RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247

Test Standard	**FCC Part 15.247** **IC RSS-247 issue 2 and IC RSS-GEN issue 5**
Product name	**Medical Computer**
Brand Name	**ADVANTECH**
FCC Model No.	**DMS-SA47, DMS-SA47XXXXXXXXXXXXXXXX (where "X" may be any alphanumeric character , "-" or blank)**
IC Model No.	**DMS-SA47**
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

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	February 8, 2023	Initial Issue	ALL	Allison Chen

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Advantech Co., Ltd. No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114 Taiwan
Manufacturer	Advantech Co., Ltd. No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114 Taiwan
Equipment	Medical Computer
FCC Model No.	DMS-SA47, DMS-SA47XXXXXXXXXXXXXXX (where “X” may be any alphanumeric character , “-” or blank)
IC Model No.	DMS-SA47
Model Discrepancy	All the above models are identical except for the designation of model numbers. The suffix of (where “X” may be any alphanumeric character , “-” or blank) on model number is just for marketing purpose only.
Trade Name	ADVANTECH
Received Date	January 13, 2021
Date of Test	April 15 ~ June 19, 2021
Power Supply	EUT Power from adapter. FSP / FSP065-DBCM1 Input: 100-240VAC, 2.0-1.0A, 50-60Hz Output: 19.0VDC, 3.43A, 65.0W
HW Version	A01
SW Version	A01
EUT Serial #	01
Module	Qualcomm / QCNFA364A

Remark:

1. For more details, 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.
3. Disclaimer: Variant information between/among model numbers / trademarks is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.

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 mode : OFDM 4. IEEE 802.11n HT 40 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 mode : 11 Channels 4. IEEE 802.11n HT 40 mode : 7 Channels

Remark:
Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 and RSS-GEN Table A1 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	Chain 0: 2.78 dBi Chain 1: 2.97 dBi Power Directional Gain= 5.89 dBi
Antenna Connector	IPEX

Notes:
1. Power Directional Gain = 10*log { [10^(Ant1/20) + 10^(Ant2/20) + … + 10^(Ant N /20)]^2 / N ANT} dBi
2. Two dipole detachable Antennas used which uses a unique coupling to the EUT meeting rule 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
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

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.

☐ No. 12, Ln. 116, Wugong 3rd Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

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

Remark: The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.6 INSTRUMENT CALIBRATION

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/08/2021	02/07/2022
Bilog Antenna	Sunol Sciences	JB3	A030105	07/24/2020	07/23/2021
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/24/2021	02/23/2022
Coaxial Cable	EMCI	EMC105	190914+327109/4	09/19/2020	09/18/2021
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/06/2021	01/05/2022
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	09/30/2020	09/29/2021
Loop Ant	COM-POWER	AL-130	121051	04/07/2021	04/06/2022
Pre-Amplifier	EMEC	EM330	060609	02/24/2021	02/23/2022
Pre-Amplifier	HP	8449B	3008A00965	12/25/2020	12/24/2021
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	07/24/2020	07/23/2021
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 6.11-20180419c				

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

RF Conducted Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EXA Signal Analyzer	KEYSIGHT	N9010B	MY55460167	09/07/2020	09/06/2021
Coaxial Cable	Woken	WC12	CC003	06/29/2020	06/28/2021
Coaxial Cable	Woken	WC12	CC001	06/29/2020	06/28/2021
Power Meter	Anritsu	ML2495A	1149001	05/24/2021	05/23/2022
Power Seneor	Anritsu	MA2491A	030982	05/24/2021	05/23/2022
Software	Radio Test Software				

AC Power Line Conducted Emission Test Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
CABLE	EMCI	CFD300-NL	CERF	06/29/2020	06/28/2021
EMI Test Receiver	R&S	ESCI	100064	07/17/2020	07/16/2021
LISN	SCHAFFNER	NNB 41	03/10013	02/02/2021	02/01/2022
Software	EZ-EMC(CCS-3A1-CE)				

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**
	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, RSS-247 Issue 2 and RSS-GEN Issue 5.

2. TEST SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
15.203	RSS-GEN 6.8	1.3	Antenna Requirement	Pass
15.207(a)	RSS-GEN 8.8	5.1	AC Conducted Emission	Pass
15.247(a)(2)	RSS-247(5.2)(a)	5.2	6 dB Bandwidth	Pass
-	RSS-GEN 6.7	5.2	Occupied Bandwidth (99%)	Pass
15.247(b)(3)	RSS-247(5.4)(d)	5.3	Output Power Measurement	Pass
15.247(e)	RSS-247(5.2)(b)	5.4	Power Spectral Density	Pass
15.247(d)	RSS-247(5.5)	5.5	Conducted Band Edge	Pass
15.247(d)	RSS-247(5.5)	5.5	Conducted Emission	Pass
15.247(d)	RSS-GEN 8.9, 8.10	5.6	Radiation Band Edge	Pass
15.247(d)	RSS-GEN 8.9, 8.10	5.6	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 :MCS8 IEEE 802.11n HT40 Mode: MCS8
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 : 2T2R IEEE 802.11n HT40 mode : 2T2R

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. MIMO mode covered SISO mode due to MIMO mode with the power equal or higher than SISO modes as worst-case scenario.

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**

Remark:
1. The worst mode was record in this test report.
2. 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.

Radiated Emission Measurement Above 1G	
Test Condition	**Radiated Emission Above 1G**
Power supply Mode	**Mode 1: EUT power by adapter. (120V)**
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. (120V)**
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(Y-Plane) were recorded in this report

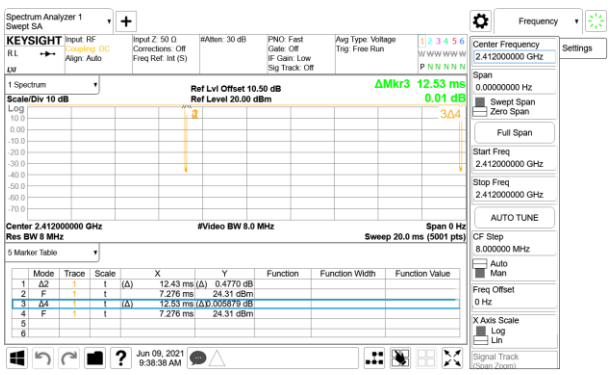
4. EUT DUTY CYCLE

Temperature: 25.8℃ **Tested by:** Jack Chen

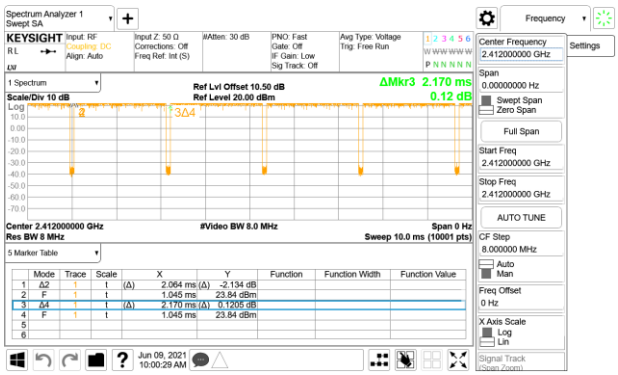
Humidity: 46.3% RH **Test date:** June 9, 2021

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b	99.20	0.03	0.08	0.01
802.11g	95.12	0.22	0.48	1.00
802.11n HT20	90.77	0.42	1.02	2.00
802.11n HT40	83.22	0.80	2.02	3.00

