



# FCC TEST REPORT

for

## 47 CFR Part 15 Subpart C

**Equipment** : Mobile Phone  
**Trade Name** : BenQ-Siemens  
**Model No.** : E81  
**Marketing Name** : MERB1A  
**FCC ID** : JVPE81  
**BenQ Ref. No.** : RY-6650  
**Filing Type** : Certification  
**Applicant** : **BenQ Corporation**  
157 Shan-Ying Road, Gueishan Taoyuan 333, Taiwan

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- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**
- The data shown in this test report were carried out on Aug. 07, 2006 at **Sporton International Inc. LAB.**
- Report No.: FR671011, Report Version: Rev. 01.

Roy Wu  
Deputy Manager

### ***SPORTON International Inc.***

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***SPORTON International Inc.***

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Report Version: Rev. 01



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### History of this test report

Report Issue Date: Aug. 09, 2006

Report No.	Description



# 1. General Description of Equipment under Test

## 1.1. Applicant

**BenQ Corporation**

157 Shan-Ying Road, Gueishan Taoyuan 333, Taiwan

## 1.2. Manufacturer

**1. BenQ Corporation**

157 Shan-Ying Road, Gueishan Taoyuan 333, Taiwan

**2. BenQ (Shanghai Pudong) Co., Ltd.**

777 Chuanqiao Road, Pudong Shanghai, P.R., China

## 1.3. Basic Description of Equipment under Test

Equipment	: Mobile Phone
Trade Name	: BenQ-Siemens
Model No.	: E81
FCC ID	: JVPE81
Power Supply Type	: Switching, From battery 3.7V
AC Power Cord	: AC 120V, Weave-shielded, Wall-mount, 1.4 meter, 2 pin
Earphone	: BenQ-Siemens, HHS-150
Adapter	: BenQ-Siemens, PS50/2205
Battery	: BenQ-Siemens, 2C.2H200.101
Data Cable	: BenQ-Siemens, DCA-140

**1.4. Feature of Equipment under Test**

Product Feature & Specification	
1. Support Band	900/1800/1900/2100/2400
2. Modulation Type/Data Rate	PCS : GMSK BT : GFSK
3. Frequency Range.	PCS : 1850.2-1909.8 MHz(Tx), 1930.2-1989.8 MHz(Rx) BT : 2400 MHz ~ 2483.5 MHz
4. Number of Channels	BT : 79
5. Carrier Frequency of each channel	BT : 2402+ n*1 MHz, n= 0~78
6. Channel Spacing	BT : 1 MHz
7. Maximum Output Power to Antenna (Normal condition)	PCS : 29.82 dBm BT : -1.28 dBm
8. Type of Antenna Connector	N/A
9. Antenna Type	PCB Antenna
10. Antenna Gain	-4 dBi
11. HW Version	LPR4-5
12. SW Version	0.05
13. Function Type	Transmitter     Transceiver   V
14. Power Rating (DC/AC , Voltage)	DC 3.8V / 1.2A
15. DUT Stage	Identical Prototype



## 2. Test Configuration of Equipment under Test

### 2.1. Test Manner

- a. 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.
- b. For spurious emission below 1GHz, only one channel of each application was tested because it is not related to channel selection.
- c. The EUT is programmed to transmit signal continuously for all testings.
- d. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.

### 2.2. Test Mode

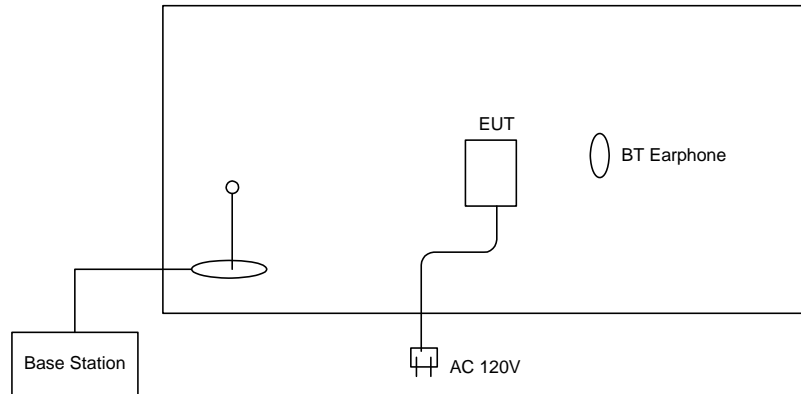
Application	Bluetooth
Radiated Emission and conducted test items	Mode 1: Tx_CH00_2402 MHz Mode 2: Tx_CH39_2441 MHz Mode 3: Tx_CH78_2480 MHz
Conducted Emission	Mode 1: PCS1900 Idle Mode + BT Link + Camera + Adapter Mode 2: PCS1900 Idle Mode + BT Link + Camera + USB Link Mode 3: PCS1900 Idle Mode + BT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

### 2.3. Ancillary Equipment List

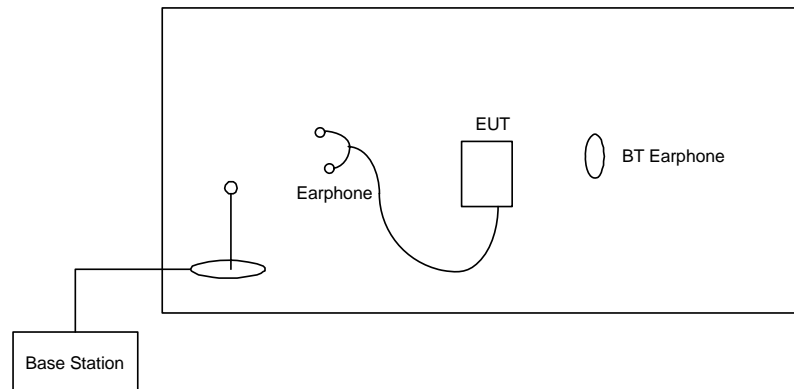
Item	Equipment	Model No.	Power Cord
1.	Base Station (R&S)	CMU200	AC 100-240V
2.	Bluetooth Earphone (Engotech)	ET-BH111	N/A

## 2.4. Connection Diagram of Test System

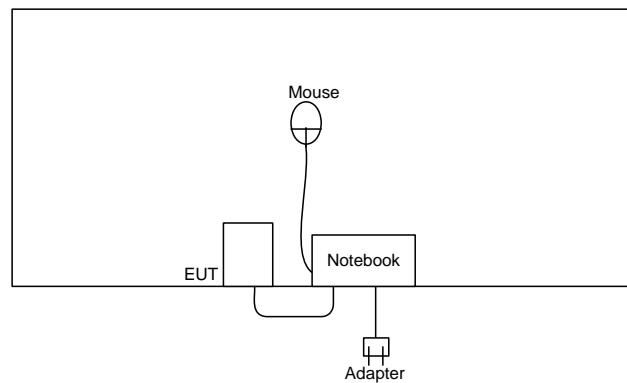
### <EUT with Adapter Mode>



### <EUT with Earphone Mode>



### <EUT with USB Link Mode>





### **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

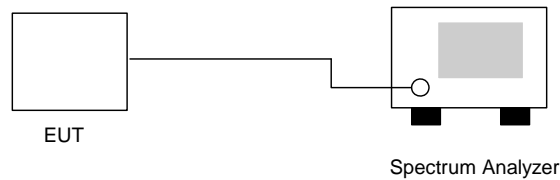
### 5.2.1. Measuring Instruments :

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: 27°C
- Relative Humidity: 51%
- Test Engineer : James

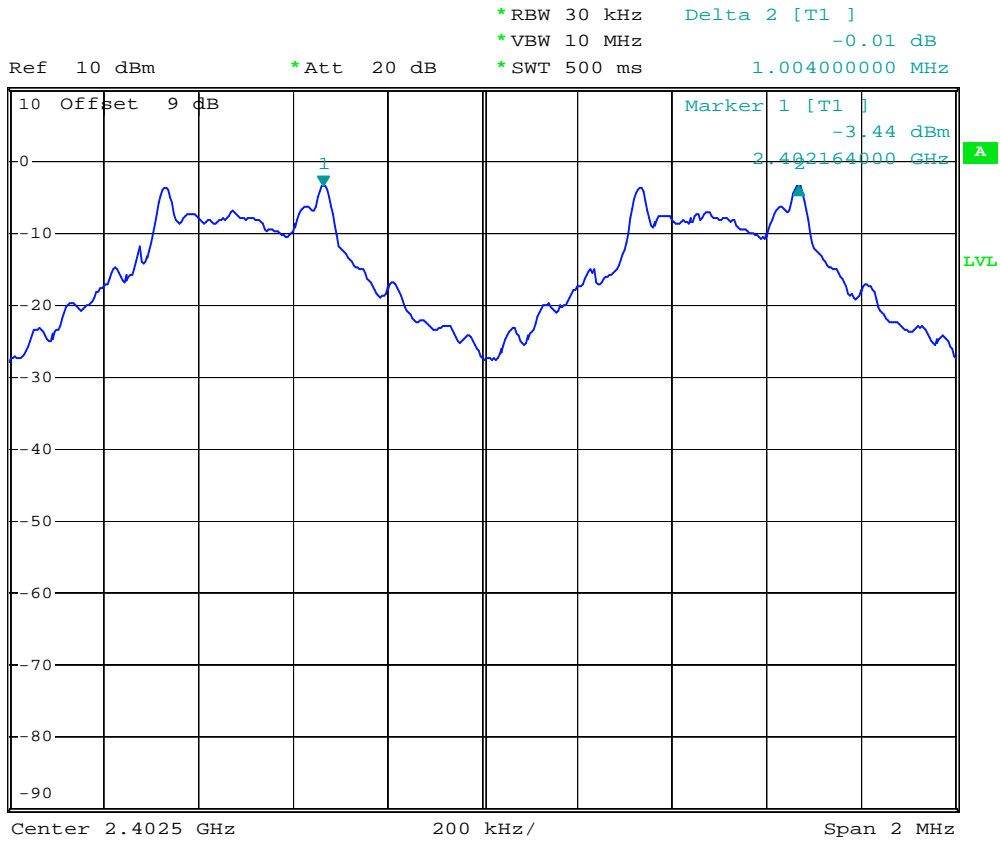
Channel	Frequency ( MHz )	Hopping Channel Separation ( MHz )	Limits ( MHz )	Plot Ref. No.
00	2402	1.004	0.814	Mode 1
39	2441	1.000	0.864	Mode 2
78	2480	1.000	0.822	Mode 3

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)



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Mode 2: CH39 (2441MHz)

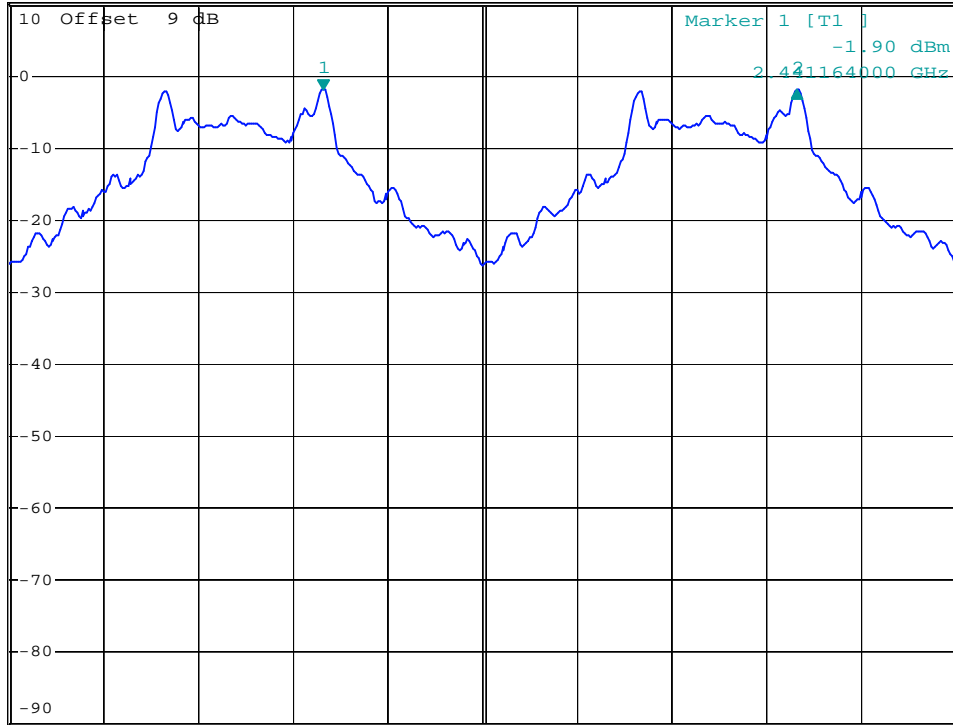


\*RBW 30 kHz    Delta 2 [T1 ]  
 \*VBW 10 MHz    -0.01 dB  
 \*SWT 500 ms    1.000000000 MHz

Ref 10 dBm

\*Att 20 dB

1 PK  
MAXH



Center 2.4415 GHz

200 kHz/

Span 2 MHz

Date: 11.JUL.2006 15:53:32



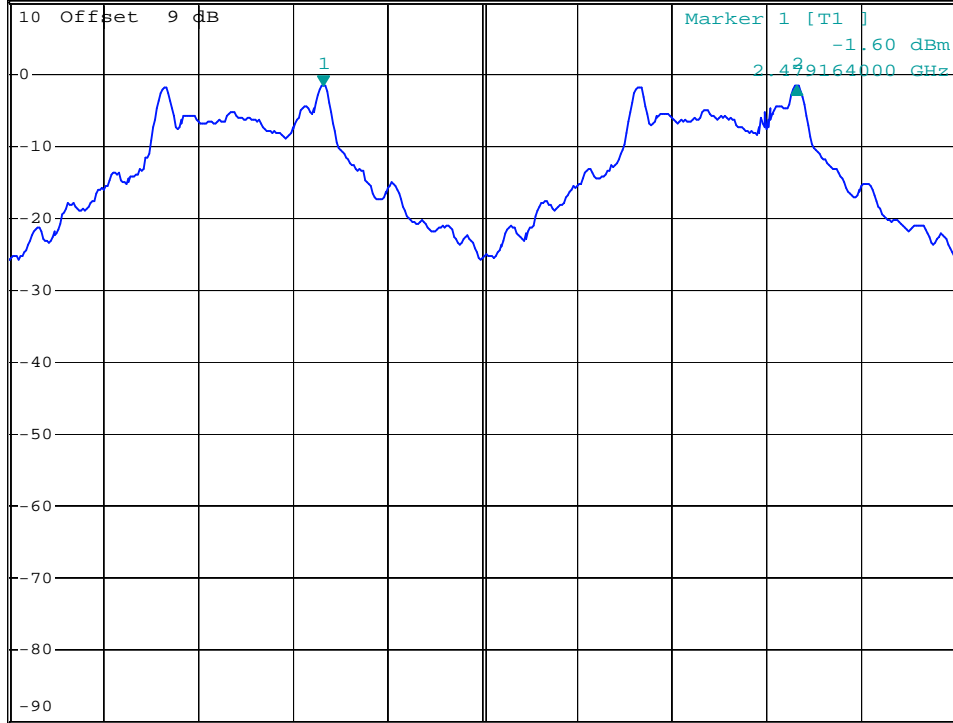
Mode 3: CH78 (2480MHz)



\*RBW 30 kHz    Delta 2 [T1 ]  
 \*VBW 10 MHz    0.01 dB  
 \*SWT 500 ms    1.000000000 MHz

Ref 10 dBm

\*Att 20 dB



Center 2.4795 GHz

200 kHz/

Span 2 MHz

Date: 11.JUL.2006 15:55:15

### 5.3. Number of Hopping Frequency

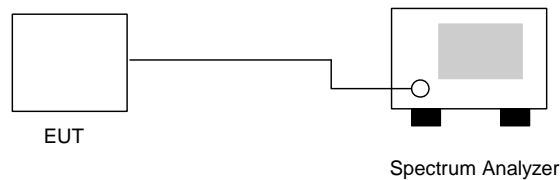
#### 5.3.1. Measuring Instruments :

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 :



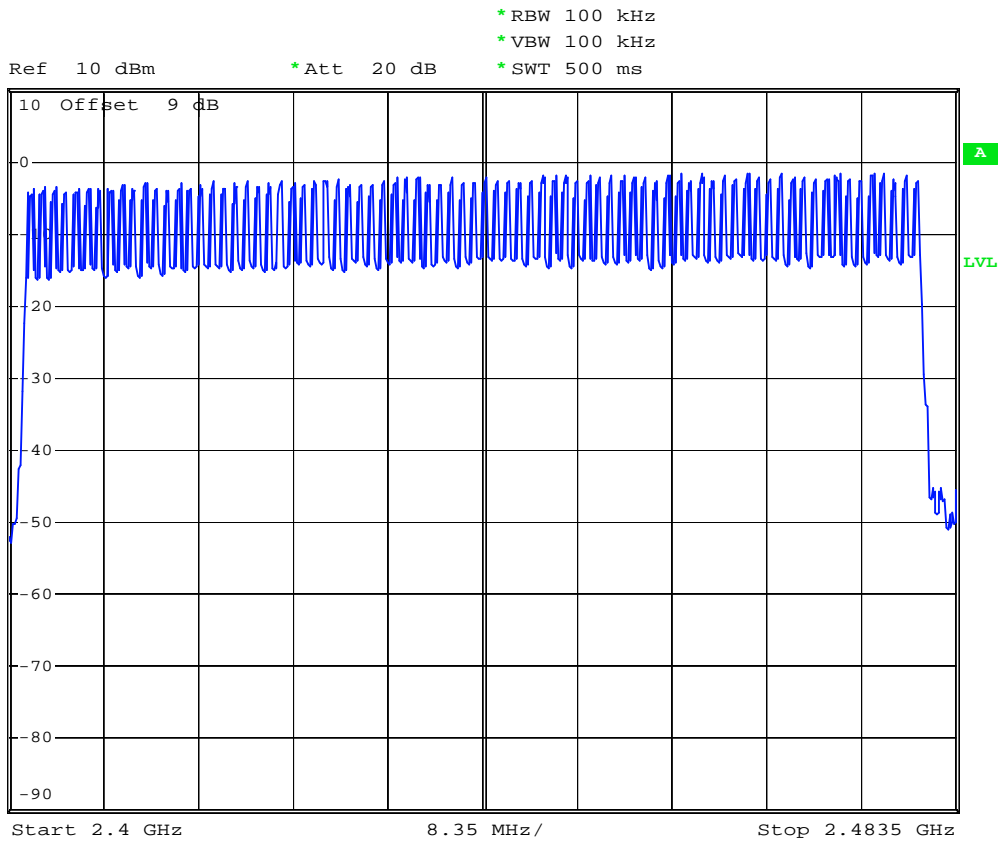
#### 5.3.4. Test Result : See spectrum analyzer plots below

- Temperature: 27°C
- Relative Humidity: 51%
- Test Engineer : James

Number of Hopping Frequency (Channel)	Limits (Channel)
79	15



5.3.5 Number of Hopping Frequency



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### 5.4 Hopping Channel Bandwidth

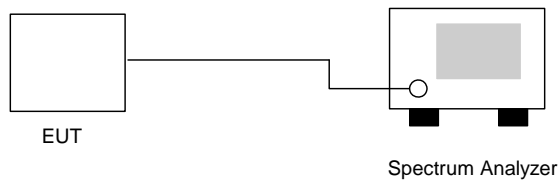
#### 5.4.1 Measuring Instruments :

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: 27°C
- Relative Humidity: 51%
- Test Engineer : James

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.814	1.0	Mode 1
39	2441	0.864	1.0	Mode 2
78	2480	0.822	1.0	Mode 3

