

FCC Radio Test Report

FCC ID: 2AEP6XM-JPL1-1

Original Grant

Report No. : TB-FCC144022
Applicant : HangZhou XiongMai Technology CO., LTD
Equipment Under Test (EUT)
EUT Name : CAR DVR
Model No. : XM-JPL1-1
Serial No. : Please see the page of 4
Brand Name : XM
Receipt Date : 2015-04-27
Test Date : 2015-04-28 to 2015-05-08
Issue Date : 2015-05-09
Standards : FCC Part 15, Subpart C (15.247:2014)
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

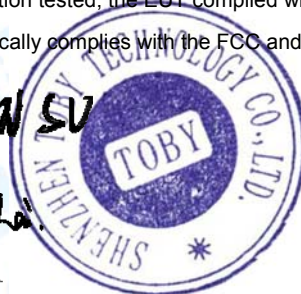
Test/Witness Engineer :

WANG SU

**Approved &
Authorized**

:

Luqin



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.

Contents

CONTENTS.....2

1. GENERAL INFORMATION ABOUT EUT4

1.1 Client Information.....4

1.2 General Description of EUT (Equipment Under Test)4

1.3 Block Diagram Showing the Configuration of System Tested.....5

1.4 Description of Support Units6

1.5 Description of Test Mode.....6

1.6 Description of Test Software Setting7

1.7 Measurement Uncertainty7

1.7 Test Facility.....8

2. TEST SUMMARY9

3. TEST EQUIPMENT10

4. CONDUCTED EMISSION TEST11

4.1 Test Standard and Limit.....11

4.2 Test Setup.....11

4.3 Test Procedure.....11

4.4 EUT Operating Mode12

4.5 Test Data.....12

5. RADIATED EMISSION TEST17

5.1 Test Standard and Limit.....17

5.2 Test Setup.....18

5.3 Test Procedure.....19

5.4 EUT Operating Condition20

5.5 Test Data.....20

6. RESTRICTED BANDS REQUIREMENT43

6.1 Test Standard and Limit.....43

6.2 Test Setup.....43

6.3 Test Procedure.....43

6.4 EUT Operating Condition44

6.5 Test Data.....44

7. BANDWIDTH TEST60

7.1 Test Standard and Limit.....60

7.2 Test Setup.....60

7.3 Test Procedure.....60

7.4 EUT Operating Condition60

7.5 Test Data.....61

8. PEAK OUTPUT POWER TEST.....67

8.1 Test Standard and Limit.....67

8.2 Test Setup.....67

- 8.3 Test Procedure.....67
- 8.4 EUT Operating Condition67
- 8.5 Test Data.....68
- 9. POWER SPECTRAL DENSITY TEST69**
- 9.1 Test Standard and Limit.....69
- 9.2 Test Setup.....69
- 9.3 Test Procedure.....69
- 9.4 EUT Operating Condition69
- 9.5 Test Data.....70
- 10. ANTENNA REQUIREMENT.....76**
- 10.1 Standard Requirement.....76
- 10.2 Antenna Connected Construction.....76
- 10.3 Result.....76

1. General Information about EUT

1.1 Client Information

Applicant : HangZhou XiongMai Technology CO., LTD
Address : 9th Floor, Building 9, Yinhu Innovation Center, No.9 FuXian Road, YinHu Street, Hangzhou, China
Manufacturer : HangZhou XiongMai Technology CO., LTD
Address : 9th Floor, Building 9, Yinhu Innovation Center, No.9 FuXian Road, YinHu Street, Hangzhou, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	CAR DVR
Models No.	:	XM-JPL1-1, XM-JPL1S-2K, XMJPL1S-4K, XM-JPL1, XM-JPL1S, XM-JPL2, XM-JPL2S, L1-1, L1S-2K, L1S-4K, L1, L1S, L2, L2S
Model Difference	:	All models are identical in the same PCB layout, interior structure and electrical circuits, the only difference is model name for commercial purpose.
Product Description	:	Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz
	Number of Channel:	802.11b/g/n(HT20):11 channels see note(3)
	RF Output Power:	802.11b: 15.30 dBm 802.11g: 13.41 dBm 802.11n (HT20): 12.16 dBm
	Antenna Gain:	2 dBi (FPC Antenna)
	Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: QPSK , BPSK, 16QAM , 64QAM 802.11n: QPSK , BPSK, 16QAM , 64QAM
	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	DC Power by Dual USB Auto Adapter
Power Rating	:	Input: DC12~24V, 1.5A USB1 output: DC 5V, 1A USB2 output: DC 5V, 2.1A
Connecting I/O Port(S)	:	Please refer to the User's Manual
Note: More detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

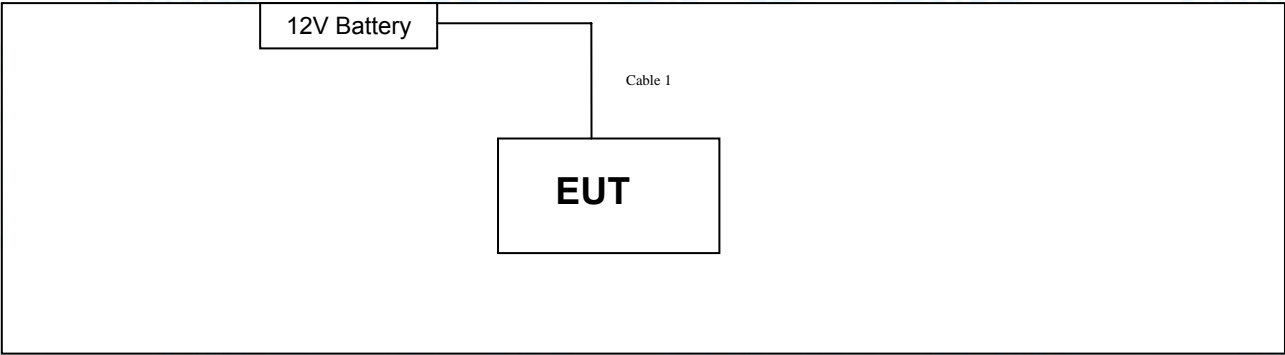
Note:

- (1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC KDB 558074 D01 DTS Meas Guidance v03r02.
- (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	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		

- (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

Equipment Information				
Name	Model	S/N	Manufacturer	Used “√”
Cable Information				
Number	Shielded Type	Ferrite Core	Length	Note
Cable 1	NO	NO	1.0M	Accessories

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	DC Charging with TX B Mode

For Radiated Test	
Final Test Mode	Description
Mode 3	TX Mode B Mode Channel 01/06/11
Mode 4	TX Mode G Mode Channel 01/06/11
Mode 5	TX Mode N(HT20) Mode Channel 01/06/11
Remark: The EUT have been pretested powered by DC 12V and DC 24V separately, and found the worst mode was when the EUT powered by DC 12V, so only showed the worst mode test data in this report.	

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:

- 802.11b Mode: CCK (1 Mbps)
- 802.11g Mode: OFDM (6 Mbps)
- 802.11n (HT20) Mode: MCS 0 (6.5 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	Realtek 11n Single Chip 92C USB WLAN MP Diagnostic Program		
Channel	CH 01	CH 06	CH 11
IEEE 802.11b DSSS	DEF	DEF	DEF
IEEE 802.11g OFDM	DEF	DEF	DEF
IEEE 802.11n (HT20)	DEF	DEF	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded 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	± 3.42 dB
	150kHz to 30MHz	± 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

1.7 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.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.

2. Test Summary

FCC Part 15 Subpart C(15.247)/RSS-210: 2010				
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-210 A.8.2(a)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS-210 A.8.4(4)	Peak Output Power	PASS	N/A
15.247(e)	RSS-210 A.8.2(b)	Power Spectral Density	PASS	N/A
15.247(d)	RSS-210 Annex 8 (A8.5)	Transmitter Radiated Spurious Emission	PASS	N/A
15.247(d)	RSS-210 Annex 8 (A8.5)	Antenna Conducted Spurious Emission	PASS	N/A

Note: “/” for no requirement for this test item.
N/A is an abbreviation for Not Applicable.

3. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Aug. 08, 2014	Aug.07, 2015
50ΩCoaxial Switch	Anritsu	MP59B	X10321	Aug. 08, 2014	Aug.07, 2015
L.I.S.N	Rohde & Schwarz	ENV216	101131	Aug. 08, 2014	Aug.07, 2015
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 08, 2014	Aug.07, 2015
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 08, 2014	Aug.07, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 08, 2014	Aug.07, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 08, 2014	Aug.07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 06, 2015	Mar.05, 2016
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	11909A	185903	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	8447B	3008A00849	Mar. 06, 2015	Mar.05, 2016
Cable	HUBER+SUHNE R	100	SUCOFLEX	Mar. 06, 2015	Mar.05, 2016
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 10, 2015	Feb.09, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

4. Conducted Emission Test

4.1 Test Standard and Limit

- 4.1.1 Test Standard
 FCC Part 15.207
- 4.1.2 Test Limit

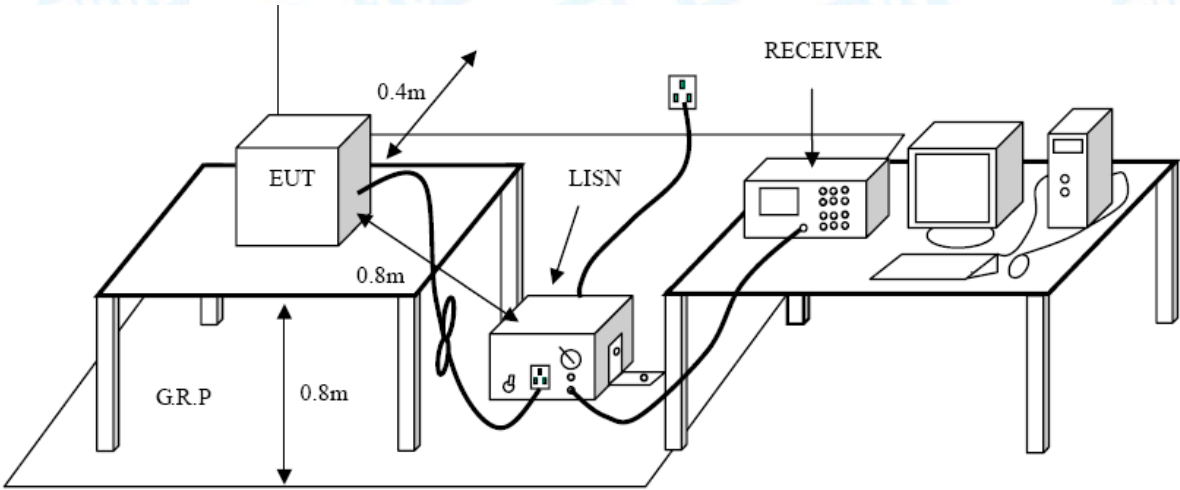
Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	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.

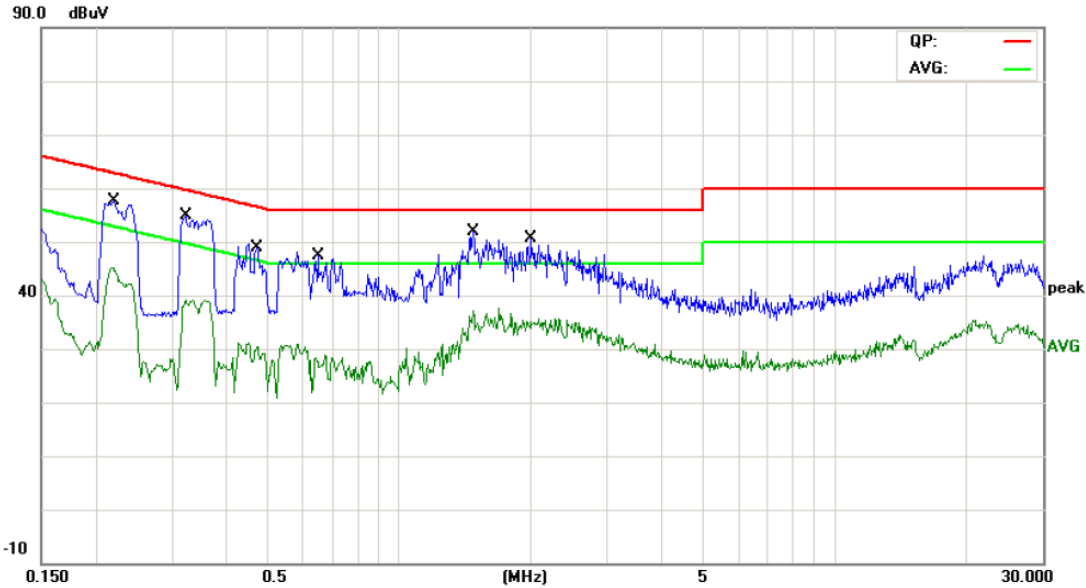
4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please see the next page.

EUT:	CAR DVR	Model Name :	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Terminal:	Line		
Test Mode:	DC Charging with TX B Mode		
Remark:	Only worse case is reported		

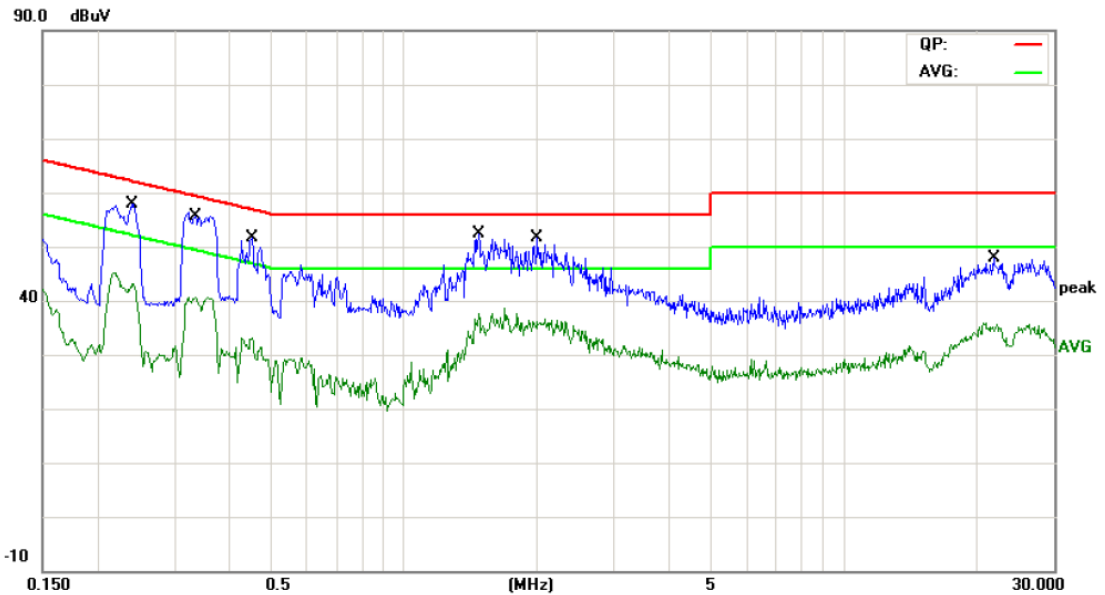


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2220	47.06	10.59	57.65	62.74	-5.09	QP
2		0.2220	33.95	10.59	44.54	52.74	-8.20	AVG
3		0.3234	44.78	10.22	55.00	59.62	-4.62	QP
4		0.3234	28.73	10.22	38.95	49.62	-10.67	AVG
5		0.4700	38.84	10.03	48.87	56.51	-7.64	QP
6		0.4700	20.46	10.03	30.49	46.51	-16.02	AVG
7		0.6500	37.39	9.95	47.34	56.00	-8.66	QP
8		0.6500	16.62	9.95	26.57	46.00	-19.43	AVG
9	*	1.4780	41.88	9.89	51.77	56.00	-4.23	QP
10		1.4780	27.20	9.89	37.09	46.00	-8.91	AVG
11		2.0059	40.80	9.88	50.68	56.00	-5.32	QP
12		2.0059	25.28	9.88	35.16	46.00	-10.84	AVG

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

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model Name :	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Terminal:	Neutral		
Test Mode:	DC Charging with TX B Mode		
Remark:	Only worse case is reported		

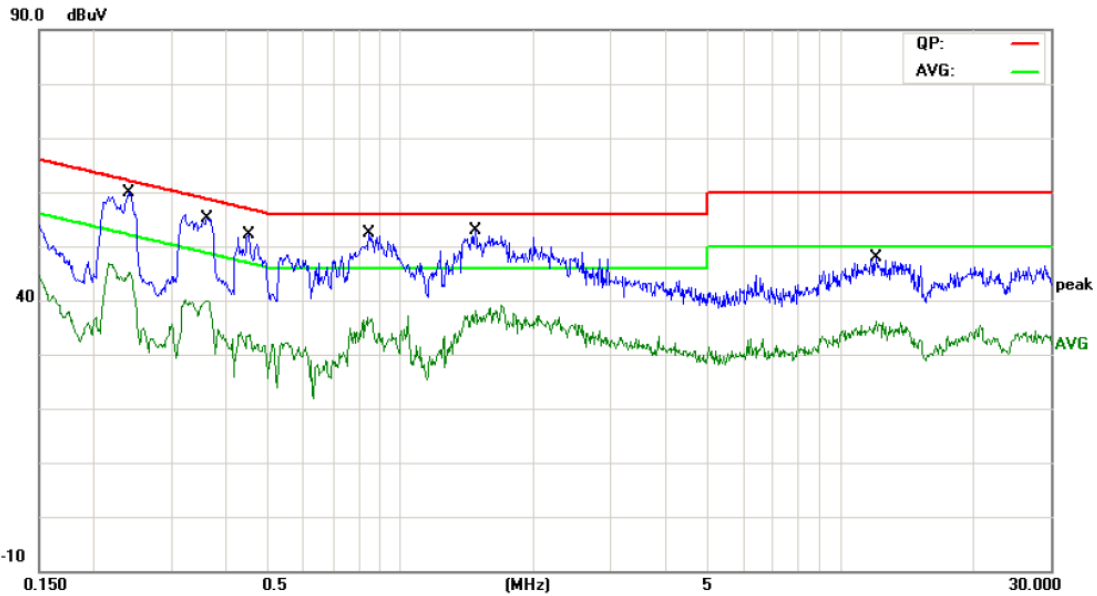


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2403	47.40	10.47	57.87	62.08	-4.21	QP
2		0.2403	32.66	10.47	43.13	52.08	-8.95	AVG
3	*	0.3339	45.52	10.21	55.73	59.35	-3.62	QP
4		0.3339	30.46	10.21	40.67	49.35	-8.68	AVG
5		0.4500	41.44	10.06	51.50	56.87	-5.37	QP
6		0.4500	22.99	10.06	33.05	46.87	-13.82	AVG
7		1.4779	42.38	9.89	52.27	56.00	-3.73	QP
8		1.4779	27.70	9.89	37.59	46.00	-8.41	AVG
9		2.0059	41.80	9.88	51.68	56.00	-4.32	QP
10		2.0059	26.28	9.88	36.16	46.00	-9.84	AVG
11		22.0459	37.16	10.71	47.87	60.00	-12.13	QP
12		22.0459	23.68	10.71	34.39	50.00	-15.61	AVG

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

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model Name :	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 24V		
Terminal:	Line		
Test Mode:	DC Charging with TX B Mode		
Remark:	Only worse case is reported		

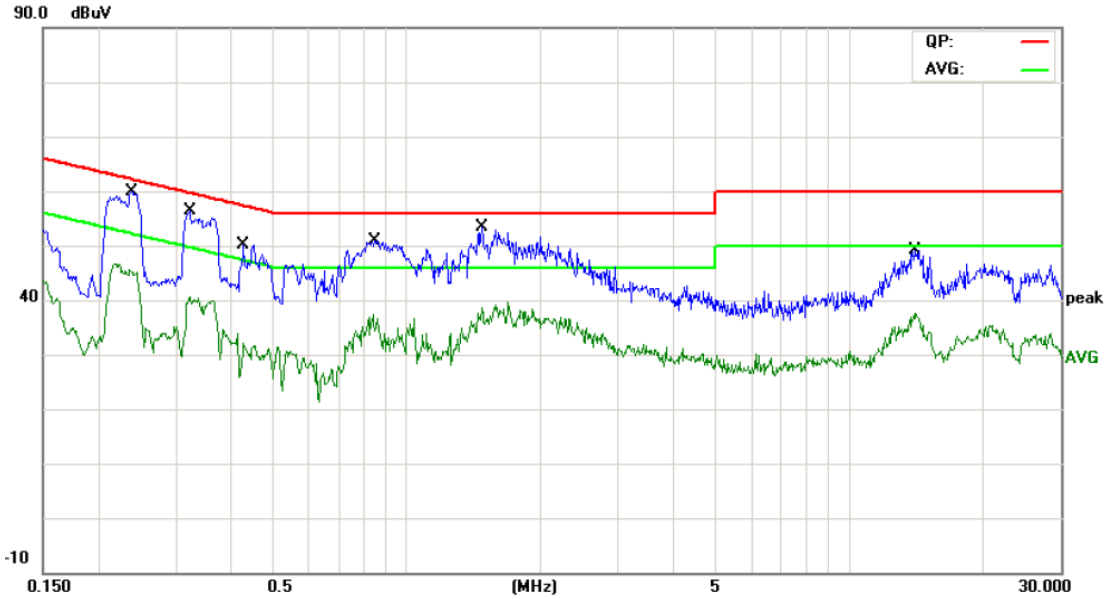


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.2403	49.40	10.47	59.87	62.08	-2.21	QP
2		0.2403	34.66	10.47	45.13	52.08	-6.95	AVG
3		0.3620	44.84	10.18	55.02	58.68	-3.66	QP
4		0.3620	29.73	10.18	39.91	48.68	-8.77	AVG
5		0.4500	41.94	10.06	52.00	56.87	-4.87	QP
6		0.4500	23.49	10.06	33.55	46.87	-13.32	AVG
7		0.8460	42.53	9.94	52.47	56.00	-3.53	QP
8		0.8460	26.02	9.94	35.96	46.00	-10.04	AVG
9		1.4778	42.88	9.89	52.77	56.00	-3.23	QP
10		1.4778	28.20	9.89	38.09	46.00	-7.91	AVG
11		12.0099	37.43	10.55	47.98	60.00	-12.02	QP
12		12.0099	25.46	10.55	36.01	50.00	-13.99	AVG

