



FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment : **Mobile Phone**
Trade Name : **BenQ-Siemens**
Model No. : **EF91**
Marketing Name : **MACC1A**
FCC ID : **JVPEF91**
BenQ Ref. No. : **NL-6402**
Filing Type : **Certification**
Applicant : **BenQ Corporation**
157 Shan-Ying Road, Gueishan Taoyuan 333, Taiwan

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- The data shown in this test report were carried out on May 06, 2006 at **Sporton International Inc. LAB.**
- Report No.: FR642603, Report Version: Rev. 01.

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Report Version: Rev. 01



Table of Contents

History of this test report.....ii

1. General Description of Equipment under Test.....1

 1.1.Applicant.....1

 1.2.Manufacturer1

 1.3.Basic Description of Equipment under Test.....1

 1.4.Feature of Equipment under Test2

2. Test Configuration of Equipment under Test3

 2.1.Test Manner3

 2.2.Test Mode3

 2.3.Ancillary Equipment List.....3

 2.4.Connection Diagram of Test System4

3. RF Utility5

4. General Information of Test.....6

 4.1.Test Voltage6

 4.2.Standard for Methods of Measurement.....6

 4.3.Test in Compliance with6

 4.4.Frequency Range Investigated6

 4.5.Test Distance6

5. Report of Measurements and Examinations7

 5.1.List of Measurements and Examinations7

 5.2.Hopping Channel Separation8

 5.3.Number of Hopping Frequency12

 5.5 Dwell Time of Each Frequency18

 5.6 Output Power38

 5.7 100kHz Bandwidth of Frequency Band Edges42

 5.8 Conducted Emission46

 5.9 Radiated Emission Measurement53

 5.10 Antenna Requirements.....70

6. List of Measuring Equipments Used71

7. Uncertainty Evaluation.....72

Appendix A. External Product Photograph

Appendix B. Internal Photograph

Appendix C. Setup Photograph



History of this test report

Report Issue Date: May 11, 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 (IT) Co., Ltd.

No. 169, Zhujiang Road, New District, Suzhou, Jiangsu, P.R., China

1.3. Basic Description of Equipment under Test

Equipment	: Mobile Phone
Trade Name	: BenQ-Siemens
Model No.	: EF91
FCC ID	: JVPEF91
Power Supply Type	: Switching, From battery 3.7V
AC Power Cord	: AC 120V, Weave-shielded, Wall-mount, 1.3 meter, 2 pin
Earphone	: 2C.43037.112
Adapter	: BenQ-Siemens, JSP050100UU
Battery	: BenQ-Siemens, 2C.2H210.001
Data Cable	: 5K.G6501.001

**1.4. Feature of Equipment under Test**

Product Feature & Specification			
1. Modulation Type/Data Rate	PCS : GMSK BT : GFSK		
2. Frequency Range.	PCS : 1850.2-1909.8 MHz(Tx), 1930.2-1989.8 MHz(Rx) BT : 2400 MHz ~ 2483.5 MHz		
3. Number of Channels	79		
4. Carrier Frequency of each channel	2402+ n*1 MHz, n= 0~78		
5. Channel Spacing	1 MHz		
6. Maximum Output Power to Antenna (Normal condition)	PCS : 29.86 dBm BT : 0.89 dBm		
7. Type of Antenna Connector	N/A		
8. Antenna Type	PIFA Antenna		
9. Antenna Gain	-3 dBi		
10. HW Version	LPR4-6		
11. SW Version	0.0912		
12. Function Type	Transmitter		Transceiver V
13. Power Rating (DC/AC , Voltage)	3.8V / 110mA		
14. 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

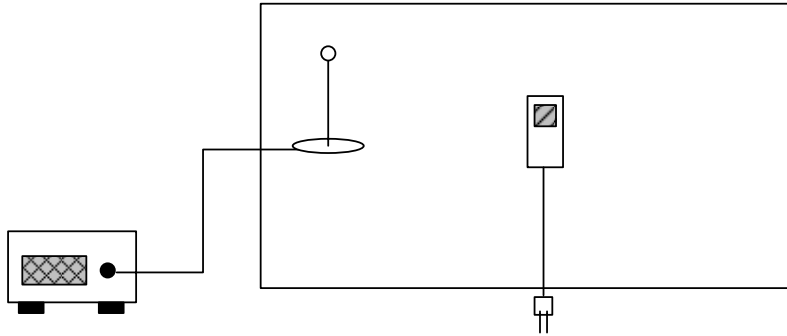
Application	Bluetooth
Radiated Emission and conducted test items	Mode 1: Tx_CH00_2402 MHz Mode 2: Tx_CH39_2441 MHz Mode 3: Tx_CH78_2480 MHz
Conducted Emission	Mode 1: PCS1900 Idle Mode + Adapter + Earphone + BT Link + Camera Mode 2: PCS1900 Idle Mode + Adapter + Earphone + BT Link + MP3 Mode 3: USB Link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

2.3. Ancillary Equipment List

Item	Equipment	Model No.	Power Cord
1.	Base Station (R&S)	CMU200	AC 100-240V
2.	Bluetooth Earphone (Free Style)	JD-100	N/A
3.	Notebook (DELL)	D400	N/A
4.	USB Mouse (Microsoft)	B75-00093	N/A
5.	USB Cable	N/A	Weave-shielded, 1m

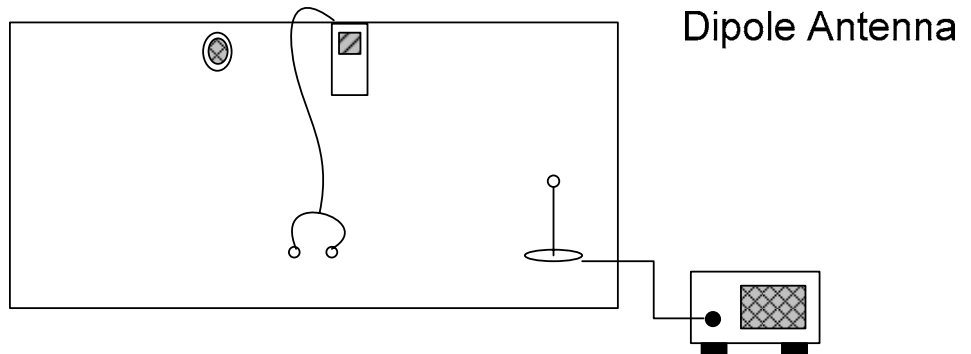
2.4. Connection Diagram of Test System

<Radiation Emission>

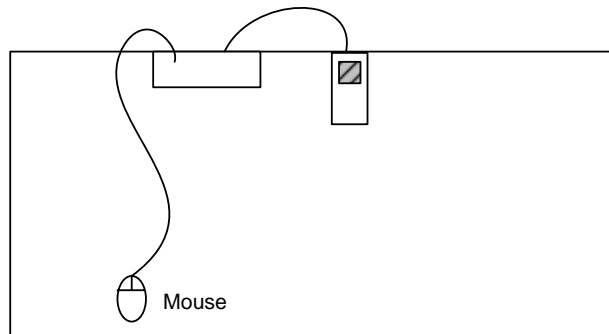


<Conduction Emission>

Mode 1-2



Mode 3





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

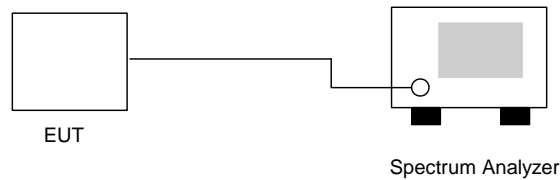
5.2.1. Measuring Instruments :

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: 52%
- Test Engineer : James

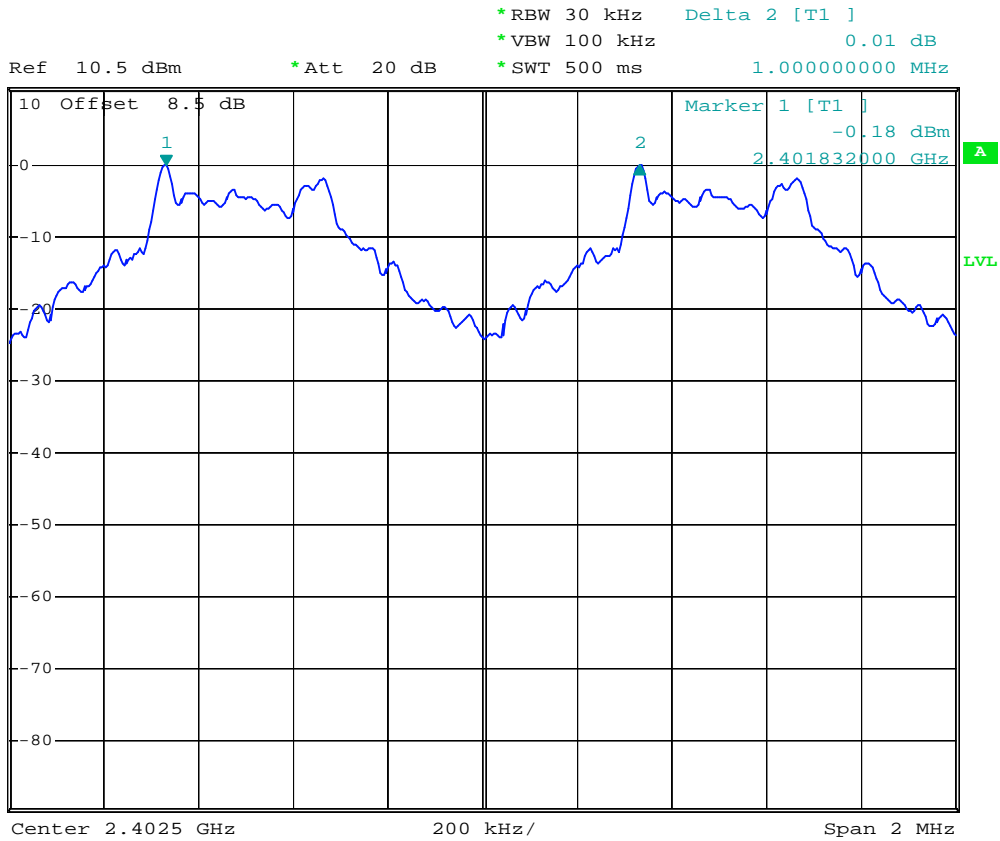
Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.861	Mode 1
39	2441	1.004	0.858	Mode 2
78	2480	1.004	0.828	Mode 3

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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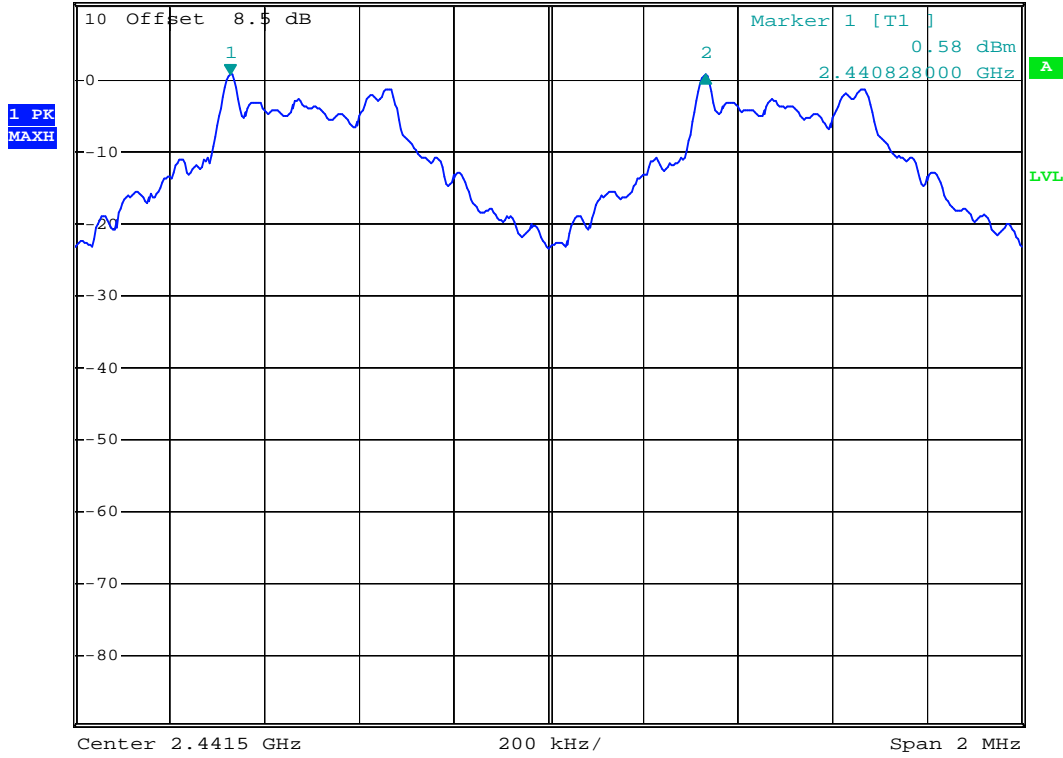


Mode 2: CH39 (2441MHz)



*RBW 30 kHz Delta 2 [T1]
 *VBW 100 kHz -0.01 dB
 *SWT 500 ms 1.004000000 MHz

Ref 10.5 dBm *Att 20 dB



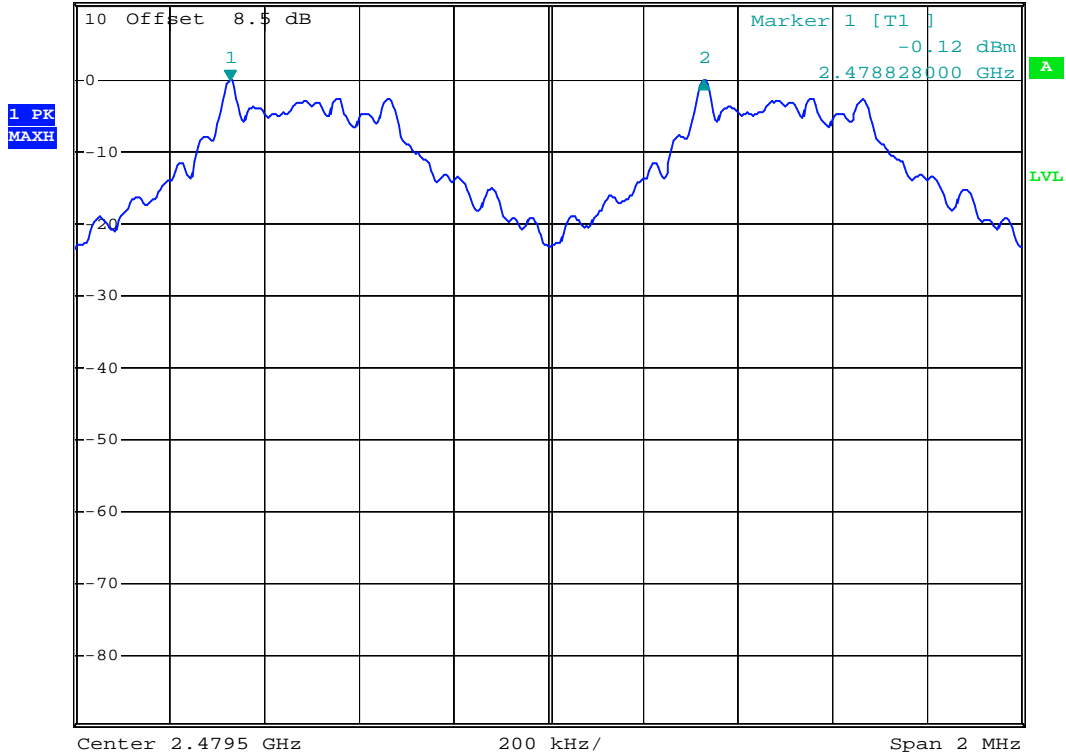
Date: 5.MAY.2006 23:28:27



Mode 3: CH78 (2480MHz)



Ref 10.5 dBm *Att 20 dB *RBW 30 kHz Delta 2 [T1]
*VBW 100 kHz -0.02 dB
*SWT 500 ms 1.000000000 MHz



Date: 5.MAY.2006 23:39:18

5.3. Number of Hopping Frequency

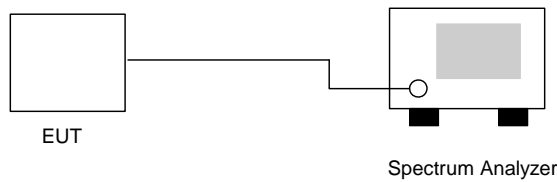
5.3.1. Measuring Instruments :

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 :



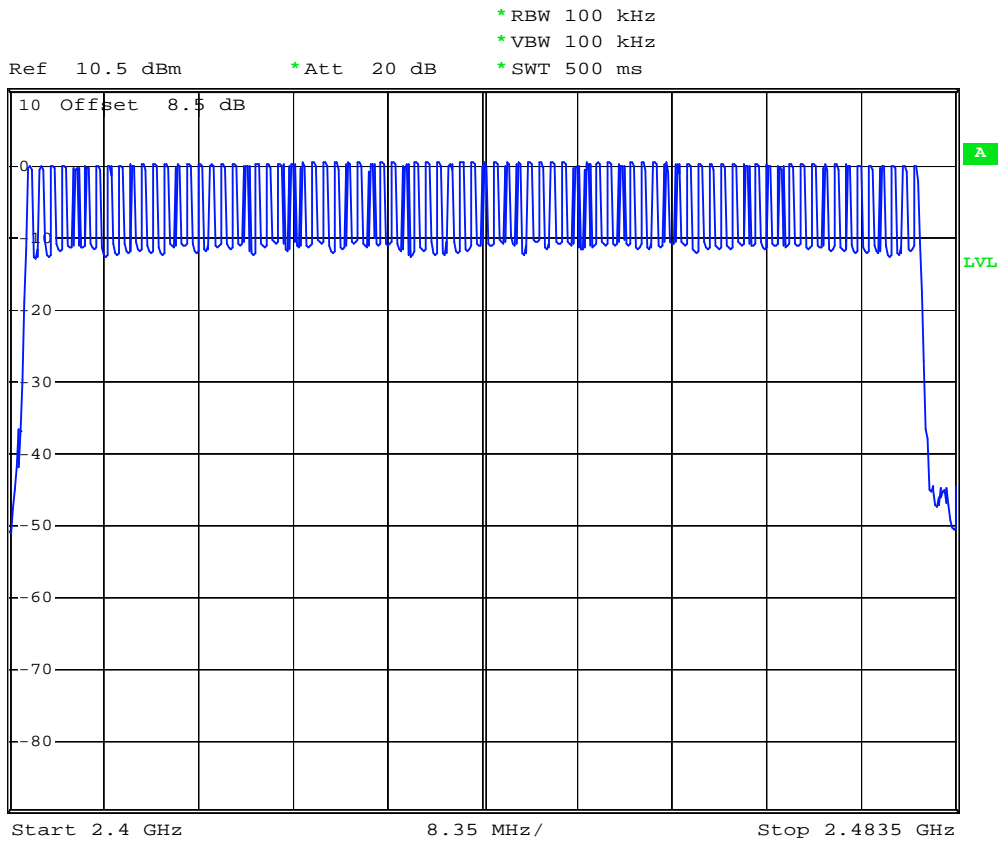
5.3.4. Test Result : See spectrum analyzer plots below

- Temperature: 24°C
- Relative Humidity: 52%
- Test Engineer : James

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



5.3.5 Number of Hopping Frequency



Date: 6.MAY.2006 00:15:35

5.4 Hopping Channel Bandwidth

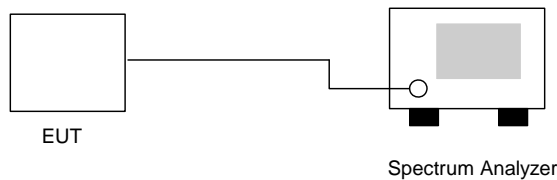
5.4.1 Measuring Instruments :

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: 52%
- Test Engineer : James

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.861	1.0	Mode 1
39	2441	0.858	1.0	Mode 2
78	2480	0.828	1.0	Mode 3



5.4.5 Hopping Channel Bandwidth

Mode 1: CH00 (2402MHz)



*RBW 30 kHz Delta 2 [T1]
 *VBW 300 kHz 0.14 dB
 *SWT 500 ms 861.00000000 kHz
 Ref 10.5 dBm *Att 20 dB



