SGS-CSTC Standards Technical Services Ltd.

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**FEDERAL COMMUNICATIONS COMMISSION**
Registration number: 282399

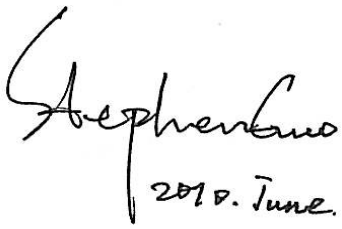


# *TEST REPORT*

| | |
|---|---|
| **Application No.:** | GZEM1005000181RF |
| **Applicant:** | CHUANGLONG PLASTIC TOYS CO., LTD. |
| **FCC ID:** | YERCL275408888 |
| **Equipment under Test (EUT)** | |
| Name: | REMOTE CONTROL CAR SERIES |
| Model No.: | 878-4, 878-7, 868A-10 ♣ |
| Addition Model No.: | 868A-6, 828, 838, 818, 878A, 868C, 868D, 868B, 828-1, 828-2, 828-3, 828-4, 838-1, 838-11, 878A-10, 878A-6 ♣ |
| ♣ | Please refer to section 3 of this report for further details. |
| Function: | Radio toys with 27.145MHz as a carrier. |
| **Standards:** | FCC PART 15, SUBPART C: 2009 (Section 15.227) |
| **Date of Receipt**: | 2010-05-12 |
| **Date of Issue:** | 2010-06-22 |
| **Test Result :** | **PASS *** |

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 3 of this report for further details.

Authorized Signature:



Stephen Guo
Lab Manager

# 2 Version

| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 00 | | 2010-06-22 | | Original |
| | | | | |
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| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| **Tested By** | | David Liu. **(David Liu) / Project Engineer** | | 2010-05-24 to 2010-05-25 **Date** |
| **Prepared By** | | Millie Li **(Millie Li) / Clerk** | | 2010-06-21 **Date** |
| **Checked By** | | Jeffrey Chen **(Jeffrey Chen) / Reviewer** | | 2010-06-22 **Date** |

# 3 Test Summary

| Test | Test Requirement | Stanadard Paragraph | Result |
|---|---|---|---|
| Radiated Emission | FCC PART 15 :2009 | Section 15.227 | PASS |
| Occupied Bandwidth | FCC PART 15 :2009 | Section 15.215 | PASS |
| Tx: In this whole report Tx (or tx) means Transmitter. | | | |
| Rx: In this whole report Rx (or rx) means Receiver. | | | |
| RF: In this whole report RF means Radiated Frequency. | | | |
| ♣ Item No.: 878-4, 878-7, 868A-10, 868A-6, 828, 838, 818, 878A, 868C, 868D, 868B, 828-1, 828-2, 828-3, 828-4, 838-1, 838-11, 878A-10, 878A-6<br>According to the declaration of the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the outer.<br>Therefore only one model 878-4 was tested in this report. | | | |

# 4 Contents

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# 5 General Information

## 5.1 Client Information

Applicant: CHUANGLONG PLASTIC TOYS CO., LTD.

Address of Applicant: Daping Industrial Area, Jianyang, Lianxia Town, Chenghai District, Shantou City, Guangdong, China

## 5.2 General Description of E.U.T.

EUT Name: REMOTE CONTROL CAR SERIES

Model No.: 878-4, 878-7, 868A-10

Addition Model No.: 868A-6, 828, 838, 818, 878A, 868C, 868D, 868B, 828-1, 828-2, 828-3, 828-4, 838-1, 838-11, 878A-10, 878A-6

## 5.3 Details of E.U.T.

EUT Power Supply: DC 3V (2 x 1.5V size “AA” batteries)

## 5.4 Description of Support Units

The EUT has been tested as an independent unit.

## 5.5 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15, SUBPART C: 2009 (Section 15.227).

## 5.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, Guangdong, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

## 5.7 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

## 5.8 Abnormalities from Standard Conditions

None.

## 5.9 Other Information Requested by the Customer

None.

## 5.10 Test Facility

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

- **NVLAP – Lab Code: 200611-0**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

  SGS-CSTC Standards Technical Services 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. Registration 282399, May 31, 2002.

