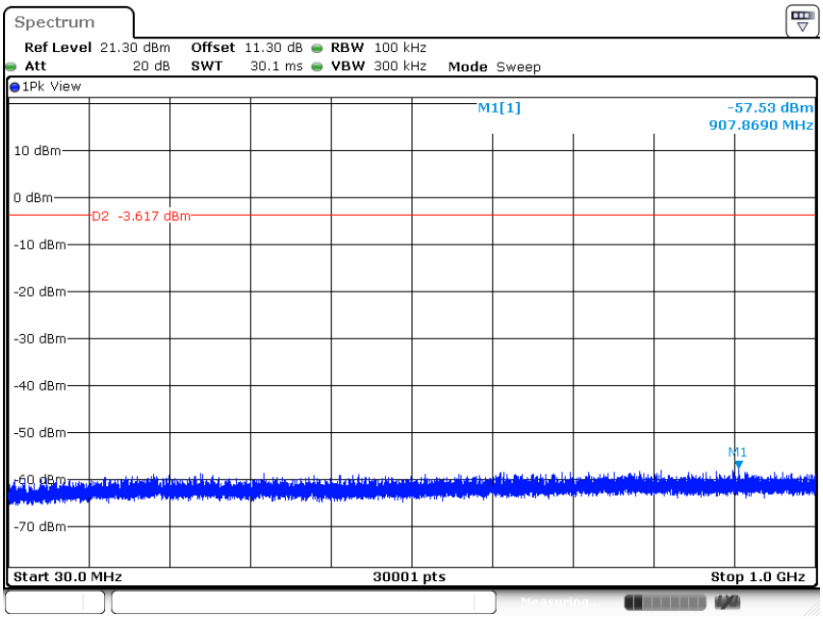
CSE Plot on Ch 78 between 30MHz ~ 3 GHz



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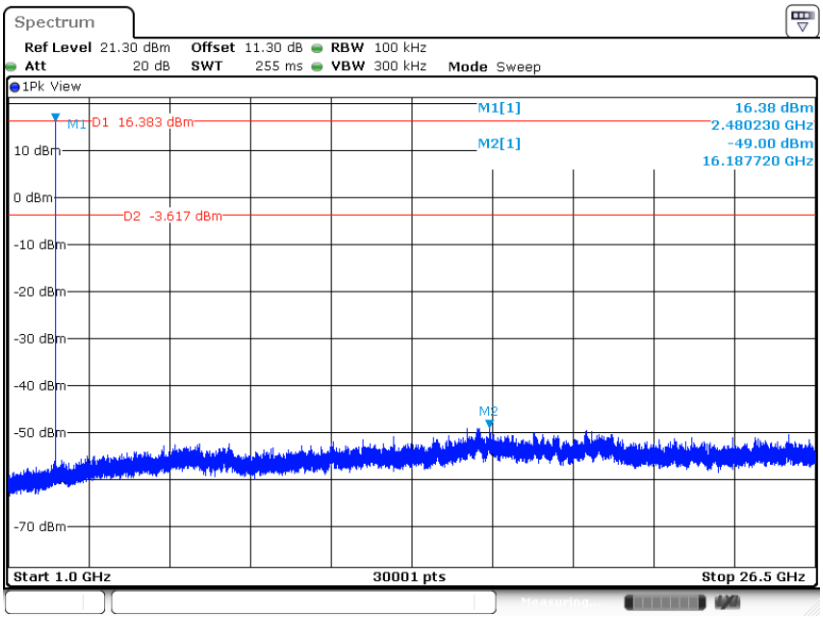
CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



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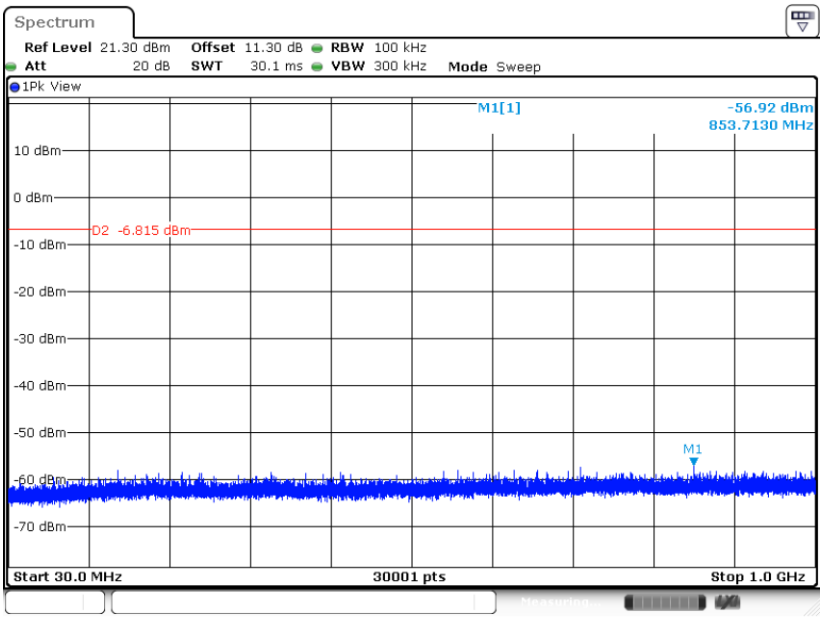

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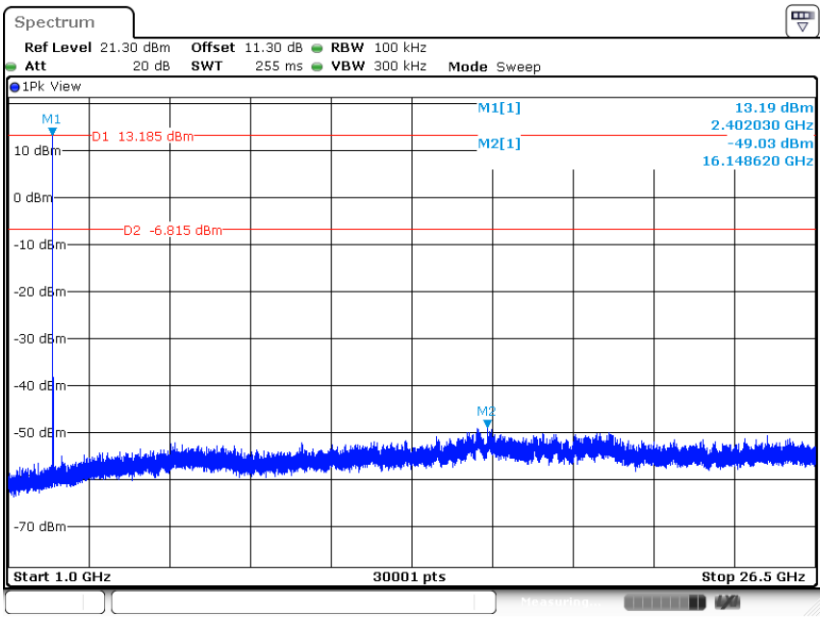
CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



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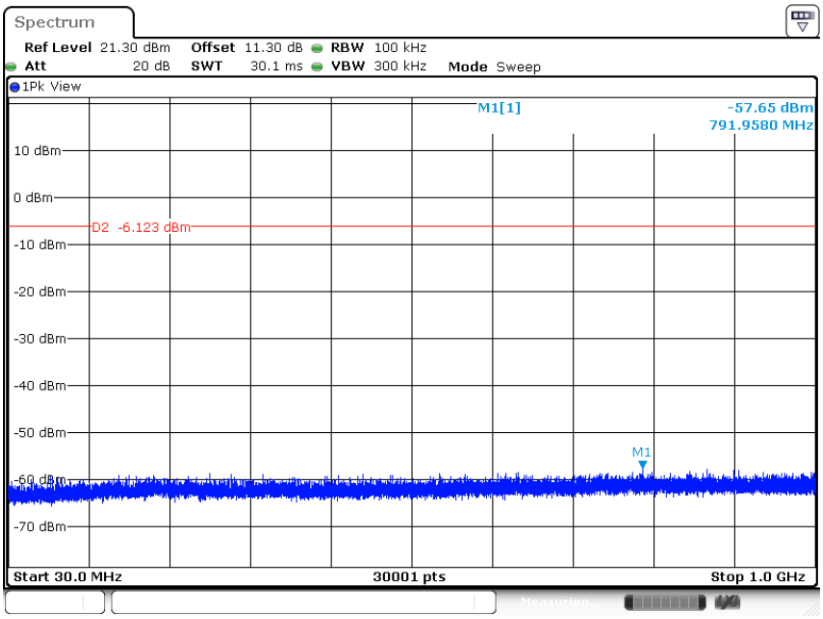

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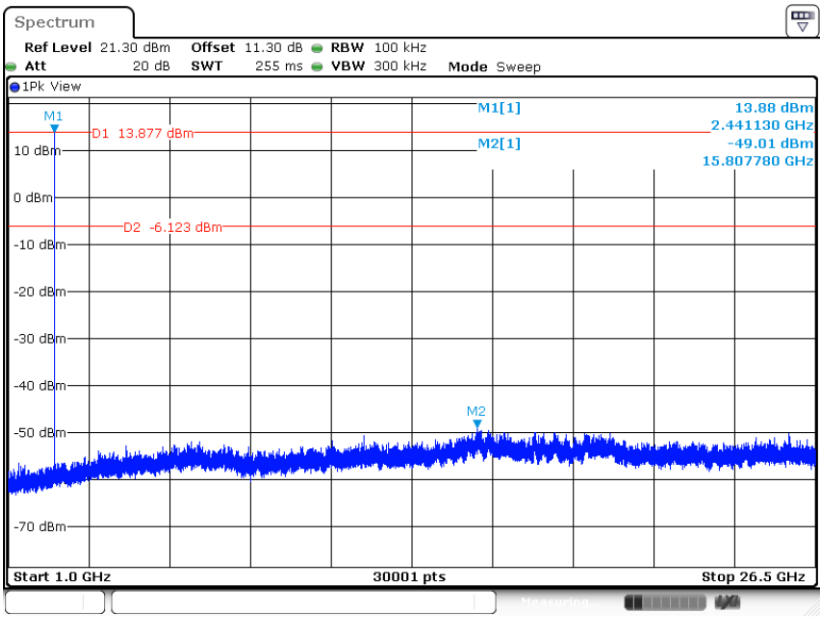

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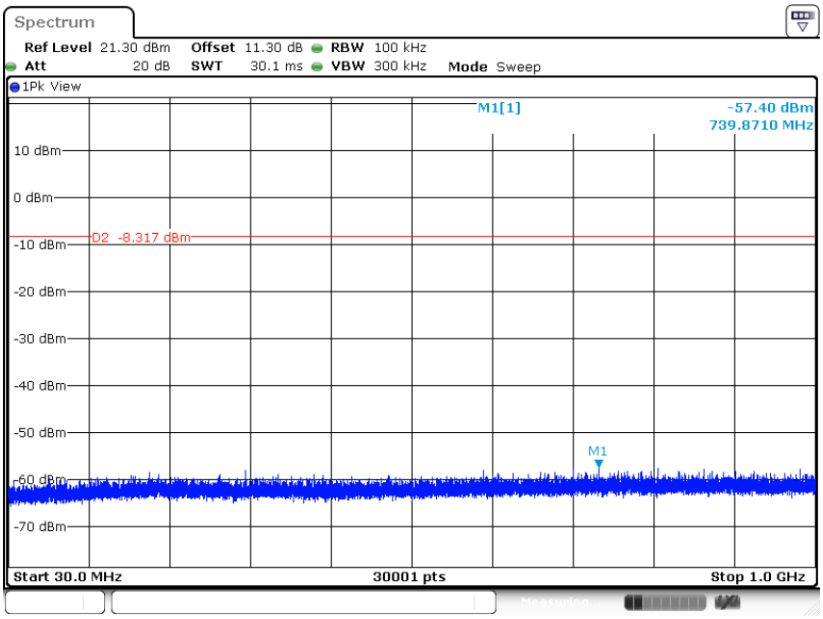
CSE Plot on Ch 78 between 30MHz ~ 3 GHz



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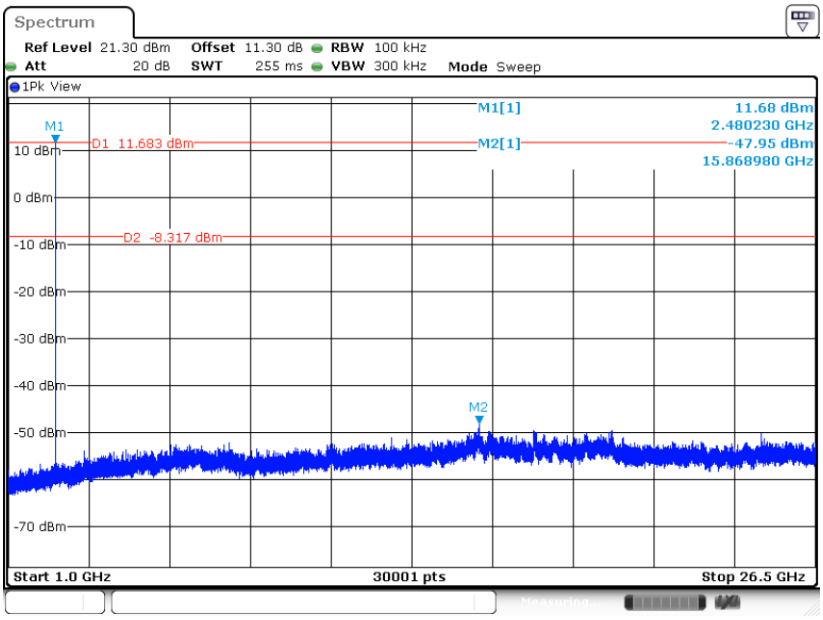
CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



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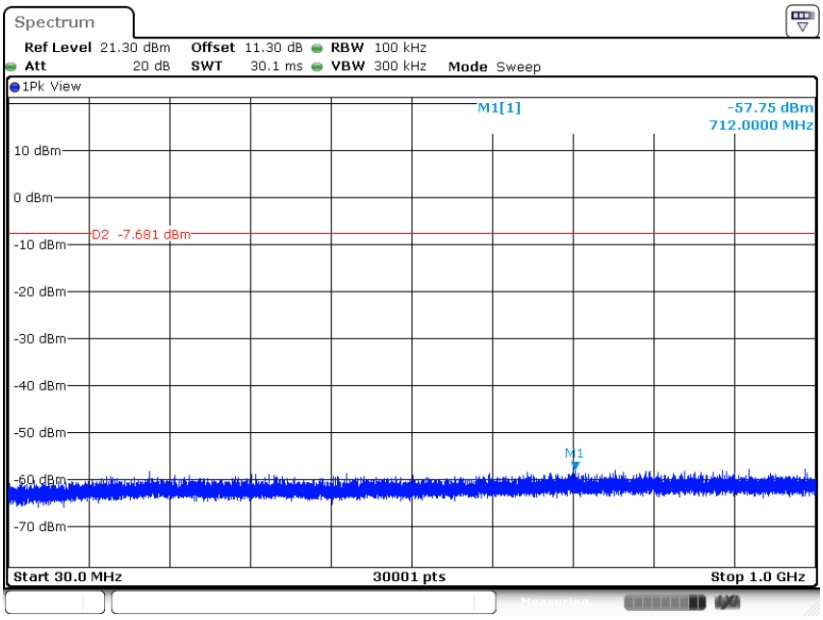

