

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. 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 >

For power measurements on IEEE 802.11 devices,

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows:

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

G_{ANT} is set equal to the gain of the antenna having the highest gain.

For PSD measurements, the directional gain calculation follows F)2)f)ii) of KDB 662911 D01 v02r01.

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

As minimum $N_{SS}=1$ is supported by EUT, the formula can be simplified as:

Directional gain = $10 \cdot \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi

Where $G_1, G_2, \dots, G_N$ denote single antenna gain.

For example: If a device has two antenna, $G_{ANT1}= 3.6$ dBi; $G_{ANT2}=4.2$ dBi

Directional gain of power measurement = $\max(3.6, 4.2) + 0 = 4.2$ dBi

Directional gain of PSD measurement = $10 \cdot \log[(10^{3.6/20} + 10^{4.2/20})^2 / 2] = 6.92$ dBi

<CDD Modes>						
			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 3	Ant. 4	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	2.63	2.15	2.63	5.40	0.00	0.00

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

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

Calculation example:

The DG for PSD is derived from formula is

$$10 \times \log \{ \{ [10^{\frac{2.63 \text{ dBi}}{20}} + 10^{\frac{2.15 \text{ dBi}}{20}}]^2 \} / 2 \}$$

$$= 5.40 \text{ dBi}$$



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 24, 2022	May 21, 2022~Jun. 08, 2022	Apr. 23, 2023	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 03, 2021	May 21, 2022~Jun. 08, 2022	Dec. 02, 2022	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 07, 2022	May 21, 2022~Jun. 08, 2022	Jan. 06, 2023	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 21, 2022	May 21, 2022~Jun. 08, 2022	Apr. 20, 2023	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 04, 2021	May 21, 2022~Jun. 08, 2022	Oct. 03, 2022	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Oct. 04, 2021	May 21, 2022~Jun. 08, 2022	Oct. 03, 2022	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 23, 2021	May 21, 2022~Jun. 08, 2022	Jul. 22, 2022	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Jul. 22, 2021	May 21, 2022~Jun. 08, 2022	Jul. 21, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 23, 2022	May 21, 2022~Jun. 08, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 23, 2022	May 21, 2022~Jun. 08, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 23, 2022	May 21, 2022~Jun. 08, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	Sep. 17, 2021	May 21, 2022~Jun. 08, 2022	Sep. 16, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 23, 2022	May 21, 2022~Jun. 08, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801606/2	9KHz ~ 40GHz	Apr. 14, 2022	May 21, 2022~Jun. 08, 2022	Apr. 13, 2023	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	May 21, 2022~Jun. 08, 2022	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	May 21, 2022~Jun. 08, 2022	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	May 21, 2022~Jun. 08, 2022	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	May 21, 2022~Jun. 08, 2022	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	May 21, 2022~Jun. 08, 2022	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 07, 2022	May 21, 2022~Jun. 08, 2022	Mar. 06, 2023	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 30, 2021	May 21, 2022~Jun. 08, 2022	Nov. 29, 2022	Radiation (03CH07-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Jun. 01, 2022~Jun. 08, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 12 (NO:113)	10MHz~6GHz	Dec. 16, 2021	Jun. 01, 2022~Jun. 08, 2022	Dec. 15, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Jun. 01, 2022~Jun. 08, 2022	Aug. 29, 2022	Conducted (TH05-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 15, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Jun. 15, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Jun. 15, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Jun. 15, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Jun. 15, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-FN	00691	N/A	Jul. 28, 2021	Jun. 15, 2022	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Jun. 15, 2022	Dec. 29, 2022	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.1 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Mina Liu	Temperature:	21~25	°C
Test Date:	2022/6/1~2022/06/08	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
					Ant3	Ant4	Ant3	Ant4		
11b	1Mbps	2	1	2412	13.54	13.69	8.60	8.58	0.50	Pass
11b	1Mbps	2	6	2437	13.09	12.94	8.10	8.09	0.50	Pass
11b	1Mbps	2	11	2462	13.69	13.99	8.12	8.61	0.50	Pass
11g	6Mbps	2	1	2412	16.93	17.28	15.49	15.75	0.50	Pass
11g	6Mbps	2	6	2437	16.83	16.88	15.97	15.73	0.50	Pass
11g	6Mbps	2	11	2462	17.23	17.28	16.09	16.37	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant3	Ant4	SUM	Ant3	Ant4	Ant3	Ant4	Ant3	Ant4	Ant3	Ant4	
11b	1Mbps	2	1	2412	19.00	19.50	22.27	30.00		2.63		24.90		36.00		Pass
11b	1Mbps	2	6	2437	18.70	19.40	22.07	30.00		2.63		24.70		36.00		Pass
11b	1Mbps	2	11	2462	18.40	18.70	21.56	30.00		2.63		24.19		36.00		Pass
11g	6Mbps	2	1	2412	17.00	17.00	20.01	30.00		2.63		22.64		36.00		Pass
11g	6Mbps	2	6	2437	18.10	18.20	21.16	30.00		2.63		23.79		36.00		Pass
11g	6Mbps	2	11	2462	16.90	17.20	20.06	30.00		2.63		22.69		36.00		Pass
HT20	MCS0	2	1	2412	16.70	17.00	19.86	30.00		2.63		22.49		36.00		Pass
HT20	MCS0	2	6	2437	16.80	16.80	19.81	30.00		2.63		22.44		36.00		Pass
HT20	MCS0	2	11	2462	16.30	16.30	19.31	30.00		2.63		21.94		36.00		Pass
HT40	MCS0	2	3	2422	16.60	16.70	19.66	30.00		2.63		22.29		36.00		Pass
HT40	MCS0	2	6	2437	16.50	16.40	19.46	30.00		2.63		22.09		36.00		Pass
HT40	MCS0	2	9	2452	16.90	16.90	19.91	30.00		2.63		22.54		36.00		Pass
VHT20	MCS0	2	1	2412	16.70	17.00	19.86	30.00		2.63		22.49		36.00		Pass
VHT20	MCS0	2	6	2437	16.80	16.80	19.81	30.00		2.63		22.44		36.00		Pass
VHT20	MCS0	2	11	2462	16.30	16.30	19.31	30.00		2.63		21.94		36.00		Pass
VHT40	MCS0	2	3	2422	16.60	16.70	19.66	30.00		2.63		22.29		36.00		Pass
VHT40	MCS0	2	6	2437	16.50	16.40	19.46	30.00		2.63		22.09		36.00		Pass
VHT40	MCS0	2	9	2452	16.90	16.90	19.91	30.00		2.63		22.54		36.00		Pass

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

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant3	Ant4	Worse + 3.01	Ant3	Ant4	Ant3	Ant4	
11b	1Mbps	2	1	2412	-4.18	-4.69	-1.17	5.40		8.00		Pass
11b	1Mbps	2	6	2437	-4.10	-4.80	-1.09	5.40		8.00		Pass
11b	1Mbps	2	11	2462	-4.20	-5.07	-1.19	5.40		8.00		Pass
11g	6Mbps	2	1	2412	-9.09	-9.16	-6.08	5.40		8.00		Pass
11g	6Mbps	2	6	2437	-8.20	-8.21	-5.19	5.40		8.00		Pass
11g	6Mbps	2	11	2462	-9.15	-9.11	-6.10	5.40		8.00		Pass

