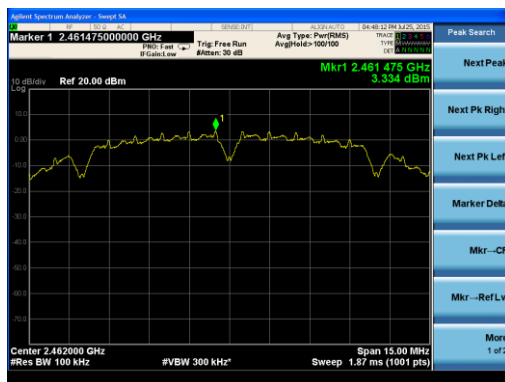
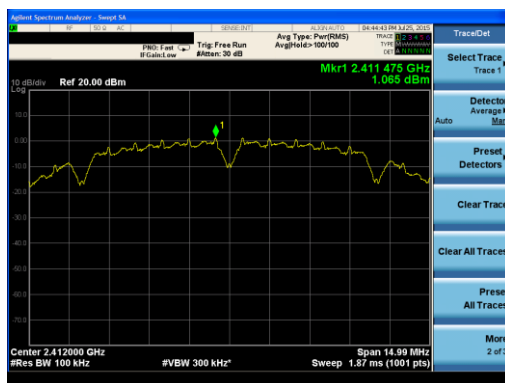
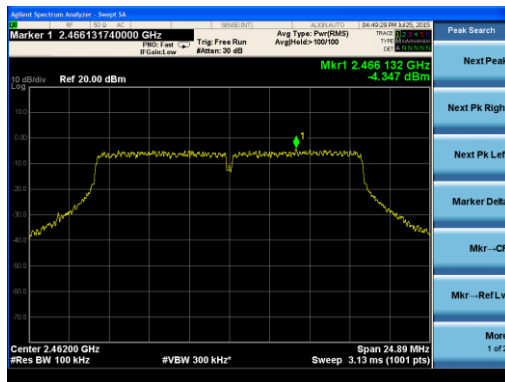
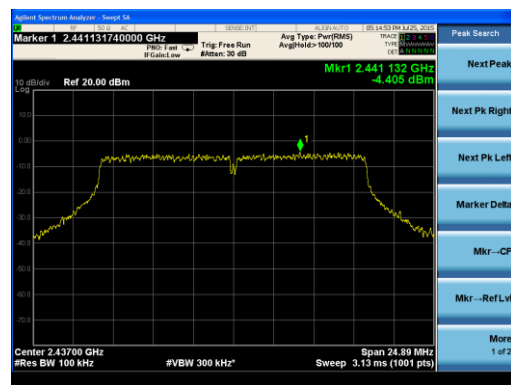
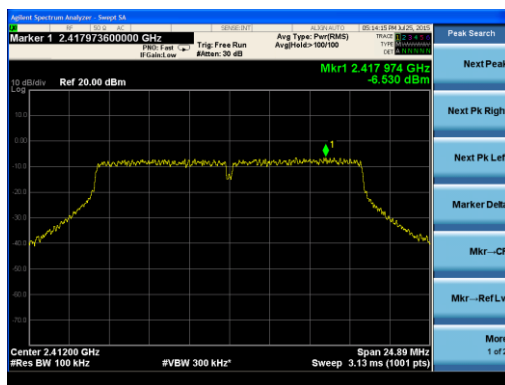


Table 10 Maximum Power Spectral Density Level Test Data 802.11g

Center Freq.[MHz]	PSD [dBm]	Limit [dBm/3KHz]	Result
2412	-6.530	8	Pass
2437	-4.405	8	Pass
2462	-4.347	8	Pass



8. CONDUCTED BANDEGE AND SPURIOUS MEASUREMENT

8.1.LIMITS OF Conducted Bandedge and Spurious Measurement

CFR 47 (FCC) part 15.247 (d) and 558074 D01 DTS Meas Guidance v03r03

8.2.TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

- a)Set instrument center frequency to DTS channel center frequency.
- b)Set the span to ≥ 1.5 times the DTS bandwidth.
- c)Set the RBW = 100 kHz.
- d)Set the VBW $\geq 3 \times$ RBW.
- e)Detector = peak.
- f)Sweep time = auto couple.
- g)Trace mode = max hold.
- h)Allow trace to fully stabilize.
- i)Use the peak marker function to determine the maximum PSD level.

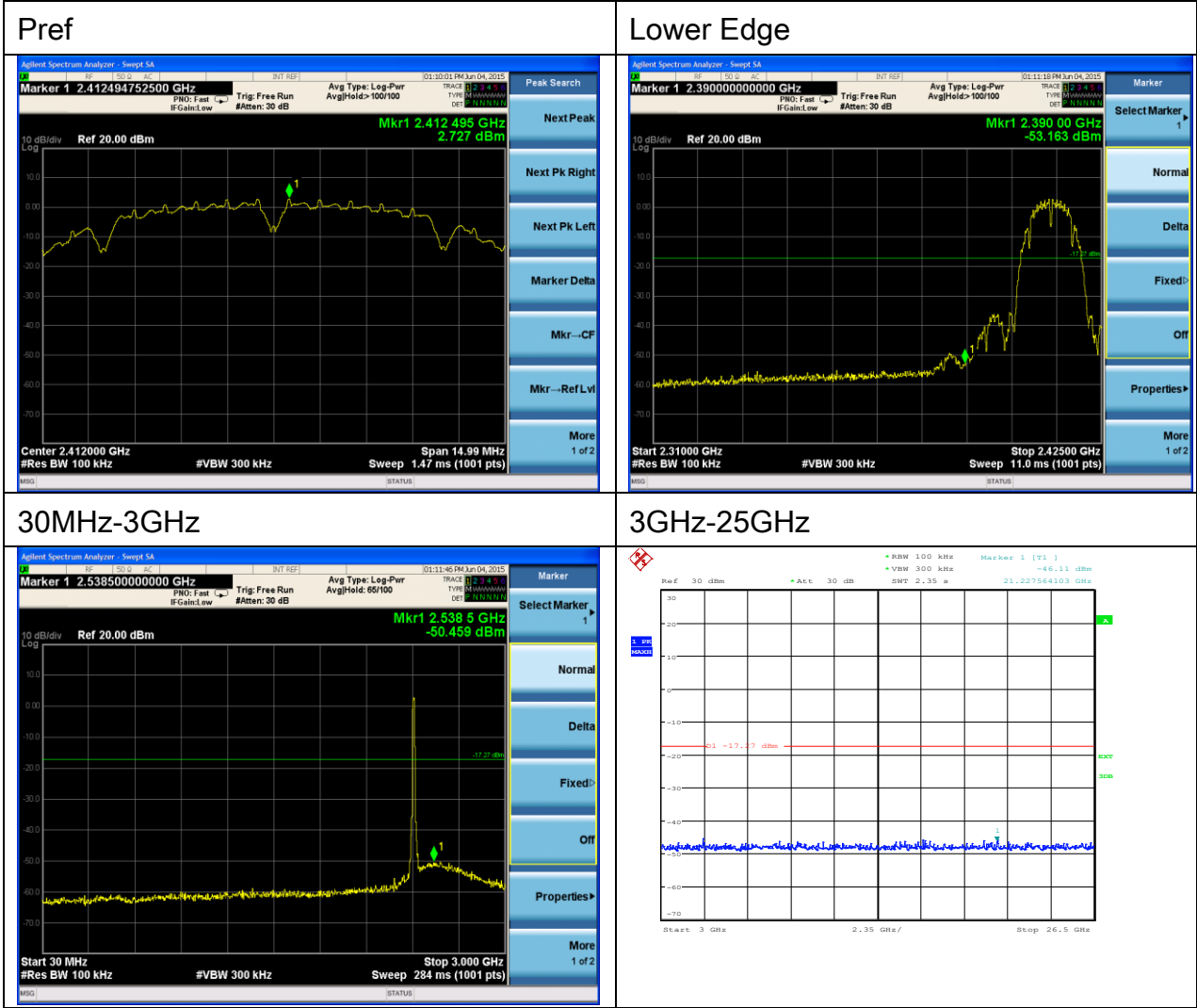
Emission level measurement

- a)Set the center frequency and span to encompass frequency range to be measured.
- b)Set the RBW = 100 kHz.
- c)Set the VBW $\geq 3 \times$ RBW.
- d)Detector = peak.
- e)Ensure that the number of measurement points \geq span/RBW
- f)Sweep time = auto couple.
- g)Trace mode = max hold.
- h)Allow trace to fully stabilize.
- i)Use the peak marker function to determine the maximum amplitude level.

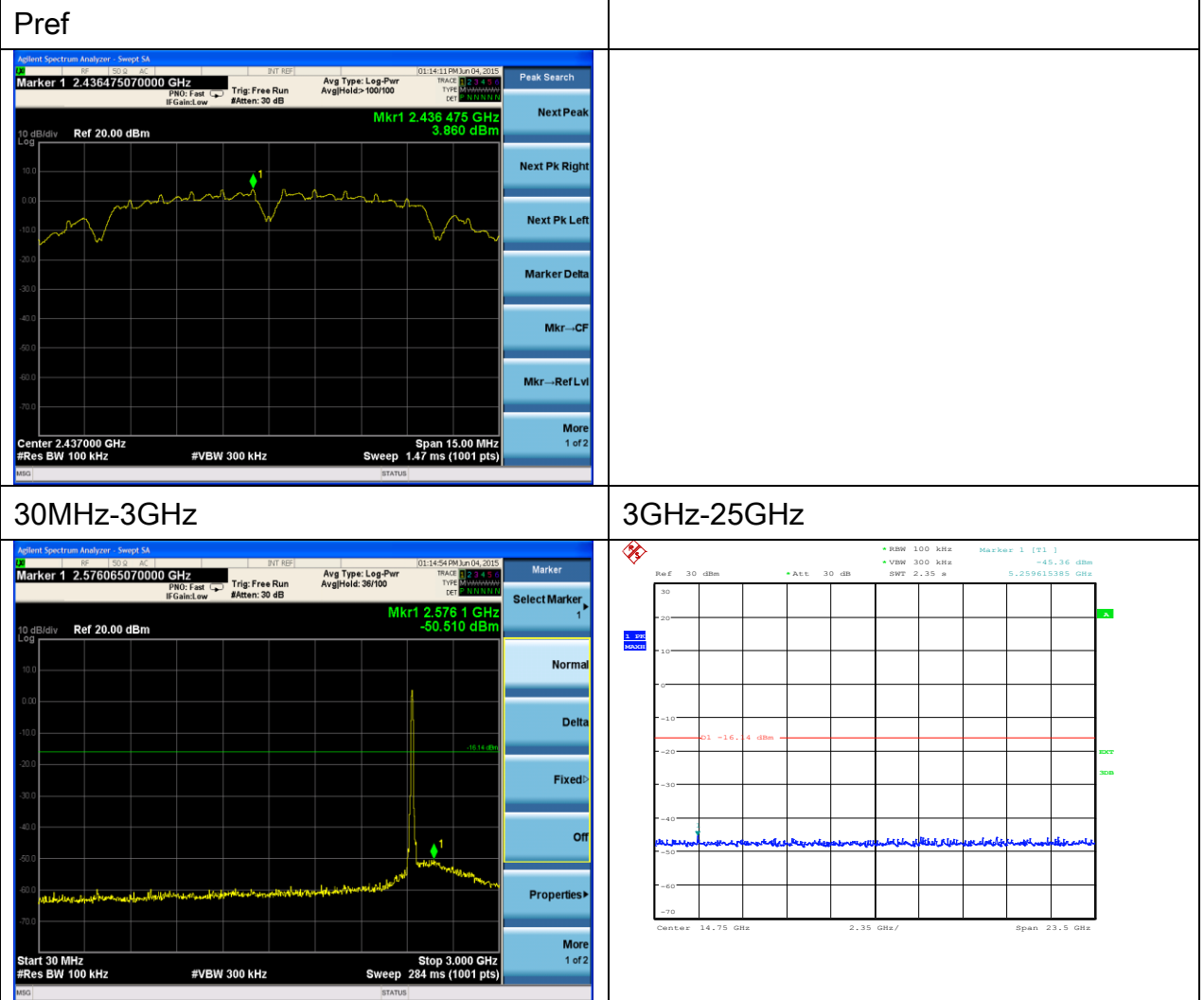
Test Result : ALL emission outside of 2400-2483.5 are lower at least 30dB than fundamental frequency.

8.3.TEST DATA

802.11b CH1

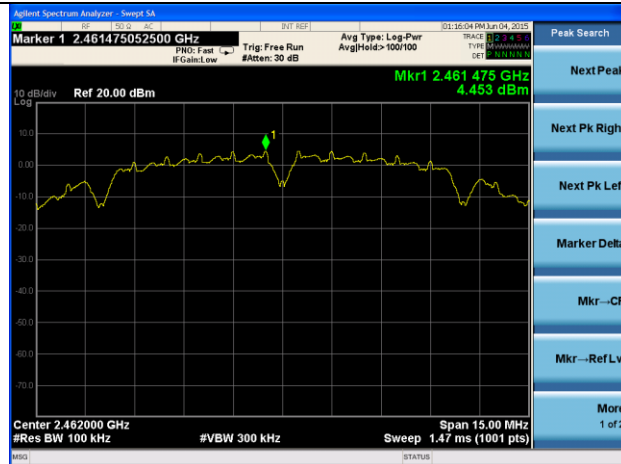


802.11b CH6



802.11b CH11

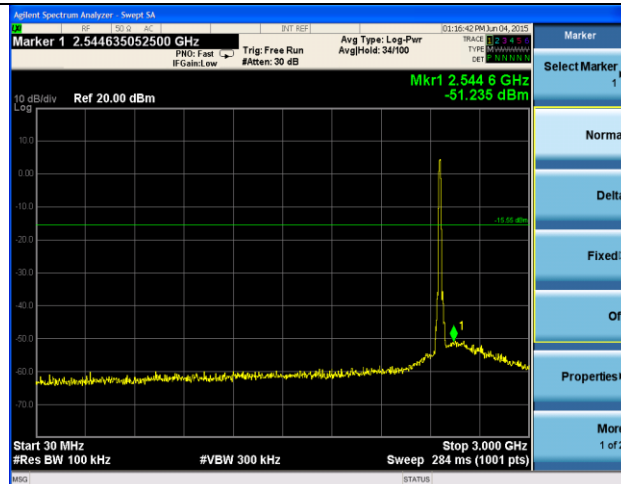
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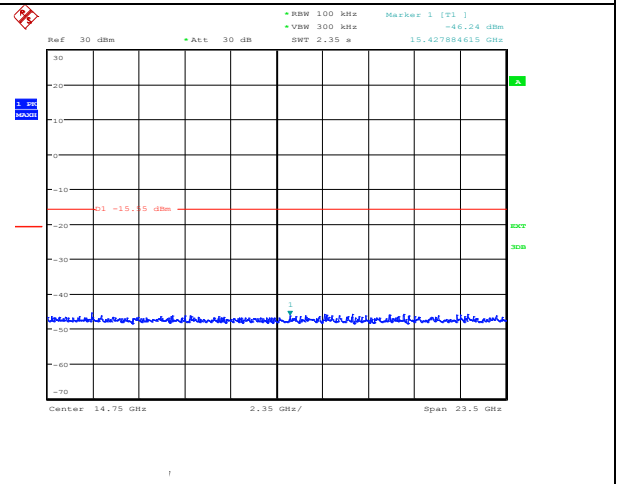
Upper Edge



