



# FCC TEST REPORT

for

## 47 CFR Part 15 Subpart C

**Equipment** : GSM Tri-band mobile phone with GPRS, Bluetooth, FM radio

**Trade Name** : Toshiba

**Model No.** : SD3-E01(TS608/TS30)

**FCC ID** : HFS-SD3-E01

**Filing Type** : Certification

**Applicant** : **Quanta Computer Inc.**

No. 211, Wen Hwa 2nd Road, Kuei Shan Hsiang, Tao Yuan Shien,  
Taiwan

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- The data shown in this test report were carried out on Mar. 03, 2006 at **Sporton International Inc. LAB.**
- Report No.: FR620907, Report Version: Rev. 01.

Dr. Daniel Lee  
EMC/SAR Director

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***SPORTON International Inc.***

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Report Version: Rev. 01



## Table of Contents

|                                                            |           |
|------------------------------------------------------------|-----------|
| <b>History of this test report.....</b>                    | <b>ii</b> |
| <b>1. General Description of Equipment under Test.....</b> | <b>1</b>  |
| 1.1.Applicant.....                                         | 1         |
| 1.2.Manufacturer .....                                     | 1         |
| 1.3.Basic Description of Equipment under Test.....         | 1         |
| 1.4.Feature of Equipment under Test .....                  | 1         |
| <b>2. Test Configuration of Equipment under Test .....</b> | <b>2</b>  |
| 2.1.Test Manner .....                                      | 2         |
| 2.2.Test Mode .....                                        | 2         |
| 2.3.Connection Diagram of Test System .....                | 2         |
| 2.4.Ancillary Equipment List.....                          | 3         |
| <b>3. RF Utility .....</b>                                 | <b>4</b>  |
| <b>4. General Information of Test.....</b>                 | <b>5</b>  |
| 4.1.Test Voltage .....                                     | 5         |
| 4.2.Standard for Methods of Measurement.....               | 5         |
| 4.3.Test in Compliance with .....                          | 5         |
| 4.4.Frequency Range Investigated .....                     | 5         |
| 4.5.Test Distance .....                                    | 5         |
| <b>5. Report of Measurements and Examinations .....</b>    | <b>6</b>  |
| 5.1.List of Measurements and Examinations .....            | 6         |
| 5.2.Hopping Channel Separation .....                       | 7         |
| 5.3.Number of Hopping Frequency .....                      | 11        |
| 5.5 Dwell Time of Each Frequency .....                     | 17        |
| 5.6 Output Power .....                                     | 37        |
| 5.7 100kHz Bandwidth of Frequency Band Edges .....         | 41        |
| 5.8 Conducted Emission .....                               | 45        |
| 5.9 Radiated Emission Measurement .....                    | 50        |
| 5.10 Antenna Requirements.....                             | 65        |
| <b>6. List of Measuring Equipments Used .....</b>          | <b>66</b> |
| <b>7. Uncertainty Evaluation.....</b>                      | <b>67</b> |
| <b>Appendix A. External Product Photograph</b>             |           |
| <b>Appendix B. Internal Photograph</b>                     |           |
| <b>Appendix C. Setup Photograph</b>                        |           |



## History of this test report

Report Issue Date: Mar. 07, 2006

| Report No. | Description |
|------------|-------------|
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## 1. General Description of Equipment under Test

### 1.1. Applicant

**Quanta Computer Inc.**

No. 211, Wen Hwa 2nd Road, Kuei Shan Hsiang, Tao Yuan Shien, Taiwan

### 1.2. Manufacturer

**Quanta Computer Inc.**

No. 211, Wen Hwa 2nd Road, Kuei Shan Hsiang, Tao Yuan Shien, Taiwan

### 1.3. Basic Description of Equipment under Test

Equipment : GSM Tri-band mobile phone with GPRS, Bluetooth, FM radio  
Trade Name : Toshiba  
Model No. : SD3-E01(TS608/TS30)  
FCC ID : HFS-SD3-E01  
Power Supply Type : Switching  
AC Power Cord : AC 120V, Weave-Shielded, 1.5 meter, 2 pin  
Battery : GS20-BTR  
Adapter : PI, P925W05  
Earphone : Merry, DD0VI1EP003

### 1.4. Feature of Equipment under Test

| Product Feature & Specification                       |                                   |  |               |
|-------------------------------------------------------|-----------------------------------|--|---------------|
| 1. Modulation Type/Data Rate                          | GFSK                              |  |               |
| 2. Frequency Range.                                   | 2400 MHz ~ 2483.5 MHz             |  |               |
| Number of Channels                                    | 79                                |  |               |
| 3. Carrier Frequency of each channel                  | 2402+ n*1 MHz, n= 0~78            |  |               |
| 4. Channel Spacing                                    | 1 MHz                             |  |               |
| 5. Maximum Output Power to Antenna (Normal condition) | -0.84 dBm                         |  |               |
| 6. Type of Antenna Connector                          | N/A                               |  |               |
| 7. Antenna Type                                       | Fixed Internal                    |  |               |
| 8. Antenna Gain                                       | 3 dBi                             |  |               |
| 9. HW Version                                         | D2B                               |  |               |
| 10. SW Version                                        | 060214n-08.00 VI1.QCI-0.10E TPWVJ |  |               |
| 11. Function Type                                     | Transmitter                       |  | Transceiver V |
| 12. Power Rating (DC/AC , Voltage)                    | 3.8V / 300mA                      |  |               |
| 13. DUT Stage                                         | Production Unit                   |  |               |

## 2. Test Configuration of Equipment under Test

### 2.1. Test Manner

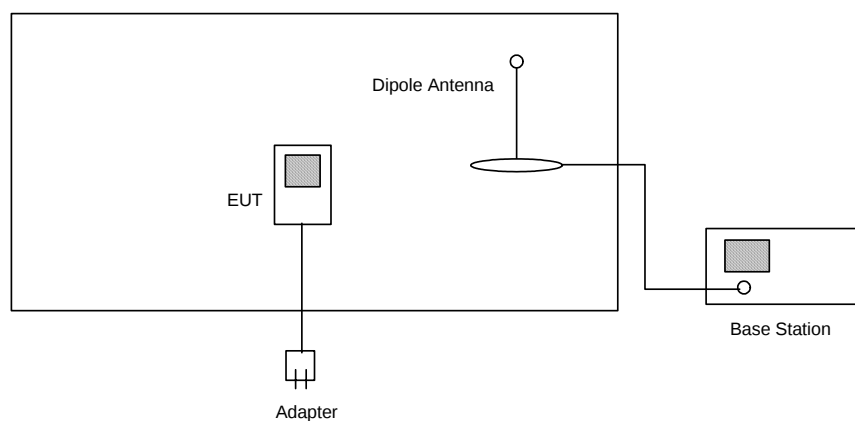
- The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- For spurious emission below 1GHz, only one channel of each application was tested because it is not related to channel selection.
- The EUT is programmed to transmit signal continuously for all testings.
- Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.

### 2.2. Test Mode

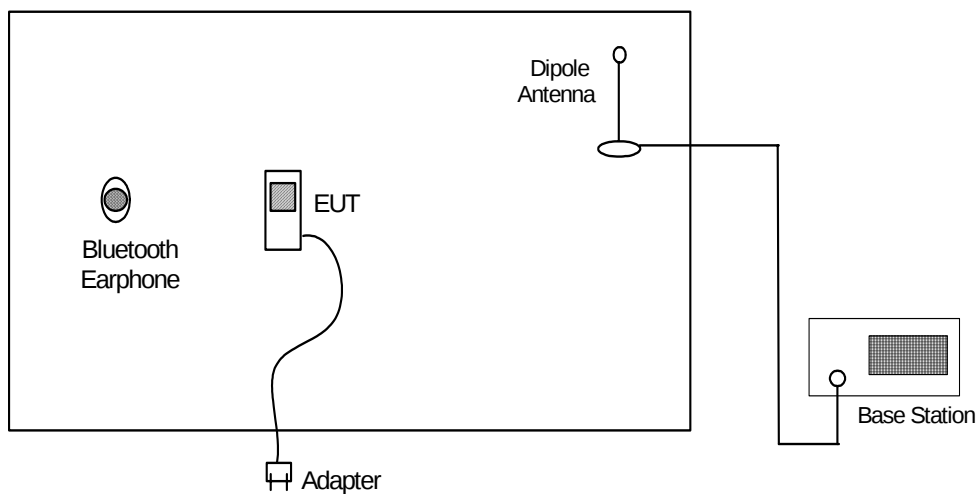
| Application                                | Bluetooth                                                  |
|--------------------------------------------|------------------------------------------------------------|
| Radiated Emission and conducted test items | Mode 1: Tx_CH00_2402 MHz                                   |
|                                            | Mode 2: Tx_CH39_2441 MHz                                   |
|                                            | Mode 3: Tx_CH78_2480 MHz                                   |
| Conducted Emission                         | Mode 1: PCS1900 Idle Mode + BT Link + Adapter + Camera     |
|                                            | Mode 2: PCS1900 Idle Mode + BT Link + Adapter + MP3 Player |

### 2.3. Connection Diagram of Test System

#### <Radiation Emission>



## &lt;Conduction Emission&gt;



## 2.4. Ancillary Equipment List

| Item | Equipment                       | Model No.       | Power Cord |
|------|---------------------------------|-----------------|------------|
| 1.   | Base Station (R&S)              | CMU200          | N/A        |
| 2.   | Bluetooth Earphone (Free Style) | JD-100          | N/A        |
| 3.   | Adapter (PIE)                   | P925BW05050ABXX | AC100-240V |
| 4.   | Earphone (Merry)                | EMC201-3        | N/A        |



### **3. RF Utility**

The EUT is in BT link mode with BT earphone for conducted emission or in BT continuous Tx Mode controlled by RF utility and base station simulator for radiation emission and other conducted tests.



## **4. General Information of Test**

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,  
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.  
TEL : 886-3-327-3456  
FAX : 886-3-318-0055  
Test Site No : CO01-HY, 03CH06-HY

### **4.1. Test Voltage**

AC 120V

### **4.2. Standard for Methods of Measurement**

ANSI C63.4-2003

### **4.3. Test in Compliance with**

47 CFR Part 15 Subpart C

### **4.4. Frequency Range Investigated**

Conduction: from 150 kHz to 30 MHz  
Radiation: from 30 MHz to 25000MHz

### **4.5. Test Distance**

The test distance of radiated emission from antenna to EUT is 3 m.

## 5. Report of Measurements and Examinations

### 5.1. List of Measurements and Examinations

| FCC Rule          | Description of Test                      | Result | Section |
|-------------------|------------------------------------------|--------|---------|
| 15.247(a)(1)      | Hopping Channel Separation               | Pass   | 5.2     |
| 15.247(a)(1)(iii) | Number of Hopping Frequency Used         | Pass   | 5.3     |
| 15.247(a)(1)      | Hopping Channel Bandwidth                | Pass   | 5.4     |
| 15.247(a)(1)(iii) | Dwell Time of Each Frequency             | Pass   | 5.5     |
| 15.247(b)(1)      | Output Power                             | Pass   | 5.6     |
| 15.247(c)         | 100kHz Bandwidth of Frequency Band Edges | Pass   | 5.7     |
| 15.207            | Conducted Emission                       | Pass   | 5.8     |
| 15.209            | Radiated Emission                        | Pass   | 5.9     |
| 15.203            | Antenna Requirement                      | Pass   | 5.10    |

## 5.2. Hopping Channel Separation

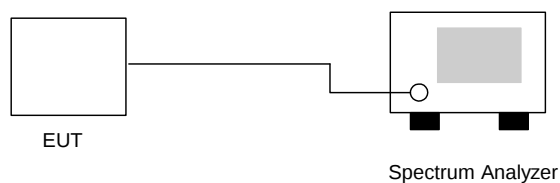
### 5.2.1. Measuring Instruments :

As described in chapter 6 of this test report.

### 5.2.2. Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 100kHz.
3. The Hopping Channel Separation is defined as the channel is separated with the next channel.

### 5.2.3. Test Setup Layout :



### 5.2.4. Test Result : The spectrum analyzer plots are attached as below

- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

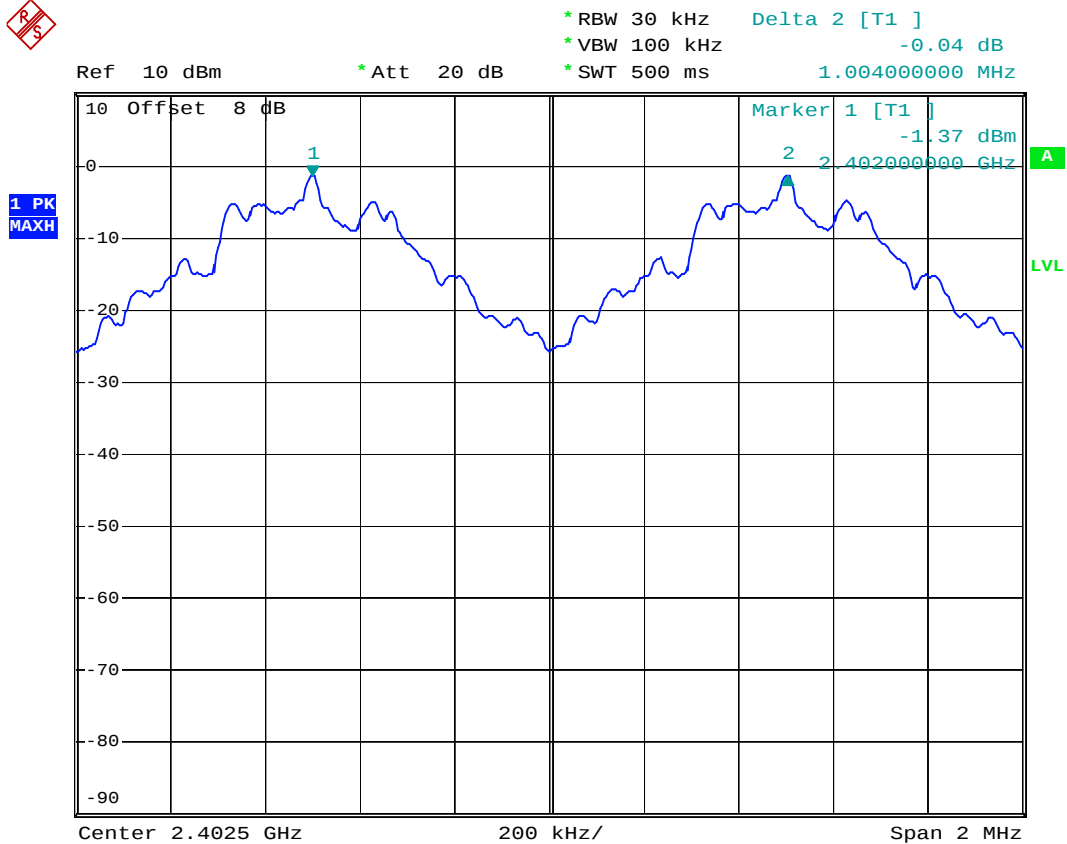
| Channel | Frequency<br>( MHz ) | Hopping Channel<br>Separation<br>( MHz ) | Limits<br>( MHz ) | Plot<br>Ref. No. |
|---------|----------------------|------------------------------------------|-------------------|------------------|
| 00      | 2402                 | 1.004                                    | 0.874             | Mode 1           |
| 39      | 2441                 | 1.000                                    | 0.870             | Mode 2           |
| 78      | 2480                 | 1.004                                    | 0.868             | Mode 3           |

Remark: Limit is the greater one of 25kHz or the 20dB bandwidth of the hopping channel.



### 5.2.5 Hopping Channel Separation

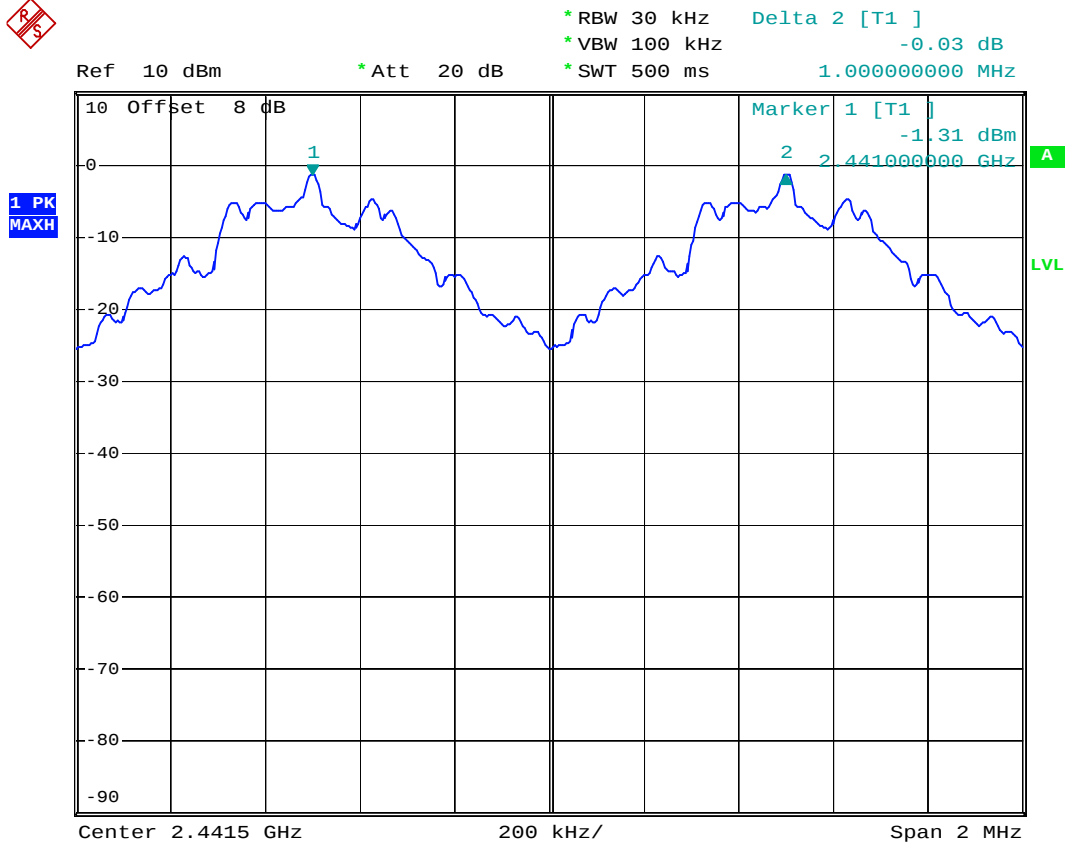
Mode 1: CH00 (2402MHz)



Date: 3.MAR.2006 19:49:15



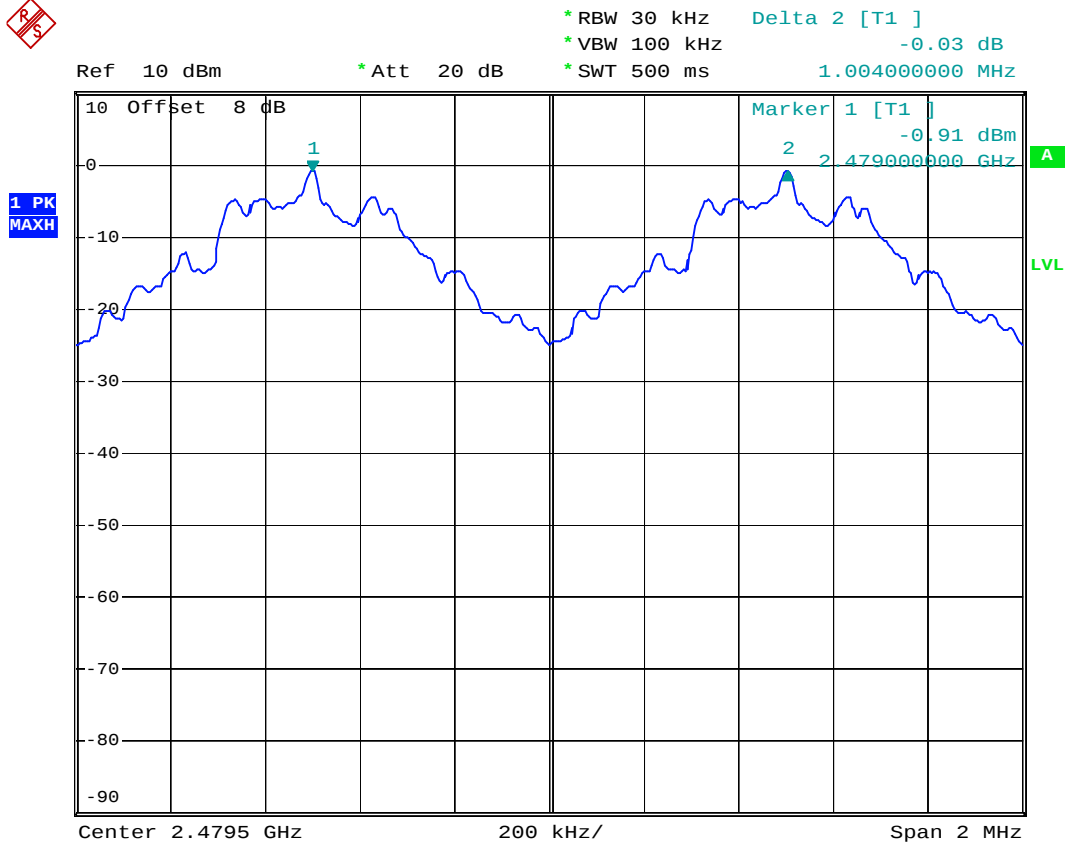
Mode 2: CH39 (2441MHz)



Date: 3.MAR.2006 19:50:07



Mode 3: CH78 (2480MHz)



Date: 3.MAR.2006 19:50:47

### 5.3. Number of Hopping Frequency

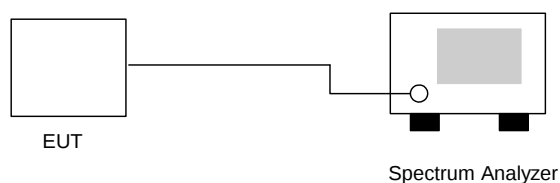
#### 5.3.1. Measuring Instruments :

As described in chapter 6 of this test report.

