4.3.Radiated Emission Limits Standard:

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000MHz	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark : (1) Emission Level (dBμV/m) = Reading (Receiver) (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB)
Emission Level (dBμV/m) = Reading (Spectrum) (dBμV) + Antenna Factor (dB/m) – Amp Factor (dB) + Cable Loss (dB)(above 1000MHz)

(2) The smaller limits shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.4.1. TrapMan (EUT)

Model Number : TM8
Serial Number : N/A

4.5.Operating Condition of EUT

4.5.1. Setup the EUT and simulator as shown as Section 4.2.

4.5.2. Turn on the power of all equipments.

4.5.3. Let EUT work in Tx mode.

4.6. Test Procedure

Frequency below 30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 regulation.

Frequency Above 30MHz:

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground for frequency 30MHz~1000MHz, 1.5 meter high above ground for frequency above 1GHz and put the absorbing with 2.4m(L)*2.4m(W)*0.3m(H) on the ground . The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it.EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna for frequency 30MHz~1000MHz, and the Horm antenna is used as receiving antenna for frequency above 1GHz. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10 on radiated emission Test

The bandwidth of the EMI test receiver (R&S ESR3) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz

This device is pulse Modulated, a duty cycle factor was used to calculated average level based measured peak level.

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.7. Radiated Emission Test Results

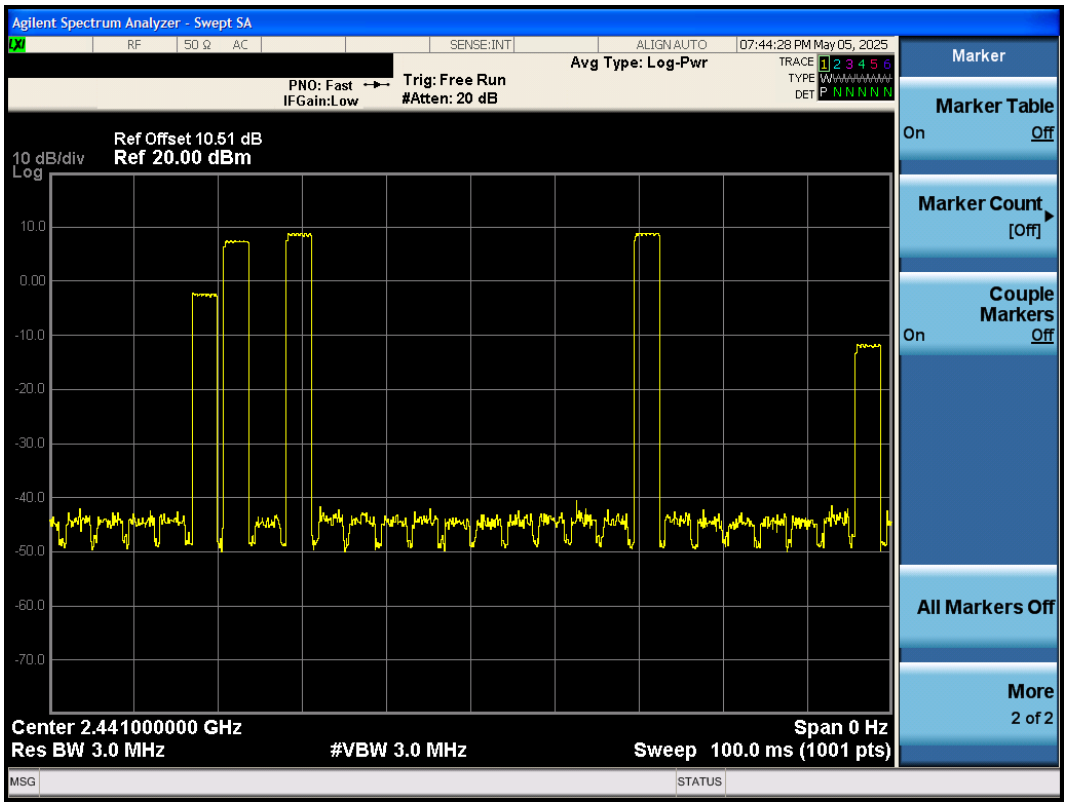
PASS.

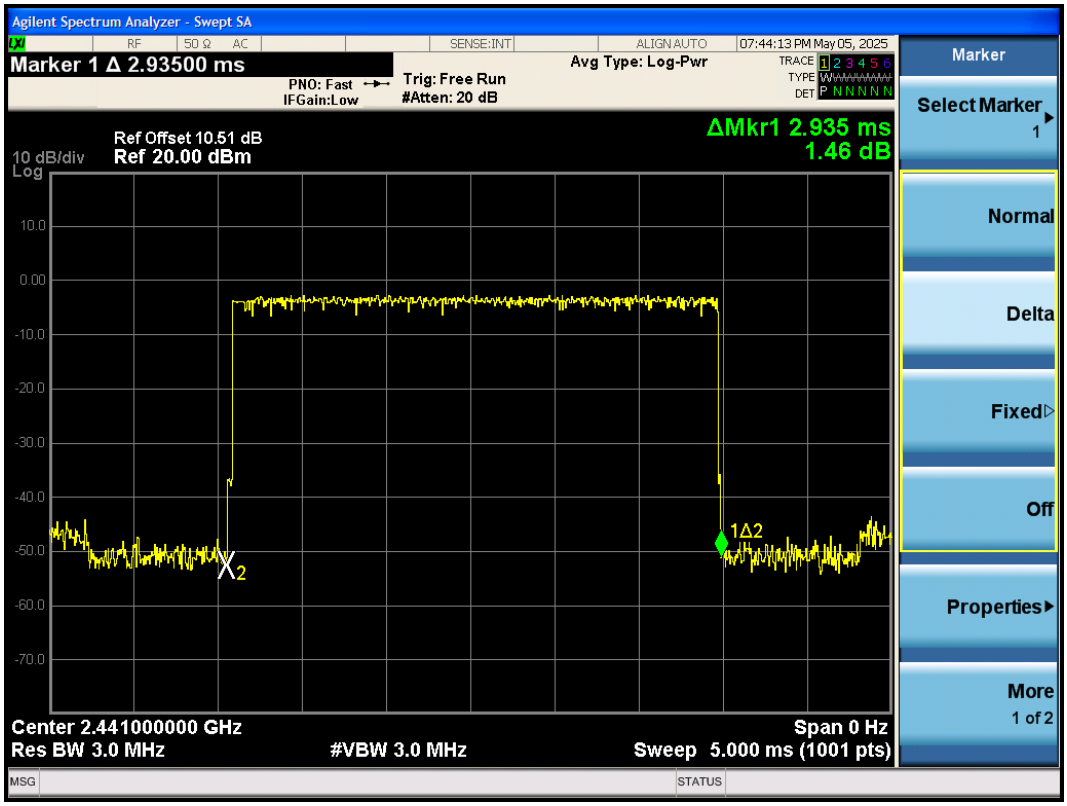
All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note 1: The duty cycle factor for calculate average level is -30.648dB, and average limit is 20dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.

