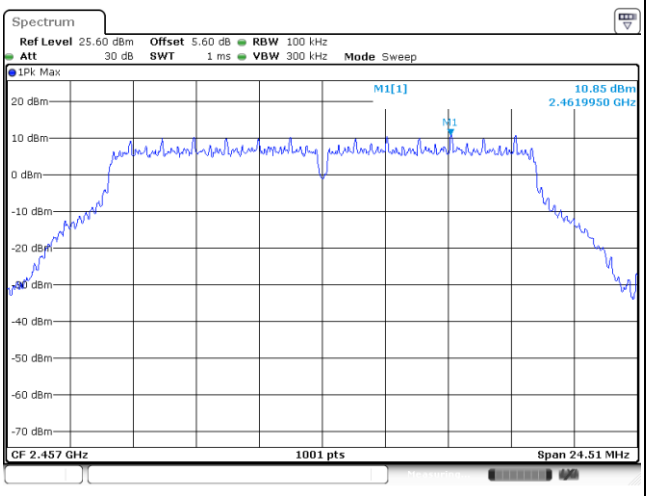
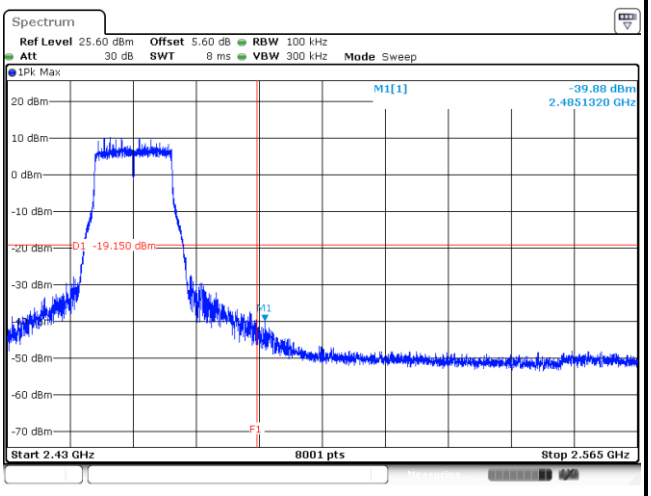
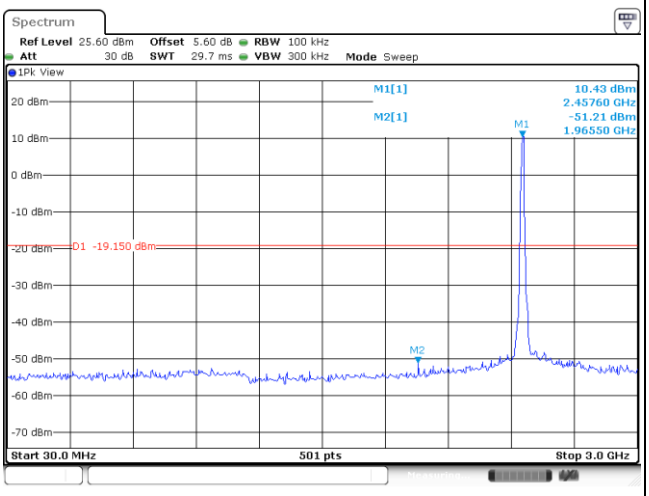
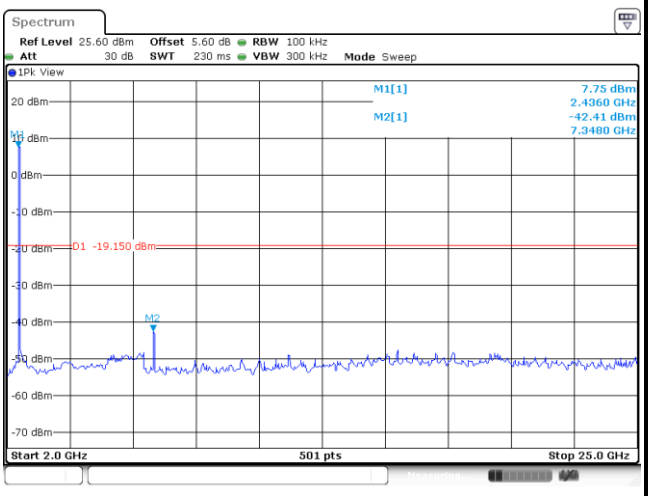
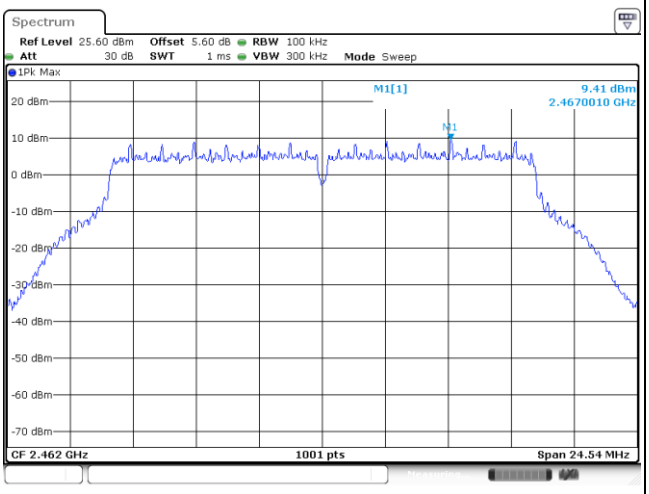
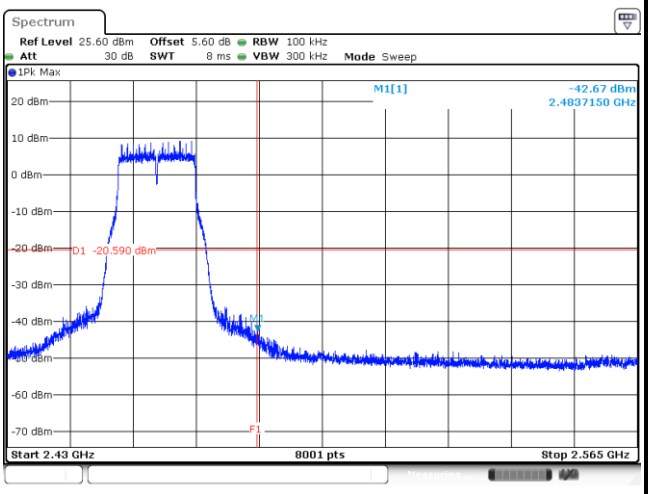
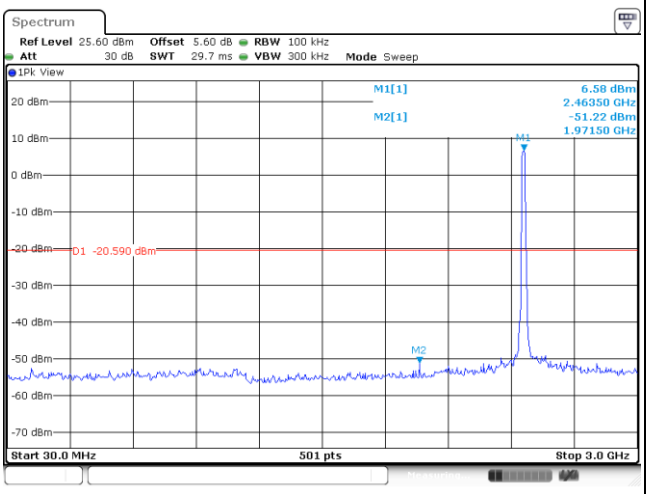
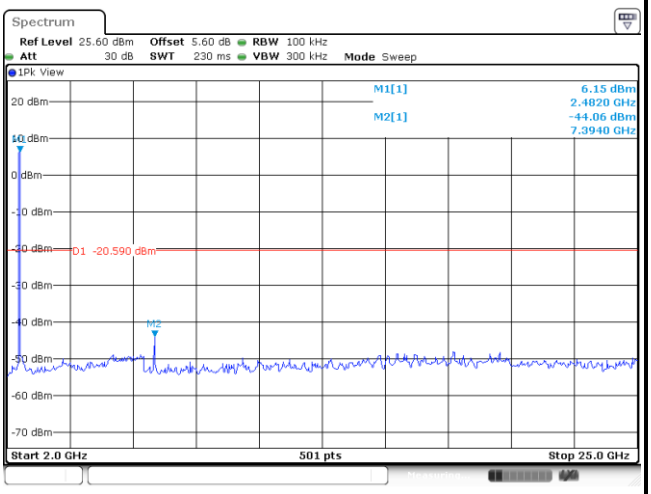
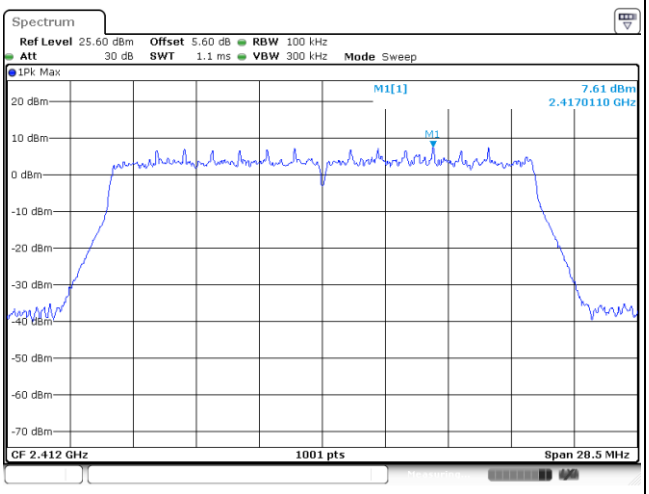
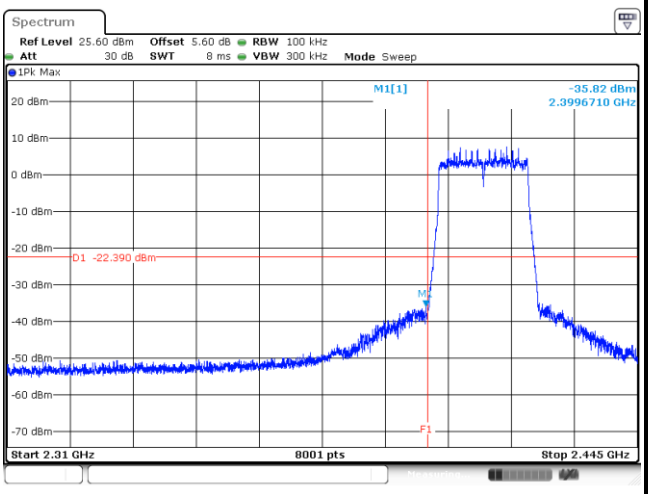
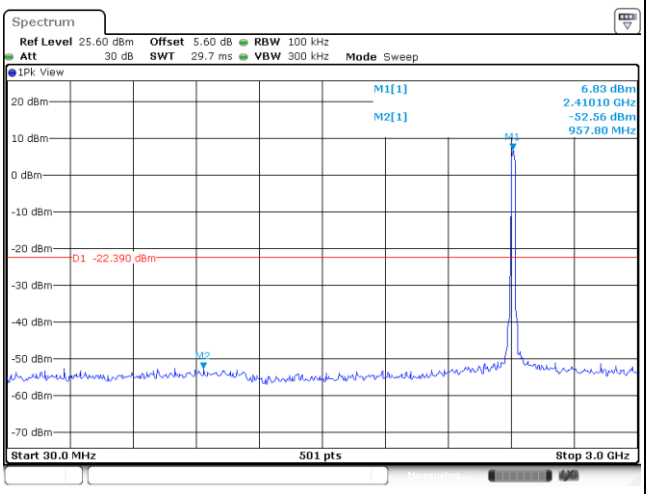
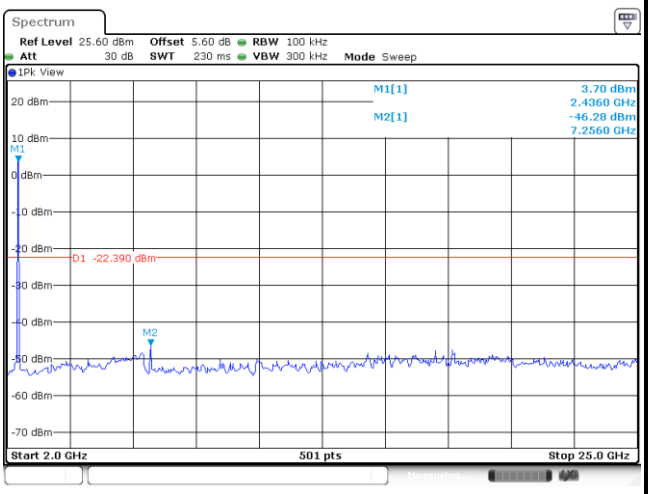
Test Mode :	802.11g	Test Channel :	10