Date: 5.MAY.2006 23:16:42

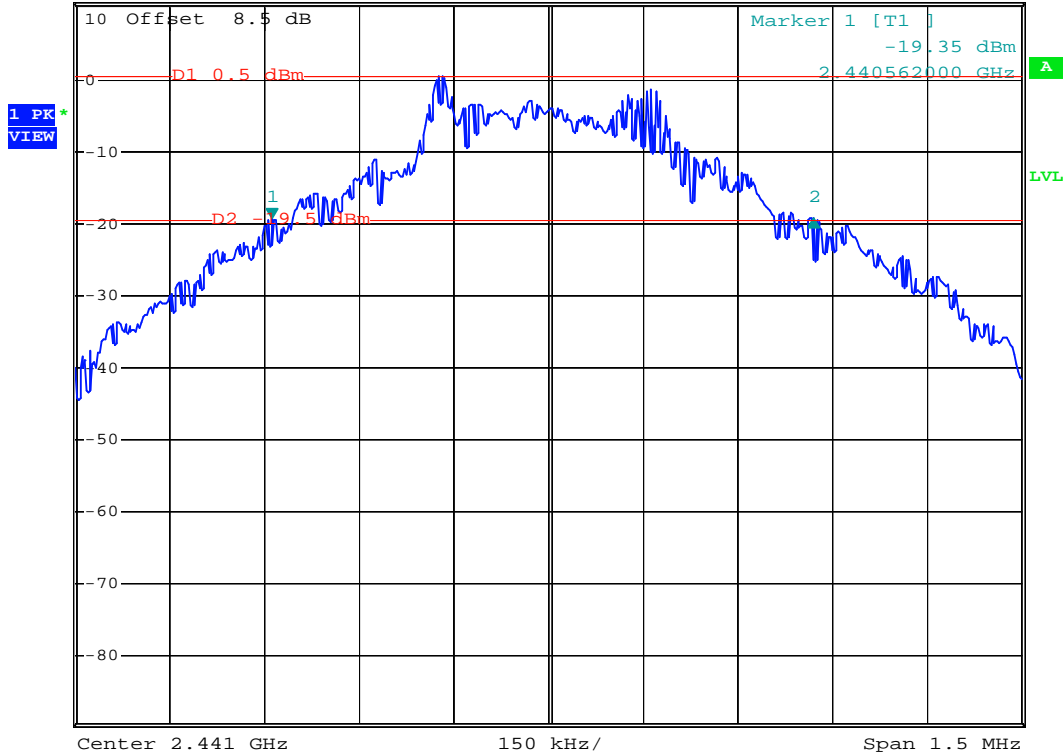


Mode 2: CH39 (2441MHz)



*RBW 30 kHz Delta 2 [T1]
 *VBW 300 kHz 0.14 dB
 *SWT 500 ms 858.000000000 kHz

Ref 10.5 dBm *Att 20 dB



Date: 5.MAY.2006 23:15:30

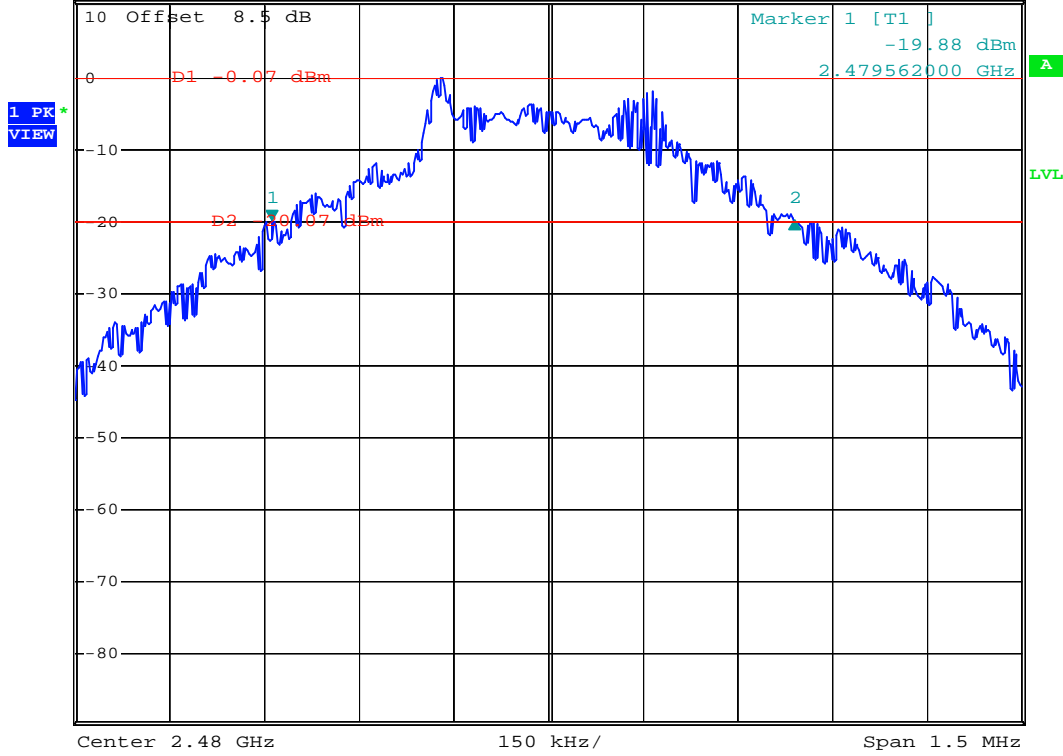


Mode 3: CH78 (2480MHz)



*RBW 30 kHz Delta 2 [T1]
 *VBW 300 kHz -0.02 dB
 *SWT 500 ms 828.000000000 kHz

Ref 10.5 dBm *Att 20 dB



Date: 5.MAY.2006 23:14:13

5.5 Dwell Time of Each Frequency

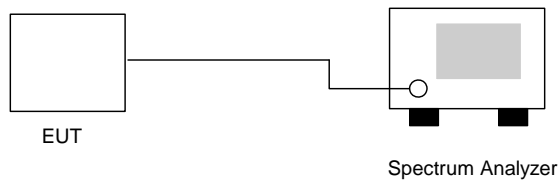
5.5.1 Measuring Instruments :

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: 52%
- Test Engineer : James

Ch00

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.7	444	0.122	0.4
DH3	4.5	1704	0.242	0.4
DH5	2.7	2984	0.255	0.4



CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	9	444	0.126	0.4
DH3	4.9	1724	0.267	0.4
DH5	3.4	3004	0.323	0.4

CH78

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	9	440	0.125	0.4
DH3	4.4	1704	0.237	0.4
DH5	2.9	3004	0.275	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)

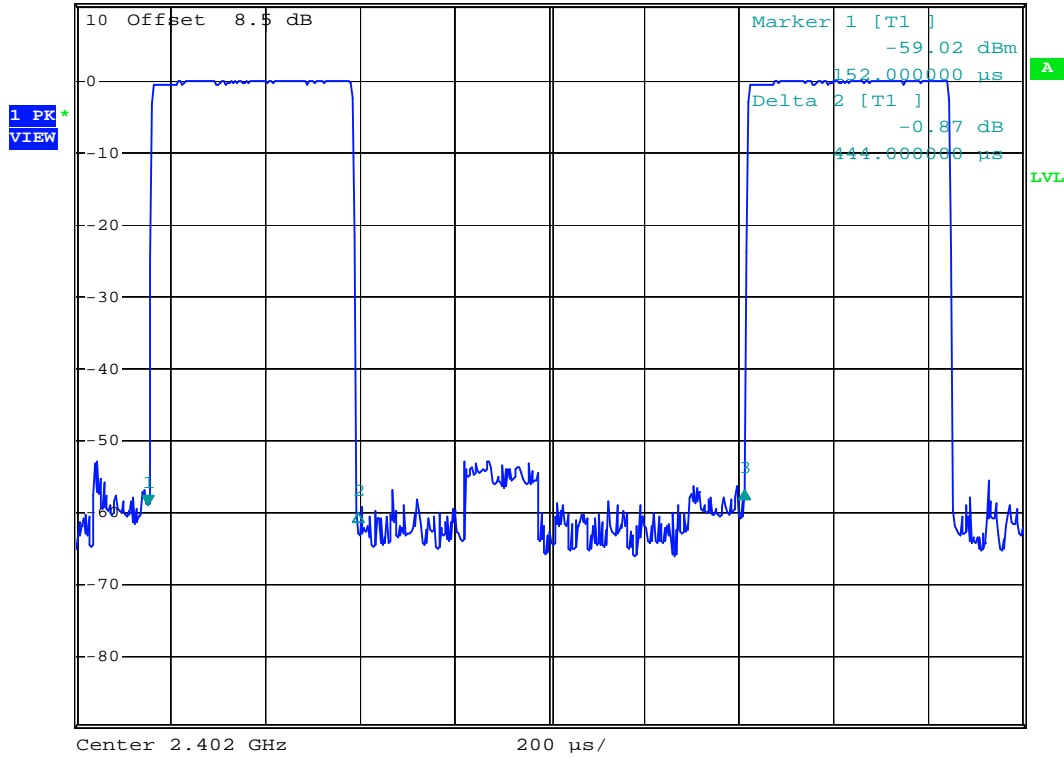


5.5.5 Dwell Time

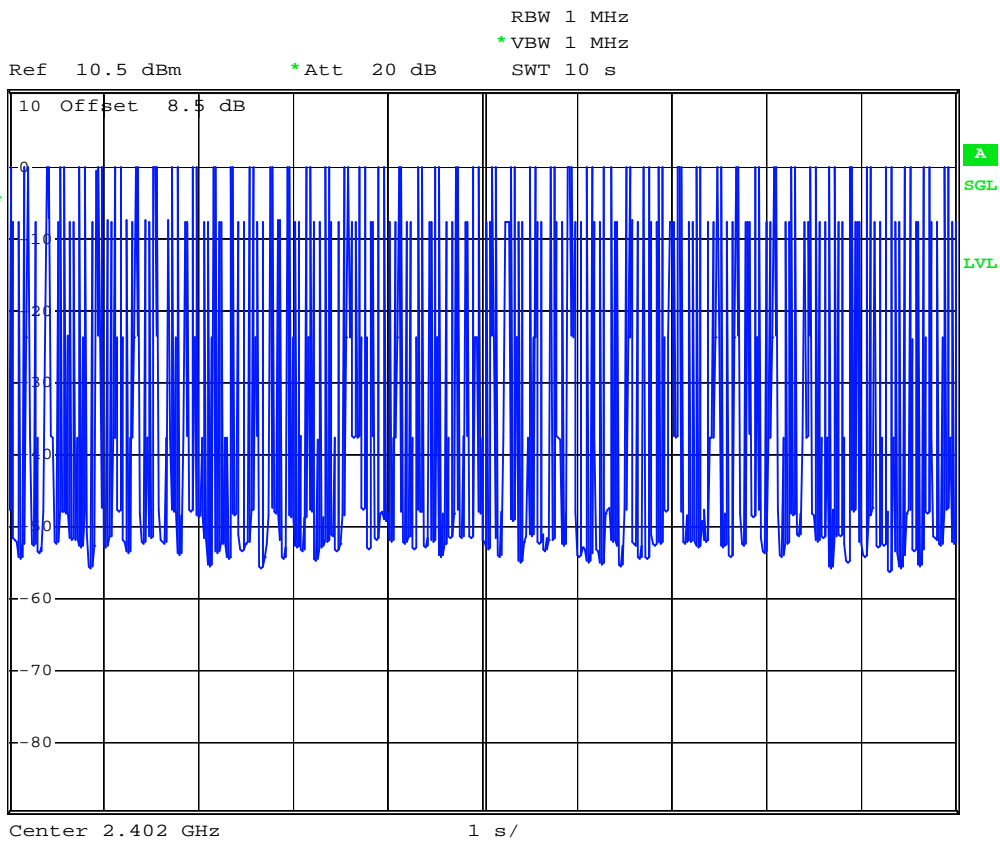
DH1 (CH00)



Ref 10.5 dBm *Att 20 dB RBW 1 MHz Delta 3 [T1] 2.16 dB
*VBW 1 MHz SWT 2 ms 1.260000 ms



Date: 5.MAY.2006 23:44:48



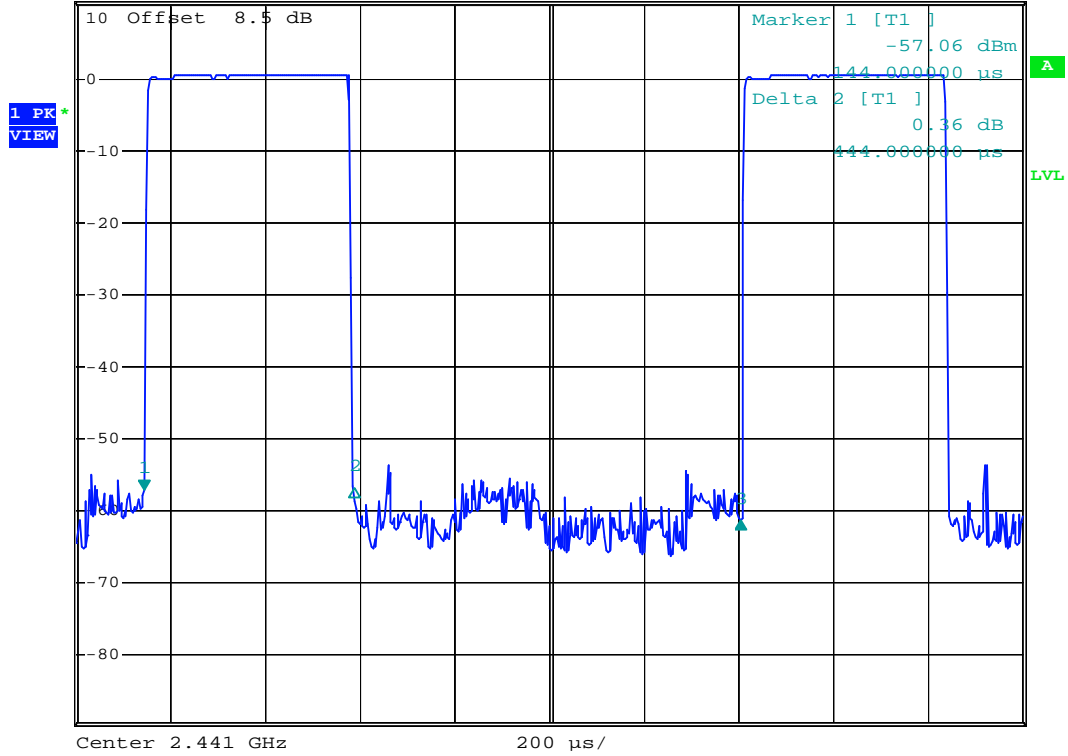
Date: 6.MAY.2006 00:01:36



DH1 (CH39)



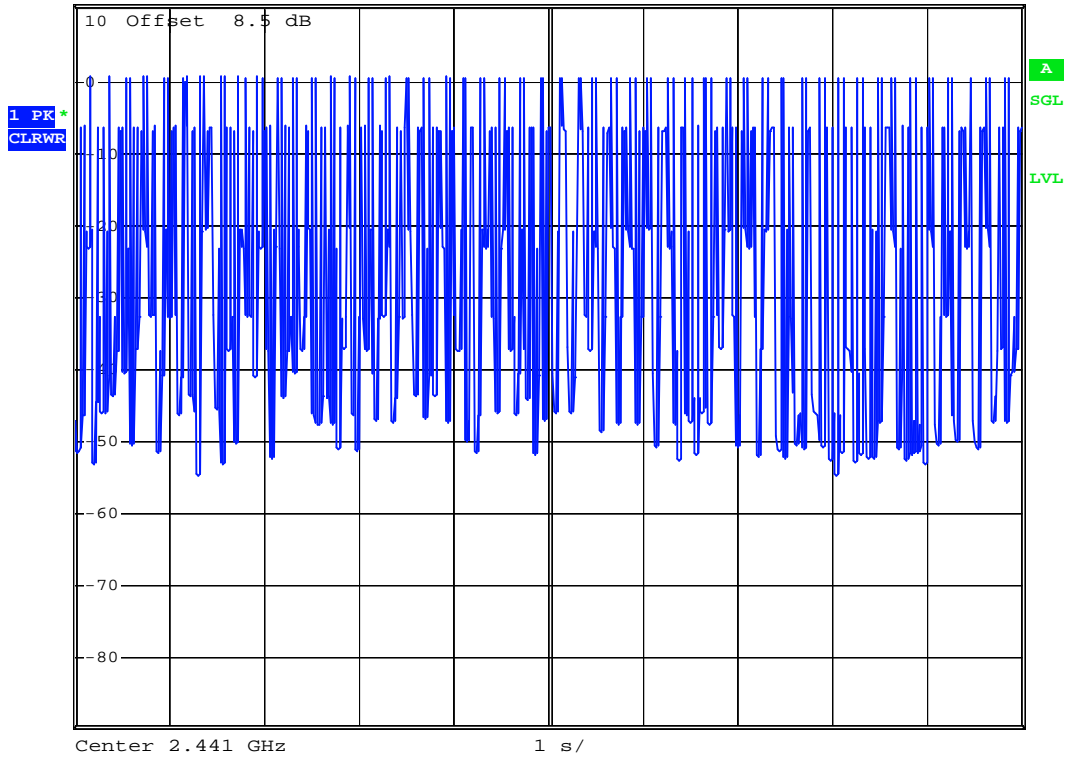
RBW 1 MHz Delta 3 [T1]
 *VBW 1 MHz -4.18 dB
 Ref 10.5 dBm *Att 20 dB SWT 2 ms 1.260000 ms



Date: 5.MAY.2006 23:43:53



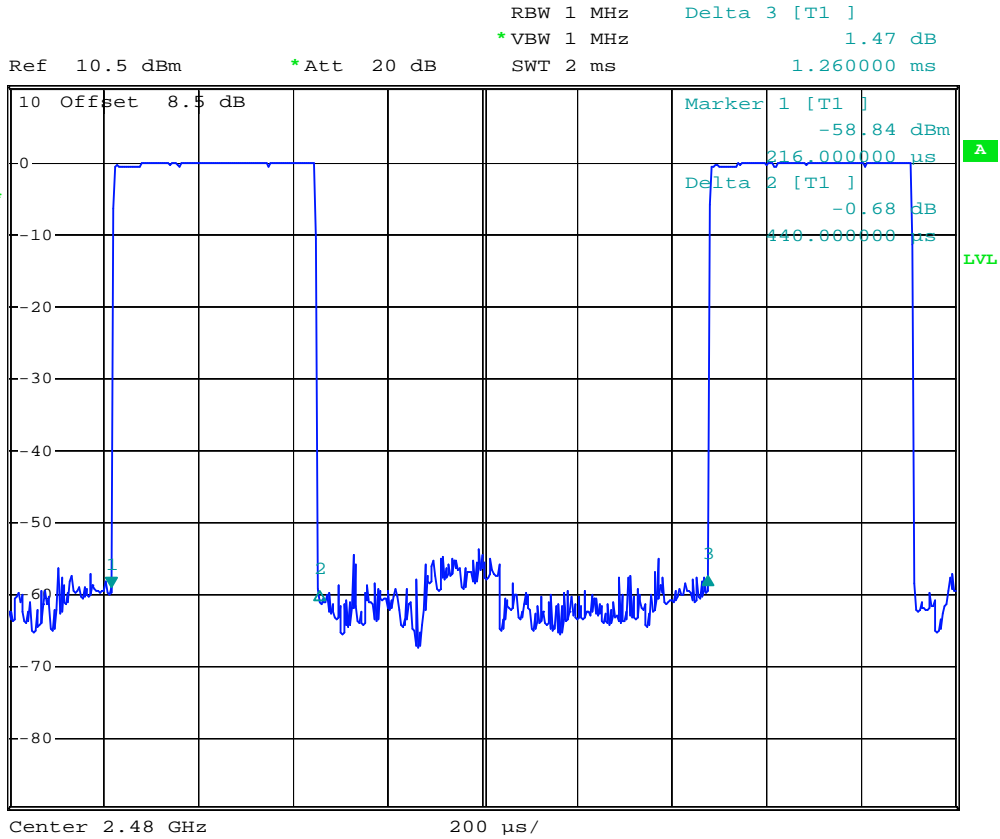
Ref 10.5 dBm *Att 20 dB RBW 1 MHz
*VBW 1 MHz SWT 10 s



