

# FCC Part 15C Measurement and Test Report

For

**Shenzhen C&D Electronics Co., Ltd**

**Building 2, Xia You Song Mountaintop Industrial Di, YouSong Village,**

**LongHua Town, Bao'an District, Shenzhen, Guangdong, China.**

**FCC ID: S4XRF143A**

<b>FCC Rule(s):</b>	<u>FCC Part 15.249</u>
<b>Product Description:</b>	<u>Remote control RF143A</u>
<b>Tested Model:</b>	<u>RF143A</u>
<b>Report No.:</b>	<u>STR14118030I</u>
<b>Tested Date:</b>	<u>2014-11-5 to 2014-11-21</u>
<b>Issued Date:</b>	<u>2014-11-21</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: Shenzhen C&D Electronics Co., Ltd  
Address of applicant: Building 2, Xia You Song Mountaintop Industrial Di, YouSong Village, LongHUa Town, Bao'an District, Shenzhen, Guangdong, China

Manufacturer: Shenzhen C&D Electronics Co., Ltd  
Address of manufacturer: Building 2, Xia You Song Mountaintop Industrial Di, YouSong Village, LongHUa Town, Bao'an District, Shenzhen, Guangdong, China

General Description of EUT	
Product Name:	Remote control RF143A
Trade Name:	ARRIS
Model No.:	RF143A
Adding Model(s):	/
Rated Voltage:	Battery: DC 3.0V
Power Adapter Model:	/
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	2425-2475MHz
Max. Field Strength:	88.46 dBuV/m (at 3m distance)
Data Rate:	/
Modulation:	QPSK
Quantity of Channels:	11
Channel Separation:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
Lowest Internal Frequency of EUT:	16MHz

## 1.2 Test Standards

The following report is prepared on behalf of the Shenzhen C&D Electronics Co., Ltd in accordance with FCC Part 15, Subpart B, Subpart C, and section 15.107, 15.203, 15.205, 15.209 and 15.249 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.107,15.203, 15.205, 15.209 and 15.249 of the Federal Communication Commissions rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

## 1.4 Test Facility

### **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

### **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2<sup>nd</sup> Road, Bao'an District, Shenzhen, P.R.C (518101).

## 1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

<b>Test Mode List</b>		
Test Mode	Description	Remark
TM1	Low Channel	2425MHz
TM2	Middle Channel	2450MHz
TM3	High Channel	2475MHz

<b>Special Cable List and Details</b>			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

<b>Auxiliary Equipment List and Details</b>			
Description	Manufacturer	Model	Serial Number
/	/	/	/

## 2. SUMMARY OF TEST RESULTS

<b>FCC Rules</b>	<b>Description of Test Item</b>	<b>Result</b>
§ 15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	N/A
§ 15.209(a)(f)	Radiated Spurious Emissions	Compliant
§15.249(a)	Field Strength of Emissions	Compliant
§15.249(d)	Out of Band Emission	Compliant
§15.215 (c)	Emission Bandwidth	Compliant

### **3. Antenna Requirements**

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#### **3.1 Standard Applicable**

According to FCC Part 15.203, 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.

#### **3.2 Test Result**

This product has an integral antenna, fulfill the requirement of this section.

## 4. Radiated Emissions

### 4.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is  $\pm 5.10$  dB.

### 4.2 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of Harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

### 4.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23
Horn Antenna	ETS	3116B	00088203	2014-05-24	2015-05-23
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2014-05-24	2015-05-23

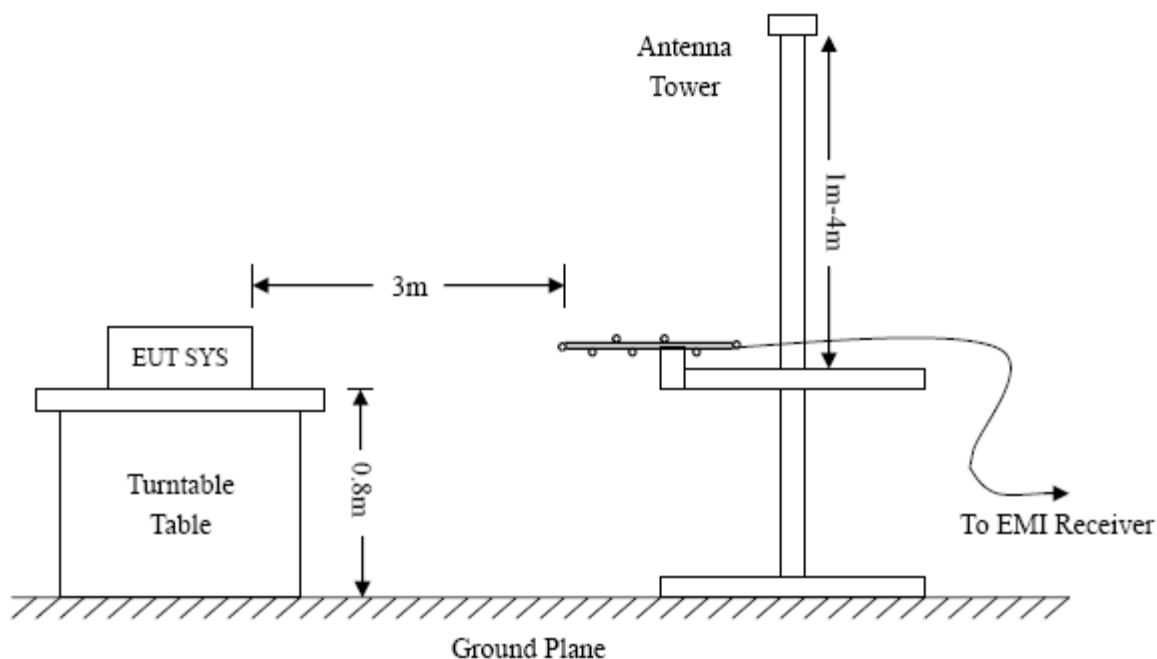


### 4.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.249(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



Frequency :9kHz-30MHz  
 RBW=10KHz,  
 VBW =30KHz  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak

Frequency :30MHz-1GHz  
 RBW=120KHz,  
 VBW=300KHz  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak, QP

Frequency :Above 1GHz  
 RBW=1MHz,  
 VBW=3MHz(Peak), 10Hz(AV)  
 Sweep time= Auto  
 Trace = max hold  
 Detector function = peak, AV

### 4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

#### 4.6 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

#### 4.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

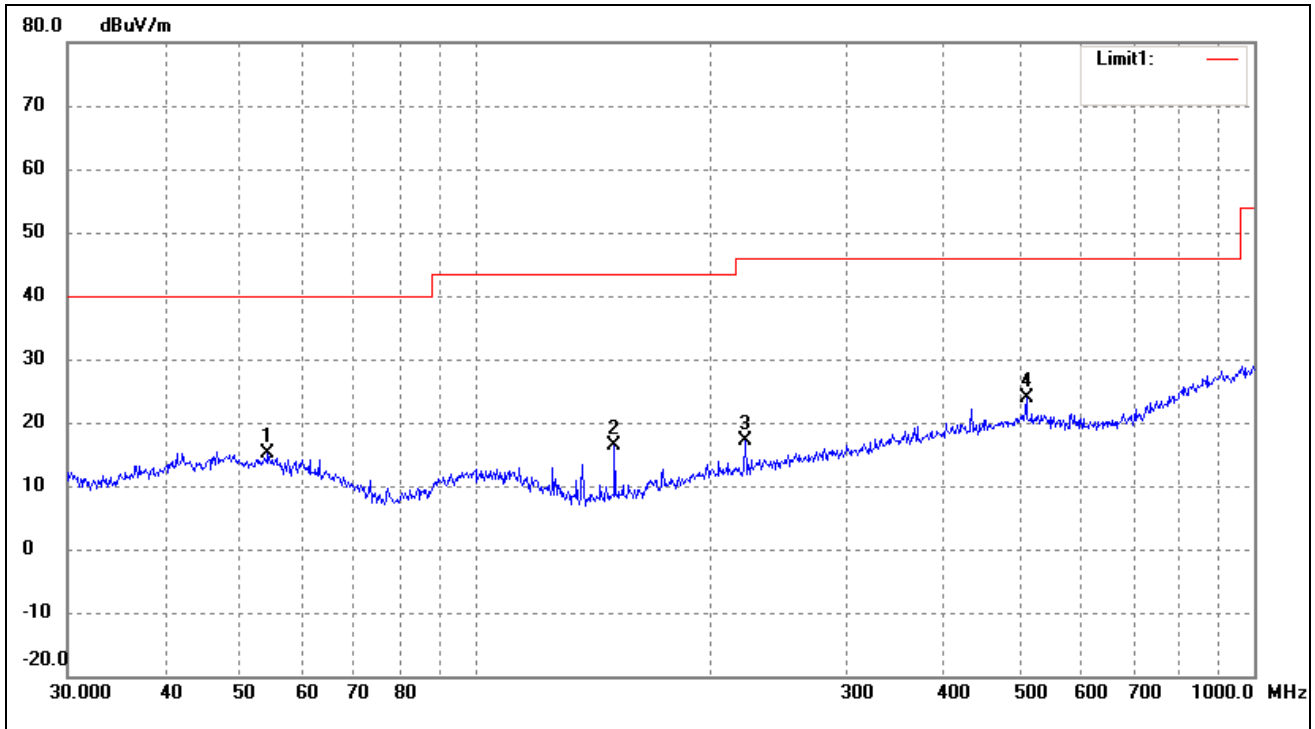
*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

