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SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.

TEST REPORT

SCOPE OF WORK
FCC TESTING–1018820

REPORT NUMBER
GZHH00583338-003S1

ISSUE DATE	**[REVISED DATE]**
JUL 3, 2025	[----------]

PAGES
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SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.

Application
For
Certification

FCC ID: R6Z202501B2W

Drone Stealth Recon 15.85inch with Camera Streaming

Model: 1018820
Additional Model: 1019048, 101XXXX(where xxxx can be 0000-9999 which represent different customers)

Brand Name: Sharper Image

2.4GHz Wi-Fi Transceiver

Report No.: GZHH00583338-003S1

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-23]

Remark: This report superseded the previous report with report No. GZHH00583338-003 dated May 6, 2025. This report correct margin calculation.

Prepared and Checked by:	**Approved by:**
Sign on file	Peter Kang
Terry Tang **Assistant Supervisor**	**Peter Kang** **Senior Technical Supervisor** **Date: Jul 3, 2025**

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Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751

MEASUREMENT/TECHNICAL REPORT

Drone Stealth Recon 15.85inch with Camera Streaming

Model: 1018820

FCC ID: R6Z202501B2W

This report concerns (check one) Original Grant ___X___Class II Change ____

Equipment Type: DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ___X_

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ___X__

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-23] Edition] provision.

Report prepared by:

Terry Tang
Intertek Testing Services Shenzhen Ltd. Longhua Branch
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Table of Contents

1.0 Summary of Test results 4

2.0 General Description 5

2.1 Product Description 5
2.2 Related Submittal(s) Grants 5
2.3 Test Methodology 6
2.4 Test Facility 6

3.0 System Test Configuration 7

3.1 Justification 7
3.2 EUT Exercising Software 7
3.3 Special Accessories 8
3.4 Measurement Uncertainty 8
3.5 Equipment Modification 8
3.6 Support Equipment List and Description 8

4.0 Measurement Results 9

4.1 Maximum Conducted Output Power at Antenna Terminals 9
4.2 Minimum 6 dB RF Bandwidth 10
4.3 Maximum Power Density Reading 17
4.4 Out of Band Conducted Emissions 24
4.5 Out of Band Radiated Emissions 43
4.6 Transmitter Radiated Emissions in Restricted Bands 44
4.7 Field Strength Calculation 45
4.8 Radiated Spurious Emission 46
4.9 Radiated Emissions from Digital Section of Transceiver 58
4.10 Transmitter Duty Cycle Calculation and Measurements 59

5.0 Equipment Photographs 60

6.0 Product Labelling 60

7.0 Technical Specifications 60

8.0 Instruction Manual 60

9.0 Confidentiality Request 60

10.0 Discussion of Pulse Desensitization 60

11.0 Test Equipment List 61

1.0 Summary of Test Results

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Applicant Address: 7th Bldg., Chousha Garth, Shanfen Road, Chenghai Shantou,Guangdong China

Model: 1018820

FCC ID: R6Z202501B2W

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Drone Stealth Recon 15.85inch with Camera Streaming with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. The EUT is powered by DC 3.7V rechargeable battery. Once use the USB cable charging to the EUT, the wireless function will be closed. For more detailed features description, please refer to the user's manual.

The Model: 1019048, 101XXXX(where xxxx can be 0000-9999 which represent different customers) is the same as the Model: 1018820 in hardware aspect.
The difference in model number serves as marketing strategy.

Type of Modulation: CCK, BPSK, QPSK, 16QAM, 64QAM.

Antenna Type: Integral Antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of:
DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

This report for DTS- Part 15 Digital Transmission Systems, and other 2.4G transmitter subjected to report number: GZHH00583338-002

Remaining portions are subject to the following procedures:
1. Receiver portion of WiFi: exempt from technical requirement of this Part.
2. Other Digital Function: Subject to FCC Part 15B SDOC.
3. The Corresponding transmitter is in the process of being filed under the FCC ID: R6Z202501B2T.

2.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.10: 2013 and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-anechoic chamber used to collect the radiated data is **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community GuanHu Subdistrict, LongHua District, Shenzhen, People's Republic of China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by DC 3.7V rechargeable battery during the test. Only the worst case mode is shown in the report.

The EUT has 802.11b/g/n-HT20 mode and one WIFI antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The unit was operated standalone and placed at the center of table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.
Test software: Wifi Test Tool v1.4.0.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

Measurement Uncertainty	Uncertainty
6 dB Bandwidth	±3.46%
RF Output Power	±0.31dB
Power Spectral Density	±1.19dB
Conducted Unwanted Emission	±0.55dB
Spurious emission (above 18GHz)	±5.3dB
Spurious emission (6GHz to 18GHz)	±5.1dB
Radiated emission (1GHz to 6GHz)	±4.8dB
Radiated emission (Up to 1GHz)	±4.8dB
Temperature	±1°C
Humidity	±5%

3.5 Equipment Modification

Any modifications installed previous to testing by SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
iPhone (Provided by Intertek)	Apple	A2404

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 1.8dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	15.0	31.6
Middle Channel: 2437	15.7	37.2
High Channel: 2462	16.4	43.7

IEEE 802.11g (Antenna Gain = 1.8dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.8	60.3
Middle Channel: 2437	19.3	85.1
High Channel: 2462	20.5	112.2

IEEE 802.11n-HT20 (Antenna Gain = 1.8dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.4	55.0
Middle Channel: 2437	18.8	75.9
High Channel: 2462	20.1	102.3

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 20.5dBm
EUT max. E.I.R.P = 20.5dBm + 1.8dBi = 22.3dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

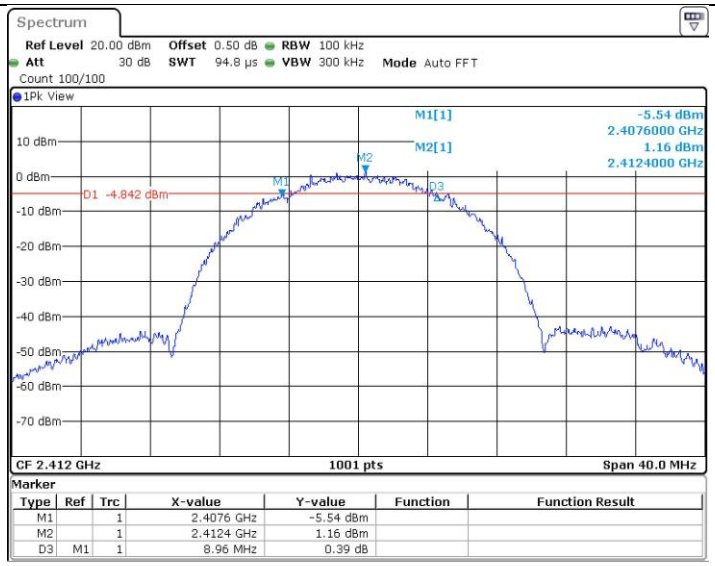
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	8.960
2437	8.720
2462	8.960

IEEE 802.11g(16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.160
2437	15.560
2462	15.760

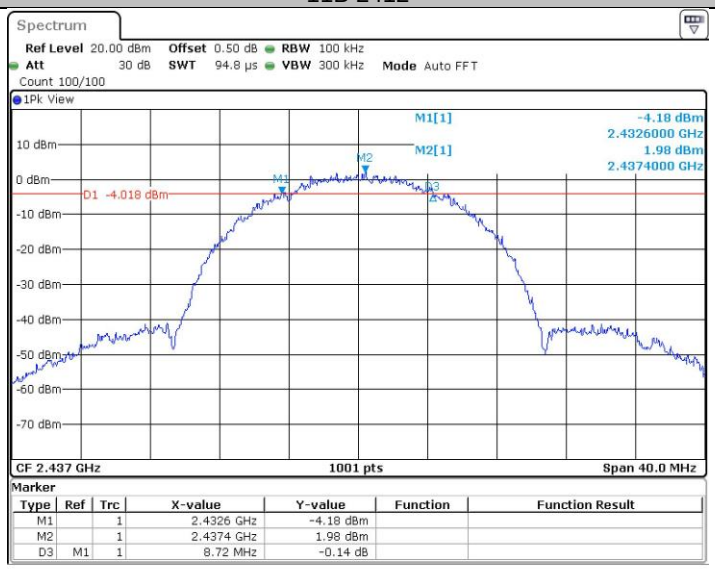
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.560
2437	15.760
2462	15.800

The test plots are attached as below.

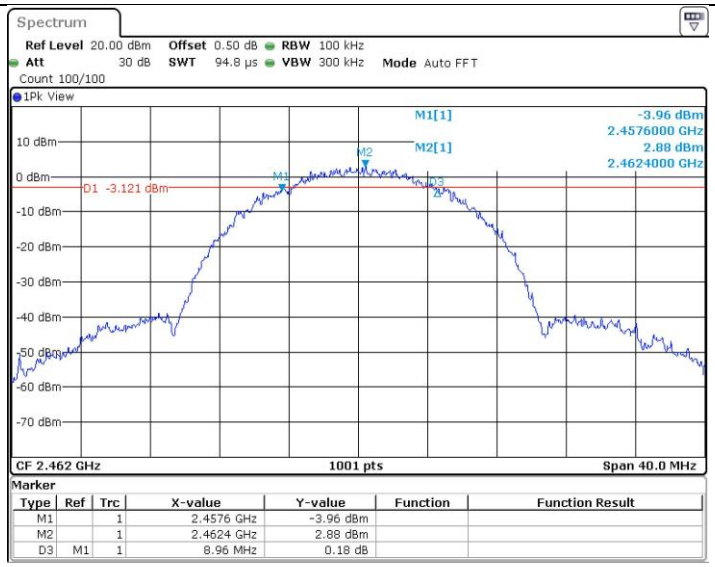
802.11b



11B 2412

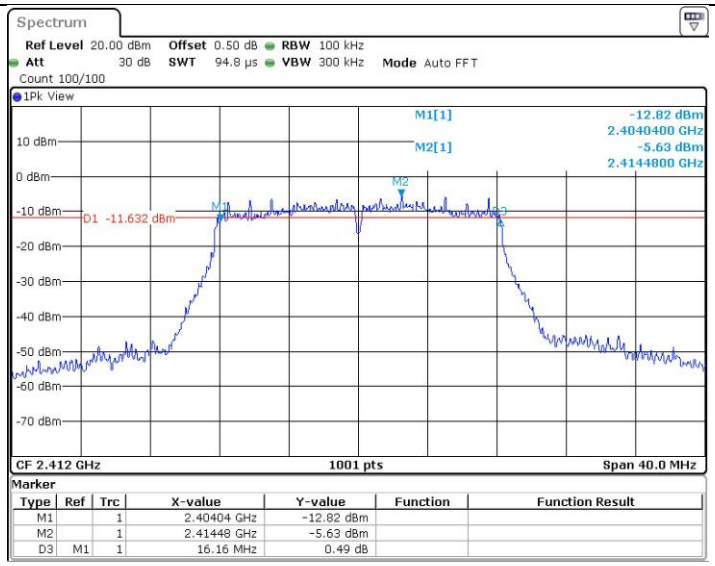


11B 437

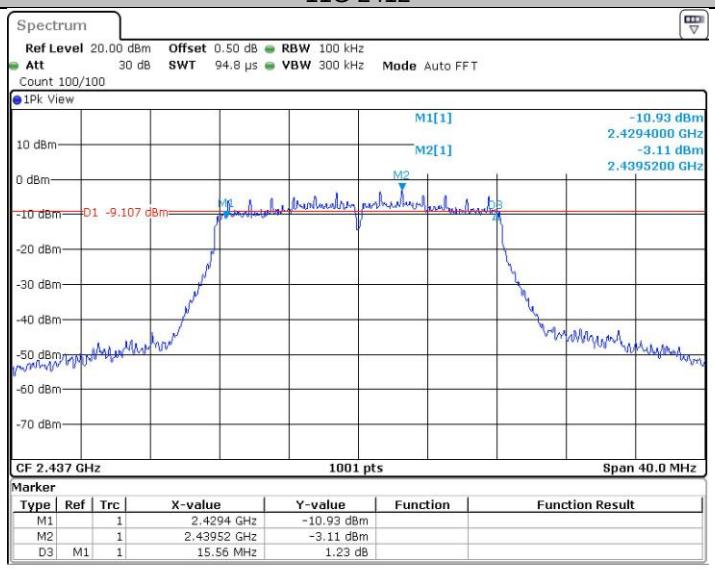

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -3.96 dBm 2.4576000 GHz
M2[1] 2.88 dBm 2.4624000 GHz
D1 -3.121 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.4576 GHz -3.96 dBm
M2 1 2.4624 GHz 2.88 dBm
D3 M1 1 8.96 MHz 0.18 dB