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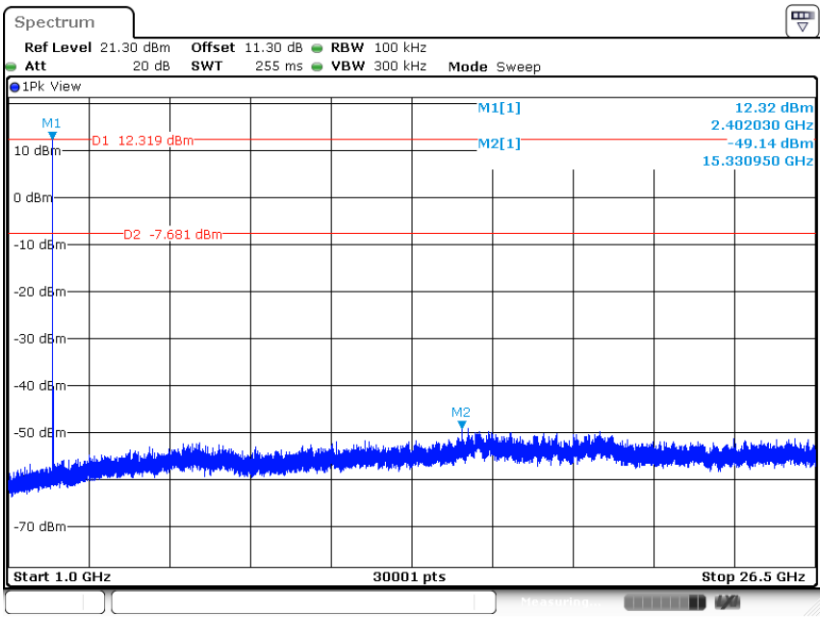
CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



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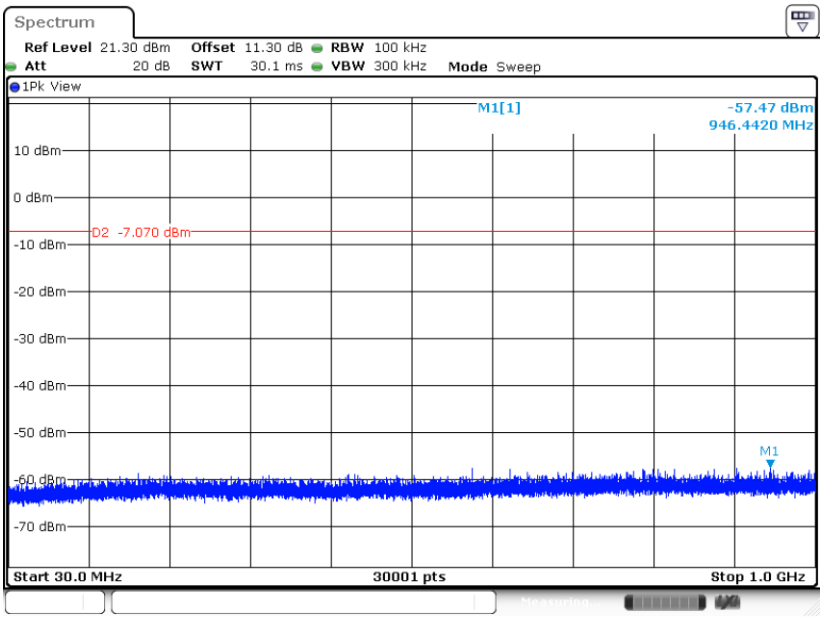

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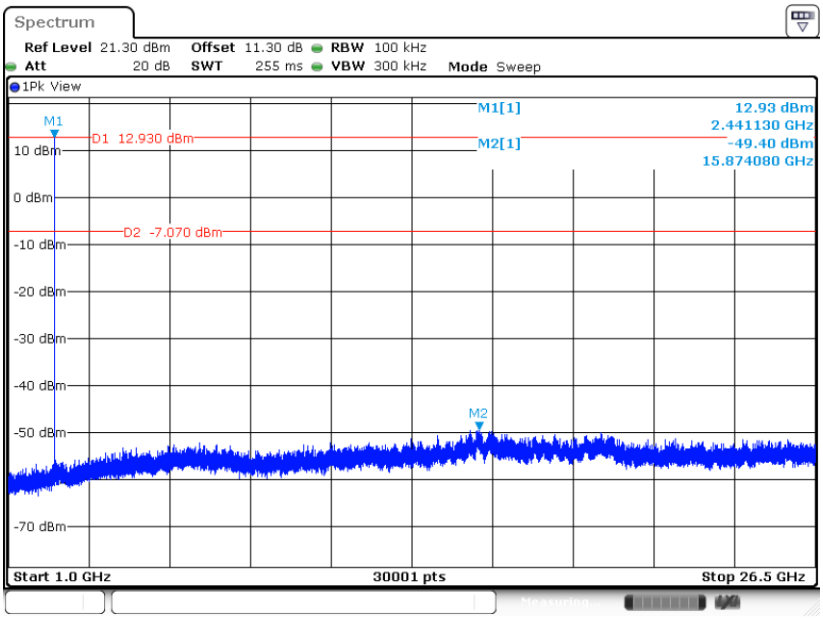
CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



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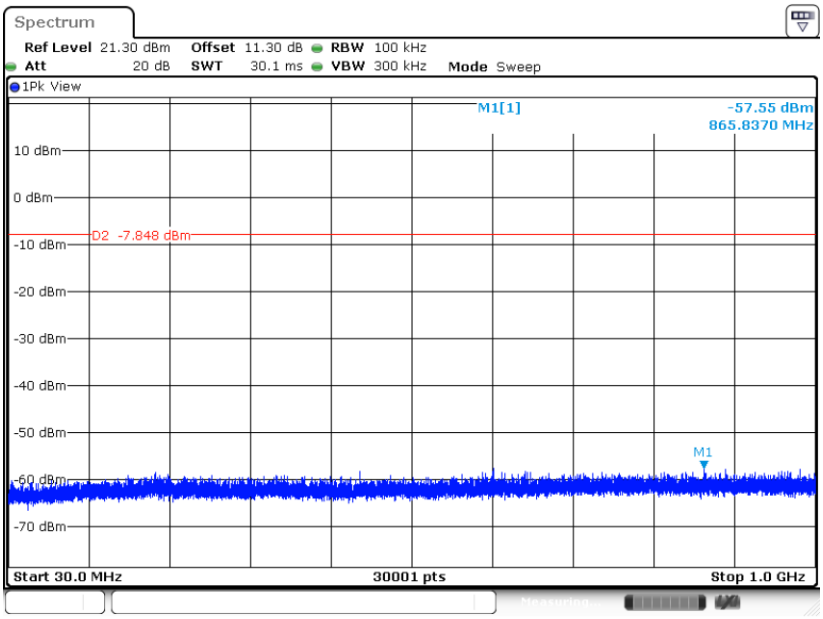
CSE Plot on Ch 78 between 30MHz ~ 3 GHz



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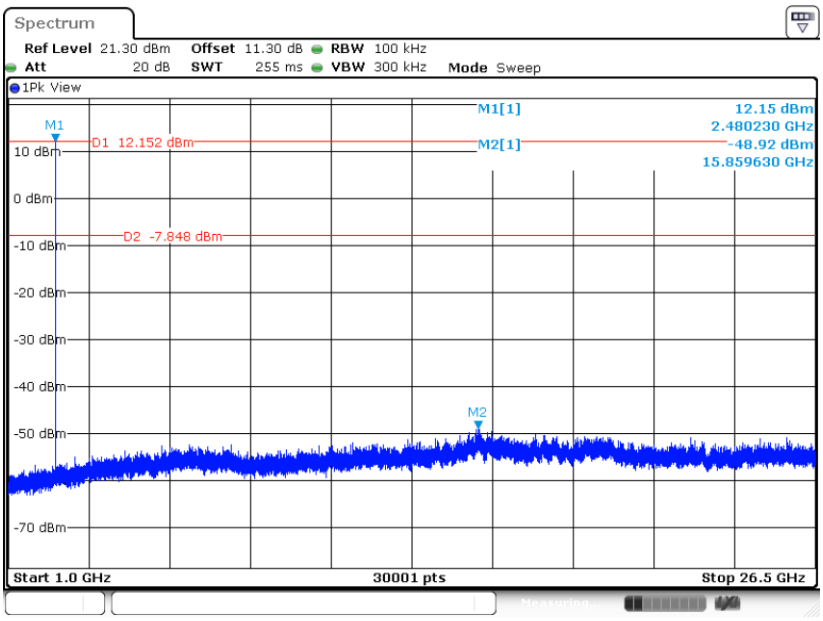
CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



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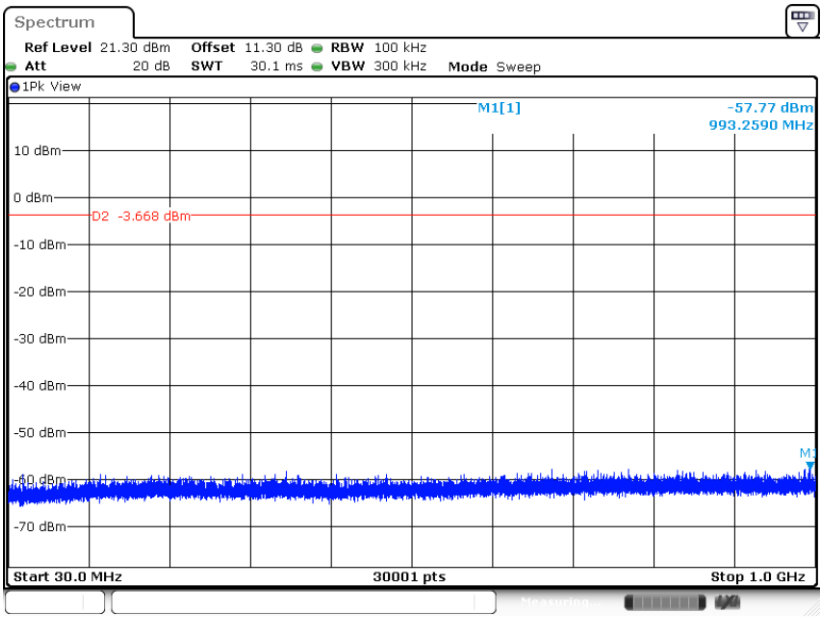

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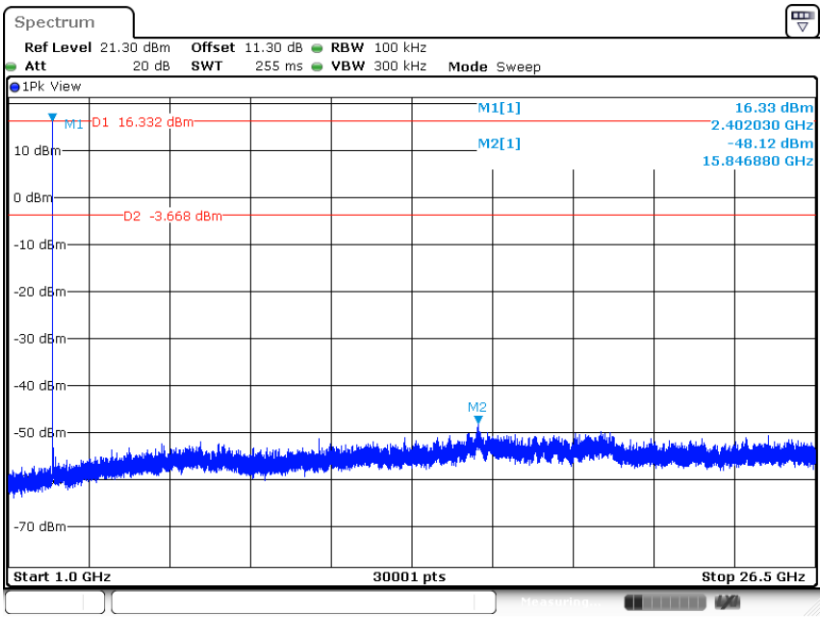

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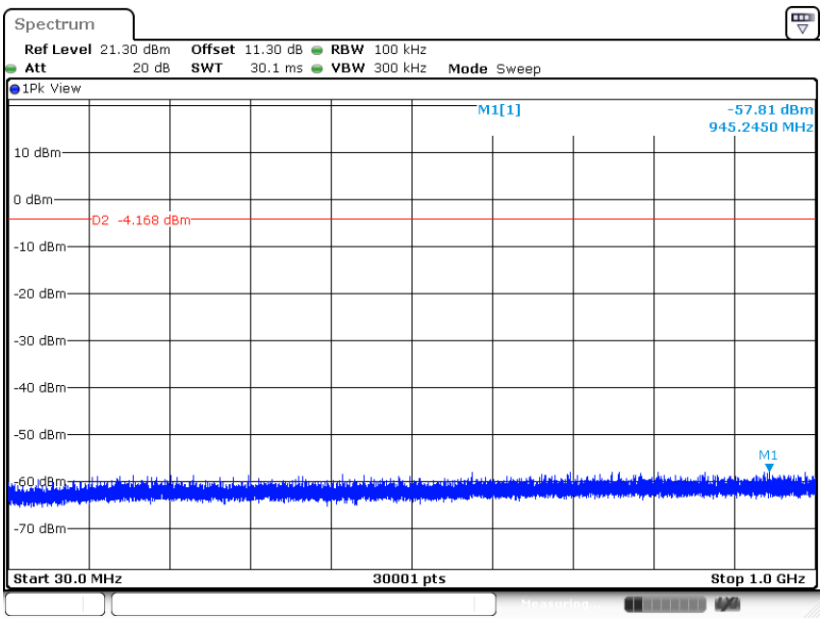
CSE Plot on Ch 39 between 30MHz ~ 3 GHz



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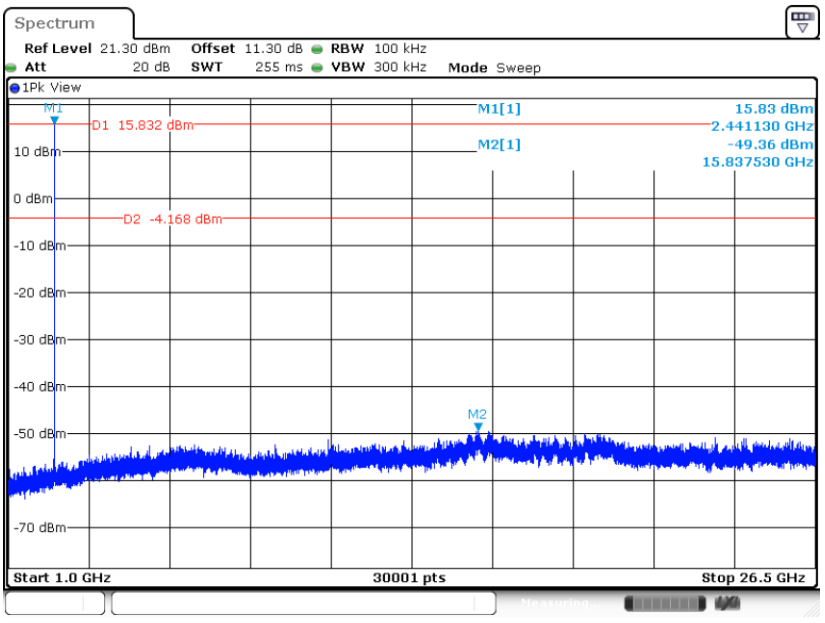
CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