# 6 Equipments Used during Test

| RE in Chamber | | | | | | |
|---|---|---|---|---|---|---|
| No. | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date (YYYY-MM-DD) | Cal.Due date (YYYY-MM-DD) |
| EMC0525 | Compact Semi-Anechoic Chamber | ChangZhou ZhongYu | N/A | N/A | N/A | N/A |
| EMC0522 | EMI Test Receiver | Rohde & Schwarz | ESIB26 | 100283 | 2010-01-25 | 2011-01-25 |
| EMC0056 | EMI Test Receiver | Rohde & Schwarz | ESCI | 10036 | 2009-07-18 | 2010-07-18 |
| N/A | EMI Test Software | Audix | E3 | N/A | N/A | N/A |
| EMC0514 | Coaxial cable | SGS | N/A | N/A | 2009-12-09 | 2010-12-09 |
| EMC0524 | Bi-log Type Antenna | Schaffner -Chase | CBL6112B | 2966 | 2009-12-20 | 2010-12-20 |
| EMC0519 | Bilog Type Antenna | Schaffner -Chase | CBL6143 | 5070 | 2009-12-20 | 2010-12-20 |
| EMC0517 | Horn Antenna | Rohde & Schwarz | HF906 | 100095 | 2009-09-15 | 2010-09-15 |
| EMC0040 | Spectrum Analyzer | Rohde & Schwarz | FSP30 | 100324 | 2009-12-05 | 2010-12-05 |
| EMC0521 | 1-26.5 GHz Pre-Amplifier | Agilent | 8449B | 3008A01649 | 2010-01-25 | 2011-01-25 |
| EMC0049 | Amplifier | Agilent | 8447D | 2944A10862 | 2010-04-21 | 2011-04-21 |
| EMC0075 | 310N Amplifier | Sonama | 310N | 272683 | 2009-10-26 | 2010-10-26 |
| EMC0523 | Active Loop Antenna | EMCO | 6502 | 42963 | 2009-11-17 | 2010-11-17 |
| EMC0530 | 10m Semi- Anechoic Chamber | ETS | N/A | N/A | 2010-05-17 | 2011-05-17 |

| General used equipment | | | | | | |
|---|---|---|---|---|---|---|
| No. | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date (YYYY-MM-DD) | Cal.Due date (YYYY-MM-DD) |
| EMC0006 | DMM | Fluke | 73 | 70681569 | 2009-12-16 | 2010-12-16 |
| EMC0007 | DMM | Fluke | 73 | 70671122 | 2009-12-16 | 2010-12-16 |

# 7 Test Results

## 7.1 E.U.T. test conditions

Power supply: DC 3V (New battery)

Requirements: **15.31(e)** :For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Type of antenna: Integral

Operating Environment:
Temperature: 22-25.0 °C
Humidity: 48-55% RH
Atmospheric Pressure: 1001-1010 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

| Frequency range over which device operates | Number of frequencies | Location in the range of operation |
|---|---|---|
| 1 MHz or less | 1 | Middle |
| 1 to 10 MHz | 2 | 1 near top and 1 near bottom |
| More than 10 MHz | 3 | 1 near top, 1 near middle and 1 near bottom |

Test nominal frequency: 27.145 MHz.

## 7.2 Radiated Emissions

| | |
|---|---|
| **Test Date:** | 2010-05-24 |
| **Test Method:** | ANSI C63.4:2009 |
| **EUT Operation:** | operating |
| Status: | Kept Tx operating with modulation and standby mode. |
| **Equipment Used:** | Refer to section 6 for details. |
| **Frequency Range:** | FCC Part15 C Section 15.33 |

(a) Unless otherwise noted in the specific rule section under which the equipment operates for an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

**Test Requirement:** FCC Part15 C Section 15.227

**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 Section 15.35 for limiting peak emissions apply.

**15.227(b)** :The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

**Out of band emissions shall not exceed:**

40.0 dBμV/m between 30MHz & 88MHz

43.5 dBμV/m between 88MHz & 216MHz

46.0 dBμV/m between 216MHz & 960MHz

54.0 dBμV/m above 960MHz

**Test Procedure:**

1)9K to 30MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4 section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specied 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.

