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**FEDERAL COMMUNICATIONS COMMISSION**  
Registration number: 282399

Report No.: GLEMR070401182RFT  
Page: 1 of 37  
FCC ID: VB3SSTB601

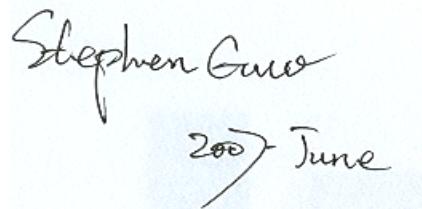
## **TEST REPORT**

**Application No. :** GLEMR070401182RF  
**Applicant:** ShenZhen Sea Star Technology Co., Ltd  
**FCC ID:** VB3SSTB601  
**Fundamental Carrier**  
**Frequency :** 2.402GHz to 2.480GHz  
**Equipment Under Test (EUT):**  
**Name:** Bluetooth Hands free car kit  
**Model No.:** SSTB601  
**Standards:** FCC PART 15, SUBPART C: 2006 (Section 15.247);  
FCC PART 15, SUBPART B: 2006.  
**Date of Receipt:** 28 April 2007  
**Date of Test:** 28 April to 6 June 2007  
**Date of Issue:** 7 June 2007

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

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details.

Authorized Signature:



Stephen Guo  
2007 June

Stephen Guo  
Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf  
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 this report.

This report may only be reproduced and distributed in full. 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.

## 2 Test Summary

| <b>For Bluetooth Function:</b>                  |                         |   |               |
|---|-------------------------|---|---------------|
| <b>Test</b>                                     | <b>Test Requirement</b> | <b>Standard Paragraph</b>               | <b>Result</b> |
| Maximum Peak Output Power                       | FCC PART 15 :2006       | Section 15.247(b)(1)                    | PASS          |
| Conducted Emission                              | FCC PART 15 :2006       | Section 15.207<br>&15.107               | N/A           |
| Conducted Spurious Emission<br>(30MHz to 25GHz) | FCC PART 15 :2006       | Section 15.209<br>&15.247(d)            | PASS          |
| Radiated Spurious Emission<br>(30MHz to 25GHz)  | FCC PART 15 :2006       | Section 15.209<br>&15.247(d)<br>&15.109 | PASS          |
| Band Edges Measurement                          | FCC PART 15 :2006       | Section 15.247 (d)<br>&15.205           | PASS          |
| Hopping Channel Number                          | FCC PART 15 :2006       | Section<br>15.247(a)(1)(iii)            | PASS          |
| Carrier Frequencies<br>Separated                | FCC PART 15 :2006       | Section 15.247(a)(1)                    | PASS          |
| Dwell Time                                      | FCC PART 15 :2006       | Section<br>15.247(a)(1)(iii)            | PASS          |
| Antenna Requirement                             | FCC PART 15 :2006       | Section 15.247 (c)                      | PASS          |

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## 4 General Information

### 4.1 Client Information

Applicant: ShenZhen Sea Star Technology Co., Ltd  
Address: 501/F., R&D Bldg. B, Tsinghua Hi-Tech Park North Area Hi-Tech Industrial Estate Nanshan District, Shenzhen.

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

Name: Bluetooth Hands free car kit  
Model No.: SSTB601  
Number of Channels 79 Channels  
Channel Separation 1 MHz  
Type of Modulation FHSS (Frequency Hopping Spread Spectrum)  
Dwell time Per channel is less than 0.4S.  
Antenna Type Integral  
Power Supply: 12V DC  
Functions: Car Kit Speaker with Bluetooth function.

### 4.3 Description of Support Units

The EUT has been tested independently or communicating with Bluetooth cell phone (SonyEriision K618i).

### 4.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15, SUBPART C: 2006 (Section 15.247);  
FCC PART 15, SUBPART B: 2006.

### 4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

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

No tests were sub-contracted.

### 4.6 Other Information Requested by the Customer

None.



#### **4.7 Test Facility**

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

- **NVLAP – Lab Code: 200611-0**

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

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.



## 5 Equipments Used during Test

| RE in Chamber/OATS |                               |                   |               |            |                      |                         |
|--------------------|-------------------------------|-------------------|---------------|------------|----------------------|-------------------------|
| No:                | Test Equipment                | Manufacturer      | Model No.     | Serial No. | Cal. Date (dd-mm-yy) | Cal.Due date (dd-mm-yy) |
| EMC0525            | Compact Semi-Anechoic Chamber | ChangZhou ZhongYu | N/A           | N/A        | 06-03-2007           | 06-03-2008              |
| EMC0522            | EMI Test Receiver             | Rohde & Schwarz   | ESIB26        | 100249     | 05-12-2006           | 05-12-2007              |
| N/A                | EMI Test Software             | Audix             | E3            | N/A        | N/A                  | N/A                     |
| EMC0514            | Coaxial cable                 | SGS               | N/A           | N/A        | 04-12-2006           | 04-12-2007              |
| EMC0524            | Bi-log Type Antenna           | Schaffner -Chase  | CBL6112B      | 2966       | 31-10-2006           | 31-10-2007              |
| EMC0519            | Bilog Type Antenna            | Schaffner -Chase  | CBL6143       | 5070       | 31-07-2006           | 31-07-2007              |
| EMC0517            | Horn Antenna                  | Rohde & Schwarz   | HF906         | 100095     | 29-07-2006           | 29-07-2007              |
| EMC0040            | Spectrum Analyzer             | Rohde & Schwarz   | FSP30         | 100324     | 05-12-2006           | 05-12-2007              |
| EMC0520            | 0.1-1300 MHz Pre-Amplifier    | HP                | 8447D OPT 010 | 2944A06252 | 06-03-2007           | 06-03-2008              |
| EMC0521            | 1-26.5 GHz Pre-Amplifier      | Agilent           | 8449B         | 3008A01649 | 06-03-2007           | 06-03-2008              |
| EMC0523            | Active Loop Antenna           | EMCO              | 6502          | 00042963   | 09-08-2006           | 09-08-2008              |
| EMC0530            | 10m Semi- Anechoic Chamber    | ETS               | N/A           | N/A        | 22-08-2006           | 22-08-2007              |

| General used equipment |                         |                   |           |            |                      |                         |
|------------------------|-------------------------|-------------------|-----------|------------|----------------------|-------------------------|
| No:                    | Test Equipment          | Manufacturer      | Model No. | Serial No. | Cal. Date (dd-mm-yy) | Cal.Due date (dd-mm-yy) |
| EMC0050-<br>EMC0053    | Temperature, & Humidity | ZHENGZHOU BO YANG | WSB       | N/A        | 05-12-2006           | 05-12-2007              |
| EMC0054                | Temperature, & Humidity | Shenzhen Tai Kong | THG-1     | N/A        | 04-01-2007           | 04-01-2008              |
| EMC0006                | DMM                     | Fluke             | 73        | 70681569   | 27-09-2006           | 27-09-2007              |
| EMC0007                | DMM                     | Fluke             | 73        | 70671122   | 27-09-2006           | 27-09-2007              |

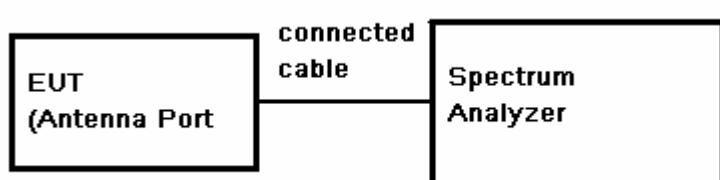
## 6 Test Results

### 6.1 E.U.T. Operation

|                        |  |
|------------------------|--|
| Input voltage:         | 12V DC   |
| Type of antenna:       | Integral   |
| Operating Environment: |  |
| Temperature:           | 20.0 -25.0 °C  |
| Humidity:              | 38-48 % RH   |
| Atmospheric Pressure:  | 992 -1006 mbar   |
| EUT Operation:         | Test the EUT as a product which has frequency hopping system. The total hopping channels are 79 channels (0 to 78 channels), the fundamental frequencies are from 2.402GHz to 2.480GHz.  |
|                        | Test the EUT to transmit and receive data at lowest ( <b>Channel 0: 2.402GHz</b> ), middle ( <b>Channel 39: 2.441GHz</b> ), and highest channel ( <b>Channel 78: 2.480GHz</b> ), frequencies individually for the compliance test. |

### 6.2 Maximum Peak Output Power

|                     |   |
|---------------------|---|
| Test Requirement:   | FCC Part15 C  |
| Test Method:        | Base on ANSI 63.4.  |
| Test Date:          | 29 April 2007   |
| Test Limit:         | Regulation 15.247 (b)(1)For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.<br>The non-overlapping hopping channels of EUT over 75, the result refer to the result "Hopping channel number" of this document. So 1 watt limit applies. |
| Test mode:          | Test in transmitting mode: Channel 0, Channel 39, Channel 78.   |
| Test Configuration: |   |

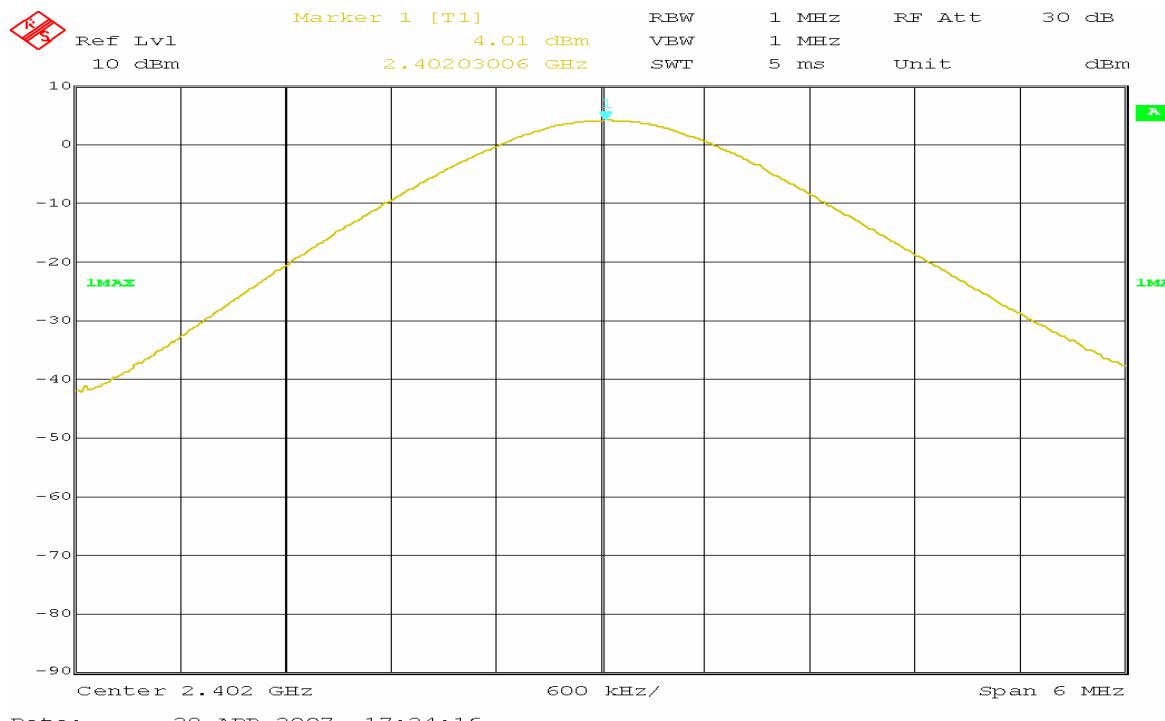


**Test Procedure:**

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz, VBW = 1 MHz, Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

