

Project No: TM-2203000166P
Report No.: TMWK2203000913KR

FCC ID: SW8TM51010

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RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.247
Product name	Wi-Fi & BLE M.2 Wireless Module
Brand Name	GOOD WAY
Model No.	TM51010
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Approved by:



Shawn Wu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May 16, 2022	Initial Issue	ALL	Doris Chu

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	GOOD WAY TECHNOLOGY CO., LTD. 3F, No. 135, Ln. 235, Baociao Rd., Sindian Dist., New Taipei City 231, Taiwan
Manufacturer	GOOD WAY TECHNOLOGY CO., LTD. 3F, No. 135, Ln. 235, Baociao Rd., Sindian Dist., New Taipei City 231, Taiwan
Equipment	Wi-Fi & BLE M.2 Wireless Module
Model No.	TM51010
Model Discrepancy	N/A
Trade Name	GOOD WAY
Received Date	March 10, 2022
Date of Test	March 18 ~ 29, 2022
Power Supply	Power from host system. 3.3VDC, 1A
HW Version	V1.0
SW Version	V3.2.4.0
Host	The subject approved module is being used in a specific host. [Product: USB-C Smart Dock, Brand name/ Model: GOOD WAY / DUD8070, Adapter: Chicony / A18-135P1B I/P: 100-240VAC, 50-60Hz, 2.37A O/P: 20VDC, 6.75A, 135W]

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

1.2 EUT CHANNEL INFORMATION

Frequency Range	802.11b/g/n HT 20: 2412MHz ~ 2462MHz 802.11n HT40: 2422MHz ~ 2452MHz
Modulation Type	1. IEEE 802.11b mode: CCK 2. IEEE 802.11g mode: OFDM 3. IEEE 802.11n HT 20 MHz mode : OFDM 4. IEEE 802.11n HT40 Mode: OFDM
Number of channel	1. IEEE 802.11b mode: 11 Channels 2. IEEE 802.11g mode: 11 Channels 3. IEEE 802.11n HT 20 MHz mode : 11 Channels 4. IEEE 802.11n HT40 Mode : 7 Channels

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	☒ PIFA ☐ PCB ☐ Dipole ☐ Coils
Antenna Gain	Gain: 3.02 dBi

Remark:

1.The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
Radiated Emission_9kHz-30MHz	+/- 3.814
Radiated Emission_30MHz-200MHz	+/- 4.272
Radiated Emission_200MHz-1GHz	+/- 4.619
Radiated Emission_1GHz-6GHz	+/- 5.522
Radiated Emission_6GHz-18GHz	+/- 5.228
Radiated Emission_18GHz-26GHz	+/- 4.089
Radiated Emission_26GHz-40GHz	+/- 4.019

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. (R.O.C.)

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Jack Chen	-
Radiation	Ray Li	-
RF Conducted	Allen Shen	-

Remark: The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Signal Analyzer	KEYSIGHT	N9010B	MY55460167	09/07/2021	09/06/2022
Power Meter	Anritsu	ML2496A	2136002	12/06/2021	12/05/2022
Power Sensor	Anritsu	MA2411B	1911386	08/19/2021	08/18/2022
Power Sensor	Anritsu	MA2411B	1911387	08/19/2021	08/18/2022
Software	Radio Test Software				

Conducted Emission Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
CABLE	EMCI	CFD300-NL	CERF	06/28/2021	06/27/2022
EMI Test Receiver	R&S	ESCI	100064	07/05/2021	07/04/2022
LISN	SCHAFFNER	NNB 41	03/10013	02/15/2022	02/14/2023
Software	EZ-EMC(CCS-3A1-CE-WUGU)				



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3M 966 Chamber Test Site					
Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal Due
Band Reject Filters	MICRO TRONICS	BRM 50702	112	11/23/2021	11/22/2022
Bilog Antenna	Sunol Sciences	JB3	A030105	07/19/2021	07/18/2022
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/23/2022	02/22/2023
Coaxial Cable	EMCI	EMC105	190914+1111	09/17/2021	09/16/2022
Coaxial Cable	Woken	J-1099	201709090004	12/23/2021	12/22/2022
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	12/28/2021	12/27/2022
Horn Antenna	ETS LINDGREN	3116	00026370	11/30/2021	11/29/2022
Horn Antenna	ETS LINDGREN	3117	00055165	07/29/2021	07/28/2022
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	12/05/2021	12/04/2022
Pre-Amplifier	EMEC	EM330	060609	02/23/2022	02/22/2023
Pre-Amplifier	HP	8449B	3008A00965	12/24/2021	12/23/2022
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	12/06/2021	12/05/2022
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 6.11-20180413				

Remark: Each piece of equipment is scheduled for calibration once a year.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
1	NB	Lenovo	20175	N/A	TX2-RTL8723AS	6317A-RTL8723AS
2	AC power Source	Extech	6805	N/A	N/A	N/A
3	NB(E)	Lenovo	IBM 7663	N/A	N/A	N/A
4	NB(L)	Toshiba	PORTEGE R30-A	N/A	PD97260H	N/A

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247 and FCC KDB 558074.

2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	Pass
15.247(a)(2)	4.2	6 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(3)	4.3	Output Power Measurement	Pass
15.247(e)	4.4	Power Spectral Density	Pass
15.247(d)	4.5	Conducted Band Edge	Pass
15.247(d)	4.5	Conducted Emission	Pass
15.247(d)	4.6	Radiation Band Edge	Pass
15.247(d)	4.6	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	IEEE 802.11b mode :1Mbps IEEE 802.11g mode :6Mbps IEEE 802.11n HT20 mode:MCS0 IEEE 802.11n HT40 Mode :MCS0
Test Channel Frequencies	IEEE 802.11b mode : 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz IEEE 802.11g mode : 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz IEEE 802.11n HT20 mode : 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz IEEE 802.11n HT40 Mode : 1. Lowest Channel : 2422MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2452MHz
Operation Transmitter	IEEE 802.11b mode : 1T1R IEEE 802.11g mode : 1T1R IEEE 802.11n HT20 mode : 1T1R IEEE 802.11n HT40 Mode : 1T1R

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1: EUT power by Adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

3.3 EUT DUTY CYCLE

Temperature: 24.5°C

Humidity: 50% RH

Tested by: Allen Shen

Test date: March 18, 2022

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b	98.95	0.05	0.08	0.01
802.11g	94.07	0.27	0.48	1.00
802.11n HT20	93.66	0.28	0.52	1.00
802.11n HT40	87.90	0.56	1.06	2.00

802.11b



802.11g



802.11n HT20



802.11n HT40



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a)(2),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

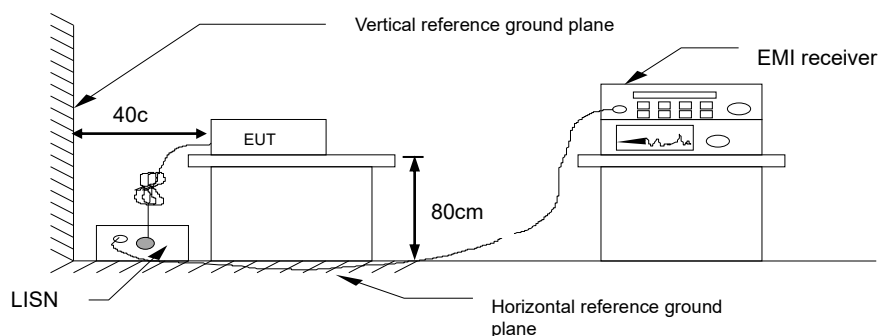
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

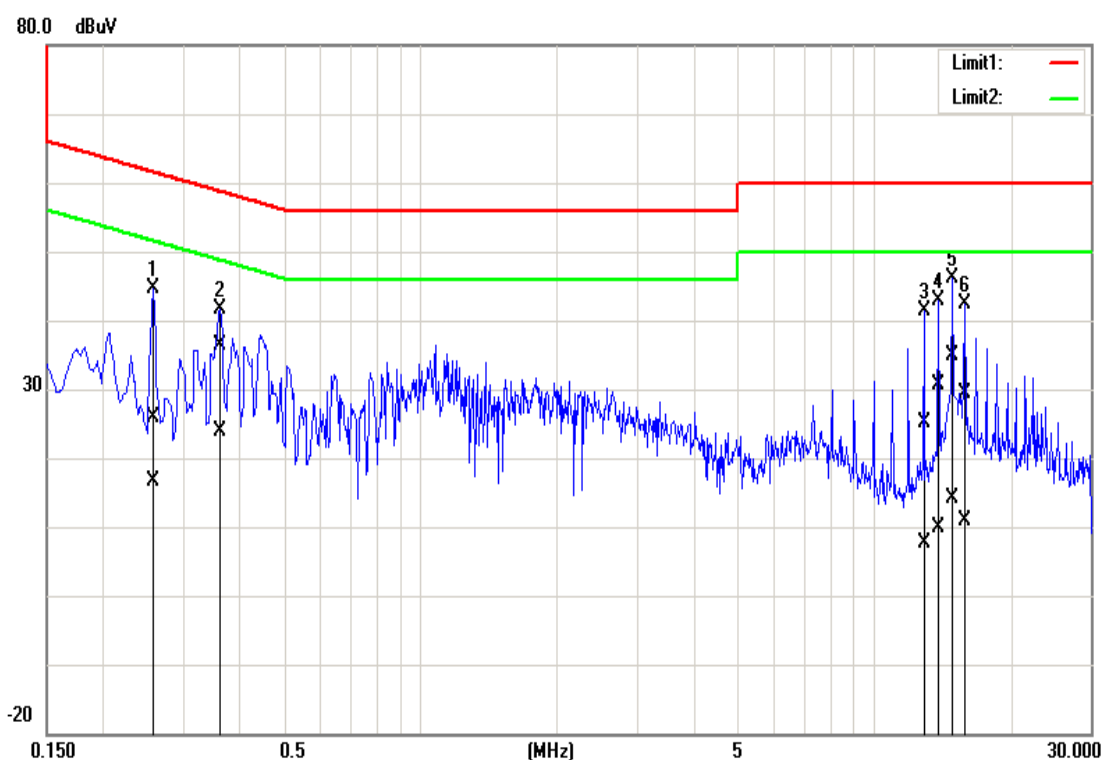


4.1.4 Test Result

PASS

Test Data

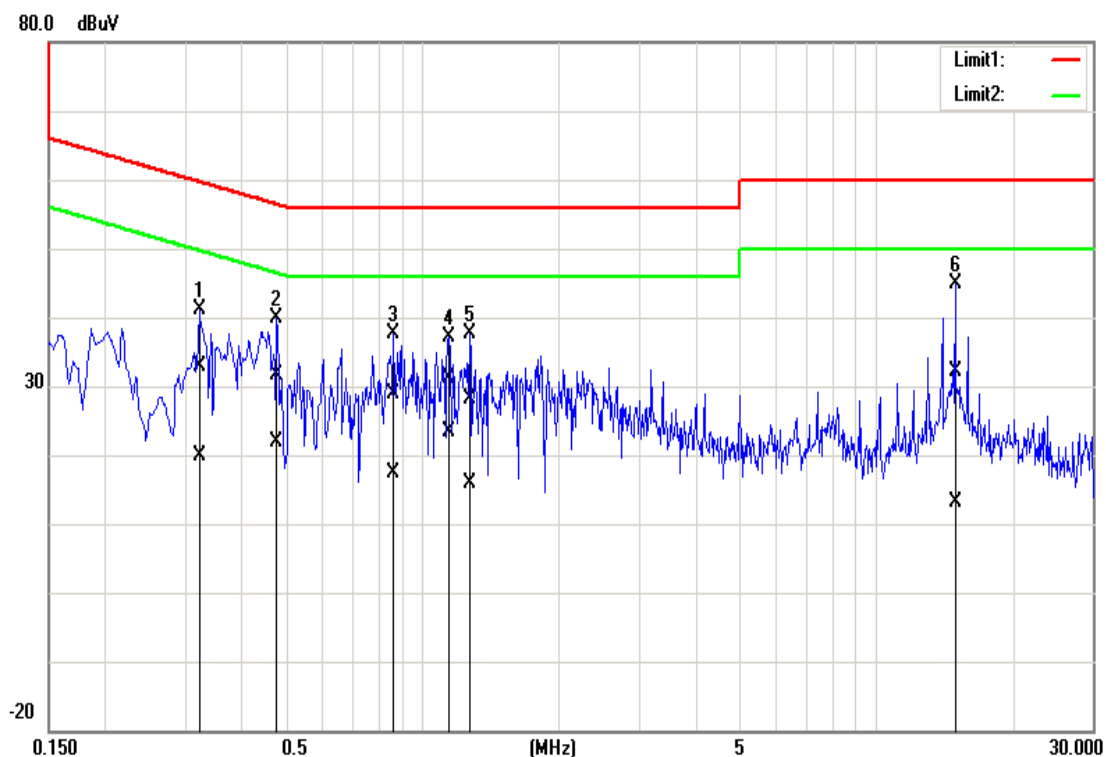
Test Mode:	Mode 1	Temp/Hum	24(°C)/ 61%RH
Phase:	Line	Test Date	March 21, 2022
		Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.2580	15.79	6.36	10.18	25.97	16.54	61.50	51.50	-35.53	-34.96	Pass
0.3620	26.27	13.63	10.19	36.46	23.82	58.68	48.68	-22.22	-24.86	Pass
12.9020	14.77	-2.82	10.36	25.13	7.54	60.00	50.00	-34.87	-42.46	Pass
13.8740	20.18	-0.57	10.37	30.55	9.80	60.00	50.00	-29.45	-40.20	Pass
14.8660	24.50	3.73	10.36	34.86	14.09	60.00	50.00	-25.14	-35.91	Pass
15.8220	19.10	0.43	10.37	29.47	10.80	60.00	50.00	-30.53	-39.20	Pass

Note: Correction factor = LISN loss + Cable loss.

Test Mode:	Mode 1	Temp/Hum	24(°C)/ 61%RH
Phase:	Neutral	Test Date	March 21, 2022
		Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.3220	22.69	9.79	10.18	32.87	19.97	59.66	49.66	-26.79	-29.69	Pass
0.4780	21.53	11.77	10.18	31.71	21.95	56.37	46.37	-24.66	-24.42	Pass
0.8620	18.56	7.13	10.20	28.76	17.33	56.00	46.00	-27.24	-28.67	Pass
1.1460	20.98	13.06	10.20	31.18	23.26	56.00	46.00	-24.82	-22.74	Pass
1.2700	17.80	5.65	10.21	28.01	15.86	56.00	46.00	-27.99	-30.14	Pass
14.9540	21.65	2.77	10.38	32.03	13.15	60.00	50.00	-27.97	-36.85	Pass

Note: Correction factor = LISN loss + Cable loss.

4.2 6dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

According to §15.247(a)(2),

6 dB Bandwidth :

Limit	Shall be at least 500kHz
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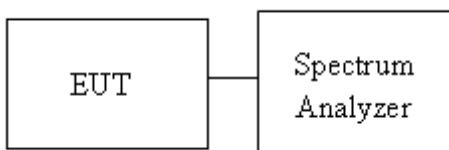
Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI C63.10: 2013,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth.
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



4.2.4 Test Result

Temperature: 24.5°C

Humidity: 50% RH

Tested by: Allen Shen

Test date: March 18, 2022

Test mode: IEEE 802.11b mode / 2412-2462 MHz				
Channel	Frequency (MHz)	OBW(99%) (MHz)	6dB BW (MHz)	6dB limit (kHz)
Low	2412	14.810	9.602	≥500
Mid	2437	14.823	10.07	
High	2462	14.832	10.08	

Test mode: IEEE 802.11g mode / 2412-2462 MHz				
Channel	Frequency (MHz)	OBW(99%) (MHz)	6dB BW (MHz)	6dB limit (kHz)
Low	2412	16.824	16.35	≥500
Mid	2437	16.874	16.36	
High	2462	16.921	16.35	

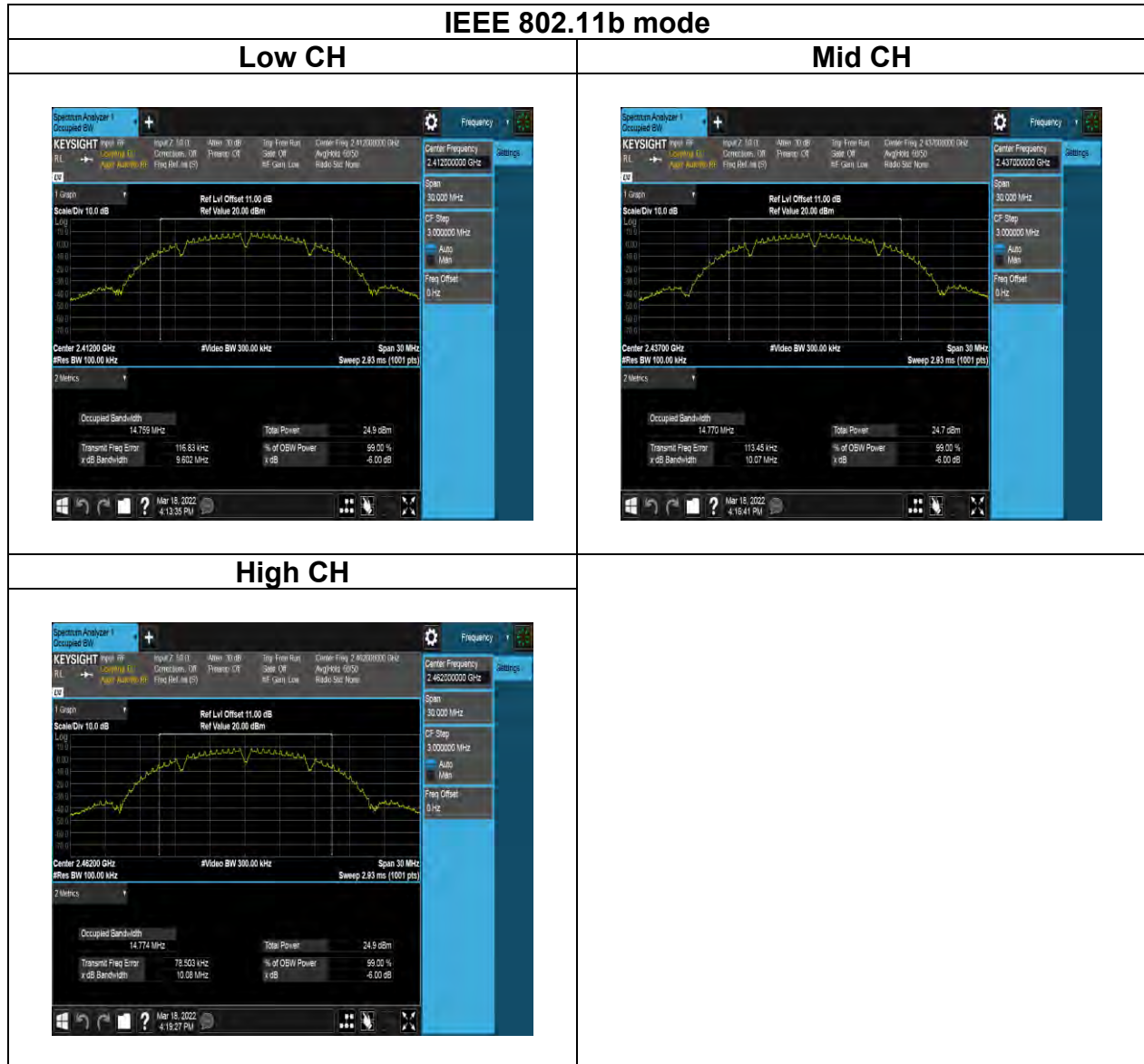
Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz				
Channel	Frequency (MHz)	OBW(99%) (MHz)	6dB BW (MHz)	6dB limit (kHz)
Low	2412	17.860	17.13	≥500
Mid	2437	17.861	17.36	
High	2462	17.929	17.16	

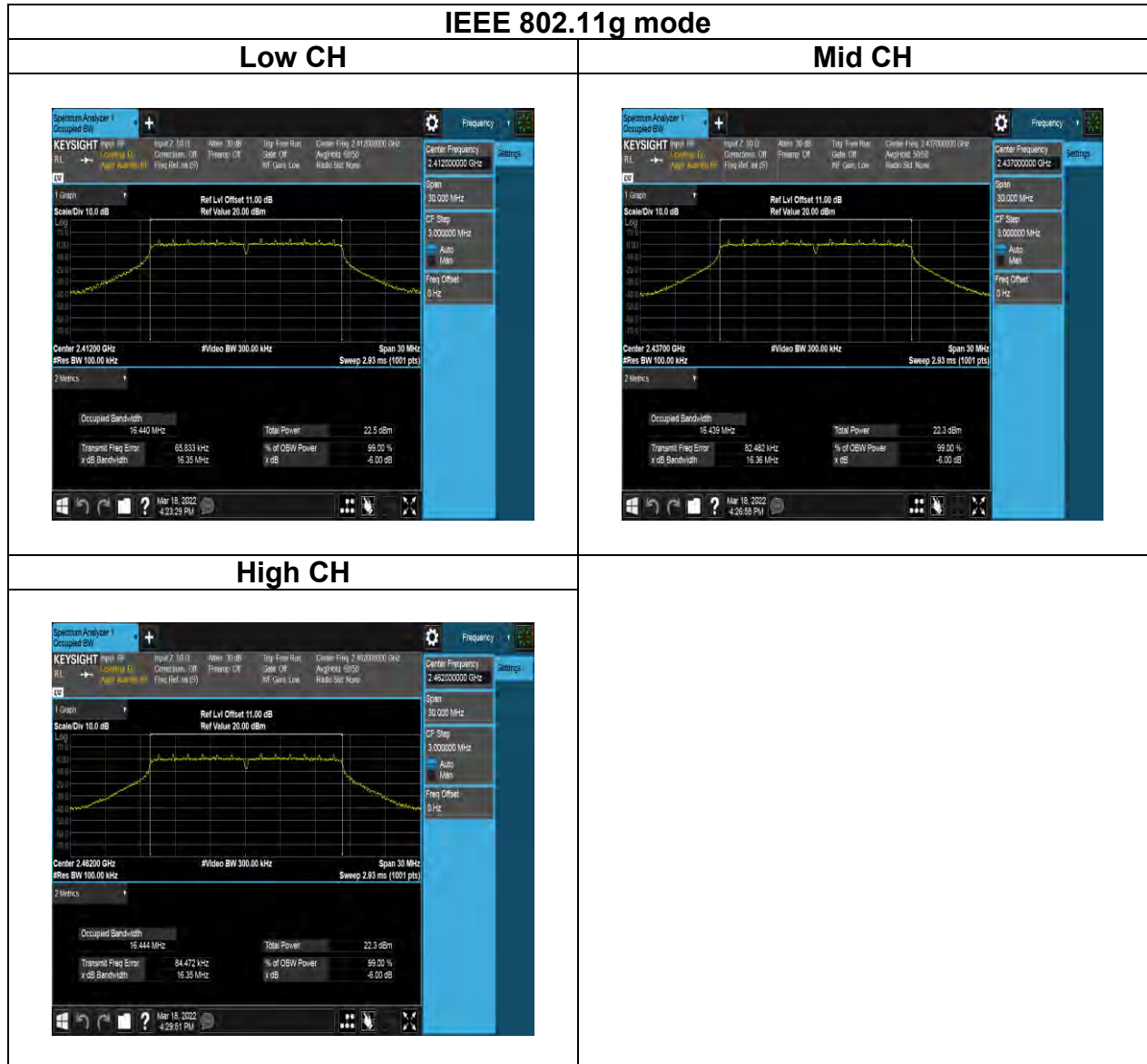
Test mode: IEEE 802.11n HT 40 mode / 2422-2452 MHz				
Channel	Frequency (MHz)	OBW(99%) (MHz)	6dB BW (MHz)	6dB limit (kHz)
Low	2422	35.848	35.20	≥500
Mid	2437	35.814	35.39	
High	2452	35.823	35.21	

