

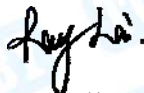
# FCC Radio Test Report

## FCC ID: 2AIRU-40239RX

**Report No.** : TB-FCC148813  
**Applicant** : Sertus Hongkong  
**Equipment Under Test (EUT)**  
**EUT Name** : TX GAMEPAD CONTROLLER AND RECEIVER  
**Model No.** : 40239  
**Serial No.** : N/A  
**Brand Name** : Tetrix  
**Receipt Date** : 2016-06-26  
**Test Date** : 2016-06-27 to 2016-06-30  
**Issue Date** : 2016-07-01  
**Standards** : FCC Part 15, Subpart C (15.249: 2015)  
**Test Method** : ANSI C63.10: 2013  
**Conclusions** : **PASS**

In the configuration tested, the EUT complied with the standards specified above,  
The EUT technically complies with the FCC requirements

**Test/Witness Engineer** : 

**Approved & Authorized** : 



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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# 1. General Information about EUT

## 1.1 Client Information

|                     |   |                                                                                       |
|---------------------|---|---------------------------------------------------------------------------------------|
| <b>Applicant</b>    | : | Sertus Hongkong                                                                       |
| <b>Address</b>      | : | Unit A 10/6F, Wong's Building, 33 Hung To Road, Kwun Tong, Kowlong Hongkong, China    |
| <b>Manufacturer</b> | : | RC Leading Toys Factory                                                               |
| <b>Address</b>      | : | Yuanlin 3 RD.,Huainan Industrial Distric, Lianxia Town, Chenghai Dist. Shantou, China |

## 1.2 General Description of EUT (Equipment Under Test)

|                        |   |                                    |                                             |
|------------------------|---|------------------------------------|---------------------------------------------|
| EUT Name               | : | TX GAMEPAD CONTROLLER AND RECEIVER |                                             |
| Models No.             | : | 40239                              |                                             |
| Model Difference       | : | N/A                                |                                             |
| Product Description    | : | Operation Frequency:2416~2475 MHz  |                                             |
|                        |   | Number of Channels:                | 60 Channels                                 |
|                        |   | Out Power:                         | 92.67 dBuV/m@3m Peak<br>90.97 dBuV/m@3m Avg |
|                        |   | Antenna Gain:                      | 0 dBi PCB Antenna                           |
|                        |   | Modulation Type:                   | GFSK                                        |
| Power Supply           | : | DC Voltage supplied by AA battery. |                                             |
| Power Rating           | : | DC 6.0V.                           |                                             |
| Connecting I/O Port(S) | : | Please refer to the User's Manual  |                                             |

### Note:

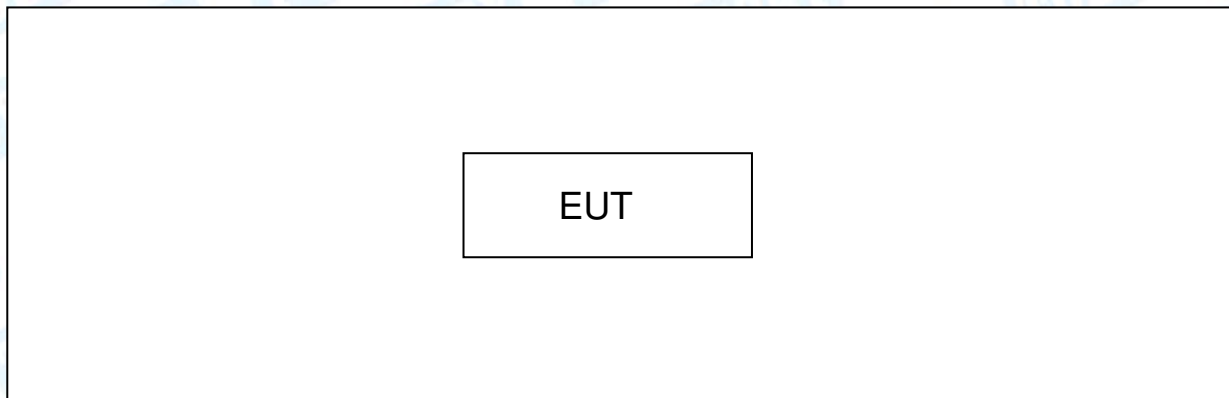
- (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (2) Channel List:

| Channel List |                 |         |                 |         |                 |
|--------------|-----------------|---------|-----------------|---------|-----------------|
| Channel      | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01           | 2416            | 21      | 2436            | 41      | 2456            |
| 02           | 2417            | 22      | 2437            | 42      | 2457            |
| 03           | 2418            | 23      | 2438            | 43      | 2458            |
| 04           | 2419            | 24      | 2439            | 44      | 2459            |
| 05           | 2420            | 25      | 2440            | 45      | 2460            |
| 06           | 2421            | 26      | 2441            | 46      | 2461            |

|    |      |           |             |           |             |
|----|------|-----------|-------------|-----------|-------------|
| 07 | 2422 | 27        | 2442        | 47        | 2462        |
| 08 | 2423 | 28        | 2443        | 48        | 2463        |
| 09 | 2424 | 29        | 2444        | 49        | 2464        |
| 10 | 2425 | 30        | 2445        | 50        | 2465        |
| 11 | 2426 | <b>31</b> | <b>2446</b> | 51        | 2466        |
| 12 | 2427 | 32        | 2447        | 52        | 2467        |
| 13 | 2428 | 33        | 2448        | 53        | 2468        |
| 14 | 2429 | 34        | 2449        | 54        | 2469        |
| 15 | 2430 | 35        | 2450        | 55        | 2470        |
| 16 | 2431 | 36        | 2451        | 56        | 2471        |
| 17 | 2432 | 37        | 2452        | 57        | 2472        |
| 18 | 2433 | 38        | 2453        | 58        | 2473        |
| 19 | 2434 | 39        | 2454        | 59        | 2474        |
| 20 | 2435 | 40        | 2455        | <b>60</b> | <b>2475</b> |

### 1.3 Block Diagram Showing the Configuration of System Tested

Mode 1: TX Mode



### 1.4 Description of Support Units

The EUT has been tested as an independent unit.

## 1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

| For Conducted Test |             |
|--------------------|-------------|
| Final Test Mode    | Description |
| N/A                | N/A         |

| For Radiated Test |                         |
|-------------------|-------------------------|
| Final Test Mode   | Description             |
| Mode 1            | TX Mode(CH01/CH31/CH60) |

### Note:

For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

- (1)According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels.
- (2)During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

## 1.6 Description of Test Software Setting

During testing channel & Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF mode.

|                                |          |         |          |
|--------------------------------|----------|---------|----------|
| <b>Product SW/HW Version :</b> | N/A      |         |          |
| <b>Radio SW/HW Version:</b>    | N/A      |         |          |
| <b>Test Software Version</b>   | N/A      |         |          |
| Frequency                      | 2416 MHz | 2446MHz | 2475 MHz |
| GFSK                           | DEF      | DEF     | DEF      |

## 1.7 Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| Test Item          | Parameters                                        | Expanded Uncertainty ( $U_{Lab}$ ) |
|--------------------|---------------------------------------------------|------------------------------------|
| Conducted Emission | Level Accuracy:<br>9kHz~150kHz<br>150kHz to 30MHz | $\pm 3.42$ dB<br>$\pm 3.42$ dB     |
| Radiated Emission  | Level Accuracy:<br>9kHz to 30 MHz                 | $\pm 4.60$ dB                      |
| Radiated Emission  | Level Accuracy:<br>30MHz to 1000 MHz              | $\pm 4.40$ dB                      |
| Radiated Emission  | Level Accuracy:<br>Above 1000MHz                  | $\pm 4.20$ dB                      |

## 1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

### **CNAS (L5813)**

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

### **FCC List No.: (811562)**

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

### **IC Registration No.: (11950A-1)**

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

## 2. Test Summary

| FCC Part 15 Subpart C(15.249)                           |                             |          |        |
|---------------------------------------------------------|-----------------------------|----------|--------|
| Standard Section                                        | Test Item                   | Judgment | Remark |
| 15.203                                                  | Antenna Requirement         | PASS     | N/A    |
| 15.205                                                  | Restricted Bands            | PASS     | N/A    |
| 15.207                                                  | AC Power Conducted Emission | N/A      | N/A    |
| 15.249 & 15.209                                         | Radiated Spurious Emission  | PASS     | N/A    |
| 15.215(C)                                               | 20dB Bandwidth              | PASS     | N/A    |
| <b>Note:</b> N/A is an abbreviation for Not Applicable. |                             |          |        |