#### 5.3.2. Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The number of hopping frequency used is defined as the device has the numbers of total channel.

#### 5.3.3. Test Setup Layout :



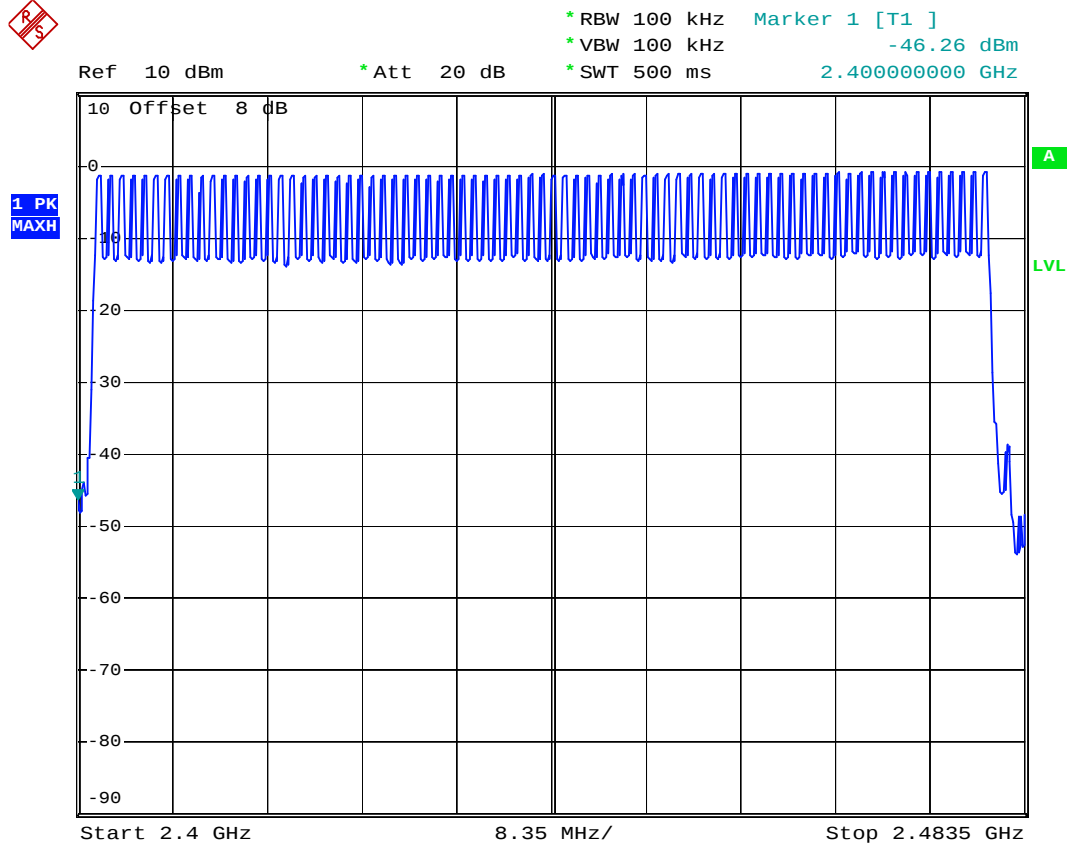
#### 5.3.4. Test Result : See spectrum analyzer plots below

- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

| Number of Hopping Frequency<br>(Channel) | Limits<br>(Channel) |
|------------------------------------------|---------------------|
| 79                                       | 15                  |



5.3.5 Number of Hopping Frequency



Date: 3.MAR.2006 20:43:00

## 5.4 Hopping Channel Bandwidth

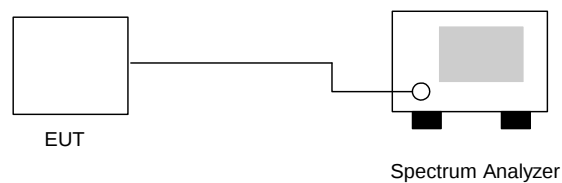
### 5.4.1 Measuring Instruments :

As described in chapter 6 of this test report.

### 5.4.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 300kHz.
3. The Hopping Channel bandwidth is defined as the frequency range where the power is higher than peak power minus 20dB.

### 5.4.3 Test Setup Layout :



### 5.4.4 Test Result : See spectrum analyzer plots below

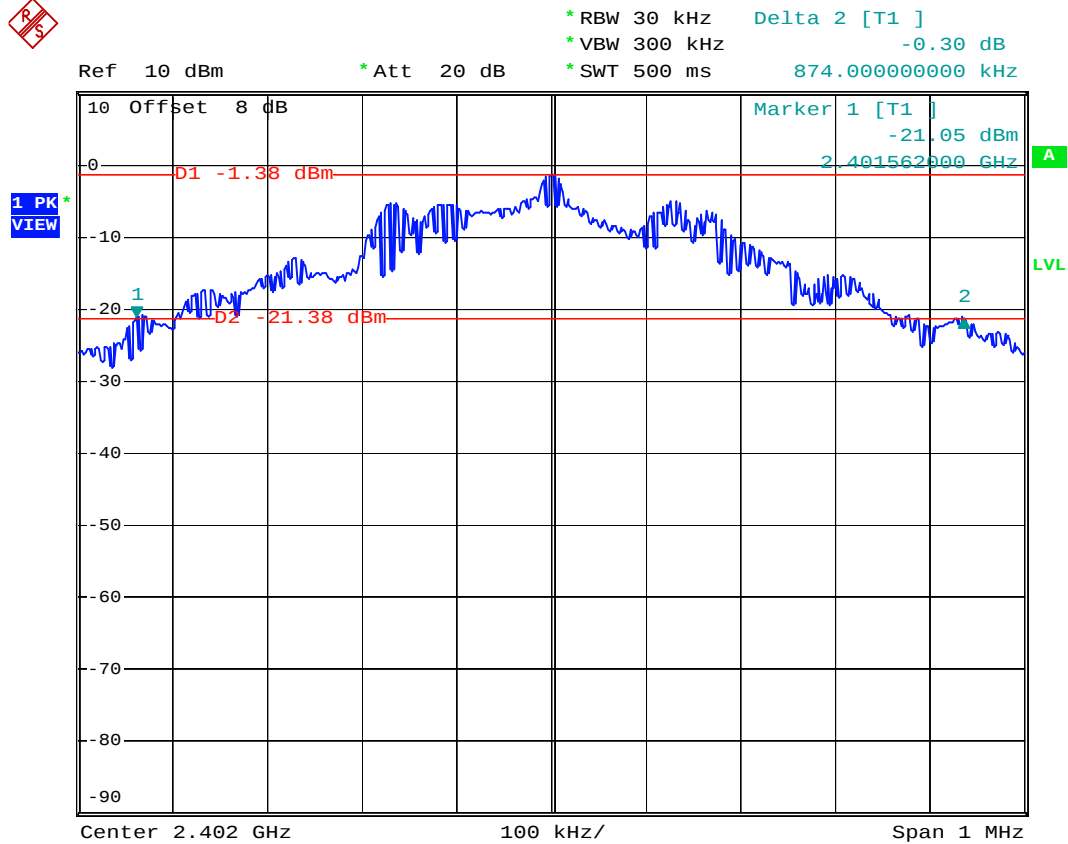
- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

| Channel | Frequency<br>(MHz) | Hopping Channel Bandwidth<br>(MHz) | Limits<br>(MHz) | Plot<br>Ref. No. |
|---------|--------------------|------------------------------------|-----------------|------------------|
| 00      | 2402               | 0.874                              | 1.0             | Mode 1           |
| 39      | 2441               | 0.870                              | 1.0             | Mode 2           |
| 78      | 2480               | 0.868                              | 1.0             | Mode 3           |



#### 5.4.5 Hopping Channel Bandwidth

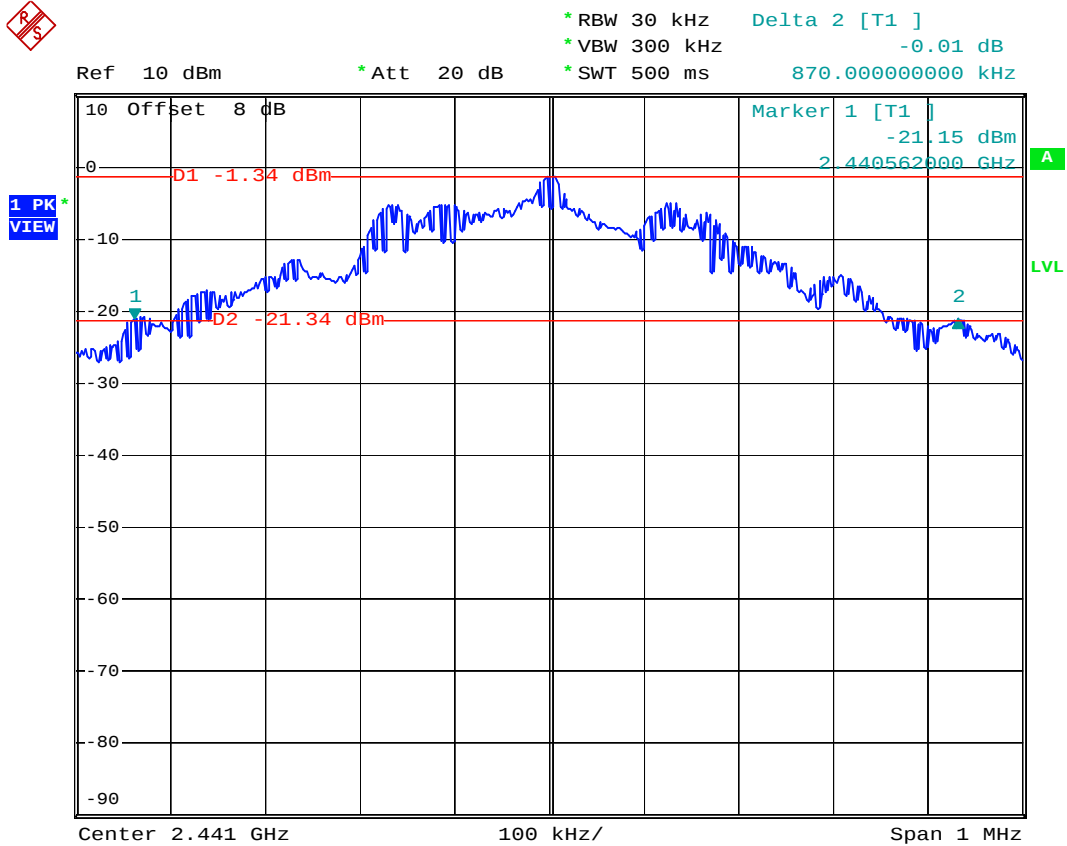
Mode 1: CH00 (2402MHz)



Date: 3.MAR.2006 19:29:10



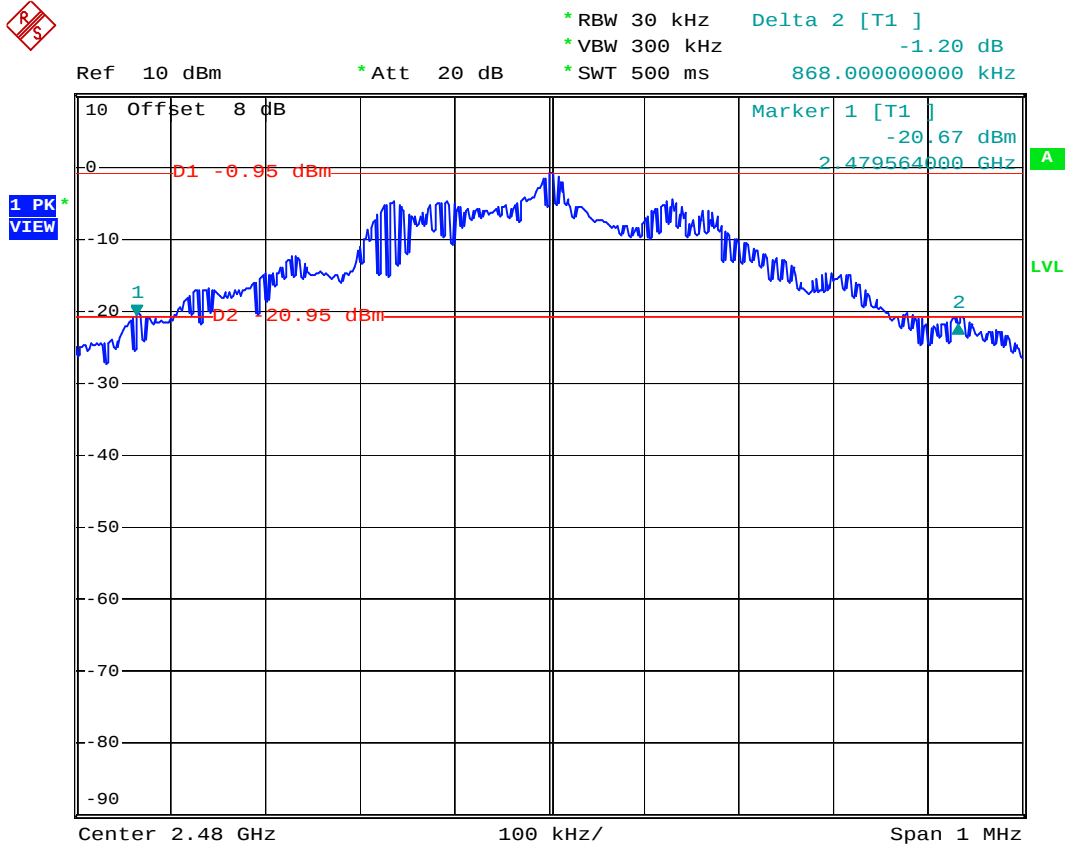
Mode 2: CH39 (2441MHz)



Date: 3.MAR.2006 19:32:56



Mode 3: CH78 (2480MHz)



Date: 3.MAR.2006 19:34:55

## 5.5 Dwell Time of Each Frequency

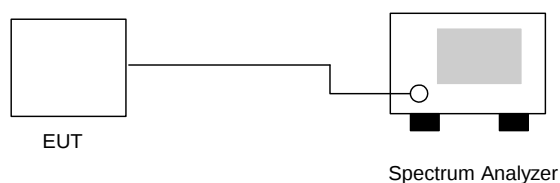
### 5.5.1 Measuring Instruments :

As described in chapter 6 of this test report.

### 5.5.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Set the center frequency on any frequency would be measured and set the frequency span to zero span.
4. The equation =  $79 \times 0.4 \times (1600/79) \times t$  (t = the time duration of one single pulse )

### 5.5.3 Test Setup Layout :



### 5.5.4 Test Result : See spectrum analyzer plots below

- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

Ch00

| Package Mode | Average Hopping Channel | Package Transfer Time (us) | Dwell Time (s) | Limit (s) |
|--------------|-------------------------|----------------------------|----------------|-----------|
| DH1          | 8.9                     | 552                        | 0.155          | 0.4       |
| DH3          | 4.4                     | 1820                       | 0.253          | 0.4       |
| DH5          | 3.1                     | 3120                       | 0.306          | 0.4       |

**CH39**

| Package Mode | Average Hopping Channel | Package Transfer Time<br>(us) | Dwell Time<br>(s) | Limit<br>(s) |
|--------------|-------------------------|-------------------------------|-------------------|--------------|
| DH1          | 9.2                     | 552                           | 0.160             | 0.4          |
| DH3          | 4.6                     | 1820                          | 0.265             | 0.4          |
| DH5          | 3.1                     | 3080                          | 0.302             | 0.4          |

**CH78**

| Package Mode | Average Hopping Channel | Package Transfer Time<br>(us) | Dwell Time<br>(s) | Limit<br>(s) |
|--------------|-------------------------|-------------------------------|-------------------|--------------|
| DH1          | 9                       | 548                           | 0.156             | 0.4          |
| DH3          | 4.6                     | 1830                          | 0.266             | 0.4          |
| DH5          | 3.6                     | 3080                          | 0.350             | 0.4          |

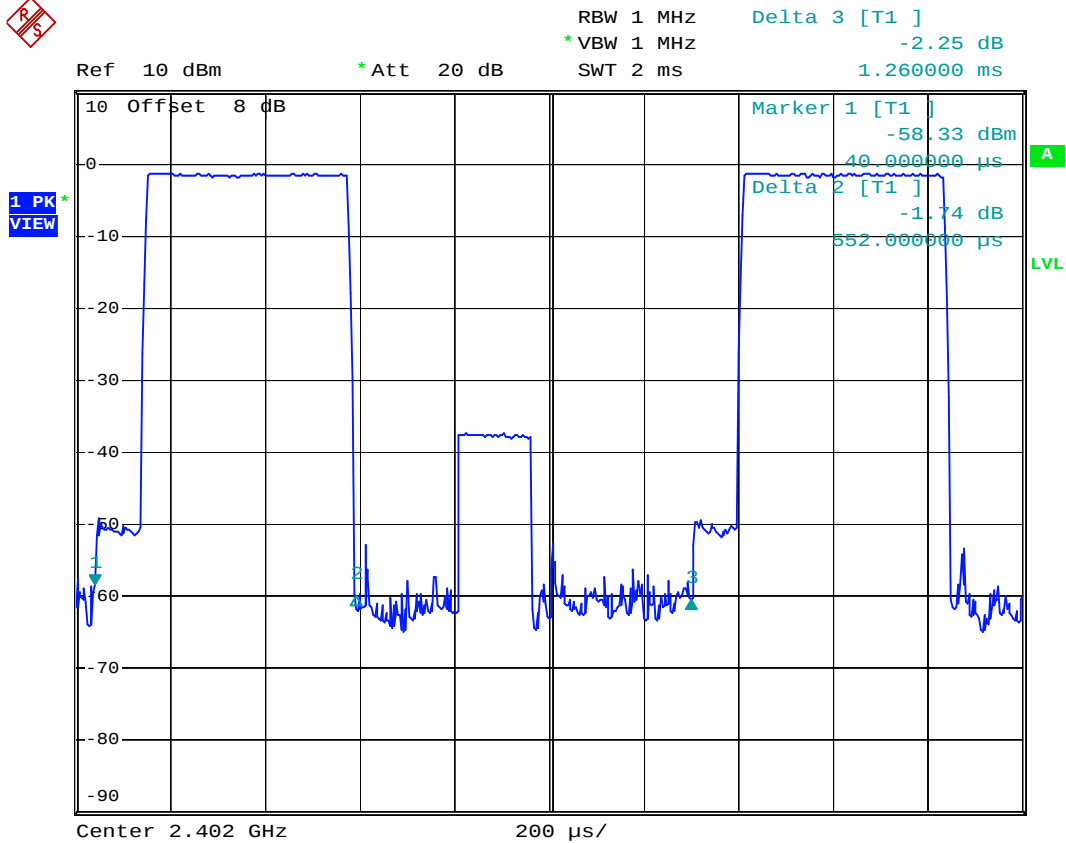
**Remark:**

1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

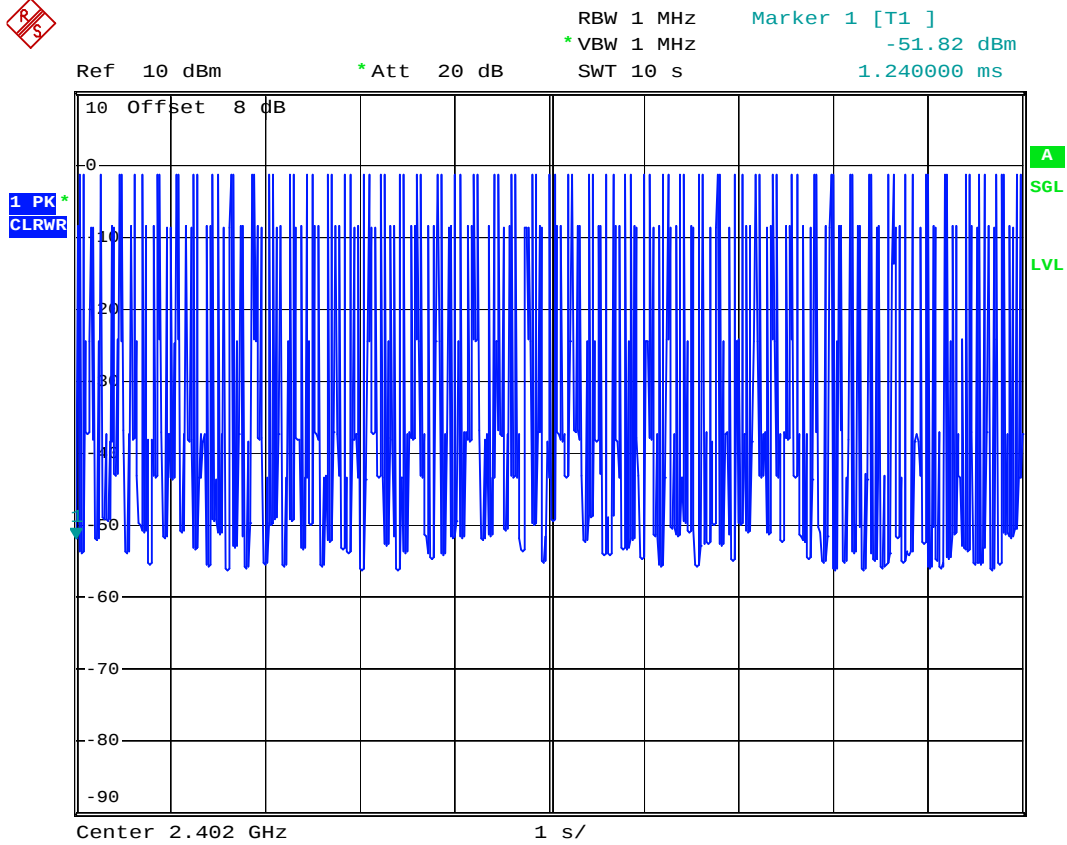


5.5.5 Dwell Time

DH1 (CH00)



