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Report No.: SZEM110900398701  
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# FCC REPORT

**Application No:** SZEM1109003987RF  
**Applicant:** CHINFAI (HK) TECHNOLOGY CO., LIMITED  
**Manufacturer:** CHINFAI (HK) TECHNOLOGY CO., LIMITED  
**Factory:** CHINFAI (HK) TECHNOLOGY CO., LIMITED  
**Product Name:** BLUETOOTH KEYBOARD  
**Operation Frequency:** 2402MHz to 2480MHz  
**FCC ID:** XJ4KB6136  
**Standards:** FCC CFR Title 47 Part 15 Subpart C: 2010  
**Date of Receipt:** 2011-10-08  
**Date of Test:** 2011-10-11 to 2011-10-21  
**Date of Issue:** 2011-10-31

|                      |               |
|----------------------|---------------|
| <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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### 3 Test Summary

| Test Item                               | Section in CFR 47                                | Result |
|---|--|--------|
| Antenna Requirement                     | 15.203/15.247 (c)                                | Pass   |
| AC Power Line Conducted Emission        | 15.207   | Pass   |
| Conducted Peak Output Power             | 15.247 (b)(1)                                    | Pass   |
| 20dB Occupied Bandwidth                 | 15.247 (a)(1)                                    | Pass   |
| Carrier Frequencies Separation          | 15.247 (a)(1)                                    | Pass   |
| Hopping Channel Number                  | 15.247 (b)                                       | Pass   |
| Dwell Time                              | 15.247 (a)(1)                                    | Pass   |
| Pseudorandom Frequency Hopping Sequence | 15.247(b)(4)&TCB Exclusion List<br>(7 July 2002) | Pass   |
| Radiated Emission                       | 15.205/15.209                                    | Pass   |
| Band Edge                               | 15.247(d)  | Pass   |

*Remark: Pass: The EUT complies with the essential requirements in the standard.*

*Fail: The EUT does not comply with the essential requirements in the standard.*



## 4 General Information

### 4.1 Client Information

|                          |   |
|--------------------------|---|
| Applicant:               | CHINFAI (HK) TECHNOLOGY CO., LIMITED  |
| Address of Applicant:    | Building 2C-2D,Yingfeng industrial Part, Sanhe economic development Zone, Huiyang District, Huizhou City, Guangdong Province, China |
| Manufacturer:            | CHINFAI (HK) TECHNOLOGY CO., LIMITED  |
| Address of Manufacturer: | Building 2C-2D,Yingfeng industrial Part, Sanhe economic development Zone, Huiyang District, Huizhou City, Guangdong Province, China |
| Factory:                 | CHINFAI (HK) TECHNOLOGY CO., LIMITED  |
| Address of Factory:      | Building 2C-2D,Yingfeng industrial Part, Sanhe economic development Zone, Huiyang District, Huizhou City, Guangdong Province, China |

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

|                      |                                       |
|----------------------|---------------------------------------|
| Product Name:        | BLUETOOTH KEYBOARD                    |
| Model No.:           | KB-6136                               |
| Operation Frequency: | 2402MHz~2480MHz                       |
| Channel numbers:     | 79                                    |
| Channel separation:  | 1MHz                                  |
| Modulation type:     | FHSS                                  |
| Antenna Type:        | Integral                              |
| Test software:       | Bluetool (manufacturer declare )      |
| Antenna gain:        | 2.0dBi                                |
| EUT power supply:    | PC USB port supply (charging)         |
| Battery:             | 3.7V Battery 340mAh (Lithium battery) |



| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1                                   | 2402MHz   | 21      | 2422MHz   | 41      | 2442MHz   | 61      | 2462MHz   |
| 2                                   | 2403MHz   | 22      | 2423MHz   | 42      | 2443MHz   | 62      | 2463MHz   |
| 3                                   | 2404MHz   | 23      | 2424MHz   | 43      | 2444MHz   | 63      | 2464MHz   |
| 4                                   | 2405MHz   | 24      | 2425MHz   | 44      | 2445MHz   | 64      | 2465MHz   |
| 5                                   | 2406MHz   | 25      | 2426MHz   | 45      | 2446MHz   | 65      | 2466MHz   |
| 6                                   | 2407MHz   | 26      | 2427MHz   | 46      | 2447MHz   | 66      | 2467MHz   |
| 7                                   | 2408MHz   | 27      | 2428MHz   | 47      | 2448MHz   | 67      | 2468MHz   |
| 8                                   | 2409MHz   | 28      | 2429MHz   | 48      | 2449MHz   | 68      | 2469MHz   |
| 9                                   | 2410MHz   | 29      | 2430MHz   | 49      | 2450MHz   | 69      | 2470MHz   |
| 10                                  | 2411MHz   | 30      | 2431MHz   | 50      | 2451MHz   | 70      | 2471MHz   |
| 11                                  | 2412MHz   | 31      | 2432MHz   | 51      | 2452MHz   | 71      | 2472MHz   |
| 12                                  | 2413MHz   | 32      | 2433MHz   | 52      | 2453MHz   | 72      | 2473MHz   |
| 13                                  | 2414MHz   | 33      | 2434MHz   | 53      | 2454MHz   | 73      | 2474MHz   |
| 14                                  | 2415MHz   | 34      | 2435MHz   | 54      | 2455MHz   | 74      | 2475MHz   |
| 15                                  | 2416MHz   | 35      | 2436MHz   | 55      | 2456MHz   | 75      | 2476MHz   |
| 16                                  | 2417MHz   | 36      | 2437MHz   | 56      | 2457MHz   | 76      | 2477MHz   |
| 17                                  | 2418MHz   | 37      | 2438MHz   | 57      | 2458MHz   | 77      | 2478MHz   |
| 18                                  | 2419MHz   | 38      | 2439MHz   | 58      | 2459MHz   | 78      | 2479MHz   |
| 19                                  | 2420MHz   | 39      | 2440MHz   | 59      | 2460MHz   | 79      | 2480MHz   |
| 20                                  | 2421MHz   | 40      | 2441MHz   | 60      | 2461MHz   |         |           |

**Note:**

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel for testing see below:

| Channel         | Frequency |
|-----------------|-----------|
| Lowest channel  | 2402MHz   |
| Middle channel  | 2441MHz   |
| Highest channel | 2480MHz   |



### 4.3 E.U.T Operation mode

|                               |   |
|-------------------------------|---|
| <b>Operating Environment:</b> |   |
| Temperature:                  | 25.0 °C   |
| Humidity:                     | 50 % RH   |
| Atmospheric Pressure:         | 1014mbar  |
| <b>Test mode:</b>             |   |
| Charge + transmitting:        | Keep the EUT exchange data and other transmitting device, and PC charge to EUT. |
| Transmitting:                 | Keep the EUT in transmitting mode.  |

### 4.4 Description of Support Units

The EUT was tested with associated equipment as below:

| Description    | Manufacturer      | Model No.    |
|----------------|-------------------|--------------|
| PC             | DELL              | OPTIPLEX 755 |
| LCD-displaying | DELL              | E1909WF      |
| KEYBOARD       | DELL              | SK-8115      |
| MOUSE          | DELL              | MOC5110      |
| PC             | DELL              | OPTIDLEX 330 |
| LCD-displaying | DELL              | SP2208WFPT   |
| KEYBOARD       | DELL              | SK-8115      |
| MOUSE          | DELL              | MOC5110      |
| Coder          | HengTong ELECTRON | HT4000       |
| Printer        | Canon             | BJC-1000SP   |
| Mobile         | Nokia             | 6300         |



## **4.5 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.

### **VCCI**

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

### **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 556682, March 16, 2011

### **Industry Canada (IC)**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

## **4.6 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

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## **4.7 Other Information Requested by the Customer**

None.

**4.8 Test Instruments list**

| <b>RE in Chamber</b> |                                   |  |                  |                      |                                      |
|----------------------|-----------------------------------|--|------------------|----------------------|--------------------------------------|
| <b>Item</b>          | <b>Test Equipment</b>             | <b>Manufacturer</b>                      | <b>Model No.</b> | <b>Inventory No.</b> | <b>Cal.Due date<br/>(yyyy-mm-dd)</b> |
| 1                    | 3m Semi-Anechoic Chamber          | ETS-LINDGREN                             | N/A              | SEL0017              | 2012-06-10                           |
| 2                    | EMI Test Receiver                 | Rohde & Schwarz                          | ESIB26           | SEL0023              | 2012-05-26                           |
| 3                    | EMI Test software                 | AUDIX                                    | E3               | SEL0050              | N/A                                  |
| 4                    | Coaxial cable                     | SGS                                      | N/A              | SEL0028              | 2012-05-29                           |
| 5                    | BiConiLog Antenna<br>(26-3000MHz) | ETS-LINDGREN                             | 3142C            | SEL0015              | 2011-11-09                           |
| 6                    | Double-ridged horn<br>(1-18GHz)   | ETS-LINDGREN                             | 3117             | SEL0006              | 2011-11-09                           |
| 7                    | Horn Antenna<br>(18-26GHz)        | ETS-LINDGREN                             | 3160             | SEL0076              | 2011-11-09                           |
| 8                    | Pre-amplifier<br>(0.1-1300MHz)    | Agilent<br>Technologies                  | 8447D            | SEL0053              | 2012-05-26                           |
| 9                    | Pre-Amplifier<br>(0.1-26.5GHz)    | Compliance<br>Directions Systems<br>Inc. | PAP-0126         | SEL0168              | 2011-10-27                           |
| 11                   | Band filter                       | Amindeon                                 | 82346            | SEL0094              | 2012-05-26                           |

| <b>RF conducted</b> |                       |                     |                  |                      |                                      |
|---------------------|-----------------------|---------------------|------------------|----------------------|--------------------------------------|
| <b>Item</b>         | <b>Test Equipment</b> | <b>Manufacturer</b> | <b>Model No.</b> | <b>Inventory No.</b> | <b>Cal.Due date<br/>(yyyy-mm-dd)</b> |
| 1                   | Spectrum Analyzer     | Rohde & Schwarz     | FSP 30           | SEL0154              | 2011-10-27                           |
| 2                   | Coaxial cable         | SGS                 | N/A              | SEL0028              | 2012-05-29                           |



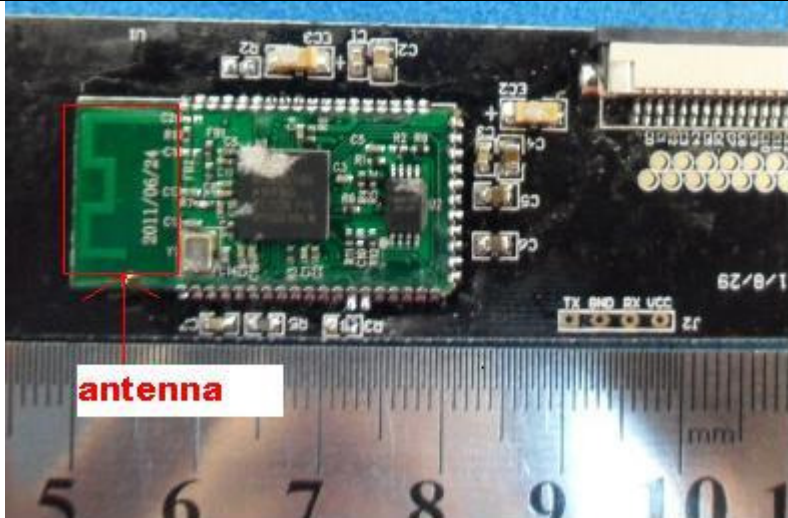


| <b>Conducted Emission</b> |                       |                     |                  |                      |                                      |
|---------------------------|-----------------------|---------------------|------------------|----------------------|--------------------------------------|
| <b>Item</b>               | <b>Test Equipment</b> | <b>Manufacturer</b> | <b>Model No.</b> | <b>Inventory No.</b> | <b>Cal.Due date<br/>(yyyy-mm-dd)</b> |
| 1                         | Shielding Room        | ZhongYu Electron    | GB-88            | SEL0042              | 2012-06-10                           |
| 2                         | LISN                  | Rohde & Schwarz     | ENV216           | SEL0152              | 2011-10-26                           |
| 3                         | Two-Line V-Network    | ETS-LINDGREN        | 3816/2           | SEL0021              | 2012-05-26                           |
| 4                         | EMI Test Receiver     | Rohde & Schwarz     | ESCI             | SEL0022              | 2012-05-26                           |
| 5                         | Coaxial Cable         | SGS                 | N/A              | SEL0024              | 2012-05-29                           |

| <b>General used equipment</b> |                                       |                     |                  |                       |                                      |
|-------------------------------|---------------------------------------|---------------------|------------------|-----------------------|--------------------------------------|
| <b>Item</b>                   | <b>Test Equipment</b>                 | <b>Manufacturer</b> | <b>Model No.</b> | <b>Inventory No.</b>  | <b>Cal.Due date<br/>(yyyy-mm-dd)</b> |
| 1                             | Humidity/<br>Temperature<br>Indicator | Shanghai            | ZJ1-2B           | SEL0102 to<br>SEL0103 | 2012-10-27                           |
| 2                             | Humidity/<br>Temperature<br>Indicator | Shanghai            | ZJ1-2B           | SEL0101               | 2012-10-27                           |
| 3                             | Barometer                             | ChangChun           | DYM3             | SEL0088               | 2012-05-18                           |

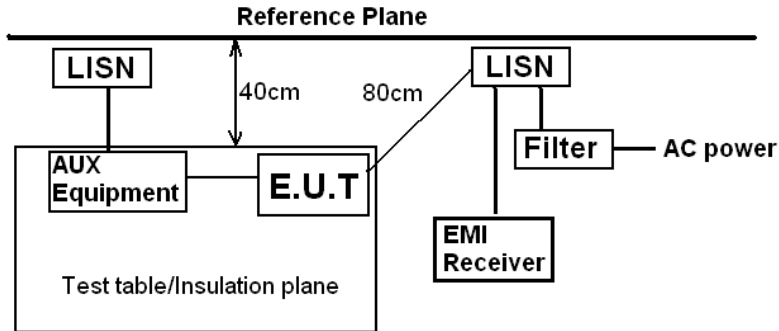
## 5 Test results and Measurement Data

### 5.1 Antenna requirement:

|  |                                     |
|--|-------------------------------------|
| <b>Standard requirement:</b>   | FCC Part15 C Section 15.203 /247(c) |
| <p>15.203 requirement:<br/> <i>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.</i></p> <p>15.247(c) (1)(i) requirement:<br/> <i>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</i></p> |                                     |
| <b>E.U.T Antenna:</b>  |                                     |
| <p>The antenna is integrated on the main PCB and no consideration of replacement. The best gain of the antenna is 2.0dBi.</p>  |                                     |
|   |                                     |



## 5.2 Conducted Emissions

|  |   |              |           |
|--|---|--------------|-----------|
| Test Requirement:                                | FCC Part15 C Section 15.207   |              |           |
| Test Method:                                     | ANSI C63.10: 2009   |              |           |
| Test Frequency Range:                            | 150KHz to 30MHz   |              |           |
| Class / Severity:                                | Class B   |              |           |
| Limit:   | Frequency range (MHz)   | Limit (dBuV) |           |
|  |   | Quasi-peak   | Average   |
|  | 0.15-0.5  | 66 to 56*    | 56 to 46* |
|  | 0.5-5   | 56           | 46        |
|  | 5-30  | 60           | 50        |
| * Decreases with the logarithm of the frequency. |   |              |           |
| Test procedure                                   | The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement. |              |           |
| Test setup:                                      |  <p><i>Remark:</i><br/> E.U.T: Equipment Under Test<br/> LISN: Line Impedance Stabilization Network<br/> Test table height=0.8m</p>   |              |           |
| Test Instruments:                                | Refer to section 4.8 for details  |              |           |
| Test mode:                                       | Charge + transmitting mode  |              |           |
| Test results:                                    | Pass  |              |           |

