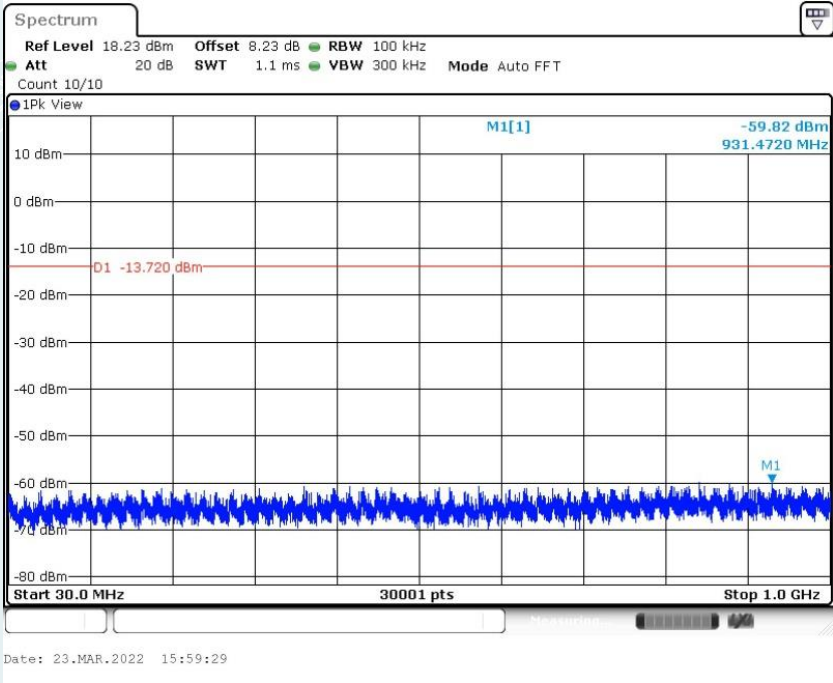
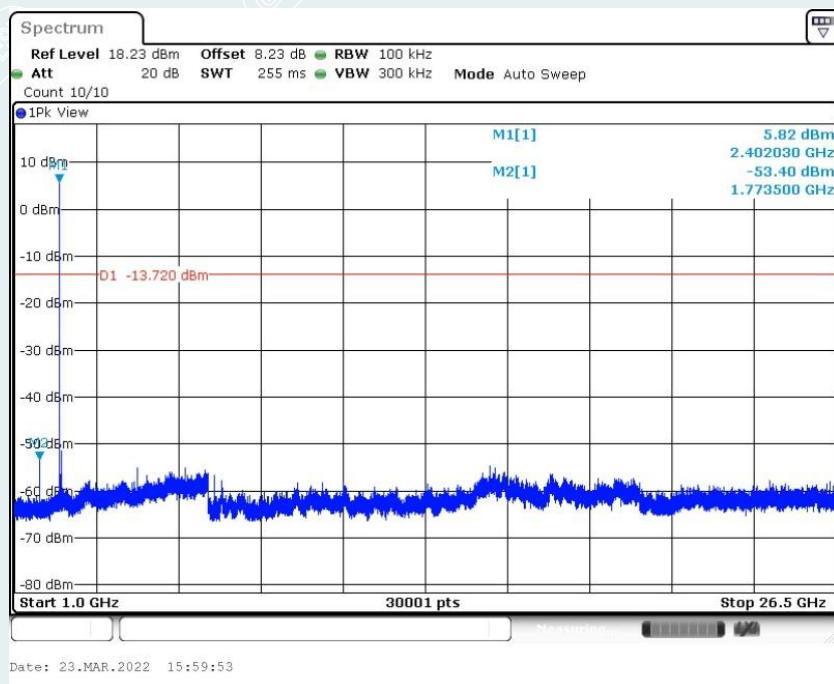


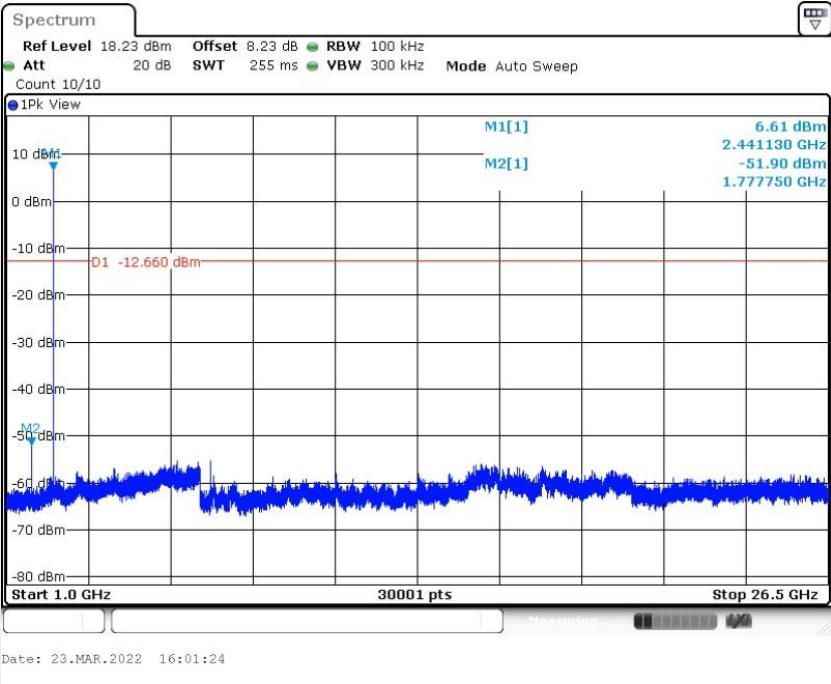
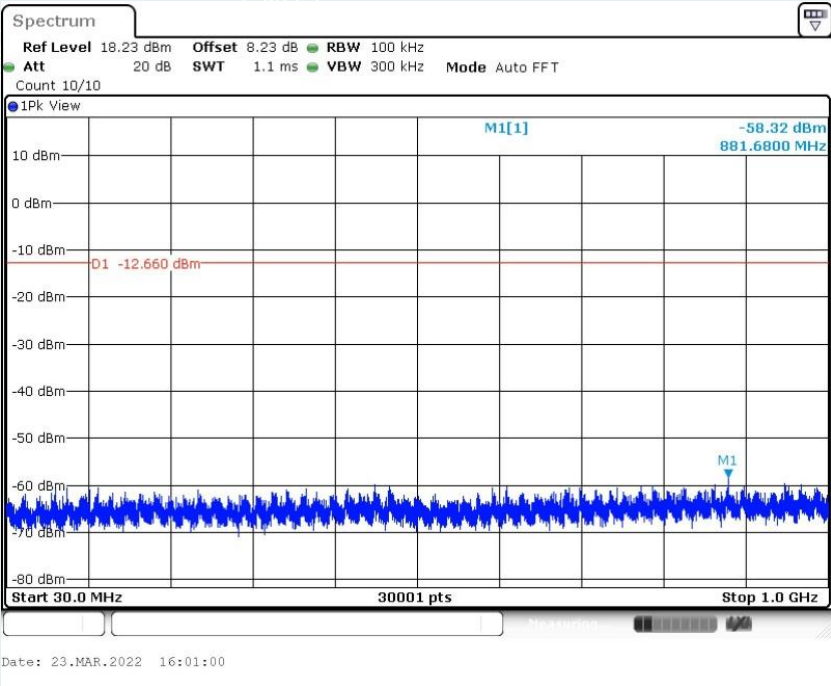
Spurious Emissions
DH5
CH Low



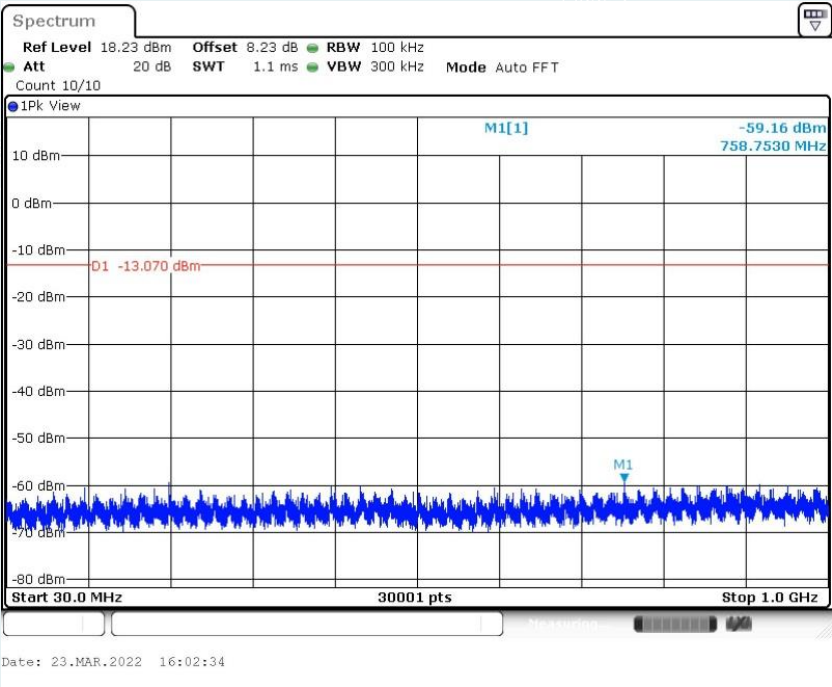
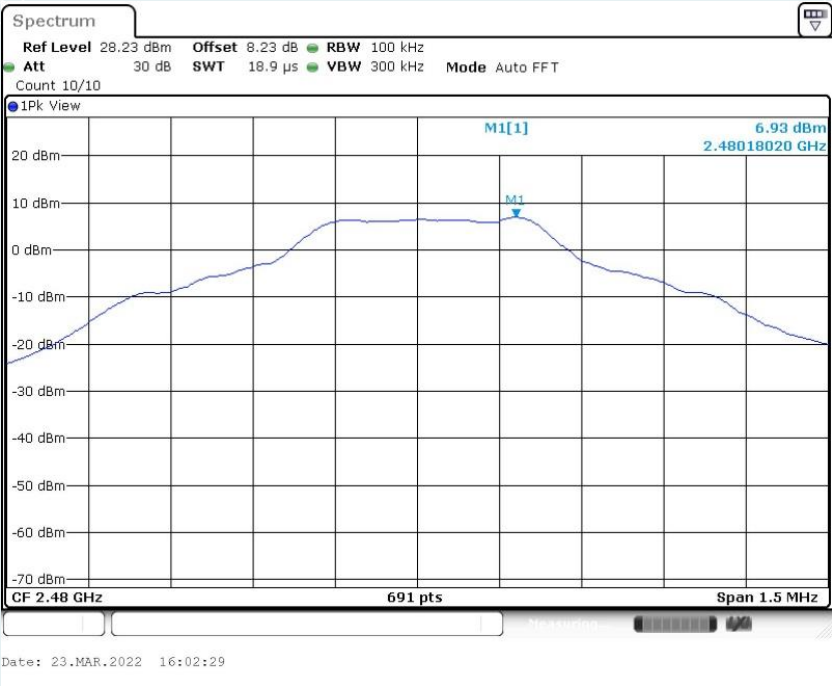


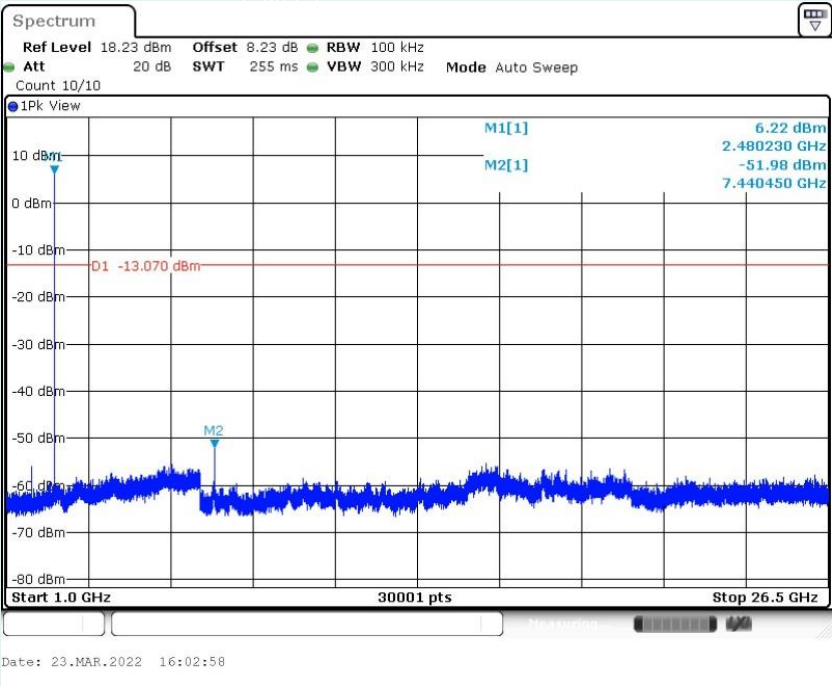
CH Mid



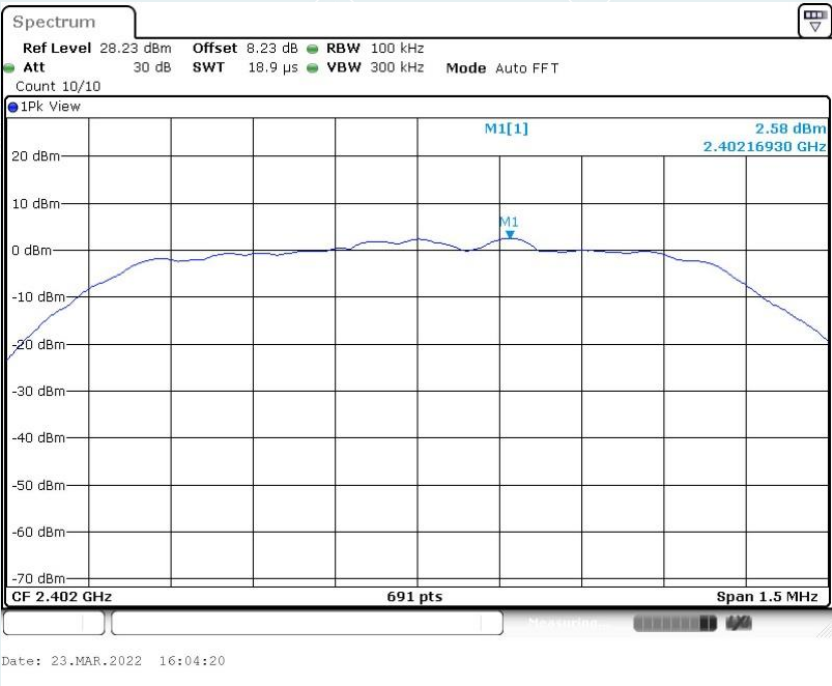


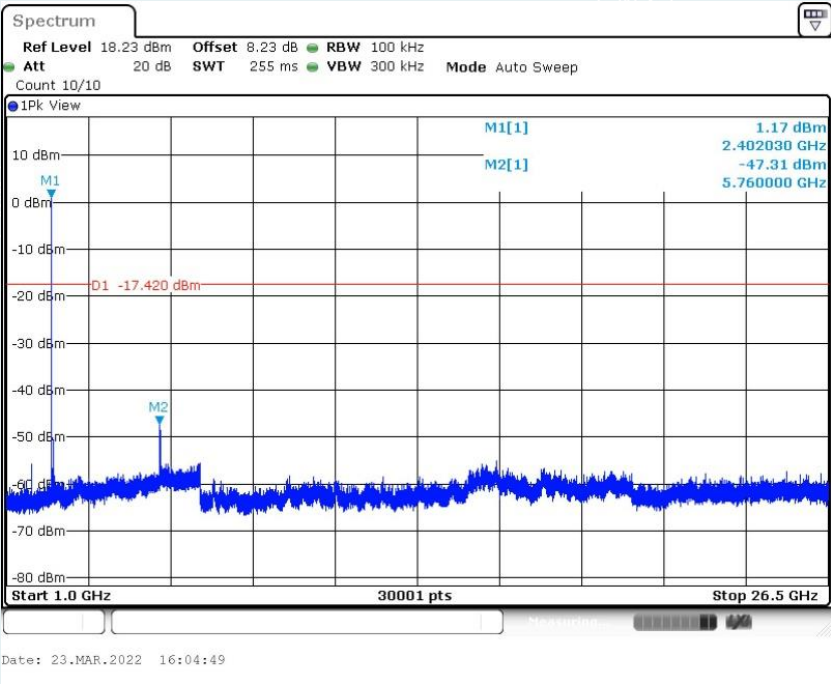
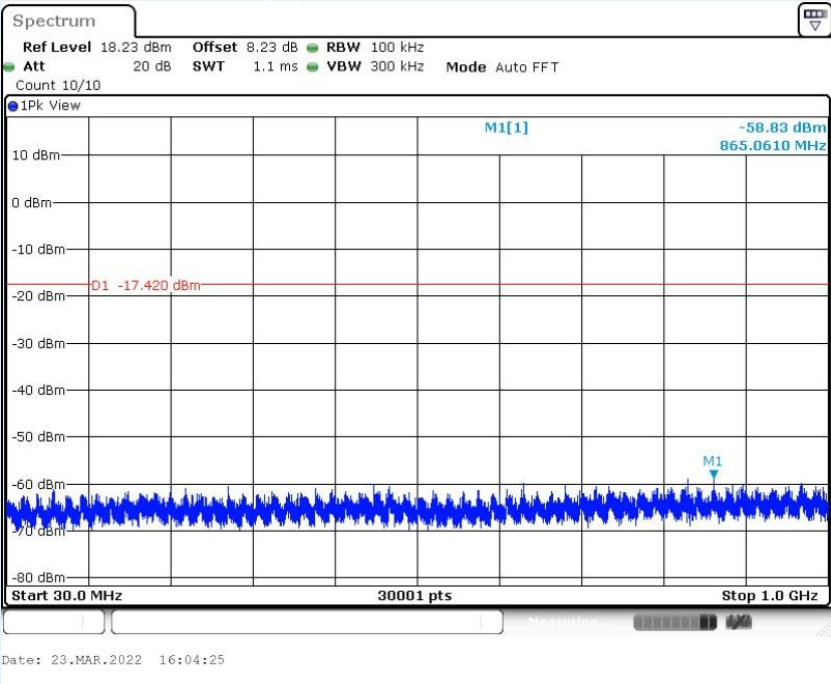
CH High



