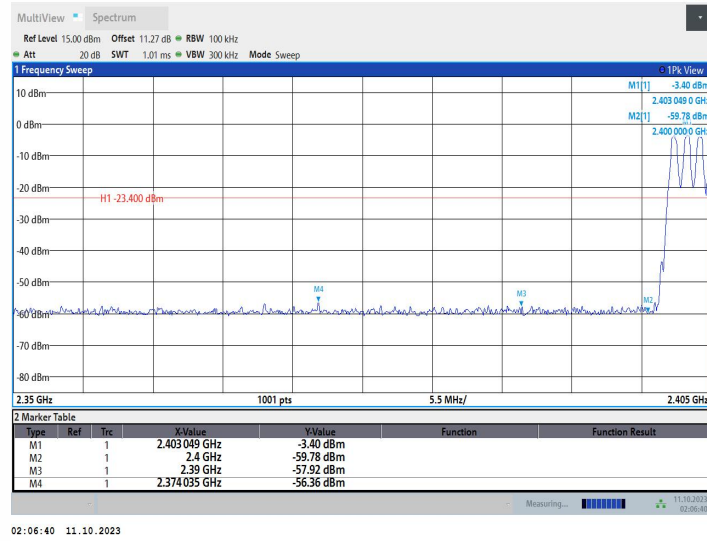
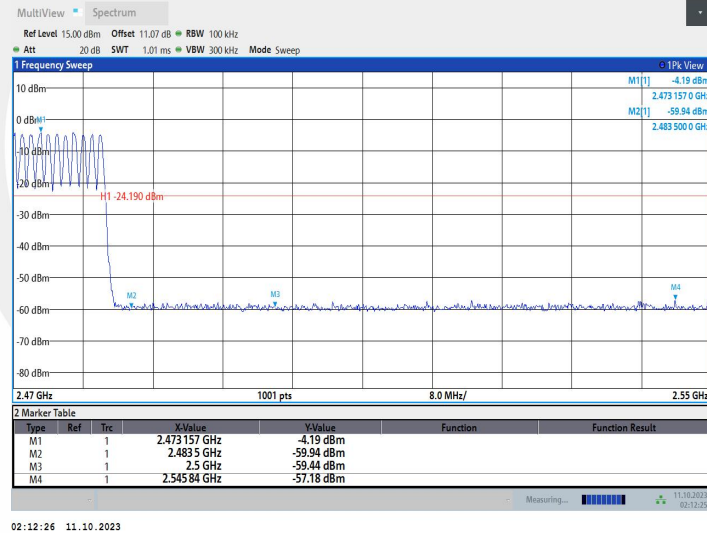
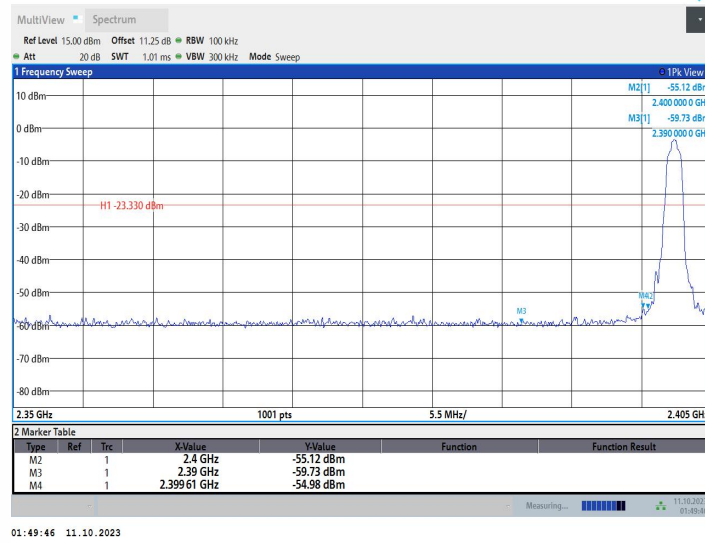