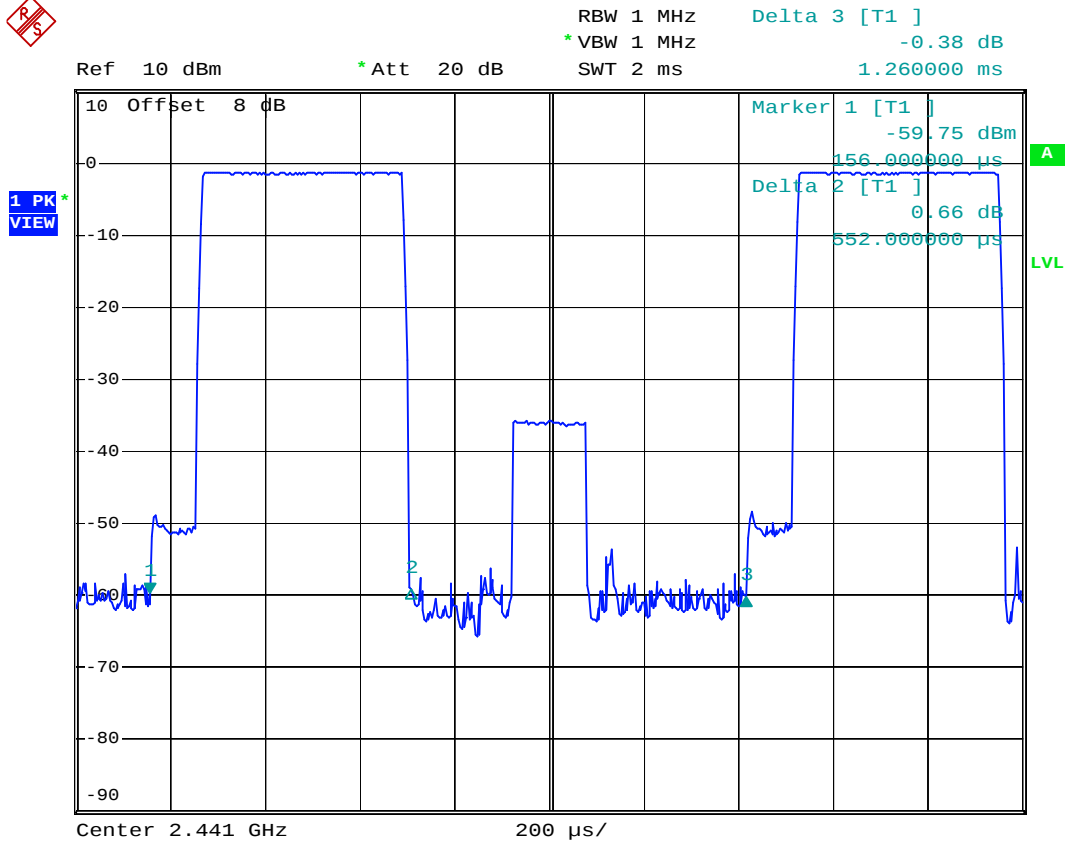
Date: 3.MAR.2006 19:53:49



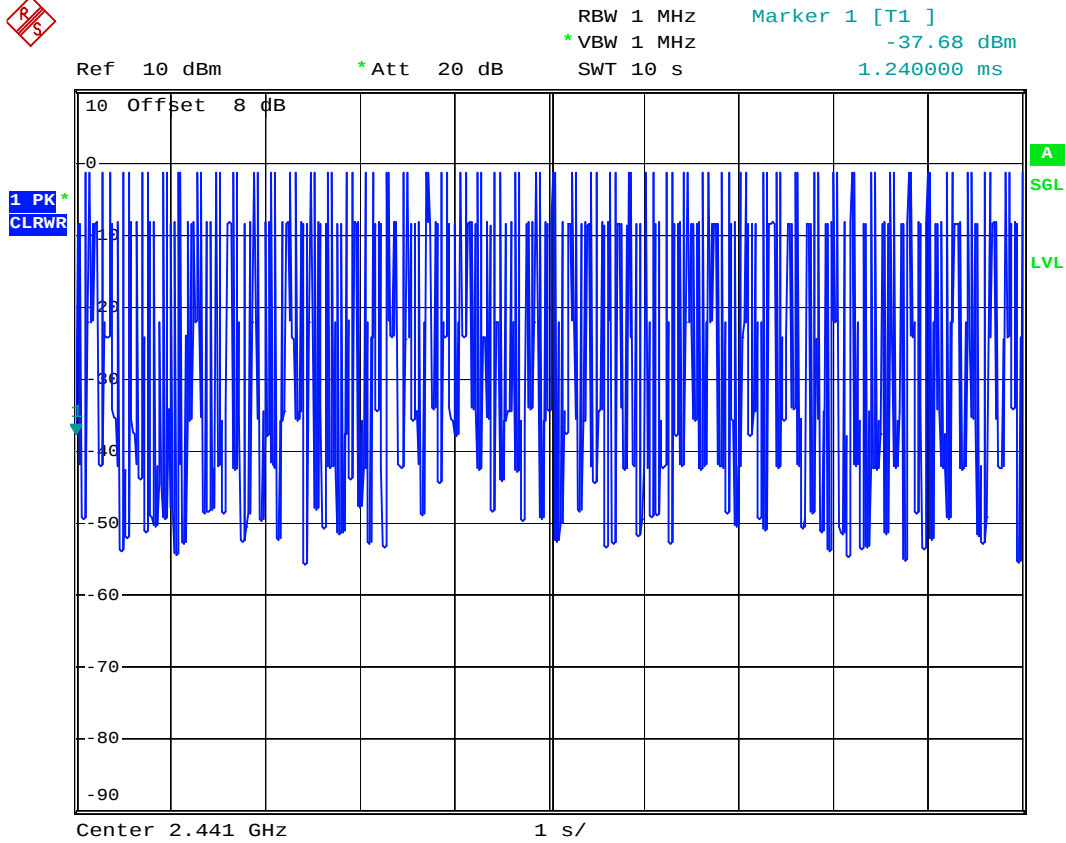
Date: 3.MAR.2006 20:11:14



DH1 (CH39)



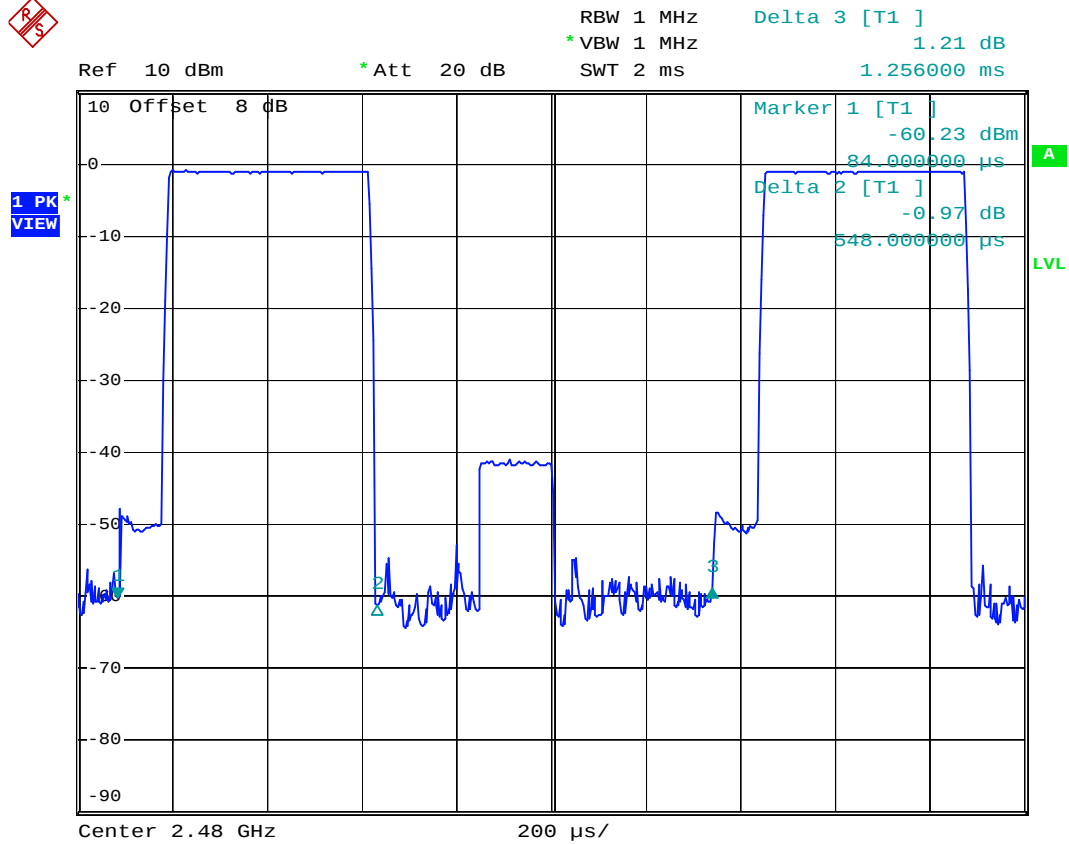
Date: 3.MAR.2006 19:55:01



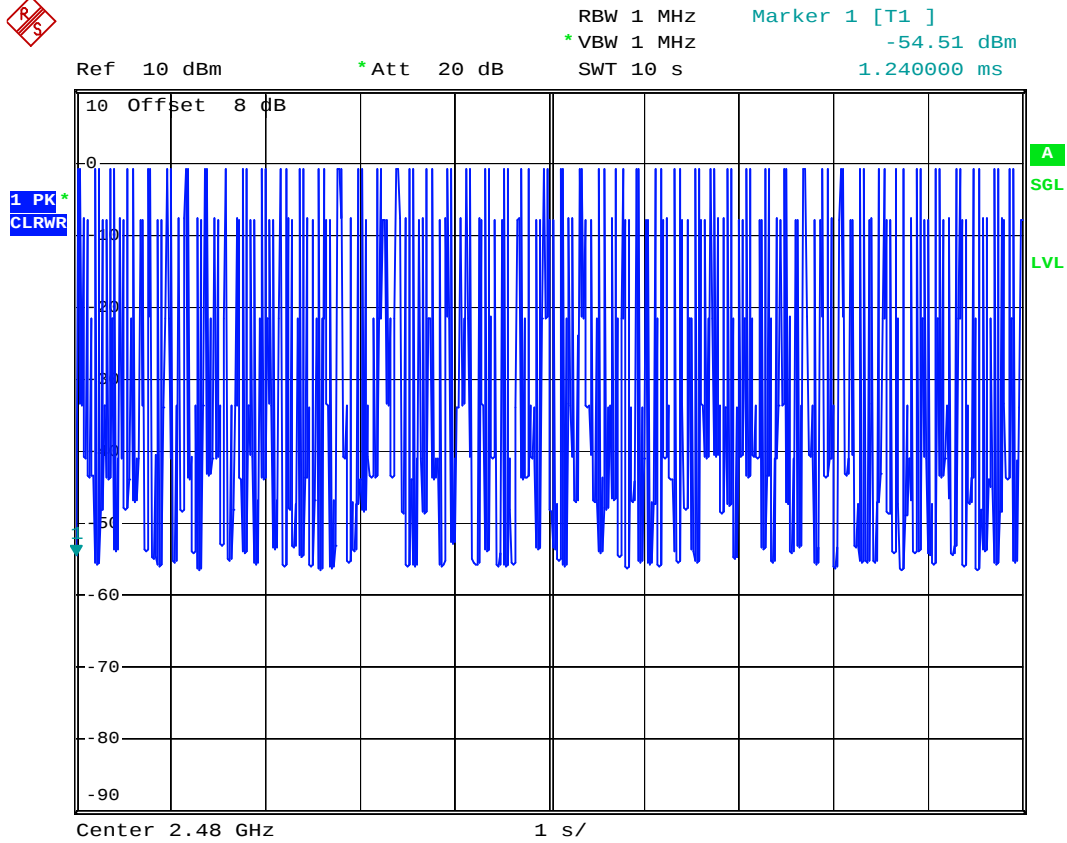
Date: 3.MAR.2006 20:10:40



DH1 (CH78)



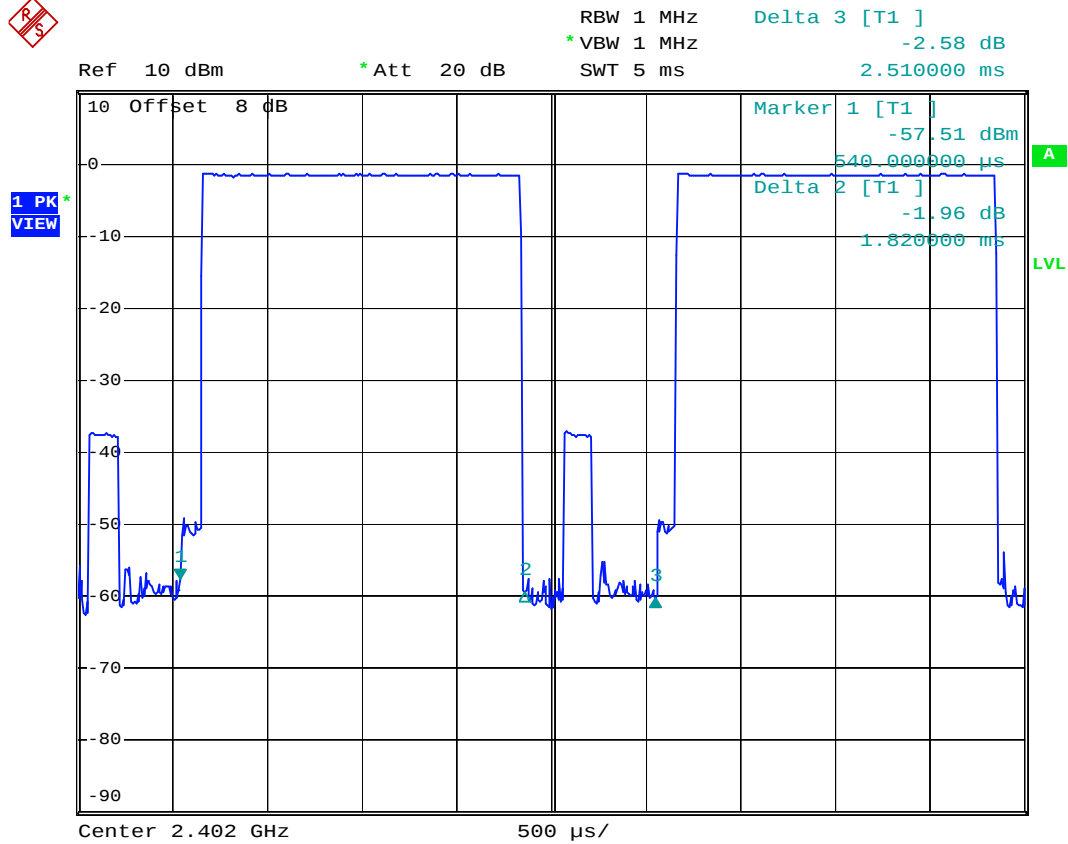
Date: 3.MAR.2006 19:56:04



Date: 3.MAR.2006 20:09:38



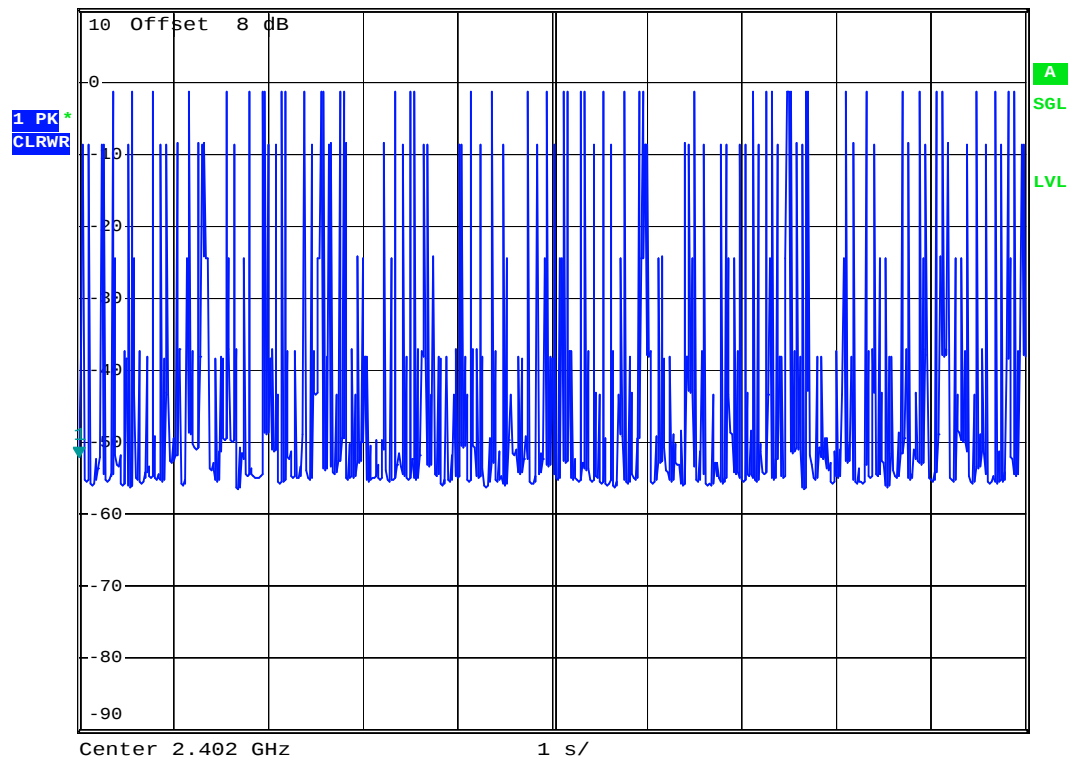
DH3 (CH00)



Date: 3.MAR.2006 19:59:44

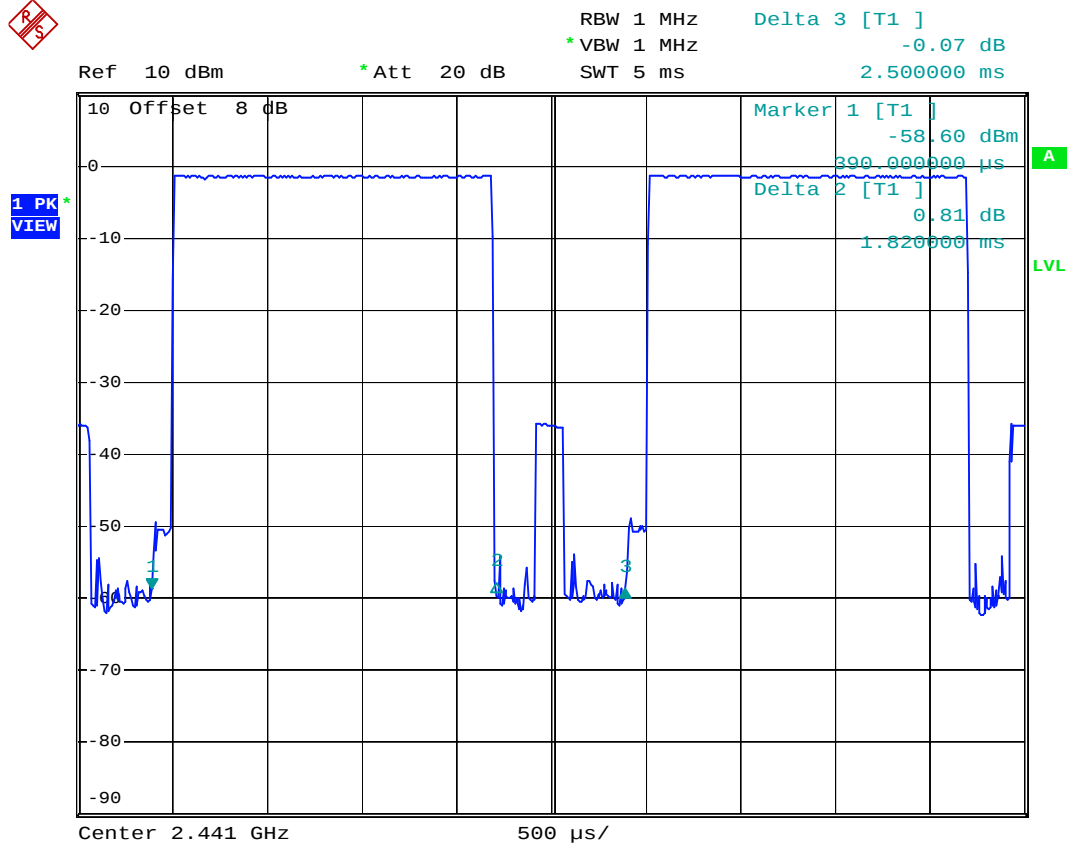



 RBW 1 MHz      Marker 1 [T1]      -52.07 dBm  
 \* VBW 1 MHz  
 Ref 10 dBm      \* Att 20 dB      SWT 10 s      1.240000 ms