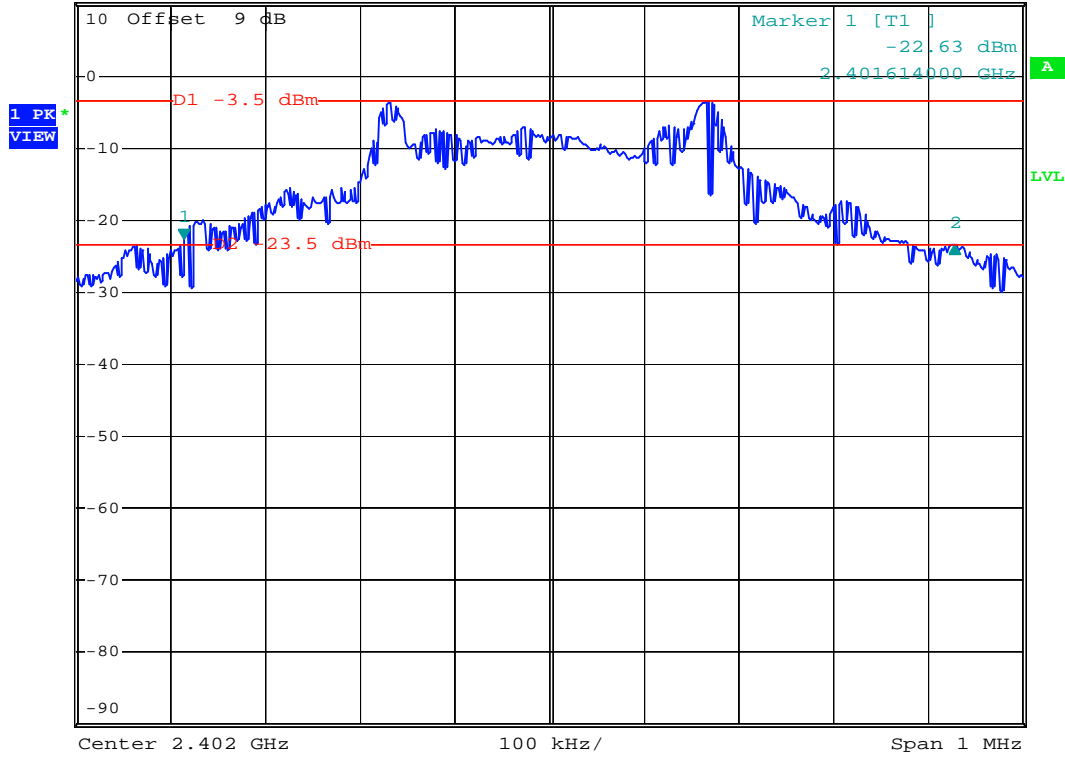


5.4.5 Hopping Channel Bandwidth

Mode 1: CH00 (2402MHz)



\*RBW 30 kHz    Delta 2 [T1 ]  
 \*VBW 300 kHz    -0.79 dB  
 \*SWT 500 ms    814.00000000 kHz  
 Ref 10 dBm    \*Att 20 dB



Date: 11.JUL.2006 15:23:09



Mode 2: CH39 (2441MHz)

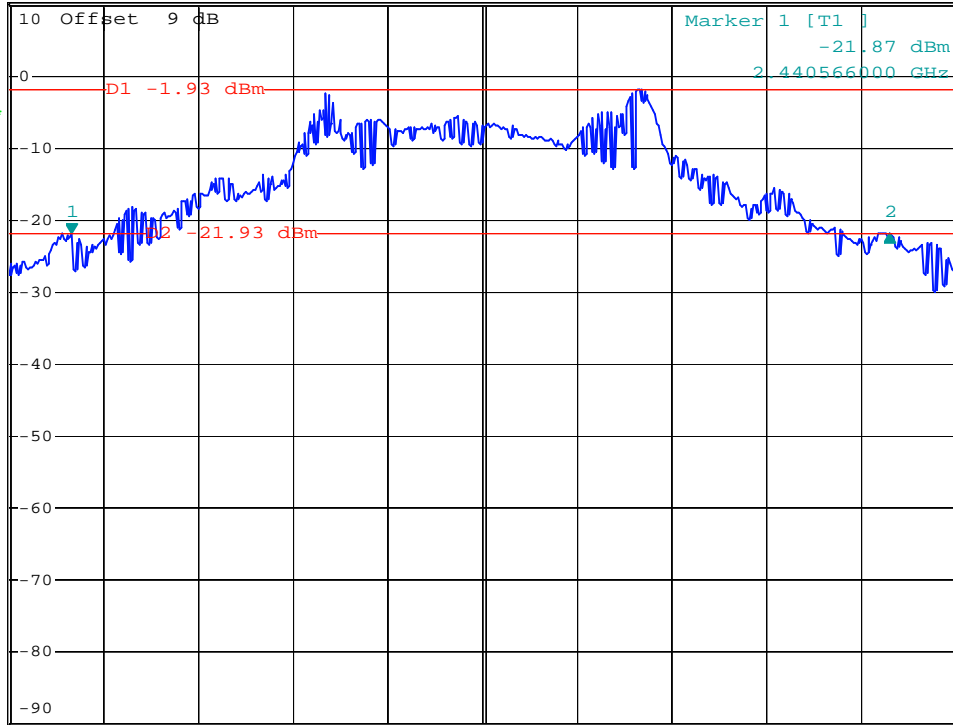


\*RBW 30 kHz    Delta 2 [T1 ]  
 \*VBW 300 kHz    -0.04 dB  
 \*SWT 500 ms    864.000000000 kHz

Ref 10 dBm

\*Att 20 dB

1 PK\*  
VIEW



Center 2.441 GHz

100 kHz/

Span 1 MHz

Date: 11.JUL.2006 15:35:51



Mode 3: CH78 (2480MHz)

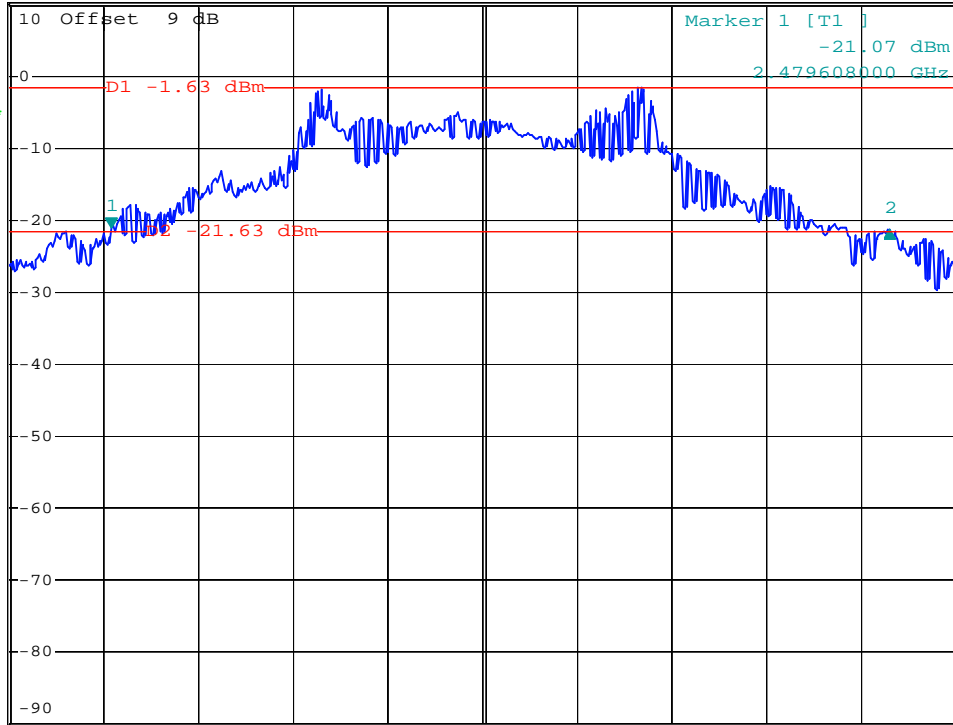


\*RBW 30 kHz    Delta 2 [T1 ]  
 \*VBW 300 kHz    -0.41 dB  
 \*SWT 500 ms    822.000000000 kHz

Ref 10 dBm

\*Att 20 dB

1 PK\*  
VIEW



Center 2.48 GHz

100 kHz/

Span 1 MHz

Date: 11.JUL.2006 15:39:15

### 5.5 Dwell Time of Each Frequency

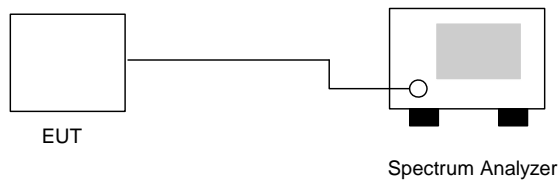
#### 5.5.1 Measuring Instruments :

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: 27°C
- Relative Humidity: 51%
- Test Engineer : James

Ch00

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.5	444	0.119	0.4
DH3	4.1	1724	0.223	0.4
DH5	3.6	2990	0.340	0.4



CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.2	444	0.115	0.4
DH3	4.1	1720	0.223	0.4
DH5	3.4	3000	0.322	0.4

CH78

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.4	444	0.118	0.4
DH3	4.8	1730	0.262	0.4
DH5	3	2980	0.283	0.4

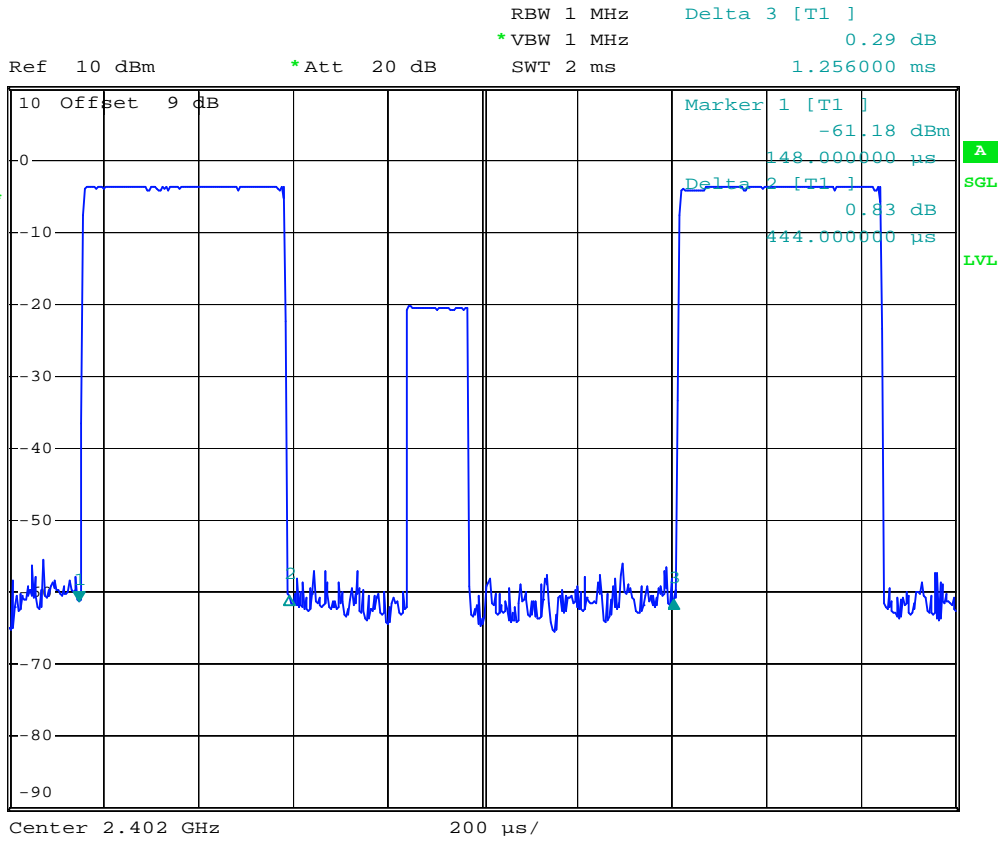
Remark:

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)

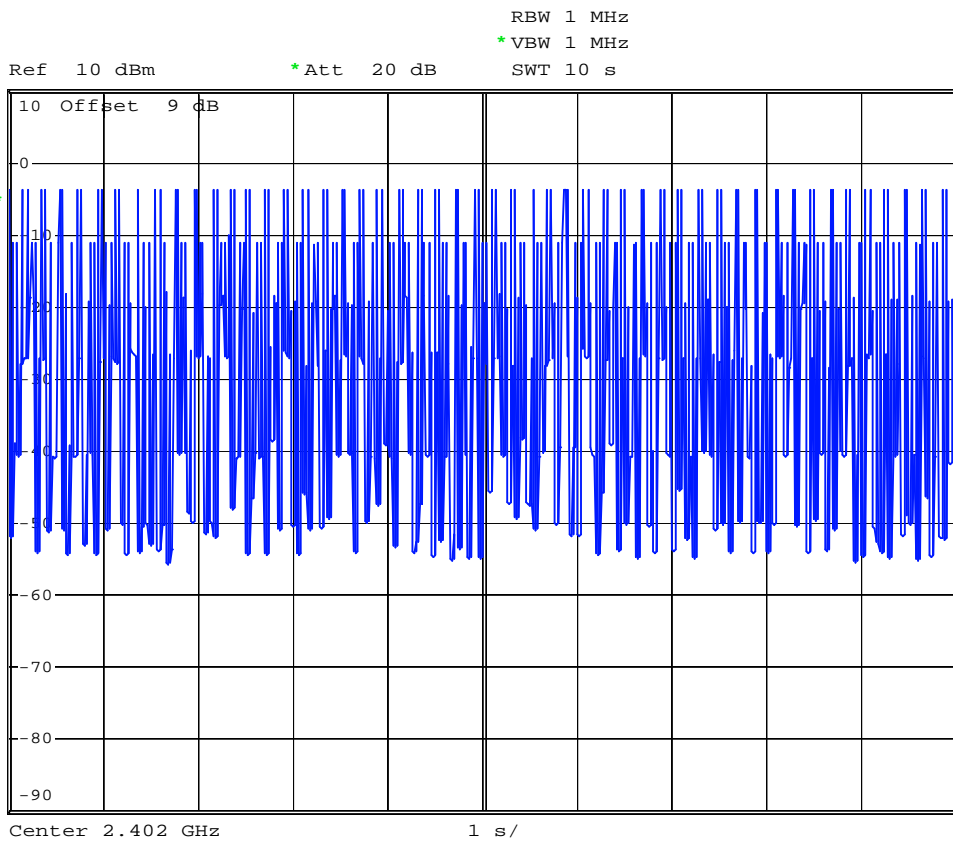


5.5.5 Dwell Time

DH1 (CH00)



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Date: 11.JUL.2006 16:11:25

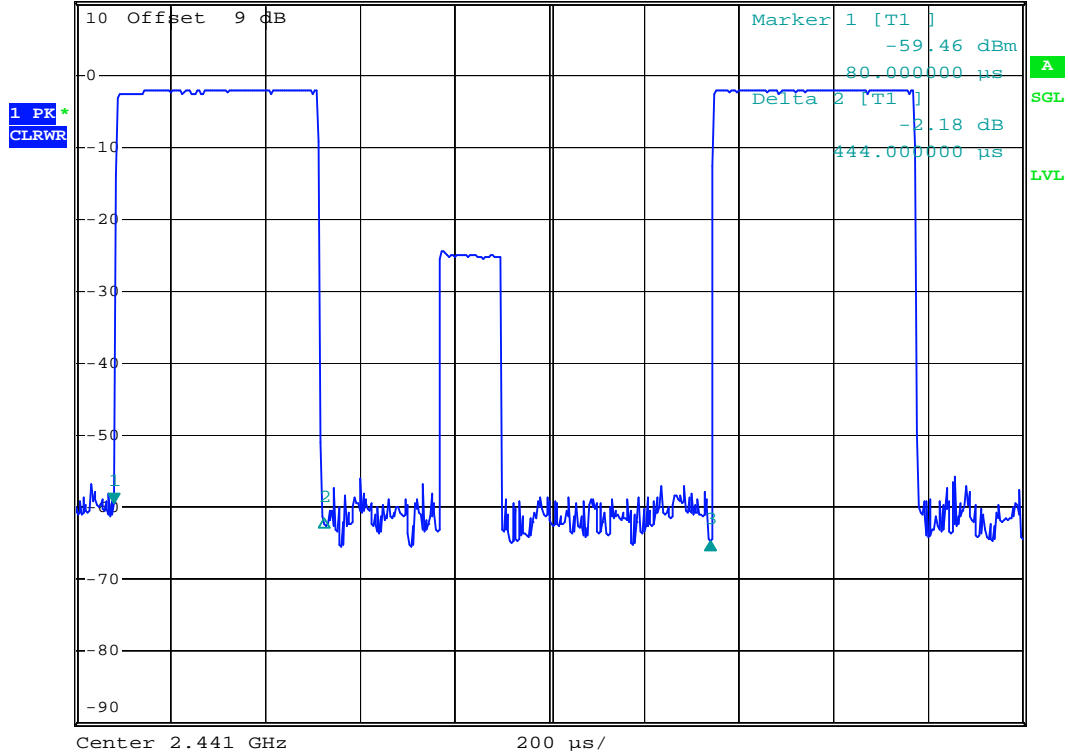




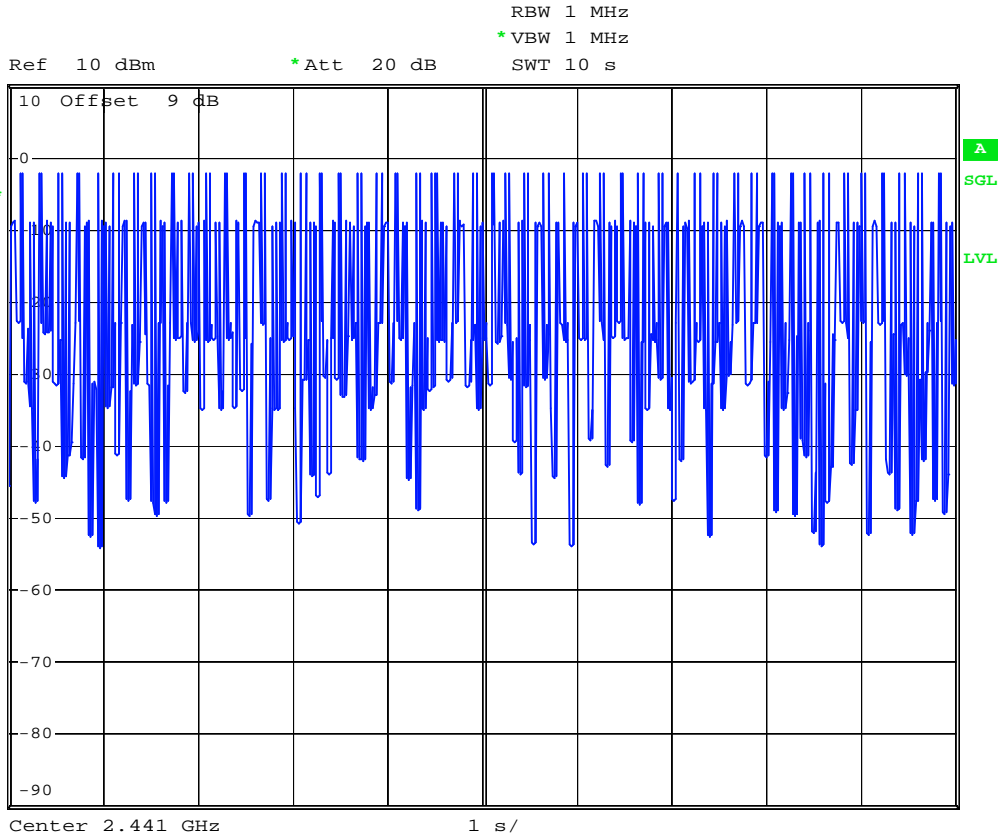
DH1 (CH39)



RBW 1 MHz    Delta 3 [T1 ]  
\*VBW 1 MHz    -5.13 dB  
Ref 10 dBm    \*Att 20 dB    SWT 2 ms    1.260000 ms