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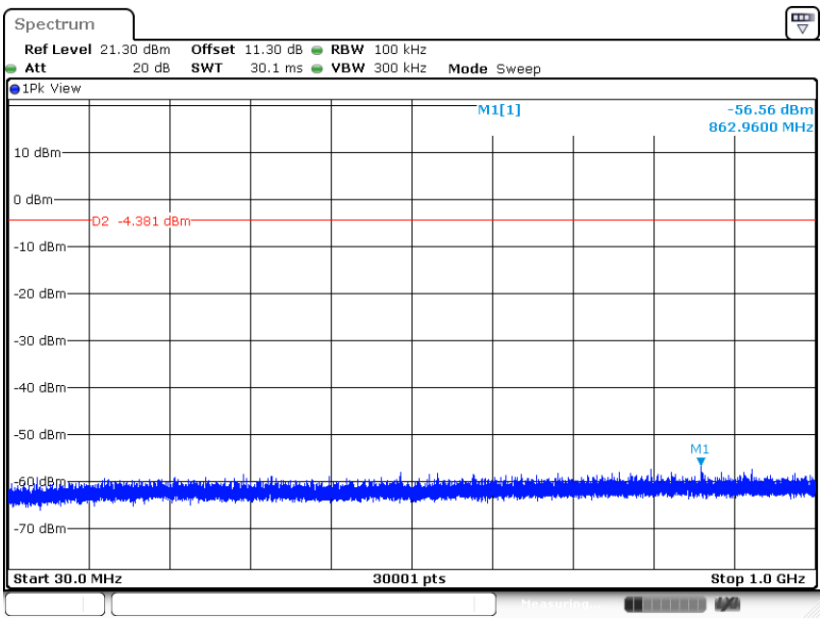

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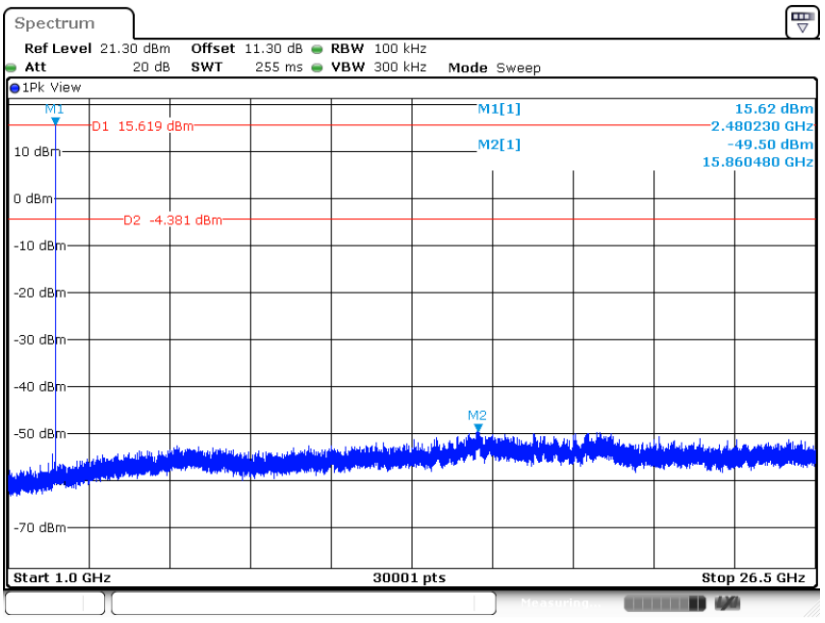

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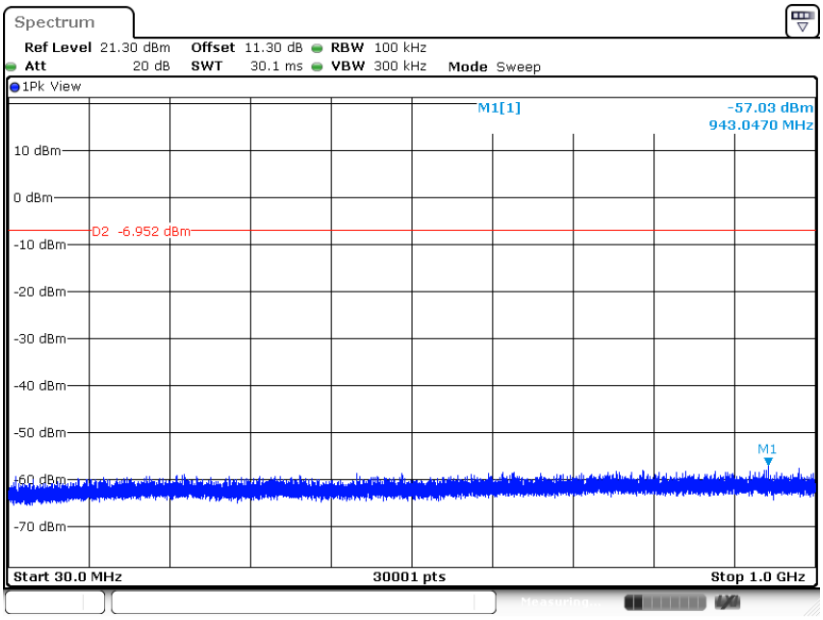

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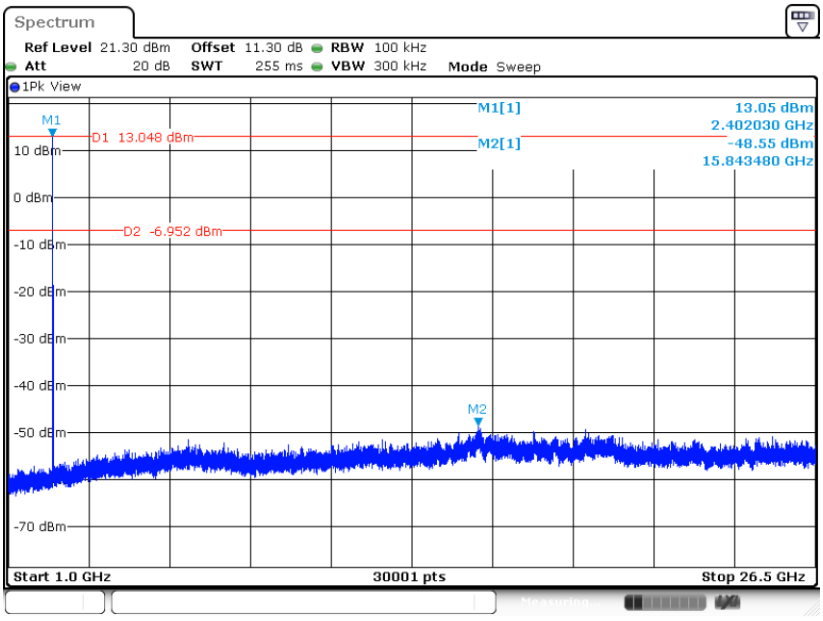

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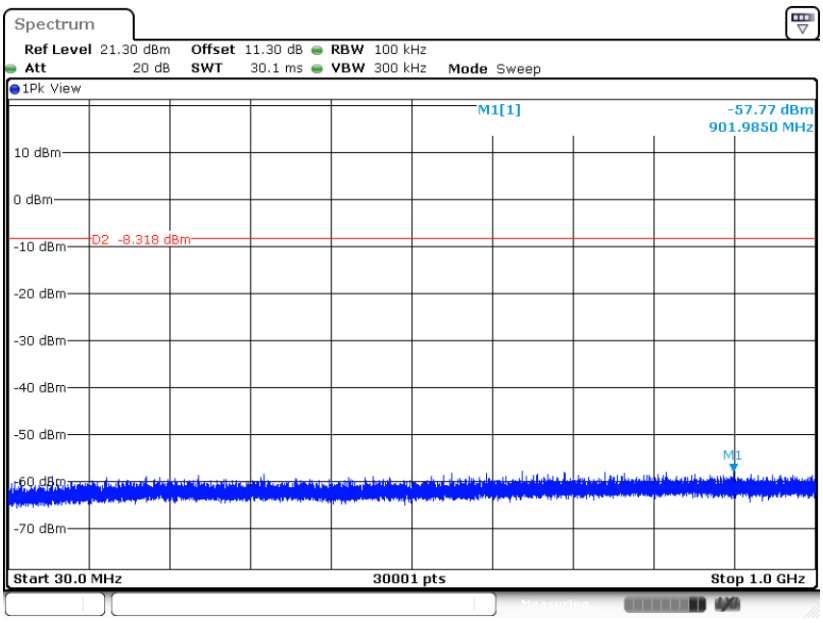

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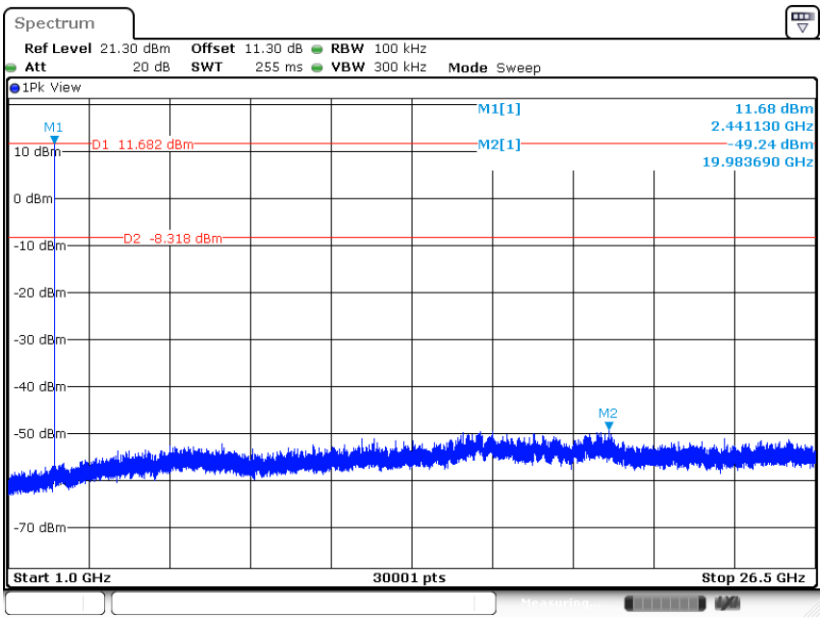
CSE Plot on Ch 39 between 2 GHz ~ 25 GHz



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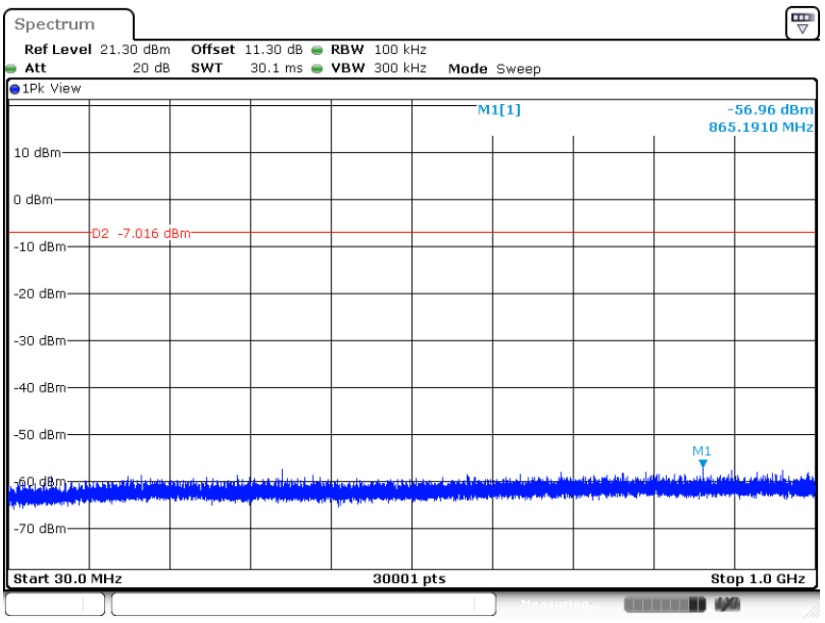
CSE Plot on Ch 78 between 30MHz ~ 3 GHz



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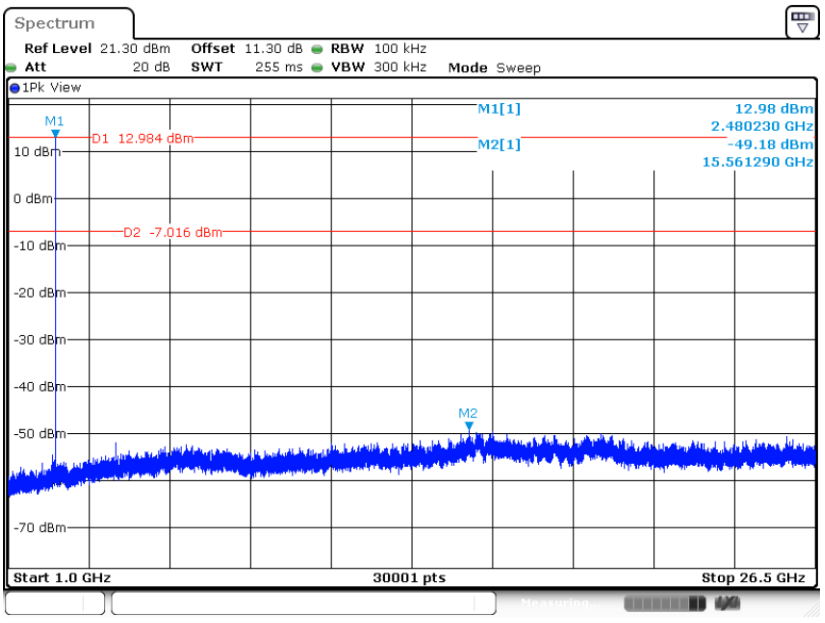
CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



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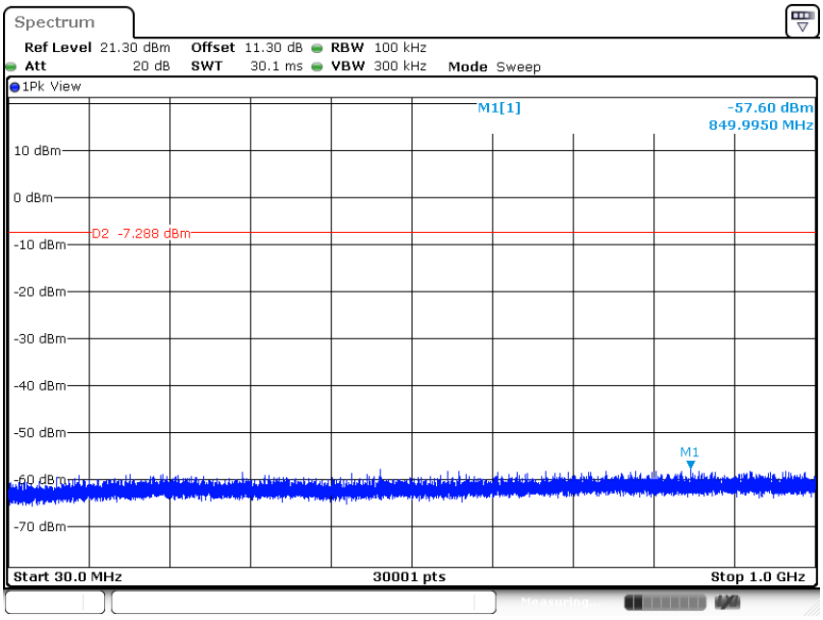