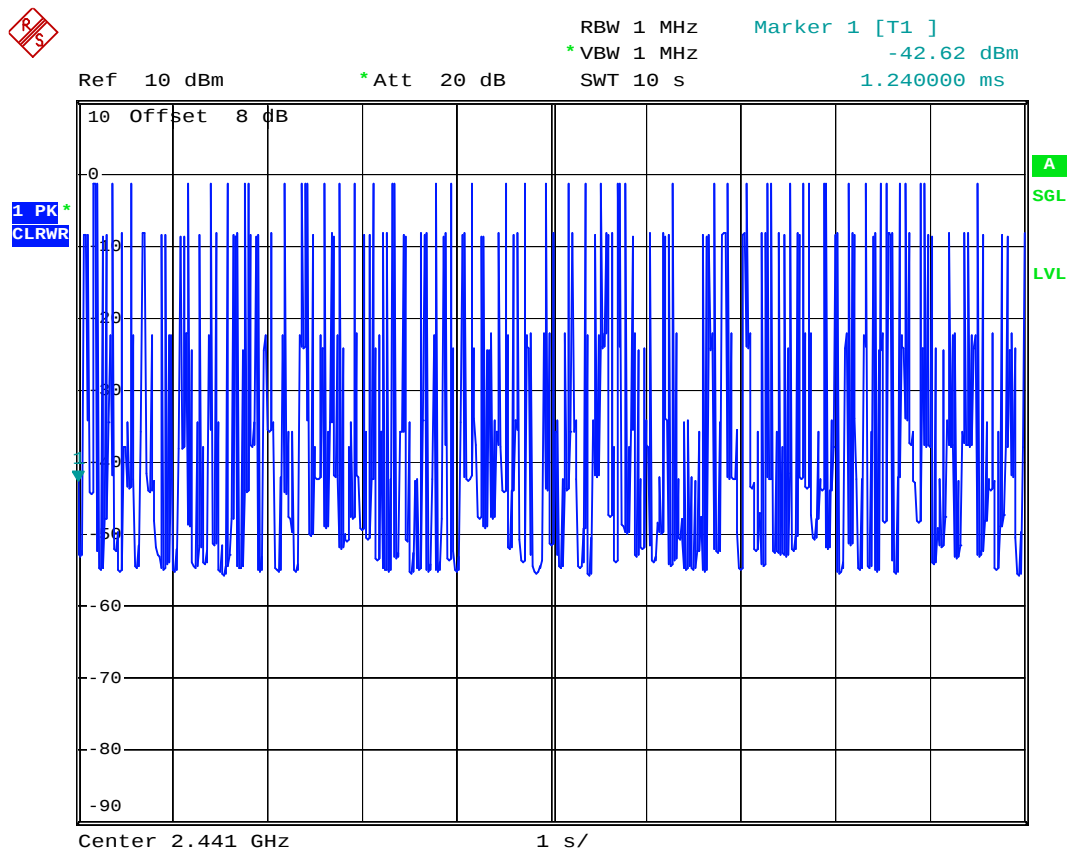


Date: 3.MAR.2006 20:07:14

DH3 (CH39)



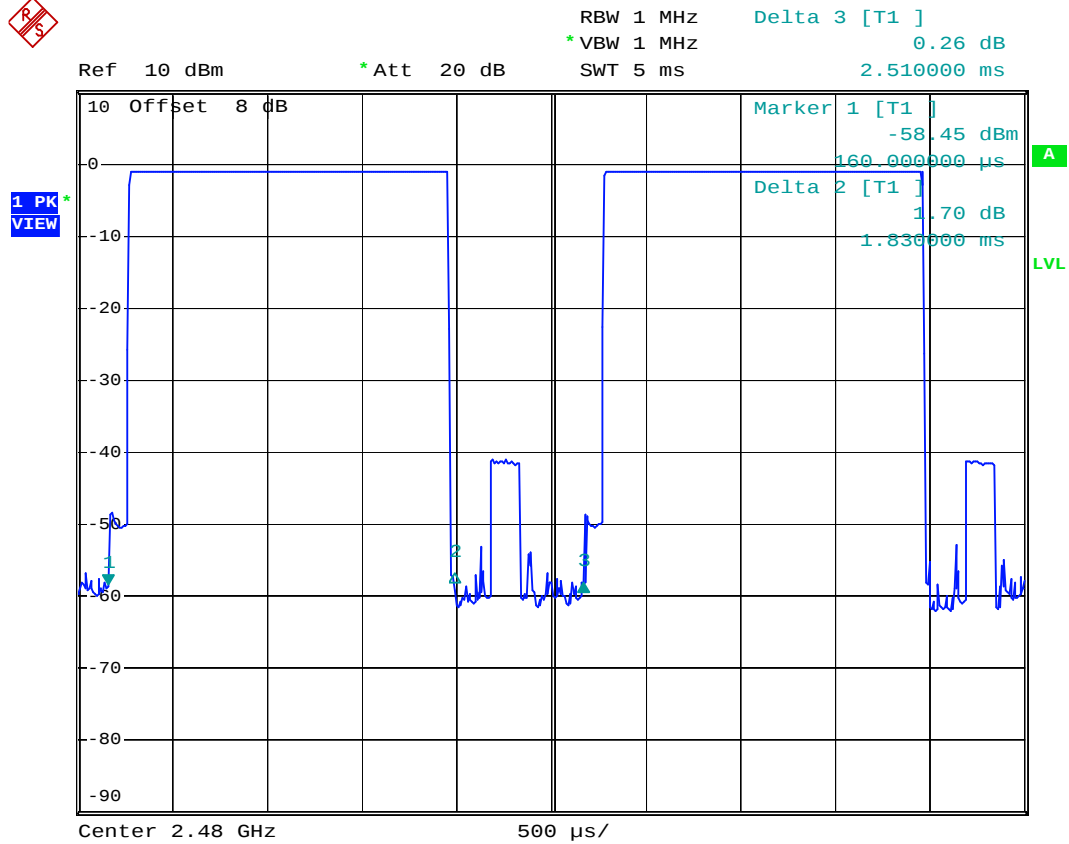
Date: 3.MAR.2006 19:58:49



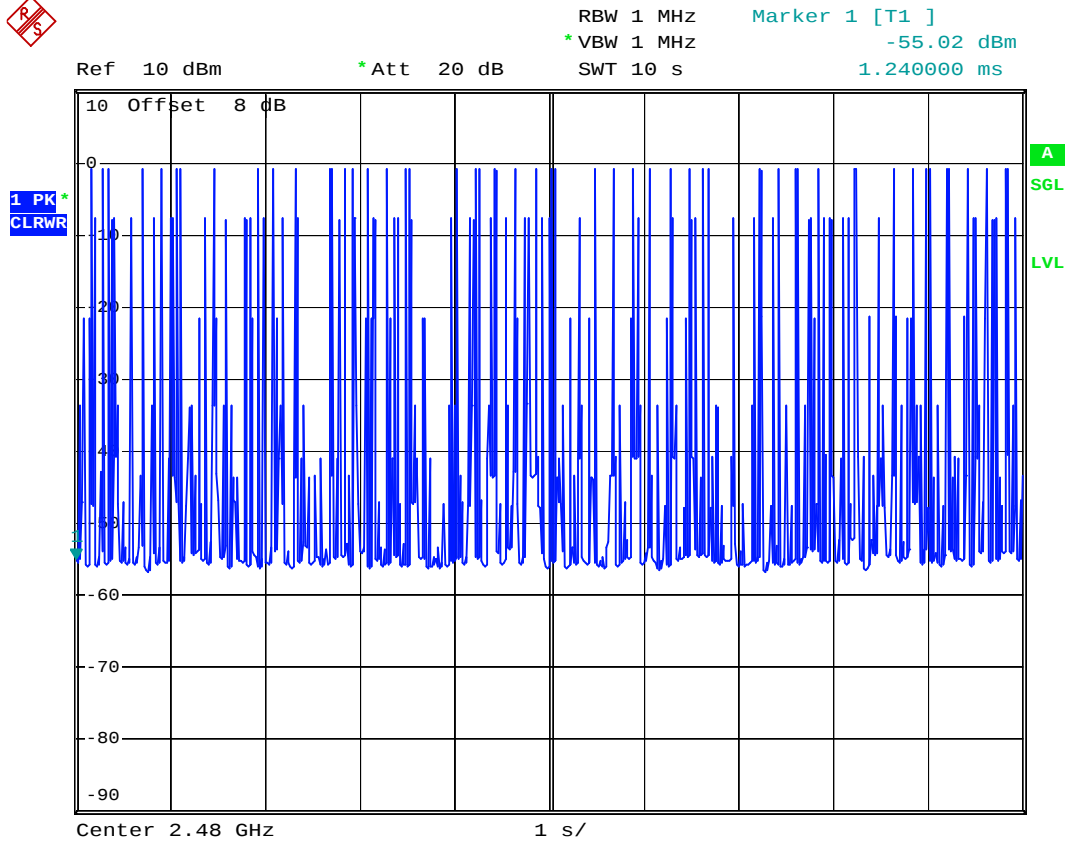
Date: 3.MAR.2006 20:08:08



DH3 (CH78)



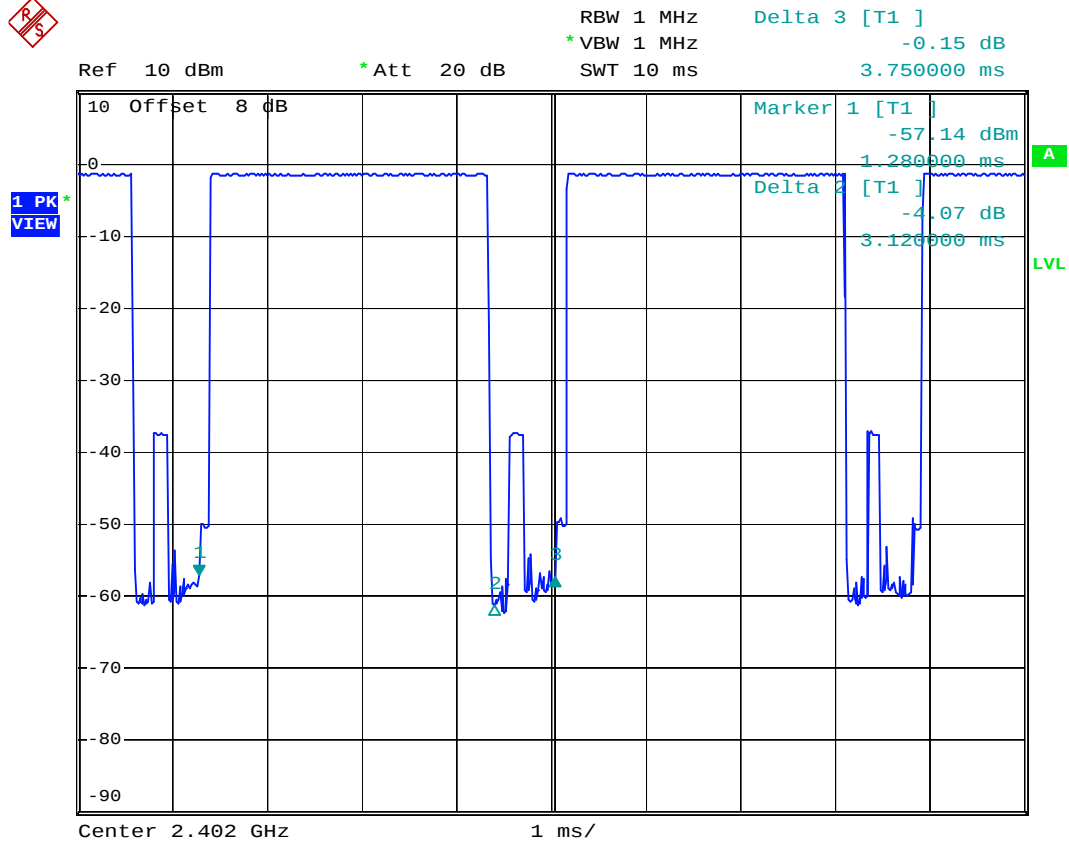
Date: 3.MAR.2006 19:57:36



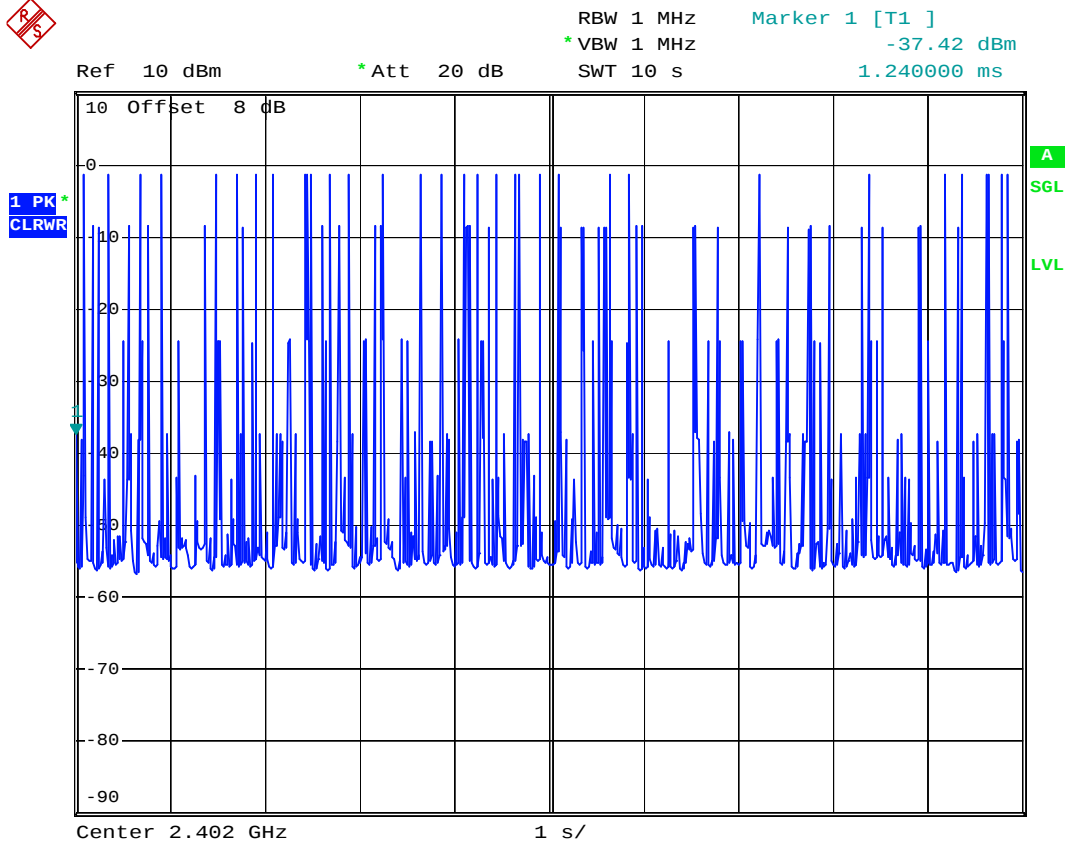
Date: 3.MAR.2006 20:09:01



DH5 (CH00)

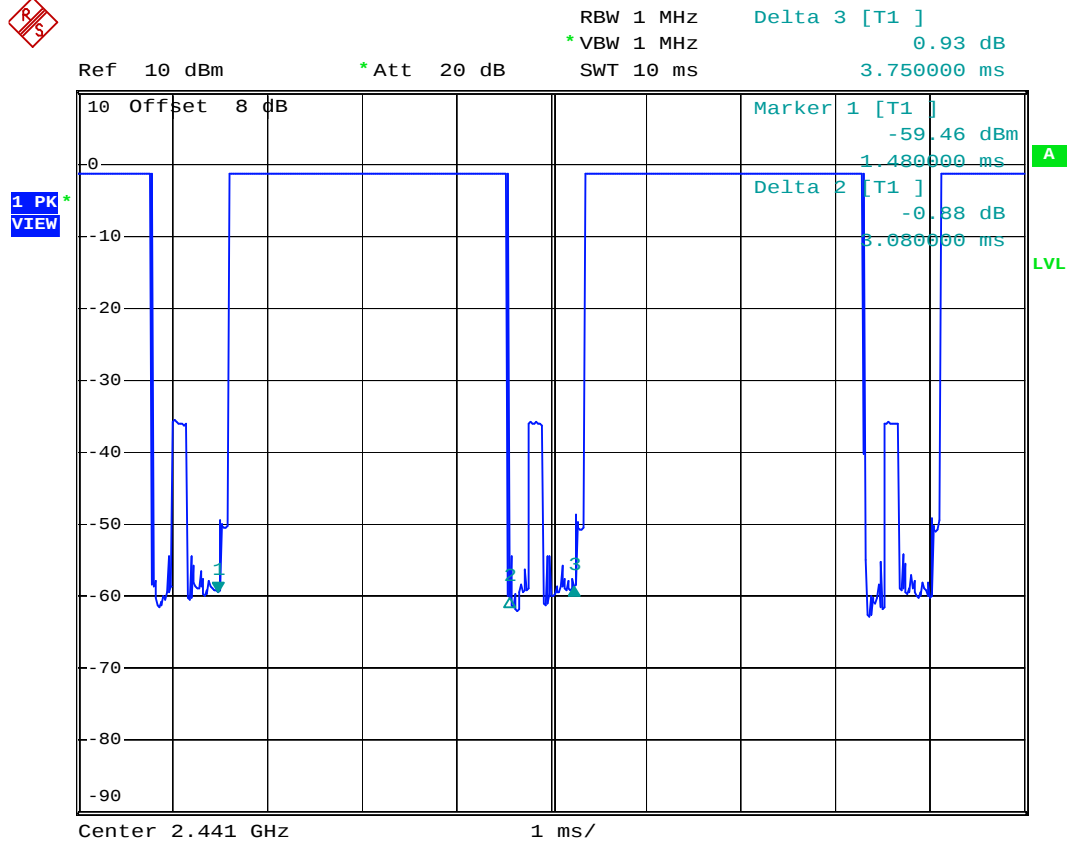


Date: 3.MAR.2006 20:01:09

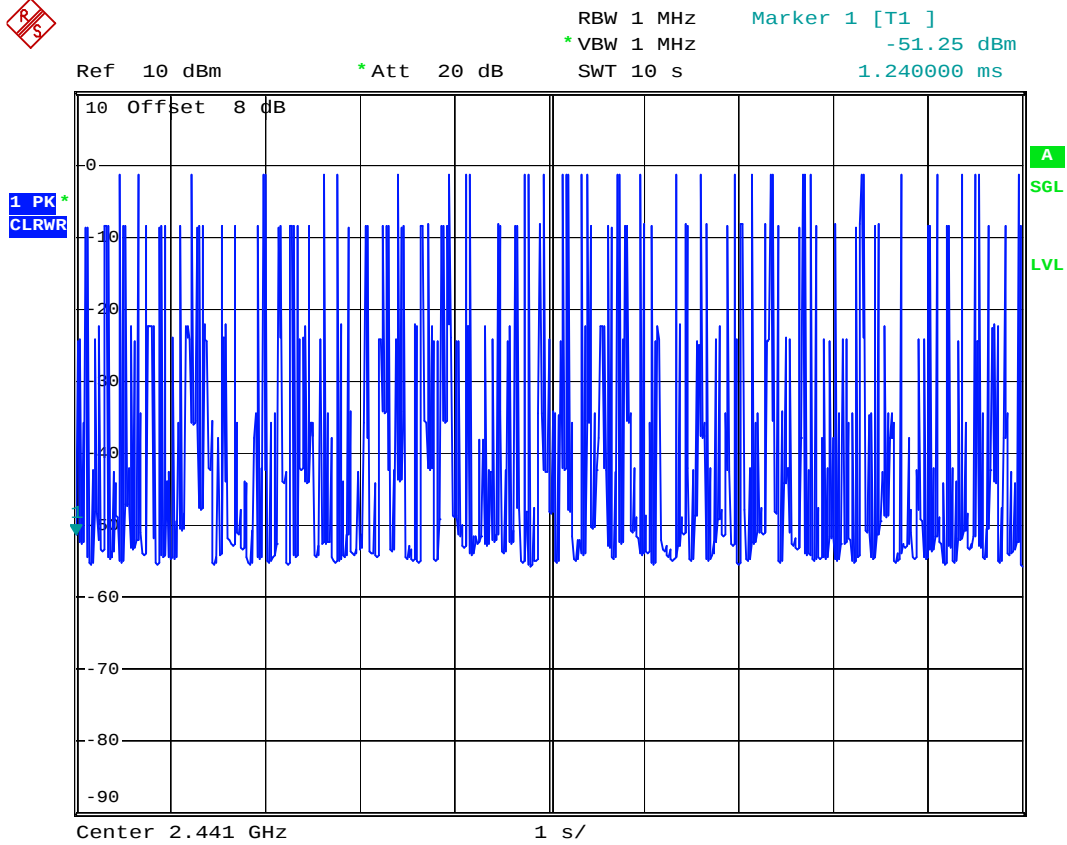


Date: 3.MAR.2006 20:06:08

DH5 (CH39)