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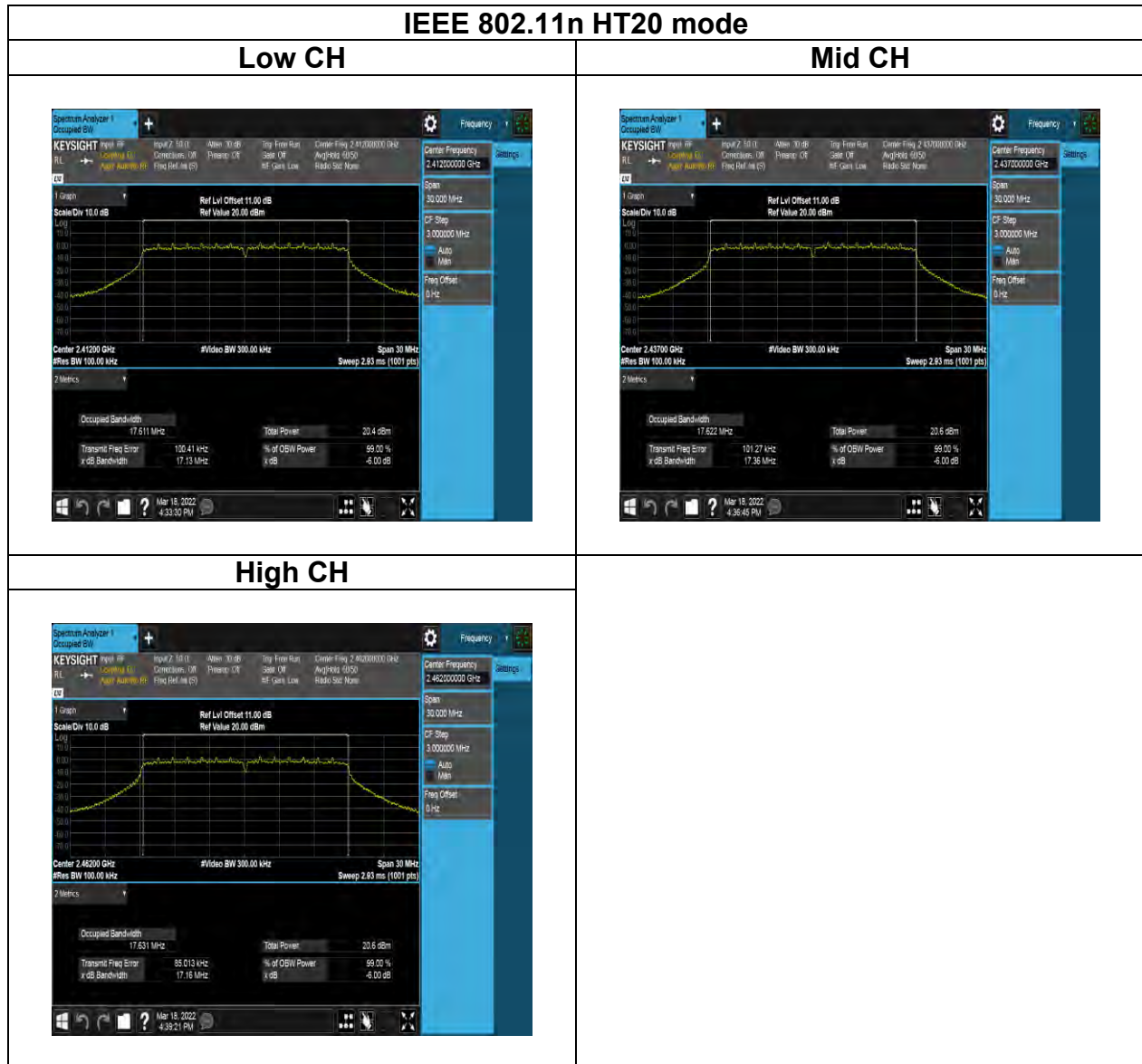
Test Data

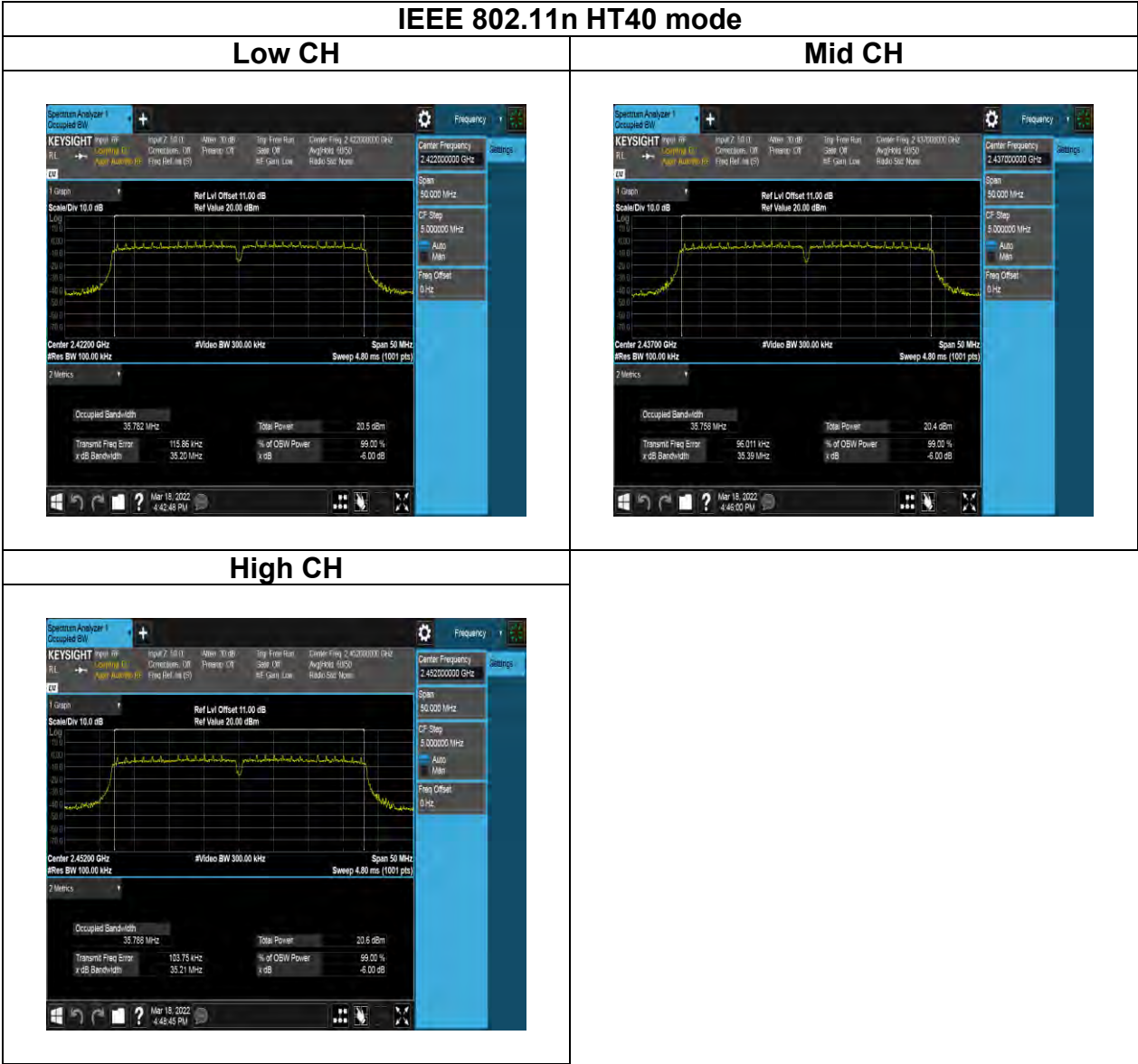
6dB BANDWIDTH





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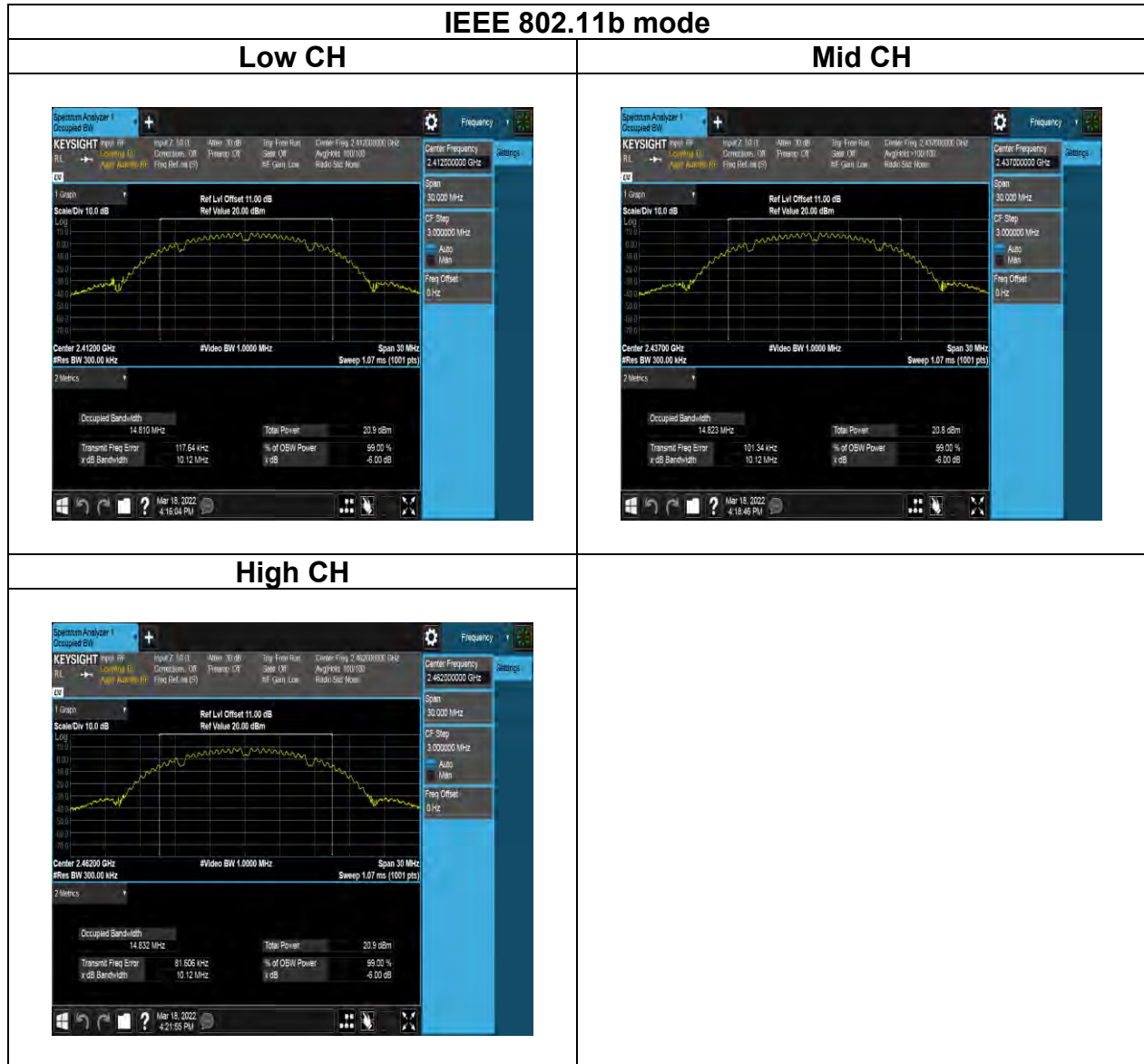


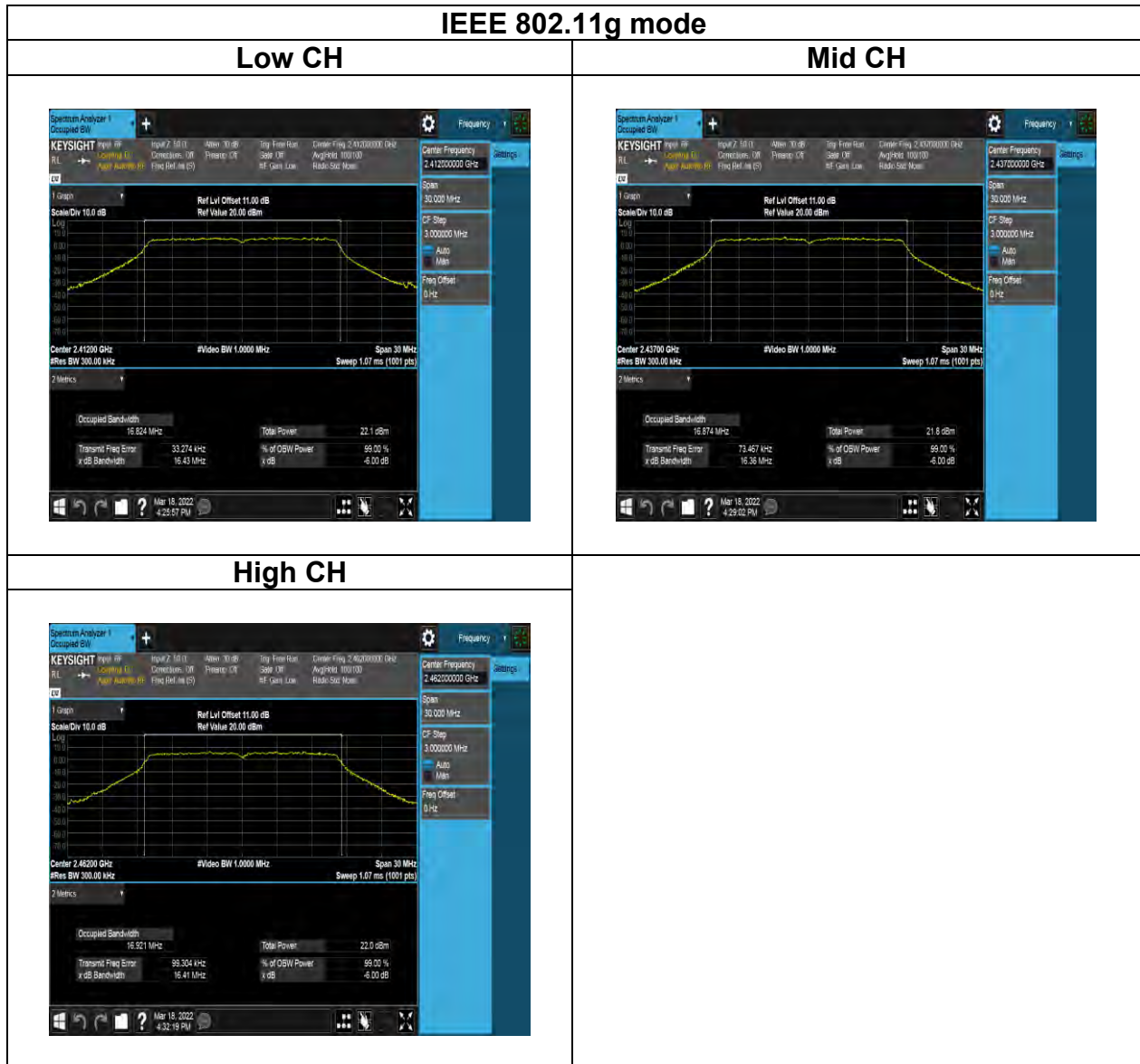


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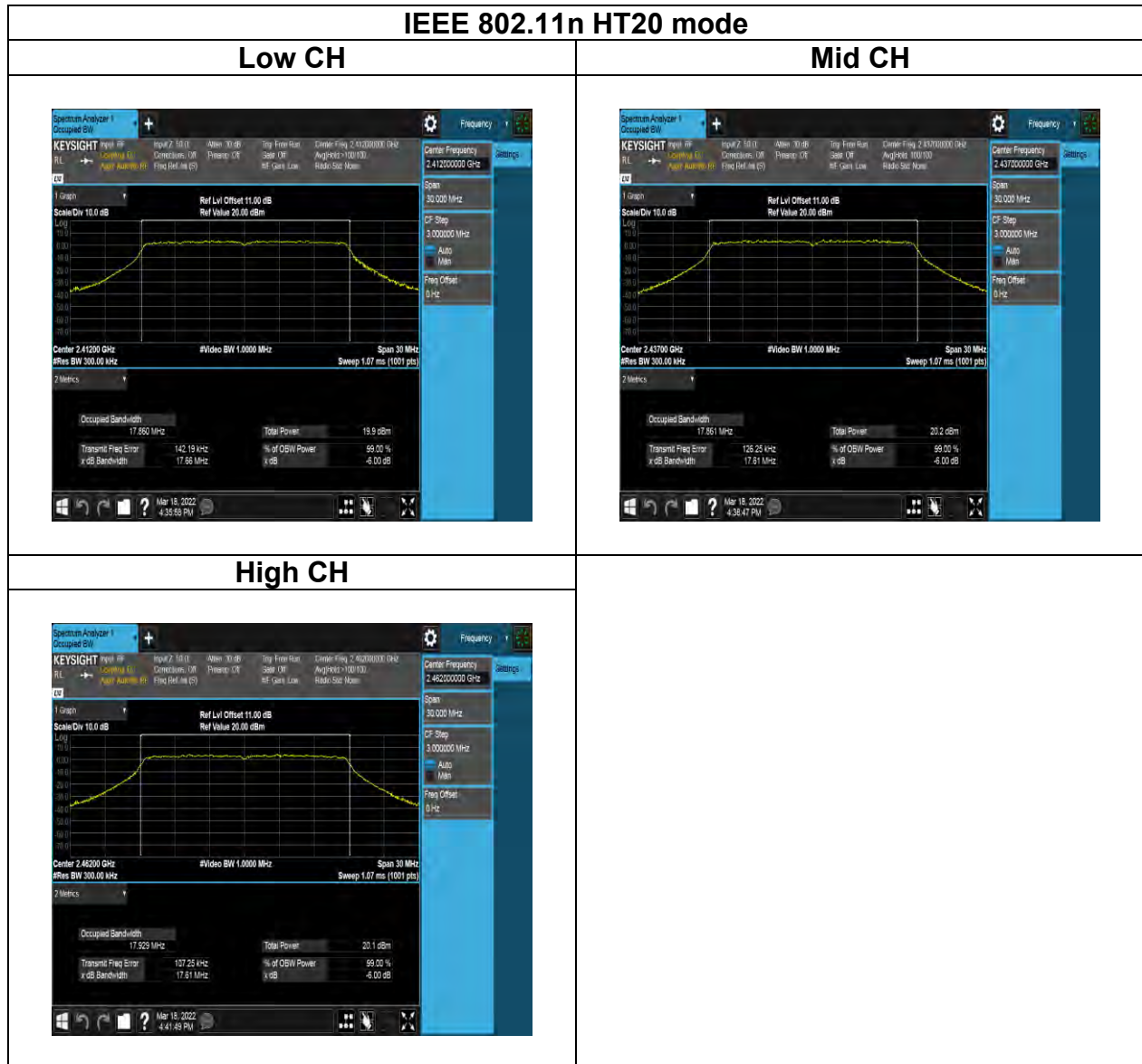
Test Data

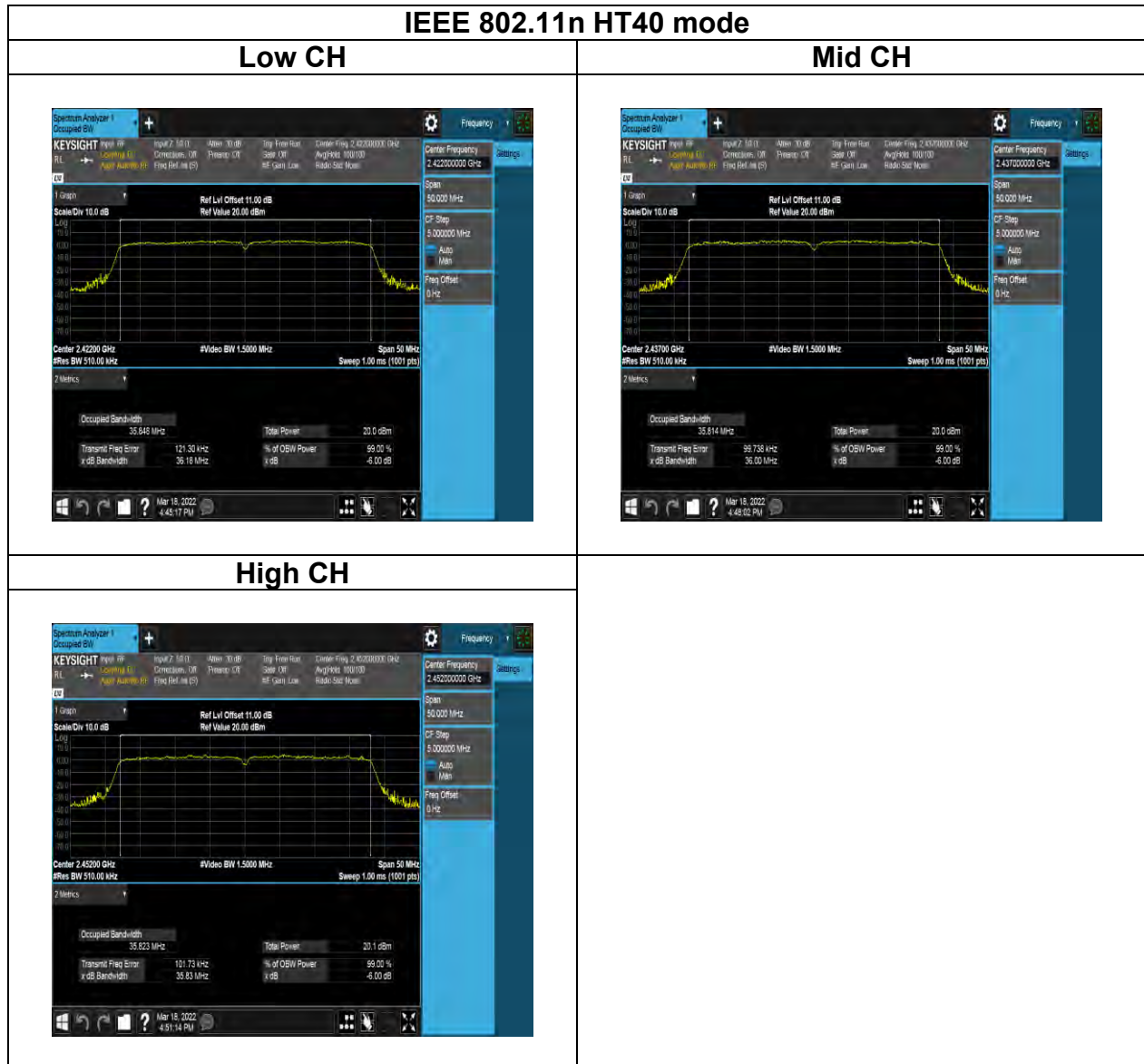
BANDWIDTH 99%





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4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b),

