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Report No.: SZEM160500319501  
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## FCC REPORT

**Application No.:** SZEM1605003195CR (SGS HK No.:T31620210005EM)  
**Applicant:** New-Ray Toys., Ltd  
Product Name: Radio Control and Battery Operated Series  
Model No.(EUT): 87913  
Ref. No.: Please refer to section 3  
Labelled Age Grading: 5+  
Country of Origin: China  
**FCC ID:** Q4S87913A  
**Standards:** 47 CFR Part 15, Subpart C (2015)  
**Date of Receipt:** 2016-05-06  
**Date of Test:** 2016-05-10 to 2016-05-11  
**Date of Issue:** 2016-05-19

<b>Test Result:</b>	<b>PASS *</b>
---------------------	---------------

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-05-19		Original

Authorized for issue by:				
				
				2016-05-11
Tested By		(Bill Chen) /Project Engineer		Date
				
				2016-05-19
Prepared By		(Joyce Shi) /Clerk		Date
				
				2016-05-19
Checked By		(Eric Fu) /Reviewer		Date



### 3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
Radiated Emission	47 CFR Part 15, Subpart C Section 15.227	ANSI C63.10 (2013)	PASS
Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215	ANSI C63.10 (2013)	PASS



**SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch**

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Remark:

08023	08303	08313	08323	08503A	08503	08443
08463	61395	61505	61515	61525	88483	88573
87533	87543	87563	87573	88853	88863	88873
88883	88825	88785	88003A	88213	87943	88713
87865	87913A	88753	88763	88773	88793	88515
00783	00817	00645C	20063	20073	1993	2003
1785	SS-34123	SS-34133	SS-33173	SS-34143	SS-34153	SS-34183
SS-34173	SS-33153	SS-33123	61395I	61395	61505	61515
61525	01956	SS-66146A	SS-66126A	66166A	66176A	66086A
66096A	SS-66146B	SS-66126B	76505	88793	88643	88703
SS-88233B	66156	66166	66176	66086	66096	888131
87533I	88483	88233	08605	SS-88243	88473	88815
88803	88215A	87193	SS-88763	SS-88773	SS-88753	88763
88773	88813I	87933	88553	01953	88555	01956
01693	01963	00655	88714	SS-88233C	87775	85353
88525	00664A	0064B	01013	76735	88673	88473
88704	88595	88613	87293	SS-87290	88893	87843
88825A	88825B	SS-08513	SS-00675B	88633	76733	76725
87913	08605	01063	8867	8821	8864	8871
8855	8857	8753	8791	8619	8617	8616
8618	8848	8870	886771	8793	8794	8786
8852	8851	87533AST	AS-88763	AS-20063	00645C	SS-00645
SS-00645C	AS-88853	01956	SS-66226	76505	SS-87073	SS-87843A
SS-33143	SS-33153	88893A	88893B	02116	02106	02056
02066	02076	02053	02063	02073	02126	02126A
02126B	02086	02086A	02086B	02083	02083A	02083B
02096	02096A	02096B	02096C	02093	02093A	02093B
02093C	02206	02206A	02206B	02206C	02216	02216A
02216B	02216C	01346	01446	01756	01856	00816
00816A	00816B	00816C	00814	00814A	00814B	00814C
SS-33033	SS-33043	SS-33133C	66236	66236A	AS-02206	AS-02216
SS-38606	AS-01756	88803A	SS-33143	AS61395	AS-02106	AS88525

Only the model 87913 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, only different on model numbers and outlook.

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## 5 General Information

### 5.1 Client Information

Applicant:	New-Ray Toys., Ltd
Address of Applicant:	Unit 9, 12F Houston Centre, 63 Mody Road, Tsim Sha Tsui East, Kowloon. Hong Kong.

### 5.2 General Description of EUT

Product Name:	Radio Control and Battery Operated Series
Model No.:	87913
Carrier Frequency	27.145MHz
Antenna Type:	Integral
Power supply:	Battery: 9.0V DC (9.0V x 1 "6F22" Size Battery) for Tx Battery: 4.5V DC (1.5V x 3 "AA" Size Batteries) for Rx

### 5.3 Test Environment and Mode

<b>Operating Environment:</b>	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1020 mbar
<b>Test mode:</b>	
Transmitting mode:	Keep the EUT in transmitting mode.