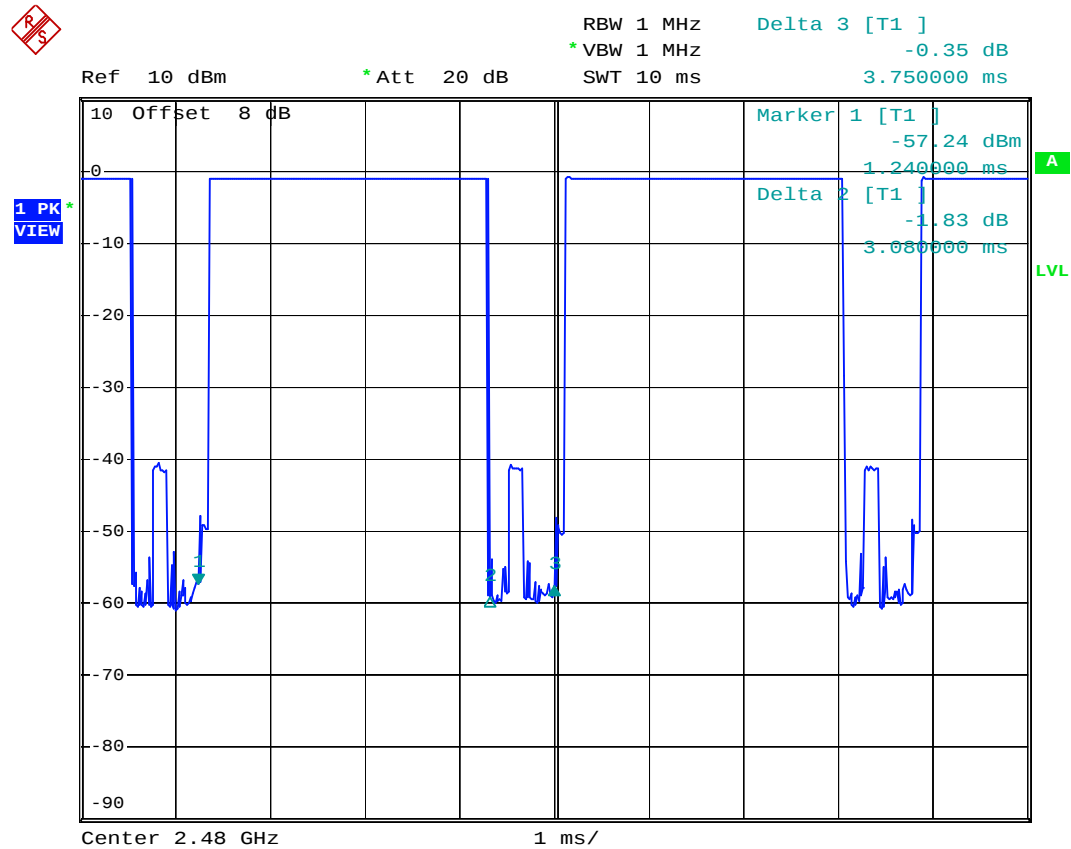


Date: 3.MAR.2006 20:02:15

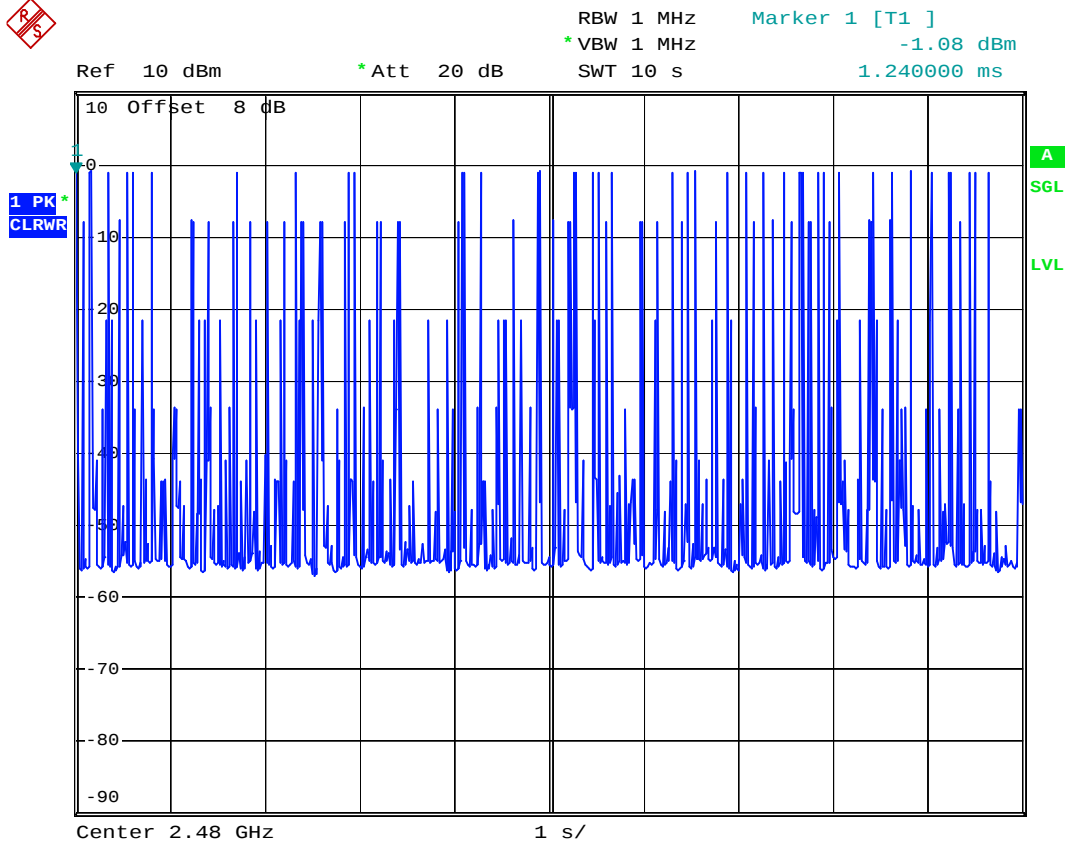


Date: 3.MAR.2006 20:05:28

DH5 (CH78)



Date: 3.MAR.2006 20:03:18



Date: 3.MAR.2006 20:04:44

## 5.6 Output Power

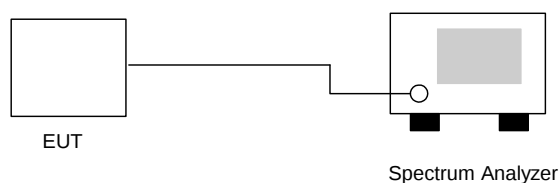
### 5.6.1 Measuring Instruments :

As described in chapter 6 of this test report.

### 5.6.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. The center frequency of the spectrum analyzer was set to the fundamental frequency and set RBW to 3MHz and VBW to 3MHz.

### 5.6.3 Test Setup Layout :



### 5.6.4 Test Result : See spectrum analyzer plots below

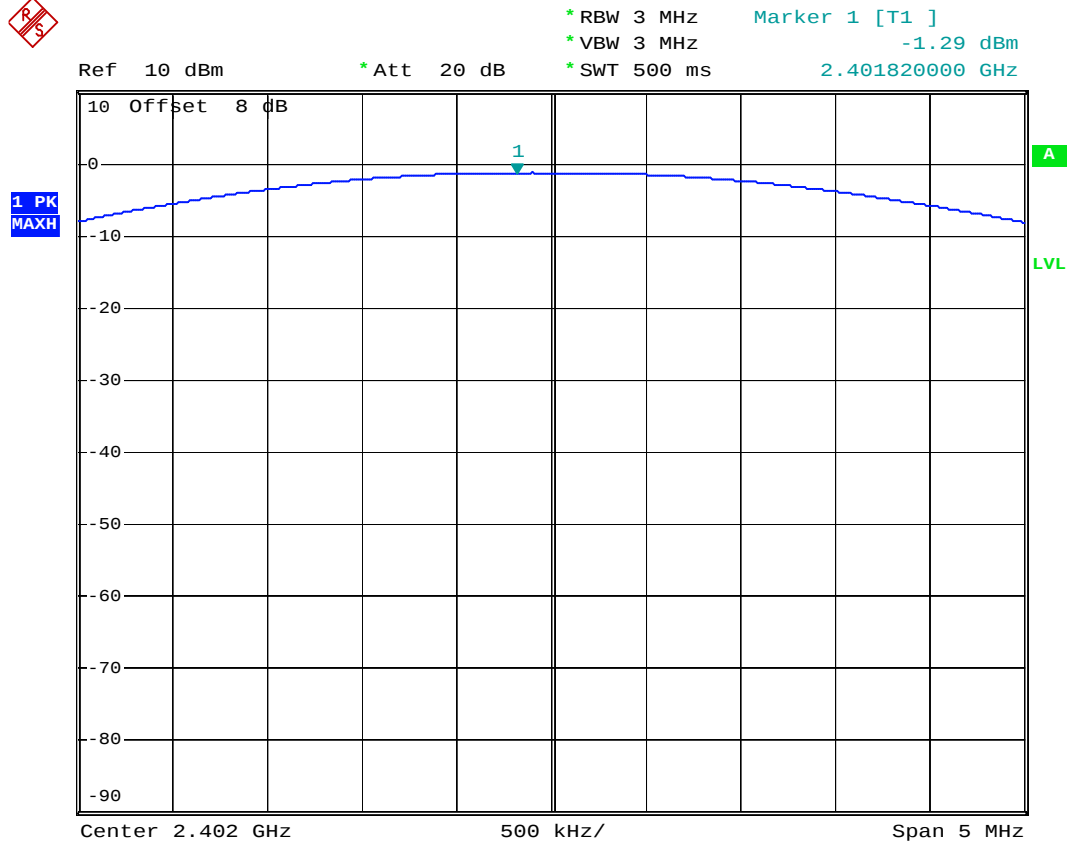
- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

| Channel | Frequency<br>(MHz) | Measured Output Power<br>(dBm) | Limits<br>(Watt/dBm ) | Plot<br>Ref. No. |
|---------|--------------------|--------------------------------|-----------------------|------------------|
| 00      | 2402               | -1.29                          | 1W/30 dBm             | Mode 1           |
| 39      | 2441               | -1.23                          | 1W/30 dBm             | Mode 2           |
| 78      | 2480               | -0.84                          | 1W/30 dBm             | Mode 3           |



### 5.6.5 Output Power

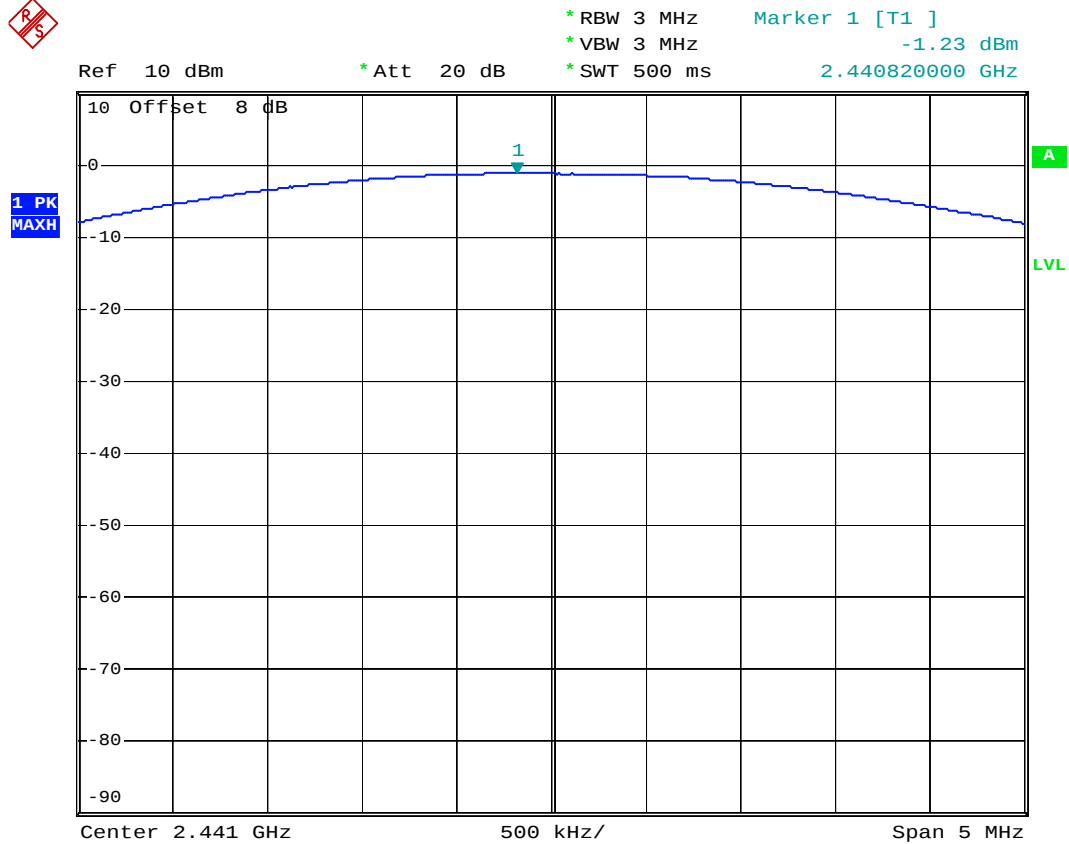
Mode 1: CH00 (2402MHz)



Date: 3.MAR.2006 19:44:30

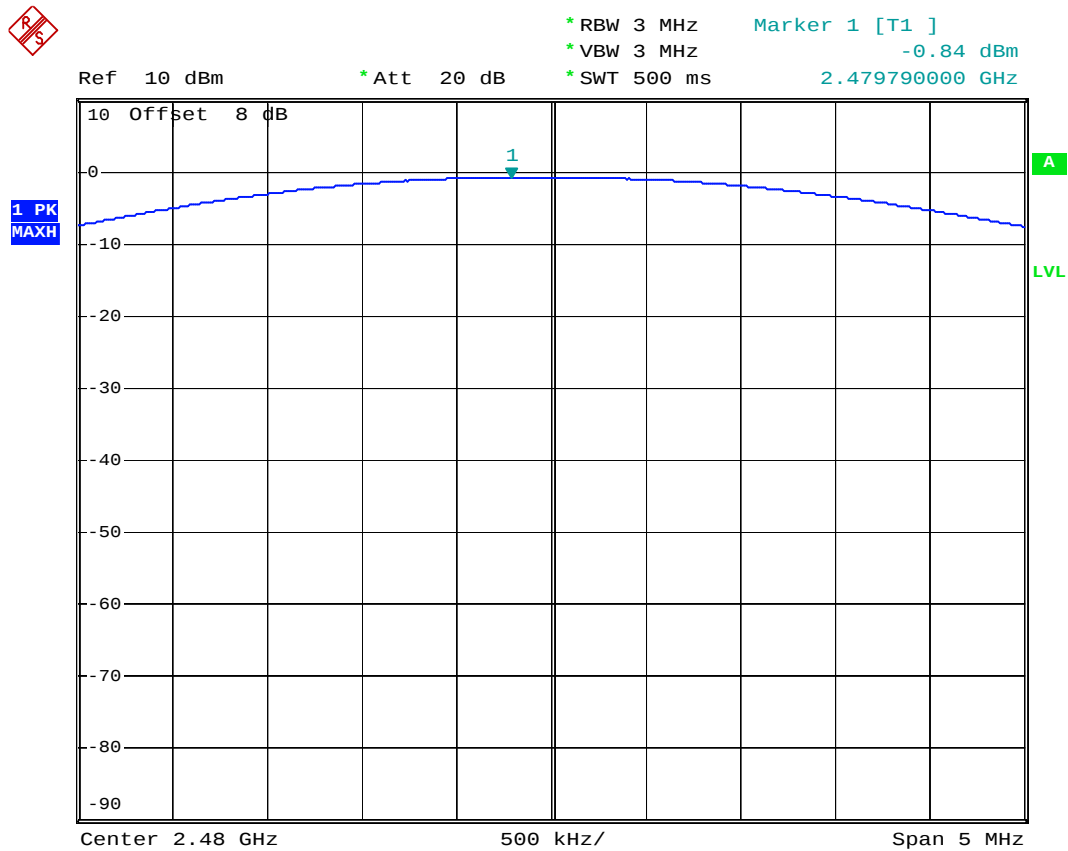


Mode 2: CH39 (2441MHz)



Date: 3.MAR.2006 19:45:14

Mode 3: CH78 (2480MHz)



Date: 3.MAR.2006 19:45:49

## 5.7 100kHz Bandwidth of Frequency Band Edges

### 5.7.1 Measuring Instruments :

As described in chapter 6 of this test report.

### 5.7.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span for the conducted measurement, and RBW/VBW=1MHz/1MHz for peak measurement and RBW/VBW=1MHz/300Hz for average measurement in the radiated measurement.
3. The band edges was measured and recorded.

### 5.7.3 Test Result :

- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

Test Result in lower band (Channel 00) : PASS

Test Result in higher band(Channel 78) : PASS

### 5.7.4 Note on Band edge Emission

#### CH00 (Horizontal)

| Frequency | Level      | Over   | Limit  | Read   |        | Preamp | Cable  | Ant    | Table   | Detect  |
|-----------|------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| ( MHz )   | ( dBuV/m ) | Limit  | Line   | Level  | Factor | Factor | Loss   | Pos    | Pos     | Mode    |
| ( dB )    | ( dBuV/m ) | ( dB ) | ( dB ) | ( dB ) | ( dB ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) |         |
| 2388.00   | 50.56      | -23.44 | 74.00  | 51.28  | 30.48  | 35.44  | 4.23   | 100    | 360     | Peak    |
| 2388.00   | 38.02      | -15.98 | 54.00  | 38.74  | 30.48  | 35.44  | 4.23   | 134    | 225     | Average |

#### CH00 (Vertical)

| Frequency | Level      | Over   | Limit  | Read   |        | Preamp | Cable  | Ant    | Table   | Detect  |
|-----------|------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| ( MHz )   | ( dBuV/m ) | Limit  | Line   | Level  | Factor | Factor | Loss   | Pos    | Pos     | Mode    |
| ( dB )    | ( dBuV/m ) | ( dB ) | ( dB ) | ( dB ) | ( dB ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) |         |
| 2368.00   | 50.78      | -23.22 | 74.00  | 51.48  | 30.51  | 35.44  | 4.23   | 100    | 360     | Peak    |
| 2368.00   | 37.94      | -16.06 | 54.00  | 38.64  | 30.51  | 35.44  | 4.23   | 100    | 255     | Average |

**CH78 (Horizontal)**

| Frequency | Level      | Over   | Limit      | Read   |        | Preamp | Cable | Ant  | Table | Detect  |
|-----------|------------|--------|------------|--------|--------|--------|-------|------|-------|---------|
| ( MHz )   | ( dBuV/m ) | Limit  | Line       | Level  | Factor | Factor | Loss  | Pos  | Pos   | Mode    |
|           |            | ( dB ) | ( dBuV/m ) | (dBuV) | ( dB ) | (dB)   | (dB)  | (cm) | (deg) |         |
| 2483.50   | 50.51      | -23.49 | 74.00      | 51.22  | 30.52  | 35.40  | 4.17  | 100  | 360   | Peak    |
| 2483.50   | 38.13      | -15.87 | 54.00      | 38.84  | 30.52  | 35.40  | 4.17  | 102  | 246   | Average |

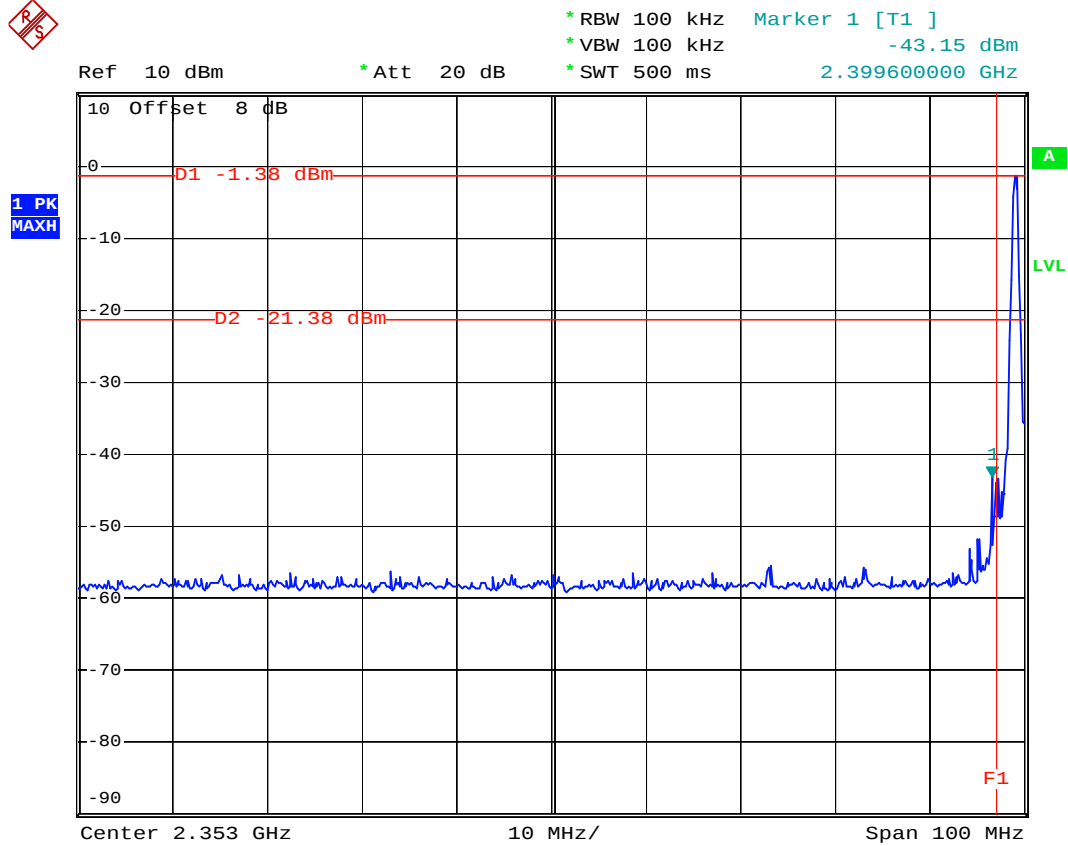
**CH78 (Vertical)**

| Frequency | Level      | Over   | Limit      | Read   |        | Preamp | Cable | Ant  | Table | Detect  |
|-----------|------------|--------|------------|--------|--------|--------|-------|------|-------|---------|
| ( MHz )   | ( dBuV/m ) | Limit  | Line       | Level  | Factor | Factor | Loss  | Pos  | Pos   | Mode    |
|           |            | ( dB ) | ( dBuV/m ) | (dBuV) | ( dB ) | (dB)   | (dB)  | (cm) | (deg) |         |
| 2484.00   | 50.18      | -23.82 | 74.00      | 50.89  | 30.52  | 35.40  | 4.17  | 100  | 360   | Peak    |
| 2484.00   | 38.14      | -15.86 | 54.00      | 38.85  | 30.52  | 35.40  | 4.17  | 104  | 258   | Average |



### 5.7.5 Frequency Band Edge

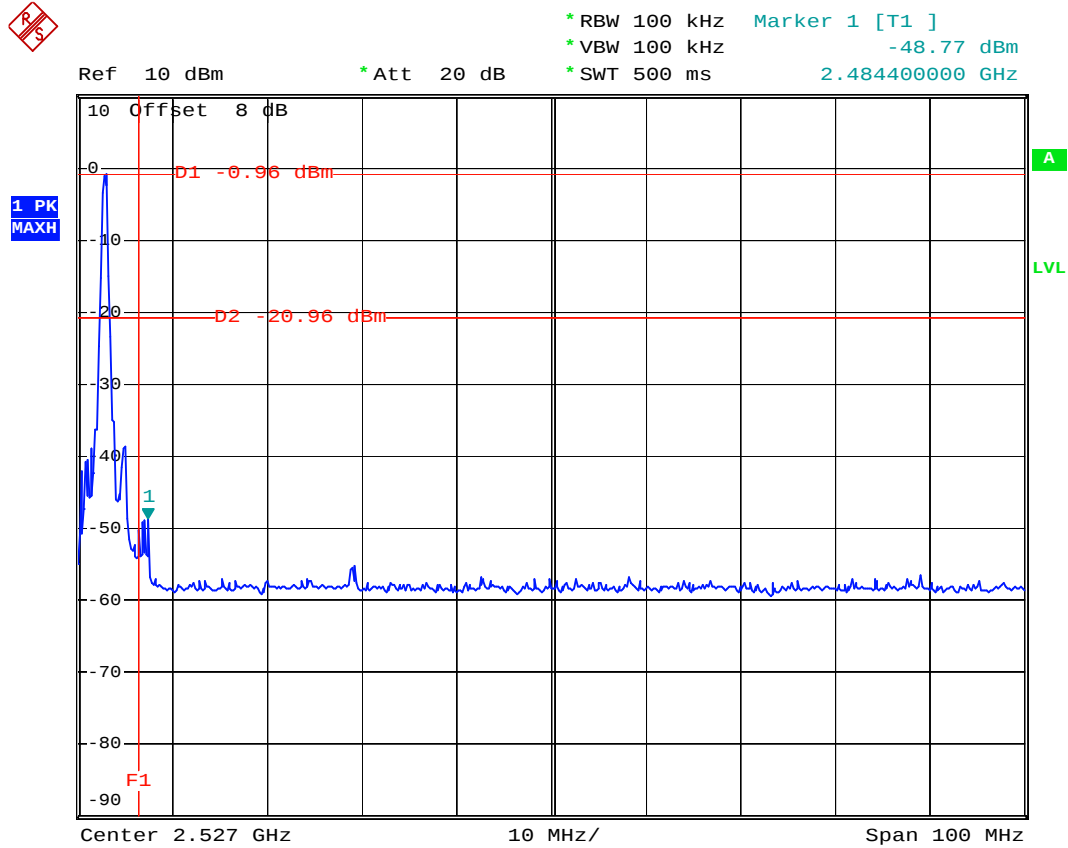
Mode 1: CH00 (2402 MHz)



Date: 3.MAR.2006 19:38:07



Mode 3: CH78 (2480 MHz)



Date: 3.MAR.2006 19:41:16



## **5.8 Conducted Emission**

### **5.8.1 Measuring Instruments**

As described in chapter 6 of this test Report.