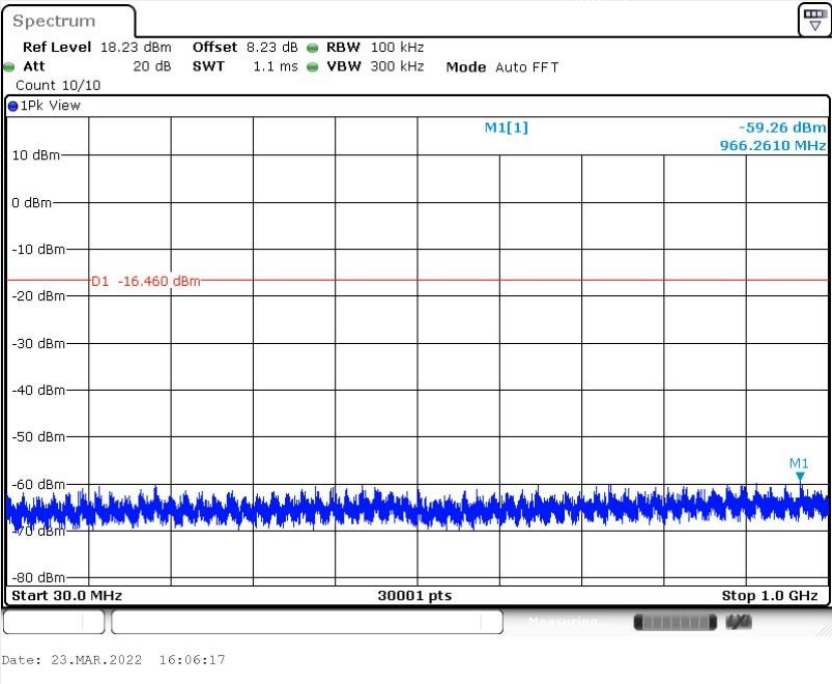
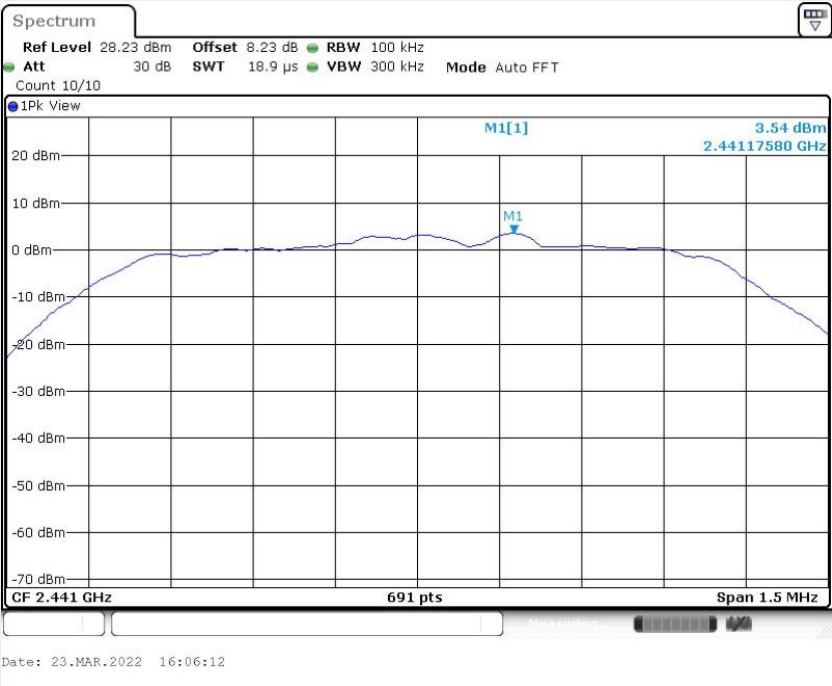


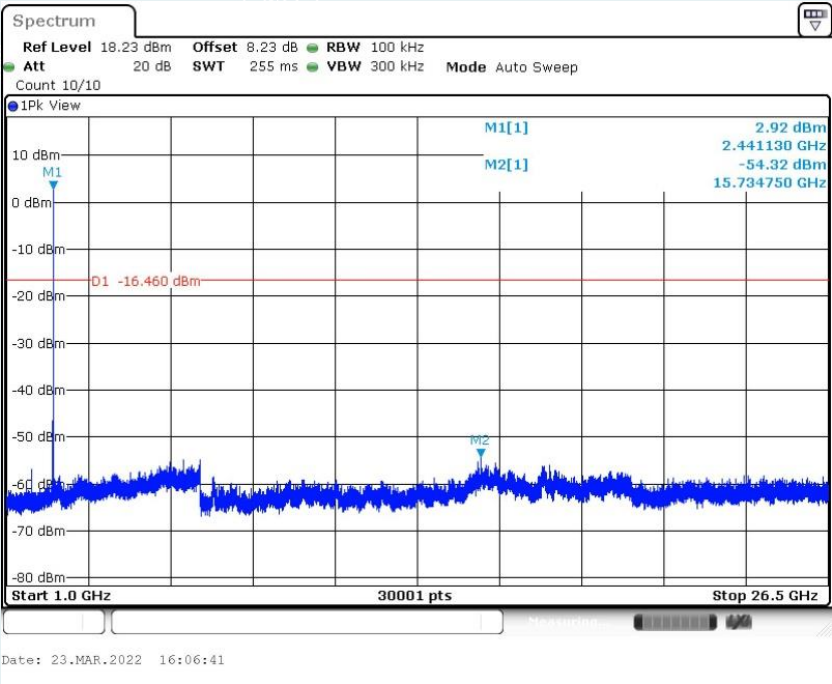
2DH5
CH Low



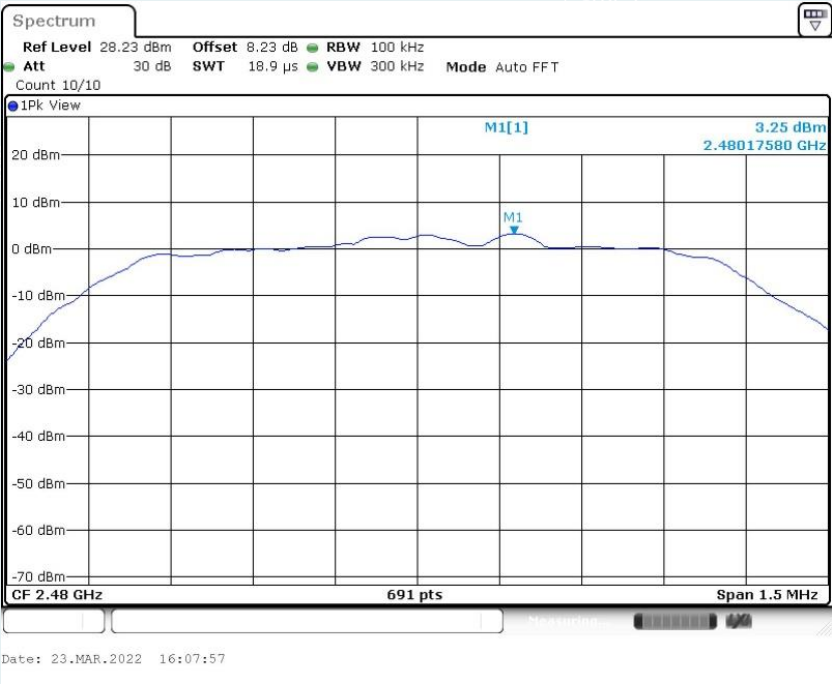


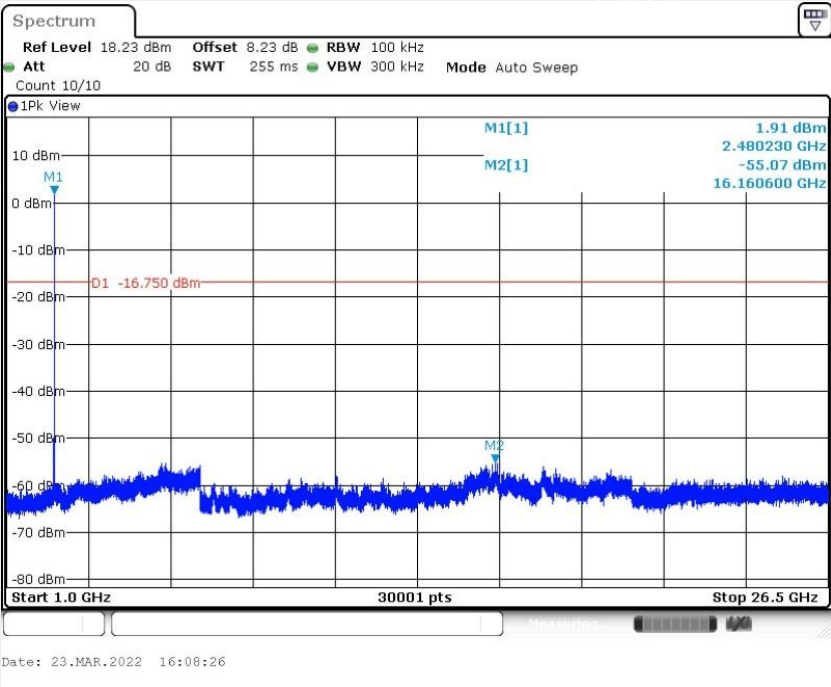
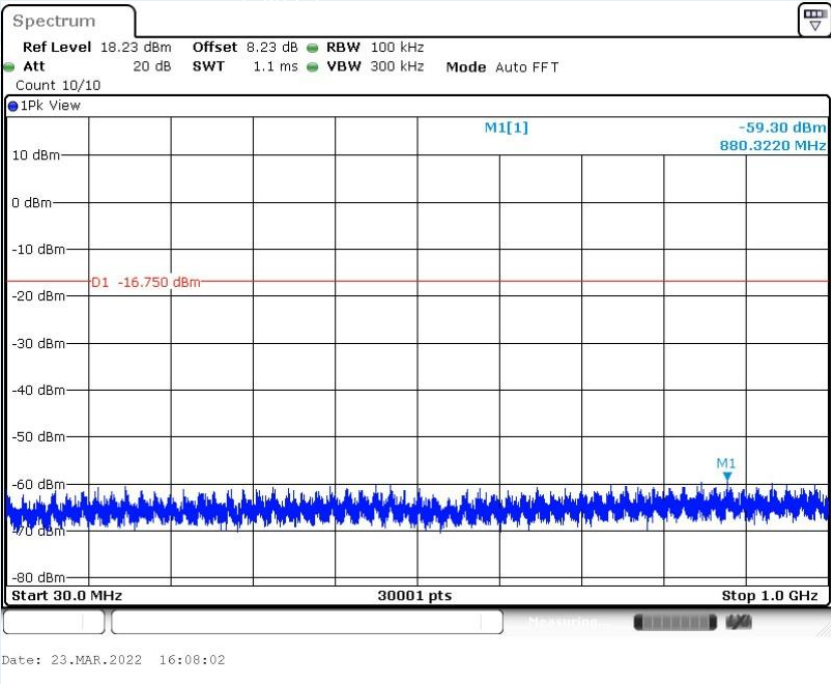
CH Mid

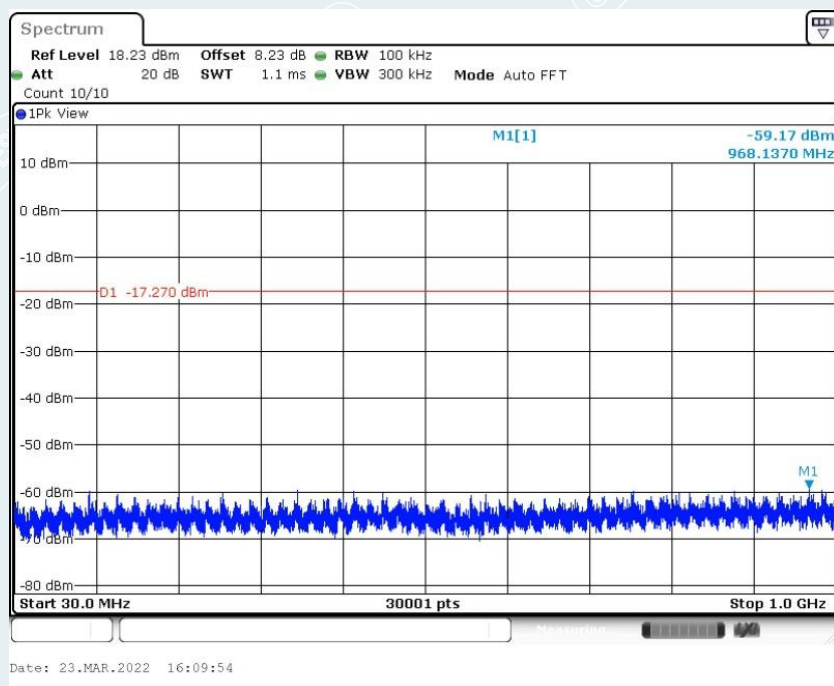
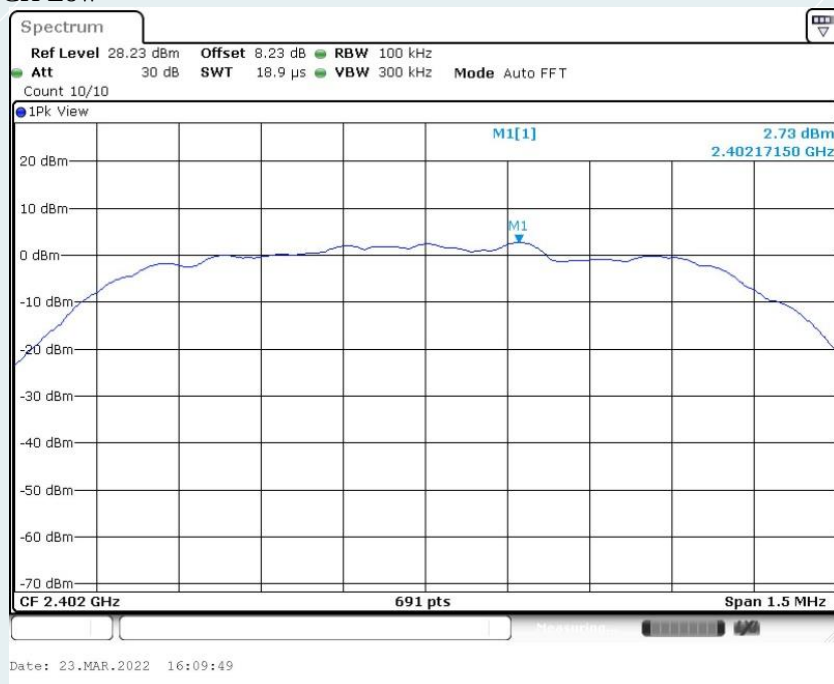