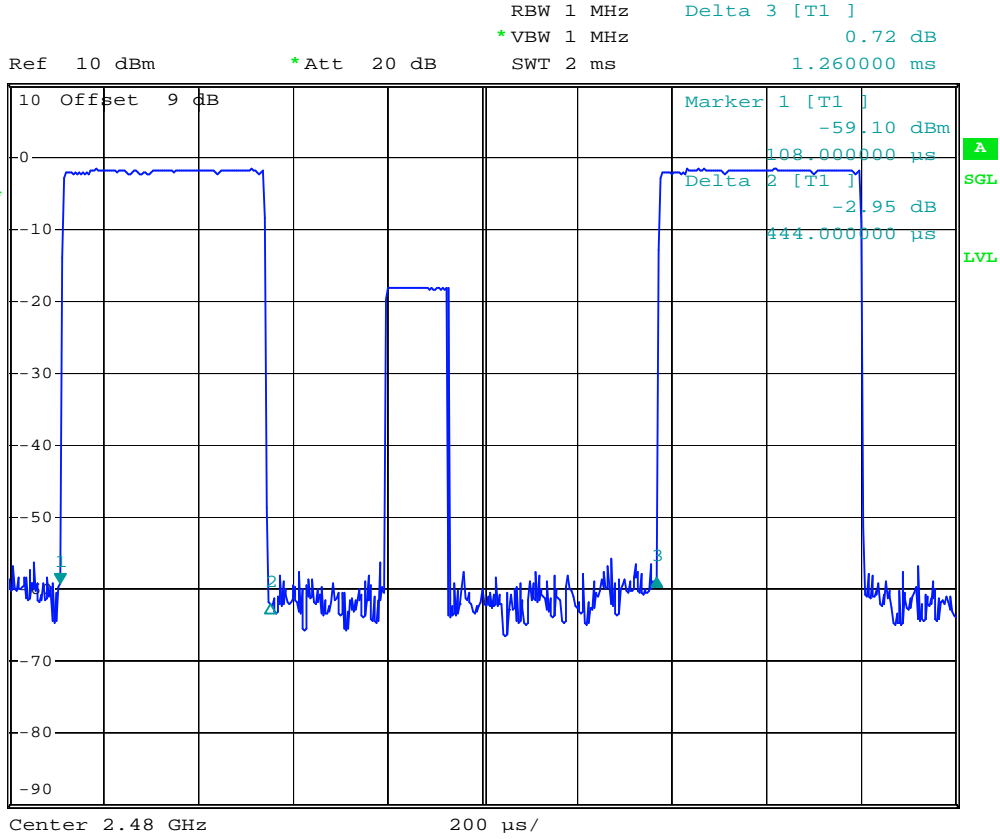
Date: 11.JUL.2006 16:00:36



Date: 11.JUL.2006 16:11:46



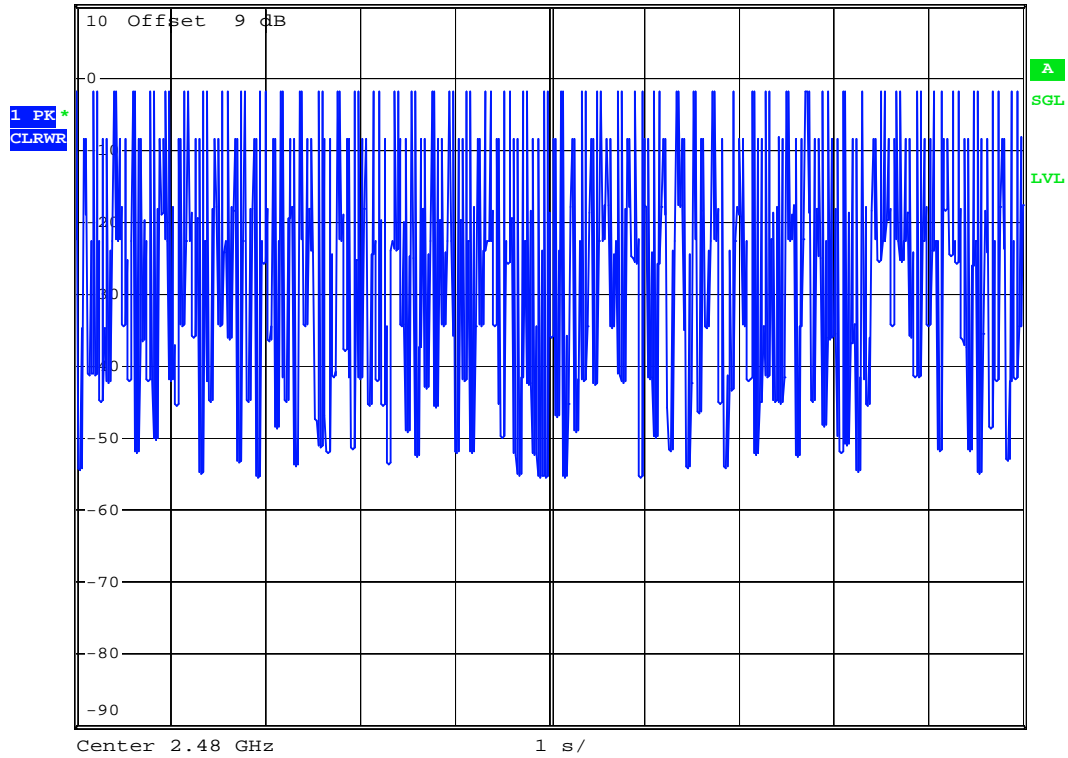
DH1 (CH78)



Date: 11.JUL.2006 16:01:17



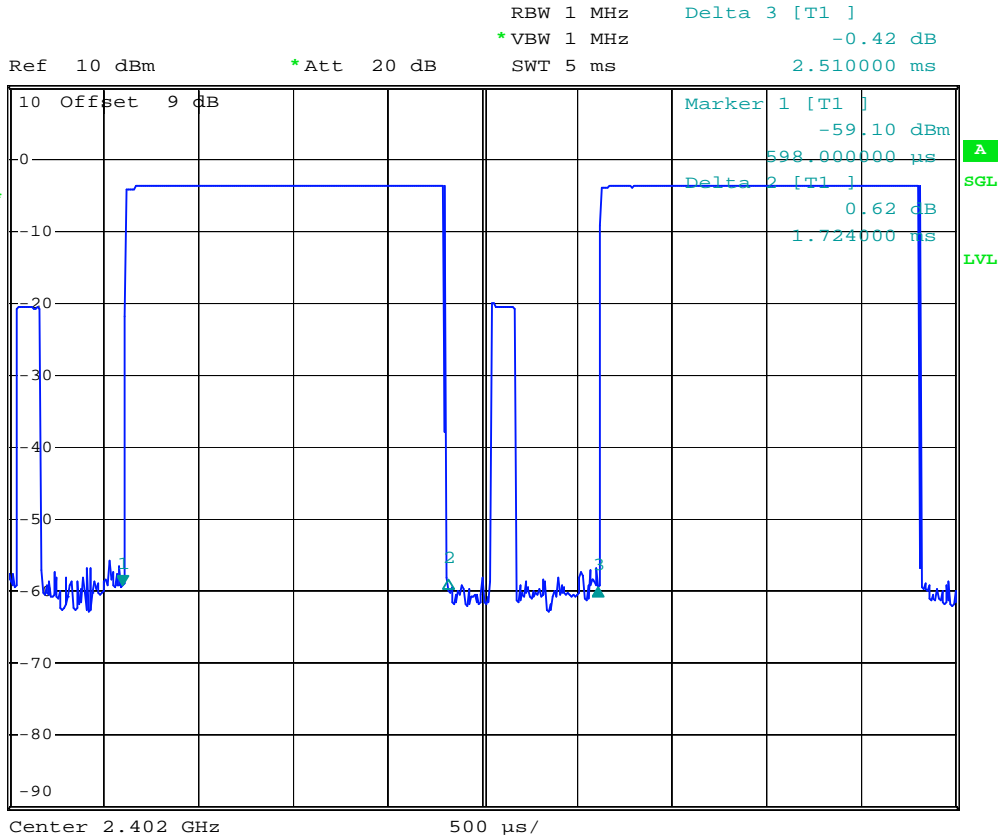
Ref 10 dBm      \*Att 20 dB      RBW 1 MHz  
\*VBW 1 MHz      SWT 10 s



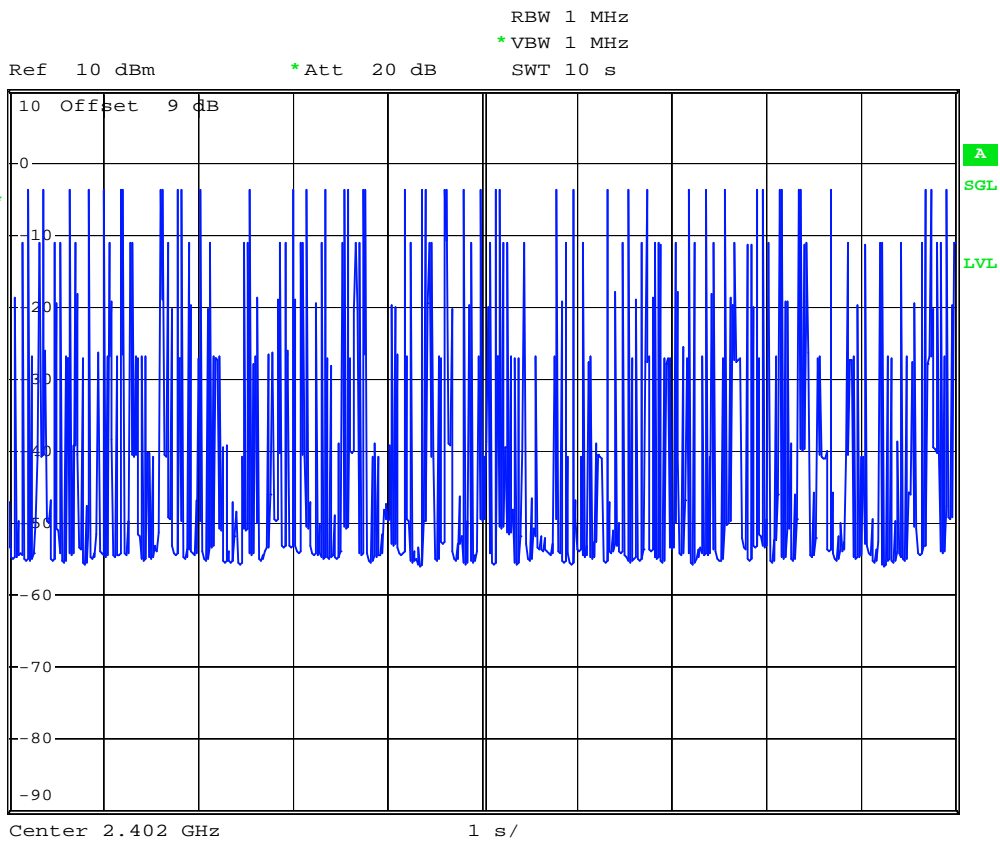
Date: 11.JUL.2006 16:16:13



DH3 (CH00)



Date: 11.JUL.2006 16:03:42



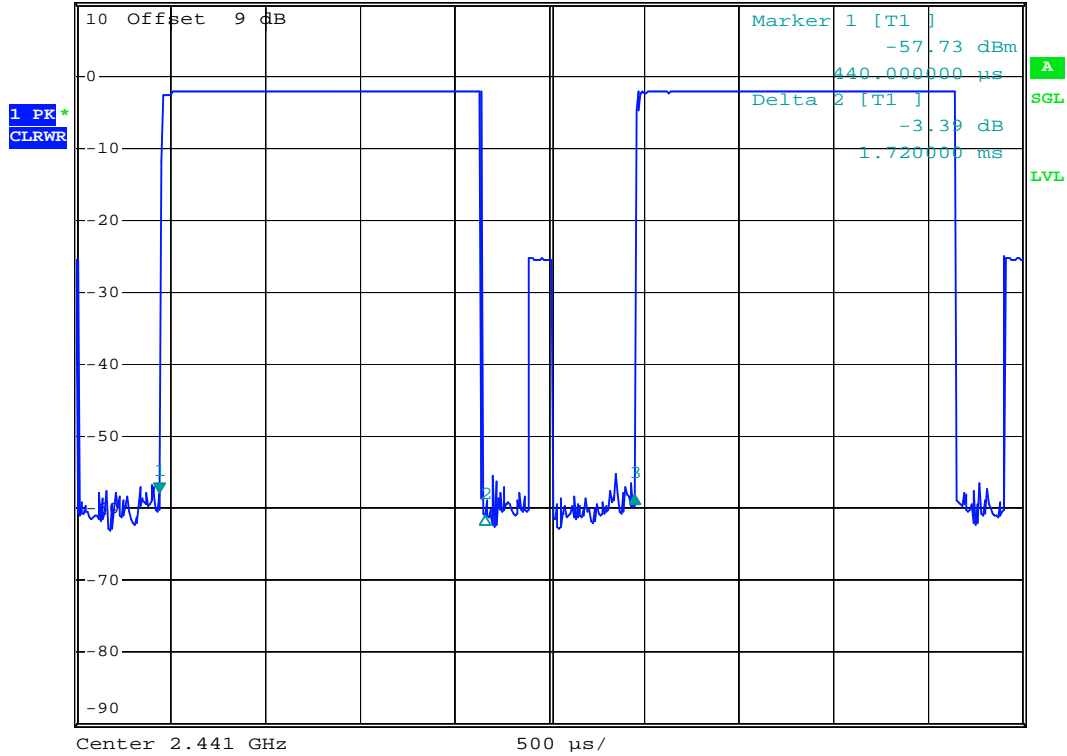
Date: 11.JUL.2006 16:16:52



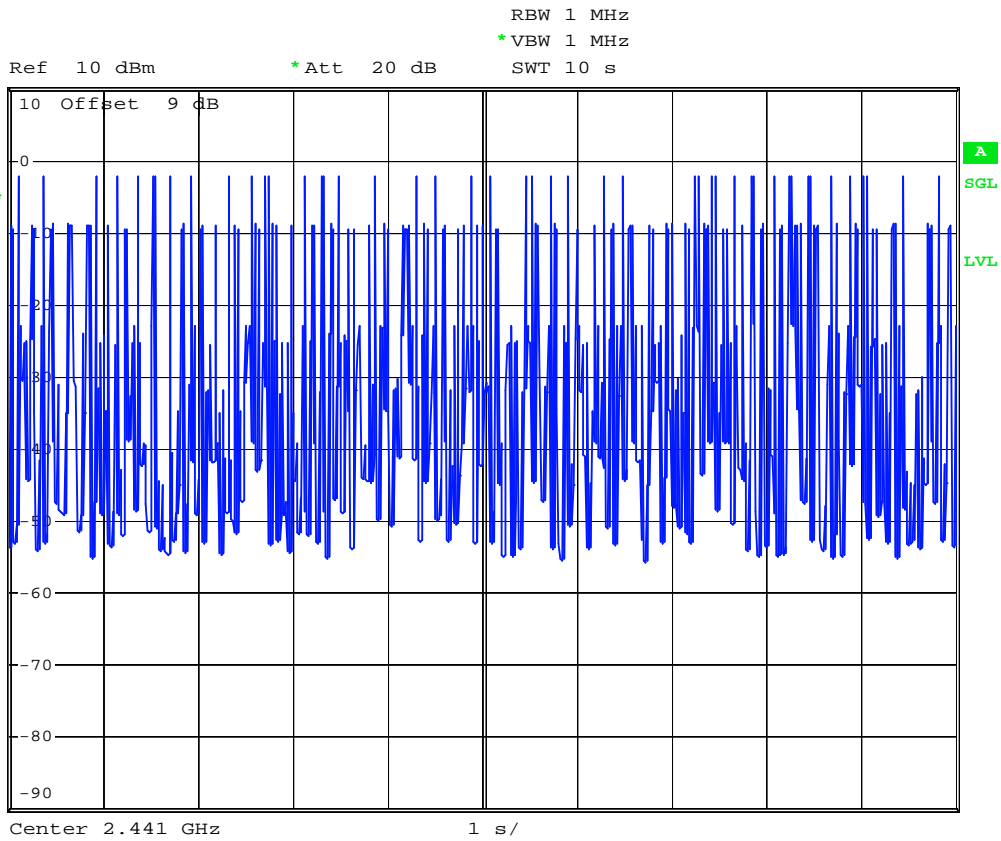
DH3 (CH39)



RBW 1 MHz      Delta 3 [T1 ]  
 \*VBW 1 MHz      -0.36 dB  
 Ref 10 dBm      \*Att 20 dB      SWT 5 ms      2.510000 ms



Date: 11.JUL.2006 16:04:23

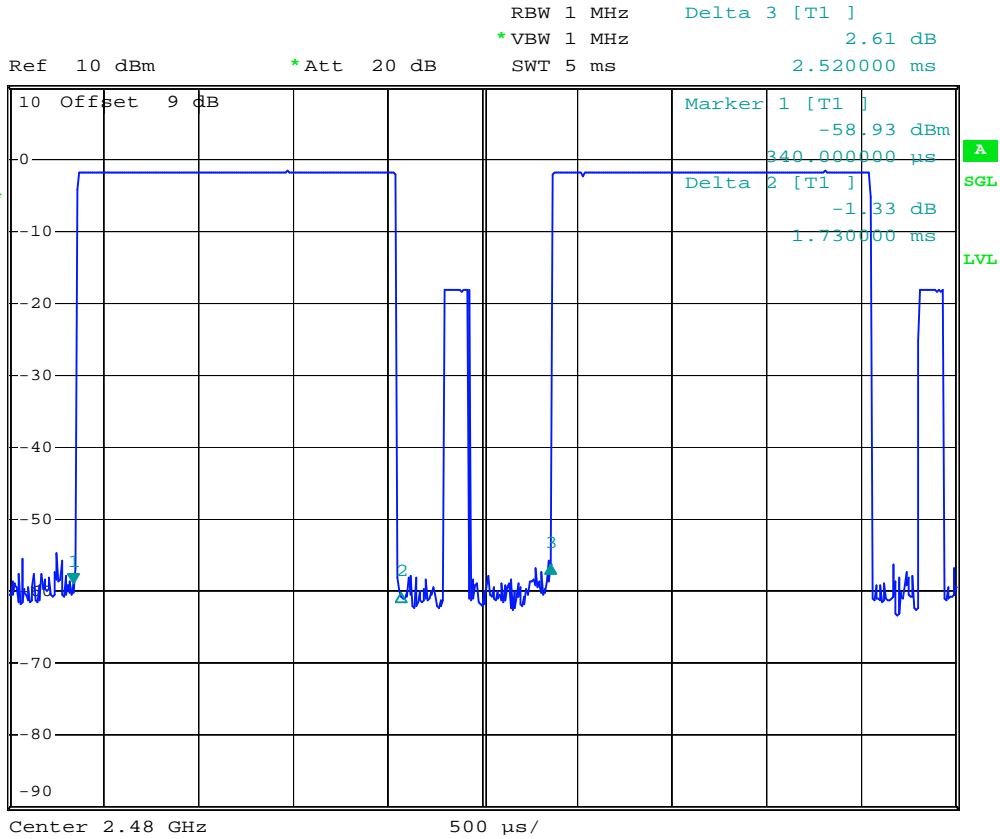


Date: 11.JUL.2006 16:17:15

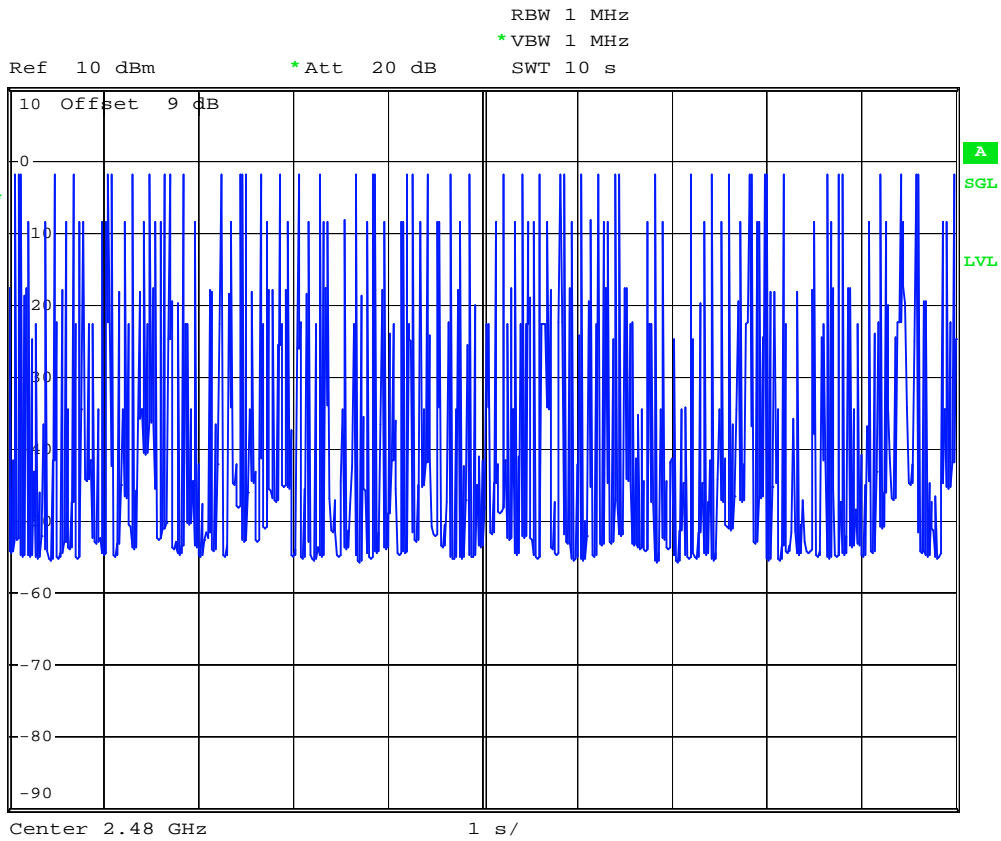




DH3 (CH78)