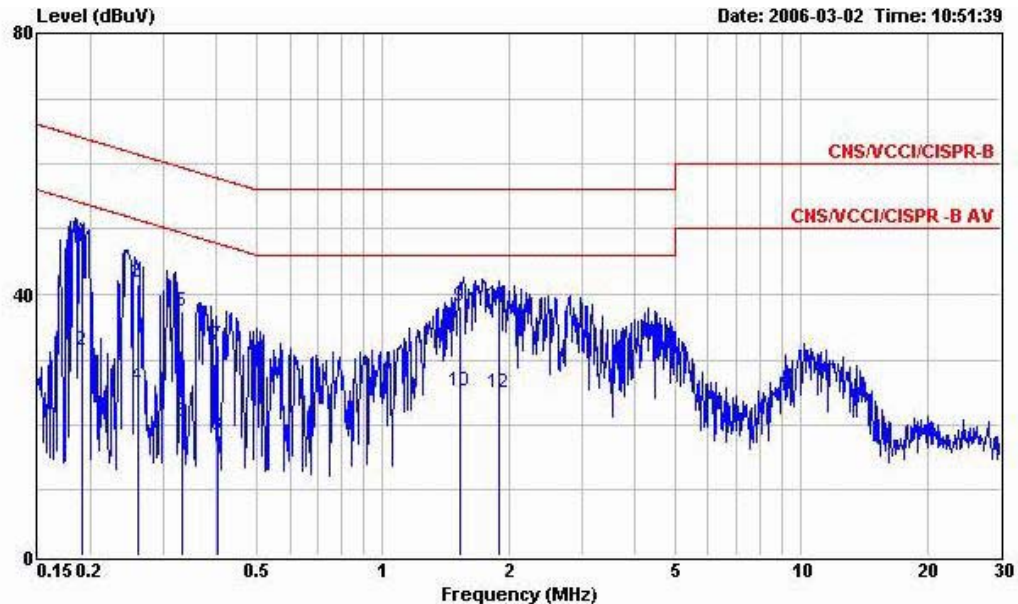
### **5.8.2 Test Procedures :**

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network (LISN).
- c. All the support units are connected to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

**5.8.3 Test Data Test Mode 1**

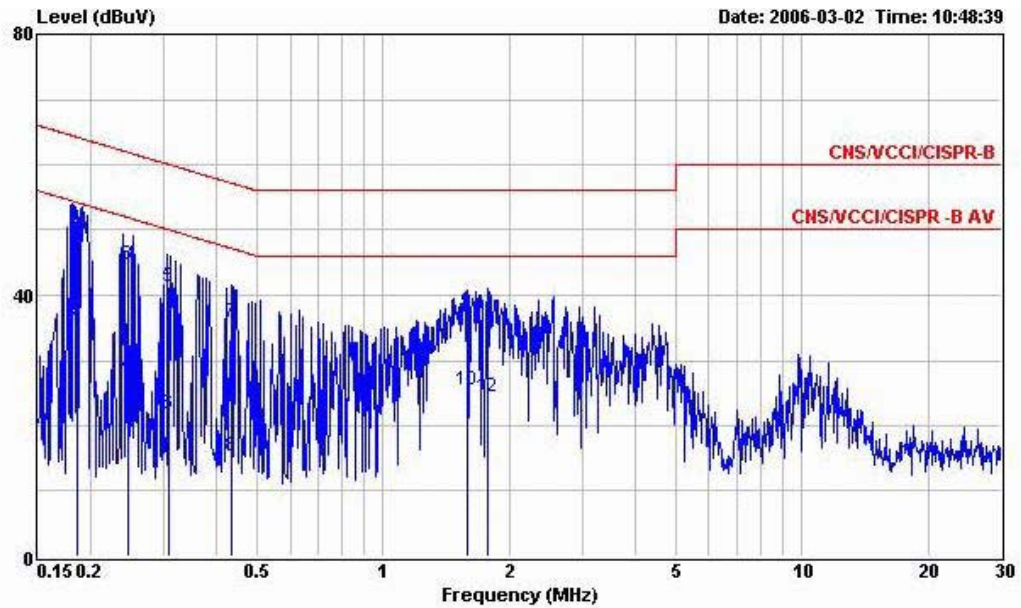
- Temperature: 25°C
- Relative Humidity: 62%
- Test Engineer: James

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2001/004 200505 LINE  
 EUT : GSM/GPRS Mobile phone with FM function  
 Power : 120V/60Hz  
 Model : FD620907  
 Memo : PCS 1900 IDLE+BT LINK+CHARGER  
 Memo : +CAMERA  
 Memo :

|    | Freq  | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Remark  |
|----|-------|-------|------------|------------|------------|--------------|------------|---------|
|    | MHz   | dBuV  | dB         | dBuV       | dBuV       | dB           | dB         |         |
| 1  | 0.192 | 47.32 | -16.65     | 63.97      | 47.14      | 0.06         | 0.12       | QP      |
| 2  | 0.192 | 31.38 | -22.59     | 53.97      | 31.20      | 0.06         | 0.12       | Average |
| 3  | 0.261 | 41.82 | -19.58     | 61.40      | 41.66      | 0.06         | 0.10       | QP      |
| 4  | 0.261 | 26.01 | -25.39     | 51.40      | 25.85      | 0.06         | 0.10       | Average |
| 5  | 0.330 | 37.35 | -22.09     | 59.44      | 37.21      | 0.06         | 0.08       | QP      |
| 6  | 0.330 | 20.57 | -28.87     | 49.44      | 20.43      | 0.06         | 0.08       | Average |
| 7  | 0.404 | 32.17 | -25.59     | 57.76      | 32.05      | 0.06         | 0.06       | QP      |
| 8  | 0.404 | 18.48 | -29.28     | 47.76      | 18.36      | 0.06         | 0.06       | Average |
| 9  | 1.533 | 38.24 | -17.76     | 56.00      | 38.01      | 0.11         | 0.12       | QP      |
| 10 | 1.533 | 25.06 | -20.94     | 46.00      | 24.83      | 0.11         | 0.12       | Average |
| 11 | 1.896 | 38.57 | -17.43     | 56.00      | 38.32      | 0.11         | 0.14       | QP      |
| 12 | 1.896 | 24.87 | -21.13     | 46.00      | 24.62      | 0.11         | 0.14       | Average |



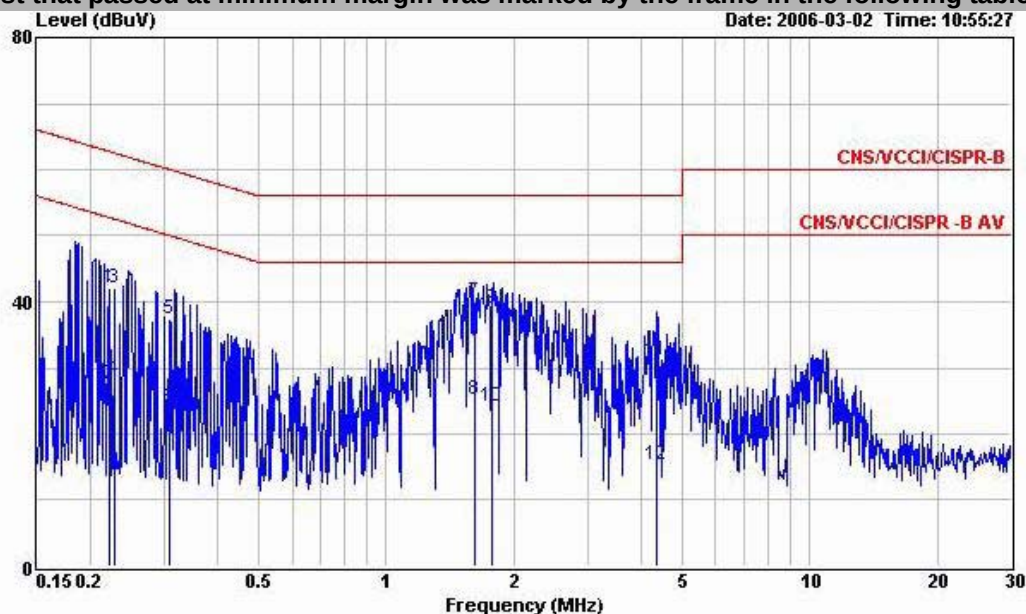
Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2001/004 200505 NEUTRAL  
 EUT : GSM/GPRS Mobile phone with FM function  
 Power : 120V/60Hz  
 Model : FD620907  
 Memo : PCS 1900 IDLE+BT LINK+CHARGER  
 Memo : +CAMERA  
 Memo :

|    | Freq  | Level | Over   | Limit | Read  | Probe  | Cable |         |
|----|-------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz   | dBuV  | Limit  | Line  | Level | Factor | Loss  | Remark  |
|    | MHz   | dBuV  | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.186 | 50.53 | -13.69 | 64.22 | 50.30 | 0.11   | 0.12  | QP      |
| 2  | 0.186 | 36.19 | -18.03 | 54.22 | 35.96 | 0.11   | 0.12  | Average |
| 3  | 0.247 | 44.71 | -17.16 | 61.87 | 44.50 | 0.11   | 0.10  | QP      |
| 4  | 0.247 | 27.83 | -24.04 | 51.87 | 27.62 | 0.11   | 0.10  | Average |
| 5  | 0.309 | 41.31 | -18.69 | 60.00 | 41.12 | 0.11   | 0.08  | QP      |
| 6  | 0.309 | 21.81 | -28.19 | 50.00 | 21.62 | 0.11   | 0.08  | Average |
| 7  | 0.436 | 35.90 | -21.23 | 57.13 | 35.72 | 0.12   | 0.06  | QP      |
| 8  | 0.436 | 15.32 | -31.81 | 47.13 | 15.14 | 0.12   | 0.06  | Average |
| 9  | 1.591 | 37.37 | -18.63 | 56.00 | 37.01 | 0.23   | 0.13  | QP      |
| 10 | 1.591 | 25.58 | -20.42 | 46.00 | 25.22 | 0.23   | 0.13  | Average |
| 11 | 1.783 | 37.03 | -18.97 | 56.00 | 36.67 | 0.23   | 0.13  | QP      |
| 12 | 1.783 | 24.34 | -21.66 | 46.00 | 23.98 | 0.23   | 0.13  | Average |

**5.8.4 Test Data Test Mode 2**

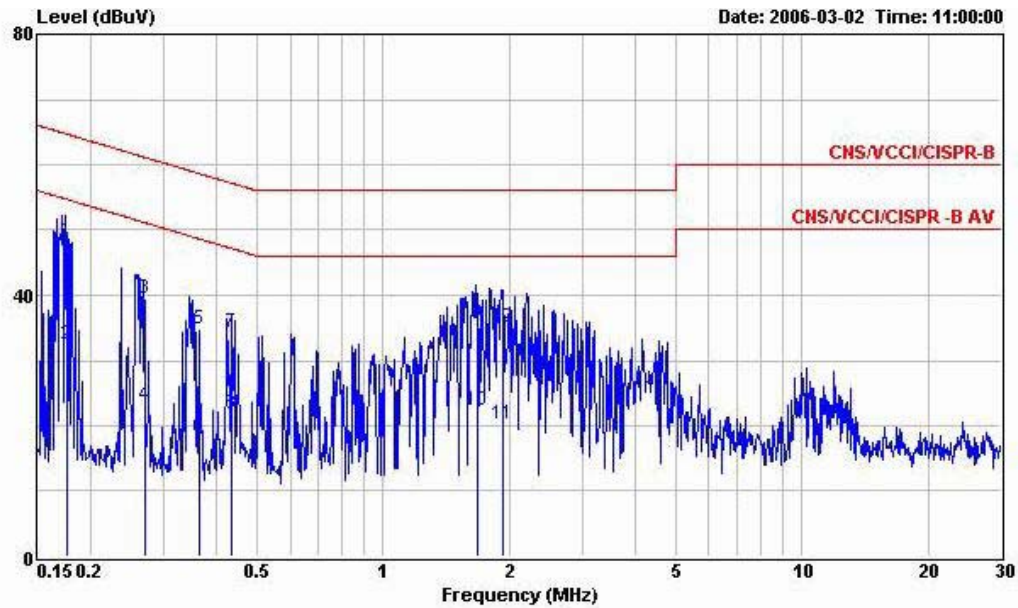
- Temperature: 25°C
- Relative Humidity: 62%
- Test Engineer : James

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY  
Condition : CNS/VCCI/CISPR-B 2001/004 200505 LINE  
EUT : GSM/GPRS Mobile phone with FM function  
Power : 120W/60Hz  
Model : FD620907  
Memo : PCS 1900 IDLE+BT LINK+CHARGER  
Memo : +MP3 PLAYER  
Memo :

|    | Freq  | Level | Over   | Limit | Read  | Probe  | Cable |         |
|----|-------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz   | dBuV  | Limit  | Line  | Level | Factor | Loss  | Remark  |
|    |       |       | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.222 | 42.13 | -20.61 | 62.74 | 41.96 | 0.06   | 0.11  | QP      |
| 2  | 0.222 | 27.42 | -25.32 | 52.74 | 27.25 | 0.06   | 0.11  | Average |
| 3  | 0.228 | 42.00 | -20.52 | 62.52 | 41.83 | 0.06   | 0.11  | QP      |
| 4  | 0.228 | 28.37 | -24.15 | 52.52 | 28.20 | 0.06   | 0.11  | Average |
| 5  | 0.307 | 37.28 | -22.76 | 60.04 | 37.14 | 0.06   | 0.08  | QP      |
| 6  | 0.307 | 23.89 | -26.15 | 50.04 | 23.75 | 0.06   | 0.08  | Average |
| 7  | 1.617 | 40.09 | -15.91 | 56.00 | 39.85 | 0.11   | 0.13  | QP      |
| 8  | 1.617 | 25.23 | -20.77 | 46.00 | 24.99 | 0.11   | 0.13  | Average |
| 9  | 1.771 | 38.91 | -17.09 | 56.00 | 38.67 | 0.11   | 0.13  | QP      |
| 10 | 1.771 | 24.15 | -21.85 | 46.00 | 23.91 | 0.11   | 0.13  | Average |
| 11 | 4.362 | 31.30 | -24.70 | 56.00 | 30.90 | 0.21   | 0.19  | QP      |
| 12 | 4.362 | 15.29 | -30.71 | 46.00 | 14.89 | 0.21   | 0.19  | Average |



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2001/004 200505 NEUTRAL  
 EUT : GSM/GPRS Mobile phone with FM function  
 Power : 120V/60Hz  
 Model : FD620907  
 Memo : PCS 1900 IDLE+BT LINK+CHARGER  
 Memo : +MP3 PLAYER  
 Memo :

|    | Freq  | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Remark  |
|----|-------|-------|------------|------------|------------|--------------|------------|---------|
|    | MHz   | dBuV  | dB         | dBuV       | dBuV       | dB           | dB         |         |
| 1  | 0.177 | 48.38 | -16.27     | 64.65      | 48.15      | 0.11         | 0.12       | QP      |
| 2  | 0.177 | 32.56 | -22.09     | 54.65      | 32.33      | 0.11         | 0.12       | Average |
| 3  | 0.271 | 39.42 | -21.68     | 61.10      | 39.22      | 0.11         | 0.09       | QP      |
| 4  | 0.271 | 23.21 | -27.89     | 51.10      | 23.01      | 0.11         | 0.09       | Average |
| 5  | 0.363 | 34.87 | -23.79     | 58.66      | 34.69      | 0.11         | 0.07       | QP      |
| 6  | 0.363 | 18.30 | -30.36     | 48.66      | 18.12      | 0.11         | 0.07       | Average |
| 7  | 0.435 | 34.22 | -22.94     | 57.16      | 34.04      | 0.12         | 0.06       | QP      |
| 8  | 0.435 | 21.77 | -25.39     | 47.16      | 21.59      | 0.12         | 0.06       | Average |
| 9  | 1.675 | 35.80 | -20.20     | 56.00      | 35.44      | 0.23         | 0.13       | QP      |
| 10 | 1.675 | 22.43 | -23.57     | 46.00      | 22.07      | 0.23         | 0.13       | Average |
| 11 | 1.930 | 20.27 | -25.73     | 46.00      | 19.90      | 0.23         | 0.14       | Average |
| 12 | 1.930 | 34.94 | -21.06     | 56.00      | 34.57      | 0.23         | 0.14       | QP      |

## 5.9 Radiated Emission Measurement

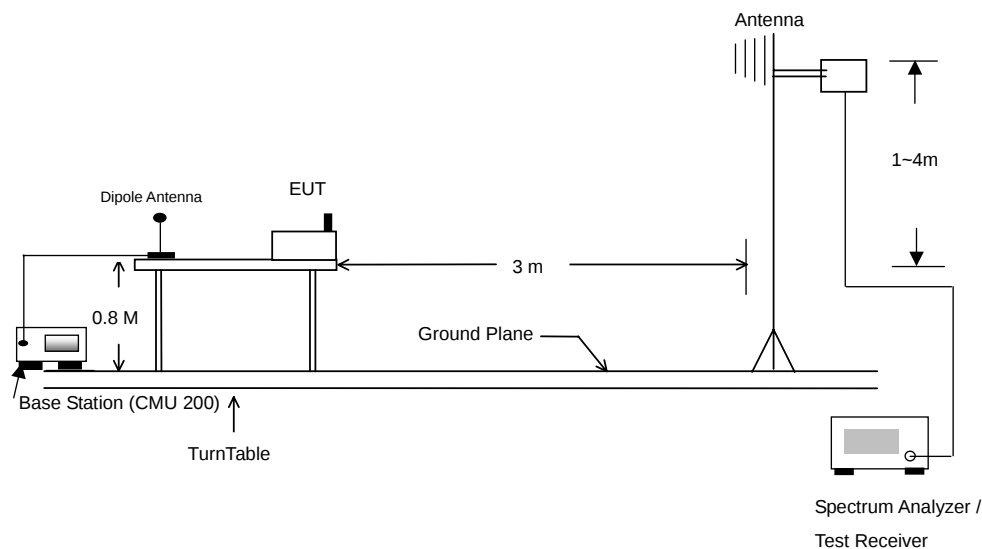
### 5.9.1 Measuring Instruments

As described in chapter 6 of this Report.