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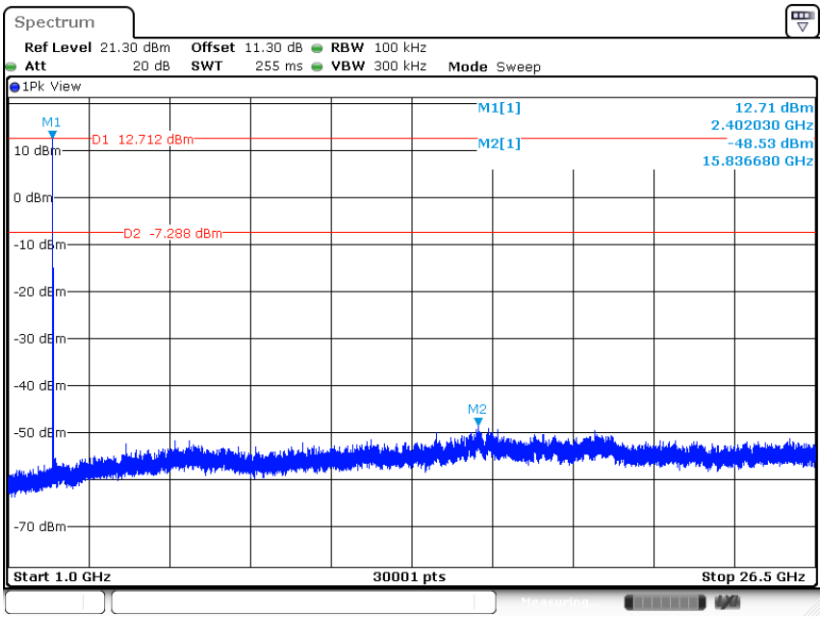
CSE Plot on Ch 00 between 2 GHz ~ 25 GHz



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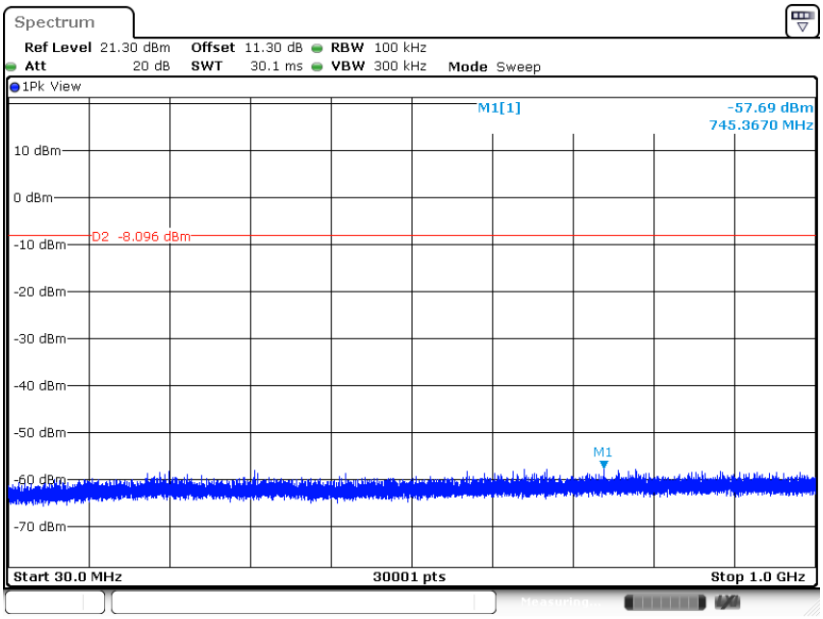
CSE Plot on Ch 39 between 30MHz ~ 3 GHz



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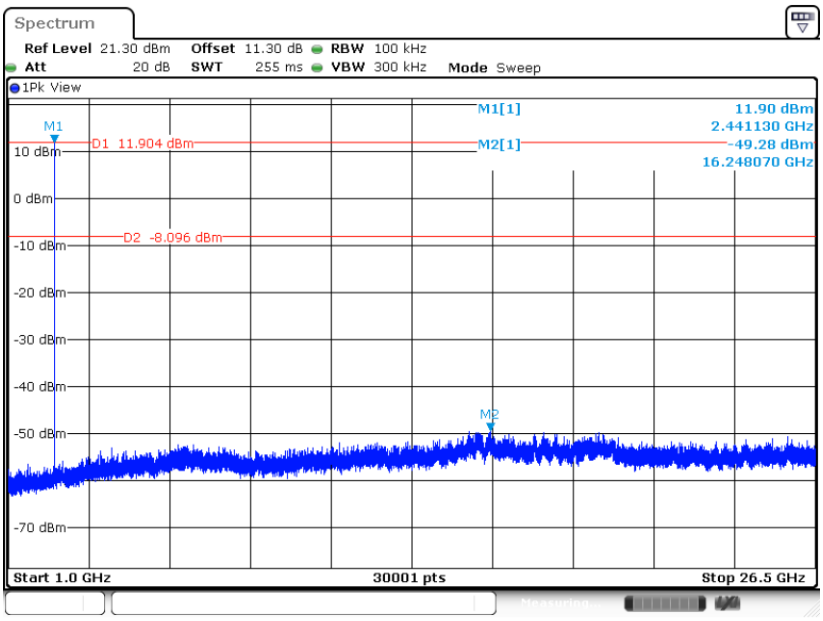

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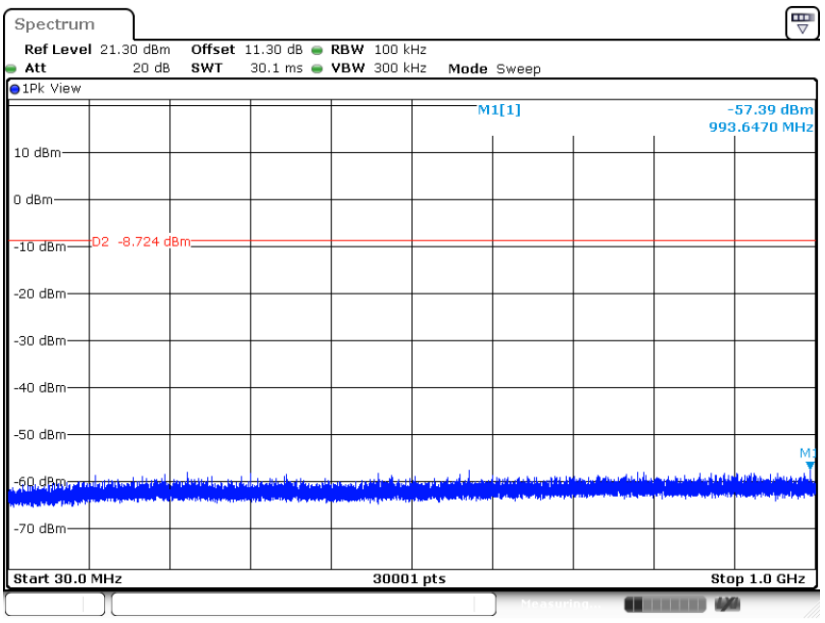

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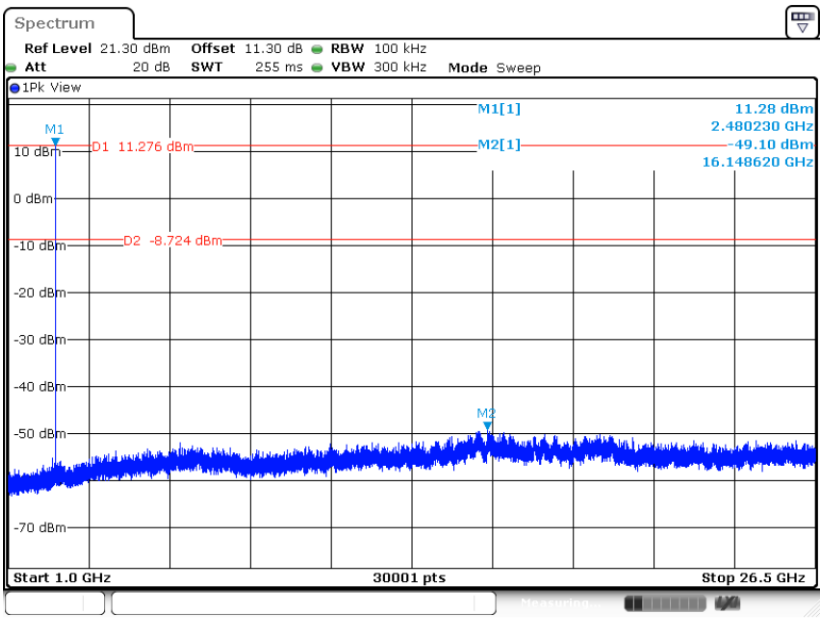
CSE Plot on Ch 78 between 2 GHz ~ 25 GHz



Date: 16.SEP.2023 10:42:18

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.

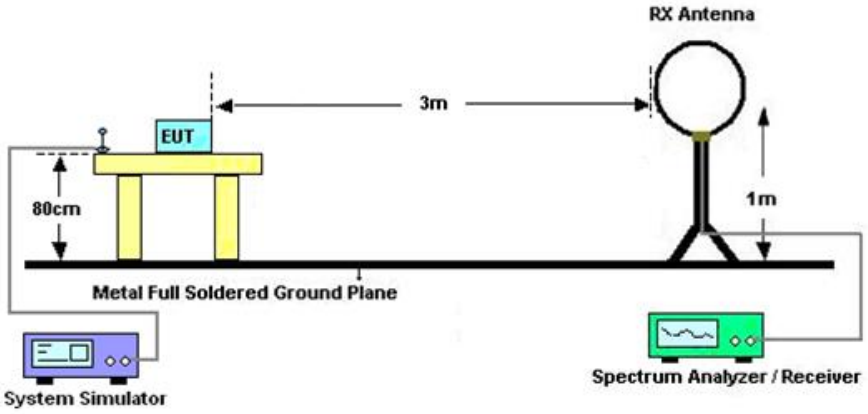
3.8.3 Test Procedures

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.

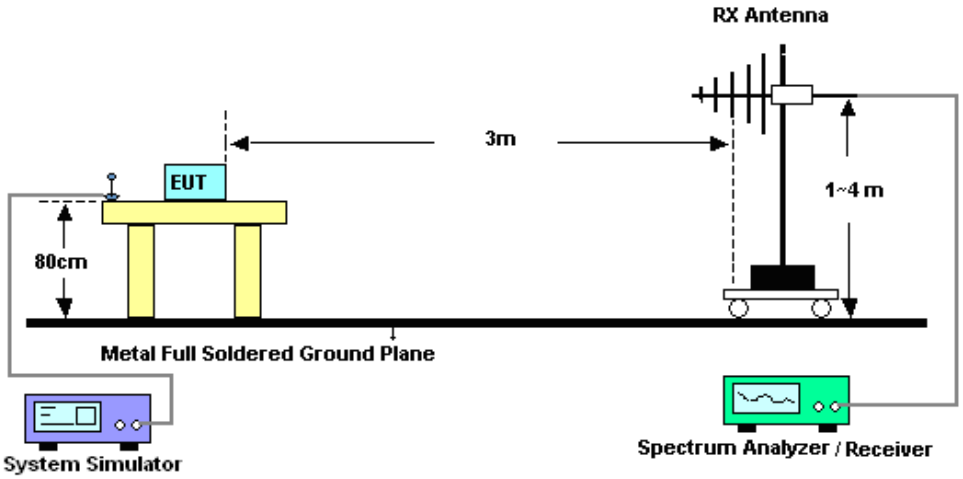
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent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

3.8.4 Test Setup

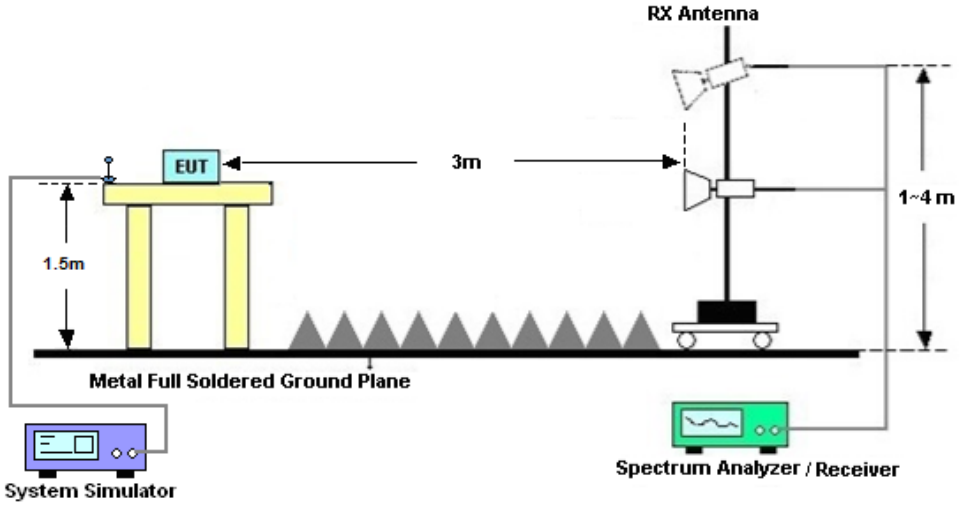
For radiated emissions below 30MHz



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.