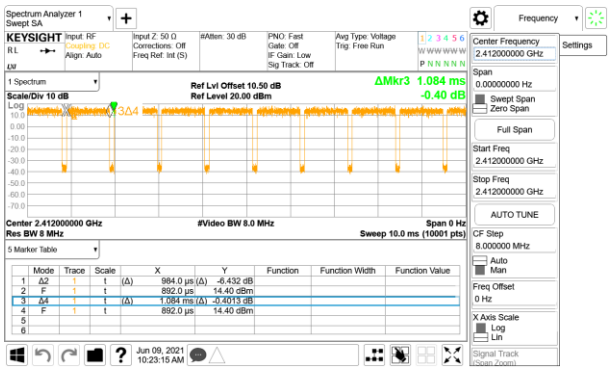
802.11b



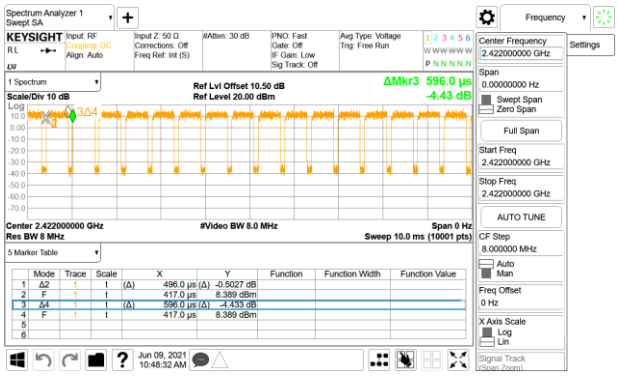
802.11g



802.11n HT20



802.11n HT40



5. TEST RESULT

5.1. AC POWER LINE CONDUCTED EMISSION

5.1.1 Test Limit

According to §15.207(a)(2) and RSS-GEN section 8.8,

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

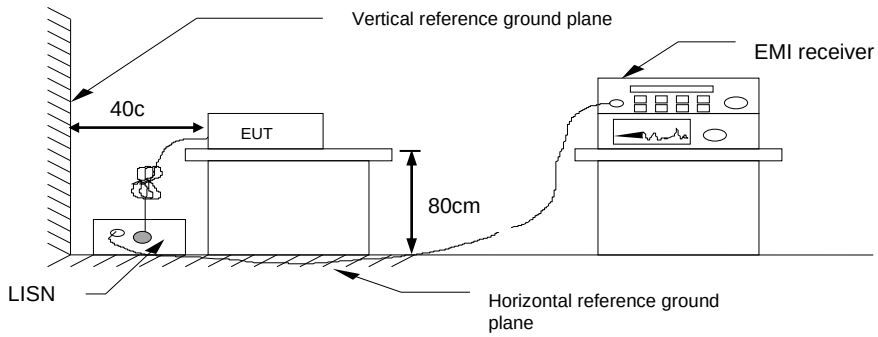
* Decreases with the logarithm of the frequency.

5.1.2 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.

5.1.3 Test Setup

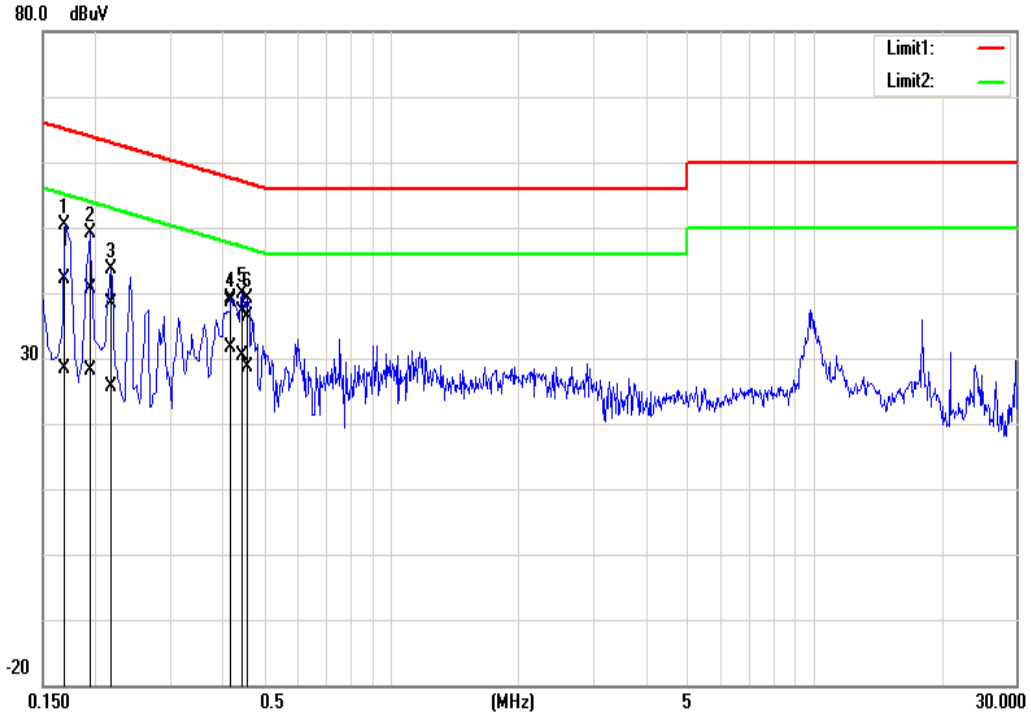


5.1.4 Test Result

PASS.

Test Data

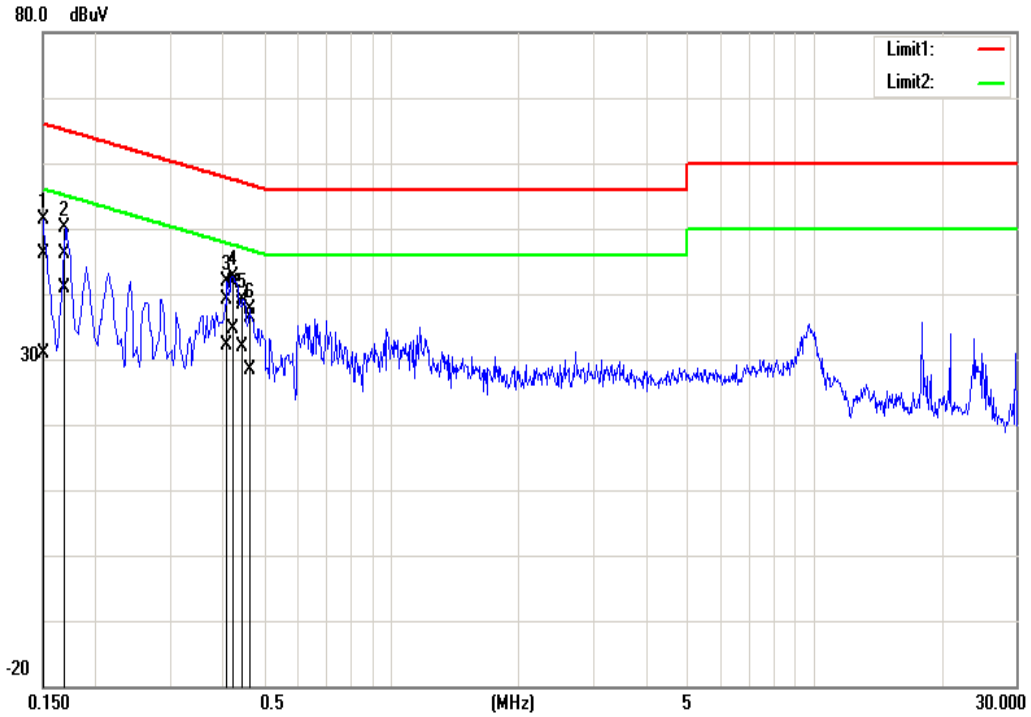
Test Mode:	Mode 1	Temp/Hum	24.9(℃)/ 46.7%RH
Phase:	Line	Test Date	June 11, 2021
		Test Engineer	Jack Chen



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
0.1700	31.92	17.98	10.29	42.21	28.27	64.96	54.96	-22.75	-26.69	Pass
0.1940	30.32	17.89	10.29	40.61	28.18	63.86	53.86	-23.25	-25.68	Pass
0.2180	28.11	15.42	10.29	38.40	25.71	62.89	52.89	-24.49	-27.18	Pass
0.4180	28.33	21.22	10.29	38.62	31.51	57.49	47.49	-18.87	-15.98	Pass
0.4460	26.92	20.17	10.29	37.21	30.46	56.95	46.95	-19.74	-16.49	Pass
0.4580	26.20	18.40	10.29	36.49	28.69	56.73	46.73	-20.24	-18.04	Pass

Note: Correction factor = LISN loss + Cable loss.

