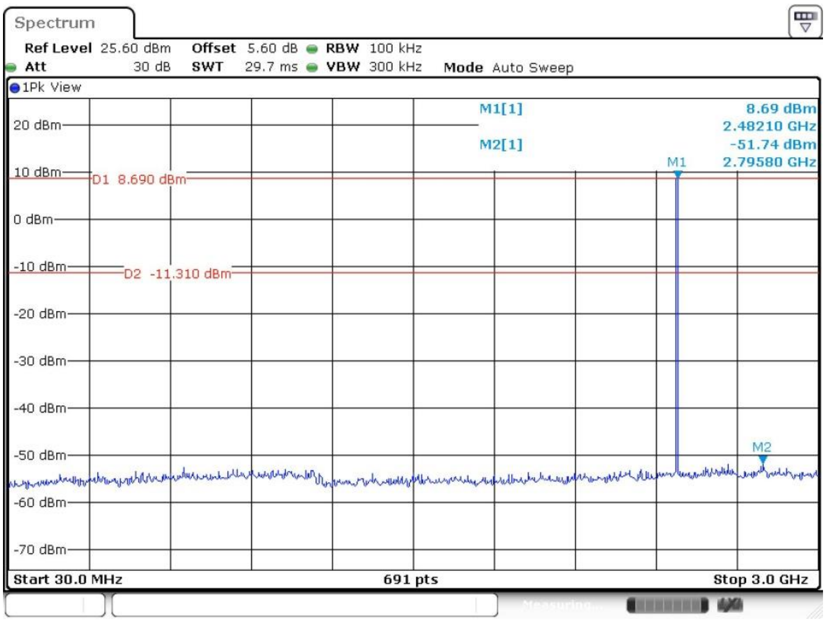
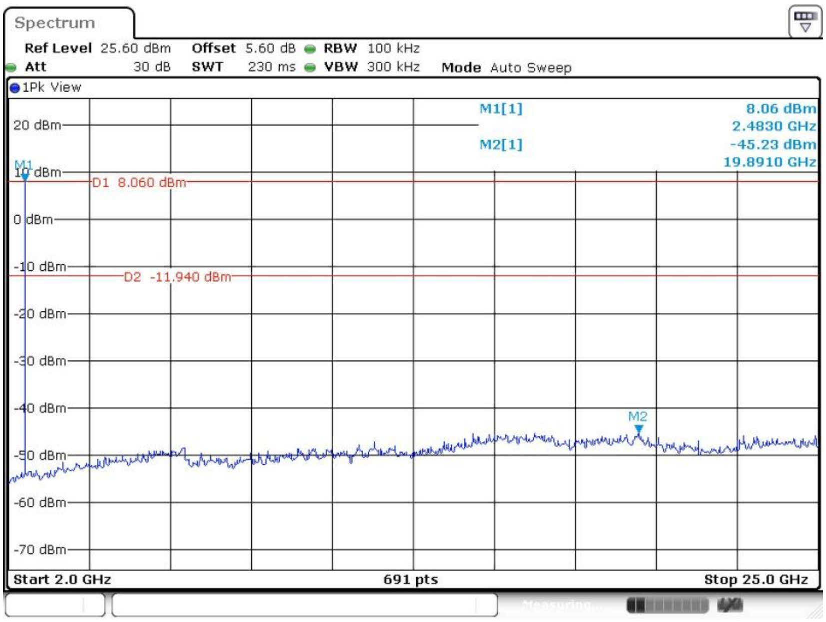
CSE Plot on Ch 78 between 30MHz ~ 3 GHz



Date: 17.JAN.2023 03:12:16

CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 17.JAN.2023 03:12:49

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

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

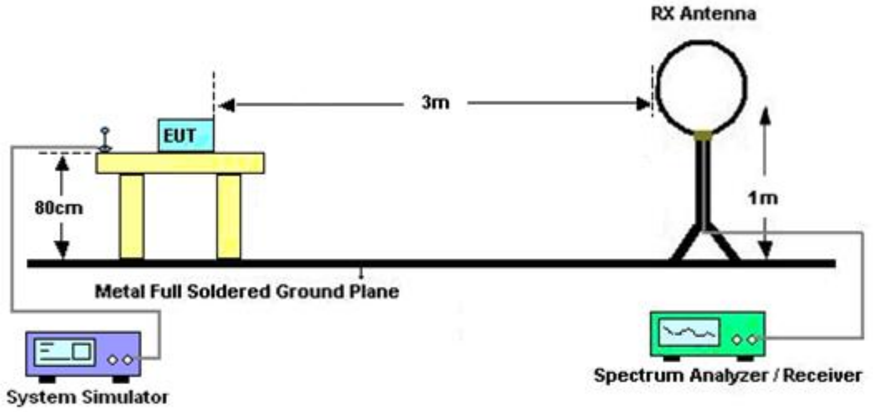
3.8.3 Test Procedures

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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=1MHz for f>1GHz ; VBW ≥ 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 = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   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)
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

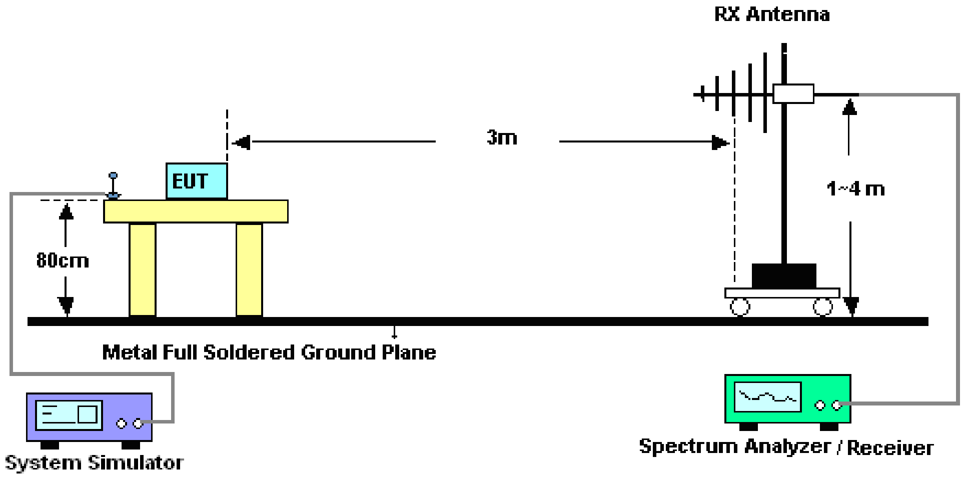
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (-24.76dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.8.4 Test Setup

