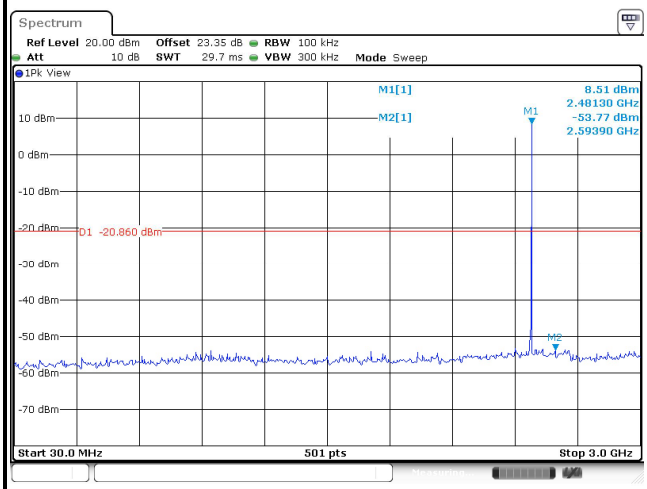
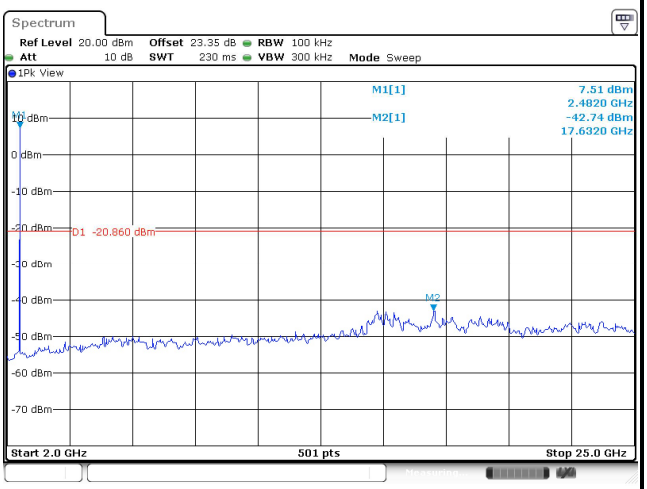
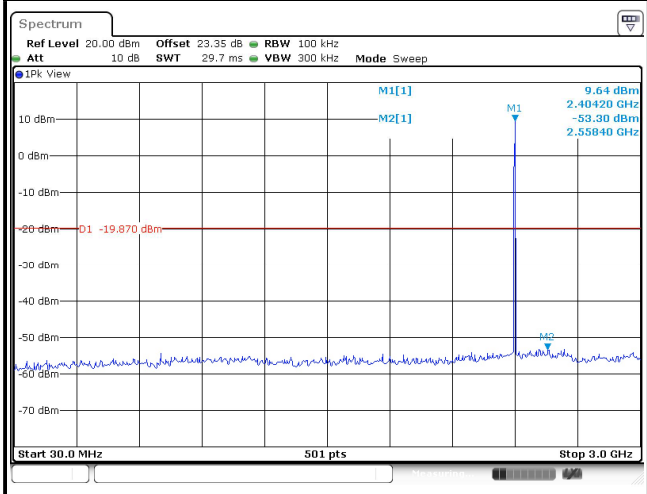
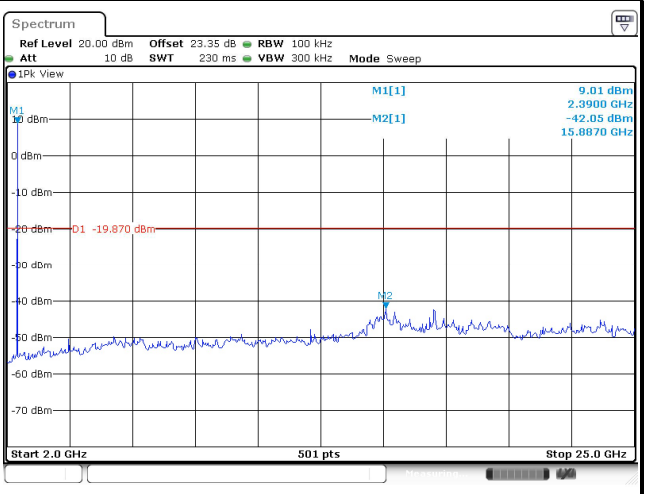
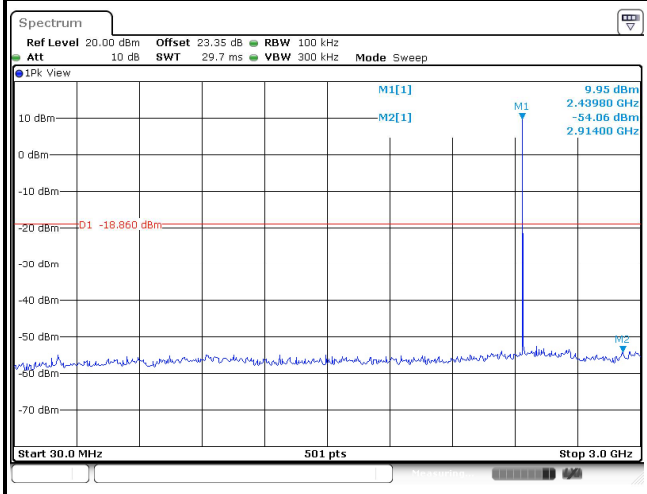
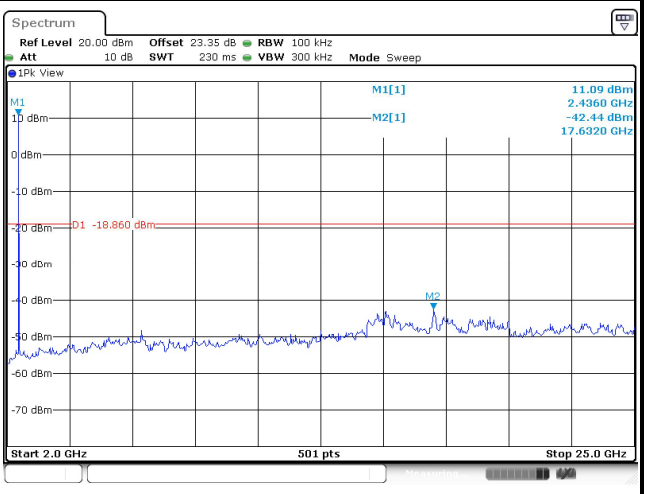
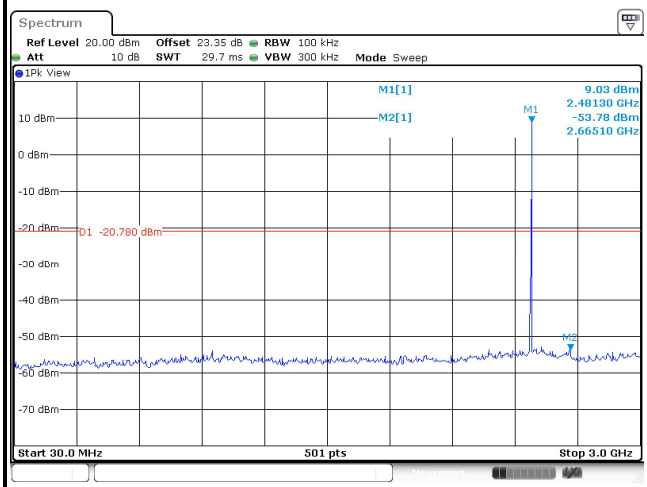
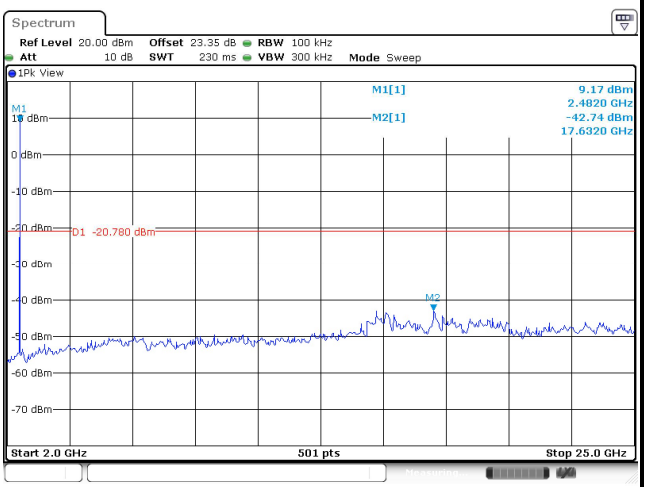
Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 39	Conducted Spurious Emission Plot on Bluetooth LE 1Mbps GFSK Channel 39
	

<2Mbps>

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 00	Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 00
	
Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 19	**Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 19**
	

Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 39	Conducted Spurious Emission Plot on Bluetooth LE 2Mbps GFSK Channel 39
	

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

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 is 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

Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.12.2 Antenna-port conducted measurements.
2. Measure the conducted output power (in dBm) using the peak detector.
3. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP.
4. Add the appropriate maximum ground reflection factor to the EIRP (6 dB for frequencies ≤ 30 MHz; 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive; and 0 dB for frequencies > 1000 MHz).
5. Convert the resultant EIRP to an equivalent electric field strength using the following relationship:

   E = EIRP − 20 log d + 104.8,

   where

   E is the electric field strength in dBμV/m

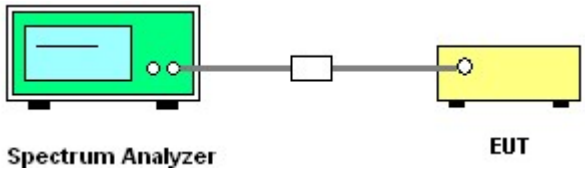
   EIRP is the equivalent isotropically radiated power in dBm

   d is the specified measurement distance in 3m
6. Compare the resultant electric field strength level with the applicable regulatory limit.
7. Corrected Reading for conducted spurious emission: Antenna Factor + Cable Loss + Read Level = Level
8. Perform the cabinet radiated spurious emission test.
9. The EUT is 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.
10. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
11. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
12. Corrected Reading for cabinet radiated spurious emission: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
13. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-“.

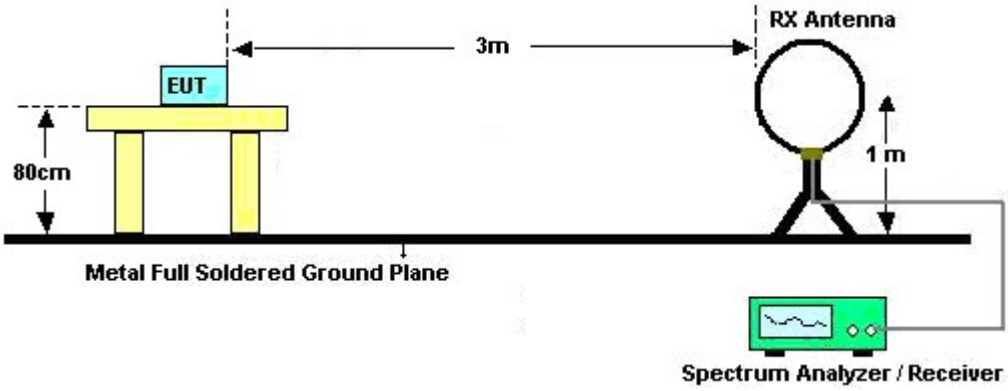
14. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".
15. 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 = 3 MHz 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

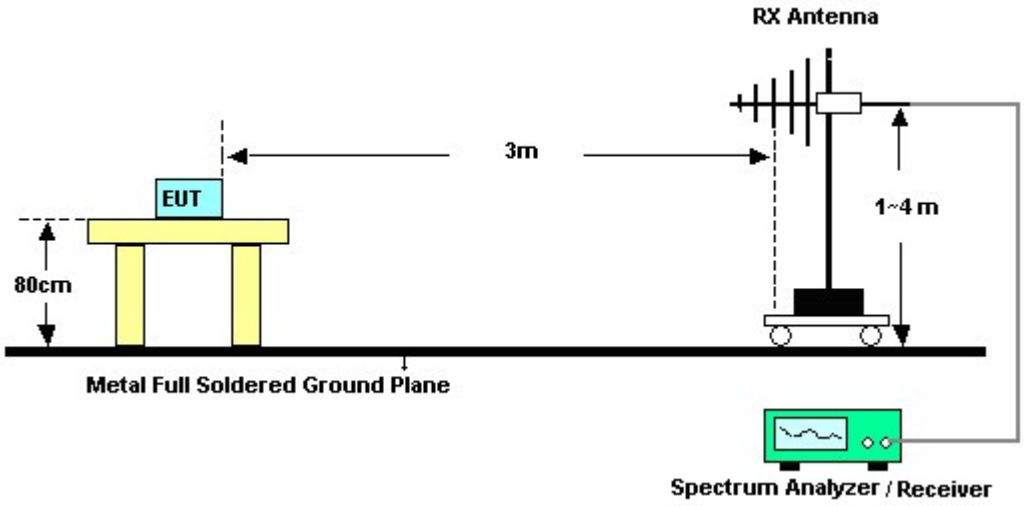
For Conducted Measurement Setup:



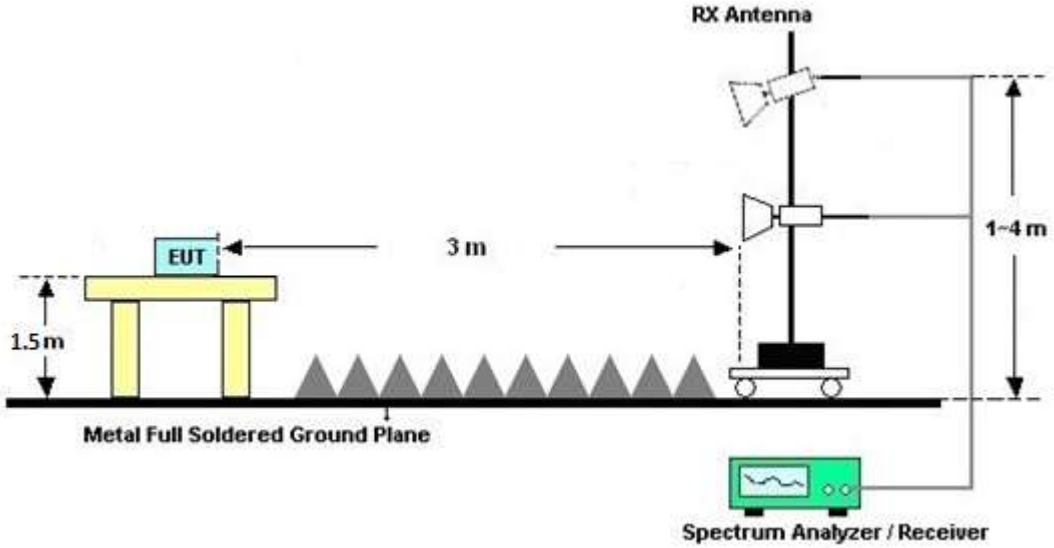
For radiated test below 30MHz



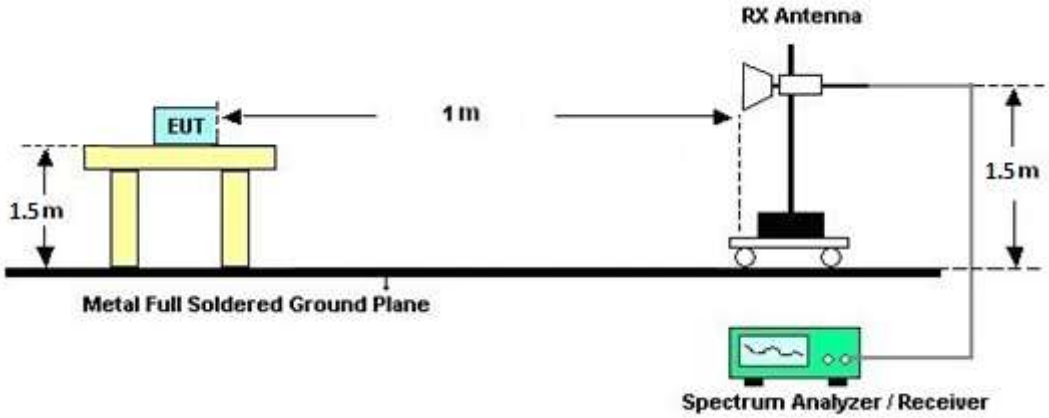
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

3.5.6 Test Result of Conduced Spurious at Band Edges in the Restricted Band

Please refer to Appendix B and C.

