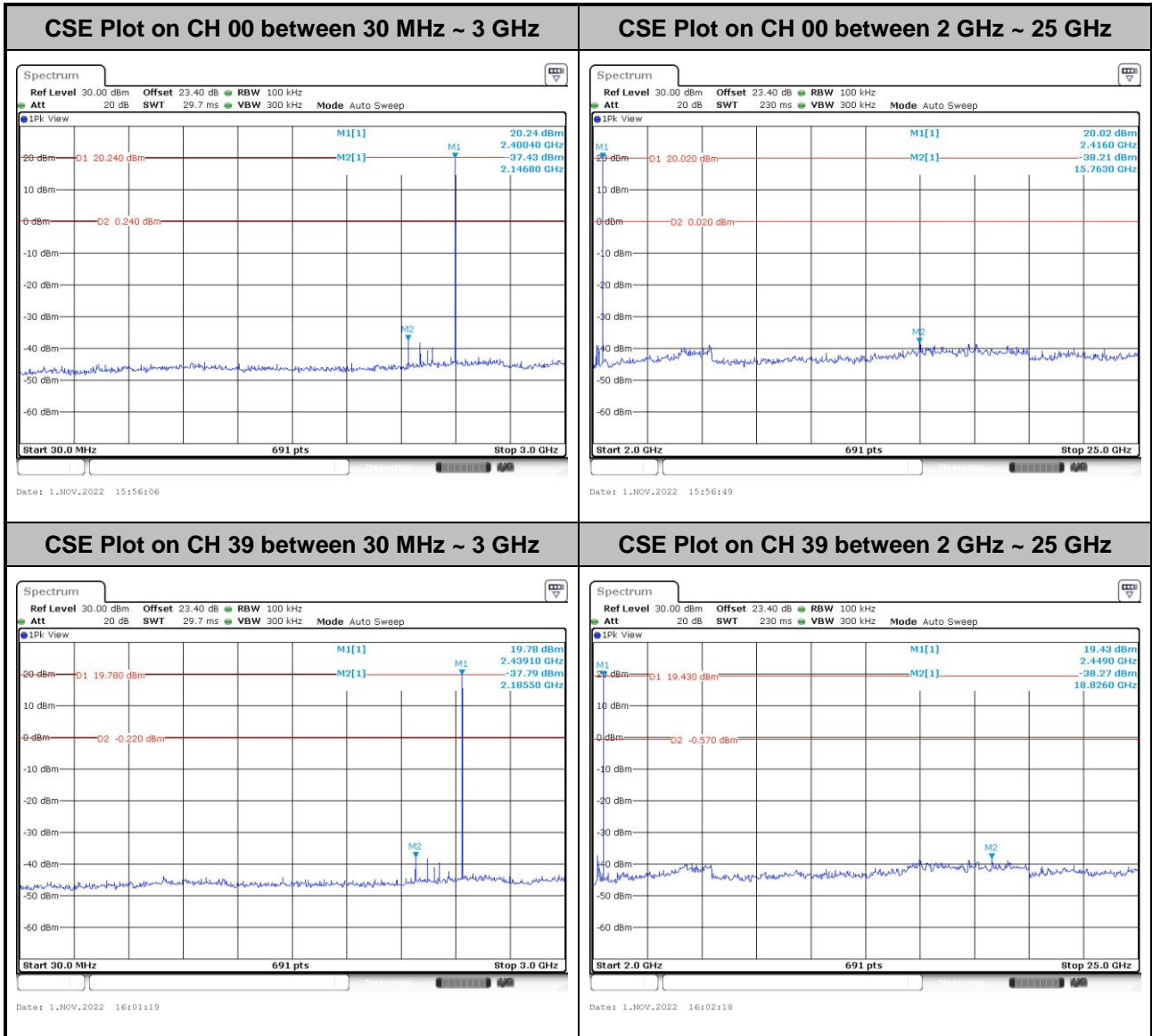
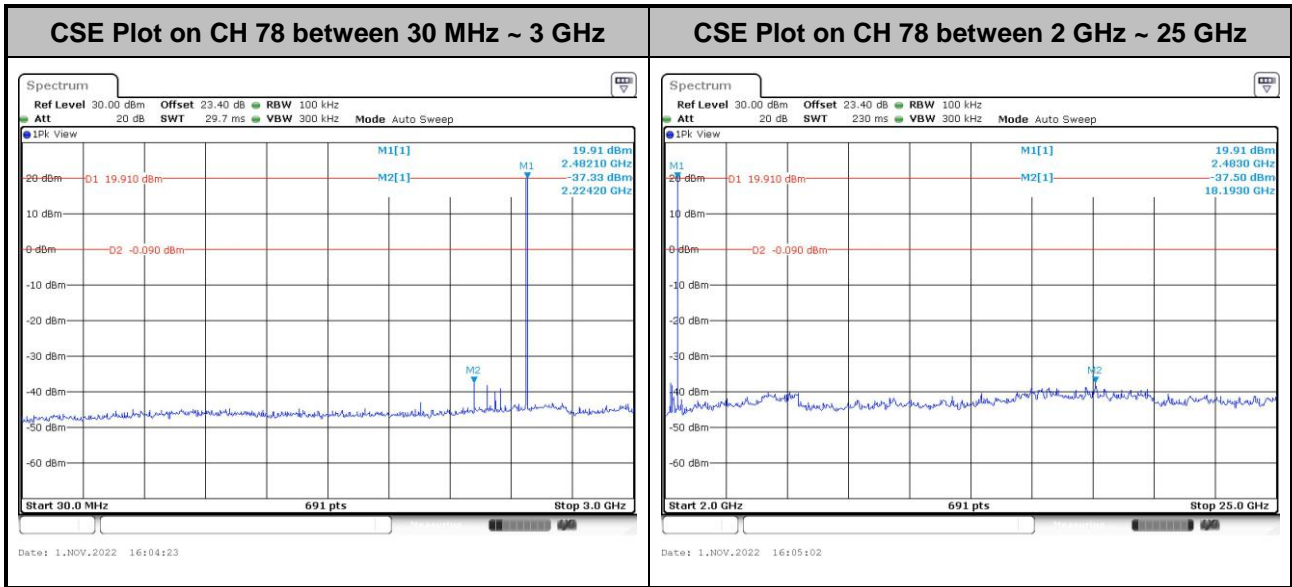




<Ant. 5>

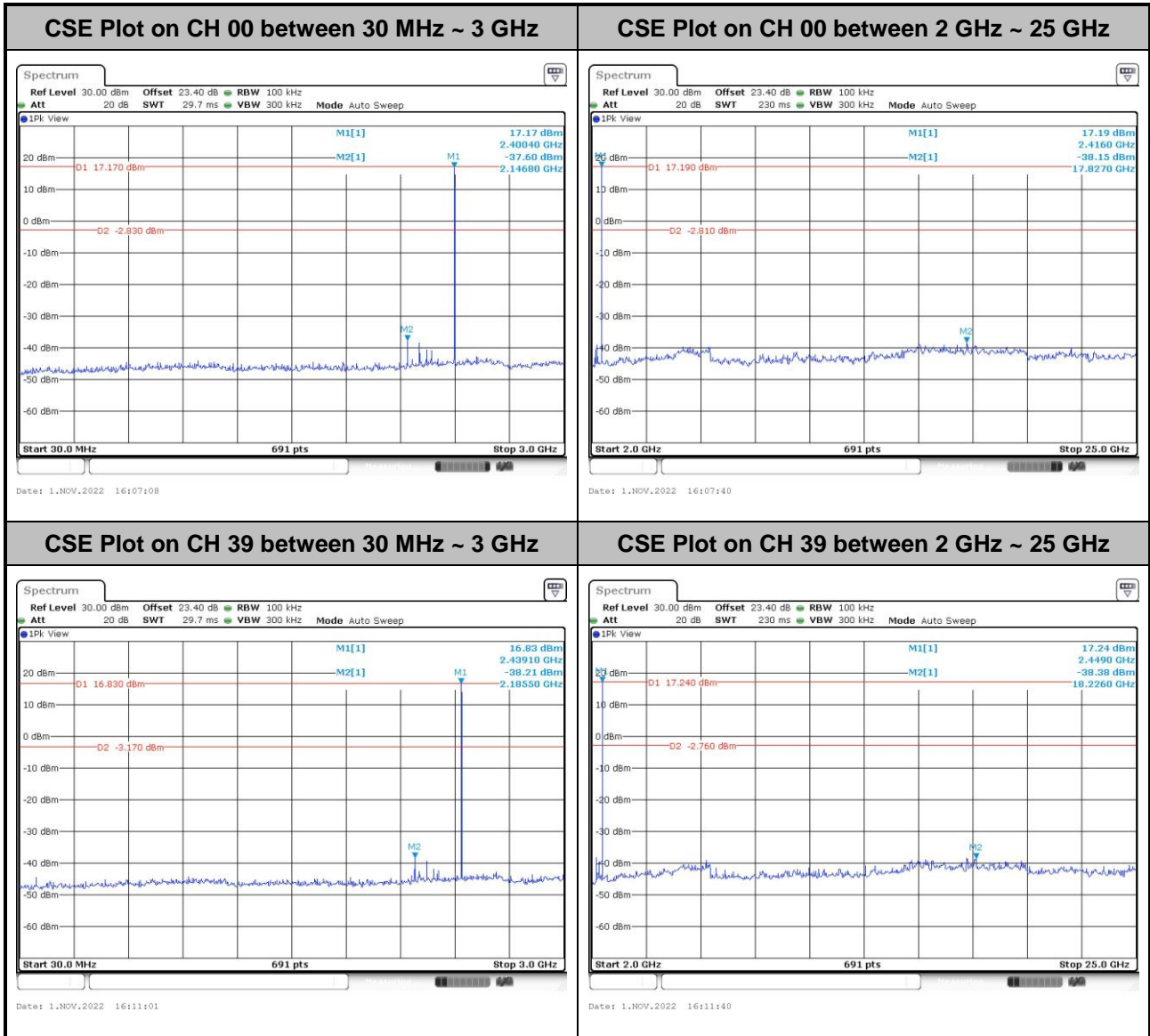
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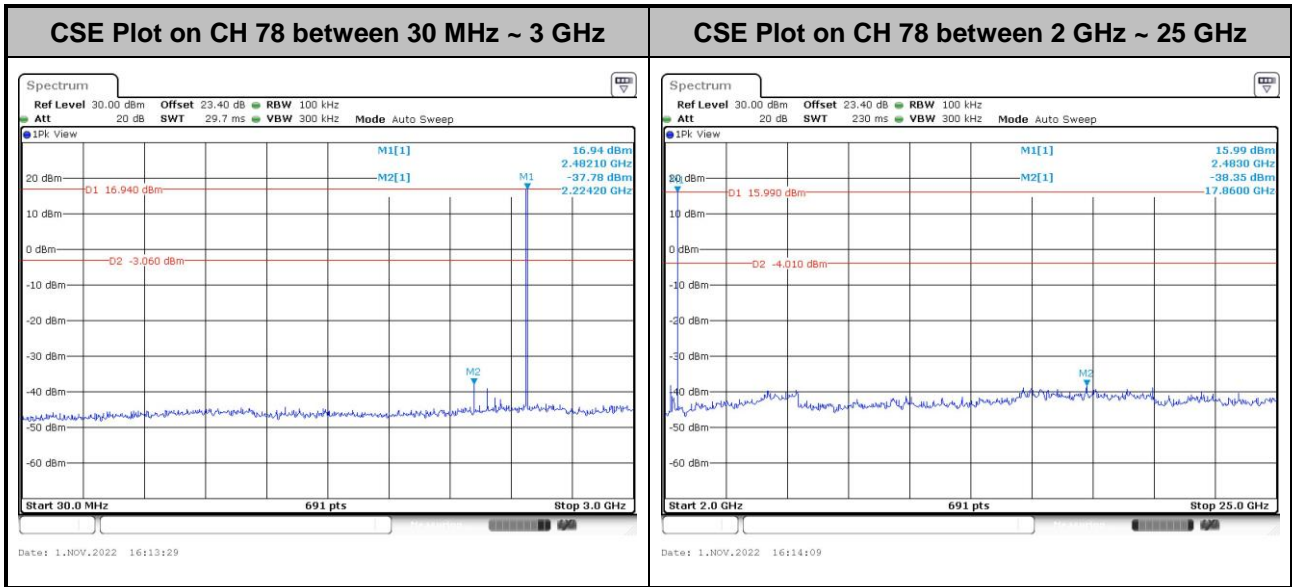






