FCC Radio Test Report

FCC ID: 2AEJ6-FF916

Original Grant

Report No.	:	TB-FCC155517
Applicant	:	Zhejiang Lucky Manufacturer Co.,Ltd
Equipment Under Test (EUT)		
EUT Name	:	Fish Finder
Model No.	:	FF916
Series Model No.	:	FF916S
Brand Name	:	LUCKY, LUCKYLAKER, LUCKYIMAGINE
Receipt Date	:	2017-06-20
Test Date	:	2017-06-21 to 2017-06-30
Issue Date	:	2017-07-02
Standards	:	FCC Part 15, Subpart C (15.247:2016)
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	:	Ray Li

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.

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, China
Tel: +86 75526509301 Fax: +86 75526509195

Contents

CONTENTS 2
1. GENERAL INFORMATION ABOUT EUT 4
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 Units 5
1.5 Description of Test Mode 5
1.6 Description of Test Software Setting 7
1.7 Measurement Uncertainty 7
1.8 Test Facility 8
2. TEST SUMMARY 9
3. TEST EQUIPMENT 10
4. CONDUCTED EMISSION TEST 11
4.1 Test Standard and Limit 11
4.2 Test Setup 11
4.3 Test Procedure 11
4.4 EUT Operating Mode 12
4.5 Test Data 12
5. RADIATED EMISSION TEST 17
5.1 Test Standard and Limit 17
5.2 Test Setup 18
5.3 Test Procedure 19
5.4 EUT Operating Condition 19
5.5 Test Data 20
6. RESTRICTED BANDS REQUIREMENT 41
6.1 Test Standard and Limit 41
6.2 Test Setup 41
6.3 Test Procedure 41
6.4 EUT Operating Condition 42
6.5 Test Data 42
7. BANDWIDTH TEST 58
7.1 Test Standard and Limit 58
7.2 Test Setup 58
7.3 Test Procedure 58
7.4 EUT Operating Condition 58
7.5 Test Data 59
8. PEAK OUTPUT POWER TEST 65
8.1 Test Standard and Limit 65
8.2 Test Setup 65

8.3 Test Procedure 65
8.4 EUT Operating Condition 65
8.5 Test Data 66
9. POWER SPECTRAL DENSITY TEST 69
9.1 Test Standard and Limit 69
9.2 Test Setup 69
9.3 Test Procedure 69
9.4 EUT Operating Condition 69
9.5 Test Data 70
10. ANTENNA REQUIREMENT 76
10.1 Standard Requirement 76
10.2 Antenna Connected Construction 76

1. General Information about EUT

1.1 Client Information

Applicant	:	Zhejiang Lucky Manufacturer Co.,Ltd
Address	:	NO.2098 Cuntong Road, Jindong Industrial Zone, JinHua City, ZheJiang Province, China
Manufacturer	:	Zhejiang Lucky Manufacturer Co.,Ltd
Address	:	NO.2098 Cuntong Road, Jindong Industrial Zone, JinHua City, ZheJiang Province, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Fish Finder	
Models No.	:	FF916, FF916S	
Model Difference	:	All models are identical in the same PCB layout interior structure and electrical circuits, The only difference is charging position.	
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: 18.72dBm 802.11g: 17.28dBm 802.11n (HT20):15.46dBm
		Antenna Gain:	3dBi Integral Antenna
		Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,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 Voltage Supply from USB Port DC Supply by the Li-ion Battery	
Power Rating	:	DC 5.0 V from the USB Cable DC 3.7V by 850mAh Li-ion Battery	
Connecting I/O Port(S)	:	Please refer to 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 v04.

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

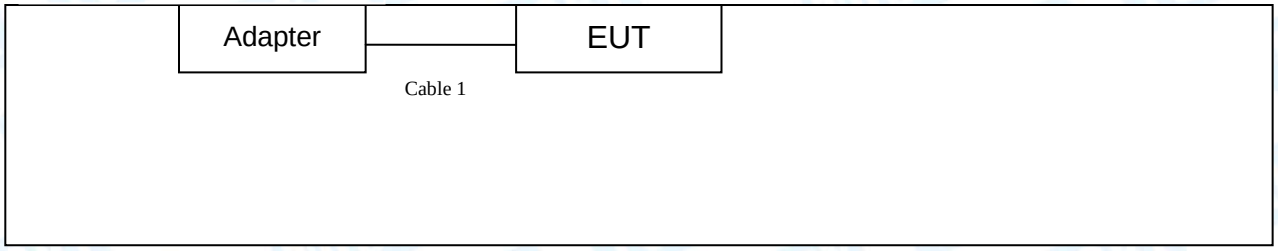
(3) Channel List:

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		
Note: CH 01~CH 11 for 802.11b/g/n(HT20)					

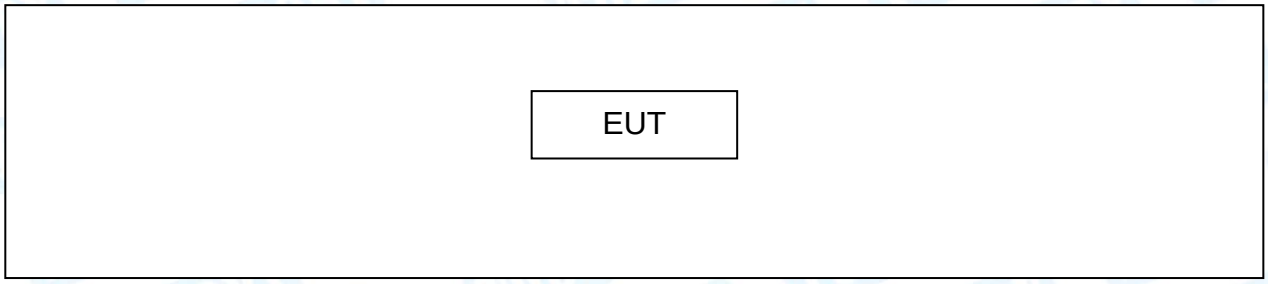
(4) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested

Normal Mode



TX Mode



1.4 Description of Support Units

Equipment Information				
Name	**Model**	**FCC ID/VOC**	**Manufacturer**	**Used "√"**
Cable Information				
Number	**Shielded Type**	**Ferrite Core**	**Length**	**Note**
Cable 1	NO	NO	1.2M	

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	Normal Mode with TX B Mode

For Radiated Test	
Final Test Mode	**Description**
Mode 2	TX Mode B Mode Channel 01/06/11
Mode 3	TX Mode G Mode Channel 01/06/11
Mode 4	TX Mode N(HT20) Mode Channel 01/06/11

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 portable 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 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 ± 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	Band Edge	PASS	N/A
15.247(d)& 15.209	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	Jul. 21, 2016	Jul. 20, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 21, 2016	Jul. 20, 2017
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 21, 2016	Jul. 20, 2017
LISN	Rohde & Schwarz	ENV216	101131	Jul. 21, 2016	Jul. 20, 2017
Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 21, 2016	Jul. 20, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 21, 2016	Jul. 20, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.25, 2017	Mar. 24, 2018
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar.25, 2017	Mar. 24, 2018
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.24, 2017	Mar. 23, 2018
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar.24, 2017	Mar. 23, 2018
Loop Antenna	Laplace instrument	RF300	0701	Mar.24, 2017	Mar. 23, 2018
Pre-amplifier	Sonoma	310N	185903	Mar.25, 2017	Mar. 24, 2018
Pre-amplifier	HP	8449B	3008A00849	Mar.24, 2017	Mar. 23, 2018
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.25, 2017	Mar. 24, 2018
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted Emission					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 21, 2016	Jul. 20, 2017
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 21, 2016	Jul. 20, 2017
Power Meter	Anritsu	ML2495A	25406005	Jul. 21, 2016	Jul. 20, 2017
Power Sensor	Anritsu	ML2411B	25406005	Jul. 21, 2016	Jul. 20, 2017

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard

FCC Part 15.207

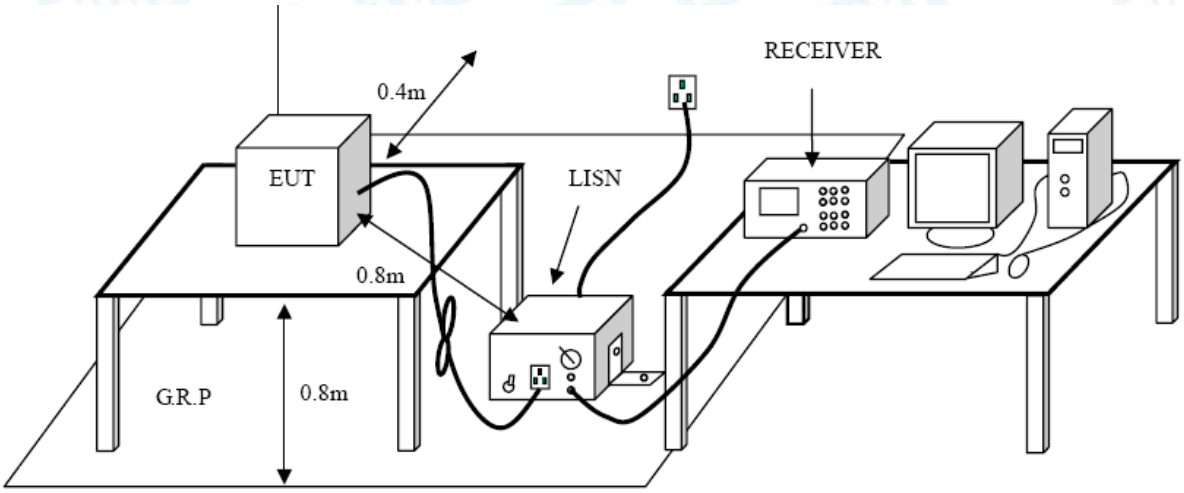
4.1.2 Test Limit

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.

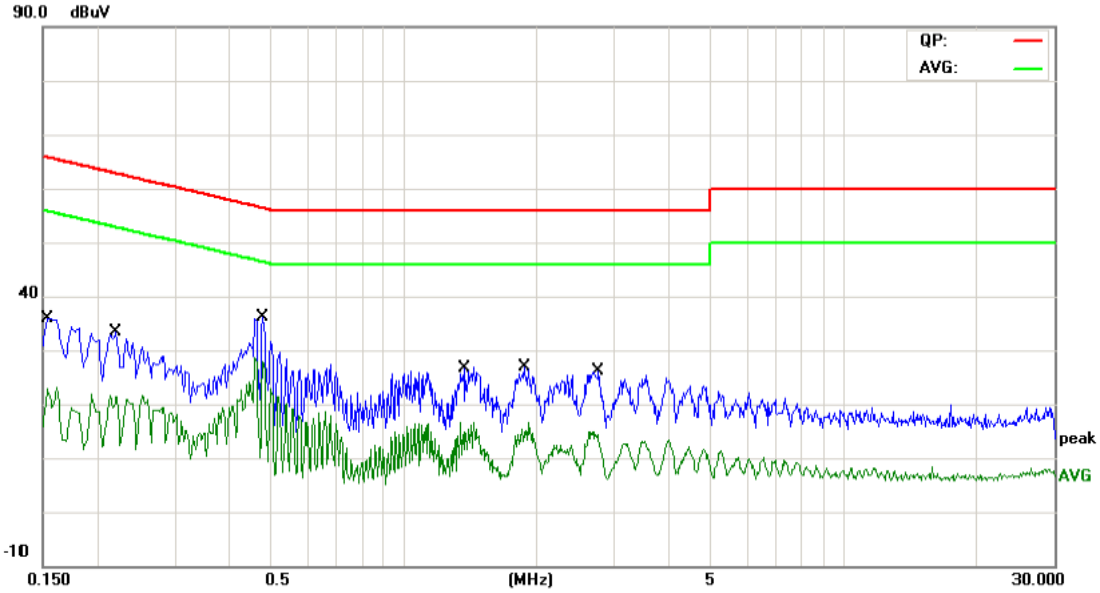
4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please see the next page.

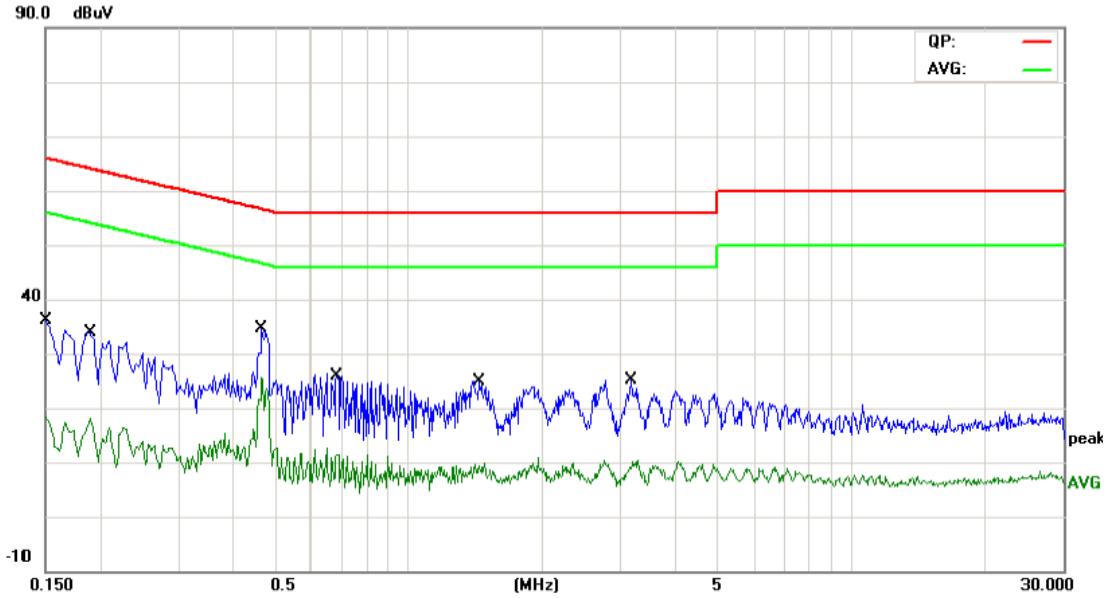
EUT:	Fish Finder	**Model Name :**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V60Hz		
Terminal:	Line		
Test Mode:	Charging with TX B Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	25.48	9.58	35.06	65.78	-30.72	QP
2		0.1539	11.34	9.58	20.92	55.78	-34.86	AVG
3		0.2220	4.48	9.58	14.06	62.74	-48.68	QP
4		0.2220	-2.67	9.58	6.91	52.74	-45.83	AVG
5		0.4780	21.64	9.60	31.24	56.37	-25.13	QP
6	*	0.4780	14.56	9.60	24.16	46.37	-22.21	AVG
7		1.3619	11.23	9.60	20.83	56.00	-35.17	QP
8		1.3619	3.99	9.60	13.59	46.00	-32.41	AVG
9		1.8740	11.61	9.61	21.22	56.00	-34.78	QP
10		1.8740	3.45	9.61	13.06	46.00	-32.94	AVG
11		2.7540	10.36	9.64	20.00	56.00	-36.00	QP
12		2.7540	3.34	9.64	12.98	46.00	-33.02	AVG

Emission Level= Read Level+ Correct Factor

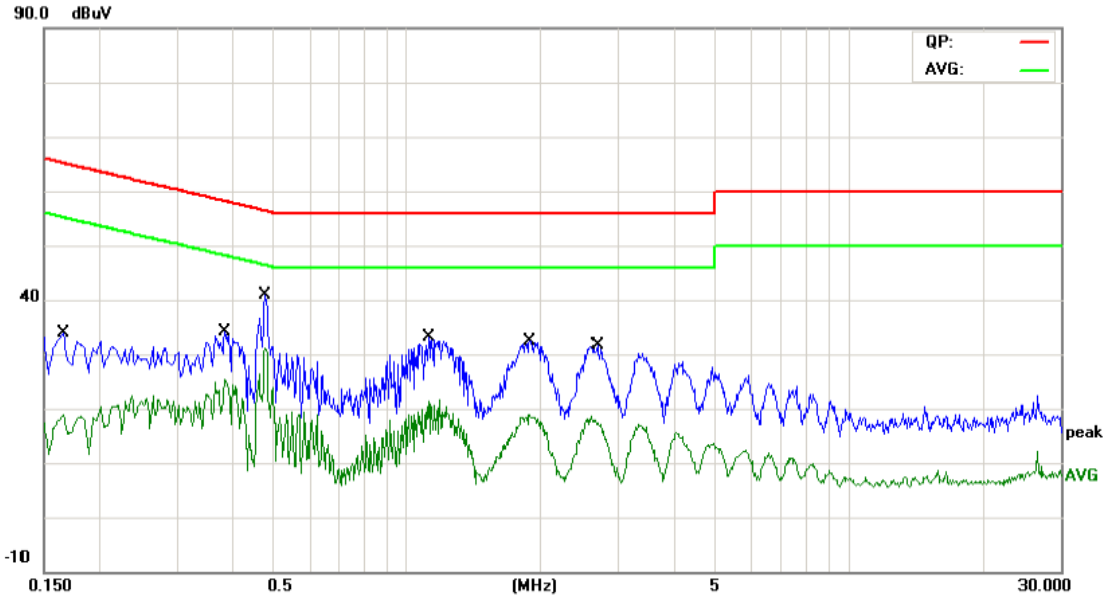
EUT:	Fish Finder	Model Name :	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V60Hz		
Terminal:	Neutral		
Test Mode:	Charging with TX B Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	24.53	9.64	34.17	65.99	-31.82	QP
2		0.1500	7.45	9.64	17.09	55.99	-38.90	AVG
3		0.1900	15.08	9.65	24.73	64.03	-39.30	QP
4		0.1900	1.10	9.65	10.75	54.03	-43.28	AVG
5	*	0.4660	18.50	9.58	28.08	56.58	-28.50	QP
6		0.4660	8.15	9.58	17.73	46.58	-28.85	AVG
7		0.6860	11.32	9.59	20.91	56.00	-35.09	QP
8		0.6860	-0.89	9.59	8.70	46.00	-37.30	AVG
9		1.4340	10.41	9.60	20.01	56.00	-35.99	QP
10		1.4340	-1.73	9.60	7.87	46.00	-38.13	AVG
11		3.1660	7.20	9.67	16.87	56.00	-39.13	QP
12		3.1660	-2.70	9.67	6.97	46.00	-39.03	AVG

Emission Level= Read Level+ Correct Factor

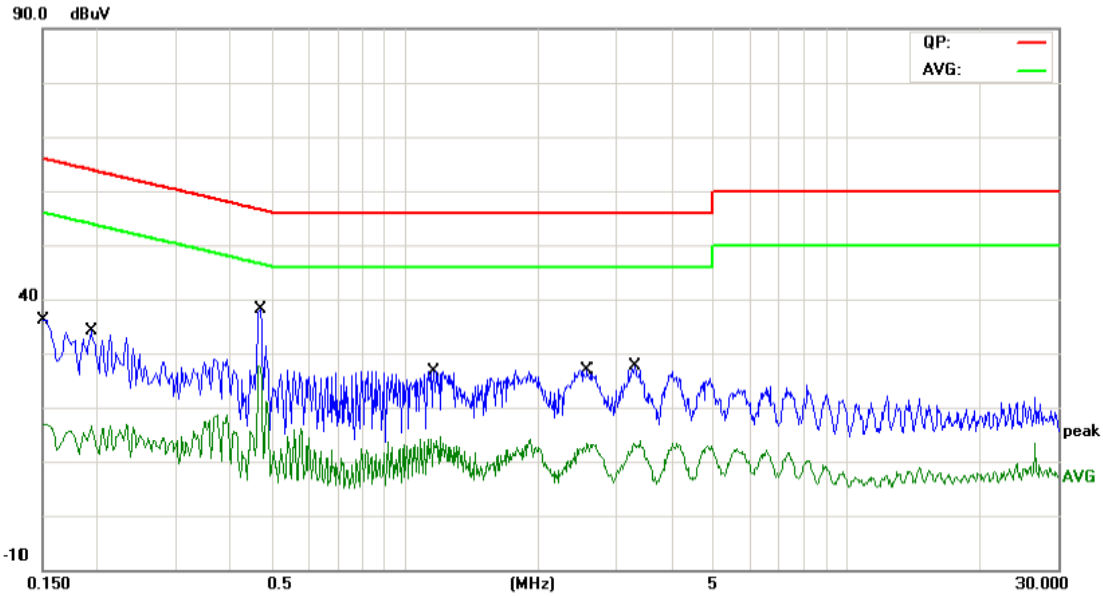
EUT:	Fish Finder	**Model Name :**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	AC 240V/60Hz		
Terminal:	Line		
Test Mode:	Charging with TX B Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1660	11.29	9.58	20.87	65.15	-44.28	QP
2		0.1660	-0.28	9.58	9.30	55.15	-45.85	AVG
3		0.3860	21.21	9.60	30.81	58.15	-27.34	QP
4		0.3860	13.75	9.60	23.35	48.15	-24.80	AVG
5		0.4780	28.28	9.60	37.88	56.37	-18.49	QP
6	*	0.4780	21.23	9.60	30.83	46.37	-15.54	AVG
7		1.1180	16.85	9.60	26.45	56.00	-29.55	QP
8		1.1180	6.28	9.60	15.88	46.00	-30.12	AVG
9		1.8900	17.60	9.61	27.21	56.00	-28.79	QP
10		1.8900	8.20	9.61	17.81	46.00	-28.19	AVG
11		2.6820	15.85	9.63	25.48	56.00	-30.52	QP
12		2.6820	7.25	9.63	16.88	46.00	-29.12	AVG

