

TEST REPORT

Report No.	CISRR250604017
Project No.	CISR250604017
FCC ID	2BK5B-TP-B01
Applicant	SHENZHEN TOPPER VISION LTD
Address	301, Building C,NO.5966,Longhua Avenue, Dahe Community, Guanhu Street, Longhua District, Shenzhen, China
Manufacturer	SHENZHEN TOPPER VISION LTD
Address	301, Building C,NO.5966,Longhua Avenue, Dahe Community, Guanhu Street, Longhua District, Shenzhen, China
Product Name	Wifi camera
Trademark	N/A
Model/Type reference	TP-B01
Listed Model(s)	TP-B02,TP-B03,TP-B04,TP-B05,TP-B06,TP-B07,TP-B08, TP-B09,TP-B10,TP-B11,TP-B12, TP-XXX,TP-XXXX,TP-XX-XXX,TP-XXXXXXX(X=0,1,2-9 X=A,B,C-Z.REPRESENT SHELL,CASING,SIZE,COLOR,RESOLUTION
Standard	47 CFR Part 15.247
Test date	June 5, 2025 to July 1, 2025
Issue date	July 1, 2025
Test result	Complied

Lucas Huang

Prepared by: Lucas Huang

Genry Long

Approved by: Genry Long

The test results relate only to the tested samples.

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Contents

1. REPORT VERSION	3
2. TEST DESCRIPTION	4
3. SUMMARY	5
3.1. Product Description *	5
3.2. Radio Specification Description *	5
3.3. Modification of EUT	6
3.4. Deviation from standards	6
3.5. Testing Site	6
4. TEST CONFIGURATION	7
4.1. Test frequency list	7
4.2. Descriptions of test mode	7
4.3. Support unit used in test configuration	7
4.4. Test sample information	7
4.5. Environmental conditions	7
4.6. Statement of the measurement uncertainty	8
4.7. Equipment Used during the Test	8
5. TEST RESULTS	10
5.1. Evaluation Results (Evaluation)	10
5.1.1. Antenna Requirement	10
5.2. Radio Spectrum Matter Test Results (RF)	11
5.2.1. Conducted Emission at AC power line	11
5.2.2. 6dB Bandwidth	14
5.2.3. 99% Occupied Bandwidth	15
5.2.4. Maximum Conducted Output Power	16
5.2.5. Power Spectral Density	17
5.2.6. Conducted band edge and spurious emission	18
5.2.7. Radiated band edge emission	19
5.2.8. Radiated Spurious Emission (below 1GHz)	25
5.2.9. Radiated Spurious Emission (Above 1GHz)	29
6. TEST SETUP PHOTOS	37
7. EXTERNAL AND INTERNAL PHOTOS	39
7.1. External Photos	39
7.2. Internal Photos	43

1. REPORT VERSION

Version No.	Issue date	Description
00	July 1, 2025	Original

2. TEST DESCRIPTION

No.	Test Item	Standard Requirement	Result
1	Antenna Requirement	47 CFR 15.203	Pass
2	Conducted Emission at AC power line	47 CFR 15.207(a)	Pass
3	6dB Bandwidth	47 CFR 15.247(a)(2)	Pass
4	Maximum Conducted Output Power	47 CFR 15.247(b)(3)	Pass
5	Power Spectral Density	47 CFR 15.247(e)	Pass
6	Conducted band edge and spurious emission	47 CFR 15.247(d), 15.209, 15.205	Pass
7	Radiated band edge emission	47 CFR 15.247(d), 15.209, 15.205	Pass
8	Radiated Spurious Emission (below 1GHz)	47 CFR 15.247(d), 15.209, 15.205	Pass
9	Radiated Spurious Emission (Above 1GHz)	47 CFR 15.247(d), 15.209, 15.205	Pass

Note:

- The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Product Description *

Main unit information:	
Product Name:	Wifi camera
Trade Mark:	N/A
Model No.:	TP-B01
Listed Model(s):	TP-B02,TP-B03,TP-B04,TP-B05,TP-B06,TP-B07,TP-B08, TP-B09,TP-B10,TP-B11,TP-B12, TP-XXX,TP-XXXX,TP-XX-XXX,TP-XXXXXXX(X=0,1,2-9 X=A,B,C-Z.REPRESENT SHELL,CASING,SIZE,COLOR,RESOLUTION
Model difference:	The difference between different models is that in this application, due to different sales channels and different model names, the differences in the same product model do not safety performance and electromagnetic affect the compatibility performance of the product.
Power supply:	Input: DC 5V
Hardware version:	N/A
Software version:	N/A
Accessory unit (AU) information:	
Battery information:	DC 3.7V

3.2. Radio Specification Description *

Modulation type:	802.11b: DSSS 802.11g/802.11n(HT20/HT40): OFDM 802.11ax(HT20/HT40): OFDMA
Operation frequency:	802.11b/802.11g/802.11n/802.11ax(HT20): 2412MHz~2462MHz 802.11n/802.11ax(HT40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n/802.11ax(HT20): 11 802.11n/802.11ax(HT40): 9
Channel separation:	5MHz
Antenna type:	FPC Antenna
Antenna gain:	2.71dBi

Note:

- 1) *: Since the above information is provided by the applicant relevant results or conclusions of this report are only made for these information , Bangce is not responsible for the authenticity, integrity and results of the information and/or the validity of the conclusion.
- 2) Operation frequency list as follow:

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	/	/

3.3. Modification of EUT

No modifications are made to the EUT during all test items.

3.4. Deviation from standards

None

3.5. Testing Site

Laboratory Name	Shenzhen Bangce Testing Technology Co., Ltd.
Laboratory Location	101, building 10, Yunli Intelligent Park, Shutianpu community, Matian Street, Guangming District, Shenzhen, Guangdong, China
Contact information	Tel: 86-755-2319 6848, email: service@cis-cn.net Website: http://www.cis-cn.net/
FCC registration number	736346
FCC designation number	CN1372

4. TEST CONFIGURATION

4.1. Test frequency list

Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
2412	2437	2462

4.2. Descriptions of test mode

No	Test mode	Description
TM1	802.11b mode	Keep the EUT in 802.11b transmitting mode at lowest, middle and highest channel.
TM2	802.11g mode	Keep the EUT in 802.11g transmitting mode at lowest, middle and highest channel.
TM3	802.11n(HT20) mode	Keep the EUT in 802.11n(HT20) transmitting mode at lowest, middle and highest channel.
TM4	802.11n(HT40) mode	Keep the EUT in 802.11n(HT40) transmitting mode at lowest, middle and highest channel.
TM5	802.11ax(HT20)	Keep the EUT in 802.11ax(HT20) transmitting mode at lowest, middle and highest channel.
TM6	802.11ax(HT40)	Keep the EUT in 802.11ax(HT40) transmitting mode at lowest, middle and highest channel.
TM7	Link mode	Keep the EUT in WiFi linking mode with AE.

4.3. Support unit used in test configuration

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Item	Equipment name	Trade Name	Model No.
1	Phone	Huawei	NZONE S7
2	Adapter	Guangdong Sangu Technology Co. Ltd	SG-0501000AU

4.4. Test sample information

Type	Sample No.
Engineer sample	CISR250604017-S01
Normal sample	CISR250604017-S02

4.5. Environmental conditions

Type	Requirement
Temperature:	15~35°C
Relative Humidity:	25~75%
Air Pressure:	860~1060mbar

4.6. Statement of the measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	AC Conducted Emission	1.63dB
2	Peak Output Power	1.34dB
3	Power Spectral Density	1.34dB
4	6dB Bandwidth	0.002%
5	Duty cycle	-
6	Conducted Band Edge and Spurious Emission	1.93dB
7	Radiated Band Edge Emission	3.76dB for 30MHz-1GHz 3.80dB for above 1GHz
8	Radiated Spurious Emission	3.76dB for 30MHz-1GHz 3.80dB for above 1GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4.7. Equipment Used during the Test

Conducted Emission at AC power line						
Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100853	2025-01-08	2026-01-07
2	Artificial power network	Schwarzbeck	NSLK8127	8127-01096	2025-01-08	2026-01-07
3	8-wire Impedance Stabilization Network	Schwarzbeck	NTFM 8158	8158-00337	2025-01-08	2026-01-07
4	Artificial power network	Schwarzbeck	ENV216	/	2025-01-08	2026-01-07

