TEST REPORT

Product Name:	Interactive Flat Panel
FCC ID:	2AYJ4TT-XXV5
Trademark:	TANGO
Model Number:	TT-75V5, TT-55V5, TT-65V5, TT-86V5, TT-98V5
Prepared For:	Osborne Technologies Limited
Address:	Unit 14 Capitol Court, Capitol Park, Dodworth, Barnsley, South Yorkshire, United Kingdom
Manufacturer:	Osborne Technologies Limited
Address:	Unit 14 Capitol Court, Capitol Park, Dodworth, Barnsley, South Yorkshire, United Kingdom
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, China.
Sample Received Date:	Apr. 13, 2023
Sample tested Date:	Apr. 13, 2023 to Apr. 18, 2023
Issue Date:	Apr. 18, 2023
Report No.:	CTB230418007RFX
Test Standards	FCC Part15.247 ANSI C63.10:2013
Test Results	PASS
Remark:	This is WIFI-2.4GHz band radio test report.

Compiled by:	Reviewed by:	Approved by:
Chen Zheng	Arron Liu	Bin Mei
Chen Zheng	Arron Liu	Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

Test Report Declaration Page
1. VERSION . . . 3
2. TEST SUMMARY . . . 4
3. MEASUREMENT UNCERTAINTY . . . 5
4. PRODUCT INFORMATION AND TEST SETUP . . . 6
4.1 Product Information . . . 6
4.2 Test Setup Configuration . . . 7
4.3 Support Equipment . . . 7
4.4 Channel List . . . 7
4.5 Test Mode . . . 8
4.6 Test Environment . . . 8
5. TEST FACILITY AND TEST INSTRUMENT USED . . . 9
5.1 Test Facility . . . 9
5.2 Test Instrument Used . . . 9
6. AC POWER LINE CONDUCTED EMISSION . . . 11
6.1 Block Diagram Of Test Setup . . . 11
6.2 Limit . . . 11
6.3 Test procedure . . . 11
6.4 Test Result . . . 13
7. RADIATED SPURIOUS EMISSION . . . 15
7.1 Block Diagram Of Test Setup . . . 15
7.2 Limit . . . 15
7.3 Test procedure . . . 16
7.4 Test Result . . . 17
8. BAND EDGE AND RF COUNDUCTED SPURIOUS EMISSIONS . . . 39
8.1 Block Diagram Of Test Setup . . . 39
8.2 Limit . . . 39
8.3 Test procedure . . . 39
8.4 Test Result . . . 40
9. COUDUCTED OUTPUT POWER . . . 72
9.1 Block Diagram Of Test Setup . . . 72
9.2 Limit . . . 72
9.3 Test procedure . . . 72
9.4 Test Result . . . 73
10. 6DB OCCUPIED BANDWIDTH . . . 74
10.1 Block Diagram Of Test Setup . . . 74
10.2 Limit . . . 74
10.3 Test procedure . . . 74
10.4 Test Result . . . 75
11. POWER SPECTRAL DENSITY . . . 94
11.1 Block Diagram Of Test Setup . . . 94
11.2 Limit . . . 94
11.3 Test procedure . . . 94
11.4 Test Result . . . 95
12. ANTENNA REQUIREMENT . . . 112
13. EUT PHOTOGRAPHS . . . 113
14. EUT TEST SETUP PHOTOGRAPHS . . . 114

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB230418007RFX	Apr. 18, 2023	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Test Item	Test Requirement	Test method	Result
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Radiated Spurious emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Band edge and RF Conducted Spurious Emissions	47 CFR Part 15 Subpart C Section 15.247(d)/15.205(a)	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01 v05r02	PASS
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (b)	ANSI C63.10-2013	PASS
RF Exposure Evaluation	47 CFR Part 15 Subpart C Section 15.247 (i)/1.1310/2.1091	KDB447498D01v06	PASS

Remark:
Test according to ANSI C63.4-2014 & ANSI C63.10-2013.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	U=±54.3Hz
Conducted output power Above 1G	U=±1.0dB
Conducted output power below 1G	U=±0.9dB
Power Spectral Density , Conduction	U=±1.0dB
Conduction spurious emissions	U=±2.8dB
Out of band emission	U=±54Hz
3m chamber Radiated spurious emission(9KHz-30MHz)	U=±4.8dB
3m chamber Radiated spurious emission(30MHz-1GHz)	U=±4.3dB
3m chamber Radiated spurious emission(1GHz-18GHz)	U=±4.5dB
3m chamber Radiated spurious emission(1GHz-40GHz)	U=±4.8dB
humidity uncertainty	U=±5.3%
Temperature uncertainty	U=±0.59℃
Supply voltages	U=±3%
Time	U=±5%
Conducted Emission (9KHz-30MHz)	3.2 dB

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	TT-75V5, TT-55V5, TT-65V5, TT-86V5, TT-98V5
Model Description:	All the model are the same circuit and RF module, only for model name. Test sample model: TT-75V5
Wi-Fi Specification:	IEEE 802.11b/g/n
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	WiFi: IEEE 802.11b/g/n 20: 2412-2462MHz/ 11 channel IEEE 802.11n 40: 2422-2452MHz/ 7 channel
Max. RF output power:	WiFi (2.4G) : 19.835dBm
Type of Modulation:	WiFi: DSSS, OFDM
Antenna installation:	WiFi: External antenna
Antenna Gain:	WiFi (2.4G) : ANT1:4.55dBi ANT2:4.55dBi ANT3:4.55dBi ANT4:4.55dBi
Ratings:	AC 100-240V~50/60Hz

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	AC adapter	Integral POLYMEDIA Systems LLC	2013010201614723	N/A	AE
2	remote control	Integral POLYMEDIA Systems LLC	FB50-65U-i5	N/A	DC

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

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

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

ANT 1, ANT 2

Test mode	Low channel	Middle channel	High channel
Transmitting(802.11b/g/n20)	2412MHz	2437MHz	2462MHz
Transmitting(802.11n40)	2422MHz	2437MHz	2452MHz

MIMO(ANT 1+ANT 2)

Test mode	Low channel	Middle channel	High channel
Transmitting(802.11n20)	2412MHz	2437MHz	2462MHz
Transmitting(802.11n40)	2422MHz	2437MHz	2452MHz

EUT has two Internal Antenna with Max Antenna Gain 1.2dBi on every antenna, CDD device with two spatial streams, according to KDB662911 D01 v02r01,

Directional gain= GANT + Array Gain, where Array Gain is as follows.

1) For power spectral density(PSD) measurements,

Array Gain=10log(NANT/NSS)dB=10log(2/1)=3.01dB,

So the directional gain for PSD is 4.01dBi

2) For power measurements,

The Array gain=0 dB for NANT≤4,

So the directional gain for Power measurements is 1dBi

NOTE: Dutycycle>98%.

Test mode	Rate
802.11b	11M
802.11g	54M
802.11/n20	65M
802.11/n40	65M

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC):	120
Normal Temperature(℃)	23
Low Temperature(℃)	0
High Temperature(℃)	50

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	2023.07.19
2	Power Sensor	Agilent	U2021XA	MY56120032	2023.07.19
3	Power Sensor	Agilent	U2021XA	MY56120034	2023.07.19
4	Communication test set	R&S	CMW500	108058	2023.07.19
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	2023.07.19
6	Signal Generator	Agilent	N5181A	MY50140365	2023.07.19
7	Vector signal generator	Agilent	N5182A	MY47420195	2023.07.19
8	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
9	2.4 GHz Filter	Shenxiang	MSF2400-2483.5MS-1154	20181015001	2023.07.19
10	5 GHz Filter	Shenxiang	MSF5150-5850 MS-1155	20181015001	2023.07.19
11	Filter	Xingbo	XBLBQ-DZA120	190821-1-1	2023.07.19
12	BT&WI-FI Automatic test software	Micowave	MTS8000	Ver. 2.0.0.0	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	2023.10.30
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	2023.07.19
15	234G Automatic test software	Micowave	MTS8200	Ver. 2.0.0.0	/
16	966 chamber	C.R.T.	966	/	2024.08.11
17	Receiver	R&S	ESPI	100362	2023.07.19
18	Amplifier	HP	8447E	2945A02747	2023.07.19
19	Amplifier	Agilent	8449B	3008A01838	2023.07.19
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22

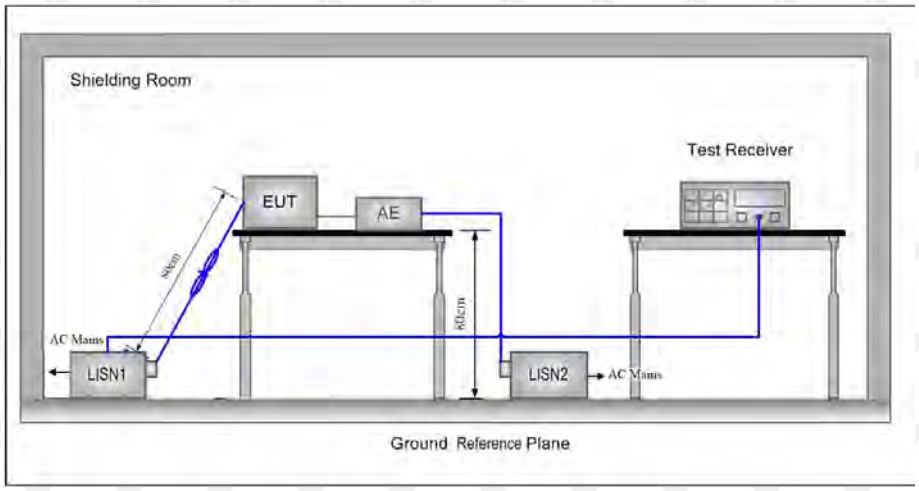
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	2023.07.22
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	2023.07.23
24	loop antenna	ZHINAN	ZN30900A	GTS534	/
25	40G Horn antenna	A/H/System	SAS-574	588	2024.10.30
26	Amplifier	AEROFLEX	Aeroflex	097	2024.10.30

Continuous disturbance					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	ROHDE&SCHWARZ	ESH3-Z5	100318	2023.07.19
2	Pulse limiter	ROHDE&SCHWARZ	ESH3Z2	357881052	2023.07.19
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428/003	2023.07.19
4	Coaxial cable	ZDECL	Z302S-NJ-SMA J-12M	18091905	2023.07.19
5	ISN	Schwarzbeck	NTFM8158	183	2023.07.19
6	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
7	Communication test set	R&S	CMW500	108058	2023.07.19
8	EZ-EMC	Frad	EMC-con3A1.1	/	/

Radiated emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	01911	2023.07.22
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	2023.07.22
3	Amplifier	Agilent	8449B	3008A01838	2023.07.19
4	Amplifier	HP	8447E	2945A02747	2023.07.19
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100428/003	2023.07.19
6	Coaxial cable	ETS	RFC-SNS-100-NMS-80 NI	/	2023.07.19
7	Coaxial cable	ETS	RFC-SNS-100-NMS-20 NI	/	2023.07.19
8	Coaxial cable	ETS	RFC-SNS-100-SMS-20 NI	/	2023.07.19
9	Coaxial cable	ETS	RFC-NNS-100 -NMS-300 NI	/	2023.07.19
10	Communication test set	Agilent	E5515C	MY50102567	2023.07.19
11	Communication test set	R&S	CMW500	108058	2023.07.19
12	EZ-EMC	Frad	EMC-con3A1.1	/	/

6. AC POWER LINE CONDUCTED EMISSION

6.1 Block Diagram Of Test Setup



6.2 Limit

Table 4 – AC power-line conducted emissions limits

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56[Note 1]	56 to 46[Note 1]
0.5 – 5	56	46
5 – 30	60	50

Note 1: The level decreases linearly with the logarithm of the frequency.

* Decreasing linearly with the logarithm of the frequency

6.3 Test procedure

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

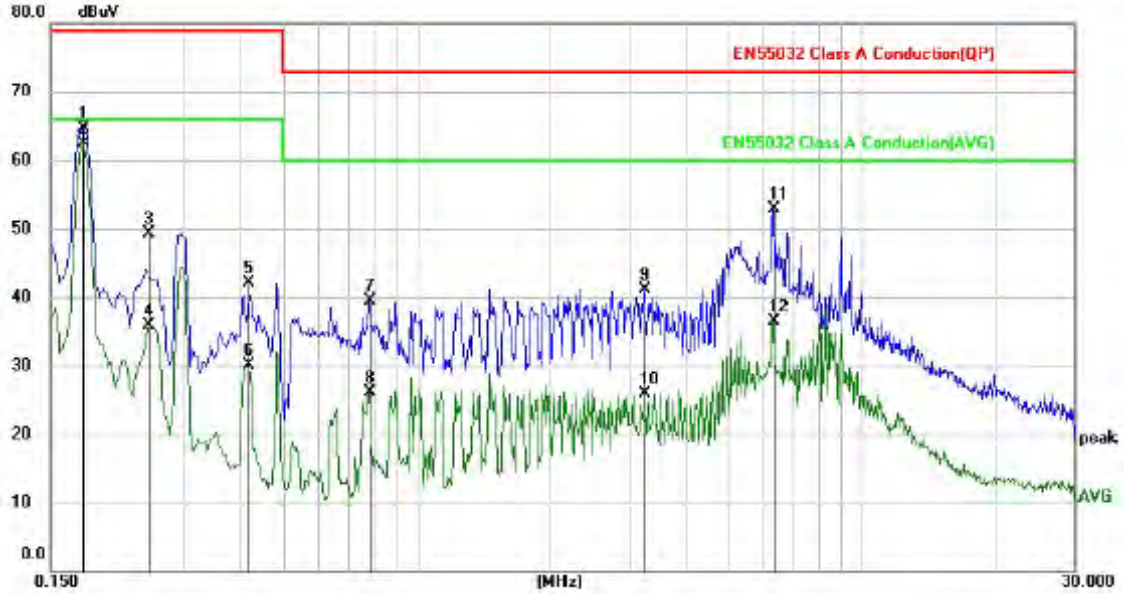
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane.

This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

6.4 Test Result

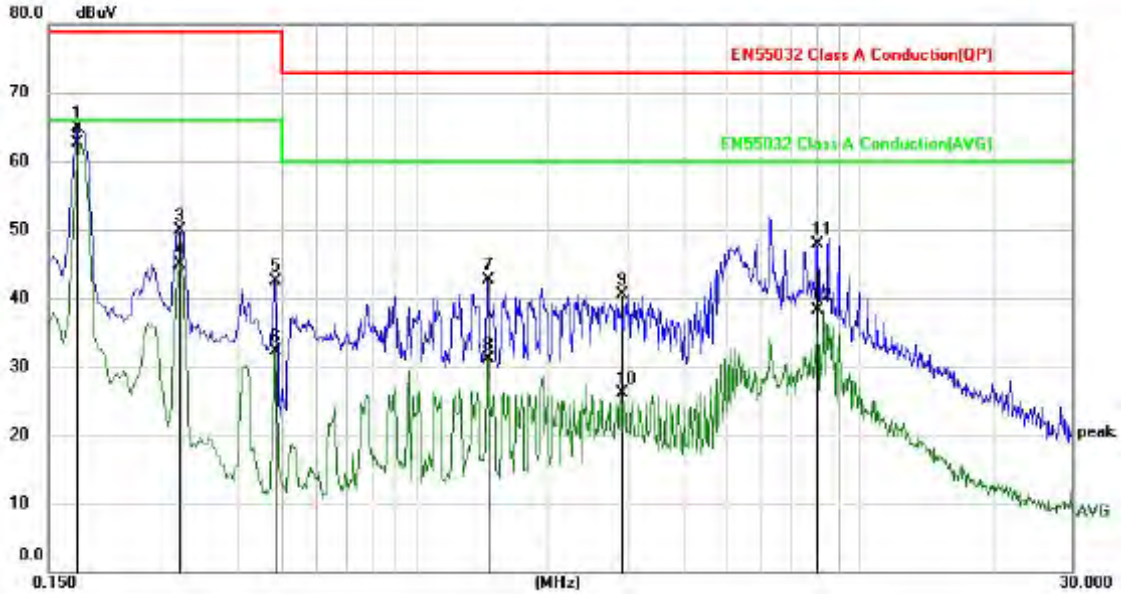
Test Specification: Line
AC 120V 60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1780	54.71	10.01	64.72	79.00	-14.28	QP
2	*	0.1780	52.59	10.01	62.60	66.00	-3.40	AVG
3		0.2500	39.36	10.00	49.36	79.00	-29.64	QP
4		0.2500	25.90	10.00	35.90	66.00	-30.10	AVG
5		0.4180	32.10	9.98	42.08	79.00	-36.92	QP
6		0.4180	20.08	9.98	30.06	66.00	-35.94	AVG
7		0.7820	29.57	9.98	39.55	73.00	-33.45	QP
8		0.7820	16.09	9.98	26.07	60.00	-33.93	AVG
9		3.2460	30.96	10.09	41.05	73.00	-31.95	QP
10		3.2460	15.80	10.09	25.89	60.00	-34.11	AVG
11		6.3300	42.62	10.22	52.84	73.00	-20.16	QP
12		6.3300	26.22	10.22	36.44	60.00	-23.56	AVG

Remark: Factor = Cable loss + LISN factor, Margin = Measurement – Limit

Test Specification: Neutral
AC 120V 60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1740	54.91	10.01	64.92	79.00	-14.08	QP
2	*	0.1740	52.71	10.01	62.72	66.00	-3.28	AVG
3		0.2940	39.82	9.99	49.81	79.00	-29.19	QP
4		0.2940	34.86	9.99	44.85	66.00	-21.15	AVG
5		0.4860	32.44	9.97	42.41	79.00	-36.59	QP
6		0.4860	22.37	9.97	32.34	66.00	-33.66	AVG
7		1.4580	32.74	10.00	42.74	73.00	-30.26	QP
8		1.4580	21.02	10.00	31.02	60.00	-28.98	AVG
9		2.9140	30.53	10.07	40.60	73.00	-32.40	QP
10		2.9140	15.94	10.07	26.01	60.00	-33.99	AVG
11		7.9820	37.67	10.28	47.95	73.00	-25.05	QP
12		7.9820	27.99	10.28	38.27	60.00	-21.73	AVG

Remark: Factor = Cable loss + LISN factor, Margin = Measurement – Limit

7. RADIATED SPURIOUS EMISSION

7.1 Block Diagram Of Test Setup

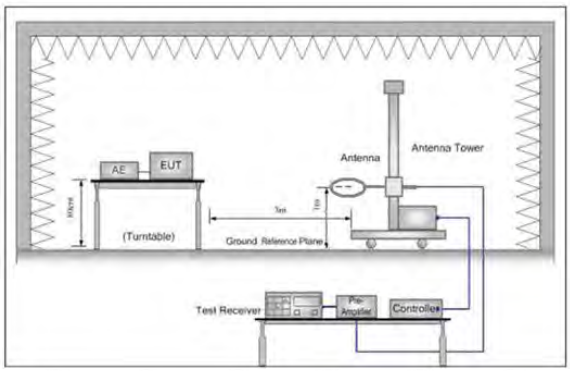


Figure 1. Below 30MHz

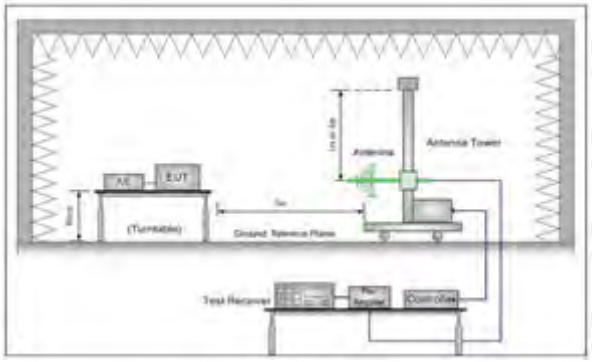


Figure 2. 30MHz to 1GHz

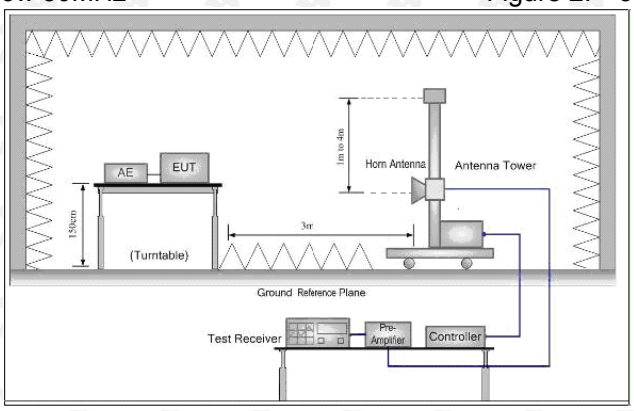


Figure 3. Above 1GHz

7.2 Limit

Spurious Emissions:

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

7.3 Test procedure

Below 1GHz test procedure as below:

a.The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b.The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c.The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d.For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f.If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g.Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).

h.Test the EUT in the lowest channel ,the middle channel ,the Highest channel

j.Repeat above procedures until all frequencies measured was complete.

Receiver set:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120 kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

7.4 Test Result

After pre-scanning three directions, the report recorded the worst case

Below 1GHz Test Results:
Antenna polarity: H

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		46.9123	38.04	-6.57	31.47	40.00	-8.53	QP
2	!	149.2238	43.61	-5.46	38.15	43.50	-5.35	QP
3		250.3010	46.12	-7.80	38.32	46.00	-7.68	QP
4		374.6225	43.02	-3.36	39.66	46.00	-6.34	QP
5	!	755.3872	35.09	4.92	40.01	46.00	-5.99	QP
6	*	876.7827	34.31	6.76	41.07	46.00	-4.93	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Antenna polarity: V

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	49.0144	41.88	-6.61	35.27	40.00	-4.73	QP
2	!	65.4578	42.85	-8.38	34.47	40.00	-5.53	QP
3		149.2238	41.99	-5.46	36.53	43.50	-6.97	QP
4	!	374.6225	44.20	-3.36	40.84	46.00	-5.16	QP
5		565.6295	37.03	1.62	38.65	46.00	-7.35	QP
6	!	876.7827	33.80	6.76	40.56	46.00	-5.44	QP

Remark: Factor = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

1. The margin of 9K-30MH measurement exceeds 20dB, so the test chart is not included.
2. All modes have been tested, and the test results show that ANT2 b-mode data is the worst, only ANT2 b-mode test chart is put.