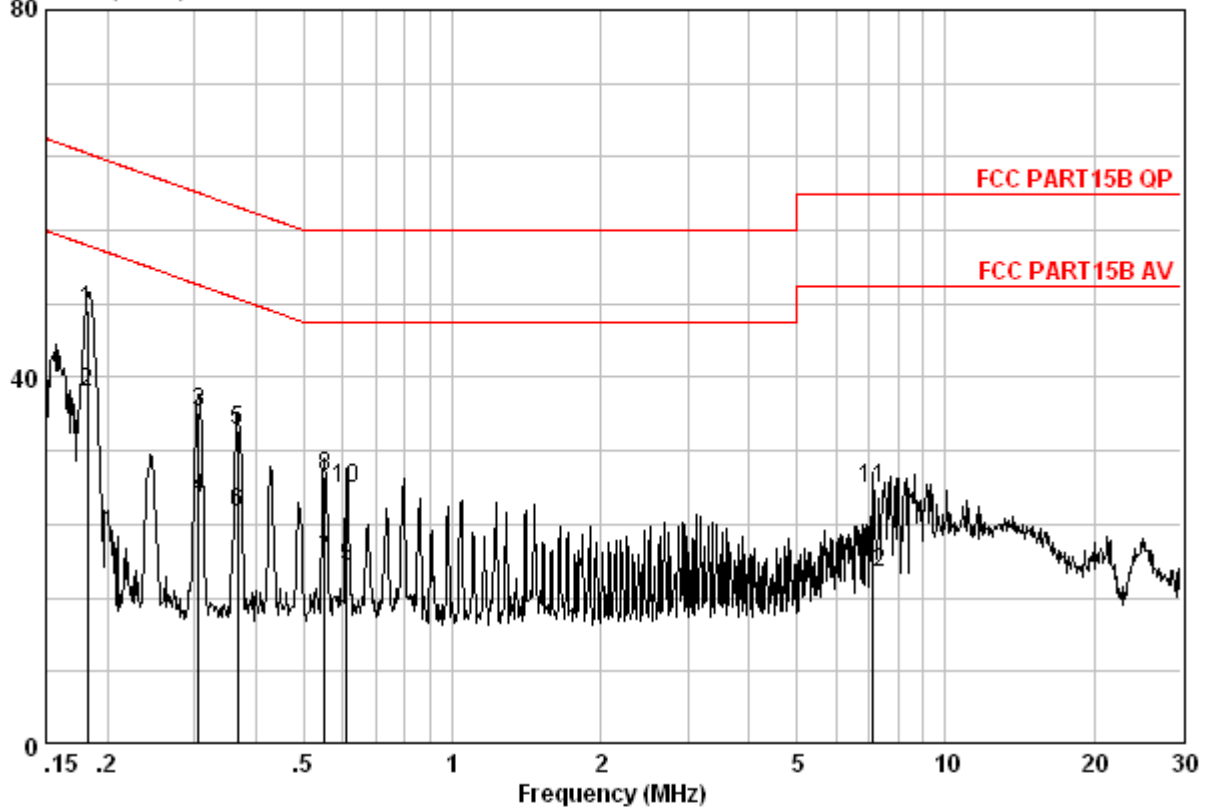
### Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

## Live Line:

Data: 242  
Level (dBuV)



|    | Freq    | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark  |
|----|---------|------------|-------------|------------|-------|------------|------------|---------|
|    | MHz     | dB         | dB          | dBuV       | dBuV  | dBuV       | dB         |         |
| 1  | 0.18200 | 0.04       | 9.60        | 37.62      | 47.26 | 64.39      | -17.13     | QP      |
| 2  | 0.18200 | 0.04       | 9.60        | 28.62      | 38.26 | 54.39      | -16.13     | Average |
| 3  | 0.30600 | 0.05       | 9.60        | 26.54      | 36.19 | 60.08      | -23.89     | QP      |
| 4  | 0.30600 | 0.05       | 9.60        | 17.10      | 26.75 | 50.08      | -23.33     | Average |
| 5  | 0.36700 | 0.05       | 9.60        | 24.49      | 34.14 | 58.57      | -24.43     | QP      |
| 6  | 0.36700 | 0.05       | 9.60        | 15.65      | 25.31 | 48.57      | -23.26     | Average |
| 7  | 0.55000 | 0.06       | 9.63        | 10.45      | 20.13 | 46.00      | -25.87     | Average |
| 8  | 0.55000 | 0.06       | 9.63        | 19.55      | 29.23 | 56.00      | -26.77     | QP      |
| 9  | 0.61000 | 0.06       | 9.66        | 9.70       | 19.42 | 46.00      | -26.58     | Average |
| 10 | 0.61000 | 0.06       | 9.66        | 18.26      | 27.98 | 56.00      | -28.02     | QP      |
| 11 | 7.100   | 0.20       | 9.90        | 17.70      | 27.79 | 60.00      | -32.21     | QP      |
| 12 | 7.100   | 0.20       | 9.90        | 8.60       | 18.69 | 50.00      | -31.31     | Average |

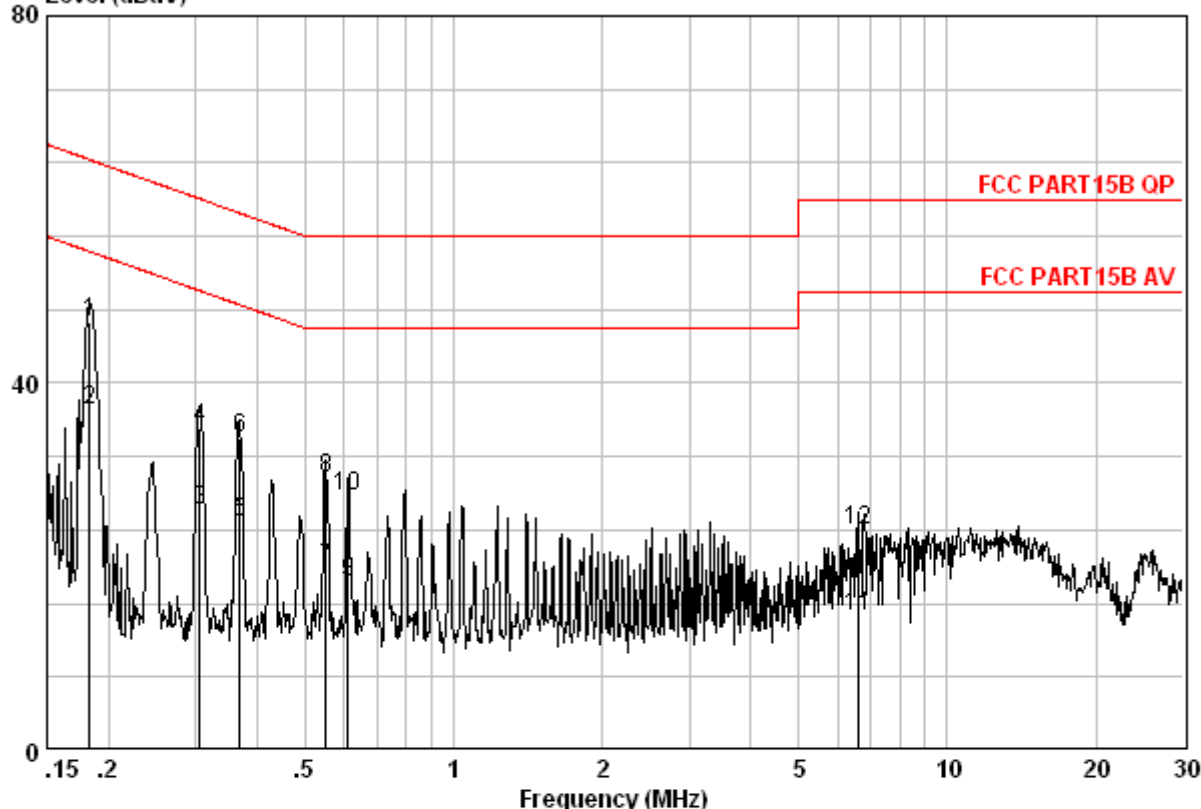
## Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



Neutral Line:

Data: 241  
Level (dBuV)

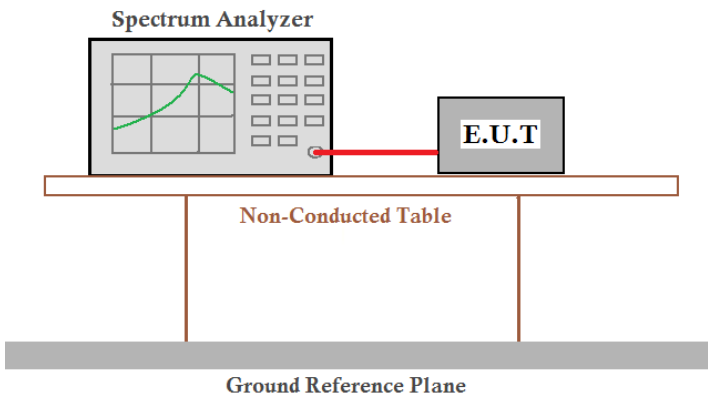


|    | Freq    | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark  |
|----|---------|------------|-------------|------------|-------|------------|------------|---------|
|    | MHz     | dB         | dB          | dBuV       | dBuV  | dBuV       | dB         |         |
| 1  | 0.18300 | 0.04       | 9.60        | 36.94      | 46.58 | 64.35      | -17.76     | QP      |
| 2  | 0.18300 | 0.04       | 9.60        | 27.40      | 37.04 | 54.35      | -17.31     | Average |
| 3  | 0.30600 | 0.05       | 9.60        | 16.60      | 26.25 | 50.08      | -23.83     | Average |
| 4  | 0.30600 | 0.05       | 9.60        | 25.40      | 35.05 | 60.08      | -25.03     | QP      |
| 5  | 0.36800 | 0.05       | 9.60        | 15.20      | 24.85 | 48.55      | -23.69     | Average |
| 6  | 0.36800 | 0.05       | 9.60        | 24.42      | 34.08 | 58.55      | -24.47     | QP      |
| 7  | 0.55000 | 0.06       | 9.63        | 10.10      | 19.79 | 46.00      | -26.21     | Average |
| 8  | 0.55000 | 0.06       | 9.63        | 19.96      | 29.65 | 56.00      | -26.35     | QP      |
| 9  | 0.61000 | 0.06       | 9.66        | 8.50       | 18.22 | 46.00      | -27.78     | Average |
| 10 | 0.61000 | 0.06       | 9.66        | 17.87      | 27.59 | 56.00      | -28.41     | QP      |
| 11 | 6.600   | 0.19       | 9.80        | 4.60       | 14.59 | 50.00      | -35.41     | Average |
| 12 | 6.600   | 0.19       | 9.80        | 13.92      | 23.91 | 60.00      | -36.09     | QP      |

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

### 5.3 Conducted Peak Output Power

|                   |   |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.247 (b)(1)  |
| Test Method:      | ANSI C63.10:2009  |
| Limit:            | 30dBm   |
| Test setup:       |  <p><i>Remark:</i><br/>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p> |
| Test Instruments: | Refer to section 4.8 for details  |
| Test state:       | Non-hopping transmitting with all kinds of modulation.  |
| Test results:     | Pass  |

### Measurement Data

| GFSK mode    |                         |             |        |
|--------------|-------------------------|-------------|--------|
| Test channel | Peak Output Power (dBm) | Limit (dBm) | Result |
| Lowest       | -2.63                   | 30.00       | Pass   |
| Middle       | -4.08                   | 30.00       | Pass   |
| Highest      | -3.49                   | 30.00       | Pass   |



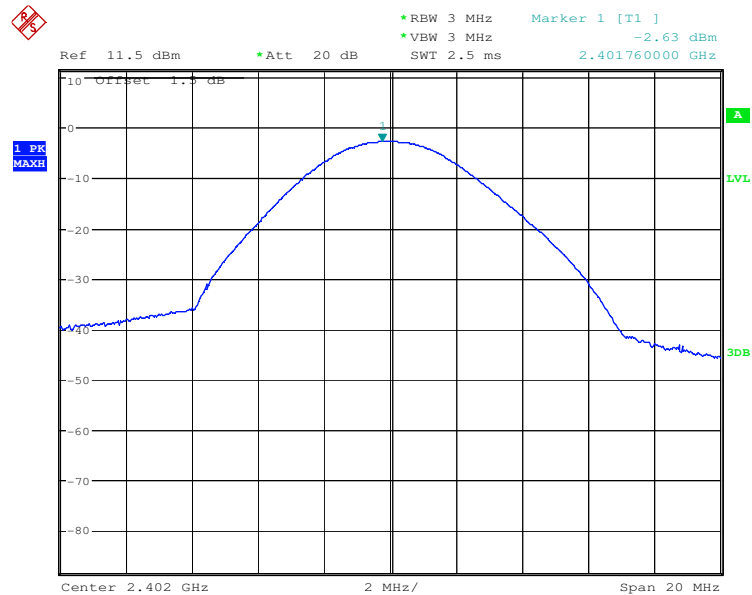
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM110900398701

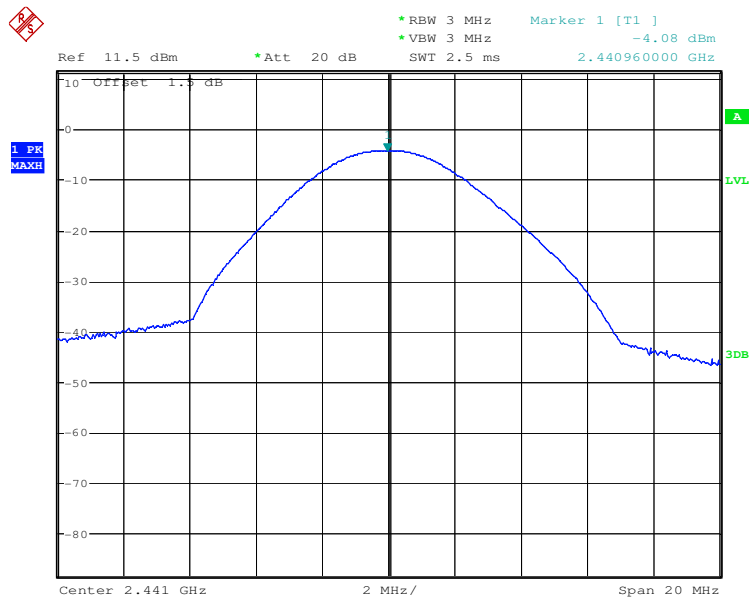
Page : 15 of 49

Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



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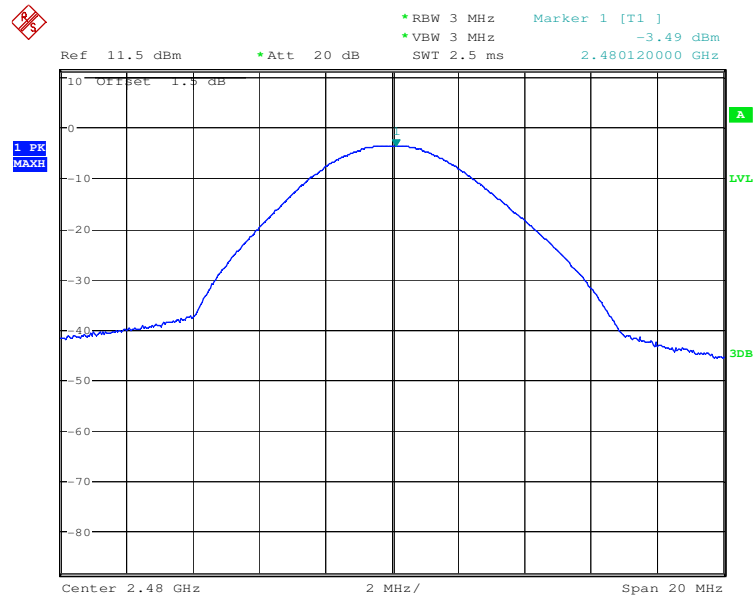