### 3. Test Equipment

| Conducted Emission Test    |                                  |             |            |               |               |
|----------------------------|----------------------------------|-------------|------------|---------------|---------------|
| Equipment                  | Manufacturer                     | Model No.   | Serial No. | Last Cal.     | Cal. Due Date |
| EMI Test Receiver          | Rohde & Schwarz                  | ESCI        | 100321     | Aug. 07, 2015 | Aug. 06, 2016 |
| RF Switching Unit          | Compliance Direction Systems Inc | RSU-A4      | 34403      | Aug. 07, 2015 | Aug. 06, 2016 |
| AMN                        | SCHWARZBECK                      | NNBL 8226-2 | 8226-2/164 | Aug. 07, 2015 | Aug. 06, 2016 |
| LISN                       | Rohde & Schwarz                  | ENV216      | 101131     | Aug. 08, 2015 | Aug. 07, 2016 |
| Radiation Emission Test    |                                  |             |            |               |               |
| Equipment                  | Manufacturer                     | Model No.   | Serial No. | Last Cal.     | Cal. Due Date |
| Spectrum Analyzer          | Agilent                          | E4407B      | MY45106456 | Aug. 07, 2015 | Aug. 06, 2016 |
| EMI Test Receiver          | Rohde & Schwarz                  | ESCI        | 100010/007 | Aug. 07, 2015 | Aug. 06, 2016 |
| Bilog Antenna              | ETS-LINDGREN                     | 3142E       | 00117537   | Mar. 26, 2016 | Mar. 25, 2017 |
| Bilog Antenna              | ETS-LINDGREN                     | 3142E       | 00117542   | Mar. 26, 2016 | Mar. 25, 2017 |
| Horn Antenna               | ETS-LINDGREN                     | 3117        | 00143207   | Mar. 26, 2016 | Mar. 25, 2017 |
| Horn Antenna               | ETS-LINDGREN                     | 3117        | 00143209   | Mar. 26, 2016 | Mar. 25, 2017 |
| Pre-amplifier              | Sonoma                           | 310N        | 185903     | Mar. 26, 2016 | Mar. 25, 2017 |
| Pre-amplifier              | HP                               | 8447B       | 3008A00849 | Mar. 26, 2016 | Mar. 25, 2017 |
| Cable                      | HUBER+SUHNER                     | 100         | SUCOFLEX   | Mar. 26, 2016 | Mar. 25, 2017 |
| Positioning Controller     | ETS-LINDGREN                     | 2090        | N/A        | N/A           | N/A           |
| Antenna Conducted Emission |                                  |             |            |               |               |
| Equipment                  | Manufacturer                     | Model No.   | Serial No. | Last Cal.     | Cal. Due Date |
| Spectrum Analyzer          | Agilent                          | E4407B      | MY45106456 | Aug. 07, 2015 | Aug. 06, 2016 |
| EMI Test Receiver          | Rohde & Schwarz                  | ESCI        | 100010/007 | Aug. 07, 2015 | Aug. 06, 2016 |
| Power Meter                | Anritsu                          | ML2495A     | 25406005   | Aug.07, 2015  | Aug.06, 2016  |
| Power Sensor               | Anritsu                          | ML2411B     | 25406005   | Aug.07, 2015  | Aug.06, 2016  |

## 4. Conducted Emission Test

### 4.1 Test Standard and Limit

#### 4.1.1 Test Standard

FCC Part 15.207

#### 4.1.2 Test Limit

**Conducted Emission Test Limit**

| Frequency     | Maximum RF Line Voltage (dB $\mu$ V) |               |
|---------------|--------------------------------------|---------------|
|               | Quasi-peak Level                     | Average Level |
| 150kHz~500kHz | 66 ~ 56 *                            | 56 ~ 46 *     |
| 500kHz~5MHz   | 56                                   | 46            |
| 5MHz~30MHz    | 60                                   | 50            |

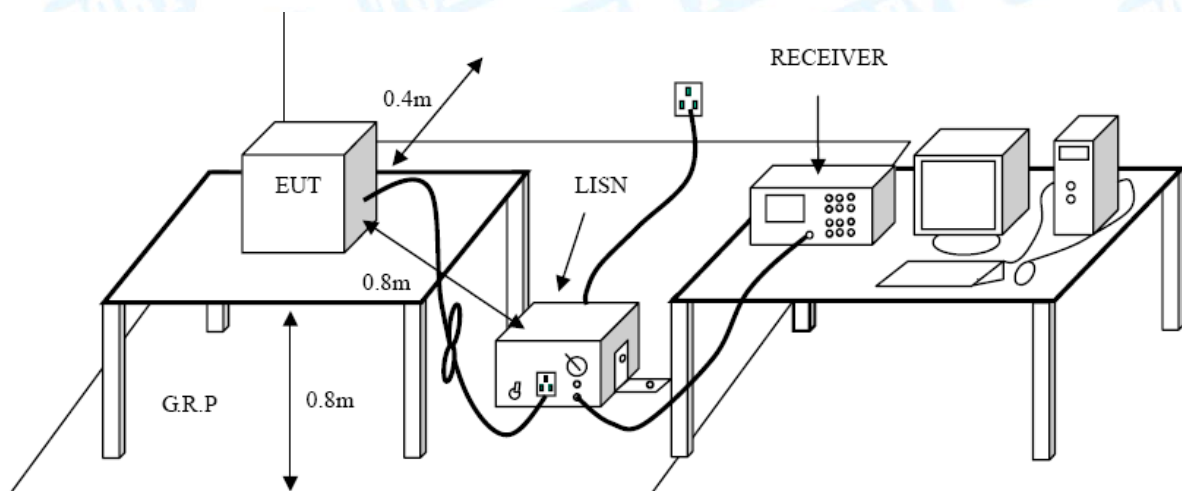
Notes:

(1) \*Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.2 Test Setup



### 4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN is at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

#### 4.4 EUT Operating Mode

Please refer to the description of test mode.

#### 4.5 Test Data

The EUT is powered by battery, so no requirement for this test item.

## 5. Radiated Emission Test

### 5.1 Test Standard and Limit

#### 5.1.1 Test Standard

FCC Part 15.209

#### 5.1.2 Test Limit

#### Radiated Emission Limit (9kHz~1000MHz)

| Frequency (MHz) | Field Strength (microvolt/meter) | Measurement Distance (meters) |
|-----------------|----------------------------------|-------------------------------|
| 0.009~0.490     | 2400/F(KHz)                      | 300                           |
| 0.490~1.705     | 24000/F(KHz)                     | 30                            |
| 1.705~30.0      | 30                               | 30                            |
| 30~88           | 100                              | 3                             |
| 88~216          | 150                              | 3                             |
| 216~960         | 200                              | 3                             |
| Above 960       | 500                              | 3                             |

#### Radiated Emission Limit (Above 1000MHz)

| Frequency (MHz) | Class B (dBuV/m)(at 3 M) |         |
|-----------------|--------------------------|---------|
|                 | Peak                     | Average |
| Above 1000      | 74                       | 54      |

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(Uv/m)

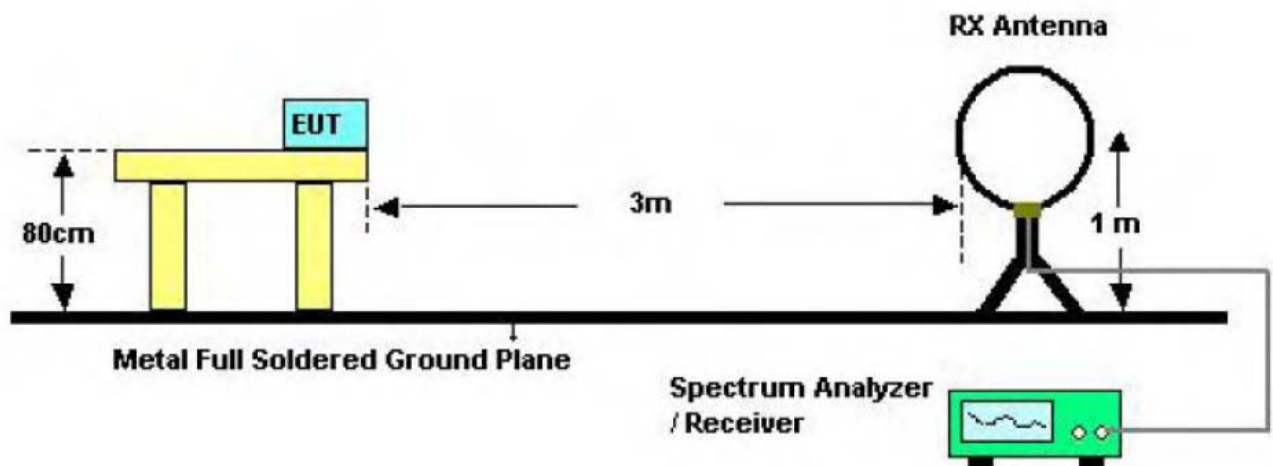
#### Limits of radiated emission measurement (15.249)

| FCC Part 15 (15.249), Subpart C                                          |                       |
|--------------------------------------------------------------------------|-----------------------|
| Limit                                                                    | Frequency Range (MHz) |
| Field strength of fundamental<br>50000 $\mu$ V/m (94 dB $\mu$ V/m) @ 3 m | 2400~2483.5           |
| Field strength of fundamental<br>500 $\mu$ V/m (94 dB $\mu$ V/m) @ 3 m   | Above 2483.5          |