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

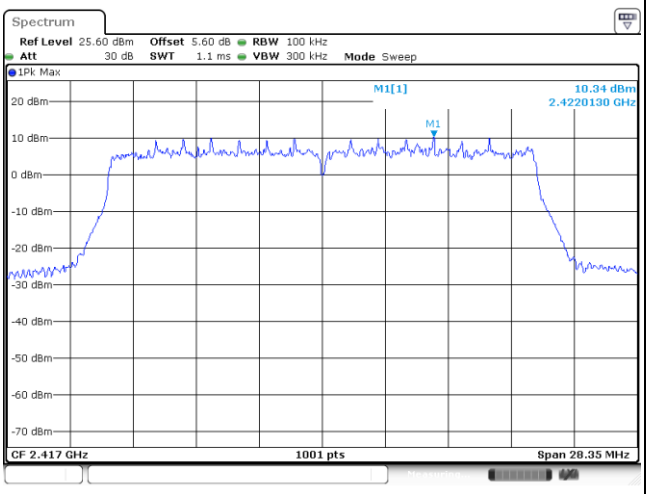
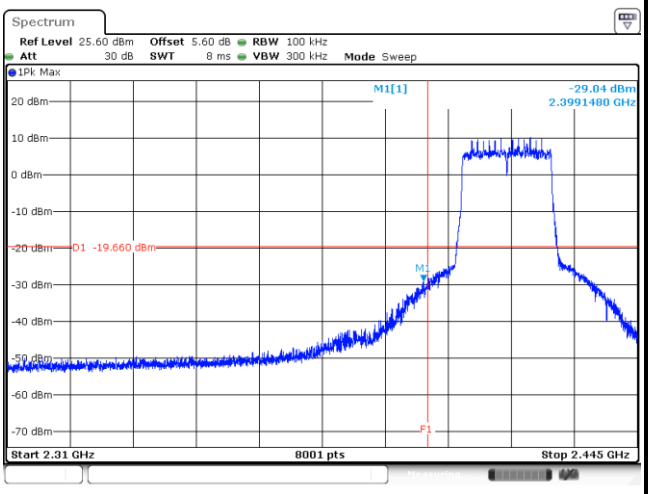
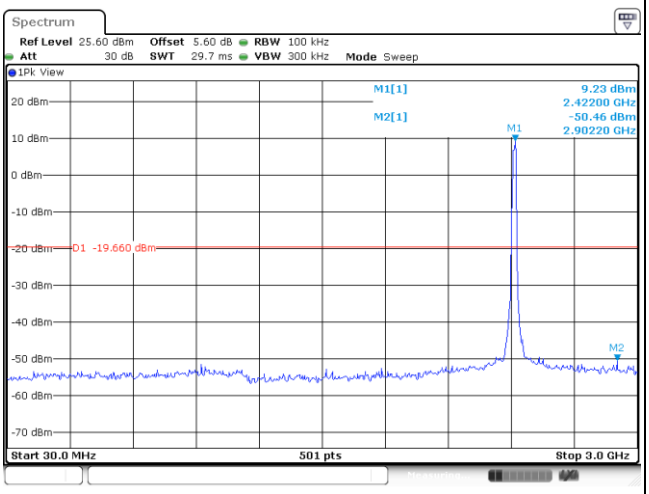
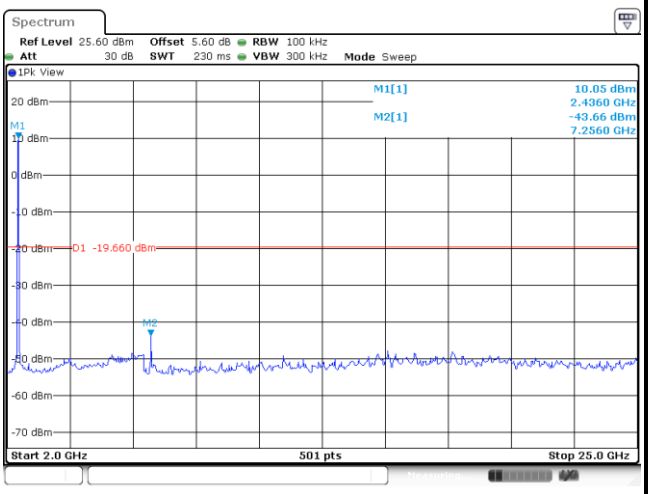
Test Mode :	802.11g	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

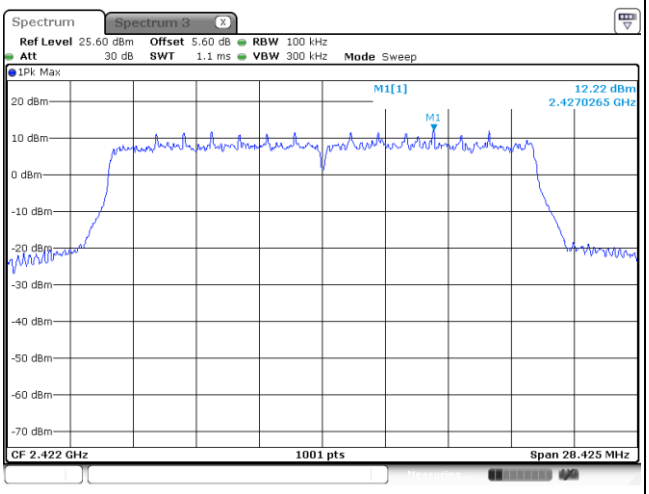
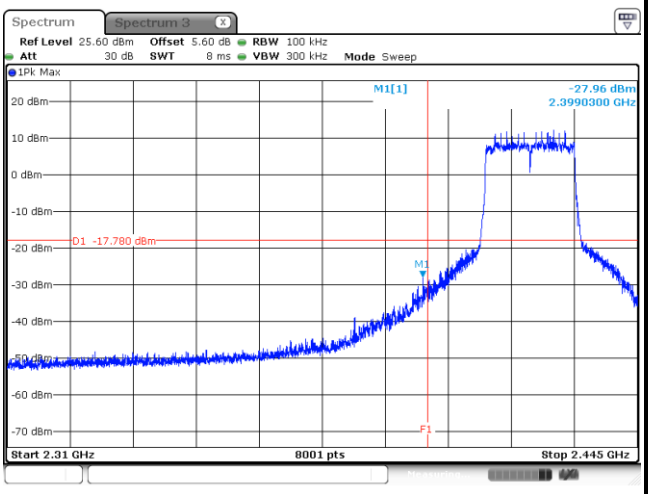
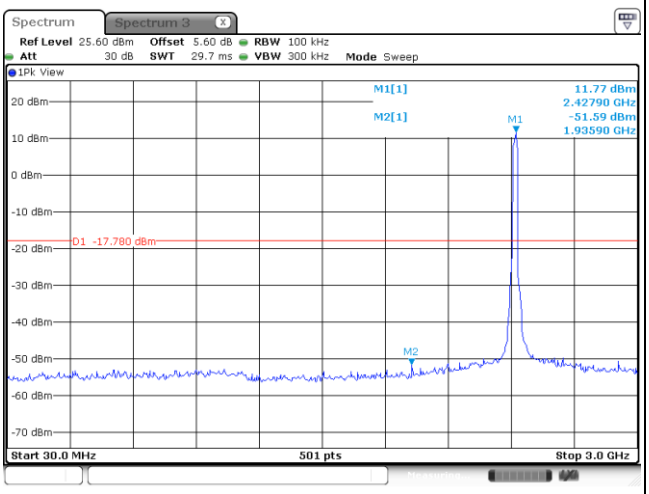
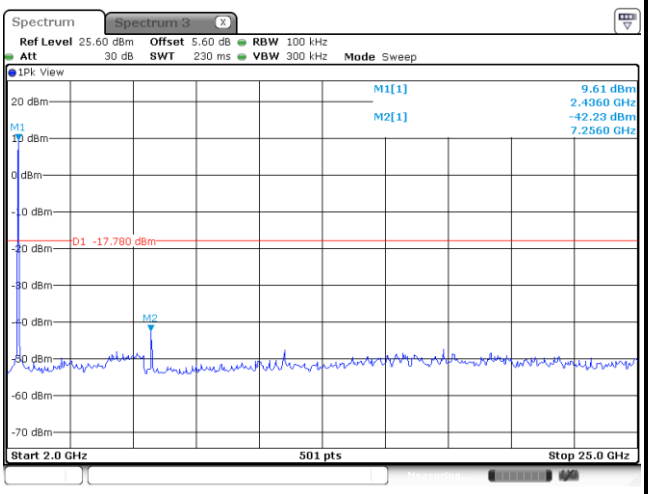
Test Mode :	802.11ax HE20	Test Channel :	01

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

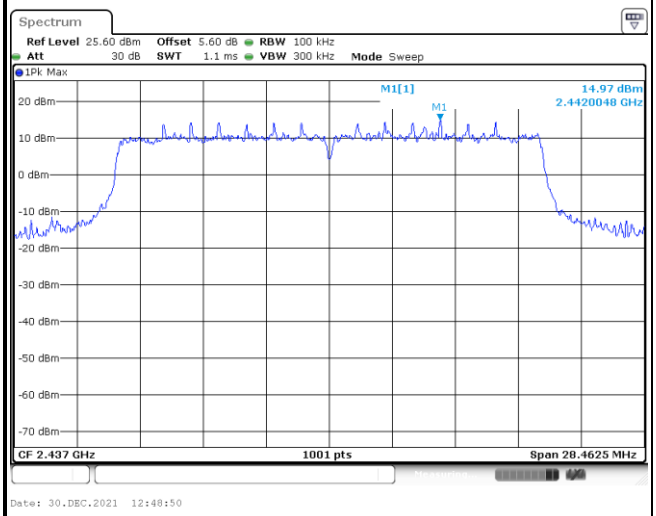
Test Mode :	802.11ax HE20	Test Channel :	02

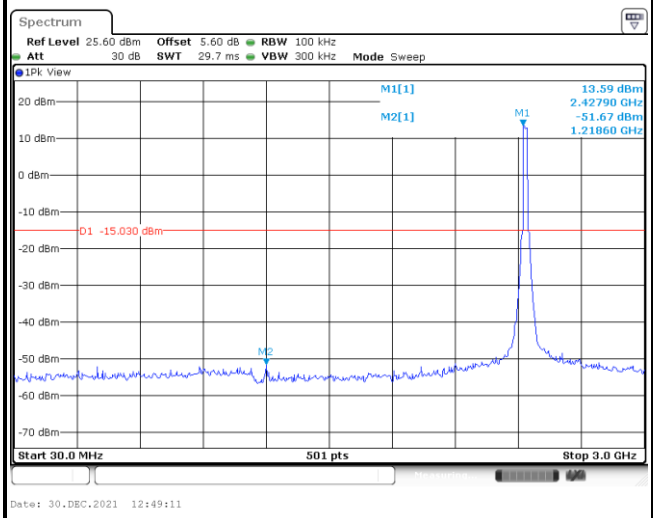
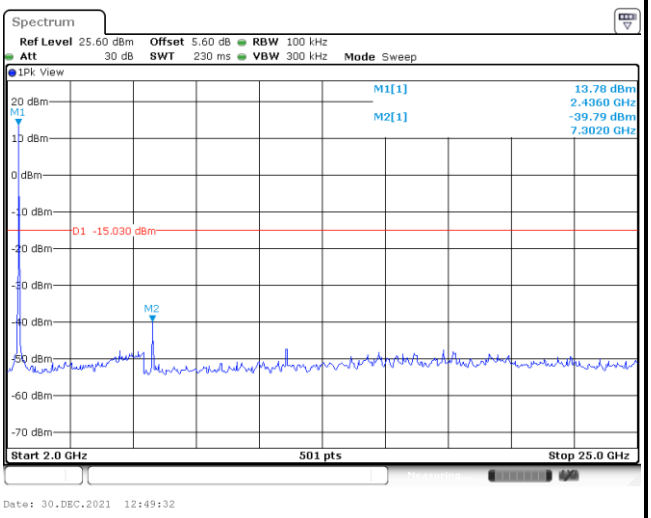
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11ax HE20	Test Channel :	03