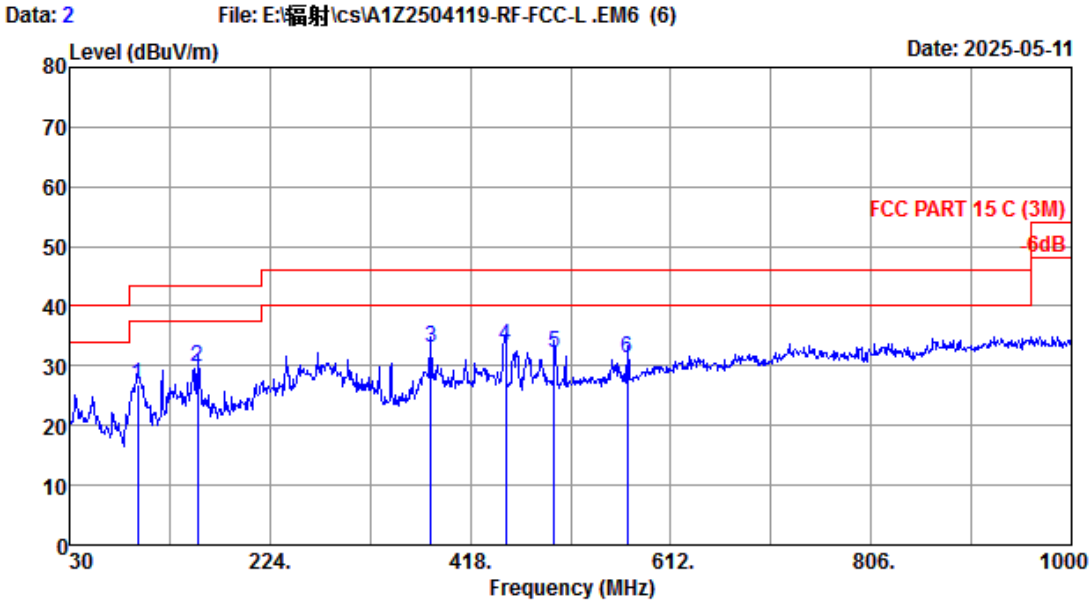
Note 2: The emissions (9kHz~30MHz) not reported for there is no emission be found.

Duty cycle factor = 20log(Dwell time/100ms)= -30.648dB
Dwell Time = 2.935*1ms





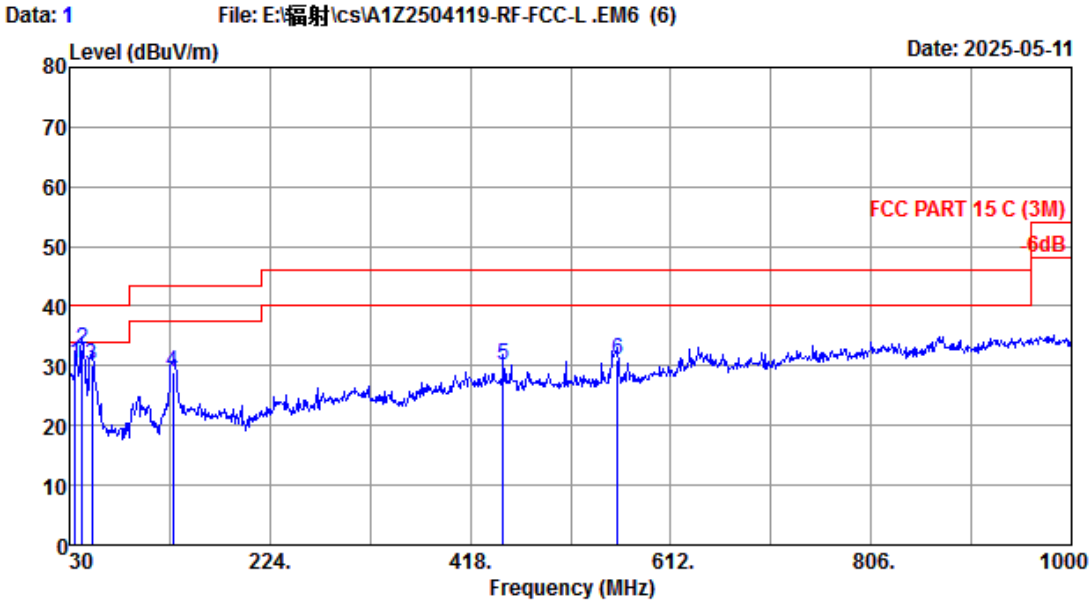
Frequency: 30MHz~1GHz



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2024 VULB 9168-01313 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 22.3*C/50% Engineer : Epoch
EUT :
Power rating :
Test Mode : BDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin Limits (dB)	Remark
1	95.960	14.60	1.11	11.23	26.94	43.50	16.56	QP
2	154.160	19.52	1.38	8.85	29.75	43.50	13.75	QP
3	380.170	21.30	2.67	8.97	32.94	46.00	13.06	QP
4	451.950	23.10	3.03	7.19	33.32	46.00	12.68	QP
5	499.480	23.61	3.26	5.41	32.28	46.00	13.72	QP
6	570.290	24.70	3.53	3.09	31.32	46.00	14.68	QP