Emission Level= Read Level+ Correct Factor

EUT:	Fish Finder	**Model Name :**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	AC 240V/60Hz		
Terminal:	Neutral		
Test Mode:	Charging with TX B 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		0.1500	24.12	9.64	33.76	65.99	-32.23	QP
2		0.1500	6.60	9.64	16.24	55.99	-39.75	AVG
3		0.1940	7.83	9.65	17.48	63.86	-46.38	QP
4		0.1940	-2.44	9.65	7.21	53.86	-46.65	AVG
5	*	0.4700	20.41	9.58	29.99	56.51	-26.52	QP
6		0.4700	9.32	9.58	18.90	46.51	-27.61	AVG
7		1.1620	10.17	9.59	19.76	56.00	-36.24	QP
8		1.1620	-1.03	9.59	8.56	46.00	-37.44	AVG
9		2.5940	11.71	9.64	21.35	56.00	-34.65	QP
10		2.5940	1.77	9.64	11.41	46.00	-34.59	AVG
11		3.2980	11.36	9.68	21.04	56.00	-34.96	QP
12		3.2980	2.06	9.68	11.74	46.00	-34.26	AVG

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 (9 kHz~1000 MHz)

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)

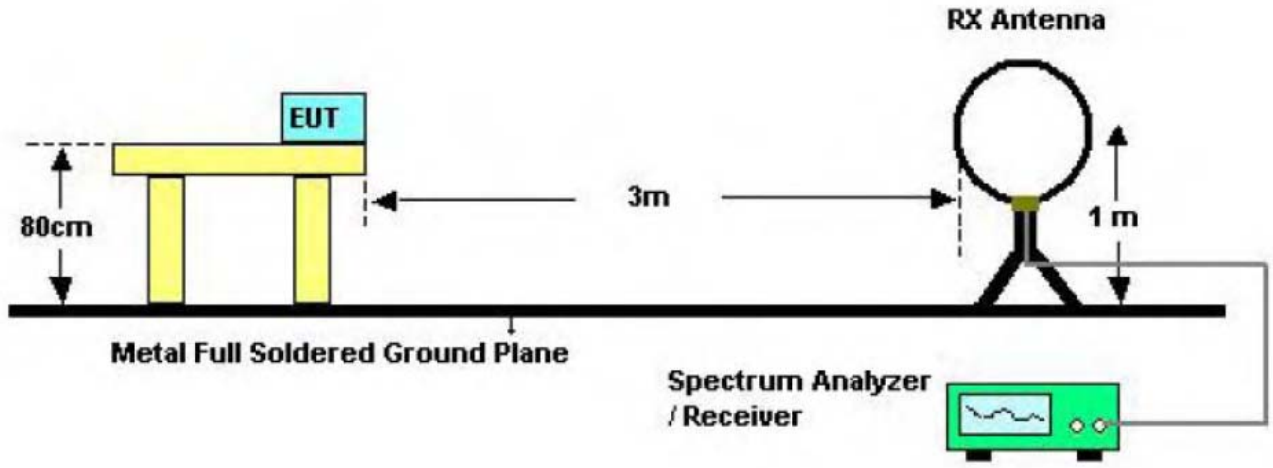
Frequency (MHz)	Distance of 3m (dBuV/m)	
	Peak	Average
Above 1000	74	54

Note:

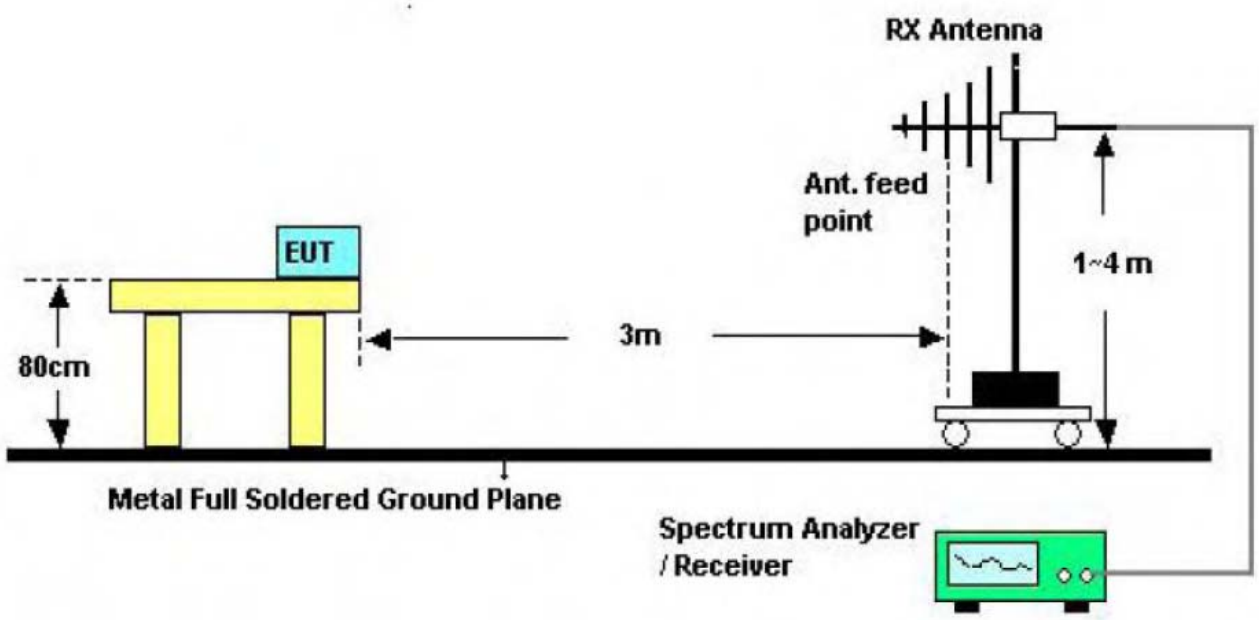
(1) The tighter limit applies at the band edges.

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

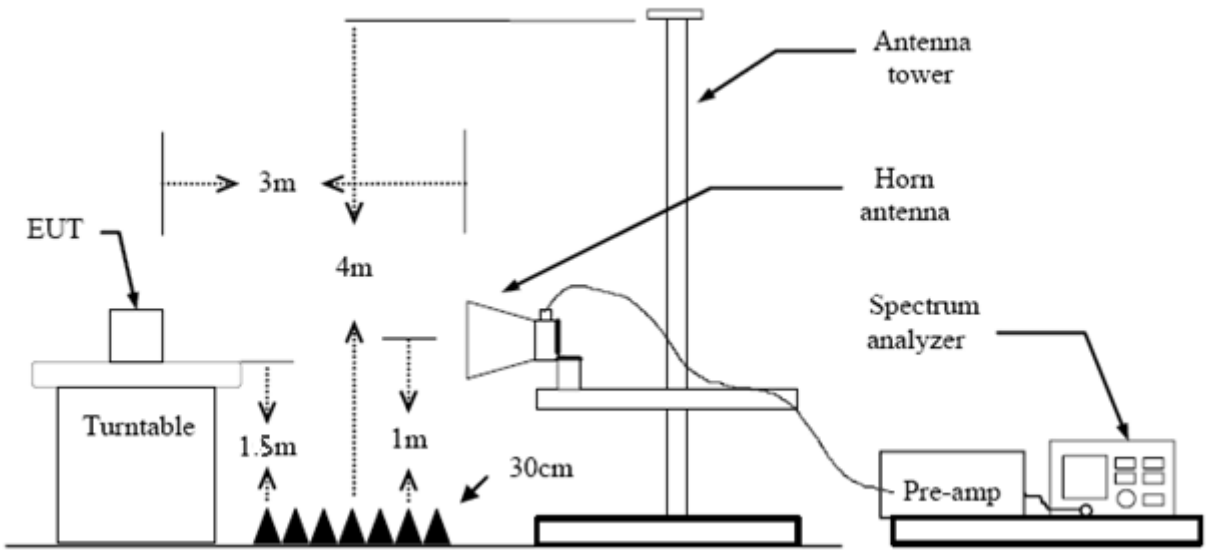
5.2 Test Setup



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.

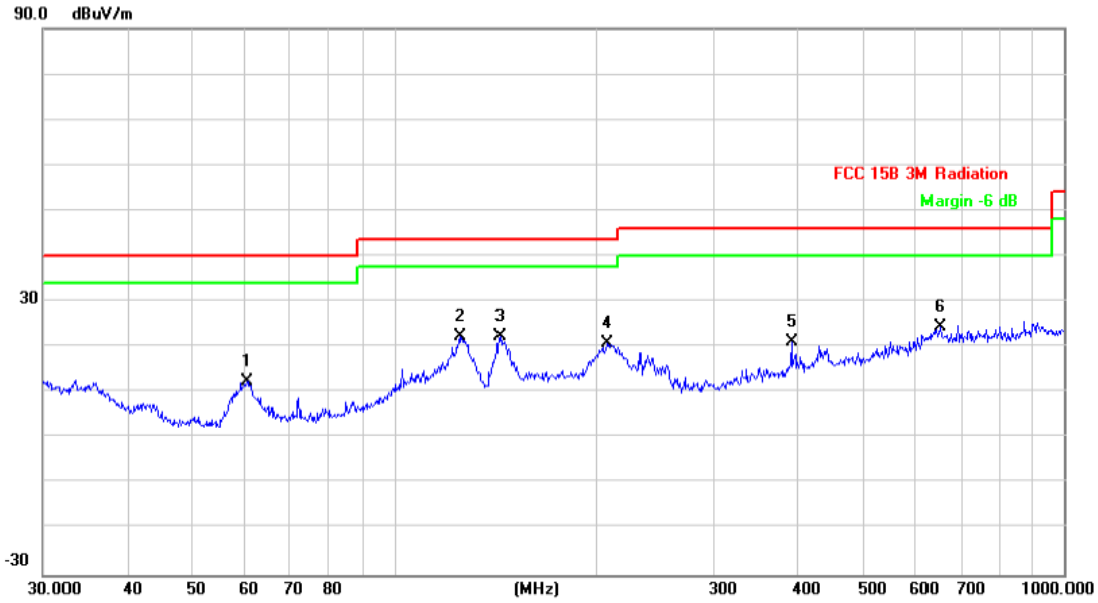
9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz~1GHz

EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

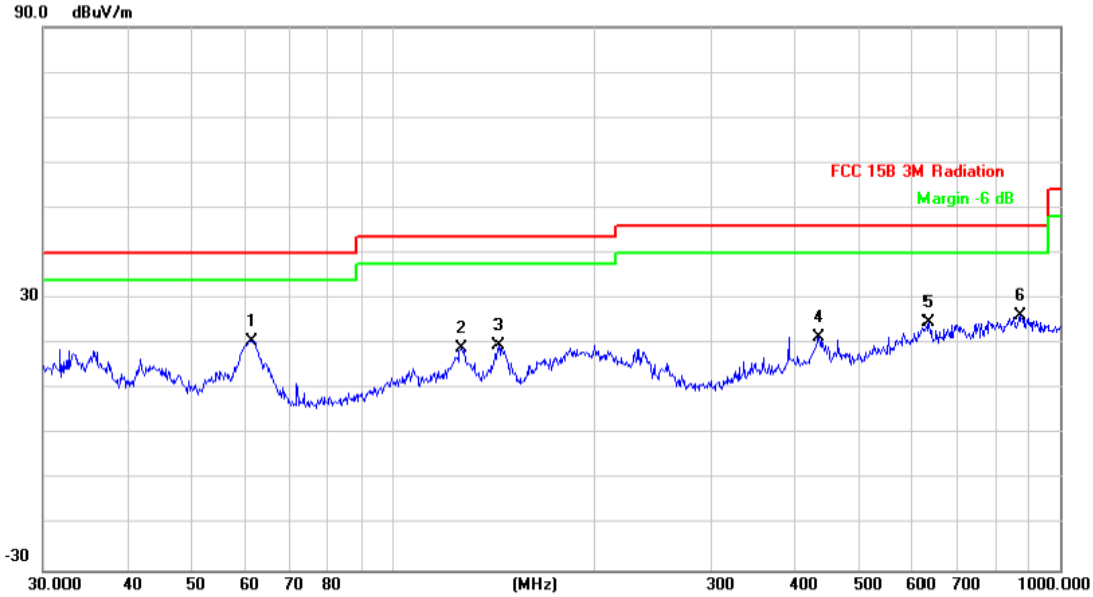


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		60.2801	36.57	-24.16	12.41	40.00	-27.59	QP
2	*	125.4457	44.32	-21.89	22.43	43.50	-21.07	QP
3		143.8295	43.56	-21.23	22.33	43.50	-21.17	QP
4		208.5803	40.37	-19.38	20.99	43.50	-22.51	QP
5		390.7226	33.86	-12.62	21.24	46.00	-24.76	QP
6		651.9417	32.02	-7.66	24.36	46.00	-21.64	QP

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

Emission Level= Read Level+ Correct Factor

EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		



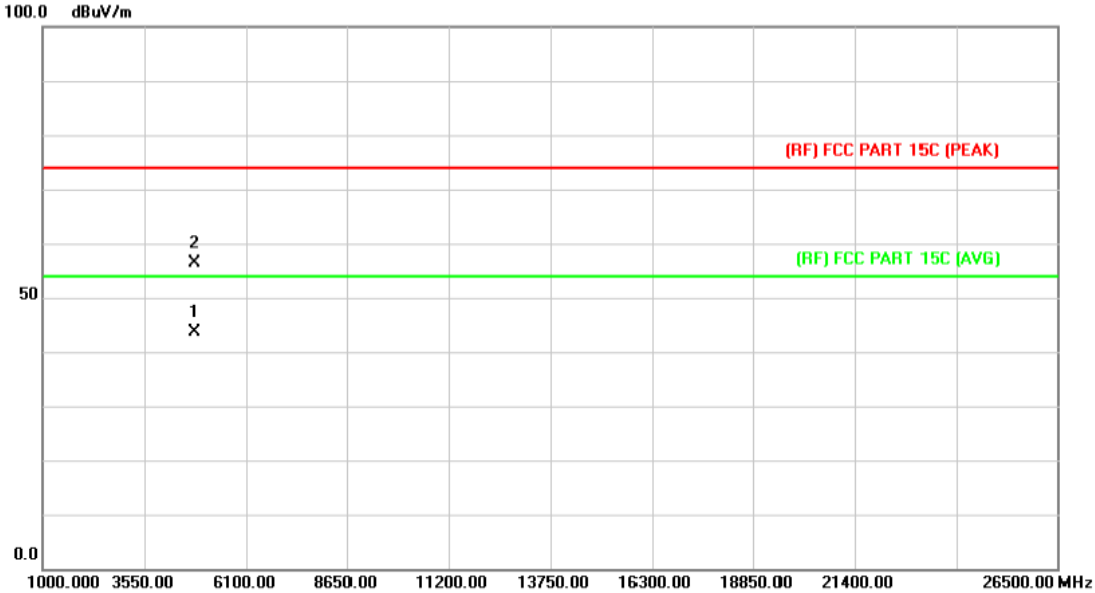
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	61.5618	44.72	-24.04	20.68	40.00	-19.32	QP
2		126.7723	41.02	-21.85	19.17	43.50	-24.33	QP
3		143.8295	40.87	-21.23	19.64	43.50	-23.86	QP
4		434.0651	33.33	-11.95	21.38	46.00	-24.62	QP
5		633.9073	32.35	-7.64	24.71	46.00	-21.29	QP
6		869.1302	31.07	-4.93	26.14	46.00	-19.86	QP

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

Emission Level= Read Level+ Correct Factor

Above 1GHz

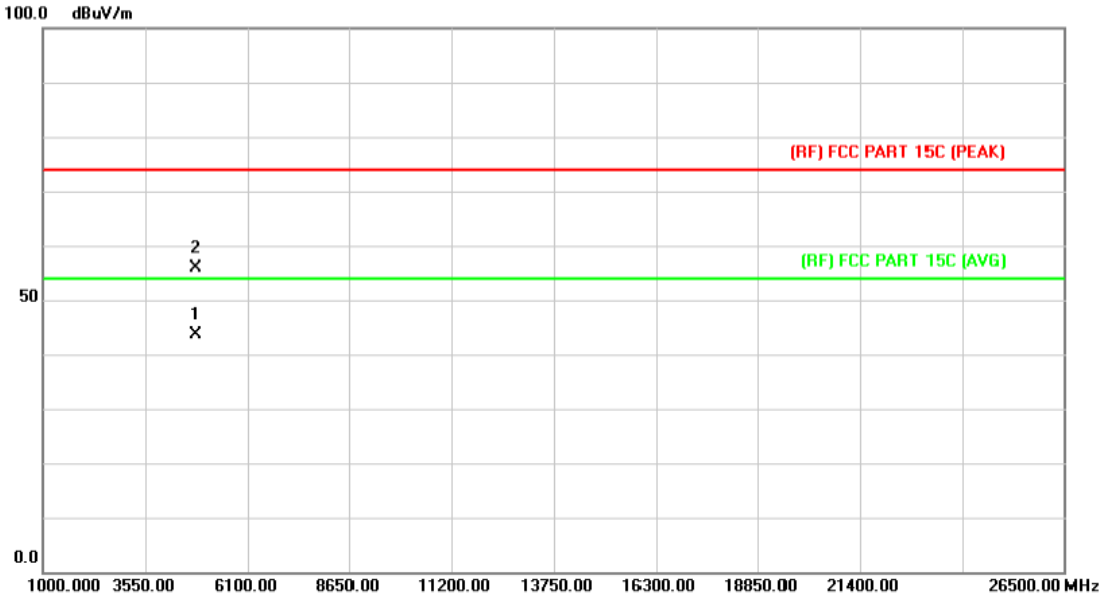
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4823.654	30.09	13.56	43.65	54.00	-10.35	AVG
2		4824.021	42.86	13.56	56.42	74.00	-17.58	peak

Emission Level= Read Level+ Correct Factor

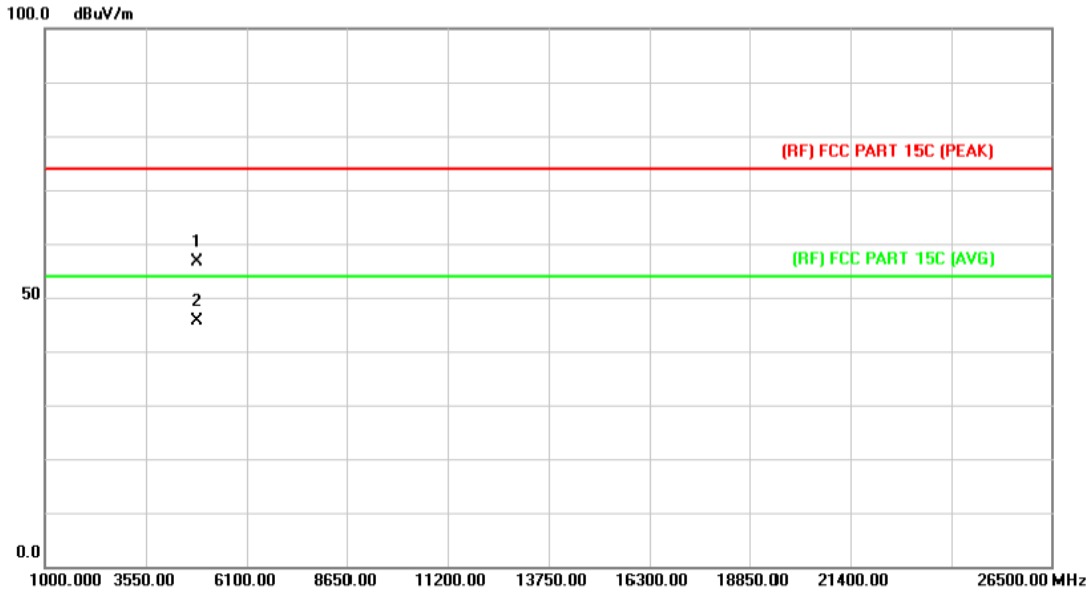
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4823.897	30.19	13.56	43.75	54.00	-10.25	AVG
2		4824.652	42.33	13.56	55.89	74.00	-18.11	peak

