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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: BY31775-27SP
Brand Name	None
Model Number	39120
Product Description	26.96-27.28 MHz Wireless Remote Control Toy - TX
Operating Frequency	27.145 MHz
Rules/Standards	Part 15.227 of the FCC Rules, RSS-310 Issue 3 and RSS-Gen Issue 3 of the Industry Canada
Received Date	11/24/2011
Tested Date	11/25/2011
Approved by	Dick Chan (Director of Gakkiku)
Tested by	Lahm Peng (Engineer of SEM.Test)
Signed by	 Jandy So (Manager of SEM.Test)
Report Number	GKK201111240A
Test Results	<input checked="" type="checkbox"/> PASSED <input type="checkbox"/> FAILED

GENERAL

The report is written by Gakkiku Technology Company. The tested device complies with the general approval requirements of the FCC Rules and the Industry Canada as identified in this test report.

TEST LOCATION

The tested device was tested at the test site of the SEM.Test Compliance Service Co., Ltd., 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, 518101, Guangdong, China. The FCC Recognized 2.948 Listed Test Firm Registration Number is 994117. The Industry Canada IC OATS Filing Number/Assigned Code is 7673A.

TABLE OF CONTENTS

1. GENERAL INFORMATION.....4

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....4

1.2 TEST STANDARDS.....4

1.3 TEST METHODOLOGY.....4

1.4 EUT EXERCISE SOFTWARE.....5

1.5 ACCESSORIES EQUIPMENT LIST AND DETAILS.....5

1.6 EUT CABLE LIST AND DETAILS.....5

2. SUMMARY OF TEST RESULTS.....6

3. PART 15.203 - ANTENNA REQUIREMENT.....7

3.1 STANDARD APPLICABLE.....7

3.2 TEST RESULT.....7

4. PART 15.205, 15.209, 15.227 & RSS-310 ISSUE 3 §3.8 - RADIATED EMISSION.....8

4.1 MEASUREMENT UNCERTAINTY.....8

4.2 STANDARD APPLICABLE.....8

4.3 TEST EQUIPMENT LIST AND DETAILS.....8

4.4 TEST PROCEDURE.....8

4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....9

4.6 ENVIRONMENTAL CONDITIONS.....9

4.7 SUMMARY OF TEST RESULTS/PLOTS.....9

5. PART 15.227(B) - OUT OF BAND EMISSIONS.....12

5.1 STANDARD APPLICABLE.....12

5.2 TEST EQUIPMENT LIST AND DETAILS.....12

5.3 TEST PROCEDURE.....12

5.4 ENVIRONMENTAL CONDITIONS.....12

5.5 SUMMARY OF TEST RESULTS/PLOTS.....12

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 E.U.T

Items	Description
EUT Description:	26.96-27.28 MHz Wireless Remote Control Toy - TX
Trade Name:	None
Model No.:	39120
Rated Voltage:	3 X 1.5V AAA-Size Batteries
Frequency Range:	27.145 MHz
Antenna Type:	Fixed Antenna
For more information refer to the circuit diagram form and the user's manual.	

The test data is gathered from a production sample, provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the Scientific Toys Ltd. in accordance with FCC Part 15, Subpart C, and Part 15.203, 15.205, 15.209 & 15.227 of the Federal Communication Commissions Rules and RSS-310 Issue 3 & RSS-Gen Issue 3 of the Industry Canada.

The objective is to determine compliance with the FCC Part 15, Subpart C, and Part 15.203, 15.205, 15.209 & 15.227 and RSS-310 Issue 3 & RSS-Gen Issue 3 of the Industry Canada.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, 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 Standards Institute for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components. The test software is started while the whole system is on.

1.5 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

2. SUMMARY OF TEST RESULTS

FCC RULES RSS-310 ISSUE 3	DESCRIPTION OF TEST	RESULT
FCC Part 15.203 RSS-Gen Issue 3 §7.1.4	Antenna Requirement	Compliant
FCC Part 15.205 §3.12 Table 1	Restricted Band of Operation	Compliant
FCC Part 15.209 §3.12 Table 2 & Table 3	Radiated Emission Limit	Compliant
FCC Part 15.227(a) §3.8	Field Strength	Compliant
FCC Part 15.227(b) §3.12 Table 2 & Table 3	Out of Band Emission	Compliant

3. Part 15.203 - ANTENNA REQUIREMENT

3.1 Standard Applicable

According to the 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 antenna, fulfill the requirement of this section.