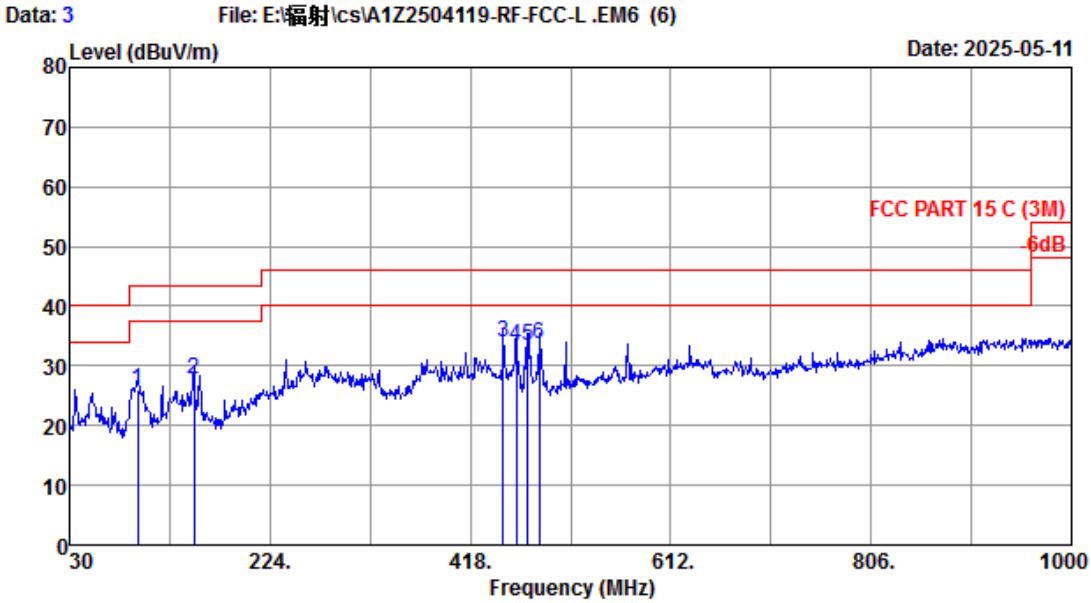
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2024 VULB 9168-01313 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 22.3*C/50% Engineer : Epoch
EUT :
Power rating :
Test Mode : BDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin Limits (dB)	Remark
1	35.820	18.70	0.72	11.11	30.53	40.00	9.47	QP
2	42.610	19.40	0.79	12.56	32.75	40.00	7.25	QP
3	51.340	19.97	0.84	9.27	30.08	40.00	9.92	QP
4	129.910	17.79	1.26	9.85	28.90	43.50	14.60	QP
5	450.010	23.10	3.03	3.85	29.98	46.00	16.02	QP
6	560.590	24.89	3.49	2.75	31.13	46.00	14.87	QP

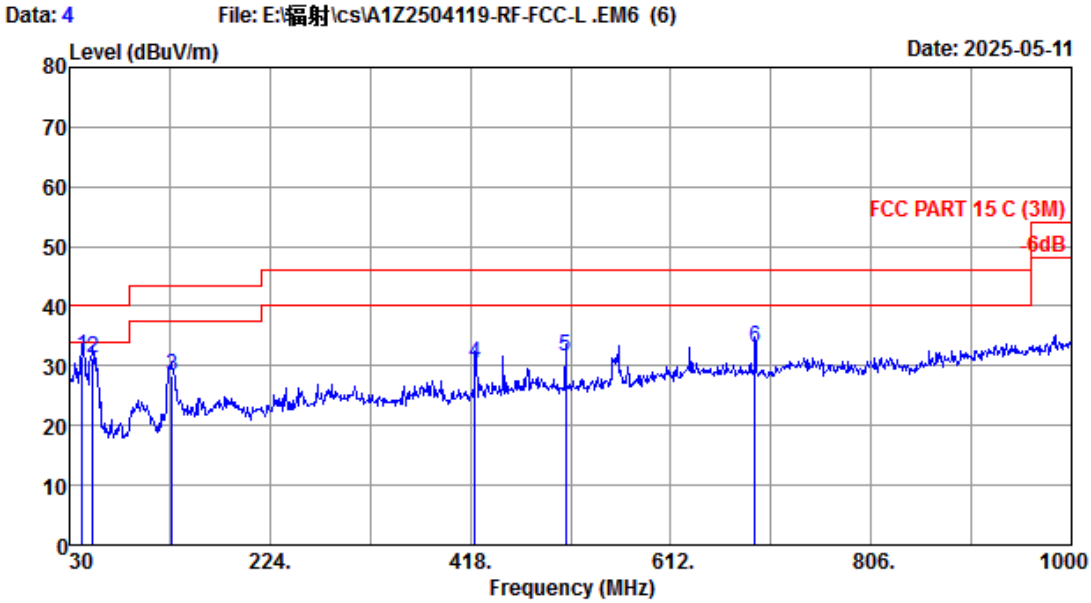
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 3
Dis. / Ant. : 3m 2024 VULB 9168-01313 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 22.3*C/50% Engineer : Epoch
EUT :
Power rating :
Test Mode : EDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin Limits (dB)	Remark
1	95.960	14.60	1.11	10.16	25.87	43.50	17.63	QP
2	150.280	19.40	1.36	7.01	27.77	43.50	15.73	QP
3	450.010	23.10	3.03	7.88	34.01	46.00	11.99	QP
4	462.620	23.00	3.08	7.17	33.25	46.00	12.75	QP
5	473.290	23.30	3.13	6.94	33.37	46.00	12.63	QP
6	484.930	23.80	3.19	6.54	33.53	46.00	12.47	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