Test Mode:	Mode 1	Temp/Hum	24.9(℃)/ 46.7%RH
Phase:	Neutral	Test Date	June 11, 2021
		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
0.1500	35.73	20.59	10.29	46.02	30.88	66.00	56.00	-19.98	-25.12	Pass
0.1700	35.94	30.65	10.29	46.23	40.94	64.96	54.96	-18.73	-14.02	Pass
0.4100	28.73	21.94	10.29	39.02	32.23	57.65	47.65	-18.63	-15.42	Pass
0.4220	31.23	24.45	10.29	41.52	34.74	57.41	47.41	-15.89	-12.67	Pass
0.4460	28.10	21.59	10.29	38.39	31.88	56.95	46.95	-18.56	-15.07	Pass
0.4620	25.97	18.02	10.29	36.26	28.31	56.66	46.66	-20.40	-18.35	Pass

Note: Correction factor = LISN loss + Cable loss.

5.2. 6dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

5.2.1 Test Limit

According to §15.247(a)(2) and RSS-247 section 5.2(a),

6 dB Bandwidth ：

Limit	Shall be at least 500kHz

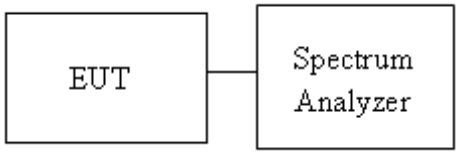
Occupied Bandwidth(99%) ： For reporting purposes only.

5.2.2 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.

5.2.3 Test Setup



5.2.4 Test Result

Temperature: 25.8℃ **Tested by:** Jack Chen

Humidity: 46.3% RH **Test date:** June 9, 2021

Test mode: IEEE 802.11b Mode / 2412-2462 MHz						
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2412	13.525	-	8.10	-	≥500
Mid	2437	13.548	-	8.10	-	
High	2462	13.709	-	8.10	-	

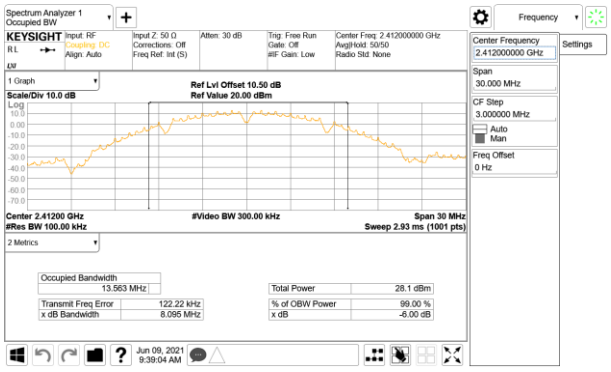
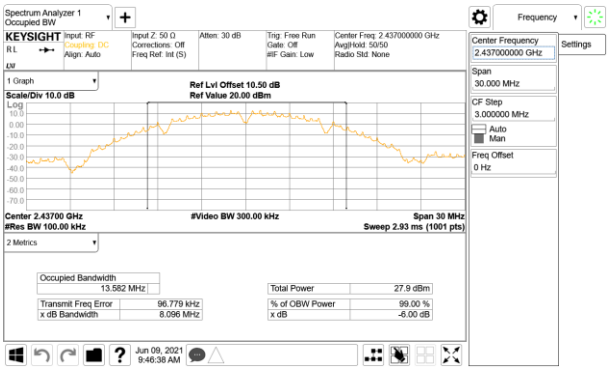
Test mode: IEEE 802.11g Mode / 2412-2462 MHz						
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2412	16.944	-	15.16	-	≥500
Mid	2437	16.951	-	15.15	-	
High	2462	16.787	-	15.15	-	

Test mode: IEEE 802.11n HT20 Mode / 2412-2462 MHz						
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2412	17.394	17.400	15.15	15.16	≥500
Mid	2437	17.398	17.395	15.15	15.16	
High	2462	17.416	17.405	15.17	15.16	

Test mode: IEEE 802.11n HT40 Mode / 2422-2452 MHz						
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2422	35.801	35.751	35.12	35.15	≥500
Mid	2437	35.780	35.730	35.15	35.14	
High	2452	35.796	35.754	35.15	35.15	

Test Data

6dB BANDWIDTH

IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
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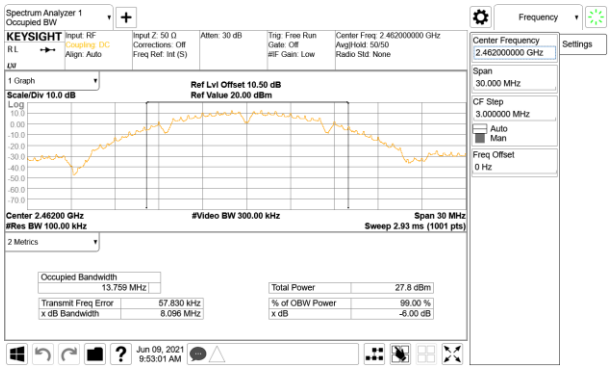
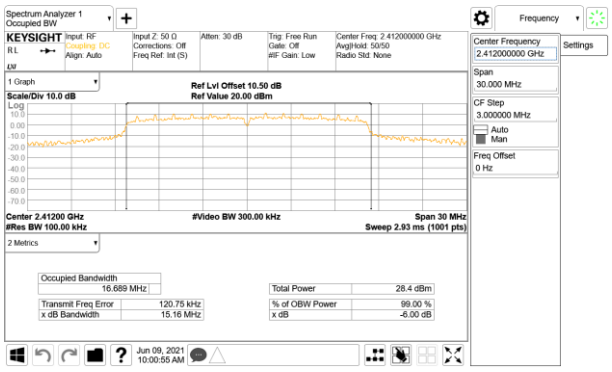
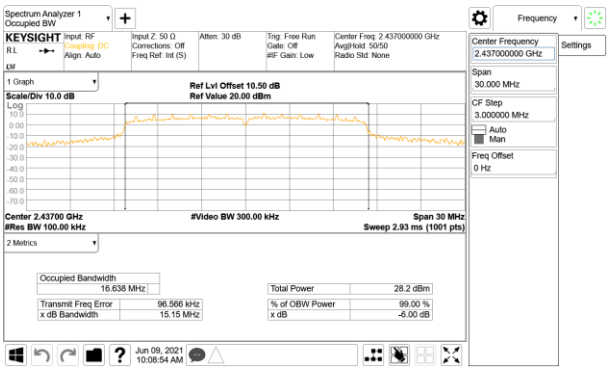
	

IEEE 802.11g mode- chain 0	
Low CH	**Mid CH**
	
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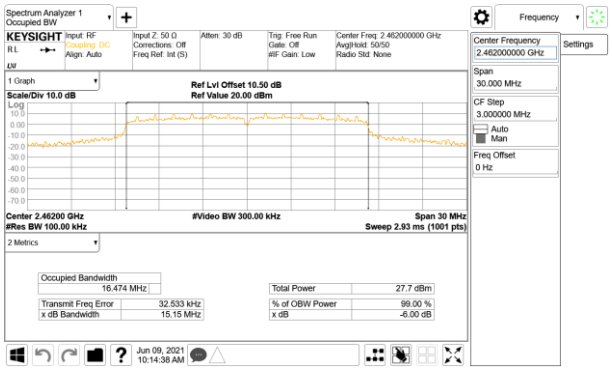
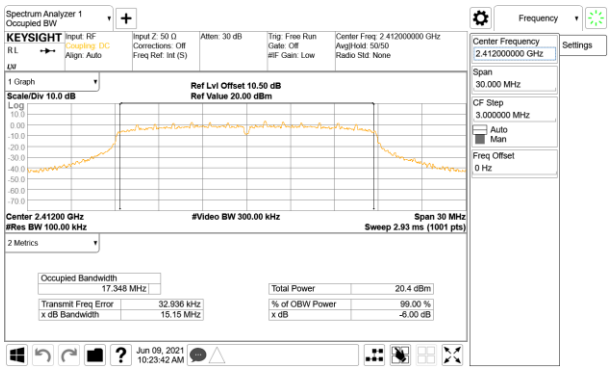
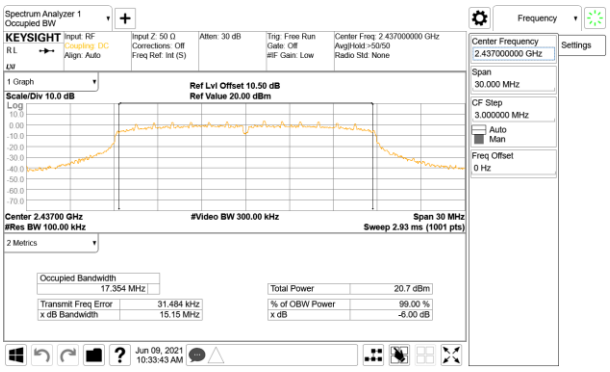
	