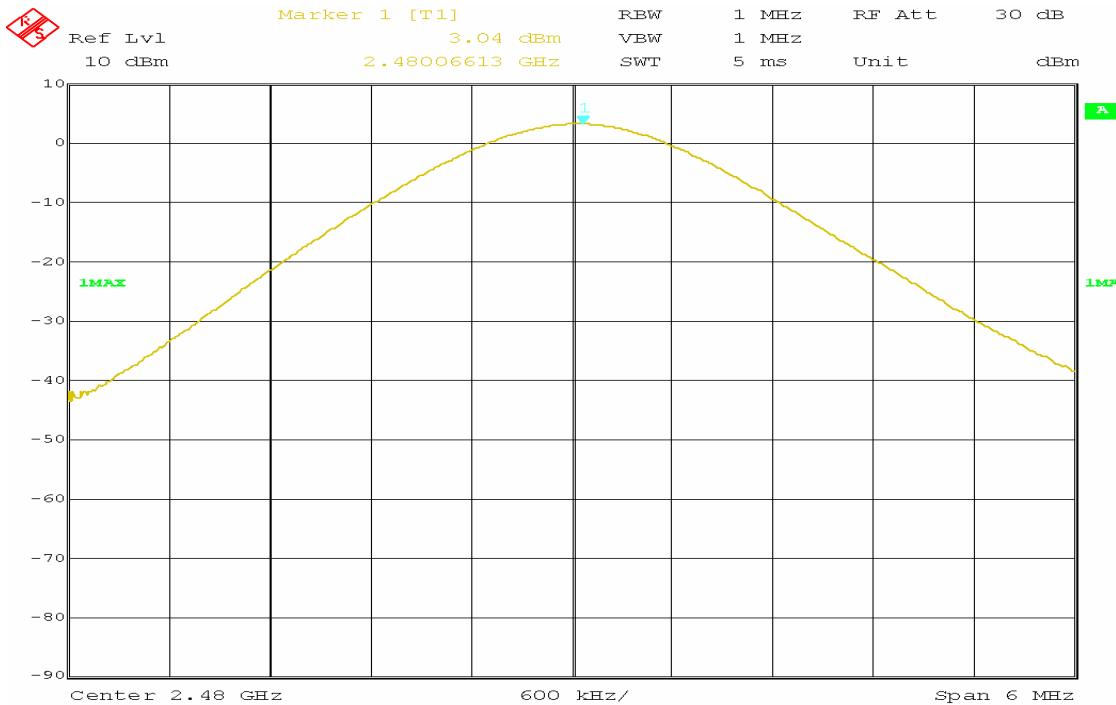
**Test Result:**

| Test Channel | Fundamental Frequency (GHz) | Reading Power (dBm) | Cable Loss (dB) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|--------------|-----------------------------|---------------------|-----------------|--------------------|-------------|-------------|
| 0            | 2.402                       | 4.01                | 0.20            | 4.21               | 30          | 25.79       |
| 39           | 2.441                       | 3.72                | 0.20            | 3.92               | 30          | 26.08       |
| 78           | 2.480                       | 3.04                | 0.20            | 3.24               | 30          | 26.76       |

**TEST RESULTS: The unit does meet the FCC requirements.**
**Channel 0:**


**Channel 39:**


Date: 28.APR.2007 17:24:56

**Channel 78:**


Date: 28.APR.2007 17:25:27

### 6.3 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: N/A

Remark: Measurements are not required for devices which only employ battery power for operation and which do not operate from the AC power lines.  
The equipment is designed for vehicular use.

### 6.4 Conducted Spurious Emissions

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247:

Test Date: 29 April 2007.

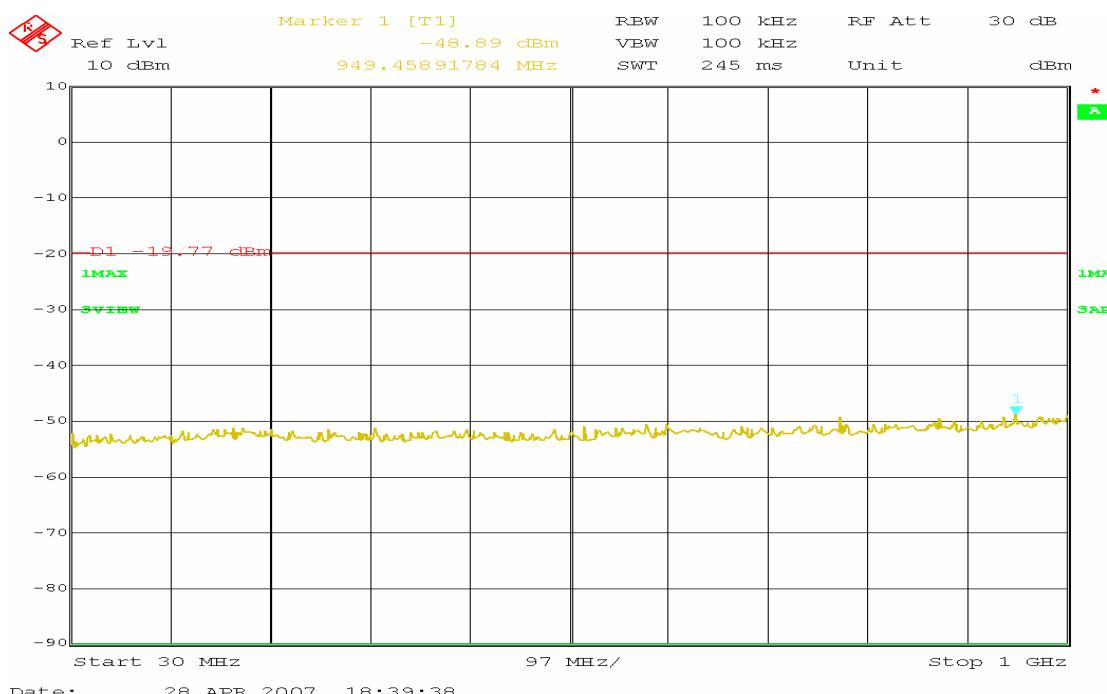
Test requirements: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

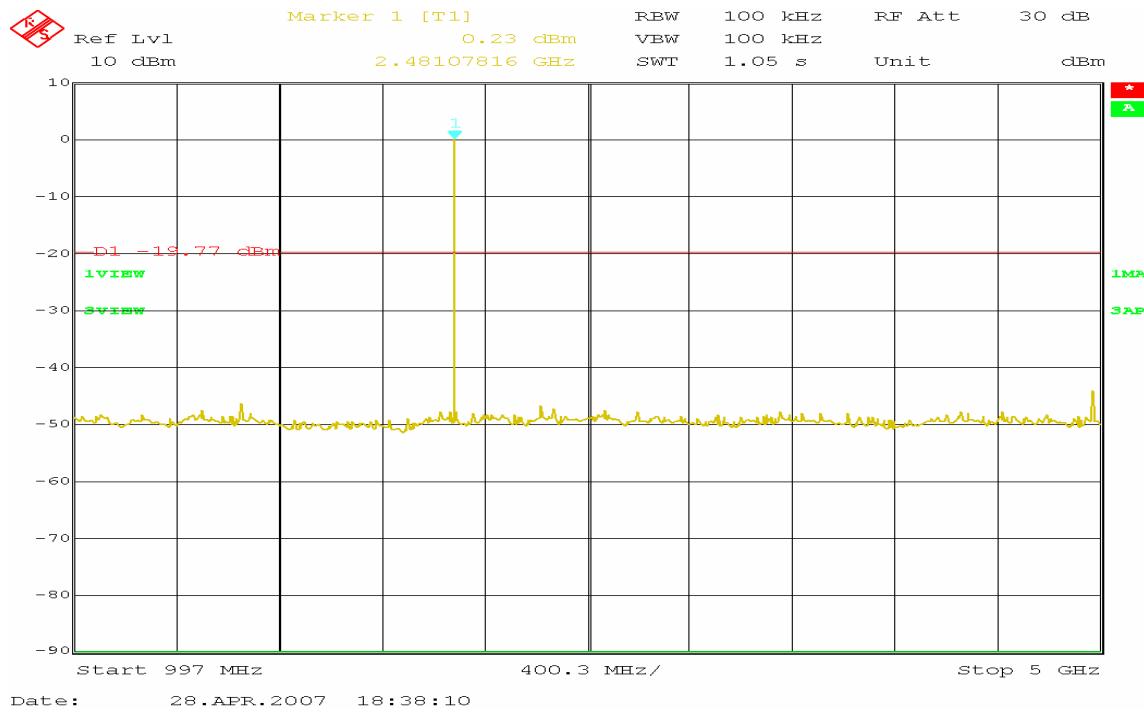
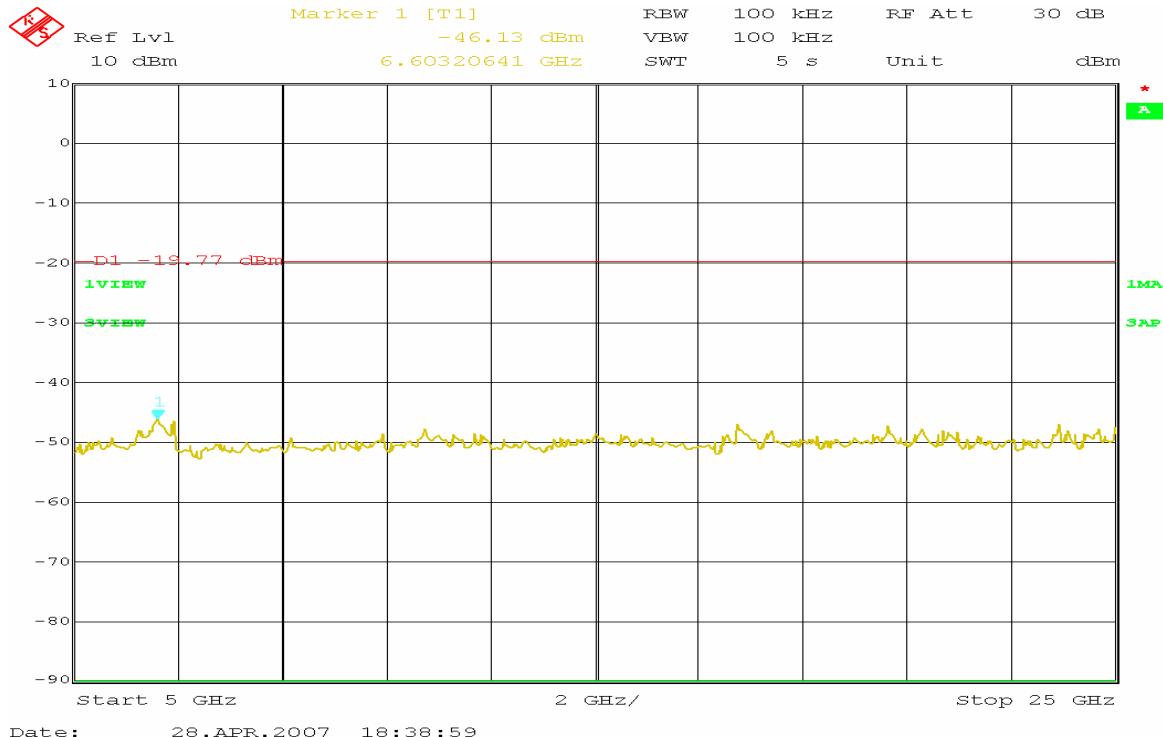
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz, VBW >= RBW (100KHz), Sweep = auto; Detector Function = Peak (Max. hold).

