

TEST REPORT

Report No.	CISRR241122149
Project No.	CISR241122149
FCC ID	2AIT9-PA-437
Applicant	SZ PGST CO., LTD
Address	No.9 Building, Huaifu Industrial Park, Huachang Road, Longhua District, Shenzhen, Guangdong, China
Manufacturer	SZ PGST CO., LTD
Address	No.9 Building, Huaifu Industrial Park, Huachang Road, Longhua District, Shenzhen, Guangdong, China
Product Name	Smoke Alarm
Trade Mark	N/A
Model/Type reference	PA-437
Listed Model(s)	PA-443
Standard	47 CFR Part 15.247
Test date	November 23, 2024 to November 30, 2024
Issue date	December 3, 2024
Test result	Complied



Prepared by: Edward Wang



Approved by: Genry Long

The test results relate only to the tested samples.

The test report should not be reproduced except in full without the written approval of Shenzhen Bangce Testing Technology Co., Ltd.

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1. REPORT VERSION

Version No.	Issue date	Description
00	December 3, 2024	Original

2. TEST DESCRIPTION

No.	Test Item	Standard Requirement	Result
1	Antenna Requirement	47 CFR 15.203	Pass
2	6dB Bandwidth	47 CFR 15.247(a)(2)	Pass
3	Maximum Conducted Output Power	47 CFR 15.247(b)(3)	Pass
4	Power Spectral Density	47 CFR 15.247(e)	Pass
5	Conducted band edge and spurious emission	47 CFR 15.247(d), 15.209, 15.205	Pass
6	Radiated band edge emission	47 CFR 15.247(d), 15.209, 15.205	Pass
7	Radiated Spurious Emission (below 1GHz)	47 CFR 15.247(d), 15.209, 15.205	Pass
8	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:	Smoke Alarm
Trade Mark:	N/A
Model No.:	PA-437
Listed Model(s):	PA-443
Power supply:	N/A
Hardware version:	V1.0
Software version:	V1.0
Accessory unit information:	
Battery information:	9V

3.2. Radio Specification Description *

Modulation type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g/n(HT20)/n(HT40): OFDM(BPSK, QPSK, 16QAM, 64QAM)
Operation frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz; 802.11n(HT40): 2422MHz to 2452MHz
Channel number:	802.11b/g/n(HT20): 11 Channels; 802.11n(HT40): 7 Channels
Channel separation:	5MHz
Antenna type:	PCB Antenna
Antenna gain:	1.37dBi

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
2422	2437	2452

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	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

4.4. Test sample information

Type	Sample No.
Engineer sample	CISR241122149-S01
Normal sample	CISR241122149-S02

4.5. Environmental conditions

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

4.6. Equipment Used during the Test

6dB Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in non-restricted frequency bands						
Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	MXG RF Signal Generator	Agilent	N5181A	MY50145362	2024-01-08	2025-01-07
2	Spectrum analyzer	R&S	FSV-40N	102130	2024-01-08	2025-01-07
3	Vector Signal Generator	Agilent	N5182A	MY50142364	2024-06-14	2025-06-13
4	Power Meter	WCS	WCS-PM	WCSPM23040 5A	2024-01-08	2025-01-07

Band edge emissions (Radiated) Emissions in frequency bands (below 1GHz) Emissions in frequency bands (above 1GHz)						
Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100853	2024-01-08	2025-01-07
2	Amplifier	Tonscend	TAP9K3G 40	AP23A806027 0	2024-01-08	2025-01-07
3	Prime amplifier	Tonscend	TAP0101 8050	AP23A806028 0	2024-01-08	2025-01-07
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	2024-01-08	2025-01-07
6	Spectrum analyzer	R&S	FSV-40N	102130	2024-01-08	2025-01-07
7	Bilog Antenna	Schwarzbeck	VULB 9163	1463	2023-01-09	2025-01-08
8	Horn Antenna	SCHWARZBECK	BBHA 9120 D	2487	2023-01-09	2025-01-08
9	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	2023-01-09	2025-01-08
10	RF Cable	Tonscend	Cable 1	/	2024-01-08	2025-01-07
11	RF Cable	Tonscend	Cable 2	/	2024-01-08	2025-01-07
12	RF Cable	SKET	Cable 3	/	2024-01-08	2025-01-07
13	L.I.S.N.#1	Schwarzbeck	NSLK812 7	/	2024-01-08	2025-01-07
14	L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	2024-01-08	2025-01-07
15	Horn Antenna	SCHWARZBECK	BBHA917 0	1130	2023-01-09	2025-01-08
16	Preamplifier	Tonscend	TAP1804 0048	AP21C806126	2024-01-08	2025-01-07

17	Variable-frequency power source	Pinhong	PH1110	/	2024-01-08	2025-01-07
18	6dB Attenuator	SKET	DC-6G	/	/	/
19	Antenna tower	SKT	Bk-4AT-BS	AT2021040101-V1	2024-06-14	2025-06-13

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 PCB Antenna(1.37dBi), 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. 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:	<p>11.8.1 Option 1 The steps for the first option are as follows: a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. b) Set the VBW $\geq [3 \times \text{RBW}]$. c) Detector = peak. d) Trace mode = max-hold. e) Sweep = No faster than coupled (auto) time. f) Allow the trace to stabilize. g) 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.</p> <p>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.</p>

5.2.1.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.1.2. Test Setup Diagram



5.2.1.3. Test Result

Pass

5.2.1.4. Test Data

Please Refer to Appendix for Details.

5.2.2. 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

5.2.2.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 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. 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

5.2.3.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.3.2. Test Setup Diagram



5.2.3.3. Test Result

Pass

5.2.3.4. Test Data

Please Refer to Appendix for Details.

5.2.4. 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

5.2.4.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.2 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 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.

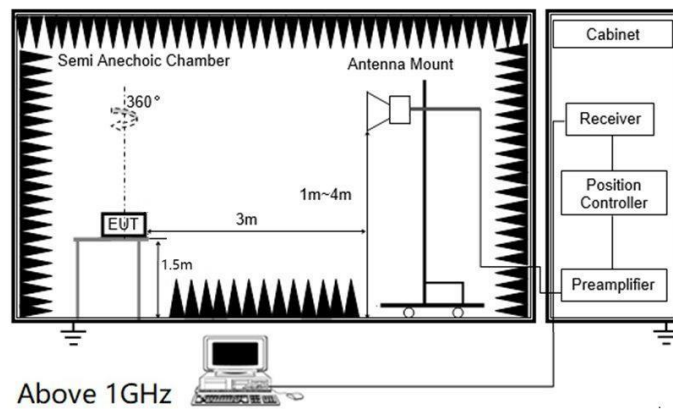
5.2.5. Radiated band edge emission

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
<p>** 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.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>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.</p>			
Test Method:	ANSI C63.10-2020 section 6.10		
Procedure:	<p>1. EUT was setup and tested according to ANSI C63.10 .</p> <p>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.</p> <p>3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.</p> <p>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.</p> <p>5. Use the following spectrum analyzer settings:</p> <p>a) Span shall wide enough to fully capture the emission being measured</p> <p>b) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement</p> <p>For average measurement: use duty cycle correction factor method (DCCF), Averager level = Peak level + DCCF</p>		

5.2.5.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.8 °C	Humidity:	55.4 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.5.2. Test Setup Diagram