3.5.7 Test Result of Conduced Spurious Emission in the Restricted Band

Please refer to Appendix B and C.

3.5.8 Test Result of Cabinet Radiated Spurious at Band Edges

Please refer to Appendix D and E.

3.5.9 Test Result of Cabinet Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix D and E.

3.5.10 Duty Cycle

Please refer to Appendix F.

3.6 Antenna Requirements

3.6.1 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.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Jun. 03, 2022~ Aug. 03, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15I00041SNO 10 (NO:248)	10MHz~6GHz	Dec. 29, 2021	Jun. 03, 2022~ Aug. 03, 2022	Dec. 28, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Jun. 03, 2022~ Aug. 03, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 09, 2021	Feb. 25, 2022~ Feb. 26, 2022	Sep. 08, 2022	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	41912 & 05	30MHz~1GHz	Feb. 06, 2022	Feb. 25, 2022~ Feb. 26, 2022	Feb. 05, 2023	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2021	Feb. 25, 2022~ Feb. 26, 2022	Dec. 26, 2022	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02038	1GHz~18GHz	Aug. 04, 2021	Feb. 25, 2022~ Feb. 26, 2022	Aug. 03, 2022	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 30, 2021	Feb. 25, 2022~ Feb. 26, 2022	Nov. 29, 2022	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	171000180005 5006	1GHz~18GHz	May 06, 2021	Feb. 25, 2022~ Feb. 26, 2022	May 05, 2022	Radiation (03CH15-HY)
Preamplifier	EM Electronics	EM01G18G	060803	1GHz-18GHz	Dec. 16, 2021	Feb. 25, 2022~ Feb. 26, 2022	Dec. 15, 2022	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060801	18-40GHz	Jun. 22, 2021	Feb. 25, 2022~ Feb. 26, 2022	Jun. 21, 2022	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20MHz~8.4GHz	Oct. 21, 2021	Feb. 25, 2022~ Feb. 26, 2022	Oct. 20, 2022	Radiation (03CH15-HY
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	May 07, 2021	Feb. 25, 2022~ Feb. 26, 2022	May 06, 2022	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Feb. 25, 2022~ Feb. 26, 2022	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Feb. 25, 2022~ Feb. 26, 2022	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24 (k5)	RK-000451	N/A	N/A	Feb. 25, 2022~ Feb. 26, 2022	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE,5 08405/2E	30MHz~18G	Nov. 15, 2021	Feb. 25, 2022~ Feb. 26, 2022	Nov. 14, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804011/2,8040 12/2	30MHz-40GHz	Jan. 04, 2022	Feb. 25, 2022~ Feb. 26, 2022	Jan. 03, 2023	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Feb. 25, 2022~ Feb. 26, 2022	Mar. 10, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-1530 -6000-40ST	SN4	1.53GHz Low Pass Filter	Jul. 02, 2021	Feb. 25, 2022~ Feb. 26, 2022	Jul. 01, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700-3 000-18000-60ST	SN4	3GHz High Pass Filter	Sep. 15, 2021	Feb. 25, 2022~ Feb. 26, 2022	Sep. 14, 2022	Radiation (03CH15-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	ROHDE & SCHWARZ	FSV40	101565	10Hz~40GHz	Dec. 29, 2021	Jun. 03, 2022~ Aug. 11, 2022	Dec. 28, 2022	CSE (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 10, 2022	Jun. 03, 2022~ Aug. 11, 2022	Mar. 09, 2023	CSE (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 10, 2021	Jun. 03, 2022~ Aug. 11, 2022	Dec. 09, 2022	CSE (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 21, 2022	Jun. 03, 2022~ Aug. 11, 2022	Feb. 20, 2023	CSE (TH05-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 15, 2022	Jun. 03, 2022~ Aug. 11, 2022	Mar. 14, 2023	CSE (TH05-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass Filter	Jul. 12, 2021	Jun. 03, 2022~ Jul. 10, 2022	Jul. 11, 2022	CSE (TH05-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass Filter	Jul. 11, 2022	Jul. 11, 2022~ Aug. 11, 2022	Jul. 10, 2023	CSE (TH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.8 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.3 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.6 dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Richard Qiu and Derek Hsu	Temperature:	21~25	°C
Test Date:	2022/06/03~2022/08/03	Relative Humidity:	51~54	%

<Ant.4>

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.017	0.670	0.50	Pass
BLE	1Mbps	1	19	2440	1.017	0.670	0.50	Pass
BLE	1Mbps	1	39	2480	1.015	0.670	0.50	Pass

TEST RESULTS DATA
Average Power Table

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
BLE	1Mbps	1	0	2402	9.55	30.00	3.53	13.08	36.00	Pass
BLE	1Mbps	1	19	2440	10.85	30.00	3.53	14.38	36.00	Pass
BLE	1Mbps	1	39	2480	8.85	30.00	3.53	12.38	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	9.49	-5.00	3.53	8.00	Pass
BLE	1Mbps	1	19	2440	10.81	-3.66	3.53	8.00	Pass
BLE	1Mbps	1	39	2480	8.66	-5.83	3.53	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

Report Number : FR1N1011B

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	2Mbps	1	0	2402	1.994	1.144	0.50	Pass
BLE	2Mbps	1	19	2440	1.998	1.144	0.50	Pass
BLE	2Mbps	1	39	2480	1.990	1.148	0.50	Pass

TEST RESULTS DATA
Average Power Table

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
BLE	2Mbps	1	0	2402	9.55	30.00	3.53	13.08	36.00	Pass
BLE	2Mbps	1	19	2440	10.85	30.00	3.53	14.38	36.00	Pass
BLE	2Mbps	1	39	2480	8.85	30.00	3.53	12.38	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	9.49	-7.74	3.53	8.00	Pass
BLE	2Mbps	1	19	2440	10.83	-6.35	3.53	8.00	Pass
BLE	2Mbps	1	39	2480	8.72	-8.49	3.53	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

<Ant.5>

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.017	0.668	0.50	Pass
BLE	1Mbps	1	19	2440	1.017	0.668	0.50	Pass
BLE	1Mbps	1	39	2480	1.015	0.666	0.50	Pass

TEST RESULTS DATA
Average Power Table

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
BLE	1Mbps	1	0	2402	10.15	30.00	3.53	13.68	36.00	Pass
BLE	1Mbps	1	19	2440	11.25	30.00	3.53	14.78	36.00	Pass
BLE	1Mbps	1	39	2480	9.25	30.00	3.53	12.78	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	10.02	-4.50	3.53	8.00	Pass
BLE	1Mbps	1	19	2440	11.05	-3.41	3.53	8.00	Pass
BLE	1Mbps	1	39	2480	9.14	-5.39	3.53	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	2Mbps	1	0	2402	1.994	1.140	0.50	Pass
BLE	2Mbps	1	19	2440	1.994	1.144	0.50	Pass
BLE	2Mbps	1	39	2480	1.986	1.144	0.50	Pass

TEST RESULTS DATA
Average Power Table

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
BLE	2Mbps	1	0	2402	10.15	30.00	3.53	13.68	36.00	Pass
BLE	2Mbps	1	19	2440	11.15	30.00	3.53	14.68	36.00	Pass
BLE	2Mbps	1	39	2480	9.35	30.00	3.53	12.88	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	10.13	-7.16	3.53	8.00	Pass
BLE	2Mbps	1	19	2440	11.14	-6.14	3.53	8.00	Pass
BLE	2Mbps	1	39	2480	9.22	-8.03	3.53	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

Appendix B. Conducted Spurious Emission

Test Engineer :	Richard Qiu, Jacob Yu, Eric Chang and Kai Liao	Temperature :	22.7~24.8°C
		Relative Humidity :	52~59%

<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant. 4		(MHz)	(dBm)	Limit (dB)	Line (dBm)	Level (dBm)	Gain (dBi)	Loss (dB)	Factor (dB)	Factor (dB)	Avg. (P/A)
BLE CH 00 2402MHz		2388.54	-54.45	-33.25	-21.2	-58.88	3.53	0.9	0	0	P
		2390	-65.81	-24.61	-41.2	-70.24	3.53	0.9	0	0	A
	*	2404	13.81	-	-	9.38	3.53	0.9	0	0	P
	*	2402	12.8	-	-	8.37	3.53	0.9	0	0	A
BLE CH 19 2440MHz		2384.06	-53.81	-32.61	-21.2	-58.24	3.53	0.9	0	0	P
		2383.92	-63.76	-22.56	-41.2	-68.19	3.53	0.9	0	0	A
	*	2440	15.29	-	-	10.9	3.53	0.86	0	0	P
	*	2440	14.09	-	-	9.7	3.53	0.86	0	0	A
		2498.32	-53.88	-32.68	-21.2	-58.2	3.53	0.79	0	0	P
		2483.83	-65.65	-24.45	-41.2	-69.99	3.53	0.81	0	0	A
BLE CH 39 2480MHz	*	2480	13.09	-	-	8.75	3.53	0.81	0	0	P
	*	2480	11.88	-	-	7.54	3.53	0.81	0	0	A
		2483.52	-42.91	-21.71	-21.2	-47.25	3.53	0.81	0	0	P
		2483.56	-62.61	-21.41	-41.2	-66.95	3.53	0.81	0	0	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

2.4GHz 2400~2483.5MHz

BLE (Harmonic)

BLE Ant. 4	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BLE		3341.6	-64.1	-42.9	-21.2	-69.5	3.53	1.87	0	0	P
CH 00		4805.6	-63.21	-42.01	-21.2	-68.09	3.53	1.35	0	0	P
2402MHz		7276.1	-71.16	-49.96	-21.2	-76.3	3.53	1.61	0	0	P
BLE		4878.8	-55.97	-34.77	-21.2	-60.84	3.53	1.34	0	0	P
CH 19		7349.3	-72.75	-51.55	-21.2	-77.92	3.53	1.64	0	0	P
2440MHz											
BLE		4958.1	-57.36	-36.16	-21.2	-62.23	3.53	1.34	0	0	P
CH 39		7404.2	-73.11	-51.91	-21.2	-78.29	3.53	1.65	0	0	P
2480MHz											
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
4		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
2.4GHz BLE LF		82.65	-82.46	-27.26	-55.2	-90.94	3.53	0.25	4.7	82.65	P
		187.95	-80.87	-29.17	-51.7	-89.47	3.53	0.37	4.7	187.95	P
		226.29	-80.58	-31.38	-49.2	-89.29	3.53	0.48	4.7	226.29	P
		388.9	-80.53	-31.33	-49.2	-89.32	3.53	0.56	4.7	388.9	P
		888.7	-79.61	-30.41	-49.2	-88.85	3.53	1.01	4.7	888.7	P
		895.7	-66.05	-16.85	-49.2	-75.29	3.53	1.01	4.7	895.7	P

Remark	
	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
5		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
BLE CH 00 2402MHz		2383.92	-53.52	-32.32	-21.2	-57.95	3.53	0.9	0	0	P
		2389.38	-65.56	-24.36	-41.2	-69.99	3.53	0.9	0	0	A
	*	2402	14.4	-	-	9.97	3.53	0.9	0	0	P
	*	2402	13.25	-	-	8.82	3.53	0.9	0	0	A
BLE CH 19 2440MHz		2366	-54.71	-33.51	-21.2	-59.12	3.53	0.88	0	0	P
		2383.92	-66.5	-25.3	-41.2	-70.93	3.53	0.9	0	0	A
	*	2440	15.45	-	-	11.06	3.53	0.86	0	0	P
	*	2440	14.35	-	-	9.96	3.53	0.86	0	0	A
		2483.55	-53.91	-32.71	-21.2	-58.25	3.53	0.81	0	0	P
		2485.58	-65.87	-24.67	-41.2	-70.2	3.53	0.8	0	0	A
BLE CH 39 2480MHz	*	2480	13.25	-	-	8.91	3.53	0.81	0	0	P
	*	2480	12.04	-	-	7.7	3.53	0.81	0	0	A
		2483.56	-43.39	-22.19	-21.2	-47.73	3.53	0.81	0	0	P
		2483.6	-63.03	-21.83	-41.2	-67.37	3.53	0.81	0	0	A

Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

BLE (Harmonic)