Emissions in non-restricted frequency bands 6dB Bandwidth Maximum Conducted Output Power Power Spectral Density						
Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	MXG RF Signal Generator	Agilent	N5181A	MY50145362	2025-01-08	2026-01-07
2	Spectrum analyzer	R&S	FSV-40N	102130	2025-01-08	2026-01-07
3	Vector Signal Generator	Agilent	N5182A	MY50142364	2025-01-08	2026-01-07

Band edge emissions (Radiated) Emissions in frequency bands (below 1GHz) Emissions in frequency bands (above 1GHz)						
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Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100853	2025-01-08	2026-01-07
2	Amplifier	Tonscend	TAP9K3G 40	AP23A806027 0	2025-01-08	2026-01-07
3	Prime amplifier	Tonscend	TAP0101 8050	AP23A806028 0	2025-01-08	2026-01-07
4	9*6*6 anechoic chamber	SKET	9.3*6.3*6	N/A	2024-09-02	2027-09-01
5	Spectrum analyzer	Agilent	N9020A	MY50530263	2025-01-08	2026-01-07
6	Spectrum analyzer	R&S	FSV-40N	102130	2025-01-08	2026-01-07
7	Bilog Antenna	Schwarzbeck	VULB 9163	1463	2023-01-09	2026-01-08
8	Horn Antenna	SCHWARZBECK	BBHA 9120 D	2487	2023-01-09	2026-01-08
9	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	2023-01-09	2026-01-08
10	RF Cable	Tonscend	Cable 1	/	2025-01-08	2026-01-07
11	RF Cable	Tonscend	Cable 2	/	2025-01-08	2026-01-07
12	RF Cable	SKET	Cable 3	/	2025-01-08	2026-01-07
13	L.I.S.N.#1	Schwarzbeck	NSLK812 7	/	2025-01-08	2026-01-07
14	L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	2025-01-08	2026-01-07
15	Horn Antenna	SCHWARZBECK	BBHA917 0	1130	2023-01-09	2026-01-08
16	Preamplifier	Tonscend	TAP1804 0048	AP21C806126	2025-01-08	2026-01-07
17	Variable-frequency power source	Pinhong	PH1110	/	2025-01-08	2026-01-07
18	6dB Attenuator	SKET	DC-6G	/	2025-01-08	2026-01-07
19	Antenna tower	SKT	Bk-4AT-BS	AT202104010 1-V1	2025-01-08	2026-01-07

5. TEST RESULTS

5.1. Evaluation Results (Evaluation)

5.1.1. Antenna Requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.
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5.1.1.1. Test Result

Pass

5.1.1.2. Conclusion:

The EUT antenna is FPC Antenna(2.71dBi), the directional gain of the antenna less than 6dBi. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used. Antenna structure please refer to the EUT internal photographs antenna photo.
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5.2. Radio Spectrum Matter Test Results (RF)

5.2.1. 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:	1. The EUT was setup according to ANSI C63.10 requirements. 2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. 3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. 4. The peripheral devices are also connected to the main power through a LISN. (Refer to the block diagram of the test setup and photographs) 5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. 6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. 7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz. 8. During the above scans, the emissions were maximized by cable manipulation.		

5.2.1.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.4 °C	Humidity:	56.7 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM7				
Final test mode:	TM7				

5.2.1.2. Test Setup Diagram

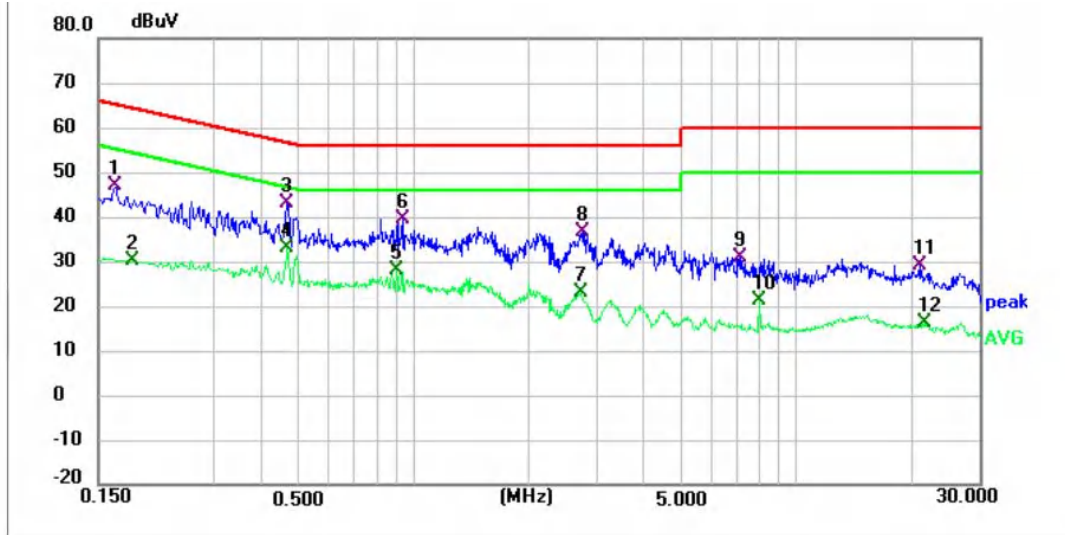


5.2.1.3. Test Result

Pass

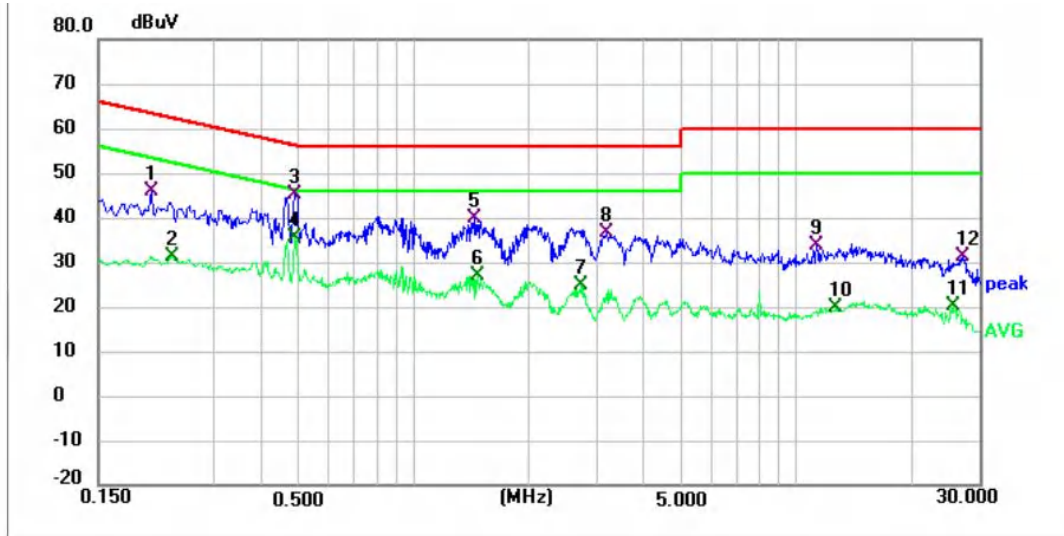
5.2.1.4. Test Data

Mode5 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.166	36.51	10.30	46.81	65.16	-18.35	QP
2	0.183	19.74	10.29	30.03	54.35	-24.32	AVG
3 *	0.466	32.78	10.32	43.10	56.58	-13.48	QP
4	0.466	22.72	10.32	33.04	46.58	-13.54	AVG
5	0.906	17.70	10.40	28.10	46.00	-17.90	AVG
6	0.934	29.06	10.40	39.46	56.00	-16.54	QP
7	2.746	12.04	10.87	22.91	46.00	-23.09	AVG
8	2.754	25.71	10.88	36.59	56.00	-19.41	QP
9	7.138	18.13	12.77	30.90	60.00	-29.10	QP
10	8.002	8.34	13.02	21.36	50.00	-28.64	AVG
11	20.930	13.66	15.47	29.13	60.00	-30.87	QP
12	21.506	0.82	15.42	16.24	50.00	-33.76	AVG