IEEE 802.11n HT20 mode- chain 0

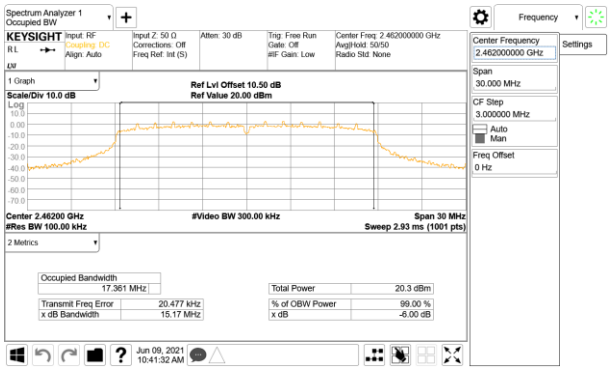
Low CH



Mid CH

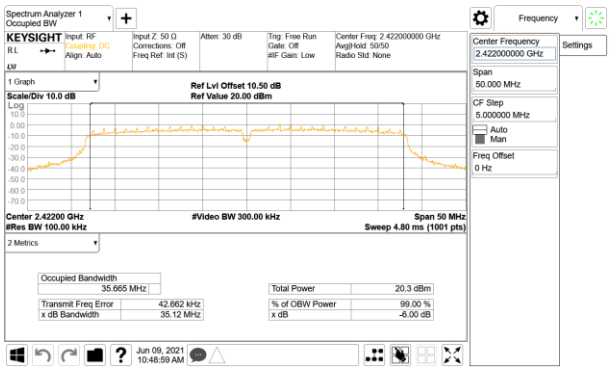


High CH

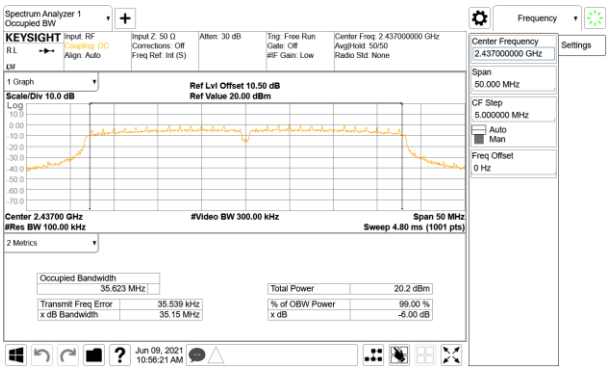


IEEE 802.11n HT40 mode- chain 0

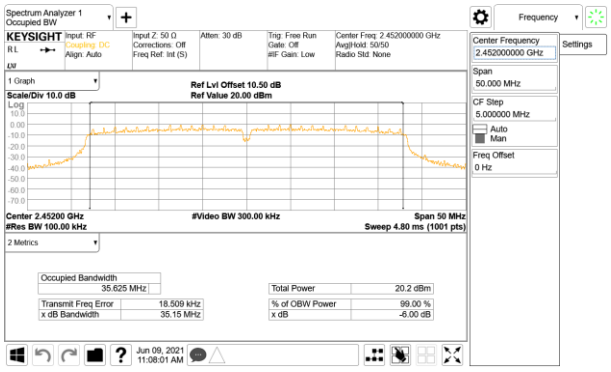
Low CH

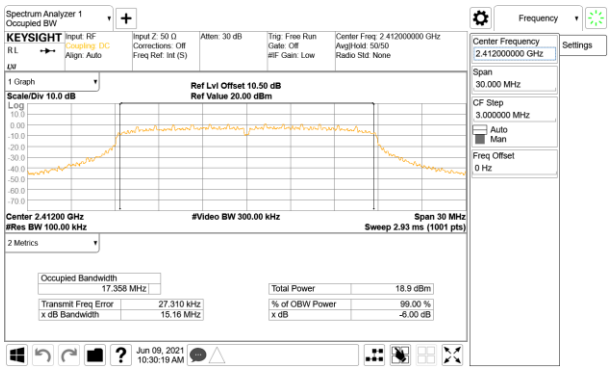
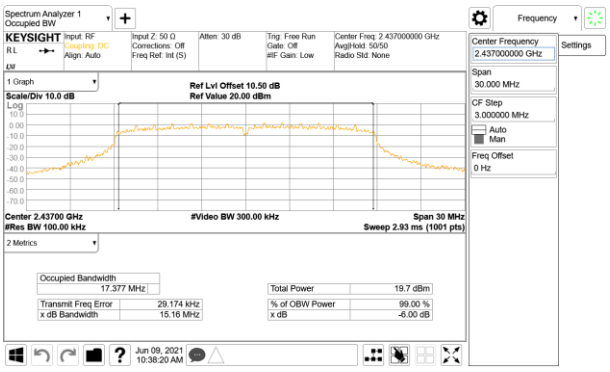
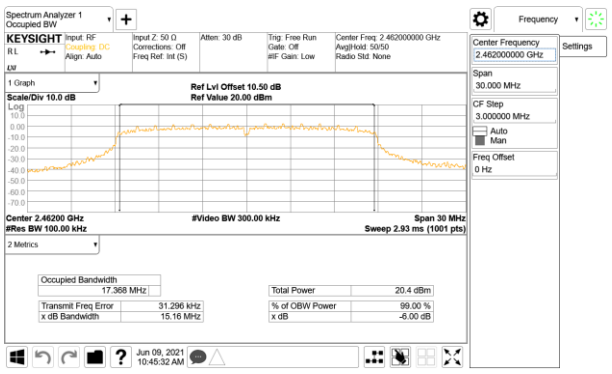


Mid CH



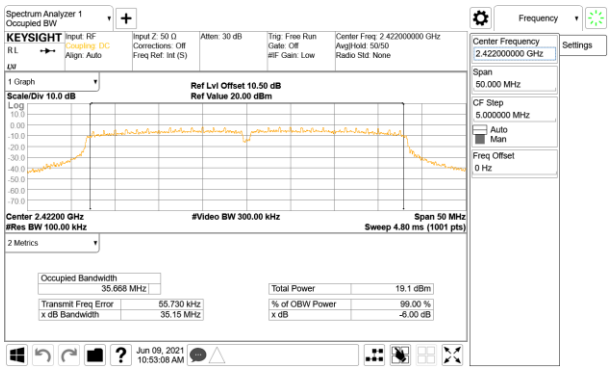
High CH



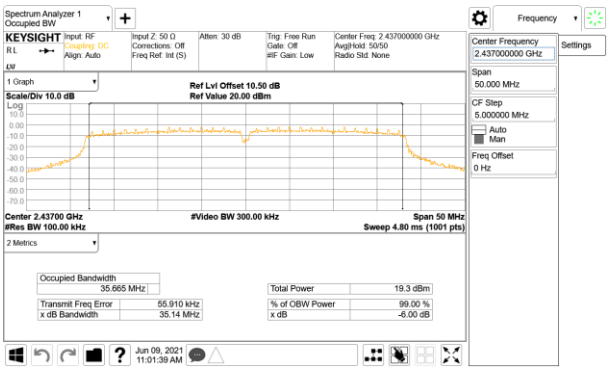
IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT40 mode- chain 1