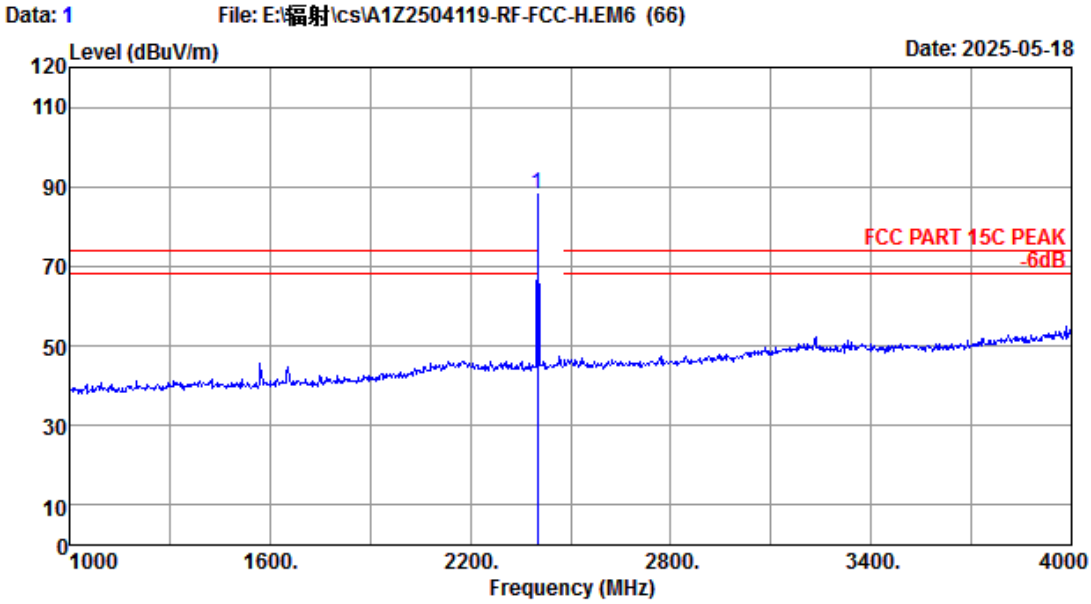


Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 2024 VULB 9168-01313 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 22.3*C/50% Engineer : Epoch
EUT :
Power rating :
Test Mode : EDR TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin Limits (dB)	Remark
1	42.610	19.40	0.79	11.39	31.58	40.00	8.42	QP
2	52.310	19.90	0.84	10.61	31.35	40.00	8.65	QP
3	128.940	17.70	1.25	9.40	28.35	43.50	15.15	QP
4	422.850	22.30	2.90	5.16	30.36	46.00	15.64	QP
5	510.150	23.70	3.30	4.53	31.53	46.00	14.47	QP
6	693.480	26.86	4.10	1.99	32.95	46.00	13.05	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