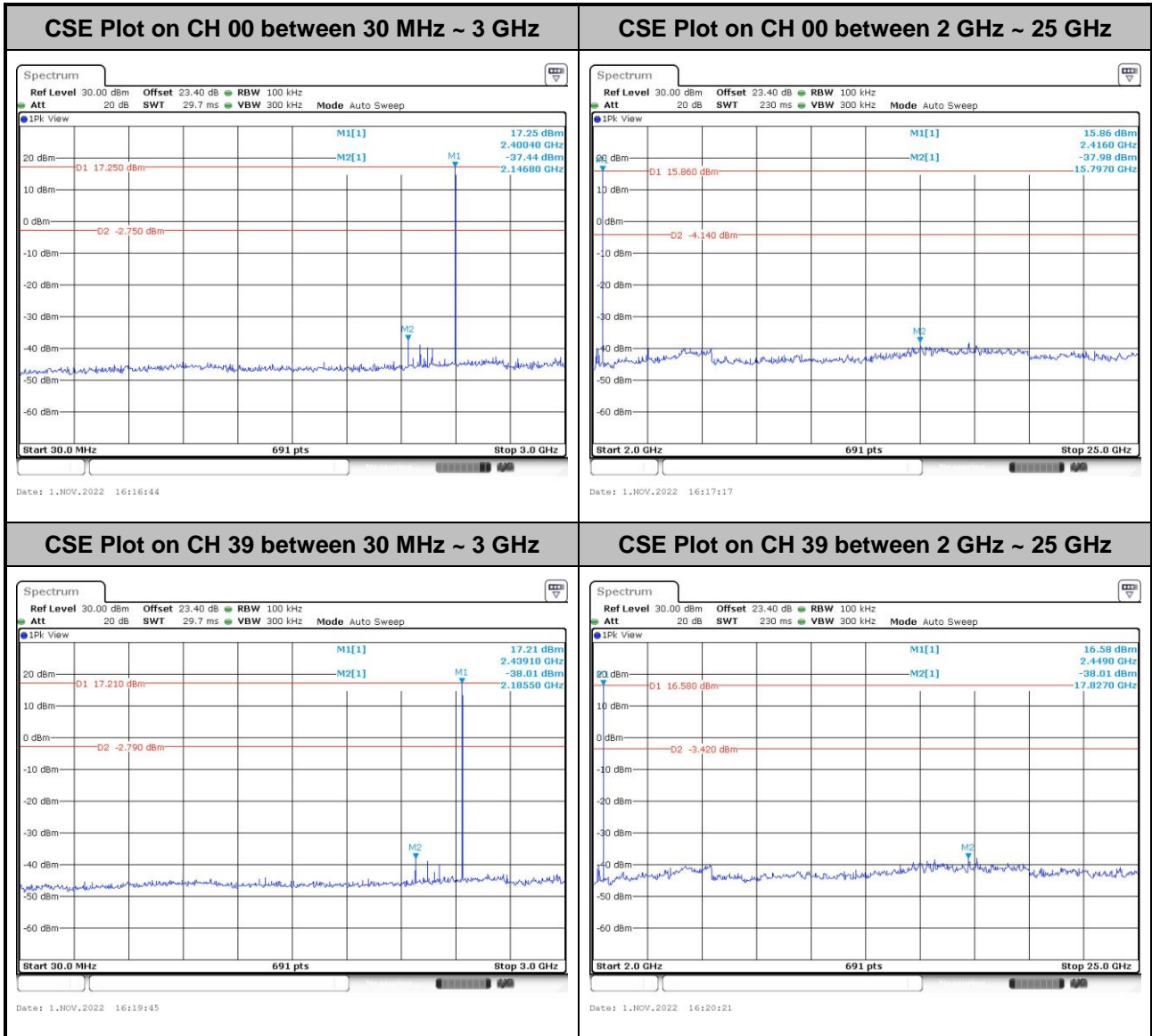
<2Mbps>

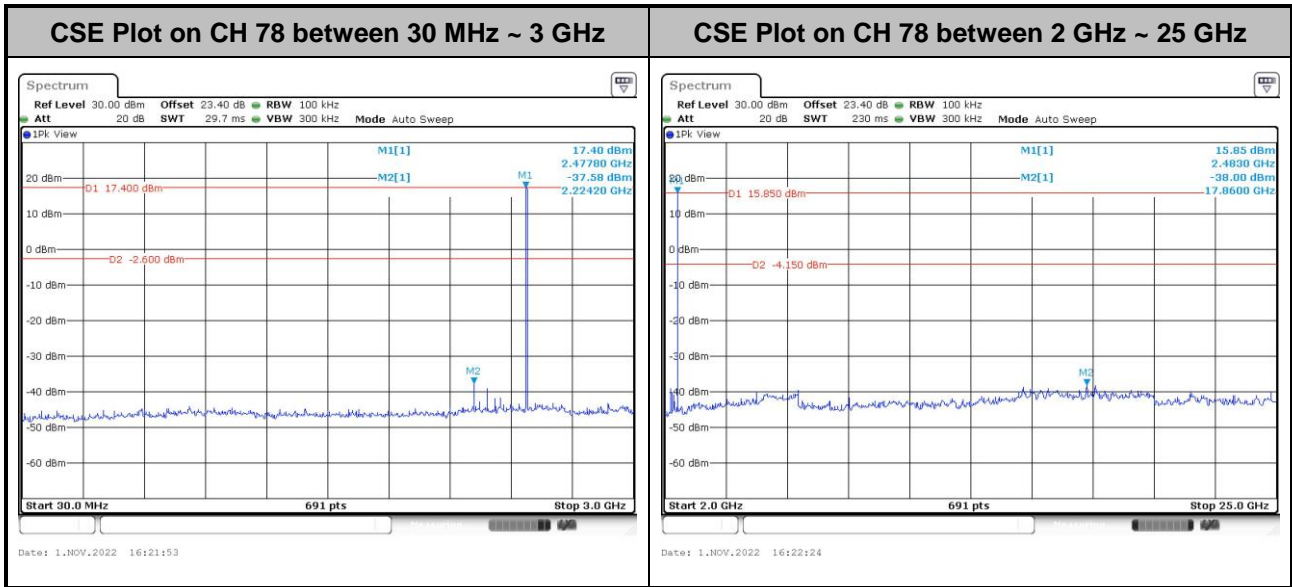






<3Mbps>







3.8 Radiated Band Edges and Spurious Emission Measurement

3.8.1 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. 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

3.8.2 Measuring Instruments

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



3.8.3 Test Procedures

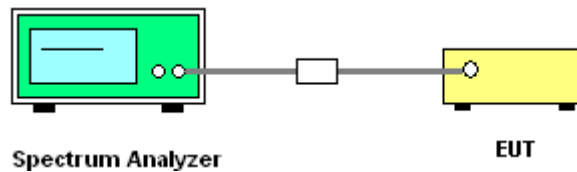
1. The testing follows the ANSI C63.10 Section 11.12.2 Antenna-port conducted measurements.
2. Measure the conducted output power (in dBm) using the peak detector.
3. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP.
4. Add the appropriate maximum ground reflection factor to the EIRP (6 dB for frequencies \leq 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:
$$E = \text{EIRP} - 20 \log d + 104.8,$$
where
E is the electric field strength in dB μ V/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 Gain + Path Loss + MIMO Factor + Read Level = Level
8. Perform the cabinet radiated spurious emission test.
9. 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.
10. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
11. For each suspected emission, 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 to comply with the guidelines.
12. Set the maximum power setting and enable the EUT to transmit continuously.
13. 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, RBW = 1 MHz for $f > 1$ GHz ; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c).
Duty cycle = On time/100 milliseconds
On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$
Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
Average Emission Level = Peak Emission Level + 20*log (Duty cycle)

14. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
15. 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 “-“.
16. 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 “-“.

