FCC Radio Test Report

FCC ID: 2AH3E-NVR02

Original Grant

Report No.	:	TB-FCC147277
Applicant	:	OPCOM O.E.(DONG GUAN)INC.
Equipment Under Test (EUT)		
EUT Name	:	Wireless NVR
Model No.	:	NVR02
Series No.	:	N/A
Brand Name	:	N/A
Receipt Date	:	2016-03-20
Test Date	:	2016-03-21 to 2016-04-18
Issue Date	:	2016-04-19
Standards	:	FCC Part 15, Subpart C (15.247:2015)
Test Method	:	ANSI C63.10: 2013
Conclusions	:	**PASS**

In the configuration tested, the EUT complied with the standards specified above,
The EUT technically complies with the FCC and IC requirements

Test/Witness Engineer : WAN SU

Approved& Authorized :

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Contents

1. General Information about EUT

1.1 Client Information

Applicant	:	OPCOM O.E.(DONG GUAN)INC.
Address	:	Gu Cun Industry Estate, Dajing Countryside Committee, Houjie Town, Dongguan City, Guang Dong Province, China
Manufacturer	:	Shenzhen Annidigital Technology Co., Ltd
Address	:	3rd Floor, Building D, Shangxue HiTech Industrial Park, Bantian, Longgang District, Shenzhen City, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Wireless NVR	
Models No.	:	NVR02	
Model Difference	:	N/A	
Product Description	:	Operation Frequency: 2408MHz~2468MHz	
		Number of Channel:	31 channels **see note(3)**
		RF Output Power:	16.94 dBm
		Antenna Gain:	3 dBi Dipole Antenna
		Modulation Type:	GFSK
		Bit Rate of Transmitter:	4 Mbps
Power Supply	:	DC power supplied by AC/DC Adapter.	
Power Rating	:	AC/DC Adapter: Input:100~240V, 50/60Hz 0.6A Output:12V, 2000mA	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

Note:

(1) This Test Report is FCC Part 15.247 for 2.4G ISM, the test procedure follows the FCC KDB 558074 D01 DTS Meas Guidance v03r05.

(2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

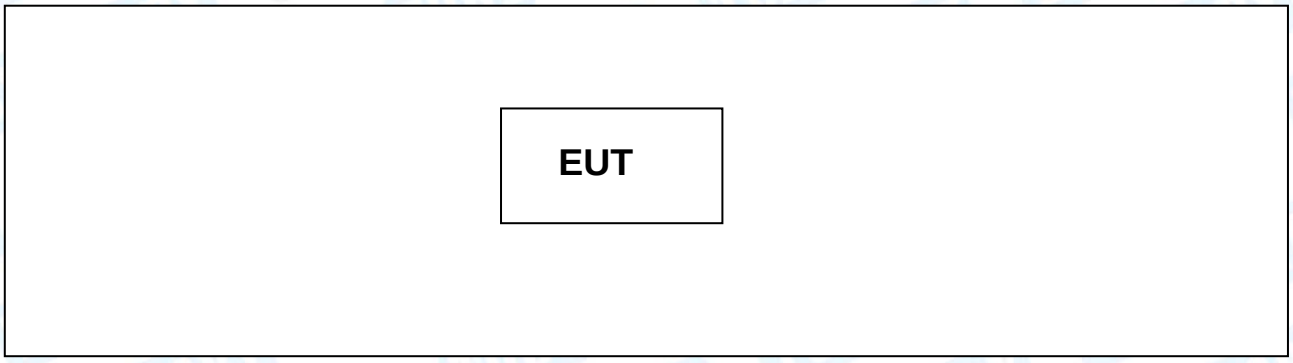
(3) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2408**	12	2430	23	2452
02	2410	13	2432	24	2454
03	2412	14	2434	25	2456
04	2414	15	2436	26	2458
05	2416	16	2438	27	2460
06	2418	**17**	**2440**	28	2462
07	2420	18	2442	29	2464
08	2422	19	2444	30	2466
09	2424	20	2446	**31**	**2468**
10	2426	21	2448		
11	2428	22	2450		

(4) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested

TX Mode



1.4 Description of Support Units

The EUT has been test as an independent unit

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test	
Final Test Mode	**Description**
Mode 1	TX Mode

For Radiated Test	
Final Test Mode	**Description**
Mode 2	TX Mode Channel 01/17/31

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

TX Mode: GFSK (4 Mbps)

(2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.

(3) The EUT is considered a mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer 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 customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

Test Software Version	**N/A**		
Channel	**CH 01**	**CH 18**	**CH 32**
2.4G ISM	DEF	DEF	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1				
Standard Section		Test Item	Judgment	Remark
FCC	IC			
15.203	/	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS 247 5.4 (4)	Peak Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.247(d)	RSS 247 5.5	Transmitter Radiated Spurious Emission	PASS	N/A
Note: "/" for no requirement for this test item. N/A is an abbreviation for Not Applicable.				

3. Test Equipment

Conducted Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Aug. 07, 2015	Aug. 06, 2016
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016
LISN	Rohde & Schwarz	ENV216	101131	Aug. 08, 2015	Aug. 07, 2016
Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 07, 2015	Aug. 06, 2016
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 26, 2016	Mar. 25, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 26, 2016	Mar. 25, 2017
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 26, 2016	Mar. 25, 2017
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 26, 2016	Mar. 25, 2017
Pre-amplifier	Sonoma	310N	185903	Mar. 26, 2016	Mar. 25, 2017
Pre-amplifier	HP	8447B	3008A00849	Mar. 26, 2016	Mar. 25, 2017
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard

FCC Part 15.207

4.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

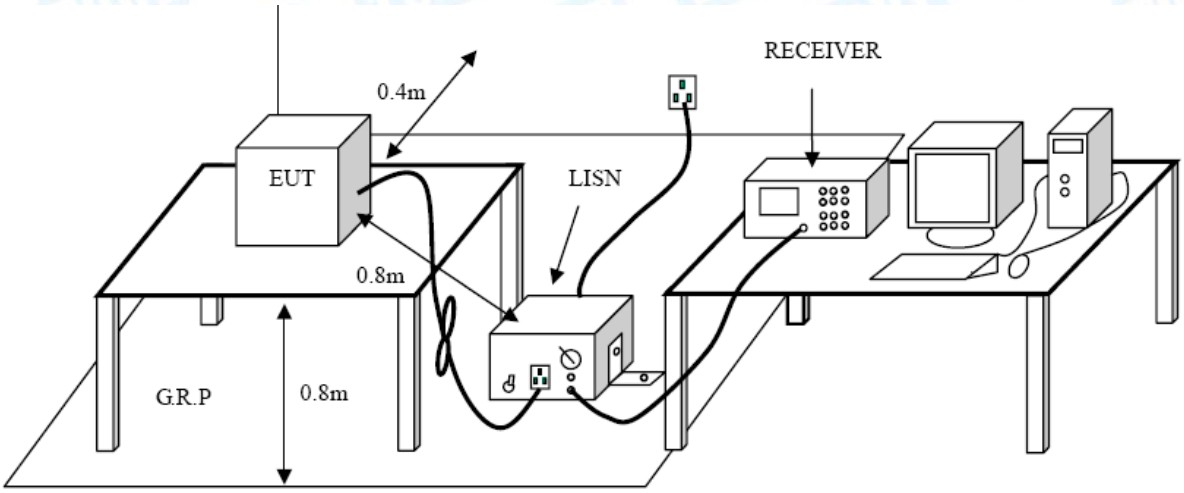
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

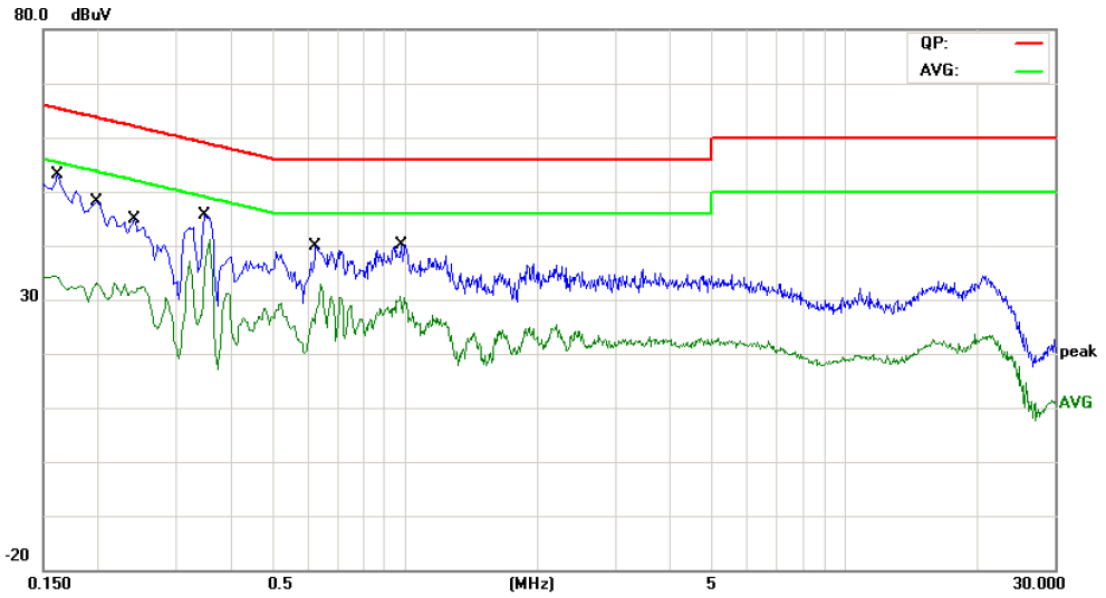
4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please see the next page.