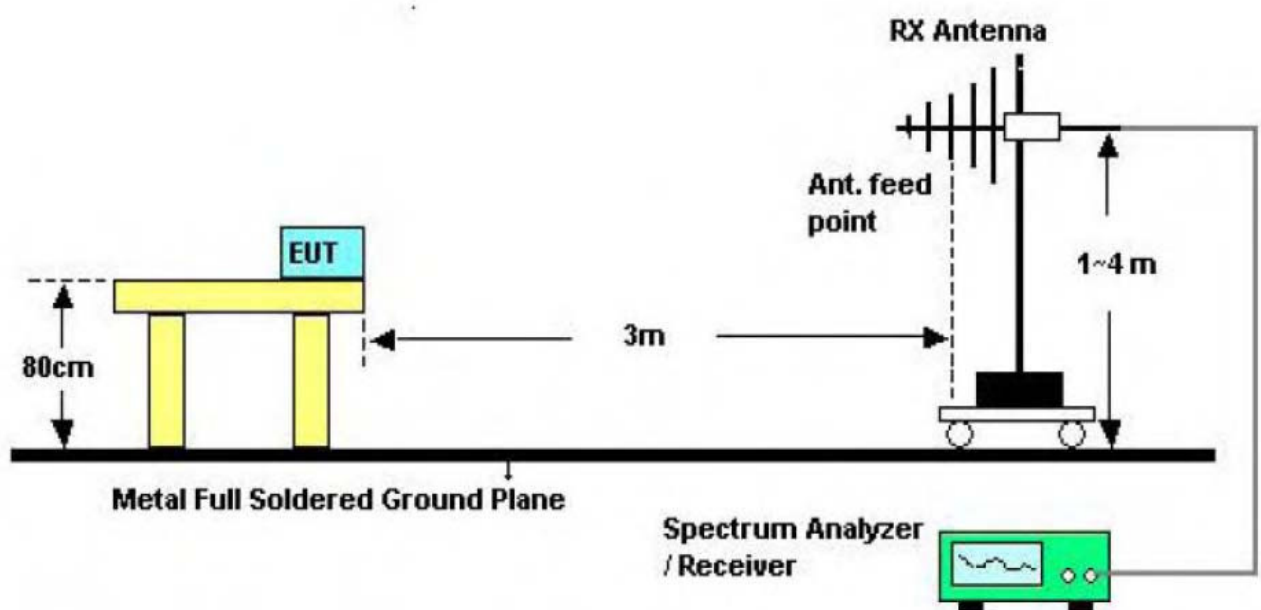
**Restricted bands requirement for equipment operating in 2400MHz to 2483.5 MHz (15.249)**

| Restricted Frequency Band (MHz) | (dBuV/m)(at 3 M)                                                                                                                                          |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2310~2390                       | 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 |
| 2483.5~2500                     |                                                                                                                                                           |

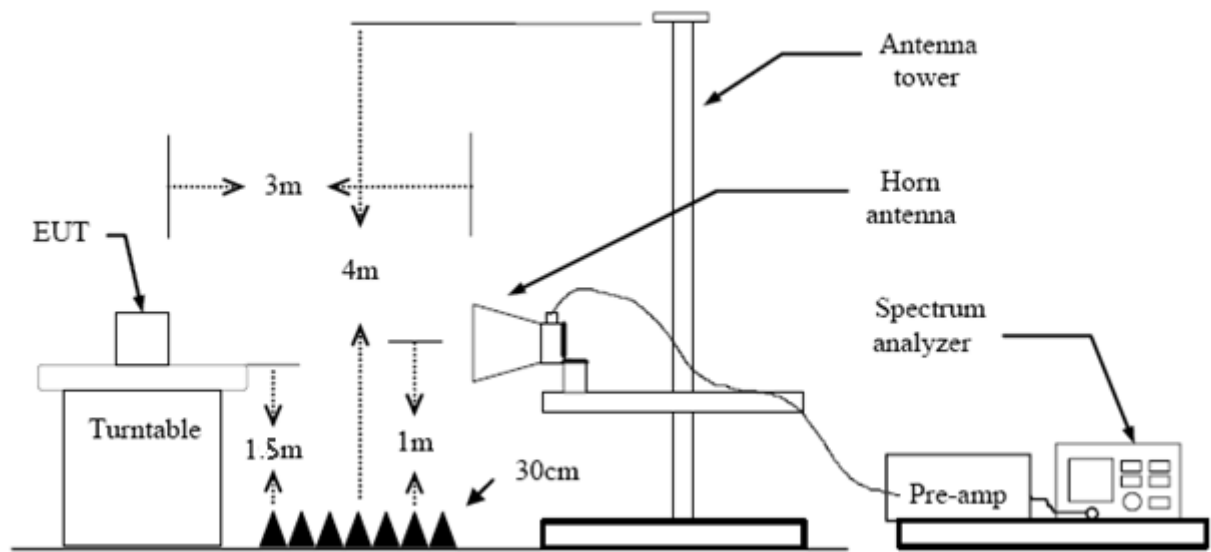
## 5.2 Test Setup



## Bellow 30MHz Test Setup



## Bellow 1000MHz Test Setup



Above 1GHz Test Setup

### 5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

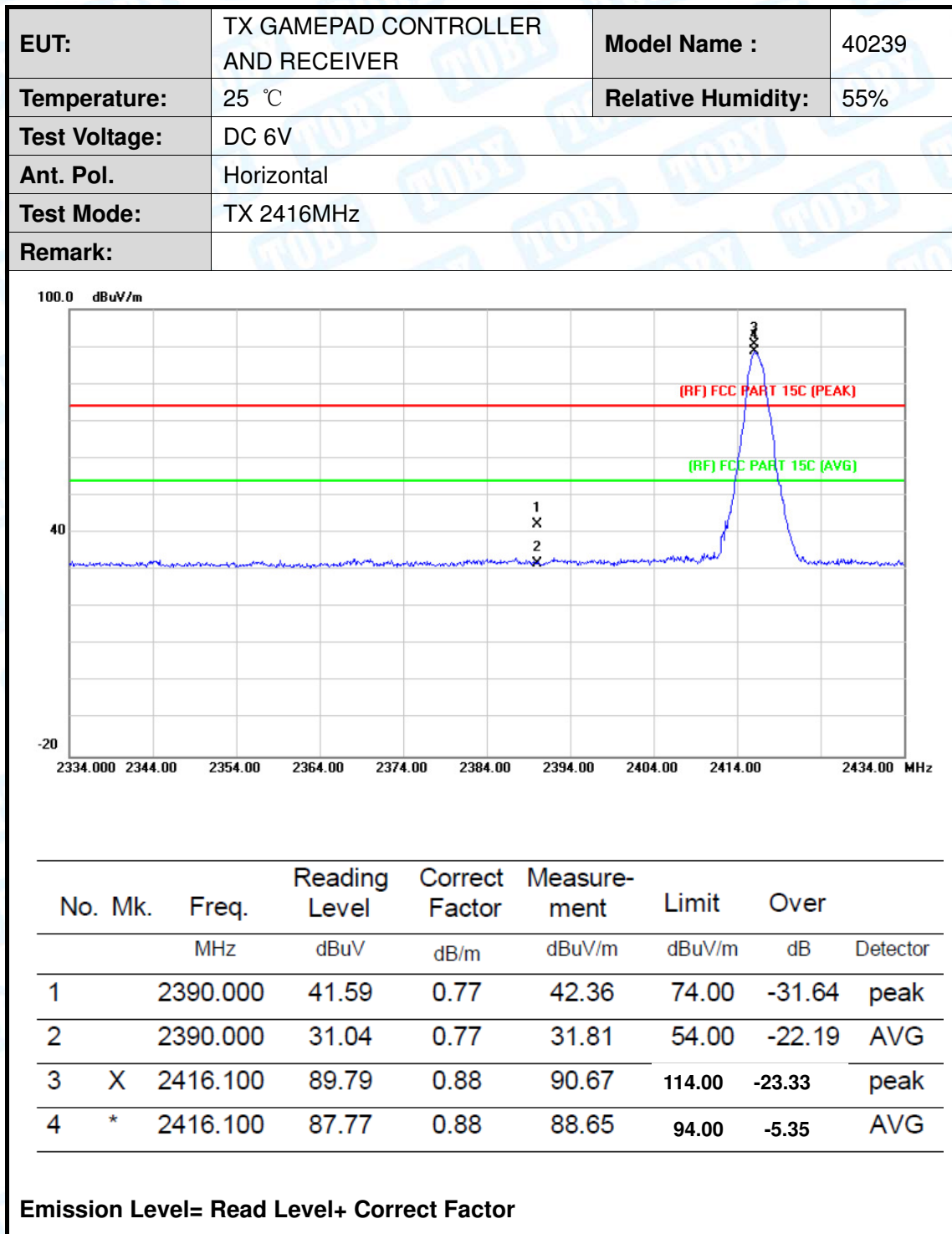
## 5.4 EUT Operating Condition

The EUT was set to Continual Transmitting in maximum power, and new batteries are used during testing.

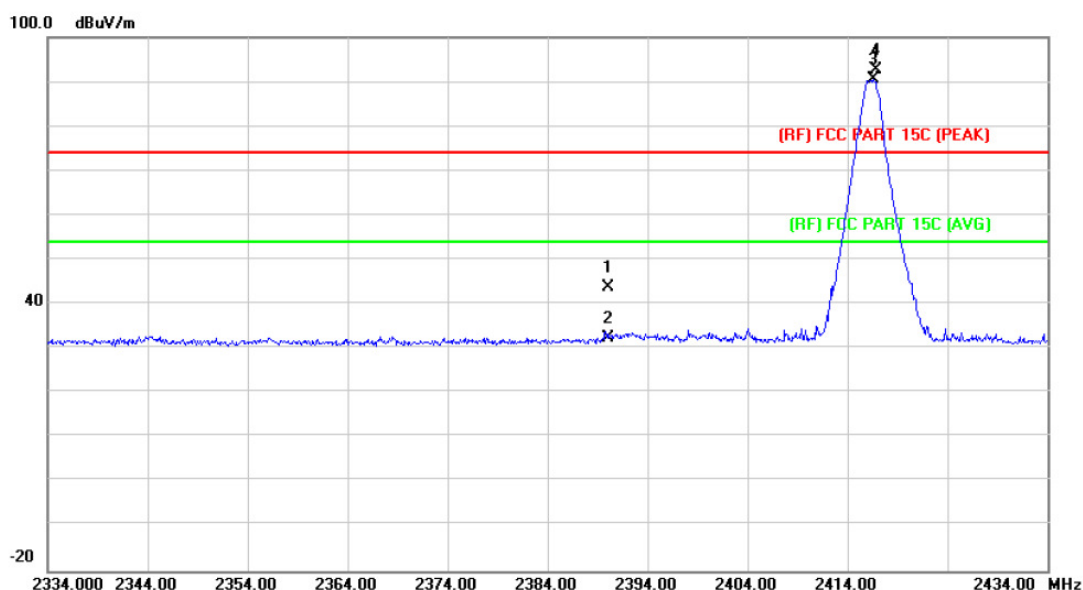
## 5.5 Test Data

Please see the next page.