11B 2462

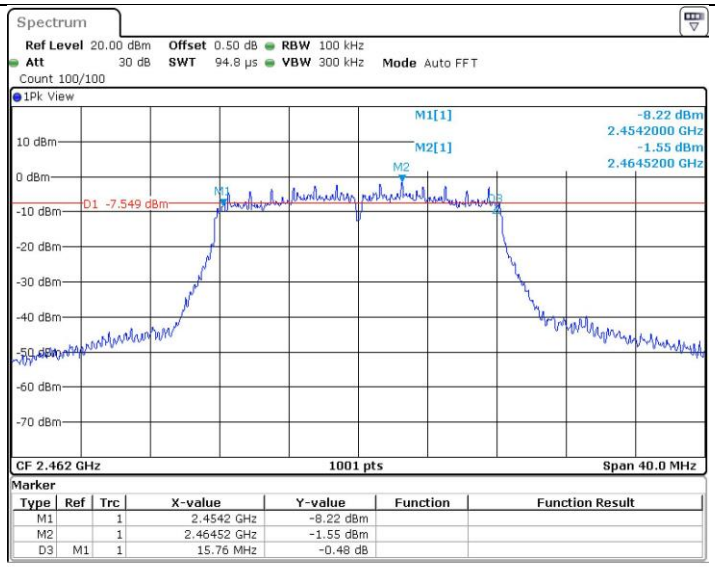
802.11g



11G 2412

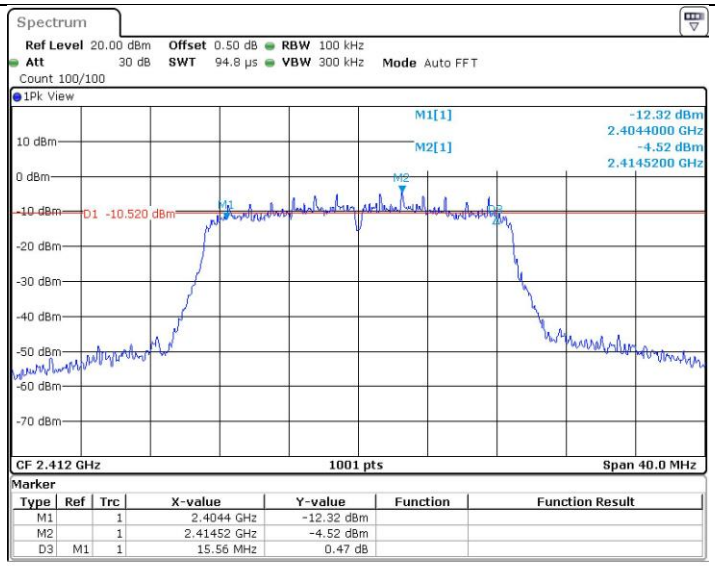


11G 2437

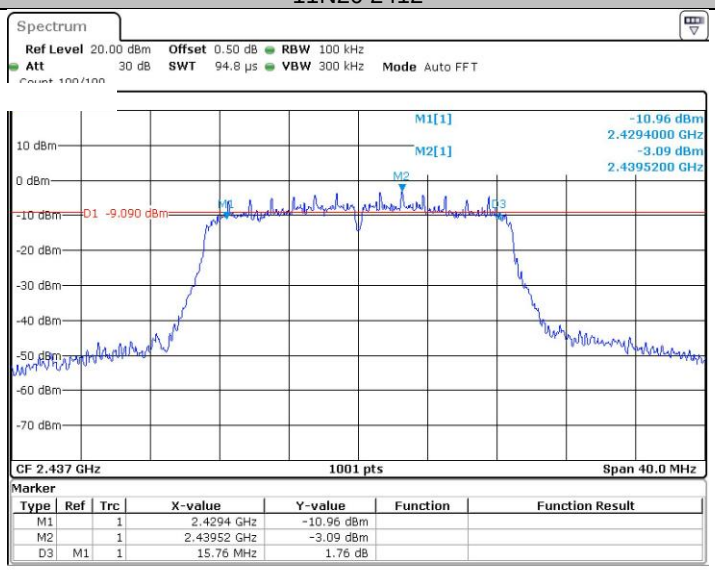

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -8.22 dBm 2.4542000 GHz
M2[1] -1.55 dBm 2.4645200 GHz
D1 -7.549 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz 1001 pts Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.4542 GHz -8.22 dBm
M2 1 2.46452 GHz -1.55 dBm
D3 M1 1 15.76 MHz -0.48 dB

11G_2462

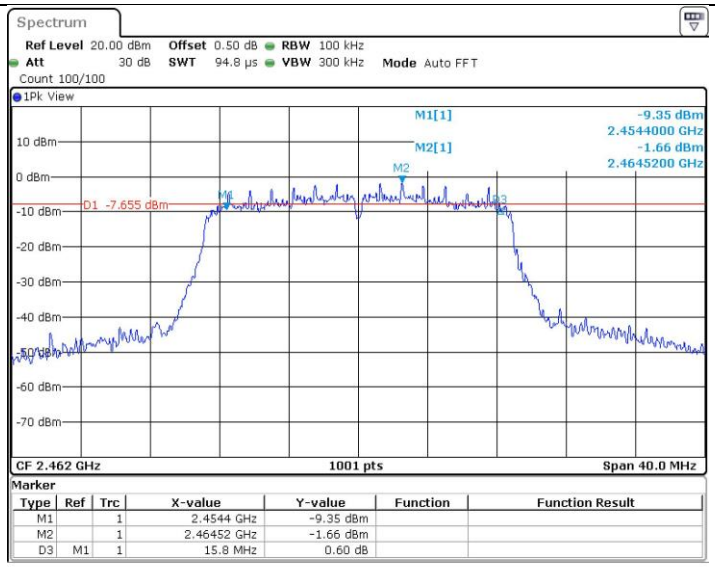
802.11n-HT20



11N20 2412



11N20 2437


Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -9.35 dBm
2.4544000 GHz
M2[1] -1.66 dBm
2.4645200 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -7.655 dBm
CF 2.462 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.4544 GHz -9.35 dBm
M2 1 2.46452 GHz -1.66 dBm
D3 M1 1 15.8 MHz 0.60 dB

11N20_2462

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

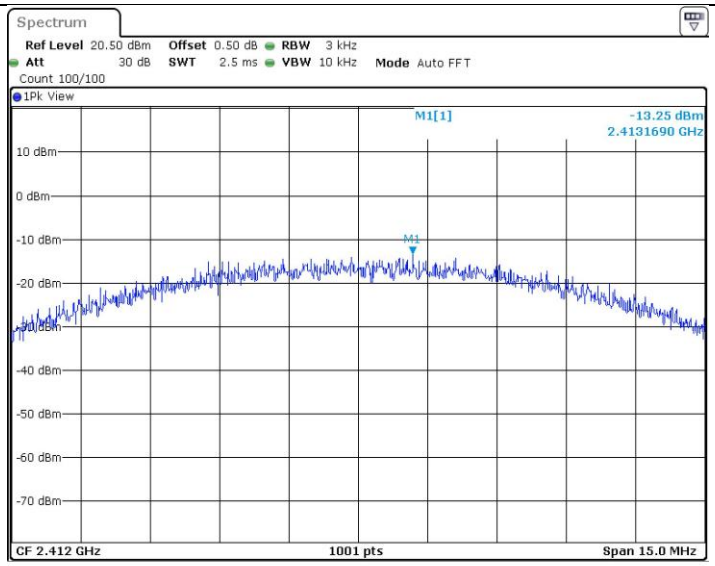
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-13.25
2437	-12.39
2462	-11.40

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-19.40
2437	-17.93
2462	-16.44

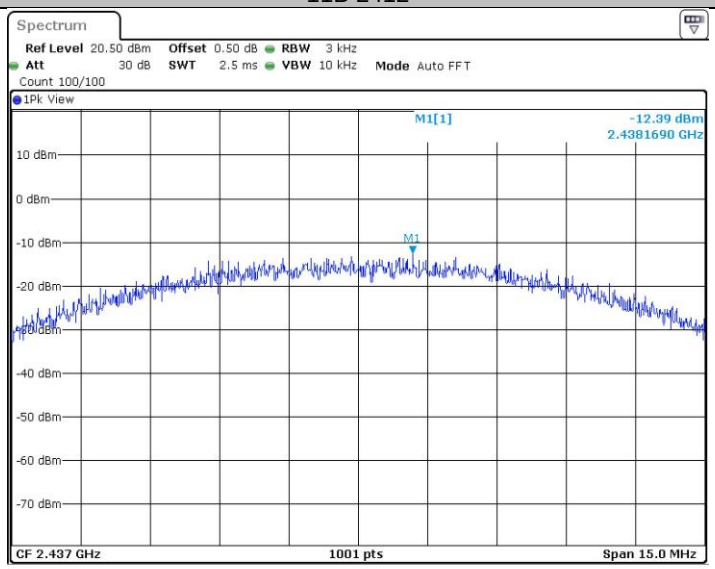
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-18.77
2437	-17.34
2462	-15.82

The test plots are attached as below.