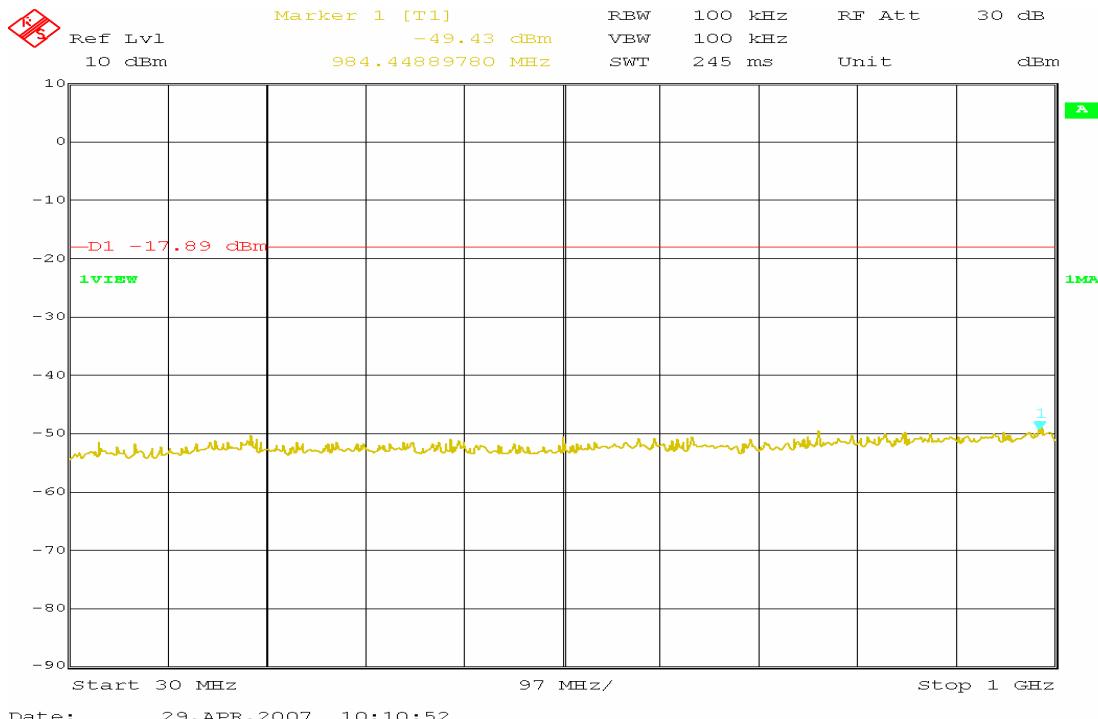
Test result: Pass

Lowest Channel (channel 0): 30M to 1GHz

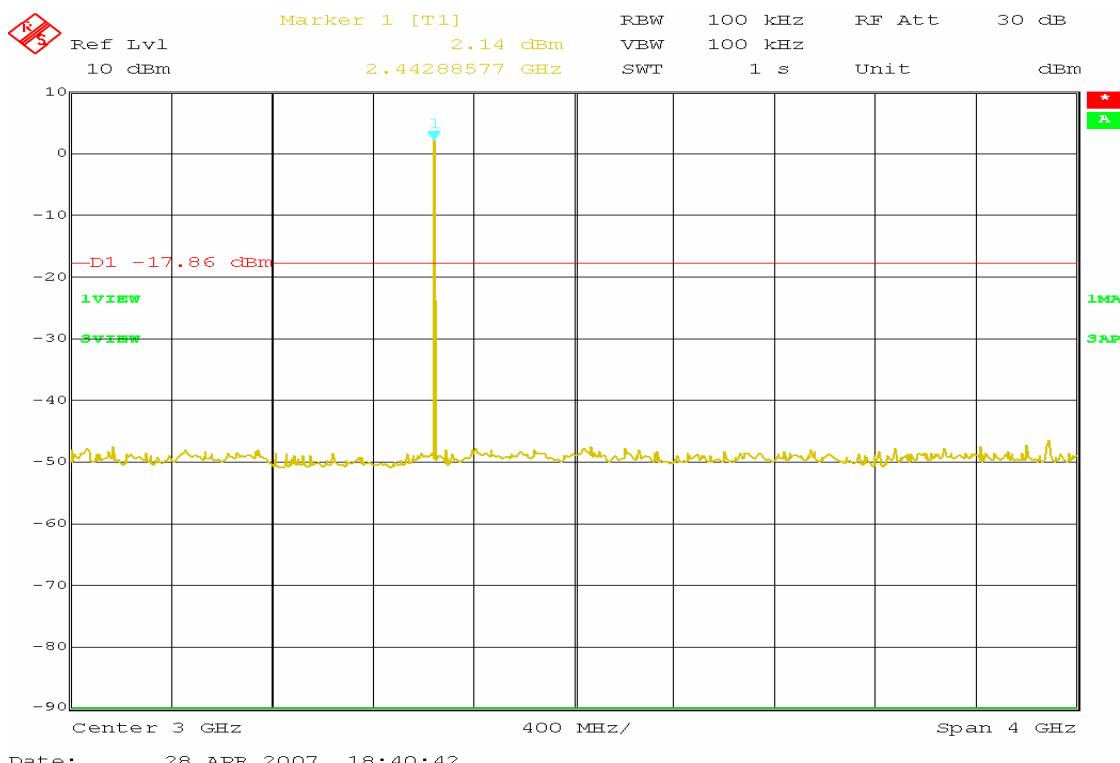


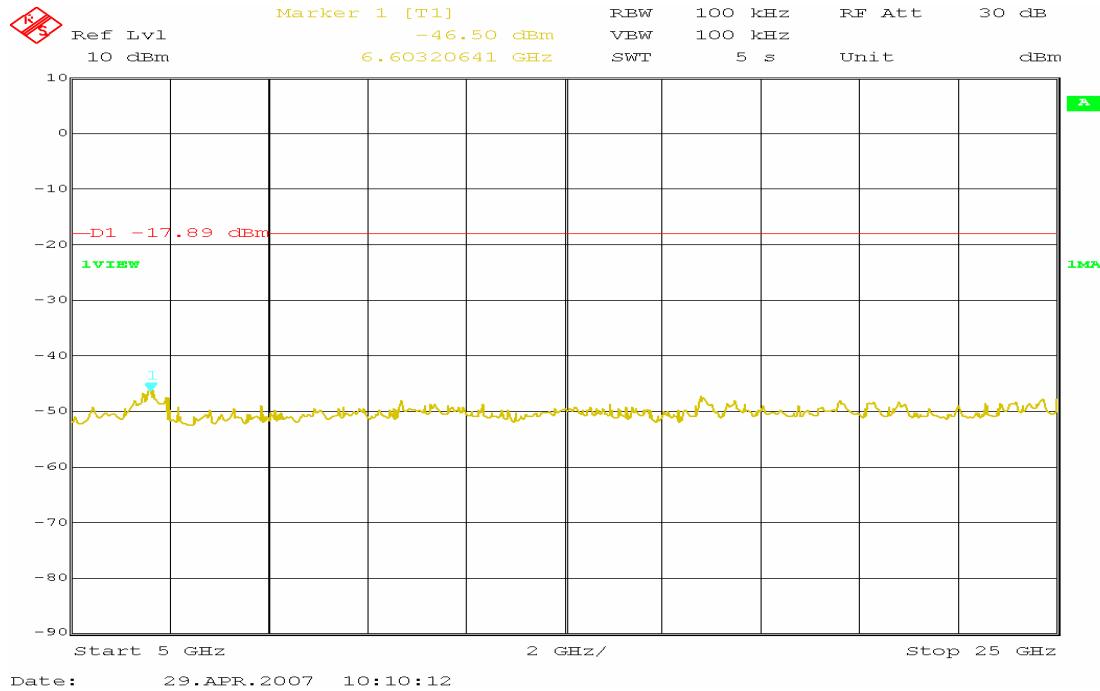
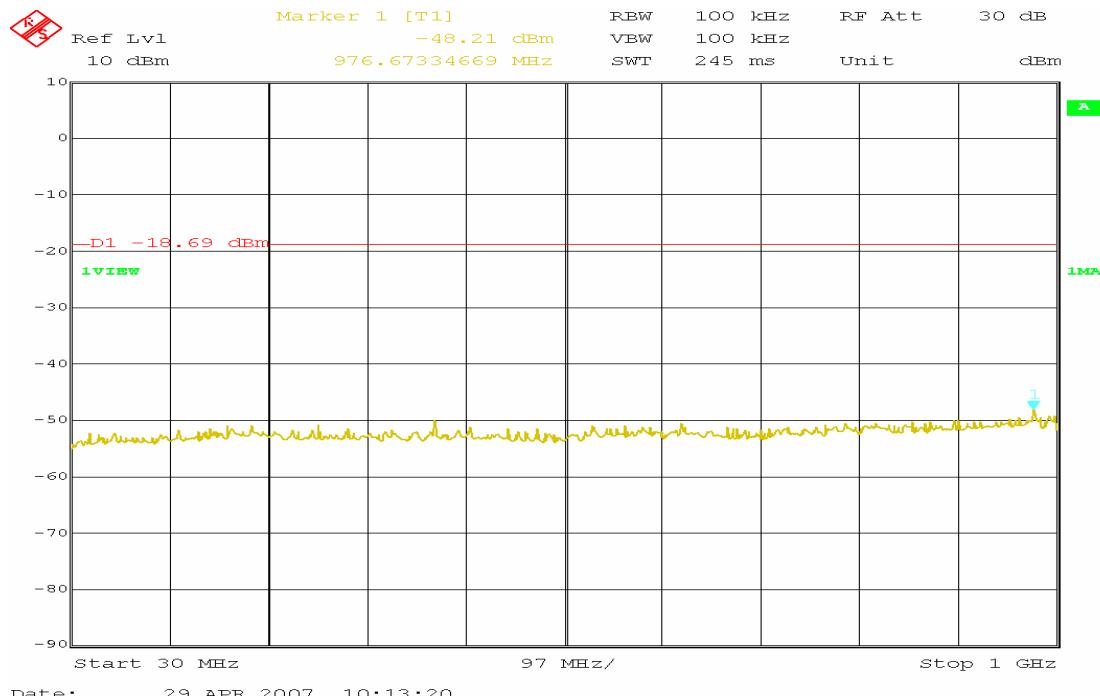
**1G to 5GHz**

**5G to 25GHz**


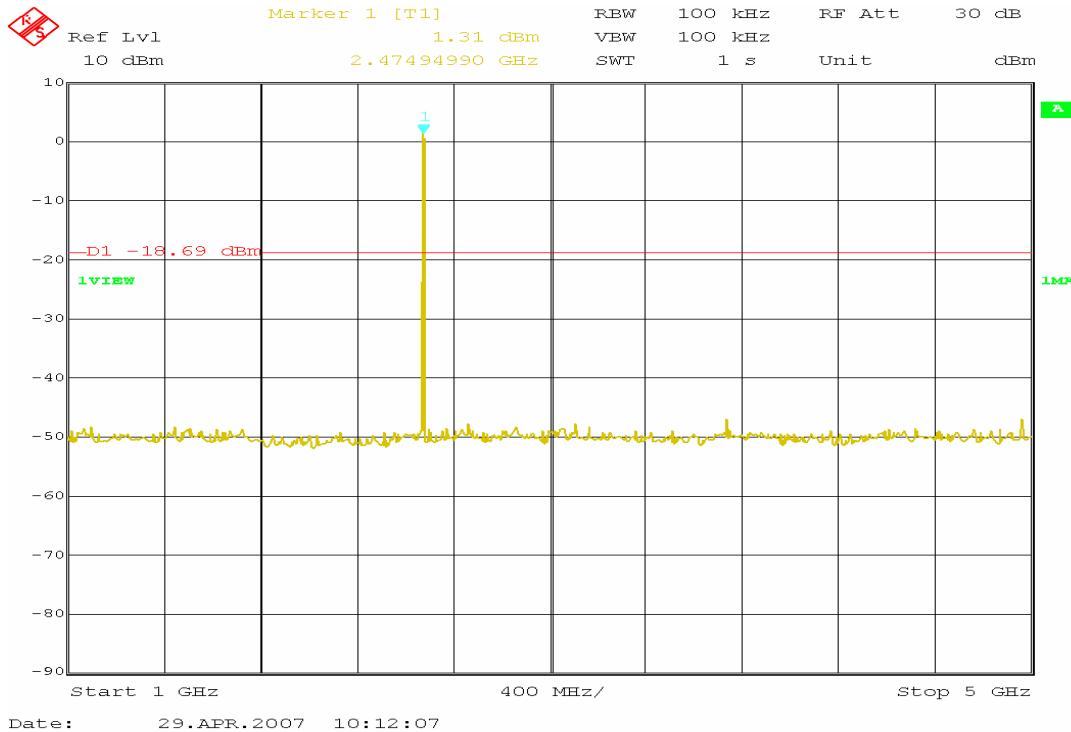
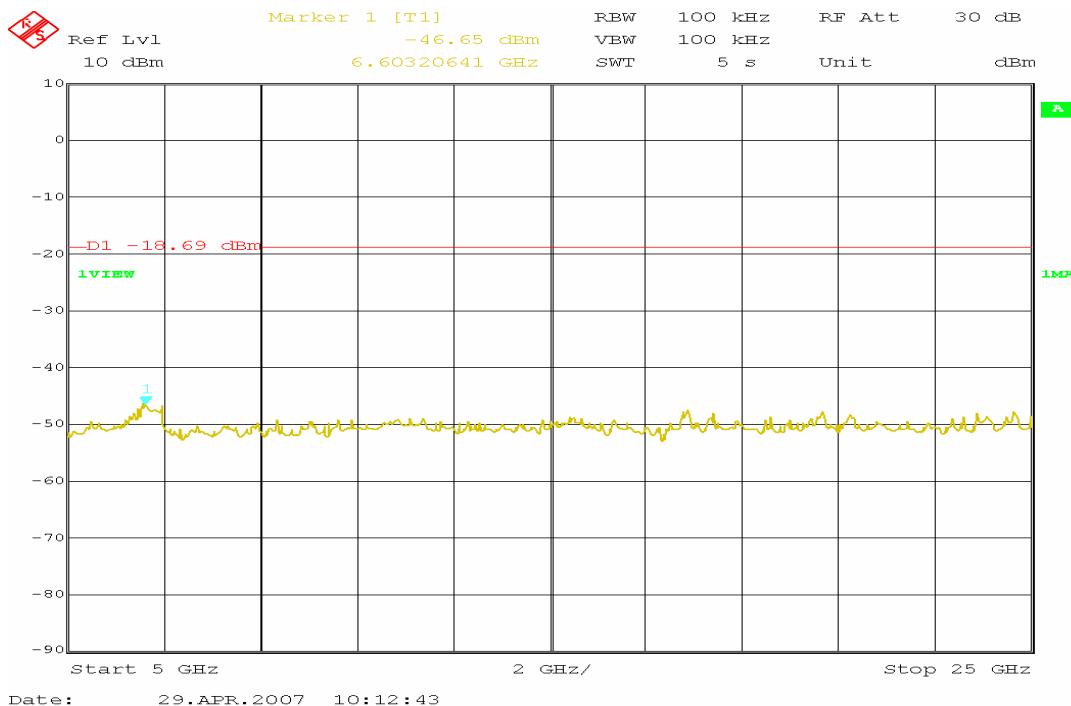
## Medium Channel (channel 39): 30M to 1GHz