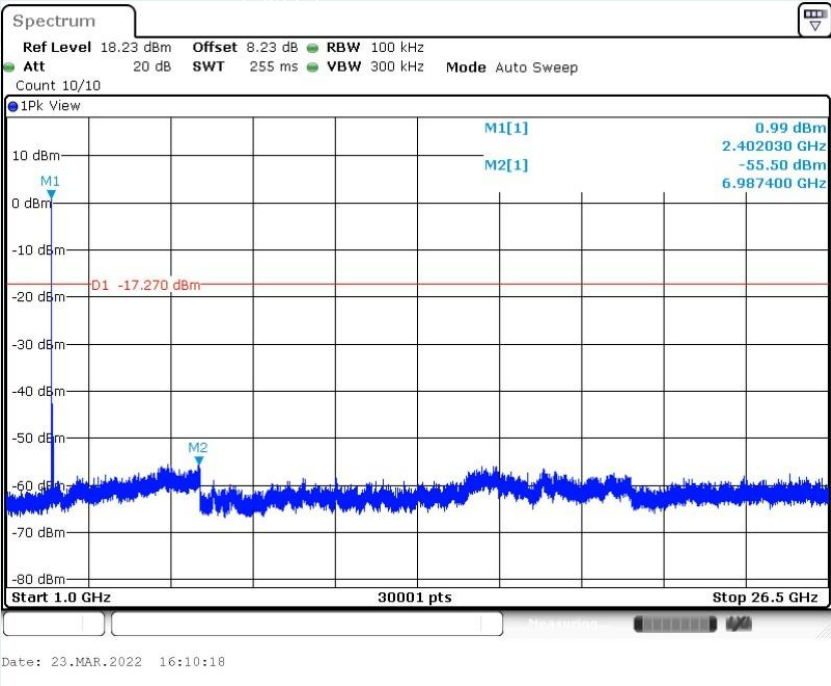


CH High

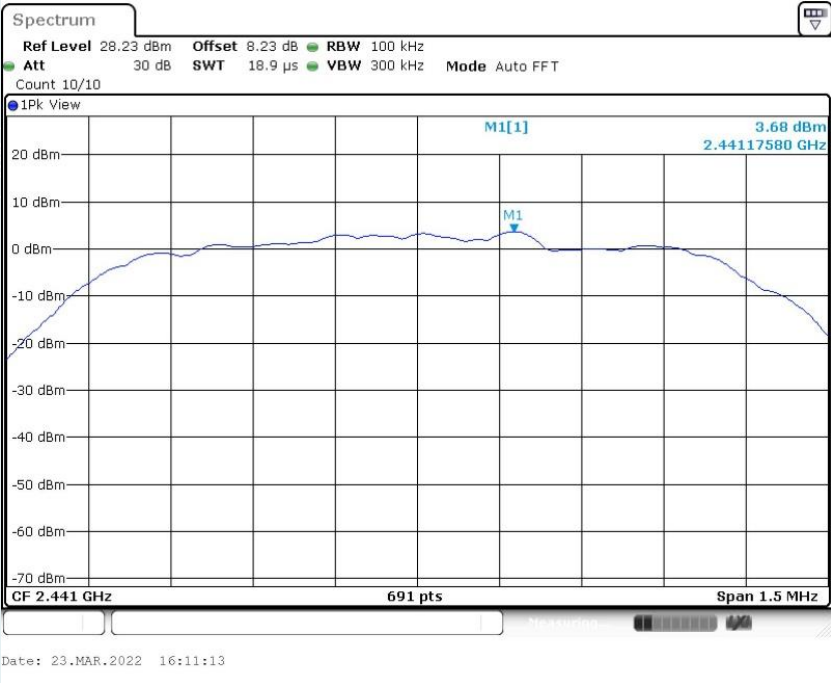


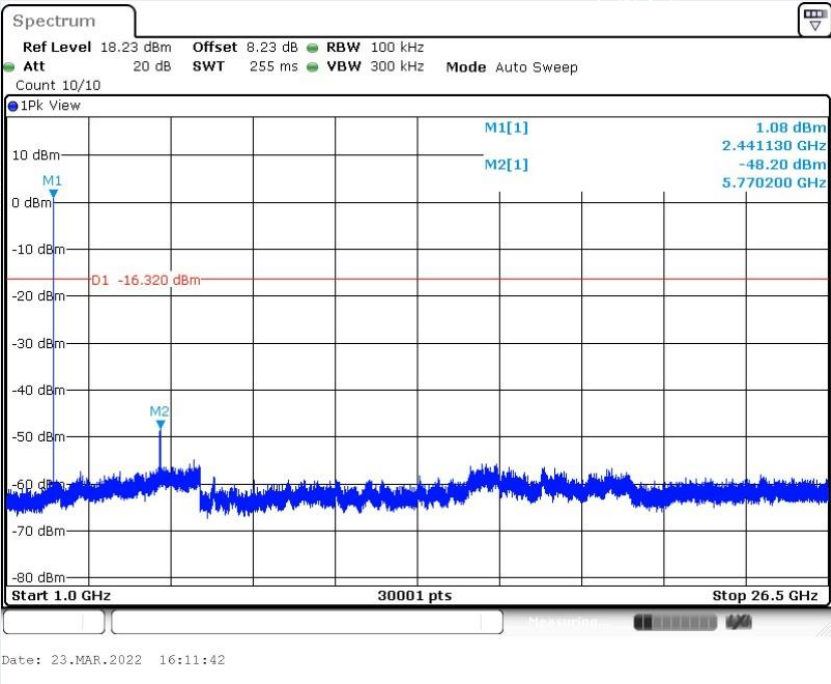
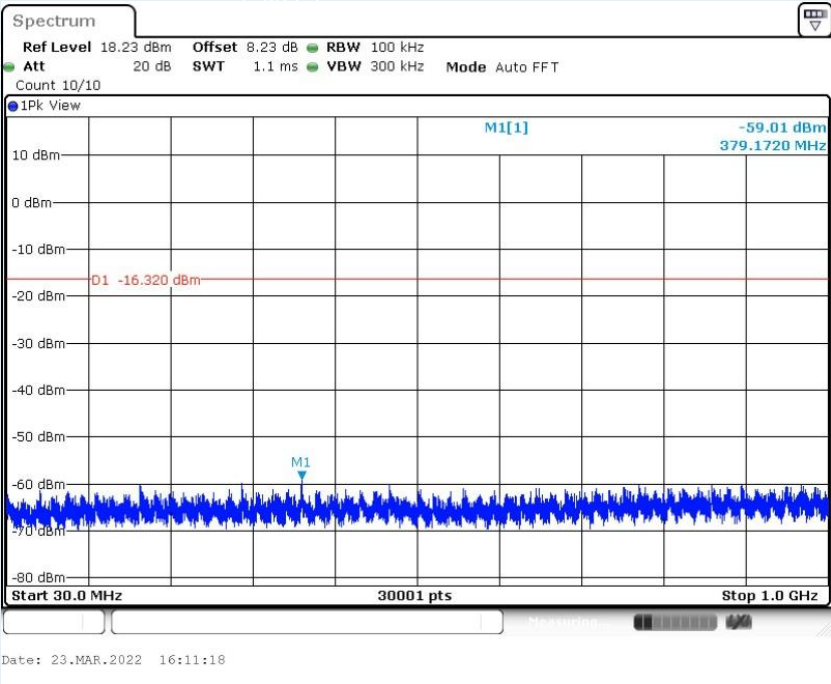


3DH5
CH Low

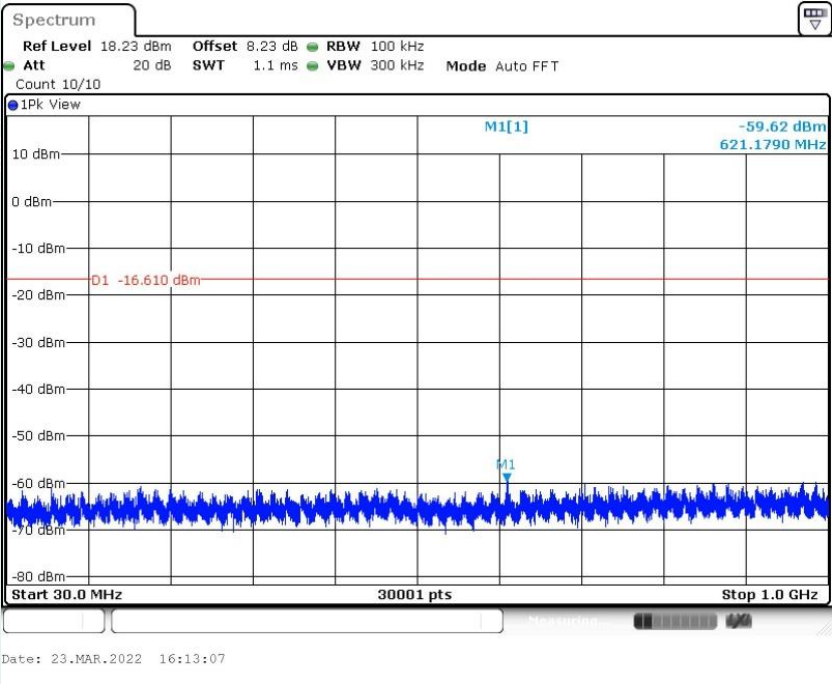
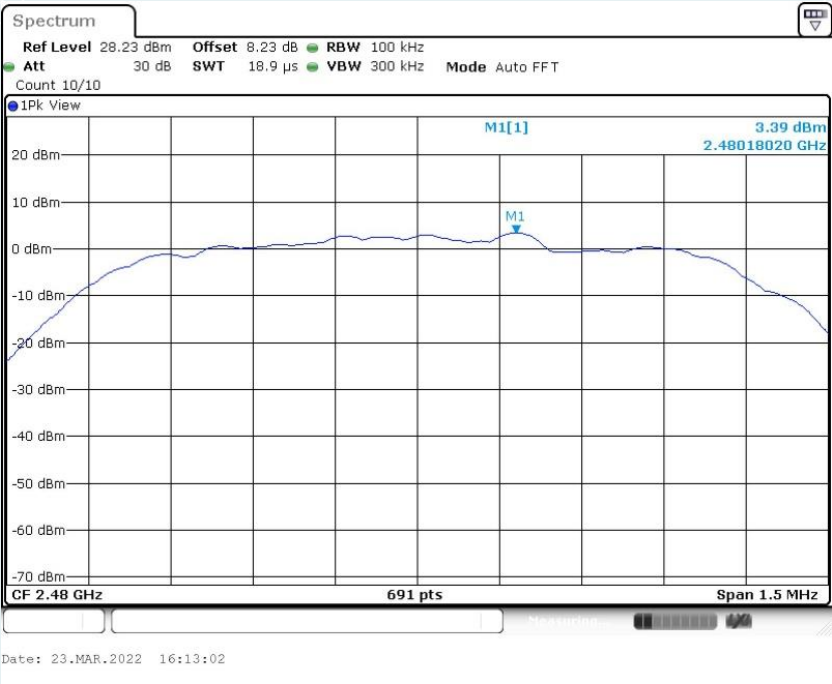


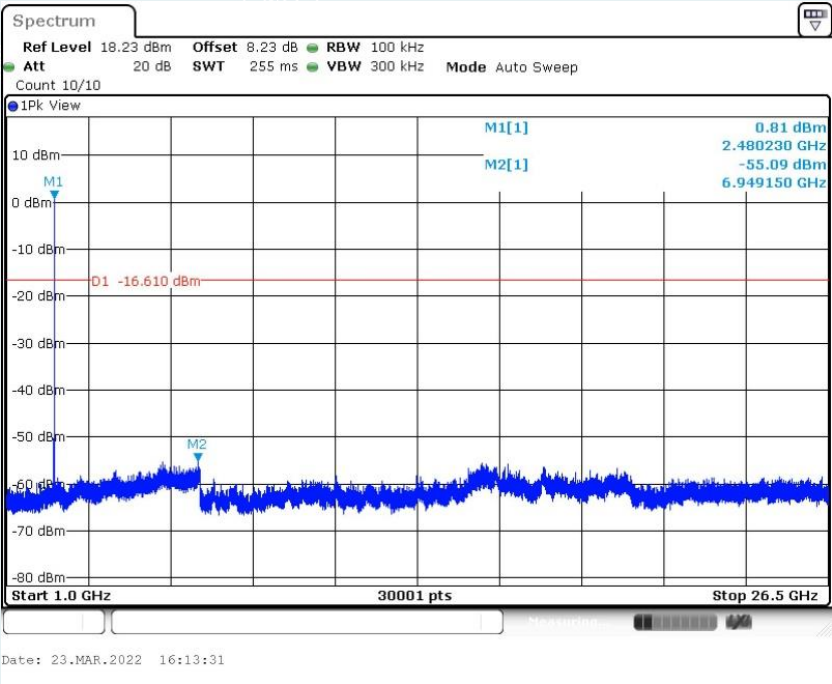
CH Mid





CH High





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13. RADIATED SPURIOUS EMISSIONS

13.1 LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak($\mu\text{V/m}$)	Measurement distance(m)	Quasi-peak(dB $\mu\text{V/m}$)@distance 3m
0.009-0.490	$2400/F(\text{kHz})$	300	128.5~93.8
0.490-1.705	$24000/F(\text{kHz})$	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE:

- (1) The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.
- (2) The lower limit shall apply at the transition frequencies.
- (3) Above 18GHz test distance is 1m, so the Peak Limit= $74+20*\log(3/1)=83.54$ (dB $\mu\text{V/m}$).
The Avg Limit= $54+20*\log(3/1)=63.54$ (dB $\mu\text{V/m}$).

13.2 TEST PROCEDURES

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0 °to 360 °.
- The antenna height is 1.0 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the pre measurement the software maximizes by rotating the turntable

position (0 ° to 360 °) and by rotating the elevation axes (0 ° to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 ° to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 4 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 ° to 360 ° and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0 °to 360 °.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0 °to 360 °and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE:

(a).The frequency from 9kHz to 150kHz, Set RBW=300Hz(for Peak & AVG), VBW=300Hz(for Peak & AVG). The frequency from 150kHz to 30MHz, Set RBW=9kHz, VBW=9kHz, (for QP Detector).

(b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, VBW=300kHz, (for QP Detector).

(c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz,VBW=3MHz.

(d). The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle $\geq 98\%$, set $VBW \leq RBW/100$ (i.e.,10kHz) but not less than 10Hz. Where duty cycle is defined in section 2.8. If the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$, Where T is defined in section 2.8.