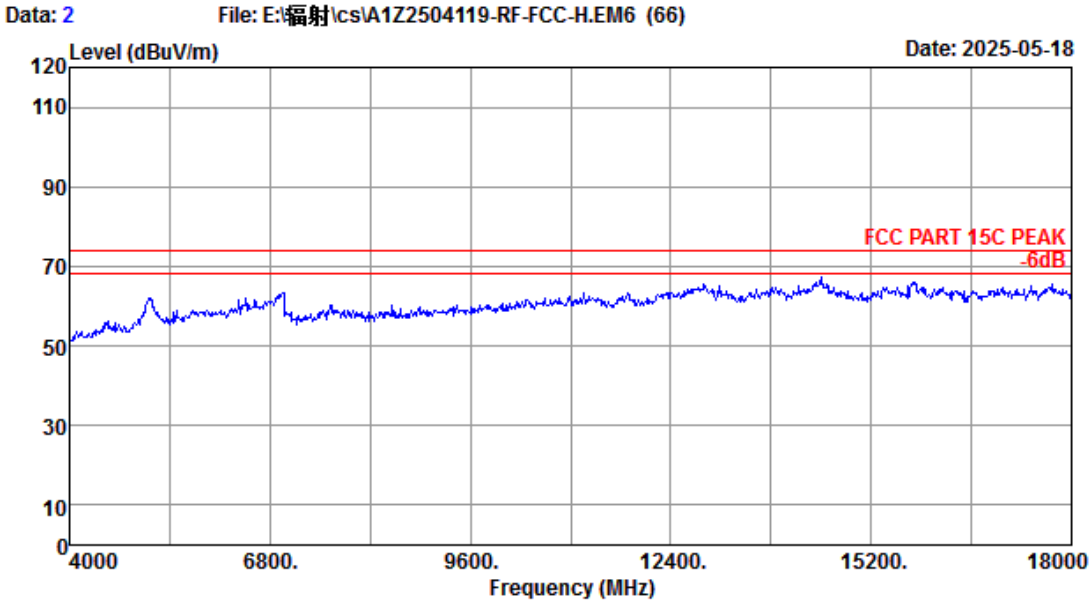
Frequency: 1GHz~18GHz



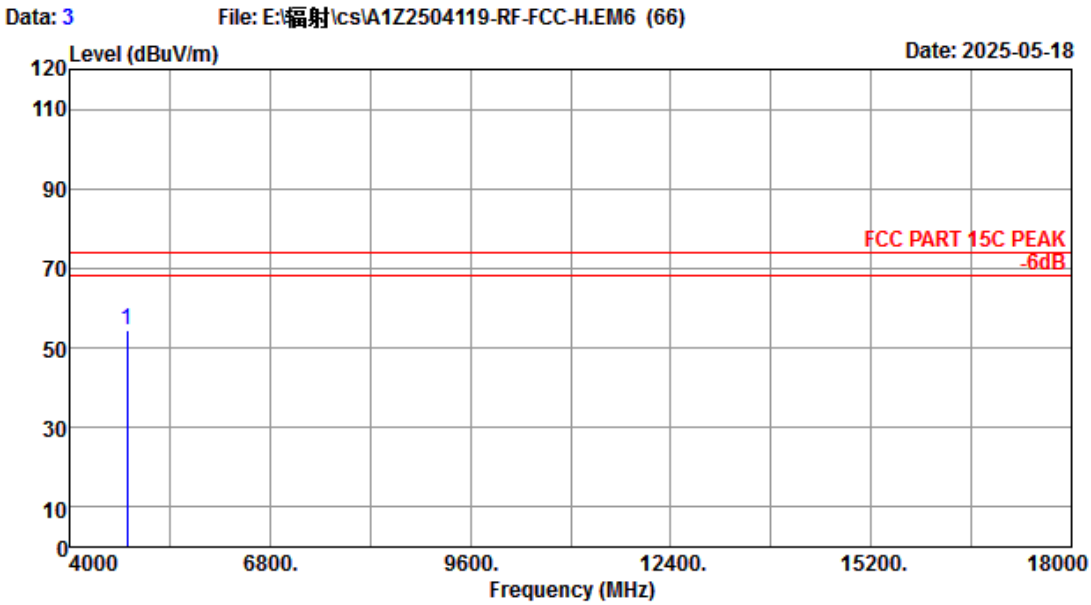
Site no. : RF Chamber
Data no. : 1
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2402MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	27.60	4.58	49.64	105.49	88.03	------	------	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



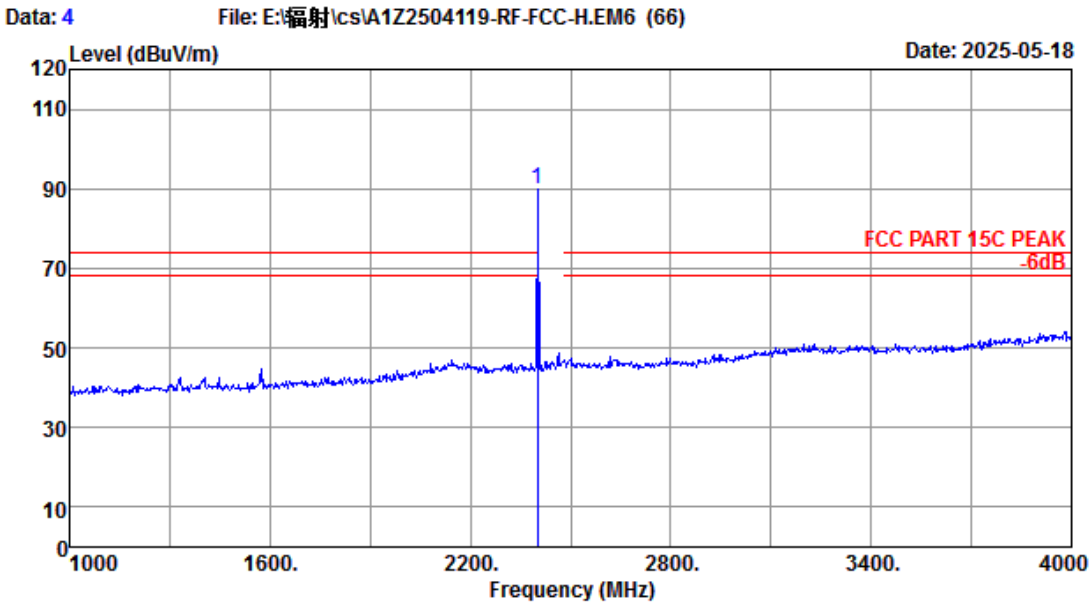
Site no. : RF Chamber
Data no. : 2
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2402MHz TX Mode



Site no. : RF Chamber
Data no. : 3
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2402MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4804.000	31.92	6.59	48.18	64.24	54.57	74.00	19.43	Peak

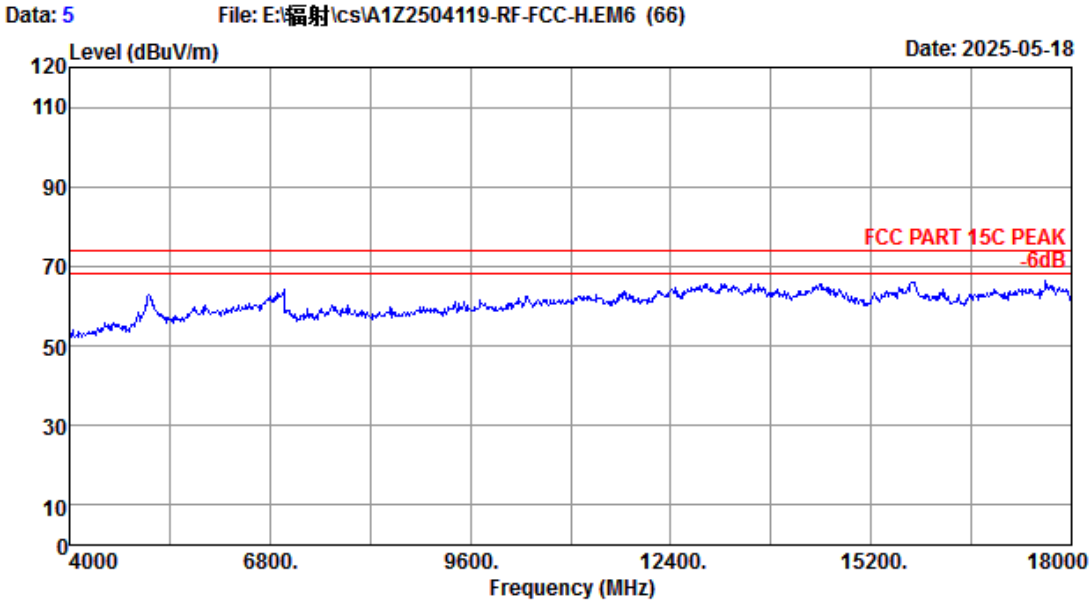
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