2)30MHz to 1GHz emissions:

For testing perfomed with the bi-log type antenna, testing was perfomed in accordance to ANSI 63.4. The measurement is performed with the EUT rotated 360º, the antenna height scaned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

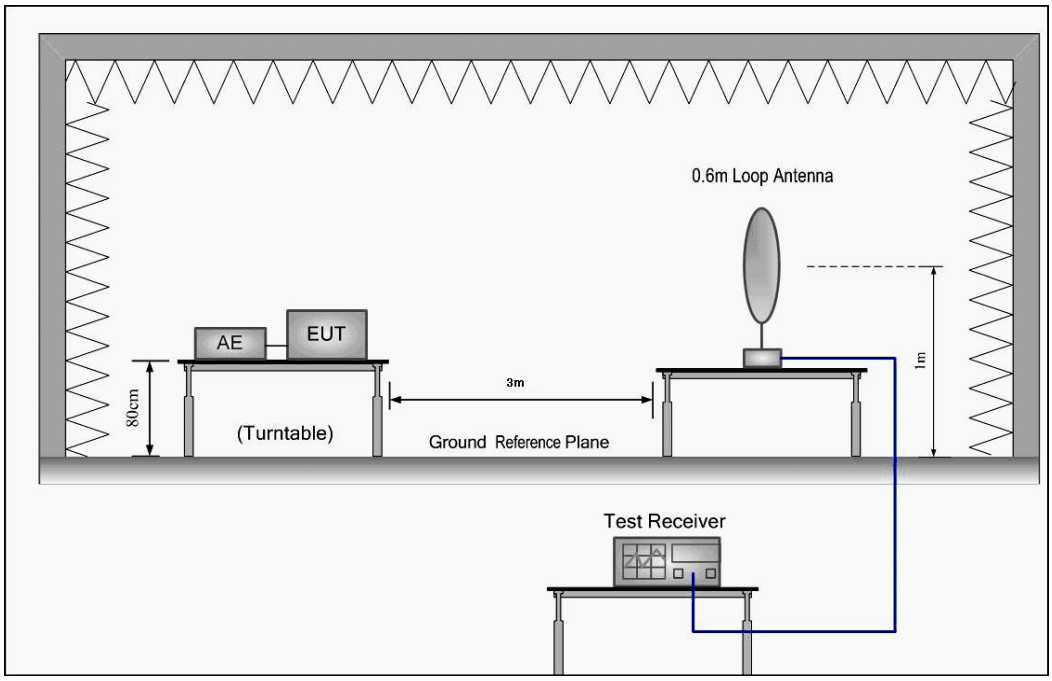
3)1GHz to 40GHz emissions:

For testing perfomed with the horn antenna, testing was perfomed in accordance to ANSI 63.4. The measurement is performed with the EUT rotated 360º, the antenna height scaned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

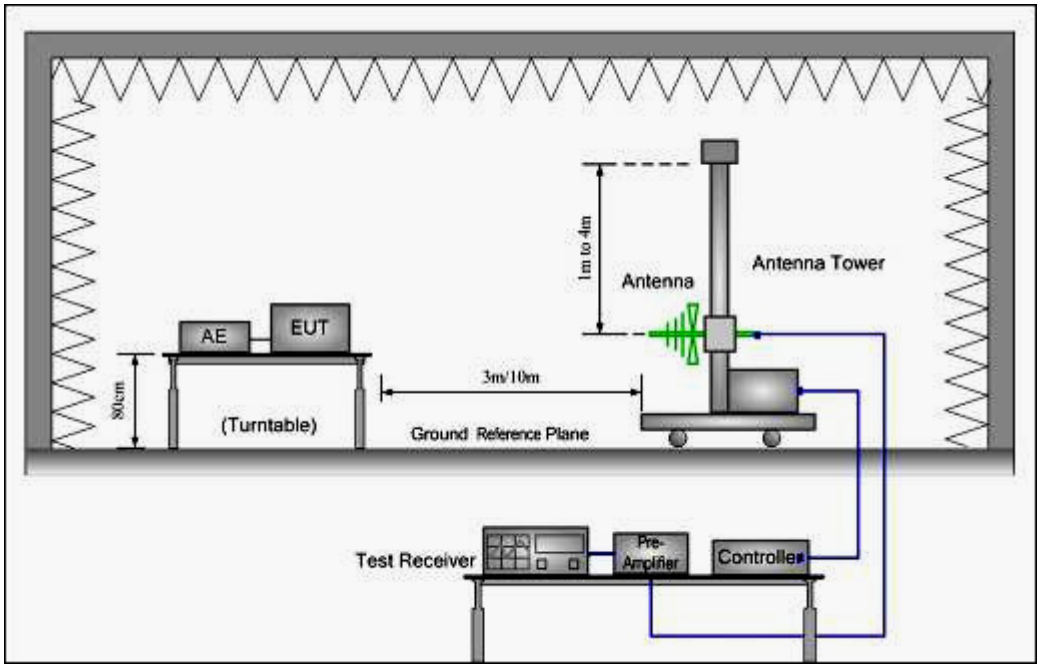
**Detector:** Peak Scan (9kHz resolution bandwidth for 9kHz to 30MHz; 120kHz resolution bandwidth for 30MHz to 1000MHz)