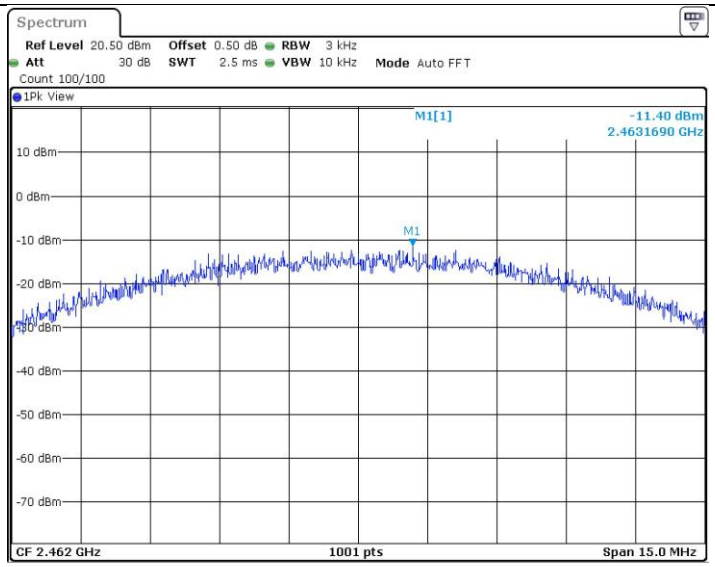
802.11b



11B 2412

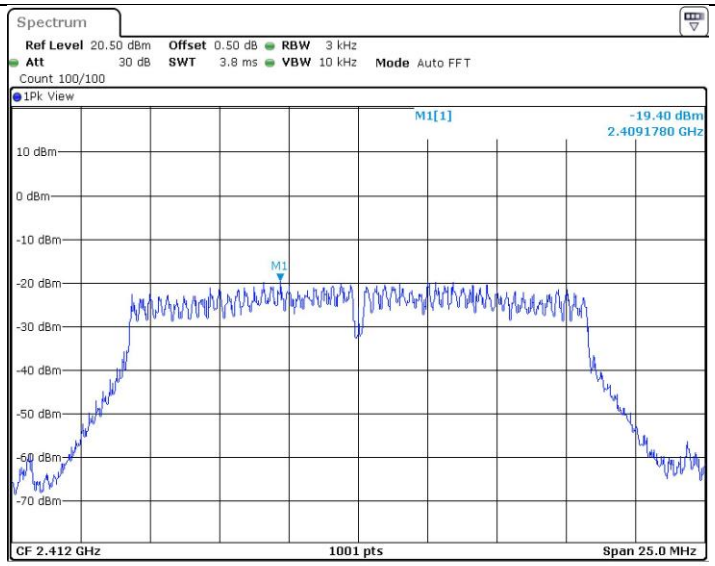


11B 2437

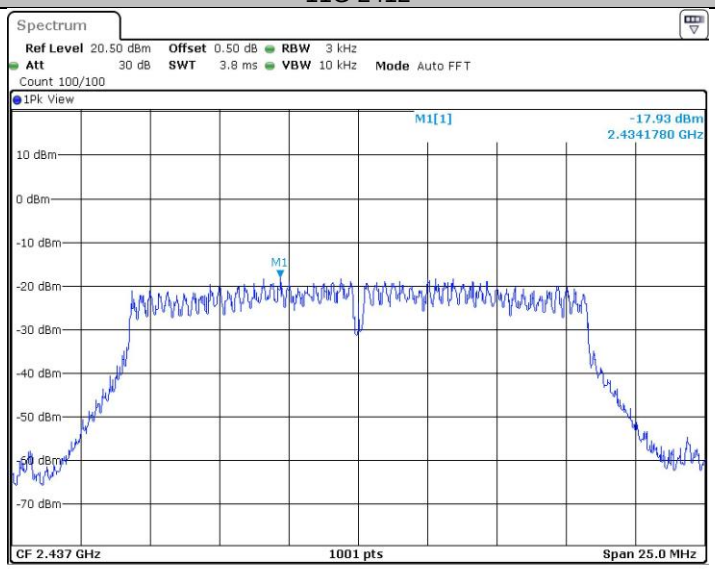

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz
Att 30 dB SWT 2.5 ms VBW 10 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -11.40 dBm
2.4631690 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.462 GHz
1001 pts
Span 15.0 MHz

11B_2462

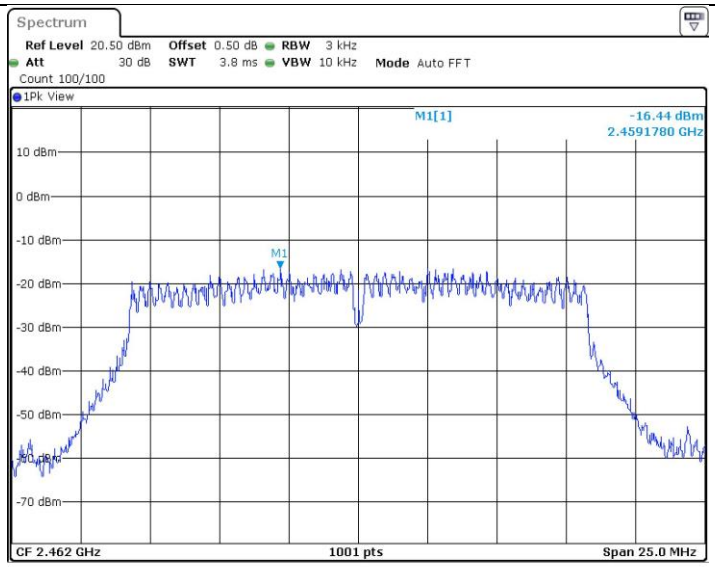
802.11g



11G 2412

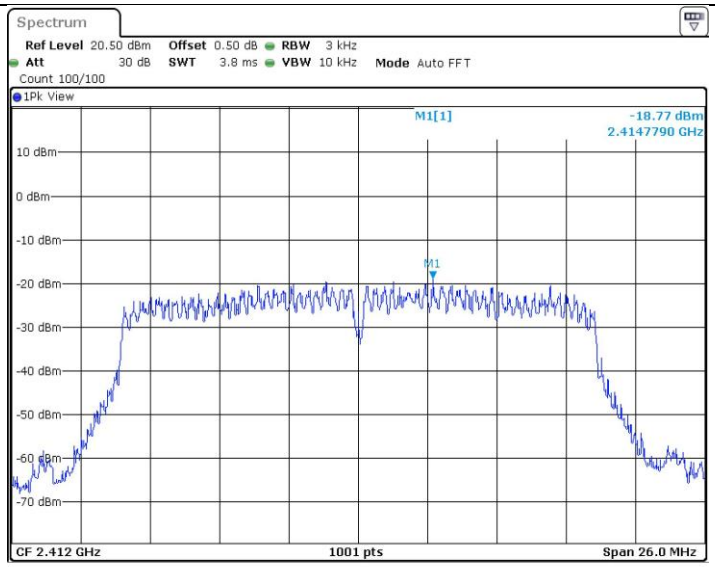


11G 2437

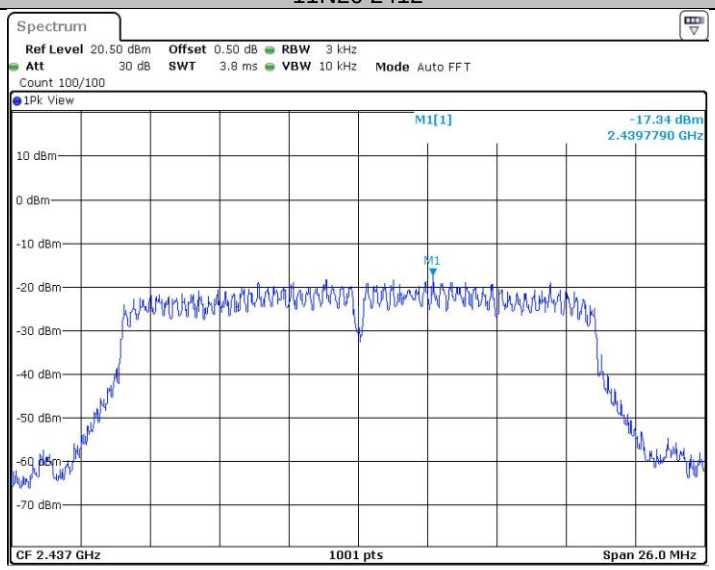

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz
Att 30 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -16.44 dBm
2.4591780 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.462 GHz
1001 pts
Span 25.0 MHz

11G_2462

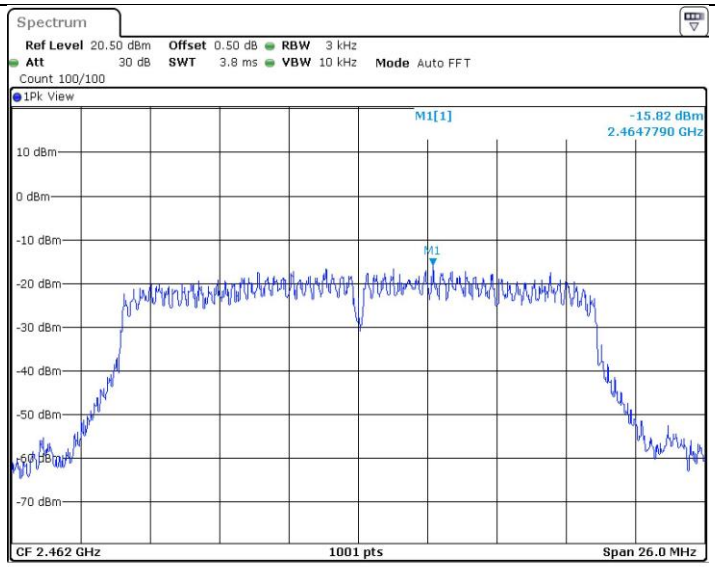
802.11n-HT20



11N20 2412



11N20 2437


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz
Att 30 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -15.82 dBm
2.4647790 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.462 GHz
1001 pts
Span 26.0 MHz

11N20_2462

4.4 Out of Band Conducted Emissions, FCC Rule 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. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

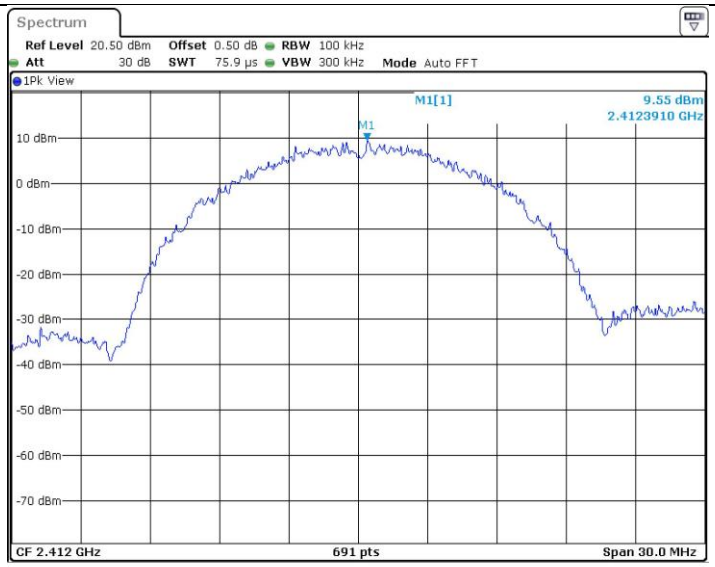
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

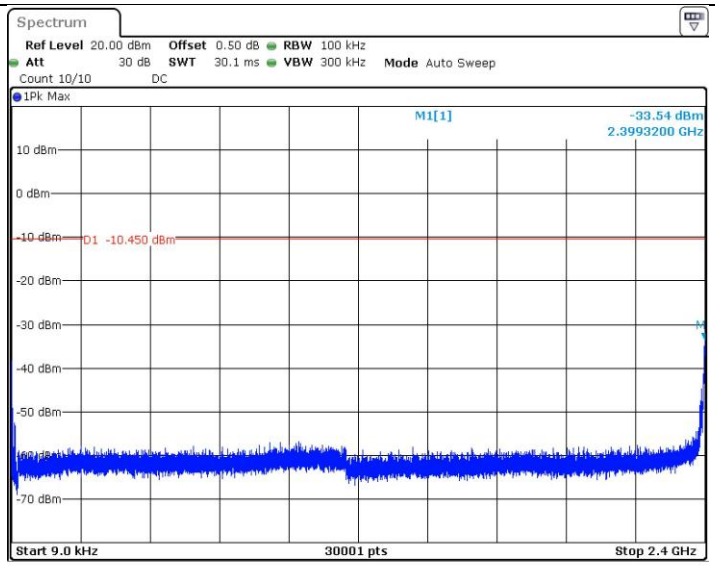
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g/n-HT20.