EUT:	Wireless NVR	Model Name :	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Line		
Test Mode:	TX Mode		
Remark:	Only worse case is reported		

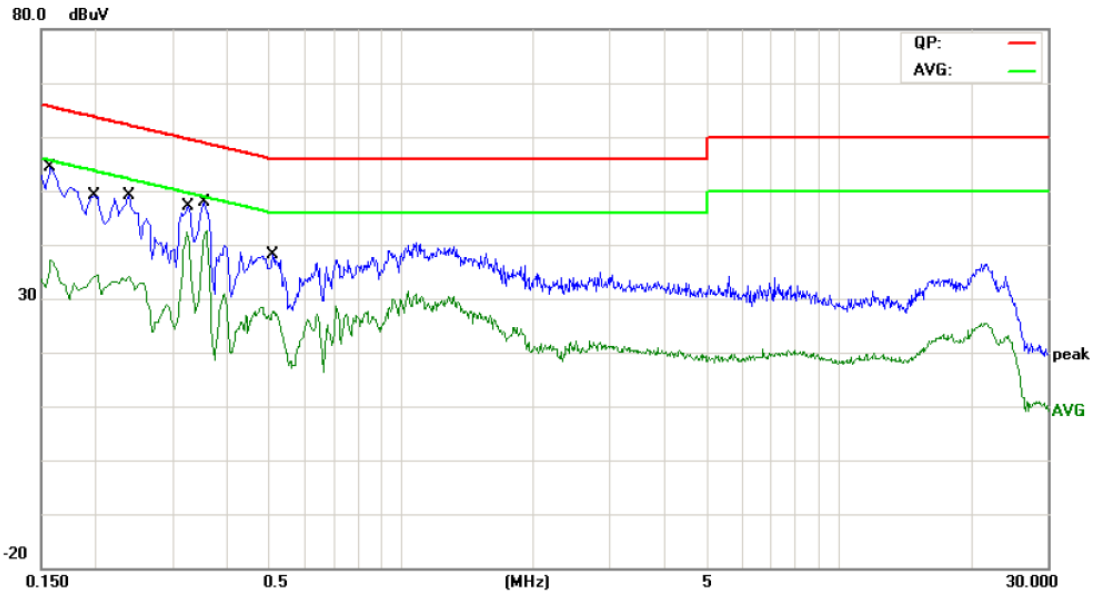


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1620	39.27	10.12	49.39	65.36	-15.97	QP
2		0.1620	23.19	10.12	33.31	55.36	-22.05	AVG
3		0.1980	34.76	10.12	44.88	63.69	-18.81	QP
4		0.1980	22.36	10.12	32.48	53.69	-21.21	AVG
5		0.2420	29.67	10.11	39.78	62.02	-22.24	QP
6		0.2420	20.86	10.11	30.97	52.02	-21.05	AVG
7		0.3500	33.08	10.07	43.15	58.96	-15.81	QP
8	*	0.3500	25.77	10.07	35.84	48.96	-13.12	AVG
9		0.6260	25.79	10.02	35.81	56.00	-20.19	QP
10		0.6260	16.11	10.02	26.13	46.00	-19.87	AVG
11		0.9820	24.90	10.15	35.05	56.00	-20.95	QP
12		0.9820	18.42	10.15	28.57	46.00	-17.43	AVG

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	Wireless NVR	Model Name :	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	TX Mode		
Remark:	Only worse case is reported		

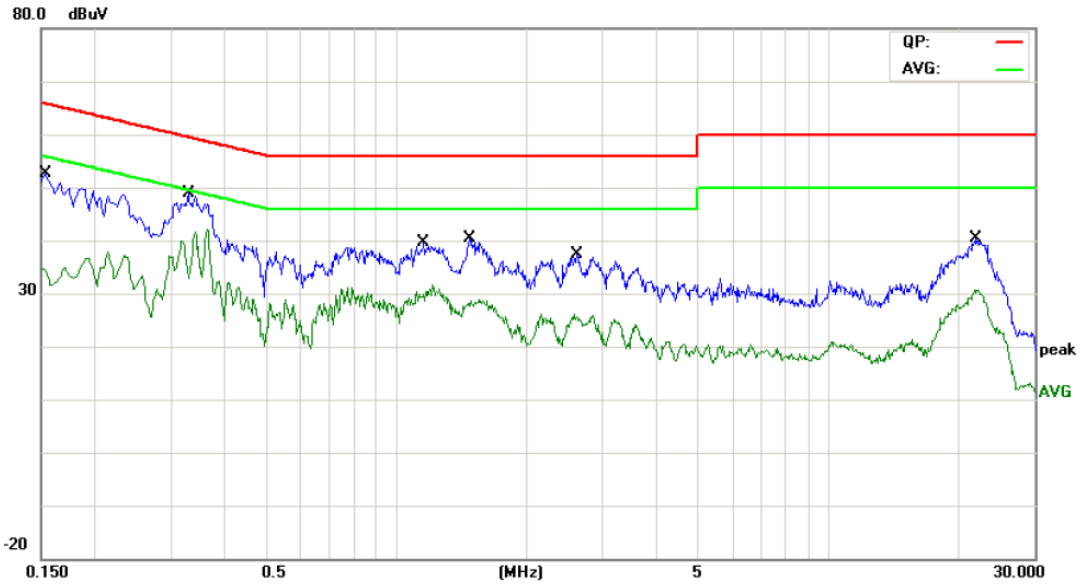


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1582	40.53	10.12	50.65	65.55	-14.90	QP
2		0.1582	24.23	10.12	34.35	55.55	-21.20	AVG
3		0.1980	36.89	10.12	47.01	63.69	-16.68	QP
4		0.1980	23.63	10.12	33.75	53.69	-19.94	AVG
5		0.2380	33.80	10.11	43.91	62.16	-18.25	QP
6		0.2380	22.90	10.11	33.01	52.16	-19.15	AVG
7		0.3260	34.71	10.08	44.79	59.55	-14.76	QP
8		0.3260	30.50	10.08	40.58	49.55	-8.97	AVG
9		0.3540	35.44	10.07	45.51	58.87	-13.36	QP
10	*	0.3540	31.91	10.07	41.98	48.87	-6.89	AVG
11		0.5100	23.16	10.02	33.18	56.00	-22.82	QP
12		0.5100	16.57	10.02	26.59	46.00	-19.41	AVG

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	Wireless NVR	**Model Name :**	NVR02
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	AC 240V/60Hz		
Terminal:	Line		
Test Mode:	TX Mode		
Remark:	Only worse case is reported		

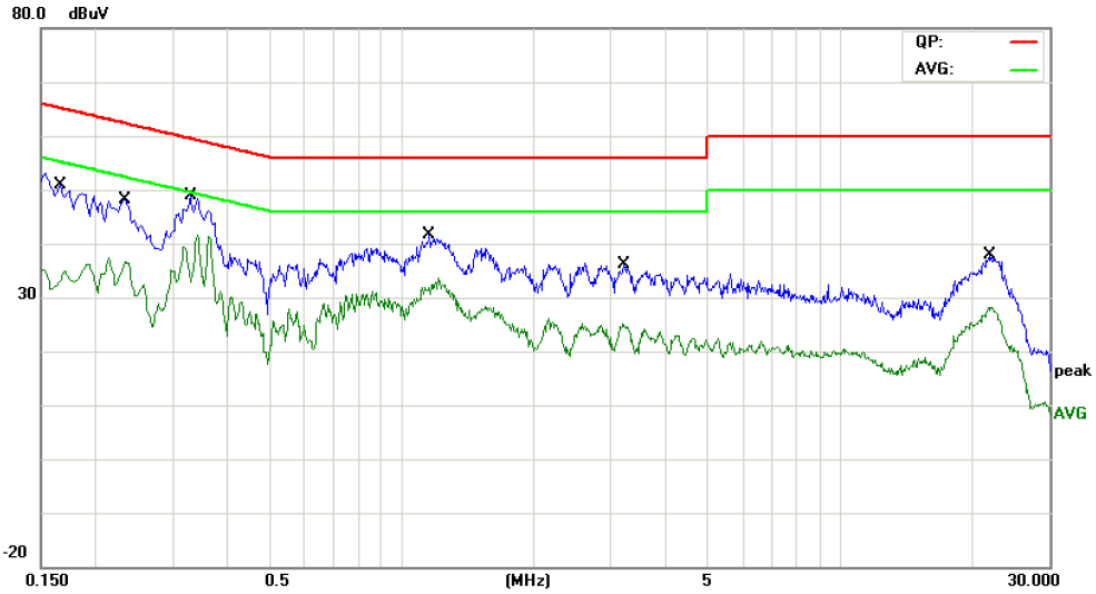


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	42.59	10.12	52.71	65.78	-13.07	QP
2		0.1539	24.28	10.12	34.40	55.78	-21.38	AVG
3	*	0.3300	38.83	10.08	48.91	59.45	-10.54	QP
4		0.3300	22.94	10.08	33.02	49.45	-16.43	AVG
5		1.1539	29.51	10.14	39.65	56.00	-16.35	QP
6		1.1539	19.65	10.14	29.79	46.00	-16.21	AVG
7		1.4738	30.20	10.11	40.31	56.00	-15.69	QP
8		1.4738	17.59	10.11	27.70	46.00	-18.30	AVG
9		2.6179	27.28	10.06	37.34	56.00	-18.66	QP
10		2.6179	15.51	10.06	25.57	46.00	-20.43	AVG
11		21.9340	30.23	10.06	40.29	60.00	-19.71	QP
12		21.9340	20.01	10.06	30.07	50.00	-19.93	AVG

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	Wireless NVR	Model Name :	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 240V/60Hz		
Terminal:	Neutral		
Test Mode:	TX Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1660	34.72	10.12	44.84	65.15	-20.31	QP
2		0.1660	21.39	10.12	31.51	55.15	-23.64	AVG
3		0.2340	33.38	10.11	43.49	62.30	-18.81	QP
4		0.2340	26.15	10.11	36.26	52.30	-16.04	AVG
5		0.3300	32.35	10.08	42.43	59.45	-17.02	QP
6		0.3300	23.10	10.08	33.18	49.45	-16.27	AVG
7		1.1539	26.98	10.14	37.12	56.00	-18.88	QP
8	*	1.1539	21.32	10.14	31.46	46.00	-14.54	AVG
9		3.2100	21.47	10.06	31.53	56.00	-24.47	QP
10		3.2100	14.25	10.06	24.31	46.00	-21.69	AVG
11		21.9340	22.82	10.06	32.88	60.00	-27.12	QP
12		21.9340	16.92	10.06	26.98	50.00	-23.02	AVG

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.209

5.1.2 Test Limit

Radiated Emission Limits (9kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

Radiated Emission Limit (Above 1000MHz)

