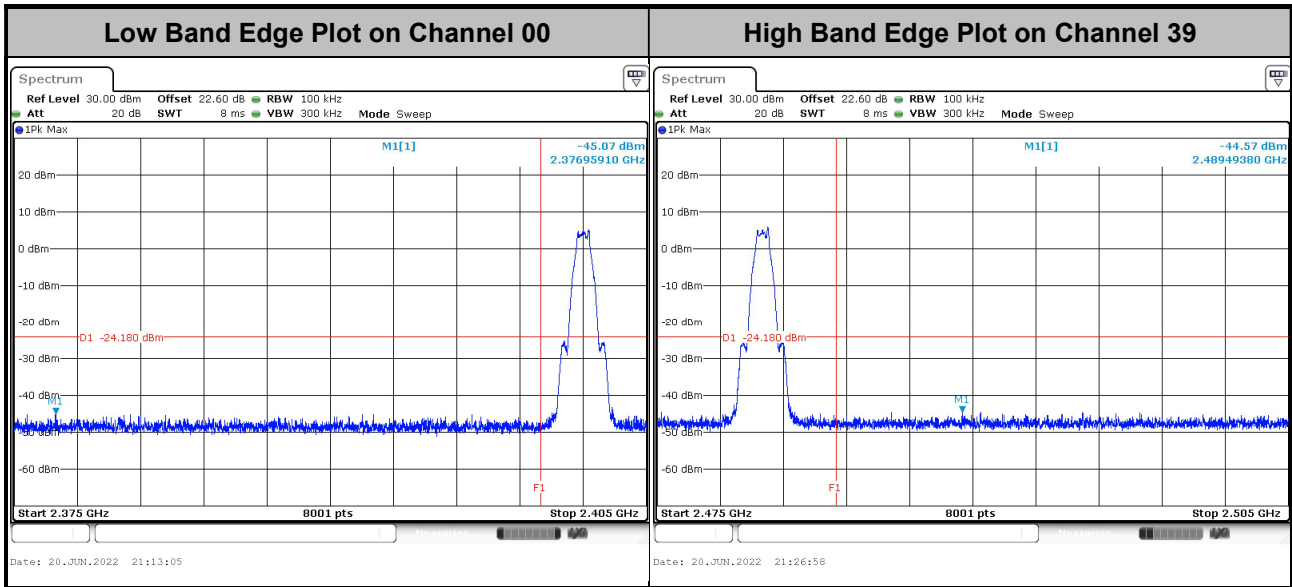


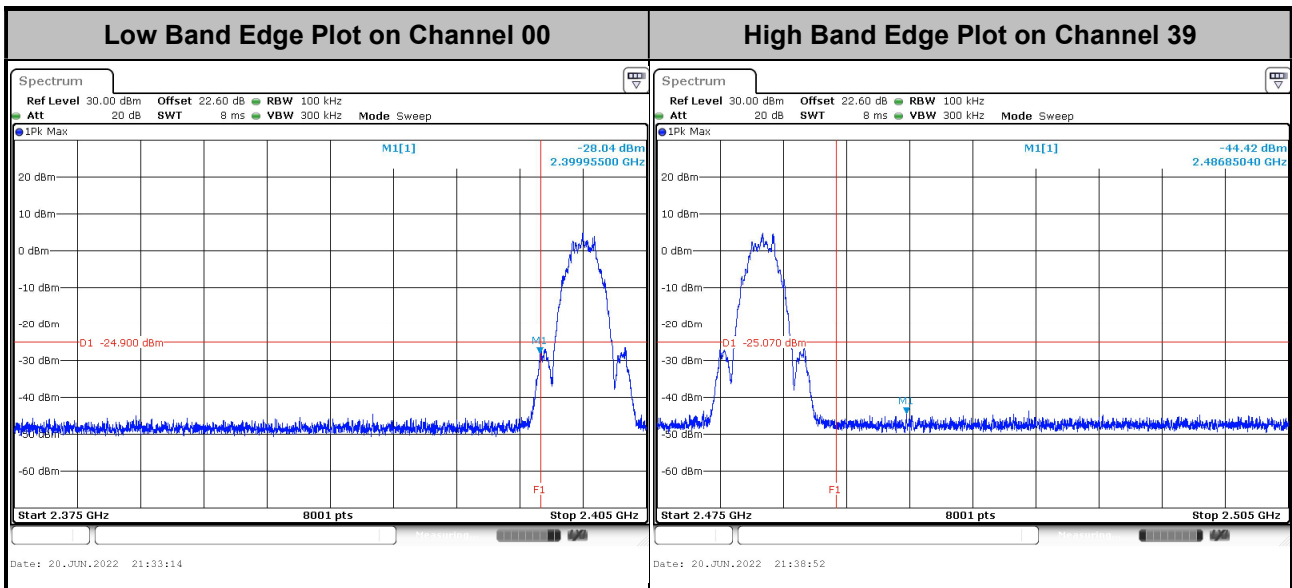


### 3.4.5 Test Result of Conducted Band Edges Plots

<1Mbps>



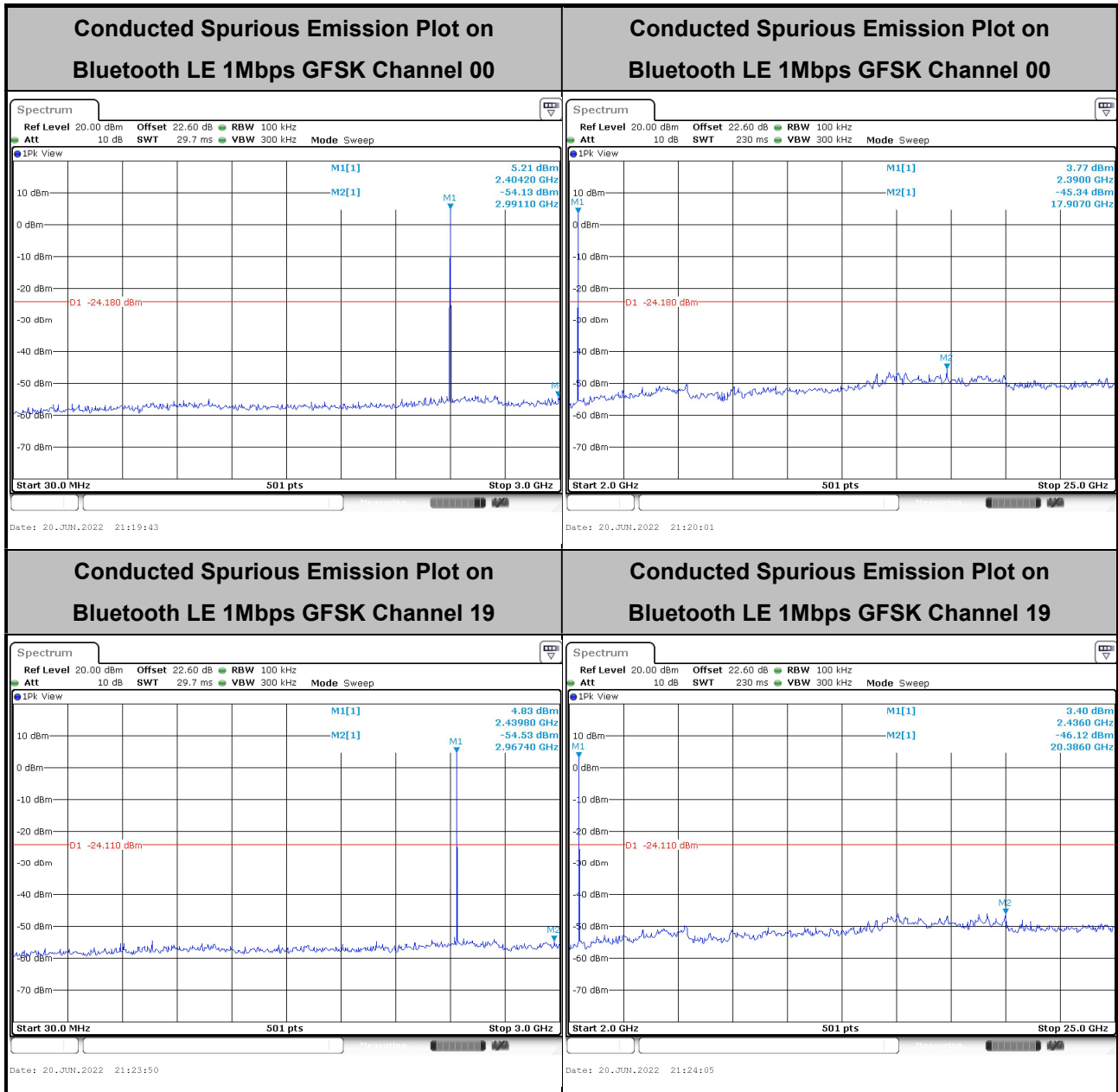
<2Mbps>

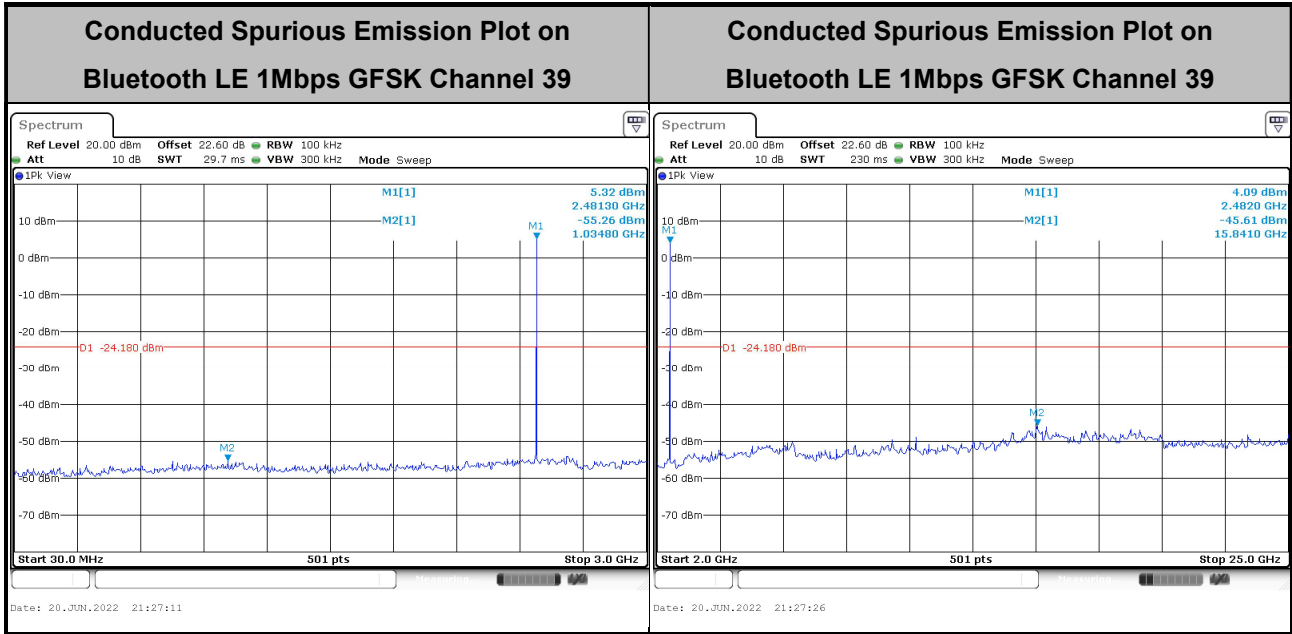




### 3.4.6 Test Result of Conducted Spurious Emission Plots

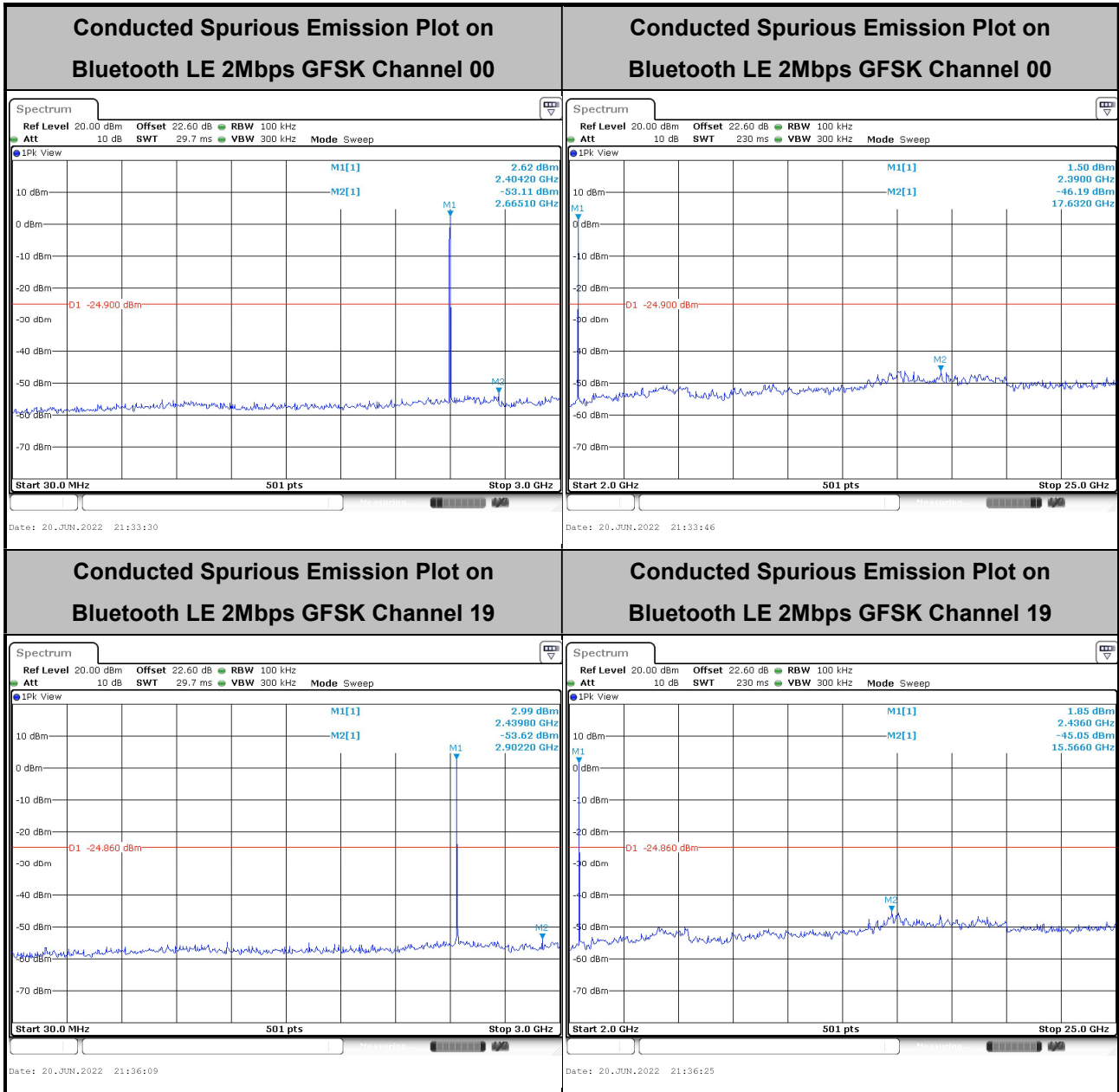
<1Mbps>

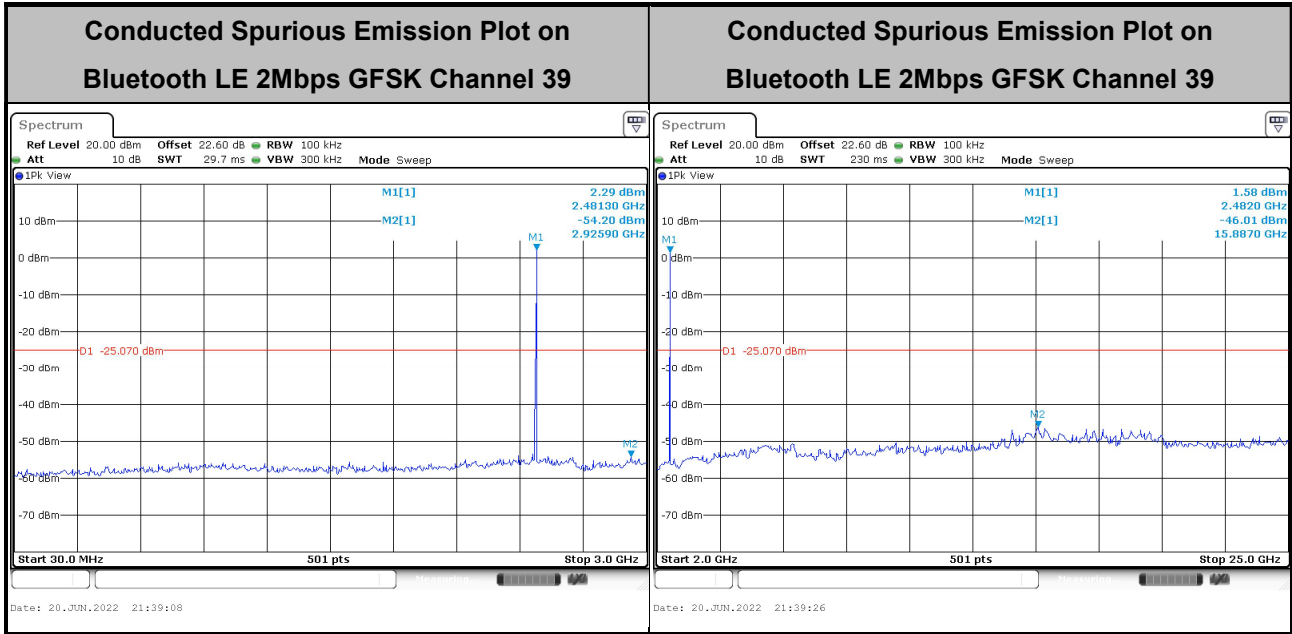






<2Mbps>







### 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

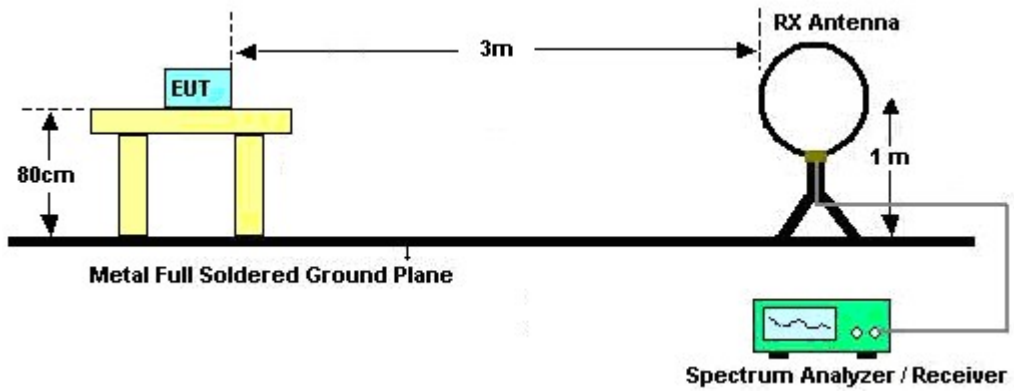
