

FCC Test Report

Report No. : 1813C50461412501

Applicant : Makeblock Co., Ltd.

Address : 4th Floor, Building C3, Nanshan ipark, No.1001
Xueyuan Avenue, Nanshan District, Shenzhen,
Guangdong Province, 518000, China

Product Name : xTool MetalFab CNC Cutter

Report Date : 2025-11-26



Shenzhen Anbotek Compliance Laboratory Limited

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Hotline: 400-003-0500 web: www.anbotek.com E-mail: service@anbotek.com



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TEST REPORT

Applicant : Makeblock Co., Ltd.
Manufacturer : Makeblock Co., Ltd.
Product Name : xTool MetalFab CNC Cutter
Model No. : MHJ-K005-001
Trade Mark : xTool
Rating(s) : Input: 100-240V~, 50/60Hz, 2.5A

**Test Standard(s) : 47 CFR Part 15.247
ANSI C63.10-2020
KDB 558074 D01 15.247 Meas Guidance v05r02**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with above listed standard(s) requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt: 2025-10-22

Date of Test: 2025-10-22 to 2025-10-30

Prepared By:

Cecilia Chen

(Cecilia Chen)

Approved & Authorized Signer:

Hugo Chen

(Hugo Chen)

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Revision History

Report Version	Description	Issued Date
R00	Original Issue.(Note 1)	2025-11-26

Note 1:

This is a Class II application which was based on the original report 1813C50223412501. The difference between the original device and current one described as following:

1. Change the power board.
2. Change the emergency stop switch and power switch.

The changes are not related with the other RF parameters, only Conducted Emission at AC power line and Emissions in restricted frequency bands (below 1GHz) were retested.

1. General Information

1.1. Client Information

Applicant	:	Makeblock Co., Ltd.
Address	:	4th Floor, Building C3, Nanshan ipark, No.1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong Province, 518000, China
Manufacturer	:	Makeblock Co., Ltd.
Address	:	4th Floor, Building C3, Nanshan ipark, No.1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong Province, 518000, China

1.2. Description of Device (EUT)

Product Name	:	xTool MetalFab CNC Cutter
Model No.	:	MHJ-K005-001
Trade Mark	:	xTool
Test Power Supply	:	AC 120V/60Hz
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Frequency	:	802.11b/g/n(HT20)/ax(HEW20): 2412MHz to 2462MHz; 802.11n(HT40)/ax(HEW40): 2422MHz to 2452MHz
Number of Channel	:	802.11b/g/n(HT20)/ax(HEW20): 11 Channels; 802.11n(HT40)/ax(HEW40): 7 Channels
Modulation Type	:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ax(HEW20 and HEW40): OFDMA(BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Antenna Type	:	Rod Antenna
Antenna Gain(Peak)	:	3.22dBi
Remark: (1) All of the RF specification are provided by customer. (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

Title	Manufacturer	Model No.	Serial No.
/	/	/	/

1.4. Operation channel list

Operation Band:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

1.5. Description of Test Modes

Pretest Modes	Descriptions
TM1	Keep the EUT in 802.11b transmitting mode.
TM2	Keep the EUT in 802.11g transmitting mode.
TM3	Keep the EUT in 802.11n(HT20) transmitting mode.
TM4	Keep the EUT in 802.11n(HT40) transmitting mode.
TM5	Keep the EUT in 802.11ax(HEW20) transmitting mode.
TM6	Keep the EUT in 802.11ax(HEW40) transmitting mode.
Note: 802.11ax mode only support full resource unit size.	