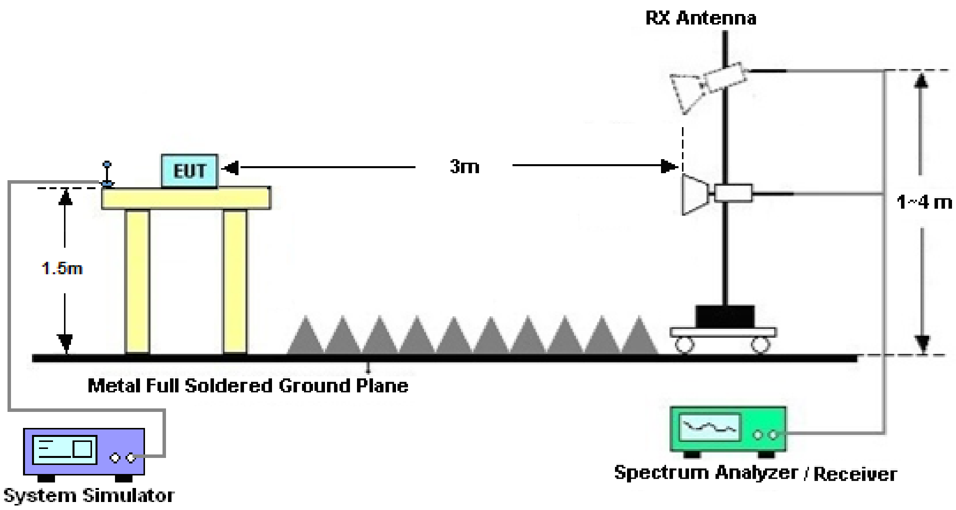
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

3.8.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

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

Please refer to Appendix C.

3.8.8 Duty cycle correction factor for average measurement

Please refer to Appendix D.

3.9 AC Conducted Emission Measurement

3.9.1 Limit of AC Conducted Emission

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

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

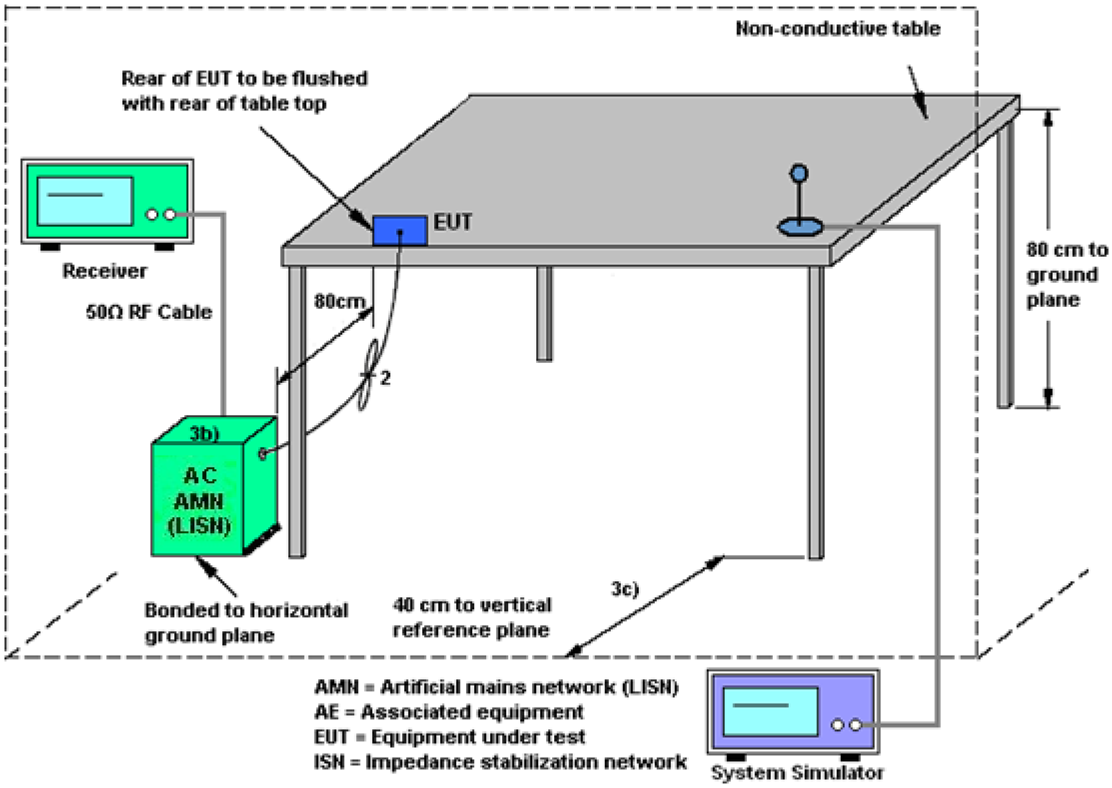
3.9.2 Measuring Instruments

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

3.9.3 Test Procedures

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

3.9.4 Test Setup



3.9.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.10 Antenna Requirements