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

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model Name :	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 24V		
Terminal:	Neutral		
Test Mode:	DC Charging with TX B Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.2380	49.44	10.49	59.93	62.16	-2.23	QP
2		0.2380	34.72	10.49	45.21	52.16	-6.95	AVG
3		0.3220	46.27	10.23	56.50	59.65	-3.15	QP
4		0.3220	30.22	10.23	40.45	49.65	-9.20	AVG
5		0.4260	40.08	10.10	50.18	57.33	-7.15	QP
6		0.4260	21.99	10.10	32.09	47.33	-15.24	AVG
7		0.8460	41.03	9.94	50.97	56.00	-5.03	QP
8		0.8460	24.52	9.94	34.46	46.00	-11.54	AVG
9		1.4778	43.38	9.89	53.27	56.00	-2.73	QP
10		1.4778	28.70	9.89	38.59	46.00	-7.41	AVG
11		14.0459	38.39	10.70	49.09	60.00	-10.91	QP
12		14.0459	25.86	10.70	36.56	50.00	-13.44	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

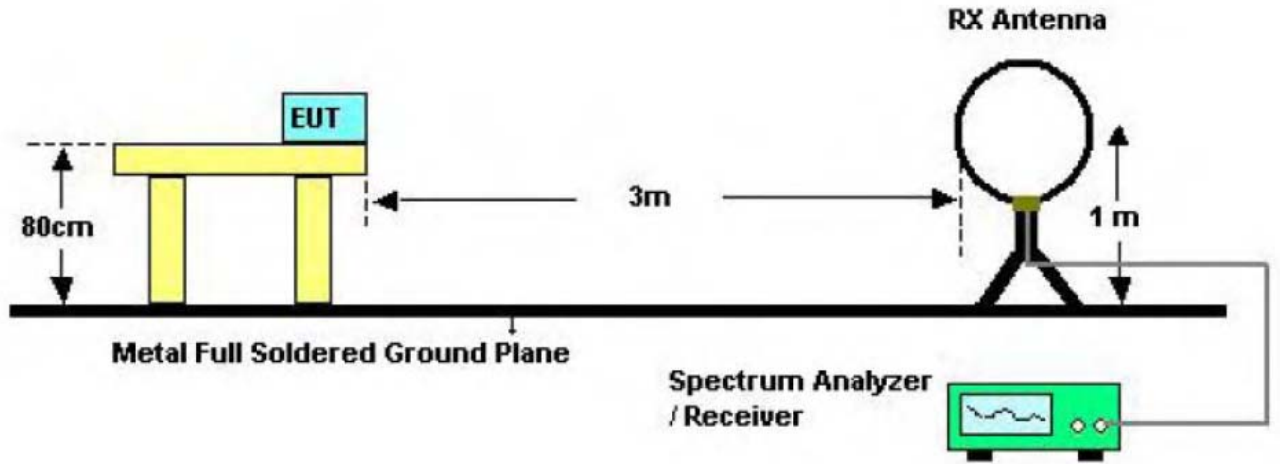
Radiated Emission Limit (Above 1000MHz)

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

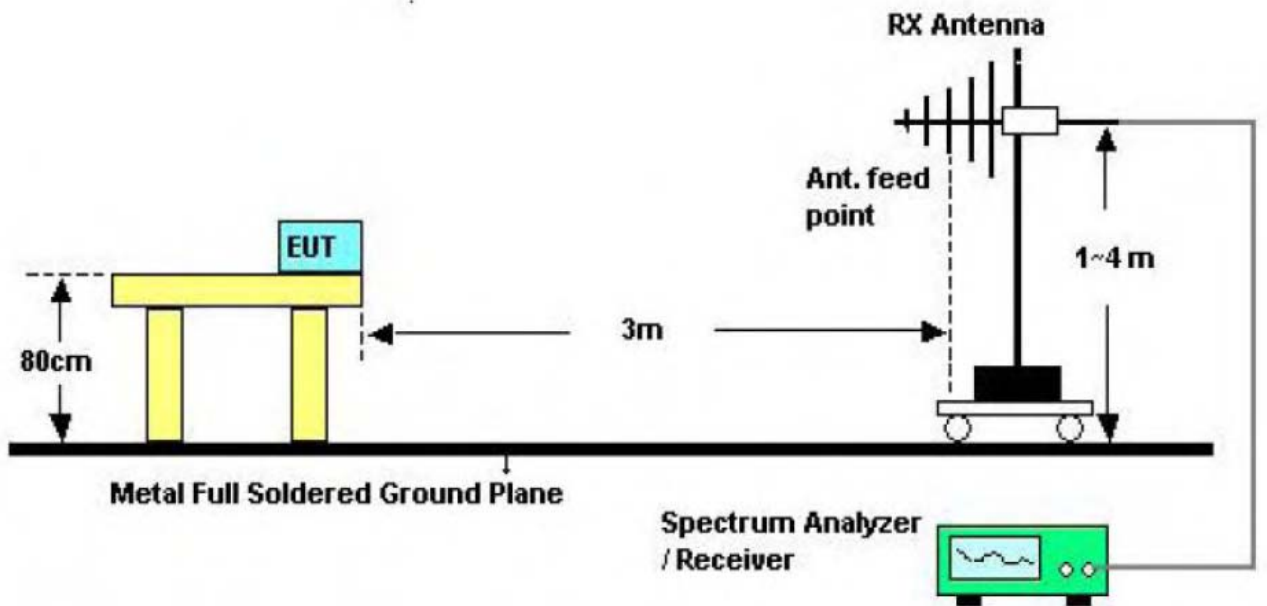
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

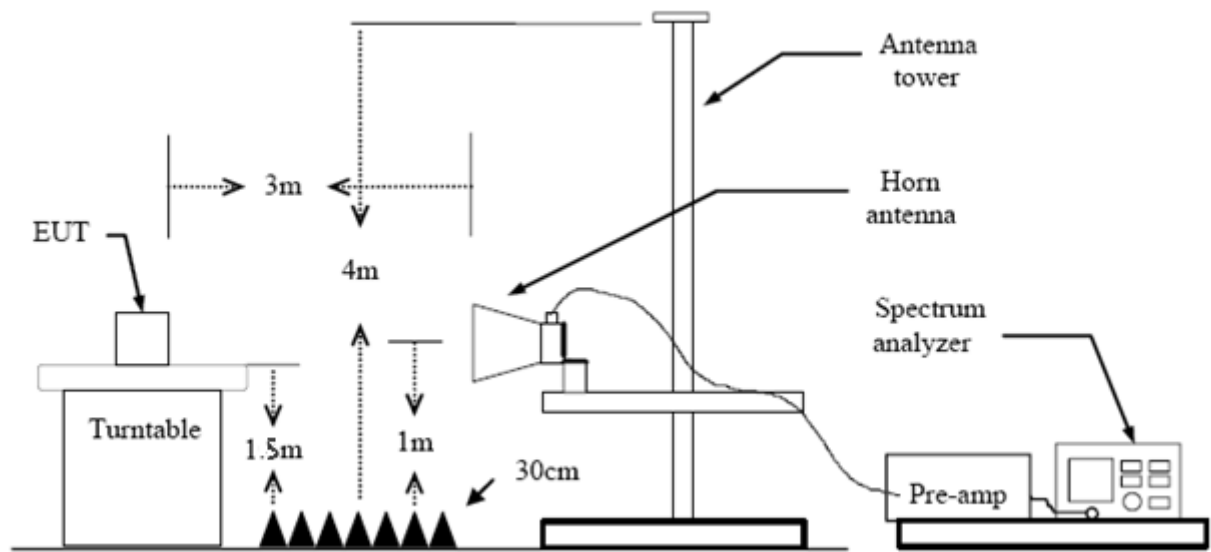
5.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

5.3 Test Procedure

- (1) 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.

5.4 EUT Operating Condition

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

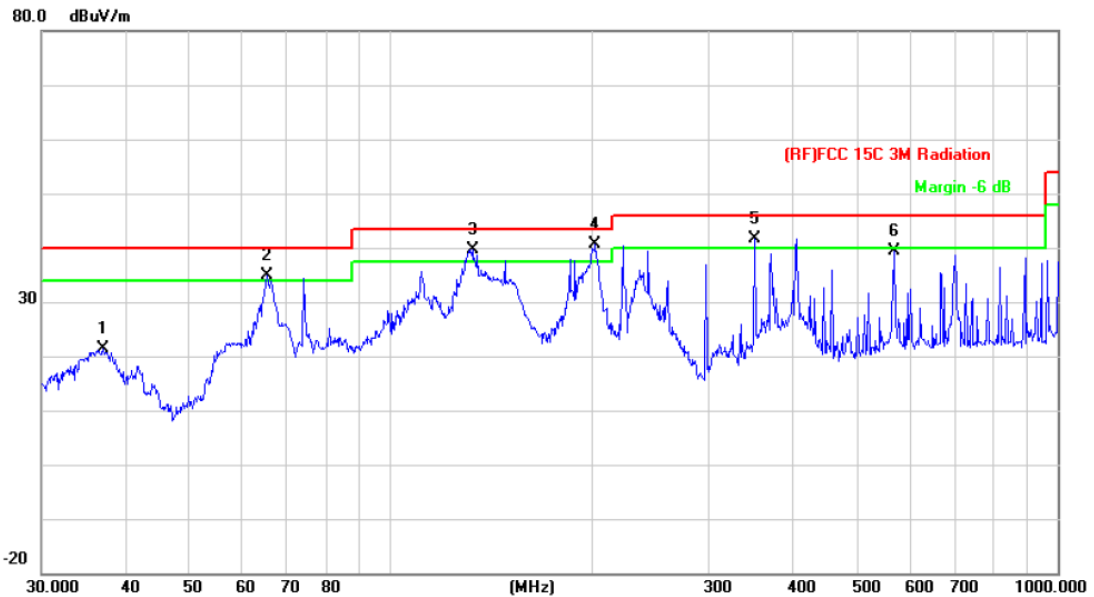
5.5 Test Data

Remark 1: 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.

Remark 2: 30 MHz~1GHz radiated emissions have been tested both DC 12V and DC 24V, and the worst mode is when the EUT powered by DC 12V power, so for the above 1 GHz radiated emissions only showed the worst mode.

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

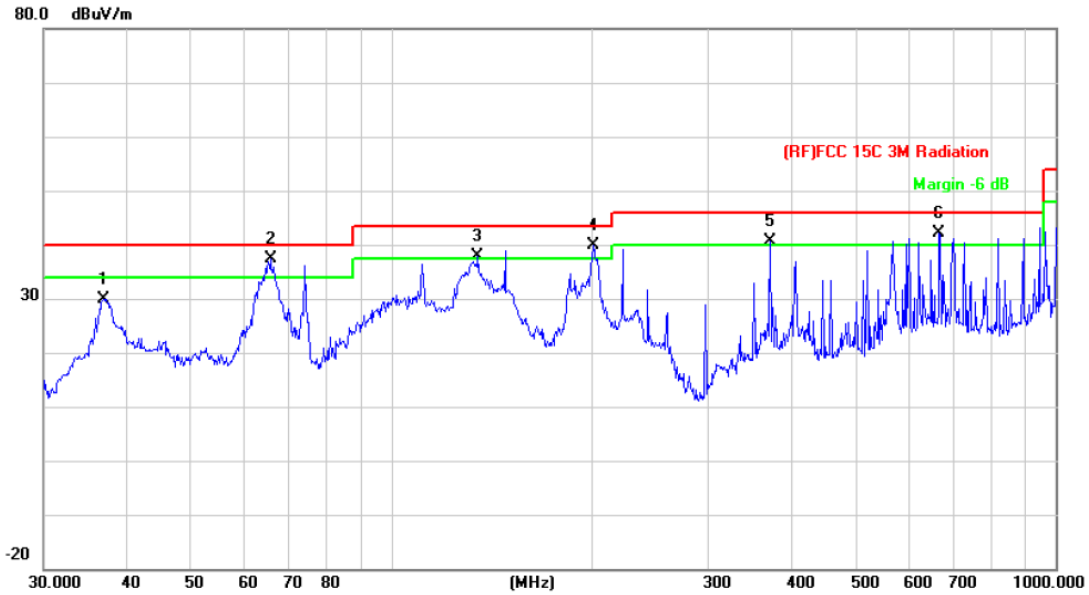


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		37.0248	39.61	-18.31	21.30	40.00	-18.70	peak
2	!	65.3431	58.89	-24.04	34.85	40.00	-5.15	peak
3	!	132.6850	61.78	-22.13	39.65	43.50	-3.85	peak
4	*	202.8103	60.90	-20.27	40.63	43.50	-2.87	peak
5	!	351.7078	56.13	-14.60	41.53	46.00	-4.47	peak
6		568.6127	49.59	-10.13	39.46	46.00	-6.54	peak

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

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

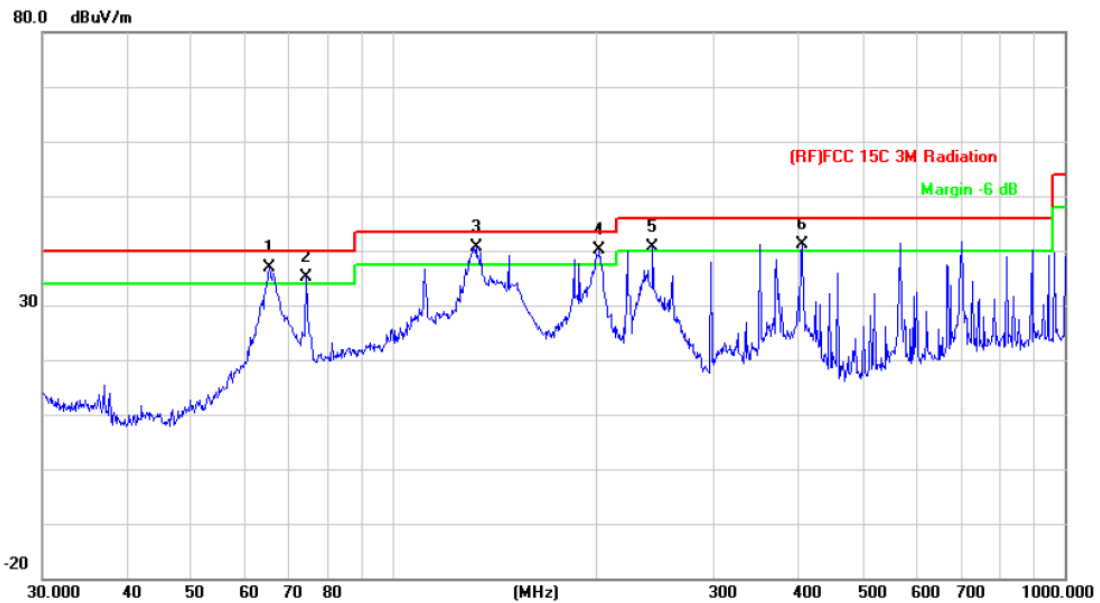


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		36.8952	48.10	-18.23	29.87	40.00	-10.13	peak
2	*	65.8031	61.47	-23.99	37.48	40.00	-2.52	peak
3	!	135.0319	59.85	-22.08	37.77	43.50	-5.73	peak
4	!	201.3930	60.30	-20.32	39.98	43.50	-3.52	peak
5	!	372.0045	55.15	-14.48	40.67	46.00	-5.33	peak
6	!	668.1422	49.94	-7.87	42.07	46.00	-3.93	peak

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

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 24V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

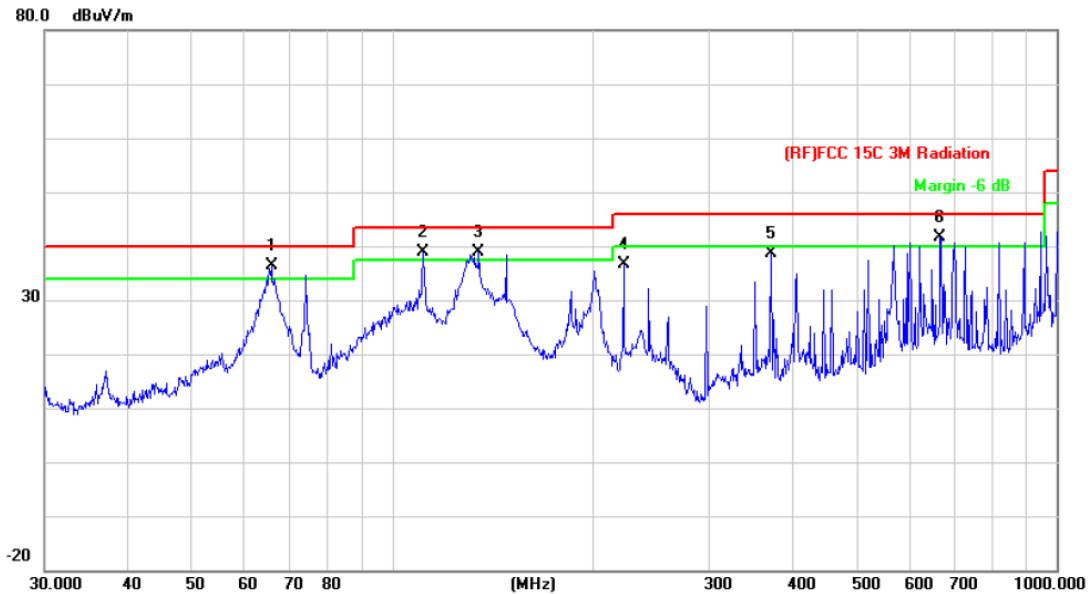


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	!	65.3431	60.89	-24.04	36.85	40.00	-3.15	peak
2	!	74.1350	58.73	-23.48	35.25	40.00	-4.75	peak
3	*	132.6850	62.78	-22.13	40.65	43.50	-2.85	peak
4	!	202.8103	60.40	-20.27	40.13	43.50	-3.37	peak
5	!	243.3771	59.18	-18.43	40.75	46.00	-5.25	peak
6	!	406.0880	53.86	-12.83	41.03	46.00	-4.97	peak

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

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 24V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

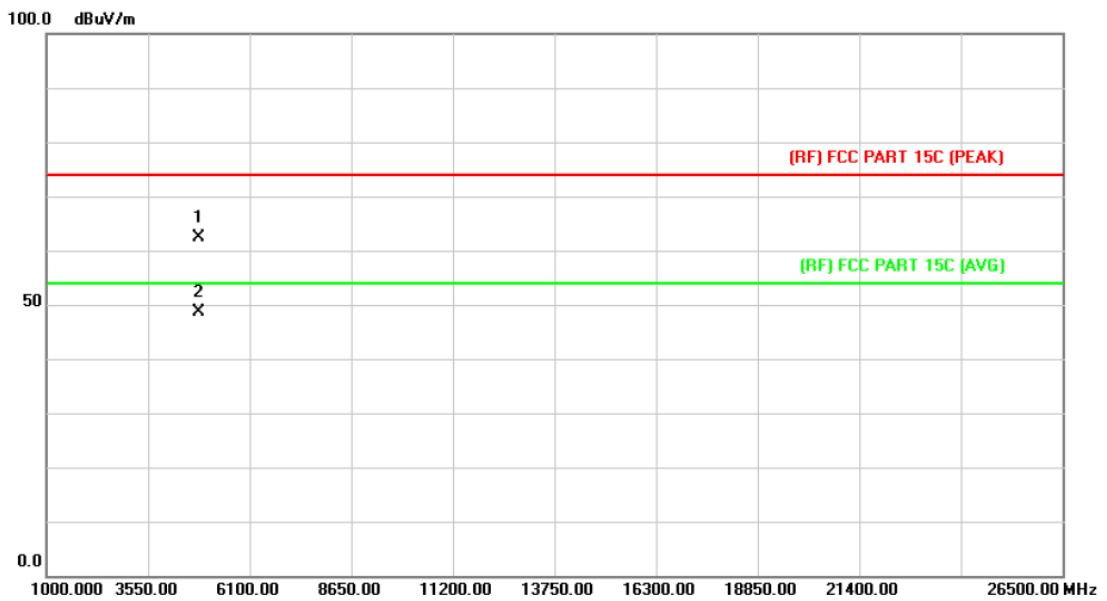


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	65.8031	60.47	-23.99	36.48	40.00	-3.52	peak
2	!	111.3468	60.76	-21.95	38.81	43.50	-4.69	peak
3	!	135.0319	60.85	-22.08	38.77	43.50	-4.73	peak
4		222.9499	56.09	-19.40	36.69	46.00	-9.31	peak
5		372.0045	53.15	-14.48	38.67	46.00	-7.33	peak
6	!	668.1422	49.44	-7.87	41.57	46.00	-4.43	peak