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

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO											
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
						Ant3	Ant4	Ant3	Ant4		
HE20	MCS0	2	1	2412	Full	19.33	19.53	17.82	16.99	0.50	Pass
HE20	MCS0	2	6	2437	Full	19.18	19.13	17.82	17.22	0.50	Pass
HE20	MCS0	2	11	2462	Full	19.43	19.53	18.75	18.62	0.50	Pass
HE40	MCS0	2	3	2422	Full	37.96	38.06	38.02	37.94	0.50	Pass
HE40	MCS0	2	6	2437	Full	37.46	37.56	35.14	33.90	0.50	Pass
HE40	MCS0	2	9	2452	Full	37.96	37.86	37.30	37.34	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant3	Ant4	SUM	Ant3	Ant4	Ant3	Ant4	Ant3	Ant4	Ant3	Ant4	
HE20	MCS0	2	1	2412	Full	16.80	17.10	19.96	30.00		2.63		22.59		36.00		Pass
HE20	MCS0	2	6	2437	Full	16.90	16.90	19.91	30.00		2.63		22.54		36.00		Pass
HE20	MCS0	2	11	2462	Full	16.40	16.40	19.41	30.00		2.63		22.04		36.00		Pass
HE40	MCS0	2	3	2422	Full	16.70	16.80	19.76	30.00		2.63		22.39		36.00		Pass
HE40	MCS0	2	6	2437	Full	16.60	16.50	19.56	30.00		2.63		22.19		36.00		Pass
HE40	MCS0	2	9	2452	Full	17.00	17.00	20.01	30.00		2.63		22.64		36.00		Pass

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

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO													
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
						Ant3	Ant4	Worse + 3.01	Ant3	Ant4	Ant3	Ant4	
HE20	MCS0	2	1	2412	Full	-9.04	-9.22	-6.03	5.40		8.00		Pass
HE20	MCS0	2	6	2437	Full	-9.19	-9.10	-6.09	5.40		8.00		Pass
HE20	MCS0	2	11	2462	Full	-9.56	-9.72	-6.55	5.40		8.00		Pass
HE40	MCS0	2	3	2422	Full	-12.24	-12.27	-9.23	5.40		8.00		Pass
HE40	MCS0	2	6	2437	Full	-12.28	-12.42	-9.27	5.40		8.00		Pass
HE40	MCS0	2	9	2452	Full	-12.34	-12.29	-9.28	5.40		8.00		Pass

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



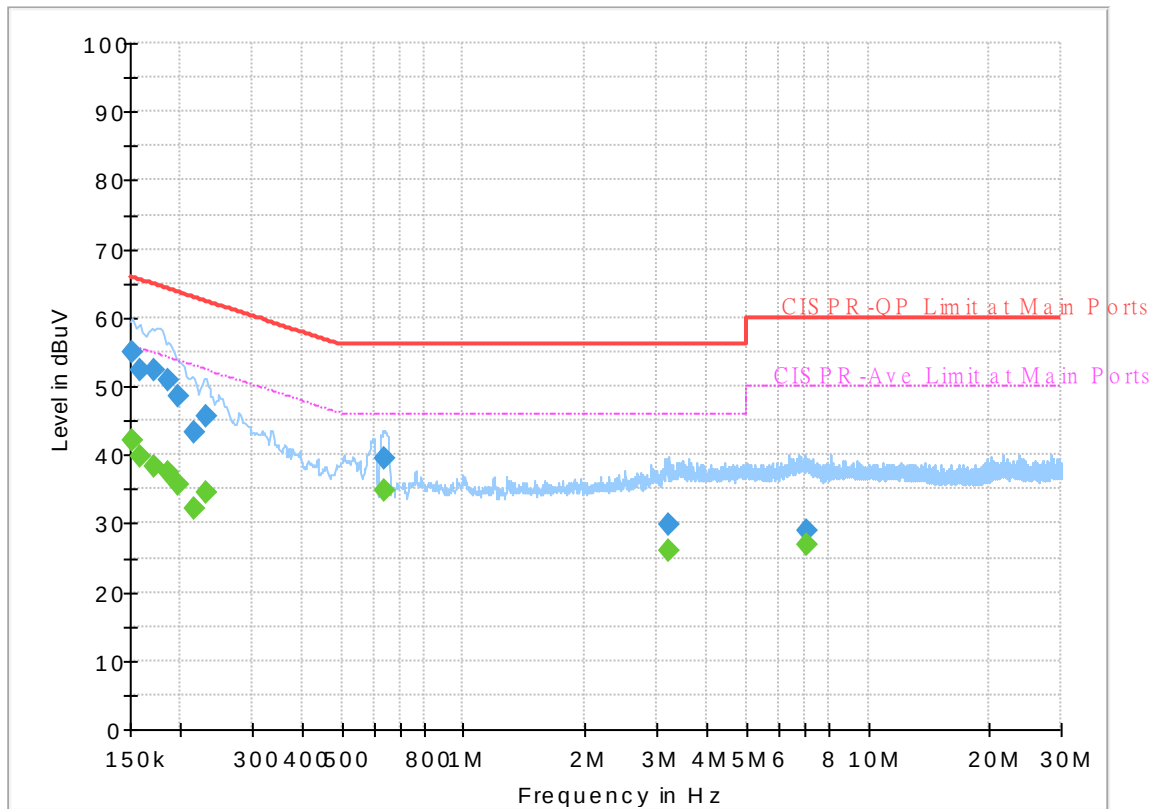
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calivn Wang	Temperature :	23~26℃
		Relative Humidity :	45~55%