## 1G to 5GHz



**5G to 25GHz**

**Highest Channel (channel 78): 30M to 1GHz**


**1G to 5GHz****5G to 25GHz**

## 6.5 Radiated Spurious Emissions

Test Requirement: FCC 15.247(d) & 15.209 & 15.109

Test Method: ANSI C63.4 section 8 & 13

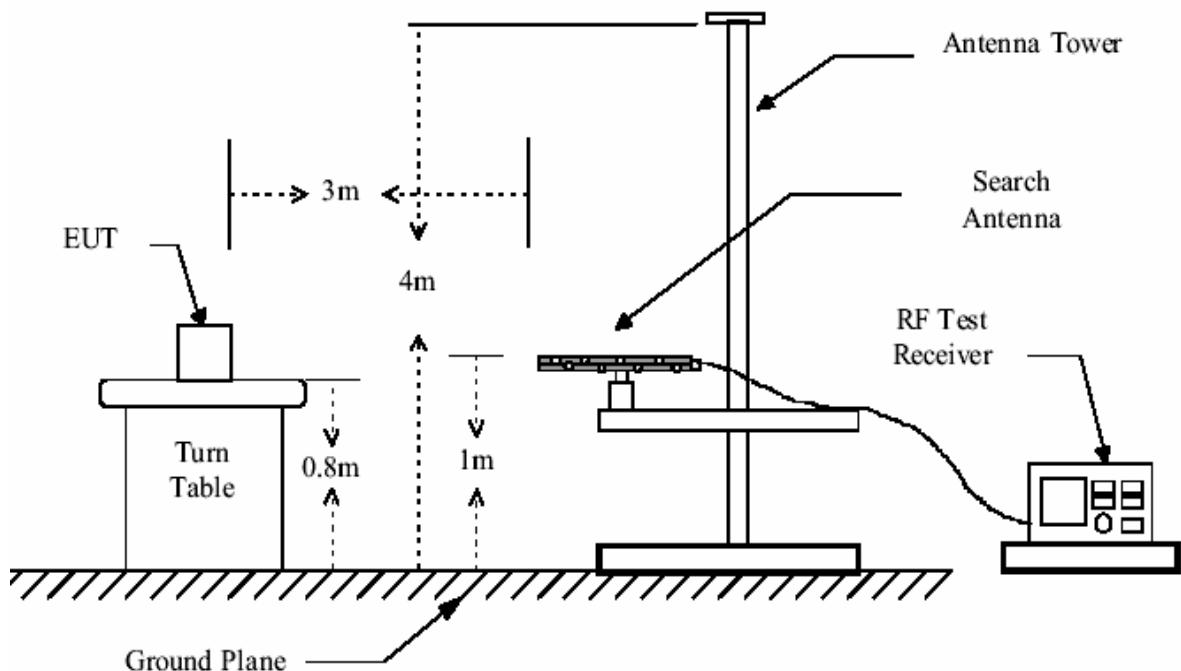
Test Date: 29 April 2007

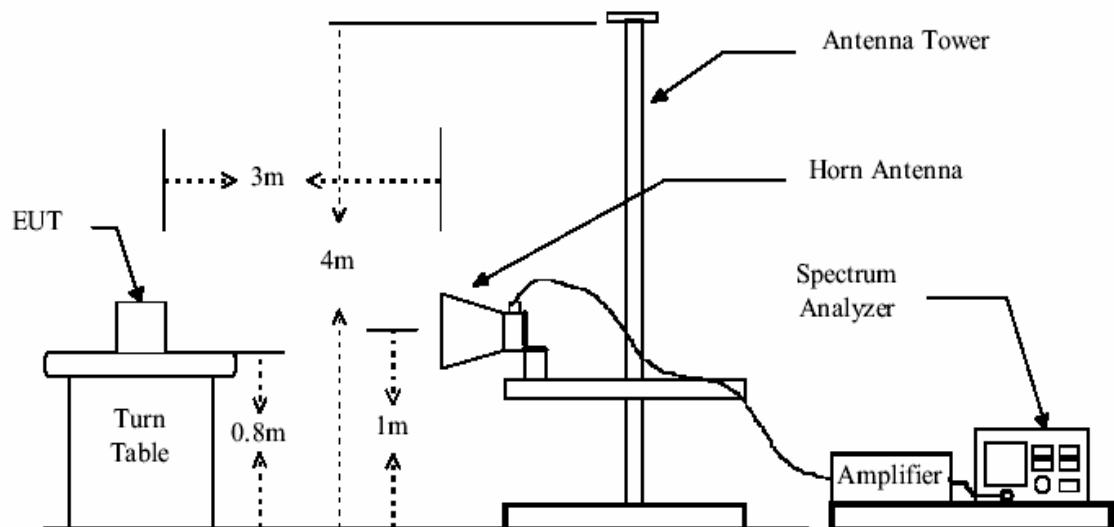
Test site: Measurement Distance: 3m (Semi-Anechoic Chamber and OATS)  
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz), 1 MHz resolution bandwidth and Peak and Average-Peak detector apply(1000 MHz – 25GHz).  
Receive antenna scan height 1 m - 4 m, polarization Vertical / Horizontal

15.209 & 15.109 Limit: 40.0 dB $\mu$ V/m between 30MHz & 88MHz  
43.5 dB $\mu$ V/m between 88MHz & 216MHz  
46.0 dB $\mu$ V/m between 216MHz & 960MHz  
54.0 dB $\mu$ V/m above 960MHz

15.247(d) limit: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

### Test Configuration:





**Test Procedure:** The procedure used was ANSI Standard C63.4-2001. The receive was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor.

The following test results were performed on the EUT.

**Transmitter:****Test in Channel 0 in transmitting status- Vertical polarization**

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

| Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|-------------------------|----------------|-------------|
| 304.510         | 38.1                    | 46.0           | 7.9         |

1~25 GHz Harmonics &amp; Spurious Emissions, Peak &amp; Average Measurement

**Peak Measurement**

| Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|-------------------------|----------------|-------------|
| 4804.000        | 52.0                    | 74.0           | 22.0        |

**Average Measurement**

| Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|-------------------------|----------------|-------------|
| 4804.000        | 36.0                    | 54.0           | 18.0        |

Remark: No other radiation has been found.

**Test in Channel 0 in transmitting status- Horizontal polarization**

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 227.880            | 41.4                       | 46.0              | 4.6            |

1~25 GHz Harmonics &amp; Spurious Emissions, Peak &amp; Average Measurement

**Peak Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4804.000           | 49.0                       | 74.0              | 25.0           |

**Average Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4804.000           | 35.6                       | 54.0              | 18.4           |

Remark: No other radiation has been found.

**Test in Channel 39 in transmitting status- Vertical polarization**

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 182.290            | 40.0                       | 43.5              | 3.5            |

1~25 GHz Harmonics &amp; Spurious Emissions, Peak &amp; Average Measurement

**Peak Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4882.000           | 51.0                       | 74.0              | 23.0           |

**Average Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4882.000           | 36.5                       | 54.0              | 17.5           |

**Test in Channel 39 in transmitting status- Horizontal polarization**

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 183.030            | 35.0                       | 43.5              | 8.5            |

1~25 GHz Harmonics &amp; Spurious Emissions, Peak &amp; Average Measurement

**Peak Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4882.000           | 49.5                       | 74.0              | 24.5           |

**Average Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4882.000           | 35.5                       | 54.0              | 18.5           |

Remark: No other radiation has been found.

**Test in Channel 78 in transmitting status- Vertical polarization**

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 184.290            | 38.3                       | 43.5              | 5.2            |

1~25 GHz Harmonics &amp; Spurious Emissions, Peak &amp; Average Measurement

**Peak Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4960.000           | 51.0                       | 74.0              | 23.0           |

**Average Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4960.000           | 35.8                       | 54.0              | 18.2           |

**Test in Channel 78 in transmitting status- Horizontal polarization**

30MHz~1GHz Spurious Emissions ,Quasi-Peak Measurement

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 183.260            | 37.5                       | 43.5              | 6.0            |



1~25 GHz Harmonics & Spurious Emissions, Peak & Average Measurement

**Peak Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4960.000           | 49.0                       | 74.0              | 25.0           |

**Average Measurement**

| Frequency<br>(MHz) | Emission Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|----------------------------|-------------------|----------------|
| 4960.000           | 35.4                       | 54.0              | 18.6           |

Remark: No other radiation has been found.

**Receiver:**

30MHz~25 GHz Harmonics & Spurious Emissions

**None of radiation has been found in receiving mode.**

**TEST RESULTS:** The unit does meet the FCC requirements.

**6.5.1 Radiated Emissions which fall in the restricted bands**

Test Requirement:

Section 15.247 (d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Method:

Base on ANSI 63.4.

Test Date:

29 April 2007

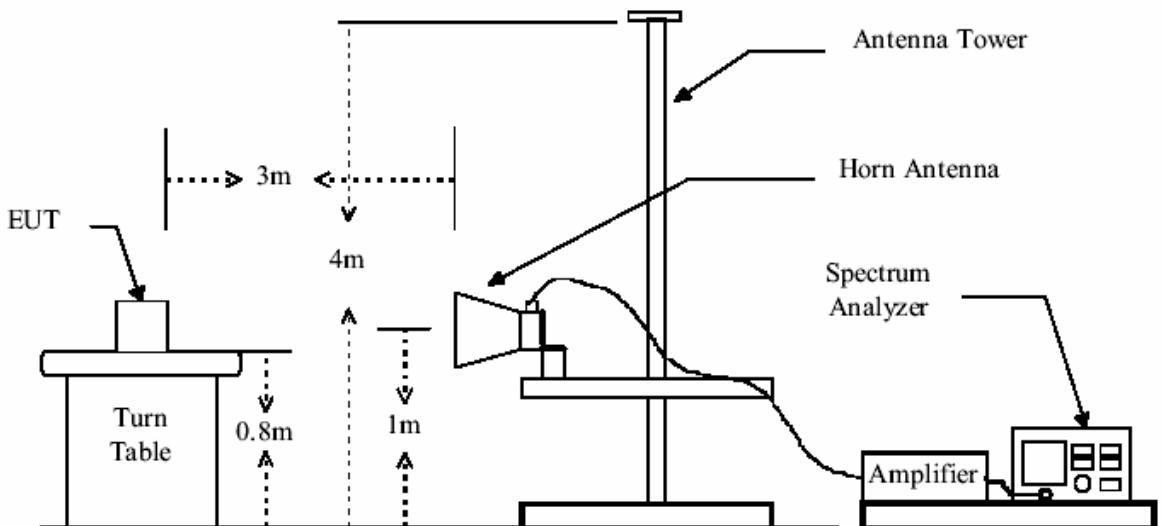
Measurement Distance:

3m (Semi-Anechoic Chamber)

Limit:

40.0 dB $\mu$ V/m between 30MHz & 88MHz43.5 dB $\mu$ V/m between 88MHz & 216MHz46.0 dB $\mu$ V/m between 216MHz & 960MHz54.0 dB $\mu$ V/m above 960MHz

Detector:

Peak for pre-scan , 120kHz resolution bandwidth within 1GHz,  
1MHz resolution bandwidth above 1GHz**Test Configuration:**

**Test Procedure:** The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

**Test Result:****1. Channel 0 ( 2.402GHz)**

| Test Frequency (MHz) | Peak Level (dBuV/m) | Average Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) |      |
|----------------------|---------------------|------------------------|---------------------|------------------------|-------------|------|
|                      |                     |                        |                     |                        | Peak        | AV   |
| 2390.000             | 46.0                | 35.0                   | 74.0                | 54.0                   | 28.0        | 19.0 |
| 2483.500             | 46.5                | 35.0                   | 74.0                | 54.0                   | 27.5        | 19.0 |

**2. Channel 39 ( 2.441GHz)**

| Test Frequency (MHz) | Peak Level (dBuV/m) | Average Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) |      |
|----------------------|---------------------|------------------------|---------------------|------------------------|-------------|------|
|                      |                     |                        |                     |                        | Peak        | AV   |
| 2390.000             | 45.5                | 35.5                   | 74.0                | 54.0                   | 27.5        | 18.5 |
| 2483.500             | 46.0                | 35.0                   | 74.0                | 54.0                   | 28.0        | 19.0 |

**3. Channel 79 ( 2.480GHz)**

| Test Frequency (MHz) | Peak Level (dBuV/m) | Average Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) |      |
|----------------------|---------------------|------------------------|---------------------|------------------------|-------------|------|
|                      |                     |                        |                     |                        | Peak        | AV   |
| 2390.000             | 45.5                | 35.5                   | 74.0                | 54.0                   | 27.5        | 18.5 |
| 2483.500             | 46.0                | 35.0                   | 74.0                | 54.0                   | 28.0        | 19.0 |

**The unit does meet the FCC requirements.**

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| <b>MHz</b>                 | <b>MHz</b>            | <b>MHz</b>      | <b>GHz</b>       |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2655 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              |                       |                 |                  |

## 6.6 Band Edges Requirement

Test Requirement: FCC Part 15 C  
Test Method: Based on ANSI 63.4  
Test Date: 29 April 2007  
Requirements: Section 15.247 (d)In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 6.6.1 100 kHz Bandwidth Outside the Frequency Band

Method of Measurement: Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge.  
The band edges was measured and recorded.

