



# CTC Laboratories, Inc.

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## TEST REPORT

**Report No.** .....: **CTC20221329E01**

**FCC ID**.....: **2AKKS-DV02V**

**Applicant**.....: **Shenzhen HDKing Electronics Co.,Ltd**

Address.....: Room 101 Building 1, Huasen Factory, No.142 Honghu Road, Yanluo Street, Baoan District, Shenzhen, China

Manufacturer.....: Shenzhen HDKing Electronics Co.,Ltd

Address.....: Room 101 Building 1, Huasen Factory, No.142 Honghu Road, Yanluo Street, Baoan District, Shenzhen, China

**Product Name**.....: **Video Camcorder**

Trade Mark.....: HDKing

Model/Type reference.....: DV02V

Listed Model(s) .....: DV02J,DV03, DV05, DV06, DV08,DV09,DC601, DC602, DC603, DC605,DC606, DV06, DV01, AC08, AC11, AC12, AC13, ZX3290

**Standard**.....: **FCC CFR Title 47 Part 15 Subpart C Section 15.247**

Date of receipt of test sample...: April 29, 2022

Date of testing.....: April 29, 2022 to May 11, 2022

Date of issue.....: May 11, 2022

**Result**.....: **PASS**

Compiled by:  
(Printed name+signature) Zoe Xie 

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Supervised by:  
(Printed name+signature) Miller Ma 

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Approved by:  
(Printed name+signature) Totti Zhao 

**Testing Laboratory Name**.....: **CTC Laboratories, Inc.**

Address.....: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

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# 1. TEST SUMMARY

## 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

## 1.2. Report version

Revised No.	Date of issue	Description
01	May 11, 2022	Original



### 1.3. Test Description

FCC Part 15 Subpart C (15.247)			
Test Item	Standard Section	Result	Test Engineer
	FCC		
Antenna Requirement	15.203	Pass	Alicia Liu
Conducted Emission	15.207	Pass	Eva Feng
Radiated Band Edge and Spurious Emissions	15.205&15.209&15.247(d)	Pass	Alicia Liu
Conducted Band Edge and Spurious Emissions	15.247(d)	Pass	Alicia Liu
6dB Bandwidth	15.247(a)(2)	Pass	Alicia Liu
Conducted Max Output Power	15.247(b)(3)	Pass	Alicia Liu
Power Spectral Density	15.247(e)	Pass	Alicia Liu
Transmitter Radiated Spurious	15.209&15.247(d)	Pass	Alicia Liu

Note: The measurement uncertainty is not included in the test result.



## 1.4. Test Facility

### CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

### Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

#### A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. 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 951311, Aug 26, 2017.

## 1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.08 dB	(1)
Radiated Emissions 30~1000MHz	4.51 dB	(1)
Radiated Emissions 1~18GHz	5.84 dB	(1)
Radiated Emissions 18~40GHz	6.12 dB	(1)
Occupied Bandwidth	-----	(1)

**Note (1):** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

## 1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa



## 2. GENERAL INFORMATION

### 2.1. Client Information

Applicant:	Shenzhen HDKing Electronics Co.,Ltd
Address:	Room 101 Building 1, Huasen Factory, No.142 Honghu Road, Yanluo Street, Baoan District, Shenzhen, China
Manufacturer:	Shenzhen HDKing Electronics Co.,Ltd
Address:	Room 101 Building 1, Huasen Factory, No.142 Honghu Road, Yanluo Street, Baoan District, Shenzhen, China



## 2.2. General Description of EUT

Product Name:	Video Camcorder
Trade Mark:	HDKing
Model/Type reference:	DV02V
Listed Model(s):	DV02J, DV03, DV05, DV06, DV08, DV09, DC601, DC602, DC603, DC605, DC606, DV06, DV01, AC08, AC11, AC12, AC13, ZX3290
Power supply:	DC 5V from USB
Adapter model:	/
Hardware version:	/
Software version:	/
Serial number:	1589992A0111
<b>WIFI 802.11b/ g/ n(HT20)</b>	
Modulation:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK, QPSK, 16QAM, 64QAM)
Operation frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz
Channel number:	802.11b/g/n(HT20):11channels
Channel separation:	5MHz
Antenna type:	Integral Antenna
Antenna gain:	1.5dBi Max





### 2.3. Accessory Equipment information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	X220	R9-NCMYL 12/04	Lenovo
Adapter	BN035-A05001200	/	HUAKLE
/	/	/	/
Cable Information			
Name	Shielded Type	Ferrite Core	Length
USB	no	no	0.8m
/	/	/	/
Test Software Information			
Name	Versions	Powe level	/
Secure CRT	8.0	38	/



## 2.4. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

Note: CH 01~CH 11 for 802.11b/g/n(HT20)

### Data Rated

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	Data rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	HT-MCS0

### Test mode

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit(100% duty cycle).
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.



## 2.5. Measurement Instruments List

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	KEYSIGHT	N9020A	100231	Dec. 25, 2022
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2023
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 25, 2022
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 25, 2022
5	Power Sensor	Agilent	U2021XA	MY5365004	Mar. 15, 2023
6	Power Sensor	Agilent	U2021XA	MY5365006	Mar. 15, 2023
7	High and low temperature box	ESPEC	MT3035	N/A	Mar. 24, 2023
8	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	102414	Dec. 25, 2022
9	300328 v2.2.2 test system	TONSCEND	v2.6	/	/

Radiated emission(3m chamber 2)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-1013	Jan. 12, 2023
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 24, 2022
3	Spectrum Analyzer	R&S	FSU26	100105	Dec. 25, 2022
4	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 15, 2023
5	Pre-Amplifier	SONOMA	310	186194	Dec. 25, 2022
6	Low Noise Pre-Amplifier	EMCI	EMC051835	980075	Dec. 25, 2022
7	Test Receiver	R&S	ESCI7	100967	Dec. 25, 2022

Radiated emission(3m chamber 3)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-759	Nov. 09, 2023
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 24, 2022
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 25, 2022
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 25, 2022
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 25, 2022

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 25, 2022
2	LISN	R&S	ENV216	101113	Dec. 25, 2022
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 25, 2022

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Test software				
Item	Test Description	Manufacturer	Model No.	Version
1	Radiated emission/ Conducted Emission	Farad	EZ-EMC	RA-03A1

Note:1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.

### 3. TEST ITEM AND RESULTS

#### 3.1. Conducted Emission

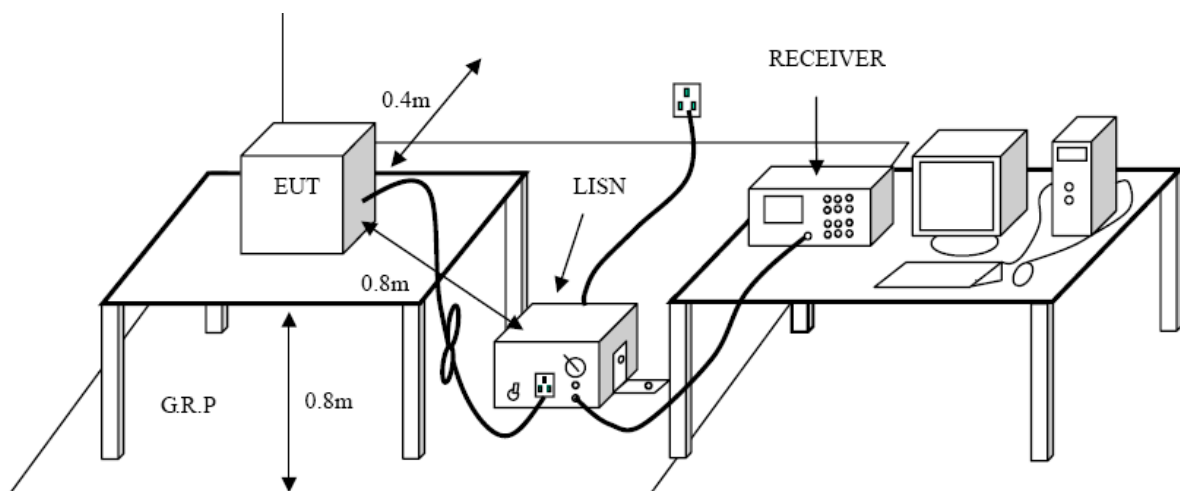
**Limit**

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

**Test Configuration**



**Test Procedure**

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

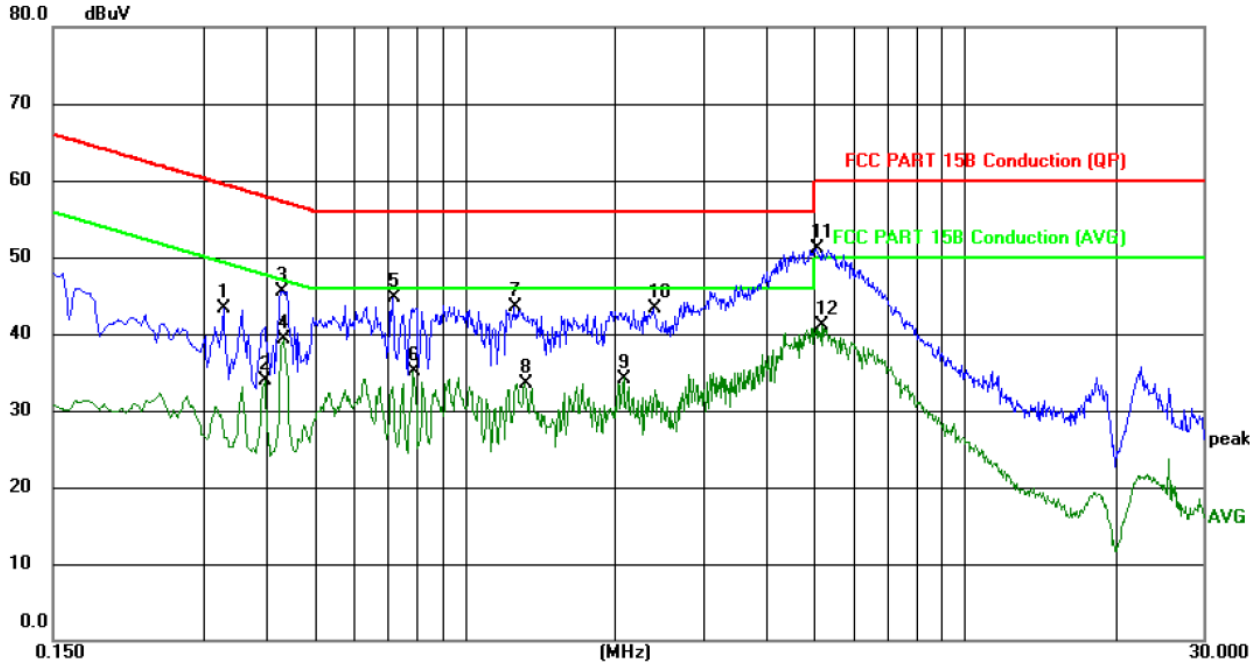


**Test Mode:**

Please refer to the clause 2.4.

**Test Results**

<b>Test Voltage:</b>	AC 120V/60 Hz
<b>Terminal:</b>	Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.3300	33.46	9.91	43.37	59.45	-16.08	QP
2		0.3980	24.08	9.84	33.92	47.90	-13.98	AVG
3		0.4300	35.70	9.85	45.55	57.25	-11.70	QP
4	*	0.4340	29.39	9.85	39.24	47.18	-7.94	AVG
5		0.7180	34.73	9.98	44.71	56.00	-11.29	QP
6		0.7900	25.01	10.02	35.03	46.00	-10.97	AVG
7		1.2579	33.46	10.01	43.47	56.00	-12.53	QP
8		1.3180	23.34	10.11	33.45	46.00	-12.55	AVG
9		2.0780	24.19	10.01	34.20	46.00	-11.80	AVG
10		2.3940	33.20	10.08	43.28	56.00	-12.72	QP
11		5.0380	40.88	10.17	51.05	60.00	-8.95	QP
12		5.1779	31.02	10.18	41.20	50.00	-8.80	AVG

Measure Level= Read Level+ Correct Factor  
Margin = Measure Level-Limit

CTC Laboratories, Inc.

