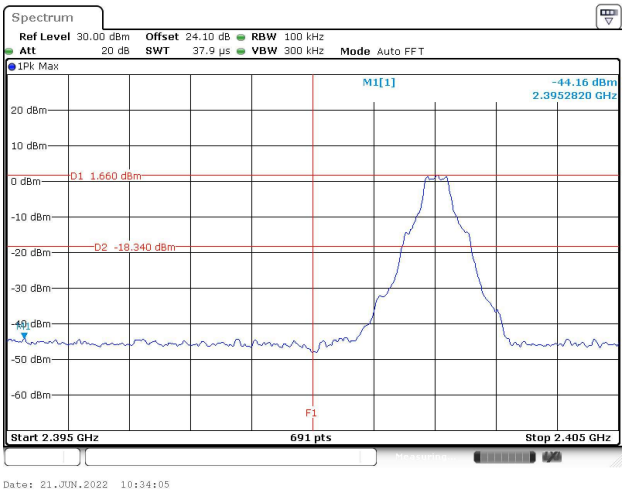
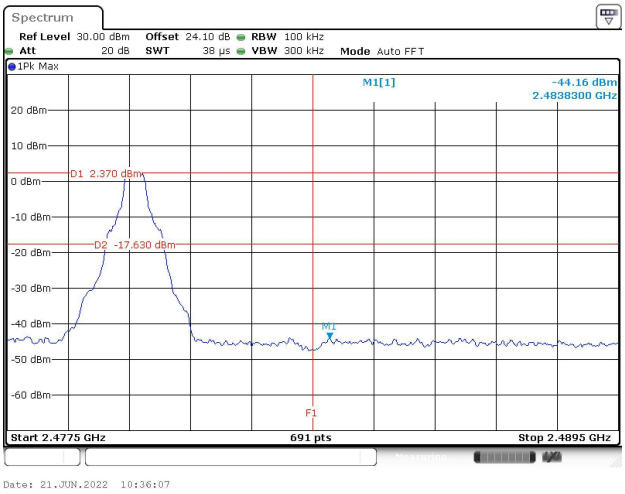
3.6.5 Test Result of Conducted Band Edges

<1Mbps>

Low Band Edge Plot on Channel 00	High Band Edge Plot on Channel 78
	

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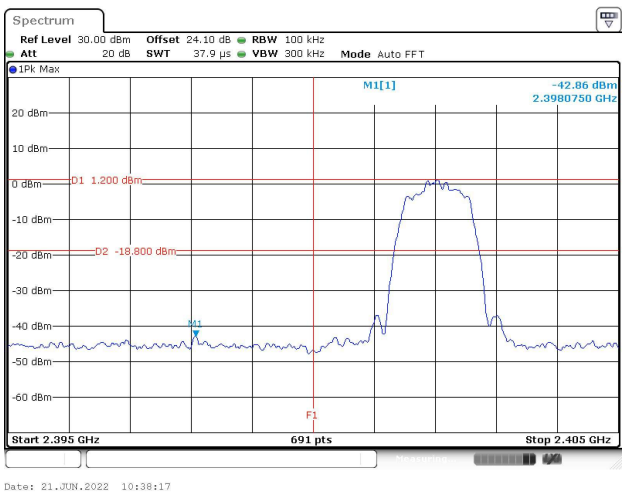
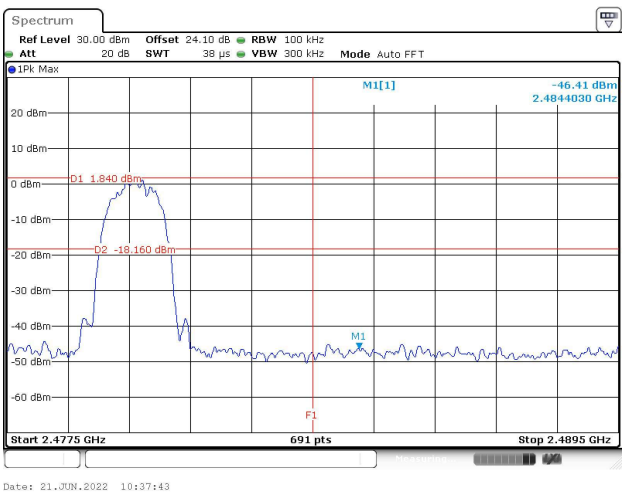
Low Band Edge Plot on Channel 00	High Band Edge Plot on Channel 78
	

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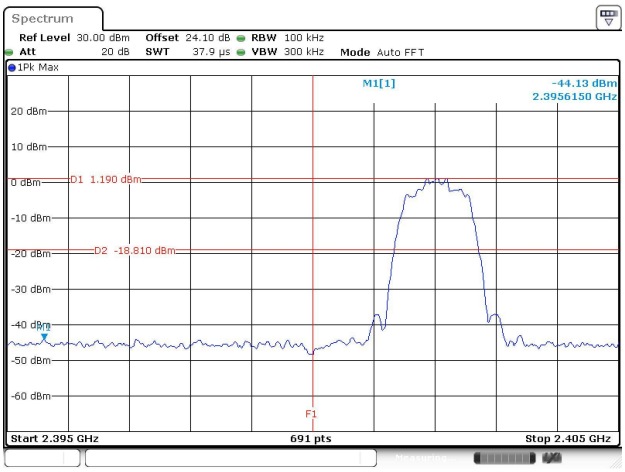
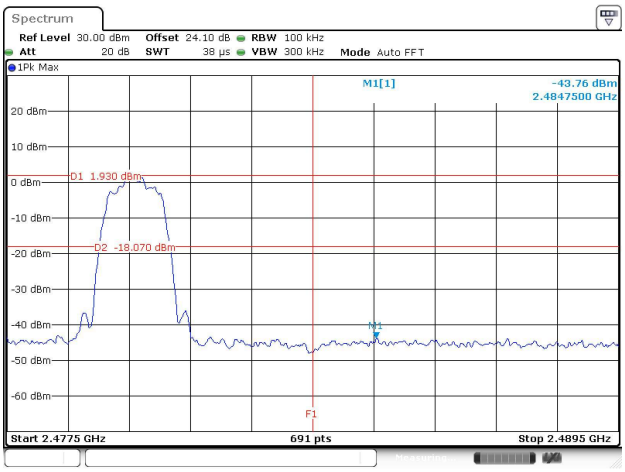
Low Band Edge Plot on Channel 00	High Band Edge Plot on Channel 78
	

3.6.6 Test Result of Conducted Hopping Mode Band Edges

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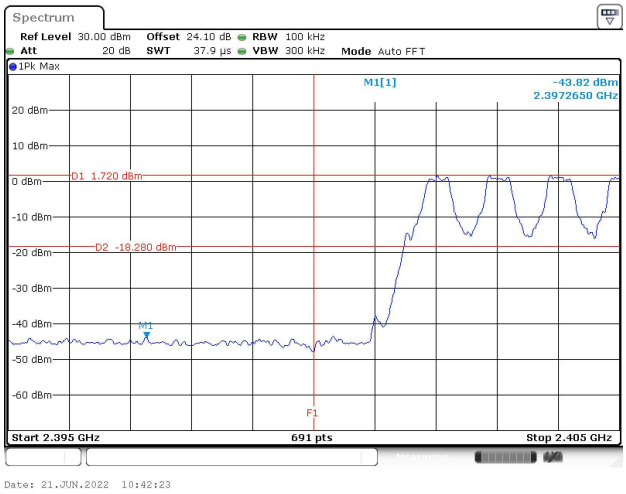
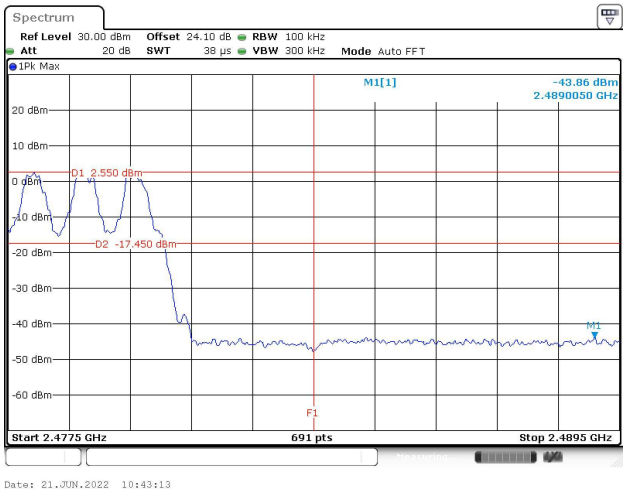
Hopping Mode Low Band Edge Plot	Hopping Mode High Band Edge Plot
	