EUT Information

Report NO : 190614-04
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



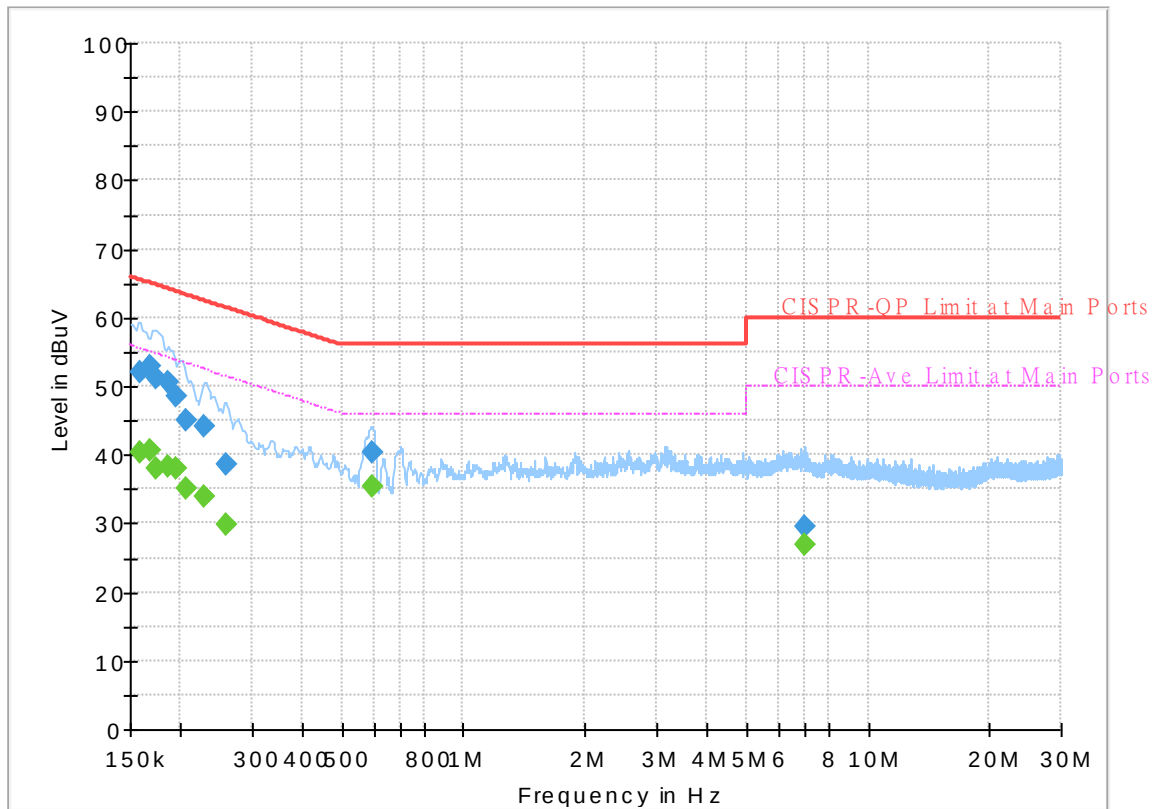
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	42.22	55.88	13.66	L1	OFF	19.6
0.152250	55.02	---	65.88	10.86	L1	OFF	19.6
0.159000	---	39.89	55.52	15.63	L1	OFF	19.6
0.159000	52.24	---	65.52	13.28	L1	OFF	19.6
0.172500	---	38.30	54.84	16.54	L1	OFF	19.6
0.172500	52.21	---	64.84	12.63	L1	OFF	19.6
0.186000	---	37.51	54.21	16.70	L1	OFF	19.6
0.186000	50.81	---	64.21	13.40	L1	OFF	19.6
0.197250	---	35.65	53.73	18.08	L1	OFF	19.6
0.197250	48.55	---	63.73	15.18	L1	OFF	19.6
0.215250	---	32.24	53.00	20.76	L1	OFF	19.6
0.215250	43.24	---	63.00	19.76	L1	OFF	19.6
0.231000	---	34.63	52.41	17.78	L1	OFF	19.6
0.231000	45.68	---	62.41	16.73	L1	OFF	19.6
0.638250	---	34.93	46.00	11.07	L1	OFF	19.6
0.638250	39.35	---	56.00	16.65	L1	OFF	19.6
3.230250	---	26.14	46.00	19.86	L1	OFF	19.8
3.230250	29.73	---	56.00	26.27	L1	OFF	19.8
7.035000	---	26.79	50.00	23.21	L1	OFF	19.9
7.035000	28.92	---	60.00	31.08	L1	OFF	19.9

EUT Information

Report NO : 190614-04
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.159000	---	40.41	55.52	15.11	N	OFF	19.6
0.159000	52.07	---	65.52	13.45	N	OFF	19.6
0.168000	---	40.75	55.06	14.31	N	OFF	19.6
0.168000	53.02	---	65.06	12.04	N	OFF	19.6
0.174750	---	37.96	54.73	16.77	N	OFF	19.6
0.174750	51.14	---	64.73	13.59	N	OFF	19.6
0.186000	---	38.36	54.21	15.85	N	OFF	19.6
0.186000	50.52	---	64.21	13.69	N	OFF	19.6
0.195000	---	37.96	53.82	15.86	N	OFF	19.6
0.195000	48.55	---	63.82	15.27	N	OFF	19.6
0.206250	---	35.01	53.36	18.35	N	OFF	19.6
0.206250	44.98	---	63.36	18.38	N	OFF	19.6
0.228750	---	33.90	52.50	18.60	N	OFF	19.6
0.228750	44.22	---	62.50	18.28	N	OFF	19.6
0.258000	---	29.89	51.50	21.61	N	OFF	19.6
0.258000	38.48	---	61.50	23.02	N	OFF	19.6
0.595500	---	35.39	46.00	10.61	N	OFF	19.6
0.595500	40.43	---	56.00	15.57	N	OFF	19.6
6.958500	---	27.05	50.00	22.95	N	OFF	19.9
6.958500	29.55	---	60.00	30.45	N	OFF	19.9



Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	22~28.1°C
		Relative Humidity :	53.3~67.5%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2351.37	53.7	-20.3	74	39.36	31.4	18.34	35.4	345	0	P	H
		2390	43.09	-10.91	54	28.66	31.4	18.45	35.42	345	0	A	H
	*	2412	112.23	-	-	97.65	31.5	18.5	35.42	345	0	P	H
	*	2412	108.91	-	-	94.33	31.5	18.5	35.42	345	0	A	H
													H
													H
		2345.49	54.04	-19.96	74	39.71	31.42	18.31	35.4	371	33	P	V
		2390	43	-11	54	28.57	31.4	18.45	35.42	371	33	A	V
	*	2412	110.02	-	-	95.44	31.5	18.5	35.42	371	33	P	V
	*	2412	107.01	-	-	92.43	31.5	18.5	35.42	371	33	A	V
													V
													V
802.11b CH 06 2437MHz		2317.28	54.5	-19.5	74	40.13	31.53	18.23	35.39	336	209	P	H
		2387.98	42.81	-11.19	54	28.38	31.4	18.44	35.41	336	209	A	H
	*	2437	111.24	-	-	96.44	31.7	18.53	35.43	336	209	P	H
	*	2437	108.02	-	-	93.22	31.7	18.53	35.43	336	209	A	H
		2490.76	54.05	-19.95	74	38.76	32.13	18.61	35.45	336	209	P	H
		2500	43.78	-10.22	54	28.42	32.2	18.62	35.46	336	209	A	H
		2384.62	53.75	-20.25	74	39.33	31.4	18.43	35.41	100	106	P	V
		2389.52	42.81	-11.19	54	28.37	31.4	18.45	35.41	100	106	A	V
	*	2437	111.25	-	-	96.45	31.7	18.53	35.43	100	106	P	V
	*	2437	108.17	-	-	93.37	31.7	18.53	35.43	100	106	A	V
		2485.44	54.36	-19.64	74	39.12	32.08	18.61	35.45	100	106	P	V
		2499.37	43.77	-10.23	54	28.41	32.19	18.63	35.46	100	106	A	V