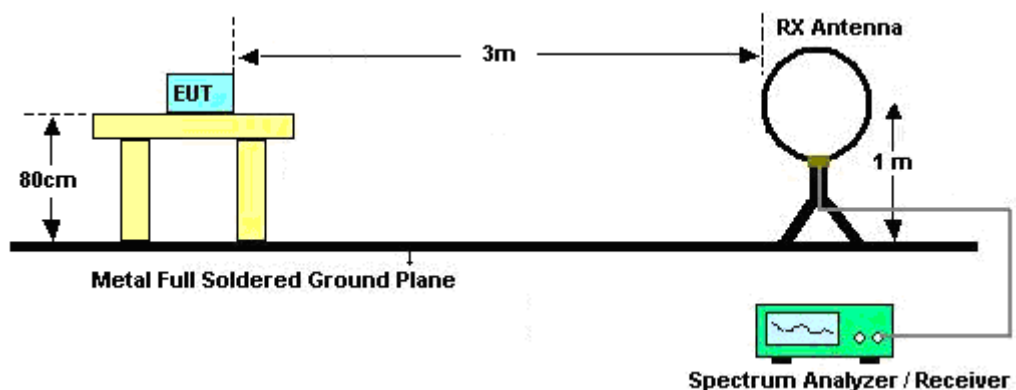
Note: The average levels are calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from $20\log(\text{dwell time}/100\text{ms})$. This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.8.4 Test Setup

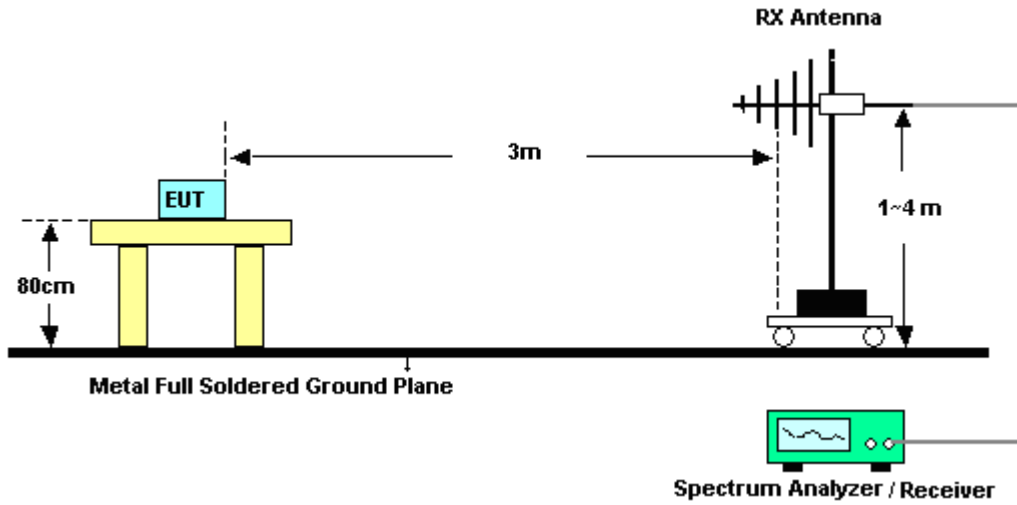
For Conducted Measurement Setup:



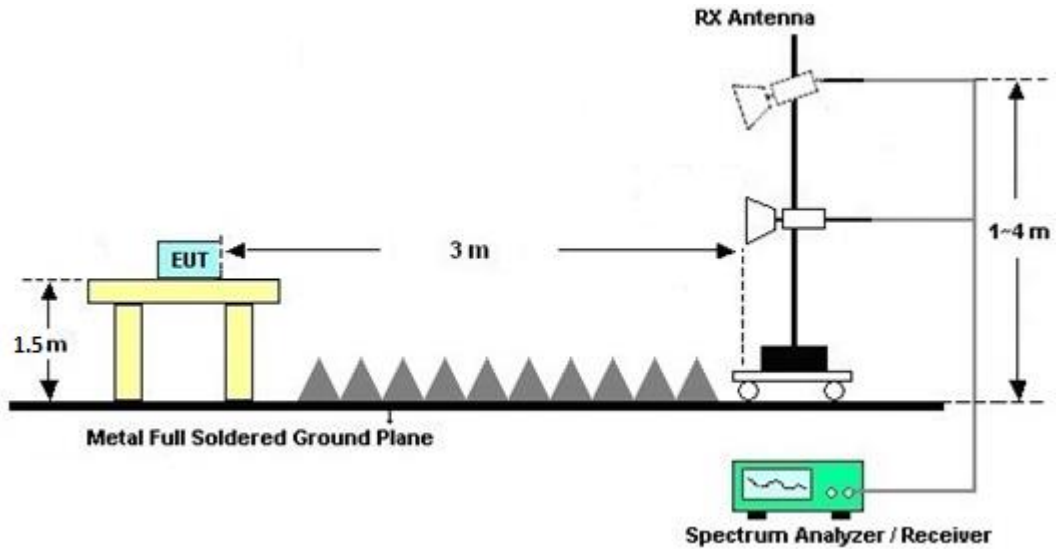
For radiated test below 30MHz



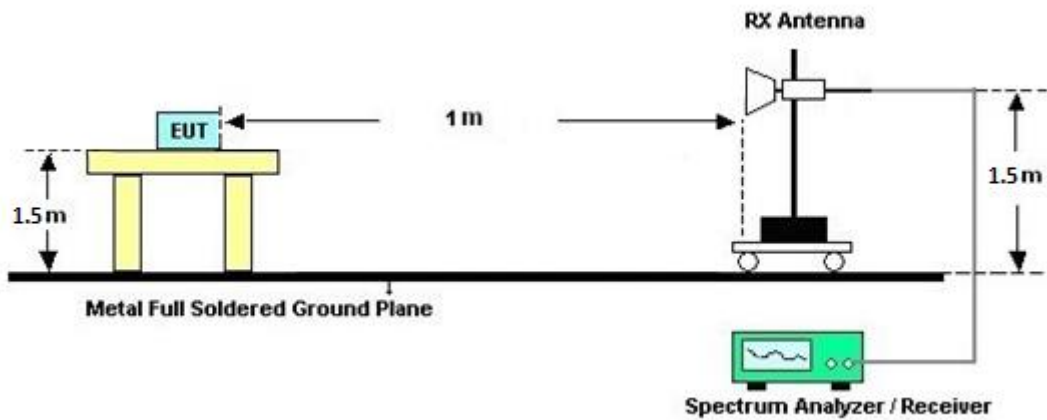
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.8.5 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.

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

Please refer to Appendix B and C.

3.8.7 Test Result of Conduced Spurious Emission in the Restricted Band

Please refer to Appendix B and C.

3.8.8 Test Result of Cabinet Radiated Spurious at Band Edges

Please refer to Appendix D and E.

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

Please refer to Appendix D and E.

3.8.10 Duty Cycle

Please refer to Appendix F.



3.9 Antenna Requirements

3.9.1 Standard Applicable

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.

3.9.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECEPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Oct. 28, 2022~ Nov. 03, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	1036004	N/A	Aug. 08, 2022	Oct. 28, 2022~ Nov. 03, 2022	Aug. 07, 2023	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 08, 2022	Oct. 28, 2022~ Nov. 03, 2022	Aug. 07, 2023	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101905	10Hz - 40GHz	Aug. 03, 2022	Oct. 28, 2022~ Nov. 03, 2022	Aug. 02, 2023	Conducted (TH05-HY)
Spectrum Analyzer	ROHDE & SCHWARZ	FSV40	101565	10Hz~40GHz	Dec. 29, 2021	Aug. 23, 2022~ Nov. 05, 2022	Dec. 28, 2022	CSE (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 10, 2022	Aug. 23, 2022~ Nov. 05, 2022	Mar. 09, 2023	CSE (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 10, 2021	Aug. 23, 2022~ Nov. 05, 2022	Dec. 09, 2022	CSE (TH05-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 21, 2022	Aug. 23, 2022~ Nov. 05, 2022	Feb. 20, 2023	CSE (TH05-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 15, 2022	Aug. 23, 2022~ Nov. 05, 2022	Mar. 14, 2023	CSE (TH05-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 OST	SN15	3GHz High Pass Filter	May 24, 2022	Aug. 23, 2022~ Nov. 05, 2022	May 23, 2023	CSE (TH05-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Mar. 18, 2022	Oct. 15, 2022~ Oct. 31, 2022	Mar. 17, 2023	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	41912 & 05	30MHz~1GHz	Feb. 06, 2022	Oct. 15, 2022~ Oct. 31, 2022	Feb. 05, 2023	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2021	Oct. 15, 2022~ Oct. 31, 2022	Dec. 26, 2022	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02294	1GHz~18GHz	Jun. 23, 2022	Oct. 15, 2022~ Oct. 31, 2022	Jun. 22, 2023	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz~40GHz	Nov. 30, 2021	Oct. 15, 2022~ Oct. 31, 2022	Nov. 29, 2022	Radiation (03CH15-HY)
Amplifier	EMEC	EM1G18G	060837	1GHz~18GHz	Sep. 01, 2022	Oct. 15, 2022~ Oct. 31, 2022	Aug. 31, 2023	Radiation (03CH15-HY)
Preamplifier	EM Electronics	EM01G18G	060803	1GHz-18GHz	Dec. 16, 2021	Oct. 15, 2022~ Oct. 31, 2022	Dec. 15, 2022	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060802	18-40GHz	Mar. 08, 2022	Oct. 15, 2022~ Oct. 31, 2022	Mar. 07, 2023	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20MHz~8.4GHz	Oct. 21, 2021	Oct. 15, 2022~ Oct. 16, 2022	Oct. 20, 2022	Radiation (03CH15-HY)
Spectrum Analyzer	Keysight	N9010	MY54200485	10Hz~44GHz	May 07, 2022	Oct. 15, 2022~ Oct. 31, 2022	May 06, 2023	Radiation (03CH15-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Oct. 15, 2022~ Oct. 31, 2022	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Oct. 15, 2022~ Oct. 31, 2022	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24 (k5)	RK-000451	N/A	N/A	Oct. 15, 2022~ Oct. 31, 2022	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE, 508405/2E	30MHz~18G	Nov. 15, 2021	Oct. 15, 2022~ Oct. 31, 2022	Nov. 14, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804011/2,804 012/2	30MHz-40GHz	Jan. 04, 2022	Oct. 15, 2022~ Oct. 31, 2022	Jan. 03, 2023	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 10, 2022	Oct. 15, 2022~ Oct. 31, 2022	Mar. 09, 2023	Radiation (03CH15-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.3 dB
---	--------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.2 dB
---	--------

Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.4 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2 dB
---	--------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Derek Hsu and Eason Huang	Temperature:	21~25	°C
Test Date:	2022/10/28~2022/11/03	Relative Humidity:	51~54	%

<Ant. 4>

TEST RESULTS DATA**20dB and 99% Occupied Bandwidth and Hopping Channel Separation**

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	20db BW (MHz)	99% Bandwidth (MHz)	Hopping Channel Separation Measurement (MHz)	Hopping Channel Separation Measurement Limit (MHz)	Pass/Fail
DH	1Mbps	1	0	2402	0.978	0.931	1.007	0.6522	Pass
DH	1Mbps	1	39	2441	0.973	0.894	1.016	0.6483	Pass
DH	1Mbps	1	78	2480	0.926	0.891	0.994	0.6175	Pass
2DH	2Mbps	1	0	2402	1.263	1.169	0.999	0.8423	Pass
2DH	2Mbps	1	39	2441	1.263	1.169	0.999	0.8423	Pass
2DH	2Mbps	1	78	2480	1.268	1.169	1.003	0.8451	Pass
3DH	3Mbps	1	0	2402	1.255	1.157	0.999	0.8365	Pass
3DH	3Mbps	1	39	2441	1.259	1.157	0.999	0.8393	Pass
3DH	3Mbps	1	78	2480	1.259	1.157	0.999	0.8393	Pass