**Test Configuration:**

1) 9K to 30MHz emissions:



2) 30MHz to 1GHz emissions:



### 7.2.1 Measurement Record:

**1) Emissions below 30MHz**:

**Vertical**:

| Test Frequency | Peak (dBμV/m) | | | Limits | Margin (dB) | | |
|---|---|---|---|---|---|---|---|
| (MHz) | X | Y | Z | (dBμV/m) | X | Y | Z |
| 27.145 | 72.2 | 72.0 | 71.3 | 100.0 | 27.8 | 28.0 | 28.7 |
| **Test Frequency** | **Average (dBμV/m)** | | | **Limits** | **Margin (dB)** | | |
| **(MHz)** | X | Y | Z | **(dBμV/m)** | X | Y | Z |
| 27.145 | 59.3 | 57.1 | 53.8 | 80.0 | 20.7 | 22.9 | 26.2 |

**Horizontal:**

| Test Frequency | Peak (dBμV/m) | | | Limits | Margin (dB) | | |
|---|---|---|---|---|---|---|---|
| (MHz) | X | Y | Z | (dBμV/m) | X | Y | Z |
| 27.145 | 69.3 | 67.2 | 67.1 | 100.0 | 30.7 | 32.8 | 32.9 |
| **Test Frequency** | **Average (dBμV/m)** | | | **Limits** | **Margin (dB)** | | |
| **(MHz)** | X | Y | Z | **(dBμV/m)** | X | Y | Z |
| 27.145 | 58.3 | 57.1 | 53.2 | 80.0 | 21.7 | 22.9 | 25.8 |

Remark:

Y: EUT as Radiated Emission test setup photograph in section 8 of this report.

X: rotate EUT by 90° clockwise.

Z: rotate EUT by 90° vertically.

According to ANSI Standard C63.4-2009, the protable equipment shall be tested with X, Y, Z axis of the EUT to find the maximum emissions. Other equipment shall be put in normal use status to find the maximum emissions.

**2) other emissions**

Remark:

When an emission was found, the table was rotated to produce the maximum signal strength.was performed in the 3m chamber using the spectrum analyser in peak detection mode.The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss –Peramplifier Factor.