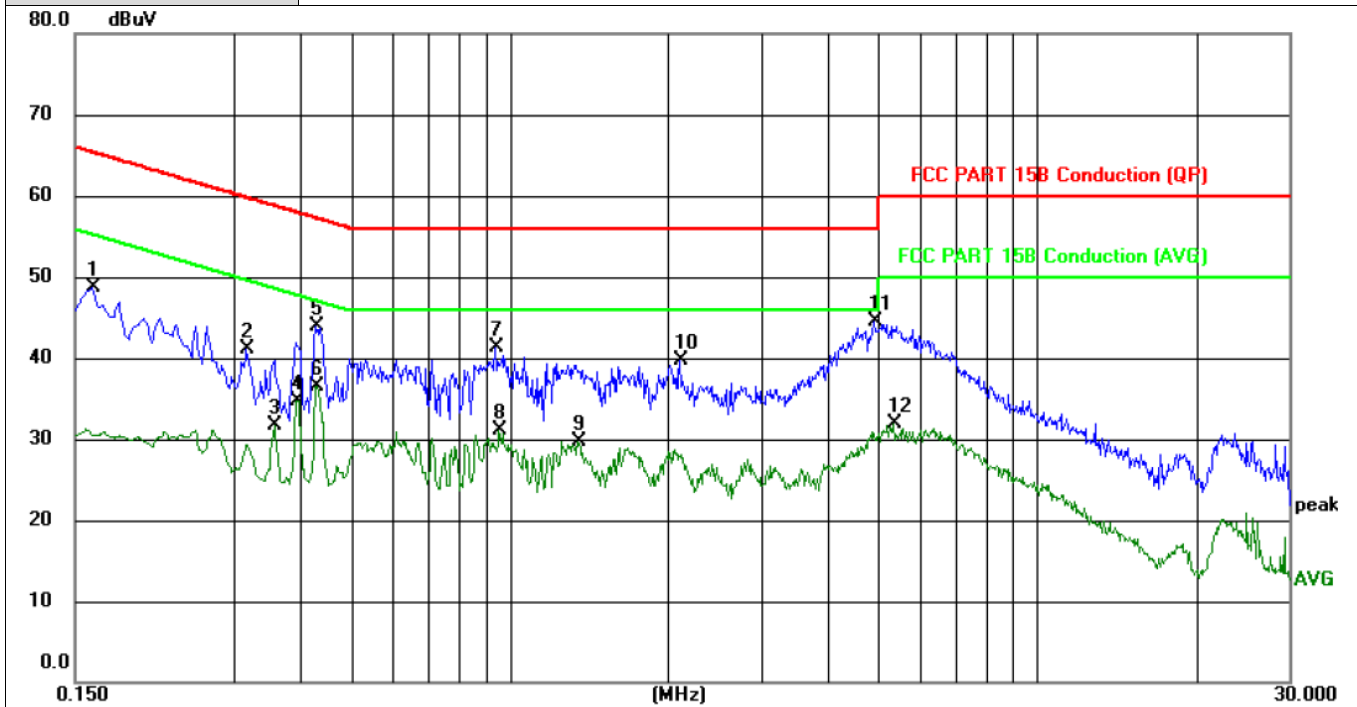
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<b>Test Voltage:</b>	AC 120V/60 Hz
<b>Terminal:</b>	Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.1620	38.95	9.67	48.62	65.36	-16.74	QP
2		0.3180	30.95	10.14	41.09	59.76	-18.67	QP
3		0.3580	21.57	10.10	31.67	48.77	-17.10	AVG
4		0.3940	24.75	10.05	34.80	47.98	-13.18	AVG
5		0.4300	33.86	10.05	43.91	57.25	-13.34	QP
6	*	0.4300	26.44	10.05	36.49	47.25	-10.76	AVG
7		0.9420	31.13	10.25	41.38	56.00	-14.62	QP
8		0.9580	20.84	10.24	31.08	46.00	-14.92	AVG
9		1.3500	19.39	10.36	29.75	46.00	-16.25	AVG
10		2.1060	29.26	10.41	39.67	56.00	-16.33	QP
11		4.9140	34.22	10.34	44.56	56.00	-11.44	QP
12		5.3540	21.63	10.35	31.98	50.00	-18.02	AVG

Measure Level= Read Level+ Correct Factor  
 Margin = Measure Level-Limit

### 3.2. Radiated Emission

#### Limit

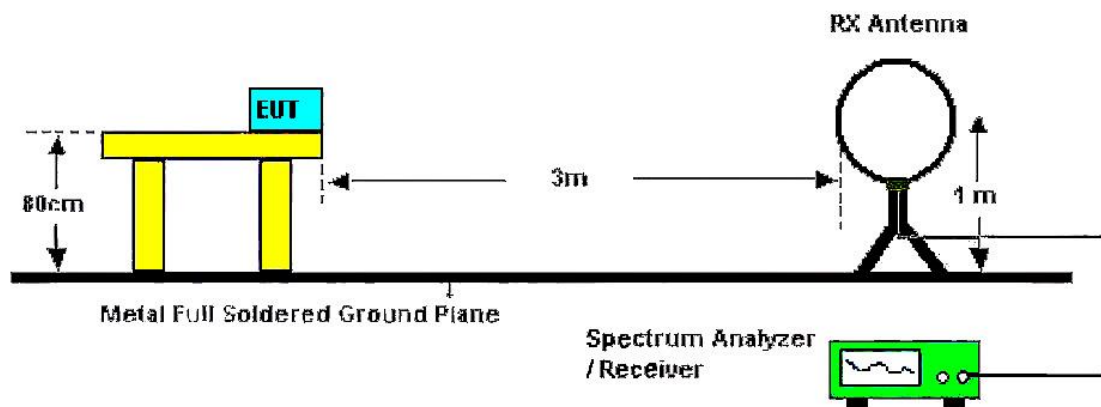
FCC CFR Title 47 Part 15 Subpart C Section 15.209:

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
	74.00	Peak

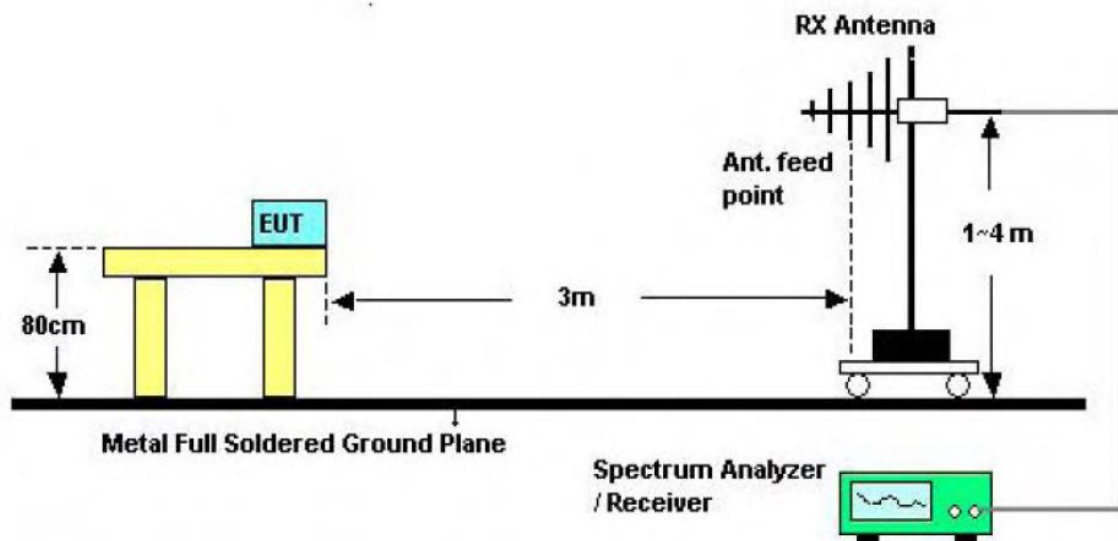
#### Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

#### Test Configuration

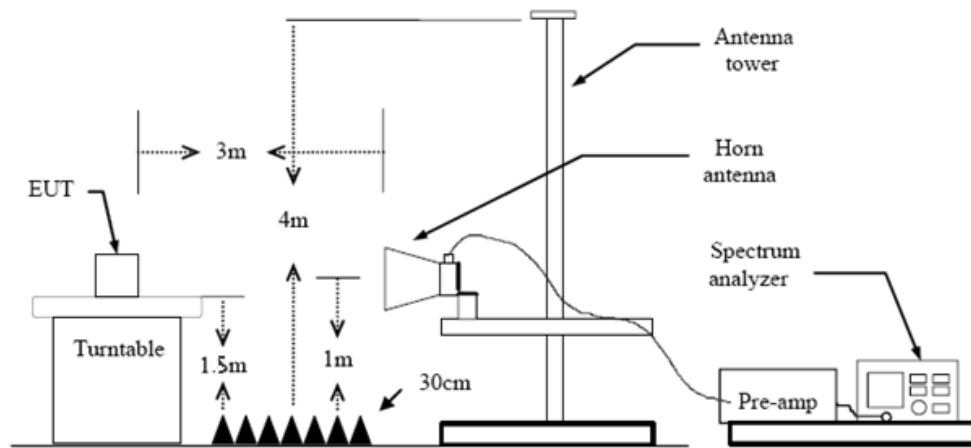


Below 30MHz Test Setup



Below 1000MHz Test Setup





Above 1GHz Test Setup

### Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
  2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
  3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
  4. For each suspected emission, 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 to comply with the guidelines.
  5. Set to the maximum power setting and enable the EUT transmit continuously.
  6. Use the following spectrum analyzer settings
    - (1) Span shall wide enough to fully capture the emission being measured;
    - (2) Below 1 GHz:  
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
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.
    - (3) From 1 GHz to 10<sup>th</sup> harmonic:  
RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW $\geq$ 1/T Peak detector for Average value.
- Note 1: For the 1/T & Duty Cycle please refer to clause 3.8 Duty Cycle.

### Test Mode

Please refer to the clause 2.4.

### Test Result

#### **9 KHz~30 MHz**

From 9 KHz to 30 MHz: Conclusion: PASS

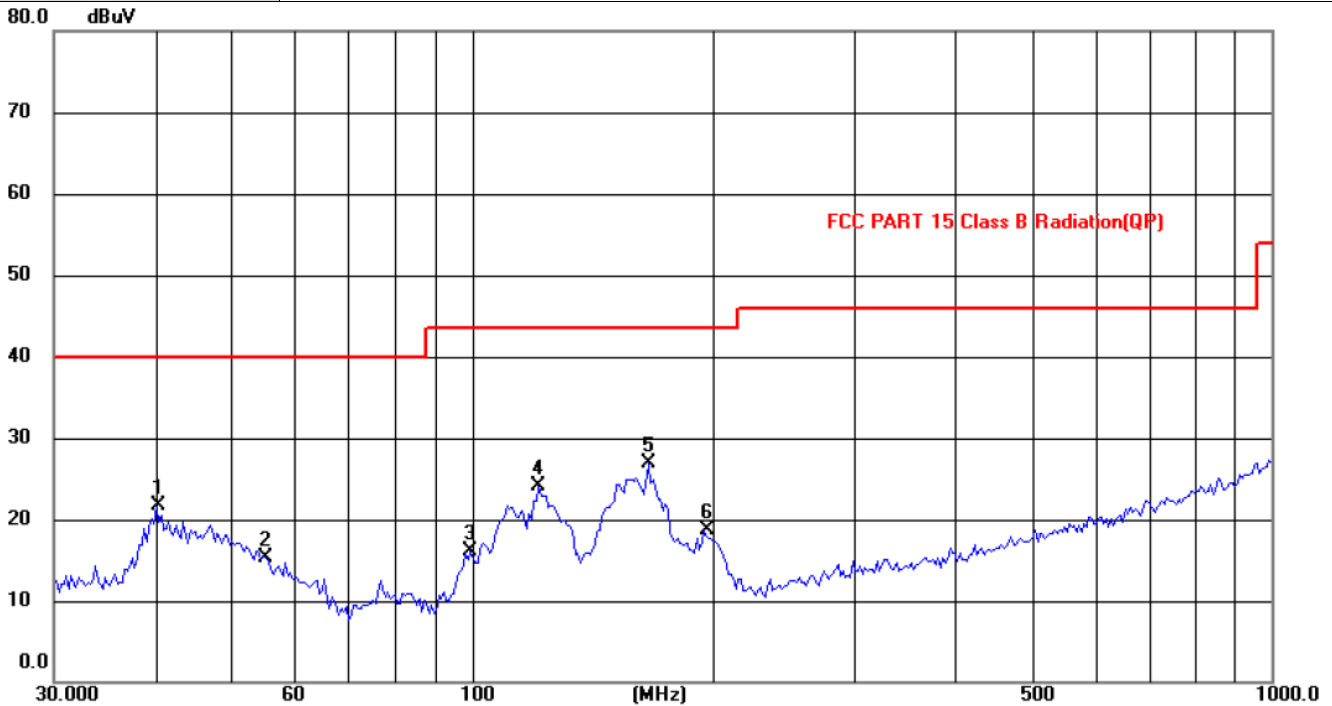
Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