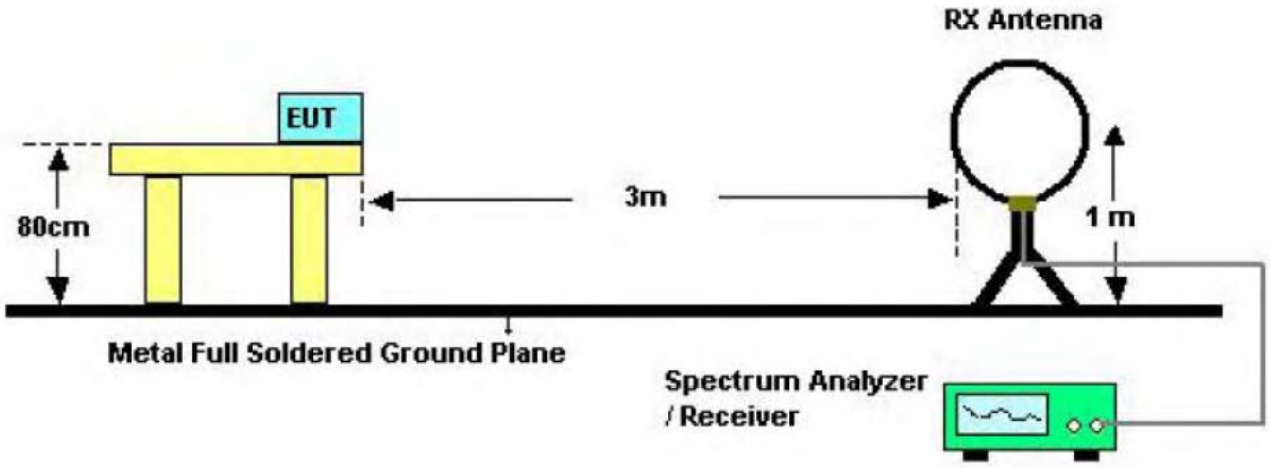
Frequency (MHz)	Class A (dBuV/m)(at 3 M)		Class B (dBuV/m)(at 3 M)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

Note:

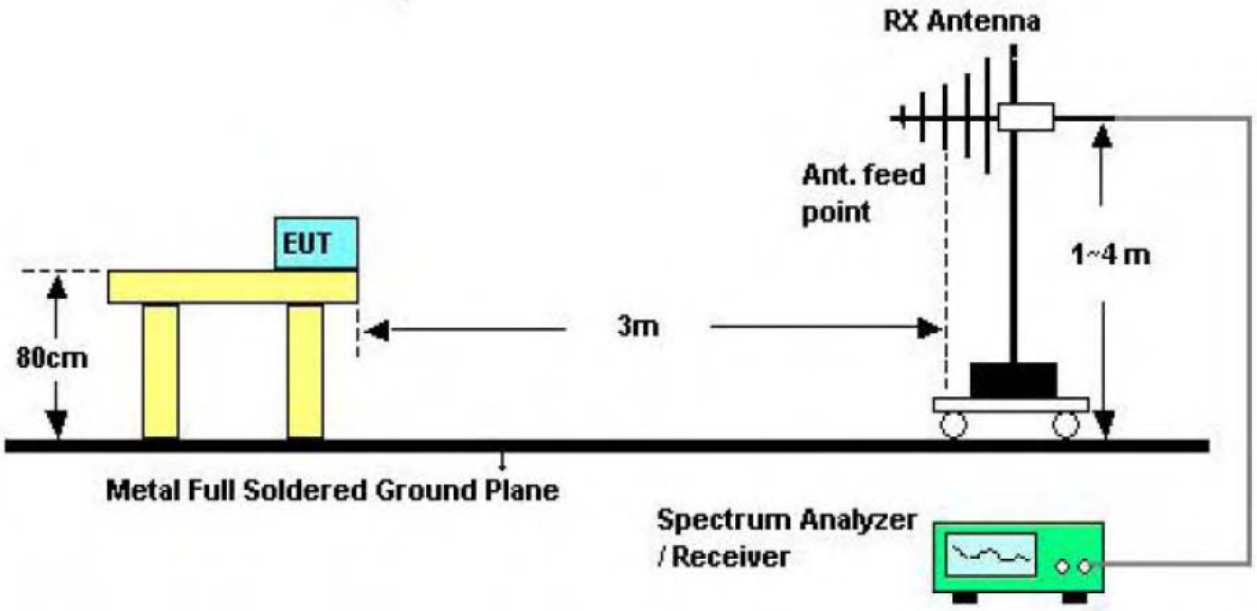
(1) The tighter limit applies at the band edges.

(2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

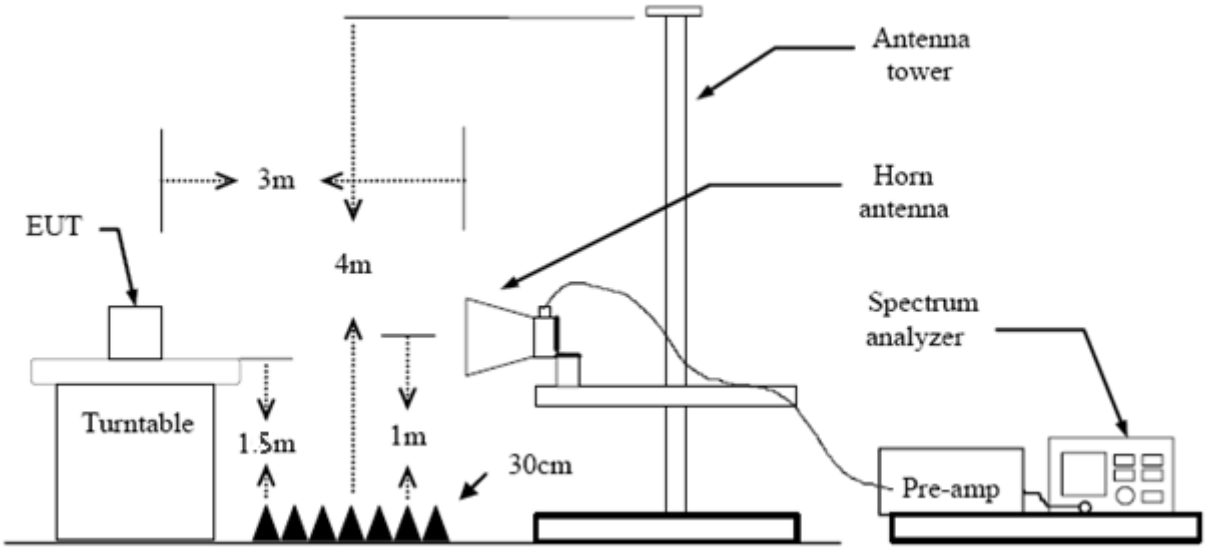
5.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

5.3 Test Procedure

(1) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

(2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

(3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

(4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

(5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.

(6) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

(7) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

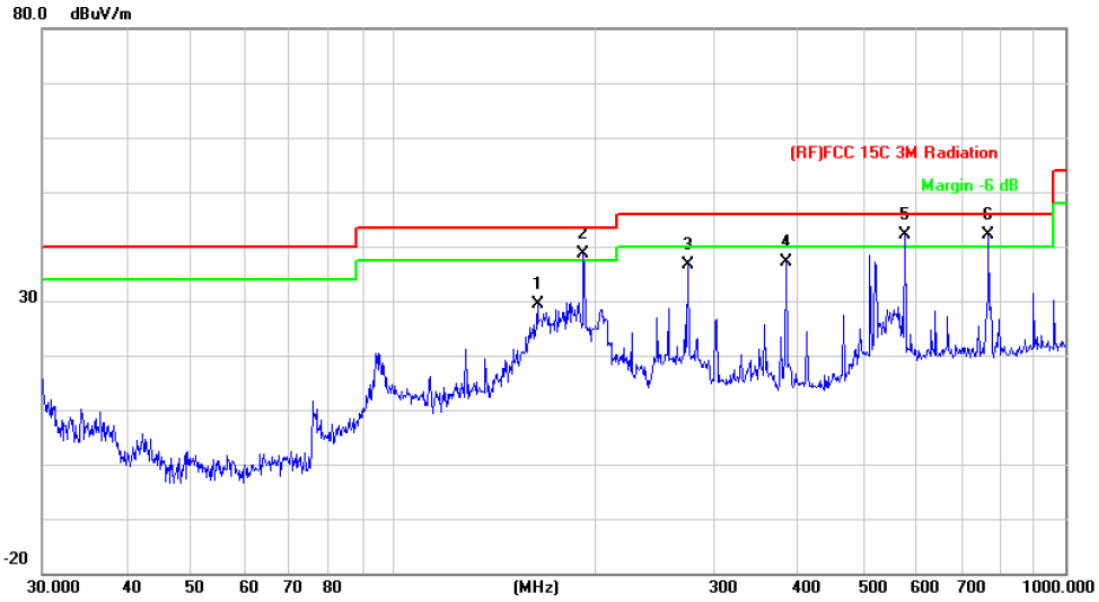
The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode 2408MHz		
Remark:	Only worse case is reported		

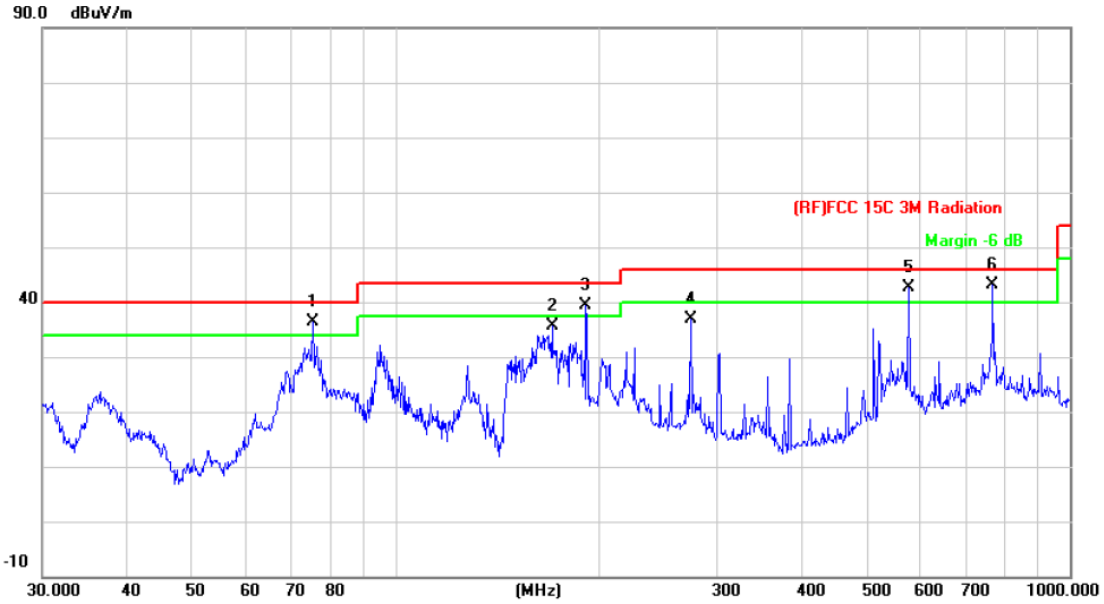


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		163.7548	50.15	-20.76	29.39	43.50	-14.11	peak
2	!	191.7450	59.55	-20.81	38.74	43.50	-4.76	peak
3		274.1938	54.35	-17.60	36.75	46.00	-9.25	peak
4		383.9318	50.90	-13.87	37.03	46.00	-8.97	peak
5	*	576.6443	52.33	-10.09	42.24	46.00	-3.76	peak
6	!	768.7481	49.05	-6.82	42.23	46.00	-3.77	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode 2408MHz		
Remark:	Only worse case is reported		