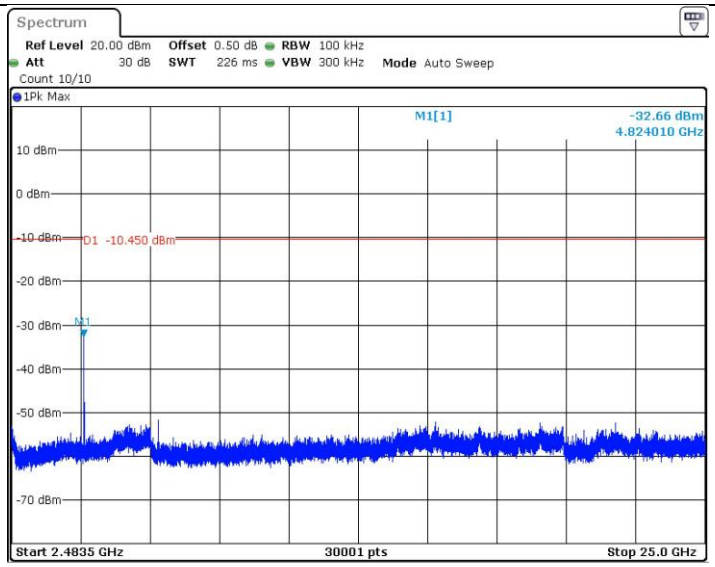
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

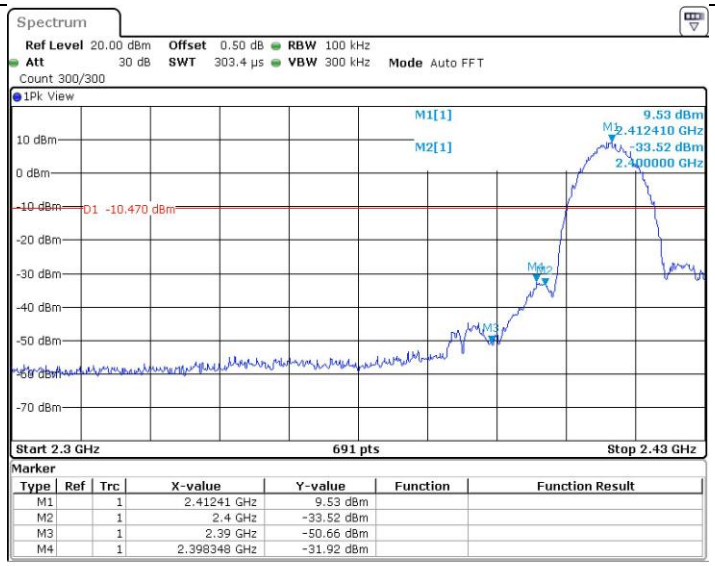
The test plots are attached as below.

802.11b
Channel 01 (2412MHz) Reference Level: 9.55dBm



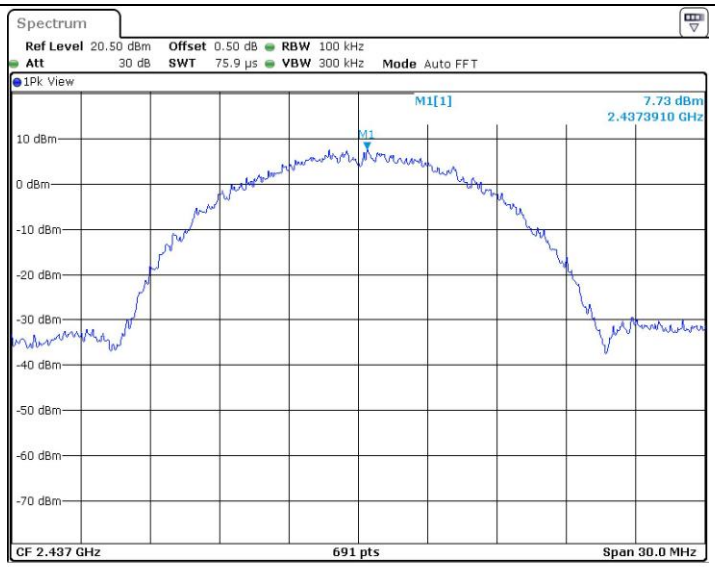


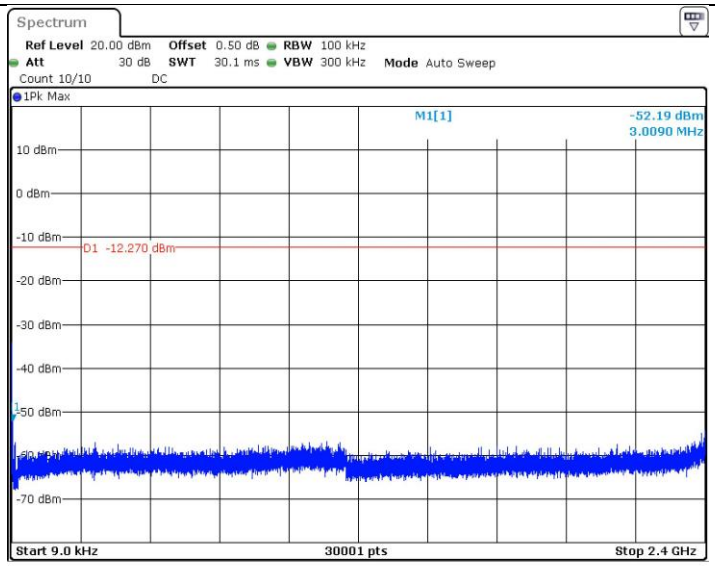


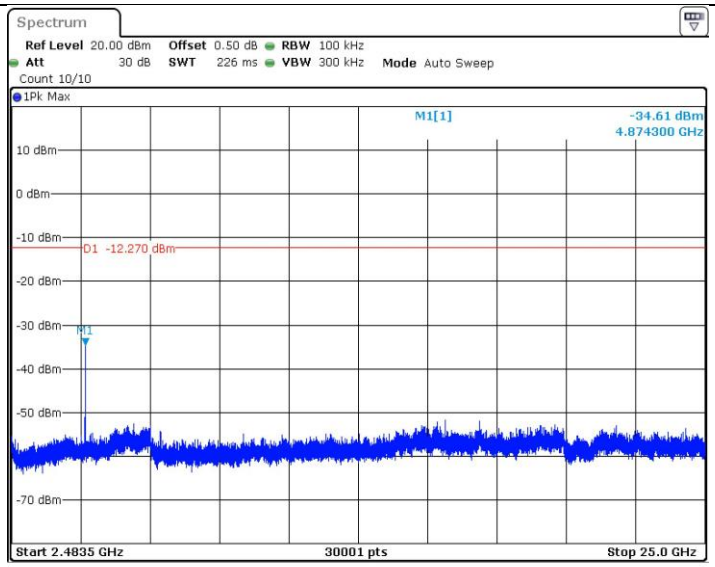


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.41241 GHz	9.53 dBm		
M2		1	2.4 GHz	-33.52 dBm		
M3		1	2.39 GHz	-50.66 dBm		
M4		1	2.398348 GHz	-31.92 dBm		

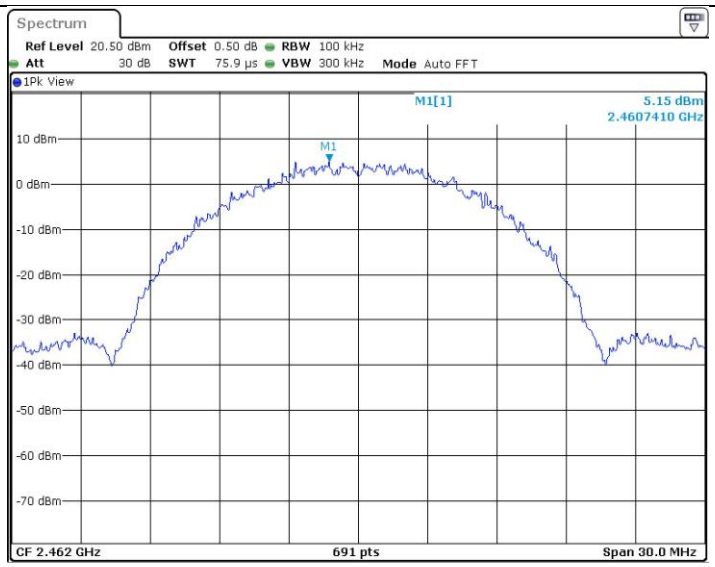
Channel 06 (2437MHz) Reference Level: 7.73dBm

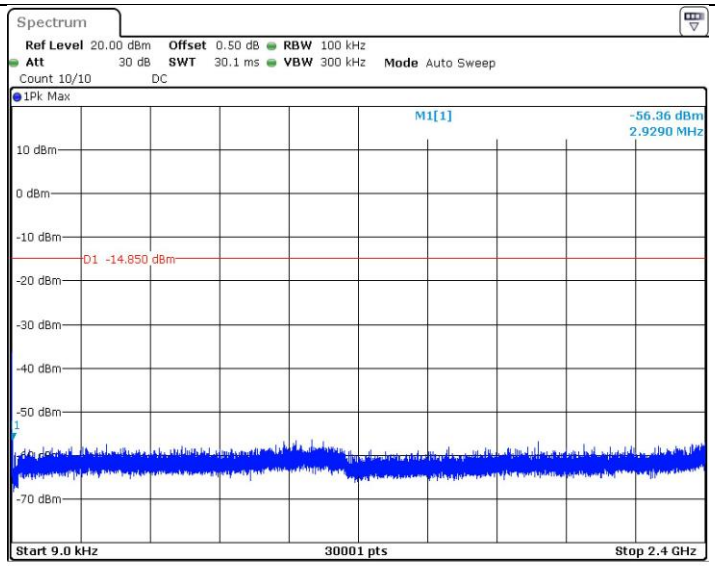


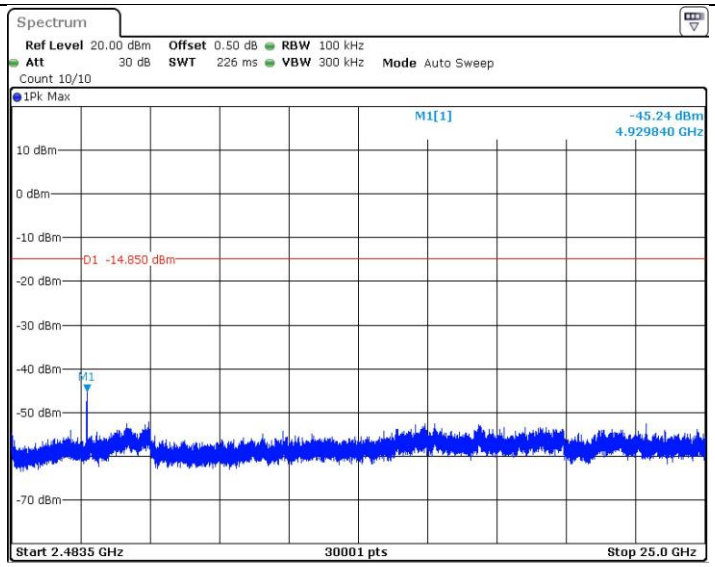


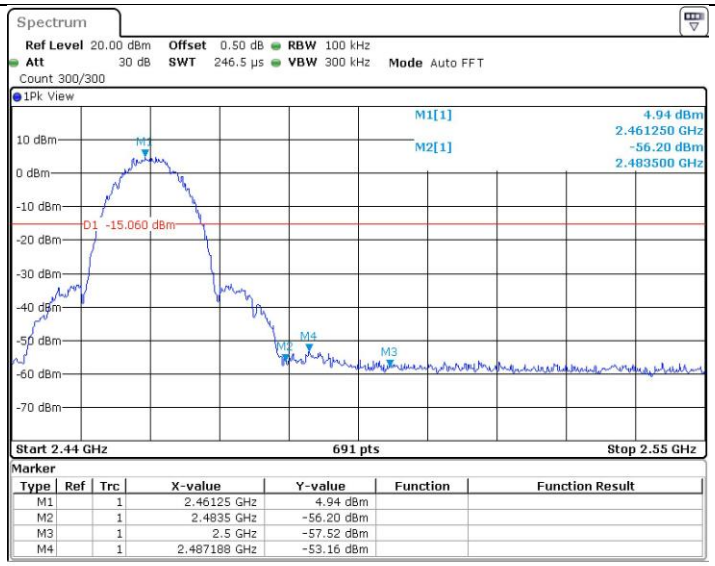

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -34.61 dBm
4.874300 GHz
10 dBm
0 dBm
-10 dBm
D1 -12.270 dBm
-20 dBm
-30 dBm
M1
-40 dBm
-50 dBm
-70 dBm
Start 2.4835 GHz
30001 pts
Stop 25.0 GHz