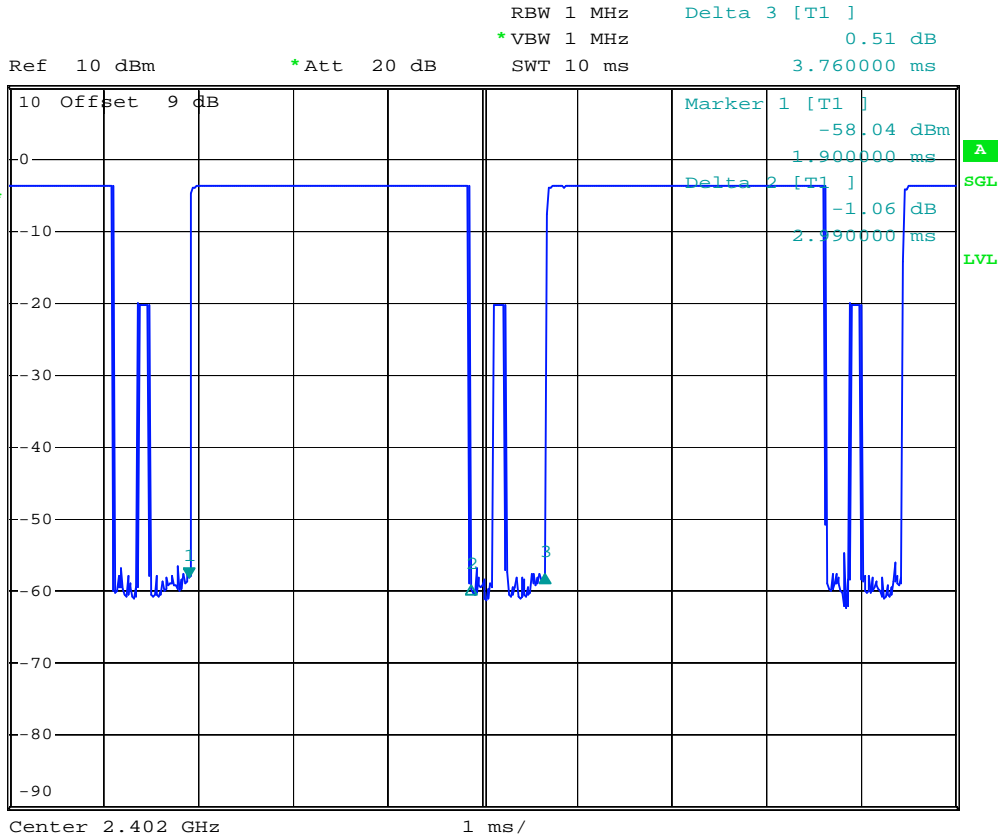
Date: 11.JUL.2006 16:04:53



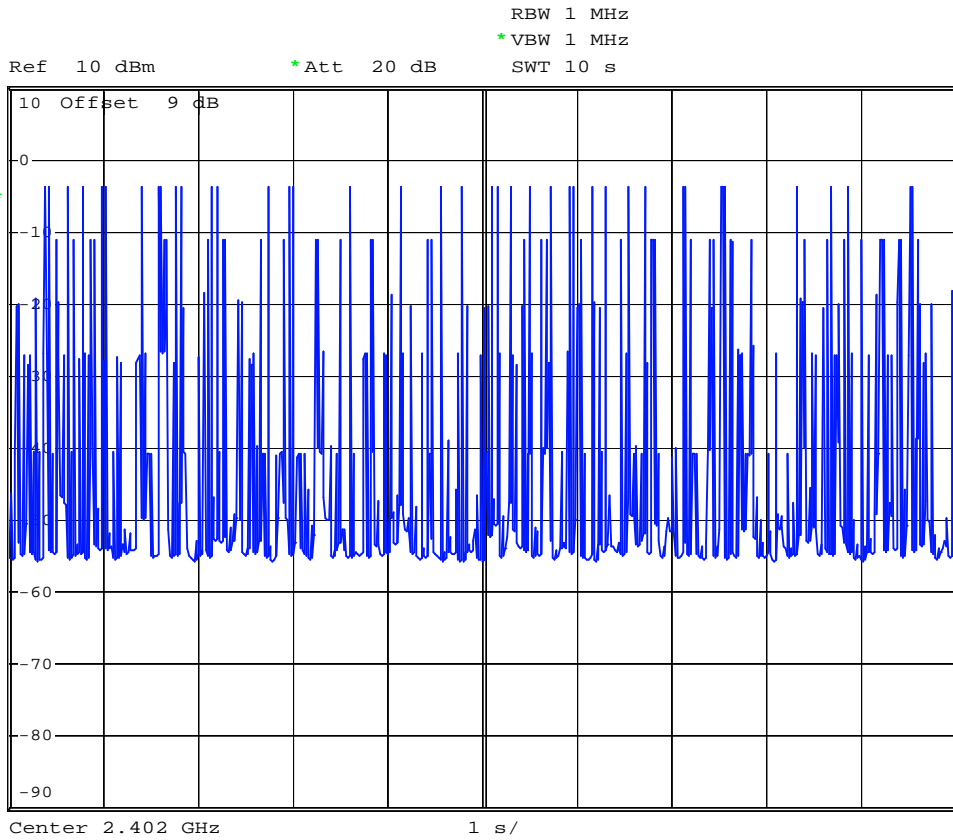
Date: 11.JUL.2006 16:18:14



DH5 (CH00)



Date: 11.JUL.2006 16:09:02



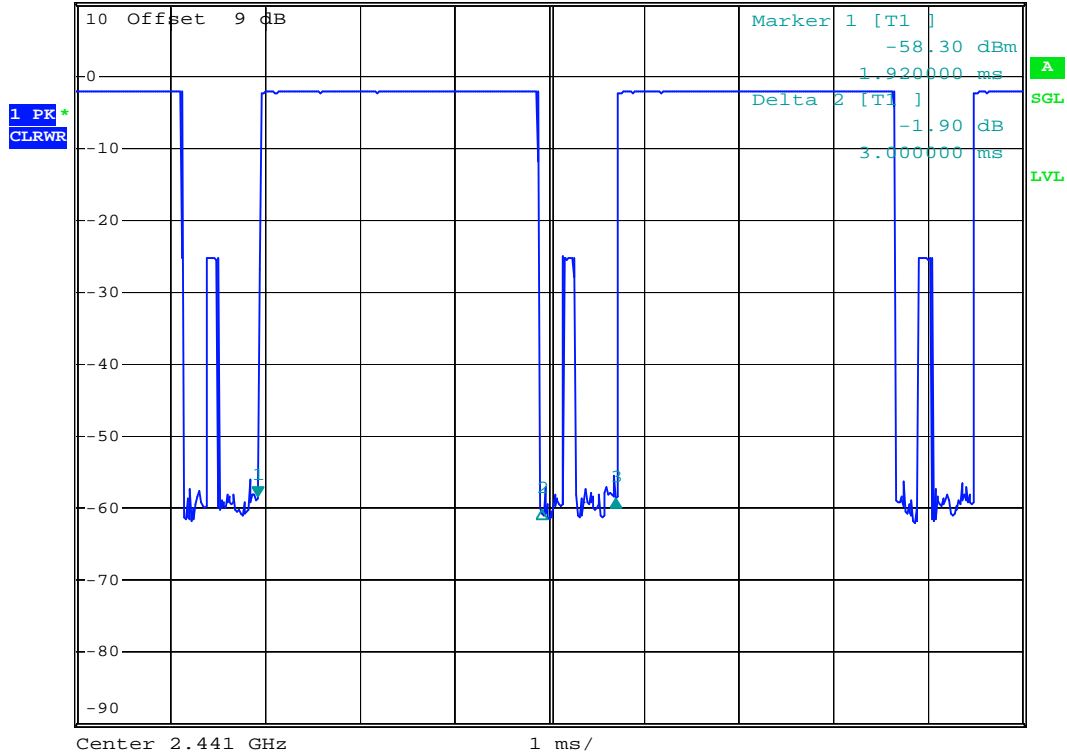
Date: 11.JUL.2006 16:18:42



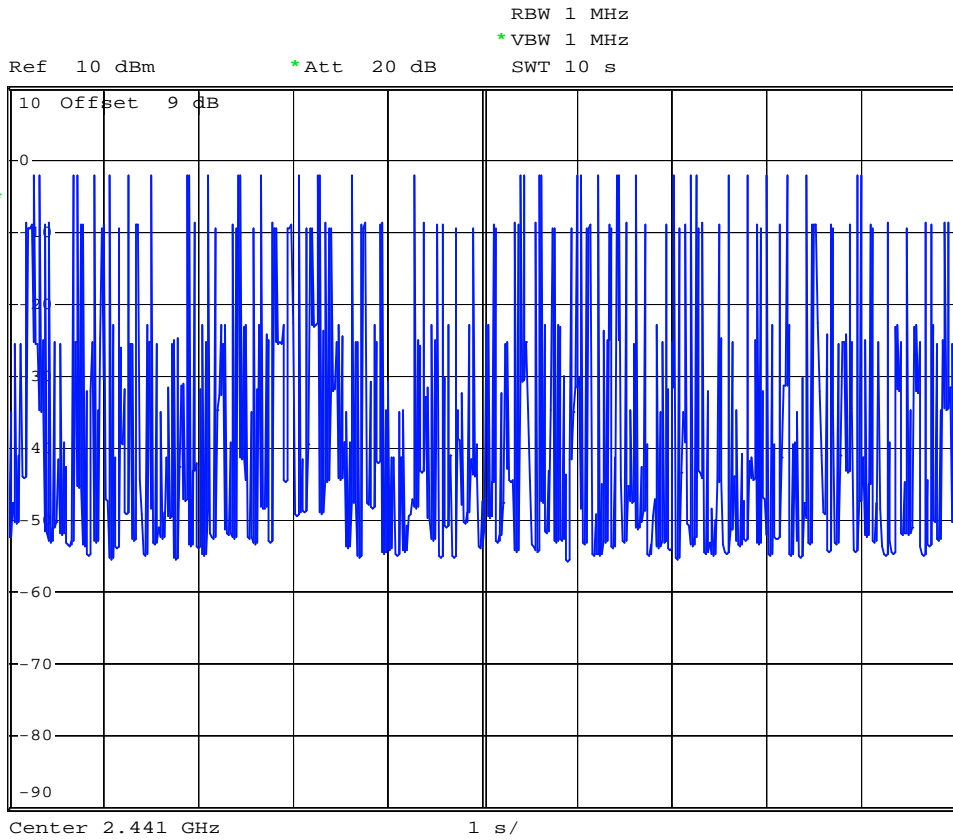
DH5 (CH39)



RBW 1 MHz      Delta 3 [T1 ]  
 \*VBW 1 MHz      -0.28 dB  
 Ref 10 dBm      \*Att 20 dB      SWT 10 ms      3.780000 ms



Date: 11.JUL.2006 16:09:29



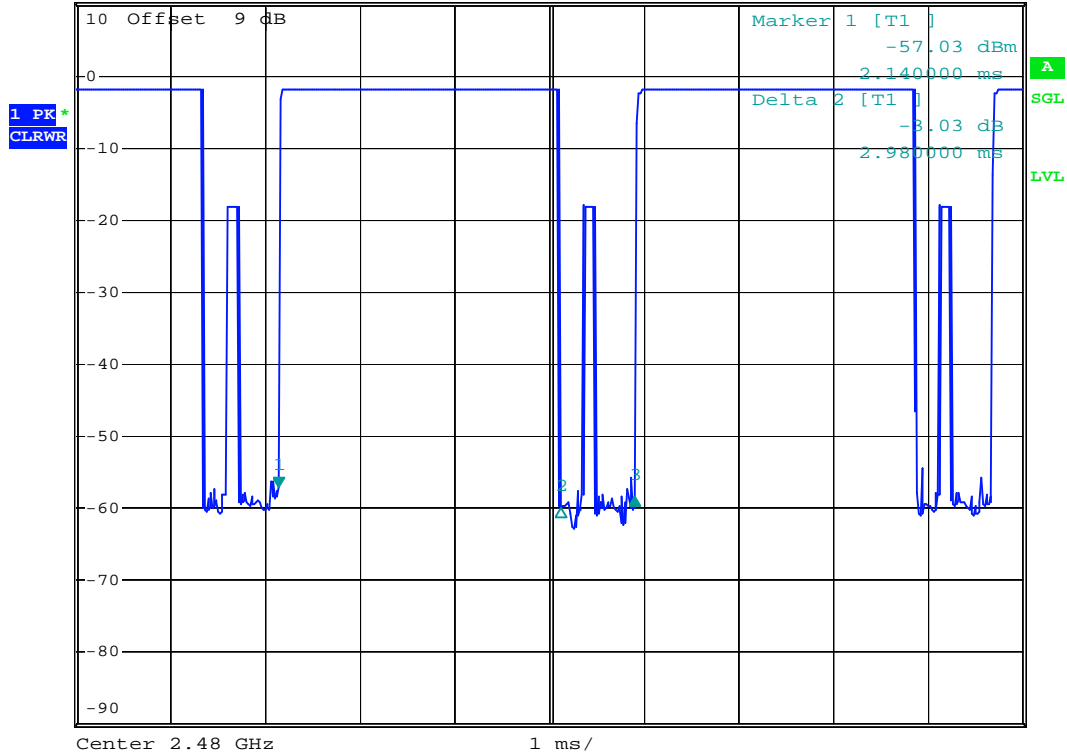
Date: 11.JUL.2006 16:19:29



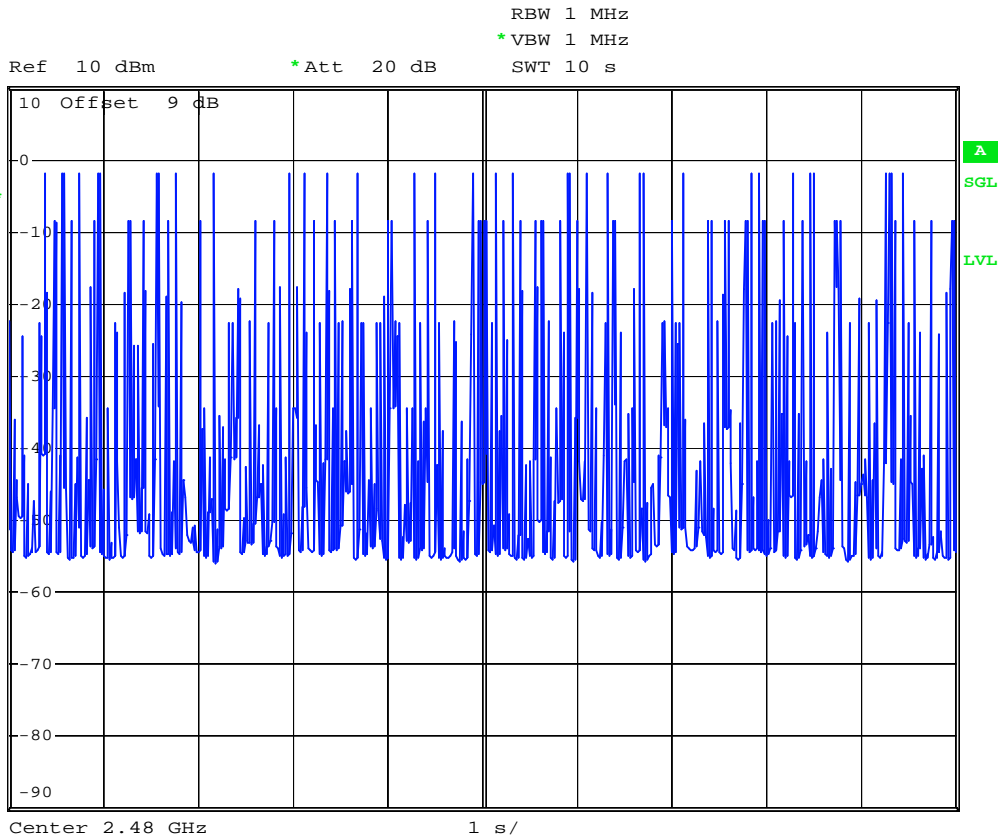
DH5 (CH78)



RBW 1 MHz      Delta 3 [T1 ]  
\*VBW 1 MHz      -1.46 dB  
Ref 10 dBm      \*Att 20 dB      SWT 10 ms      3.760000 ms



Date: 11.JUL.2006 16:09:59



Date: 11.JUL.2006 16:20:08



## 5.6 Output Power

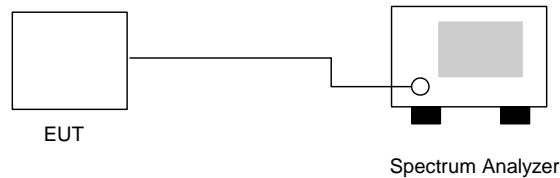
### 5.6.1 Measuring Instruments :

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

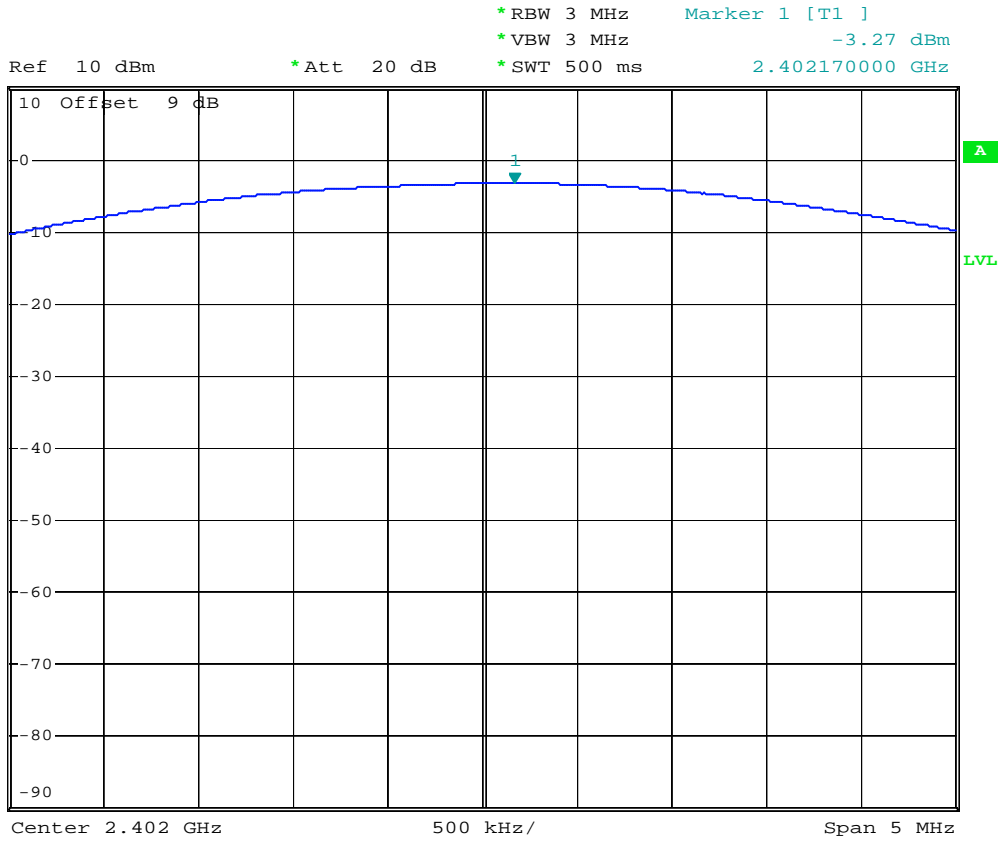
- Temperature: 27°C
- Relative Humidity: 51%
- Test Engineer : James