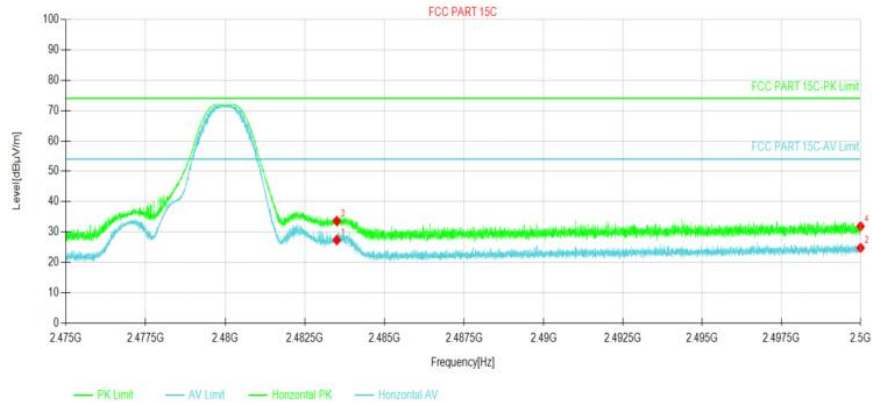
5.2.5.3. Test Result

Pass

5.2.5.4. Test Data

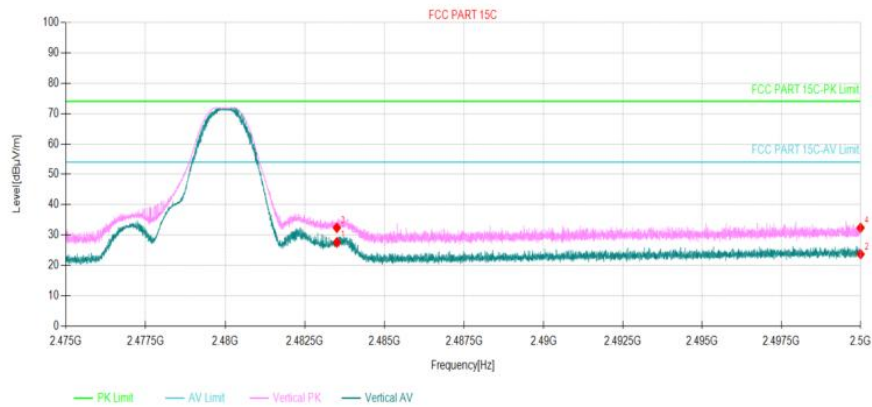
Have pre-scan all test model, found 802.11b which it was worst case, so only show the worst case' s data on this report.

Mode1 / Polarization: Horizontal / CH: L



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2483.5	44.38	27.36	-17.02	54.00	26.64	Horizontal	PASS
2	2500	41.71	24.79	-16.92	54.00	29.21	Horizontal	PASS
3	2483.5	50.65	33.63	-17.02	74.00	40.37	Horizontal	PASS
4	2500	48.82	31.90	-16.92	74.00	42.10	Horizontal	PASS

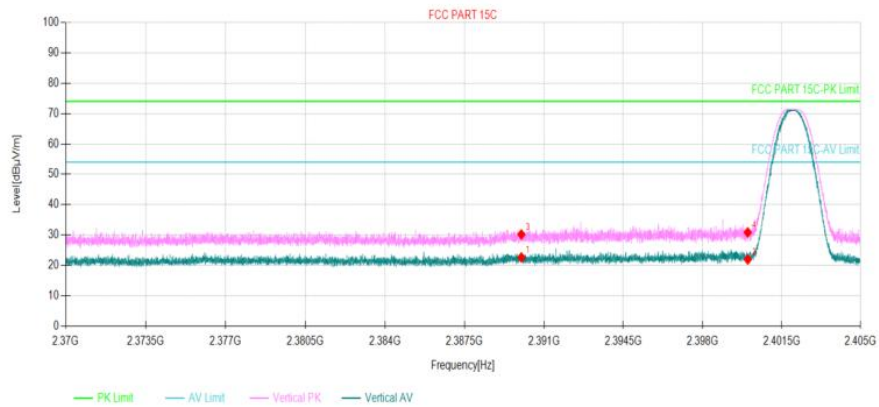
Mode1 / Polarization: Vertical / CH: L



Suspected Data List

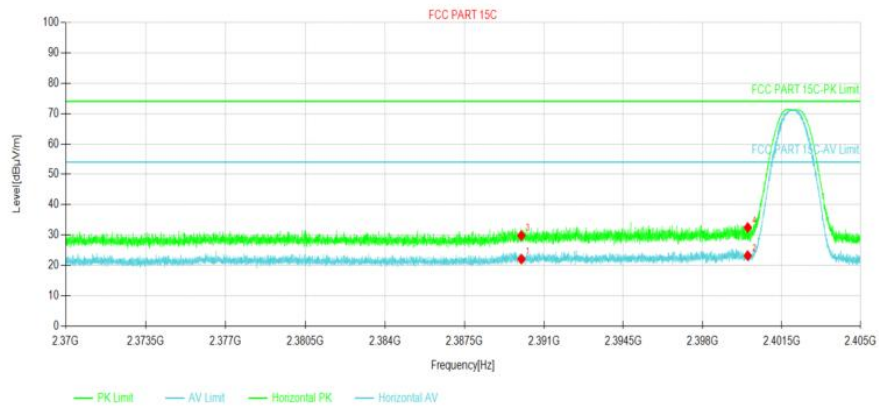
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2483.5	44.59	27.57	-17.02	54.00	26.43	Vertical	PASS
2	2500	40.60	23.68	-16.92	54.00	30.32	Vertical	PASS
3	2483.5	49.41	32.39	-17.02	74.00	41.61	Vertical	PASS
4	2500	49.30	32.38	-16.92	74.00	41.62	Vertical	PASS

Mode1 / Polarization: Horizontal / CH: H



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2390.00	40.18	22.63	-17.55	54.00	31.37	Vertical	PASS
2	2400.00	39.49	21.96	-17.53	54.00	32.04	Vertical	PASS
3	2390.00	47.74	30.19	-17.55	74.00	43.81	Vertical	PASS
4	2400.00	48.39	30.86	-17.53	74.00	43.14	Vertical	PASS

Mode1 / Polarization: Vertical / CH: H



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2390.00	39.63	22.08	-17.55	54.00	31.92	Horizontal	PASS
2	2400.00	40.74	23.21	-17.53	54.00	30.79	Horizontal	PASS
3	2390.00	47.37	29.82	-17.55	74.00	44.18	Horizontal	PASS
4	2400.00	50.02	32.49	-17.53	74.00	41.51	Horizontal	PASS

5.2.6. 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
<p>** 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.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>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.</p>			
Test Method:	ANSI C63.10-2020 section 6.6.4		
Procedure:	<p>1. The EUT was setup and tested according to ANSI C63.10.</p> <p>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.</p> <p>3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>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.</p> <p>5. Set to the maximum power setting and enable the EUT transmit continuously.</p> <p>6. Use the following spectrum analyzer settings</p> <p>a) Span shall wide enough to fully capture the emission being measured;</p> <p>b) RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;</p> <p>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.</p>		

5.2.6.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.8 °C	Humidity:	55.4 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.6.2. Test Setup Diagram