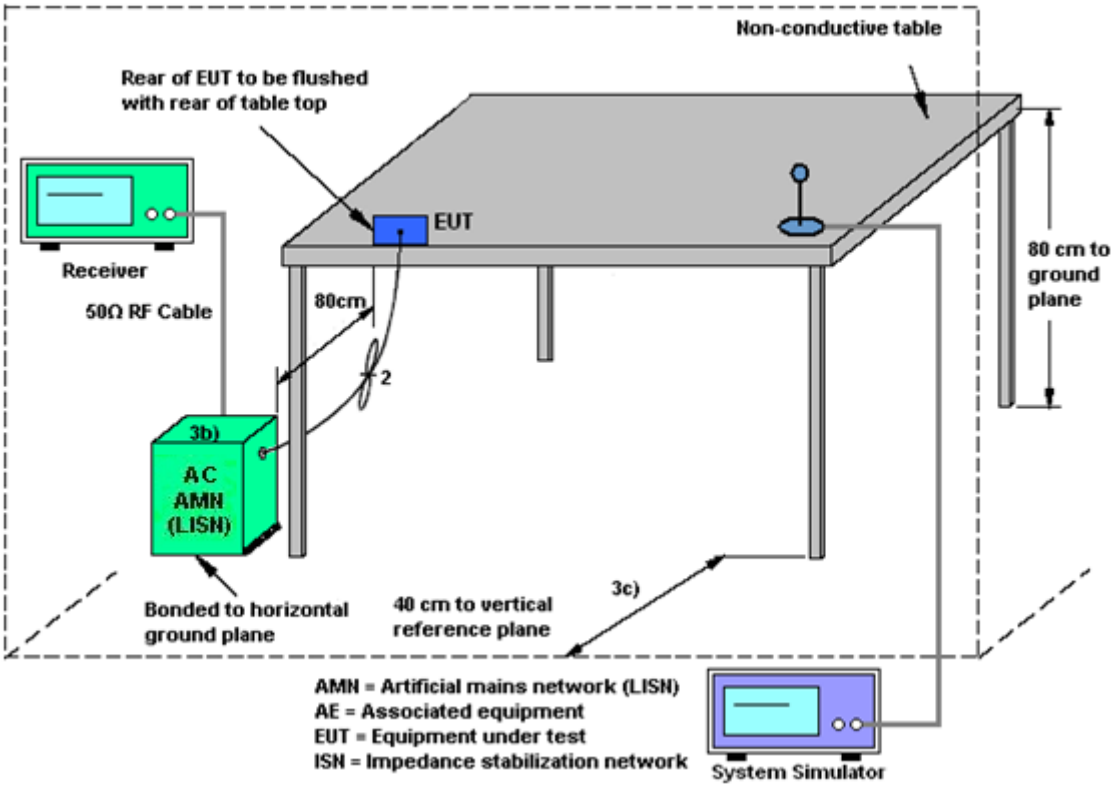
3.9.2 Measuring Instruments

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
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 04, 2023	Sep. 11, 2023~ Sep. 13, 2023	Apr. 03, 2024	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 04, 2023	Sep. 11, 2023~ Sep. 13, 2023	Apr. 03, 2024	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jul. 28, 2022	Sep. 11, 2023~ Sep. 13, 2023	Jul. 27, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Aug. 20, 2023	Sep. 11, 2023~ Sep. 13, 2023	Aug. 19, 2025	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 08, 2023	Sep. 11, 2023~ Sep. 13, 2023	Apr. 07, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 07, 2023	Sep. 11, 2023~ Sep. 13, 2023	Jul.06, 2024	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 08, 2023	Sep. 11, 2023~ Sep. 13, 2023	Apr. 07, 2024	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 19, 2022	Sep. 11, 2023~ Sep. 13, 2023	Oct. 18, 2023	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 19, 2022	Sep. 11, 2023~ Sep. 13, 2023	Oct. 18, 2023	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Dec. 26, 2022	Sep. 11, 2023~ Sep. 13, 2023	Dec. 25, 2023	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002729	1 N/A	Nov. 10, 2022	Sep. 11, 2023~ Sep. 13, 2023	Nov. 09, 2023	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 11, 2023~ Sep. 13, 2023	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 11, 2023~ Sep. 13, 2023	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 06, 2023	Sep. 15, 2023~ Sep. 26, 2023	Jul. 05, 2024	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Aug. 21, 2023	Sep. 15, 2023~ Sep. 26, 2023	Aug. 20, 2024	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2022	Sep. 15, 2023~ Sep. 26, 2023	Oct. 16, 2023	Conduction (CO01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 06, 2023	Sep. 05, 2023~ Sep. 18, 2023	Apr. 05, 2024	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 27, 2022	Sep. 05, 2023~ Sep. 18, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1542004	50MHz Bandwidth	Dec. 27, 2022	Sep. 05, 2023~ Sep. 18, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
Thermo meter	Anymetre	JR593	#7	- 10℃ ~ 50℃ 10%RH~99%RH	Apr. 08, 2023	Sep. 05, 2023~ Sep. 18, 2023	Apr. 07, 2024	Conducted (TH01-SZ)

NCR: No Calibration Required

5 Measurement Uncertainty

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	±1.34 dB
Conducted Emissions	±1.34 dB
Occupied Channel Bandwidth	±0.012 %

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.7 dB

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.9 dB

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

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

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

Appendix A. Conducted Test Results

Report Number : FR382311A

Bluetooth ANT 7

Test Engineer:	Ma Jie	Temperature:	21~25	°C
Test Date:	2023/9/5~2023/9/18	Relative Humidity:	51~54	%

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

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	20db BW (MHz)	99% Bandwidth (MHz)	Hopping Channel Separation Measurement (MHz)	Hopping Channel Separation Measurement Limit (MHz)	Pass/Fail
DH	1Mbps	1	0	2402	0.957	0.855	0.999	0.6377	Pass
DH	1Mbps	1	39	2441	0.961	0.851	0.999	0.6406	Pass
DH	1Mbps	1	78	2480	0.961	0.855	0.990	0.6406	Pass
2DH	2Mbps	1	0	2402	1.330	1.181	0.999	0.8869	Pass
2DH	2Mbps	1	39	2441	1.330	1.179	0.999	0.8869	Pass
2DH	2Mbps	1	78	2480	1.335	1.179	1.003	0.8899	Pass
3DH	3Mbps	1	0	2402	1.317	1.179	1.003	0.8783	Pass
3DH	3Mbps	1	39	2441	1.313	1.179	1.003	0.8753	Pass
3DH	3Mbps	1	78	2480	1.335	1.185	1.003	0.8899	Pass

TEST RESULTS DATA
Dwell Time

Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time(hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Nomal	79	106.67	2.89	0.31	0.4	Pass
AFH	20	53.33	2.89	0.15	0.4	Pass

TEST RESULTS DATA
Peak Power Table

DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH5	0	1	17.48	20.97	Pass
	39	1	**17.72**	20.97	Pass
	78	1	16.68	20.97	Pass

2DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
2DH5	0	1	17.63	20.97	Pass
	39	1	**17.74**	20.97	Pass
	78	1	17.13	20.97	Pass

3DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
3DH5	0	1	17.83	20.97	Pass
	39	1	**17.88**	20.97	Pass
	78	1	17.34	20.97	Pass

TEST RESULTS DATA
Number of Hopping Frequency

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

Report Number : FR382311A

Bluetooth ANT 12

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

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	20db BW (MHz)	99% Bandwidth (MHz)	Hopping Channel Separation Measurement (MHz)	Hopping Channel Separation Measurement Limit (MHz)	Pass/Fail
DH	1Mbps	1	0	2402	0.957	0.851	0.994	0.6377	Pass
DH	1Mbps	1	39	2441	0.957	0.849	0.973	0.6377	Pass
DH	1Mbps	1	78	2480	0.957	0.847	0.999	0.6377	Pass
2DH	2Mbps	1	0	2402	1.304	1.195	1.003	0.8696	Pass
2DH	2Mbps	1	39	2441	1.326	1.181	1.003	0.8841	Pass
2DH	2Mbps	1	78	2480	1.348	1.181	1.003	0.8986	Pass
3DH	3Mbps	1	0	2402	1.300	1.183	1.003	0.8667	Pass
3DH	3Mbps	1	39	2441	1.322	1.179	1.003	0.8812	Pass
3DH	3Mbps	1	78	2480	1.309	1.181	1.003	0.8725	Pass

TEST RESULTS DATA
Dwell Time

Mod.	Hopping Channel Number Rate	Hops Over Occupancy Time(hops)	Package Transfer Time (msec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
Nomal	79	106.67	2.88	0.31	0.4	Pass
AFH	20	53.33	2.88	0.15	0.4	Pass

TEST RESULTS DATA
Peak Power Table

DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
DH5	0	1	**17.47**	20.97	Pass
	39	1	17.25	20.97	Pass
	78	1	16.65	20.97	Pass

2DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
2DH5	0	1	**17.34**	20.97	Pass
	39	1	17.32	20.97	Pass
	78	1	16.84	20.97	Pass

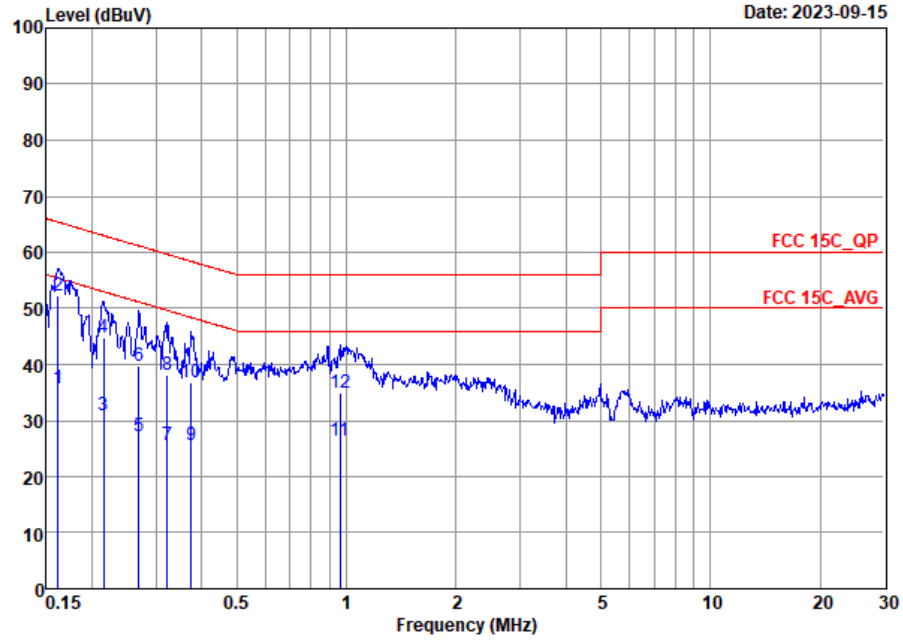
3DH	CH.	NTX	Peak Power (dBm)	Power Limit (dBm)	Test Result
3DH5	0	1	**17.71**	20.97	Pass
	39	1	17.62	20.97	Pass
	78	1	17.31	20.97	Pass

TEST RESULTS DATA
Number of Hopping Frequency

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

Appendix B. AC Conducted Emission Test Results

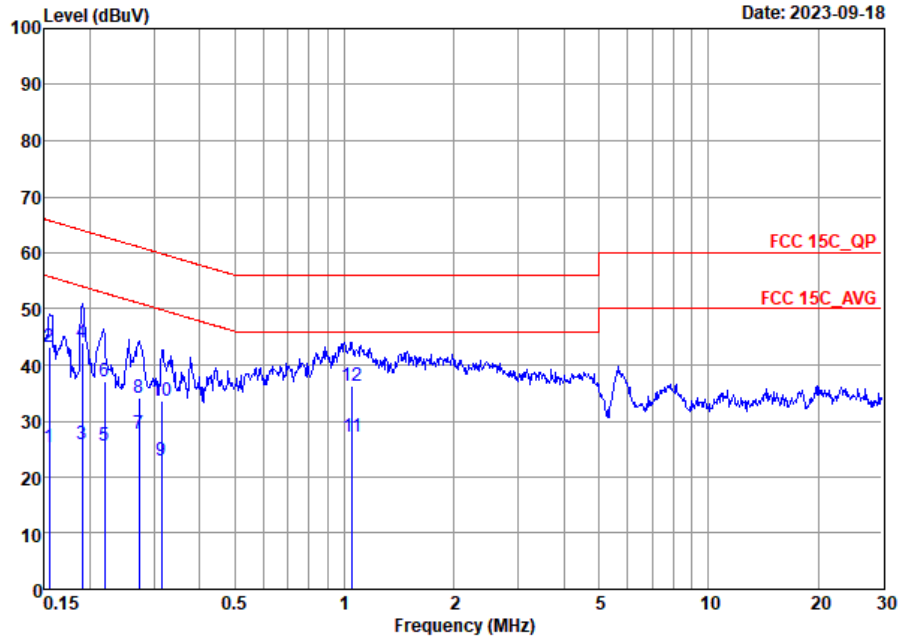
Test Engineer :	Lily Qiu	**Temperature :**	22~24℃
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_20230420_L LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.16	35.81	-19.57	55.38	15.19	10.48	10.14	Average
2	*	0.16	52.21	-13.17	65.38	31.59	10.48	10.14	QP
3		0.22	30.95	-22.06	53.01	10.40	10.40	10.15	Average
4		0.22	44.75	-18.26	63.01	24.20	10.40	10.15	QP
5		0.27	27.13	-24.03	51.16	6.60	10.38	10.15	Average
6		0.27	39.83	-21.33	61.16	19.30	10.38	10.15	QP
7		0.32	25.70	-23.96	49.66	5.20	10.34	10.16	Average
8		0.32	38.10	-21.56	59.66	17.60	10.34	10.16	QP
9		0.38	25.65	-22.74	48.39	5.20	10.29	10.16	Average
10		0.38	36.75	-21.64	58.39	16.30	10.29	10.16	QP
11		0.96	26.30	-19.70	46.00	5.90	10.24	10.16	Average
12		0.96	35.00	-21.00	56.00	14.60	10.24	10.16	QP

Test Engineer :	Lily Qiu	Temperature :	22~24℃
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15C QP LISN 20230420 N NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.15	25.29	-30.45	55.74	4.70	10.45	10.14	Average
2		0.15	43.09	-22.65	65.74	22.50	10.45	10.14	QP
3		0.19	25.82	-28.20	54.02	5.30	10.37	10.15	Average
4		0.19	43.92	-20.10	64.02	23.40	10.37	10.15	QP
5		0.22	25.59	-27.24	52.83	5.10	10.34	10.15	Average
6		0.22	36.99	-25.84	62.83	16.50	10.34	10.15	QP
7		0.27	27.77	-23.26	51.03	7.30	10.32	10.15	Average
8		0.27	34.07	-26.96	61.03	13.60	10.32	10.15	QP
9		0.31	22.95	-26.89	49.84	2.51	10.29	10.15	Average
10		0.31	33.65	-26.19	59.84	13.21	10.29	10.15	QP
11	*	1.05	27.22	-18.78	46.00	6.81	10.25	10.16	Average
12		1.05	36.22	-19.78	56.00	15.81	10.25	10.16	QP

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 Data

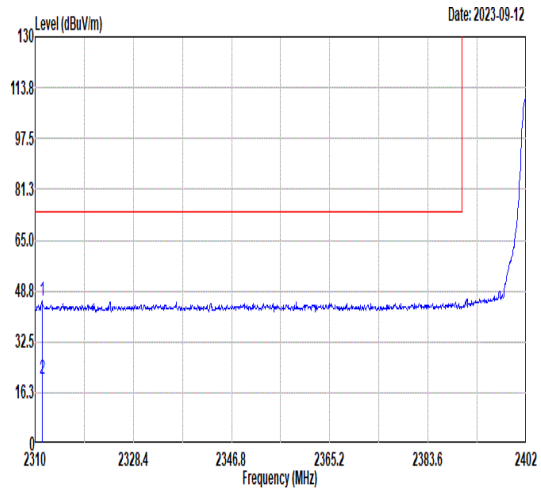
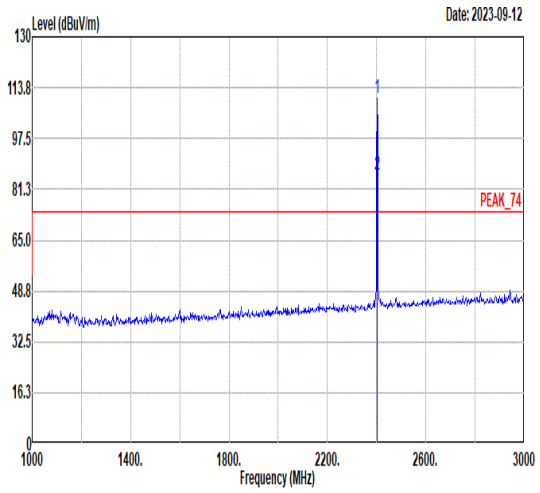
Test Engineer :	Eason Wu	Relative Humidity :	41 ~ 42%
		Temperature :	22 ~ 23℃