30MHz-3GHz

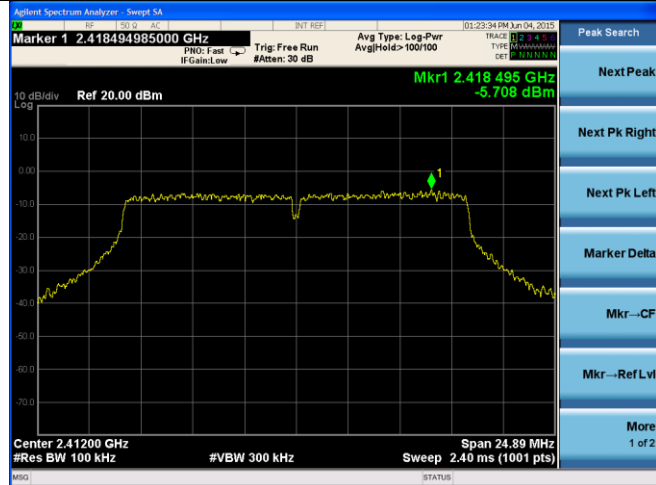


3GHz-25GHz

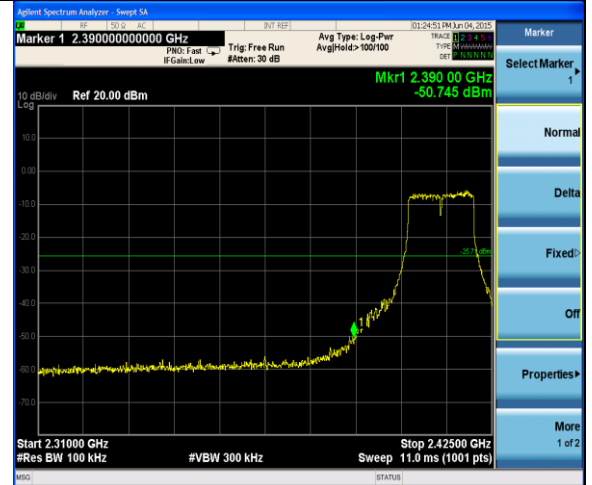


802.11g CH1

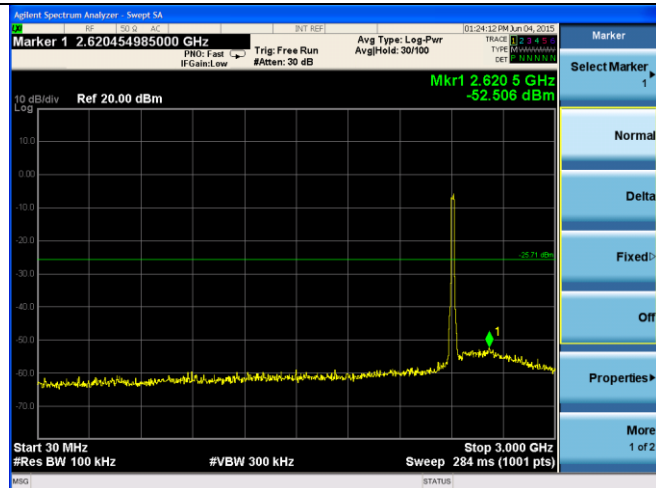
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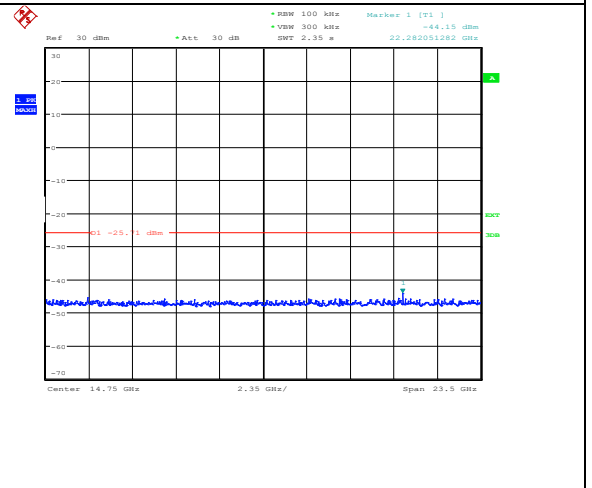
Lower Edge



30MHz-3GHz

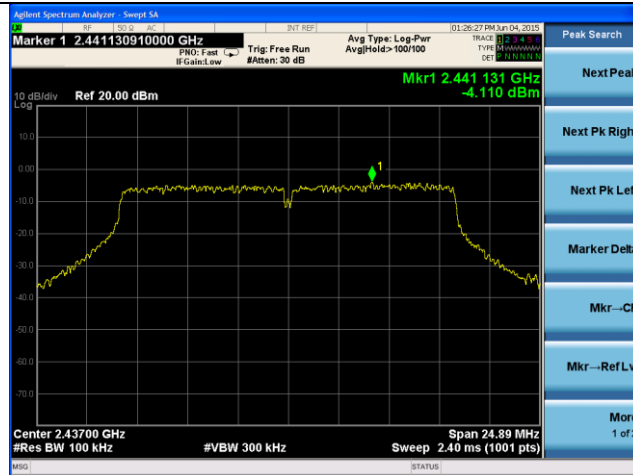


3GHz-25GHz

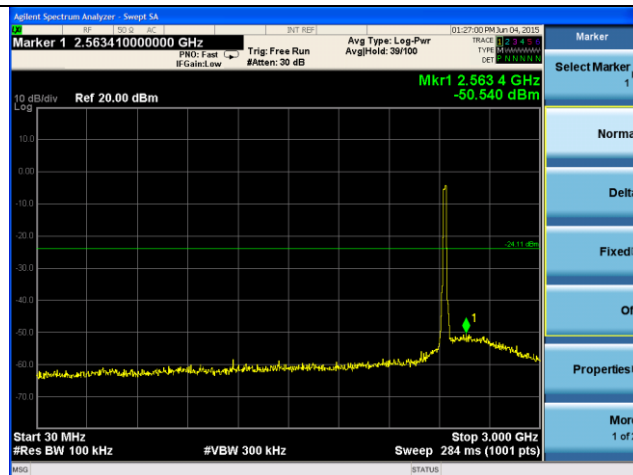


802.11g CH6

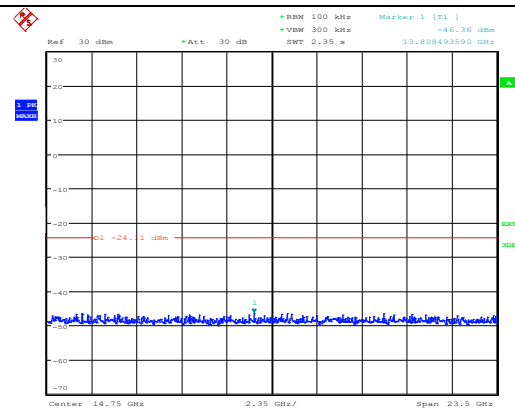
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30MHz-3GHz

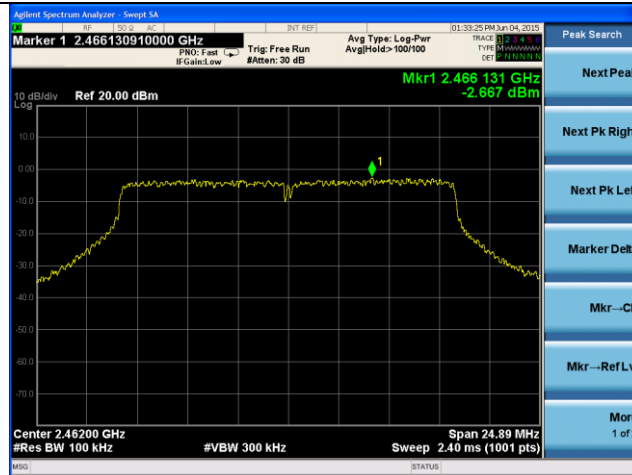


3GHz-25GHz



802.11g CH11

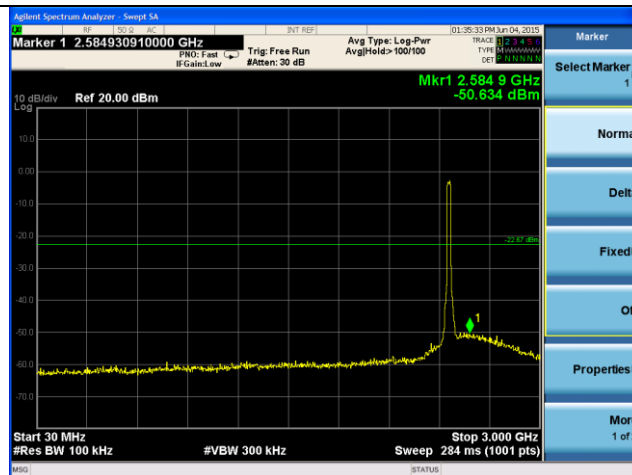
Pref



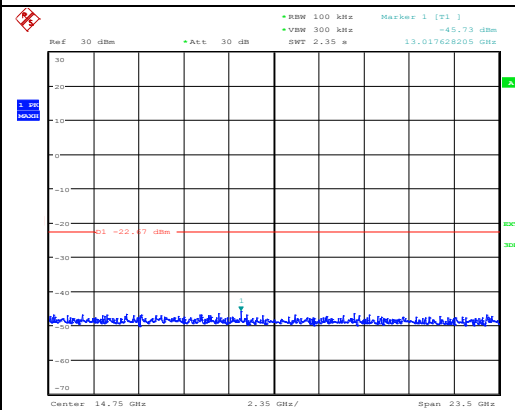
Upper Edge



30MHz-3GHz



3GHz-25GHz



9. RADIATED BANDEGE AND SPURIOUS MEASUREMENT

9.1.LIMITS OF Radiated Bandedge and Spurious Measurement

CFR 47 (FCC) part 15.247 (d) and 558074 D01 DTS Meas Guidance v03r03

9.2.TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz Detector function = peak for $f > 1$ GHz for peak measurement.
Set RBW = 1 MHz, VBW= 10Hz Detector function = peak for $f > 1$ GHz for AV measurement.

9.3.TEST DATA

9KHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Radiated Emission Test Data 9k Hz-30MHz

Frequency MHz	Cable Loss(dB)	Antenna Factor(dB)	Readings(dBμV/m)	Level(dBμV/m)	Polarity(H/V)	Turntable Angle(deg)	Antenna Height(m)	Limits(dBμV/m)	Margin(dB)
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--

30MHz-1GHz

Worst case is shown below for 30MHz-1GHz only.

The emissions don't show in following result tables are more than 20dB below the limits.

Radiated Emission Test Data 30MHz-1GHz

Frequency MHz	Cable Loss(dB)	Antenna Factor(dB)	Readings(dBμV/m)	Level(dBμV/m)	Polarity(H/V)	Turntable Angle(deg)	Antenna Height(m)	Limits(dBμV/m)	Margin(dB)
30.000	0.6	12.3	17.9	30.8	V	30.6	1.0	40.0	9.2
79.813	1.0	7.8	23.8	32.6	V	26.4	1.0	40.0	7.4
127.194	1.3	10.5	15.0	26.8	V	342.6	1.0	43.5	16.7
148.577	1.5	8.2	17.9	27.6	V	131.6	1.1	43.5	15.9
329.358	2.2	13.3	14.3	29.8	V	127.6	1.2	46.0	16.2
370.180	2.3	14.3	11.5	28.1	V	78.2	1.1	46.0	17.9
80.541	0.9	8.5	20.4	29.8	H	110.7	1.0	40.0	10.2
150.521	1.4	8.3	13.9	23.6	H	143.7	1.1	43.5	19.9
259.378	1.9	12.1	18.6	32.6	H	101.1	1.1	46.0	13.4
321.583	2.0	13.3	15.9	31.2	H	123.7	1.2	46.0	14.8
469.480	2.7	15.6	12.5	30.8	H	241.7	1.3	46.0	15.2
811.442	3.6	20.1	11.6	35.3	H	330.1	1.1	46.0	10.7

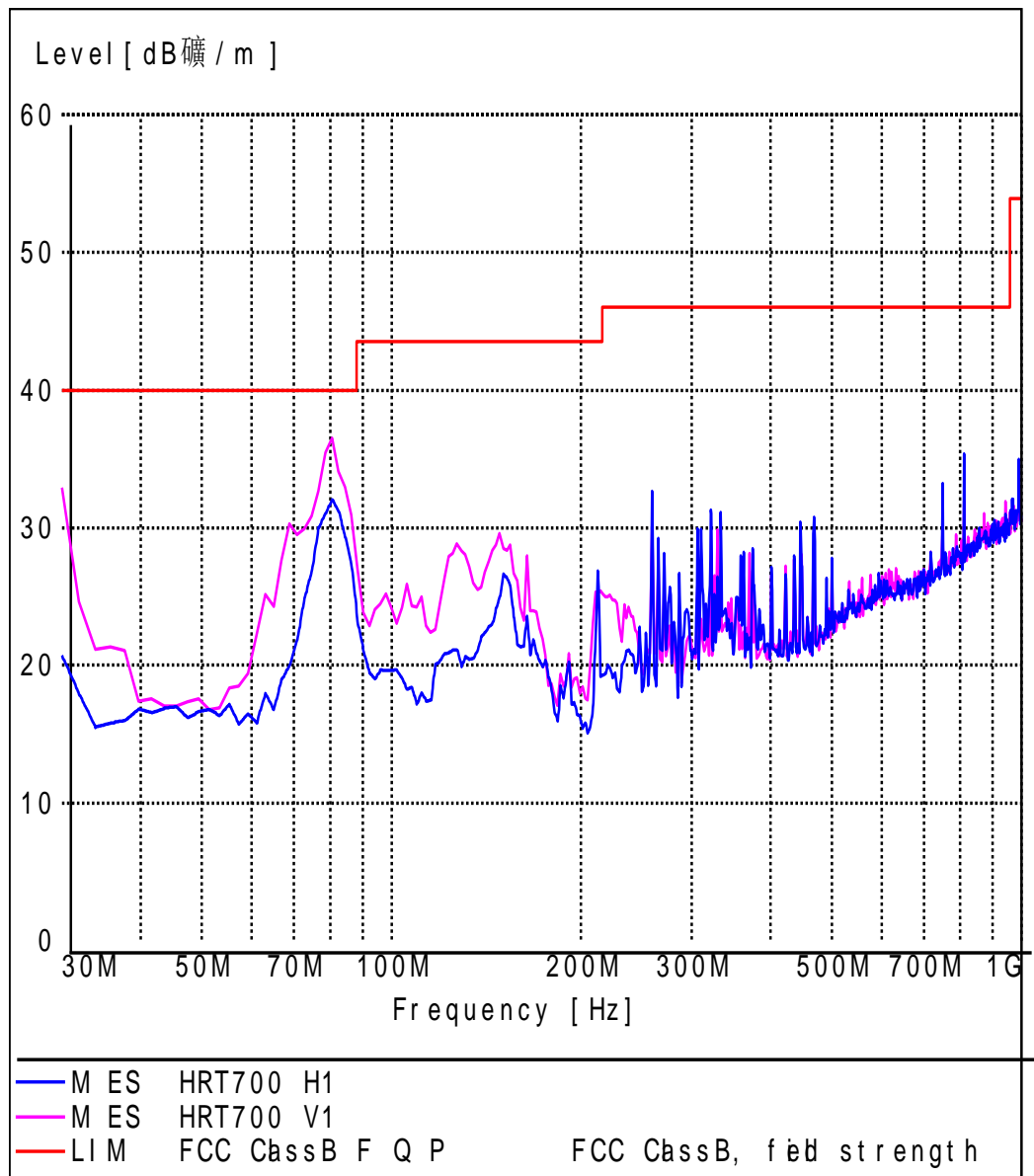
Radiated Emission

EUT Information

EUT Model Name: HRT500i
Operation mode: Charging and transmitter
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal/Vertical
Operator Name:
Comment:



1-18G

11b

Ch1

Radiated Emission

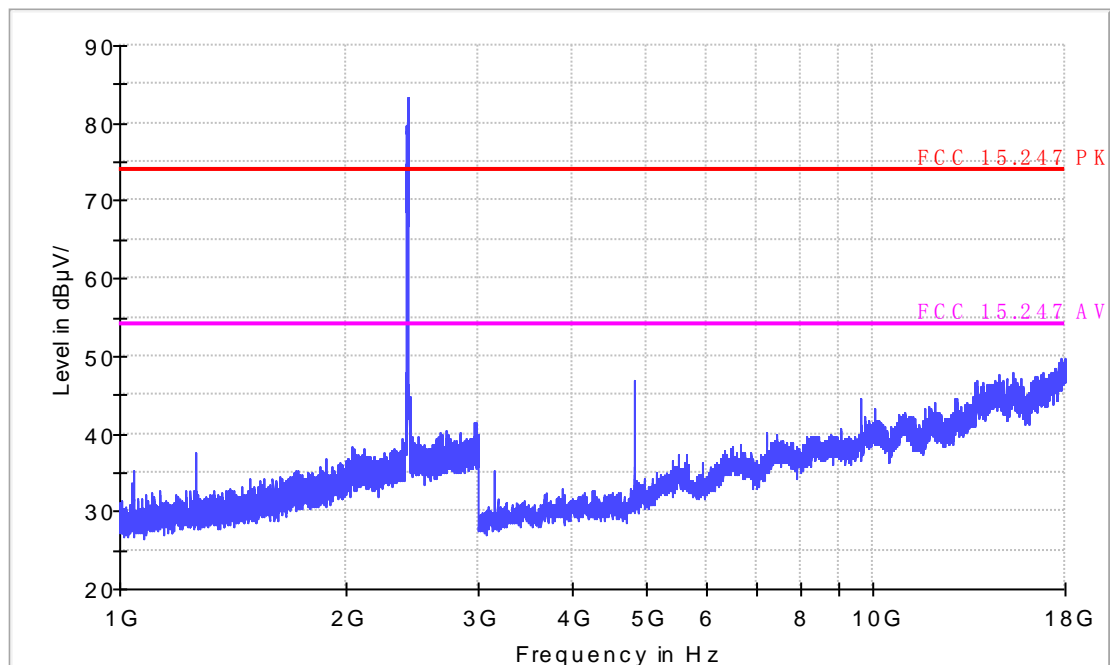
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