Antenna: AN0

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)**

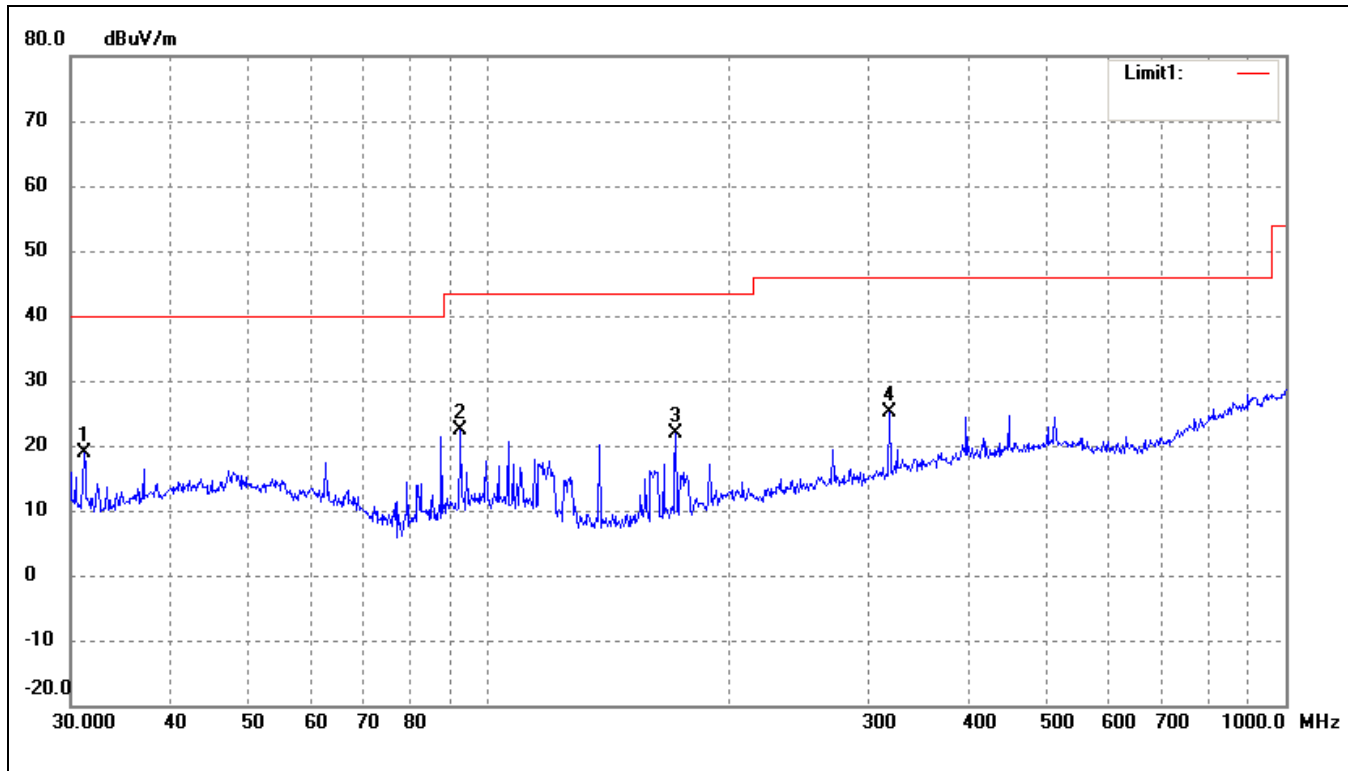
EUT: Remote control RF143A  
 Tested Model: RF143A  
 Operating Condition: Transmitting Low Channel (2425MHz)  
 Comment: Battery DC 3.0V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	54.2610	22.97	-7.88	15.09	40.00	-24.91	145	100	peak
2	151.0666	29.32	-12.88	16.44	43.50	-27.06	166	100	peak
3	222.1698	25.92	-8.78	17.14	46.00	-28.86	172	100	peak
4*	510.0436	25.06	-1.18	23.88	46.00	-22.12	184	10	peak

Test Specification: Vertical

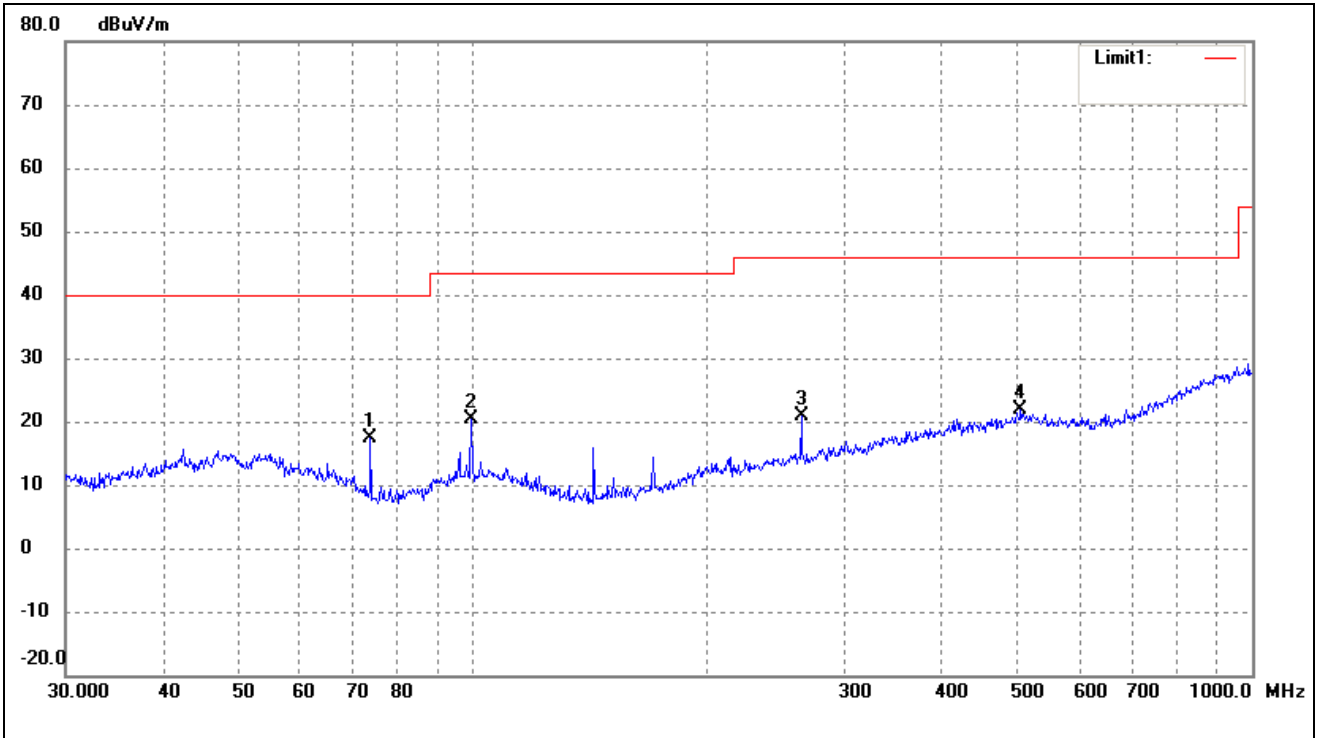


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	31.1798	29.42	-10.60	18.82	40.00	-21.18	112	100	peak
2	92.4624	33.08	-10.69	22.39	43.50	-21.11	136	100	peak
3	171.9946	33.70	-11.70	22.00	43.50	-21.50	149	100	peak
4*	318.8170	30.60	-5.57	25.03	46.00	-20.97	166	100	peak

Operating Condition: Transmitting Middle Channel (2450MHz)

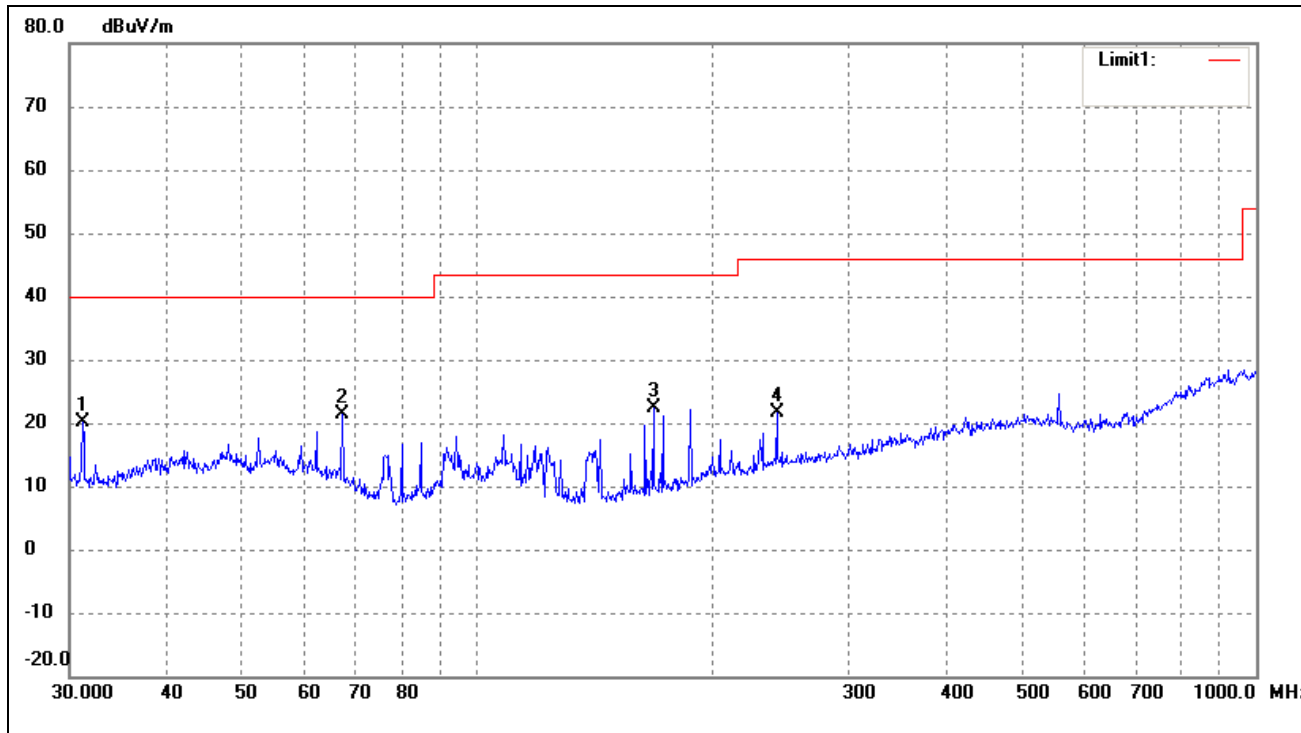
Comment: Battery DC 3.0V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1*	73.8756	30.30	-12.90	17.40	40.00	-22.60	126	100	peak
2	99.5281	30.00	-9.61	20.39	43.50	-23.11	149	100	peak
3	263.8190	28.01	-7.09	20.92	46.00	-25.08	157	100	peak
4	504.7062	23.08	-1.15	21.93	46.00	-24.07	181	100	peak