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	7	Bluetooth BR_GFSK	00	2402	3DH5	-	-
Mode 2	2400-2483.5	7	Bluetooth BR_GFSK	39	2441	3DH5	-	-
Mode 3	2400-2483.5	7	Bluetooth BR_GFSK	78	2480	3DH5	-	-
Mode 4	2400-2483.5	7	Bluetooth BR_GFSK	78	2480	3DH5	-	LF
Mode 5	2400-2483.5	12	Bluetooth BR_GFSK	00	2402	3DH5	-	-
Mode 6	2400-2483.5	12	Bluetooth BR_GFSK	39	2441	3DH5	-	-
Mode 7	2400-2483.5	12	Bluetooth BR_GFSK	78	2480	3DH5	-	-
Mode 8	2400-2483.5	12	Bluetooth BR_GFSK	39	2441	3DH5	-	LF

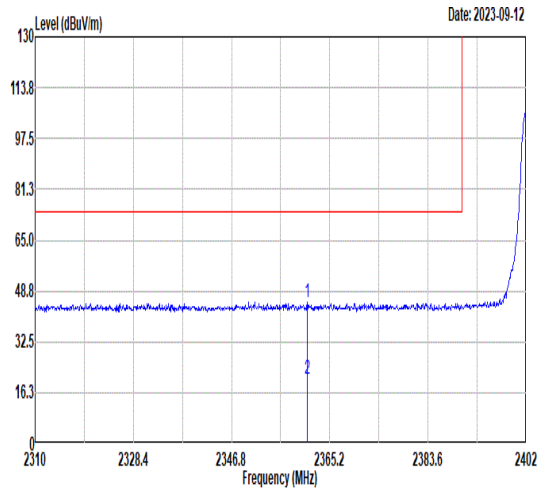
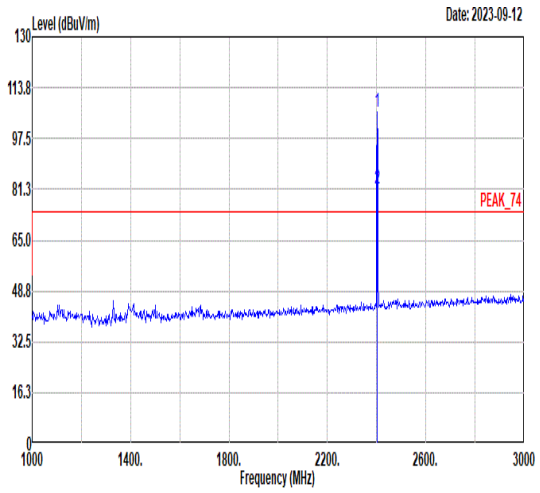
Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Bluetooth BR_GFSK	00	2311.29	45.44	74.00	-28.56	H	PEAK	Pass	Band Edge
1	Bluetooth BR_GFSK	00	4804.00	43.21	74.00	-30.79	H	Peak	Pass	Harmonic
2	Bluetooth BR_GFSK	39	-	-	-	-	-	-	-	Band Edge
2	Bluetooth BR_GFSK	39	7323.00	44.06	74.00	-29.94	V	Peak	Pass	Harmonic
3	Bluetooth BR_GFSK	78	2484.42	51.35	74.00	-22.65	H	PEAK	Pass	Band Edge
3	Bluetooth BR_GFSK	78	7440.00	44.82	74.00	-29.18	V	Peak	Pass	Harmonic
4	Bluetooth BR_GFSK	78	927.25-	32.28	46.00	-13.72	H	PEAK	Pass	LF
5	Bluetooth BR_GFSK	00	2332.26	45.73	74.00	-28.27	H	PEAK	Pass	Band Edge
	Bluetooth BR_GFSK	00	4804.00	43.34	74.00	-30.66	H	Peak	Pass	Harmonic
6	Bluetooth BR_GFSK	39	-	-	-	-	-	-	-	Band Edge
	Bluetooth BR_GFSK	39	7323.00	44.74	74.00	-29.26	H	Peak	Pass	Harmonic
7	Bluetooth BR_GFSK	78	2483.54	55.72	74.00	-18.28	V	PEAK	Pass	Band Edge
	Bluetooth BR_GFSK	78	7440.00	43.23	74.00	-30.77	V	Peak	Pass	Harmonic
8	Bluetooth BR_GFSK	78	950.53	32.11	46.00	-13.89	V	PEAK	Pass	LF

Mode	1	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Horizontal	Fundamental
Peak		

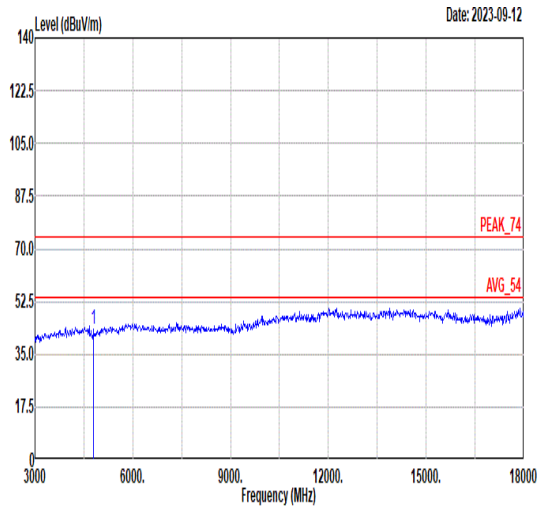
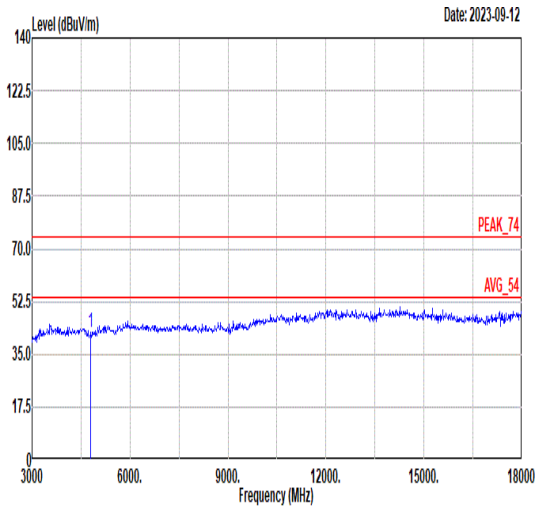
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2311.29	45.44	74.00	-28.56	42.44	32.01	4.71	33.72	171	159	PEAK
2	2311.29	20.65	54.00	-33.35	17.65	32.01	4.71	33.72	171	159	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2402.00	110.45	------	------	107.05	32.25	4.81	33.66	171	159	PEAK
2	2402.00	85.66	------	------	82.26	32.25	4.81	33.66	171	159	AVERAGE

Mode	1	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Vertical	Fundamental
Peak		

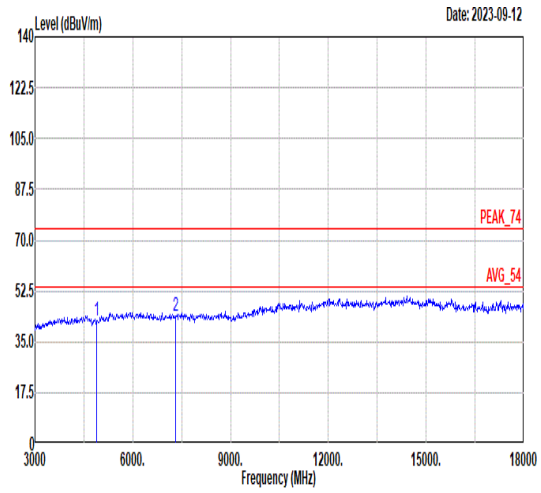
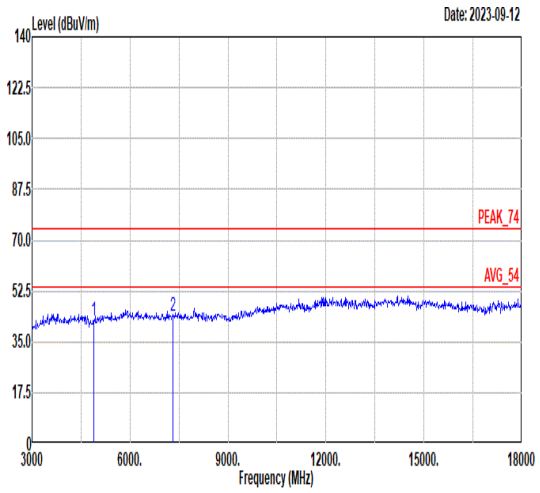
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2360.97	45.30	74.00	-28.70	42.08	32.14	4.77	33.69	117	304	PEAK
2	2360.97	20.51	54.00	-33.49	17.29	32.14	4.77	33.69	117	304	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2402.00	105.99	------	------	102.59	32.25	4.81	33.66	117	304	PEAK
2	2402.00	81.20	------	------	77.80	32.25	4.81	33.66	117	304	AVERAGE

Mode	1	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	7	
Pol.	Horizontal	Vertical
Peak Avg		

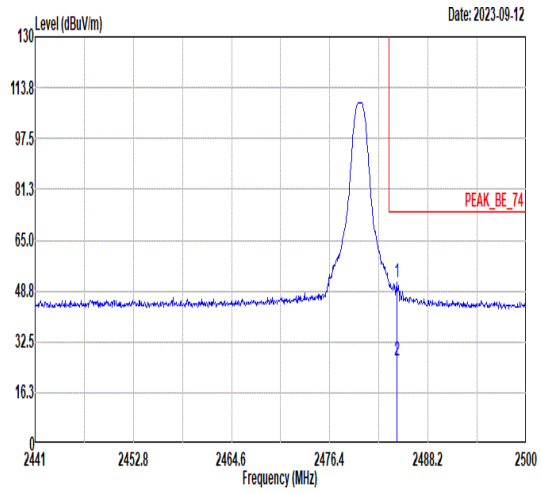
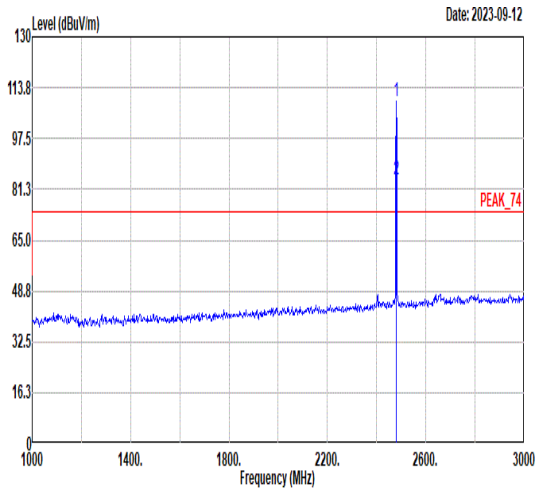
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4804.00	43.21	74.00	-30.79	58.52	34.42	7.74	57.47	--	--	Peak

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4804.00	42.12	74.00	-31.88	57.43	34.42	7.74	57.47	--	--	Peak

Mode	2	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	7	
Pol.	Horizontal	Vertical
Peak Avg		

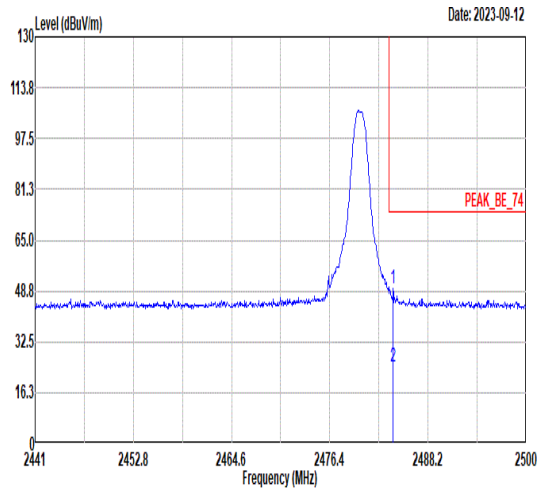
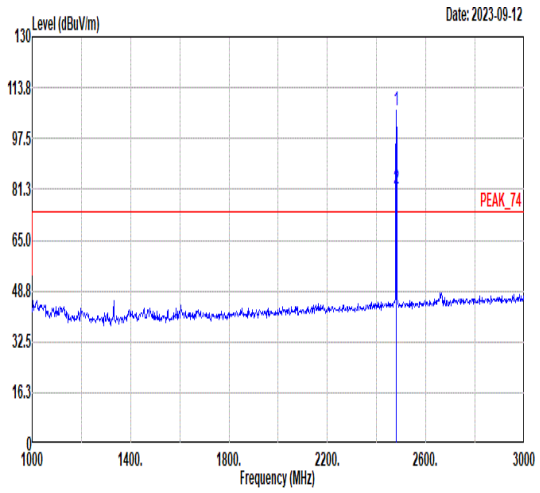
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4882.00	42.27	74.00	-31.73	57.65	34.37	7.77	57.52	--	--	Peak
2	7323.00	43.96	74.00	-30.04	57.88	36.04	8.97	58.93	--	--	Peak

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4882.00	42.13	74.00	-31.87	57.51	34.37	7.77	57.52	--	--	Peak
2	7323.00	44.06	74.00	-29.94	57.98	36.04	8.97	58.93	--	--	Peak

Mode	3	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Horizontal	Fundamental
Peak		

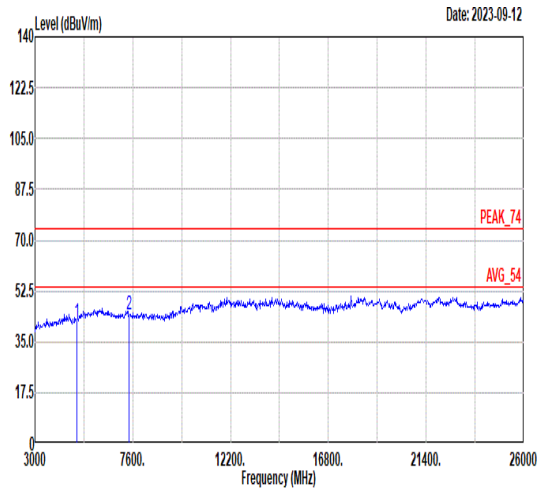
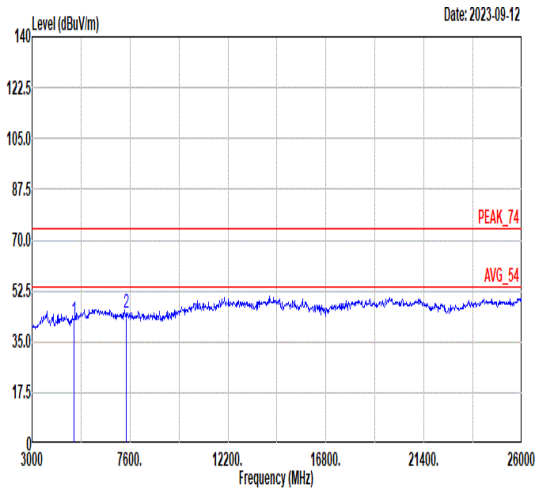
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2484.42	51.35	74.00	-22.65	47.58	32.46	4.92	33.61	167	152	PEAK
2	2484.42	26.56	54.00	-27.44	22.79	32.46	4.92	33.61	167	152	AVERAGE