Above 1 GHz Test Results:

ANT2 LOW CH1 (802.11b Mode)/2412

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	63.74	-3.64	60.10	74	-13.90	peak
4824	49.12	-3.64	45.48	54	-8.52	AVG
7236	57.97	-0.95	57.02	74	-16.98	peak
7236	46.34	-0.95	45.39	54	-8.61	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	66.50	-3.64	62.86	74	-11.14	peak
4824	48.56	-3.64	44.92	54	-9.08	AVG
7236	59.00	-0.95	58.05	74	-15.95	peak
7236	44.34	-0.95	43.39	54	-10.61	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT2 MID CH6 (802.11b Mode)/2437

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	65.84	-3.51	62.33	74	-11.67	peak
4874	48.88	-3.51	45.37	54	-8.63	AVG
7311	59.81	-0.82	58.99	74	-15.01	peak
7311	45.76	-0.82	44.94	54	-9.06	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	63.14	-3.51	59.63	74	-14.37	peak
4874	47.48	-3.51	43.97	54	-10.03	AVG
7311	59.71	-0.82	58.89	74	-15.11	peak
7311	44.87	-0.82	44.05	54	-9.95	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT2 HIGH CH11 (802.11b Mode)/2462

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	62.44	-3.43	59.01	74	-14.99	peak
4924	45.91	-3.43	42.48	54	-11.52	AVG
7386	57.57	-0.75	56.82	74	-17.18	peak
7386	42.65	-0.75	41.90	54	-12.10	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	62.89	-3.43	59.46	74	-14.54	peak
4924	46.19	-3.43	42.76	54	-11.24	AVG
7386	59.13	-0.75	58.38	74	-15.62	peak
7386	41.22	-0.75	40.47	54	-13.53	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Remark:
(1). Measuring frequencies from 9KHz to the 25 GHz. The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report
(2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(3) Data of measurement within this frequency range shown "--- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

ANT2 LOW CH1 (802.11g Mode)/2412

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	64.57	-3.64	60.93	74	-13.07	peak
4824	48.90	-3.64	45.26	54	-8.74	AVG
7236	57.91	-0.95	56.96	74	-17.04	peak
7236	46.04	-0.95	45.09	54	-8.91	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	62.55	-3.64	58.91	74	-15.09	peak
4824	46.90	-3.64	43.26	54	-10.74	AVG
7236	58.98	-0.95	58.03	74	-15.97	peak
7236	45.11	-0.95	44.16	54	-9.84	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT2 MID CH6 (802.11g Mode)/2437

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	64.01	-3.51	60.50	74	-13.50	peak
4874	48.78	-3.51	45.27	54	-8.73	AVG
7311	58.26	-0.82	57.44	74	-16.56	peak
7311	45.28	-0.82	44.46	54	-9.54	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	63.47	-3.51	59.96	74	-14.04	peak
4874	46.97	-3.51	43.46	54	-10.54	AVG
7311	56.91	-0.82	56.09	74	-17.91	peak
7311	41.52	-0.82	40.70	54	-13.30	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	62.77	-3.43	59.34	74	-14.66	peak
4924	47.61	-3.43	44.18	54	-9.82	AVG
7386	56.09	-0.75	55.34	74	-18.66	peak
7386	42.65	-0.75	41.90	54	-12.10	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT2 HIGH CH11 (802.11g Mode)/2462

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	64.33	-3.43	60.90	74	-13.10	peak
4924	48.56	-3.43	45.13	54	-8.87	AVG
7386	56.89	-0.75	56.14	74	-17.86	peak
7386	42.55	-0.75	41.80	54	-12.20	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Remark :

(1). Measuring frequencies from 9KHz to the 25 GHz. The test range is 9K ~10 times the main wave, and other spurious below the limit of 20dB will not be reflected in the report

(2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(3) Data of measurement within this frequency range shown "--- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(4) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

Above 1GHz ANT1+ANT2 :

LOW CH1 (802.11n/H20 Mode)/2412

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	63.59	-3.64	59.95	74	-14.05	peak
4824	47.52	-3.64	43.88	54	-10.12	AVG
7236	58.26	-0.95	57.31	74	-16.69	peak
7236	45.47	-0.95	44.52	54	-9.48	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	64.78	-3.64	61.14	74	-12.86	peak
4824	48.13	-3.64	44.49	54	-9.51	AVG
7236	59.86	-0.95	58.91	74	-15.09	peak
7236	44.45	-0.95	43.50	54	-10.50	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT1+ANT2 MID CH6 (802.11n/H20 Mode)/2437

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874.00	63.85	-3.51	60.34	74.00	-13.66	peak
4874.00	48.25	-3.51	44.74	54.00	-9.26	AVG
7311.00	58.11	-0.82	57.29	74.00	-16.71	peak
7311.00	45.39	-0.82	44.57	54.00	-9.43	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874.00	64.15	-3.51	60.64	74.00	-13.36	peak
4874.00	48.26	-3.51	44.75	54.00	-9.25	AVG
7311.00	57.81	-0.82	56.99	74.00	-17.01	peak
7311.00	41.95	-0.82	41.13	54.00	-12.87	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT1+ANT2 HIGH CH11 (802.11n/H20 Mode)/2462

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	62.87	-3.43	59.44	74	-14.56	peak
4924	46.81	-3.43	43.38	54	-10.62	AVG
7386	58.48	-0.75	57.73	74	-16.27	peak
7386	42.68	-0.75	41.93	54	-12.07	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	63.53	-3.43	60.10	74	-13.90	peak
4924	47.36	-3.43	43.93	54	-10.07	AVG
7386	57.94	-0.75	57.19	74	-16.81	peak
7386	43.37	-0.75	42.62	54	-11.38	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT1+ANT2 LOW CH3 (802.11n/H40 Mode)/2422

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4844	63.51	-3.63	59.88	74	-14.12	peak
4844	49.82	-3.63	46.19	54	-7.81	AVG
7266	59.76	-0.94	58.82	74	-15.18	peak
7266	46.28	-0.94	45.34	54	-8.66	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4844	64.22	-3.63	60.59	74	-13.41	peak
4844	48.62	-3.63	44.99	54	-9.01	AVG
7266	59.45	-0.94	58.51	74	-15.49	peak
7266	45.05	-0.94	44.11	54	-9.89	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT1+ANT2 MID CH6 (802.11n/H40 Mode)/2437

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	64.70	-3.51	61.19	74	-12.81	peak
4874	46.85	-3.51	43.34	54	-10.66	AVG
7311	60.96	-0.82	60.14	74	-13.86	peak
7311	44.65	-0.82	43.83	54	-10.17	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	62.31	-3.51	58.80	74	-15.20	peak
4874	46.50	-3.51	42.99	54	-11.01	AVG
7311	56.64	-0.82	55.82	74	-18.18	peak
7311	43.32	-0.82	42.50	54	-11.50	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

ANT1+ANT2 HIGH CH9 (802.11n/H40 Mode)/2452

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4904	64.84	-3.43	61.41	74	-12.59	peak
4904	47.62	-3.43	44.19	54	-9.81	AVG
7356	56.35	-0.75	55.60	74	-18.40	peak
7356	40.98	-0.75	40.23	54	-13.77	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4904	63.53	-3.43	60.10	74	-13.90	peak
4904	46.62	-3.43	43.19	54	-10.81	AVG
7356	56.90	-0.75	56.15	74	-17.85	peak
7356	42.11	-0.75	41.36	54	-12.64	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Remark:
(1). Measuring frequencies from 9KHz to the 25 GHz. The test range is 9K ~10 times the main wave, and o ther spurious below the limit of 20dB will not be reflected in the report
(2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(3) Data of measurement within this frequency range shown "--- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

Restricted bands around fundamental frequency (Radiated)

Operation Mode:
ANT 2 802.11b Mode TX CH Low (2412MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390	56.61	-5.81	50.80	74	-23.20	peak
2390	/	-5.81	/	54	/	AVG
2399	65.24	-5.84	59.40	74	-14.60	peak
2399	49.47	-5.84	43.63	54	-10.37	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390	57.71	-5.81	51.90	74	-22.10	peak
2390	/	-5.81	/	54	/	AVG
2399	62.71	-5.84	56.87	74	-17.13	peak
2399	46.84	-5.84	41.00	54	-13.00	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

When the peak value is smaller than the AVG limit, AVG is not reflected.

Operation Mode: ANT2 802.11b Mode TX CH High (2462MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	57.33	-5.65	51.68	74	-22.32	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	56.30	-5.65	50.65	74	-23.35	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

Operation Mode: ANT2 802.11g Mode TX CH Low (2412MHz)

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390	58.57	-5.81	52.76	74	-21.24	peak
2390	/	-5.81	/	54	/	AVG
2399	61.59	-5.84	55.75	74	-18.25	peak
2399	46.13	-5.84	40.29	54	-13.71	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390	56.61	-5.81	50.80	74	-23.20	peak
2390	/	-5.81	/	54	/	AVG
2399	61.51	-5.84	55.67	74	-18.33	peak
2399	46.53	-5.84	40.69	54	-13.31	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Operation Mode: ANT2 802.11g Mode TX CH High (2462MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	56.75	-5.65	51.10	74	-22.90	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	56.89	-5.65	51.24	74	-22.76	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

Operation Mode: ANT1+ANT2 802.11n/H20 Mode TX CH Low (2412MHz)

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390	56.34	-5.81	50.53	74	-23.47	peak
2390	/	-5.81	/	54	/	AVG
2399	62.52	-5.84	56.68	74	-17.32	peak
2399	48.40	-5.84	42.56	54	-11.44	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390	55.71	-5.81	49.90	74	-24.10	peak
2390	/	-5.81	/	54	/	AVG
2399	60.17	-5.84	54.33	74	-19.67	peak
2399	48.13	-5.84	42.29	54	-11.71	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Operation Mode: ANT1+ANT2 802.11n/H20 Mode TX CH High (2462MHz)

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	56.68	-5.65	51.03	74	-22.97	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.5	57.06	-5.65	51.41	74	-22.59	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

Operation Mode: ANT1+ANT2 802.11n/H40 Mode TX CH Low (2422MHz)

Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390	58.20	-5.81	52.39	74	-21.61	peak
2390	/	-5.81	/	54	/	AVG
2399	63.95	-5.84	58.11	74	-15.89	peak
2399	47.09	-5.84	41.25	54	-12.75	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390	57.82	-5.81	52.01	74	-21.99	peak
2390	/	-5.81	/	54	/	AVG
2399	60.73	-5.84	54.89	74	-19.11	peak
2399	45.48	-5.84	39.64	54	-14.36	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Operation Mode: ANT1+ANT2 802.11n/H40 Mode TX CH High (2452MHz)

Horizontal

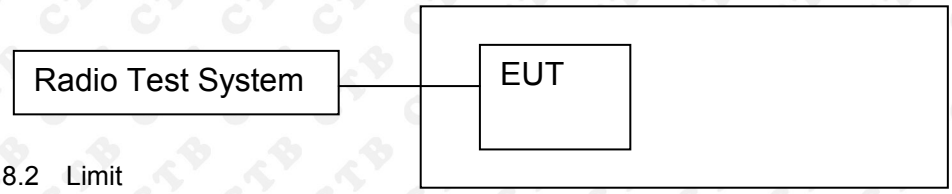
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	58.08	-5.65	52.43	74	-21.57	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	55.69	-5.65	50.04	74	-23.96	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

8. BAND EDGE AND RF COUNDUCTED SPURIOUS EMISSIONS

8.1 Block Diagram Of Test Setup



8.2 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

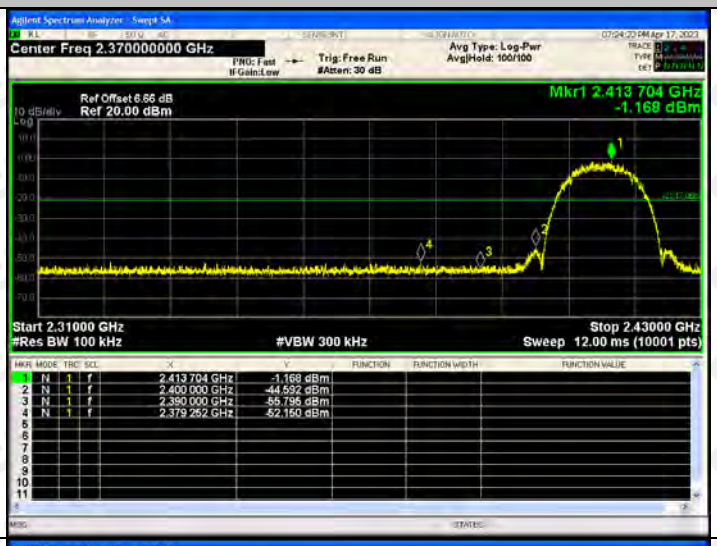
8.3 Test procedure

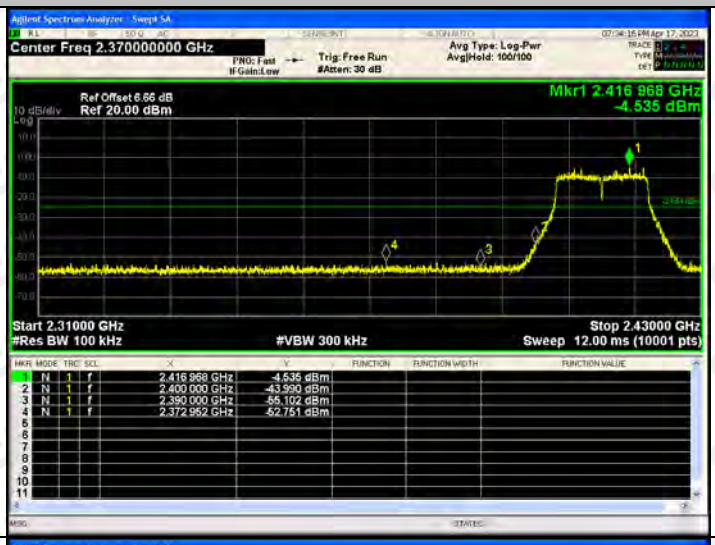
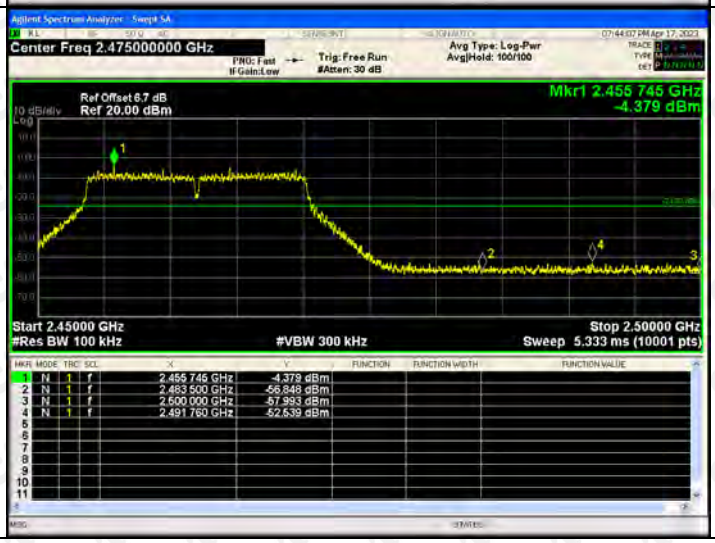
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:

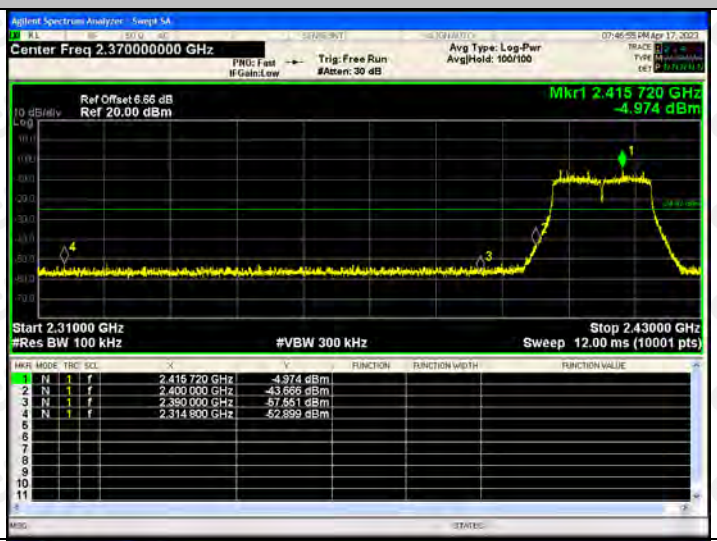
Blow 30MHz:
RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold
Above 30MHz:
RBW = 100KHz, VBW = 300KHz, Sweep = auto
Detector function = peak, Trace = max hold

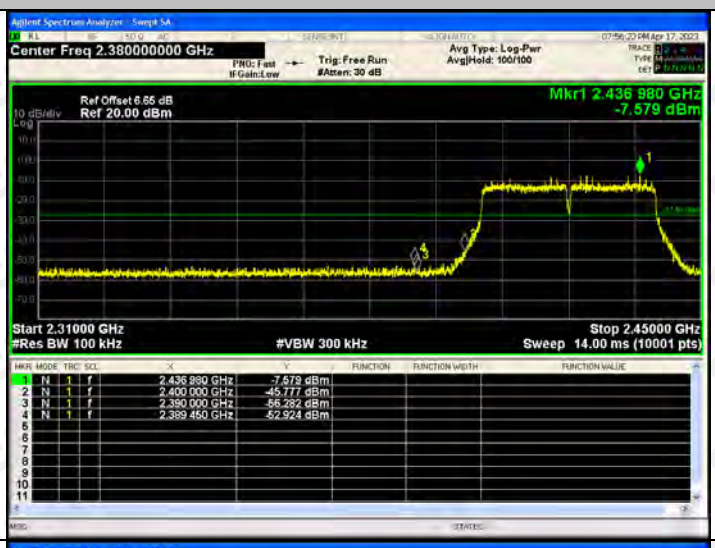
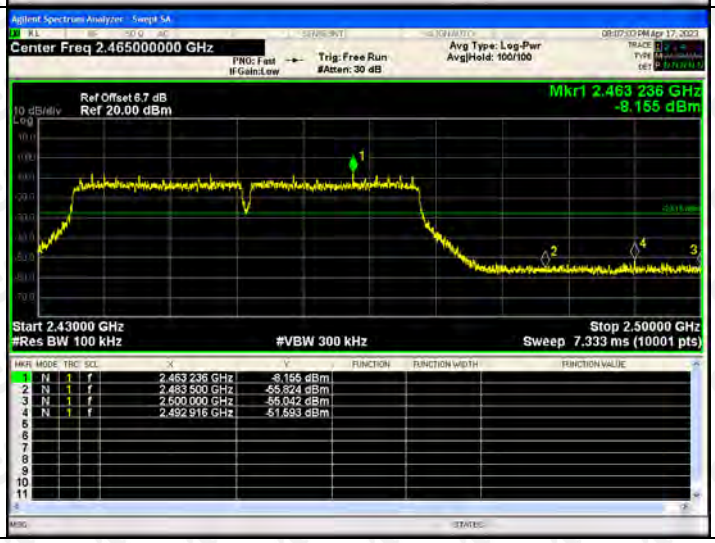
8.4 Test Result

ANT1:

BAND EDGE Graphs			
802.11b/LCH			
802.11b/HCH			

BAND EDGE Graphs			
802.11g/LCH			
802.11g/HCH			

BAND EDGE Graphs			
802.11n(HT20)/L CH			
802.11n(HT20)/H CH			

BAND EDGE Graphs			
802.11n(HT40)/L CH			
802.11n(HT40)/H CH			

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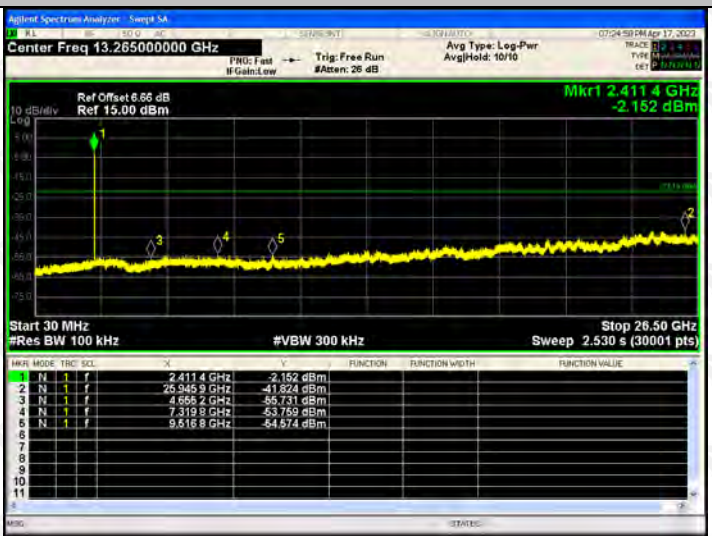
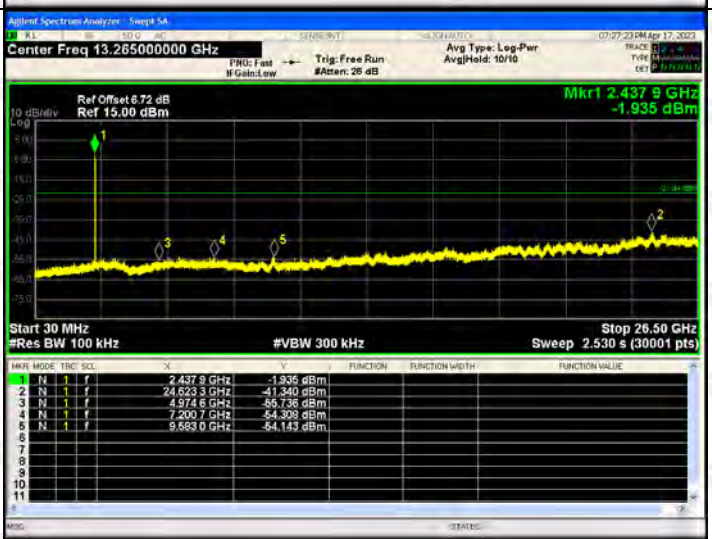
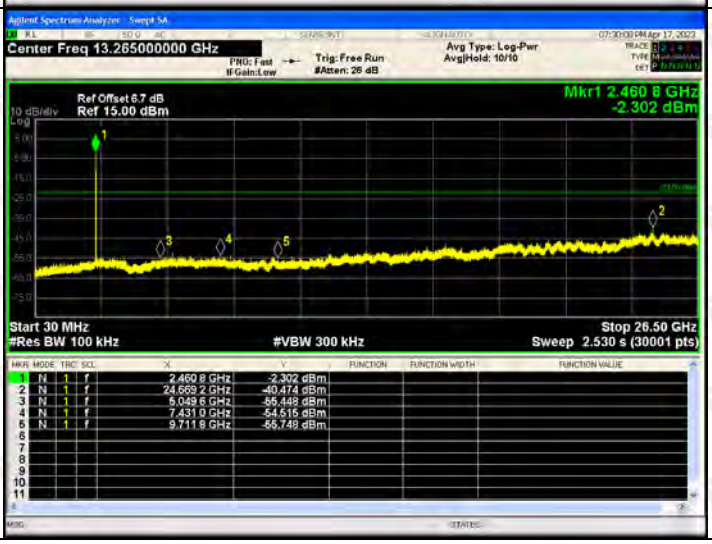
802.11b /LCH			
802.11b /MCH			
802.11b /HCH			

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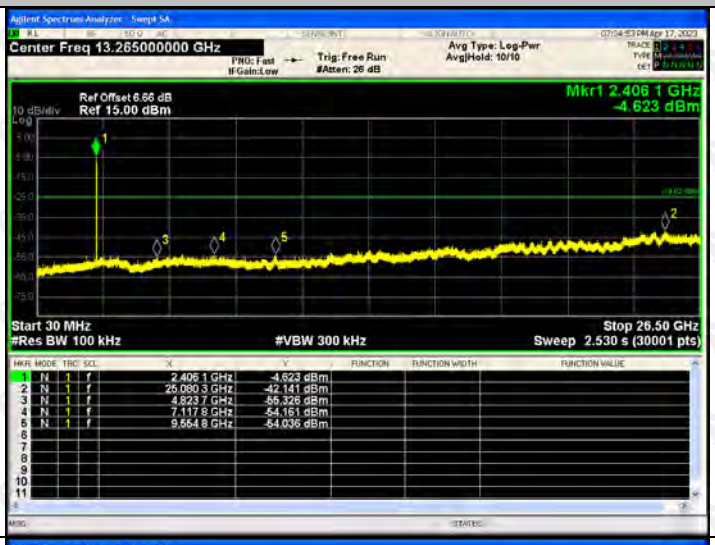
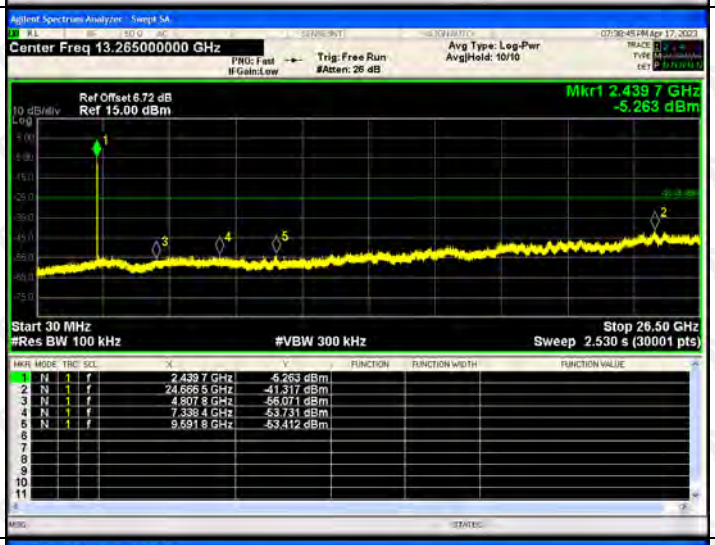
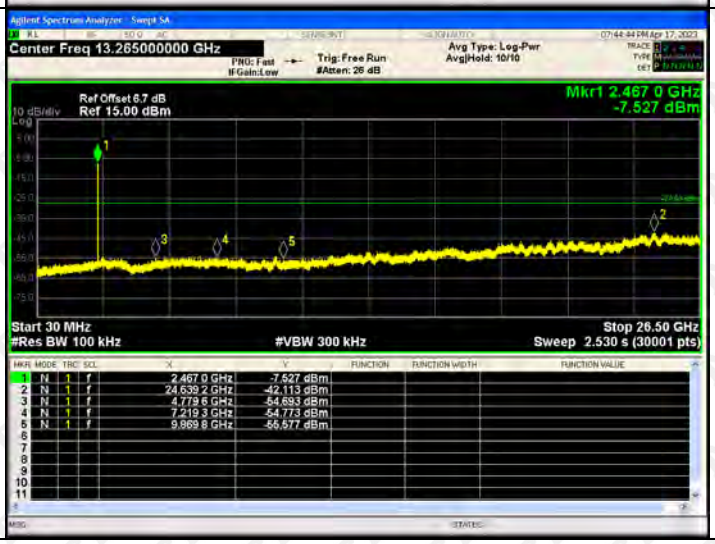
802.11g /LCH			
802.11g /MCH			
802.11g /HCH			

