



Gakkiku Compliance Company Limited

Room 1501, 15/F., SPA Centre,
 53-55 Lockhart Road,
 Wanchai,
 Hong Kong
 Tel: (852) 8113 2281
 Email: info@gakkiku.com

Test Report




Applicant	Scientific Toys Ltd
Address	Rm. 1108, 11/F., Block B, New Mandarin Plaza, 14 Science Museum Road, TST East, Kowloon, Hong Kong
FCC ID Number	FCC ID: BY34339-24GR
Tested Brand Name(s)	None
Tested Model Number(s)/ Item Number(s)	BY34339-24GR
Product Description	2.4GHz Wireless Remote Control Device - TX Portion
Operating Frequency	2402.00-2480.00 MHz
Rules/Standards	Part 15.249 of the FCC Rules
Received Date	6th July, 2017
Tested Date	6th July, 2017
Tested by	 Jason Su (Engineer of Shenzhen SEM.Test Technology Co., Ltd.)
Reviewed by	 Silin Chen (EMC Manager of Shenzhen SEM.Test Technology Co., Ltd.)
Signed by	 Jandy So (Manager of Shenzhen SEM.Test Technology Co., Ltd.)
Approved by	Gilbert Lui (Marketing Manager of Gakkiku Compliance Company Limited)
Report Number	GCCL201708180A
Test Results	<input checked="" type="checkbox"/> PASSED <input type="checkbox"/> FAILED

TABLE OF CONTENTS

1. GENERAL INFORMATION 3

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 3

1.2 TEST STANDARDS 4

1.3 TEST METHODOLOGY 4

1.4 TEST FACILITY..... 4

1.5 EUT SETUP AND TEST MODE 5

1.6 MEASUREMENT UNCERTAINTY..... 5

1.7 TEST EQUIPMENT LIST AND DETAILS..... 6

2. SUMMARY OF TEST RESULTS 7

3. ANTENNA REQUIREMENTS 8

3.1 STANDARD APPLICABLE..... 8

3.2 TEST RESULT 8

4. RADIATED EMISSIONS 9

4.1 STANDARD APPLICABLE..... 9

4.2 TEST PROCEDURE 9

4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION 11

4.4 ENVIRONMENTAL CONDITIONS..... 11

4.5 SUMMARY OF TEST RESULTS/PLOTS 11

5. OUT OF BAND EMISSIONS 20

5.1 STANDARD APPLICABLE..... 20

5.2 TEST PROCEDURE 20

5.3 ENVIRONMENTAL CONDITIONS 20

5.4 SUMMARY OF TEST RESULTS/PLOTS 20

6. EMISSION BANDWIDTH 23

6.1 STANDARD APPLICABLE..... 23

6.2 TEST PROCEDURE 23

6.3 ENVIRONMENTAL CONDITIONS 23

6.4 SUMMARY OF TEST RESULTS/PLOTS 23

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Scientific Toys Ltd
 Address of applicant: Rm. 1108, 11/F., Block B, New Mandarin Plaza,
 14 Science Museum Road, TST East, Kowloon, Hong Kong

Manufacturer: Scientific Toys Ltd
 Address of manufacturer: Rm. 1108, 11/F., Block B, New Mandarin Plaza,
 14 Science Museum Road, TST East, Kowloon, Hong Kong

General Description of EUT	
Product Description:	2.4GHz Wireless Remote Control Device - TX Portion
Tested Trade Name:	None
Tested Model Number/ Item Number:	BY34339-24GR
Adding Model Number(s)/ Item Number(s):	AD16712, 99110 [All Adding Brand Name(s) and Model Number(s)/Item Number(s) are same electrically identical as Tested Brand Name and Model Number/Item Number]
Power Source:	DC 7.5V (5 units of DC 1.5V AA-Size Battery)
Power Adapter Model:	/
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of above adding model number(s)/item number(s) listed in the report is different from above tested model number/item number, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Frequency Range:	2402.00-2480.00 MHz
Max. Field Strength/ RF Output Power::	85.63dBuV/m
Type of Modulation:	GFSK
Type of Antenna:	Fixed 34mm-long (1.6mm-diameter) AWG#22 wire integral antenna
Antenna Gain:	0 dBi
Lowest Internal Clock Frequency of EUT:	12 MHz

1.2 Test Standards

The following report is prepared on behalf of the Scientific Toys Ltd in accordance with FCC Part 15, Subpart B, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the FCC Rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the FCC 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 C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, 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

Federal Communications Commission (FCC) - Registration No.: 934118

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Federal Communications Commission (FCC). 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 (IC) for radio equipment testing with Registration No.: 11464A.

China National Accreditation Service for Conformity Assessment (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 2nd Road, Bao'an District, Shenzhen, Guangdong, 518101, China.

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:

Test Mode List		
Test Mode	Description	Remark
TM1	Lowest Channel	2402.00 MHz
TM2	Near Middle Channel	2440.00 MHz
TM3	Highest Channel	2480.00 MHz

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
A tact switch and a pairs of 7cm-long (0.5mm-diameter) yellow wires (unshielded and without core) which connect between pin11 of U5 (2.4G RF IC) and GND	N/A	N/A	N/A
A LED and a pairs of 7cm-long (0.5mm-diameter) yellow wires (unshielded and without core) which connect between pin7 of U5 and current limit resistor to GND	N/A	N/A	N/A

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-12	2018-06-11
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-12	2018-06-11
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-12	2018-06-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-12	2018-06-11
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
Part 15.203	Antenna Requirement	Compliant
Part 15.205	Restricted Band of Operation	Compliant
Part 15.107(a)/15.207(a)	Conducted Emission	N/A*
Part 15.209(a)(f)	Radiated Spurious Emissions	Compliant
Part 15.249(a)	Field Strength of Emissions	Compliant
Part 15.249(d)	Out of Band Emission	Compliant
Part 15.215 (c)	Emission Bandwidth	Compliant

*Remark:

The AC Line Conducted Emissions testing is exempted because it is powered solely by batteries. Thus, the AC Line Conducted Emissions testing is not applicable.

3. Antenna Requirements

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 a fixed 34mm-long (1.6mm-diameter) AWG#22 wire integral antenna, fulfill the requirement of this section.

4. Radiated Emissions

4.1 Standard Applicable

According to FCC Part 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.