BLE Ant. 5	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BLE		4805.6	-68.79	-47.59	-21.2	-73.67	3.53	1.35	0	0	P
CH 00		7282.2	-72.62	-51.42	-21.2	-77.77	3.53	1.62	0	0	P
2402MHz											
BLE		4823.9	-68.17	-46.97	-21.2	-73.05	3.53	1.35	0	0	P
CH 19		7324.9	-72.74	-51.54	-21.2	-77.9	3.53	1.63	0	0	P
2440MHz											
BLE		4823.9	-68.66	-47.46	-21.2	-73.54	3.53	1.35	0	0	P
CH 39		7446.9	-72.78	-51.58	-21.2	-77.98	3.53	1.67	0	0	P
2480MHz											P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
5		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
2.4GHz BLE LF		47.82	-82.37	-27.17	-55.2	-90.79	3.53	0.19	0	4.7	P
		197.4	-80.93	-29.23	-51.7	-89.6	3.53	0.44	0	4.7	P
		233.04	-81.23	-32.03	-49.2	-89.93	3.53	0.47	0	4.7	P
		661.9	-80.22	-31.02	-49.2	-89.24	3.53	0.79	0	4.7	P
		687.1	-79.82	-30.62	-49.2	-88.89	3.53	0.84	0	4.7	P
		986	-79.87	-38.67	-41.2	-89.33	3.53	1.23	0	4.7	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant. 4		(MHz)	(dBm)	Limit (dB)	Line (dBm)	Level (dBm)	Gain (dBi)	Loss (dB)	Factor (dB)	Factor (dB)	Avg. (P/A)
BLE CH 00 2402MHz		2385.39	-44.09	-22.89	-21.2	-48.52	3.53	0.9	0	0	P
		2381.715	-54.35	-13.15	-41.2	-58.78	3.53	0.9	0	0	A
	*	2402	14.14	-	-	9.71	3.53	0.9	0	0	P
	*	2402	12.23	-	-	7.8	3.53	0.9	0	0	A
BLE CH 19 2440MHz		2384.34	-43.17	-21.97	-21.2	-47.6	3.53	0.9	0	0	P
		2383.36	-54.77	-13.57	-41.2	-59.2	3.53	0.9	0	0	A
	*	2440	15.31	-	-	10.92	3.53	0.86	0	0	P
	*	2440	13.38	-	-	8.99	3.53	0.86	0	0	A
		2499.93	-43.94	-22.74	-21.2	-48.26	3.53	0.79	0	0	P
		2495.87	-54.28	-13.08	-41.2	-58.61	3.53	0.8	0	0	A
BLE CH 39 2480MHz	*	2480	13.07	-	-	8.73	3.53	0.81	0	0	P
	*	2480	11.31	-	-	6.97	3.53	0.81	0	0	A
		2483.52	-40.65	-19.45	-21.2	-44.99	3.53	0.81	0	0	P
		2490.2	-53.35	-12.15	-41.2	-57.68	3.53	0.8	0	0	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

2.4GHz 2400~2483.5MHz

BLE (Harmonic)

BLE Ant. 4	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BLE		4805.6	-64.96	-43.76	-21.2	-69.84	3.53	1.35	0	0	P
CH 00		7270	-72.25	-51.05	-21.2	-77.39	3.53	1.61	0	0	P
2402MHz											
BLE		4878.8	-56.91	-35.71	-21.2	-61.78	3.53	1.34	0	0	P
CH 19		7349.3	-72.14	-50.94	-21.2	-77.31	3.53	1.64	0	0	P
2440MHz											
BLE		4958.1	-57.82	-36.62	-21.2	-62.69	3.53	1.34	0	0	P
CH 39		7422.5	-72.99	-51.79	-21.2	-78.18	3.53	1.66	0	0	P
2480MHz											
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
5		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
BLE CH 00 2402MHz		2331.735	-44.23	-23.03	-21.2	-48.6	3.53	0.84	0	0	P
		2367.015	-54.93	-13.73	-41.2	-59.34	3.53	0.88	0	0	A
	*	2402	14.37	-	-	9.94	3.53	0.9	0	0	P
	*	2402	12.63	-	-	8.2	3.53	0.9	0	0	A
BLE CH 19 2440MHz		2334.92	-44.68	-23.48	-21.2	-49.05	3.53	0.84	0	0	P
		2326.52	-54.86	-13.66	-41.2	-59.23	3.53	0.84	0	0	A
	*	2440	15.49	-	-	11.1	3.53	0.86	0	0	P
	*	2440	13.63	-	-	9.24	3.53	0.86	0	0	A
		2496.01	-44.29	-23.09	-21.2	-48.62	3.53	0.8	0	0	P
		2490.62	-54.47	-13.27	-41.2	-58.8	3.53	0.8	0	0	A
BLE CH 39 2480MHz	*	2480	13.43	-	-	9.09	3.53	0.81	0	0	P
	*	2480	11.48	-	-	7.14	3.53	0.81	0	0	A
		2483.6	-40.03	-18.83	-21.2	-44.37	3.53	0.81	0	0	P
		2492.56	-54.01	-12.81	-41.2	-58.34	3.53	0.8	0	0	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										

2.4GHz 2400~2483.5MHz

BLE (Harmonic)

BLE Ant. 5	Note	Frequency (MHz)	Level (dBm)	Over Limit (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BLE CH 00 2402MHz		4823.9	-68.99	-47.79	-21.2	-73.87	3.53	1.35	0	0	P
		7300.5	-73.1	-51.9	-21.2	-78.25	3.53	1.62	0	0	P
BLE CH 19 2440MHz		4823.9	-68.64	-47.44	-21.2	-73.52	3.53	1.35	0	0	P
		4878.8	-66.07	-44.87	-21.2	-70.94	3.53	1.34	0	0	P
		5226.5	-64.64	-43.44	-21.2	-69.52	3.53	1.35	0	0	P
		7318.8	-69.47	-48.27	-21.2	-74.62	3.53	1.62	0	0	P
BLE CH 39 2480MHz		4823.9	-65.53	-44.33	-21.2	-73.42	6.54	1.35	0	0	P
		4958.1	-61.97	-40.77	-21.2	-69.85	6.54	1.34	0	0	P
		7440.8	-67.25	-46.05	-21.2	-75.46	6.54	1.67	0	0	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average 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

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

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg.
4		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
BLE CH 00 2402MHz		2388.54	-54.45	-33.25	-21.2	-58.88	3.53	0.9	0	0	P
		2390	-65.81	-24.61	-41.2	-70.24	3.53	0.9	0	0	A
	*	2404	13.81	-	-	9.38	3.53	0.9	0	0	P
	*	2402	12.8	-	-	8.37	3.53	0.9	0	0	A

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. MIMO Factor(dB) = 10 log (*N*ANT) , where *N*ANT is the number of outputs
3. Grounding Factor(dB) = Ground reflection factor (i.e., 6 dB for f ≤ 30 MHz and 4.7 dB for 30 MHz < f ≤ 960 MHz)
4. Level(dBμV/m) = Antenna Gain(dBi) + Path Loss(dB) + Read Level(dBm) + MIMO Factor(dB) + Grounding Factor(dB)
5. Over Limit(dB) = Level(dBm) – Limit Line(dBm)

For Peak Limit @ 2388.54MHz:

1. Level(dBm)

= Antenna Gain(dBi) + Path Loss(dB) + MIMO Factor(dB) + Grounding Factor(dB) + Read Level(dBm)
= 3.53(dB) + 0.9(dB) – 58.88(dBm)
= -54.45(dBm)

2. Over Limit(dB)

= Level(dBm) – Limit Line(dBm)
= -54.45(dBm) + 21.2(dBm)
= -33.25(dB)

For Average Limit @ 2390MHz:

1. Level(dBm)

= Antenna Gain(dBi) + Path Loss(dB) + MIMO Factor(dB) + Grounding Factor(dB) + Read Level(dBm)
= 3.53(dBi) + 0.9(dB) – 70.24(dBm)
= -65.81(dBm)

2. Over Limit(dB)

= Level(dBm) – Limit Line(dBm)
= -68.81(dBm) + 41.2(dBm)
= -24.61(dB)

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

Appendix C. Conducted Spurious Emission Plots

Test Engineer :	Richard Qiu, Jacob Yu, Eric Chang and Kai Liao	**Temperature :**	22.7~24.8°C
		Relative Humidity :	52~59%

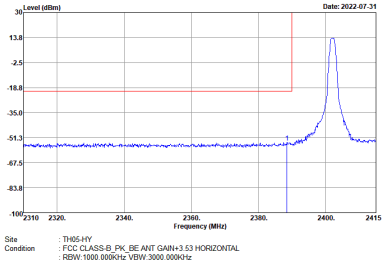
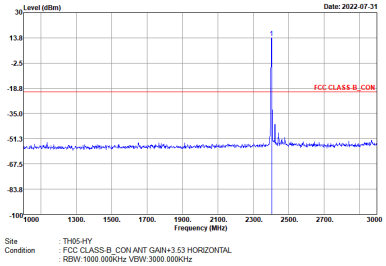
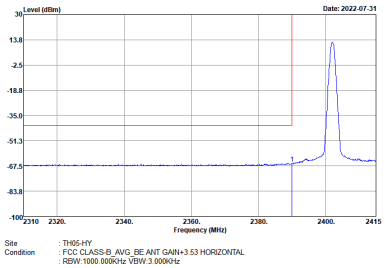
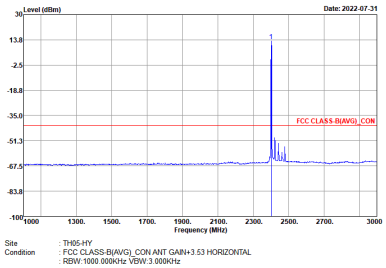
Note symbol

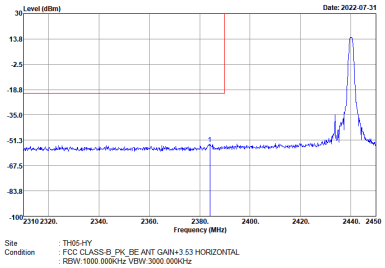
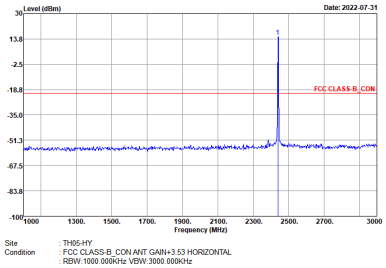
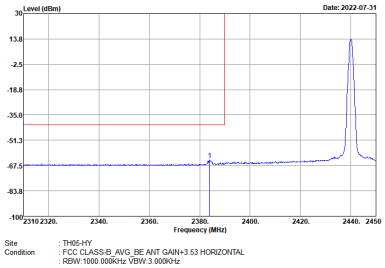
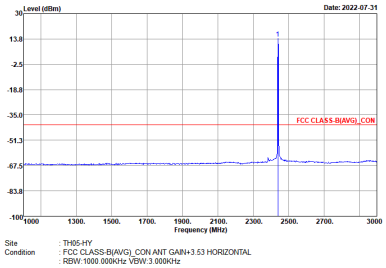
-L	**Low channel location**
-R	**High channel location**

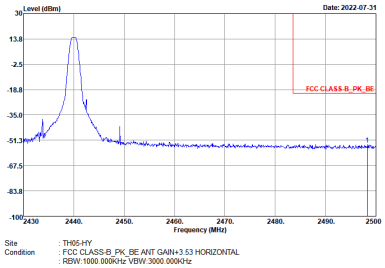
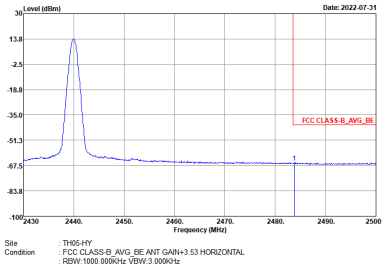
<1Mbps>

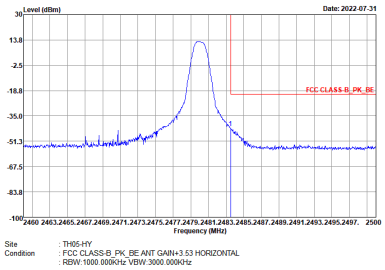
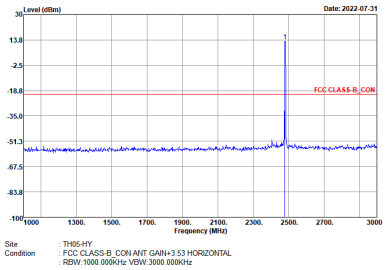
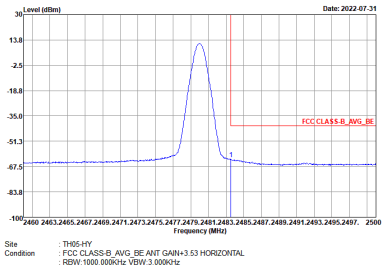
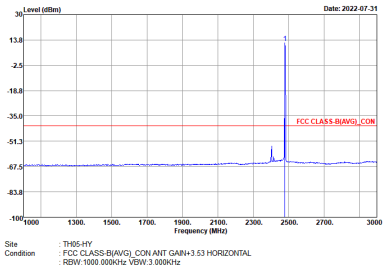
2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH00 2402MHz	
4	CSE	Fundamental
Peak		
Avg.		

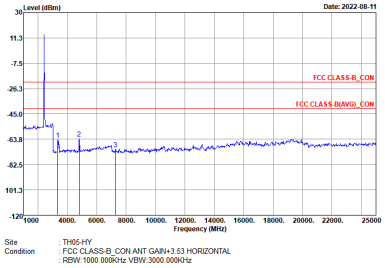
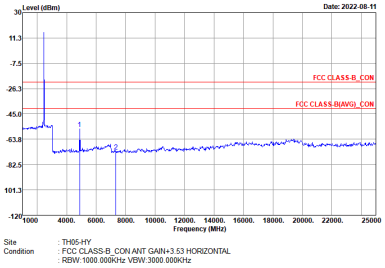
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - L	
4	CSE	Fundamental
Peak		
Avg.		