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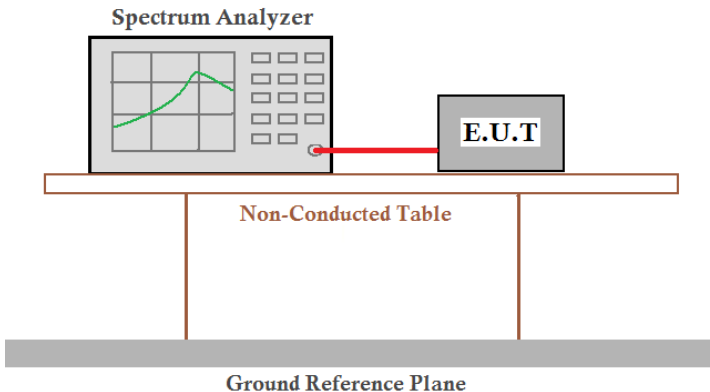
|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



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## 5.4 20dB Occupy Bandwidth

|                   |  |
|-------------------|--|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)   |
| Test Method:      | ANSI C63.10:2009   |
| Limit:            | NA   |
| Test setup:       |  |
| Test Instruments: | Refer to section 4.8 for details   |
| Test state:       | Non-hopping transmitting with all kind of modulation.                              |
| Test results:     | Pass   |

### Measurement Data

| Test channel | 20dB Occupy Bandwidth (KHz) |
|--------------|-----------------------------|
|              | GFSK                        |
| Lowest       | 752                         |
| Middle       | 640                         |
| Highest      | 748                         |



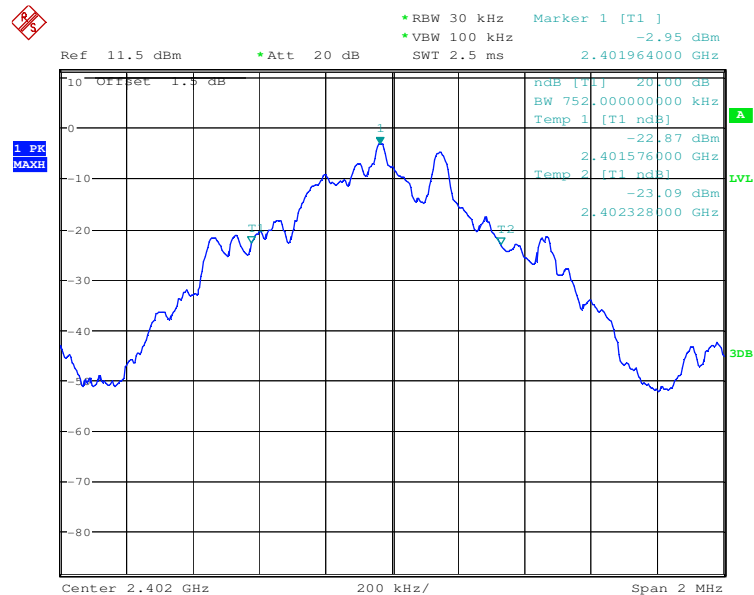
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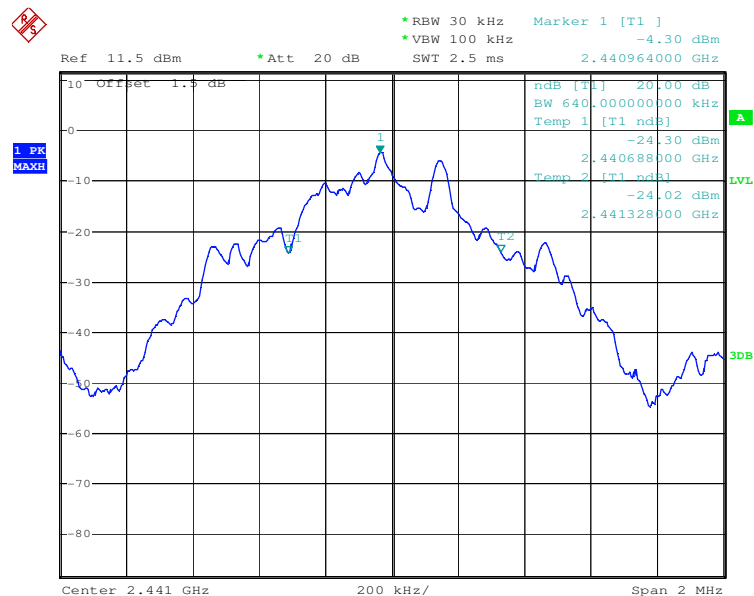
Page : 18 of 49

Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



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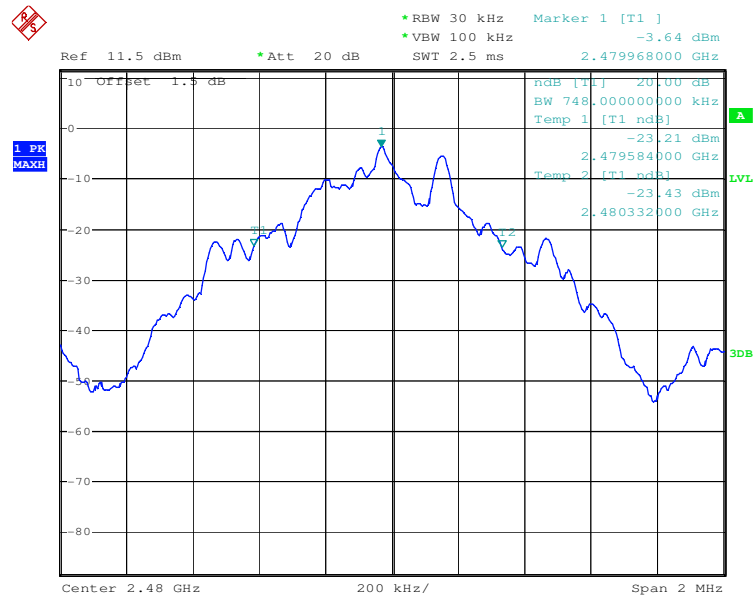


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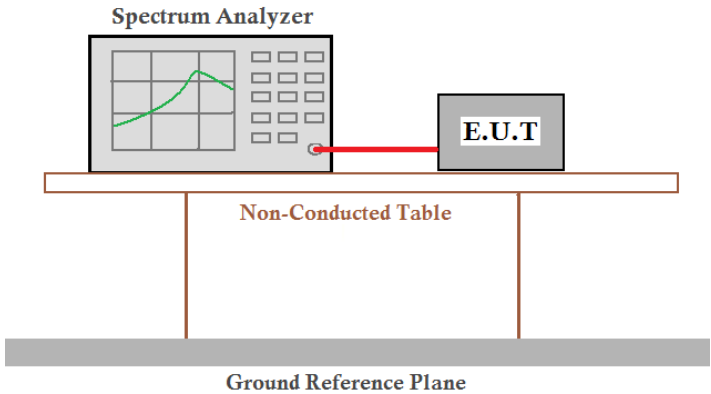
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|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



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## 5.5 Carrier Frequencies Separation

|                   |  |
|-------------------|--|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)   |
| Test Method:      | ANSI C63.10:2009   |
| Test state:       | Hopping transmitting with all kind of modulation.                                  |
| Test setup:       |  |
| Test Instruments: | Refer to section 4.8 for details   |
| Limit:            | 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)                       |
| Test results:     | Pass   |

### Measurement Data

| GFSK mode    |                                      |              |        |
|--------------|--------------------------------------|--------------|--------|
| Test channel | Carrier Frequencies Separation (KHz) | Limit (KHz)  | Result |
| Lowest       | 1004                                 | $\geq 498.7$ | Pass   |
| Middle       | 1004                                 | $\geq 498.7$ | Pass   |
| Highest      | 1004                                 | $\geq 498.7$ | Pass   |

Note: According to section 5.4,

| Mode | 20dB bandwidth (KHz)<br>(worse case) | Limit (KHz)<br>(Carrier Frequencies Separation) |
|------|--------------------------------------|---|
| GFSK | 748                                  | 498.7   |



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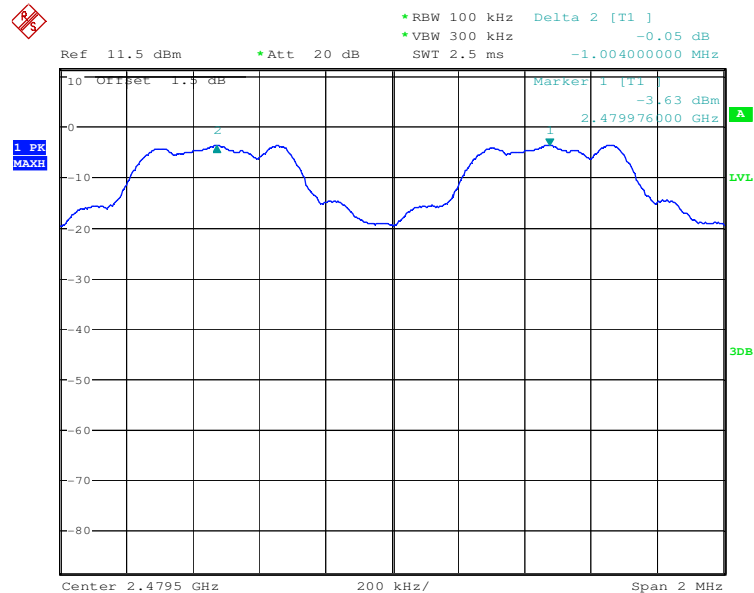


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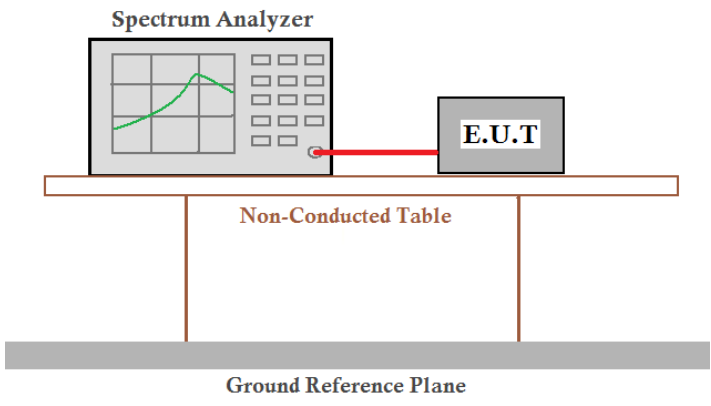
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|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



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## 5.6 Hopping Channel Number

|                   |  |
|-------------------|--|
| Test Requirement: | FCC Part15 C Section 15.247 (b)  |
| Test Method:      | ANSI C63.10:2009   |
| Requirement:      | $\geq 75$ channels   |
| Test setup:       |  |
| Test Instruments: | Refer to section 4.8 for details   |
| Test state:       | Hopping transmitting with all kind of modulation.                                  |
| Test results:     | Pass   |

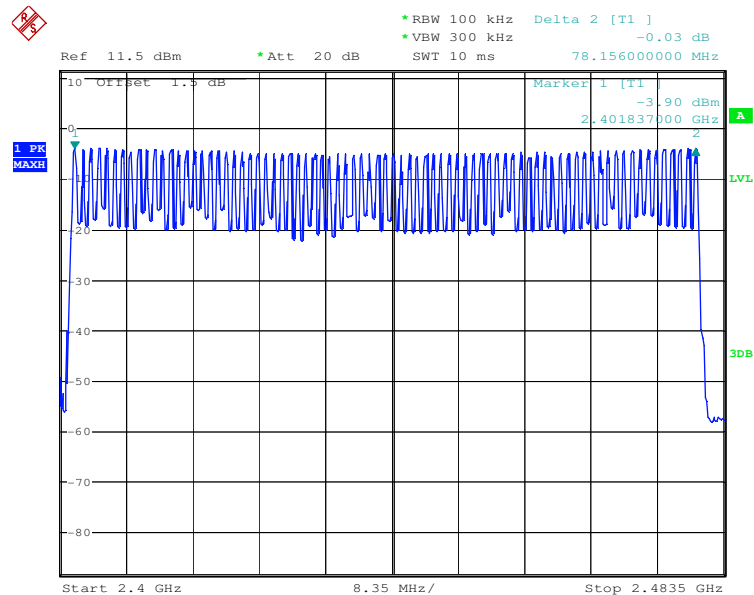
### Measurement Data

| Mode | Hopping channel | Requirement |
|------|-----------------|-------------|
| GFSK | 79              | $\geq 75$   |



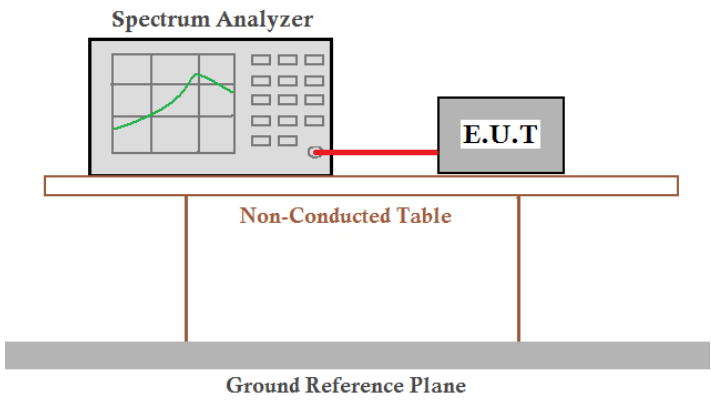
Test plot as follows

|            |      |  |
|------------|------|--|
| Test mode: | GFSK |  |
|------------|------|--|





## 5.7 Dwell Time

|                   |  |
|-------------------|--|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)   |
| Test Method:      | ANSI C63.10:2009   |
| Limit:            | $\leq 0.4$ Second  |
| Test setup:       |  |
| Test Instruments: | Refer to section 4.8 for details   |
| Test state:       | Hopping transmitting with all kind of modulation.                                  |
| Test results:     | Pass   |

### Measurement Data

| Mode | Packet | Dwell time (second) | Limit (second) |
|------|--------|---------------------|----------------|
| GFSK | DH1    | 0.1440              | $\leq 0.4$     |
|      | DH3    | 0.2736              | $\leq 0.4$     |
|      | DH5    | 0.3177              | $\leq 0.4$     |

### Test Result:

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

The lowest channel (2402MHz), middle channel (2441MHz), highest channel (2480MHz) as blow

DH1 time slot =  $0.450(\text{ms}) \times (1600 / (2 \times 79)) \times 31.6 = 144.0\text{ms}$

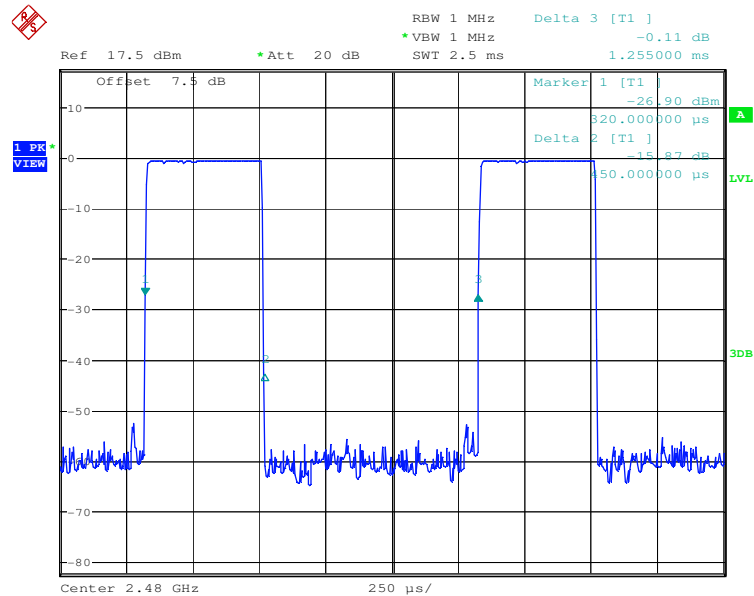
DH3 time slot =  $1.710(\text{ms}) \times (1600 / (4 \times 79)) \times 31.6 = 273.6\text{ms}$