Test Result:

The Lower Edge 2.4000GHz: the value is -47.50dB that is attenuated more than 20dB.

The Upper Edge 2.4835GHz: the value is -49.20dB that is attenuated more than 20dB.

**The unit does meet the FCC requirements.**

## 6.7 Hopping Channel Number

Test Requirement: FCC Part15 C

Test Method: Based on FCC Part15 C Section 15.247

Test Date: 28 April 2007

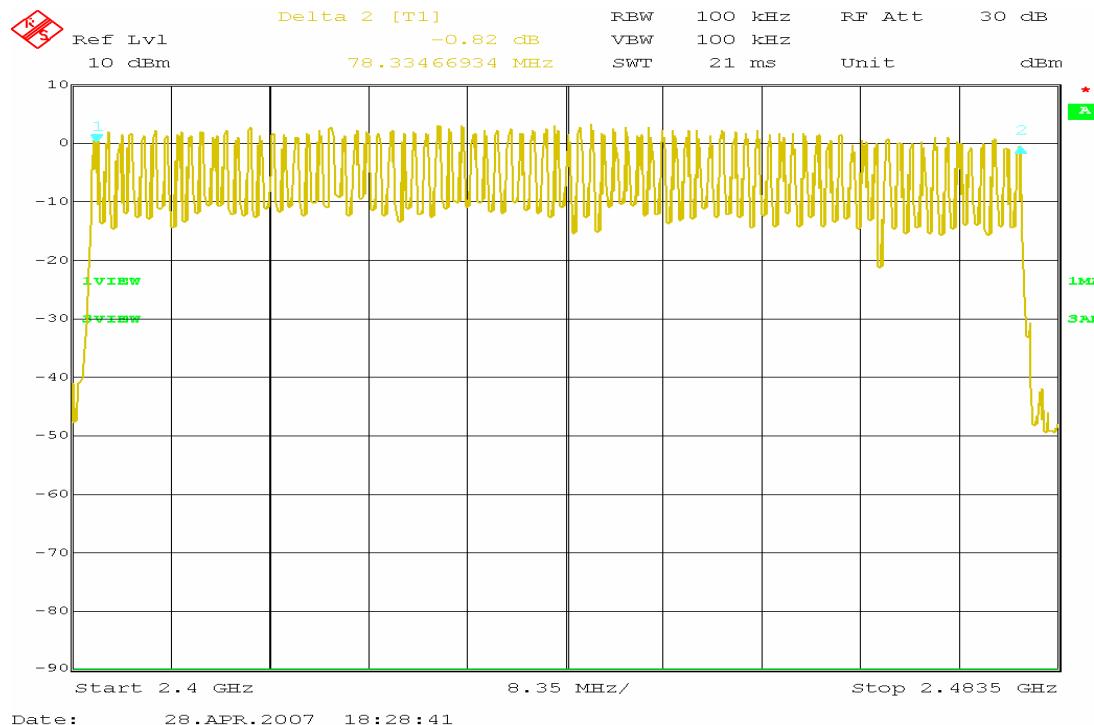
Requirements: Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz, VBW = 100KHz, Sweep = auto; Detector Function = Peak.
3. Set the spectrum analyzer: start frequency = 2400MHz, stop frequency = 2483.5MHz. Record the max. hold reading graph.

**Test result:** Total channels are 79 channels, channel 0 to channel 78.

It also comply with the demand of frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels. The Maximum peak conducted output power limit apply 1 watt according to regulation 15.247 (b)(1).



## 6.8 Occupied Bandwidth

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247:

Test Date: 28 April 2007

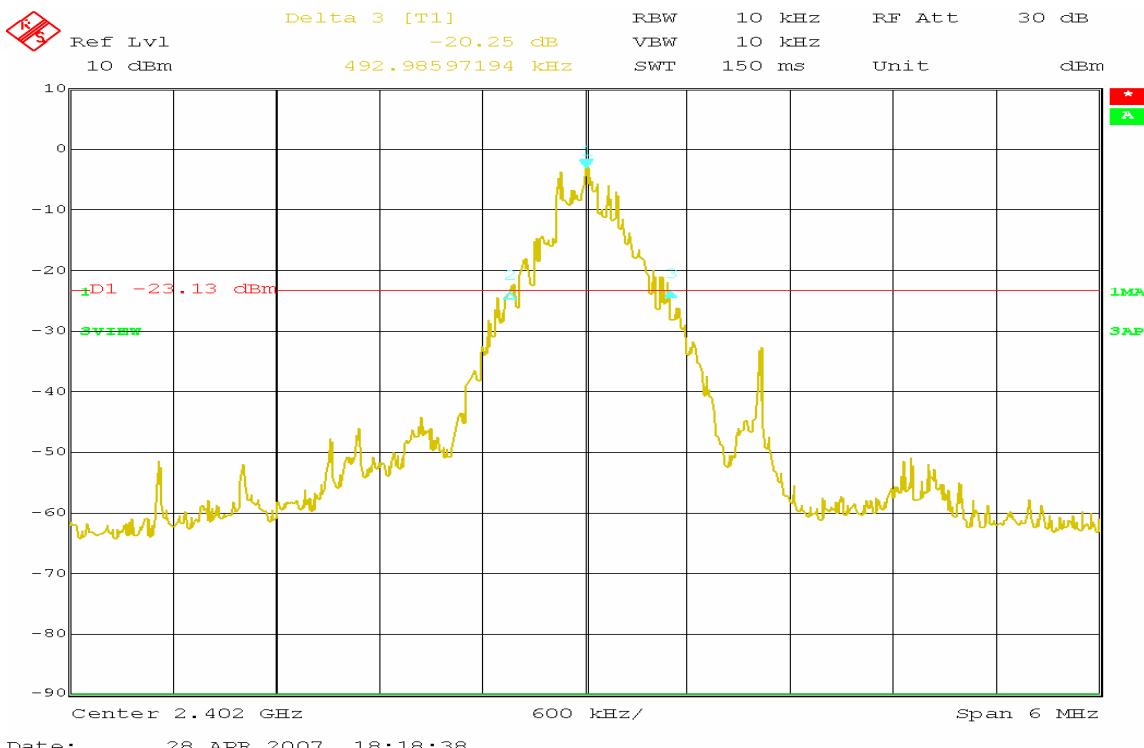
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW  $\geq$  1% of the 20dB bandwidth (set 10KHz), VBW  $\geq$  RBW (set 10KHz), Sweep = auto; Detector Function = Peak (Max. hold).
3. Mark the peak frequency and -20dB points.

**Test result:**

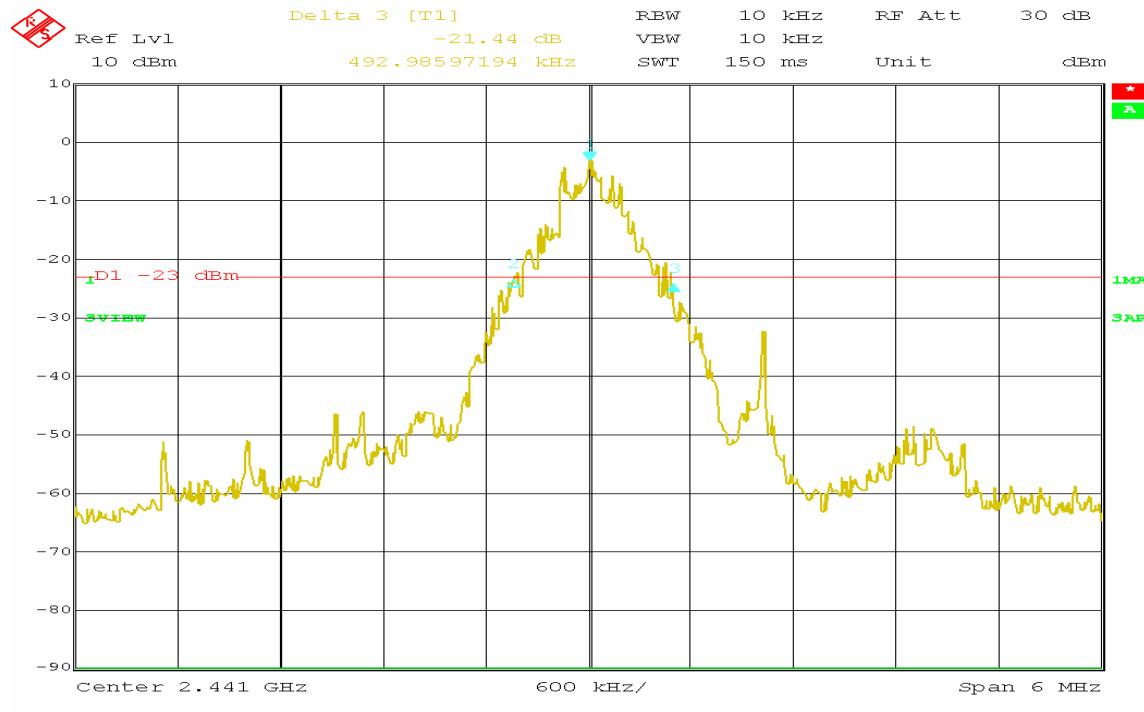
| Test Channel | 20 dB bandwidth |
|--------------|-----------------|
| 0            | 937.86KHz       |
| 39           | 937.86KHz       |
| 78           | 913.83KHz       |

Channel 0:

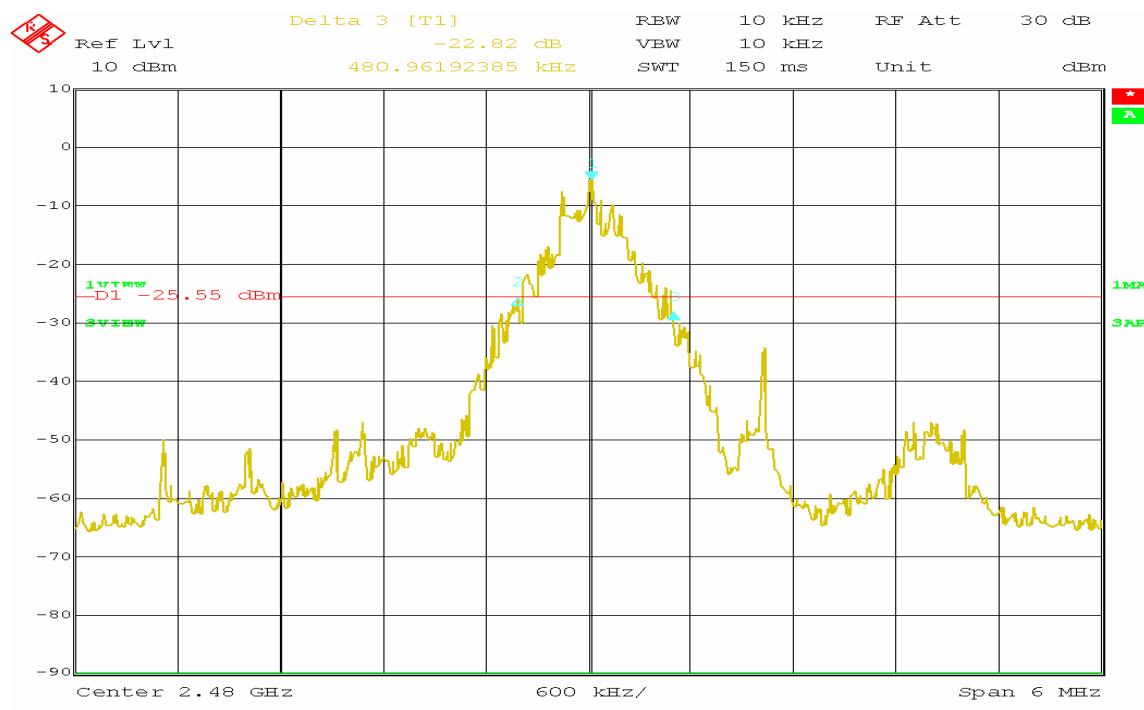


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Remark: Bandwidth='Delta 2'(444.89K)+'Delta 3'(492.99K)=937.86KHz

