

MEASUREMENT REPORT

FCC PART 15.247 / RSS-247 WLAN 802.11b/g/n

Report No.: S20210419941902

Issue Date: 05-14-2021

Applicant: kantiantech Inc.

Address: NO.3 JinPin Street, Ya An Road, NanKai District. Tianjin
China

FCC ID: 2AWHIWSPRK1

IC: 26041-WSPRK1

Product: WYZE SPRINKLER CONTROLLER

Model No.: WSPRK1

FCC Classification: Digital Transmission System (DTS)


FCC Rule Part(s): Part 15 Subpart C (15.247)

IC Rule(s): RSS-247 Issue 2, RSS-GEN Issue 5

Test Procedure(s): ANSI C63.10-2013, KDB 558074 D01v05r02

Test Date: April 19 ~ 28, 2021

Reviewed By


(Line Chen)
Senior Test Engineer

Approved By


(Kerry Zhou)
Engineer Manager

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of Fangguang Inspection & Testing Co., Ltd.

The test report must not be used by the client to claim product certifications, approval, or endorsement by NVLAP, NIST or any agency of U.S. Government.

Revision History

Report No.	Version	Description	Issue Date
S20210419941902	Rev. 01	This is a C2PC project, the modification is the LED, TVS tube, Fuse and Resistance on the circuit board, not effect the RF circuit and antenna, Therefore, only the worst mode of Radiated Restricted Band Edge and Radiated Spurious Emission is reevaluated, the original test data please refer to the test report: S202005114008E02	05-14-2021

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§2.1033 General Information

Applicant:	kantiantech Inc.
Applicant Address:	NO.3 JinPin Street,Ya An Road,NanKai District.Tianjin China
Manufacturer:	kantiantech Inc.
Manufacturer Address:	NO.3 JinPin Street,Ya An Road,NanKai District.Tianjin China
Factory:	kantiantech Inc.
Factory Address:	NO.3 JinPin Street,Ya An Road,NanKai District.Tianjin China
Test Site:	Fanguang Inspection & Testing Co., Ltd.
Test Site Address:	200 Linghu Avenue, Xinwu District, Wuxi City, China
Test Device Serial No.:	N/A <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering
FCC Classification:	Digital Transmission System (DTS)

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2. Fangguang Test Location

These measurement tests were performed at the Fangguang Inspection and testing Co.,LTD located at 200 Linghu Avenue, Xinwu District, Wuxi City. The detailed description of the measurement facility was found to be in compliance with the requirements of ANSI C63.10-2013.

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	WYZE SPRINKLER CONTROLLER
Model Name:	WSPRK1
Input Voltage Range:	AC 24V~, 60Hz, 800mA
Wi-Fi Specification:	802.11b/g/n-HT20/n-HT40
Bluetooth Version:	V3.0/4.0
Adapter Information:	Model: HMQ-SM2401 Rated Input: 120V~, 60Hz , Max. Input current: 800mA, Rated Output: 24V~, 1.0A

2.2. Product Specification Subjective to this Report

Frequency Range:	802.11b/g/n-HT20: 2412 ~ 2462MHz 802.11n-HT40: 2422 ~ 2452MHz
Channel Number:	802.11b/g/n-HT20: 11 802.11n-HT40: 7
Type of Modulation:	802.11b: DSSS 802.11g/n: OFDM
Data Rate:	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0~MCS7
Antenna Type:	FPC Antenna
Antenna Gain:	2.64dBi

2.3. Operation Frequency / Channel List

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	--	--

802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	N/A	N/A	N/A	N/A

2.4. Device Capabilities

This device contains the following capabilities:

2.4GHz WLAN (DTS) & Bluetooth (v3.0/4.0)

Note: 2.4GHz WLAN (DTS) operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycle was determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are 100%.

2.5. Description of Test Software

The test utility software used during testing was “ESP_RF_test_tool”, the version was v2.3, and the emission setting value is the software default value.

2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11b Ant 1
	Mode 2: Transmit by 802.11g Ant 1
	Mode 3: Transmit by 802.11n-HT20 Ant 1
	Mode 4: Transmit by 802.11n-HT40 Ant 1

2.7. Test Configuration

The EUT was tested per the guidance of KDB 558074 D01 v05r02. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.8. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.9. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase.

However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

RSP-100 Issue 11 Section 3

The manufacturer, importer or distributor shall meet the labelling requirements set out in this section for every unit:

- (i) prior to marketing in Canada, for products manufactured in Canada
- (ii) prior to importation into Canada, for imported products

For information regarding the e-labelling option, see Notice 2014-DRS1003. The label for the certified product represents the manufacturer's or importer's compliance with Innovation, Science and Economic Development Canada's (ISED) regulatory requirements.

Please see attachment for IC label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 558074 D01 v05r02 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. The turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-25GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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.”

- The antennas of the EUT are **permanently attached**.
- There are no provisions for connections to an external antenna.

5. TEST EQUIPMENT CALIBRATION DATE

Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Loop Antenna	Schwarzbeck	FMZB 1519B	FWXGJC-2018-015	1 year	2021/08/23
Bi-Log Antenna	R&S	HL562E	FWXGJC-2016-267-06	3 year	2022/03/30
Broadband Horn Antenna	R&S	HF907	FWXGJC-2016-267-07	1 year	2022/03/30
Broadband Horn Antenna	Schwarzbeck	BBHA9170	FWXGJC-2018-016	1 year	2021/08/19
EMI Receiver	R&S	ESR26	FWXGJC-2016-267-01	1 year	2022/01/17
Pre-Amplifier	R&S	SCU-18D	FWXGJC-2016-267-05	1 year	2022/01/15
Pre-Amplifier	R&S	EMC184055 SE	FWXGJC-2018-018	1 year	2021/07/10
Thermohygrometer	Yuhuaze	HTC-1	FWXDA-2016-386	1 year	2022/01/17
Anechoic Chamber	Aimuke	EMCCT-3	FWXGJC-2016-270	1 year	2023/04/07