TEST RESULTS DATA**Dwell Time**

Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time (hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH1	79	320.000	0.38	0.00	0.4	Pass
DH1 (AFH)	20	160.000	0.38	0.00	0.4	Pass

TEST RESULTS DATA**Peak Power Table**

DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH1	0	1	19.68	30.00	Pass
	39	1	19.28	30.00	Pass
	78	1	19.19	30.00	Pass
2DH1	0	1	18.79	20.97	Pass
	39	1	18.34	20.97	Pass
	78	1	18.29	20.97	Pass
3DH1	0	1	19.16	20.97	Pass
	39	1	18.73	20.97	Pass
	78	1	18.67	20.97	Pass

TEST RESULTS DATA**Average Power Table
(Reporting Only)**

DH	CH.	NTX	Average Power (dBm)	Duty Factor (dB)
DH1	0	1	19.39	5.18
	39	1	19.00	5.18
	78	1	18.88	5.18
2DH1	0	1	16.42	5.12
	39	1	15.95	5.12
	78	1	15.93	5.12
3DH1	0	1	16.55	5.12
	39	1	16.05	5.12
	78	1	16.01	5.12

TEST RESULTS DATA**Number of Hopping Frequency**

Number of Hopping (Channel)	Adaptive Frequency Hopping (Channel)	Limits (Channel)	Pass/Fail
79	20	> 15	Pass

<Ant. 5>

TEST RESULTS DATA**20dB and 99% Occupied Bandwidth and Hopping Channel Separation**

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	20db BW (MHz)	99% Bandwidth (MHz)	Hopping Channel Separation Measurement (MHz)	Hopping Channel Separation Measurement Limit (MHz)	Pass/Fail
DH	1Mbps	1	0	2402	0.874	0.802	1.146	0.5827	Pass
DH	1Mbps	1	39	2441	0.874	0.808	1.155	0.5827	Pass
DH	1Mbps	1	78	2480	0.871	0.810	1.146	0.5807	Pass
2DH	2Mbps	1	0	2402	1.263	1.166	0.999	0.8423	Pass
2DH	2Mbps	1	39	2441	1.263	1.166	0.999	0.8420	Pass
2DH	2Mbps	1	78	2480	1.263	1.169	0.999	0.8420	Pass
3DH	3Mbps	1	0	2402	1.255	1.151	0.999	0.8365	Pass
3DH	3Mbps	1	39	2441	1.255	1.154	0.999	0.8365	Pass
3DH	3Mbps	1	78	2480	1.255	1.154	0.999	0.8365	Pass

TEST RESULTS DATA**Dwell Time**

Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time (hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH5	79	106.670	2.88	0.31	0.4	Pass
DH5 (AFH)	20	53.330	2.88	0.15	0.4	Pass

TEST RESULTS DATA**Peak Power Table**

DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH1	0	1	20.05	30.00	Pass
	39	1	20.01	30.00	Pass
	78	1	20.04	30.00	Pass
2DH1	0	1	19.19	20.97	Pass
	39	1	19.11	20.97	Pass
	78	1	19.18	20.97	Pass
3DH1	0	1	19.60	20.97	Pass
	39	1	19.51	20.97	Pass
	78	1	19.62	20.97	Pass

TEST RESULTS DATA**Average Power Table
(Reporting Only)**

DH	CH.	NTX	Average Power (dBm)	Duty Factor (dB)
DH1	0	1	19.88	5.19
	39	1	19.80	5.19
	78	1	19.86	5.19
2DH1	0	1	16.92	5.12
	39	1	16.77	5.12
	78	1	16.79	5.12
3DH1	0	1	16.86	5.12
	39	1	16.72	5.12
	78	1	16.88	5.12

TEST RESULTS DATA**Number of Hopping Frequency**

Number of Hopping (Channel)	Adaptive Frequency Hopping (Channel)	Limits (Channel)	Pass/Fail
79	20	> 15	Pass



Appendix B. Conducted Spurious Emission

Test Engineer :	Kai Liao and Nick Yu	Temperature :	22.7~24.8°C
		Relative Humidity :	52~59%

2.4GHz 2400~2483.5MHz

BT (Band Edge)

BT Ant.	Note	Frequency (MHz)	Level (dBm)	Margin (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BT CH 00 2402MHz		2325.33	-41.74	-20.54	-21.2	-46.36	3.53	1.09	0	0	P
		2325.33	-66.52	-25.32	-41.2	-	-	-	-	-	A
	*	2402	22.97	-	-	18.27	3.53	1.17	0	0	P
	*	2402	-1.81	-	-	-	-	-	-	-	A
BT CH 39 2441MHz		2312.94	-32.46	-11.26	-21.2	-37.07	3.53	1.08	0	0	P
		2312.94	-57.24	-16.04	-41.2	-	-	-	-	-	A
	*	2441	22.87	-	-	18.14	3.53	1.2	0	0	P
	*	2441	-1.91	-	-	-	-	-	-	-	A
		2484.53	-44.32	-23.12	-21.2	-49.08	3.53	1.23	0	0	P
		2484.53	-69.1	-27.9	-41.2	-	-	-	-	-	A
BT CH 78 2480MHz	*	2480	21.96	-	-	17.2	3.53	1.23	0	0	P
	*	2480	-2.82	-	-	-	-	-	-	-	A
		2483.52	-30.45	-9.25	-21.2	-35.21	3.53	1.23	0	0	P
		2483.52	-55.23	-14.03	-41.2	-	-	-	-	-	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



2.4GHz 2400~2483.5MHz

BT (Harmonic)

BT Ant. 4	Note	Frequency (MHz)	Level (dBm)	Margin (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BT CH 00 2402MHz		2146	-39.1	-17.9	-21.2	-43.66	3.53	1.03	0	0	P
		2146	-63.88	-22.68	-41.2	-	-	-	-	-	A
		2210	-40.76	-19.56	-21.2	-45.3	3.53	1.01	0	0	P
		2210	-65.54	-24.34	-41.2	-	-	-	-	-	A
		2248	-38.41	-17.21	-21.2	-42.98	3.53	1.04	0	0	P
		2248	-63.19	-21.99	-41.2	-	-	-	-	-	A
		2274	-33.61	-12.41	-21.2	-38.19	3.53	1.05	0	0	P
		2274	-58.39	-17.19	-41.2	-	-	-	-	-	A
		2530	-37.29	-16.09	-21.2	-42.06	3.53	1.24	0	0	P
		2530	-62.07	-20.87	-41.2	-	-	-	-	-	A
		4804	-60.24	-39.04	-21.2	-65.12	3.53	1.35	0	0	P
		4804	-85.02	-43.82	-41.2	-	-	-	-	-	A
		7206	-51.79	-30.59	-21.2	-56.91	3.53	1.59	0	0	P
		7206	-76.57	-35.37	-41.2	-	-	-	-	-	A
		9608	-57.23	-36.03	-21.2	-62.52	3.53	1.76	0	0	P
		9608	-82.01	-40.81	-41.2	-	-	-	-	-	A
		12010	-58.11	-36.91	-21.2	-63.43	3.53	1.79	0	0	P
		12010	-82.89	-41.69	-41.2	-	-	-	-	-	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



BT Ant. 4	Note	Frequency (MHz)	Level (dBm)	Margin (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BT CH 39 2441MHz		2186	-37.53	-16.33	-21.2	-42.08	3.53	1.02	0	0	P
		2186	-62.31	-21.11	-41.2	-	-	-	-	-	A
		2250	-40.46	-19.26	-21.2	-45.03	3.53	1.04	0	0	P
		2250	-65.24	-24.04	-41.2	-	-	-	-	-	A
		2288	-38.16	-16.96	-21.2	-42.75	3.53	1.06	0	0	P
		2288	-62.94	-21.74	-41.2	-	-	-	-	-	A
		2314	-33.23	-12.03	-21.2	-37.84	3.53	1.08	0	0	P
		2314	-58.01	-16.81	-41.2	-	-	-	-	-	A
		2570	-37.52	-16.32	-21.2	-42.29	3.53	1.24	0	0	P
		2570	-62.3	-21.1	-41.2	-	-	-	-	-	A
		4882	-51.29	-30.09	-21.2	-56.15	3.53	1.33	0	0	P
		4882	-76.07	-34.87	-41.2	-	-	-	-	-	A
		7323	-53.89	-32.69	-21.2	-59.04	3.53	1.62	0	0	P
		7323	-78.67	-37.47	-41.2	-	-	-	-	-	A
		9764	-54.46	-33.26	-21.2	-59.73	3.53	1.74	0	0	P
		9764	-79.24	-38.04	-41.2	-	-	-	-	-	A
		12205	-51.19	-29.99	-21.2	-56.55	3.53	1.83	0	0	P
		12205	-75.97	-34.77	-41.2	-	-	-	-	-	A
	17087	-60.87	-39.67	-21.2	-66.9	3.53	2.5	0	0	P	
	17087	-85.65	-44.45	-41.2	-	-	-	-	-	A	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



BT Ant. 4	Note	Frequency (MHz)	Level (dBm)	Margin (dB)	Limit Line (dBm)	Read Level (dBm)	Antenna Gain (dBi)	Path Loss (dB)	MIMO Factor (dB)	Grounding Factor (dB)	Peak Avg. (P/A)
BT CH 78 2480MHz		2172	-40.8	-19.6	-21.2	-45.35	3.53	1.02	0	0	P
		2172	-65.58	-24.38	-41.2	-	-	-	-	-	A
		2224	-35.31	-14.11	-21.2	-39.86	3.53	1.02	0	0	P
		2224	-60.09	-18.89	-41.2	-	-	-	-	-	A
		2288	-40.47	-19.27	-21.2	-45.06	3.53	1.06	0	0	P
		2288	-65.25	-24.05	-41.2	-	-	-	-	-	A
		2326	-37.45	-16.25	-21.2	-42.07	3.53	1.09	0	0	P
		2326	-62.23	-21.03	-41.2	-	-	-	-	-	A
		2352	-33.41	-12.21	-21.2	-38.06	3.53	1.12	0	0	P
		2352	-58.19	-16.99	-41.2	-	-	-	-	-	A
		2608	-37.97	-16.77	-21.2	-42.72	3.53	1.22	0	0	P
		2608	-62.75	-21.55	-41.2	-	-	-	-	-	A
		4960	-58.72	-37.52	-21.2	-63.59	3.53	1.34	0	0	P
		4960	-83.5	-42.3	-41.2	-	-	-	-	-	A
		7440	-51.66	-30.46	-21.2	-56.86	3.53	1.67	0	0	P
		7440	-76.44	-35.24	-41.2	-	-	-	-	-	A
		9920	-55.82	-34.62	-21.2	-61.06	3.53	1.71	0	0	P
		9920	-80.6	-39.4	-41.2	-	-	-	-	-	A
	12400	-63.15	-41.95	-21.2	-68.54	3.53	1.86	0	0	P	
	12400	-87.93	-46.73	-41.2	-	-	-	-	-	A	
	17360	-64.01	-42.81	-21.2	-70.04	3.53	2.5	0	0	P	
	17360	-88.79	-47.59	-41.2	-	-	-	-	-	A	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.					Line	Level	Gain	Loss	Factor	Factor	Avg.
4		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
2.4GHz BT LF		39.72	-82.59	-27.39	-55.2	-91	3.53	0.18	0	4.7	P
		122.61	-81.34	-29.64	-51.7	-89.93	3.53	0.36	0	4.7	P
		243.84	-81.22	-32.02	-49.2	-89.92	3.53	0.47	0	4.7	P
		437.2	-81.67	-32.47	-49.2	-90.54	3.53	0.64	0	4.7	P
		647.9	-80.34	-31.14	-49.2	-89.33	3.53	0.76	0	4.7	P
		784.4	-79.9	-30.7	-49.2	-89.02	3.53	0.89	0	4.7	P
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