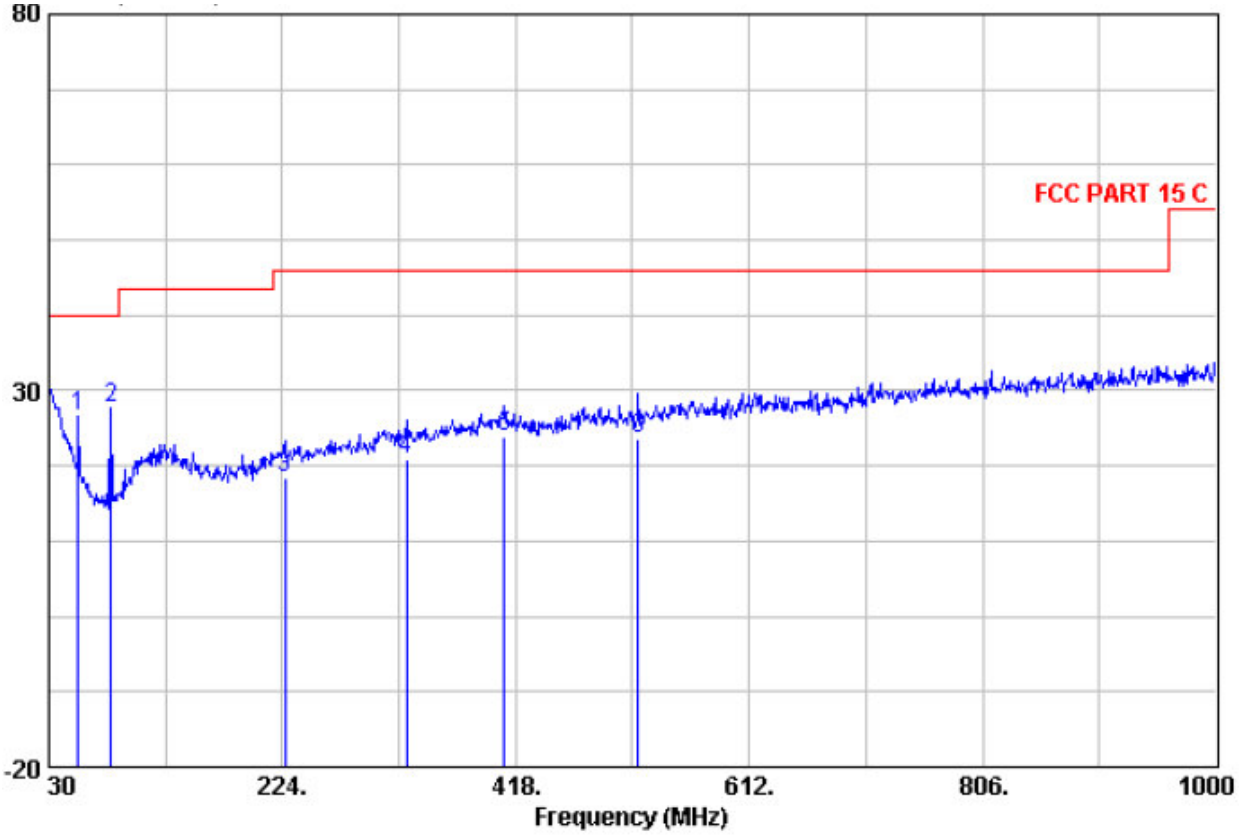
The following test results were performed on the EUT.

**30MHz to 1GHz emissions** **Tx Transmitting mode**

Horizontal:

Peak scan:

Level:dBuV/m




Quasi-peak measurement

| Freq | ReadAntenna Level | Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 54.250 | 48.68 | 11.40 | 0.60 | 24.50 | 36.18 | 40.00 | -3.82 | QP |
| 81.410 | 44.98 | 6.88 | 0.80 | 24.58 | 28.08 | 40.00 | -11.92 | QP |
| 108.570 | 39.83 | 11.94 | 0.90 | 24.50 | 28.17 | 43.50 | -15.33 | QP |
| 135.730 | 40.34 | 11.78 | 1.00 | 24.40 | 28.72 | 43.50 | -14.78 | QP |
| 162.890 | 36.42 | 10.08 | 1.10 | 24.40 | 23.20 | 43.50 | -20.30 | QP |
| 244.370 | 40.44 | 12.15 | 1.40 | 24.10 | 29.89 | 46.00 | -16.11 | QP |

