



FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment : GSM Tri-band mobile phone with GPRS, Bluetooth, FM radio
Trade Name : Toshiba
Model No. : SD3-E02
FCC ID : HFS-SD3-E01
Filing Type : Certification
Applicant : **Quanta Computer Inc.**
No.211, Wen Hwa 2nd Road, Kuei Shan Hsiang, Tao Yuan Shien, Taiwan

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- The data shown in this test report were carried out on Sep. 12, 2006 at **Sporton International Inc. LAB.**
- Report No.: FR620907-03, Report Version: Rev. 01.

Roy Wu
Deputy Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.



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History of this test report

Report Issue Date: Sep. 20, 2006

Report No.	Description
620907-03	SD3-E02 is the serial model of SD3-E01. They have the same RF chipset, RF board, antenna, battery and PCB layout. The differences between these models are ID, housing stuff (metal change to plastic) and partial components for FM. Update test report no. FR620907 by retesting radiated emission for SD3-E02.



1. General Description of Equipment under Test

1.1. Applicant

Quanta Computer Inc.

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

1.2. Manufacturer

Quanta Computer Inc.

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

1.3. Basic Description of Equipment under Test

Equipment	: GSM Tri-band mobile phone with GPRS, Bluetooth, FM radio
Trade Name	: Toshiba
Model No.	: SD3-E02
FCC ID	: HFS-SD3-E01
Power Supply Type	: Switching, From battery 3.7V
AC Power Cord	: AC 120V, Wall-mount, 1.6 meter, 2 pin
Battery	: Cheng Uei Precision Industry Co. Ltd., GS20-BTR
Adapter	: PI Electronics (H.K.) Ltd., P925W05
Earphone	: Merry CO. LTD. DD0VI5EP001

1.4. Feature of Equipment under Test

Product Feature & Specification			
1.	Modulation Type/Data Rate	GFSK	
2.	Frequency Range.	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)	-0.84 dBm	
7.	Type of Antenna Connector	N/A	
8.	Antenna Type	Fixed Internal	
9.	Antenna Gain	3 dBi	
10.	HW Version	D2B for SD3-E01 A3A for SD3-E02	
11.	SW Version	060214n-08.00 VI1.QCI-0.10E TPWVJ for SD3-E01 060817n-08.00 VI5.QCI-0.13ETPWVJ for SD3-E02	
12.	Function Type	Transmitter	Transceiver V
13.	Power Rating (DC/AC , Voltage)	DC 3.8V / 300mA	
14.	DUT Stage	Production Unit	

2. Test Configuration of Equipment under Test

2.1. Test Manner

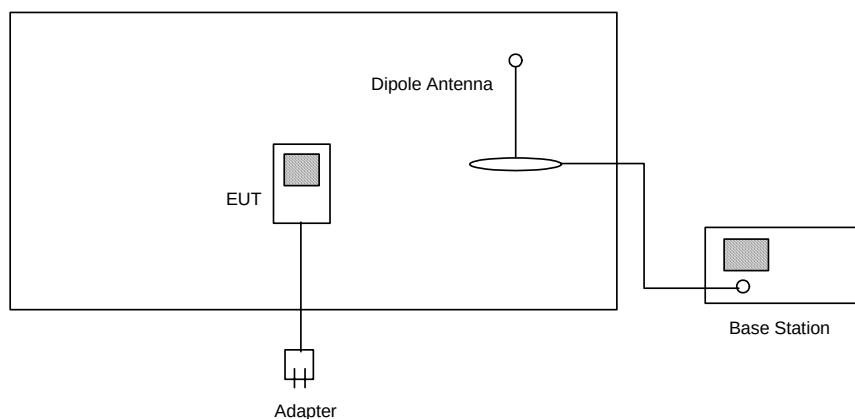
- The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- For spurious emission below 1GHz, only one channel of each application was tested because it is not related to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

2.2. Test Mode

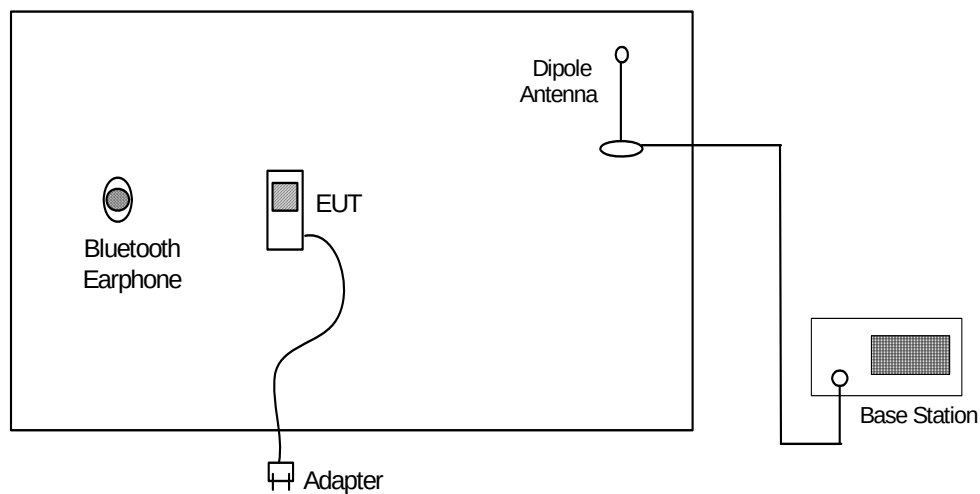
Application	Bluetooth
Radiated Emission	Mode 1: Tx_CH00_2402 MHz for SD3-E01 Mode 2: Tx_CH39_2441 MHz for SD3-E01 Mode 3: Tx_CH78_2480 MHz for SD3-E01 Mode 4: Tx_CH78_2480 MHz for SD3-E02
Conducted Emission	Mode 1: PCS1900 Idle Mode + BT Link + Adapter + Camera for SD3-E01 Mode 2: PCS1900 Idle Mode + BT Link + Adapter + MP3 Player for SD3-E01

2.3. Connection Diagram of Test System

<Radiated Emission>



<Conducted Emission>



2.4. Ancillary Equipment List

Item	Equipment	Model No.	Power Cord
1.	Base Station (R&S)	CMU200	N/A
2.	Bluetooth Earphone (Free Style)	JD-100	N/A
3.	BT Base Station (Anritus)	8852A	N/A
4.	Adapter (PIE)	P925BW05050ABXX	AC100-240V
5.	Dipole Antenna	Sporton	N/A
6.	Earphone (Merry)	EMC201-3	N/A



3. RF Utility

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



4. General Information of Test

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

4.1. Test Voltage

AC 120V

4.2. Standard for Methods of Measurement

ANSI C63.4-2003

4.3. Test in Compliance with

47 CFR Part 15 Subpart C

4.4. Frequency Range Investigated

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

4.5. Test Distance

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

5. Report of Measurements and Examinations

5.1. List of Measurements and Examinations

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

5.2. Hopping Channel Separation

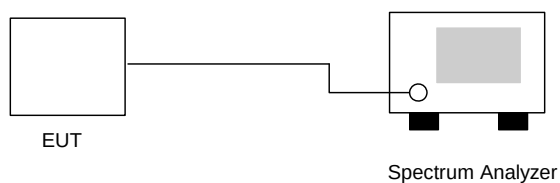
5.2.1. Measuring Instruments :

As described in chapter 6 of this test report.

5.2.2. Test Procedure :

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

5.2.3. Test Setup Layout :



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

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

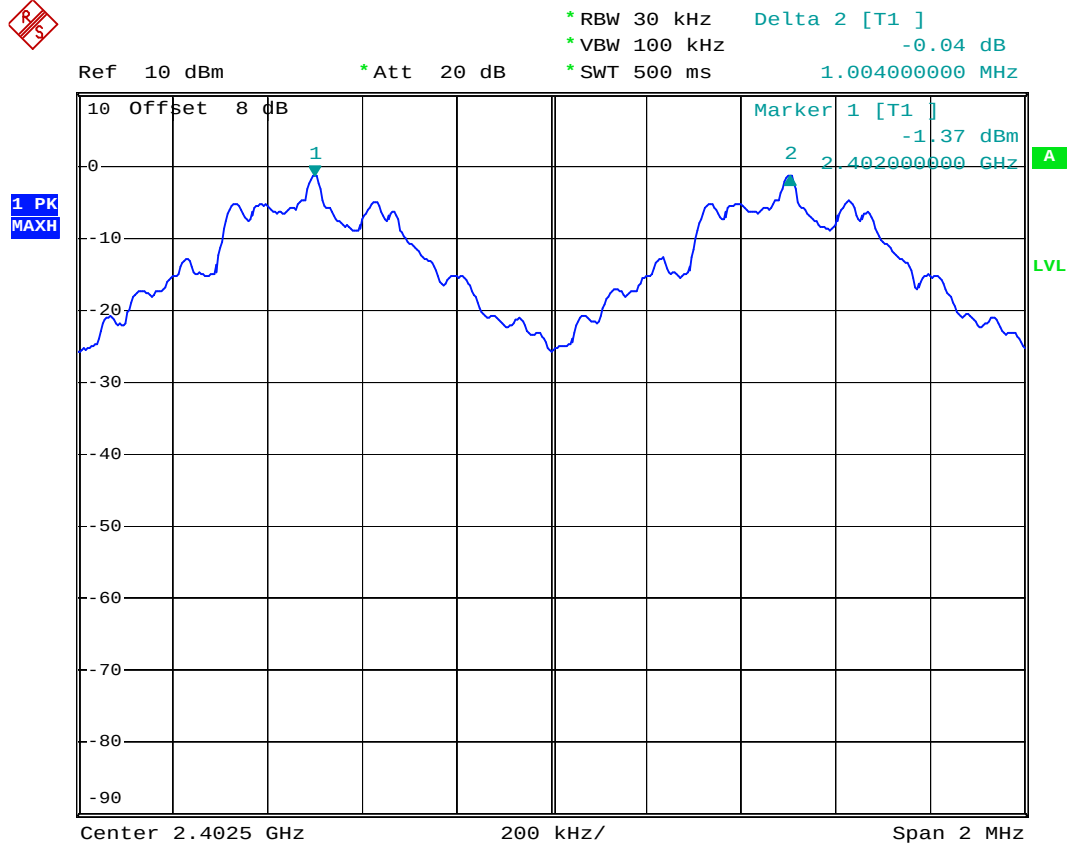
Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.004	0.874	Mode 1
39	2441	1.000	0.870	Mode 2
78	2480	1.004	0.868	Mode 3

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



5.2.5 Hopping Channel Separation

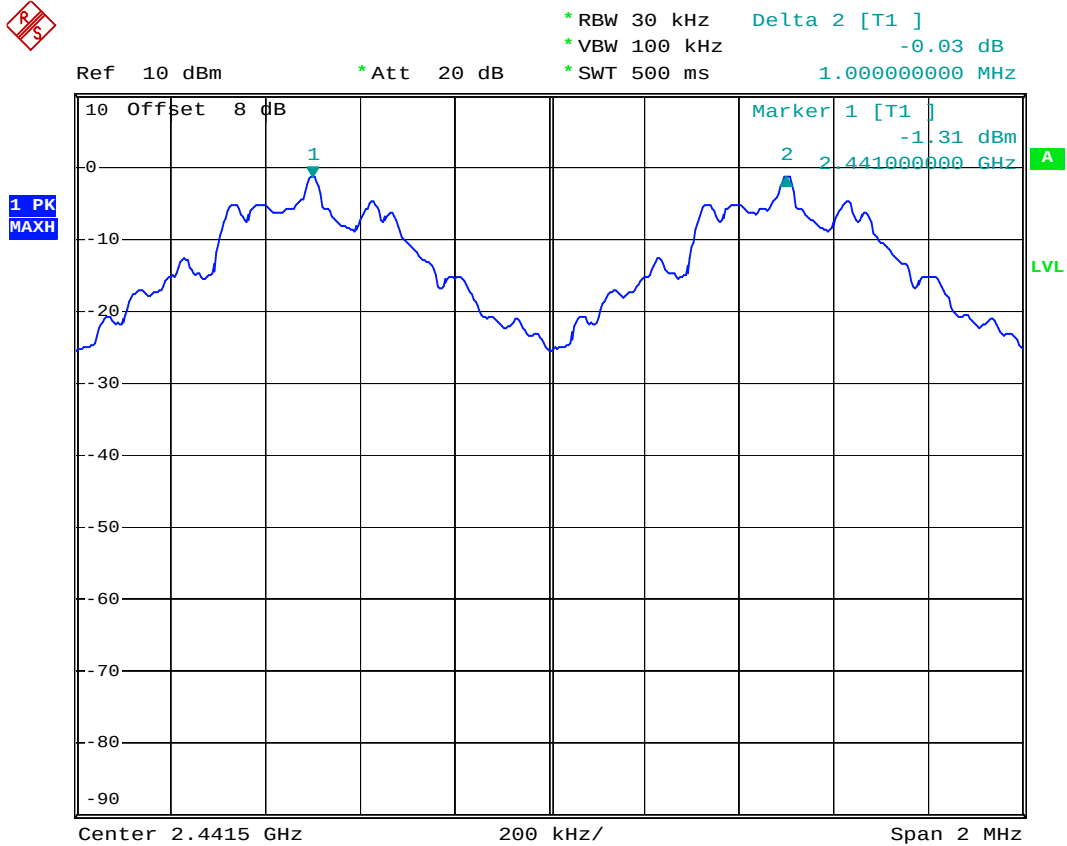
Mode 1: CH00 (2402MHz)