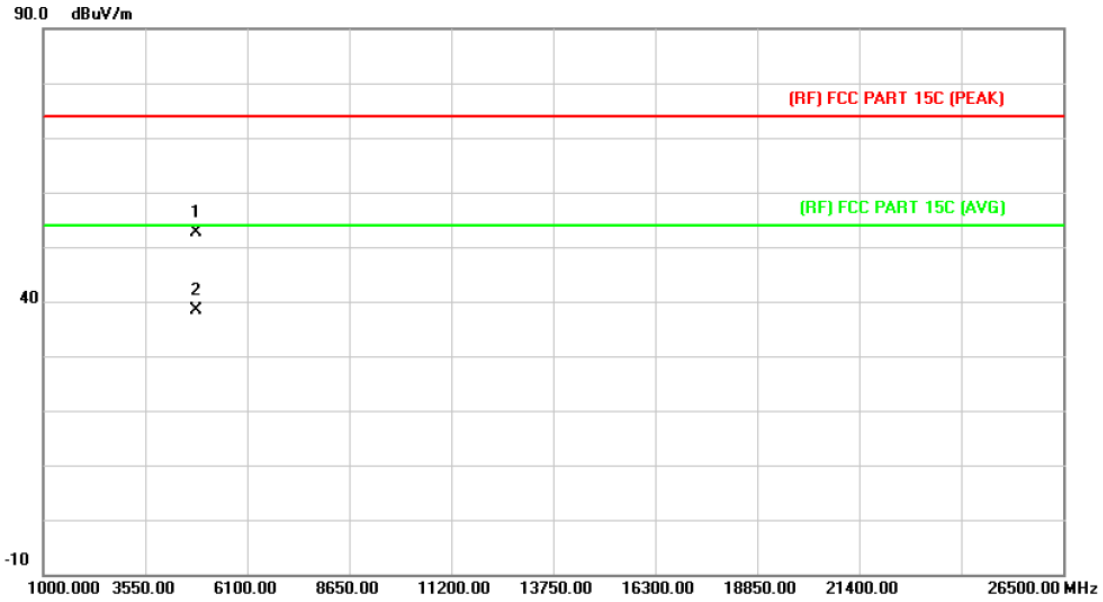


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	!	75.4462	59.81	-23.43	36.38	40.00	-3.62	peak
2		170.7923	56.71	-21.13	35.58	43.50	-7.92	peak
3	!	191.7450	60.17	-20.81	39.36	43.50	-4.14	peak
4		274.1938	54.58	-17.60	36.98	46.00	-9.02	peak
5	!	576.6443	52.83	-10.09	42.74	46.00	-3.26	peak
6	*	768.7481	49.97	-6.82	43.15	46.00	-2.85	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

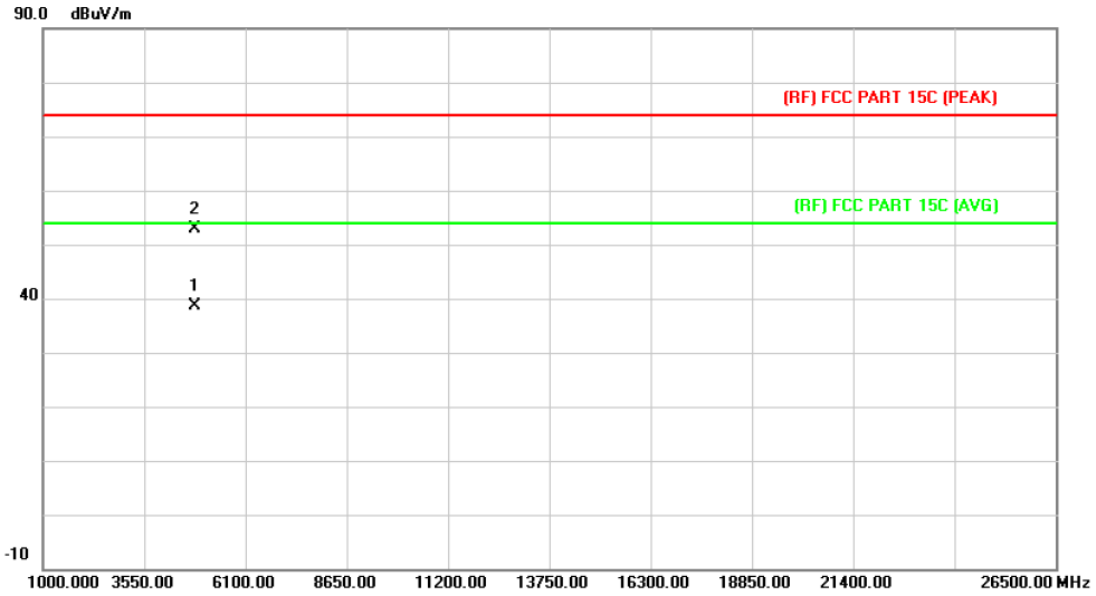
EUT:	Wireless NVR	**Model:**	NVR02
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode 2408MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4815.300	39.22	13.51	52.73	74.00	-21.27	peak
2	*	4815.600	24.84	13.51	38.35	54.00	-15.65	AVG

Emission Level= Read Level+ Correct Factor

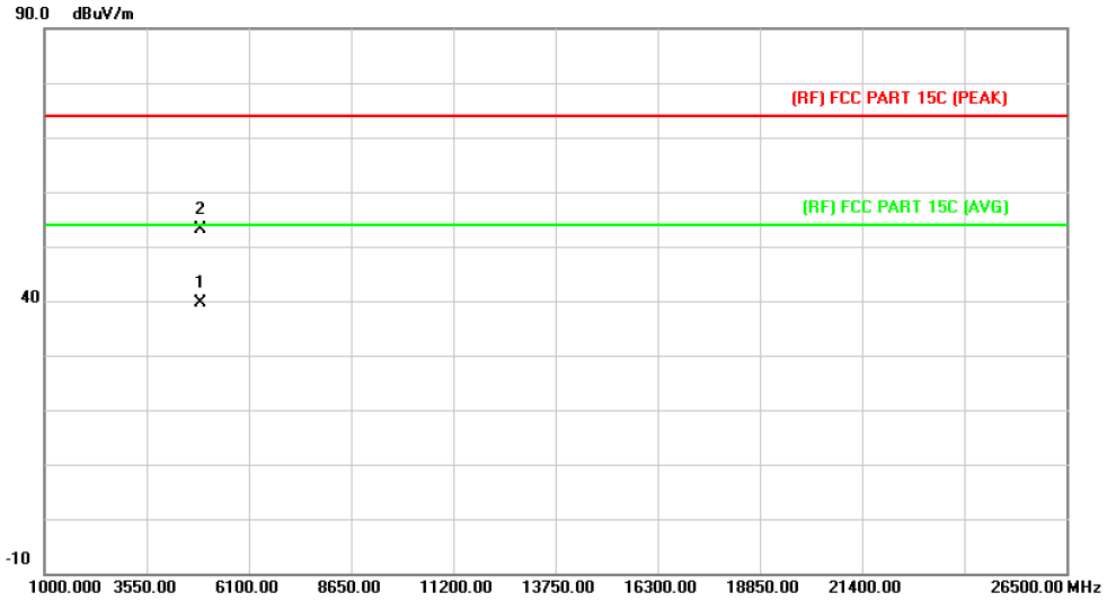
EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode 2408MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4816.139	25.22	13.51	38.73	54.00	-15.27	AVG
2		4816.229	39.48	13.51	52.99	74.00	-21.01	peak

Emission Level= Read Level+ Correct Factor

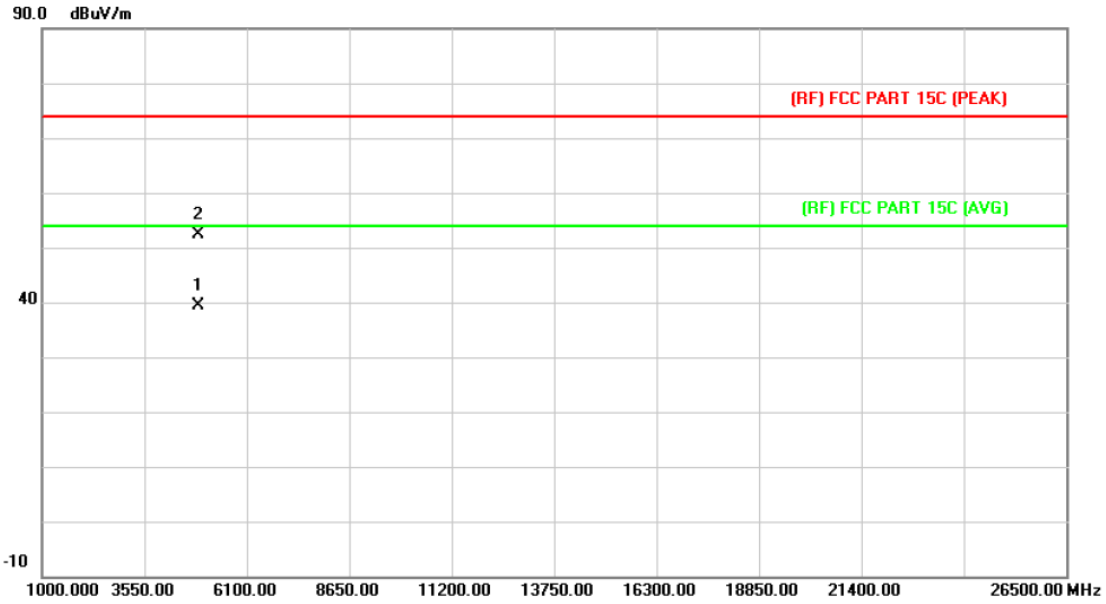
EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode 2440MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4880.076	25.73	13.89	39.62	54.00	-14.38	AVG
2		4880.127	39.31	13.89	53.20	74.00	-20.80	peak