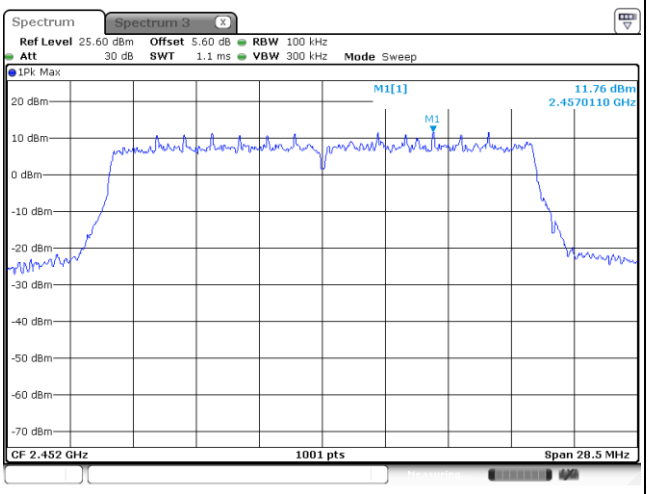
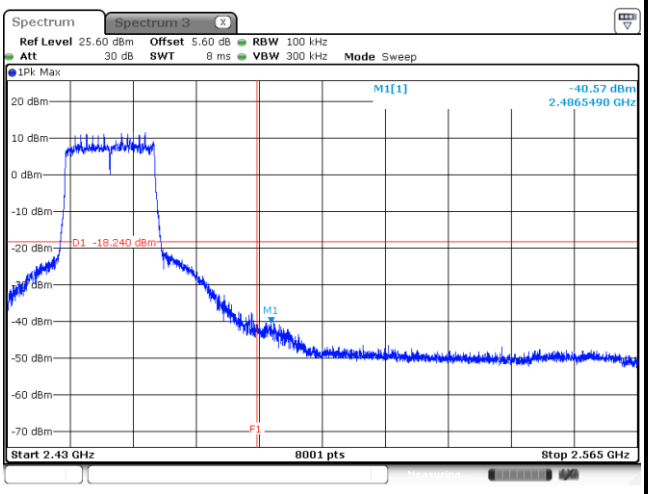
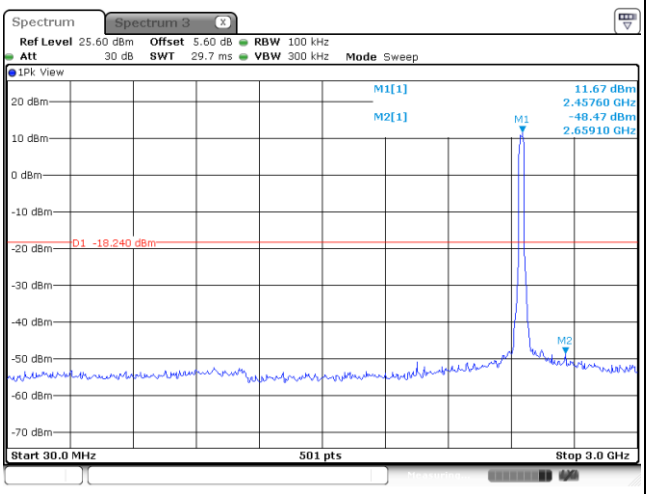
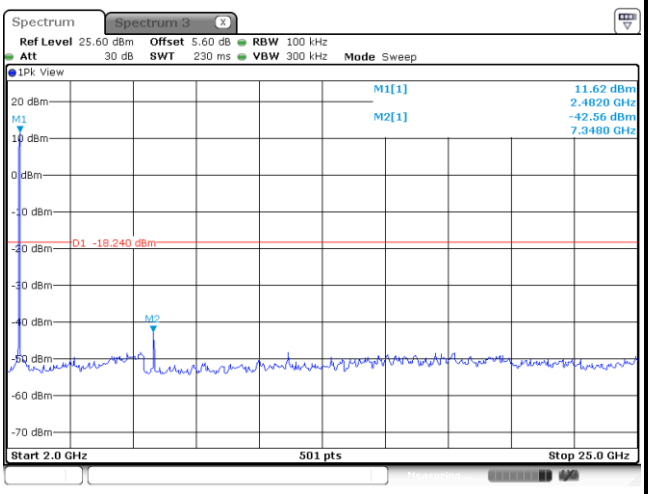
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11ax HE20	Test Channel :	06

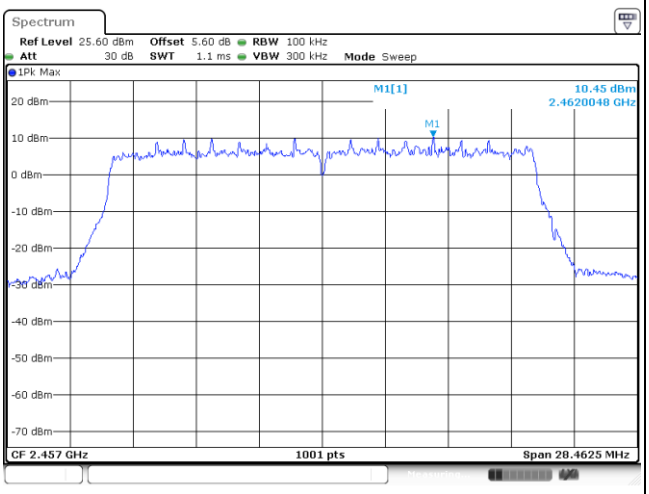
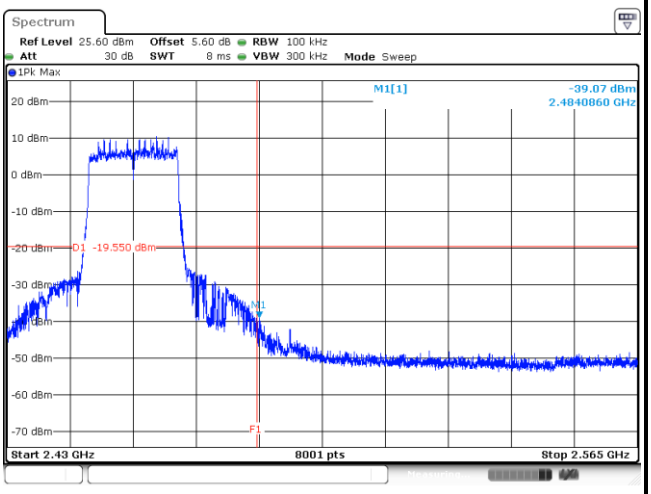
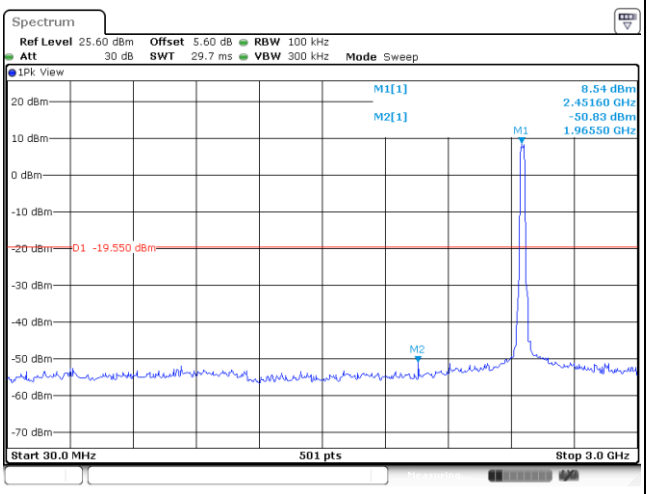
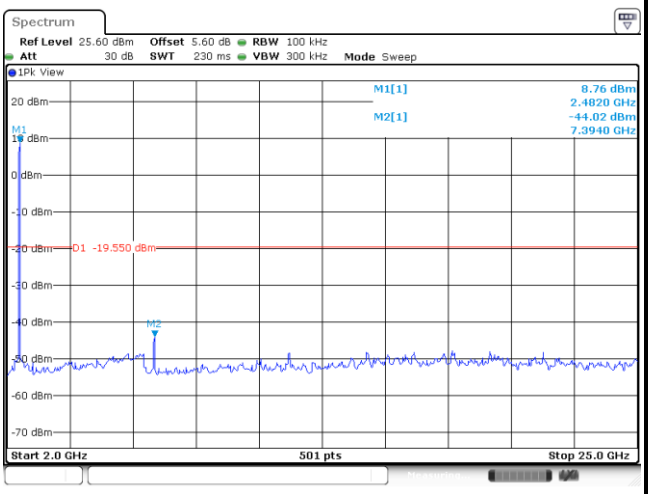
100kHz PSD reference Level	
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

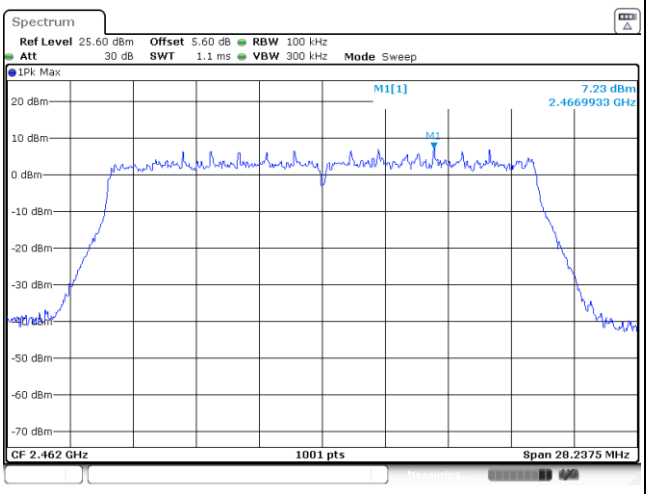
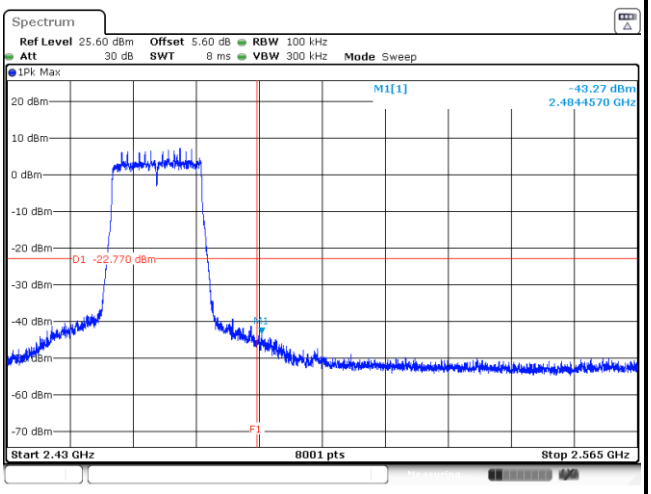
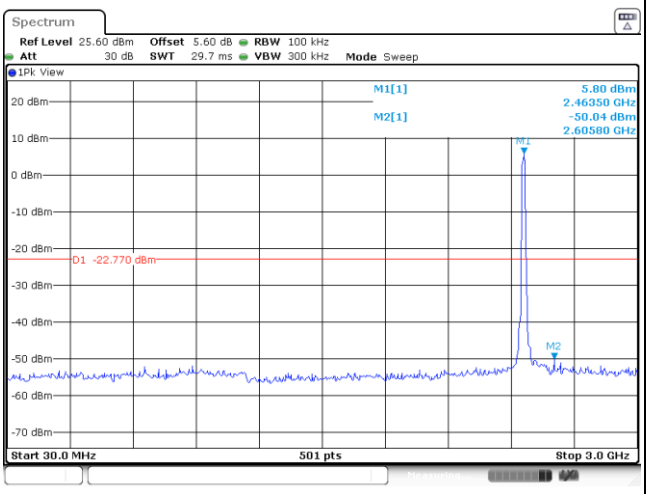
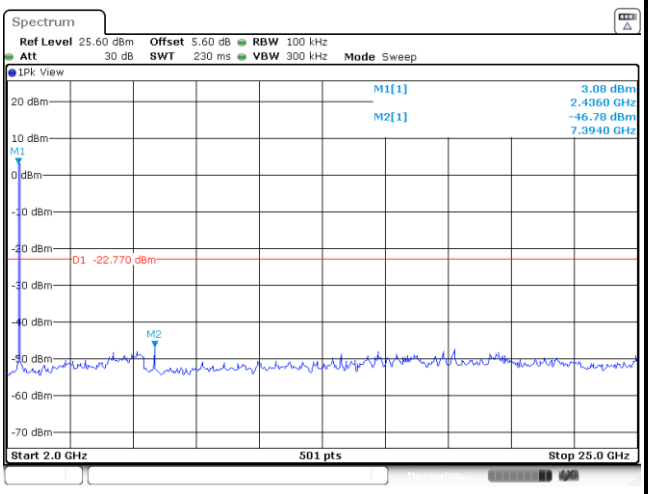
Test Mode :	802.11ax HE20	Test Channel :	09

