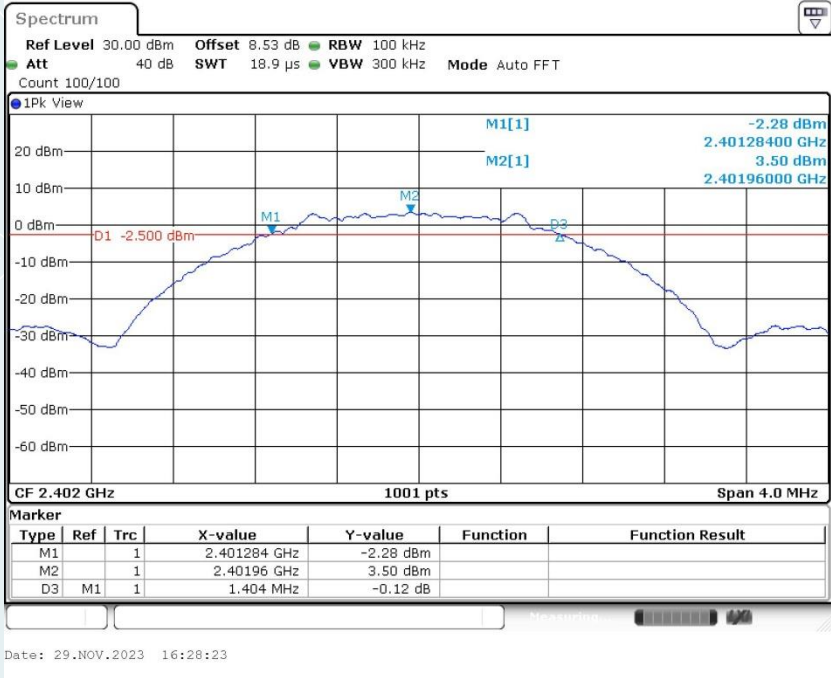
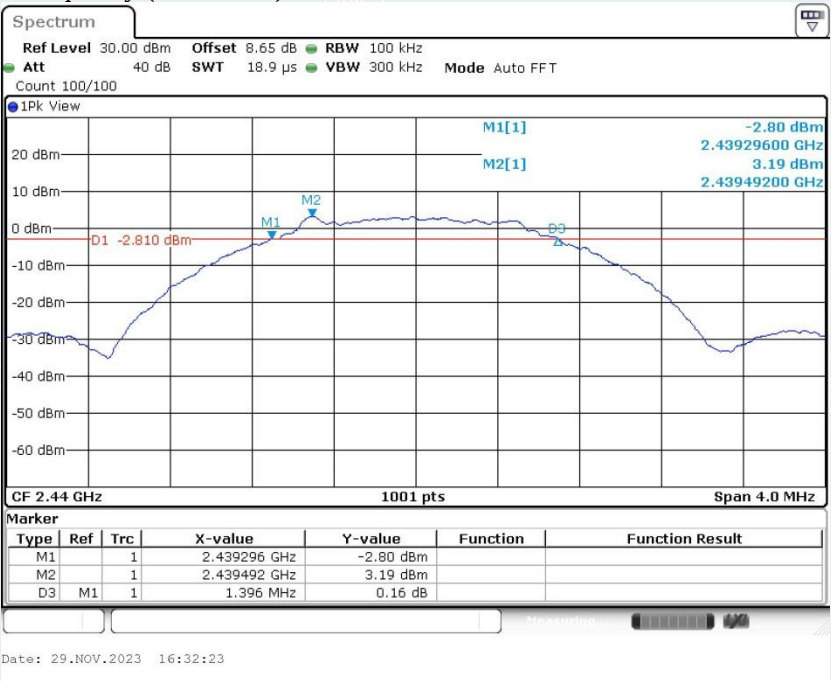


BLE_2M

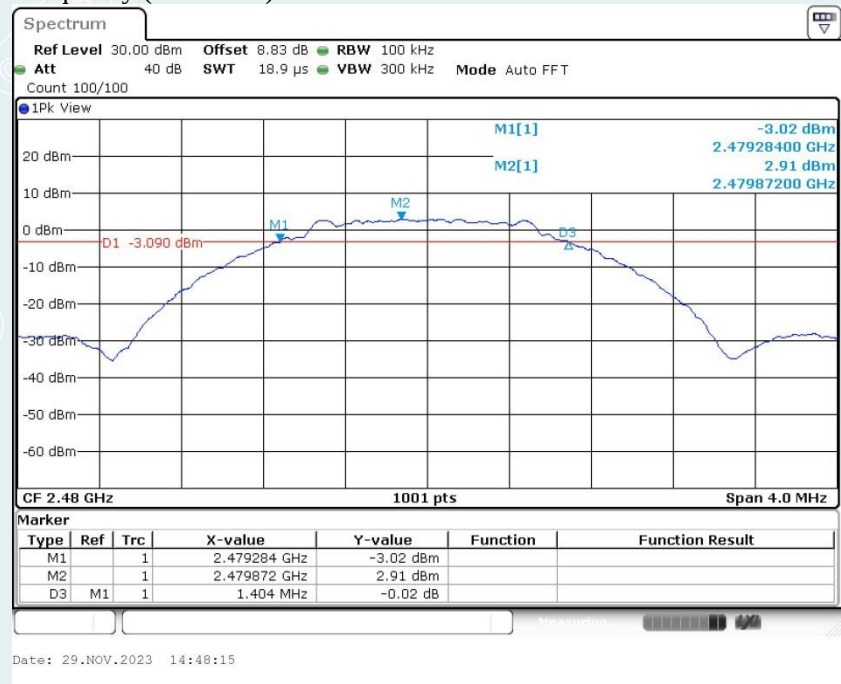
Lowest Frequency (2402MHz)



Middle Frequency (2440 MHz)



Highest Frequency (2480MHz)



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

9. MAXIMUM PEAK OUTPUT POWER

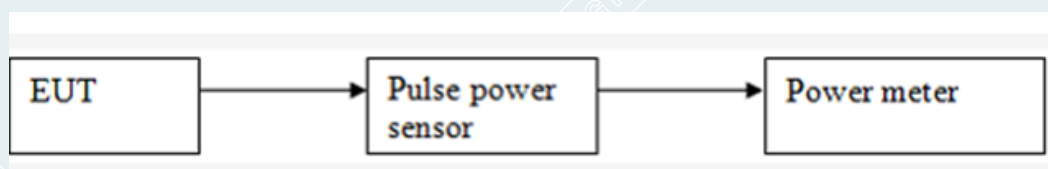
9.1 LIMITS

The maximum Peak output power measurement is 1W

9.2 TEST PROCEDURES

- RF output of EUT was connected to the broadband peak RF power meter by RF cable. The path loss was compensated to the results for each measurement.
- Set to the maximum power setting and enable the EUT transmit continuously.
- Measure the conducted output power and record the results in the test report.

9.3 TEST SETUP



9.4 TEST RESULTS

Environment: 27.1°C/49%RH/101.0kPa
Tested By: Huang Tianmei

Voltage: DC 5V
Date: 2023-11-29

BLE_1M

Channel	Frequency (MHz)	Measured Channel Power (dBm)	Limit	Peak/Average	Result
Lowest	2402	4.71	1W (30dBm)	Peak	Pass
Middle	2440	4.79			Pass
Highest	2480	5.50			Pass

BLE_2M

Channel	Frequency (MHz)	Measured Channel Power (dBm)	Limit	Peak/Average	Result
Lowest	2402	4.75	1W (30dBm)	Peak	Pass
Middle	2440	4.78			Pass
Highest	2480	5.50			Pass

10. POWER SPECTRAL DENSITY

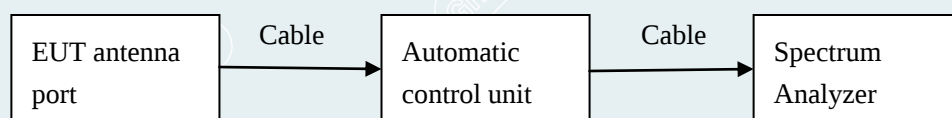
10.1 LIMITS

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

10.2 TEST PROCEDURES

- Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- Set the analyzer span to 1.5 times the DTS bandwidth. Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$. Set the VBW $\geq [3 \times \text{RBW}]$. Detector = peak. Sweep time = auto couple. Trace mode = max hold. Allow trace to fully stabilize. Use the peak marker function to determine the maximum amplitude level within the RBW. If measured value exceeds requirement, then reduce RBW (but no less than 3kHz) and repeat.
- Repeat above procedures until all frequencies measured were complete.

10.3 TEST SETUP



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

10.4 TEST RESULTS

Environment: 27.1℃/49%RH/101.0kPa
Tested By: Huang Tianmei

Voltage: DC 3V
Date: 2023-11-29

BLE_1M

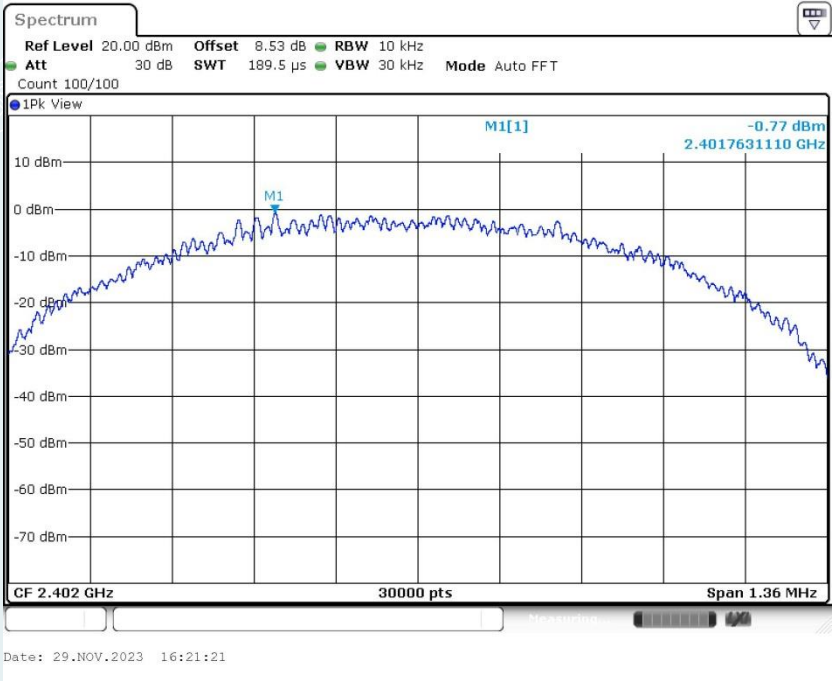
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-0.77	8.00	PASS
Middle	2440	0.32		PASS
Highest	2480	-0.26		PASS

BLE_2M

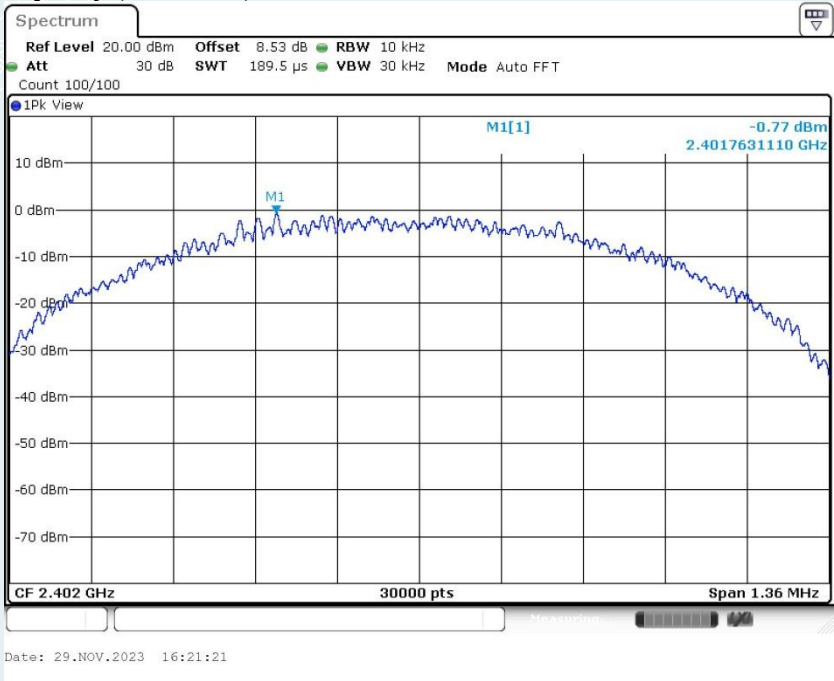
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-2.37	8.00	PASS
Middle	2440	-1.13		PASS
Highest	2480	-1.97		PASS