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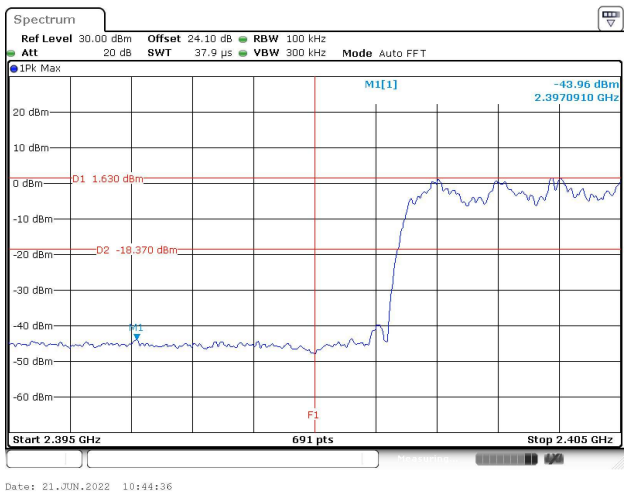
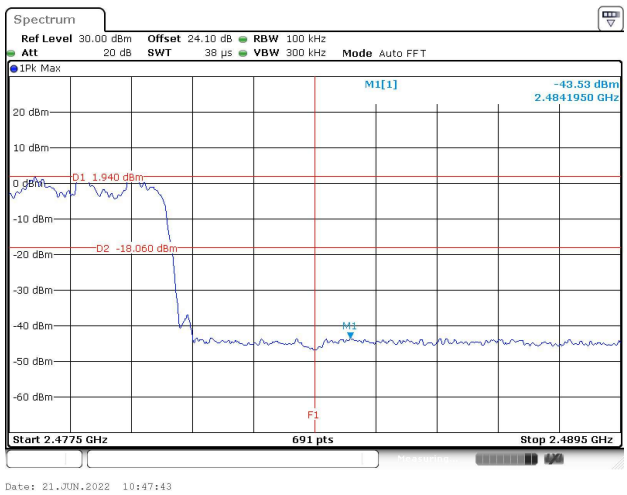
Hopping Mode Low Band Edge Plot	Hopping Mode High Band Edge Plot
	

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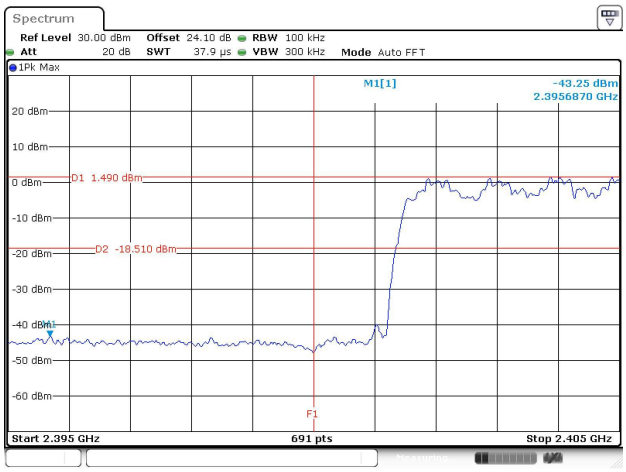
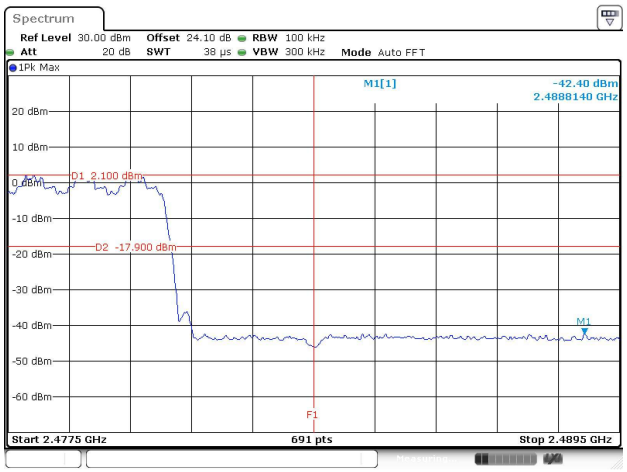
Hopping Mode Low Band Edge Plot	Hopping Mode High Band Edge Plot
	

3.7 Conducted Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

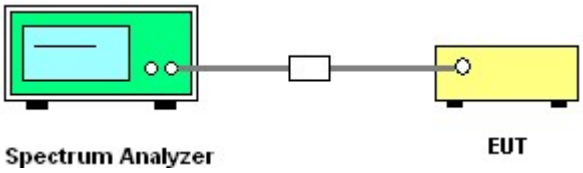
3.7.2 Measuring Instruments

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

3.7.3 Test Procedure

1. The testing follows ANSI C63.10-2013 clause 7.8.8.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics / spurious must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.7.4 Test Setup



3.7.5 Test Result of Conducted Spurious Emission

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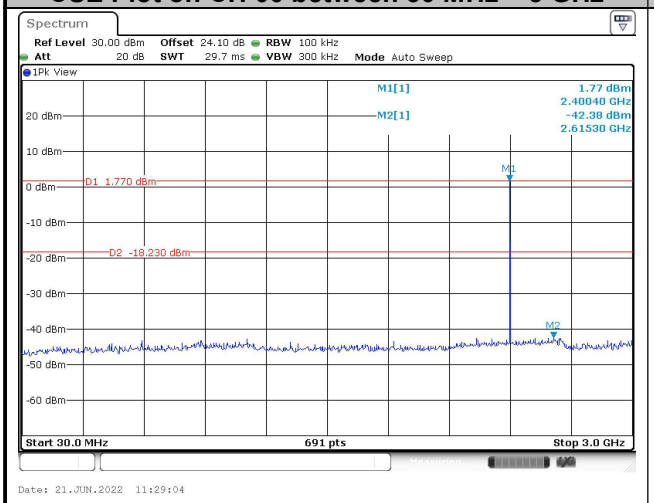
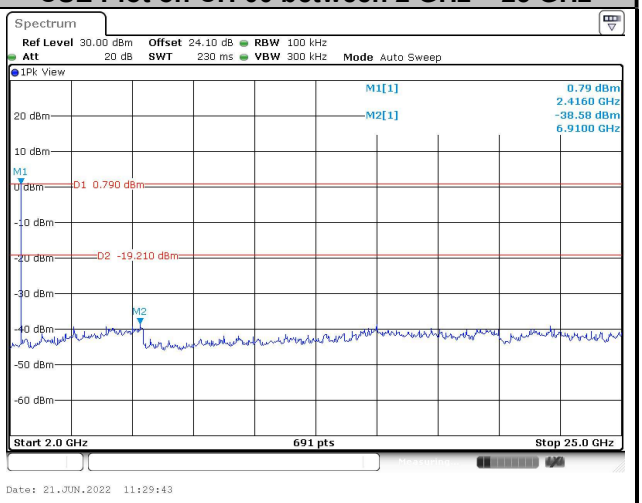
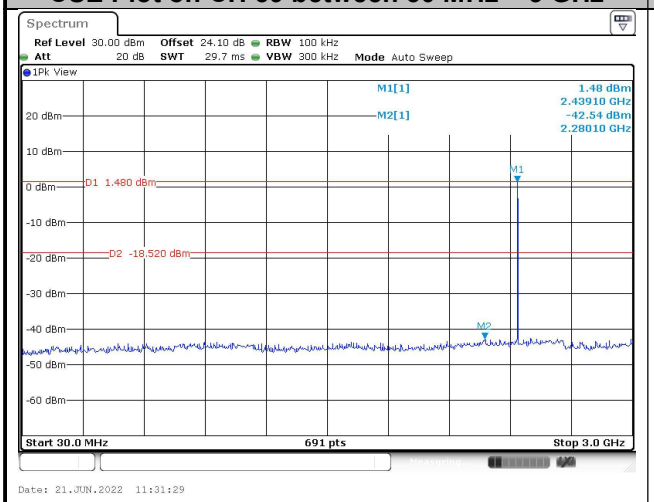
CSE Plot on CH 00 between 30 MHz ~ 3 GHz



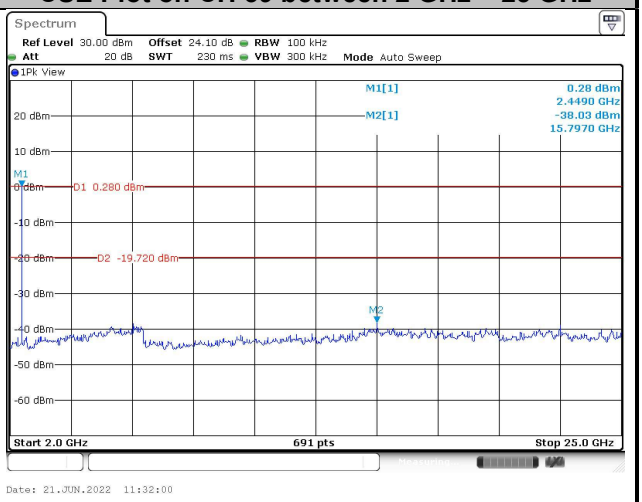
CSE Plot on CH 00 between 2 GHz ~ 25 GHz