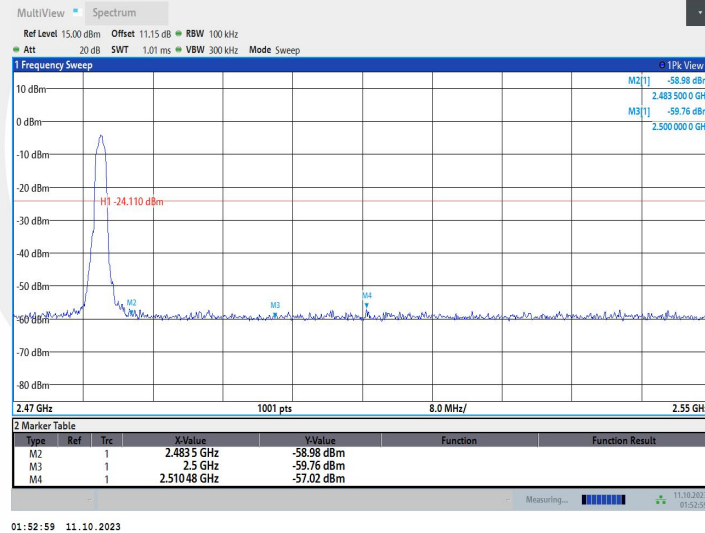
DH5 Ant1_High_Hop_2480



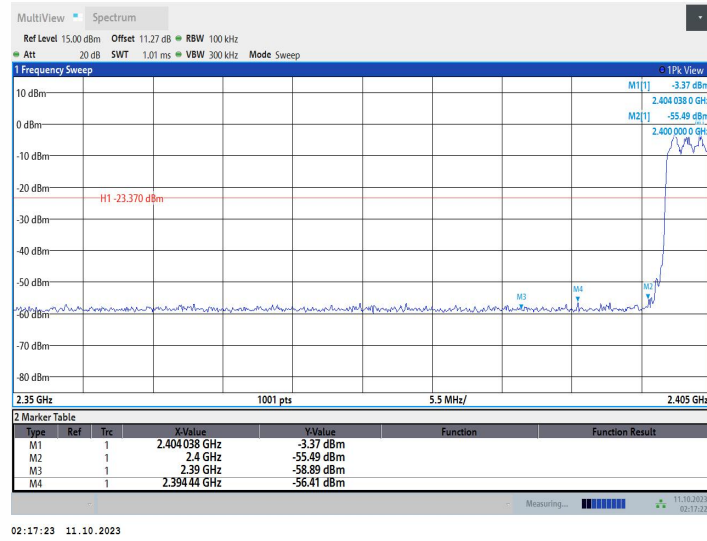
2DH5 Ant1_Low_2402



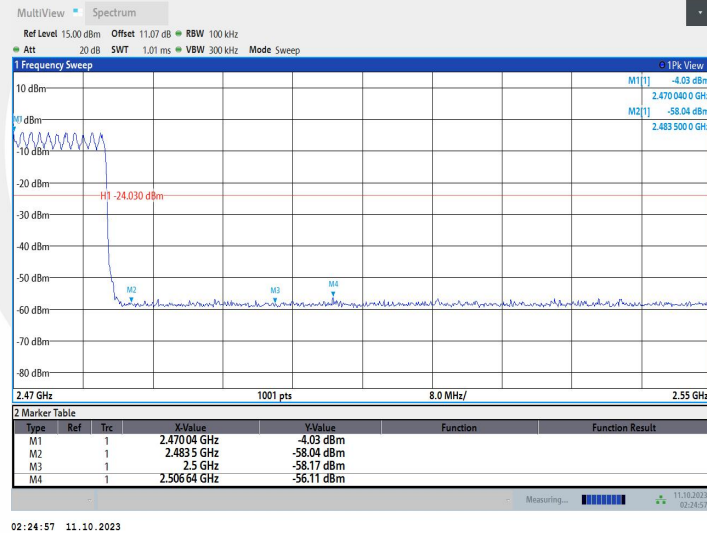
2DH5_Ant1_High_2480



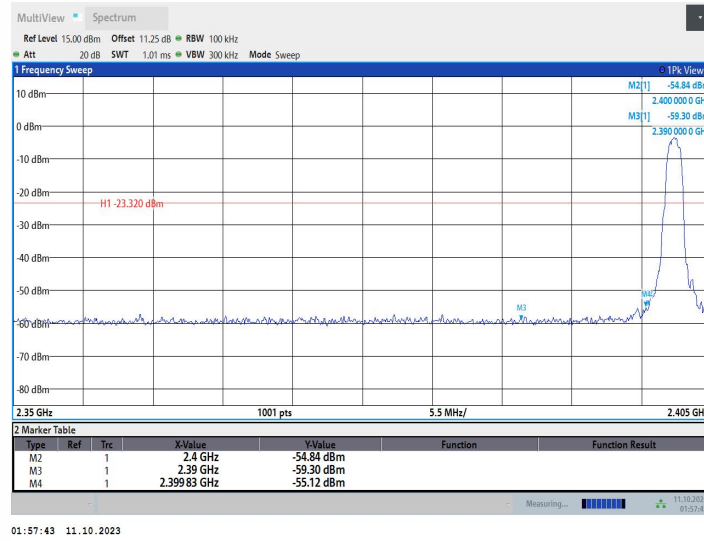
2DH5_Ant1_Low_Hop_2402



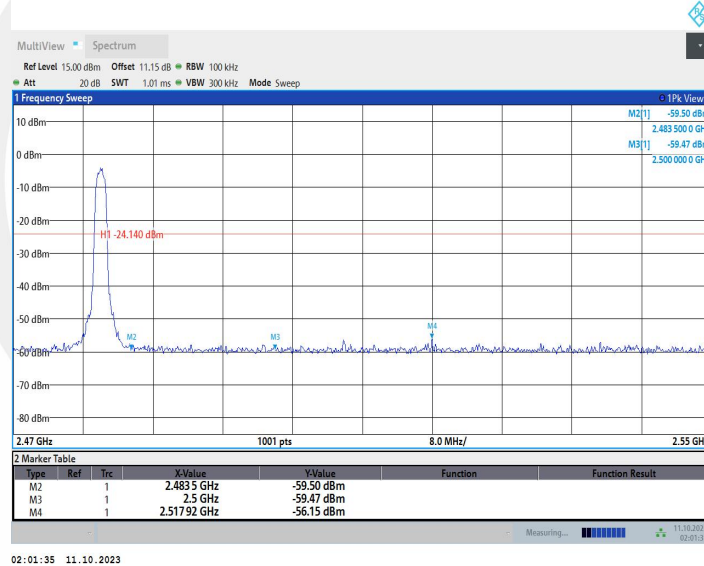
2DH5_Ant1_High_Hop_2480



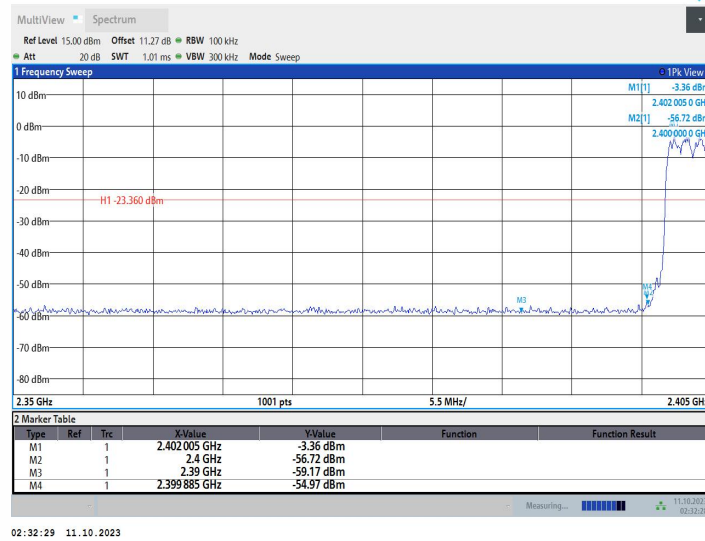
3DH5_Ant1_Low_2402



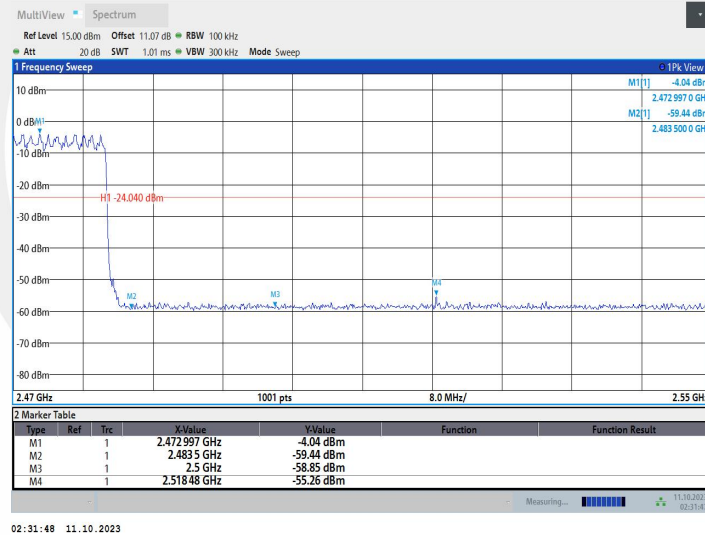
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402