BLE_1M

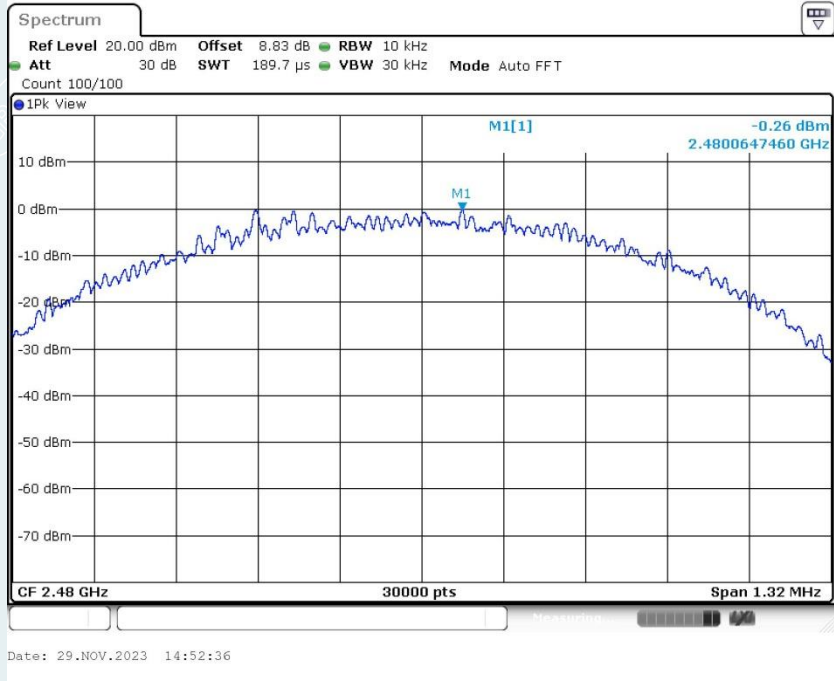
Lowest Frequency (2402MHz)



Middle Frequency (2440 MHz)

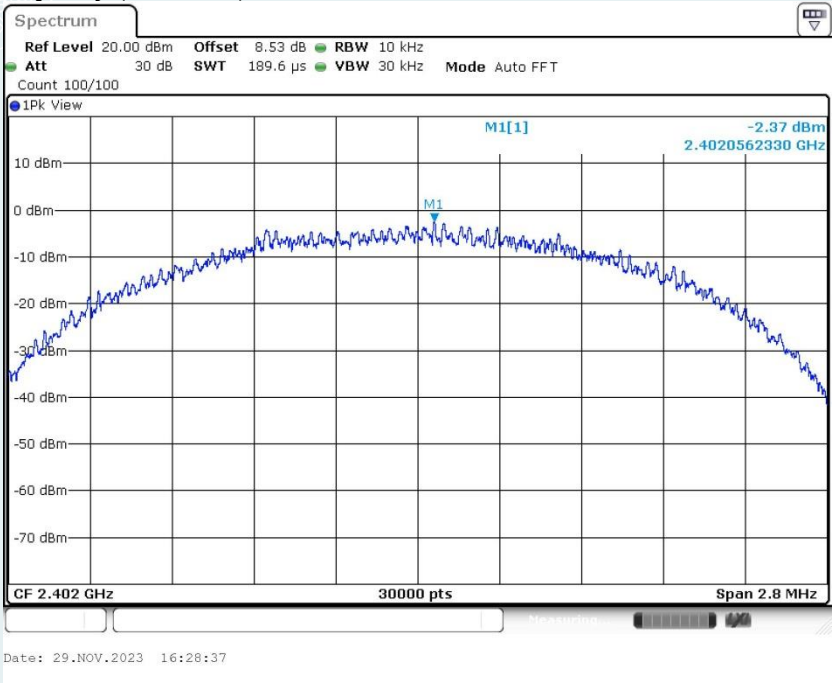


Highest Frequency (2480MHz)

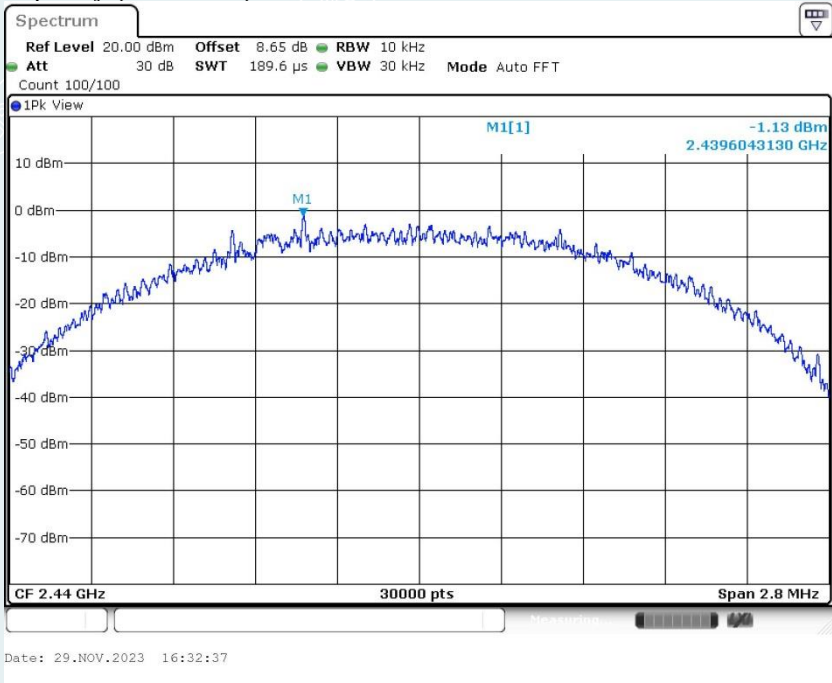


BLE_2M

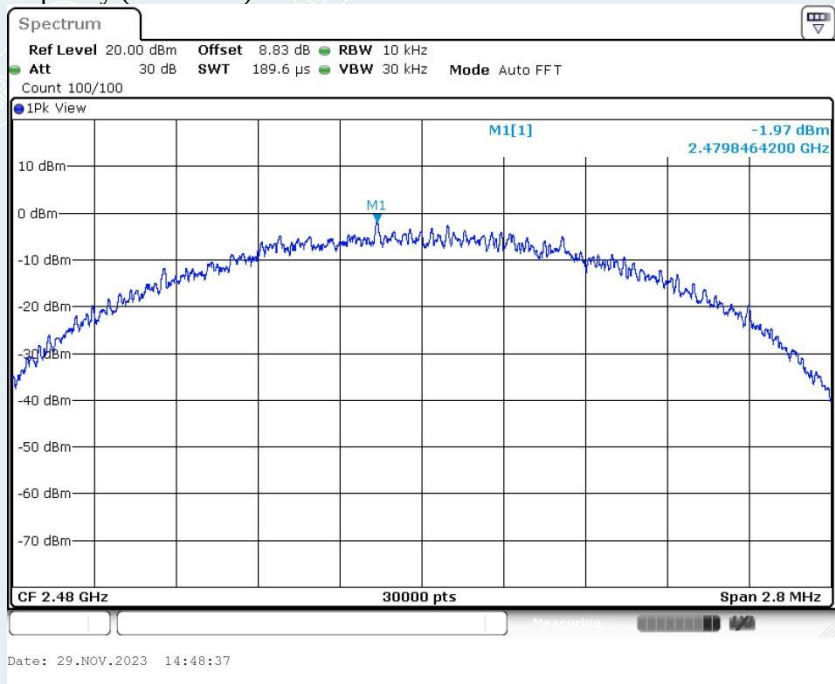
Lowest Frequency (2402MHz)



Middle Frequency (2440 MHz)



Highest Frequency (2480MHz)



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

11. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

11.1 LIMITS

In any 100kHz 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 20dB below that in the 100kHz 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 30dB instead of 20dB.

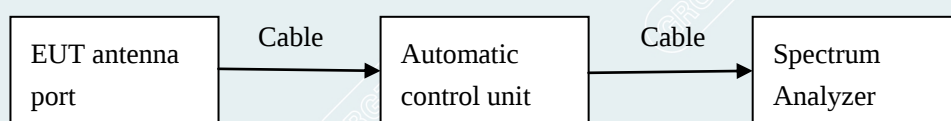
11.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 15.247 Measurement Guidance v05r02.

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

- Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
- Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
- Measure and record the results in the test report.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

11.3 TEST SETUP



11.4 TEST RESULTS

Environment: 27.1°C/49%RH/101.0kPa
Tested By: Huang Tianmei

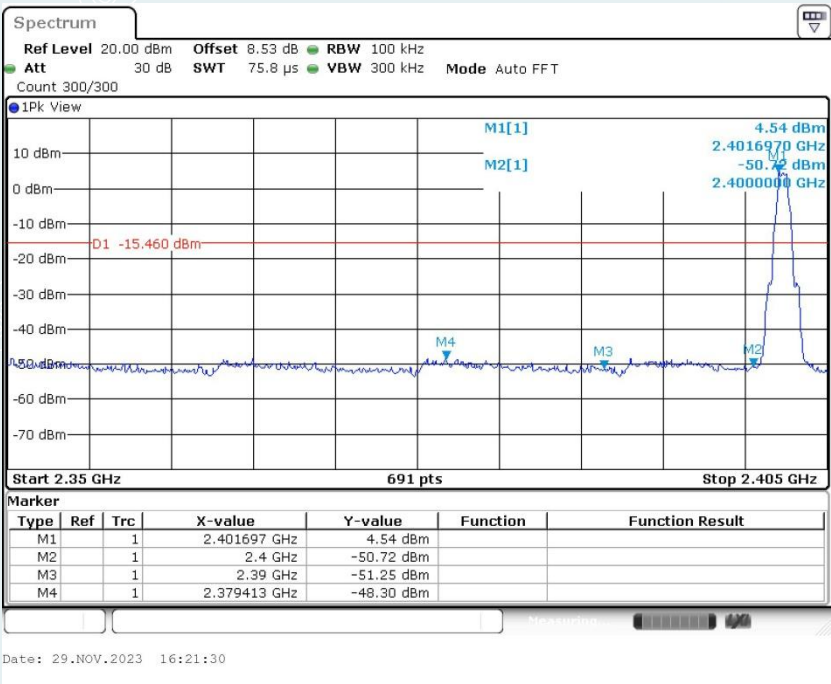
Voltage: DC 5V
Date: 2023-11-29

Band edge measurements

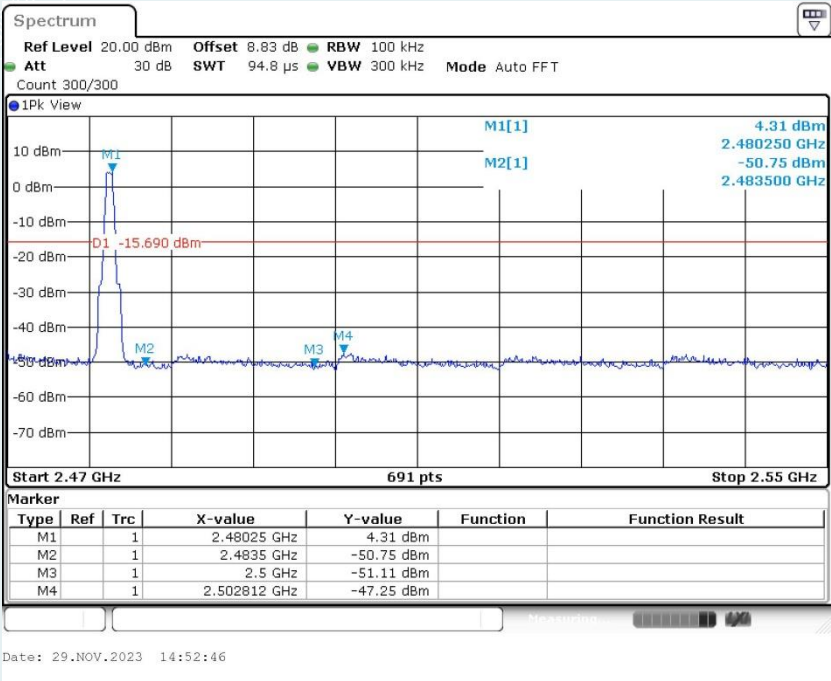
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.54	-48.3	≤-15.46	PASS
		High	2480	4.31	-47.25	≤-15.69	PASS
BLE_2M	Ant1	Low	2402	3.24	-29.2	≤-16.76	PASS
		High	2480	3.26	-45.84	≤-16.74	PASS