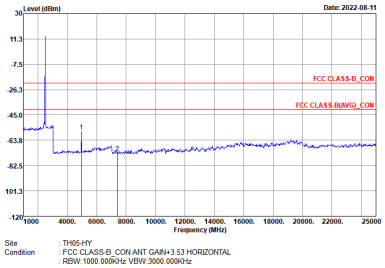
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - R	
4	CSE	Fundamental
Peak		Left blank
Avg.		Left blank

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH39 2480MHz	
4	CSE	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

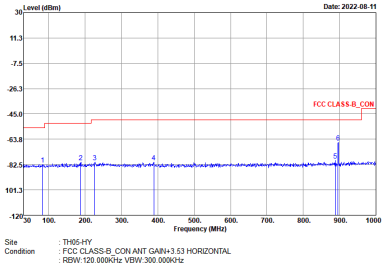
BLE (Harmonic)

BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
4	BLE CH00 2402MHz	BLE CH19 2440MHz
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
4	BLE CH39 2480MHz	-
Peak Avg.		Left blank

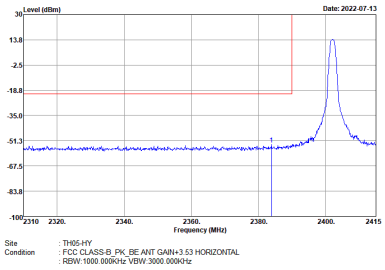
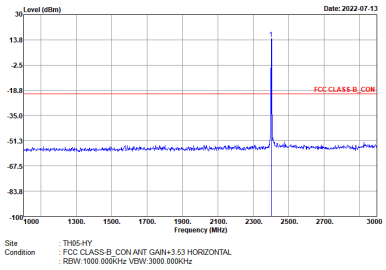
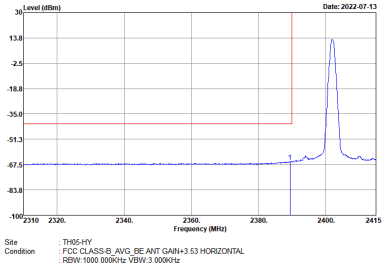
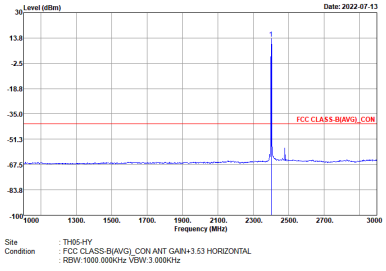
Emission below 1GHz

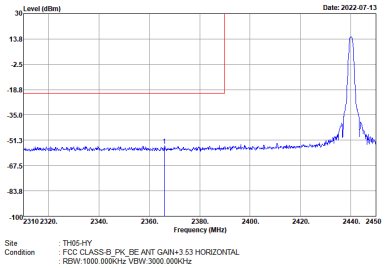
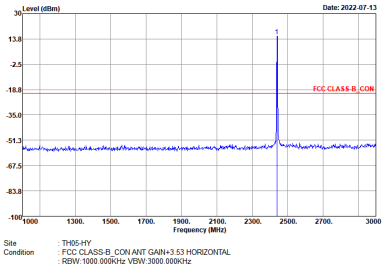
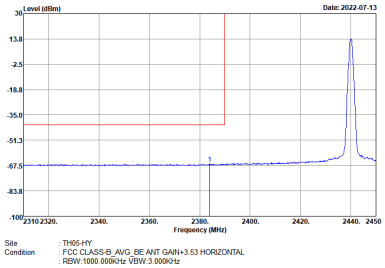
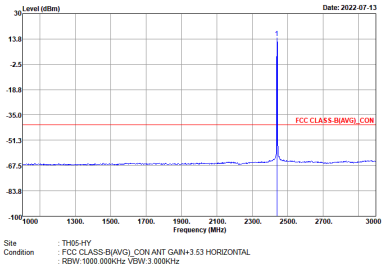
2.4GHz BLE (LF)

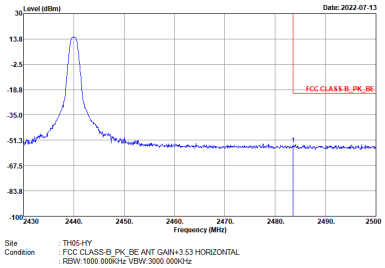
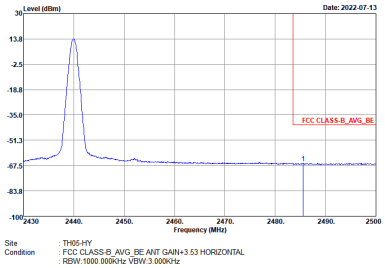
BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
4		
QP / Peak		Left blank

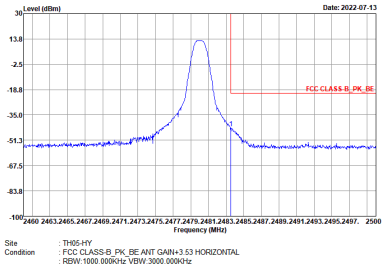
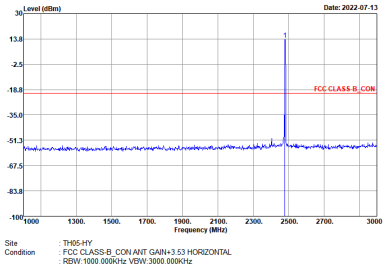
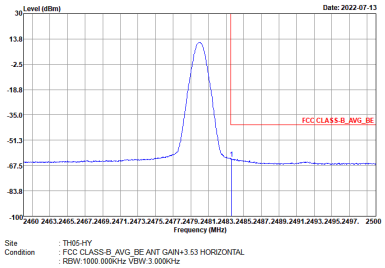
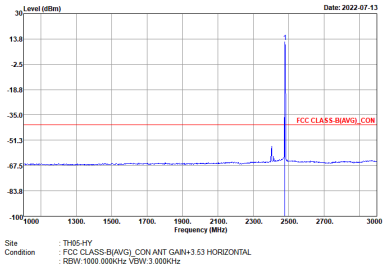
2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH00 2402MHz	
5	CSE	Fundamental
Peak		
Avg.		

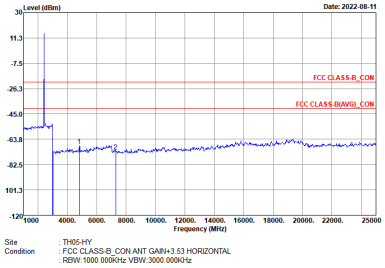
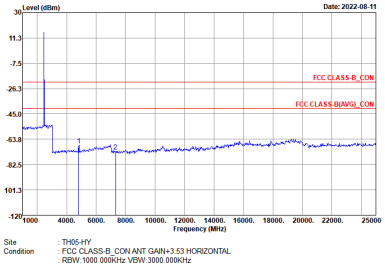
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - L	
5	CSE	Fundamental
Peak		
Avg.		

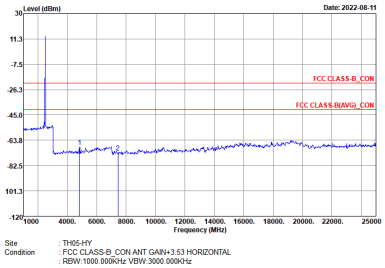
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - R	
5	CSE	Fundamental
Peak		Left blank
Avg.		Left blank

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH39 2480MHz	
5	CSE	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

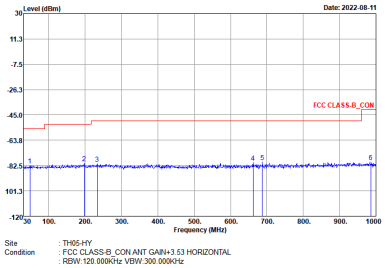
BLE (Harmonic)

BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
5	BLE CH00 2402MHz	BLE CH19 2440MHz
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
5	BLE CH39 2480MHz	-
Peak Avg.		Left blank

Emission below 1GHz

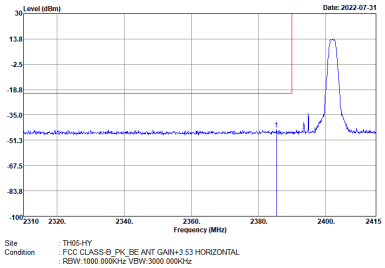
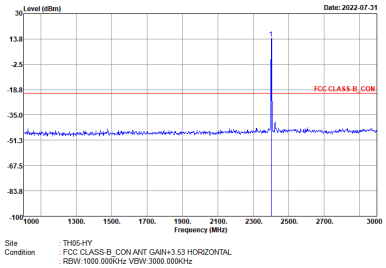
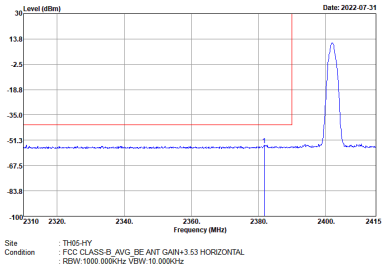
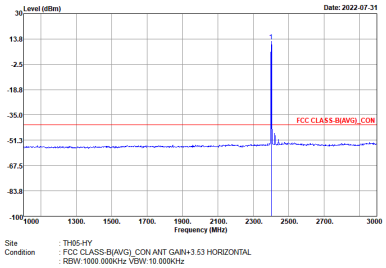
BLE (LF)

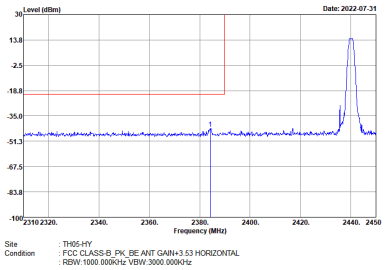
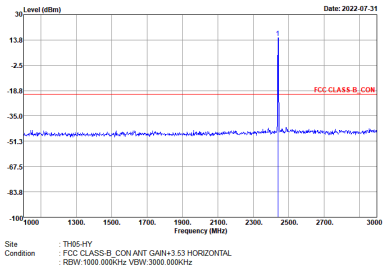
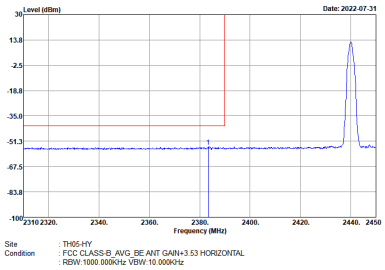
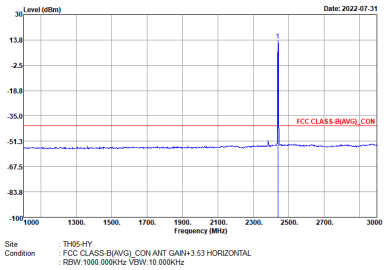
BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
5		
QP / Peak		Left blank

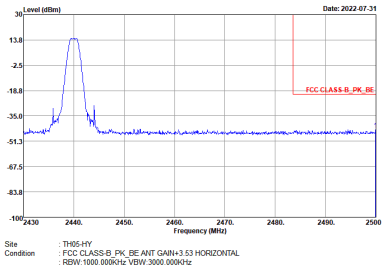
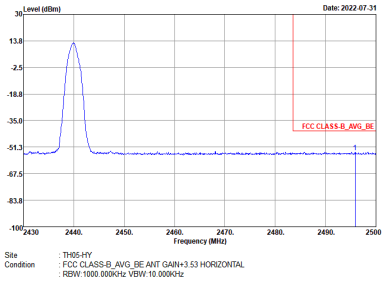
<2Mbps>

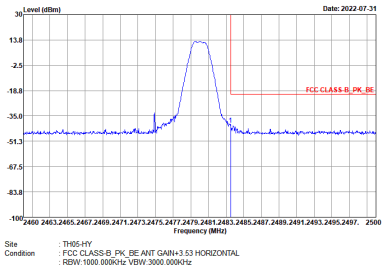
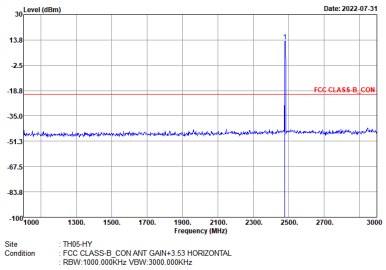
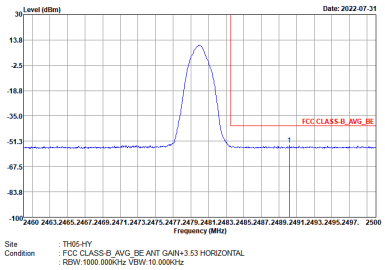
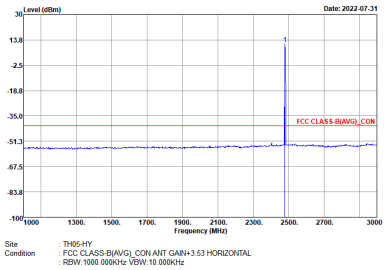
2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH00 2402MHz	
4	CSE	Fundamental
Peak		
Avg.		

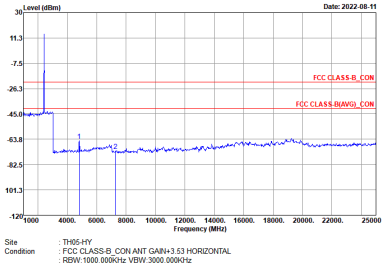
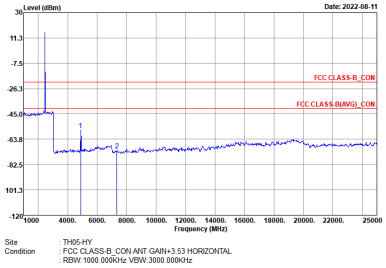
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - L	
4	CSE	Fundamental
Peak		
Avg.		