1.6. Measurement Uncertainty

Parameter	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	3.2dB
Radiated spurious emissions (30MHz~1GHz)	Horizontal: 4.44dB; Vertical: 4.82dB
The measurement uncertainty and decision risk evaluated according to AB/WI-RF-F-032. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.7. Additional Instructions

Power level setup in software: <http://201.234.3.1:8083/wifi.html>

Operation Band:

Mode	Channel(MHz)	Power level	Transmitting type
802.11b	2412	default	data pack TX
802.11b	2437	default	data pack TX
802.11b	2462	default	data pack TX
802.11g	2412	default	data pack TX
802.11g	2437	default	data pack TX
802.11g	2462	default	data pack TX
802.11n(HT20)	2412	default	data pack TX
802.11n(HT20)	2437	default	data pack TX
802.11n(HT20)	2462	default	data pack TX
802.11n(HT40)	2422	default	data pack TX
802.11n(HT40)	2437	default	data pack TX
802.11n(HT40)	2452	default	data pack TX
802.11ax(HEW20)	2412	default	data pack TX
802.11ax(HEW20)	2437	default	data pack TX
802.11ax(HEW20)	2462	default	data pack TX
802.11ax(HEW40)	2422	default	data pack TX
802.11ax(HEW40)	2437	default	data pack TX
802.11ax(HEW40)	2452	default	data pack TX

1.8. Test Summary

Test Items	Test Modes	Status
Conducted Emission at AC power line	Mode1,2,3,4,5,6	P
Emissions in restricted frequency bands (below 1GHz)	Mode1,2,3,4,5,6	P
Note: P: Pass N: N/A, not applicable		

1.9. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.:279531

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 279531.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
Sogood Industrial Zone Laboratory & 1/F. of Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China.

1.10. Disclaimer

1. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
2. The test report is invalid if there is any evidence and/or falsification.
3. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
4. This document may not be altered or revised in any way unless done so by Anbotek and all revisions are duly noted in the revisions section.
5. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
6. The authenticity of the information provided by the customer is the responsibility of the customer and the laboratory is not responsible for its authenticity.
7. The data in this report will be synchronized with the corresponding national market supervision and management departments and cross-border e-commerce platforms as required by regulatory agencies.

The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

1.11. Test Equipment List

Conducted Emission at AC power line						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due Date
1	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	2025-09-05	2026-09-04
2	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	2025-01-13	2026-01-12
3	Software Name EZ-EMC	Farad Technology	ANB-03A	N/A	/	/
4	EMI Test Receiver(CE2#)	Rohde & Schwarz	ESPI3	100926	2025-09-05	2026-09-04

Emissions in frequency bands (below 1GHz)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due Date
1	EMI Test Receiver(RE2/3#)	Rohde & Schwarz	ESR26	101481	2025-01-14	2026-01-13
2	Pre-amplifier	SONOMA	310N	186860	2025-01-14	2026-01-13
3	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	2025-09-05	2028-09-04
4	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	2025-01-13	2026-01-12
5	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	2555	2025-09-05	2026-09-04
6	Loop Antenna (9K-30M)	Schwarzbeck	FMZB1519 B	00053	2025-09-05	2026-09-04
7	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	/	/
8	MXA Spectrum Analysis	Agilent	N9020A	MY511700 37	2025-09-05	2026-09-04
9	MXG RF Vector Signal Generator	Agilent	N5182A	MY474208 22	2025-02-21	2026-02-20
10	DC Power Supply	IVYTECH	IV3605	1804D360 510	2025-09-05	2026-09-04
11	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	2025-10-10	2026-10-09
12	Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	167336	2025-02-21	2026-02-20
13	High-Pass Filter	CDKMV	ZHPF-BM1100-4730	B2015094 550	2025-09-05	2026-09-04
14	High-Pass Filter	CDKMV	ZHPF-M3.5-18G-3834	13070065 23	2025-09-05	2026-09-04