Test Software	Manufacturer	Version	Asset No.	Function
EMI Test Software	tonscend	/	/	/

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 2.72dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 30MHz-1GHz: 1.00 dB 1GHz-26.5GHz: 1.30 dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	$\geq 500\text{kHz}$	Conducted	Note 4	Section 7.2
15.247(b)(3)	RSS-247 [5.4]	Output Power	$\leq 30\text{dBm}$		Note 4	Section 7.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$		Note 4	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge	$\geq 20\text{dBc}$		Note 4	Section 7.5
15.247(d)	RSS-247 [5.5]	Out-of-Band Emissions	$\geq 20\text{dBc}$		Note 4	Section 7.6
15.205 15.209	RSS GEN [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS GEN [8.9])	Radiated	Pass	Section 7.7, 7.8
15.207	RSS GEN [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits (RSS GEN [8.8])	Line Conducted	Note 4	Section 7.9

Notes:

- 1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) The original test data please refer to the test report: S202005114008E02.

7.2. Radiated Spurious Emission Measurement

7.2.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.2.2. Test Procedure Used

ANSI C63.10-2013 – Section 6.6.4.3

7.2.3. Test Setting

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

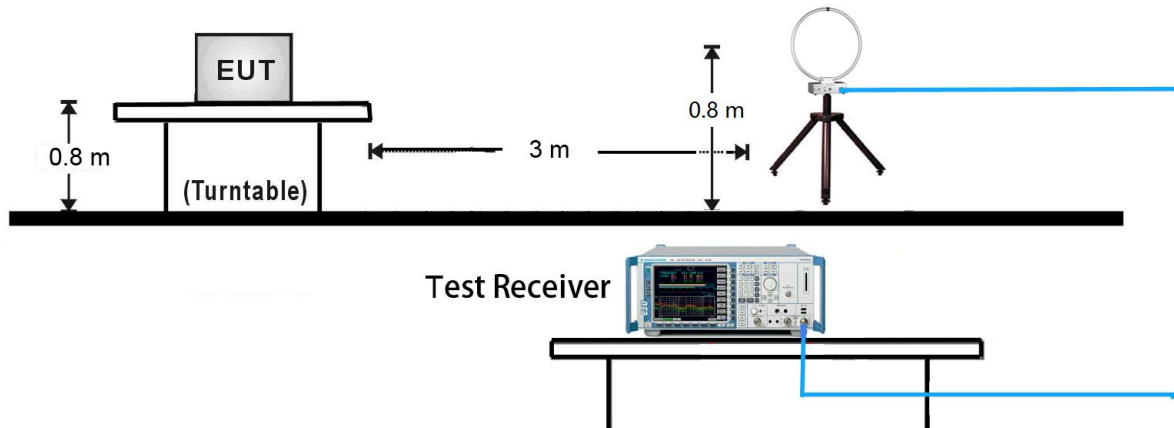
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

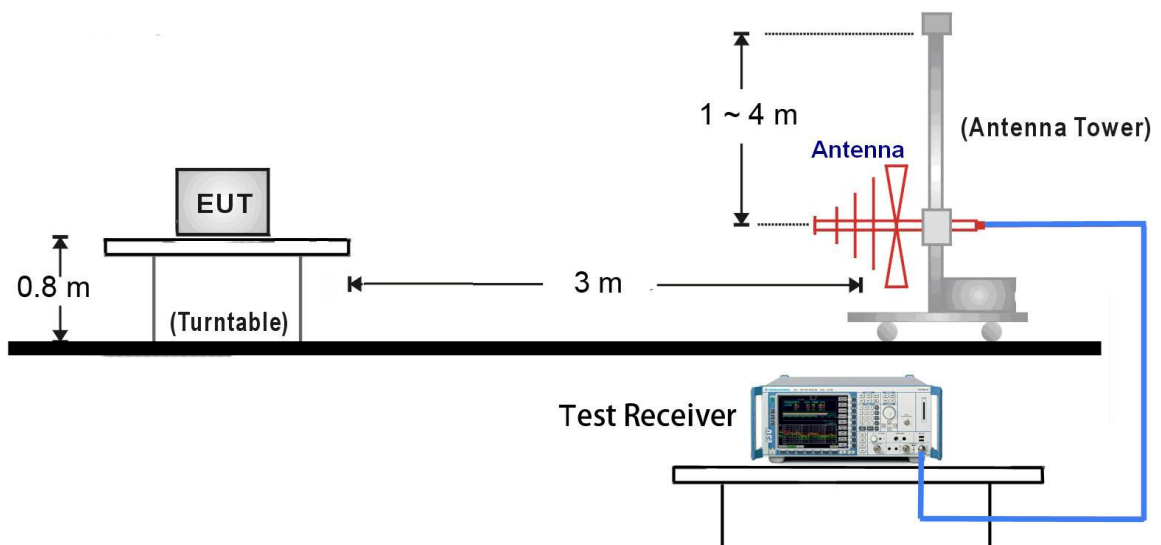
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Power Average (RMS)
5. Number of sweep point = 2001 (Number of sweep points must be $\geq 2 \times \text{span} / \text{RBW}$)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