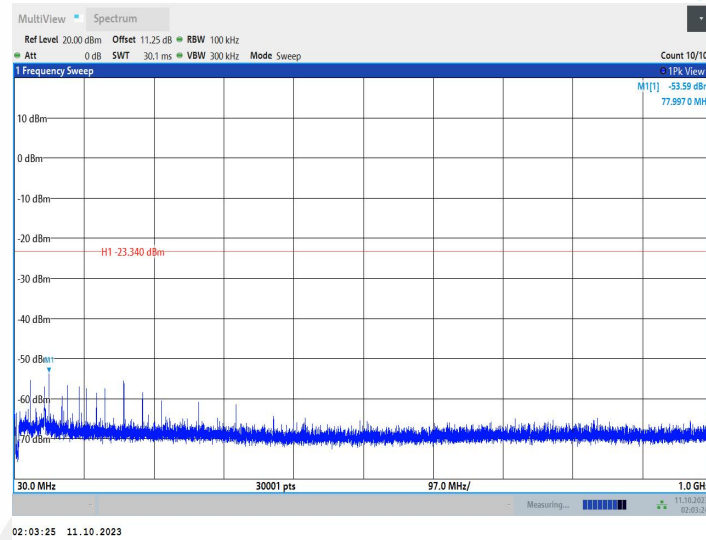


3DH5_Ant1_High_Hop_2480

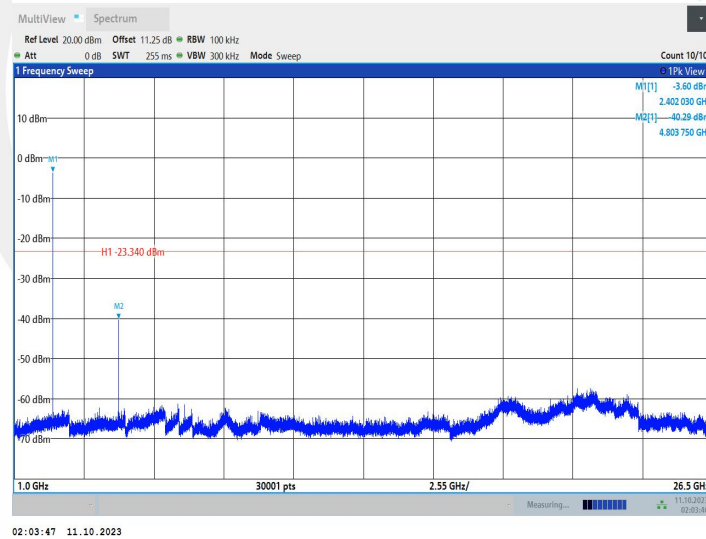


Conducted Spurious Emission

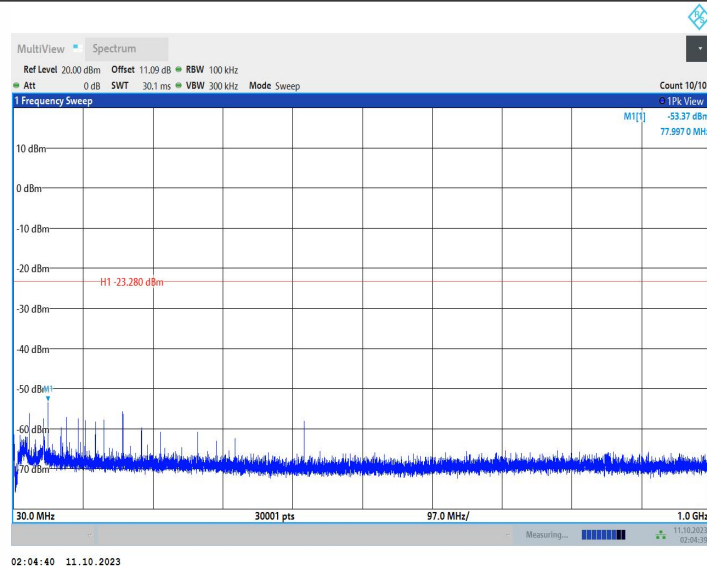
DH5_Ant1_2402_30~1000



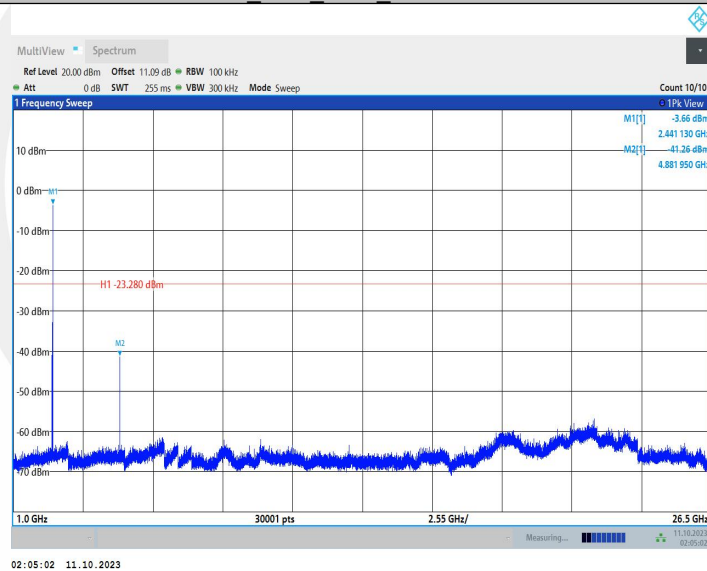
DH5_Ant1_2402_1000~26500



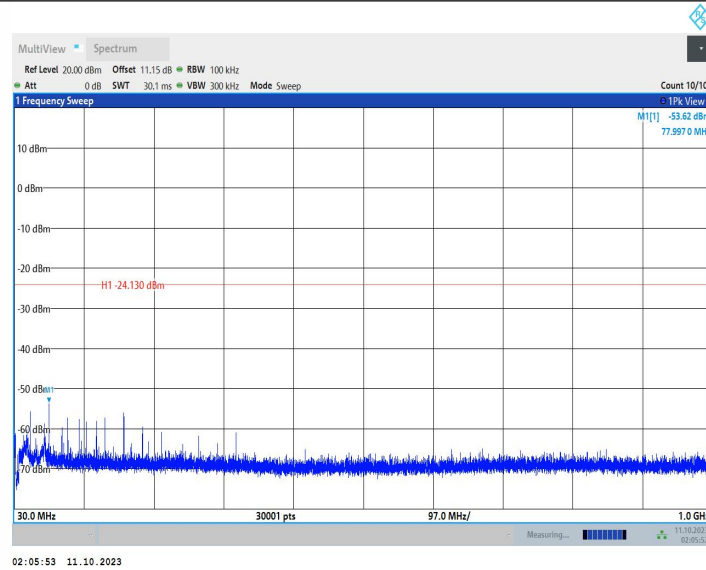
DH5_Ant1_2441_30~1000



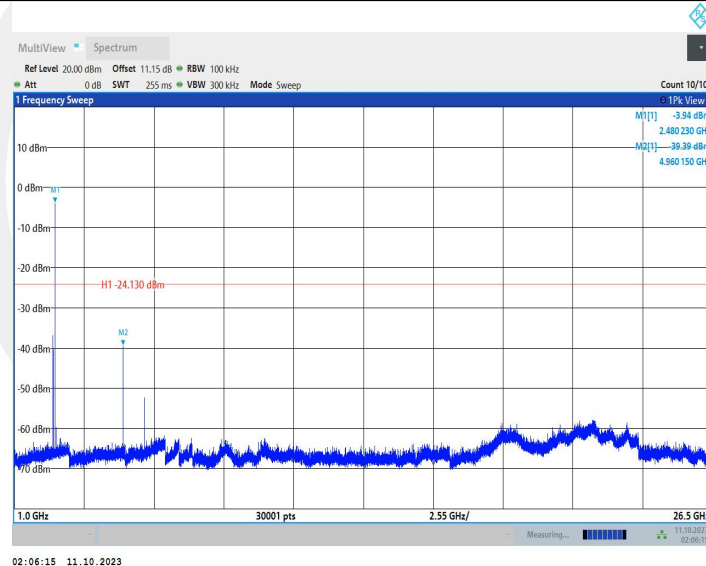
DH5_Ant1_2441_1000~26500



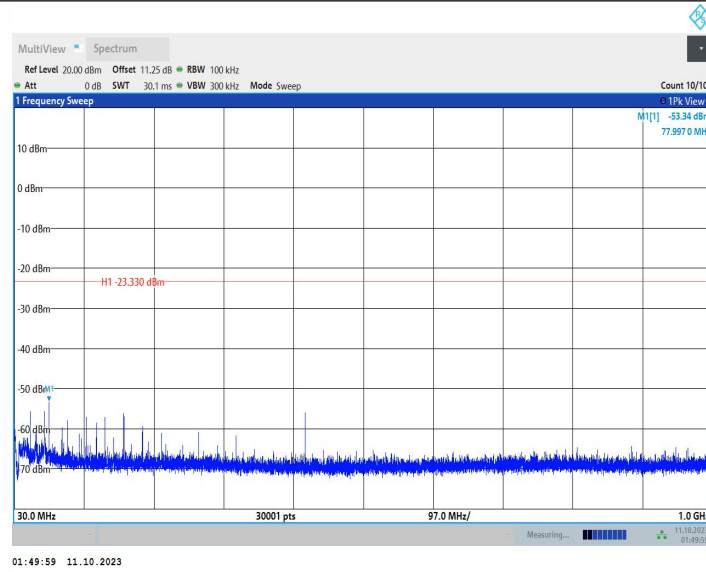
DH5_Ant1_2480_30~1000



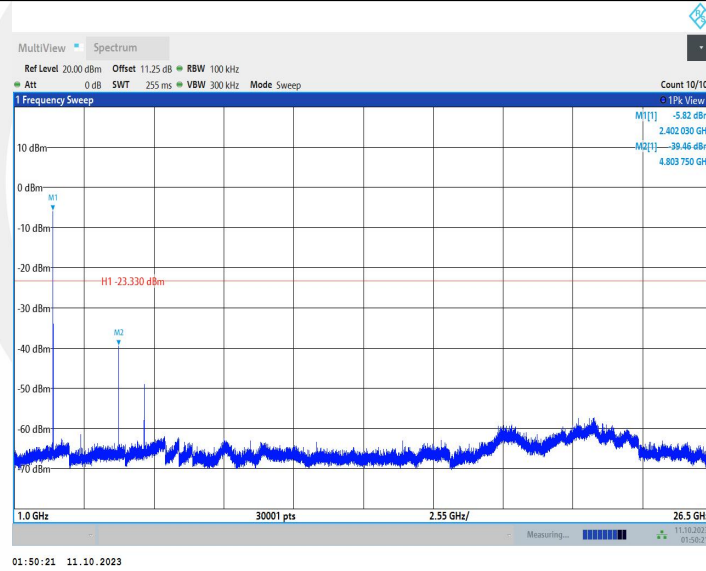
DH5_Ant1_2480_1000~26500



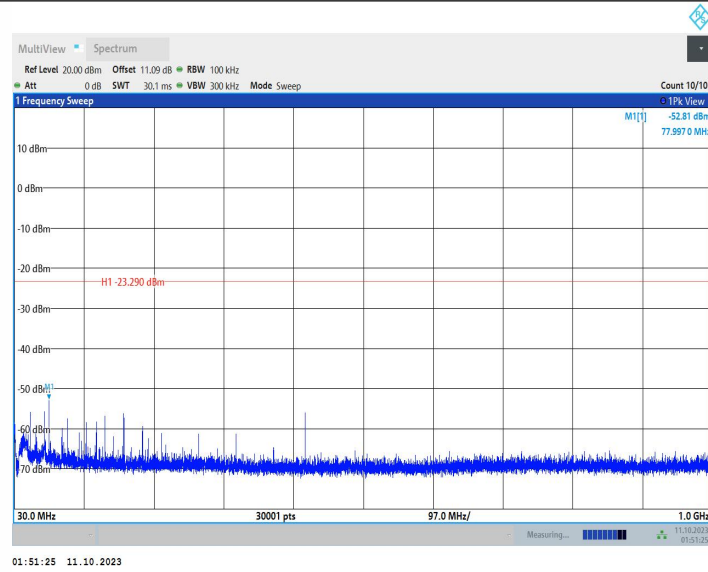
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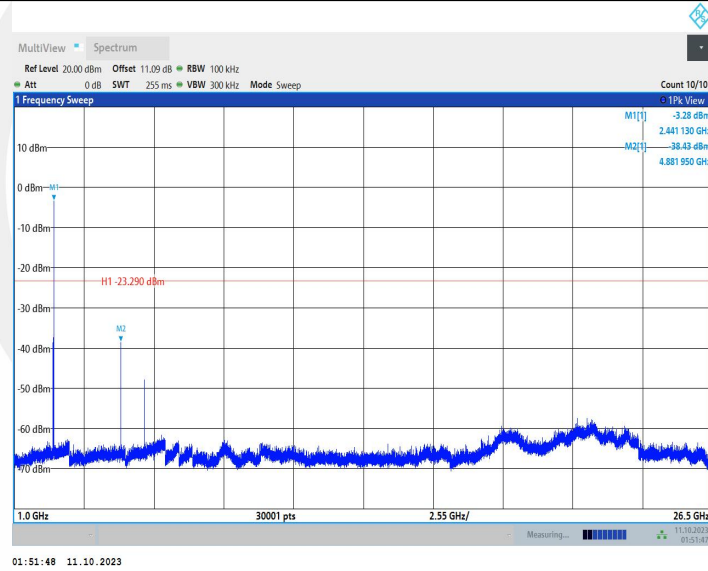
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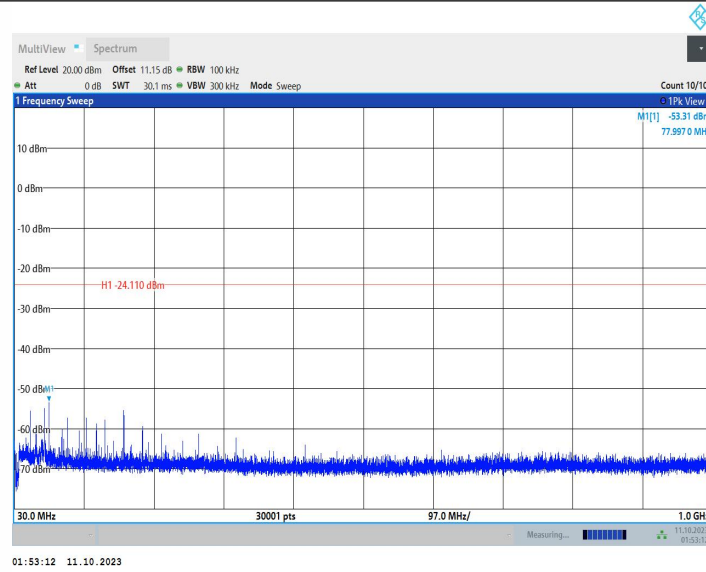
2DH5_Ant1_2441_30~1000