802.11b CH 11 2462MHz	*	2462	110.57	-	-	95.54	31.9	18.57	35.44	374	341	P	H
	*	2462	107.41	-	-	92.38	31.9	18.57	35.44	374	341	A	H
		2491.04	54.56	-19.44	74	39.27	32.13	18.61	35.45	374	341	P	H
		2499.36	43.79	-10.21	54	28.43	32.19	18.63	35.46	374	341	A	H
													H
													H
	*	2462	111.86	-	-	96.83	31.9	18.57	35.44	108	106	P	V
	*	2462	108.89	-	-	93.86	31.9	18.57	35.44	108	106	A	V
		2491.92	54.3	-19.7	74	39.01	32.14	18.61	35.46	108	106	P	V
		2484.76	43.9	-10.1	54	28.66	32.08	18.61	35.45	108	106	A	V
													V
													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. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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)
802.11b CH 01 2412MHz		4824	43	-31	74	55.18	34.05	12.73	58.96	-	-	P	H
													H
													H
													H
		4824	41.97	-32.03	74	54.15	34.05	12.73	58.96	-	-	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	42.15	-31.85	74	54.22	34.05	12.75	58.87	-	-	P	H
		7311	43.17	-30.83	74	49.99	35.64	15.04	57.5	-	-	P	H
													H
													H
		4874	42.67	-31.33	74	54.74	34.05	12.75	58.87	-	-	P	V
		7311	42.41	-31.59	74	49.23	35.64	15.04	57.5	-	-	P	V
													V
													V
802.11b CH 11 2462MHz		4924	42.54	-31.46	74	54.48	34.05	12.79	58.78	-	-	P	H
		7386	41.31	-32.69	74	47.99	35.87	15	57.55	-	-	P	H
													H
													H
		4924	41.98	-32.02	74	53.92	34.05	12.79	58.78	-	-	P	V
		7386	42.25	-31.75	74	48.93	35.87	15	57.55	-	-	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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 01 2412MHz		2389.38	62.75	-11.25	74	48.31	31.4	18.45	35.41	100	205	P	H
		2390	51.65	-2.35	54	37.22	31.4	18.45	35.42	100	205	A	H
	*	2412	109.75	-	-	95.17	31.5	18.5	35.42	100	205	P	H
	*	2412	102.53	-	-	87.95	31.5	18.5	35.42	100	205	A	H
													H
													H
		2390	61.95	-12.05	74	47.52	31.4	18.45	35.42	227	26	P	V
		2390	51.04	-2.96	54	36.61	31.4	18.45	35.42	227	26	A	V
	*	2412	110.33	-	-	95.75	31.5	18.5	35.42	227	26	P	V
	*	2412	102.79	-	-	88.21	31.5	18.5	35.42	227	26	A	V
													V
													V
802.11g CH 11 2462MHz	*	2462	109.54	-	-	94.51	31.9	18.57	35.44	100	154	P	H
	*	2462	102.86	-	-	87.83	31.9	18.57	35.44	100	154	A	H
		2483.72	63.84	-10.16	74	48.62	32.07	18.6	35.45	100	154	P	H
		2484.16	52.61	-1.39	54	37.38	32.07	18.61	35.45	100	154	A	H
													H
													H
	*	2462	112.32	-	-	97.29	31.9	18.57	35.44	348	39	P	V
	*	2462	105.38	-	-	90.35	31.9	18.57	35.44	348	39	A	V
		2483.92	64.43	-9.57	74	49.21	32.07	18.6	35.45	301	39	P	V
		2483.88	52.6	-1.4	54	37.38	32.07	18.6	35.45	301	39	A	V
													V
													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. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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		4874	41.8	-32.2	74	53.87	34.05	12.75	58.87	-	-	P	H
		7311	42.92	-31.08	74	49.74	35.64	15.04	57.5	-	-	P	H
													H
													H
		4874	42.66	-31.34	74	54.73	34.05	12.75	58.87	-	-	P	V
		7311	41.88	-32.12	74	48.7	35.64	15.04	57.5	-	-	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												



2.4GHz 2400~2483.5MHz

WIFI 802.11ax HE20 Full (Band Edge @ 3m)

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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 HE20 Full CH 01 2412MHz		2389.59	62.56	-11.44	74	48.12	31.4	18.45	35.41	108	202	P	H
		2390	50.18	-3.82	54	35.75	31.4	18.45	35.42	108	202	A	H
	*	2412	113.61	-	-	99.03	31.5	18.5	35.42	108	202	P	H
	*	2412	104.09	-	-	89.51	31.5	18.5	35.42	108	202	A	H
													H
													H
		2389.59	62.62	-11.38	74	48.18	31.4	18.45	35.41	371	30	P	V
		2390	50.46	-3.54	54	36.03	31.4	18.45	35.42	371	30	A	V
	*	2412	112.33	-	-	97.75	31.5	18.5	35.42	371	30	P	V
	*	2412	103.58	-	-	89	31.5	18.5	35.42	371	30	A	V
													V
													V
802.11ax HE20 Full CH 11 2462MHz	*	2462	113.86	-	-	98.83	31.9	18.57	35.44	100	201	P	H
	*	2462	103.8	-	-	88.77	31.9	18.57	35.44	100	201	A	H
		2485.2	60.14	-13.86	74	44.9	32.08	18.61	35.45	100	201	P	H
		2483.52	48.24	-5.76	54	33.02	32.07	18.6	35.45	100	201	A	H
													H
													H
	*	2462	112.94	-	-	97.91	31.9	18.57	35.44	358	45	P	V
	*	2462	104.4	-	-	89.37	31.9	18.57	35.44	358	45	A	V
		2484	64.83	-9.17	74	49.61	32.07	18.6	35.45	123	114	P	V
		2483.52	52.13	-1.87	54	36.91	32.07	18.6	35.45	123	114	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz****WIFI 802.11ax HE20 Full (Harmonic @ 3m)**

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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 HE20 Full CH 06 2437MHz		4874	41.97	-32.03	74	54.04	34.05	12.75	58.87	-	-	P	H
		7311	41.9	-32.1	74	48.72	35.64	15.04	57.5	-	-	P	H
													H
													H
		4874	41.13	-32.87	74	53.2	34.05	12.75	58.87	-	-	P	V
		7311	42.14	-31.86	74	48.96	35.64	15.04	57.5	-	-	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												



2.4GHz 2400~2483.5MHz

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

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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 HE40 Full CH 03 2422MHz		2389.52	65.56	-8.44	74	51.12	31.4	18.45	35.41	100	203	P	H
		2389.94	51.5	-2.5	54	37.07	31.4	18.45	35.42	100	203	A	H
	*	2422	110.01	-	-	95.35	31.58	18.51	35.43	100	203	P	H
	*	2422	100.8	-	-	86.14	31.58	18.51	35.43	100	203	A	H
		2499.51	55.57	-18.43	74	40.2	32.2	18.63	35.46	100	203	P	H
		2484.67	44.56	-9.44	54	29.32	32.08	18.61	35.45	100	203	A	H
		2388.54	62.1	-11.9	74	47.67	31.4	18.44	35.41	375	28	P	V
		2389.94	51.3	-2.7	54	36.87	31.4	18.45	35.42	375	28	A	V
	*	2422	107.25	-	-	92.59	31.58	18.51	35.43	375	28	P	V
	*	2422	98.36	-	-	83.7	31.58	18.51	35.43	375	28	A	V
		2492.16	54.24	-19.76	74	38.95	32.14	18.61	35.46	375	28	P	V
		2486	43.99	-10.01	54	28.74	32.09	18.61	35.45	375	28	A	V
802.11ax HE40 Full CH 09 2452MHz		2355.92	53.4	-20.6	74	39.05	31.4	18.35	35.4	100	154	P	H
		2389.94	43.19	-10.81	54	28.76	31.4	18.45	35.42	100	154	A	H
	*	2452	110.12	-	-	95.19	31.82	18.55	35.44	100	154	P	H
	*	2452	100.54	-	-	85.61	31.82	18.55	35.44	100	154	A	H
		2483.9	67.39	-6.61	74	52.17	32.07	18.6	35.45	100	154	P	H
		2484.39	50.42	-3.58	54	35.18	32.08	18.61	35.45	100	154	A	H
		2318.68	53.66	-20.34	74	39.29	31.53	18.23	35.39	100	104	P	V
		2389.1	43.02	-10.98	54	28.59	31.4	18.44	35.41	100	104	A	V
	*	2452	111.32	-	-	96.39	31.82	18.55	35.44	100	104	P	V
	*	2452	102	-	-	87.07	31.82	18.55	35.44	100	104	A	V
		2483.55	68.4	-5.6	74	53.18	32.07	18.6	35.45	100	104	P	V
		2483.5	53.23	-0.77	54	38.01	32.07	18.6	35.45	100	104	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz
2.4GHz WIFI 802.11ax HE40 (LF)