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

Emission Level= Read Level+ Correct Factor

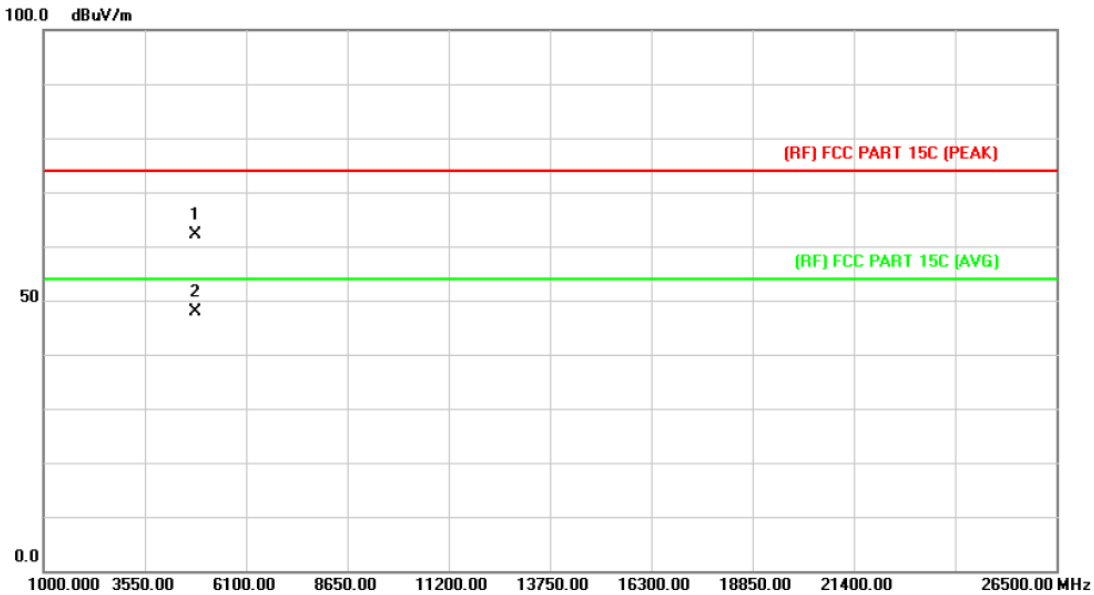
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4823.955	48.92	13.56	62.48	74.00	-11.52	peak
2	*	4823.994	35.06	13.56	48.62	54.00	-5.38	AVG

Emission Level= Read Level+ Correct Factor

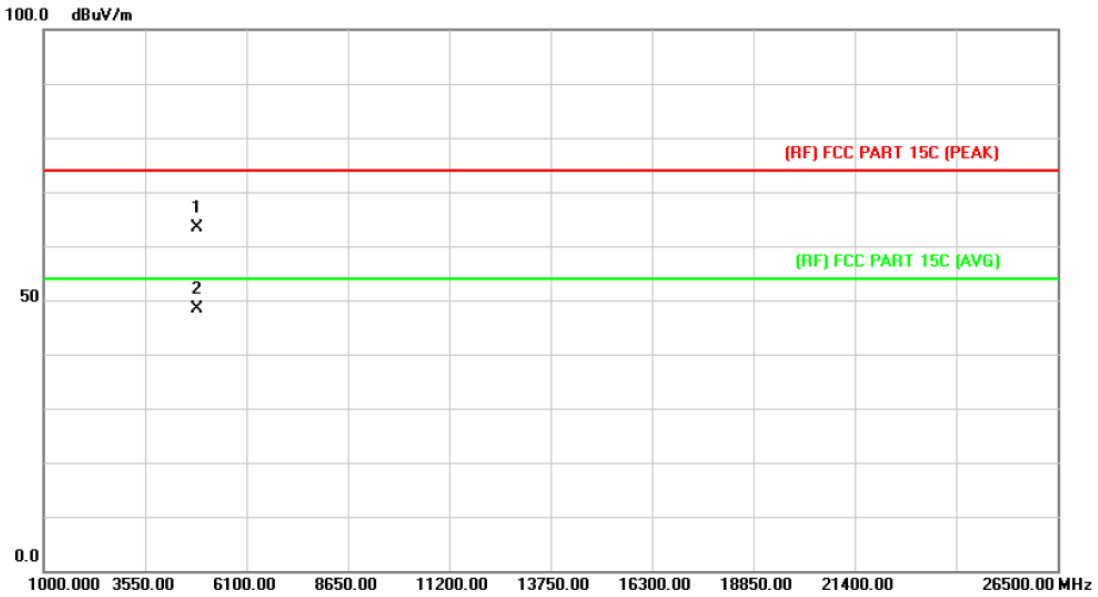
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.982	48.56	13.56	62.12	74.00	-11.88	peak
2	*	4824.009	34.42	13.56	47.98	54.00	-6.02	AVG

Emission Level= Read Level+ Correct Factor

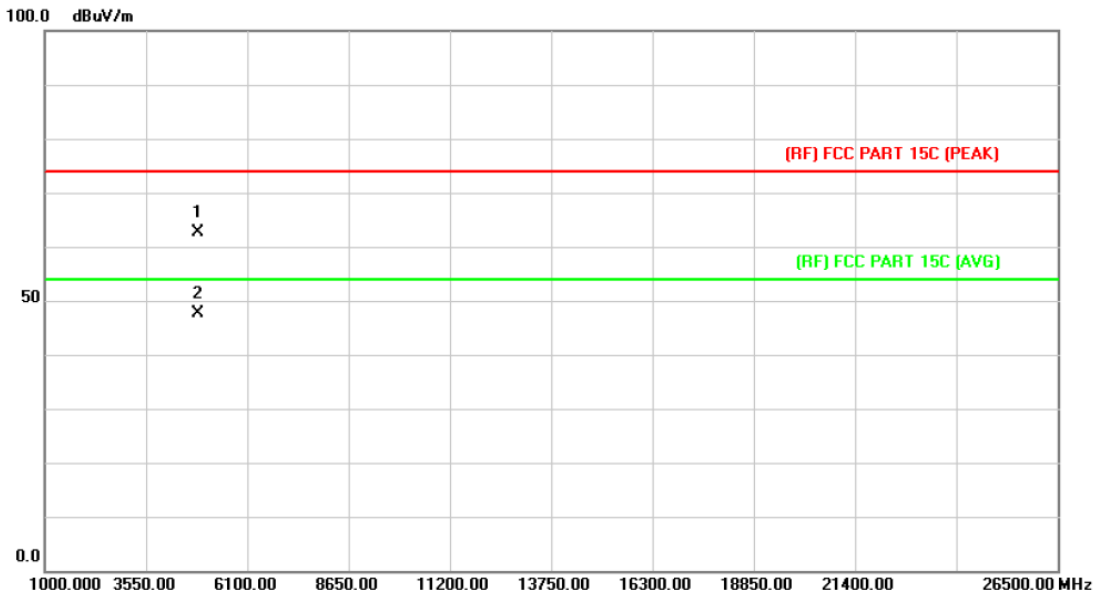
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4873.912	49.55	13.86	63.41	74.00	-10.59	peak
2	*	4873.956	34.45	13.86	48.31	54.00	-5.69	AVG

Emission Level= Read Level+ Correct Factor

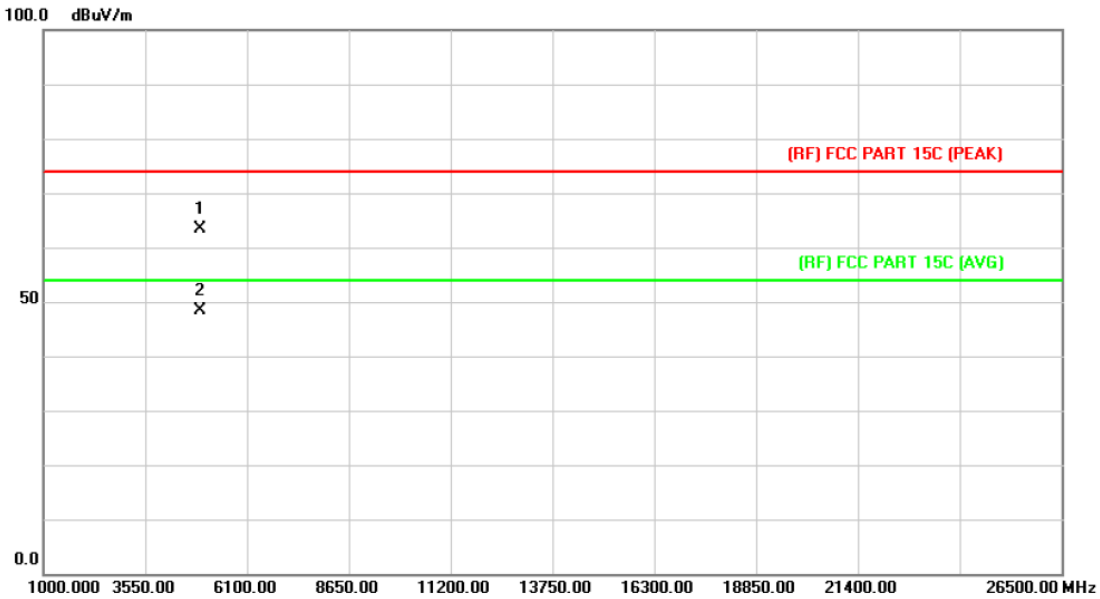
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4873.830	48.71	13.86	62.57	74.00	-11.43	peak
2	*	4873.830	33.79	13.86	47.65	54.00	-6.35	AVG

Emission Level= Read Level+ Correct Factor

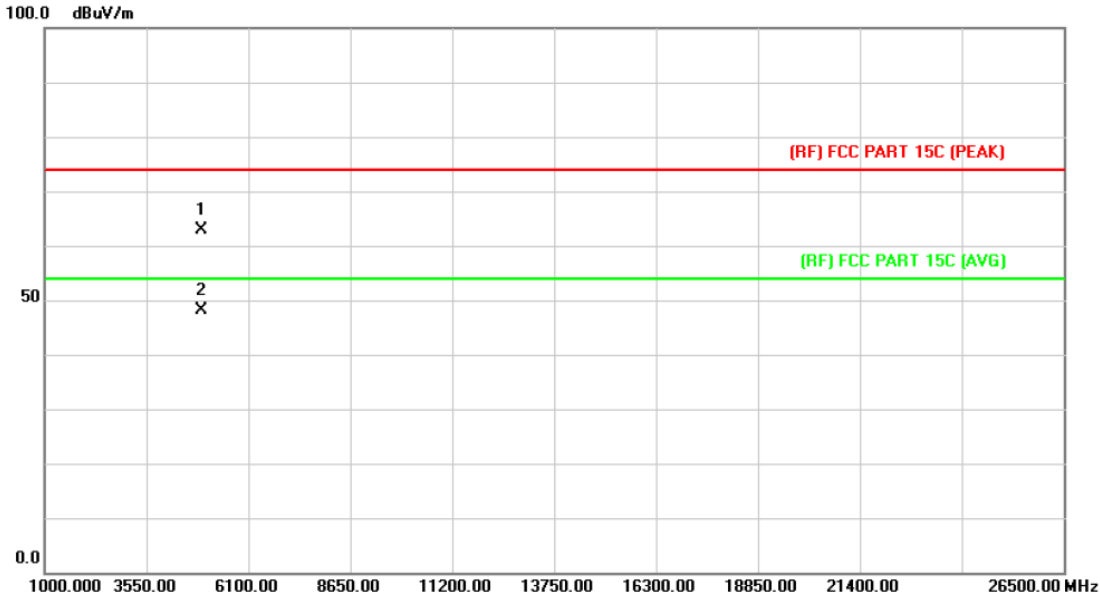
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4924.037	49.29	14.15	63.44	74.00	-10.56	peak
2	*	4924.063	34.20	14.15	48.35	54.00	-5.65	AVG

Emission Level= Read Level+ Correct Factor

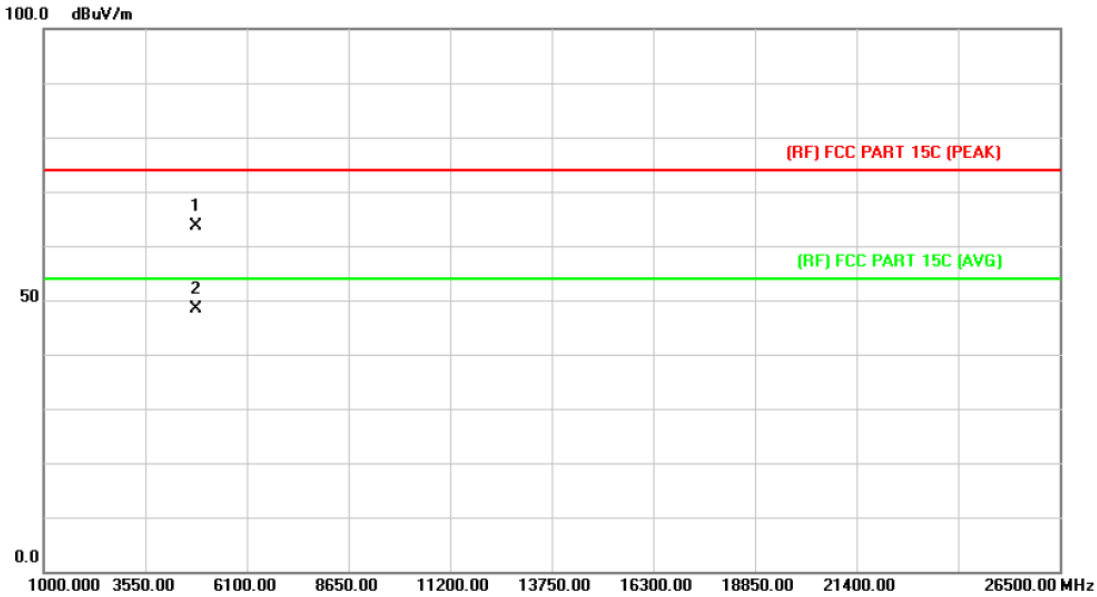
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4923.981	48.72	14.15	62.87	74.00	-11.13	peak
2	*	4924.081	33.96	14.15	48.11	54.00	-5.89	AVG

Emission Level= Read Level+ Correct Factor

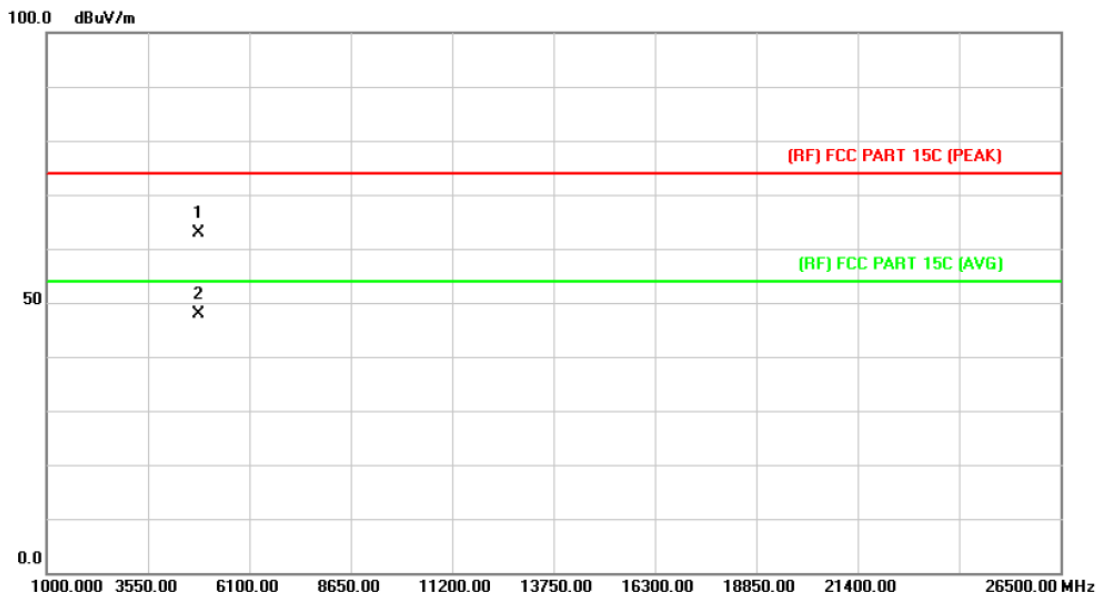
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4823.921	50.08	13.56	63.64	74.00	-10.36	peak
2	*	4823.963	34.78	13.56	48.34	54.00	-5.66	AVG

Emission Level= Read Level+ Correct Factor

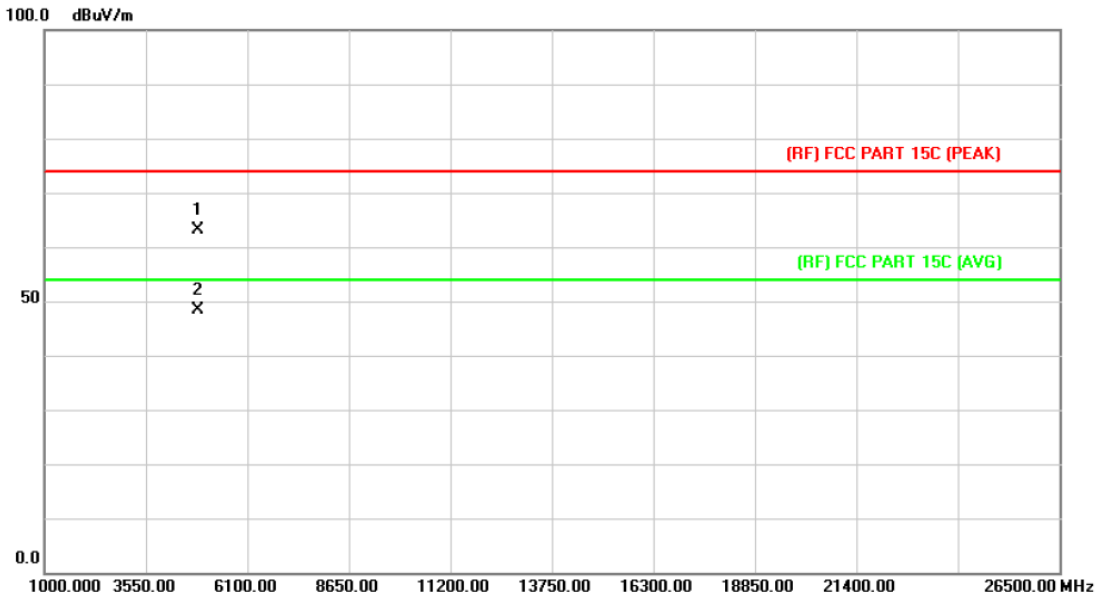
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.887	49.21	13.56	62.77	74.00	-11.23	peak
2	*	4823.895	34.22	13.56	47.78	54.00	-6.22	AVG

Emission Level= Read Level+ Correct Factor

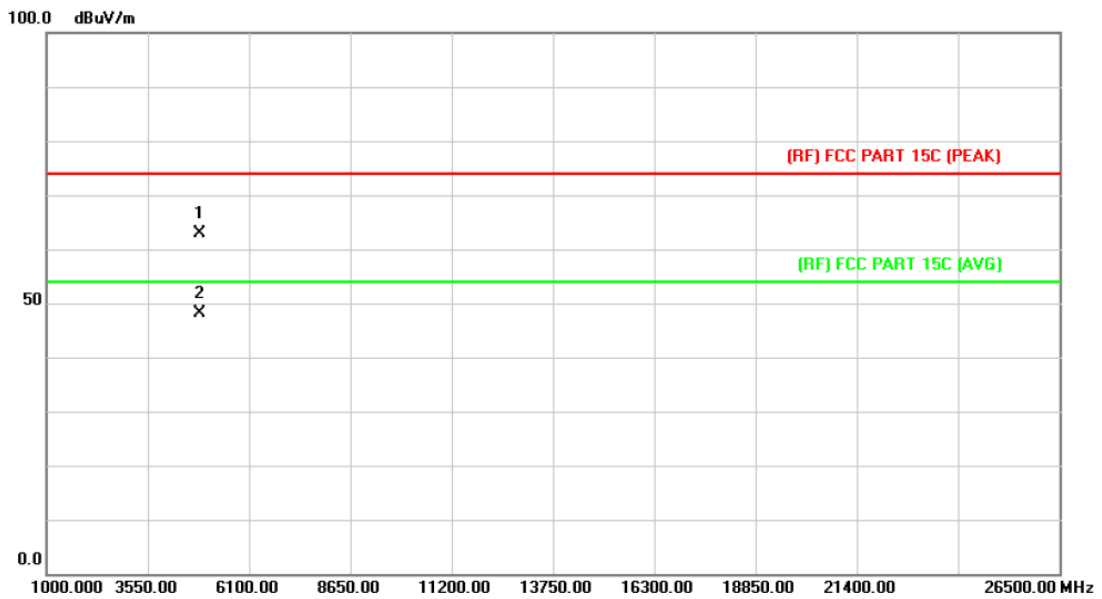
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4873.857	49.39	13.86	63.25	74.00	-10.75	peak
2	*	4873.903	34.57	13.86	48.43	54.00	-5.57	AVG

Emission Level= Read Level+ Correct Factor

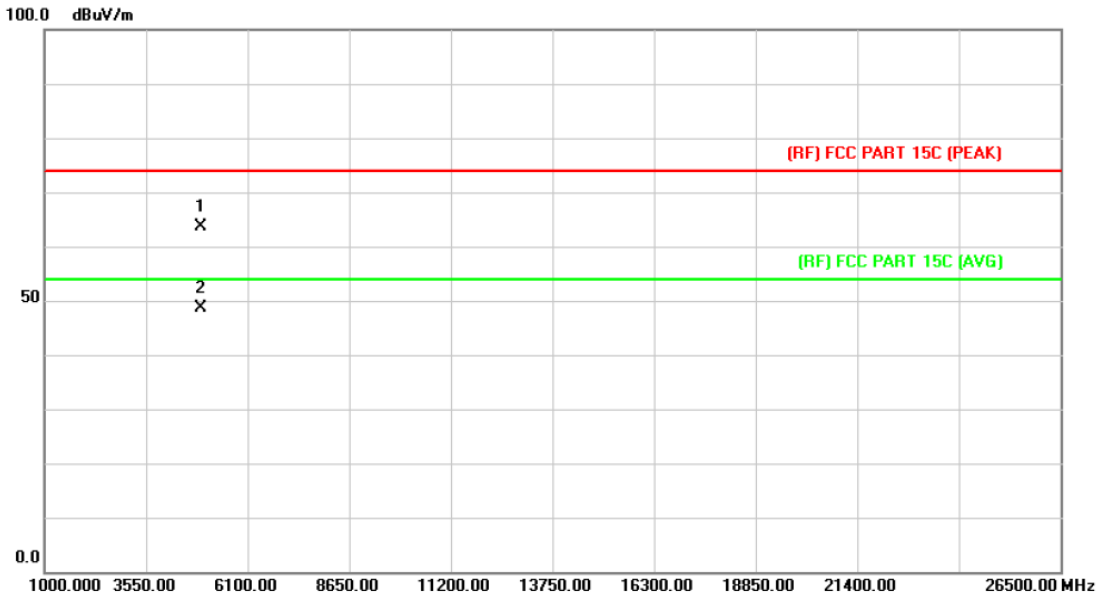
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4874.031	49.02	13.86	62.88	74.00	-11.12	peak
2	*	4874.083	34.15	13.86	48.01	54.00	-5.99	AVG