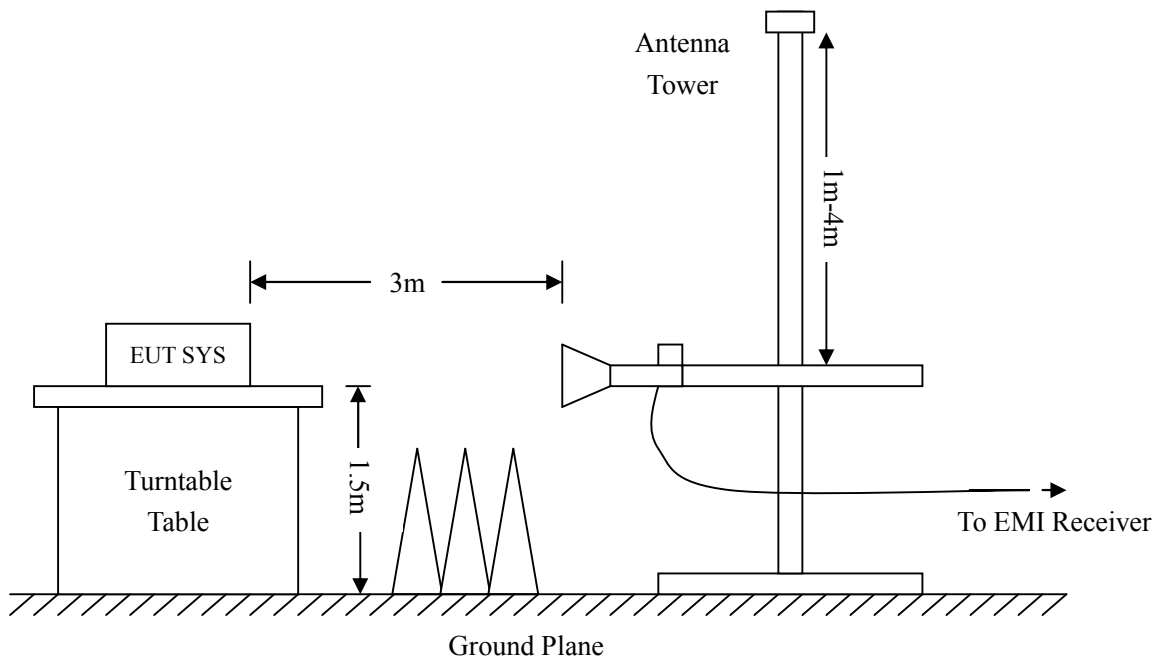
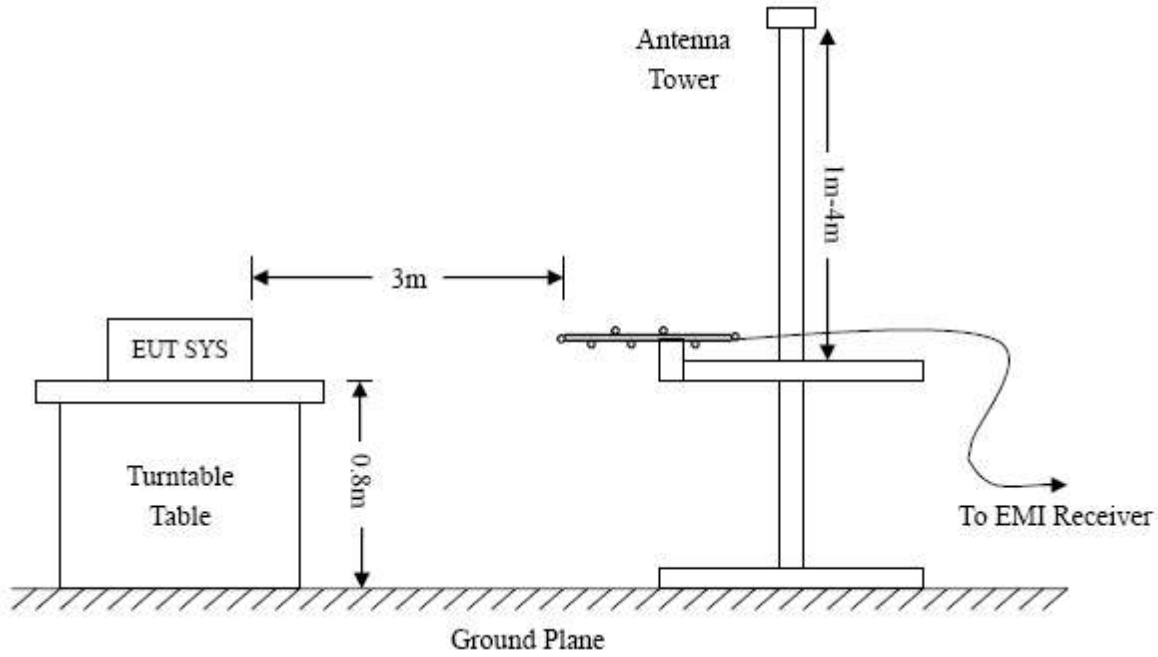
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

4.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 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

4.3 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 -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

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

4.4 Environmental Conditions

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

4.5 Summary of Test Results/Plots

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

-17.11 dB at 645.1195 MHz in the *Vertical* polarization, **Highest Channel, 9 kHz to 25 GHz,**
3Meters