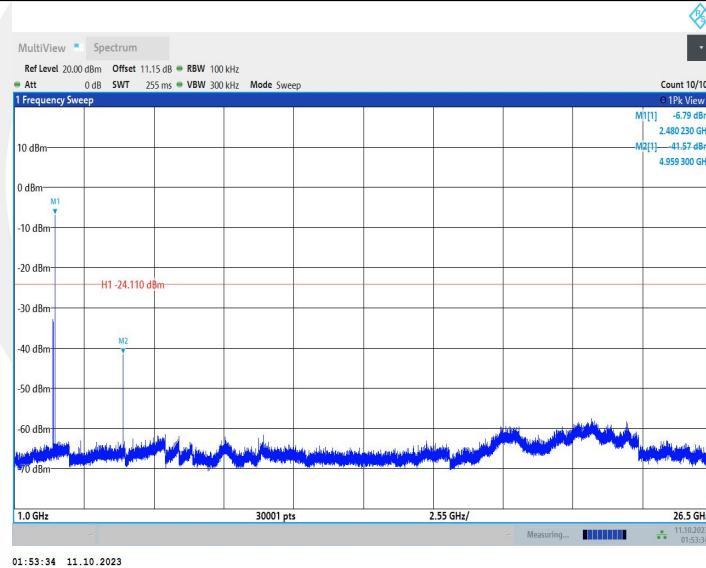
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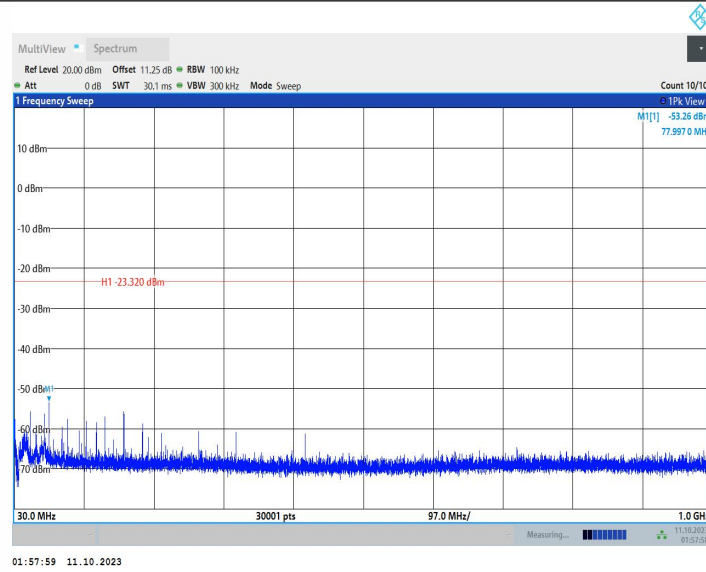
2DH5_Ant1_2480_30~1000



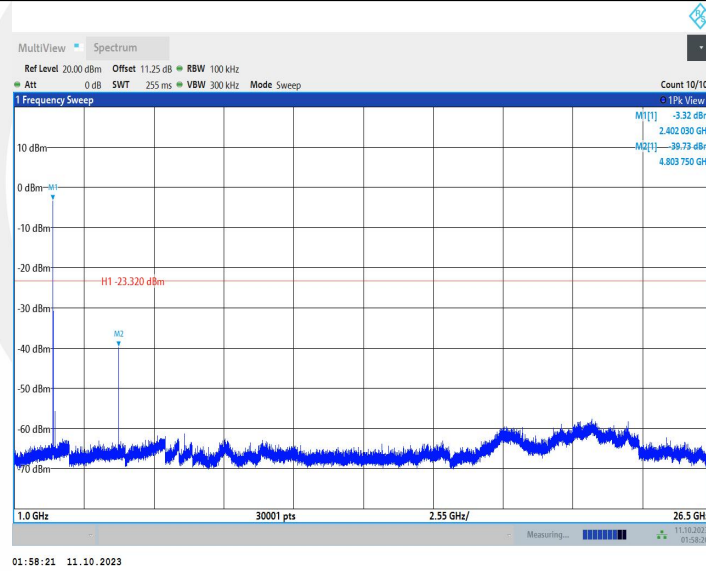
2DH5_Ant1_2480_1000~26500



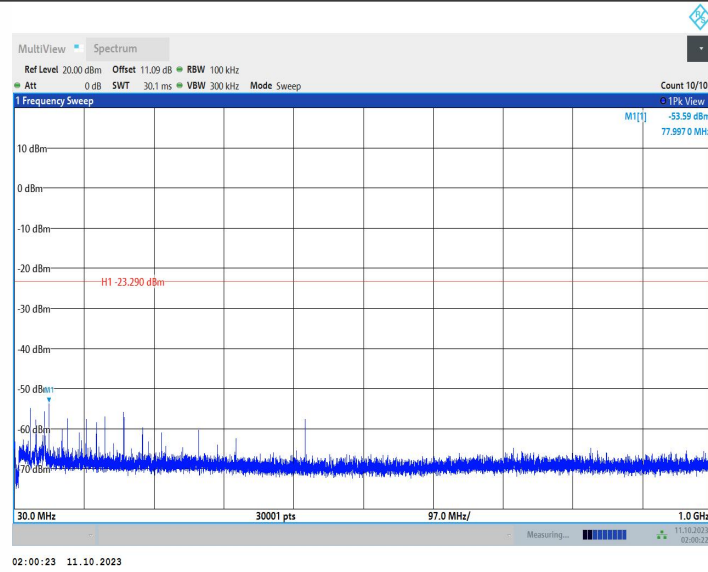
3DH5_Ant1_2402_30~1000



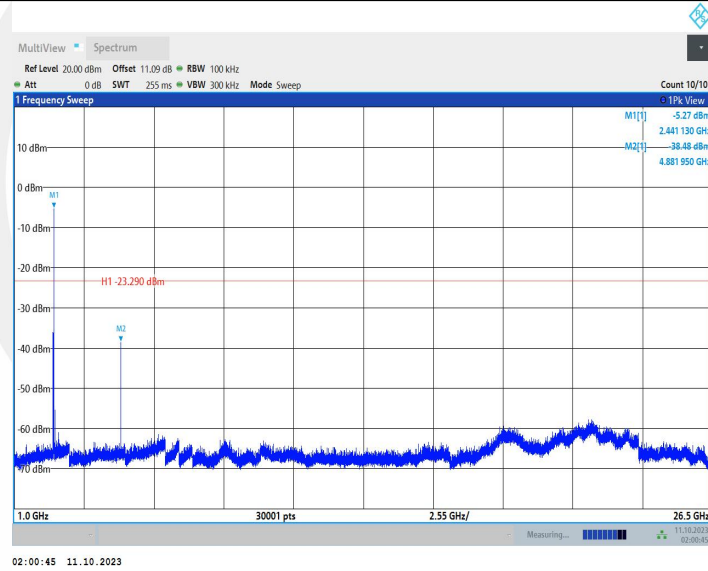
3DH5_Ant1_2402_1000~26500



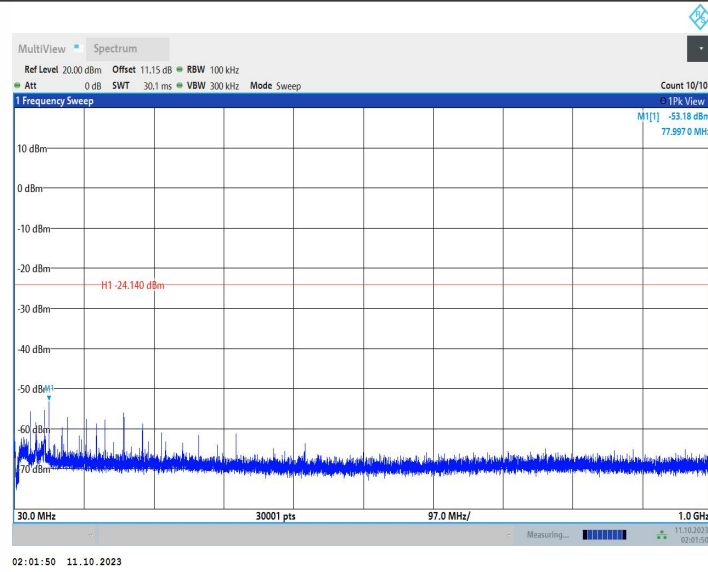
3DH5_Ant1_2441_30~1000



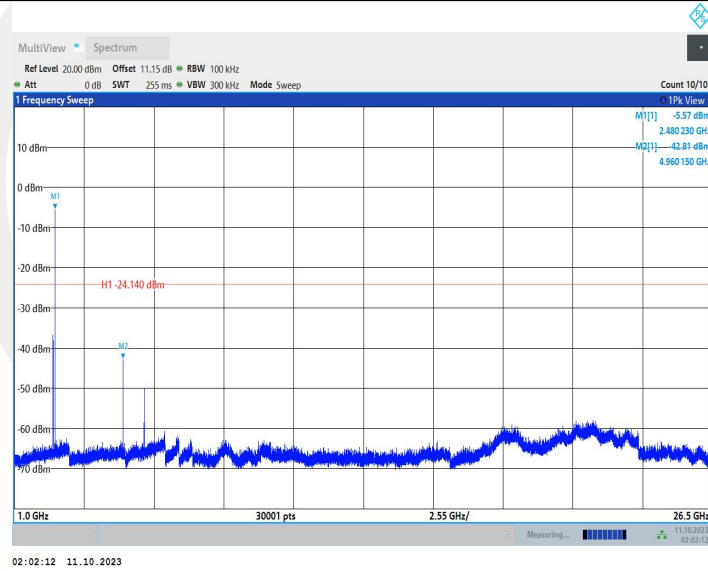
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and FCC KDB 558074 D01 15.247 Meas Guidance v05r02

9.7.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	2400/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz(1GHz to 25GHz), 100 kHz for $f < 1$ GHz(30MHz to 1GHz)