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



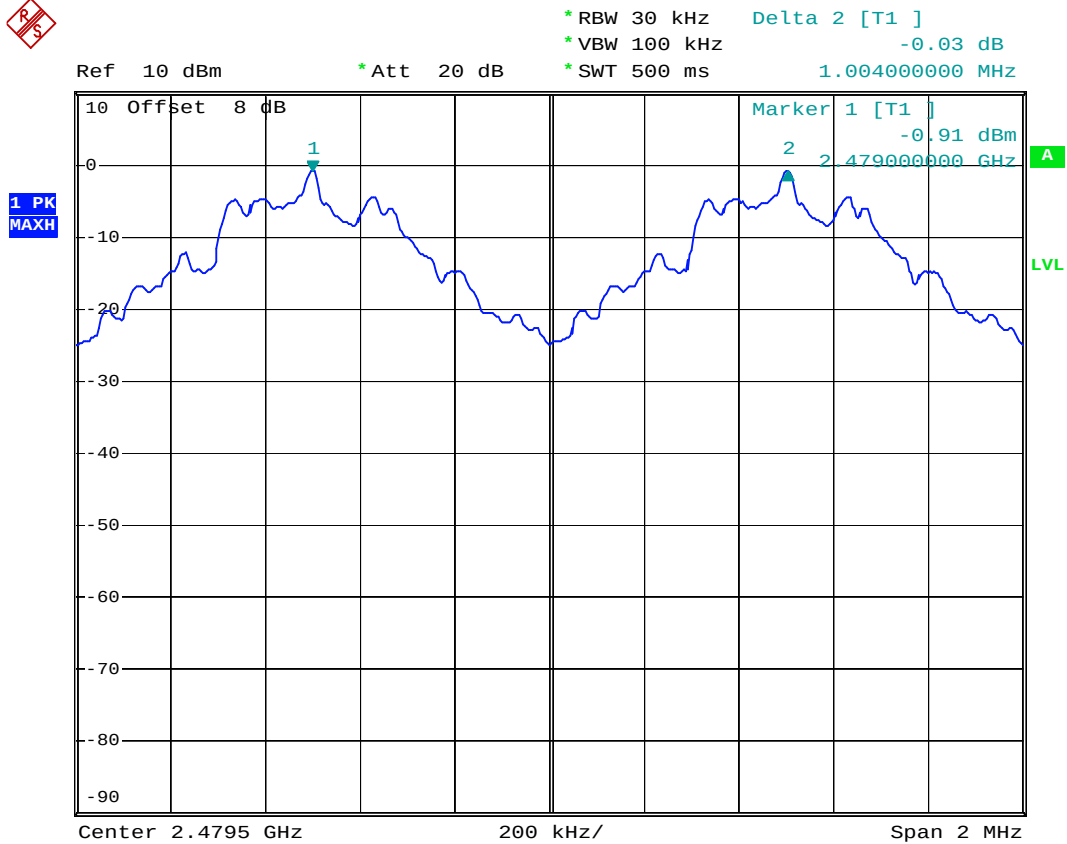
Mode 2: CH39 (2441MHz)



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



Mode 3: CH78 (2480MHz)



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

5.3. Number of Hopping Frequency

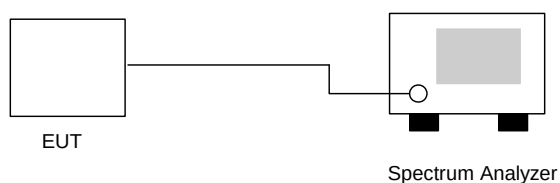
5.3.1. Measuring Instruments :

As described in chapter 6 of this test report.

5.3.2. Test Procedure :

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

5.3.3. Test Setup Layout :



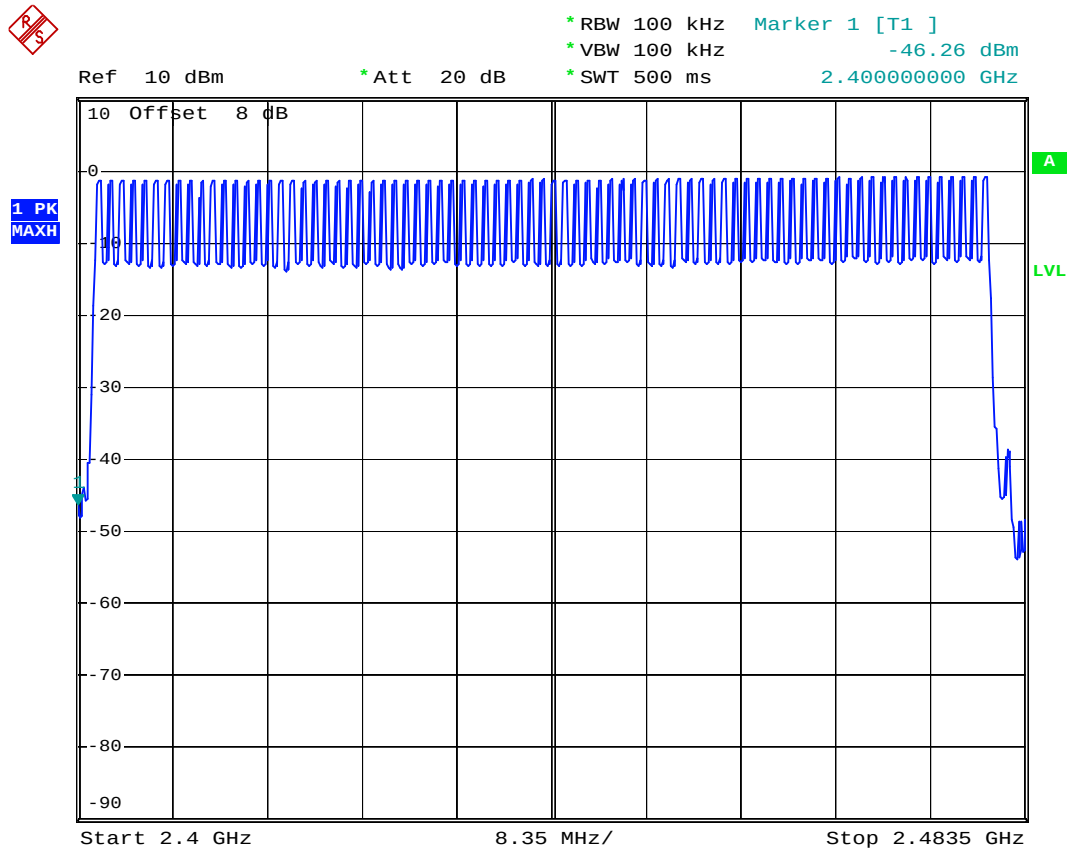
5.3.4. Test Result : See spectrum analyzer plots below

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

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



5.3.5 Number of Hopping Frequency



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

5.4 Hopping Channel Bandwidth

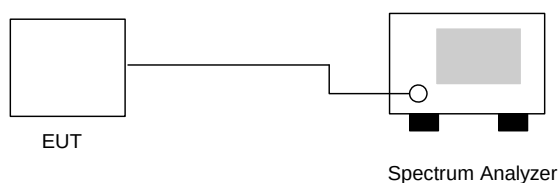
5.4.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.4.2 Test Procedure :

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

5.4.3 Test Setup Layout :



5.4.4 Test Result : See spectrum analyzer plots below

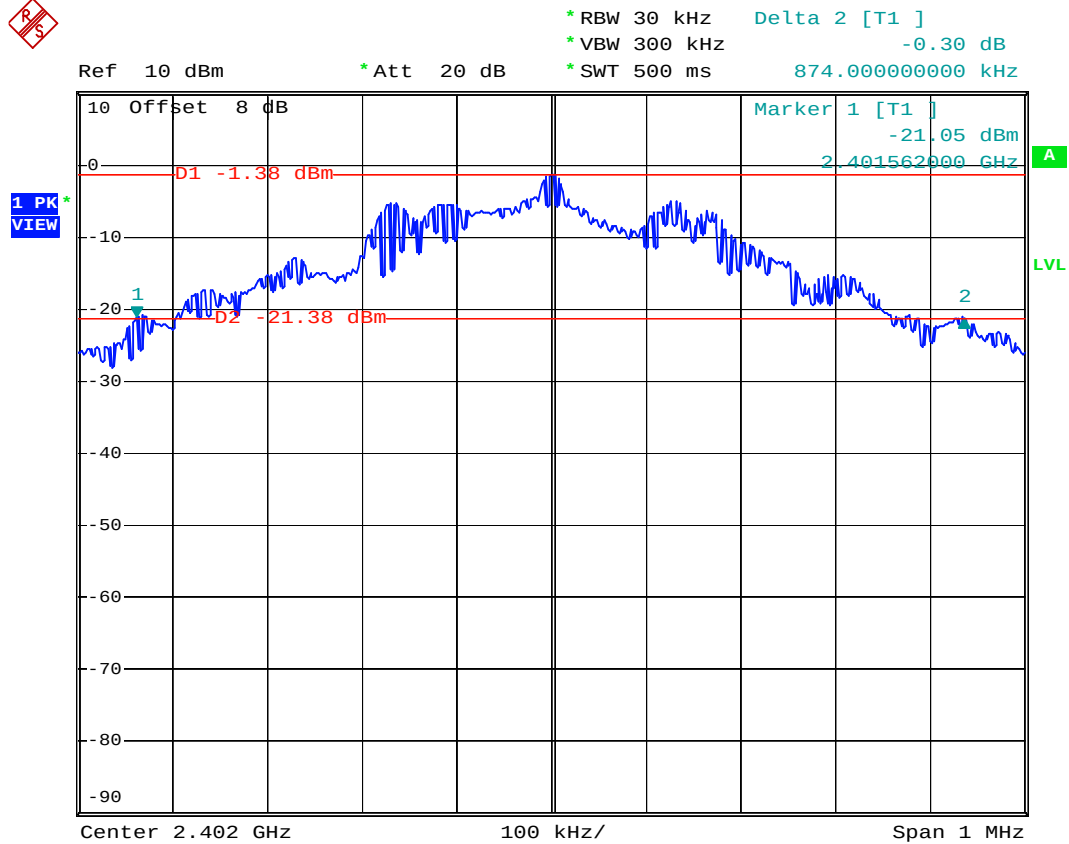
- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

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



5.4.5 Hopping Channel Bandwidth

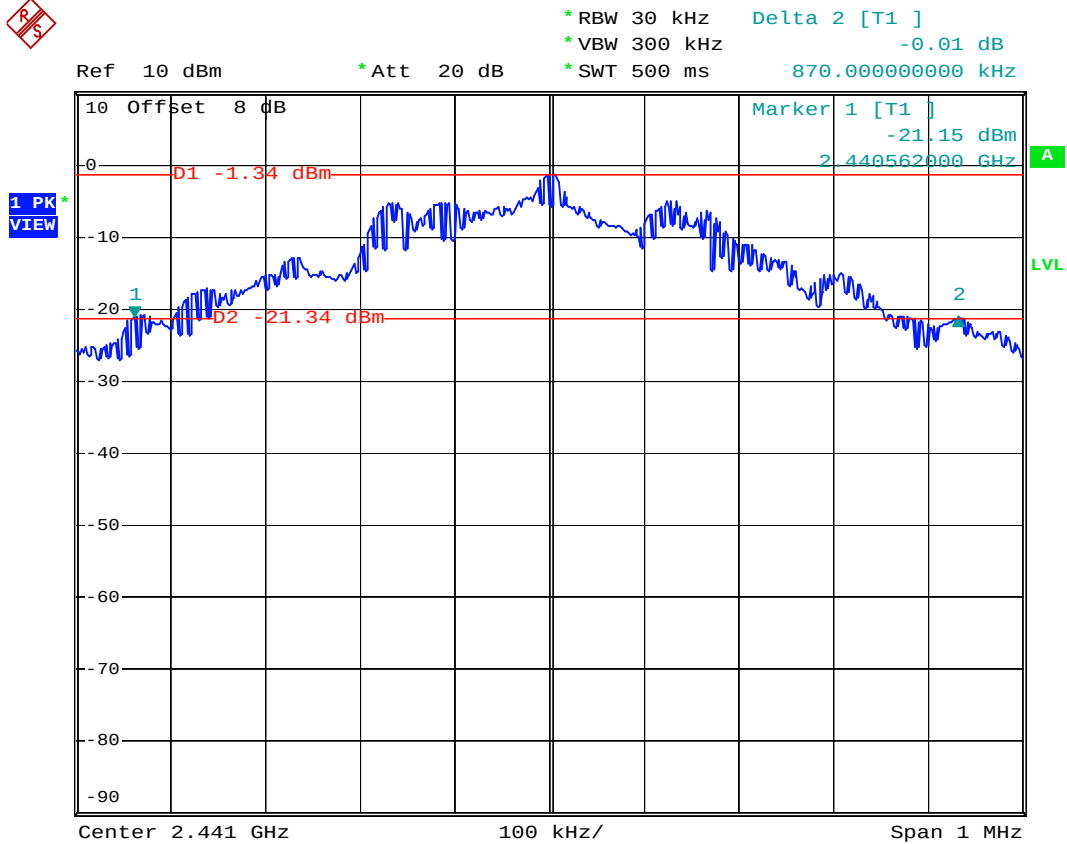
Mode 1: CH00 (2402MHz)