Peak output power :

FCC:

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement,

Limit	☒ Antenna not exceed 6 dBi : 30dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)] ☐ Point-to-point operation :
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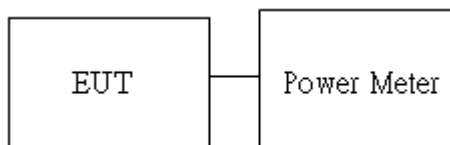
Average output power : For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Temperature: 24.5°C

Humidity: 50% RH

Tested by: Allen Shen

Test date: March 18, 2022

Peak output power :

802.11b Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	96	20.17	30.00	PASS
6	2437	1	94	20.10	30.00	PASS
11	2462	1	94	20.24	30.00	PASS

802.11g Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	85	24.81	30.00	PASS
6	2437	6	82	24.64	30.00	PASS
11	2462	6	82	24.79	30.00	PASS

802.11nHT_20M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	77	22.73	30.00	PASS
6	2437	MCS0	75	22.93	30.00	PASS
11	2462	MCS0	75	22.67	30.00	PASS

802.11nHT_40M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	76	23.18	30.00	PASS
6	2437	MCS0	77	23.68	30.00	PASS
9	2452	MCS0	77	23.39	30.00	PASS

Average output power :

802.11b Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	1	96	17.47	30.00	PASS
6	2437	1	94	17.47	30.00	PASS
11	2462	1	94	17.49	30.00	PASS

802.11g Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	6	85	15.44	30.00	PASS
6	2437	6	82	15.47	30.00	PASS
11	2462	6	82	15.43	30.00	PASS

802.11nHT_20M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	77	13.45	30.00	PASS
6	2437	MCS0	75	13.49	30.00	PASS
11	2462	MCS0	75	13.45	30.00	PASS

802.11nHT_40M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	76	13.40	30.00	PASS
6	2437	MCS0	77	13.48	30.00	PASS
9	2452	MCS0	77	13.45	30.00	PASS

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e),

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

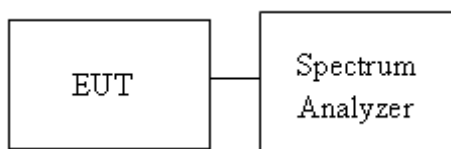
Limit	☒ Antenna not exceed 6 dBi : 8dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 8 – (DG – 6)] ☐ Point-to-point operation :
-------	---

4.4.2 Test Procedure

Test method Refer as ANSI C63.10:2013

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 10kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



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4.4.4 Test Result

Temperature: 24.5°C

Humidity: 50% RH

Tested by: Allen Shen

Test date: March 18, 2022

POWER DENSITY 802.11b				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-5.43	-5.43	8.00	PASS
2437	-6.10	-6.10	8.00	PASS
2462	-5.17	-5.17	8.00	PASS

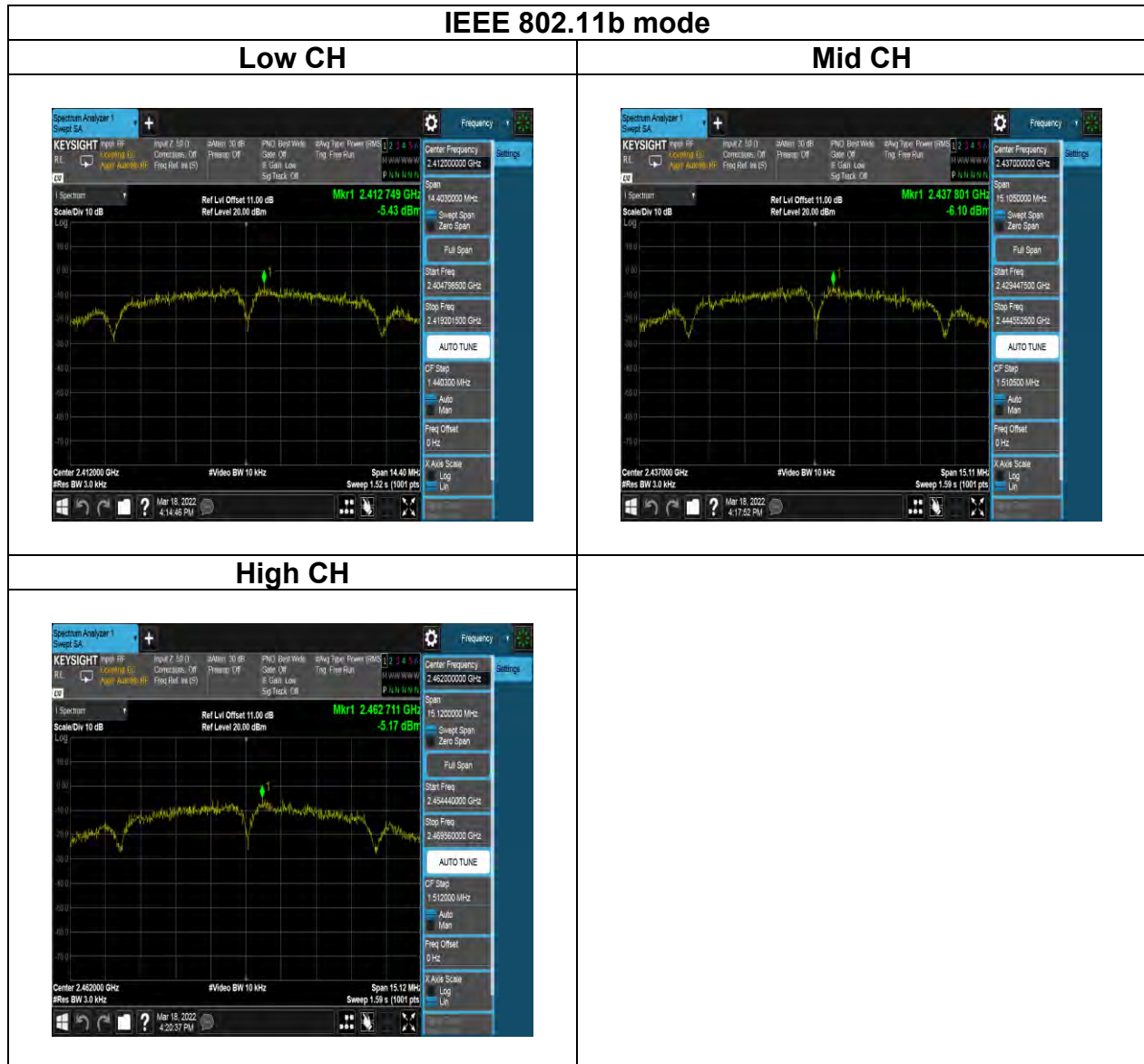
POWER DENSITY 802.11g				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-10.44	-10.44	8.00	PASS
2437	-10.74	-10.74	8.00	PASS
2462	-9.92	-9.92	8.00	PASS

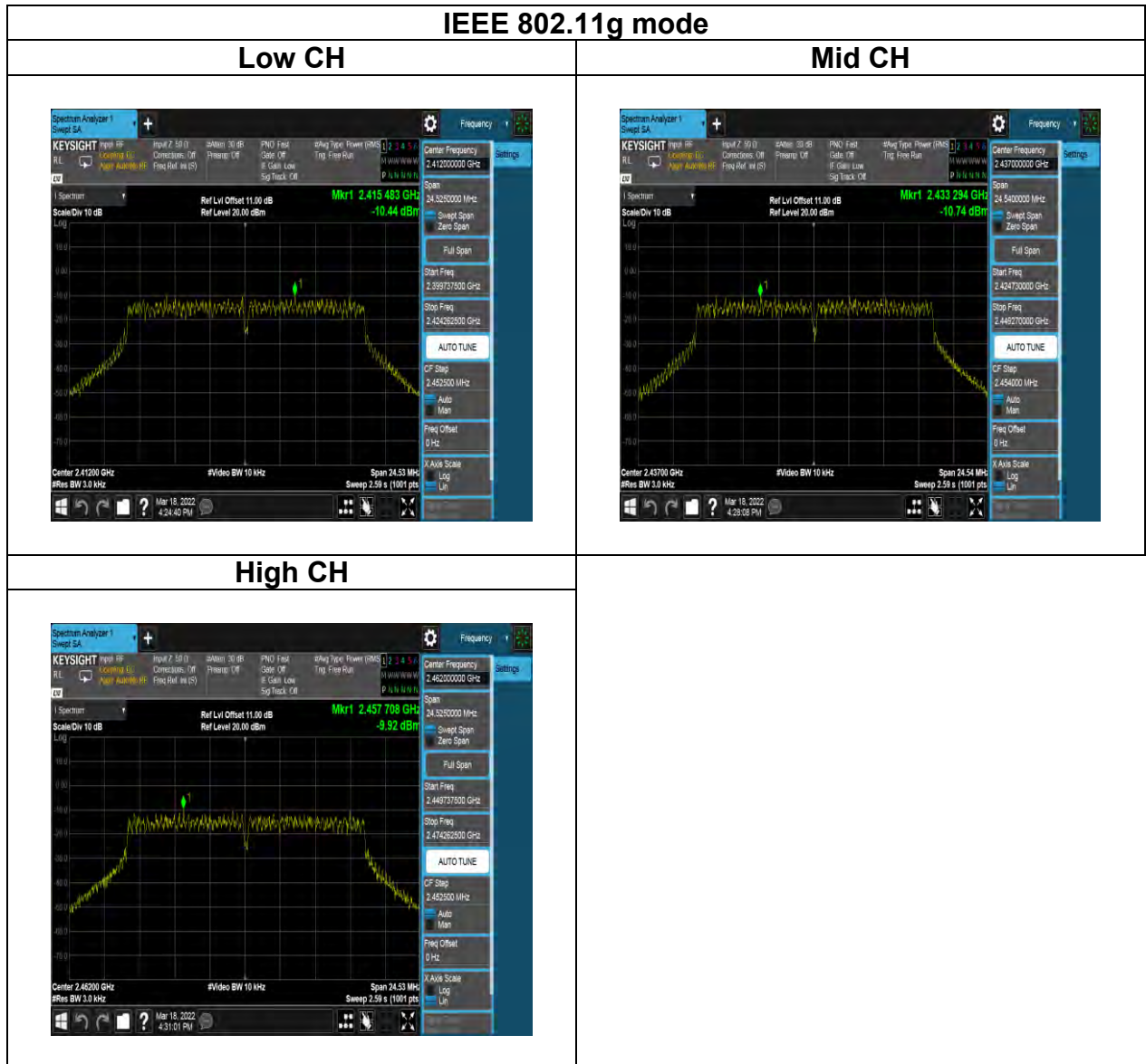
POWER DENSITY 802.11n HT20				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-12.57	-12.57	8.00	PASS
2437	-12.66	-12.66	8.00	PASS
2462	-12.73	-12.73	8.00	PASS

POWER DENSITY 802.11n HT40				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422	-15.70	-15.70	8.00	PASS
2437	-15.43	-15.43	8.00	PASS
2452	-15.63	-15.63	8.00	PASS

Report No.: TMWK2203000913KR

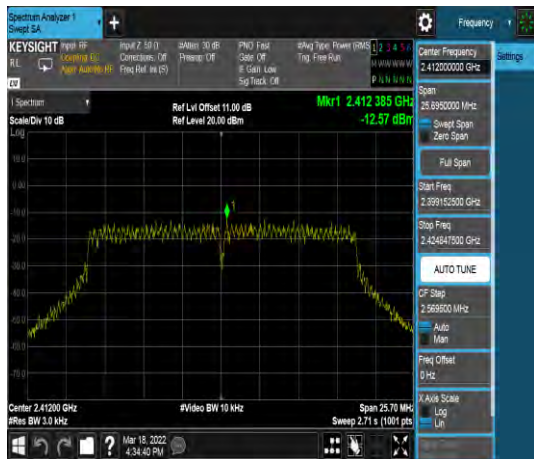
Test Data



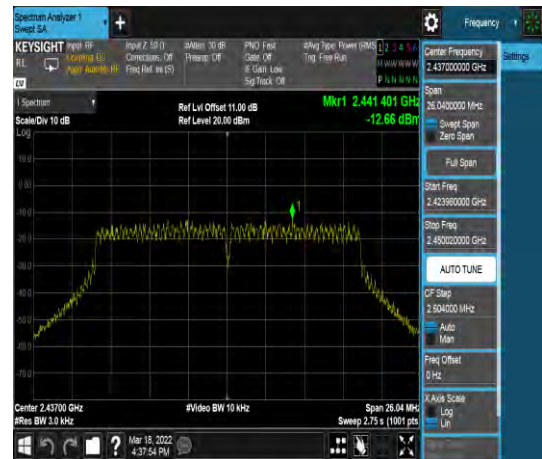


IEEE 802.11n HT20 mode

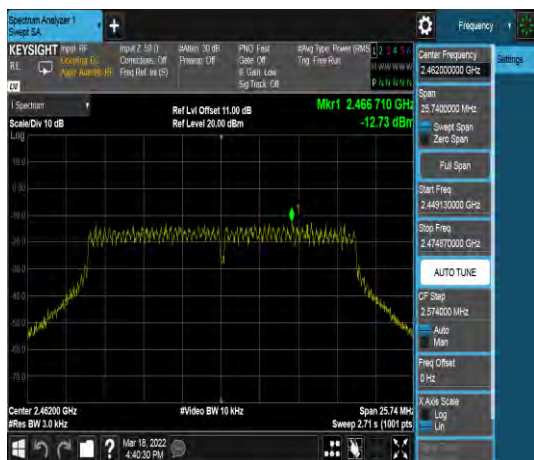
Low CH

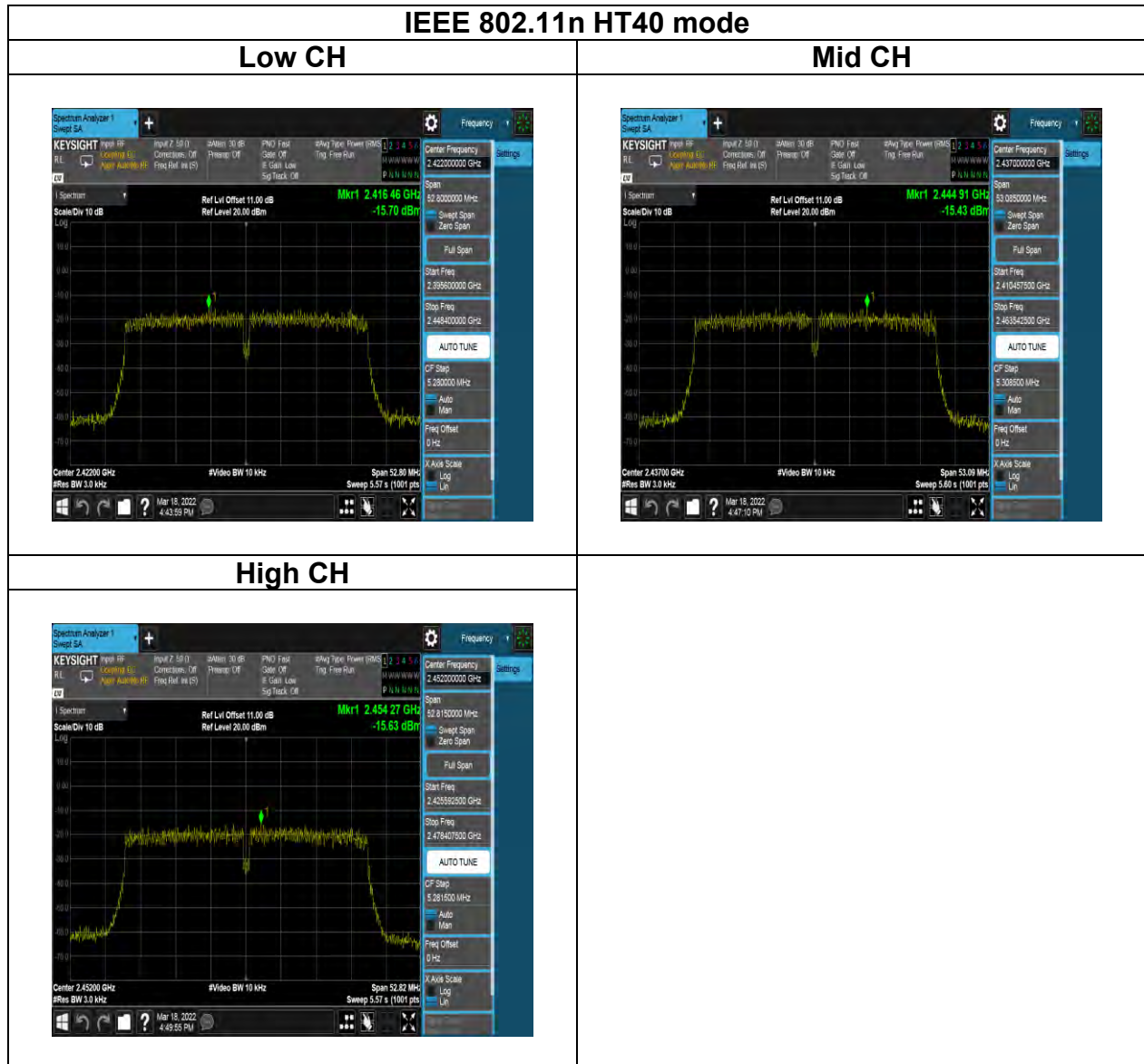


Mid CH



High CH





4.5 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d),

FCC:

In any 100 kHz bandwidth outside the authorized frequency band,

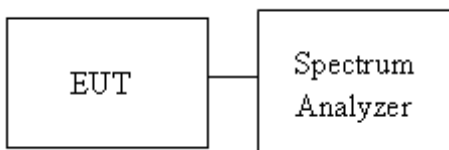
Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