Test Specification: Vertical

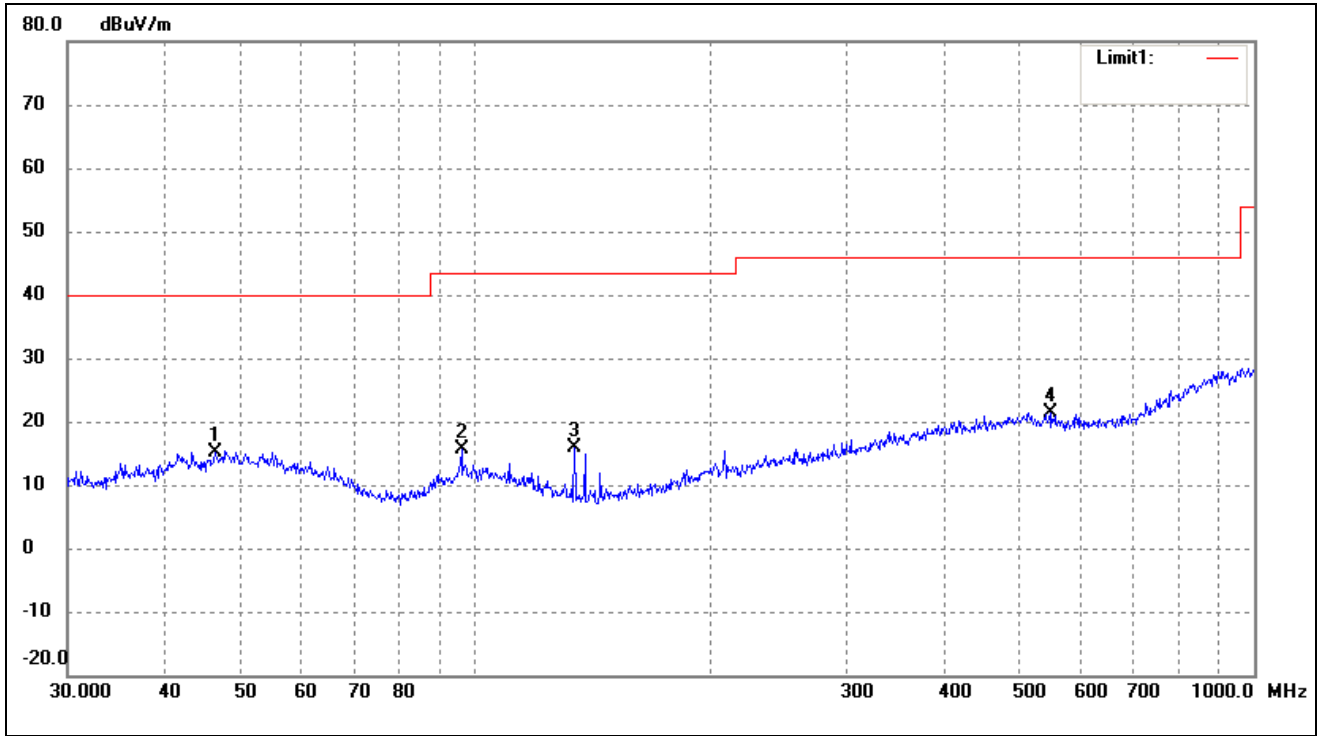


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	31.1798	30.84	-10.60	20.24	40.00	-19.76	101	100	peak
2*	67.2022	31.88	-10.51	21.37	40.00	-18.63	124	100	peak
3	168.4138	34.22	-11.92	22.30	43.50	-21.20	136	100	peak
4	242.5253	29.31	-7.71	21.60	46.00	-24.40	149	100	peak

Operating Condition: Transmitting High Channel (2475MHz)

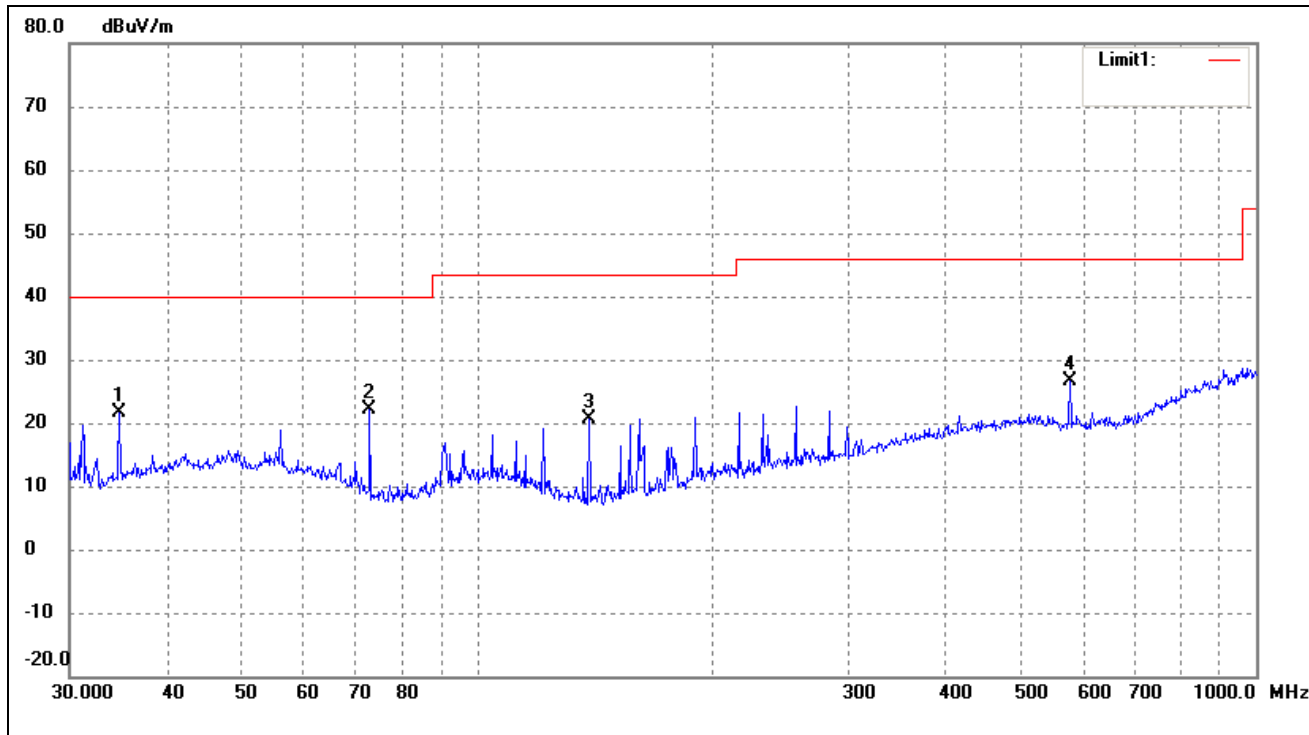
Comment: Battery DC 3.0V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	46.3402	22.56	-7.46	15.10	40.00	-24.90	102	100	peak
2	96.0986	25.69	-10.04	15.65	43.50	-27.85	159	100	peak
3	134.0882	28.75	-12.91	15.84	43.50	-27.66	168	100	peak
4*	547.0977	22.79	-1.35	21.44	46.00	-24.56	182	100	peak

Test Specification: Vertical



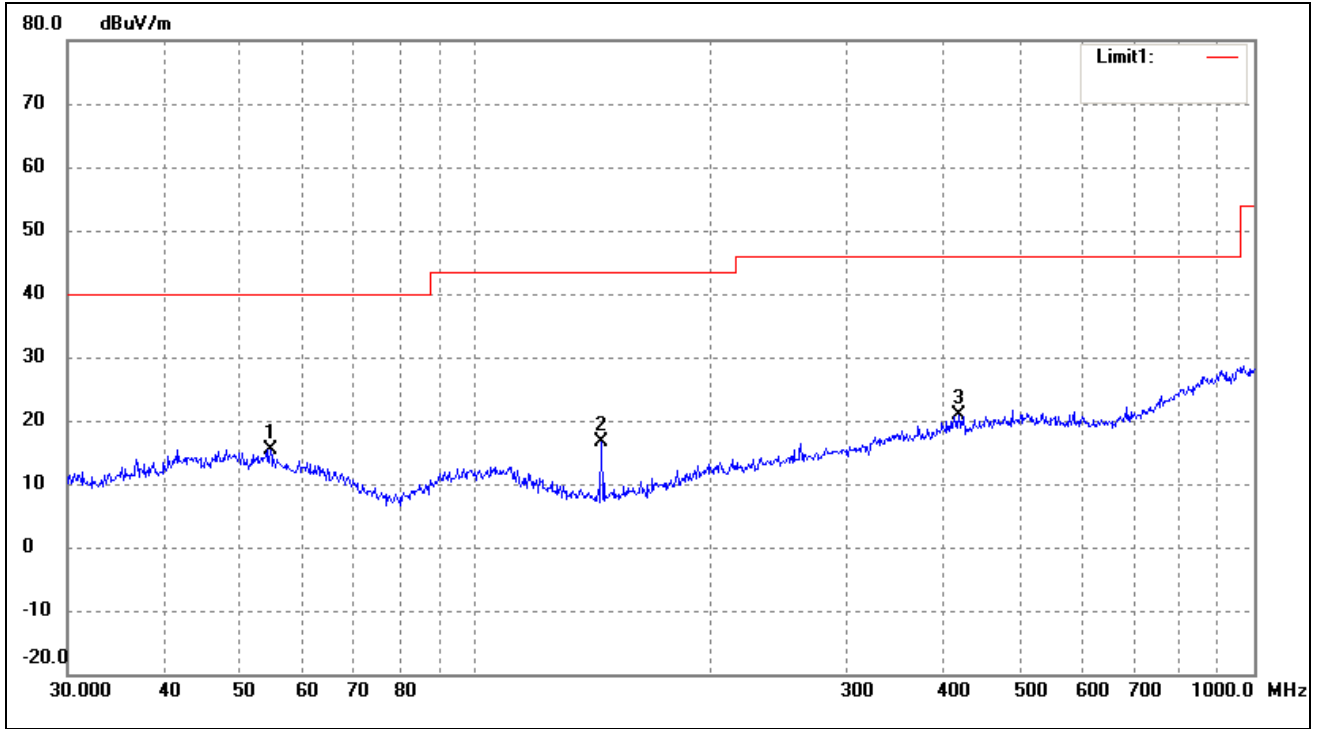
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	34.7602	31.77	-10.11	21.66	40.00	-18.34	112	100	peak
2*	72.8466	34.79	-12.57	22.22	40.00	-17.78	145	100	peak
3	139.3613	33.73	-13.13	20.60	43.50	-22.90	168	100	peak
4	576.6443	25.89	0.68	26.57	46.00	-19.43	181	100	peak