DH5 time slot =  $2.980(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 317.7\text{ms}$

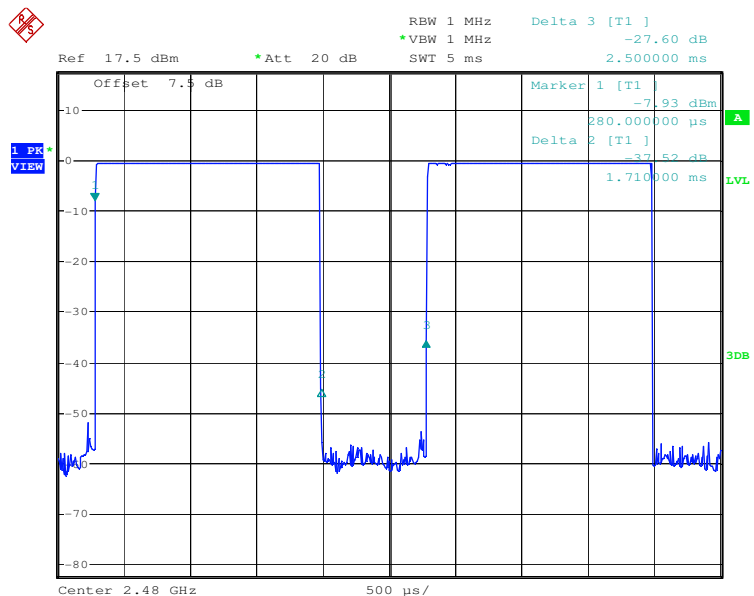


Test plot as follows

|            |      |              |     |
|------------|------|--------------|-----|
| Test mode: | GFSK | Test Packet: | DH1 |
|------------|------|--------------|-----|



|            |      |              |     |
|------------|------|--------------|-----|
| Test mode: | GFSK | Test Packet: | DH3 |
|------------|------|--------------|-----|



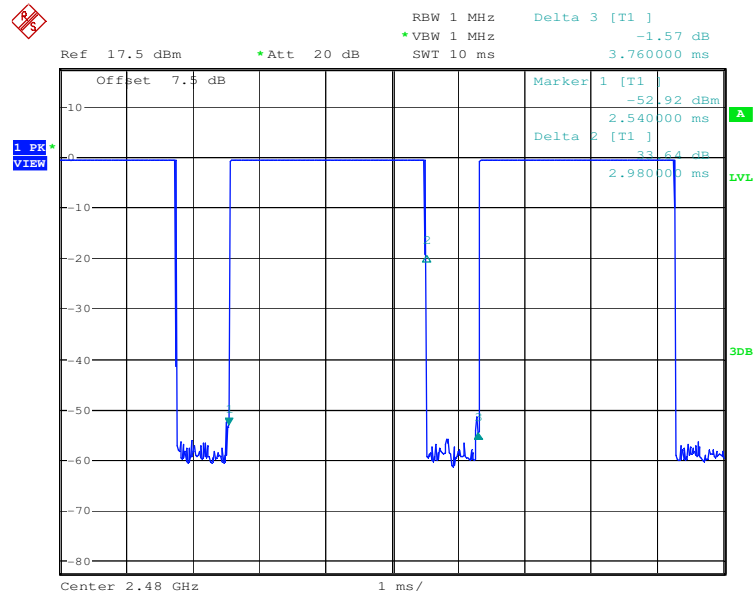


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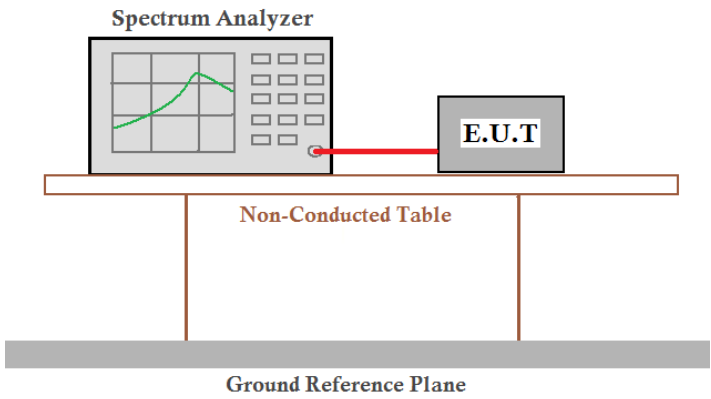
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|            |      |              |     |
|------------|------|--------------|-----|
| Test mode: | GFSK | Test Packet: | DH5 |
|------------|------|--------------|-----|



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## 5.8 Band Edge

|                   |   |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d)   |
| Test Method:      | ANSI C63.10:2009  |
| Limit:            | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test setup:       |  <p><i>Remark:</i><br/>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>  |
| Test Instruments: | Refer to section 4.8 for details  |
| Test state:       | Hopping transmitting with all kinds of modulation.  |
| Test results:     | Pass  |



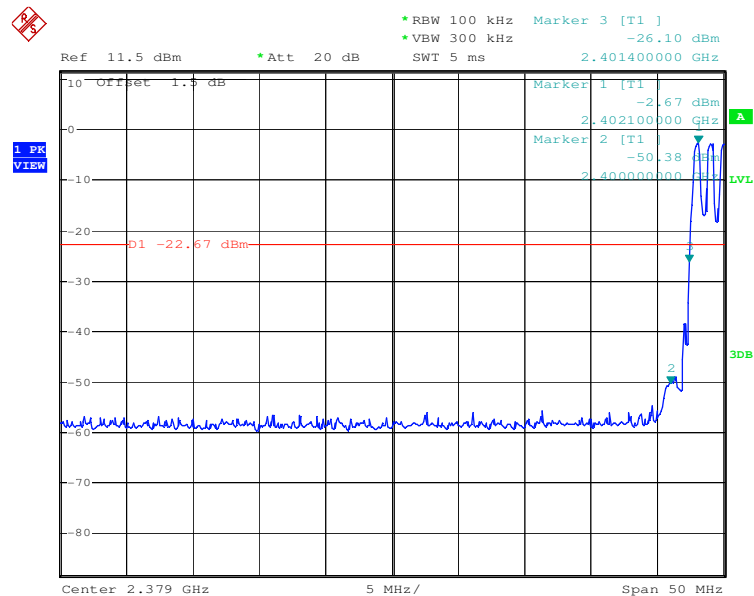
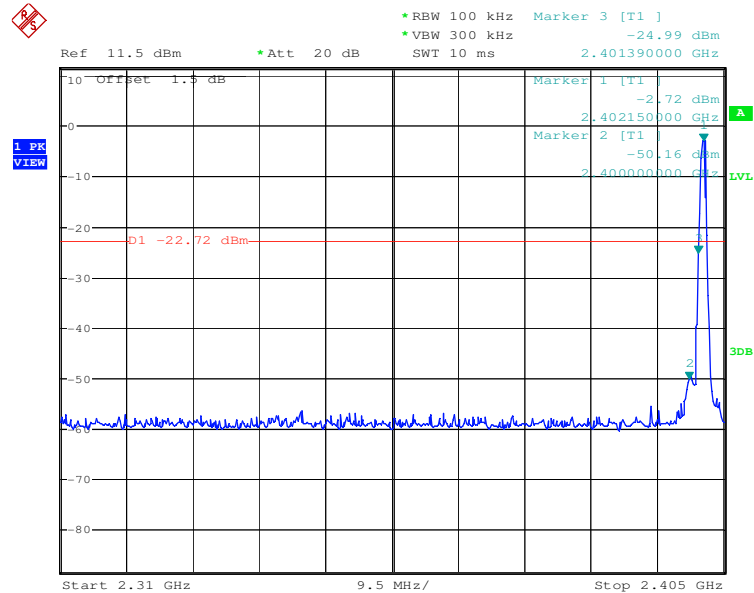
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Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



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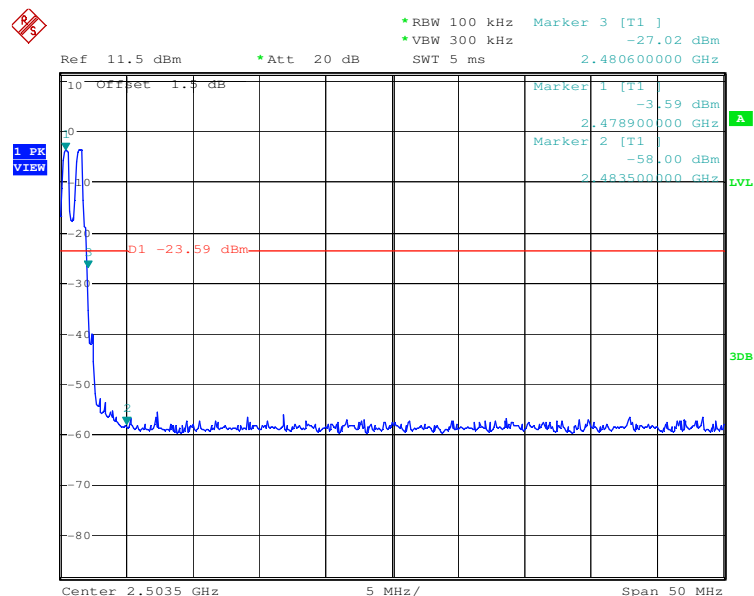
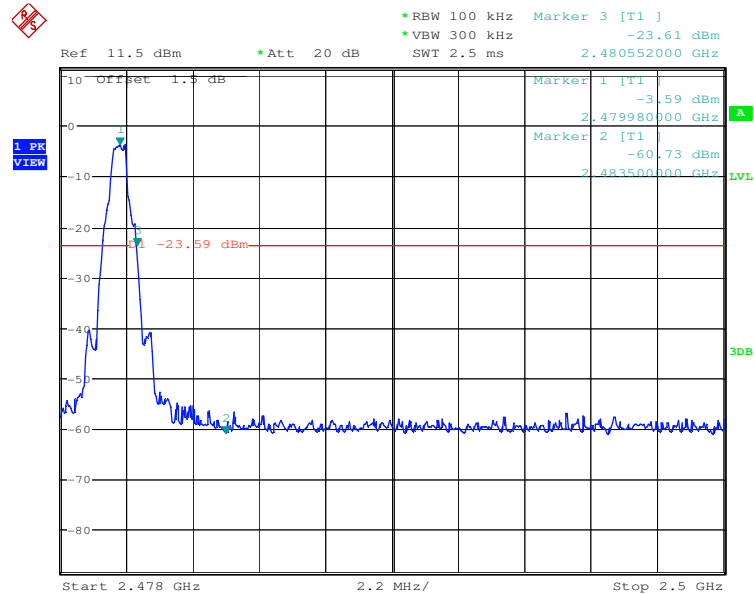


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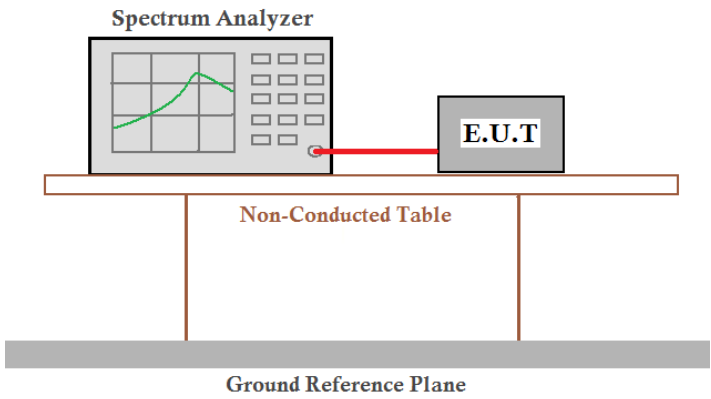
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|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



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## 5.9 RF Antenna Conducted spurious emissions

|                   |   |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d)   |
| Test Method:      | ANSI C63.10:2009  |
| Limit:            | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test setup:       |  <p><i>Remark:</i><br/>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>  |
| Test Instruments: | Refer to section 4.8 for details  |
| Test results:     | Pass  |

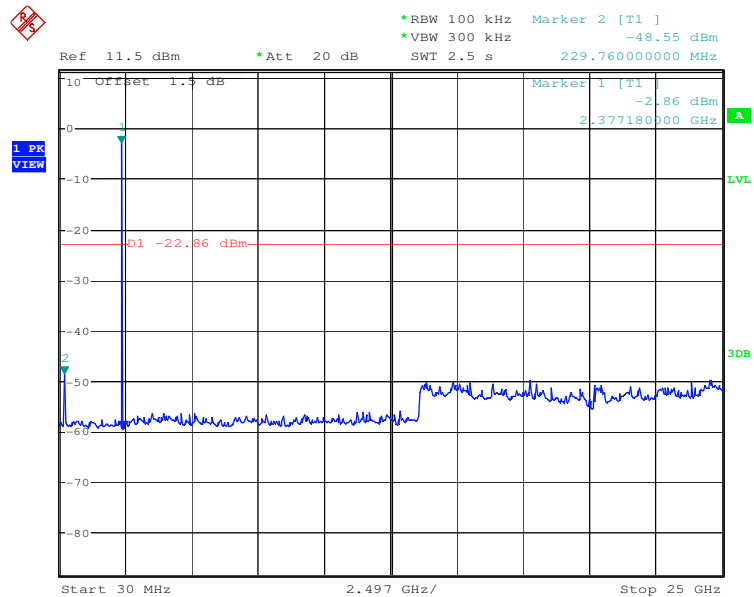


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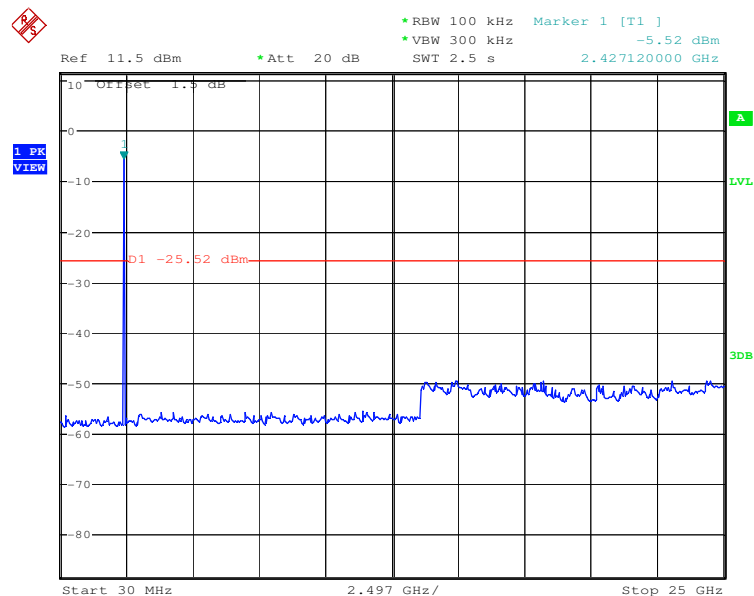
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|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|



|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|



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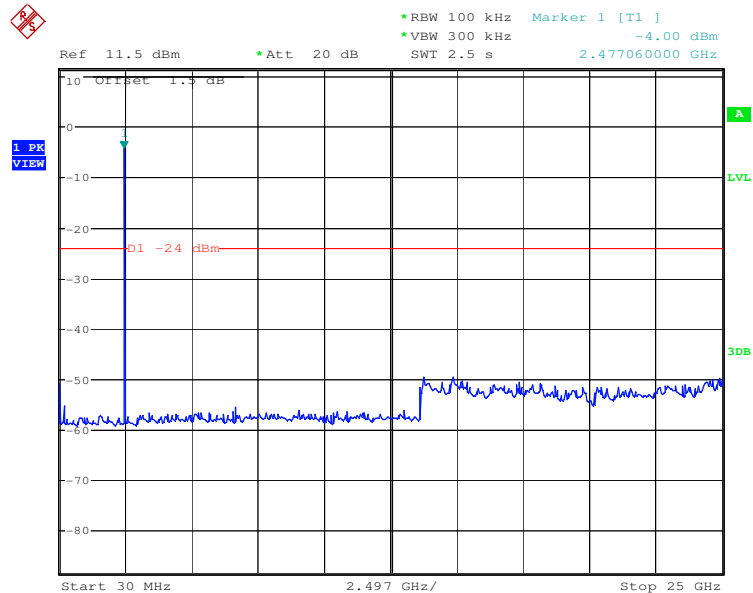