Mode5 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.206	35.64	10.29	45.93	63.37	-17.44	QP
2	0.234	20.95	10.30	31.25	52.31	-21.06	AVG
3	0.490	34.96	10.35	45.31	56.17	-10.86	QP
4 *	0.490	25.09	10.35	35.44	46.17	-10.73	AVG
5	1.442	29.18	10.52	39.70	56.00	-16.30	QP
6	1.470	16.37	10.53	26.90	46.00	-19.10	AVG
7	2.742	13.89	10.88	24.77	46.00	-21.23	AVG
8	3.178	25.58	11.02	36.60	56.00	-19.40	QP
9	11.302	19.72	14.14	33.86	60.00	-26.14	QP
10	12.714	5.07	14.75	19.82	50.00	-30.18	AVG
11	25.694	4.74	15.29	20.03	50.00	-29.97	AVG
12	27.158	16.08	15.11	31.19	60.00	-28.81	QP

Note:

- 1). Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)
- 2). Margin = Result - Limit

5.2.2. 6dB Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10-2020, section 11.8
Procedure:	11.8.1 Option 1 The steps for the first option are as follows: - Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. - Set the VBW $\geq [3 \times \text{RBW}]$. - Detector = peak. - Trace mode = max-hold. - Sweep = No faster than coupled (auto) time. - Allow the trace to stabilize. - Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-6 dB down amplitude”. If a marker is below this “-6 dB down amplitude” value, then it shall be as close as possible to this value. 11.8.2 Option 2 The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW $\geq 3 \times \text{RBW}$, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

5.2.2.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	56.5 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.2.2. Test Setup Diagram



5.2.2.3. Test Result

Pass

5.2.2.4. Test Data

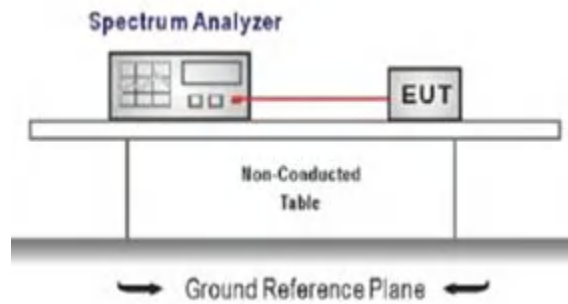
Please Refer to Appendix for Details.

5.2.3. 99% Occupied Bandwidth

Limit:

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Test configuration:



Test procedure:

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
Center Frequency = channel center frequency
Span $\geq 1.5 \times \text{OBW}$
RBW = 1%~5%OBW, VBW $\geq 3 \times \text{RBW}$
Sweep time = auto couple
Detector = Peak, Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.

Test mode:

TM1, TM2, TM3, TM4

Test data:

Please Refer to Appendix for Details.

Result:

Pass

5.2.4. Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Method:	ANSI C63.10-2020 section 11.9.1
Procedure:	ANSI C63.10-2020, section 11.9.1 Maximum peak conducted output power

5.2.4.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	56.5 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.4.2. Test Setup Diagram



5.2.4.3. Test Result

Pass

5.2.4.4. Test Data

Please Refer to Appendix for Details.

5.2.5. Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz 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.
Test Method:	ANSI C63.10-2020, section 11.10
Procedure:	ANSI C63.10-2020, section 11.10, Maximum power spectral density level in the fundamental emission

5.2.5.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	56.5 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.5.2. Test Setup Diagram



5.2.5.3. Test Result

Pass

5.2.5.4. Test Data

Please Refer to Appendix for Details.

5.2.6. Conducted band edge and spurious emission

Test Requirement:	47 CFR 15.247(d), 15.209, 15.205
Test Limit:	Refer to 47 CFR 15.247(d), 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.
Test Method:	ANSI C63.10-2020 section 11.11
Procedure:	ANSI C63.10-2020 Section 11.11.1, Section 11.11.2, Section 11.11.3

5.2.6.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	56.5 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.6.2. Test Setup Diagram



5.2.6.3. Test Result

Pass

5.2.6.4. Test Data

Please Refer to Appendix for Details.

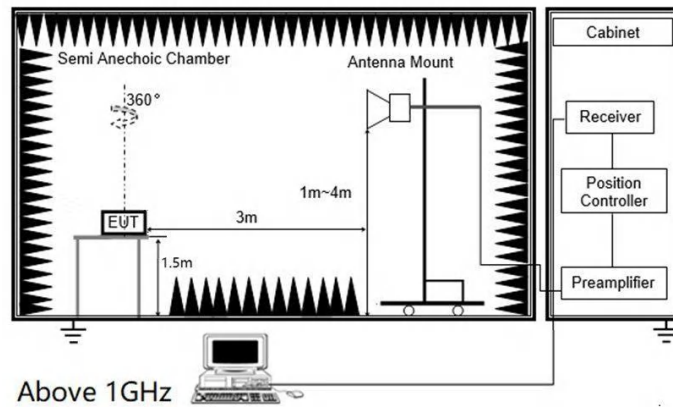
5.2.7. Radiated band edge emission

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 6.10		
Procedure:	1. EUT was setup and tested according to ANSI C63.10 . 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. 3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 on radiated measurement. 5. Use the following spectrum analyzer settings: a) Span shall wide enough to fully capture the emission being measured b) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement For average measurement: use duty cycle correction factor method (DCCF), Averager level = Peak level + DCCF		

5.2.7.1. E.U.T. Operation

Operating Environment:					
Temperature:	23 °C	Humidity:	56.1 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4, TM5, TM6				
Final test mode:	TM1, TM2, TM3, TM4, TM5, TM6				

5.2.7.2. Test Setup Diagram



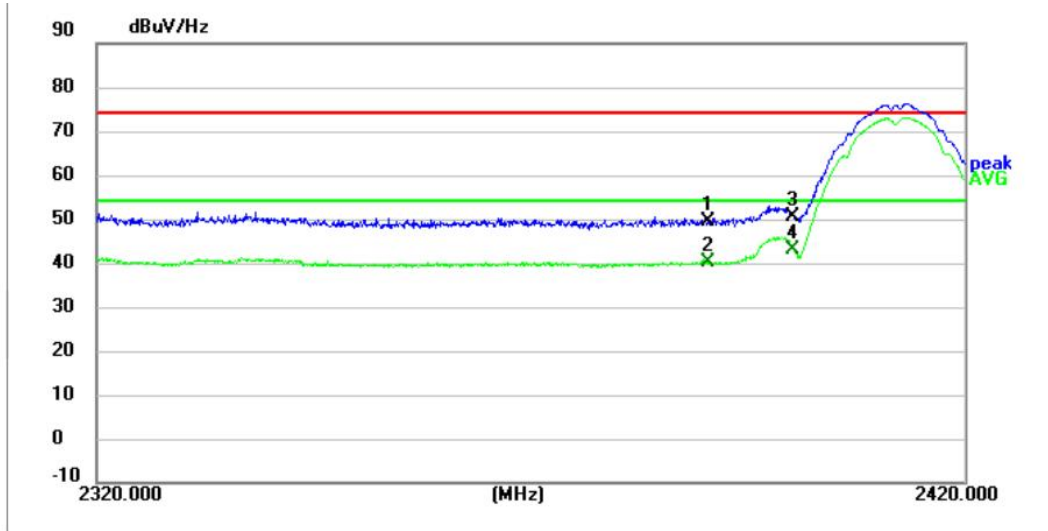
5.2.7.3. Test Result

Pass

5.2.7.4. Test Data

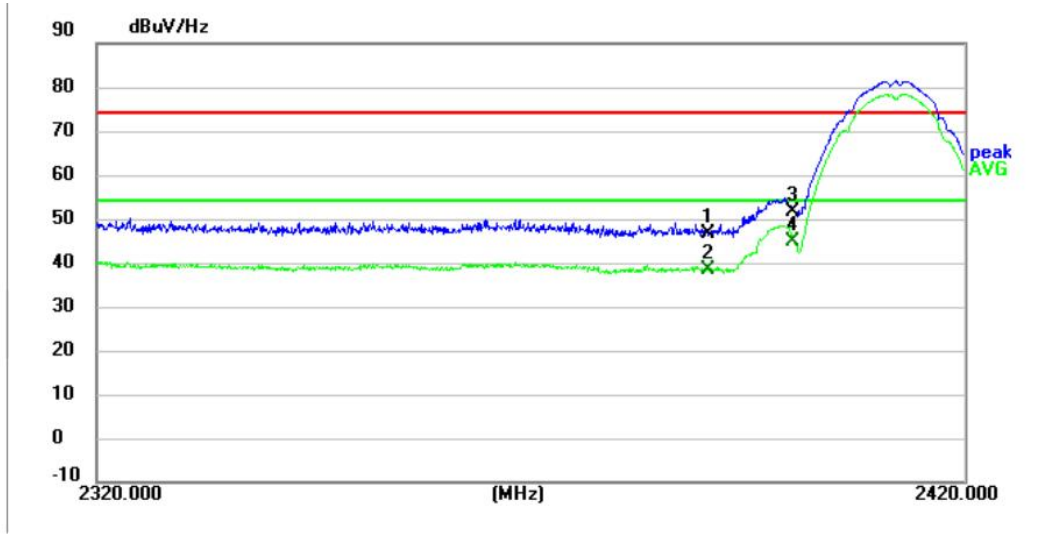
Have pre-scan all test mode, found 802.11b which it was worst case, so only show the worst case' s data on this report.