4. Part 15.205, 15.209, 15.227 & RSS-310 Issue 3 §3.8 - RADIATED EMISSION

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 ± 5.10 dB.

4.2 Standard Applicable

According to the FCC Part 15.227(a), the field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in the FCC Part 15.35 for limiting peak emissions apply.

According to RSS-310 Issue 3 §3.8, the field strength shall not exceed 10 millivolts/m measured at 3 metres (equivalent with an averaging or a CISPR quasi-peak detector (equivalent to 30 μ W e.i.r.p.)).

According to the FCC Part 15.227(b), the field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in the FCC Part 15.209. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

According to RSS-310 Issue 3 §3.8, the field strength of any emissions which appear outside of this band shall apply Tables 2 and 3 limits.

4.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2011-01-09	2012-01-08

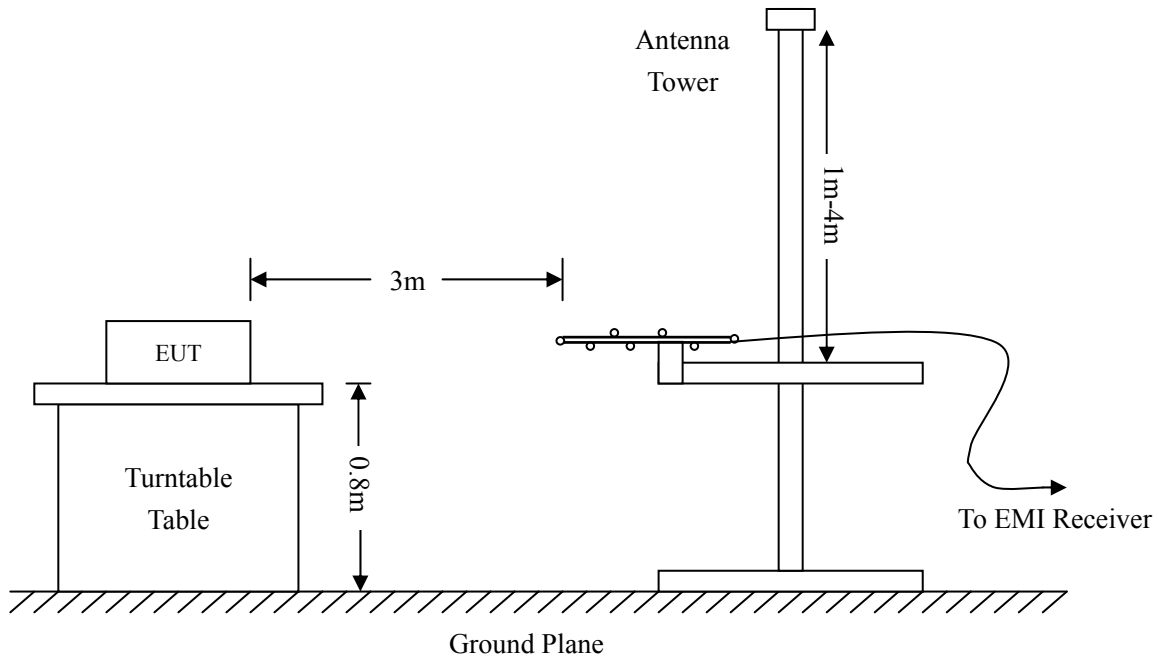
Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

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, 15.227(a) & 15.209 and RSS-310 Issue 3 §3.8 and 3.12 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.