13.3 TEST SETUP

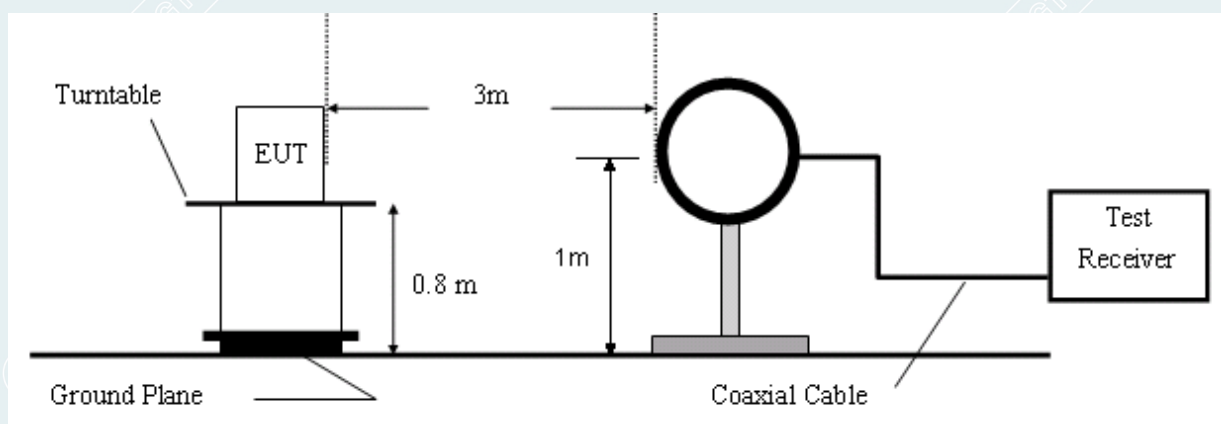


Figure 1. 9 kHz to 30MHz radiated emissions test configuration

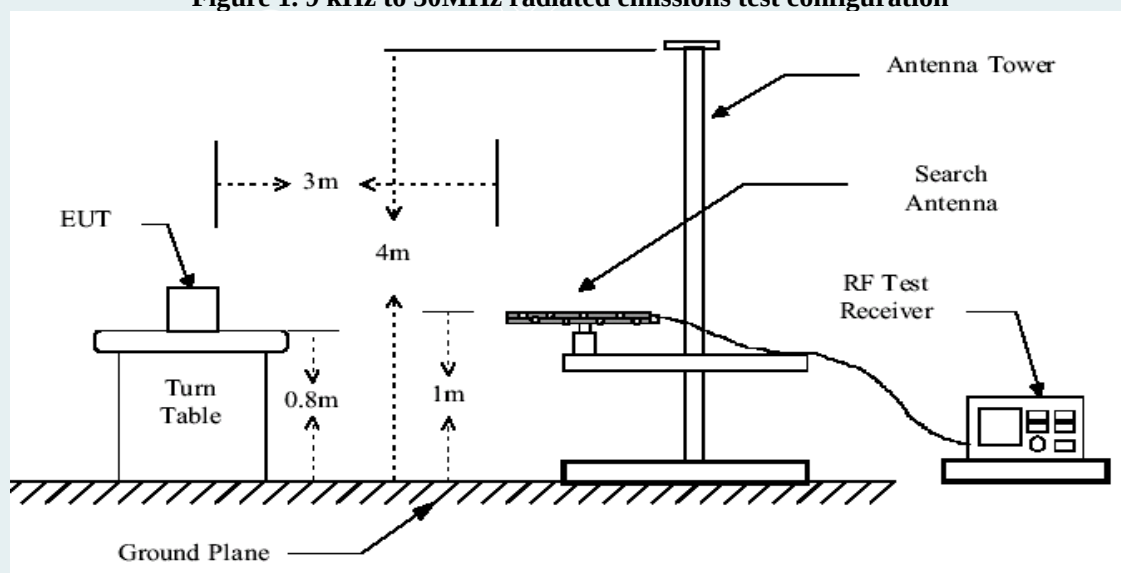


Figure 2. 30MHz to 1GHz radiated emissions test configuration

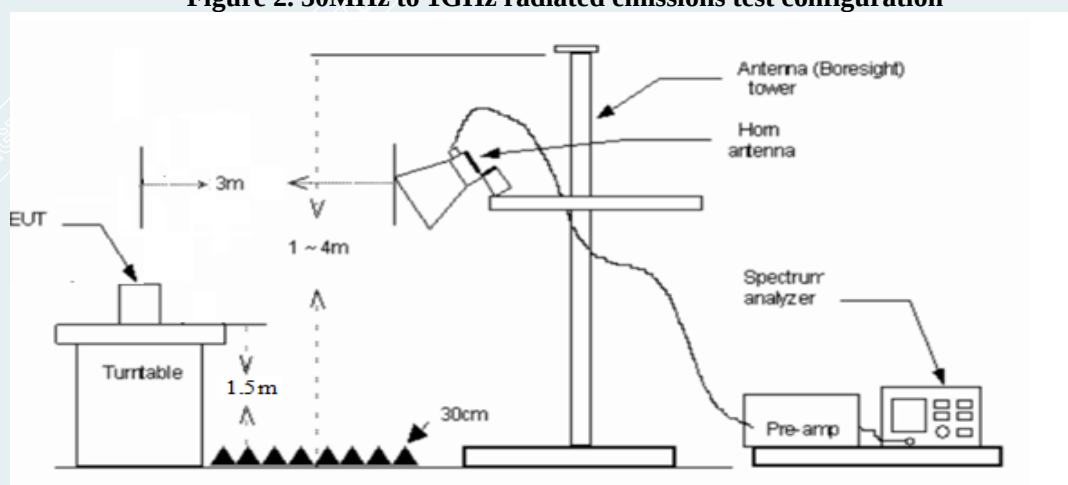


Figure 3. 1GHz to 18GHz radiated emissions test configuration

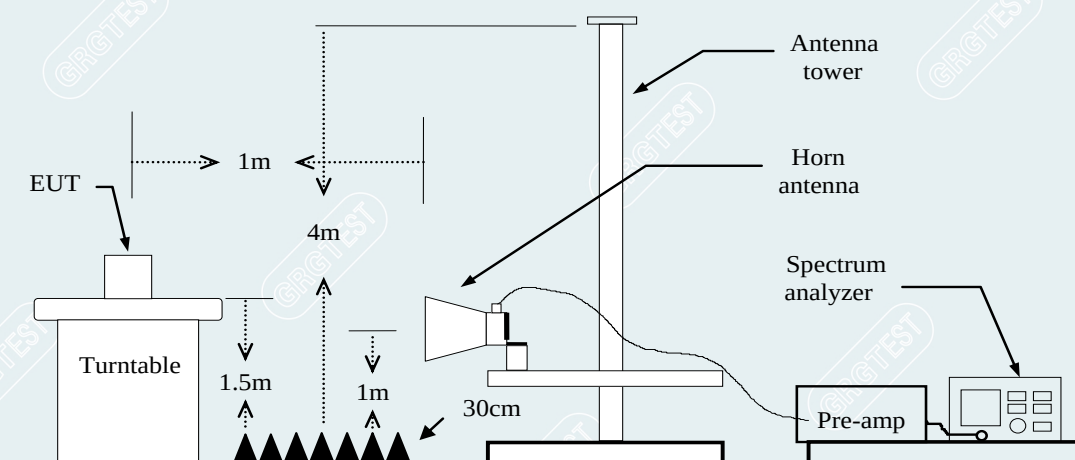


Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

13.4 DATA SAMPLE

30MHz to 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

1GHz to 18GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical

Above 18GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	68.86	57.66	-11.20	83.54	25.88	peak	Vertical
xxx	xxx	68.89	-11.20	57.69	63.54	5.85	AVG	Vertical

Frequency (MHz)

= Emission frequency in MHz

Ant.Pol. (H/V)

= Antenna polarization

Reading (dBuV)

= Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m)

= Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m)

= Reading (dBuV) + Correction Factor (dB/m)

Limit (dBuV/m)

= Limit stated in standard

Margin (dB)

= Remark Result (dBuV/m) – Limit (dBuV/m)

Peak

= Peak Reading

QP

= Quasi-peak Reading

AVG

= Average Reading

13.5 TEST RESULTS

Below 1GHz:

Recorded the worst case GFSK 2402MHz test results in the report.

Mode: DH5

Low Frequency (2402MHz)

Environment:

Test Engineer:

Test Voltage:

Polarity:

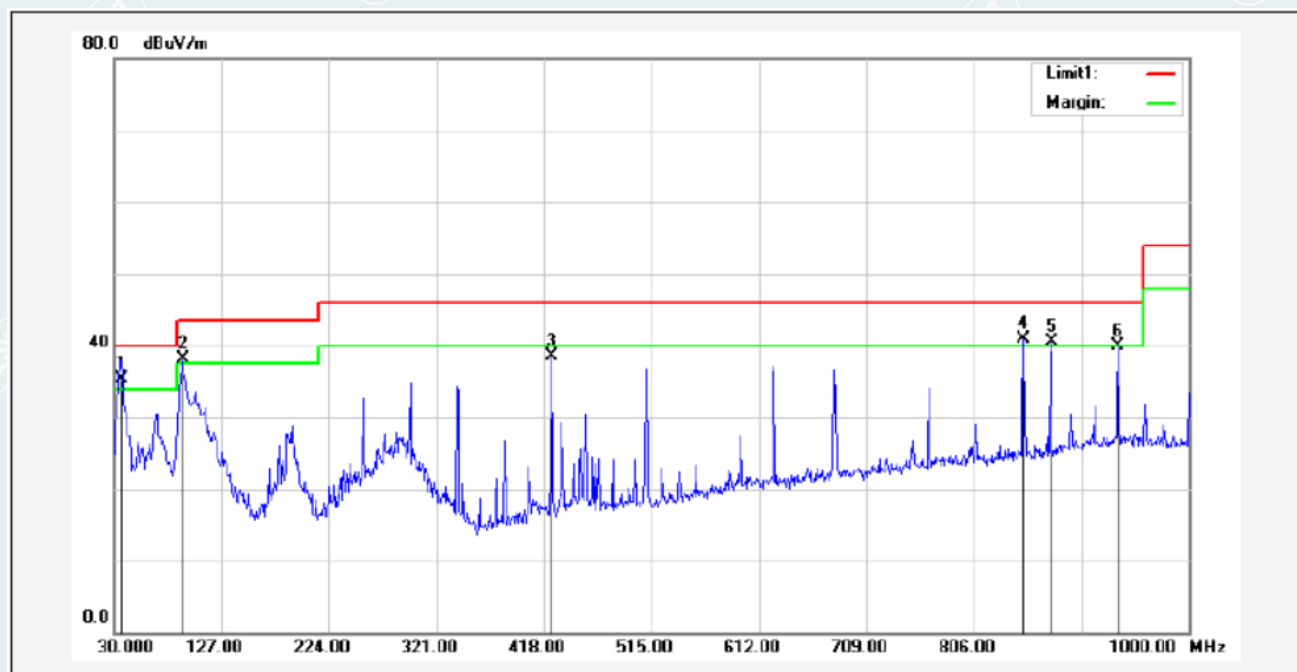
Date: 2022-03-30

23.7 °C / 54 %RH

Zeng Xianglong

AC 120V/60Hz

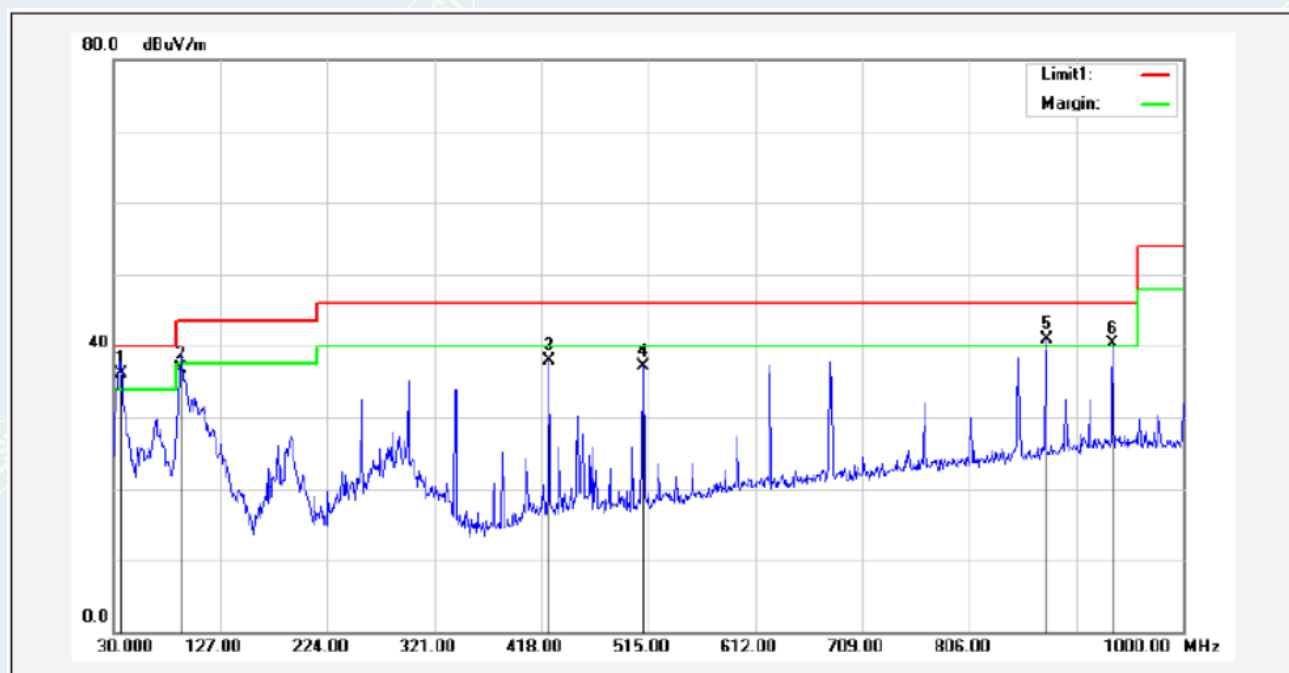
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	36.7900	63.06	-27.66	35.40	40.00	-4.60	10	100	QP
2I	92.0800	68.99	-30.85	38.14	43.50	-5.36	67	100	QP
3	424.7900	58.22	-19.63	38.59	46.00	-7.41	224	100	QP
4I	850.6200	51.87	-10.91	40.96	46.00	-5.04	360	143	QP
5I	875.8400	51.03	-10.50	40.53	46.00	-5.47	351	100	QP
6	935.9800	49.45	-9.60	39.85	46.00	-6.15	185	100	QP

Mode: DH5
 Low Frequency (2402MHz)
 Environment:
 Test Engineer:
 Test Voltage:
 Polarity:

Date: 2022-03-30
 23.7 °C / 54 %RH
 Zeng Xianglong
 AC 120V/60Hz
 Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1*	36.7900	63.76	-27.66	36.10	40.00	-3.90	254	100	QP
2	91.1100	67.76	-31.06	36.70	43.50	-6.80	0	173	QP
3	424.7900	57.57	-19.63	37.94	46.00	-8.06	232	100	QP
4	510.1500	54.85	-17.65	37.20	46.00	-8.80	146	100	QP
5!	875.8400	51.38	-10.50	40.88	46.00	-5.12	1	100	QP
6!	935.9800	49.82	-9.60	40.22	46.00	-5.78	185	100	QP

Remark:

- No emission found between lowest internal used/generated frequency to 30MHz.
- Pre-scan all mode and recorded the worst case results in this report (DH5).
- Measuring frequencies from 9kHz to the 1GHz.
- Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak/Quasi-peak detector mode.
- Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- The IF bandwidth of SPA between 30MHz to 1GHz was 120kHz.

Above 1GHz:

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Mode: DH5

Lowest Frequency (2402MHz)

Environment:

Test Engineer:

Test Voltage:

Date: 2022-03-23

25°C / 60 %RH

Lu Qiang

AC 120V/60Hz

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.5000	70.45	45.78	-24.67	74.00	28.22	200	206	Horizontal
2	1368.0000	73.31	50.34	-22.97	74.00	23.66	200	136	Horizontal
3	1701.0000	65.46	43.86	-21.60	74.00	30.14	200	154	Horizontal
4	1870.2500	62.01	40.88	-21.13	74.00	33.12	200	136	Horizontal
5	1955.2500	63.36	42.32	-21.04	74.00	31.68	200	182	Horizontal
6	2286.2500	69.97	50.25	-19.72	74.00	23.75	200	156	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.0000	70.09	45.42	-24.67	74.00	28.58	200	200	Vertical
2	1368.2500	72.63	49.66	-22.97	74.00	24.34	200	334	Vertical
3	1700.0000	64.98	43.38	-21.60	74.00	30.62	100	149	Vertical
4	2040.7500	63.98	43.41	-20.57	74.00	30.59	200	195	Vertical
5	2274.7500	70.62	50.88	-19.74	74.00	23.12	200	190	Vertical
6	3193.1250	61.42	44.69	-16.73	74.00	29.31	100	119	Vertical

----- The following blanks -----

Mode: DH5
Middle Frequency (2441MHz)
Environment:
Test Engineer:
Test Voltage:

Date: 2022-03-23
25°C / 60 %RH
Chen Xiacong
AC 120V/60Hz

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1374.0468	58.56	34.94	-23.62	74.00	39.06	200	160	Horizontal
2	2285.6607	60.08	39.88	-20.20	74.00	34.12	200	176	Horizontal
3	3193.1491	53.85	37.87	-15.98	74.00	36.13	100	248	Horizontal
4	4198.2748	52.57	39.48	-13.09	74.00	34.52	200	37	Horizontal
5	5795.9745	50.75	42.37	-8.38	74.00	31.63	200	79	Horizontal
6	7219.2774	49.24	45.90	-3.34	74.00	28.10	200	352	Horizontal

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.0460	62.48	38.83	-23.65	74.00	35.17	100	185	Vertical
2	2040.1300	61.98	40.49	-21.49	74.00	33.51	200	4	Vertical
3	2285.9107	66.28	46.08	-20.20	74.00	27.92	200	346	Vertical
4	3806.3508	55.55	41.23	-14.32	74.00	32.77	200	359	Vertical
5	4100.7626	56.40	42.53	-13.87	74.00	31.47	200	3	Vertical
6	7134.8919	49.56	45.88	-3.68	74.00	28.12	200	1	Vertical

----- The following blanks -----

Mode: DH5
Highest Frequency (2480MHz)
Environment:
Test Engineer:
Test Voltage:

Date: 2022-03-23
25°C / 60 %RH
Chen Xiacong
AC 120V/60Hz

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1373.5467	57.72	34.10	-23.62	74.00	39.90	100	160	Horizontal
2	1761.5952	57.19	34.84	-22.35	74.00	39.16	200	87	Horizontal
3	2275.4094	60.56	40.27	-20.29	74.00	33.73	100	151	Horizontal
4	3191.2739	54.70	38.68	-16.02	74.00	35.32	100	258	Horizontal
5	4655.8320	50.61	40.36	-10.25	74.00	33.64	100	217	Horizontal
6	7215.5269	48.87	45.57	-3.30	74.00	28.43	200	346	Horizontal

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1700.5876	61.00	38.64	-22.36	74.00	35.36	100	332	Vertical
2	2285.6607	67.15	46.95	-20.20	74.00	27.05	200	345	Vertical
3	3200.6501	56.62	40.78	-15.84	74.00	33.22	200	314	Vertical
4	4098.8874	55.99	42.10	-13.89	74.00	31.90	200	0	Vertical
5	5923.4904	53.00	45.22	-7.78	74.00	28.78	200	0	Vertical
6	7982.4978	47.87	46.28	-1.59	74.00	27.72	100	330	Vertical