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



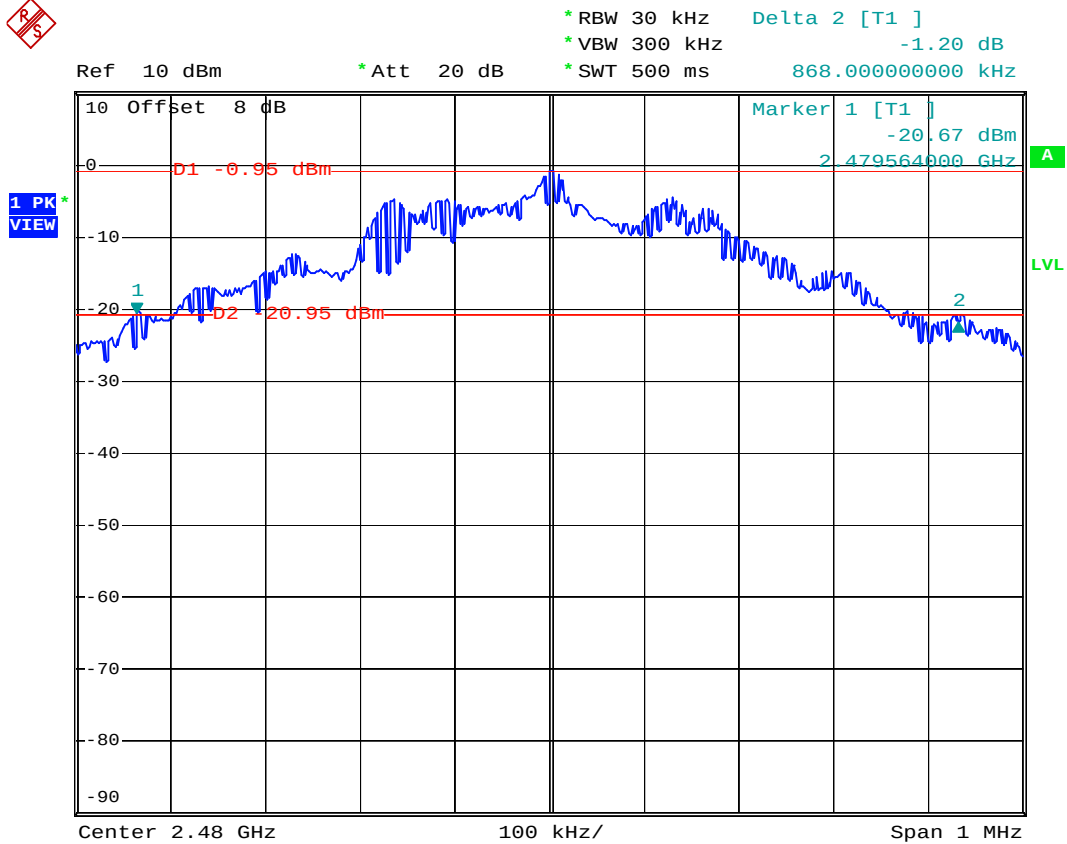
Mode 2: CH39 (2441MHz)



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



Mode 3: CH78 (2480MHz)



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

5.5 Dwell Time of Each Frequency

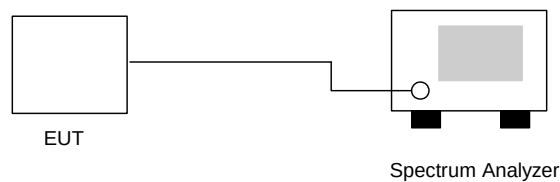
5.5.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.5.2 Test Procedure :

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

5.5.3 Test Setup Layout :



5.5.4 Test Result : See spectrum analyzer plots below

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

Ch00

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

**CH39**

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

CH78

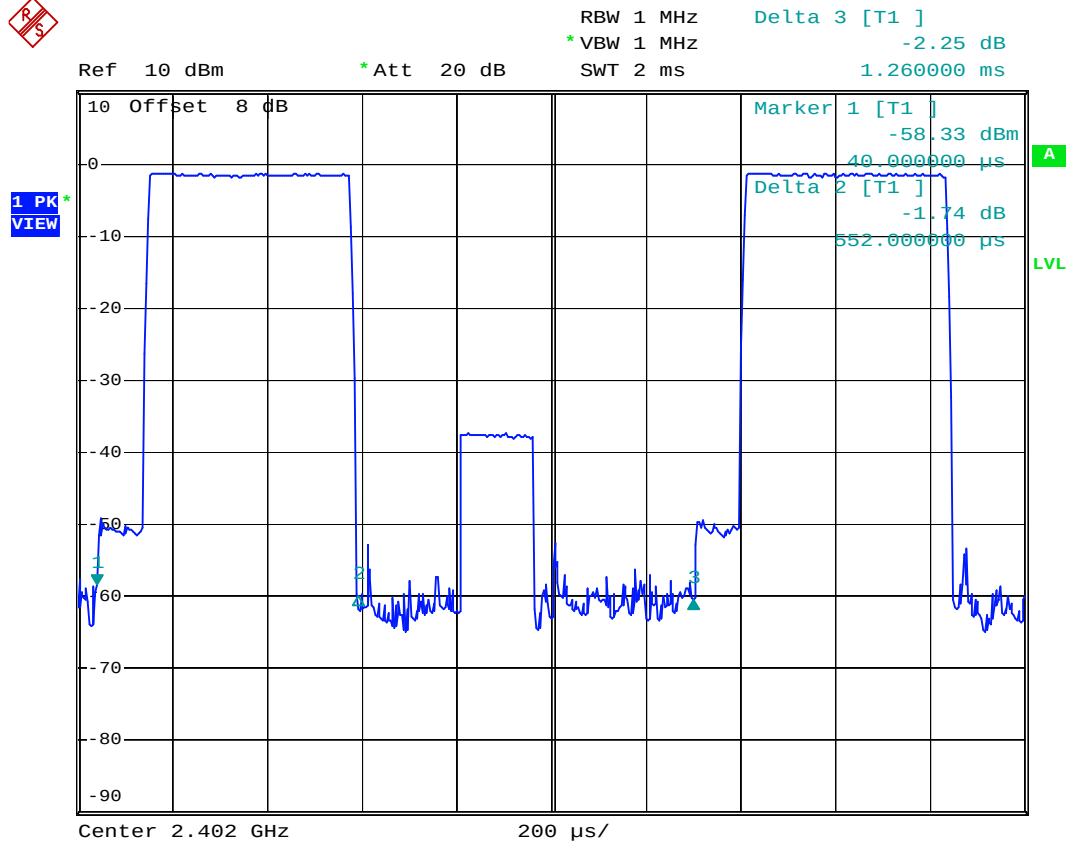
Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	9	548	0.156	0.4
DH3	4.6	1830	0.266	0.4
DH5	3.6	3080	0.350	0.4

※ Remark:

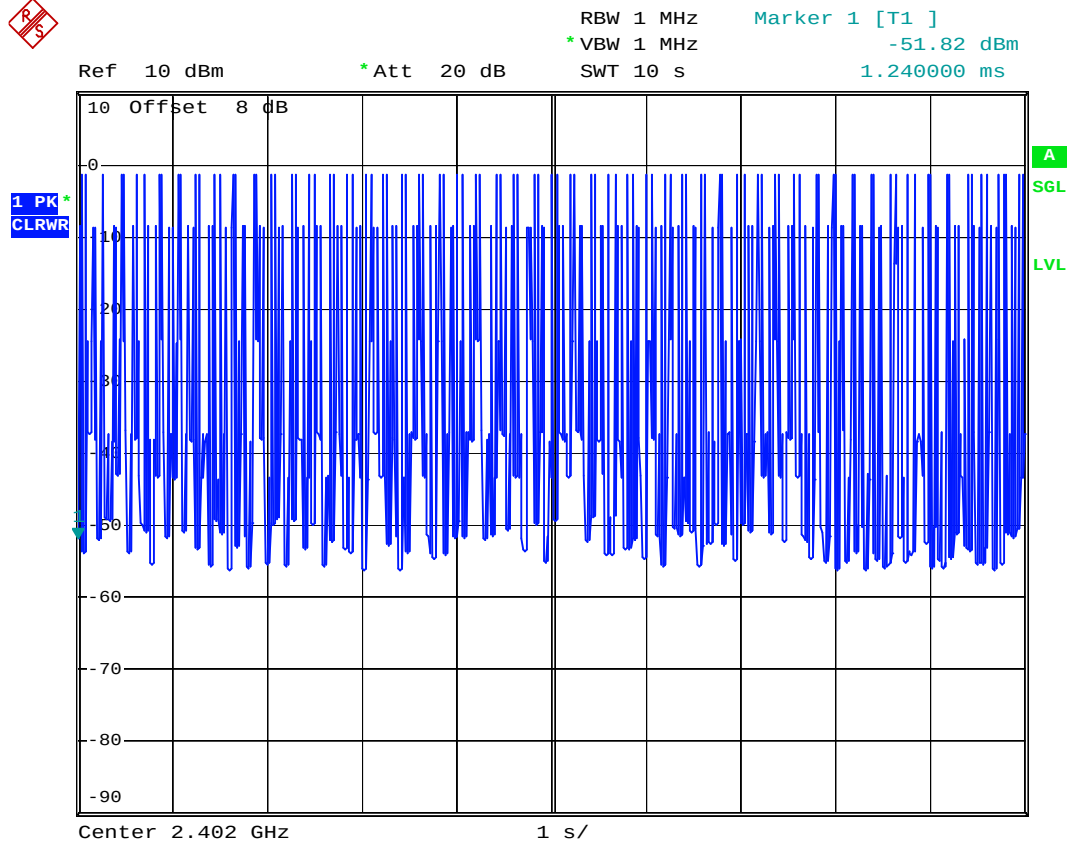
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

**5.5.5 Dwell Time**

DH1 (CH00)



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



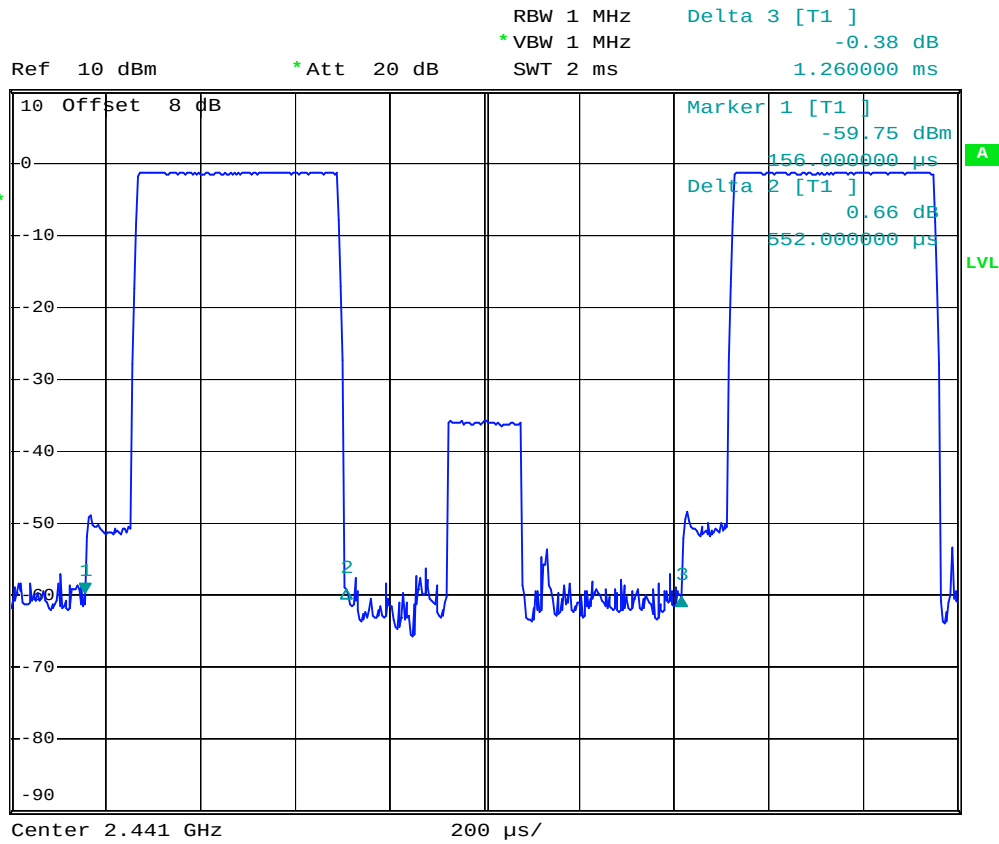
Date: 3.MAR.2006 20:11:14



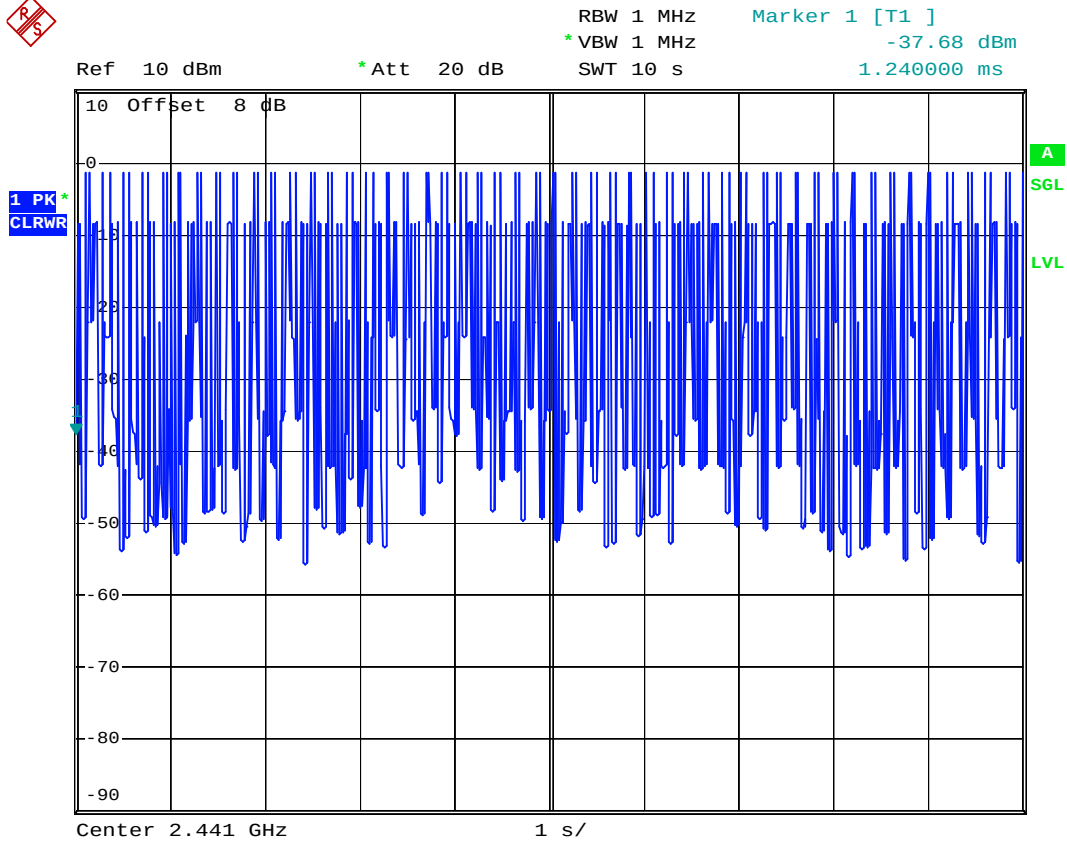
DH1 (CH39)