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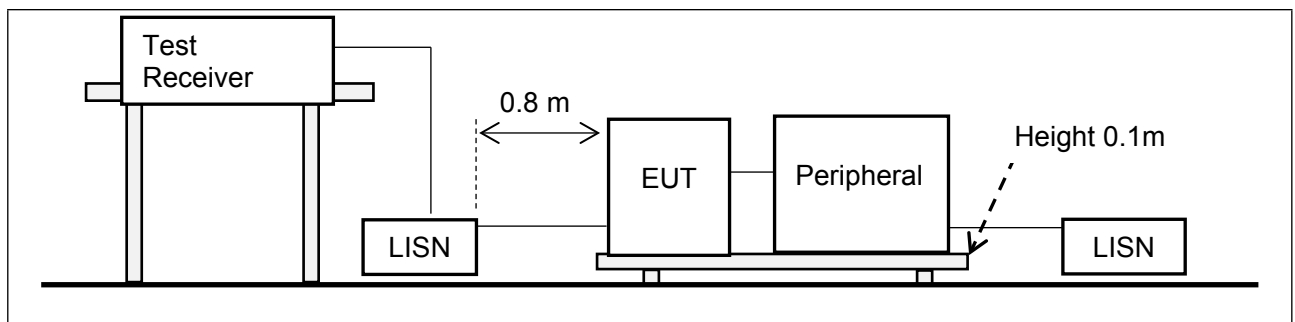
2. Conducted Emission at AC power line

Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	*Decreases with the logarithm of the frequency.		
Test Method:	ANSI C63.10-2020 section 6.2		
Procedure:	Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices		

2.1. EUT Operation

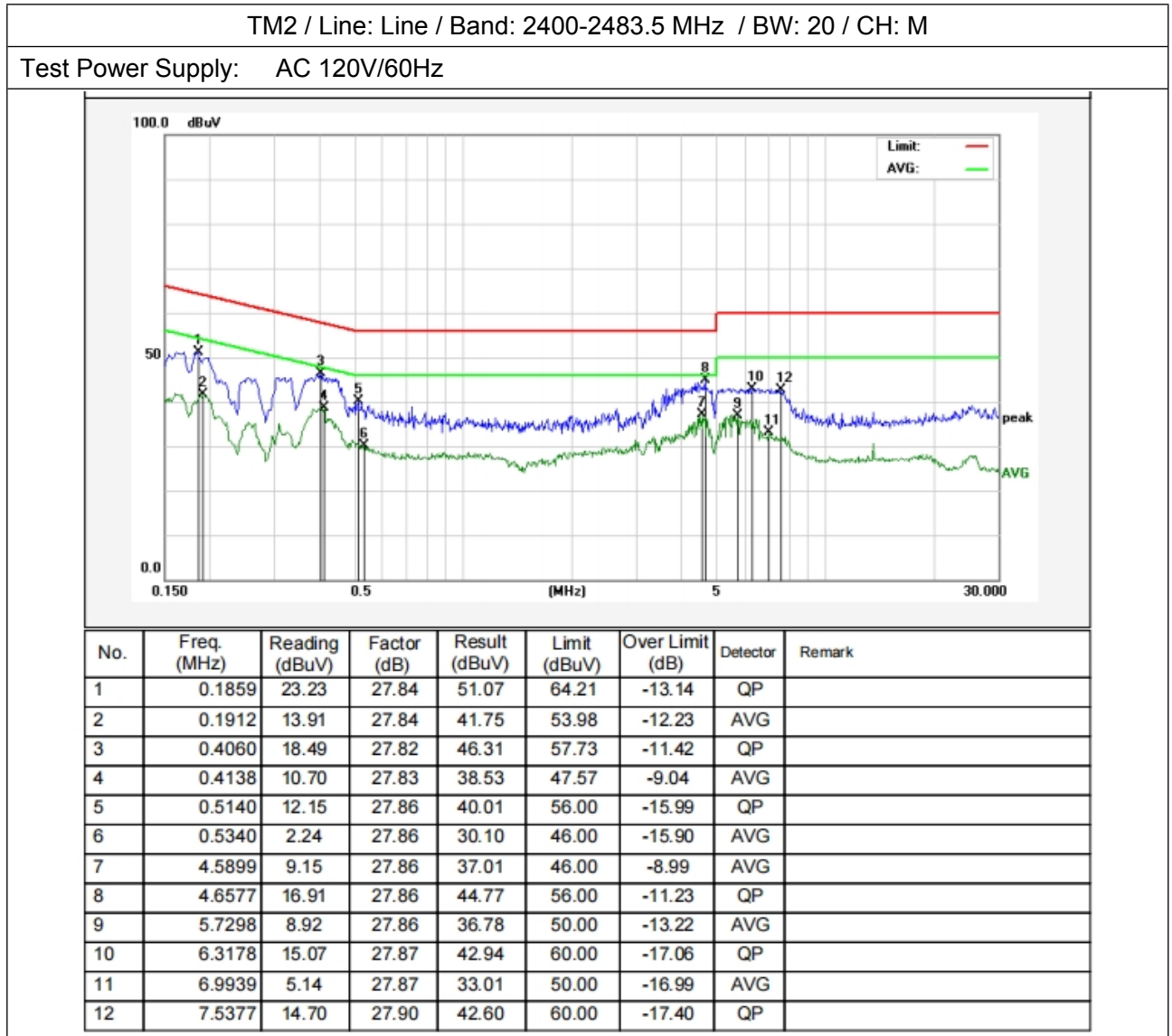
Operating Environment:	
Test mode:	1: 802.11b mode: Keep the EUT in 802.11b transmitting mode. 2: 802.11g mode: Keep the EUT in 802.11g transmitting mode. 3: 802.11n(HT20) mode: Keep the EUT in 802.11n(HT20) transmitting mode. 4: 802.11n(HT40) mode: Keep the EUT in 802.11n(HT40) transmitting mode. 5: 802.11ax(HEW20): Keep the EUT in 802.11ax(HEW20) transmitting mode. 6: 802.11ax(HEW40): Keep the EUT in 802.11ax(HEW40) transmitting mode.