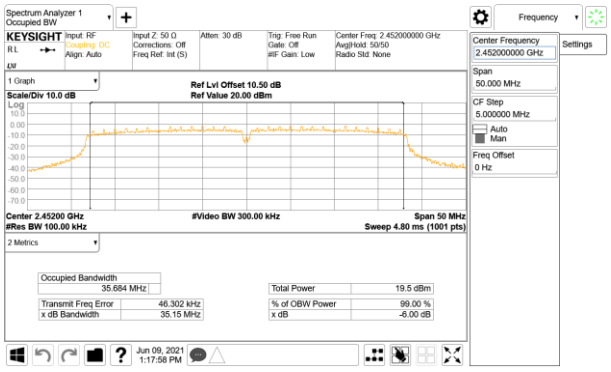
Low CH



Mid CH

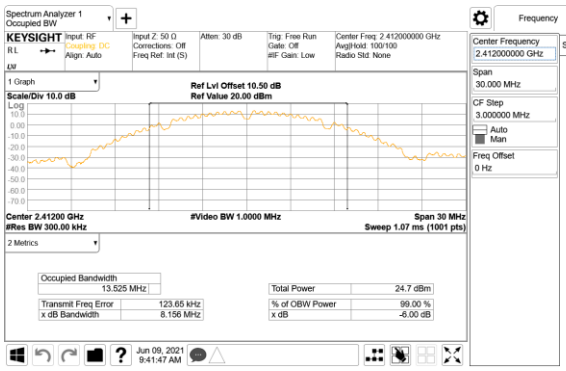
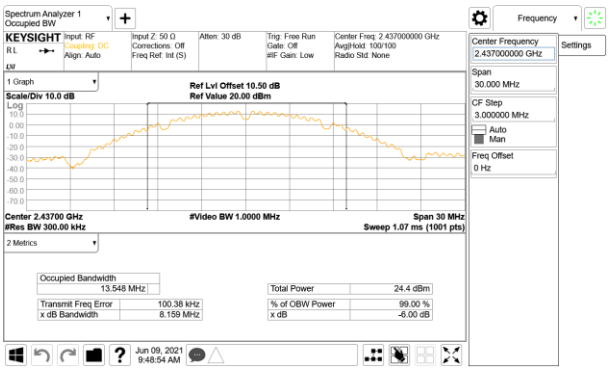
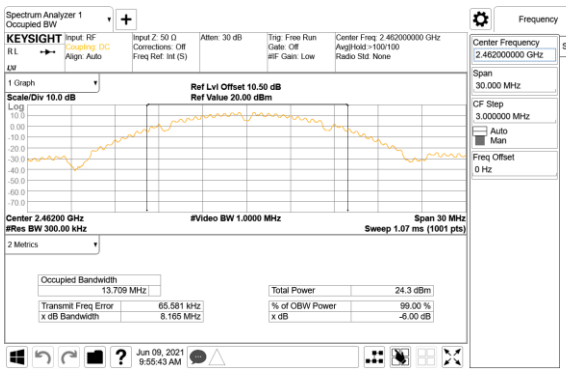


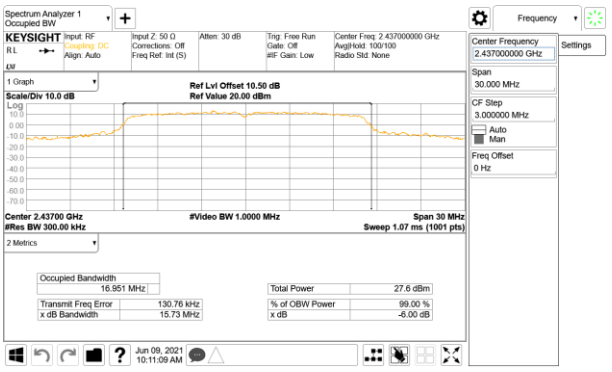
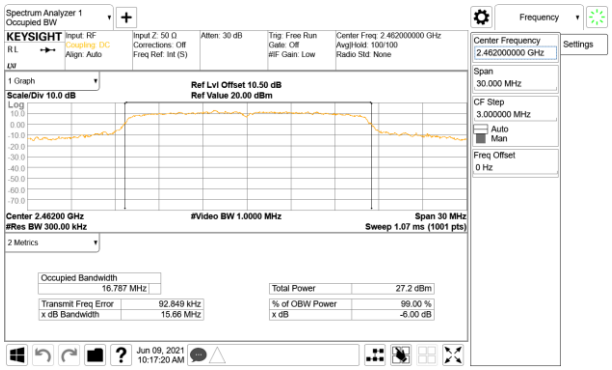
High CH

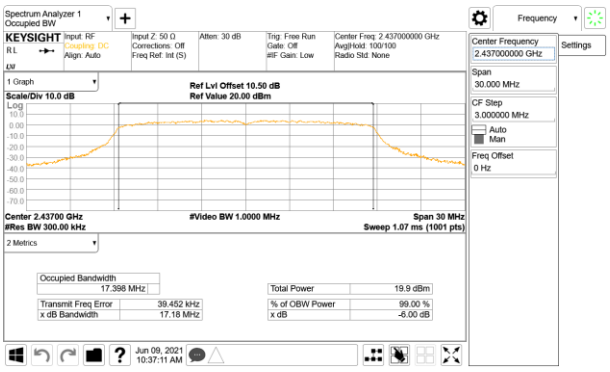
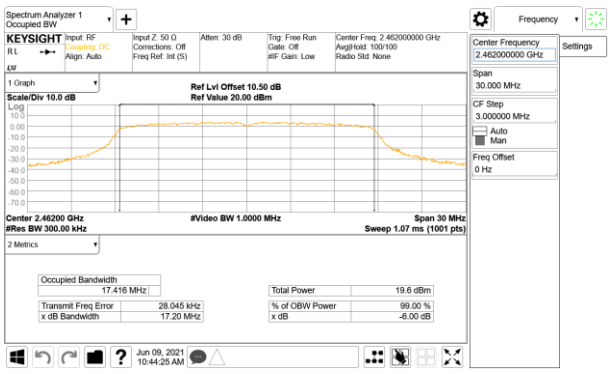


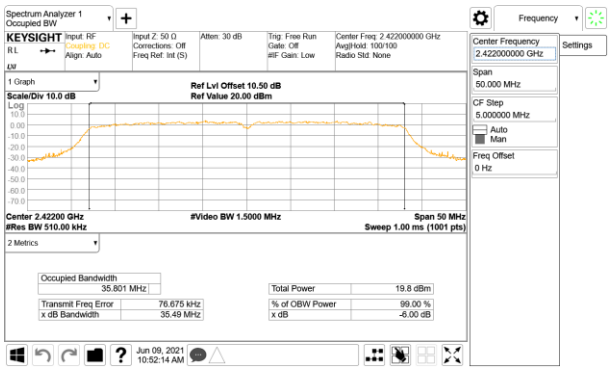
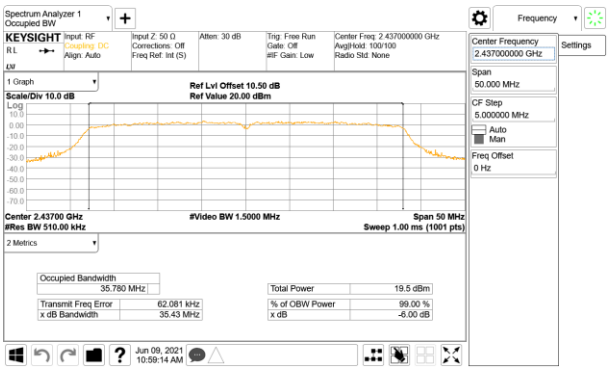
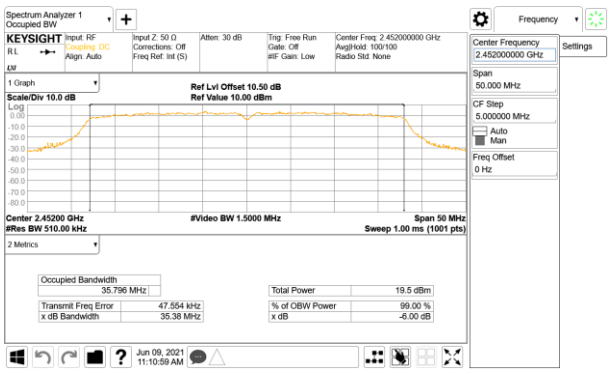
Test Data