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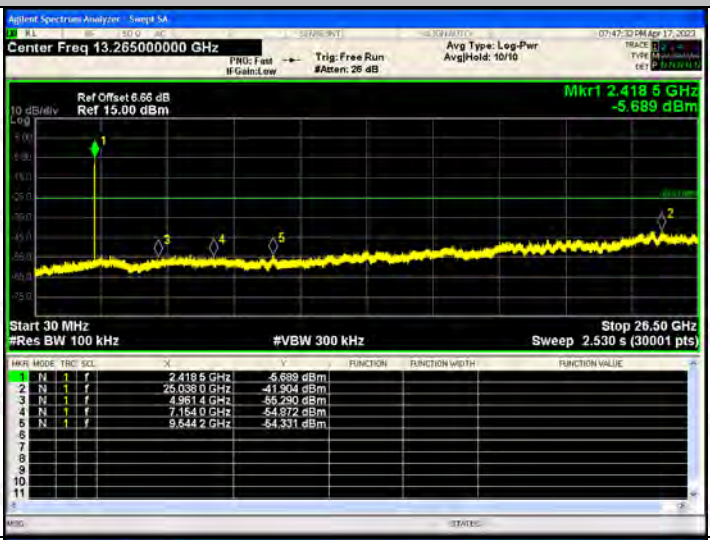
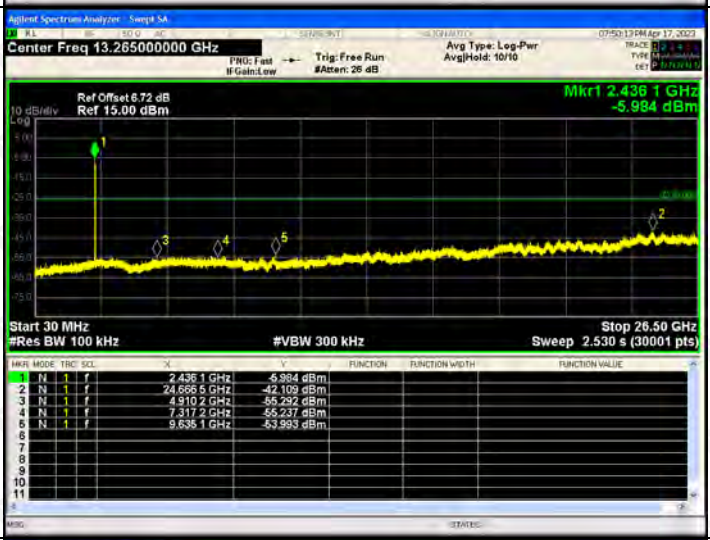
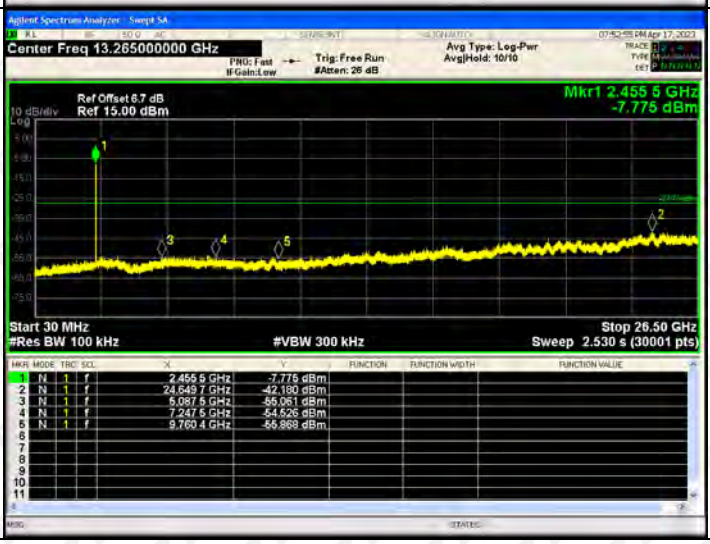
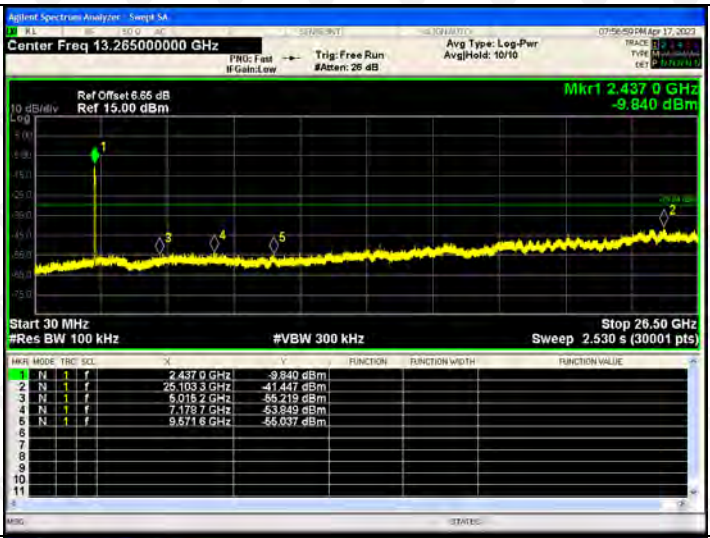
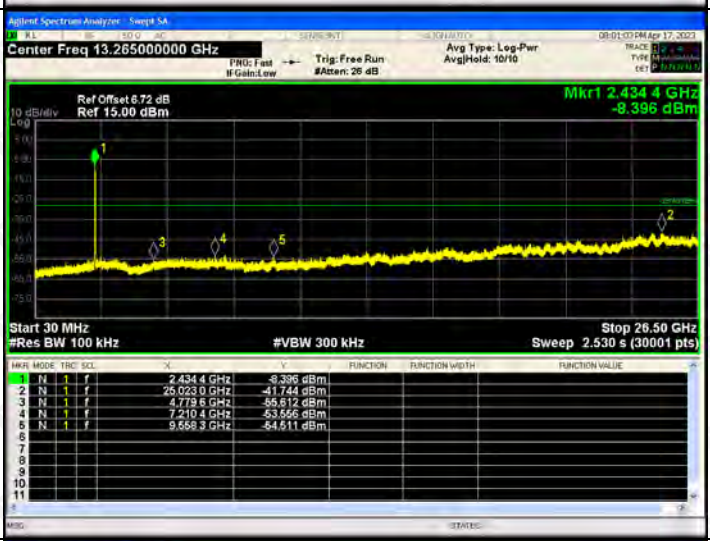
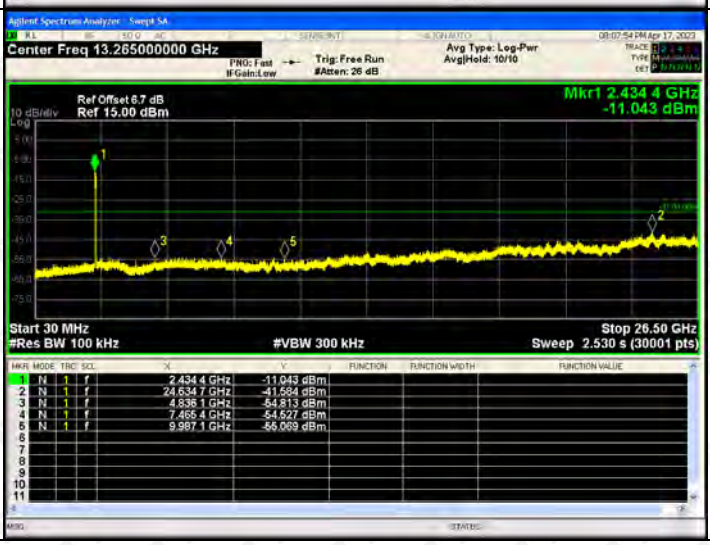
802.11n (HT20)/ LCH			
802.11 n(HT20) /MCH			
802.11 n(HT20) /HCH			

802.11n (HT40)/ LCH			
802.11 n(HT40) /MCH			
802.11 n(HT40) /HCH			

ANT2:

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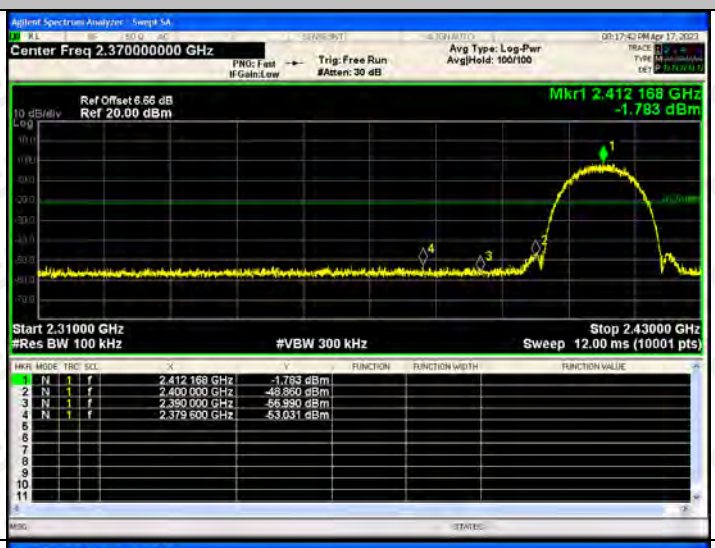
802.11b/LCH			
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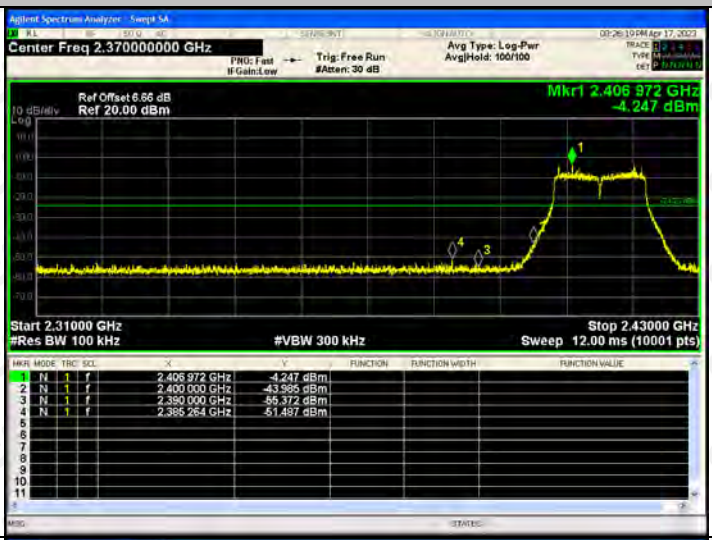
802.11g/LCH			
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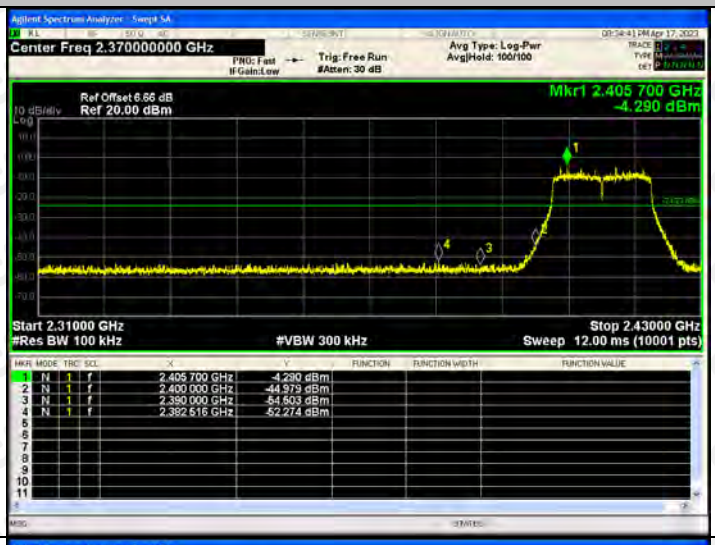
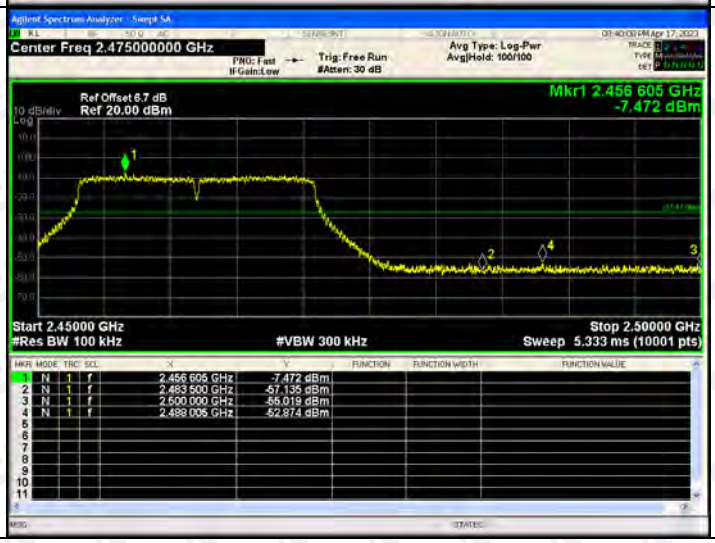
802.11n(HT20)/LCH			
802.11n(HT20)/HCH			

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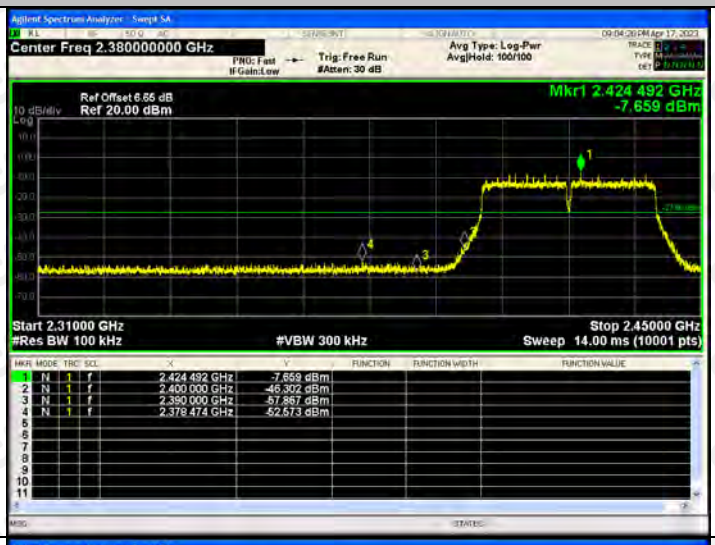
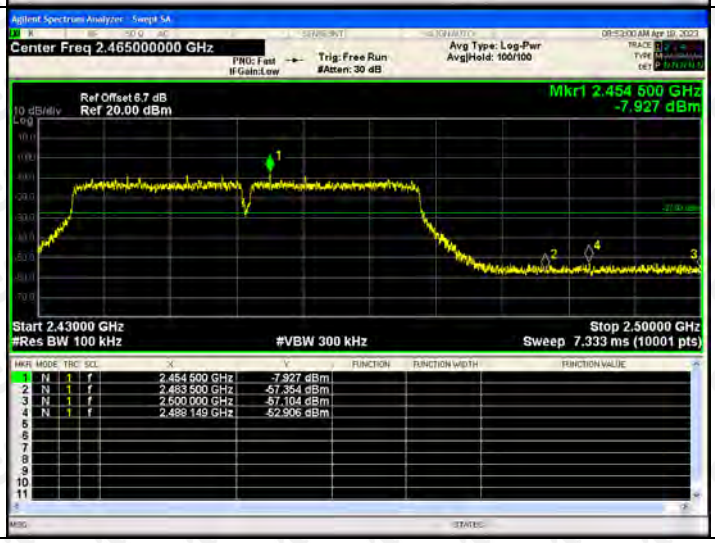
802.11n(HT40)/L CH			
802.11n(HT40)/H CH			

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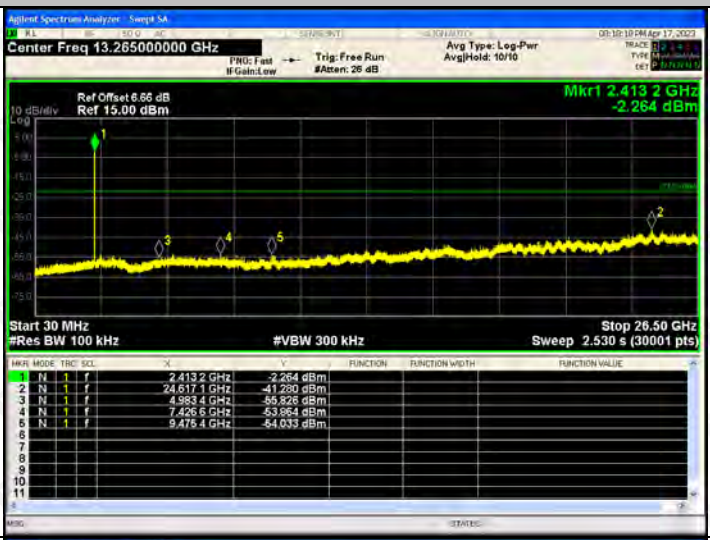
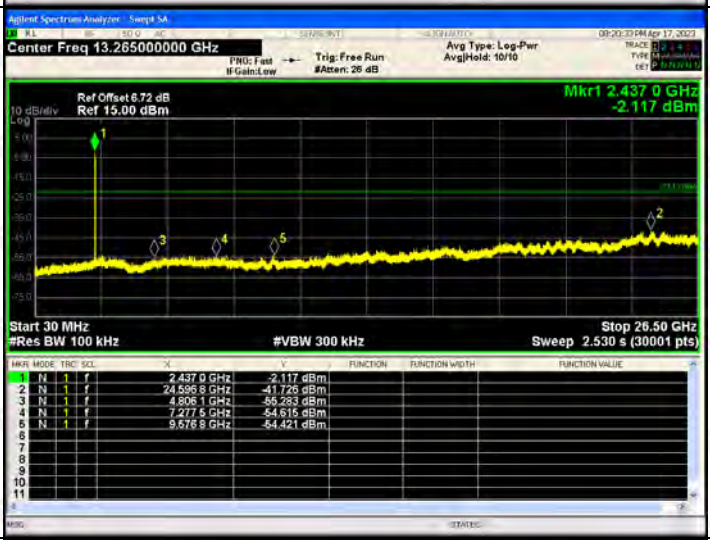
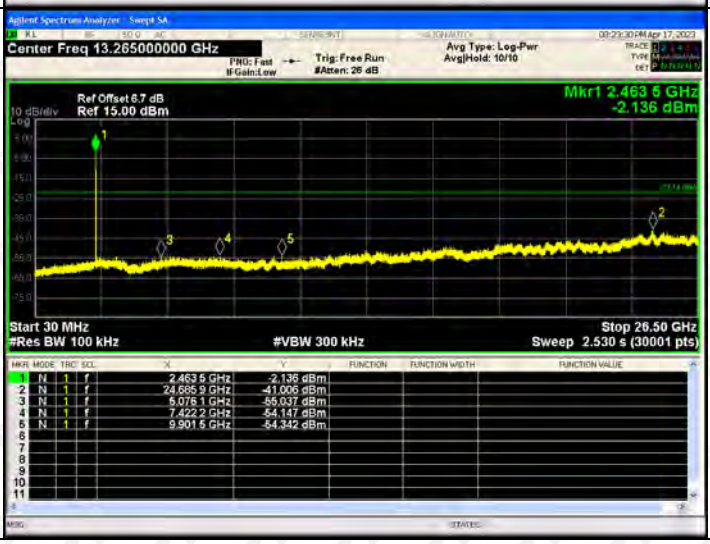
802.11b /LCH			
802.11b /MCH			
802.11b /HCH			

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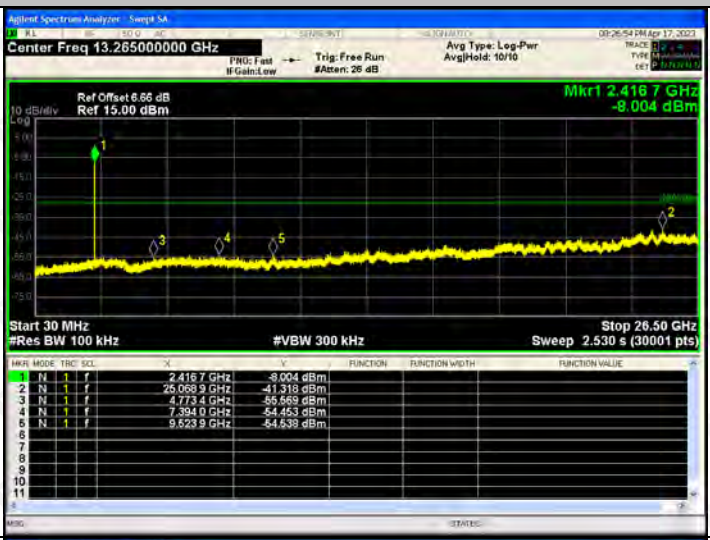
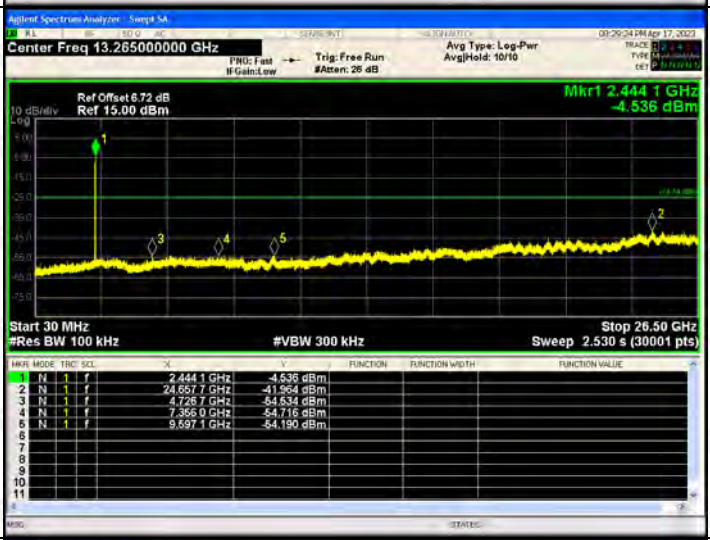
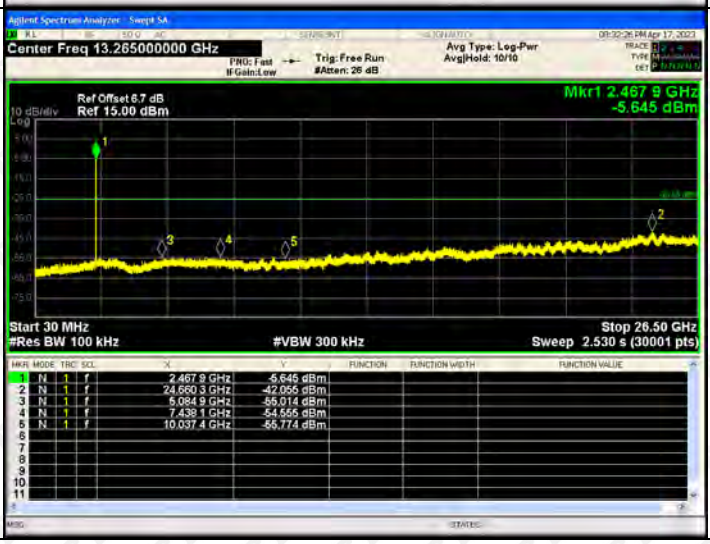
802.11g /LCH			
802.11g /MCH			
802.11g /HCH			