Mode1 / Polarization: Horizontal / CH: L



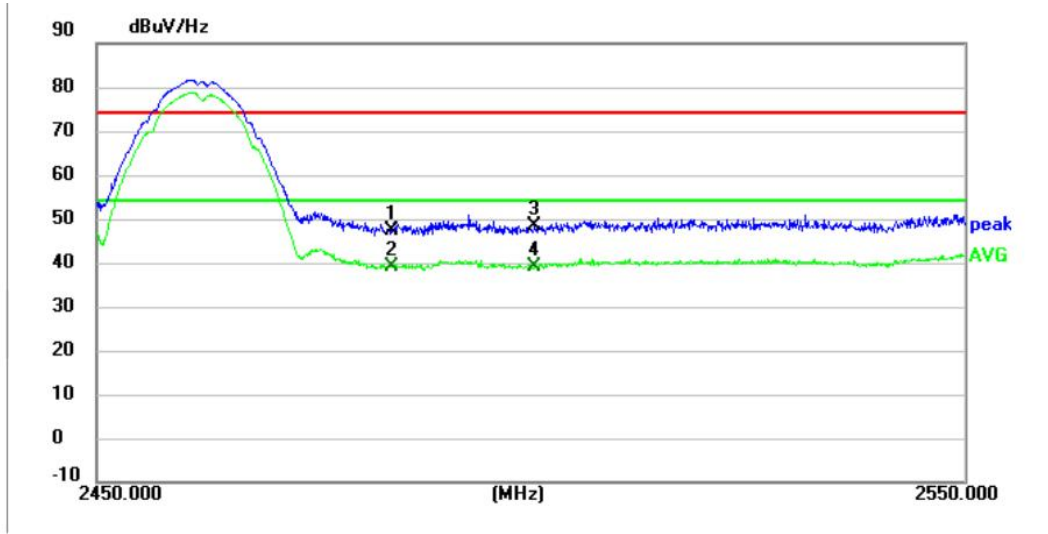
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	2390.0000	47.21	2.34	49.55	74.00	-24.45	peak
2	2390.0000	37.90	2.34	40.24	54.00	-13.76	AVG
3	2400.0000	48.33	2.38	50.71	74.00	-23.29	peak
4 *	2400.0000	40.72	2.38	43.10	54.00	-10.90	AVG

Mode1 / Polarization: Vertical / CH: L



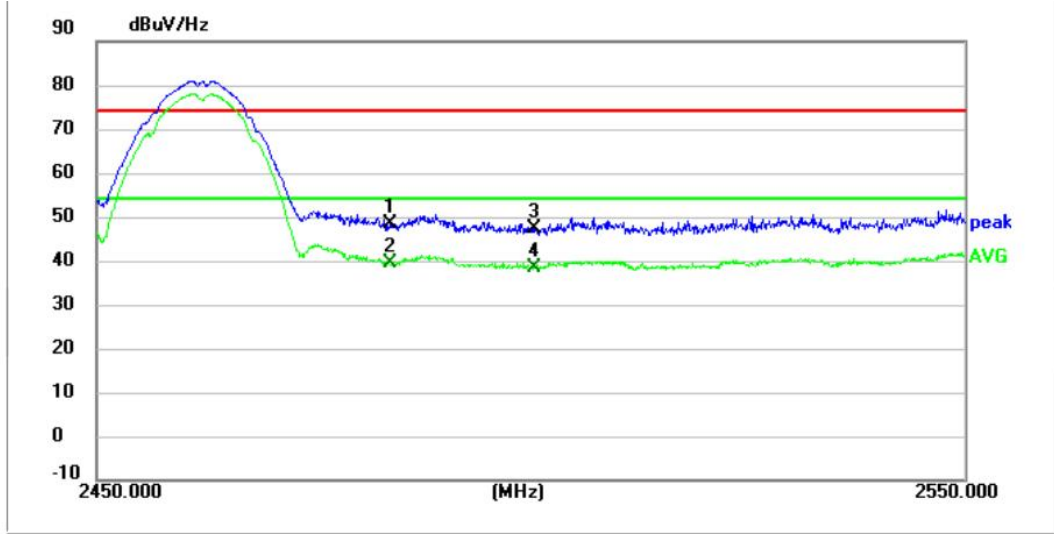
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	2390.0000	44.29	2.34	46.63	74.00	-27.37	peak
2	2390.0000	36.06	2.34	38.40	54.00	-15.60	AVG
3	2400.0000	49.30	2.38	51.68	74.00	-22.32	peak
4 *	2400.0000	42.52	2.38	44.90	54.00	-9.10	AVG

Mode1 / Polarization: Horizontal / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	2483.5000	44.57	2.66	47.23	74.00	-26.77	peak
2 *	2483.5000	36.50	2.66	39.16	54.00	-14.84	AVG
3	2500.0000	45.58	2.80	48.38	74.00	-25.62	peak
4	2500.0000	36.20	2.80	39.00	54.00	-15.00	AVG

Mode1 / Polarization: Vertical / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	2483.5000	45.72	2.66	48.38	74.00	-25.62	peak
2 *	2483.5000	36.82	2.66	39.48	54.00	-14.52	AVG
3	2500.0000	44.61	2.80	47.41	74.00	-26.59	peak
4	2500.0000	35.52	2.80	38.32	54.00	-15.68	AVG

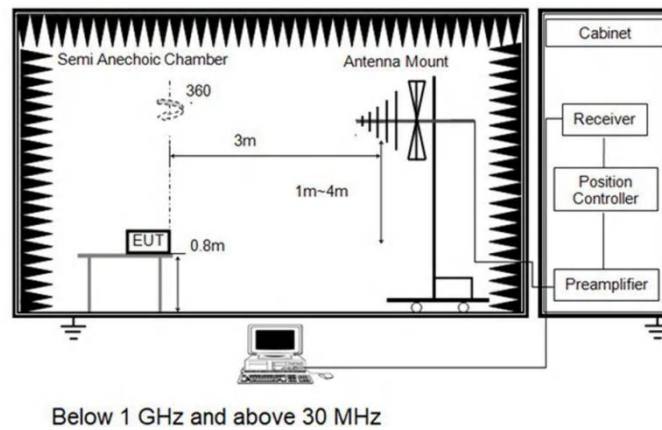
5.2.8. Radiated Spurious Emission (below 1GHz)

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		
Procedure:	1. The EUT was setup and tested according to ANSI C63.10. 2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level. 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower. 4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines. 5. Set to the maximum power setting and enable the EUT transmit continuously. 6. Use the following spectrum analyzer settings a) Span shall wide enough to fully capture the emission being measured; b) RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.		