### 5.6.1 Field Strength of the Fundamental



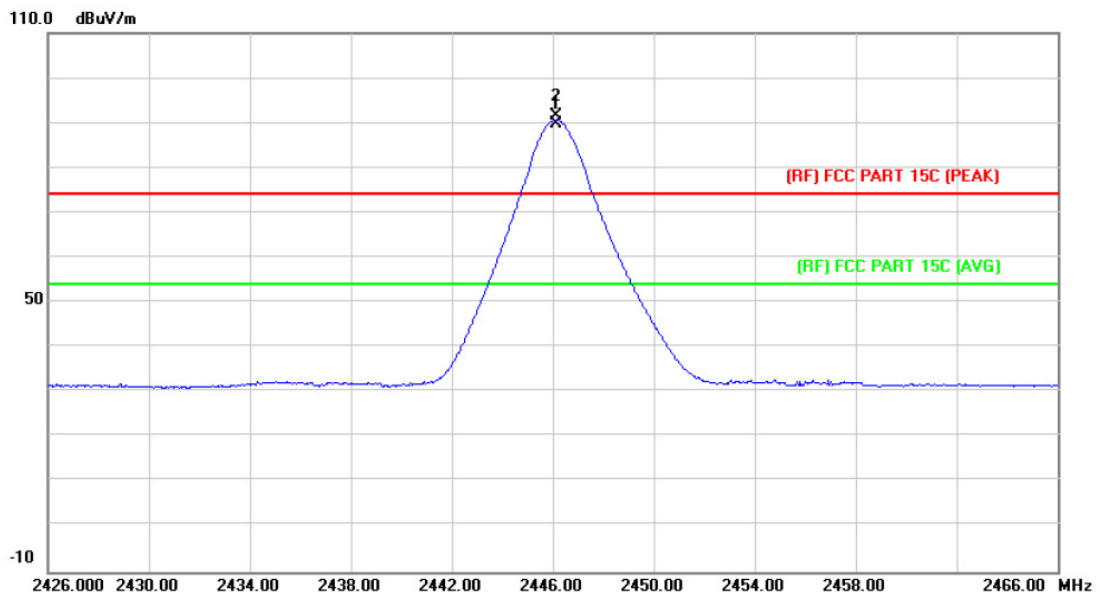
|                      |                                    |                           |       |
|----------------------|------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                              | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                              |                           |       |
| <b>Ant. Pol.</b>     | Vertical                           |                           |       |
| <b>Test Mode:</b>    | TX 2416MHz                         |                           |       |
| <b>Remark:</b>       |                                    |                           |       |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1   |     | 2390.000     | 42.90                    | 0.77                      | 43.67                      | 74.00           | -30.33     | peak     |
| 2   |     | 2390.000     | 31.68                    | 0.77                      | 32.45                      | 54.00           | -21.55     | AVG      |
| 3   | *   | 2416.600     | 89.53                    | 0.88                      | 90.41                      | 94.00           | -3.59      | AVG      |
| 4   | X   | 2416.800     | 91.79                    | 0.88                      | 92.67                      | 114.00          | -21.33     | peak     |

Emission Level= Read Level+ Correct Factor

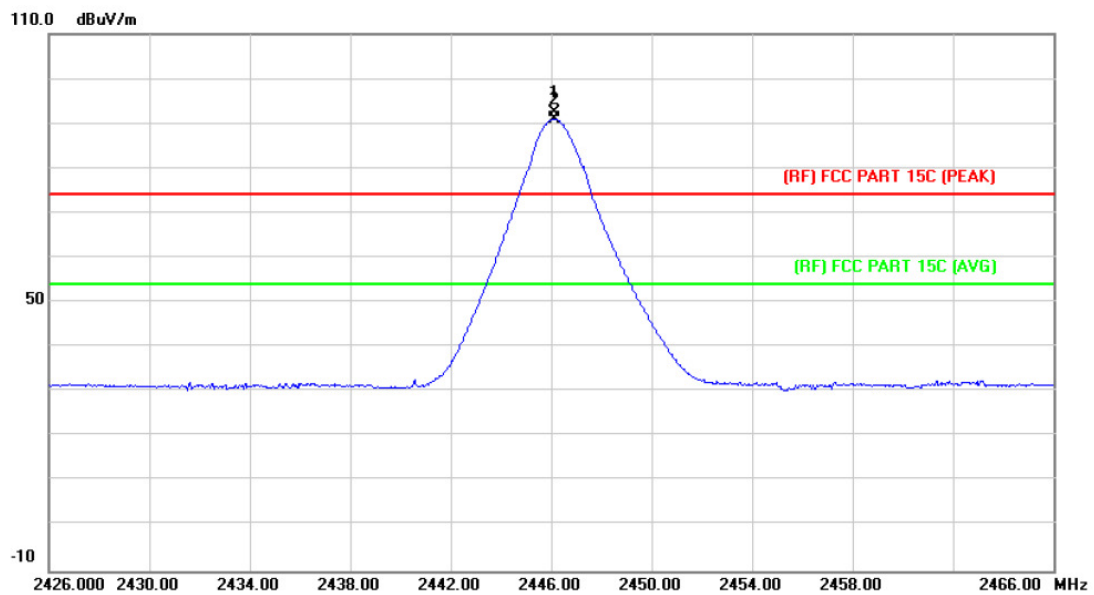
|                      |                                    |                           |       |
|----------------------|------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                              | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                              |                           |       |
| <b>Ant. Pol.</b>     | Horizontal                         |                           |       |
| <b>Test Mode:</b>    | TX 2446MHz                         |                           |       |
| <b>Remark:</b>       |                                    |                           |       |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     | Detector |
| 1   | *   | 2446.120 | 88.66         | 1.01           | 89.67       | 94.00  | -4.33  | AVG      |
| 2   | X   | 2446.160 | 90.63         | 1.01           | 91.64       | 114.00 | -22.36 | peak     |

Emission Level= Read Level+ Correct Factor

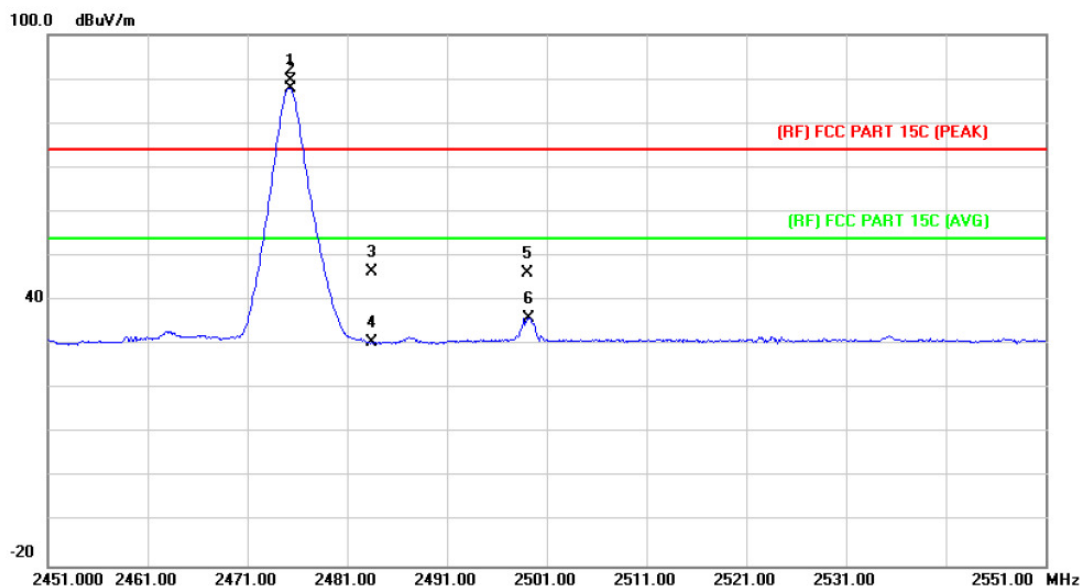
|                      |                                    |                           |       |
|----------------------|------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                              | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                              |                           |       |
| <b>Ant. Pol.</b>     | Vertical                           |                           |       |
| <b>Test Mode:</b>    | TX 2446MHz                         |                           |       |
| <b>Remark:</b>       |                                    |                           |       |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     | Detector |
| 1   | X   | 2446.120 | 91.31         | 1.01           | 92.32       | 114.00 | -21.68 | peak     |
| 2   | *   | 2446.120 | 89.96         | 1.01           | 90.97       | 94.00  | -3.03  | AVG      |