Date: 6.MAY.2006 00:00:57



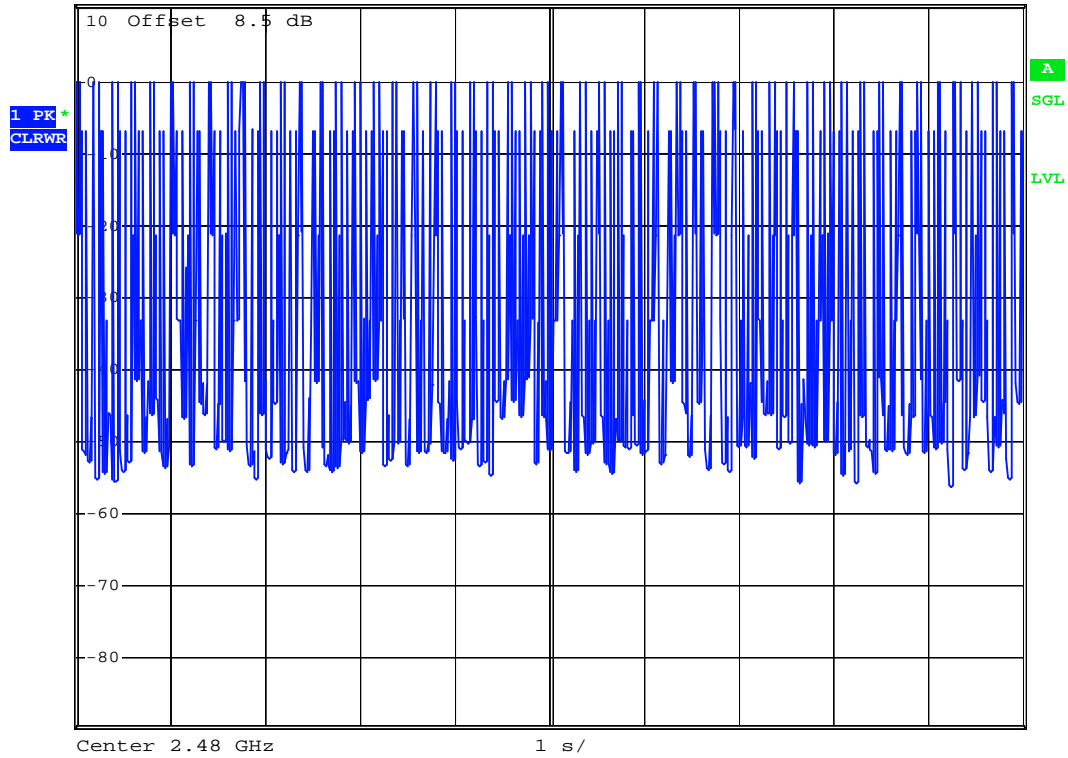
DH1 (CH78)



Date: 5.MAY.2006 23:42:46



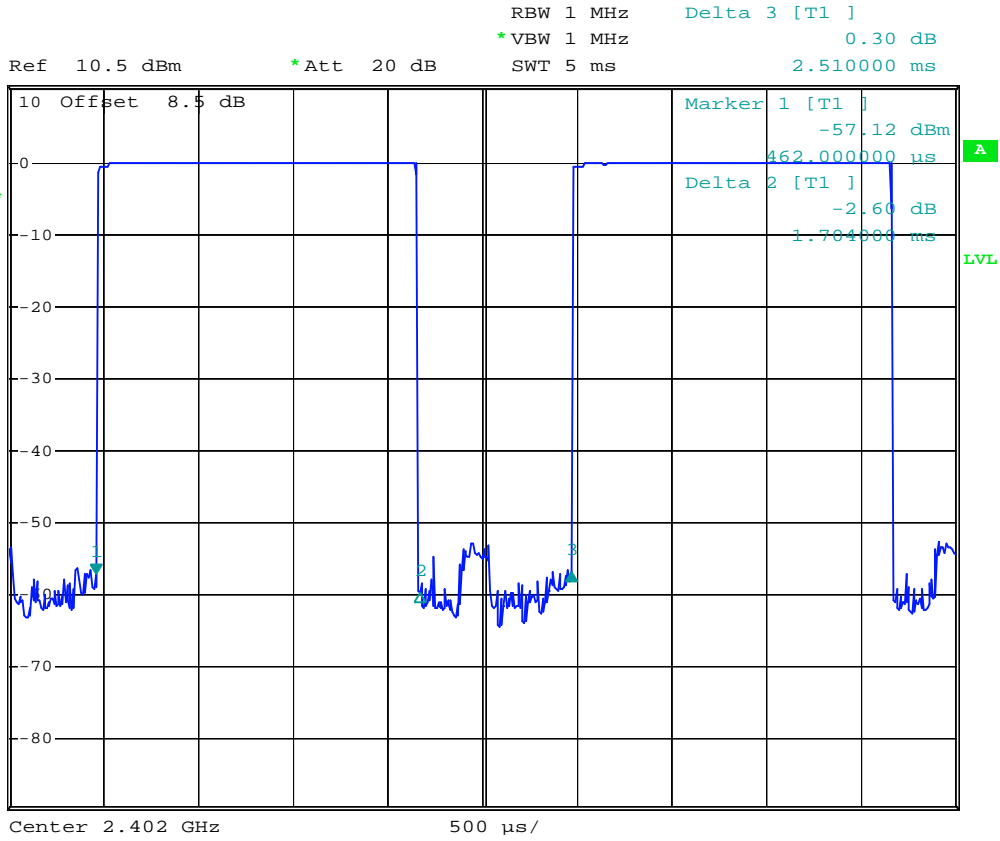
Ref 10.5 dBm *Att 20 dB RBW 1 MHz
*VBW 1 MHz SWT 10 s



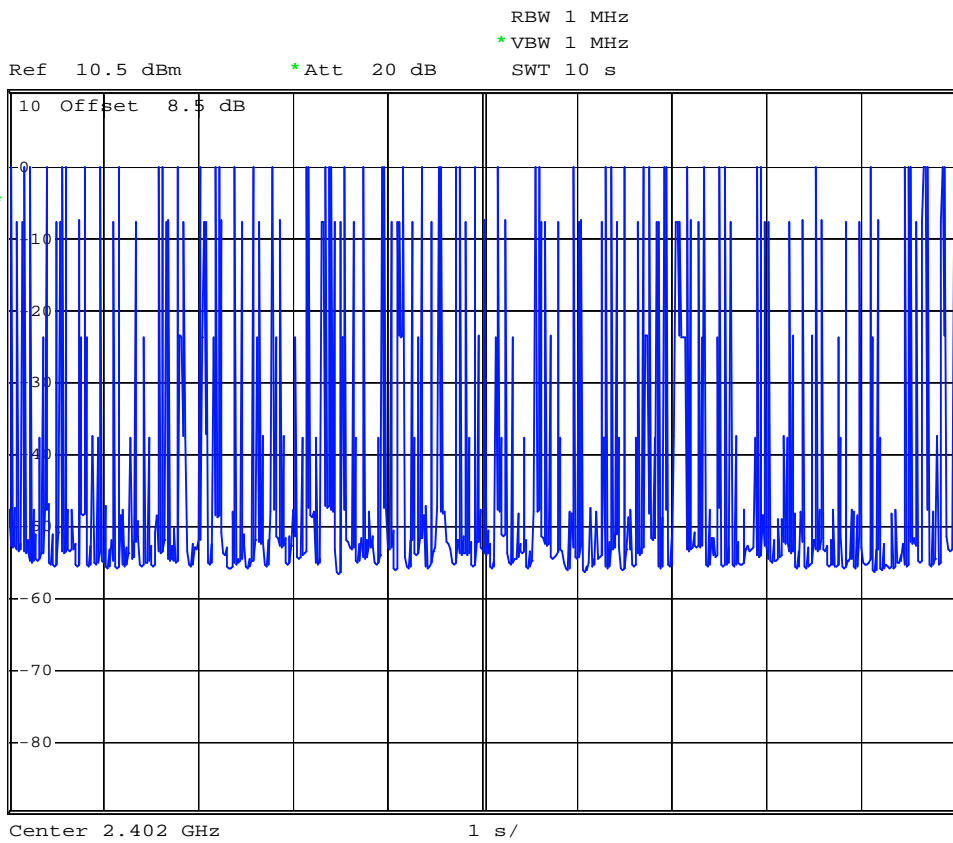
Date: 6.MAY.2006 00:00:26



DH3 (CH00)



Date: 5.MAY.2006 23:47:26



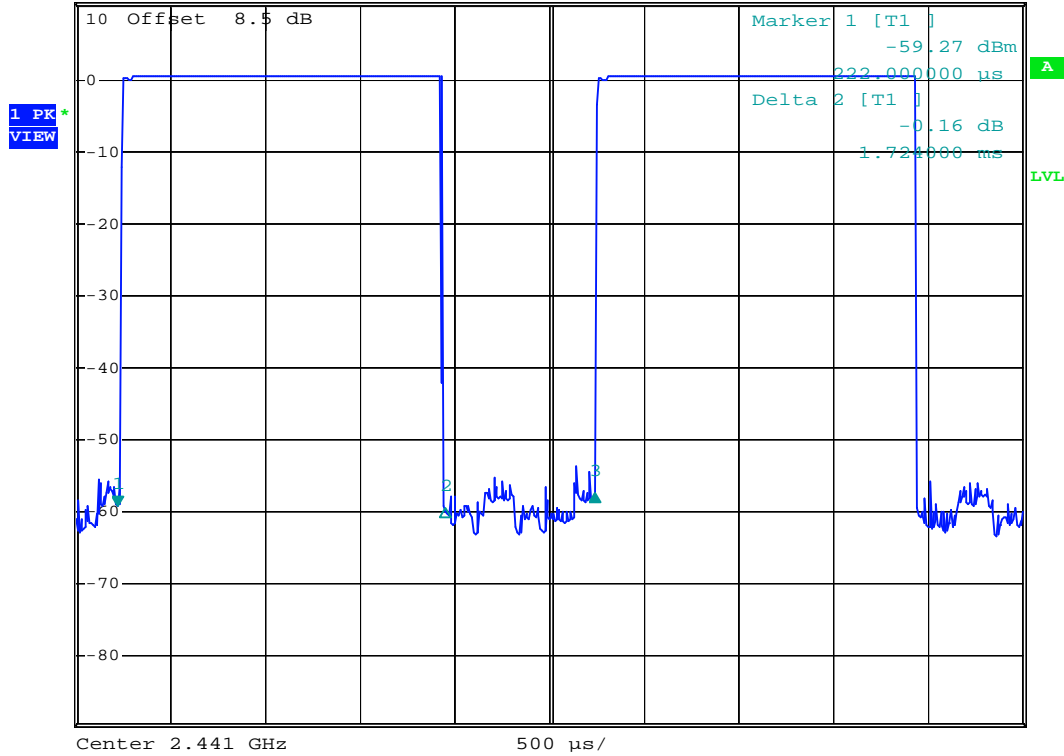
Date: 5.MAY.2006 23:58:42



DH3 (CH39)



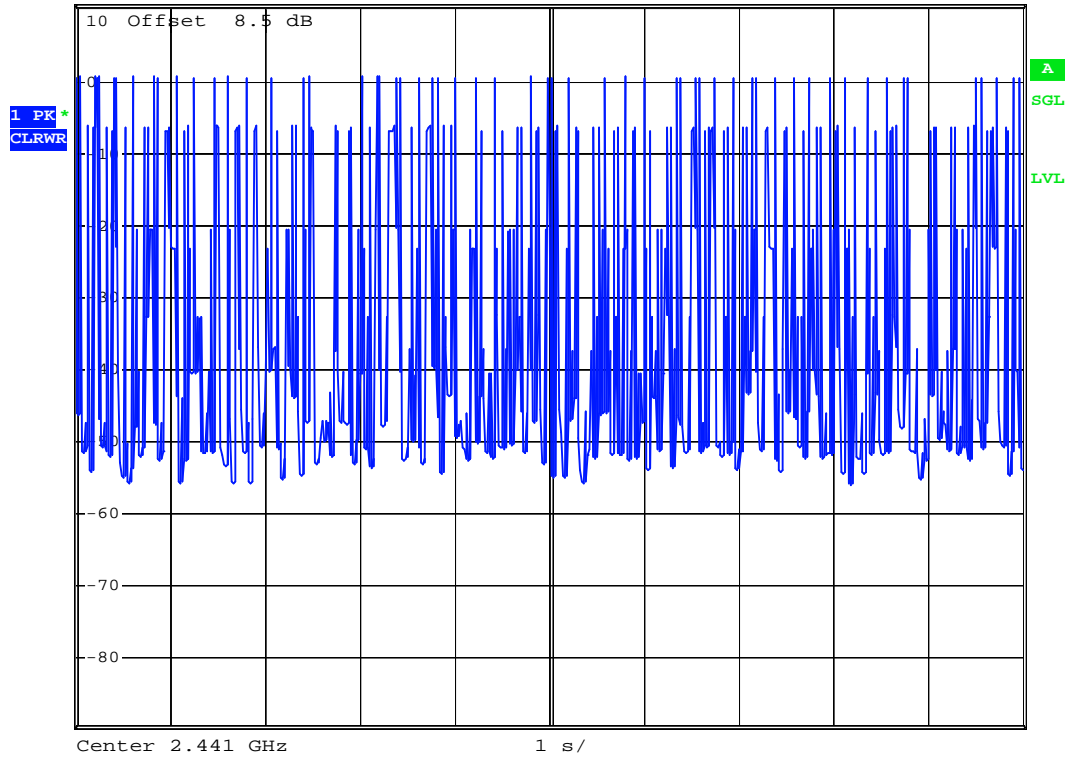
RBW 1 MHz Delta 3 [T1]
 *VBW 1 MHz 1.87 dB
 Ref 10.5 dBm *Att 20 dB SWT 5 ms 2.520000 ms



Date: 5.MAY.2006 23:48:22



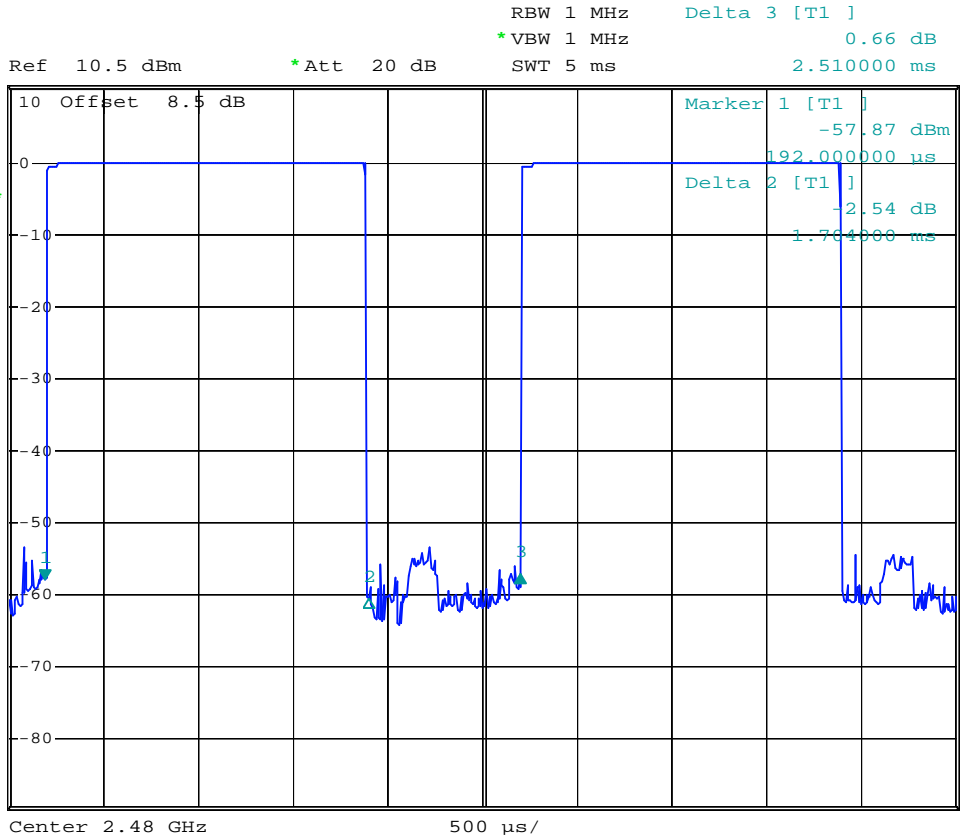
Ref 10.5 dBm *Att 20 dB RBW 1 MHz
*VBW 1 MHz SWT 10 s



Date: 5.MAY.2006 23:59:16



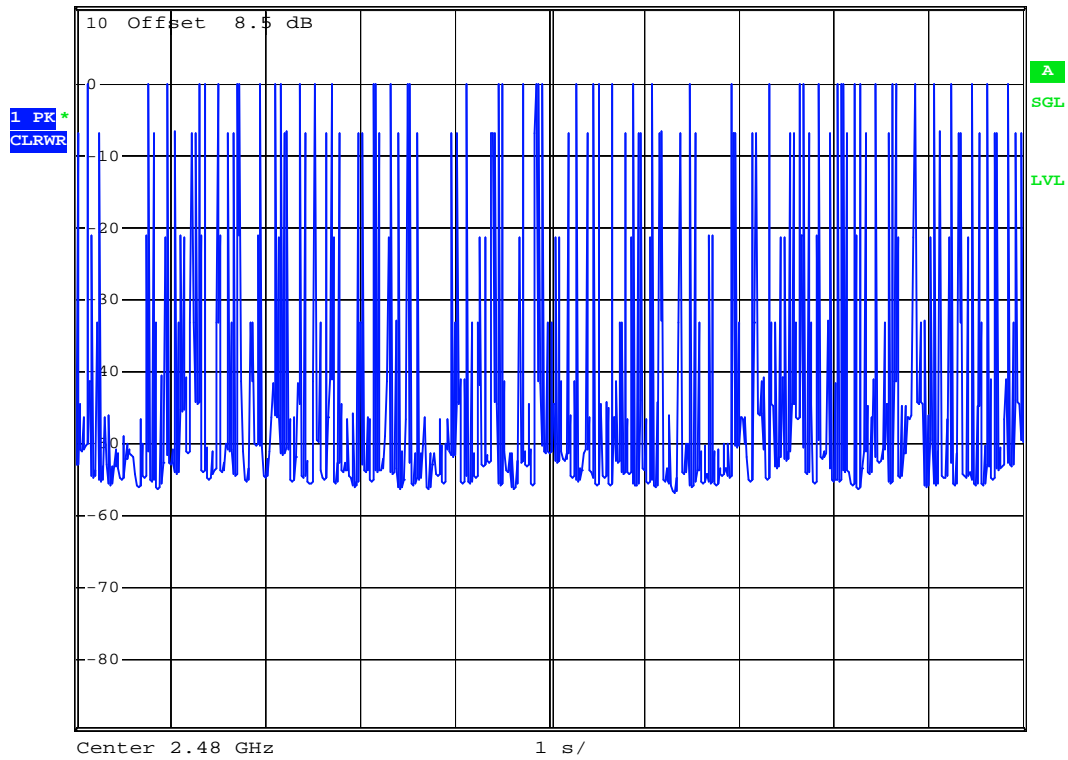
DH3 (CH78)



Date: 5.MAY.2006 23:48:56



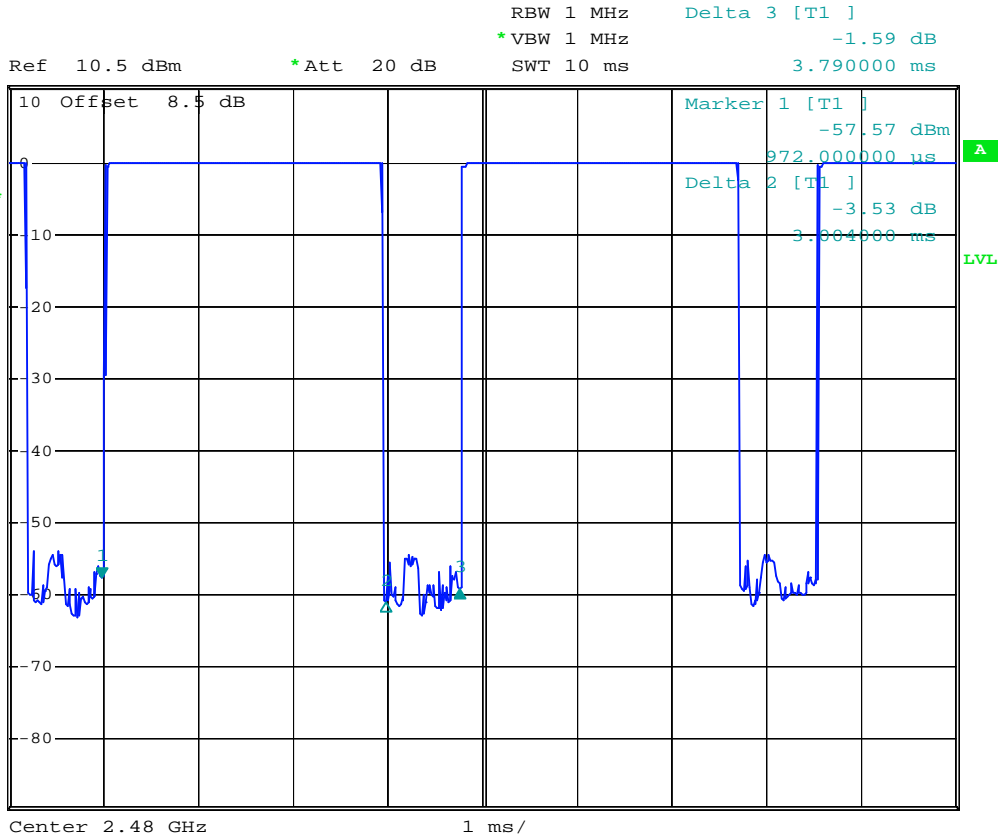
Ref 10.5 dBm *Att 20 dB RBW 1 MHz
*VBW 1 MHz SWT 10 s