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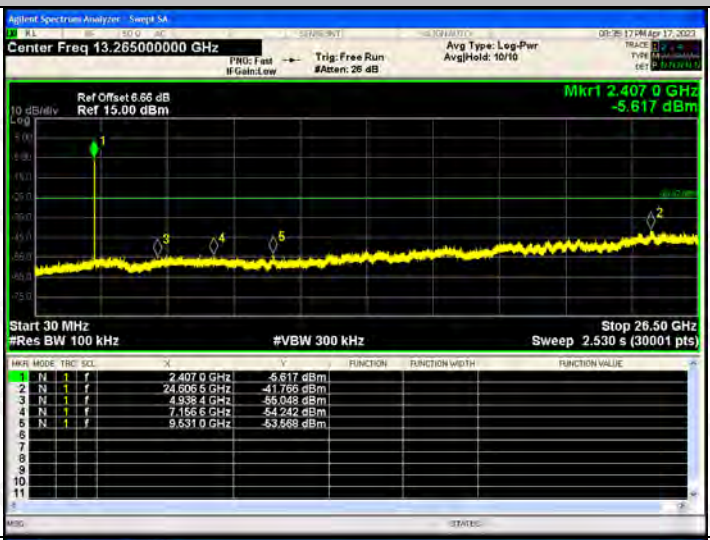
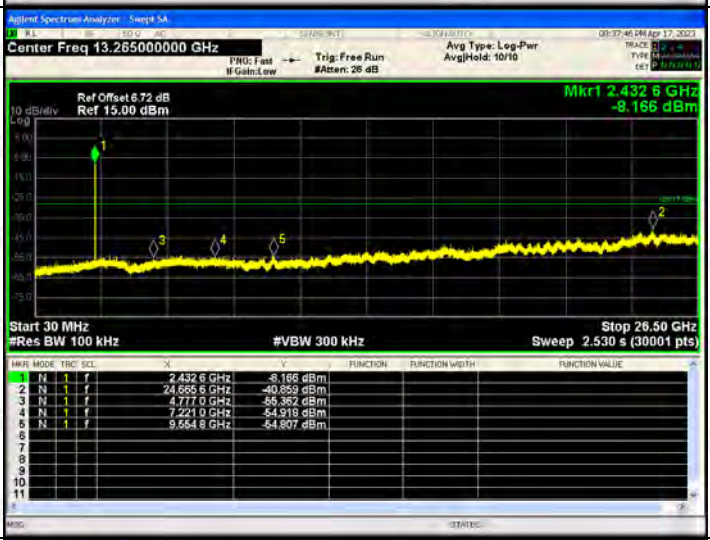
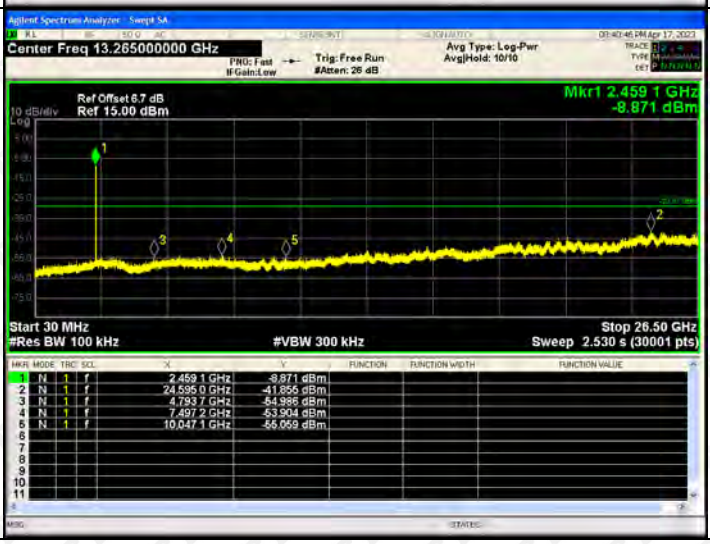
802.11n (HT20)/ LCH			
802.11 n(HT20) /MCH			
802.11 n(HT20) /HCH			

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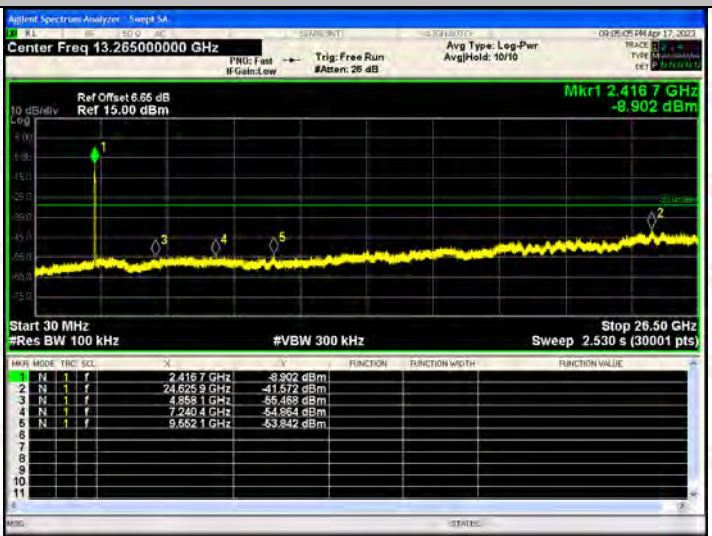
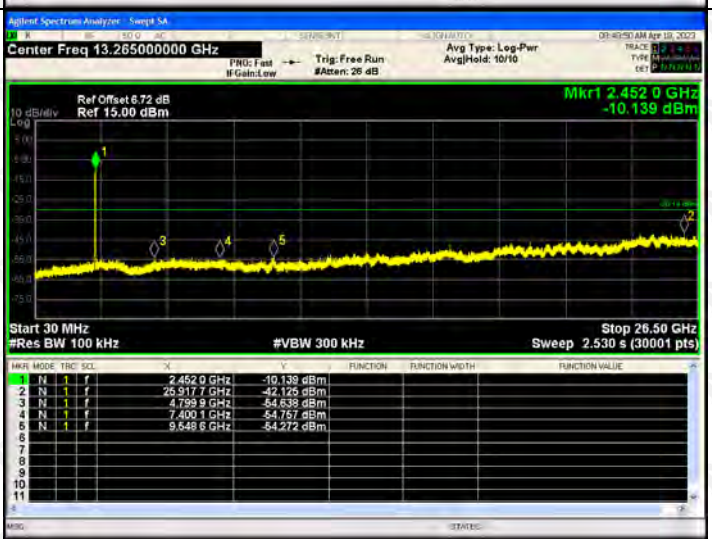
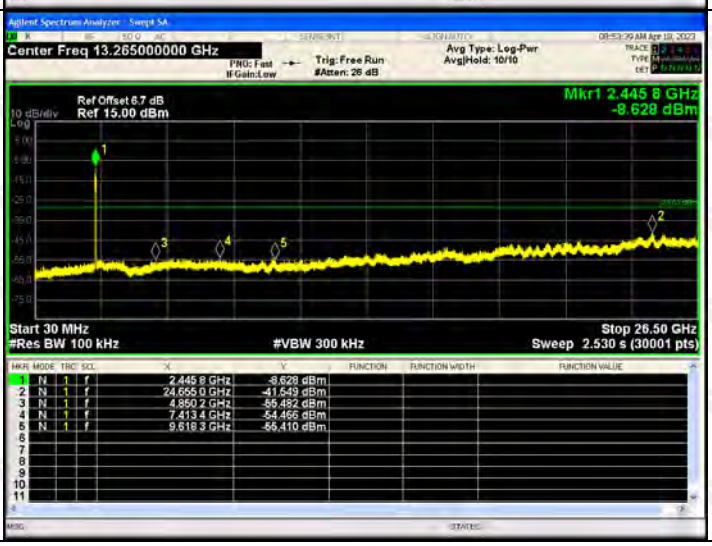
802.11 n(HT40) /LCH			
802.11 n(HT40) /MCH			
802.11 n(HT40) /HCH			

ANT3:

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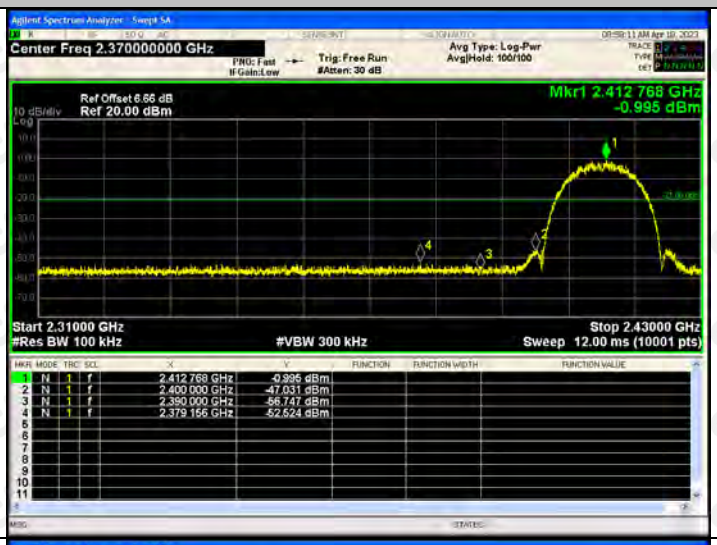
802.11b/LCH			
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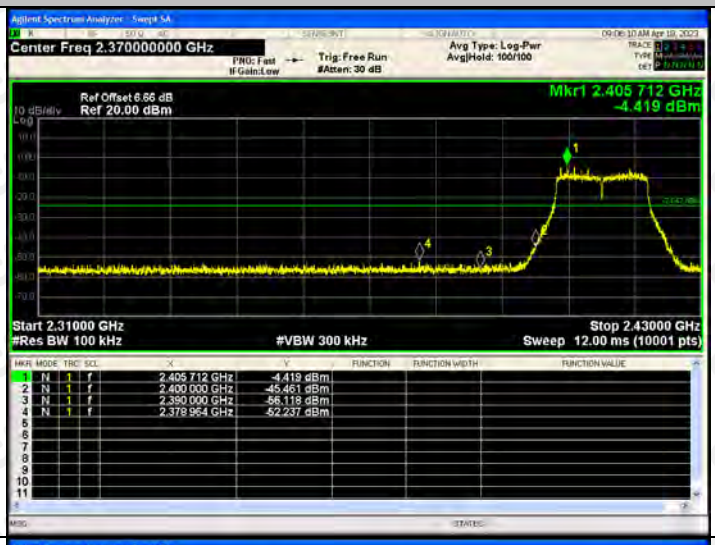
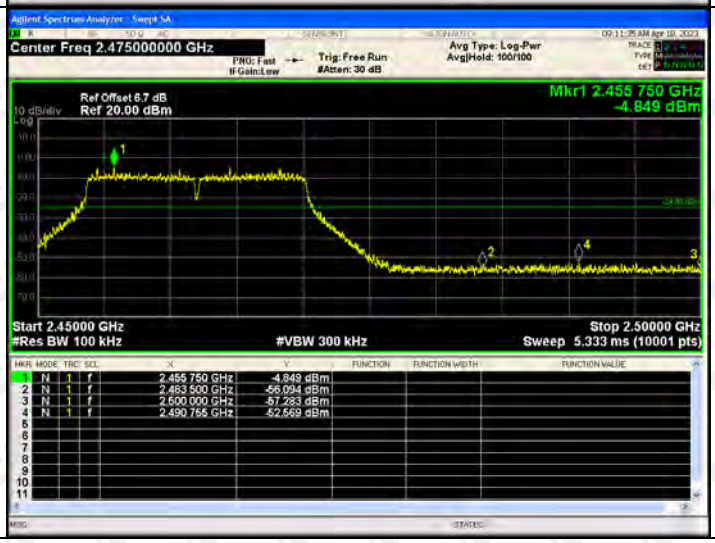
802.11g/LCH			
802.11g/HCH			

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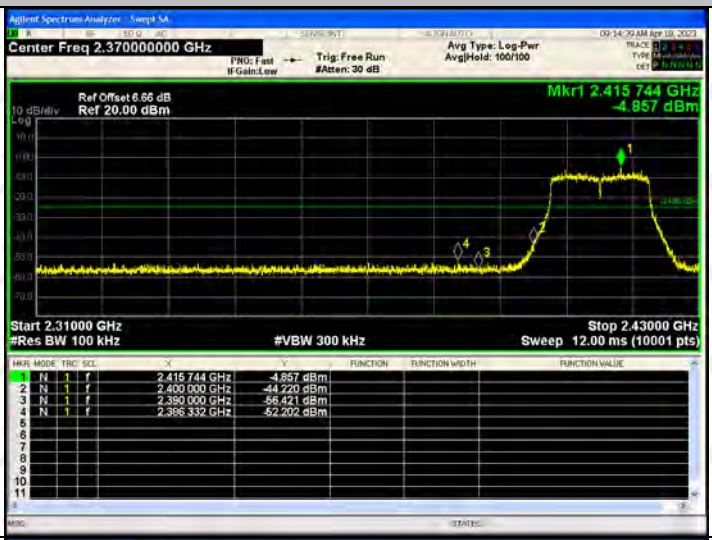
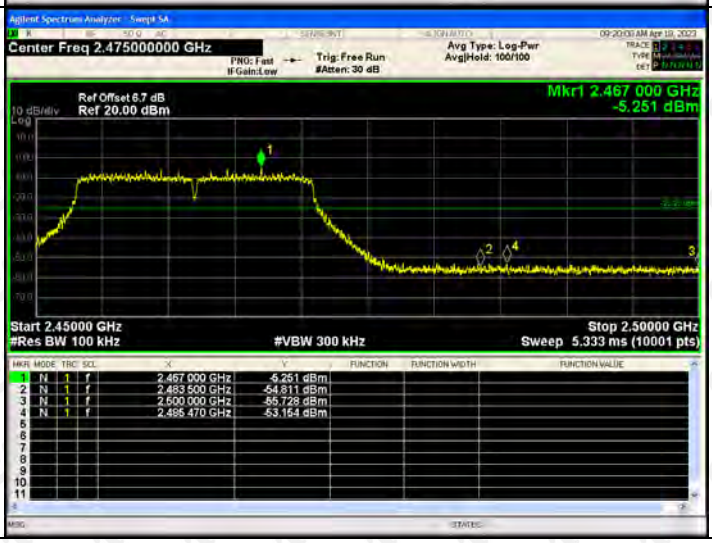
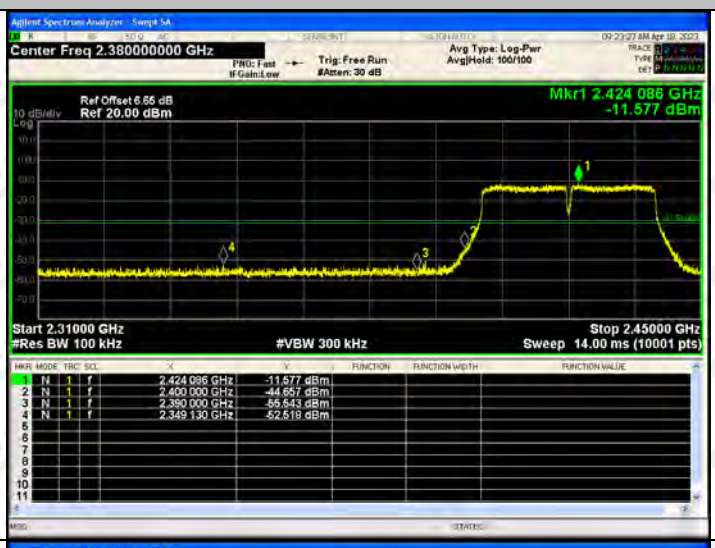
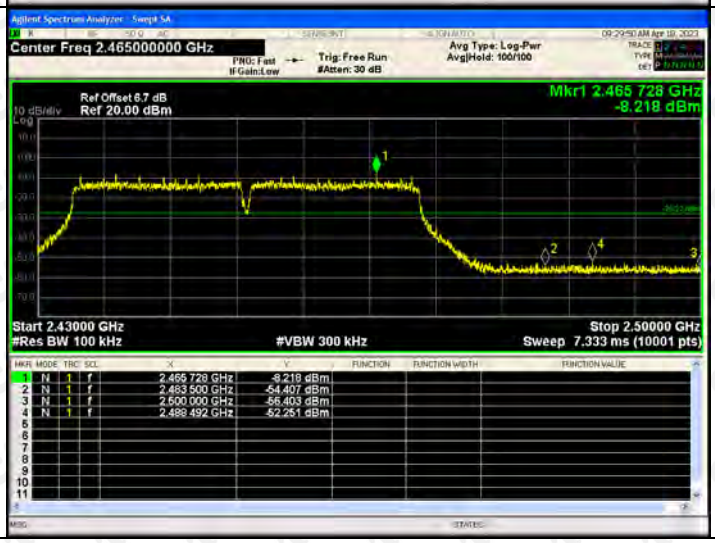
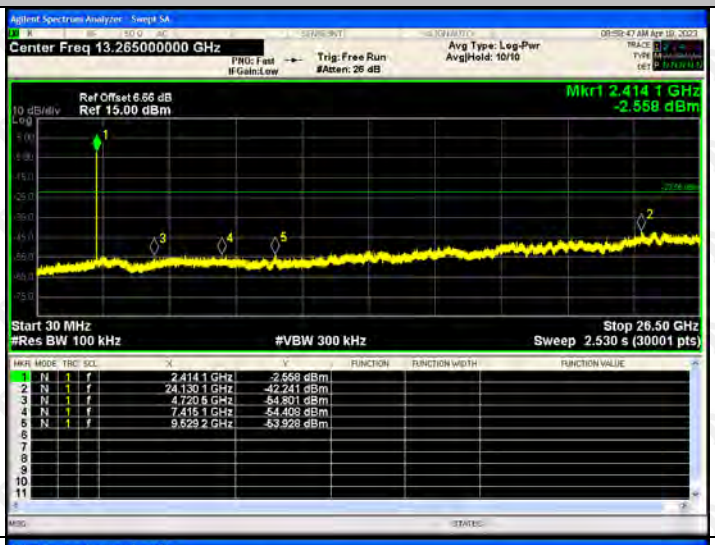
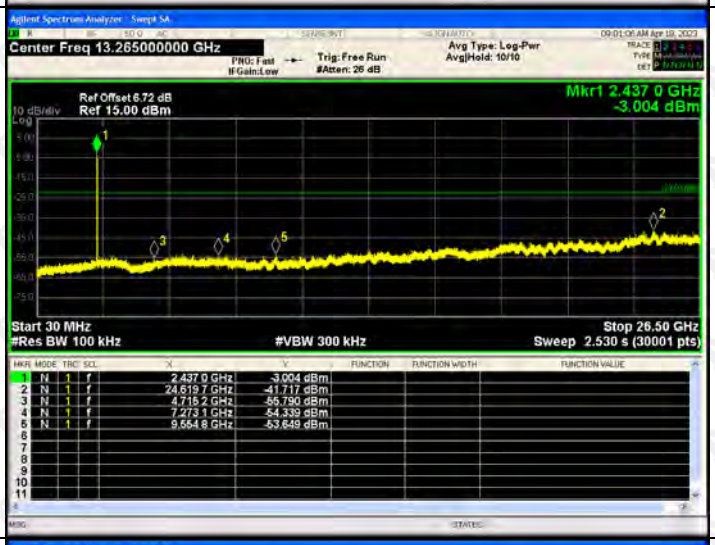
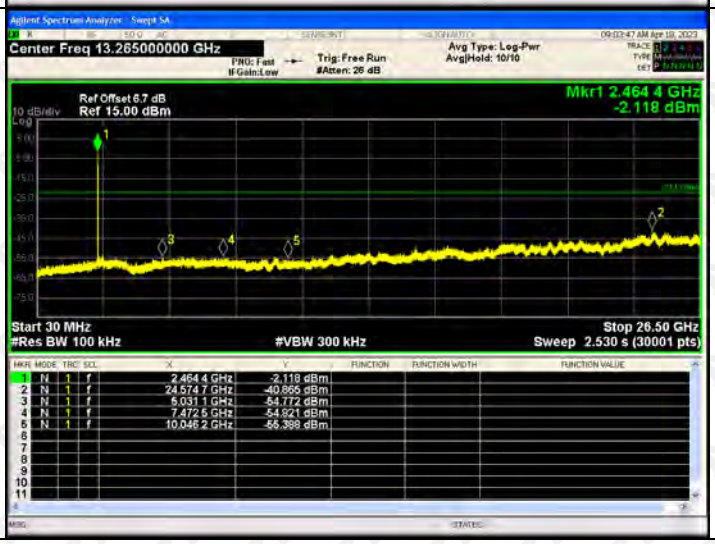
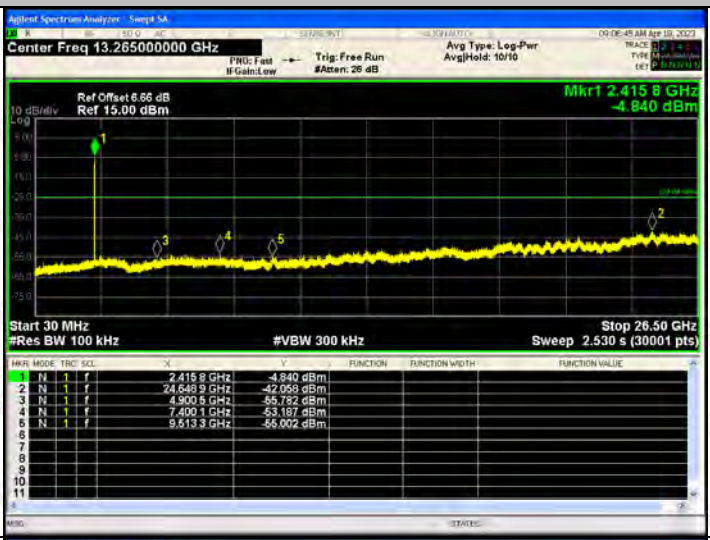
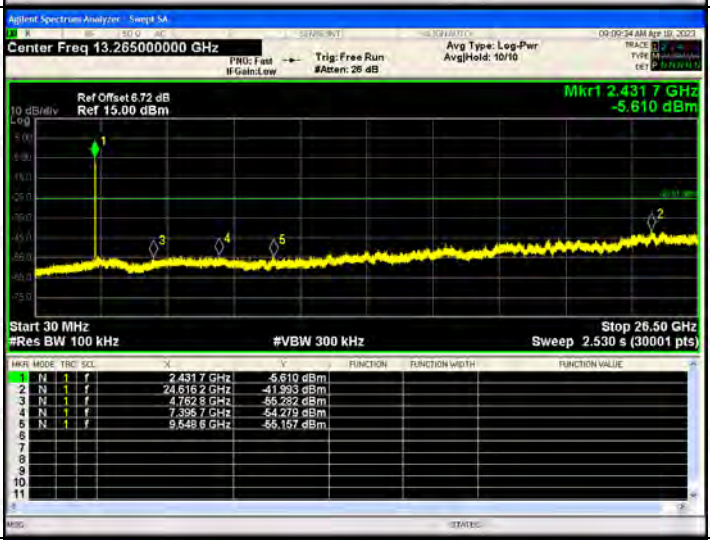
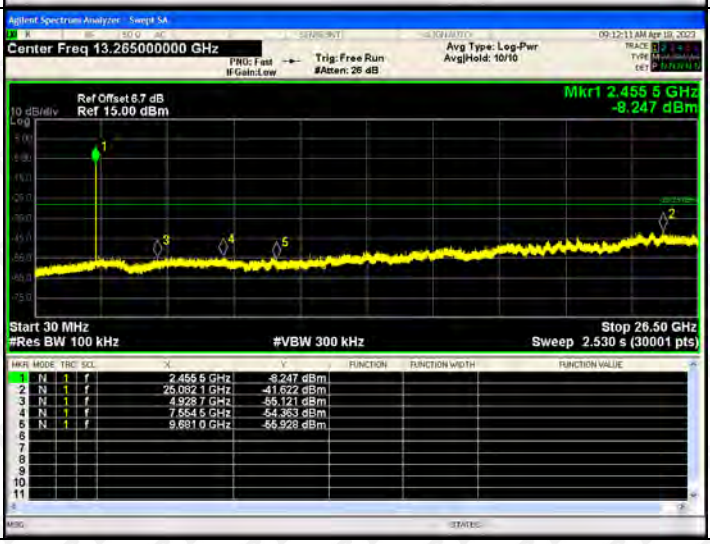
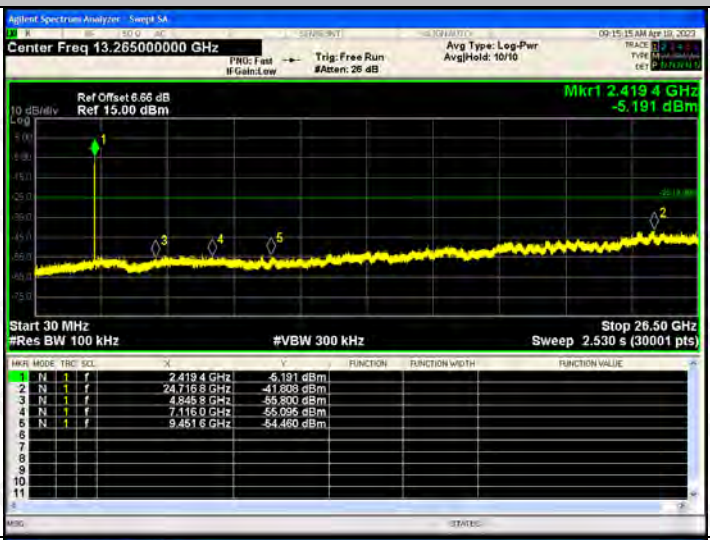
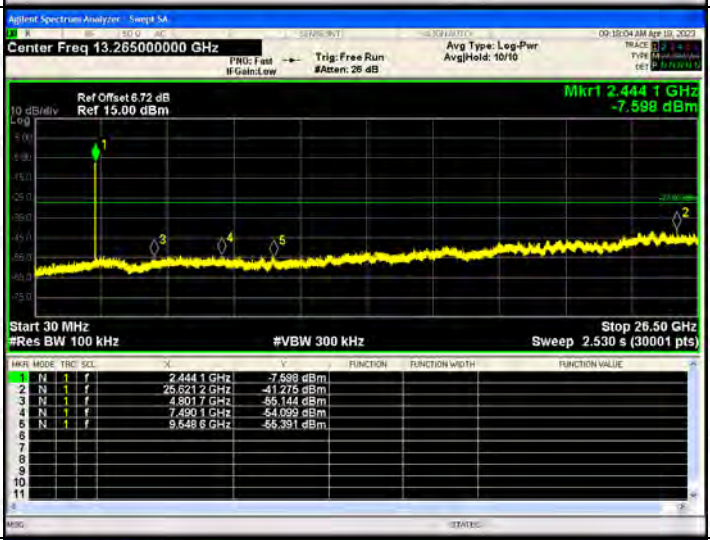
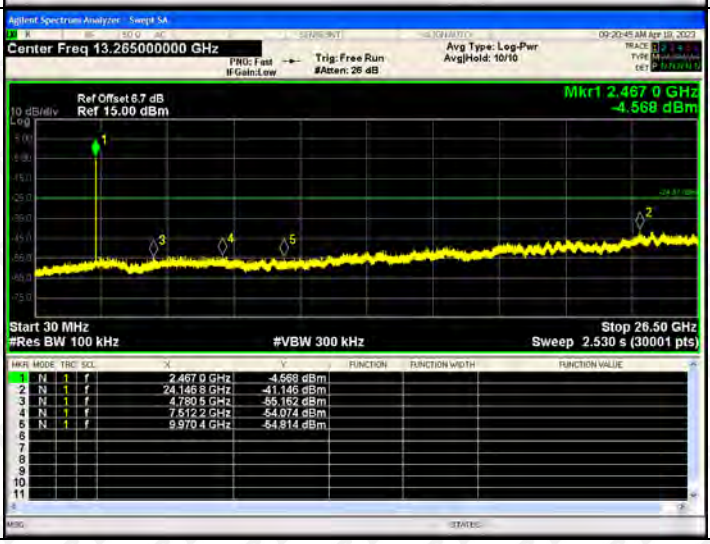
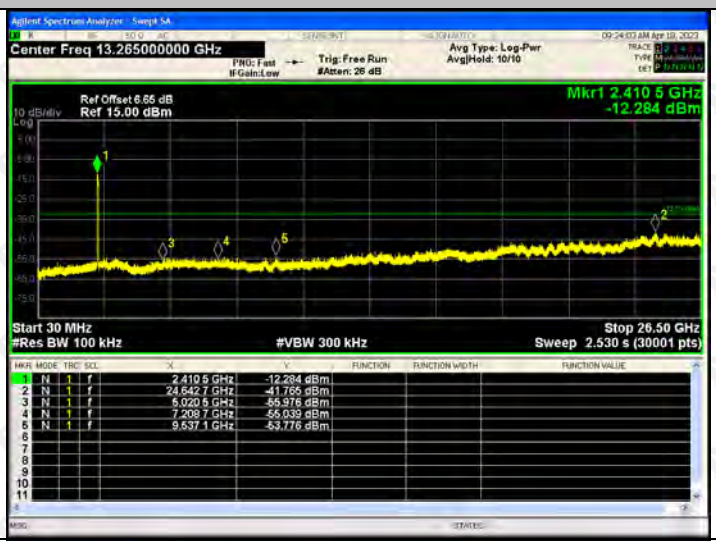
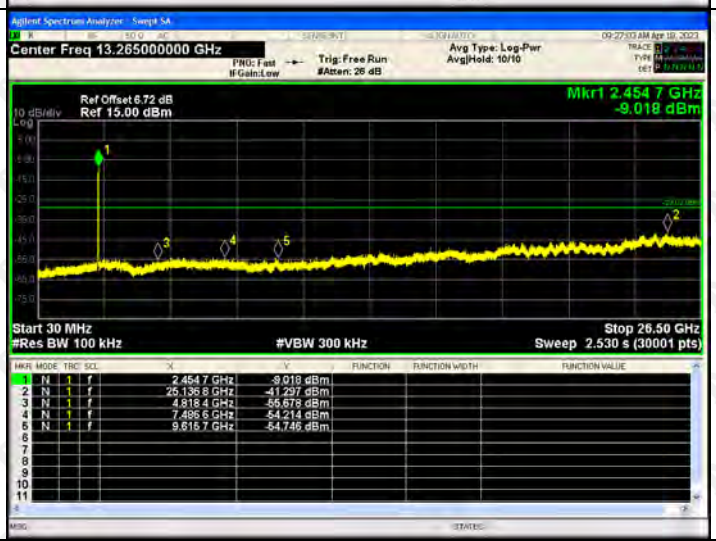
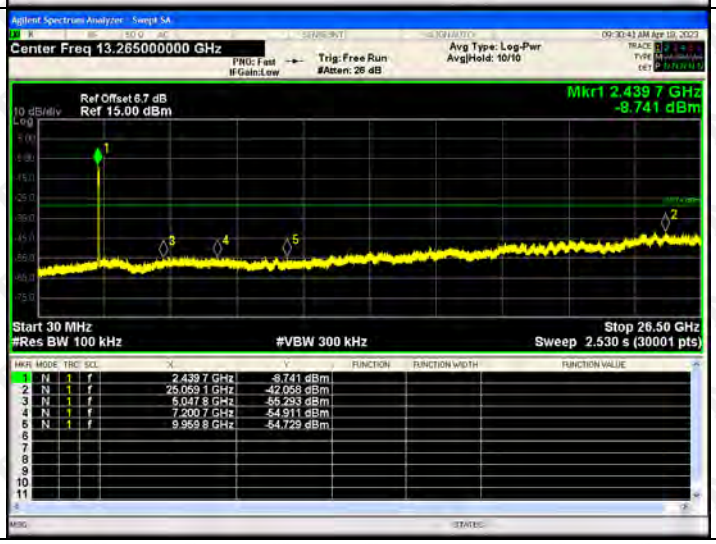
802.11n(HT20)/L CH			
802.11n(HT20)/H CH			