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm )	Plot Ref. No.
00	2402	-3.27	1W/30 dBm	Mode 1
39	2441	-1.67	1W/30 dBm	Mode 2
78	2480	-1.28	1W/30 dBm	Mode 3



5.6.5 Output Power

Mode 1: CH00 (2402MHz)



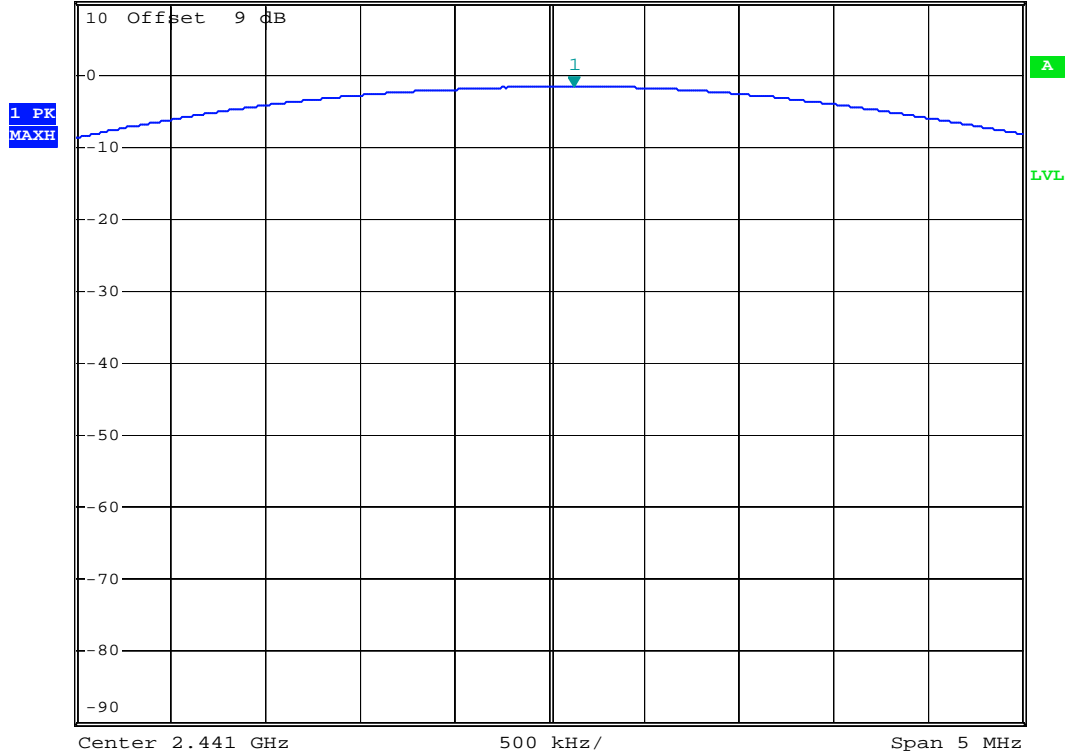
Date: 11.JUL.2006 15:17:12



Mode 2: CH39 (2441MHz)



Ref 10 dBm      \*Att 20 dB      \*RBW 3 MHz      Marker 1 [T1]      -1.67 dBm  
\*VBW 3 MHz      2.441130000 GHz  
\*SWT 500 ms



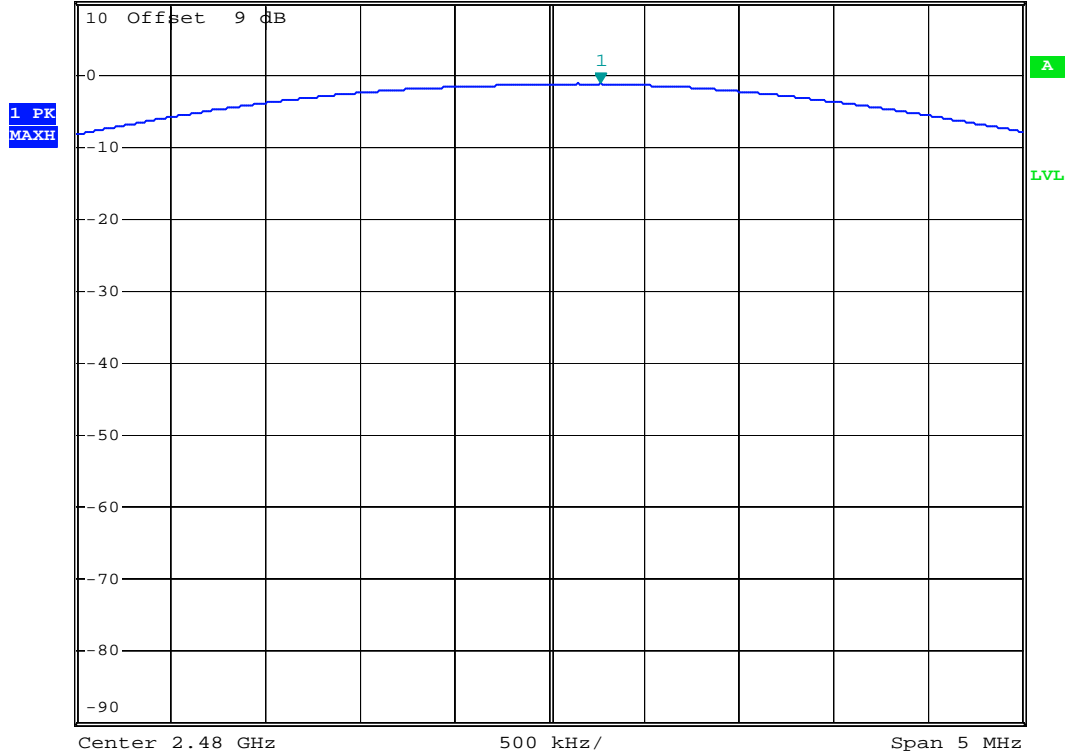
Date: 11.JUL.2006 15:17:37



Mode 3: CH78 (2480MHz)



Ref 10 dBm      \*Att 20 dB      \*RBW 3 MHz      Marker 1 [T1]      -1.28 dBm  
\*VBW 3 MHz      2.480270000 GHz  
\*SWT 500 ms



Date: 11.JUL.2006 15:18:24



### 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: 27°C
- Relative Humidity: 51%
- 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 ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2378.16	50.47	-23.53	74.00	51.43	30.25	35.44	4.23	100	360	Peak
2378.16	40.02	-13.98	54.00	40.98	30.25	35.44	4.23	100	30	Average

##### CH00 (Vertical)

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2337.00	49.47	-24.53	74.00	50.47	30.24	35.40	4.17	100	360	Peak
2337.00	39.17	-14.83	54.00	40.17	30.24	35.40	4.17	105	303	Average



CH78 (Horizontal)

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2483.50	67.38	-6.62	74.00	68.24	30.29	35.51	4.36	100	360	Peak
2483.50	48.34	-5.66	54.00	49.20	30.29	35.51	4.36	100	206	Average

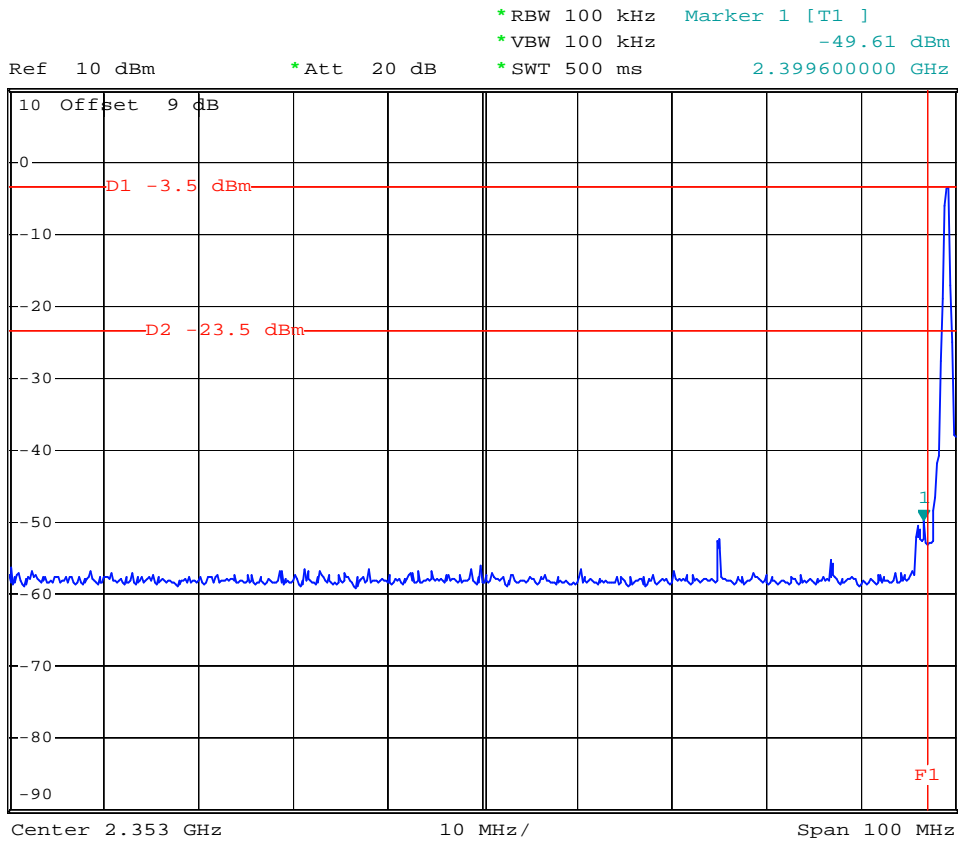
CH78 (Vertical)

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Detect Mode
2484.97	59.61	-14.39	74.00	60.47	30.29	35.51	4.36	100	0	Peak
2484.97	39.66	-14.34	54.00	40.52	30.29	35.51	4.36	100	132	Average



5.7.5 Frequency Band Edge

Mode 1: CH00 (2402 MHz)



Date: 11.JUL.2006 15:44:59



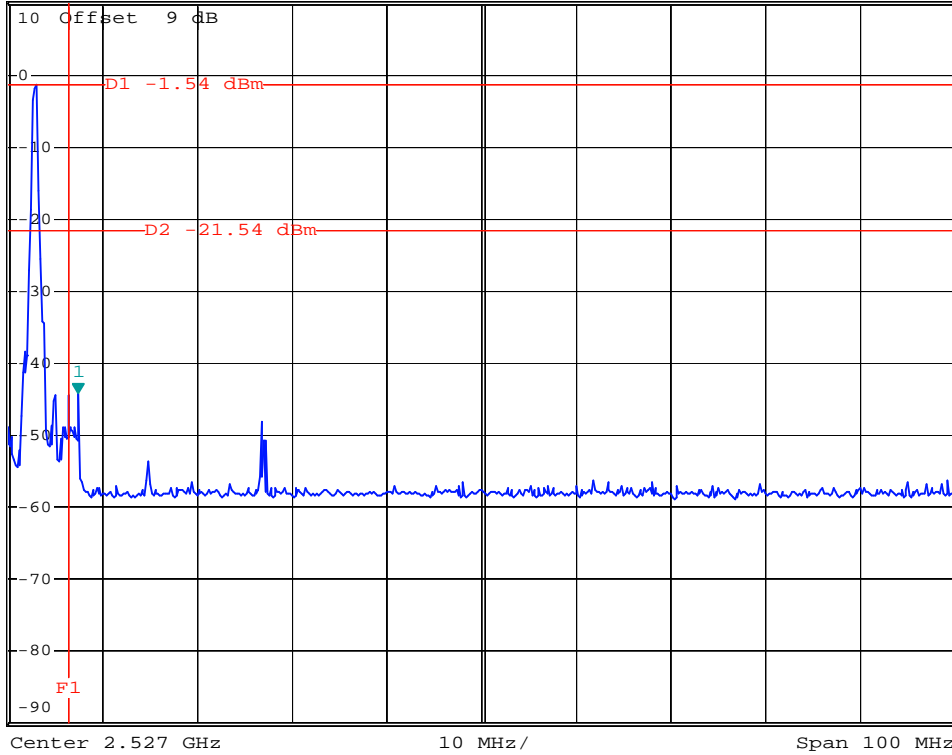
Mode 3: CH78 (2480 MHz)



\*RBW 100 kHz    Marker 1 [T1 ]  
\*VBW 100 kHz                    -44.24 dBm  
\*SWT 500 ms                      2.484300000 GHz

Ref 10 dBm

\*Att 20 dB



Date: 11.JUL.2006 15:42:35





## **5.8 Conducted Emission**

### **5.8.1 Measuring Instruments**

As described in chapter 6 of this test Report.

### **5.8.2 Test Procedures :**

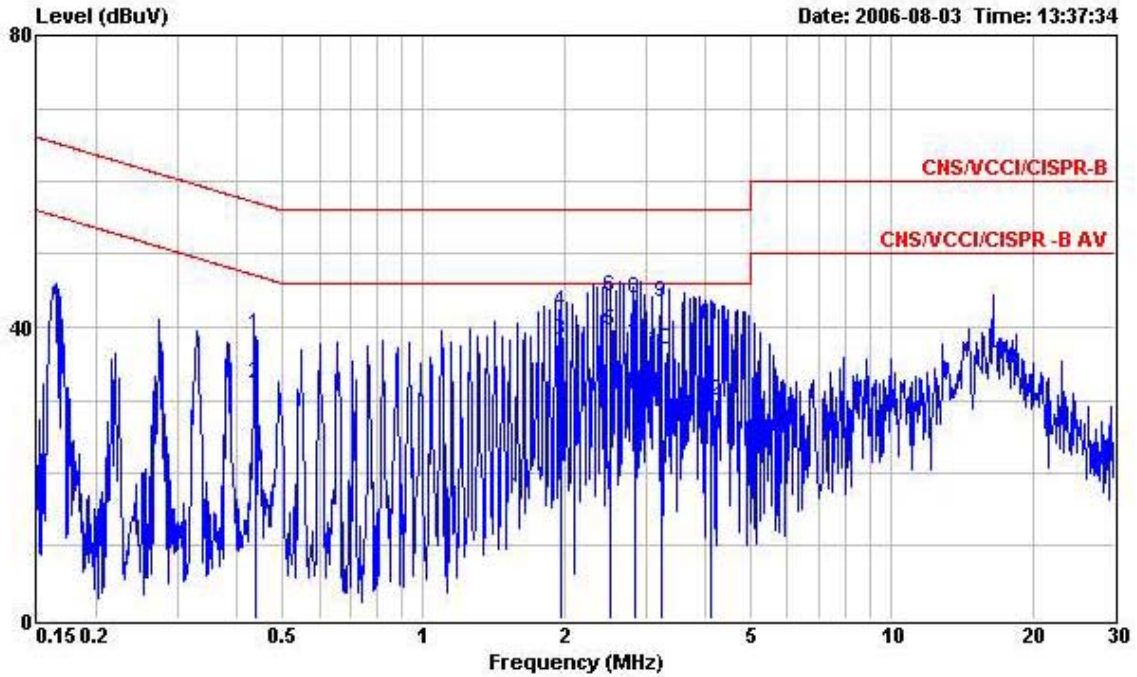
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network (LISN).
- c. All the support units are connected to the other LISN.
- 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

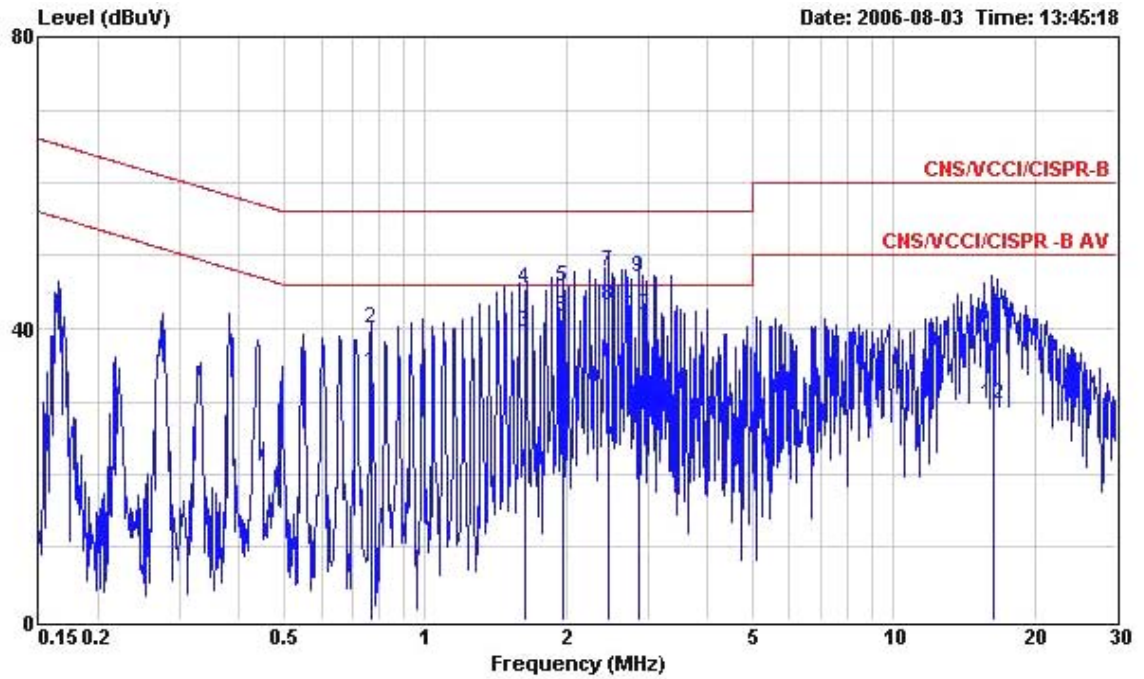
- Temperature: 24°C
- Relative Humidity: 61%
- Test Engineer: James

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 200604 LINE  
 EUT : GSM 900/1800/1900/2100 Mobile Phone  
 : (Bluetooth)  
 Power : 120V/60Hz  
 Model : FR671011  
 Memo : PCS1900 Idle+BT LINK+Camera+Adaptor  
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.439	38.99	-18.09	57.08	38.62	0.10	0.27	QP
2	0.439	32.27	-14.81	47.08	31.90	0.10	0.27	Average
3	1.970	38.17	-7.83	46.00	37.81	0.10	0.26	Average
4	1.970	42.15	-13.85	56.00	41.79	0.10	0.26	QP
5	2.515	39.47	-6.53	46.00	39.08	0.13	0.26	Average
6	2.515	44.08	-11.92	56.00	43.69	0.13	0.26	QP
7	2.841	37.45	-8.55	46.00	37.05	0.15	0.25	Average
8	2.841	43.82	-12.18	56.00	43.42	0.15	0.25	QP
9	3.226	43.26	-12.74	56.00	42.84	0.17	0.25	QP
10	3.226	36.79	-9.21	46.00	36.37	0.17	0.25	Average
11	4.100	40.23	-15.77	56.00	39.78	0.20	0.25	QP
12	4.100	29.82	-16.18	46.00	29.37	0.20	0.25	Average



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone  
 : (Bluetooth)  
 Power : 120V/60Hz  
 Model : FR671011  
 Memo : PCS1900 Idle+BT LINK+Camera+Adaptor  
 Memo :