2.2. Test Setup



2.3. Test Data

Temperature:	23.2 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
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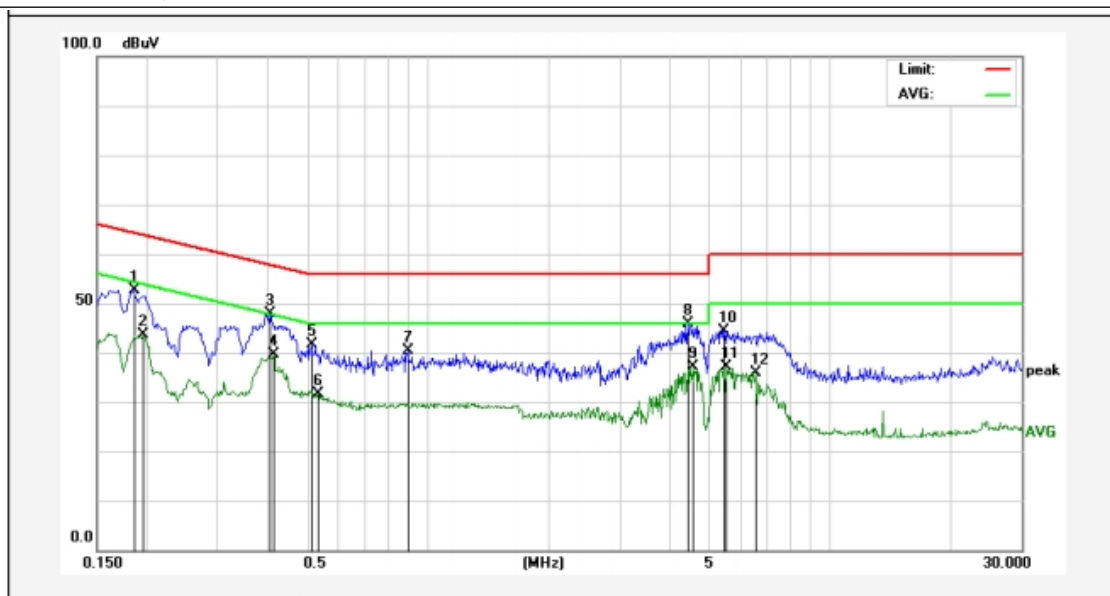
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Hotline: 400-003-0500 web: www.anbotek.com E-mail: service@anbotek.com

Temperature:	23.2 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
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TM2 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 20 / CH: M