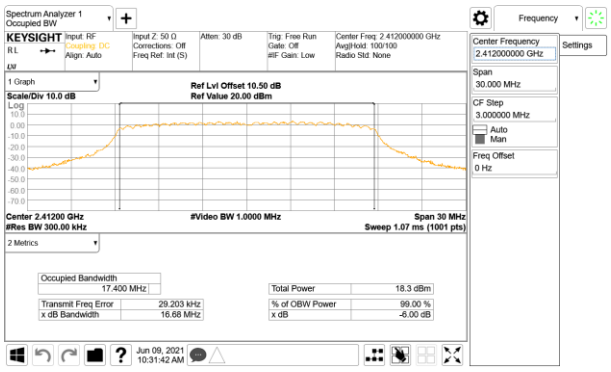
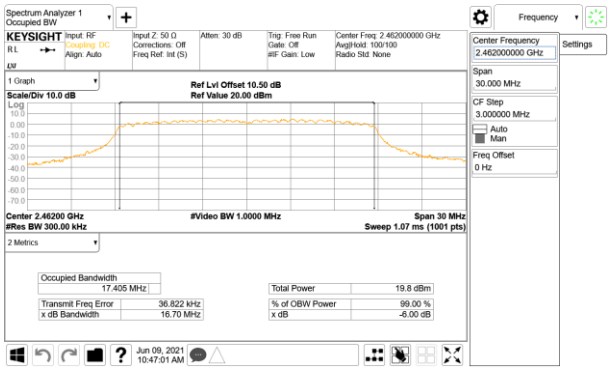
BANDWIDTH 99%

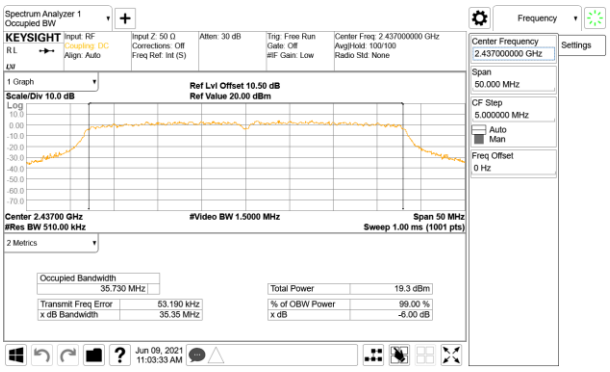
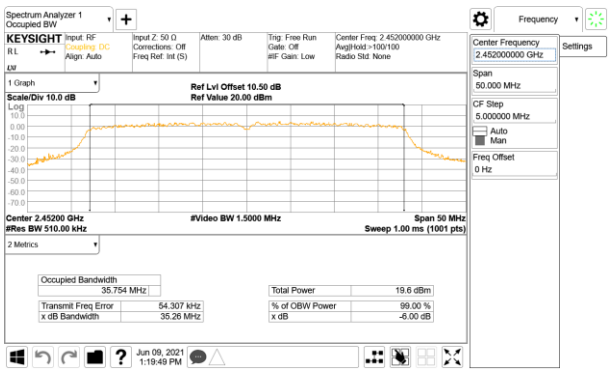
IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11g mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT40 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT40 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

5.3. OUTPUT POWER MEASUREMENT

5.3.1 Test Limit

According to §15.247(b) and RSS-247 section 5.4(d),

Peak output power：

For systems using digital modulation in the 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt(30 dBm) and the e.i.r.p. shall not exceed 4Watt(36 dBm), base on the use of antennas with directional gain not exceed 6 dBi If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)] ☐ Point-to-point operation：

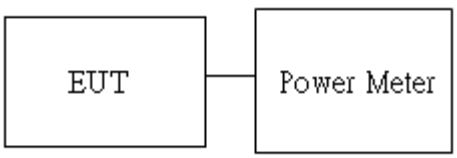
Average output power：For reporting purposes only.

5.3.2 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.

5.3.3 Test Setup



5.3.4 Test Result

Temperature:	25.6~26.4℃	**Tested by:**	Jack Chen
Humidity:	45.6~49.8 %RH	**Test date:**	June 18~19, 2021

Peak output power：

1TX:

802.11b Ch0						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Peak Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	1	21.5	20.38	30.00	PASS
6	2437	1	21.5	20.39	30.00	PASS
11	2462	1	21.5	**20.45**	30.00	PASS

802.11b Ch1						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Peak Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	1	21	20.15	30.00	PASS
6	2437	1	21	20.18	30.00	PASS
11	2462	1	21	20.27	30.00	PASS

802.11g Ch0						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Peak Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	6	22	**23.46**	30.00	PASS
6	2437	6	22	23.21	30.00	PASS
11	2462	6	21.5	23.18	30.00	PASS

802.11g Ch0						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Peak Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	6	21.5	23.08	30.00	PASS
6	2437	6	21.5	22.96	30.00	PASS
11	2462	6	21.5	23.04	30.00	PASS

2TX:

802.11n_HT20M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
1	2412	MCS8	13	15.89	15.94	**18.93**	30.00	PASS
6	2437	MCS8	13.5	15.11	16.53	18.89	30.00	PASS
11	2462	MCS8	13	15.23	15.67	18.47	30.00	PASS

802.11n_HT40M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
3	2422	MCS8	13	15.07	15.29	18.19	30.00	PASS
6	2437	MCS8	13	15.08	15.61	18.36	30.00	PASS
9	2452	MCS8	13	15.31	15.65	**18.49**	30.00	PASS

Average output power：

1TX:

802.11b Ch0						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Max. Avg. Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	1	21.5	17.81	30.00	PASS
6	2437	1	21.5	17.59	30.00	PASS
11	2462	1	21.5	**17.95**	30.00	PASS

802.11b Ch1						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Max. Avg. Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	1	21	17.65	30.00	PASS
6	2437	1	21	17.55	30.00	PASS
11	2462	1	21	17.75	30.00	PASS

802.11g Ch0						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Max. Avg. Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	6	22	**17.94**	30.00	PASS
6	2437	6	22	17.79	30.00	PASS
11	2462	6	21.5	17.75	30.00	PASS

802.11g Ch1						
CH	**Freq. (MHz)**	**Data Rate**	**Power set**	**Max. Avg. Output Power (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	6	21.5	17.78	30.00	PASS
6	2437	6	21.5	17.71	30.00	PASS
11	2462	6	21.5	17.74	30.00	PASS

2TX:

802.11n_HT20M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
1	2412	MCS8	13	9.08	9.12	12.53	30.00	PASS
6	2437	MCS8	13.5	8.58	9.75	12.64	30.00	PASS
11	2462	MCS8	13	8.96	9.54	**12.69**	30.00	PASS

802.11n_HT40M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
3	2422	MCS8	13	8.45	9.37	**12.74**	30.00	PASS
6	2437	MCS8	13	8.23	9.29	12.60	30.00	PASS
9	2452	MCS8	13	8.13	9.45	12.65	30.00	PASS

EIRP output power：

1TX-Chain 0:

802.11b Ch0							
CH	**Freq. (MHz)**	**Data Rate**	**Avg. Output Power (dBm)**	**Antenna Gain (dBi)**	**EIRP (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	1	17.81	2.78	20.59	36	PASS
6	2437	1	17.59	2.78	20.37	36	PASS
11	2462	1	17.95	2.78	**20.73**	36	PASS

802.11g Ch0							
CH	**Freq. (MHz)**	**Data Rate**	**Avg. Output Power (dBm)**	**Antenna Gain (dBi)**	**EIRP (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	6	17.94	2.78	20.72	36	PASS
6	2437	6	17.79	2.78	20.57	36	PASS
11	2462	6	17.75	2.78	20.53	36	PASS

1TX-Chain 1:

802.11b Ch1							
CH	**Freq. (MHz)**	**Data Rate**	**Avg. Output Power (dBm)**	**Antenna Gain (dBi)**	**EIRP (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	1	17.65	2.97	20.62	36	PASS
6	2437	1	17.55	2.97	20.52	36	PASS
11	2462	1	17.75	2.97	20.72	36	PASS

802.11g Ch1							
CH	**Freq. (MHz)**	**Data Rate**	**Avg. Output Power (dBm)**	**Antenna Gain (dBi)**	**EIRP (dBm)**	**Limit (dBm)**	**RESULT**
1	2412	6	17.78	2.97	**20.75**	36	PASS
6	2437	6	17.71	2.97	20.68	36	PASS
11	2462	6	17.74	2.97	20.71	36	PASS

2TX:

802.11n_HT20M MIMO									
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			CH 0	CH 1					
1	2412	MCS8	15.89	15.94	12.53	5.89	18.42	36	PASS
6	2437	MCS8	15.11	16.53	12.64	5.89	18.53	36	PASS
11	2462	MCS8	15.23	15.67	12.69	5.89	**18.58**	36	PASS

802.11n_HT40M MIMO									
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			CH 0	CH 1					
3	2422	MCS8	8.45	9.37	12.74	5.89	**18.63**	36	PASS
6	2437	MCS8	8.23	9.29	12.60	5.89	18.49	36	PASS
9	2452	MCS8	8.13	9.45	12.65	5.89	18.54	36	PASS

5.4. POWER SPECTRAL DENSITY

5.4.1 Test Limit

According to §15.247(e) and RSS-247 section 5.2(b),

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.