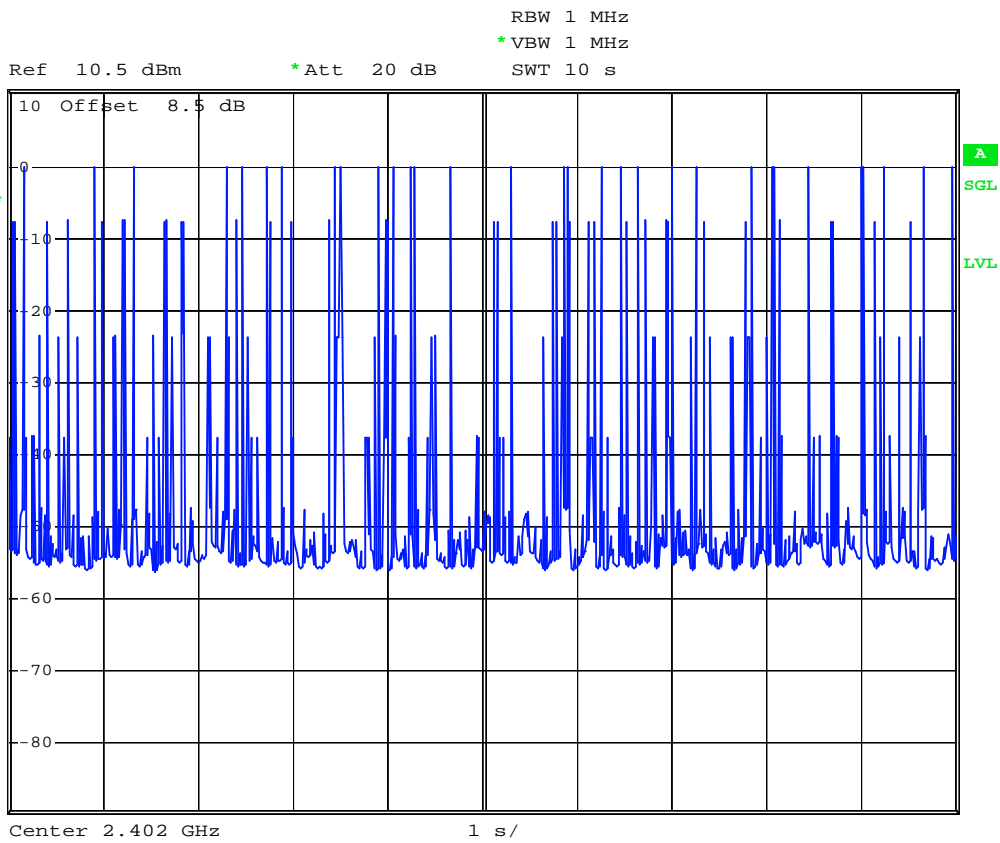
Date: 5.MAY.2006 23:59:46



DH5 (CH00)



Date: 5.MAY.2006 23:52:44



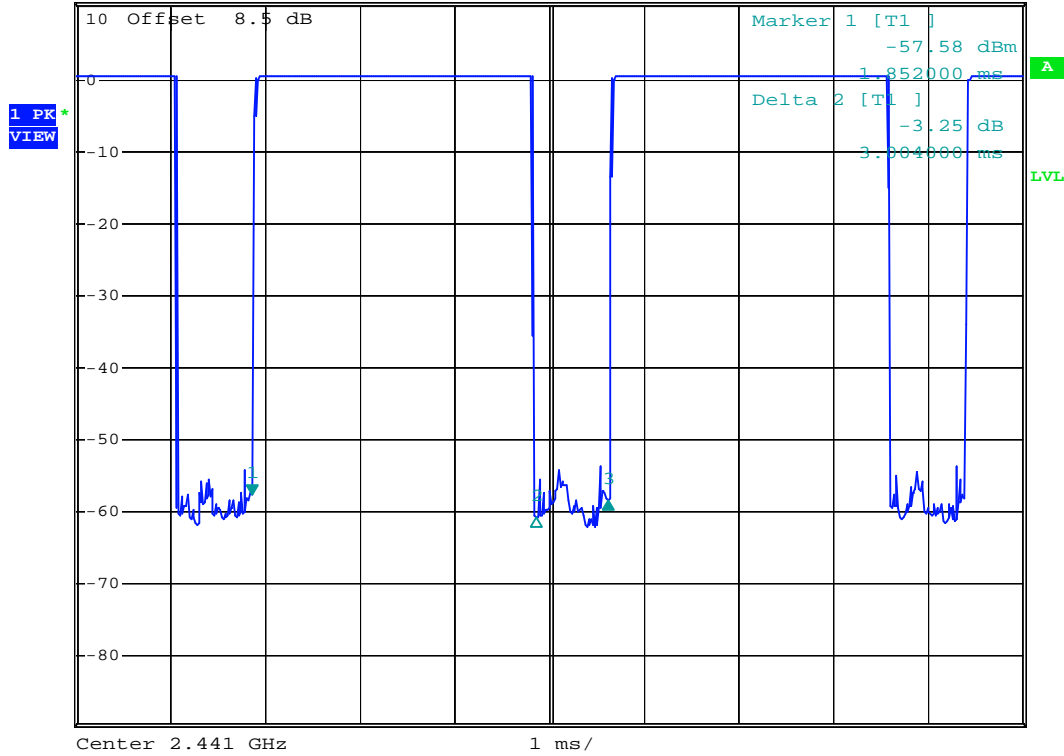
Date: 5.MAY.2006 23:58:13



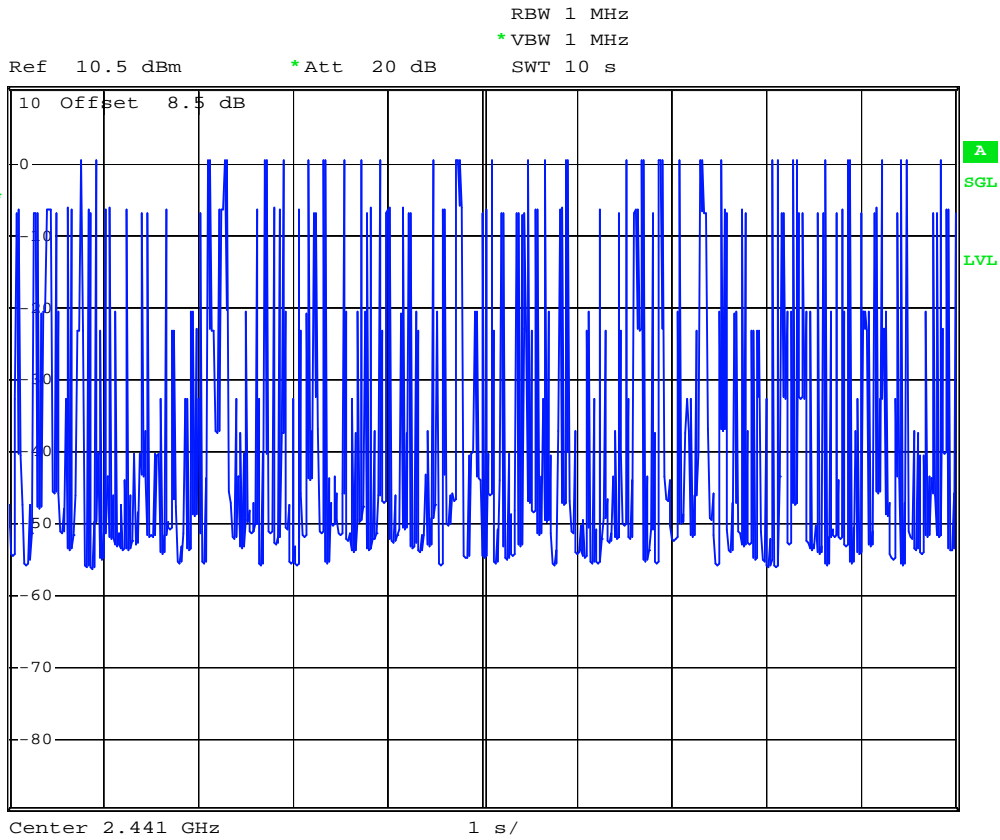
DH5 (CH39)



RBW 1 MHz Delta 3 [T1]
 *VBW 1 MHz -0.78 dB
 Ref 10.5 dBm *Att 20 dB SWT 10 ms 3.777000 ms



Date: 5.MAY.2006 23:53:45



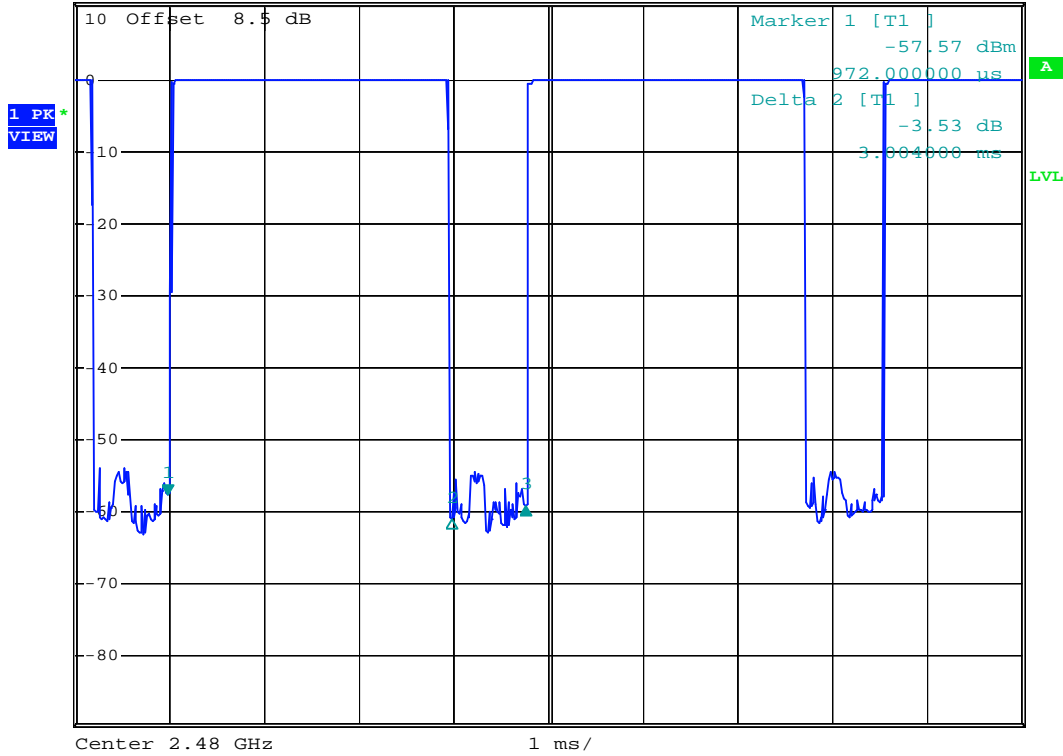
Date: 5.MAY.2006 23:57:33



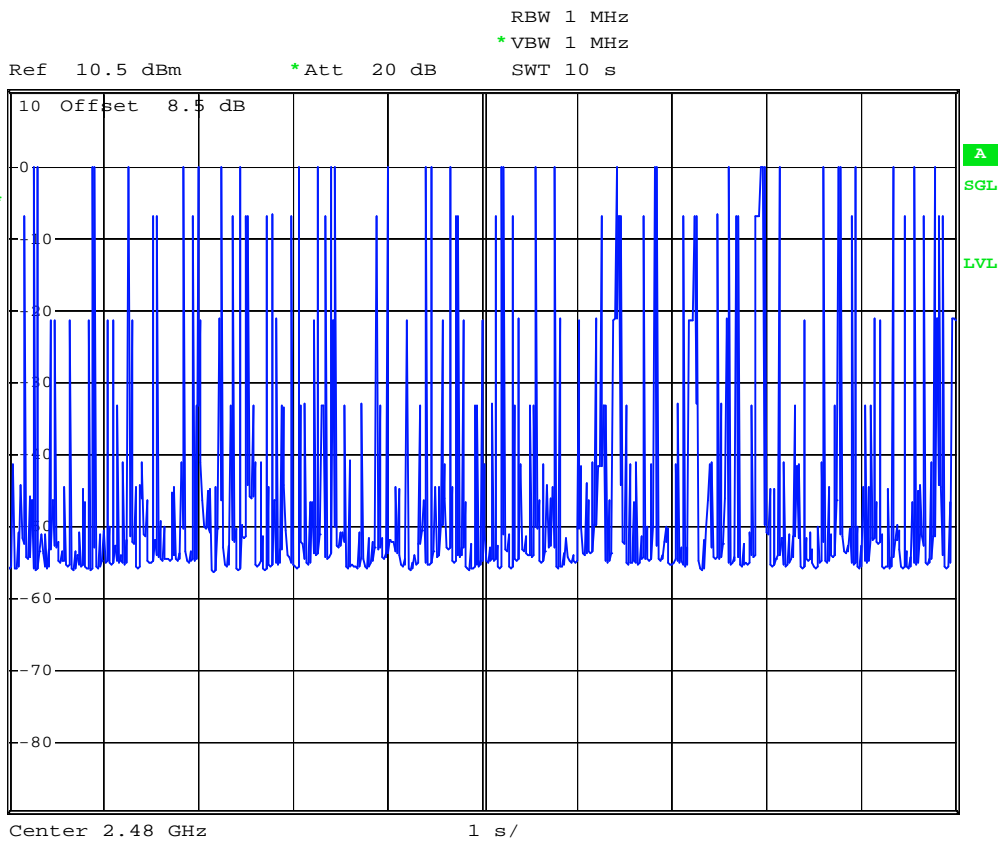
DH5 (CH78)



RBW 1 MHz Delta 3 [T1]
 *VBW 1 MHz -1.59 dB
 Ref 10.5 dBm *Att 20 dB SWT 10 ms 3.790000 ms



Date: 5.MAY.2006 23:52:44



Date: 5.MAY.2006 23:57:05

5.6 Output Power

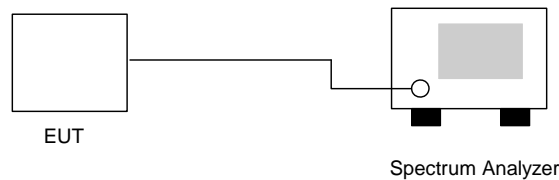
5.6.1 Measuring Instruments :

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: 52%
- Test Engineer : James

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)	Plot Ref. No.
00	2402	0.18	1W/30 dBm	Mode 1
39	2441	0.89	1W/30 dBm	Mode 2
78	2480	0.3	1W/30 dBm	Mode 3

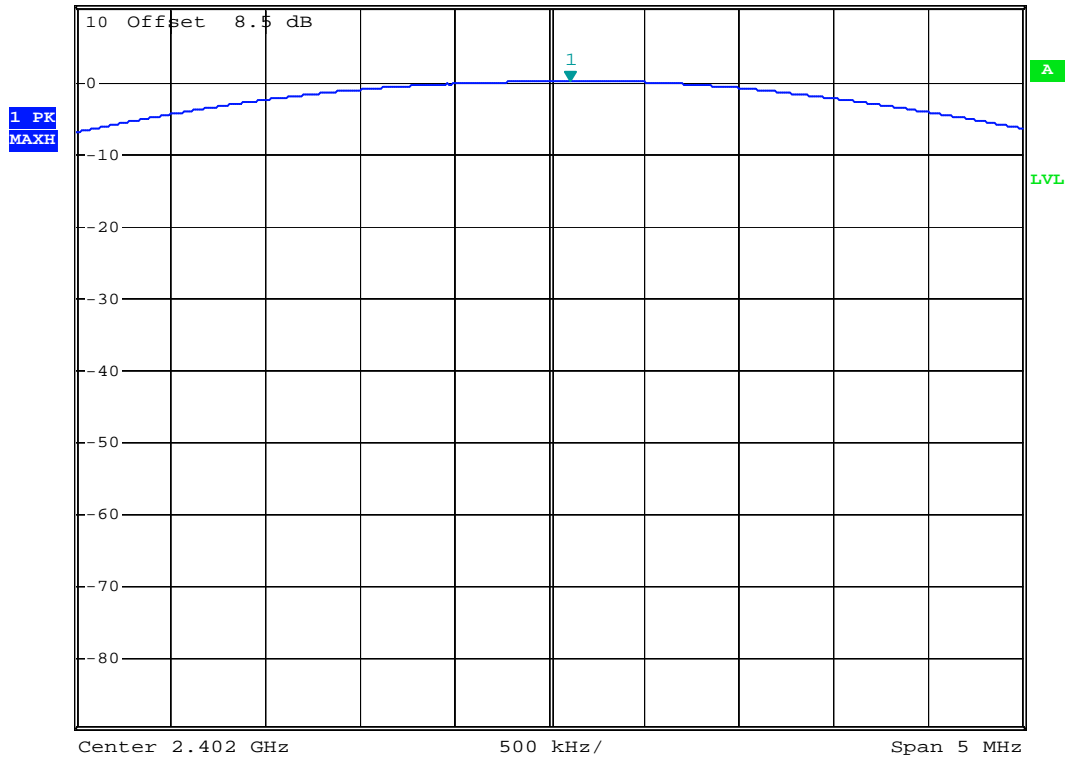


5.6.5 Output Power

Mode 1: CH00 (2402MHz)



Ref 10.5 dBm *Att 20 dB *RBW 3 MHz Marker 1 [T1]
*VBW 3 MHz 0.18 dBm
*SWT 500 ms 2.402110000 GHz



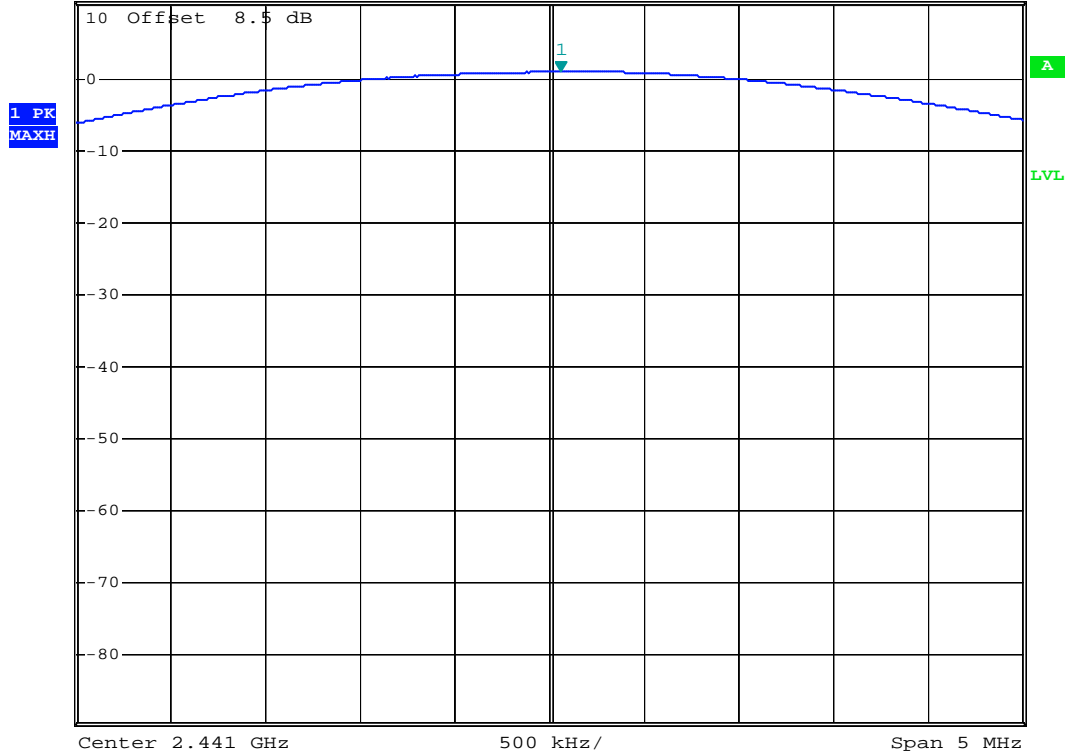
Date: 5.MAY.2006 23:07:15



Mode 2: CH39 (2441MHz)