Test Power Supply: AC 120V/60Hz



No.	Freq. (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Over Limit (dB)	Detector	Remark
1	0.1859	24.73	27.84	52.57	64.21	-11.64	QP	
2	0.1955	15.74	27.84	43.58	53.80	-10.22	AVG	
3	0.4060	19.99	27.82	47.81	57.73	-9.92	QP	
4	0.4138	11.70	27.83	39.53	47.57	-8.04	AVG	
5	0.5140	13.65	27.86	41.51	56.00	-14.49	QP	
6	0.5340	3.74	27.86	31.60	46.00	-14.40	AVG	
7	0.8900	12.51	27.87	40.38	56.00	-15.62	QP	
8	4.4499	17.99	27.85	45.84	56.00	-10.16	QP	
9	4.5899	9.15	27.86	37.01	46.00	-8.99	AVG	
10	5.4618	16.52	27.86	44.38	60.00	-15.62	QP	
11	5.5217	9.21	27.86	37.07	50.00	-12.93	AVG	
12	6.5259	7.93	27.87	35.80	50.00	-14.20	AVG	

Note:

- Only the worst case data was showed in the report.
- Result(dBμV) = Reading(dBμV) + Factor(dB);
Over Limit(dB) = Result(dBμV) - Limit(dBμV)

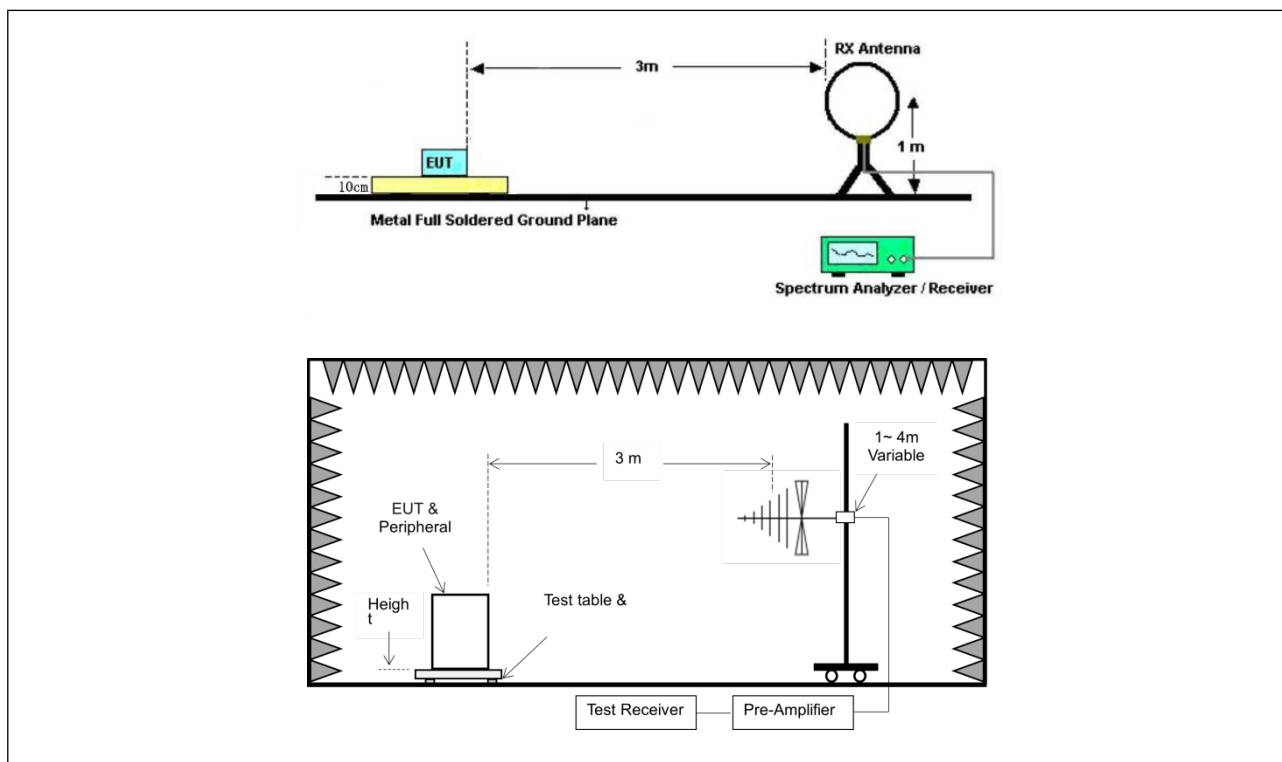
3. Emissions in restricted frequency bands (below 1GHz)