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

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

Product Description: 2.4GHz Wireless Remote Control Device - TX Portion

Tested Model

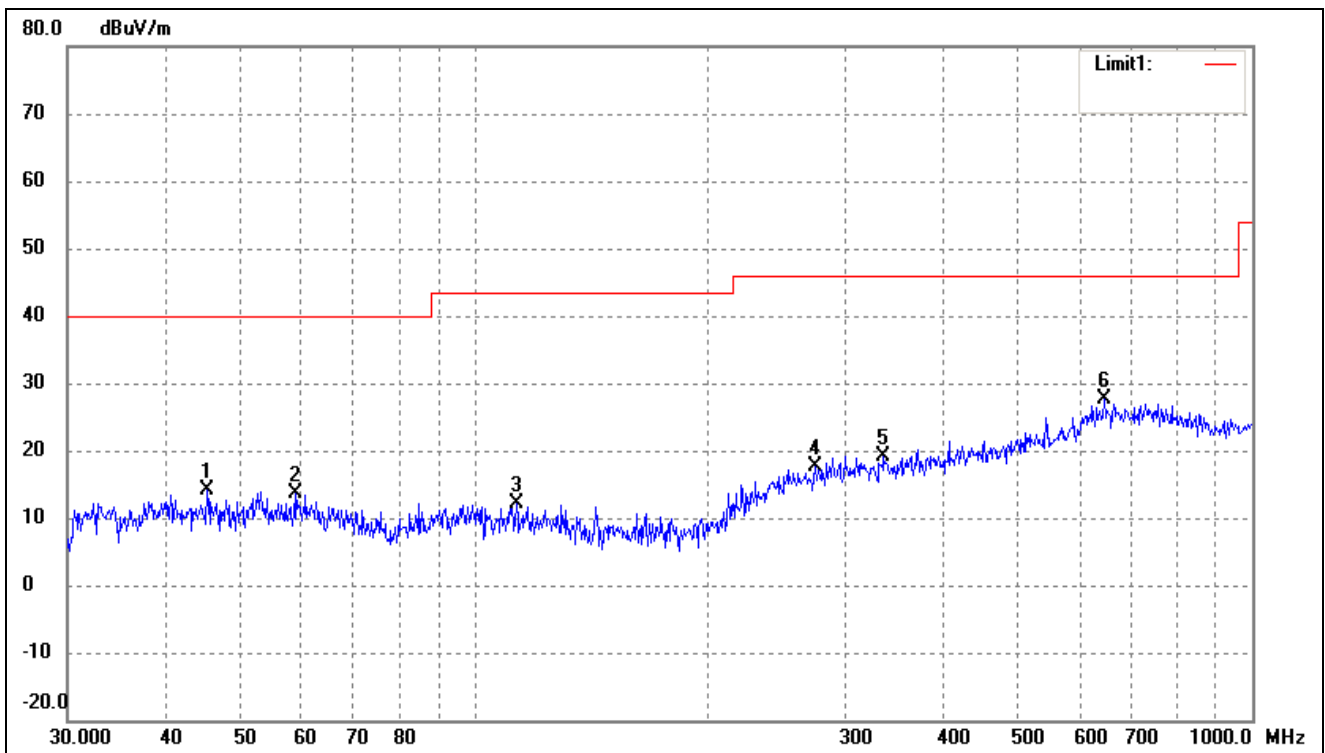
Number/ BY34339-24GR

Item Number:

Operating Condition: Transmitting (Lowest Channel: 2402.00 MHz)

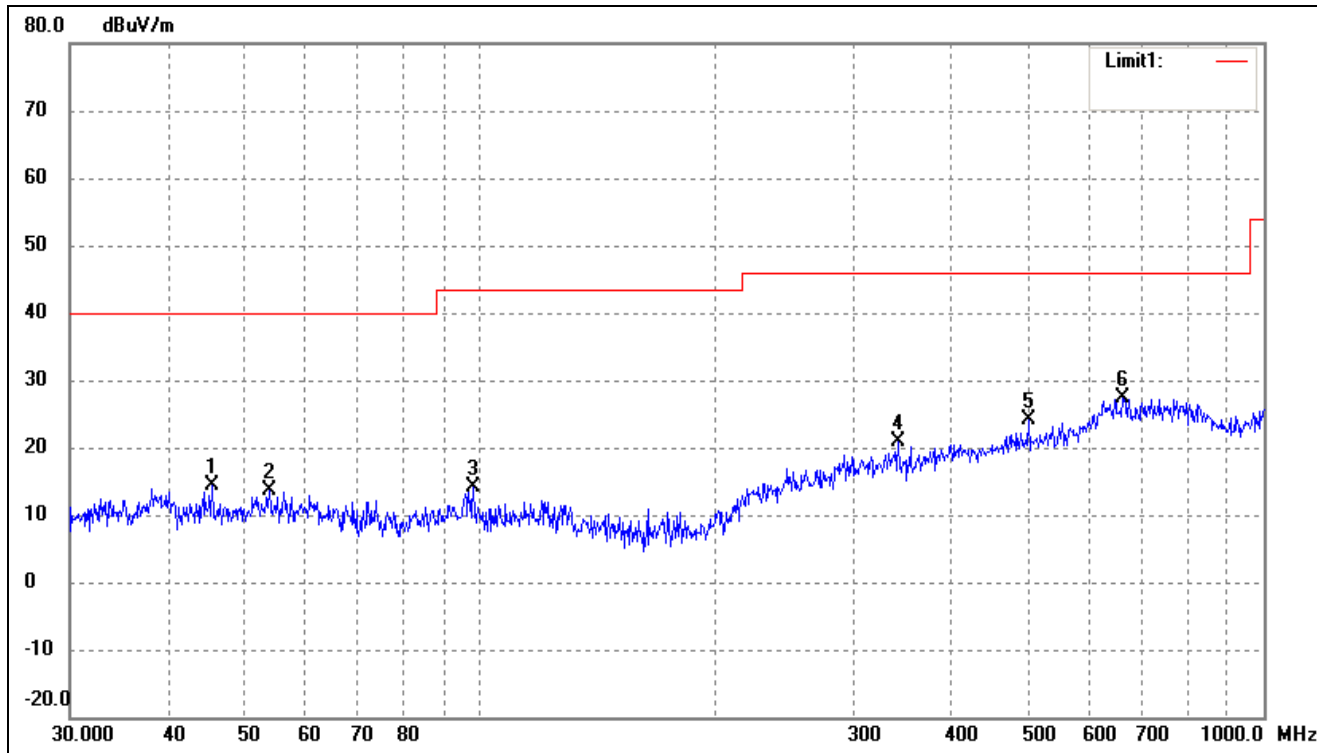
Power Source: DC 7.5V (5 units of DC 1.5V AA-Size Battery)

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	45.3755	30.65	-16.49	14.16	40.00	-25.84	126	109	Peak
2	58.8185	30.23	-16.53	13.70	40.00	-26.30	157	112	Peak
3	113.3163	28.70	-16.63	12.07	43.50	-31.43	241	142	Peak
4	274.1939	28.41	-10.78	17.63	46.00	-28.37	183	248	Peak
5	336.0352	28.86	-9.62	19.24	46.00	-26.76	225	185	Peak
6	645.1195	28.80	-1.15	27.65	46.00	-18.35	298	287	Peak