Emission Level= Read Level+ Correct Factor

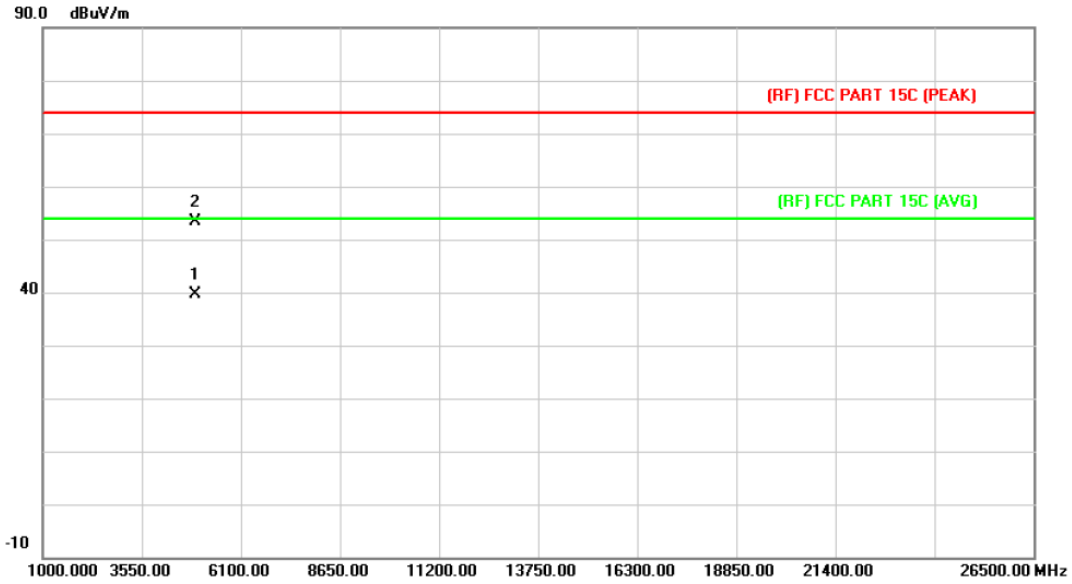
EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode 2440MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4879.500	25.53	13.89	39.42	54.00	-14.58	AVG
2		4879.891	38.55	13.89	52.44	74.00	-21.56	peak

Emission Level= Read Level+ Correct Factor

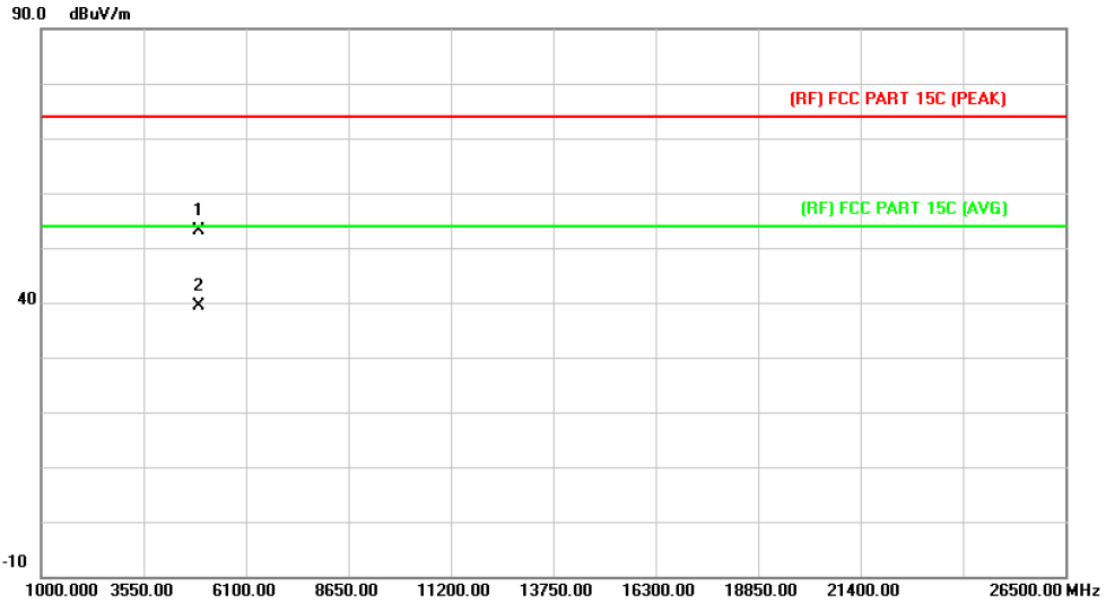
EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode 2468MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4935.597	25.33	14.22	39.55	54.00	-14.45	AVG
2		4936.316	39.16	14.22	53.38	74.00	-20.62	peak

Emission Level= Read Level+ Correct Factor

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode 2468MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4935.548	38.86	14.22	53.08	74.00	-20.92	peak
2	*	4936.084	25.27	14.22	39.49	54.00	-14.51	AVG

Emission Level= Read Level+ Correct Factor

6. Restricted Bands Requirement

6.1 Test Standard and Limit

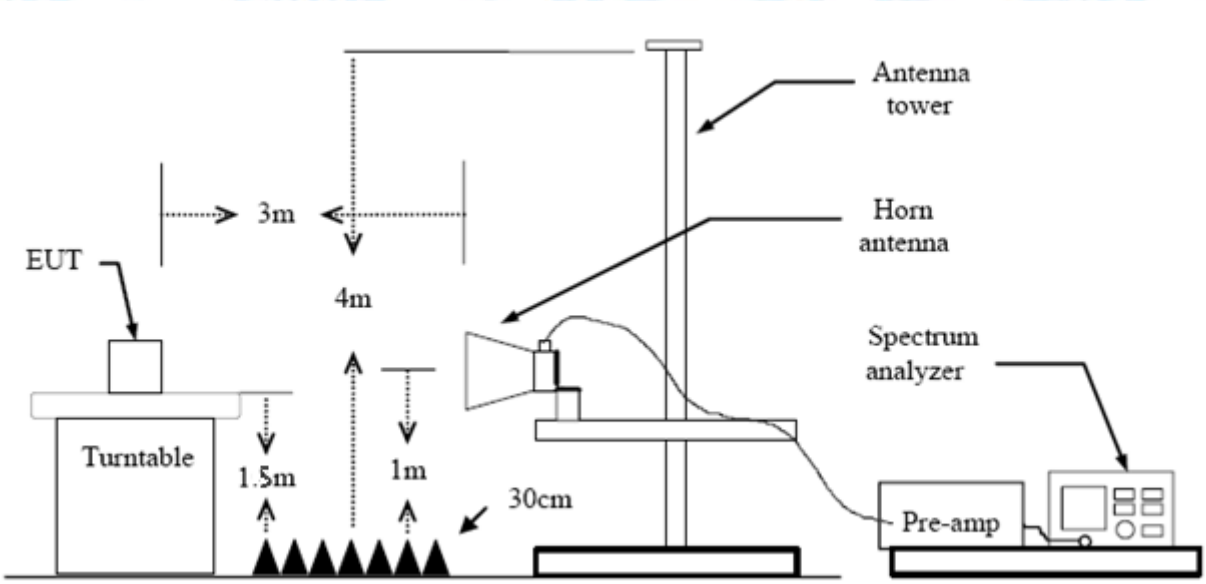
6.1.1 Test Standard

FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency Band (MHz)	Class B (dBuV/m)(at 3 M)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

6.2 Test Setup



6.3 Test Procedure

(1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.

(2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

(3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

(4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
(5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
(6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
(7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
(8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

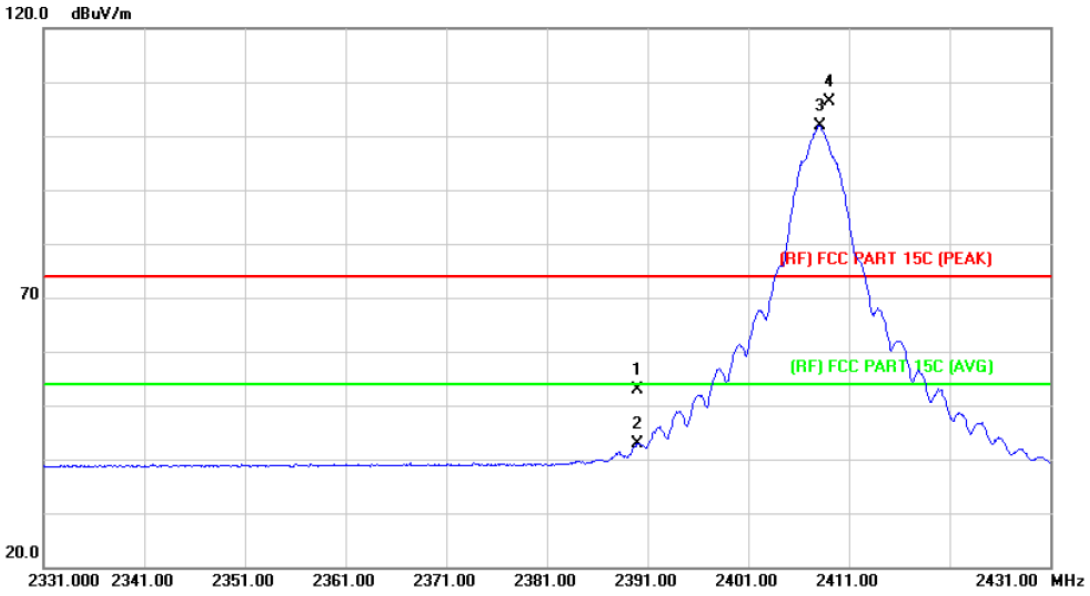
The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Please see the next page.

(1) Radiation Test

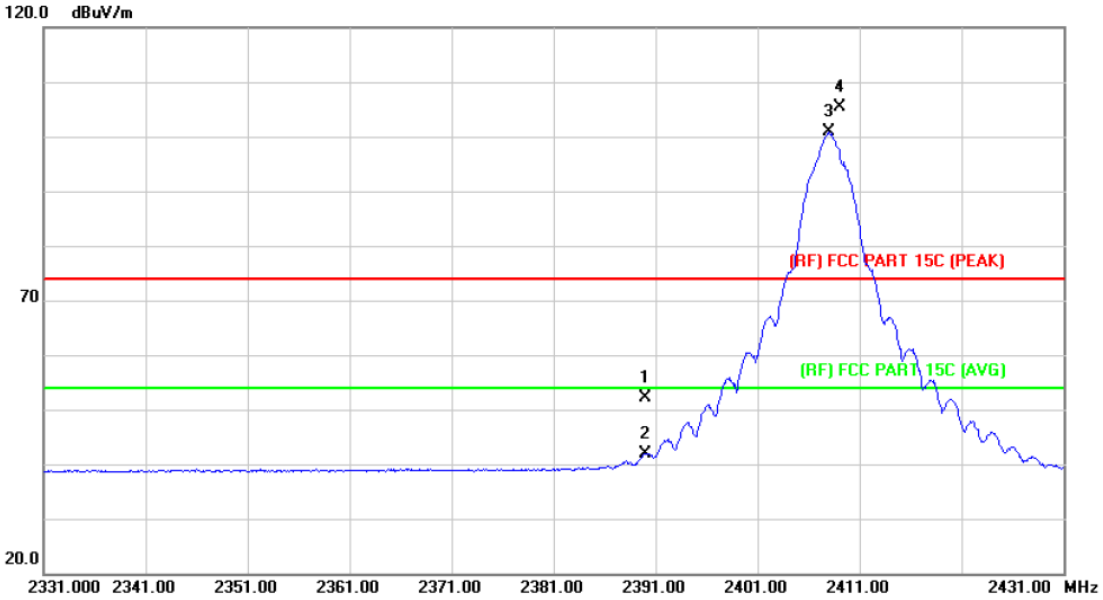
EUT:	Wireless NVR	**Model:**	NVR02
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode 2408MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	52.14	0.77	52.91	74.00	-21.09	peak
2		2390.000	42.20	0.77	42.97	54.00	-11.03	AVG
3	*	2408.100	101.10	0.85	101.95	Fundamental Frequency		AVG
4	X	2409.000	105.45	0.85	106.30	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