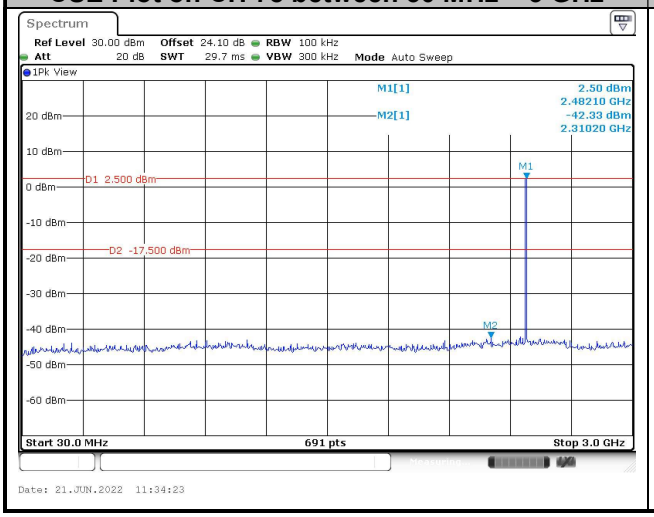
CSE Plot on CH 39 between 30 MHz ~ 3 GHz



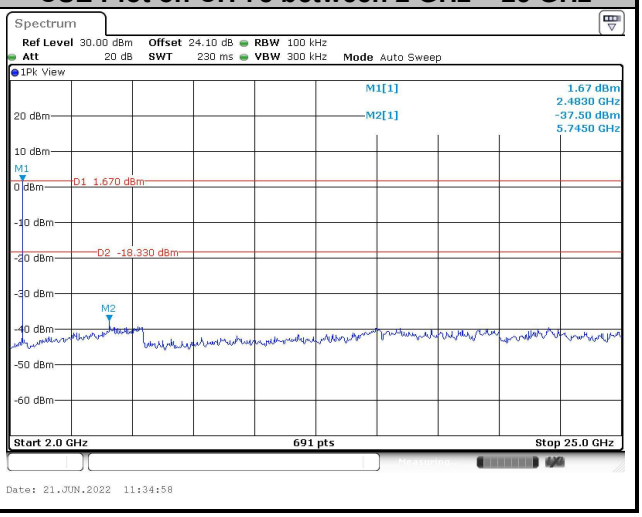
CSE Plot on CH 39 between 2 GHz ~ 25 GHz



CSE Plot on CH 78 between 30 MHz ~ 3 GHz



CSE Plot on CH 78 between 2 GHz ~ 25 GHz



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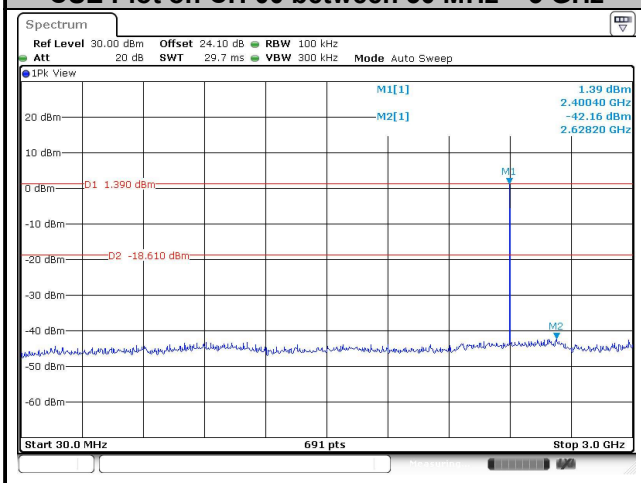
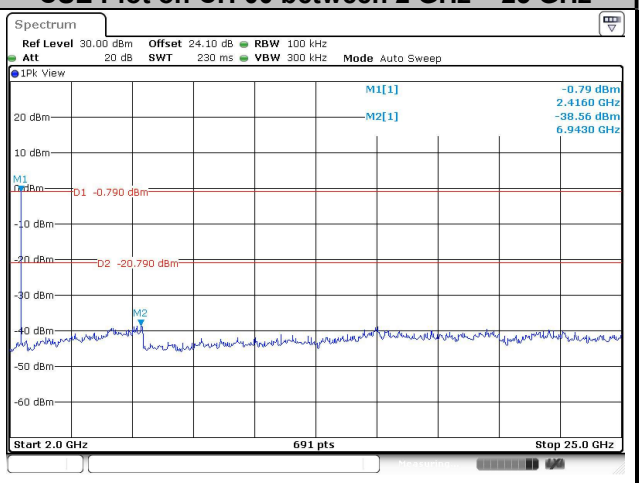
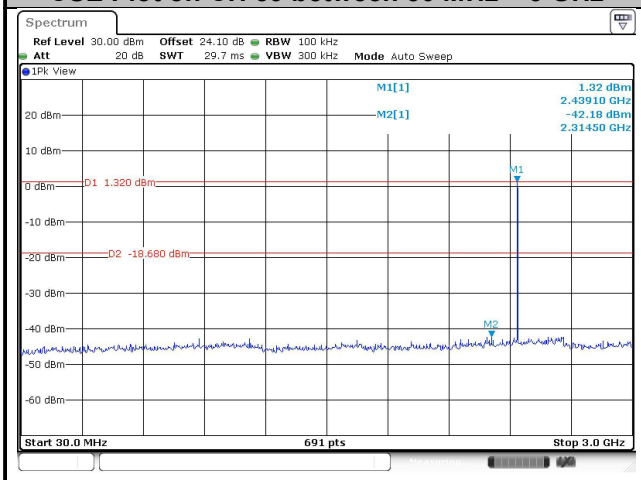
CSE Plot on CH 00 between 30 MHz ~ 3 GHz



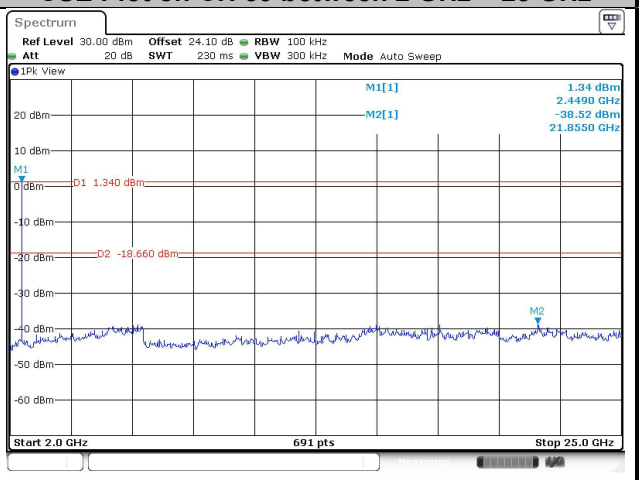
CSE Plot on CH 00 between 2 GHz ~ 25 GHz



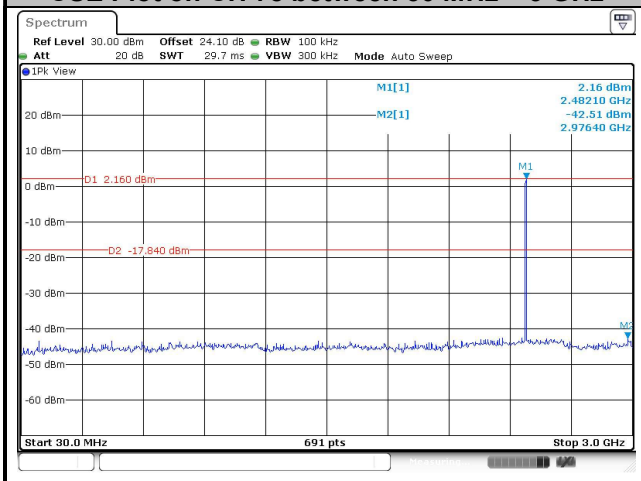
CSE Plot on CH 39 between 30 MHz ~ 3 GHz



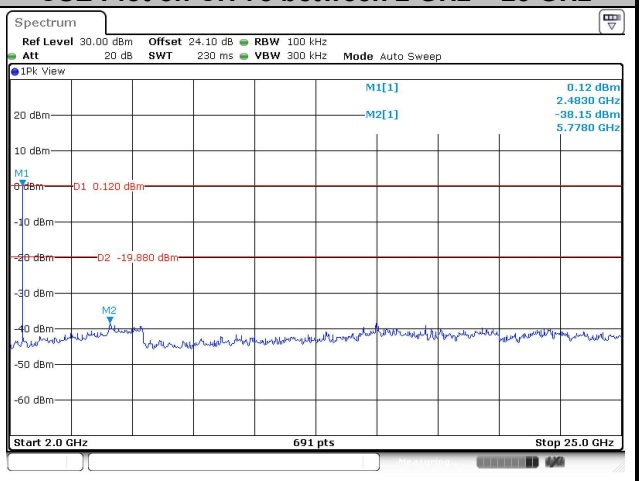
CSE Plot on CH 39 between 2 GHz ~ 25 GHz