Antenna: AN1

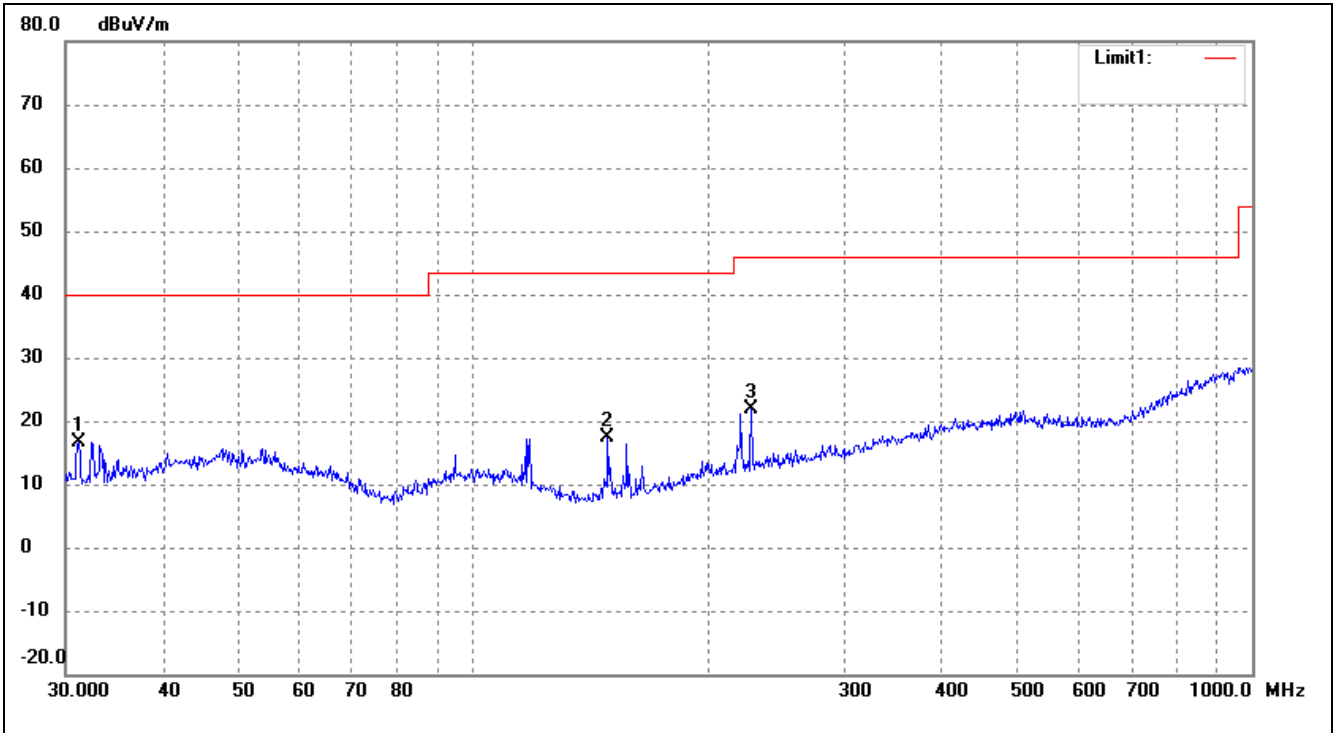
**Plot of Radiated Emissions Test Data (30MHz to 1GHz)**

EUT: Remote control RF143A  
 Tested Model: RF143A  
 Operating Condition: Transmitting Low Channel (2425MHz)  
 Comment: Battery DC 3.0V  
 Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1*	54.6429	23.40	-7.91	15.49	40.00	-24.51	148	100	peak
2	145.3506	29.60	-13.04	16.56	43.50	-26.94	166	100	peak
3	417.6411	23.28	-2.51	20.77	46.00	-25.23	172	100	peak

Test Specification: Vertical

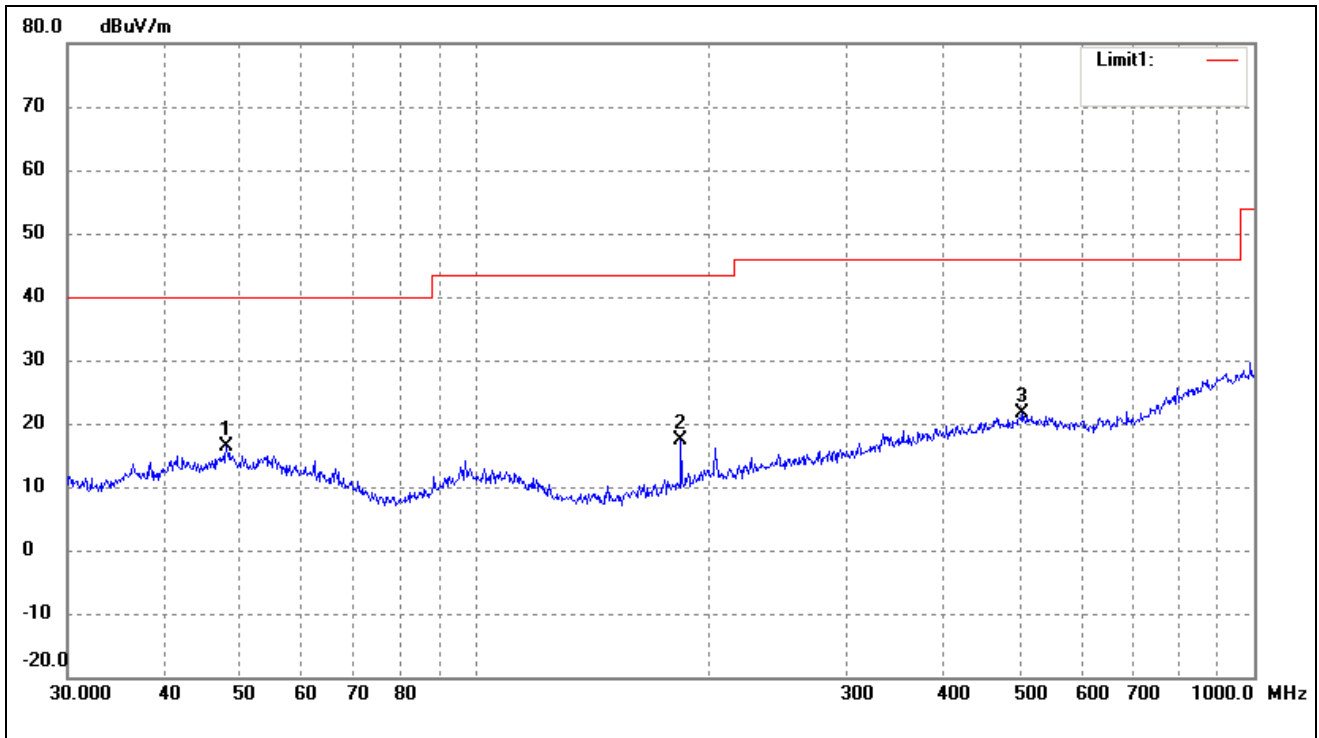


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1*	31.1798	27.17	-10.60	16.57	40.00	-23.43	122	100	peak
2	148.9625	30.28	-12.98	17.30	43.50	-26.20	178	100	peak
3	227.6906	30.48	-8.49	21.99	46.00	-24.01	199	100	peak

Operating Condition: Transmitting Middle Channel (2450MHz)

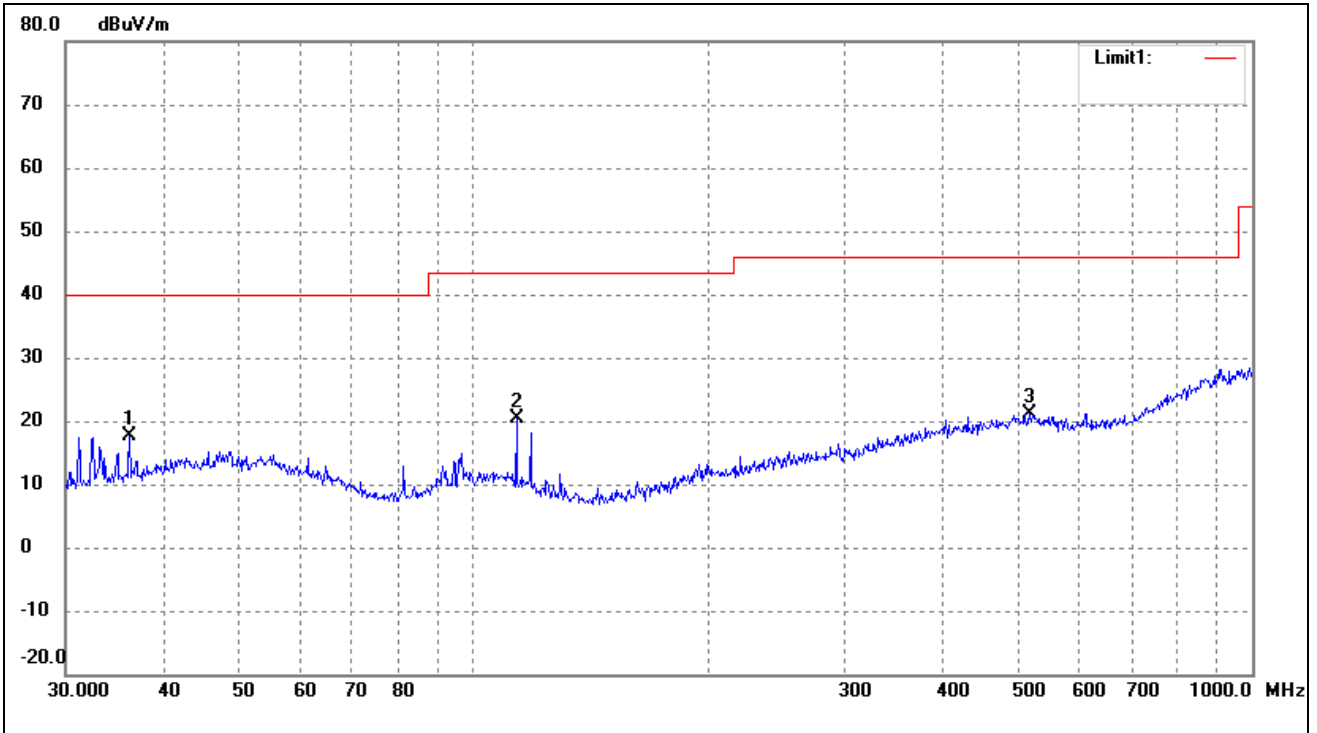
Comment: Battery DC 3.0V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1*	47.9940	23.74	-7.46	16.28	40.00	-23.72	148	100	peak
2	183.8440	28.16	-10.72	17.44	43.50	-26.06	167	100	peak
3	504.7062	22.85	-1.15	21.70	46.00	-24.30	184	100	peak