Emission Level= Read Level+ Correct Factor

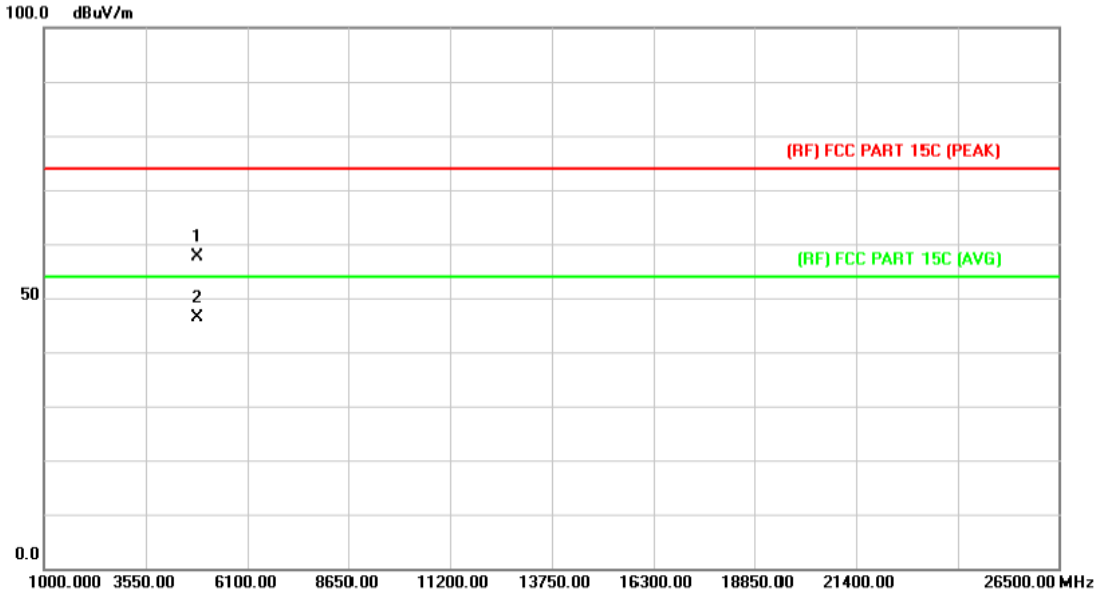
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4873.899	42.73	13.86	56.59	74.00	-17.41	peak
2	*	4874.065	31.76	13.86	45.62	54.00	-8.38	AVG

Emission Level= Read Level+ Correct Factor

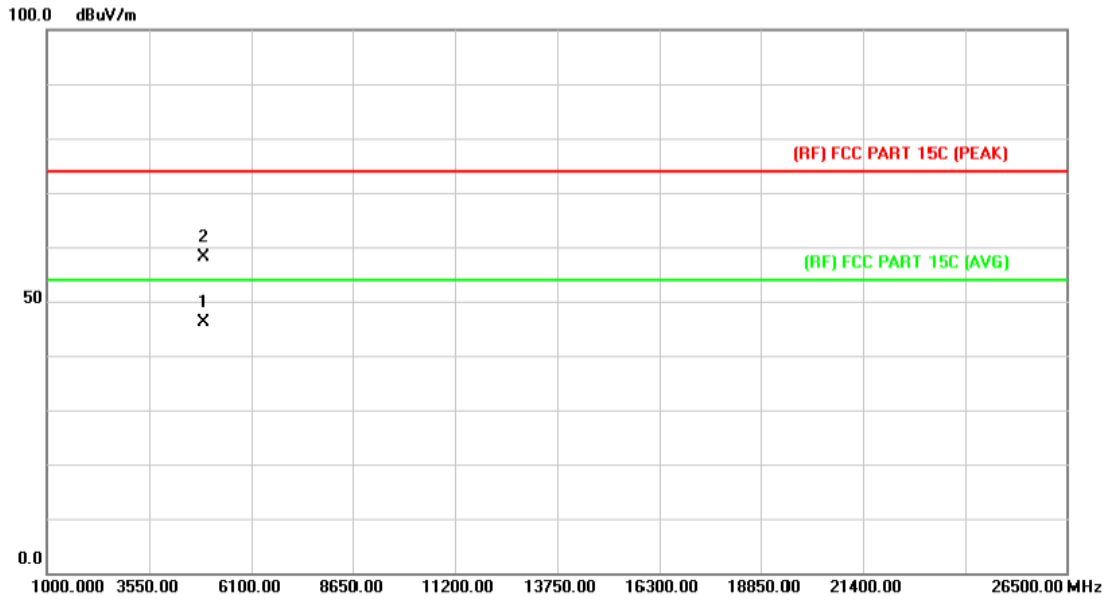
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4873.584	43.83	13.86	57.69	74.00	-16.31	peak
2	*	4874.254	32.46	13.86	46.32	54.00	-7.68	AVG

Emission Level= Read Level+ Correct Factor

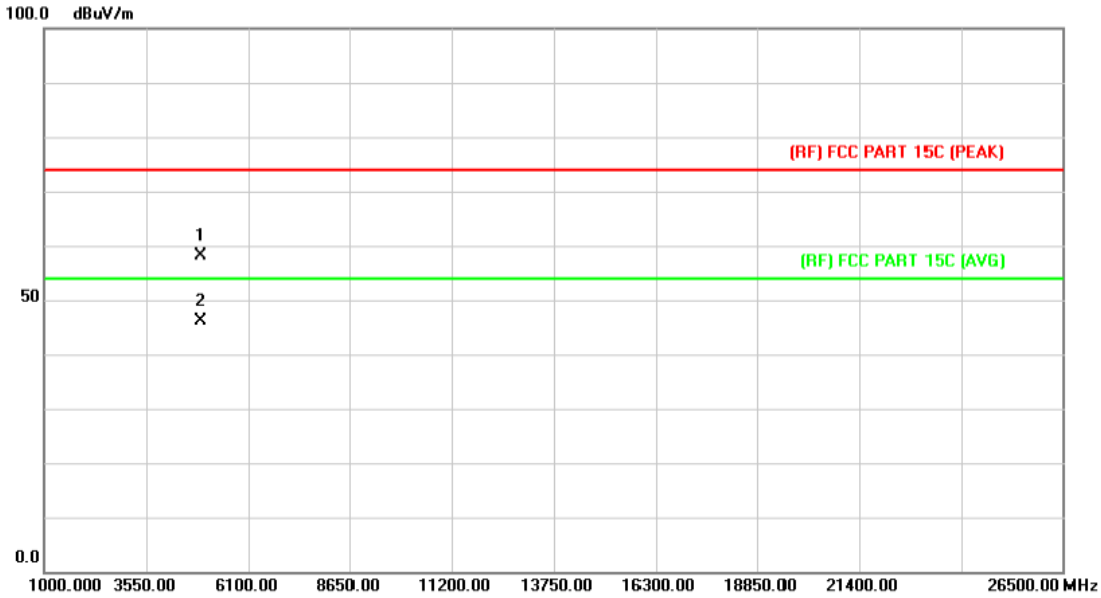
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4923.514	31.97	14.15	46.12	54.00	-7.88	AVG
2		4924.021	44.08	14.15	58.23	74.00	-15.77	peak

Emission Level= Read Level+ Correct Factor

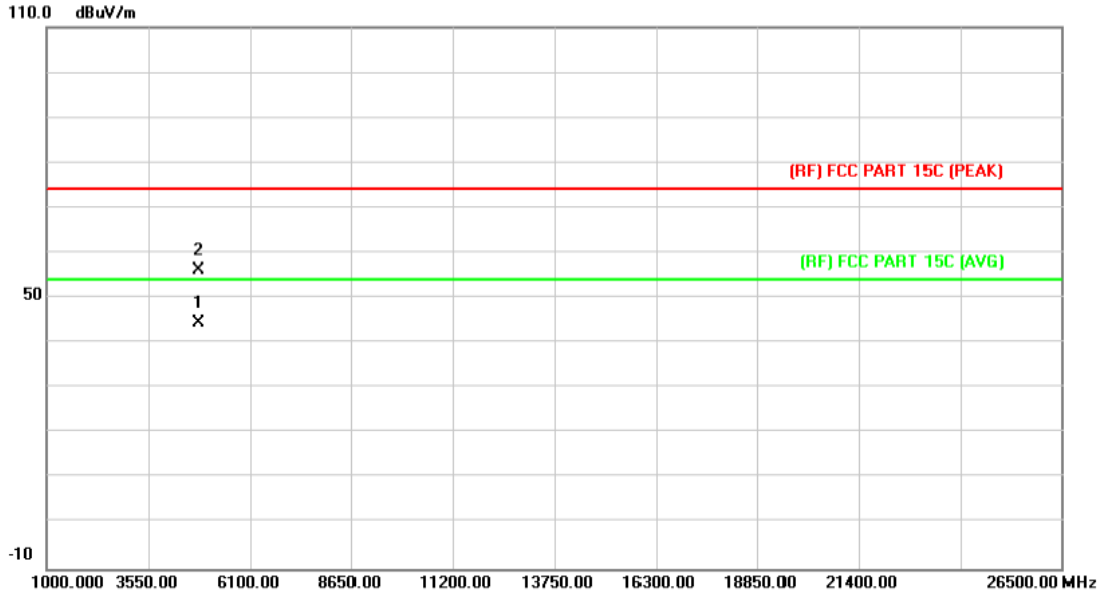
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4923.987	43.97	14.15	58.12	74.00	-15.88	peak
2	*	4924.354	32.06	14.15	46.21	54.00	-7.79	AVG

Emission Level= Read Level+ Correct Factor

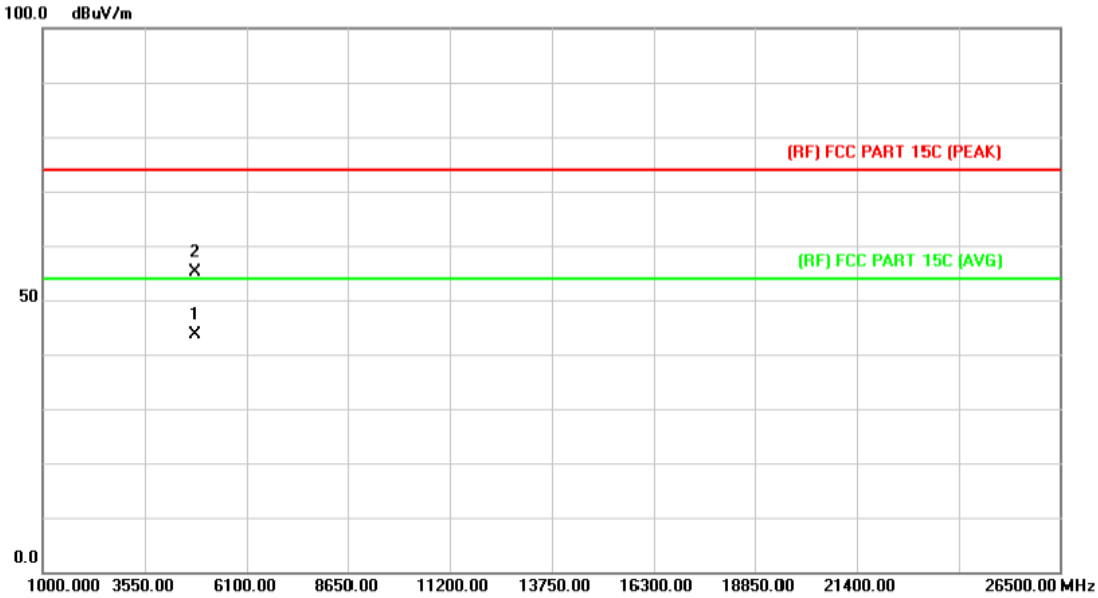
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4824.387	30.78	13.56	44.34	54.00	-9.66	AVG
2		4825.194	42.57	13.57	56.14	74.00	-17.86	peak

Emission Level= Read Level+ Correct Factor

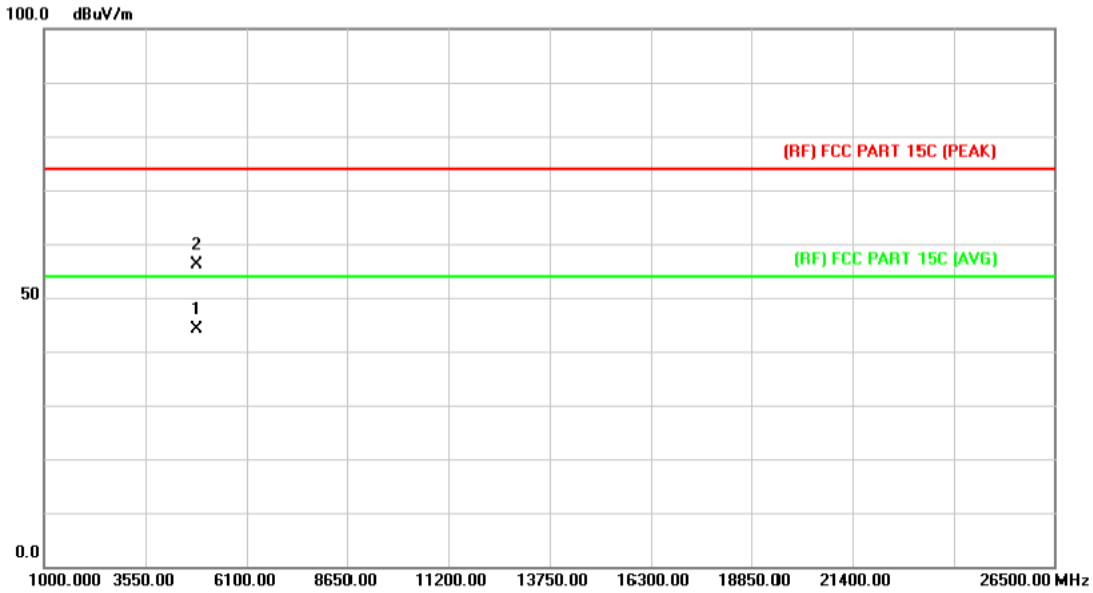
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4823.687	30.12	13.56	43.68	54.00	-10.32	AVG
2		4824.556	41.52	13.56	55.08	74.00	-18.92	peak

Emission Level= Read Level+ Correct Factor

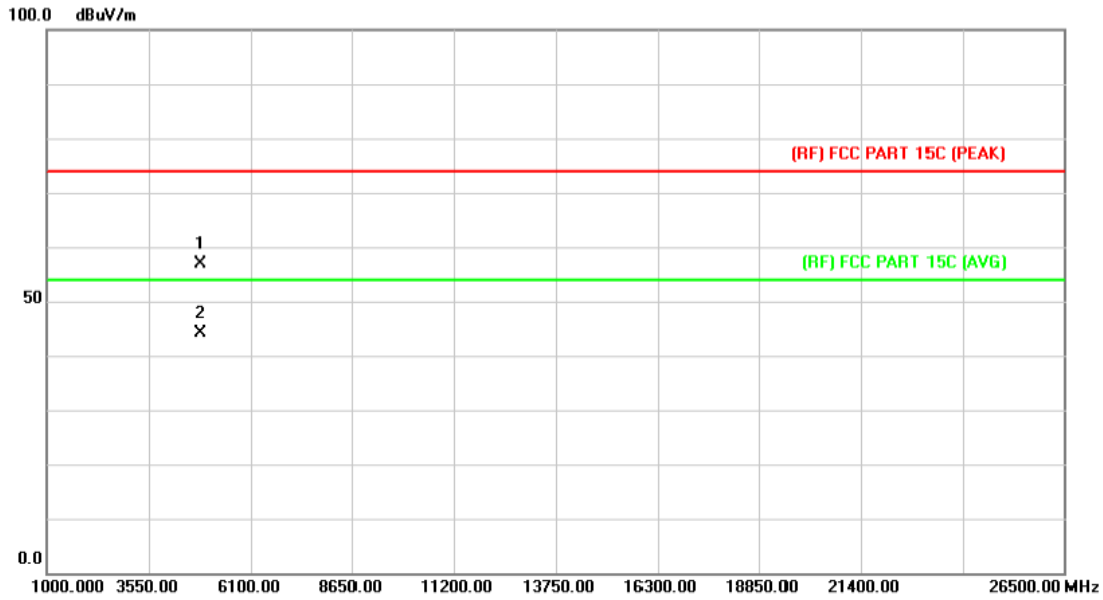
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4873.854	30.37	13.86	44.23	54.00	-9.77	AVG
2		4874.685	42.35	13.86	56.21	74.00	-17.79	peak

Emission Level= Read Level+ Correct Factor

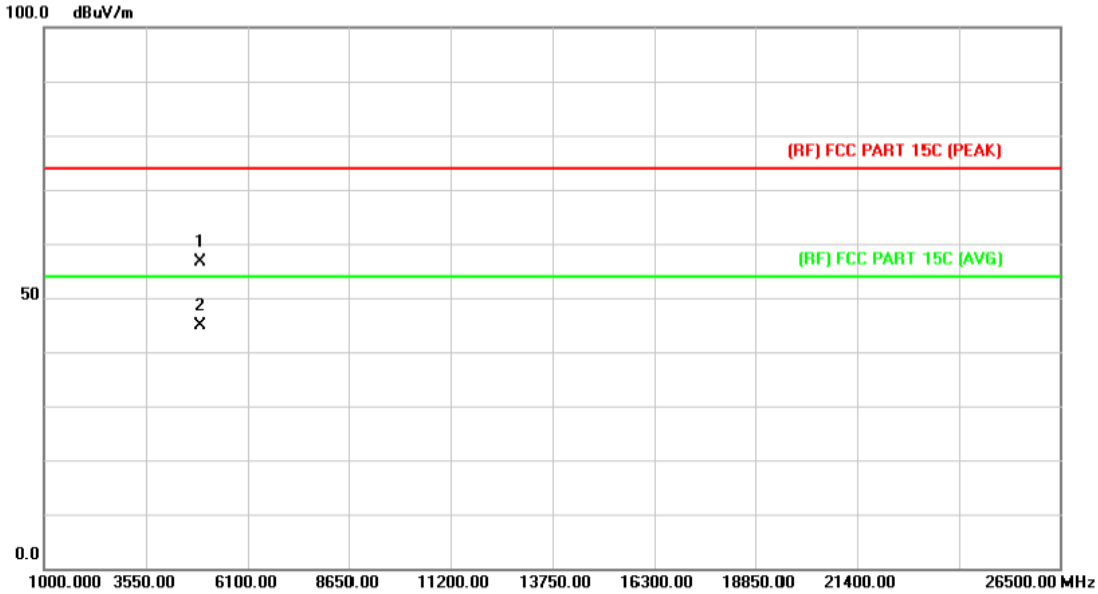
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4873.735	43.01	13.86	56.87	74.00	-17.13	peak
2	*	4874.035	30.39	13.86	44.25	54.00	-9.75	AVG

Emission Level= Read Level+ Correct Factor

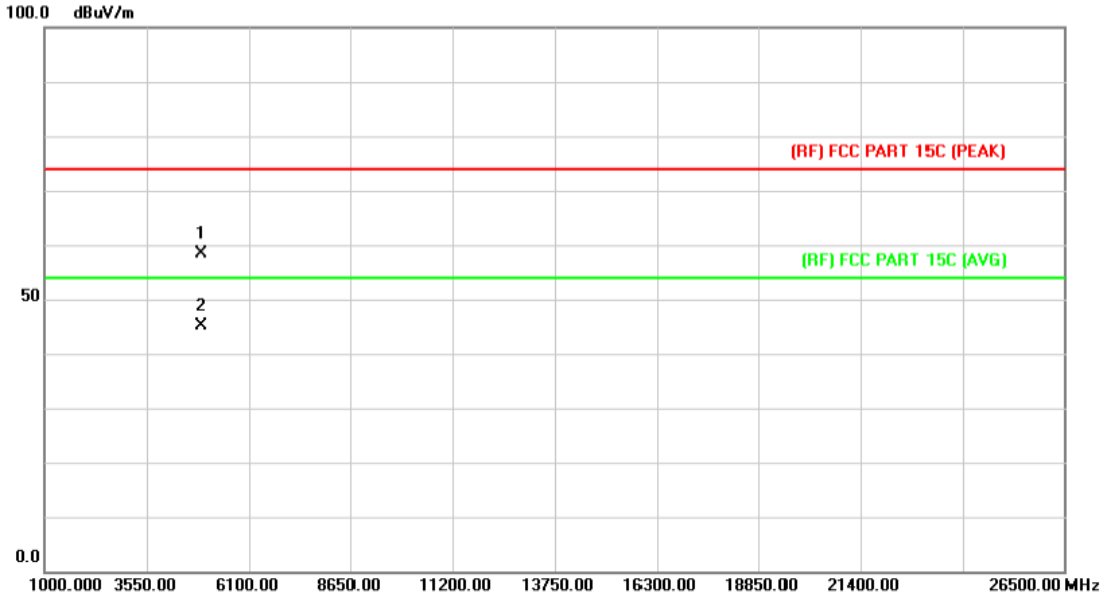
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4923.608	42.39	14.15	56.54	74.00	-17.46	peak
2	*	4923.987	30.74	14.15	44.89	54.00	-9.11	AVG