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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

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 for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 (RSS-310 Issue 3) Limit}$$

4.6 Environmental Conditions

Temperature:	26° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

4.7 Summary of Test Results/Plots

According to the data below, the standards of FCC Part 15.205, 15.209 & 15.227 and RSS-310 Issue 3 & RSS-Gen Issue 3 of the Industry Canada, and had the worst margin of:

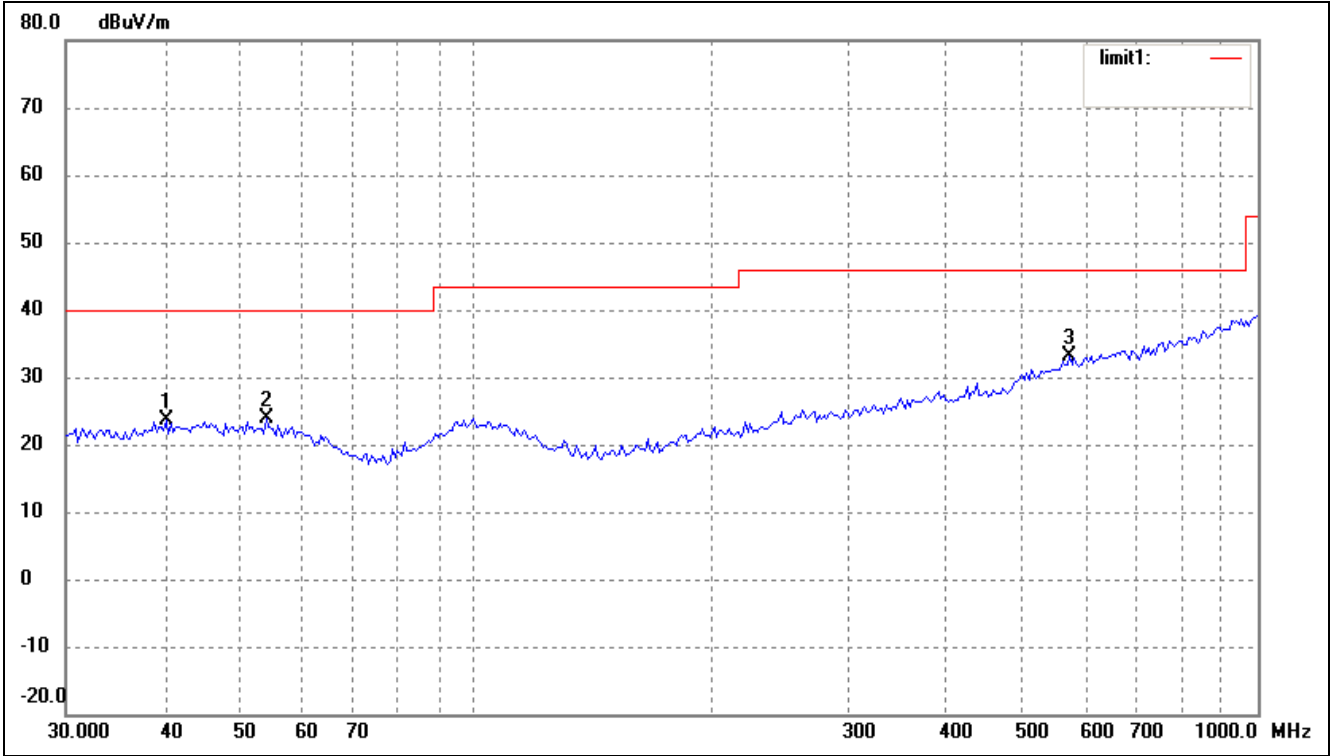
-6.18 dBµV at 27.145 MHz in the Vertical polarization, 9 kHz to 1 GHz, 3Meters