**Channel 39:**


Remark: Bandwidth='Delta 2'(444.89K)+'Delta 3'(492.99K)=937.86KHz

**Channel 78:**


Remark: Bandwidth='Delta 2'(432.87K)+'Delta 3'(480.96K)=913.83KHz

## 6.9 Carrier Frequencies Separated

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247:

Test Date: 28 April 2007

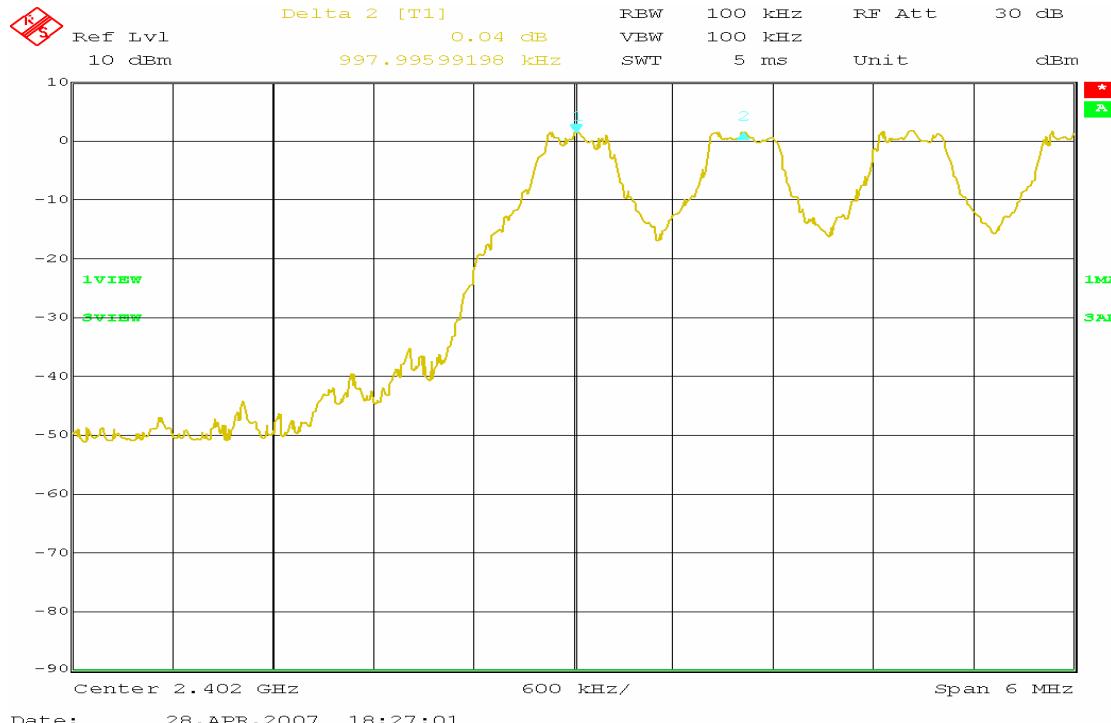
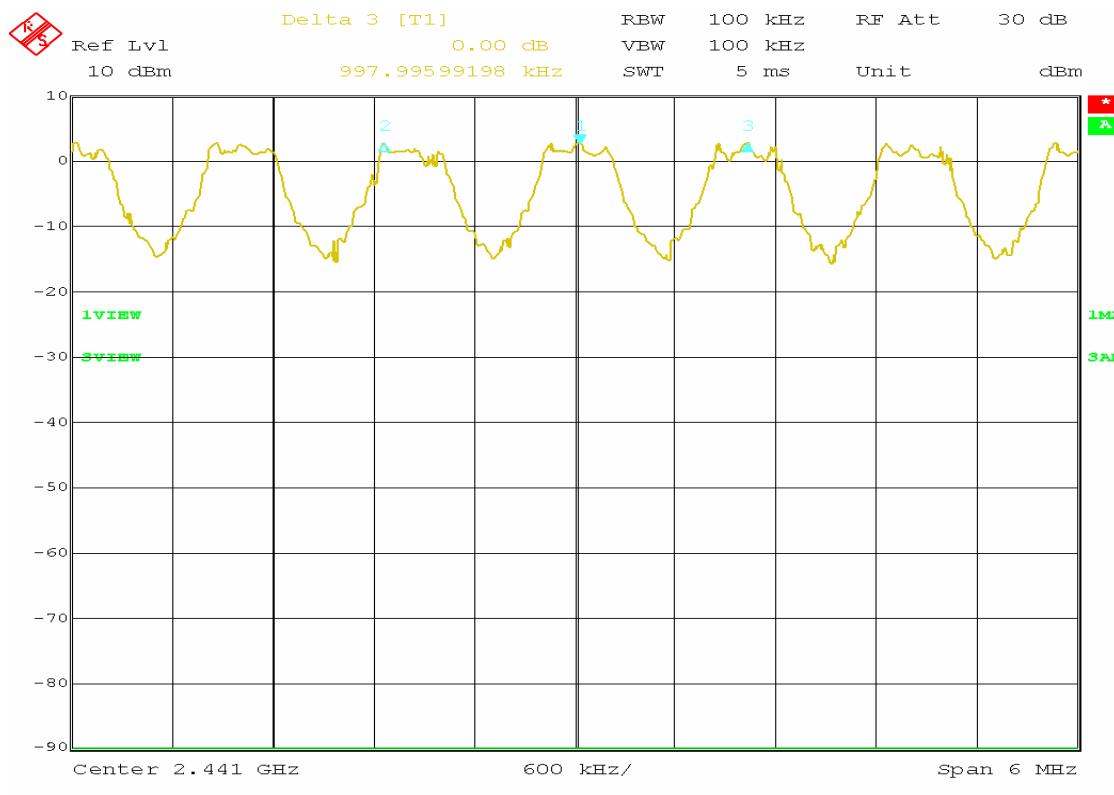
Test requirements: Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may 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.

Test Procedure:

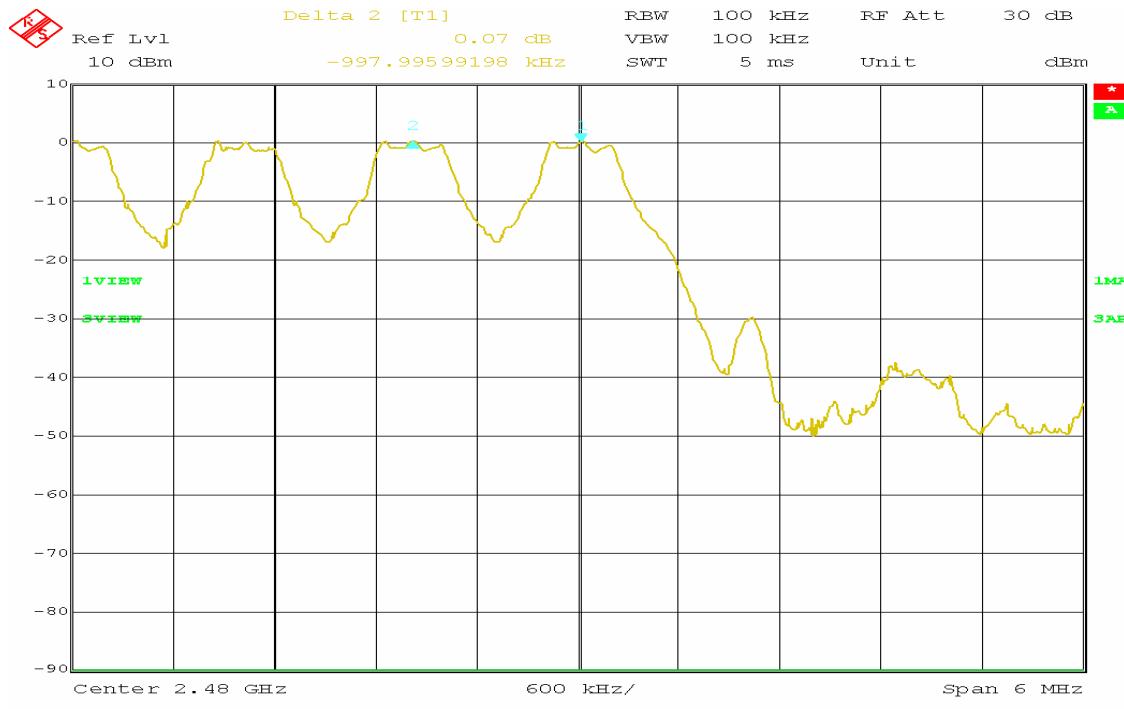
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW  $\geq$  1% of the span (set 100KHz), VBW  $\geq$  RBW (set 300KHz), Span = 10MHz, Sweep = auto; Detector Function = Peak (Max. hold).
3. Mark the peak frequency and -20dB.

**Test result:**

| <b>Test Channel</b>                            | <b>Carrier Frequencies Separated</b> | <b>Limit</b>                    | <b>Verdict</b> |
|--|--------------------------------------|---------------------------------|----------------|
| Lower Channels<br>(channel 0 and channel 1)    | 997.99KHz                            |                                 | Pass           |
| Middle Channels<br>(channel 39 and channel 40) | 997.99KHz                            | >20dBm<br>Occupied<br>bandwidth | Pass           |
| Middle Channels<br>(channel 38 and channel 39) | 1144.0KHz                            |                                 | Pass           |
| Upper Channels<br>(channel 77 and channel 78)  | 997.99KHz                            |                                 | Pass           |

**Channel 0:****Channel 39:**

## Channel 78:



## 6.10 Dwell Time

Test Requirement: FCC Part 15 C  
Test Method: Based on FCC Part15 C Section 15.247:  
Test Date: 28 April 2007  
Test requirements: Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set RBW of spectrum analyzer to 1MHz and VBW of spectrum analyzer to 1MHz, Set the test channel frequency span to 0.

Test Result:

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

**1. Channel 0: 2.402GHz**

$\text{DH1 time slot} = 0.391 \text{ (ms)} * (1600/(2*79)) * 31.6 = 126.630 \text{ ms}$

$\text{DH3 time slot} = 1.659 \text{ (ms)} * (1600/(4*79)) * 31.6 = 265.440 \text{ ms}$

$\text{DH5 time slot} = 2.886 \text{ (ms)} * (1600/(6*79)) * 31.6 = 307.840 \text{ ms}$

**2. Channel 39: 2.441GHz**

$\text{DH1 time slot} = 0.391 \text{ (ms)} * (1600/(2*79)) * 31.6 = 126.630 \text{ ms}$

$\text{DH3 time slot} = 1.641 \text{ (ms)} * (1600/(4*79)) * 31.6 = 262.560 \text{ ms}$

$\text{DH5 time slot} = 2.886 \text{ (ms)} * (1600/(6*79)) * 31.6 = 307.840 \text{ ms}$

**3. Channel 78: 2.4835GHz**

$\text{DH1 time slot} = 0.391 \text{ (ms)} * (1600/(2*79)) * 31.6 = 126.630 \text{ ms}$

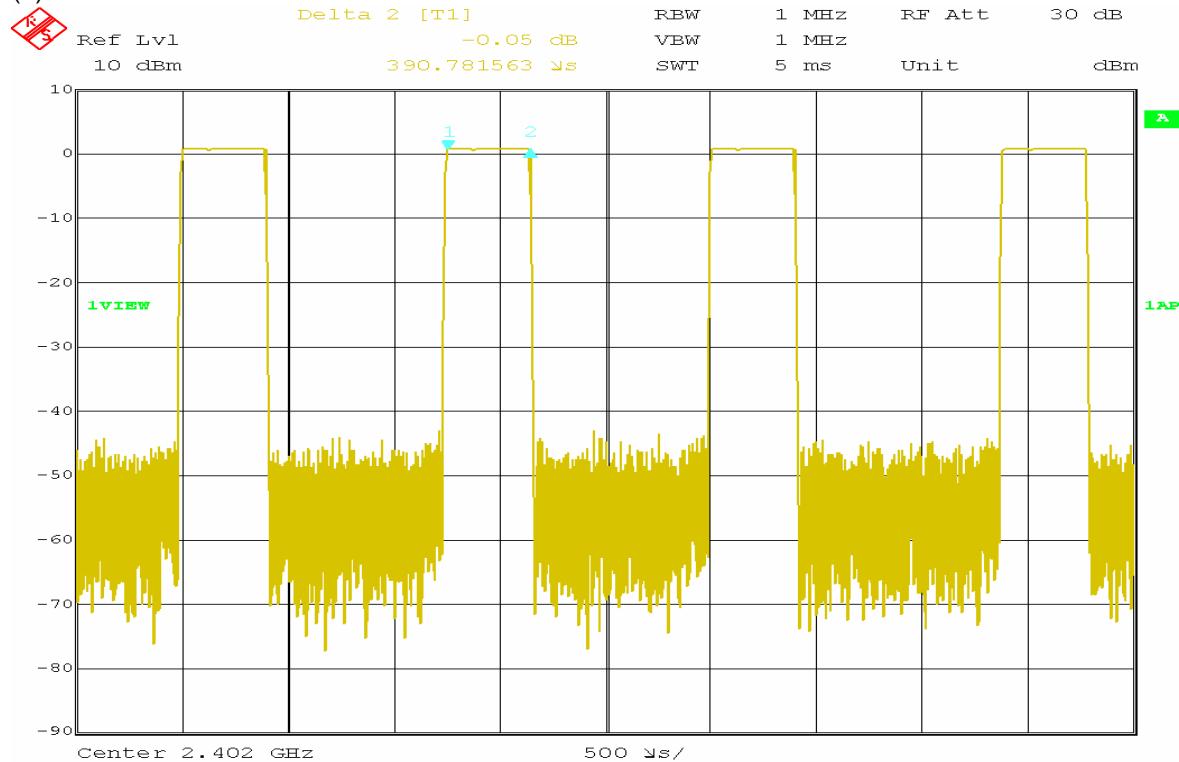
$\text{DH3 time slot} = 1.659 \text{ (ms)} * (1600/(4*79)) * 31.6 = 265.440 \text{ ms}$