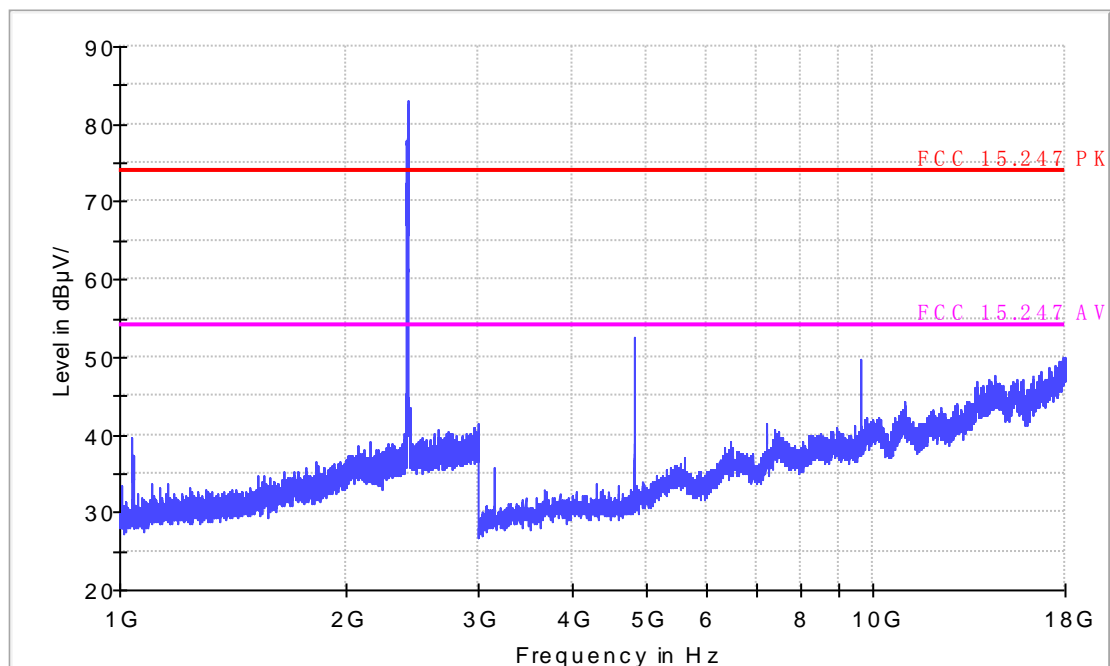
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



1-18G
11b
CH6

Radiated Emission

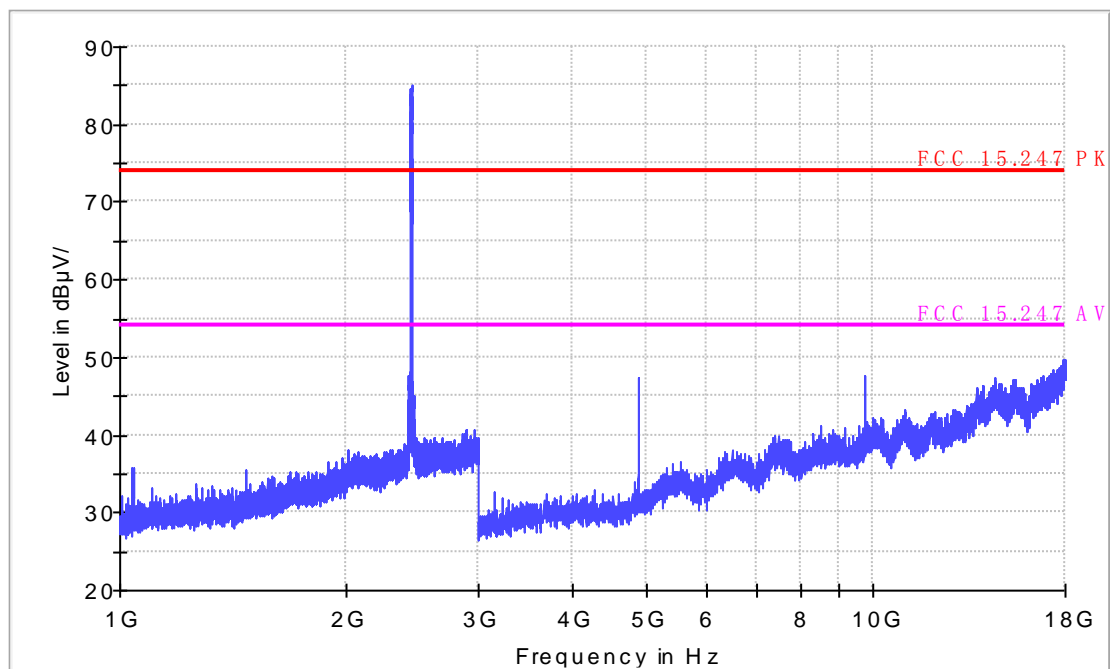
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

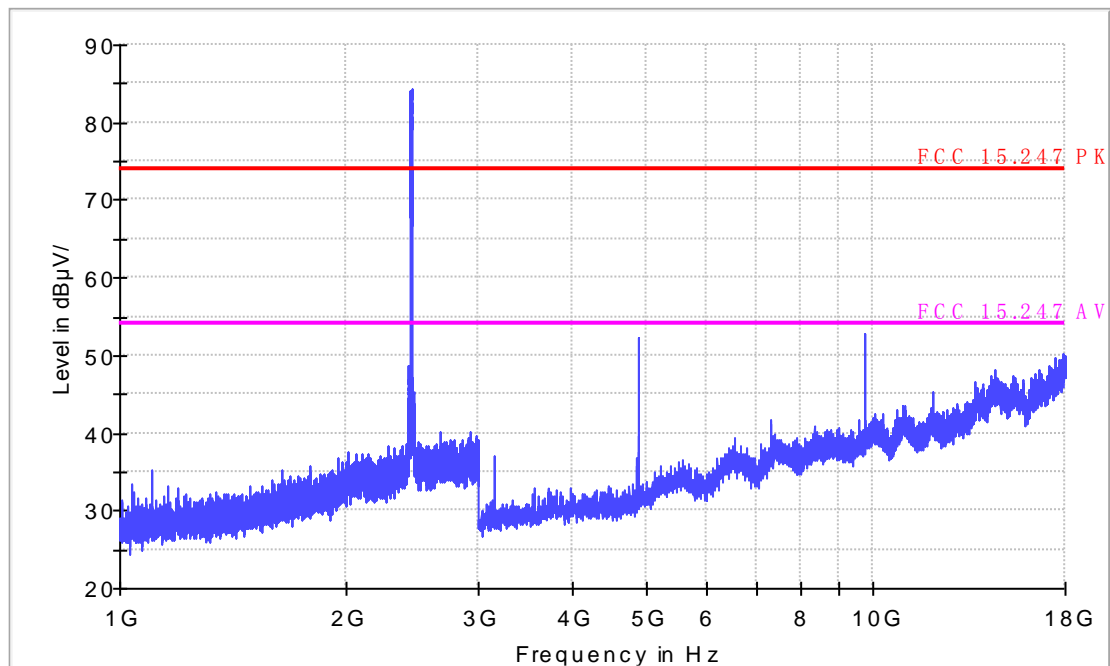
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



1-18G

11b

CH11

Radiated Emission

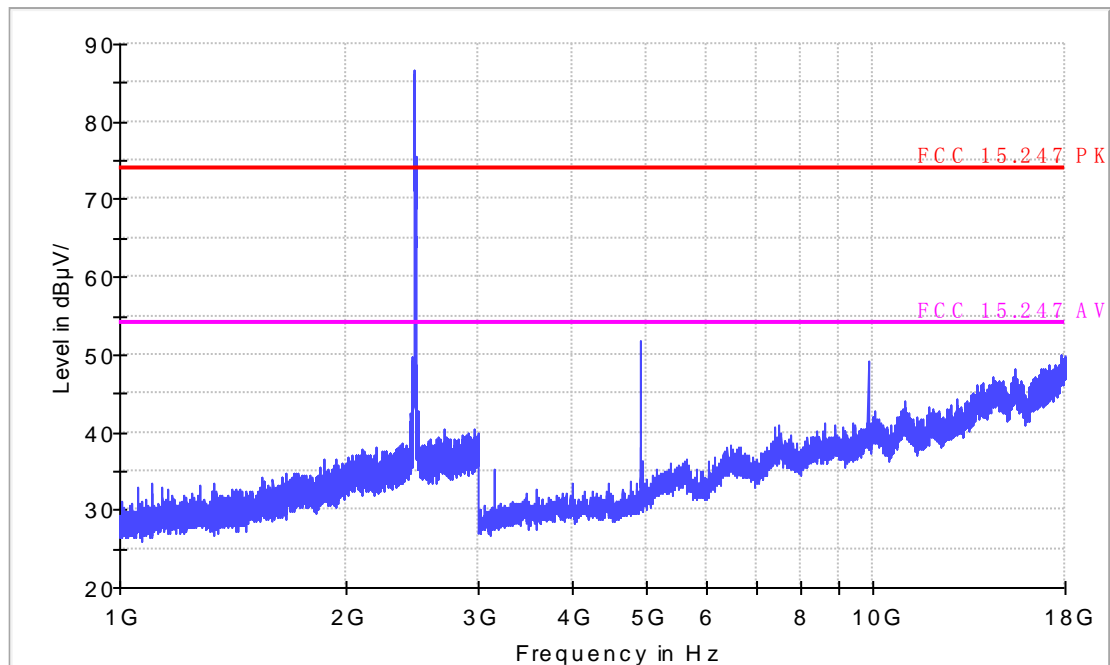
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

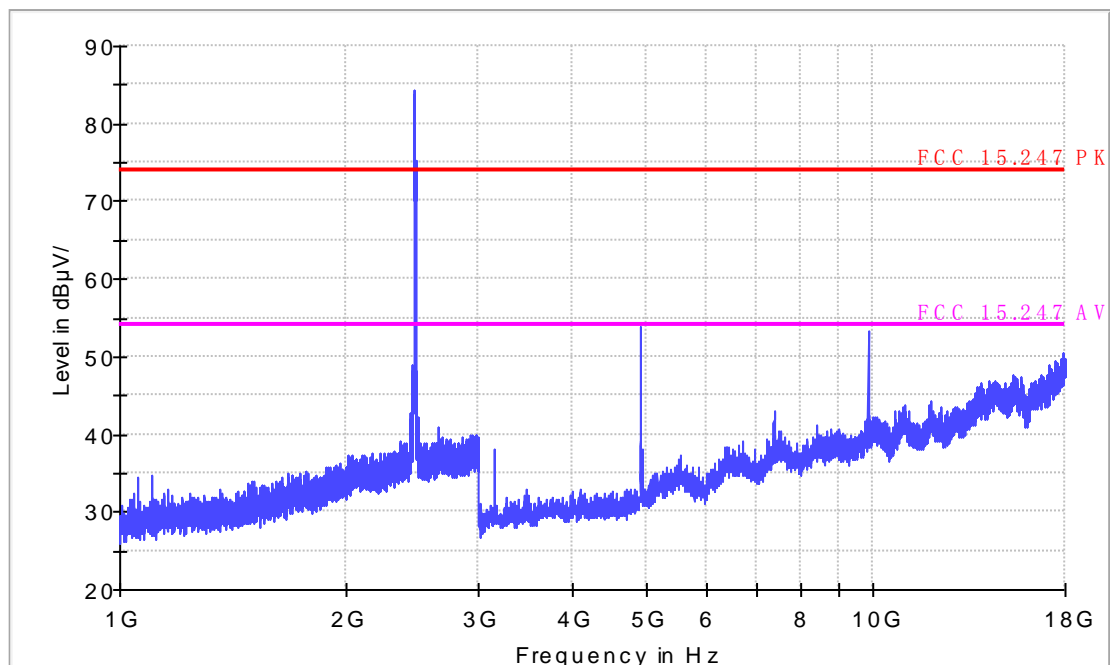
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



1-18G

11g

CH1

Radiated Emission

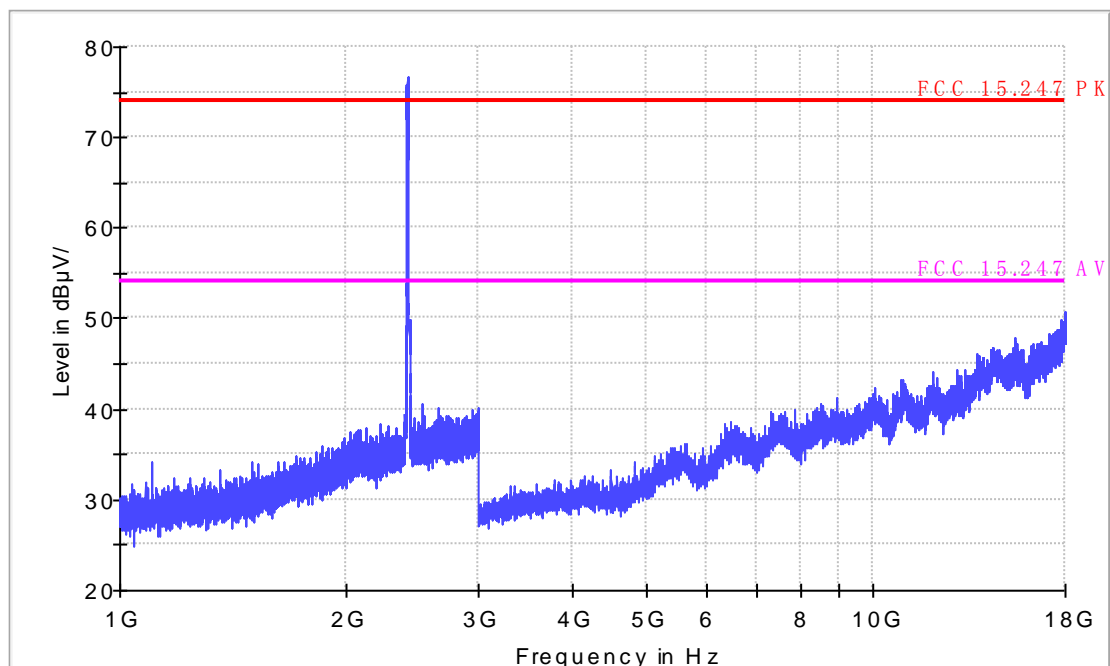
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

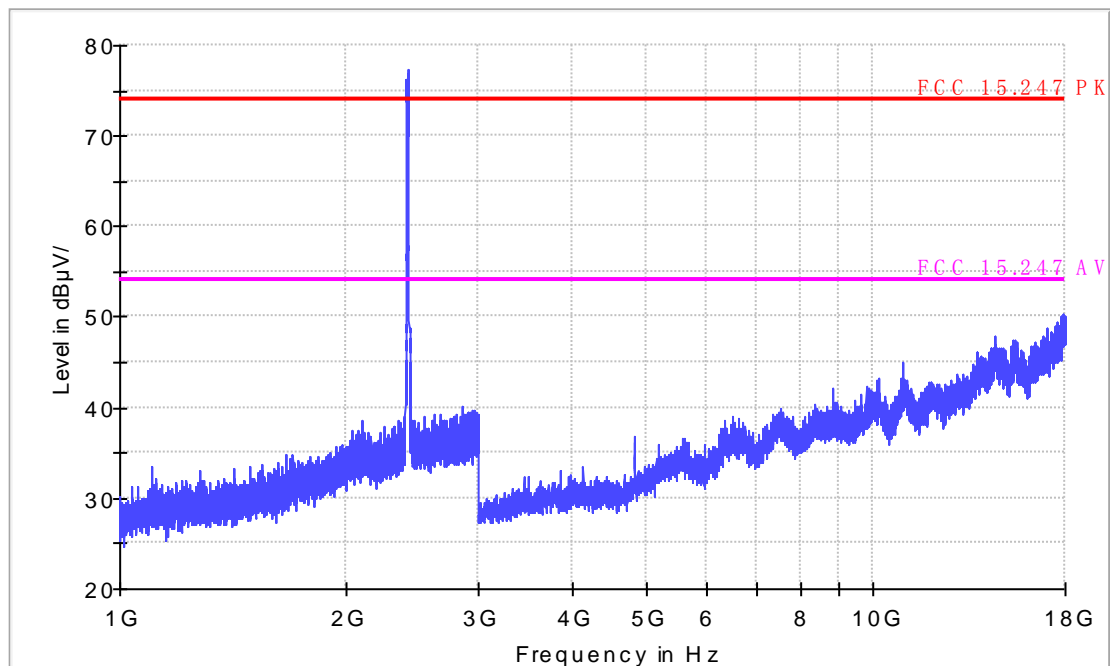
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