2.4GHz 2400~2483.5MHz

BT (Band Edge)

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Groun ding	Peak
Ant.					Line	Level	Gain	Loss	Factor	Factor	Avg.
5		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
BT CH 00 2402MHz		2325.225	-42.55	-21.35	-21.2	-47.17	3.53	1.09	0	0	P
		2325.225	-67.33	-26.13	-41.2	-	-	-	-	-	A
	*	2402	23.01	-		18.31	3.53	1.17	0	0	P
	*	2402	-1.77	-	-	-	-	-	-	-	A
BT CH 39 2441MHz		2312.8	-36.48	-15.28	-21.2	-41.09	3.53	1.08	0	0	P
		2312.8	-61.26	-20.06	-41.2	-	-	-	-	-	A
	*	2441	22.99	-		18.26	3.53	1.2	0	0	P
	*	2441	-1.79	-	-	-	-	-	-	-	A
		2494.33	-44.59	-23.39	-21.2	-49.36	3.53	1.24	0	0	P
		2494.33	-69.37	-28.17	-41.2	-	-	-	-	-	A
BT CH 78 2480MHz	*	2480	22.24	-		17.48	3.53	1.23	0	0	P
	*	2480	-2.54	-	-	-	-	-	-	-	A
		2483.52	-31.2	-10	-21.2	-35.96	3.53	1.23	0	0	P
		2483.52	-55.98	-14.78	-41.2	-	-	-	-	-	A
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



2.4GHz 2400~2483.5MHz

BT (Harmonic)

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant. 5		(MHz)	(dBm)	(dB)	Line (dBm)	Level (dBm)	Gain (dBi)	Loss (dB)	Factor (dB)	Factor (dB)	Avg. (P/A)
BT CH 00 2402MHz		2146	-35.79	-14.59	-21.2	-40.35	3.53	1.03	0	0	P
		2146	-60.57	-19.37	-41.2	-	-	-	-	-	A
		2172	-42.19	-20.99	-21.2	-46.74	3.53	1.02	0	0	P
		2172	-66.93	-25.73	-41.2	-	-	-	-	-	A
		2210	-35.81	-14.61	-21.2	-40.35	3.53	1.01	0	0	P
		2210	-60.59	-19.39	-41.2	-	-	-	-	-	A
		2248	-39	-17.8	-21.2	-43.57	3.53	1.04	0	0	P
		2248	-63.78	-22.58	-41.2	-	-	-	-	-	A
		2274	-37.86	-16.66	-21.2	-42.44	3.53	1.05	0	0	P
		2274	-62.64	-21.44	-41.2	-	-	-	-	-	A
		2530	-40.25	-19.05	-21.2	-45.02	3.53	1.24	0	0	P
		2530	-65.03	-23.83	-41.2	-	-	-	-	-	A
		4804	-55.3	-34.1	-21.2	-60.18	3.53	1.35	0	0	P
		4804	-80.08	-38.88	-41.2	-	-	-	-	-	A
		6905.2	-54.88	-33.68	-21.2	-59.91	3.53	1.5	0	0	P
		6905.2	-79.66	-38.46	-41.2	-	-	-	-	-	A
		7206	-42.28	-21.08	-21.2	-47.4	3.53	1.59	0	0	P
		7206	-67.06	-25.86	-41.2	-	-	-	-	-	A
		9608	-64.25	-43.05	-21.2	-69.54	3.53	1.76	0	0	P
		9608	-89.03	-47.83	-41.2	-	-	-	-	-	A
	12010	-62.38	-41.18	-21.2	-67.7	3.53	1.79	0	0	P	
	12010	-87.16	-45.96	-41.2	-	-	-	-	-	A	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant. 5		(MHz)	(dBm)	(dB)	Line (dBm)	Level (dBm)	Gain (dBi)	Loss (dB)	Factor (dB)	Factor (dB)	Avg. (P/A)
BT CH 39 2441MHz		2184	-35.21	-14.01	-21.2	-39.76	3.53	1.02	0	0	P
		2184	-59.99	-18.79	-41.2	-	-	-	-	-	A
		2248	-35.19	-13.99	-21.2	-39.76	3.53	1.04	0	0	P
		2248	-59.97	-18.77	-41.2	-	-	-	-	-	A
		2288	-37.66	-16.46	-21.2	-42.25	3.53	1.06	0	0	P
		2288	-62.44	-21.24	-41.2	-	-	-	-	-	A
		2314	-37.88	-16.68	-21.2	-42.49	3.53	1.08	0	0	P
		2314	-62.66	-21.46	-41.2	-	-	-	-	-	A
		2570	-41.29	-20.09	-21.2	-46.06	3.53	1.24	0	0	P
		2570	-66.07	-24.87	-41.2	-	-	-	-	-	A
		2698	-41.56	-20.36	-21.2	-46.2	3.53	1.11	0	0	P
		2698	-66.34	-25.14	-41.2	-	-	-	-	-	A
		4882	-53.18	-31.98	-21.2	-58.04	3.53	1.33	0	0	P
		4882	-77.96	-36.76	-41.2	-	-	-	-	-	A
		6905.2	-54.72	-33.52	-21.2	-59.75	3.53	1.5	0	0	P
		6905.2	-79.5	-38.3	-41.2	-	-	-	-	-	A
		7323	-45.53	-24.33	-21.2	-50.68	3.53	1.62	0	0	P
		7323	-70.31	-29.11	-41.2	-	-	-	-	-	A
		9764	-58.5	-37.3	-21.2	-63.77	3.53	1.74	0	0	P
		9764	-83.28	-42.08	-41.2	-	-	-	-	-	A
	12205	-56.04	-34.84	-21.2	-61.4	3.53	1.83	0	0	P	
	12205	-80.82	-39.62	-41.2	-	-	-	-	-	A	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant. 5		(MHz)	(dBm)	(dB)	Line (dBm)	Level (dBm)	Gain (dBi)	Loss (dB)	Factor (dB)	Factor (dB)	Avg. (P/A)
BT CH 78 2480MHz		2172	-41.34	-20.14	-21.2	-45.89	3.53	1.02	0	0	P
		2172	-66.12	-24.92	-41.2	-	-	-	-	-	A
		2224	-34.69	-13.49	-21.2	-39.24	3.53	1.02	0	0	P
		2224	-59.47	-18.27	-41.2	-	-	-	-	-	A
		2288	-34.64	-13.44	-21.2	-39.23	3.53	1.06	0	0	P
		2288	-59.42	-18.22	-41.2	-	-	-	-	-	A
		2326	-38.68	-17.48	-21.2	-43.3	3.53	1.09	0	0	P
		2326	-63.46	-22.26	-41.2	-	-	-	-	-	A
		2352	-37.72	-16.52	-21.2	-42.37	3.53	1.12	0	0	P
		2352	-62.5	-21.3	-41.2	-	-	-	-	-	A
		2736	-41.65	-20.45	-21.2	-46.35	3.53	1.17	0	0	P
		2736	-66.43	-25.23	-41.2	-	-	-	-	-	A
		4960	-51.17	-29.97	-21.2	-56.04	3.53	1.34	0	0	P
		4960	-75.95	-34.75	-41.2	-	-	-	-	-	A
		6905.2	-54.75	-33.55	-21.2	-59.78	3.53	1.5	0	0	P
		6905.2	-79.53	-38.33	-41.2	-	-	-	-	-	A
		7440	-37.3	-16.1	-21.2	-42.5	3.53	1.67	0	0	P
		7440	-62.08	-20.88	-41.2	-	-	-	-	-	A
	9920	-62.35	-41.15	-21.2	-67.59	3.53	1.71	0	0	P	
	9920	-87.13	-45.93	-41.2	-	-	-	-	-	A	
	12400	-59.72	-38.52	-21.2	-65.11	3.53	1.86	0	0	P	
	12400	-84.5	-43.3	-41.2	-	-	-	-	-	A	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.										



Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.					Line	Level	Gain	Loss	Factor	Factor	Avg.
5		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
2.4GHz BT LF		51.06	-81.99	-26.79	-55.2	-90.41	3.53	0.19	0	4.7	P
		122.07	-81.73	-30.03	-51.7	-90.32	3.53	0.36	0	4.7	P
		275.16	-81.43	-32.23	-49.2	-90.14	3.53	0.48	0	4.7	P
		863.5	-79.85	-30.65	-49.2	-89.09	3.53	1.01	0	4.7	P
		878.2	-79.39	-30.19	-49.2	-88.63	3.53	1.01	0	4.7	P
		897.1	-77.98	-28.78	-49.2	-87.22	3.53	1.01	0	4.7	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	Peak or Average



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

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	MIMO	Grounding	Peak
Ant.					Line	Level	Gain	Loss	Factor	Factor	Avg.
4		(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dBi)	(dB)	(dB)	(dB)	(P/A)
BT CH 00 2402MHz		2382.24	-38.94	-17.74	-21.2	-43.37	3.53	0.9	0	0	P

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. MIMO Factor(dB) = 10 log (NANT) , where NANT 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(dBm) = Antenna Gain(dBi) + Path Loss(dB) + Read Level(dBm) + MIMO Factor(dB) + Grounding Factor(dB)
5. Margin Limit(dB) = Level(dBm) – Limit Line(dBm)

For Peak Limit @ 2382.24MHz:

1. Level(dBm)
 = Antenna Gain(dBi) + Path Loss(dB) + MIMO Factor(dB) + Grounding Factor(dB) + Read Level(dBm)
 = 3.53(dB) + 0.9(dB) – 43.37(dBm)
 = -38.94(dBm)
2. Margin Limit(dB)
 = Level(dBm) – Limit Line(dBm)
 = -38.94(dBm) + 21.2(dBm)
 = -17.74(dB)

Peak measured complies with the limit line, so test result is “PASS”.