CSE Plot on CH 78 between 30 MHz ~ 3 GHz



CSE Plot on CH 78 between 2 GHz ~ 25 GHz



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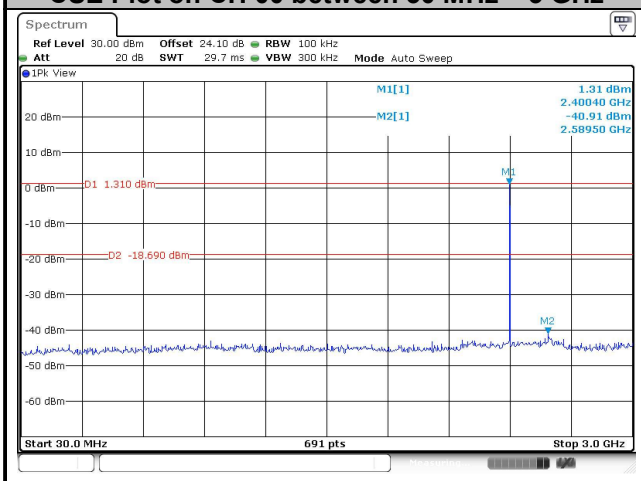
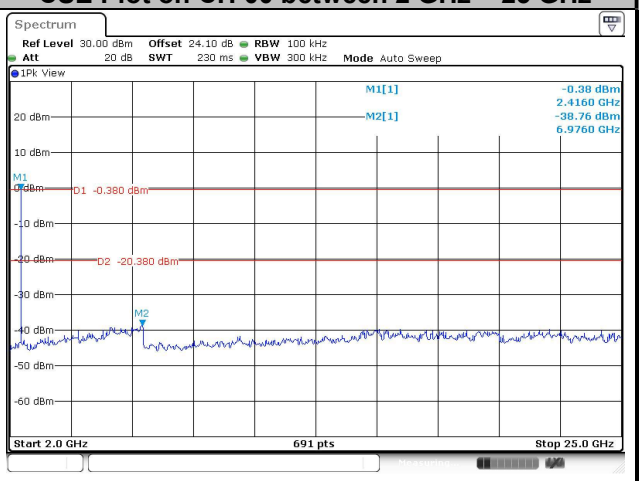
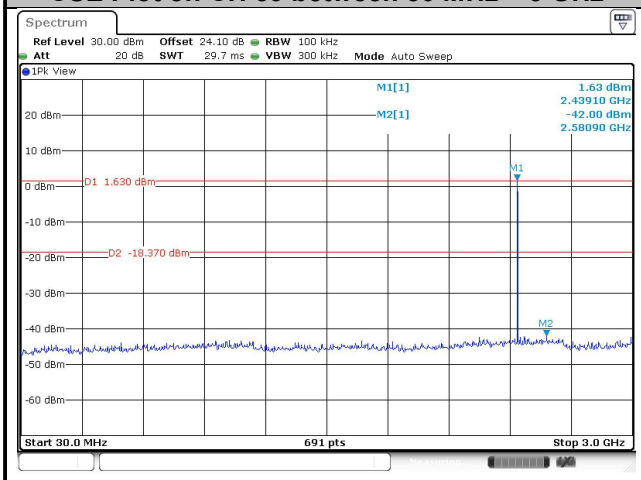
CSE Plot on CH 00 between 30 MHz ~ 3 GHz



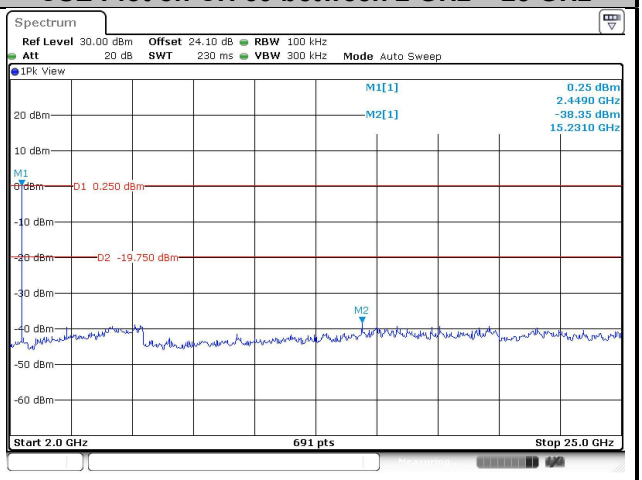
CSE Plot on CH 00 between 2 GHz ~ 25 GHz



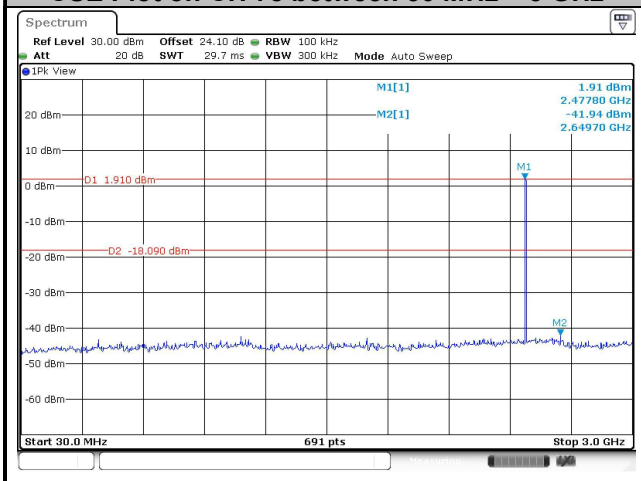
CSE Plot on CH 39 between 30 MHz ~ 3 GHz



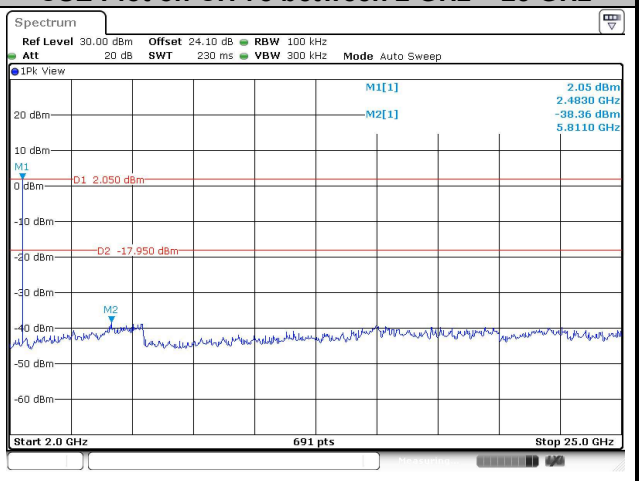
CSE Plot on CH 39 between 2 GHz ~ 25 GHz



CSE Plot on CH 78 between 30 MHz ~ 3 GHz



CSE Plot on CH 78 between 2 GHz ~ 25 GHz



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.

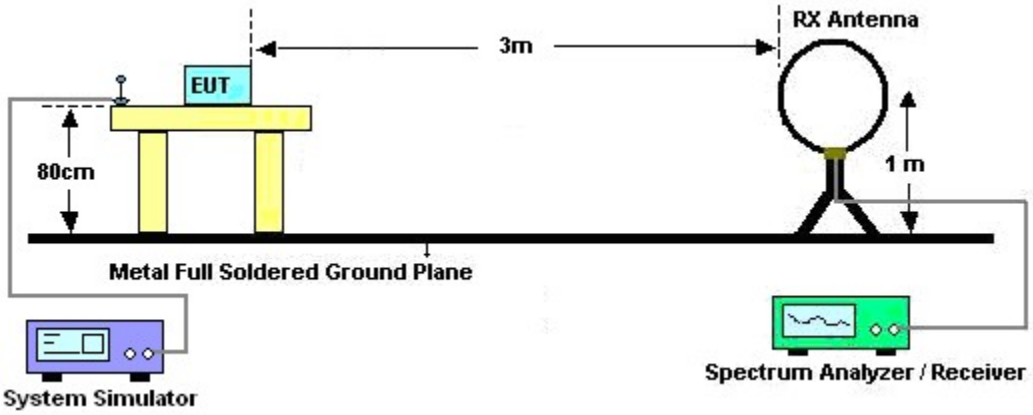
3.8.3 Test Procedures

1. The 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.
2. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
3. 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.
4. Set the maximum power setting and enable the EUT to 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 = 1 MHz for f>1 GHz ; 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. 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 "-".
8. 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 "-".