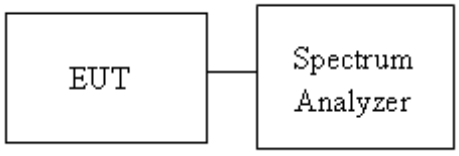
Limit	☒ Antenna not exceed 6 dBi：8dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 8 – (DG – 6)] ☐ Point-to-point operation：

5.4.2 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 = 30kHz, 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.

5.4.3 Test Setup



5.4.4 Test Result

Temperature:	25.8℃	**Tested by:**	Jack Chen
Humidity:	46.3% RH	**Test date:**	June 9, 2021

1TX

Test mode: IEEE 802.11b Mode / 2412-2462 MHz						
Channel	**Frequency (MHz)**	**Chain 0 PSD (dBm)**	**Chain 1 PSD (dBm)**	**Total PSD (dBm/3kHz)**	**Limit (dBm/3kHz)**	**Result**
Low	2412	-3.51	-	-3.51	8	PASS
Mid	2437	-3.05	-	-3.05		PASS
High	2462	1.85	-	1.85		PASS

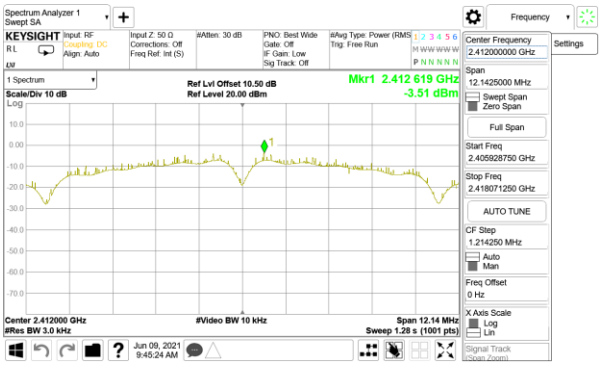
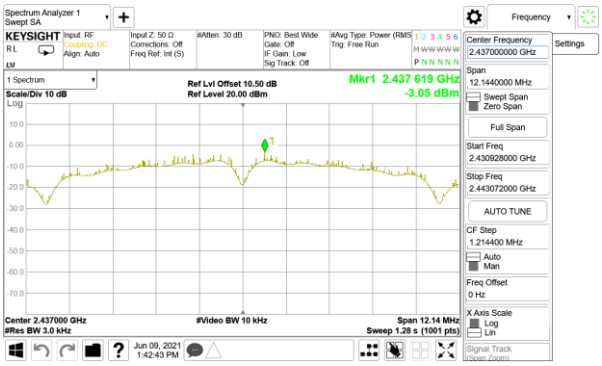
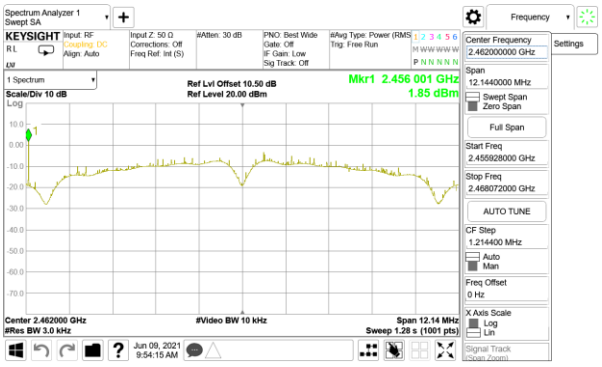
Test mode: IEEE 802.11g Mode / 2412-2462 MHz						
Channel	**Frequency (MHz)**	**Chain 0 PSD (dBm)**	**Chain 1 PSD (dBm)**	**Total PSD (dBm/3kHz)**	**Limit (dBm/3kHz)**	**Result**
Low	2412	-6.75	-	-6.75	8	PASS
Mid	2437	-5.45	-	-5.45		PASS
High	2462	-7.33	-	-7.33		PASS

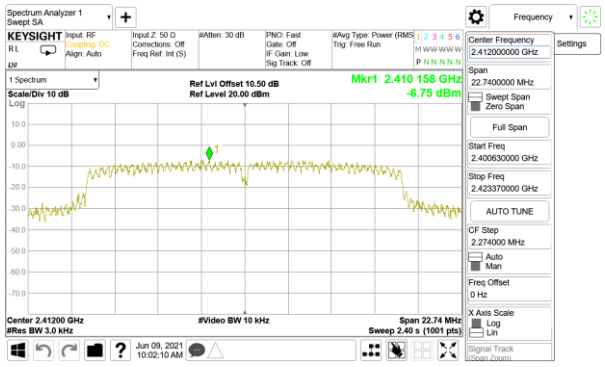
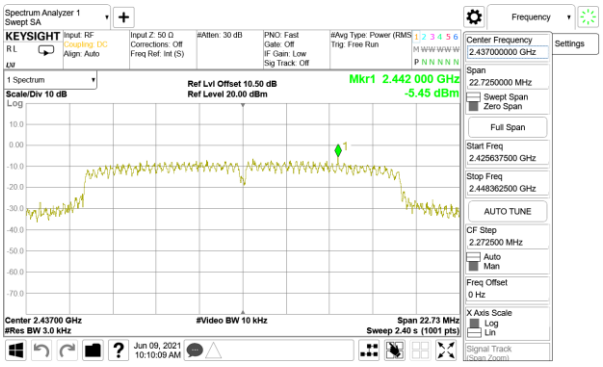
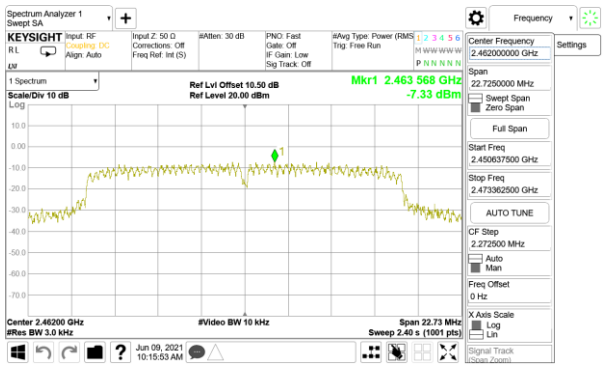
2TX:

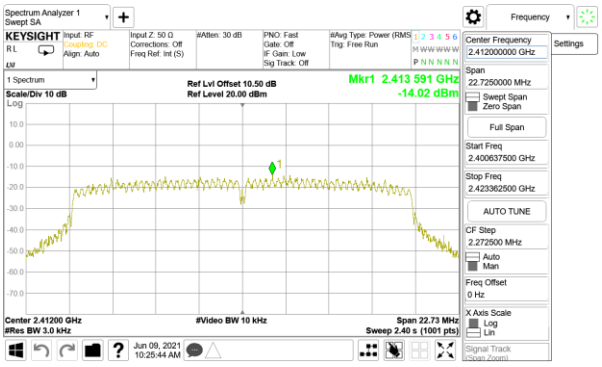
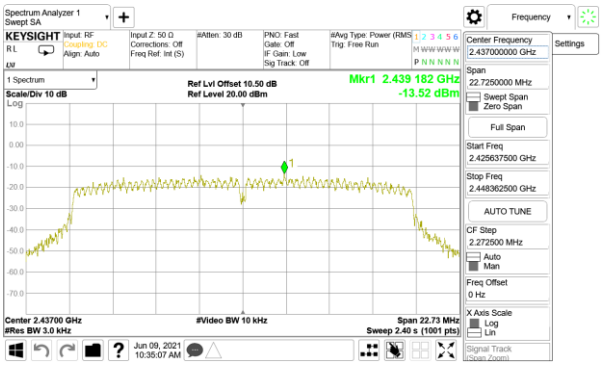
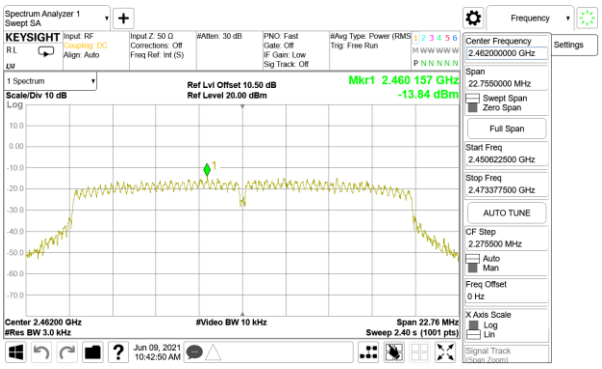
Test mode: IEEE 802.11n HT20 Mode / 2412-2462 MHz						
Channel	**Frequency (MHz)**	**Chain 0 PSD (dBm)**	**Chain 1 PSD (dBm)**	**Total PSD (dBm/3kHz)**	**Limit (dBm/3kHz)**	**Result**
Low	2412	-14.02	-15.64	-11.74	8	PASS
Mid	2437	-13.52	-14.89	-11.14		PASS
High	2462	-13.84	-13.88	-10.85		PASS

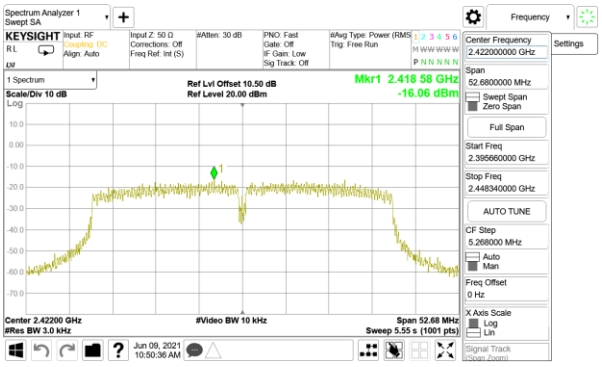
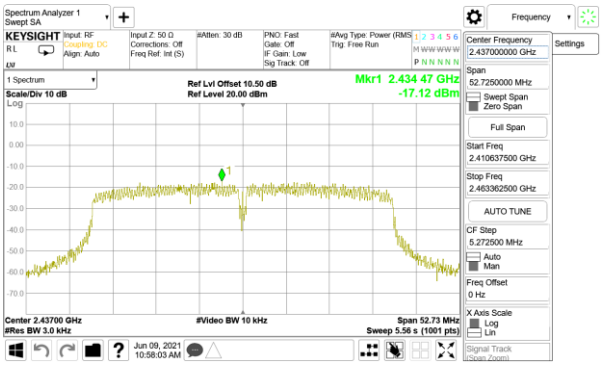
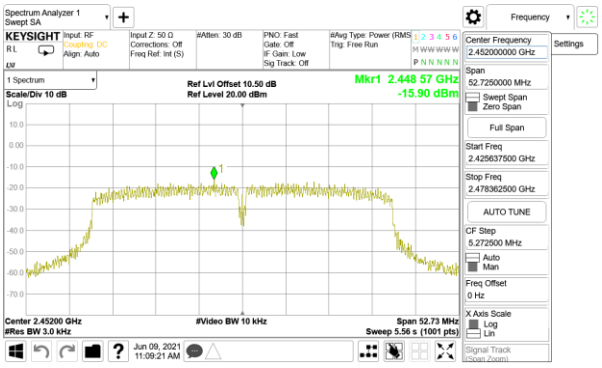
Test mode: IEEE 802.11n HT40 Mode / 2422-2452 MHz						
Channel	**Frequency (MHz)**	**Chain 0 PSD (dBm)**	**Chain 1 PSD (dBm)**	**Total PSD (dBm/3kHz)**	**Limit (dBm/3kHz)**	**Result**
Low	2422	-16.06	-17.58	-13.74	8	PASS
Mid	2437	-17.12	-17.52	-14.31		PASS
High	2452	-15.9	-17.7	-13.70		PASS

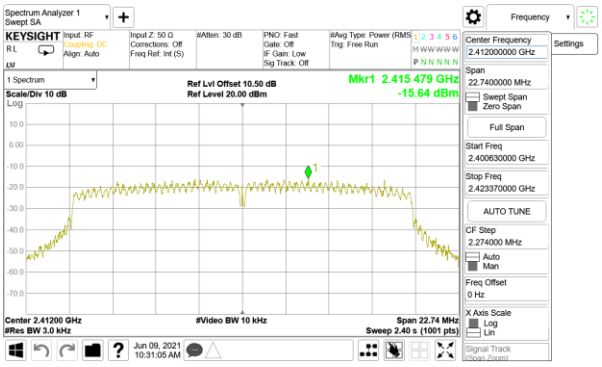
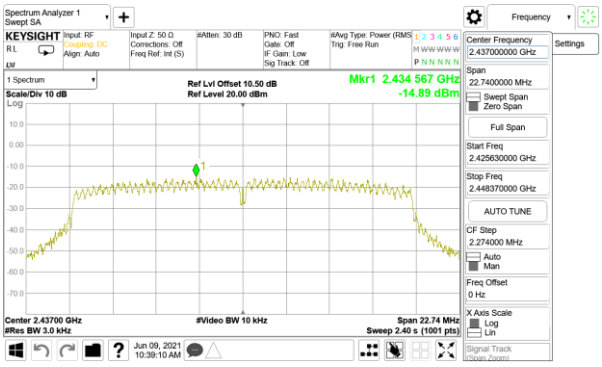
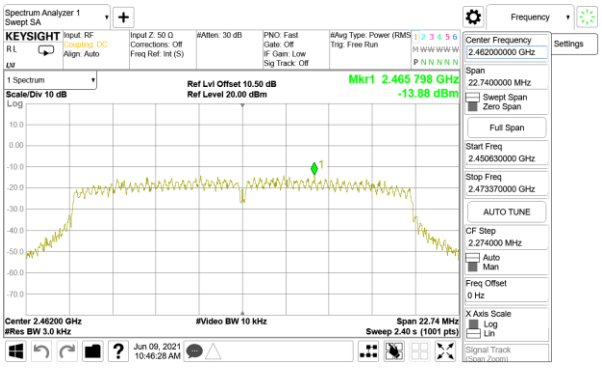
Test Data

IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11g mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

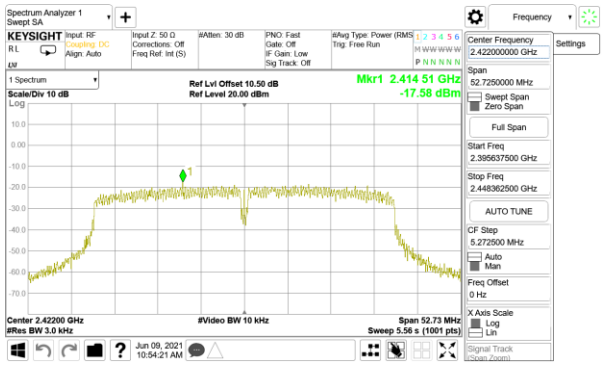
IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT40 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

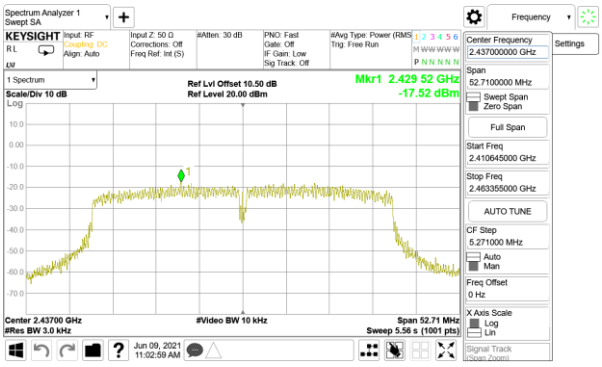
IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11n HT40 mode- chain 1

Low CH



Mid CH



High CH