BAND EDGE Graphs			
802.11n(HT40)/L CH			
802.11n(HT40)/H CH			

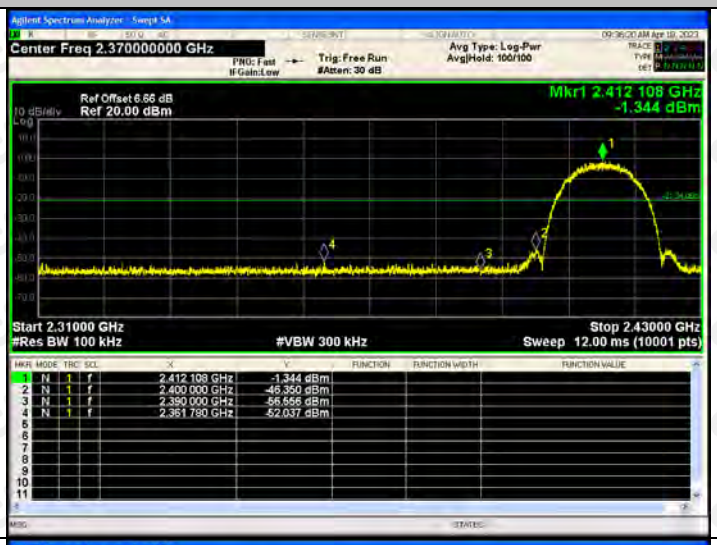
RF Conducted Spurious Emissions Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b /HCH			

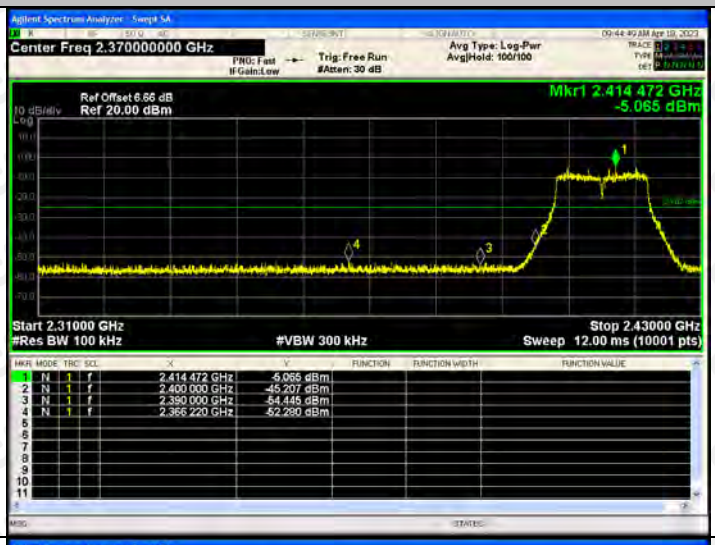
RF Conducted Spurious Emissions Graphs			
802.11g /LCH			
802.11g /MCH			
802.11g /HCH			

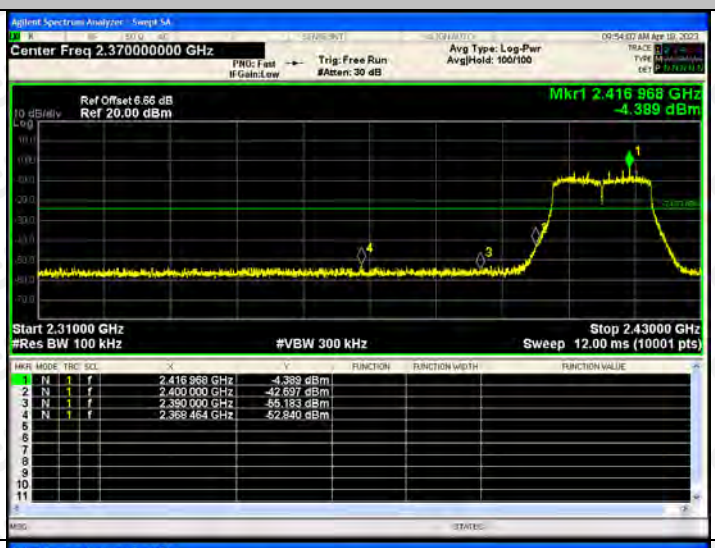
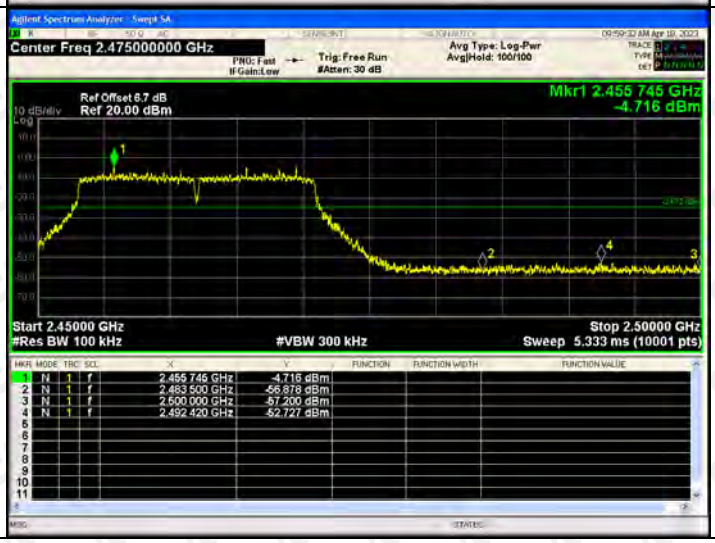
RF Conducted Spurious Emissions Graphs			
802.11n (HT20)/ LCH			
802.11 n(HT20) /MCH			
802.11 n(HT20) /HCH			

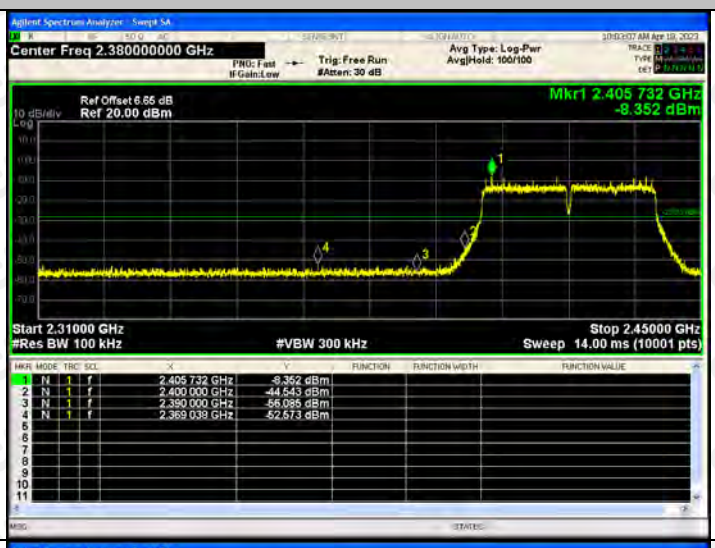
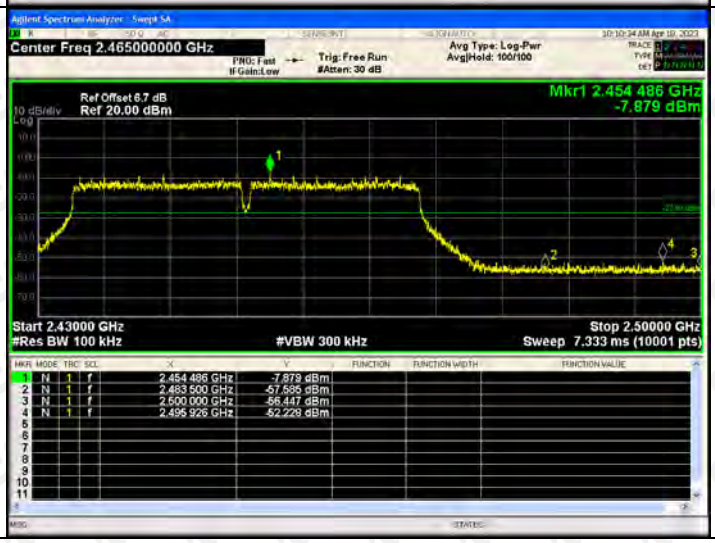
RF Conducted Spurious Emissions Graphs			
802.11 n(HT40) /LCH			
802.11 n(HT40) /MCH			
802.11 n(HT40) /HCH			

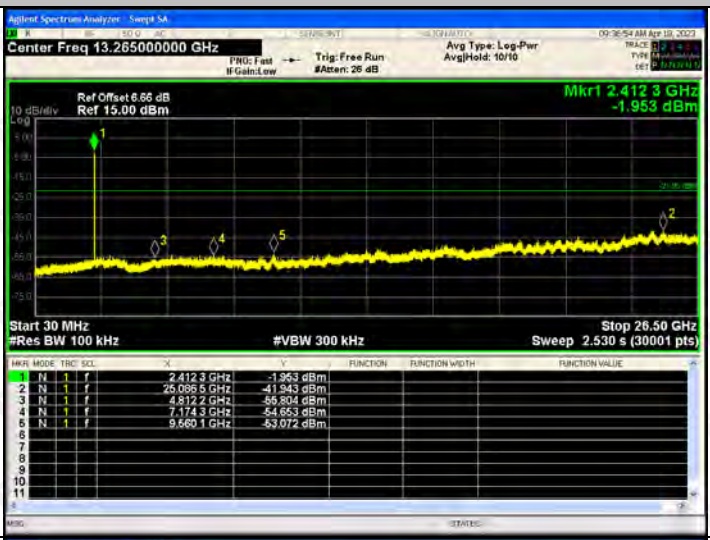
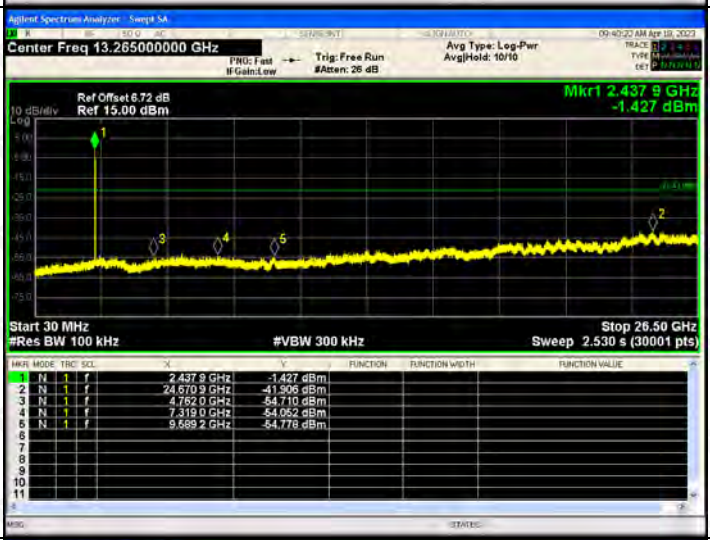
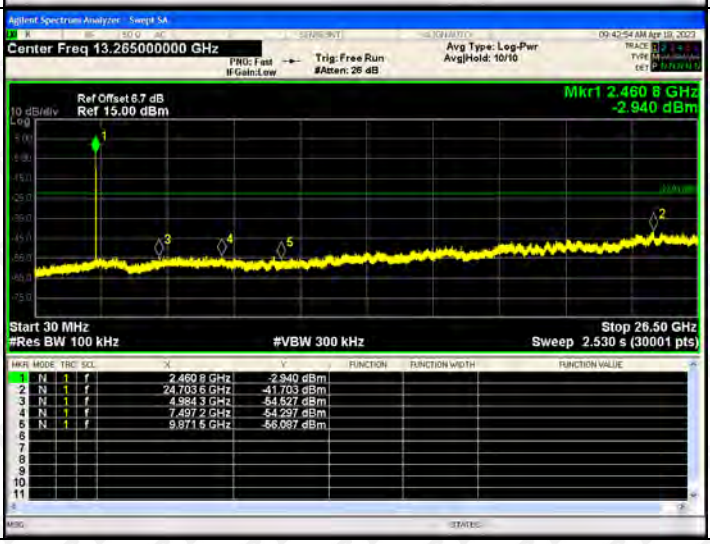
ANT4:

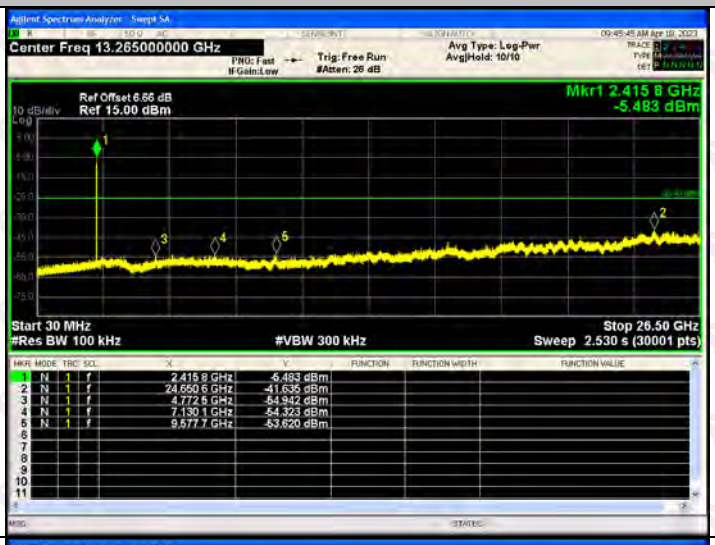
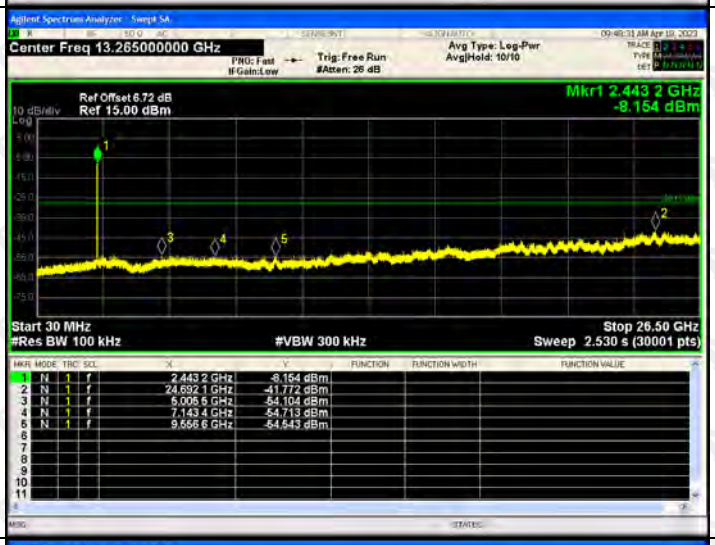
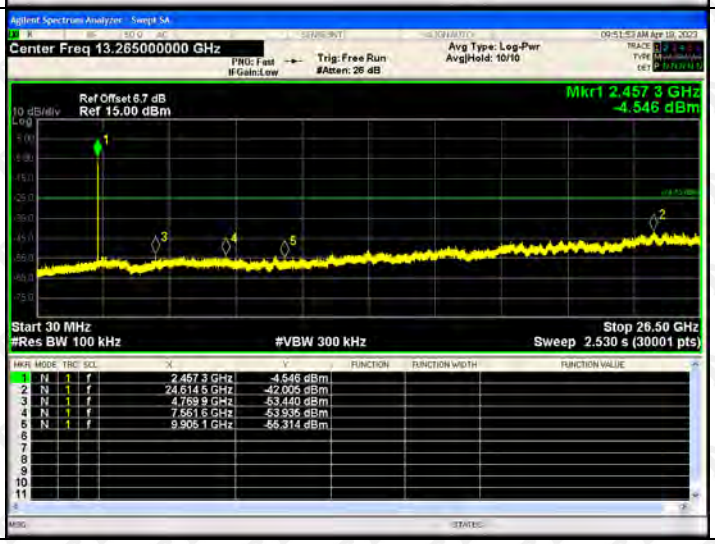
BAND EDGE Graphs			
802.11b/LCH			
802.11b/HCH			

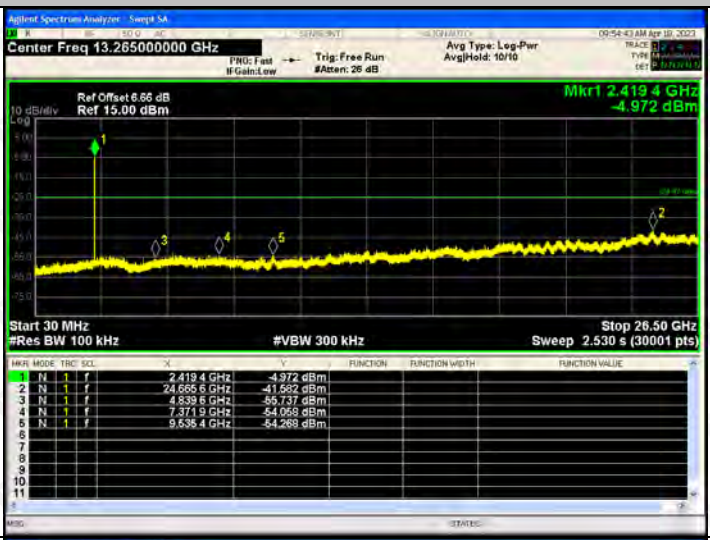
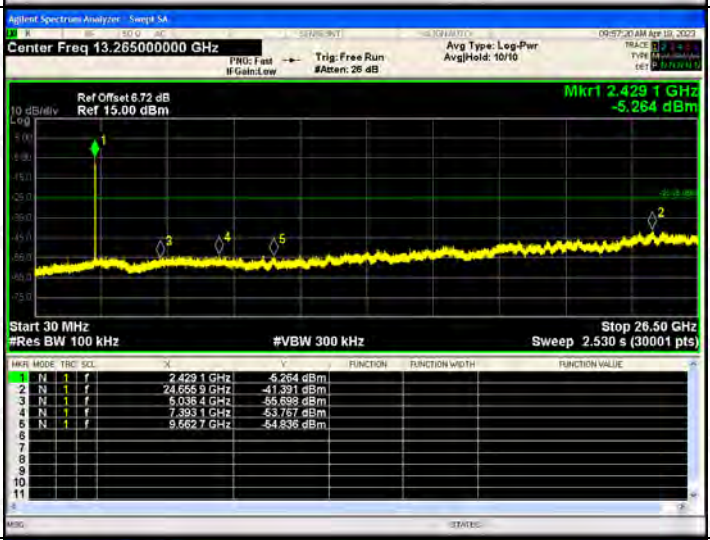
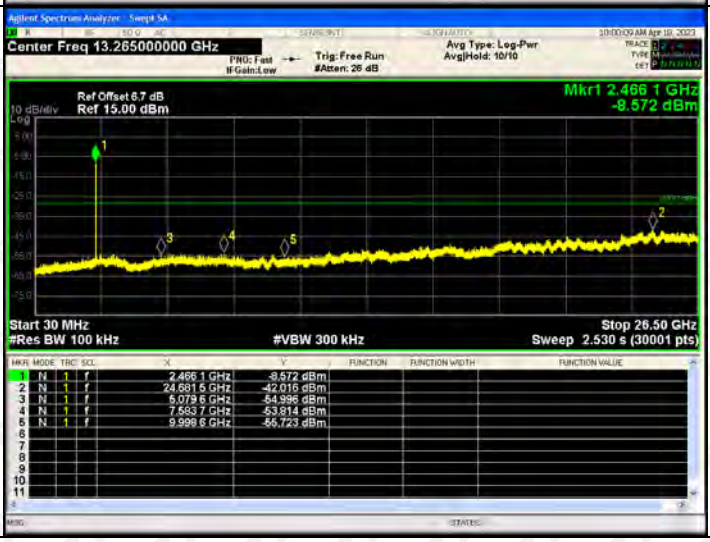
BAND EDGE Graphs			
802.11g/LCH			
802.11g/HCH			