Test Specification: Vertical

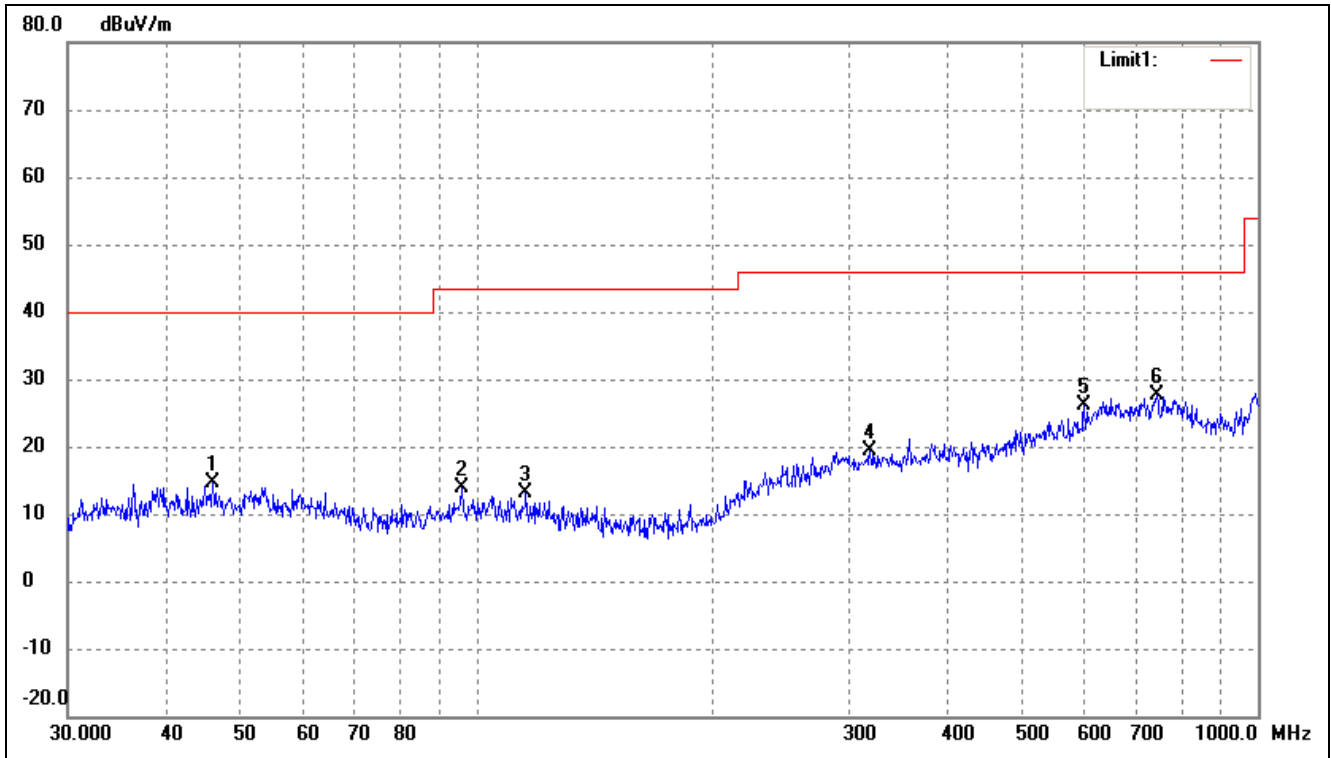


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	45.5348	30.98	-16.49	14.49	40.00	-25.51	149	107	Peak
2	53.8818	30.01	-16.49	13.52	40.00	-26.48	269	153	Peak
3	98.1419	30.92	-16.83	14.09	43.50	-29.41	145	250	Peak
4	341.9787	30.43	-9.59	20.84	46.00	-25.16	314	215	Peak
5	501.1790	29.82	-5.78	24.04	46.00	-21.96	175	297	Peak
6	661.1505	28.89	-1.44	27.45	46.00	-18.55	215	102	Peak

Operating Condition: Transmitting (Near Middle Channel: 2440.00 MHz)

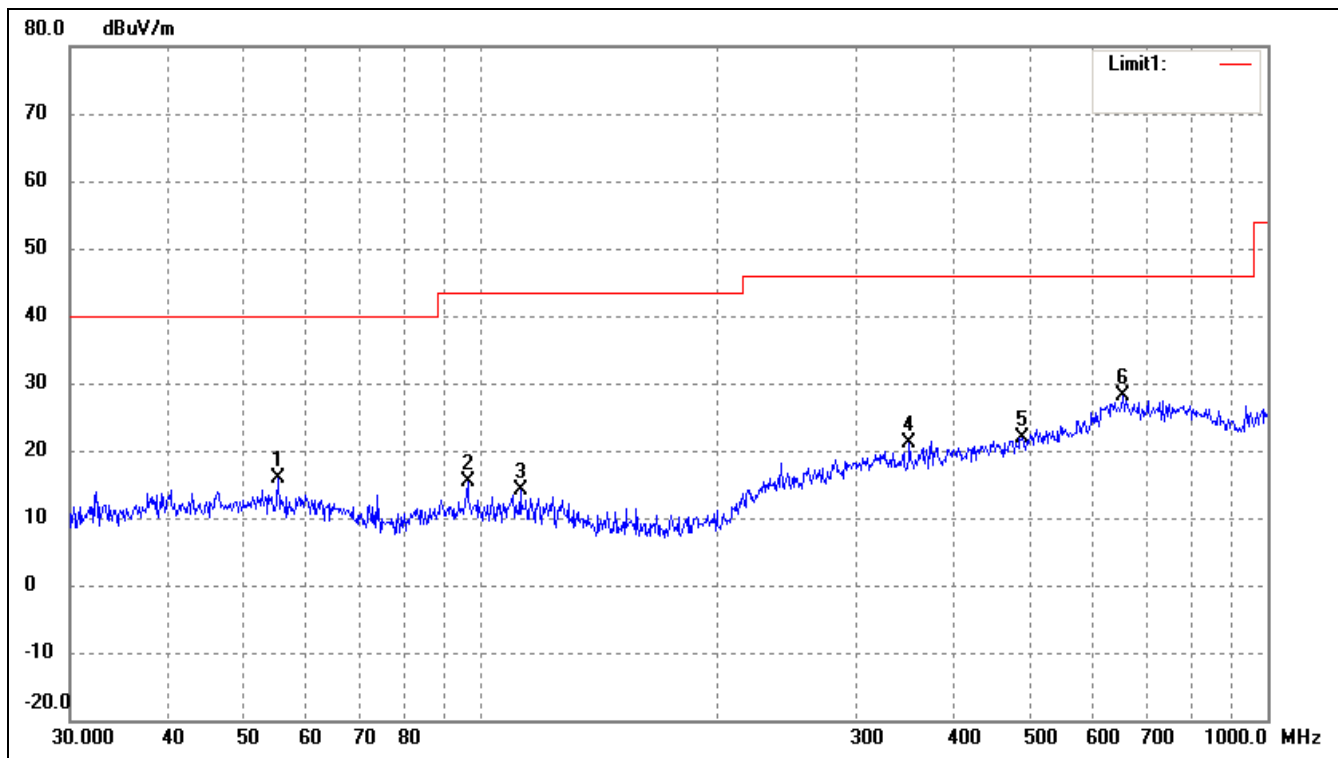
Power Source: DC 7.5V (5 units of DC 1.5V AA-Size Battery)

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	46.0164	31.02	-16.49	14.53	40.00	-25.47	120	121	Peak
2	95.7622	30.99	-17.19	13.80	43.50	-29.70	111	108	Peak
3	115.7256	29.87	-16.65	13.22	43.50	-30.28	105	104	Peak
4	318.8170	28.80	-9.35	19.45	46.00	-26.55	143	121	Peak
5	599.3213	26.49	-0.40	26.09	46.00	-19.91	178	149	Peak
6	742.2587	27.60	0.09	27.69	46.00	-18.31	253	249	Peak