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

Test Mode: Transmitting

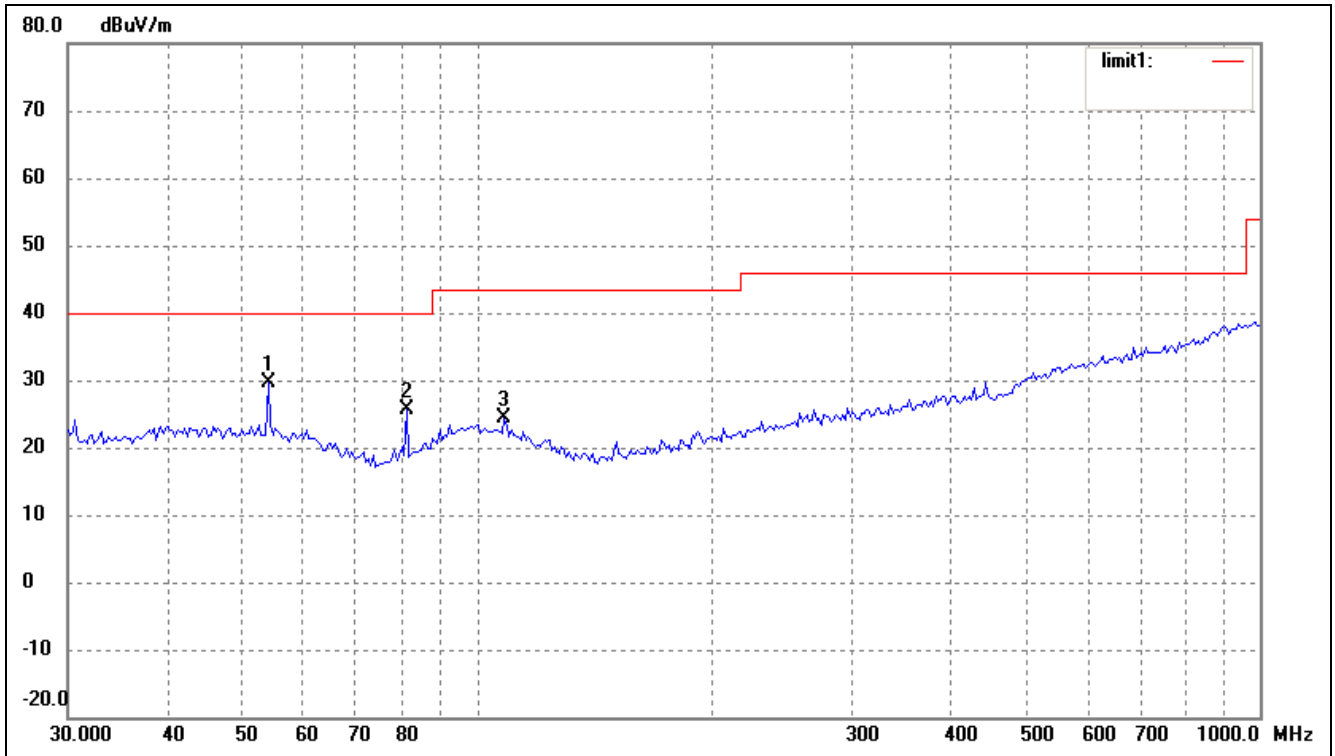
Plot of Radiation Emissions Test

Horizontal:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
Fundamental	27.145	58.75	6.85	65.60	100.0	-34.40	75	200	Peak
Fundamental	27.145	57.45	6.85	64.30	80.0	-15.70	75	200	Ave
1	40.2757	15.55	8.15	23.70	40.00	-16.30	14	100	peak
2	54.0711	16.19	7.80	23.99	40.00	-16.01	52	100	peak
3	574.6258	17.10	16.10	33.20	46.00	-12.80	35	100	peak

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
Fundamental	27.145	68.36	6.85	75.21	100.00	-24.79	145	200	Peak
Fundamental	27.145	66.97	6.85	73.82	80.00	-6.18	145	200	Ave
1	54.0711	21.87	7.80	29.67	40.00	-10.33	21	100	peak
2	81.2116	21.59	4.07	25.66	40.00	-14.34	43	100	peak
3	108.2667	16.54	7.73	24.27	43.50	-19.23	157	200	peak

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4. The measurements greater than 20dB below the limit from 9kHz to 30MHz.

5. Part 15.227(b) - OUT OF BAND EMISSIONS

5.1 Standard Applicable

According to the FCC Part 15.227(b) and RSS-310 Issue 3, the field strength of any emissions which appear outside of 26.96MHz to 27.28MHz shall not exceed the general radiated emission limits in the FCC Part 15.209 and RSS-310 Issue 3 §3.8.