7.2.4. Test Setup

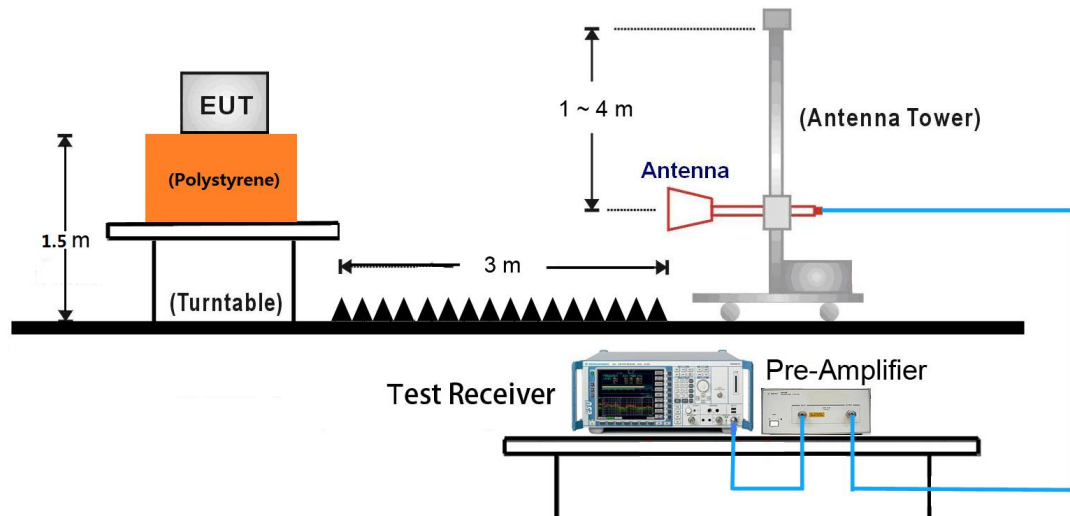
9kHz ~ 30MHz Test Setup:



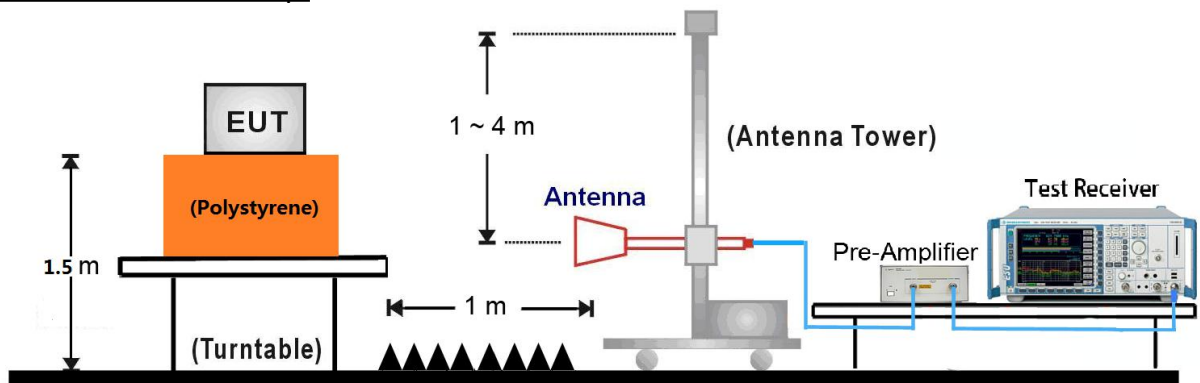
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~ 25GHz Test Setup:



7.2.5. Test Result

Test Mode:	802.11b - Ant 1	Test Date:	2021-04-29
Test Channel:	01	Test Engineer:	Line Chen
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. 3. The worst case of Radiated Spurious Emission is this mode.		

Mark	Frequency (MHz)	Level (dBμV)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4823.4117	56.81	7.50	74.00	17.19	Peak	Horizontal
	7620.0000	49.21	14.75	74.00	24.79	Peak	Horizontal
*	9578.0000	51.40	17.27	87.12	35.72	Peak	Horizontal
*	10253.0000	53.81	18.14	87.12	33.31	Peak	Horizontal
	4823.4117	51.44	7.50	74.00	22.56	Peak	Vertical
	5423.0000	44.71	9.70	74.00	29.29	Peak	Vertical
*	6750.0000	47.35	13.64	87.12	39.77	Peak	Vertical
*	9872.0000	52.57	17.43	87.12	34.55	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (107.12dBμV/m) or 15.209 which is higher.

Test Mode:	802.11b - Ant 1	Test Date:	2021-04-29
Test Channel:	06	Test Engineer:	Line Chen
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. 3. The worst case of Radiated Spurious Emission is this mode.		

Mark	Frequency (MHz)	Level (dBμV)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4200.0000	41.74	6.25	74.00	32.26	Peak	Horizontal
	4800.0000	42.76	7.53	74.00	31.24	Peak	Horizontal
*	7120.0000	48.66	14.70	88.62	39.96	Peak	Horizontal
*	8871.0000	50.86	15.77	88.62	37.76	Peak	Horizontal
	4868.4342	52.63	7.55	74.00	21.37	Peak	Vertical
	7620.0000	49.65	14.75	74.00	24.35	Peak	Vertical
*	9578.0000	52.63	17.27	88.62	35.99	Peak	Vertical
*	10253.0000	53.61	18.14	88.62	35.01	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (108.62dBμV/m) or 15.209 which is higher.

Test Mode:	802.11b - Ant 1	Test Date:	2021-04-29
Test Channel:	11	Test Engineer:	Line Chen
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. 3. The worst case of Radiated Spurious Emission is this mode.		