Channel 11 (2462MHz) Reference Level: 5.15dBm

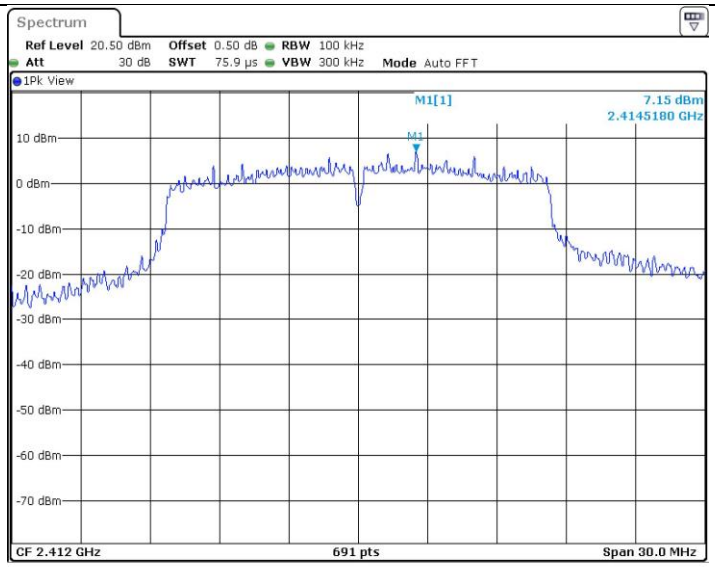


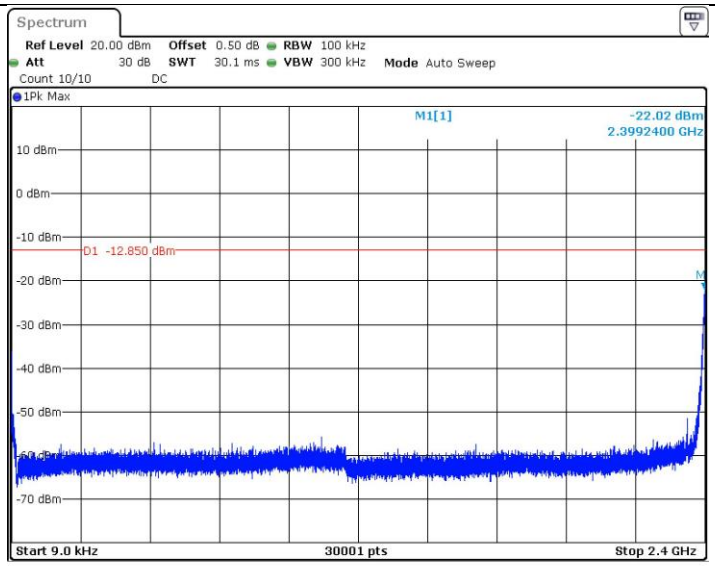


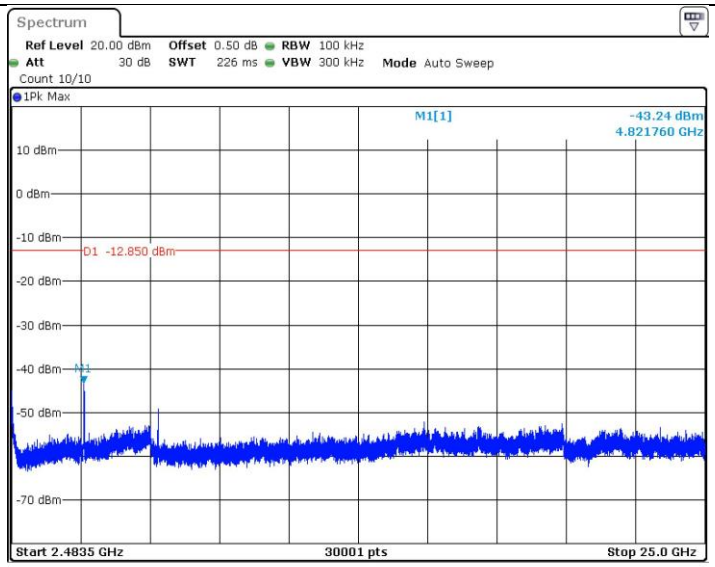

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -45.24 dBm
4.929840 GHz
10 dBm
0 dBm
-10 dBm
D1 -14.850 dBm
-20 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-70 dBm
Start 2.4835 GHz
30001 pts
Stop 25.0 GHz

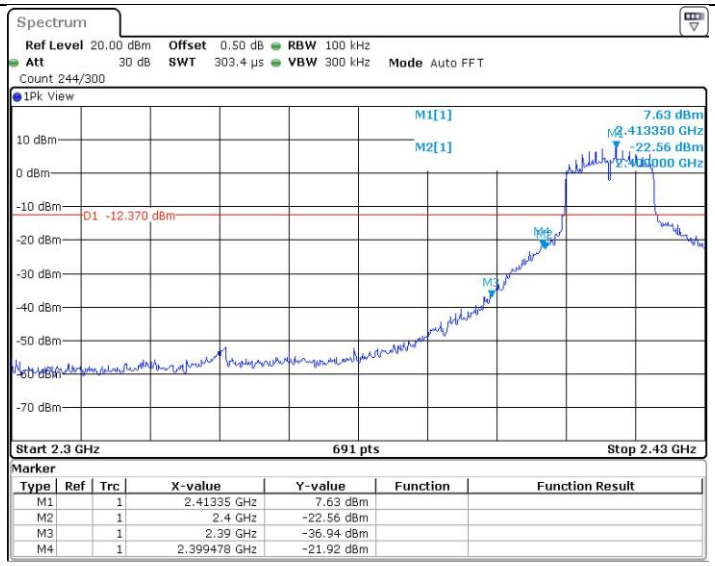

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 246.5 µs VBW 300 kHz Mode Auto FFT
Count 300/300
1Pk View
M1[1] 4.94 dBm
2.461250 GHz
M2[1] -56.20 dBm
2.483500 GHz
10 dBm
M1
0 dBm
-10 dBm
D1 -15.060 dBm
-20 dBm
-30 dBm
-40 dBm
M4
-50 dBm
M2
M3
-60 dBm
-70 dBm
Start 2.44 GHz
691 pts
Stop 2.55 GHz
Marker
Type | Ref | Trc | X-value | Y-value | Function | Function Result
M1 | | 1 | 2.46125 GHz | 4.94 dBm
M2 | | 1 | 2.4835 GHz | -56.20 dBm
M3 | | 1 | 2.5 GHz | -57.52 dBm
M4 | | 1 | 2.487188 GHz | -53.16 dBm

802.11g
Channel 01 (2412MHz) Reference Level: 7.15dBm



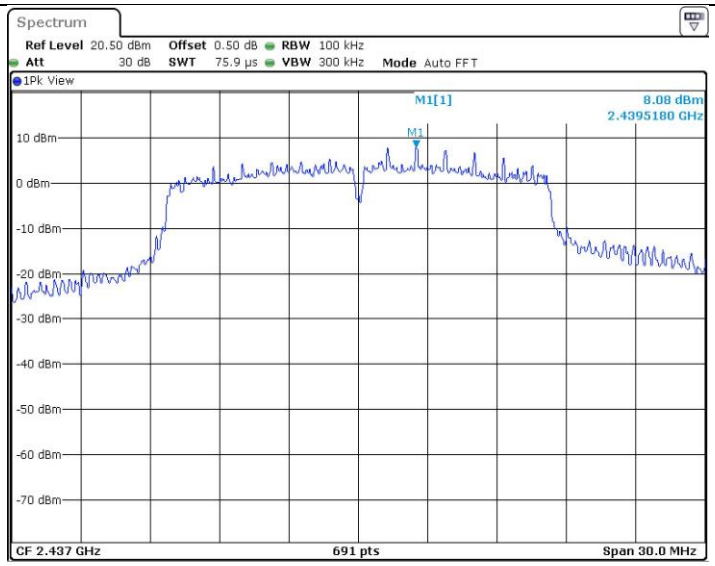


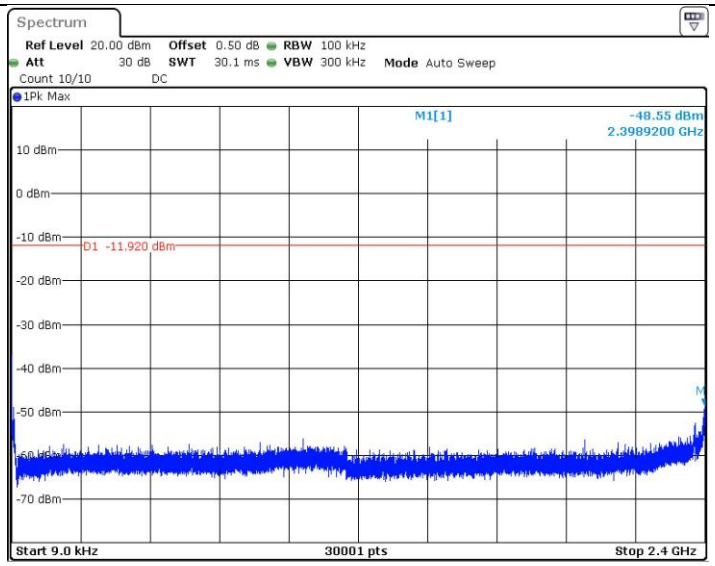


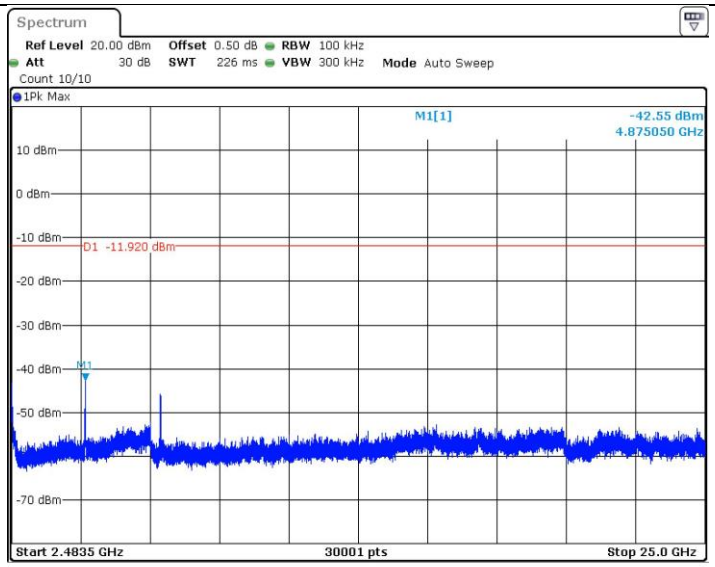


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.41335 GHz	7.63 dBm		
M2		1	2.4 GHz	-22.56 dBm		
M3		1	2.39 GHz	-36.94 dBm		
M4		1	2.399478 GHz	-21.92 dBm		