5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2011-01-09	2012-01-08

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

5.3 Test Procedure

As the radiation test, set the RBW=10kHz VBW=30kHz, observed the outside band of 26.96MHz to 27.28MHz, than mark the higher-level emission for comparing with the FCC Rules.

5.4 Environmental Conditions

Temperature:	26° C
Relative Humidity:	52%
ATM Pressure:	1022 mbar

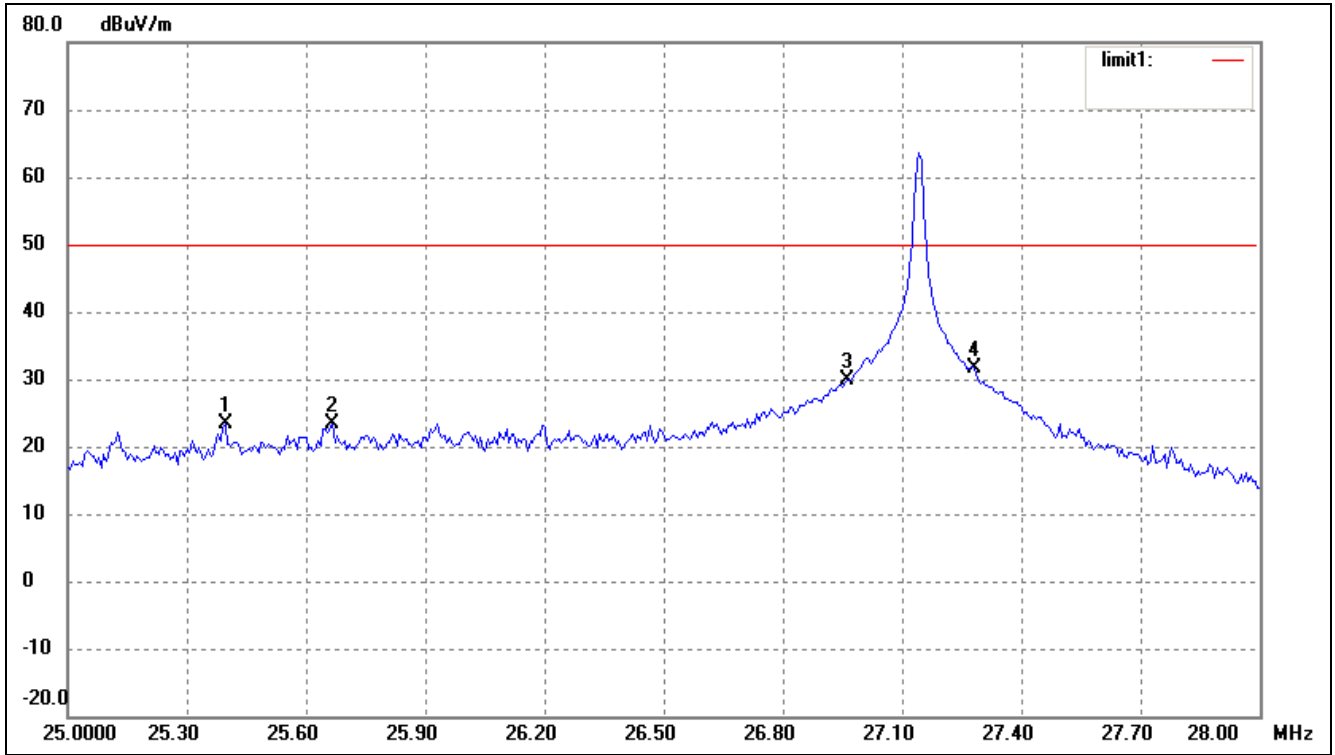
5.5 Summary of Test Results/Plots

Frequency MHz	Emission dB μ V/m	Limit dB μ V/m
25.3960	27.50	50
25.6660	23.44	50
26.0680	29.58	50
26.9600	40.53	50
27.2800	41.74	50