$\text{DH5 time slot} = 2.886 \text{ (ms)} * (1600/(6*79)) * 31.6 = 307.840 \text{ ms}$

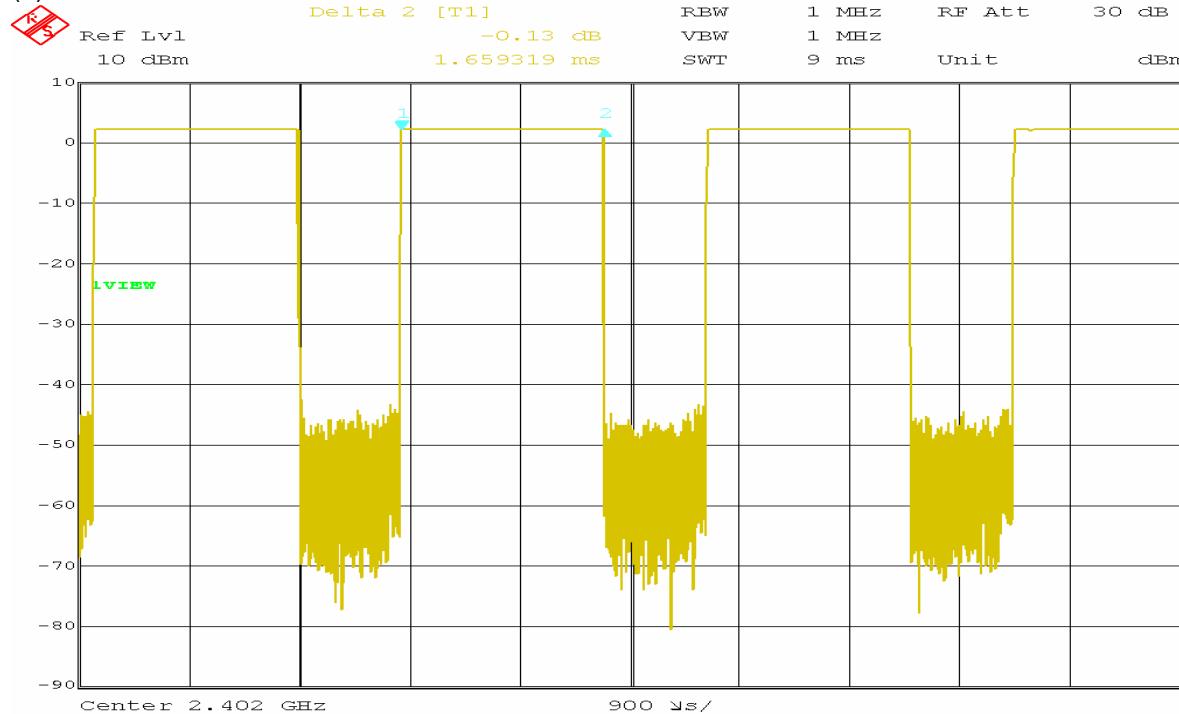
The results are not be greater than 0.4 seconds.

**The unit does meet the FCC requirements.**

Please refer the graph as below:

**1. Lowest channel (2.402 GHz):**
**(1). DH1**


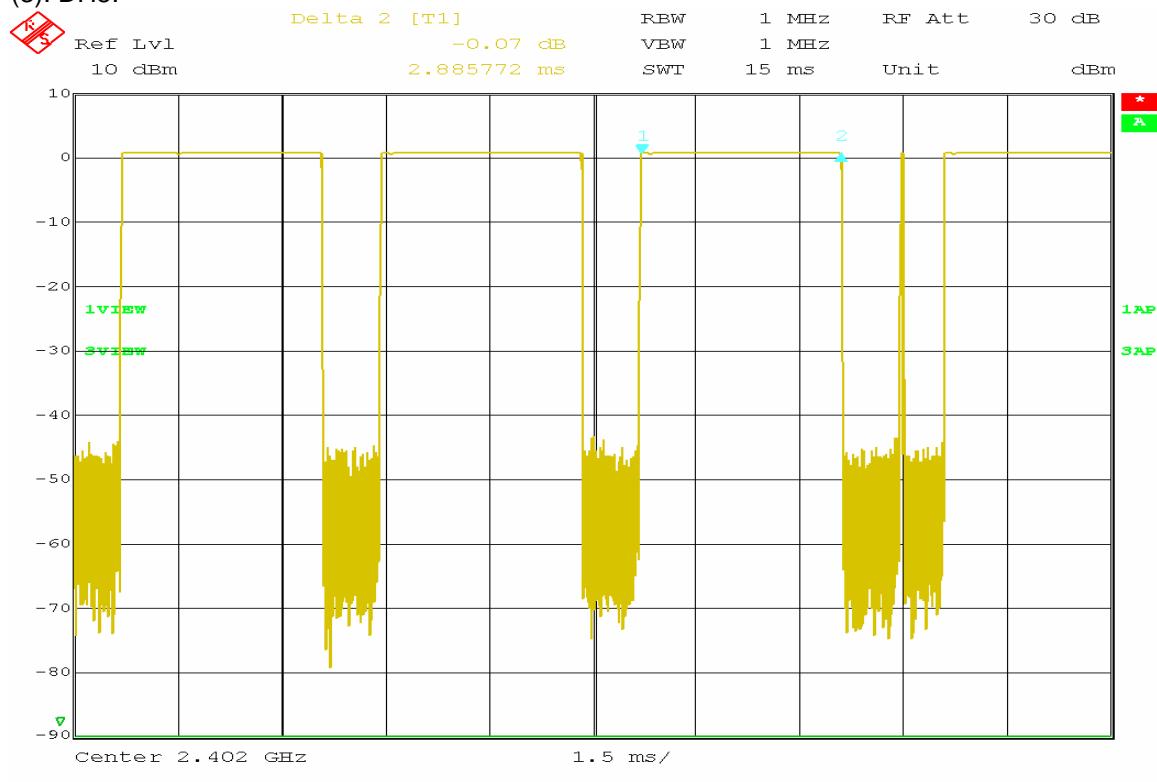
Date: 28.APR.2007 17:29:11

**(2) DH3:**


Date: 28.APR.2007 18:10:06

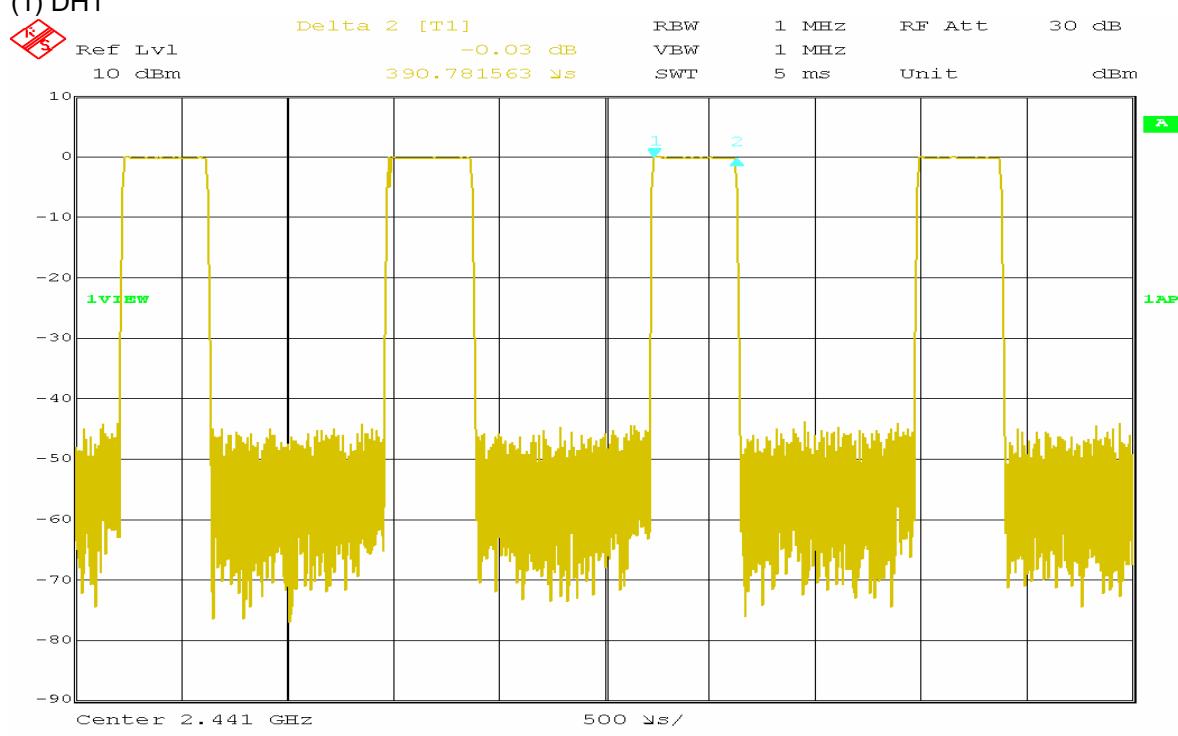
## 1. Lowest channel (2.402 GHz):

(3). DH5:



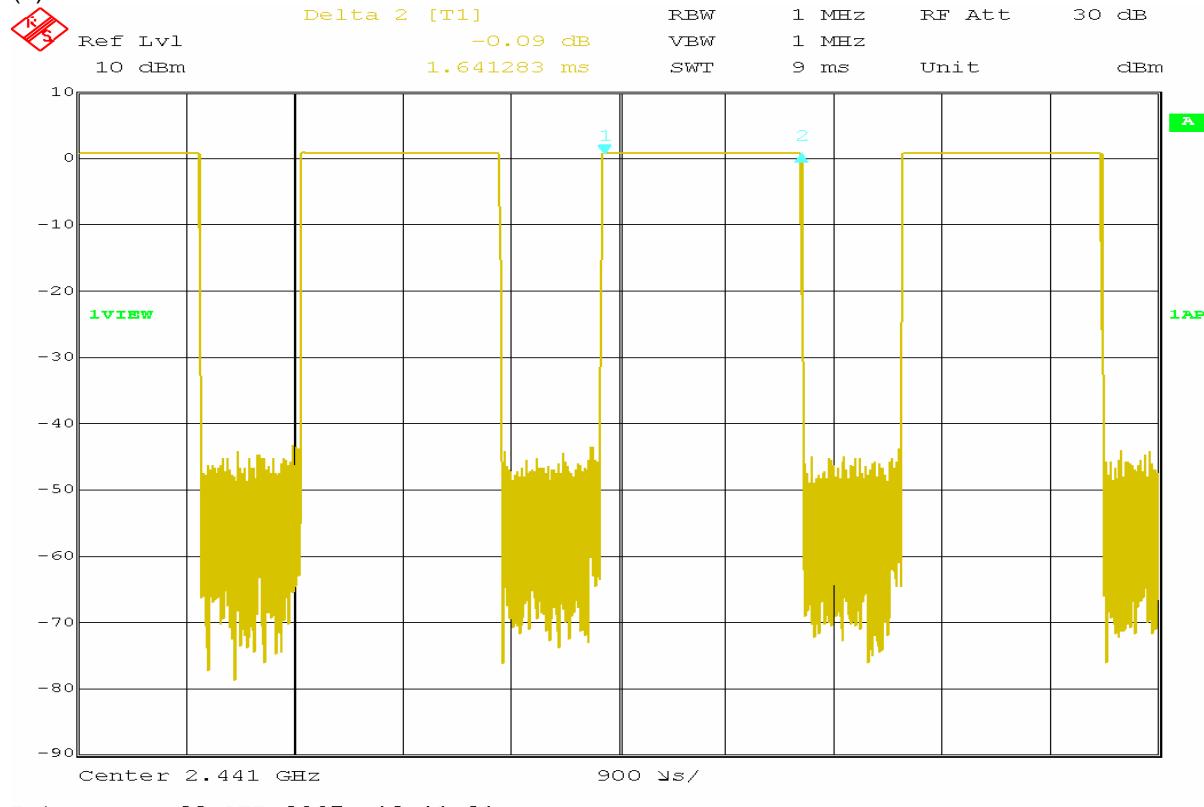
## 2. Middle Channel (2.441GHz)