Mark	Frequency (MHz)	Level (dBμV)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4920.9605	57.89	7.66	74.00	16.11	Peak	Horizontal
	5423.0000	44.50	9.70	74.00	29.50	Peak	Horizontal
*	6750.0000	48.16	13.64	89.16	41.00	Peak	Horizontal
*	9872.0000	52.06	17.43	89.16	37.10	Peak	Horizontal
	4920.9605	54.07	7.66	74.00	19.93	Peak	Vertical
	5132.0000	44.01	8.16	74.00	29.99	Peak	Vertical
*	6782.0000	47.14	13.84	89.16	42.02	Peak	Vertical
*	7200.0000	49.94	14.95	89.16	39.22	Peak	Vertical

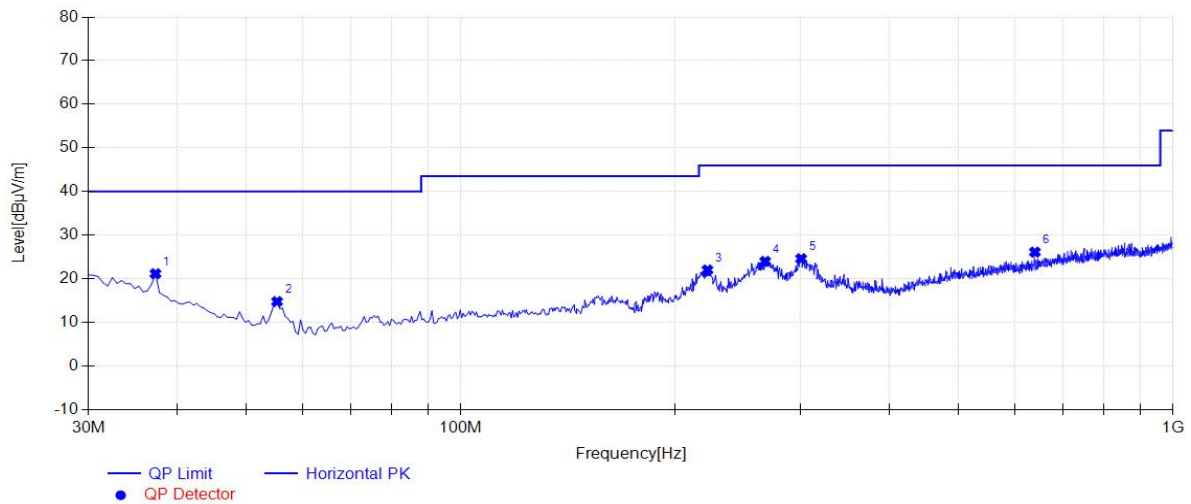
Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (109.16dBμV/m) or 15.209 which is higher.

The worst case of Radiated Emission below 1GHz:

30MHz – 1GHz Test Data

EUT:	WYZE SPRINKLER CONTROLLER	Polarity:	Horizontal
Model:	WSPRK1	SN:	N/A
Mode:	Transmit by 802.11b at Channel 2437MHz	Voltage:	120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen

Test Graph



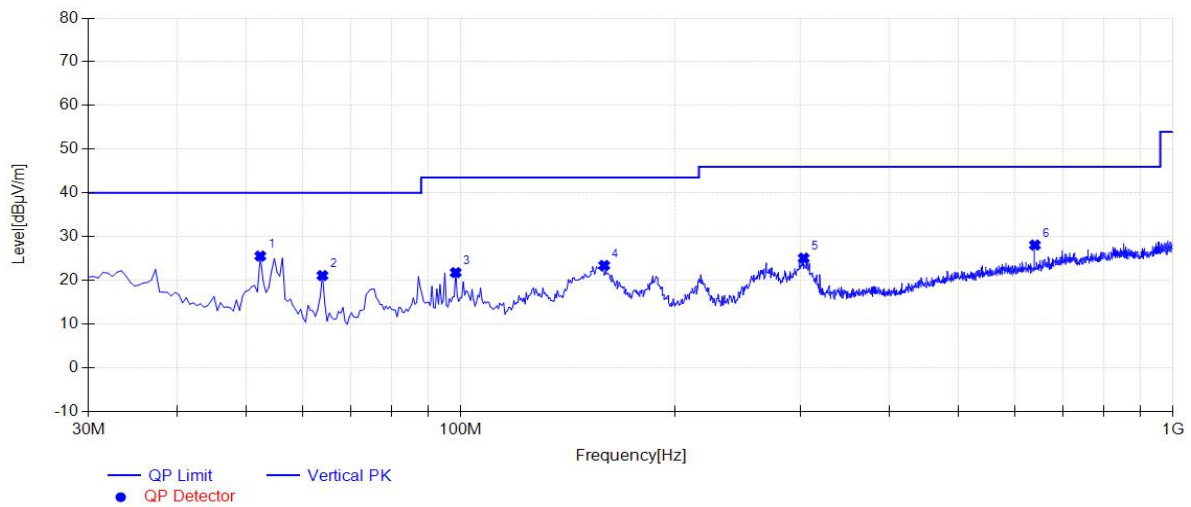
Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.2750	21.17	16.02	40.00	18.83	100	154	Horizontal
2	55.2200	14.77	8.10	40.00	25.23	200	122	Horizontal
3	222.060	22.03	10.52	46.00	23.97	100	253	Horizontal
4	267.650	23.99	12.34	46.00	22.01	100	318	Horizontal
5	300.630	24.62	13.76	46.00	21.38	100	339	Horizontal
6	640.130	26.12	20.92	46.00	19.88	200	236	Horizontal

Note 1: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

EUT:	WYZE SPRINKLER	Polarity:	Vertical
Model:	WSPRK1	SN:	N/A
Mode:	Transmit by 802.11b at Channel 2437MHz	Voltage:	120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen

Test Graph



Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	25.56	8.89	40.00	14.44	100	206	Vertical
2	63.9500	21.10	7.50	40.00	18.90	200	328	Vertical
3	98.3850	21.78	11.04	43.50	21.72	100	69	Vertical
4	159.010	23.40	10.39	43.50	20.10	100	97	Vertical
5	303.055	25.09	13.82	46.00	20.91	100	112	Vertical
6	640.130	28.07	20.92	46.00	17.93	100	328	Vertical

Note 1: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

7.3. Radiated Restricted Band Edge Measurement

7.3.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.25 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

For RSS-Gen Section 8.10 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 8.10 of RSS-Gen, must also comply with the radiated emission limits specified in Section 8.9.

Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.009 - 0.110	240 - 285	9.0 - 9.2
2.1735 - 2.1905	322 - 335.4	9.3 - 9.5
3.020 - 3.026	399.9 - 410	10.6 - 12.7
4.125 - 4.128	608 - 614	13.25 - 13.4
4.17725 - 4.17775	960 - 1427	14.47 - 14.5
4.20725 - 4.20775	1435 - 1626.5	15.35 - 16.2
5.677 - 5.683	1645.5 - 1646.5	17.7 - 21.4
6.215 - 6.218	1660 - 1710	22.01 - 23.12
6.26775 - 6.26825	1718.8 -1722.2	23.6 - 24.0
6.31175 - 6.31225	2200 - 2300	31.2 - 31.8
8.291 - 8.294	2310 -2390	36.43 - 36.5
8.362 - 8.366	2655 - 2900	Above 38.6
8.37625 - 8.38675	3260 - 3267	--
8.41425 - 8.41475	3332 -3339	
12.29 - 12.293	334.5 - 3358	
12.51975 - 12.52025	3500 - 4400	
12.57675 - 12.57725	4500 - 5150	
13.36 -13.41	5350 - 5460	
16.42 - 16.423	7250 - 7750	
16.69475 - 16.69525	8025 - 8500	
16.80425 - 16.80475	--	
25.5 - 25.67		
37.5 - 38.25		
73 - 74.6		
74.8 - 75.2		
108 - 138		
156.52475 - 156.525225		
156.7 - 156.9		

All out of band emissions appearing in a restricted band as specified in Section 8.10 of the RSS-Gen

must not exceed the limits shown in Table per Section 8.9.

RSS-Gen Section 8.9		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.3.2. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

7.3.3. Test Setting

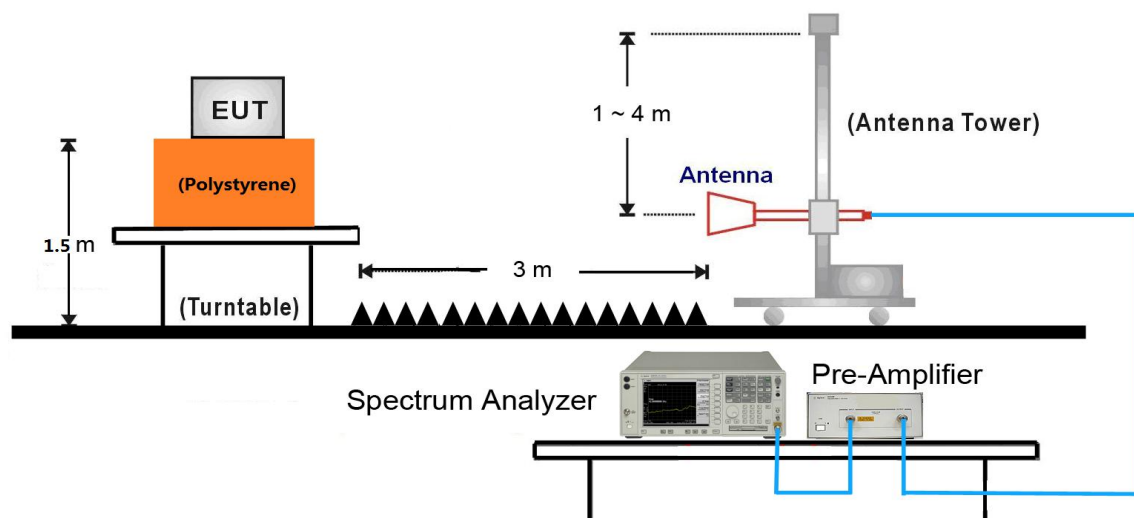
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Power Average (RMS)
5. Number of sweep point = 2001 (Number of sweep points must be $\geq 2 \times \text{span} / \text{RBW}$)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

7.3.4. Test Setup



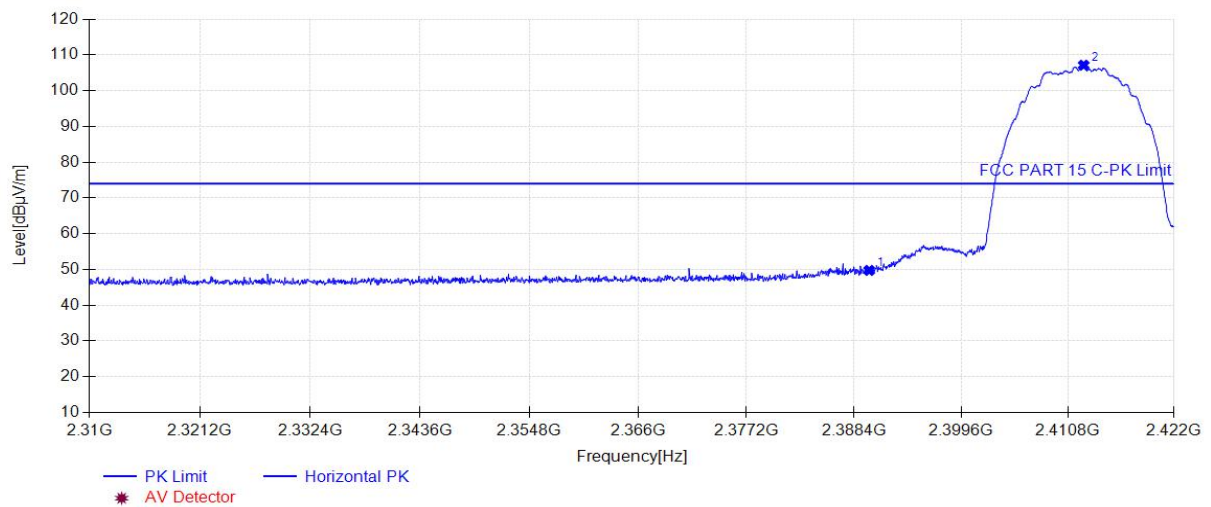
Note: This item was performed with the WIFI antenna connected.