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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)
2.4GHz 802.11ax HE40 LF		50.79	29.49	-10.51	40	44.42	13.95	1.15	30.03	-	-	P	H
		98.04	34.6	-8.9	43.5	47.07	15.75	1.77	29.99	-	-	P	H
		145.02	24.18	-19.32	43.5	34.7	17.28	2.08	29.88	-	-	P	H
		897.1	32.2	-13.8	46	26.96	28.62	5.44	28.82	-	-	P	H
		930	32.57	-13.43	46	26.58	29.19	5.51	28.71	-	-	P	H
		951	33.95	-12.05	46	26.69	30.36	5.55	28.65	-	-	P	H
		30	31.02	-8.98	40	35.55	24.57	1.01	30.11	-	-	P	V
		51.6	32.67	-7.33	40	47.97	13.56	1.17	30.03	-	-	P	V
		94.26	33.95	-9.55	43.5	46.97	15.25	1.72	29.99	-	-	P	V
		746.6	33.89	-12.11	46	31	27.55	4.78	29.44	-	-	P	V
		889.4	32.5	-13.5	46	27.29	28.68	5.39	28.86	-	-	P	V
		955.9	34.03	-11.97	46	26.5	30.59	5.57	28.63	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.												



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	Peak or Average
H/V	Horizontal or Vertical



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

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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”.



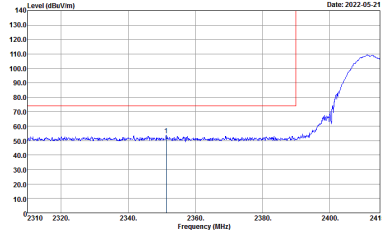
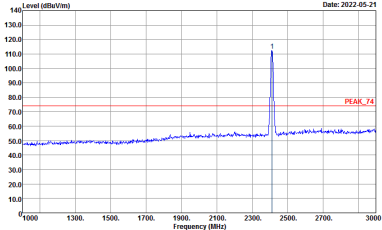
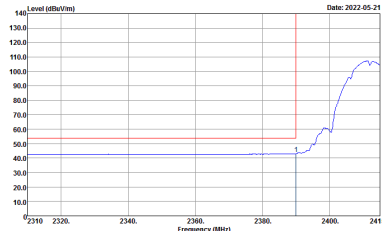
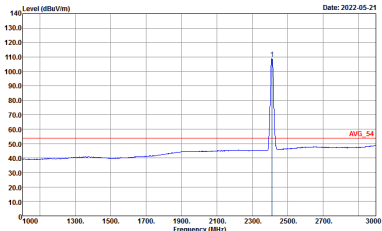
Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	22~28.1°C
		Relative Humidity :	53.3~67.5%

Note symbol

-L	Low channel location
-R	High channel location

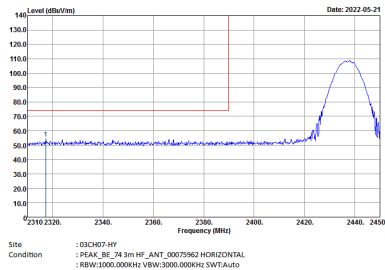
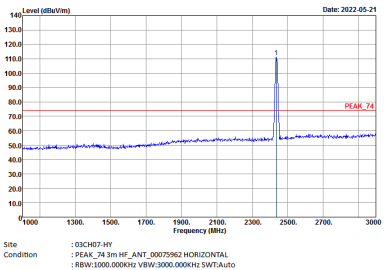
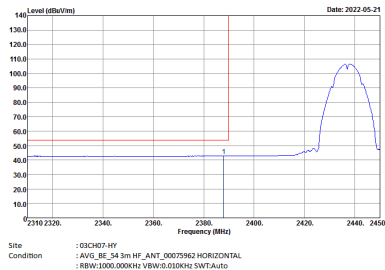
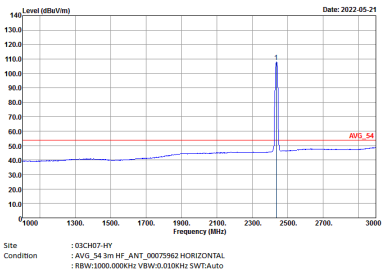
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : PEAK_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

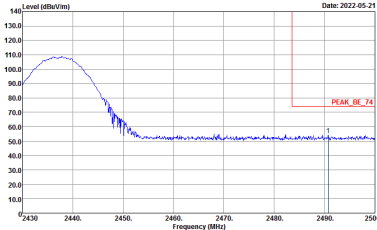
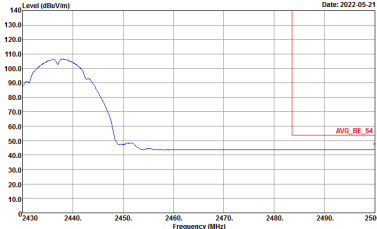


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
3+4	Vertical	Fundamental
Peak		
Avg.		



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_RE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : : AVG_RE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

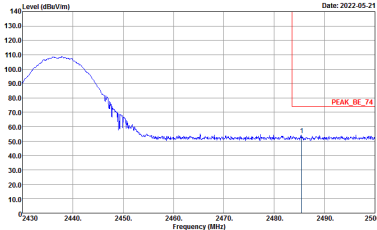
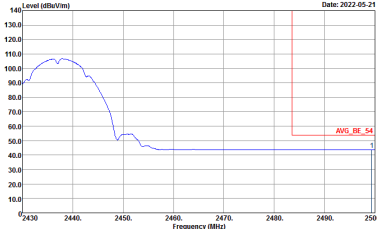


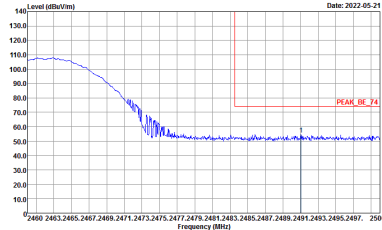
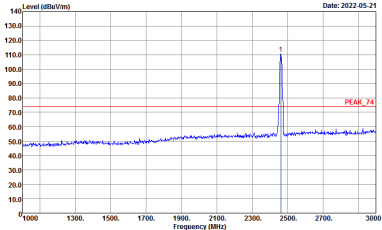
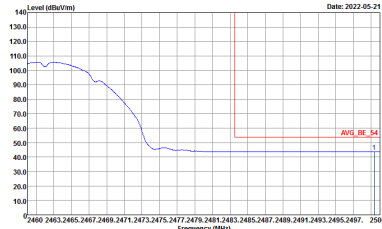
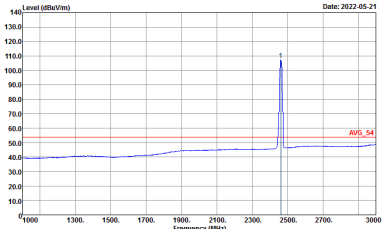
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PSKAIK_BE_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWTAuto	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWTAuto	Left blank