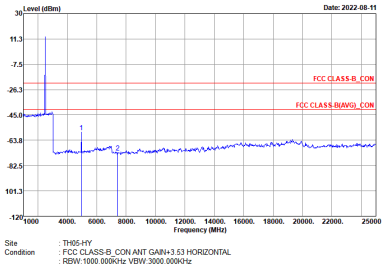
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - R	
4	CSE	Fundamental
Peak		Left blank
Avg.		Left blank

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH39 2480MHz	
4	CSE	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

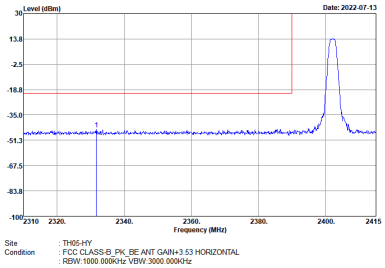
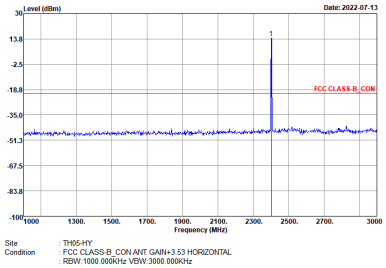
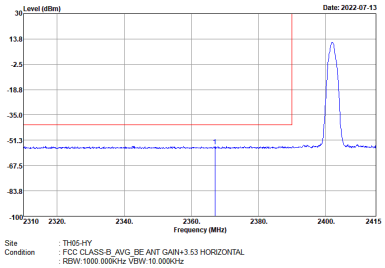
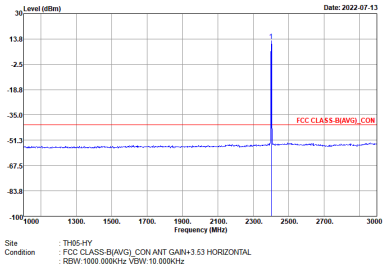
BLE (Harmonic)

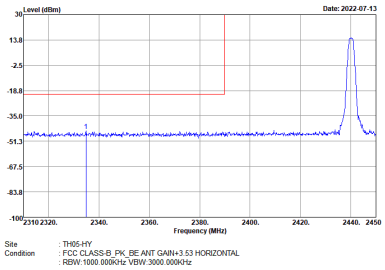
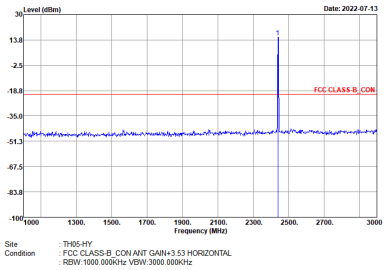
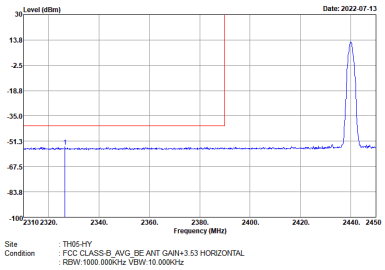
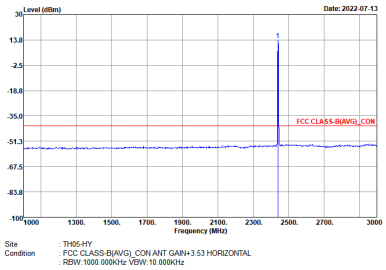
BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
4	BLE CH00 2402MHz	BLE CH19 2440MHz
Peak Avg.		

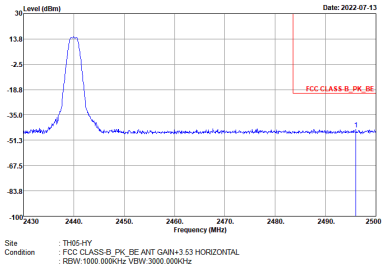
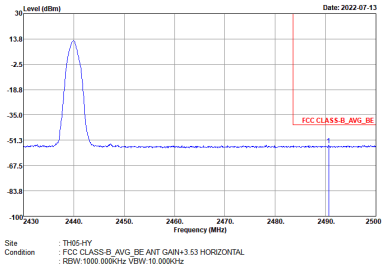
BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
4	BLE CH39 2480MHz	-
Peak Avg.		Left blank

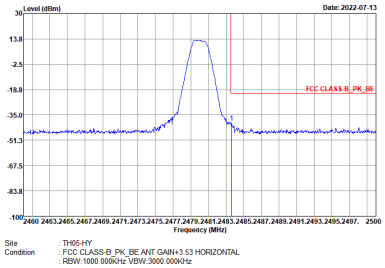
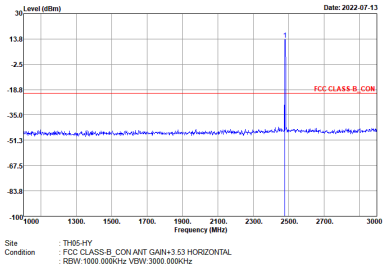
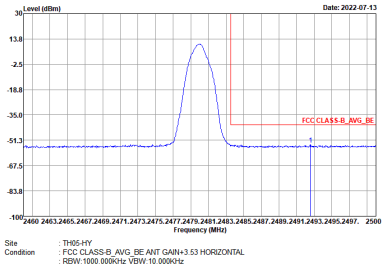
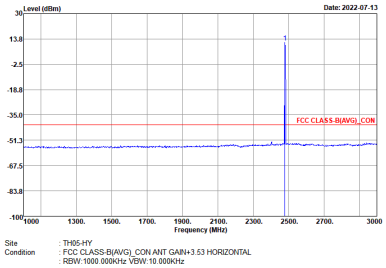
2.4GHz 2400~2483.5MHz

BLE (Band Edge)

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH00 2402MHz	
5	CSE	Fundamental
Peak		
Avg.		

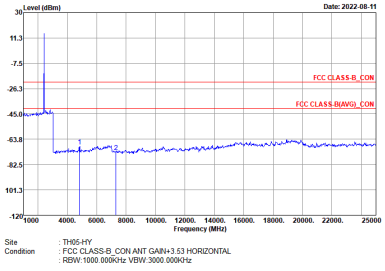
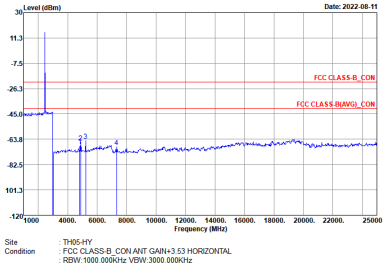
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - L	
5	CSE	Fundamental
Peak		
Avg.		

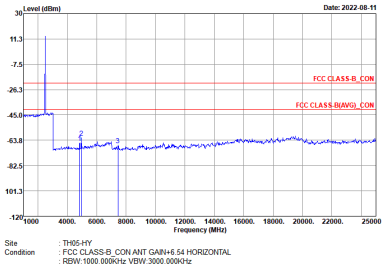
BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH19 2440MHz - R	
5	CSE	Fundamental
Peak		Left blank
Avg.		Left blank

BLE	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BLE CH39 2480MHz	
5	CSE	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

BLE (Harmonic)

BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
5	BLE CH00 2402MHz	BLE CH19 2440MHz
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BLE	
5	BLE CH39 2480MHz	-
Peak Avg.		Left blank

Appendix D. Cabinet Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	**Temperature :**	22.1~23.1°C
		Relative Humidity :	55~60%

<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2334.675	51.32	-22.68	74	44.57	27.14	16.47	36.86	138	313	P	H
		2371.11	41.67	-12.33	54	34.7	27.28	16.53	36.84	138	313	A	H
	*	2402	74.02	-	-	66.87	27.4	16.58	36.83	138	313	P	H
	*	2402	73.28	-	-	66.13	27.4	16.58	36.83	138	313	A	H
		2355.15	51.52	-22.48	74	44.64	27.22	16.51	36.85	305	203	P	V
		2387.595	41.9	-12.1	54	34.82	27.35	16.56	36.83	305	203	A	V
	*	2402	70.97	-	-	63.82	27.4	16.58	36.83	305	203	P	V
	*	2402	70.14	-	-	62.99	27.4	16.58	36.83	305	203	A	V
BLE CH 19 2440MHz		2346.32	50.91	-23.09	74	44.08	27.19	16.49	36.85	136	313	P	H
		2388.08	41.68	-12.32	54	34.6	27.35	16.56	36.83	136	313	A	H
	*	2440	75.72	-	-	68.41	27.48	16.64	36.81	136	313	P	H
	*	2440	75.09	-	-	67.78	27.48	16.64	36.81	136	313	A	H
		2487.31	51.8	-22.2	74	44.22	27.65	16.72	36.79	136	313	P	H
		2492.89	42.14	-11.86	54	34.53	27.67	16.72	36.78	136	313	A	H
		2337.36	51.17	-22.83	74	44.39	27.15	16.48	36.85	294	206	P	V
		2345.04	41.73	-12.27	54	34.91	27.18	16.49	36.85	294	206	A	V
	*	2440	71.93	-	-	64.62	27.48	16.64	36.81	294	206	P	V
	*	2440	70.89	-	-	63.58	27.48	16.64	36.81	294	206	A	V
		2483.71	51.15	-22.85	74	43.6	27.63	16.71	36.79	294	206	P	V
		2497.48	42.24	-11.76	54	34.6	27.69	16.73	36.78	294	206	A	V

BLE CH 39 2480MHz	*	2480	70.87	-	-	63.34	27.62	16.7	36.79	100	42	P	H
	*	2480	69.52	-	-	61.99	27.62	16.7	36.79	100	42	A	H
		2488.64	51.84	-22.16	74	44.26	27.65	16.72	36.79	100	42	P	H
		2488.88	42.18	-11.82	54	34.59	27.66	16.72	36.79	100	42	A	H
	*	2480	67.04	-	-	59.51	27.62	16.7	36.79	302	18	P	V
	*	2480	65.76	-	-	58.23	27.62	16.7	36.79	302	18	A	V
		2484.44	51.96	-22.04	74	44.4	27.64	16.71	36.79	302	18	P	V
		2498.12	42.32	-11.68	54	34.68	27.69	16.73	36.78	302	18	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE Ant. 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)
BLE CH 00 2402MHz		4804	37.91	-36.09	74	54.32	32.31	10.13	58.85	-	-	P	H
		10785	48.63	-25.37	74	55.9	38.97	14.65	60.89	-	-	P	H
		10785	39.51	-14.49	54	46.78	38.97	14.65	60.89	-	-	A	H
		14490	48.17	-25.83	74	53.97	40.51	16.86	63.17	-	-	P	H
		14490	41.17	-12.83	54	46.97	40.51	16.86	63.17	-	-	A	H
		17985	52.25	-21.75	74	47.61	42.97	18.94	57.27	-	-	P	H
		17985	41.25	-12.75	54	36.61	42.97	18.94	57.27	-	-	A	H
		4804	38.36	-35.64	74	54.77	32.31	10.13	58.85	-	-	P	V
		11055	48.74	-25.26	74	56.22	38.6	14.78	60.86	-	-	P	V
		11055	39.63	-14.37	54	47.11	38.6	14.78	60.86	-	-	A	V
		14475	48.7	-25.3	74	54.5	40.53	16.85	63.18	-	-	P	V
		14475	41.27	-12.73	54	47.07	40.53	16.85	63.18	-	-	A	V
		18000	51.74	-22.26	74	46.93	43.1	18.95	57.24	-	-	P	V
		18000	41.79	-12.21	54	36.98	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

BLE Ant. 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)
		4880	39.08	-34.92	74	55.26	32.52	10.21	58.91	-	-	P	H
		7320	43.01	-30.99	74	52.47	36.52	12.43	58.41	-	-	P	H
		10800	48.67	-25.33	74	55.91	39	14.65	60.89	-	-	P	H
		10800	39.66	-14.34	54	46.9	39	14.65	60.89	-	-	A	H
		14475	48.71	-25.29	74	54.51	40.53	16.85	63.18	-	-	P	H
		14475	41.27	-12.73	54	47.07	40.53	16.85	63.18	-	-	A	H
		17940	51.55	-22.45	74	47.46	42.56	18.91	57.38	-	-	P	H
		17940	40.56	-13.44	54	36.47	42.56	18.91	57.38	-	-	A	H
BLE CH 19 2440MHz													
		4880	38.56	-35.44	74	54.74	32.52	10.21	58.91	-	-	P	V
		7320	42.6	-31.4	74	52.06	36.52	12.43	58.41	-	-	P	V
		11925	48.49	-25.51	74	56	38.6	15.21	61.32	-	-	P	V
		11925	39.36	-14.64	54	46.87	38.6	15.21	61.32	-	-	A	V
		14490	47.93	-26.07	74	53.73	40.51	16.86	63.17	-	-	P	V
		14490	41.23	-12.77	54	47.03	40.51	16.86	63.17	-	-	A	V
		18000	52.03	-21.97	74	47.22	43.1	18.95	57.24	-	-	P	V
		18000	41.28	-12.72	54	36.47	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

BLE Ant. 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)
		4960	38.85	-35.15	74	54.71	32.84	10.28	58.98	-	-	P	H
		7440	43.43	-30.57	74	53.13	36.02	12.48	58.2	-	-	P	H
		10980	48.46	-25.54	74	55.96	38.62	14.74	60.86	-	-	P	H
		10980	39.45	-14.55	54	46.95	38.62	14.74	60.86	-	-	A	H
		14490	48.56	-25.44	74	54.36	40.51	16.86	63.17	-	-	P	H
		14490	41.36	-12.64	54	47.16	40.51	16.86	63.17	-	-	A	H
		18000	51.97	-22.03	74	47.16	43.1	18.95	57.24	-	-	P	H
		18000	41.17	-12.83	54	36.36	43.1	18.95	57.24	-	-	A	H
BLE CH 39 2480MHz													
		4960	38.91	-35.09	74	54.77	32.84	10.28	58.98	-	-	P	V
		7440	43.84	-30.16	74	53.54	36.02	12.48	58.2	-	-	P	V
		10935	48.32	-25.68	74	55.8	38.67	14.72	60.87	-	-	P	V
		10935	39.41	-14.59	54	46.89	38.67	14.72	60.87	-	-	A	V
		14475	49.01	-24.99	74	54.81	40.53	16.85	63.18	-	-	P	V
		14475	41.38	-12.62	54	47.18	40.53	16.85	63.18	-	-	A	V
		18000	51.94	-22.06	74	47.13	43.1	18.95	57.24	-	-	P	V
		18000	41.94	-12.06	54	37.13	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

Emission above 18GHz

2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE SHF		19224	41.73	-32.27	74	61.51	38.09	-2.81	55.06	-	-	P	H
		23112	41.34	-32.66	74	59.33	38.9	-2.81	54.08	-	-	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 with sufficient margin against limit line or noise floor only.

Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		30.97	23.44	-16.56	40	31.29	24.01	0.62	32.48	-	-	P	H
		82.38	22.31	-17.69	40	40.08	13.5	1.21	32.48	-	-	P	H
		97.9	23.26	-20.24	43.5	38.84	15.59	1.3	32.47	-	-	P	H
		143.49	21.8	-21.7	43.5	35.27	17.28	1.74	32.49	-	-	P	H
		315.18	21.69	-24.31	46	32.43	19.26	2.41	32.41	-	-	P	H
		892.33	31.75	-14.25	46	30.5	28.75	4.08	31.58	-	-	P	H
		30.97	30.48	-9.52	40	38.33	24.01	0.62	32.48	-	-	P	V
		54.25	30.81	-9.19	40	49.83	12.58	0.96	32.56	-	-	P	V
		81.41	28.02	-11.98	40	45.92	13.38	1.2	32.48	-	-	P	V
		98.87	24.08	-19.42	43.5	39.55	15.69	1.31	32.47	-	-	P	V
		196.84	22.76	-20.74	43.5	38.64	14.7	1.92	32.5	-	-	P	V
		882.63	30.49	-15.51	46	29.39	28.71	4.06	31.67	-	-	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.