7.3.5. Test Result

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2412MHz		

Start of Test:2021-04-26 16:48:33

Test Graph

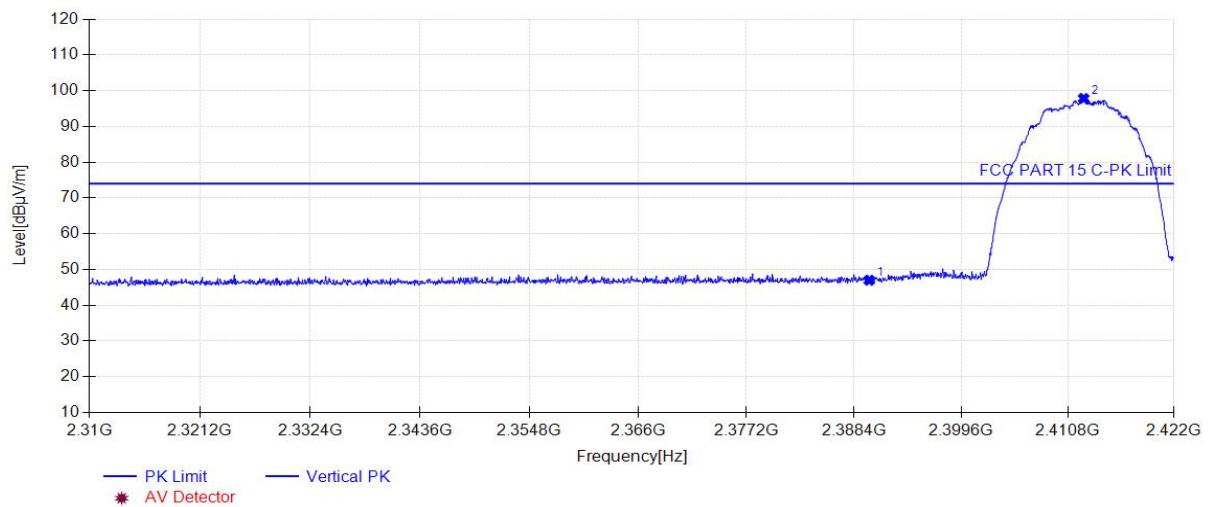


Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.00	49.72	34.25	74.00	24.28	160	1	Horizontal
2	2412.48	107.12	34.38	N/A	N/A	160	9	Horizontal

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2412MHz		

Start of Test:2021-04-26 16:48:37

Test Graph

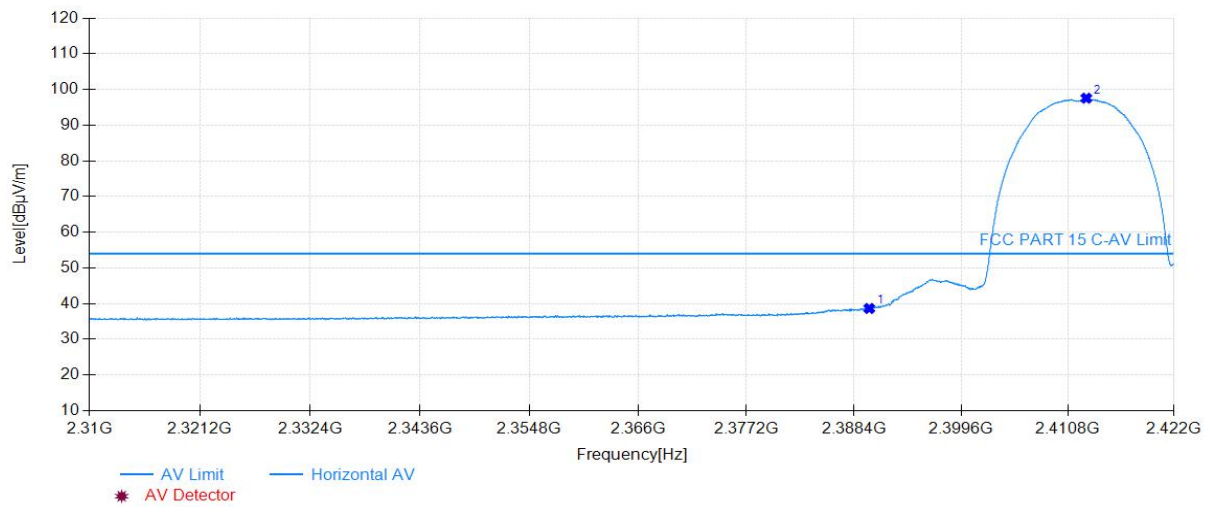


Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.00	46.96	34.25	74.00	27.04	160	300	Vertical
2	2412.48	97.82	34.38	N/A	N/A	160	263	Vertical