BLE_1M

Lowest Frequency (2402MHz)
2.35GHz-2.405GHz

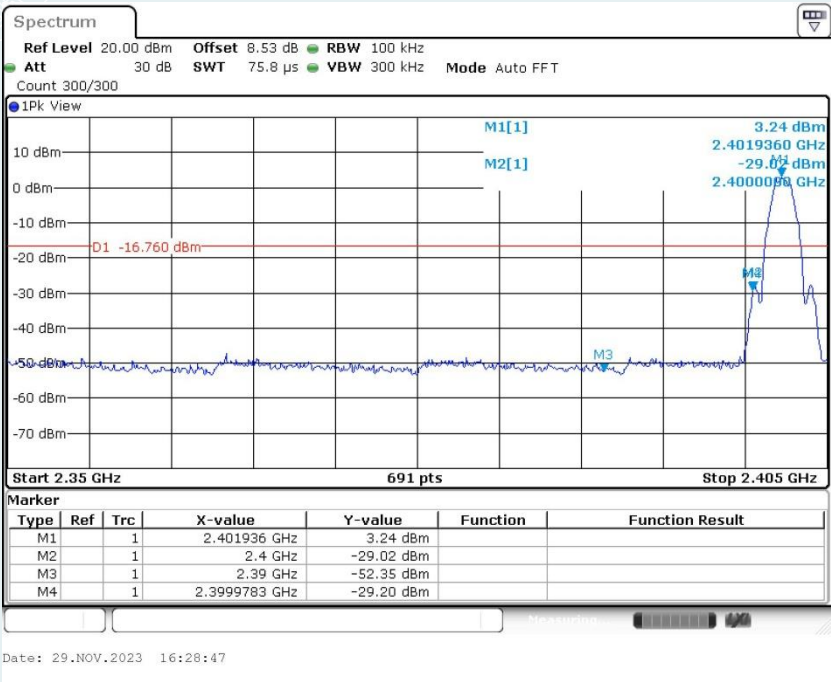


Highest Frequency (2480MHz)
2.47GHz-2.55GHz

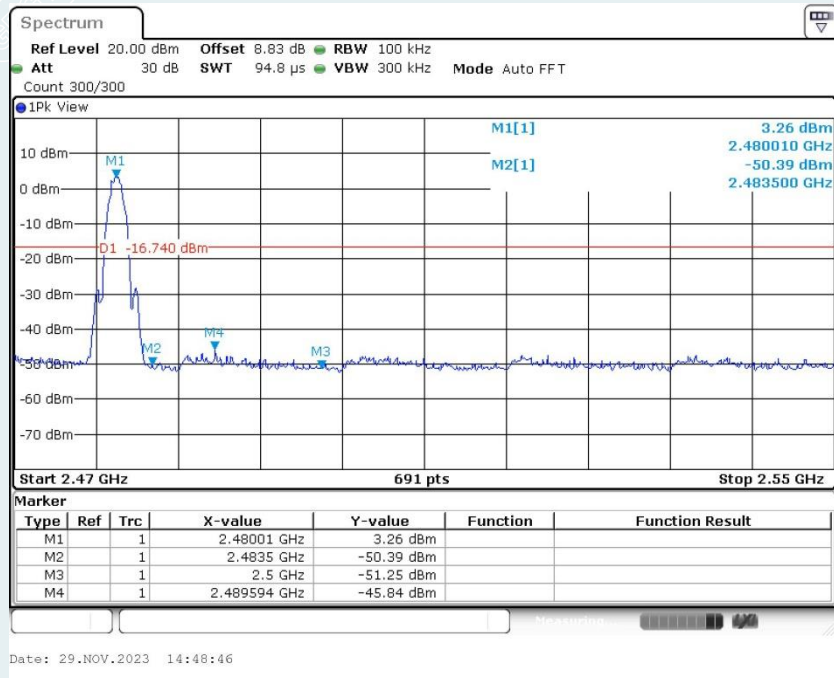


BLE_2M

Lowest Frequency (2402MHz)
2.35GHz-2.405GHz



Highest Frequency (2480MHz)
2.47GHz-2.55GHz

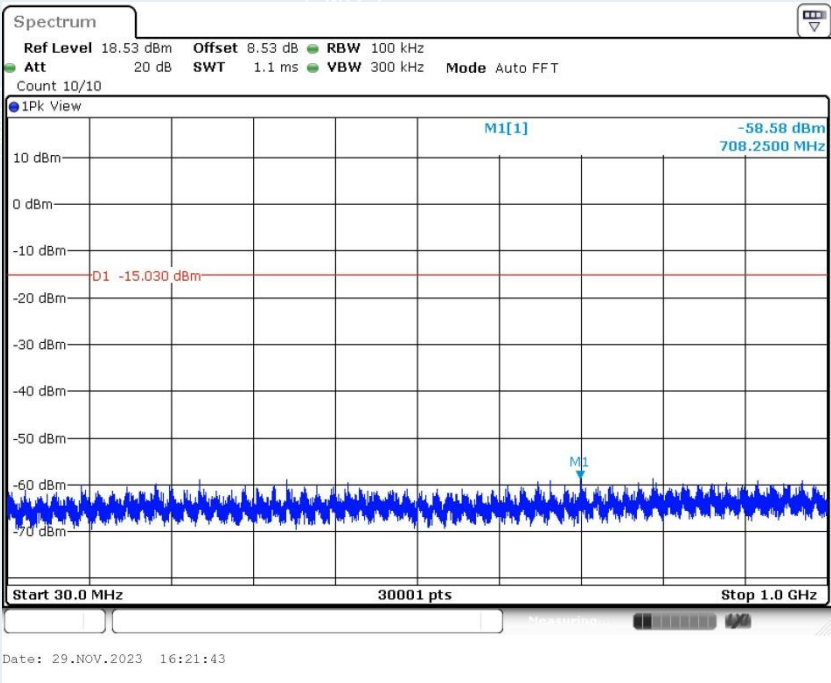


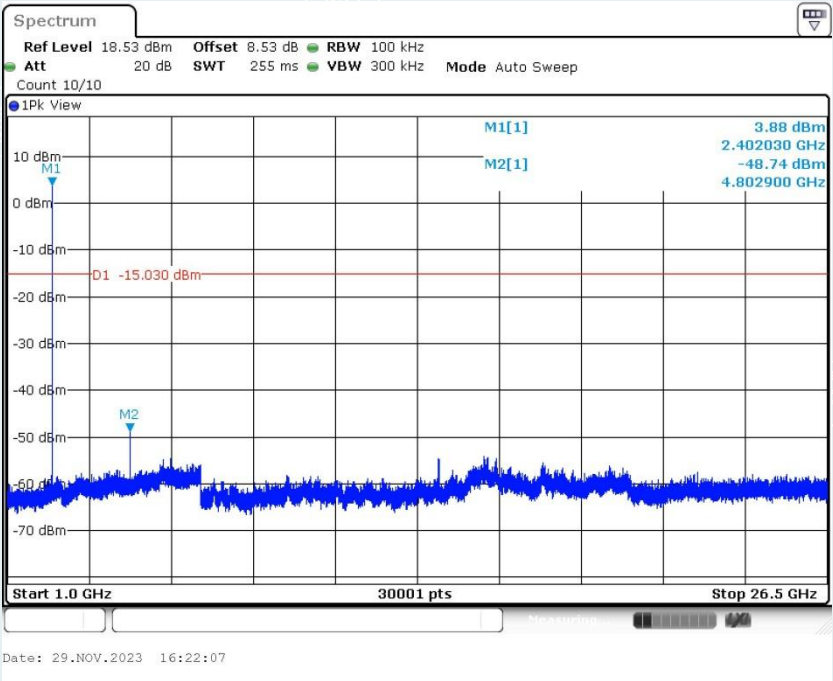
Conducted Spurious Emission

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	4.97	4.97	---	PASS
			30~1000	4.97	-58.58	≤ -15.03	PASS
			1000~26500	4.97	-48.74	≤ -15.03	PASS
		2440	Reference	4.96	4.96	---	PASS
			30~1000	4.96	-57.78	≤ -15.04	PASS
			1000~26500	4.96	-47.08	≤ -15.04	PASS
		2480	Reference	4.80	4.80	---	PASS
			30~1000	4.80	-57.75	≤ -15.2	PASS
			1000~26500	4.80	-51.46	≤ -15.2	PASS
BLE_2M	Ant1	2402	Reference	3.53	3.53	---	PASS
			30~1000	3.53	-58.65	≤ -16.47	PASS
			1000~26500	3.53	-42.95	≤ -16.47	PASS
		2440	Reference	3.45	3.45	---	PASS
			30~1000	3.45	-58.52	≤ -16.55	PASS
			1000~26500	3.45	-48.6	≤ -16.55	PASS
		2480	Reference	3.99	3.99	---	PASS
			30~1000	3.99	-57.56	≤ -16.01	PASS
			1000~26500	3.99	-49.29	≤ -16.01	PASS

BLE_1M

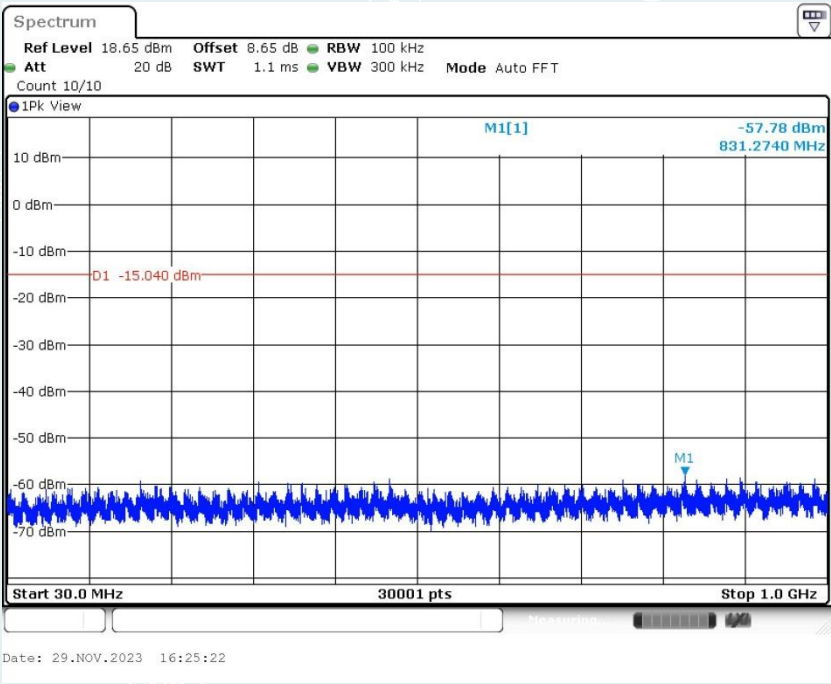
Lowest Frequency (2402MHz)