5.2.8.1. E.U.T. Operation

Operating Environment:					
Temperature:	23 °C	Humidity:	56.1 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4, TM5, TM6, TM7				
Final test mode:	TM1, TM2, TM3, TM4, TM5, TM6, TM7				

5.2.8.2. Test Setup Diagram



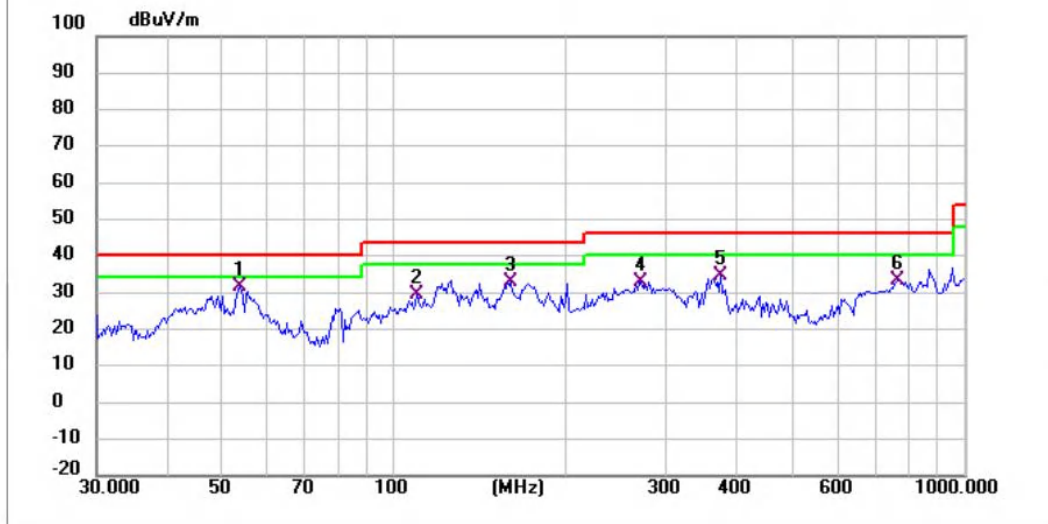
5.2.8.3. Test Result

Pass

5.2.8.4. Test Data

Have pre-scan all test channel, found CH1(802.11b) which it was worst case, so only show the worst case' s data on this report.

Mode1 / Polarization: Horizontal / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	53.6931	61.42	-29.97	31.45	40.00	-8.55	QP
2	109.7960	59.91	-30.48	29.43	43.50	-14.07	QP
3	160.3454	65.96	-32.97	32.99	43.50	-10.51	QP
4	271.3245	61.30	-28.23	33.07	46.00	-12.93	QP
5	374.6225	60.14	-25.51	34.63	46.00	-11.37	QP
6	766.0570	50.43	-17.09	33.34	46.00	-12.66	QP

Mode1 / Polarization: Vertical / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	49.7066	58.32	-29.12	29.20	40.00	-10.80	QP
2	106.7587	60.66	-30.69	29.97	43.50	-13.53	QP
3	200.6880	57.90	-29.83	28.07	43.50	-15.43	QP
4	301.4223	52.85	-27.05	25.80	46.00	-20.20	QP
5	422.0577	59.37	-24.23	35.14	46.00	-10.86	QP
6	566.6221	54.33	-20.15	34.18	46.00	-11.82	QP

Note:

1) For 9 kHz ~ 30 MHz Measurement

The EUT was pre-scanned this frequency band, found the radiated level 20dB lower than the limit, so don't show data on this report.

2) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor

3) Margin = Limit – Level

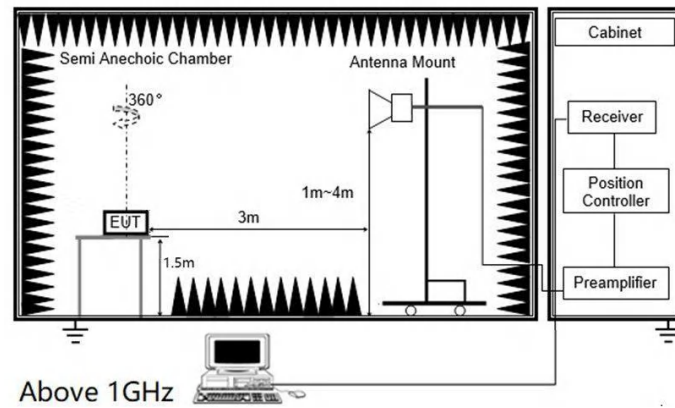
5.2.9. Radiated Spurious Emission (Above 1GHz)

Test Requirement:	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		
Procedure:	1. The EUT was setup and tested according to ANSI C63.10. 2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level. 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower. 4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines. 5. Set to the maximum power setting and enable the EUT transmit continuously. 6. Use the following spectrum analyzer settings a) Span shall wide enough to fully capture the emission being measured; b) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement For average measurement: use duty cycle correction factor method (DCCF)Averager level = Peak level + DCCF		

5.2.9.1. E.U.T. Operation

Operating Environment:					
Temperature:	23 °C	Humidity:	56.1 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4, TM5, TM6, TM7				
Final test mode:	TM1, TM2, TM3, TM4, TM5, TM6, TM7				

5.2.9.2. Test Setup Diagram



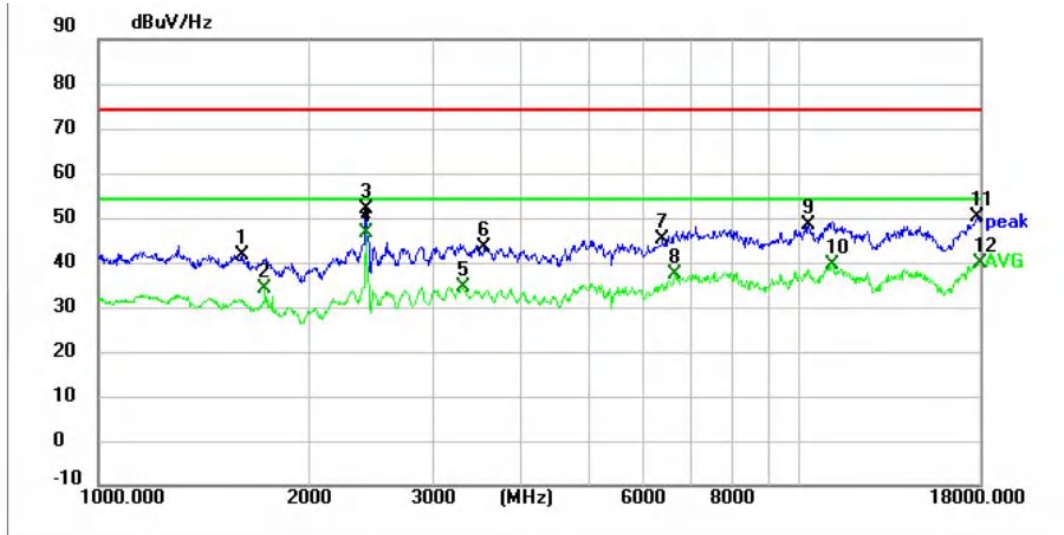
5.2.9.3. Test Result

Pass

5.2.9.4. Test Data

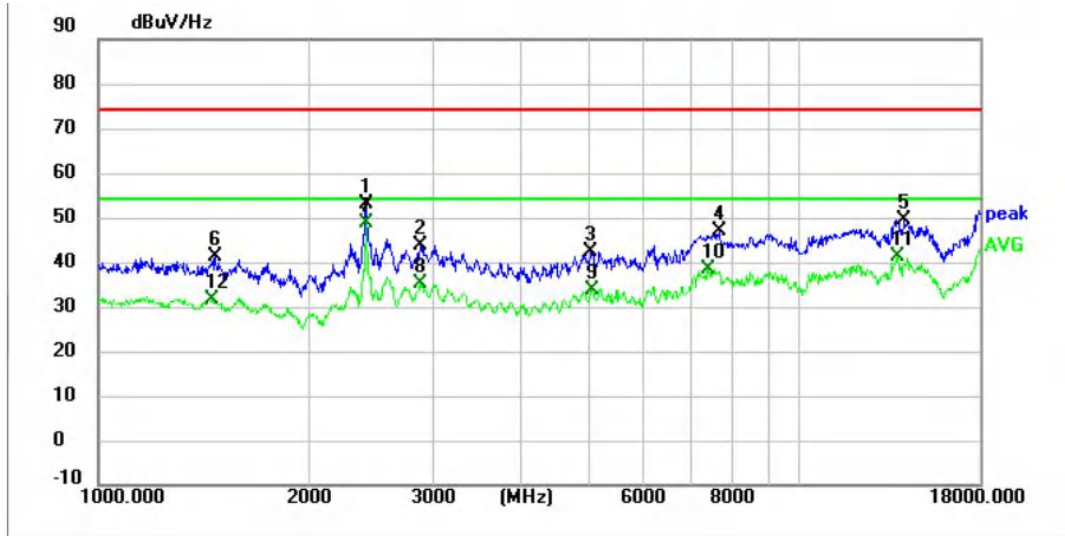
Have pre-scan all test channel, found CH1(802.11b) which it was worst case, so only show the worst case' s data on this report.