1 PK
VIEW



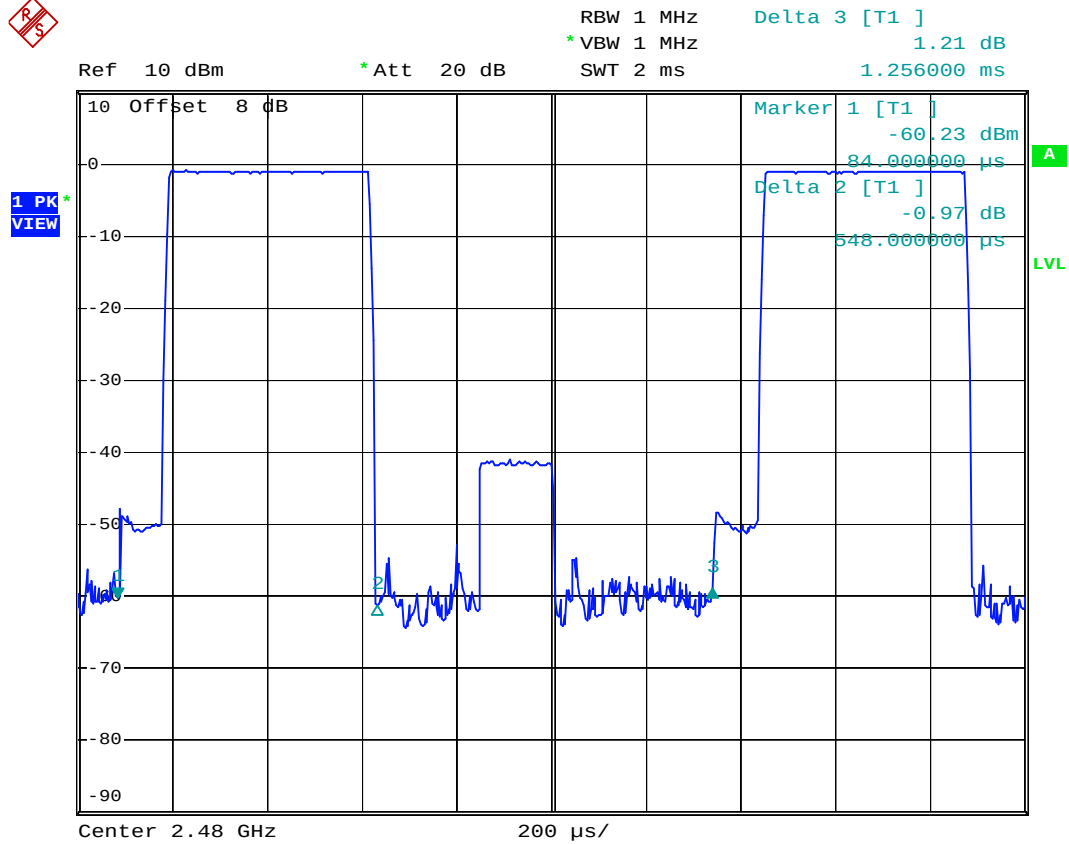
Date: 3.MAR.2006 19:55:01



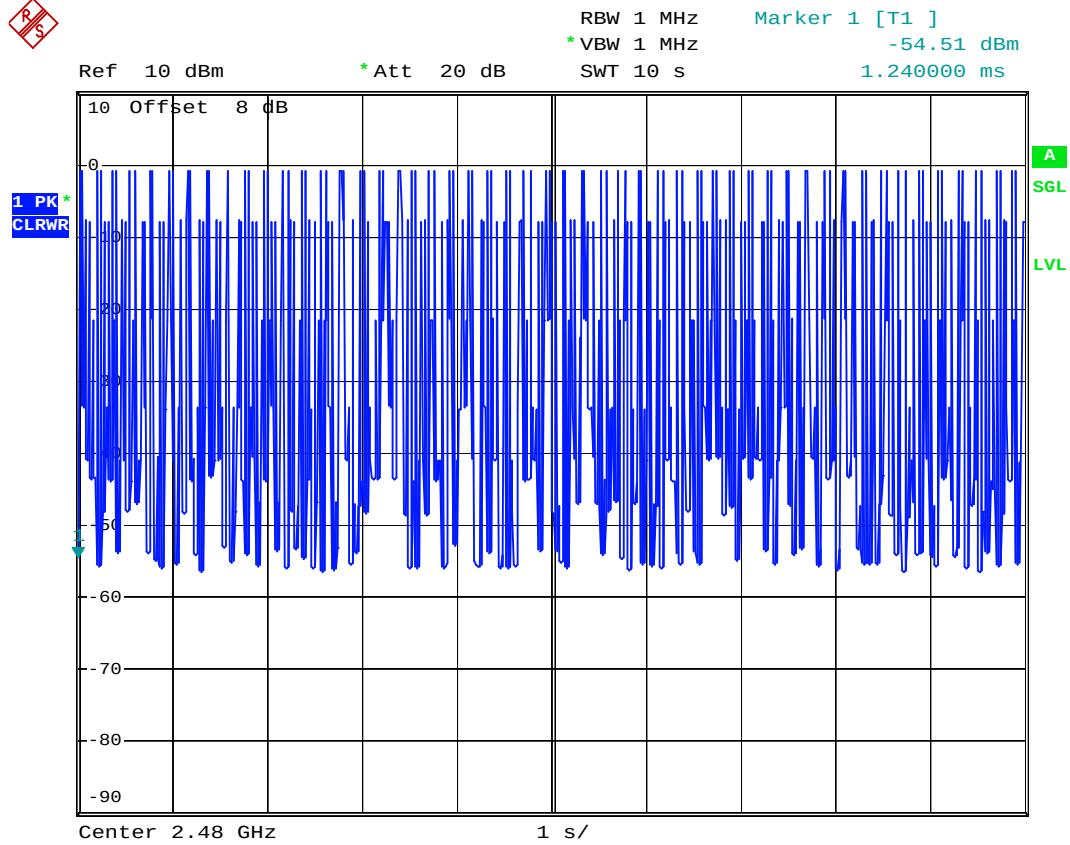
Date: 3.MAR.2006 20:10:40



DH1 (CH78)



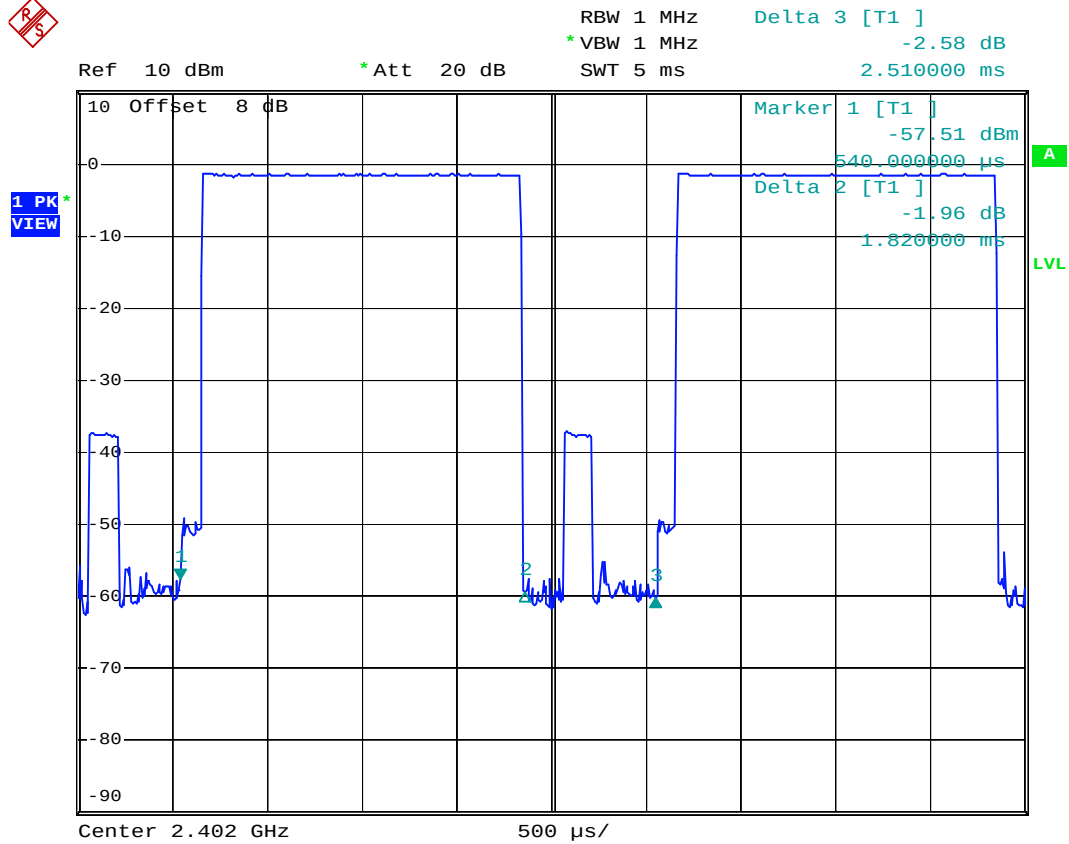
Date: 3.MAR.2006 19:56:04



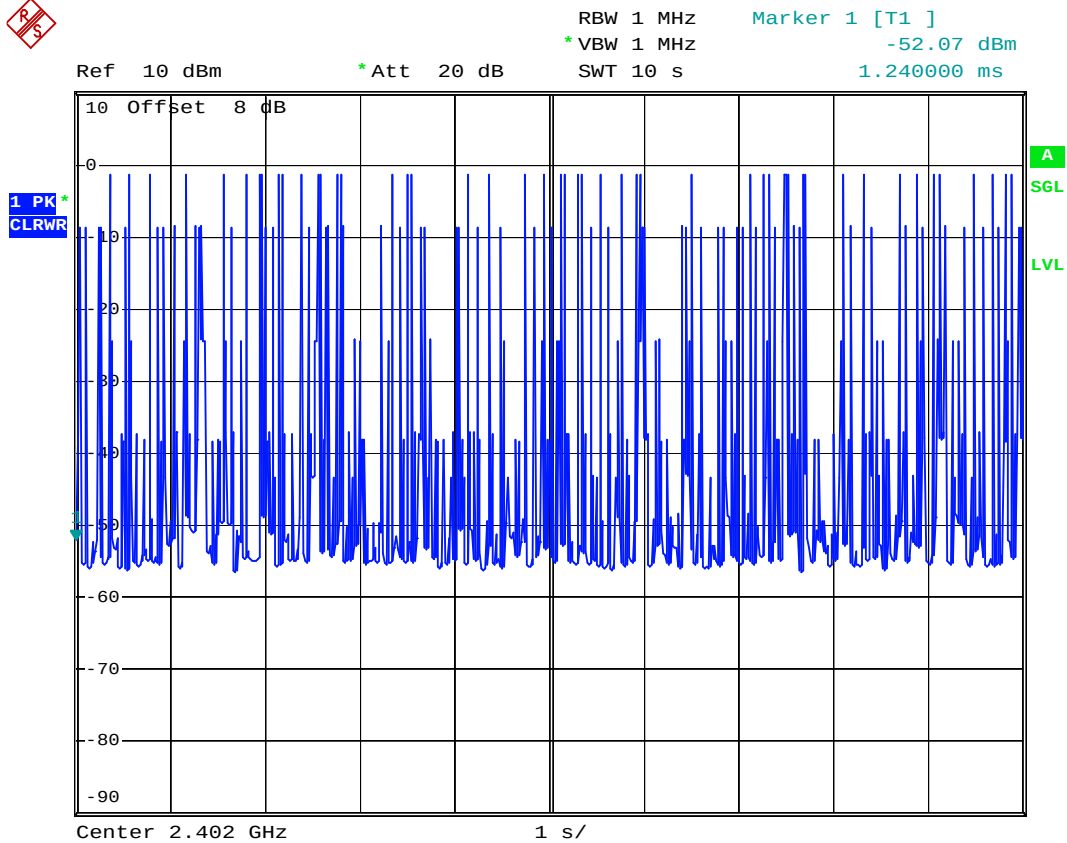
Date: 3.MAR.2006 20:09:38



DH3 (CH00)