Emission Level= Read Level+ Correct Factor

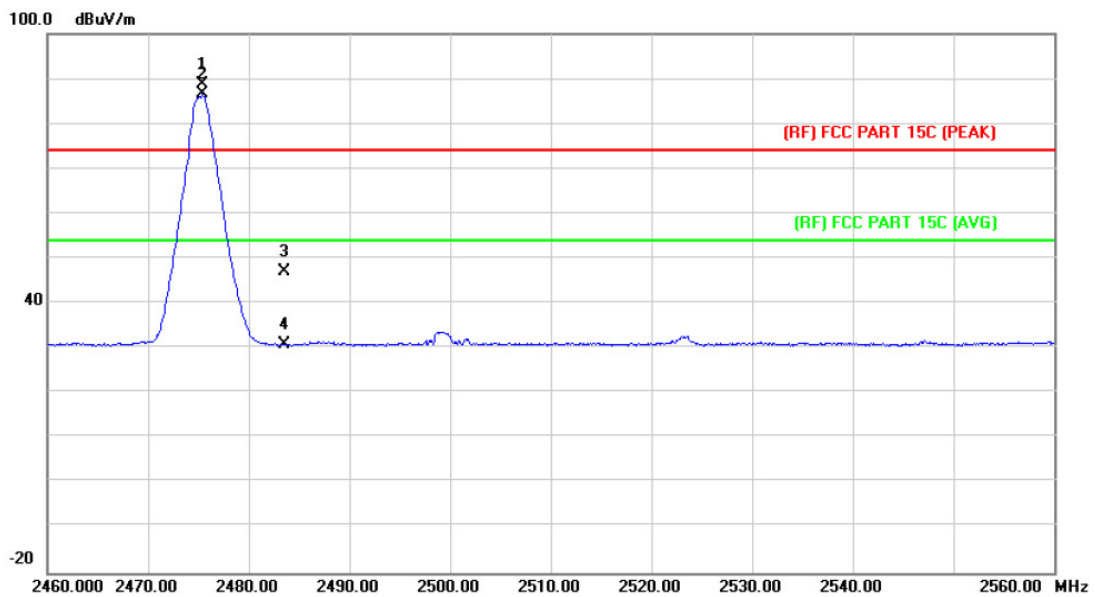
|                      |                                    |                           |       |
|----------------------|------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                              | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                              |                           |       |
| <b>Ant. Pol.</b>     | Horizontal                         |                           |       |
| <b>Test Mode:</b>    | TX 2475MHz                         |                           |       |
| <b>Remark:</b>       |                                    |                           |       |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1   | X   | 2475.300     | 88.54                    | 1.14                      | 89.68                      | 114.00          | -24.32     | peak     |
| 2   | *   | 2475.300     | 86.77                    | 1.14                      | 87.91                      | 94.00           | -6.09      | AVG      |
| 3   |     | 2483.500     | 45.22                    | 1.17                      | 46.39                      | 74.00           | -27.61     | peak     |
| 4   |     | 2483.500     | 29.36                    | 1.17                      | 30.53                      | 54.00           | -23.47     | AVG      |
| 5   |     | 2499.000     | 45.07                    | 1.23                      | 46.30                      | 74.00           | -27.70     | peak     |
| 6   |     | 2499.200     | 34.79                    | 1.23                      | 36.02                      | 54.00           | -17.98     | AVG      |

Emission Level= Read Level+ Correct Factor

|                      |                                    |                           |       |
|----------------------|------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                              | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                              |                           |       |
| <b>Ant. Pol.</b>     | Vertical                           |                           |       |
| <b>Test Mode:</b>    | TX 2475MHz                         |                           |       |
| <b>Remark:</b>       |                                    |                           |       |

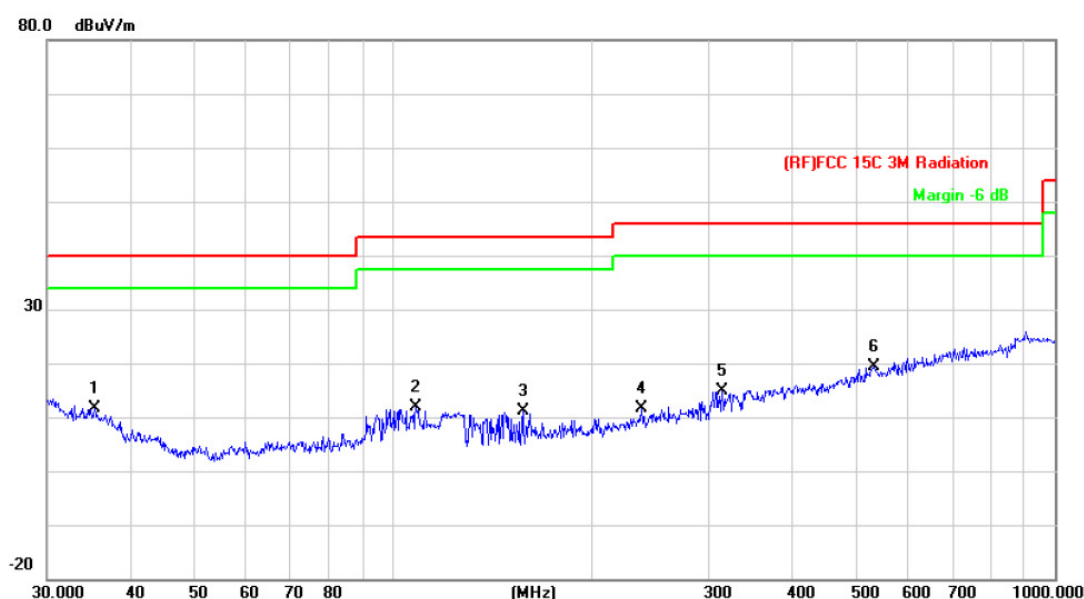


| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1   | X   | 2475.400     | 87.48                    | 1.14                      | 88.62                      | 114.00          | -25.38     | peak     |
| 2   | *   | 2475.400     | 85.43                    | 1.14                      | 86.57                      | 114.00          | -7.43      | AVG      |
| 3   |     | 2483.500     | 45.81                    | 1.17                      | 46.98                      | 74.00           | -27.02     | peak     |
| 4   |     | 2483.500     | 29.69                    | 1.17                      | 30.86                      | 54.00           | -23.14     | AVG      |

**Emission Level= Read Level+ Correct Factor**

## 5.6.2 Radiated Spurious Emission (Below 1 GHz)

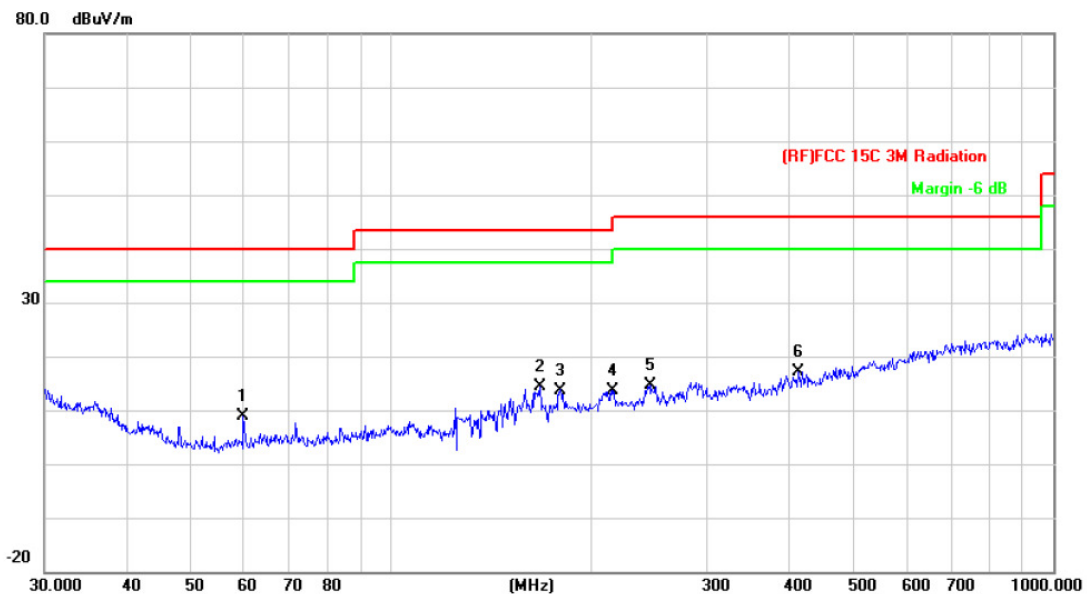
|               |                                    |                    |       |
|---------------|------------------------------------|--------------------|-------|
| EUT:          | TX GAMEPAD CONTROLLER AND RECEIVER | Model Name :       | 40239 |
| Temperature:  | 25 °C                              | Relative Humidity: | 55%   |
| Test Voltage: | DC 6V                              |                    |       |
| Ant. Pol.     | Horizontal                         |                    |       |
| Test Mode:    | TX 2416MHz                         |                    |       |
| Remark:       | Only worse case is reported        |                    |       |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1   |     | 35.3750      | 28.80                    | -17.29                    | 11.51                      | 40.00           | -28.49     | peak     |
| 2   |     | 108.2667     | 33.72                    | -21.86                    | 11.86                      | 43.50           | -31.64     | peak     |
| 3   |     | 157.0072     | 31.77                    | -20.71                    | 11.06                      | 43.50           | -32.44     | peak     |
| 4   |     | 237.4757     | 30.34                    | -18.72                    | 11.62                      | 46.00           | -34.38     | peak     |
| 5   |     | 314.3765     | 31.50                    | -16.54                    | 14.96                      | 46.00           | -31.04     | peak     |
| 6   | *   | 533.8318     | 29.55                    | -10.14                    | 19.41                      | 46.00           | -26.59     | peak     |