3.10.1 Standard Applicable

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

3.10.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.10.3 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	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Jan. 11, 2023~ Jan. 17, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2023	Jan. 11, 2023~ Jan. 17, 2023	Jan. 04, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2023	Jan. 11, 2023~ Jan. 17, 2023	Jan. 04, 2024	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 13, 2022	Jan. 17, 2023	Oct. 12, 2023	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Mar. 24, 2022	Jan. 17, 2023	Mar. 23, 2023	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Jan. 17, 2023	Oct. 15, 2023	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 24 ,2022	Jan. 17, 2023	May 23, 2023	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 18, 2022	Jan. 17, 2023	Apr. 17, 2023	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 04, 2023	Jan. 17, 2023	Jan. 03, 2024	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	380826	9KHz-1GHz	Jul. 11, 2022	Jan. 17, 2023	Jul. 10, 2023	Radiation (03CH05-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 04, 2023	Jan. 17, 2023	Jan. 03, 2024	Radiation (03CH05-KS)
high gain Amplifier	EM	EM01G18GA	060839	1Ghz-18Ghz	Oct. 12, 2022	Jan. 17, 2023	Oct. 11, 2023	Radiation (03CH05-KS)
Amplifier	EM	EM01G18GA	060833	1Ghz-18Ghz	Jan. 04, 2023	Jan. 17, 2023	Jan. 03, 2024	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 17, 2023	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jan. 17, 2023	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jan. 17, 2023	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 24, 2022	Jan. 13, 2023	May 23, 2023	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2022	Jan. 13, 2023	Oct. 12, 2023	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 24, 2022	Jan. 13, 2023	May 23, 2023	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2022	Jan. 13, 2023	Oct. 11, 2023	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	**±0.46 dB**
Conducted Emissions	**±0.48 dB**
Occupied Channel Bandwidth	**±0.1 %**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.78dB**

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

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

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

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

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

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

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

Appendix A. Conducted Test Results

Bluetooth

Test Engineer:	Wei Xu	Temperature:	20~26	°C
Test Date:	2023/1/11~2023/1/17	Relative Humidity:	40~51	%

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 (KHz)	Hopping Channel Separation Measurement Limit (MHz)	Pass/Fail
DH	1Mbps	1	0	2402	0.944	0.854	1002.900	0.6291	Pass
DH	1Mbps	1	39	2441	0.944	0.857	903.000	0.6291	Pass
DH	1Mbps	1	78	2480	0.947	0.854	998.600	0.6310	Pass
2DH	2Mbps	1	0	2402	1.259	1.164	911.700	0.8393	Pass
2DH	2Mbps	1	39	2441	1.259	1.164	1002.900	0.8393	Pass
2DH	2Mbps	1	78	2480	1.255	1.166	907.400	0.8365	Pass
3DH	3Mbps	1	0	2402	1.229	1.149	911.700	0.8191	Pass
3DH	3Mbps	1	39	2441	1.233	1.152	1072.400	0.8220	Pass
3DH	3Mbps	1	78	2480	1.229	1.146	1094.100	0.8191	Pass

TEST RESULTS DATA
Dwell Time

Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time(hops)	Package Transfer Time (msec) (MHz)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Nomal	79	106.67	2.91	0.31	0.4	Pass
AFH	20	53.33	2.91	0.16	0.4	Pass

TEST RESULTS DATA
Peak Power Table

DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH1	0	1	9.23	20.97	Pass
	39	1	8.97	20.97	Pass
	78	1	**9.58**	20.97	Pass

2DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
2DH1	0	1	9.74	20.97	Pass
	39	1	9.73	20.97	Pass
	78	1	**10.04**	20.97	Pass

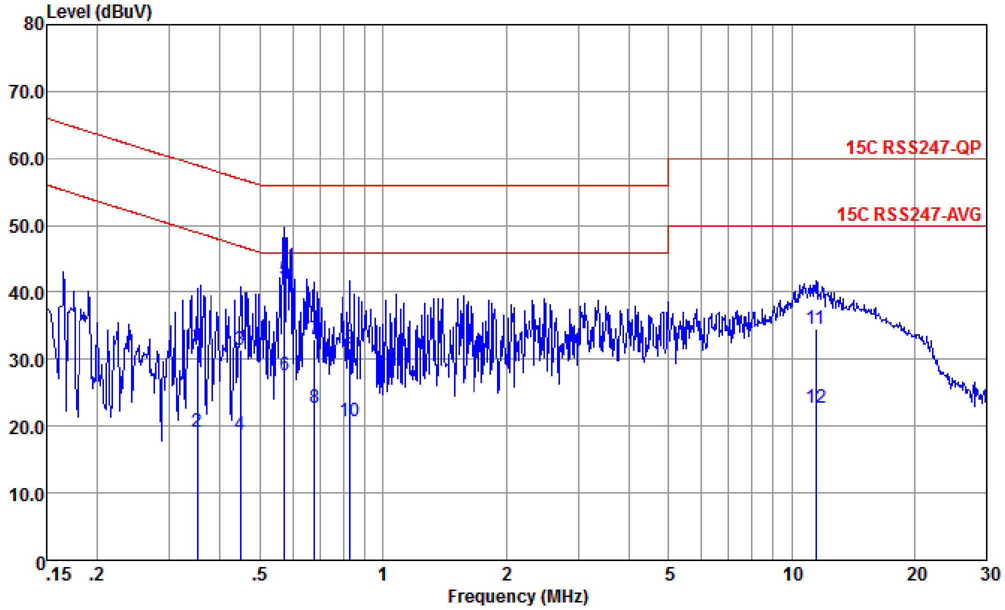
3DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
3DH1	0	1	10.05	20.97	Pass
	39	1	10.11	20.97	Pass
	78	1	**10.36**	20.97	Pass