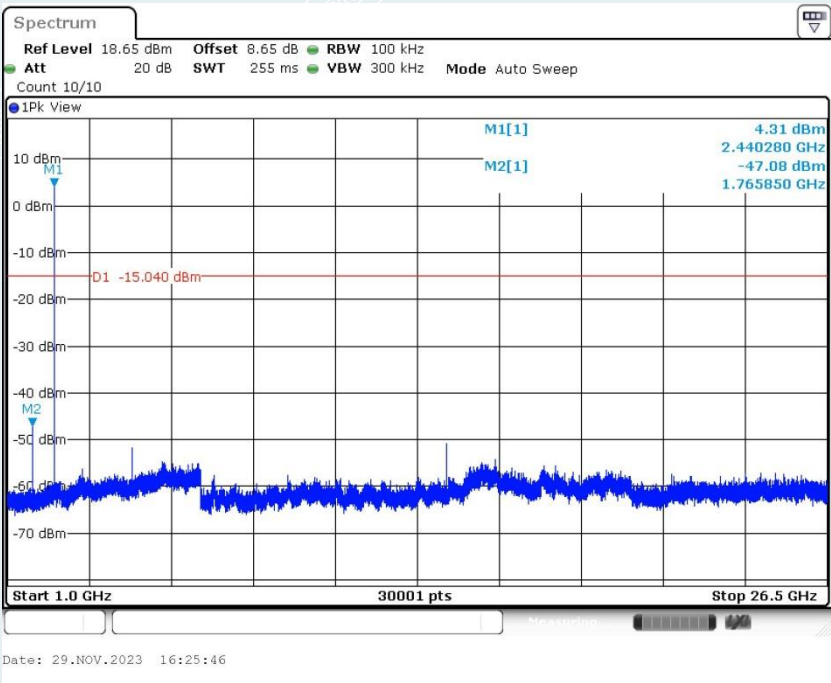




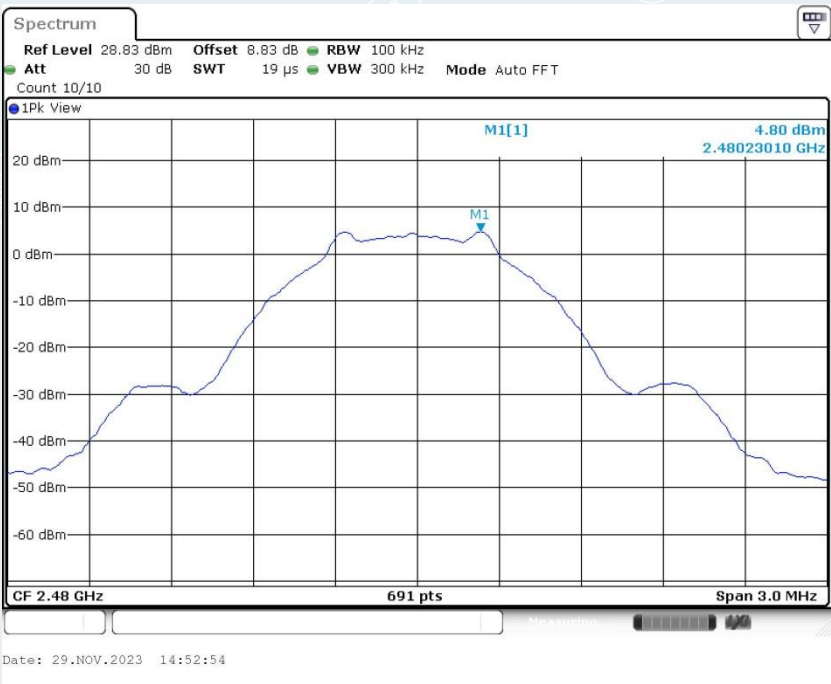
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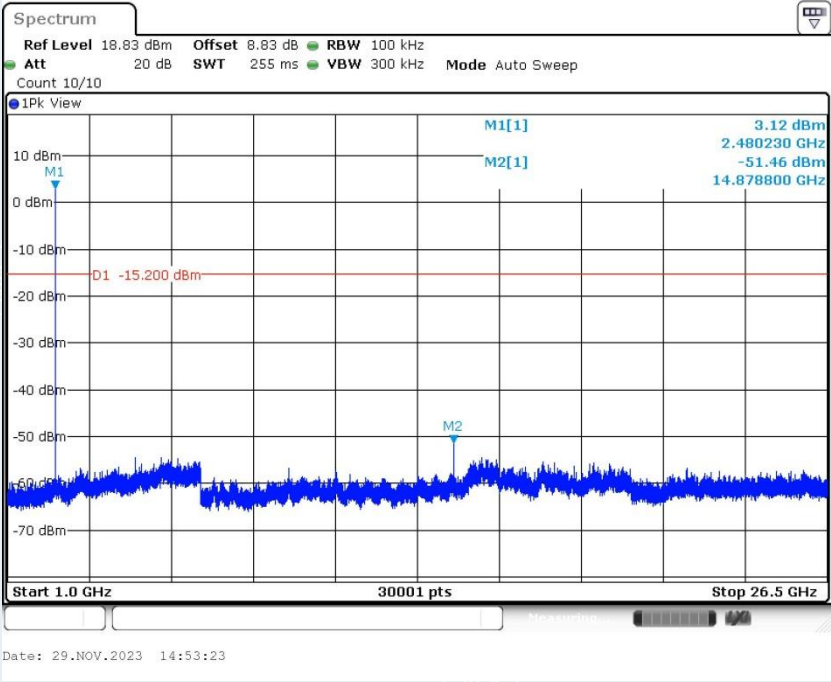
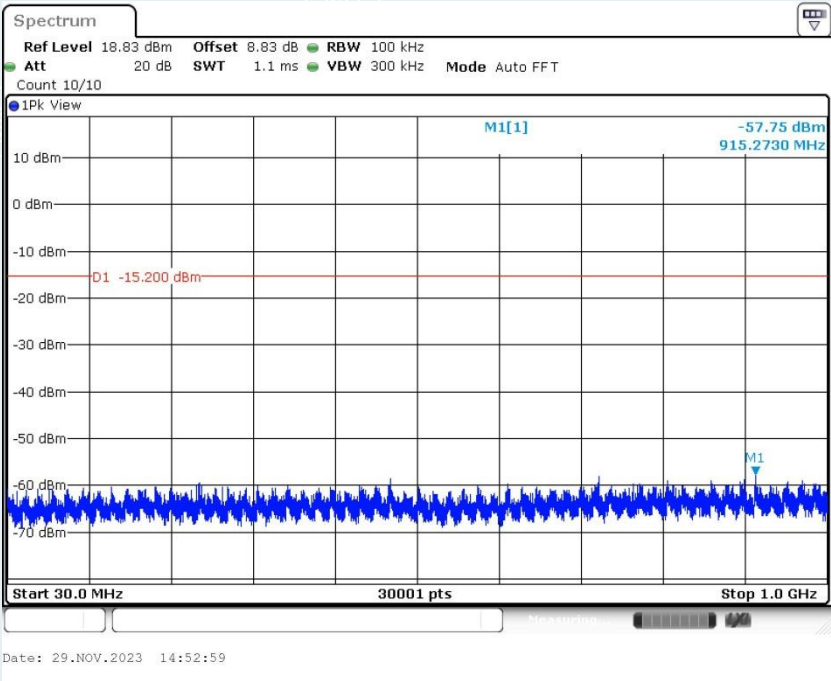
Middle Frequency (2440MHz)





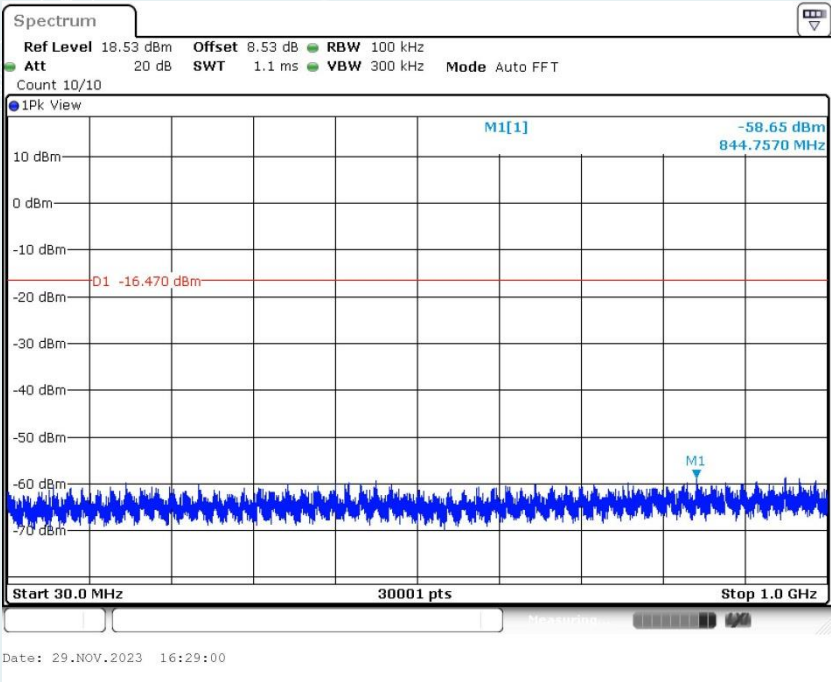
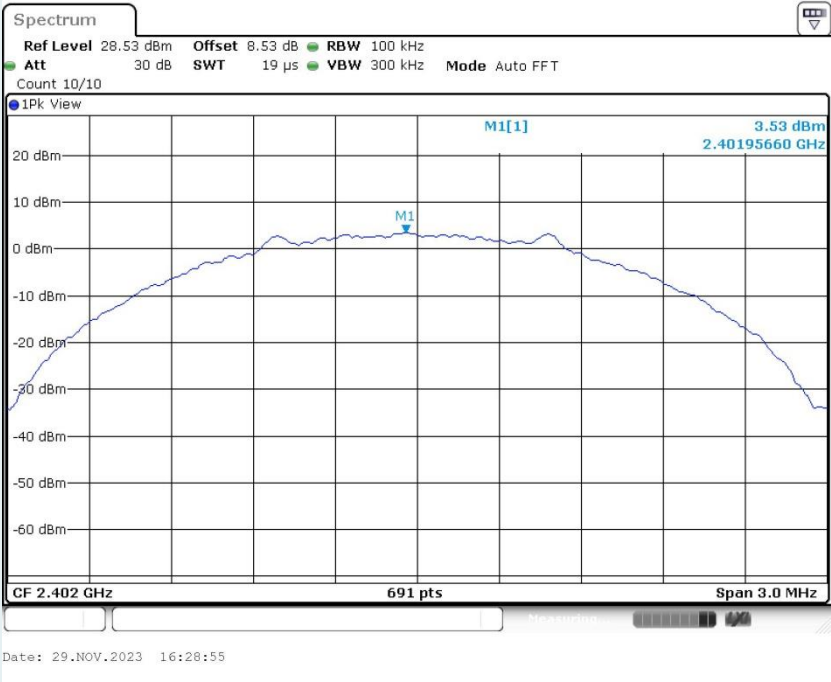
Highest Frequency (2480MHz)