Emission Level= Read Level+ Correct Factor

|                      |                                    |                           |       |
|----------------------|------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                              | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                              |                           |       |
| <b>Ant. Pol.</b>     | Vertical                           |                           |       |
| <b>Test Mode:</b>    | TX 2416MHz                         |                           |       |
| <b>Remark:</b>       | Only worse case is reported        |                           |       |

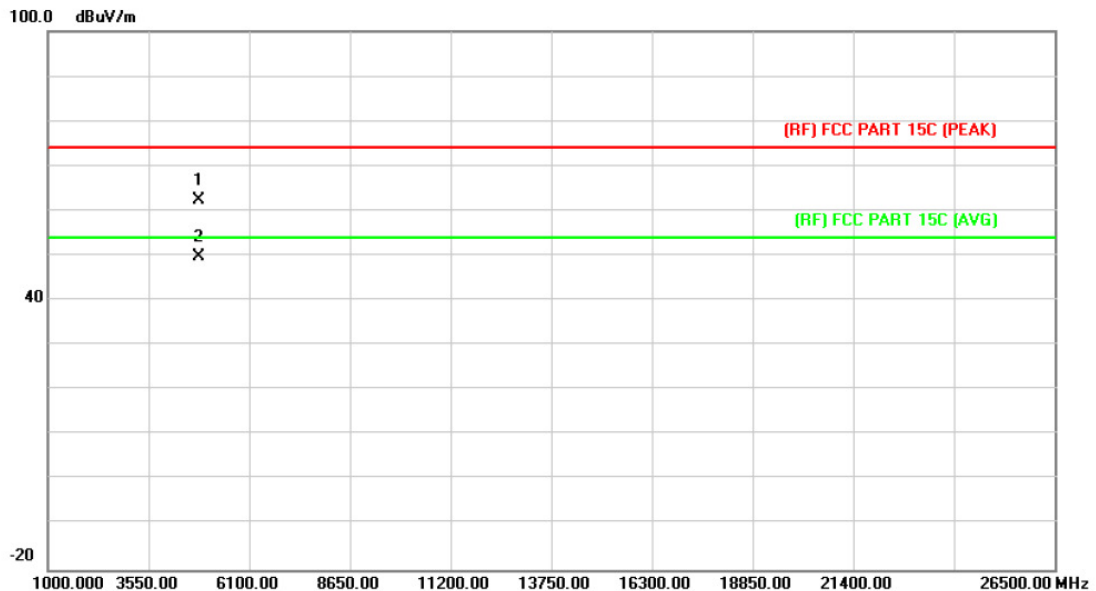


| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1   |     | 59.8588      | 33.32                    | -24.53                    | 8.79                       | 40.00           | -31.21     | peak     |
| 2   |     | 167.8241     | 35.49                    | -21.04                    | 14.45                      | 43.50           | -29.05     | peak     |
| 3   |     | 180.0165     | 34.32                    | -20.57                    | 13.75                      | 43.50           | -29.75     | peak     |
| 4   |     | 216.0240     | 33.26                    | -19.70                    | 13.56                      | 46.00           | -32.44     | peak     |
| 5   |     | 245.9507     | 32.95                    | -18.31                    | 14.64                      | 46.00           | -31.36     | peak     |
| 6   | *   | 411.8240     | 29.89                    | -12.86                    | 17.03                      | 46.00           | -28.97     | peak     |

**Emission Level= Read Level+ Correct Factor**

### 5.6.3 Radiated Spurious Emission (Above 1 GHz)

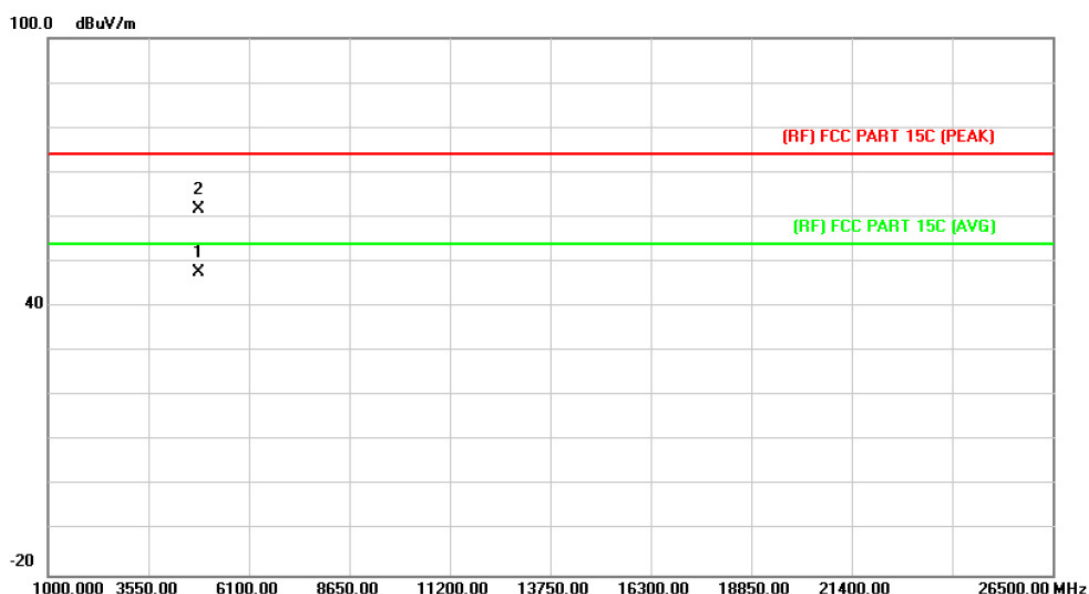
|                      |                                                                              |                           |       |
|----------------------|------------------------------------------------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER<br>AND RECEIVER                                        | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                                                                        | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                                                                        |                           |       |
| <b>Ant. Pol.</b>     | Horizontal                                                                   |                           |       |
| <b>Test Mode:</b>    | TX 2416MHz                                                                   |                           |       |
| <b>Remark:</b>       | No report for the emission which more than 10 dB below the prescribed limit. |                           |       |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Detector |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     |          |
| 1   |     | 4832.581 | 48.73         | 13.61          | 62.34       | 74.00  | -11.66 | peak     |
| 2   | *   | 4832.651 | 36.07         | 13.61          | 49.68       | 54.00  | -4.32  | AVG      |

Emission Level= Read Level+ Correct Factor

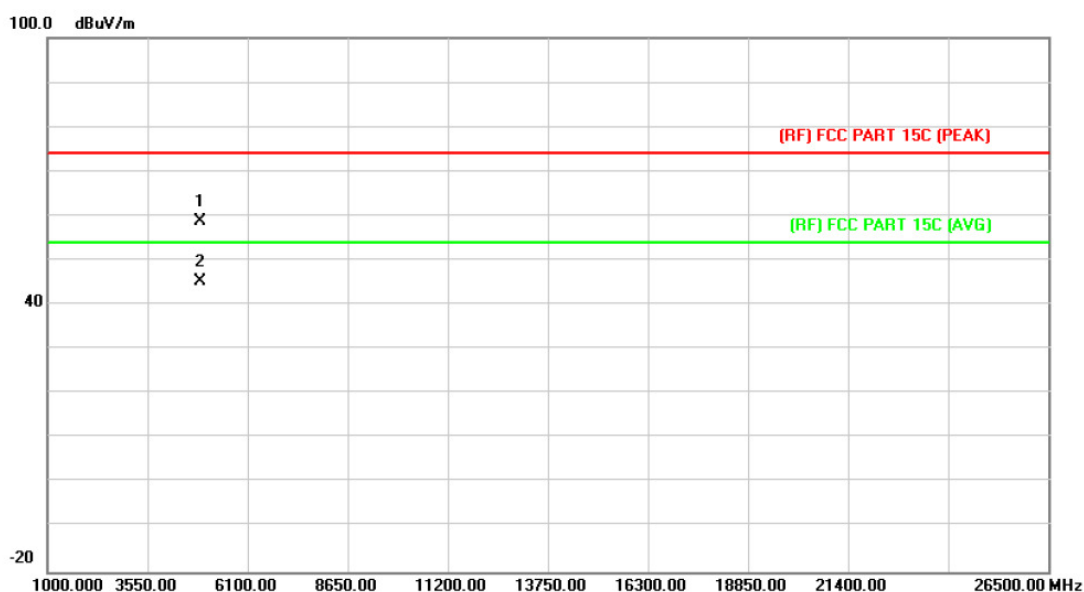
|                      |                                                                              |                           |       |
|----------------------|------------------------------------------------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER                                           | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                                                                        | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                                                                        |                           |       |
| <b>Ant. Pol.</b>     | Vertical                                                                     |                           |       |
| <b>Test Mode:</b>    | TX 2416MHz                                                                   |                           |       |
| <b>Remark:</b>       | No report for the emission which more than 10 dB below the prescribed limit. |                           |       |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     | Detector |
| 1   | *   | 4831.624 | 34.04         | 13.61          | 47.65       | 54.00  | -6.35  | AVG      |
| 2   |     | 4832.061 | 48.04         | 13.61          | 61.65       | 74.00  | -12.35 | peak     |