4.5.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

4.5.3 Test Setup



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4.5.4 Test Result

Test Data

Temperature: 24.5°C

Humidity: 50% RH

Tested by: Allen Shen

Test date: March 18, 2022

IEEE 802.11b mode Low CH

Reference Level of PSD in 100kHz

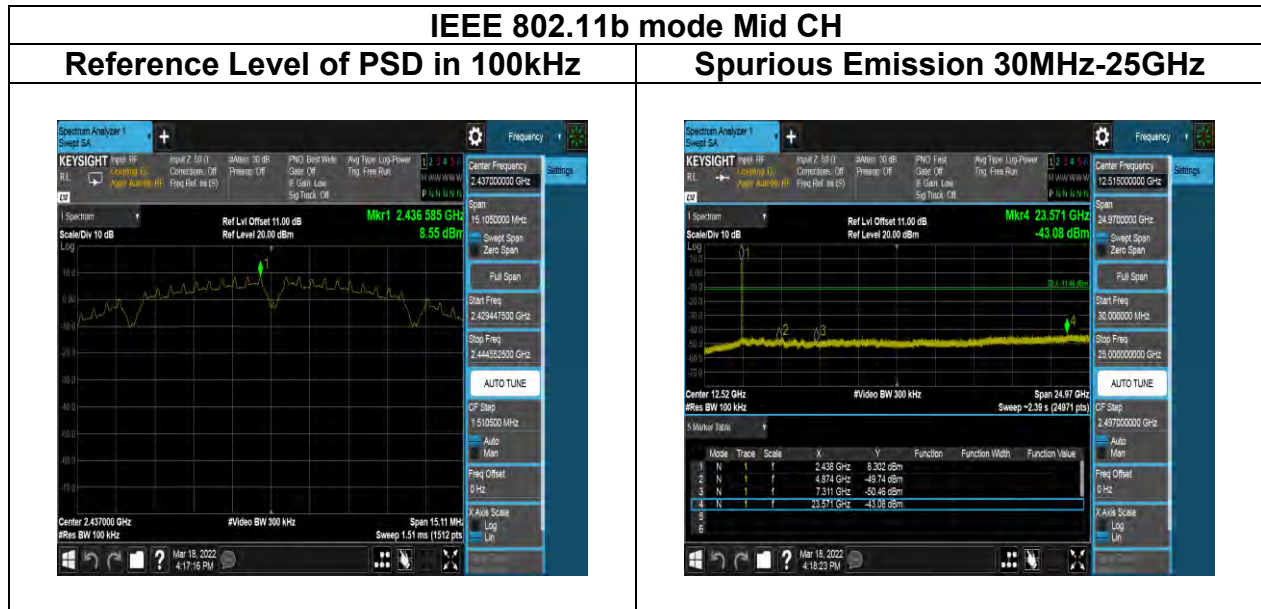


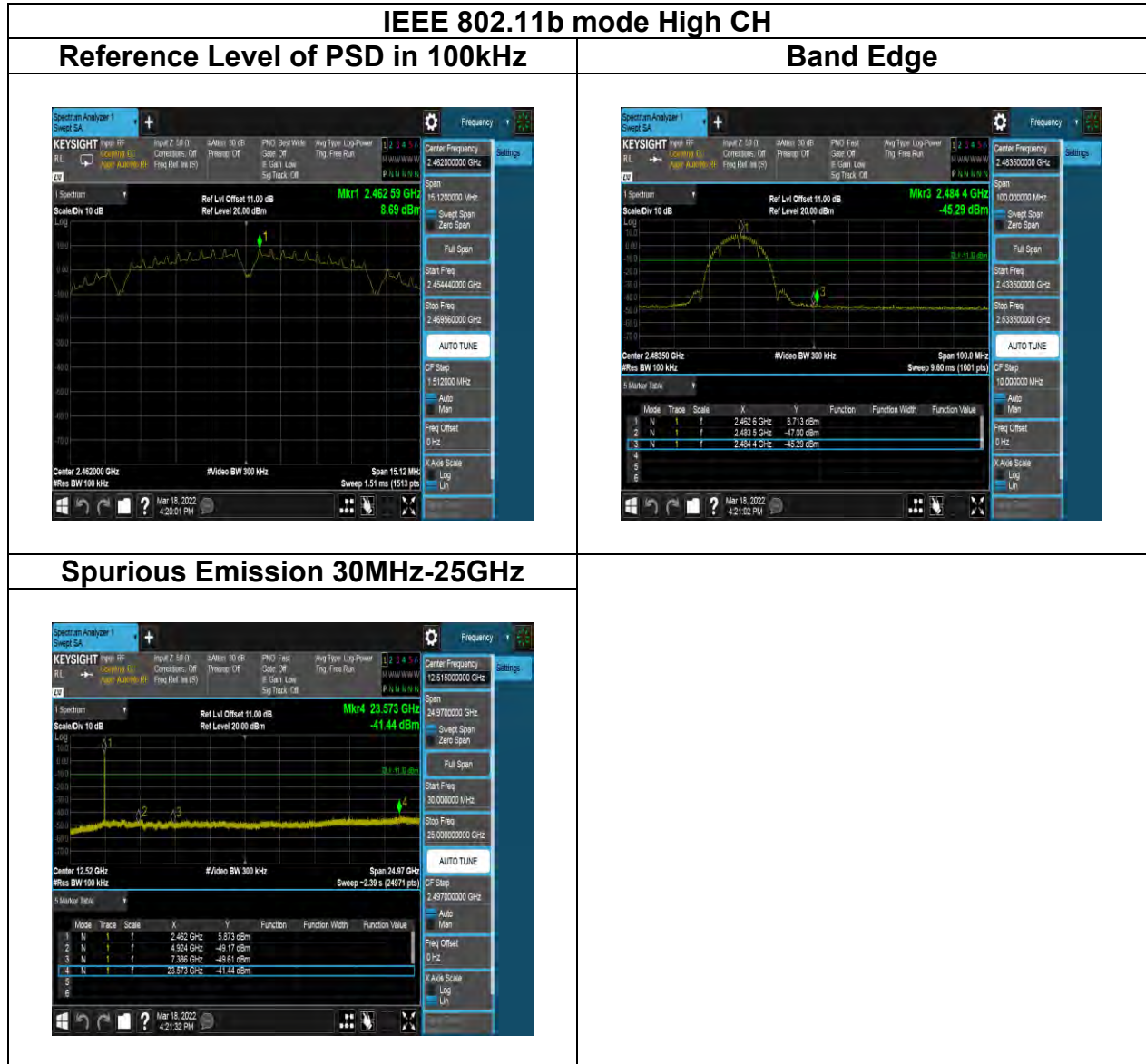
Band Edge

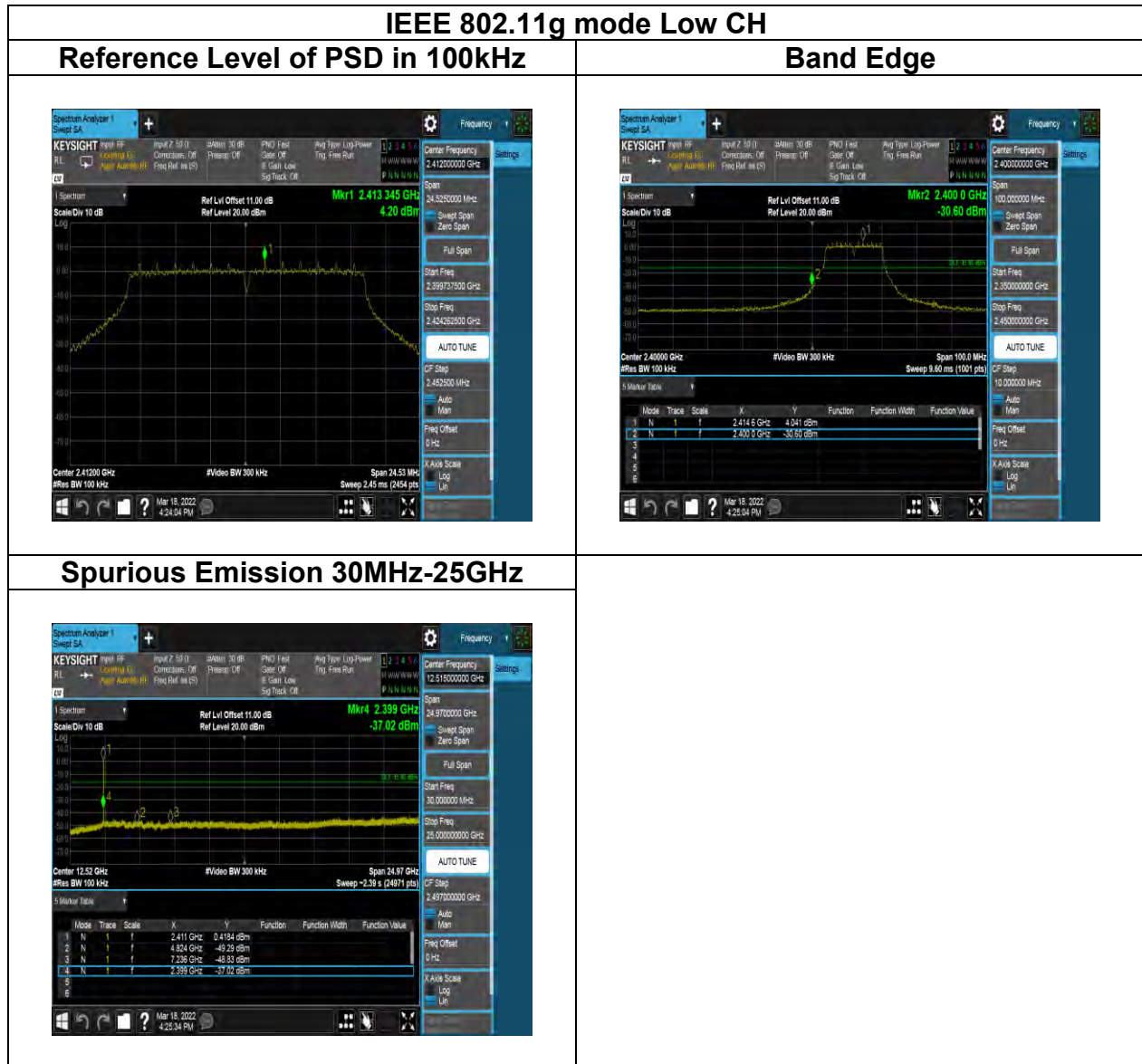


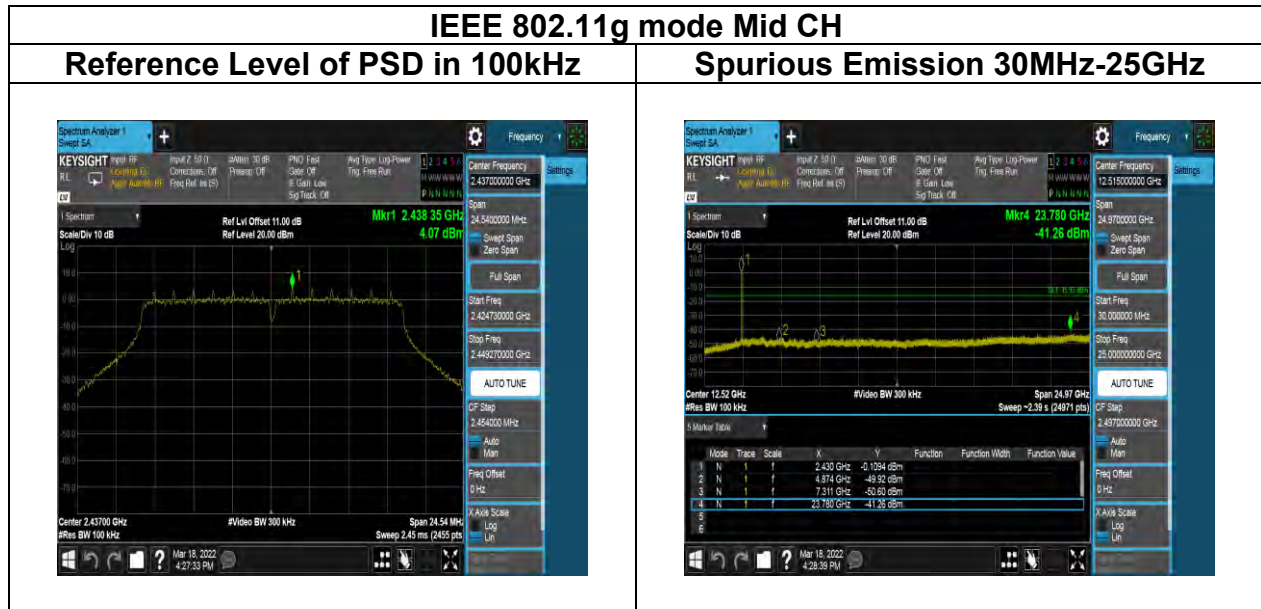
Spurious Emission 30MHz-25GHz

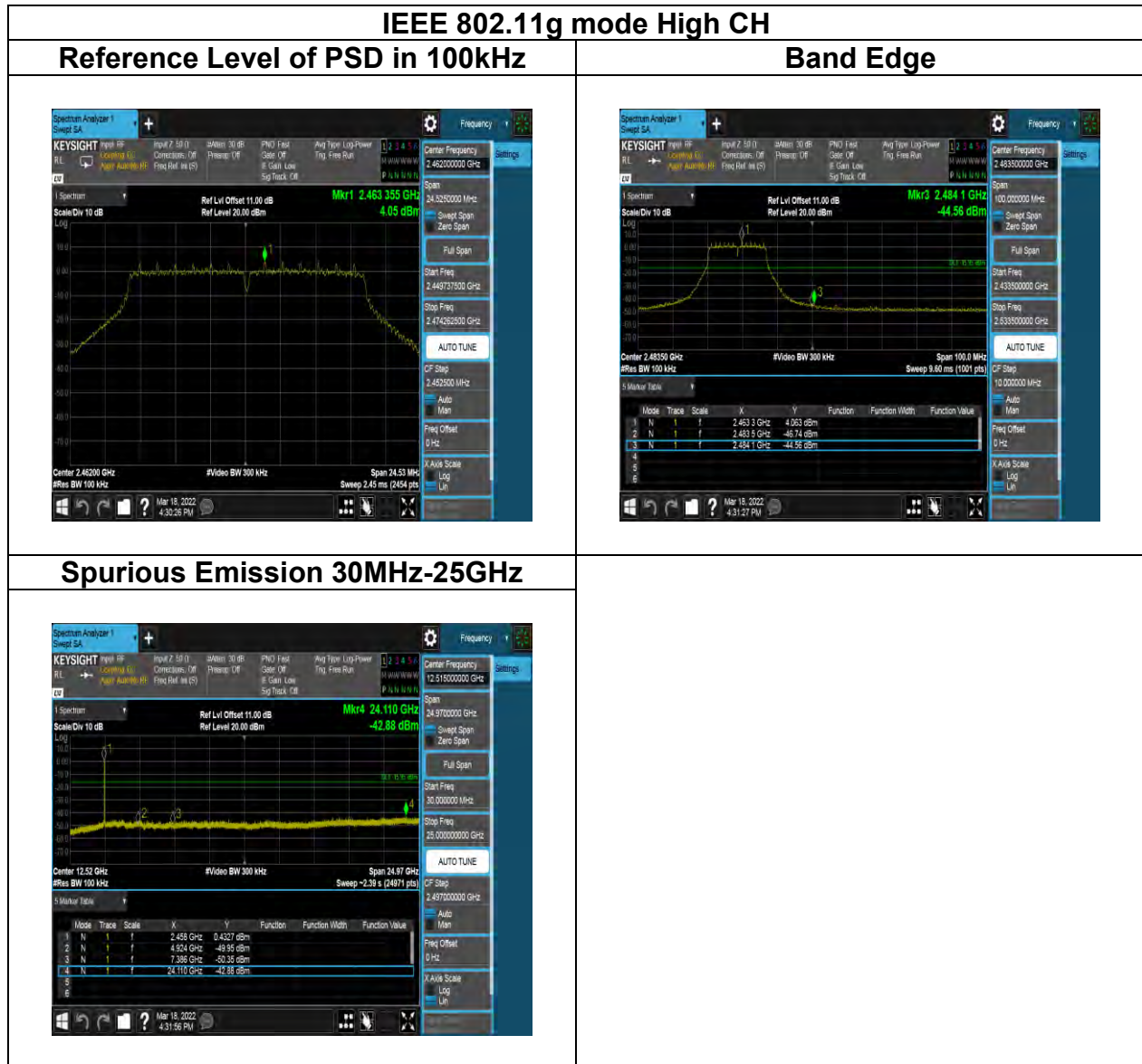


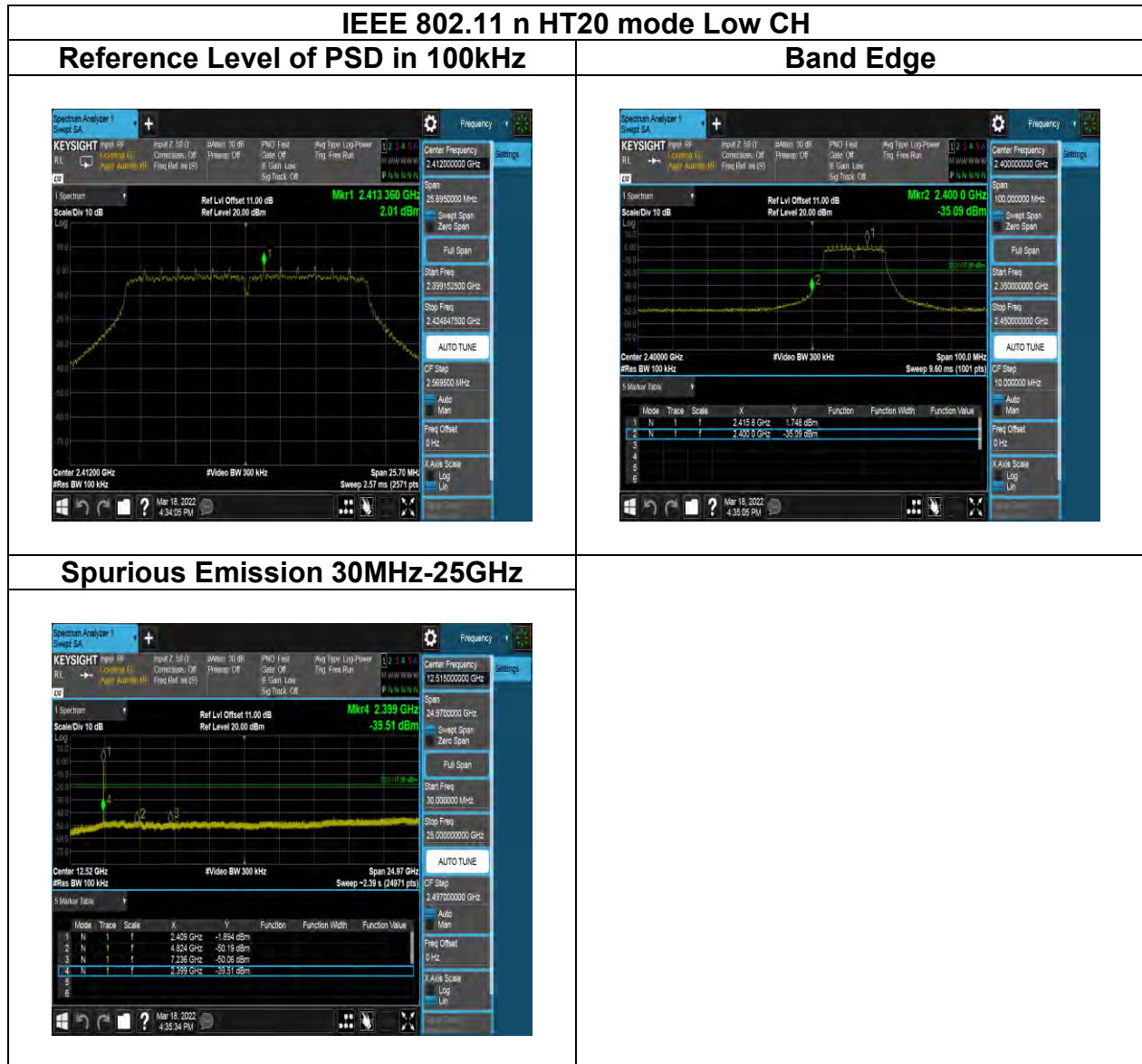


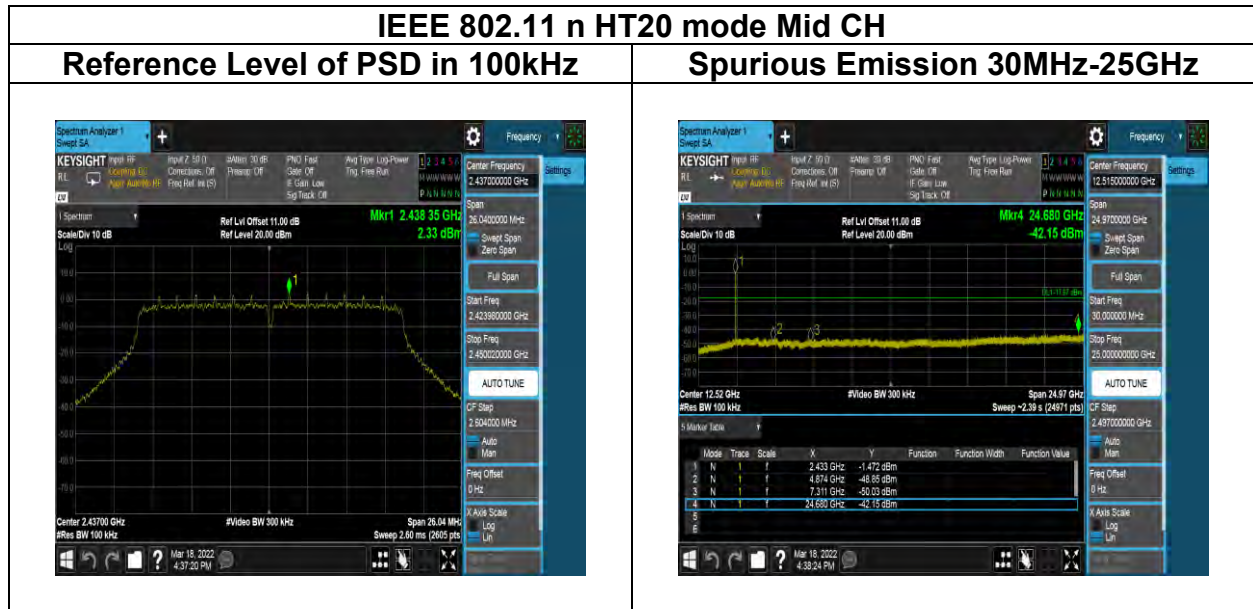












IEEE 802.11n HT20 mode High CH

Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz



IEEE 802.11 n HT40 mode Low CH

Reference Level of PSD in 100kHz

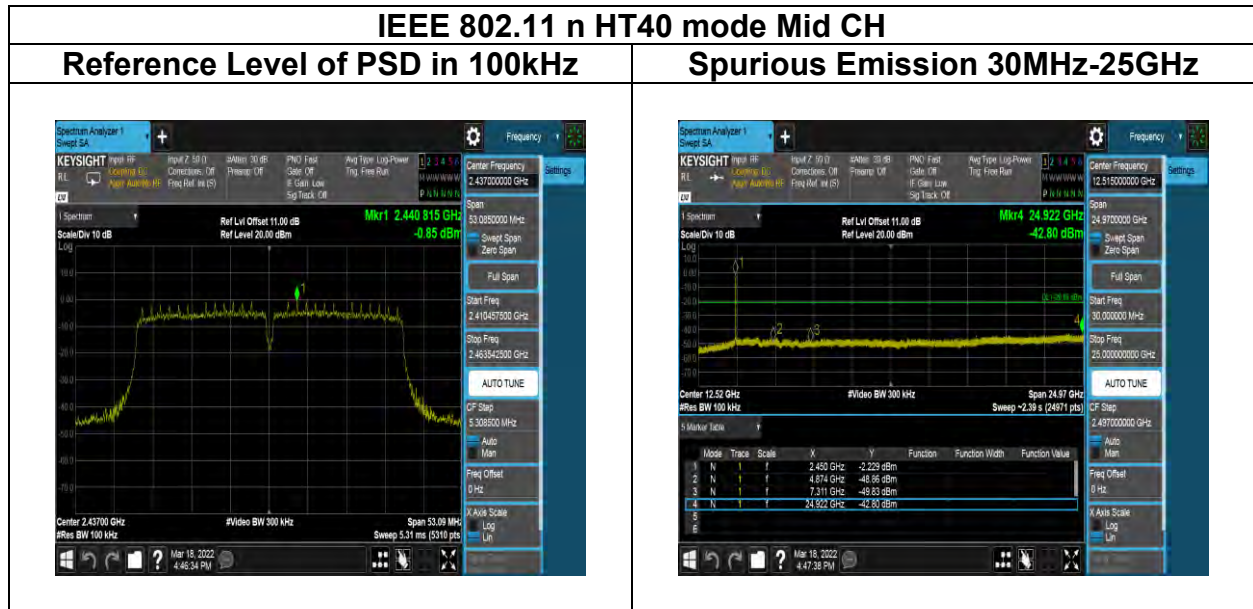


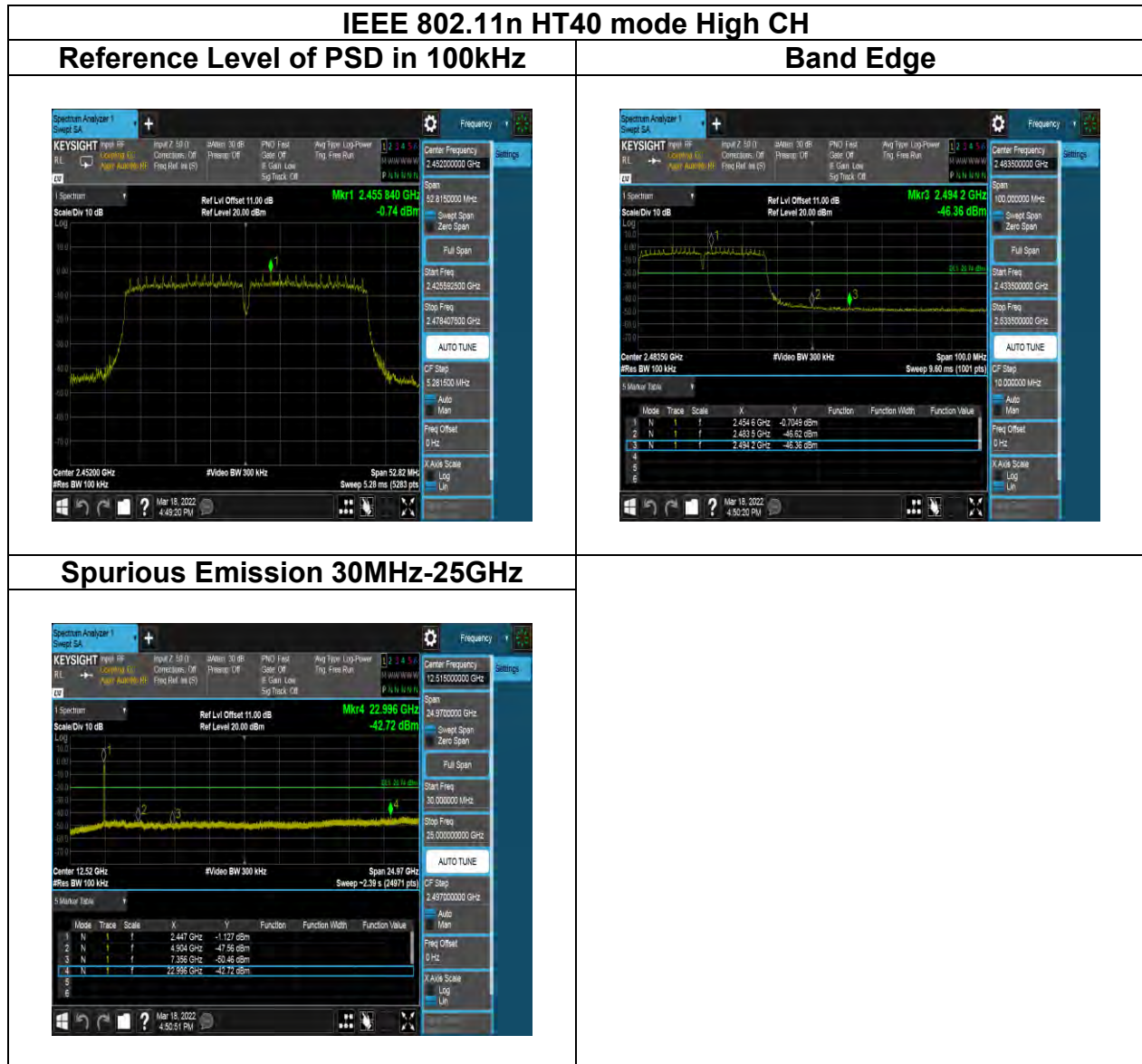
Band Edge



Spurious Emission 30MHz-25GHz







4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency	Field Strength (microvolts/m)	Measurement Distance (metres)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

4.6.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 9kHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

Note: No emission found between lowest internal used/generated frequency to 30MHz (9KHz~30MHz)

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

4. The SA setting following :

(1) Below 1G : RBW = 100kHz, VBW $\geq$ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G :

(2.1) For Peak measurement : RBW = 1MHz, VBW $\geq$ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2.2) For Average measurement : RBW = 1MHz, VBW

·If Duty Cycle $\geq$ 98%, VBW=10Hz.