Test Requirement:	Refer to 47 CFR 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)).`		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. 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.		
Test Method:	ANSI C63.10-2020 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2020 section 6.6.4		

3.1. EUT Operation

Operating Environment:	
Test mode:	1: 802.11b mode: Keep the EUT in 802.11b transmitting mode. 2: 802.11g mode: Keep the EUT in 802.11g transmitting mode. 3: 802.11n(HT20) mode: Keep the EUT in 802.11n(HT20) transmitting mode. 4: 802.11n(HT40) mode: Keep the EUT in 802.11n(HT40) transmitting mode. 5: 802.11ax(HEW20): Keep the EUT in 802.11ax(HEW20) transmitting mode. 6: 802.11ax(HEW40): Keep the EUT in 802.11ax(HEW40) transmitting mode.

3.2. Test Setup

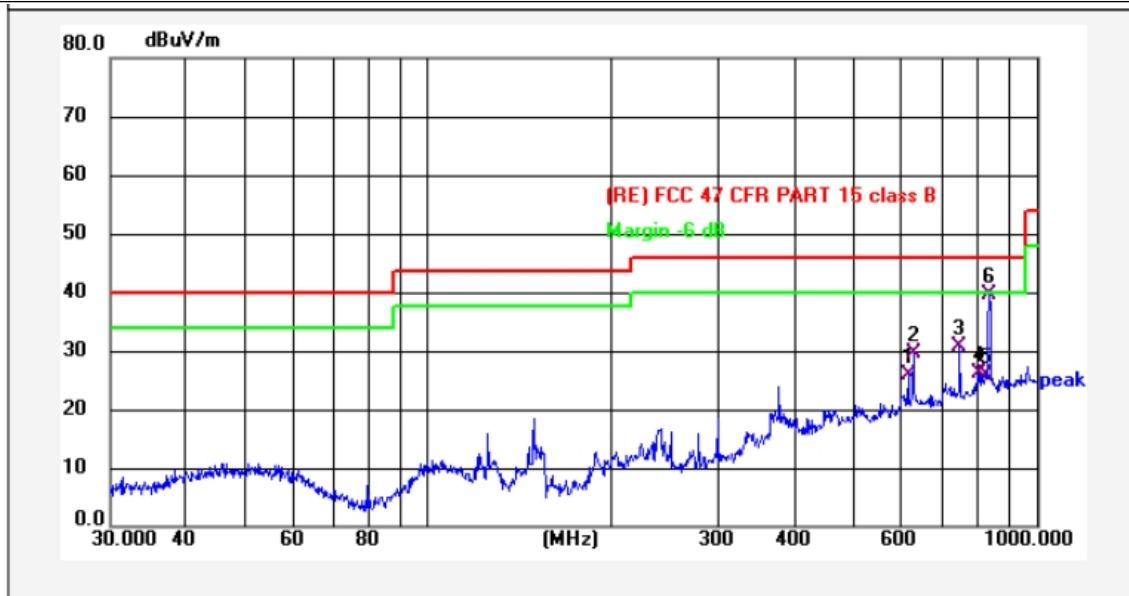


3.3. Test Data

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

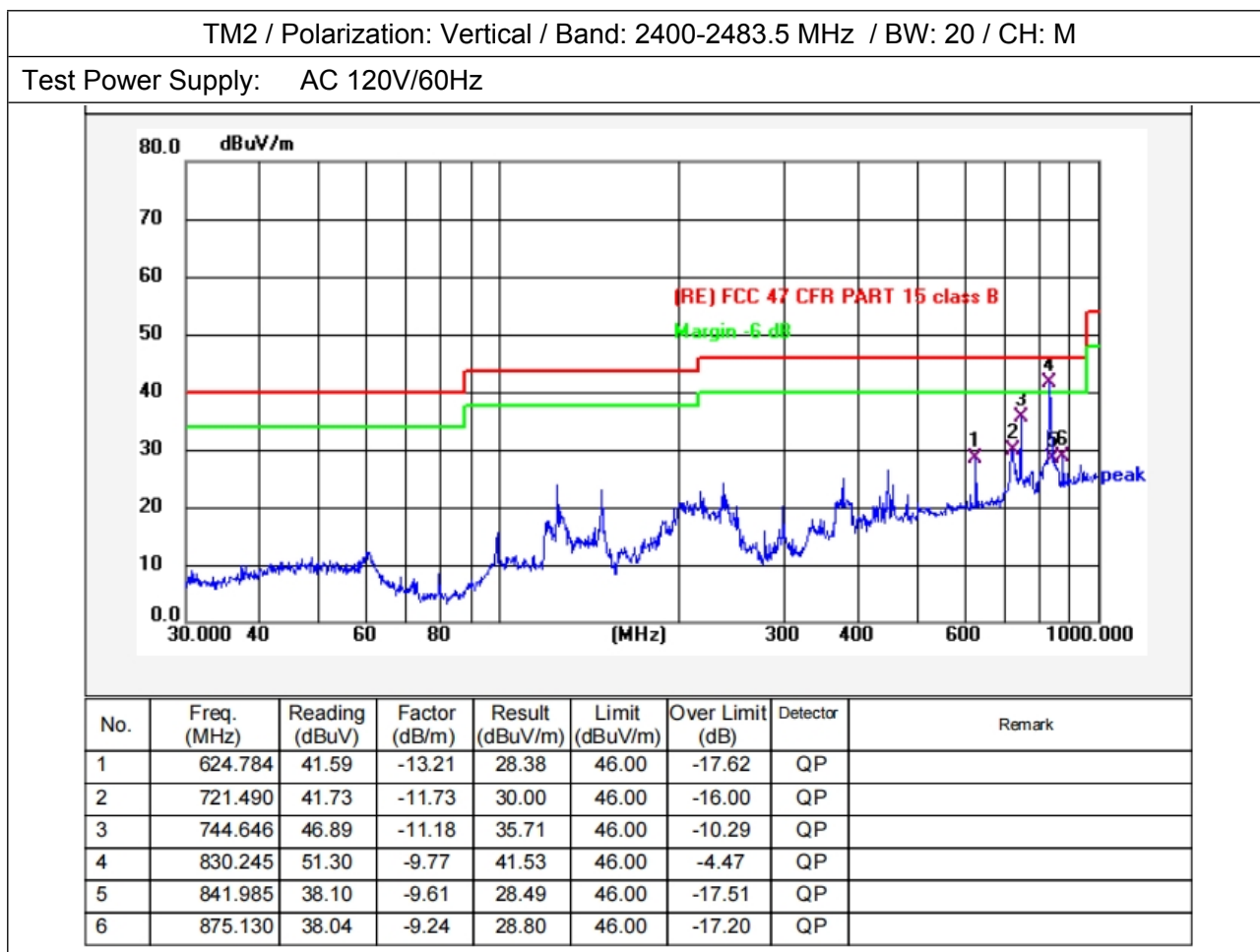
Temperature:	24.4 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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TM2 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: M
Test Power Supply: AC 120V/60Hz



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Remark
1	615.774	39.20	-13.34	25.86	46.00	-20.14	QP	
2	626.688	42.70	-13.18	29.52	46.00	-16.48	QP	
3	747.047	41.90	-11.13	30.77	46.00	-15.23	QP	
4	801.431	36.29	-10.15	26.14	46.00	-19.86	QP	
5	824.278	35.70	-9.85	25.85	46.00	-20.15	QP	
6	835.945	49.34	-9.69	39.65	46.00	-6.35	QP	

Temperature:	24.4 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa
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Note:

- Only the worst case data was showed in the report.
- Result(dBuV/m) = Reading(dBuV) + Factor(dB/m);
Over Limit(dB) = Result(dBuV/m) - Limit(dBuV/m)

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_RF

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

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