Emission Level= Read Level+ Correct Factor

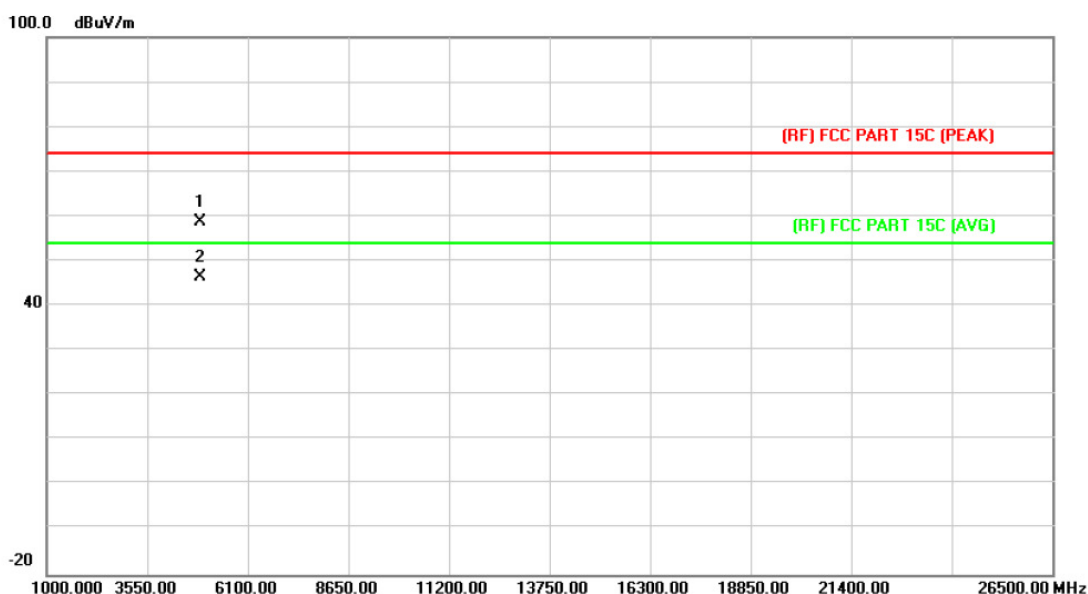
|                      |                                                                              |                           |       |
|----------------------|------------------------------------------------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER                                           | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                                                                        | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                                                                        |                           |       |
| <b>Ant. Pol.</b>     | Horizontal                                                                   |                           |       |
| <b>Test Mode:</b>    | TX 2446MHz                                                                   |                           |       |
| <b>Remark:</b>       | No report for the emission which more than 10 dB below the prescribed limit. |                           |       |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Detector |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     |          |
| 1   |     | 4893.251 | 44.72         | 13.97          | 58.69       | 74.00  | -15.31 | peak     |
| 2   | *   | 4893.671 | 31.15         | 13.97          | 45.12       | 54.00  | -8.88  | AVG      |

Emission Level= Read Level+ Correct Factor

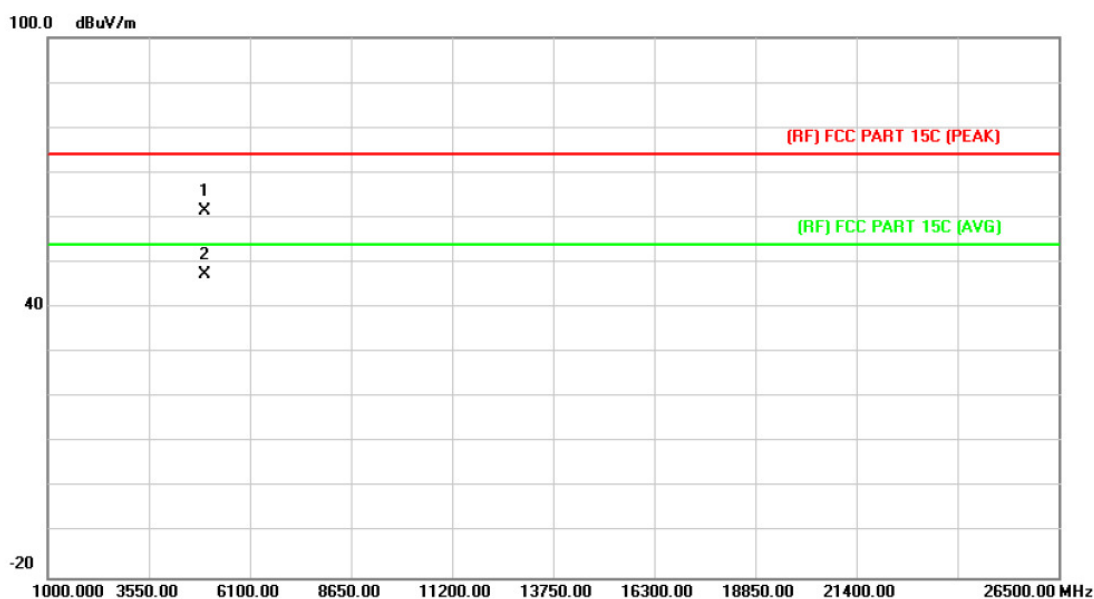
|                      |                                                                              |                           |       |
|----------------------|------------------------------------------------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER                                           | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                                                                        | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                                                                        |                           |       |
| <b>Ant. Pol.</b>     | Vertical                                                                     |                           |       |
| <b>Test Mode:</b>    | TX 2446MHz                                                                   |                           |       |
| <b>Remark:</b>       | No report for the emission which more than 10 dB below the prescribed limit. |                           |       |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB/m | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1   |     | 4890.360     | 44.66                    | 13.95                     | 58.61                      | 74.00           | -15.39     | peak     |
| 2   | *   | 4891.160     | 32.40                    | 13.96                     | 46.36                      | 54.00           | -7.64      | AVG      |

Emission Level= Read Level+ Correct Factor

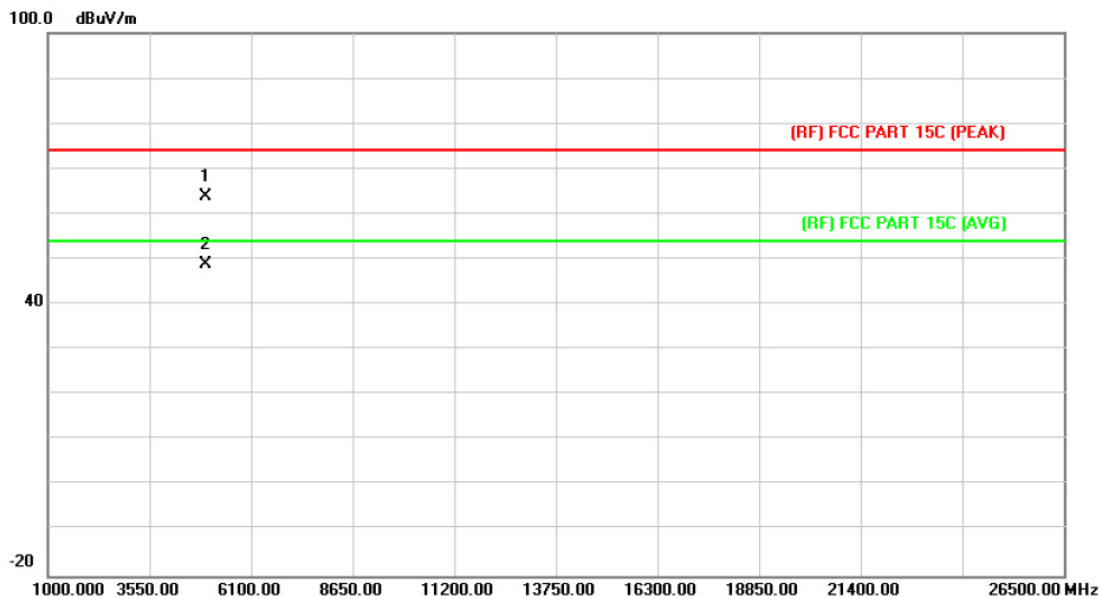
|                      |                                                                              |                           |       |
|----------------------|------------------------------------------------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER                                           | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                                                                        | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                                                                        |                           |       |
| <b>Ant. Pol.</b>     | Horizontal                                                                   |                           |       |
| <b>Test Mode:</b>    | TX 2475MHz                                                                   |                           |       |
| <b>Remark:</b>       | No report for the emission which more than 10 dB below the prescribed limit. |                           |       |



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     | Detector |
| 1   |     | 4949.671 | 47.05         | 14.30          | 61.35       | 74.00  | -12.65 | peak     |
| 2   | *   | 4949.987 | 33.05         | 14.30          | 47.35       | 54.00  | -6.65  | AVG      |

Emission Level= Read Level+ Correct Factor

|                      |                                                                              |                           |       |
|----------------------|------------------------------------------------------------------------------|---------------------------|-------|
| <b>EUT:</b>          | TX GAMEPAD CONTROLLER AND RECEIVER                                           | <b>Model Name :</b>       | 40239 |
| <b>Temperature:</b>  | 25 °C                                                                        | <b>Relative Humidity:</b> | 55%   |
| <b>Test Voltage:</b> | DC 6V                                                                        |                           |       |
| <b>Ant. Pol.</b>     | Vertical                                                                     |                           |       |
| <b>Test Mode:</b>    | TX 2475MHz                                                                   |                           |       |
| <b>Remark:</b>       | No report for the emission which more than 10 dB below the prescribed limit. |                           |       |

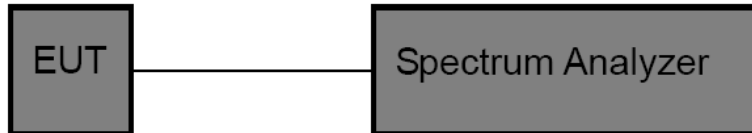


| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     | Detector |
| 1   |     | 4950.360 | 49.60         | 14.31          | 63.91       | 74.00  | -10.09 | peak     |
| 2   | *   | 4950.641 | 34.44         | 14.31          | 48.75       | 54.00  | -5.25  | AVG      |

Emission Level= Read Level+ Correct Factor

## 6. Bandwidth Test

### 6.1 Test Setup



### 6.2 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:  
Bandwidth: RBW=100 kHz, VBW=300kHz.
- (3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.