·If Duty Cycle < 98%, VBW=1/T.

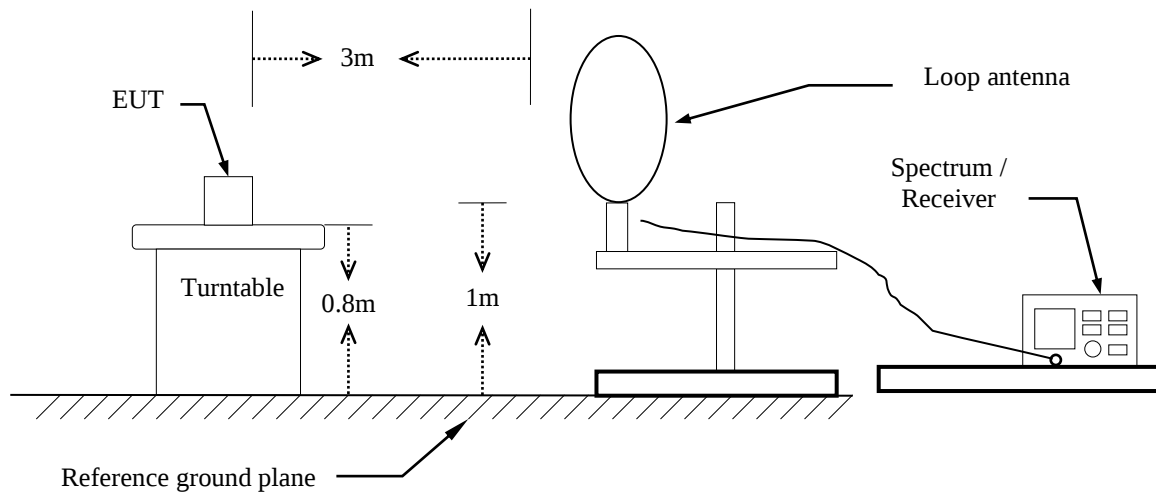
5. Data result

Actual FS=Spectrum Reading Level + Factor

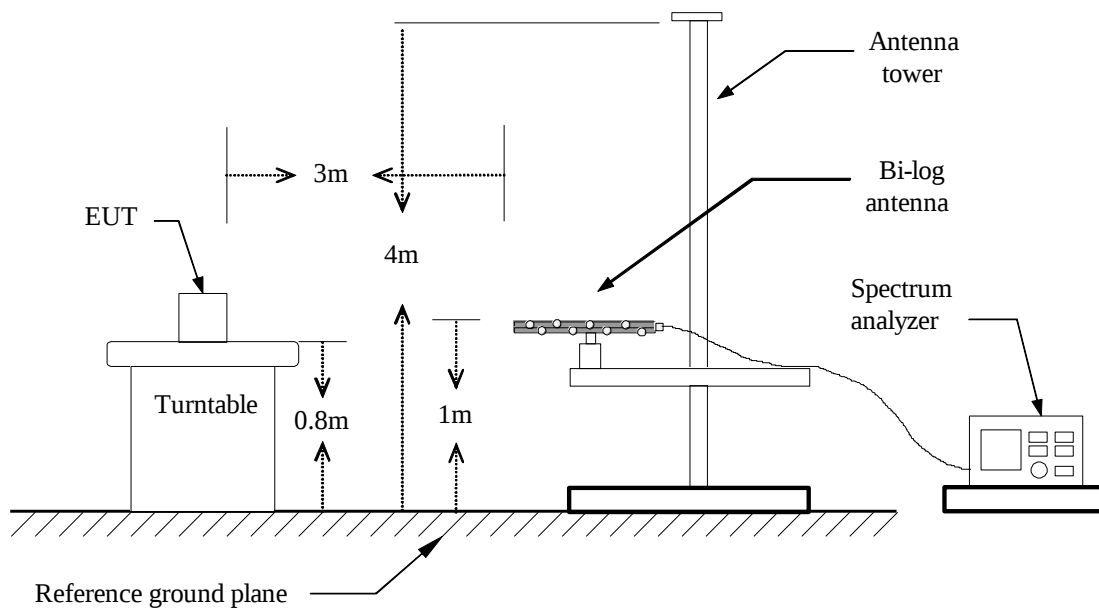
Margin=Actual FS- Limit

4.6.3 Test Setup

9kHz ~ 30MHz



30MHz ~ 1GHz

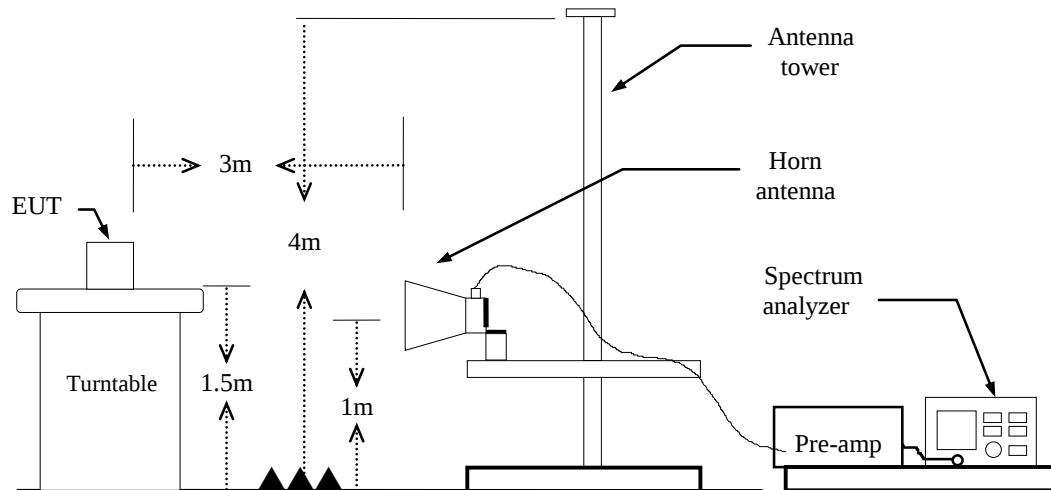


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Above 1 GHz

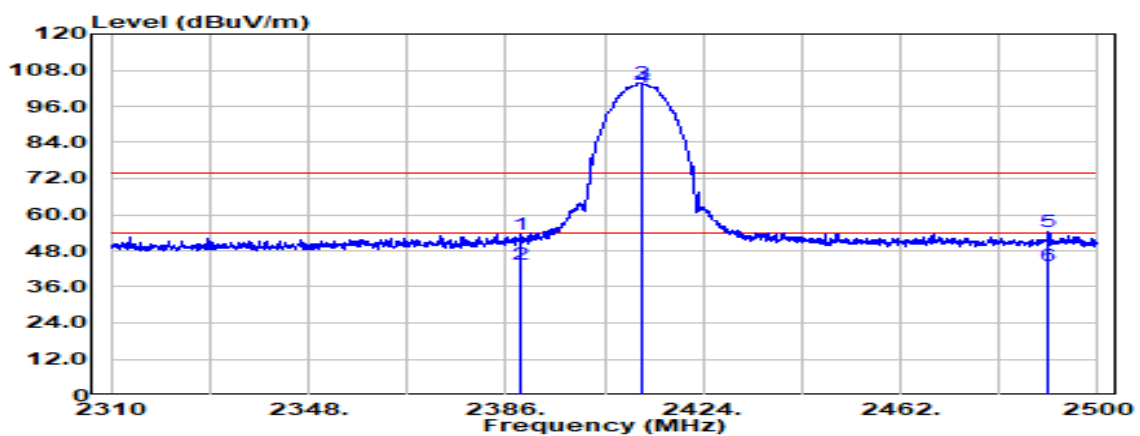


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4.6.4 Test Result

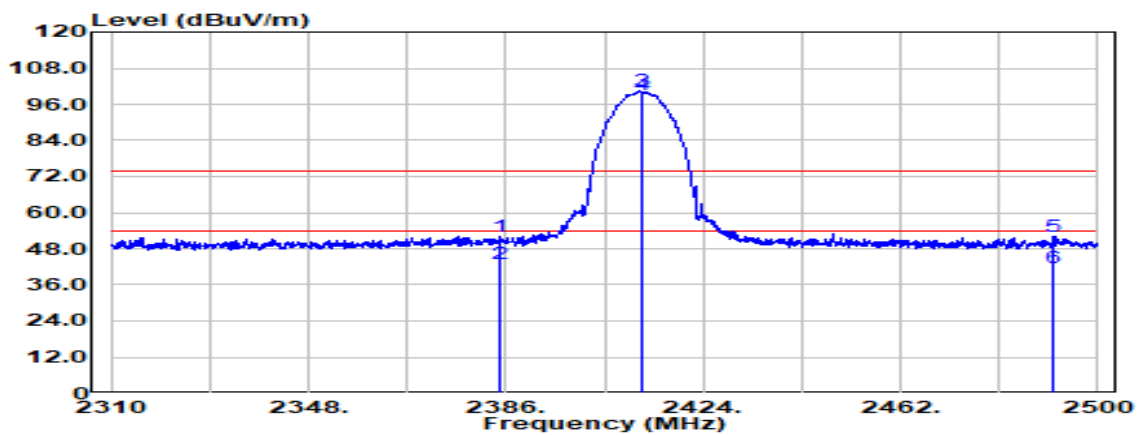
Band Edge Test Data

Test Mode	IEEE 802.11b Low CH 2412MHz	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



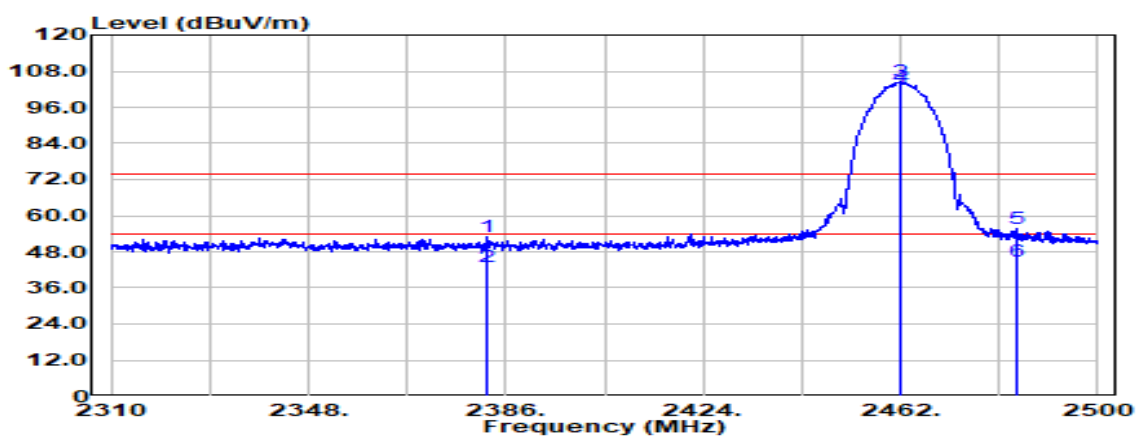
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2388.945	Peak	41.03	12.47	53.51	74.00	-20.49
2388.945	Average	30.87	12.47	43.35	54.00	-10.65
2412.000	Peak	91.09	12.61	103.70	-	-
2412.000	Average	89.72	12.61	102.32	-	-
2490.595	Peak	41.02	13.13	54.15	74.00	-19.85
2490.595	Average	30.08	13.13	43.21	54.00	-10.79

Test Mode	IEEE 802.11b Low CH 2412MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



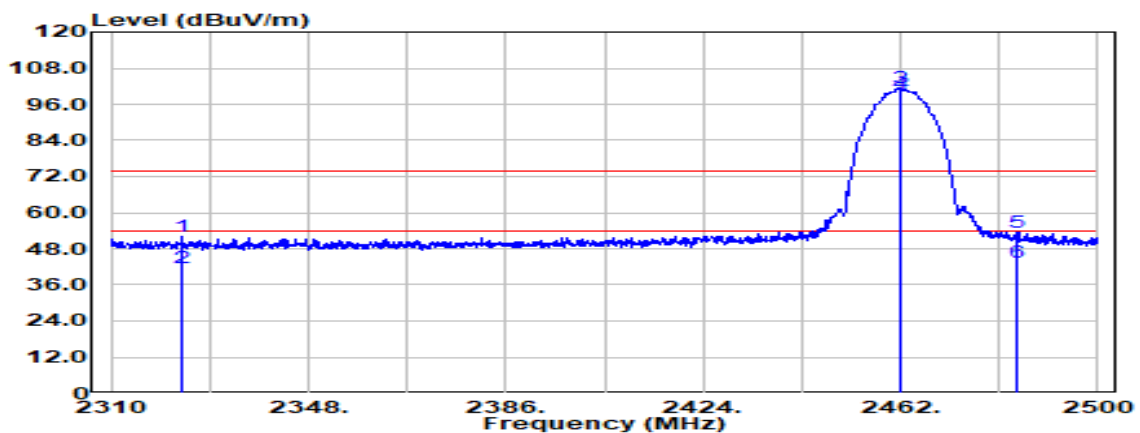
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2384.955	Peak	39.80	12.45	52.25	74.00	-21.75
2384.955	Average	30.34	12.45	42.80	54.00	-11.20
2412.000	Peak	87.73	12.61	100.34	-	-
2412.000	Average	86.45	12.61	99.06	-	-
2491.545	Peak	38.97	13.13	52.10	74.00	-21.90
2491.545	Average	28.61	13.13	41.74	54.00	-12.26

Test Mode	IEEE 802.11b High CH 2462MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



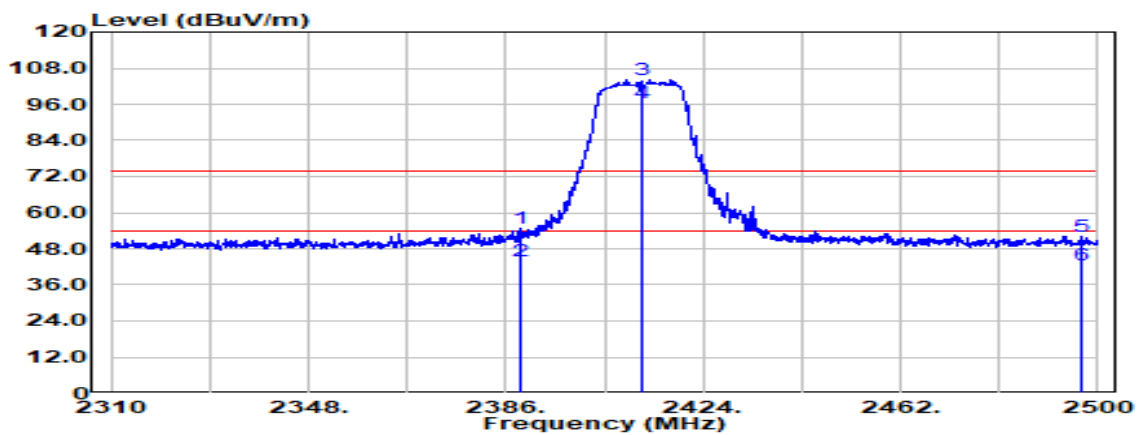
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2382.390	Peak	40.52	12.44	52.96	74.00	-21.04
2382.390	Average	30.51	12.44	42.95	54.00	-11.05
2462.000	Peak	91.65	12.93	104.58	-	-
2462.000	Average	90.08	12.93	103.01	-	-
2484.325	Peak	42.45	13.08	55.53	74.00	-18.47
2484.325	Average	31.89	13.08	44.97	54.00	-9.03

Test Mode	IEEE 802.11b High CH 2462MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2323.585	Peak	39.66	12.24	51.90	74.00	-22.10
2323.585	Average	29.28	12.24	41.52	54.00	-12.48
2462.000	Peak	88.35	12.93	101.28	-	-
2462.000	Average	86.91	12.93	99.84	-	-
2484.610	Peak	40.18	13.09	53.27	74.00	-20.73
2484.610	Average	30.34	13.09	43.43	54.00	-10.57

Test Mode	IEEE 802.11g Low CH 2412MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		

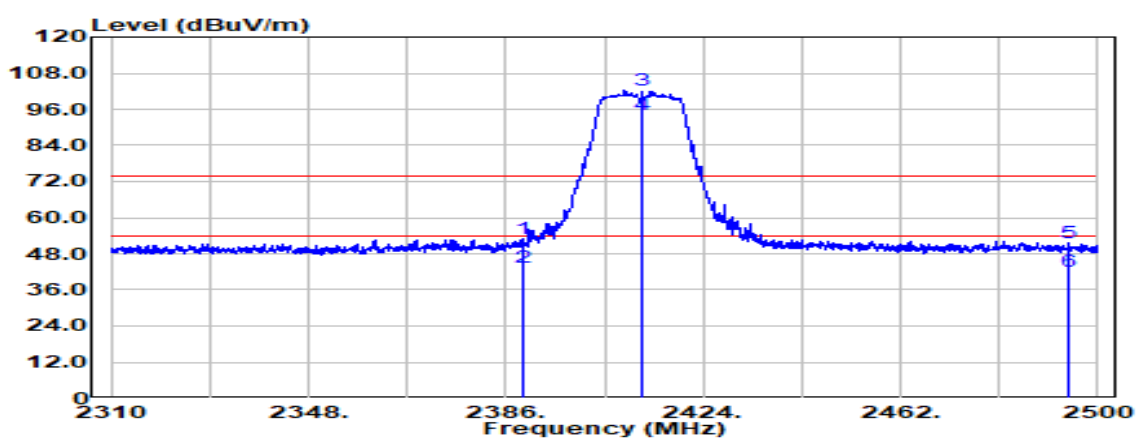


Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBPμV)	Factor (dB)	Actual FS (dBPμV/m)	Limit @3m (dBPμV/m)	Margin (dB)
2389.040	Peak	42.32	12.48	54.80	74.00	-19.20
2389.040	Average	31.35	12.48	43.82	54.00	-10.18
2412.000	Peak	91.71	12.61	104.31	-	-
2412.000	Average	84.00	12.61	96.60	-	-
2496.675	Peak	39.10	13.17	52.26	74.00	-21.74
2496.675	Average	29.32	13.17	42.49	54.00	-11.51

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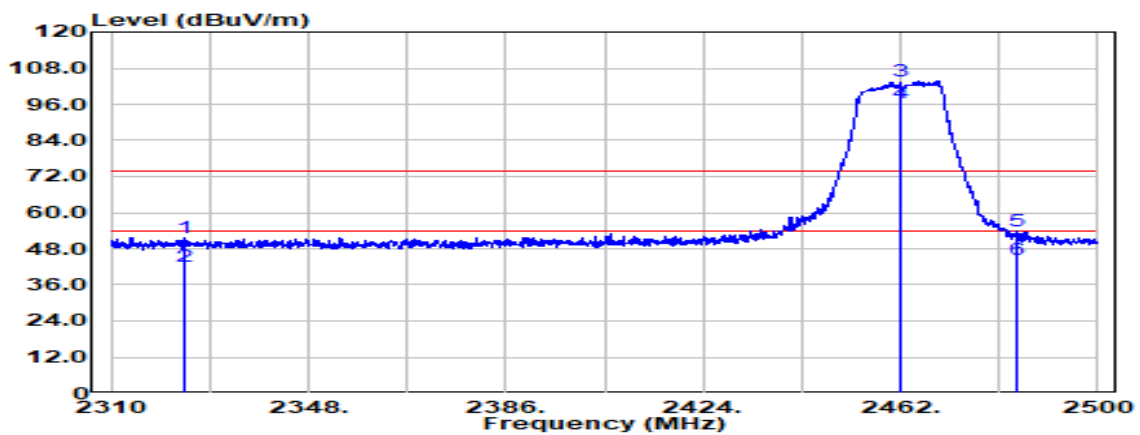
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Test Mode	IEEE 802.11g Low CH 2412MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2389.420	Peak	40.68	12.48	53.16	74.00	-20.84
2389.420	Average	30.85	12.48	43.33	54.00	-10.67
2412.000	Peak	89.77	12.61	102.37	-	-
2412.000	Average	81.79	12.61	94.39	-	-
2494.585	Peak	38.63	13.15	51.79	74.00	-22.21
2494.585	Average	29.18	13.15	42.33	54.00	-11.67

Test Mode	IEEE 802.11g High CH 2462MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