Test Specification: Vertical

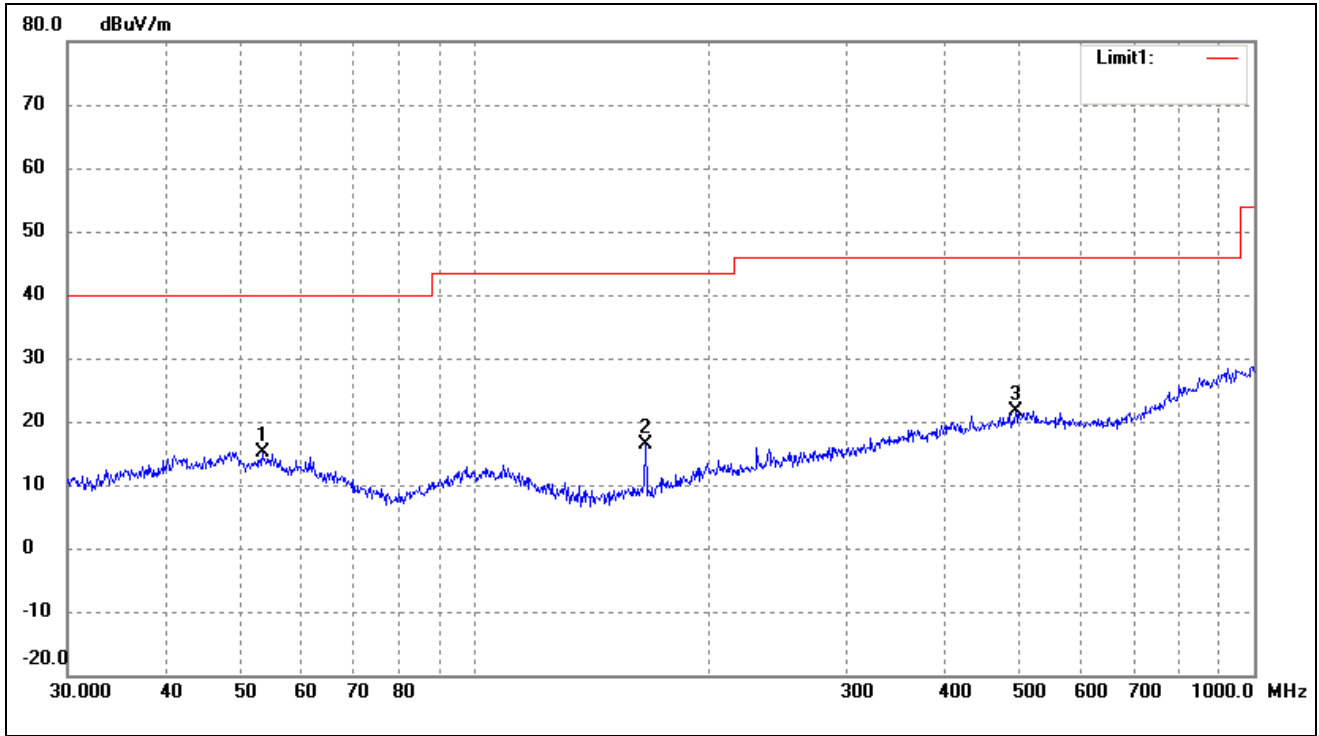


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1*	36.2541	27.15	-9.58	17.57	40.00	-22.43	149	100	peak
2	113.7143	30.61	-10.22	20.39	43.50	-23.11	164	100	peak
3	517.2480	21.81	-0.68	21.13	46.00	-24.87	181	100	peak

Operating Condition: Transmitting High Channel (2475MHz)

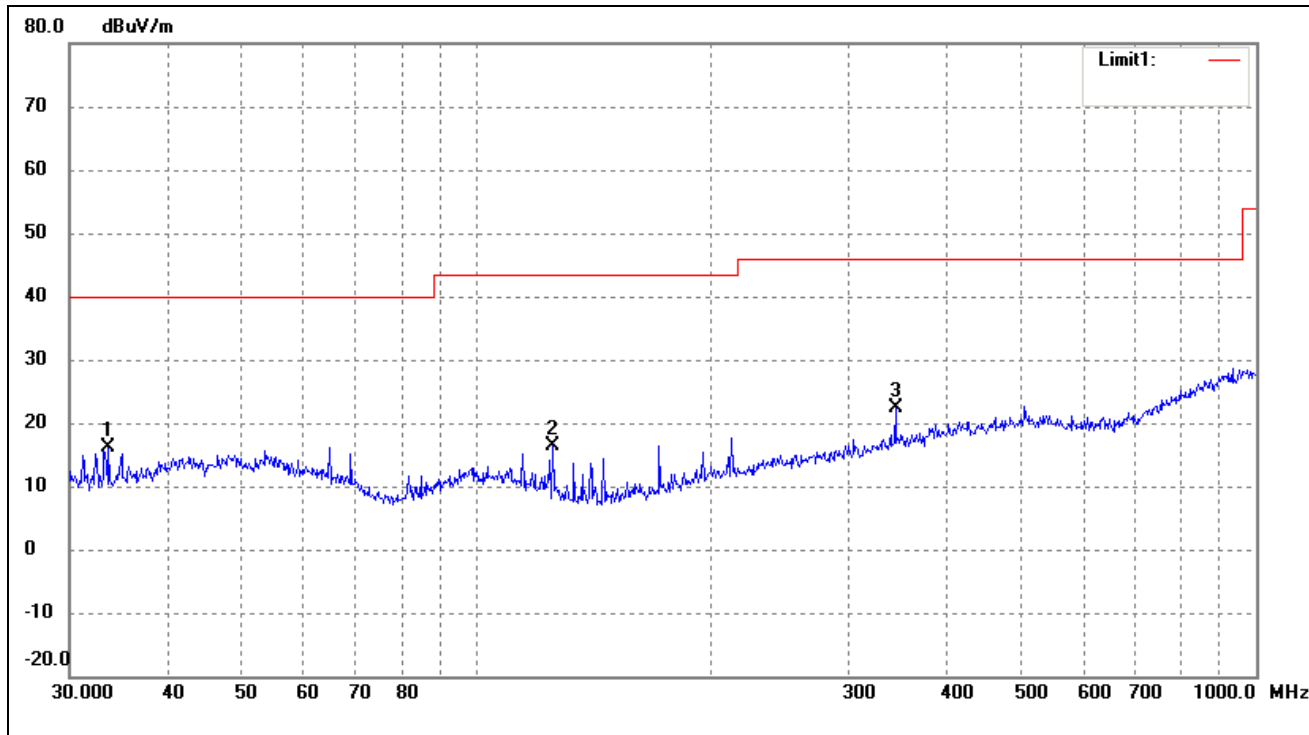
Comment: Battery DC 3.0V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	53.3179	23.03	-7.78	15.25	40.00	-24.75	167	100	peak
2	165.4867	28.56	-12.07	16.49	43.50	-27.01	188	100	peak
3*	494.1984	22.94	-1.26	21.68	46.00	-24.32	194	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	33.6803	26.49	-10.34	16.15	40.00	-23.85	162	100	peak
2	125.0066	28.28	-12.00	16.28	43.50	-27.22	173	100	peak
3*	344.3855	26.75	-4.39	22.36	46.00	-23.64	186	100	peak

Antenna: AN0

## Spurious Emissions Above 1GHz

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2425MHz							
2425	89.51	-3.46	86.05	114	-27.95	H	PK
2425	81.32	-3.46	77.86	94	-16.14	H	AV
4850	42.45	0.60	43.05	74	-30.95	H	PK
4850	32.77	0.60	33.37	54	-20.63	H	AV
7275	34.84	3.72	38.56	74	-35.44	H	PK
7275	26.07	3.82	29.89	54	-24.11	H	AV
2425	83.96	-3.46	80.50	114	-33.50	V	PK
2425	75.64	-3.46	72.18	94	-21.82	V	AV
4850	42.66	0.60	43.26	74	-30.74	V	PK
4850	31.54	0.94	32.48	54	-21.52	V	AV
7275	36.58	3.72	40.30	74	-33.70	V	PK
7275	26.14	3.82	29.96	54	-24.04	V	AV
Middle Channel-2450MHz							
2450	86.69	-3.38	83.31	114	-30.69	H	PK
2450	78.19	-3.38	74.81	94	-19.19	H	AV
4900	44.95	0.70	45.65	74	-28.35	H	PK
4900	32.71	0.70	33.41	54	-20.59	H	AV
7350	37.34	3.79	41.13	74	-32.87	H	PK
7350	26.06	3.82	29.88	54	24.12	H	AV
2450	84.29	-3.38	80.91	114	-33.09	V	PK
2450	73.77	-3.38	70.39	94	-23.61	V	AV
4900	44.90	0.70	45.60	74	-28.40	V	PK
4900	32.65	0.70	33.35	54	-20.65	V	AV
7350	37.57	3.79	41.36	74	-32.64	V	PK
7350	26.09	3.82	29.91	54	-24.09	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2475MHz							
2475	88.17	-3.33	84.81	114	-29.19	H	PK
2475	78.83	-3.33	75.50	94	-18.50	H	AV
4950	42.44	0.70	43.14	74	-30.86	H	PK
4950	32.15	0.77	32.92	54	-21.08	H	AV
7425	37.90	3.84	41.74	74	-32.26	H	PK
7425	26.05	3.82	29.87	54	-24.13	H	AV
2475	84.05	-3.33	80.72	114	-33.28	V	PK
2475	73.81	-3.33	70.48	94	-23.52	V	AV
4950	43.91	0.76	44.67	74	-29.37	V	PK
4950	32.27	0.77	33.04	54	-20.96	V	AV
7425	37.37	3.84	41.21	74	-32.79	V	PK
7425	26.12	3.82	29.94	54	-24.06	V	AV