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2412MHz		

Start of Test:2021-04-26 16:40:36

Test Graph

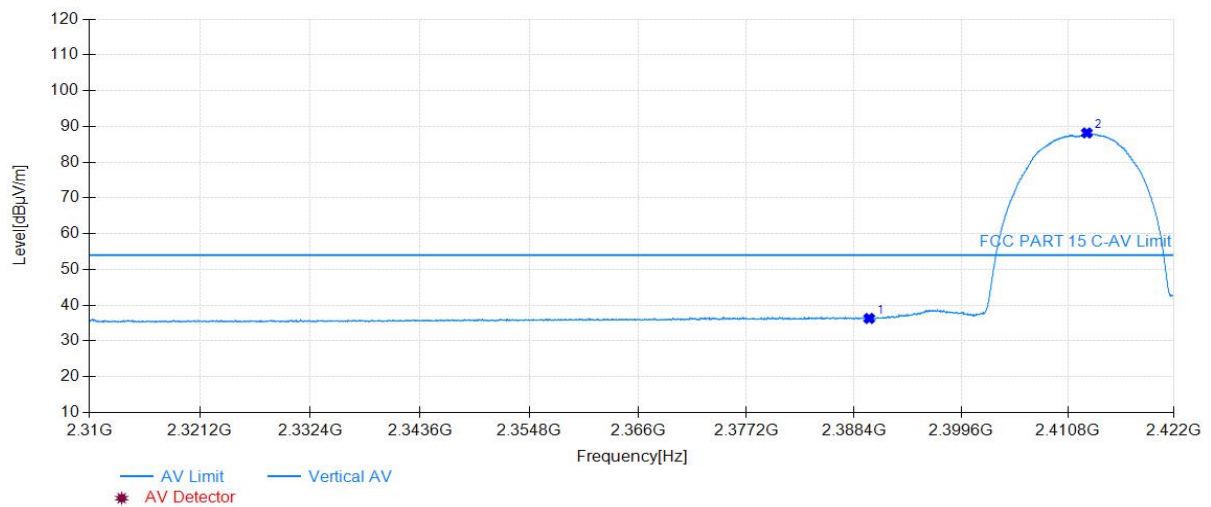


Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.00	38.64	34.25	54.00	15.36	160	4	Horizontal
2	2412.76	97.55	34.38	N/A	N/A	160	32	Horizontal

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2412MHz		

Start of Test:2021-04-26 16:40:39

Test Graph

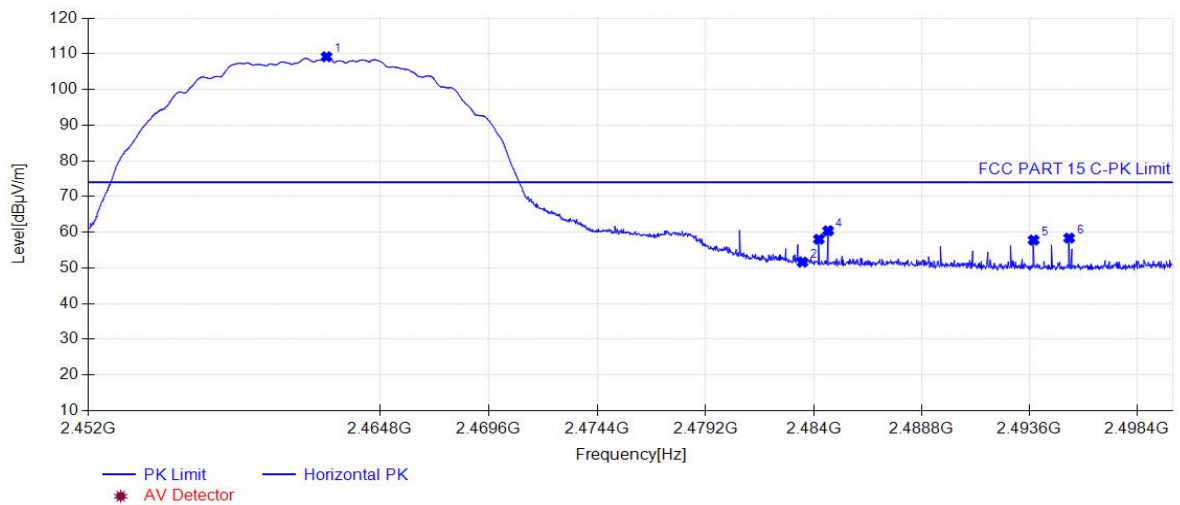


Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2390.00	36.30	34.25	54.00	17.70	160	31	Vertical
2	2412.81	88.17	34.38	N/A	N/A	160	270	Vertical

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2462MHz		

Start of Test:2021-04-26 10:02:33

Test Graph



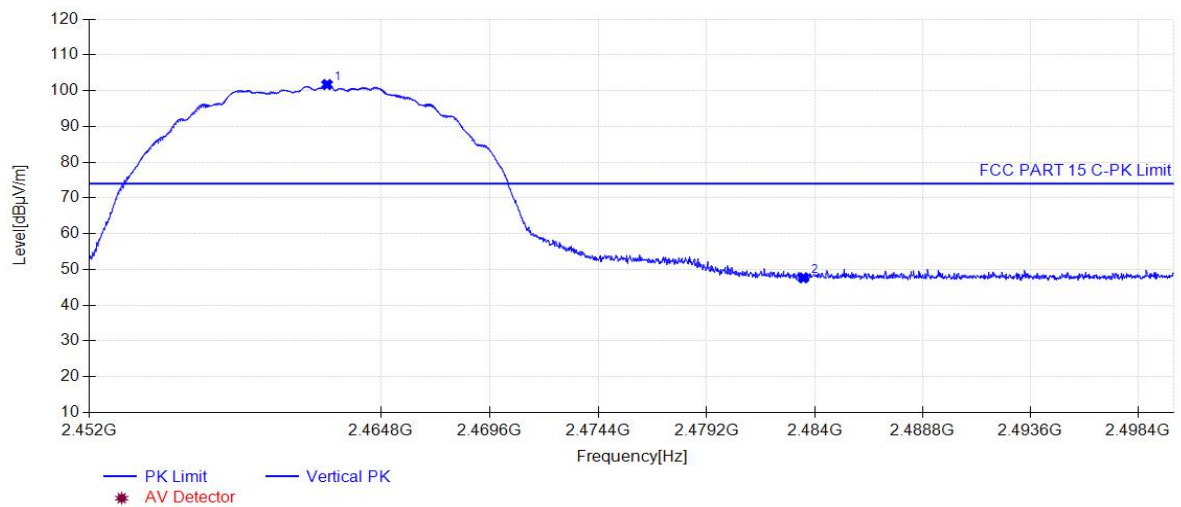
Suspected Data List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.4640	109.16	34.63	N/A	N/A	160	1	Horizontal
2	2483.5000	51.61	34.65	74.00	22.39	160	2	Horizontal
3	2484.2320	58.03	34.65	74.00	15.97	160	192	Horizontal
4	2484.6400	60.37	34.65	74.00	13.63	160	192	Horizontal
5	2493.7840	57.79	34.66	74.00	16.21	160	251	Horizontal
6	2495.3680	58.35	34.66	74.00	15.65	160	251	Horizontal