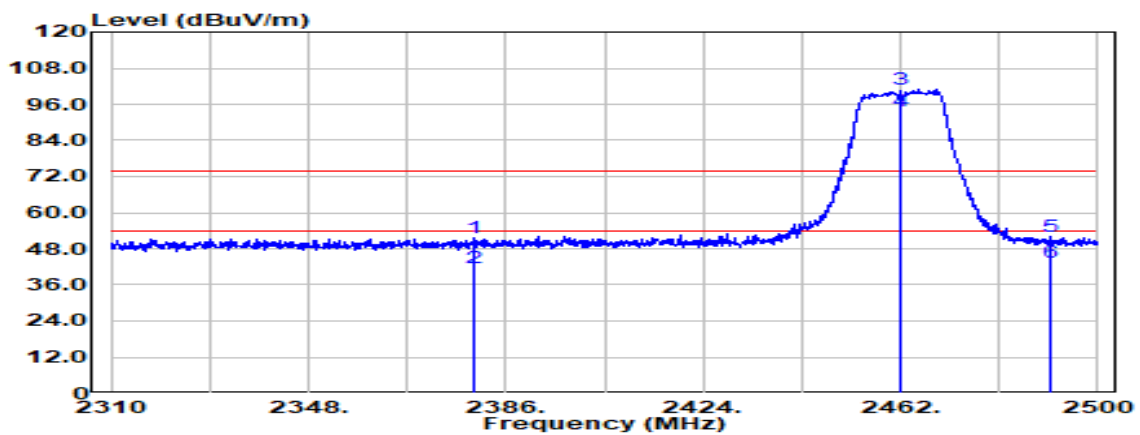
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2324.155	Peak	39.50	12.24	51.73	74.00	-22.27
2324.155	Average	29.96	12.24	42.19	54.00	-11.81
2462.000	Peak	90.75	12.93	103.68	-	-
2462.000	Average	83.73	12.93	96.66	-	-
2484.610	Peak	40.59	13.09	53.67	74.00	-20.33
2484.610	Average	31.11	13.09	44.19	54.00	-9.81

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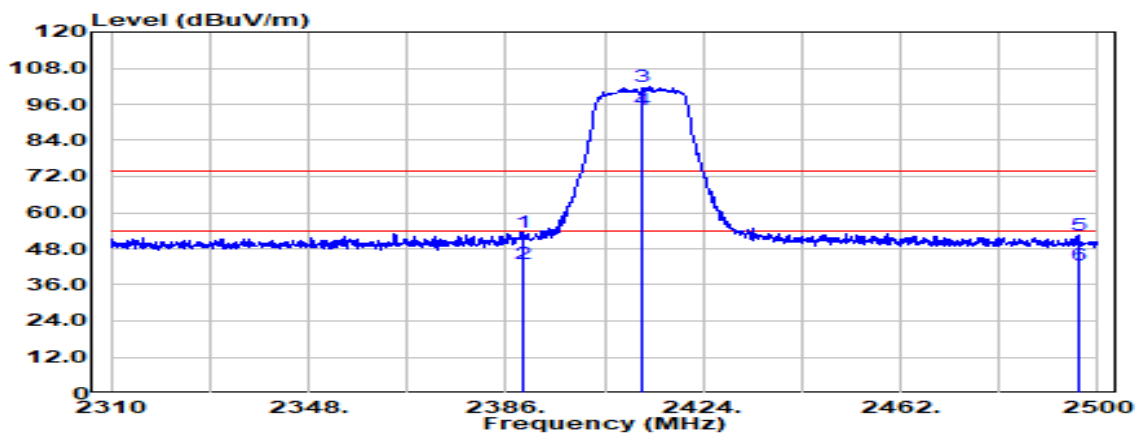
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Test Mode	IEEE 802.11g High CH 2462MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



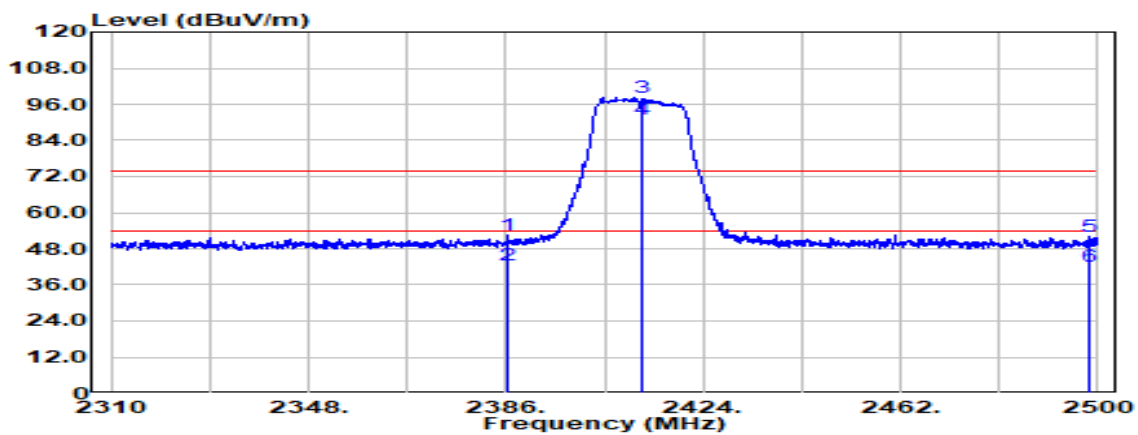
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2379.730	Peak	39.40	12.43	51.83	74.00	-22.17
2379.730	Average	29.36	12.43	41.79	54.00	-12.21
2462.000	Peak	88.09	12.93	101.02	-	-
2462.000	Average	80.86	12.93	93.79	-	-
2491.070	Peak	38.74	13.13	51.87	74.00	-22.13
2491.070	Average	30.25	13.13	43.38	54.00	-10.62

Test Mode	IEEE 802.11n HT20 Low CH 2412MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



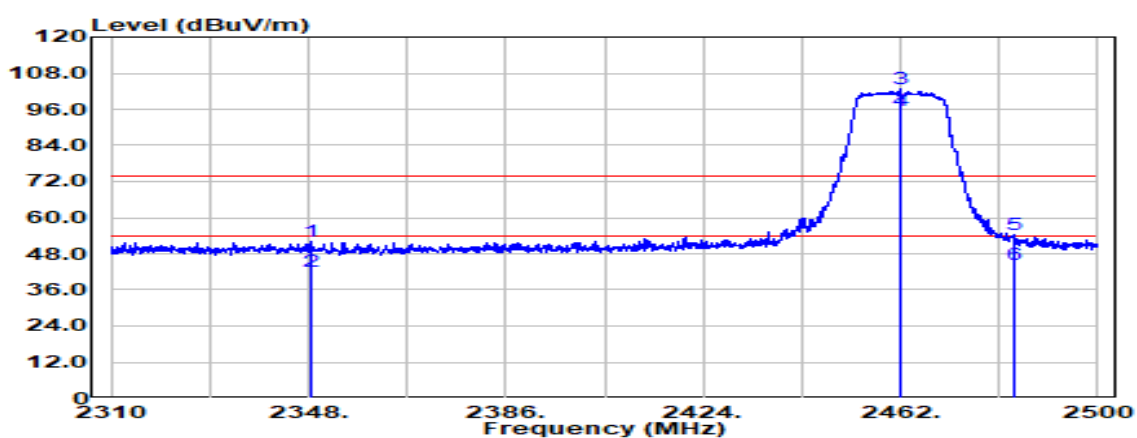
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2389.420	Peak	41.05	12.48	53.53	74.00	-20.47
2389.420	Average	30.73	12.48	43.21	54.00	-10.79
2412.000	Peak	89.41	12.61	102.02	-	-
2412.000	Average	81.69	12.61	94.29	-	-
2496.200	Peak	39.52	13.16	52.69	74.00	-21.31
2496.200	Average	29.23	13.16	42.39	54.00	-11.61

Test Mode	IEEE 802.11 n20 Low CH 2412MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



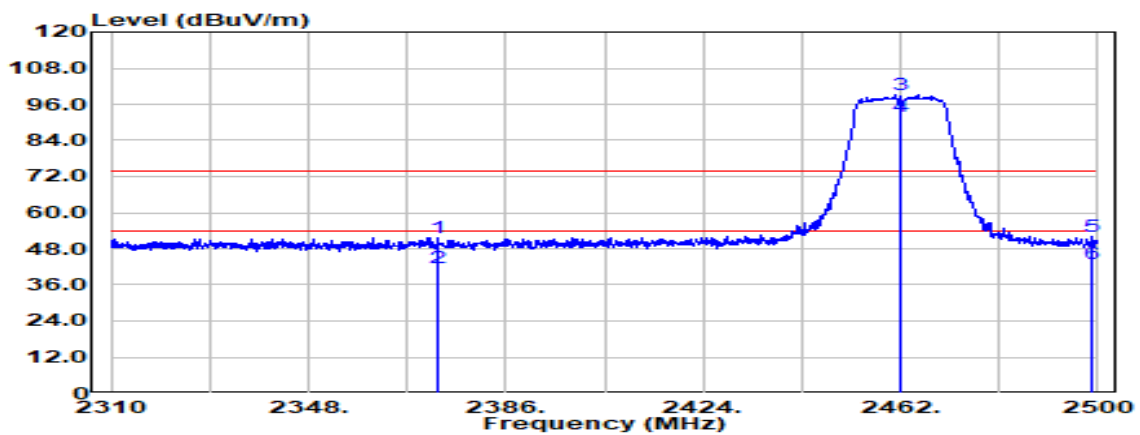
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2386.285	Peak	40.04	12.46	52.50	74.00	-21.50
2386.285	Average	30.14	12.46	42.60	54.00	-11.40
2412.000	Peak	85.65	12.61	98.26	-	-
2412.000	Average	78.55	12.61	91.16	-	-
2498.385	Peak	38.99	13.18	52.17	74.00	-21.83
2498.385	Average	28.98	13.18	42.15	54.00	-11.85

Test Mode	IEEE 802.11n HT20 High CH 2462MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2348.285	Peak	39.58	12.28	51.86	74.00	-22.14
2348.285	Average	29.84	12.28	42.12	54.00	-11.88
2462.000	Peak	89.65	12.93	102.58	-	-
2462.000	Average	82.62	12.93	95.55	-	-
2483.945	Peak	41.22	13.08	54.30	74.00	-19.70
2483.945	Average	31.44	13.08	44.52	54.00	-9.48

Test Mode	IEEE 802.11n20 High CH 2462MHz	Temp/Hum	21.4(°C) / 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

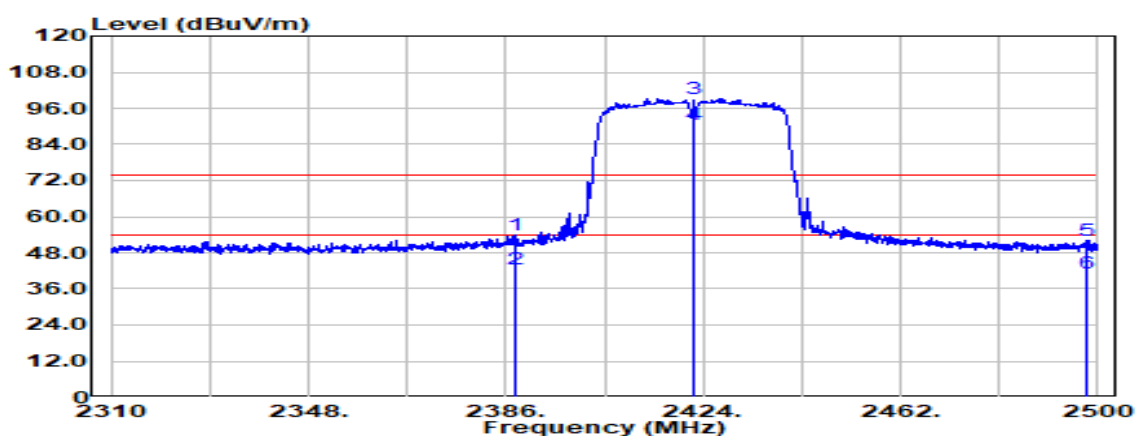


Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2372.890	Peak	39.26	12.39	51.65	74.00	-22.35
2372.890	Average	29.29	12.39	41.68	54.00	-12.32
2462.000	Peak	86.43	12.93	99.37	-	-
2462.000	Average	79.18	12.93	92.11	-	-
2498.860	Peak	38.93	13.18	52.11	74.00	-21.89
2498.860	Average	30.05	13.18	43.23	54.00	-10.77

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Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak and Average		



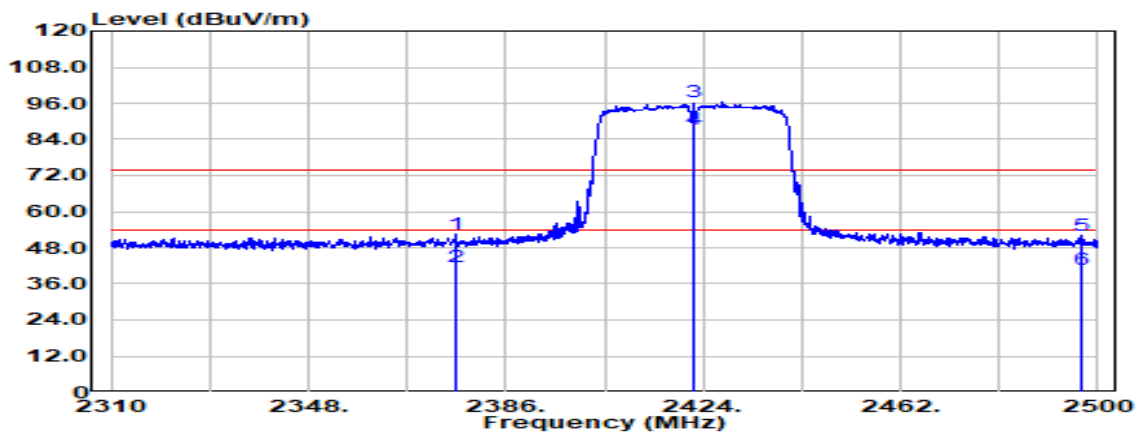
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2387.615	Peak	41.57	12.47	54.04	74.00	-19.96
2387.615	Average	29.94	12.47	42.41	54.00	-11.59
2422.000	Peak	86.68	12.67	99.35	-	-
2422.000	Average	77.76	12.67	90.43	-	-
2498.005	Peak	38.68	13.18	51.86	74.00	-22.14
2498.005	Average	27.90	13.18	41.08	54.00	-12.92

Report No.: TMWK2203000913KR

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Rev.: 00

Test Mode	IEEE 802.11n HT40 Low CH	Temperature:	21.4(°C)/ 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak and Average		



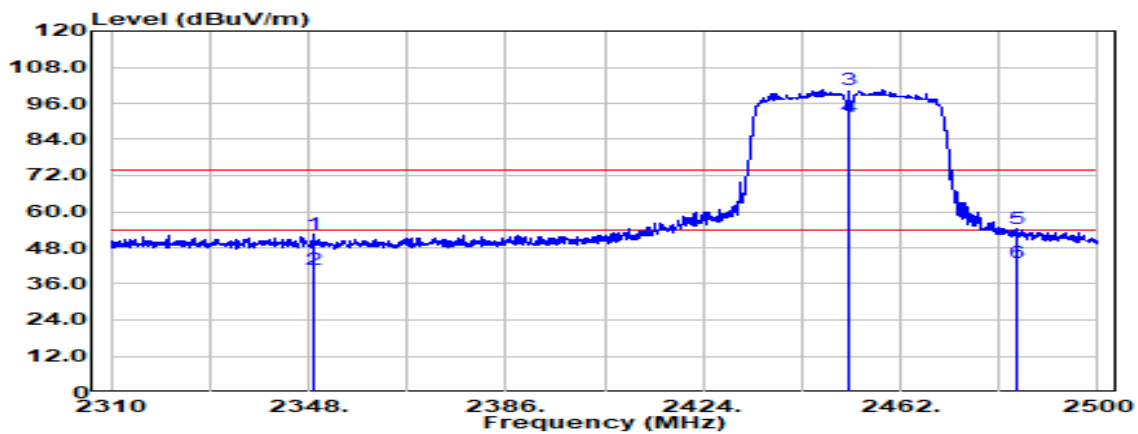
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2376.500	Peak	40.11	12.41	52.52	74.00	-21.48
2376.500	Average	29.25	12.41	41.66	54.00	-12.34
2422.000	Peak	83.89	12.67	96.56	-	-
2422.000	Average	74.77	12.67	87.44	-	-
2496.675	Peak	38.90	13.17	52.07	74.00	-21.93
2496.675	Average	27.51	13.17	40.68	54.00	-13.32

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Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak and Average		



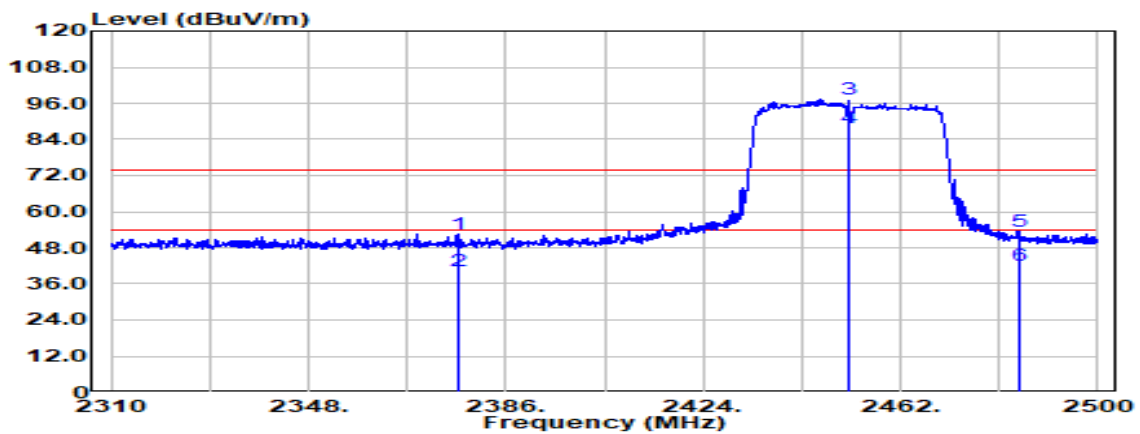
Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
2348.855	Peak	40.05	12.28	52.32	74.00	-21.68
2348.855	Average	28.44	12.28	40.72	54.00	-13.28
2452.000	Peak	87.65	12.86	100.51	-	-
2452.000	Average	78.54	12.86	91.41	-	-
2484.230	Peak	41.22	13.08	54.31	74.00	-19.69
2484.230	Average	30.06	13.08	43.14	54.00	-10.86

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Test Mode	IEEE 802.11n HT40 High CH	Temperature:	21.4(°C)/ 60%RH
Test Item	Band Edge	Test Date	March 28, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak and Average		



Frequency (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2376.690	Peak	40.14	12.41	52.55	74.00	-21.45
2376.690	Average	28.01	12.41	40.42	54.00	-13.58
2452.000	Peak	84.60	12.86	97.47	-	-
2452.000	Average	75.03	12.86	87.90	-	-
2484.705	Peak	40.51	13.09	53.59	74.00	-20.41
2484.705	Average	29.02	13.09	42.10	54.00	-11.90

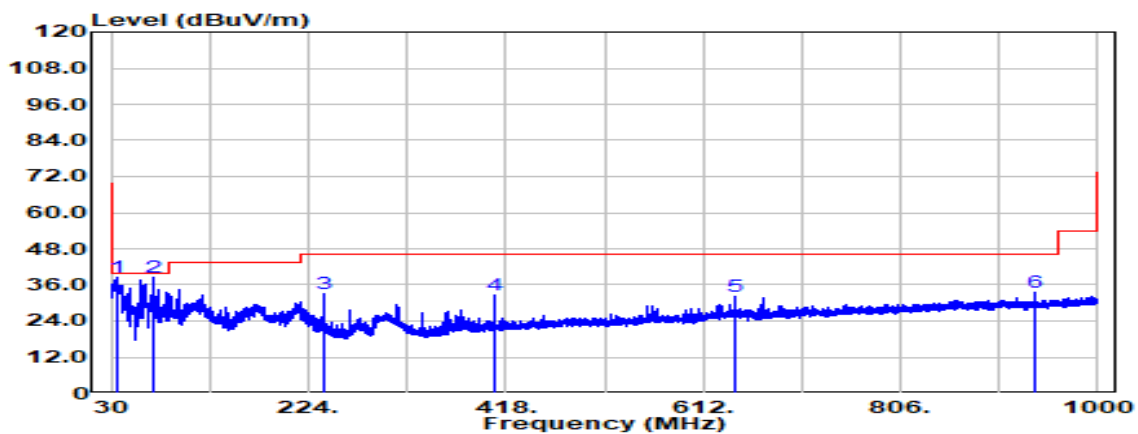
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Below 1G Test Data

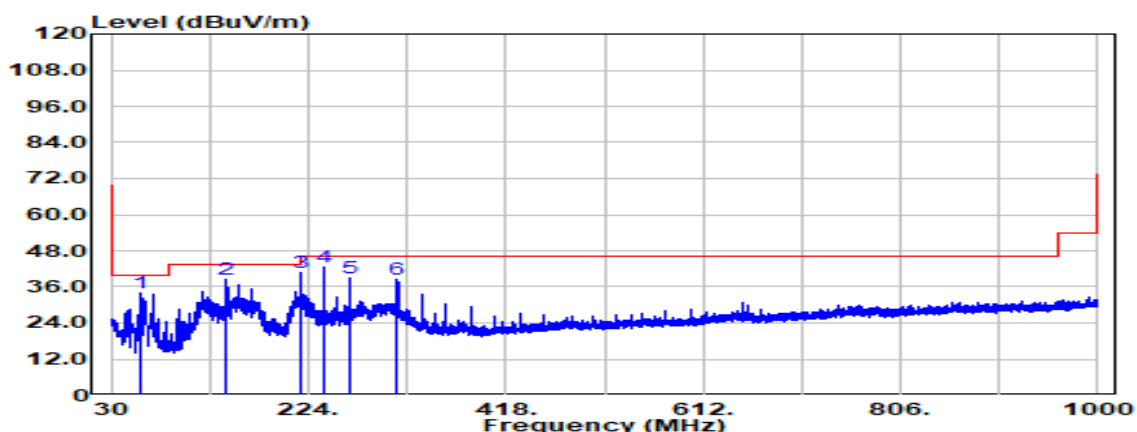
Test Mode	Mode 1	Temp/Hum	19.9(°C) / 62%RH
Test Item	30MHz-1GHz	Test Date	March 25, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak	Test Voltage	



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
35.941	Peak	45.32	-6.97	38.35	40.00	-1.65
71.953	Peak	53.80	-15.40	38.40	40.00	-1.60
239.763	Peak	44.09	-10.88	33.21	46.00	-12.79
408.058	Peak	38.30	-5.81	32.48	46.00	-13.52
643.040	Peak	32.79	-0.78	32.01	46.00	-13.99
937.556	Peak	30.55	3.19	33.73	46.00	-12.27

Note: No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)

Test Mode	Mode 1	Temp/Hum	19.9(°C)/ 62%RH
Test Item	30MHz-1GHz	Test Date	March 25, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak	Test Voltage	