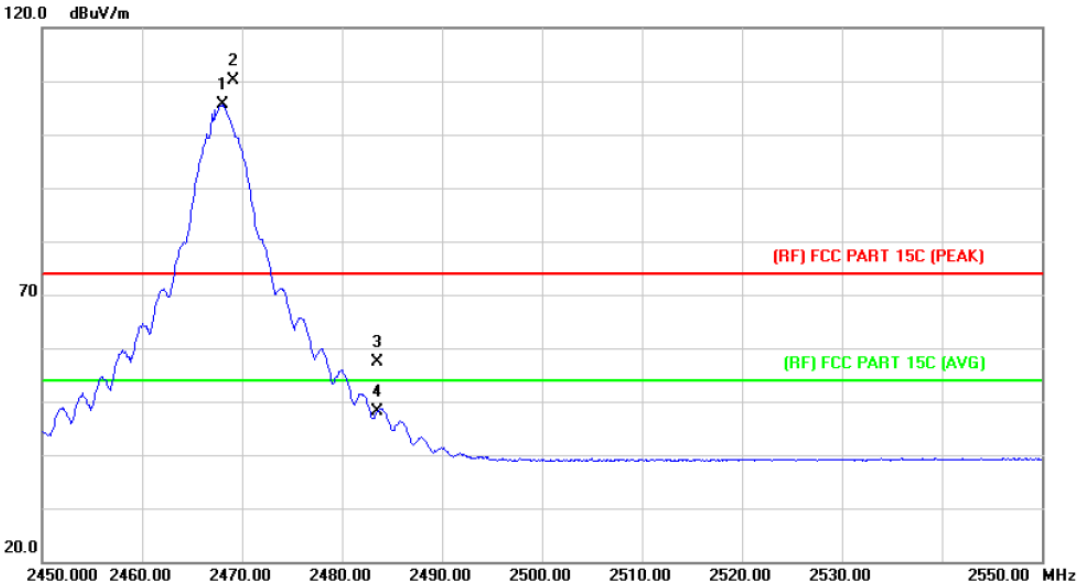
EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode 2408MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	51.35	0.77	52.12	74.00	-21.88	peak
2		2390.000	41.11	0.77	41.88	54.00	-12.12	AVG
3	*	2408.000	100.04	0.85	100.89	Fundamental Frequency		AVG
4	X	2409.000	104.47	0.85	105.32	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

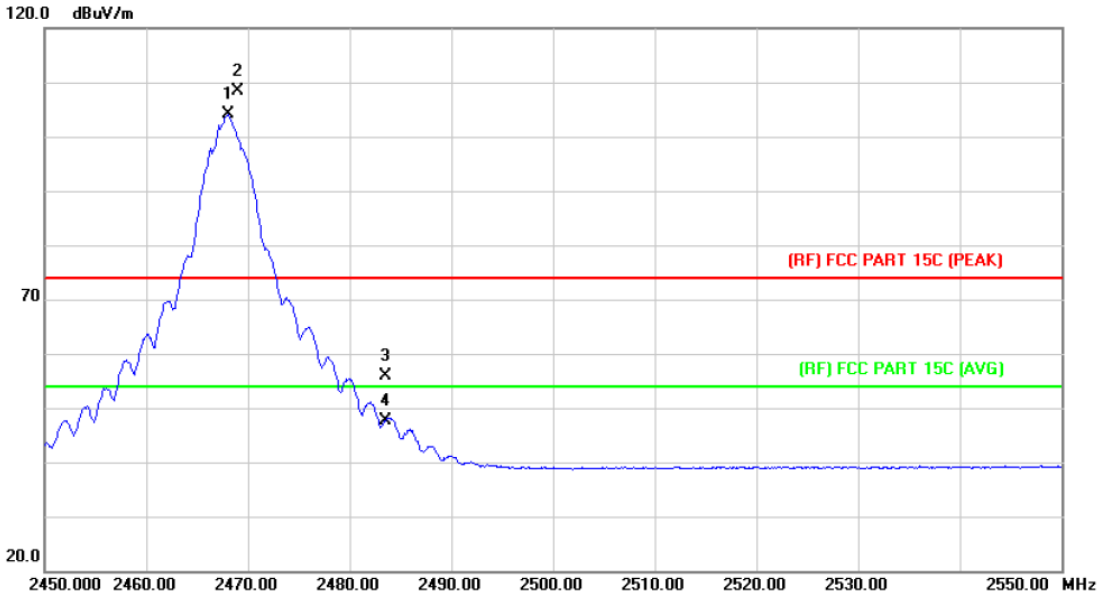
EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode 2468MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2468.000	104.41	1.11	105.52	Fundamental Frequency		AVG
2	X	2469.100	108.95	1.11	110.06	Fundamental Frequency		peak
3		2483.500	56.29	1.17	57.46	74.00	-16.54	peak
4		2483.500	46.85	1.17	48.02	54.00	-5.98	AVG

Emission Level= Read Level+ Correct Factor

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical		
Test Mode:	TX Mode 2468MHz		
Remark:	N/A		

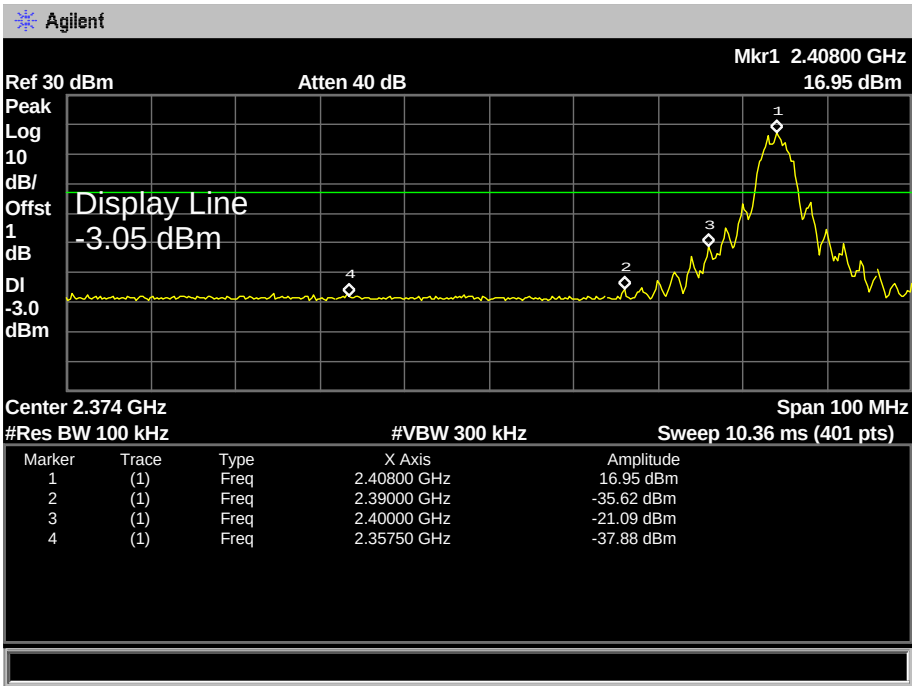


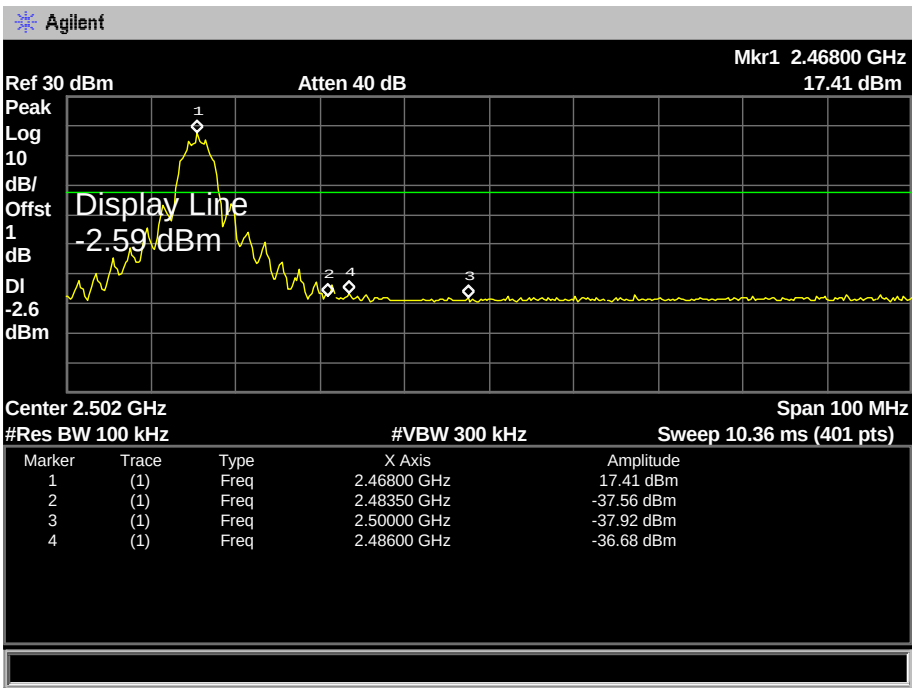
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2468.100	102.91	1.11	104.02	Fundamental Frequency		AVG
2	X	2469.000	107.24	1.11	108.35	Fundamental Frequency		peak
3		2483.500	54.83	1.17	56.00	74.00	-18.00	peak
4		2483.500	46.49	1.17	47.66	54.00	-6.34	AVG

Emission Level= Read Level+ Correct Factor

(2) Conducted Test

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Test Mode:	TX Mode 2408MHz / TX Mode 2468MHz		
Remark:	The EUT is programed in continuously transmitting mode		





7. Bandwidth Test

7.1 Test Standard and Limit

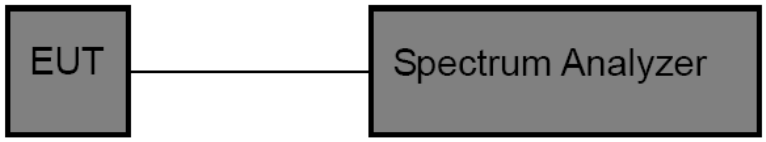
7.1.1 Test Standard

FCC Part 15.247 (a)(2)

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	**Limit**	**Frequency Range(MHz)**
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

7.2 Test Setup



7.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.