Test Specification: Vertical

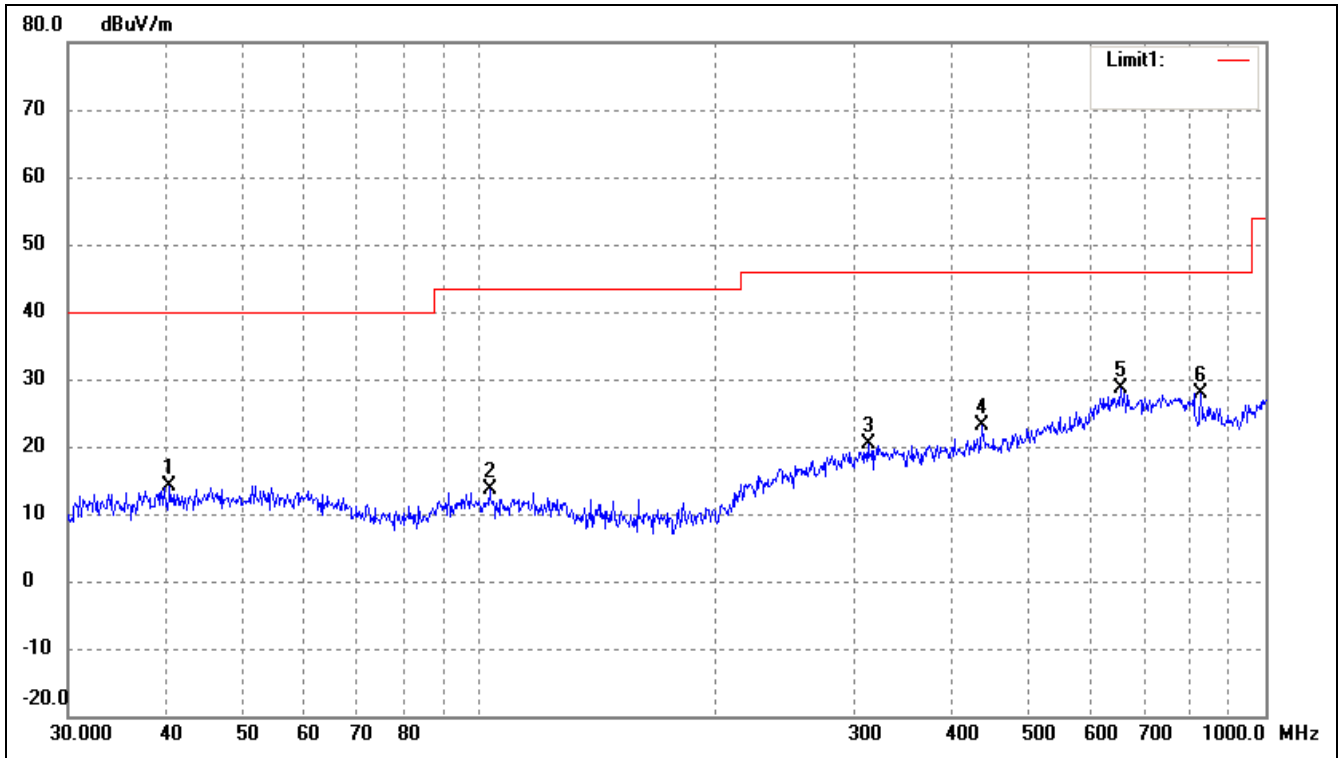


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	55.2207	32.33	-16.51	15.82	40.00	-24.18	109	143	Peak
2	96.0986	32.47	-17.14	15.33	43.50	-28.17	148	138	Peak
3	112.1304	30.64	-16.63	14.01	43.50	-29.49	153	203	Peak
4	350.4768	30.44	-9.26	21.18	46.00	-24.82	124	280	Peak
5	487.3150	28.37	-6.48	21.89	46.00	-24.11	144	155	Peak
6	654.2318	29.42	-1.38	28.04	46.00	-17.96	134	168	Peak

Operating Condition: Transmitting (Highest Channel: 2480.00 MHz)

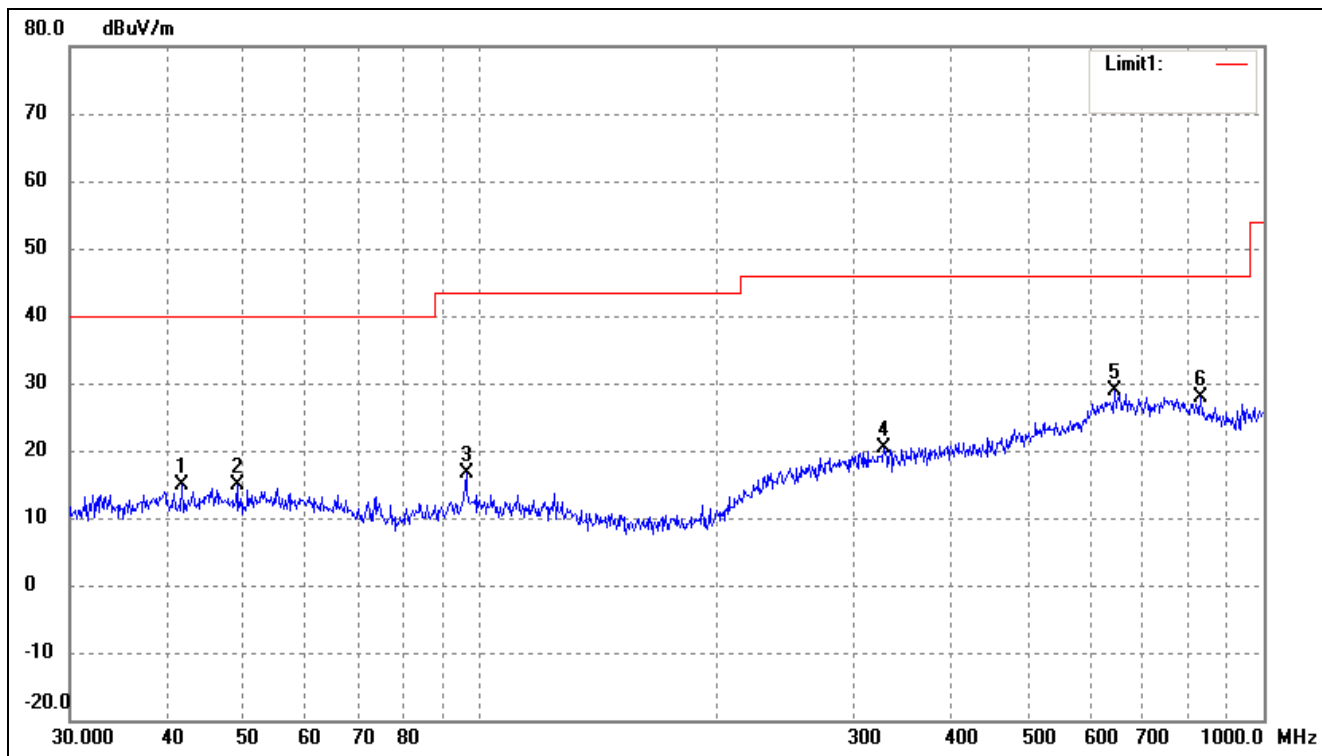
Power Source: DC 7.5V (5 units of DC 1.5V AA-Size Battery)