1-18G

11g

CH6

Radiated Emission

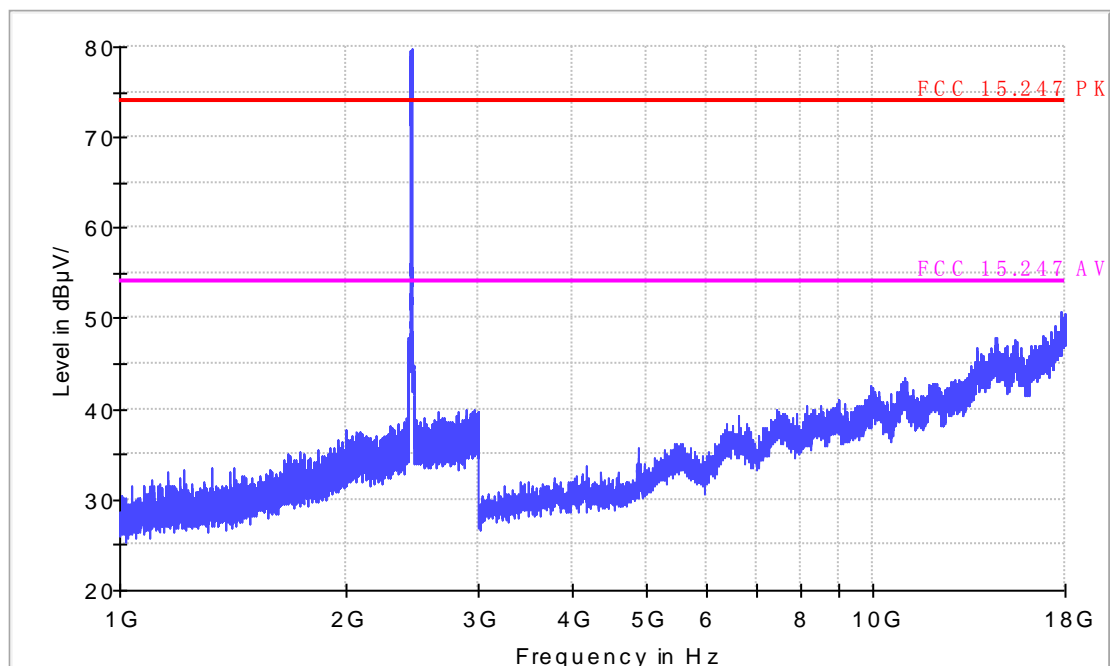
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

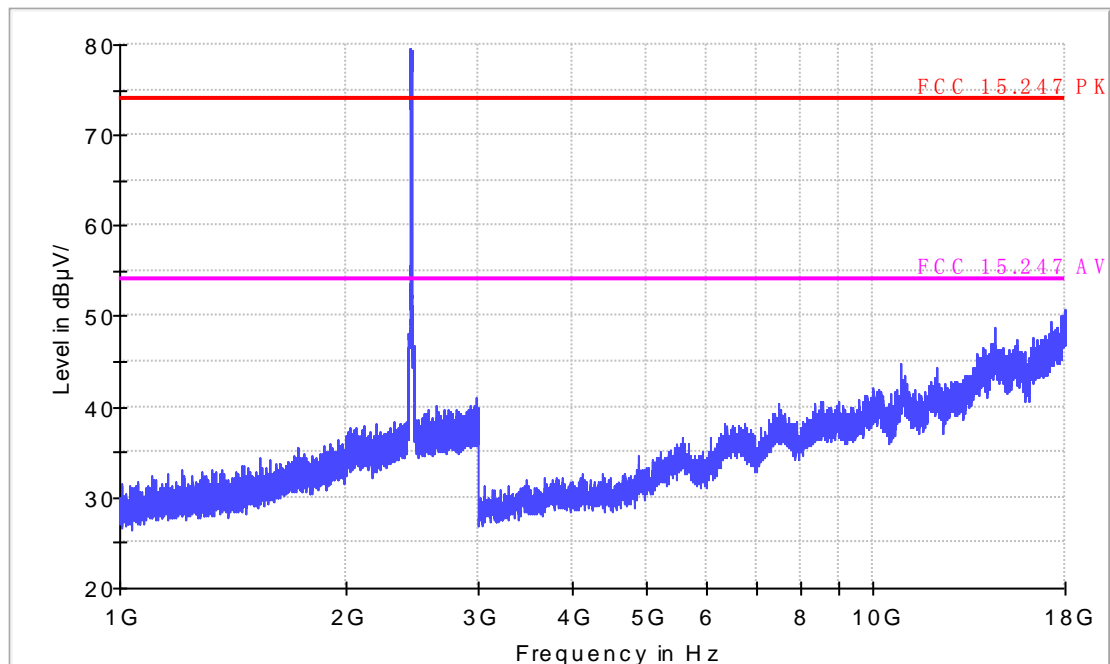
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



1-18G

11g

CH11

Radiated Emission

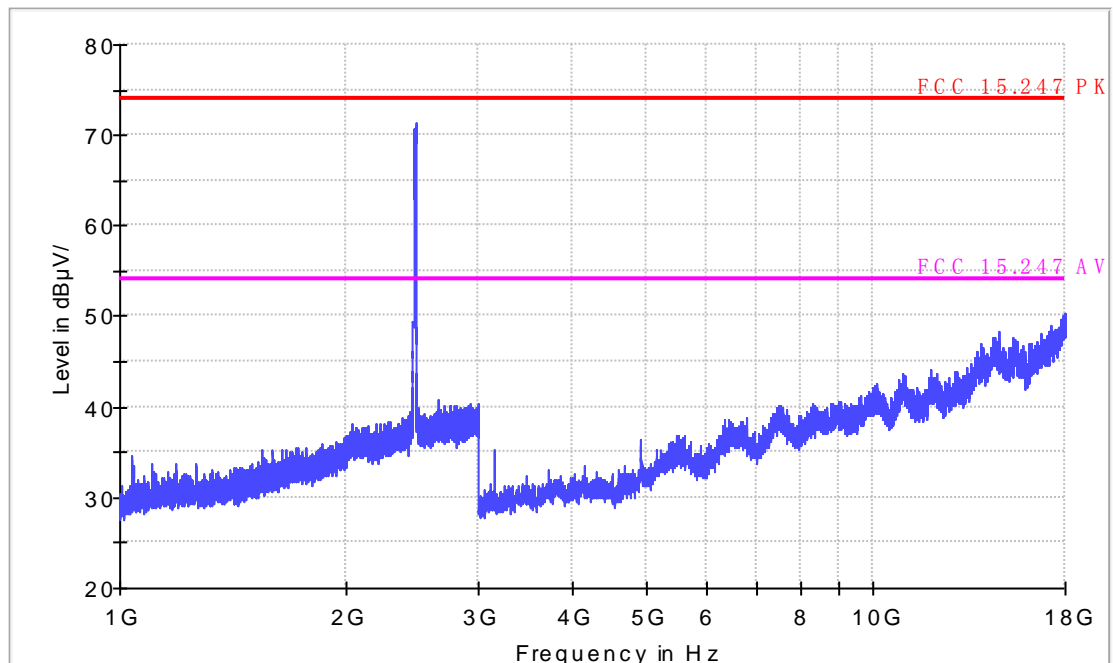
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

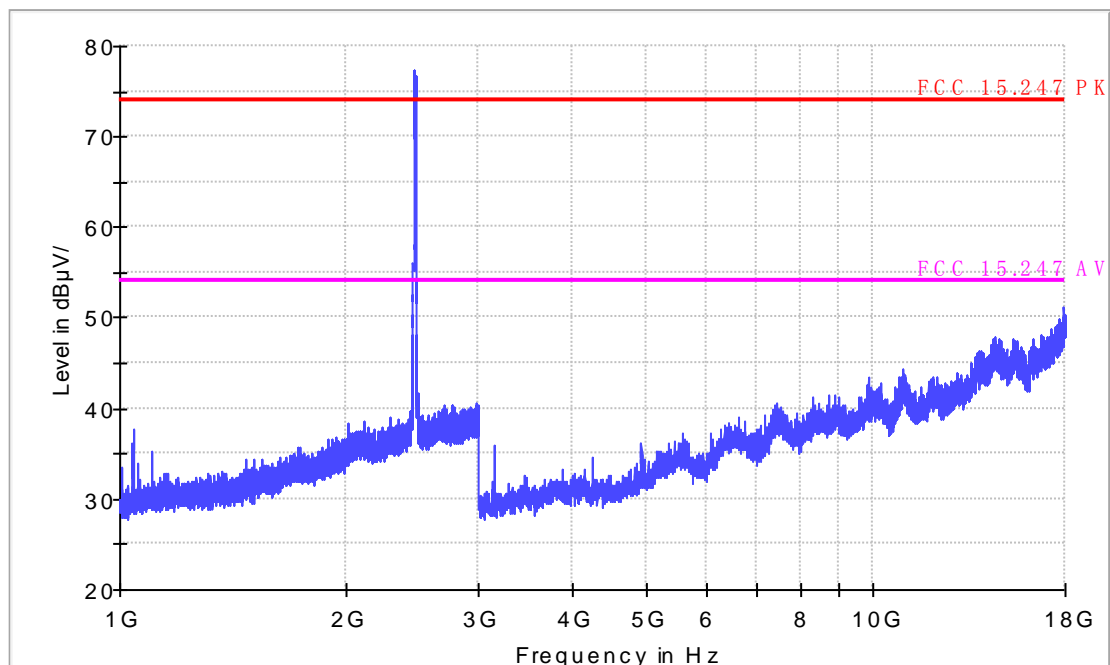
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 1-18GHz operate on 2.4GHz



Radiated Emission

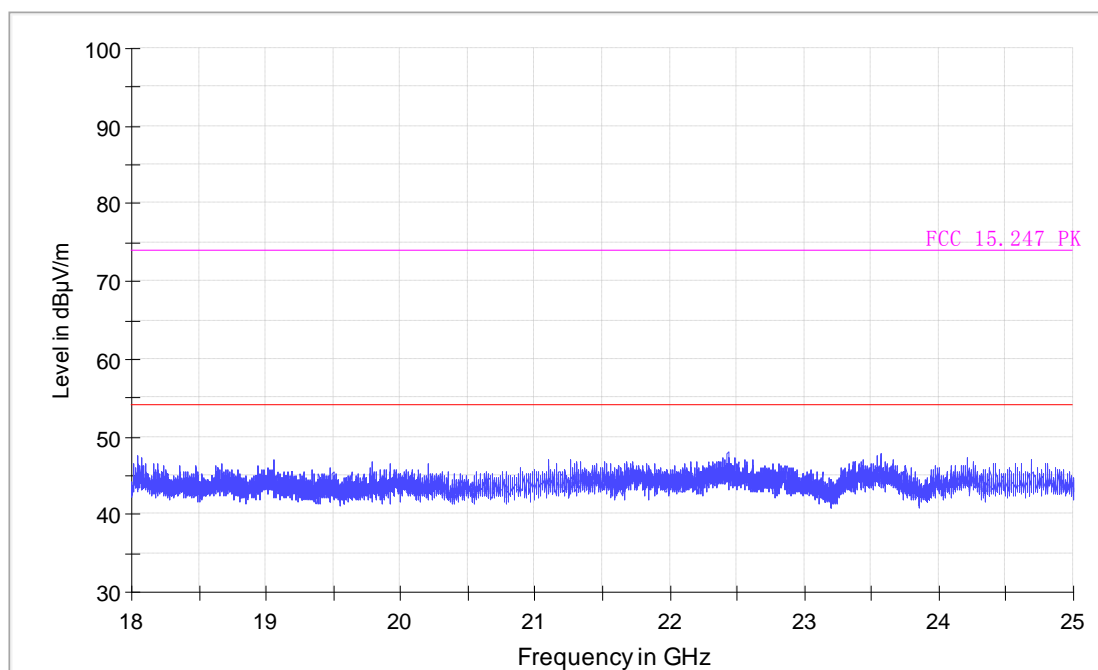
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

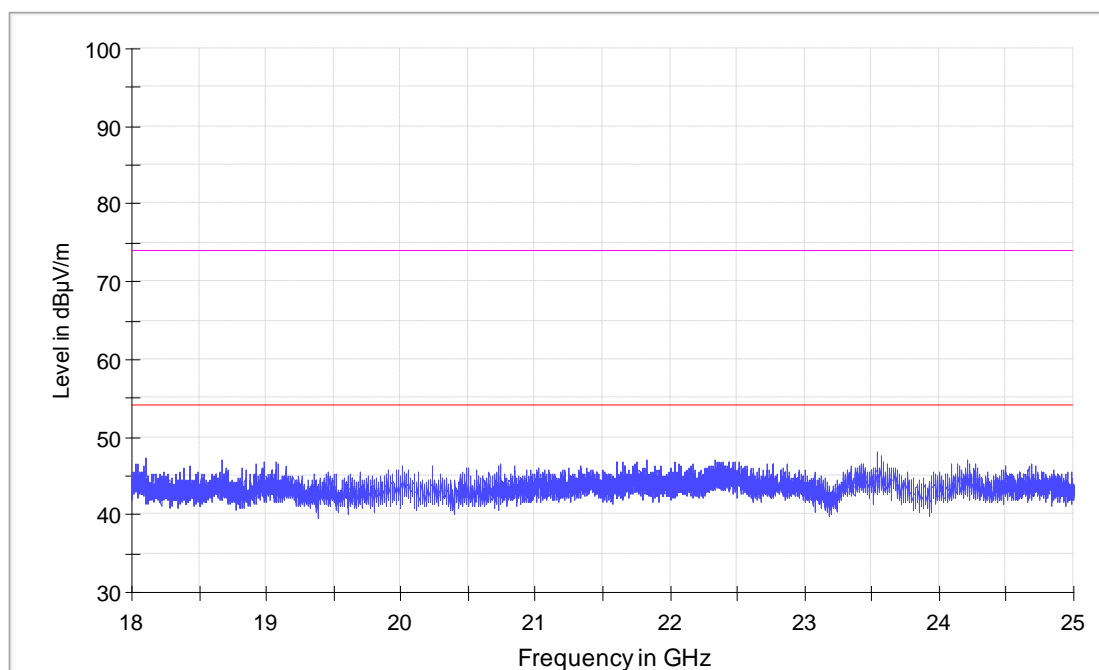
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