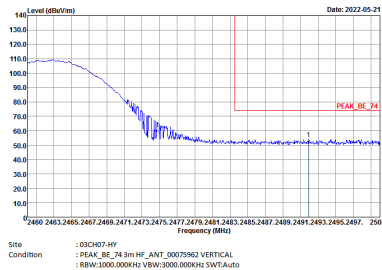
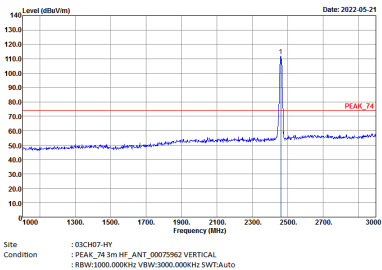
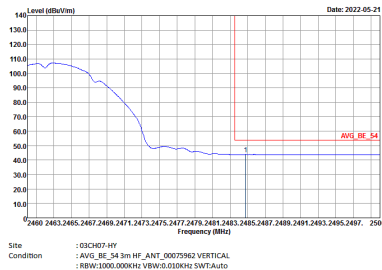
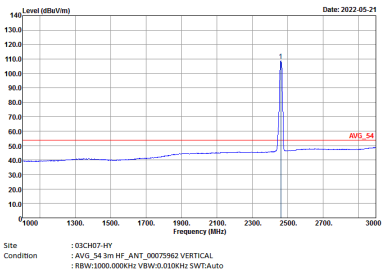
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
3+4	Vertical	Fundamental
Peak		
Avg.		



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PSKAIK_BE_74.3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54.3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:3.010kHz SWT:Auto	Left blank

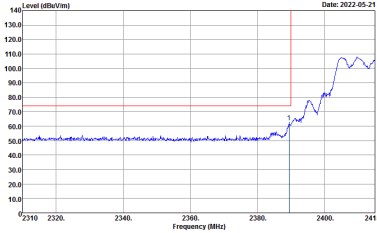
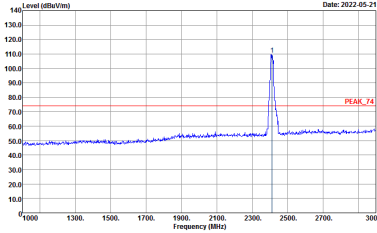
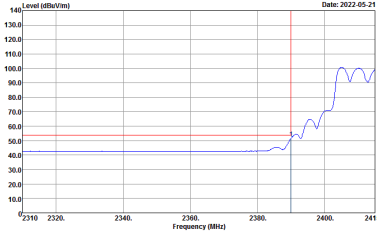
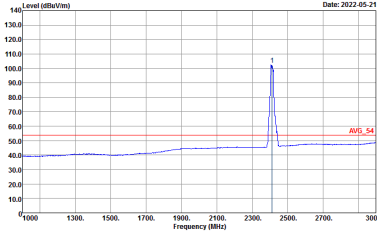
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH07-HY Condition : : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto



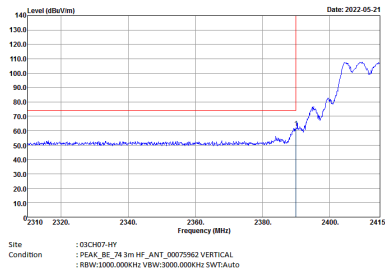
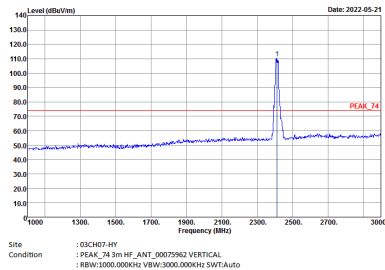
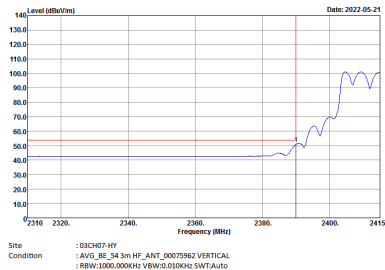
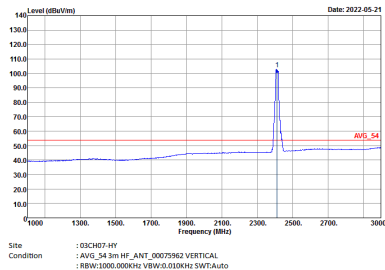
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

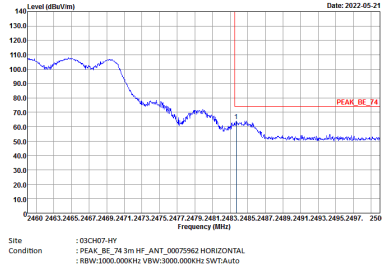
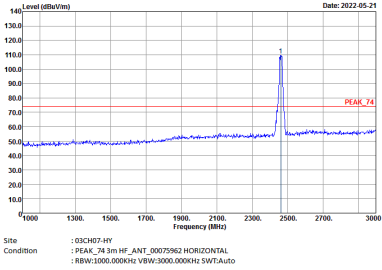
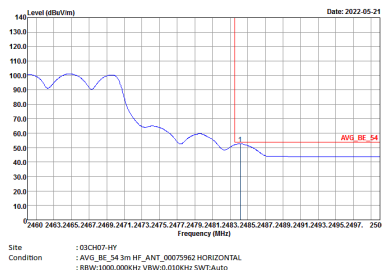
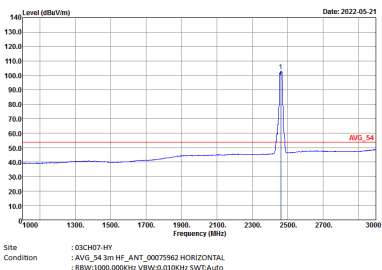


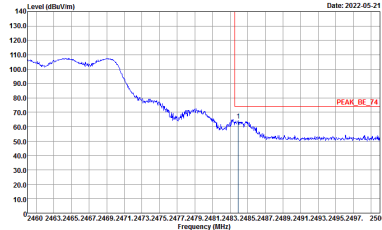
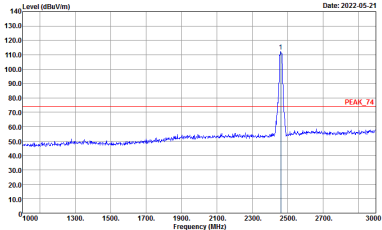
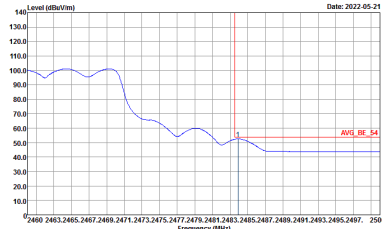
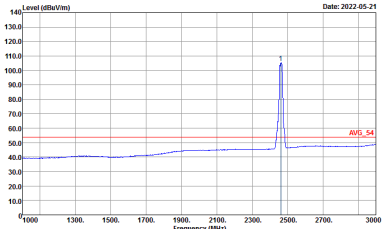
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : PEAK_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
3+4	Vertical	Fundamental
Peak		
Avg.		