Appendix C. Conducted Spurious Emission Plots

Test Engineer :	Kai Liao and Nick Yu	Temperature :	22.7~24.8°C
		Relative Humidity :	52~59%

2.4GHz 2400~2483.5MHz

BT (Band Edge)

BT	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BT CH00 2402MHz	
4	CSE	Fundamental
Peak	<p>Site Condition : TH05-HY : FCC CLASS-B PK BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz</p>	<p>Site Condition : TH05-HY : FCC CLASS-B CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz</p>



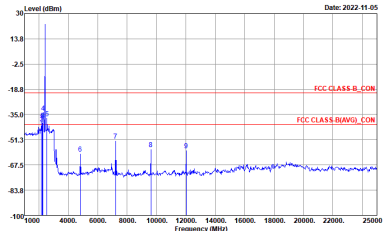
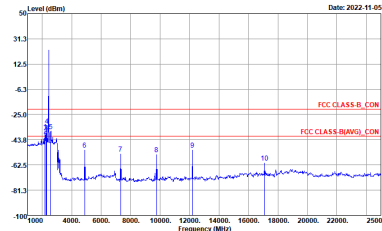
BT	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BT CH39 2441MHz	
4	CSE	Fundamental
Peak	<p>Site : TH05-HY Condition : FCC CLASS-B, PK, BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	<p>Site : TH05-HY Condition : FCC CLASS-B, CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>
Peak	<p>Site : TH05-HY Condition : FCC CLASS-B, PK, BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BT CH78 2480MHz	
4	CSE	Fundamental
Peak	<p>Date: 2022-10-06</p> <p>Site : TH05-HY Condition : FCC CLASS-B, PK, BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	<p>Date: 2022-10-06</p> <p>Site : TH05-HY Condition : FCC CLASS-B, CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>



2.4GHz 2400~2483.5MHz
BT (Harmonic)

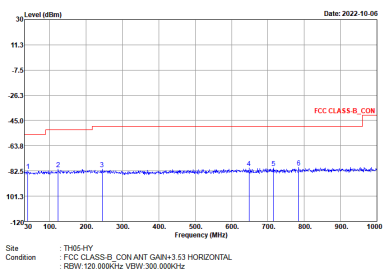
BT	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BR	
4	BT CH00 2402MHz	BT CH39 2441MHz
Peak Avg.	 <p>Date: 2022-11-05</p> <p>Site Condition : TH05-HY : FCC CLASS B_CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.0000Hz VBW:3000.0000Hz</p>	 <p>Date: 2022-11-05</p> <p>Site Condition : TH05-HY : FCC CLASS B_CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.0000Hz VBW:3000.0000Hz</p>



BT	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BR	
4	BT CH78 2480MHz	-
Peak Avg.	<p>The spectrum plot displays the power level in dBm on the y-axis (ranging from -100 to 50) against frequency in MHz on the x-axis (ranging from 1000 to 25000). A prominent peak is visible at approximately 2480 MHz, reaching a level of about 31.3 dBm. Two horizontal red lines indicate the FCC Class B limits: the upper line is at -25.0 dBm (labeled 'FCC CLASS B_CON') and the lower line is at -43.8 dBm (labeled 'FCC CLASS B_UWG_CON'). The plot also shows several smaller peaks at lower frequencies, labeled 7, 8, 9, 10, and 11. The date '2022.11.05' is noted in the top right corner of the plot area.</p>	Left blank



Emission below 1GHz
BT (LF)

BT	2.4GHz 2400~2483.5MHz	
ANT	BR	
4	BT LF	-
QP / Peak	 <p>Site : TH05-HY Condition : FCC CLASS B_CON ANT GAIN=3.53 HORIZONTAL : RBW=120.0000GHz VBW=300.0000Hz</p>	Left blank



2.4GHz 2400~2483.5MHz
BT (Band Edge)

BT	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BT CH00 2402MHz	
5	CSE	Fundamental
Peak	<p>Site : TH05-HY Condition : FCC CLASS B_PK_BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.0000Hz VSW:3000.0000Hz</p>	<p>Site : TH05-HY Condition : FCC CLASS B_CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.0000Hz VSW:3000.0000Hz</p>



BT	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BT CH39 2441MHz	
5	CSE	Fundamental
Peak	<p>Site : TH05-HY Condition : FCC CLASS-B, PK, BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	<p>Site : TH05-HY Condition : FCC CLASS-B, CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>
Peak	<p>Site : TH05-HY Condition : FCC CLASS-B, PK, BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge	
ANT	BT CH78 2480MHz	
5	CSE	Fundamental
Peak	<p style="font-size: small;">Date: 2022-10-06 Site : TH05-HY Condition : FCC CLASS-B, PK, BE ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	<p style="font-size: small;">Date: 2022-10-06 Site : TH05-HY Condition : FCC CLASS-B, CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>



2.4GHz 2400~2483.5MHz
BT (Harmonic)

BT	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BR	
5	BT CH00 2402MHz	BT CH39 2441MHz
Peak Avg.	<p>Site Condition : TH05-HY : FCC CLASS B_CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz</p>	<p>Site Condition : TH05-HY : FCC CLASS B_CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz</p>



BT	2.4GHz 2400~2483.5MHz Harmonic	
ANT	BR	
5	BT CH78 2480MHz	-
Peak Avg.	<p>The spectrum plot displays the harmonic levels of a 2.4GHz signal. The y-axis represents Level (dBm) from -100 to 50, and the x-axis represents Frequency (MHz) from 1000 to 25000. Two horizontal red lines indicate FCC Class B limits: -25.0 dBm (CON) and -43.8 dBm (BWG). The plot shows a primary signal at 2480 MHz and several harmonics at 4960, 7440, 9920, 12400, and 14880 MHz. All measured levels are significantly below the -43.8 dBm limit.</p> <p>Site : TH05-HY Condition : FCC CLASS-B_CON ANT GAIN+3.53 HORIZONTAL : RBW:1000.000Hz VBW:3000.000Hz</p>	Left blank



Emission below 1GHz
BT (LF)

BT	2.4GHz 2400~2483.5MHz	
ANT	BR	
5	BT LF	-
QP / Peak	<p>The spectrum plot shows a red line for the FCC CLASS B_CON limit and a blue line for the measured signal. The y-axis is Level (dBm) ranging from -120 to 30. The x-axis is Frequency (MHz) ranging from 50 to 1000. The measured signal is significantly below the limit line. Several peaks are labeled with numbers 1 through 5.</p> <p>Site : TH05-HY Condition : FCC CLASS B_CON ANT GAIN+3.53 HORIZONTAL : RBW:120.0000Hz VBW:300.0000Hz</p>	Left blank



Appendix D. Cabinet Radiated Spurious Emission

Test Engineer :	Bigshow Wang and Quentin Liu	Temperature :	21.1~23.1°C
		Relative Humidity :	49~58%

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT 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)	
BT CH00 2402MHz		2388.015	40.71	-33.29	74	44.16	27.3	6.11	36.86	138	77	P	H	
		2388.015	15.92	-38.08	54	-	-	-	-	-	-	A	H	
	*	2402	74.06	-	-	77.38	27.41	6.13	36.86	138	77	P	H	
	*	2402	49.27	-	-	-	-	-	-	-	-	A	H	
													H	
			2321.025	40.34	-33.66	74	44.21	27	5.99	36.86	340	31	P	V
			2321.025	15.55	-38.45	54	-	-	-	-	-	-	A	V
	*		2402	69.81	-	-	73.13	27.41	6.13	36.86	340	31	P	V
	*		2402	45.02	-	-	-	-	-	-	-	-	A	V
														V
													V	
BT CH 39 2441MHz		2359.98	41.1	-32.9	74	44.82	27.08	6.06	36.86	110	67	P	H	
		2359.98	16.31	-37.69	54	-	-	-	-	-	-	A	H	
	*	2441	74.4	-	-	77.41	27.65	6.19	36.85	110	67	P	H	
	*	2441	49.61	-	-	-	-	-	-	-	-	A	H	
			2489.78	41.32	-32.68	74	44.04	27.86	6.27	36.85	110	67	P	H
			2489.78	16.53	-37.47	54	-	-	-	-	-	-	A	H
			2323.58	40.66	-33.34	74	44.53	27	5.99	36.86	400	47	P	V
			2323.58	15.87	-38.13	54	-	-	-	-	-	-	A	V
	*		2441	70.61	-	-	73.62	27.65	6.19	36.85	400	47	P	V
	*		2441	45.82	-	-	-	-	-	-	-	-	A	V
			2500	42.1	-31.9	74	44.77	27.9	6.28	36.85	400	47	P	V
			2500	17.31	-36.69	54	-	-	-	-	-	-	A	V



BT 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)	
BT CH 78 2480MHz	*	2480	75.69	-	-	78.47	27.82	6.25	36.85	100	69	P	H	
	*	2480	50.9	-	-	-	-	-	-	-	-	A	H	
		2489.48	41.63	-32.37	74	44.35	27.86	6.27	36.85	100	69	P	H	
		2489.48	16.84	-37.16	54	-	-	-	-	-	-	A	H	
													H	
													H	
	*	2480	71.58	-	-	74.36	27.82	6.25	36.85	393	55	P	V	
	*	2480	46.79	-	-	-	-	-	-	-	-	-	A	V
		2491.48	41.34	-32.66	74	44.05	27.87	6.27	36.85	393	55	P	V	
		2491.48	16.55	-37.45	54	-	-	-	-	-	-	A	V	
													V	
													V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. 													



2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT 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)	
BT CH 00 2402MHz		4804	34.89	-39.11	74	53.85	32.32	9.42	60.7	-	-	P	H	
		4804	10.1	-43.9	54	-	-	-	-	-	-	A	H	
													H	
													H	
			4804	34.31	-39.69	74	53.27	32.32	9.42	60.7	-	-	P	V
			4804	9.52	-44.48	54	-	-	-	-	-	-	A	V
														V
														V
BT CH 39 2441MHz		4882	34.55	-39.45	74	53.27	32.6	9.39	60.71	-	-	P	H	
		4882	9.76	-44.24	54	-	-	-	-	-	-	A	H	
		7323	38.8	-35.2	74	52.25	36.61	10.86	60.92	-	-	P	H	
		7323	14.01	-39.99	54	-	-	-	-	-	-	A	H	
		4882	34.52	-39.48	74	53.24	32.6	9.39	60.71	-	-	P	V	
		4882	9.73	-44.27	54	-	-	-	-	-	-	A	V	
		7323	38.88	-35.12	74	52.33	36.61	10.86	60.92	-	-	P	V	
		7323	14.09	-39.91	54	-	-	-	-	-	-	A	V	
BT CH 78 2480MHz		4960	34.9	-39.1	74	53.31	32.94	9.37	60.72	-	-	P	H	
		4960	10.11	-43.89	54	-	-	-	-	-	-	A	H	
		7440	37.85	-36.15	74	51.53	36.34	10.96	60.98	-	-	P	H	
		7440	13.06	-40.94	54	-	-	-	-	-	-	A	H	
		4960	35.4	-38.6	74	53.81	32.94	9.37	60.72	-	-	P	V	
		4960	10.61	-43.39	54	-	-	-	-	-	-	A	V	
		7440	37.23	-36.77	74	50.91	36.34	10.96	60.98	-	-	P	V	
		7440	12.44	-41.56	54	-	-	-	-	-	-	A	V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. 													