Mode1 / Polarization: Horizontal / CH: L



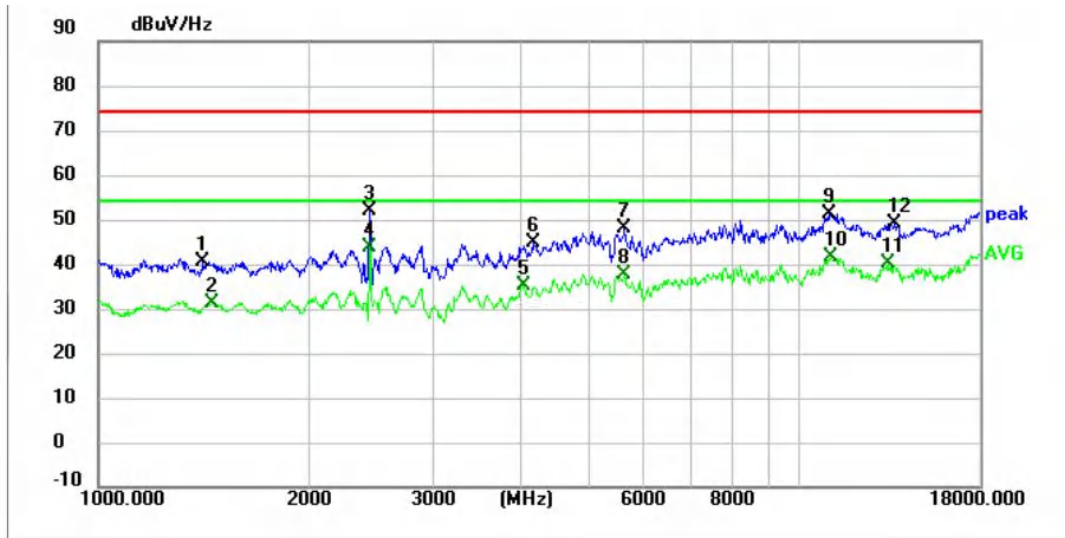
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	1603.5000	42.68	-1.21	41.47	74.00	-32.53	peak
2	1731.0000	34.63	-0.67	33.96	54.00	-20.04	AVG
3	2412.7000	49.41	2.38	51.79	74.00	-22.21	peak
4 *	2412.7000	44.09	2.38	46.47	54.00	-7.53	AVG
5	3320.5000	28.07	6.43	34.50	54.00	-19.50	AVG
6	3556.8000	37.00	6.32	43.32	74.00	-30.68	peak
7	6360.1000	27.45	17.69	45.14	74.00	-28.86	peak
8	6642.3000	17.65	19.63	37.28	54.00	-16.72	AVG
9	10278.6000	22.39	26.00	48.39	74.00	-25.61	peak
10	11137.1000	11.30	28.11	39.41	54.00	-14.59	AVG
11	17869.1000	59.64	-9.59	50.05	74.00	-23.95	peak
12	18000.0000	48.81	-8.90	39.91	54.00	-14.09	AVG

Mode1 / Polarization: Vertical / CH: L



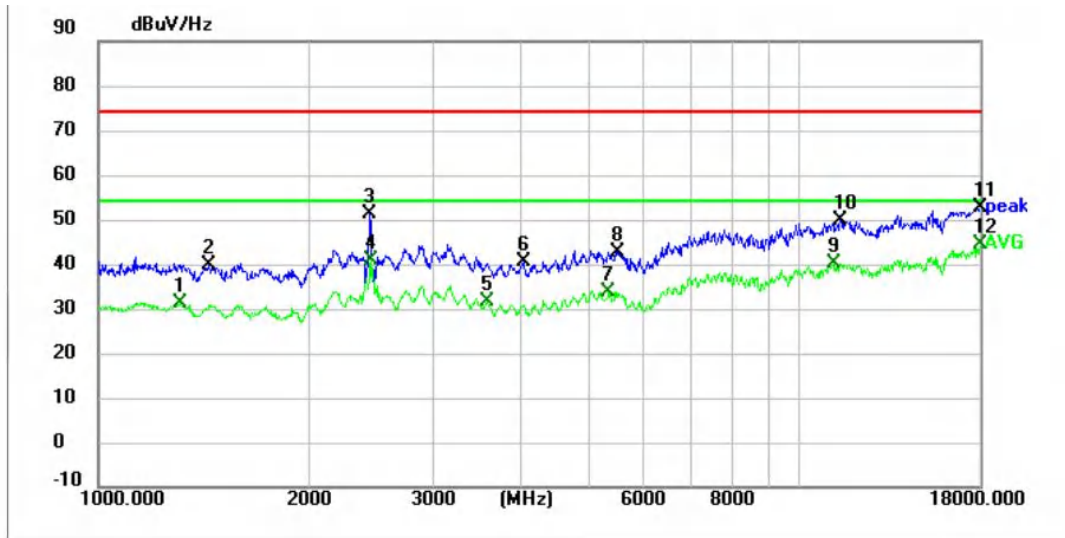
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	2412.7000	50.64	2.38	53.02	74.00	-20.98	peak
2	2885.3000	37.94	5.75	43.69	74.00	-30.31	peak
3	5034.1000	29.66	12.82	42.48	74.00	-31.52	peak
4	7672.5000	24.14	22.67	46.81	74.00	-27.19	peak
5	14095.1000	60.16	-10.71	49.45	74.00	-24.55	peak
6	1467.5000	42.59	-1.33	41.26	74.00	-32.74	peak
7 *	2412.7000	46.48	2.38	48.86	54.00	-5.14	AVG
8	2885.3000	29.58	5.75	35.33	54.00	-18.67	AVG
9	5059.6000	20.88	13.03	33.91	54.00	-20.09	AVG
10	7412.4000	16.16	22.16	38.32	54.00	-15.68	AVG
11	13777.2000	52.27	-11.18	41.09	54.00	-12.91	AVG
12	1455.6000	32.97	-1.32	31.65	54.00	-22.35	AVG

Mode1 / Polarization: Horizontal / CH: M



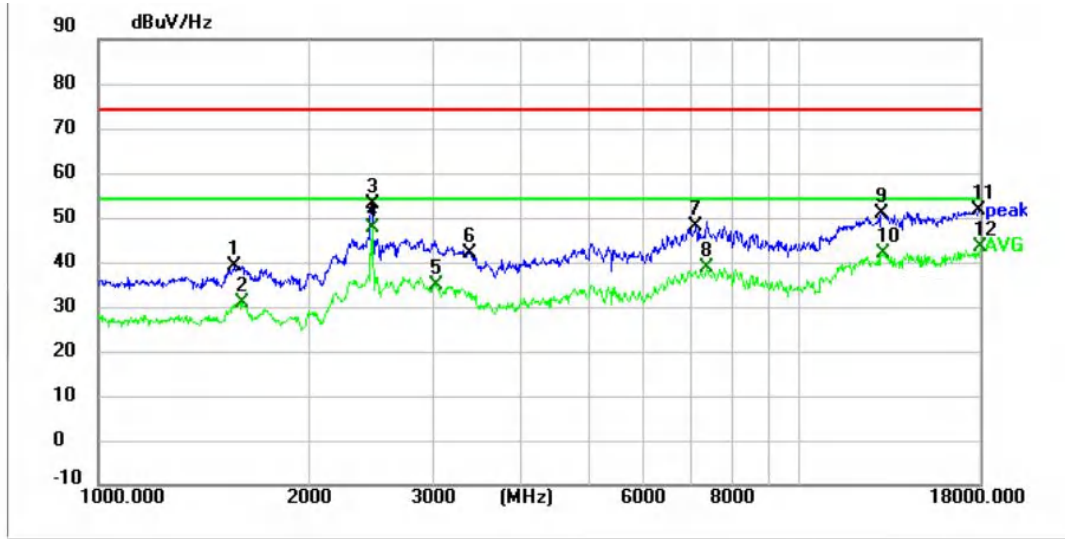
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	1411.4000	42.17	-1.59	40.58	74.00	-33.42	peak
2	1452.2000	32.68	-1.32	31.36	54.00	-22.64	AVG
3	2434.8000	49.65	2.39	52.04	74.00	-21.96	peak
4 *	2439.9000	41.45	2.39	43.84	54.00	-10.16	AVG
5	4046.4000	27.83	7.30	35.13	54.00	-18.87	AVG
6	4179.0000	36.99	7.84	44.83	74.00	-29.17	peak
7	5618.9000	33.25	14.79	48.04	74.00	-25.96	peak
8	5618.9000	22.73	14.79	37.52	54.00	-16.48	AVG
9	10999.4000	23.13	28.10	51.23	74.00	-22.77	peak
10	11106.5000	13.40	28.07	41.47	54.00	-12.53	AVG
11	13345.4000	51.84	-11.58	40.26	54.00	-13.74	AVG
12	13642.9000	60.49	-11.34	49.15	74.00	-24.85	peak