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2013 respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

9.7.5 Test Results

■ Spurious Emission below 30MHz(9KHz to 30MHz)

Temperature: 25°C
Humidity: 60 %
Test mode: GFSK

Test Date: October 13, 2023
Test By: KK

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance}/\text{test distance})$ (dB);

Limit line = Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result(AC 120V/60Hz) was report as below:

Temperature: 25°C
Humidity: 60 %
Test mode: GFSK

Test Date: October 13, 2023
Test By: KK
Frequency: Channel 0: 2402MHz

Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity	Pass/Fail
4803.75	56.75	74	17.25	PK	Vertical	Pass
14645.625	63.22	74	10.78	PK	Vertical	Pass
17613.75	69.32	74	4.68	PK	Vertical	Pass
4803.7941	49.25	54	4.75	AV	Vertical	Pass
14645.625	48.45	54	5.55	AV	Vertical	Pass
17613.75	47.91	54	6.09	AV	Vertical	Pass
4803.75	55.2	74	18.8	PK	Horizontal	Pass
14698.125	63.43	74	10.57	PK	Horizontal	Pass
17940	68.2	74	5.8	PK	Horizontal	Pass
4803.75	47.15	54	6.85	AV	Horizontal	Pass
14698.125	47.3	54	6.7	AV	Horizontal	Pass
17940	47.32	54	6.68	AV	Horizontal	Pass

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) Margin = Limit - Emission Level
- (5) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Temperature: 25°C
Humidity: 60 %
Test mode: GFSK

Test Date: October 13, 2023
Test By: KK
Frequency: Channel 39: 2441MHz

Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity	Pass/Fail
4882.5	50.37	74	23.63	PK	Vertical	Pass
14649.375	63.77	74	10.23	PK	Vertical	Pass
17625	68.26	74	5.74	PK	Vertical	Pass
4882.5	42.35	54	11.65	AV	Vertical	Pass
14649.375	47.37	54	6.63	AV	Vertical	Pass
17625	49.56	54	4.44	AV	Vertical	Pass
4880.625	50.39	74	23.61	PK	Horizontal	Pass
14656.875	63.98	74	10.02	PK	Horizontal	Pass
17606.25	69.03	74	4.97	PK	Horizontal	Pass
4880.625	42.4	54	11.6	AV	Horizontal	Pass
14656.875	47.51	54	6.49	AV	Horizontal	Pass
17606.25	50.04	54	3.96	AV	Horizontal	Pass

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) Margin = Limit - Emission Level
- (5) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Temperature: 25°C
Humidity: 60 %
Test mode: GFSK

Test Date: October 13, 2023
Test By: KK
Frequency: Channel 78: 2480MHz

Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity	Pass/Fail
4959.375	49.2	74	24.8	PK	Vertical	Pass
14598.75	63.25	74	10.75	PK	Vertical	Pass
17638.125	69.2	74	4.8	PK	Vertical	Pass
4959.375	41.46	54	12.54	AV	Vertical	Pass
14598.75	48.41	54	5.59	AV	Vertical	Pass
17638.125	49.02	54	4.98	AV	Vertical	Pass
4959.375	51.44	74	22.56	PK	Horizontal	Pass
14600.625	63.31	74	10.69	PK	Horizontal	Pass
17628.75	69.15	74	4.85	PK	Horizontal	Pass
4959.375	43.75	54	10.25	AV	Horizontal	Pass
14600.625	48.35	54	5.65	AV	Horizontal	Pass
17628.75	49.74	54	4.26	AV	Horizontal	Pass

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
- (2) Emission Level= Reading Level+Correct Factor.
- (3) Correct Factor= Ant_F + Cab_L - Preamp
- (4) Margin = Limit - Emission Level
- (5) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result(AC 120V/60Hz) was report as below:

Test mode: GFSK Frequency: Channel 0: 2402MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2341.71	H	50.64	74.00	43.00	54.00
2343.451	V	51.30	74.00	42.54	54.00

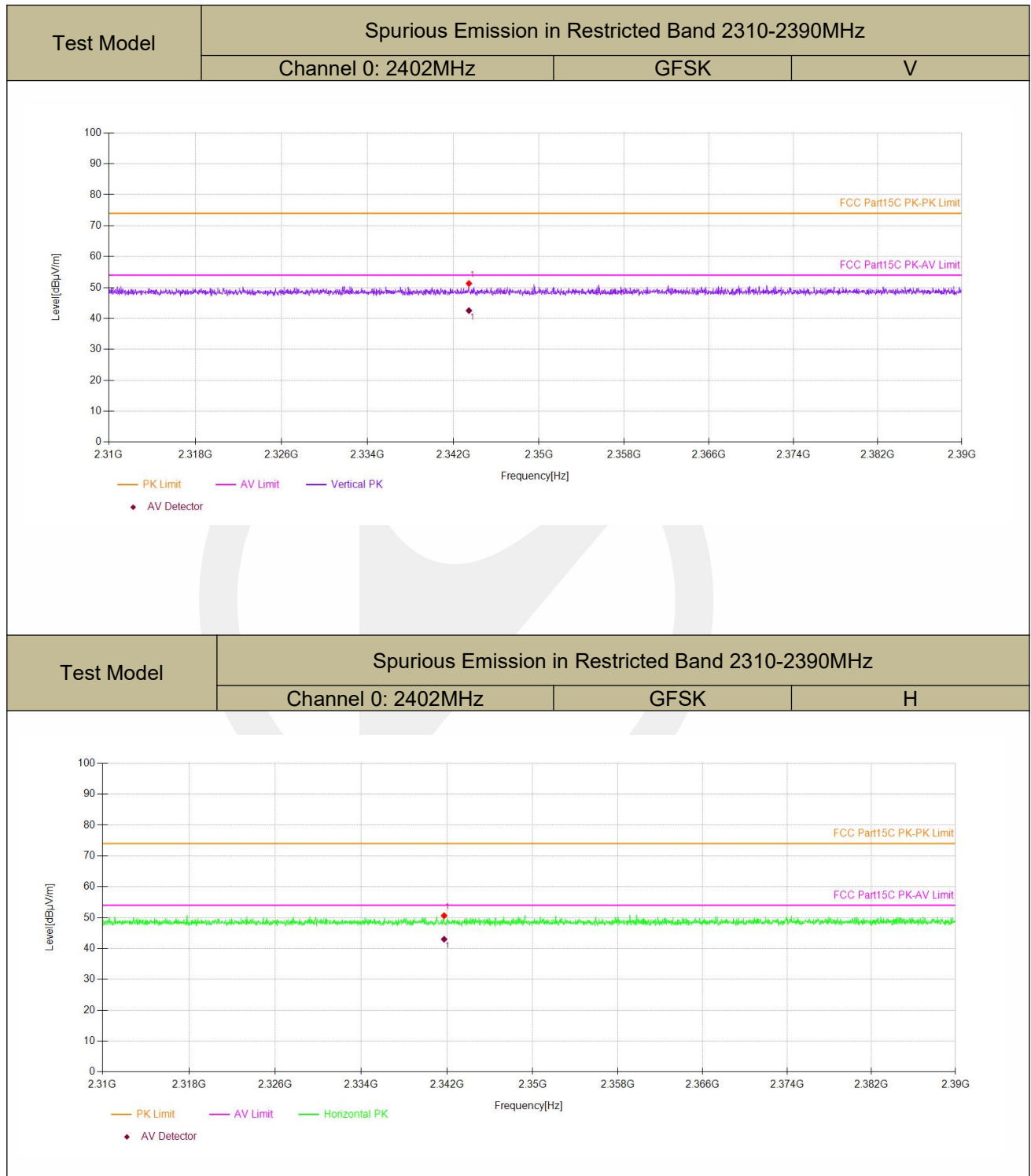
Test mode: GFSK Frequency: Channel 39: 2480MHz