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	40.4172	30.70	-16.53	14.17	40.00	-25.83	145	118	Peak
2	103.0799	30.22	-16.59	13.63	43.50	-29.87	150	164	Peak
3	312.1793	29.81	-9.44	20.37	46.00	-25.63	138	146	Peak
4	435.5898	30.78	-7.68	23.10	46.00	-22.90	164	163	Peak
5	654.2318	29.90	-1.38	28.52	46.00	-17.48	204	148	Peak
6	827.4933	30.54	-2.67	27.87	46.00	-18.13	207	198	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	41.7130	31.50	-16.52	14.98	40.00	-25.02	120	141	Peak
2	49.0145	31.37	-16.54	14.83	40.00	-25.17	181	199	Peak
3	96.0986	33.85	-17.14	16.71	43.50	-26.79	162	202	Peak
4	327.8873	29.75	-9.49	20.26	46.00	-25.74	154	254	Peak
5	645.1195	30.04	-1.15	28.89	46.00	-17.11	146	157	Peak
6	830.4002	30.42	-2.61	27.81	46.00	-18.19	194	229	Peak

Spurious Emissions Above 1GHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Lowest Channel: 2402.00 MHz							
2402	89.12	-3.49	85.63	114	-28.37	H	PK
2402	88.64	-3.49	85.15	94	-8.85	H	AV
4804	42.85	2.21	45.06	74	-28.94	H	PK
4804	29.27	2.13	31.40	54	-22.60	H	AV
7206	41.79	7.23	49.02	74	-24.98	H	PK
7206	28.93	7.19	36.12	54	-17.88	H	AV
2402	84.58	-3.49	81.09	114	-32.91	V	PK
2402	77.02	-3.49	73.53	94	-20.47	V	AV
4804	42.04	2.13	44.17	74	-29.83	V	PK
4804	30.05	2.13	32.18	54	-21.82	V	AV
7206	41.53	7.23	48.76	74	-25.24	V	PK
7206	30.25	7.19	37.44	54	-16.56	V	AV
Near Middle Channel: 2440.00 MHz							
2440	85.47	-3.43	82.04	114	-31.96	H	PK
2440	82.02	-3.43	78.59	94	-15.41	H	AV
4880	43.80	1.25	45.05	74	-28.95	H	PK
4880	30.80	1.34	32.14	54	-21.86	H	AV
7320	39.10	7.23	46.33	74	-27.67	H	PK
7320	27.70	7.15	34.85	54	-19.15	H	AV
2440	82.99	-3.43	79.56	114	-34.44	V	PK
2440	73.03	-3.43	69.60	94	-24.40	V	AV
4880	40.97	1.41	42.38	74	-31.62	V	PK
4880	30.93	1.34	32.27	54	-21.73	V	AV
7320	40.12	8.26	48.38	74	-25.62	V	PK
7320	25.18	8.26	33.44	54	-20.56	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Highest Channel: 2480.00 MHz							
2480	86.18	-3.33	82.85	114	-31.15	H	PK
2480	84.27	-3.33	80.94	94	-13.06	H	AV
4960	41.38	2.13	43.51	74	-30.49	H	PK
4960	31.43	2.13	33.56	54	-20.44	H	AV
7440	40.02	7.19	47.21	74	-26.79	H	PK
7440	29.61	7.19	36.80	54	-17.20	H	AV
2480	82.38	-3.33	79.05	114	-34.95	V	PK
2480	71.73	-3.33	68.40	94	-25.60	V	AV
4960	40.15	2.10	42.25	74	-31.75	V	PK
4960	28.55	2.13	30.68	54	-23.32	V	AV
7440	40.62	7.23	47.85	74	-26.15	V	PK
7440	28.99	7.15	36.14	54	-17.86	V	AV

Note: Testing is carried out with frequency rang 9 kHz to the 10th harmonic, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Emissions attenuated more than 20 dB below the permissible value are not reported.

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 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.