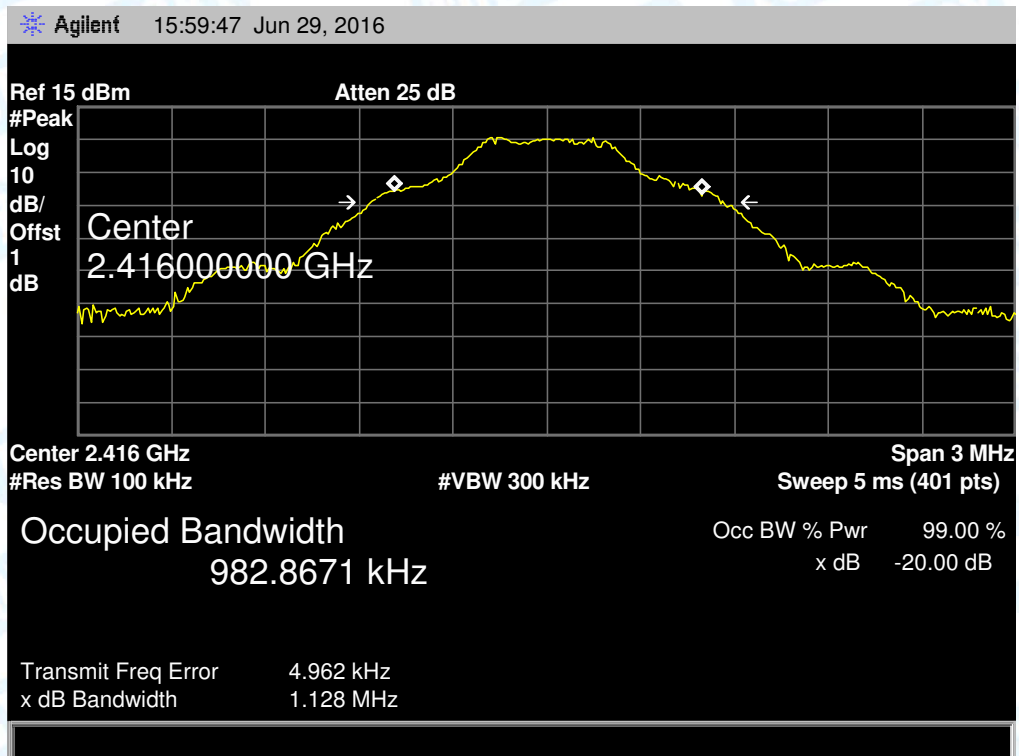
### 6.3 EUT Operating Condition

The EUT was set to continuously transmitting for the Bandwidth Test.

### 6.4 Test Data

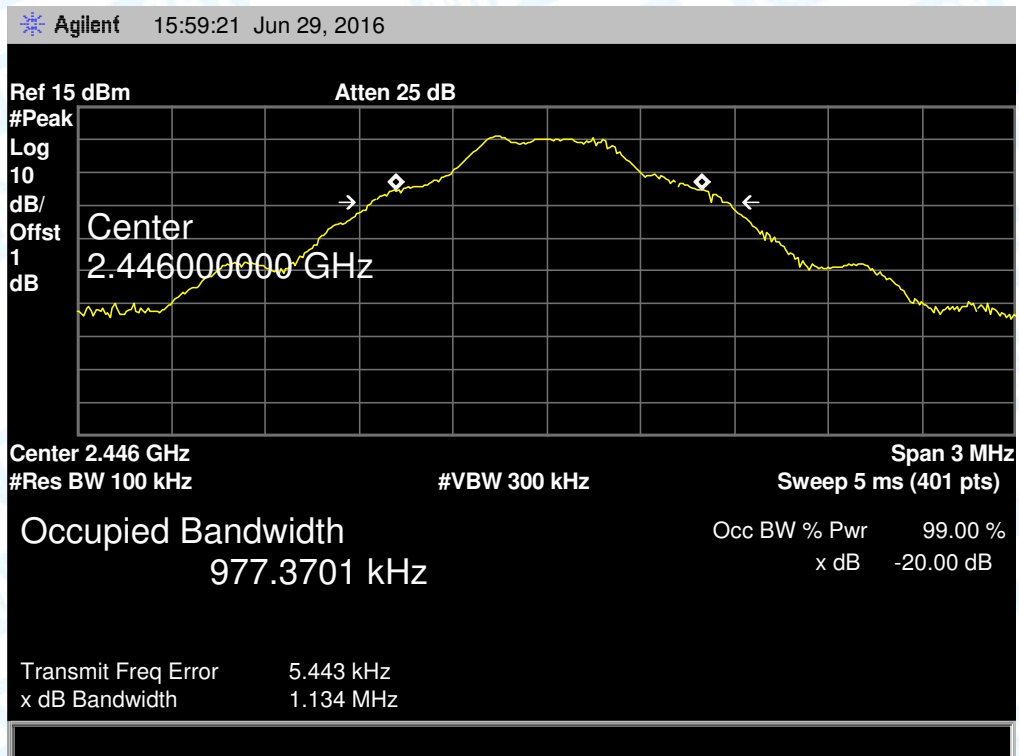
| Low Channel Frequency (MHz) | 20dB Bandwidth (MHz) |
|-----------------------------|----------------------|
| 2416                        | 1.128                |

### 2416 MHz



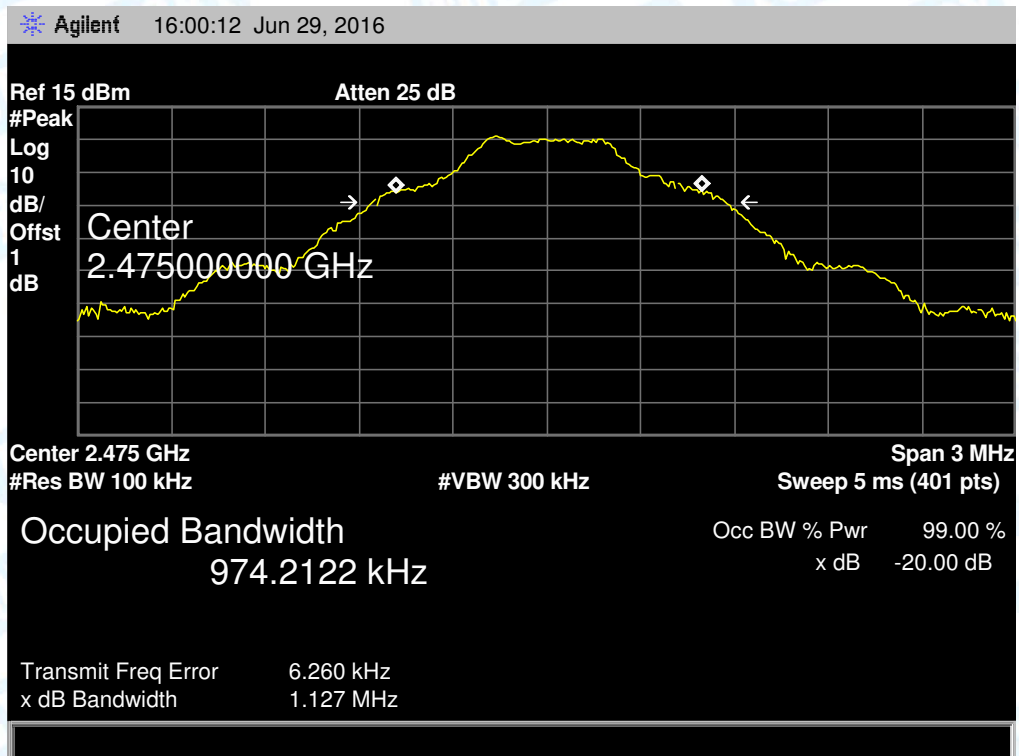
| MID Channel Frequency (MHz) | 20dB Bandwidth (MHz) |
|-----------------------------|----------------------|
| 2446                        | 1.134                |

### 2446 MHz



| HIGH Channel Frequency (MHz) | 20dB Bandwidth (MHz) |
|------------------------------|----------------------|
| 2475                         | 1.127                |

### 2475 MHz



## 7. Antenna Requirement

### 7.1 Standard Requirement

#### 7.1.1 Standard

FCC Part 15.203

#### 7.1.2 Requirement

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. 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.

### 7.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

### 7.3 Result

The EUT antenna is a PCB Antenna. It complies with the standard requirement.

| Antenna Type                                                   |
|----------------------------------------------------------------|
| <input checked="" type="checkbox"/> Permanent attached antenna |
| <input type="checkbox"/> Unique connector antenna              |
| <input type="checkbox"/> Professional installation antenna     |

-----End of Report-----