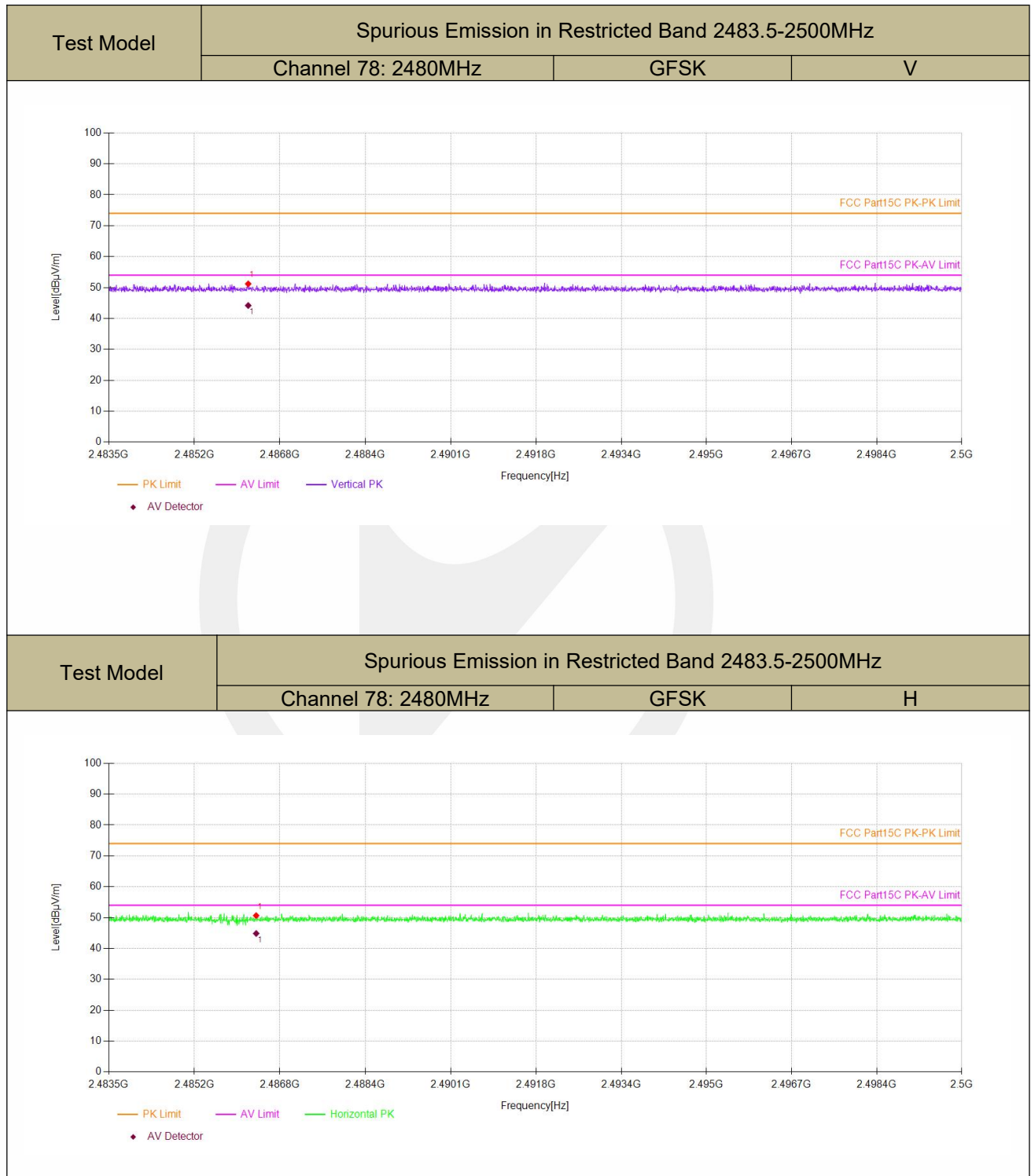
Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2486.34	H	50.66	74.00	44.86	54.00
2486.19	V	51.19	74.00	44.19	54.00

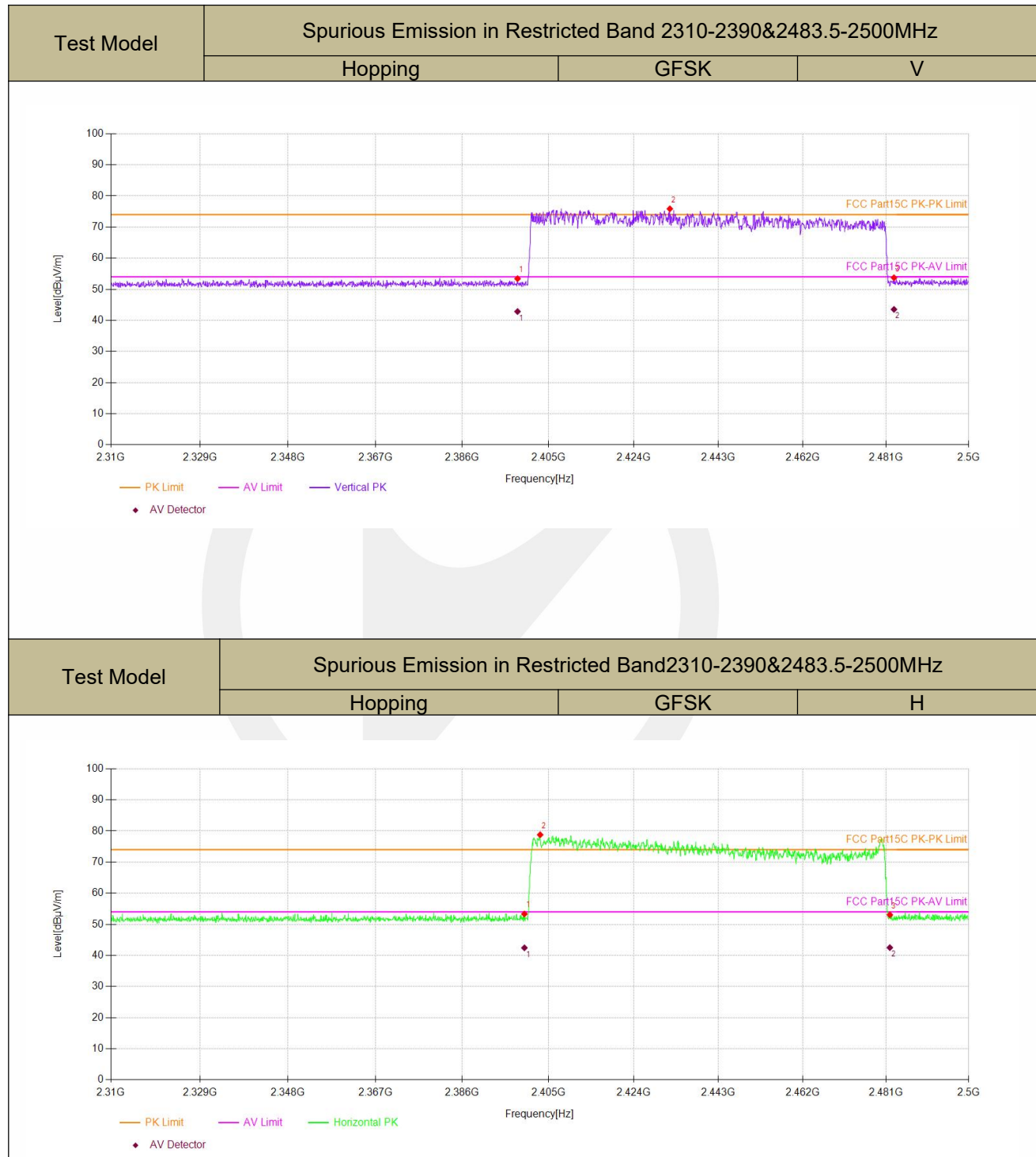
Test mode: GFSK Frequency: Hopping

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2400.00	H	53.31	74.00	42.44	54.00
2483.50	H	53.04	74.00	42.50	54.00
2400.00	V	53.40	74.00	42.85	54.00
2483.50	V	53.71	74.00	43.53	54.00

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
 - (2) Emission Level= Reading Level+Correct Factor.
 - (3) Correct Factor= Ant_F + Cab_L - Preamp
 - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



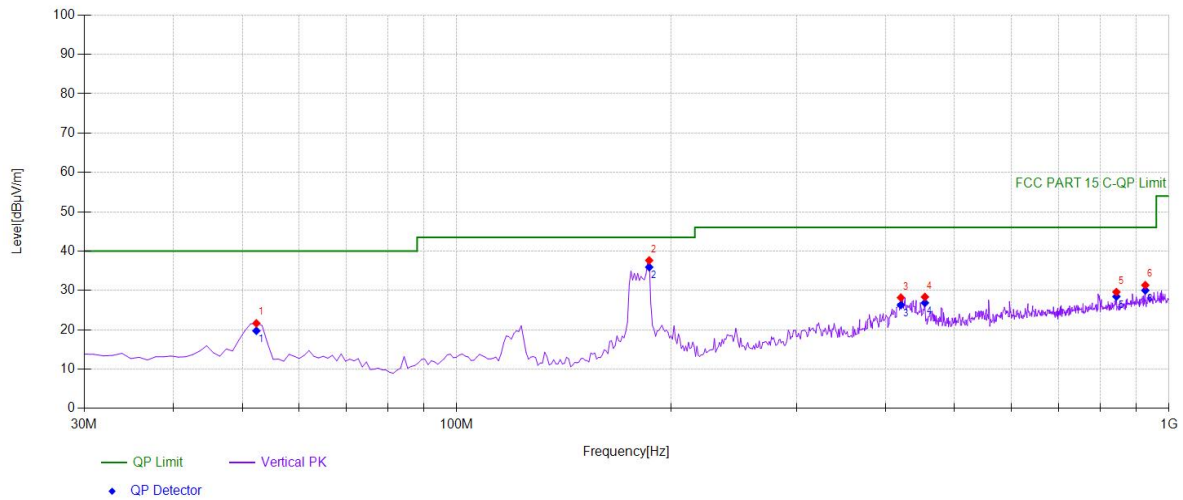




■ Spurious Emission below 1GHz(30MHz to 1GHz)

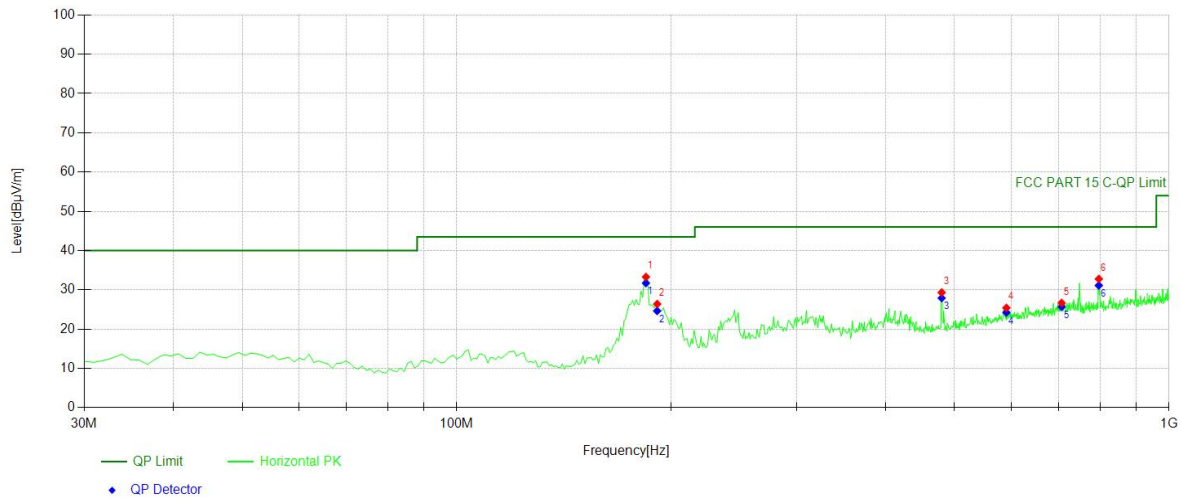
Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result was 8DPSK report as below:

2402



Suspected Data List

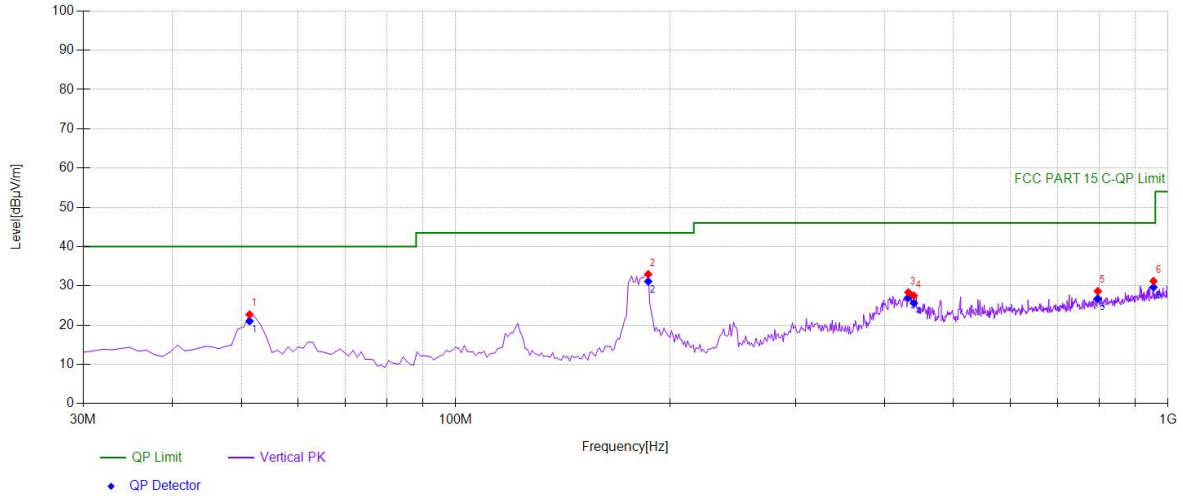
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	52.3323	39.17	-17.52	21.65	PK	40.00	18.35	Vertical
2	186.326	55.61	-17.98	37.63	PK	43.50	5.87	Vertical
3	420.330	39.90	-11.73	28.17	PK	46.00	17.83	Vertical
4	454.314	39.44	-11.09	28.35	PK	46.00	17.65	Vertical
5	843.673	33.44	-3.84	29.60	PK	46.00	16.40	Vertical
6	926.206	34.06	-2.71	31.35	PK	46.00	14.65	Vertical



Suspected Data List

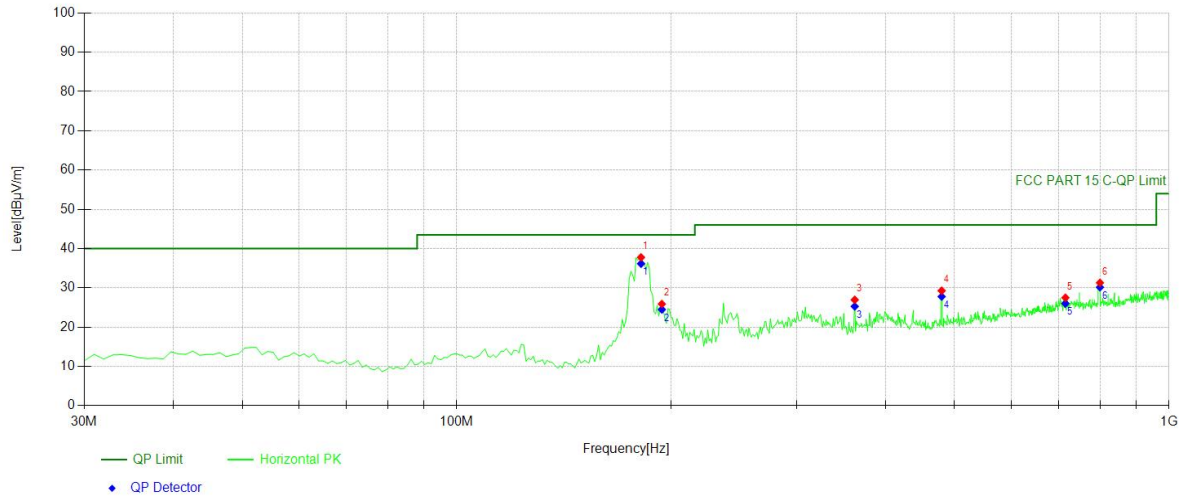
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	184.384	51.41	-18.11	33.30	PK	43.50	10.20	Horizontal
2	191.181	44.08	-17.68	26.40	PK	43.50	17.10	Horizontal
3	479.559	39.13	-9.81	29.32	PK	46.00	16.68	Horizontal
4	591.221	32.57	-7.14	25.43	PK	46.00	20.57	Horizontal
5	706.766	32.56	-5.87	26.69	PK	46.00	19.31	Horizontal
6	797.067	37.23	-4.45	32.78	PK	46.00	13.22	Horizontal

2441



Suspected Data List

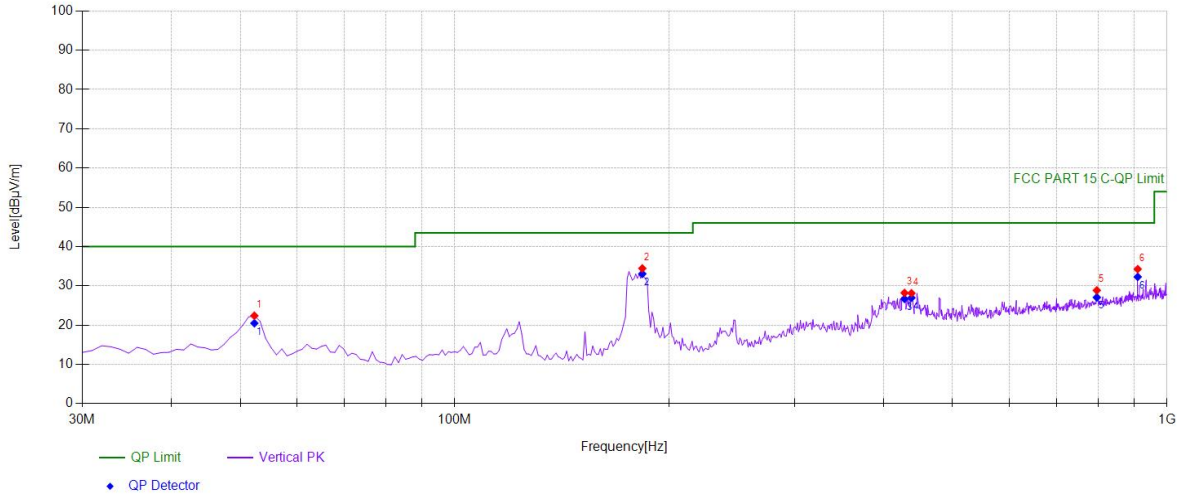
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	51.3614	40.08	-17.39	22.69	PK	40.00	17.31	Vertical
2	186.326	50.94	-17.98	32.96	PK	43.50	10.54	Vertical
3	431.982	39.73	-11.40	28.33	PK	46.00	17.67	Vertical
4	439.749	38.70	-11.19	27.51	PK	46.00	18.49	Vertical
5	797.067	33.09	-4.45	28.64	PK	46.00	17.36	Vertical
6	954.364	33.52	-2.31	31.21	PK	46.00	14.79	Vertical



Suspected Data List

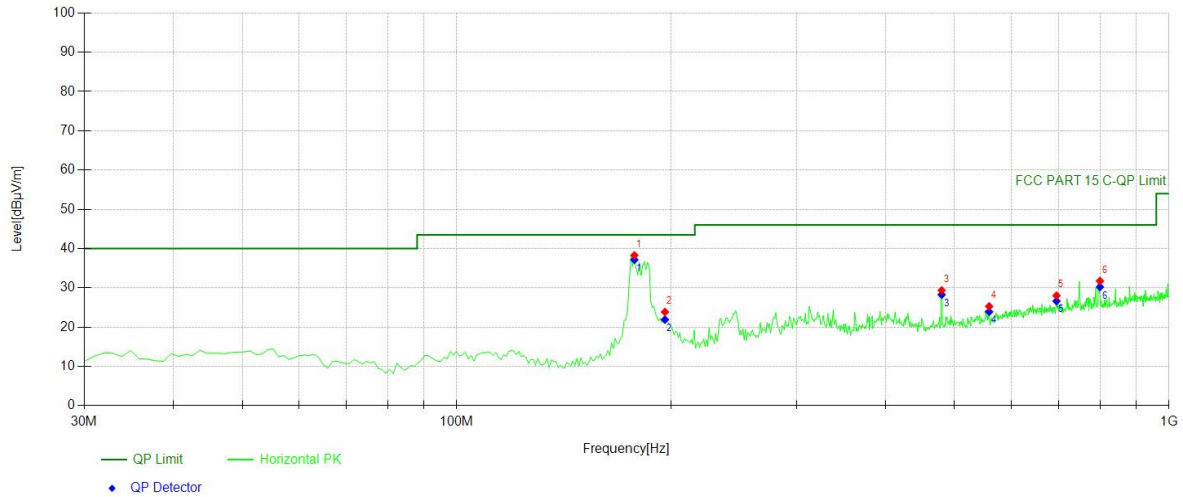
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	181.471	56.06	-18.30	37.76	PK	43.50	5.74	Horizontal
2	194.094	43.38	-17.49	25.89	PK	43.50	17.61	Horizontal
3	362.072	40.23	-13.27	26.96	PK	46.00	19.04	Horizontal
4	479.559	39.08	-9.81	29.27	PK	46.00	16.73	Horizontal
5	715.505	33.33	-5.83	27.50	PK	46.00	18.50	Horizontal
6	799.98	35.71	-4.42	31.29	PK	46.00	14.71	Horizontal