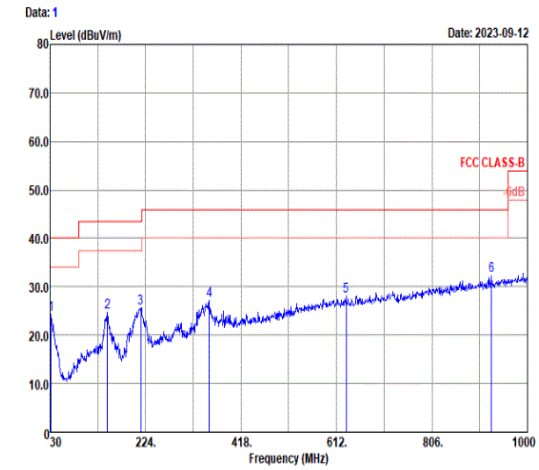
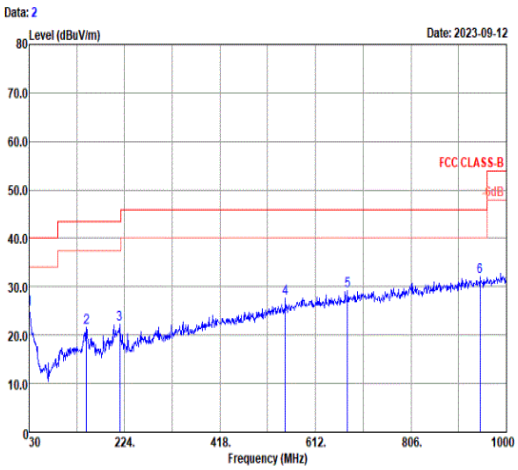
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2480.00	109.20	74.00	35.20	105.44	32.45	4.92	33.61	167	152	PEAK
2	2480.00	84.41	54.00	30.41	80.65	32.45	4.92	33.61	167	152	AVERAGE

Mode	3	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Vertical	Fundamental
Peak		

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2484.01	49.33	74.00	-24.67	45.56	32.46	4.92	33.61	100	299	PEAK
2	2484.01	24.54	54.00	-29.46	20.77	32.46	4.92	33.61	100	299	AVERAGE

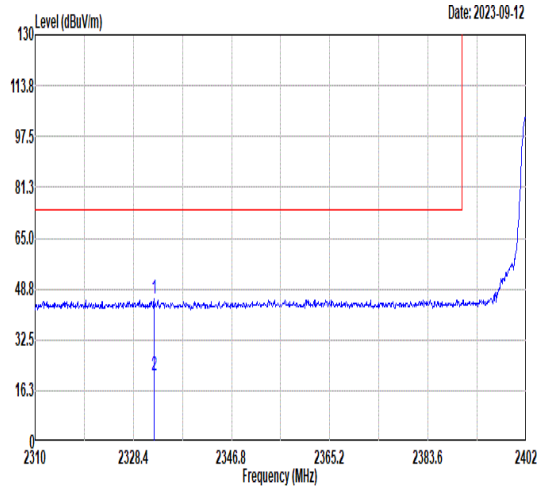
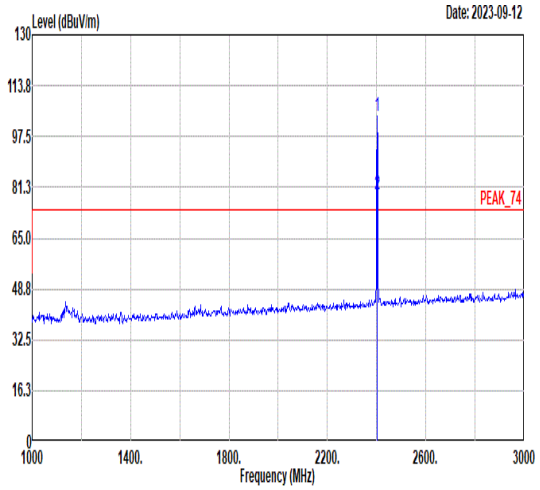
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2480.00	106.42	------	------	102.66	32.45	4.92	33.61	100	299	PEAK
2	2480.00	81.63	------	------	77.87	32.45	4.92	33.61	100	299	AVERAGE

Mode	3	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Horizontal	Vertical
Peak Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB cm deg 1 4960.00 41.87 74.00 -32.13 57.32 34.32 7.81 57.58 -- -- Peak 2 7440.00 44.60 74.00 -29.40 58.45 35.94 9.19 58.98 -- -- Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB cm deg 1 4960.00 42.38 74.00 -31.62 57.83 34.32 7.81 57.58 -- -- Peak 2 7440.00 44.82 74.00 -29.18 58.67 35.94 9.19 58.98 -- -- Peak

Mode	4	
	LF	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	7	
Pol.	Horizontal	Vertical
QP/Peak		

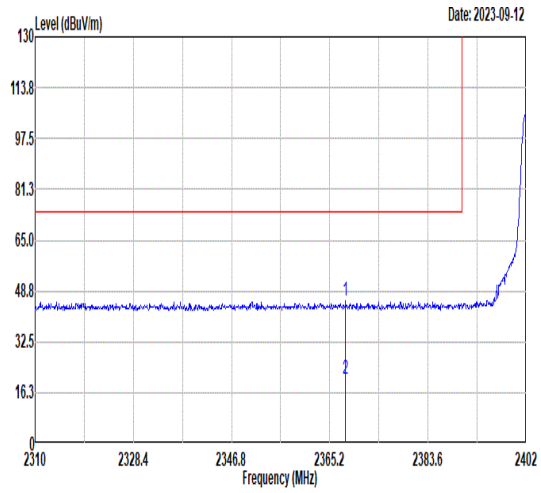
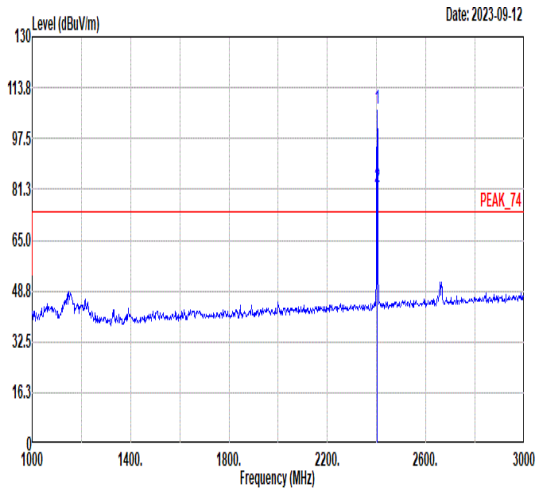
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.94	24.39	-15.61	40.00	31.28	24.32	0.55	31.76	---	---	Peak
2	146.40	24.68	-18.82	43.50	37.58	17.21	1.24	31.35	---	---	Peak
3	214.30	25.69	-17.81	43.50	40.26	15.24	1.49	31.30	---	---	Peak
4	353.98	27.21	-18.79	46.00	35.67	20.85	1.99	31.30	---	---	Peak
5	631.40	28.13	-17.87	46.00	30.39	26.41	2.62	31.29	---	---	Peak
6	927.25	32.28	-13.72	46.00	30.75	29.88	3.20	31.55	---	---	Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	25.31	-14.69	40.00	31.24	25.34	0.53	31.80	---	---	Peak
2	146.40	21.62	-21.88	43.50	34.52	17.21	1.24	31.35	---	---	Peak
3	214.30	22.33	-21.17	43.50	36.90	15.24	1.49	31.30	---	---	Peak
4	550.89	27.57	-18.43	46.00	31.18	25.18	2.46	31.25	---	---	Peak
5	676.99	29.28	-16.72	46.00	31.31	26.69	2.71	31.43	---	---	Peak
6	946.65	32.09	-13.91	46.00	30.24	30.13	3.23	31.51	---	---	Peak

Mode	5	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	12	
Pol.	Horizontal	Fundamental
Peak		

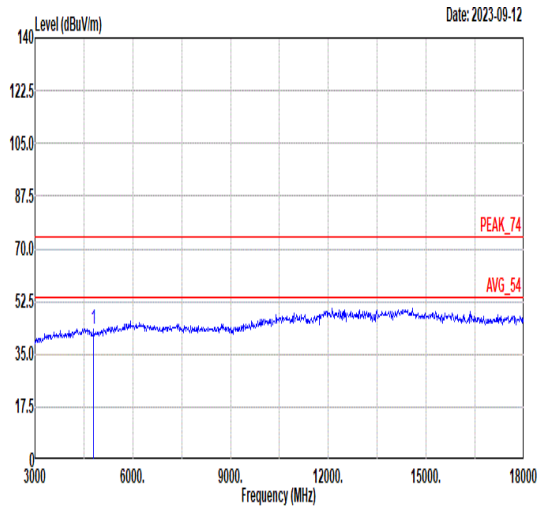
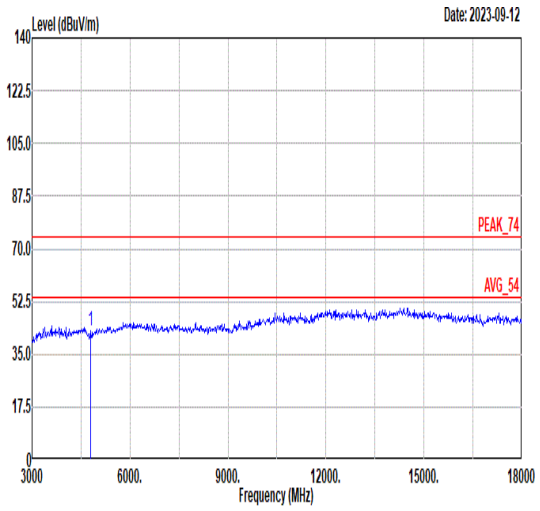
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2332.26	45.73	74.00	-28.27	42.63	32.06	4.74	33.70	100	7	PEAK
2	2332.26	20.94	54.00	-33.06	17.84	32.06	4.74	33.70	100	7	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2402.00	103.97	------	------	100.57	32.25	4.81	33.66	100	7	PEAK
2	2402.00	79.18	------	------	75.78	32.25	4.81	33.66	100	7	AVERAGE

Mode	5	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	12	
Pol.	Vertical	Fundamental
Peak		

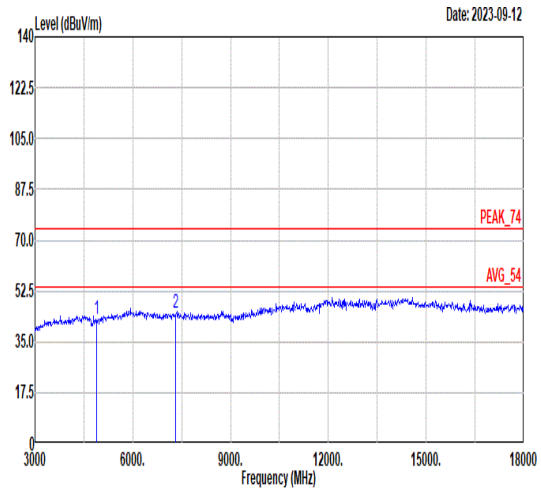
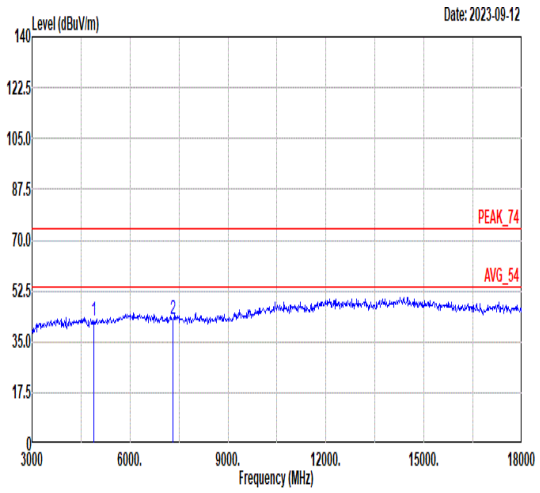
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2368.14	45.59	74.00	-28.41	42.34	32.16	4.77	33.68	100	262	PEAK
2	2368.14	20.80	54.00	-33.20	17.55	32.16	4.77	33.68	100	262	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2402.00	106.75	------	------	103.35	32.25	4.81	33.66	100	262	PEAK
2	2402.00	81.96	------	------	78.56	32.25	4.81	33.66	100	262	AVERAGE

Mode	5	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH00_2402MHz	
ANT	12	
Pol.	Horizontal	Vertical
Peak Avg		

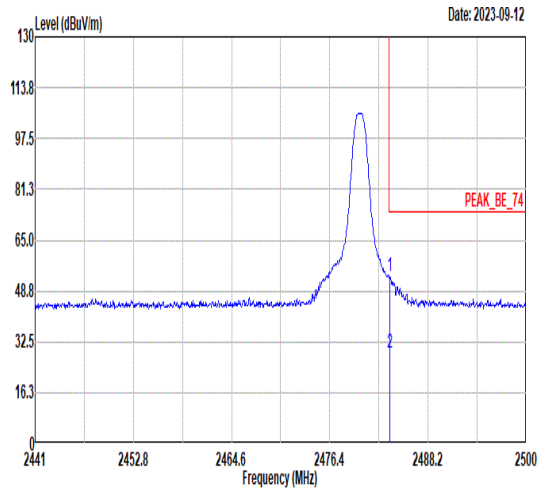
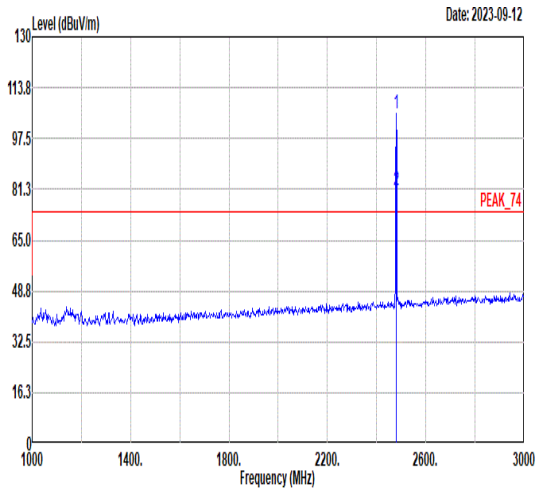
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4804.00	43.34	74.00	-30.66	58.65	34.42	7.74	57.47	--	--	Peak

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4804.00	42.61	74.00	-31.39	57.92	34.42	7.74	57.47	--	--	Peak

Mode	6	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2441MHz	
ANT	12	
Pol.	Horizontal	Vertical
Peak Avg		