5.3 Environmental Conditions

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

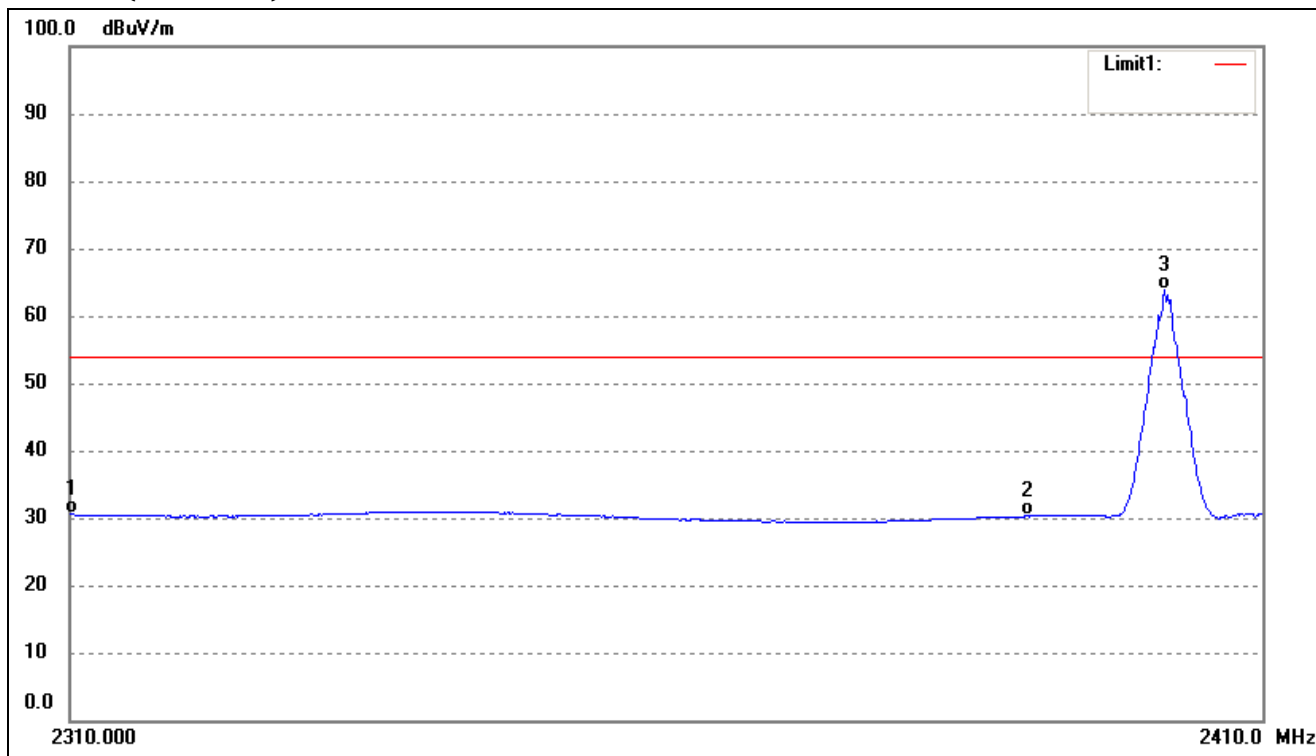
5.4 Summary of Test Results/Plots

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

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

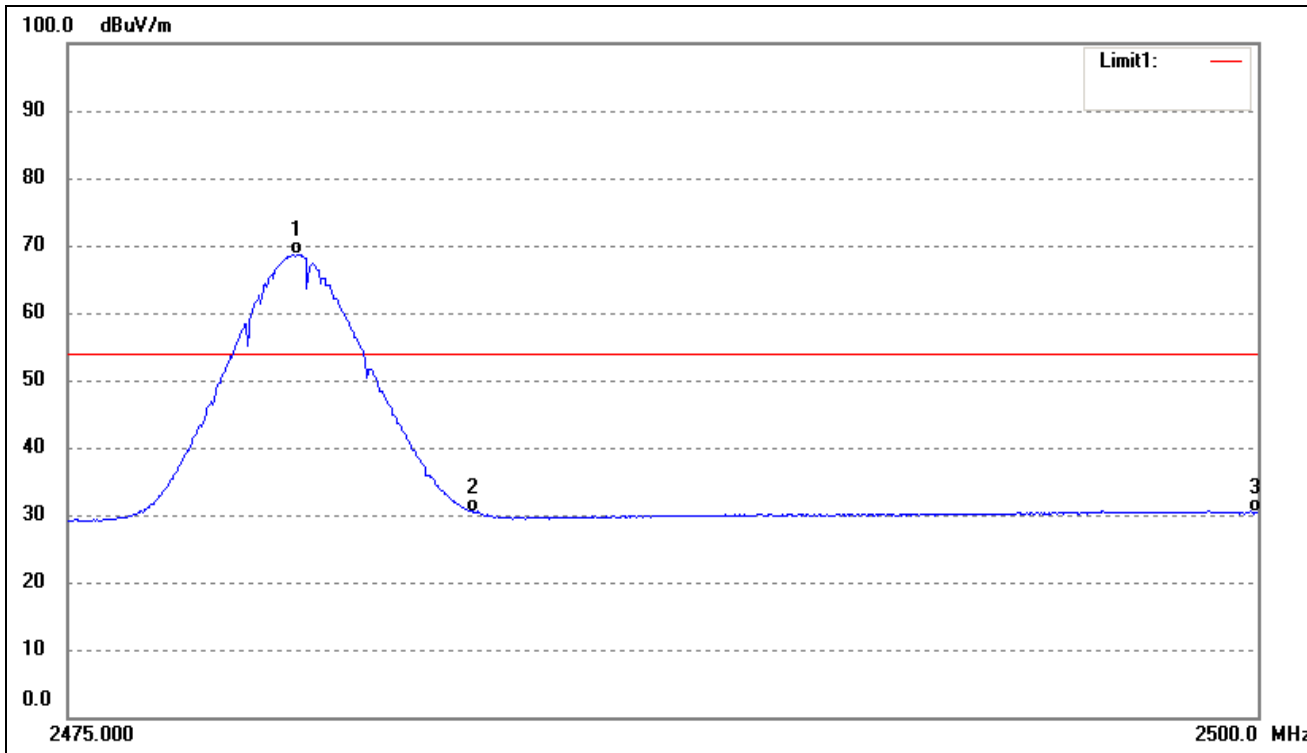
Please refer to the test plots as below.

Lowest Bandedge
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.99	-6.38	30.61	54.00	-23.39	Average Detector
	2310.000	50.30	-6.38	43.92	74.00	-30.08	Peak Detector
2	2390.000	37.52	-7.26	30.26	54.00	-23.74	Average Detector
	2390.000	50.67	-7.26	43.41	74.00	-30.59	Peak Detector
3	2401.640	71.32	-7.39	63.93	/	/	Average Detector
	2400.215	77.73	-7.37	70.36	/	/	Peak Detector

Highest Bandedge
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.805	75.94	-7.28	68.66	/	/	Average Detector
	2479.531	78.87	-7.28	71.59	/	/	Peak Detector
2	2483.500	37.70	-7.28	30.42	54.00	-23.58	Average Detector
	2483.500	55.39	-7.28	48.11	74.00	-25.89	Peak Detector
3	2500.000	37.55	-7.25	30.30	54.00	-23.70	Average Detector
	2500.000	51.37	-7.25	44.12	74.00	-29.88	Peak Detector

6. Emission Bandwidth

6.1 Standard Applicable

According to FCC Part 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 Procedure

According to the ANSI 63.10-2013, 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.