Emission Level= Read Level+ Correct Factor

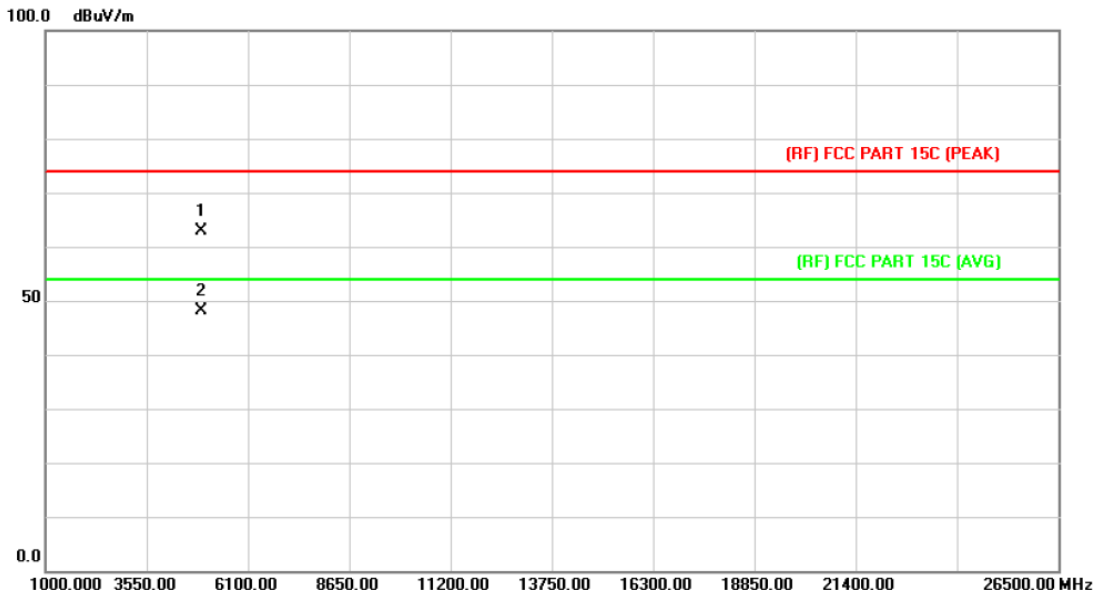
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4924.076	49.40	14.15	63.55	74.00	-10.45	peak
2	*	4924.148	34.52	14.15	48.67	54.00	-5.33	AVG

Emission Level= Read Level+ Correct Factor

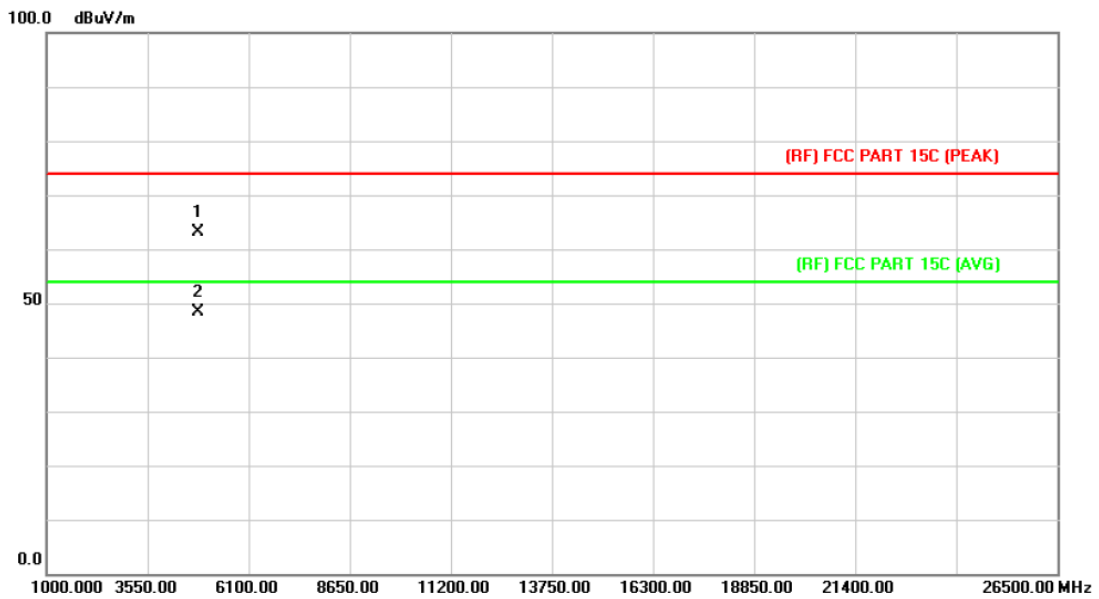
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4923.858	48.74	14.15	62.89	74.00	-11.11	peak
2	*	4923.924	33.96	14.15	48.11	54.00	-5.89	AVG

Emission Level= Read Level+ Correct Factor

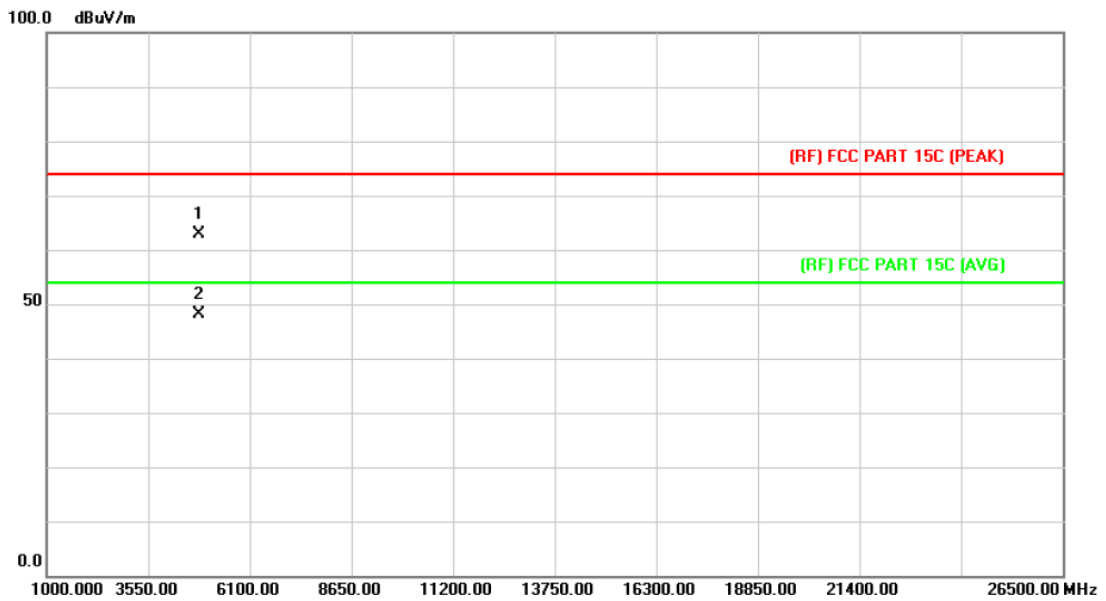
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.918	49.63	13.56	63.19	74.00	-10.81	peak
2	*	4824.008	34.75	13.56	48.31	54.00	-5.69	AVG

Emission Level= Read Level+ Correct Factor

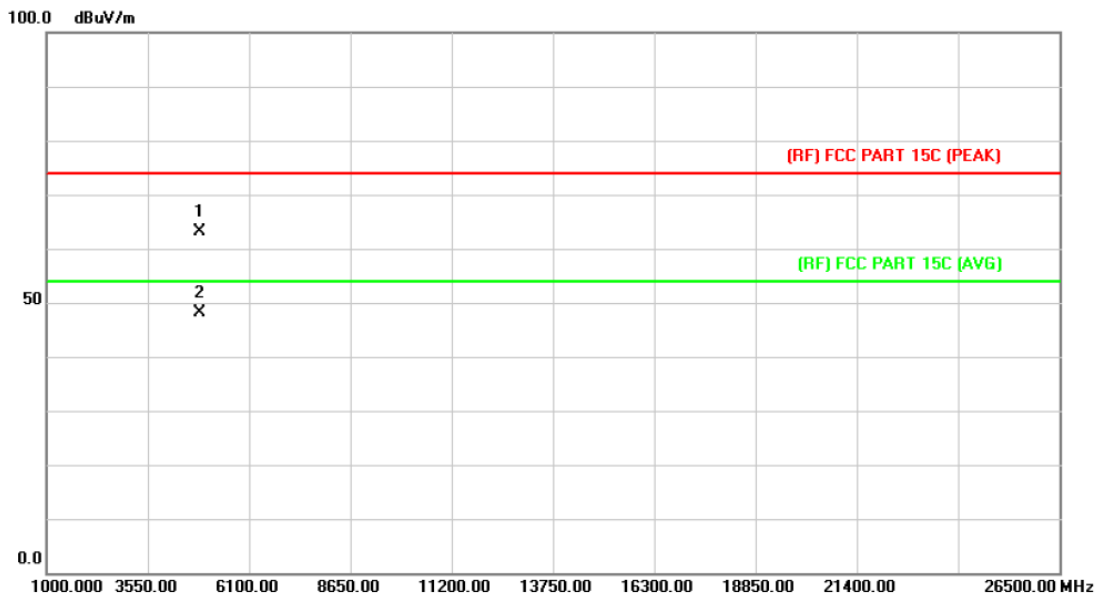
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4824.104	49.40	13.56	62.96	74.00	-11.04	peak
2	*	4824.162	34.49	13.56	48.05	54.00	-5.95	AVG

Emission Level= Read Level+ Correct Factor

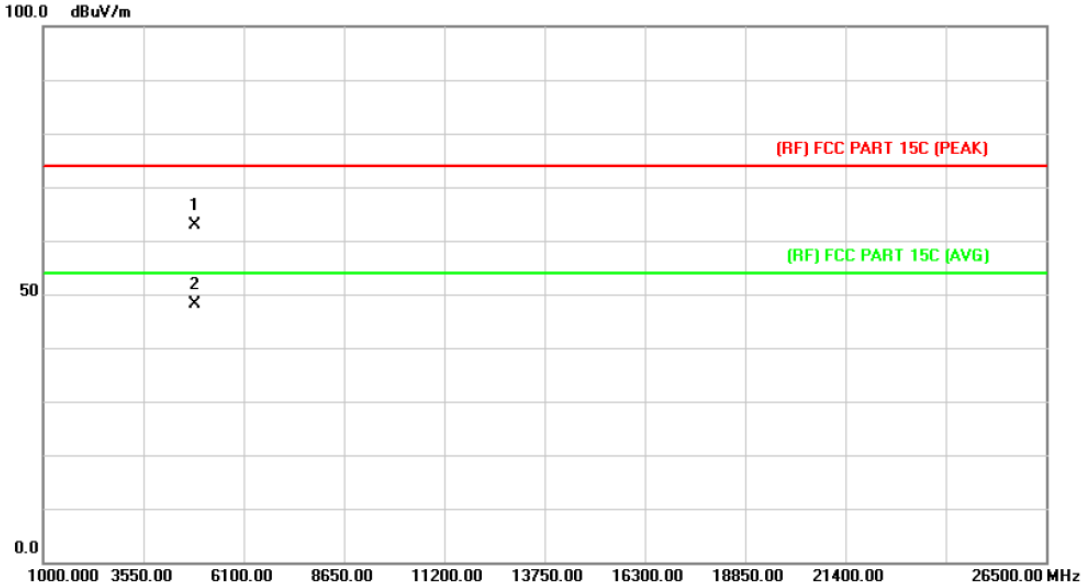
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4874.025	49.29	13.86	63.15	74.00	-10.85	peak
2	*	4874.123	34.38	13.86	48.24	54.00	-5.76	AVG

Emission Level= Read Level+ Correct Factor

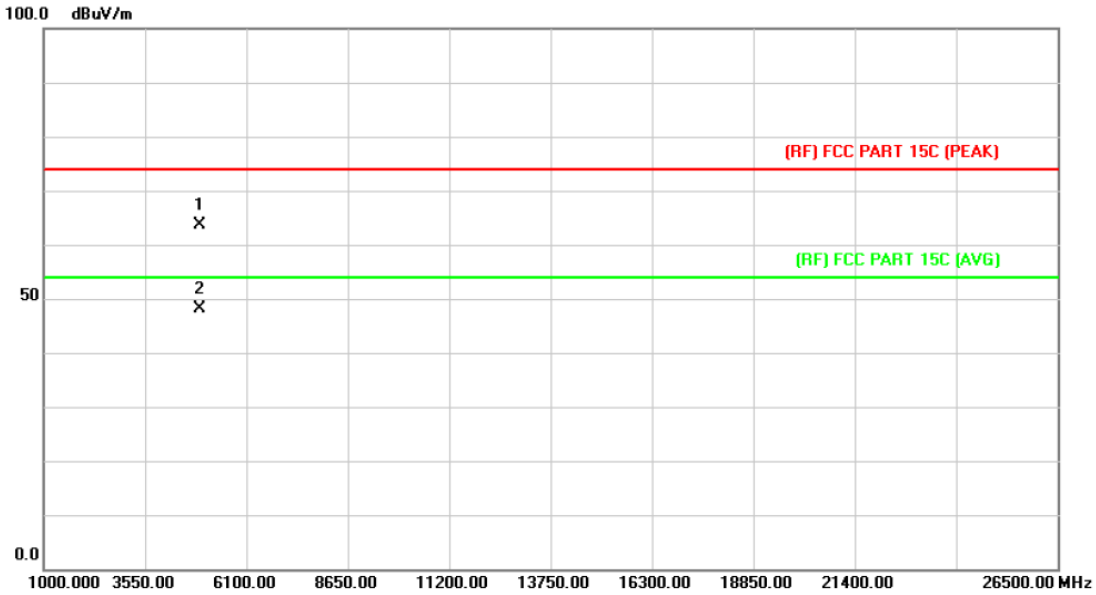
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4873.873	48.99	13.86	62.85	74.00	-11.15	peak
2	*	4873.885	34.29	13.86	48.15	54.00	-5.85	AVG

Emission Level= Read Level+ Correct Factor

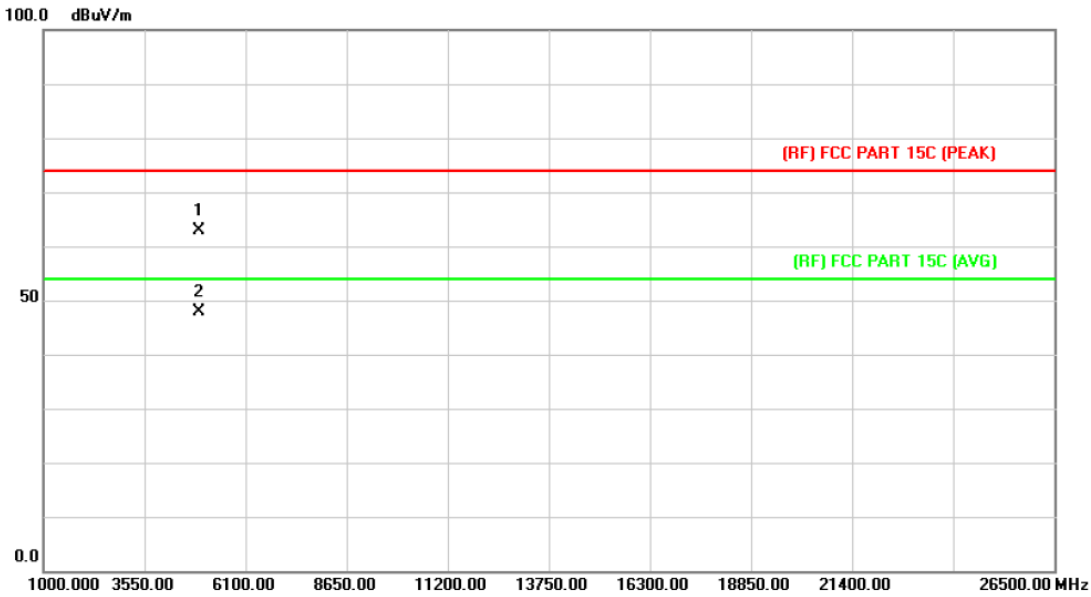
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4924.180	49.36	14.15	63.51	74.00	-10.49	peak
2	*	4924.196	33.88	14.15	48.03	54.00	-5.97	AVG

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4924.090	48.66	14.15	62.81	74.00	-11.19	peak
2	*	4924.098	33.76	14.15	47.91	54.00	-6.09	AVG

Emission Level= Read Level+ Correct Factor

6. Restricted Bands Requirement

6.1 Test Standard and Limit

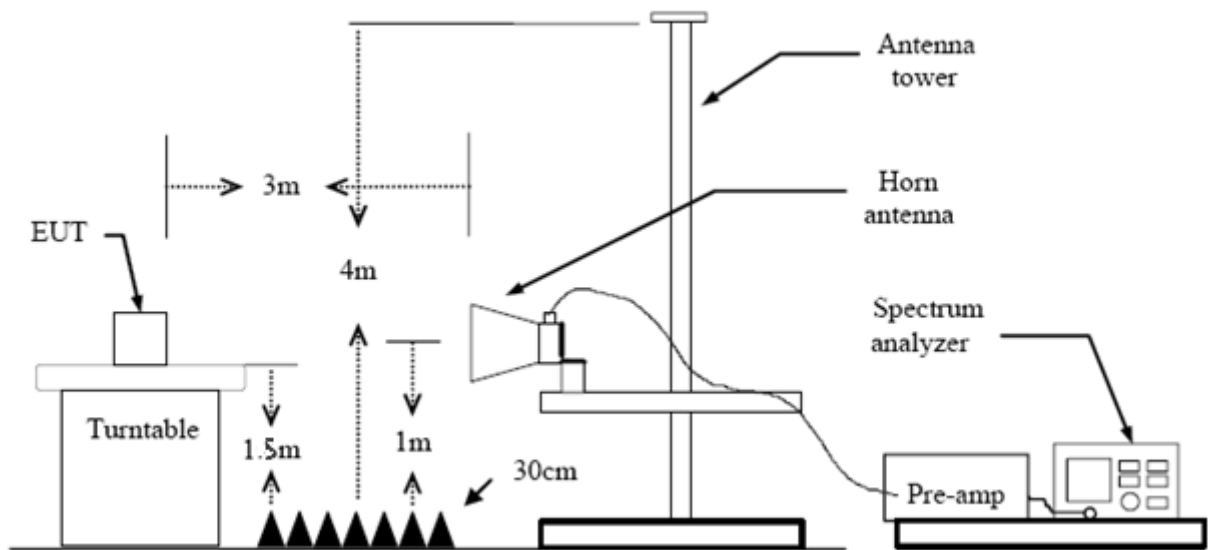
6.1.1 Test Standard

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

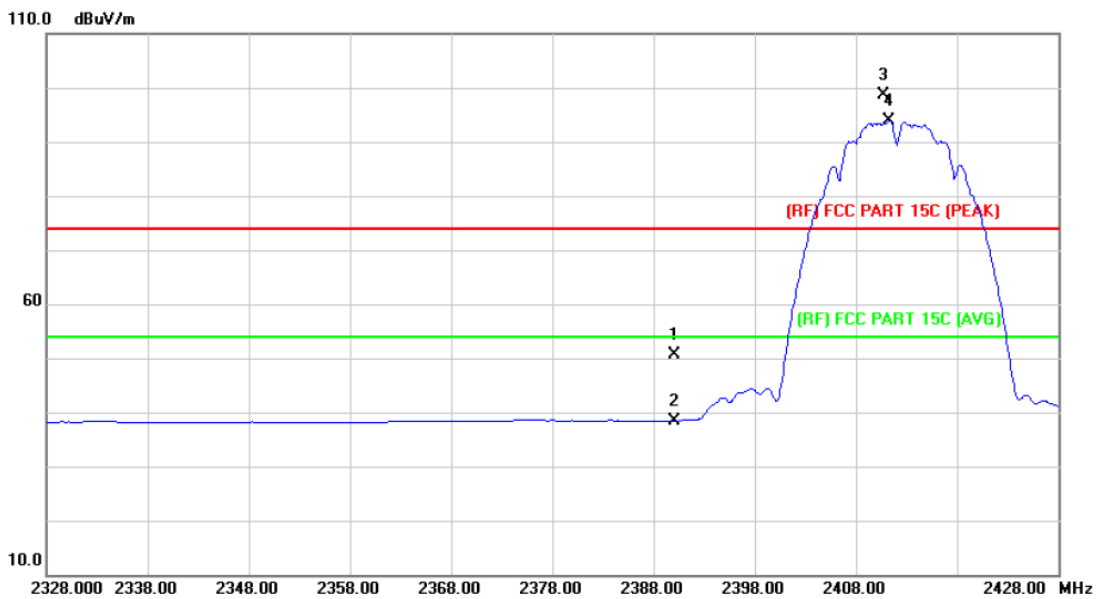
The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Remark: Only showed the data of worst mode when the EUT is powered by DC 12V.
Please see the next page.