Mode1 / Polarization: Vertical / CH: M



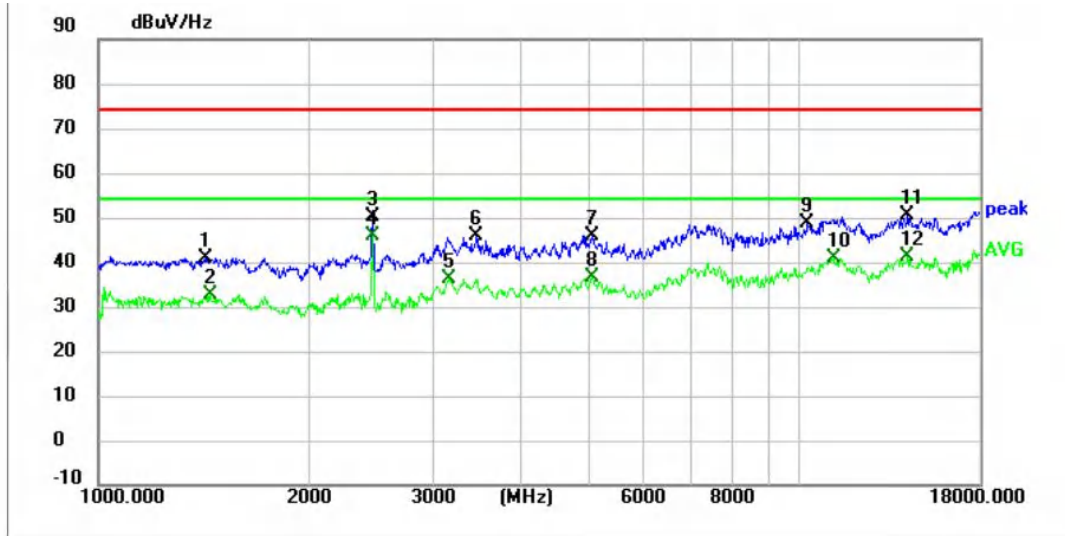
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	1311.1000	32.70	-1.62	31.08	54.00	-22.92	AVG
2	1442.0000	41.26	-1.37	39.89	74.00	-34.11	peak
3	2439.9000	48.70	2.39	51.09	74.00	-22.91	peak
4	2443.3000	38.43	2.39	40.82	54.00	-13.18	AVG
5	3587.4000	25.30	6.34	31.64	54.00	-22.36	AVG
6	4032.8000	33.20	7.30	40.50	74.00	-33.50	peak
7	5333.3000	20.16	13.63	33.79	54.00	-20.21	AVG
8	5506.7000	27.77	14.85	42.62	74.00	-31.38	peak
9	11143.9000	12.05	28.11	40.16	54.00	-13.84	AVG
10	11429.5000	21.38	28.29	49.67	74.00	-24.33	peak
11	18000.0000	61.73	-8.90	52.83	74.00	-21.17	peak
12 *	18000.0000	53.23	-8.90	44.33	54.00	-9.67	AVG

Mode1 / Polarization: Horizontal / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	1564.4000	40.30	-1.34	38.96	74.00	-35.04	peak
2	1606.9000	32.08	-1.21	30.87	54.00	-23.13	AVG
3	2462.0000	50.62	2.49	53.11	74.00	-20.89	peak
4 *	2462.0000	45.25	2.49	47.74	54.00	-6.26	AVG
5	3033.2000	28.61	6.11	34.72	54.00	-19.28	AVG
6	3385.1000	35.67	6.45	42.12	74.00	-31.88	peak
7	7108.1000	26.28	21.58	47.86	74.00	-26.14	peak
8	7380.1000	16.66	22.12	38.78	54.00	-15.22	AVG
9	13071.7000	63.08	-12.09	50.99	74.00	-23.01	peak
10	13172.0000	53.88	-11.96	41.92	54.00	-12.08	AVG
11	17991.5000	60.49	-8.94	51.55	74.00	-22.45	peak
12	18000.0000	52.19	-8.90	43.29	54.00	-10.71	AVG

Mode1 / Polarization: Vertical / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/Hz)	Limit (dBuV/Hz)	Margin (dB)	Detector
1	1419.9000	42.38	-1.53	40.85	74.00	-33.15	peak
2	1443.7000	33.97	-1.37	32.60	54.00	-21.40	AVG
3	2462.0000	47.61	2.49	50.10	74.00	-23.90	peak
4 *	2462.0000	43.34	2.49	45.83	54.00	-8.17	AVG
5	3167.5000	29.88	6.43	36.31	54.00	-17.69	AVG
6	3458.2000	39.68	6.24	45.92	74.00	-28.08	peak
7	5064.7000	32.78	13.03	45.81	74.00	-28.19	peak
8	5064.7000	23.40	13.03	36.43	54.00	-17.57	AVG
9	10271.8000	22.64	25.99	48.63	74.00	-25.37	peak
10	11142.2000	12.85	28.11	40.96	54.00	-13.04	AVG
11	14224.3000	61.17	-10.54	50.63	74.00	-23.37	peak
12	14224.3000	51.92	-10.54	41.38	54.00	-12.62	AVG

Note:

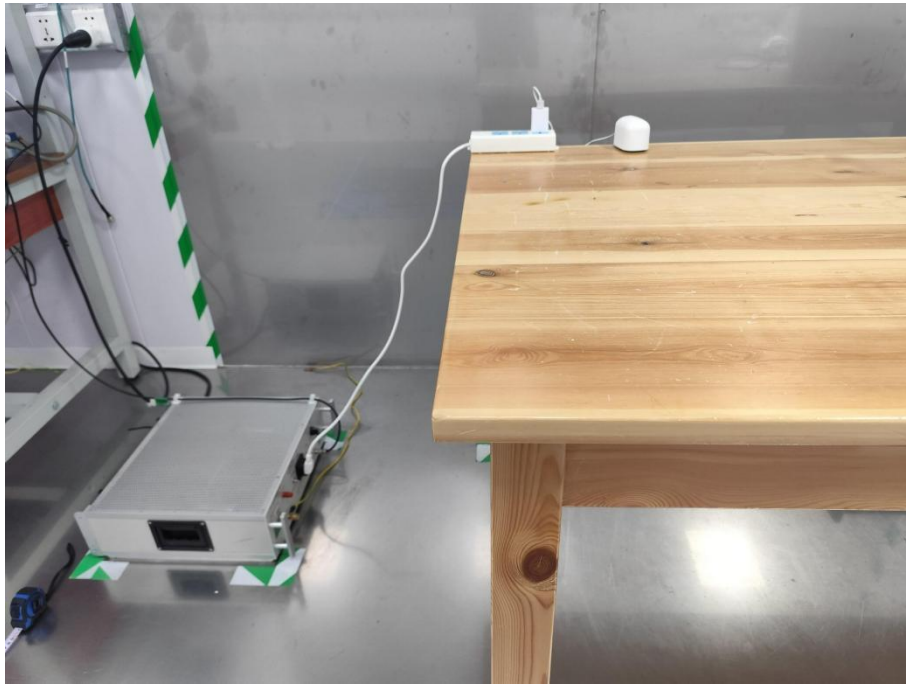
1) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor

2) Margin = Limit – Level

3) Average measurement was not performed if peak level is lower than average limit (54dBuV/m) for above 1GHz.