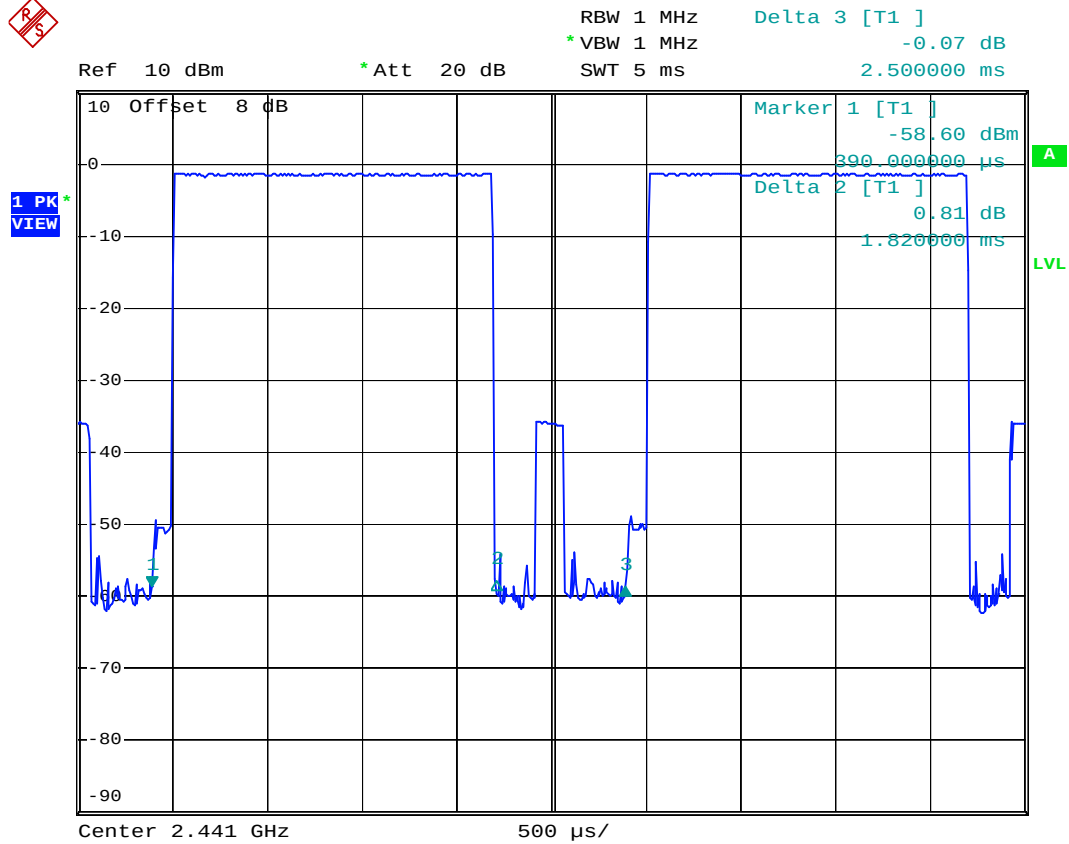
Date: 3.MAR.2006 19:59:44



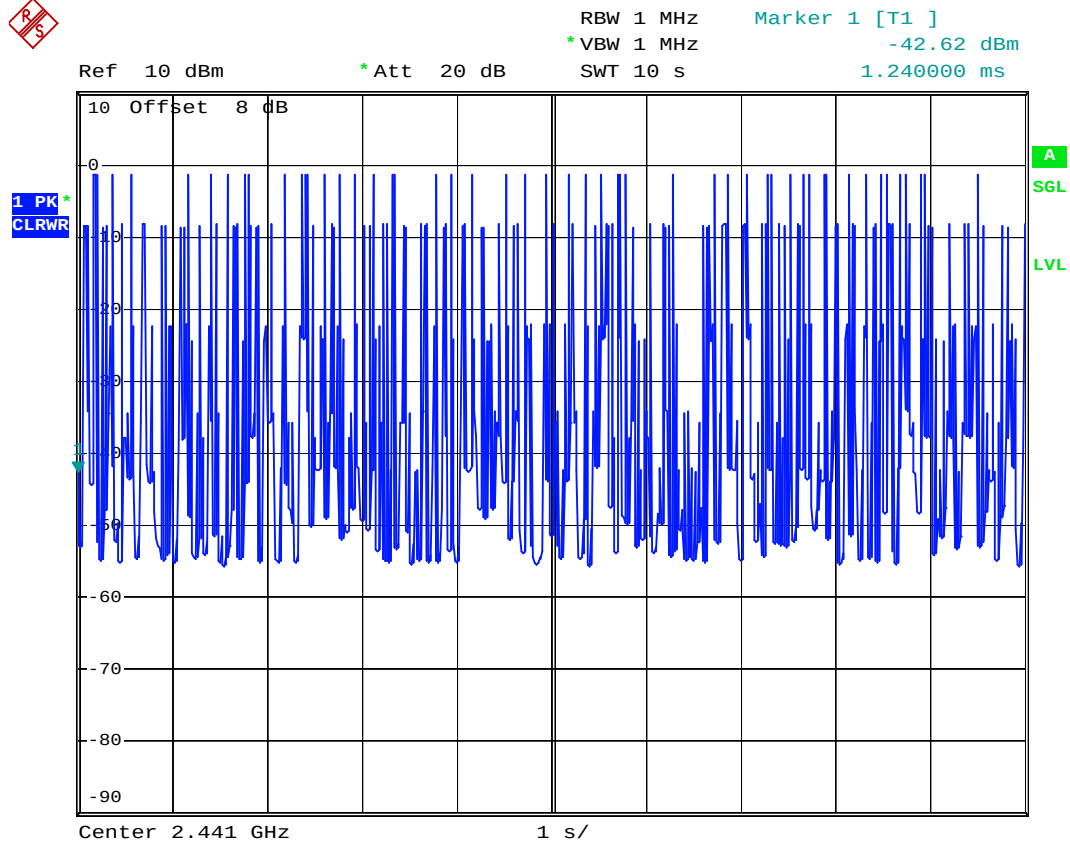
Date: 3.MAR.2006 20:07:14



DH3 (CH39)



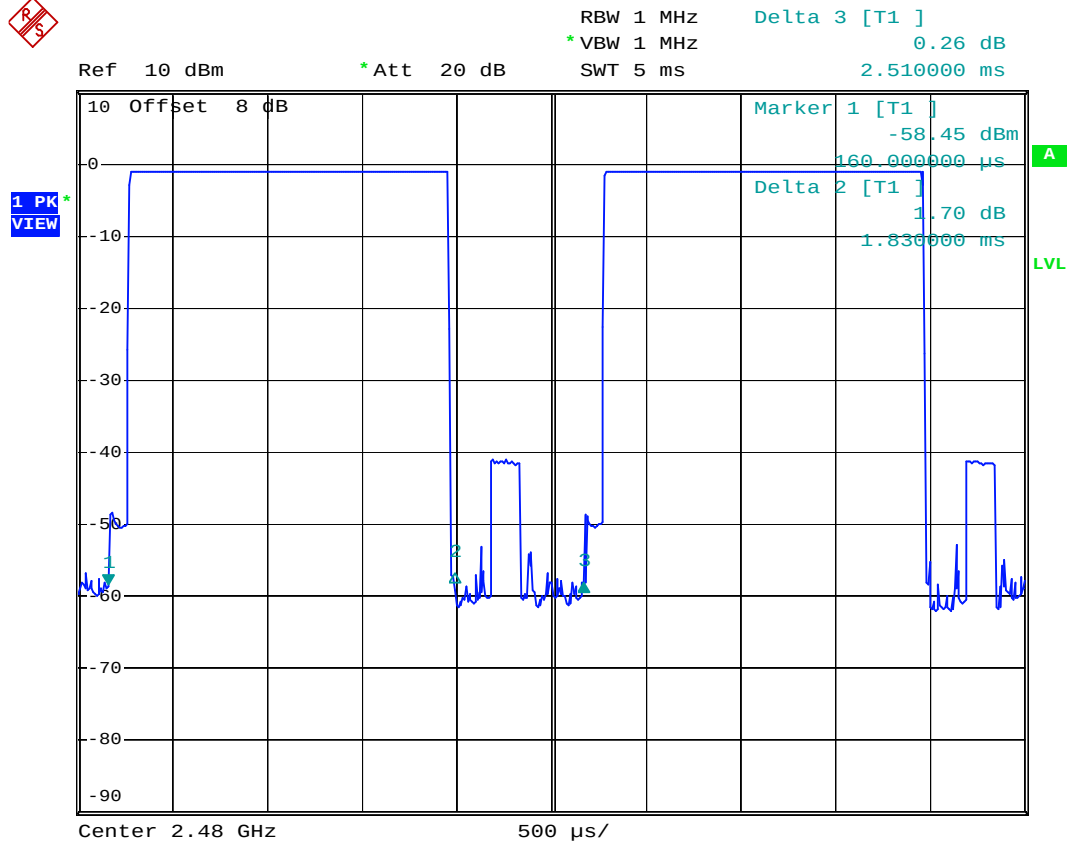
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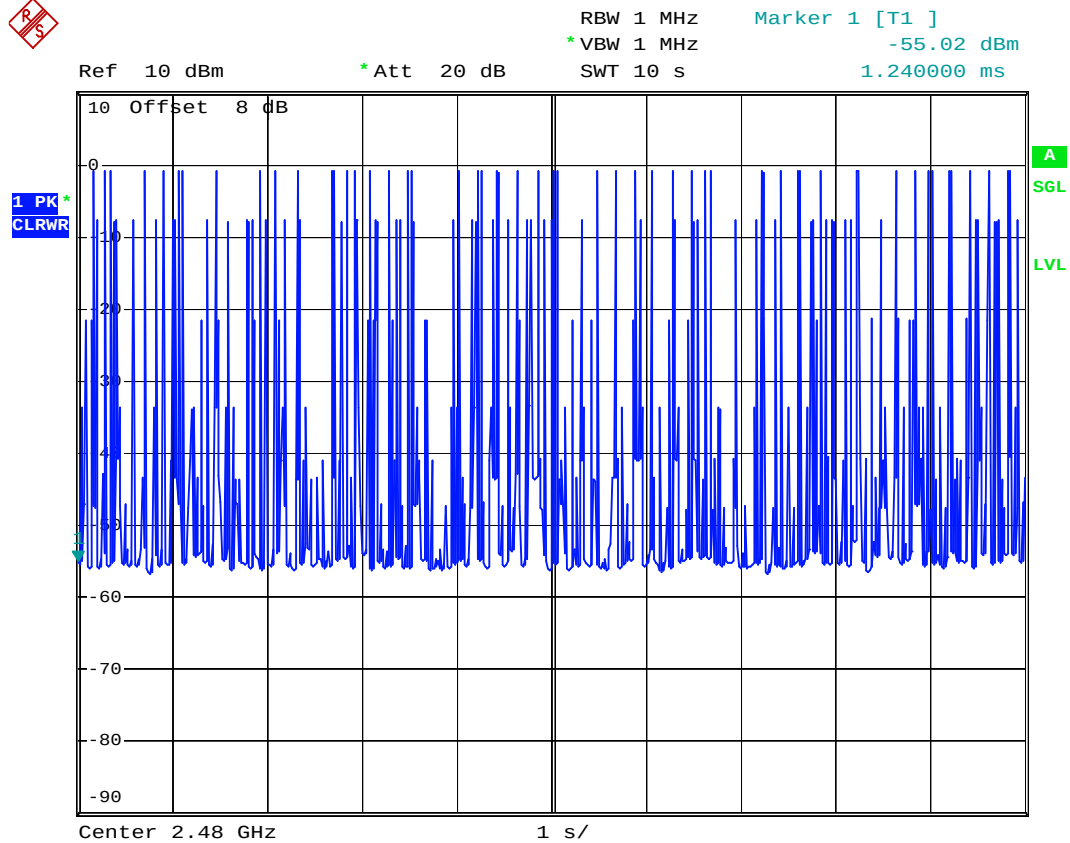
Date: 3.MAR.2006 20:08:08



DH3 (CH78)