*Pre-scan all antenna, only show the test data for worse case antenna on the test report.*



30MHz-1GHz

Ant. Pol.	Horizontal
Test Mode:	802.11b Mode 2412MHz
Remark:	Only worse case is reported

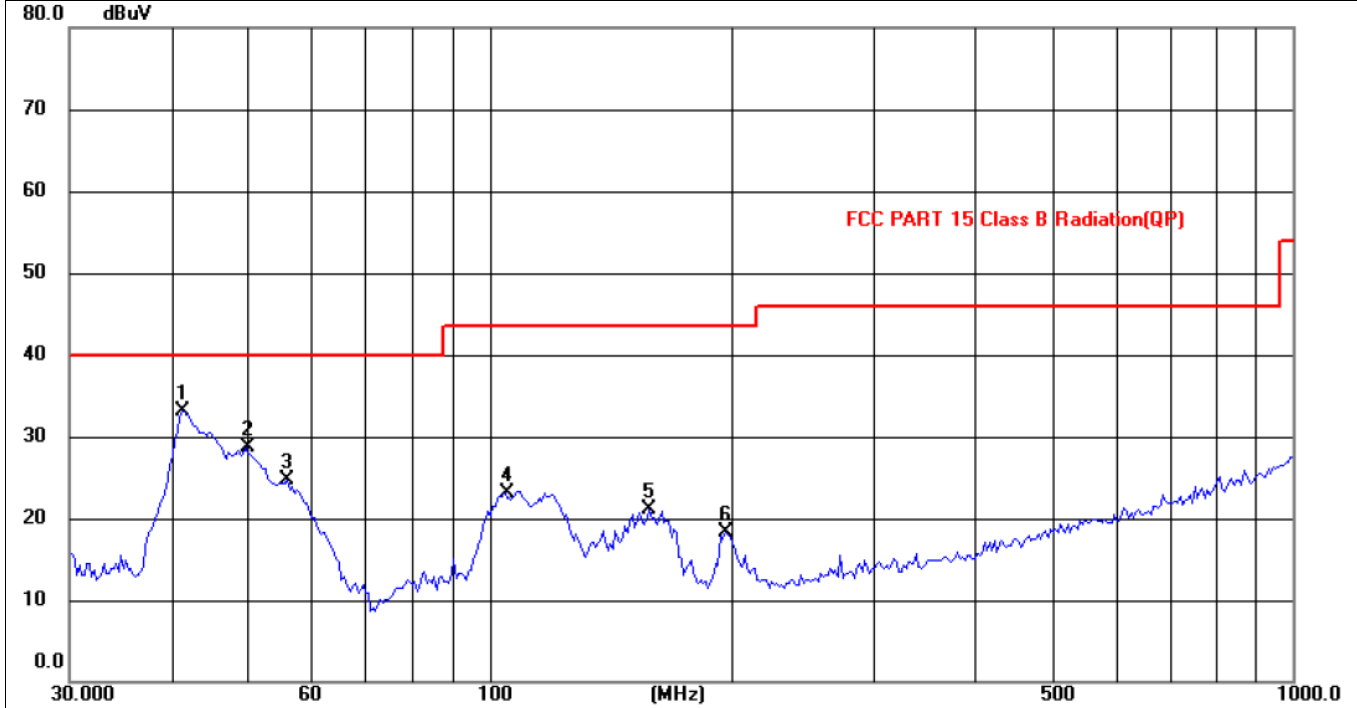


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		40.2757	36.10	-14.40	21.70	40.00	-18.30	QP
2		55.2207	29.09	-13.76	15.33	40.00	-24.67	QP
3		99.5281	31.50	-15.35	16.15	43.50	-27.35	QP
4		121.1231	41.51	-17.47	24.04	43.50	-19.46	QP
5	*	166.0680	44.83	-17.87	26.96	43.50	-16.54	QP
6		195.1365	34.48	-15.68	18.80	43.50	-24.70	QP

Remarks:  
 1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor  
 2. Measure Level= Read Level+ Correct Factor  
 3. Margin = Measure Level-Limit



Ant. Pol.	Vertical
Test Mode:	802.11b Mode 2412MHz
Remark:	Only worse case is reported



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	41.4215	40.68	-7.51	33.17	40.00	-6.83	QP
2		49.7068	36.59	-7.96	28.63	40.00	-11.37	QP
3		56.0007	36.23	-11.61	24.62	40.00	-15.38	QP
4		104.5361	38.85	-15.66	23.19	43.50	-20.31	QP
5		158.1123	39.35	-18.22	21.13	43.50	-22.37	QP
6		196.5098	34.16	-15.82	18.34	43.50	-25.16	QP

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Measure Level= Read Level+ Correct Factor
- Margin = Measure Level-Limit



## Adobe 1GHz

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2412MHz							
4824.000	58.88	-4.86	54.02	74	-19.98	H	PK
4824.000	43.61	-4.86	38.75	54	-15.25	H	AV
7236.000	55.02	1.6	56.62	74	-17.38	H	PK
7236.000	40.57	1.6	42.17	54	-11.83	H	AV
4824.000	61.71	-4.86	56.85	74	-17.15	V	PK
4824.000	41.61	-4.86	36.75	54	-17.25	V	AV
7236.000	52.66	1.6	54.26	74	-19.74	V	PK
7236.000	40.81	1.6	42.41	54	-11.59	V	AV
Middle Channel-2437MHz							
4874.000	58.73	-4.92	53.81	74	-20.19	H	PK
4874.000	41.85	-4.92	36.93	54	-17.07	H	AV
7311.000	52.9	1.5	54.4	74	-19.6	H	PK
7311.000	38.87	1.5	40.37	54	-13.63	H	AV
4874.000	58.82	-4.92	53.9	74	-20.1	V	PK
4874.000	42.02	-4.92	37.1	54	-16.9	V	AV
7311.000	56.01	1.5	57.51	74	-16.49	V	PK
7311.000	38.58	1.5	40.08	54	-13.92	V	AV
High Channel-2462MHz							
4924.000	59.24	-5.12	54.12	74	-19.88	H	PK
4924.000	42.14	-5.12	37.02	54	-16.98	H	AV
7386.000	53.73	1.55	55.28	74	-18.72	H	PK
7386.000	38.21	1.55	39.76	54	-14.24	H	AV
4924.000	57.61	-5.12	52.49	74	-21.51	V	PK
4924.000	42.18	-5.12	37.06	54	-16.94	V	AV
7386.000	52.91	1.55	54.46	74	-19.54	V	PK
7386.000	39.01	1.55	40.56	54	-13.44	V	AV

## Remarks:

1. Correct (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Measure Level= Read Level+ Correct Factor
3. Margin = Measure Level-Limit
4. worse case is 802.11b Mode.
5. Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3h Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

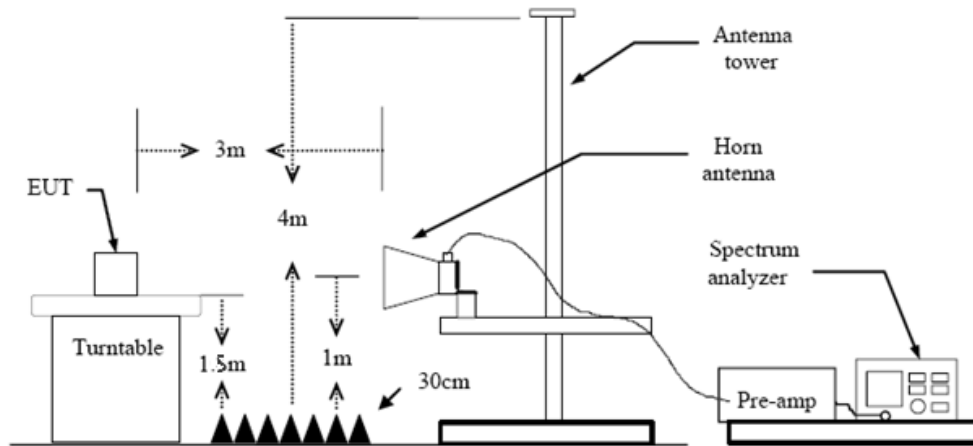
### 3.3. Band Edge Emissions (Radiated)

**Limit**

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

**Test Configuration**



**Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:  
 RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
 RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

**Test Mode**

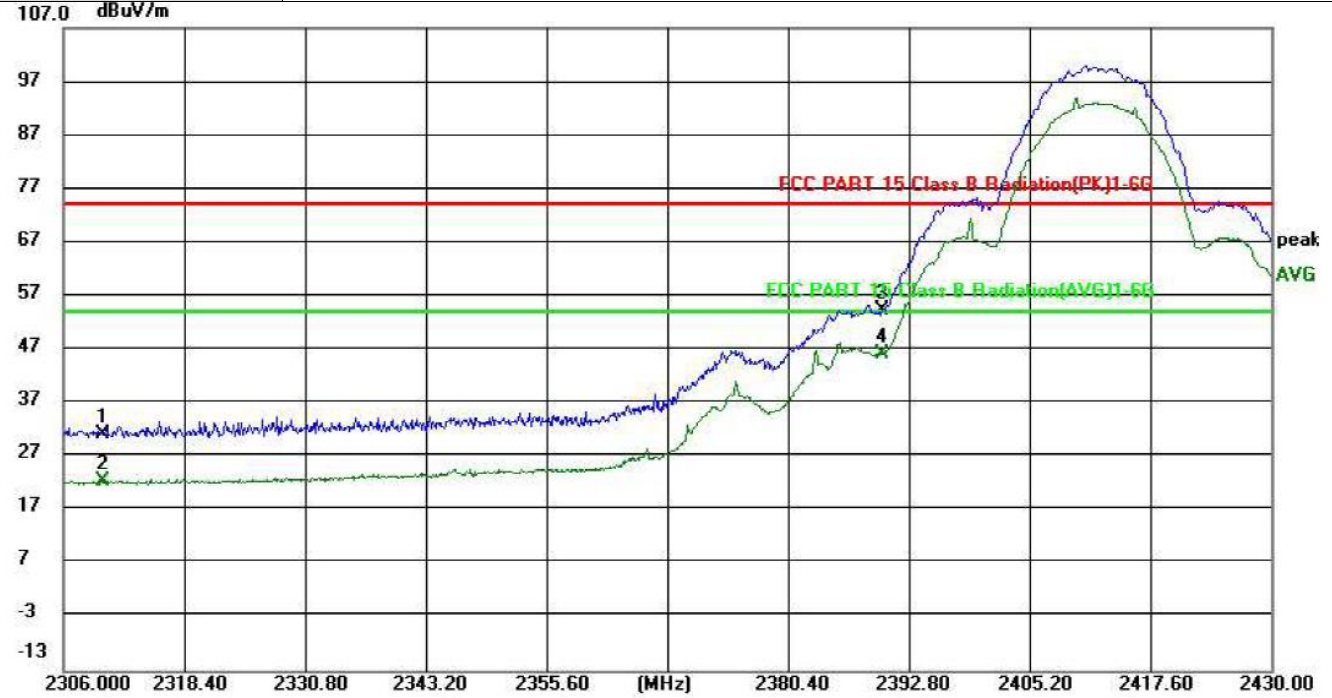
Please refer to the clause 2.4.