Emission above 18GHz

2.4GHz BT (SHF)

BT	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 BT SHF		39956.5	45.76	-28.24	74	58.42	43.28	-0.1	55.84	-	-	P	H	
													H	
													H	
													H	
			36491	45.93	-28.07	74	62.24	42.91	-0.81	58.41	-	-	P	V
														V
														V
														V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. 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 BT (LF)

BT	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 BT LF		30	31.24	-8.76	40	38.77	24.3	0.64	32.47	-	-	P	H
		50.37	31.51	-8.49	40	49.04	14.14	0.9	32.57	-	-	P	H
		134.76	27.11	-16.39	43.5	40.79	17.44	1.39	32.51	-	-	P	H
		272.5	25.57	-20.43	46	37.17	18.81	2.02	32.43	-	-	P	H
		439.34	25	-21	46	32.02	22.9	2.5	32.42	-	-	P	H
		745.86	36.31	-9.69	46	37.47	27.82	3.31	32.29	-	-	P	H
		30.97	39.02	-0.98	40	46.82	24.01	0.67	32.48	113	121	Q	V
		54.25	33.03	-6.97	40	52.1	12.58	0.91	32.56	-	-	P	V
		133.79	27.29	-16.21	43.5	40.96	17.46	1.38	32.51	-	-	P	V
		218.18	19.69	-26.31	46	35.34	14.98	1.85	32.48	-	-	P	V
		484.93	24.44	-21.56	46	30.6	23.66	2.62	32.44	-	-	P	V
		903	40.05	-5.95	46	39	28.84	3.7	31.49	-	-	P	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. 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

BT (Band Edge @ 3m)

BT	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)	
BT CH00 2402MHz		2374.89	40.74	-33.26	74	44.32	27.2	6.08	36.86	139	77	P	H	
		2374.89	15.95	-38.05	54	-	-	-	-	-	-	A	H	
	*	2402	74.09	-	-	77.41	27.41	6.13	36.86	139	77	P	H	
	*	2402	49.3	-	-	-	-	-	-	-	-	A	H	
													H	
														H
			2377.515	41.29	-32.71	74	44.84	27.22	6.09	36.86	388	243	P	V
			2377.515	16.5	-37.5	54	-	-	-	-	-	-	A	V
	*		2402	71.15	-	-	74.47	27.41	6.13	36.86	388	243	P	V
	*		2402	46.36	-	-	-	-	-	-	-	-	A	V
														V
														V
BT CH 39 2441MHz		2389.38	40.57	-33.43	74	44	27.32	6.11	36.86	112	69	P	H	
		2389.38	15.78	-38.22	54	-	-	-	-	-	-	A	H	
	*	2441	74.36	-	-	77.37	27.65	6.19	36.85	112	69	P	H	
	*	2441	49.57	-	-	-	-	-	-	-	-	A	H	
			2490.83	41.62	-32.38	74	44.34	27.86	6.27	36.85	112	69	P	H
			2490.83	16.83	-37.17	54	-	-	-	-	-	-	A	H
			2369.5	40.55	-33.45	74	44.17	27.16	6.08	36.86	375	242	P	V
			2369.5	15.76	-38.24	54	-	-	-	-	-	-	A	V
	*		2441	70.59	-	-	73.6	27.65	6.19	36.85	375	242	P	V
	*		2441	45.8	-	-	-	-	-	-	-	-	A	V
			2485.51	41.25	-32.75	74	44	27.84	6.26	36.85	375	242	P	V
			2485.51	16.46	-37.54	54	-	-	-	-	-	-	A	V



BT 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)	
BT CH 78 2480MHz	*	2480	75.7	-	-	78.48	27.82	6.25	36.85	100	68	P	H	
	*	2480	50.91	-	-	-	-	-	-	-	-	A	H	
		2499.08	41.93	-32.07	74	44.6	27.9	6.28	36.85	100	68	P	H	
		2499.08	17.14	-36.86	54	-	-	-	-	-	-	A	H	
													H	
													H	
	*	2480	71.77	-	-	74.55	27.82	6.25	36.85	400	235	P	V	
	*	2480	46.98	-	-	-	-	-	-	-	-	-	A	V
		2493.24	41.31	-32.69	74	44.02	27.87	6.27	36.85	400	235	P	V	
		2493.24	16.52	-37.48	54	-	-	-	-	-	-	A	V	
													V	
													V	
	Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT 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)	
BT CH 00 2402MHz		4804	34.36	-39.64	74	53.32	32.32	9.42	60.7	-	-	P	H	
		4804	9.57	-44.43	54	-	-	-	-	-	-	A	H	
													H	
													H	
			4804	34.69	-39.31	74	53.65	32.32	9.42	60.7	-	-	P	V
			4804	9.9	-44.1	54	-	-	-	-	-	-	A	V
														V
														V
BT CH 39 2441MHz		4882	34.17	-39.83	74	52.89	32.6	9.39	60.71	-	-	P	H	
		4882	9.38	-44.62	54	-	-	-	-	-	-	A	H	
		7323	38.11	-35.89	74	51.56	36.61	10.86	60.92	-	-	P	H	
		7323	13.32	-40.68	54	-	-	-	-	-	-	A	H	
			4882	34.73	-39.27	74	53.45	32.6	9.39	60.71	-	-	P	V
			4882	9.94	-44.06	54	-	-	-	-	-	-	A	V
			7323	38.11	-35.89	74	51.56	36.61	10.86	60.92	-	-	P	V
			7323	13.32	-40.68	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4960	34.71	-39.29	74	53.12	32.94	9.37	60.72	-	-	P	H	
		4960	9.92	-44.08	54	-	-	-	-	-	-	A	H	
		7440	37.07	-36.93	74	50.75	36.34	10.96	60.98	-	-	P	H	
		7440	12.28	-41.72	54	-	-	-	-	-	-	A	H	
			4960	35.22	-38.78	74	53.63	32.94	9.37	60.72	-	-	P	V
			4960	10.43	-43.57	54	-	-	-	-	-	-	A	V
			7440	36.93	-37.07	74	50.61	36.34	10.96	60.98	-	-	P	V
			7440	12.14	-41.86	54	-	-	-	-	-	-	A	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. 													



Emission above 18GHz

2.4GHz BT (SHF)

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
ANT					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
5		(MHz)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB μ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz BT SHF		39956.5	45.76	-28.24	74	58.42	43.28	-0.1	55.84	-	-	P	H	
													H	
													H	
													H	
			36491	45.93	-28.07	74	62.24	42.91	-0.81	58.41	-	-	P	V
														V
														V
														V
Remark	<ol style="list-style-type: none"> 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 BT (LF)

BT	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 BT LF		30	31.74	-8.26	40	39.27	24.3	0.64	32.47	-	-	P	H
		50.37	32.58	-7.42	40	50.11	14.14	0.9	32.57	-	-	P	H
		133.79	27.01	-16.49	43.5	40.68	17.46	1.38	32.51	-	-	P	H
		256.01	24.51	-21.49	46	35.81	19.16	1.98	32.44	-	-	P	H
		567.38	26.7	-19.3	46	30.31	25.98	2.91	32.5	-	-	P	H
		773.02	29.86	-16.14	46	30.85	27.9	3.37	32.26	-	-	P	H
		30.97	38.78	-1.22	40	46.58	24.01	0.67	32.48	101	114	Q	V
		49.4	31.48	-8.52	40	48.56	14.6	0.89	32.57	-	-	P	V
		134.76	27.62	-15.88	43.5	41.3	17.44	1.39	32.51	-	-	P	V
		166.77	20.57	-22.93	43.5	35.56	15.83	1.64	32.46	-	-	P	V
		365.62	21.96	-24.04	46	31.4	20.74	2.27	32.45	-	-	P	V
		743.92	36.7	-9.3	46	37.9	27.79	3.3	32.29	-	-	P	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. The emission position marked as "-" means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only. 												



Note symbol

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



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

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	Limit Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
					(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

Peak measured complies with the limit line, so test result is “PASS”.



Appendix E. Cabinet Radiated Spurious Emission Plots

Test Engineer :	Bigshow Wang and Quentin Liu	Temperature :	21.1~23.1°C
		Relative Humidity :	49~58%

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
4	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
4	Vertical	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_SC_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

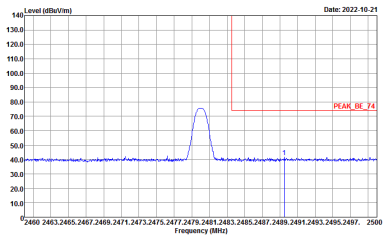
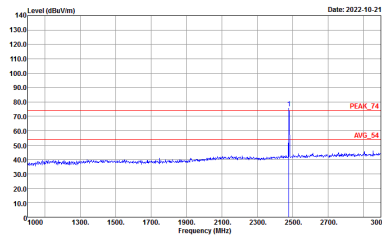


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
4	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank

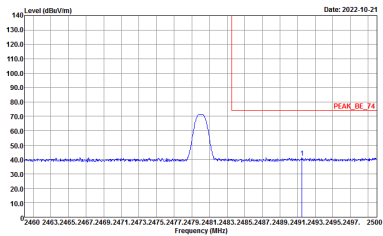
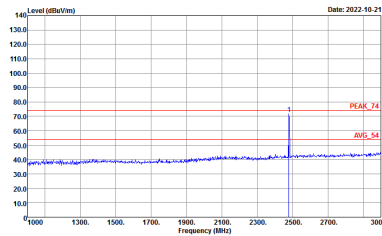


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
4	Vertical	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
4	Horizontal	Fundamental
Peak	 <p>Date: 2022-10-21</p> <p>Site : 03CH15-HY Condition : PEAK_BC_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2022-10-21</p> <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