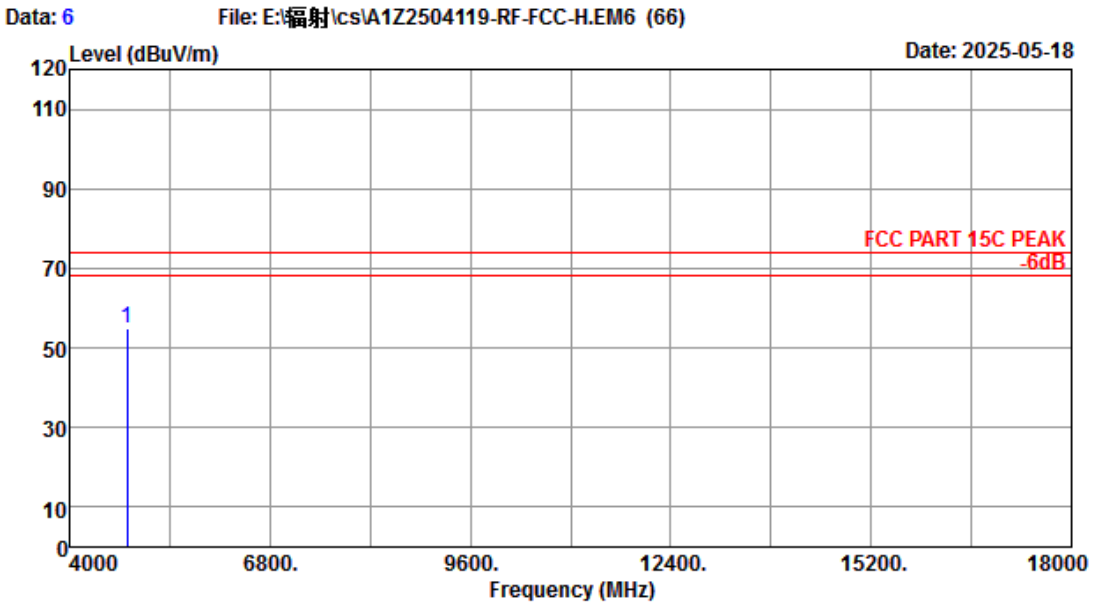
Site no. : RF Chamber
Data no. : 4
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2402MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	27.60	4.58	49.64	107.16	89.70	------	------	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



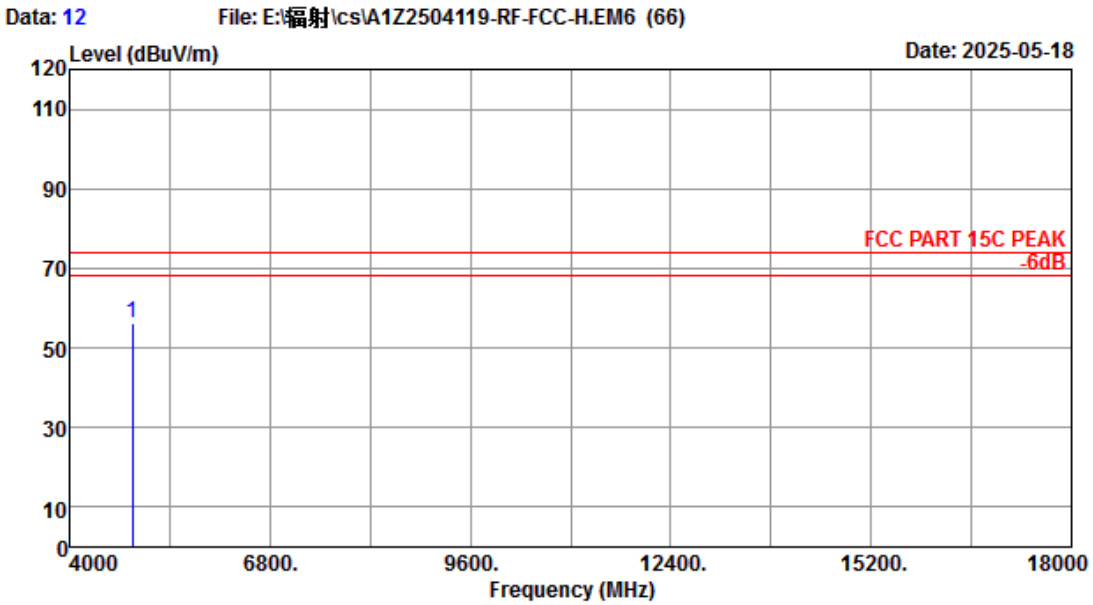
Site no. : RF Chamber
Data no. : 5
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2402MHz TX Mode



Site no. : RF Chamber
Data no. : 6
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2402MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4804.000	31.92	6.59	48.18	64.79	55.12	74.00	18.88	Peak