TEST RESULTS DATA
Number of Hopping Frequency

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

Appendix B. AC Conducted Emission Test Results

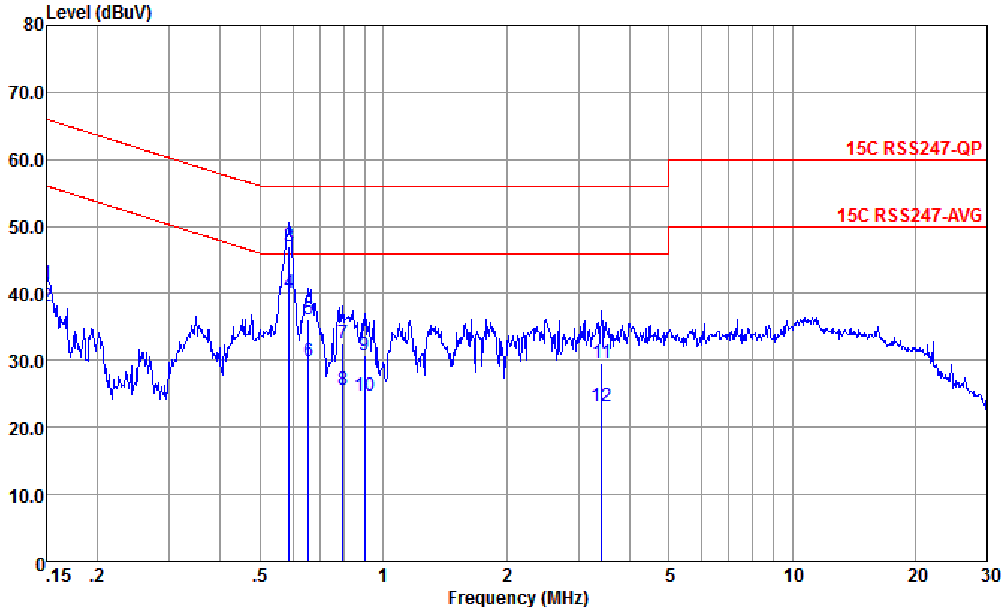
Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15C RSS247-QP LISN-060103-L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.350	32.09	-26.87	58.96	21.50	0.27	10.32	QP
2	0.350	19.19	-29.77	48.96	8.60	0.27	10.32	Average
3	0.447	31.33	-25.60	56.93	20.80	0.27	10.26	QP
4	0.447	18.73	-28.20	46.93	8.20	0.27	10.26	Average
5 *	0.573	41.96	-14.04	56.00	31.50	0.27	10.19	QP
6	0.573	27.66	-18.34	46.00	17.20	0.27	10.19	Average
7	0.679	33.04	-22.96	56.00	22.61	0.27	10.16	QP
8	0.679	22.64	-23.36	46.00	12.21	0.27	10.16	Average
9	0.830	31.63	-24.37	56.00	21.20	0.30	10.13	QP
10	0.830	20.63	-25.37	46.00	10.20	0.30	10.13	Average
11	11.438	34.64	-25.36	60.00	23.31	0.44	10.89	QP
12	11.438	22.84	-27.16	50.00	11.51	0.44	10.89	Average

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



Site : CO01-KS
Condition : 15C RSS247-QP LISN-060103-N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	41.35	-24.65	66.00	30.60	0.32	10.43	QP
2	0.150	38.05	-17.95	56.00	27.30	0.32	10.43	Average
3	0.589	47.06	-8.94	56.00	36.60	0.27	10.19	QP
4 *	0.589	40.06	-5.94	46.00	29.60	0.27	10.19	Average
5	0.658	36.05	-19.95	56.00	25.60	0.28	10.17	QP
6	0.658	29.75	-16.25	46.00	19.30	0.28	10.17	Average
7	0.796	32.64	-23.36	56.00	22.20	0.30	10.14	QP
8	0.796	25.64	-20.36	46.00	15.20	0.30	10.14	Average
9	0.899	30.83	-25.17	56.00	20.30	0.41	10.12	QP
10	0.899	24.73	-21.27	46.00	14.20	0.41	10.12	Average
11	3.417	29.66	-26.34	56.00	19.30	0.30	10.06	QP
12	3.417	23.16	-22.84	46.00	12.80	0.30	10.06	Average

Note:

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

Appendix C. Radiated Spurious Emission

Test Engineer :	Henzy Li	Relative Humidity :	41 ~ 42 %
		Temperature :	22 ~ 23 ℃

Radiated Spurious Emission Test Modes

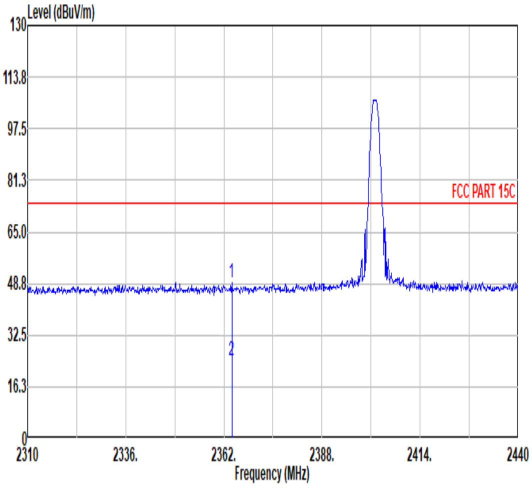
Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	1	Bluetooth BR_GFSK	00	2402	1Mbps	-	-
Mode 2	2400-2483.5	1	Bluetooth BR_GFSK	39	2441	1Mbps	-	-
Mode 3	2400-2483.5	1	Bluetooth BR_GFSK	78	2480	1Mbps	-	-
Mode 4	2400-2483.5	1	Bluetooth BR_GFSK	78	2480	1Mbps	-	LF

Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Bluetooth BR_GFSK	00	2384.10	49.61	74.00	-24.39	V	PEAK	Pass	Band Edge
	Bluetooth BR_GFSK	00	4804.00	41.44	74.00	-32.56	V	PEAK	Pass	Harmonic
2	Bluetooth BR_GFSK	39	-	-	-	-	-	-	-	Band Edge
	Bluetooth BR_GFSK	39	7323.00	42.25	74.00	-31.75	V	PEAK	Pass	Harmonic
3	Bluetooth BR_GFSK	78	2483.72	55.27	74.00	-18.73	H	PEAK	Pass	Band Edge
	Bluetooth BR_GFSK	78	7440.00	42.75	74.00	-31.25	H	PEAK	Pass	Harmonic
4	Bluetooth BR_GFSK	78	47.46	29.22	40.00	-10.78	V	Peak	Pass	LF