----- The following blanks -----

Mode: 2DH5
Lowest Frequency (2402MHz)
Environment:
Test Engineer:
Test Voltage:

Date: 2022-03-23
25°C / 60 %RH
Chen Xiacong
AC 120V/60Hz

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.0460	60.04	36.39	-23.65	74.00	37.61	200	168	Horizontal
2	2280.6601	59.74	39.50	-20.24	74.00	34.50	100	200	Horizontal
3	3198.7748	54.75	38.89	-15.86	74.00	35.11	200	281	Horizontal
4	3768.8461	54.05	39.58	-14.47	74.00	34.42	200	256	Horizontal
5	6167.2709	50.26	43.57	-6.69	74.00	30.43	200	352	Horizontal
6	7624.3280	48.14	45.72	-2.42	74.00	28.28	200	256	Horizontal

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.2525	62.07	36.95	-25.12	74.00	37.05	200	1	Vertical
2	1368.7961	61.79	38.14	-23.65	74.00	35.86	100	14	Vertical
3	2285.9107	66.31	46.11	-20.20	74.00	27.89	200	22	Vertical
4	3191.2739	58.20	42.18	-16.02	74.00	31.82	200	315	Vertical
5	4102.6378	56.16	42.30	-13.86	74.00	31.70	200	3	Vertical
6	5929.1161	51.99	44.18	-7.81	74.00	29.82	200	359	Vertical

----- The following blanks -----

Mode: 2DH5
Middle Frequency (2441MHz)
Environment:
Test Engineer:
Test Voltage:

Date: 2022-03-23
25°C / 60 %RH
Chen Xiacong
AC 120V/60Hz

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.2960	58.14	34.49	-23.65	74.00	39.51	100	296	Horizontal
2	2275.4094	60.35	40.06	-20.29	74.00	33.94	100	151	Horizontal
3	3191.2739	54.36	38.34	-16.02	74.00	35.66	200	273	Horizontal
4	3641.3302	52.89	38.26	-14.63	74.00	35.74	100	62	Horizontal
5	4755.2194	50.75	41.26	-9.49	74.00	32.74	200	216	Horizontal
6	7247.4059	49.70	46.04	-3.66	74.00	27.96	100	200	Horizontal

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.2525	62.01	36.89	-25.12	74.00	37.11	200	8	Vertical
2	1367.7960	62.48	38.83	-23.65	74.00	35.17	200	4	Vertical
3	2040.3800	61.54	40.05	-21.49	74.00	33.95	200	1	Vertical
4	3187.5234	56.50	40.39	-16.11	74.00	33.61	200	314	Vertical
5	4097.0121	55.57	41.65	-13.92	74.00	32.35	200	0	Vertical
6	5929.1161	52.49	44.68	-7.81	74.00	29.32	100	7	Vertical

----- The following blanks -----

Mode: 2DH5
Highest Frequency (2480MHz)
Environment:
Test Engineer:
Test Voltage:

Date: 2022-03-23
25°C / 60 %RH
Chen Xiacong
AC 120V/60Hz

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1123.0154	57.16	32.41	-24.75	74.00	41.59	200	250	Horizontal
2	1368.0460	59.36	35.71	-23.65	74.00	38.29	100	242	Horizontal
3	2285.4107	60.57	40.37	-20.20	74.00	33.63	100	153	Horizontal
4	3195.0244	54.88	38.94	-15.94	74.00	35.06	200	241	Horizontal
5	4640.8301	51.59	41.14	-10.45	74.00	32.86	200	101	Horizontal
6	5824.1030	51.41	43.38	-8.03	74.00	30.62	200	68	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.2525	61.25	36.13	-25.12	74.00	37.87	200	9	Vertical
2	1368.2960	64.64	40.99	-23.65	74.00	33.01	200	1	Vertical
3	2040.6301	61.19	39.71	-21.48	74.00	34.29	200	1	Vertical
4	2286.1608	67.64	47.44	-20.20	74.00	26.56	200	341	Vertical
5	3193.1491	56.37	40.39	-15.98	74.00	33.61	200	3	Vertical
6	4095.1369	56.38	42.44	-13.94	74.00	31.56	200	323	Vertical

----- The following blanks -----

Mode: 3DH5
 Lowest Frequency (2402MHz)
 Environment:
 Test Engineer:
 Test Voltage:

Date: 2022-04-15
 25°C / 60 %RH
 Zhang Qiang
 AC 120V/60Hz

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.0025	67.13	42.90	-24.23	74.00	31.10	100	141	Horizontal
2	1367.7960	64.76	41.73	-23.03	74.00	32.27	100	296	Horizontal
3	1615.3269	62.97	40.43	-22.54	74.00	33.57	200	208	Horizontal
4	2280.6601	68.95	49.96	-18.99	74.00	24.04	200	139	Horizontal
5	3230.6538	58.62	41.85	-16.77	74.00	32.15	100	299	Horizontal
6	4102.6378	51.92	36.85	-15.07	74.00	37.15	100	200	Horizontal

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1019.5024	72.28	47.84	-24.44	74.00	26.16	200	81	Vertical
2	1368.5461	74.19	52.68	-21.51	74.00	21.32	100	92	Vertical
3	1955.3694	65.91	44.63	-21.28	74.00	29.37	200	87	Vertical
4	2040.1300	66.24	46.30	-19.94	74.00	27.70	200	63	Vertical
5	2635.2044	61.87	43.76	-18.11	74.00	30.24	200	63	Vertical
6	3193.1491	61.86	44.44	-17.42	74.00	29.56	200	53	Vertical

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.1355	-21.51	66.16	44.65	54.00	9.35	193	139.4	Vertical

Mode: 3DH5
Middle Frequency (2441MHz)
Environment:
Test Engineer:
Test Voltage:

Date: 2022-04-15
25°C / 60 %RH
Zhang Qiang
AC 120V/60Hz

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.2525	61.22	36.98	-24.24	74.00	37.02	100	145	Horizontal
2	1367.7960	65.55	42.52	-23.03	74.00	31.48	100	211	Horizontal
3	1615.3269	61.87	39.33	-22.54	74.00	34.67	100	270	Horizontal
4	1894.1118	66.20	45.46	-20.74	74.00	28.54	100	237	Horizontal
5	2549.9437	57.96	39.92	-18.04	74.00	34.08	100	10	Horizontal
6	3230.6538	53.89	37.12	-16.77	74.00	36.88	100	330	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.2525	72.79	48.39	-24.40	74.00	25.61	200	113	Vertical
2	1373.5467	71.55	50.05	-21.50	74.00	23.95	100	76	Vertical
3	1892.1115	66.49	44.31	-22.18	74.00	29.69	200	10	Vertical
4	1954.8694	67.53	46.24	-21.29	74.00	27.76	100	64	Vertical
5	2040.3800	64.98	45.04	-19.94	74.00	28.96	200	67	Vertical
6	3193.1491	59.81	42.39	-17.42	74.00	31.61	100	81	Vertical

----- The following blanks -----

Mode: 3DH5
 Highest Frequency (2480MHz)
 Environment:
 Test Engineer:
 Test Voltage:

Date: 2022-04-15
 25°C / 60 %RH
 Chen Xiacong
 AC 120V/60Hz

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.0460	57.58	33.93	-23.65	74.00	40.07	100	160	Horizontal
2	1712.3390	56.28	33.90	-22.38	74.00	40.10	100	185	Horizontal
3	2275.1594	58.69	38.40	-20.29	74.00	35.60	200	210	Horizontal
4	3765.0956	53.47	38.98	-14.49	74.00	35.02	200	86	Horizontal
5	4665.2082	51.14	41.03	-10.11	74.00	32.97	100	159	Horizontal
6	6784.2230	49.51	44.91	-4.60	74.00	29.09	100	192	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1020.2525	61.70	36.58	-25.12	74.00	37.42	200	8	Vertical
2	1368.2960	62.15	38.50	-23.65	74.00	35.50	100	37	Vertical
3	2040.3800	61.28	39.79	-21.49	74.00	34.21	200	1	Vertical
4	3195.0244	57.51	41.57	-15.94	74.00	32.43	200	207	Vertical
5	4100.7626	55.93	42.06	-13.87	74.00	31.94	200	3	Vertical
6	5925.3657	51.86	44.07	-7.79	74.00	29.93	200	359	Vertical

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- The amplitude of 18GHz to 26.5GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

14. RESTRICTED BANDS OF OPERATION

14.1 LIMITS

Section 15.247(d) In addition, 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)).

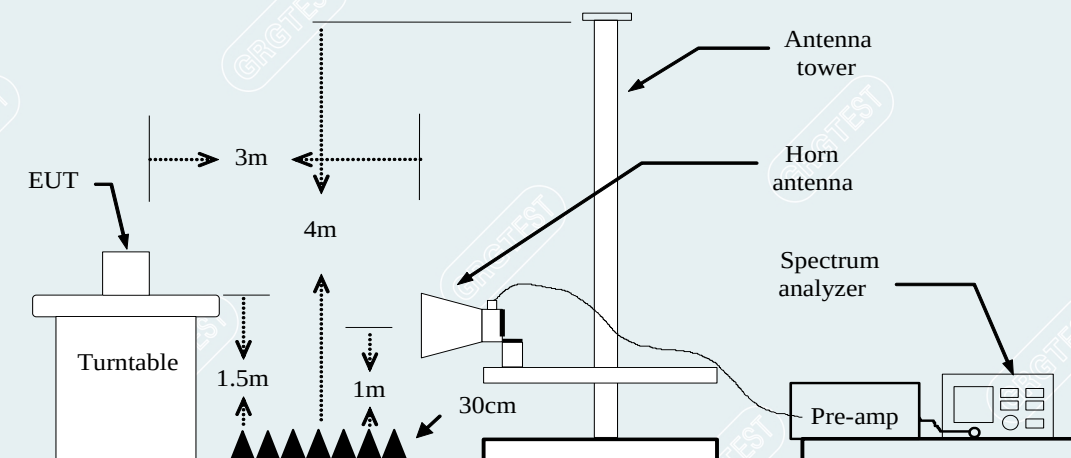
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	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	2655 - 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	
13.36 - 13.41			

Frequency (MHz)	Quasi-peak(μ V/m)	Measurement distance(m)	Quasi-peak(dB μ V/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5~93.8
0.490-1.705	24000/F(kHz)	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

14.2 TEST PROCEDURES

- 1) The EUT is placed on a turntable, which is 1.5m above the ground plane.
- 2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4) Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - a) The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=3MHz.
 - b) The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle $\geq 98\%$, set $VBW \leq RBW/100$ (i.e., 10kHz) but not less than 10Hz, Where duty cycle is defined in section 2.8. If the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$, Where T is defined in section 2.8.
- 5) Repeat the procedures until all the PEAK and AVERAGE versus polarization are measured.

14.3 TEST SETUP



----- The following blanks -----

14.4 TEST RESULTS

Equipment:	Tablet	Test Date	2022-01-14
Model No.:	UCTB-27	Test Engineer:	Lu Qiang
Test Voltage:	AC 120V/60Hz	Environment:	25℃ / 60 %RH

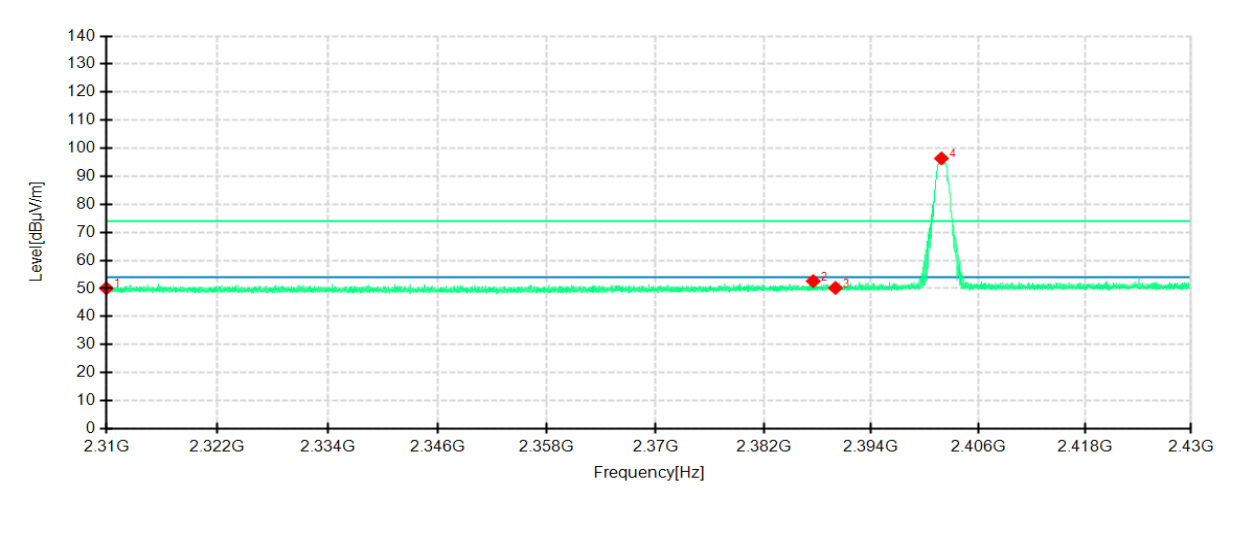
DH5

Lowest Channel

Frequency 2402MHz

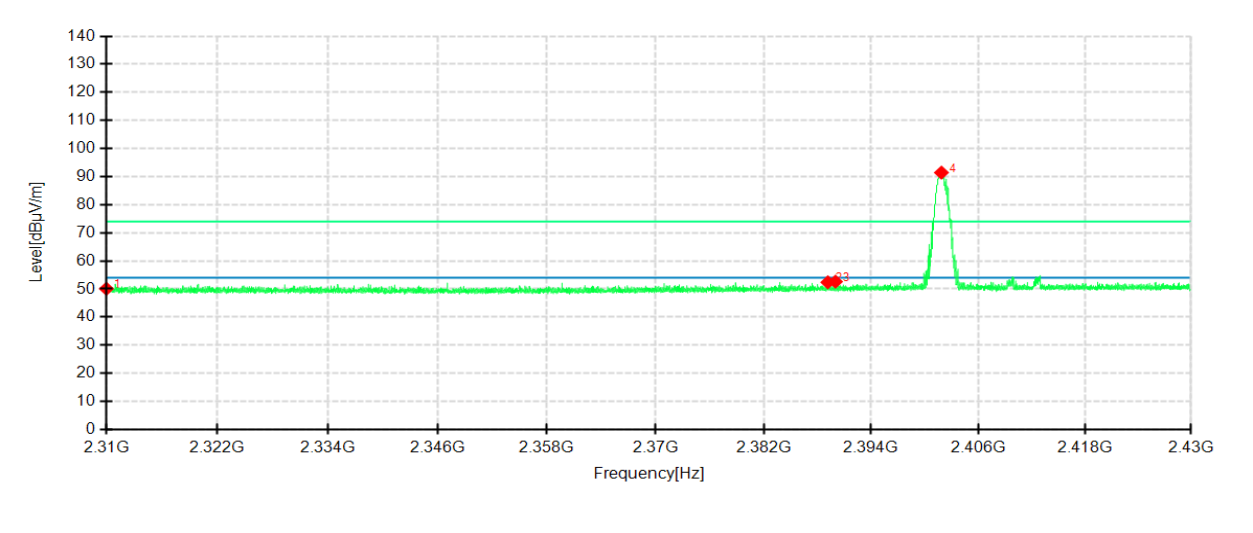
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



No.	Frequency MHz	Reading dB μ V/m	Level dB μ V/m	Factor dB	Limit dB μ V/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	46.54	50.02	3.48	74.00	23.98	100	218	Horizontal	/
2	2387.5200	48.82	52.59	3.77	74.00	21.41	200	176	Horizontal	/
3	2390.0000	46.36	50.17	3.81	74.00	23.83	200	142	Horizontal	/
4	2401.8600	92.37	96.36	3.99	74.00	-22.36	200	142	Horizontal	No limit
1	2310.0000	46.60	50.08	3.48	74.00	23.92	100	142	Vertical	/
2	2389.1520	48.58	52.38	3.80	74.00	21.62	200	102	Vertical	/
3	2390.0000	48.81	52.62	3.81	74.00	21.38	200	218	Vertical	/
4	2401.8600	87.44	91.43	3.99	74.00	-17.43	200	40	Vertical	No limit