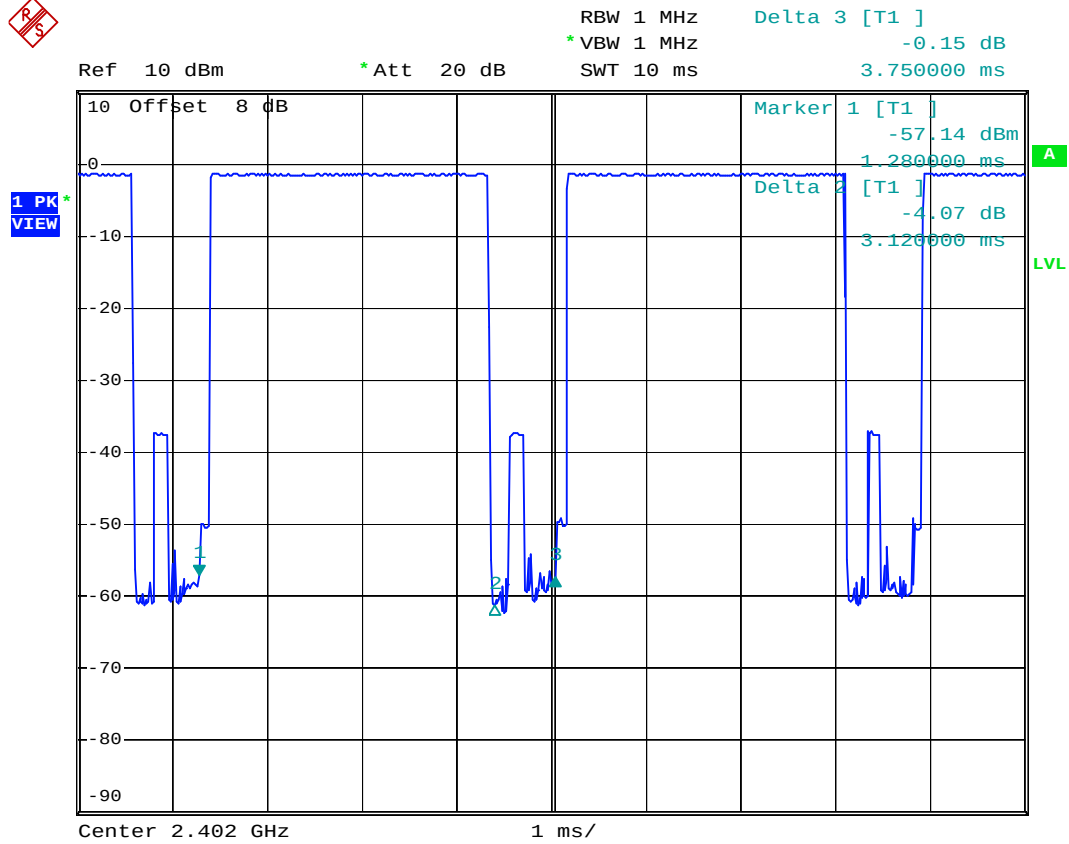
Date: 3.MAR.2006 19:57:36



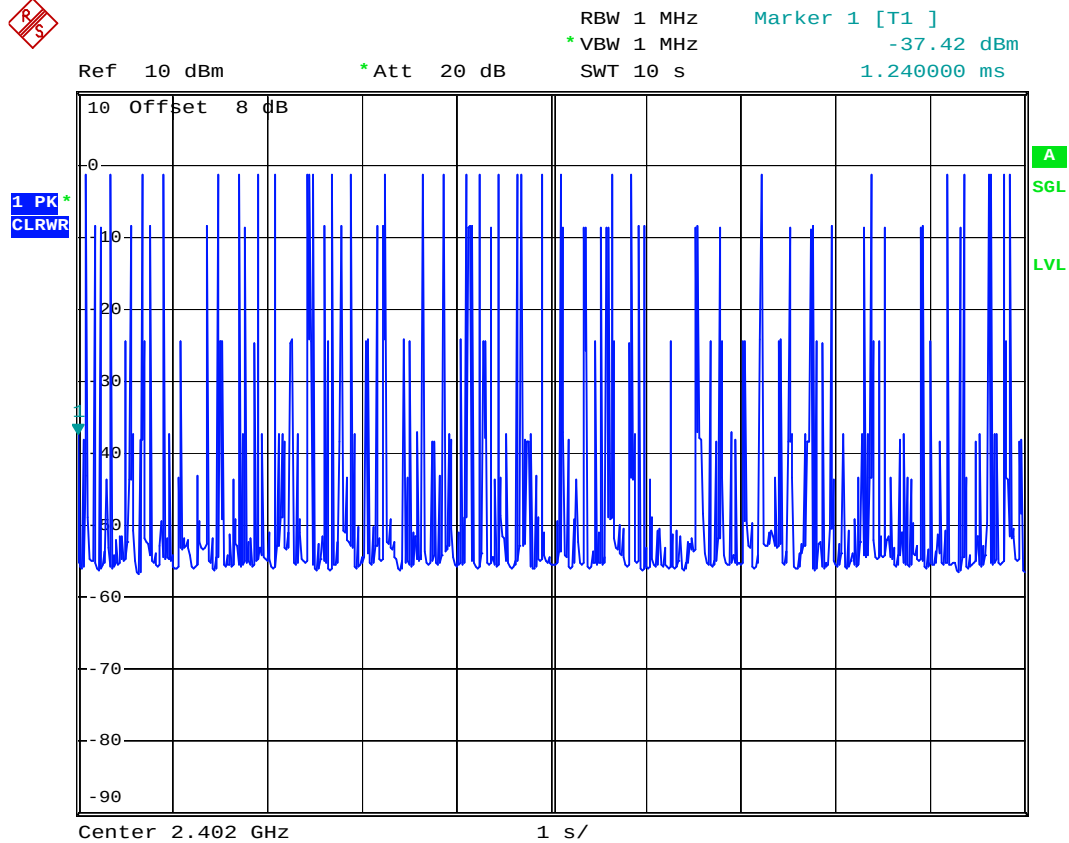
Date: 3.MAR.2006 20:09:01



DH5 (CH00)



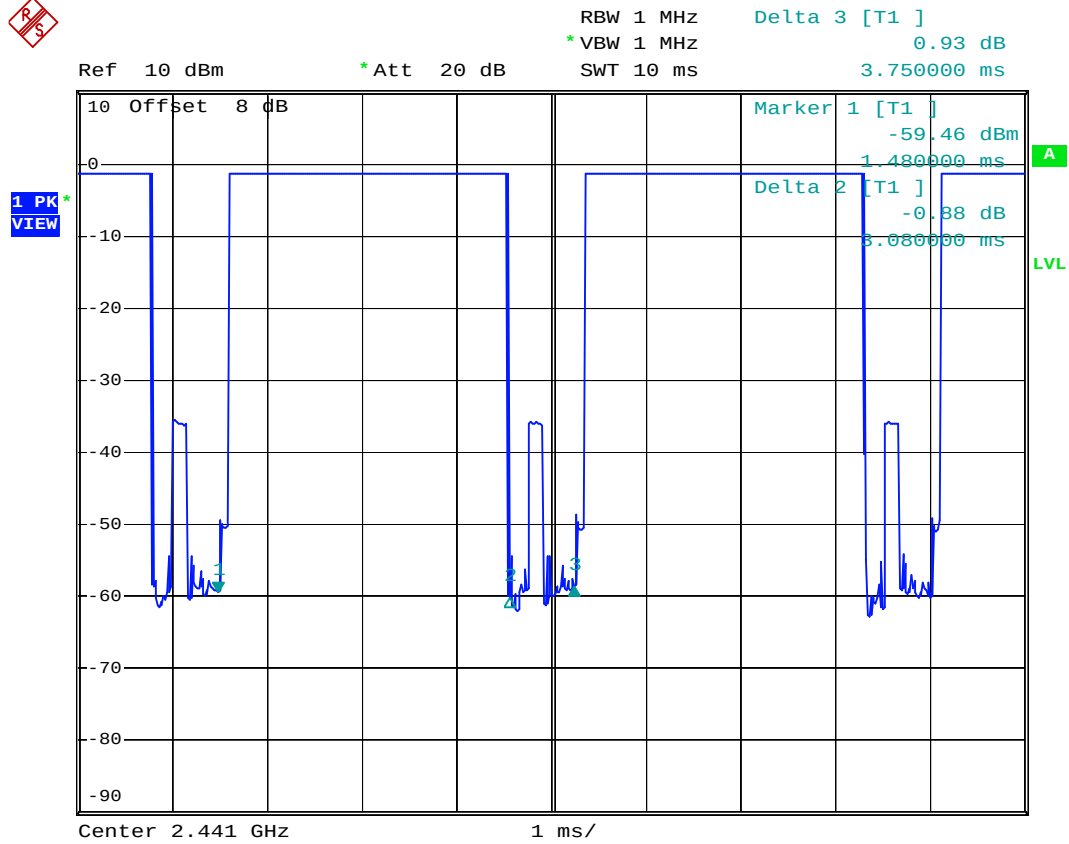
Date: 3.MAR.2006 20:01:09



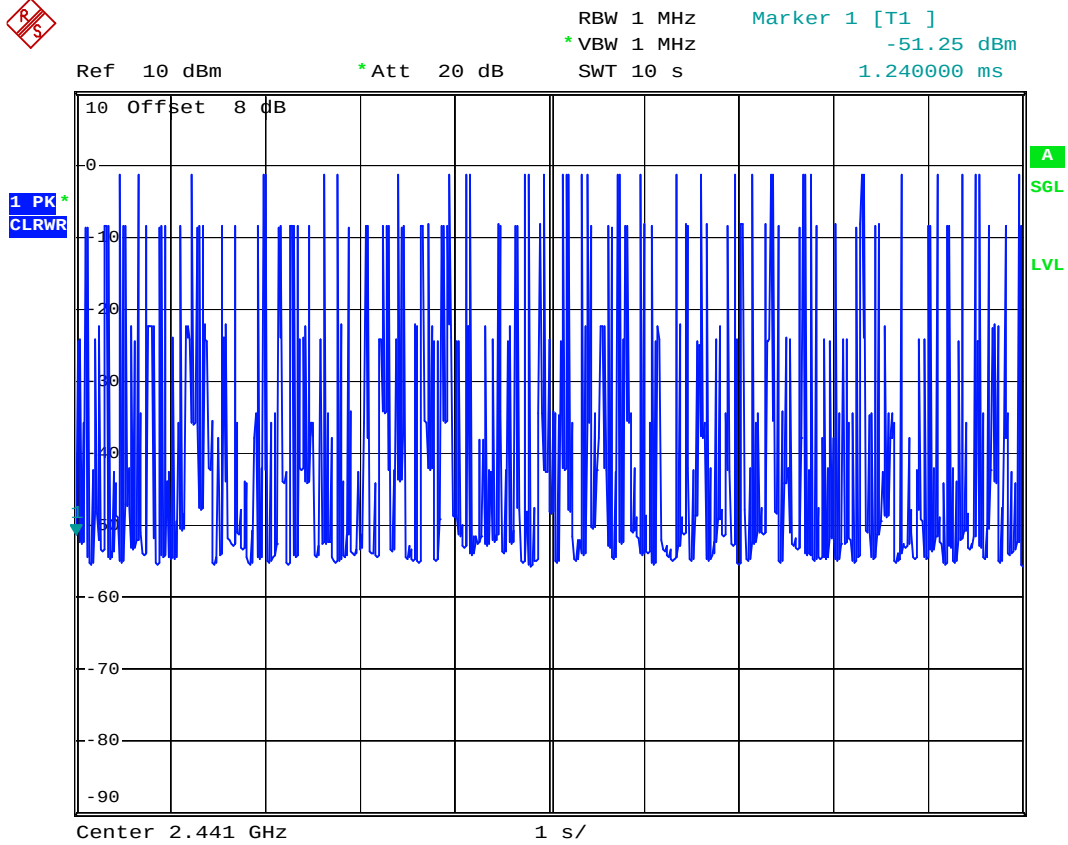
Date: 3.MAR.2006 20:06:08



DH5 (CH39)



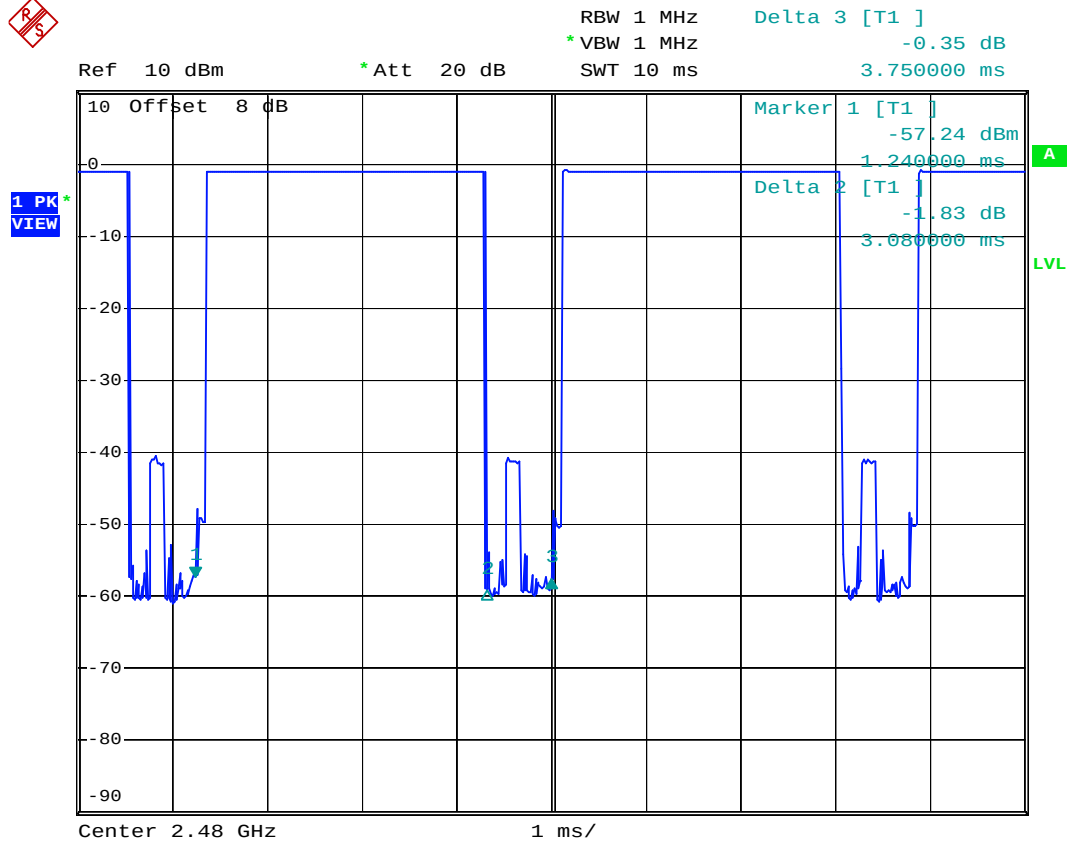
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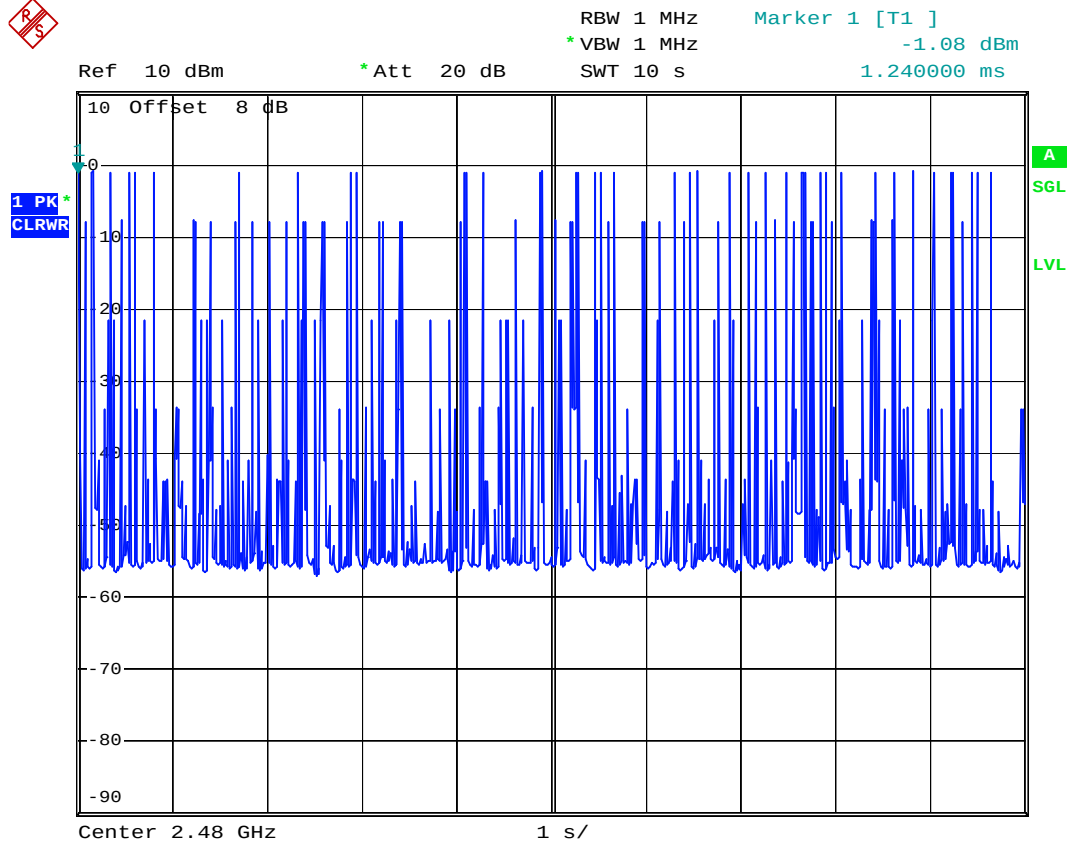
Date: 3.MAR.2006 20:05:28