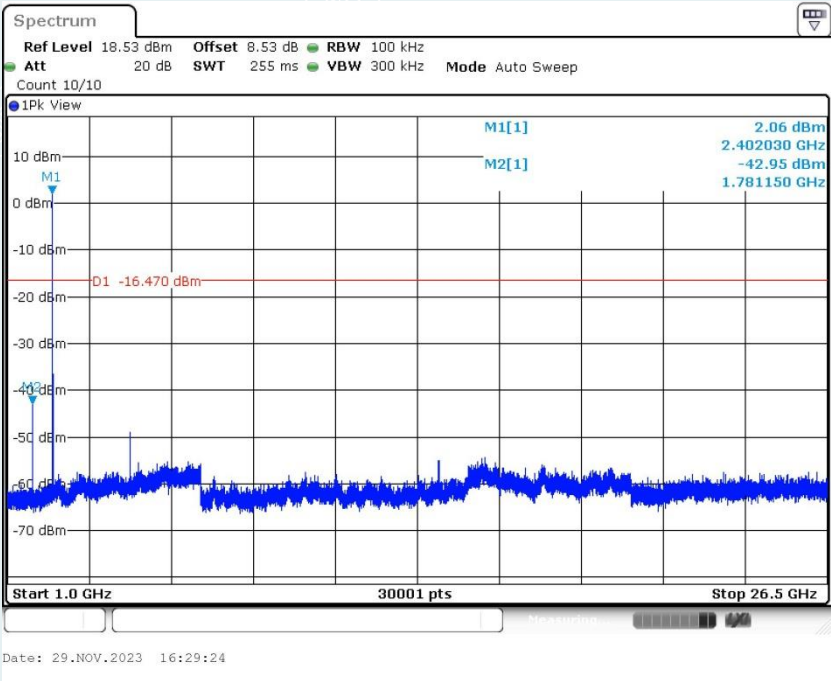




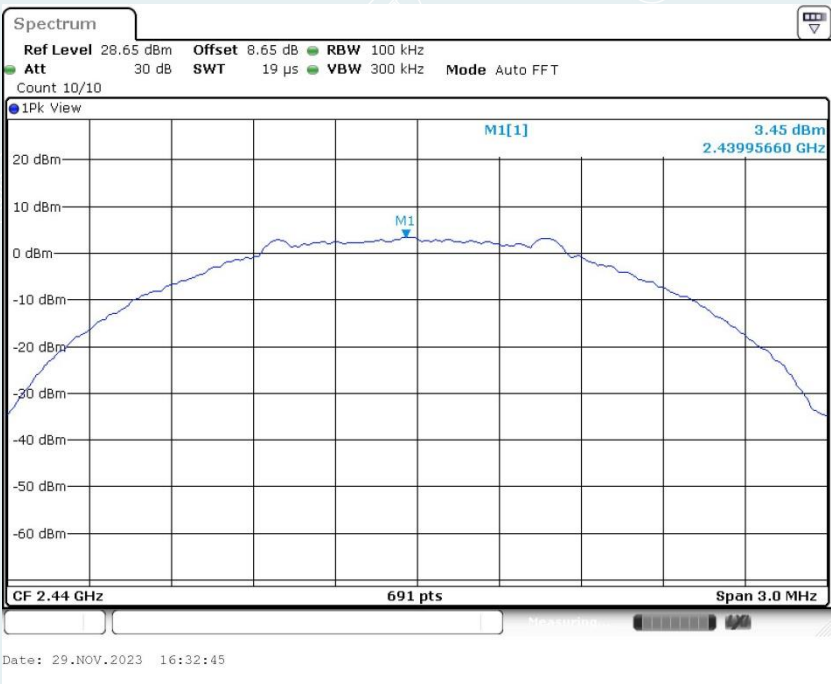
BLE_2M

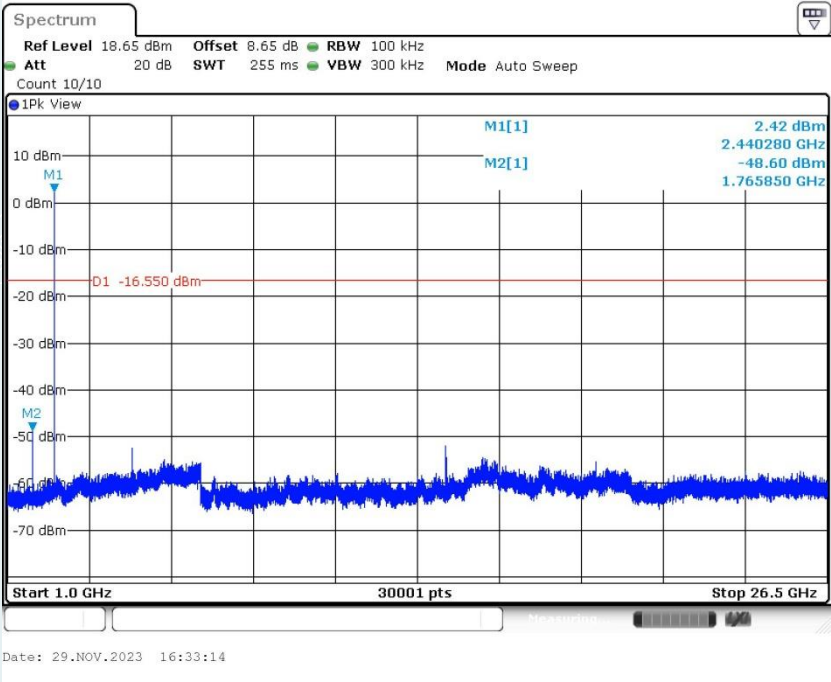
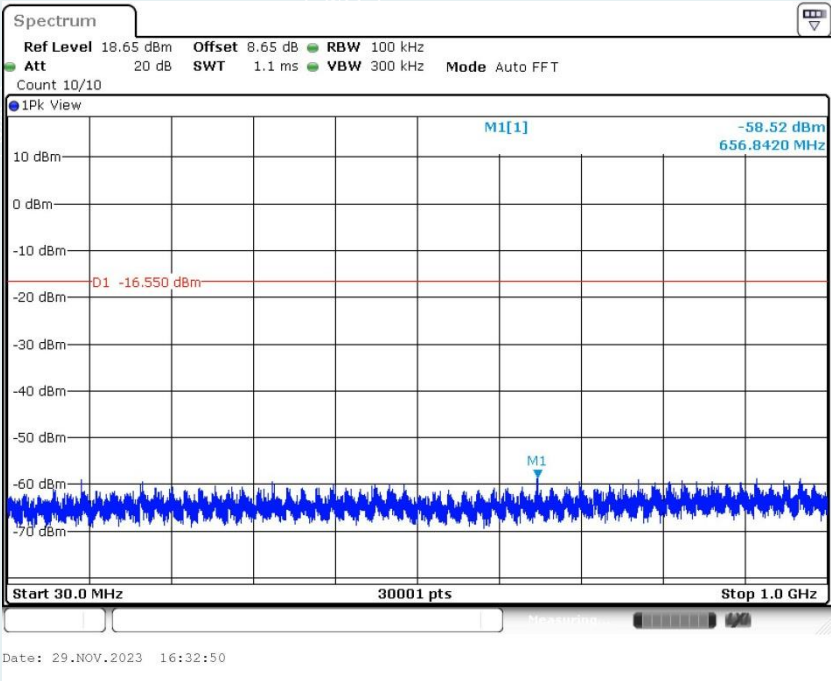
Lowest Frequency (2402MHz)



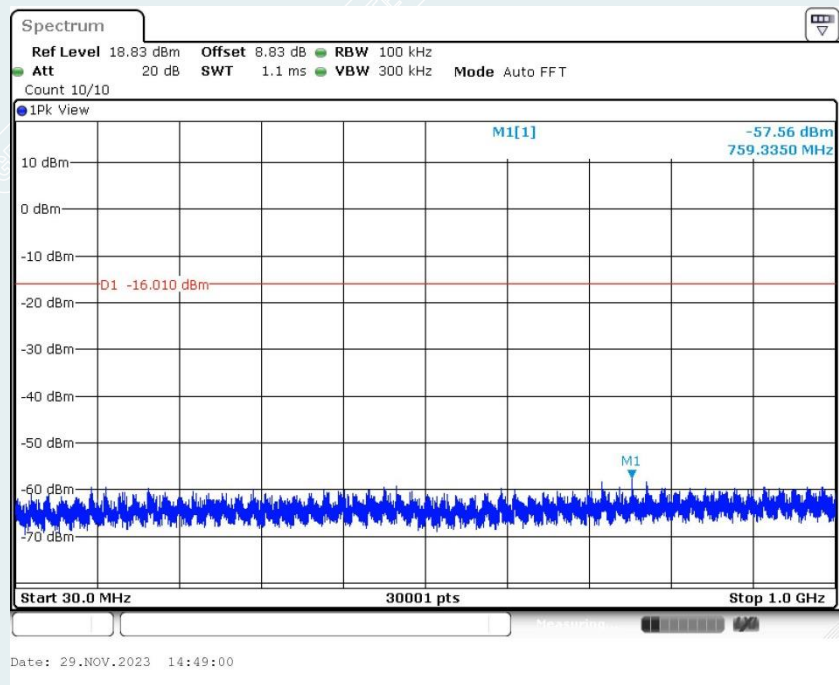
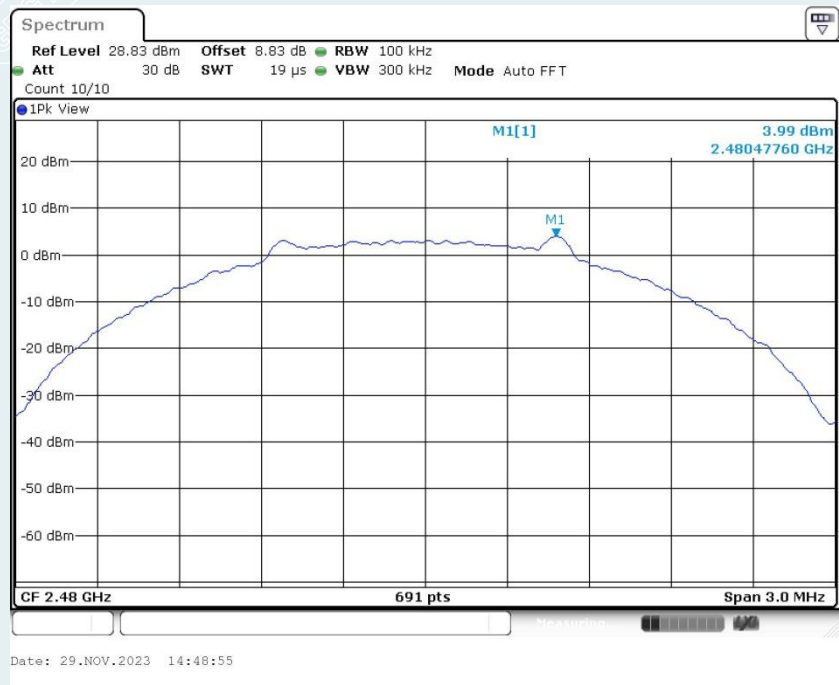


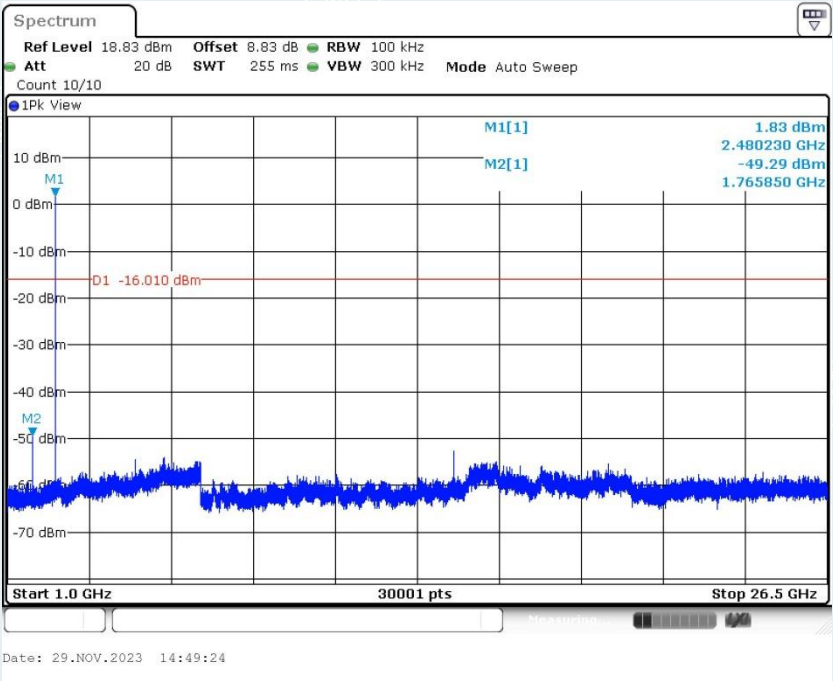
Middle Frequency (2440MHz)





Highest Frequency (2480MHz)





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12. RESTRICTED BANDS OF OPERATION

12.1 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

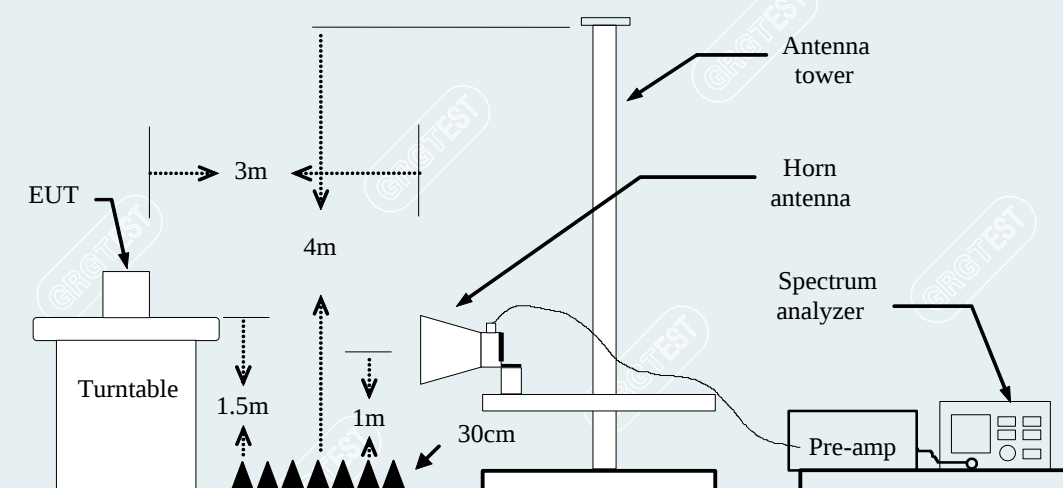
12.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 15.247 Meas Guidance v05r02.

- The EUT is placed on a turntable, which is 1.5m above the ground plane.
- The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - PEAK: RBW=1MHz / VBW=1MHz / Sweep=AUTO.
 - AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO.

If the EUT is configured to transmit with duty cycle $\geq 98\%$, set $VBW \leq RBW/100$ (i.e., 10kHz) but not less than 10 Hz. If the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$, Where T is defined in section 2.8.
- Repeat the procedures until all the PEAK and AVERAGE versus polarization are measured.

12.3 TEST SETUP



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

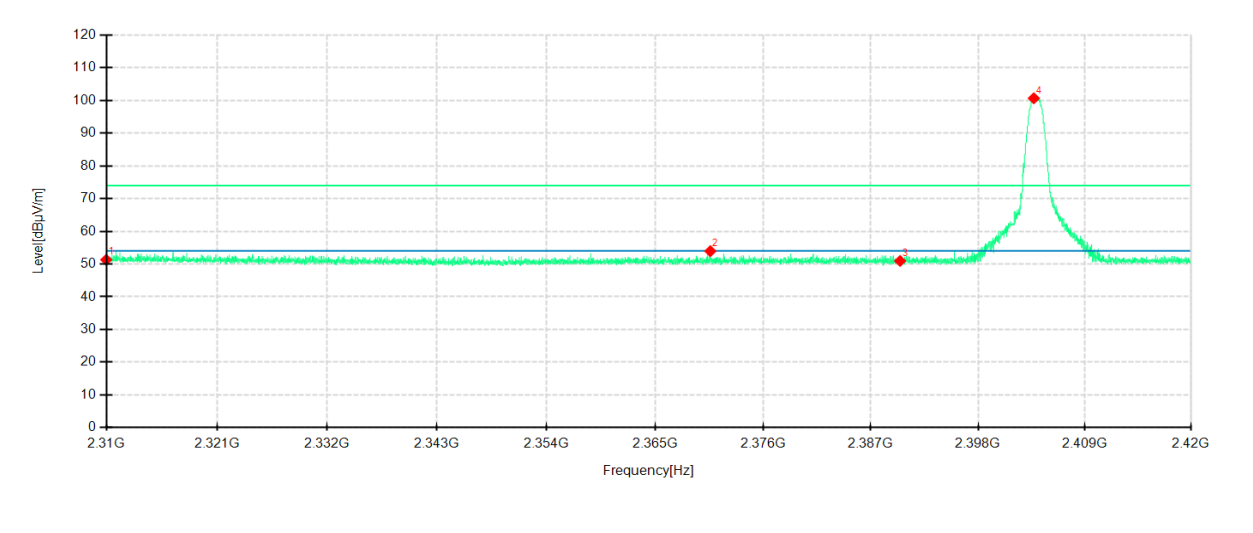
12.4 TEST RESULTS

Pre-scan all modes, the worst power supply is AC 120V/60Hz(DC 5V/2A power by Adapter), in the two power supply modes, only the worst power supply mode is recorded in this report.