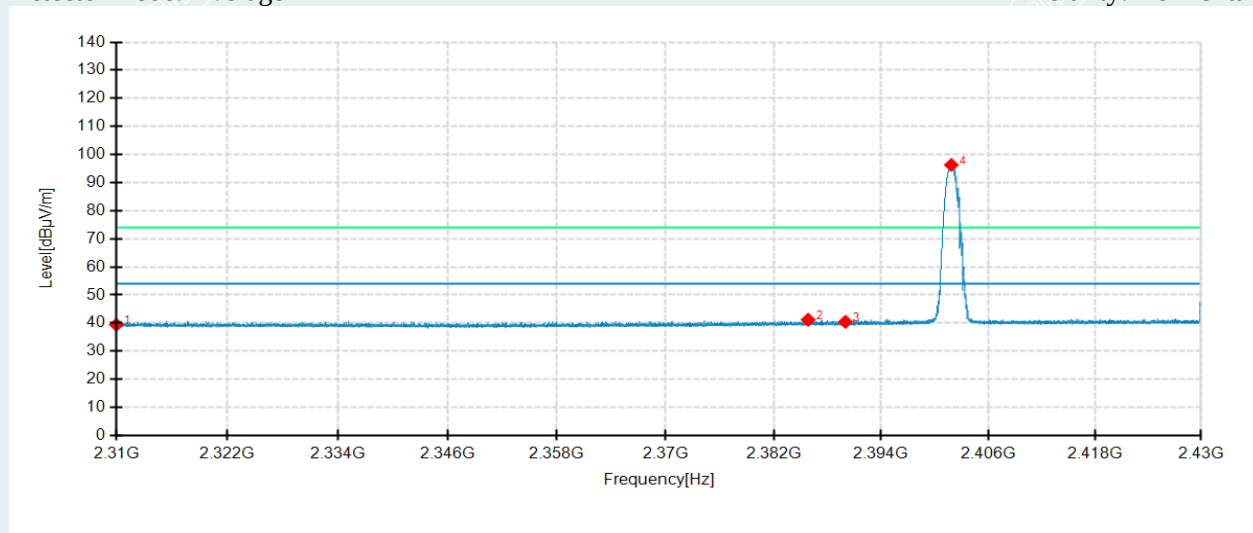
----- The following blanks -----

Lowest Channel

Frequency 2402MHz

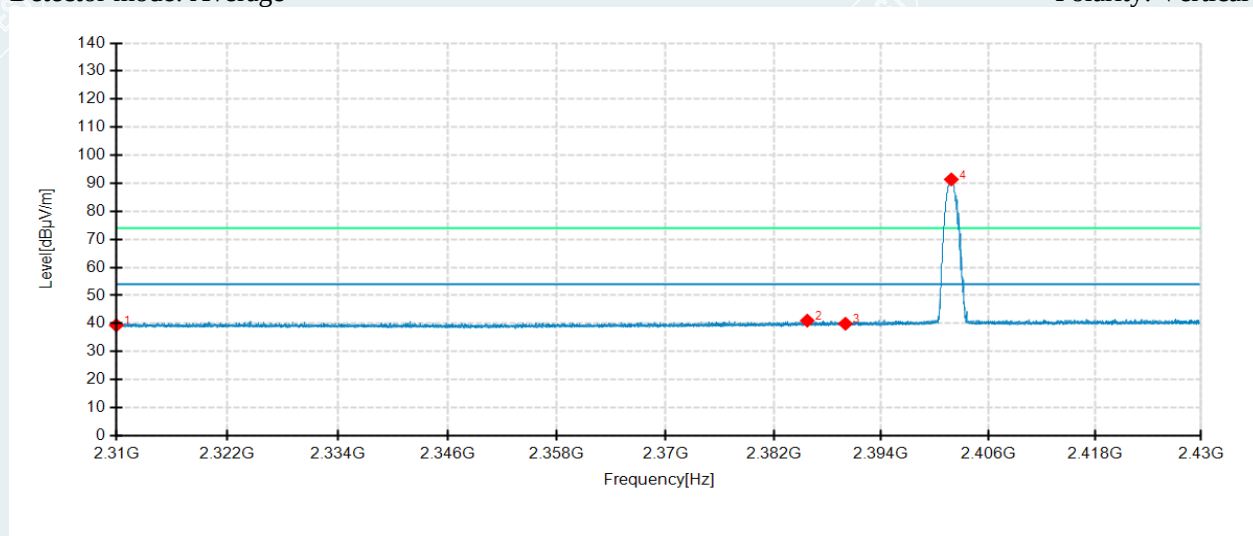
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



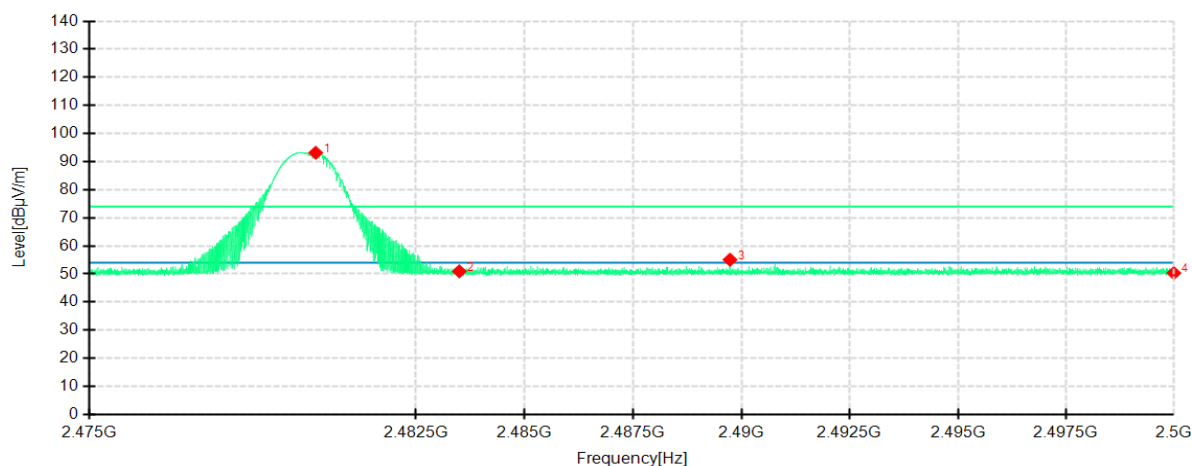
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	35.92	39.40	3.48	54.00	14.60	100	75	Horizontal	/
2	2385.8400	37.44	41.18	3.74	54.00	12.82	200	142	Horizontal	/
3	2390.0000	36.61	40.42	3.81	54.00	13.58	100	20	Horizontal	/
4	2401.8480	92.29	96.28	3.99	54.00	-42.28	200	142	Horizontal	No limit
1	2310.0000	35.89	39.37	3.48	54.00	14.63	100	359	Vertical	/
2	2385.7440	37.28	41.02	3.74	54.00	12.98	200	218	Vertical	/
3	2390.0000	36.09	39.90	3.81	54.00	14.10	200	40	Vertical	/
4	2401.8480	87.37	91.36	3.99	54.00	-37.36	200	40	Vertical	No limit

Highest Channel

Frequency 2480MHz

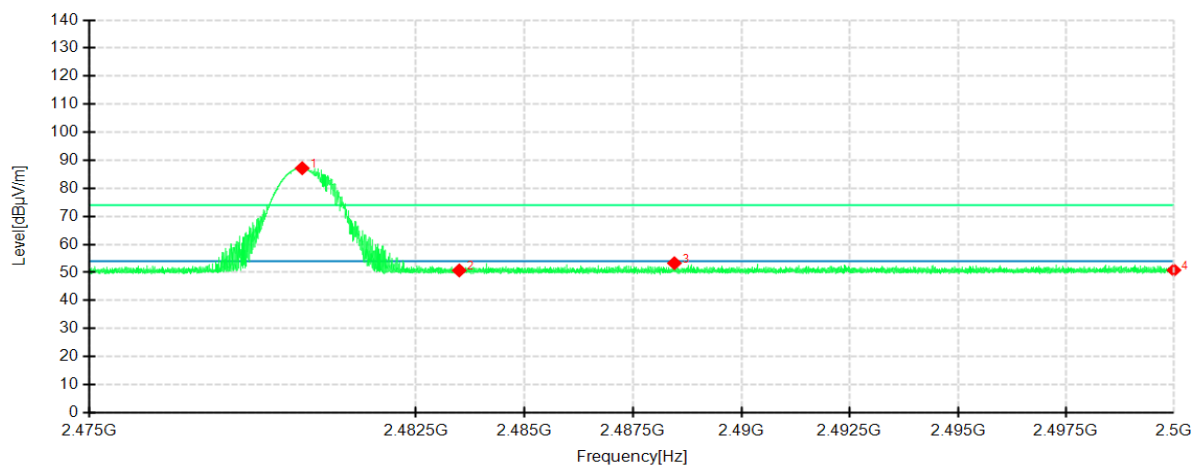
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



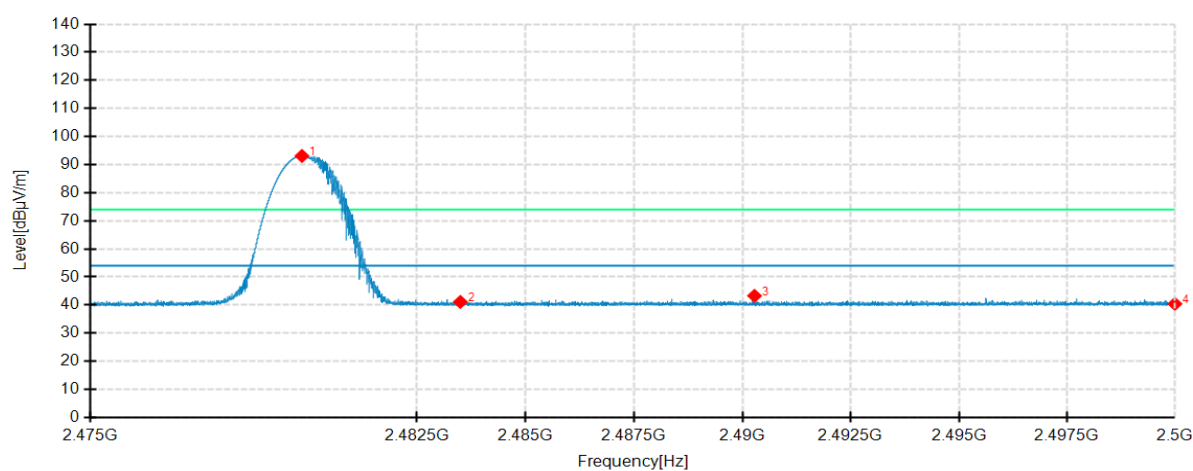
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2480.1975	88.83	93.15	4.32	74.00	-19.15	200	3	Horizontal	No limit
2	2483.5000	46.61	50.94	4.33	74.00	23.06	200	95	Horizontal	/
3	2489.7375	50.72	55.07	4.35	74.00	18.93	200	218	Horizontal	/
4	2500.0000	45.94	50.32	4.38	74.00	23.68	100	252	Horizontal	/
1	2479.8875	82.85	87.17	4.32	74.00	-13.17	200	142	Vertical	No limit
2	2483.5000	46.38	50.71	4.33	74.00	23.29	200	142	Vertical	/
3	2488.4550	48.95	53.30	4.35	74.00	20.70	200	252	Vertical	/
4	2500.0000	46.43	50.81	4.38	74.00	23.19	200	279	Vertical	/

Highest Channel

Frequency 2480MHz

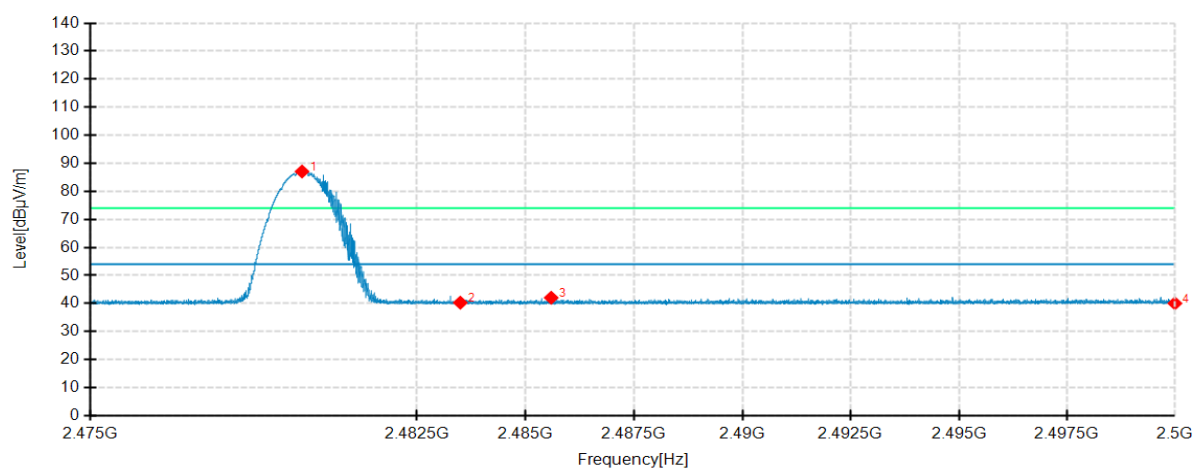
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



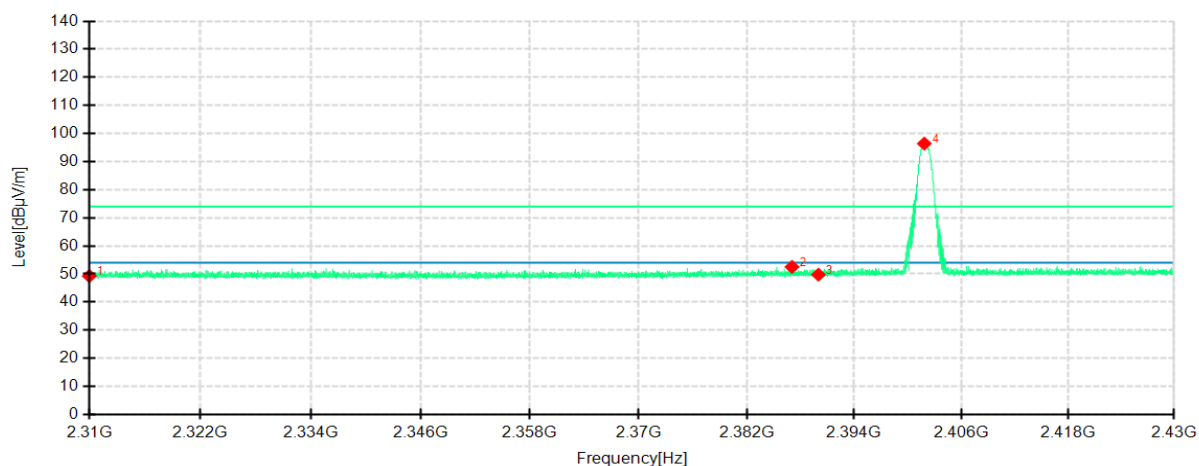
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.8575	88.76	93.08	4.32	54.00	-39.08	200	3	Horizontal	No limit
2	2483.5000	36.80	41.13	4.33	54.00	12.87	200	218	Horizontal	/
3	2490.2800	38.95	43.30	4.35	54.00	10.70	100	142	Horizontal	/
4	2500.0000	36.04	40.42	4.38	54.00	13.58	100	292	Horizontal	/
1	2479.8600	82.75	87.07	4.32	54.00	-33.07	200	142	Vertical	No limit
2	2483.5000	35.96	40.29	4.33	54.00	13.71	200	142	Vertical	/
3	2485.5925	37.71	42.05	4.34	54.00	11.95	200	142	Vertical	/
4	2500.0000	35.66	40.04	4.38	54.00	13.96	100	1	Vertical	/

2DH5**Lowest Channel**

Frequency 2402MHz

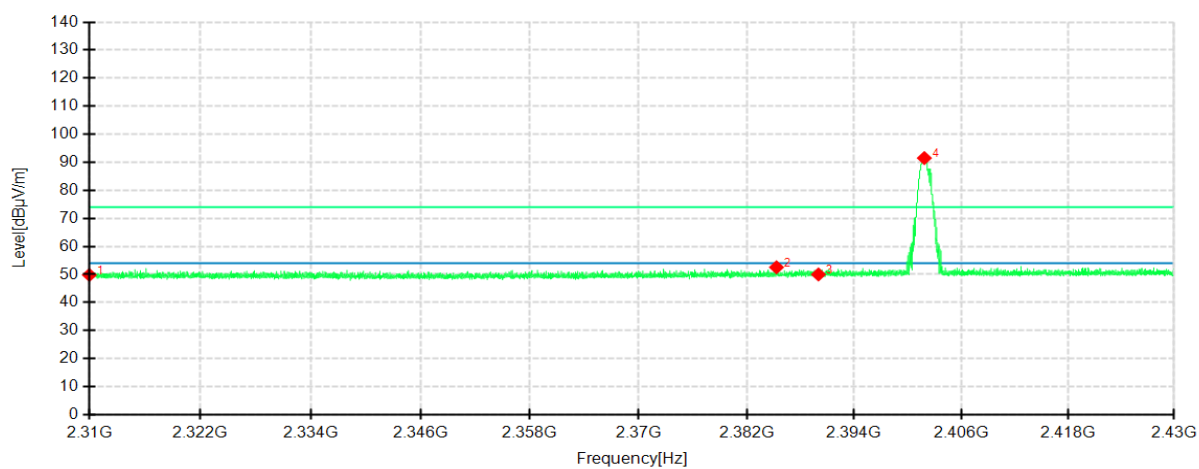
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