Emission Level= Read Level+ Correct Factor

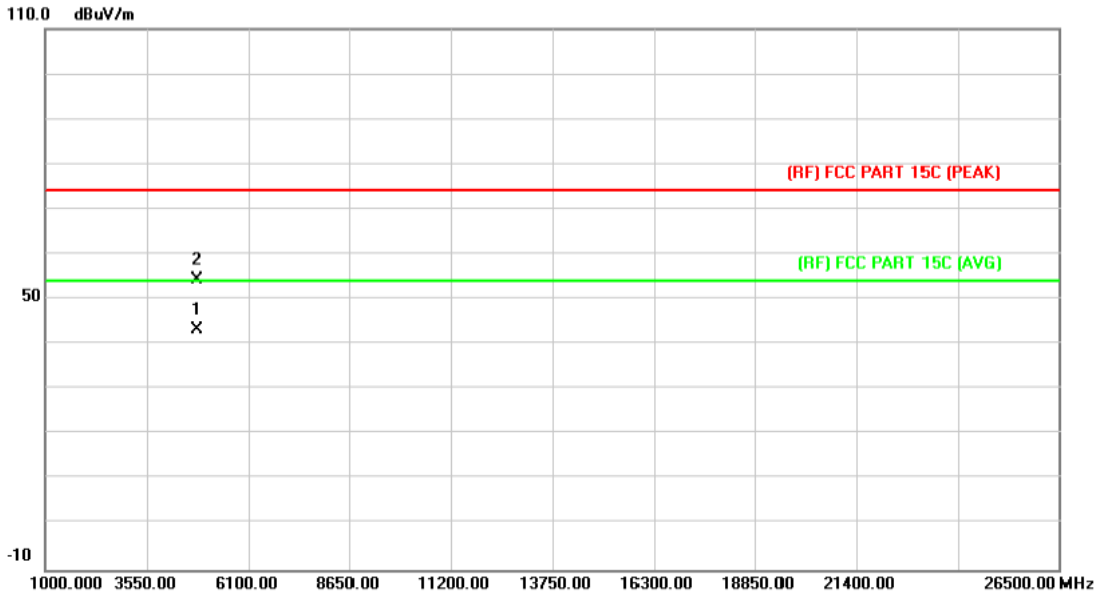
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4923.574	44.18	14.15	58.33	74.00	-15.67	peak
2	*	4923.621	30.89	14.15	45.04	54.00	-8.96	AVG

Emission Level= Read Level+ Correct Factor

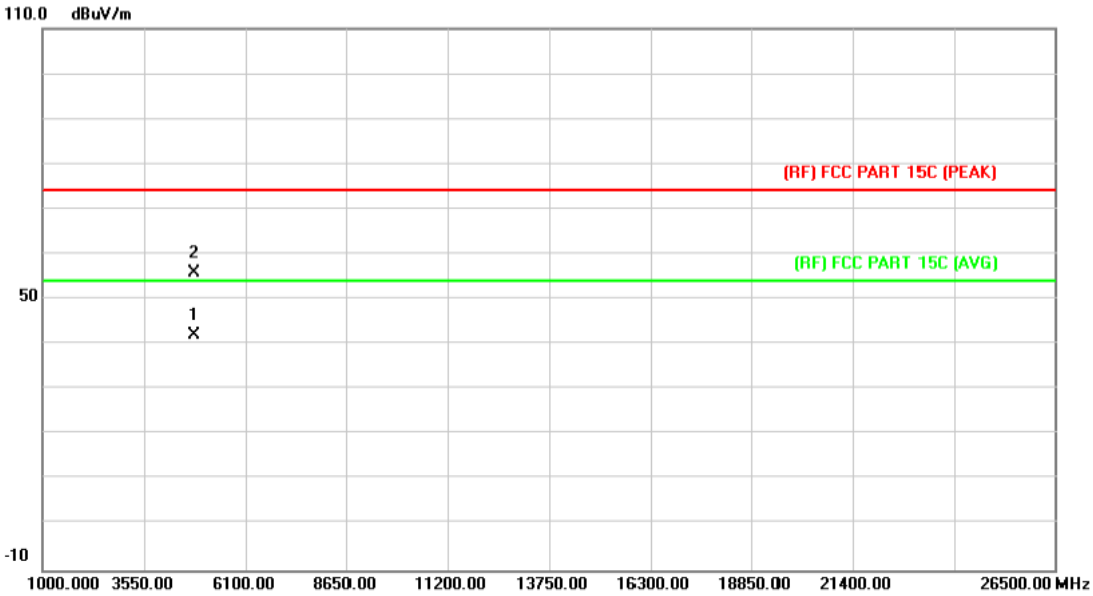
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4824.342	29.65	13.56	43.21	54.00	-10.79	AVG
2		4824.588	40.75	13.56	54.31	74.00	-19.69	peak

Emission Level= Read Level+ Correct Factor

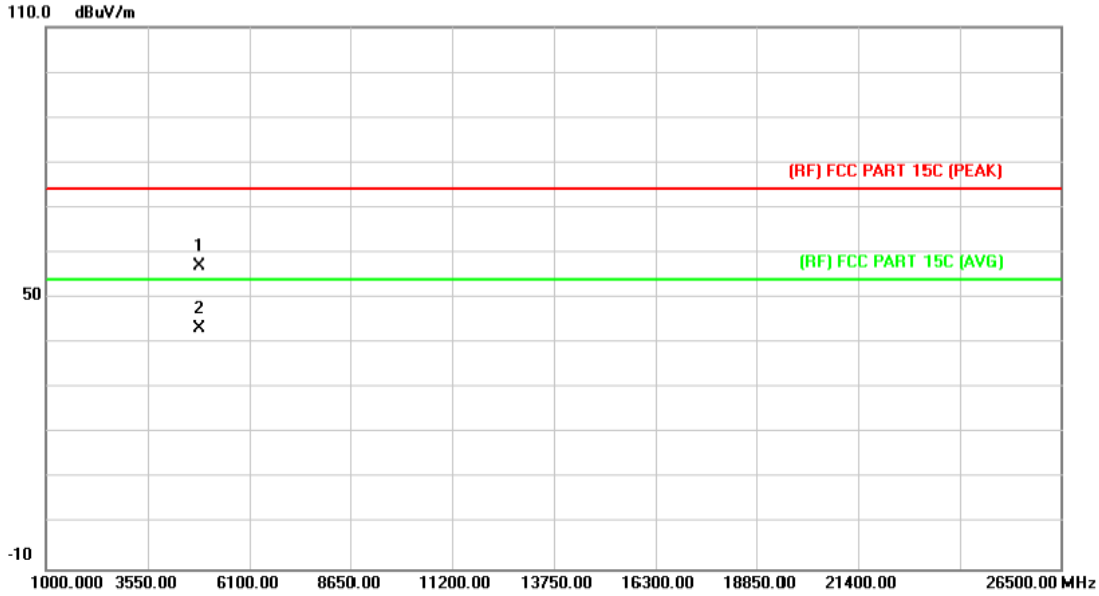
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4823.016	28.45	13.56	42.01	54.00	-11.99	AVG
2		4824.027	42.42	13.56	55.98	74.00	-18.02	peak

Emission Level= Read Level+ Correct Factor

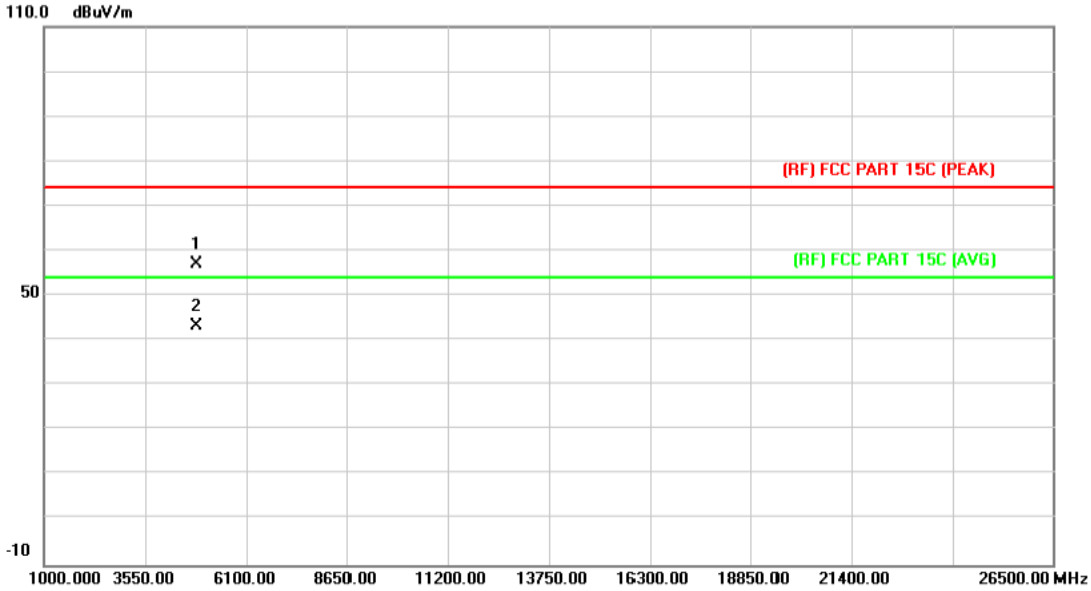
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4874.726	43.12	13.86	56.98	74.00	-17.02	peak
2	*	4874.882	29.33	13.86	43.19	54.00	-10.81	AVG

Emission Level= Read Level+ Correct Factor

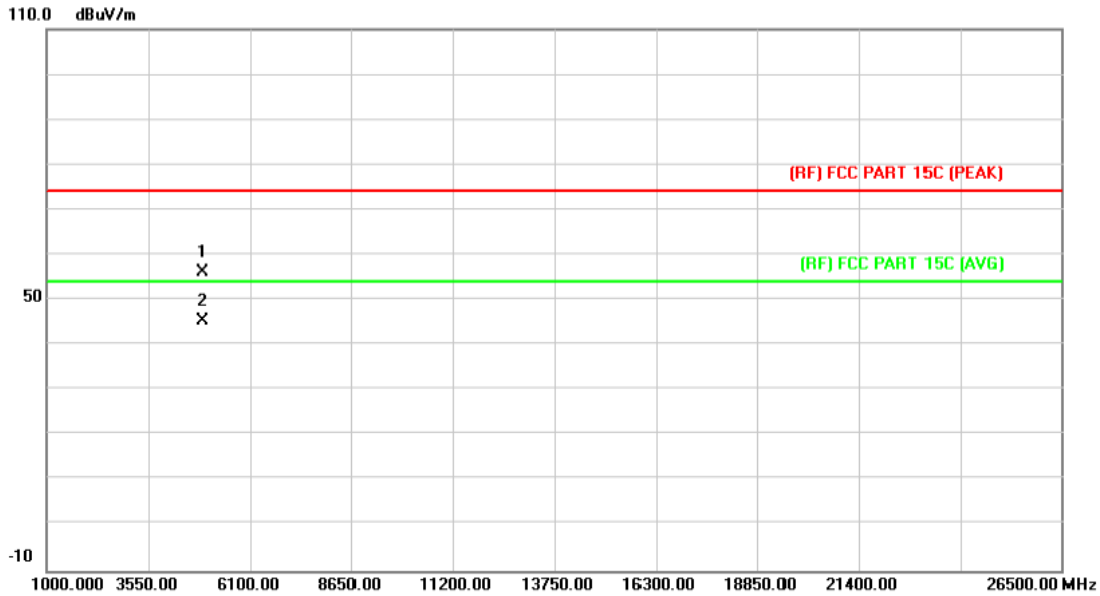
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4872.503	43.06	13.85	56.91	74.00	-17.09	peak
2	*	4872.503	29.34	13.85	43.19	54.00	-10.81	AVG

Emission Level= Read Level+ Correct Factor

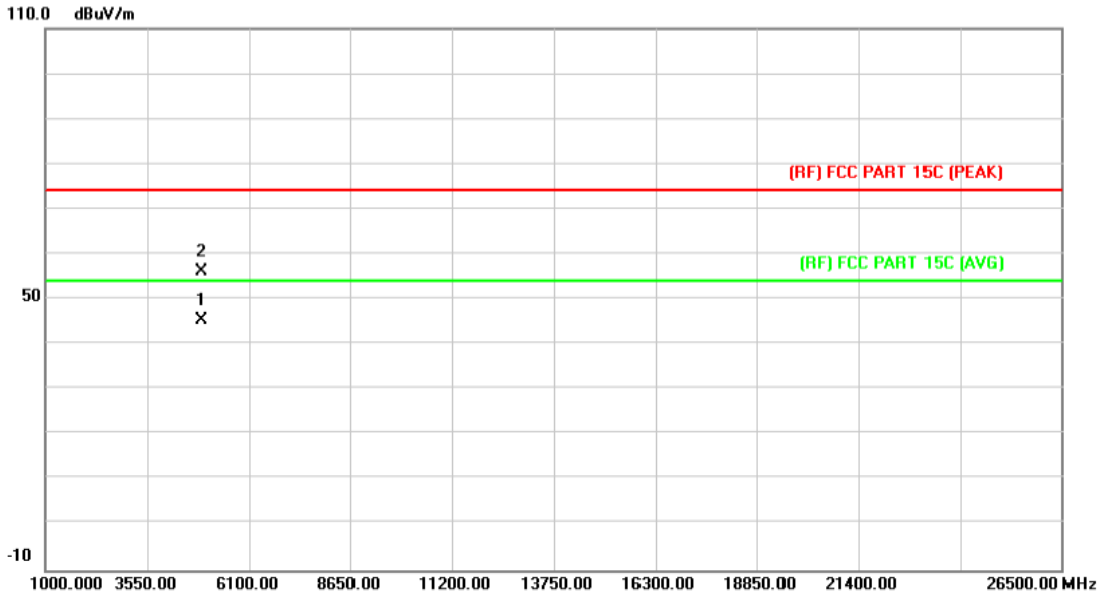
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4922.905	42.15	14.14	56.29	74.00	-17.71	peak
2	*	4924.201	31.21	14.15	45.36	54.00	-8.64	AVG

Emission Level= Read Level+ Correct Factor

EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
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.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4922.746	31.23	14.14	45.37	54.00	-8.63	AVG
2		4923.274	42.04	14.15	56.19	74.00	-17.81	peak

Emission Level= Read Level+ Correct Factor

6. Restricted Bands Requirement

6.1 Test Standard and Limit

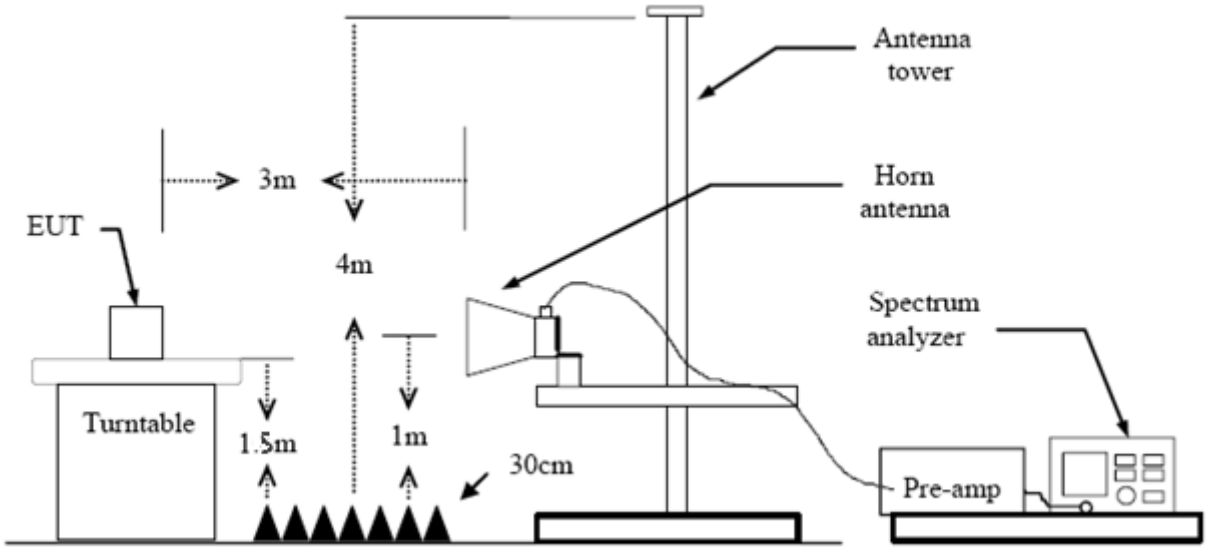
6.1.1 Test Standard

FCC Part 15.247(d)
FCC Part 15.209
FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency Band (MHz)	Distance of 3m (dBuV/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

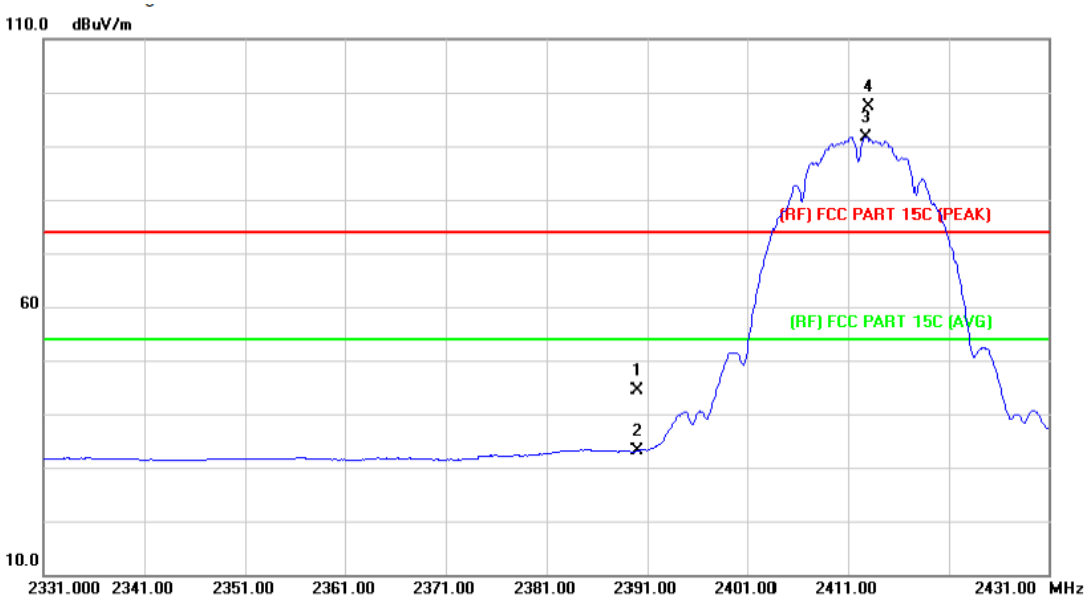
The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Please see the next page.