Please refer to the measuring equipment list in this test report.

**3.5.3 Test Procedures**

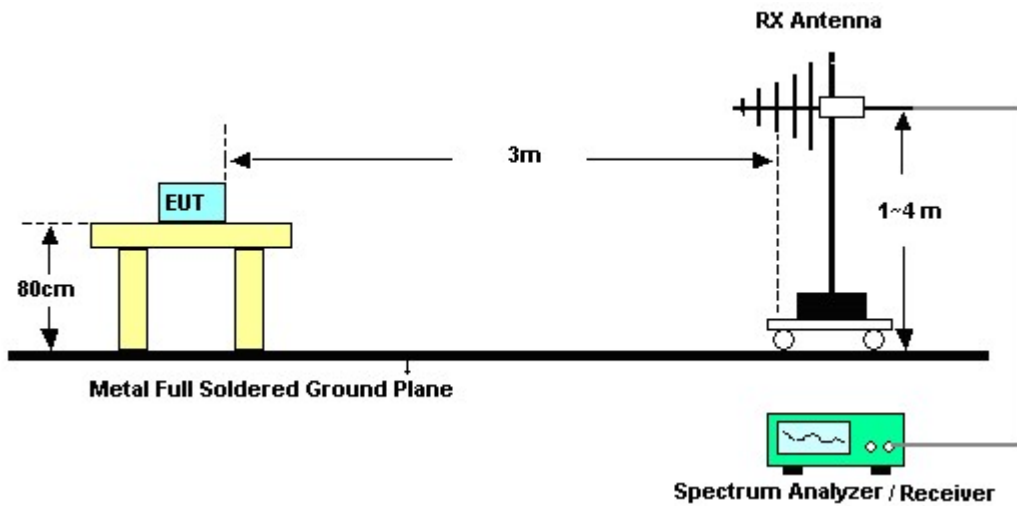
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. 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.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. 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 “-“.
7. 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 “-“.
8. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW = 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW = 3 MHz for  $f \geq 1$  GHz for peak measurement.  