(1) DH1

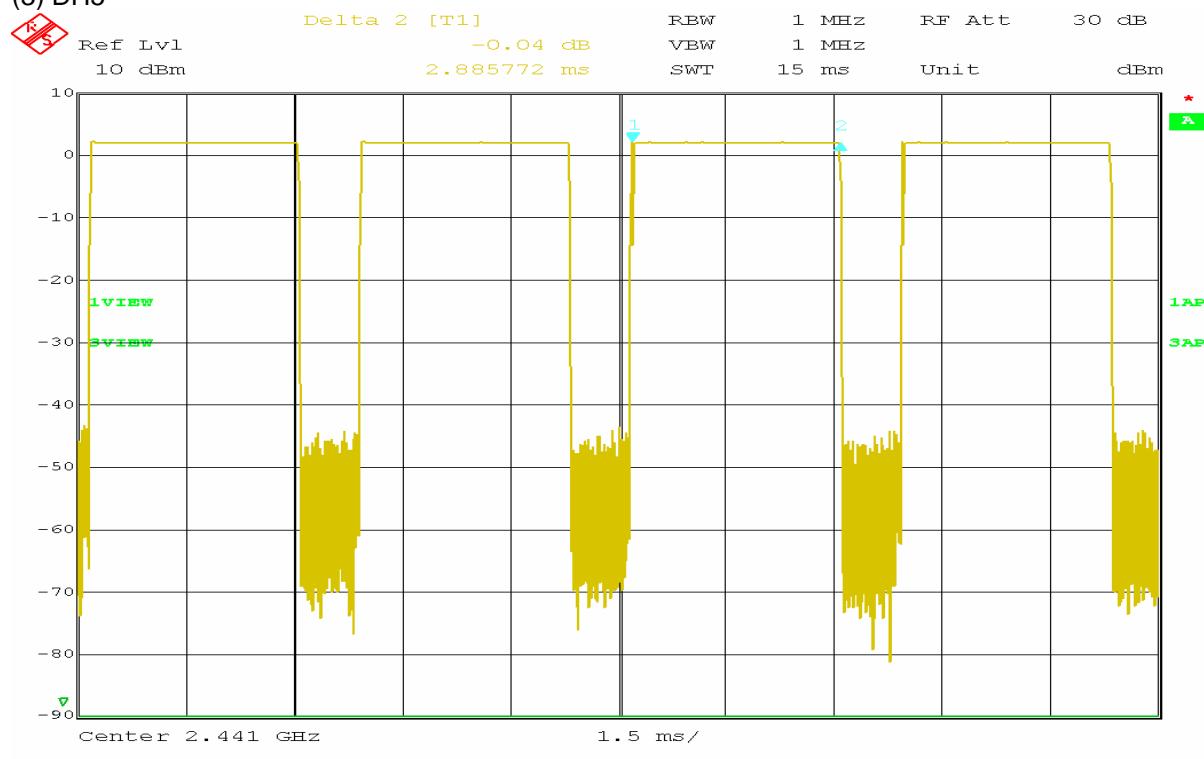


## 2. Middle Channel (2.441GHz)

(2) DH3

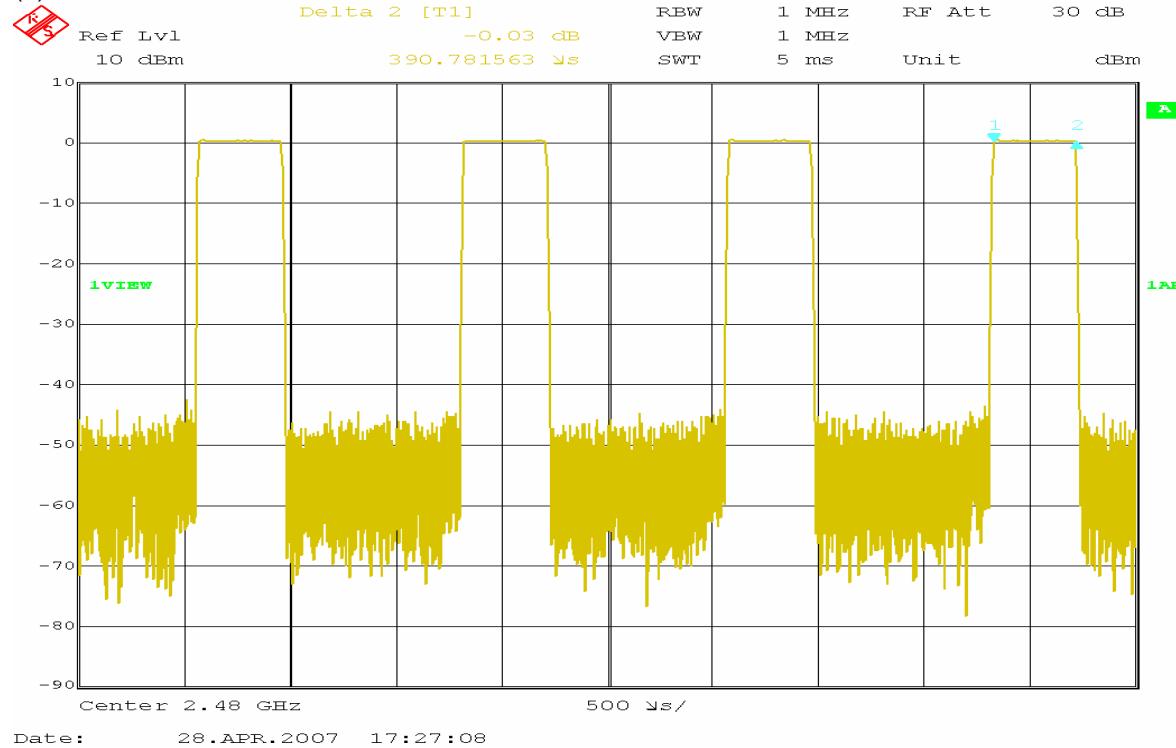


(3) DH5

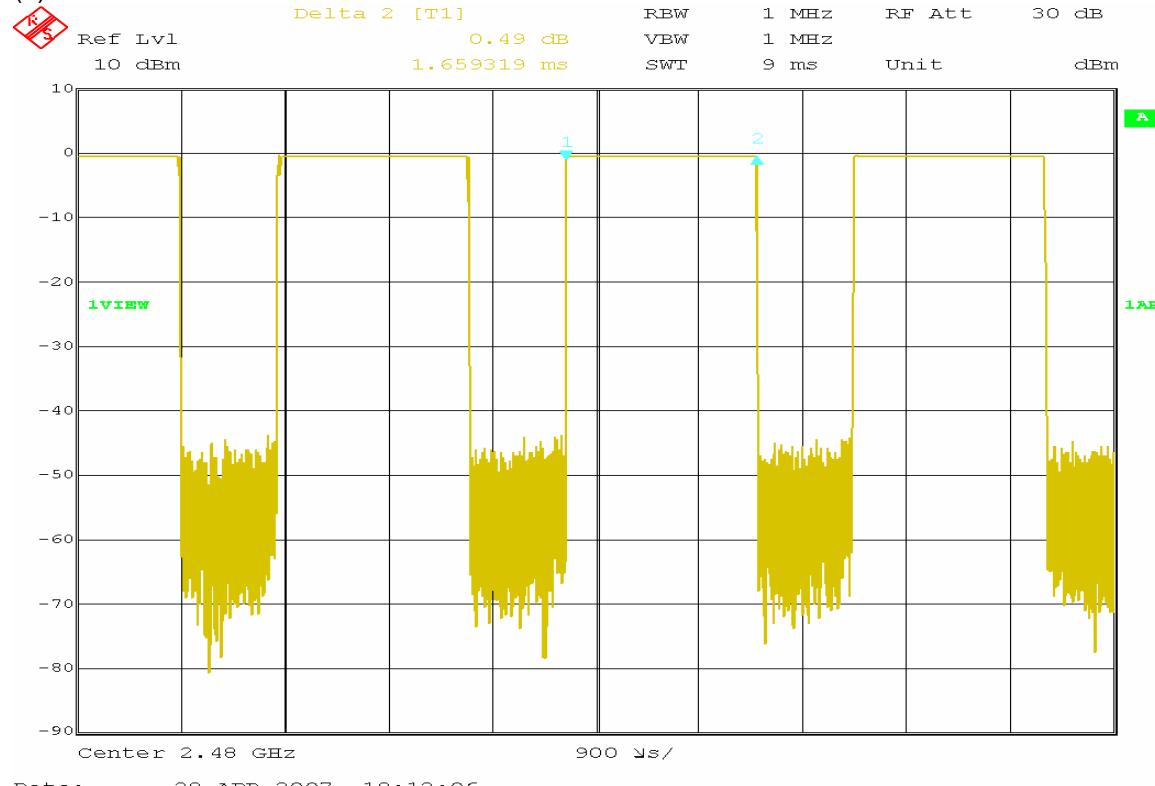


### 3. Highest channel (2.480GHz)

#### (1). DH1

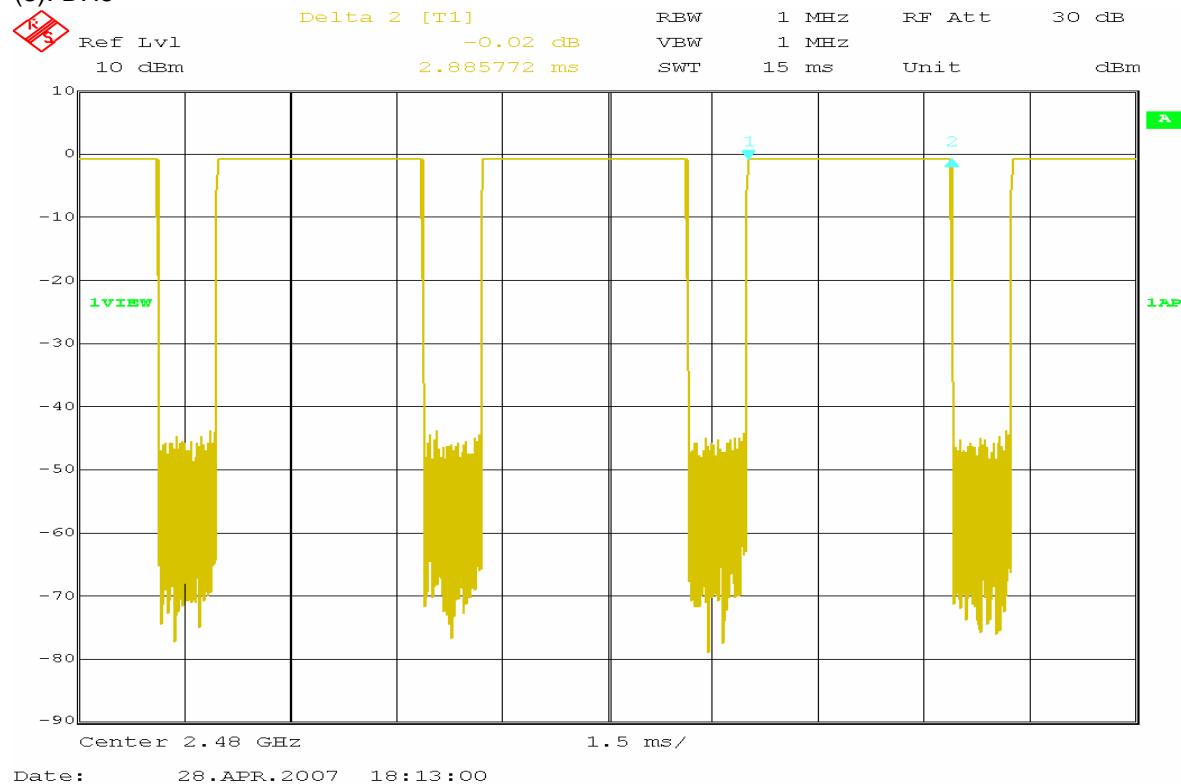


#### (2). DH3



## 3. Highest channel (2.480GHz)

(3). DH5



## **6.11 Antenna Requirement**

### **6.11.1 Standard Applicable**

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Regulation 15.247(c) (1)(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi 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 6 dBi.

### **6.11.2 Antenna Construction**

The antenna is integrated on the main PCB and no consideration of replacement.