### 5.9.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 5.9.3 Typical Test Setup Layout of Radiated Emission

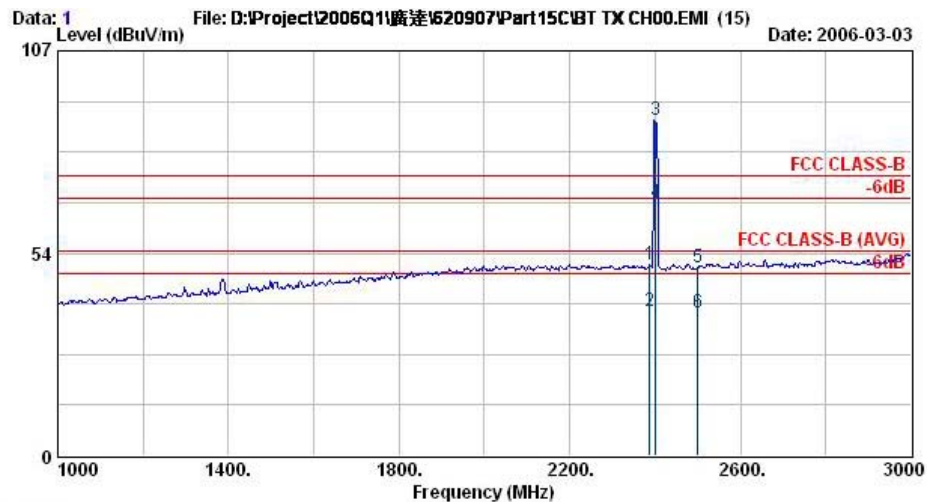




## 5.9.4 Test Data

- Temperature : 24 °C
- Relative Humidity : 53 %
- Test Engineer : Jay
- Test Mode : Mode 1
- Polarization : Horizontal

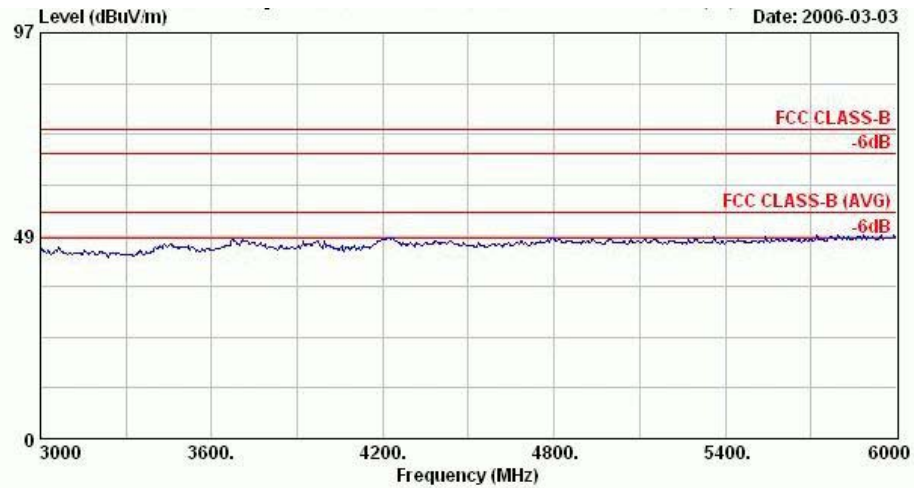
■ The test that passed at the minimum margin was marked by the frame in the following test record



Site : 03CH06-HY  
 Condition : HF-ANT-071025-940201 HORIZONTAL  
 EUT : GSM/GPRS Mobile Phone with FM  
 Power : 120Vac/60Hz  
 Model : FR620907  
 Memo : Bluetooth TX Ch00;2402Mhz  
 Plane : E1

|     | Freq    | Level  | Over   | Limit  | Read  | Antenna | Preamp | Cable | Ant | Table |         |
|-----|---------|--------|--------|--------|-------|---------|--------|-------|-----|-------|---------|
|     | MHz     | dBuV/m | Limit  | Line   | Level | Factor  | Factor | Loss  | Pos | Pos   | Remark  |
|     |         |        | dB     | dBuV/m | dBuV  | dB/m    | dB     | dB    | cm  | deg   |         |
| 1 @ | 2388.00 | 50.56  | -23.44 | 74.00  | 51.28 | 30.48   | 35.44  | 4.23  | 100 | 360   | Peak    |
| 2 @ | 2388.00 | 38.02  | -15.98 | 54.00  | 38.74 | 30.48   | 35.44  | 4.23  | 134 | 225   | Average |
| 3 @ | 2402.00 | 88.63  |        |        | 89.34 | 30.48   | 35.46  | 4.26  | 100 | 360   | Peak    |
| 4 @ | 2402.00 | 66.89  |        |        | 67.60 | 30.48   | 35.46  | 4.26  | 134 | 225   | Average |
| 5 @ | 2500.00 | 49.72  | -24.28 | 74.00  | 50.46 | 30.40   | 35.53  | 4.39  | 100 | 360   | Peak    |
| 6 @ | 2500.00 | 37.96  | -16.04 | 54.00  | 38.70 | 30.40   | 35.53  | 4.39  | 134 | 225   | Average |

Remark: #3 and #4 Fundamental Signal

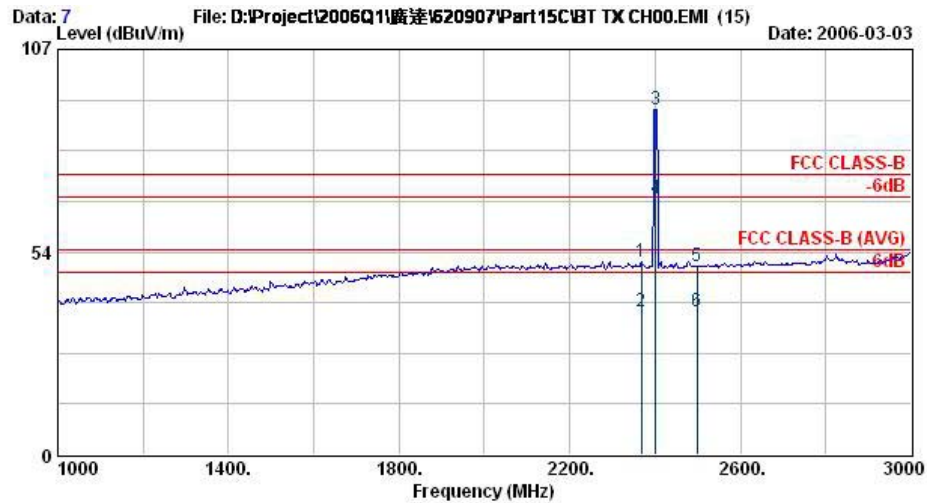


Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 HORIZONTAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch00,2402Mhz  
Plane : E1



- Test Mode : Mode 1
- Polarization : Vertical

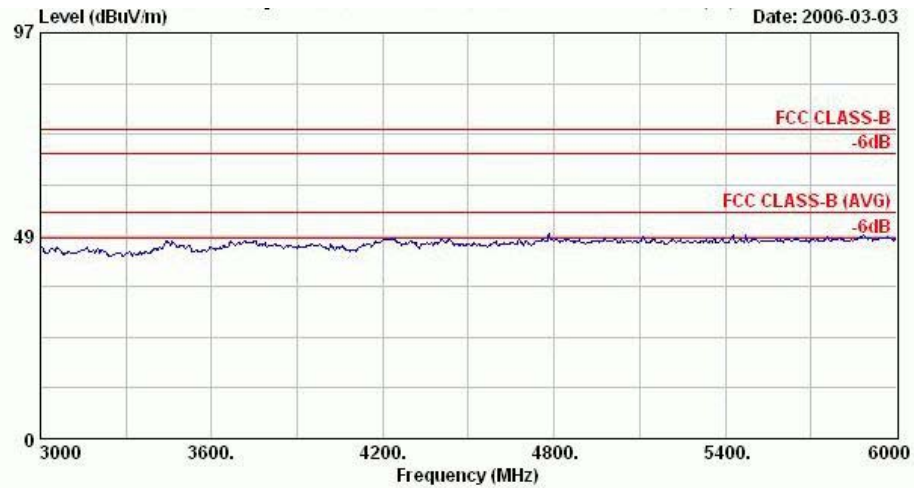
■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch00,2402Mhz  
Plane : E1

|     | Freq    | Level  | Over<br>Limit | Limit<br>Line | ReadAntenna<br>Level Factor | Preamp<br>Factor | Cable<br>Loss | Ant<br>Pos | Table<br>Pos | Remark |         |
|-----|---------|--------|---------------|---------------|-----------------------------|------------------|---------------|------------|--------------|--------|---------|
|     | MHz     | dBuV/m | dB            | dBuV/m        | dBuV                        | dB/m             | dB            | dB         | cm           | deg    |         |
| 1 @ | 2368.00 | 50.78  | -23.22        | 74.00         | 51.48                       | 30.51            | 35.44         | 4.23       | 100          | 360    | Peak    |
| 2 @ | 2368.00 | 37.94  | -16.06        | 54.00         | 38.64                       | 30.51            | 35.44         | 4.23       | 100          | 255    | Average |
| 3 @ | 2402.00 | 90.95  |               |               | 91.66                       | 30.48            | 35.46         | 4.26       | 100          | 360    | Peak    |
| 4 @ | 2402.00 | 67.74  |               |               | 68.45                       | 30.48            | 35.46         | 4.26       | 100          | 255    | Average |
| 5 @ | 2498.00 | 49.79  | -24.21        | 74.00         | 50.53                       | 30.40            | 35.53         | 4.39       | 100          | 360    | Peak    |
| 6 @ | 2498.00 | 37.89  | -16.11        | 54.00         | 38.63                       | 30.40            | 35.53         | 4.39       | 100          | 255    | Average |

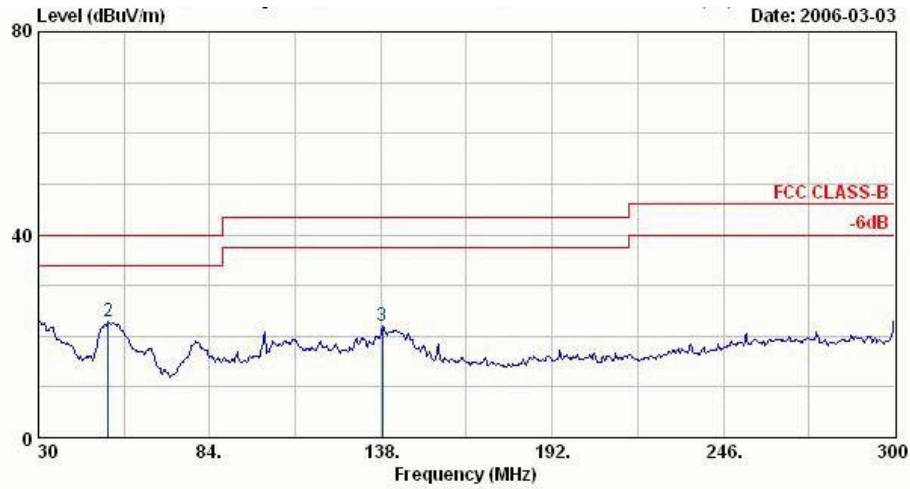
Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch00,2402Mhz  
Plane : E1

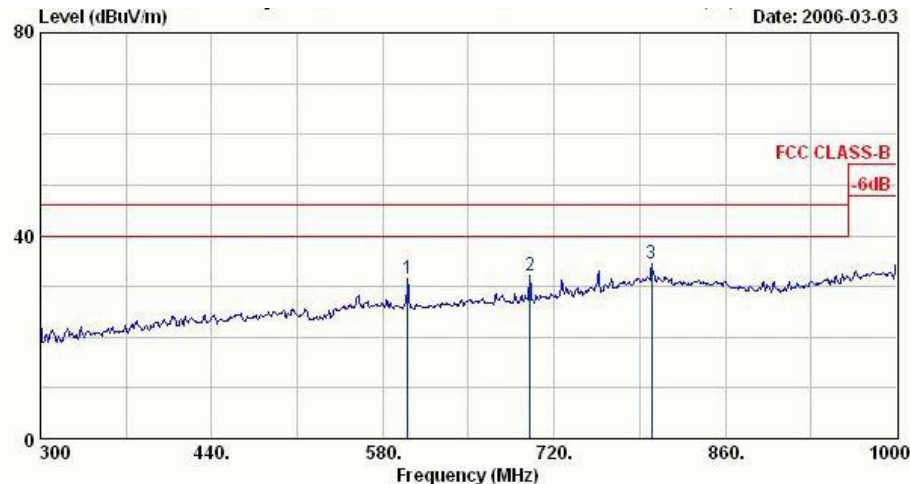
- Test Mode : Mode 2
- Polarization : Horizontal

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY  
Condition : BI-LOG-2004-1122 HORIZONTAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

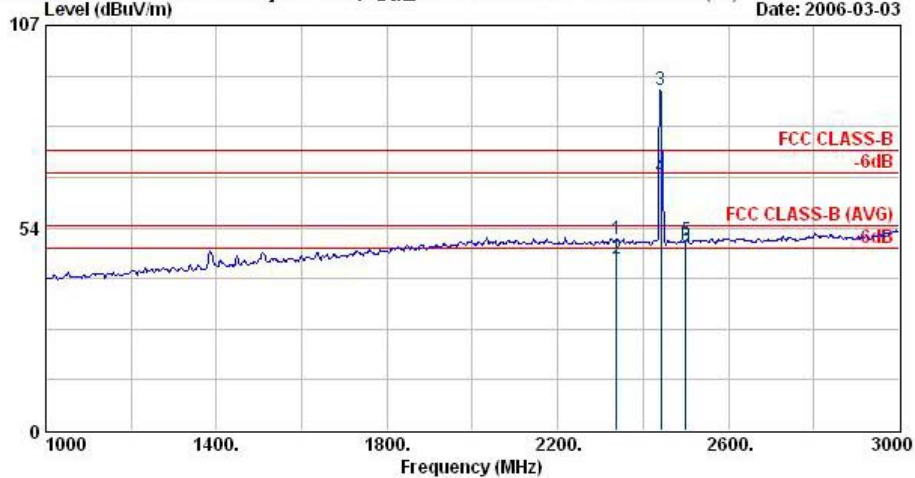
|     | Freq   | Level  | Over   | Limit  | ReadAntenna | Preamp | Cable | Ant  | Table |        |
|-----|--------|--------|--------|--------|-------------|--------|-------|------|-------|--------|
|     | MHz    | dBuV/m | Limit  | Line   | Level       | Factor | Loss  | Pos  | Pos   | Remark |
|     | MHz    | dBuV/m | dB     | dBuV/m | dBuV        | dB/m   | dB    | cm   | deg   |        |
| 1 @ | 30.00  | 22.95  | -17.05 | 40.00  | 34.36       | 18.73  | 31.49 | 1.35 | 400   | 0 Peak |
| 2 @ | 52.14  | 22.76  | -17.24 | 40.00  | 43.23       | 9.24   | 31.45 | 1.74 | 400   | 0 Peak |
| 3 @ | 138.54 | 22.01  | -21.49 | 43.50  | 39.63       | 11.06  | 31.53 | 2.85 | 400   | 0 Peak |



Site : 03CH06-HY  
Condition : BI-LOG-2004-1122 HORIZONTAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

|     | Freq   | Level  | Over   | Limit  | ReadAntenna | Preamp | Cable | Ant  | Table |          |
|-----|--------|--------|--------|--------|-------------|--------|-------|------|-------|----------|
|     | MHz    | dBuV/m | Limit  | Line   | Level       | Factor | Loss  | Pos  | Pos   | Remark   |
|     |        |        | dB     | dBuV/m | dBuV        | dB/m   | dB    | cm   | deg   |          |
| 1 @ | 600.30 | 31.41  | -14.59 | 46.00  | 37.76       | 17.94  | 30.64 | 6.35 | 100   | 0 Peak   |
| 2 @ | 700.40 | 32.24  | -13.76 | 46.00  | 36.89       | 19.04  | 30.61 | 6.93 | 100   | 0 Peak   |
| 3 @ | 799.80 | 34.49  | -11.51 | 46.00  | 35.26       | 21.90  | 30.12 | 7.45 | 100   | 223 Peak |

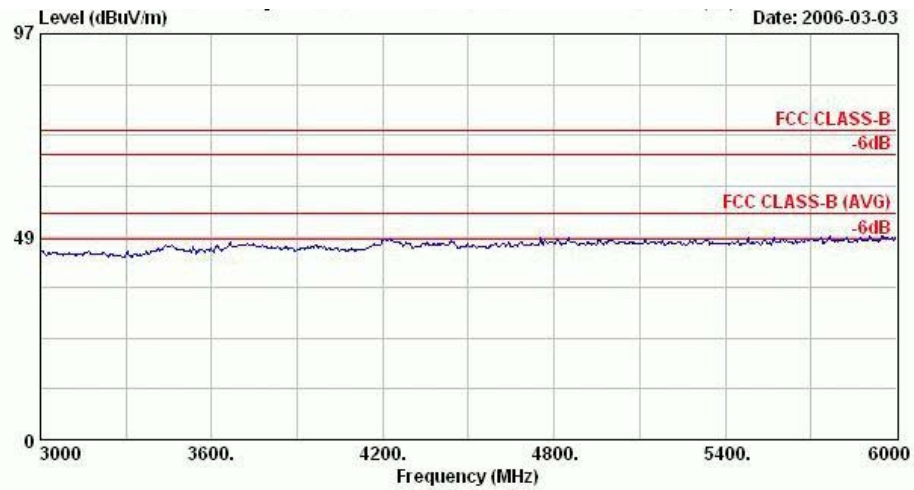
Data: 3 File: D:\Project\2006Q1\廣達\620907\Part15C\BT TX CH39.EMI (20)



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 HORIZONTAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

|     | Freq    | Level  | Over   | Limit  | ReadAntenna | Preamp | Cable | Ant  | Table |             |
|-----|---------|--------|--------|--------|-------------|--------|-------|------|-------|-------------|
|     | MHz     | dBuV/m | Limit  | Line   | Level       | Factor | Loss  | Pos  | Pos   | Remark      |
|     |         |        | dB     | dBuV/m | dBuV        | dB/m   | dB    | cm   | deg   |             |
| 1 @ | 2338.00 | 50.67  | -23.33 | 74.00  | 51.38       | 30.52  | 35.40 | 4.17 | 100   | 360 Peak    |
| 2 @ | 2338.00 | 45.15  | -8.85  | 54.00  | 45.86       | 30.52  | 35.40 | 4.17 | 100   | 207 Average |
| 3 @ | 2441.00 | 89.72  |        |        | 90.46       | 30.44  | 35.47 | 4.29 | 100   | 360 Peak    |
| 4 @ | 2441.00 | 66.73  |        |        | 67.46       | 30.44  | 35.49 | 4.33 | 100   | 207 Average |
| 5 @ | 2500.00 | 50.09  | -23.91 | 74.00  | 50.83       | 30.40  | 35.53 | 4.39 | 100   | 360 Peak    |
| 6 @ | 2500.00 | 48.59  | -5.41  | 54.00  | 49.33       | 30.40  | 35.53 | 4.39 | 100   | 207 Average |

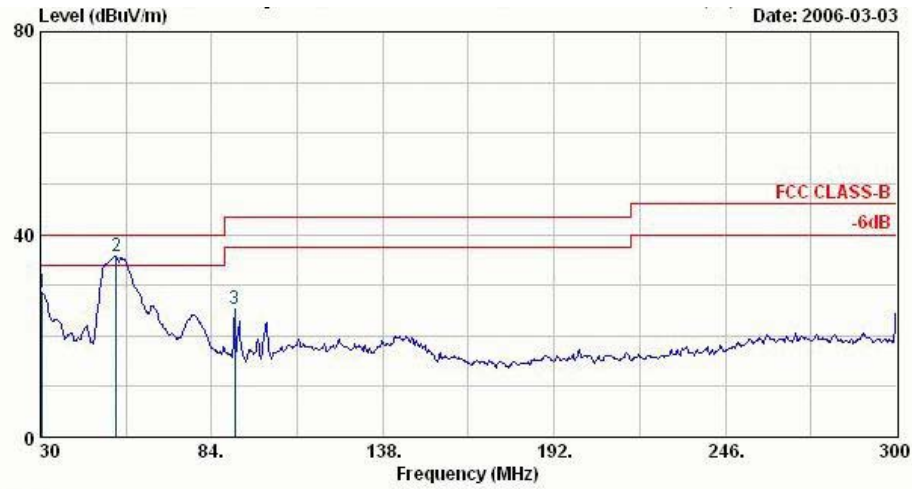
Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 HORIZONTAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

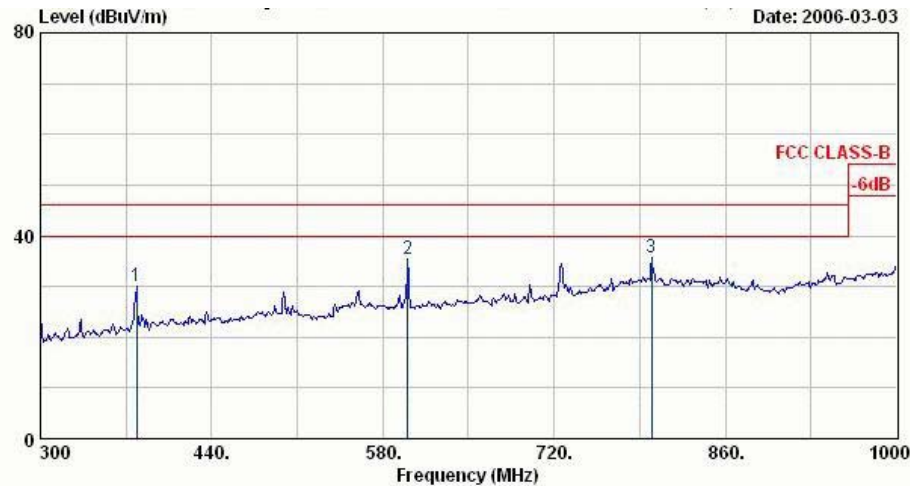
- Test Mode : Mode 2
- Polarization : Vertical

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY  
Condition : BI-LOG-2004-1122 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

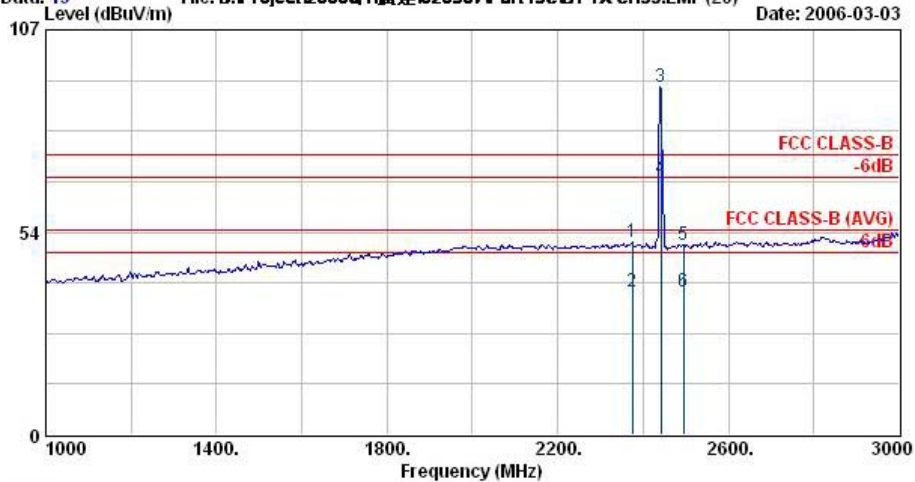
|     | Freq  | Level  | Over   | Limit  | ReadAntenna | Preamp | Cable  | Ant  | Table |     |
|-----|-------|--------|--------|--------|-------------|--------|--------|------|-------|-----|
|     | MHz   | dBuV/m | Limit  | Line   | Level       | Factor | Factor | Loss | Pos   | Pos |
|     |       |        | dB     | dBuV/m | dBuV        | dB/m   | dB     | dB   | cm    | deg |
| 1 @ | 30.54 | 28.56  | -11.44 | 40.00  | 40.31       | 18.40  | 31.52  | 1.37 | 400   | 0   |
| 2 @ | 54.03 | 35.74  | -4.26  | 40.00  | 56.88       | 8.53   | 31.44  | 1.77 | 124   | 334 |
| 3 @ | 91.29 | 25.19  | -18.31 | 43.50  | 45.20       | 9.18   | 31.52  | 2.33 | 400   | 0   |