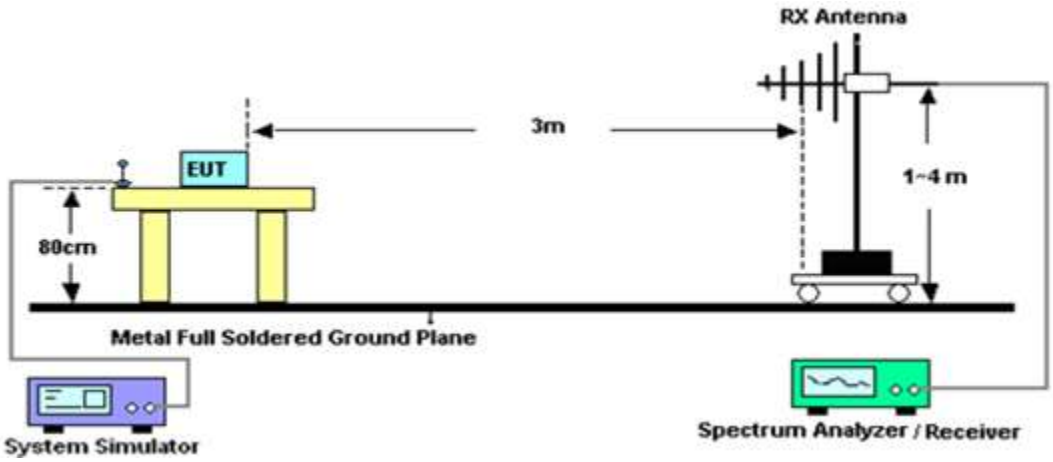
Note: The average levels are calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent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

3.8.4 Test Setup

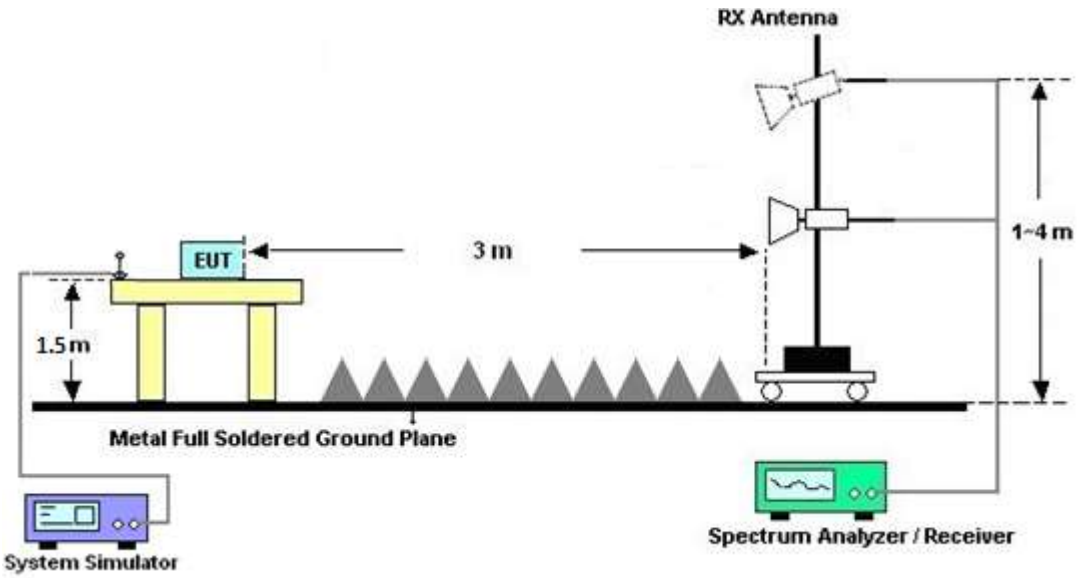
For radiated test below 30MHz



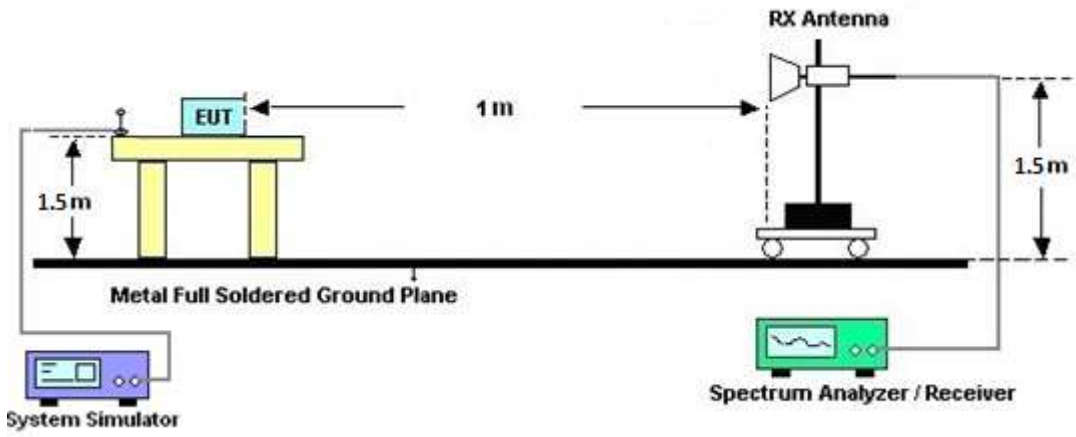
For radiated test from 30MHz to 1GHz



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 Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.8.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.

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.

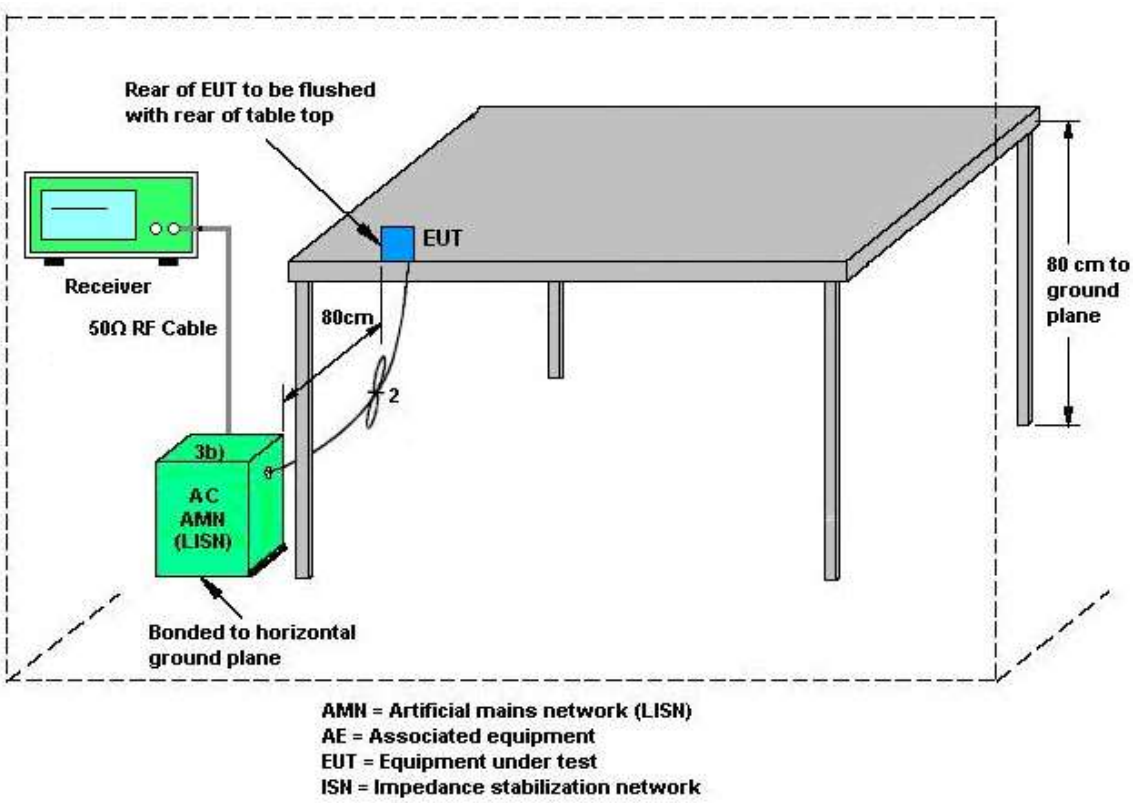
3.9.2 Measuring Instruments

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

3.9.3 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.

3.9.4 Test Setup



3.9.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

3.10 Antenna Requirements

3.10.1 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.