Equipment:	Hub M3	Test Date	2023-12-01
Model No.:	HM-G01E	Test Engineer:	Zhang Zishan
Test Voltage:	AC 120V/60Hz	Environmental Conditions	23.5℃/47%RH/101.0kPa

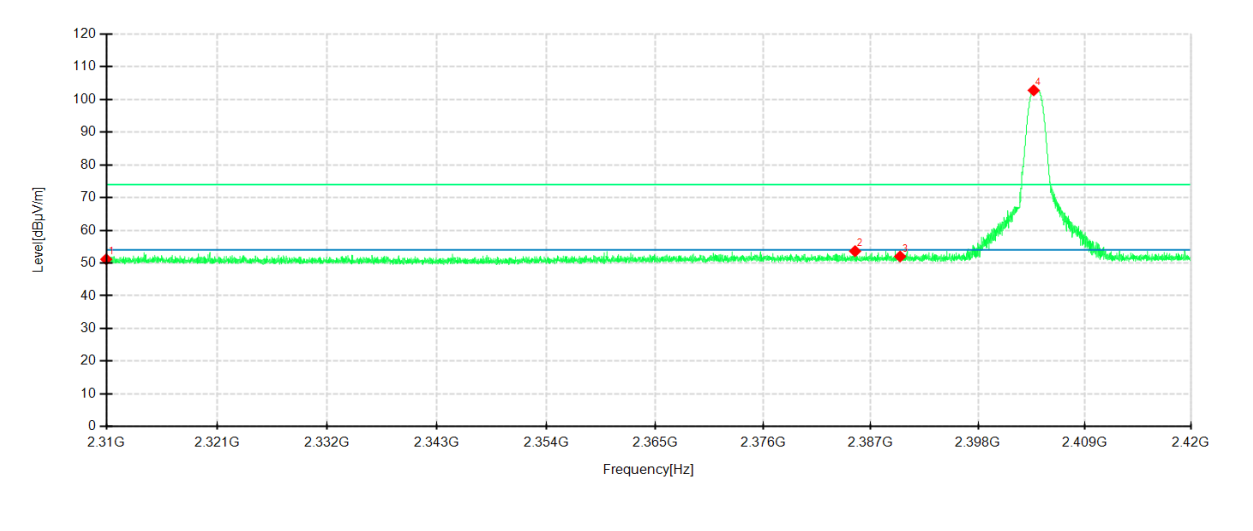
BLE 1M
Lowest Frequency
Frequency 2402MHz
Detector mode: Peak

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	45.72	51.31	5.59	74.00	22.69	200	301	Horizontal	/
2	2370.6238	49.30	53.94	4.64	74.00	20.06	200	233	Horizontal	/
3	2390.0000	46.14	50.94	4.80	74.00	23.06	100	205	Horizontal	/
4	2403.7475	95.77	100.66	4.89	74.00	-26.66	200	213	Horizontal	No limit
1	2310.0000	46.26	51.15	4.89	74.00	22.85	200	89	Vertical	/
2	2385.3913	48.48	53.62	5.14	74.00	20.38	200	176	Vertical	/
3	2390.0000	46.79	52.01	5.22	74.00	21.99	100	124	Vertical	/
4	2403.7338	97.37	102.77	5.40	74.00	-28.77	100	253	Vertical	No limit

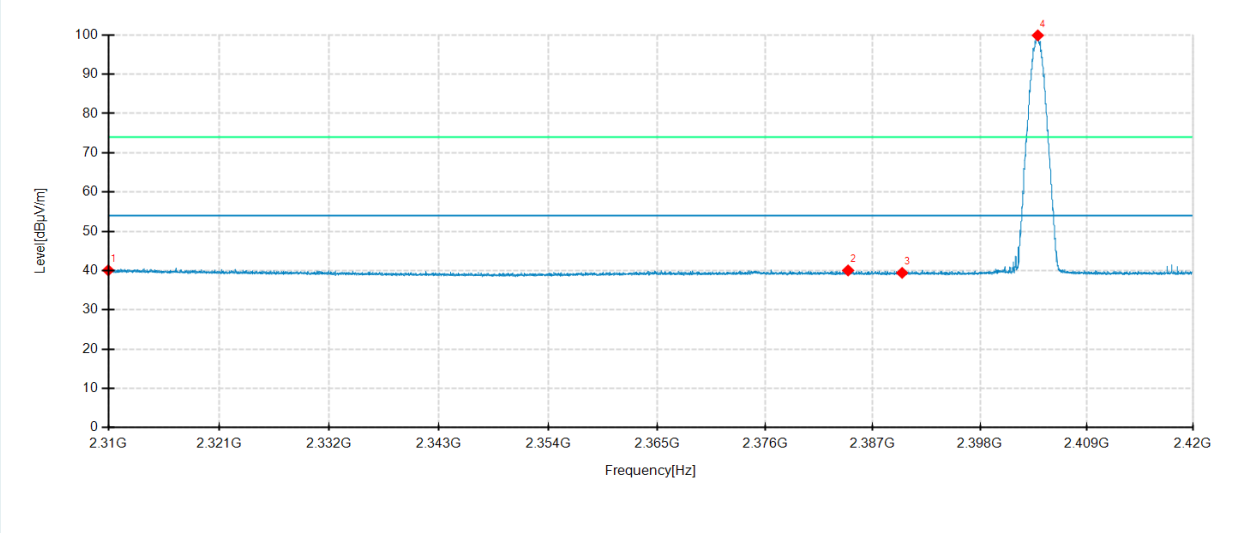
----- The following blanks -----

Lowest Frequency

Frequency 2402MHz

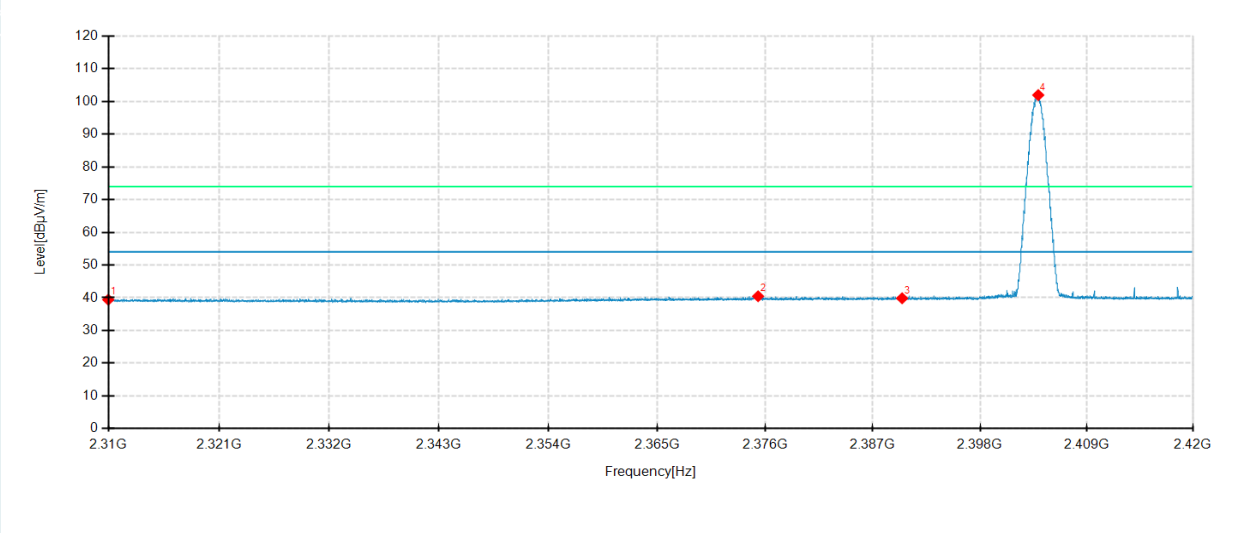
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

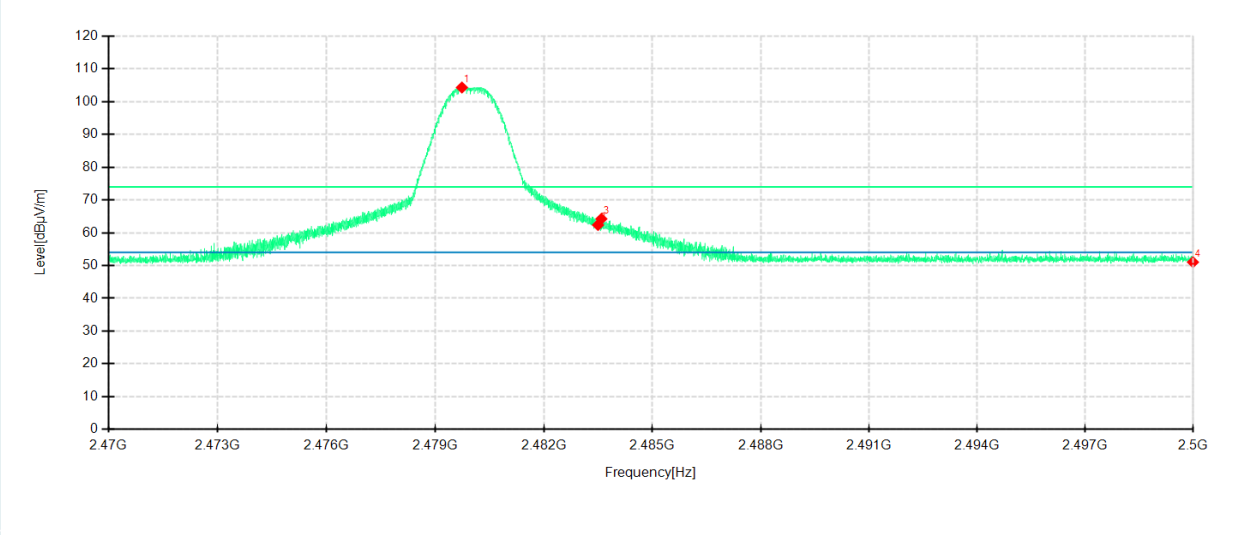
Polarity: Vertical



No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	34.49	40.08	5.59	54.00	13.92	100	215	Horizontal	/
2	2384.4700	35.29	40.04	4.75	54.00	13.96	200	16	Horizontal	/
3	2390.0000	34.62	39.42	4.80	54.00	14.58	200	265	Horizontal	/
4	2403.9538	94.99	99.89	4.90	54.00	-45.89	200	215	Horizontal	No limit
1	2310.0000	34.53	39.42	4.89	54.00	14.58	200	95	Vertical	/
2	2375.2850	35.50	40.47	4.97	54.00	13.53	100	54	Vertical	/
3	2390.0000	34.63	39.85	5.22	54.00	14.15	200	56	Vertical	/
4	2403.9950	96.53	101.94	5.41	54.00	-47.94	100	254	Vertical	No limit

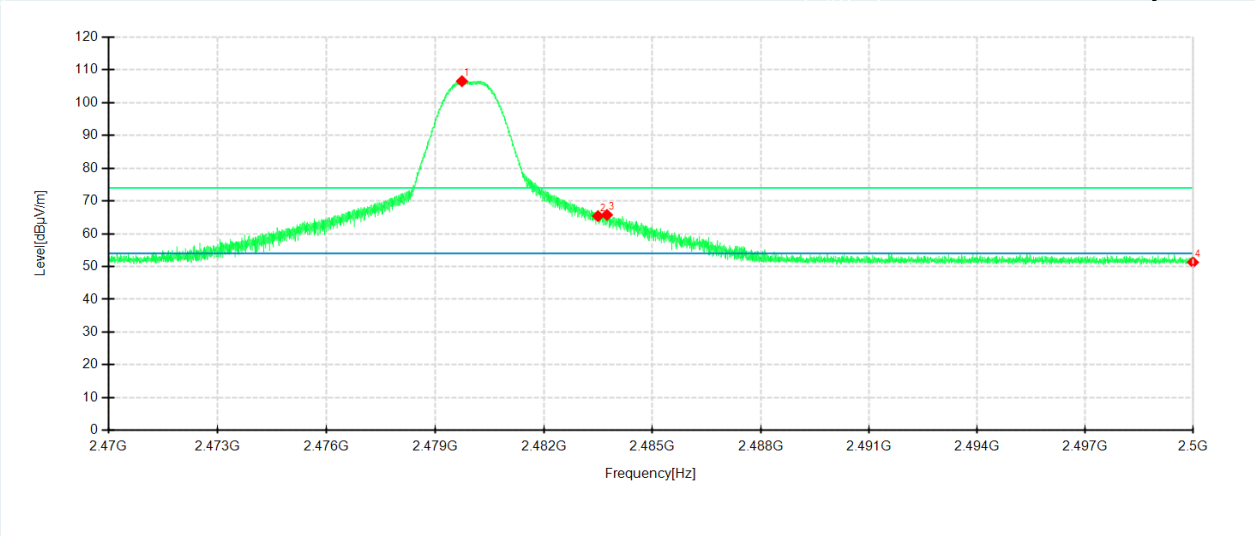
Highest Frequency
Frequency 2480MHz
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