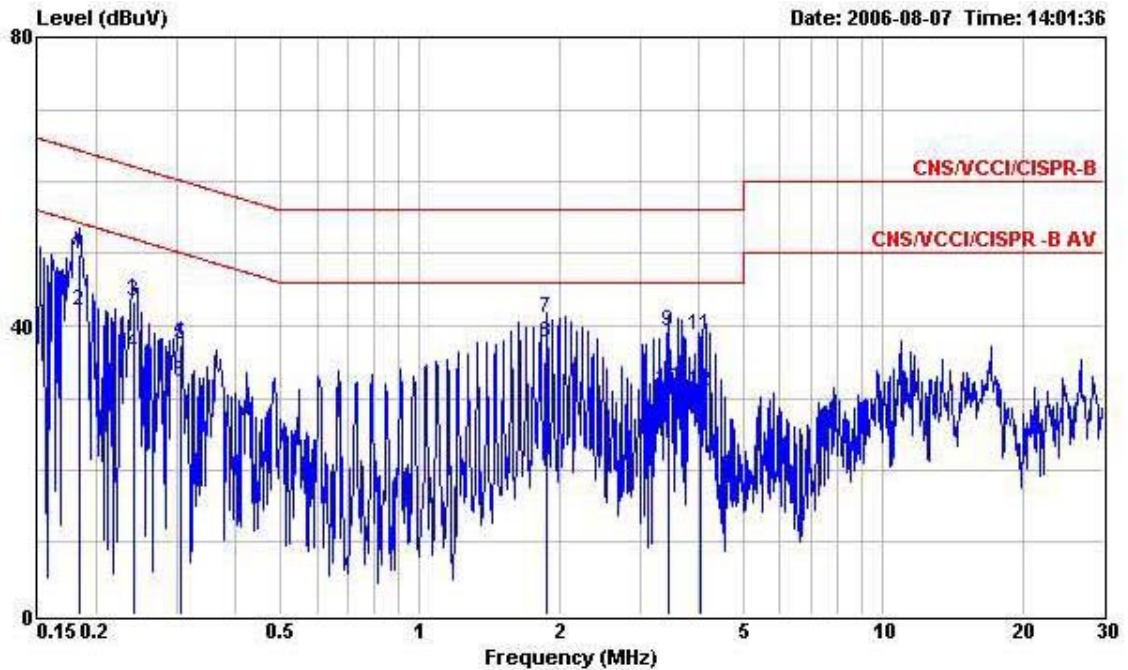
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.766	34.09	-11.91	46.00	33.86	0.10	0.13	Average
2	0.766	39.94	-16.06	56.00	39.71	0.10	0.13	QP
3	1.641	39.47	-6.53	46.00	39.17	0.10	0.20	Average
4	1.641	45.41	-10.59	56.00	45.11	0.10	0.20	QP
5	1.971	45.77	-10.23	56.00	45.41	0.10	0.26	QP
6	1.971	41.63	-4.37	46.00	41.27	0.10	0.26	Average
7	2.464	47.86	-8.14	56.00	47.50	0.10	0.26	QP
8	2.464	43.12	-2.88	46.00	42.76	0.10	0.26	Average
9	2.847	46.97	-9.03	56.00	46.62	0.10	0.25	QP
10	2.847	41.84	-4.16	46.00	41.49	0.10	0.25	Average
11	16.408	40.51	-19.49	60.00	39.92	0.33	0.26	QP
12	16.408	29.50	-20.50	50.00	28.91	0.33	0.26	Average



5.8.4 Test Data Test Mode 2

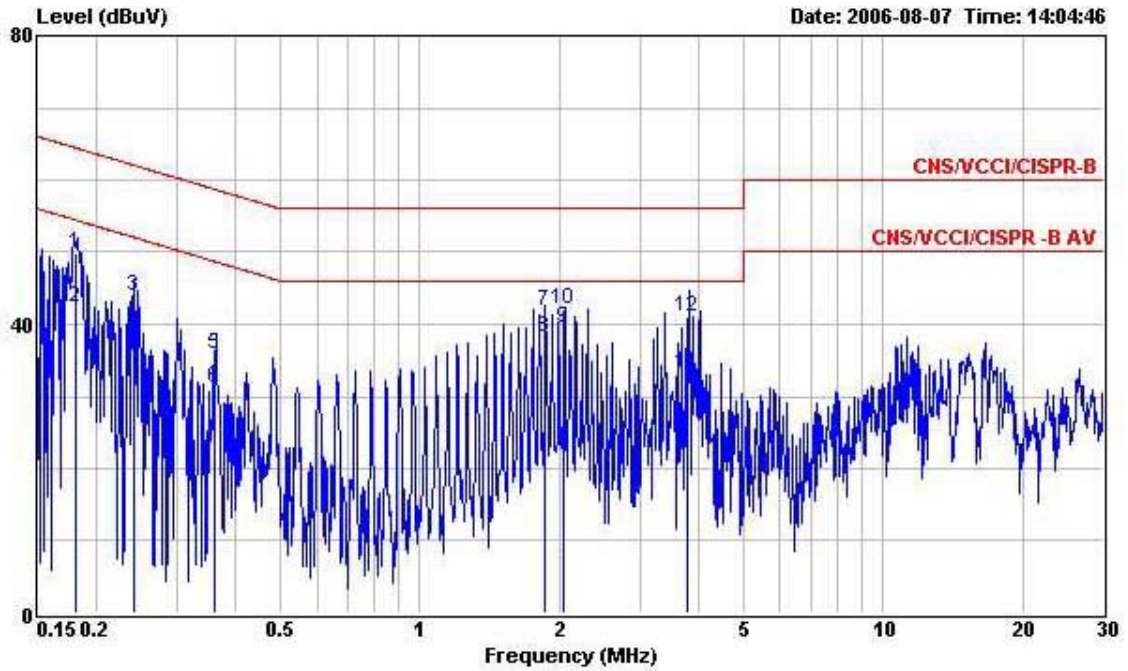
- Temperature: 24°C
- Relative Humidity: 61%
- Test Engineer: James

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 200604 LINE  
 EUT : GSM 900/1800/1900/2100 Mobile Phone  
 : (Bluetooth)  
 Power : 120V/60Hz  
 Model : FD671011  
 Memo : PCS1900 IDLE+BT LINK+CAMERA+USB LINK  
 Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.184	49.84	-14.46	64.30	49.72	0.10	0.02	QP
2	0.184	42.19	-12.11	54.30	42.07	0.10	0.02	Average
3	0.240	43.50	-18.59	62.09	43.31	0.10	0.09	QP
4	0.240	36.21	-15.88	52.09	36.02	0.10	0.09	Average
5	0.304	37.37	-22.77	60.14	37.09	0.10	0.18	QP
6	0.304	32.11	-18.03	50.14	31.83	0.10	0.18	Average
7	1.872	41.16	-14.84	56.00	40.82	0.10	0.24	QP
8	1.872	37.62	-8.38	46.00	37.28	0.10	0.24	Average
9	3.445	39.32	-16.68	56.00	38.89	0.18	0.25	QP
10	3.445	31.16	-14.84	46.00	30.73	0.18	0.25	Average
11	4.045	38.58	-17.42	56.00	38.13	0.20	0.25	QP
12	4.045	30.91	-15.09	46.00	30.46	0.20	0.25	Average



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone  
 : (Bluetooth)  
 Power : 120V/60Hz  
 Model : FD671011  
 Memo : PCS1900 IDLE+BT LINK+CAMERA+USB LINK  
 Memo :

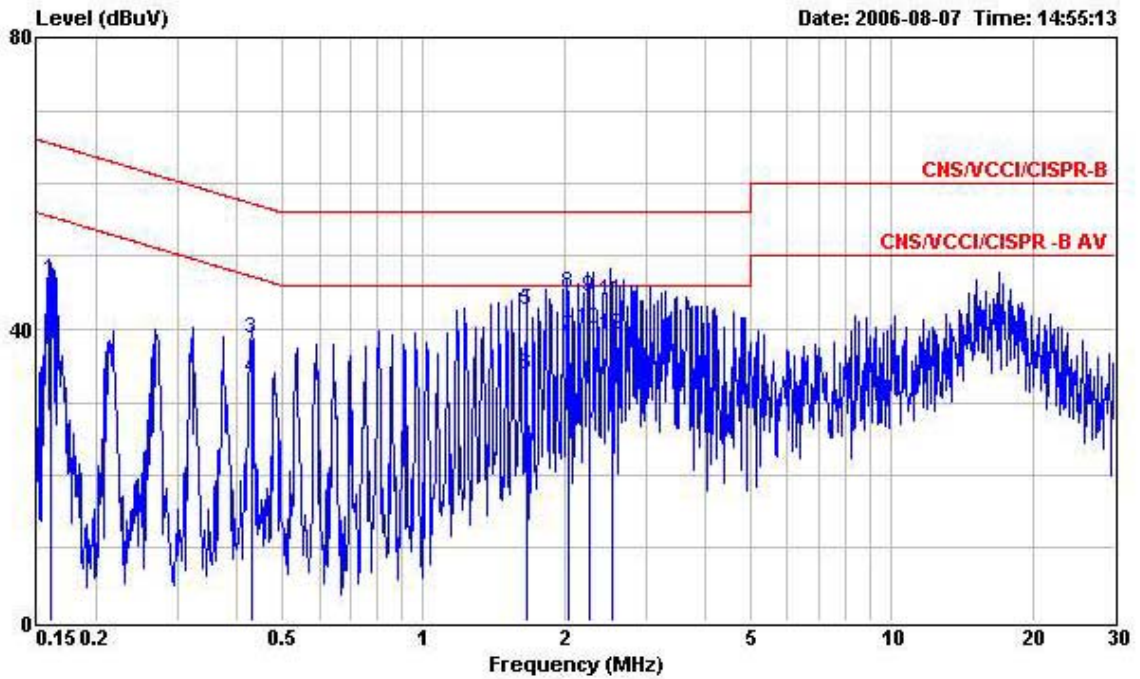
	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.180	49.82	-14.65	64.47	49.70	0.10	0.02	QP
2	0.180	42.37	-12.10	54.47	42.25	0.10	0.02	Average
3	0.241	43.90	-18.17	62.07	43.71	0.10	0.09	QP
4	0.241	35.88	-16.19	52.07	35.69	0.10	0.09	Average
5	0.362	35.93	-22.76	58.69	35.58	0.10	0.25	QP
6	0.362	31.08	-17.61	48.69	30.73	0.10	0.25	Average
7	1.867	41.82	-14.18	56.00	41.48	0.10	0.24	QP
8	1.867	38.08	-7.92	46.00	37.74	0.10	0.24	Average
9	2.047	39.41	-6.59	46.00	39.05	0.10	0.26	Average
10	2.047	41.96	-14.04	56.00	41.60	0.10	0.26	QP
11	3.792	33.23	-12.77	46.00	32.88	0.10	0.25	Average
12	3.792	41.13	-14.87	56.00	40.78	0.10	0.25	QP



5.8.5 Test Data Test Mode 3

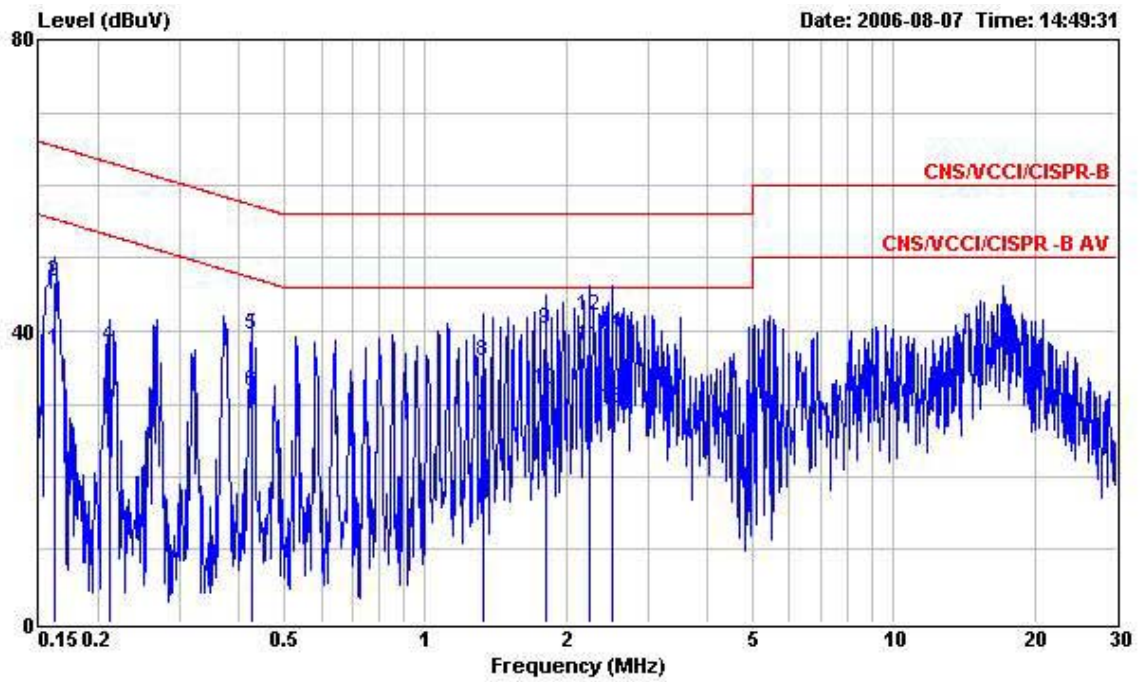
- Temperature: 24°C
- Relative Humidity: 61%
- Test Engineer: James

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 200604 LINE  
 EUT : GSM 900/1800/1900/2100 Mobile Phone  
 : (Bluetooth)  
 Power : 120V/60Hz  
 Model : FR671011  
 Memo : PCS1900 Idle+BT LINK+MP3+ADAPTER  
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.160	46.73	-18.73	65.46	46.60	0.10	0.03	QP
2	0.160	37.94	-17.52	55.46	37.81	0.10	0.03	Average
3	0.431	38.64	-18.59	57.23	38.27	0.10	0.27	QP
4	0.431	33.18	-14.05	47.23	32.81	0.10	0.27	Average
5	1.666	42.56	-13.44	56.00	42.25	0.10	0.21	QP
6	1.666	33.66	-12.34	46.00	33.35	0.10	0.21	Average
7	2.041	38.94	-7.06	46.00	38.58	0.10	0.26	Average
8	2.041	44.94	-11.06	56.00	44.58	0.10	0.26	QP
9	2.256	44.31	-11.69	56.00	43.93	0.12	0.26	QP
10	2.256	39.96	-6.04	46.00	39.58	0.12	0.26	Average
11	2.523	43.84	-12.16	56.00	43.45	0.13	0.26	QP
12	2.523	39.33	-6.67	46.00	38.94	0.13	0.26	Average



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone  
 : (Bluetooth)  
 Power : 120V/60Hz  
 Model : FR671011  
 Memo : PCS1900 Idle+BT LINK+MP3+ADAPTER  
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.162	37.32	-18.04	55.36	37.19	0.10	0.03	Average
2	0.162	46.63	-18.73	65.36	46.50	0.10	0.03	QP
3	0.212	27.80	-25.33	53.13	27.66	0.10	0.04	Average
4	0.212	38.02	-25.11	63.13	37.88	0.10	0.04	QP
5	0.427	39.52	-17.79	57.31	39.15	0.10	0.27	QP
6	0.427	31.74	-15.57	47.31	31.37	0.10	0.27	Average
7	1.331	28.34	-17.66	46.00	28.10	0.10	0.14	Average
8	1.331	35.92	-20.08	56.00	35.68	0.10	0.14	QP
9	1.811	40.24	-15.76	56.00	39.91	0.10	0.23	QP
10	1.811	31.86	-14.14	46.00	31.53	0.10	0.23	Average
11	2.241	37.94	-8.06	46.00	37.58	0.10	0.26	Average
12	2.241	42.14	-13.86	56.00	41.78	0.10	0.26	QP
13	2.500	29.25	-16.75	46.00	28.89	0.10	0.26	Average
14	2.500	39.87	-16.13	56.00	39.51	0.10	0.26	QP

## 5.9 Radiated Emission Measurement

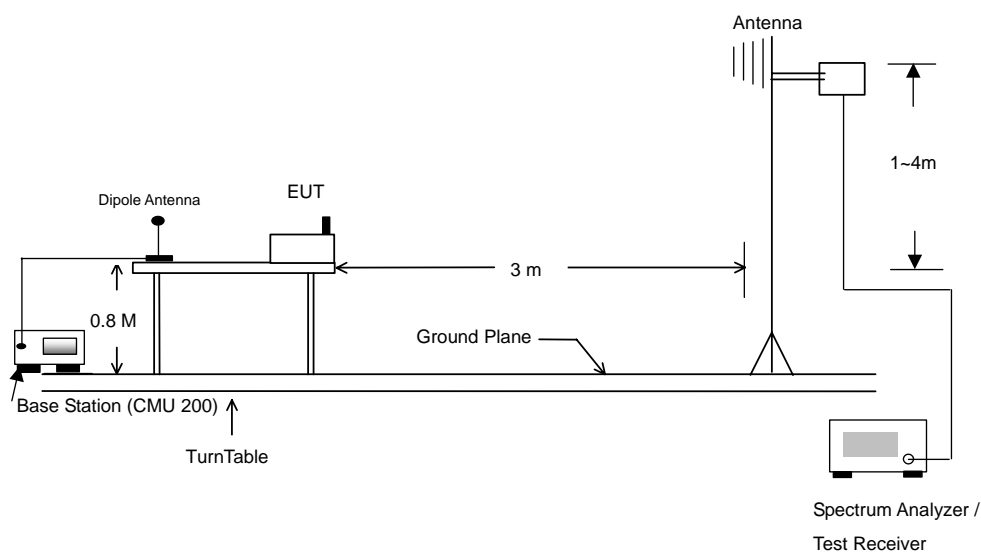
### 5.9.1 Measuring Instruments

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



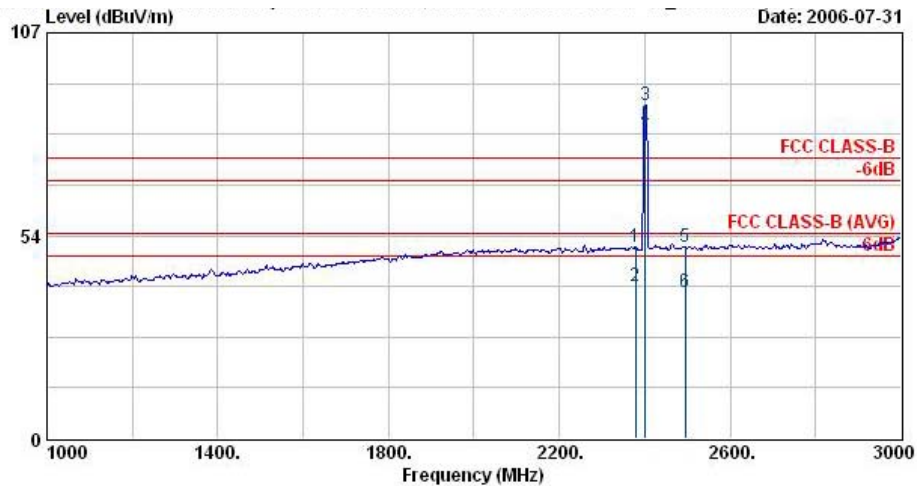




5.9.4 Test Data

- Temperature : 26 °C
- Relating Humidity : 55 %
- Test Engineer : Anderson
- Test Mode : Mode 1
- Polarization : Horizontal

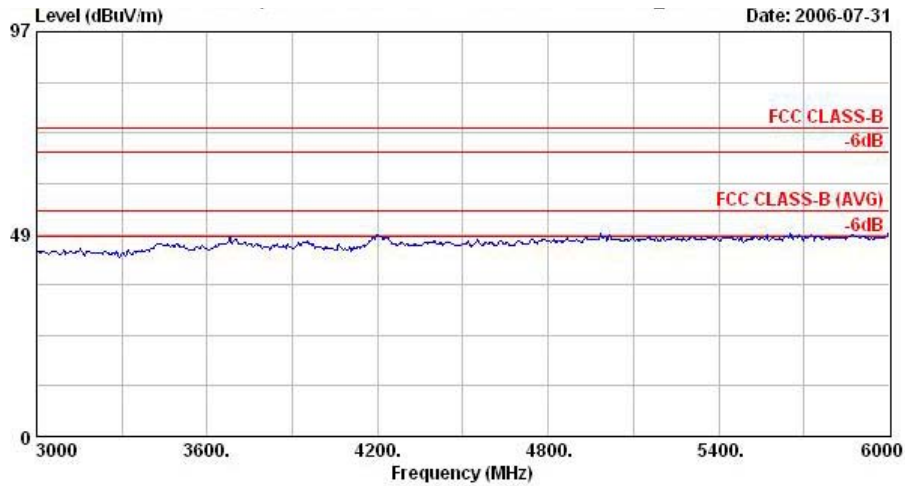
The test that passed at the minimum margin was marked by the frame in the following test record