For average measurement:
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.5.4 Test Setup

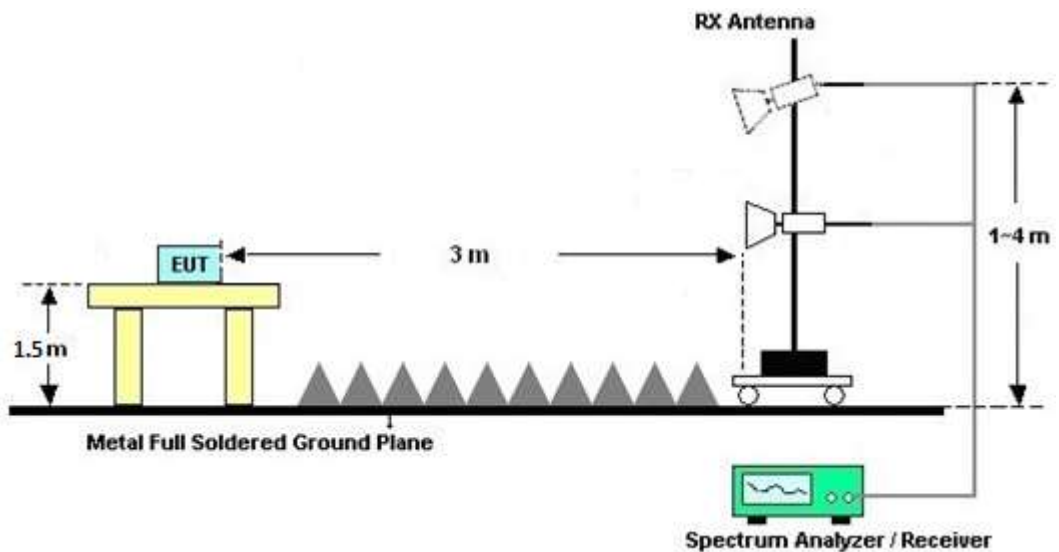
For radiated test below 30MHz



For radiated test from 30MHz to 1GHz

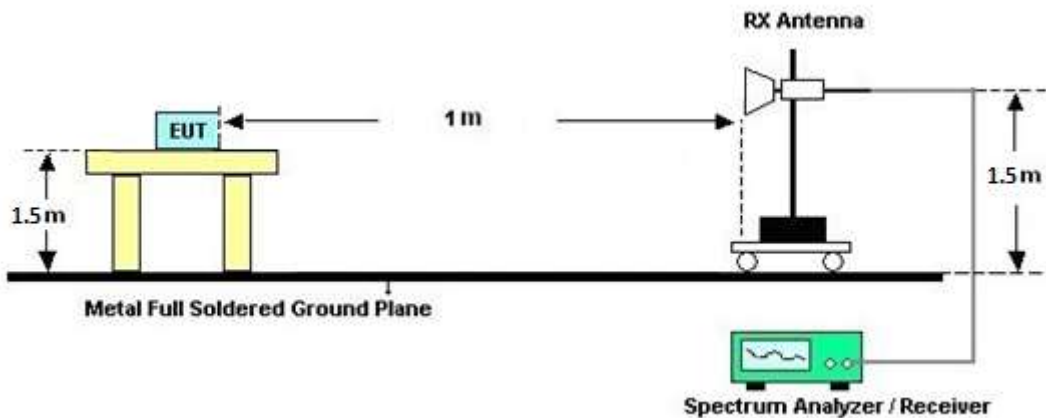


For radiated test from 1GHz to 18GHz





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 Radiated Spurious at Band Edges

Please refer to Appendix C and D.

### 3.5.7 Duty Cycle

Please refer to Appendix E.