(1) Radiation Test

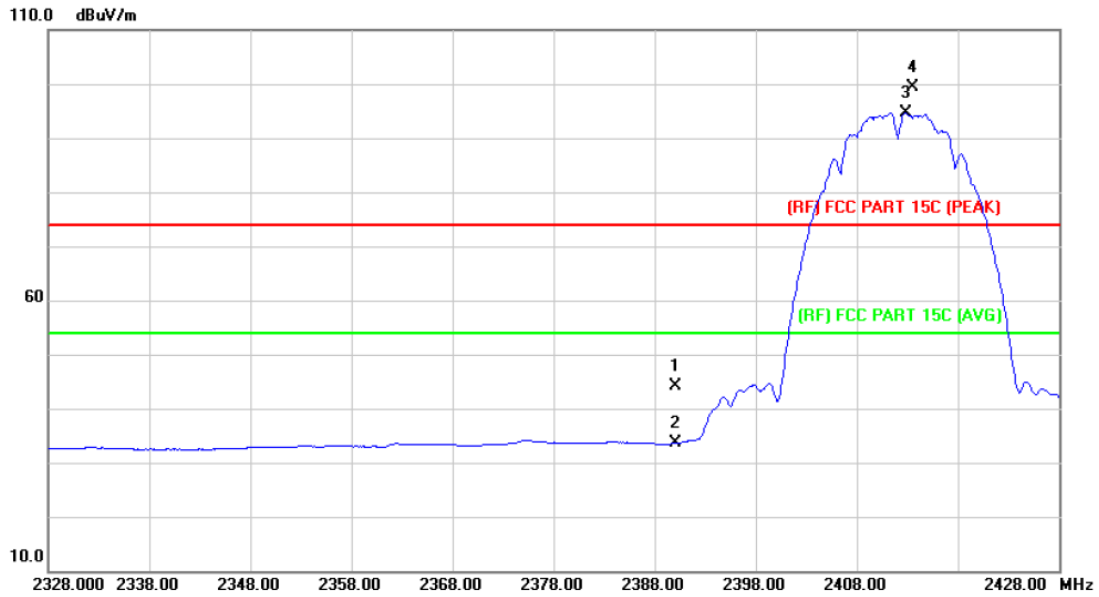
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	49.91	0.77	50.68	Fundamental Frequency		peak
2		2390.000	37.70	0.77	38.47	Fundamental Frequency		AVG
3	X	2410.700	97.84	0.86	98.70	74.00	24.70	peak
4	*	2411.300	92.98	0.86	93.84	54.00	39.84	AVG

Emission Level= Read Level+ Correct Factor

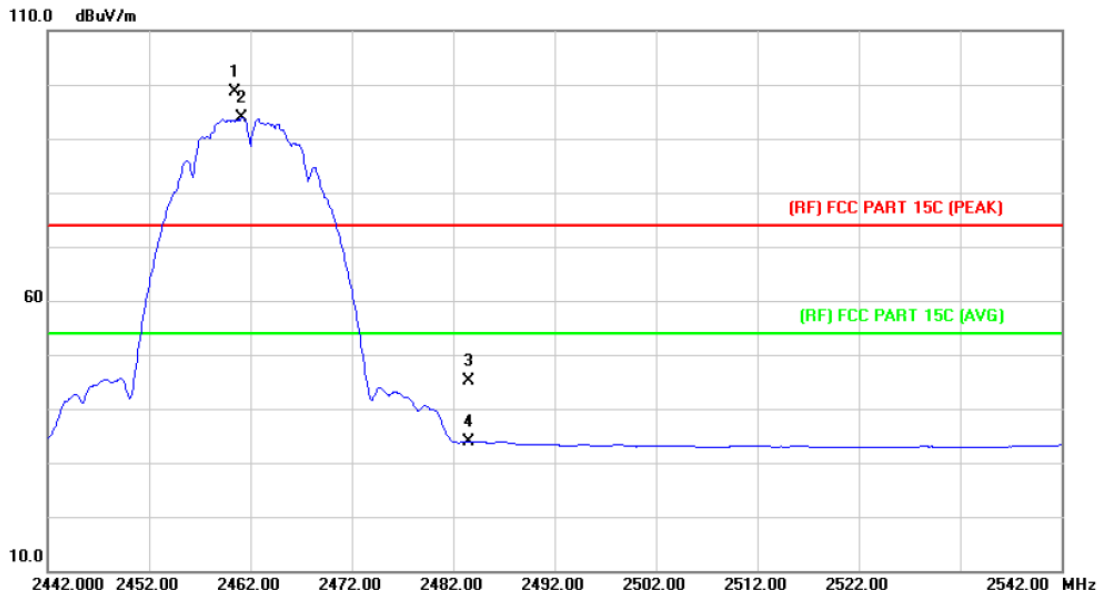
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	43.47	0.77	44.24	74.00	-29.76	peak
2		2390.000	32.83	0.77	33.60	54.00	-20.40	AVG
3	*	2412.800	93.78	0.86	94.64	Fundamental Frequency		AVG
4	X	2413.500	98.64	0.86	99.50	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

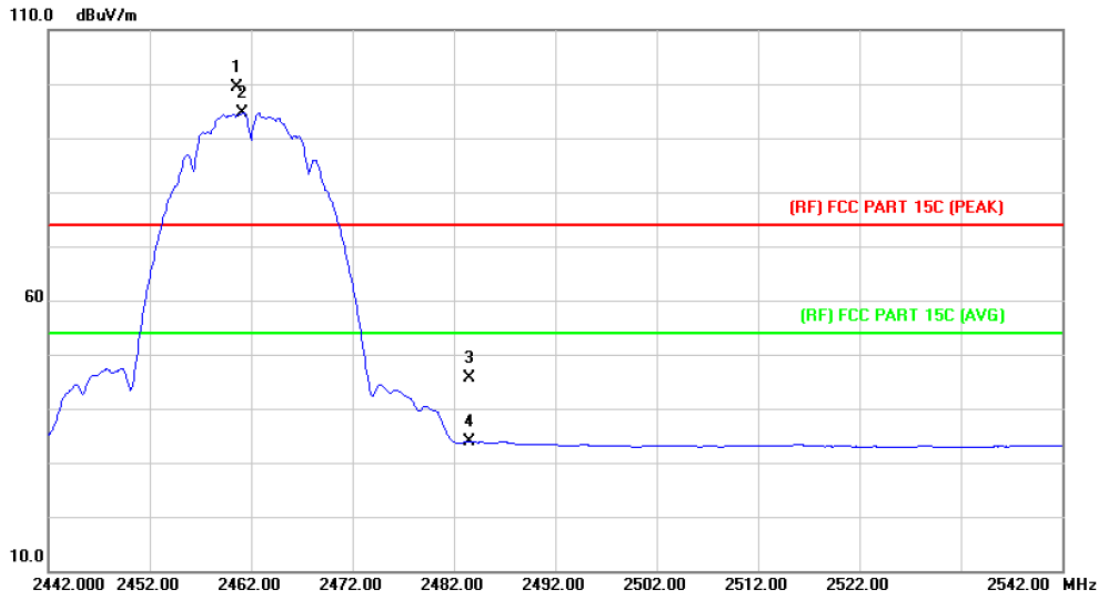
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2460.500	97.56	1.06	98.62	Fundamental Frequency		peak
2	*	2461.200	92.79	1.07	93.86	Fundamental Frequency		AVG
3		2483.500	43.84	1.17	45.01	74.00	-28.99	peak
4		2483.500	32.76	1.17	33.93	54.00	-20.07	AVG

Emission Level= Read Level+ Correct Factor

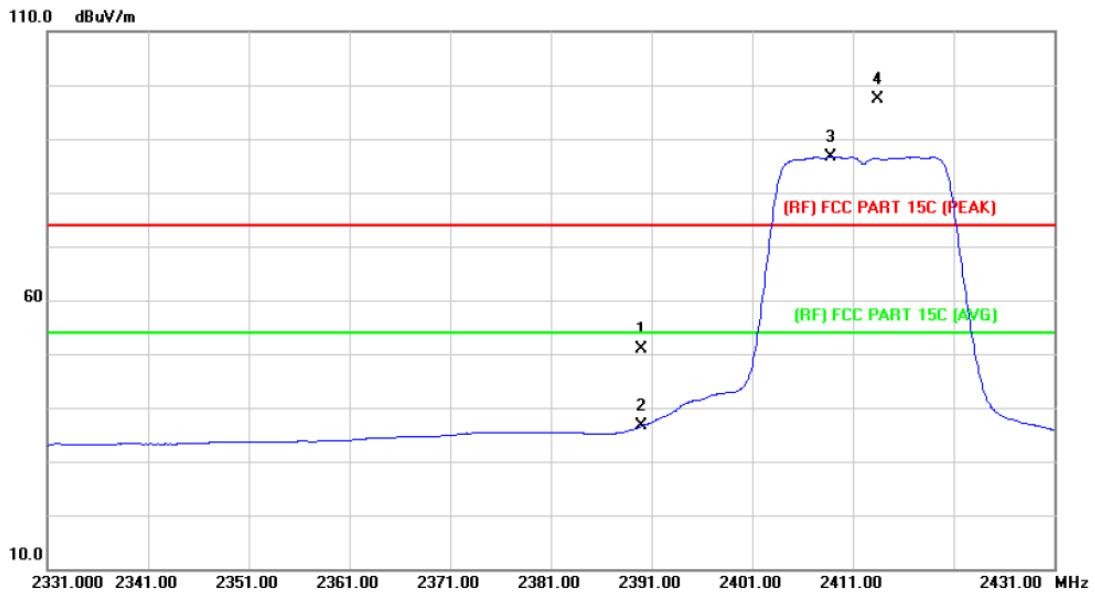
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2460.600	98.20	1.06	99.26	Fundamental Frequency		peak
2	*	2461.200	93.66	1.07	94.73	Fundamental Frequency		AVG
3		2483.500	44.37	1.17	45.54	74.00	-28.46	peak
4		2483.500	32.70	1.17	33.87	54.00	-20.13	AVG

Emission Level= Read Level+ Correct Factor

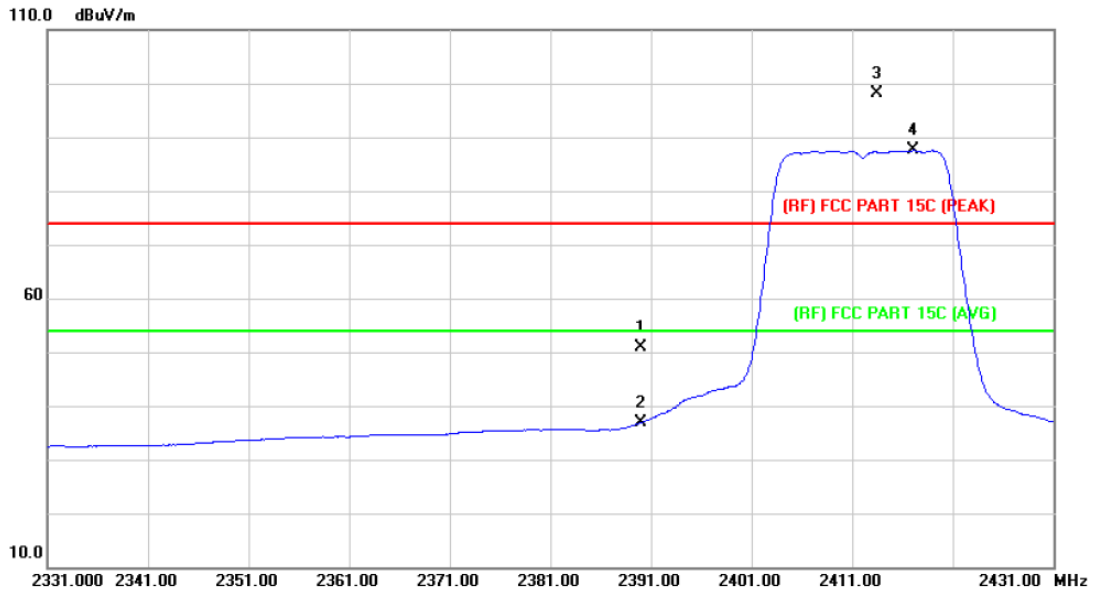
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	50.05	0.77	50.82	74.00	-23.18	peak
2		2390.000	35.76	0.77	36.53	54.00	-17.47	AVG
3	*	2408.800	85.86	0.85	86.71	Fundamental Frequency		AVG
4	X	2413.500	96.40	0.86	97.26	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

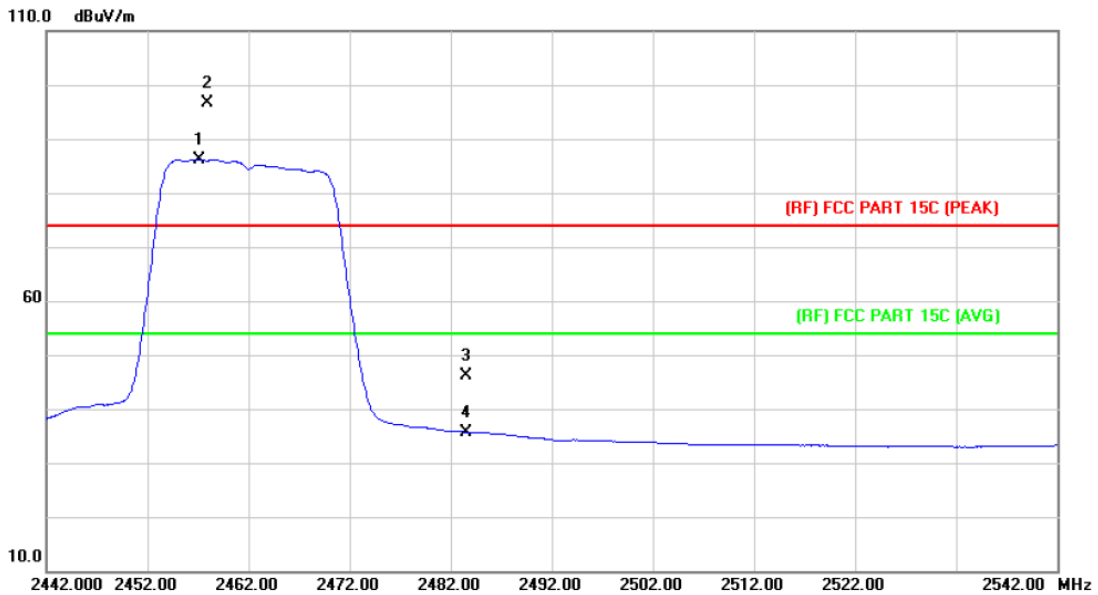
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		2390.000	50.10	0.77	50.87	74.00	-23.13	peak
2		2390.000	36.14	0.77	36.91	54.00	-17.09	AVG
3	X	2413.500	97.30	0.86	98.16	Fundamental Frequency		peak
4	*	2417.100	86.64	0.88	87.52	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

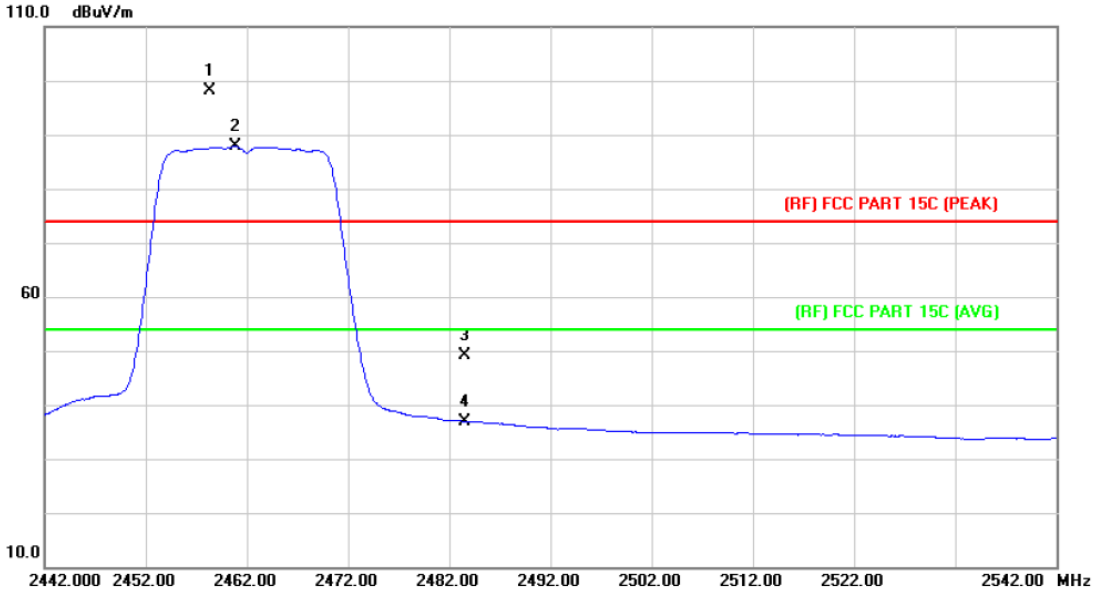
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2457.100	85.11	1.05	86.16	Fundamental Frequency		AVG
2	X	2457.900	95.56	1.06	96.62	Fundamental Frequency		peak
3		2483.500	44.89	1.17	46.06	74.00	-27.94	peak
4		2483.500	34.47	1.17	35.64	54.00	-18.36	AVG

Emission Level= Read Level+ Correct Factor

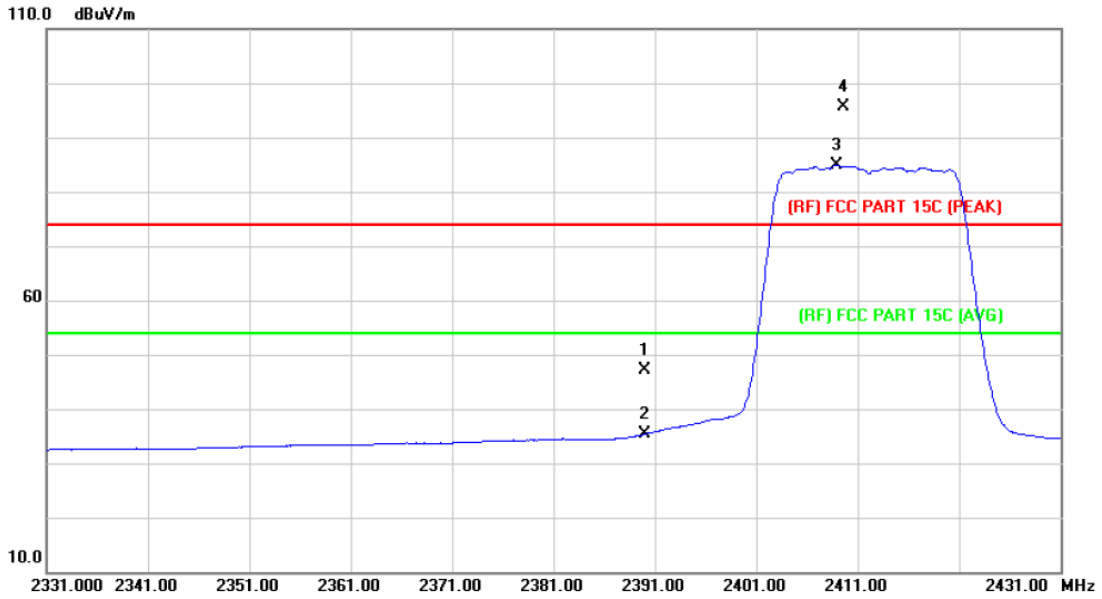
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2458.300	97.00	1.06	98.06			peak
2	*	2460.800	86.71	1.06	87.77			AVG
3		2483.500	47.92	1.17	49.09	74.00	-24.91	peak
4		2483.500	35.73	1.17	36.90	54.00	-17.10	AVG

Emission Level= Read Level+ Correct Factor

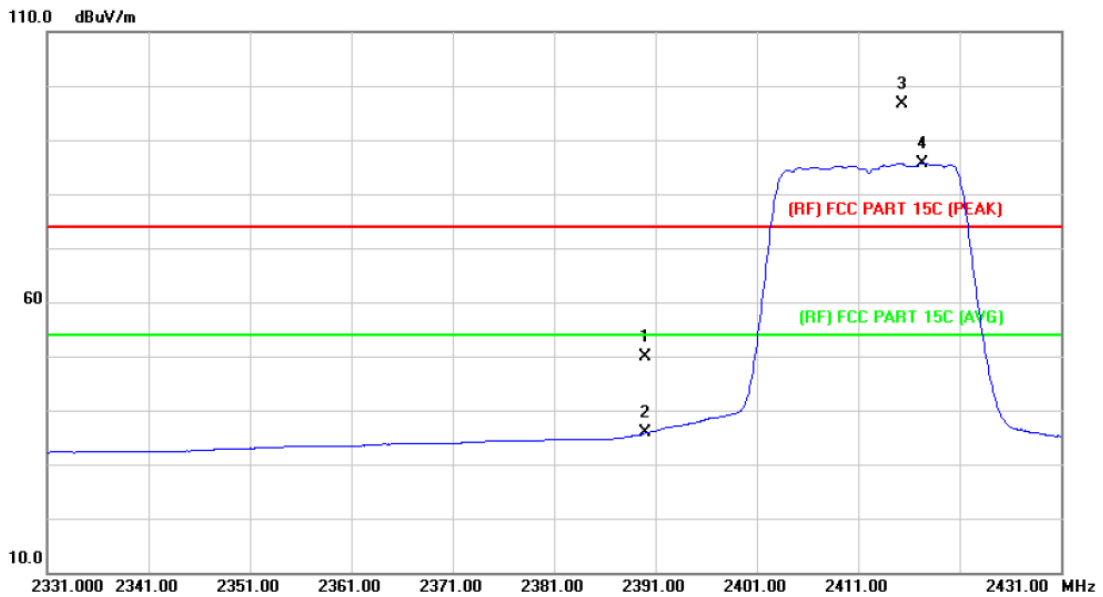
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	46.40	0.77	47.17	74.00	-26.83	peak
2		2390.000	34.64	0.77	35.41	54.00	-18.59	AVG
3	*	2408.900	84.05	0.85	84.90	Fundamental Frequency		AVG
4	X	2409.600	94.81	0.85	95.66	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