(3)Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

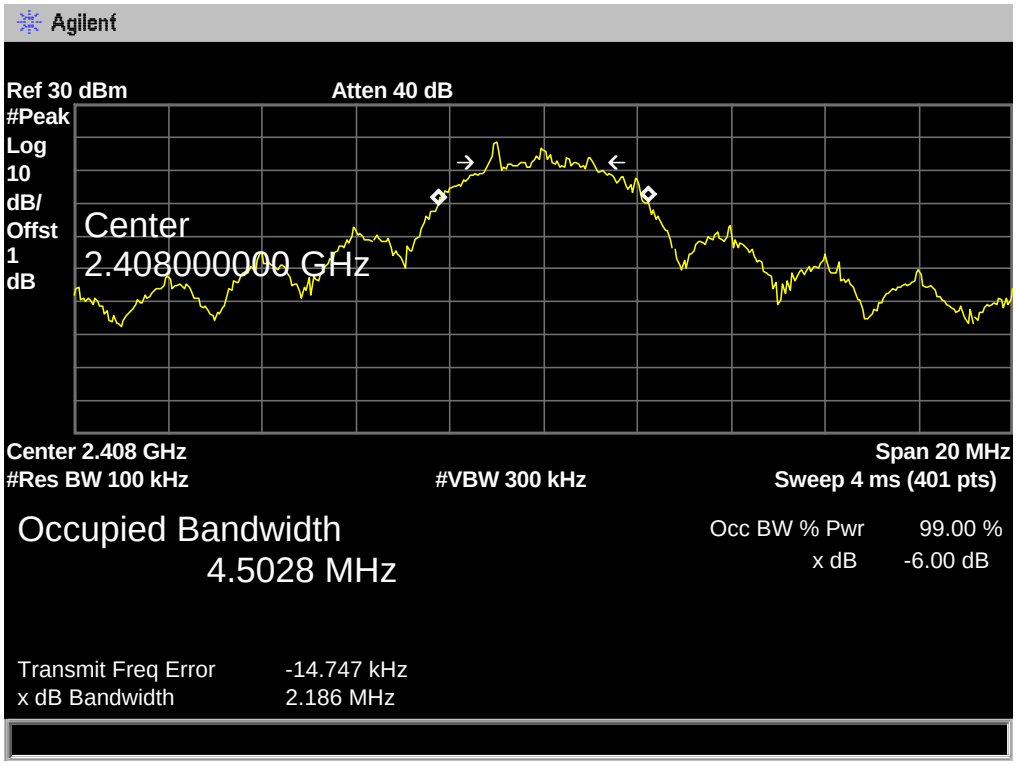
7.5 Test Data

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Test Mode:	TX Mode		

Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2408	2.186	4.5028	>=0.5
2440	2.341	4.6325	
2468	2.197	4.6251	

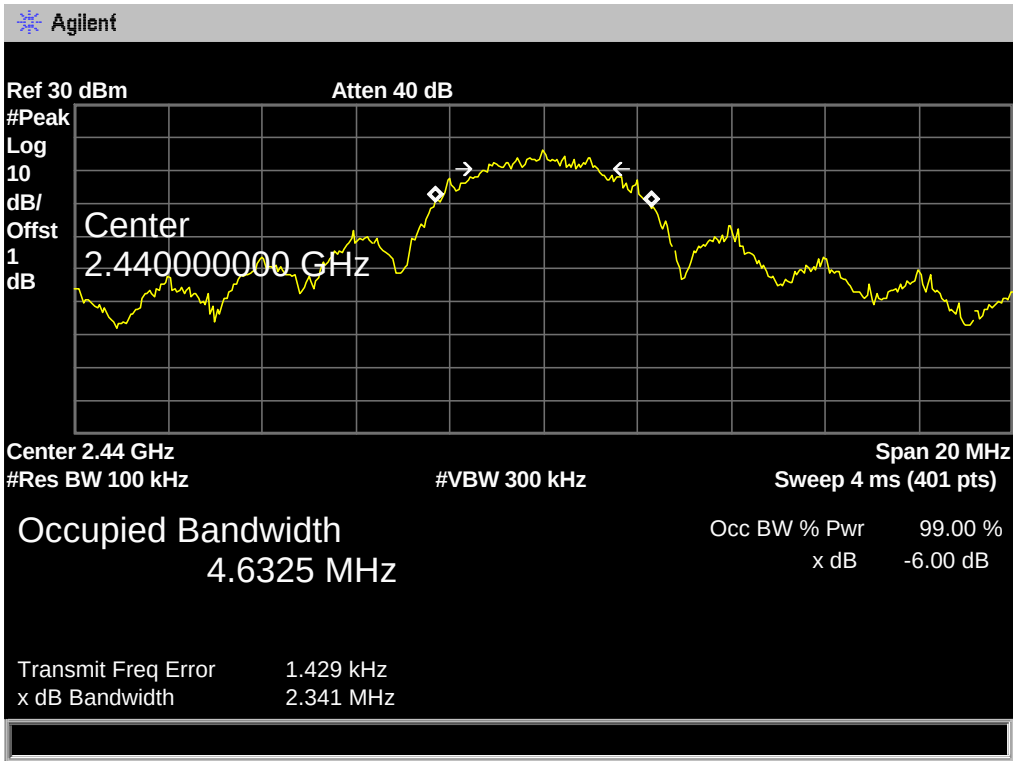
TX Mode

2408 MHz



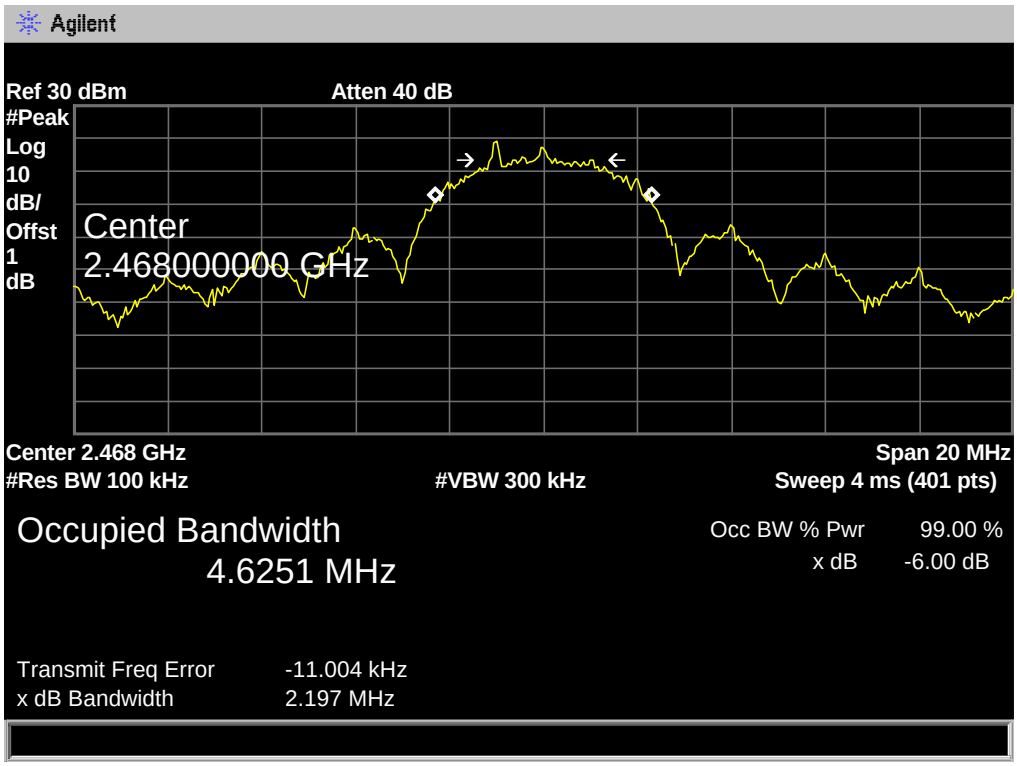
TX Mode

2440 MHz



TX Mode

2468 MHz



8. Peak Output Power Test

8.1 Test Standard and Limit

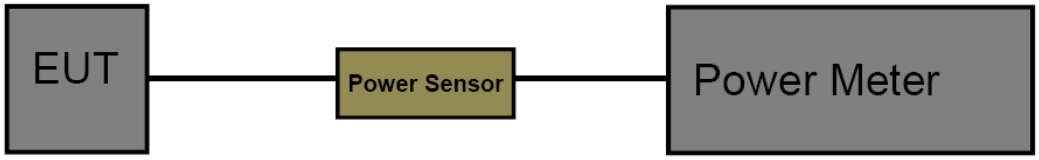
8.1.1 Test Standard

FCC Part 15.247 (b)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	**Limit**	**Frequency Range(MHz)**
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

8.2 Test Setup



8.3 Test Procedure

The measurement is according to section 9.1.2 of KDB 558074 D01 DTS Meas Guidance v03r05.
The EUT was connected to RF power meter via a broadband power sensor as show the block above. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

8.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

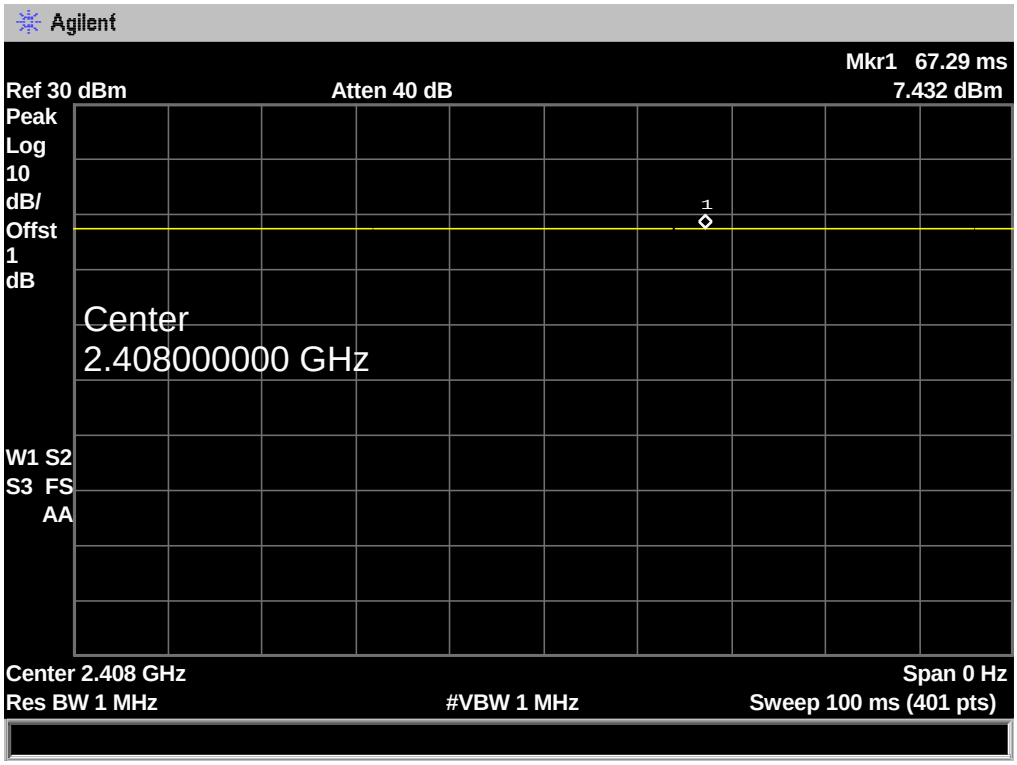
8.5 Test Data

EUT:	Wireless NVR	Model Name :	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		