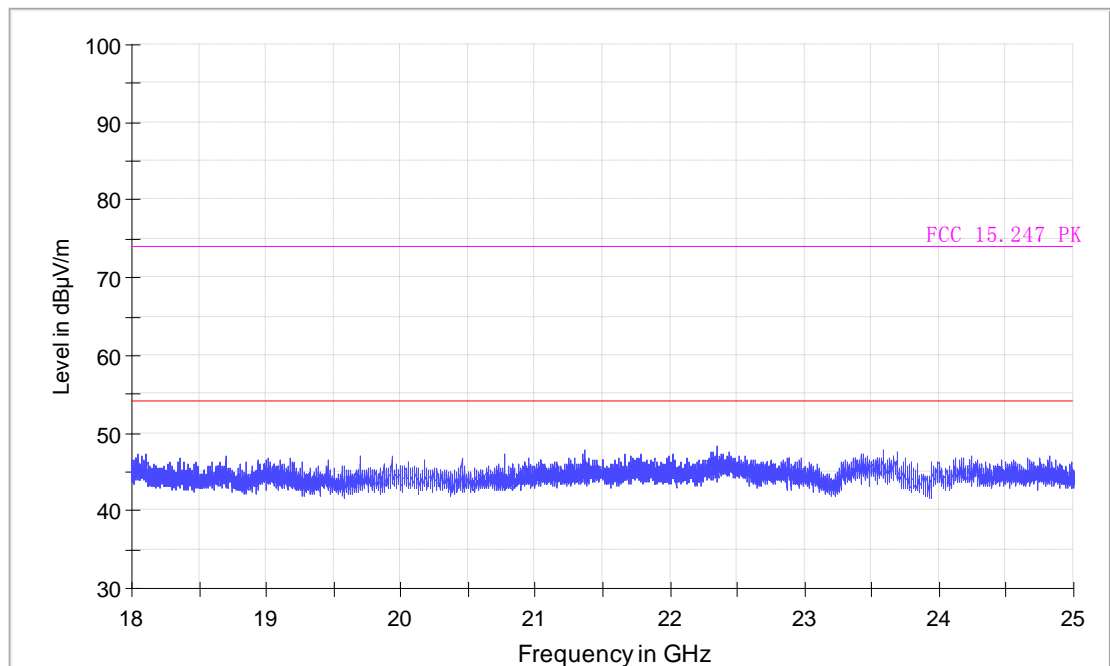
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

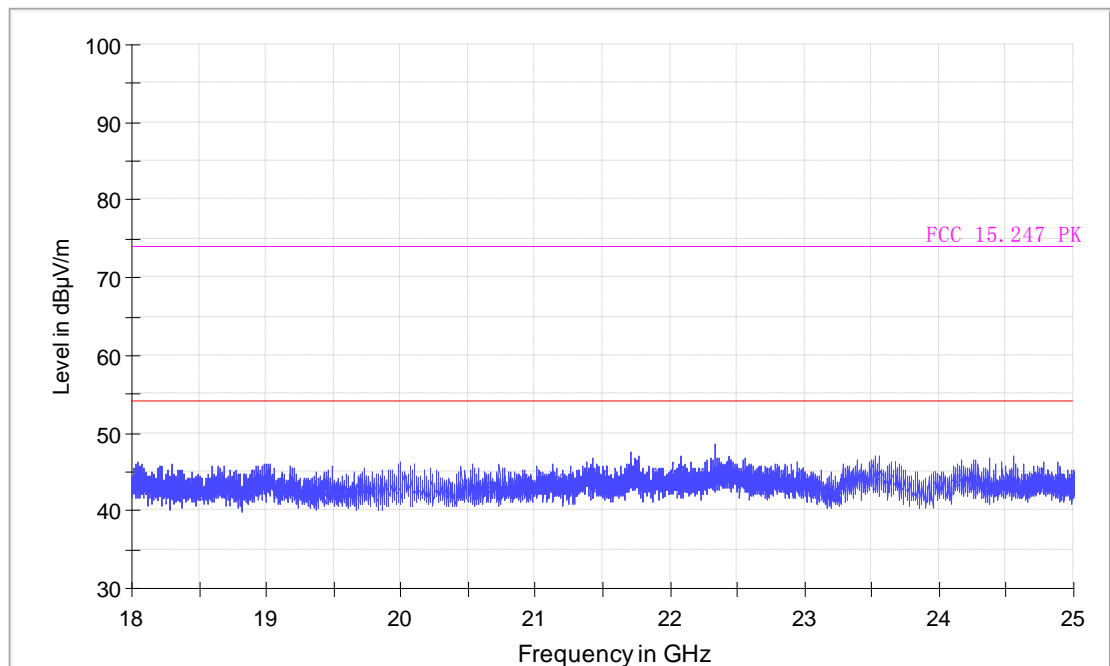
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

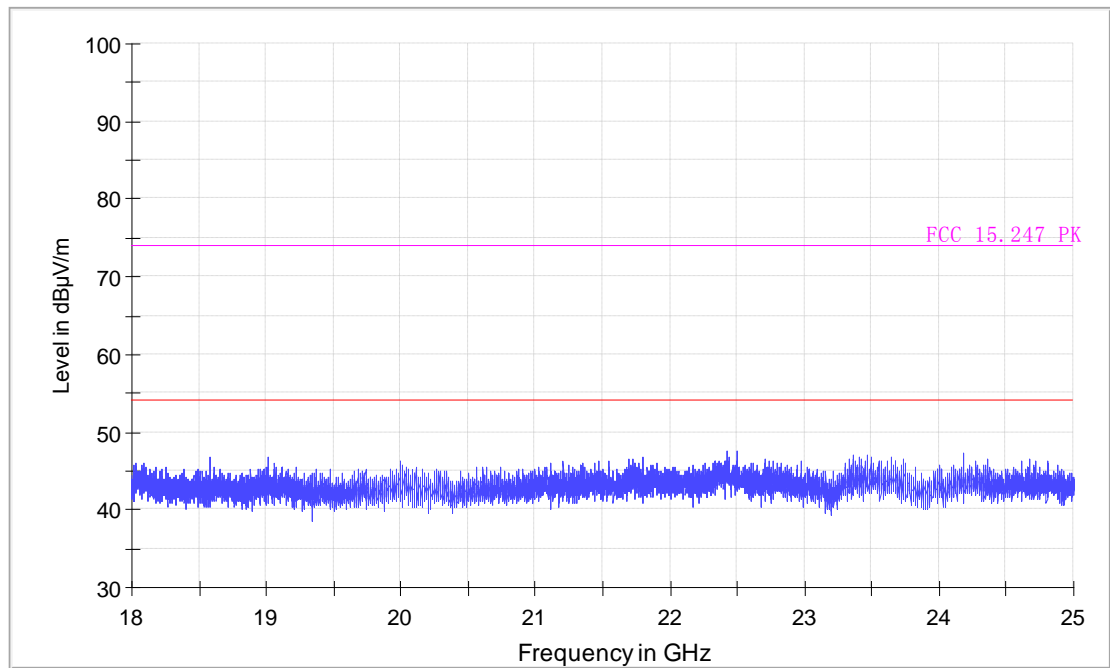
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

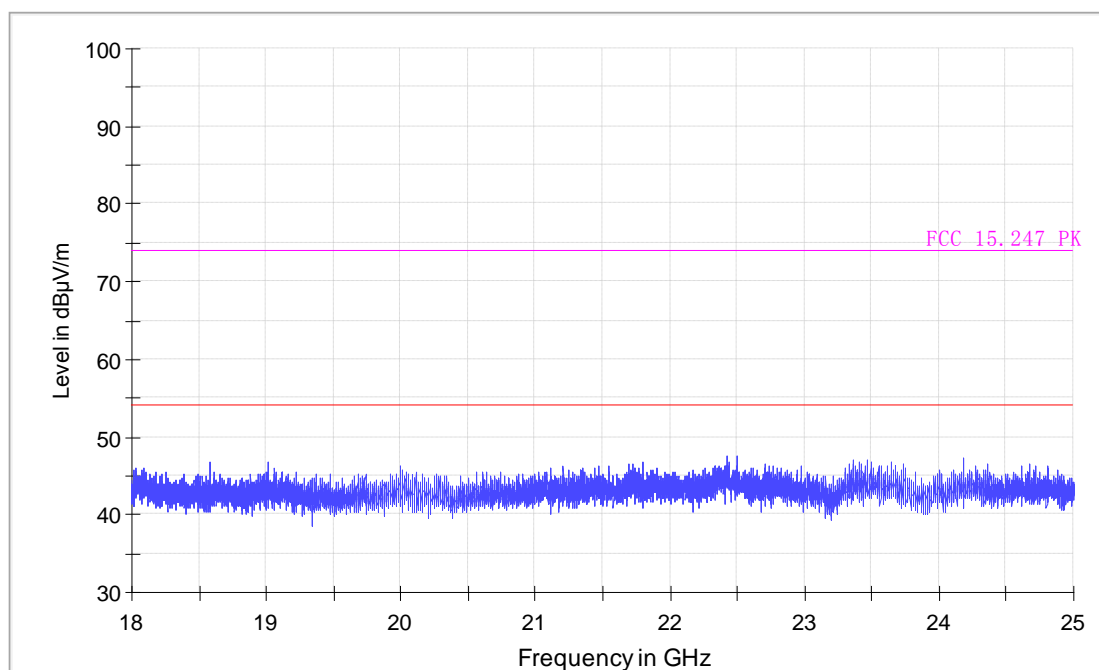
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

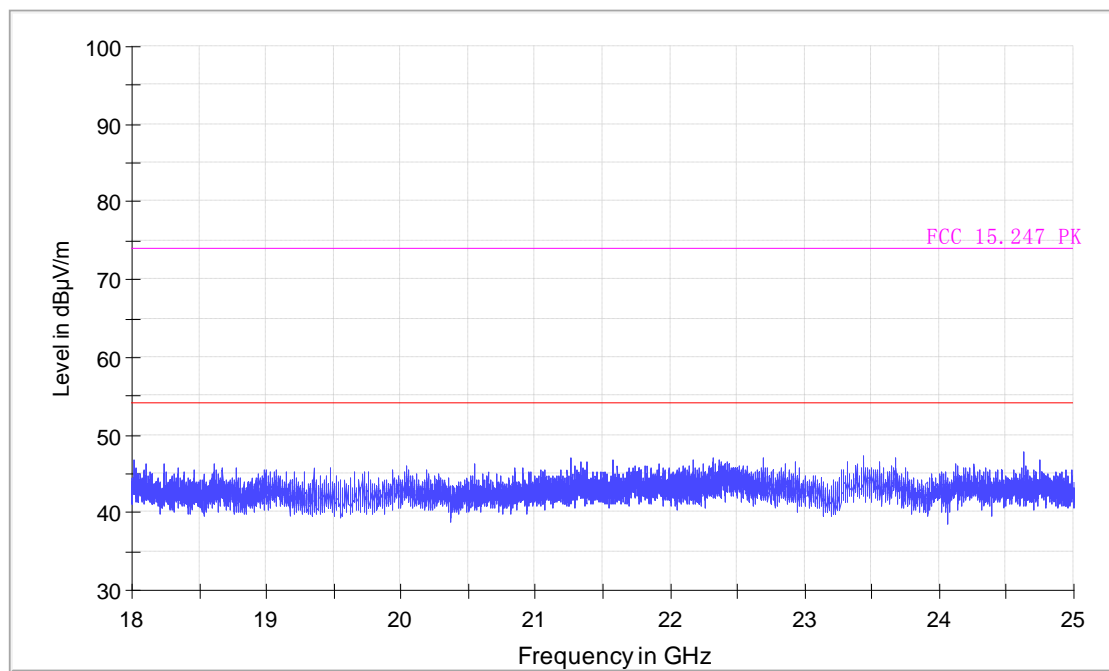
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

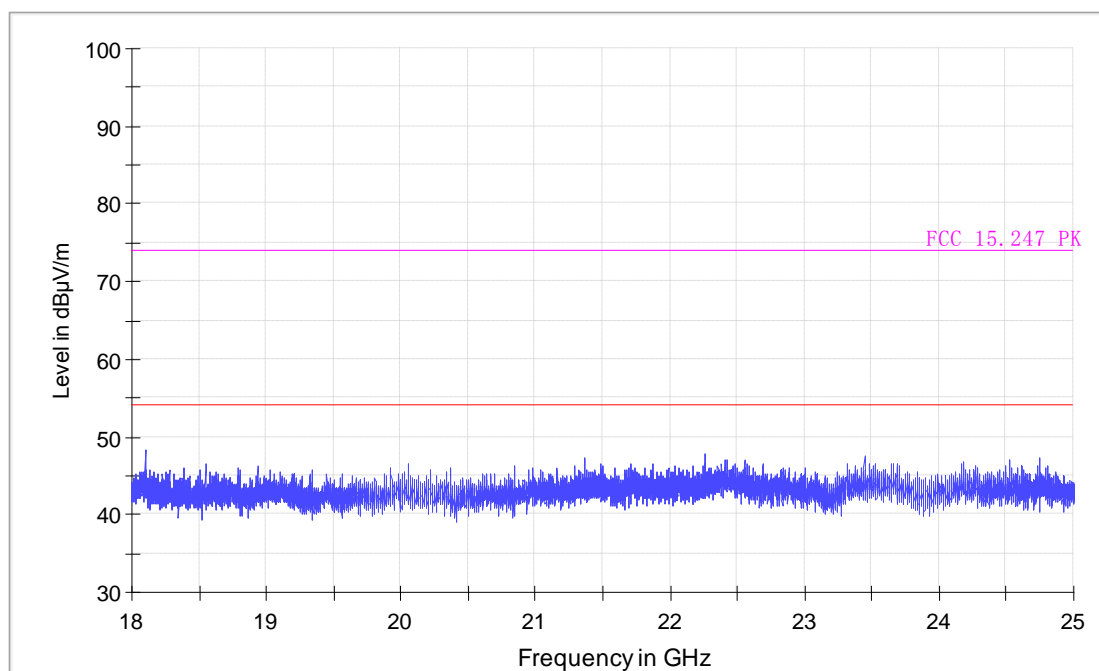
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

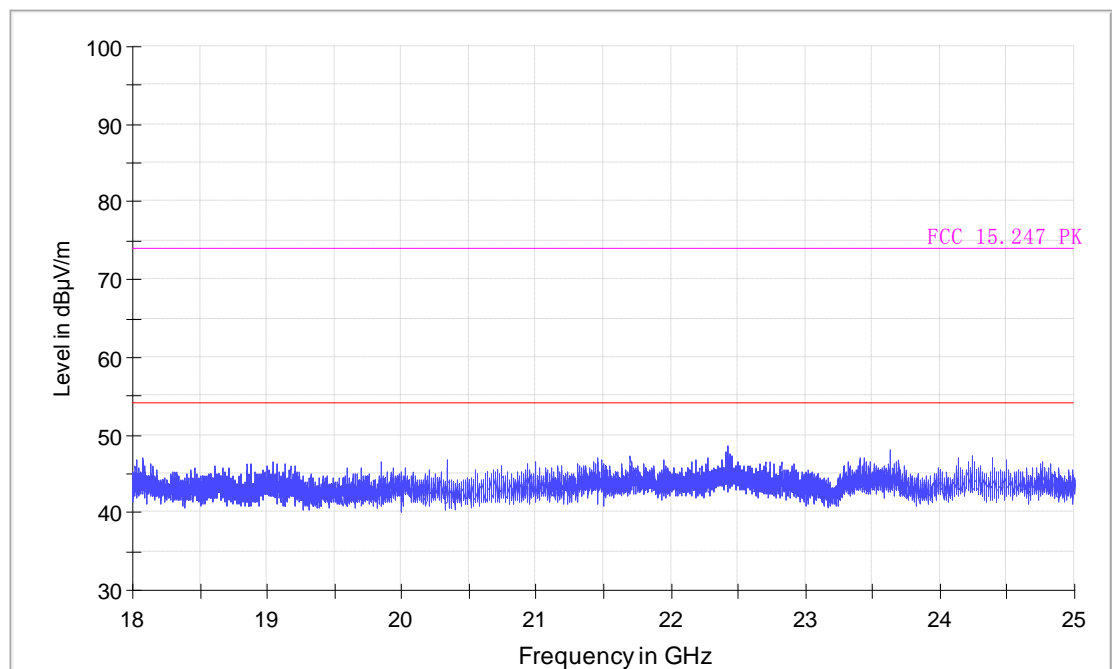
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