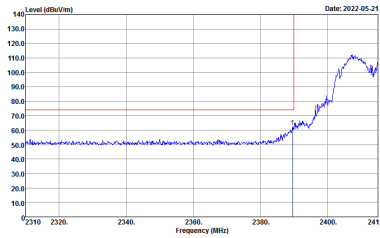
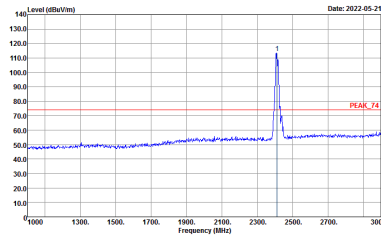
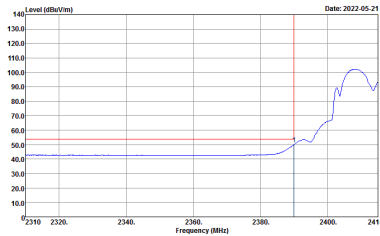
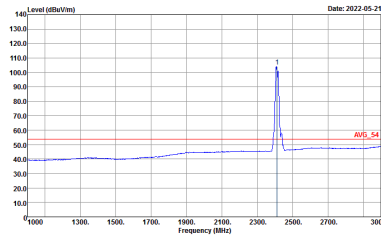
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH07-HY Condition : : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto
Avg.		



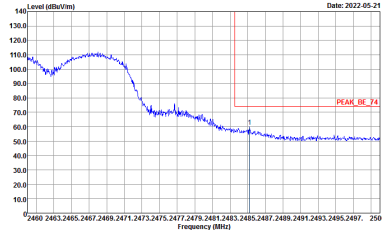
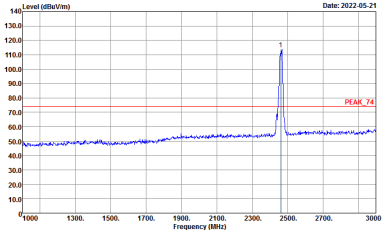
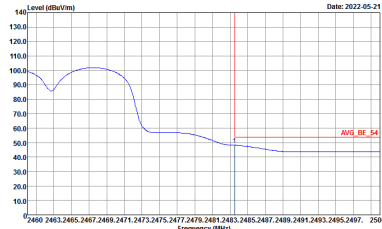
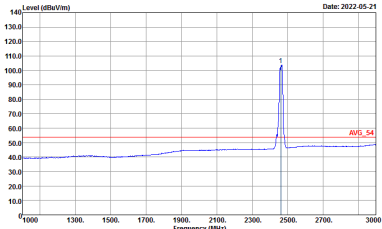
2.4GHz 2400~2483.5MHz

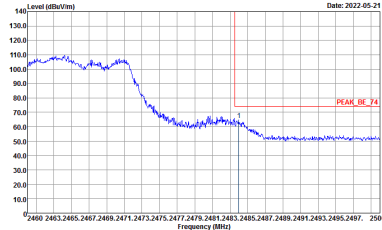
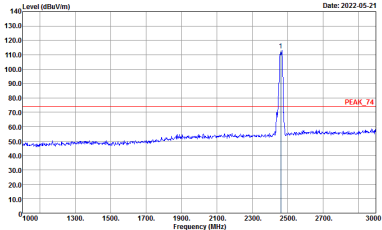
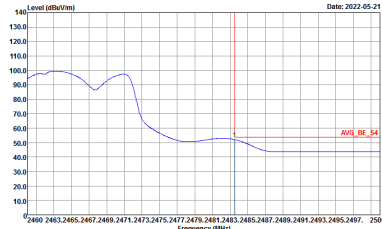
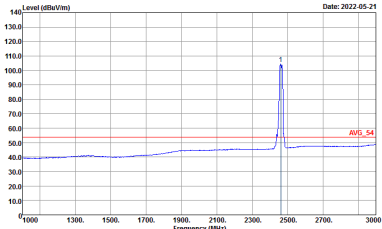
WIFI 802.11ax HE20 Full (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH01 2412MHz	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : PEAK_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

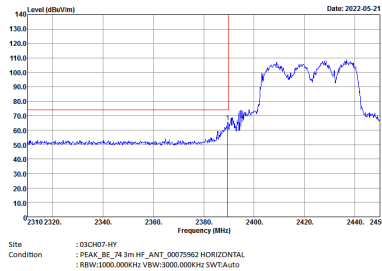
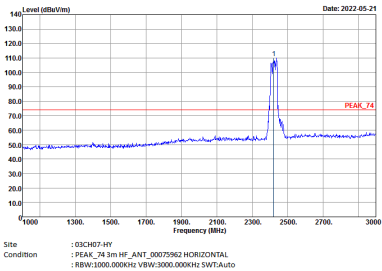
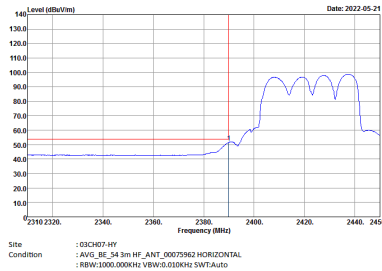
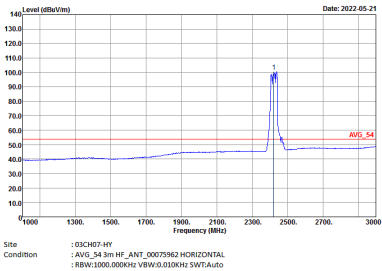


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH01 2412MHz	
3+4	Vertical	Fundamental
Peak	Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

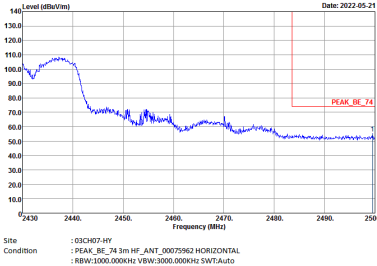
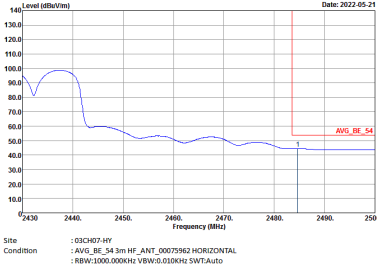
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH11 2462MHz	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH11 2462MHz	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:0.010kHz SWT:Auto

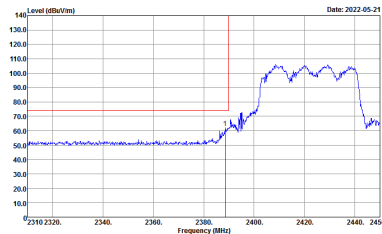
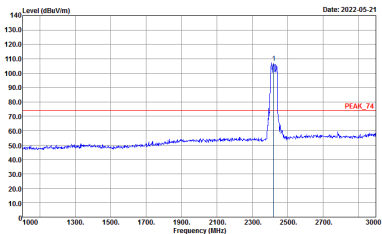
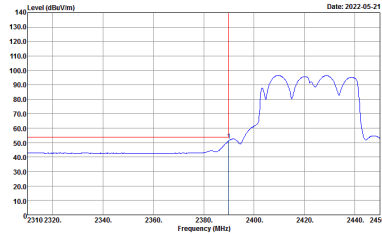
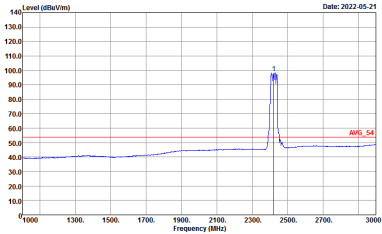
2.4GHz 2400~2483.5MHz
WIFI 802.11ax HE40 Full (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - L	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : PEAK_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.010kHz SWT:Auto	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.010kHz SWT:Auto