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

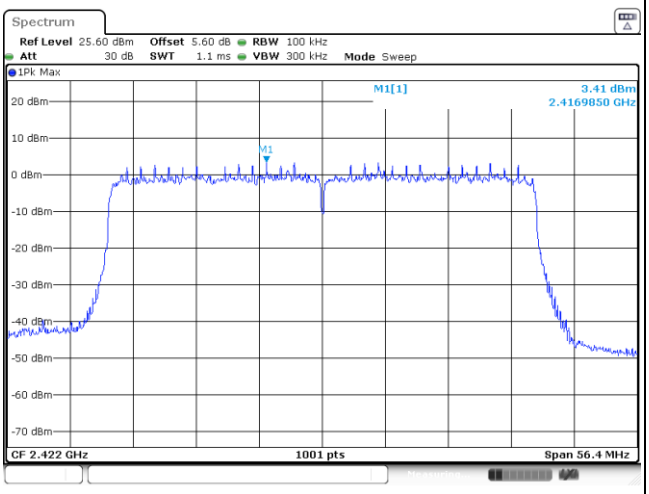
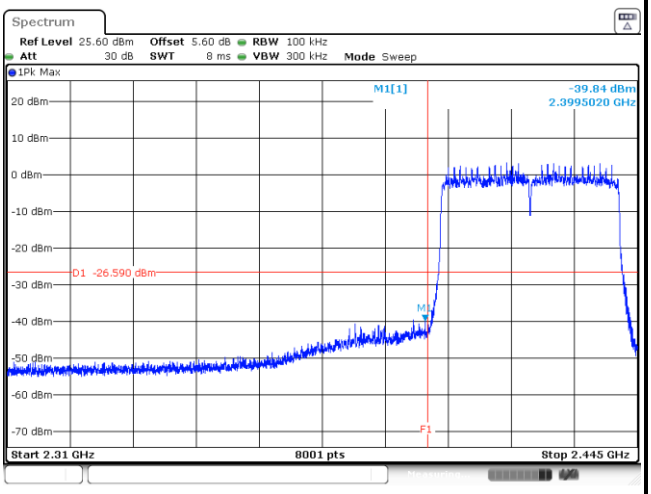
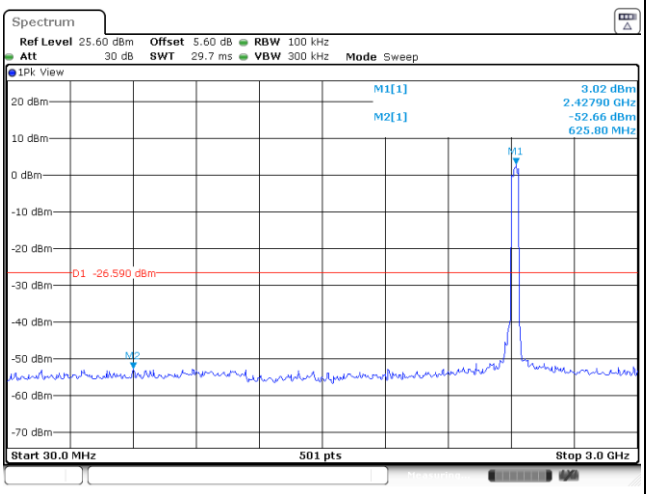
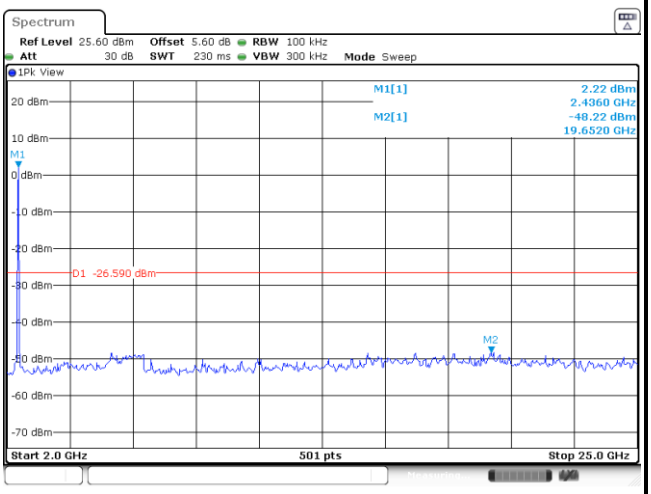
Test Mode :	802.11ax HE20	Test Channel :	10

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

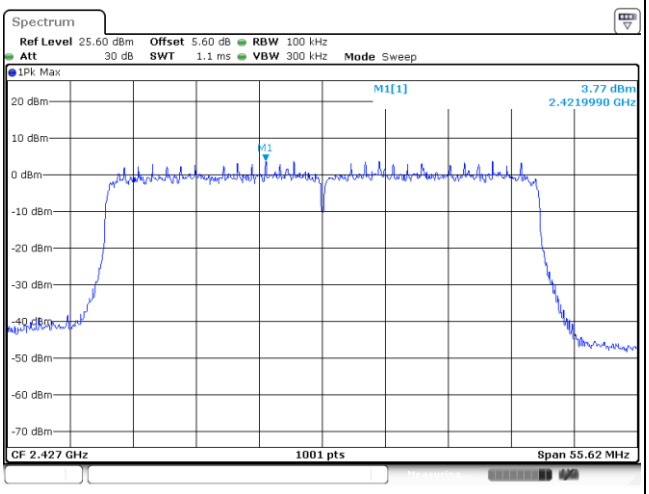
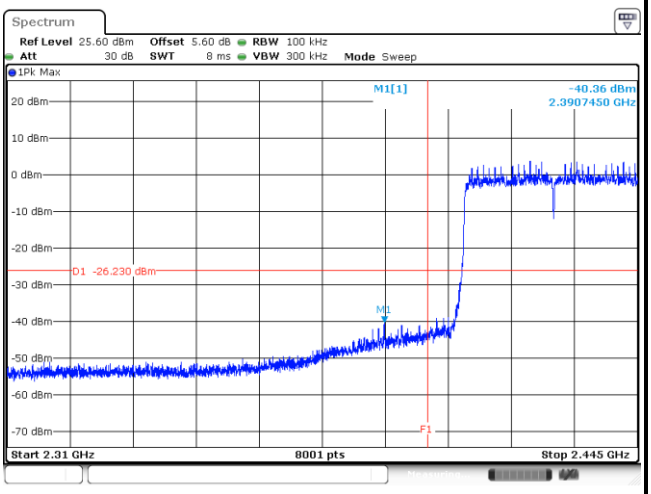
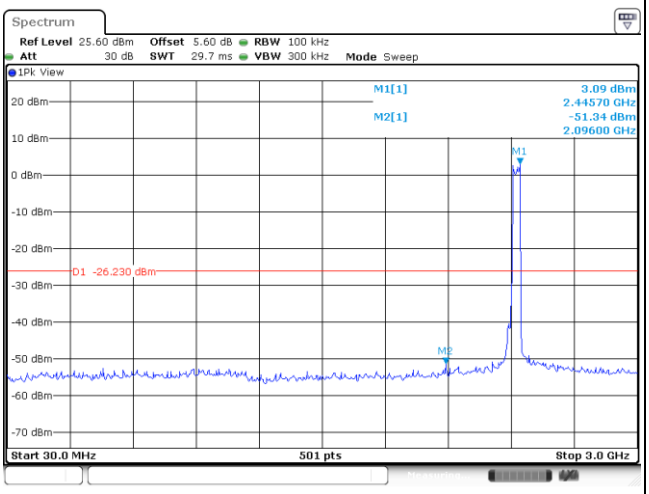
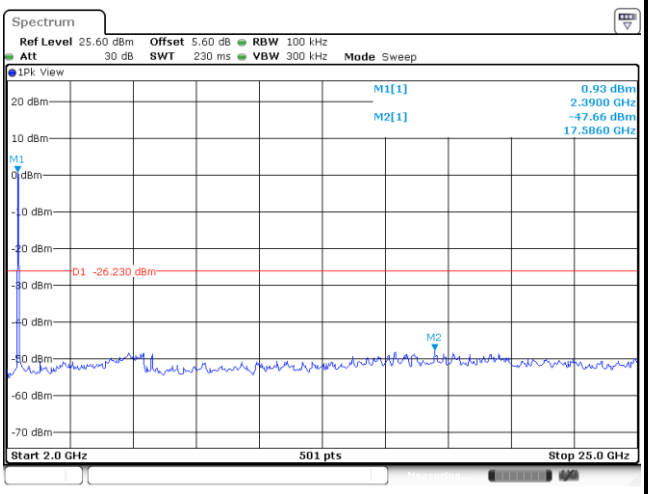
Test Mode :	802.11ax HE20	Test Channel :	11

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

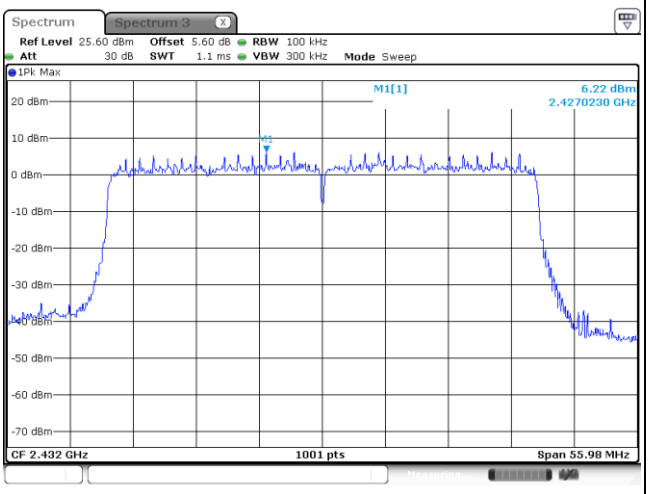
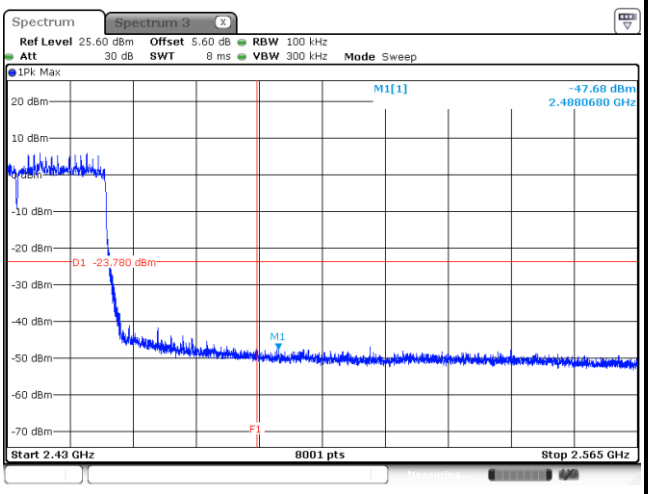
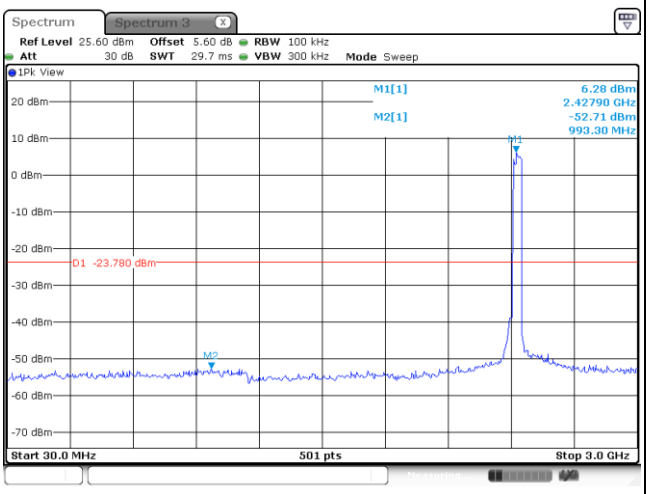
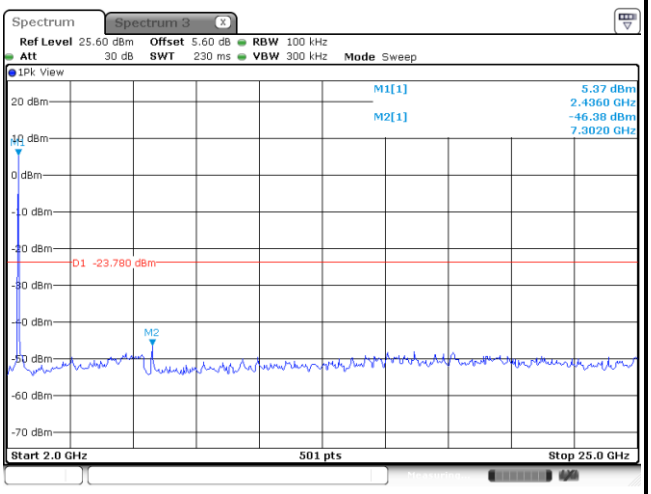
Test Mode :	802.11ax HE40	Test Channel :	03

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

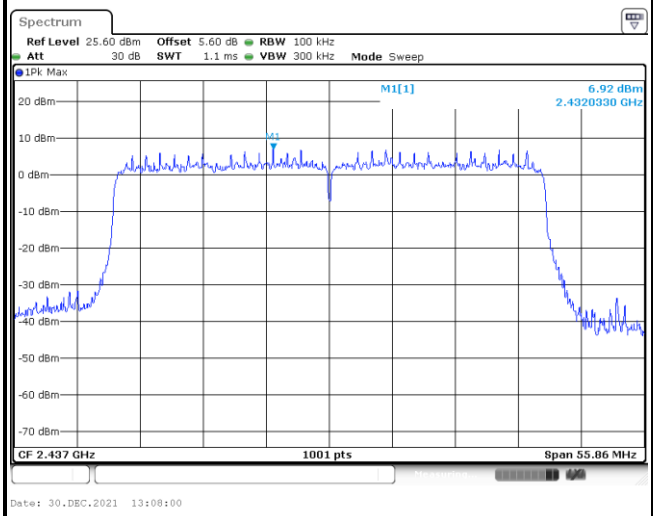
Test Mode :	802.11ax HE40	Test Channel :	04