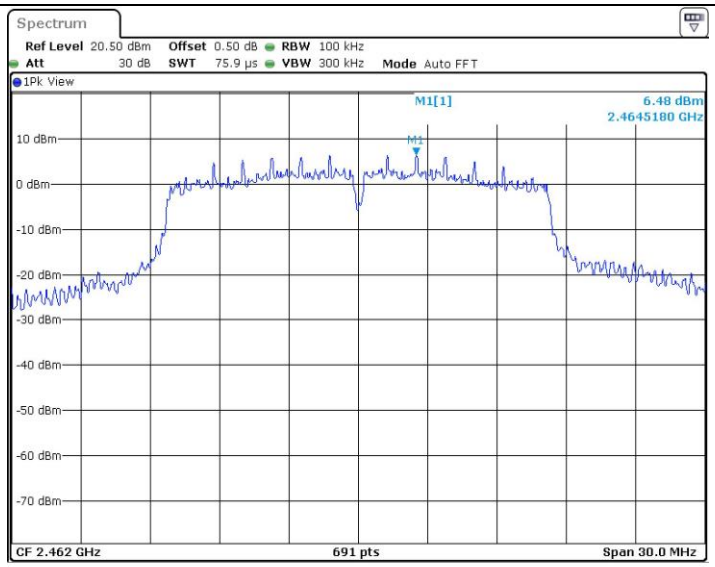
Channel 06 (2437MHz) Reference Level: 8.08dBm

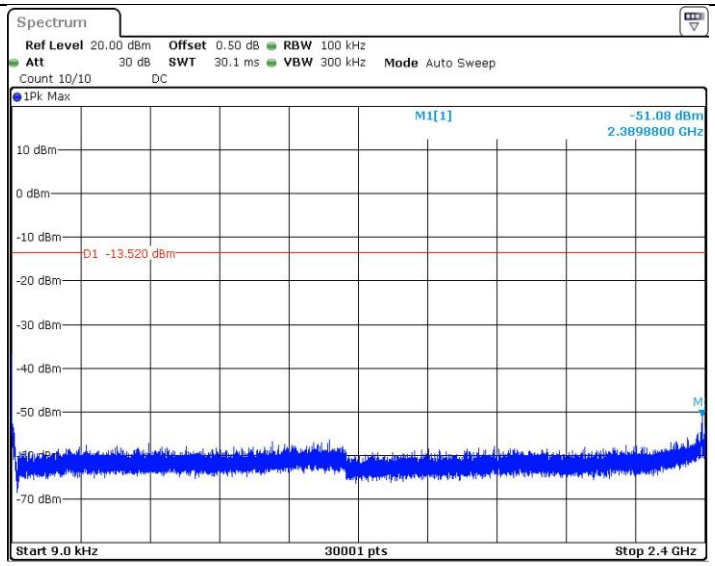


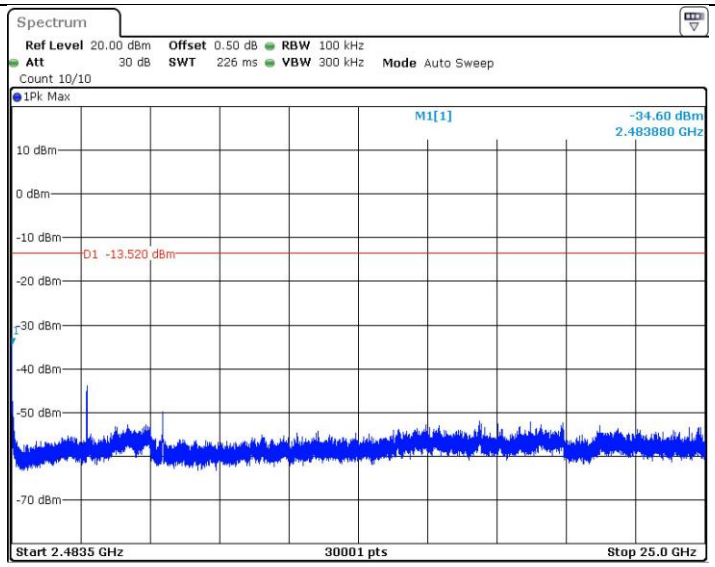


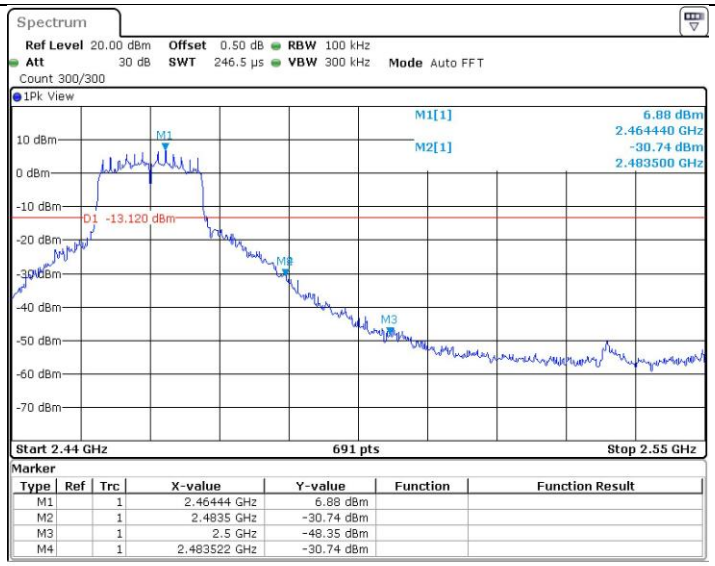

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -42.55 dBm
4.875050 GHz
10 dBm
0 dBm
-10 dBm
D1 -11.920 dBm
-20 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-70 dBm
Start 2.4835 GHz
30001 pts
Stop 25.0 GHz

Channel 11 (2462MHz) Reference Level: 6.48dBm

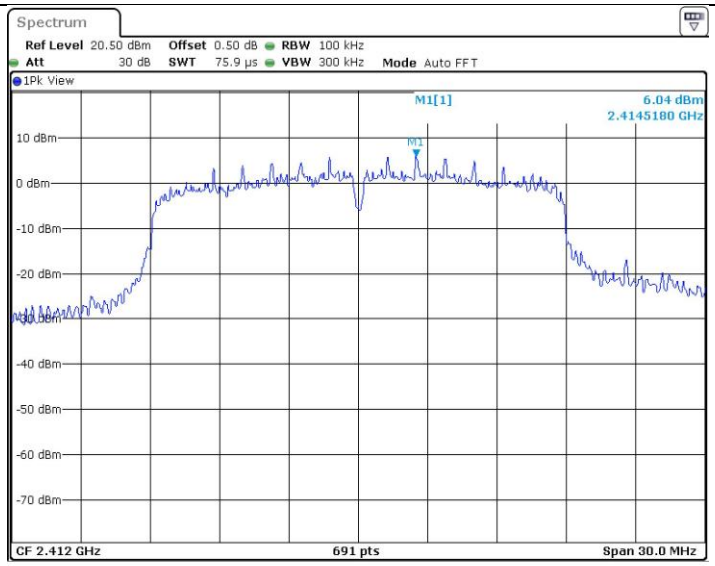


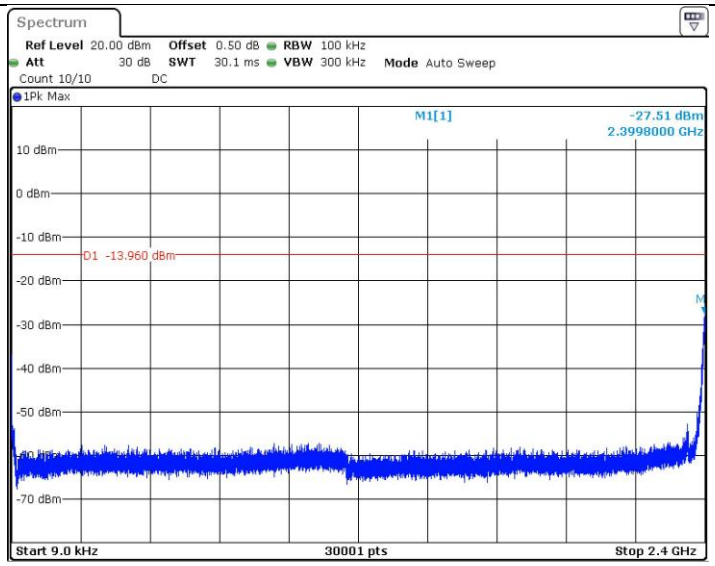


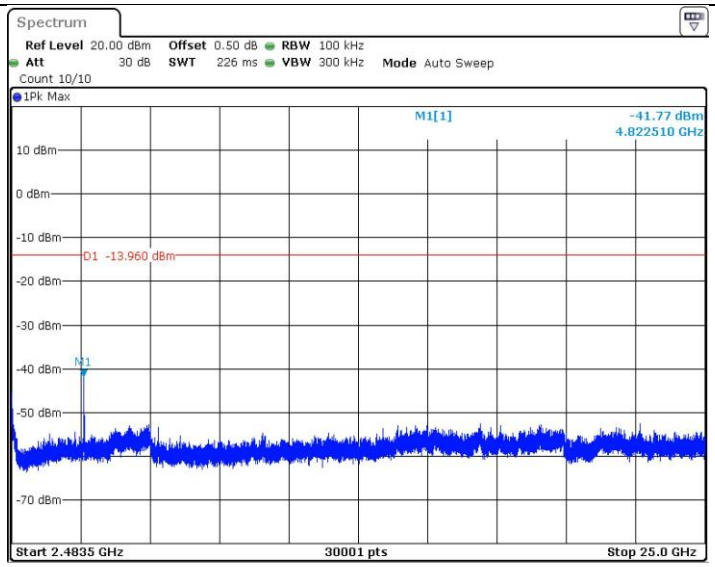

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -34.60 dBm
2.483880 GHz
D1 -13.520 dBm
Start 2.4835 GHz 30001 pts Stop 25.0 GHz