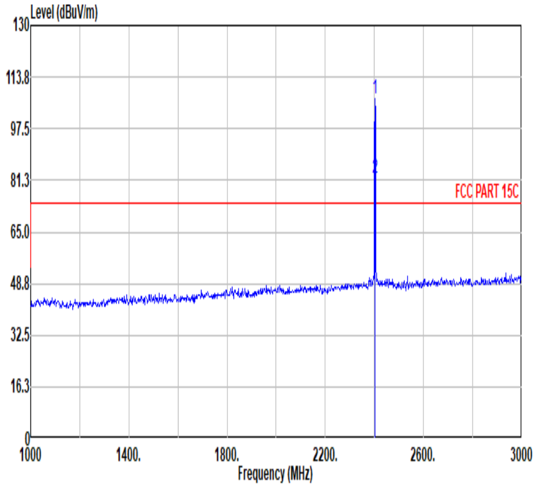
Mode	1	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	1	
Pol.	Horizontal	Fundamental
Peak	see below	see below

Peak – Horizontal

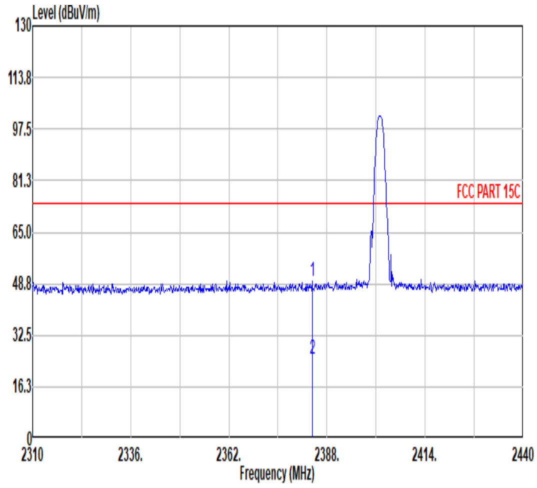
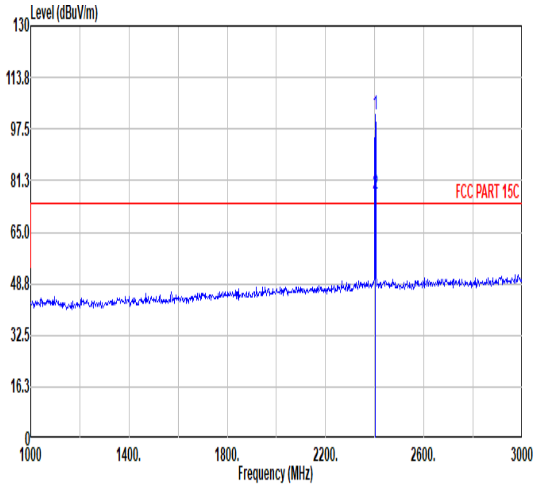


	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2364.08	49.12	74.00	-24.88	40.38	32.24	7.07	36.57	6.00	117	185	PEAK
2	2364.08	24.36	54.00	-29.64	15.62	32.24	7.07	36.57	6.00	117	185	AVERAGE

Peak – Fundamental

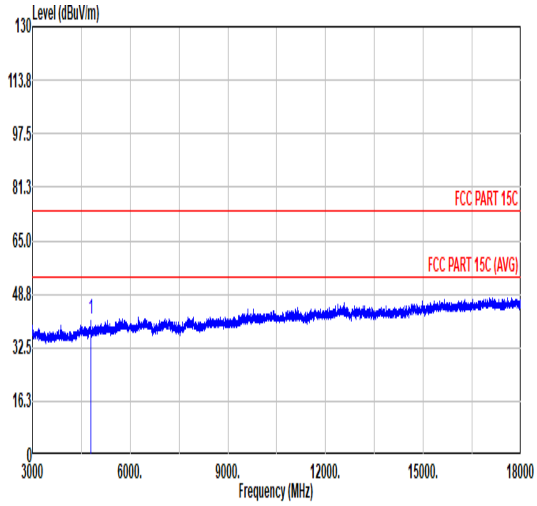
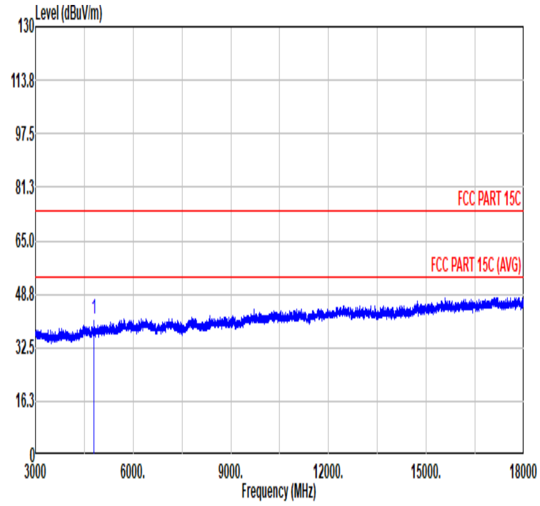


	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2402.00	106.80	------	------	97.85	32.39	7.12	36.56	6.00	117	185	PEAK
2	2402.00	82.04	------	------	73.09	32.39	7.12	36.56	6.00	117	185	AVERAGE

Mode	1	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	1	
Pol.	Vertical	Fundamental
Peak		

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2384.10	49.61	74.00	-24.39	40.69	32.35	7.10	36.53	6.00	252	90	PEAK
2	2384.10	24.85	54.00	-29.15	15.93	32.35	7.10	36.53	6.00	252	90	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2402.00	101.83	------	------	92.88	32.39	7.12	36.56	6.00	252	90	PEAK
2	2402.00	77.07	------	------	68.12	32.39	7.12	36.56	6.00	252	90	AVERAGE

Mode	1	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	1	
Pol.	Horizontal	Vertical
Peak Avg		

Horizontal:

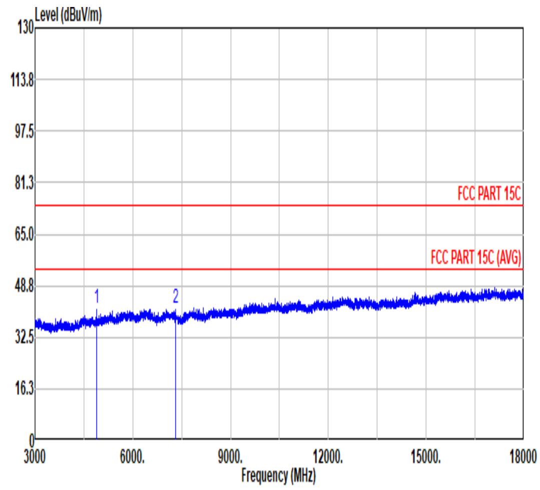
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4804.00	41.19	74.00	-32.81	62.24	34.00	10.20	65.25	0.00	---	---	PEAK