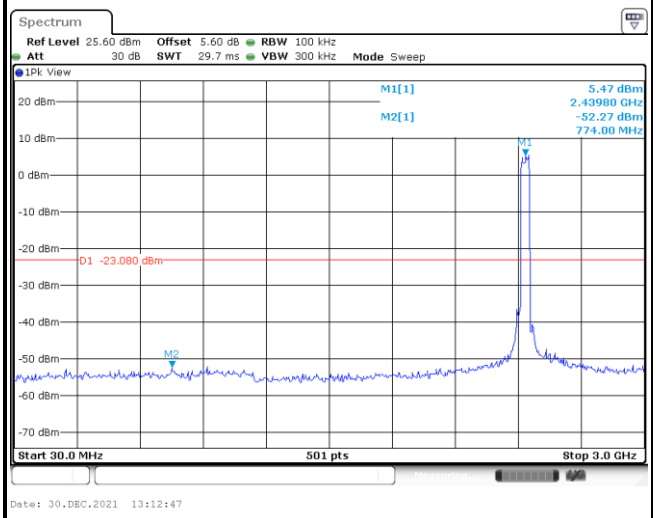
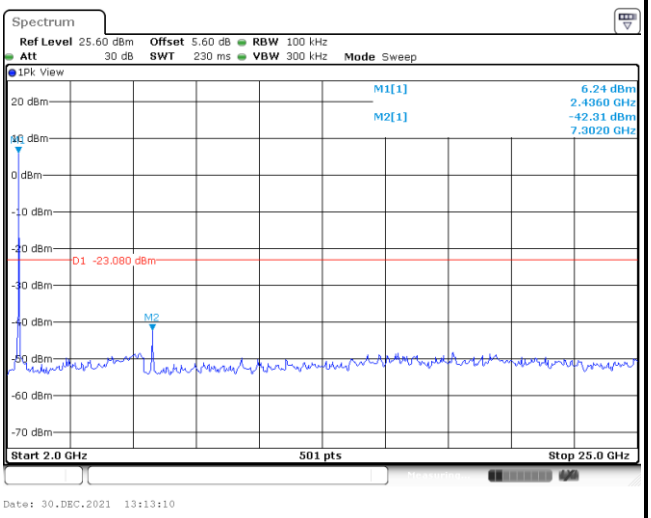
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11ax HE40	Test Channel :	05

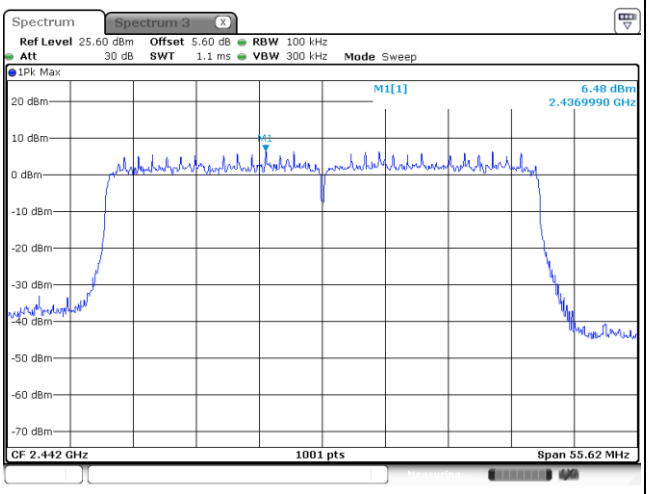
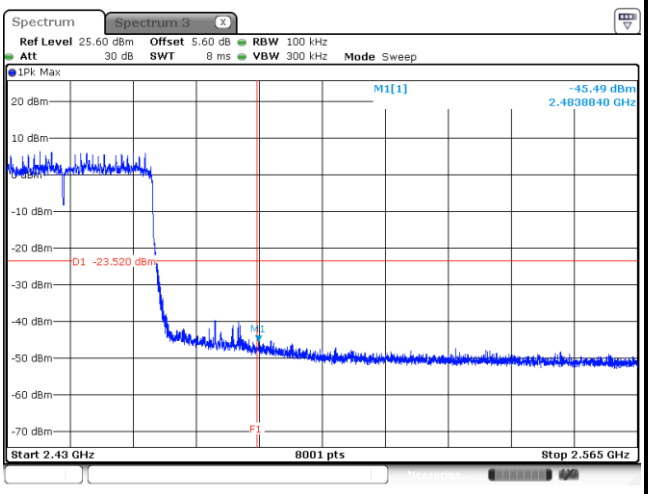
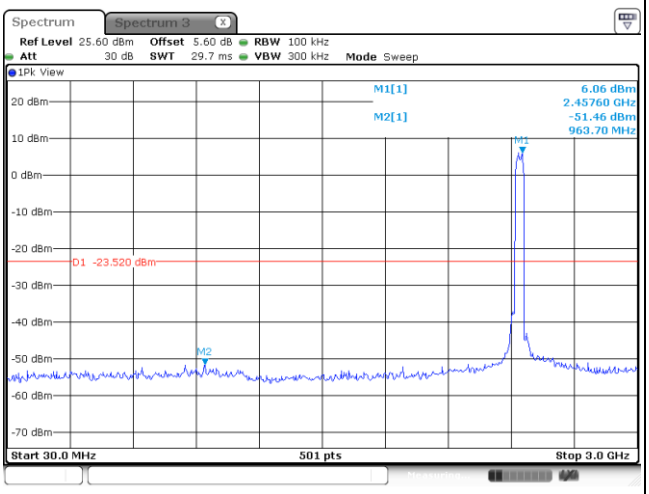
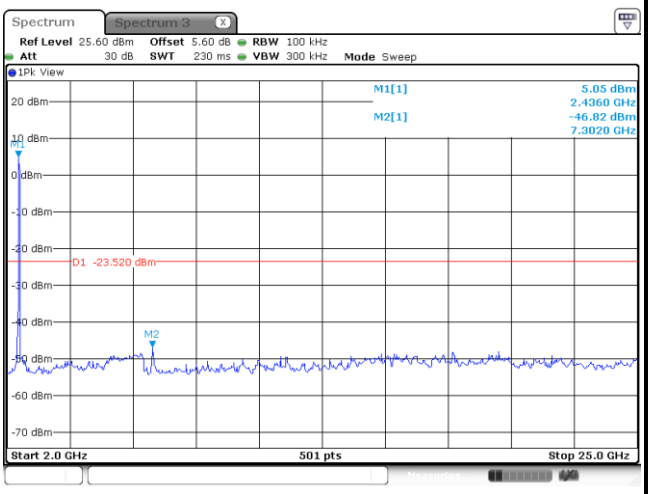
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11ax HE40	Test Channel :	06

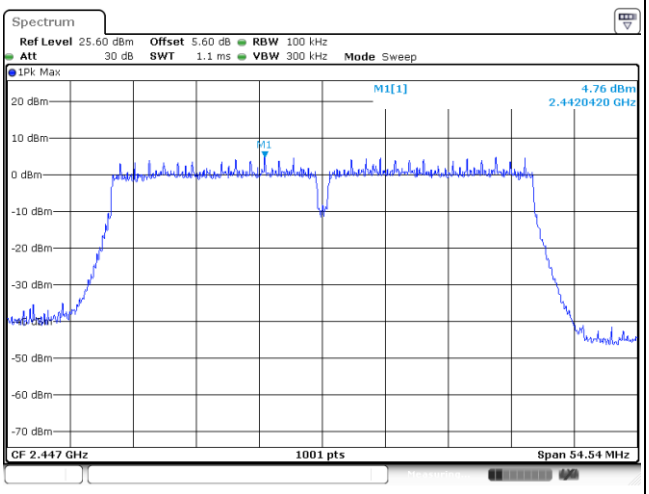
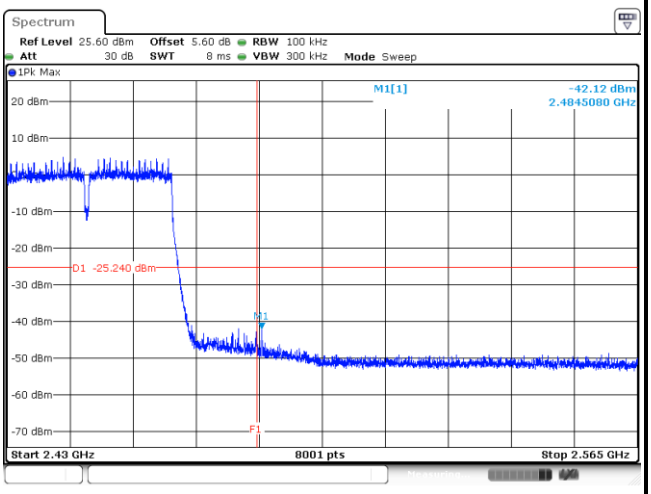
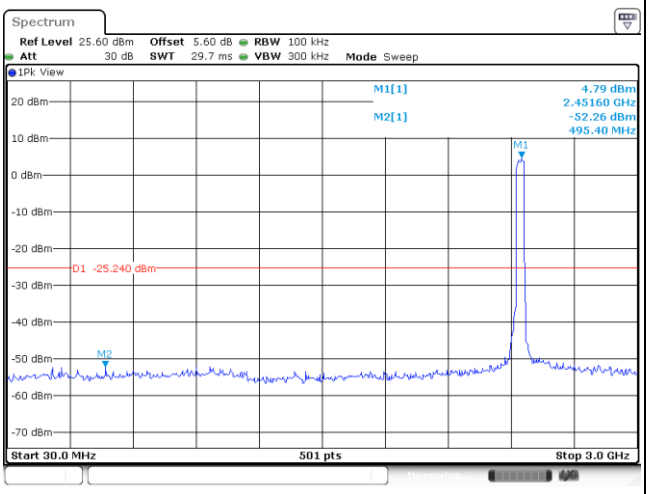
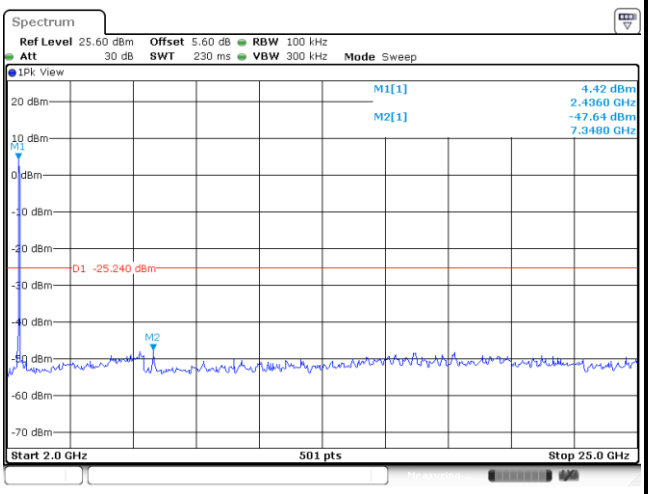
100kHz PSD reference Level	
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