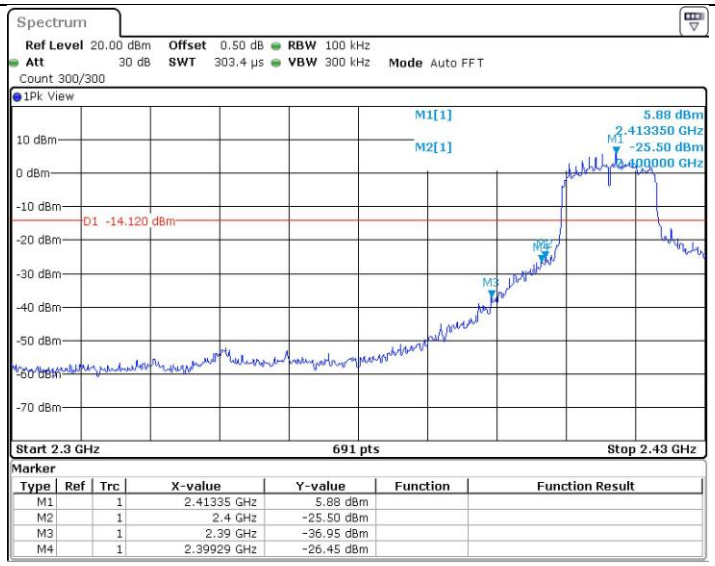

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 246.5 µs VBW 300 kHz Mode Auto FFT
Count 300/300
1Pk View
M1[1] 6.88 dBm
2.464440 GHz
M2[1] -30.74 dBm
2.483500 GHz
D1 -13.120 dBm
Start 2.44 GHz 691 pts Stop 2.55 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.46444 GHz 6.88 dBm
M2 1 2.4835 GHz -30.74 dBm
M3 1 2.5 GHz -48.35 dBm
M4 1 2.483522 GHz -30.74 dBm

802.11n-HT20
Channel 01 (2412MHz) Reference Level: 6.04dBm



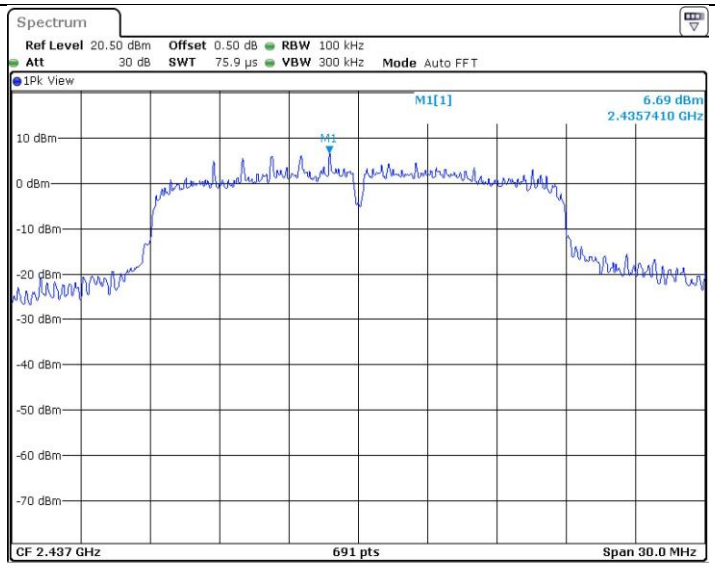


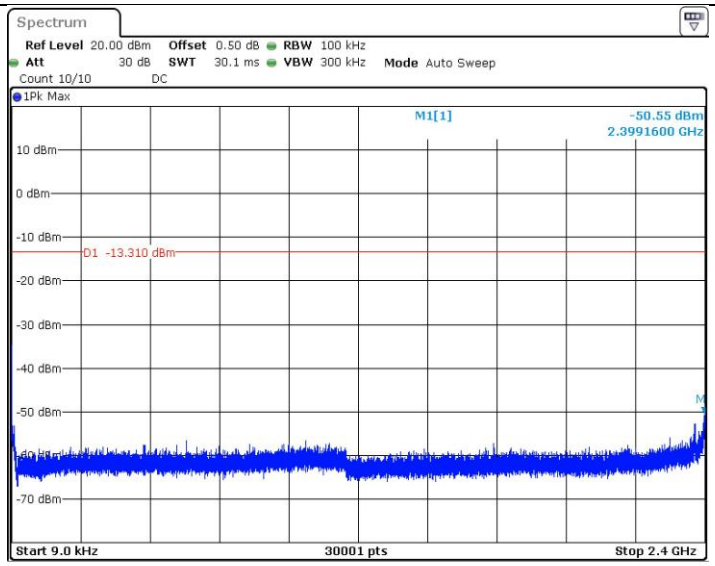


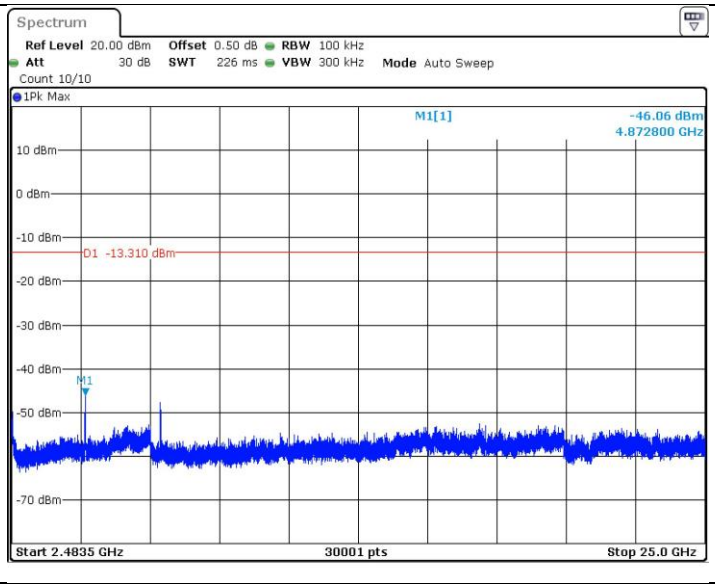


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.41335 GHz	5.88 dBm		
M2		1	2.4 GHz	-25.50 dBm		
M3		1	2.39 GHz	-36.95 dBm		
M4		1	2.39929 GHz	-26.45 dBm		

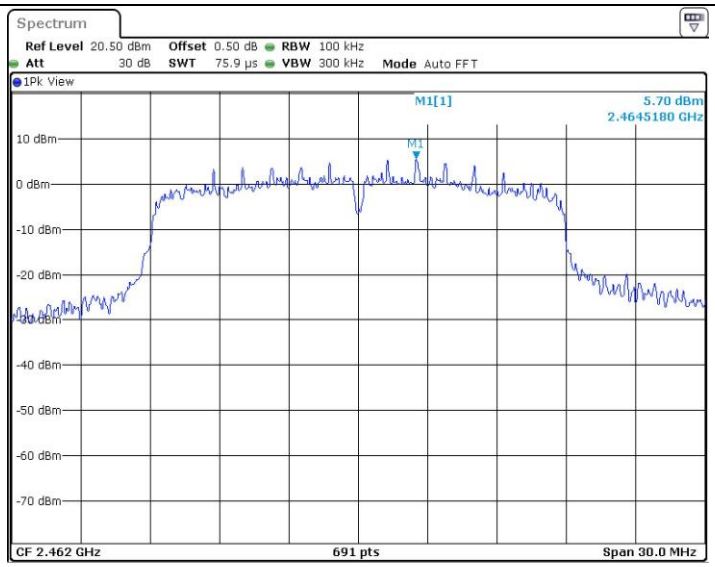
Channel 06 (2437MHz) Reference Level: 6.69dBm

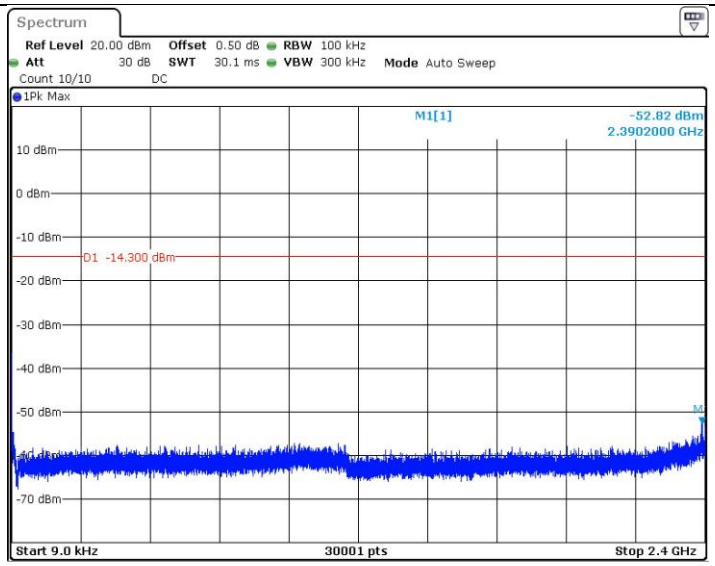


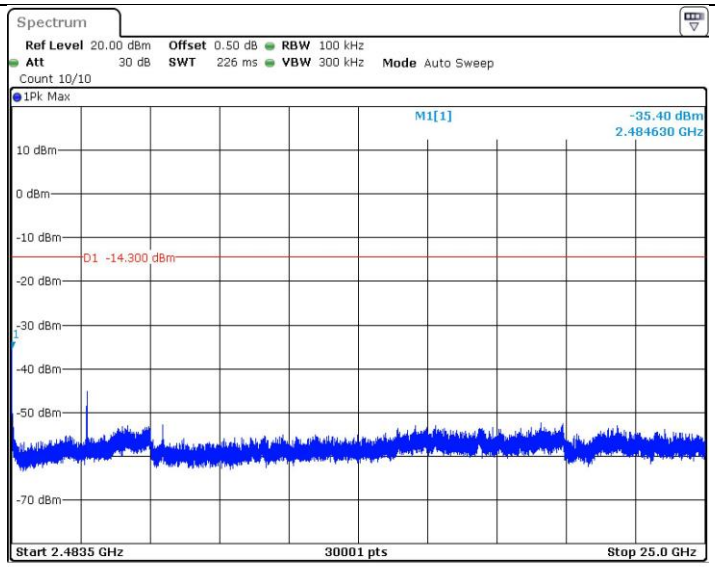


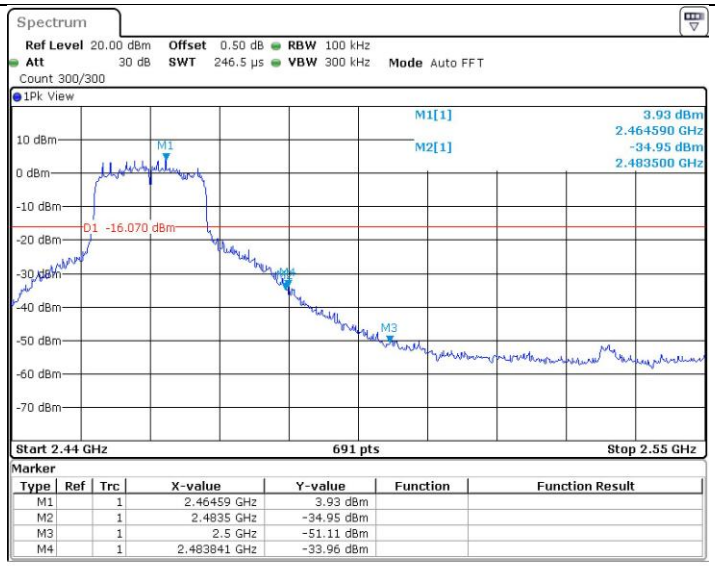

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -46.06 dBm
4.872800 GHz
10 dBm
0 dBm
-10 dBm
D1 -13.310 dBm
-20 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-70 dBm
Start 2.4835 GHz
30001 pts
Stop 25.0 GHz