3.10.2 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	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Jun. 14, 2022 Jun. 21, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	1036004	N/A	Aug. 01, 2021	Jun. 14, 2022 Jun. 21, 2022	Jul. 31, 2022	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 01, 2021	Jun. 14, 2022 Jun. 21, 2022	Jul. 31, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Jun. 14, 2022 Jun. 21, 2022	Aug. 29, 2022	Conducted (TH05-HY)
BT Base Station (Measure)	Rohde & Schwarz	CBT	101136	BT 3.0	Oct. 17, 2021	Jun. 14, 2022 Jun. 21, 2022	Oct. 16, 2022	Conducted (TH05-HY)
Switch Control Mainframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Jun. 14, 2022 Jun. 21, 2022	Aug. 11, 2022	Conducted (TH05-HY)
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Jul. 04, 2022	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 04, 2022	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Oct. 29, 2021	Jul. 04, 2022	Oct. 28, 2022	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 16, 2022	Jul. 04, 2022	Mar. 15, 2023	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Feb. 16, 2022	Jul. 04, 2022	Feb. 15, 2023	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI7	100724	9kHz~7GHz	Feb. 24, 2022	Jul. 04, 2022	Feb. 23, 2023	Conduction (CO07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	May 13, 2022	Jun. 23, 2022~ Jun. 30, 2022	May 12, 2023	Radiation (03CH16-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00802N1D01N -06	47020 & 06	30MHz to 1GHz	Oct. 09, 2021	Jun. 23, 2022~ Jun. 30, 2022	Oct. 08, 2022	Radiation (03CH16-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	Mar. 10, 2022	Jun. 23, 2022~ Jun. 30, 2022	Mar. 09, 2023	Radiation (03CH16-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz ~40GHz	Nov. 30, 2021	Jun. 23, 2022~ Jun. 30, 2022	Nov. 29, 2022	Radiation (03CH16-HY)
Amplifier	SONOMA	310N	371607	9kHz~1G	Jul. 05, 2021	Jun. 23, 2022~ Jun. 30, 2022	Jul. 04, 2022	Radiation (03CH16-HY)
Preamplifier	EMEC	EM18G40G	060812	18GHz~40GHz	Dec. 27, 2021	Jun. 23, 2022~ Jun. 30, 2022	Dec. 26, 2022	Radiation (03CH16-HY)
Preamplifier	Keysight	83017A	MY53270264	1GHz~26.5GHz	Dec. 09, 2021	Jun. 23, 2022~ Jun. 30, 2022	Dec. 08,.2022	Radiation (03CH16-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY57290111	3Hz~26.5GHz	Dec.15, 2021	Jun. 23, 2022~ Jun. 30, 2022	Dec. 14, 2022	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY11680/4PE	NA	Aug. 28, 2021	Jun. 23, 2022~ Jun. 30, 2022	Aug. 27, 2022	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY11688/4PE	NA	Aug. 28, 2021	Jun. 23, 2022~ Jun. 30, 2022	Aug. 27, 2022	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	EC-A5-300-5 757	NA	Aug. 28, 2021	Jun. 23, 2022~ Jun. 30, 2022	Aug. 27, 2022	Radiation (03CH16-HY)
Software	Audix	E3 6.2009-8-24	RK-001136	N/A	N/A	Jun. 23, 2022~ Jun. 30, 2022	N/A	Radiation (03CH16-HY)
Controller	ChainTek	3000-1	N/A	Control Turn table & Ant Mast	N/A	Jun. 23, 2022~ Jun. 30, 2022	N/A	Radiation (03CH16-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Jun. 23, 2022~ Jun. 30, 2022	N/A	Radiation (03CH16-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Jun. 23, 2022~ Jun. 30, 2022	N/A	Radiation (03CH16-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))	2.3 dB

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

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

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

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

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

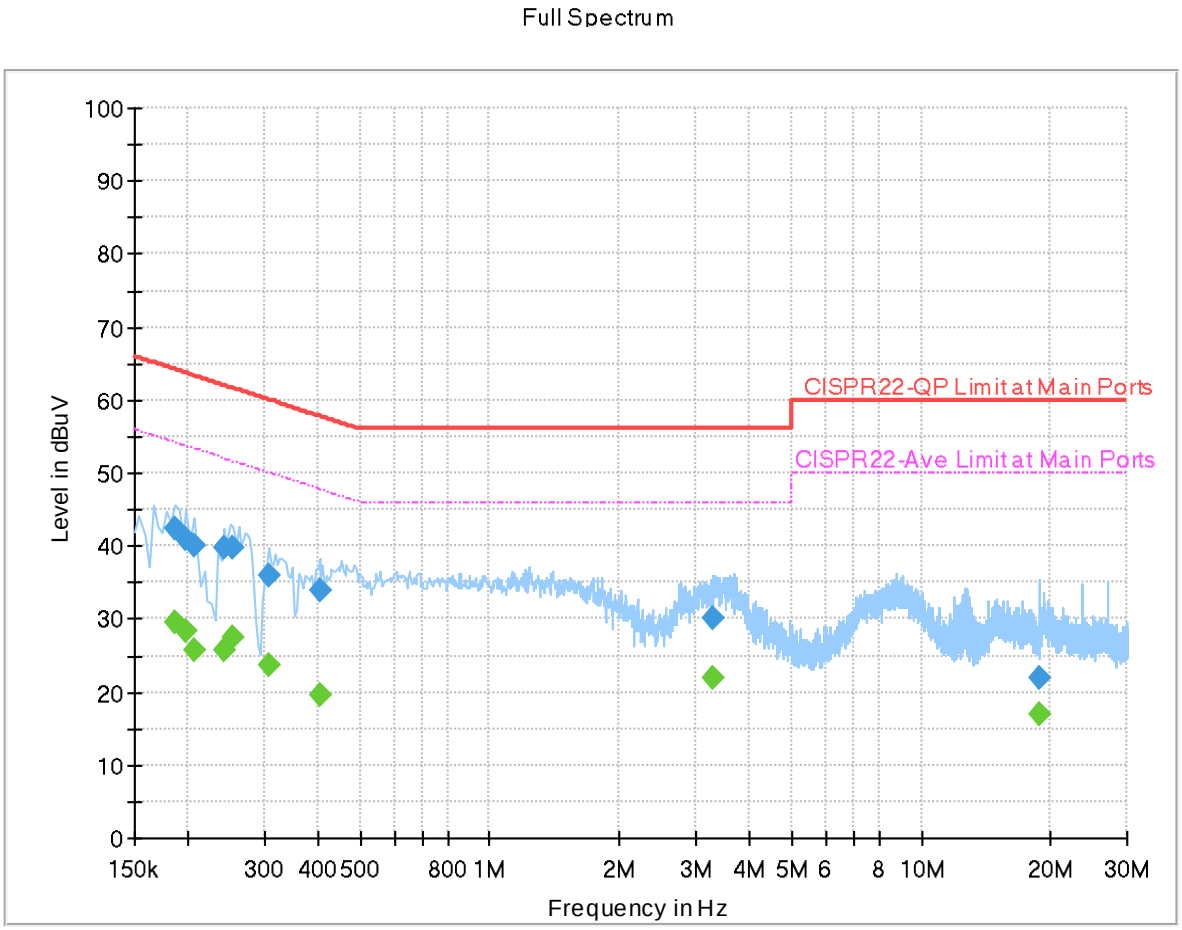
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.8 dB

Appendix A. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	**Temperature :**	22.2~26.3℃
		Relative Humidity :	48.2~58.7%