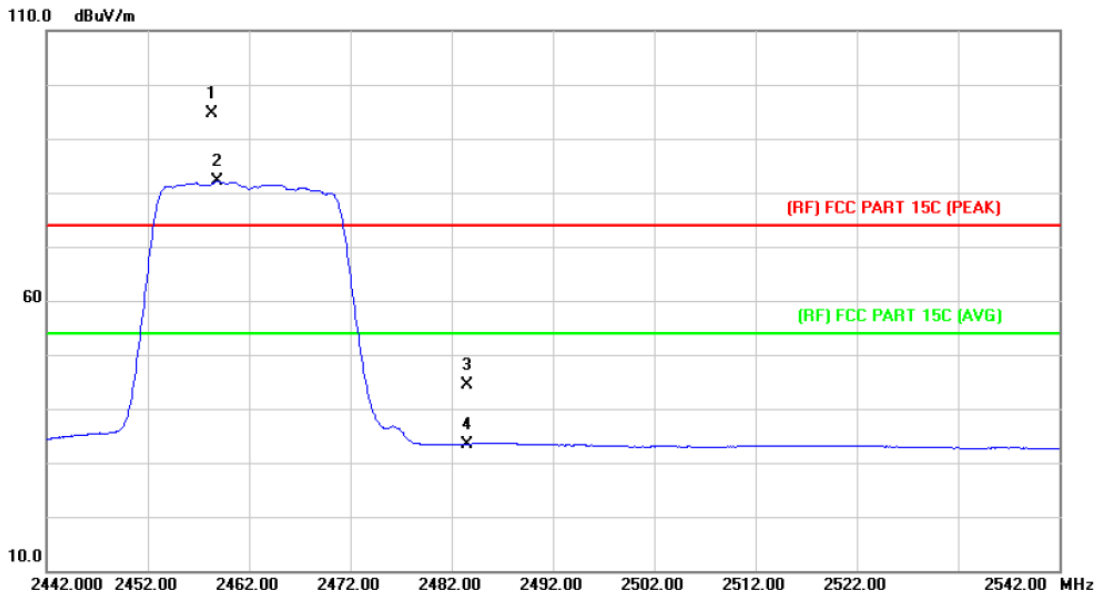
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	49.16	0.77	49.93	74.00	-24.07	peak
2		2390.000	35.04	0.77	35.81	54.00	-18.19	AVG
3	X	2415.300	95.70	0.88	96.58	Fundamental Frequency		peak
4	*	2417.300	84.83	0.89	85.72	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

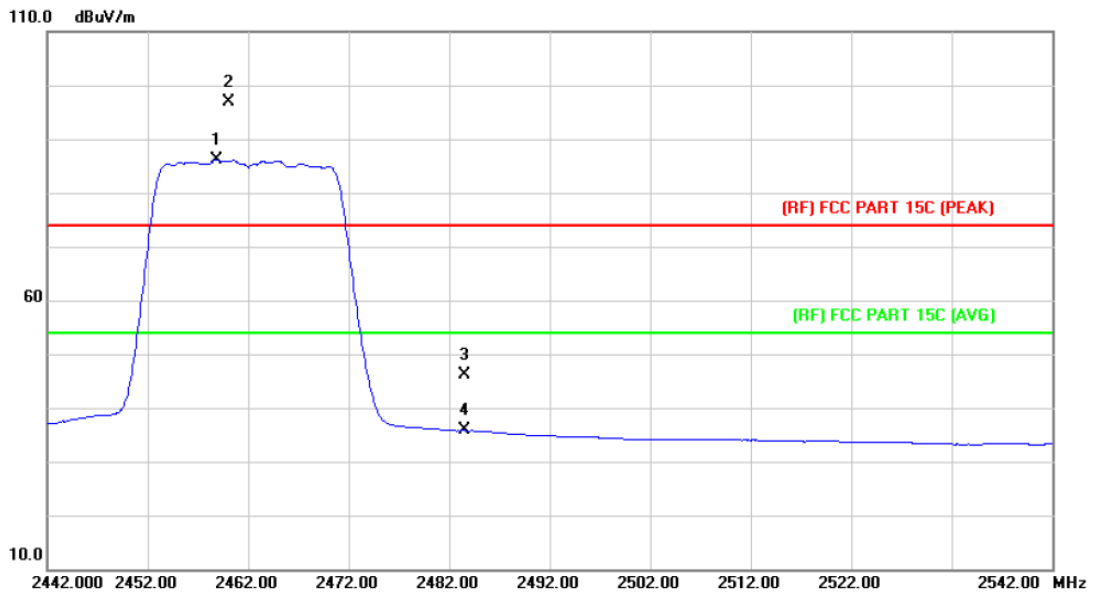
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2458.300	93.62	1.06	94.68	Fundamental Frequency		peak
2	*	2458.900	81.00	1.06	82.06	Fundamental Frequency		AVG
3		2483.500	43.25	1.17	44.42	74.00	-29.58	peak
4		2483.500	32.27	1.17	33.44	54.00	-20.56	AVG

Emission Level= Read Level+ Correct Factor

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		

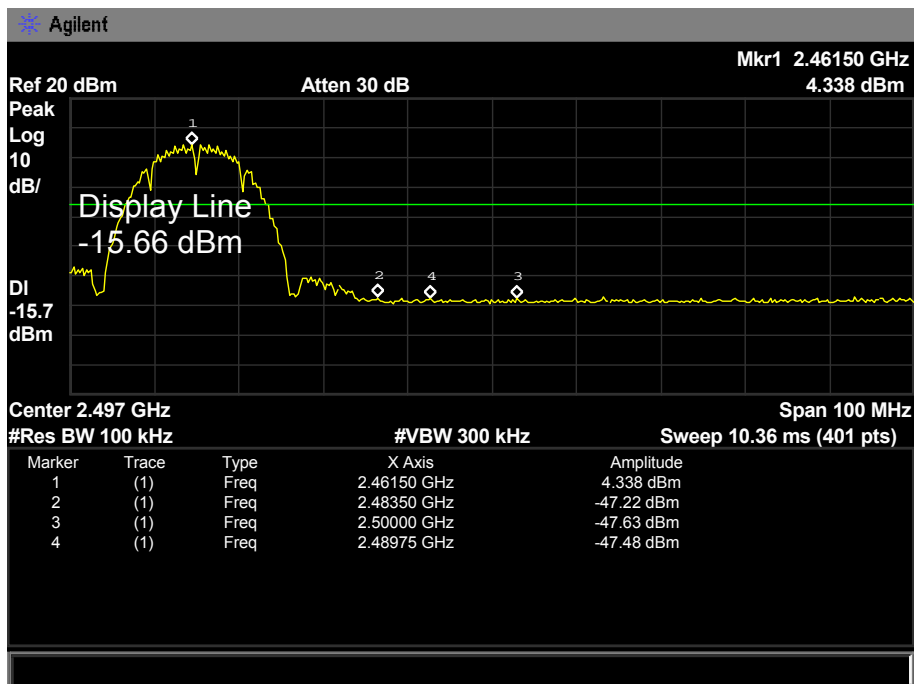
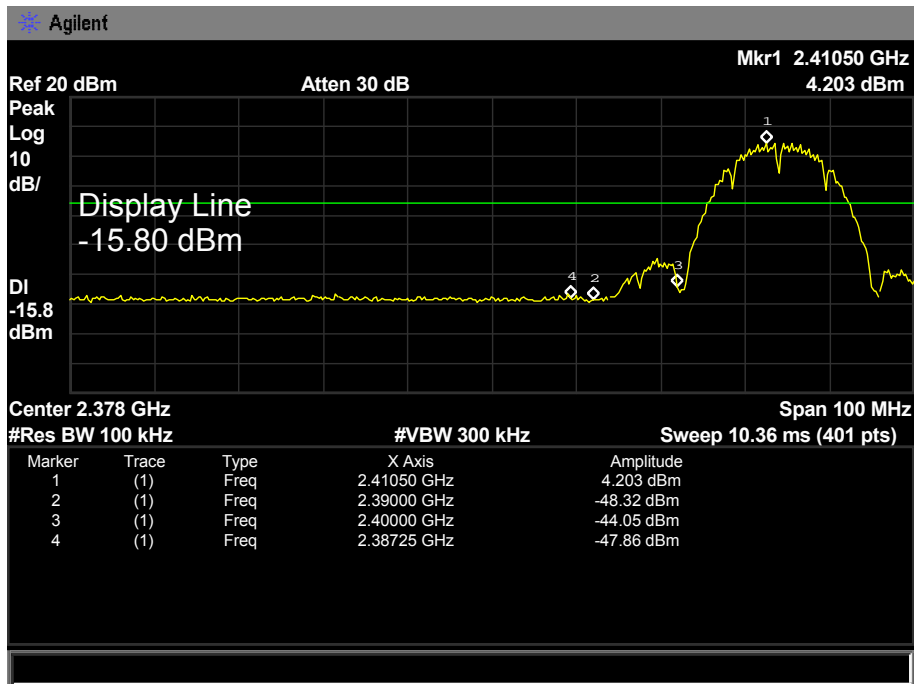


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2458.900	85.03	1.06	86.09	Fundamental Frequency		AVG
2	X	2460.000	95.82	1.06	96.88	Fundamental Frequency		peak
3		2483.500	44.87	1.17	46.04	74.00	-27.96	peak
4		2483.500	34.59	1.17	35.76	54.00	-18.24	AVG

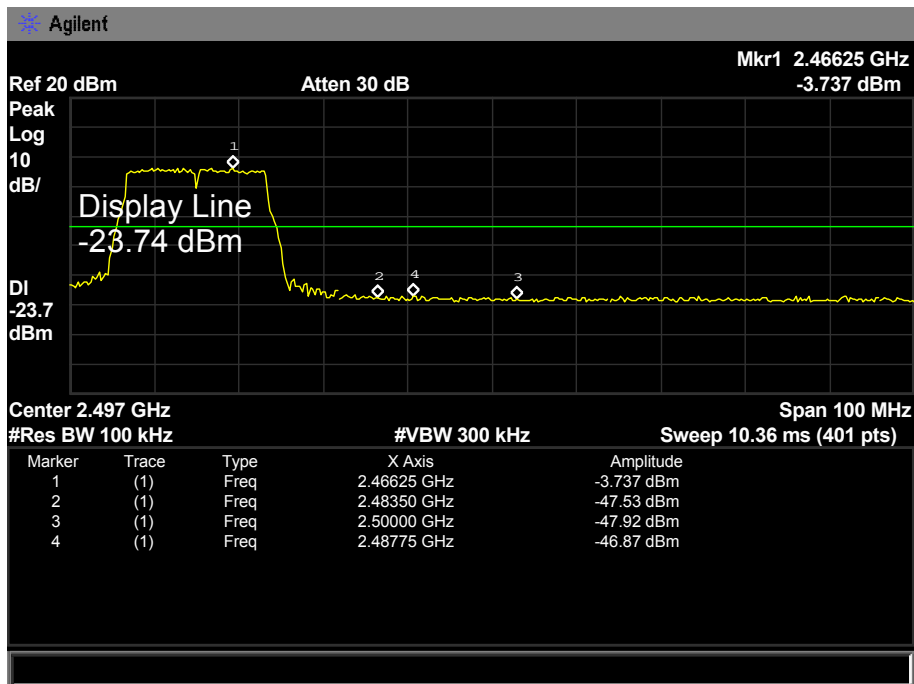
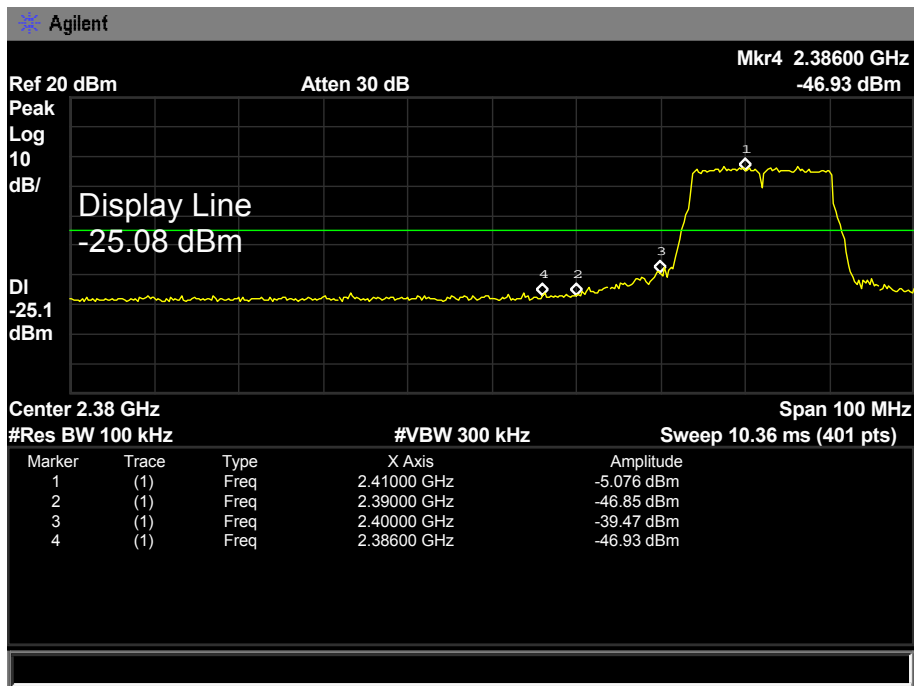
Emission Level= Read Level+ Correct Factor

(2) Conducted Test

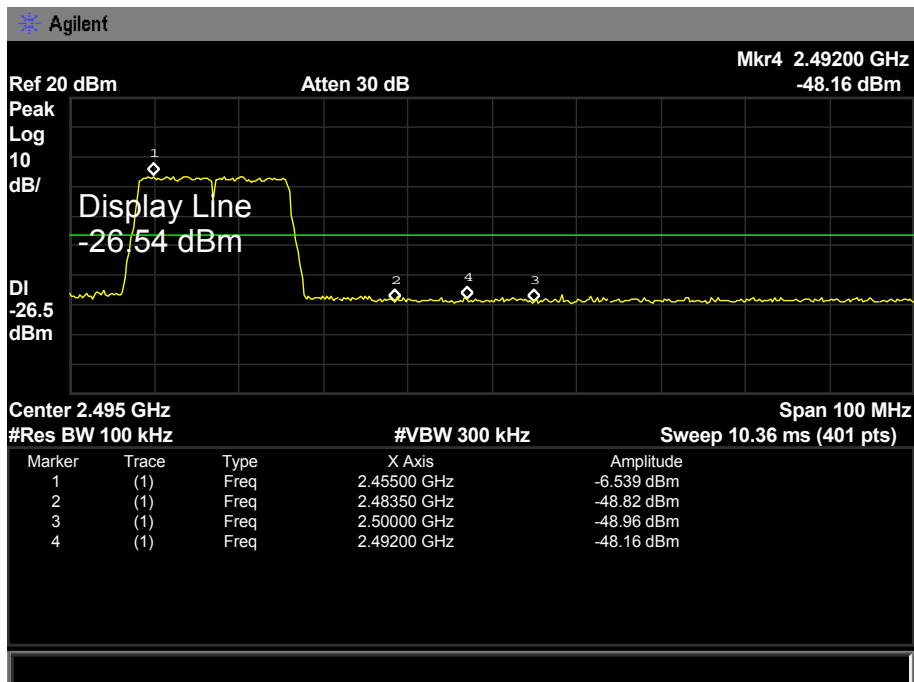
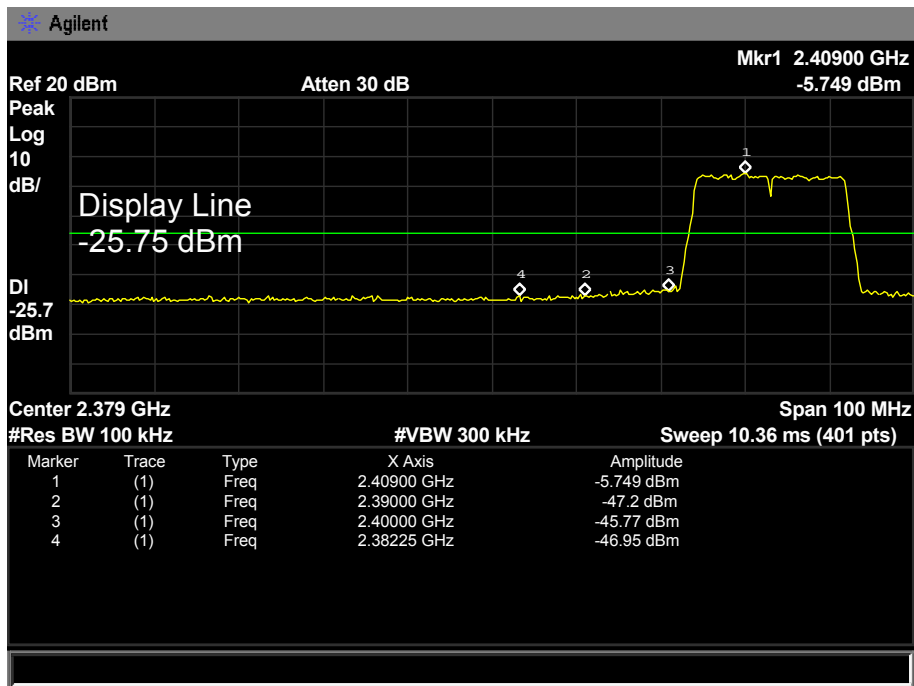
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX B Mode 2412MHz / TX B Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		



EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX G Mode 2412MHz / TX G Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		



EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX N(HT20) Mode 2412MHz / TX N(HT20) Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		



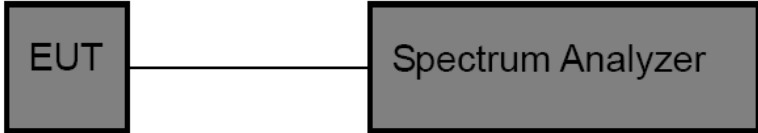
7. Bandwidth Test

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

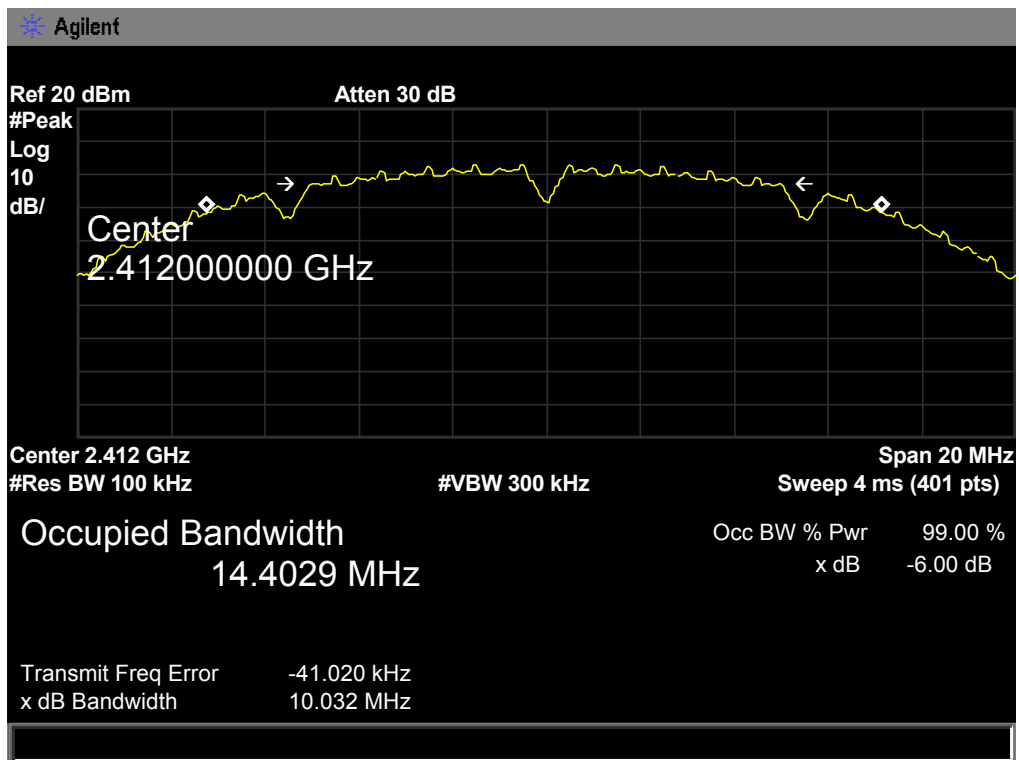
The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