Vertical:

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4804.00	41.44	74.00	-32.56	62.49	34.00	10.20	65.25	0.00	---	---	PEAK

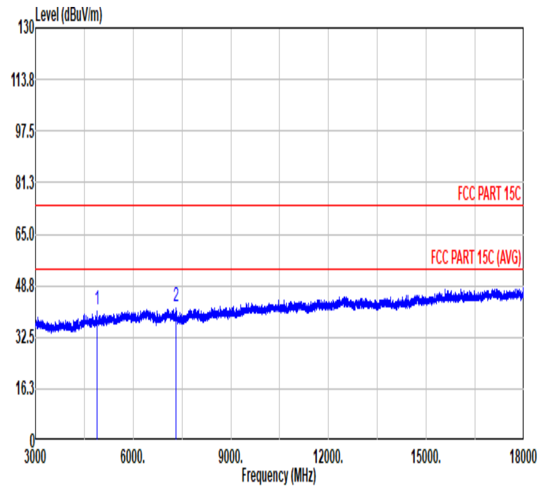
Mode	2	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	1	
Pol.	Horizontal	Vertical
Peak Avg	(see below)	(see below)

Peak / Avg – Horizontal



	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4882.00	41.57	74.00	-32.43	62.55	34.00	10.30	65.28	0.00	---	---	PEAK
2	7323.00	41.80	74.00	-32.20	60.04	35.77	12.72	66.73	0.00	---	---	PEAK

Peak / Avg – Vertical

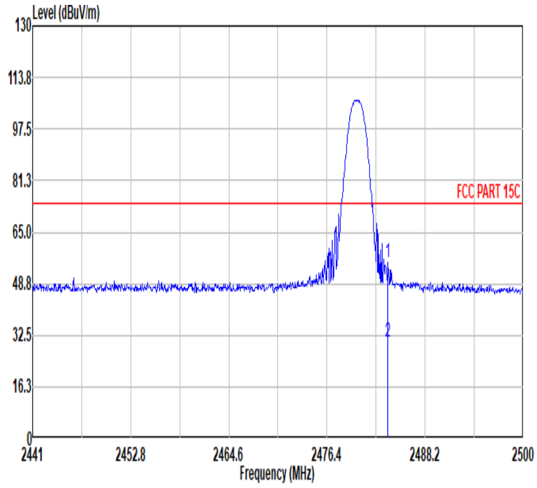


	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4882.00	41.14	74.00	-32.86	62.12	34.00	10.30	65.28	0.00	---	---	PEAK
2	7323.00	42.25	74.00	-31.75	60.49	35.77	12.72	66.73	0.00	---	---	PEAK

Mode	**3**	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	**1**	
Pol.	**Horizontal**	**Fundamental**

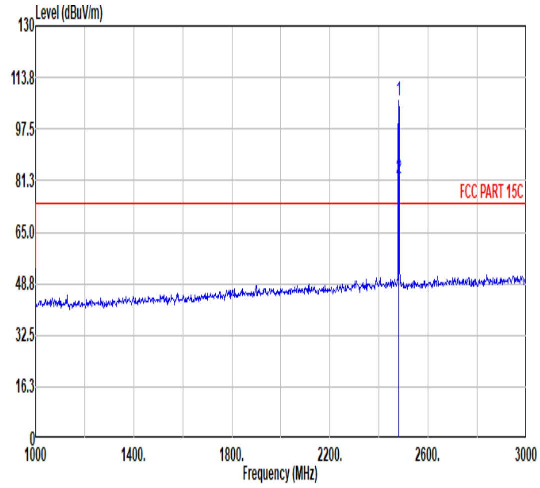
Peak

Horizontal

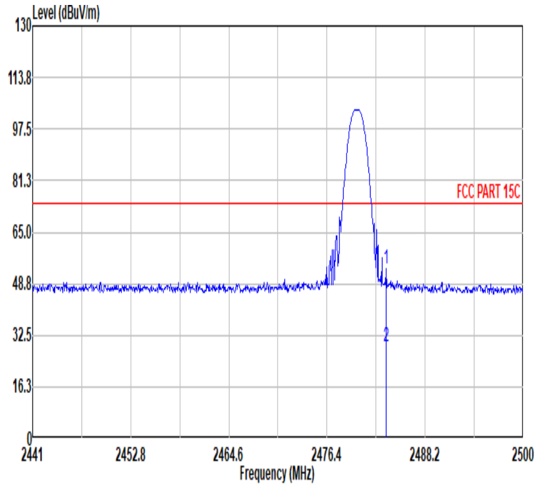
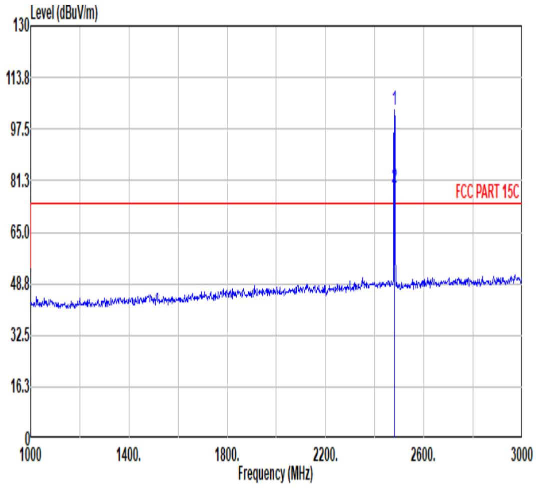


	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2483.72	55.27	74.00	-18.73	46.72	32.34	7.26	37.05	6.00	165	187	PEAK
2	2483.72	30.51	54.00	-23.49	21.96	32.34	7.26	37.05	6.00	165	187	AVERAGE