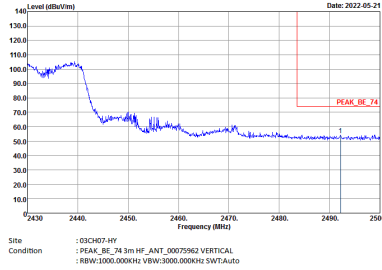
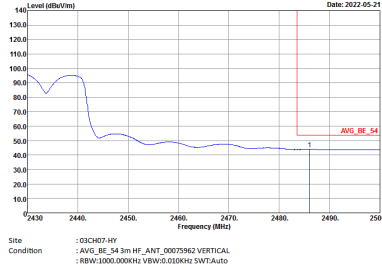


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - R	
3+4	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - L	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH07-HY Condition : : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH07-HY Condition : : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto

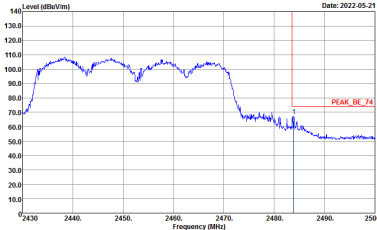
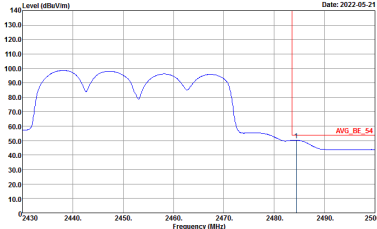


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - R	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:0.0100kHz SWT:Auto	Left blank

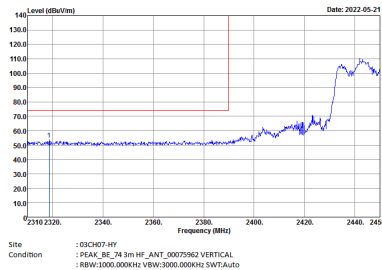
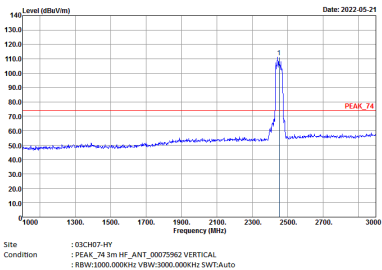
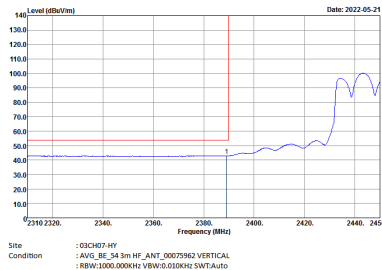
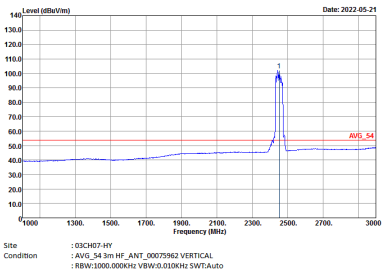


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - L	
3+4	Horizontal	Fundamental
Peak		
Avg.		

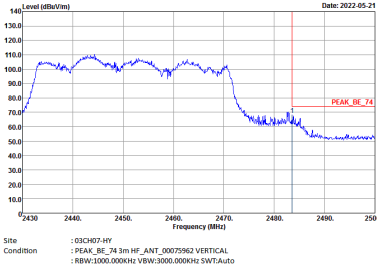
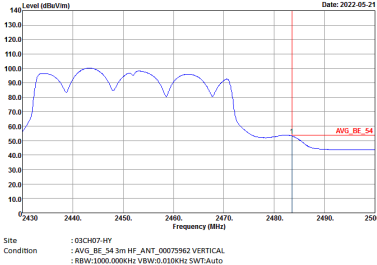


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - R	
3+4	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWTAuto	Left blank
Avg.	 Site : 03CH07-HY Condition : : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.010kHz SWTAuto	Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - L	
3+4	Vertical	Fundamental
Peak		
Avg.		



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - R	
3+4	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PSKAX_BE_74 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL RBW:1000.000kHz VBW:0.0100kHz SWT:Auto	Left blank



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
3+4	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2022-05-27 Site : 03CH07-HY Condition : PEAK_74 3m HP_ANT_00075962 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2022-05-27 Site : 03CH07-HY Condition : PEAK_74 3m HP_ANT_00075962 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
3+4	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2022-05-27 Frequency (MHz) Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2022-05-27 Frequency (MHz) Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
3+4	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2022-05-27 Frequency (MHz) Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2022-05-27 Frequency (MHz) Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak



2.4GHz 2400~2483.5MHz

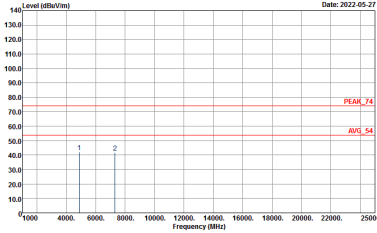
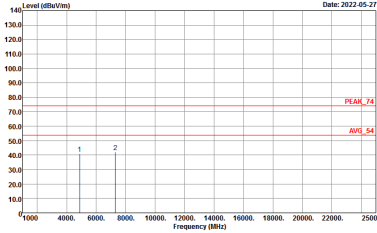
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
3+4	Horizontal	Vertical
Peak Avg.	Site : 03CH07-HY Condition : PEAK_74 3m HP_ANT_00075962 HORIZONTAL Detector : Peak	Site : 03CH07-HY Condition : PEAK_74 3m HP_ANT_00075962 VERTICAL Detector : Peak

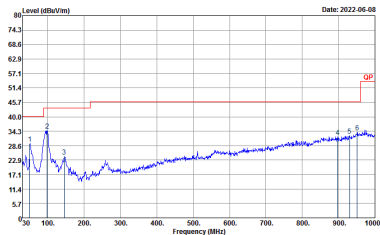
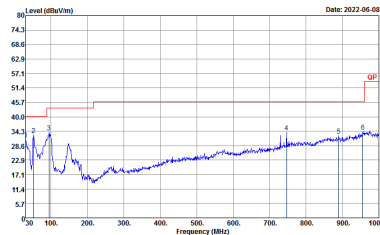


2.4GHz 2400~2483.5MHz

WIFI 802.11 ax HE20 Full (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH06 2437MHz	
3+4	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m HP_ANT_00075962 HORIZONTAL Detector : Peak	 Site : 03CH07-HY Condition : PEAK_74 3m HP_ANT_00075962 VERTICAL Detector : Peak

Emission above 18GHz
2.4GHz WIFI 802.11ax HE40 Full (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11ax HE40 Full LF	
3+4	Horizontal	Vertical
QP / Peak	 Site : 03CH07-HY Condition : QP 3m LP-ANT-35419(s) HORIZONTAL Detector : Peak	 Site : 03CH07-HY Condition : QP 3m LP-ANT-35419(s) VERTICAL Detector : Peak



Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
3+4	802.11b	98.28	-	-	10Hz
3+4	802.11g	99.29	-	-	10Hz
3+4	2.4GHz 802.11ax HE20 Full RU	99.73	-	-	10Hz
3+4	2.4GHz 802.11ax HE40 Full RU	99.73	-	-	10Hz

MIMO <Ant. 3+4>