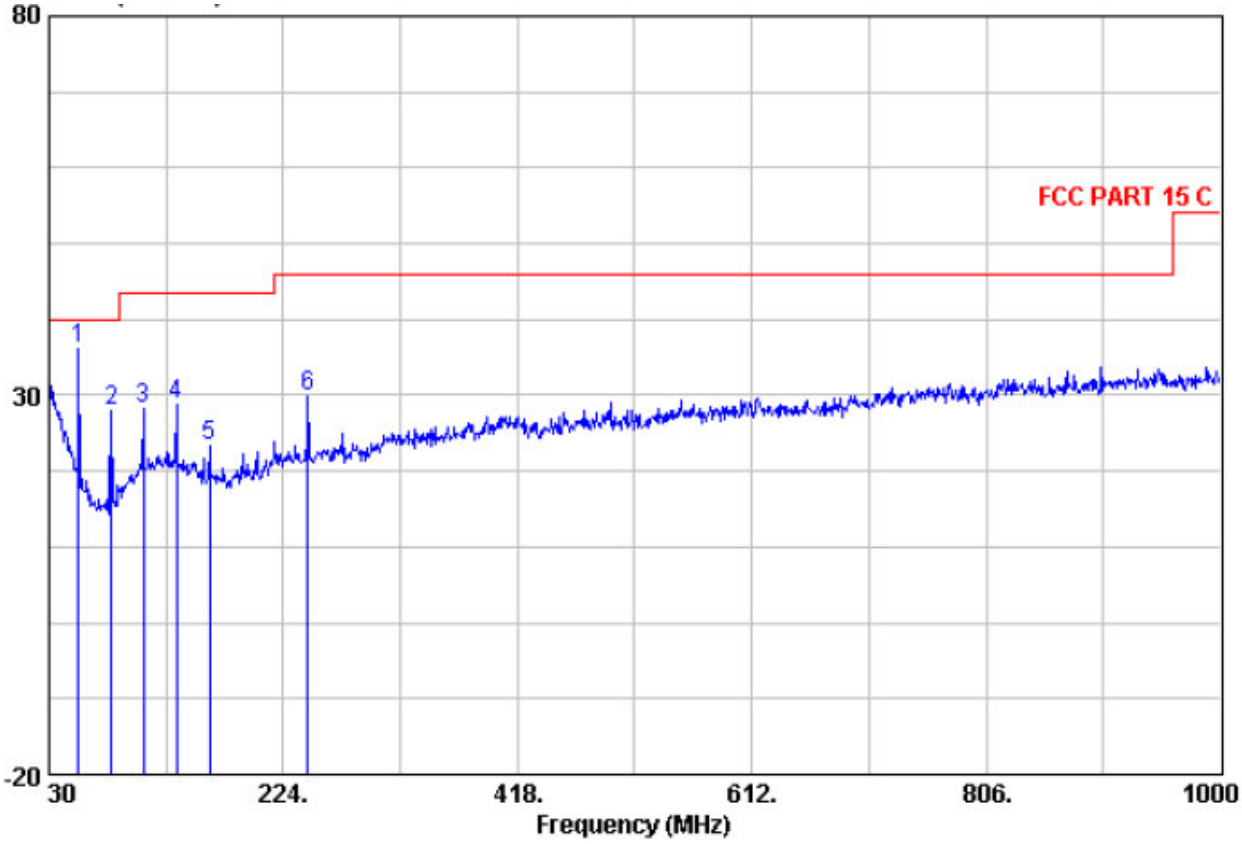
Remark:
Level = Read level + Antenna Factor + Cable Loss – Preamp Factor

**30MHz to 1GHz emissions** **Tx Transmitting mode**

Vertical:

Peak scan:

Level:dBuV/m




Quasi-peak measurement

| Freq | ReadAntenna Level | Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 54.250 | 39.21 | 11.40 | 0.60 | 24.50 | 26.71 | 40.00 | -13.29 | QP |
| 81.410 | 44.61 | 6.88 | 0.80 | 24.58 | 27.71 | 40.00 | -12.29 | QP |
| 225.940 | 29.40 | 11.78 | 1.30 | 24.10 | 18.38 | 46.00 | -27.62 | QP |
| 326.820 | 29.70 | 14.00 | 1.60 | 24.30 | 21.00 | 46.00 | -25.00 | QP |
| 408.300 | 30.84 | 16.45 | 1.80 | 25.08 | 24.00 | 46.00 | -22.00 | QP |
| 519.850 | 30.09 | 17.10 | 2.00 | 25.50 | 23.69 | 46.00 | -22.31 | QP |

Remark:
Level = Read level + Antenna Factor + Cable Loss – Preamp Factor

## 7.3 Occupied Bandwidth

**Test Date:** 2010-05-24

**Test Method:** ANSI C63.4:2009

**EUT Operation:** transmitter

Status: Kept Tx operating with modulation and standby mode.

**Equipment Used:** Refer to section 6 for details.

**Test Requirement:** FCC Part 15 C Section 15.215 (C) and Section 15.227.

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 is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB 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.

**Limit:** **Operation within the band 26.960 – 27.280 MHz**

**Test Procedure:** The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. Record the 20 dB bandwidth of the carrier.

The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 20KHz per division. Read the down 26dB bandwidth of the carrier.