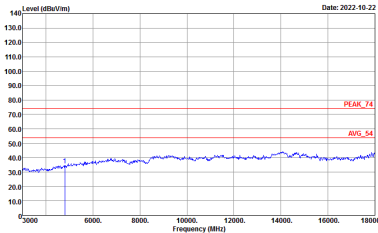
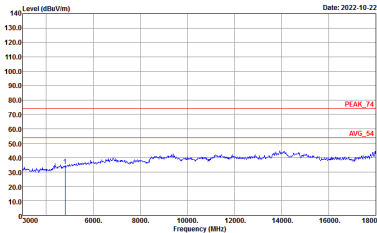


BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
4	Vertical	Fundamental
Peak	 <p>Date: 2022-10-21</p> <p>Site : 03CH15-HY Condition : PEAK_BC_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2022-10-21</p> <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

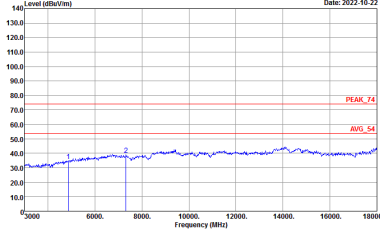
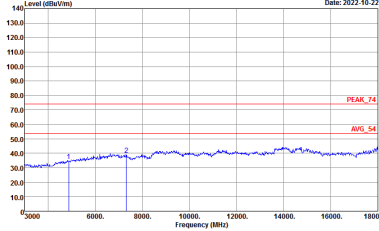


2.4GHz 2400~2483.5MHz

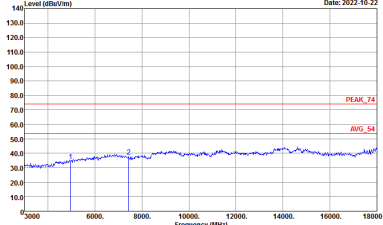
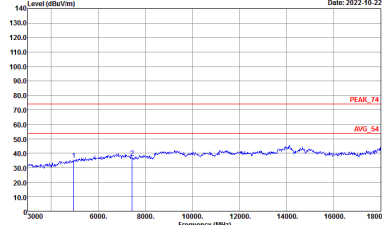
BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH00 2402MHz	
4	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL</p>



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH39 2441MHz	
4	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL</p>



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
4	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL</p>



Emission above 18GHz

2.4GHz BT (SHF @ 1m)

BT	2.4GHz 2400~2483.5MHz	
ANT	BT SHF	
4	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH15-HY Condition : PEAK_74 1m SHF_BBHA917000993 HORIZONTAL</p>	<p>Site : 03CH15-HY Condition : PEAK_74 1m SHF_BBHA917000993 VERTICAL</p>



Emission below 1GHz

2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
ANT	BT LF	
4	Horizontal	Vertical
QP / Peak	<p>Site : 03CH15-HY Condition : QP 3m BIL06_41912_20220206 HORIZONTAL</p>	<p>Site : 03CH15-HY Condition : QP 3m BIL06_41912_20220206 VERTICAL</p>



2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
5	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
5	Vertical	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
5	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
5	Vertical	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	<p>Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
5	Horizontal	Fundamental
Peak	<p>Date: 2022-10-21</p> <p>Site : 03CH15-HY Condition : PEAK_BC_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Date: 2022-10-21</p> <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>



BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
5	Vertical	Fundamental
Peak	<p>Site : 03CH15-HY Condition : PEAK_BC_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

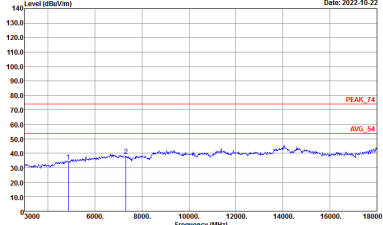
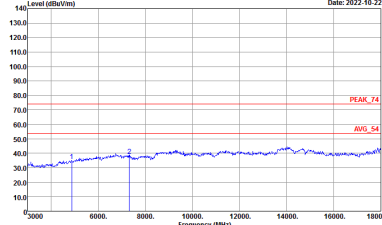


2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH00 2402MHz	
5	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL</p>



BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH39 2441MHz	
5	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL</p>

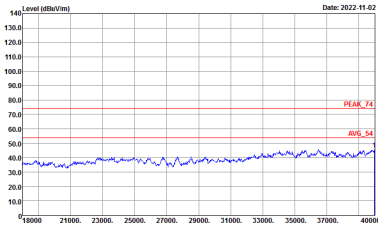
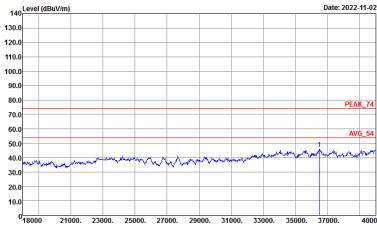


BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz	
5	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 HORIZONTAL</p>	<p>Site : 03CH15-HY Condition : PEAK_74 3m 91200_02294_220623 VERTICAL</p>



Emission above 18GHz

2.4GHz BT (SHF @ 1m)

BT	2.4GHz 2400~2483.5MHz	
ANT	BT SHF	
5	Horizontal	Vertical
<p>Peak Avg.</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 1m SHF_BBHA917000993 HORIZONTAL</p>	 <p>Site : 03CH15-HY Condition : PEAK_74 1m SHF_BBHA917000993 VERTICAL</p>



Emission below 1GHz

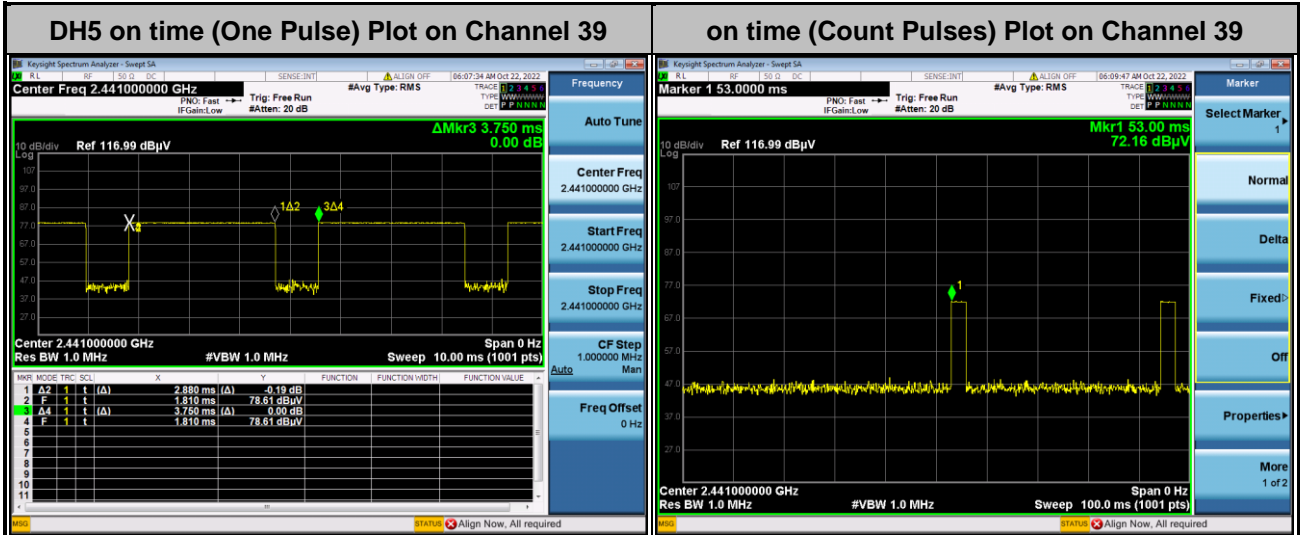
2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
ANT	BT LF	
5	Horizontal	Vertical
QP / Peak	<p>Site : 03CH15-HY Condition : QP 3m BIL06_41912_20220206 HORIZONTAL</p>	<p>Site : 03CH15-HY Condition : QP 3m BIL06_41912_20220206 VERTICAL</p>

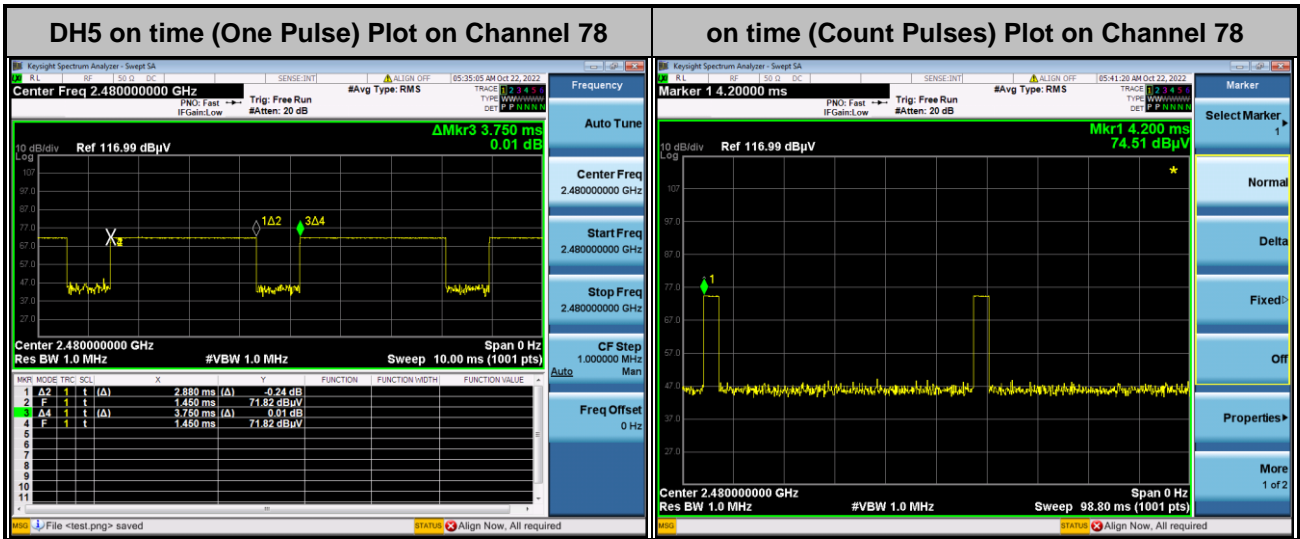


Appendix F. Duty Cycle Plots

<Ant. 4>



<Ant. 5>



Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. DH5 has the highest duty cycle worst case and is reported.



Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the on time period to have DH5 packet completing one hopping sequence is

$$2.88 \text{ ms} \times 20 \text{ channels} = 57.6 \text{ ms}$$

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. $[100 \text{ ms} / 57.6 \text{ ms}] = 2 \text{ hops}$

Thus, the maximum possible ON time:

$$2.88 \text{ ms} \times 2 = 5.76 \text{ ms}$$

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

$$20 \times \log(5.76 \text{ ms}/100 \text{ ms}) = -24.79 \text{ dB}$$