Fundamental



	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2480.00	106.53	------	------	97.97	32.34	7.25	37.03	6.00	165	187	PEAK
2	2480.00	81.77	------	------	73.21	32.34	7.25	37.03	6.00	165	187	AVERAGE

Mode	3	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	1	
Pol.	Vertical	Fundamental
Peak		

Vertical:

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2483.54	53.58	74.00	-20.42	45.03	32.34	7.26	37.05	6.00	313	85	PEAK
2	2483.54	28.82	54.00	-25.18	20.27	32.34	7.26	37.05	6.00	313	85	AVERAGE

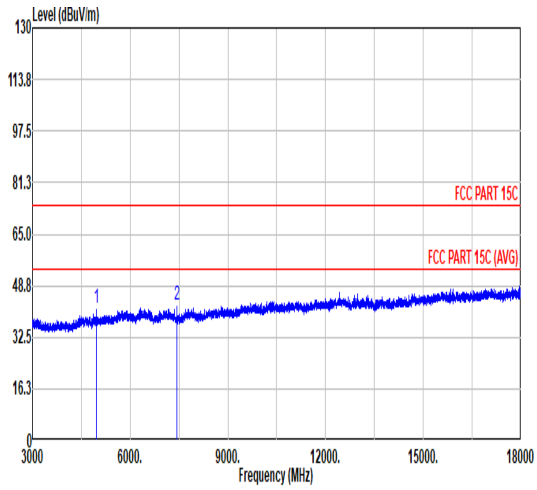
Fundamental:

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	2480.00	103.68	------	------	95.12	32.34	7.25	37.03	6.00	313	85	PEAK
2	2480.00	78.92	------	------	70.36	32.34	7.25	37.03	6.00	313	85	AVERAGE

Mode	3	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	1	
Pol.	Horizontal	Vertical

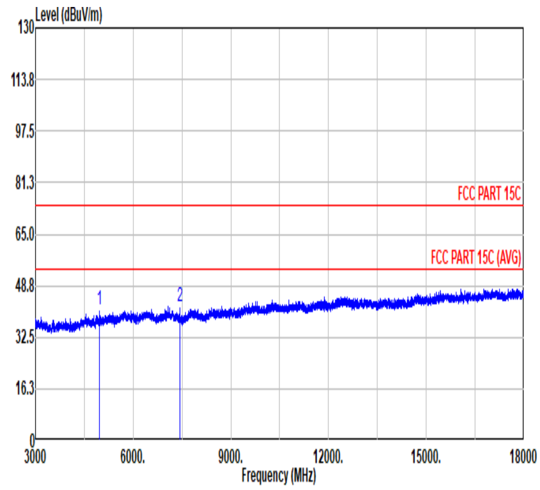
Peak / Avg

Horizontal

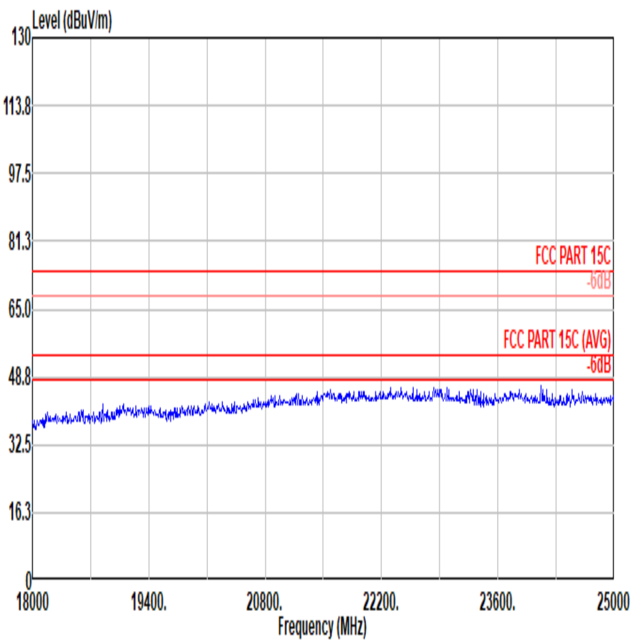
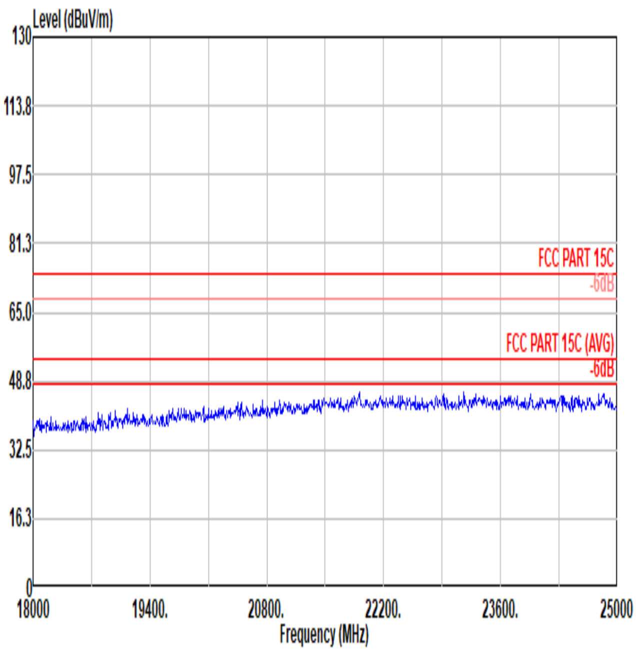


	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4960.00	41.53	74.00	-32.47	62.45	34.00	10.40	65.32	0.00	---	---	PEAK
2	7440.00	42.75	74.00	-31.25	61.31	35.79	12.78	67.13	0.00	---	---	PEAK

Vertical

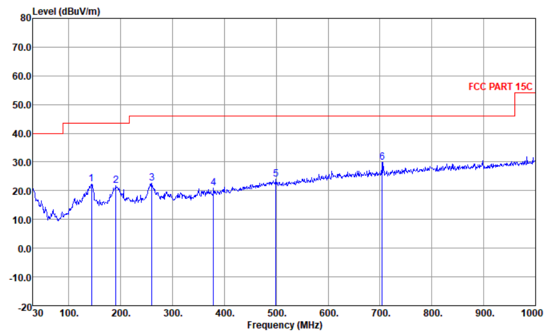


	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4960.00	41.20	74.00	-32.80	62.12	34.00	10.40	65.32	0.00	---	---	PEAK
2	7440.00	42.34	74.00	-31.66	60.90	35.79	12.78	67.13	0.00	---	---	PEAK