Mode	Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
TX Mode	2408	16.51	30
	2440	16.60	
	2468	16.94	
Result： PASS			

Duty Cycle	
Mode	Test Result
TX Mode	>98%

TX Mode 2408 MHz



9. Power Spectral Density Test

9.1 Test Standard and Limit

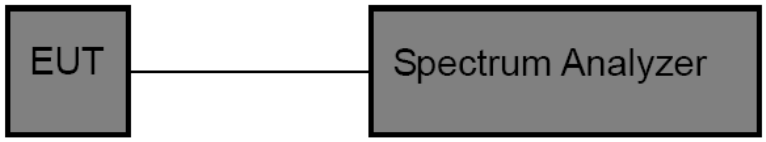
9.1.1 Test Standard

FCC Part 15.247 (e)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	**Limit**	**Frequency Range(MHz)**
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

9.2 Test Setup



9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v03r05.

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Set analyser center frequency to DTS channel center frequency.
(3) Set the span to 1.5 times the DTS bandwidth.
(4) Set the RBW to: 3 kHz
(5) Set the VBW to: 10 kHz
(6) Detector: peak
(7) Sweep time: auto
(8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

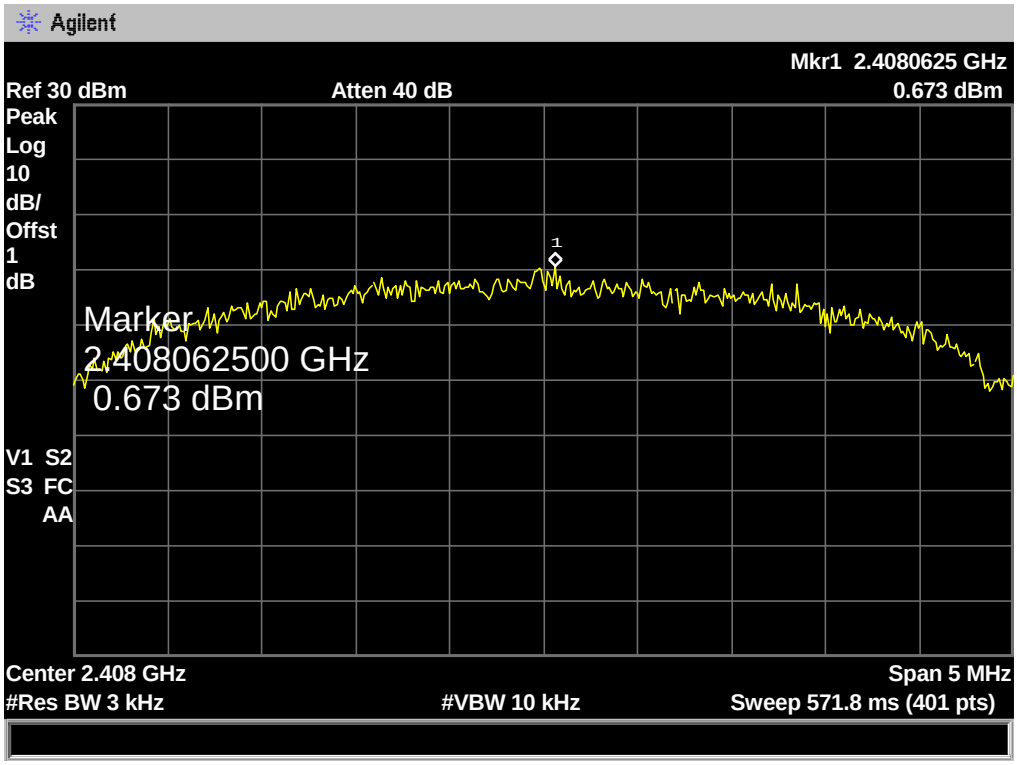
9.5 Test Data

EUT:	Wireless NVR	Model:	NVR02
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60Hz		
Test Mode:	TX Mode		

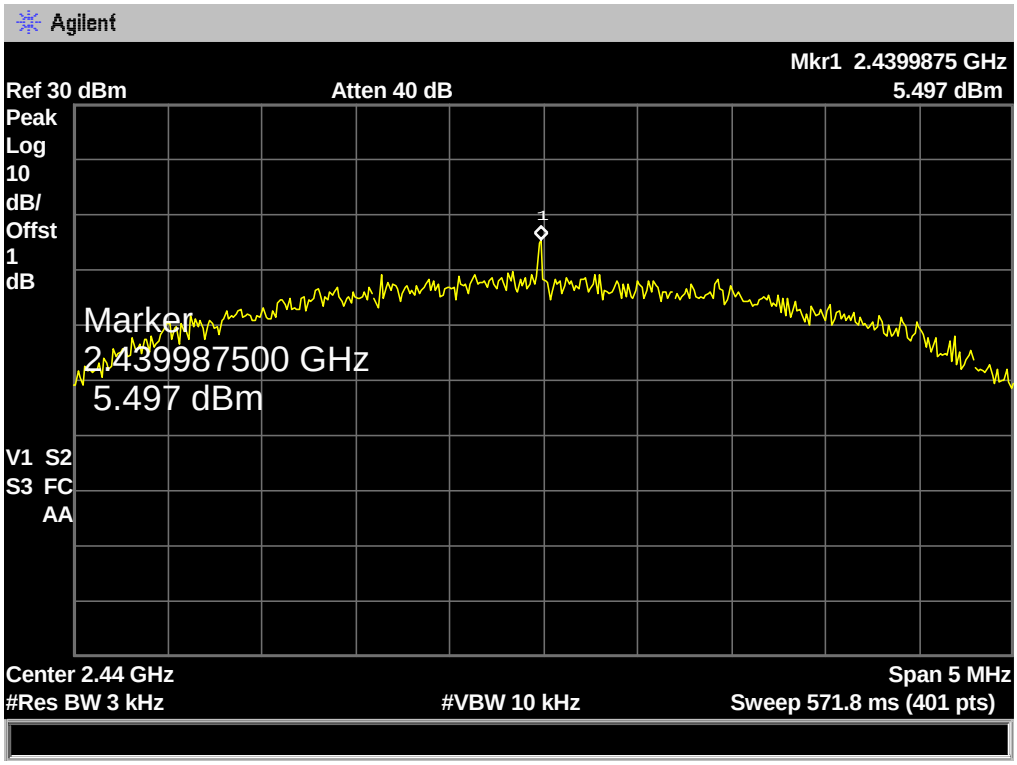
Channel Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)
2408	0.673	8
2440	5.497	
2468	4.239	

TX Mode

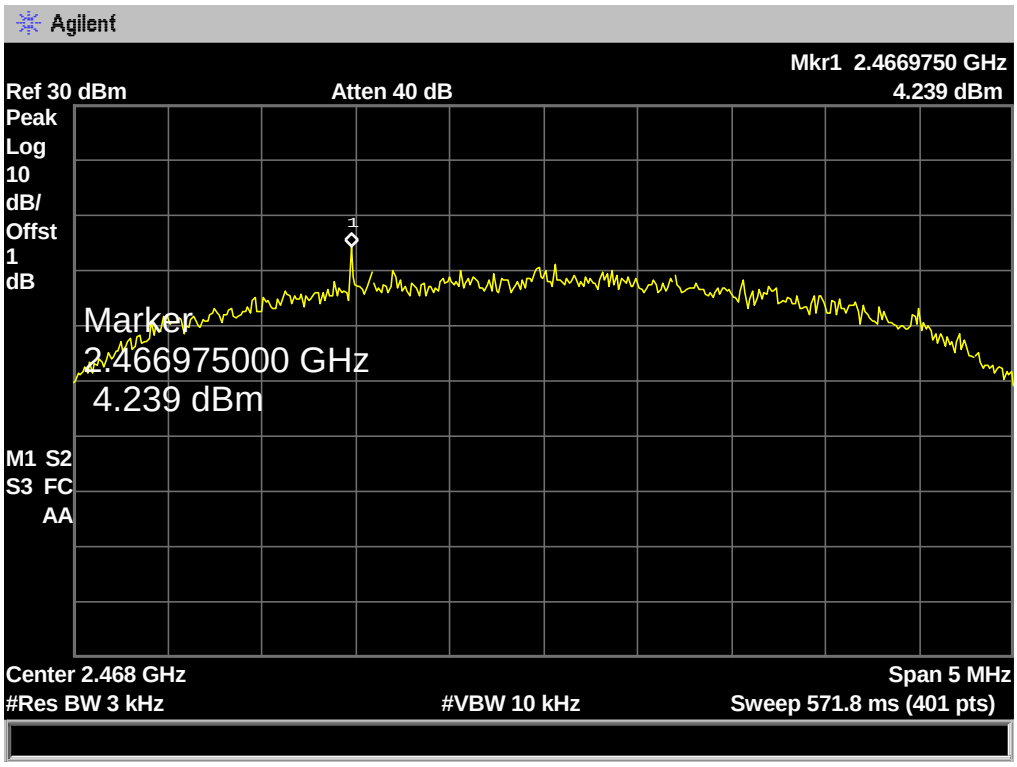
2408 MHz



TX Mode
2440 MHz



TX Mode
2468 MHz



10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard

FCC Part 15.203

10.1.2 Requirement

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 3 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

Result

The EUT antenna is a Dipole Antenna. It complies with the standard requirement.

Antenna Type
☐ Permanent attached antenna
☑ Unique connector antenna
☐ Professional installation antenna