(1) Radiation Test

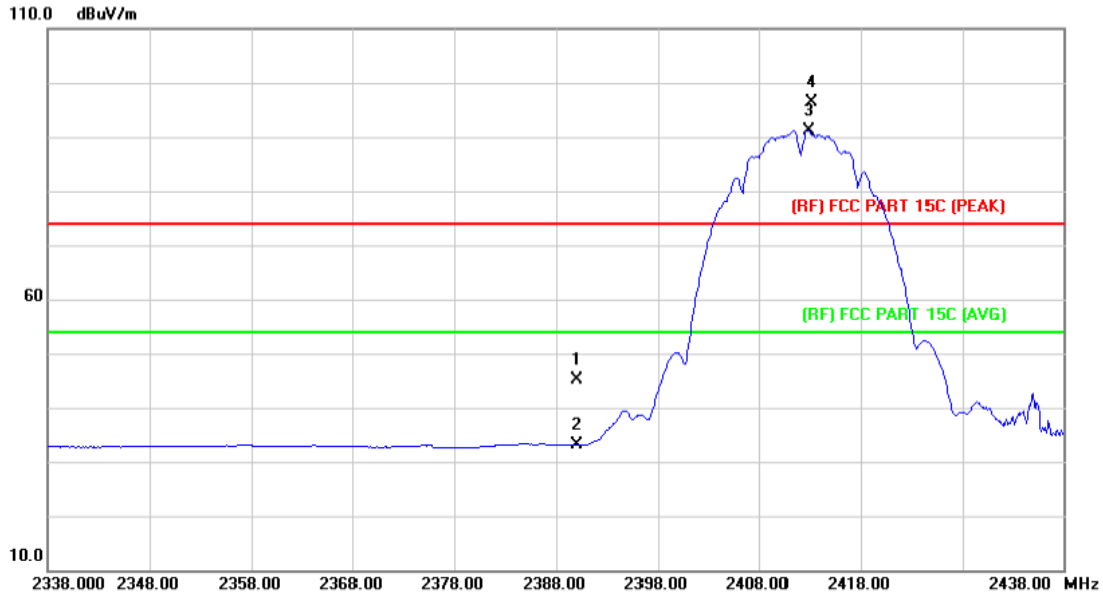
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	43.61	0.77	44.38	74.00	-29.62	peak
2		2390.000	32.36	0.77	33.13	54.00	-20.87	AVG
3	*	2412.800	90.88	0.86	91.74	Fundamental Frequency		AVG
4	X	2413.000	96.49	0.86	97.35	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

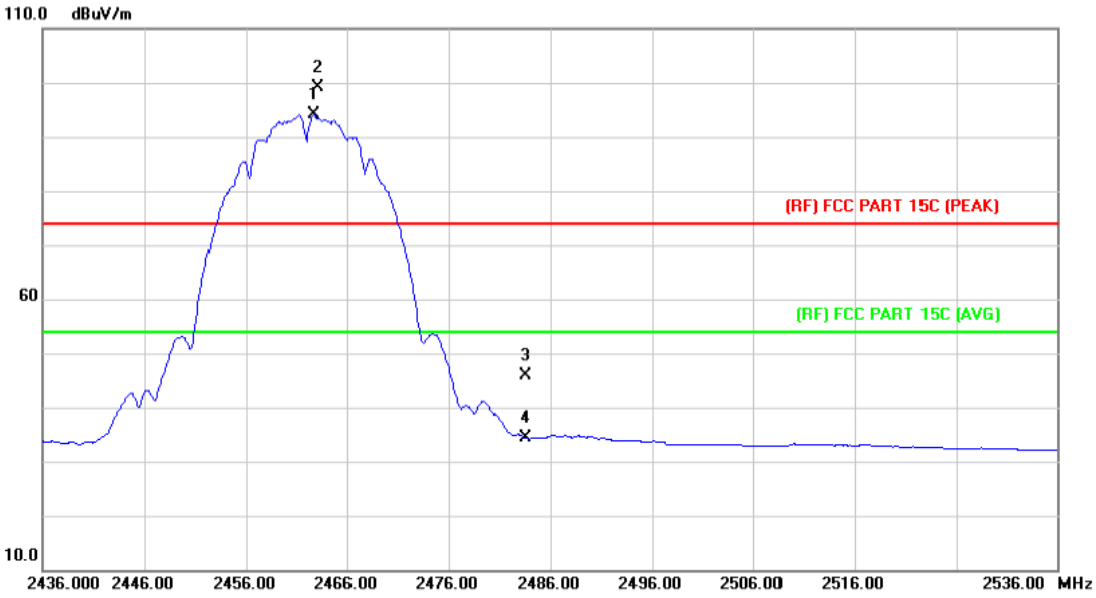
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	44.25	0.77	45.02	74.00	-28.98	peak
2		2390.000	32.36	0.77	33.13	54.00	-20.87	AVG
3	*	2412.800	90.33	0.86	91.19	Fundamental Frequency		AVG
4	X	2413.100	95.55	0.86	96.41	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

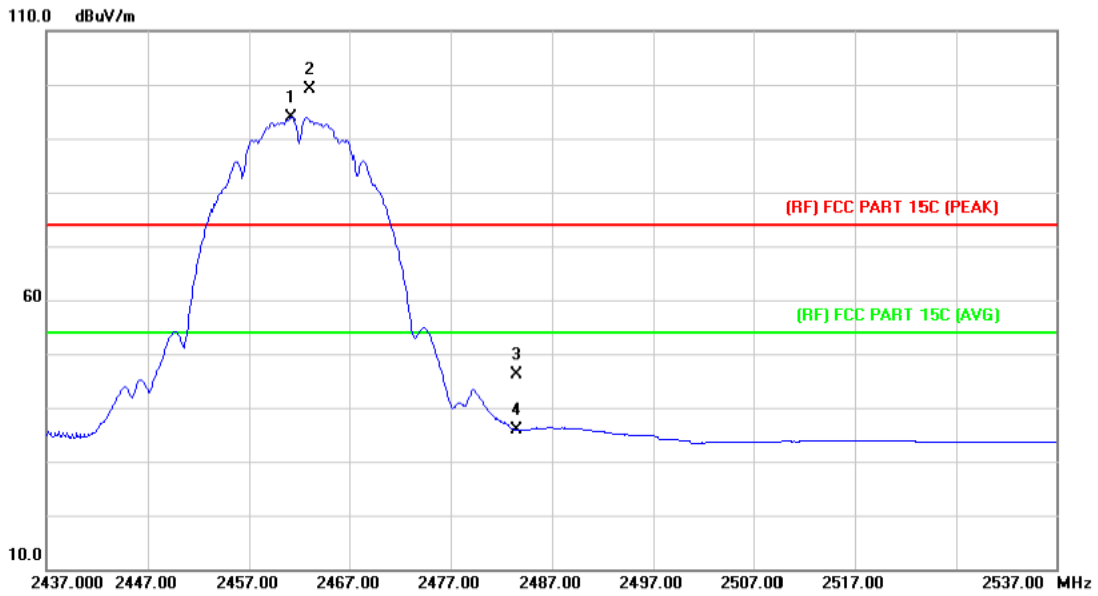
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2462.700	92.97	1.08	94.05	Fundamental Frequency		AVG
2	X	2463.100	98.17	1.08	99.25	Fundamental Frequency		peak
3		2483.500	44.76	1.17	45.93	74.00	-28.07	peak
4		2483.500	33.18	1.17	34.35	54.00	-19.65	AVG

Emission Level= Read Level+ Correct Factor

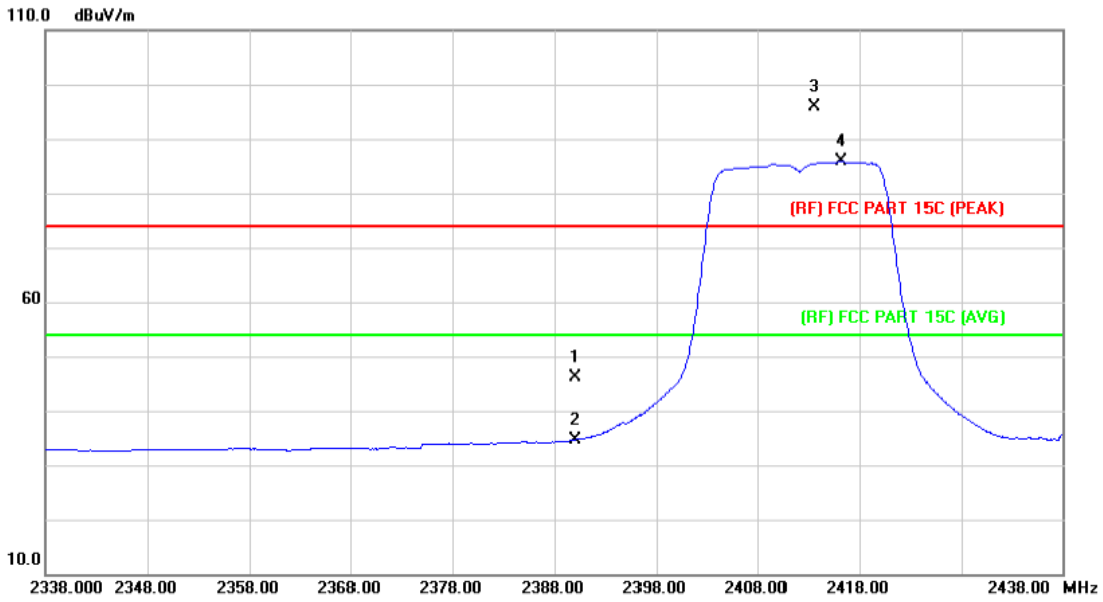
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2461.200	92.87	1.07	93.94	Fundamental Frequency		AVG
2	X	2463.100	98.02	1.08	99.10	Fundamental Frequency		peak
3		2483.500	45.00	1.17	46.17	74.00	-27.83	peak
4		2483.500	34.64	1.17	35.81	54.00	-18.19	AVG

Emission Level= Read Level+ Correct Factor

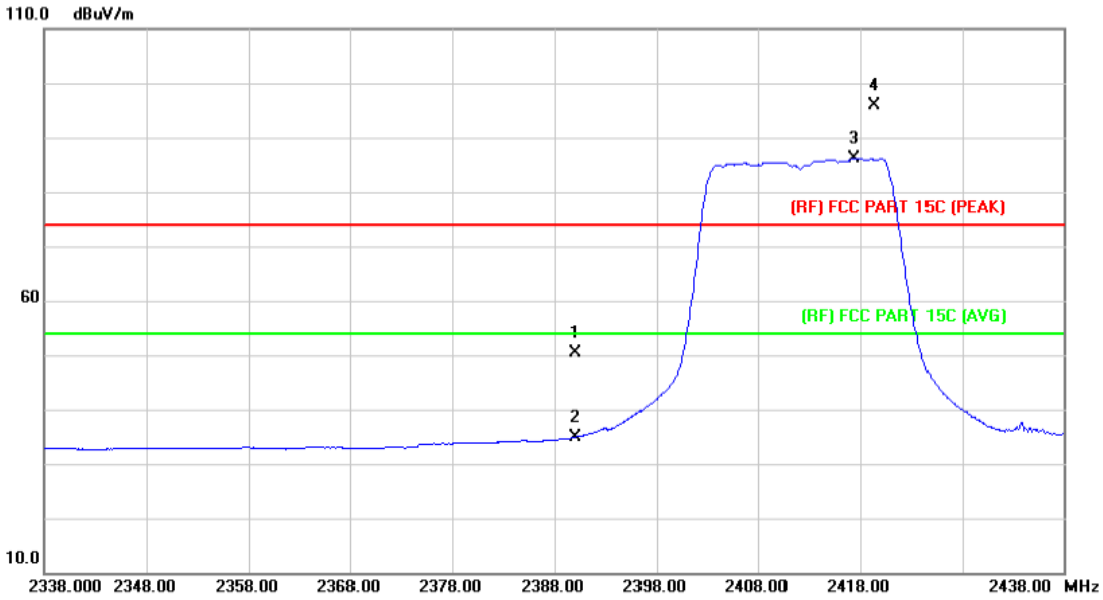
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	45.33	0.77	46.10	74.00	-27.90	peak
2		2390.000	33.93	0.77	34.70	54.00	-19.30	AVG
3	X	2413.500	94.95	0.86	95.81	Fundamental Frequency		peak
4	*	2416.200	84.91	0.88	85.79	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

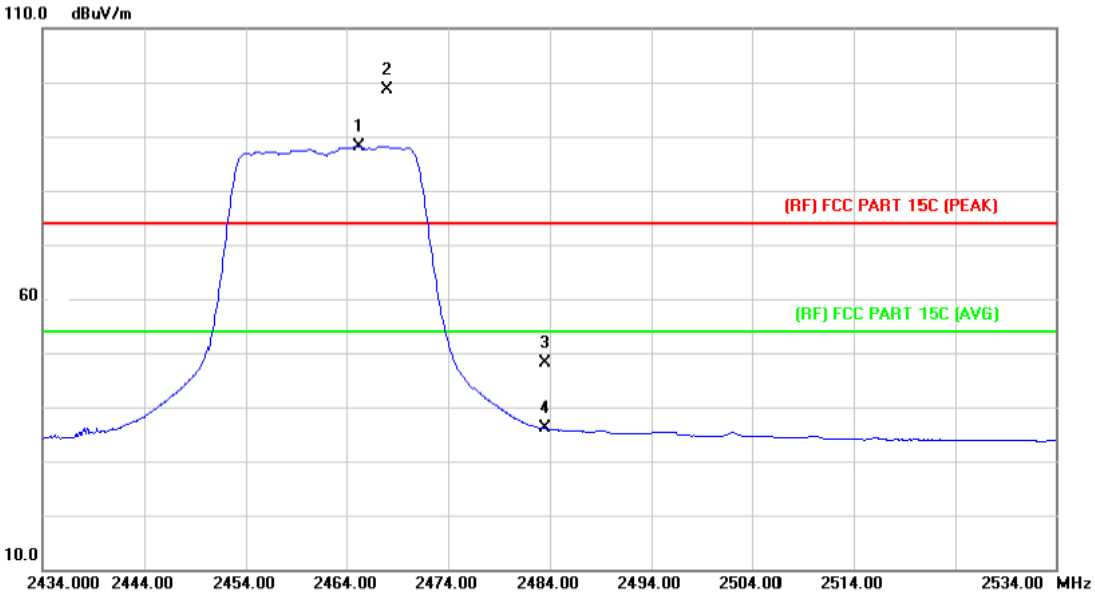
EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	49.49	0.77	50.26	74.00	-23.74	peak
2		2390.000	34.20	0.77	34.97	54.00	-19.03	AVG
3	*	2417.400	85.25	0.89	86.14	Fundamental Frequency		AVG
4	X	2419.400	95.11	0.89	96.00	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

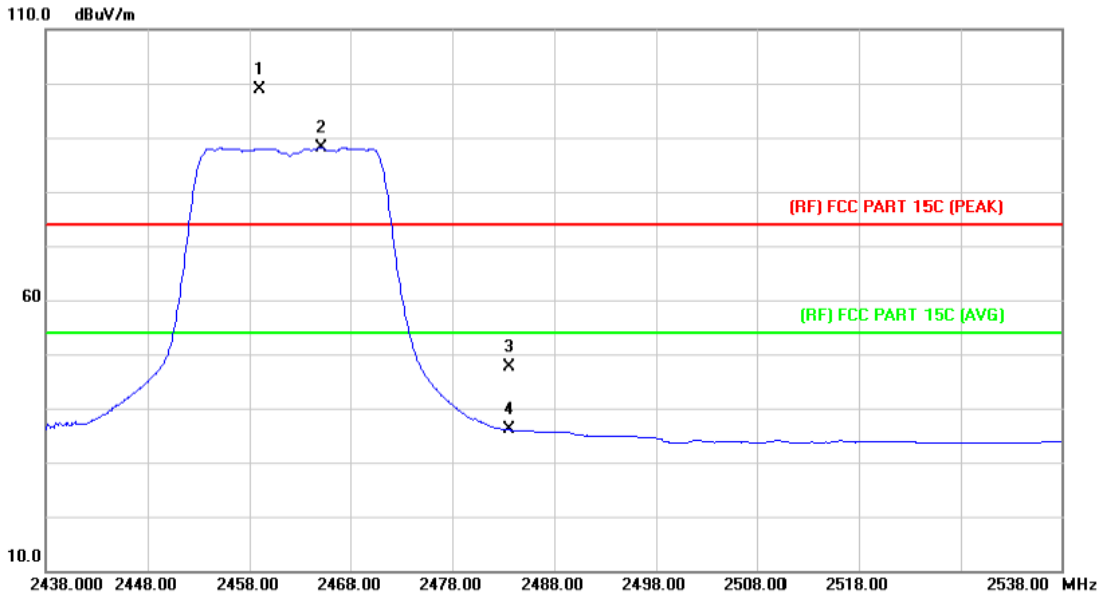
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2465.100	87.14	1.09	88.23	Fundamental Frequency		AVG
2	X	2467.900	97.48	1.10	98.58	Fundamental Frequency		peak
3		2483.500	46.97	1.17	48.14	74.00	-25.86	peak
4		2483.500	34.89	1.17	36.06	54.00	-17.94	AVG

Emission Level= Read Level+ Correct Factor

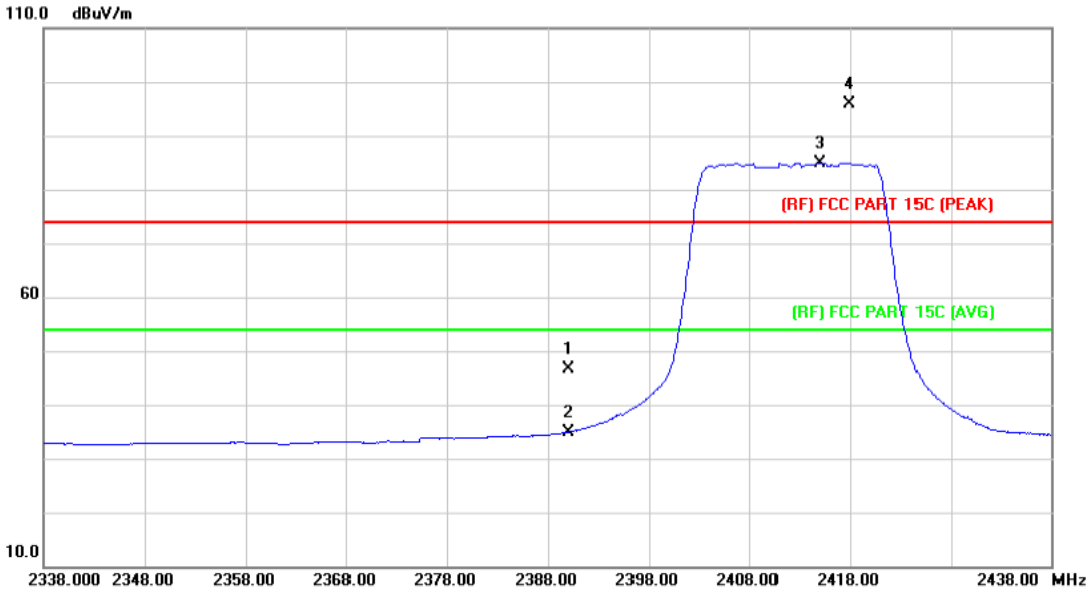
EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2459.000	97.74	1.06	98.80	Fundamental Frequency		peak
2	*	2465.200	86.99	1.09	88.08	Fundamental Frequency		AVG
3		2483.500	46.47	1.17	47.64	74.00	-26.36	peak
4		2483.500	34.86	1.17	36.03	54.00	-17.97	AVG

Emission Level= Read Level+ Correct Factor

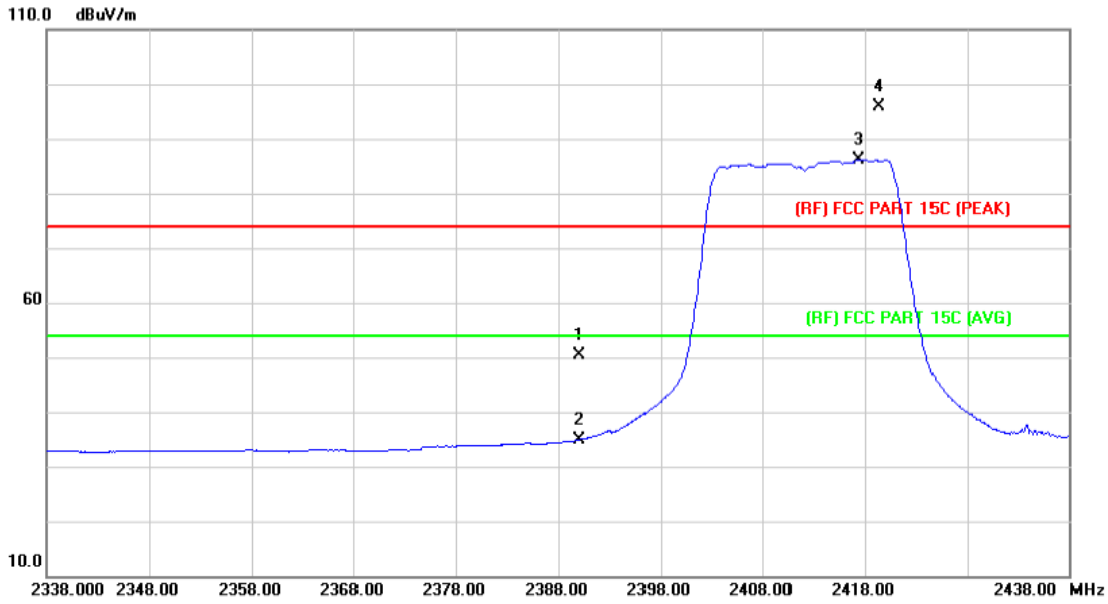
EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	45.97	0.77	46.74	74.00	-27.26	peak
2		2390.000	34.19	0.77	34.96	54.00	-19.04	AVG
3	*	2415.000	84.06	0.88	84.94	Fundamental Frequency		AVG
4	X	2417.900	94.87	0.89	95.76	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

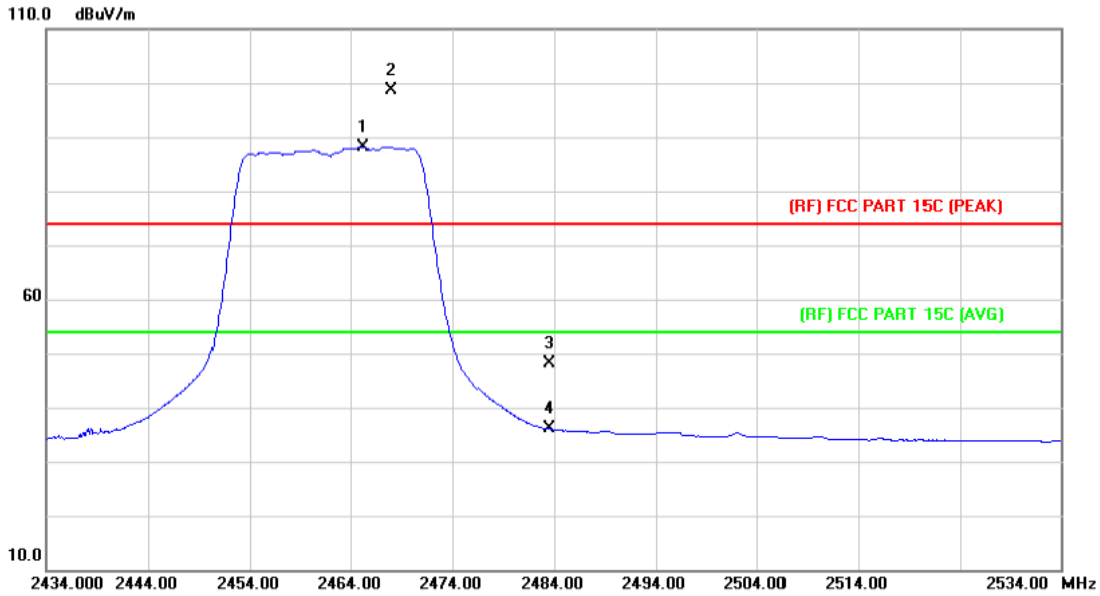
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	49.49	0.77	50.26	74.00	-23.74	peak
2		2390.000	34.20	0.77	34.97	54.00	-19.03	AVG
3	*	2417.400	85.25	0.89	86.14	Fundamental Frequency		AVG
4	X	2419.400	95.11	0.89	96.00	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