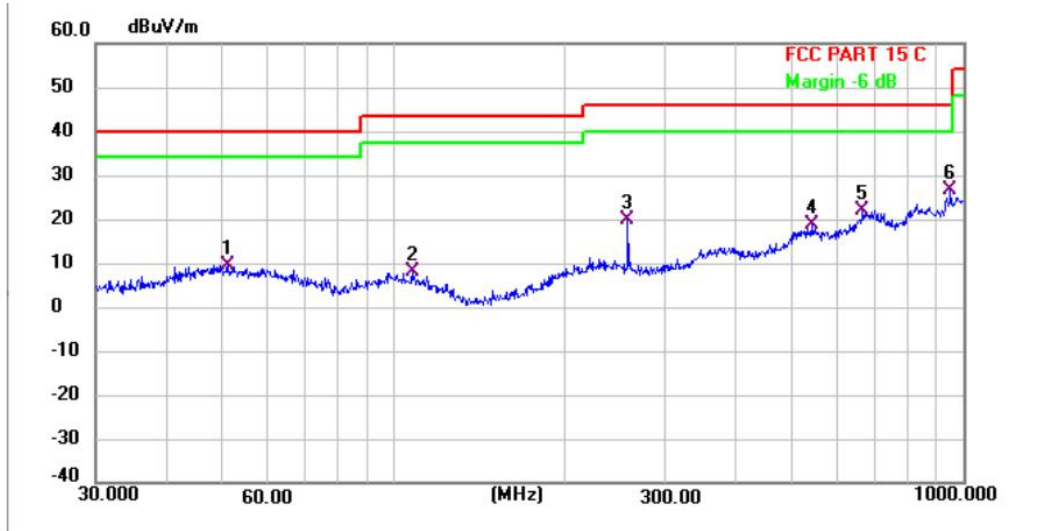
5.2.6.3. Test Result

Pass

5.2.6.4. Test Data

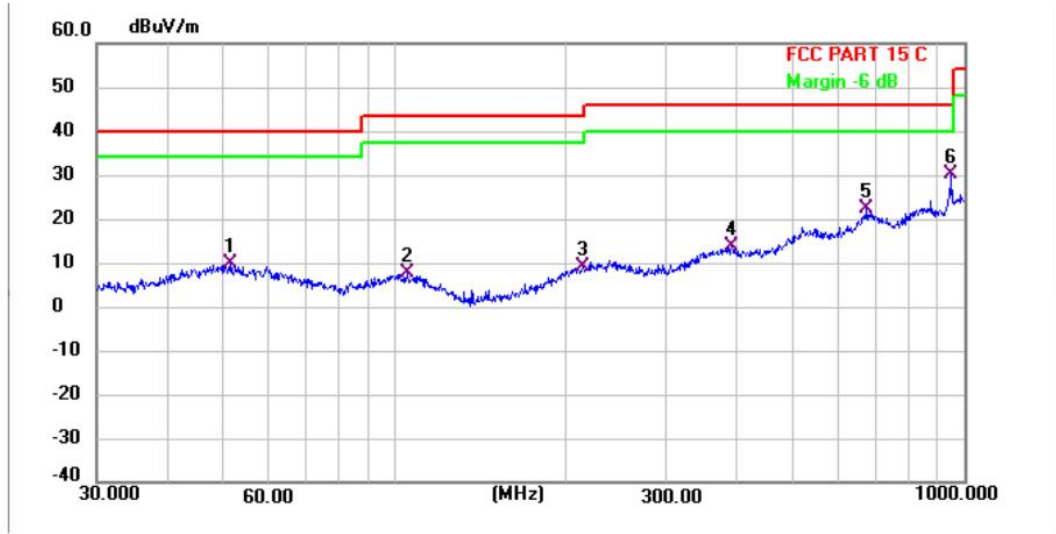
Have pre-scan all test channel, found CH1(802.11b) which it was worst case, so only show the worst case' s data on this report.

Mode1 / Polarization: Horizontal / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	51.121	38.66	-29.37	9.29	40.00	-30.71	QP	100	264	P	
2	107.888	38.56	-30.61	7.95	43.50	-35.55	QP	100	222	P	
3	257.422	48.24	-28.31	19.93	46.00	-26.07	QP	100	89	P	
4	541.372	39.66	-20.83	18.83	46.00	-27.17	QP	100	229	P	
5	665.803	39.68	-17.70	21.98	46.00	-24.02	QP	100	180	P	
6 *	948.761	40.64	-14.04	26.60	46.00	-19.40	QP	100	180	P	

Mode1 / Polarization: Vertical / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	51.662	39.17	-29.50	9.67	40.00	-30.33	QP	100	140	P	
2	105.272	38.32	-30.79	7.53	43.50	-35.97	QP	100	140	P	
3	214.514	38.82	-29.66	9.16	43.50	-34.34	QP	100	252	P	
4	390.723	38.83	-25.19	13.64	46.00	-32.36	QP	100	259	P	
5	675.208	39.73	-17.46	22.27	46.00	-23.73	QP	100	252	P	
6 *	948.761	44.15	-14.04	30.11	46.00	-15.89	QP	100	338	P	

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

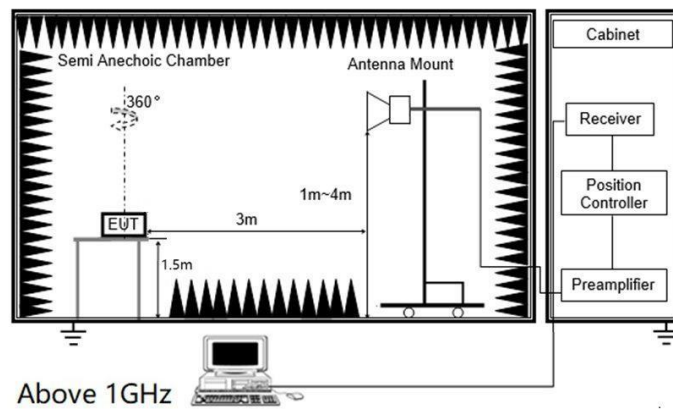
5.2.7. Radiated Spurious Emission (Above 1GHz)

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
<p>** 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.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>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.</p>			
Test Method:	ANSI C63.10-2020 section 6.6.4		
Procedure:	<p>1. The EUT was setup and tested according to ANSI C63.10.</p> <p>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.</p> <p>3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>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.</p> <p>5. Set to the maximum power setting and enable the EUT transmit continuously.</p> <p>6. Use the following spectrum analyzer settings</p> <p>a) Span shall wide enough to fully capture the emission being measured;</p> <p>b) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement</p> <p>For average measurement: use duty cycle correction factor method (DCCF)Averager level = Peak level + DCCF</p>		

5.2.7.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.8 °C	Humidity:	55.4 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.7.2. Test Setup Diagram



5.2.7.3. Test Result

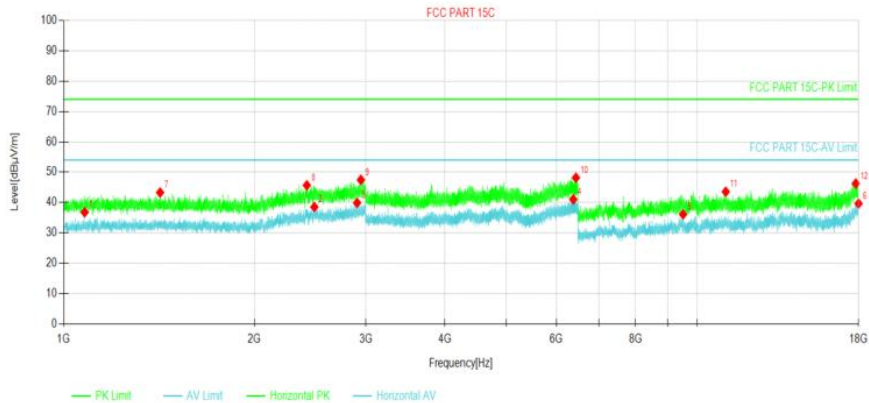
Pass

5.2.7.4. Test Data

Note:

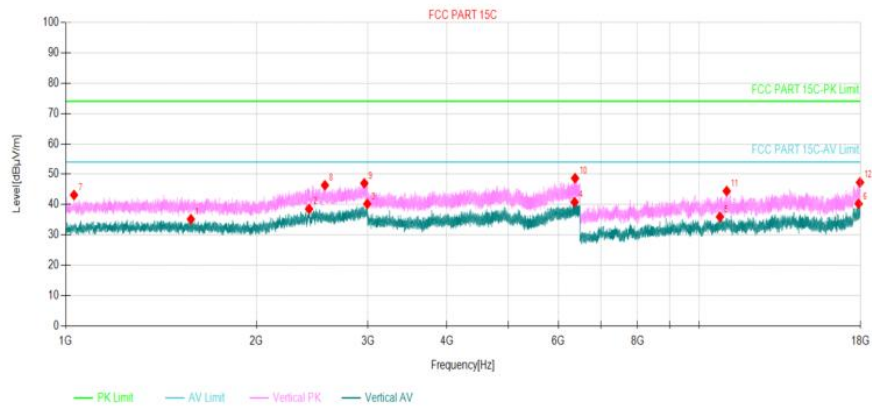
1. In order to prevent the amplifier from saturating, we add a band-stop filter that filters out the main frequency.
2. 18GHz-25GHz is the background of the site, there is no radiated spurious.
3. Have pre-scan all test model, found 802.11b which it was worst case, so only show the worst case' s data on this report.

Mode1 / Polarization: Horizontal / CH: L



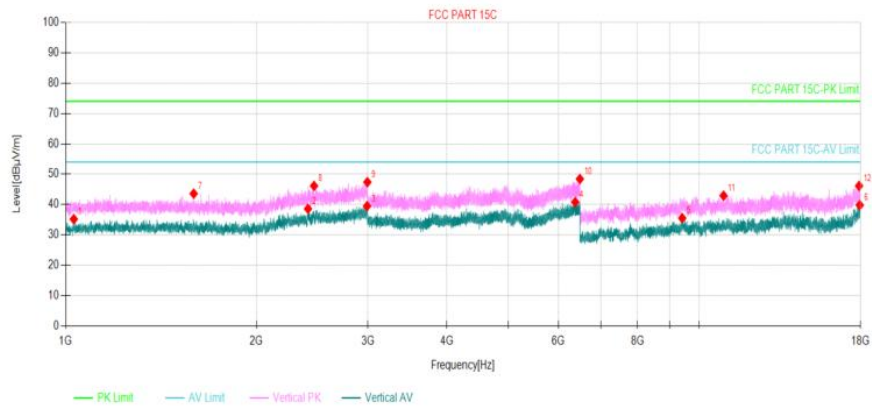
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	1079.2	35.96	36.80	0.84	54.00	17.20	Horizontal	PASS
2	2487.8	30.89	38.54	7.65	54.00	15.46	Horizontal	PASS
3	2906.2	30.74	39.91	9.17	54.00	14.09	Horizontal	PASS
4	6379.6	34.66	41.06	6.40	54.00	12.94	Horizontal	PASS
5	9508.4	32.95	36.12	3.17	54.00	17.88	Horizontal	PASS
6	17997.7	26.15	39.67	13.52	54.00	14.33	Horizontal	PASS
7	1419.8	40.32	43.31	2.99	74.00	30.69	Horizontal	PASS
8	2420.8	38.55	45.70	7.15	74.00	28.30	Horizontal	PASS
9	2946.8	37.96	47.48	9.52	74.00	26.52	Horizontal	PASS
10	6440.85	41.65	48.18	6.53	74.00	25.82	Horizontal	PASS
11	11104.6	38.75	43.57	4.82	74.00	30.43	Horizontal	PASS
12	17818.3	33.19	46.28	13.09	74.00	27.72	Horizontal	PASS

Mode1 / Polarization: Vertical / CH: L



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	1576.6	31.94	35.17	3.23	54.00	18.83	Vertical	PASS
2	2423.2	31.39	38.55	7.16	54.00	15.45	Vertical	PASS
3	2993.6	30.30	40.22	9.92	54.00	13.78	Vertical	PASS
4	6363.5	34.52	40.81	6.29	54.00	13.19	Vertical	PASS
5	10794.1	31.10	35.96	4.86	54.00	18.04	Vertical	PASS
6	17875.8	27.30	40.25	12.95	54.00	13.75	Vertical	PASS
7	1030.8	42.90	43.15	0.25	74.00	30.85	Vertical	PASS
8	2566.6	38.94	46.36	7.42	74.00	27.64	Vertical	PASS
9	2962	37.37	47.02	9.65	74.00	26.98	Vertical	PASS
10	6374.35	42.31	48.67	6.36	74.00	25.33	Vertical	PASS
11	11062.0	39.75	44.46	4.71	74.00	29.54	Vertical	PASS
12	17958.6	34.03	47.30	13.27	74.00	26.70	Vertical	PASS

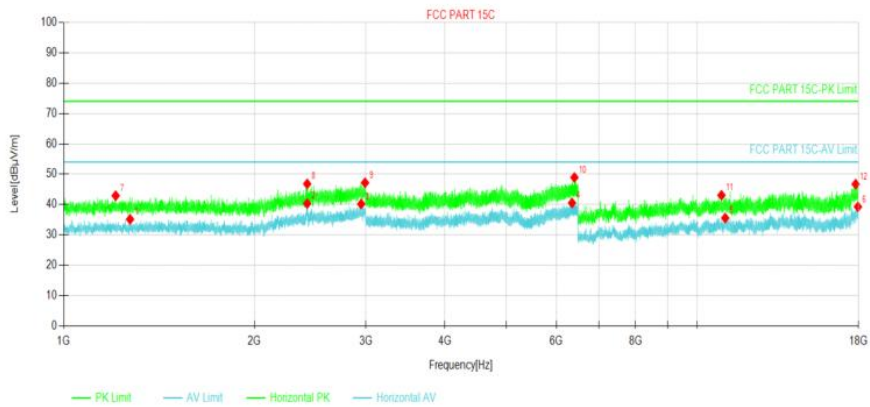
Mode1 / Polarization: Horizontal / CH: M



Suspected Data List

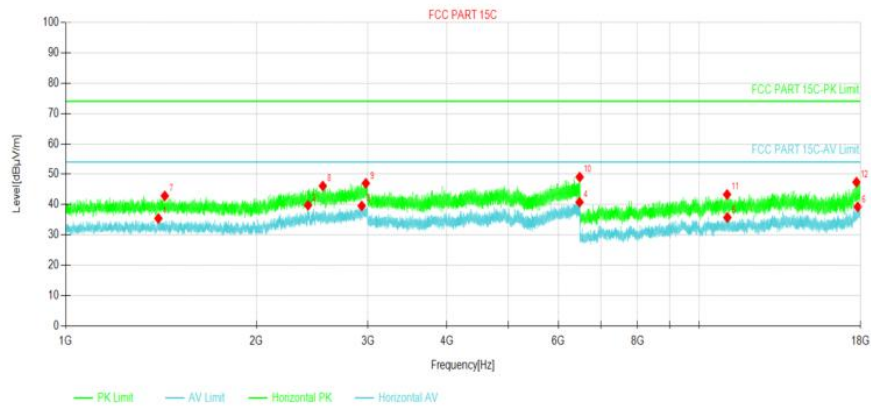
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	1030	34.97	35.21	0.24	54.00	18.79	Vertical	PASS
2	2413.6	31.51	38.60	7.09	54.00	15.40	Vertical	PASS
3	2991	29.58	39.47	9.89	54.00	14.53	Vertical	PASS
4	6377.5	34.43	40.81	6.38	54.00	13.19	Vertical	PASS
5	9409.5	32.48	35.53	3.05	54.00	18.47	Vertical	PASS
6	17947.1	26.64	39.83	13.19	54.00	14.17	Vertical	PASS
7	1592.8	40.35	43.58	3.23	74.00	30.42	Vertical	PASS
8	2467.2	38.66	46.15	7.49	74.00	27.85	Vertical	PASS
9	2995.2	37.46	47.39	9.93	74.00	26.61	Vertical	PASS
10	6485.65	41.91	48.44	6.53	74.00	25.56	Vertical	PASS
11	10937.8	38.26	42.93	4.67	74.00	31.07	Vertical	PASS
12	17901.1	33.27	46.17	12.90	74.00	27.83	Vertical	PASS