Ref 10.5 dBm *Att 20 dB *RBW 3 MHz Marker 1 [T1] 0.89 dBm
*VBW 3 MHz *SWT 500 ms 2.441060000 GHz



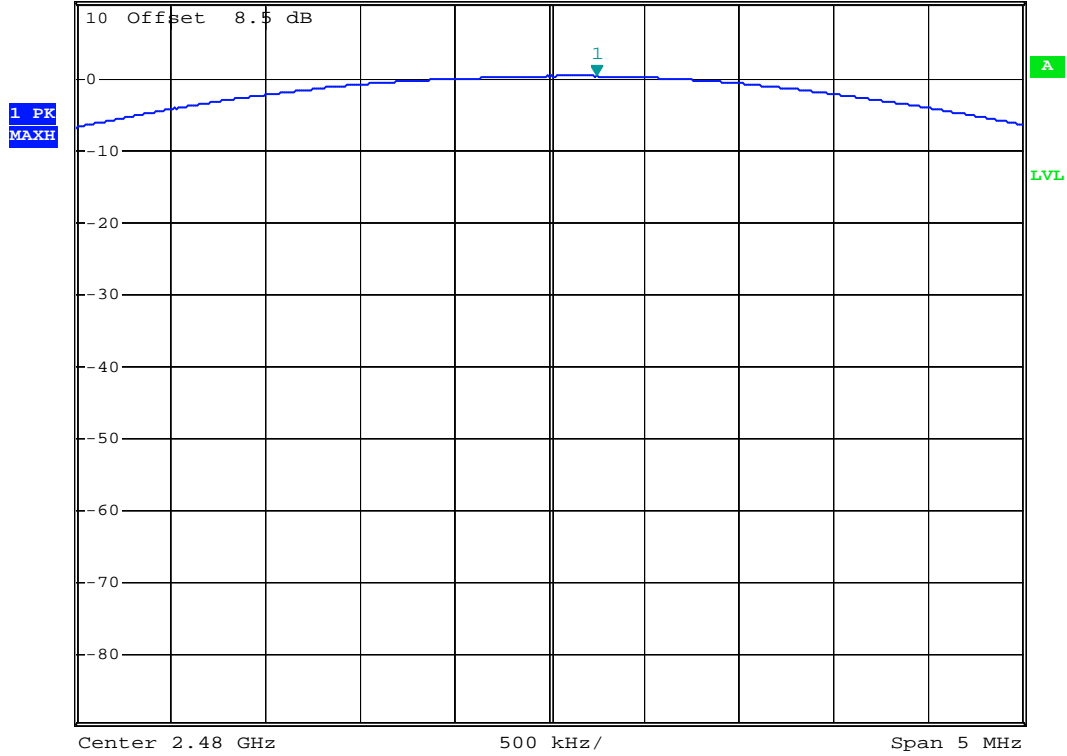
Date: 5.MAY.2006 23:08:52



Mode 3: CH78 (2480MHz)



Ref 10.5 dBm *Att 20 dB *RBW 3 MHz Marker 1 [T1] 0.30 dBm
*VBW 3 MHz *SWT 500 ms 2.480250000 GHz



Date: 5.MAY.2006 23:09:29



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: 52%
- 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
2388.00	51.32	-22.68	74.00	52.27	30.26	35.44	4.23	100	360	Peak
2388.00	39.59	-14.41	54.00	40.54	30.26	35.44	4.23	100	28	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
2378.00	51.86	-22.14	74.00	52.81	30.25	35.44	4.23	100	360	Peak
2378.00	41.95	-12.05	54.00	42.91	30.25	35.44	4.23	100	84	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	58.42	-15.58	74.00	59.28	30.29	35.51	4.36	100	360	Average
2483.50	46.18	-7.82	54.00	47.04	30.29	35.51	4.36	100	40	Peak

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
2483.50	64.08	-9.92	74.00	64.94	30.29	35.51	4.36	100	360	Peak
2483.50	49.58	-4.42	54.00	50.44	30.29	35.51	4.36	100	81	Average

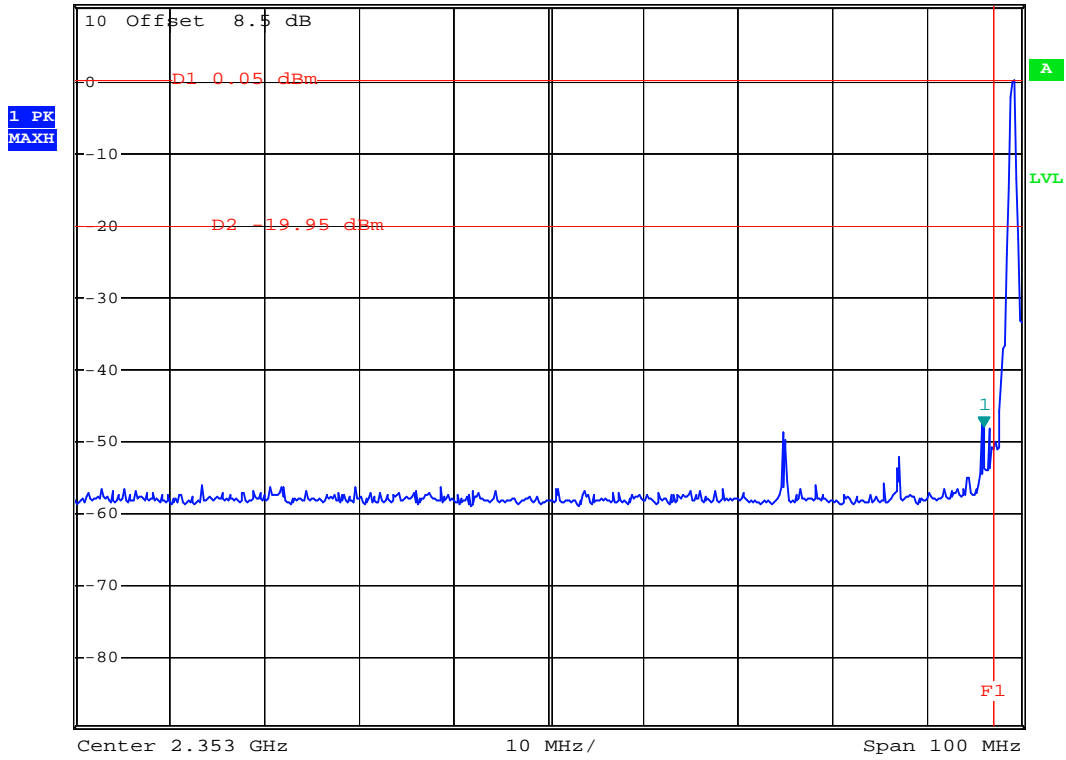


5.7.5 Frequency Band Edge

Mode 1: CH00 (2402 MHz)



Ref 10.5 dBm *Att 20 dB *RBW 100 kHz Marker 1 [T1]
*VBW 100 kHz -47.95 dBm
*SWT 500 ms 2.399000000 GHz



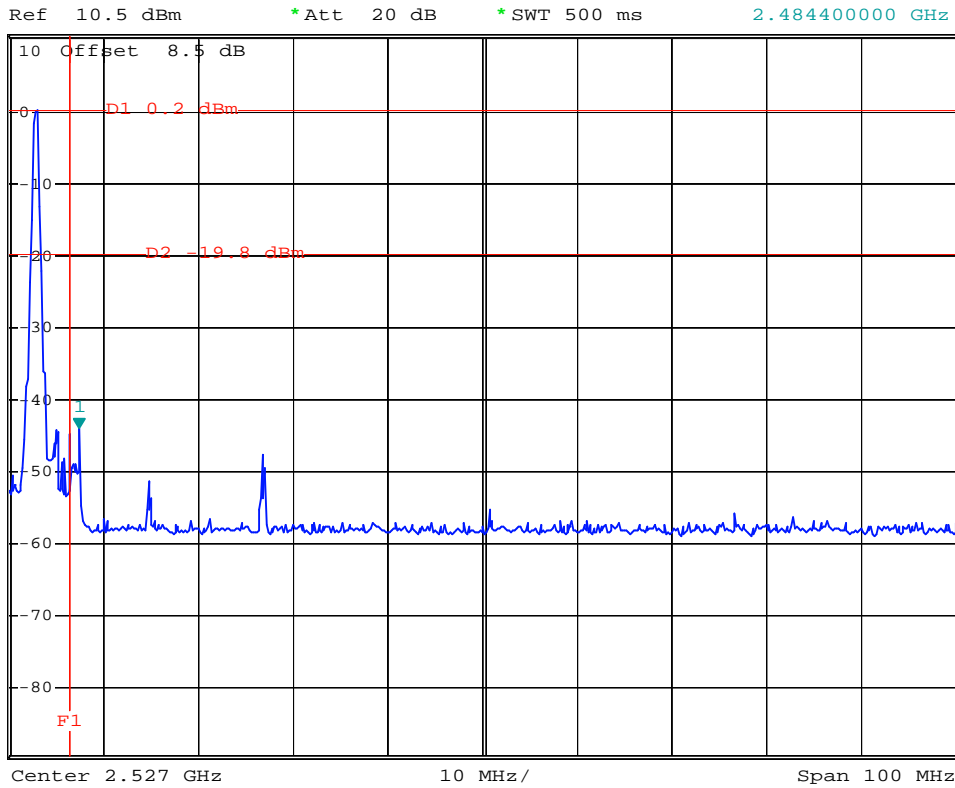
Date: 5.MAY.2006 23:18:26



Mode 3: CH78 (2480 MHz)



*RBW 100 kHz Marker 1 [T1]
*VBW 100 kHz -43.99 dBm
*SWT 500 ms 2.484400000 GHz



Date: 5.MAY.2006 23:20:00



5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

5.8.2 Test Procedures :

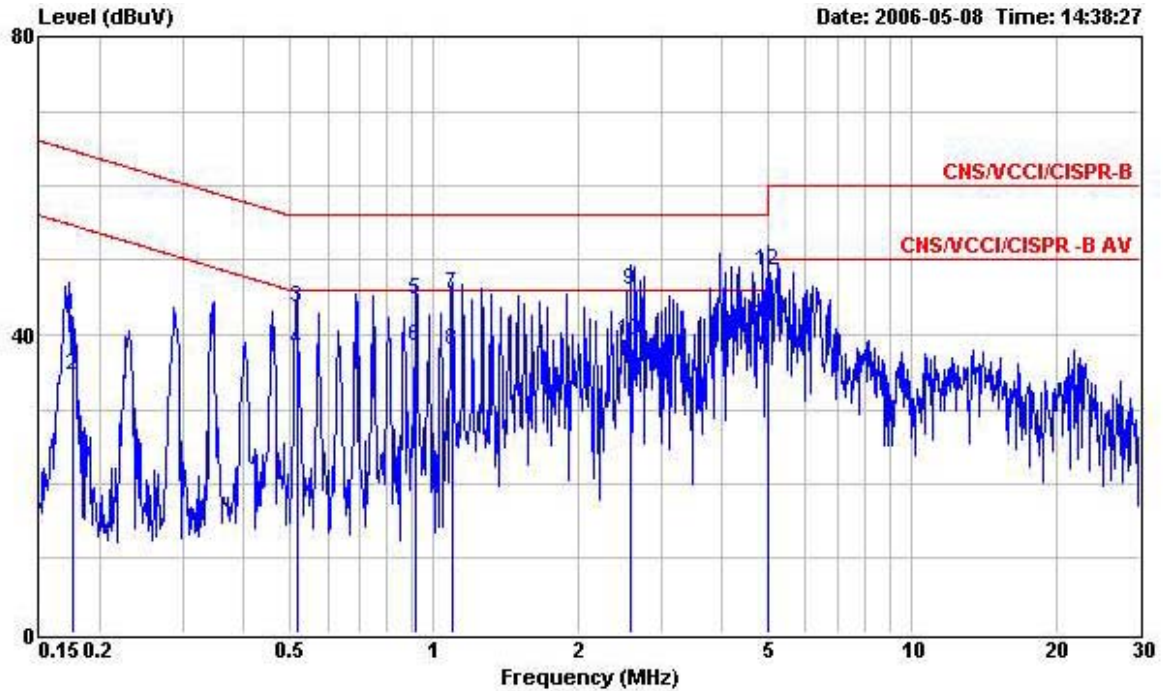
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network (LISN).
- c. All the support units are connected to the other LISN.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

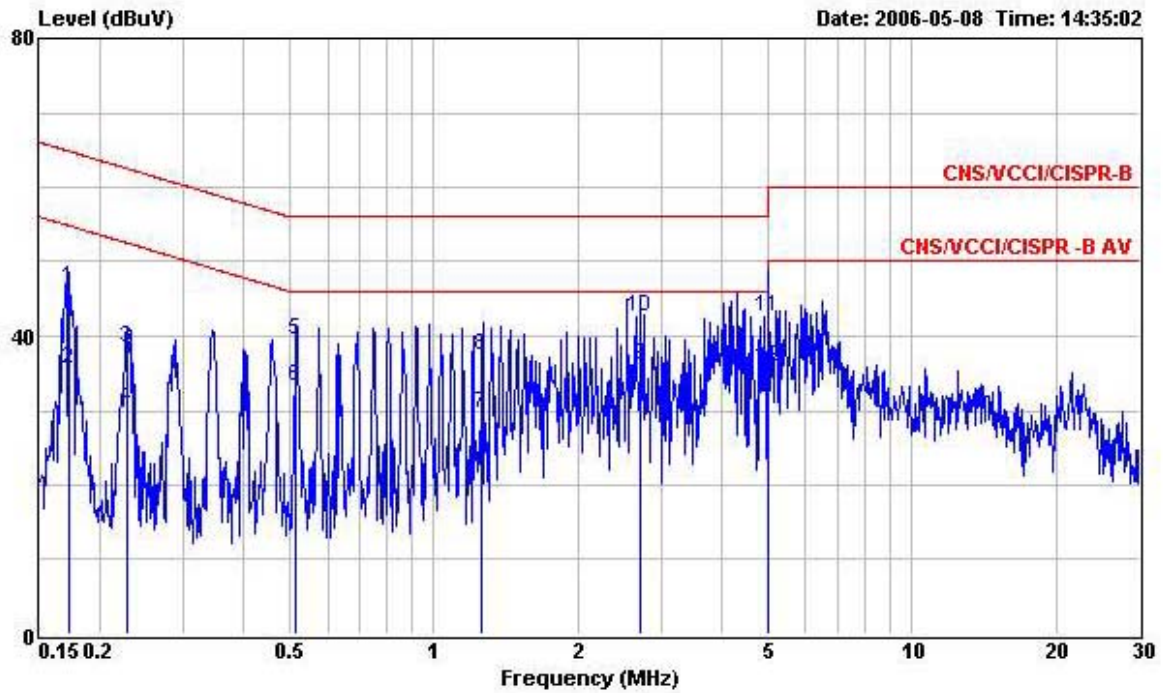
- Temperature: 24°C
- Relative Humidity: 52%
- Test Engineer: James

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



Site : site
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 LINE
 EUT : GSM 900/1800/1900/2100 MOBILE PHONE
 Power : 120V/60Hz
 Model : FD642603
 Memo : PCS 1900 IDLE+EARPHONE+ADAPTER
 Memo : +BT LINK+CAMERA
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.176	42.58	-22.10	64.68	42.42	0.10	0.06	QP
2	0.176	34.52	-20.16	54.68	34.36	0.10	0.06	Average
3	0.518	43.75	-12.25	56.00	43.58	0.10	0.07	QP
4	0.518	37.92	-8.08	46.00	37.75	0.10	0.07	Average
5	0.918	44.72	-11.28	56.00	44.58	0.10	0.04	QP
6	0.918	38.52	-7.48	46.00	38.38	0.10	0.04	Average
7	1.090	45.46	-10.54	56.00	45.31	0.10	0.05	QP
8	1.090	38.03	-7.97	46.00	37.88	0.10	0.05	Average
9	2.580	46.02	-9.98	56.00	45.76	0.14	0.12	QP
10	2.580	39.30	-6.70	46.00	39.04	0.14	0.12	Average
11	4.990	41.51	-4.49	46.00	41.17	0.22	0.12	Average
12	4.990	48.54	-7.46	56.00	48.20	0.22	0.12	QP



Site : site
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL
 EUT : GSM 900/1800/1900/2100 MOBILE PHONE
 Power : 120V/60Hz
 Model : FD642603
 Memo : PCS 1900 IDLE+EARPHONE+ADAPTER
 Memo : +BT LINK+CAMERA
 Memo :

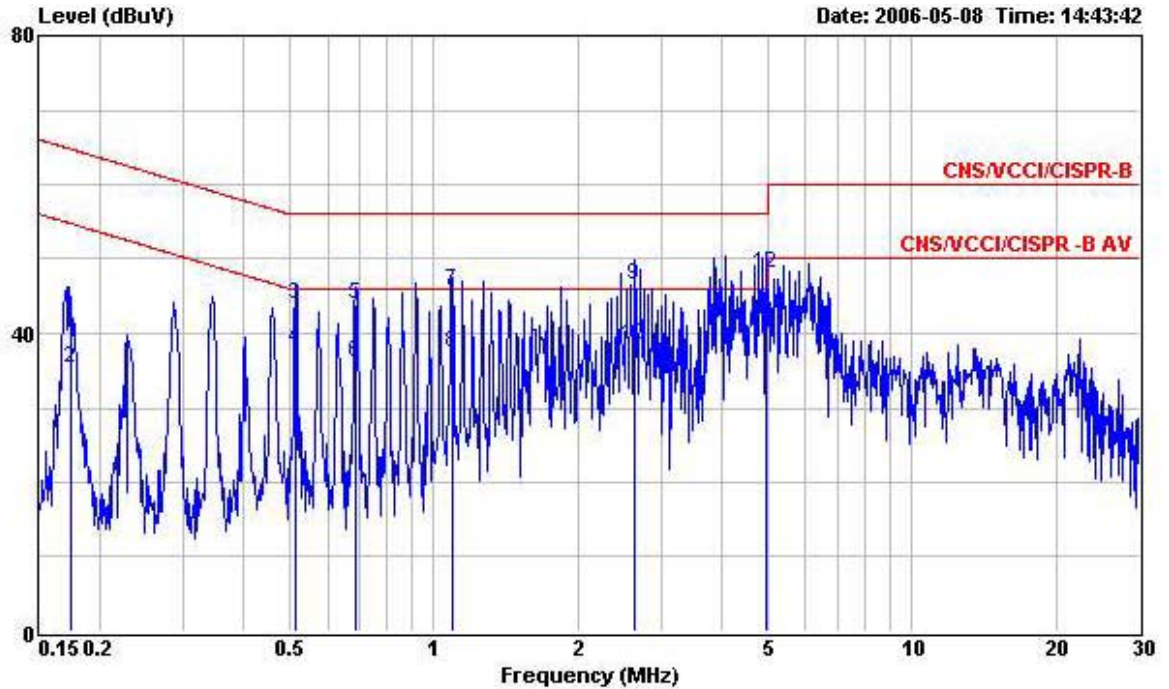
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.172	46.50	-18.36	64.86	46.34	0.10	0.06	QP
2	0.172	35.49	-29.37	64.86	35.33	0.10	0.06	Average
3	0.229	38.51	-23.98	62.49	38.35	0.10	0.06	QP
4	0.229	30.33	-32.16	62.49	30.17	0.10	0.06	Average
5	0.516	39.59	-16.41	56.00	39.42	0.10	0.07	QP
6	0.516	33.14	-22.86	56.00	32.97	0.10	0.07	Average
7	1.260	29.54	-26.46	56.00	29.37	0.10	0.07	Average
8	1.260	37.42	-18.58	56.00	37.25	0.10	0.07	QP
9	2.700	36.10	-19.90	56.00	35.88	0.10	0.12	Average
10	2.700	42.54	-13.46	56.00	42.32	0.10	0.12	QP
11	4.990	42.68	-13.32	56.00	42.44	0.12	0.12	QP
12	4.990	35.88	-20.12	56.00	35.64	0.12	0.12	Average