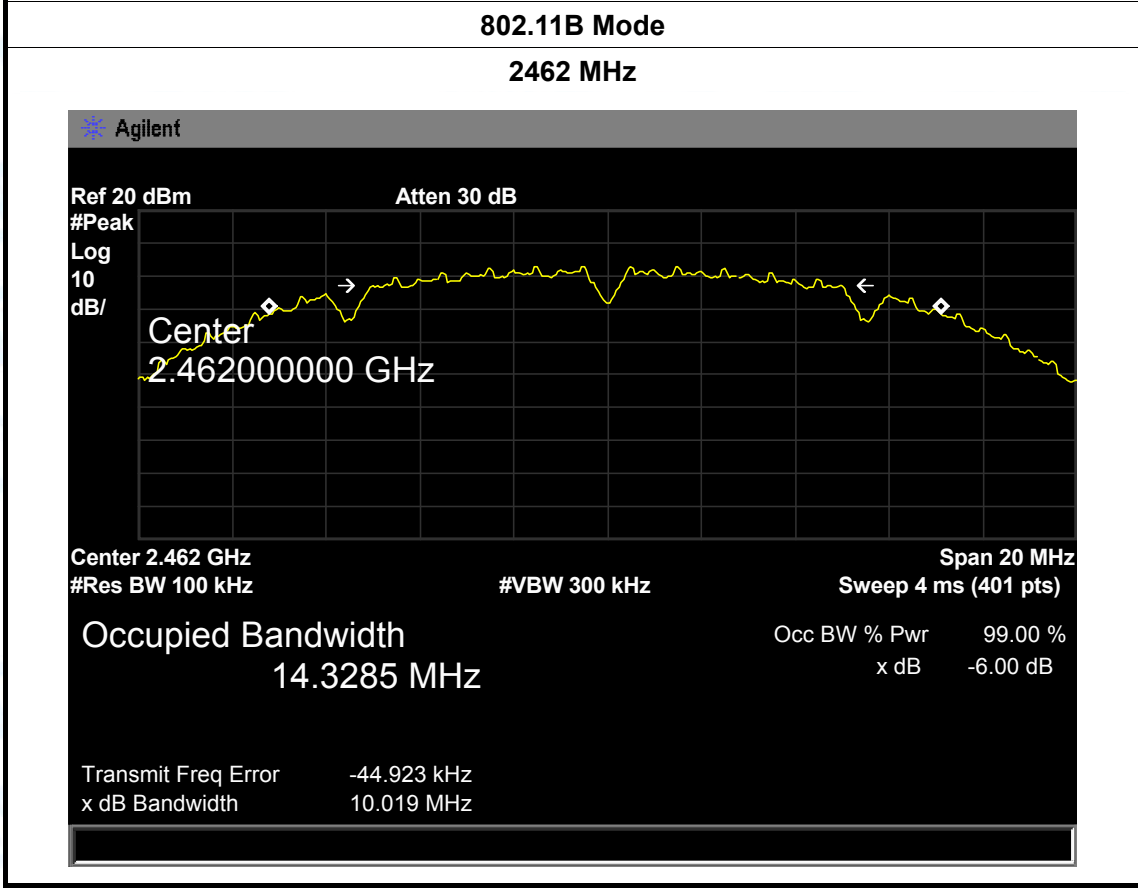
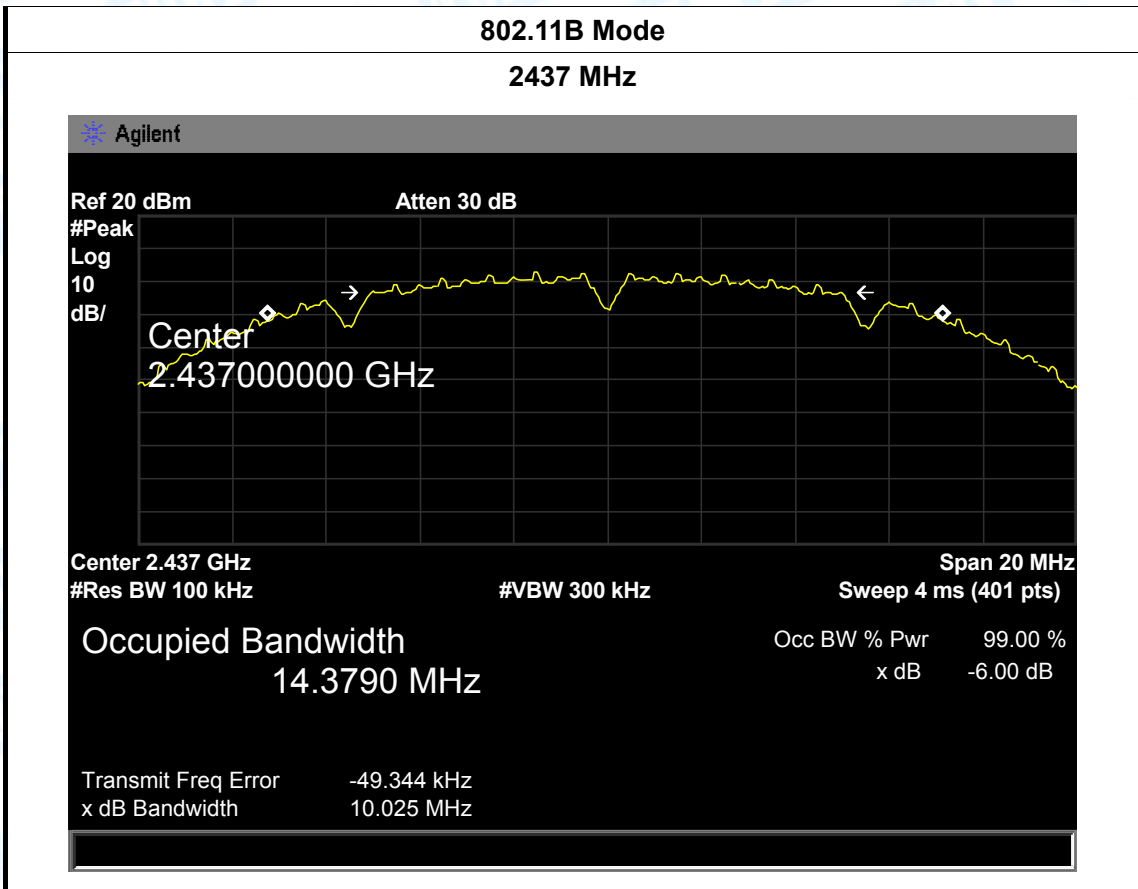
7.5 Test Data

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX 802.11B Mode		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	10.032	14.4029	>=0.5
2437	10.025	14.3790	
2462	10.019	14.3285	

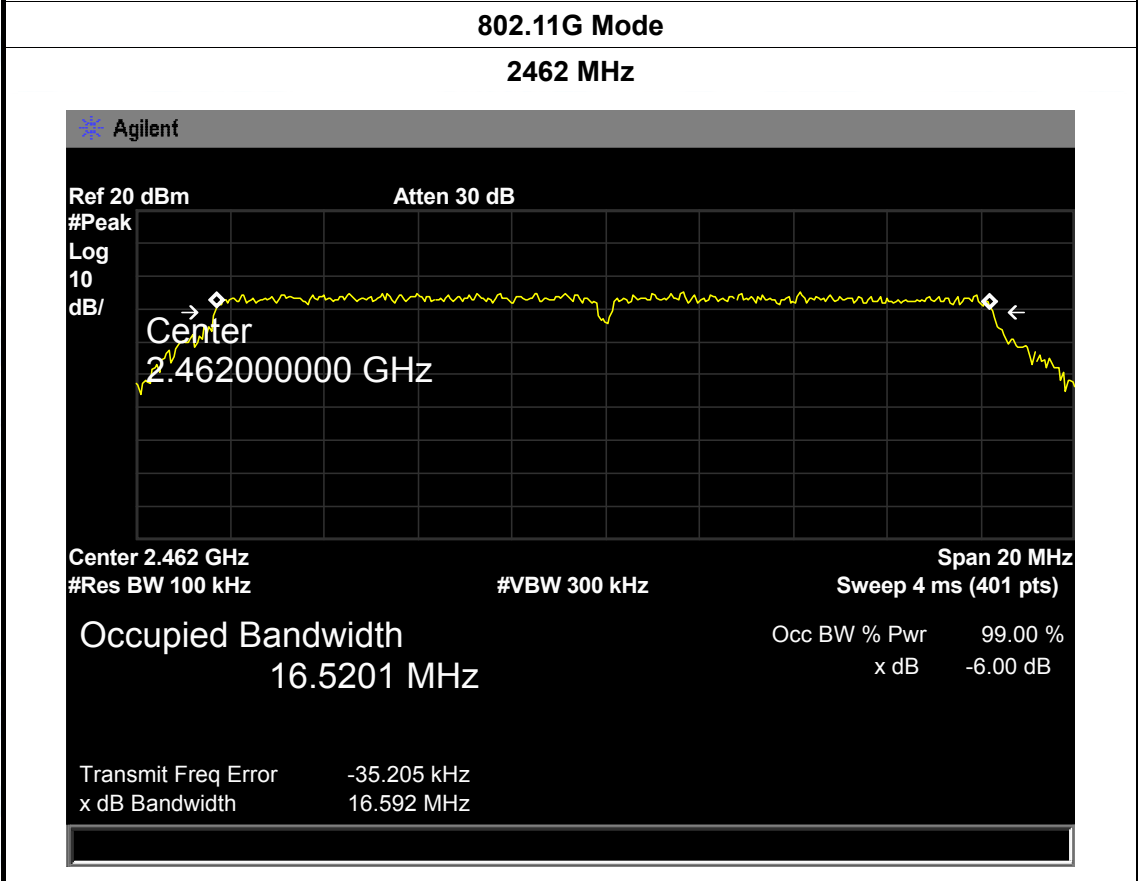
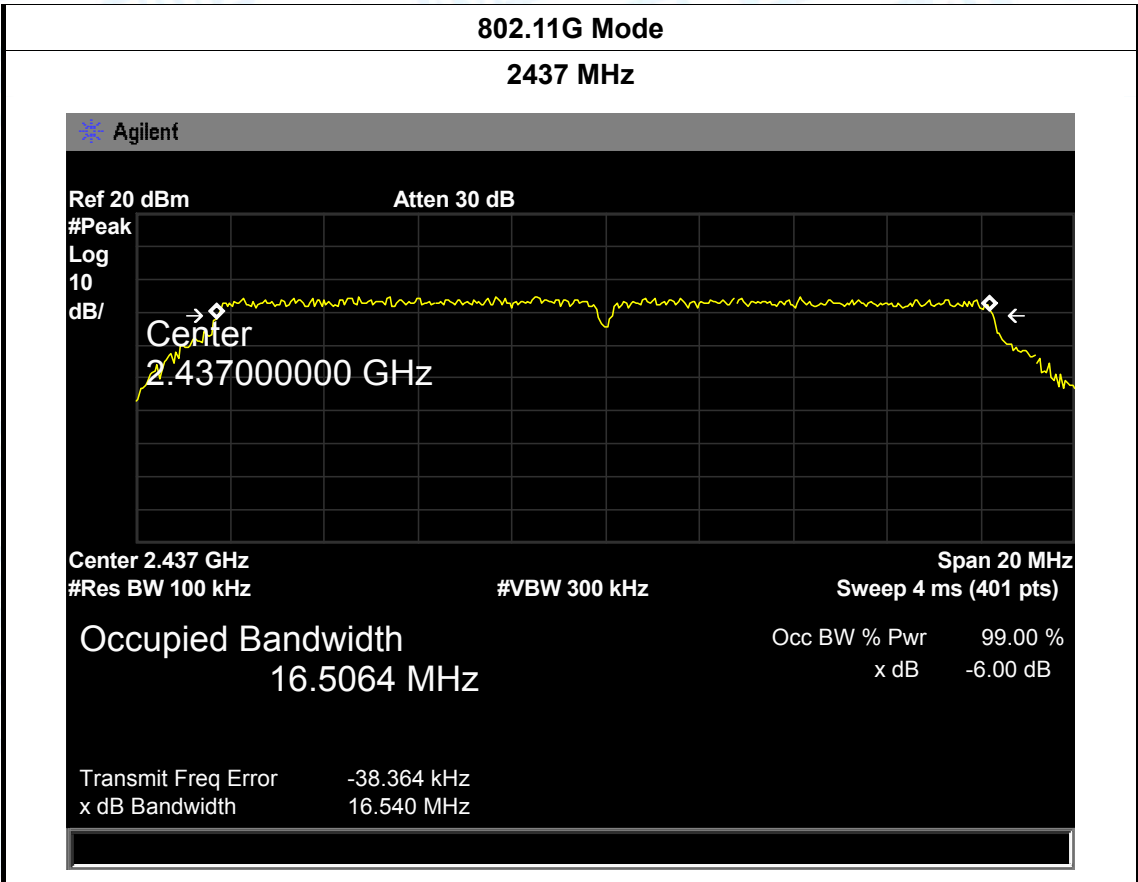
802.11B Mode

2412 MHz



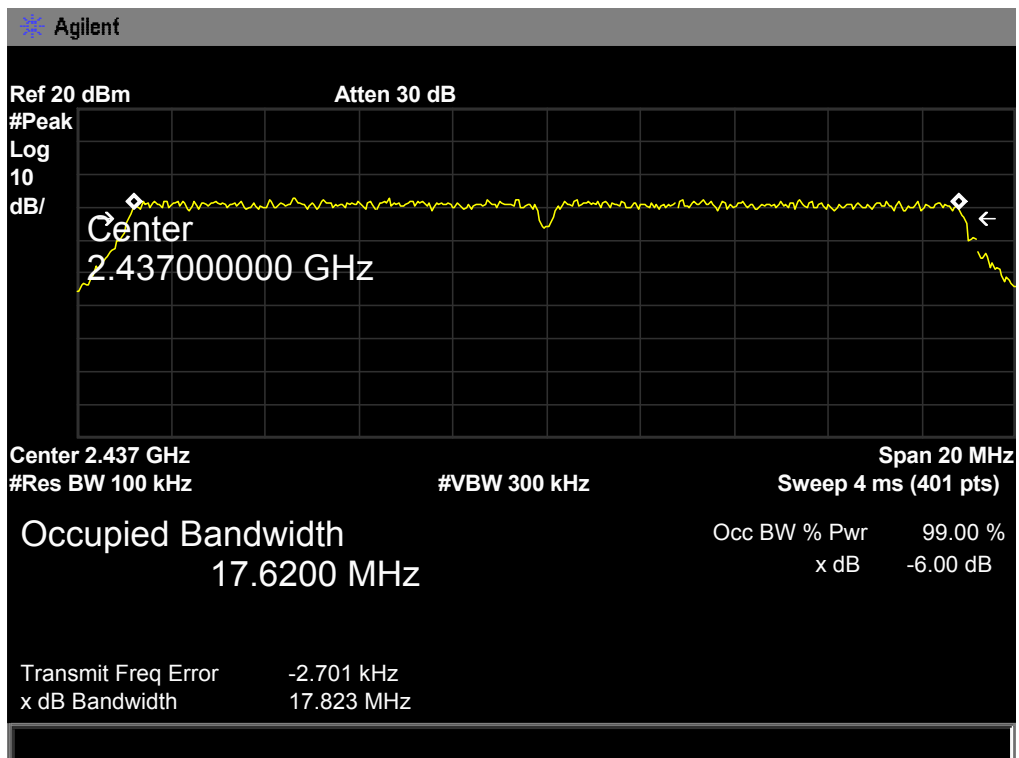


EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX 802.11G Mode		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	16.596	16.5255	≥0.5
2437	16.540	16.5064	
2462	16.592	16.5201	
802.11G Mode			
2412 MHz			
<p>Agilent</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Center 2.41200000 GHz</p> <p>Center 2.412 GHz Span 20 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.5255 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -28.651 kHz</p> <p>x dB Bandwidth 16.596 MHz</p>			

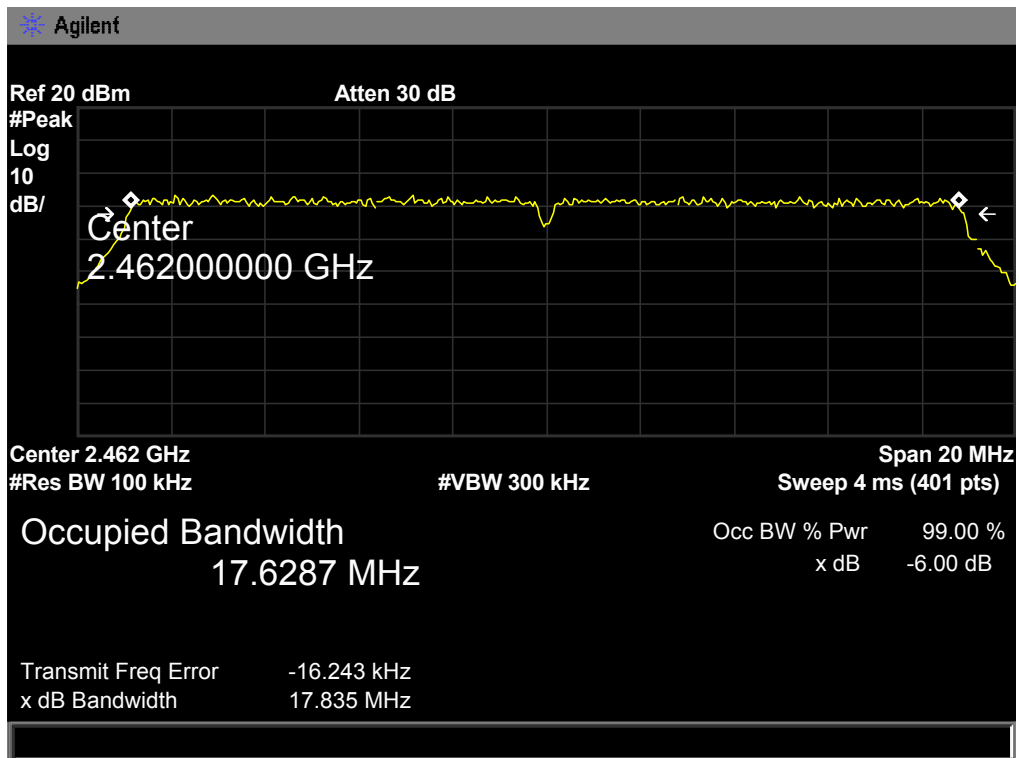


EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX 802.11N(HT20) Mode		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	17.822	17.6337	≥0.5
2437	17.823	17.6200	
2462	17.835	17.6287	
802.11N(HT20) Mode			
2412 MHz			
<p>Agilent</p> <p>Ref 20 dBm Atten 30 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Center 2.41200000 GHz</p> <p>Center 2.412 GHz Span 20 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>17.6337 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -4.737 kHz</p> <p>x dB Bandwidth 17.822 MHz</p>			

802.11N(HT20) Mode
2437 MHz



802.11N(HT20) Mode
2462 MHz



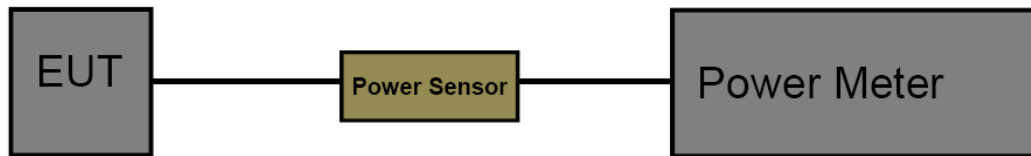
8. Peak Output Power Test

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 v03r02.

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:	CAR DVR	Model Name :	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Mode	Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
802.11b	2412	15.06	30
	2437	15.16	
	2462	15.30	
802.11g	2412	13.41	
	2437	12.83	
	2462	13.36	
802.11n (HT20)	2412	12.16	
	2437	11.77	
	2462	12.08	
Result: PASS			

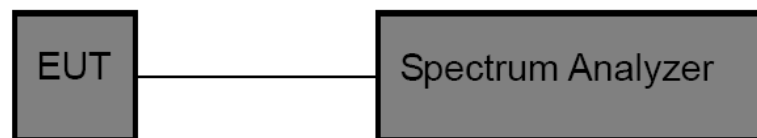
9. Power Spectral Density Test

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 v03r02.