Antenna:ANI

## Spurious Emissions Above 1GHz

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2425MHz							
2425	91.97	-3.51	88.46	114.00	-25.54	H	PK
2425	90.38	-3.51	86.17	94.00	-7.83	H	AV
4850	44.18	0.54	44.72	74.00	-29.28	H	PK
4850	32.18	0.55	32.73	54.00	-21.27	H	AV
7275	35.42	3.67	39.09	74.00	-34.91	H	PK
7275	26.74	3.76	30.50	54.00	-23.50	H	AV
2425	78.44	-3.51	74.93	114.00	-39.07	V	PK
2425	76.19	-3.50	72.69	94.00	-21.31	V	AV
4850	43.57	0.54	44.11	74.00	-29.89	V	PK
4850	31.66	0.55	32.21	54.00	-21.79	V	AV
7275	34.74	3.67	38.41	74.00	-35.59	V	PK
7275	23.30	3.68	26.98	54.00	-27.02	V	AV
Middle Channel-2450MHz							
2450	88.56	-3.43	85.13	114.00	-28.87	H	PK
2450	84.34	-3.43	80.91	94.00	-13.09	H	AV
4900	43.35	0.66	44.01	74.00	-29.99	H	PK
4900	31.78	0.66	32.44	54.00	-21.56	H	AV
7350	38.34	3.76	42.10	74.00	-31.90	H	PK
7350	26.90	3.77	30.67	54.00	-23.33	H	AV
2450	77.64	-3.43	74.21	114.00	-39.79	V	PK
2450	74.74	-3.43	71.31	94.00	-12.69	V	AV
4900	43.16	0.66	43.82	74.00	-30.18	V	PK
4900	31.91	0.68	32.59	54.00	-21.41	V	AV
7350	38.55	3.76	42.31	74.00	-31.69	V	PK
7350	26.91	3.80	30.71	54.00	-23.29	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2475MHz							
2475	90.44	-3.34	87.10	114.00	-26.90	H	PK
2475	88.12	-3.34	84.78	94.00	-9.22	H	AV
4950	42.93	0.76	43.69	74.00	-30.31	H	PK
4950	31.92	0.77	32.69	54.00	-21.31	H	AV
7425	26.78	3.84	30.62	54.00	-23.38	H	PK
7425	38.73	3.84	42.57	74.00	-31.43	H	AV
2475	70.04	-3.34	76.70	114.00	-37.30	V	PK
2475	77.14	-3.34	73.80	94.00	-20.20	V	AV
4950	43.22	0.76	43.98	74.00	-30.02	V	PK
4950	31.90	0.77	32.67	54.00	-21.33	V	AV
7425	26.92	3.83	30.75	54.00	-23.25	V	PK
7425	37.57	3.84	41.41	74.00	-32.59	V	AV

*Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5<sup>th</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

*The measurements greater than 20dB below the limit from 9kHz to 30MHz..*

## 5. Out of Band Emissions

### 5.1 Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### 5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23

### 5.3 Test Procedure

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2483.5MHz, than mark the higher-level emission for comparing with the FCC rules.

### 5.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

### 5.5 Summary of Test Results/Plots

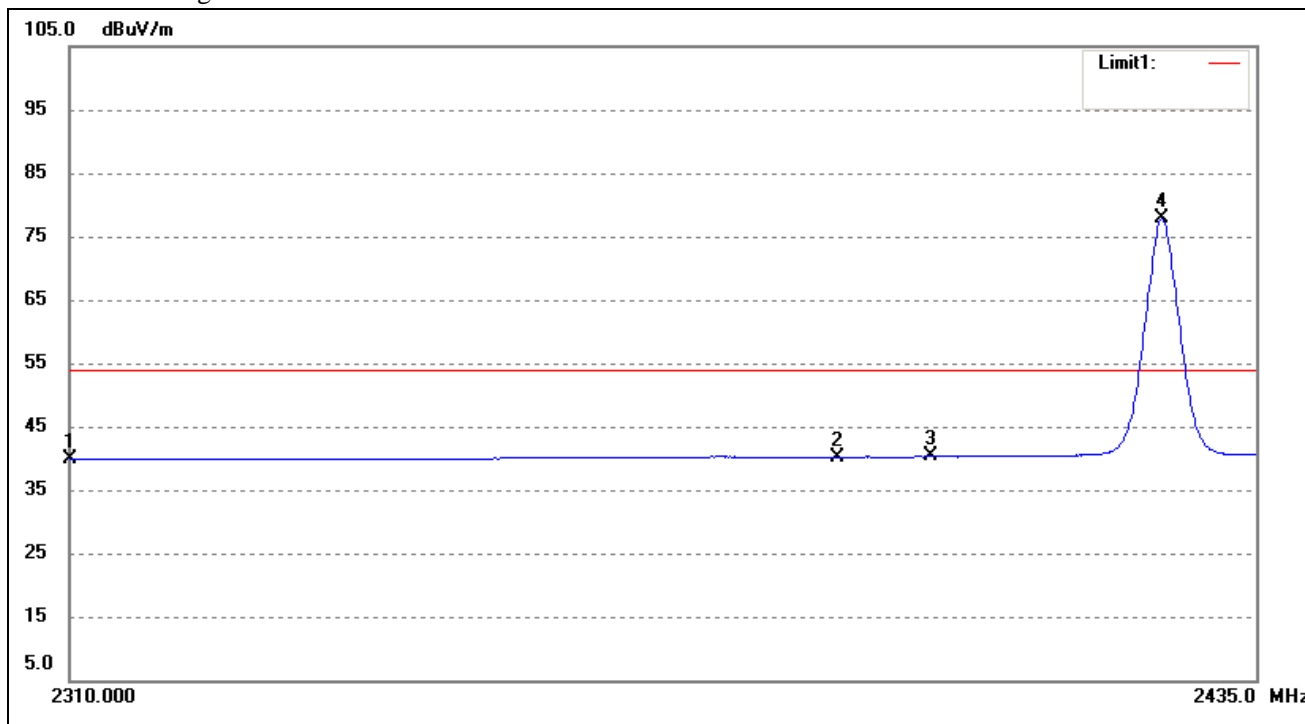
Test mode	Frequency	Limit	Result
	MHz	dBuV / dBc	
Lowest	2310.00	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
Highest	2483.50	<54 dBuV	Pass
	2500.00	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

Please refer to the test plots as below.

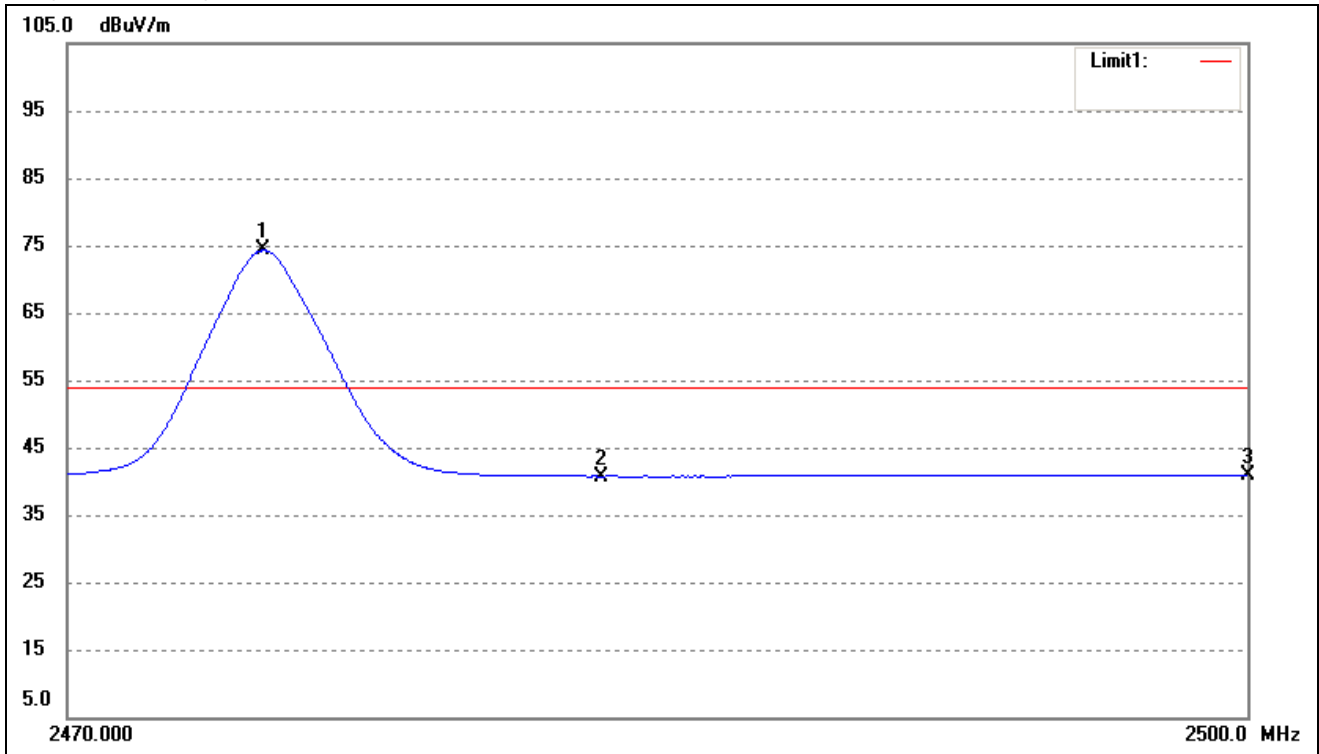
Antenna: AN0

Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	23.56	16.34	39.90	54.00	-14.10	Average Detector
	2310.000	35.97	16.34	52.31	74.00	-21.69	Peak Detector
2	2390.000	23.12	17.03	40.15	54.00	-13.85	Average Detector
	2390.000	35.45	17.03	52.48	74.00	-21.52	Peak Detector
3	2400.000	23.18	17.11	40.29	54.00	-13.71	Average Detector
	2400.000	36.53	17.11	53.64	74.00	-20.36	Peak Detector
4	2424.884	60.57	17.29	77.86	/	/	Average Detector