5.8.4 Test Data Test Mode 2

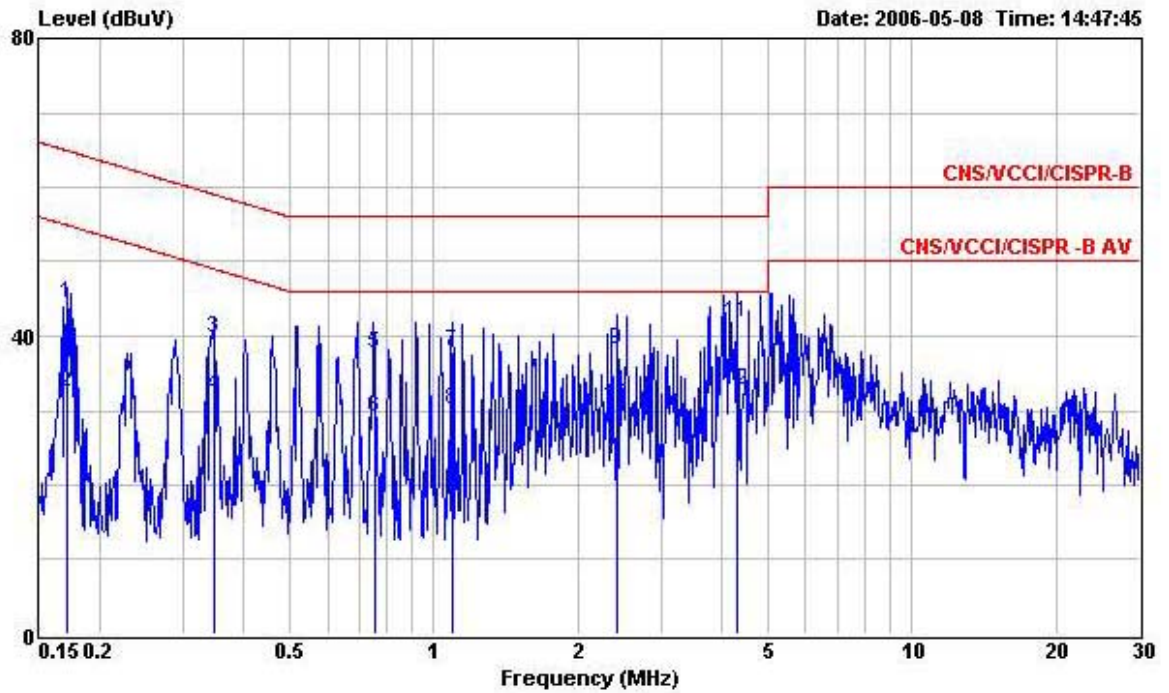
- Temperature: 24°C
- Relative Humidity: 52%
- Test Engineer: James

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



Site : site
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 LINE
 EUT : GSM 900/1800/1900/2100 MOBILE PHONE
 Power : 120V/60Hz
 Model : FD642603
 Memo : PCS 1900 IDLE+EARPHONE+ADAPTER
 Memo : +BT LINK+MP3
 Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.174	43.48	-21.31	64.79	43.32	0.10	0.06	QP
2	0.174	35.42	-19.37	54.79	35.26	0.10	0.06	Average
3	0.516	43.91	-12.09	56.00	43.74	0.10	0.07	QP
4	0.516	37.87	-8.13	46.00	37.70	0.10	0.07	Average
5	0.688	43.94	-12.06	56.00	43.78	0.10	0.06	QP
6	0.688	35.99	-10.01	46.00	35.83	0.10	0.06	Average
7	1.090	45.74	-10.26	56.00	45.59	0.10	0.05	QP
8	1.090	37.37	-8.63	46.00	37.22	0.10	0.05	Average
9	2.640	46.58	-9.42	56.00	46.32	0.14	0.12	QP
10	2.640	38.41	-7.59	46.00	38.15	0.14	0.12	Average
11	4.939	39.88	-6.12	46.00	39.54	0.22	0.12	Average
12	4.939	48.08	-7.92	56.00	47.74	0.22	0.12	QP



Site : site
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL
 EUT : GSM 900/1800/1900/2100 MOBILE PHONE
 Power : 120V/60Hz
 Model : FD642603
 Memo : PCS 1900 IDLE+EARPHONE+ADAPTER
 Memo : +BT LINK+MP3
 Memo :

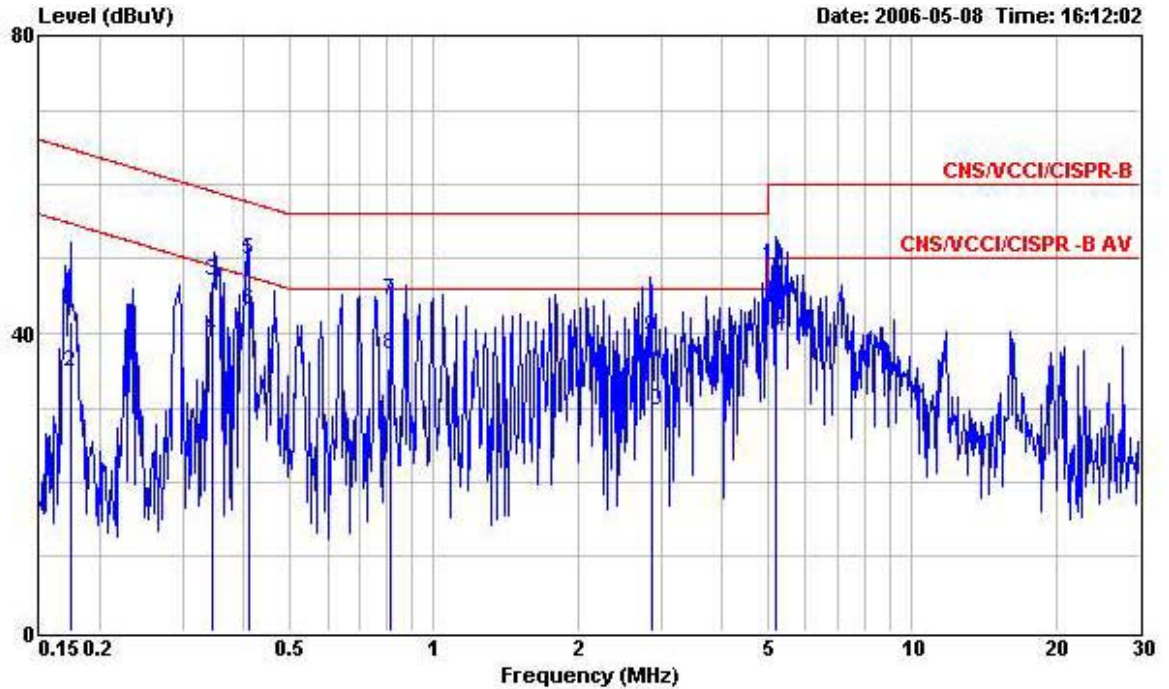
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.171	44.32	-20.59	64.91	44.16	0.10	0.06	QP
2	0.171	32.48	-32.43	64.91	32.32	0.10	0.06	Average
3	0.348	39.68	-19.33	59.01	39.50	0.10	0.08	QP
4	0.348	31.95	-27.06	59.01	31.77	0.10	0.08	Average
5	0.751	37.63	-18.37	56.00	37.48	0.10	0.05	QP
6	0.751	29.01	-26.99	56.00	28.86	0.10	0.05	Average
7	1.090	37.86	-18.14	56.00	37.71	0.10	0.05	QP
8	1.090	30.04	-25.96	56.00	29.89	0.10	0.05	Average
9	2.420	38.20	-17.80	56.00	37.98	0.10	0.12	QP
10	2.420	30.70	-25.30	56.00	30.48	0.10	0.12	Average
11	4.310	41.85	-14.15	56.00	41.62	0.11	0.12	QP
12	4.310	32.80	-23.20	56.00	32.57	0.11	0.12	Average



5.8.5 Test Data Test Mode 3

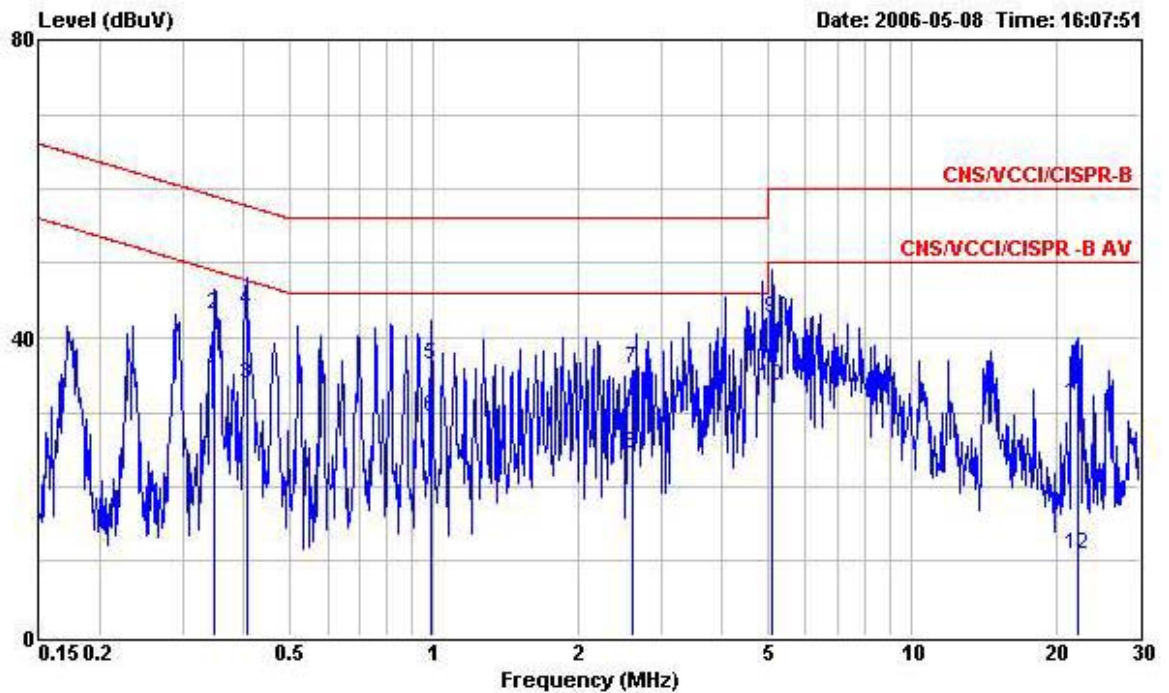
- Temperature: 24°C
- Relative Humidity: 52%
- Test Engineer: James

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



Site : site
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 LINE
 EUT : GSM 900/1800/1900/2100 MOBILE PHONE
 Power : 120V/60Hz
 Model : FD642603
 Memo : USB LINK+ADAPTER
 Memo :
 Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.174	41.72	-23.05	64.77	41.56	0.10	0.06	QP
2	0.174	34.77	-20.00	54.77	34.61	0.10	0.06	Average
3	0.345	47.08	-12.00	59.08	46.90	0.10	0.08	QP
4	0.345	39.41	-9.67	49.08	39.23	0.10	0.08	Average
5	0.409	49.92	-7.75	57.67	49.74	0.10	0.08	QP
6	0.409	43.06	-4.61	47.67	42.88	0.10	0.08	Average
7	0.813	44.35	-11.65	56.00	44.20	0.10	0.05	QP
8	0.813	37.15	-8.85	46.00	37.00	0.10	0.05	Average
9	2.855	39.46	-16.54	56.00	39.19	0.15	0.12	QP
10	2.855	29.70	-16.30	46.00	29.43	0.15	0.12	Average
11	5.181	49.02	-10.98	60.00	48.66	0.23	0.13	QP
12	5.181	40.42	-9.58	50.00	40.06	0.23	0.13	Average



Site : site
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL
 EUT : GSM 900/1800/1900/2100 MOBILE PHONE
 Power : 120V/60Hz
 Model : FD642603
 Memo : USB LINK+ADAPTER
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.348	34.37	-24.64	59.01	34.19	0.10	0.08	Average
2	0.348	43.00	-16.01	59.01	42.82	0.10	0.08	QP
3	0.406	33.82	-23.91	57.73	33.64	0.10	0.08	Average
4	0.406	43.54	-14.19	57.73	43.36	0.10	0.08	QP
5	0.987	36.26	-19.74	56.00	36.12	0.10	0.04	QP
6	0.987	29.33	-26.67	56.00	29.19	0.10	0.04	Average
7	2.610	35.80	-20.20	56.00	35.58	0.10	0.12	QP
8	2.610	24.30	-31.70	56.00	24.08	0.10	0.12	Average
9	5.120	42.54	-17.46	60.00	42.28	0.13	0.13	QP
10	5.120	33.49	-26.51	60.00	33.23	0.13	0.13	Average
11	22.300	31.06	-28.94	60.00	30.41	0.45	0.20	QP
12	22.300	11.03	-48.97	60.00	10.38	0.45	0.20	Average

5.9 Radiated Emission Measurement

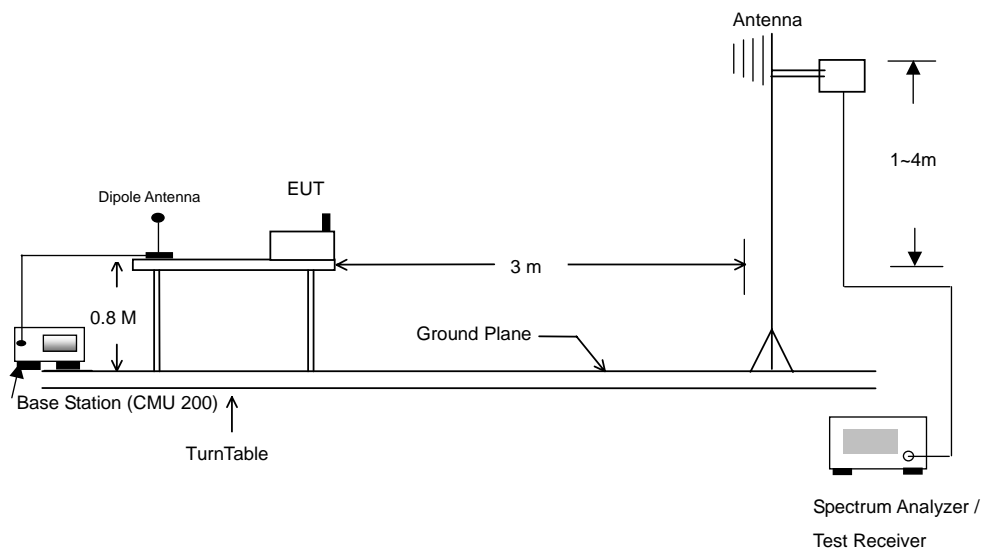
5.9.1 Measuring Instruments

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

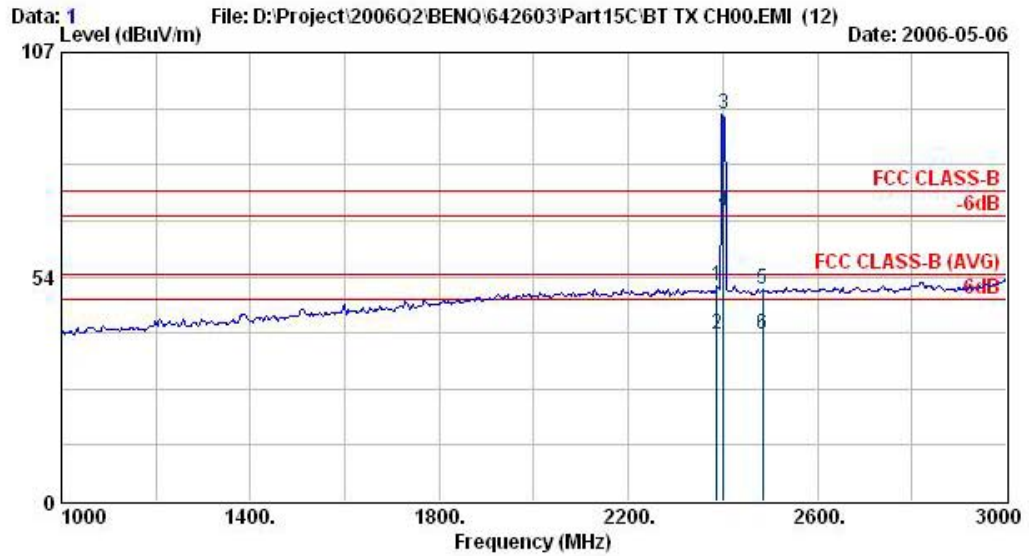




5.9.4 Test Data

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

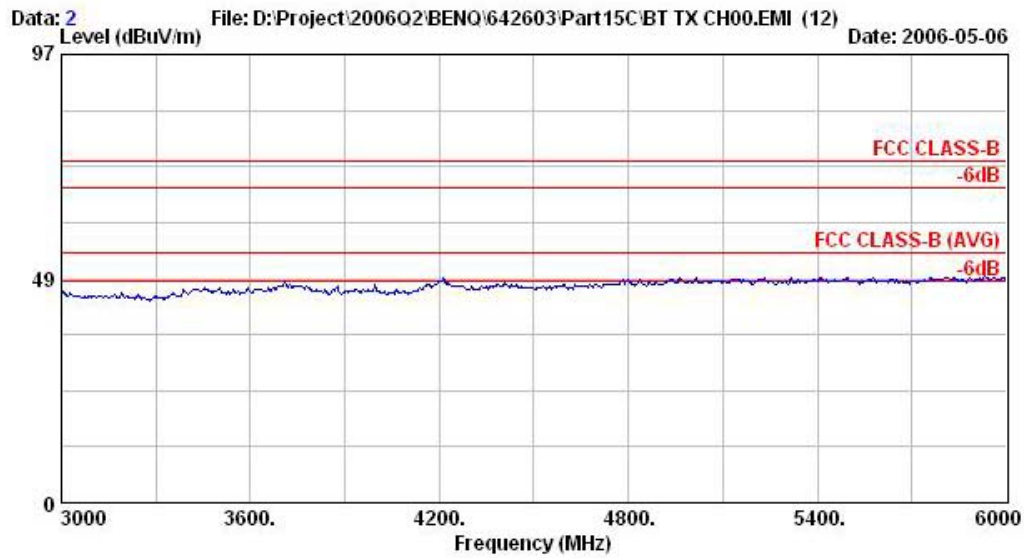
The test that passed at the minimum margin was marked by the frame in the following test record



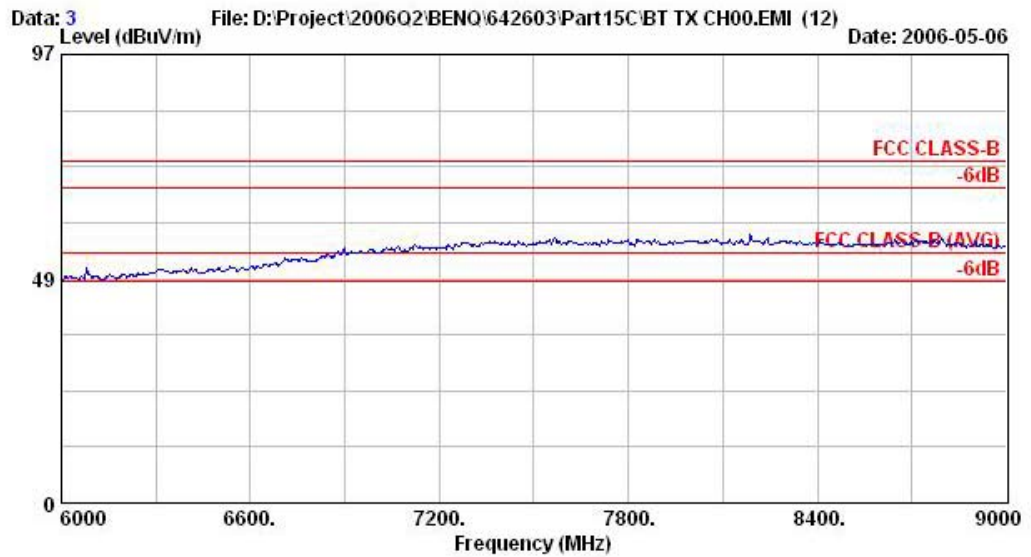
Site : 03CH06-HY
 Condition : HF-ANT-060410 HORIZONTAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH00,2402MHz
 Plane : E1
 Memo : DH1