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
5		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2387.92	50.82	-23.18	74	43.74	27.35	16.56	36.83	116	316	P	H
		2385.2	41.73	-12.27	54	34.66	27.34	16.56	36.83	116	316	A	H
	*	2402	74.34	-	-	67.19	27.4	16.58	36.83	116	316	P	H
	*	2402	73.48	-	-	66.33	27.4	16.58	36.83	116	316	A	H
		2384.865	51.23	-22.77	74	44.16	27.34	16.56	36.83	307	202	P	V
		2347.065	41.85	-12.15	54	35.02	27.19	16.49	36.85	307	202	A	V
	*	2402	71.12	-	-	63.97	27.4	16.58	36.83	307	202	P	V
	*	2402	70.13	-	-	62.98	27.4	16.58	36.83	307	202	A	V
BLE CH 19 2440MHz		2384.08	50.83	-23.17	74	43.77	27.34	16.55	36.83	140	314	P	H
		2386.64	41.73	-12.27	54	34.65	27.35	16.56	36.83	140	314	A	H
	*	2440	76.04	-	-	68.73	27.48	16.64	36.81	140	314	P	H
	*	2440	75.34	-	-	68.03	27.48	16.64	36.81	140	314	A	H
		2489.83	51.52	-22.48	74	43.92	27.66	16.72	36.78	140	314	P	H
		2495.77	42.31	-11.69	54	34.68	27.68	16.73	36.78	140	314	A	H
		2384.4	51.61	-22.39	74	44.55	27.34	16.55	36.83	260	203	P	V
		2340.08	41.72	-12.28	54	34.93	27.16	16.48	36.85	260	203	A	V
	*	2440	70.22	-	-	62.91	27.48	16.64	36.81	260	203	P	V
	*	2440	69.03	-	-	61.72	27.48	16.64	36.81	260	203	A	V
		2484.34	50.83	-23.17	74	43.27	27.64	16.71	36.79	260	203	P	V
		2494.24	42.22	-11.78	54	34.59	27.68	16.73	36.78	260	203	A	V

BLE CH 39 2480MHz	*	2480	76.14	-	-	68.61	27.62	16.7	36.79	115	311	P	H
	*	2480	75.42	-	-	67.89	27.62	16.7	36.79	115	311	A	H
		2499.32	51.3	-22.7	74	43.65	27.7	16.73	36.78	115	311	P	H
		2495.56	42.49	-11.51	54	34.86	27.68	16.73	36.78	115	311	A	H
	*	2480	71.86	-	-	64.33	27.62	16.7	36.79	281	203	P	V
	*	2480	70.93	-	-	63.4	27.62	16.7	36.79	281	203	A	V
		2496.92	51.59	-22.41	74	43.95	27.69	16.73	36.78	281	203	P	V
		2492	42.17	-11.83	54	34.56	27.67	16.72	36.78	281	203	A	V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE Ant. 5	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)
BLE CH 00 2402MHz		4804	37.72	-36.28	74	54.13	32.31	10.13	58.85	-	-	P	H
		10785	48.2	-25.8	74	55.47	38.97	14.65	60.89	-	-	P	H
		10785	38.42	-15.58	54	45.69	38.97	14.65	60.89	-	-	A	H
		14505	48.19	-25.81	74	54	40.49	16.87	63.17	-	-	P	H
		14505	39.41	-14.59	54	45.22	40.49	16.87	63.17	-	-	A	H
		17940	51.92	-22.08	74	47.83	42.56	18.91	57.38	-	-	P	H
		17940	42.14	-11.86	54	38.05	42.56	18.91	57.38	-	-	A	H
		4804	37.69	-36.31	74	54.1	32.31	10.13	58.85	-	-	P	V
		11250	48.48	-25.52	74	55.61	38.85	14.88	60.86	-	-	P	V
		11250	38.7	-15.3	54	45.83	38.85	14.88	60.86	-	-	A	V
		14475	50.34	-23.66	74	56.14	40.53	16.85	63.18	-	-	P	V
		14475	41.56	-12.44	54	47.36	40.53	16.85	63.18	-	-	A	V
		18000	51.85	-22.15	74	47.04	43.1	18.95	57.24	-	-	P	V
		18000	42.07	-11.93	54	37.26	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

BLE Ant. 5	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)
		4880	38.88	-35.12	74	55.06	32.52	10.21	58.91	-	-	P	H
		7320	43.07	-30.93	74	52.53	36.52	12.43	58.41	-	-	P	H
		11415	48.38	-25.62	74	55.23	39.06	14.96	60.87	-	-	P	H
		11415	38.6	-15.4	54	45.45	39.06	14.96	60.87	-	-	A	H
		14505	48.4	-25.6	74	54.21	40.49	16.87	63.17	-	-	P	H
		14505	39.62	-14.38	54	45.43	40.49	16.87	63.17	-	-	A	H
		17985	51.58	-22.42	74	46.94	42.97	18.94	57.27	-	-	P	H
		17985	41.8	-12.2	54	37.16	42.97	18.94	57.27	-	-	A	H
BLE CH 19 2440MHz		4880	38.75	-35.25	74	54.93	32.52	10.21	58.91	-	-	P	V
		7320	42.91	-31.09	74	52.37	36.52	12.43	58.41	-	-	P	V
		11400	48.42	-25.58	74	55.23	39.1	14.96	60.87	-	-	P	V
		11400	38.64	-15.36	54	45.45	39.1	14.96	60.87	-	-	A	V
		14505	48.28	-25.72	74	54.09	40.49	16.87	63.17	-	-	P	V
		14505	39.5	-14.5	54	45.31	40.49	16.87	63.17	-	-	A	V
		18000	51.52	-22.48	74	46.71	43.1	18.95	57.24	-	-	P	V
		18000	41.74	-12.26	54	36.93	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

BLE Ant. 5	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)
		4960	39.27	-34.73	74	55.13	32.84	10.28	58.98	-	-	P	H
		7440	44.6	-29.4	74	54.3	36.02	12.48	58.2	-	-	P	H
		11400	48.37	-25.63	74	55.18	39.1	14.96	60.87	-	-	P	H
		11400	38.59	-15.41	54	45.4	39.1	14.96	60.87	-	-	A	H
		14505	48.57	-25.43	74	54.38	40.49	16.87	63.17	-	-	P	H
		14505	38.79	-15.21	54	44.6	40.49	16.87	63.17	-	-	A	H
		17925	51.74	-22.26	74	47.83	42.42	18.9	57.41	-	-	P	H
BLE CH 39 2480MHz													
		4960	39.2	-34.8	74	55.06	32.84	10.28	58.98	-	-	P	V
		7440	43.84	-30.16	74	53.54	36.02	12.48	58.2	-	-	P	V
		11190	48.65	-25.35	74	55.88	38.78	14.85	60.86	-	-	P	V
		11190	38.87	-15.13	54	46.1	38.78	14.85	60.86	-	-	A	V
		14505	48.81	-25.19	74	54.62	40.49	16.87	63.17	-	-	P	V
		14505	40.03	-13.97	54	45.84	40.49	16.87	63.17	-	-	A	V
		18000	53.13	-20.87	74	48.32	43.1	18.95	57.24	-	-	P	V
		18000	43.35	-10.65	54	38.54	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

Emission above 18GHz

2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
5		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE SHF		19232	43.8	-30.2	74	63.58	38.09	-2.82	55.05	-	-	P	H
		19232	42.36	-31.64	74	62.14	38.09	-2.82	55.05	-	-	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 with sufficient margin against limit line or noise floor only.

Emission below 1GHz

2.4GHz BLE (LF)

BLE Ant. 5	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 BLE LF		30.97	23.6	-16.4	40	31.45	24.01	0.62	32.48	-	-	P	H
		54.25	21.57	-18.43	40	40.59	12.58	0.96	32.56	-	-	P	H
		81.41	22.94	-17.06	40	40.84	13.38	1.2	32.48	-	-	P	H
		97.9	23.51	-19.99	43.5	39.09	15.59	1.3	32.47	-	-	P	H
		143.49	22.6	-20.9	43.5	36.07	17.28	1.74	32.49	-	-	P	H
		944.71	33.14	-12.86	46	29.83	30.31	4.25	31.25	-	-	P	H
		30.97	30.79	-9.21	40	38.64	24.01	0.62	32.48	-	-	P	V
		59.1	30	-10	40	49.8	11.73	1.02	32.55	-	-	P	V
		82.38	30.21	-9.79	40	47.98	13.5	1.21	32.48	-	-	P	V
		97.9	23.57	-19.93	43.5	39.15	15.59	1.3	32.47	-	-	P	V
		202.66	22.64	-20.86	43.5	38.28	14.91	1.95	32.5	-	-	P	V
		953.44	33.4	-12.6	46	29.49	30.82	4.28	31.19	-	-	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.

<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 19 2440MHz		4880	39.11	-34.89	74	55.29	32.52	10.21	58.91	-	-	P	H
		7320	43.21	-30.79	74	52.67	36.52	12.43	58.41	-	-	P	H
		10785	48.55	-25.45	74	55.82	38.97	14.65	60.89	-	-	A	H
		10785	39.6	-14.4	54	46.87	38.97	14.65	60.89	-	-	P	H
		14490	48.93	-25.07	74	54.73	40.51	16.86	63.17	-	-	A	H
		14490	41.41	-12.59	54	47.21	40.51	16.86	63.17	-	-	P	H
		17940	52.59	-21.41	74	48.5	42.56	18.91	57.38	-	-	A	H
		4880	38.16	-35.84	74	54.34	32.52	10.21	58.91	-	-	P	V
		7320	42.93	-31.07	74	52.39	36.52	12.43	58.41	-	-	P	V
		11280	49.13	-24.87	74	56.22	38.88	14.9	60.87	-	-	A	V
		11280	39.63	-14.37	54	46.72	38.88	14.9	60.87	-	-	P	V
		14490	49.23	-24.77	74	55.03	40.51	16.86	63.17	-	-	A	V
		14490	41.23	-12.77	54	47.03	40.51	16.86	63.17	-	-	P	V
		18000	52.37	-21.63	74	47.56	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE Ant. 5	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)
BLE CH 19 2440MHz		4880	38.84	-35.16	74	54.7	32.52	10.21	58.59	-	-	P	H
		7320	43.54	-30.46	74	52.66	36.52	12.43	58.07	-	-	P	H
		12360	48.31	-25.69	74	55.66	38.74	15.49	61.58	-	-	A	H
		12360	39.52	-14.48	54	46.87	38.74	15.49	61.58	-	-	P	H
		14475	48.66	-25.34	74	54.74	40.53	16.85	63.46	-	-	A	H
		14475	39.87	-14.13	54	45.95	40.53	16.85	63.46	-	-	P	H
		18000	51.64	-22.36	74	46.76	43.1	18.95	57.17	-	-	A	H
		4880	38.79	-35.21	74	54.65	32.52	10.21	58.59	-	-	P	V
		7320	44.37	-29.63	74	53.49	36.52	12.43	58.07	-	-	P	V
		12360	48.15	-25.85	74	55.5	38.74	15.49	61.58	-	-	A	V
		12360	39.36	-14.64	54	46.71	38.74	15.49	61.58	-	-	P	V
		14490	48.5	-25.5	74	54.61	40.51	16.86	63.48	-	-	A	V
		14490	39.71	-14.29	54	45.82	40.51	16.86	63.48	-	-	P	V
		18000	52.35	-21.65	74	47.47	43.1	18.95	57.17	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level 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	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		2334.675	51.32	-22.68	74	44.57	27.14	16.47	36.86	138	313	P	H
		2371.11	41.67	-12.33	54	34.7	27.28	16.53	36.84	138	313	A	H
	*	2402	74.02	-	-	66.87	27.4	16.58	36.83	138	313	P	H
	*	2402	73.28	-	-	66.13	27.4	16.58	36.83	138	313	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. Margin(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2333.675MHz:

1. Level(dBμV/m)

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

= 27.14(dB/m) + 16.47(dB) + 44.57(dBμV) – 36.86 (dB)

= 51.32 (dBμV/m)

2. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 51.32(dBμV/m) – 74(dBμV/m)

= -22.68(dB)

For Average Limit @ 2371.11MHz:

1. Level(dBμV/m)

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

= 27.28(dB/m) + 16.53(dB) + 34.7(dBμV) – 36.84 (dB)

= 41.67 (dBμV/m)

2. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 41.67(dBμV/m) – 54(dBμV/m)

= -12.33(dB)

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

Appendix E. Cabinet Radiated Spurious Emission Plots

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	**Temperature :**	22.1~23.1°C
		Relative Humidity :	55~60%

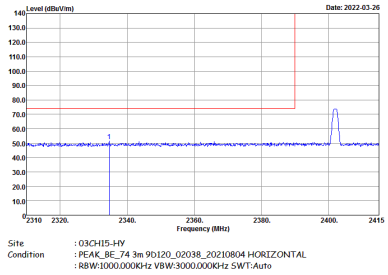
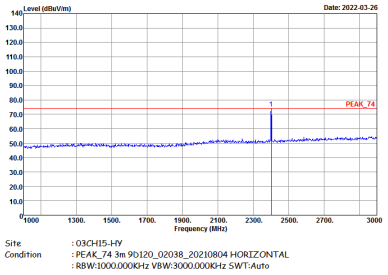
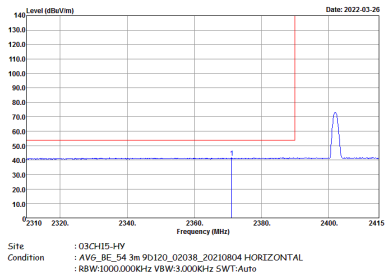
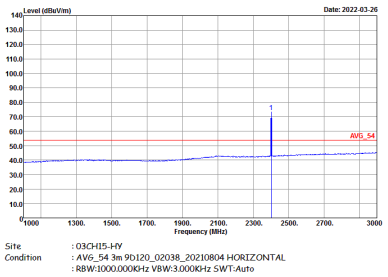
Note symbol