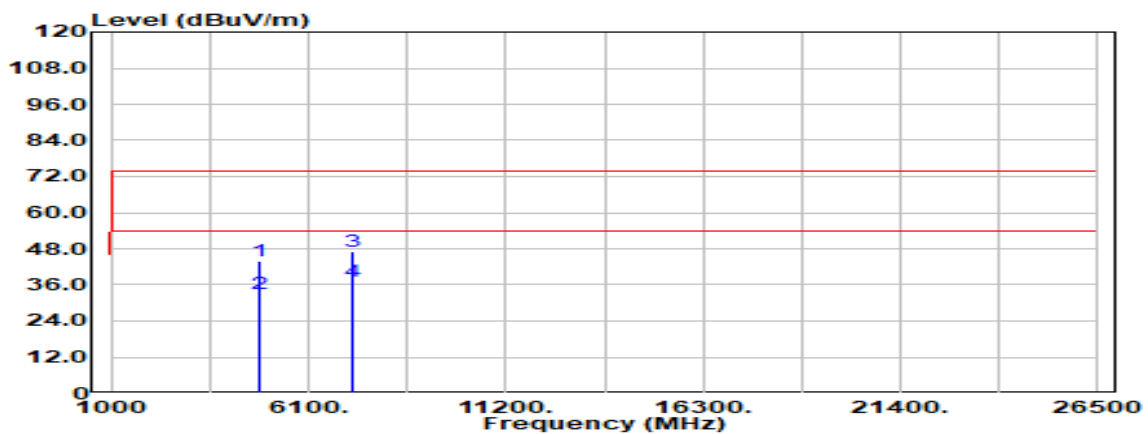


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
59.949	Peak	50.14	-16.07	34.07	40.00	-5.93
143.854	Peak	48.84	-10.40	38.43	43.50	-5.07
215.755	Peak	52.69	-12.12	40.57	43.50	-2.93
239.763	Peak	53.40	-10.88	42.53	46.00	-3.47
263.770	Peak	48.72	-9.60	39.12	46.00	-6.88
311.664	Peak	47.30	-8.64	38.66	46.00	-7.34

Note: No emission found between lowest internal used/generated frequency to 30MHz(9KHz~30MHz)

Above 1G Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4824.000	Peak	34.41	9.53	43.93	74.00	-30.07
4824.000	Average	23.32	9.53	32.85	54.00	-21.15
7236.000	Peak	33.67	13.41	47.08	74.00	-26.92
7236.000	Average	23.70	13.41	37.10	54.00	-16.90

Remark:

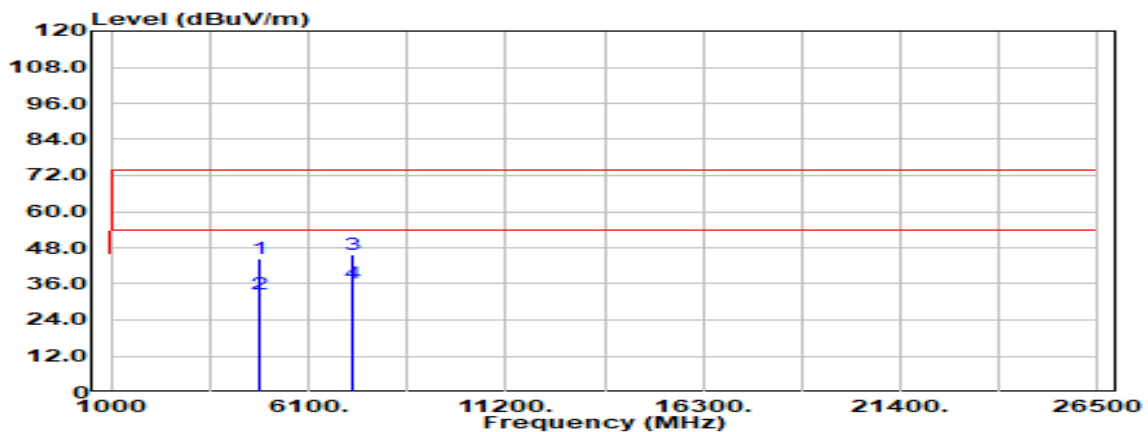
- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11b Low CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

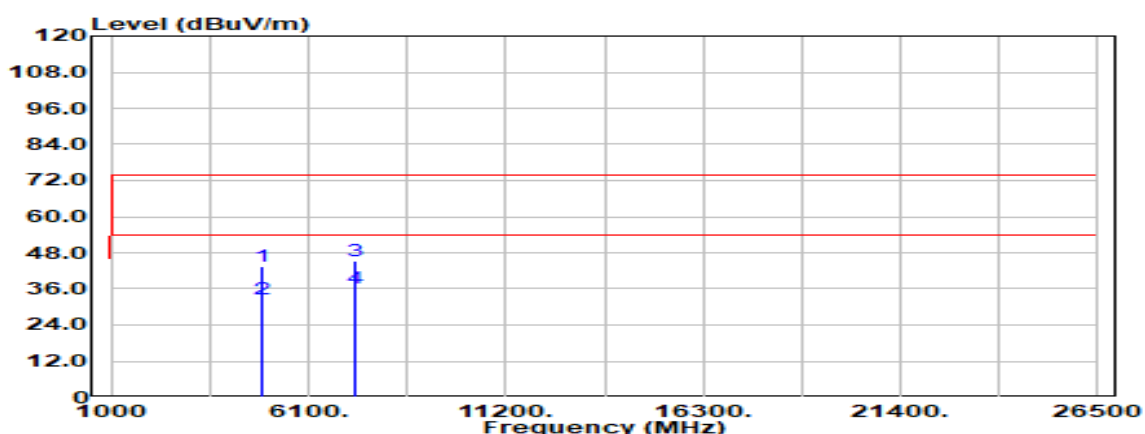


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBPμV)	Factor (dB)	Actual FS (dBPμV/m)	Limit @3m (dBPμV/m)	Margin (dB)
4824.000	Peak	34.98	9.53	44.50	74.00	-29.50
4824.000	Average	23.25	9.53	32.78	54.00	-21.22
7236.000	Peak	32.50	13.41	45.91	74.00	-28.09
7236.000	Average	22.66	13.41	36.07	54.00	-17.93

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11b Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

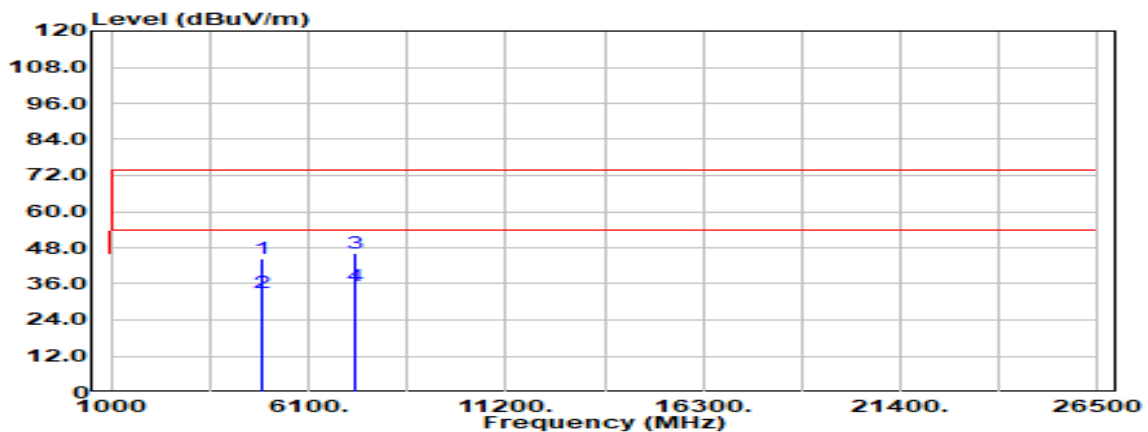


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4874.000	Peak	34.05	9.60	43.65	74.00	-30.35
4874.000	Average	23.22	9.60	32.81	54.00	-21.19
7311.000	Peak	32.21	13.23	45.45	74.00	-28.55
7311.000	Average	22.91	13.23	36.14	54.00	-17.86

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11b Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

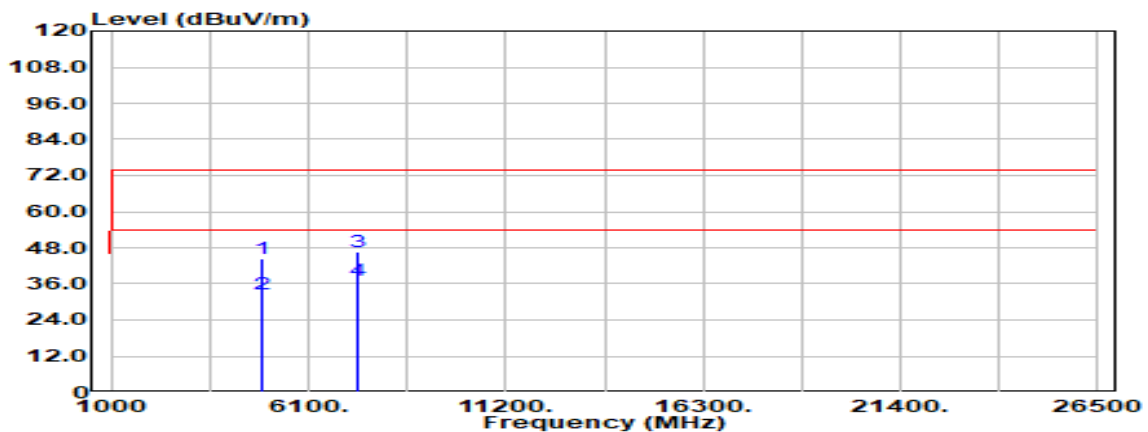


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4874.000	Peak	35.01	9.60	44.60	74.00	-29.40
4874.000	Average	23.44	9.60	33.03	54.00	-20.97
7311.000	Peak	33.06	13.23	46.30	74.00	-27.70
7311.000	Average	22.17	13.23	35.41	54.00	-18.59

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11b High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

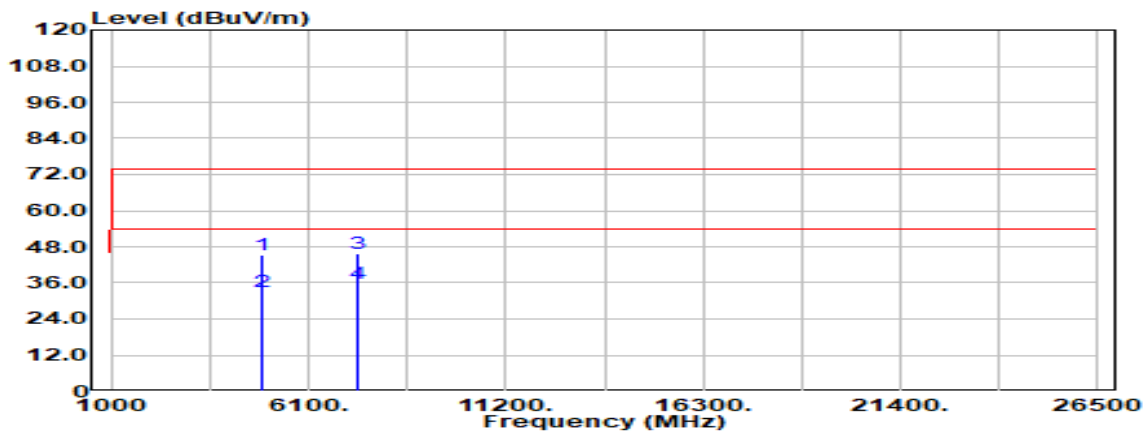


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4924.000	Peak	34.77	9.63	44.40	74.00	-29.60
4924.000	Average	23.14	9.63	32.77	54.00	-21.23
7386.000	Peak	33.21	13.43	46.64	74.00	-27.36
7386.000	Average	23.62	13.43	37.05	54.00	-16.95

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11b High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

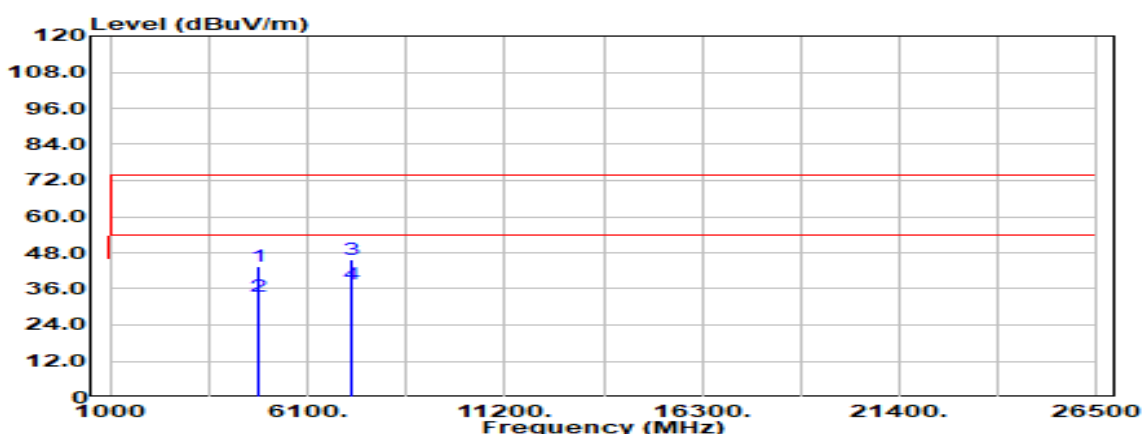


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4924.000	Peak	35.46	9.63	45.08	74.00	-28.92
4924.000	Average	23.28	9.63	32.91	54.00	-21.09
7386.000	Peak	32.52	13.43	45.95	74.00	-28.05
7386.000	Average	22.36	13.43	35.79	54.00	-18.21

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11g Low CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

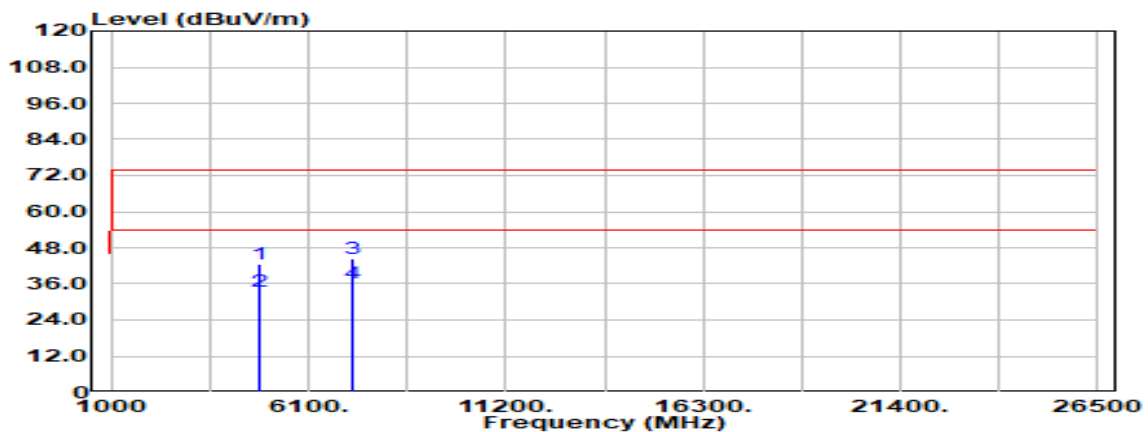


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4824.000	Peak	33.75	9.53	43.28	74.00	-30.72
4824.000	Average	23.86	9.53	33.39	54.00	-20.61
7236.000	Peak	32.22	13.41	45.63	74.00	-28.37
7236.000	Average	24.03	13.41	37.44	54.00	-16.56

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11g Low CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

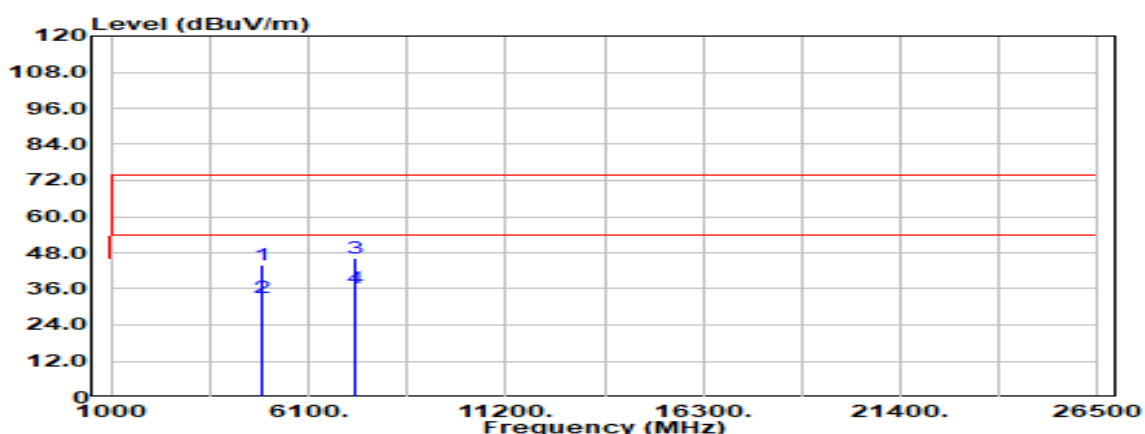


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4824.000	Peak	33.19	9.53	42.72	74.00	-31.28
4824.000	Average	23.99	9.53	33.52	54.00	-20.48
7236.000	Peak	30.96	13.41	44.36	74.00	-29.64
7236.000	Average	22.91	13.41	36.32	54.00	-17.68

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11g Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

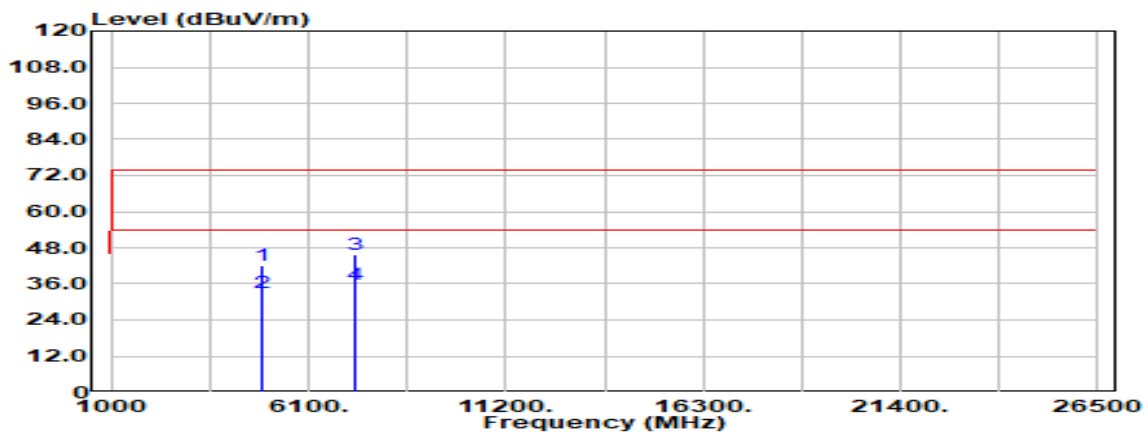


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4874.000	Peak	34.31	9.60	43.90	74.00	-30.10
4874.000	Average	23.59	9.60	33.19	54.00	-20.81
7311.000	Peak	32.76	13.23	46.00	74.00	-28.00
7311.000	Average	23.21	13.23	36.45	54.00	-17.55

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11g Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

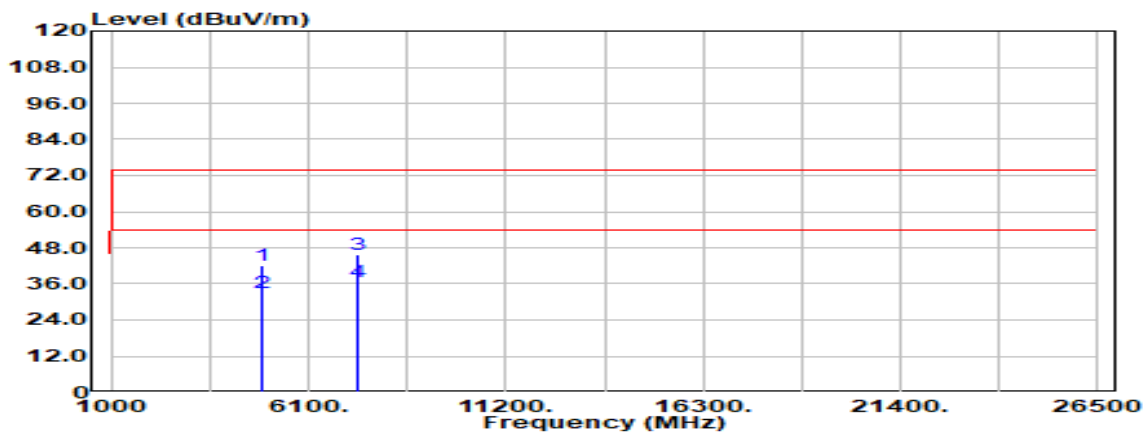


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4874.000	Peak	32.61	9.60	42.21	74.00	-31.79
4874.000	Average	23.54	9.60	33.13	54.00	-20.87
7311.000	Peak	32.42	13.23	45.66	74.00	-28.34
7311.000	Average	22.68	13.23	35.91	54.00	-18.09

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11g High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

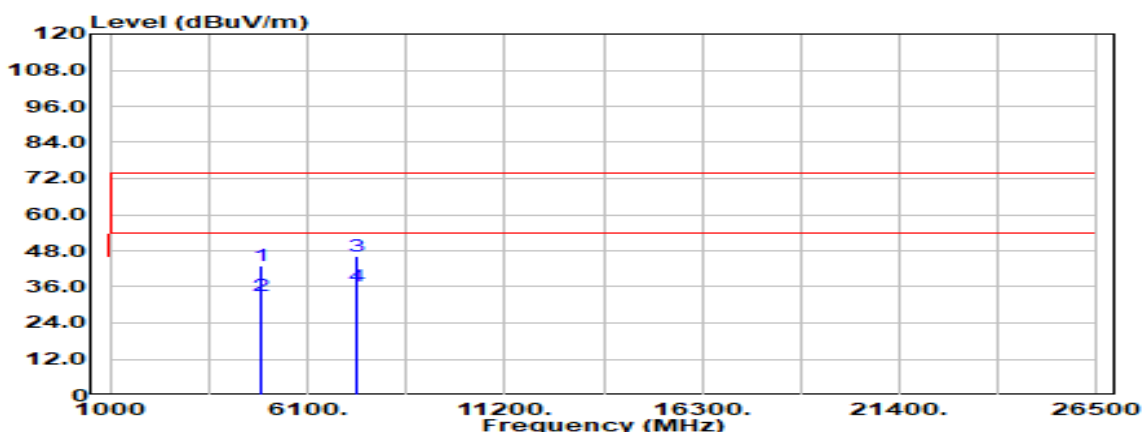


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4924.000	Peak	32.32	9.63	41.95	74.00	-32.05
4924.000	Average	23.54	9.63	33.17	54.00	-20.83
7386.000	Peak	32.50	13.43	45.93	74.00	-28.07
7386.000	Average	23.43	13.43	36.86	54.00	-17.14

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11g High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