	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 @	2388.00	51.32	-22.68	74.00	52.27	30.26	4.23	35.44	100	360	Peak
2 @	2388.00	39.59	-14.41	54.00	40.54	30.26	4.23	35.44	100	28	Average
3 @	2402.00	92.42			93.35	30.26	4.26	35.46	100	360	Peak
4 @	2402.00	69.01			69.95	30.26	4.26	35.46	100	28	Average
5 @	2484.00	50.59	-23.41	74.00	51.45	30.29	4.36	35.51	100	360	Peak
6 @	2484.00	39.67	-14.33	54.00	40.53	30.29	4.36	35.51	100	28	Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH00,2402MHz
Plane : E1
Memo : DH1

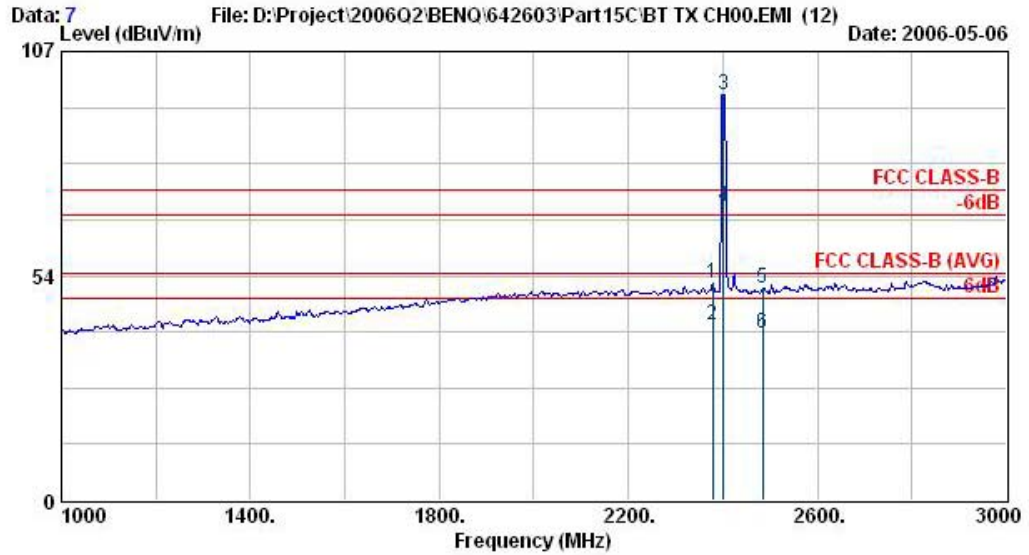


Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH00,2402MHz
Plane : E1
Memo : DH1



- Test Mode : Mode 1
- Polarization : Vertical

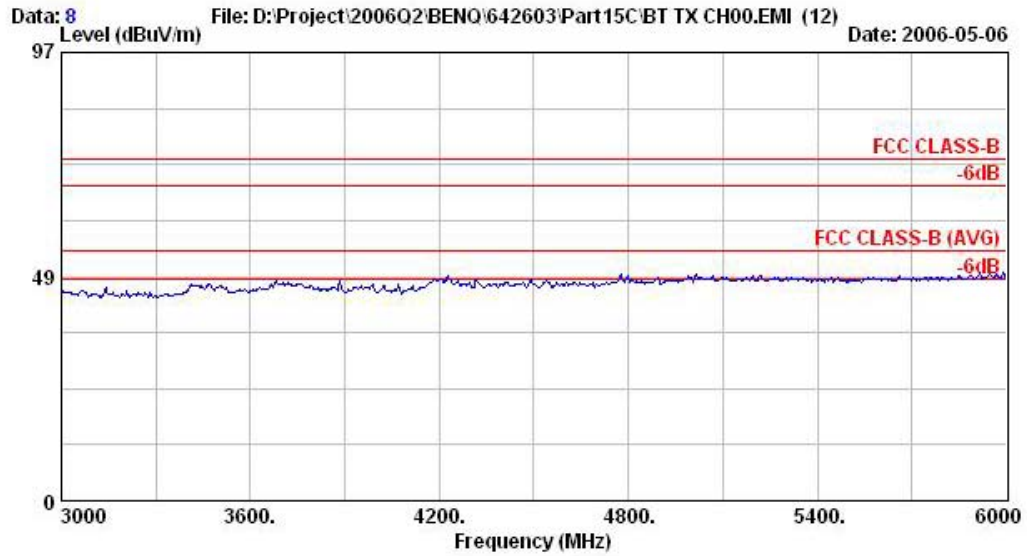
The test that passed at minimum margin was marked by the frame in the following table.



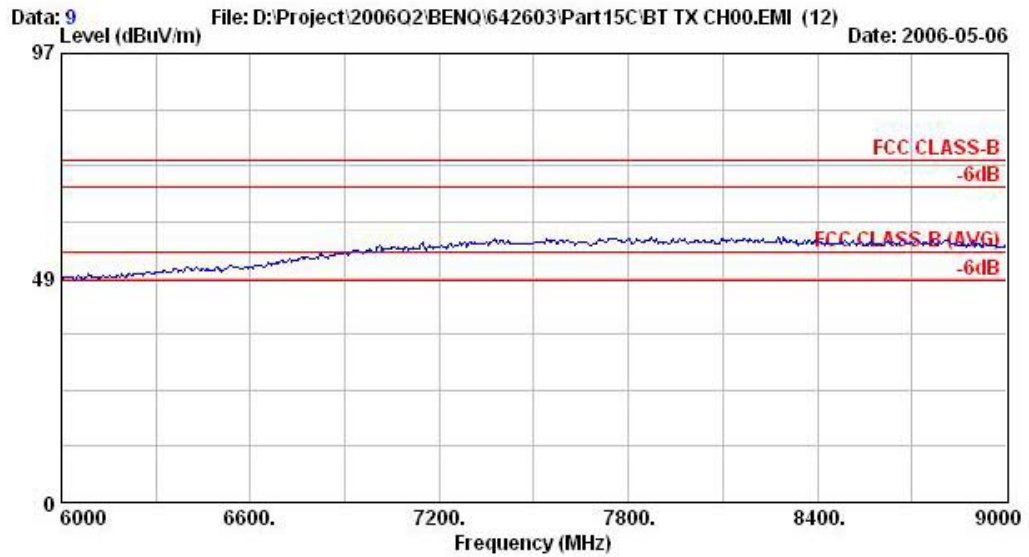
Site : 03CH06-HY
 Condition : HF-ANT-060410 VERTICAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH00,2402MHz
 Plane : E1
 Memo : DH1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	Level	Loss	Factor	Pos	Pos	Remark
					dBuV	dB	dB	cm	deg	
1 @	2378.00	51.86	-22.14	74.00	52.81	30.25	4.23	35.44	100	360 Peak
2 @	2378.00	41.95	-12.05	54.00	42.91	30.25	4.23	35.44	100	84 Average
3 @	2402.00	96.82			97.75	30.27	4.26	35.46	100	360 Peak
4 @	2402.00	69.93			70.87	30.26	4.26	35.46	100	84 Average
5 @	2484.00	50.59	-23.41	74.00	51.45	30.29	4.36	35.51	100	360 Peak
6 @	2484.00	39.69	-14.31	54.00	40.55	30.29	4.36	35.51	100	84 Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH00,2402MHz
Plane : E1
Memo : DH1

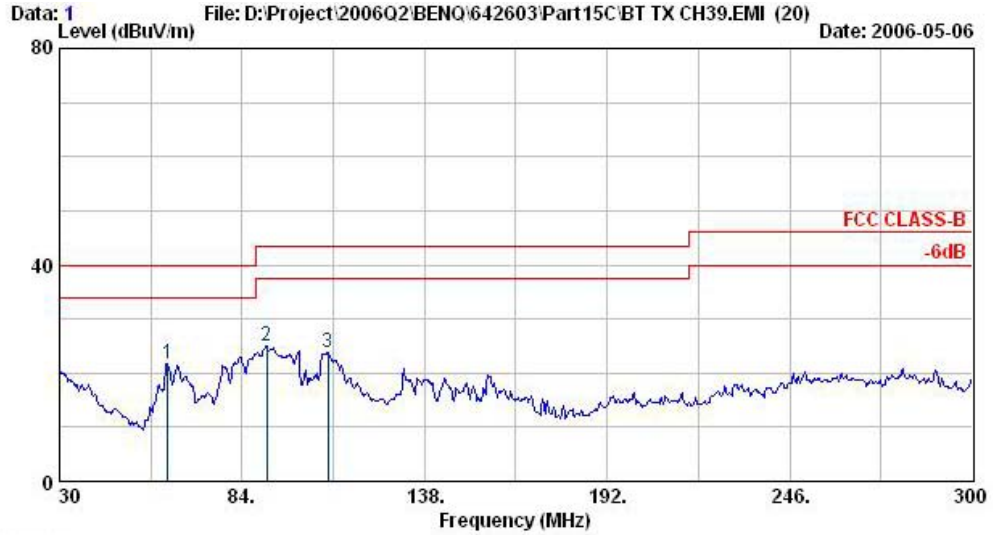


Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH00,2402MHz
Plane : E1
Memo : DH1



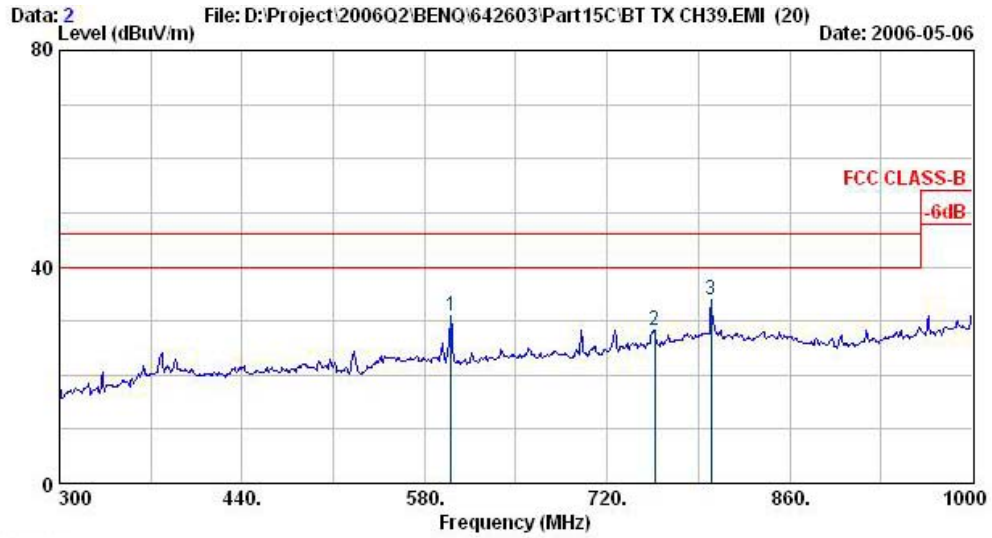
- Test Mode : Mode 2
- Polarization : Horizontal

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



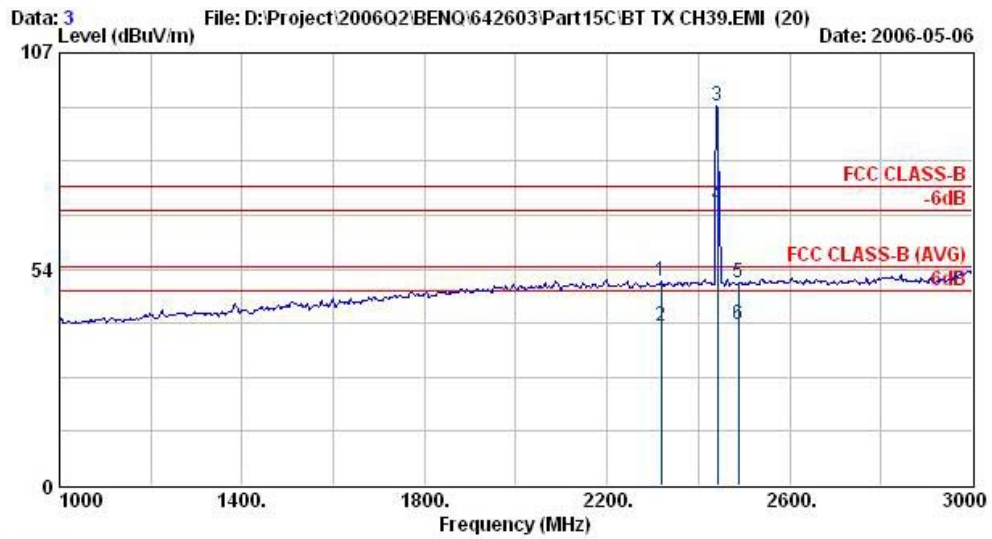
Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 HORIZONTAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH39,2441MHz
 Plane : E1
 Memo : DH1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBUV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
			dB	dBUV/m	dBUV	dB	dB	cm	deg	
1 @	62.13	21.68	-18.32	40.00	45.36	6.51	1.25	31.44	400	0 Peak
2	91.29	25.10	-18.40	43.50	45.75	9.18	1.68	31.52	400	0 Peak
3	109.38	23.90	-19.60	43.50	41.30	11.59	1.92	30.90	400	0 Peak



Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 HORIZONTAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH39,2441MHz
 Plane : E1
 Memo : DH1

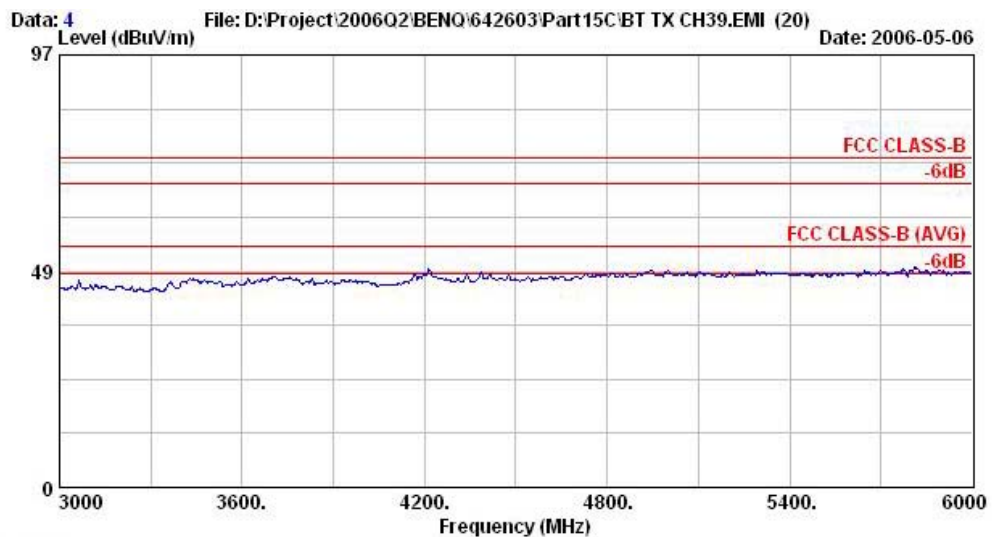
	Freq	Level	Over Limit	Limit Line	Read Antenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	600.30	30.93	-15.07	46.00	38.98	17.94	4.65	30.64	100	0	Peak
2 @	756.40	28.40	-17.60	46.00	33.25	20.65	5.23	30.73	100	0	Peak
3 @	799.80	33.81	-12.19	46.00	36.41	21.90	5.62	30.12	142	227	Peak



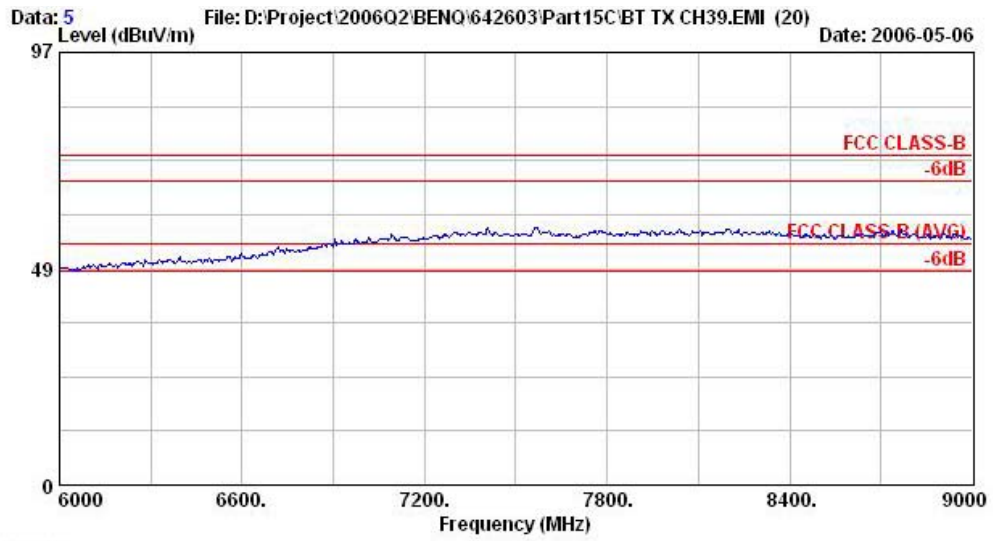
Site : 03CH06-HY
 Condition : HF-ANT-060410 HORIZONTAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH39,2441MHz
 Plane : E1
 Memo : DH1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBUV/m	dB	dBUV/m	dBUV	dB	dB	cm	deg	
1	2318.00	50.49	-23.51	74.00	51.49	30.23	4.17	35.40	100	360 Peak
2 @	2318.00	39.56	-14.44	54.00	40.56	30.23	4.17	35.40	100	32 Average
3 @	2441.00	93.78			94.69	30.28	4.29	35.47	100	360 Peak
4 @	2441.00	69.22			70.11	30.28	4.33	35.49	100	32 Average
5	2488.00	50.02	-23.98	74.00	50.87	30.30	4.36	35.51	100	360 Peak
6 @	2488.00	39.75	-14.25	54.00	40.60	30.30	4.36	35.51	100	32 Average

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY
 Condition : HF-ANT-060410 HORIZONTAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH39,2441MHz
 Plane : E1
 Memo : DH1

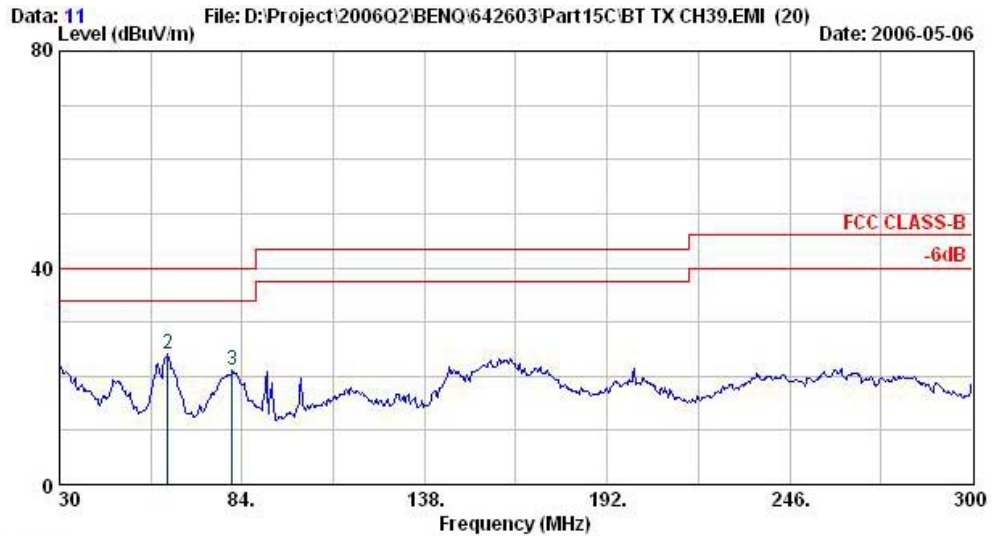


Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH39,2441MHz
Plane : E1
Memo : DH1



- Test Mode : Mode 2
- Polarization : Vertical

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

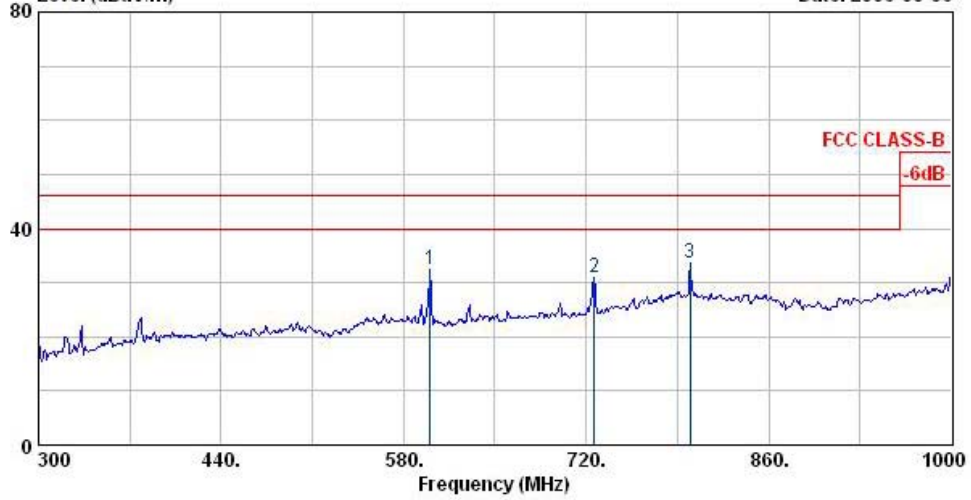


Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 VERTICAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH39;2441MHz
 Plane : E1
 Memo : DH1