DH5 (CH78)



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



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

5.6 Output Power

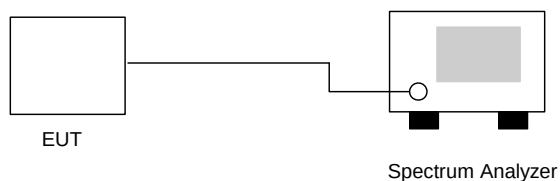
5.6.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.6.2 Test Procedure :

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

5.6.3 Test Setup Layout :



5.6.4 Test Result : See spectrum analyzer plots below

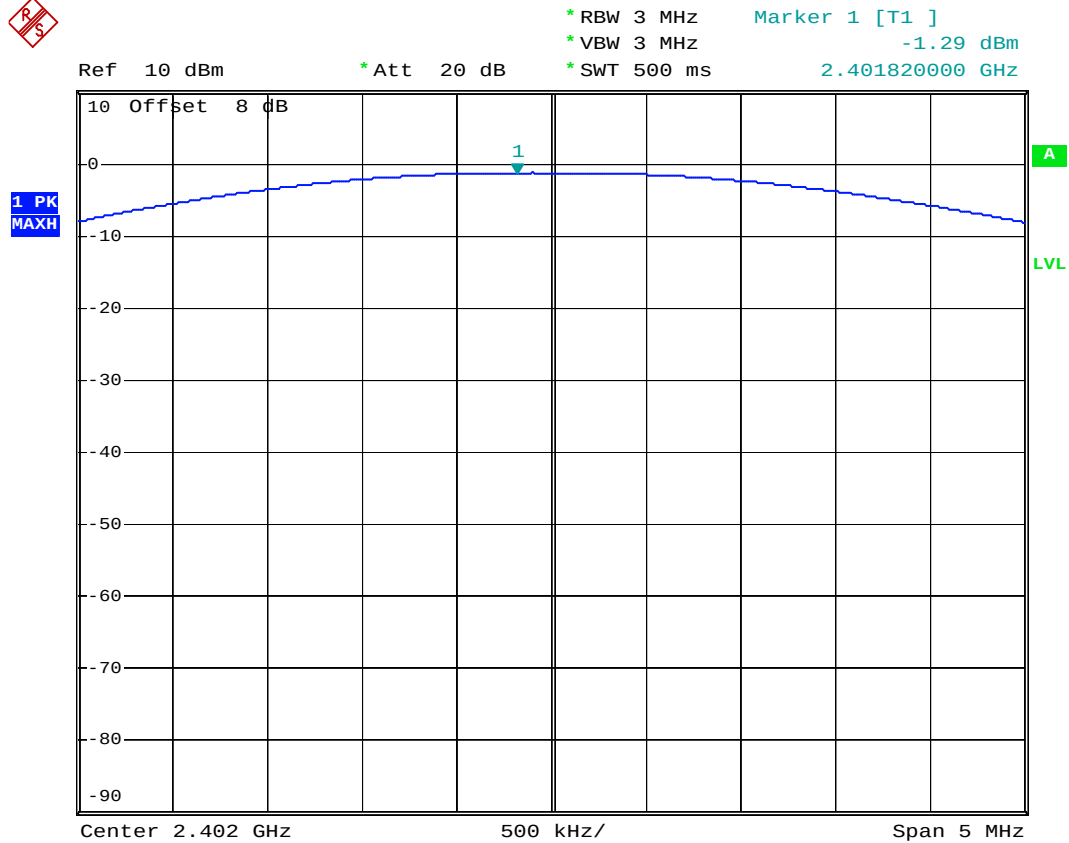
- Temperature: 24°C
- Relative Humidity: 53%
- Test Engineer : James

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



5.6.5 Output Power

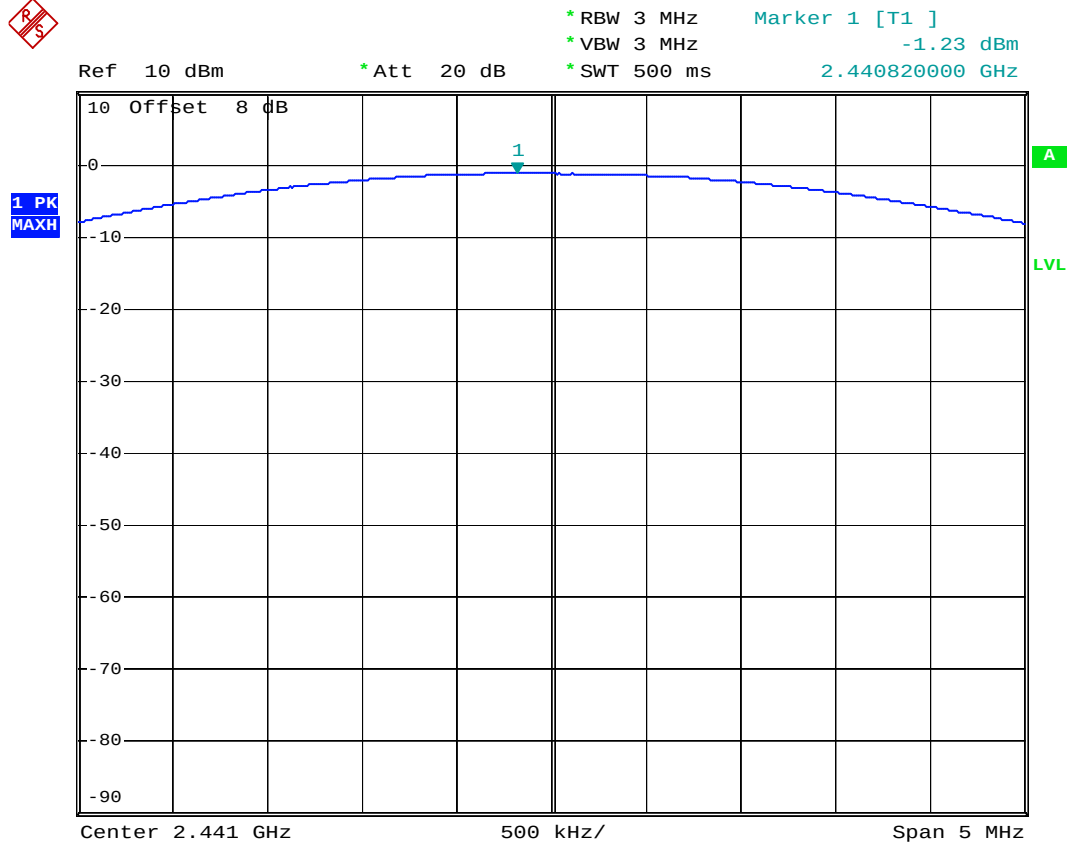
Mode 1: CH00 (2402MHz)



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



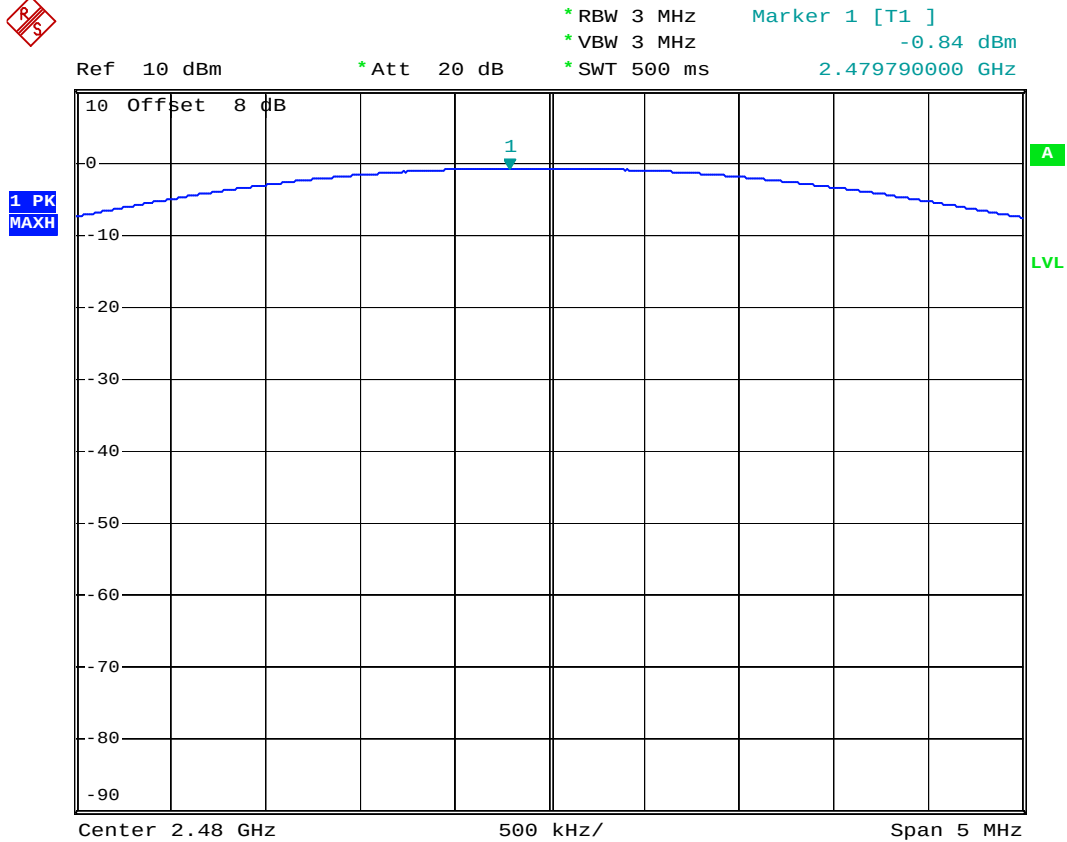
Mode 2: CH39 (2441MHz)



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



Mode 3: CH78 (2480MHz)



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



5.7 100kHz Bandwidth of Frequency Band Edges

5.7.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.7.2 Test Procedure :

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

5.7.3 Test Result :

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

Test Result in lower band (Channel 00) : PASS

Test Result in higher band(Channel 78) : PASS

5.7.4 Note on Band edge Emission

CH00 (Horizontal)

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

CH00 (Vertical)