### 3.5.8 Test Result of Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix C and D.



### 3.6 AC Conducted Emission Measurement

#### 3.6.1 Limit of AC Conducted Emission

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

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

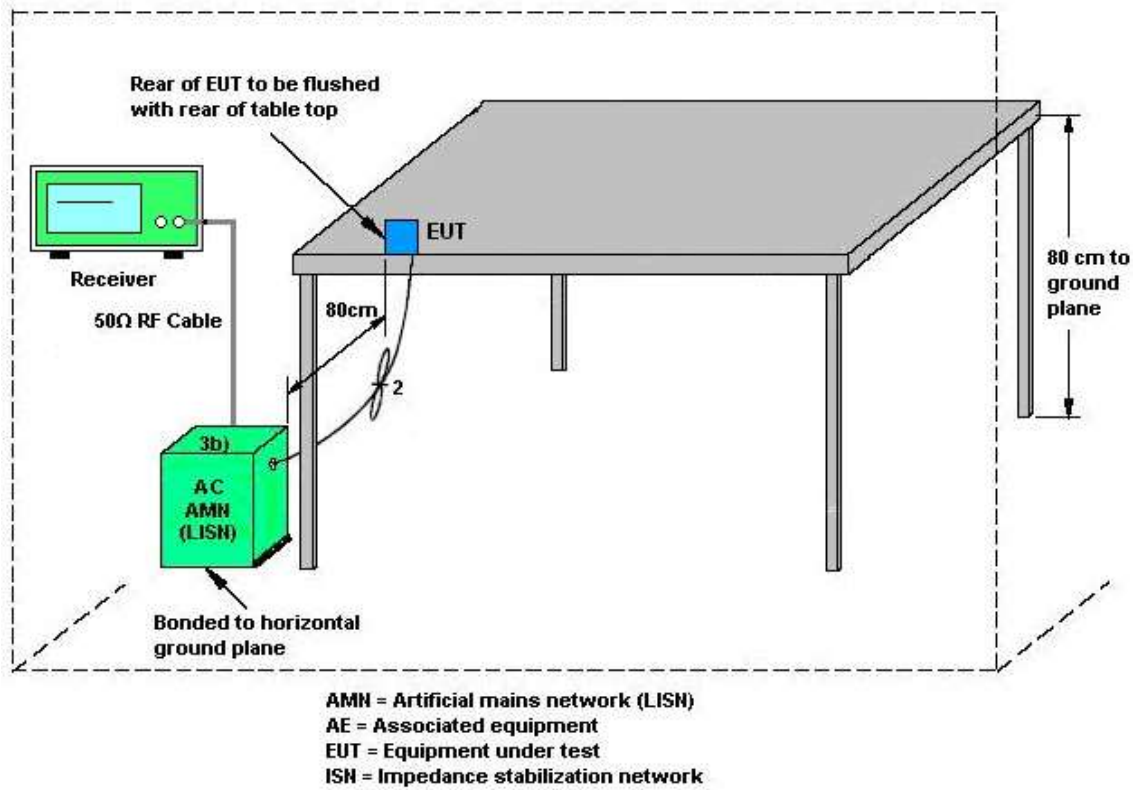
#### 3.6.2 Measuring Instruments

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

#### 3.6.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9 kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

### 3.6.4 Test Setup



### 3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



## **3.7 Antenna Requirements**

### **3.7.1 Standard Applicable**

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

### **3.7.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.7.3 Antenna Gain**

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	TECEPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Jun. 14, 2022~ Jun. 20, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	DARE	RPR3006W	16I00054SNO 12 (NO:113)	10MHz~6GHz	Dec. 16, 2021	Jun. 14, 2022~ Jun. 20, 2022	Dec. 15, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Jun. 14, 2022~ Jun. 20, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Mainframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Jun. 14, 2022~ Jun. 20, 2022	Aug. 11, 2022	Conducted (TH05-HY)
AC Power Source	Chain Tek	APC-1000W	N/A	N/A	N/A	Jun. 17, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Jun. 17, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Jun. 17, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Jun. 17, 2022	Dec. 02, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2021	Jun. 17, 2022	Nov. 15, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Jun. 17, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	Jun. 17, 2022	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Jun. 17, 2022	Dec. 29, 2022	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9kHz~30MHz	Sep. 07, 2021	May 31, 2022~ Jun. 21, 2022	Sep. 06, 2022	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	40103 & 07	30MHz~1GHz	Apr. 24, 2022	May 31, 2022~ Jun. 21, 2022	Apr. 23, 2023	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz~18GHz	Jul. 13, 2021	May 31, 2022~ Jun. 21, 2022	Jul. 12, 2022	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00994	18GHz~40GHz	Nov. 04, 2021	May 31, 2022~ Jun. 21, 2022	Nov. 03, 2022	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9kHz~1GHz	Dec. 15, 2021	May 31, 2022~ Jun. 21, 2022	Dec. 14, 2022	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 17, 2022	May 31, 2022~ Jun. 21, 2022	May 16, 2023	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 26, 2021	May 31, 2022~ Jun. 21, 2022	Oct. 25, 2022	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 24, 2021	May 31, 2022~ Jun. 21, 2022	Dec. 23, 2022	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 18, 2022	May 31, 2022~ Jun. 21, 2022	Mar. 17, 2023	Radiation (03CH13-HY)
Hygrometer	TECEPEL	DTM-303B	TP200889	N/A	Sep. 30, 2021	May 31, 2022~ Jun. 21, 2022	Sep. 29, 2022	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 31, 2022~ Jun. 21, 2022	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 31, 2022~ Jun. 21, 2022	N/A	Radiation (03CH13-HY)
Software	Audix	E3 6.2009-8-24	RK-000992	N/A	N/A	May 31, 2022~ Jun. 21, 2022	N/A	Radiation (03CH13-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30MHz~18GHz	Feb. 09, 2022	May 31, 2022~ Jun. 21, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30MHz~18GHz	Feb. 09, 2022	May 31, 2022~ Jun. 21, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30MHz~18GHz	Feb. 09, 2022	May 31, 2022~ Jun. 21, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804011/2, 804012/2	18GHz~40GHz	Jan. 04, 2022	May 31, 2022~ Jun. 21, 2022	Jan. 03, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 10, 2022	May 31, 2022~ Jun. 21, 2022	Mar. 09, 2023	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 14, 2021	May 31, 2022~ Jun. 21, 2022	Sep. 13, 2022	Radiation (03CH13-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN5	6.75GHz High Pass Filter	Mar. 10, 2022	May 31, 2022~ Jun. 21, 2022	Mar. 09, 2023	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0SS	SN2	3GHz High Pass Filter	Jul. 12, 2021	May 31, 2022~ Jun. 21, 2022	Jul. 11, 2022	Radiation (03CH13-HY)



## 5 Uncertainty of Evaluation

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

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	6.0 dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.2 dB
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.9 dB
---	--------

**Appendix A. Test Result of Conducted Test Items**

Test Engineer:	Junyu Jhou	Temperature:	21~25	°C
Test Date:	2022/6/14~2022/6/20	Relative Humidity:	51~54	%

**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	1.031	0.670	0.50	Pass
BLE	1Mbps	1	19	2440	1.031	0.670	0.50	Pass
BLE	1Mbps	1	39	2480	1.029	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	6.20	30.00	3.34	9.54	36.00	Pass
BLE	1Mbps	1	19	2440	6.20	30.00	3.34	9.54	36.00	Pass
BLE	1Mbps	1	39	2480	6.00	30.00	3.34	9.34	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	5.82	-10.70	3.34	8.00	Pass
BLE	1Mbps	1	19	2440	5.89	-10.57	3.34	8.00	Pass
BLE	1Mbps	1	39	2480	5.82	-10.70	3.34	8.00	Pass

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



Test Engineer:	Junyu Zhou	Temperature:	21~25	°C
Test Date:	2022/6/14~2022/6/20	Relative Humidity:	51~54	%

**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	2.054	1.188	0.50	Pass
BLE	2Mbps	1	19	2440	2.054	1.192	0.50	Pass
BLE	2Mbps	1	39	2480	2.054	1.188	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	6.20	30.00	3.34	9.54	36.00	Pass
BLE	2Mbps	1	19	2440	6.20	30.00	3.34	9.54	36.00	Pass
BLE	2Mbps	1	39	2480	6.00	30.00	3.34	9.34	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	5.10	-12.66	3.34	8.00	Pass
BLE	2Mbps	1	19	2440	5.14	-12.54	3.34	8.00	Pass
BLE	2Mbps	1	39	2480	4.93	-12.83	3.34	8.00	Pass