Channel 11 (2462MHz) Reference Level: 5.70Bm









Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.46459 GHz	3.93 dBm		
M2		1	2.4835 GHz	-34.95 dBm		
M3		1	2.5 GHz	-51.11 dBm		
M4		1	2.483841 GHz	-33.96 dBm		

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, since all emissions are more than 20dB below fundamental
[ ] See attached data sheet

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

<u>Example</u>
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

4.8 Radiated Spurious Emission

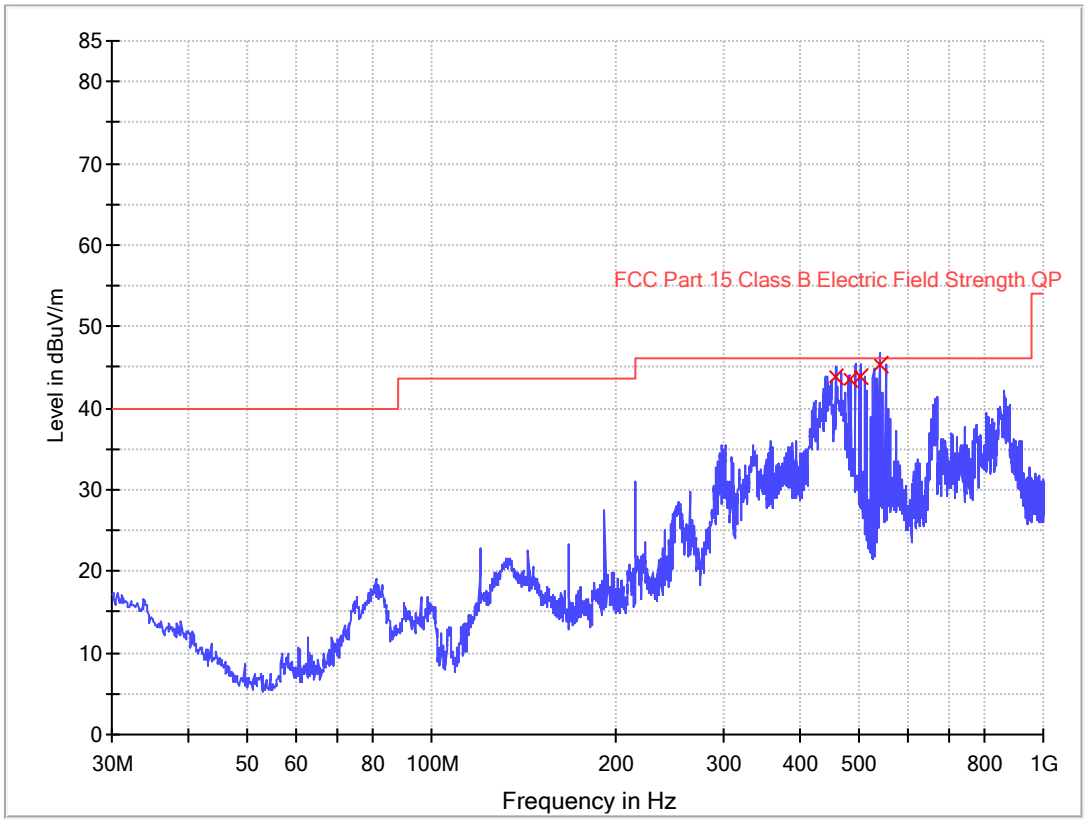
Worst Case Radiated Spurious Emission (802.11b-Channel 01)
at
539.977500MHz

Judgement: Passed by 1.0dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

ANT Polarity: Horizontal



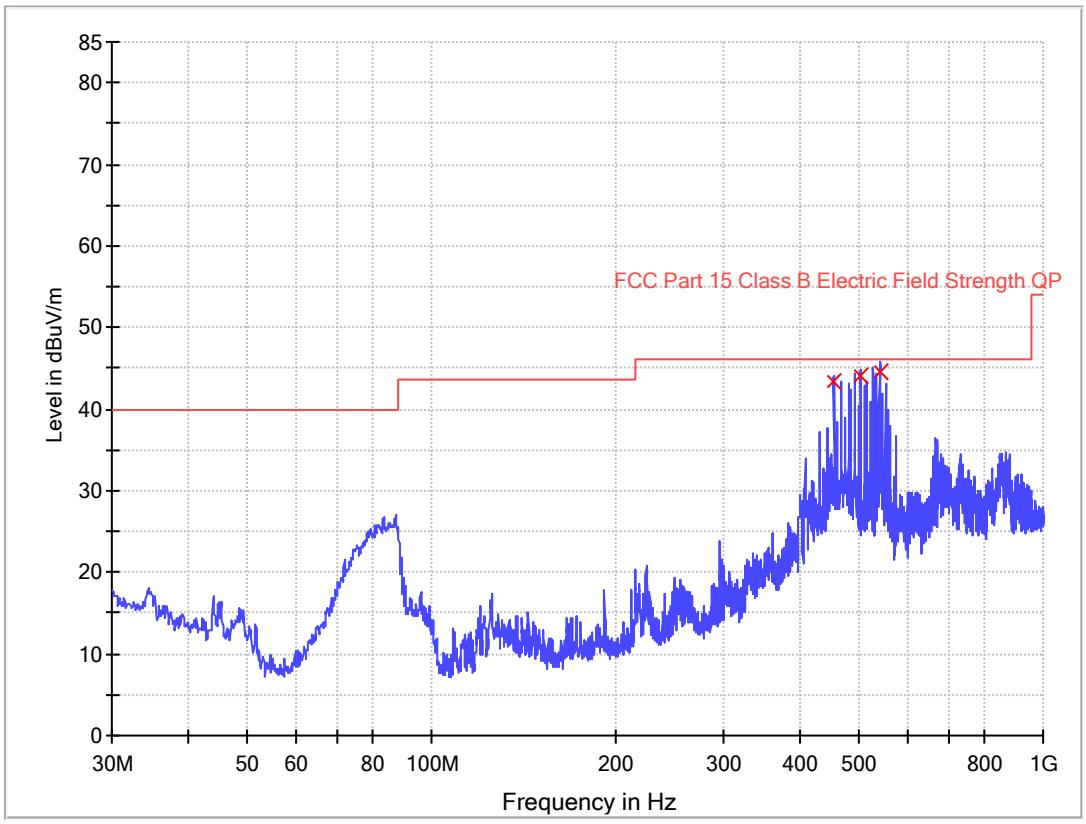
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
455.951150	43.6	1000.0	120.000	H	18.5	2.4	46.0
492.083850	43.2	1000.0	120.000	H	18.9	2.8	46.0
504.087500	43.7	1000.0	120.000	H	19.8	2.3	46.0
539.977500	45.0	1000.0	120.000	H	20.8	1.0	46.0

Remark:
1. Corr. (dB/m)= Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

ANT Polarity: Vertical

FCC Part 15



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
455.961150	42.4	1000.0	120.000	V	18.5	3.6	46.0
504.097500	44.2	1000.0	120.000	V	19.8	1.8	46.0
539.977500	44.5	1000.0	120.000	V	20.8	1.5	46.0

Remark:
1. Corr. (dB/m)= Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11b-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	56.9	36.1	34.2	55.0	74.0	-19.0
Horizontal	*2388.316	60.2	34.7	33.1	58.6	74.0	-15.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	45.6	36.1	34.2	43.7	54.0	-10.3
Horizontal	*2388.316	53.6	34.7	33.1	52.0	54.0	-2.0

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11b-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	56.9	36.1	34.6	55.4	74.0	-18.6
Horizontal	*7311.000	57.0	35.6	37.1	58.5	74.0	-15.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	43.5	36.1	34.6	42.0	54.0	-12.0
Horizontal	*7311.000	43.6	35.6	37.1	45.1	54.0	-8.9

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11b-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	56.3	36.1	34.6	54.8	74.0	-19.2
Horizontal	*2483.220	54.2	35.6	37.2	55.8	74.0	-18.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	46.7	36.1	34.6	45.2	54.0	-8.8
Horizontal	*2483.220	46.6	35.6	37.2	48.2	54.0	-5.8

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11g-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	50.4	36.1	34.2	48.5	74.0	-25.5
Horizontal	*2387.355	58.1	34.7	33.1	56.5	74.0	-17.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	42.2	36.1	34.2	40.3	54.0	-13.7
Horizontal	*2387.355	51.2	34.7	33.1	49.6	54.0	-4.4

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11g-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	50.2	36.1	34.6	48.7	74.0	-25.3
Horizontal	*7311.000	48.0	35.6	37.1	49.5	74.0	-24.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	42.7	36.1	34.6	41.2	54.0	-12.8
Horizontal	*7311.000	40.4	35.6	37.1	41.9	54.0	-12.1

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11g-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	50.5	36.1	34.6	49.0	74.0	-25.0
Horizontal	*2483.920	54.6	35.6	37.2	56.2	74.0	-17.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	41.6	36.1	34.6	40.1	54.0	-13.9
Horizontal	*2483.920	47.8	35.6	37.2	49.4	54.0	-4.6

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11n-HT20-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	50.5	36.1	34.2	48.6	74.0	-25.4
Horizontal	*2389.200	61.5	34.7	33.1	59.9	74.0	-14.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	43.1	36.1	34.2	41.2	54.0	-12.8
Horizontal	*2389.200	51.9	34.7	33.1	50.3	54.0	-3.7

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11n-HT20-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	50.5	36.1	34.6	49.0	74.0	-25.0
Horizontal	*7311.000	48.7	35.6	37.1	50.2	74.0	-23.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	41.7	36.1	34.6	40.2	54.0	-13.8
Horizontal	*7311.000	40.0	35.6	37.1	41.5	54.0	-12.5

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820
Operating Mode: Transmitting (802.11n-HT20-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.4	36.1	34.6	49.9	74.0	-24.1
Horizontal	*2483.500	55.2	35.6	37.2	56.8	74.0	-17.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	42.0	36.1	34.6	40.5	54.0	-13.5
Horizontal	*2483.500	49.0	35.6	37.2	50.6	54.0	-3.4

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820

4.9 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required - No digital part

[ ] Test results are attached

[x] Included in the separated report.

Applicant: SHANTOU CITY HAPPY COW TOYS INDUSTRIAL CO., LTD.
Date of Test: Mar 15, 2025 Model: 1018820

4.10 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

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10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-13	BiConiLog Antenna	ETS	3142E	00217919	13-Jul-2022	13-Jul-2025
SZ185-04	EMI Receiver	R & S	ESR7	102466	10-Nov-2024	10-Nov-2025
SZ061-09	Horn Antenna	ETS	3115	00092347	14-Oct-2022	14-Oct-2025
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	5-May-2024	5-May-2027
SZ061-15	Double-Ridged Waveguide Horn Antenna	ETS	3116C-PA	00224718	14-Jun-2024	14-Jun-2027
SZ056-06	Spectrum Analyzer	R&S	FSV40	101101	10-Nov-2024	10-Nov-2025
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	23-Apr-2024	23-Apr-2025
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	12-Dec-2021	12-Dec-2026
SZ062-02	RF Cable	RADIALL	RG 213U	--	1-Nov-2024	1-May -2025
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	1-Nov-2024	1-May -2025
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	1-Nov-2024	1-May -2025
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	23-Apr-2024	23-Apr-2025
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	23-Apr-2024	23-Apr-2025
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	23-Apr-2024	23-Apr-2025

********** End of Report**********