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2462MHz		

Start of Test:2021-04-26 10:02:41

Test Graph

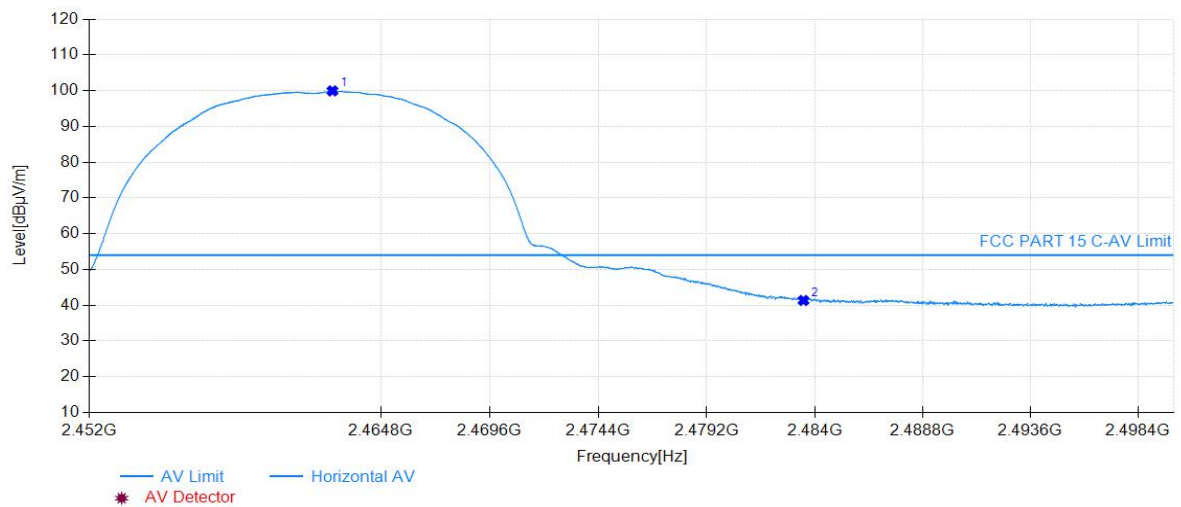


Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.44	101.70	34.63	N/A	N/A	160	297	Vertical
2	2483.50	47.66	34.65	74.00	26.34	160	282	Vertical

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2462MHz		

Start of Test:2021-04-26 10:07:07

Test Graph

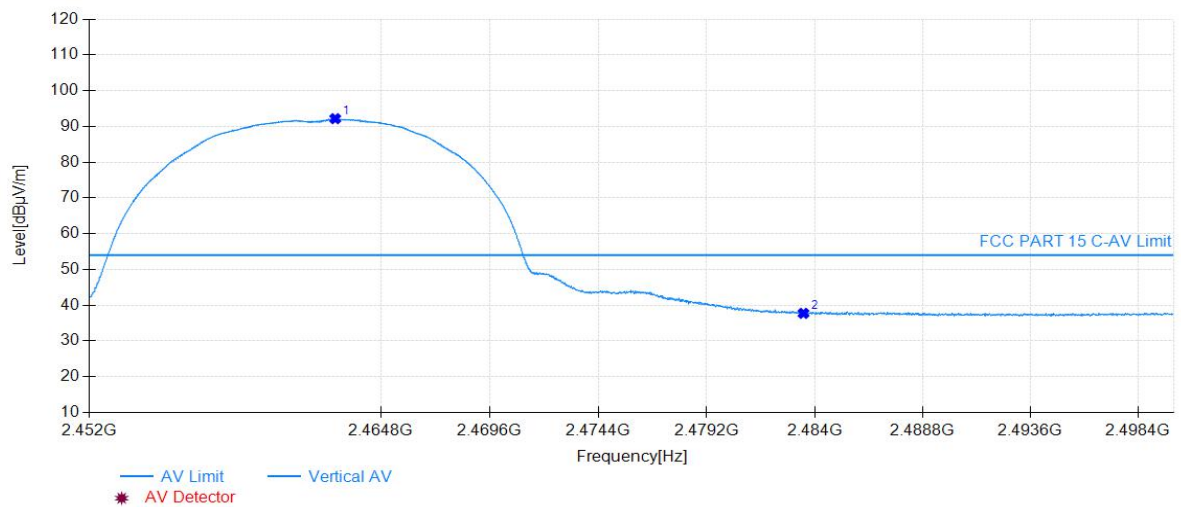


Suspected Data List							
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Polarity
1	2462.680	99.92	34.63	N/A	N/A	160	357
2	2483.500	41.32	34.65	54.00	12.68	160	45

Project Information			
EUT:	WYZE SPRINKLER CONTROLLER	Model:	WSPRK1
SN:	N/A	Voltage:	AC 120V/60Hz
Environment:	Temp: 25°C; Humi:60%	Engineer:	Line Chen
Remark:	Transmit by 802.11b at Channel 2462MHz		

Start of Test:2021-04-26 10:08:16

Test Graph



Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.80	92.16	34.63	N/A	N/A	160	297	Vertical
2	2483.50	37.72	34.65	54.00	16.28	160	268	Vertical

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **WYZE SPRINKLER CONTROLLER** is in compliance with Part 15C of the FCC and RSS Rules.

The End