Mode1 / Polarization: Vertical / CH: M



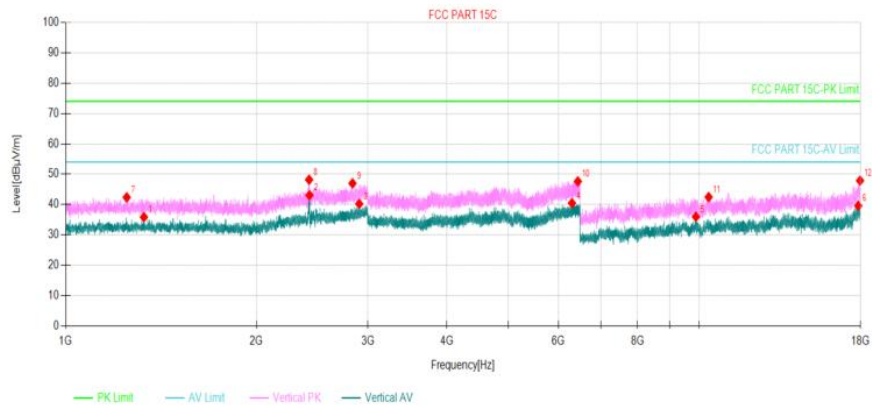
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	1272.8	32.92	35.15	2.23	54.00	18.85	Horizontal	PASS
2	2424.2	33.16	40.33	7.17	54.00	13.67	Horizontal	PASS
3	2949.6	30.64	40.18	9.54	54.00	13.82	Horizontal	PASS
4	6350.2	34.32	40.53	6.21	54.00	13.47	Horizontal	PASS
5	11082.7	30.79	35.56	4.77	54.00	18.44	Horizontal	PASS
6	17956.3	26.01	39.26	13.25	54.00	14.74	Horizontal	PASS
7	1208.2	41.10	42.92	1.82	74.00	31.08	Horizontal	PASS
8	2424	39.64	46.81	7.17	74.00	27.19	Horizontal	PASS
9	2991.4	37.29	47.19	9.90	74.00	26.81	Horizontal	PASS
10	6405.15	42.40	48.93	6.53	74.00	25.07	Horizontal	PASS
11	10934.4	38.40	43.08	4.68	74.00	30.92	Horizontal	PASS
12	17811.4	33.61	46.72	13.11	74.00	27.28	Horizontal	PASS

Mode1 / Polarization: Horizontal / CH: H



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	1400.8	32.51	35.44	2.93	54.00	18.56	Horizontal	PASS
2	2413.8	32.65	39.74	7.09	54.00	14.26	Horizontal	PASS
3	2934.2	30.14	39.55	9.41	54.00	14.45	Horizontal	PASS
4	6478.3	34.26	40.79	6.53	54.00	13.21	Horizontal	PASS
5	11090.8	30.96	35.76	4.80	54.00	18.24	Horizontal	PASS
6	17813.7	26.15	39.25	13.10	54.00	14.75	Horizontal	PASS
7	1433.8	39.83	42.86	3.03	74.00	31.14	Horizontal	PASS
8	2547.2	38.63	46.14	7.51	74.00	27.86	Horizontal	PASS
9	2979	37.22	47.01	9.79	74.00	26.99	Horizontal	PASS
10	6481.8	42.54	49.07	6.53	74.00	24.93	Horizontal	PASS
11	11078.1	38.56	43.32	4.76	74.00	30.68	Horizontal	PASS
12	17733.2	35.16	47.39	12.23	74.00	26.61	Horizontal	PASS

Mode1 / Polarization: Vertical / CH: H



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Polarity	Verdict
1	1329	33.31	35.87	2.56	54.00	18.13	Vertical	PASS
2	2426.4	35.89	43.08	7.19	54.00	10.92	Vertical	PASS
3	2908.2	31.04	40.23	9.19	54.00	13.77	Vertical	PASS
4	6302.6	34.58	40.48	5.90	54.00	13.52	Vertical	PASS
5	9890.2	32.55	35.99	3.44	54.00	18.01	Vertical	PASS
6	17848.2	26.59	39.61	13.02	54.00	14.39	Vertical	PASS
7	1248.4	40.30	42.38	2.08	74.00	31.62	Vertical	PASS
8	2423.2	41.02	48.18	7.16	74.00	25.82	Vertical	PASS
9	2837.6	38.30	46.99	8.69	74.00	27.01	Vertical	PASS
10	6438.05	41.10	47.63	6.53	74.00	26.37	Vertical	PASS
11	10359.4	38.30	42.47	4.17	74.00	31.53	Vertical	PASS
12	17965.5	34.59	47.90	13.31	74.00	26.10	Vertical	PASS

Note:

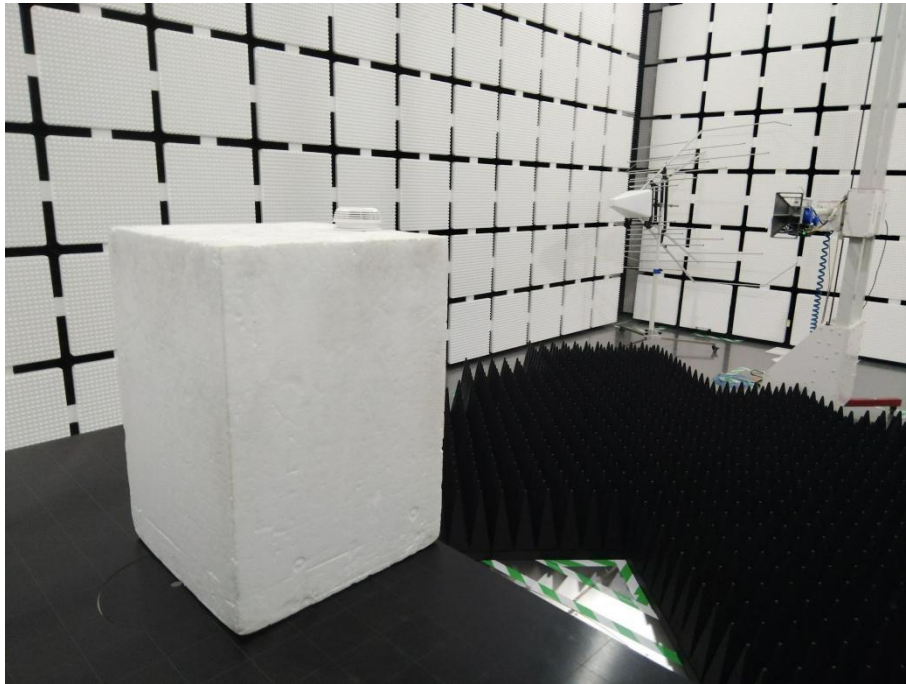
1) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor

2) Margin = Limit – Level

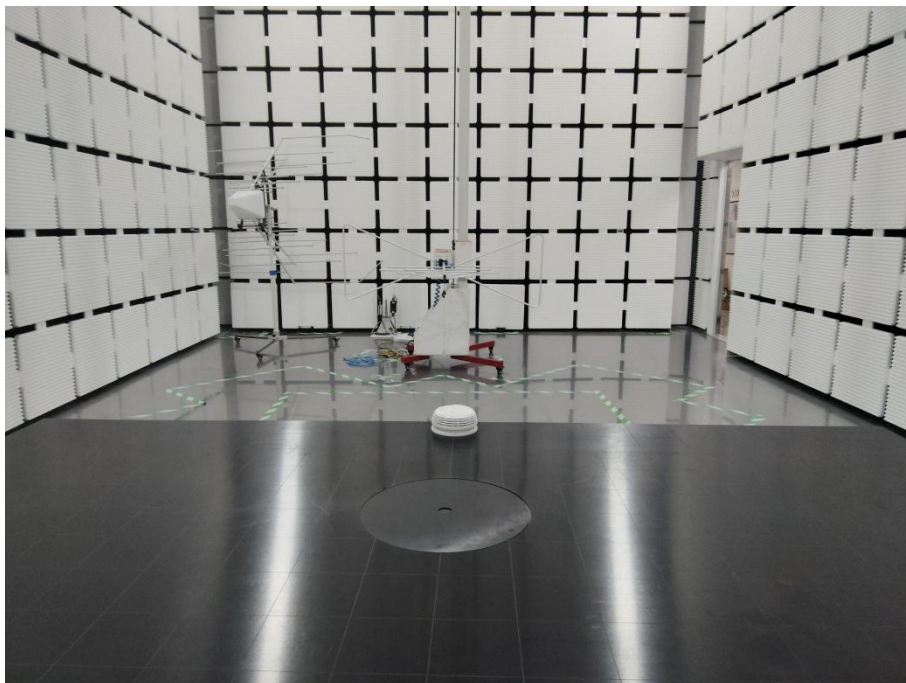
3) Average measurement was not performed if peak level is lower than average limit (54dBuV/m) for above 1GHz.

6. TEST SETUP PHOTOS

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



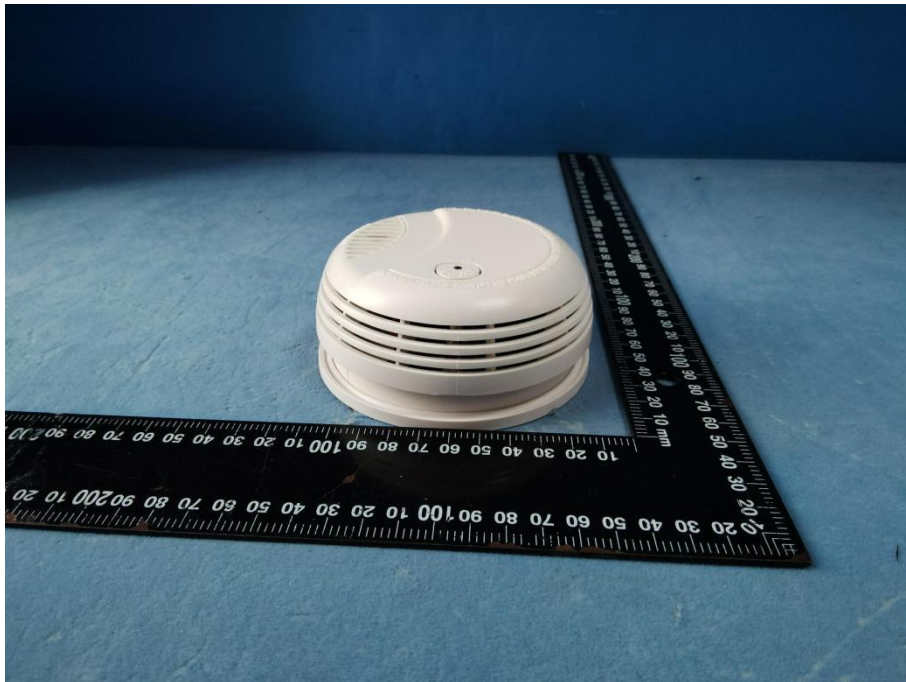
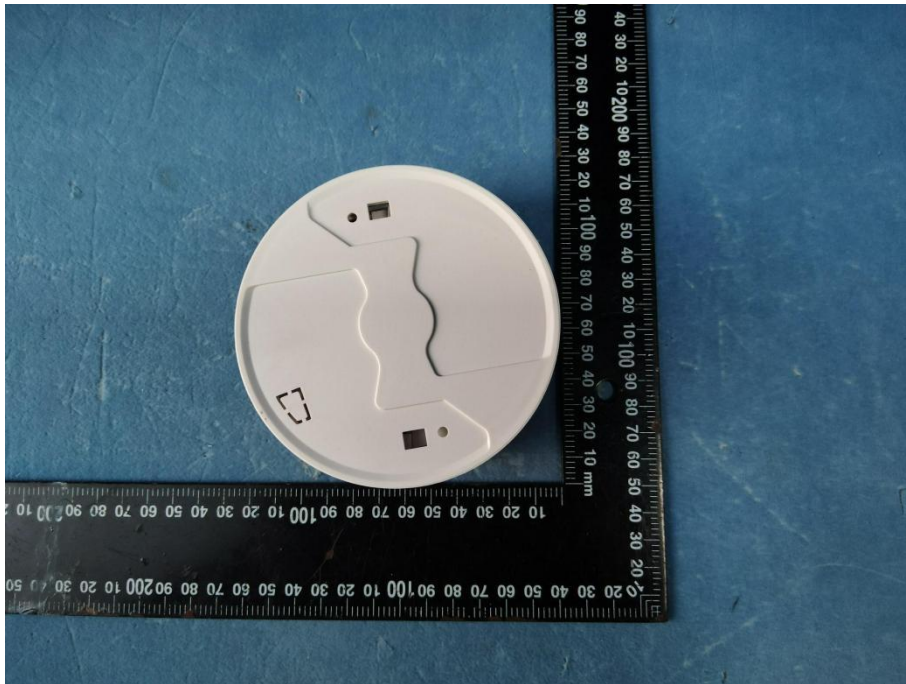
Radiated Spurious Emission (below 1GHz)