EUT Information

Report NO :	1N2541
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

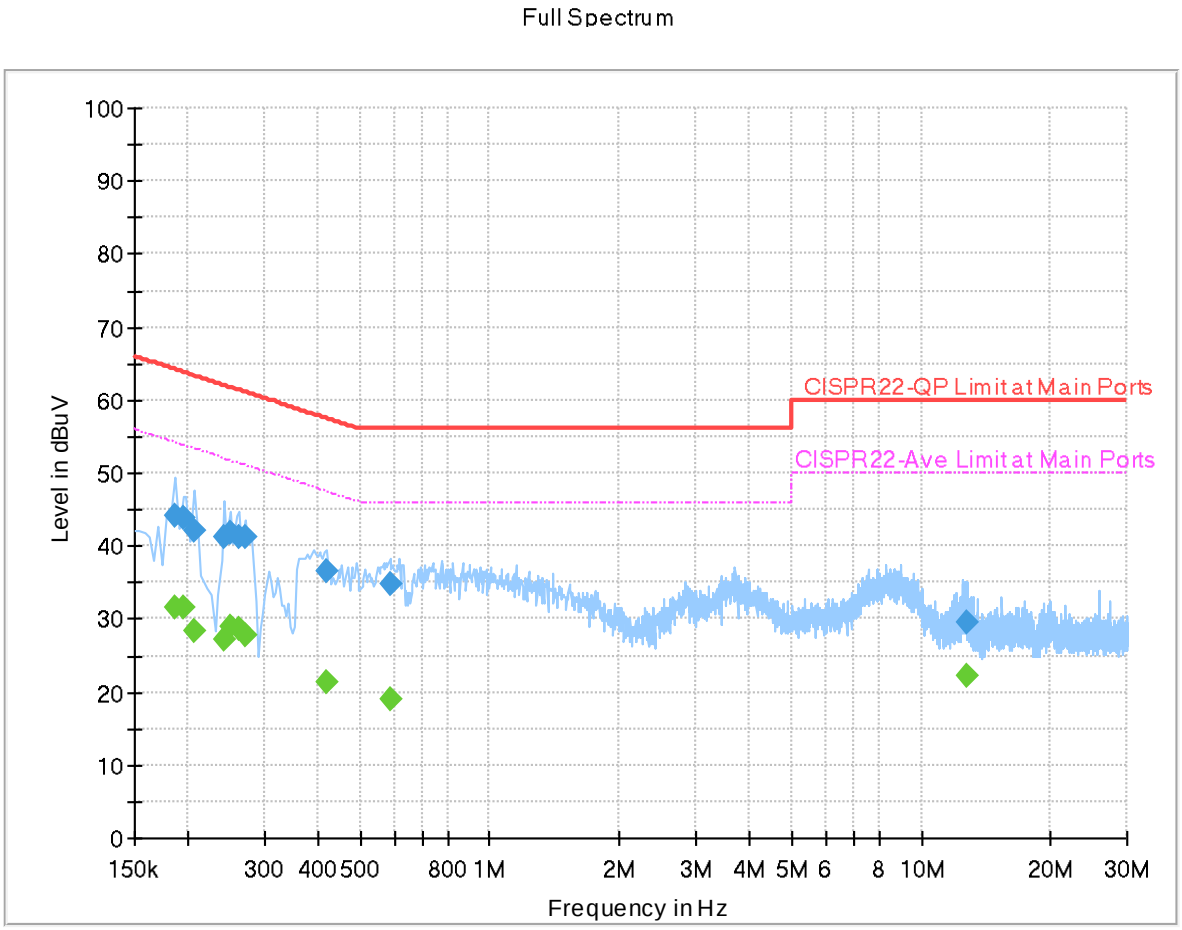


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.186000	---	29.64	54.21	24.57	L1	OFF	20.0
0.186000	42.41	---	64.21	21.80	L1	OFF	20.0
0.198000	---	28.30	53.69	25.39	L1	OFF	20.0
0.198000	40.97	---	63.69	22.72	L1	OFF	20.0
0.206000	---	25.66	53.37	27.71	L1	OFF	20.0
0.206000	40.05	---	63.37	23.32	L1	OFF	20.0
0.242000	---	25.77	52.03	26.26	L1	OFF	20.0
0.242000	39.86	---	62.03	22.17	L1	OFF	20.0
0.254000	---	27.63	51.63	24.00	L1	OFF	20.0
0.254000	39.74	---	61.63	21.89	L1	OFF	20.0
0.306000	---	23.55	50.08	26.53	L1	OFF	20.0
0.306000	35.86	---	60.08	24.22	L1	OFF	20.0
0.402000	---	19.63	47.81	28.18	L1	OFF	20.0
0.402000	34.05	---	57.81	23.76	L1	OFF	20.0
3.286000	---	22.03	46.00	23.97	L1	OFF	20.0
3.286000	30.11	---	56.00	25.89	L1	OFF	20.0
18.826000	---	16.91	50.00	33.09	L1	OFF	20.2
18.826000	21.87	---	60.00	38.13	L1	OFF	20.2

EUT Information

Report NO :	1N2541
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.186000	---	31.60	54.21	22.61	N	OFF	20.0
0.186000	44.26	---	64.21	19.95	N	OFF	20.0
0.194000	---	31.48	53.86	22.38	N	OFF	20.0
0.194000	43.72	---	63.86	20.14	N	OFF	20.0
0.206000	---	28.41	53.37	24.96	N	OFF	20.0
0.206000	42.09	---	63.37	21.28	N	OFF	20.0
0.242000	---	27.33	52.03	24.70	N	OFF	20.0
0.242000	41.16	---	62.03	20.87	N	OFF	20.0
0.250000	---	29.05	51.76	22.71	N	OFF	20.0
0.250000	41.70	---	61.76	20.06	N	OFF	20.0
0.262000	---	28.68	51.37	22.69	N	OFF	20.0
0.262000	41.32	---	61.37	20.05	N	OFF	20.0
0.270000	---	27.78	51.12	23.34	N	OFF	20.0
0.270000	41.15	---	61.12	19.97	N	OFF	20.0
0.418000	---	21.28	47.49	26.21	N	OFF	20.0
0.418000	36.69	---	57.49	20.80	N	OFF	20.0
0.586000	---	19.15	46.00	26.85	N	OFF	20.0
0.586000	34.77	---	56.00	21.23	N	OFF	20.0
12.718000	---	22.17	50.00	27.83	N	OFF	20.2

12.718000	**29.44**	**---**	**60.00**	**30.56**	**N**	**OFF**	**20.2**

Appendix B. Radiated Spurious Emission

Test Engineer :	Andy Yang , Karl Hou and Steven Wu	Temperature :	20~25°C
		Relative Humidity :	50~60%

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	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)
BT CH00 2402MHz		2324.175	45.66	-28.34	74	40.38	27.2	8.17	30.09	132	130	P	H
		2324.175	20.87	-33.13	54	-	-	-	-	-	-	A	H
	*	2402	97.71	-	-	92.05	27.41	8.32	30.07	132	130	P	H
	*	2402	72.92	-	-	-	-	-	-	-	-	A	H
													H
													H
		2351.16	45.75	-28.25	74	40.41	27.2	8.22	30.08	379	193	P	V
		2351.16	20.96	-33.04	54	-	-	-	-	-	-	A	V
	*	2402	97.86	-	-	92.2	27.41	8.32	30.07	379	193	P	V
	*	2402	73.07	-	-	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		2389.52	47.14	-26.86	74	41.55	27.36	8.3	30.07	106	151	P	H
		2389.52	22.35	-31.65	54	-	-	-	-	-	-	A	H
	*	2441	97.15	-	-	91.17	27.65	8.39	30.06	106	151	P	H
	*	2441	72.36	-	-	-	-	-	-	-	-	A	H
		2486.77	47.12	-26.88	74	40.83	27.85	8.48	30.04	106	151	P	H
		2486.77	22.33	-31.67	54	-	-	-	-	-	-	A	H
		2365.3	45.9	-28.1	74	40.47	27.26	8.25	30.08	366	197	P	V
		2365.3	21.11	-32.89	54	-	-	-	-	-	-	A	V
	*	2441	94.08	-	-	88.1	27.65	8.39	30.06	366	197	P	V
	*	2441	69.29	-	-	-	-	-	-	-	-	A	V
		2486.49	46.51	-27.49	74	40.22	27.85	8.48	30.04	366	197	P	V
		2486.49	21.72	-32.28	54	-	-	-	-	-	-	A	V

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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	97.9	-	-	91.67	27.82	8.46	30.05	127	152	P	H
	*	2480	73.11	-	-	-	-	-	-	-	-	A	H
		2487.68	47.34	-26.66	74	41.05	27.85	8.48	30.04	127	152	P	H
		2487.68	22.55	-31.45	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	95.4	-	-	89.17	27.82	8.46	30.05	399	172	P	V
	*	2480	70.61	-	-	-	-	-	-	-	-	A	V
		2496.88	47.86	-26.14	74	41.52	27.89	8.49	30.04	399	172	P	V
		2496.88	23.07	-30.93	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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	39.44	-34.56	74	60.94	32.32	12.35	66.17	-	-	P	H
		4804	14.65	-39.35	54	-	-	-	-	-	-	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4804	39.53	-34.47	74	61.03	32.32	12.35	66.17	-	-	P	V
		4804	14.74	-39.26	54	-	-	-	-	-	-	A	V
													V
													V
													V
													V
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													V
													V

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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 39 2441MHz		4882	39.78	-34.22	74	60.84	32.73	12.32	66.11	-	-	P	H
		4882	14.99	-39.01	54	-	-	-	-	-	-	A	H
		7323	45.33	-28.67	74	58.1	37.06	15.89	65.72	-	-	P	H
		7323	20.54	-33.46	54	-	-	-	-	-	-	A	H
													H
													H
													H
													H
													H
													H
													H
													H
		4882	39.77	-34.23	74	60.83	32.73	12.32	66.11	-	-	P	V
		4882	14.98	-39.02	54	-	-	-	-	-	-	A	V
		7323	45.44	-28.56	74	58.21	37.06	15.89	65.72	-	-	P	V
		7323	20.65	-33.35	54	-	-	-	-	-	-	A	V
													V
													V
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													V

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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		4960	40.41	-33.59	74	61.07	33.12	12.28	66.06	-	-	P	H
		4960	15.62	-38.38	54	-	-	-	-	-	-	A	H
		7440	44.87	-29.13	74	58	36.46	16.2	65.79	-	-	P	H
		7440	20.08	-33.92	54	-	-	-	-			A	H
													H
													H
													H
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													H
													H
													H
													H
		4960	40.97	-33.03	74	61.63	33.12	12.28	66.06	-	-	P	V
		4960	16.18	-37.82	54	-	-	-	-	-	-	A	V
		7440	45.16	-28.84	74	58.29	36.46	16.2	65.79	-	-	P	V
		7440	20.37	-33.63	54	-	-	-	-	-	-	A	V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Emission below 1GHz

2.4GHz BT (LF)

BT	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)
2.4GHz BT LF		66.86	25.74	-14.26	40	44.43	12.14	1.45	32.28	-	-	P	H
		133.79	29.1	-14.4	43.5	41.77	17.57	2.03	32.27	-	-	P	H
		178.41	24.15	-19.35	43.5	38.84	15.15	2.38	32.22	-	-	P	H
		380.17	26.22	-19.78	46	33.9	21.26	3.39	32.33	-	-	P	H
		692.51	28.13	-17.87	46	29.63	26.36	4.54	32.4	-	-	P	H
		950.53	34.28	-11.72	46	29.51	30.57	5.4	31.2	-	-	P	H
													H
													H
													H
													H
													H
													H
		37.76	33.06	-6.94	40	43.56	20.79	1.01	32.3	-	-	P	V
		51.34	33.99	-6.01	40	51.34	13.67	1.27	32.29	-	-	P	V
		184.23	30.08	-13.42	43.5	45.01	14.88	2.42	32.23	-	-	P	V
		474.26	25.53	-20.47	46	30.51	23.61	3.8	32.39	-	-	P	V
		653.71	28.3	-17.7	46	30.11	26.22	4.45	32.48	-	-	P	V
		952.47	34.24	-11.76	46	29.4	30.62	5.4	31.18	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.												