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



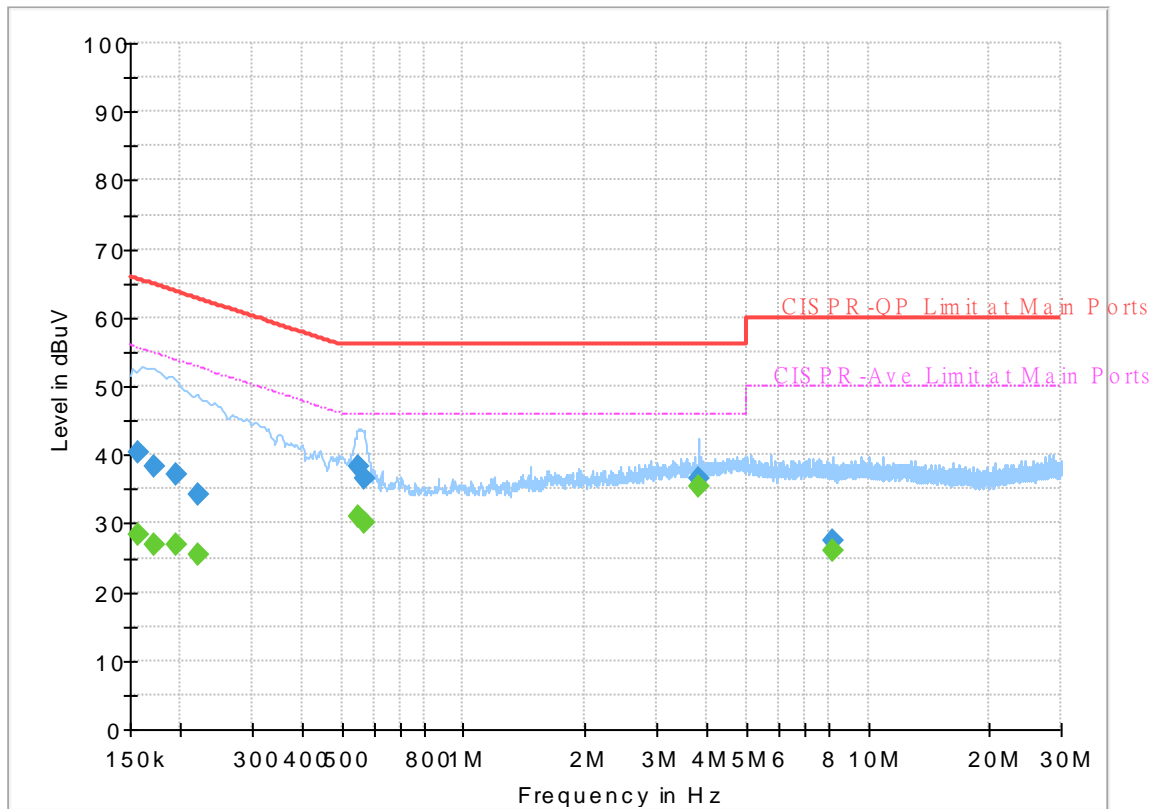
## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	Temperature :	23~26°C
		Relative Humidity :	45~55%

# EUT Information

Report NO : 211819-01  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Line

Full Spectrum



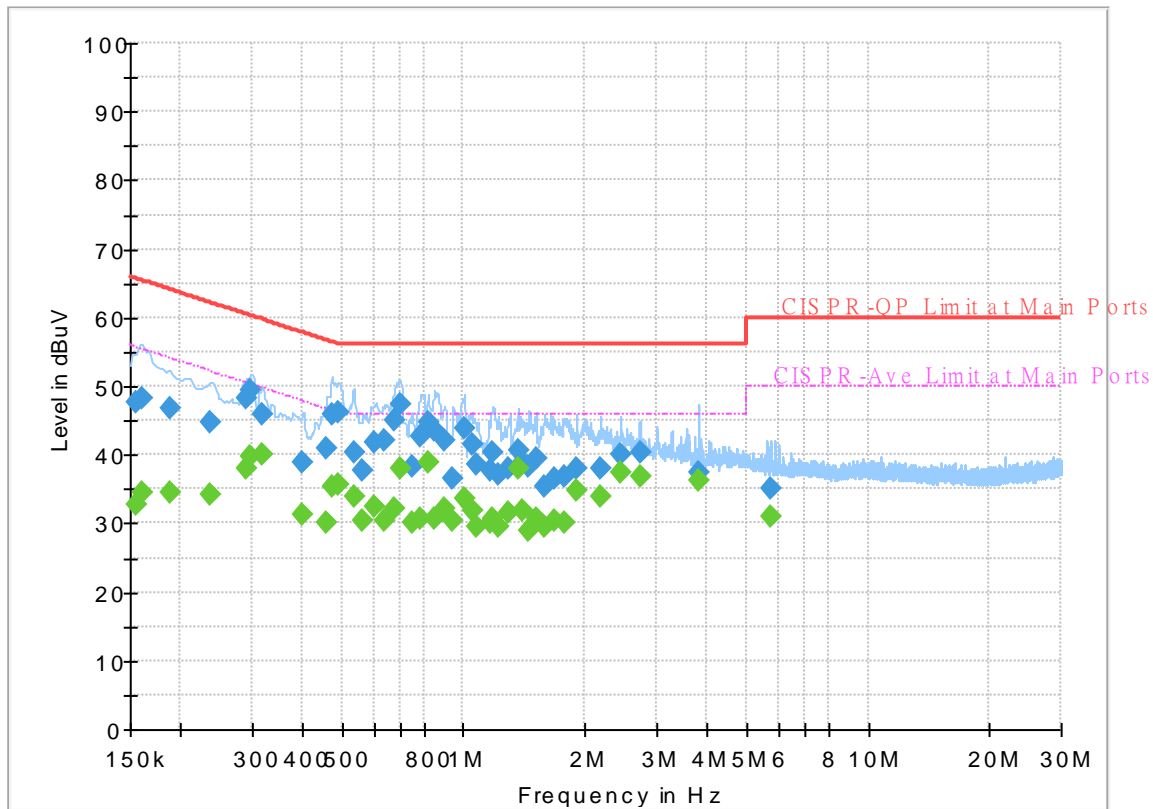
## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.156750	---	28.51	55.63	27.12	L1	OFF	19.6
0.156750	40.37	---	65.63	25.26	L1	OFF	19.6
0.172500	---	27.04	54.84	27.80	L1	OFF	19.6
0.172500	38.43	---	64.84	26.41	L1	OFF	19.6
0.195000	---	26.85	53.82	26.97	L1	OFF	19.6
0.195000	37.02	---	63.82	26.80	L1	OFF	19.6
0.222000	---	25.40	52.74	27.34	L1	OFF	19.6
0.222000	34.25	---	62.74	28.49	L1	OFF	19.6
0.552750	---	30.96	46.00	15.04	L1	OFF	19.6
0.552750	38.25	---	56.00	17.75	L1	OFF	19.6
0.568500	---	30.26	46.00	15.74	L1	OFF	19.6
0.568500	36.68	---	56.00	19.32	L1	OFF	19.6
3.819750	---	35.37	46.00	10.63	L1	OFF	19.8
3.819750	36.67	---	56.00	19.33	L1	OFF	19.8
8.155500	---	25.90	50.00	24.10	L1	OFF	20.0
8.155500	27.61	---	60.00	32.39	L1	OFF	20.0

# EUT Information

Report NO : 211819-01  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Neutral

Full Spectrum



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154500	---	32.75	55.75	23.00	N	OFF	19.6
0.154500	47.74	---	65.75	18.01	N	OFF	19.6
0.161250	---	34.48	55.40	20.92	N	OFF	19.6
0.161250	48.17	---	65.40	17.23	N	OFF	19.6
0.188250	---	34.55	54.11	19.56	N	OFF	19.6
0.188250	46.91	---	64.11	17.20	N	OFF	19.6
0.235500	---	34.31	52.25	17.94	N	OFF	19.6
0.235500	44.66	---	62.25	17.59	N	OFF	19.6
0.291750	---	37.87	50.47	12.60	N	OFF	19.6
0.291750	48.34	---	60.47	12.13	N	OFF	19.6
0.298500	---	39.64	50.28	10.64	N	OFF	19.6
0.298500	49.50	---	60.28	10.78	N	OFF	19.6
0.318750	---	40.08	49.74	9.66	N	OFF	19.6
0.318750	45.90	---	59.74	13.84	N	OFF	19.6
0.399750	---	31.27	47.86	16.59	N	OFF	19.6
0.399750	38.85	---	57.86	19.01	N	OFF	19.6
0.458250	---	30.12	46.72	16.60	N	OFF	19.6
0.458250	41.07	---	56.72	15.65	N	OFF	19.6
0.471750	---	35.31	46.48	11.17	N	OFF	19.6
0.471750	46.01	---	56.48	10.47	N	OFF	19.6
0.492000	---	35.69	46.13	10.44	N	OFF	19.6