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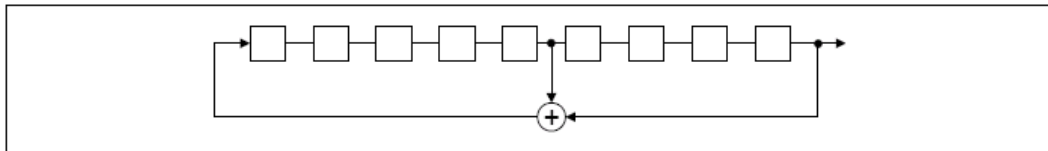
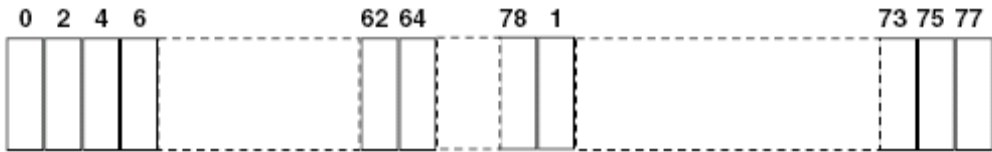
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|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



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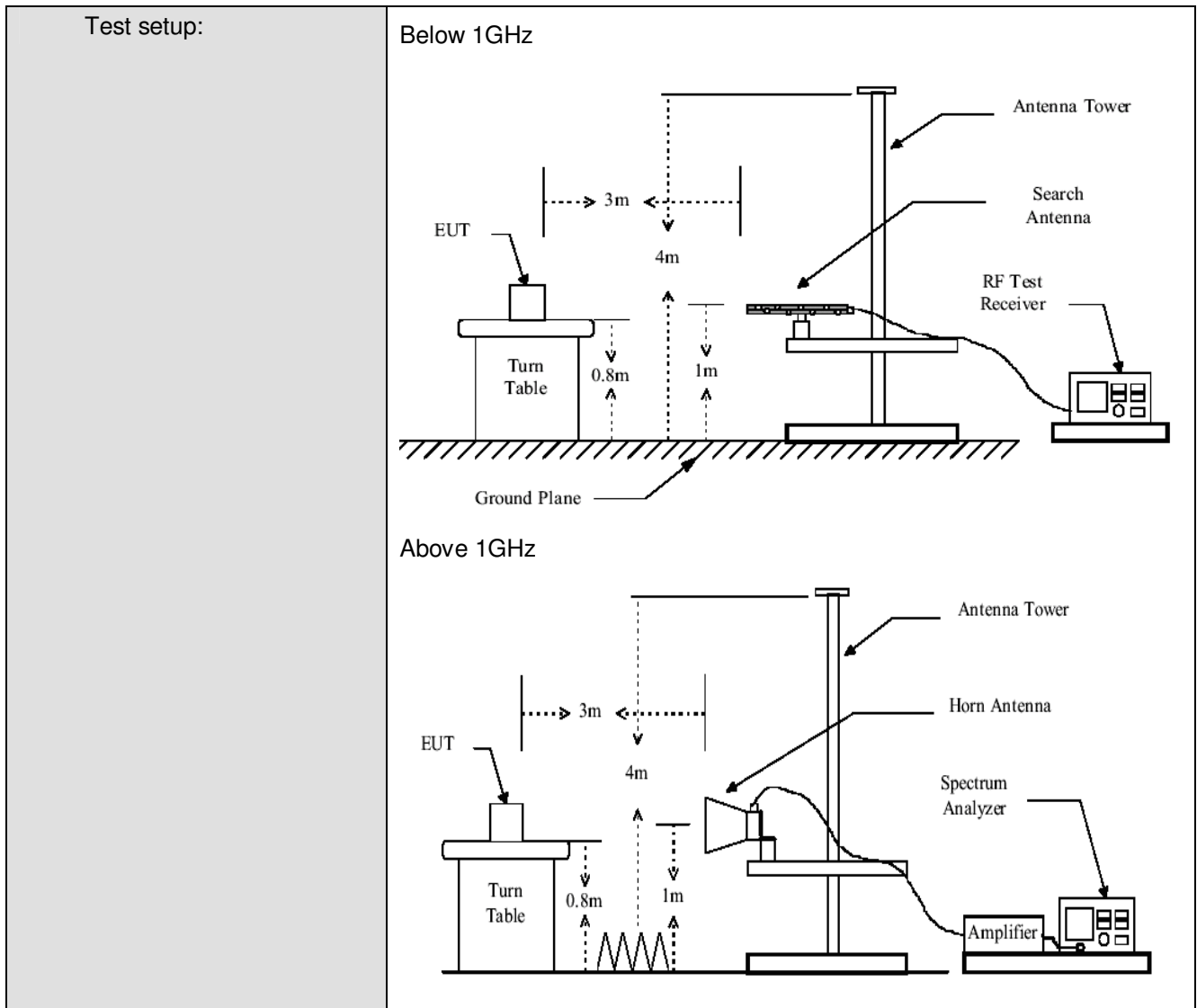
## 5.10 Pseudorandom Frequency Hopping Sequence

| Test Requirement:   | FCC Part15 C Section 15.247 (a)(1) requirement: |
|---|---|
| <p>Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.</p> <p>Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.</p>  |   |
| EUT Pseudorandom Frequency Hopping Sequence   |   |
| <p>The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.</p> <ul style="list-style-type: none"> <li>• Number of shift register stages: 9</li> <li>• Length of pseudo-random sequence: <math>2^9 - 1 = 511</math> bits</li> <li>• Longest sequence of zeros: 8 (non-inverted signal)</li> </ul> <div data-bbox="300 996 1353 1146" data-label="Diagram">  </div> <p style="text-align: center;"><i>Linear Feedback Shift Register for Generation of the PRBS sequence</i></p> <p>An example of Pseudorandom Frequency Hopping Sequence as follow:</p> <div data-bbox="277 1249 1273 1400" data-label="Diagram">  </div> <p>Each frequency used equally on the average by each transmitter.<br/>The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.</p> |   |



## 5.11 Radiated Emission

|                       |  |            |                    |               |                  |
|-----------------------|--|------------|--------------------|---------------|------------------|
| Test Requirement:     | FCC Part15 C Section 15.209 and 15.205   |            |                    |               |                  |
| Test Method:          | ANSI C63.10: 2009  |            |                    |               |                  |
| Test Frequency Range: | 30MHz to 25GHz   |            |                    |               |                  |
| Test site:            | Measurement Distance: 3m (Semi-Anechoic Chamber)   |            |                    |               |                  |
| Receiver setup:       |  |            |                    |               |                  |
|                       | Frequency  | Detector   | RBW                | VBW           | Remark           |
|                       | 30MHz-1GHz   | Quasi-peak | 100KHz             | 300KHz        | Quasi-peak Value |
|                       | Above 1GHz   | Peak       | 1MHz               | 3MHz          | Peak Value       |
| Peak                  |  | 1MHz       | 10Hz               | Average Value |                  |
| Limit:                |  |            |                    |               |                  |
|                       | Frequency  |            | Limit (dBuV/m @3m) |               | Remark           |
|                       | 30MHz-88MHz  |            | 40.0               |               | Quasi-peak Value |
|                       | 88MHz-216MHz   |            | 43.5               |               | Quasi-peak Value |
|                       | 216MHz-960MHz  |            | 46.0               |               | Quasi-peak Value |
|                       | 960MHz-1GHz  |            | 54.0               |               | Quasi-peak Value |
|                       | Above 1GHz   |            | 54.0               |               | Average Value    |
| 74.0                  |  |            | Peak Value         |               |                  |
| Test Procedure:       | <div>1. The EUT is placed on a turntable, which is 0.8m above ground plane.</div> <div>2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.</div> <div>3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.</div> <div>4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.</div> <div>5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.</div> <div>6. Repeat above procedures until the measurements for all frequencies are complete.</div> <div>7. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.</div> |            |                    |               |                  |
| Test Instruments:     | Refer to section 4.8 for details   |            |                    |               |                  |
| Test mode:            | Charge + transmitting mode   |            |                    |               |                  |
| Test results:         | Pass   |            |                    |               |                  |



**Note:**

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

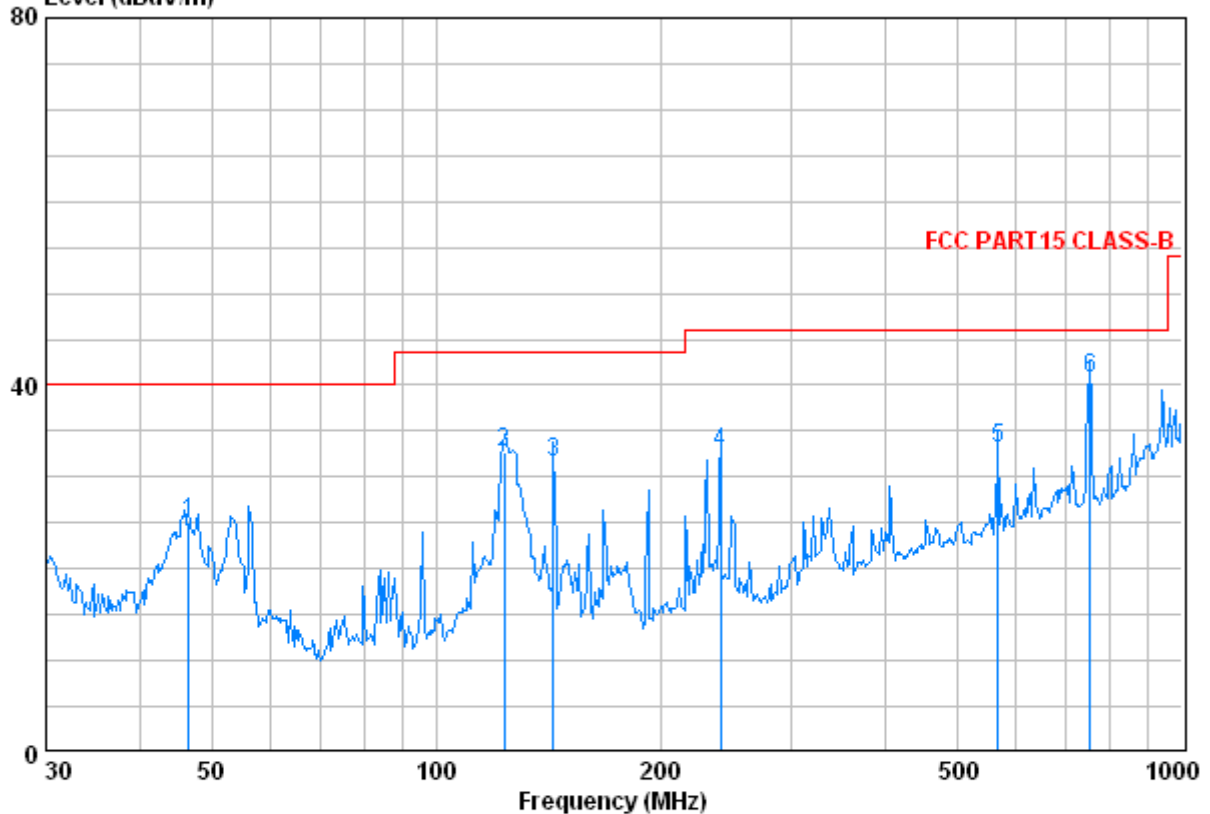
### 5.11.1 Radiated emission below 1GHz

Charge + transmitting mode

Vertical

Data: 312

Level (dBuV/m)

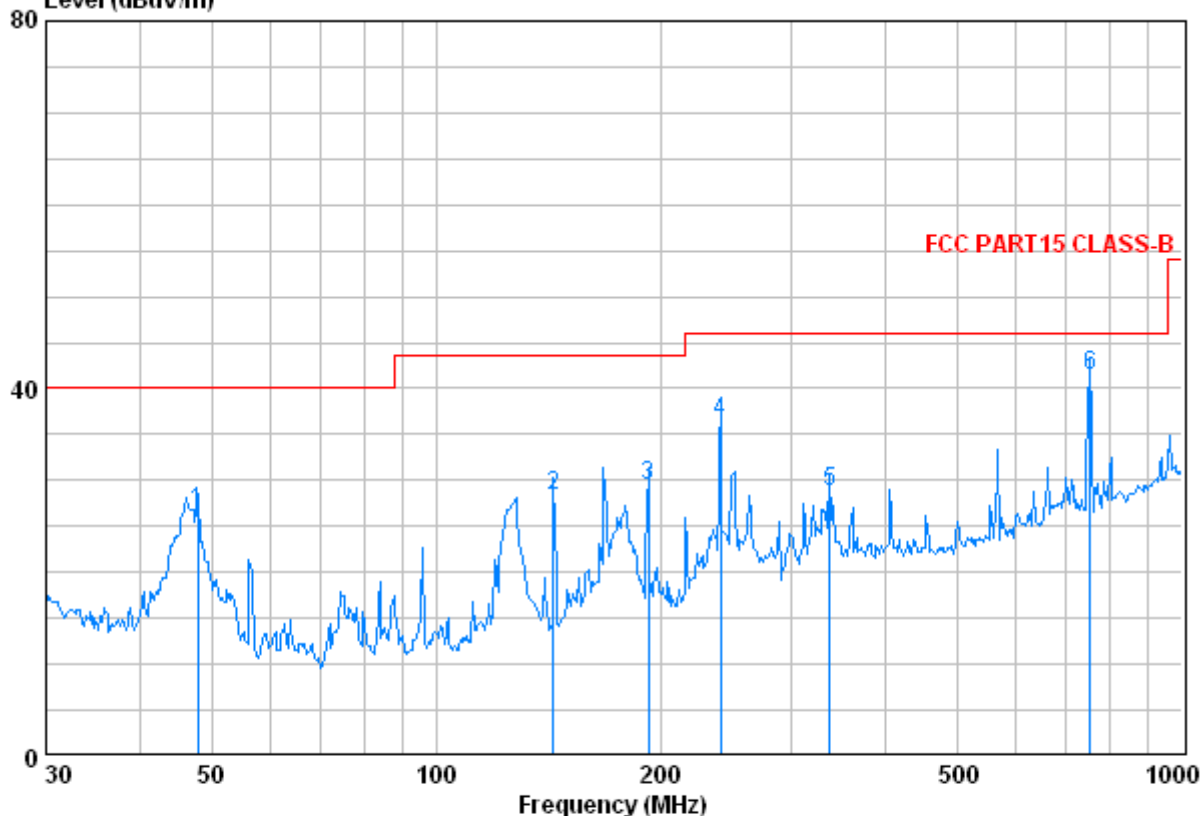


|      | Cable   | Antenna | Preamp | Read  |        | Limit  | Over         |
|------|---------|---------|--------|-------|--------|--------|--------------|
| Freq | Loss    | Factor  | Factor | Level | Level  | Line   | Limit        |
| MHz  | dB      | dB/m    | dB     | dBuV  | dBuV/m | dBuV/m | dB           |
| 1    | 46.666  | 0.74    | 8.98   | 27.30 | 42.71  | 25.13  | 40.00 -14.87 |
| 2    | 123.266 | 1.26    | 7.83   | 27.05 | 50.57  | 32.61  | 43.50 -10.89 |
| 3    | 143.830 | 1.31    | 8.43   | 26.94 | 48.90  | 31.70  | 43.50 -11.80 |
| 4    | 240.830 | 1.63    | 12.01  | 26.56 | 45.51  | 32.60  | 46.00 -13.40 |
| 5    | 566.622 | 2.67    | 19.03  | 27.59 | 38.97  | 33.08  | 46.00 -12.92 |
| 6    | 752.743 | 3.07    | 21.73  | 27.35 | 43.33  | 40.78  | 46.00 -5.22  |