Test Result: Pass

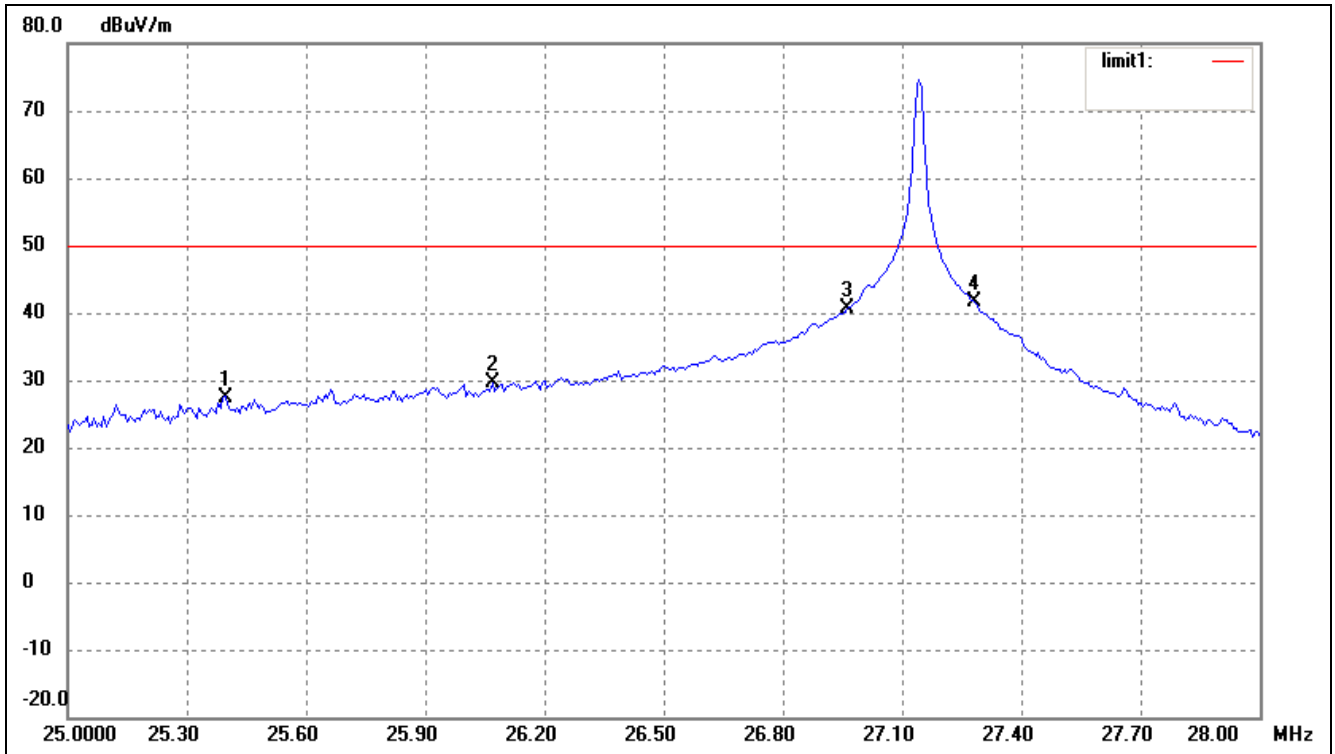
Refer to the attached plots.

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ($^{\circ}$)	Height (cm)	Remark
1	25.3960	15.16	8.12	23.28	50.00	-26.72	23	200	peak
2	25.6660	15.52	7.92	23.44	50.00	-26.56	124	200	peak
3	26.9600	22.96	6.94	29.90	50.00	-20.10	54	100	peak
4	27.2800	24.76	6.90	31.66	50.00	-18.34	61	100	peak

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	25.3960	19.38	8.12	27.50	50.00	-22.50	235	200	peak
2	26.0680	21.97	7.61	29.58	50.00	-20.42	54	200	peak
3	26.9600	33.59	6.94	40.53	50.00	-9.47	75	100	peak
4	27.2800	34.84	6.90	41.74	50.00	-8.26	24	100	peak

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