0.492000	46.10	---	56.13	10.03	N	OFF	19.6
0.534750	---	33.90	46.00	12.10	N	OFF	19.6
0.534750	40.45	---	56.00	15.55	N	OFF	19.6
0.564000	---	30.45	46.00	15.55	N	OFF	19.6
0.564000	37.80	---	56.00	18.20	N	OFF	19.6
0.600000	---	32.35	46.00	13.65	N	OFF	19.6
0.600000	41.78	---	56.00	14.22	N	OFF	19.6
0.640500	---	30.55	46.00	15.45	N	OFF	19.6
0.640500	41.96	---	56.00	14.04	N	OFF	19.6
0.676500	---	32.17	46.00	13.83	N	OFF	19.6
0.676500	44.93	---	56.00	11.07	N	OFF	19.6
0.696750	---	38.07	46.00	7.93	N	OFF	19.6
0.696750	47.29	---	56.00	8.71	N	OFF	19.6
0.748500	---	30.00	46.00	16.00	N	OFF	19.6
0.748500	38.28	---	56.00	17.72	N	OFF	19.6
0.786750	---	30.78	46.00	15.22	N	OFF	19.6
0.786750	42.68	---	56.00	13.32	N	OFF	19.6
0.818250	---	38.88	46.00	7.12	N	OFF	19.6
0.818250	44.75	---	56.00	11.25	N	OFF	19.6
0.849750	---	30.62	46.00	15.38	N	OFF	19.6
0.849750	43.56	---	56.00	12.44	N	OFF	19.6
0.899250	---	32.10	46.00	13.90	N	OFF	19.6
0.899250	42.00	---	56.00	14.00	N	OFF	19.6
0.944250	---	30.47	46.00	15.53	N	OFF	19.6
0.944250	36.51	---	56.00	19.49	N	OFF	19.6
1.002750	---	33.60	46.00	12.40	N	OFF	19.6
1.002750	43.97	---	56.00	12.03	N	OFF	19.6
1.050000	---	31.85	46.00	14.15	N	OFF	19.6
1.050000	41.58	---	56.00	14.42	N	OFF	19.6
1.074750	---	29.60	46.00	16.40	N	OFF	19.6
1.074750	38.51	---	56.00	17.49	N	OFF	19.6
1.169250	---	30.24	46.00	15.76	N	OFF	19.6
1.169250	37.61	---	56.00	18.39	N	OFF	19.6
1.185000	---	30.64	46.00	15.36	N	OFF	19.6
1.185000	40.21	---	56.00	15.79	N	OFF	19.6
1.218750	---	29.51	46.00	16.49	N	OFF	19.6
1.218750	37.01	---	56.00	18.99	N	OFF	19.6
1.290750	---	31.72	46.00	14.28	N	OFF	19.7
1.290750	38.05	---	56.00	17.95	N	OFF	19.7
1.362750	---	37.96	46.00	8.04	N	OFF	19.7
1.362750	40.77	---	56.00	15.23	N	OFF	19.7
1.403250	---	31.76	46.00	14.24	N	OFF	19.7
1.403250	38.85	---	56.00	17.15	N	OFF	19.7
1.455000	---	28.93	46.00	17.07	N	OFF	19.7
1.455000	38.43	---	56.00	17.57	N	OFF	19.7
1.513500	---	30.64	46.00	15.36	N	OFF	19.7
1.513500	39.37	---	56.00	16.63	N	OFF	19.7
1.585500	---	29.58	46.00	16.42	N	OFF	19.7
1.585500	35.27	---	56.00	20.73	N	OFF	19.7
1.673250	---	30.28	46.00	15.72	N	OFF	19.7
1.673250	36.64	---	56.00	19.36	N	OFF	19.7
1.788000	---	30.08	46.00	15.92	N	OFF	19.7
1.788000	36.75	---	56.00	19.25	N	OFF	19.7
1.911750	---	34.86	46.00	11.14	N	OFF	19.7
1.911750	37.96	---	56.00	18.04	N	OFF	19.7
2.181750	---	33.97	46.00	12.03	N	OFF	19.7
2.181750	38.04	---	56.00	17.96	N	OFF	19.7
2.454000	---	37.51	46.00	8.49	N	OFF	19.7
2.454000	40.08	---	56.00	15.92	N	OFF	19.7
2.726250	---	36.74	46.00	9.26	N	OFF	19.7
2.726250	40.47	---	56.00	15.53	N	OFF	19.7
3.815700	---	36.20	46.00	9.80	N	OFF	19.8
3.815700	37.31	---	56.00	18.69	N	OFF	19.8
5.736750	---	30.89	50.00	19.11	N	OFF	19.9
5.736750	35.03	---	60.00	24.97	N	OFF	19.9



### Appendix C. Radiated Spurious Emission

Test Engineer :	Rain Lee and Jacky Hong	Temperature :	20~25°C
		Relative Humidity :	50~60%

<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	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		2328.9	55.88	-18.12	74	40.98	27.97	14.01	27.08	286	7	P	H
		2332.05	45.11	-8.89	54	30.24	27.94	14.01	27.08	286	7	A	H
	*	2402	102.56	-	-	87.85	27.7	14.07	27.06	286	7	P	H
	*	2402	101.68	-	-	86.97	27.7	14.07	27.06	286	7	A	H
		2381.085	55.48	-18.52	74	40.76	27.74	14.05	27.07	100	120	P	V
		2311.68	45.2	-8.8	54	30.19	28.11	13.99	27.09	100	120	A	V
	*	2402	101.12	-	-	86.41	27.7	14.07	27.06	100	120	P	V
	*	2402	100.3	-	-	85.59	27.7	14.07	27.06	100	120	A	V
BLE CH 19 2440MHz		2321.62	56.1	-17.9	74	41.16	28.03	14	27.09	312	8	P	H
		2316.44	45.2	-8.8	54	30.23	28.07	13.99	27.09	312	8	A	H
	*	2440	102.67	-	-	87.99	27.62	14.11	27.05	312	8	P	H
	*	2440	102.03	-	-	87.35	27.62	14.11	27.05	312	8	A	H
		2496.36	55	-19	74	40.18	27.69	14.16	27.03	312	8	P	H
		2486.63	45.21	-8.79	54	30.42	27.67	14.15	27.03	312	8	A	H
		2321.62	55.93	-18.07	74	40.99	28.03	14	27.09	100	314	P	V
		2322.32	45.15	-8.85	54	30.22	28.02	14	27.09	100	314	A	V
	*	2440	100.05	-	-	85.37	27.62	14.11	27.05	100	314	P	V
	*	2440	99.12	-	-	84.44	27.62	14.11	27.05	100	314	A	V
		2484.88	54.93	-19.07	74	40.14	27.67	14.15	27.03	100	314	P	V
		2497.13	45.24	-8.76	54	30.42	27.69	14.16	27.03	100	314	A	V



BLE	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 39 2480MHz	*	2480	102.6	-	-	87.84	27.66	14.14	27.04	300	10	P	H
	*	2480	101.97	-	-	87.21	27.66	14.14	27.04	300	10	A	H
		2497.96	55.44	-18.56	74	40.61	27.7	14.16	27.03	300	10	P	H
		2492.76	45.3	-8.7	54	30.49	27.69	14.15	27.03	300	10	A	H
	*	2480	99.83	-	-	85.07	27.66	14.14	27.04	100	304	P	V
	*	2480	99.2	-	-	84.44	27.66	14.14	27.04	100	304	A	V
		2487.72	55.36	-18.64	74	40.56	27.68	14.15	27.03	100	304	P	V
		2483.84	45.15	-8.85	54	30.37	27.67	14.15	27.04	100	304	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	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	39.31	-34.69	74	58.45	31.41	6.79	57.34	-	-	P	H
		10995	48.99	-25.01	74	54.63	40.71	10.06	56.41	-	-	P	H
		10995	38.48	-15.52	54	44.12	40.71	10.06	56.41	-	-	A	H
		14490	50.05	-23.95	74	53.23	41.86	11.77	56.81	-	-	P	H
		14490	40.81	-13.19	54	43.99	41.86	11.77	56.81	-	-	A	H
		18000	56.43	-17.57	74	51.41	48.5	13.55	57.03	-	-	P	H
		18000	46.24	-7.76	54	41.22	48.5	13.55	57.03	-	-	A	H
		4804	39.17	-34.83	74	58.31	31.41	6.79	57.34	-	-	P	V
		10635	49.24	-24.76	74	55.48	40.31	9.85	56.4	-	-	P	V
		10635	37.76	-16.24	54	44	40.31	9.85	56.4	-	-	A	V
		14490	49.86	-24.14	74	53.04	41.86	11.77	56.81	-	-	P	V
		14490	40.67	-13.33	54	43.85	41.86	11.77	56.81	-	-	A	V
		17985	56.3	-17.7	74	51.69	48.1	13.54	57.03	-	-	P	V
		17985	45.62	-8.38	54	41.01	48.1	13.54	57.03	-	-	A	V