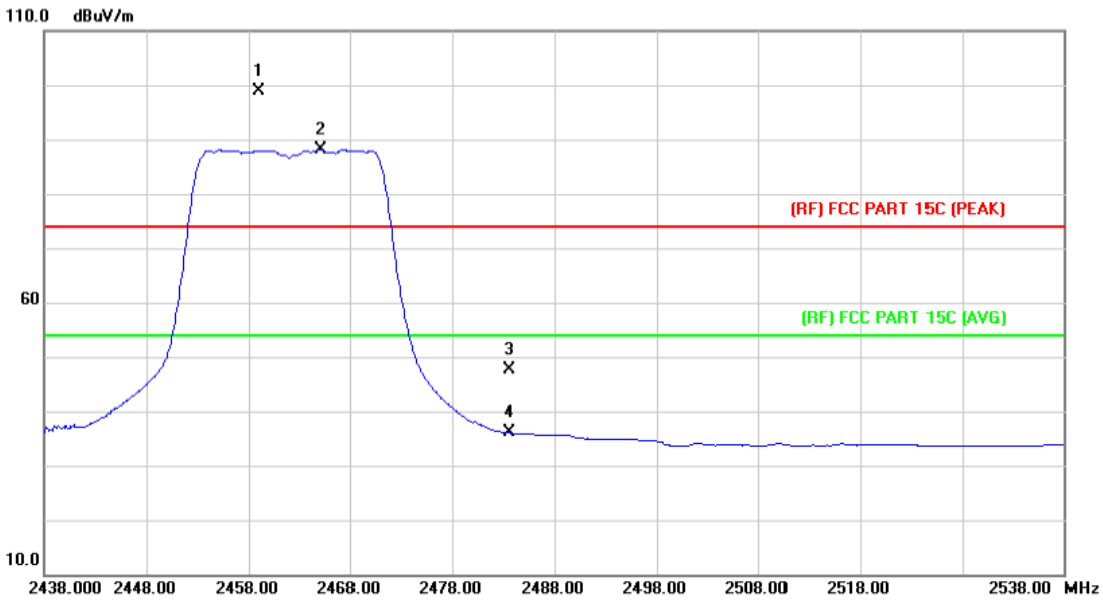
EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2465.100	87.14	1.09	88.23	Fundamental Frequency		AVG
2	X	2467.900	97.48	1.10	98.58	Fundamental Frequency		peak
3		2483.500	46.97	1.17	48.14	74.00	-25.86	peak
4		2483.500	34.89	1.17	36.06	54.00	-17.94	AVG

Emission Level= Read Level+ Correct Factor

EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		

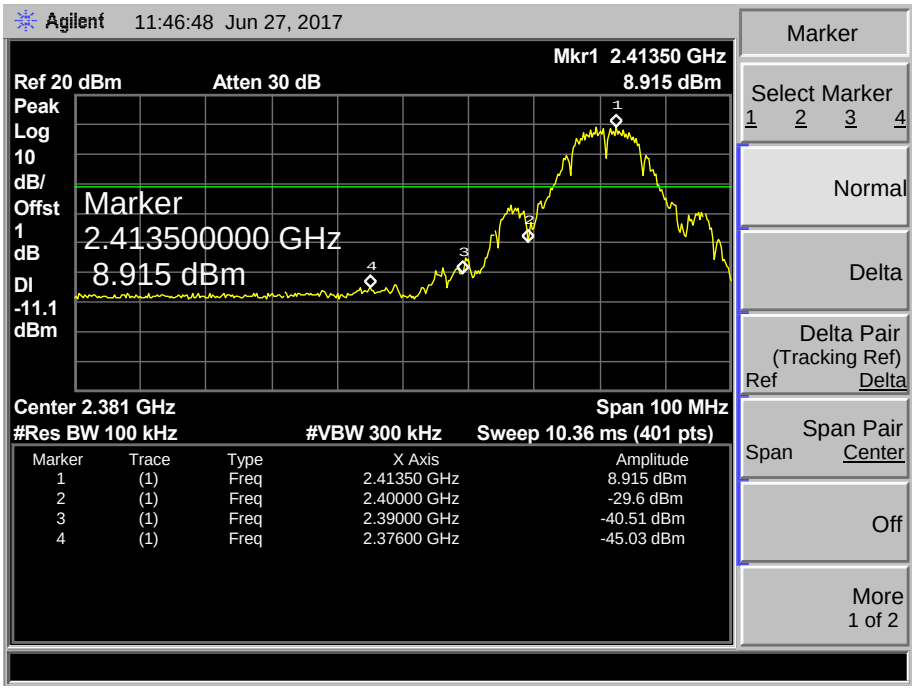


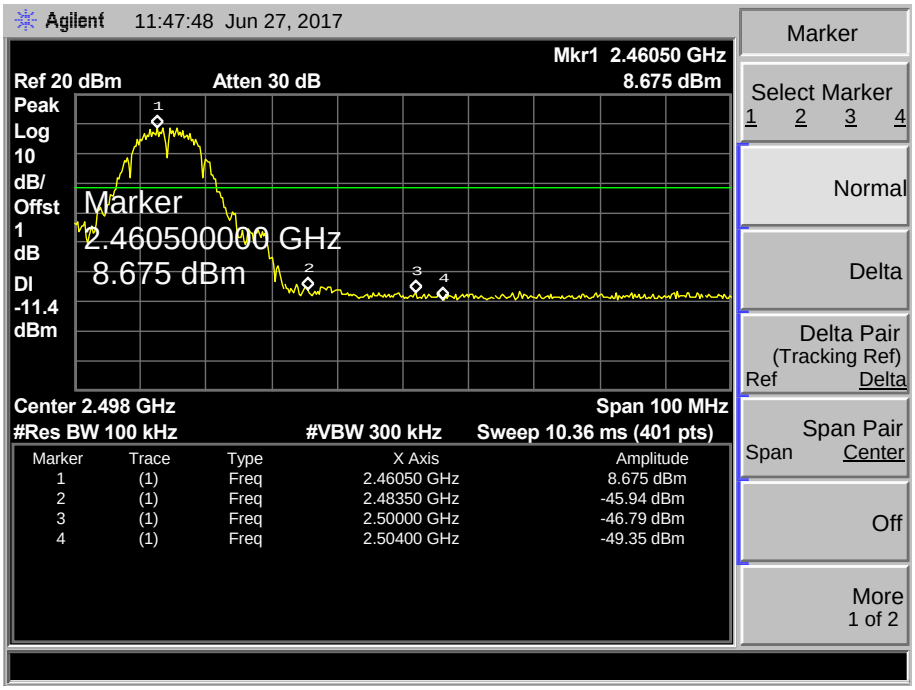
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2459.000	97.74	1.06	98.80	Fundamental Frequency		peak
2	*	2465.200	86.99	1.09	88.08	Fundamental Frequency		AVG
3		2483.500	46.47	1.17	47.64	74.00	-26.36	peak
4		2483.500	34.86	1.17	36.03	54.00	-17.97	AVG

Emission Level= Read Level+ Correct Factor

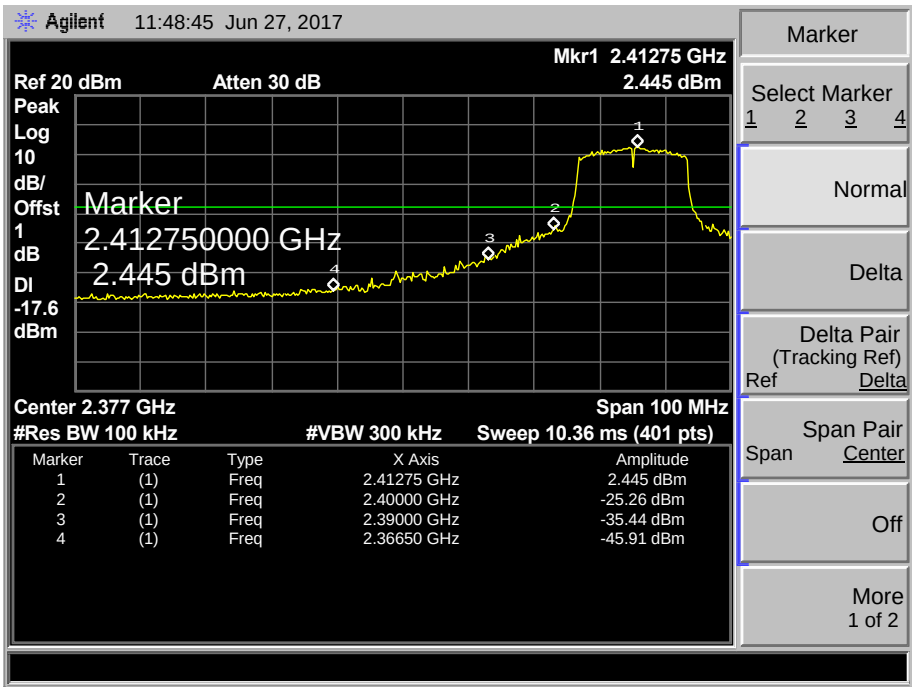
(2) Conducted Test

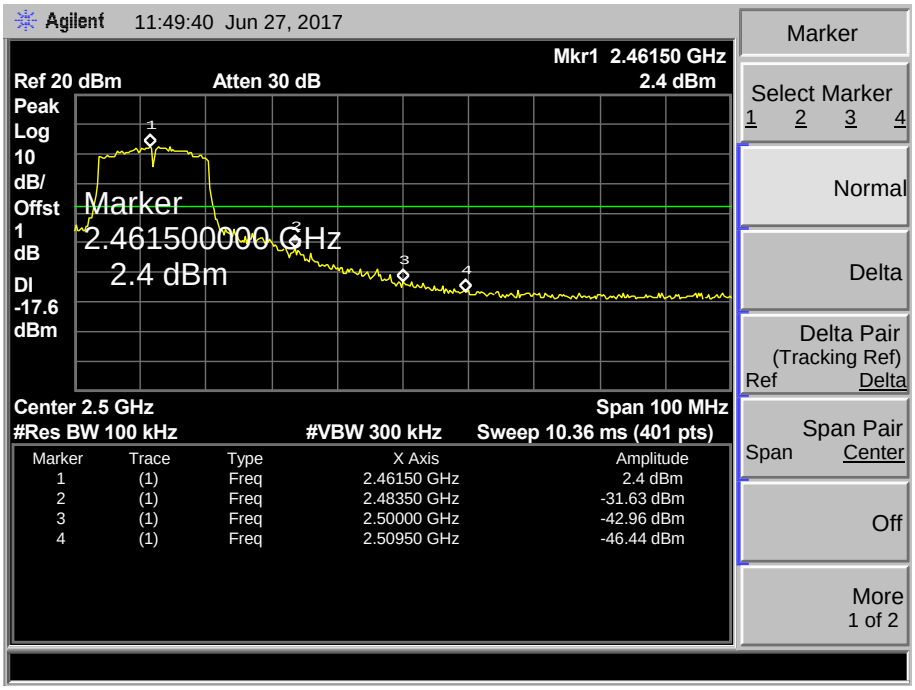
EUT:	Fish Finder	**Model:**	FF916
Temperature:	25 ℃	**Relative Humidity:**	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX B Mode 2412MHz / TX B Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		



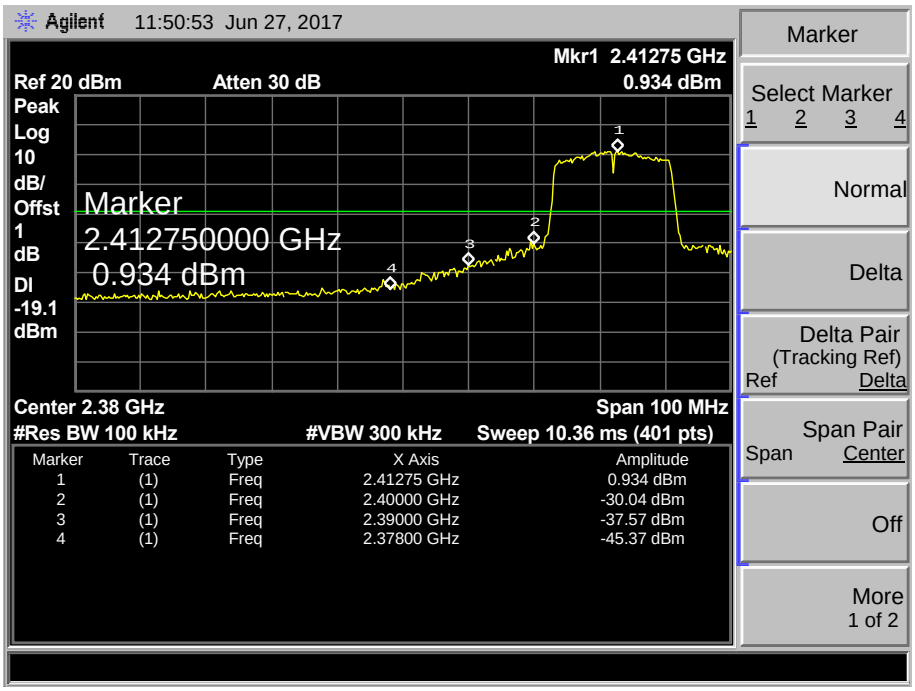


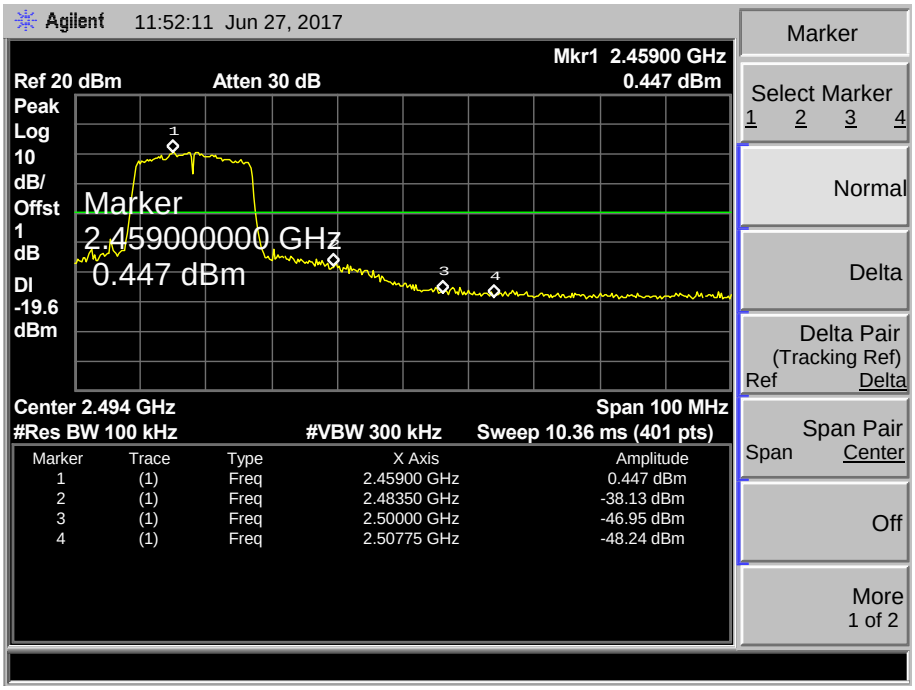
EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX G Mode 2412MHz / TX G Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		





EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
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

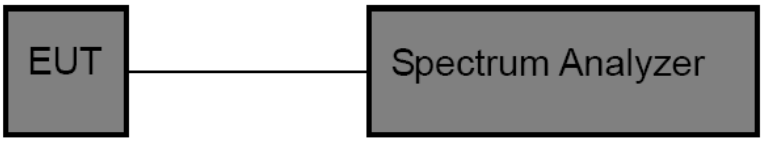
7.1.1 Test Standard

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, Digital photo framesdle and high channel for the test.

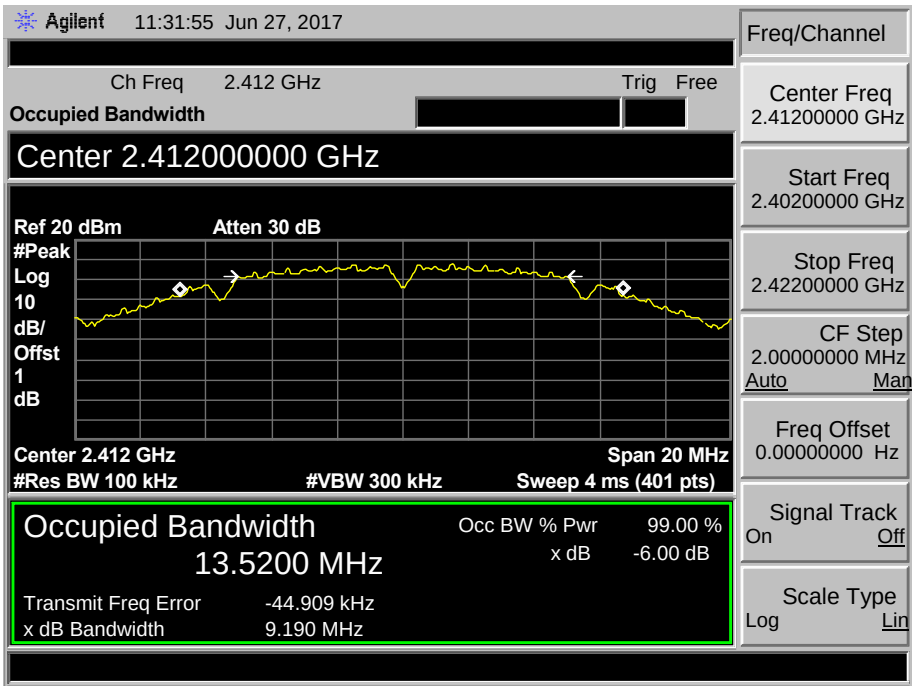
7.5 Test Data

EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX 802.11B Mode		

Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	9.190	13.5200	>=0.5
2437	9.192	13.2144	
2462	9.212	12.9613	