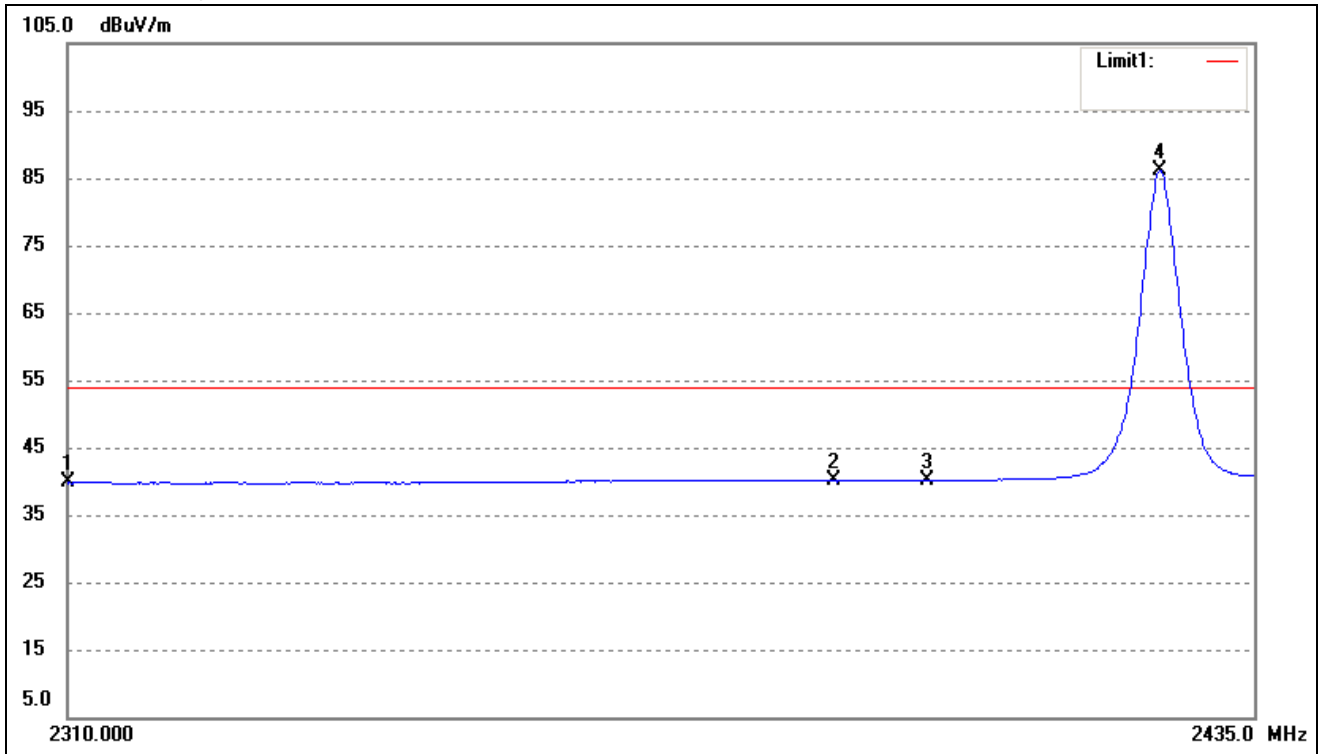
Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1*	2474.955	56.62	17.67	74.29	/	/	Peak Detector
	2475.493	67.13	17.68	84.81	/	/	Average Detector
2	2483.500	23.02	17.73	40.75	54.00	-13.25	Peak Detector
	2483.500	35.67	17.73	53.40	74.00	-20.60	Average Detector
3	2500.000	23.03	17.86	40.89	54.00	-13.11	Peak Detector
	2500.000	35.42	17.86	53.28	74.00	-20.72	Average Detector

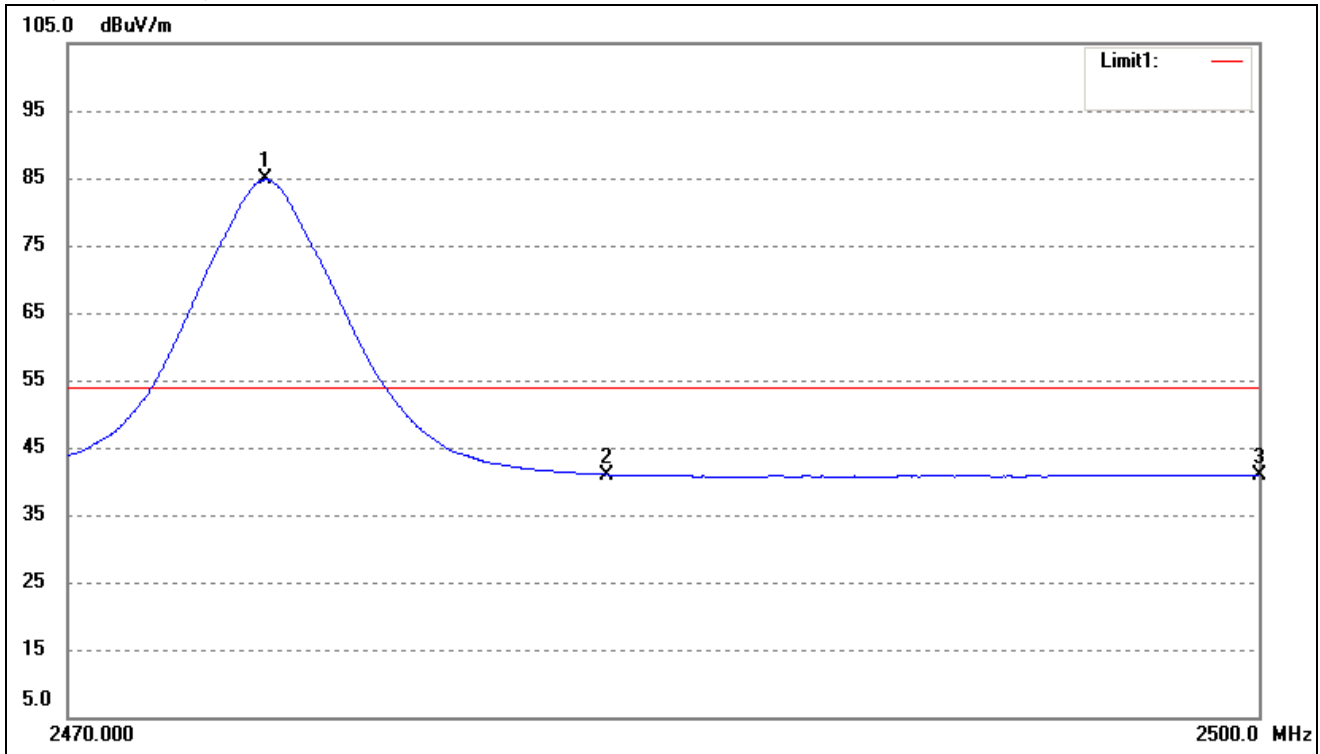
Antenna: AN1

Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	23.42	16.34	39.76	54.00	-14.24	Average Detector
		35.19	16.34	51.53	74.00	-22.47	Peak Detector
2	2390.000	22.98	17.03	40.01	54.00	-13.99	Average Detector
		35.47	17.03	52.50	74.00	-21.50	Peak Detector
3	2400.000	23.05	17.11	40.16	54.00	-13.84	Average Detector
		35.99	17.11	53.10	74.00	-20.90	Peak Detector
4	2424.884	68.88	17.29	86.17	/	/	Average Detector

Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1*	2474.955	67.11	17.67	84.78	/	/	Average Detector
	2474.417	69.43	17.67	87.10	/	/	Peak Detector
2	2483.500	23.27	17.73	41.00	54.00	-13.00	Average Detector
	2483.500	35.41	17.73	53.14	74.00	-20.86	Peak Detector
3	2500.000	22.95	17.86	40.81	54.00	-13.19	Average Detector
	2500.000	35.35	17.85	53.20	74.00	-20.80	Peak Detector

## 6. Emission Bandwidth

### 6.1 Standard Applicable

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### 6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-28	2015-05-27
Attenuator	ATTEN	ATS100-4-20	/	2014-05-28	2015-05-27

### 6.3 Test Procedure

According to the ANSI 63.4-2003, the emission bandwidth test method as follows.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set span = 1MHz, centered on a transmitting channel

RBW  $\geq$ 1% 20dB Bandwidth, VBW  $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