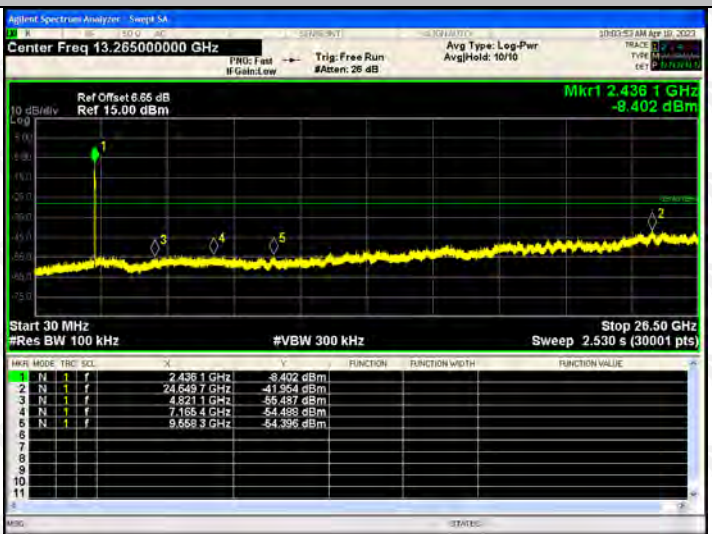
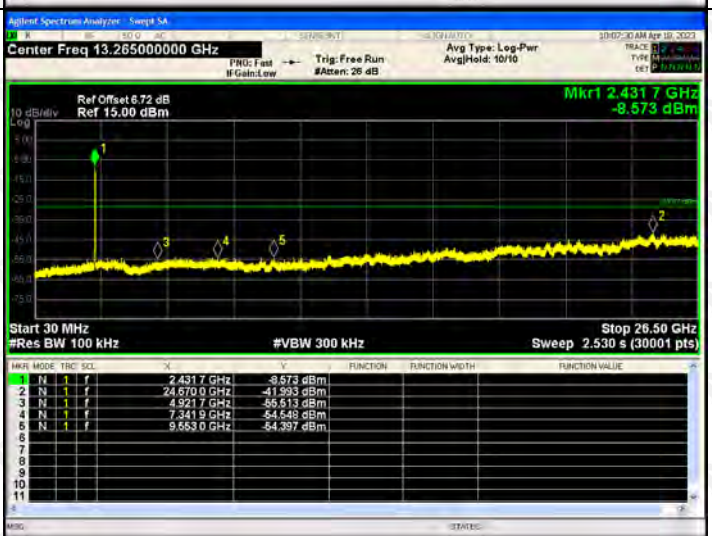
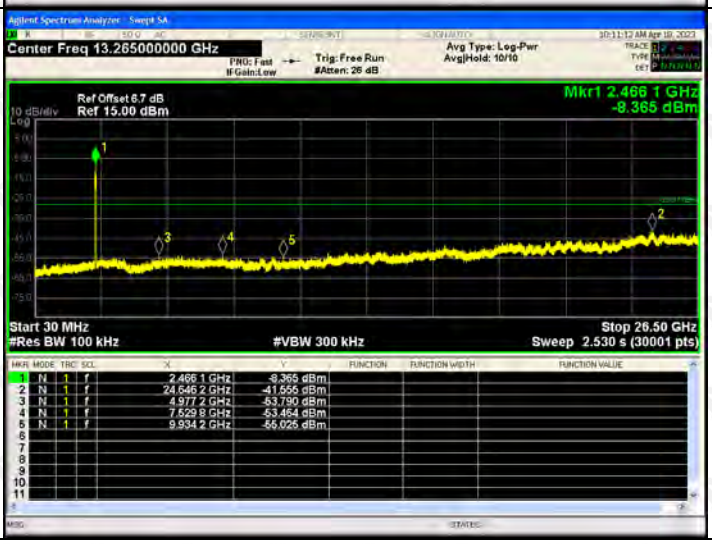
BAND EDGE Graphs			
802.11n(HT20)/LCH			
802.11n(HT20)/HCH			

BAND EDGE Graphs			
802.11n(HT40)/L CH			
802.11n(HT40)/H CH			

RF Conducted Spurious Emissions Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b /HCH			

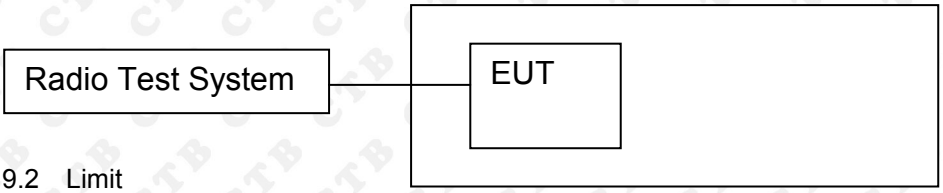
RF Conducted Spurious Emissions Graphs			
802.11g /LCH			
802.11g /MCH			
802.11g /HCH			

RF Conducted Spurious Emissions Graphs			
802.11n (HT20)/ LCH			
802.11 n(HT20) /MCH			
802.11 n(HT20) /HCH			

RF Conducted Spurious Emissions Graphs			
802.11 n(HT40) /LCH			
802.11 n(HT40) /MCH			
802.11 n(HT40) /HCH			

9. COUDUCTED OUTPUT POWER

9.1 Block Diagram Of Test Setup



9.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

9.3 Test procedure

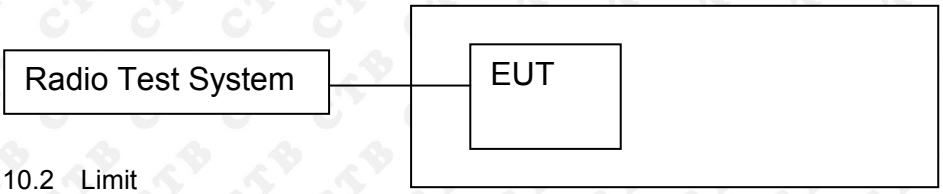
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1MHz. VBW = 3MHz. Sweep = auto; Detector Function = Peak. Channel power function is used
3. Keep the EUT in transmitting at lowest, middle and highest channel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

9.4 Test Result

Mode	Channel.	Antenna	Maximum Output Power [dBm]	Total Power Conducted Output Power(PK)	Limit[dBm]
802.11b	LCH	ANT1	14.616	/	30
		ANT2	14.342		
		ANT3	14.695		
		ANT4	14.606		
	MCH	ANT1	14.372	/	30
		ANT2	14.526		
		ANT3	14.156		
		ANT4	14.764		
	HCH	ANT1	14.215	/	30
		ANT2	14.195		
		ANT3	14.484		
		ANT4	14.473		
802.11g	LCH	ANT1	13.51	/	30
		ANT2	13.833		
		ANT3	13.687		
		ANT4	13.616		
	MCH	ANT1	13.642	/	30
		ANT2	14.115		
		ANT3	13.76		
		ANT4	13.759		
	HCH	ANT1	13.917	/	30
		ANT2	13.744		
		ANT3	13.824		
		ANT4	13.769		
802.11n(HT20)	LCH	ANT1	13.403	19.835	30
		ANT2	13.893		
		ANT3	13.574		
		ANT4	13.708		
	MCH	ANT1	13.601	19.669	30
		ANT2	14.08		
		ANT3	13.727		
		ANT4	13.749		
	HCH	ANT1	13.631	19.813	30
		ANT2	13.772		
		ANT3	13.579		
		ANT4	13.791		
802.11n(HT40)	LCH	ANT1	13.036	19.715	30
		ANT2	12.821		
		ANT3	13.045		
		ANT4	12.579		
	MCH	ANT1	12.924	18.895	30
		ANT2	12.612		
		ANT3	12.718		
		ANT4	12.782		
	HCH	ANT1	12.937	18.781	30
		ANT2	12.912		
		ANT3	12.798		
		ANT4	12.926		

10. 6DB OCCUPIED BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

10.3 Test procedure

1. Rem1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

10.4 Test Result

ANT1:

Test Mode	Frequency	6dB Bandwidth (MHz)	Limit(kHz)	Result
802.11b	LCH	9.426	500	**PASS**
	MCH	9.616	500	**PASS**
	HCH	9.88	500	**PASS**
802.11g	LCH	16.355	500	**PASS**
	MCH	16.353	500	**PASS**
	HCH	16.361	500	**PASS**
802.11n(HT20)	LCH	17.251	500	**PASS**
	MCH	17.193	500	**PASS**
	HCH	17.555	500	**PASS**
802.11n(HT40)	LCH	35.599	500	**PASS**
	MCH	36.043	500	**PASS**
	HCH	35.682	500	**PASS**

ANT2:

Test Mode	Frequency	6dB Bandwidth (MHz)	Limit(kHz)	Result
802.11b	LCH	10.053	500	**PASS**
	MCH	9.999	500	**PASS**
	HCH	9.978	500	**PASS**
802.11g	LCH	16.355	500	**PASS**
	MCH	16.341	500	**PASS**
	HCH	16.365	500	**PASS**
802.11n(HT20)	LCH	17.275	500	**PASS**
	MCH	17.369	500	**PASS**
	HCH	17.769	500	**PASS**
802.11n(HT40)	LCH	35.725	500	**PASS**
	MCH	35.705	500	**PASS**
	HCH	35.475	500	**PASS**

ANT3:

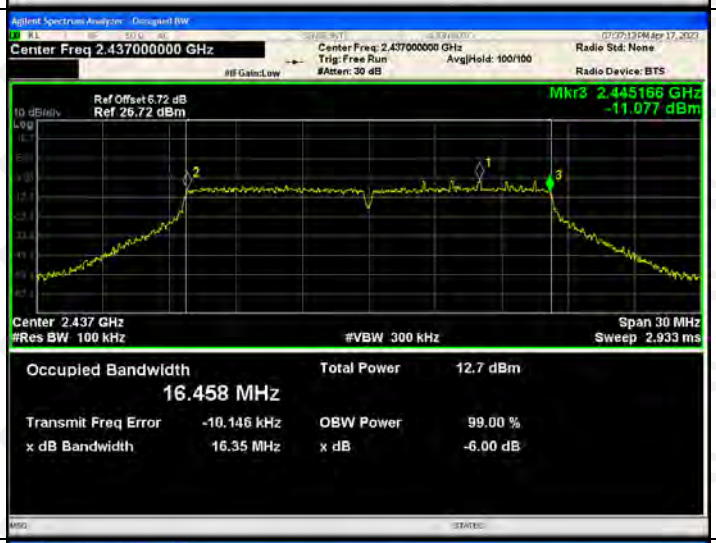
Test Mode	Frequency	6dB Bandwidth (MHz)	Limit(kHz)	Result
802.11b	LCH	10.227	500	**PASS**
	MCH	10.182	500	**PASS**
	HCH	10.863	500	**PASS**
802.11g	LCH	16.354	500	**PASS**
	MCH	16.4	500	**PASS**
	HCH	16.355	500	**PASS**
802.11n(HT20)	LCH	17.27	500	**PASS**
	MCH	17.305	500	**PASS**
	HCH	16.941	500	**PASS**
802.11n(HT40)	LCH	36.516	500	**PASS**
	MCH	35.446	500	**PASS**
	HCH	36.052	500	**PASS**

ANT4:

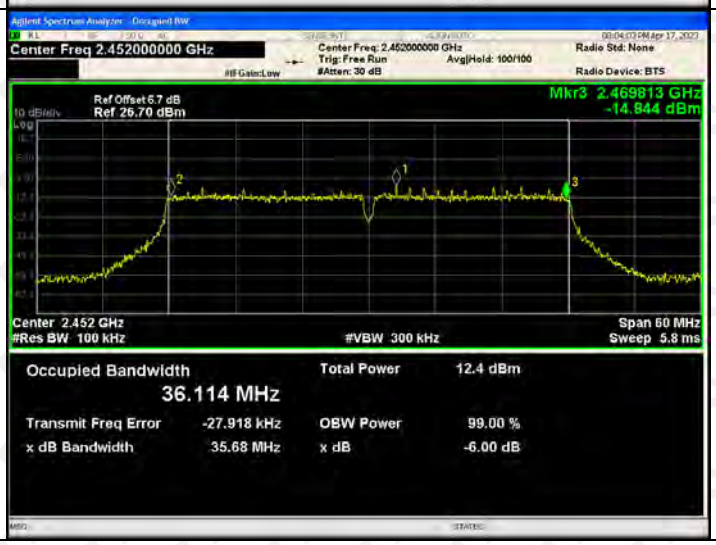
Test Mode	Frequency	6dB Bandwidth (MHz)	Limit(kHz)	Result
802.11b	LCH	9.044	500	**PASS**
	MCH	10.142	500	**PASS**
	HCH	9.617	500	**PASS**
802.11g	LCH	16.462	500	**PASS**
	MCH	16.341	500	**PASS**
	HCH	16.337	500	**PASS**
802.11n(HT20)	LCH	17.571	500	**PASS**
	MCH	17.327	500	**PASS**
	HCH	17.306	500	**PASS**
802.11n(HT40)	LCH	35.921	500	**PASS**
	MCH	36.319	500	**PASS**
	HCH	35.555	500	**PASS**

ANT1:
Test Graph:

Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

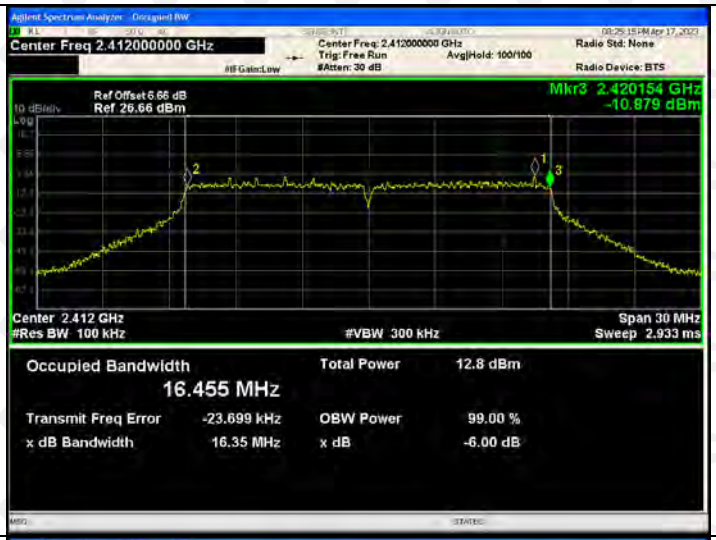
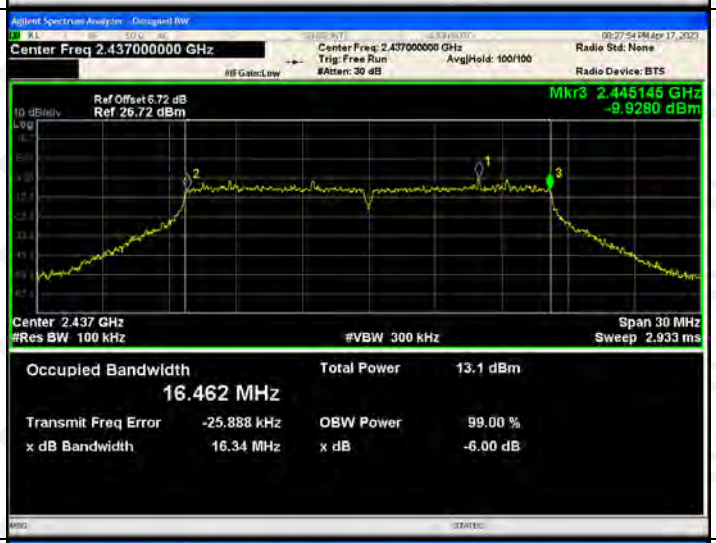
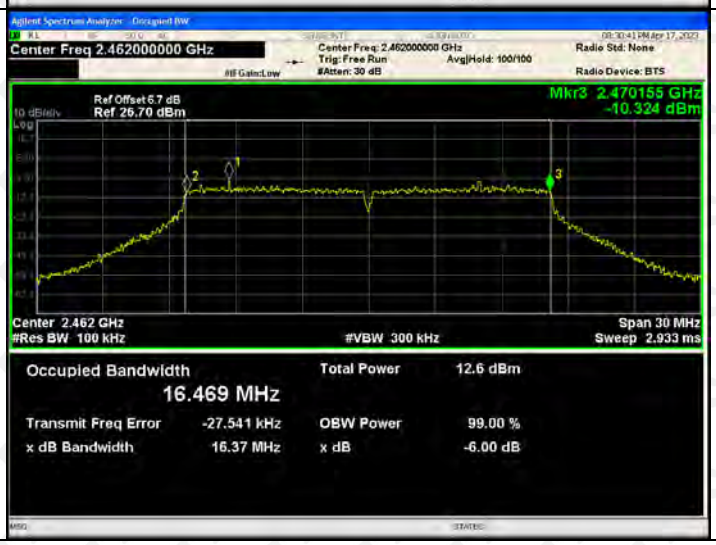
802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

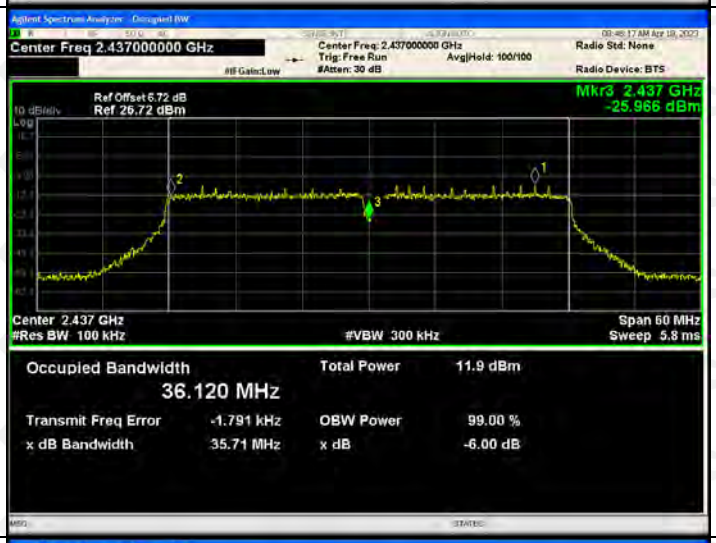
802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

ANT2:
Test Graph:

Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

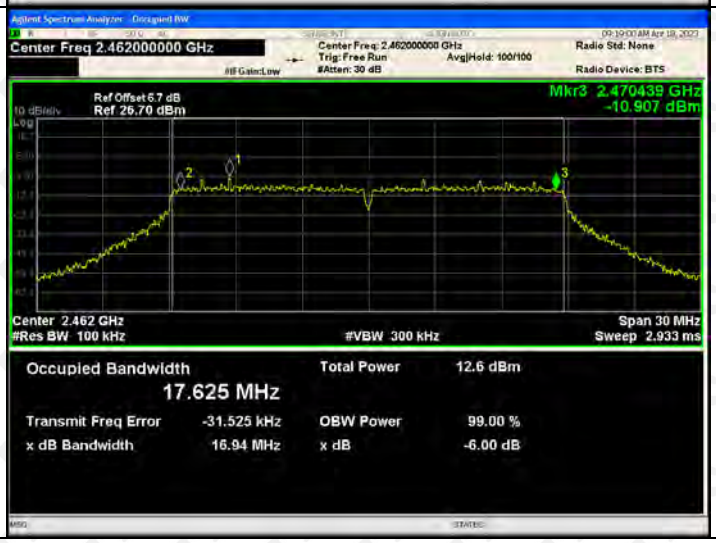
802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

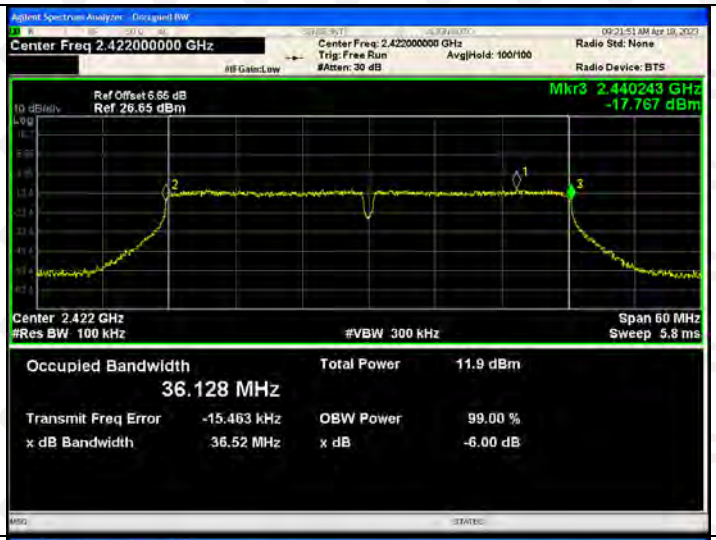
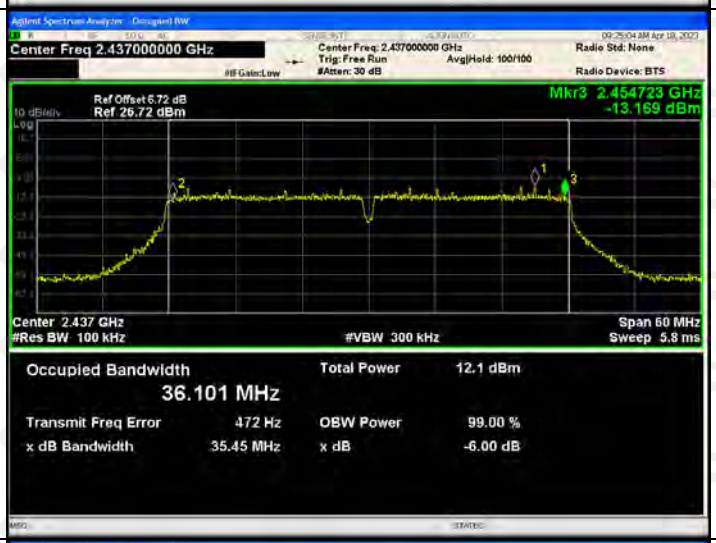
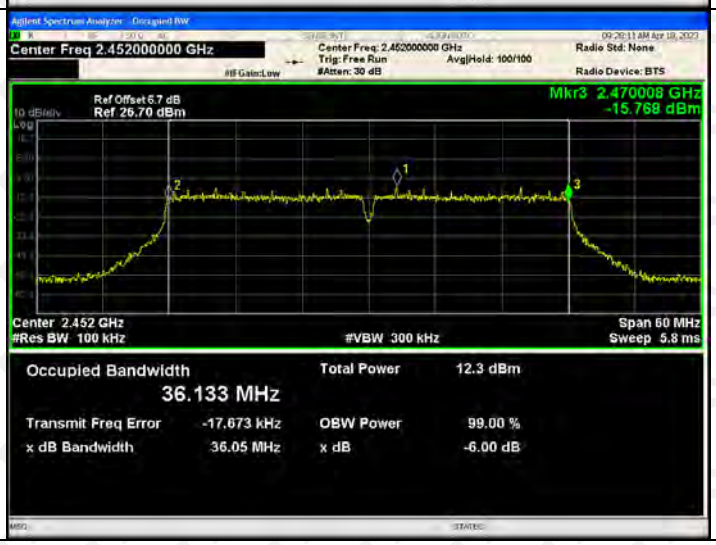
802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

ANT3:
Test Graph:

Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

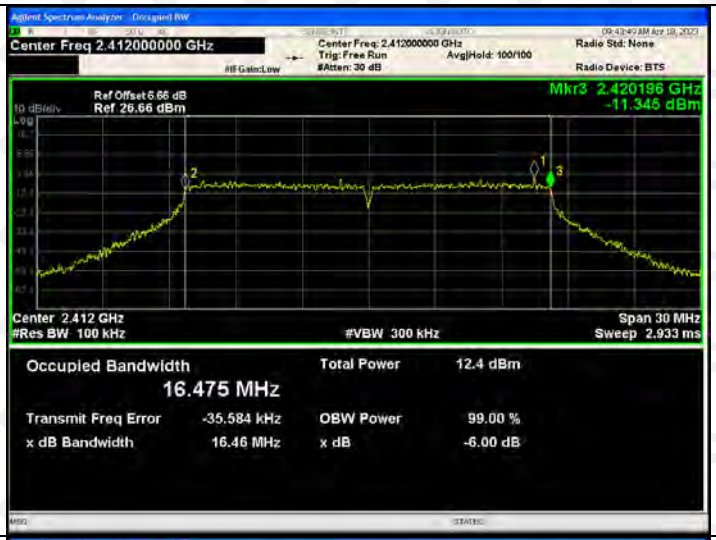
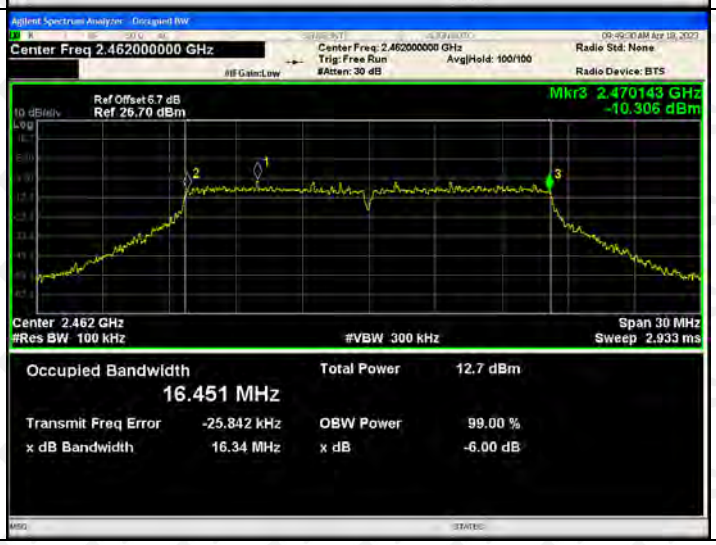
802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

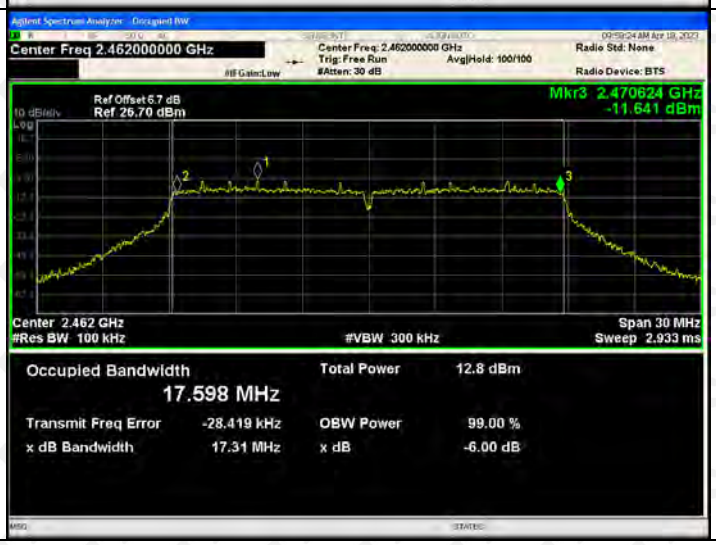
802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

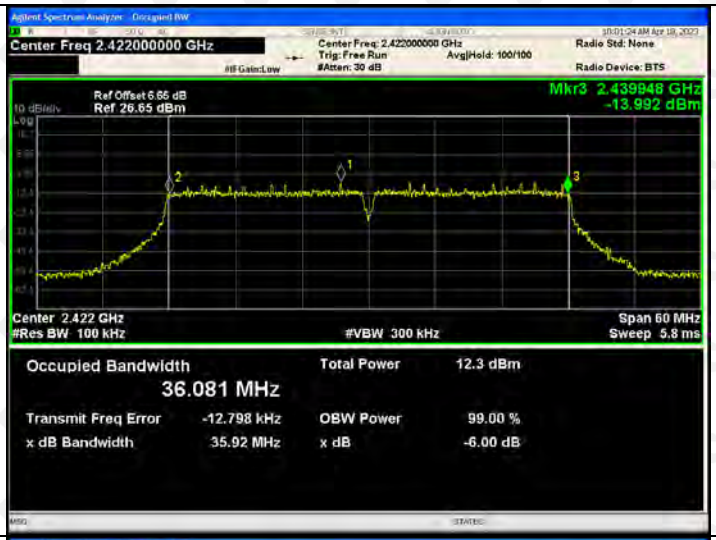
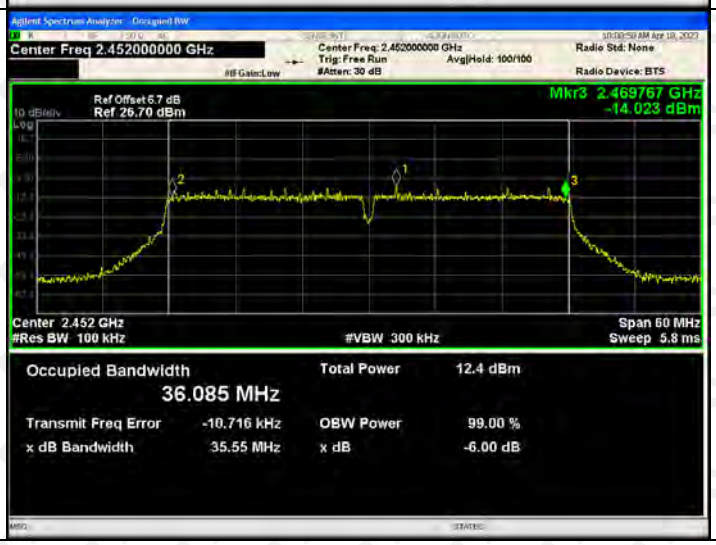
802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

ANT4:
Test Graph:

Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

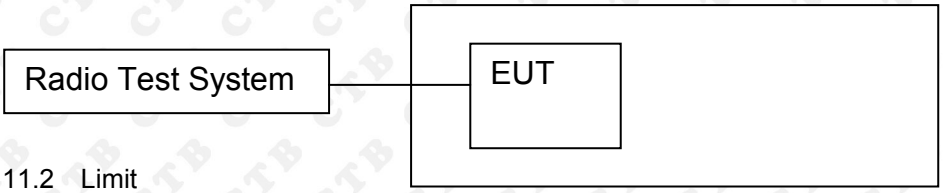
802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

11. POWER SPECTRAL DENSITY

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

11.3 Test procedure

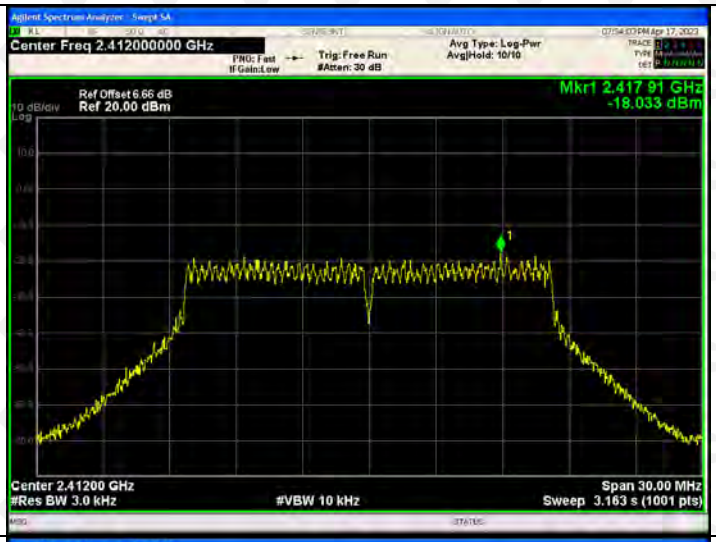
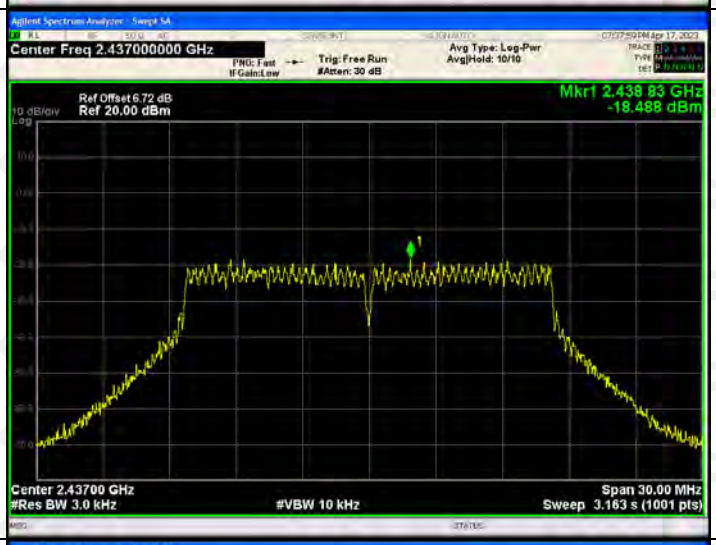
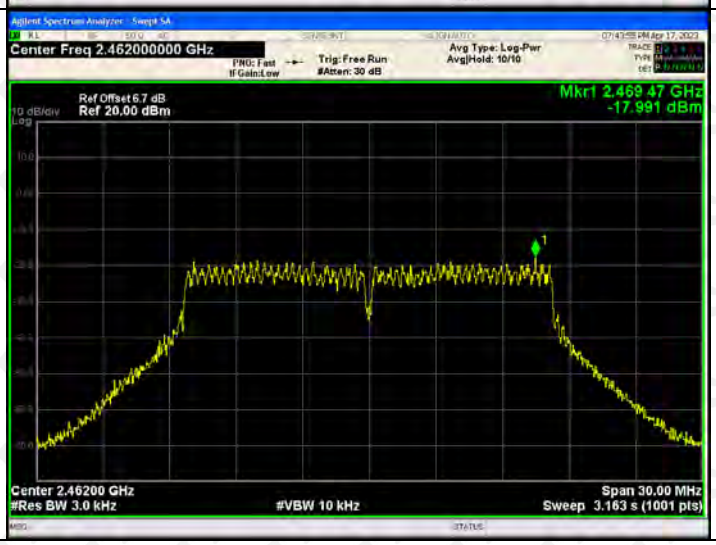
1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = Peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

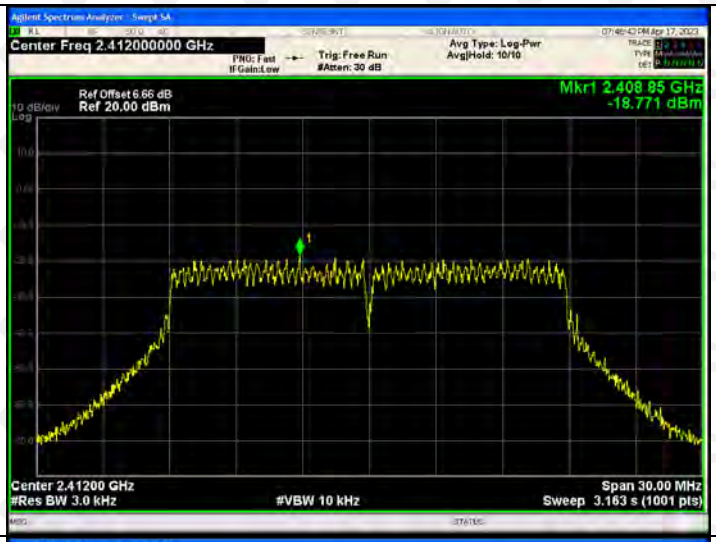
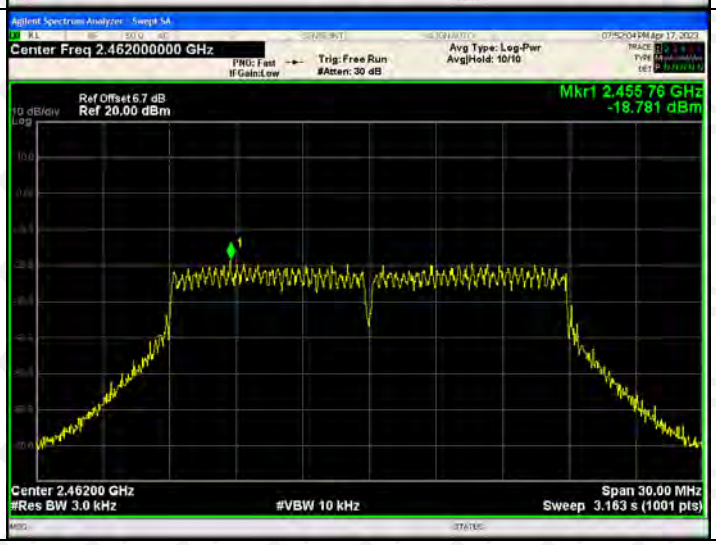
11.4 Test Result

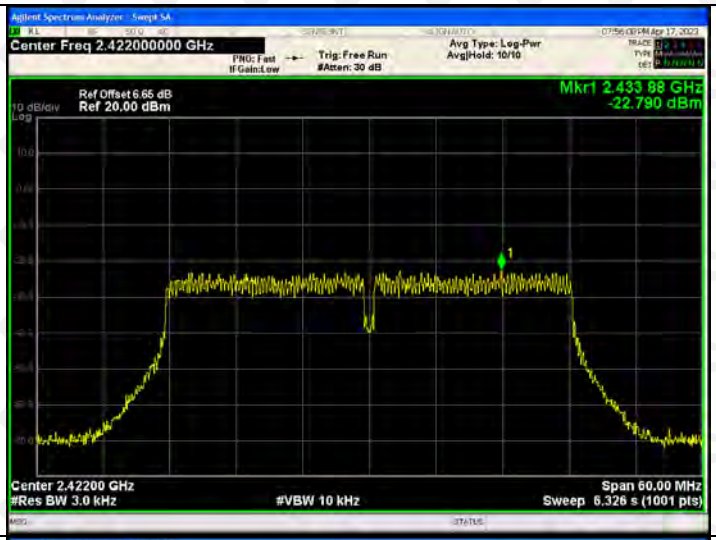
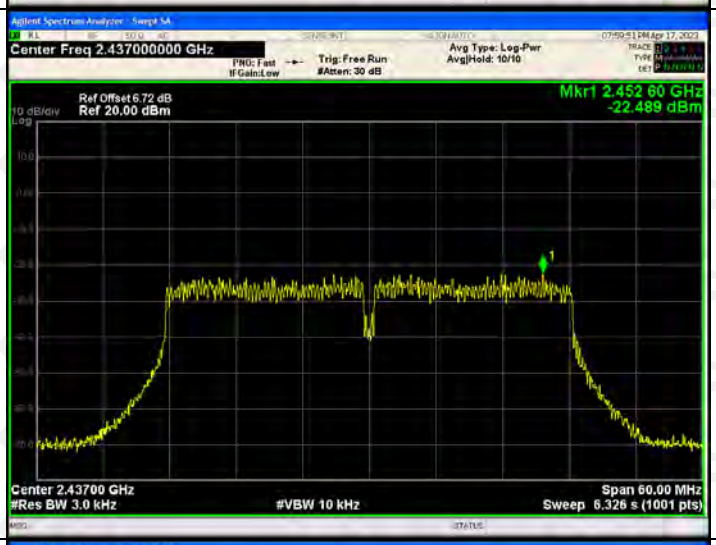
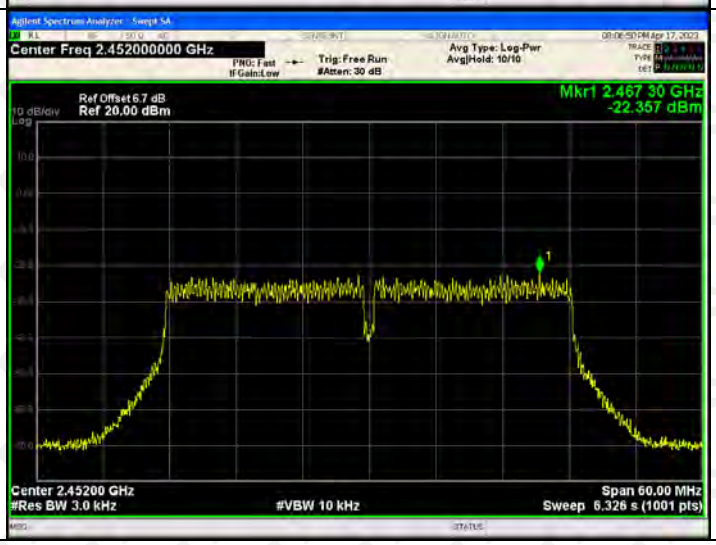
Mode	Channel.	Antenna	Power Spectral Density [dBm /3KHz] ANT 1	Power Spectral Density [dBm /3KHz]Total	Limit(dBm)
802.11b	LCH	ANT1	-14.943	/	3.43
		ANT2	-15.5		
		ANT3	-15.466		
		ANT4	-15.621		
	MCH	ANT1	-15.021	/	3.43
		ANT2	-15.11		
		ANT3	-15.088		
		ANT4	-15.082		
	HCH	ANT1	-14.807	/	3.43
		ANT2	-14.933		
		ANT3	-14.82		
		ANT4	-14.971		
802.11g	LCH	ANT1	-18.033	/	3.43
		ANT2	-18.062		
		ANT3	-18.249		
		ANT4	-17.742		
	MCH	ANT1	-18.488	/	3.43
		ANT2	-18.341		
		ANT3	-18.162		
		ANT4	-18.918		
	HCH	ANT1	-17.991	/	3.43
		ANT2	-18.005		
		ANT3	-18.286		
		ANT4	-18.402		
802.11n(HT20)	LCH	ANT1	-18.771	-12.147	3.43
		ANT2	-17.494		
		ANT3	-18.783		
		ANT4	-18.891		
	MCH	ANT1	-18.863	-12.424	3.43
		ANT2	-17.31		
		ANT3	-18.473		
		ANT4	-18.53		
	HCH	ANT1	-18.781	-12.232	3.43
		ANT2	-21.494		
		ANT3	-17.991		
		ANT4	-18.619		
802.11n(HT40)	LCH	ANT1	-22.79	-13.014	3.43
		ANT2	-21.843		
		ANT3	-24.382		
		ANT4	-20.454		
	MCH	ANT1	-22.489	-16.116	3.43
		ANT2	-22.632		
		ANT3	-20.57		
		ANT4	-22.587		
	HCH	ANT1	-22.357	-15.956	3.43
		ANT2	-22.222		
		ANT3	-23.173		
		ANT4	-21.855		

ANT1:
Test Graph

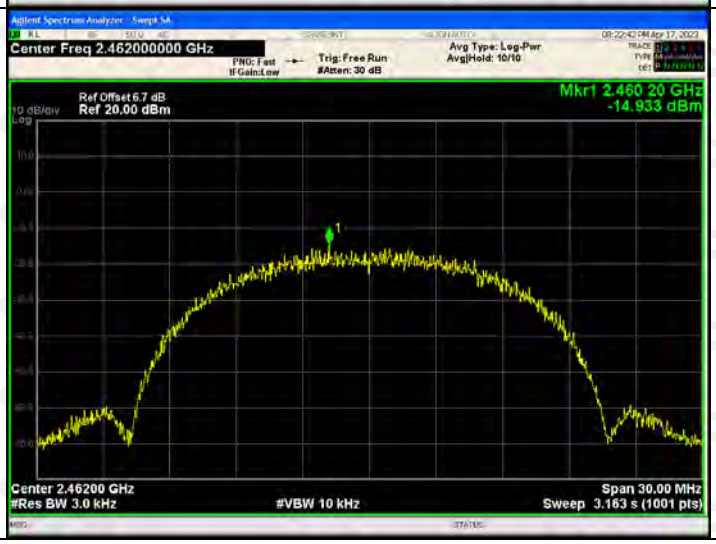
Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

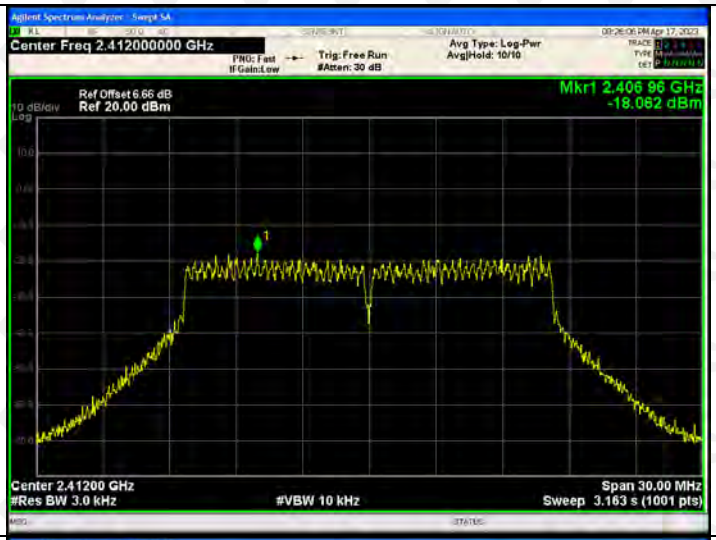
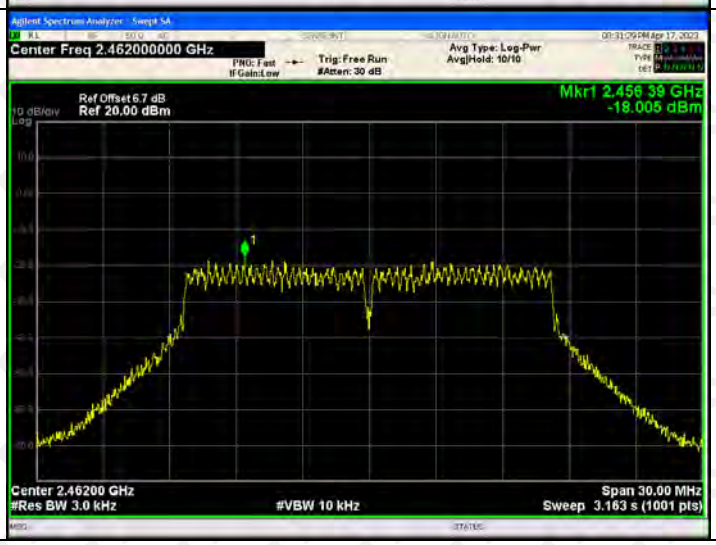
802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