Note symbol

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

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.
				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)
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)

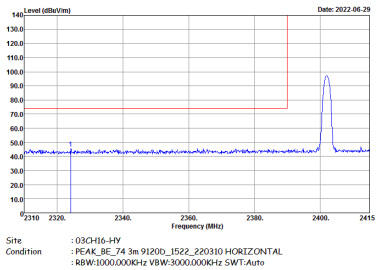
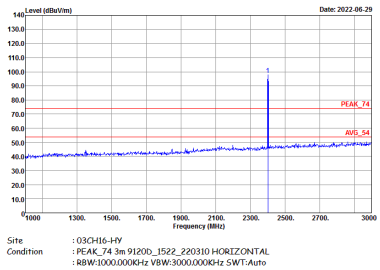
Peak measured complies with the limit line, so test result is “PASS”.

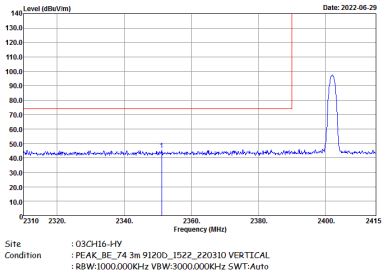
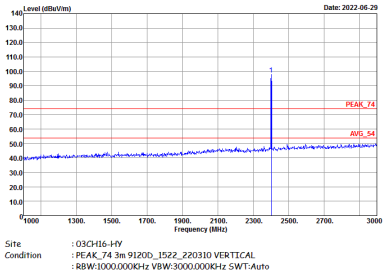
Appendix C. Radiated Spurious Emission Plots

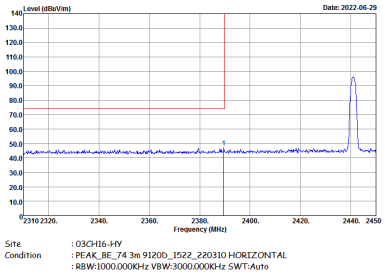
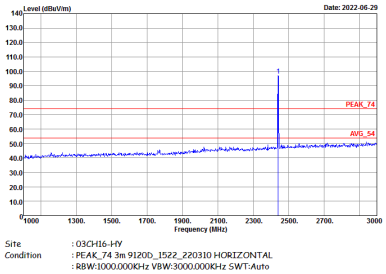
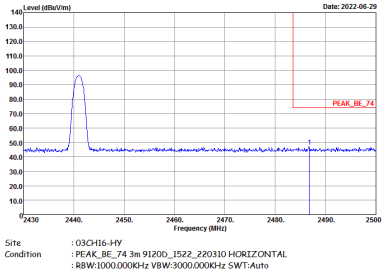
Test Engineer :	Andy Yang , Karl Hou and Steven Wu	Temperature :	20~25°C
		Relative Humidity :	50~60%

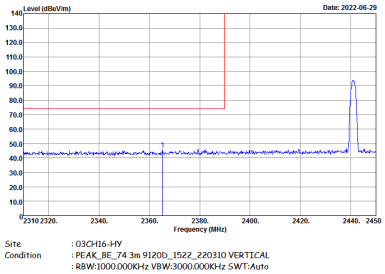
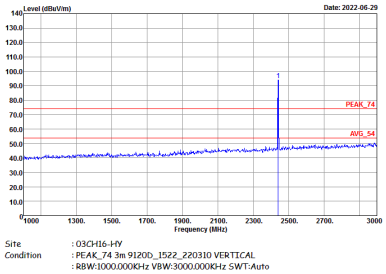
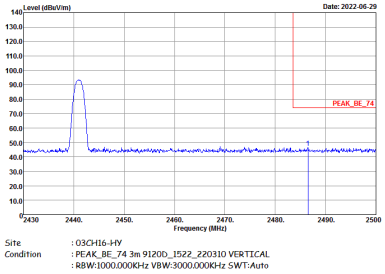
2.4GHz 2400~2483.5MHz

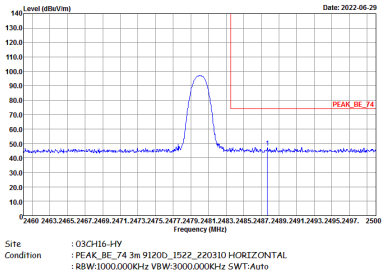
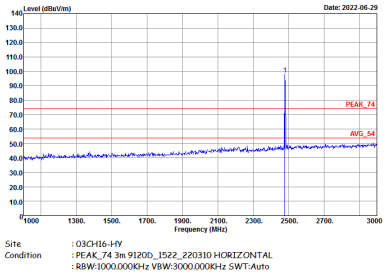
BT (Band Edge @ 3m)

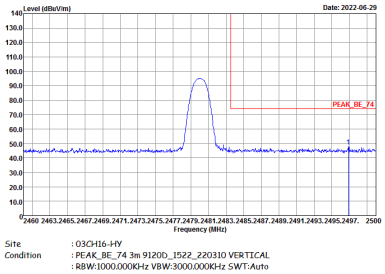
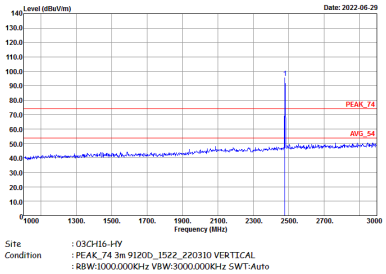
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Horizontal	Fundamental
Peak		

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH00 2402MHz	
	Vertical	Fundamental
Peak		

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Horizontal	Fundamental
Peak		
Peak		Left blank

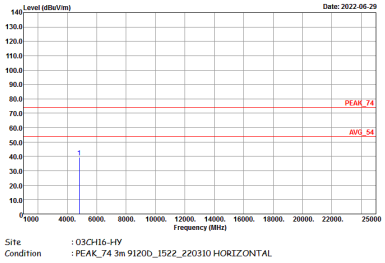
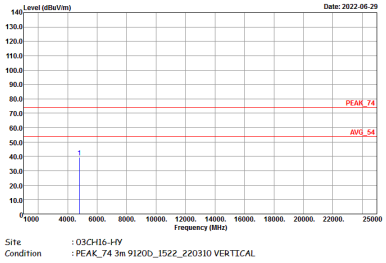
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH39 2441MHz	
	Vertical	Fundamental
Peak		
Peak		Left blank

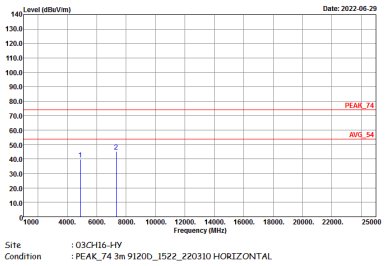
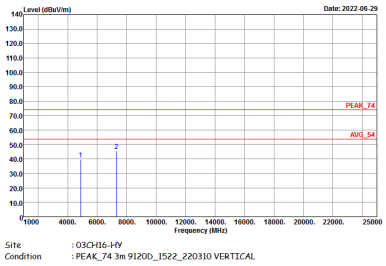
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Horizontal	Fundamental
Peak		

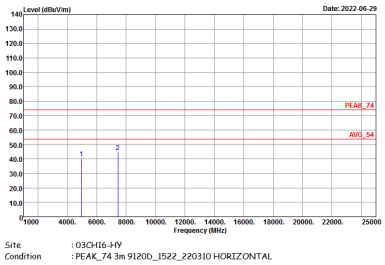
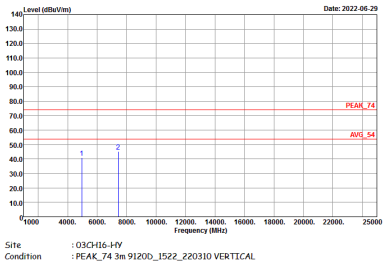
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BT CH78 2480MHz	
	Vertical	Fundamental
Peak		

2.4GHz 2400~2483.5MHz

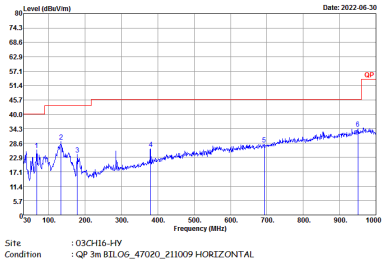
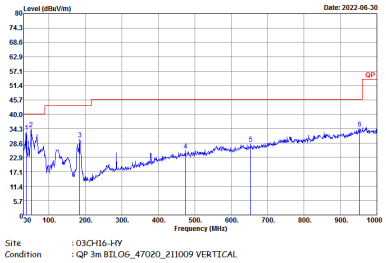
BT (Harmonic @ 3m)

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

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH39 2441MHz	
	Horizontal	Vertical
Peak Avg.		

BT	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BT CH78 2480MHz	
	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

2.4GHz BT (LF)

BT	2.4GHz 2400~2483.5MHz	
	BT LF	
	Horizontal	Vertical
QP / Peak