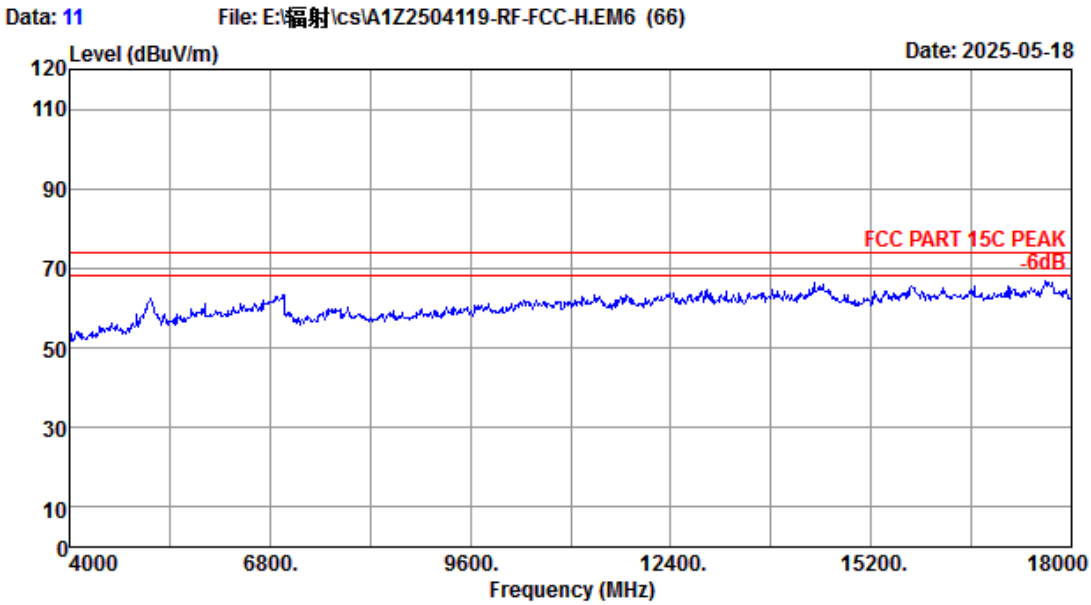
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



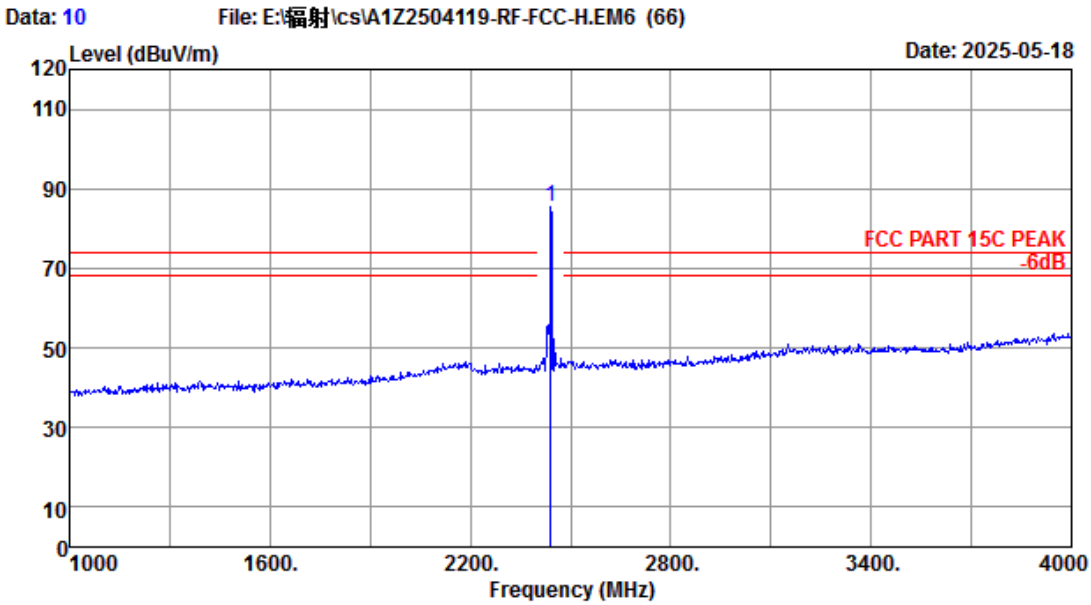
Site no. : RF Chamber
Data no. : 12
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2441MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4882.000	32.55	6.63	48.19	65.36	56.35	74.00	17.65	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



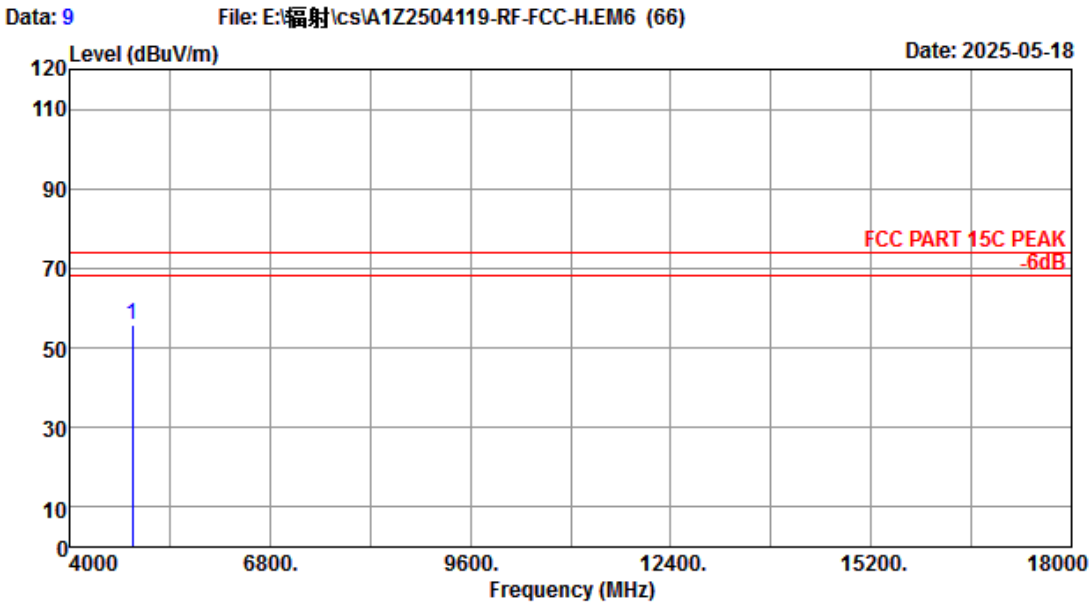
Site no. : RF Chamber
Data no. : 11
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2441MHz TX Mode