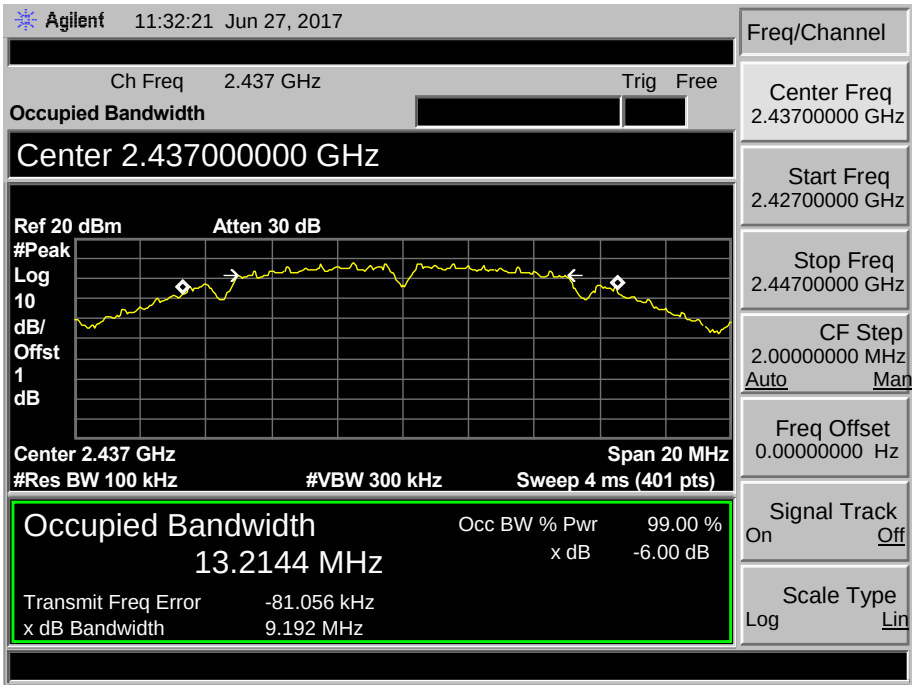
802.11B Mode

2412 MHz



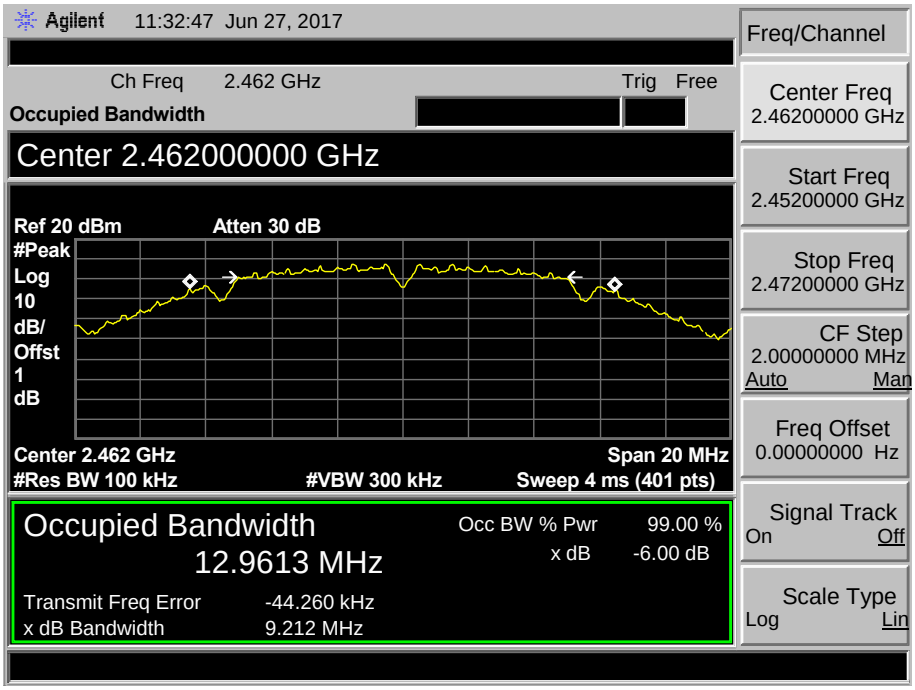
802.11B Mode

2437 MHz



802.11B Mode

2462 MHz

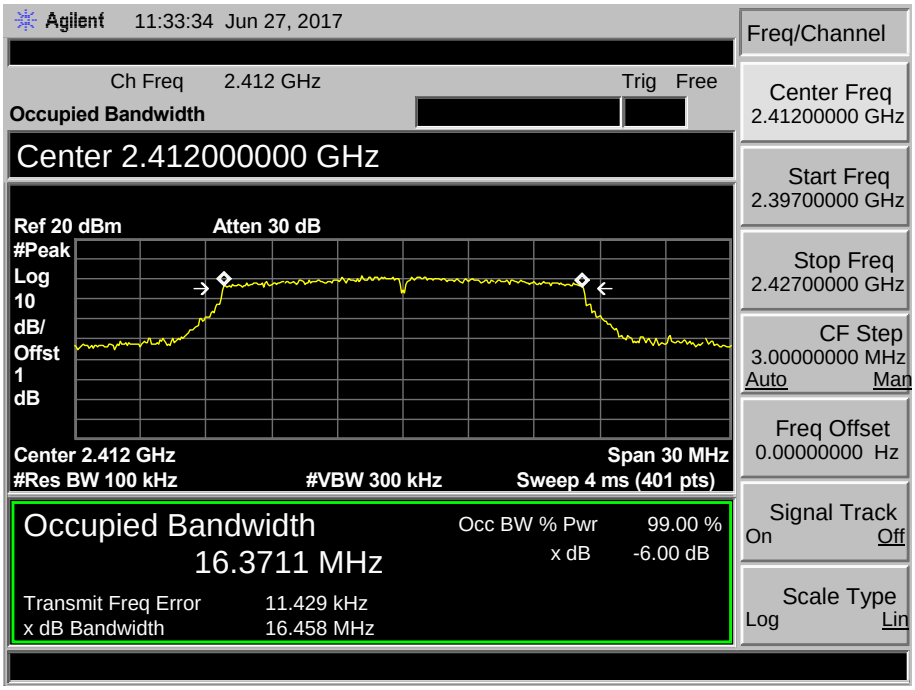


EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX 802.11G Mode		

Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	16.458	16.3711	>=0.5
2437	16.461	16.3716	
2462	16.471	16.3677	

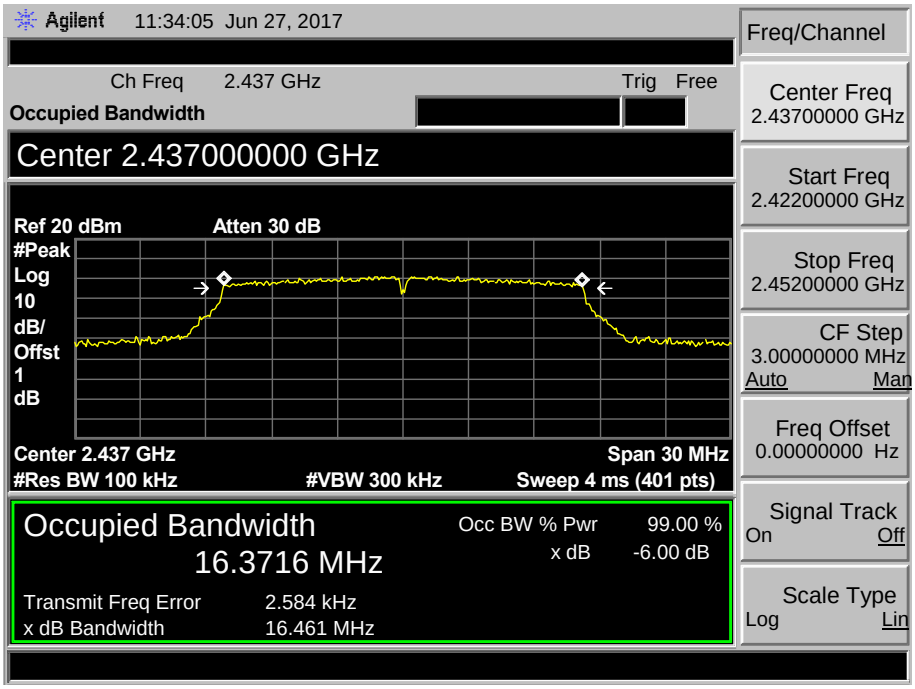
802.11G Mode

2412 MHz



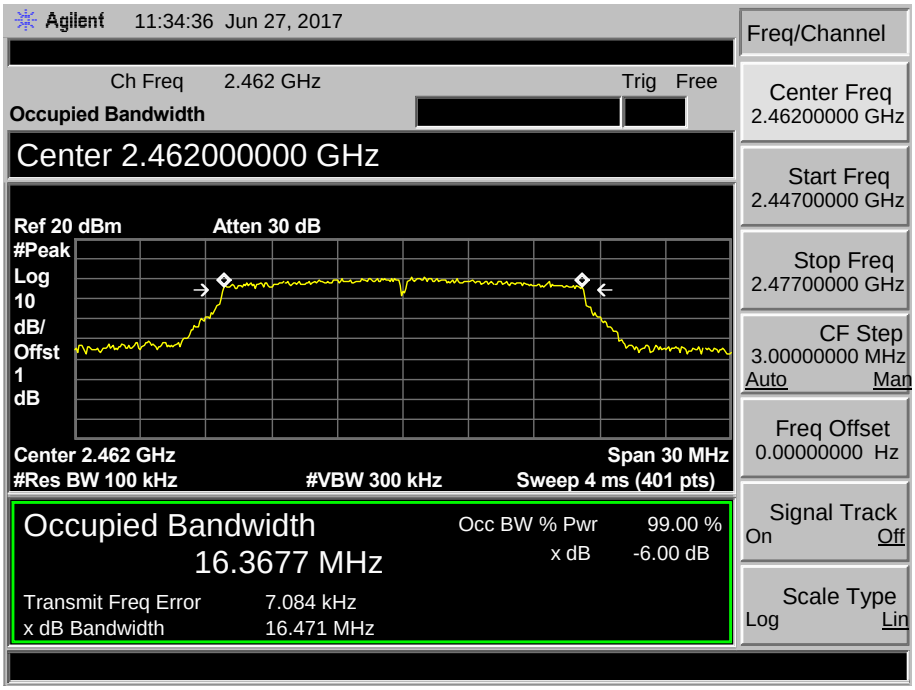
802.11G Mode

2437 MHz



802.11G Mode

2462 MHz

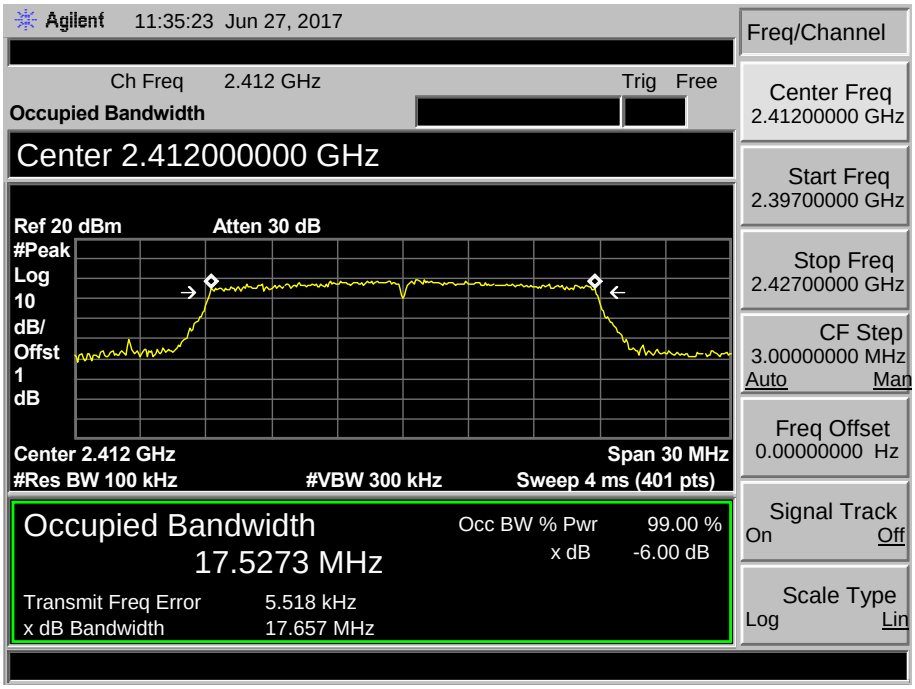


EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX 802.11N(HT20) Mode		

Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	17.657	17.5273	>=0.5
2437	17.631	17.5158	
2462	17.624	17.5332	

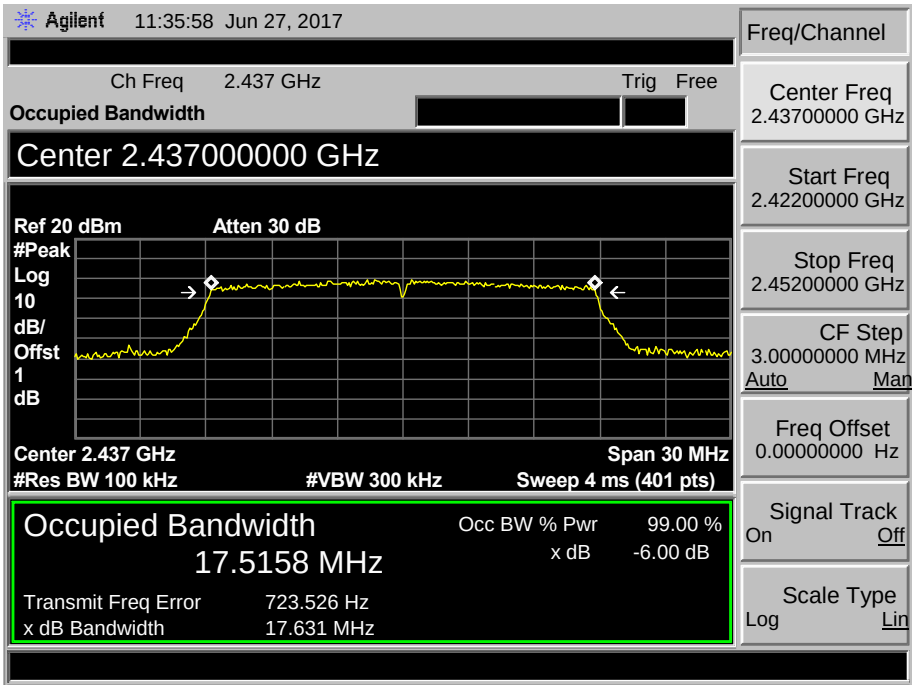
802.11N(HT20) Mode

2412 MHz



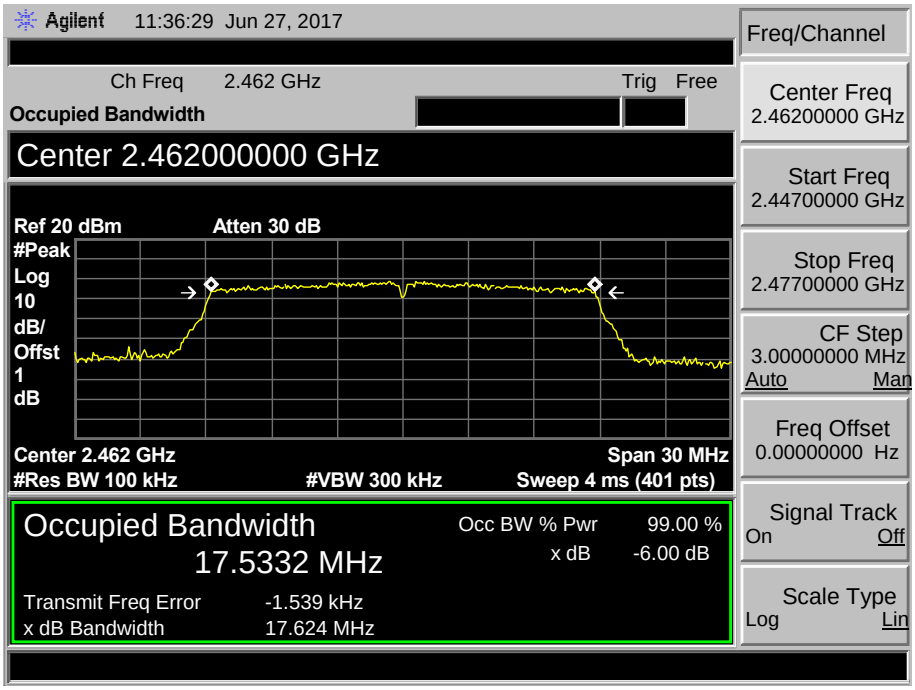
802.11N(HT20) Mode

2437 MHz



802.11N(HT20) Mode

2462 MHz



8. Peak Output Power Test

8.1 Test Standard and Limit

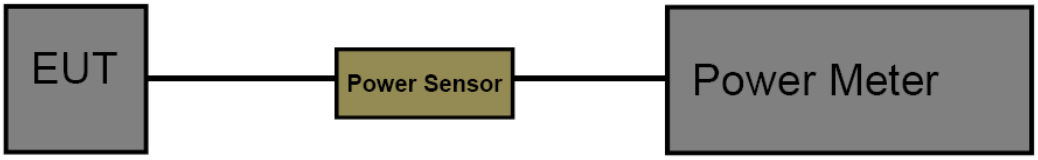
8.1.1 Test Standard

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 v04. 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.

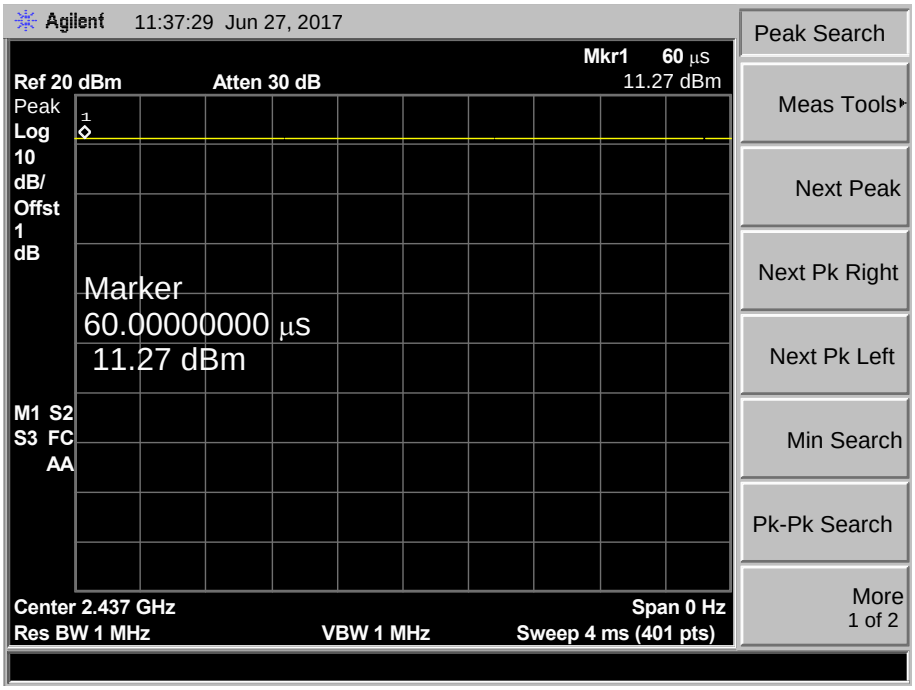
8.5 Test Data

EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		

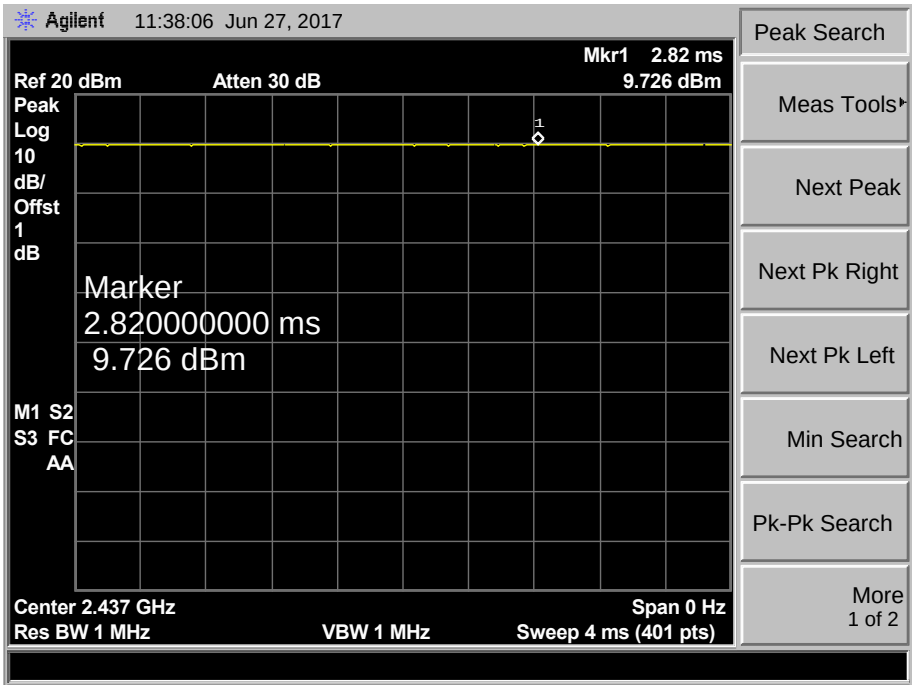
Mode	Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
802.11b	2412	18.59	30
	2437	18.72	
	2462	18.01	
802.11g	2412	16.88	
	2437	17.28	
	2462	16.92	
802.11n (HT20)	2412	15.46	
	2437	15.10	
	2462	14.61	
Result: PASS			

Duty Cycle		
Mode	Channel frequency (MHz)	Test Result
802.11b	2412	>98%
	2437	
	2462	
802.11g	2412	
	2437	
	2462	
802.11n (HT20)	2412	
	2437	
	2462	
Please see below plots		

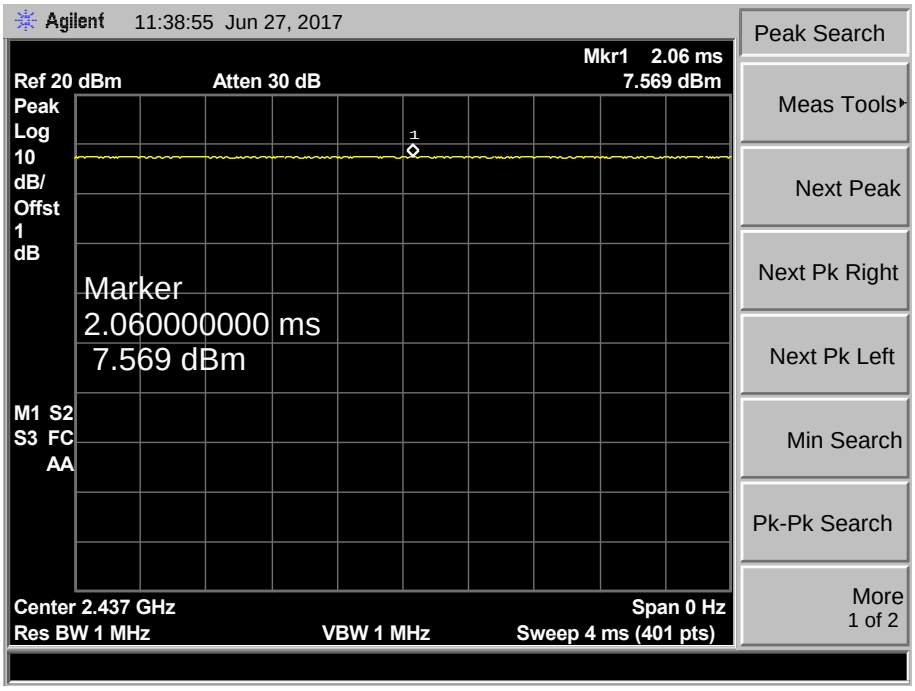
802.11 B Mode 2437 MHz



802.11 G Mode 2437 MHz



802.11 N(HT20) Mode 2437 MHz



9. Power Spectral Density Test

9.1 Test Standard and Limit

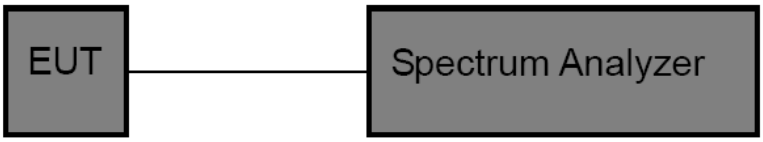
9.1.1 Test Standard

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 v04.