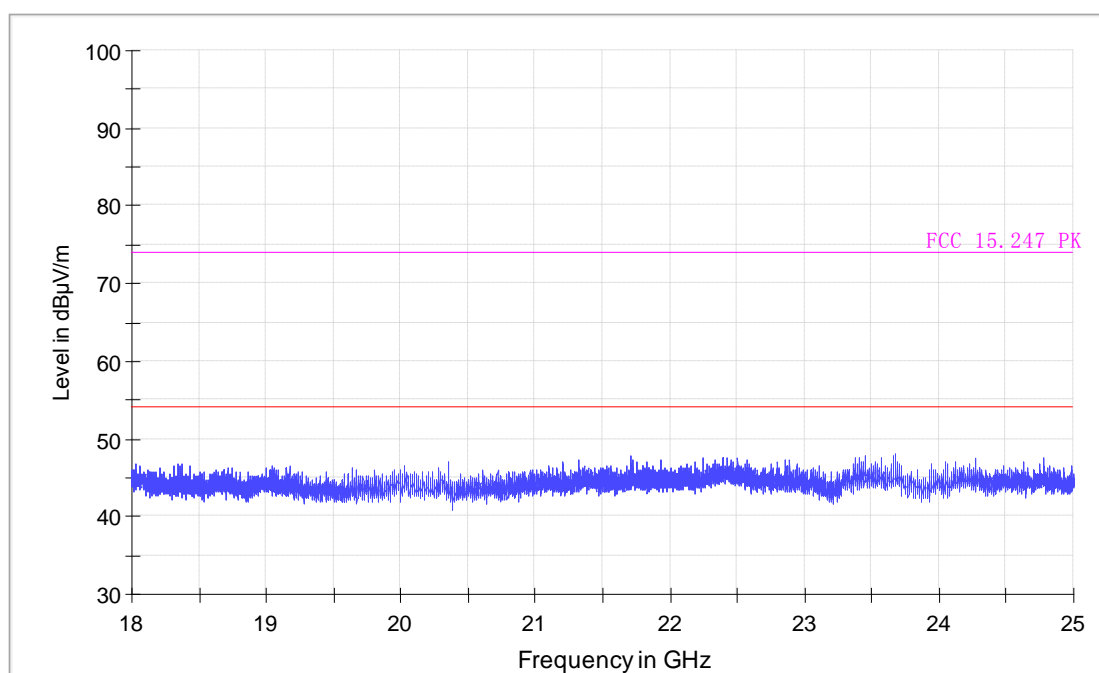
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH6
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

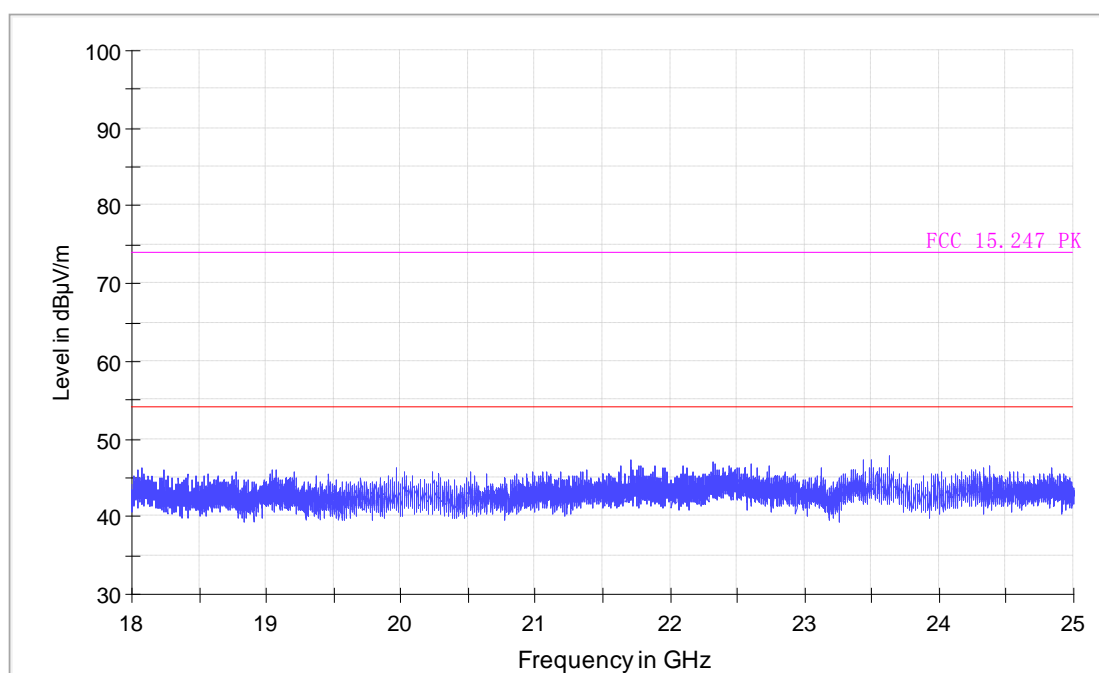
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Radiated Emission

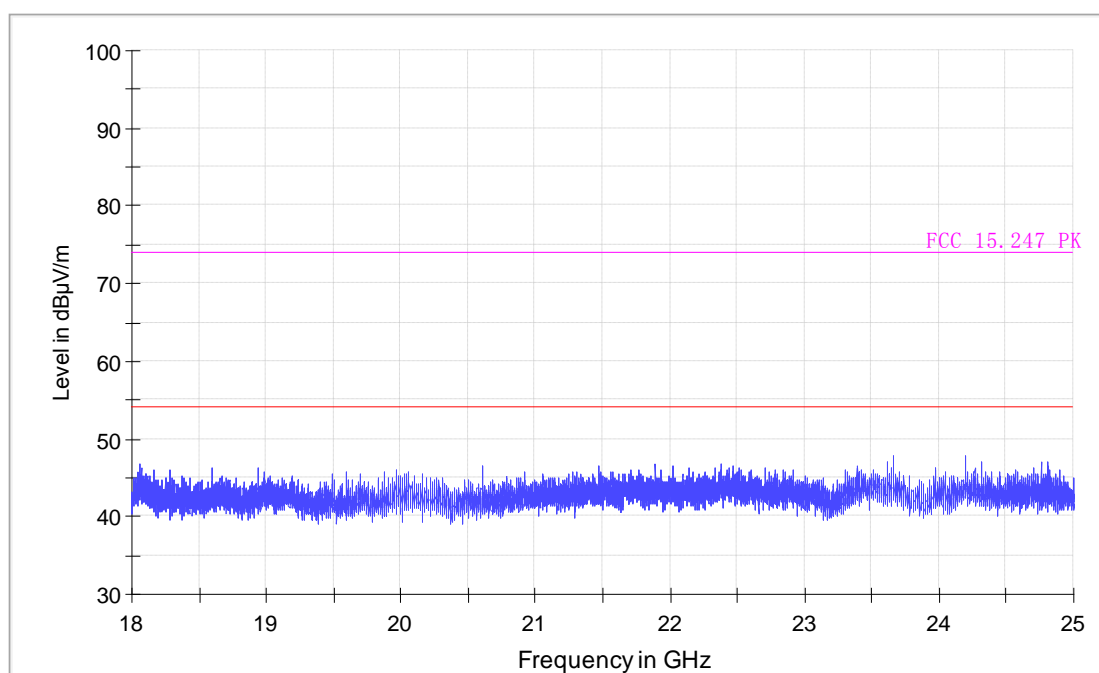
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 18-26.5GHz



Band edge

11b

CH1

Radiated Emission

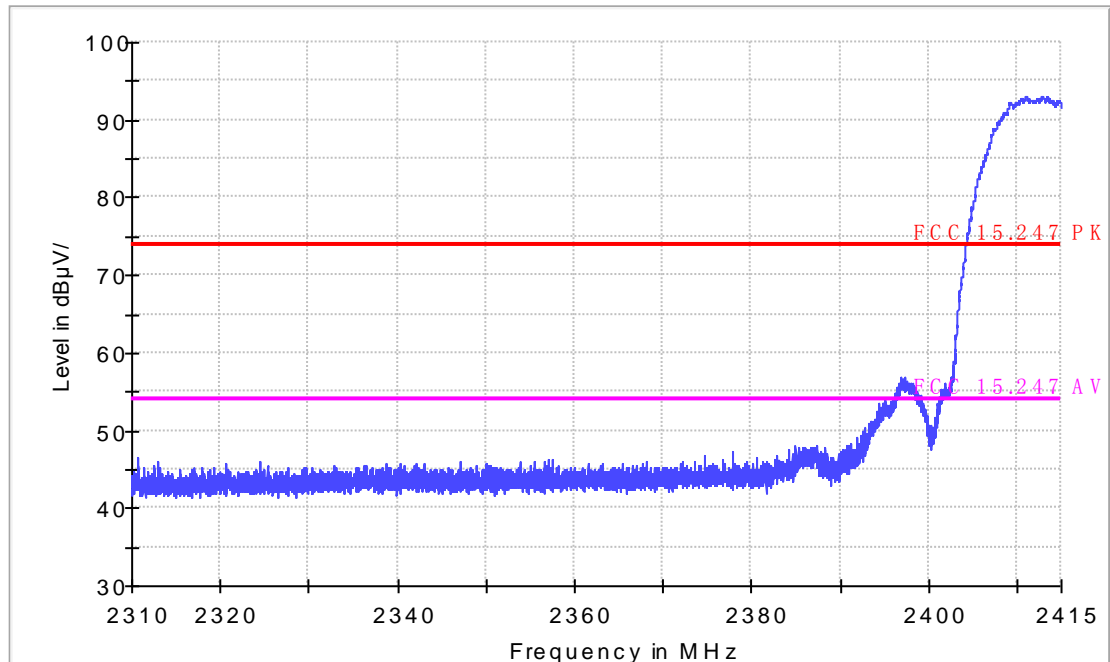
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

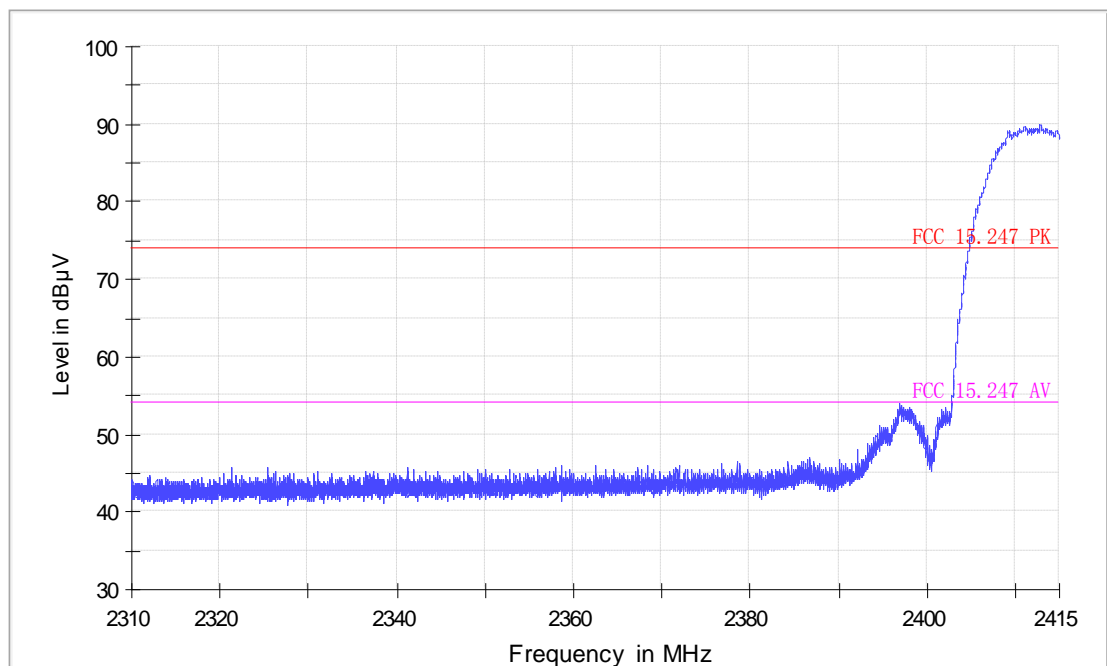
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Radiated Emission

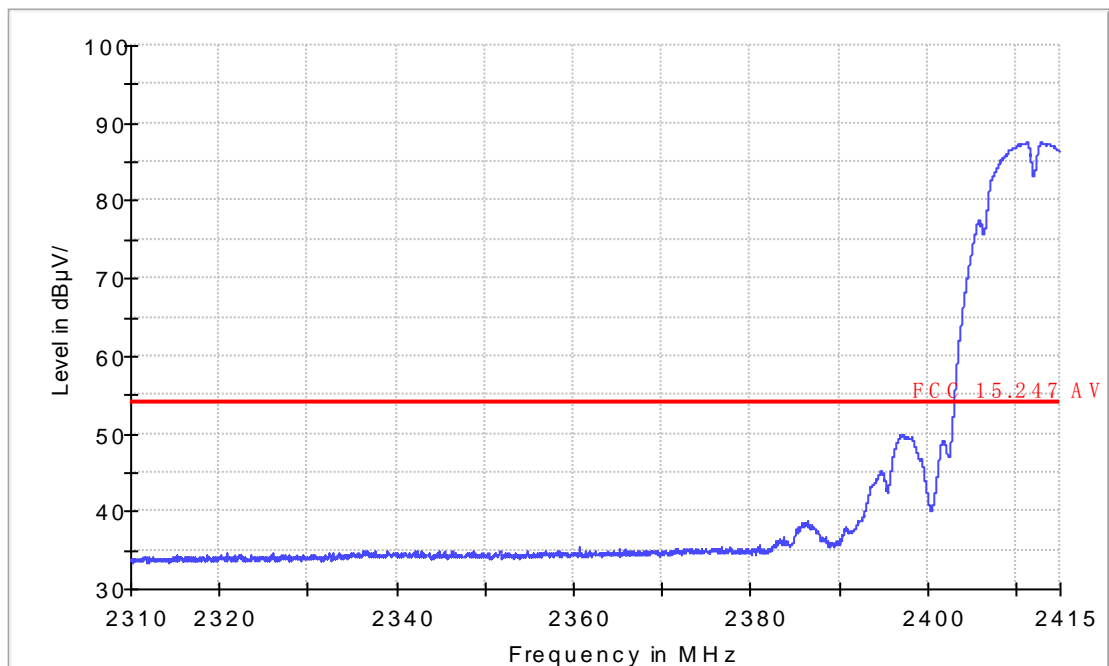
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Band edge

11g

CH1

Radiated Emission

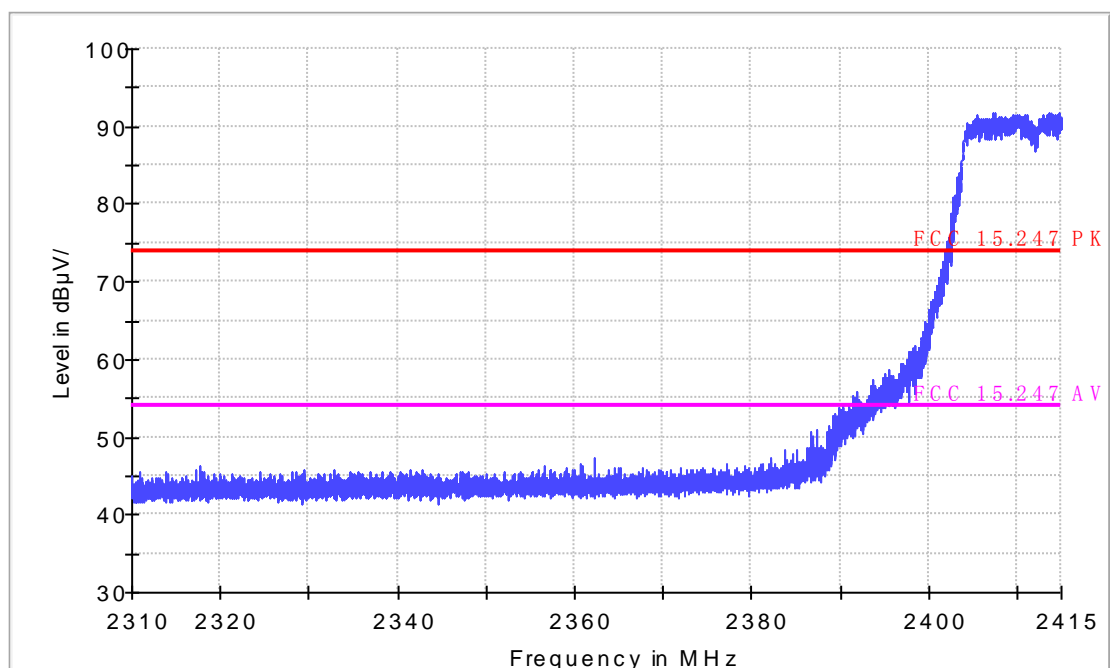
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