### 5.4 Description of Support Units

The EUT has been tested independent unit.



## 5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,  
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

## 5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

## 5.7 Deviation from Standards

None.

## 5.8 Abnormalities from Standard Conditions

None.

## 5.9 Other Information Requested by the Customer

None.



### 5.10 Equipment List

RE in Chamber					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2016-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	Coaxial cable	SGS	N/A	SEL0027	2016-05-13
5	Coaxial cable	SGS	N/A	SEL0189	2016-05-13
6	Coaxial cable	SGS	N/A	SEL0121	2016-05-13
7	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
8	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2015-10-24
9	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-24
10	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2016-05-13
11	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-24
12	Barometer	ChangChun	DYM3	SEL0088	2016-05-13
13	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
14	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24
15	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2015-10-24
16	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2016-05-13
17	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2016-05-13

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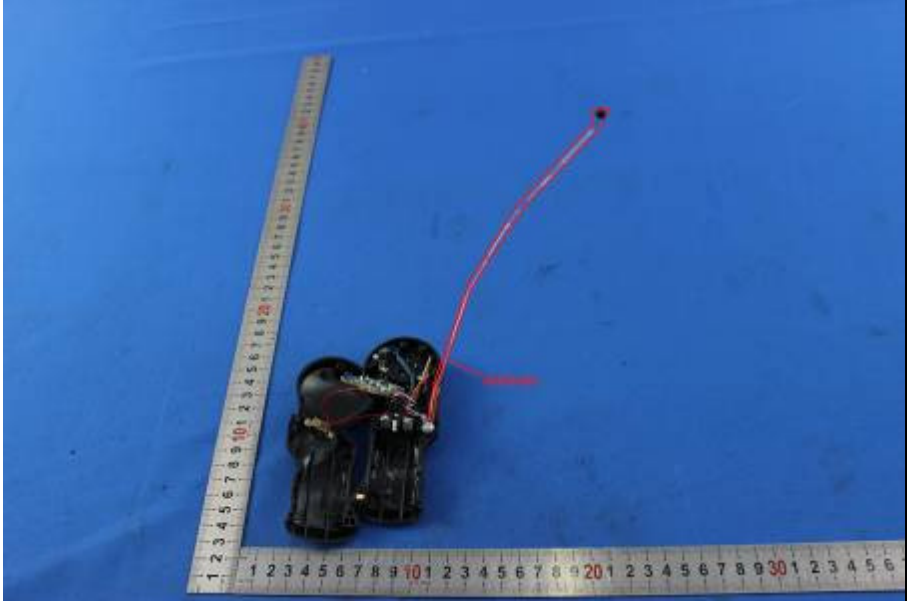


RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Temperature Chamber	GuangZhou GongWen	GDJW-100	SEM002-02	2016-07-18	2017-07-18
2	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2015-10-09	2016-10-09
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2015-10-17	2016-10-17
4	Barometer	ChangChun	DYM3	SEM002-01	2016-04-25	2017-04-25
5	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
6	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
7	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2015-10-09	2016-10-09
8	NOISE GENERATOR	Beijin Daming Jidian	DM1660	EMC0047	2015-10-24	2016-10-24

Note: The calibration interval is one year, all the instruments are valid.

## 6 Test Result & Measurement Data

### 6.1 Antenna Requirement

<b>Standard Requirement:</b>	47 CFR Part 15C Section 15.203
<p>15.203 Requirement:</p> <p>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, 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.</p>	
<b>EUT Antenna:</b>	



**6.2 Radiated Emissions**

<b>Test Requirement:</b>	47 CFR Part 15C Section 15.227				
<b>Test Method:</b>	ANSI C63.10: 2013				
<b>Test Site:</b>	3m (Semi-Anechoic Chamber)				
<b>ERP Limit:</b>	Carrier Power will not exceed 80dBuV/m at 3m (Average).				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
<b>Limit:</b>	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					
<b>Test Procedure:</b>	<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable</p>				

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table was turned from 0 degrees to 360 degrees to find the maximum reading.

- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

**Test Setup:**

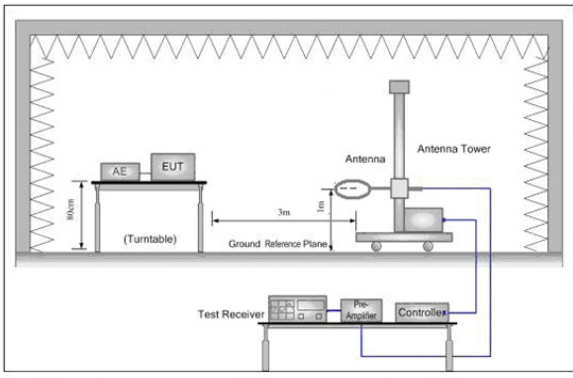


Figure 1. Below 30MHz

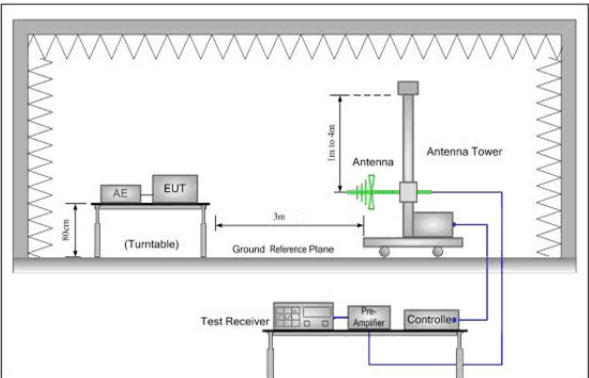


Figure 2. 30MHz to 1GHz

**Test Mode:** Transmitting mode.

**Instruments Used:** Refer to section 5.10 for details.

**Test Result:** Pass

**27.145MHz Mode**  
 Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10: 2013. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

**Test Result:**  
**Intentional emission**

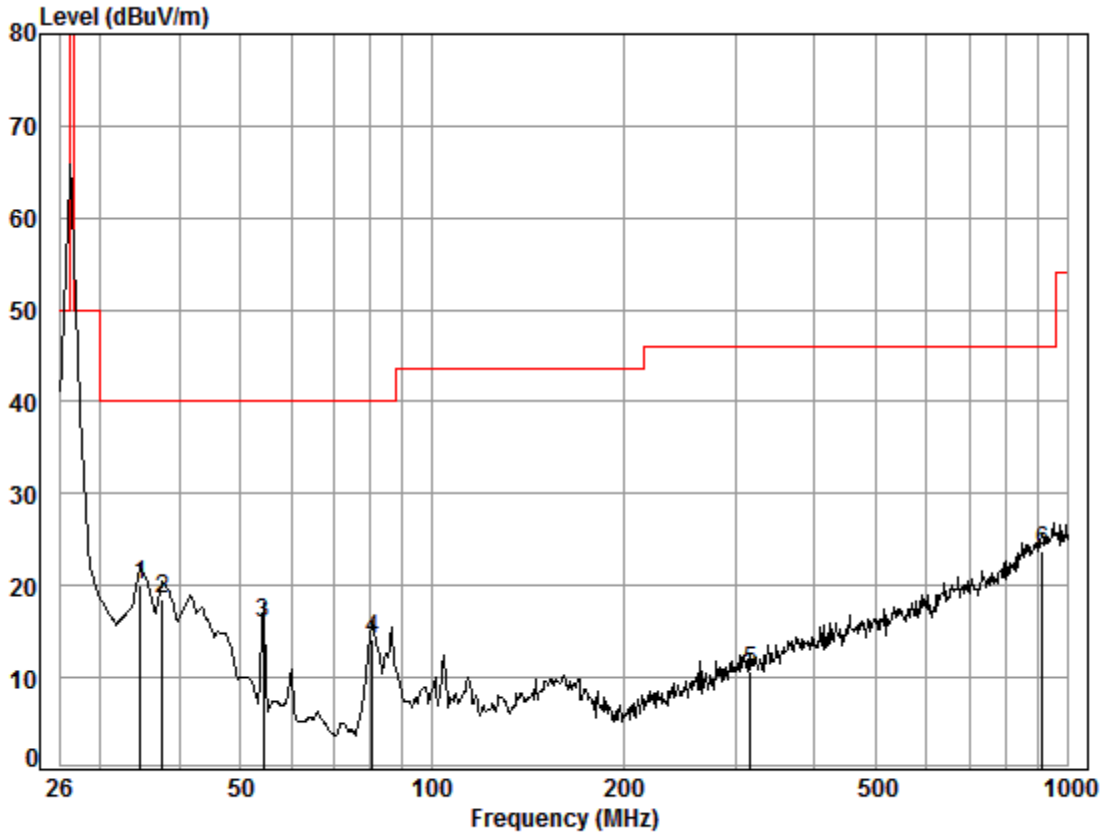
Test Frequency (MHz)	Peak (dBµV/m)		Limits (dBµV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.145	66.17	66.17	100.00	33.83	33.83