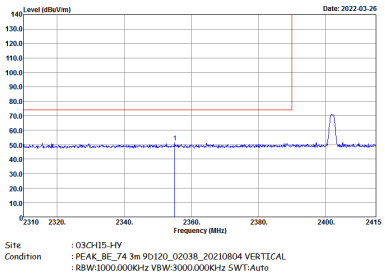
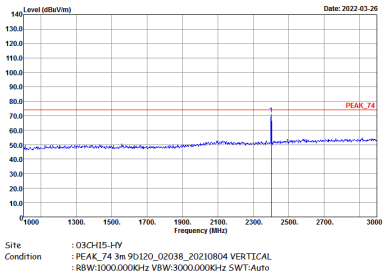
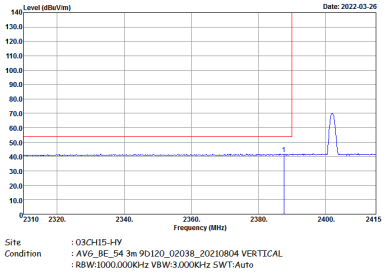
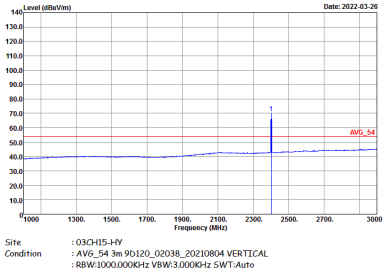
-L	**Low channel location**
-R	**High channel location**

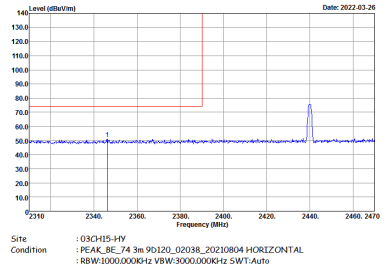
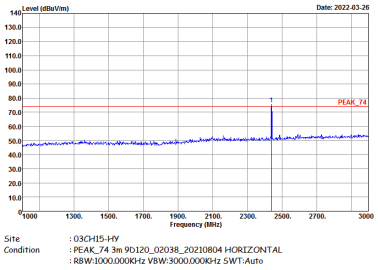
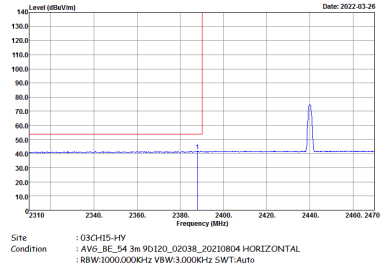
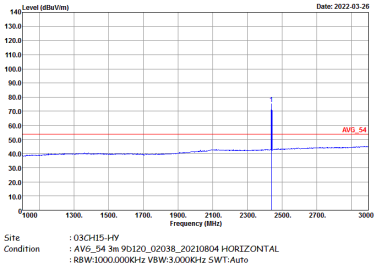
<1Mbps>

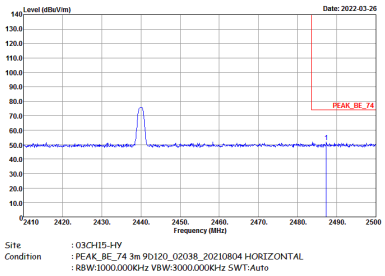
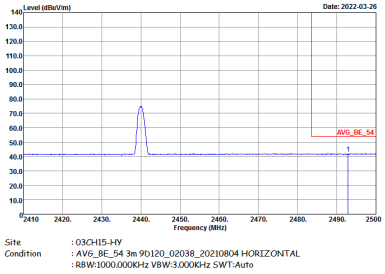
2.4GHz 2400~2483.5MHz

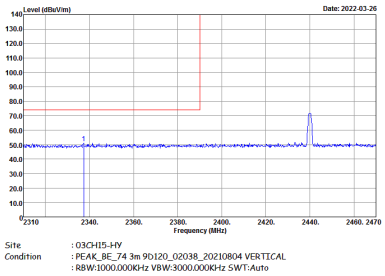
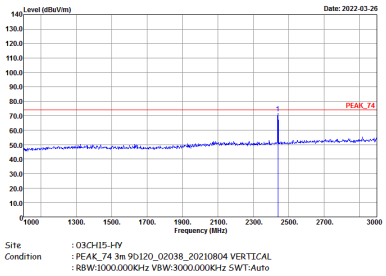
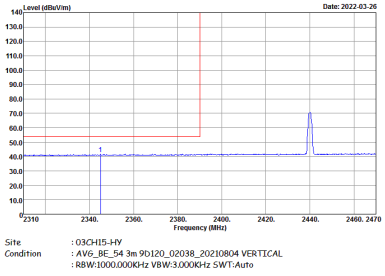
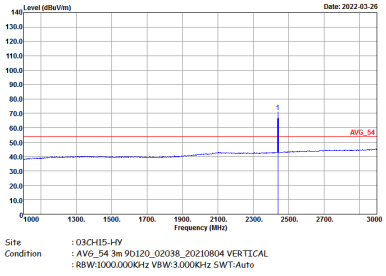
BLE (Band Edge @ 3m)

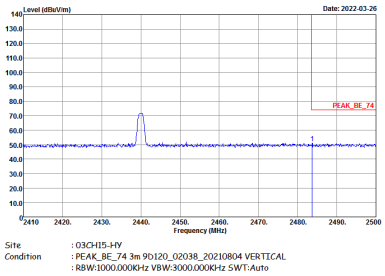
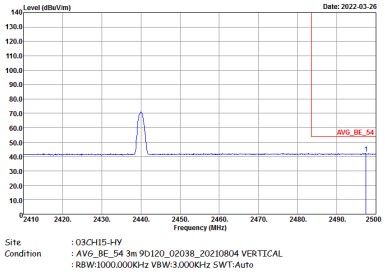
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
4	Horizontal	Fundamental
Peak		
Avg.		

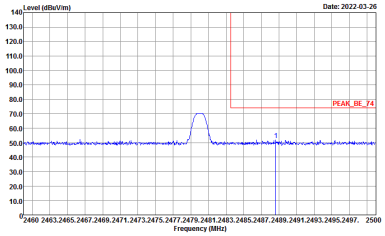
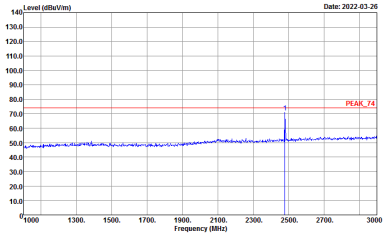
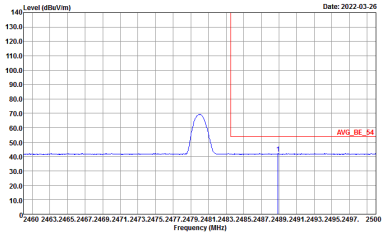
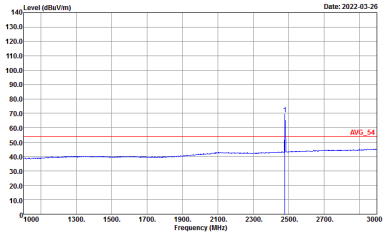
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
4	Vertical	Fundamental
Peak		
Avg		

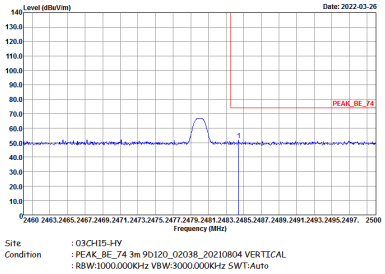
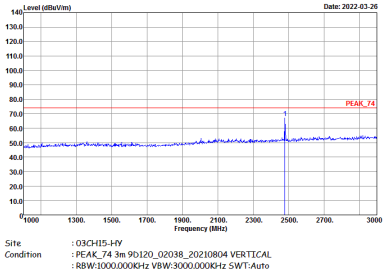
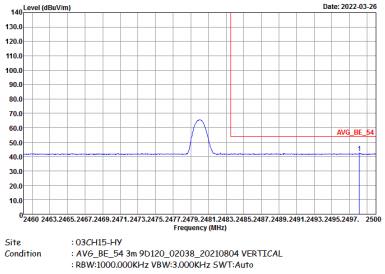
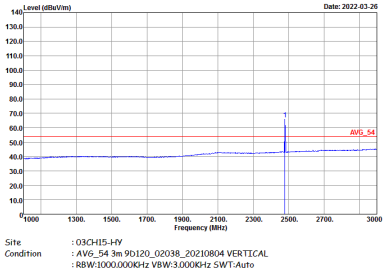
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
4	Horizontal	Fundamental
Peak		
Avg.		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
4	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
4	Vertical	Fundamental
Peak		
Avg.		

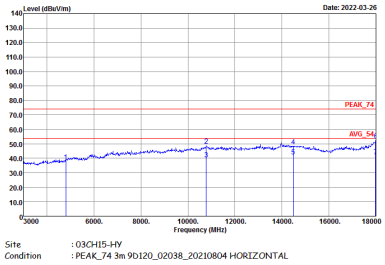
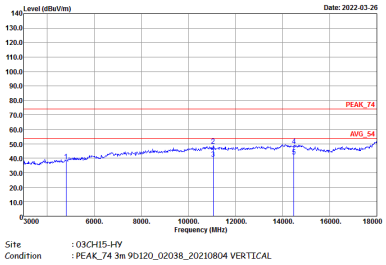
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
4	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

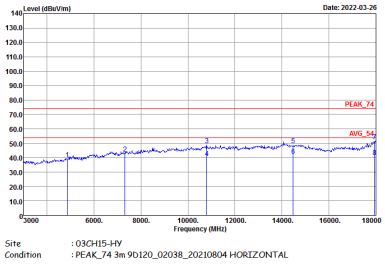
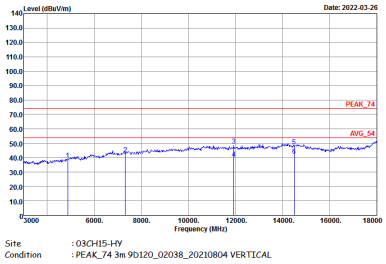
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
4	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_74 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	 Site : 03CH15-HY Condition : AVG_54 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto

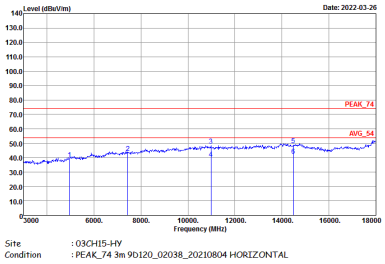
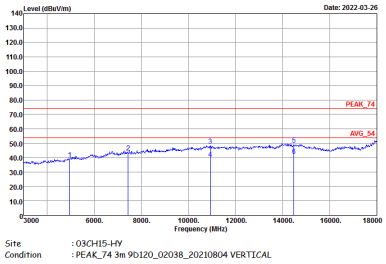
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
4	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

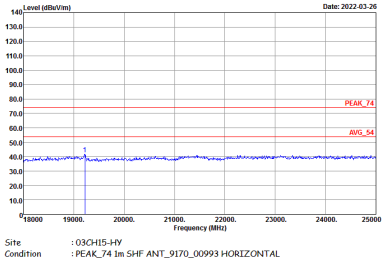
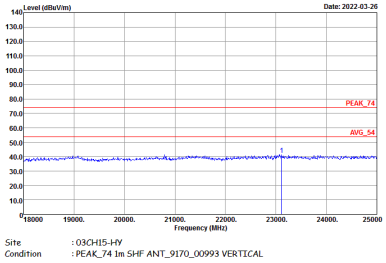
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
4	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
4	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH39 2480MHz	
4	Horizontal	Vertical
Peak		

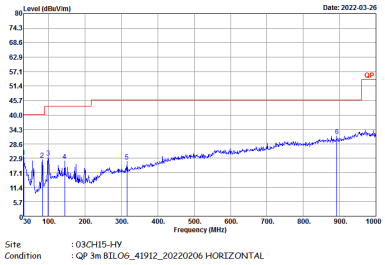
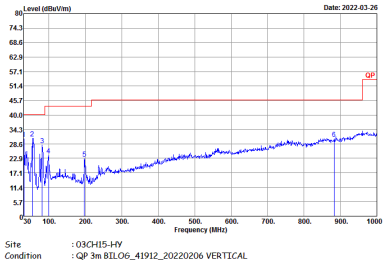
Emission above 18GHz

2.4GHz BLE (SHF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE SHF	
4	Horizontal	Vertical
QP / Peak		

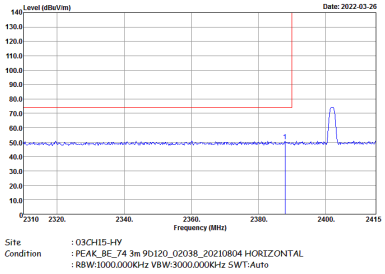
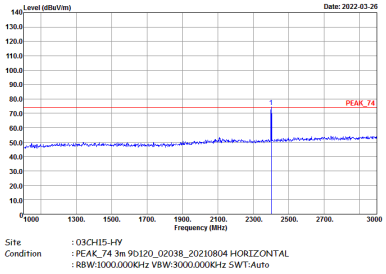
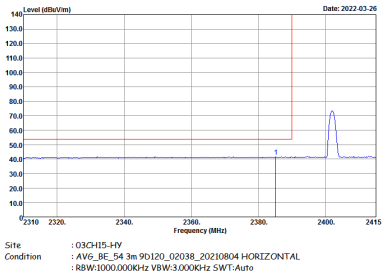
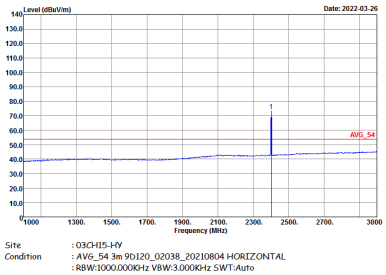
Emission below 1GHz

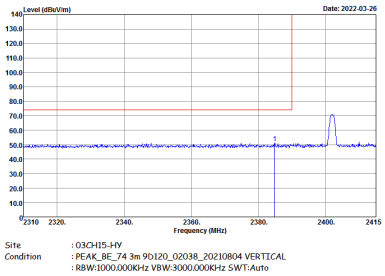
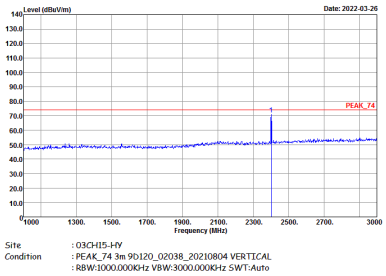
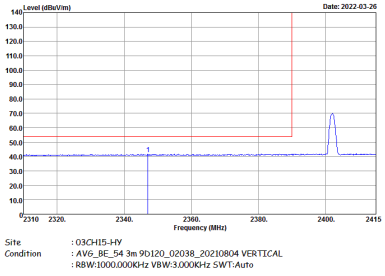
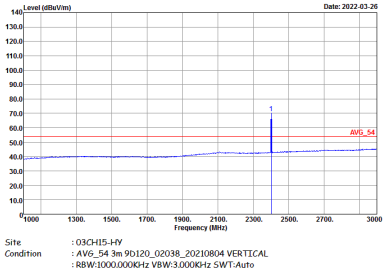
2.4GHz BLE (LF)