**Test Results**

Pre-scan all antenna, only show the test data for worse case antenna on the test report.

<b>Ant. Pol.</b>	Vertical (worst case)
<b>Test Mode:</b>	802.11b Mode 2412MHz (worst case)



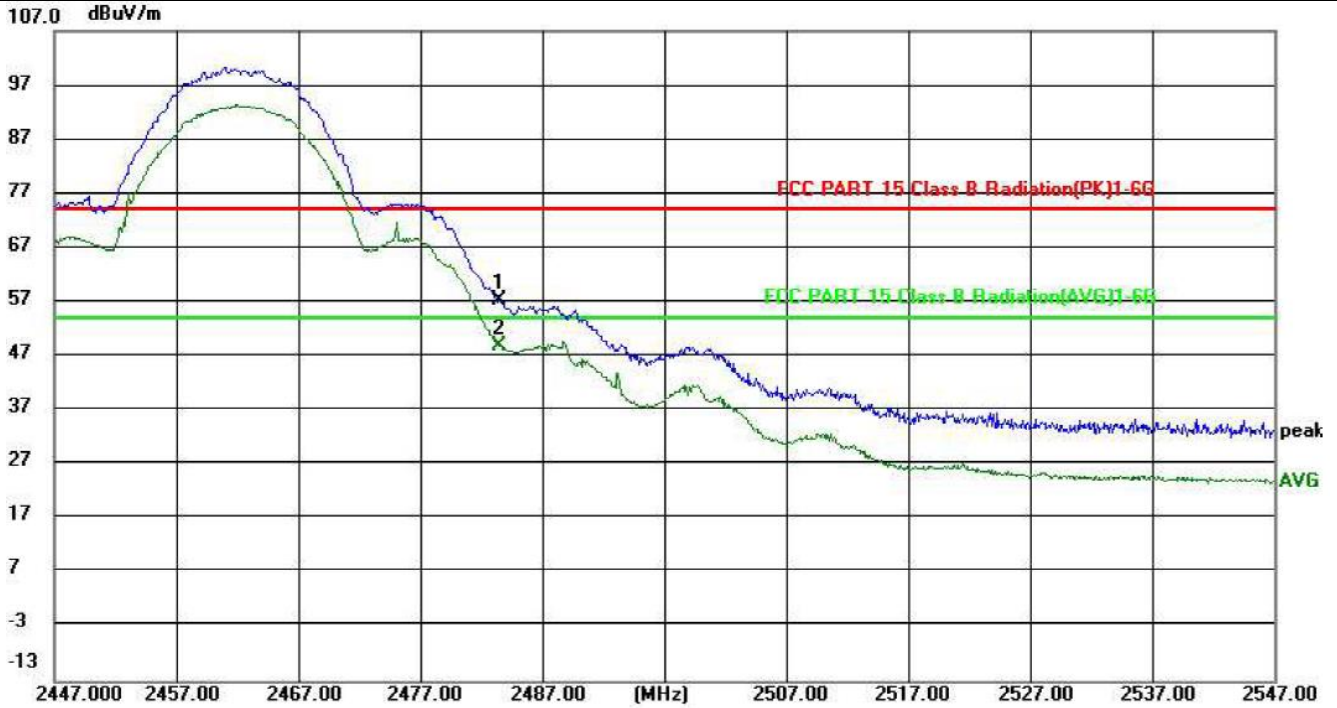
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2310.000	42.61	-11.50	31.11	73.90	42.79	peak
2		2310.092	33.98	-11.50	22.48	53.90	31.42	AVG
3		2390.000	65.66	-11.28	54.38	73.90	19.52	peak
4	*	2390.072	57.53	-11.28	46.25	53.90	7.65	AVG

Remarks:

- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Measure Level= Read Level+ Correct Factor
- Margin = Limit-Measure Level



Ant. Pol.	Vertical (worst case)
Test Mode:	802.11b Mode 2462 MHz (worst case)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2483.500	68.39	-11.04	57.35	73.90	16.55	peak
2	*	2483.500	60.06	-11.04	49.02	53.90	4.88	AVG

Remarks:

1. Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2. Measure Level= Read Level+ Correct Factor
3. Margin = Limit-Measure Level

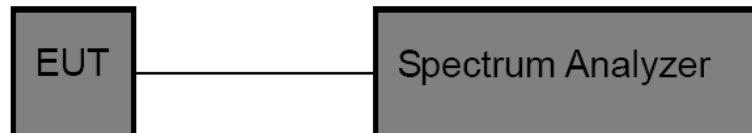


### 3.4. Band edge and Spurious Emissions (Conducted)

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

#### Test Configuration



#### Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:  
RBW = 100 kHz, VBW  $\geq$  RBW, scan up through 10<sup>th</sup> harmonic.  
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

#### Test Mode

Please refer to the clause 2.4.

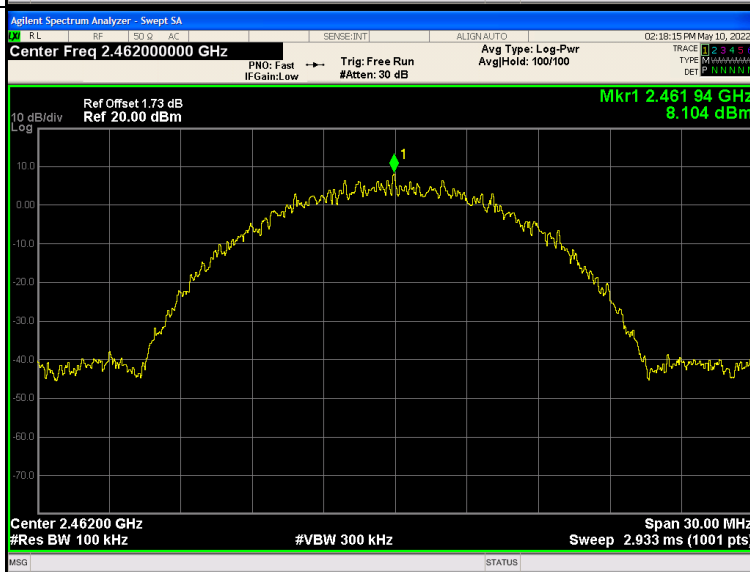
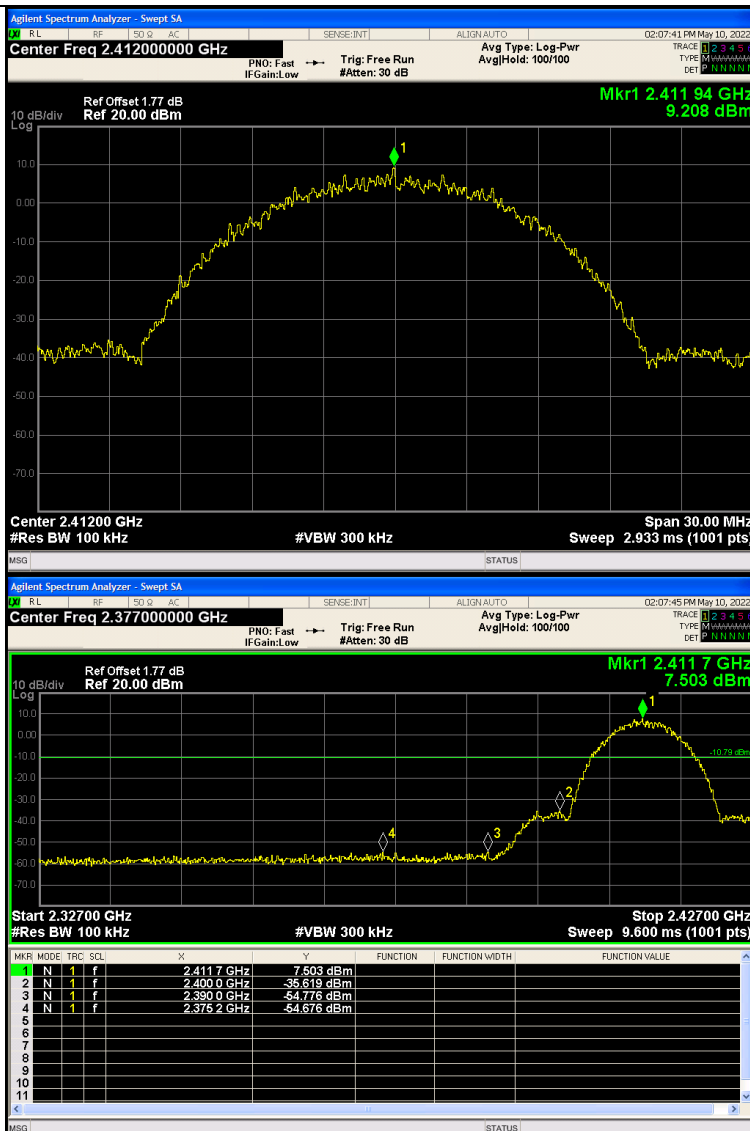
#### Test Results