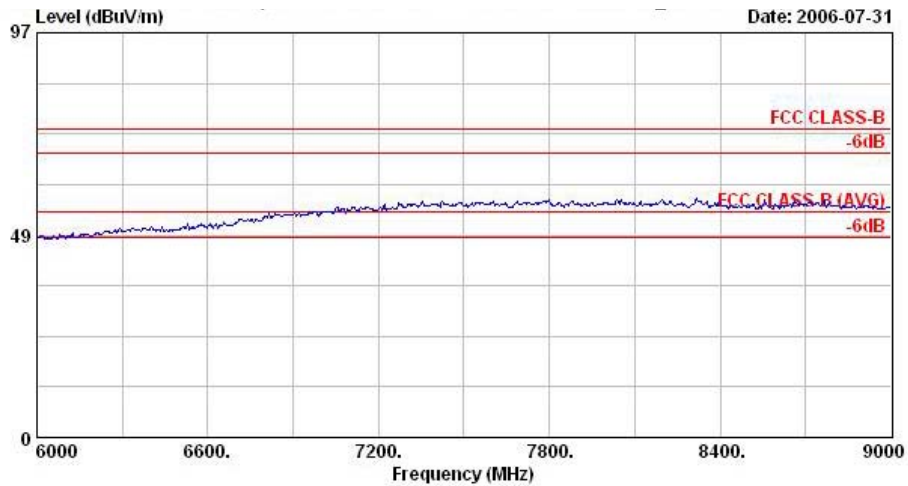
Site : 03CH06-HY  
 Condition : HF-ANT-060410 HORIZONTAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch00;2402MHz  
 Plane : E2  
 Data Rate : DH5

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2378.16	50.47	-23.53	74.00	51.43	30.25	4.23	35.44	100	360	Peak
2	2378.16	40.02	-13.98	54.00	40.98	30.25	4.23	35.44	100	30	Average
3 X	2402.00	87.77			88.70	30.27	4.26	35.46	100	360	Peak
4 @	2402.00	81.86			82.80	30.26	4.26	35.46	100	30	Average
5	2494.00	50.71	-23.29	74.00	51.55	30.30	4.39	35.53	100	360	Peak
6	2494.00	38.55	-15.45	54.00	39.39	30.30	4.39	35.53	100	30	Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-060410 HORIZONTAL  
EUT : GSM 900/1800/1900/2100Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch00;2402MHz  
Plane : E2  
Data Rate : DH5

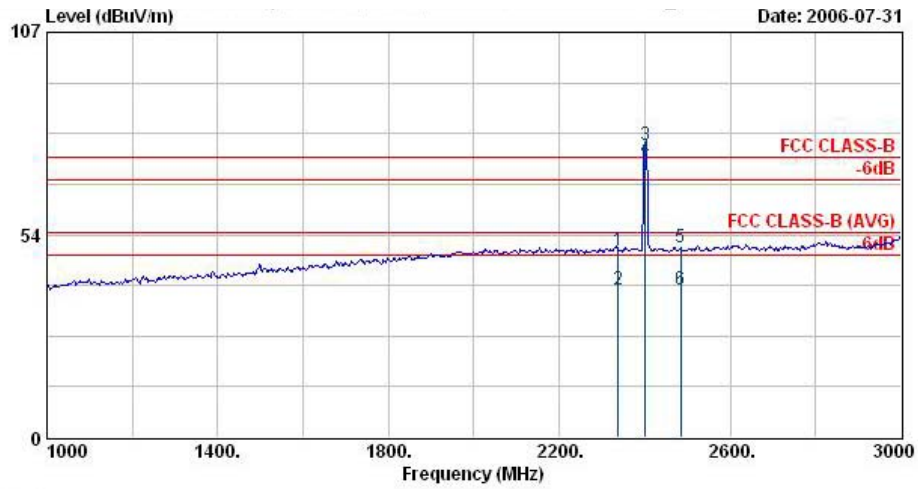


Site : 03CH06-HY  
Condition : HF-ANT-060410 HORIZONTAL  
EUT : GSM 900/1800/1900/2100Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch00;2402MHz  
Plane : E2  
Data Rate : DH5



- Test Mode : Mode 1
- Polarization : Vertical

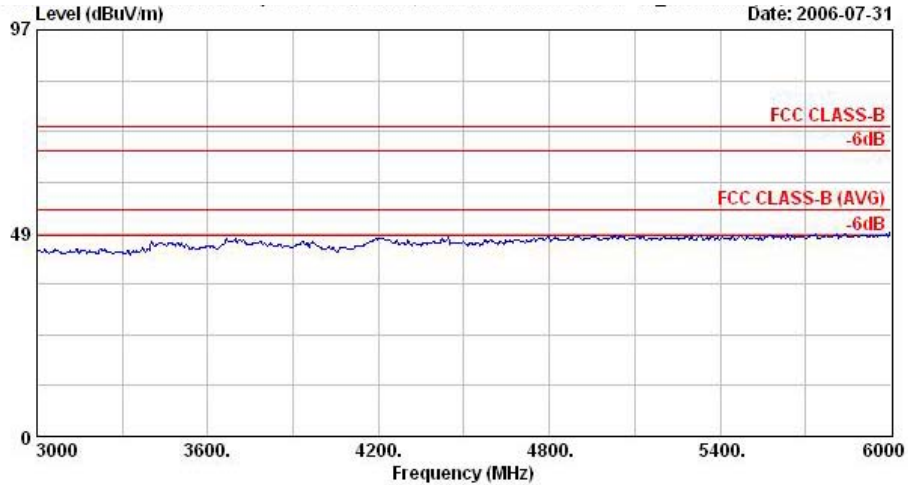
The test that passed at minimum margin was marked by the frame in the following table.



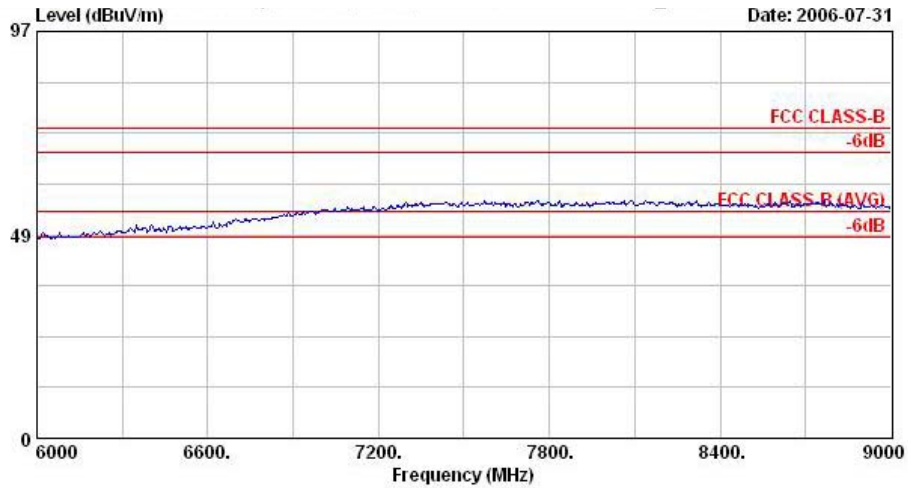
Site : 09CH06-HY  
 Condition : HF-ANT-060410 VERTICAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch00;2402MHz  
 Plane : E2  
 Data Rate : DHS

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg		
1	2337.00	49.47	-24.53	74.00	50.47	30.24	4.17	35.40	100	360	Peak
2	2337.00	39.17	-14.83	54.00	40.17	30.24	4.17	35.40	105	303	Average
3 X	2402.00	77.10			78.03	30.27	4.26	35.46	100	360	Peak
4 X	2402.00	73.56			74.50	30.26	4.26	35.46	105	303	Average
5	2484.00	50.04	-23.96	74.00	50.90	30.29	4.36	35.51	100	360	Peak
6	2484.00	38.99	-15.01	54.00	39.85	30.29	4.36	35.51	105	303	Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-060410 VERTICAL  
EUT : GSM 900/1800/1900/2100Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch00;2402MHz  
Plane : E2  
Data Rate : DHS

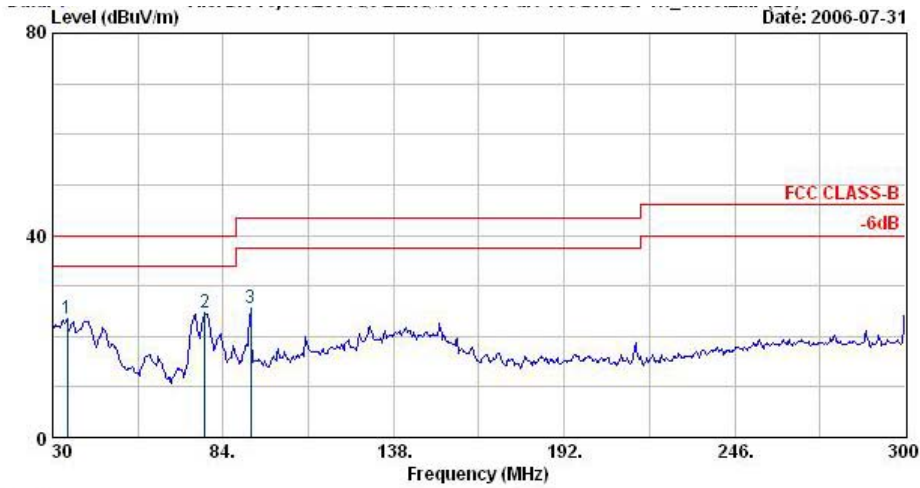


Site : 03CH06-HY  
Condition : HF-ANT-060410 VERTICAL  
EUT : GSM 900/1800/1900/2100Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch00;2402MHz  
Plane : E2  
Data Rate : DHS



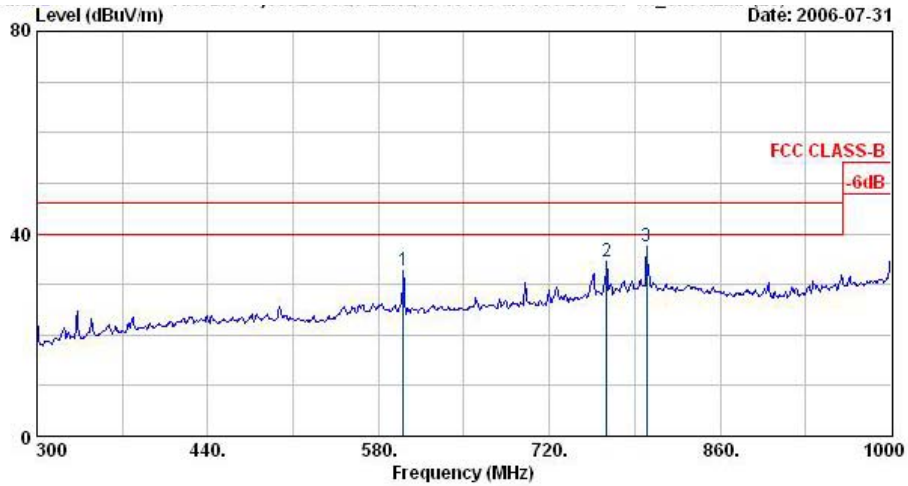
- Test Mode : Mode 2
- Polarization : Horizontal

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



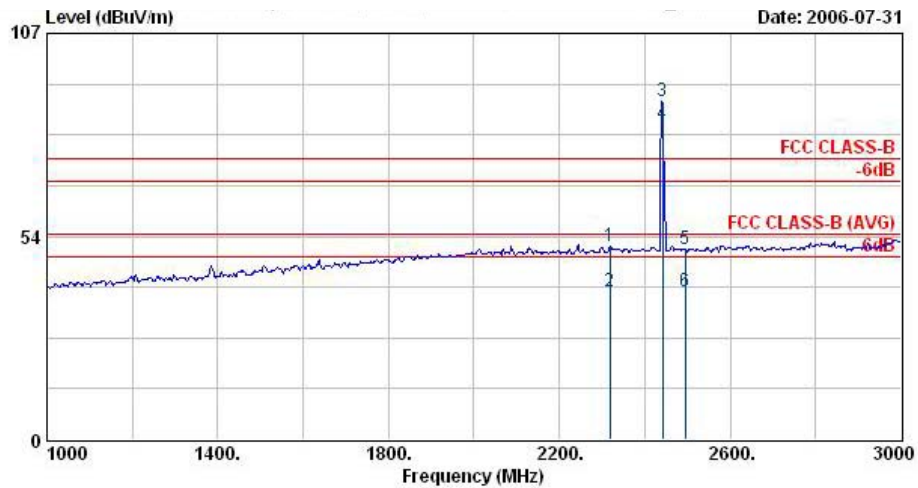
Site : 03CH06-HY  
 Condition : BI-LOG-2004-1122 HORIZONTAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39;2441MHz  
 Plane : E2  
 Data Rate : DH5

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	34.59	23.42	-16.58	40.00	33.91	17.07	1.08	28.64	400	0 Peak
2 @	78.33	24.72	-15.28	40.00	44.99	6.92	1.53	28.72	400	0 Peak
3 @	92.64	25.62	-17.88	43.50	43.31	9.47	1.67	28.82	400	0 Peak



Site : 03CH06-HY  
 Condition : BI-LOG-2004-1122 HORIZONTAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39,2441MHz  
 Plane : E2  
 Data Rate : DH5

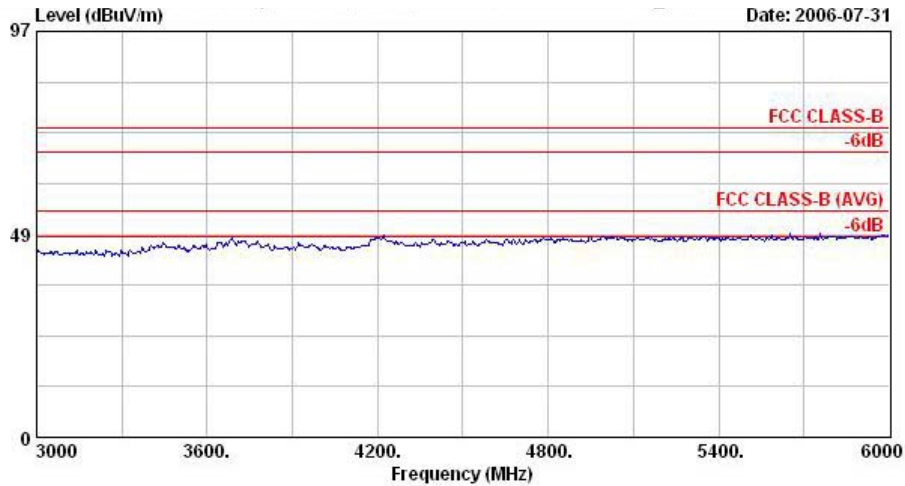
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1 @	600.30	32.79	-13.21	46.00	38.97	17.94	4.65	28.77	100	0 Peak
2 @	766.90	34.62	-11.38	46.00	37.32	20.96	5.28	28.94	100	0 Peak
3 @	799.80	37.61	-8.39	46.00	38.96	21.90	5.62	28.87	125	330 Peak



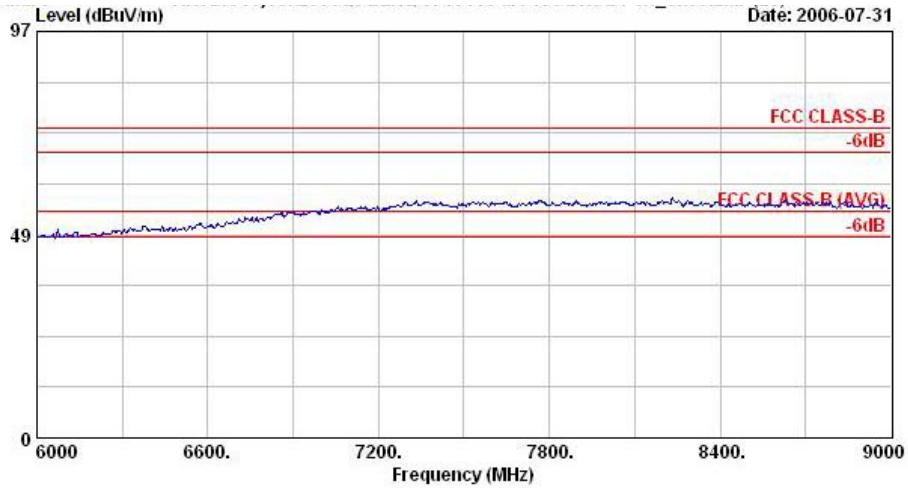
Site : 03CH06-HY  
 Condition : HF-ANT-060410 HORIZONTAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39\_2441MHz  
 Plane : E2  
 Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2318.00	50.72	-23.28	74.00	51.72	30.23	4.17	35.40	100	360	Peak
2 @	2318.00	38.99	-15.01	54.00	39.99	30.23	4.17	35.40	100	27	Average
3 @	2441.00	88.91			89.81	30.28	4.29	35.47	100	360	Peak
4 @	2441.00	83.01			83.90	30.28	4.33	35.49	100	27	Average
5 @	2494.00	50.26	-23.74	74.00	51.10	30.30	4.39	35.53	100	360	Peak
6 @	2494.00	39.09	-14.91	54.00	39.93	30.30	4.39	35.53	100	27	Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
 Condition : HF-ANT-060410 HORIZONTAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39\_2441MHz  
 Plane : E2  
 Data Rate : DH5



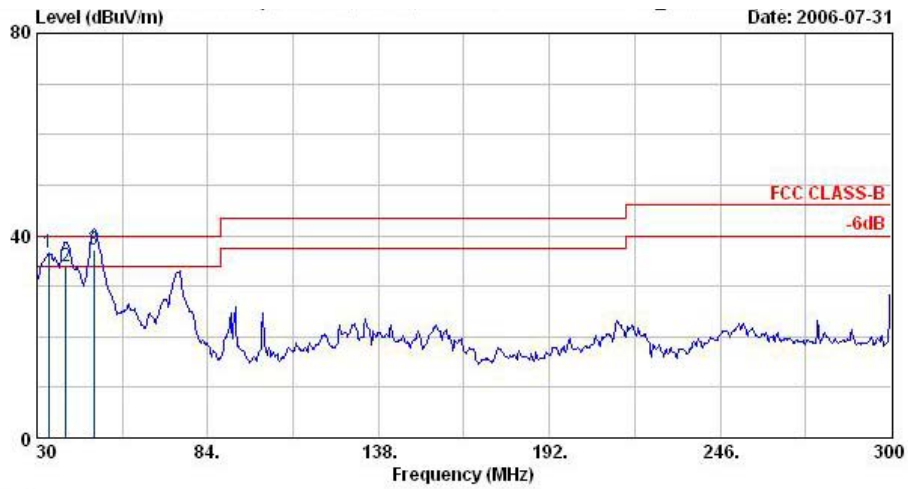
Site : 03CH06-HY  
Condition : HF-ANT-060410 HORIZONTAL  
EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch39\_2441MHz  
Plane : E2  
Data Rate : DH5