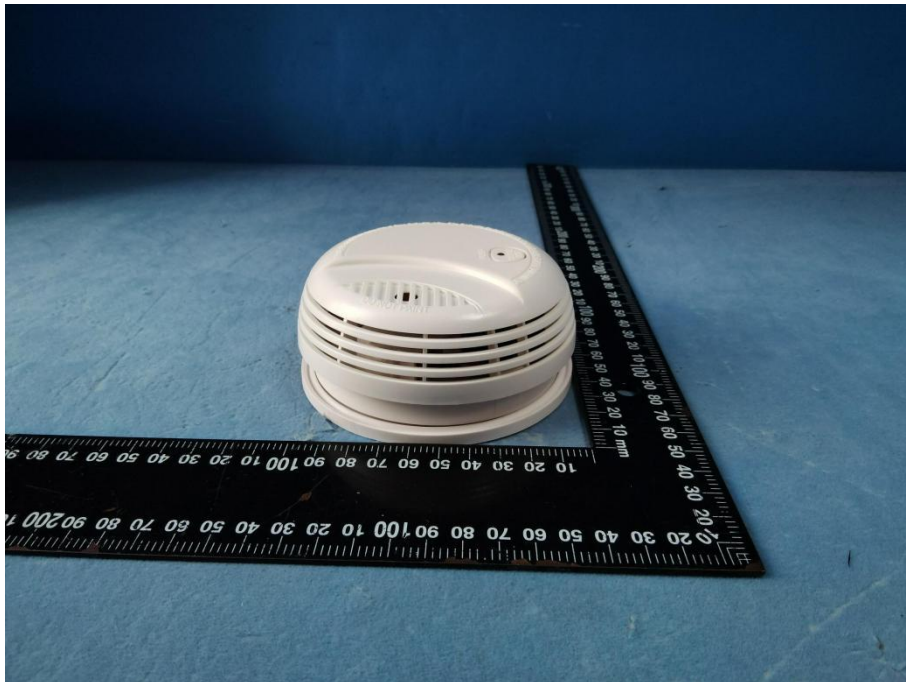


7. EXTERNAL AND INTERNAL PHOTOS

7.1. External Photos

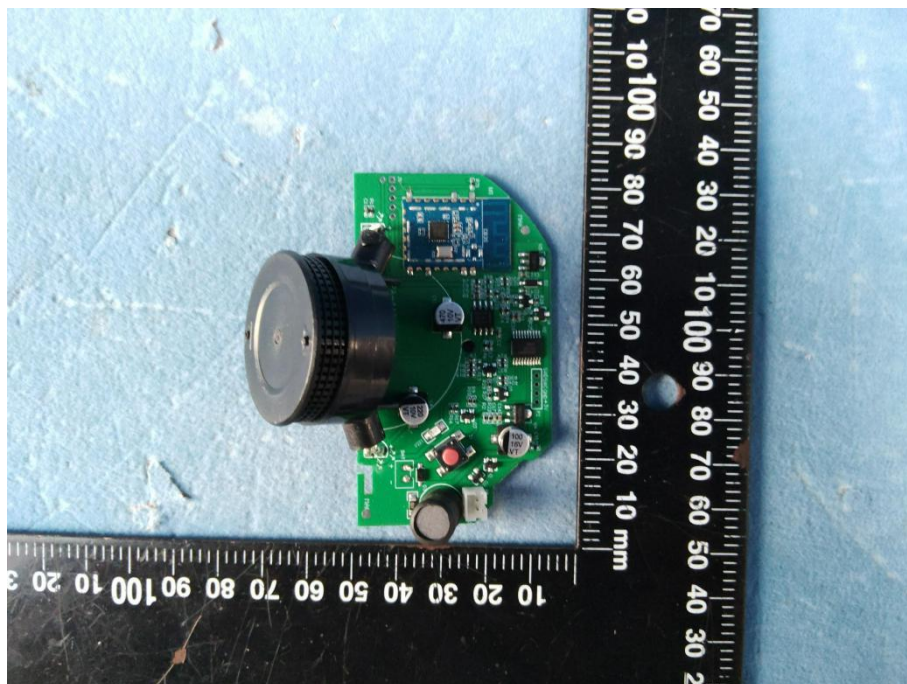
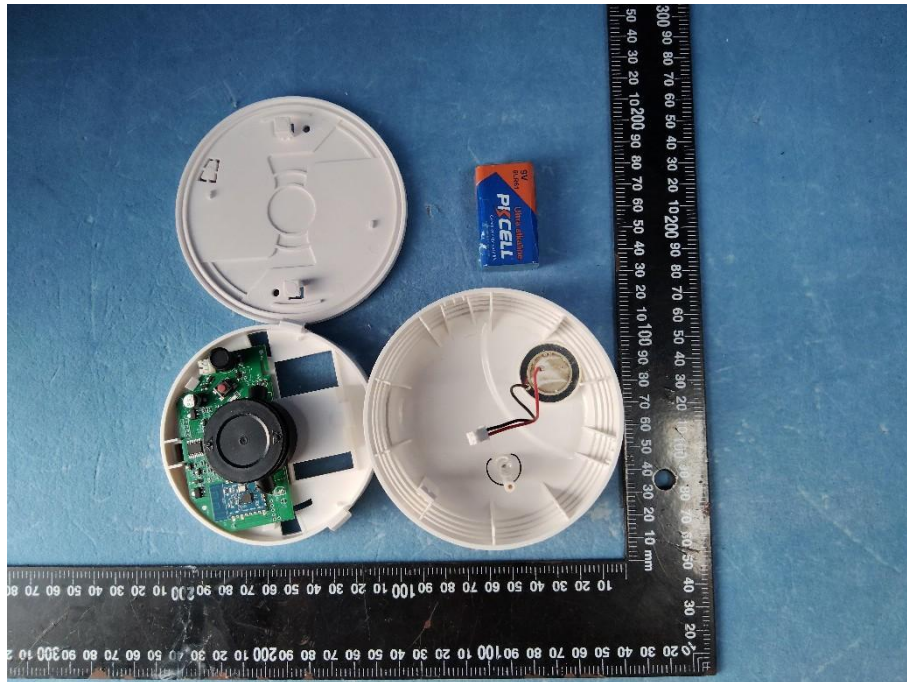


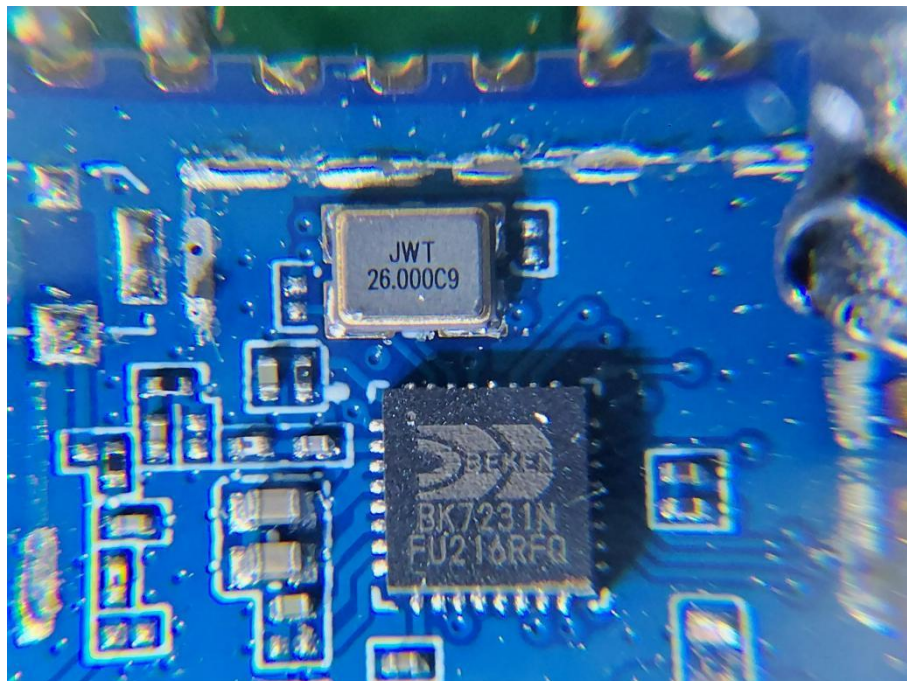
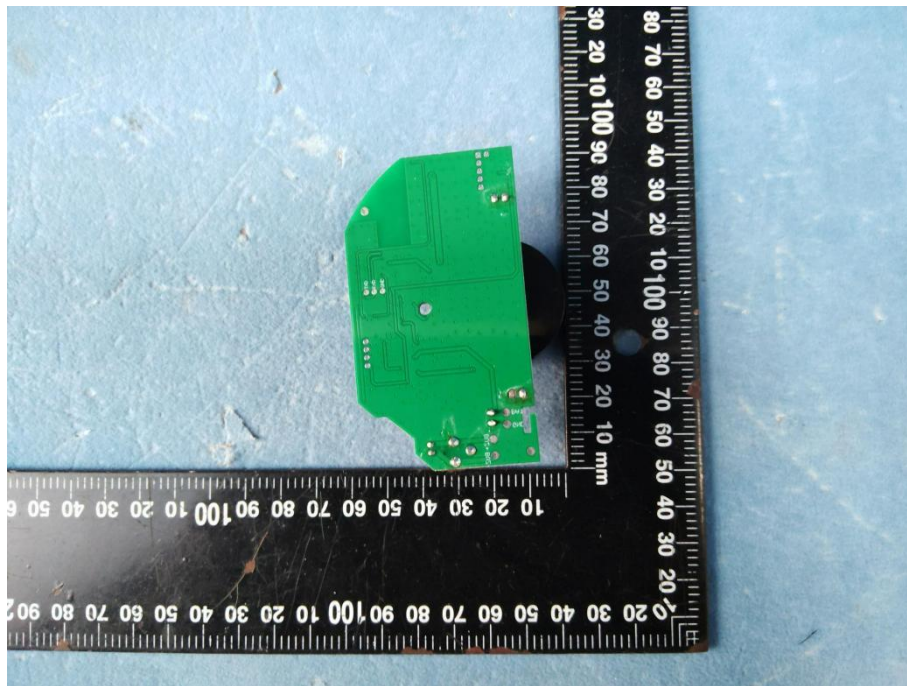