BLE	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)
<b>BLE CH 19 2440MHz</b>		4880	45.46	-28.54	74	64.42	31.44	6.82	57.22	-	-	P	H
		7320	44.54	-29.46	74	56.36	37.06	8.46	57.34	-	-	P	H
		10950	48.5	-25.5	74	54.08	40.8	10.03	56.41	-	-	P	H
		10950	37.69	-16.31	54	43.27	40.8	10.03	56.41	-	-	A	H
		14475	50.11	-23.89	74	53.39	41.8	11.76	56.84	-	-	P	H
		14475	39.38	-14.62	54	42.66	41.8	11.76	56.84	-	-	A	H
		18000	56.85	-17.15	74	51.83	48.5	13.55	57.03	-	-	P	H
		18000	46.78	-7.22	54	41.76	48.5	13.55	57.03	-	-	A	H
		4880	46.36	-27.64	74	65.32	31.44	6.82	57.22	-	-	P	V
		7320	44.78	-29.22	74	56.6	37.06	8.46	57.34	-	-	P	V
		10830	48.7	-25.3	74	54.38	40.76	9.97	56.41	-	-	P	V
		10830	37.85	-16.15	54	43.53	40.76	9.97	56.41	-	-	A	V
		14505	49.97	-24.03	74	53.08	41.91	11.78	56.8	-	-	P	V
		14505	39.7	-14.3	54	42.81	41.91	11.78	56.8	-	-	A	V
		18000	55.96	-18.04	74	50.94	48.5	13.55	57.03	-	-	P	V
		18000	46.6	-7.4	54	41.58	48.5	13.55	57.03	-	-	A	V



BLE	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 39 2480MHz		4960	39.75	-34.25	74	58.27	31.72	6.86	57.1	-	-	P	H
		7440	43.87	-30.13	74	55.84	37.02	8.53	57.52	-	-	P	H
		10695	48.42	-25.58	74	54.44	40.49	9.89	56.4	-	-	P	H
		10695	37.55	-16.45	54	43.57	40.49	9.89	56.4	-	-	A	H
		14490	51.04	-22.96	74	54.22	41.86	11.77	56.81	-	-	P	H
		14490	40.75	-13.25	54	43.93	41.86	11.77	56.81	-	-	A	H
		18000	56.18	-17.82	74	51.16	48.5	13.55	57.03	-	-	P	H
		18000	46.14	-7.86	54	41.12	48.5	13.55	57.03	-	-	A	H
		4960	39.24	-34.76	74	57.76	31.72	6.86	57.1	-	-	P	V
		7440	44.2	-29.8	74	56.17	37.02	8.53	57.52	-	-	P	V
		11010	49.05	-24.95	74	54.74	40.65	10.06	56.4	-	-	P	V
		11010	37.56	-16.44	54	43.25	40.65	10.06	56.4	-	-	A	V
		14475	50.15	-23.85	74	53.43	41.8	11.76	56.84	-	-	P	V
		14475	40.83	-13.17	54	44.11	41.8	11.76	56.84	-	-	A	V
		18000	57.97	-16.03	74	52.95	48.5	13.55	57.03	-	-	P	V
		18000	45.97	-8.03	54	40.95	48.5	13.55	57.03	-	-	A	V
<b>Remark</b>	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against Peak and Average limit line.</li> <li>The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.</li> <li>The emission level close to 18GHz is checked that the average emission level is noise floor only.</li> </ol>												



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BLE CH 00 2402MHz		2386.965	54.93	-19.07	74	40.21	27.73	14.06	27.07	323	13	P	H
		2311.47	45.05	-8.95	54	30.04	28.11	13.99	27.09	323	13	A	H
	*	2402	102.3	-	-	87.59	27.7	14.07	27.06	323	13	P	H
	*	2402	100.54	-	-	85.83	27.7	14.07	27.06	323	13	A	H
		2317.56	54.94	-19.06	74	39.97	28.06	14	27.09	400	145	P	V
		2323.02	45.22	-8.78	54	30.29	28.02	14	27.09	400	145	A	V
	*	2402	96.71	-	-	82	27.7	14.07	27.06	400	145	P	V
	*	2402	95.08	-	-	80.37	27.7	14.07	27.06	400	145	A	V
BLE CH 19 2440MHz		2326.38	55.2	-18.8	74	40.3	27.99	14	27.09	357	11	P	H
		2314.48	45.2	-8.8	54	30.22	28.08	13.99	27.09	357	11	A	H
	*	2440	102.51	-	-	87.83	27.62	14.11	27.05	357	11	P	H
	*	2440	100.75	-	-	86.07	27.62	14.11	27.05	357	11	A	H
		2494.05	54.95	-19.05	74	40.14	27.69	14.15	27.03	357	11	P	H
		2498.39	45.17	-8.83	54	30.34	27.7	14.16	27.03	357	11	A	H
		2325.12	55.68	-18.32	74	40.77	28	14	27.09	393	182	P	V
		2316.72	45.03	-8.97	54	30.05	28.07	14	27.09	393	182	A	V
	*	2440	97.58	-	-	82.9	27.62	14.11	27.05	393	182	P	V
	*	2440	95.62	-	-	80.94	27.62	14.11	27.05	393	182	A	V
		2489.22	54.88	-19.12	74	40.08	27.68	14.15	27.03	393	182	P	V
		2483.9	45.24	-8.76	54	30.46	27.67	14.15	27.04	393	182	A	V



BLE	Note	Frequency ( MHz )	Level ( dB $\mu$ V/m )	Margin ( dB )	Limit Line ( dB $\mu$ V/m )	Read Level ( dB $\mu$ V )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
<b>BLE CH 39 2480MHz</b>	*	2480	103.25	-	-	88.49	27.66	14.14	27.04	268	11	P	H
	*	2480	101.43	-	-	86.67	27.66	14.14	27.04	268	11	A	H
		2497.84	56.19	-17.81	74	41.36	27.7	14.16	27.03	268	11	P	H
		2483.56	46.06	-7.94	54	31.28	27.67	14.15	27.04	268	11	A	H
	*	2480	97.72	-	-	82.96	27.66	14.14	27.04	312	285	P	V
	*	2480	95.89	-	-	81.13	27.66	14.14	27.04	312	285	A	V
		2497.08	54.92	-19.08	74	40.1	27.69	14.16	27.03	312	285	P	V
		2491.72	45.21	-8.79	54	30.41	27.68	14.15	27.03	312	285	A	V
<b>Remark</b>	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	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	39.23	-34.77	74	58.37	31.41	6.79	57.34	-	-	P	H
		10935	49.22	-24.78	74	54.78	40.83	10.02	56.41	-	-	P	H
		10935	38.55	-15.45	54	44.11	40.83	10.02	56.41	-	-	A	H
		14505	50.53	-23.47	74	53.64	41.91	11.78	56.8	-	-	P	H
		14505	40.82	-13.18	54	43.93	41.91	11.78	56.8	-	-	A	H
		18000	55.89	-18.11	74	50.87	48.5	13.55	57.03	-	-	P	H
		18000	47.68	-6.32	54	42.66	48.5	13.55	57.03	-	-	A	H
		4804	39.61	-34.39	74	58.75	31.41	6.79	57.34	-	-	P	V
		10800	48.82	-25.18	74	54.58	40.7	9.95	56.41	-	-	P	V
		10800	38.69	-15.31	54	44.45	40.7	9.95	56.41	-	-	A	V
		14505	50.33	-23.67	74	53.44	41.91	11.78	56.8	-	-	P	V
		14505	40.64	-13.36	54	43.75	41.91	11.78	56.8	-	-	A	V
		17985	56.06	-17.94	74	51.45	48.1	13.54	57.03	-	-	P	V
		17985	46.62	-7.38	54	42.01	48.1	13.54	57.03	-	-	A	V