Horizontal

Data: 311  
Level (dBuV/m)



|   | Freq    | Cable Loss | Antenna Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit |
|---|---------|------------|----------------|---------------|------------|--------|------------|------------|
|   | MHz     | dB         | dB/m           | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |
| 1 | 47.994  | 0.76       | 9.11           | 27.30         | 44.02      | 26.59  | 40.00      | -13.41     |
| 2 | 143.830 | 1.31       | 8.43           | 26.94         | 45.53      | 28.33  | 43.50      | -15.17     |
| 3 | 192.419 | 1.39       | 10.12          | 26.73         | 44.54      | 29.33  | 43.50      | -14.17     |
| 4 | 240.830 | 1.63       | 12.01          | 26.56         | 49.26      | 36.34  | 46.00      | -9.66      |
| 5 | 337.216 | 2.02       | 15.10          | 26.68         | 38.39      | 28.83  | 46.00      | -17.17     |
| 6 | 752.743 | 3.07       | 21.73          | 27.35         | 44.07      | 41.52  | 46.00      | -4.48      |

**5.11.2 Transmitter emission above 1GHz**

| Test mode:      |                 | GFSK                  |                          | Test channel:     |                         | Lowest              |                 | Remark:              | Peak |
|-----------------|-----------------|-----------------------|--------------------------|-------------------|-------------------------|---------------------|-----------------|----------------------|------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamplifier Factor (dB) | Read Level (dBuV) | Emission Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Antenna polarization |      |
| 1575.750        | 2.57            | 28.72                 | 39.38                    | 50.49             | 42.40                   | 74.00               | -31.60          | Vertical             |      |
| 2316.000        | 2.96            | 32.36                 | 39.79                    | 46.62             | 42.15                   | 74.00               | -31.85          | Vertical             |      |
| 3996.250        | 4.16            | 33.80                 | 41.04                    | 47.57             | 44.49                   | 74.00               | -29.51          | Vertical             |      |
| 6875.000        | 5.41            | 35.92                 | 40.17                    | 49.12             | 50.28                   | 74.00               | -23.72          | Vertical             |      |
| 9295.500        | 6.07            | 36.95                 | 38.06                    | 45.49             | 50.45                   | 74.00               | -23.55          | Vertical             |      |
| 11645.500       | 6.38            | 38.54                 | 38.13                    | 45.20             | 51.99                   | 74.00               | -22.01          | Vertical             |      |
| 1611.000        | 2.58            | 28.96                 | 39.40                    | 46.59             | 38.73                   | 74.00               | -35.27          | Horizontal           |      |
| 2316.000        | 2.96            | 32.36                 | 39.79                    | 46.82             | 42.35                   | 74.00               | -31.65          | Horizontal           |      |
| 4466.250        | 4.47            | 35.11                 | 41.37                    | 48.77             | 46.98                   | 74.00               | -27.02          | Horizontal           |      |
| 6452.000        | 5.24            | 36.24                 | 40.53                    | 48.65             | 49.60                   | 74.00               | -24.40          | Horizontal           |      |
| 9836.000        | 5.98            | 37.54                 | 37.60                    | 45.24             | 51.16                   | 74.00               | -22.84          | Horizontal           |      |
| 11880.500       | 6.44            | 38.78                 | 38.23                    | 45.41             | 52.40                   | 74.00               | -21.60          | Horizontal           |      |

| Test mode:      |                 | GFSK                  |                          | Test channel:     |                         | Lowest              |                 | Remark:              | Average |
|-----------------|-----------------|-----------------------|--------------------------|-------------------|-------------------------|---------------------|-----------------|----------------------|---------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamplifier Factor (dB) | Read Level (dBuV) | Emission Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Antenna polarization |         |
| 1575.750        | 2.57            | 28.72                 | 39.38                    | 42.57             | 34.48                   | 54.00               | -19.52          | Vertical             |         |
| 2316.000        | 2.96            | 32.36                 | 39.79                    | 37.62             | 33.15                   | 54.00               | -20.85          | Vertical             |         |
| 3996.250        | 4.16            | 33.80                 | 41.04                    | 40.09             | 37.01                   | 54.00               | -16.99          | Vertical             |         |
| 6875.000        | 5.41            | 35.92                 | 40.17                    | 41.36             | 42.52                   | 54.00               | -11.48          | Vertical             |         |
| 9295.500        | 6.07            | 36.95                 | 38.06                    | 36.49             | 41.45                   | 54.00               | -12.55          | Vertical             |         |
| 11645.500       | 6.38            | 38.54                 | 38.13                    | 36.25             | 43.04                   | 54.00               | -10.96          | Vertical             |         |
| 1611.000        | 2.58            | 28.96                 | 39.40                    | 39.63             | 31.77                   | 54.00               | -22.23          | Horizontal           |         |
| 2316.000        | 2.96            | 32.36                 | 39.79                    | 39.82             | 35.35                   | 54.00               | -18.65          | Horizontal           |         |
| 4466.250        | 4.47            | 35.11                 | 41.37                    | 41.77             | 39.98                   | 54.00               | -14.02          | Horizontal           |         |
| 6452.000        | 5.24            | 36.24                 | 40.53                    | 40.75             | 41.70                   | 54.00               | -12.30          | Horizontal           |         |
| 9836.000        | 5.98            | 37.54                 | 37.60                    | 36.71             | 42.63                   | 54.00               | -11.37          | Horizontal           |         |
| 11880.500       | 6.44            | 38.78                 | 38.23                    | 36.21             | 43.20                   | 54.00               | -10.80          | Horizontal           |         |



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| Test mode:      |                 | GFSK                  |                    | Test channel:     |                         | Middle              |                 | Remark:              | Peak |
|-----------------|-----------------|-----------------------|--------------------|-------------------|-------------------------|---------------------|-----------------|----------------------|------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Emission Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Antenna polarization |      |
| 1587.500        | 2.57            | 28.84                 | 39.39              | 47.68             | 39.70                   | 74.00               | -34.30          | Vertical             |      |
| 2374.750        | 2.98            | 32.48                 | 39.84              | 46.25             | 41.87                   | 74.00               | -32.13          | Vertical             |      |
| 4442.750        | 4.46            | 35.06                 | 41.36              | 48.85             | 47.01                   | 74.00               | -26.99          | Vertical             |      |
| 6687.000        | 5.30            | 36.11                 | 40.33              | 48.60             | 49.68                   | 74.00               | -24.32          | Vertical             |      |
| 8990.000        | 6.16            | 36.59                 | 38.32              | 45.46             | 49.89                   | 74.00               | -24.11          | Vertical             |      |
| 11387.000       | 6.32            | 38.42                 | 38.02              | 44.61             | 51.33                   | 74.00               | -22.67          | Vertical             |      |
| 1587.500        | 2.57            | 28.84                 | 39.39              | 48.31             | 40.33                   | 74.00               | -33.67          | Horizontal           |      |
| 2374.750        | 2.98            | 32.48                 | 39.84              | 46.97             | 42.59                   | 74.00               | -31.41          | Horizontal           |      |
| 4395.750        | 4.42            | 34.92                 | 41.33              | 47.60             | 45.61                   | 74.00               | -28.39          | Horizontal           |      |
| 6687.000        | 5.30            | 36.11                 | 40.33              | 48.55             | 49.63                   | 74.00               | -24.37          | Horizontal           |      |
| 8813.750        | 6.16            | 36.45                 | 38.49              | 46.19             | 50.31                   | 74.00               | -23.69          | Horizontal           |      |
| 10952.250       | 6.21            | 38.48                 | 37.84              | 43.84             | 50.69                   | 74.00               | -23.31          | Horizontal           |      |

| Test mode:      |                 | GFSK                  |                    | Test channel:     |                         | Middle              |                 | Remark:              | Average |
|-----------------|-----------------|-----------------------|--------------------|-------------------|-------------------------|---------------------|-----------------|----------------------|---------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Emission Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Antenna polarization |         |
| 1587.500        | 2.57            | 28.84                 | 39.39              | 43.25             | 35.27                   | 54.00               | -18.73          | Vertical             |         |
| 2374.750        | 2.98            | 32.48                 | 39.84              | 41.25             | 36.87                   | 54.00               | -17.13          | Vertical             |         |
| 4442.750        | 4.46            | 35.06                 | 41.36              | 42.31             | 40.47                   | 54.00               | -13.53          | Vertical             |         |
| 6687.000        | 5.30            | 36.11                 | 40.33              | 40.15             | 41.23                   | 54.00               | -12.77          | Vertical             |         |
| 8990.000        | 6.16            | 36.59                 | 38.32              | 37.27             | 41.70                   | 54.00               | -12.30          | Vertical             |         |
| 11387.000       | 6.32            | 38.42                 | 38.02              | 35.74             | 42.46                   | 54.00               | -11.54          | Vertical             |         |
| 1587.500        | 2.57            | 28.84                 | 39.39              | 41.31             | 33.33                   | 54.00               | -20.67          | Horizontal           |         |
| 2374.750        | 2.98            | 32.48                 | 39.84              | 41.25             | 36.87                   | 54.00               | -17.13          | Horizontal           |         |
| 4395.750        | 4.42            | 34.92                 | 41.33              | 42.60             | 40.61                   | 54.00               | -13.39          | Horizontal           |         |
| 6687.000        | 5.30            | 36.11                 | 40.33              | 39.31             | 40.39                   | 54.00               | -13.61          | Horizontal           |         |
| 8813.750        | 6.16            | 36.45                 | 38.49              | 36.19             | 40.31                   | 54.00               | -13.69          | Horizontal           |         |
| 10952.250       | 6.21            | 38.48                 | 37.84              | 35.56             | 42.41                   | 54.00               | -11.59          | Horizontal           |         |



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| Test mode:      |                 | GFSK                  |                    | Test channel:     |                         | Highest             |                 | Remark:              | Peak |
|-----------------|-----------------|-----------------------|--------------------|-------------------|-------------------------|---------------------|-----------------|----------------------|------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Emission Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Antenna polarization |      |
| 1317.250        | 2.40            | 27.79                 | 39.28              | 44.98             | 35.89                   | 74.00               | -38.11          | Vertical             |      |
| 2386.500        | 2.98            | 32.51                 | 39.85              | 46.59             | 42.23                   | 74.00               | -31.77          | Vertical             |      |
| 4278.250        | 4.35            | 34.59                 | 41.25              | 48.10             | 45.79                   | 74.00               | -28.21          | Vertical             |      |
| 5641.250        | 5.00            | 35.12                 | 41.24              | 47.82             | 46.70                   | 74.00               | -27.30          | Vertical             |      |
| 7309.750        | 5.90            | 35.92                 | 39.79              | 48.00             | 50.03                   | 74.00               | -23.97          | Vertical             |      |
| 10458.750       | 6.09            | 38.24                 | 37.64              | 43.93             | 50.62                   | 74.00               | -23.38          | Vertical             |      |
| 1434.750        | 2.48            | 28.01                 | 39.33              | 45.83             | 36.99                   | 74.00               | -37.01          | Horizontal           |      |
| 2374.750        | 2.98            | 32.48                 | 39.84              | 46.47             | 42.09                   | 74.00               | -31.91          | Horizontal           |      |
| 4478.000        | 4.48            | 35.15                 | 41.39              | 47.85             | 46.09                   | 74.00               | -27.91          | Horizontal           |      |
| 6898.500        | 5.43            | 35.90                 | 40.15              | 47.94             | 49.12                   | 74.00               | -24.88          | Horizontal           |      |
| 9718.500        | 5.98            | 37.42                 | 37.70              | 44.35             | 50.05                   | 74.00               | -23.95          | Horizontal           |      |
| 11845.250       | 6.43            | 38.74                 | 38.21              | 44.59             | 51.55                   | 74.00               | -22.45          | Horizontal           |      |

| Test mode:      |                 | GFSK                  |                    | Test channel:     |                         | Highest             |                 | Remark:              | Average |
|-----------------|-----------------|-----------------------|--------------------|-------------------|-------------------------|---------------------|-----------------|----------------------|---------|
| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Emission Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Antenna polarization |         |
| 1317.250        | 2.40            | 27.79                 | 39.28              | 40.15             | 31.06                   | 54.00               | -22.94          | Vertical             |         |
| 2386.500        | 2.98            | 32.51                 | 39.85              | 39.59             | 35.23                   | 54.00               | -18.77          | Vertical             |         |
| 4278.250        | 4.35            | 34.59                 | 41.25              | 40.08             | 37.77                   | 54.00               | -16.23          | Vertical             |         |
| 5641.250        | 5.00            | 35.12                 | 41.24              | 39.82             | 38.70                   | 54.00               | -15.30          | Vertical             |         |
| 7309.750        | 5.90            | 35.92                 | 39.79              | 39.00             | 41.03                   | 54.00               | -12.97          | Vertical             |         |
| 10458.750       | 6.09            | 38.24                 | 37.64              | 36.32             | 43.01                   | 54.00               | -10.99          | Vertical             |         |
| 1434.750        | 2.48            | 28.01                 | 39.33              | 37.83             | 28.99                   | 54.00               | -25.01          | Horizontal           |         |
| 2374.750        | 2.98            | 32.48                 | 39.84              | 38.15             | 33.77                   | 54.00               | -20.23          | Horizontal           |         |
| 4478.000        | 4.48            | 35.15                 | 41.39              | 38.85             | 37.09                   | 54.00               | -16.91          | Horizontal           |         |
| 6898.500        | 5.43            | 35.90                 | 40.15              | 39.05             | 40.23                   | 54.00               | -13.77          | Horizontal           |         |
| 9718.500        | 5.98            | 37.42                 | 37.70              | 35.48             | 41.18                   | 54.00               | -12.82          | Horizontal           |         |
| 11845.250       | 6.43            | 38.74                 | 38.21              | 36.15             | 43.11                   | 54.00               | -10.89          | Horizontal           |         |

Remark: The disturbance above 12GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