### 6.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

### 6.5 Summary of Test Results/Plots

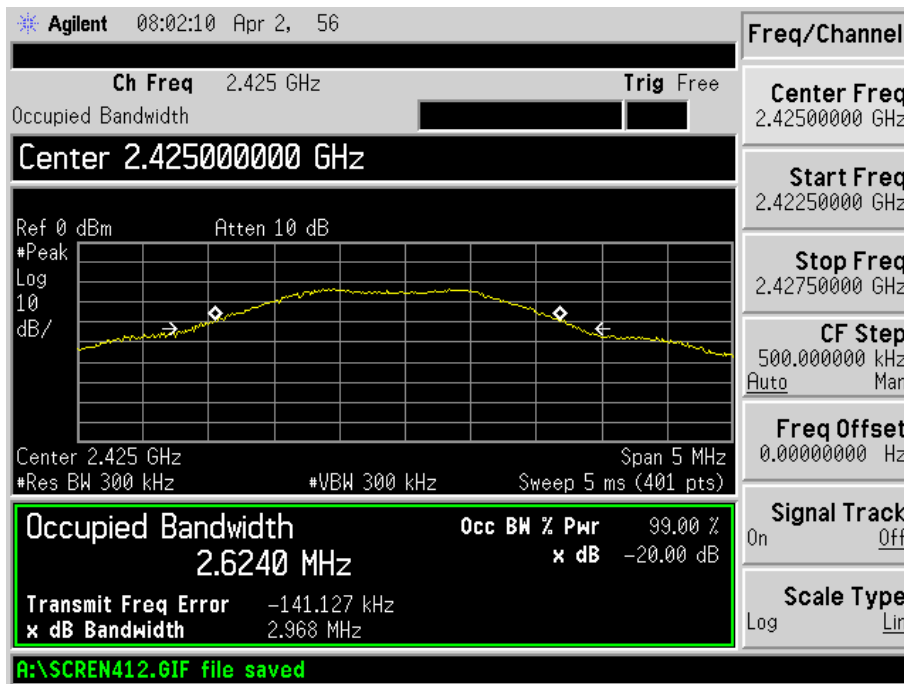


Antenna: AN0

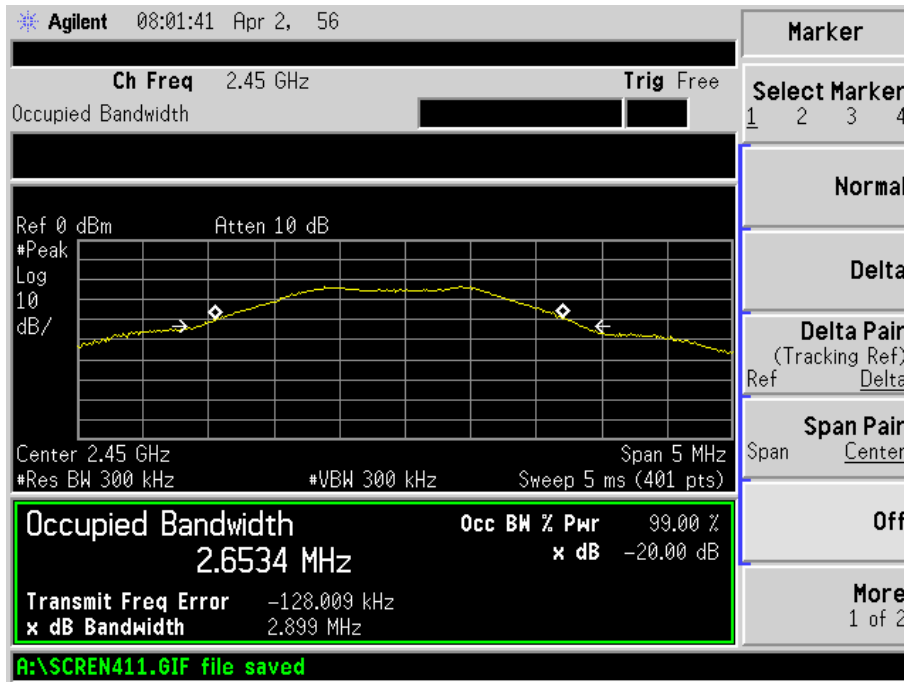
Channel	Frequency MHz	20dB Bandwidth kHz	99% Bandwidth kHz
Low Channel	2425	2968	2624.0
Middle Channel	2450	2899	2653.4
High Channel	2475	2922	2599.8

Please refer to the following test plots

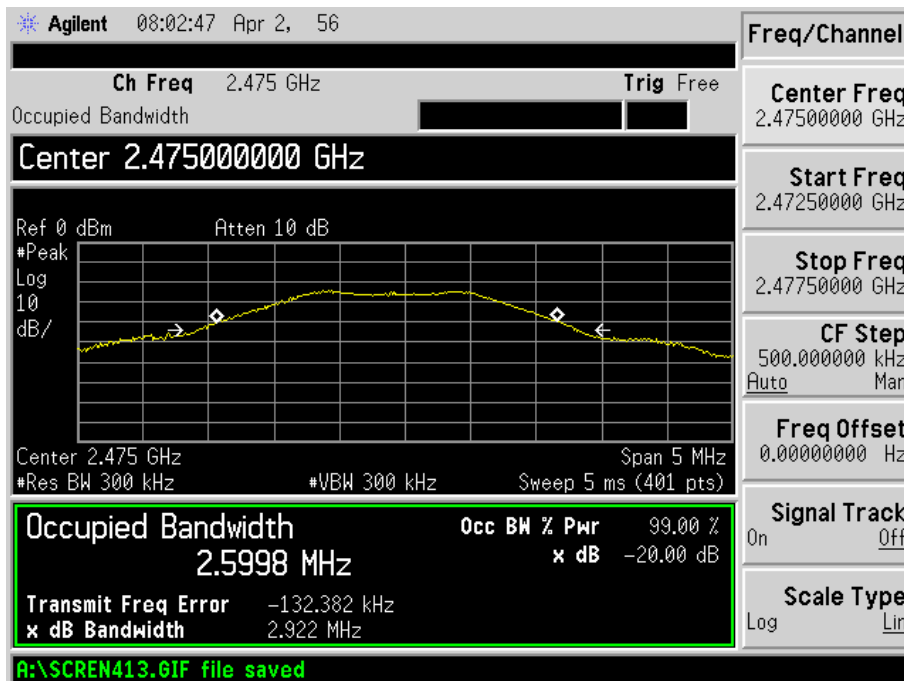
Low Channel:



Middle Channel:



High Channel:

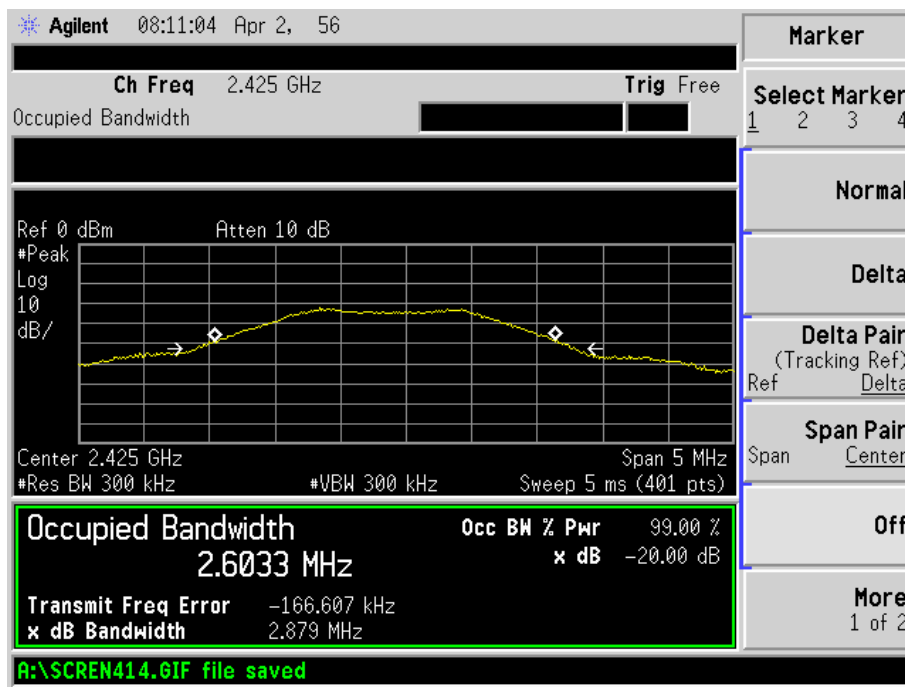


Antenna:ANI

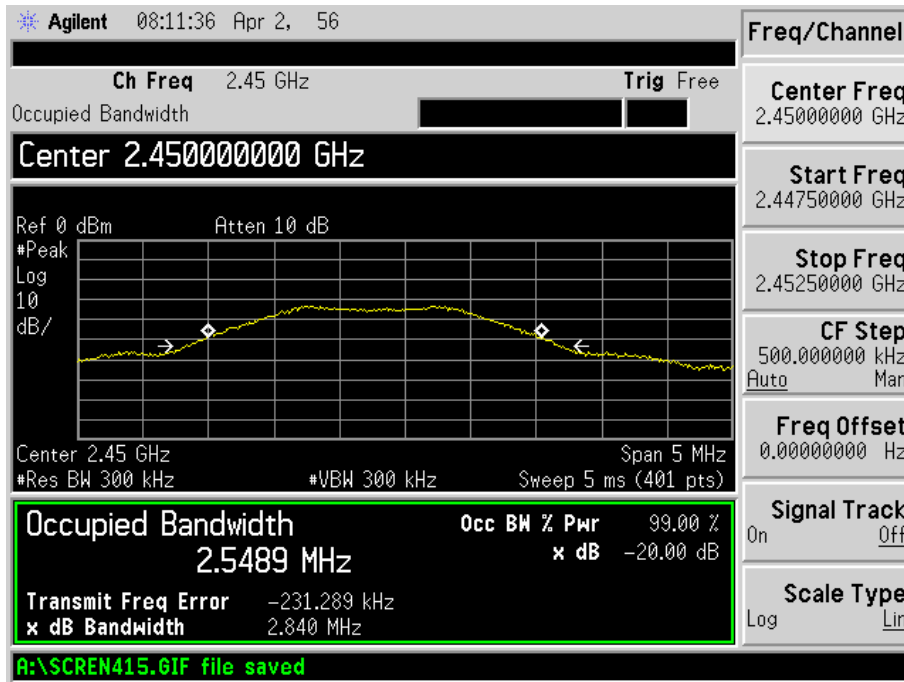
Channel	Frequency MHz	20dB Bandwidth kHz	99% Bandwidth kHz
Low Channel	2425	2879	2603.3
Middle Channel	2450	2840	2548.9
High Channel	2475	2849	2546.6

Please refer to the following test plots

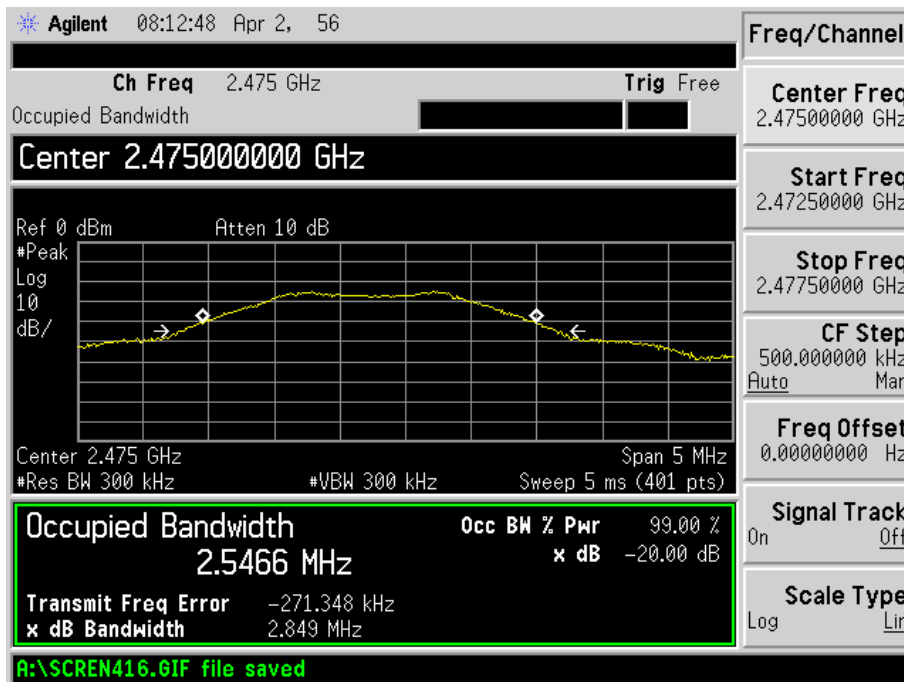
Low Channel:



Middle Channel:



High Channel:



\*\*\*\*\* END OF REPORT \*\*\*\*\*