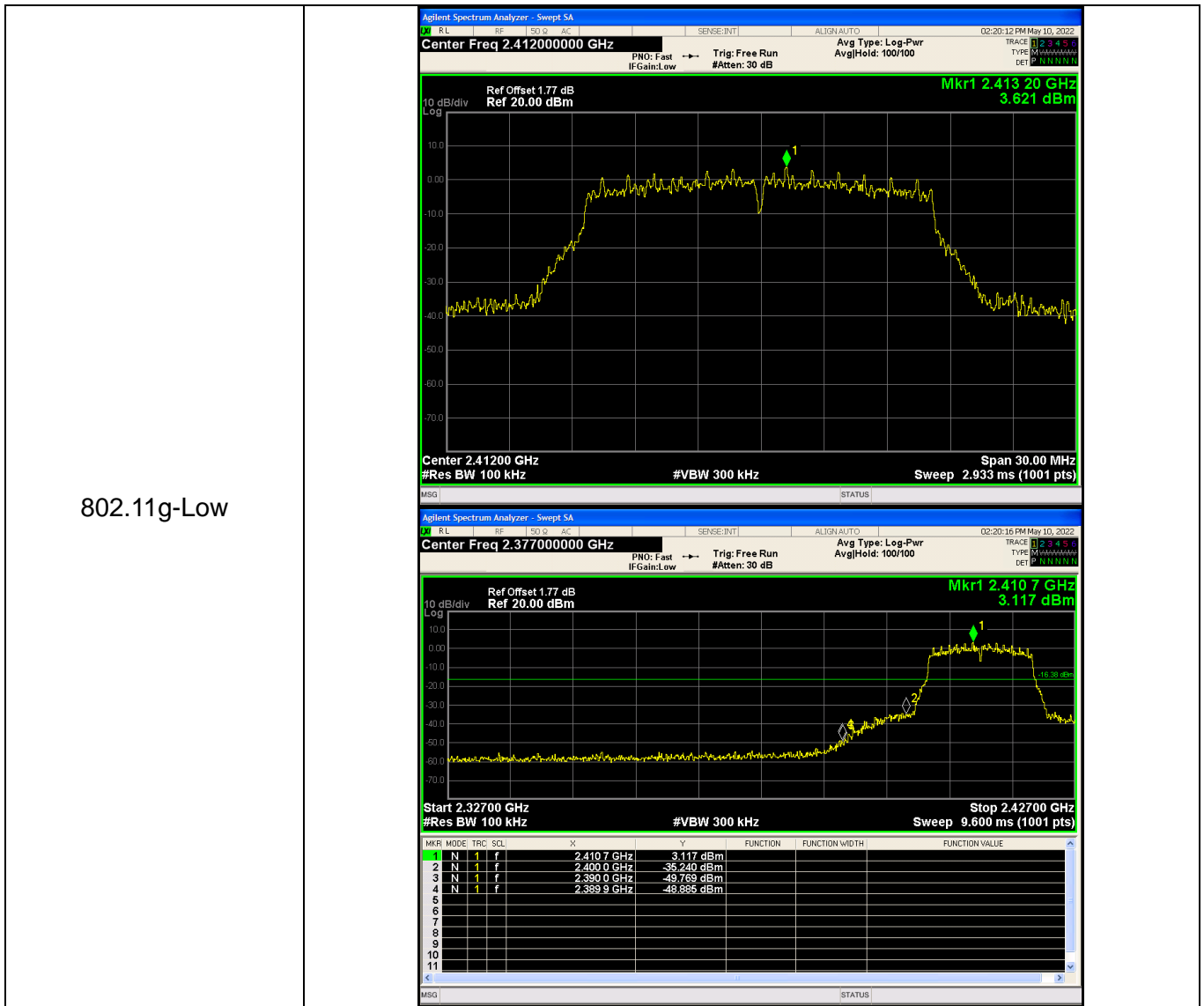
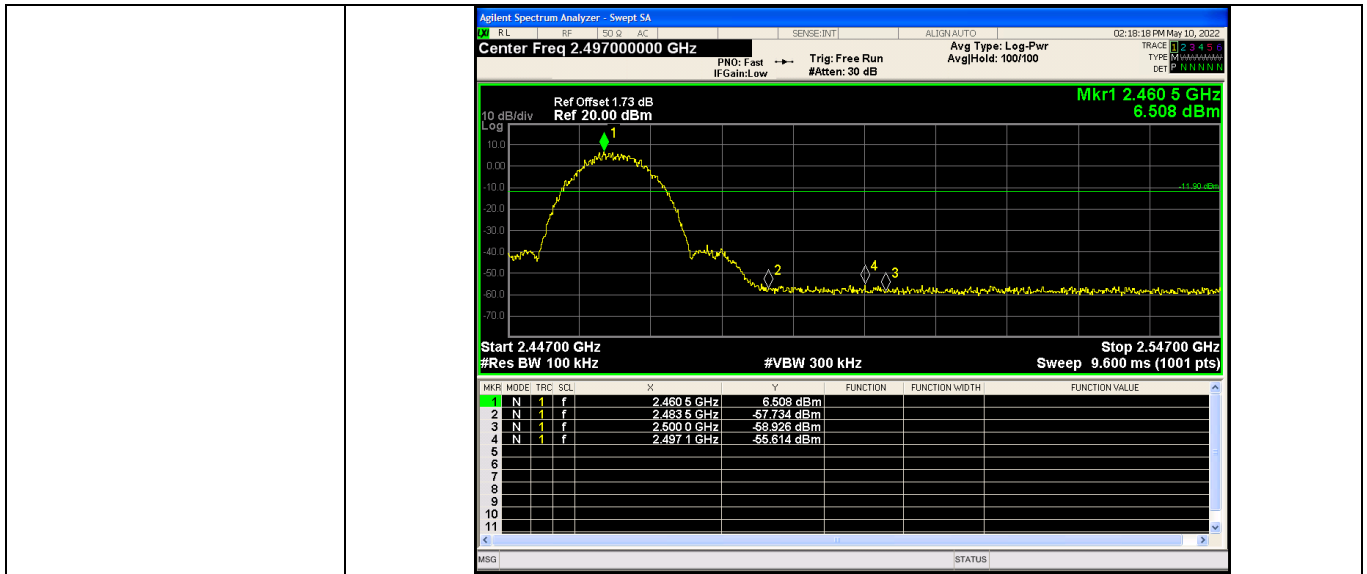