Site no. : RF Chamber
Data no. : 10
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2441MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	27.60	4.64	49.60	102.72	85.36	------	------	Peak

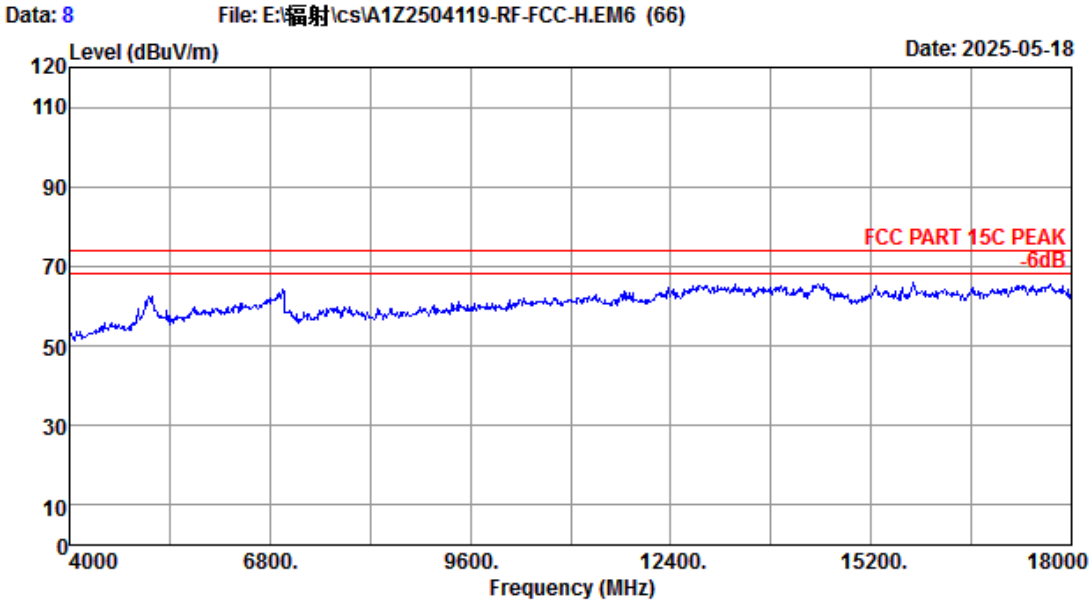
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



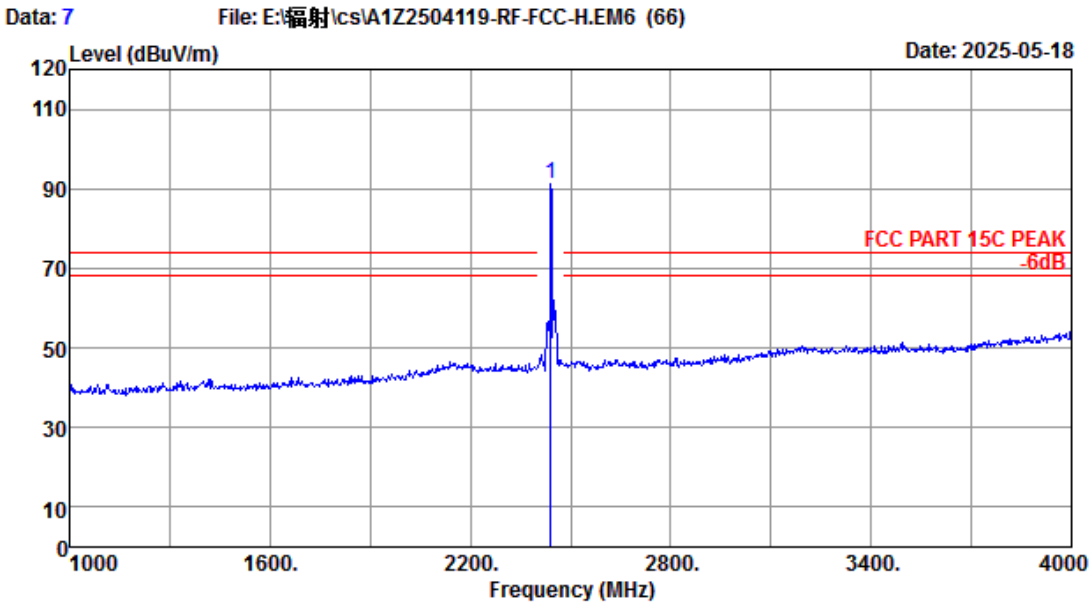
Site no. : RF Chamber
Data no. : 9
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2441MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4882.000	32.55	6.63	48.19	64.59	55.58	74.00	18.42	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : RF Chamber
Data no. : 8
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2441MHz TX Mode



Site no. : RF Chamber
Data no. : 7
Dis. / Ant. : 3m 2024 MCTD1209-3007
Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Engineer : Epoch
Env. / Ins. : 22.3*C/50%
Test Mode : GFSK 2441MHz TX Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	27.60	4.64	49.60	108.79	91.43	------	------	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.