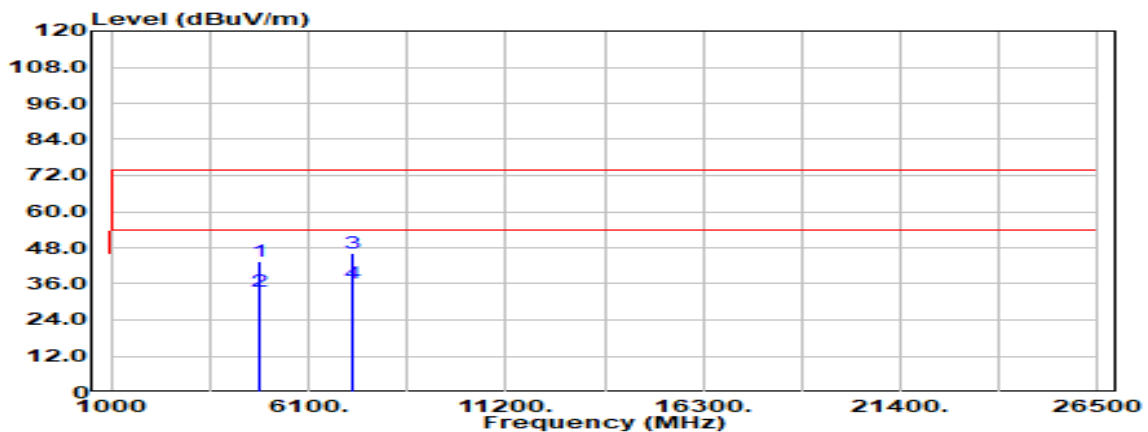


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4924.000	Peak	33.29	9.63	42.91	74.00	-31.09
4924.000	Average	23.49	9.63	33.12	54.00	-20.88
7386.000	Peak	32.94	13.43	46.37	74.00	-27.63
7386.000	Average	22.81	13.43	36.24	54.00	-17.76

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

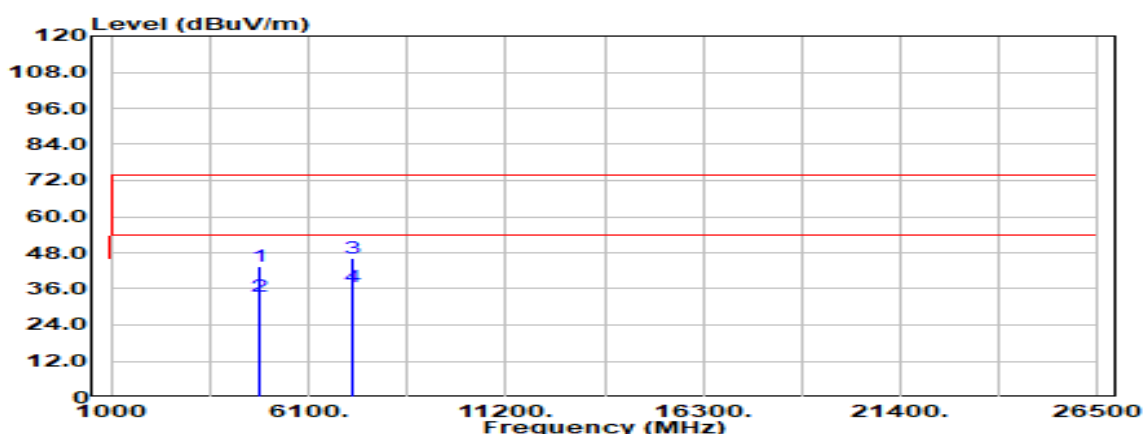


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4824.000	Peak	33.79	9.53	43.31	74.00	-30.69
4824.000	Average	23.87	9.53	33.39	54.00	-20.61
7236.000	Peak	32.92	13.41	46.32	74.00	-27.68
7236.000	Average	22.82	13.41	36.23	54.00	-17.77

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		

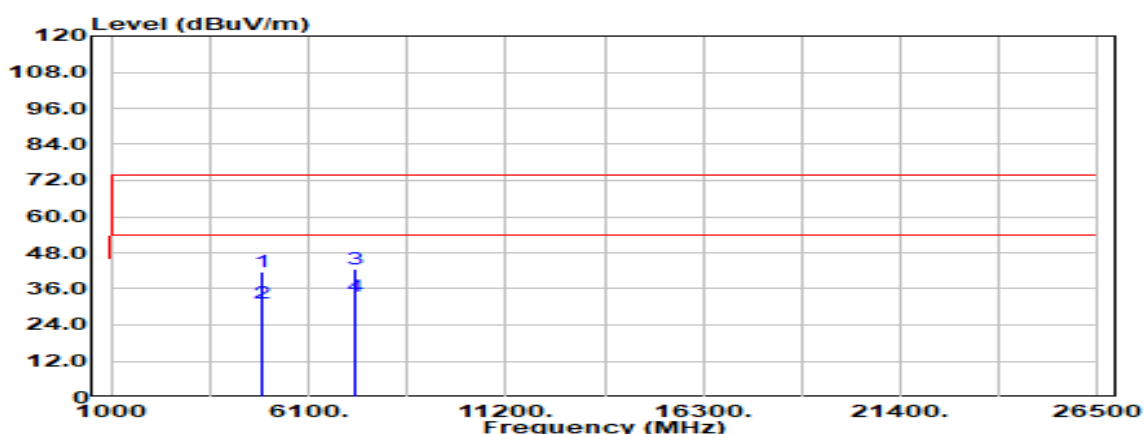


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4824.000	Peak	33.84	9.53	43.36	74.00	-30.64
4824.000	Average	23.87	9.53	33.40	54.00	-20.60
7236.000	Peak	32.61	13.41	46.02	74.00	-27.98
7236.000	Average	23.09	13.41	36.50	54.00	-17.50

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBμV/m)	Margin (dB)
4874.000	Peak	32.16	9.60	41.75	74.00	-32.25
4874.000	Average	21.53	9.60	31.13	54.00	-22.87
7311.000	Peak	29.52	13.23	42.76	74.00	-31.24
7311.000	Average	20.35	13.23	33.58	54.00	-20.42

Remark:

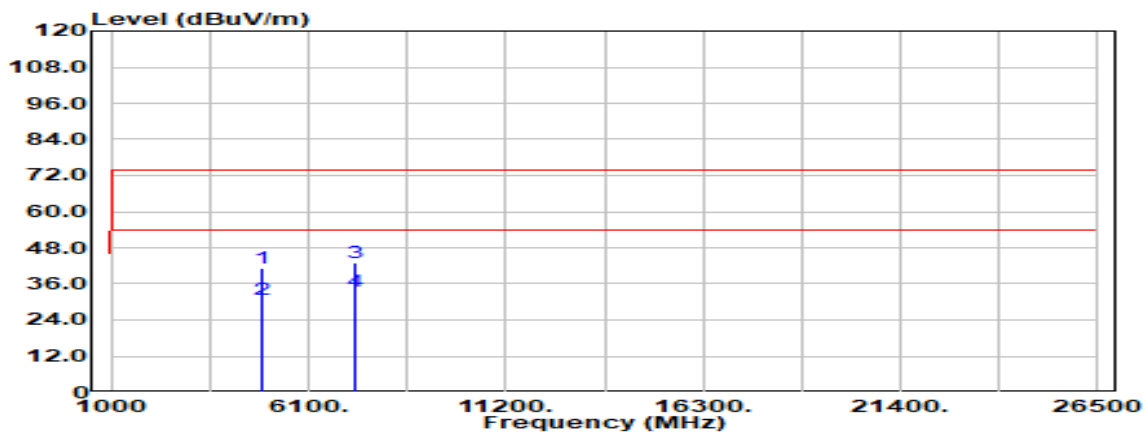
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4874.000	Peak	31.52	9.60	41.12	74.00	-32.88
4874.000	Average	21.20	9.60	30.80	54.00	-23.20
7311.000	Peak	29.89	13.23	43.12	74.00	-30.88
7311.000	Average	20.19	13.23	33.43	54.00	-20.57

Remark:

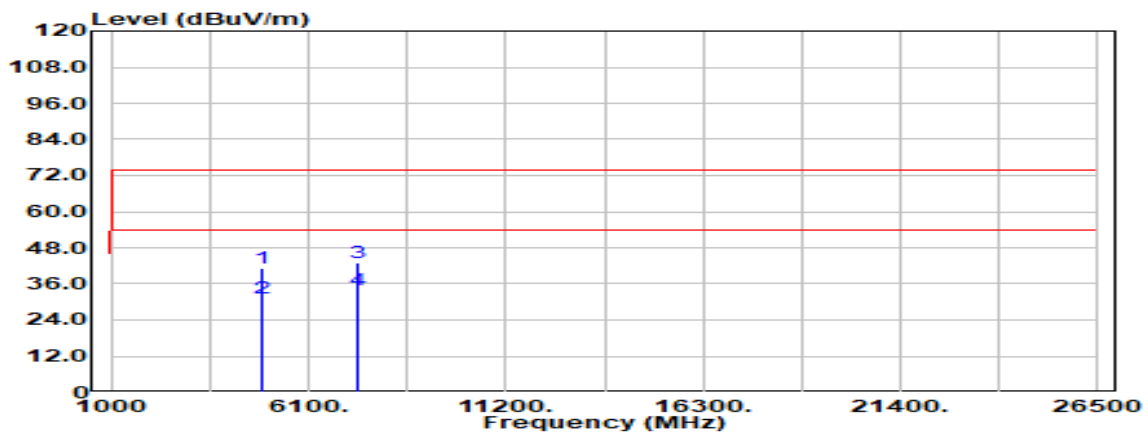
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4924.000	Peak	31.68	9.63	41.31	74.00	-32.69
4924.000	Average	21.59	9.63	31.22	54.00	-22.78
7386.000	Peak	29.56	13.43	42.99	74.00	-31.01
7386.000	Average	20.69	13.43	34.12	54.00	-19.88

Remark:

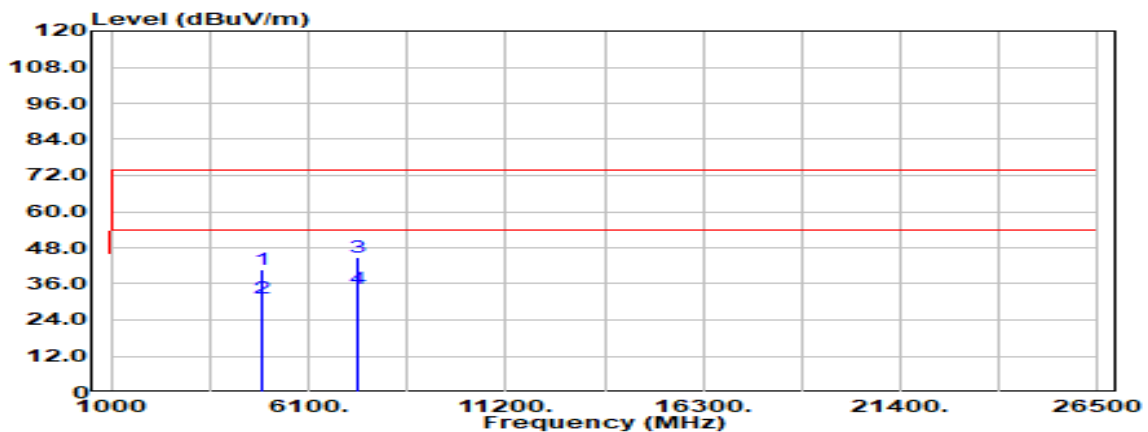
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBPμV)	Factor (dB)	Actual FS (dBPμV/m)	Limit @3m (dBPμV/m)	Margin (dB)
4924.000	Peak	31.26	9.63	40.89	74.00	-33.11
4924.000	Average	21.44	9.63	31.07	54.00	-22.93
7386.000	Peak	31.33	13.43	44.76	74.00	-29.24
7386.000	Average	20.78	13.43	34.21	54.00	-19.79

Remark:

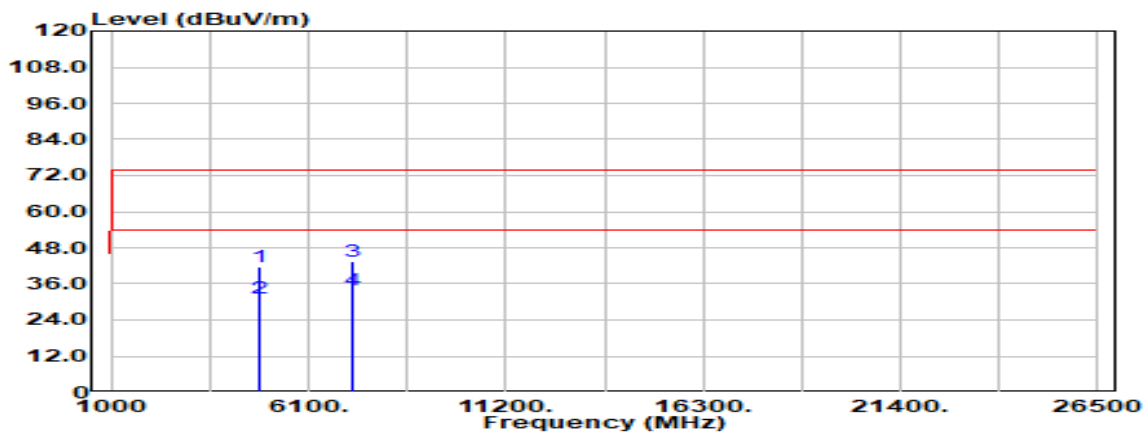
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		

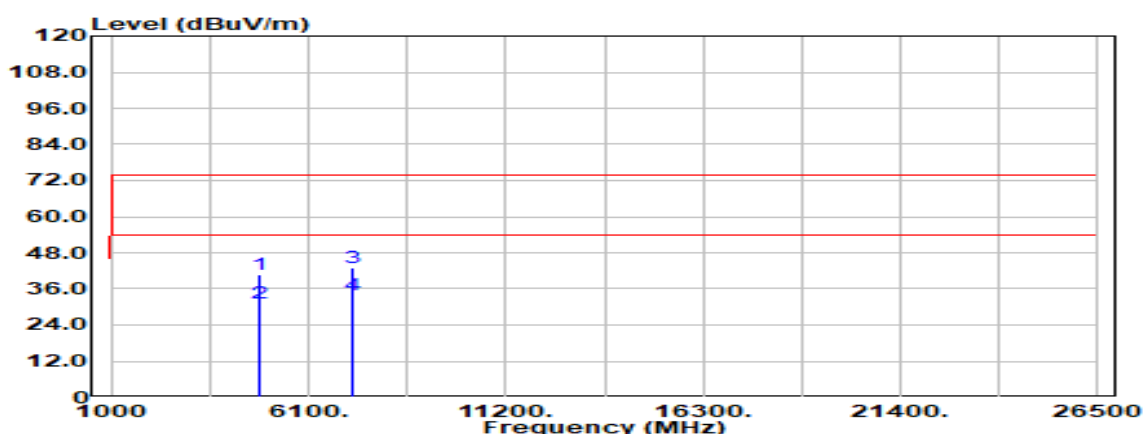


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4844.000	Peak	31.85	9.59	41.44	74.00	-32.56
4844.000	Average	21.71	9.59	31.30	54.00	-22.70
7266.000	Peak	30.08	13.32	43.39	74.00	-30.61
7266.000	Average	20.45	13.32	33.77	54.00	-20.23

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4844.000	Peak	30.95	9.59	40.54	74.00	-33.46
4844.000	Average	21.71	9.59	31.30	54.00	-22.70
7266.000	Peak	29.88	13.32	43.20	74.00	-30.80
7266.000	Average	20.69	13.32	34.01	54.00	-19.99

Remark:

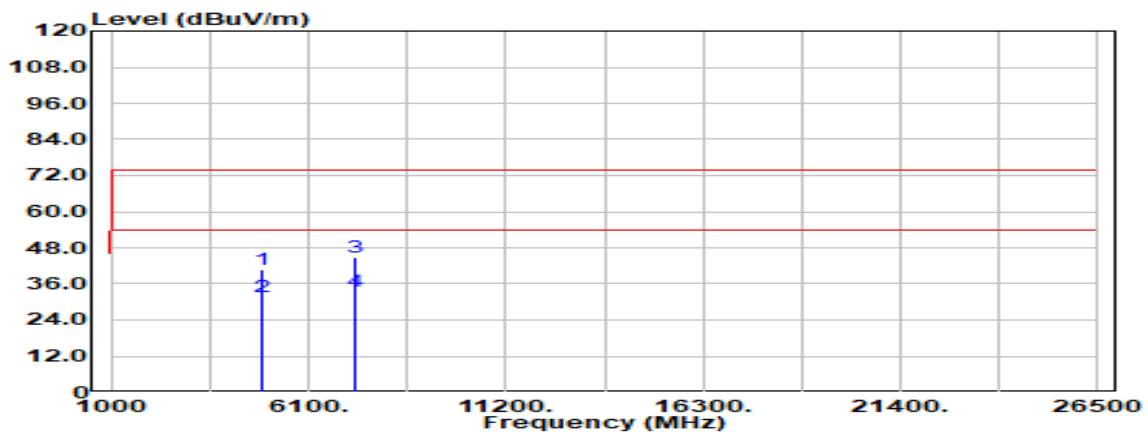
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT40 Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
4874.000	Peak	31.37	9.60	40.97	74.00	-33.03
4874.000	Average	21.99	9.60	31.59	54.00	-22.41
7311.000	Peak	31.43	13.23	44.66	74.00	-29.34
7311.000	Average	20.49	13.23	33.73	54.00	-20.27

Remark:

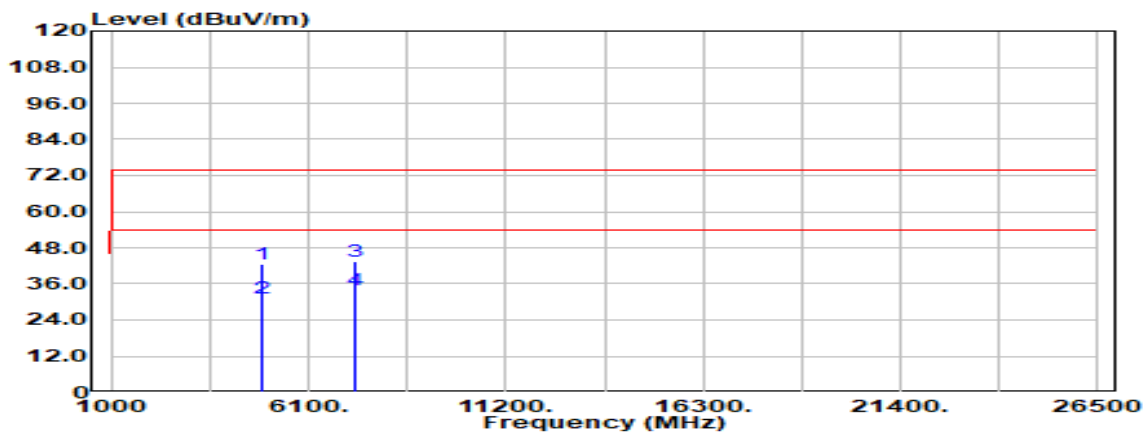
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT40 Mid CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4874.000	Peak	32.97	9.60	42.56	74.00	-31.44
4874.000	Average	21.87	9.60	31.47	54.00	-22.53
7311.000	Peak	30.14	13.23	43.37	74.00	-30.63
7311.000	Average	20.68	13.23	33.92	54.00	-20.08

Remark:

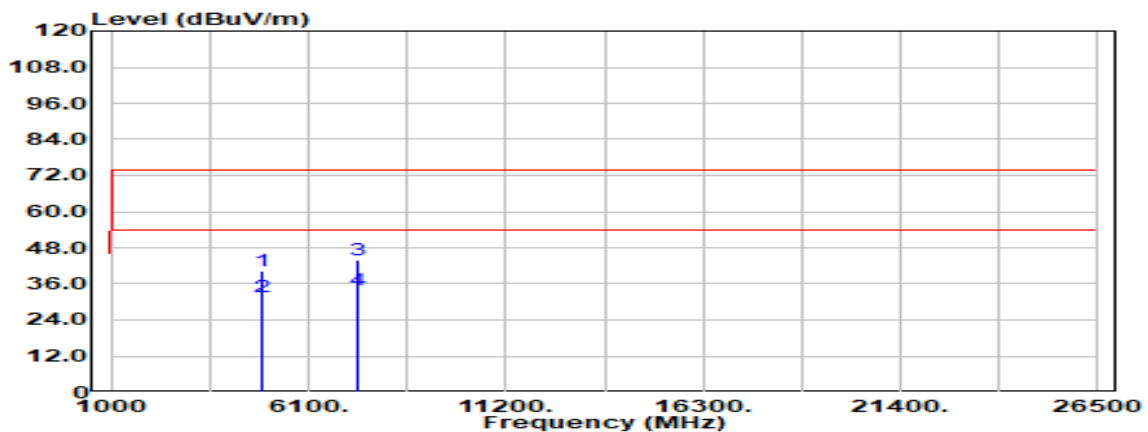
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	21.4(°C)/ 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4904.000	Peak	30.86	9.59	40.44	74.00	-33.56
4904.000	Average	21.99	9.59	31.58	54.00	-22.42
7356.000	Peak	30.61	13.28	43.89	74.00	-30.11
7356.000	Average	20.84	13.28	34.12	54.00	-19.88

Remark:

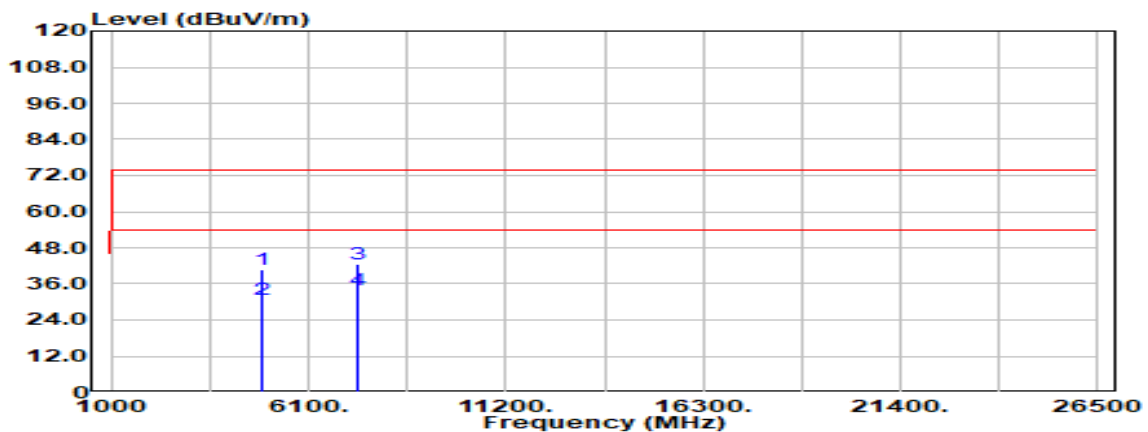
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

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Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	21.4(°C) / 60%RH
Test Item	Harmonic	Test Date	March 29, 2022
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak & Average		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBμV)	Factor (dB)	Actual FS (dBμV/m)	Limit @3m (dBμV/m)	Margin (dB)
4904.000	Peak	31.01	9.59	40.60	74.00	-33.40
4904.000	Average	21.37	9.59	30.95	54.00	-23.05
7356.000	Peak	29.33	13.28	42.61	74.00	-31.39
7356.000	Average	20.46	13.28	33.74	54.00	-20.26

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

- End of Test Report -