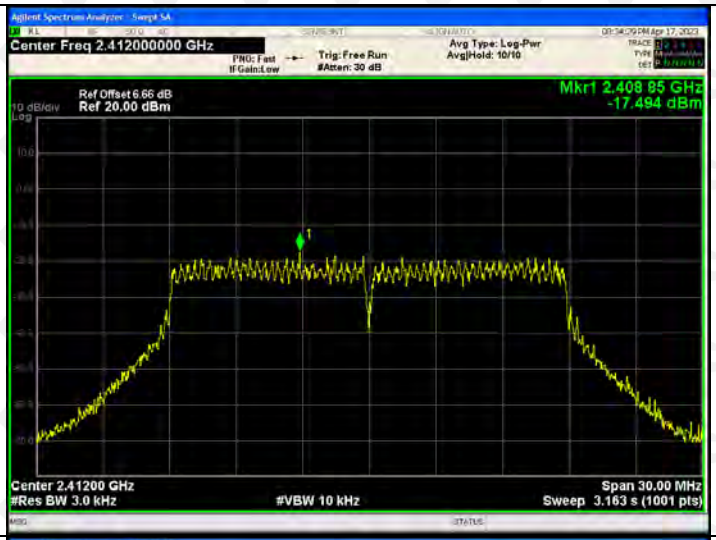
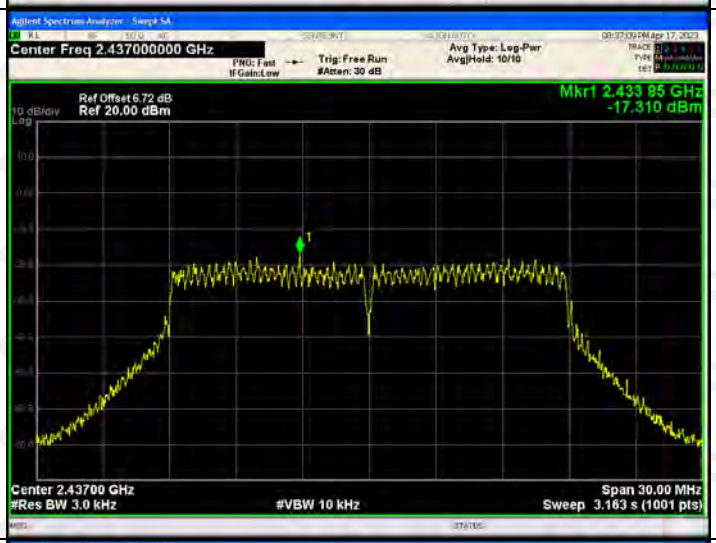
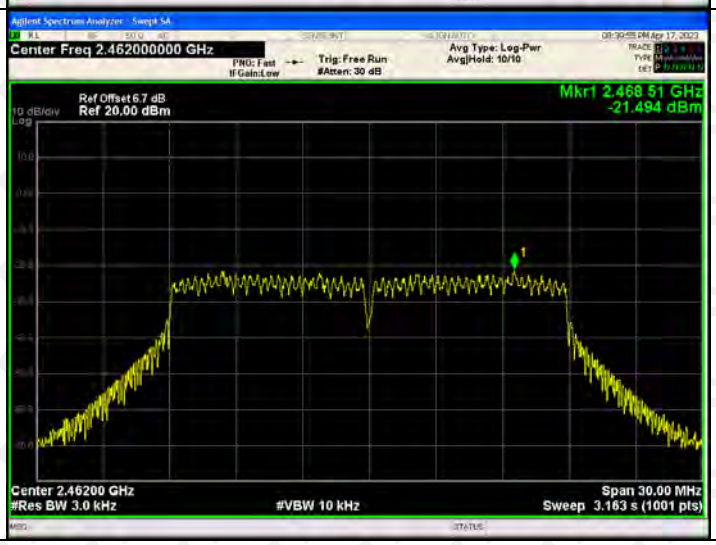
802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

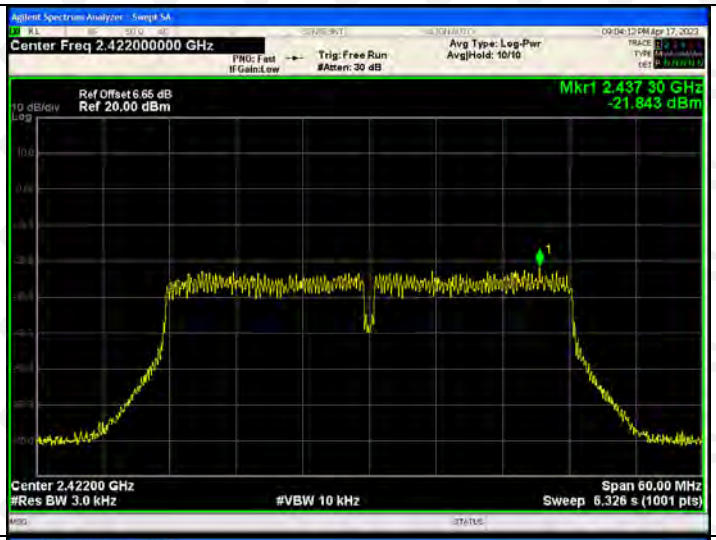
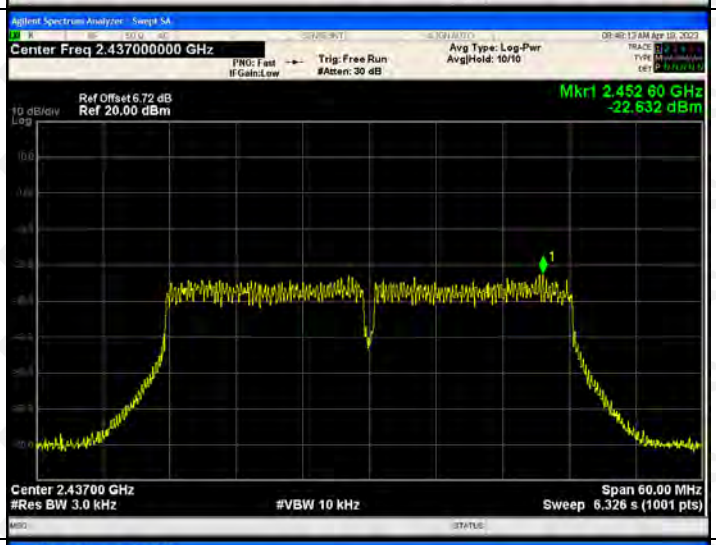
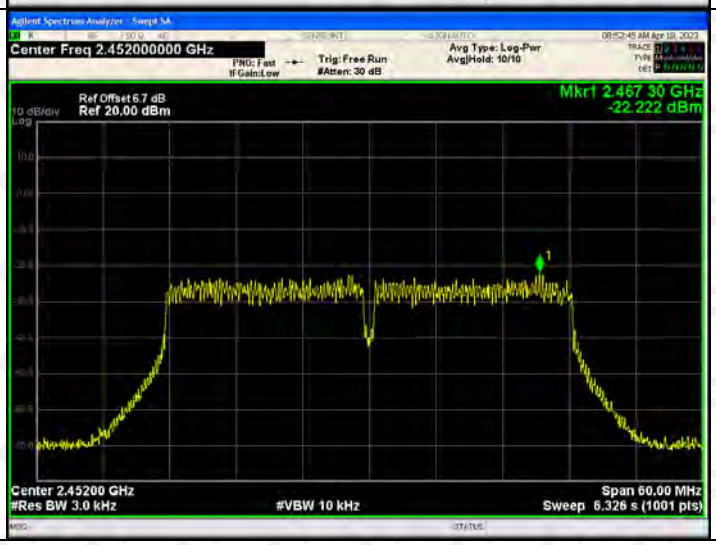
802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

ANT 2:
Test Graph

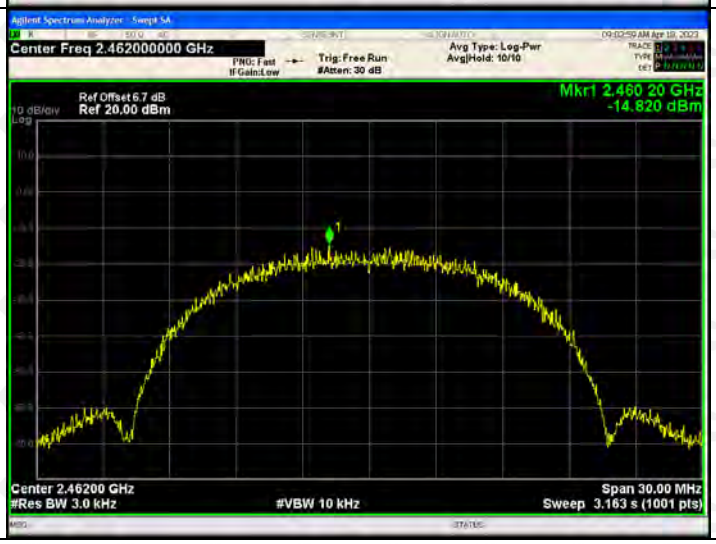
Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

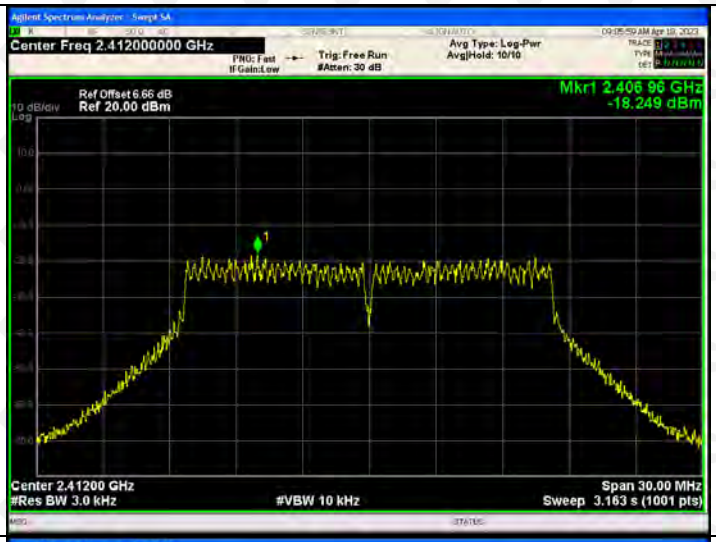
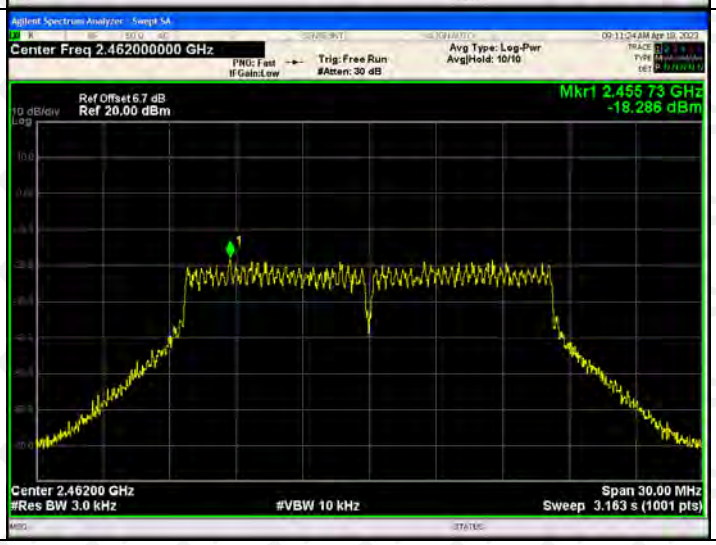
802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

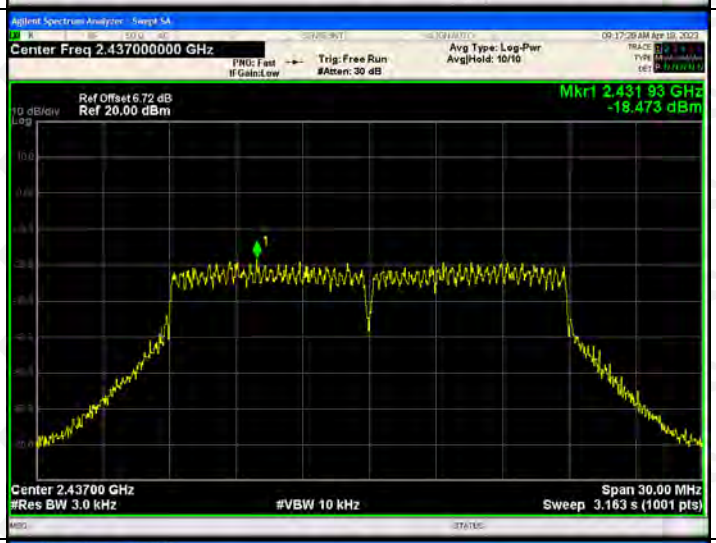
802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

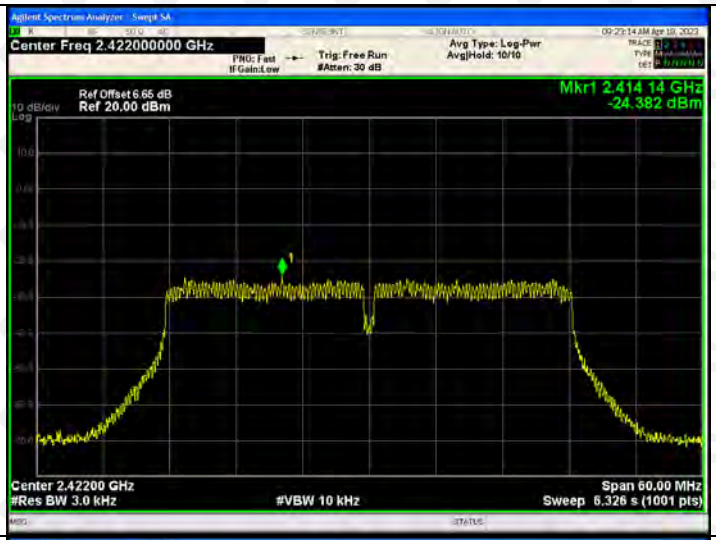
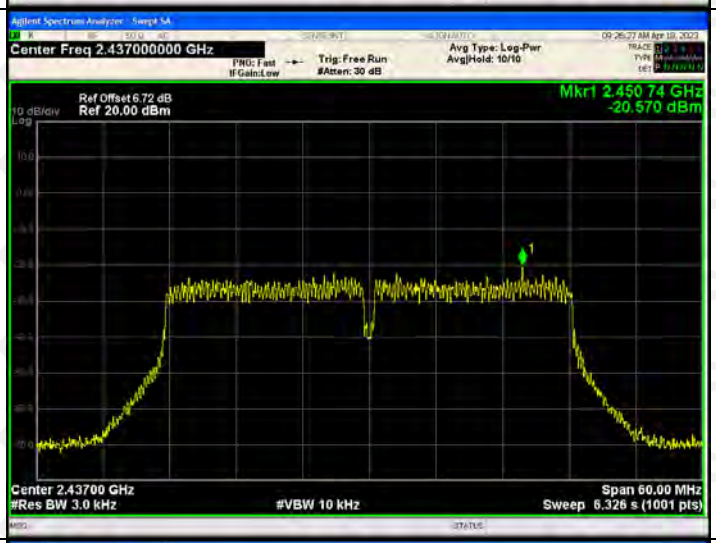
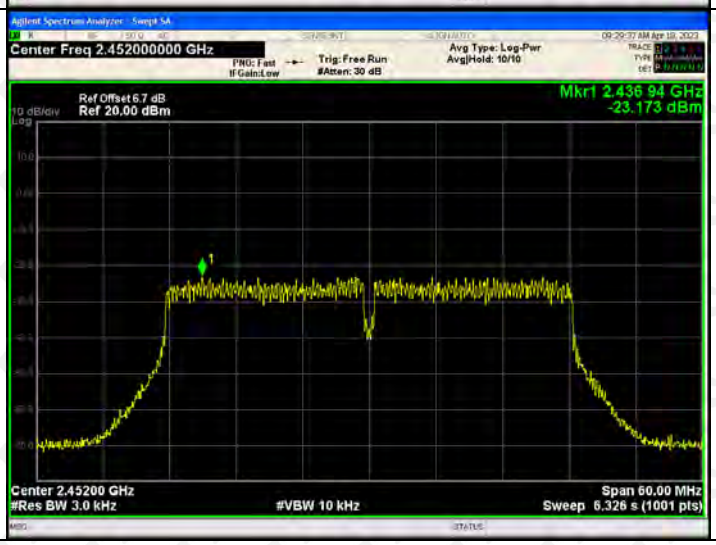
802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

ANT3:
Test Graph

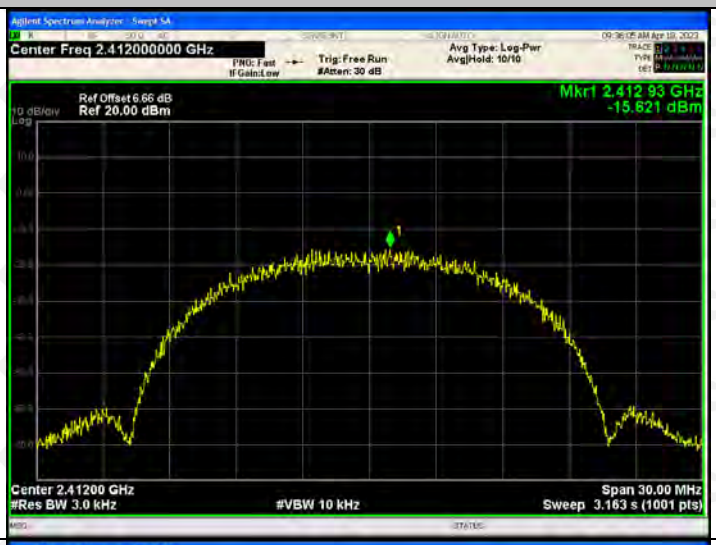
Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

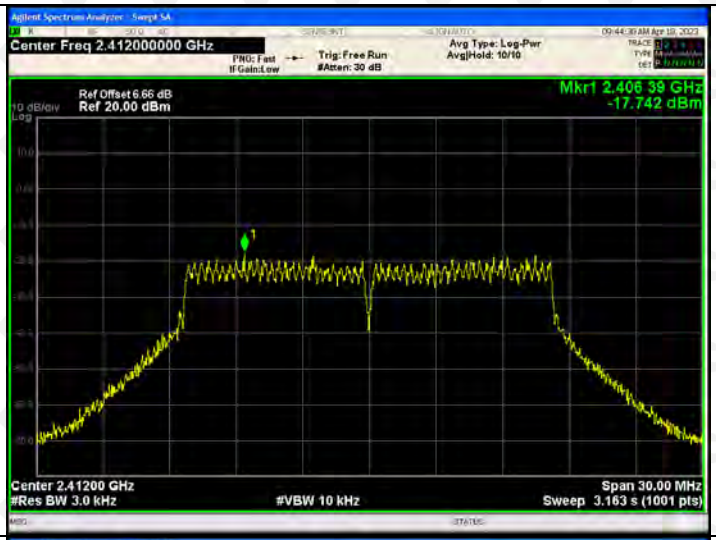
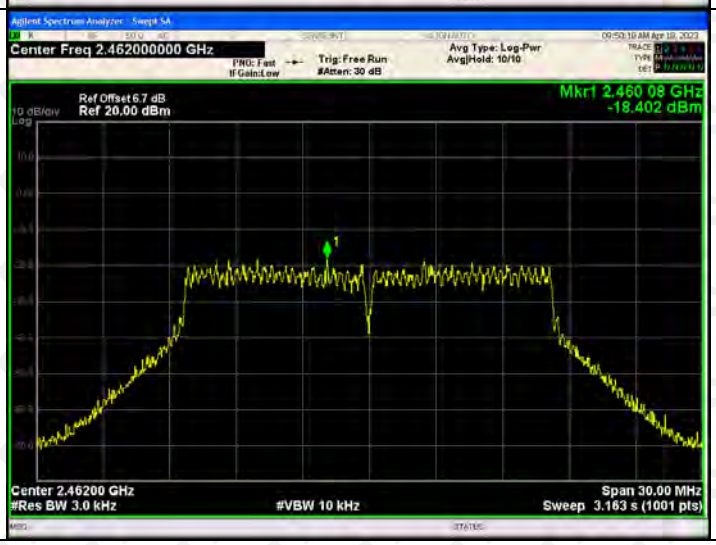
802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

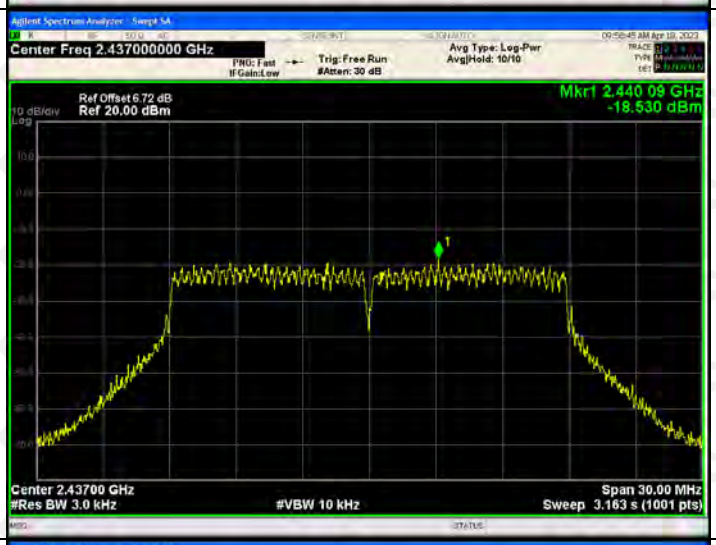
802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

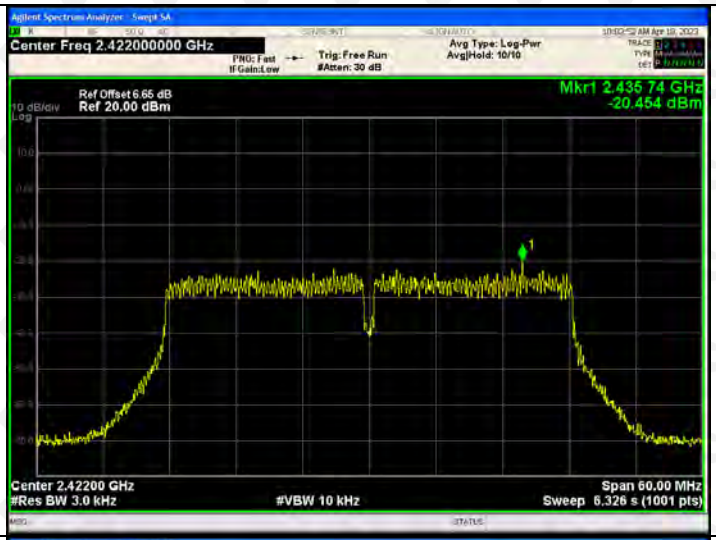
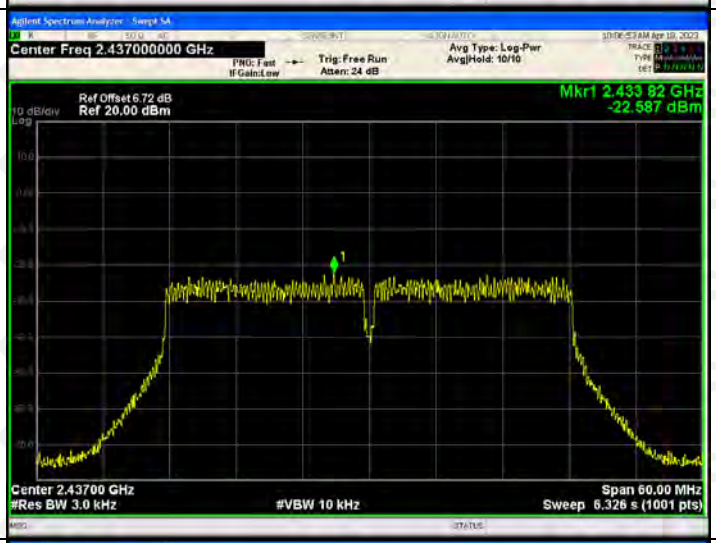
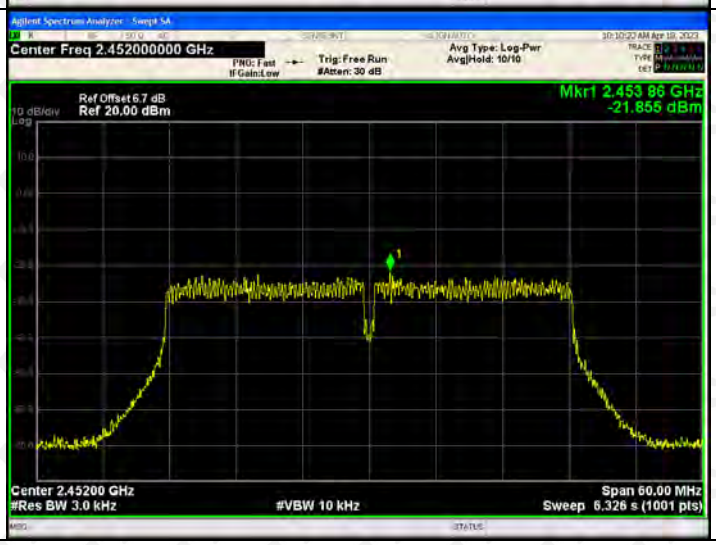
802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

ANT4:
Test Graph

Graphs			
802.11b /LCH			
802.11b /MCH			
802.11b/HCH			

802.11g/LCH			
802.11g/MCH			
802.11g/HCH			

802.11n(HT20)/LCH			
802.11n(HT20)/MCH			
802.11n(HT20)/HCH			

802.11n(HT40)/LCH			
802.11n(HT40)/MCH			
802.11n(HT40)/HCH			

12. ANTENNA REQUIREMENT

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is External antenna and no consideration of replacement. The best case gain of the antenna is ANT1:4.55dBi, ANT2:4.55dBi, ANT3:4.55dBi, ANT4:4.55dBi.

13. EUT PHOTOGRAPHS

External Photos

EUT Photo 1

EUT Photo 2

14. EUT TEST SETUP PHOTOGRAPHS

Radiated Emission

Below 1G

Above 1G

Conducted Emission

※※※※※ **END OF REPORT** ※※※※※