BLE	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)
<b>BLE CH 19 2440MHz</b>		4880	44.85	-29.15	74	63.81	31.44	6.82	57.22	-	-	P	H
		7320	44.59	-29.41	74	56.41	37.06	8.46	57.34	-	-	P	H
		10845	48.37	-25.63	74	54.02	40.79	9.97	56.41	-	-	P	H
		10845	37.96	-16.04	54	43.61	40.79	9.97	56.41	-	-	A	H
		14505	49.49	-24.51	74	52.6	41.91	11.78	56.8	-	-	P	H
		14505	39.65	-14.35	54	42.76	41.91	11.78	56.8	-	-	A	H
		18000	55.88	-18.12	74	50.86	48.5	13.55	57.03	-	-	P	H
		18000	46.62	-7.38	54	41.6	48.5	13.55	57.03	-	-	A	H
		4880	47.63	-26.37	74	66.59	31.44	6.82	57.22	-	-	P	V
		7320	44.95	-29.05	74	56.77	37.06	8.46	57.34	-	-	P	V
		10755	48.54	-25.46	74	54.42	40.61	9.92	56.41	-	-	P	V
		10755	36.97	-17.03	54	42.85	40.61	9.92	56.41	-	-	A	V
		14505	49.65	-24.35	74	52.76	41.91	11.78	56.8	-	-	P	V
		14505	39.68	-14.32	54	42.79	41.91	11.78	56.8	-	-	A	V
		18000	56.28	-17.72	74	51.26	48.5	13.55	57.03	-	-	P	V
		18000	46.64	-7.36	54	41.62	48.5	13.55	57.03	-	-	A	V



BLE	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 39 2480MHz		4960	40.18	-33.82	74	58.7	31.72	6.86	57.1	-	-	P	H
		7440	44.42	-29.58	74	56.39	37.02	8.53	57.52	-	-	P	H
		10995	49.21	-24.79	74	54.85	40.71	10.06	56.41	-	-	P	H
		10995	38.62	-15.38	54	44.26	40.71	10.06	56.41	-	-	A	H
		14475	49.69	-24.31	74	52.97	41.8	11.76	56.84	-	-	P	H
		14475	40.52	-13.48	54	43.8	41.8	11.76	56.84	-	-	A	H
		17985	56.29	-17.71	74	51.68	48.1	13.54	57.03	-	-	P	H
		17985	47.07	-6.93	54	42.46	48.1	13.54	57.03	-	-	A	H
		4960	40.36	-33.64	74	58.88	31.72	6.86	57.1	-	-	P	V
		7440	45.11	-28.89	74	57.08	37.02	8.53	57.52	-	-	P	V
		10800	48.39	-25.61	74	54.15	40.7	9.95	56.41	-	-	P	V
		10800	38.48	-15.52	54	44.24	40.7	9.95	56.41	-	-	A	V
		14505	50.75	-23.25	74	53.86	41.91	11.78	56.8	-	-	P	V
		14505	40.78	-13.22	54	43.89	41.91	11.78	56.8	-	-	A	V
		17970	55.93	-18.07	74	51.75	47.69	13.52	57.03	-	-	P	V
		17970	46.57	-7.43	54	42.39	47.69	13.52	57.03	-	-	A	V
<b>Remark</b>	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against Peak and Average limit line.</li> <li>The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.</li> <li>The emission level close to 18GHz is checked that the average emission level is noise floor only.</li> </ol>												



Emission above 18GHz

2.4GHz BLE (SHF)

BT	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
2.4GHz		20536	35.35	-38.65	74	54.82	37.97	-4.05	53.39	-	-	P	H
BLE		22184	35.11	-38.89	74	54.02	38.2	-3.71	53.4	-	-	P	V
SHF													
<b>Remark</b>	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against limit line.</li> <li>The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.</li> </ol>												





**Emission below 1GHz**

**2.4GHz BLE (LF)**

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
<b>2.4GHz BLE LF</b>		30	22.96	-17.04	40	30.05	24.53	0.72	32.34	-	-	P	H
		147.37	26.07	-17.43	43.5	40.02	17.15	1.19	32.29	-	-	P	H
		199.75	17.85	-25.65	43.5	33.76	14.99	1.36	32.26	-	-	P	H
		314.21	20.53	-25.47	46	31.47	19.59	1.63	32.16	-	-	P	H
		570.29	26.23	-19.77	46	30.38	25.97	2.13	32.25	-	-	P	H
		896.21	36.59	-9.41	46	36.63	28.97	2.54	31.55	-	-	P	H
		30.97	21.93	-18.07	40	29.32	24.24	0.72	32.35	-	-	P	V
		131.85	22.14	-21.36	43.5	35.82	17.46	1.15	32.29	-	-	P	V
		261.83	19.15	-26.85	46	29.83	20.04	1.5	32.22	-	-	P	V
		438.37	25.15	-20.85	46	32.31	23.09	1.92	32.17	-	-	P	V
		566.41	26.43	-19.57	46	30.47	26.09	2.12	32.25	-	-	P	V
		897.18	35.15	-10.85	46	35.14	29.01	2.54	31.54	-	-	P	V
<b>Remark</b>	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against limit line.</li> <li>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.</li> </ol>												



**Note symbol**

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



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

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BLE CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

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

**For Peak Limit @ 2390MHz:**

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

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)  
= 43.54 (dBμV/m)
2. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 43.54(dBμV/m) – 54(dBμV/m)  
= -10.46(dB)

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



## Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Rain Lee and Jacky Hong	Temperature :	20~25°C
		Relative Humidity :	50~60%

### Note symbol

-L	Low channel location
-R	High channel location



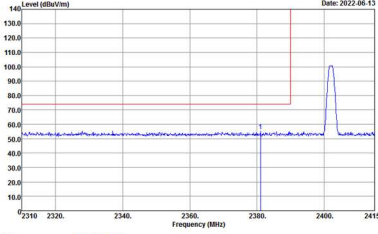
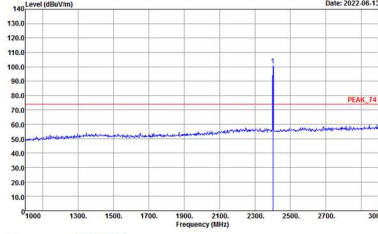
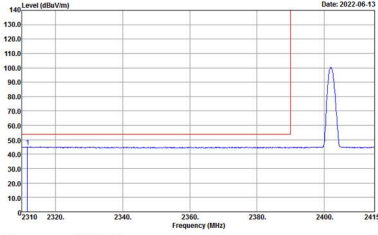
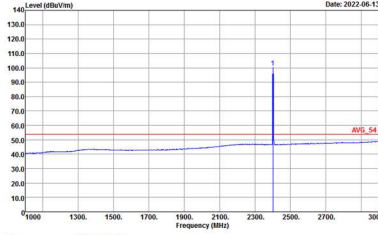
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2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
BLE CH00 2402MHz		
	Horizontal	Fundamental
Peak	<p>Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH13-HY Condition : PEAK_74 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>	<p>Site : 03CH13-HY Condition : AVG_54 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
BLE CH00 2402MHz		
	Vertical	Fundamental
Peak	 <p>Site Condition : 03CH13-HY : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site Condition : 03CH13-HY : PEAK_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg	 <p>Site Condition : 03CH13-HY : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>	 <p>Site Condition : 03CH13-HY : AVG_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
BLE CH19 2440MHz - L		
	Horizontal	Fundamental
Peak	<p>Date: 2022-06-13</p> <p>Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Date: 2022-06-13</p> <p>Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Date: 2022-06-13</p> <p>Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>	<p>Date: 2022-06-13</p> <p>Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>



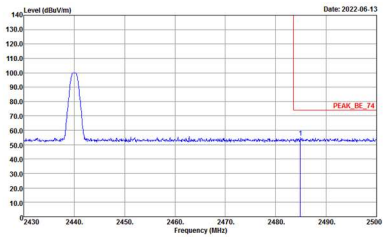
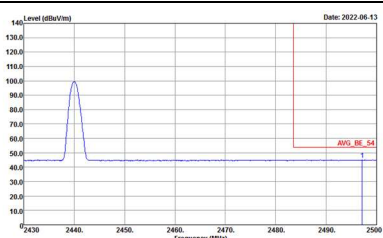
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak	<p>Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank
Avg.	<p>Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>	Left blank





BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
BLE CH19 2440MHz - L		
	Vertical	Fundamental
Peak	<p>Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>	<p>Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
BLE CH19 2440MHz - R		
	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank
Avg.	 <p>Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto</p>	Left blank