(1) Band edge Conducted Test

802.11b-Low



802.11b-High

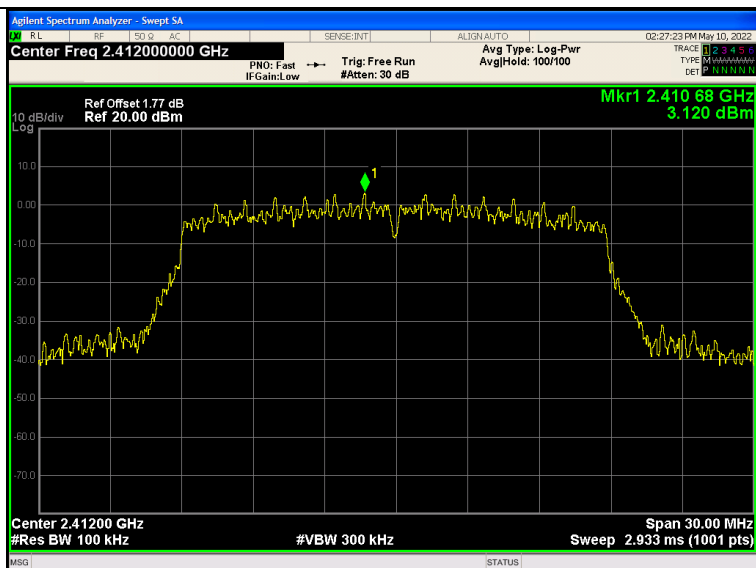


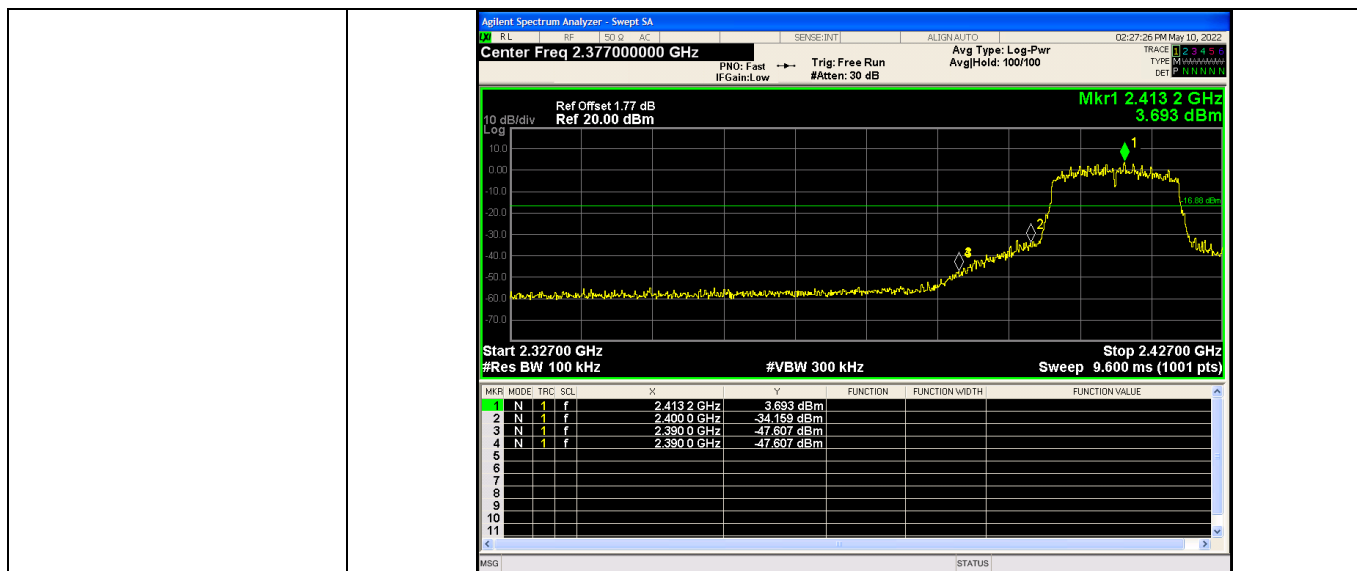


802.11g-High



802.11n20-Low

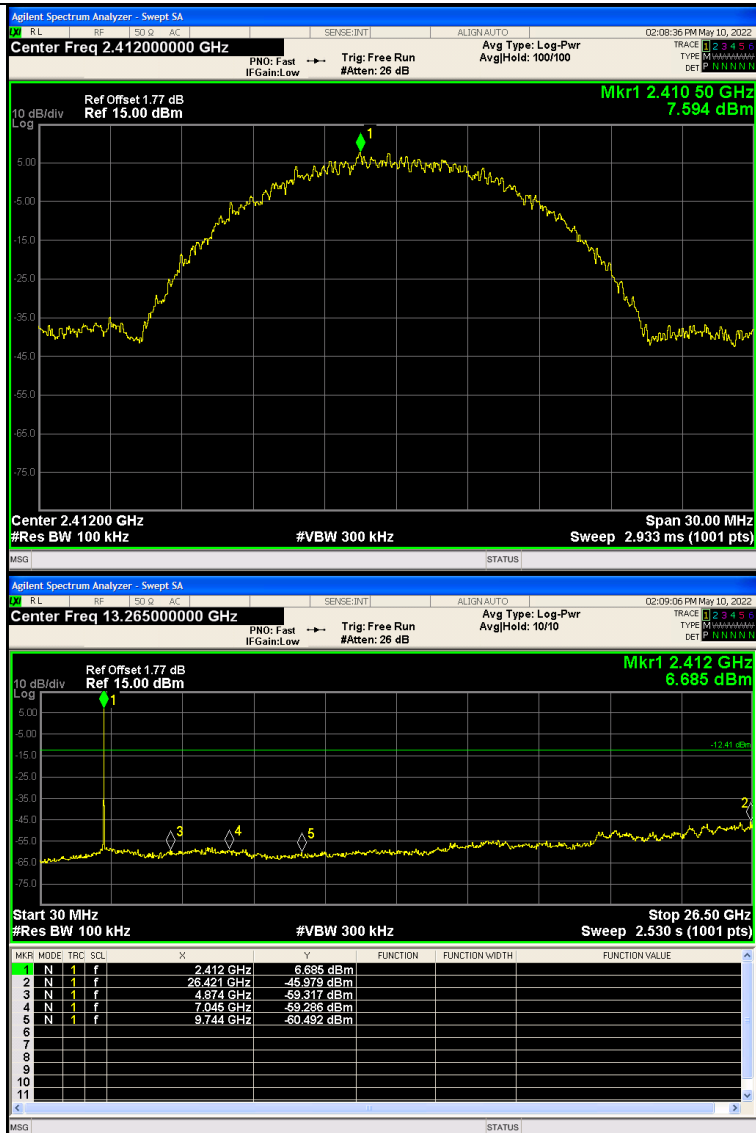




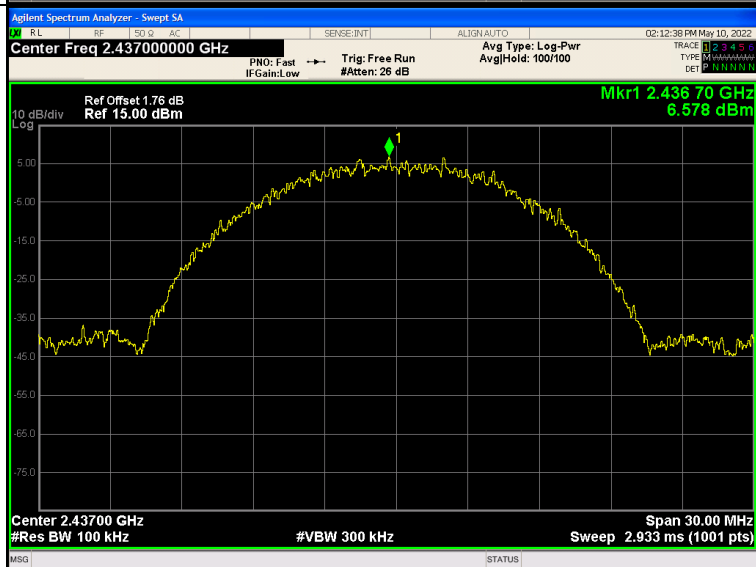


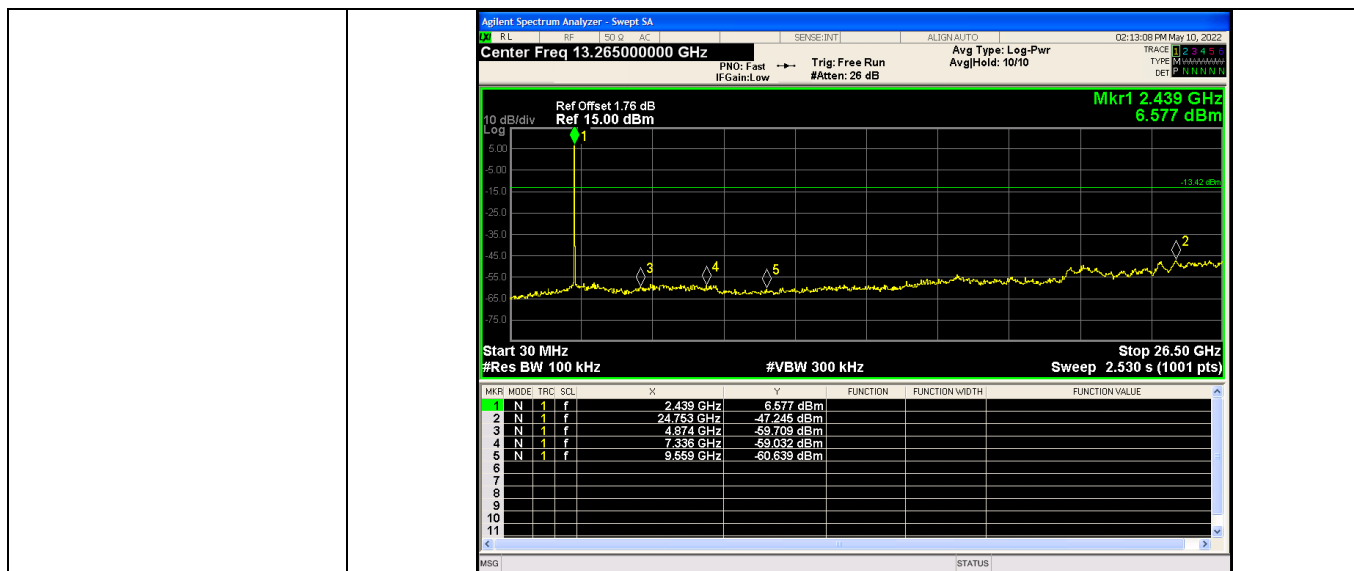
(2) Conducted Spurious Emissions Test

802.11b-Low



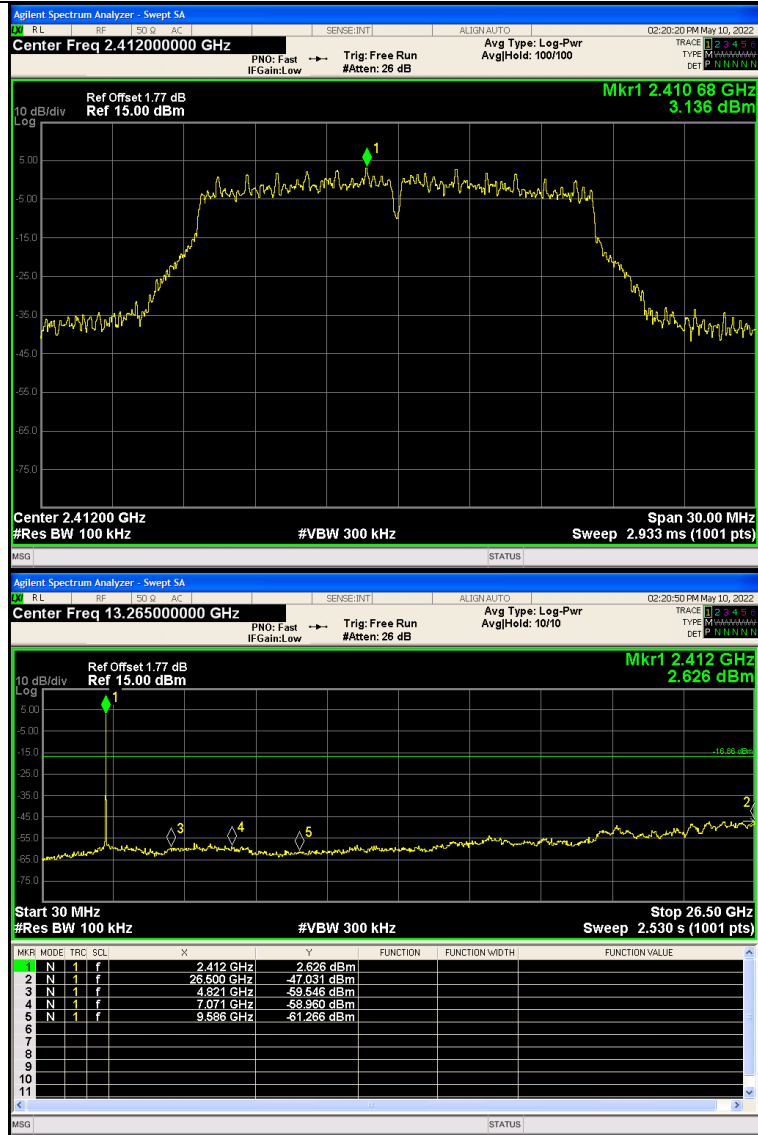
802.11b-Middle



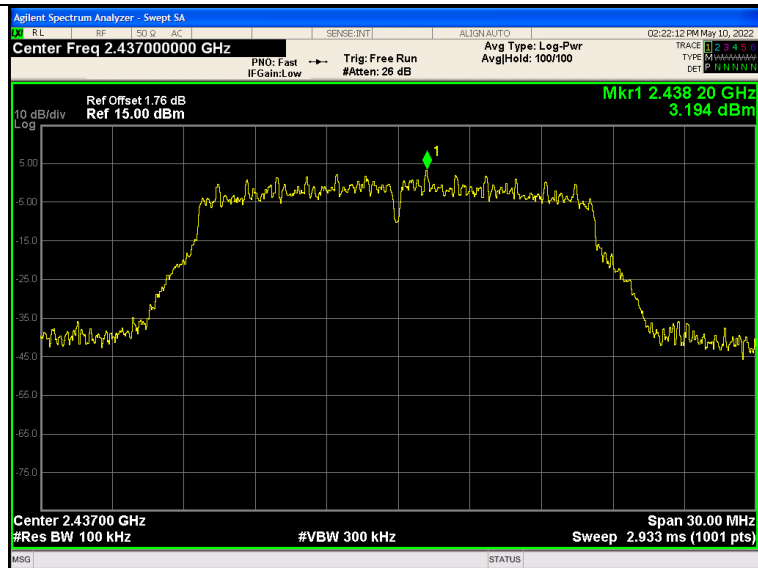


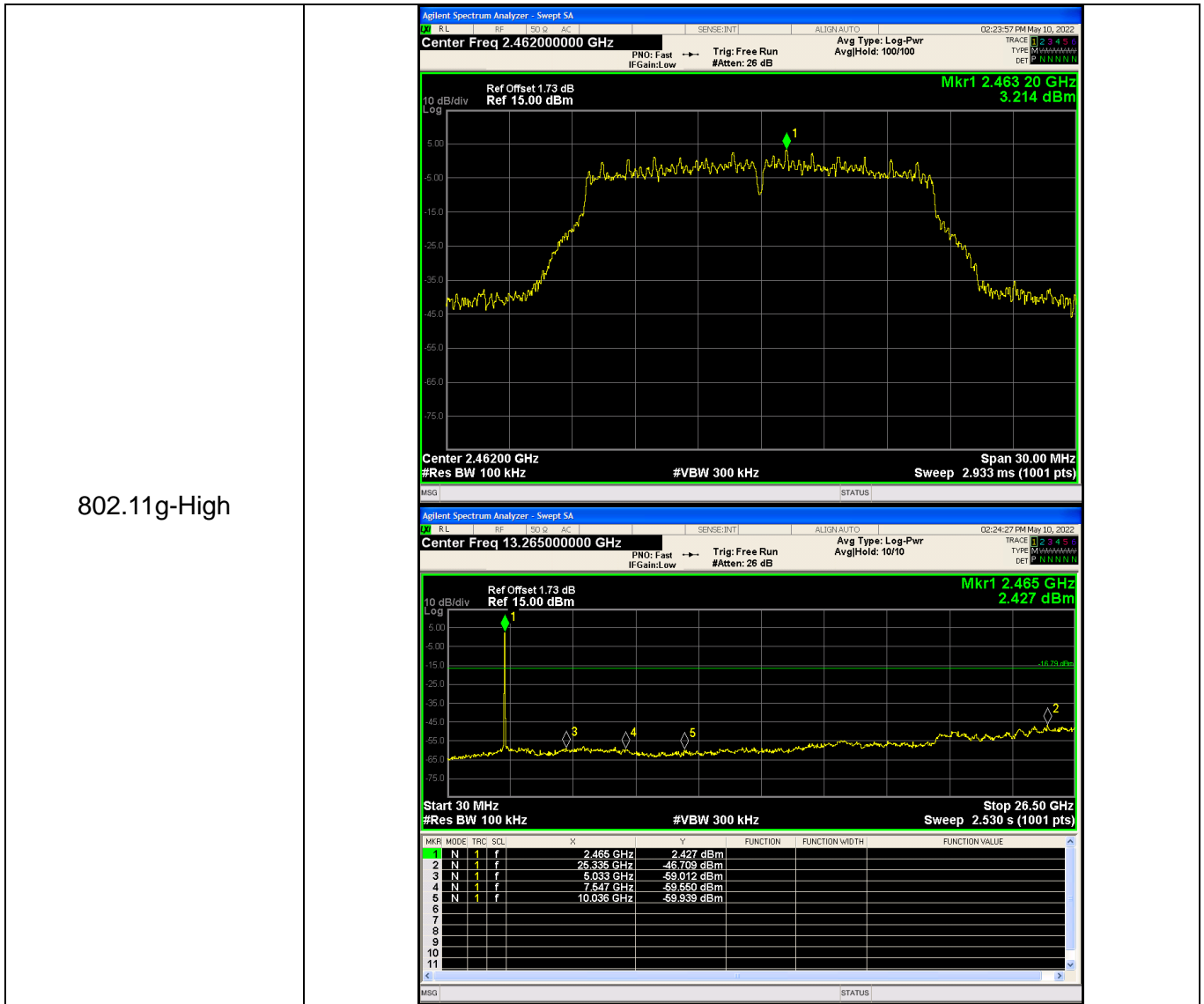
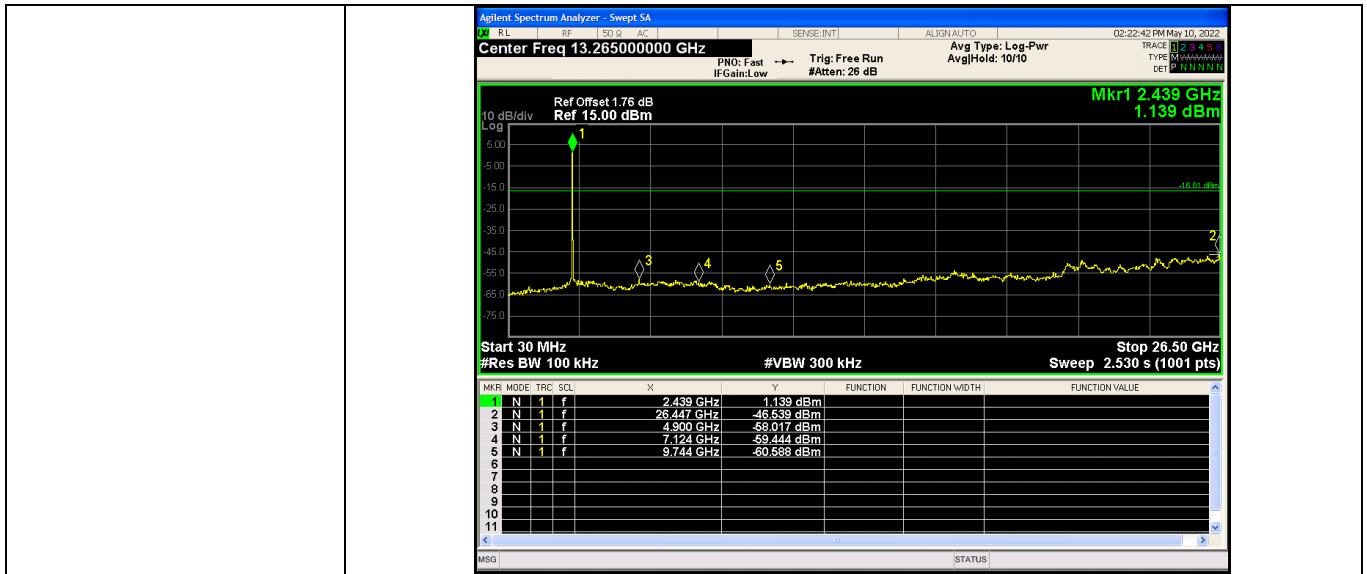