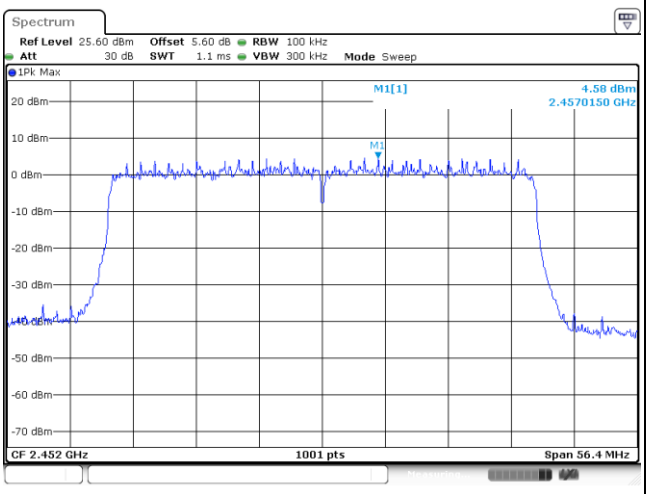
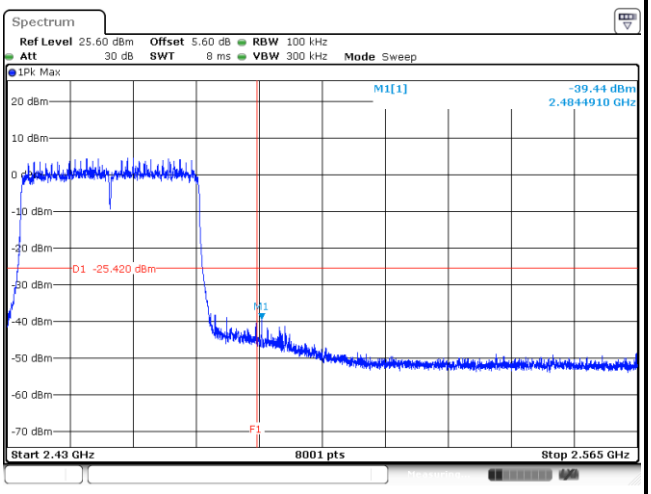
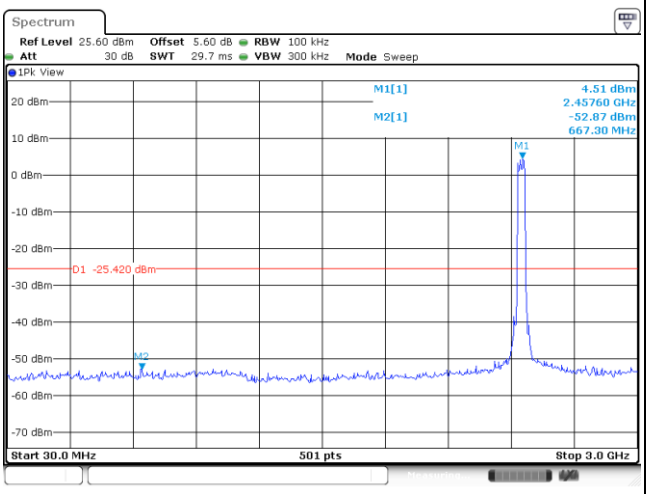
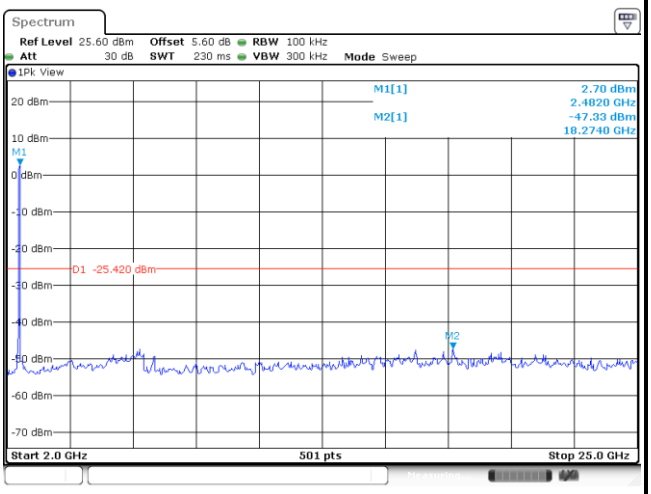
Test Mode :	802.11ax HE40	Test Channel :	07

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11ax HE40	Test Channel :	08

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11ax HE40	Test Channel :	09

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

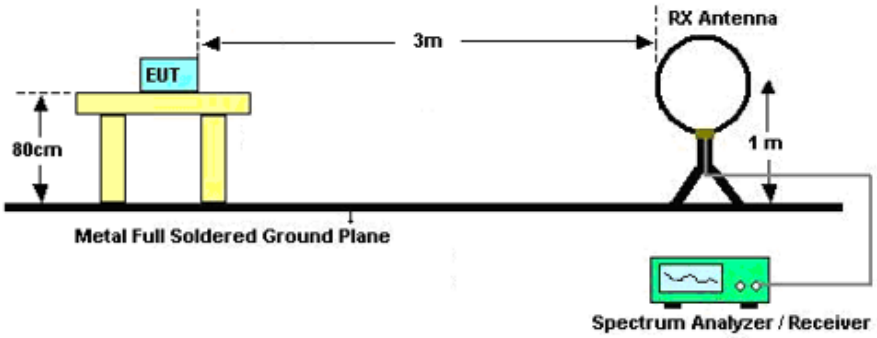
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

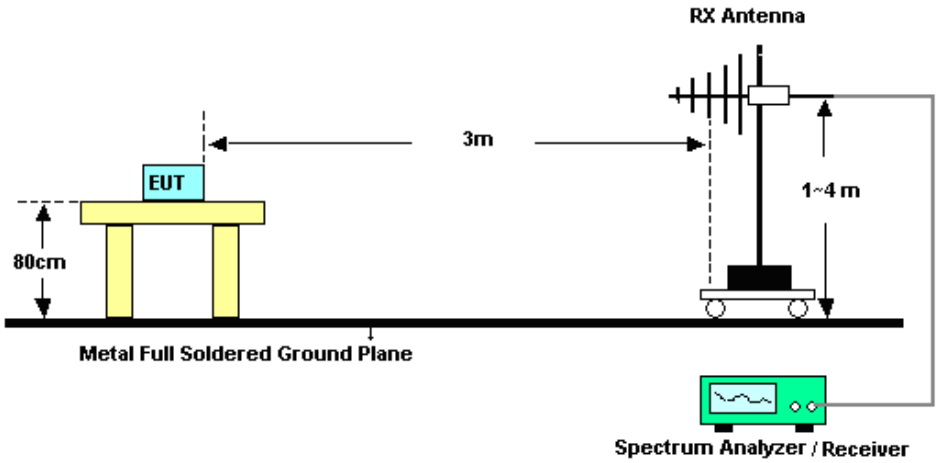
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

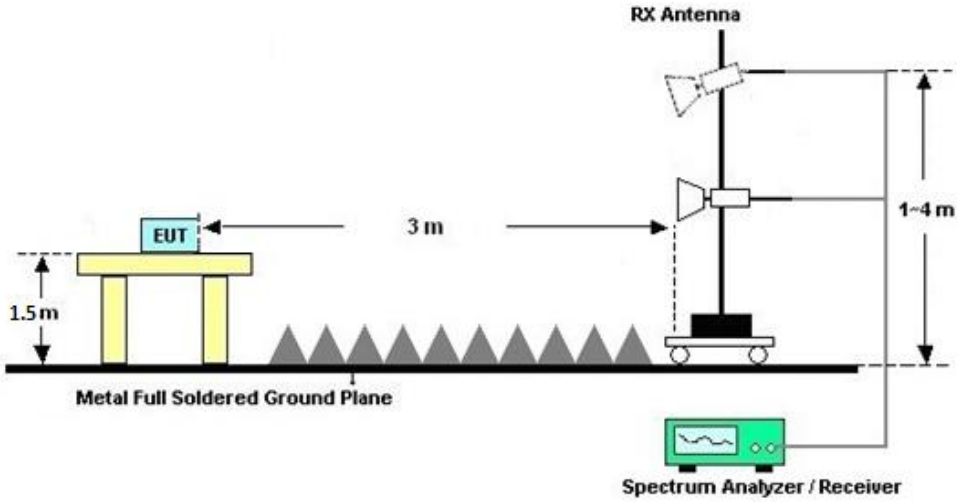
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

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

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

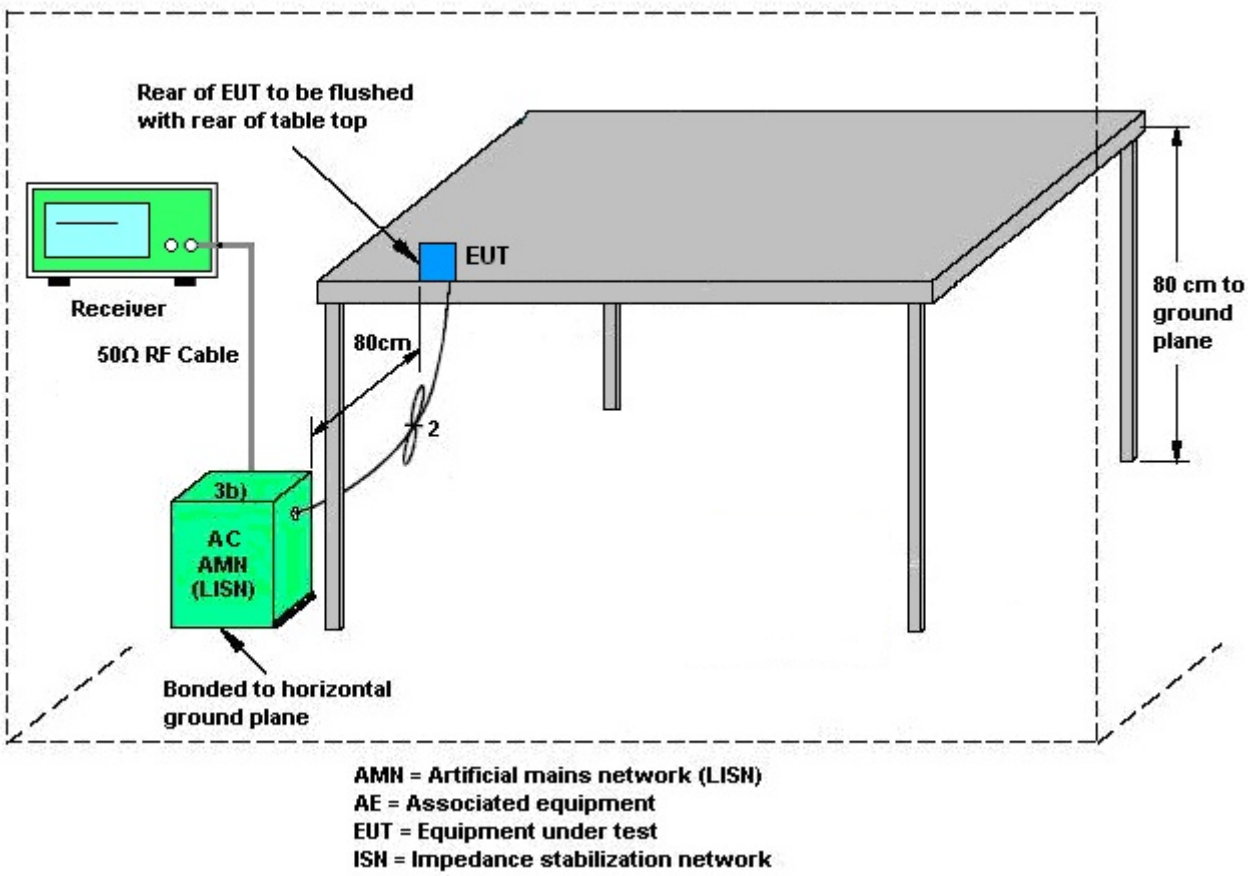
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…) + Array Gain, as following table for Power,

where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

For PSD, the directional gain calculation is following,

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2 / N_{ANT}$] dBi, as following table for PSD.

N_{ANT} = number of transmit antennas

N_{SS} = number of spatial streams. (The worst case directional gain will occur when NSS = 1).

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

<CDD Modes>

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	3.40	3.40	3.40	6.41	0.00	0.41

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 14, 2021	Dec. 29, 2021~ Jan. 02, 2021	Oct. 13, 2022	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 07, 2021	Dec. 29, 2021~ Jan. 02, 2021	Jan. 06, 2022	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 07, 2021	Dec. 29, 2021~ Jan. 02, 2021	Jan. 06, 2022	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 16, 2021	Jan. 05, 2022	Oct. 15, 2022	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr.13, 2021	Jan. 05, 2022	Apr. 12, 2022	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Jan. 05, 2022	Oct. 29, 2022	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jun. 04 ,2021	Jan. 05, 2022	Jun. 03, 2022	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 24, 2021	Jan. 05, 2022	Apr. 23, 2022	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 06, 2021	Jan. 05, 2022	Jan. 05, 2022	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Apr. 12, 2021	Jan. 05, 2022	Apr. 11, 2022	Radiation (03CH05-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 07, 2021	Jan. 05, 2022	Jan. 06, 2022	Radiation (03CH05-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2012228	1Ghz-18Ghz	Oct. 16, 2021	Jan. 05, 2022	Oct. 15, 2022	Radiation (03CH05-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct. 16, 2021	Jan. 05, 2022	Oct. 15, 2022	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 05, 2022	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jan. 05, 2022	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jan. 05, 2022	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 21, 2021	Dec. 20, 2021	Apr. 20, 2022	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 14, 2021	Dec. 20, 2021	Oct. 13, 2022	Conduction (CO01-KS)
AC LISN	R&S	ENV216	100334	9kHz~30MHz	Oct. 14, 2021	Dec. 20, 2021	Oct. 13, 2022	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 14, 2021	Dec. 20, 2021	Oct. 13, 2022	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.94dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