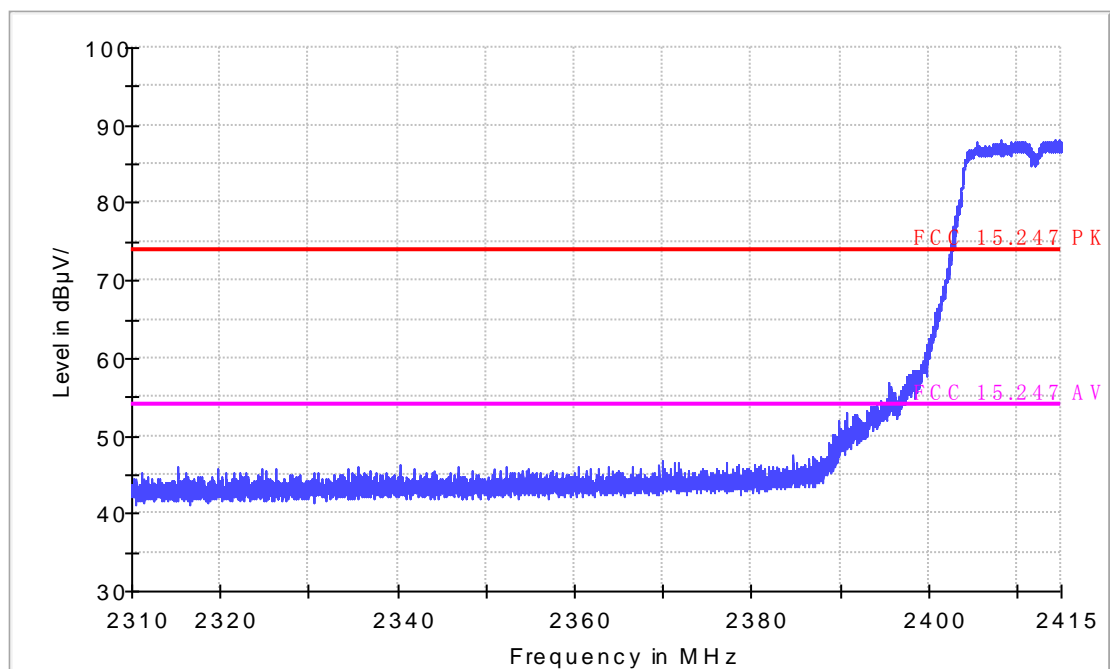
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

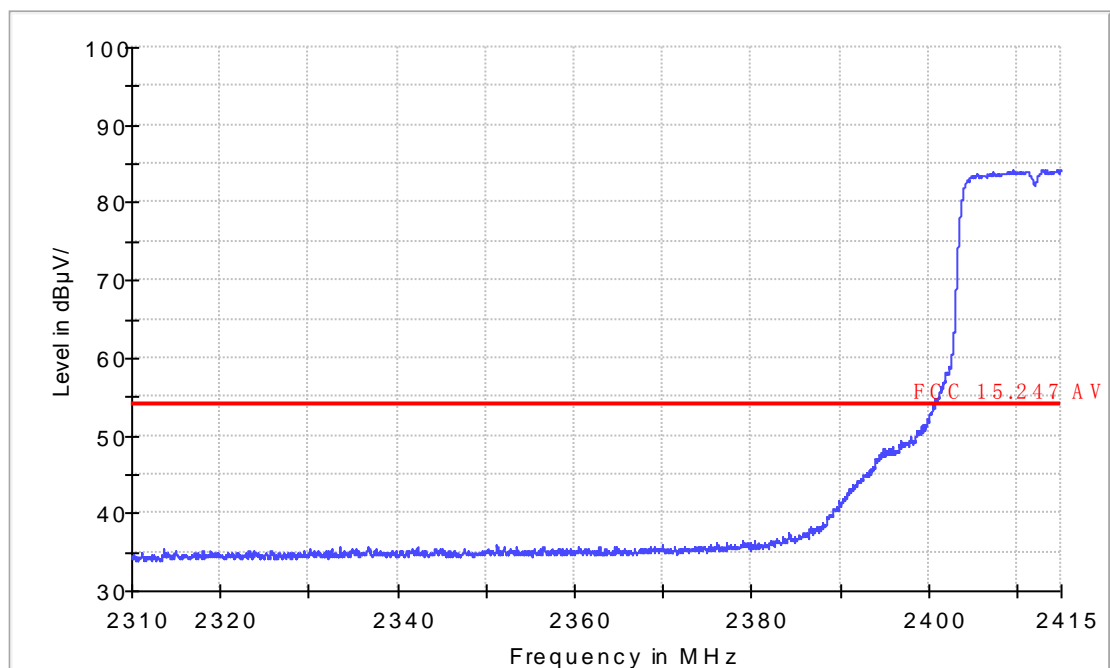
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Radiated Emission

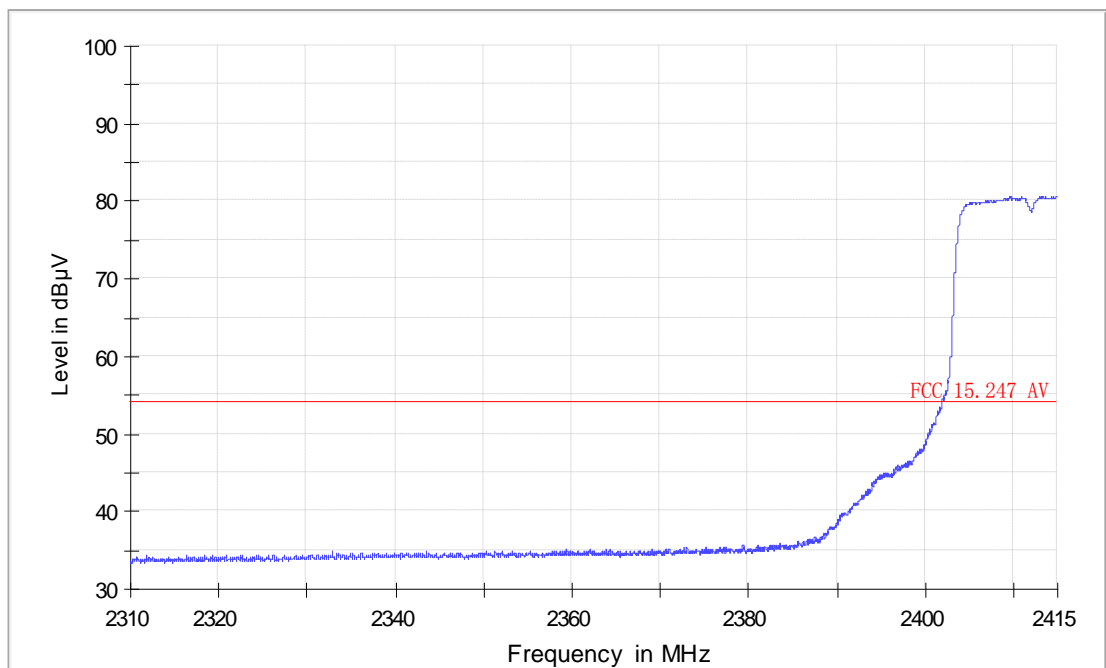
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH1
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Band edge

11b

CH11

Radiated Emission

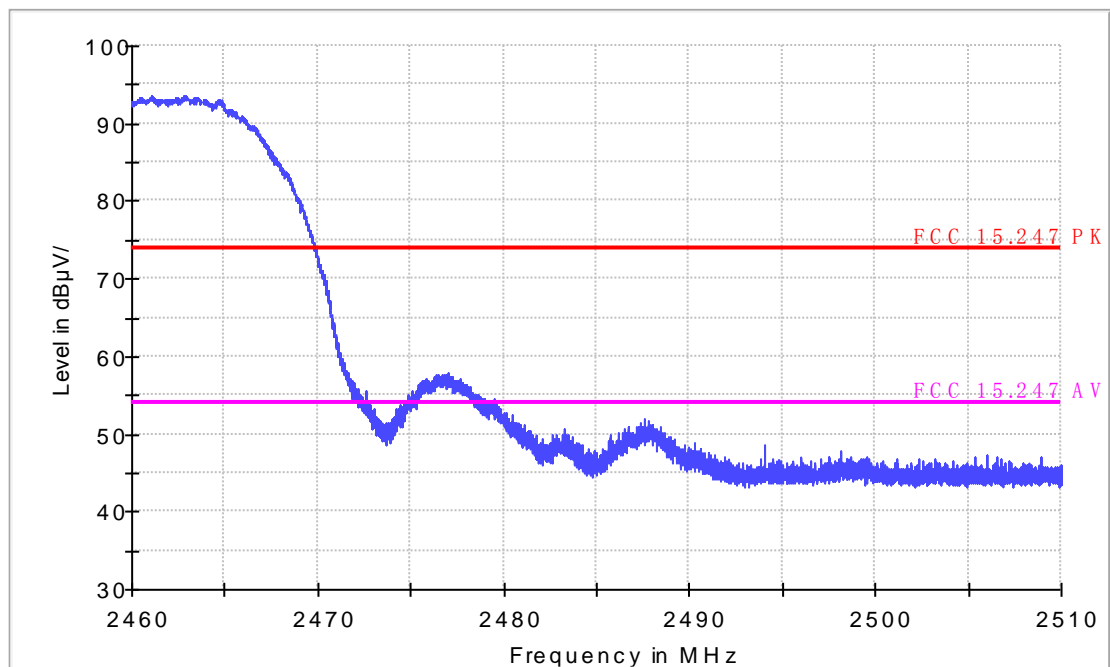
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

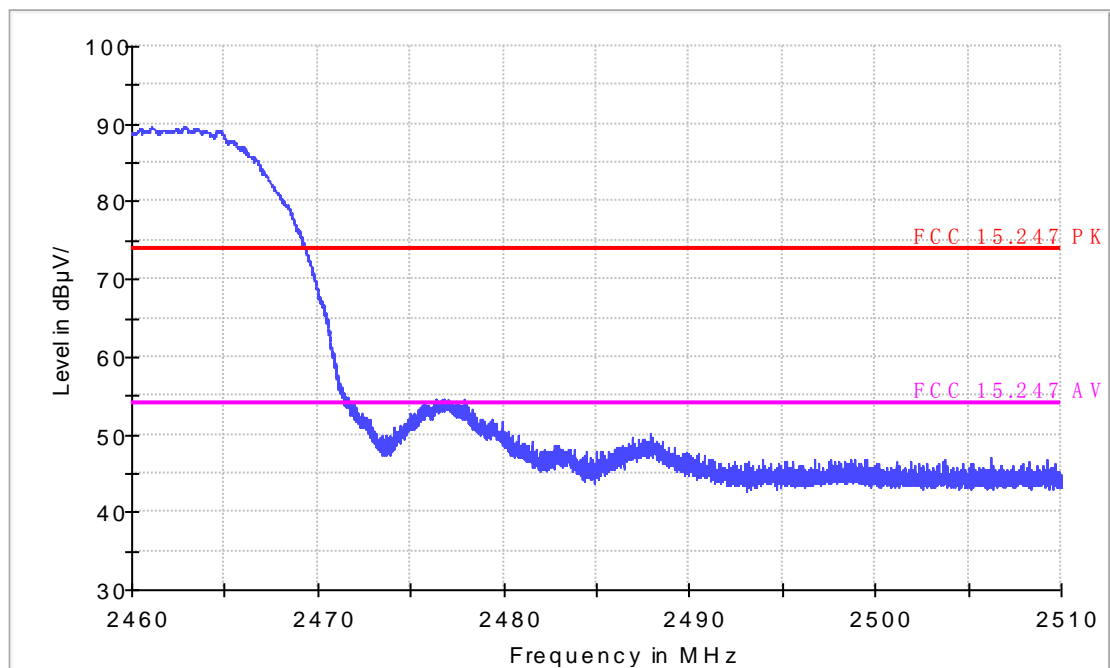
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

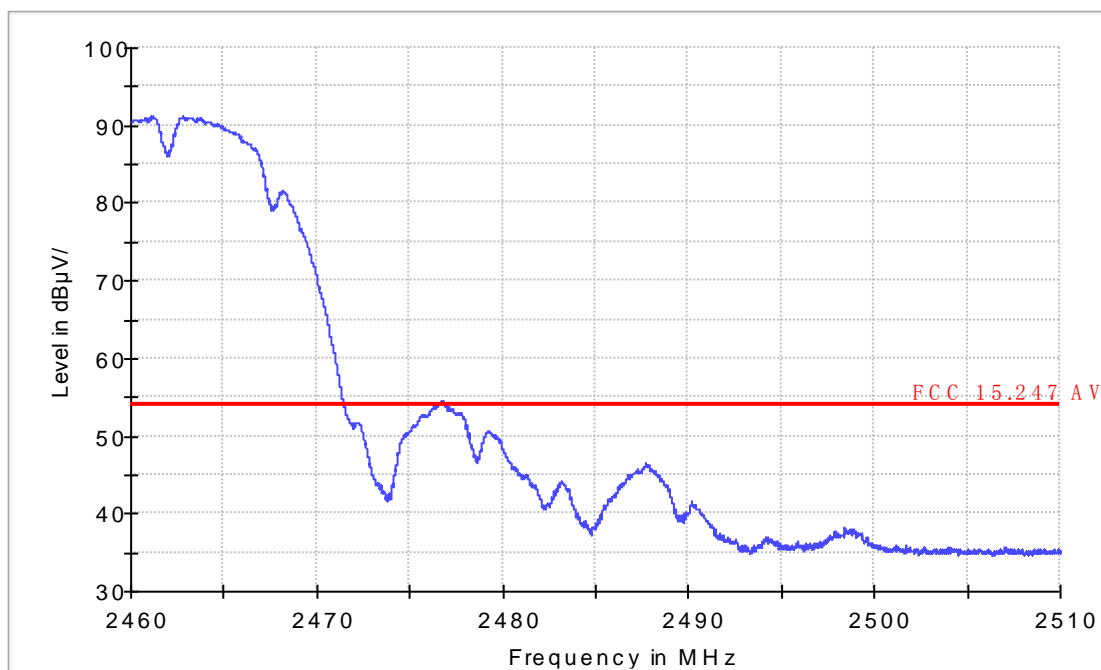
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Radiated Emission

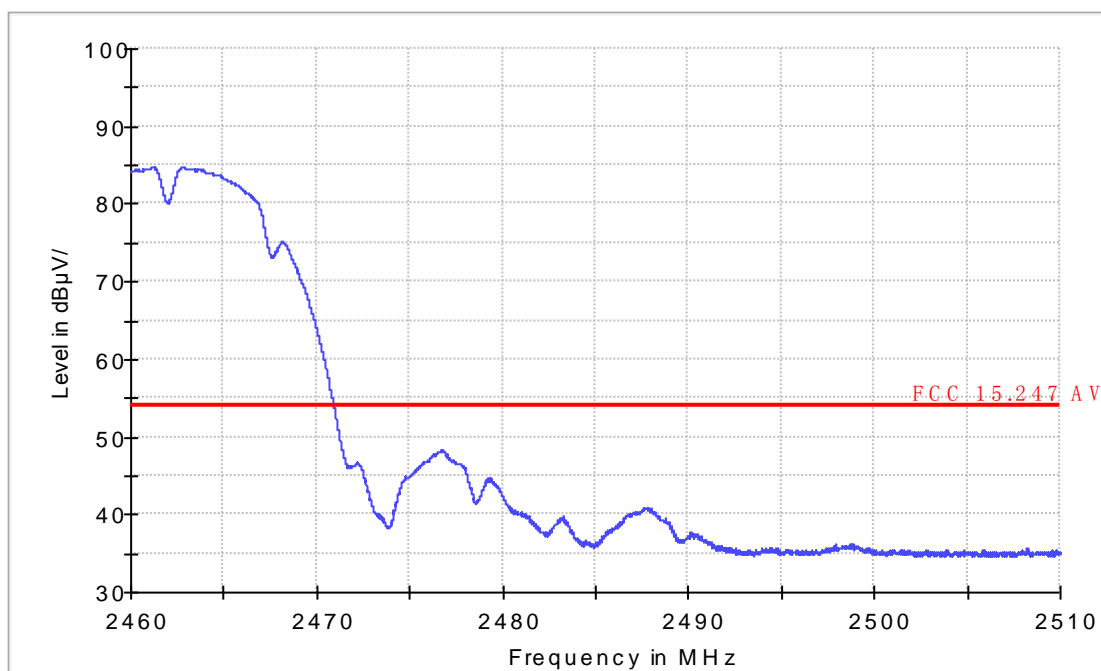
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11b CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Band edge