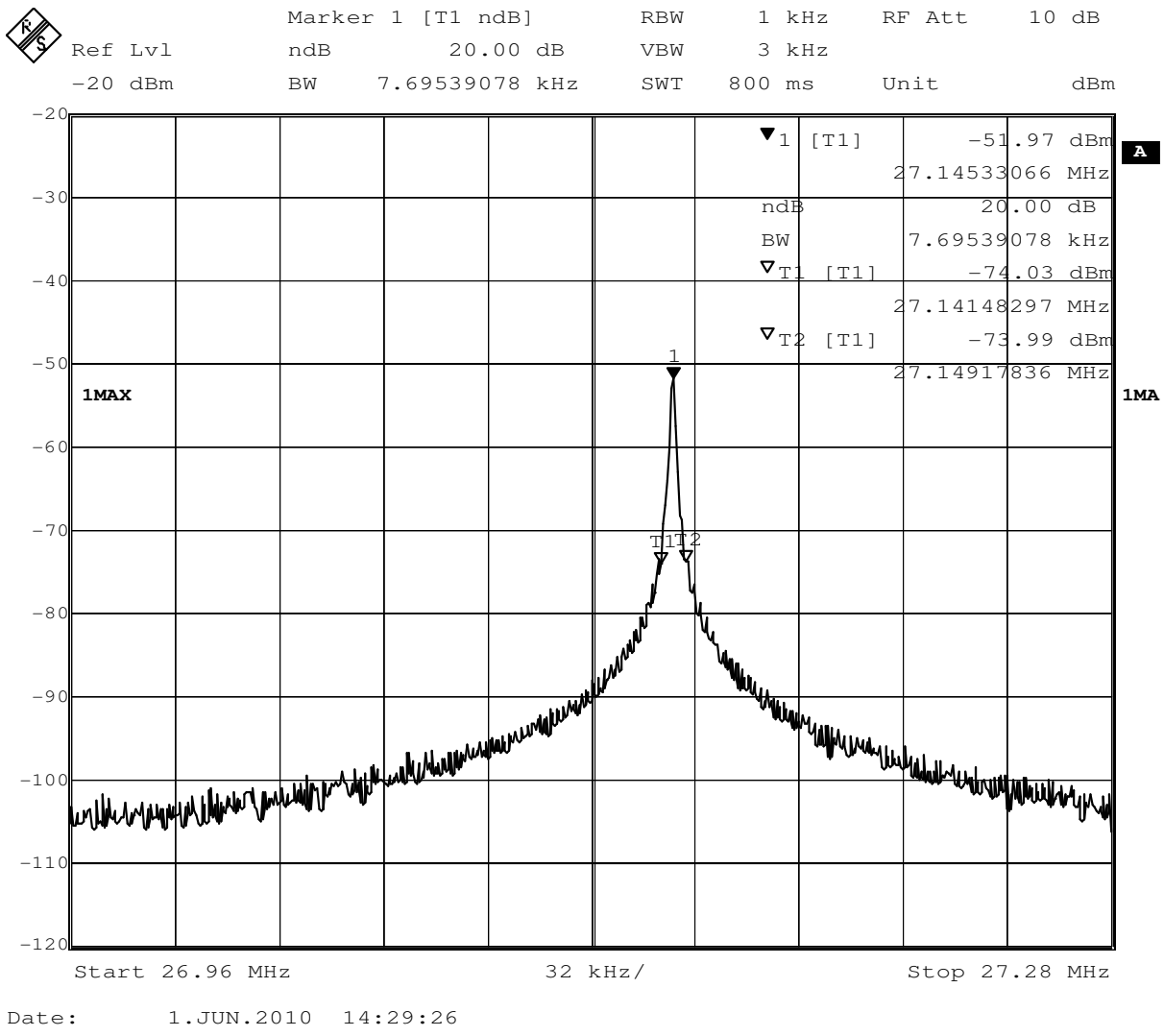
Set the spectrum analyzer: start at 26.96MHz and stop at 27.28MHz

Set the spectrum analyzer: RBW = 1kHz, VBW = 3KHz

Sweep = auto; Detector Function = Peak. Trace = Max Hold.

Mark the peak frequency and -20dB points bandwidth.

The graph as below:




20dB bandwidth lower frequency : 27.14148297MHz

20dB bandwidth upper frequency : 27.14917836MHz

**The results: The unit does meet the FCC requirements**

**--End of the Report--**