Test Frequency (MHz)	Average (dBµV/m)		Limits (dBµV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.145	65.07	65.07	80.00	14.93	14.93

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Out of Band Emissions  
Vertical



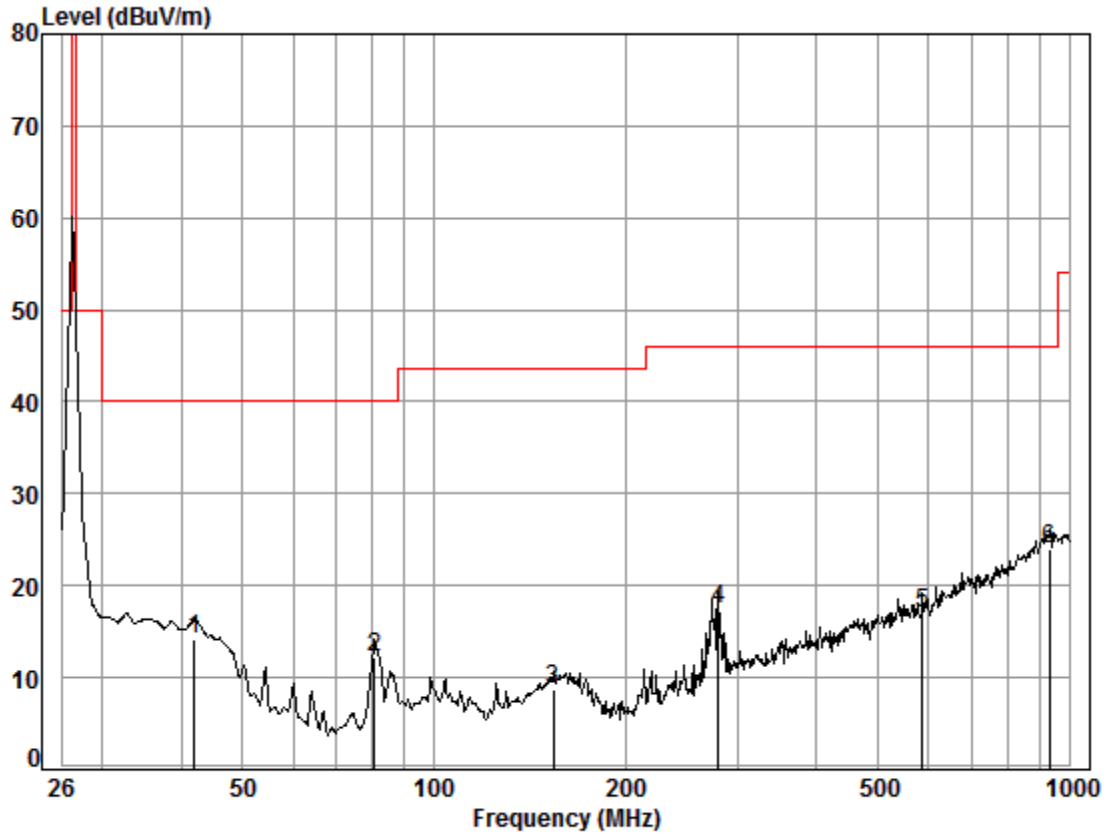
Condition: 3m Vertical  
Job No. : 3195CR  
Mode : TX ON

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	34.82	0.60	17.29	25.99	28.25	20.15	40.00	-19.85
2	37.73	0.60	16.74	25.98	27.13	18.49	40.00	-21.51
3	54.34	0.80	7.70	25.95	33.46	16.01	40.00	-23.99
4	80.60	1.10	5.59	25.92	33.38	14.15	40.00	-25.85
5	316.75	1.96	11.56	25.69	22.77	10.60	46.00	-35.40
6	912.80	3.62	21.81	24.97	23.32	23.78	46.00	-22.22