2480



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	52.3323	39.92	-17.52	22.40	PK	40.00	17.60	Vertical
2	183.413	52.62	-18.17	34.45	PK	43.50	9.05	Vertical
3	428.098	39.72	-11.51	28.21	PK	46.00	17.79	Vertical
4	437.807	39.36	-11.23	28.13	PK	46.00	17.87	Vertical
5	797.067	33.31	-4.45	28.86	PK	46.00	17.14	Vertical
6	909.699	37.11	-2.84	34.27	PK	46.00	11.73	Vertical



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	177.587	56.81	-18.52	38.29	PK	43.50	5.21	Horizontal
2	196.036	41.24	-17.38	23.86	PK	43.50	19.64	Horizontal
3	479.559	39.18	-9.81	29.37	PK	46.00	16.63	Horizontal
4	559.179	34.31	-9.02	25.29	PK	46.00	20.71	Horizontal
5	695.115	34.01	-5.98	28.03	PK	46.00	17.97	Horizontal
6	799.98	36.18	-4.42	31.76	PK	46.00	14.24	Horizontal

9.8 CONDUCTED EMISSION TEST

9.8.1 Applicable Standard

According to FCC Part 15.207(a)

9.8.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

9.8.3 Test Configuration

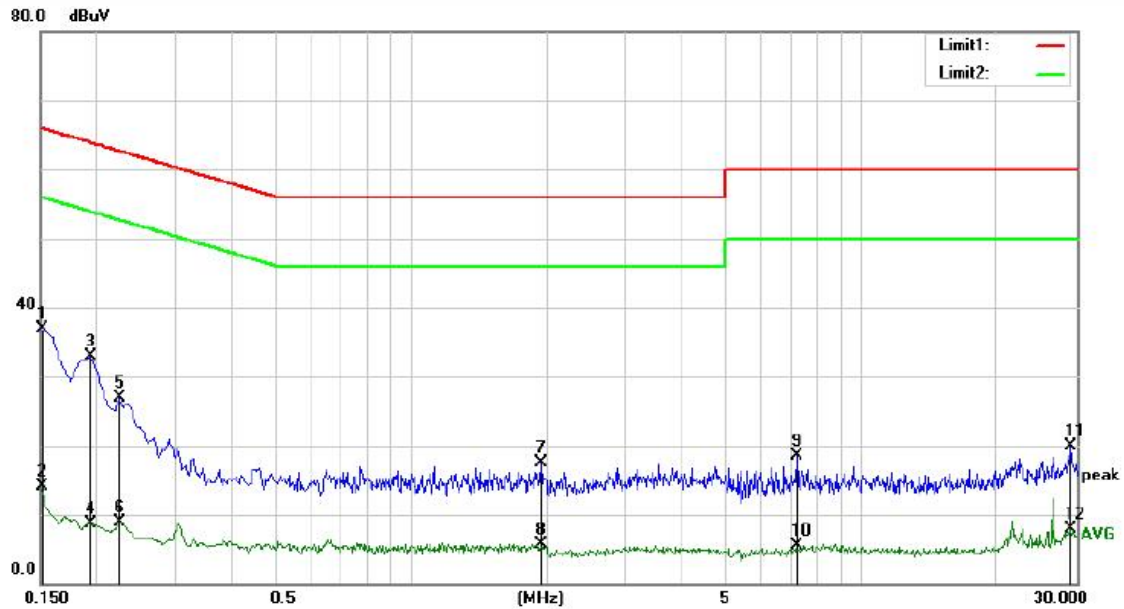
Test according to clause 7.3 conducted emission test setup

9.8.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

9.8.5 Test Results

The 120V & 240V voltage have been tested, and the worst result recorded as below:



Site: Conduction #1

Phase: **N**

Temperature: 21.9

Limit: (CE)FCC PART 15 class B_QP

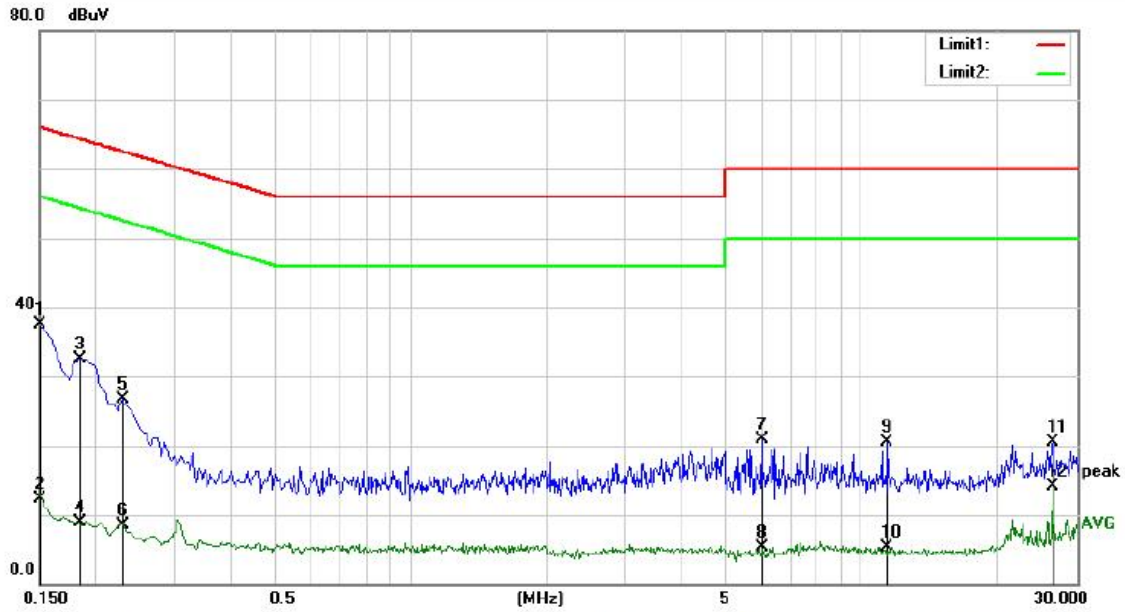
Power: AC 120V/60Hz

Humidity: 58 %

Mode: BT mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1516	27.47	9.53	37.00	65.91	-28.91	QP	
2		0.1516	4.62	9.53	14.15	55.91	-41.76	AVG	
3		0.1950	22.78	10.04	32.82	63.82	-31.00	QP	
4		0.1950	-1.26	10.04	8.78	53.82	-45.04	AVG	
5		0.2250	16.75	10.08	26.83	62.63	-35.80	QP	
6		0.2250	-1.09	10.08	8.99	52.63	-43.64	AVG	
7		1.9450	7.78	9.71	17.49	56.00	-38.51	QP	
8		1.9450	-3.96	9.71	5.75	46.00	-40.25	AVG	
9		7.1800	8.44	9.98	18.42	60.00	-41.58	QP	
10		7.1800	-4.46	9.98	5.52	50.00	-44.48	AVG	
11		29.1550	9.84	10.05	19.89	60.00	-40.11	QP	
12		29.1550	-2.10	10.05	7.95	50.00	-42.05	AVG	



Site Conduction #1

Phase: **L1**

Temperature: 21.9

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

Humidity: 58 %

Mode: BT mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	28.00	9.51	37.51	66.00	-28.49	QP	
2		0.1500	2.71	9.51	12.22	56.00	-43.78	AVG	
3		0.1850	22.53	9.92	32.45	64.26	-31.81	QP	
4		0.1850	-1.04	9.92	8.88	54.26	-45.38	AVG	
5		0.2300	16.56	10.08	26.64	62.45	-35.81	QP	
6		0.2300	-1.48	10.08	8.60	52.45	-43.85	AVG	
7		6.0050	10.95	9.93	20.88	60.00	-39.12	QP	
8		6.0050	-4.70	9.93	5.23	50.00	-44.77	AVG	
9		11.4050	10.52	10.01	20.53	60.00	-39.47	QP	
10		11.4050	-4.67	10.01	5.34	50.00	-44.66	AVG	
11		26.5300	10.66	9.83	20.49	60.00	-39.51	QP	
12		26.5300	4.33	9.83	14.16	50.00	-35.84	AVG	

9.9 ANTENNA APPLICATION

9.9.1 Antenna Requirement

Standard	Requirement
FCC CRF Part15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.9.2 Result

The EUT'S antenna is PCB antenna. The antenna's gain is -0.58 dBi, and the antenna can't be replaced by the user which in accordance to section 15.203, please refer to the photos.

-----The end-----