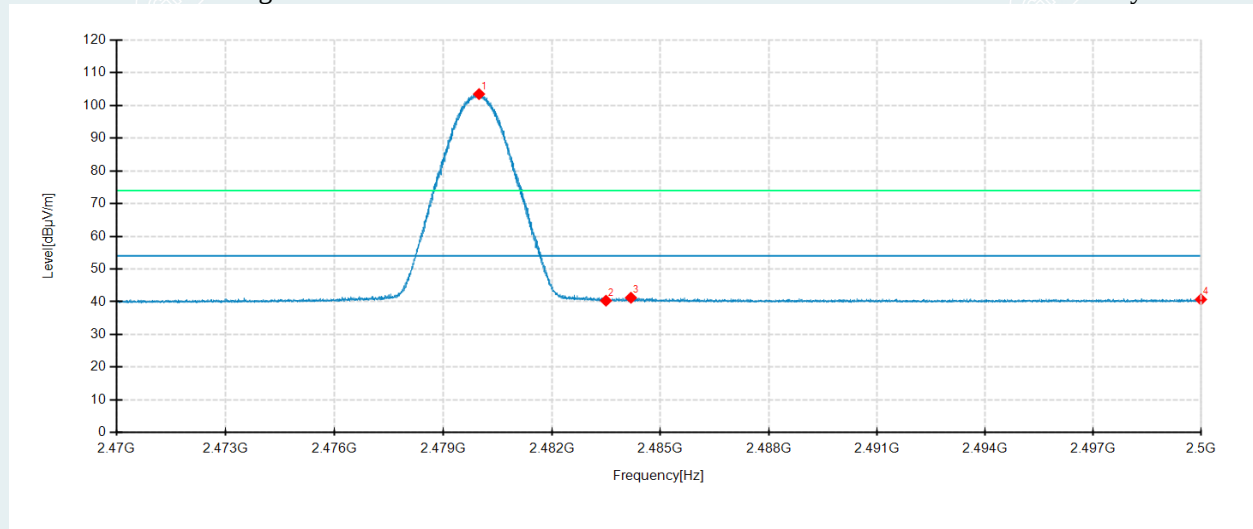
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.7425	98.73	104.30	5.57	74.00	-30.30	200	223	Horizontal	No limit
2	2483.5000	56.74	62.37	5.63	74.00	11.63	100	195	Horizontal	/
3	2483.5938	58.60	64.23	5.63	74.00	9.77	200	193	Horizontal	/
4	2500.0000	45.13	51.03	5.90	74.00	22.97	200	16	Horizontal	/
1	2479.7425	100.84	106.53	5.69	74.00	-32.53	100	243	Vertical	No limit
2	2483.5000	59.69	65.39	5.70	74.00	8.61	100	273	Vertical	/
3	2483.7475	60.06	65.76	5.70	74.00	8.24	100	253	Vertical	/
4	2500.0000	45.60	51.30	5.70	74.00	22.70	100	243	Vertical	/

Highest Frequency

Frequency 2480MHz

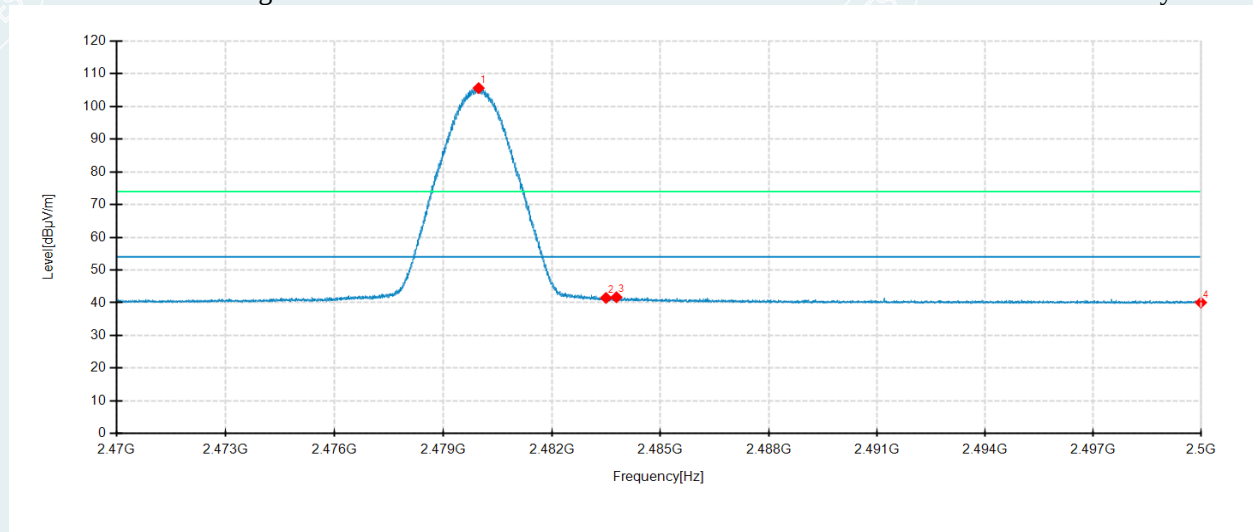
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



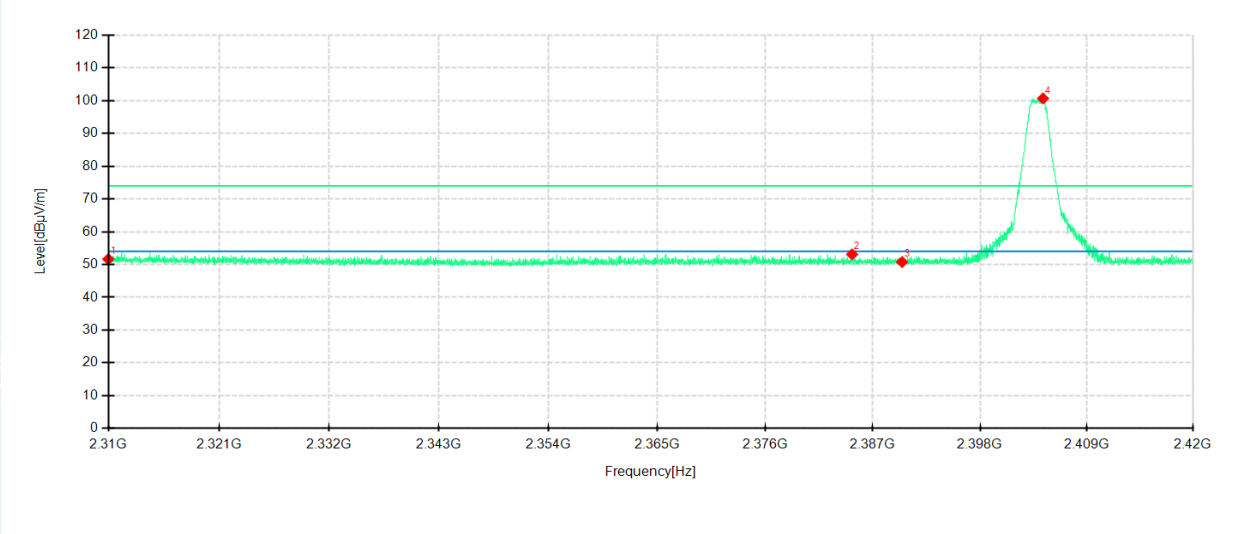
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.9938	97.90	103.47	5.57	54.00	-49.47	200	225	Horizontal	No limit
2	2483.5000	34.71	40.34	5.63	54.00	13.66	200	214	Horizontal	/
3	2484.1900	35.58	41.23	5.65	54.00	12.77	100	233	Horizontal	/
4	2500.0000	34.80	40.70	5.90	54.00	13.30	100	46	Horizontal	/
1	2479.9825	99.91	105.60	5.69	54.00	-51.60	100	243	Vertical	No limit
2	2483.5000	35.78	41.48	5.70	54.00	12.52	100	243	Vertical	/
3	2483.7888	35.99	41.69	5.70	54.00	12.31	100	273	Vertical	/
4	2500.0000	34.37	40.07	5.70	54.00	13.93	200	276	Vertical	/

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

Equipment:	Hub M3	Test Date	2023-09-05
Model No.:	HM-G01E	Test Engineer:	Zhang Zishan
Test Voltage:	AC 120V/60Hz	Environmental Conditions	25.8℃/53%RH/101.0kPa

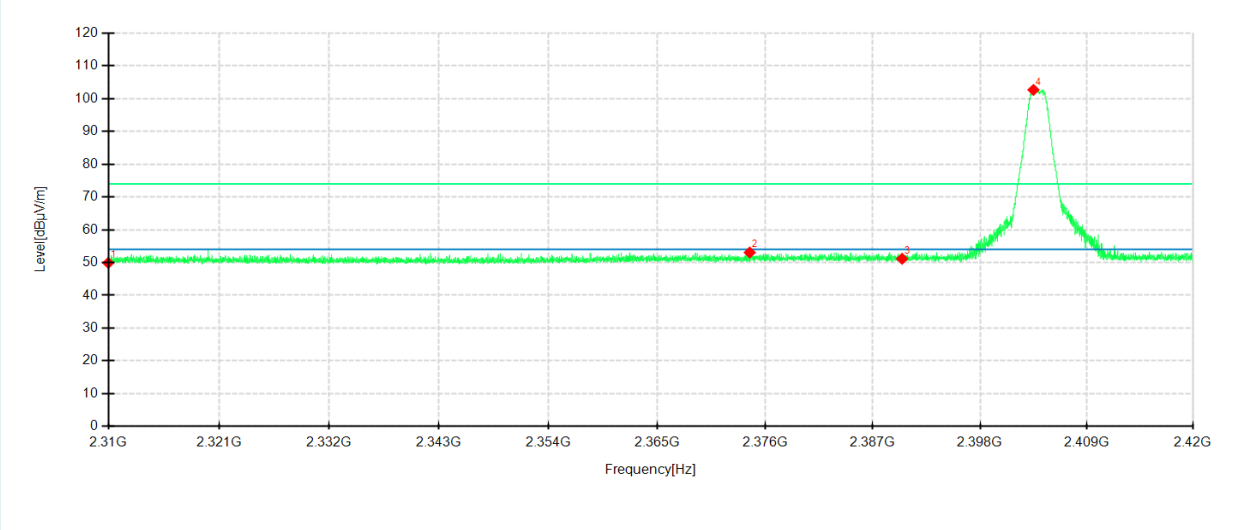
BLE 2M
Lowest Frequency
Frequency 2402MHz
Detector mode: Peak

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	46.06	51.65	5.59	74.00	22.35	100	1	Horizontal	/
2	2384.8825	48.35	53.10	4.75	74.00	20.90	100	284	Horizontal	/
3	2390.0000	45.97	50.77	4.80	74.00	23.23	200	360	Horizontal	/
4	2404.4900	95.77	100.67	4.90	74.00	-26.67	200	212	Horizontal	No limit
1	2310.0000	45.00	49.89	4.89	74.00	24.11	100	193	Vertical	/
2	2374.4325	48.09	53.05	4.96	74.00	20.95	200	345	Vertical	/
3	2390.0000	45.93	51.15	5.22	74.00	22.85	200	256	Vertical	/
4	2403.5000	97.26	102.66	5.40	74.00	-28.66	100	243	Vertical	No limit