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Horizontal



Condition: 3m Horizontal

Job No. : 3195CR

Mode : TX ON

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	41.94	0.64	16.50	25.98	23.11	14.27	40.00	-25.73
2	80.60	1.10	5.59	25.92	31.36	12.13	40.00	-27.87
3	154.34	1.33	9.85	25.82	23.37	8.73	43.50	-34.77
4	279.79	1.81	10.27	25.71	31.12	17.49	46.00	-28.51
5	586.93	2.69	15.36	25.60	24.64	17.09	46.00	-28.91
6	929.61	3.63	22.00	24.86	23.28	24.05	46.00	-21.95

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## SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

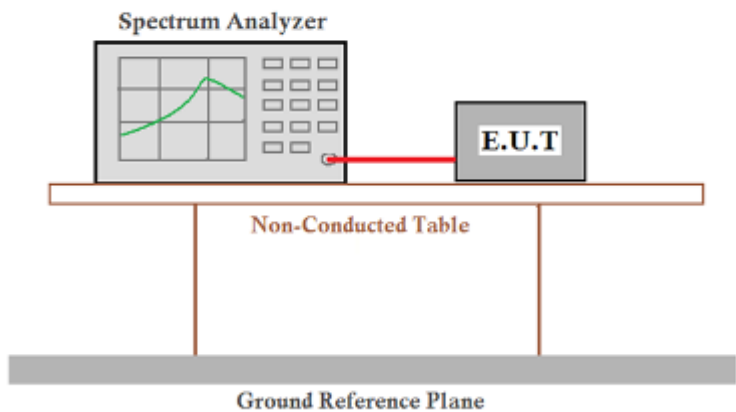
Report No.: SZEM160500319501

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### Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) The disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

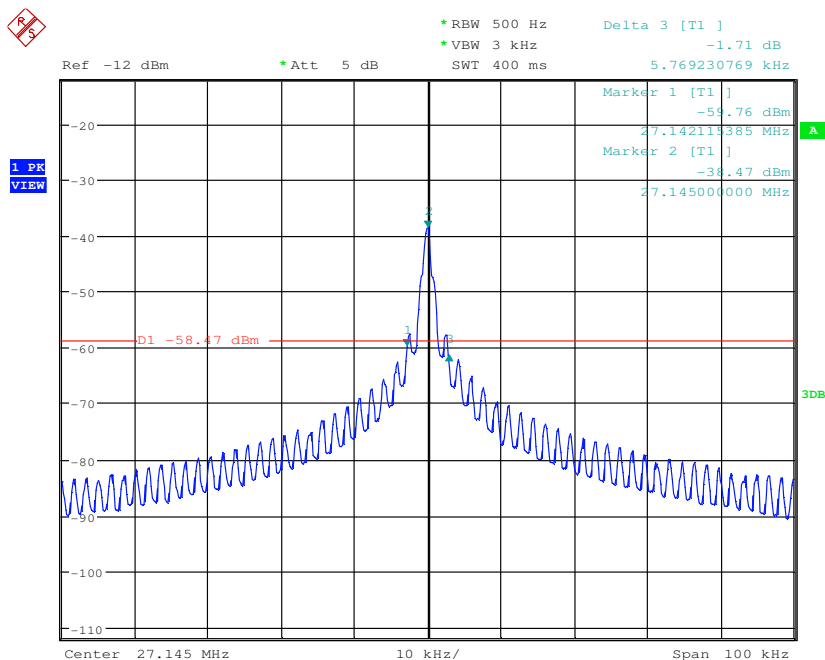
### 6.3 Occupied Bandwidth

<b>Test Requirement:</b>	47 CFR Part 15C Section 15.215 (C)
<b>Test Method:</b>	ANSI C63.10: 2013
<b>Limit:</b>	Operation within the band 26.960 – 27.280 MHz
<b>Requirement :</b>	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 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator’s antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be.deomonstrated by measuring the radiated emissions.
<b>Test Setup:</b>	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>
<b>Test Mode:</b>	Transmitting mode.
<b>Instruments Used:</b>	Refer to section 5.10 for details.
<b>Test Result:</b>	Pass





Test Result:



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## 7 Photographs - EUT Test Setup

Test model No.: 87913

### 7.1 Radiated Emission



## 8 Photographs - EUT Construction Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1605003195CR.