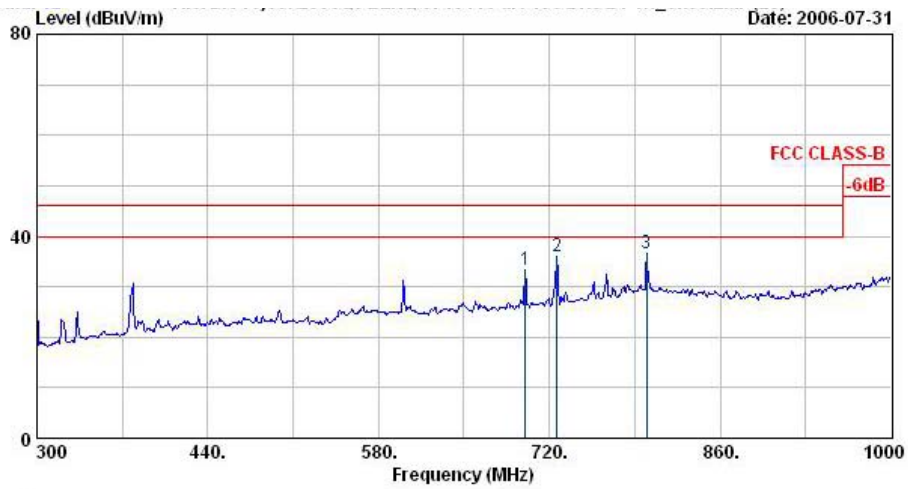
- Test Mode : Mode 2
- Polarization : Vertical

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



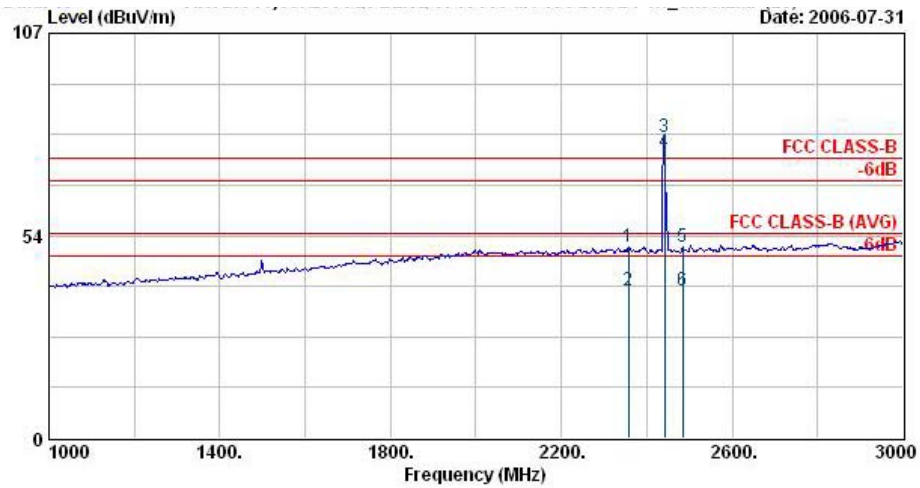
Site : 03CH06-HY  
 Condition : BI-LOG-2004-1122 VERTICAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39,2441MHz  
 Plane : E2  
 Data Rate : DHS

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	33.78	36.55	-3.45	40.00	46.75	17.40	1.04	28.64	400	0 Peak
2 @	39.18	34.05	-5.95	40.00	46.20	15.28	1.23	28.66	100	0 OP
3 @	48.09	37.11	-2.89	40.00	54.00	10.66	1.06	28.61	100	217 OP



Site : 03CH06-HY  
 Condition : BI-LOG-2004-1122 VERTICAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39,2441MHz  
 Plane : E2  
 Data Rate : DH5

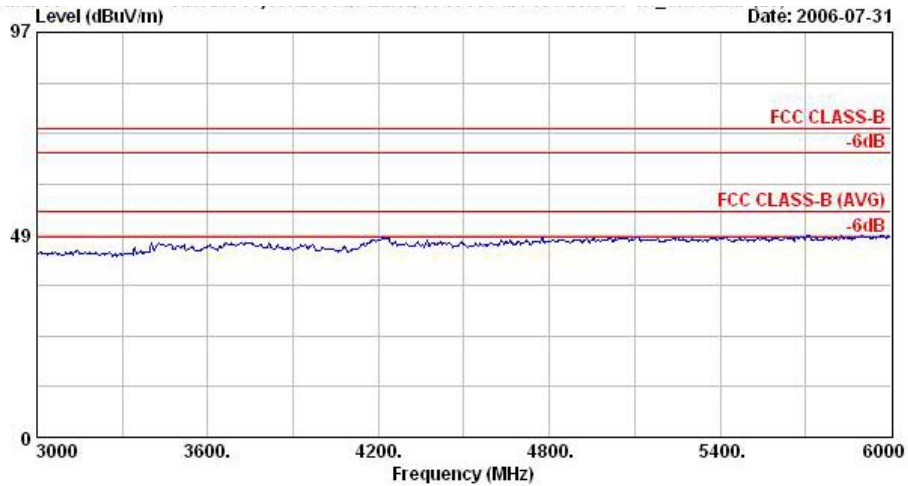
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	700.40	33.32	-12.68	46.00	37.91	19.04	5.13	28.76	100	0	Peak
2 @	726.30	35.98	-10.02	46.00	40.06	19.79	5.00	28.87	100	0	Peak
3 @	799.80	36.45	-9.55	46.00	37.80	21.90	5.62	28.87	100	0	Peak



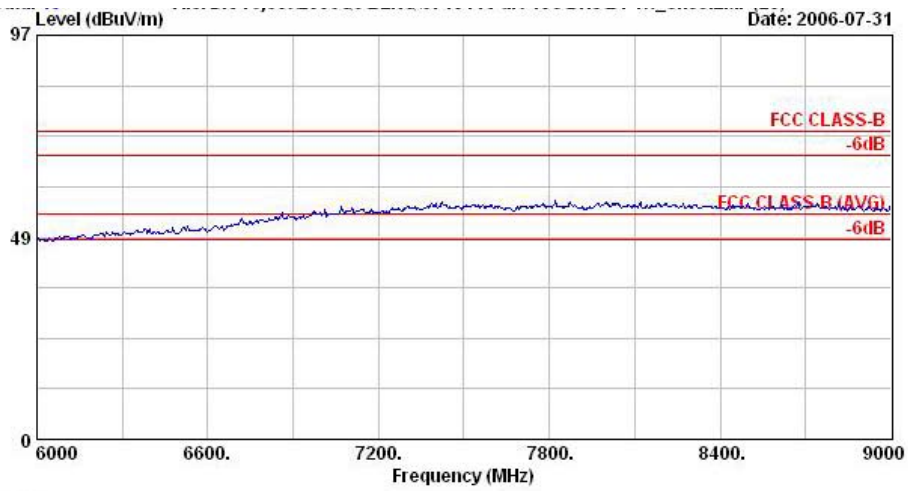
Site : 03CH06-HY  
 Condition : HF-ANT-060410 VERTICAL  
 EUT : GSM 900/1800/1900/2100Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39,2441MHz  
 Plane : E2  
 Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	2358.00	50.34	-23.66	74.00	51.31	30.24	4.20	35.42	100	360 Peak
2 @	2358.00	39.11	-14.89	54.00	40.09	30.24	4.20	35.42	100	144 Average
3 @	2441.00	79.48			80.38	30.28	4.29	35.47	100	360 Peak
4 @	2441.00	75.39			76.28	30.28	4.33	35.49	100	144 Average
5 @	2484.00	50.38	-23.62	74.00	51.24	30.29	4.36	35.51	100	360 Peak
6 @	2484.00	39.10	-14.90	54.00	39.96	30.29	4.36	35.51	100	144 Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
 Condition : HF-ANT-060410 VERTICAL  
 EUT : GSM 900/1800/1900/2100Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch39,2441MHz  
 Plane : E2  
 Data Rate : DH5

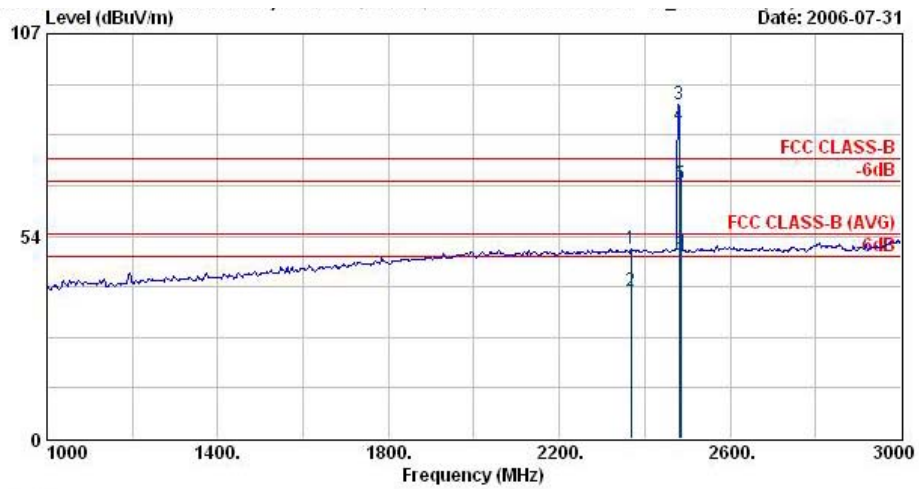


Site : 03CH06-HY  
Condition : HF-ANT-060410 VERTICAL  
EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch39\_2441MHz  
Plane : E2  
Data Rate : DHS



- Test Mode : Mode 3
- Polarization : Horizontal

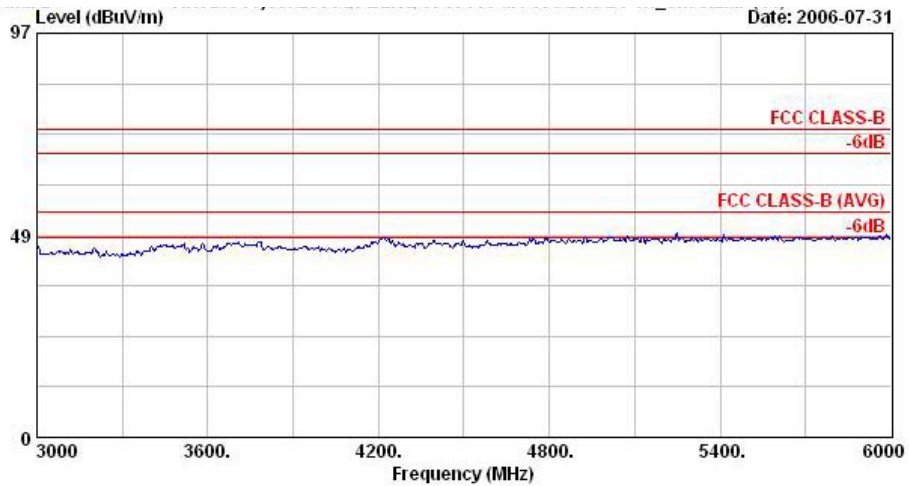
The test that passed at minimum margin was marked by the frame in the following table.



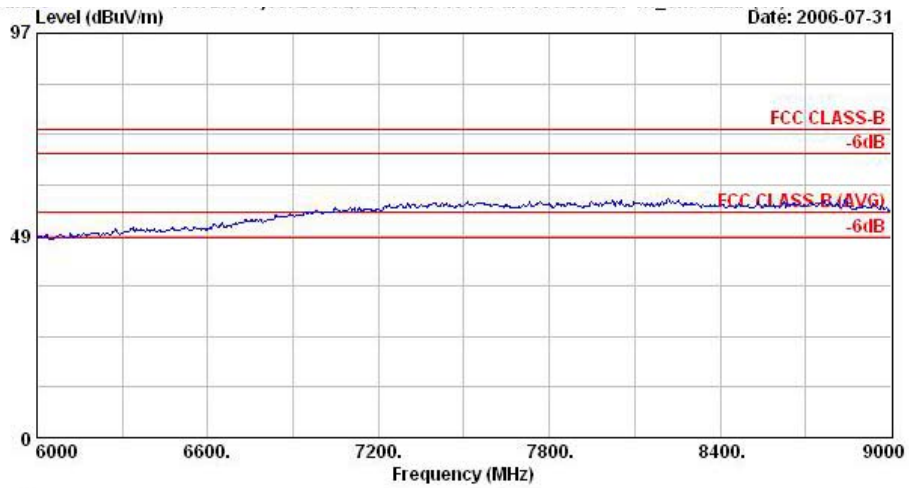
Site : 03CH06-HY  
 Condition : HF-ANT-060410 HORIZONTAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch78;2480MHz  
 Plane : E2  
 Data Rate : DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2368.00	50.05	-23.95	74.00	51.01	30.24	4.23	35.44	100	360	Peak
2	2368.00	38.93	-15.07	54.00	39.89	30.24	4.23	35.44	100	206	Average
3 X	2480.00	88.42			89.27	30.29	4.36	35.51	100	360	Peak
4 @	2480.00	82.76			83.62	30.29	4.36	35.51	100	206	Average
5	2483.50	67.38	-6.62	74.00	68.24	30.29	4.36	35.51	100	360	Peak
6 !	2483.50	48.34	-5.66	54.00	49.20	30.29	4.36	35.51	100	206	Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-060410 HORIZONTAL  
EUT : GSM 900/1800/1900Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch39\_2480MHz  
Plane : E2  
Data Rate : DHS

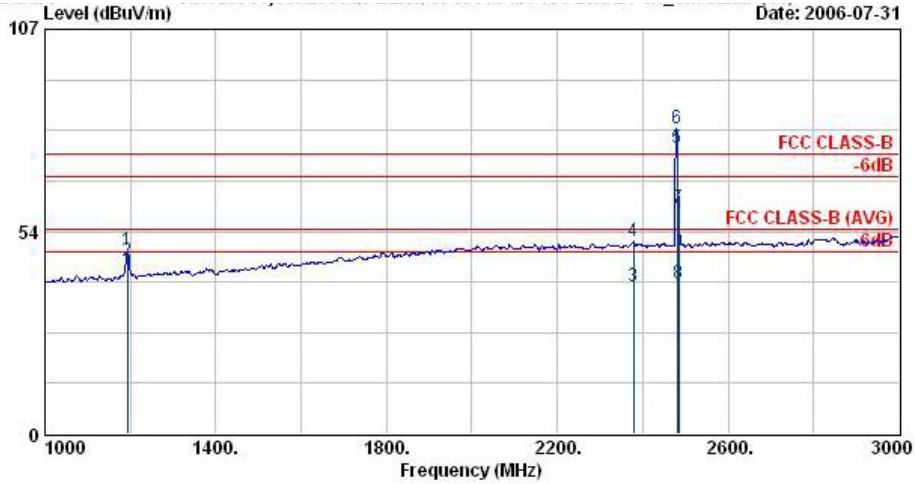


Site : 03CH06-HY  
Condition : HF-ANT-060410 HORIZONTAL  
EUT : GSM 900/1800/1900Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch39\_2480MHz  
Plane : E2  
Data Rate : DHS



- Test Mode : Mode 3
- Polarization : Vertical

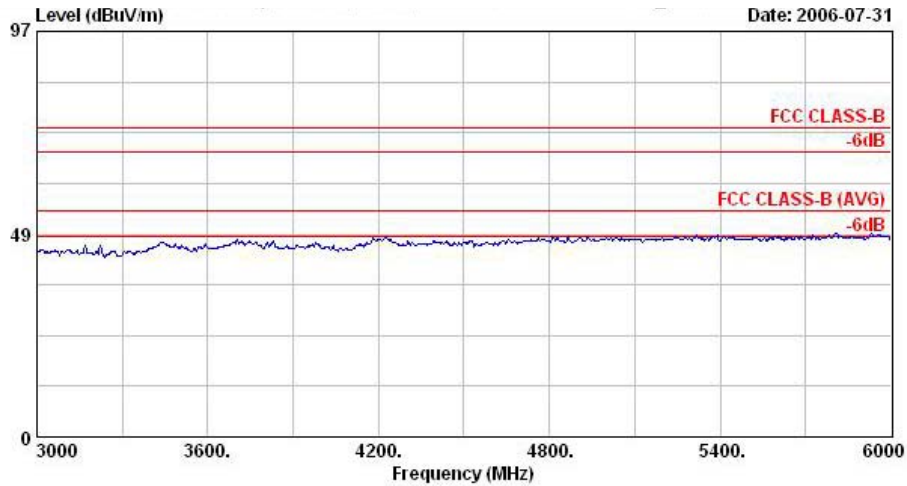
The test that passed at minimum margin was marked by the frame in the following table.



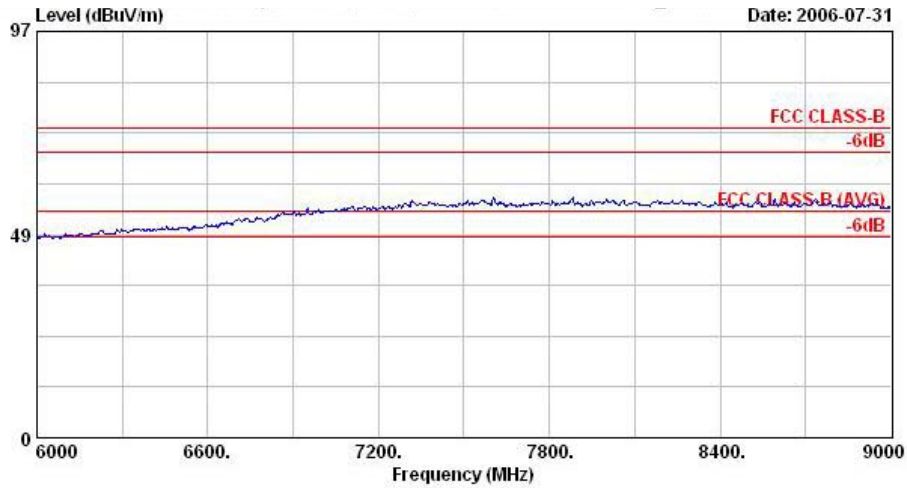
Site : 03CH06-HY  
 Condition : HF-ANT-060410 VERTICAL  
 EUT : GSM 900/1800/1900/2100 Mobile Phone(BT)  
 Power : 120Vac/60Hz  
 Model : FR 671011  
 Memo : Bluetooth Tx\_Ch78,2480MHz  
 Plane : E2  
 Data Rate : DH5

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1194.00	48.49	-25.51	74.00	56.81	24.92	2.99	36.23	100	0	Peak
2	1194.00	45.65	-8.35	54.00	53.97	24.92	2.99	36.23	100	132	Average
3	2378.00	39.01	-14.99	54.00	39.97	30.25	4.23	35.44	100	132	Average
4	2378.00	50.75	-23.25	74.00	51.70	30.25	4.23	35.44	100	0	Peak
5 X	2480.00	75.42			76.28	30.29	4.36	35.51	100	132	Average
6 X	2480.00	80.62			81.48	30.29	4.36	35.51	100	0	Peak
7	2484.97	59.61	-14.39	74.00	60.47	30.29	4.36	35.51	100	0	Peak
8	2484.97	39.66	-14.34	54.00	40.52	30.29	4.36	35.51	100	132	Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY  
Condition : HF-ANT-060410 VERTICAL  
EUT : GSM 900/1800/1900Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch39,2480MHz  
Plane : E2  
Data Rate : DH5



Site : 03CH06-HY  
Condition : HF-ANT-060410 VERTICAL  
EUT : GSM 900/1800/1900Mobile Phone(BT)  
Power : 120Vac/60Hz  
Model : FR 671011  
Memo : Bluetooth Tx\_Ch39,2480MHz  
Plane : E2  
Data Rate : DH5

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 PCB 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	100132	9kHz – 2.75GHz	Jun. 28, 2006	Jun. 28, 2007	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/008	9kHz – 30MHz	Mar. 29, 2006	Mar. 29, 2007	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz – 30MHz	Apr. 19, 2006	Apr. 19, 2007	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	Dec. 22, 2005	Dec. 22, 2006	Radiation (03CH06-HY)
Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 25, 2006	Jul. 24, 2007	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	Jun. 28, 2006	Jun. 27, 2007	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	N/A	N/A	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	Nov. 22, 2004	Nov. 22, 2006	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Feb. 1, 2005	Feb. 1, 2007	Radiation (03CH06-HY)
HF Amplifier	MITEQ	AFS44	973248	0.1G - 26.5G	Jul. 21, 2006	Jul. 20, 2007	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F	997165	26G - 40G	Jul. 21, 2006	Jul. 20, 2007	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 Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ 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 Uc(y)</b>	<b>2.36</b>				
<b>Measuring uncertainty for a level of confidence of 95% U=2Ue(y)</b>	<b>4.72</b>				