	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 @	30.00	21.76	-18.24	40.00	33.62	18.73	0.90	31.49	400	0	Peak
2 @	62.13	23.98	-16.02	40.00	47.66	6.51	1.25	31.44	400	0	Peak
3	81.03	20.98	-19.02	40.00	43.73	7.27	1.58	31.59	400	0	Peak



Data: 12 File: D:\Project\2006Q2\BENQ\642603\Part15C\BT TX CH39.EMI (20) Date: 2006-05-06
 Level (dBuV/m)

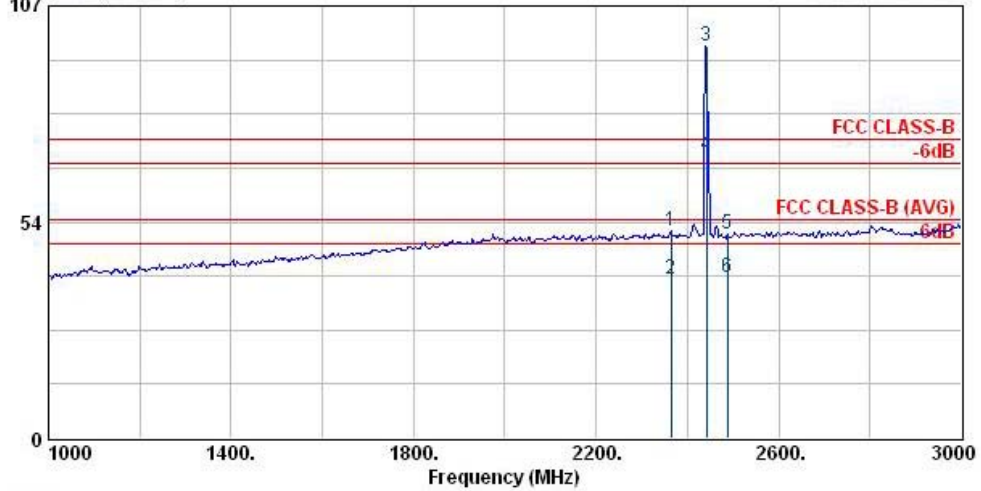


Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 VERTICAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH39;2441MHz
 Plane : E1
 Memo : DH1

	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 @	600.30	32.40	-13.60	46.00	40.44	17.94	4.65	30.64	100	0	Peak
2 @	726.30	30.90	-15.10	46.00	36.64	19.79	5.00	30.53	100	0	Peak
3 @	799.80	33.57	-12.43	46.00	36.17	21.90	5.62	30.12	152	147	Peak



Data: 13 File: D:\Project\2006Q2\BENQ\642603\Part15C\BT TX CH39.EMI (20) Date: 2006-05-06

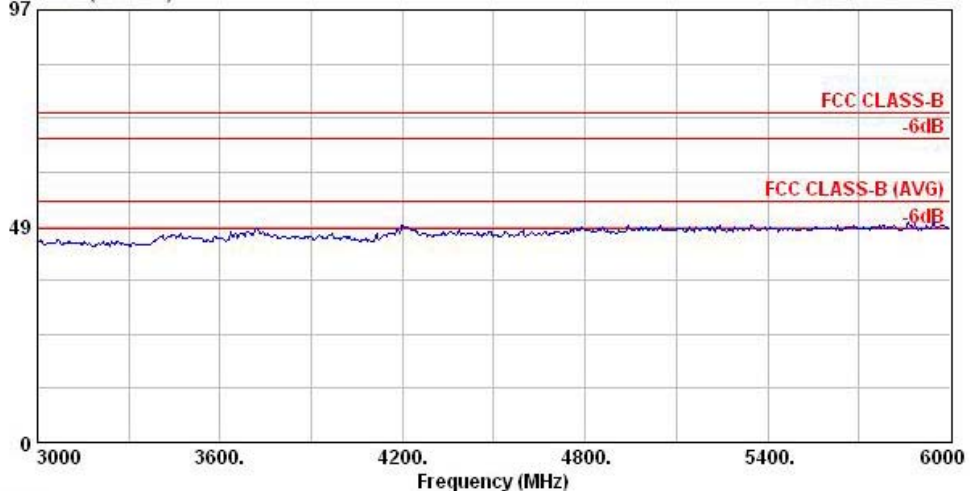


Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH39,2441MHz
Plane : E1
Memo : DH1

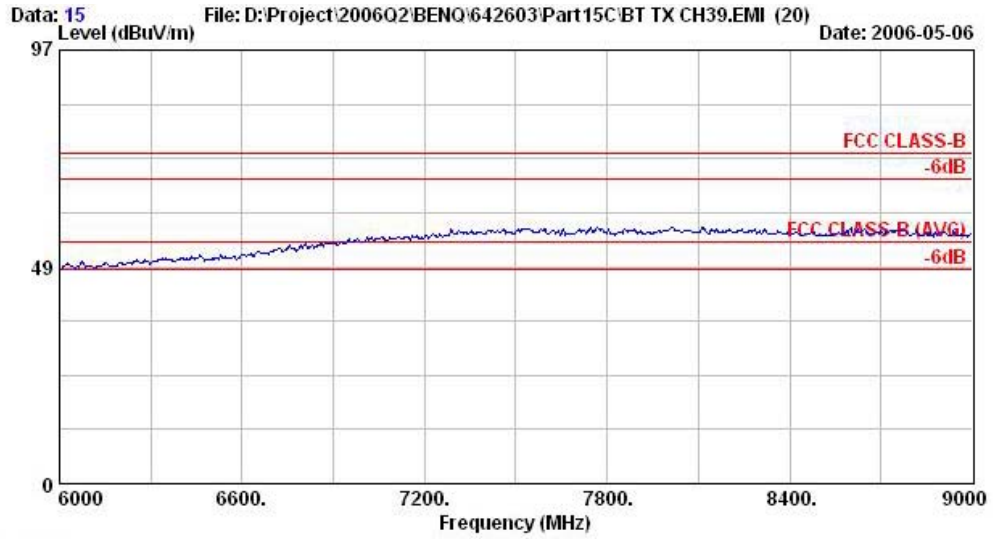
Table with 12 columns: Freq, Level, Over Limit, Limit Line, ReadAntenna Level Factor, Cable Loss, Preamp Factor, Ant Pos, Table Pos, Remark. Contains 6 rows of measurement data.

Remark: #3 and #4 Fundamental Signal

Data: 14 File: D:\Project\2006Q2\BENQ\642603\Part15C\BT TX CH39.EMI (20) Date: 2006-05-06



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH39,2441MHz
Plane : E1
Memo : DH1

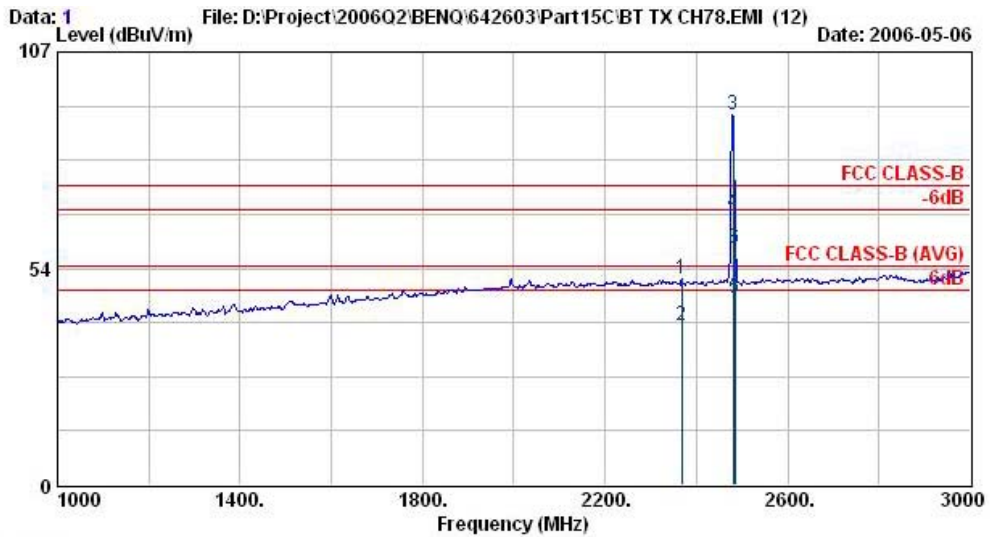


Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH39,2441MHz
Plane : E1
Memo : DH1



- Test Mode : Mode 3
- Polarization : Horizontal

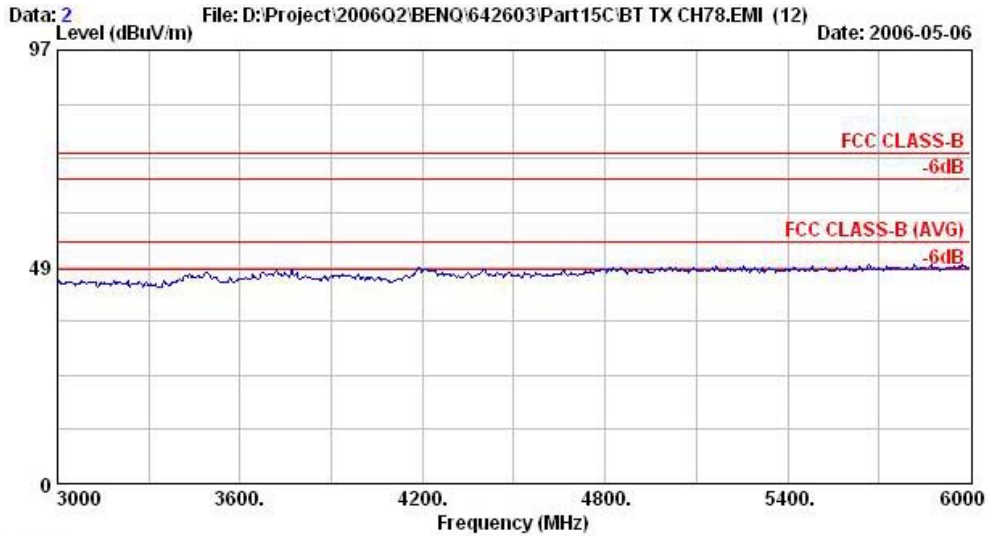
The test that passed at minimum margin was marked by the frame in the following table.



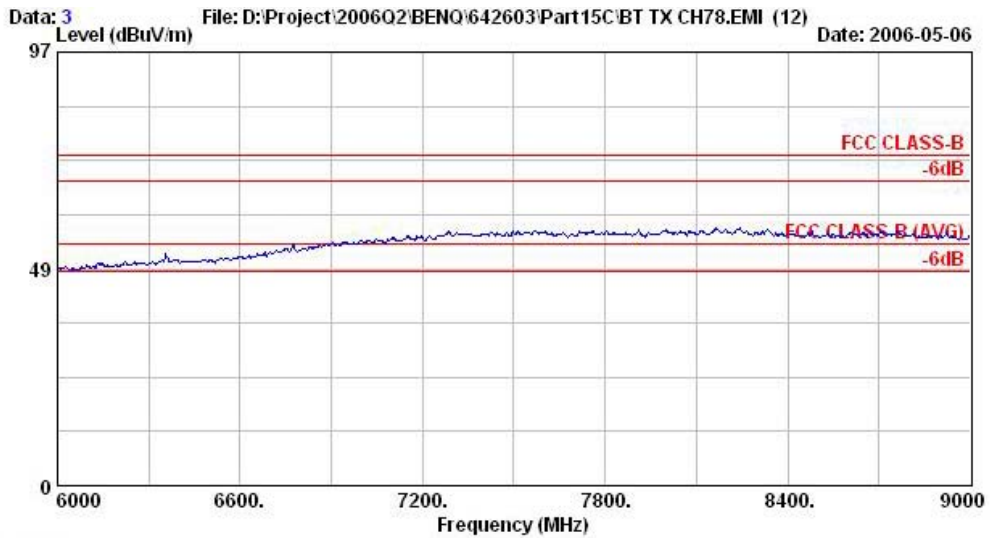
Site : 03CH06-HY
 Condition : HF-ANT-060410 HORIZONTAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH78,2480MHz
 Plane : E1
 Memo : DH1

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2368.00	50.77	-23.23	74.00	51.73	30.24	4.23	35.44	100	360	Peak
2	2368.00	39.57	-14.43	54.00	40.53	30.24	4.23	35.44	100	40	Average
3 @	2480.00	91.49			92.35	30.29	4.36	35.51	100	360	Peak
4 X	2480.00	67.38			68.24	30.29	4.36	35.51	100	40	Average
5	2483.50	46.18	-7.82	54.00	47.04	30.29	4.36	35.51	100	40	Average
6	2483.50	58.42	-15.58	74.00	59.28	30.29	4.36	35.51	100	360	Peak

Remark: #3 and #4 Fundamental Signal



Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH78;2480MHz
Plane : E1
Memo : DH1

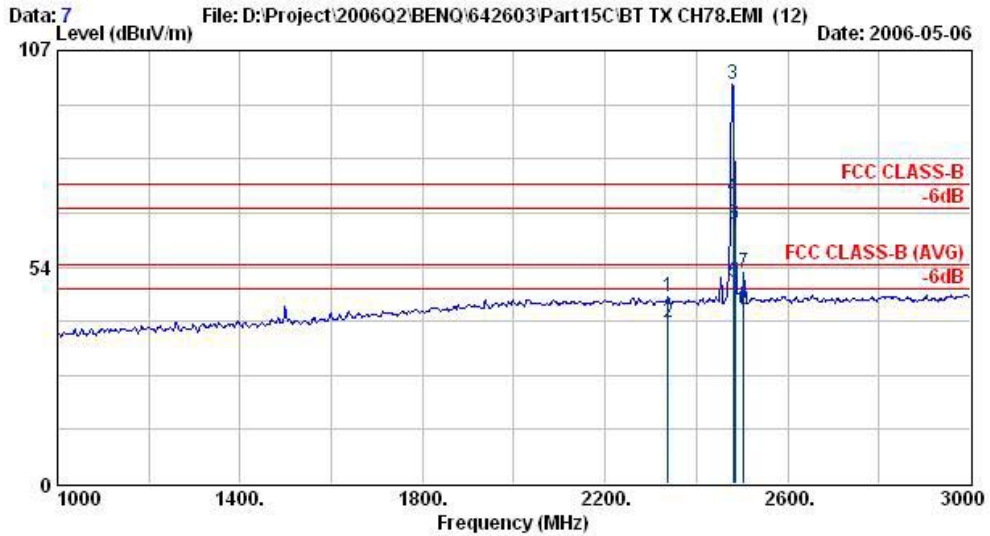


Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
Power : 120Vac/60Hz
Model : FR642603
Memo : BT TX CH78;2480MHz
Plane : E1
Memo : DH1



- Test Mode : Mode 3
- Polarization : Vertical

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



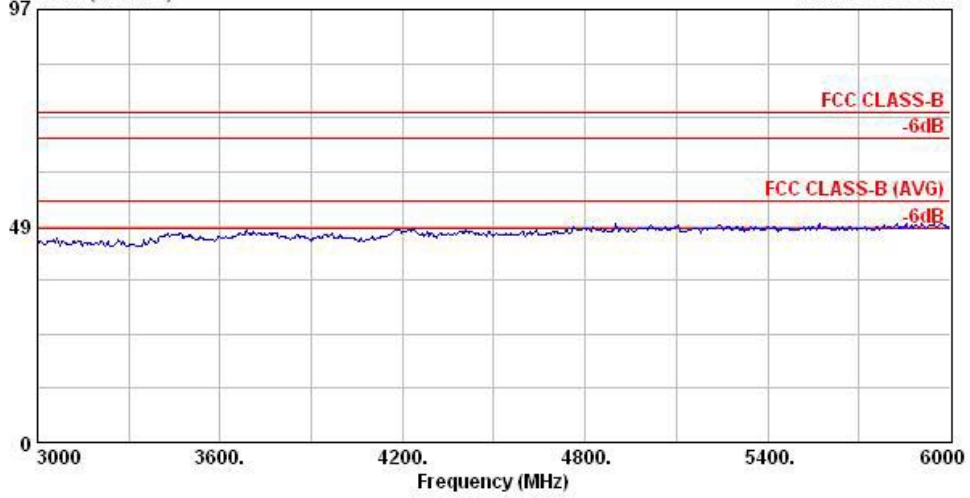
Site : 03CH06-HY
 Condition : HF-ANT-060410 VERTICAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH78,2480MHz
 Plane : E1
 Memo : DH1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	2338.00	46.04	-27.96	74.00	47.04	30.24	4.17	35.40	100	360 Peak
2	2338.00	39.69	-14.31	54.00	40.69	30.24	4.17	35.40	100	81 Average
3 @	2480.00	98.56			99.42	30.29	4.36	35.51	100	360 Peak
4 X	2480.00	70.70			71.56	30.29	4.36	35.51	100	81 Average
5 !	2483.50	49.58	-4.42	54.00	50.44	30.29	4.36	35.51	100	81 Average
6	2483.50	64.08	-9.92	74.00	64.94	30.29	4.36	35.51	100	360 Peak
7	2504.00	52.01	-21.99	74.00	52.85	30.30	4.39	35.53	100	360 Peak
8	2504.00	42.80	-11.20	54.00	43.64	30.30	4.39	35.53	100	78 Average

Remark: #3 and #4 Fundamental Signal

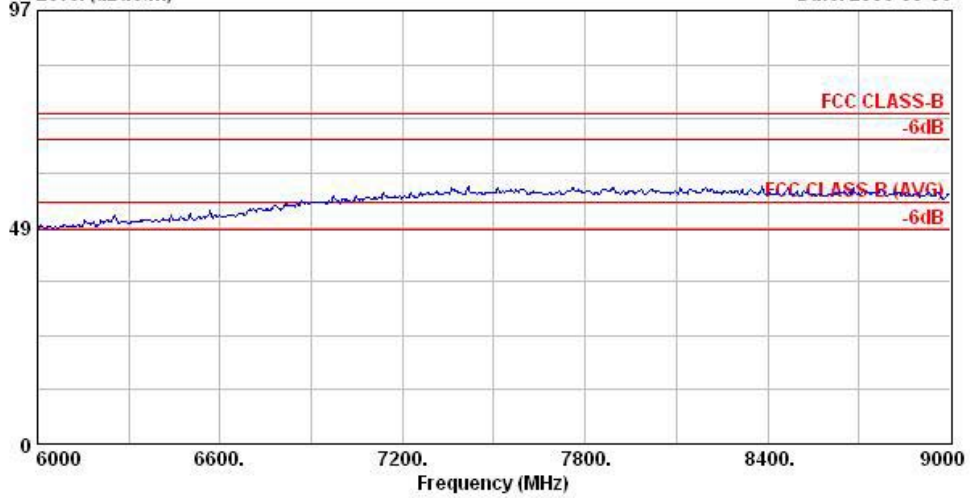


Data: 8 File: D:\Project\2006Q2\BENQ\642603\Part15C\BT TX CH78.EMI (12) Date: 2006-05-06



Site : 03CH06-HY
 Condition : HF-ANT-060410 VERTICAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH78,2480MHz
 Plane : E1
 Memo : DH1

Data: 9 File: D:\Project\2006Q2\BENQ\642603\Part15C\BT TX CH78.EMI (12) Date: 2006-05-06



Site : 03CH06-HY
 Condition : HF-ANT-060410 VERTICAL
 EUT : GSM900/1800/1900/2100 Mobile Phone(BT)
 Power : 120Vac/60Hz
 Model : FR642603
 Memo : BT TX CH78,2480MHz
 Plane : E1
 Memo : DH1

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 PIFA 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, 2005	Jun. 28, 2006	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, 2005	Jul. 24, 2006	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	Jun. 28, 2005	Jun. 27, 2006	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, 2005	Jul. 20, 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
combined standard uncertainty Uc(y)	1.13		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.26		

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
combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.54		



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
Combined standard uncertainty Uc(y)	2.36				
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	4.72				