- (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

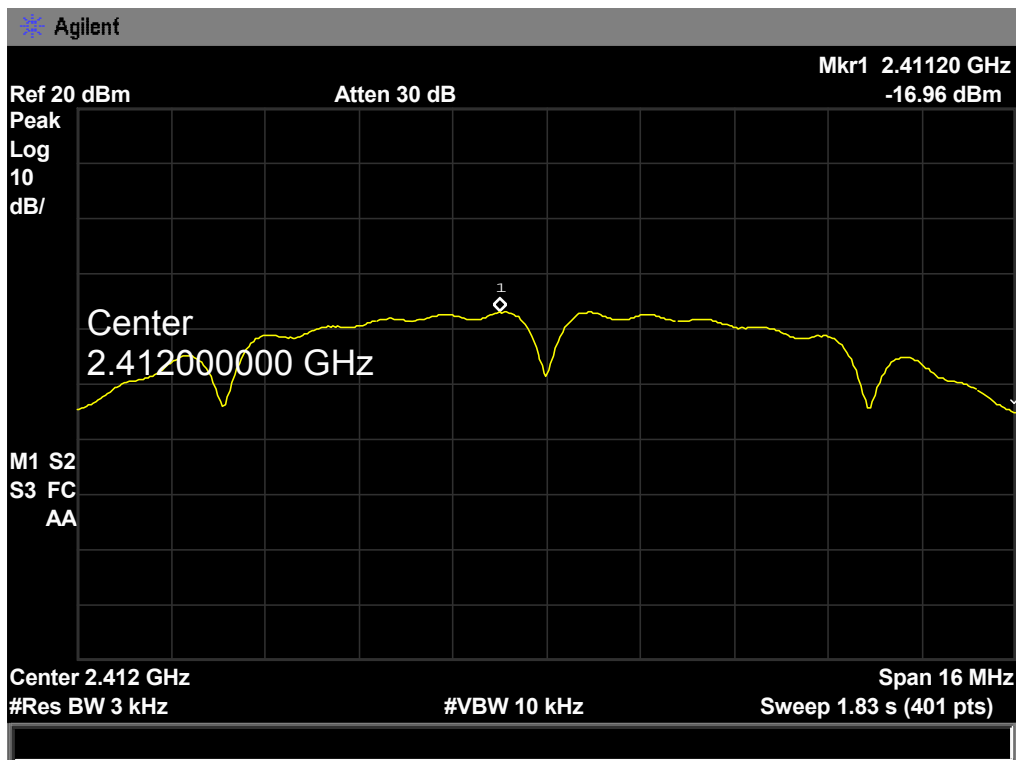
The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

9.5 Test Data

EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX 802.11B Mode		
Channel Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)	
2412	-16.96	8	
2437	-14.49		
2462	-14.21		

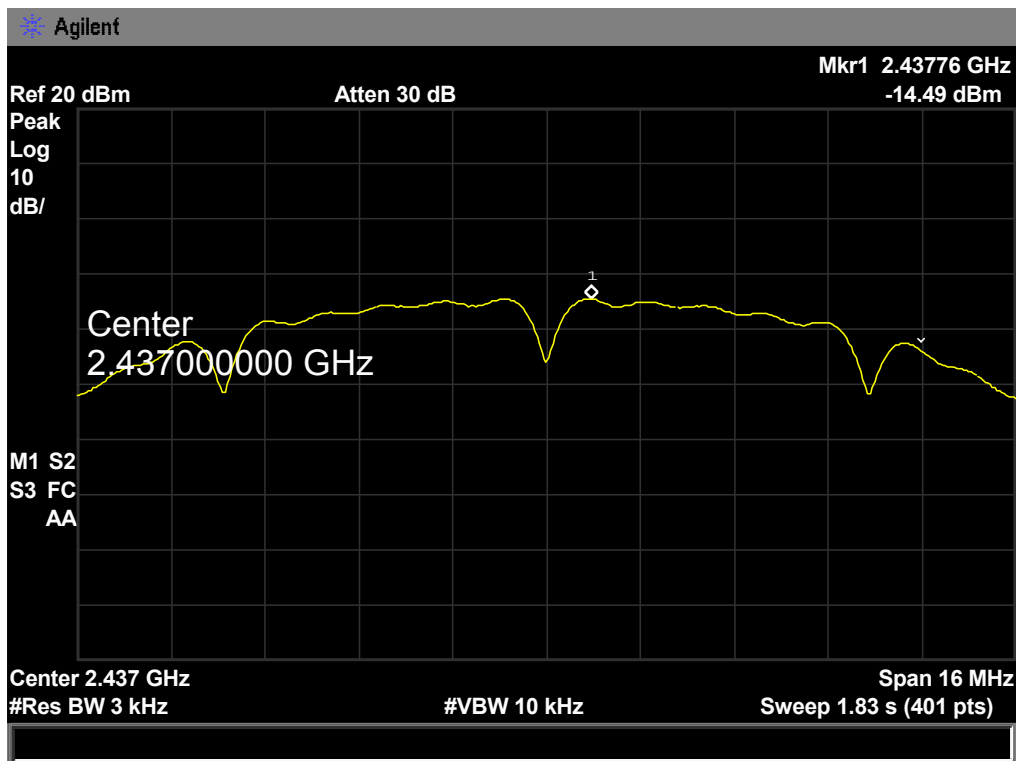
802.11B Mode

2412 MHz



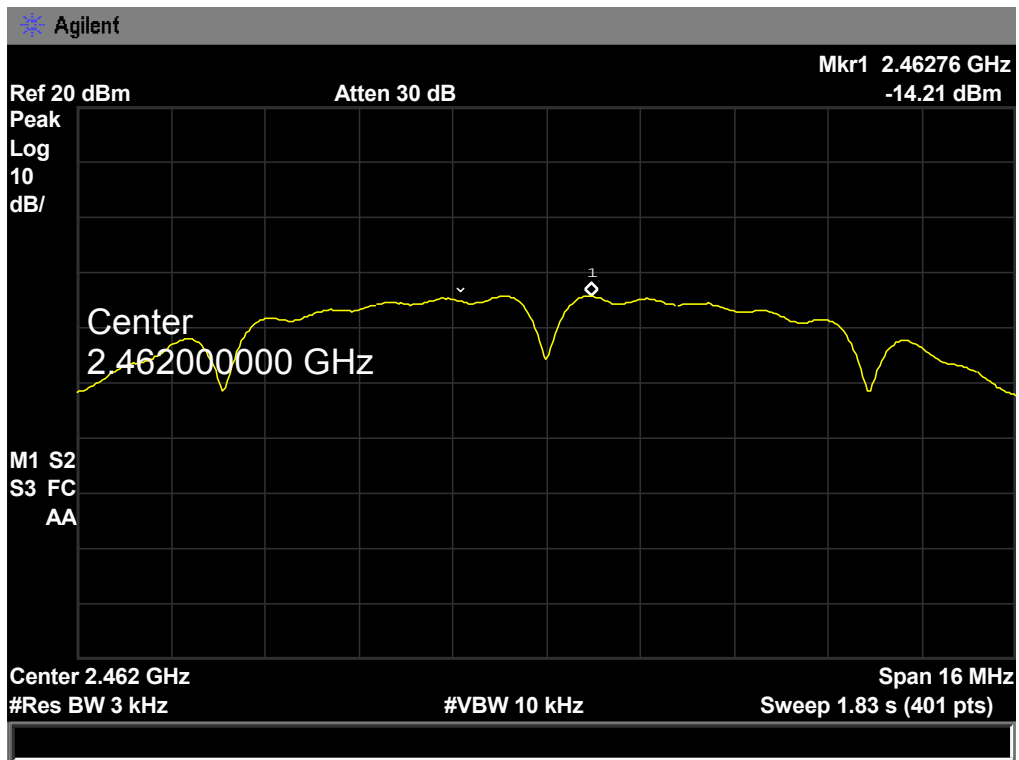
802.11B Mode

2437 MHz



802.11B Mode

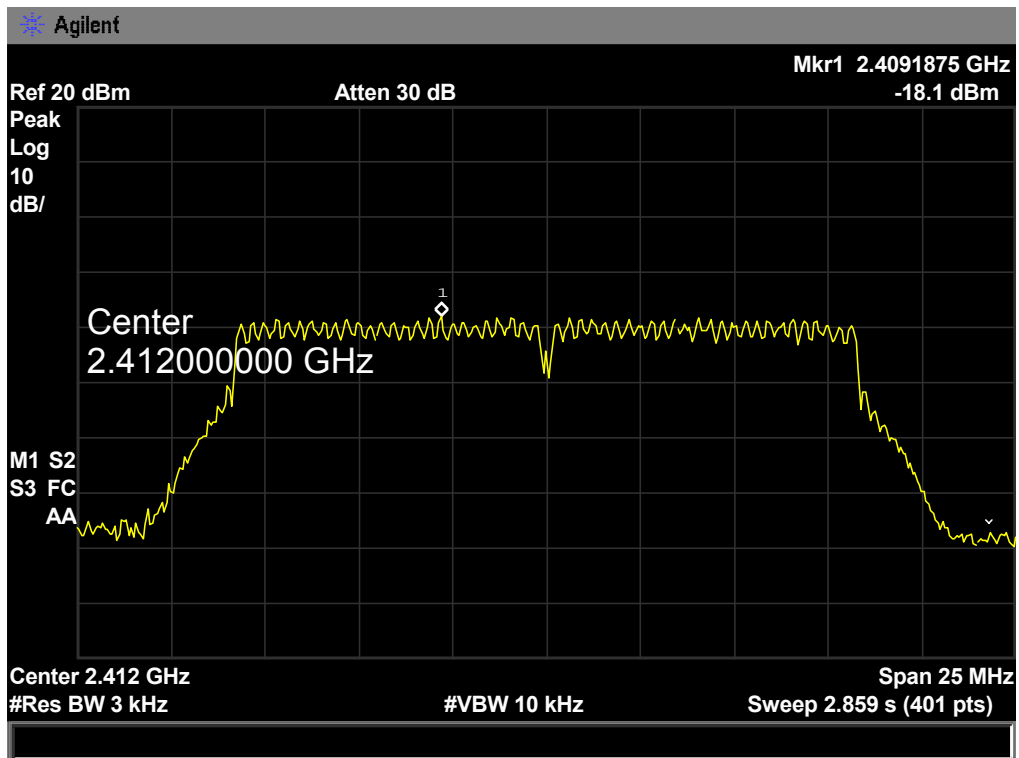
2462 MHz



EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Temperature:	25 °C
Test Voltage:	DC 12V		
Test Mode:	TX 802.11G Mode		
Channel Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)	
2412	-18.10	8	
2437	-18.43		
2462	-18.03		

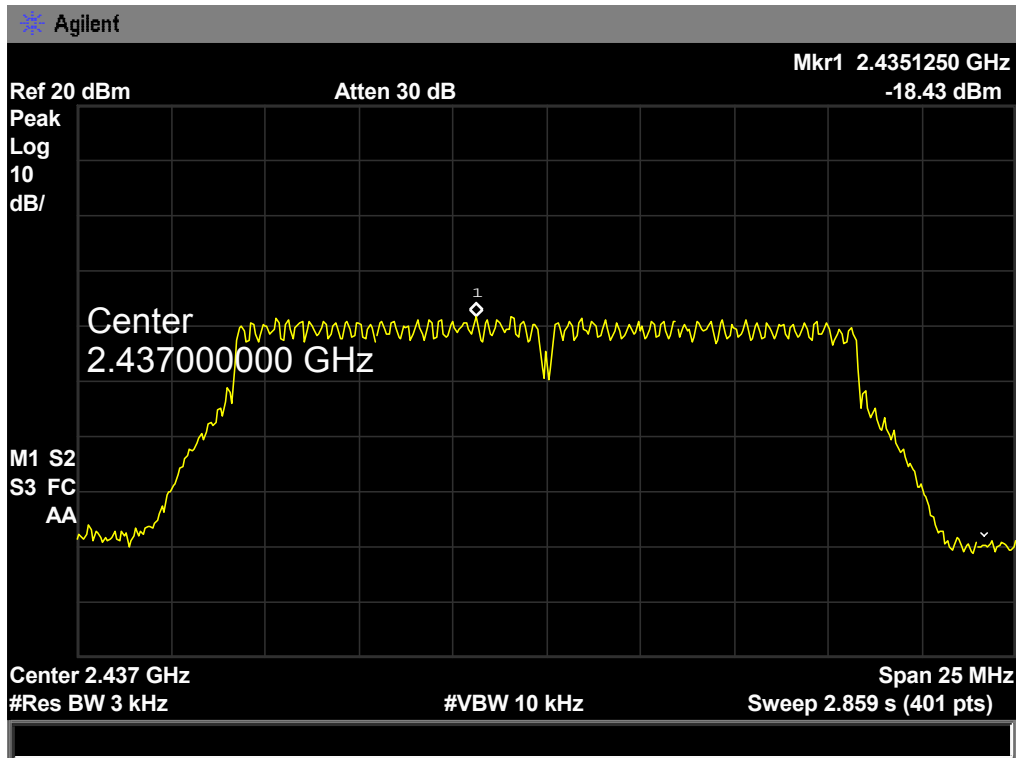
802.11G Mode

2412 MHz



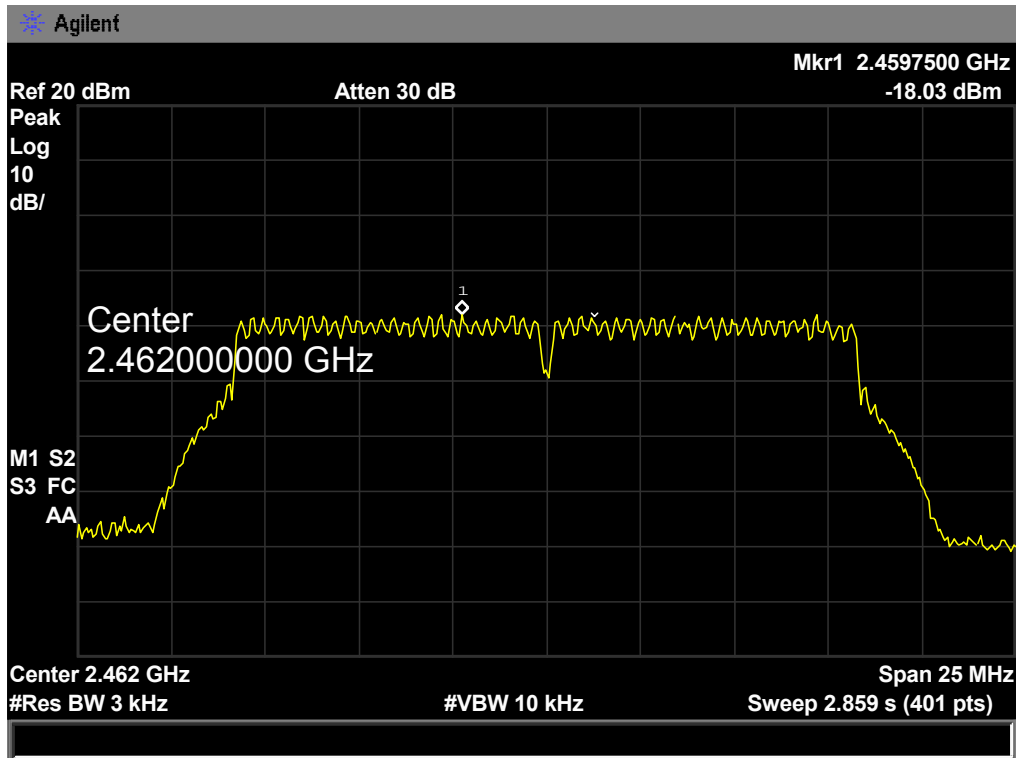
802.11G Mode

2437 MHz



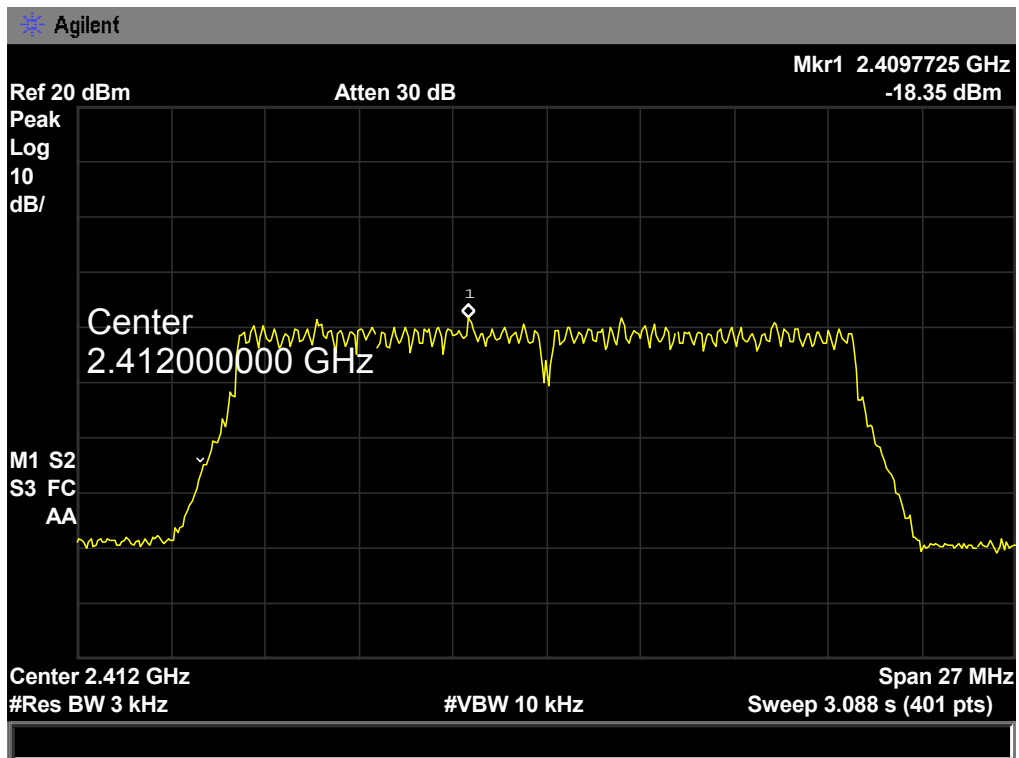
802.11G Mode

2462 MHz



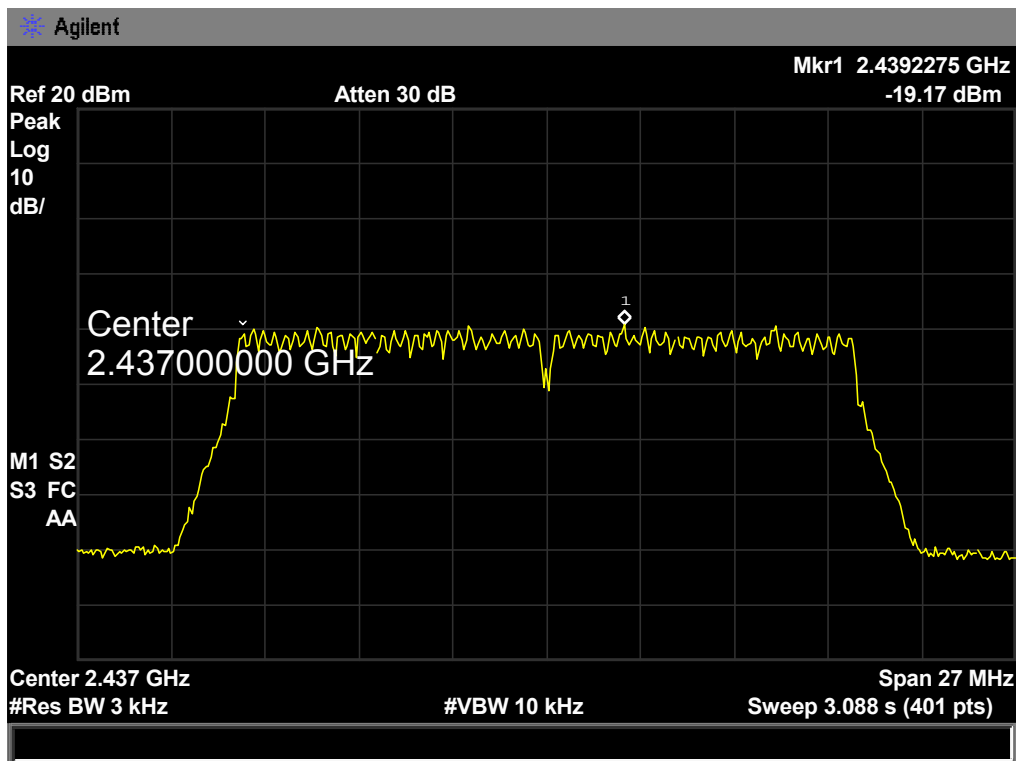
EUT:	CAR DVR	Model:	XM-JPL1-1
Temperature:	25 °C	Temperature:	25 °C
Test Voltage:	DC 12V		
Test Mode:	TX 802.11N(HT20) Mode		
Channel Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)	
2412	-18.35	8	
2437	-19.17		
2462	-19.05		

802.11N(HT20) Mode
2412 MHz



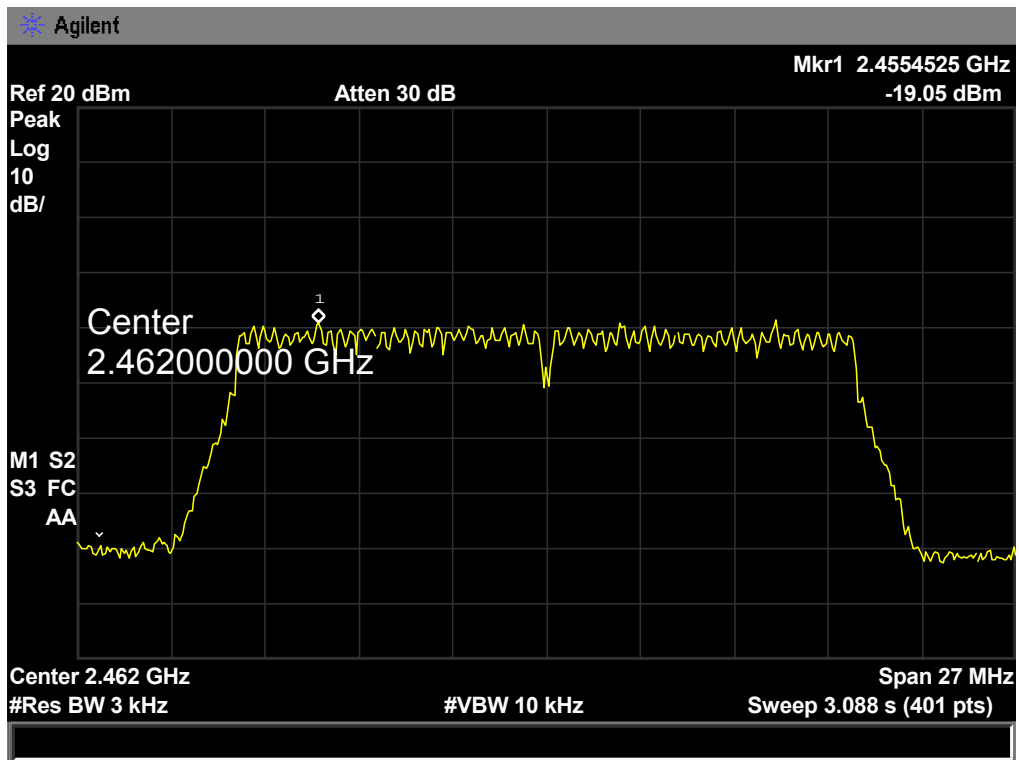
802.11N(HT20) Mode

2437 MHz



802.11N(HT20) Mode

2462 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 2 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.3 Result

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

Antenna Type
<input checked="" type="checkbox"/> Permanent attached antenna
<input type="checkbox"/> Unique connector antenna
<input type="checkbox"/> Professional installation antenna