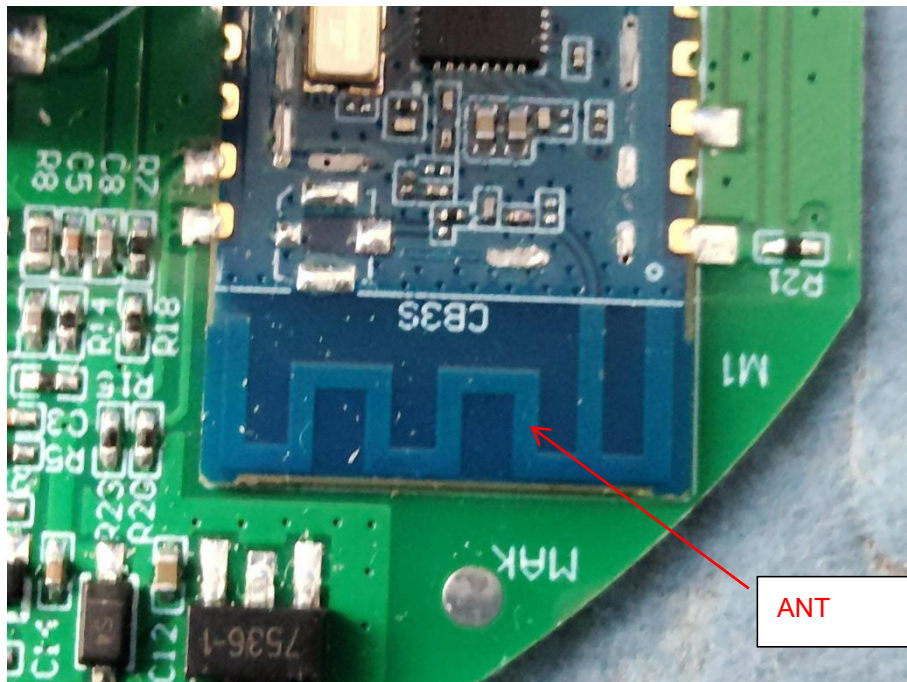
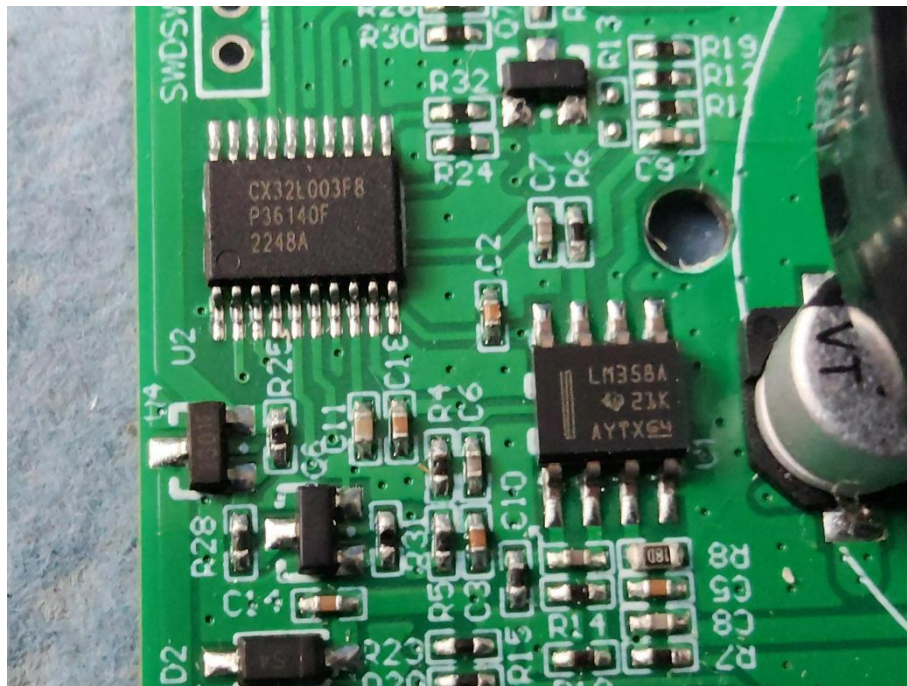


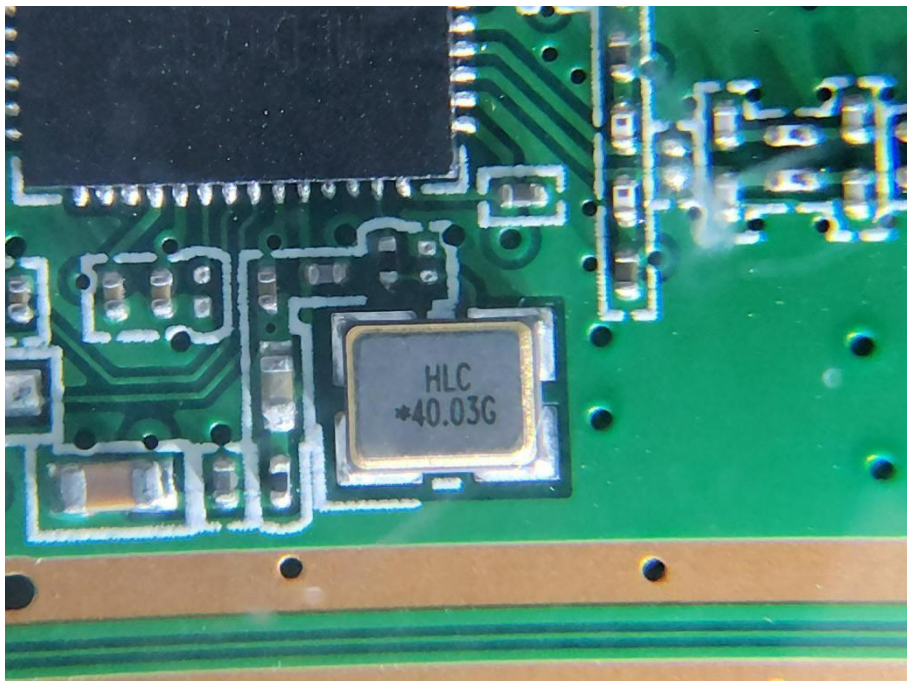


7.2. Internal Photos











-----End of the report-----