6. TEST SETUP PHOTOS

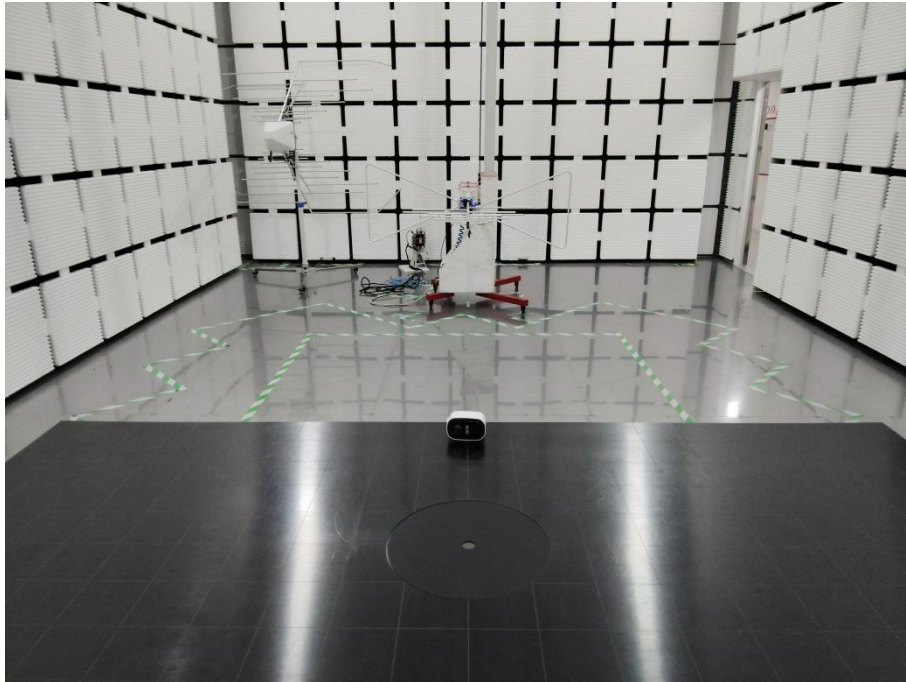
Conducted Emission at AC power line



Radiated band edge emission
Radiated Spurious Emission (Above 1GHz)



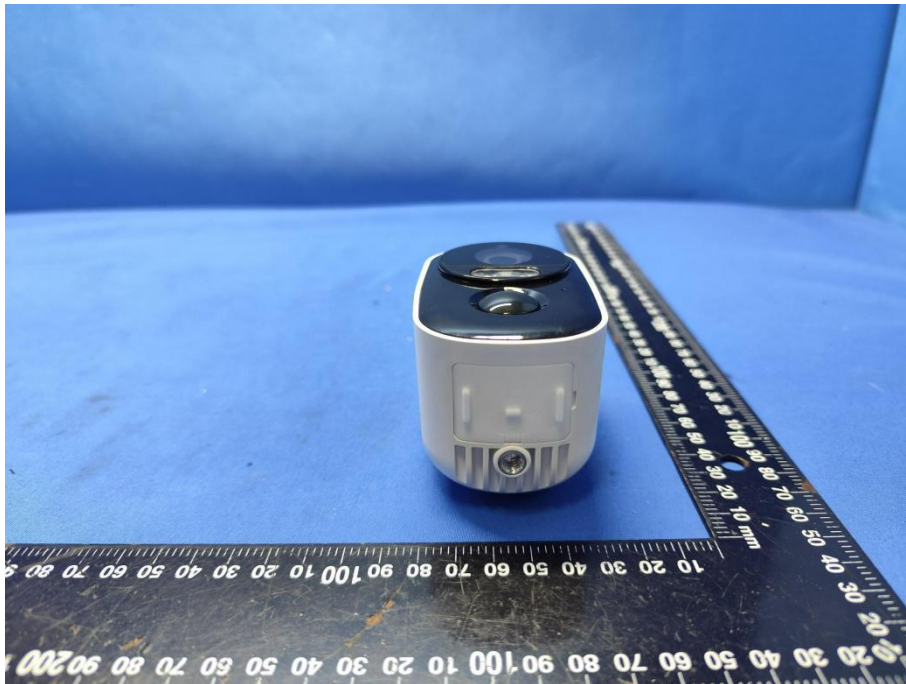
Radiated Spurious Emission (below 1GHz)

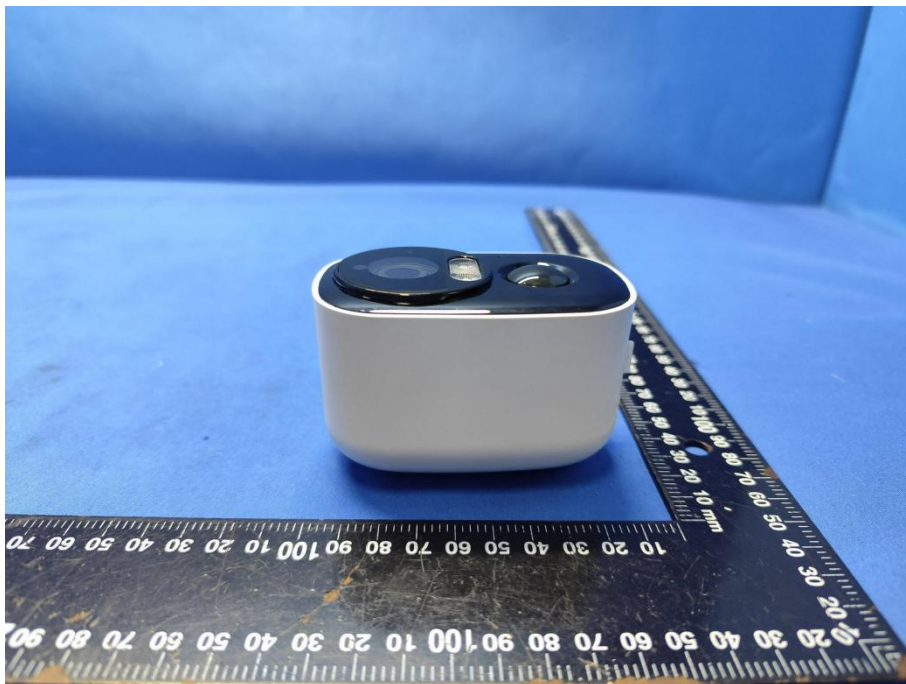


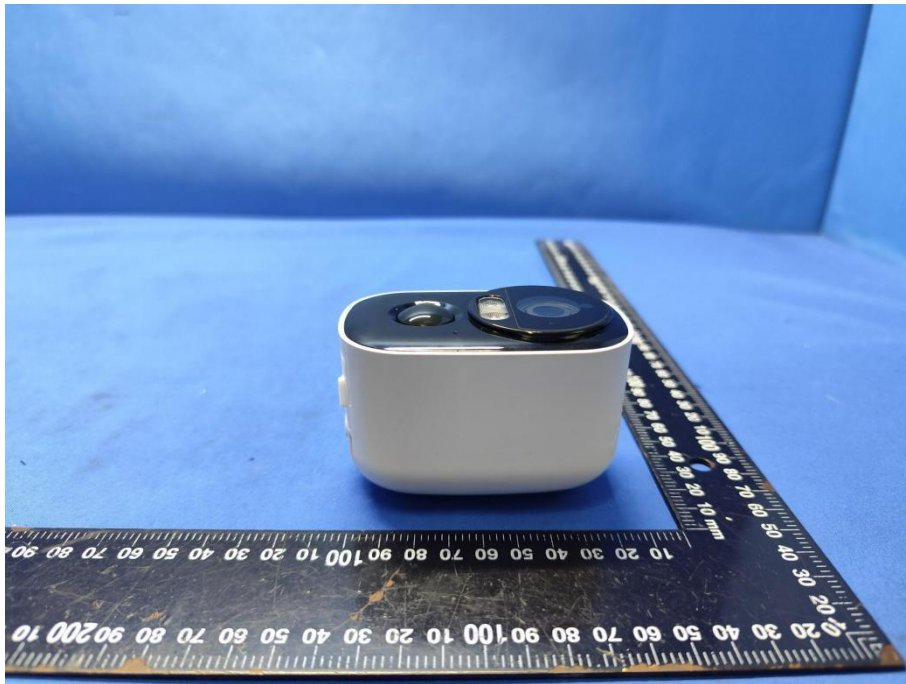
7. EXTERNAL AND INTERNAL PHOTOS

7.1. External Photos









7.2. Internal Photos