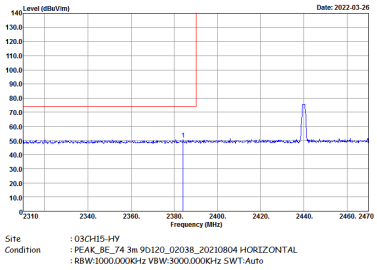
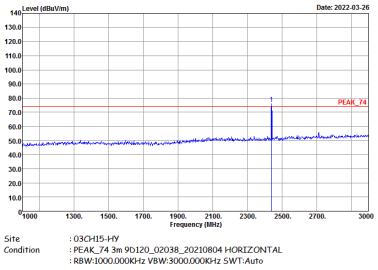
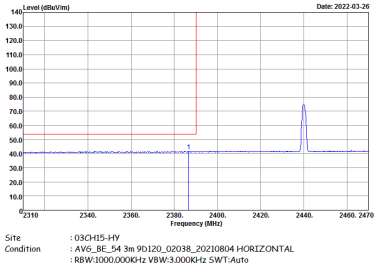
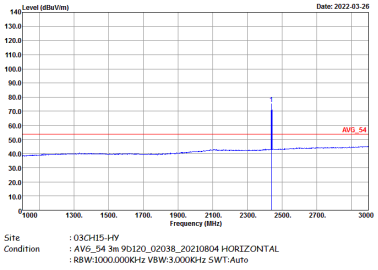
BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
4	Horizontal	Vertical
QP / Peak		

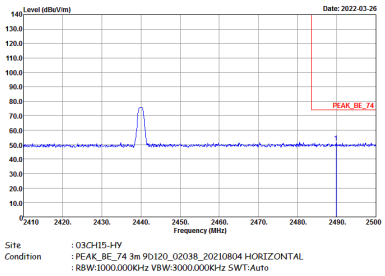
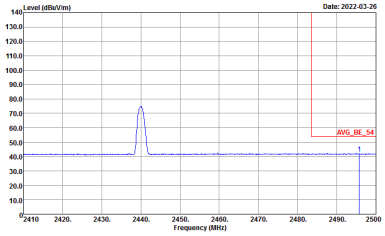
2.4GHz 2400~2483.5MHz

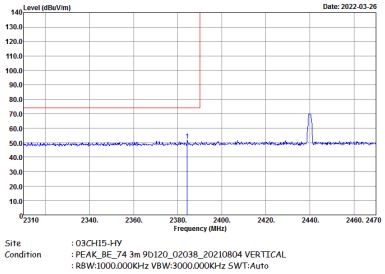
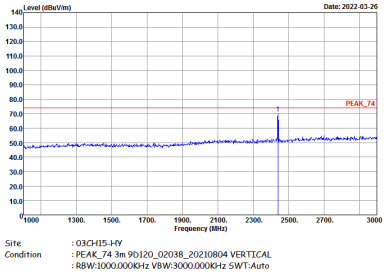
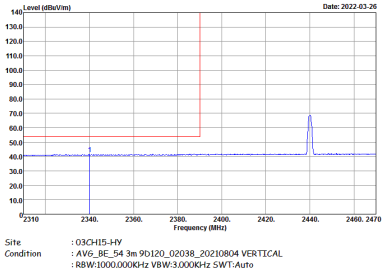
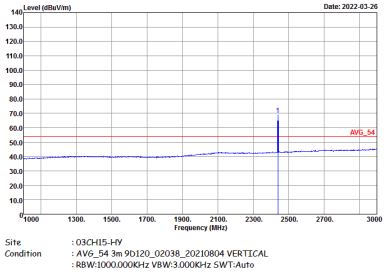
BLE (Band Edge @ 3m)

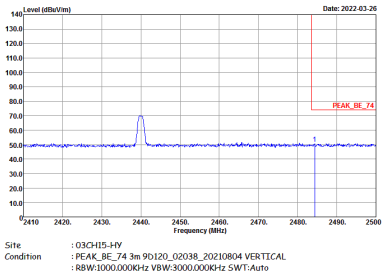
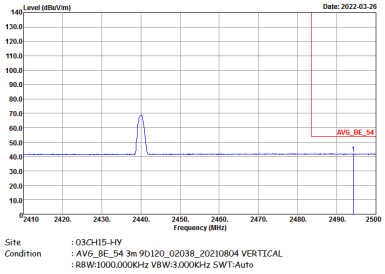
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
5	Horizontal	Fundamental
Peak		
Avg.		

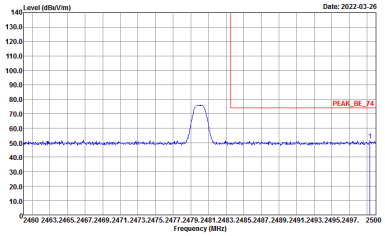
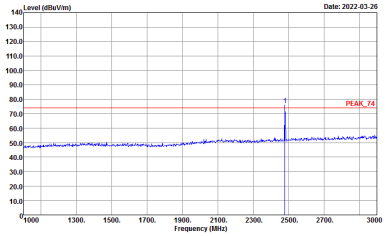
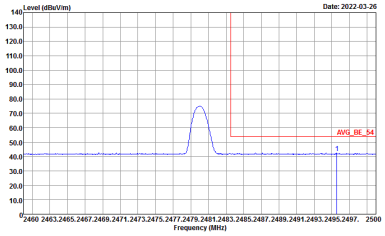
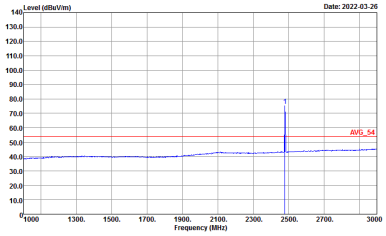
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
5	Vertical	Fundamental
Peak		
Avg		

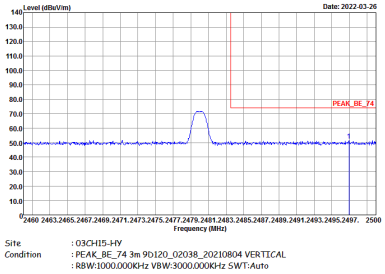
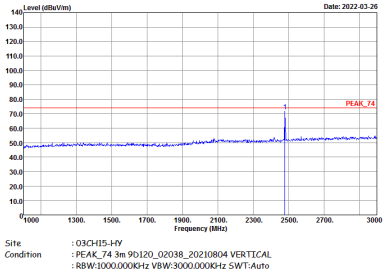
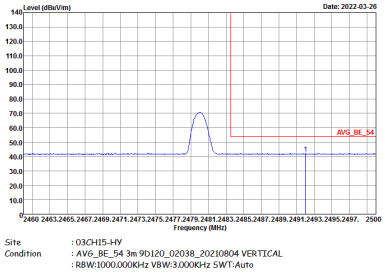
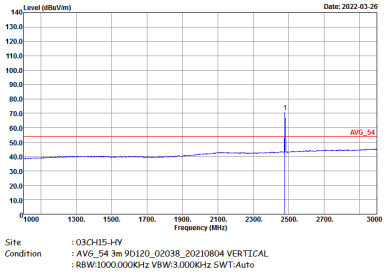
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
5	Horizontal	Fundamental
Peak		
Avg.		

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
5	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
5	Vertical	Fundamental
Peak		
Avg.		

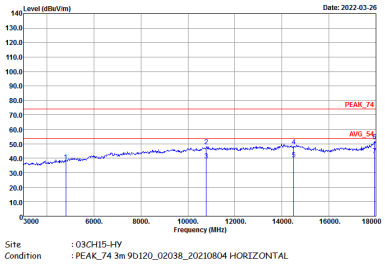
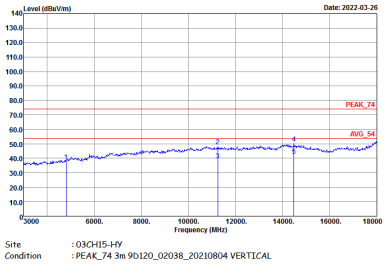
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
5	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

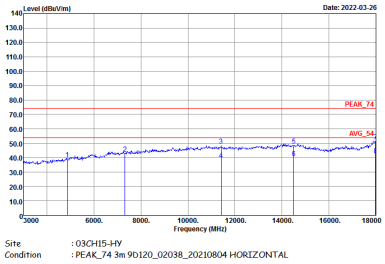
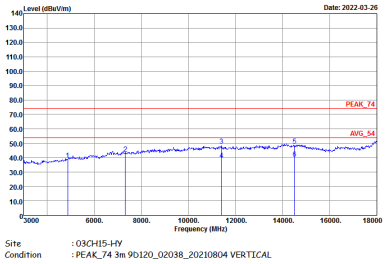
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
5	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_74 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	 Site : 03CH15-HY Condition : AVG_54 3m 9D120_02038_20210804 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto

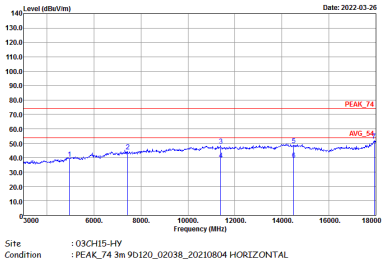
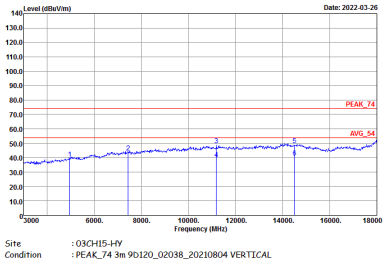
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
5	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

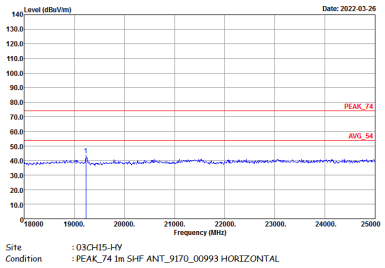
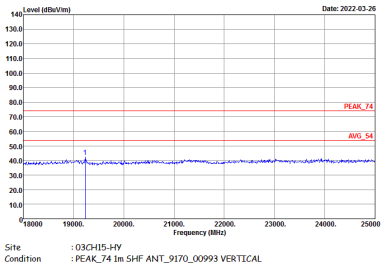
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
5	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
5	Horizontal	Vertical
Peak Avg.		

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH39 2480MHz	
5	Horizontal	Vertical
Peak		

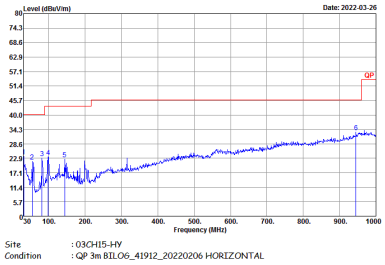
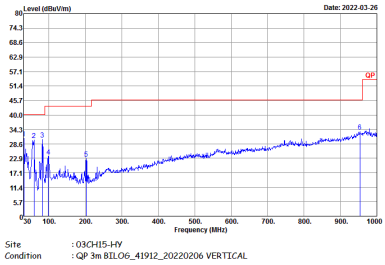
Emission above 18GHz

2.4GHz BLE (SHF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE SHF	
5	Horizontal	Vertical
QP / Peak		

Emission below 1GHz

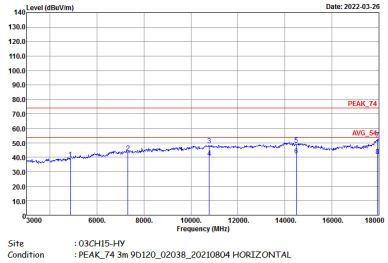
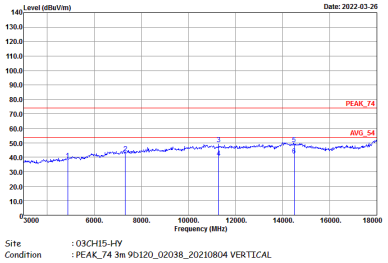
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
5	Horizontal	Vertical
QP / Peak		

<2Mbps>

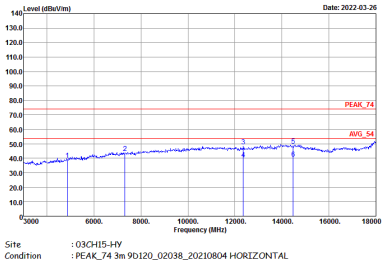
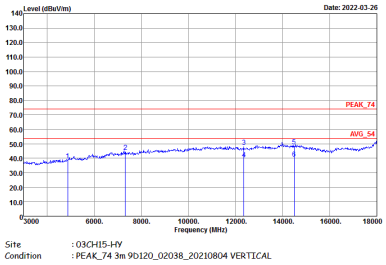
2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
4	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

BLE 2Mbps (Harmonic @ 3m)

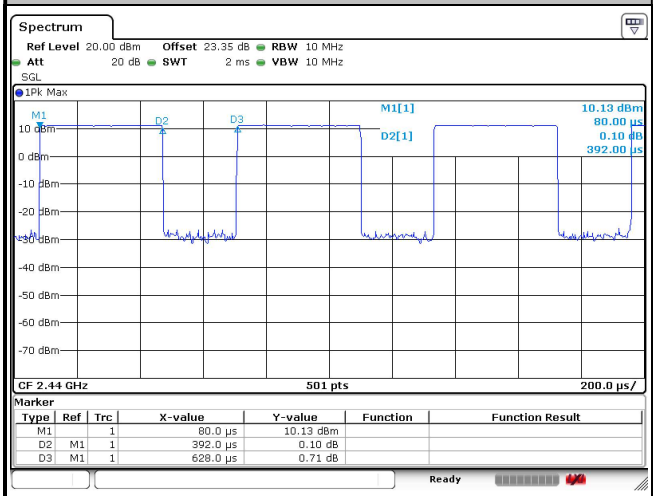
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
5	Horizontal	Vertical
Peak Avg.		

Appendix F. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
4	Bluetooth - LE for 1Mbps	62.18	392	2.55	3kHz
4	Bluetooth - LE for 2Mbps	33.12	208	4.81	10kHz
5	Bluetooth - LE for 1Mbps	62.18	388	2.58	3kHz
5	Bluetooth - LE for 2Mbps	33.12	208	4.81	10kHz

<Ant. 4>

Bluetooth – LE for 1Mbps



Bluetooth – LE for 2Mbps