6.3 Environmental Conditions

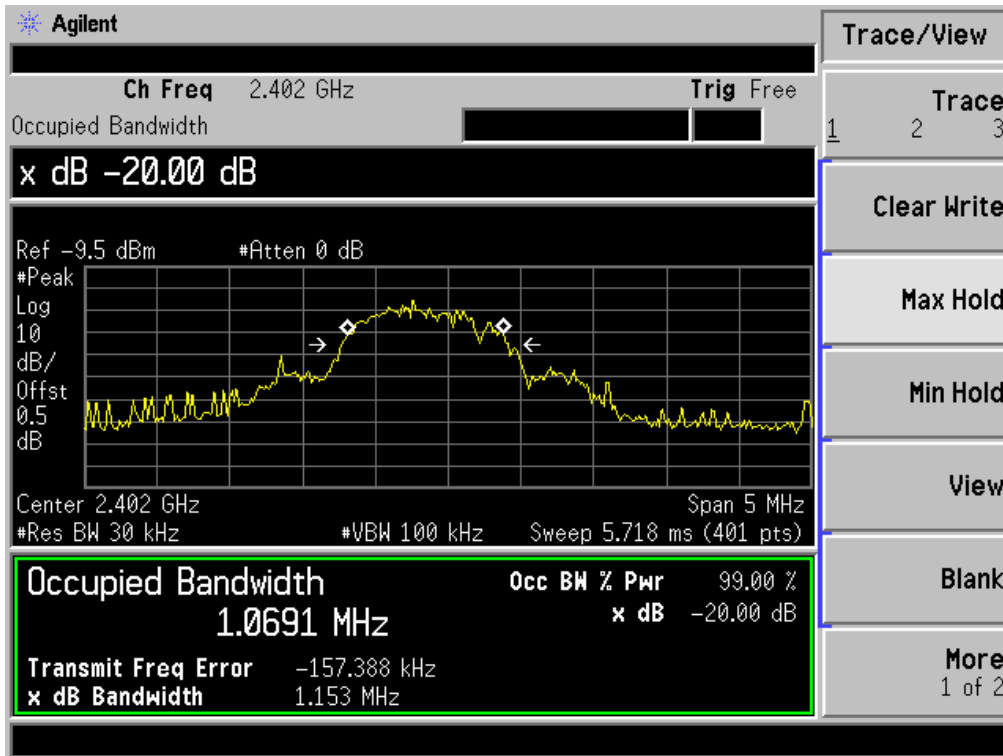
Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

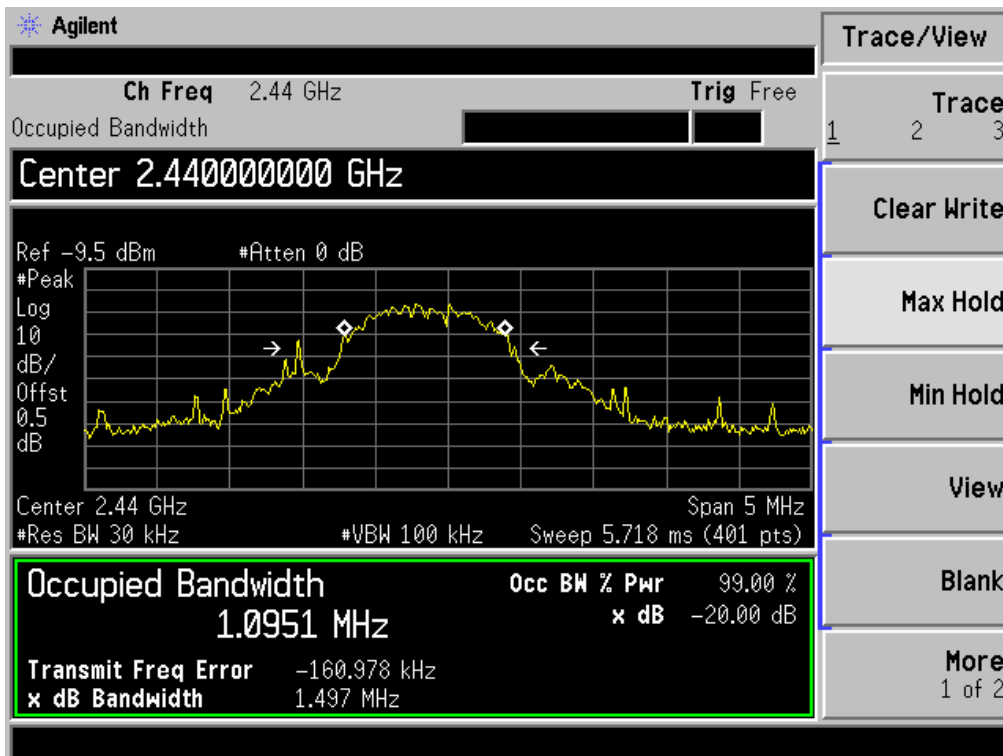
Channel	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
Lowest Channel	2402.00	1153	1069.1
Near Middle Channel	2440.00	1497	1095.1
Highest Channel	2480.00	1775	1125.1

Please refer to the following test plots

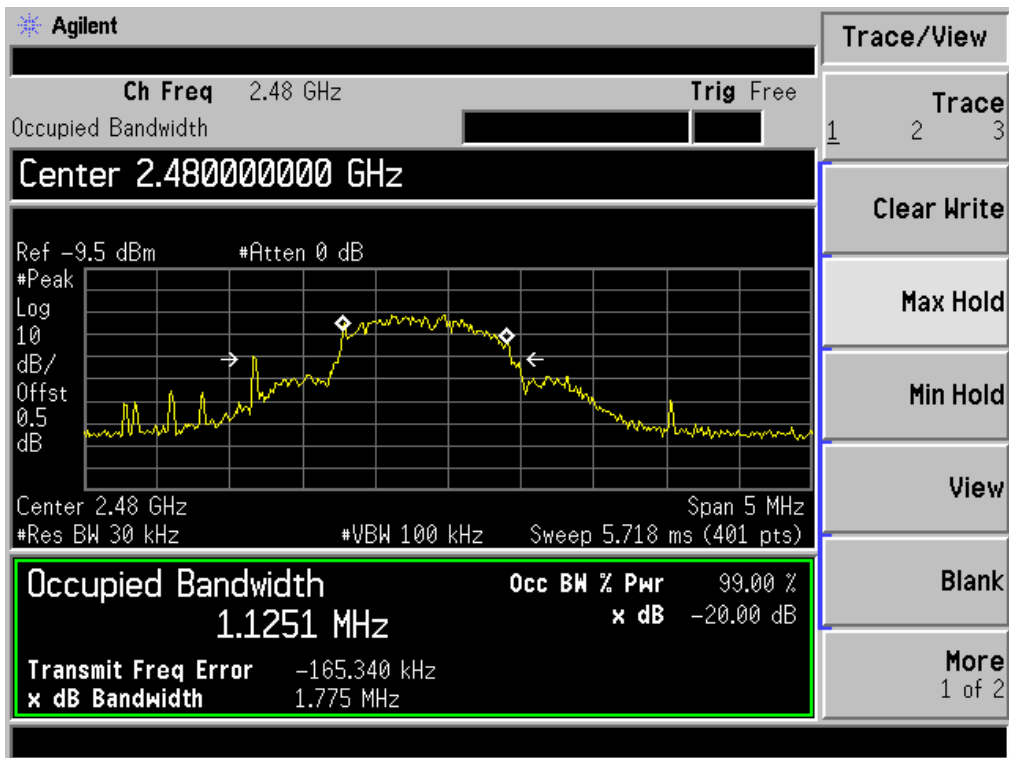
Lowest Channel:



Near Middle Channel:



Highest Channel:



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