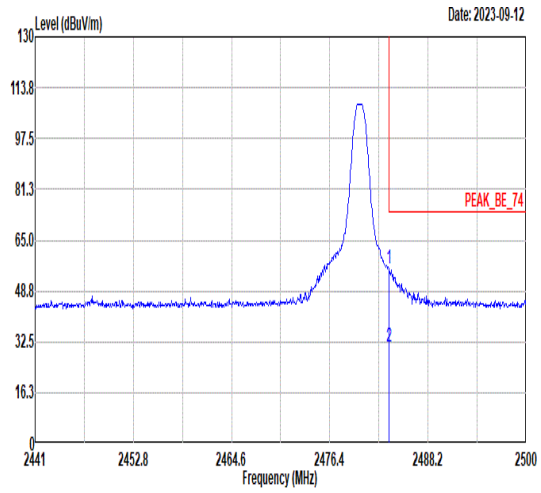
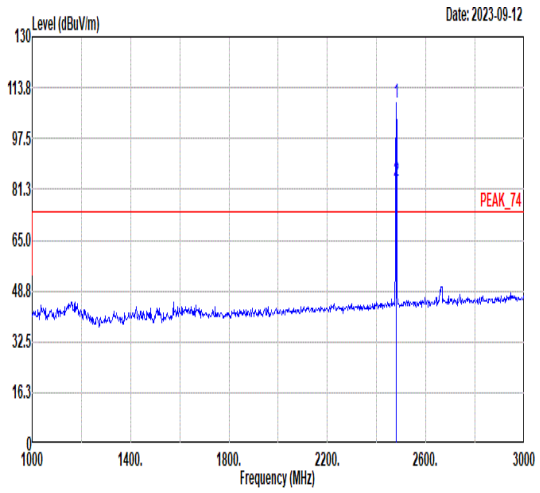
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4882.00	42.53	74.00	-31.47	57.91	34.37	7.77	57.52	--	--	Peak
2	7323.00	44.74	74.00	-29.26	58.66	36.04	8.97	58.93	--	--	Peak

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4882.00	42.28	74.00	-31.72	57.66	34.37	7.77	57.52	--	--	Peak
2	7323.00	42.95	74.00	-31.05	56.87	36.04	8.97	58.93	--	--	Peak

Mode	7	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	12	
Pol.	Horizontal	Fundamental
Peak		

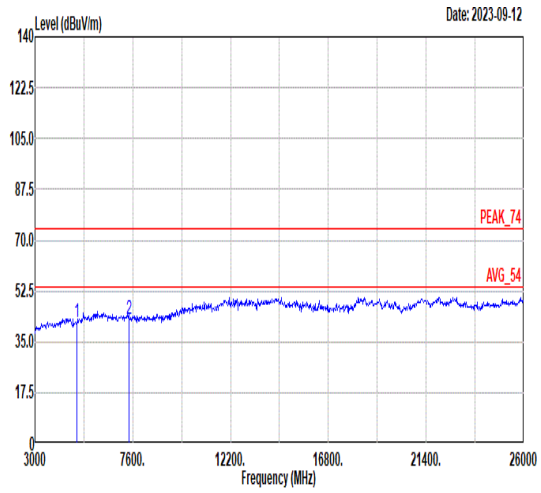
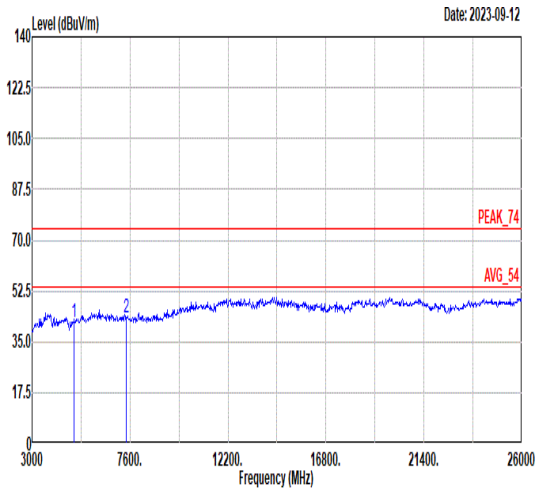
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2483.60	53.54	74.00	-20.46	49.77	32.46	4.92	33.61	100	2	PEAK
2	2483.60	28.75	54.00	-25.25	24.98	32.46	4.92	33.61	100	2	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2480.00	105.70	------	------	101.94	32.45	4.92	33.61	100	2	PEAK
2	2480.00	80.91	------	------	77.15	32.45	4.92	33.61	100	2	AVERAGE

Mode	7	
	Band Edge	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	12	
Pol.	Vertical	Fundamental
Peak		

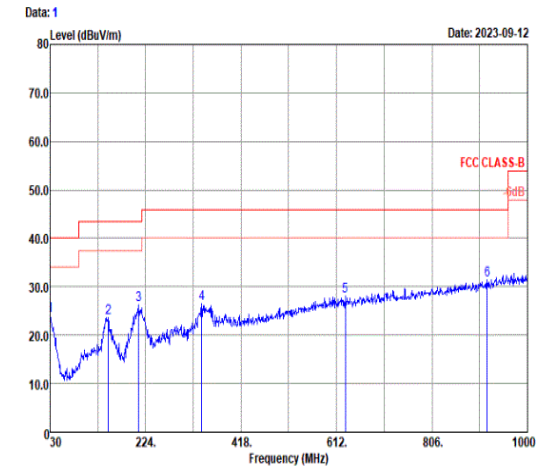
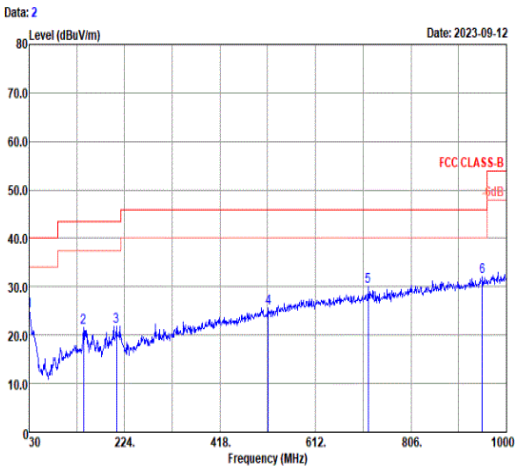
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2483.54	55.72	74.00	-18.28	51.95	32.46	4.92	33.61	105	279	PEAK
2	2483.54	30.93	54.00	-23.07	27.16	32.46	4.92	33.61	105	279	AVERAGE

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	2480.00	108.70	------	------	104.94	32.45	4.92	33.61	105	279	PEAK
2	2480.00	83.91	------	------	80.15	32.45	4.92	33.61	105	279	AVERAGE

Mode	7	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	12	
Pol.	Horizontal	Vertical
Peak Avg		

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4960.00	41.90	74.00	-32.10	57.35	34.32	7.81	57.58	--	--	Peak
2	7440.00	42.82	74.00	-31.18	56.67	35.94	9.19	58.98	--	--	Peak

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	
1	4960.00	41.79	74.00	-32.21	57.24	34.32	7.81	57.58	--	--	Peak
2	7440.00	43.23	74.00	-30.77	57.08	35.94	9.19	58.98	--	--	Peak

Mode	8	
	LF	
	2400-2483.5_Bluetooth BR_GFSK_CH78_2480MHz	
ANT	12	
Pol.	Horizontal	Vertical
QP/Peak		

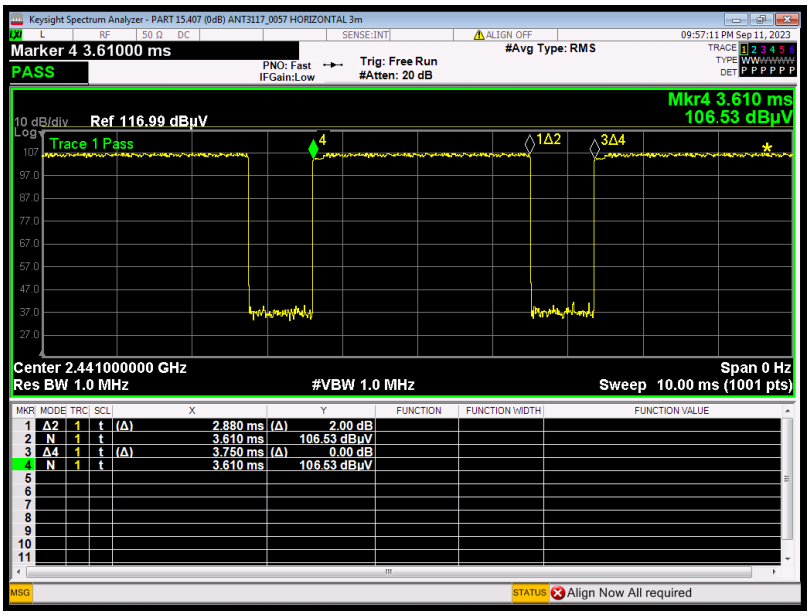
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	24.09	-15.91	40.00	30.02	25.34	0.53	31.80	---	---	Peak
2	148.34	23.70	-19.80	43.50	36.74	17.07	1.24	31.35	---	---	Peak
3	210.42	26.23	-17.27	43.50	40.88	15.17	1.48	31.30	---	---	Peak
4	338.46	26.48	-19.52	46.00	35.44	20.40	1.94	31.30	---	---	Peak
5	630.43	28.10	-17.90	46.00	30.37	26.41	2.61	31.29	---	---	Peak
6	918.52	31.48	-14.52	46.00	30.09	29.76	3.19	31.56	---	---	Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	24.87	-15.13	40.00	30.80	25.34	0.53	31.80	---	---	Peak
2	140.58	21.52	-21.98	43.50	34.04	17.63	1.21	31.36	---	---	Peak
3	207.51	21.92	-21.58	43.50	36.64	15.12	1.46	31.30	---	---	Peak
4	515.97	25.70	-20.30	46.00	30.16	24.45	2.37	31.28	---	---	Peak
5	718.70	30.05	-15.95	46.00	31.63	27.11	2.79	31.48	---	---	Peak
6	950.53	32.11	-13.89	46.00	30.20	30.18	3.23	31.50	---	---	Peak

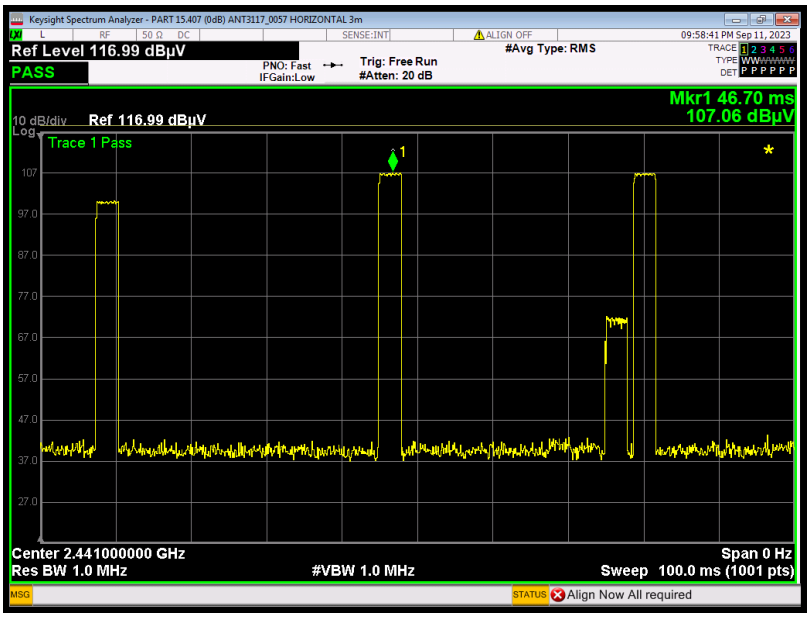
Appendix D. Duty Cycle Plots

Ant 7:

3DH5 on time (One Pulse) Plot



3DH5 on time (Count Pulses) Plot on Channel 00

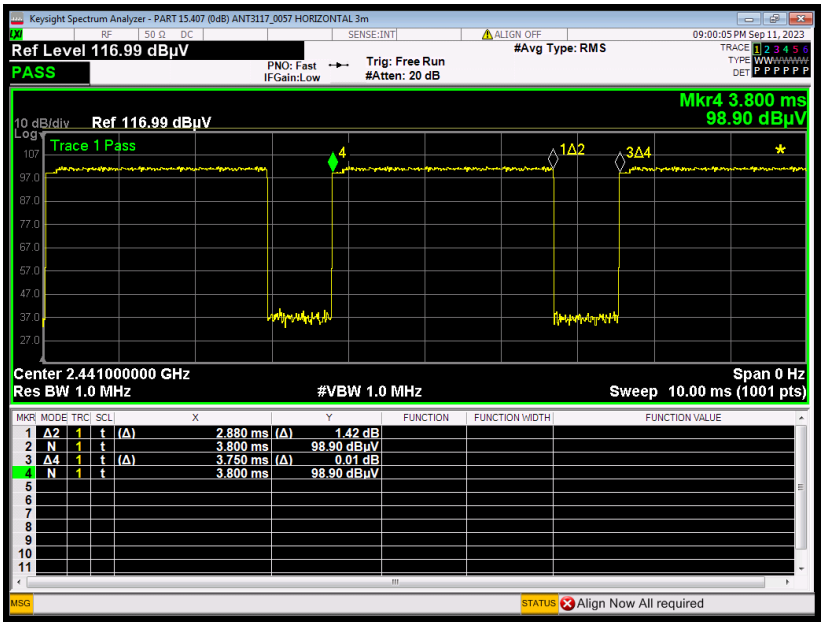


Note:

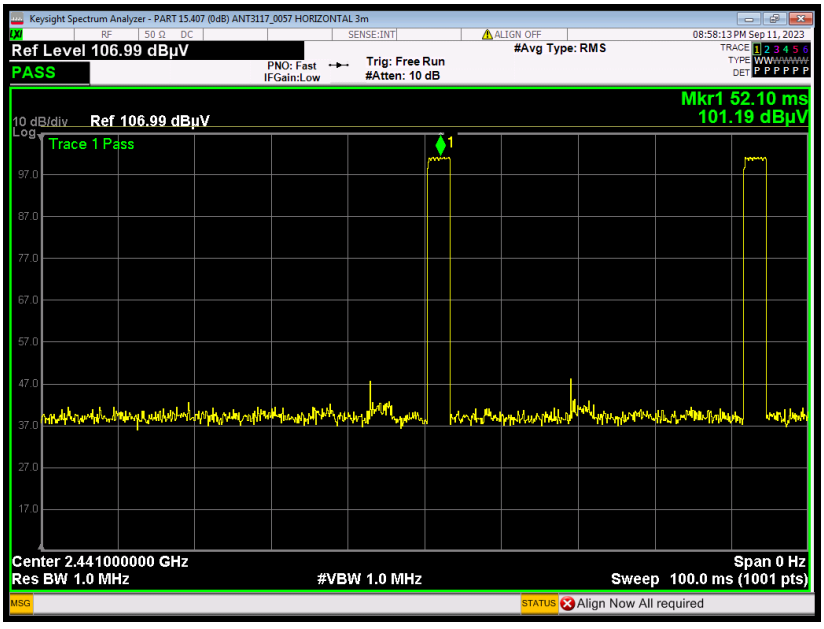
1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. 3DH5 has the highest duty cycle worst case and is reported.

Ant 12:

3DH5 on time (One Pulse) Plot



3DH5 on time (Count Pulses) Plot on Channel 00



Note:

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