---------- THE END ----------

Appendix A. Conducted Test Results

Report Number : FR1D0112A

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2021/12/29~2022/1/2	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	2	1	2412	11.34	11.29	7.06	7.04	0.50	Pass
11b	1Mbps	2	6	2437	11.24	11.14	7.04	7.06	0.50	Pass
11b	1Mbps	2	11	2462	11.24	11.14	7.06	7.06	0.50	Pass
11g	6Mbps	2	1	2412	17.98	18.28	16.36	16.36	0.50	Pass
11g	6Mbps	2	2	2417	18.43	18.18	16.34	16.34	0.50	Pass
11g	6Mbps	2	3	2422	18.58	18.33	16.34	16.34	0.50	Pass
11g	6Mbps	2	6	2437	19.58	19.18	16.34	16.36	0.50	Pass
11g	6Mbps	2	9	2452	18.58	18.18	16.34	16.36	0.50	Pass
11g	6Mbps	2	10	2457	18.33	17.98	16.34	16.34	0.50	Pass
11g	6Mbps	2	11	2462	18.38	17.93	16.36	16.36	0.50	Pass
HE20	MCS0	2	1	2412	19.68	19.88	19.03	19.00	0.50	Pass
HE20	MCS0	2	2	2417	19.83	19.98	18.98	18.90	0.50	Pass
HE20	MCS0	2	3	2422	19.83	19.98	18.98	18.95	0.50	Pass
HE20	MCS0	2	6	2437	20.33	20.23	18.95	18.98	0.50	Pass
HE20	MCS0	2	9	2452	19.83	19.88	19.00	19.00	0.50	Pass
HE20	MCS0	2	10	2457	19.73	19.88	18.98	18.98	0.50	Pass
HE20	MCS0	2	11	2462	19.63	19.83	19.00	18.83	0.50	Pass
HE40	MCS0	2	3	2422	37.76	37.66	37.68	37.60	0.50	Pass
HE40	MCS0	2	4	2427	37.76	37.66	37.48	37.08	0.50	Pass
HE40	MCS0	2	5	2432	37.66	37.56	37.68	37.32	0.50	Pass
HE40	MCS0	2	6	2437	37.76	37.66	37.60	37.24	0.50	Pass
HE40	MCS0	2	7	2442	37.76	37.56	37.68	37.08	0.50	Pass
HE40	MCS0	2	8	2447	36.76	36.56	36.32	36.36	0.50	Pass
HE40	MCS0	2	9	2452	37.66	37.76	36.96	37.60	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	2	1	2412	26.60	26.77	29.70	30.00		3.40		33.10		36.00		Pass
11b	1Mbps	2	6	2437	26.99	26.88	29.95	30.00		3.40		33.35		36.00		Pass
11b	1Mbps	2	11	2462	26.91	26.98	29.96	30.00		3.40		33.36		36.00		Pass
11g	6Mbps	2	1	2412	20.10	20.12	23.12	30.00		3.40		26.52		36.00		Pass
11g	6Mbps	2	2	2417	22.83	22.73	25.79	30.00		3.40		29.19		36.00		Pass
11g	6Mbps	2	3	2422	24.29	24.26	27.29	30.00		3.40		30.69		36.00		Pass
11g	6Mbps	2	6	2437	26.10	25.95	29.04	30.00		3.40		32.44		36.00		Pass
11g	6Mbps	2	9	2452	23.77	23.78	26.79	30.00		3.40		30.19		36.00		Pass
11g	6Mbps	2	10	2457	21.95	21.96	24.97	30.00		3.40		28.37		36.00		Pass
11g	6Mbps	2	11	2462	20.13	20.17	23.16	30.00		3.40		26.56		36.00		Pass
HT20	MCS0	2	1	2412	18.74	18.70	21.73	30.00		3.40		25.13		36.00		Pass
HT20	MCS0	2	2	2417	21.49	21.37	24.44	30.00		3.40		27.84		36.00		Pass
HT20	MCS0	2	3	2422	23.24	23.26	26.26	30.00		3.40		29.66		36.00		Pass
HT20	MCS0	2	6	2437	25.70	25.67	28.70	30.00		3.40		32.10		36.00		Pass
HT20	MCS0	2	9	2452	22.72	22.74	25.74	30.00		3.40		29.14		36.00		Pass
HT20	MCS0	2	10	2457	21.15	21.32	24.25	30.00		3.40		27.65		36.00		Pass
HT20	MCS0	2	11	2462	18.42	18.35	21.40	30.00		3.40		24.80		36.00		Pass
HT40	MCS0	2	3	2422	17.21	17.25	20.24	30.00		3.40		23.64		36.00		Pass
HT40	MCS0	2	4	2427	17.74	17.79	20.78	30.00		3.40		24.18		36.00		Pass
HT40	MCS0	2	5	2432	19.72	19.75	22.75	30.00		3.40		26.15		36.00		Pass
HT40	MCS0	2	6	2437	20.82	20.68	23.76	30.00		3.40		27.16		36.00		Pass
HT40	MCS0	2	7	2442	20.11	20.05	23.09	30.00		3.40		26.49		36.00		Pass
HT40	MCS0	2	8	2447	18.52	18.49	21.52	30.00		3.40		24.92		36.00		Pass
HT40	MCS0	2	9	2452	18.67	18.61	21.65	30.00		3.40		25.05		36.00		Pass
HE20	MCS0	2	1	2412	18.86	19.05	21.97	30.00		3.40		25.37		36.00		Pass
HE20	MCS0	2	2	2417	21.90	21.79	24.86	30.00		3.40		28.26		36.00		Pass
HE20	MCS0	2	3	2422	23.30	23.27	26.30	30.00		3.40		29.70		36.00		Pass
HE20	MCS0	2	6	2437	25.80	25.70	28.76	30.00		3.40		32.16		36.00		Pass
HE20	MCS0	2	9	2452	22.85	22.76	25.82	30.00		3.40		29.22		36.00		Pass
HE20	MCS0	2	10	2457	21.40	21.66	24.54	30.00		3.40		27.94		36.00		Pass
HE20	MCS0	2	11	2462	18.45	18.57	21.52	30.00		3.40		24.92		36.00		Pass
HE40	MCS0	2	3	2422	17.34	17.38	20.37	30.00		3.40		23.77		36.00		Pass
HE40	MCS0	2	4	2427	17.96	17.90	20.94	30.00		3.40		24.34		36.00		Pass
HE40	MCS0	2	5	2432	19.80	19.82	22.82	30.00		3.40		26.22		36.00		Pass
HE40	MCS0	2	6	2437	20.84	20.79	23.83	30.00		3.40		27.23		36.00		Pass
HE40	MCS0	2	7	2442	20.19	20.05	23.13	30.00		3.40		26.53		36.00		Pass
HE40	MCS0	2	8	2447	18.63	18.55	21.60	30.00		3.40		25.00		36.00		Pass
HE40	MCS0	2	9	2452	18.71	18.69	21.71	30.00		3.40		25.11		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

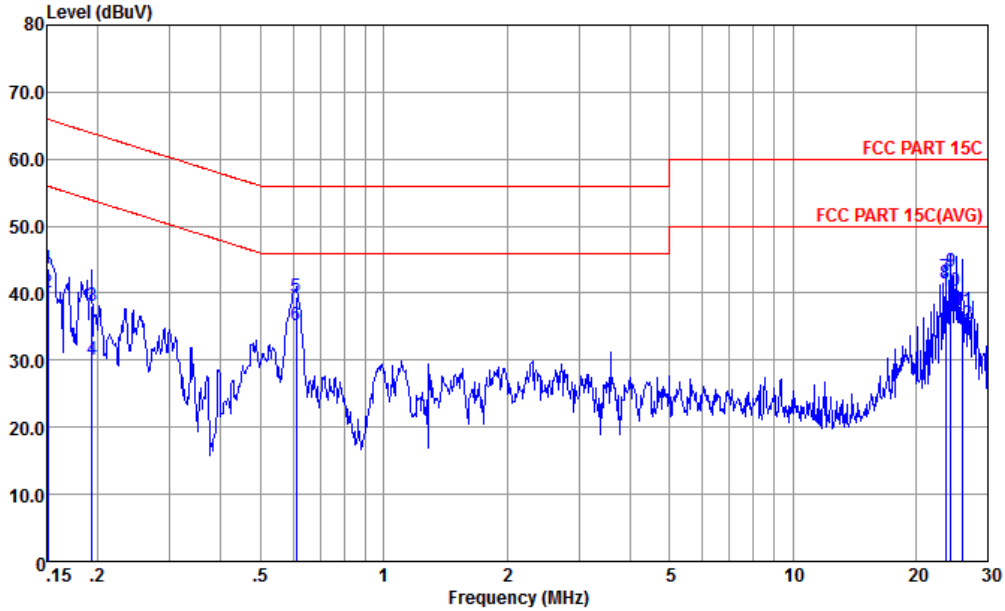
TEST RESULTS DATA
Average Power Spectral Density

2.4GHz Band														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average PSD (dBm/3kHz)			DG (dBi)		Average PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	2	1	2412	0.22	0.22	-3.41	-3.54	-0.40	6.41		7.59		Pass
11b	1Mbps	2	6	2437	0.22	0.22	-3.46	-3.62	-0.45	6.41		7.59		Pass
11b	1Mbps	2	11	2462	0.22	0.22	-3.28	-3.12	-0.11	6.41		7.59		Pass
11g	6Mbps	2	1	2412	0.22	0.21	-13.95	-13.82	-10.81	6.41		7.59		Pass
11g	6Mbps	2	2	2417	0.22	0.21	-11.41	-11.48	-8.40	6.41		7.59		Pass
11g	6Mbps	2	3	2422	0.22	0.21	-9.62	-9.51	-6.50	6.41		7.59		Pass
11g	6Mbps	2	6	2437	0.22	0.21	-7.61	-7.99	-4.60	6.41		7.59		Pass
11g	6Mbps	2	9	2452	0.22	0.21	-9.92	-9.62	-6.61	6.41		7.59		Pass
11g	6Mbps	2	10	2457	0.22	0.21	-12.00	-11.96	-8.95	6.41		7.59		Pass
11g	6Mbps	2	11	2462	0.22	0.21	-13.71	-13.72	-10.70	6.41		7.59		Pass
HE20	MCS0	2	1	2412	0.08	0.08	-15.93	-16.48	-12.92	6.41		7.59		Pass
HE20	MCS0	2	2	2417	0.08	0.08	-13.61	-13.80	-10.60	6.41		7.59		Pass
HE20	MCS0	2	3	2422	0.08	0.08	-11.92	-11.62	-8.61	6.41		7.59		Pass
HE20	MCS0	2	6	2437	0.08	0.08	-9.37	-9.54	-6.36	6.41		7.59		Pass
HE20	MCS0	2	9	2452	0.08	0.08	-12.28	-12.29	-9.27	6.41		7.59		Pass
HE20	MCS0	2	10	2457	0.08	0.08	-13.58	-13.65	-10.57	6.41		7.59		Pass
HE20	MCS0	2	11	2462	0.08	0.08	-16.69	-16.85	-13.68	6.41		7.59		Pass
HE40	MCS0	2	3	2422	0.17	0.17	-21.08	-20.71	-17.70	6.41		7.59		Pass
HE40	MCS0	2	4	2427	0.17	0.17	-20.39	-20.24	-17.23	6.41		7.59		Pass
HE40	MCS0	2	5	2432	0.17	0.17	-18.31	-18.64	-15.30	6.41		7.59		Pass
HE40	MCS0	2	6	2437	0.17	0.17	-17.77	-17.69	-14.68	6.41		7.59		Pass
HE40	MCS0	2	7	2442	0.17	0.17	-17.97	-17.75	-14.74	6.41		7.59		Pass
HE40	MCS0	2	8	2447	0.17	0.17	-18.49	-18.34	-15.33	6.41		7.59		Pass
HE40	MCS0	2	9	2452	0.17	0.17	-19.29	-19.64	-16.28	6.41		7.59		Pass

Measured power density (dBm) has offset with cable loss.

Appendix B. AC Conducted Emission Test Results

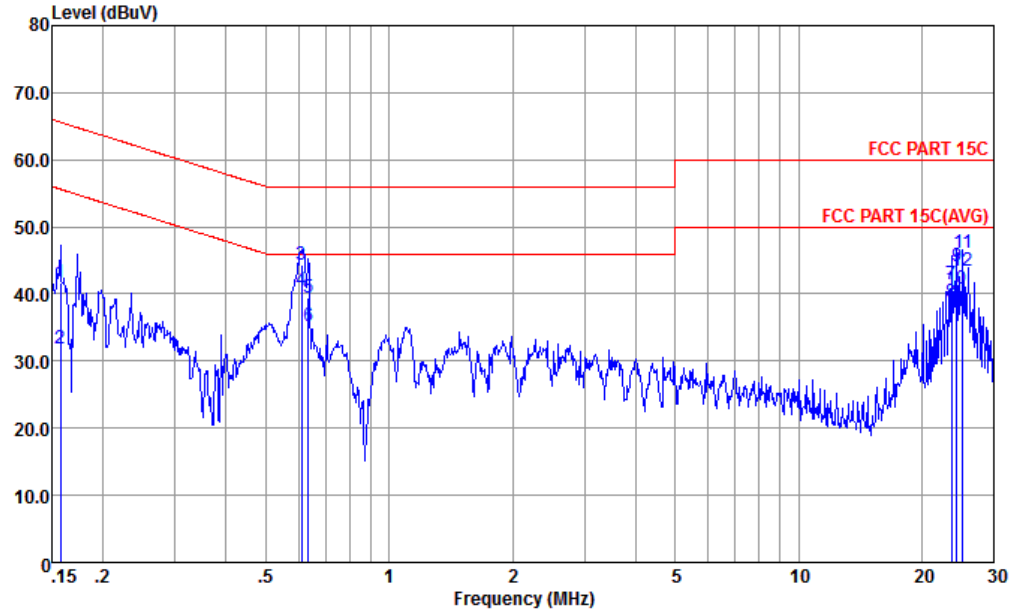
Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC PART 15C LISN-060105-L LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.151	43.70	-22.26	65.96	33.20	0.02	10.48	QP
2		0.151	40.20	-15.76	55.96	29.70	0.02	10.48	Average
3		0.193	38.22	-25.67	63.89	27.80	0.04	10.38	QP
4		0.193	30.02	-23.87	53.89	19.60	0.04	10.38	Average
5		0.611	39.54	-16.46	56.00	29.19	0.11	10.24	QP
6		0.611	35.14	-10.86	46.00	24.79	0.11	10.24	Average
7		23.636	42.27	-17.73	60.00	31.10	0.62	10.55	QP
8	*	23.636	41.37	-8.63	50.00	30.20	0.62	10.55	Average
9		24.400	43.31	-16.69	60.00	32.11	0.64	10.56	QP
10		24.400	40.41	-9.59	50.00	29.21	0.64	10.56	Average
11		26.001	37.37	-22.63	60.00	26.10	0.69	10.58	QP
12		26.001	35.37	-14.63	50.00	24.10	0.69	10.58	Average