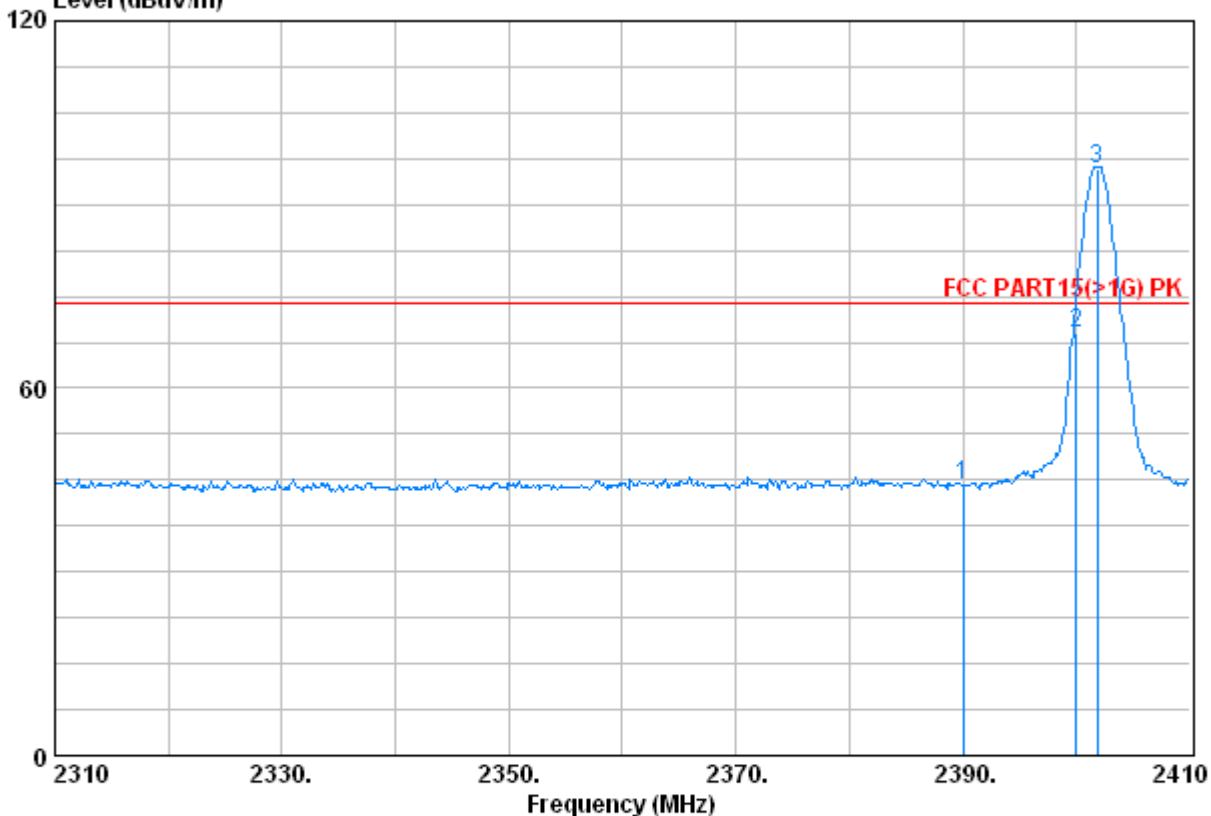
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### 5.11.3 Band edge (Radiated Emission)

|            |              |               |        |         |      |          |
|------------|--------------|---------------|--------|---------|------|----------|
| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Peak | Vertical |
|------------|--------------|---------------|--------|---------|------|----------|

Data: 159  
Level (dBuV/m)



|     |          | CableAntenna Preampl |        |        | Read   |        | Limit  | Over   |
|-----|----------|----------------------|--------|--------|--------|--------|--------|--------|
|     | Freq     | Loss                 | Factor | Factor | Level  | Level  | Line   | Limit  |
|     | MHz      | dB                   | dB/m   | dB     | dBuV   | dBuV/m | dBuV/m | dB     |
| 1   | 2390.000 | 2.98                 | 32.51  | 39.85  | 48.44  | 44.09  | 74.00  | -29.91 |
| 2 @ | 2400.000 | 2.98                 | 32.51  | 39.86  | 73.41  | 69.04  | 74.00  | -4.96  |
| 3 @ | 2401.800 | 2.98                 | 32.51  | 39.86  | 100.21 | 95.84  | 74.00  | 21.84  |



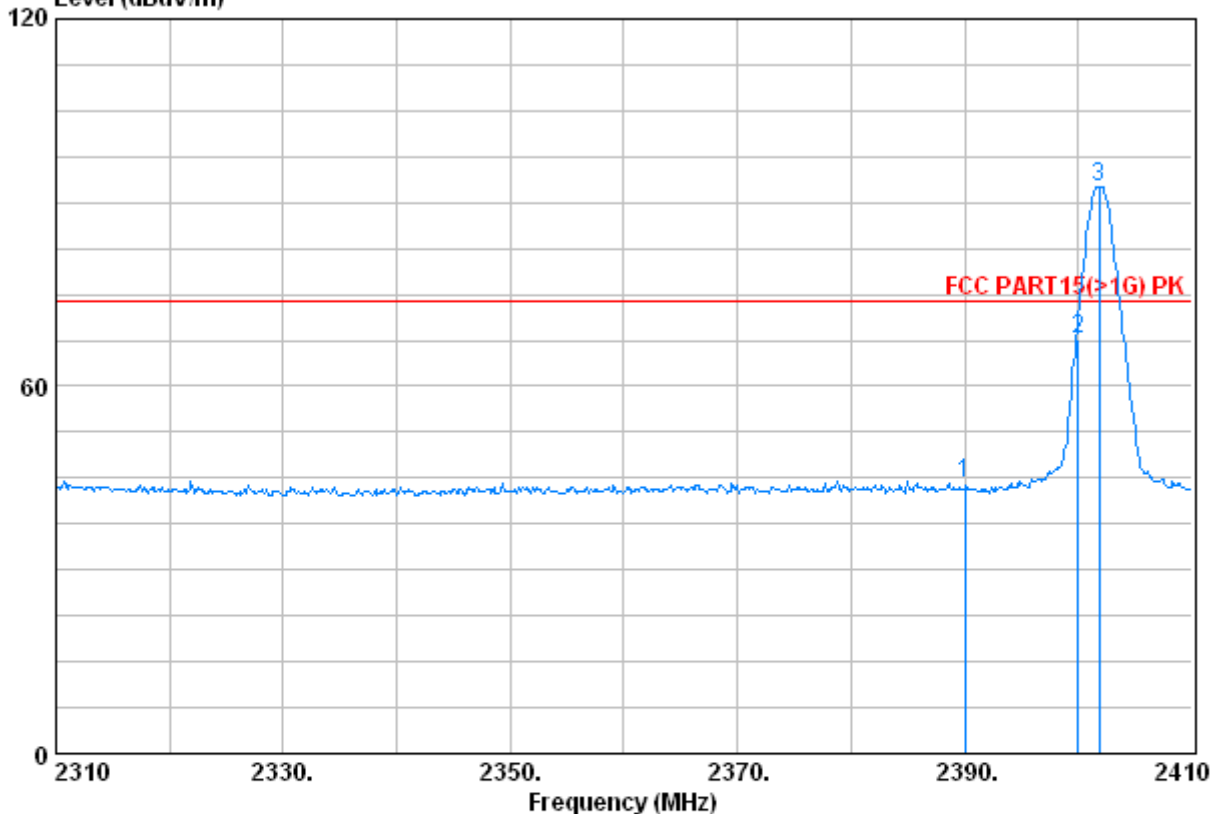
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|            |              |               |        |         |      |            |
|------------|--------------|---------------|--------|---------|------|------------|
| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Peak | Horizontal |
|------------|--------------|---------------|--------|---------|------|------------|

Data: 158  
Level (dBuV/m)



|     | Freq     | Cable Loss | Antenna Factor | Preamp Factor | Read Level | Level  | Limit  | Over   |
|-----|----------|------------|----------------|---------------|------------|--------|--------|--------|
|     | MHz      | dB         | dB/m           | dB            | dBuV       | dBuV/m | dBuV/m | dB     |
| 1   | 2390.000 | 2.98       | 32.51          | 39.85         | 48.35      | 44.00  | 74.00  | -30.00 |
| 2 @ | 2400.000 | 2.98       | 32.51          | 39.86         | 72.01      | 67.64  | 74.00  | -6.36  |
| 3 @ | 2401.800 | 2.98       | 32.51          | 39.86         | 96.88      | 92.51  | 74.00  | 18.51  |

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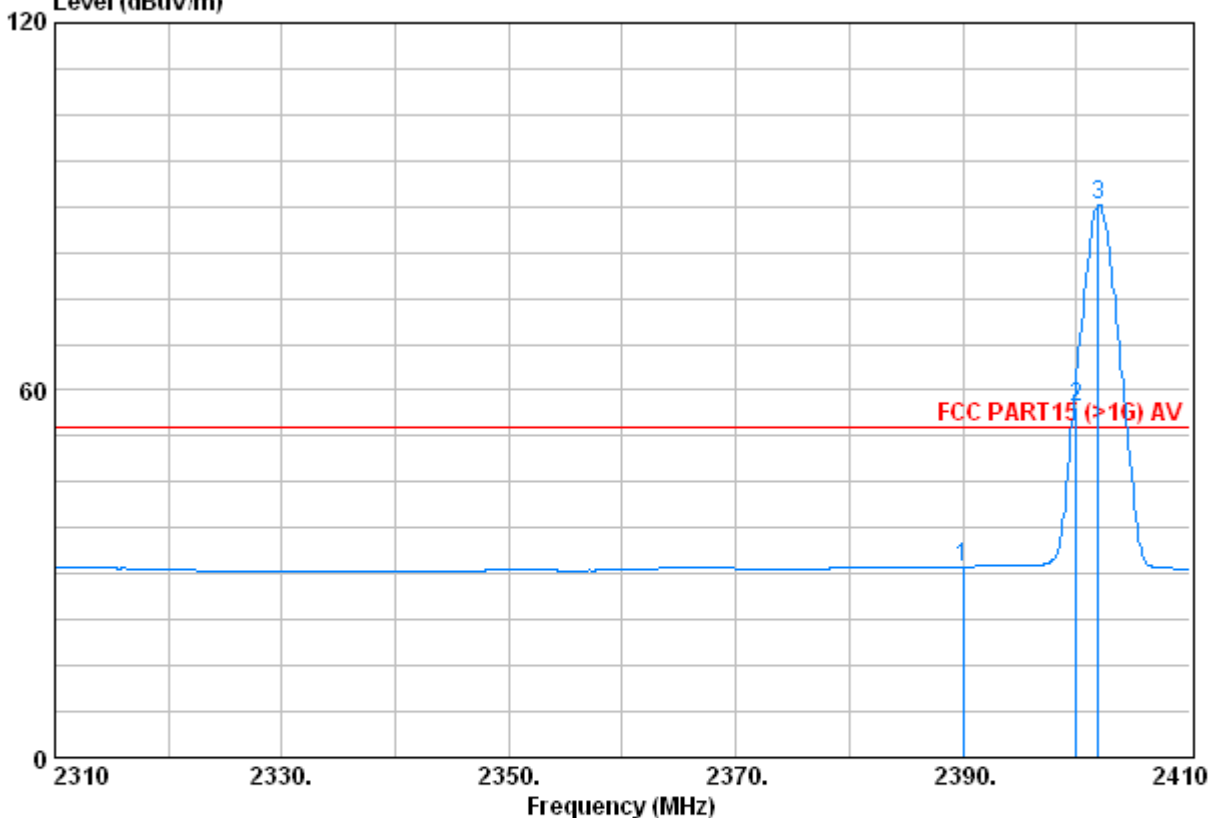


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|            |              |               |        |         |         |          |
|------------|--------------|---------------|--------|---------|---------|----------|
| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Average | Vertical |
|------------|--------------|---------------|--------|---------|---------|----------|

Data: 161  
Level (dBuV/m)



|     |          | CableAntenna Preamp |        |        | Read  |        | Limit  | Over   |
|-----|----------|---------------------|--------|--------|-------|--------|--------|--------|
|     | Freq     | Loss                | Factor | Factor | Level | Level  | Line   | Limit  |
|     | MHz      | dB                  | dB/m   | dB     | dBuV  | dBuV/m | dBuV/m | dB     |
| 1   | 2390.000 | 2.98                | 32.51  | 39.85  | 35.52 | 31.17  | 54.00  | -22.83 |
| 2 @ | 2400.000 | 2.98                | 32.51  | 39.86  | 61.47 | 57.10  | 54.00  | 3.10   |
| 3 @ | 2401.900 | 2.98                | 32.51  | 39.86  | 94.49 | 90.12  | 54.00  | 36.12  |

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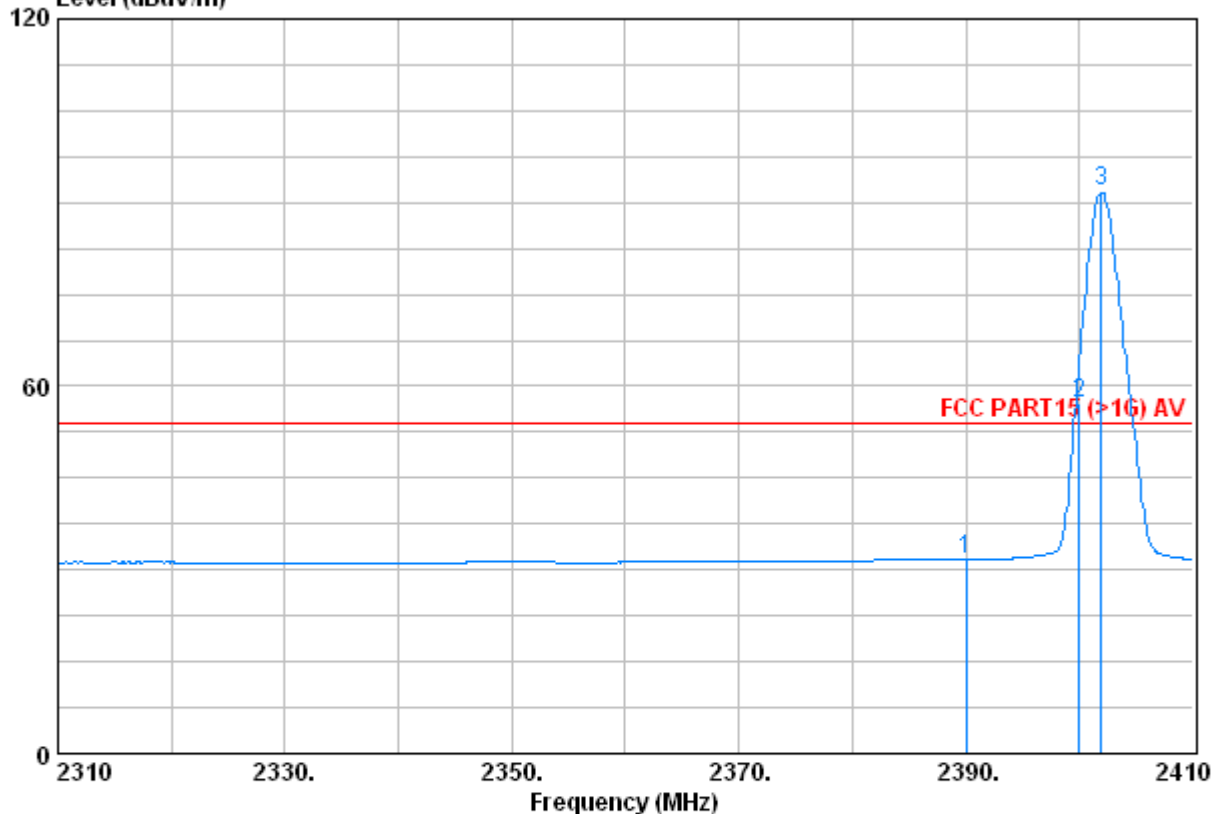
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|            |              |               |        |         |         |            |
|------------|--------------|---------------|--------|---------|---------|------------|
| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Average | Horizontal |
|------------|--------------|---------------|--------|---------|---------|------------|

Data: 160  
Level (dBuV/m)



|     | Freq     | Cable Loss | Antenna Factor | Preamp Factor | Read Level | Level  | Limit  | Over   |
|-----|----------|------------|----------------|---------------|------------|--------|--------|--------|
|     | MHz      | dB         | dB/m           | dB            | dBuV       | dBuV/m | dBuV/m | dB     |
| 1   | 2390.000 | 2.98       | 32.51          | 39.85         | 36.02      | 31.67  | 54.00  | -22.33 |
| 2 @ | 2400.000 | 2.98       | 32.51          | 39.86         | 61.74      | 57.37  | 54.00  | 3.37   |
| 3 @ | 2401.900 | 2.98       | 32.51          | 39.86         | 96.11      | 91.74  | 54.00  | 37.74  |