802.11g-Low



802.11g-Middle

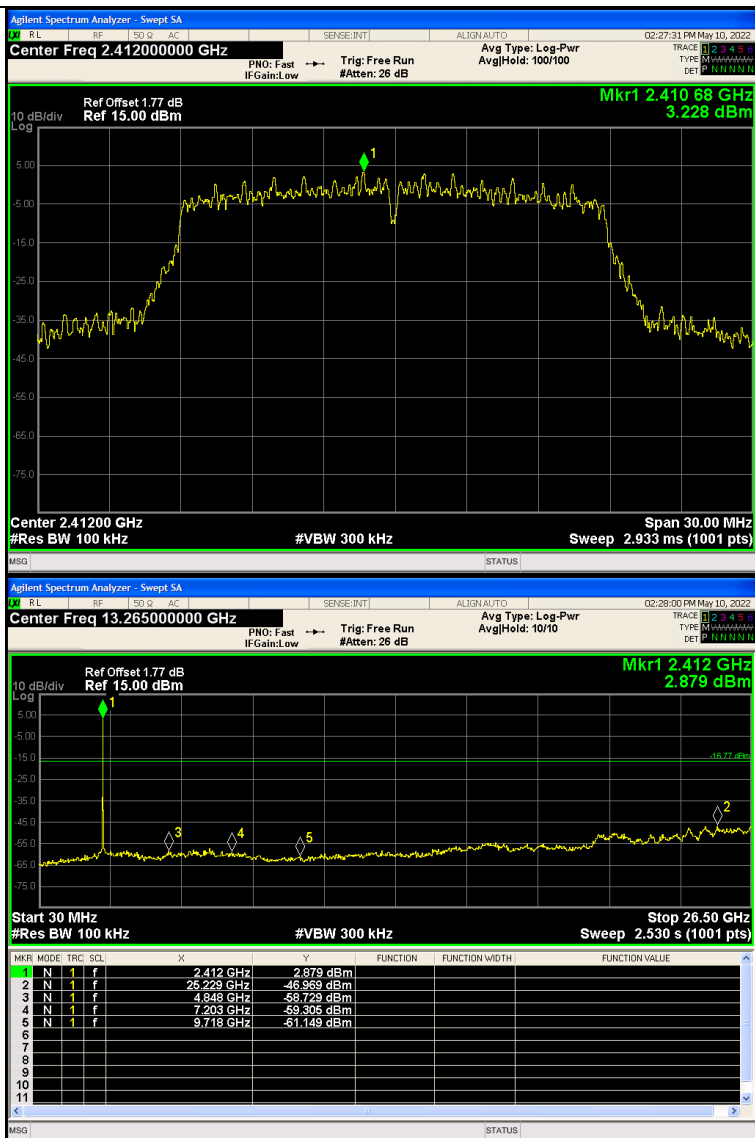




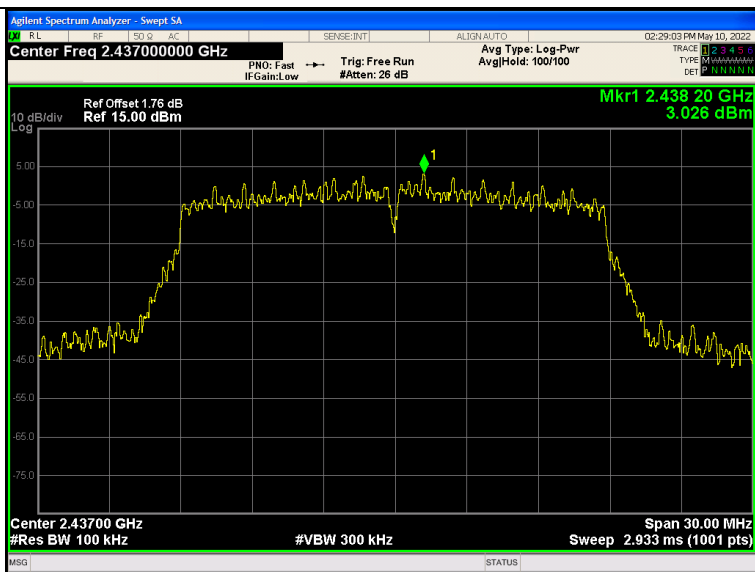


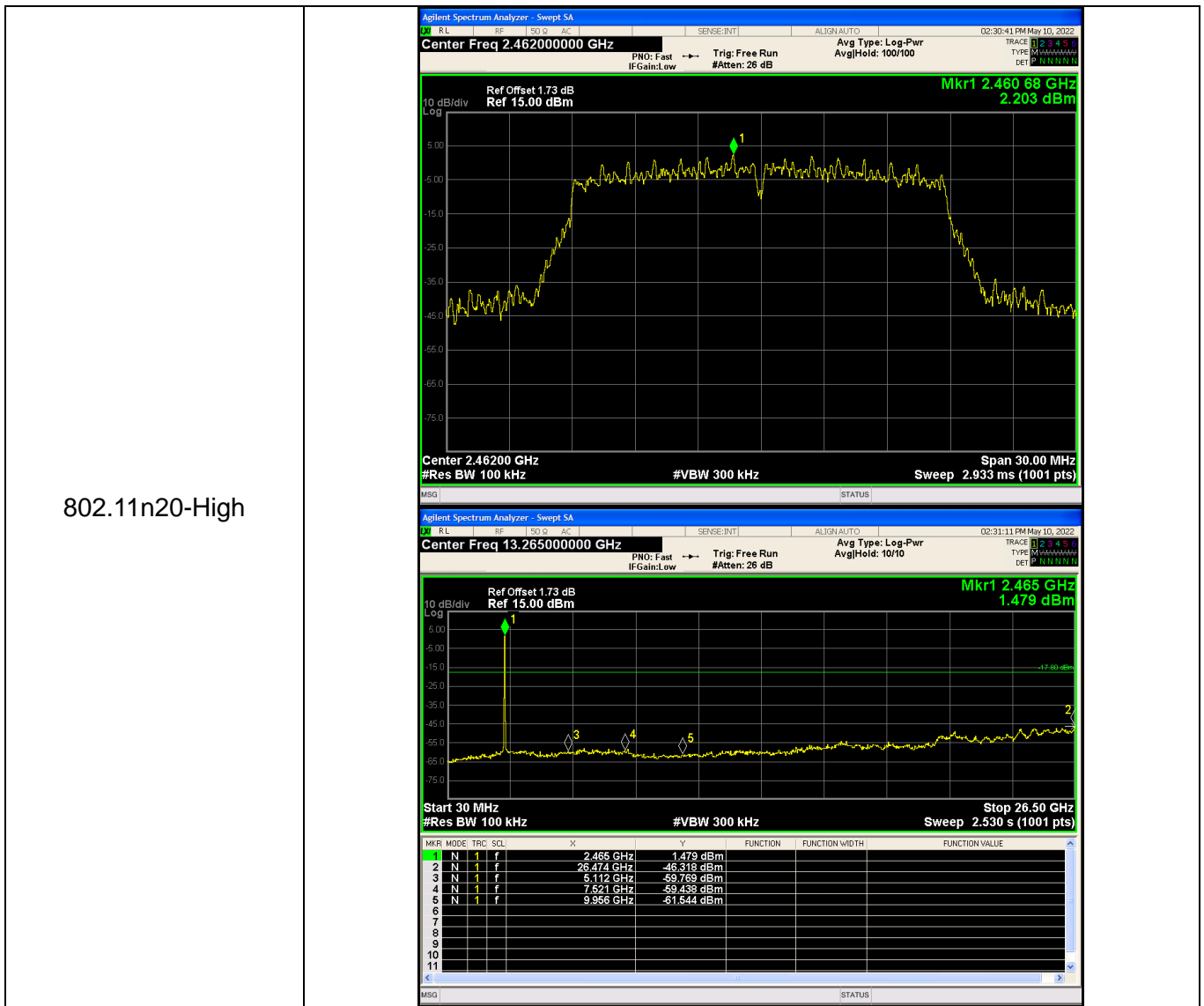
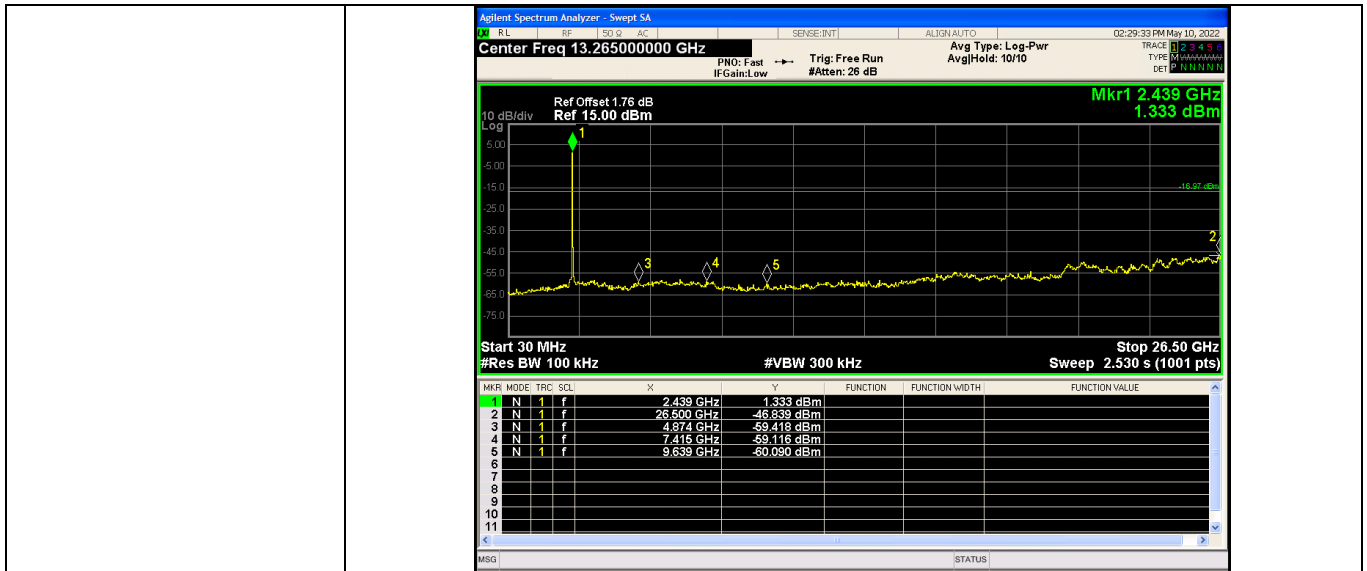


802.11n20-Low



802.11n20-Middle







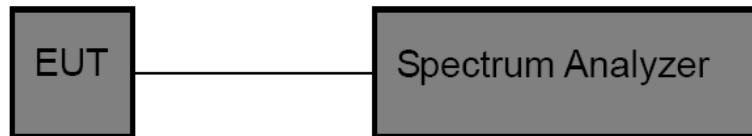
### 3.5. DTS Bandwidth

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	$\geq 500$ KHz (6dB bandwidth)	2400~2483.5

#### Test Configuration



#### Test Procedure

5. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
6. DTS Spectrum Setting:
  - (1) Set RBW = 100 kHz.
  - (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.
- OCB Spectrum Setting:
  - (1) Set RBW = 1% ~ 5% occupied bandwidth.
  - (2) Set the video bandwidth (VBW)  $\geq 3$  RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

#### Test Mode

Please refer to the clause 2.4.