Mode	**3**	
	Emission above 18GHz	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	**1**	
Pol.	**Horizontal**	**Vertical**
Peak **Avg**		

Mode	4	
	LF	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	1	
Pol.	Horizontal	Vertical
QP/ Peak		

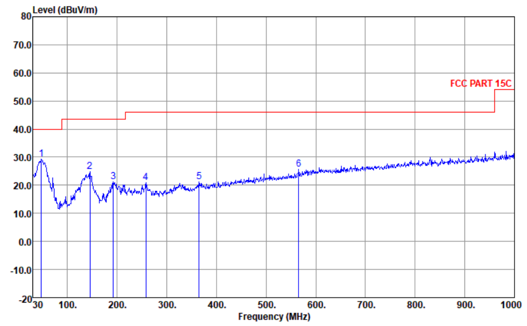
Horizontal



Site : 03CH05-KS
Condition : FCC PART 15C 3m CBL6111D SN23188 HORIZONTAL
: RBW:100.000KHz VBW:300.000KHz SWT:Auto
Project : 2D2302

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phas
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		
1	143.49	22.38	-21.12	43.50	36.88	16.51	1.82	32.83	---	---	Peak	HORIZONT
2	191.02	21.71	-21.79	43.50	36.86	15.59	2.10	32.84	---	---	Peak	HORIZONT
3	259.89	22.61	-23.39	46.00	34.33	18.60	2.46	32.78	---	---	Peak	HORIZONT
4	379.20	21.06	-24.94	46.00	29.80	21.16	2.97	32.87	---	---	Peak	HORIZONT
5	499.48	23.98	-22.02	46.00	29.89	23.59	3.42	32.92	---	---	Peak	HORIZONT
6	704.15	29.79	-16.21	46.00	33.51	25.28	4.06	33.06	---	---	Peak	HORIZONT

Vertical

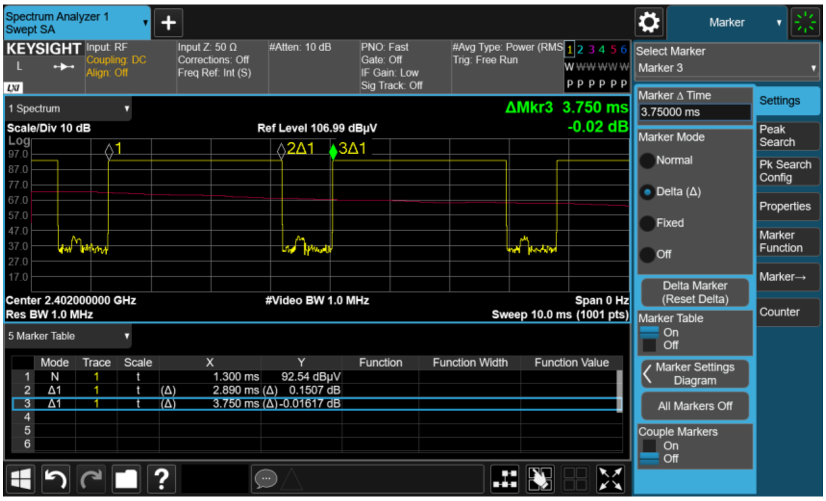


Site : 03CH05-KS
Condition : FCC PART 15C 3m CBL6111D SN23188 VERTICAL
: RBW:100.000KHz VBW:300.000KHz SWT:Auto
Project : 2D2302

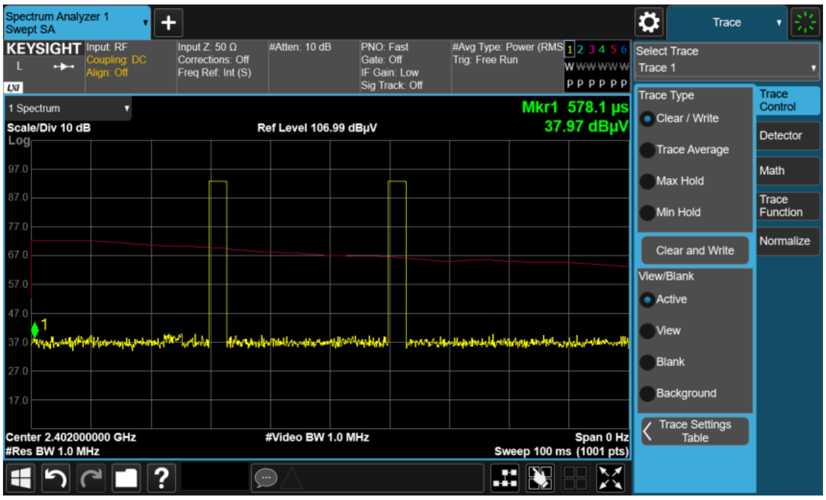
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phas
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		
1	47.46	29.22	-10.78	40.00	45.72	15.40	1.04	32.94	---	---	Peak	VERTICAL
2	145.43	24.86	-18.64	43.50	39.37	16.48	1.83	32.82	---	---	Peak	VERTICAL
3	191.99	21.11	-22.39	43.50	36.27	15.57	2.11	32.84	---	---	Peak	VERTICAL
4	257.95	20.84	-25.16	46.00	32.61	18.56	2.45	32.78	---	---	Peak	VERTICAL
5	364.65	21.14	-24.86	46.00	30.34	20.79	2.91	32.90	---	---	Peak	VERTICAL
6	565.44	25.57	-20.43	46.00	29.98	25.06	3.63	33.10	---	---	Peak	VERTICAL

Appendix D. Duty Cycle Plots

3DH5 on time (One Pulse) Plot on Channel 39



3DH5 on time (Count Pulses) Plot on Channel 39



Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
3. 3DH5 has the highest duty cycle worst case and is reported.