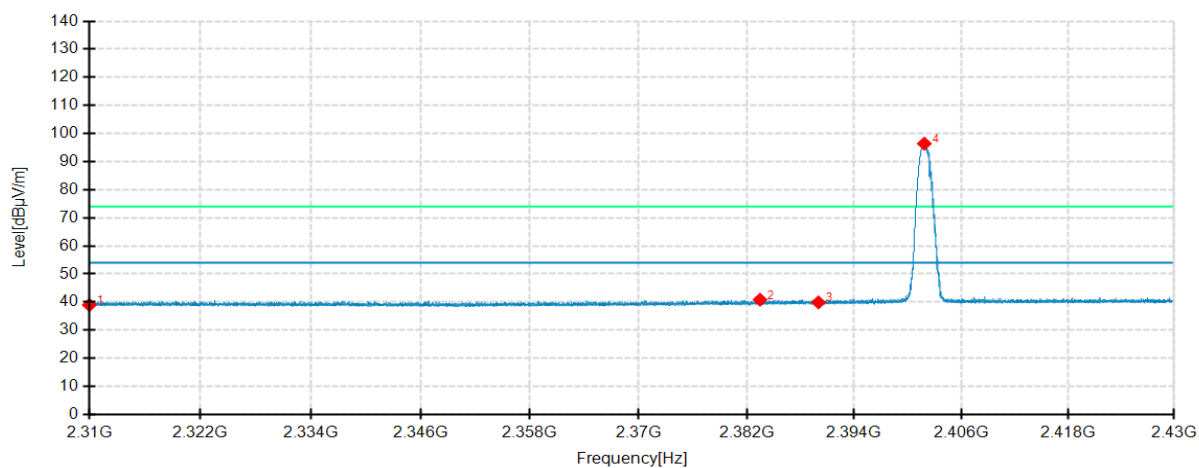
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	45.80	49.28	3.48	74.00	24.72	100	142	Horizontal	/
2	2387.0520	48.75	52.51	3.76	74.00	21.49	100	353	Horizontal	/
3	2390.0000	45.94	49.75	3.81	74.00	24.25	100	258	Horizontal	/
4	2401.8480	92.42	96.41	3.99	74.00	-22.41	200	7	Horizontal	No limit
1	2310.0000	46.33	49.81	3.48	74.00	24.19	200	142	Vertical	/
2	2385.3240	48.82	52.55	3.73	74.00	21.45	200	359	Vertical	/
3	2390.0000	46.19	50.00	3.81	74.00	24.00	200	142	Vertical	/
4	2401.8480	87.50	91.49	3.99	74.00	-17.49	200	142	Vertical	No limit

Lowest Channel

Frequency 2402MHz

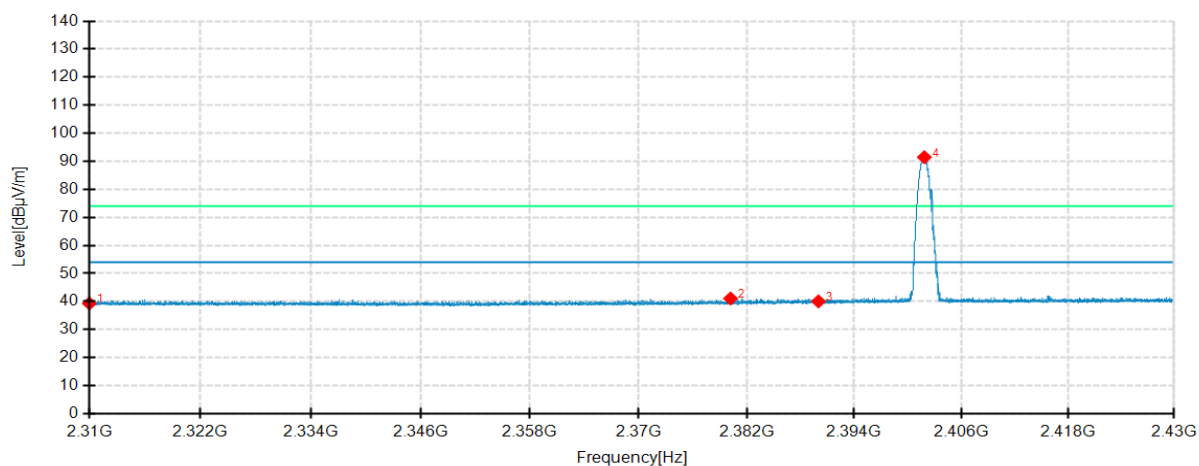
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



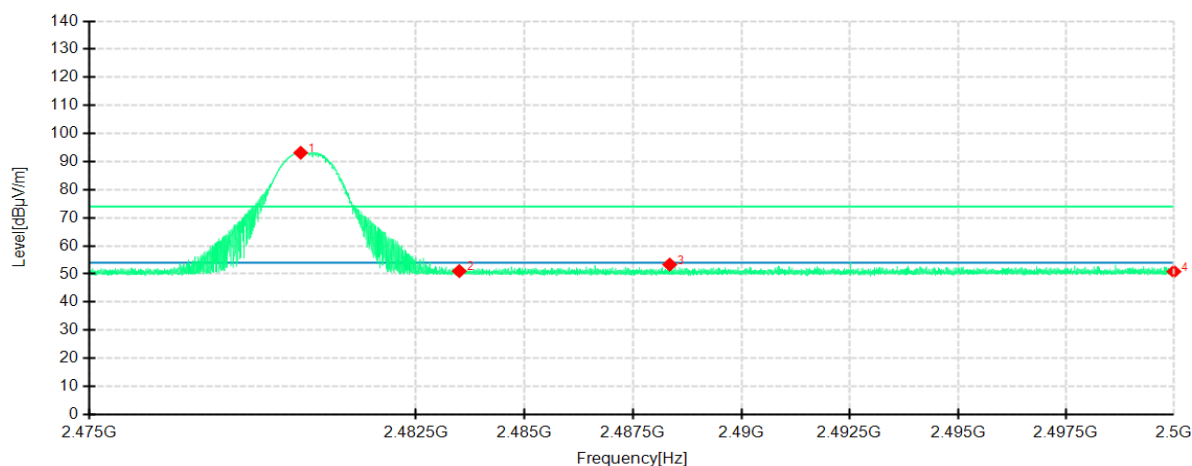
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	35.48	38.96	3.48	54.00	15.04	100	265	Horizontal	/
2	2383.4880	37.15	40.85	3.70	54.00	13.15	200	59	Horizontal	/
3	2390.0000	36.08	39.89	3.81	54.00	14.11	200	108	Horizontal	/
4	2401.8480	92.40	96.39	3.99	54.00	-42.39	200	6	Horizontal	No limit
1	2310.0000	35.82	39.30	3.48	54.00	14.70	200	251	Vertical	/
2	2380.2120	37.42	41.06	3.64	54.00	12.94	100	197	Vertical	/
3	2390.0000	36.22	40.03	3.81	54.00	13.97	100	218	Vertical	/
4	2401.8480	87.46	91.45	3.99	54.00	-37.45	200	142	Vertical	No limit

Highest Channel

Frequency 2480MHz

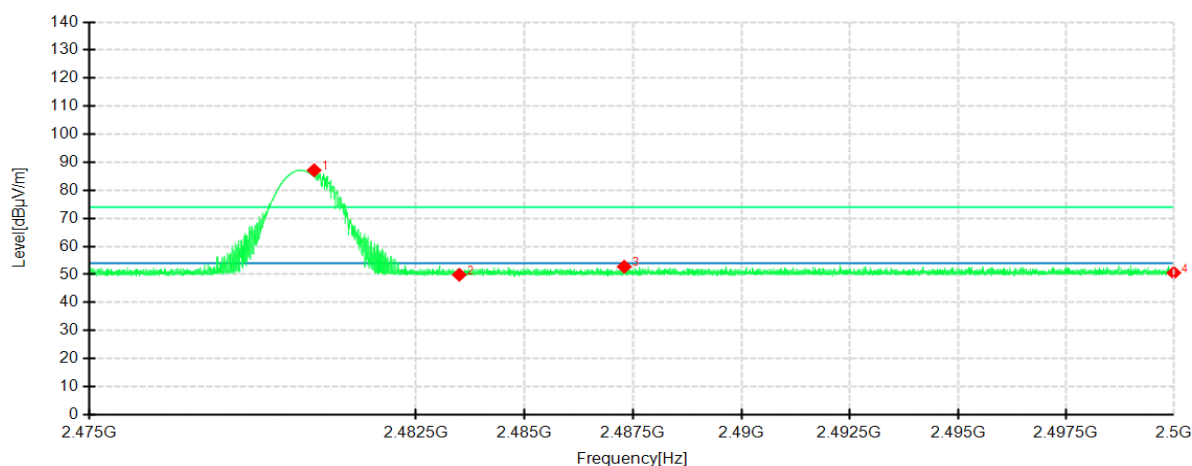
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



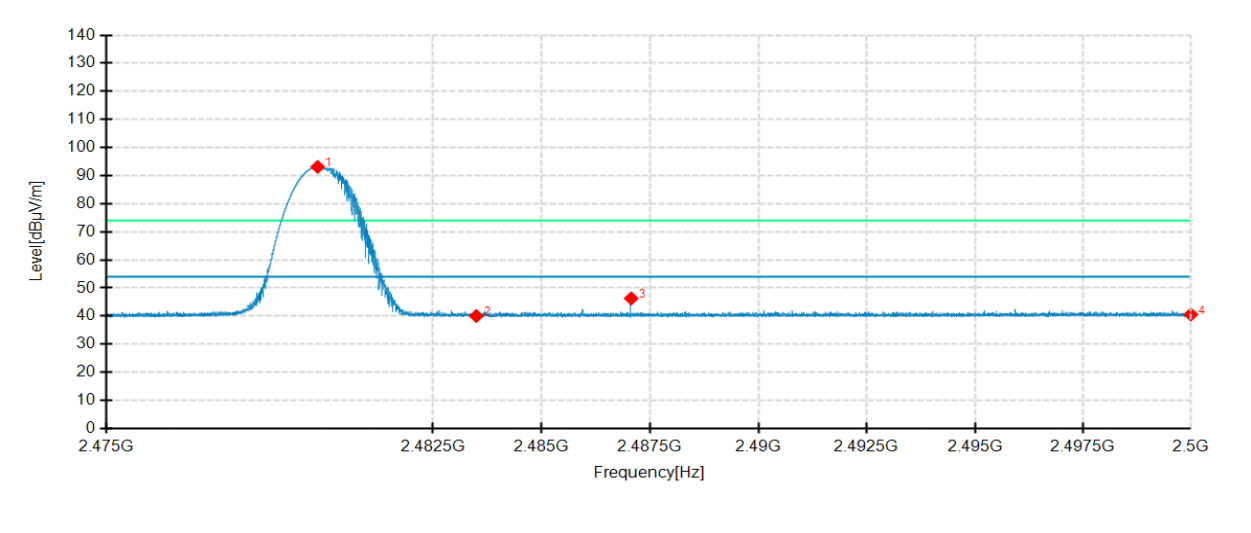
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.8525	88.83	93.15	4.32	74.00	-19.15	200	3	Horizontal	No limit
2	2483.5000	46.69	51.02	4.33	74.00	22.98	200	129	Horizontal	/
3	2488.3475	48.99	53.34	4.35	74.00	20.66	100	142	Horizontal	/
4	2500.0000	46.48	50.86	4.38	74.00	23.14	200	218	Horizontal	/
1	2480.1625	82.83	87.15	4.32	74.00	-13.15	200	142	Vertical	No limit
2	2483.5000	45.55	49.88	4.33	74.00	24.12	100	60	Vertical	/
3	2487.3000	48.40	52.74	4.34	74.00	21.26	100	218	Vertical	/
4	2500.0000	46.20	50.58	4.38	74.00	23.42	200	285	Vertical	/

Highest Channel

Frequency 2480MHz

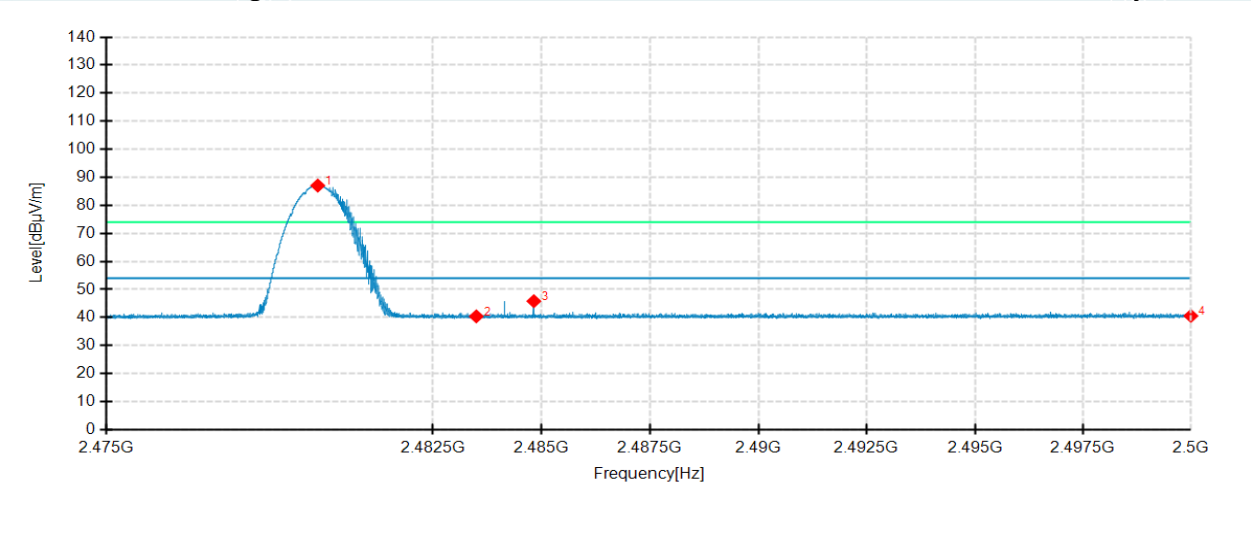
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



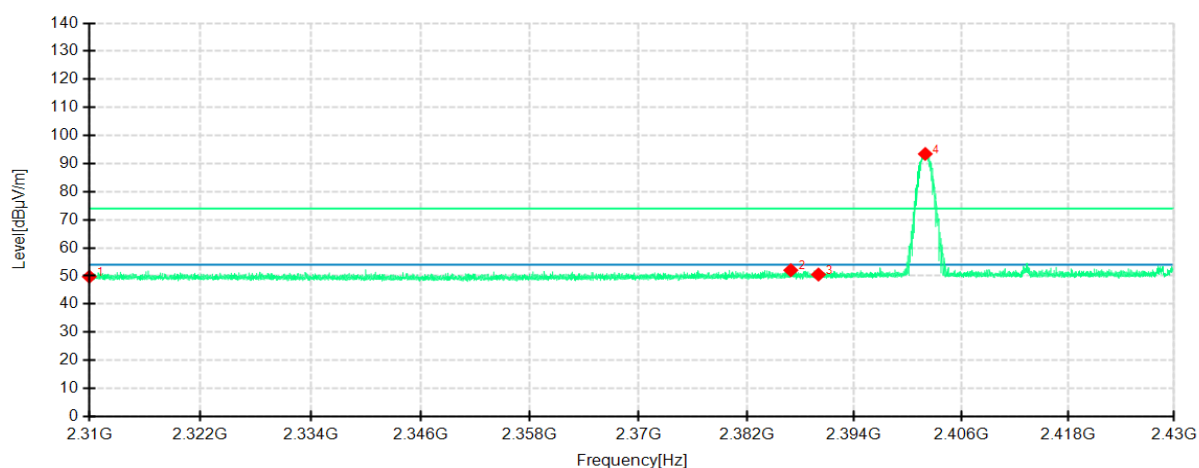
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.8525	88.77	93.09	4.32	54.00	-39.09	200	6	Horizontal	No limit
2	2483.5000	35.69	40.02	4.33	54.00	13.98	200	67	Horizontal	/
3	2487.0675	41.93	46.27	4.34	54.00	7.73	200	81	Horizontal	/
4	2500.0000	36.17	40.55	4.38	54.00	13.45	200	176	Horizontal	/
1	2479.8550	82.72	87.04	4.32	54.00	-33.04	200	142	Vertical	No limit
2	2483.5000	36.06	40.39	4.33	54.00	13.61	200	142	Vertical	/
3	2484.8250	41.49	45.82	4.33	54.00	8.18	200	231	Vertical	/
4	2500.0000	36.19	40.57	4.38	54.00	13.43	200	142	Vertical	/