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC PART 15C LISN-060105-N NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.157	41.77	-23.83	65.60	31.20	0.11	10.46	QP
2		0.157	31.87	-23.73	55.60	21.30	0.11	10.46	Average
3		0.611	44.45	-11.55	56.00	34.10	0.11	10.24	QP
4	*	0.611	40.55	-5.45	46.00	30.20	0.11	10.24	Average
5		0.634	39.45	-16.55	56.00	29.10	0.11	10.24	QP
6		0.634	35.25	-10.75	46.00	24.90	0.11	10.24	Average
7		23.636	41.50	-18.50	60.00	30.30	0.65	10.55	QP
8		23.636	38.70	-11.30	50.00	27.50	0.65	10.55	Average
9		24.400	44.14	-15.86	60.00	32.91	0.67	10.56	QP
10		24.400	40.74	-9.26	50.00	29.51	0.67	10.56	Average
11		25.188	46.06	-13.94	60.00	34.80	0.69	10.57	QP
12		25.188	43.36	-6.64	50.00	32.10	0.69	10.57	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

Appendix C. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2388.26	59.91	-14.09	74	59.17	30.5	7.1	36.86	244	237	P	H
		2388	49.85	-4.15	54	49.11	30.5	7.1	36.86	244	237	A	H
	*	2412	117.71	-	-	116.86	30.57	7.13	36.85	244	237	P	H
	*	2412	114.53	-	-	113.68	30.57	7.13	36.85	244	237	A	H
		2387.87	63.03	-10.97	74	62.29	30.5	7.1	36.86	107	122	P	V
		2388.13	53.35	-0.65	54	52.61	30.5	7.1	36.86	107	122	A	V
	*	2412	120.71	-	-	119.86	30.57	7.13	36.85	107	122	P	V
	*	2412	117.45	-	-	116.6	30.57	7.13	36.85	107	122	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		4830	40	-34	74	60.52	34.61	10.25	65.38	300	0	P	H
		4830	40.34	-33.66	74	60.86	34.61	10.25	65.38	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 06 2437MHz		2389.69	66.52	-7.48	74	65.78	30.5	7.1	36.86	275	234	P	H
		2389.95	50.01	-3.99	54	49.27	30.5	7.1	36.86	275	234	A	H
		2483.74	65.76	-8.24	74	64.47	30.86	7.25	36.82	275	234	P	H
		2483.5	48.31	-5.69	54	47.02	30.86	7.25	36.82	275	234	A	H
	*	2434	117.44	-	-	116.49	30.64	7.16	36.85	275	234	P	H
	*	2434	109.42	-	-	108.47	30.64	7.16	36.85	275	234	A	H
		2388.52	68.13	-5.87	74	67.39	30.5	7.1	36.86	221	208	P	V
		2389.95	52.39	-1.61	54	51.65	30.5	7.1	36.86	221	208	A	V
		2484.16	70.63	-3.37	74	69.34	30.86	7.25	36.82	221	208	P	V
		2483.68	53.15	-0.85	54	51.86	30.86	7.25	36.82	221	208	A	V
	*	2434	119.02	-	-	118.07	30.64	7.16	36.85	221	208	P	V
	*	2438	110.87	-	-	109.81	30.71	7.19	36.84	221	208	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 06 2437MHz		4875	40.92	-33.08	74	61.36	34.69	10.29	65.42	300	0	P	H
		7311	44.46	-29.54	74	60.97	36.68	12.72	65.91	300	0	P	H
		4875	40.38	-33.62	74	60.82	34.69	10.29	65.42	100	0	P	V
		7311	45.29	-28.71	74	61.8	36.68	12.72	65.91	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11 ax HE40 Full (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2387.48	63.49	-10.51	74	62.75	30.5	7.1	36.86	343	236	P	H
		2387.22	51.38	-2.62	54	50.64	30.5	7.1	36.86	343	236	A	H
	*	2486.2	55.97	-18.03	74	54.68	30.86	7.25	36.82	343	236	P	H
	*	2483.86	43.89	-10.11	54	42.6	30.86	7.25	36.82	343	236	A	H
802.11ax		2432	109.94	-	-	108.99	30.64	7.16	36.85	343	236	P	H
HE40 Full		2430	99.53	-	-	98.58	30.64	7.16	36.85	343	236	A	H
CH 05		2387.61	67.46	-6.54	74	66.72	30.5	7.1	36.86	107	113	P	V
2432MHz		2389.56	53.23	-0.77	54	52.49	30.5	7.1	36.86	107	113	A	V
	*	2487.58	57.78	-16.22	74	56.41	30.93	7.25	36.81	107	113	P	V
	*	2483.62	46.28	-7.72	54	44.99	30.86	7.25	36.82	107	113	A	V
		2418	111.7	-	-	110.82	30.57	7.16	36.85	107	113	P	V
		2416	101.81	-	-	100.93	30.57	7.16	36.85	107	113	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11 ax HE40 Full (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ax		4860	39.7	-34.3	74	60.17	34.66	10.27	65.4	300	0	P	H
HE40 Full		7296	44.13	-29.87	74	60.59	36.68	12.72	65.86	300	0	P	H
CH 05		4864	40.04	-33.96	74	60.51	34.66	10.27	65.4	100	0	P	V
2432MHz		7290	44.38	-29.62	74	60.84	36.68	12.72	65.86	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11b LF		45.52	27.41	-12.59	40	42.45	16.2	0.96	32.2	-	-	P	H
		124.09	24.08	-19.42	43.5	37.18	17.4	1.65	32.15	-	-	P	H
		148.34	25.08	-18.42	43.5	38.29	17.1	1.79	32.1	-	-	P	H
		261.83	23.97	-22.03	46	33.95	20	2.2	32.18	-	-	P	H
		318.09	23.77	-22.23	46	33.98	19.3	2.63	32.14	-	-	P	H
		534.4	32.61	-13.39	46	37.87	23.9	3.17	32.33	-	-	P	H
		45.52	36.3	-3.7	40	51.34	16.2	0.96	32.2	116	234	P	V
		60.07	28.13	-11.87	40	47.36	11.8	1.07	32.1	-	-	P	V
		125.06	26.68	-16.82	43.5	39.67	17.5	1.66	32.15	-	-	P	V
		243.4	20.22	-25.78	46	32.72	17.6	2.09	32.19	-	-	P	V
		521.79	32.73	-13.27	46	38.03	23.9	3.16	32.36	-	-	P	V
		875.84	29	-17	46	27.74	29.18	4.38	32.3	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

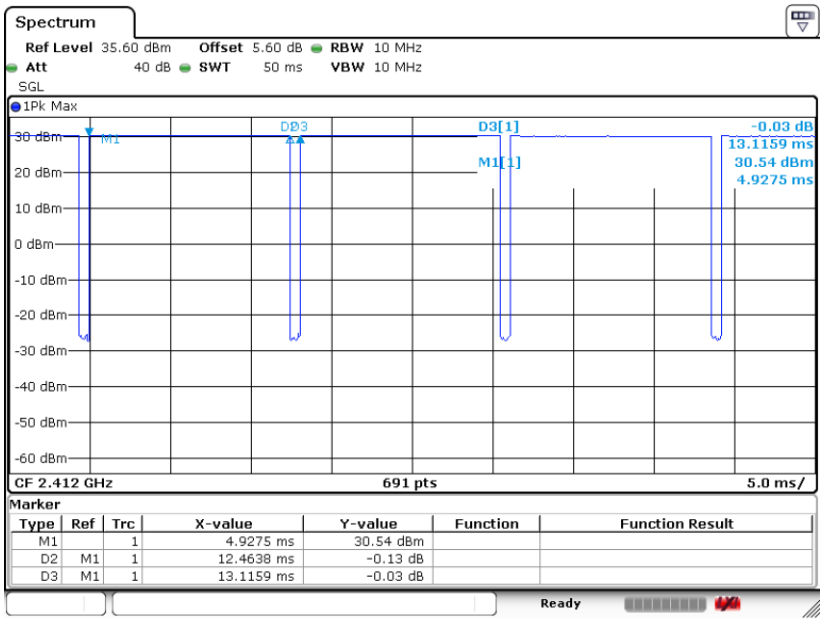
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

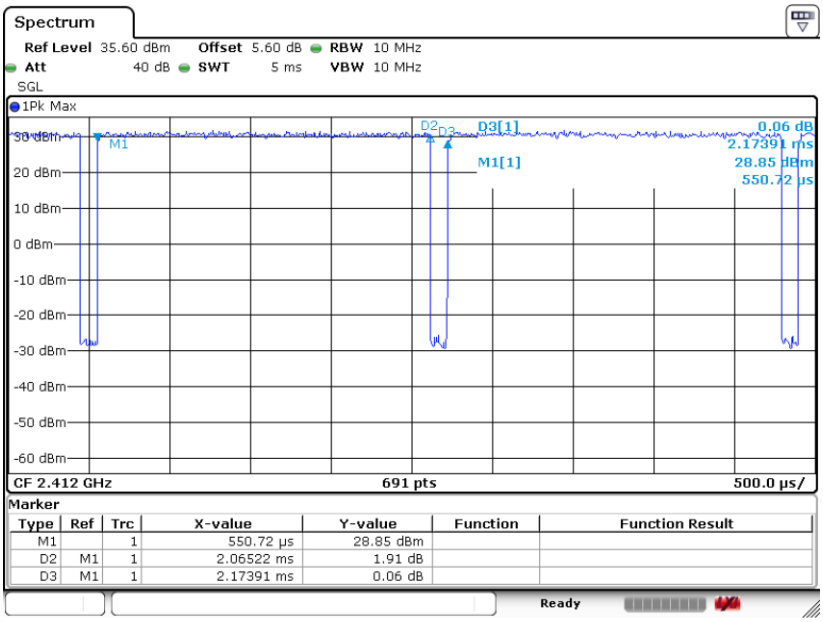
Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1+2	802.11b	95.03	12.464	0.080	0.82kHz
1+2	802.11g	95.00	2.065	0.484	0.51kHz
1+2	802.11ax HE20	98.09	-	-	10Hz
1+2	802.11ax HE40	96.09	0.783	1.278	1.3kHz

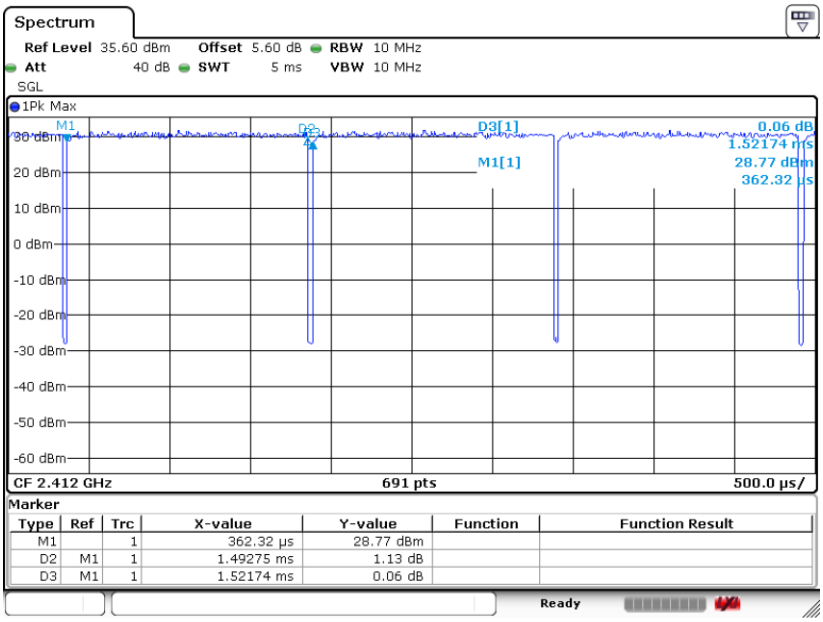
802.11b



802.11g



802.11ax HE20



802.11ax HE40