**Test Results**

Test Mode	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
802.11b	2412	8.294	$\geq 0.5$	PASS
	2437	8.35	$\geq 0.5$	PASS
	2462	7.866	$\geq 0.5$	PASS
802.11g	2412	15.102	$\geq 0.5$	PASS
	2437	15.684	$\geq 0.5$	PASS
	2462	15.059	$\geq 0.5$	PASS
802.11n(HT20)	2412	15.101	$\geq 0.5$	PASS
	2437	15.114	$\geq 0.5$	PASS
	2462	16.002	$\geq 0.5$	PASS



<p>802.11b-Low</p>	<p>Agilent Spectrum Analyzer - Occupied BW  Center Freq: 2.412000000 GHz  Center Freq: 2.412000000 GHz  Trig: Free Run  Avg/Hold: 100/100  Radio Std: None  Radio Device: BTS</p> <p>Ref Offset 1.77 dB  Ref 21.77 dBm  Mkr3 2.416067 GHz  3.8460 dBm</p> <p>Center 2.412 GHz  #Res BW 100 kHz  #VBW 300 kHz  Span 30 MHz  Sweep 3.333 ms</p> <p>Occupied Bandwidth 13.499 MHz  Total Power 23.2 dBm</p> <p>Transmit Freq Error -79.835 kHz  OBW Power 99.00 %  x dB Bandwidth 8.294 MHz  x dB -6.00 dB</p>
<p>802.11b-Middle</p>	<p>Agilent Spectrum Analyzer - Occupied BW  Center Freq: 2.437000000 GHz  Center Freq: 2.437000000 GHz  Trig: Free Run  Avg/Hold: 100/100  Radio Std: None  Radio Device: BTS</p> <p>Ref Offset 1.76 dB  Ref 21.76 dBm  Mkr3 2.441078 GHz  3.0137 dBm</p> <p>Center 2.437 GHz  #Res BW 100 kHz  #VBW 300 kHz  Span 30 MHz  Sweep 3.333 ms</p> <p>Occupied Bandwidth 13.497 MHz  Total Power 22.5 dBm</p> <p>Transmit Freq Error -96.979 kHz  OBW Power 99.00 %  x dB Bandwidth 8.350 MHz  x dB -6.00 dB</p>
<p>802.11b-High</p>	<p>Agilent Spectrum Analyzer - Occupied BW  Center Freq: 2.462000000 GHz  Center Freq: 2.462000000 GHz  Trig: Free Run  Avg/Hold: 100/100  Radio Std: None  Radio Device: BTS</p> <p>Ref Offset 1.73 dB  Ref 21.73 dBm  Mkr3 2.465879 GHz  -1.7517 dBm</p> <p>Center 2.462 GHz  #Res BW 100 kHz  #VBW 300 kHz  Span 30 MHz  Sweep 3.333 ms</p> <p>Occupied Bandwidth 13.398 MHz  Total Power 22.1 dBm</p> <p>Transmit Freq Error -54.088 kHz  OBW Power 99.00 %  x dB Bandwidth 7.866 MHz  x dB -6.00 dB</p>



<p>802.11g-Low</p>	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.412000000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 3.333 ms</p> <p>Occupied Bandwidth: 16.351 MHz Total Power: 19.6 dBm Transmit Freq Error: -84.100 kHz x dB Bandwidth: 15.10 MHz</p>
<p>802.11g-Middle</p>	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.437000000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 3.333 ms</p> <p>Occupied Bandwidth: 16.304 MHz Total Power: 19.3 dBm Transmit Freq Error: -80.868 kHz x dB Bandwidth: 15.68 MHz</p>
<p>802.11g-High</p>	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.462000000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 3.333 ms</p> <p>Occupied Bandwidth: 16.308 MHz Total Power: 19.3 dBm Transmit Freq Error: -58.173 kHz x dB Bandwidth: 15.06 MHz</p>



<p>802.11n20-Low</p>	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.412000000 GHz #Res BW 100 kHz #VBW 300 kHz Occupied Bandwidth: 17.499 MHz Total Power: 19.9 dBm Transmit Freq Error: -83.646 kHz x dB Bandwidth: 15.10 MHz</p>
<p>802.11n20-Middle</p>	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.437000000 GHz #Res BW 100 kHz #VBW 300 kHz Occupied Bandwidth: 17.500 MHz Total Power: 19.3 dBm Transmit Freq Error: -86.313 kHz x dB Bandwidth: 15.11 MHz</p>
<p>802.11n20-High</p>	<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 2.462000000 GHz #Res BW 100 kHz #VBW 300 kHz Occupied Bandwidth: 17.519 MHz Total Power: 19.0 dBm Transmit Freq Error: -62.007 kHz x dB Bandwidth: 16.00 MHz</p>

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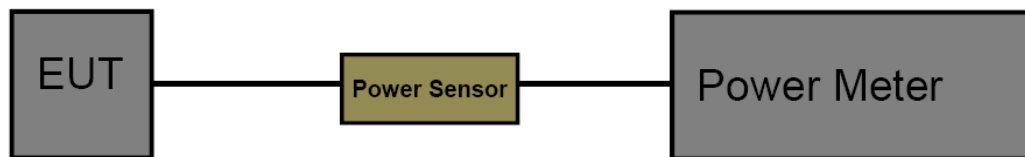
### 3.6. Peak Output Power

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The maximum conducted output power may be measured using a broadband Peak RF power meter.
2. Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
4. Record the measurement data.

#### Test Mode

Please refer to the clause 2.4.

#### Test Result





Test Mode	Channel	Result[dBm]	Limit[dBm]	Verdict
802.11b	2412	18.305	<=30	PASS
	2437	18.484	<=30	PASS
	2462	18.236	<=30	PASS
802.11g	2412	10.861	<=30	PASS
	2437	11.049	<=30	PASS
	2462	10.656	<=30	PASS
802.11n(HT20)	2412	11.184	<=30	PASS
	2437	10.576	<=30	PASS
	2462	10.158	<=30	PASS



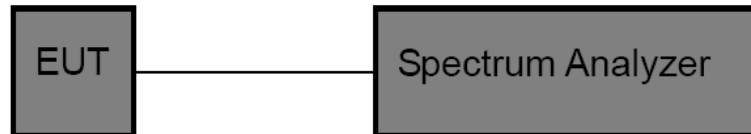
### 3.7. Power Spectral Density

#### Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

#### Test Configuration



#### Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:  
 Set analyzer center frequency to DTS channel center frequency.  
 Set the span to 1.5 times the DTS bandwidth.  
 Set the RBW to:  $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$ .  
 Set the VBW to:  $\geq 3 \times \text{RBW}$   
 Detector: power averaging (RMS) or sample detector (when RMS not available).  
 Sweep time = auto couple.  
 Employ trace averaging (RMS) mode over a minimum of 100 traces.  
 Use the peak marker function to determine the maximum amplitude level.  
 If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

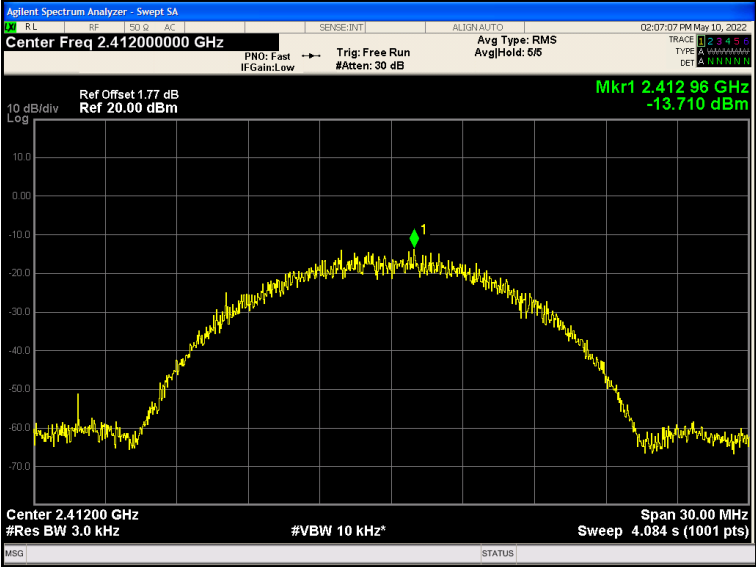
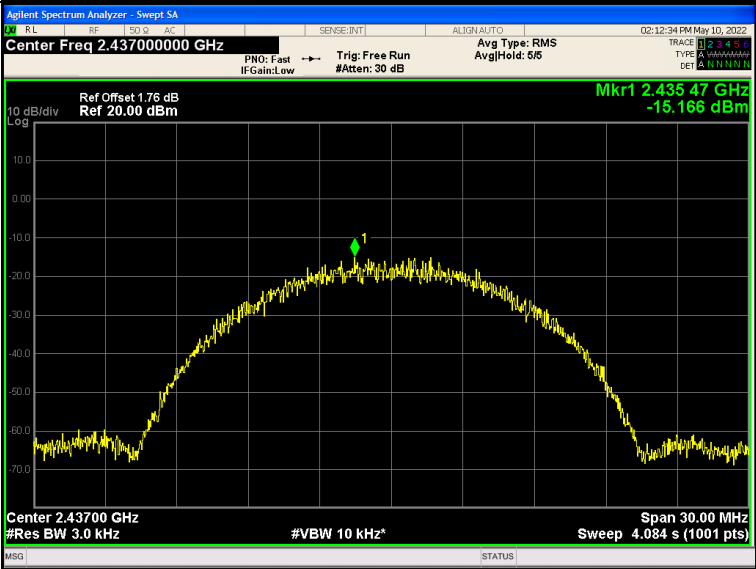
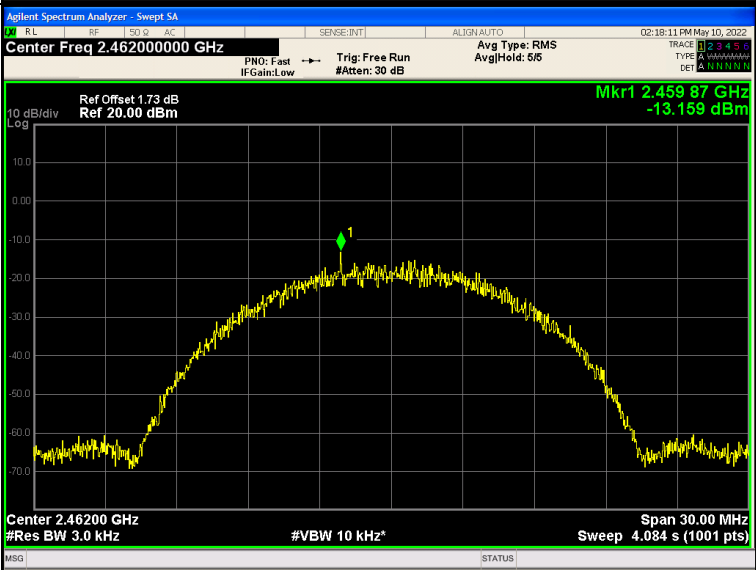
#### Test Mode

Please refer to the clause 2.4.

**Test Result**

Test Mode	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
802.11b	2412	-13.71	<=8	PASS
	2437	-15.166	<=8	PASS
	2462	-13.159	<=8	PASS
802.11g	2412	-22.083	<=8	PASS
	2437	-21.492	<=8	PASS
	2462	-20.575	<=8	PASS
802.11n(HT20)	2412	-21.054	<=8	PASS
	2437	-21.501	<=8	PASS
	2462	-21.835	<=8	PASS



<p>802.11b-Low</p>		
<p>802.11b-Middle</p>		
<p>802.11b-High</p>		

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<p>802.11g-Low</p>	
<p>802.11g-Middle</p>	
<p>802.11g-High</p>	



<p>802.11n20-Low</p>		
<p>802.11n20-Middle</p>		
<p>802.11n20-High</p>		

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### 3.8. Antenna requirement

#### Requirement

**FCC CFR Title 47 Part 15 Subpart C 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 use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):**

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### Test Result

This product has an integral antenna, fulfill the requirement of this section.

\*\*\*\*\*THE END\*\*\*\*\*

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