Site : 03CH06-HY  
Condition : BI-LOG-2004-1122 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

|     | Freq   | Level  | Over   | Limit  | ReadAntenna | Preamp | Cable | Ant  | Table |        |
|-----|--------|--------|--------|--------|-------------|--------|-------|------|-------|--------|
|     | MHz    | dBuV/m | Limit  | Line   | Level       | Factor | Loss  | Pos  | Pos   | Remark |
|     |        |        | dB     | dBuV/m | dBuV        | dB/m   | dB    | cm   | deg   |        |
| 1 @ | 378.40 | 29.91  | -16.09 | 46.00  | 40.69       | 15.24  | 30.90 | 4.88 | 100   | 0 Peak |
| 2 @ | 600.30 | 35.49  | -10.51 | 46.00  | 41.84       | 17.94  | 30.64 | 6.35 | 100   | 0 Peak |
| 3 @ | 799.80 | 35.80  | -10.20 | 46.00  | 36.57       | 21.90  | 30.12 | 7.45 | 100   | 0 Peak |

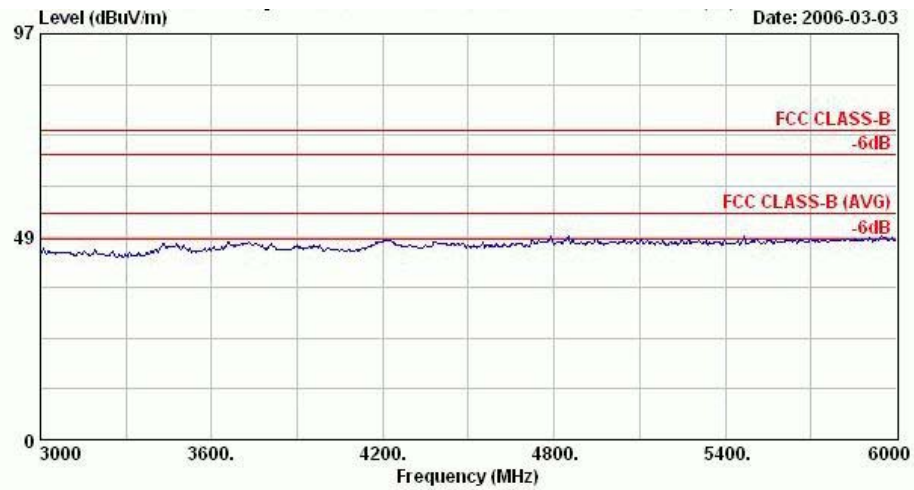
Data: 13 File: D:\Project\2006Q1\廣達\620907\Part15C\BT TX CH39.EMI (20)



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1

|     | Freq    | Level  | Over   | Limit  | ReadAntenna | Preamp | Cable | Ant  | Table |             |
|-----|---------|--------|--------|--------|-------------|--------|-------|------|-------|-------------|
|     | MHz     | dBuV/m | Limit  | Line   | Level       | Factor | Loss  | Pos  | Pos   | Remark      |
|     |         |        | dB     | dBuV/m | dBuV        | dB/m   | dB    | cm   | deg   |             |
| 1 @ | 2374.00 | 50.81  | -23.19 | 74.00  | 51.52       | 30.50  | 35.44 | 4.23 | 100   | 360 Peak    |
| 2 @ | 2374.00 | 37.96  | -16.04 | 54.00  | 38.67       | 30.50  | 35.44 | 4.23 | 100   | 256 Average |
| 3 @ | 2441.00 | 91.75  |        |        | 92.49       | 30.44  | 35.47 | 4.29 | 100   | 360 Peak    |
| 4 @ | 2441.00 | 67.69  |        |        | 68.42       | 30.44  | 35.49 | 4.33 | 100   | 256 Average |
| 5 @ | 2494.00 | 50.16  | -23.84 | 74.00  | 50.89       | 30.40  | 35.53 | 4.39 | 100   | 360 Peak    |
| 6 @ | 2494.00 | 37.78  | -16.22 | 54.00  | 38.52       | 30.40  | 35.53 | 4.39 | 100   | 256 Average |

Remark: #3 and #4 Fundamental Signal

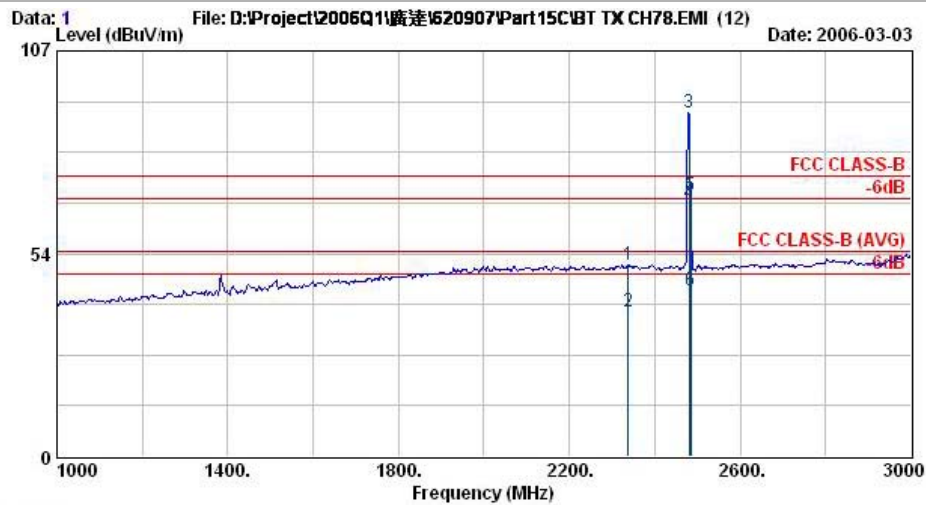


Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch39,2441Mhz  
Plane : E1



- Test Mode : Mode 3
- Polarization : Horizontal

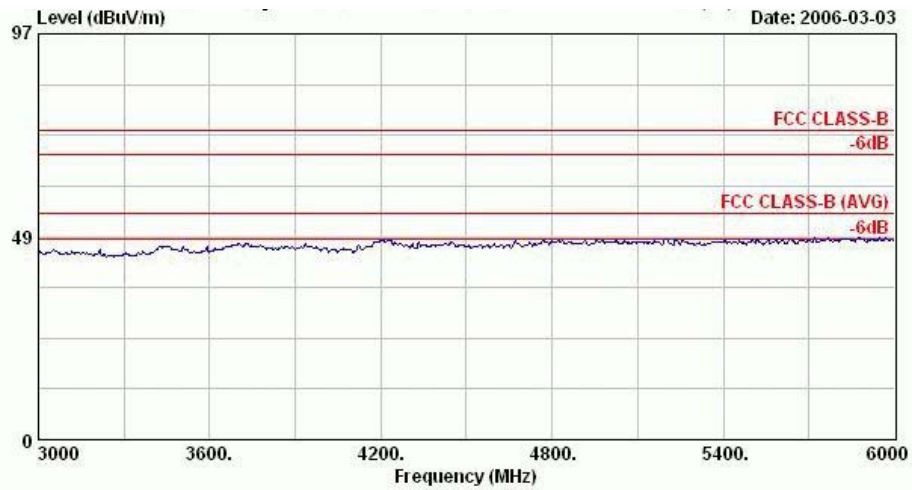
■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY  
 Condition : HF-ANT-071025-940201 HORIZONTAL  
 EUT : GSM/GPRS Mobile Phone with FM  
 Power : 120Vac/60Hz  
 Model : FR620907  
 Memo : Bluetooth TX Ch78,2480Mhz  
 Plane : E1

|     | Freq    | Level  | Over   | Limit  | Read  | Antenna | Preamp | Cable | Ant | Table | Remark  |
|-----|---------|--------|--------|--------|-------|---------|--------|-------|-----|-------|---------|
|     | MHz     | dBuV/m | Limit  | Line   | Level | Factor  | Factor | Loss  | Pos | Pos   |         |
|     |         |        | dB     | dBuV/m | dBuV  | dB/m    | dB     | dB    | cm  | deg   |         |
| 1 @ | 2338.00 | 50.51  | -23.49 | 74.00  | 51.22 | 30.52   | 35.40  | 4.17  | 100 | 360   | Peak    |
| 2 @ | 2338.00 | 38.13  | -15.87 | 54.00  | 38.84 | 30.52   | 35.40  | 4.17  | 102 | 246   | Average |
| 3 @ | 2480.00 | 90.58  |        |        | 91.32 | 30.41   | 35.51  | 4.36  | 100 | 360   | Peak    |
| 4 @ | 2480.00 | 67.01  |        |        | 67.75 | 30.41   | 35.51  | 4.36  | 102 | 246   | Average |
| 5 @ | 2483.50 | 68.75  | -5.25  | 74.00  | 69.49 | 30.41   | 35.51  | 4.36  | 100 | 360   | Peak    |
| 6 @ | 2483.50 | 43.69  | -10.31 | 54.00  | 44.43 | 30.41   | 35.51  | 4.36  | 102 | 246   | Average |

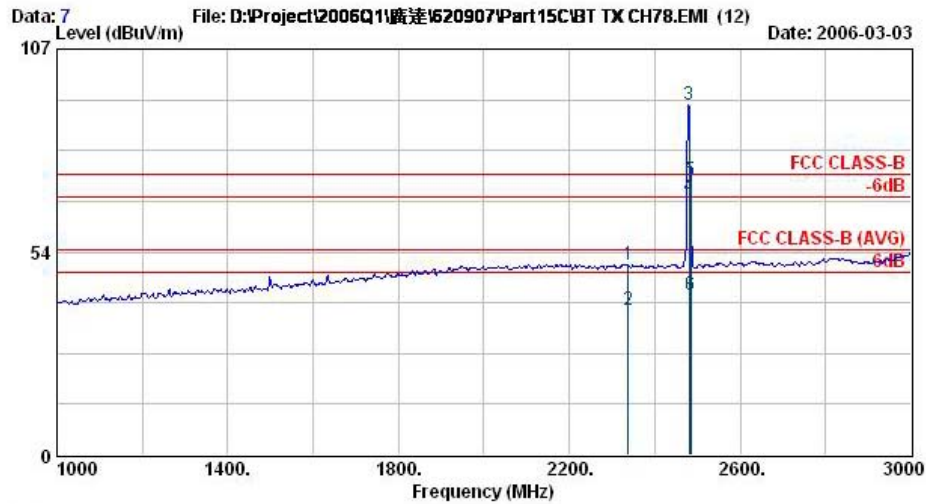
Remark: #3 and #4 Fundamental Signal.



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 HORIZONTAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch78,2480Mhz  
Plane : E1

- Test Mode : Mode 3
- Polarization : Vertical

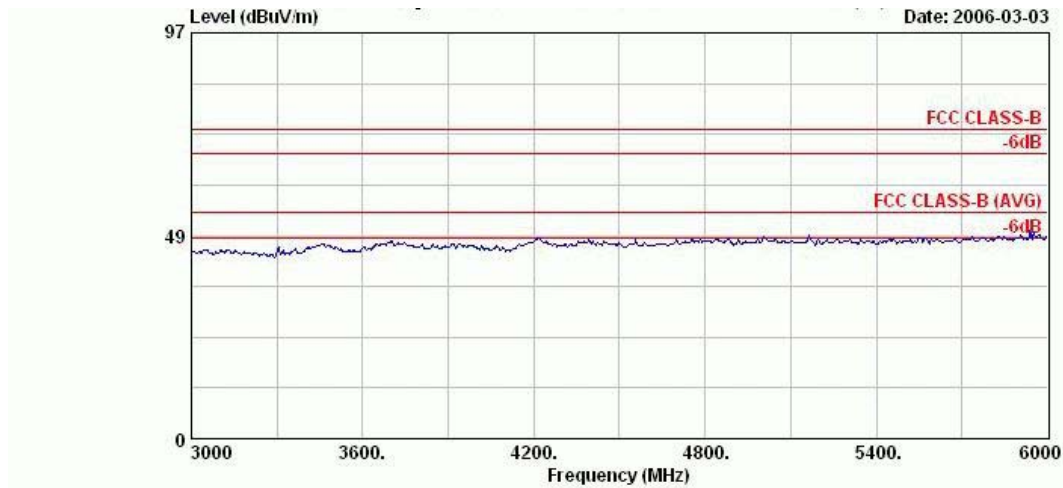
■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch78,2480Mhz  
Plane : E1

|     | Freq    | Level  | Over   | Limit  | Read  | Antenna | Preamp | Cable | Ant | Table | Remark  |
|-----|---------|--------|--------|--------|-------|---------|--------|-------|-----|-------|---------|
|     | MHz     | dBuV/m | dB     | dBuV/m | Level | Factor  | Factor | Loss  | Pos | Pos   |         |
|     |         |        |        |        | dBuV  | dB/m    | dB     | dB    | cm  | deg   |         |
| 1 @ | 2338.00 | 50.18  | -23.82 | 74.00  | 50.89 | 30.52   | 35.40  | 4.17  | 100 | 360   | Peak    |
| 2 @ | 2338.00 | 38.14  | -15.86 | 54.00  | 38.85 | 30.52   | 35.40  | 4.17  | 104 | 258   | Average |
| 3 @ | 2480.00 | 92.41  |        |        | 93.15 | 30.41   | 35.51  | 4.36  | 100 | 360   | Peak    |
| 4 @ | 2480.00 | 67.91  |        |        | 68.65 | 30.41   | 35.51  | 4.36  | 104 | 258   | Average |
| 5 @ | 2484.00 | 72.28  | -1.72  | 74.00  | 73.02 | 30.41   | 35.51  | 4.36  | 100 | 360   | Peak    |
| 6 @ | 2484.00 | 42.35  | -11.65 | 54.00  | 43.09 | 30.41   | 35.51  | 4.36  | 104 | 258   | Average |

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-071025-940201 VERTICAL  
EUT : GSM/GPRS Mobile Phone with FM  
Power : 120Vac/60Hz  
Model : FR620907  
Memo : Bluetooth TX Ch78,2480Mhz  
Plane : E1

Remark: There is no more obvious emission except the listings above.



## **5.10 Antenna Requirements**

### **5.10.1 Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

### **5.10.2 Antenna Connected Construction**

The antenna used in this product is a fixed internal antenna without connector and it is considered to meet antenna requirement of FCC.

### **5.10.3 Antenna Gain**

The antenna gain of EUT is less than 6dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 6. List of Measuring Equipments Used

| Instrument          | Manufacturer       | Model No. | Serial No. | Characteristics | Calibration Date | Due Date      | Remark                |
|---------------------|--------------------|-----------|------------|-----------------|------------------|---------------|-----------------------|
| EMC Receiver        | R&S                | ESCS 30   | 100174     | 9kHz – 2.75GHz  | Oct. 19, 2005    | Oct. 19, 2006 | Conduction (CO01-HY)  |
| LISN                | MessTec            | NNB-2/16Z | 2001/009   | 9kHz – 30MHz    | Apr. 26, 2005    | Apr. 26, 2006 | Conduction (CO01-HY)  |
| LISN (Support Unit) | MessTec            | NNB-2/16Z | 2001/004   | 9kHz – 30MHz    | Apr. 20, 2005    | Apr. 20, 2006 | Conduction (CO01-HY)  |
| EMI Filter          | LINDGREN           | LRE-2060  | 1004       | < 450Hz         | N/A              | N/A           | Conduction (CO01-HY)  |
| EMI Filter          | LINDGREN           | N6006     | 201052     | 0 – 60Hz        | N/A              | N/A           | Conduction (CO01-HY)  |
| RF Cable-CON        | Suhner Switzerland | RG223/U   | CB029      | 9kHz – 30MHz    | Dec. 22, 2005    | Dec. 22, 2006 | Conduction (CO01-HY)  |
| Spectrum analyzer   | Agilent            | E4408B    | MY44211030 | 9KHz-26.5GHz    | Jul. 25, 2005    | Jul. 24, 2006 | Radiation (03CH06-HY) |
| Receiver            | R&S                | ESCS30    | 100356     | 9KHz-2.75GHz    | Jun. 28, 2005    | Jun. 27, 2006 | Radiation (03CH06-HY) |
| Controller          | CT                 | SC100     | N/A        | N/A             | N/A              | N/A           | Radiation (03CH06-HY) |
| Bilog Antenna       | SCHAFFNER          | CBL6112B  | 2885       | 30MHz -2GHz     | Nov. 22, 2004    | Nov. 22, 2006 | Radiation (03CH06-HY) |
| Horn Antenna        | Com-Power          | AH118     | 071025     | 1G-18G          | Feb. 22, 2006    | Feb. 22, 2007 | Radiation (03CH06-HY) |
| SHF-EHF Horn        | SCHWARZBECK        | BBHA 9170 | 9170-249   | 14G - 40G       | Jul. 21, 2005    | Jul. 20, 2006 | Radiation (03CH06-HY) |
| HF Amplifier        | MITEQ              | AFS44     | 973248     | 0.1G - 26.5G    | Nov. 23, 2005    | Nov. 22, 2006 | Radiation (03CH06-HY) |
| Amplifier           | MITEQ              | AMF-6F    | 997165     | 26G - 40G       | Jul. 21, 2005    | Jul. 20, 2006 | Radiation (03CH06-HY) |
| Turn Table          | HD                 | DS 420    | 420/650/00 | 0 ~ 360 degree  | N/A              | N/A           | Radiation (03CH06-HY) |
| Antenna Mast        | HD                 | MA 240    | 240/560/00 | 1 m - 4 m       | N/A              | N/A           | Radiation (03CH06-HY) |

## 7. Uncertainty Evaluation

### Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

| Contribution                                                           | Uncertainty of $x_i$ |                          | $u(x_i)$ |
|------------------------------------------------------------------------|----------------------|--------------------------|----------|
|                                                                        | dB                   | Probability Distribution |          |
| Receiver reading                                                       | 0.10                 | Normal(k=2)              | 0.05     |
| Cable loss                                                             | 0.10                 | Normal(k=2)              | 0.05     |
| AMN insertion loss                                                     | 2.50                 | Rectangular              | 0.63     |
| Receiver Spec                                                          | 1.50                 | Rectangular              | 0.43     |
| Site imperfection                                                      | 1.39                 | Rectangular              | 0.80     |
| Mismatch                                                               | +0.34/-0.35          | U-shape                  | 0.24     |
| <b>combined standard uncertainty Uc(y)</b>                             | <b>1.13</b>          |                          |          |
| <b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b> | <b>2.26</b>          |                          |          |

### Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

| Contribution                                                           | Uncertainty of $x_i$ |                          | $u(x_i)$ |
|------------------------------------------------------------------------|----------------------|--------------------------|----------|
|                                                                        | dB                   | Probability Distribution |          |
| Receiver reading                                                       | 0.41                 | Normal(k=2)              | 0.21     |
| Antenna factor calibration                                             | 0.83                 | Normal(k=2)              | 0.42     |
| Cable loss calibration                                                 | 0.25                 | Normal(k=2)              | 0.13     |
| Pre Amplifier Gain calibration                                         | 0.27                 | Normal(k=2)              | 0.14     |
| RCV/SPA specification                                                  | 2.50                 | Rectangular              | 0.72     |
| Antenna Factor Interpolation for Frequency                             | 1.00                 | Rectangular              | 0.29     |
| Site imperfection                                                      | 1.43                 | Rectangular              | 0.83     |
| Mismatch                                                               | +0.39/-0.41          | U-shaped                 | 0.28     |
| <b>combined standard uncertainty Uc(y)</b>                             | <b>1.27</b>          |                          |          |
| <b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b> | <b>2.54</b>          |                          |          |

**Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)**

| Contribution                                                                                                                                  | Uncertainty of $x_i$ |                          | $u(x_i)$ | $C_i$ | $C_i * u(x_i)$ |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------|-------|----------------|
|                                                                                                                                               | dB                   | Probability Distribution |          |       |                |
| Receiver reading                                                                                                                              | ±0.10                | Normal(k=1)              | 0.10     | 1     | 0.10           |
| Antenna factor calibration                                                                                                                    | ±1.70                | Normal(k=2)              | 0.85     | 1     | 0.85           |
| Cable loss calibration                                                                                                                        | ±0.50                | Normal(k=2)              | 0.25     | 1     | 0.25           |
| Receiver Correction                                                                                                                           | ±2.00                | Rectangular              | 1.15     | 1     | 1.15           |
| Antenna Factor Directional                                                                                                                    | ±1.50                | Rectangular              | 0.87     | 1     | 0.87           |
| Site imperfection                                                                                                                             | ±2.80                | Triangular               | 1.14     | 1     | 1.14           |
| Mismatch<br>Receiver VSWR $\Gamma_1 = 0.197$<br>Antenna VSWR $\Gamma_2 = 0.194$<br>Uncertainty = $20\log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$ | +0.34/-0.35          | U-shaped                 | 0.244    | 1     | 0.244          |
| <b>Combined standard uncertainty<br/>Uc(y)</b>                                                                                                | <b>2.36</b>          |                          |          |       |                |
| <b>Measuring uncertainty for a level<br/>of confidence of 95% U=2Ue(y)</b>                                                                    | <b>4.72</b>          |                          |          |       |                |