3DH5**Lowest Channel**

Frequency 2402MHz

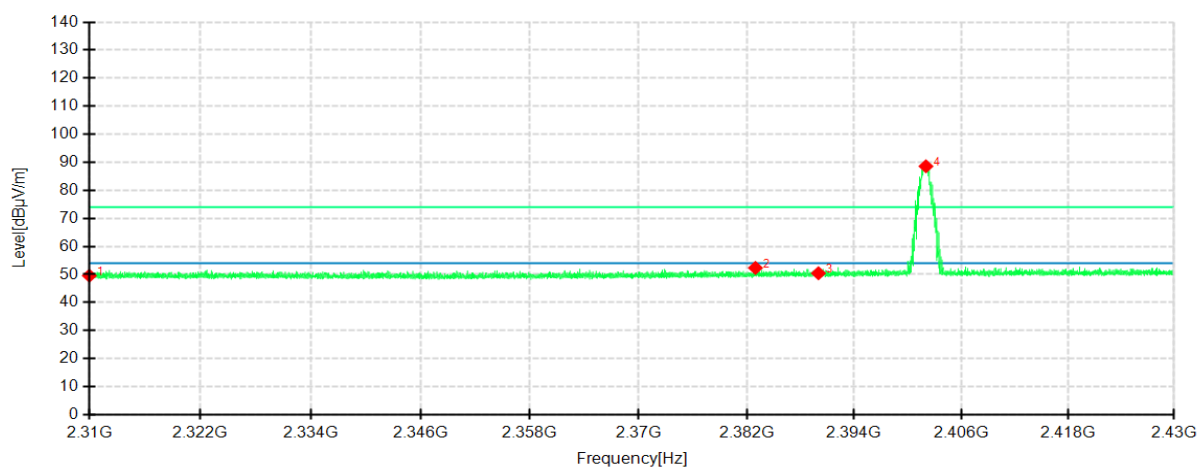
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



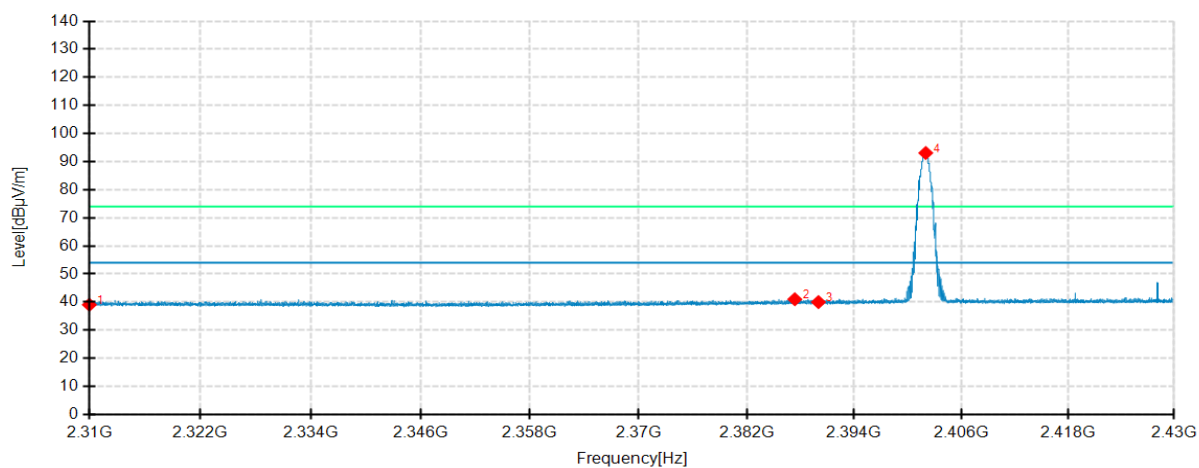
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	46.26	49.74	3.48	74.00	24.26	200	129	Horizontal	/
2	2386.9200	48.29	52.05	3.76	74.00	21.95	200	46	Horizontal	/
3	2390.0000	46.70	50.51	3.81	74.00	23.49	200	218	Horizontal	/
4	2401.9560	89.45	93.44	3.99	74.00	-19.44	200	7	Horizontal	No limit
1	2310.0000	46.07	49.55	3.48	74.00	24.45	200	142	Vertical	/
2	2382.9840	48.64	52.33	3.69	74.00	21.67	100	26	Vertical	/
3	2390.0000	46.62	50.43	3.81	74.00	23.57	100	1	Vertical	/
4	2402.0280	84.58	88.57	3.99	74.00	-14.57	200	142	Vertical	No limit

Lowest Channel

Frequency 2402MHz

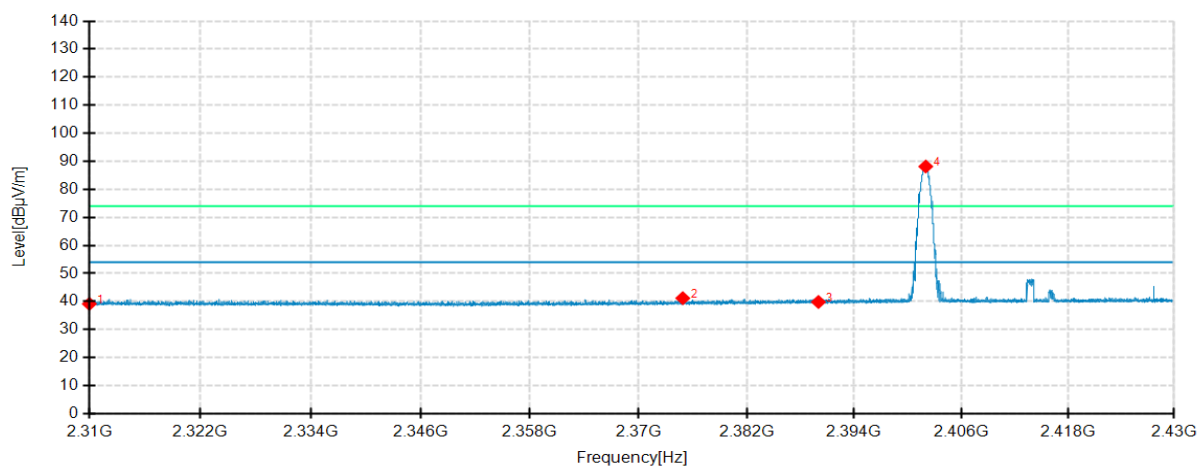
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



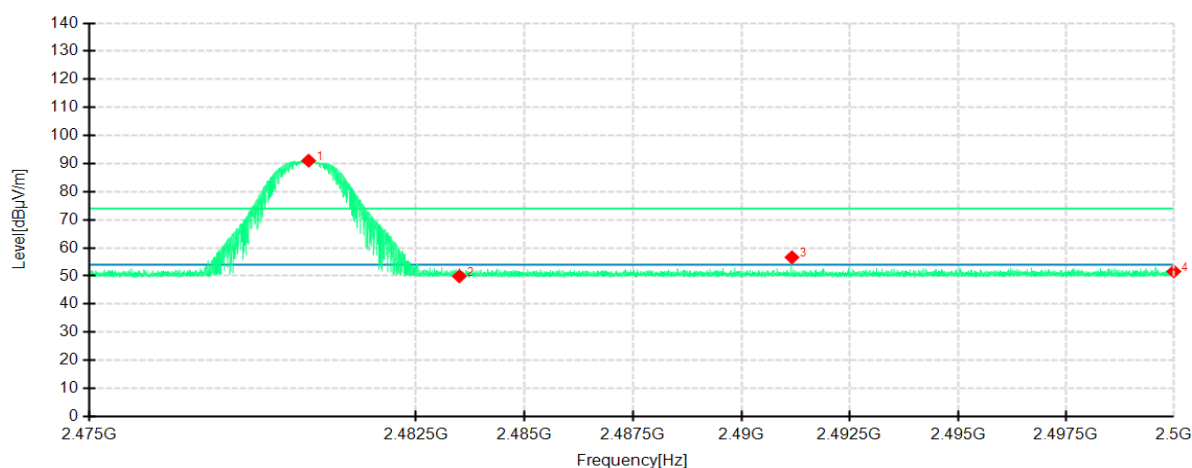
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	35.55	39.03	3.48	54.00	14.97	100	334	Horizontal	/
2	2387.3640	37.23	41.00	3.77	54.00	13.00	200	19	Horizontal	/
3	2390.0000	36.18	39.99	3.81	54.00	14.01	100	306	Horizontal	/
4	2402.0040	89.07	93.06	3.99	54.00	-39.06	200	7	Horizontal	No limit
1	2310.0000	35.67	39.15	3.48	54.00	14.85	200	279	Vertical	/
2	2374.9080	37.63	41.18	3.55	54.00	12.82	200	142	Vertical	/
3	2390.0000	36.02	39.83	3.81	54.00	14.17	100	88	Vertical	/
4	2402.0040	84.15	88.14	3.99	54.00	-34.14	200	142	Vertical	No limit

Highest Channel

Frequency 2480MHz

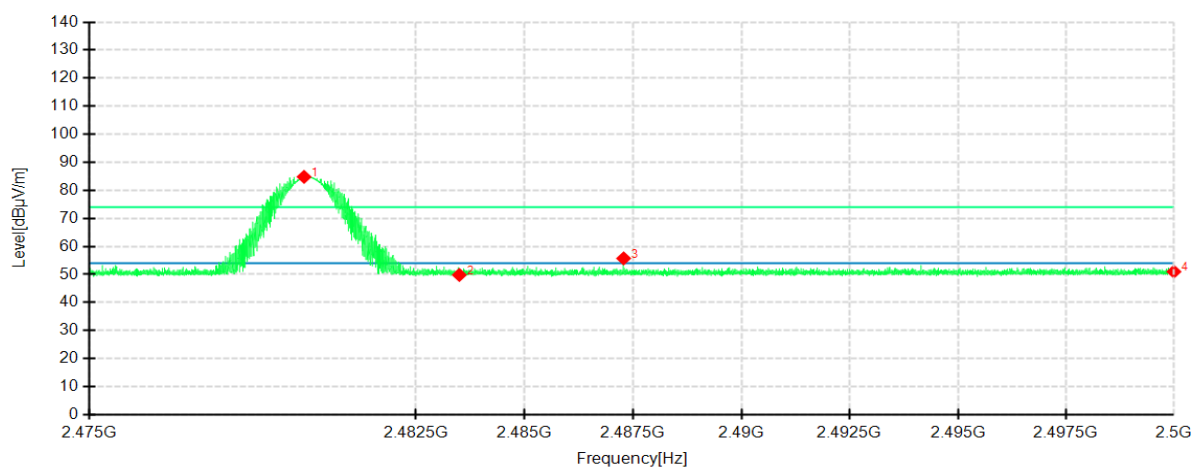
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



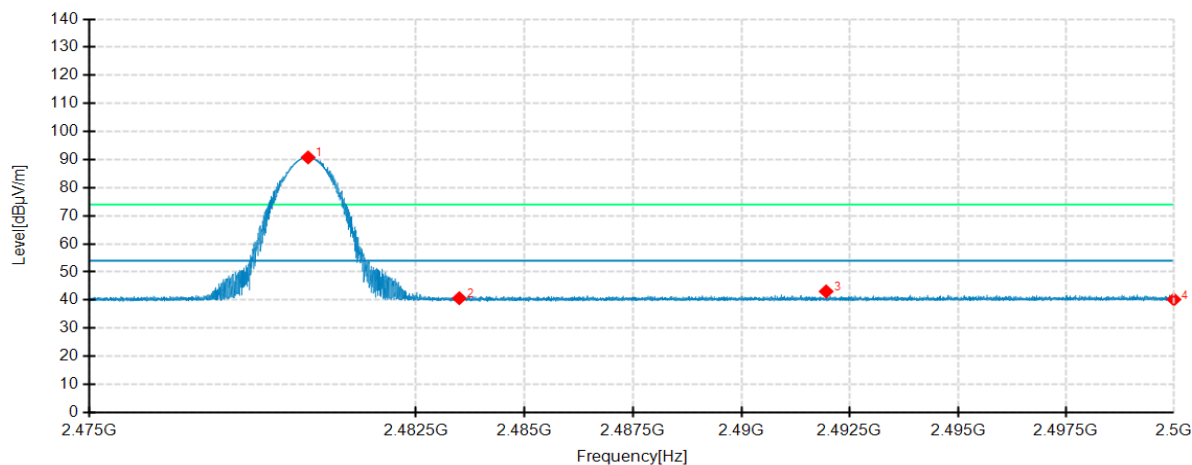
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2480.0350	86.72	91.04	4.32	74.00	-17.04	200	218	Horizontal	No limit
2	2483.5000	45.55	49.88	4.33	74.00	24.12	200	218	Horizontal	/
3	2491.1675	52.28	56.63	4.35	74.00	17.37	200	218	Horizontal	
4	2500.0000	47.24	51.62	4.38	74.00	22.38	200	218	Horizontal	/
1	2479.9300	80.48	84.80	4.32	74.00	-10.80	200	142	Vertical	No limit
2	2483.5000	45.49	49.82	4.33	74.00	24.18	100	218	Vertical	/
3	2487.2850	51.38	55.72	4.34	74.00	18.28	200	142	Vertical	/
4	2500.0000	46.60	50.98	4.38	74.00	23.02	200	142	Vertical	/

Highest Channel

Frequency 2480MHz

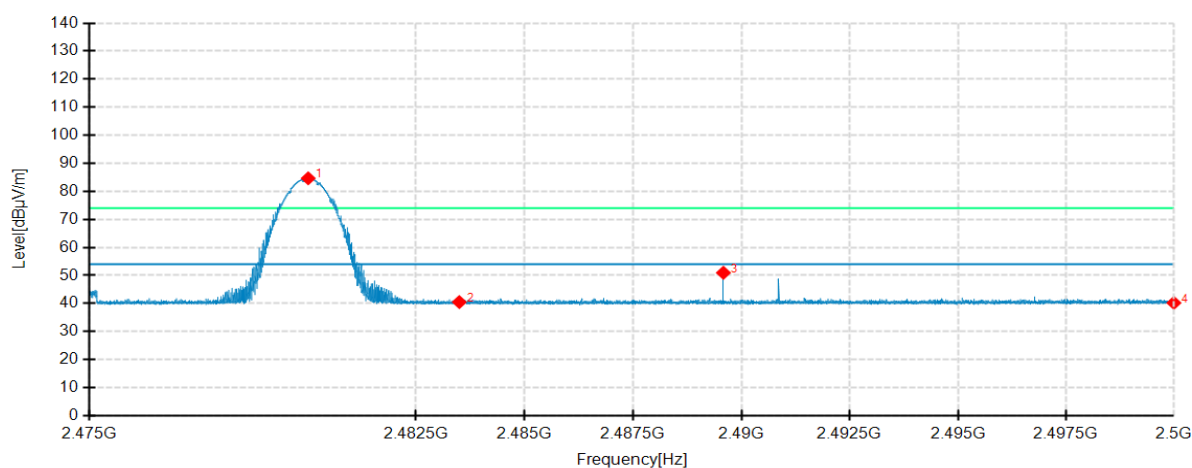
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2480.0225	86.46	90.78	4.32	54.00	-36.78	200	218	Horizontal	No limit
2	2483.5000	36.32	40.65	4.33	54.00	13.35	100	259	Horizontal	/
3	2491.9575	38.70	43.06	4.36	54.00	10.94	100	204	Horizontal	/
4	2500.0000	35.84	40.22	4.38	54.00	13.78	200	154	Horizontal	/
1	2480.0250	80.32	84.64	4.32	54.00	-30.64	200	142	Vertical	No limit
2	2483.5000	36.18	40.51	4.33	54.00	13.49	100	47	Vertical	/
3	2489.5850	46.60	50.95	4.35	54.00	3.05	200	142	Vertical	/
4	2500.0000	35.84	40.22	4.38	54.00	13.78	200	142	Vertical	/

Remark: Max field strength in 3m distance. No any other emission which falls in restricted bands can be detected and be reported.

APPENDIX A. PHOTOGRAPH OF THE TEST CONNECTION DIAGRAM

Please refer to the attached document E202112276794-Test photo-27.

APPENDIX B. PHOTOGRAPH OF THE EUT

Please refer to the attached document E202112276794-EUT photo-27.

----- End of Report -----