11g

CH11

Radiated Emission

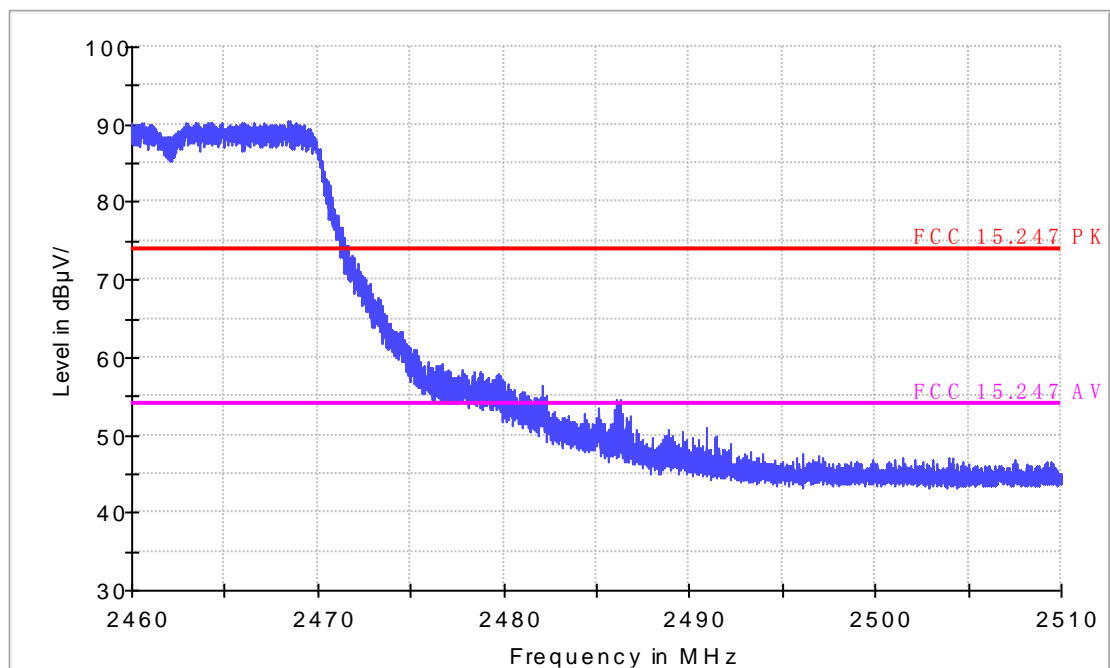
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

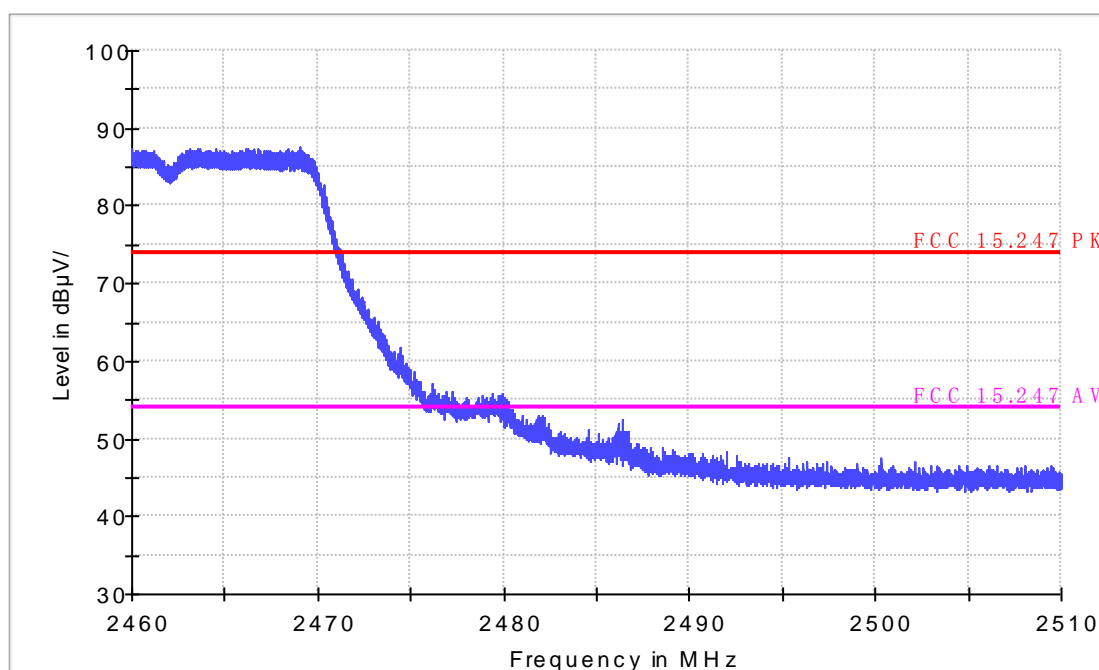
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-PK



Radiated Emission

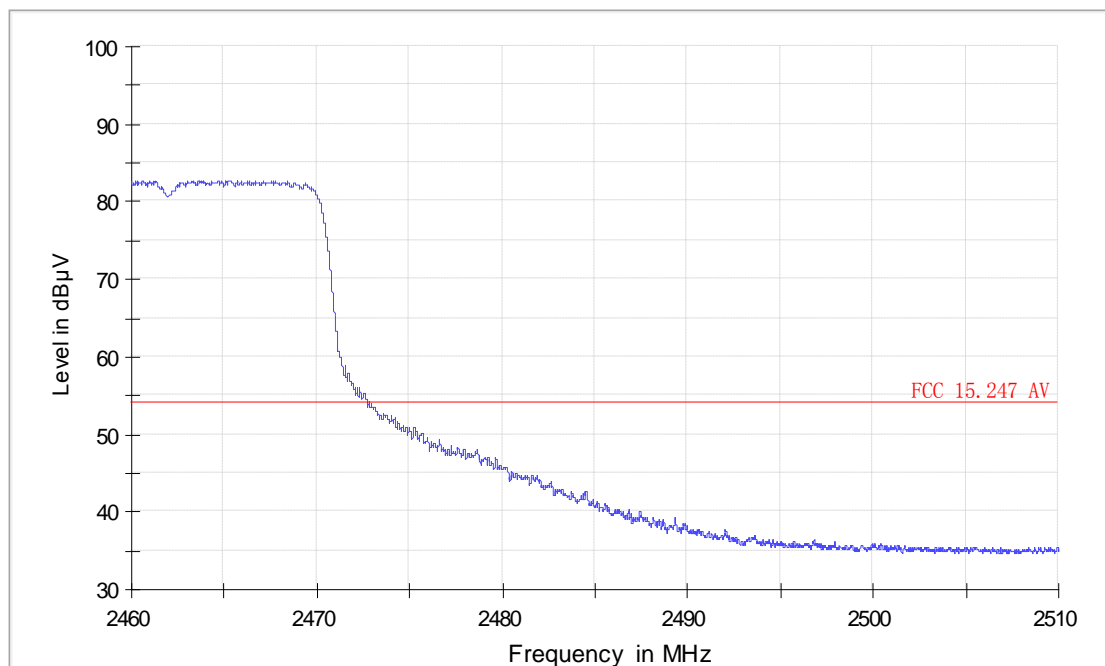
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Horizontal
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



Radiated Emission

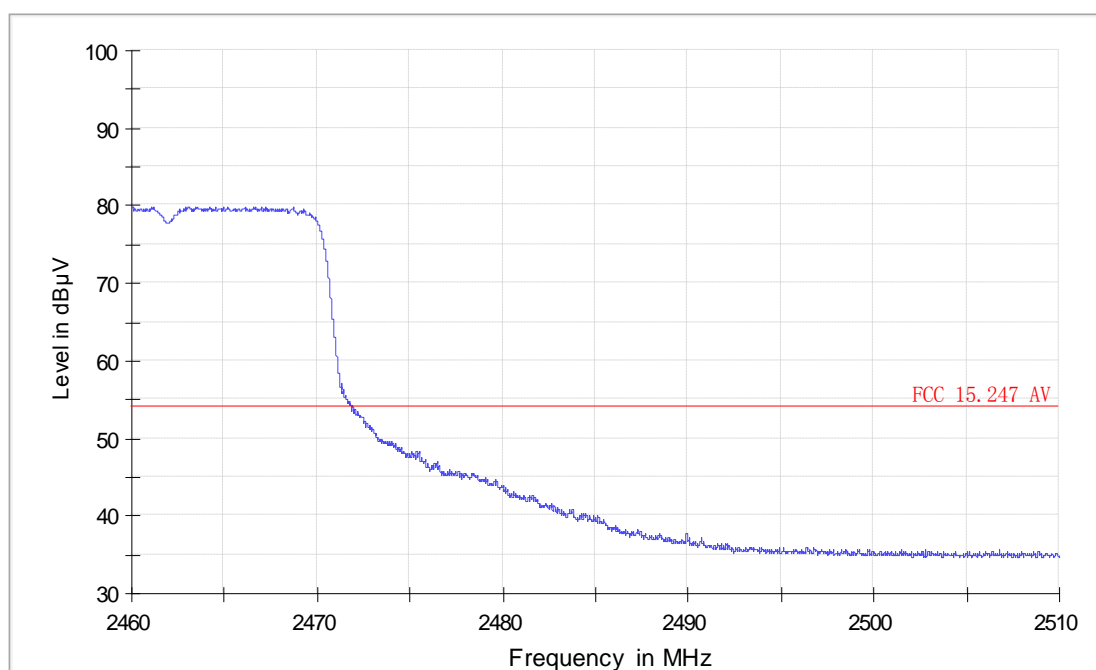
EUT Information

EUT Model Name: HRT500i
Operation mode: Wifi 11g CH11
Test Voltage:
Comment:

Common Information

Test Site: SMQ EMC Lab.
Environment
Antenna Polarization: Vertical
Operator Name:
Comment:

FCC Electric Field Strength 2.4GHz Bandedge-AV



10.CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT

10.1.Test Standard and Limit

10.1.1.Test Standard

FCC Part 15 15.207

10.1.2.Test Limit

Table 11 Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency

* The lower limit shall apply at the transition frequency.

10.2.Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

The bandwidth of EMI test receiver is set at 9kHz.

10.3.Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

10.4.Test Data

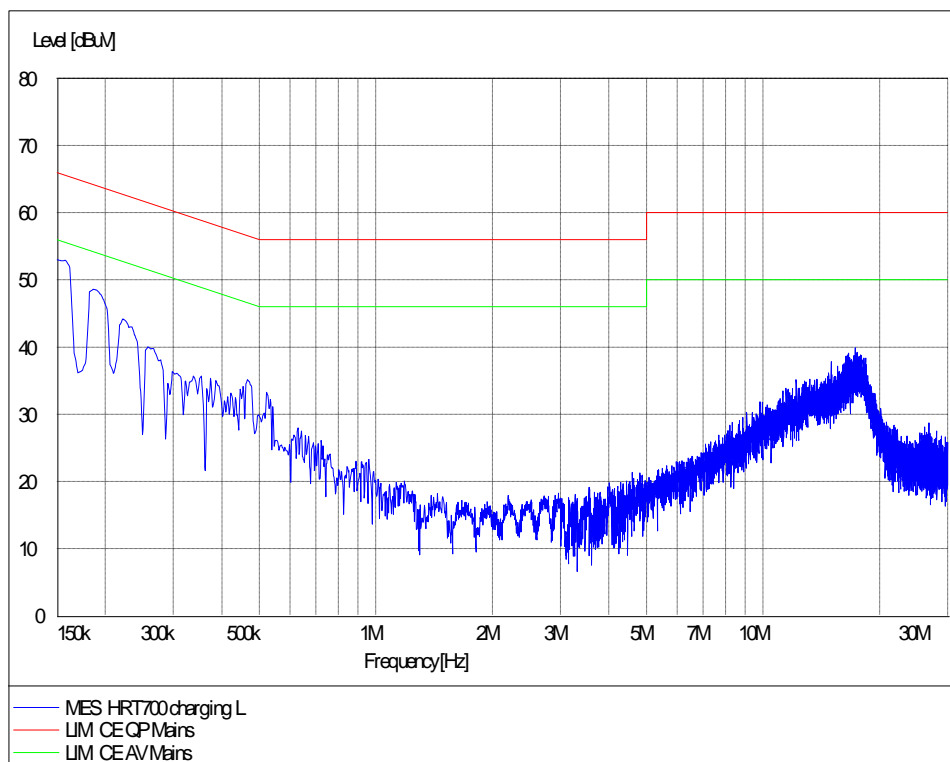
The emissions don't show in below are too low against the limits. Refer to the test curves.

Table 12 Conducted Disturbance Test Data

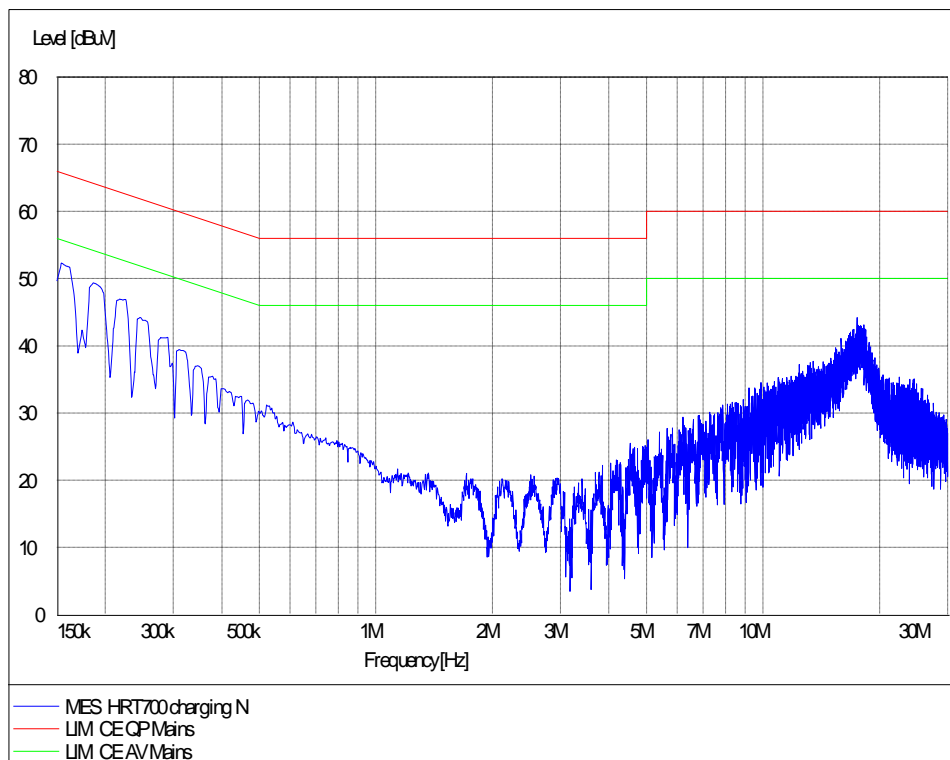
Model No.: HRT500i								
Test mode: Charging and transmitter								
	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
			Reading (dB μ V)	Emission Level (dB μ V)	Limits (dB μ V)	Reading (dB μ V)	Emission Level (dB μ V)	Limits (dB μ V)
Line	0.156	9.7	40.0	49.7	65.7	24.8	34.5	55.7
	0.186	9.7	35.8	45.5	64.2	18.2	27.9	54.2
	0.222	9.7	31.2	40.9	62.7	14.1	23.8	52.7
	0.258	9.7	26.0	35.7	61.5	8.9	18.6	51.5
	0.466	9.7	20.1	29.8	56.6	7.0	16.7	46.6
	17.369	9.9	24.9	34.8	60	19.6	29.5	50
Neutral	0.158	9.7	39.5	49.2	65.6	25.9	35.6	55.6
	0.186	9.7	36.3	46	64.2	19.9	29.6	54.2
	0.218	9.7	33.8	43.5	62.9	18.2	27.9	52.9
	0.246	9.7	29.4	39.1	61.9	10.9	20.6	51.9
	0.282	9.7	28.1	37.8	60.8	12.2	21.9	50.8
	17.536	9.9	28.4	38.3	60	22.9	32.8	50

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)
 3. The other emission levels were very low against the limit.

EUT: HRT500i
Manufacturer:
Operating Condition: Charging and transmitter
Test Site:
Operator:
Test Specification: L
Comment: AC 120V/60Hz



EUT: HRT500i
Manufacturer:
Operating Condition: Charging and transmitter
Test Site:
Operator:
Test Specification: N
Comment: AC 120V/60Hz



11.ANTENNA REQUIREMENT

According to 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.

The EUT has a built in antenna which is integrated inside the enclosure, this is permanently attached antenna and meets the requirements of this section.