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

Lowest Frequency

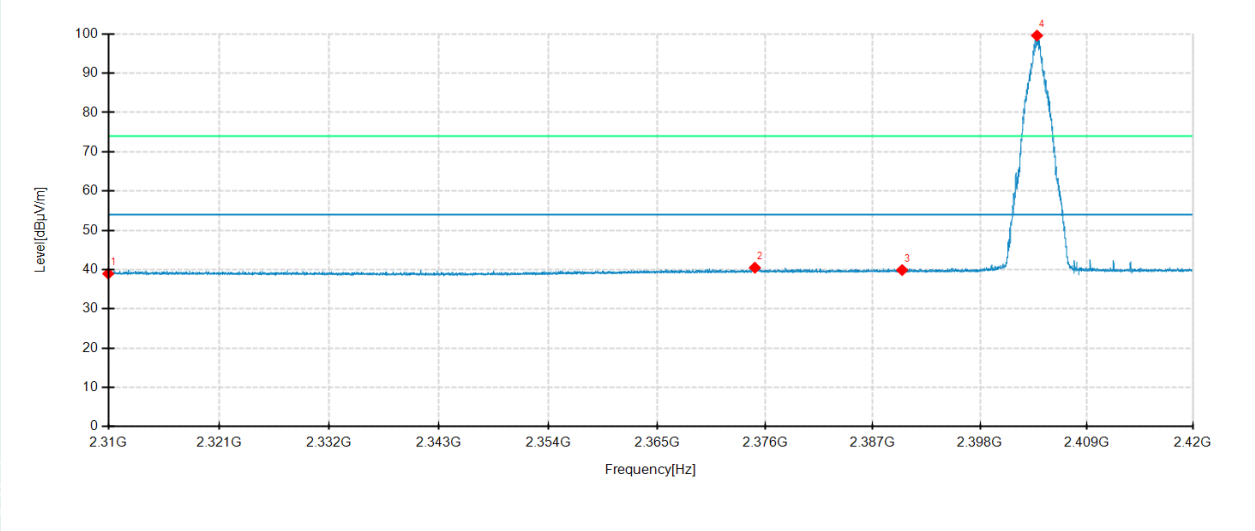
Frequency 2402MHz

Detector mode: Average

Polarity: Horizontal

Detector mode: Average

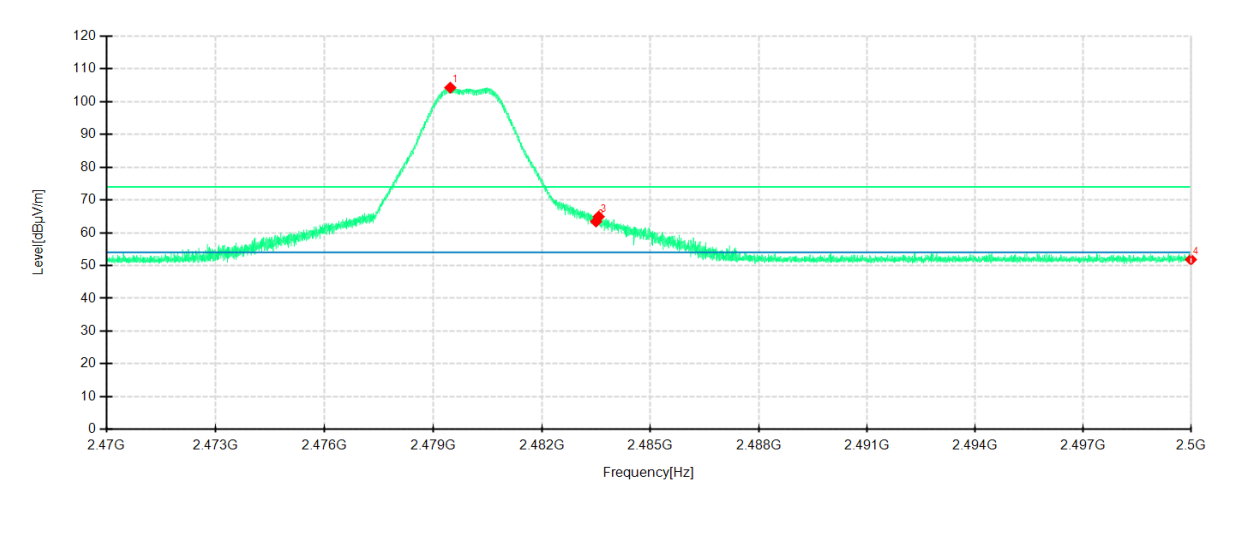
Polarity: Vertical



No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	34.11	39.70	5.59	54.00	14.30	200	15	Horizontal	/
2	2386.1475	35.24	40.01	4.77	54.00	13.99	100	267	Horizontal	/
3	2390.0000	34.24	39.04	4.80	54.00	14.96	200	154	Horizontal	/
4	2403.9813	92.13	97.03	4.90	54.00	-43.03	200	214	Horizontal	No limit
1	2310.0000	34.07	38.96	4.89	54.00	15.04	100	194	Vertical	/
2	2374.9550	35.51	40.48	4.97	54.00	13.52	200	7	Vertical	/
3	2390.0000	34.66	39.88	5.22	54.00	14.12	200	315	Vertical	/
4	2403.8713	94.18	99.59	5.41	54.00	-45.59	100	243	Vertical	No limit

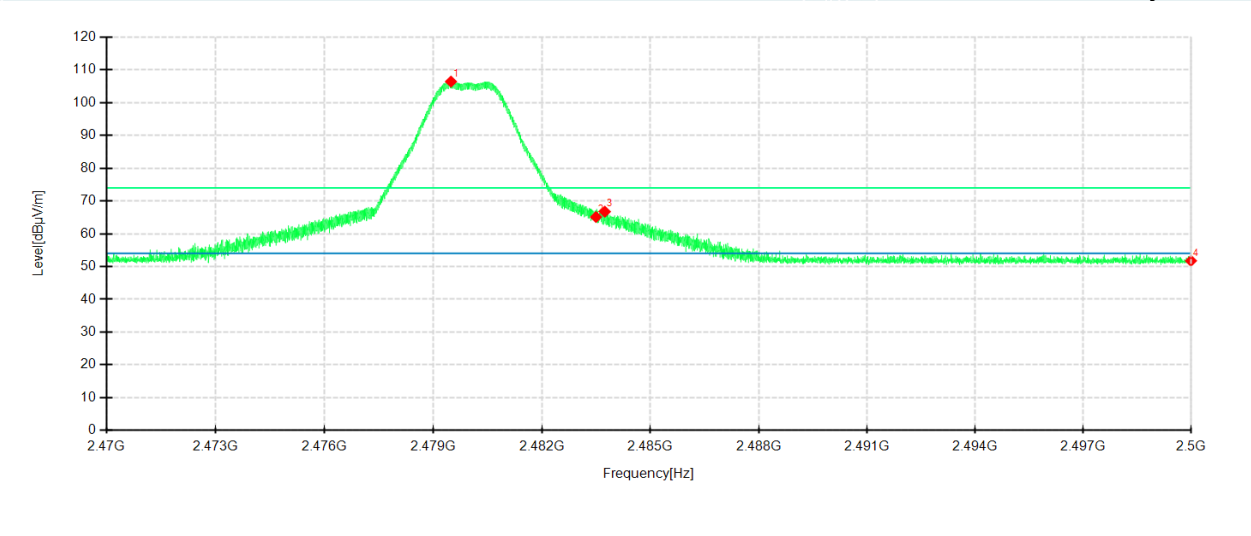
Highest Frequency
Frequency 2480MHz
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



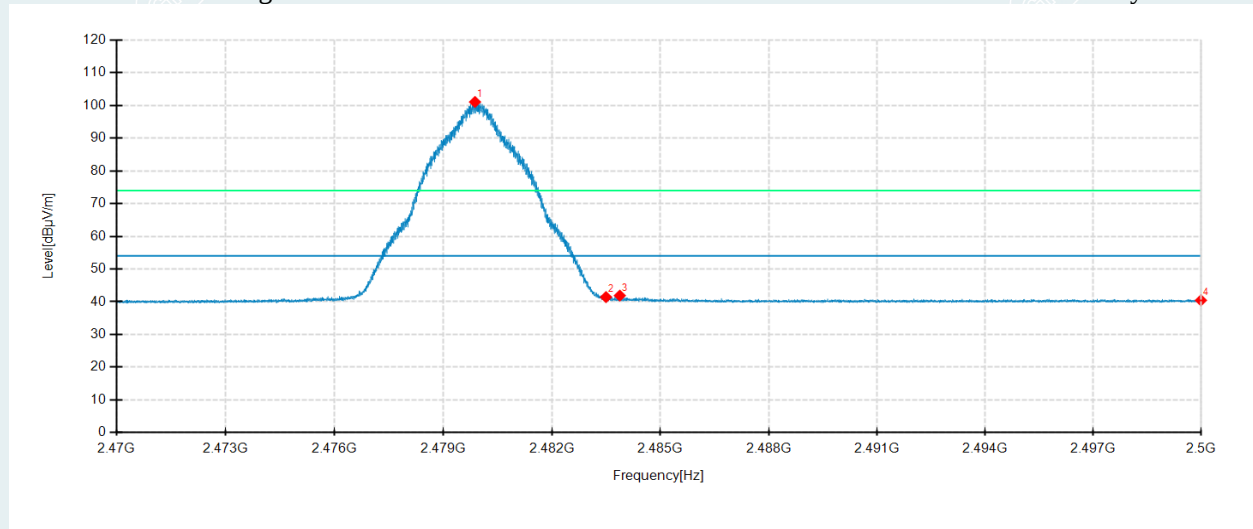
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.4763	98.68	104.24	5.56	74.00	-30.24	200	224	Horizontal	No limit
2	2483.5000	57.80	63.43	5.63	74.00	10.57	100	224	Horizontal	/
3	2483.5750	59.28	64.91	5.63	74.00	9.09	200	213	Horizontal	/
4	2500.0000	45.92	51.82	5.90	74.00	22.18	100	5	Horizontal	/
1	2479.4950	100.73	106.42	5.69	74.00	-32.42	100	253	Vertical	No limit
2	2483.5000	59.41	65.11	5.70	74.00	8.89	100	213	Vertical	/
3	2483.7438	61.04	66.74	5.70	74.00	7.26	100	243	Vertical	/
4	2500.0000	46.05	51.75	5.70	74.00	22.25	200	334	Vertical	/

Highest Frequency

Frequency 2480MHz

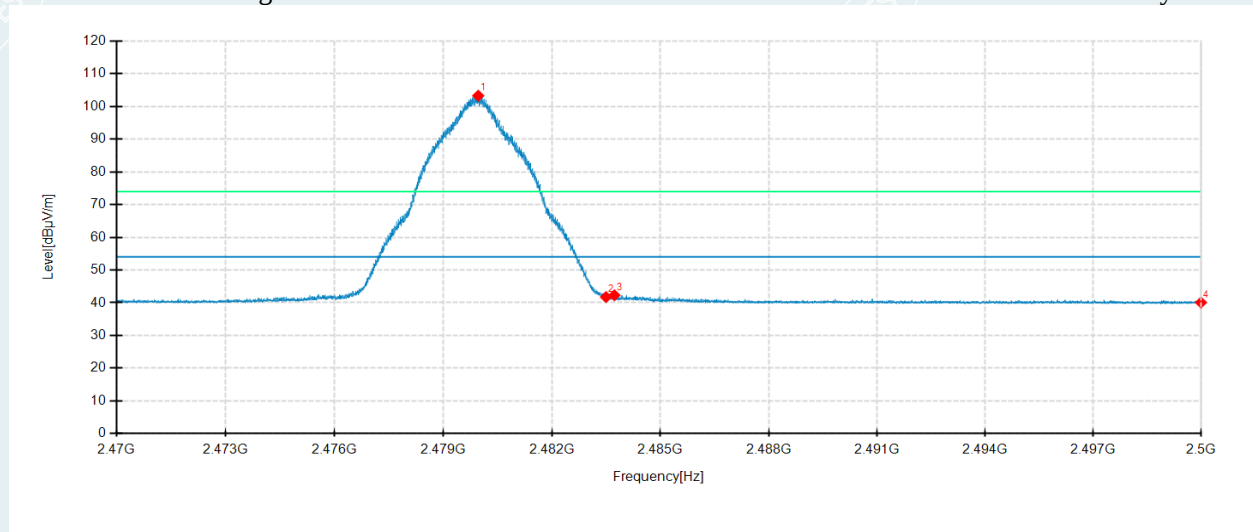
Detector mode: Average

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	2479.8813	95.49	101.06	5.57	54.00	-47.06	200	224	Horizontal	No limit
2	2483.5000	35.80	41.43	5.63	54.00	12.57	200	224	Horizontal	/
3	2483.8825	36.25	41.89	5.64	54.00	12.11	200	194	Horizontal	/
4	2500.0000	34.55	40.45	5.90	54.00	13.55	100	47	Horizontal	/
1	2479.9713	97.58	103.27	5.69	54.00	-49.27	100	245	Vertical	No limit
2	2483.5000	36.05	41.75	5.70	54.00	12.25	100	215	Vertical	/
3	2483.7325	36.60	42.30	5.70	54.00	11.70	100	255	Vertical	/
4	2500.0000	34.39	40.09	5.70	54.00	13.91	100	175	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 E20230331478001-30 FCC ISED-Test Photo.

APPENDIX B. PHOTOGRAPH OF THE EUT

Please refer to the attached document E20230331478001-29 EUT photo.

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