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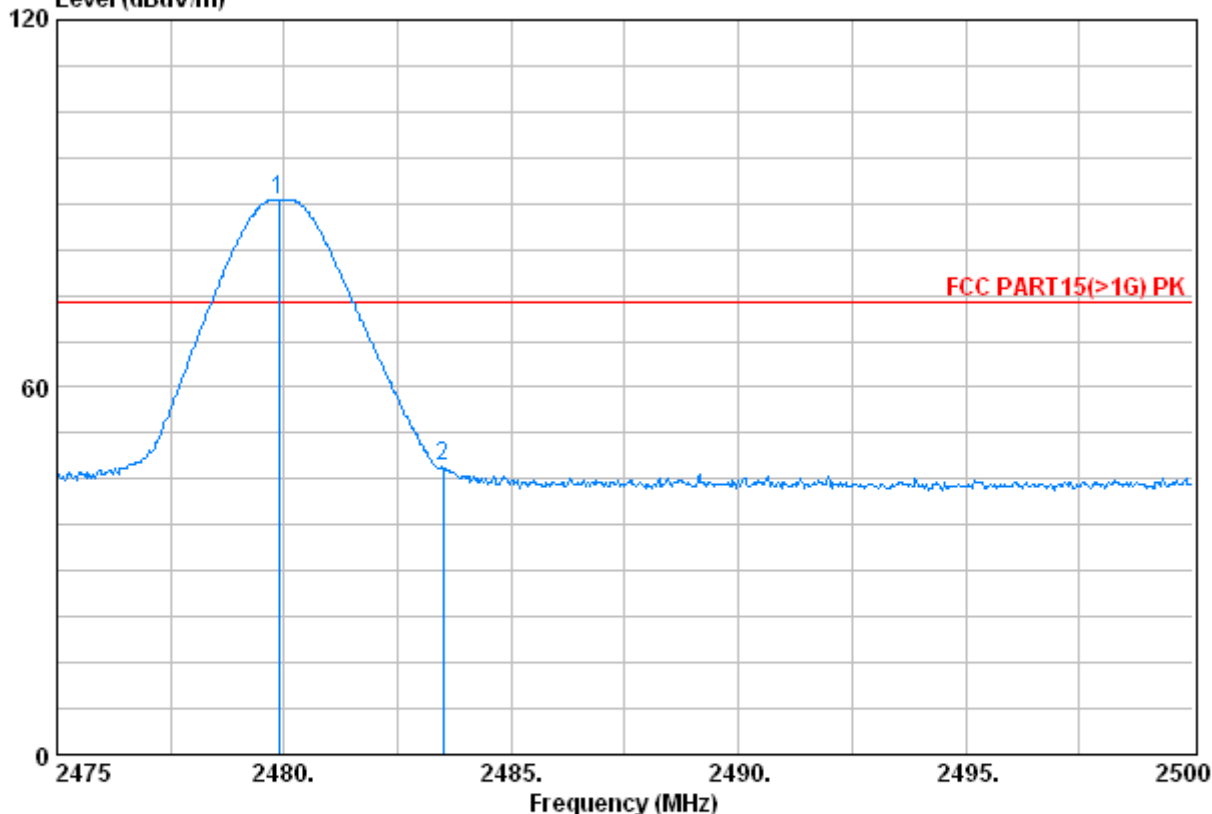
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|            |              |               |         |         |      |          |
|------------|--------------|---------------|---------|---------|------|----------|
| Test mode: | Transmitting | Test channel: | Highest | Remark: | Peak | Vertical |
|------------|--------------|---------------|---------|---------|------|----------|

Data: 162

Level (dBuV/m)



|     | Freq     | Cable Loss | Antenna Factor | Preamp Factor | Read Level | Level  | Limit Line | Over Limit |
|-----|----------|------------|----------------|---------------|------------|--------|------------|------------|
|     | MHz      | dB         | dB/m           | dB            | dBuV       | dBuV/m | dBuV/m     | dB         |
| 1 @ | 2479.875 | 3.03       | 32.67          | 39.92         | 94.85      | 90.63  | 74.00      | 16.63      |
| 2   | 2483.500 | 3.03       | 32.67          | 39.92         | 51.32      | 47.10  | 74.00      | -26.90     |

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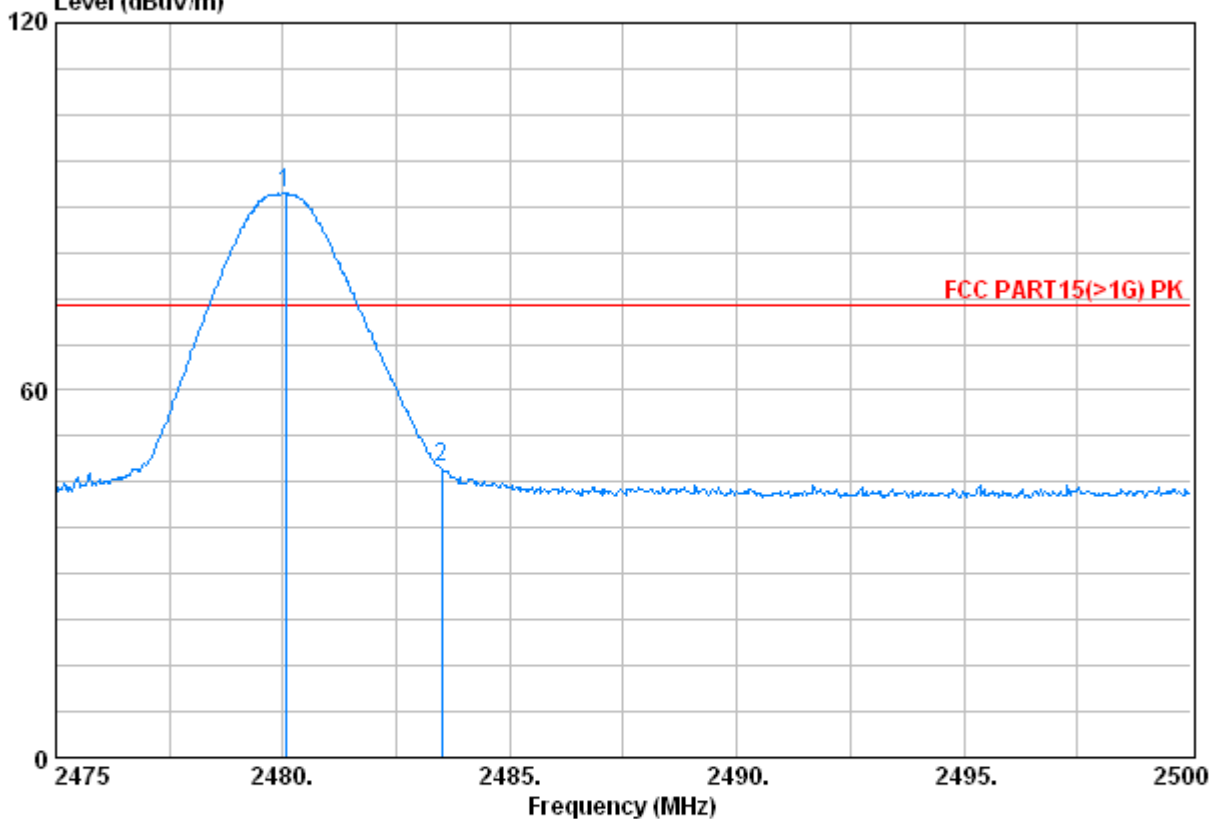


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|            |              |               |         |         |      |            |
|------------|--------------|---------------|---------|---------|------|------------|
| Test mode: | Transmitting | Test channel: | Highest | Remark: | Peak | Horizontal |
|------------|--------------|---------------|---------|---------|------|------------|

Data: 163  
Level (dBuV/m)



|     | Freq     | CableAntenna<br>Loss | Antenna<br>Factor | Preamp<br>Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit |
|-----|----------|----------------------|-------------------|------------------|---------------|--------|---------------|---------------|
|     | MHz      | dB                   | dB/m              | dB               | dBuV          | dBuV/m | dBuV/m        | dB            |
| 1 @ | 2480.050 | 3.03                 | 32.67             | 39.92            | 96.34         | 92.12  | 74.00         | 18.12         |
| 2   | 2483.500 | 3.03                 | 32.67             | 39.92            | 51.62         | 47.40  | 74.00         | -26.60        |

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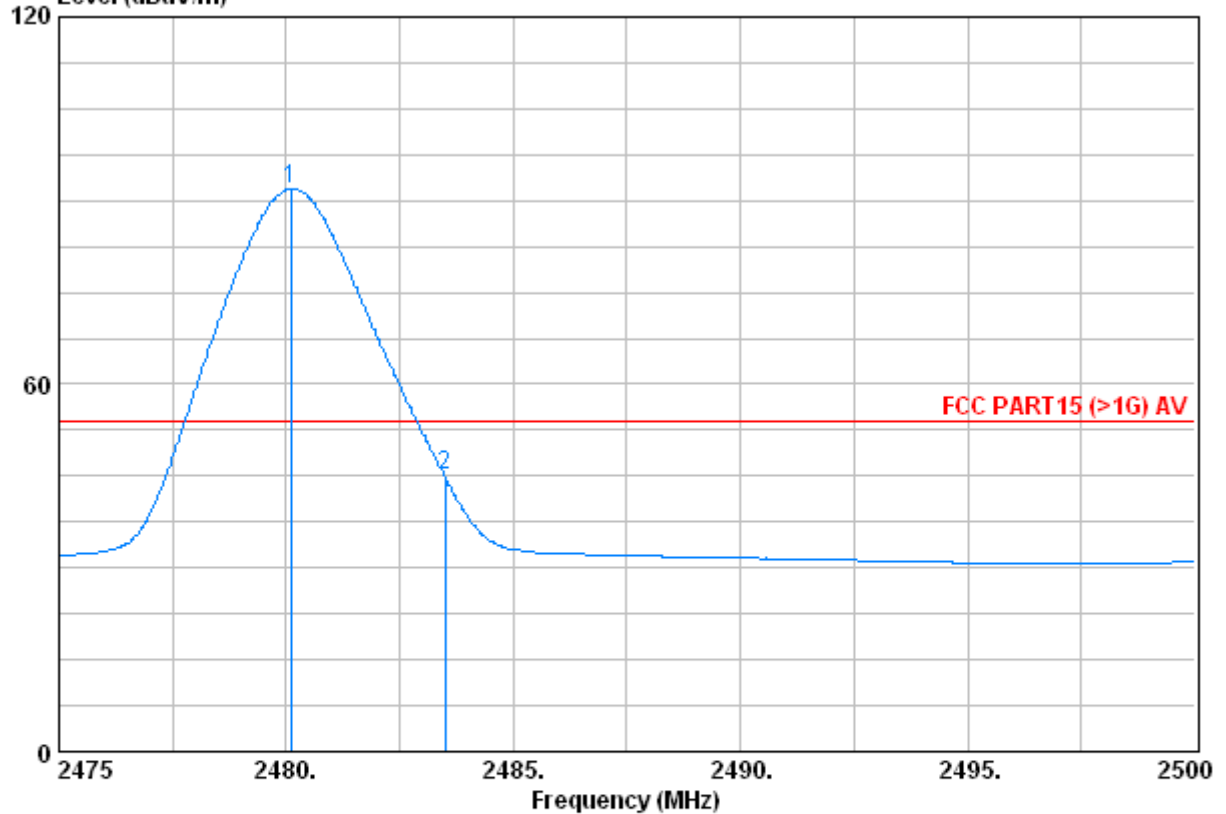
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|            |              |               |         |         |         |          |
|------------|--------------|---------------|---------|---------|---------|----------|
| Test mode: | Transmitting | Test channel: | Highest | Remark: | Average | Vertical |
|------------|--------------|---------------|---------|---------|---------|----------|

Data: 165

Level (dBuV/m)



|   | Freq     | Cable Loss | Antenna Factor | Preamp Factor | Read Level | Level  | Limit  | Over Limit |
|---|----------|------------|----------------|---------------|------------|--------|--------|------------|
|   | MHz      | dB         | dB/m           | dB            | dBuV       | dBuV/m | dBuV/m | dB         |
| 1 | 2480.100 | 3.03       | 32.67          | 39.92         | 96.21      | 91.99  | 54.00  | 37.99      |
| 2 | 2483.500 | 3.03       | 32.67          | 39.92         | 49.30      | 45.08  | 54.00  | -8.92      |

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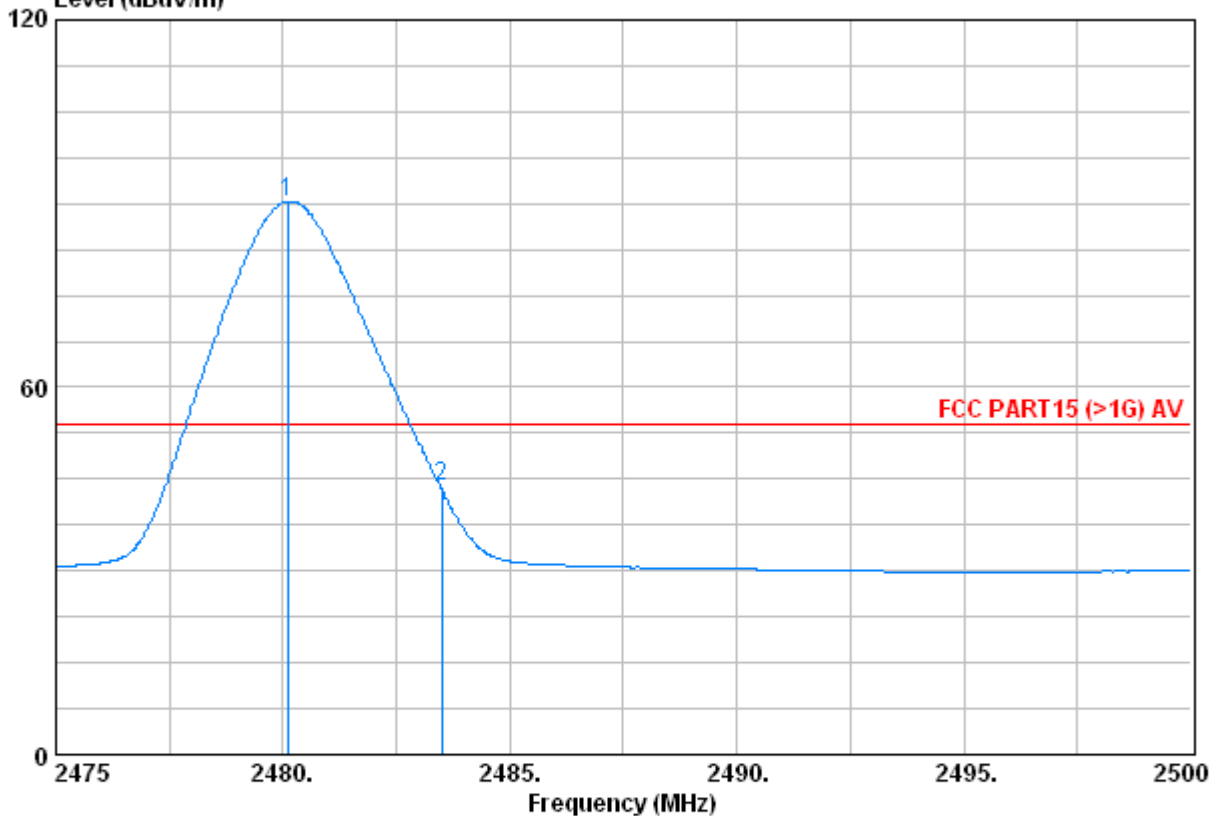
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|------------|--------------|---------------|---------|---------|---------|------------|
| Test mode: | Transmitting | Test channel: | Highest | Remark: | Average | Horizontal |
|------------|--------------|---------------|---------|---------|---------|------------|

Data: 164  
Level (dBuV/m)



|     | Freq     | Cable Loss | Antenna Factor | Preamplifier Factor | Read Level | Level  | Limit  | Over Limit |
|-----|----------|------------|----------------|---------------------|------------|--------|--------|------------|
|     | MHz      | dB         | dB/m           | dB                  | dBuV       | dBuV/m | dBuV/m | dB         |
| 1 @ | 2480.100 | 3.03       | 32.67          | 39.92               | 94.51      | 90.29  | 54.00  | 36.29      |
| 2 @ | 2483.500 | 3.03       | 32.67          | 39.92               | 48.05      | 43.83  | 54.00  | -10.17     |

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