(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, Digital photo framesdle and high channel for the test.

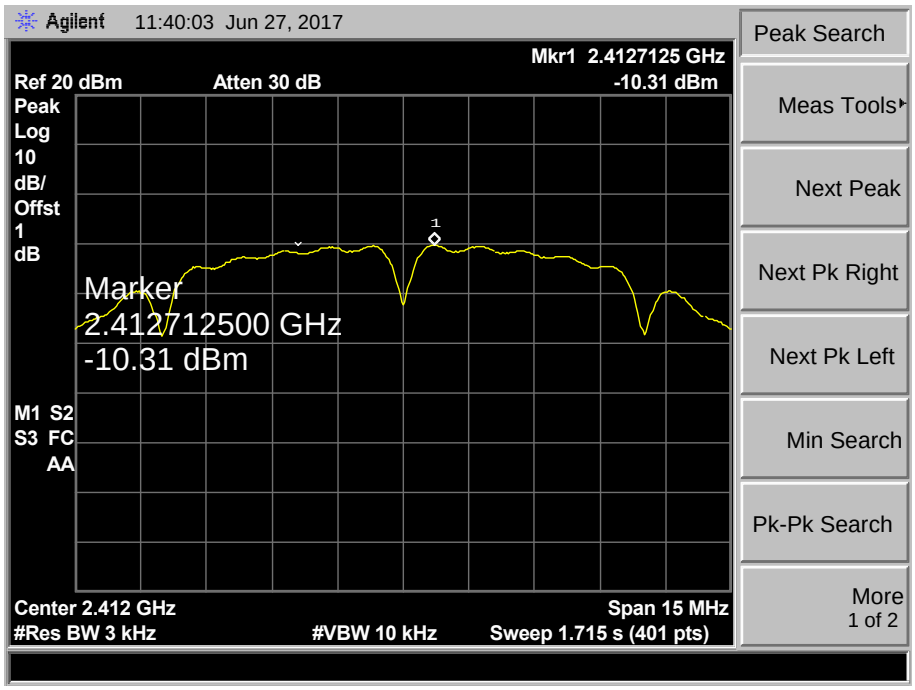
9.5 Test Data

EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Test Mode:	TX 802.11B Mode		

Channel Frequency (MHz)	Power Density (dBm/3 kHz)	Limit (dBm)
2412	-10.31	8
2437	-10.20	
2462	-10.60	

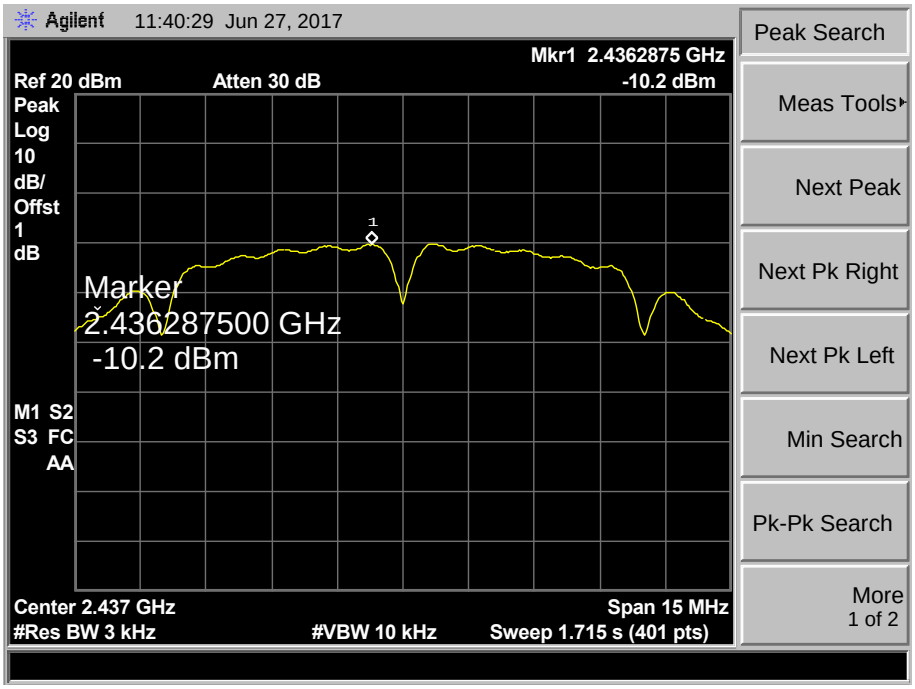
802.11B Mode

2412 MHz



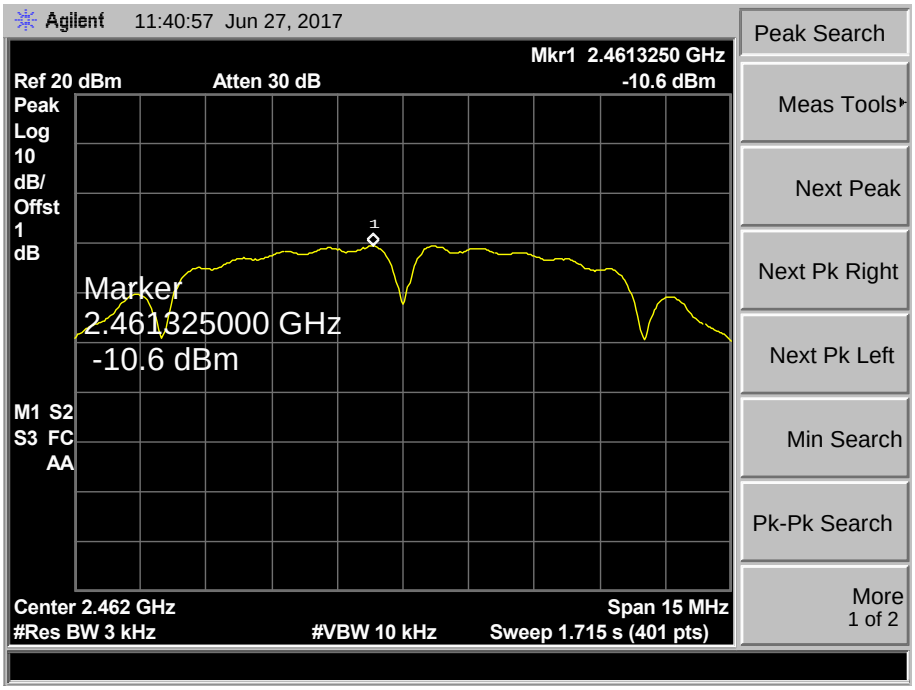
802.11B Mode

2437 MHz



802.11B Mode

2462 MHz

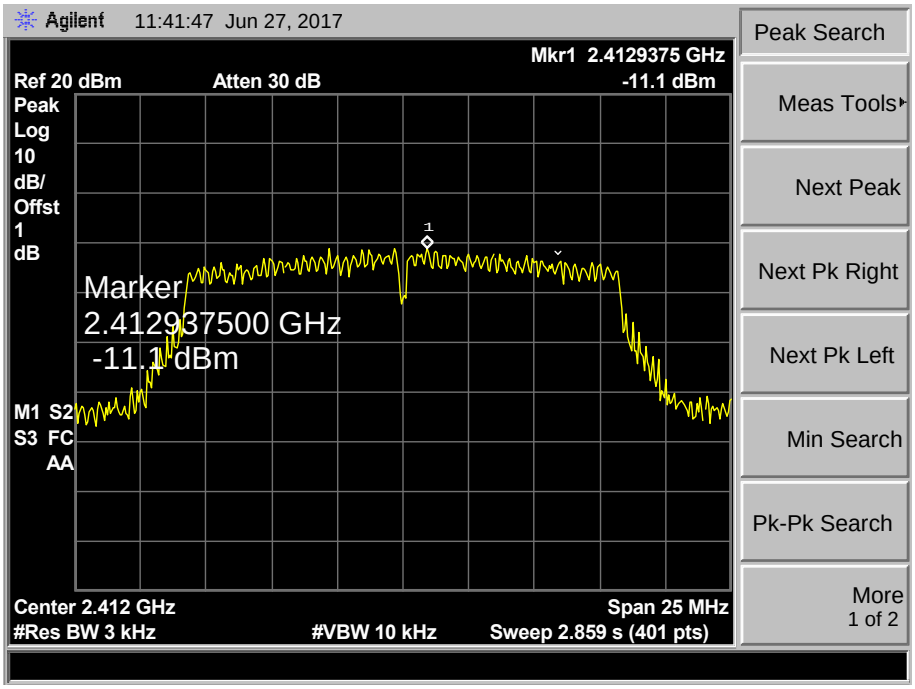


EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Temperature:	25 ℃
Test Voltage:	DC 3.7V		
Test Mode:	TX 802.11G Mode		

Channel Frequency (MHz)	Power Density (dBm/3 kHz)	Limit (dBm)
2412	-11.10	8
2437	-11.17	
2462	-11.59	

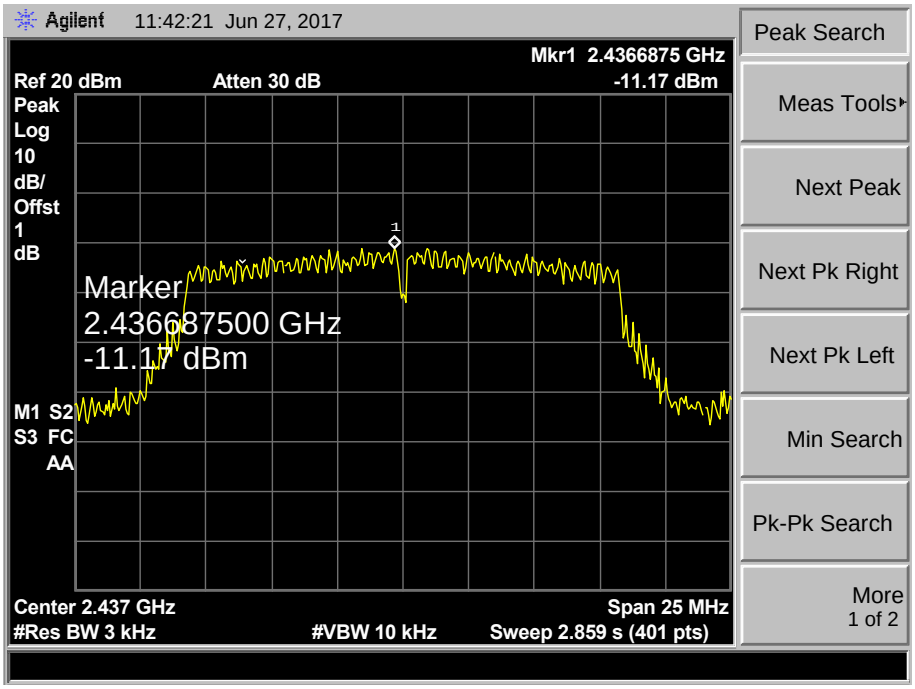
802.11G Mode

2412 MHz



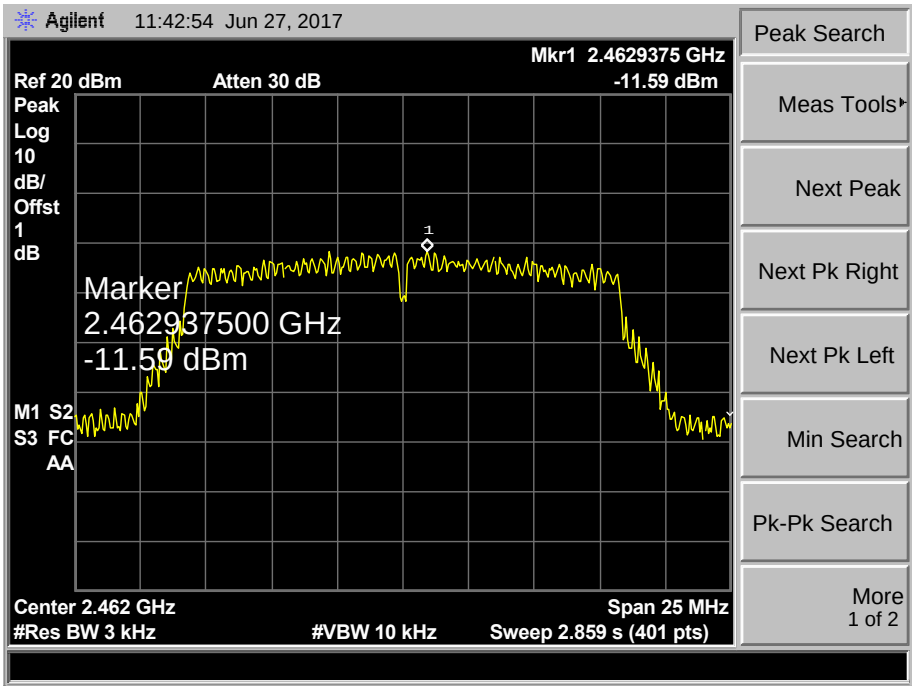
802.11G Mode

2437 MHz



802.11G Mode

2462 MHz

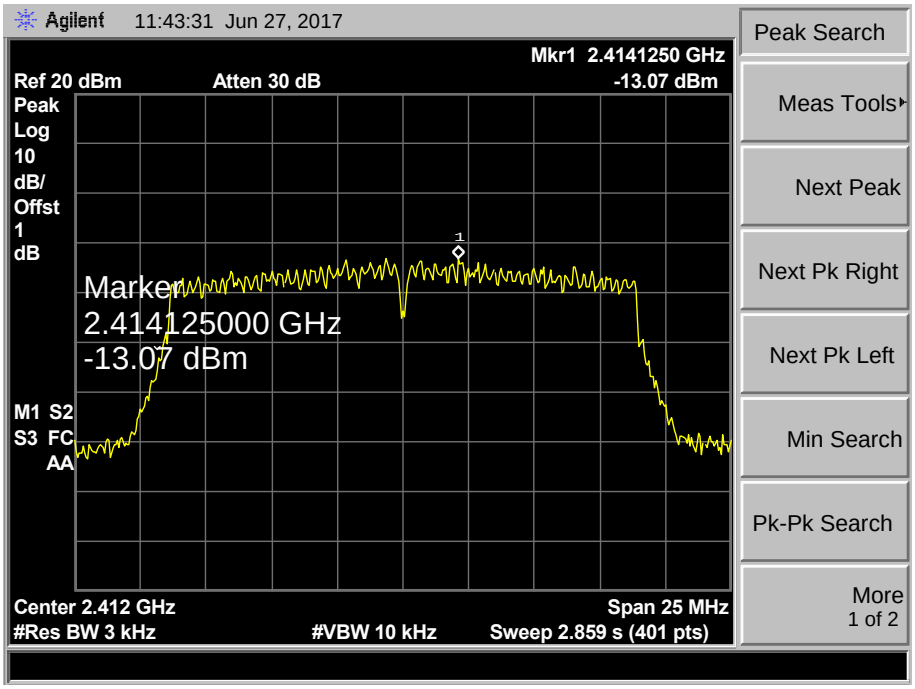


EUT:	Fish Finder	Model:	FF916
Temperature:	25 ℃	Temperature:	25 ℃
Test Voltage:	DC 3.7V		
Test Mode:	TX 802.11N(HT20) Mode		

Channel Frequency (MHz)	Power Density (dBm/3 kHz)	Limit (dBm)
2412	-13.07	8
2437	-13.11	
2462	-13.38	

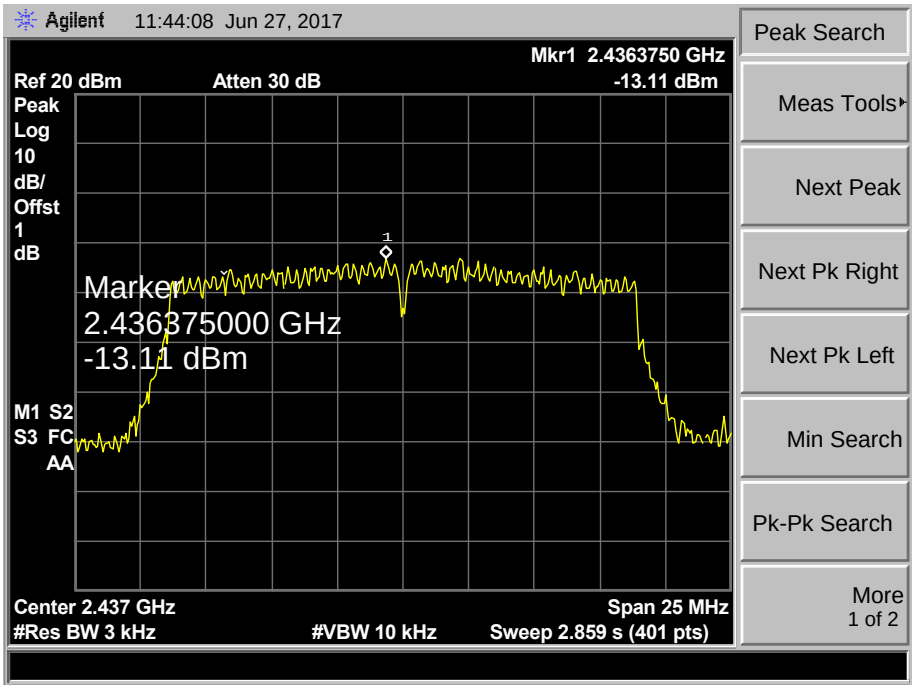
802.11N(HT20) Mode

2412 MHz



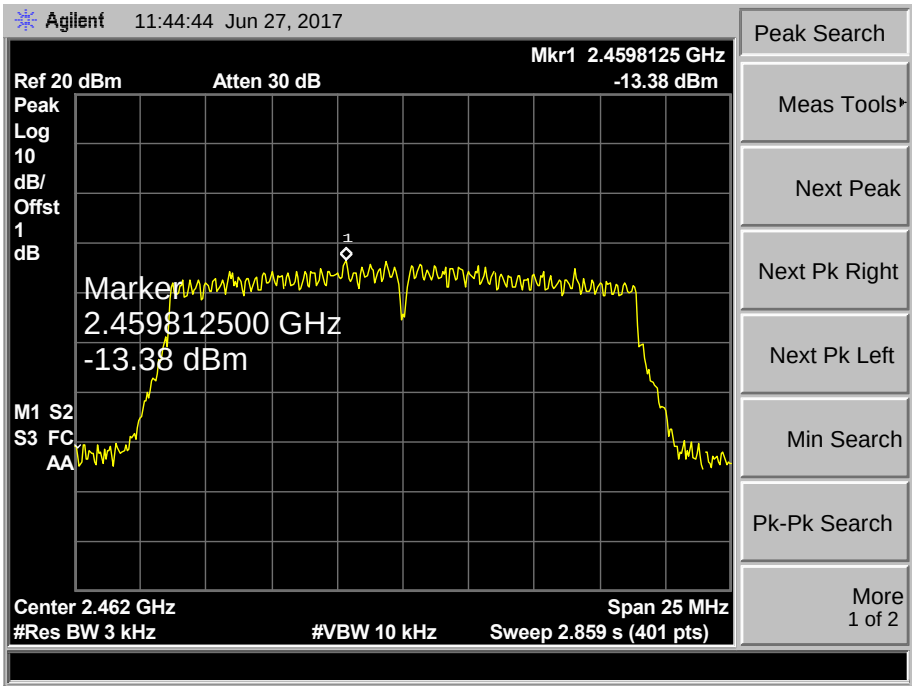
802.11N(HT20) Mode

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 3dBi, 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 Internal Antenna. It complies with the standard requirement.

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

-----END OF REPORT-----