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

**CH78 (Horizontal)**

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

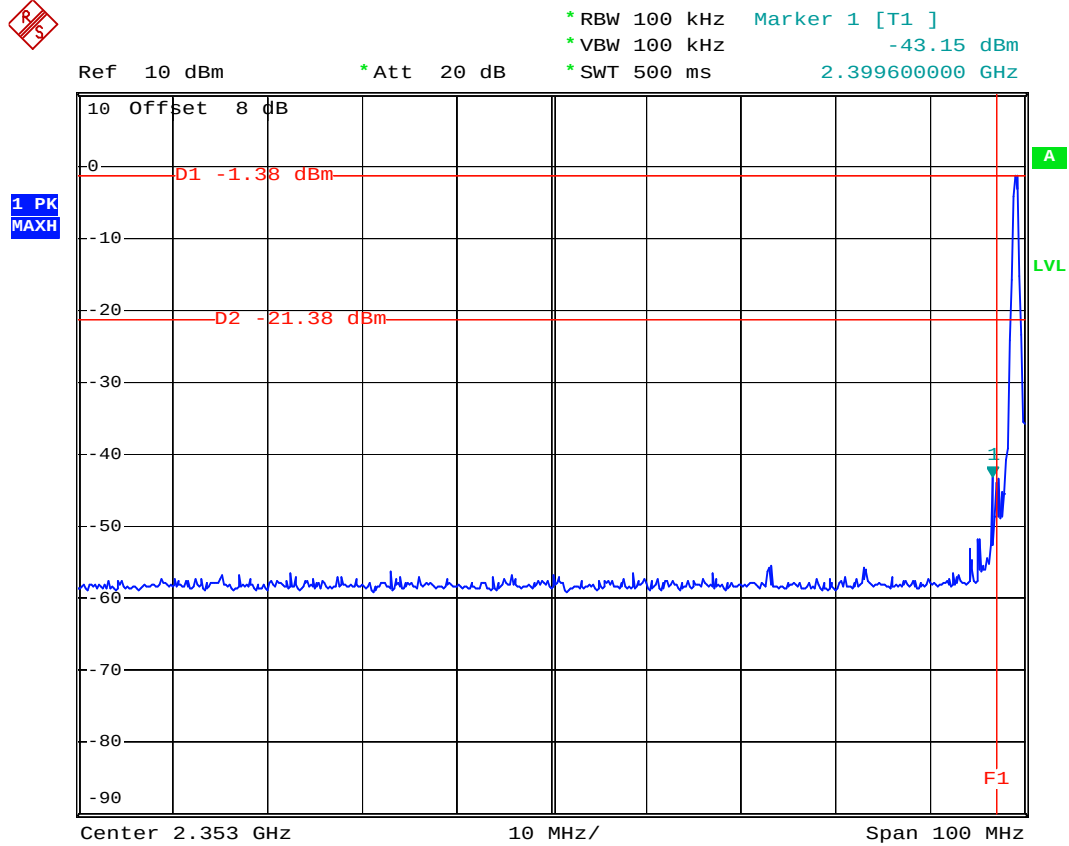
CH78 (Vertical)

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



5.7.5 Frequency Band Edge

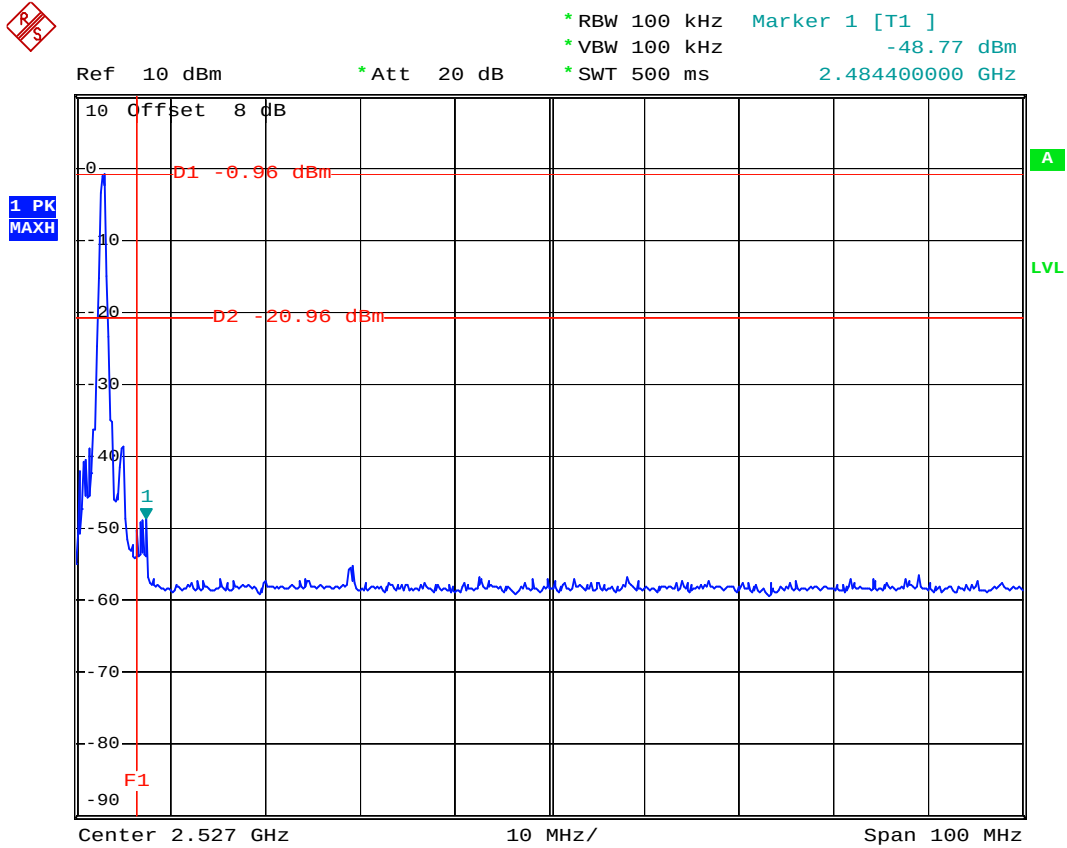
Mode 1: CH00 (2402 MHz)



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



Mode 3: CH78 (2480 MHz)



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



5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

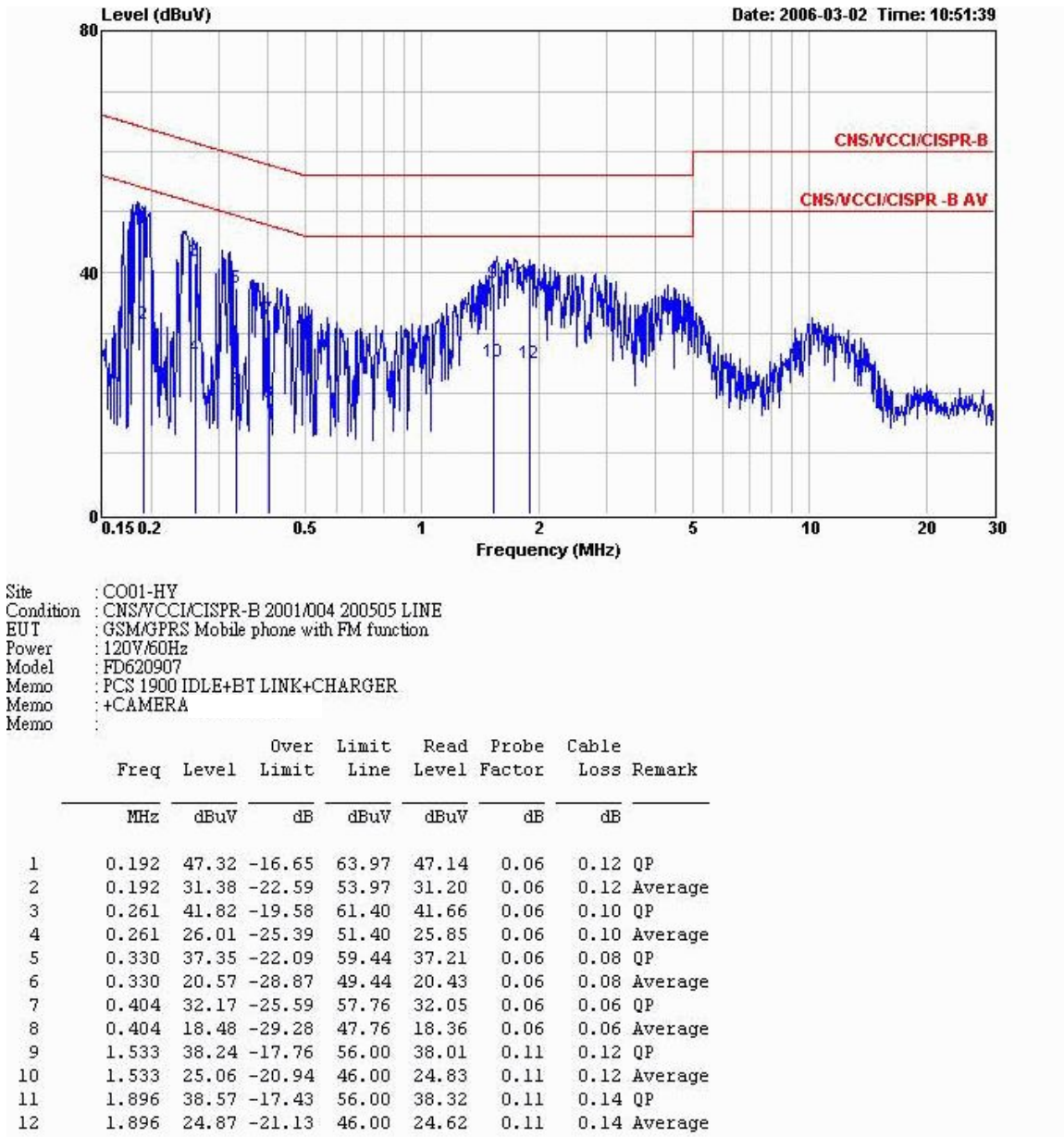
5.8.2 Test Procedures :

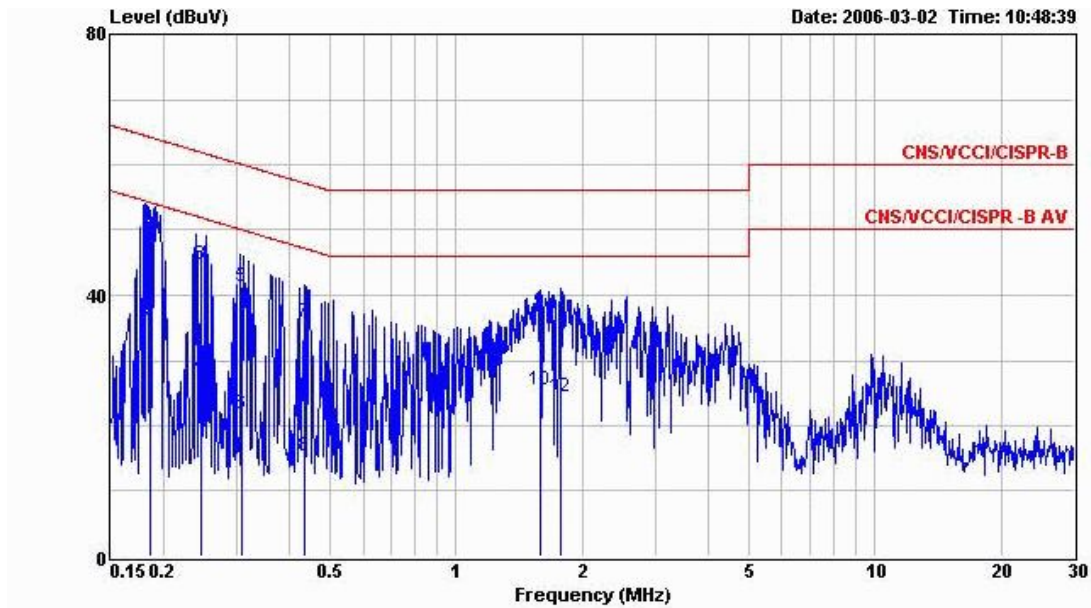
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network (LISN).
- c. All the support units are connected to the other LISN.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

5.8.3 Test Data Test Mode 1

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

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





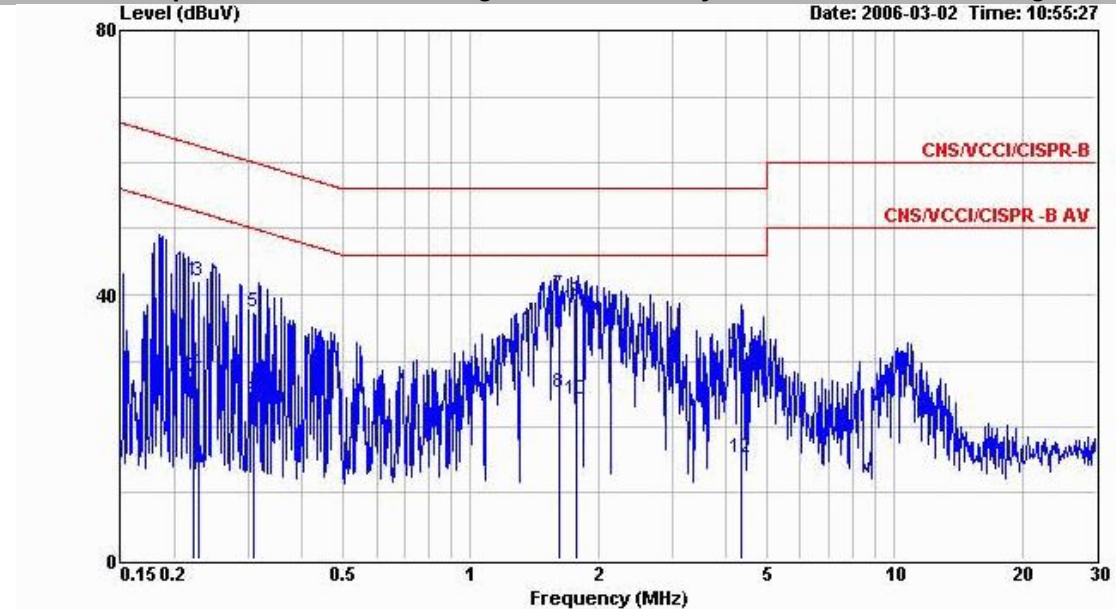
Site : CO01-HY
 Condition : CNS/VCCI/CISPR-B 2001/004 200505 NEUTRAL
 EUT : GSM/GPRS Mobile phone with FM function
 Power : 120V/60Hz
 Model : FD620907
 Memo : PCS 1900 IDLE+BT LINK+CHARGER
 Memo : +CAMERA
 Memo :

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

5.8.4 Test Data Test Mode 2

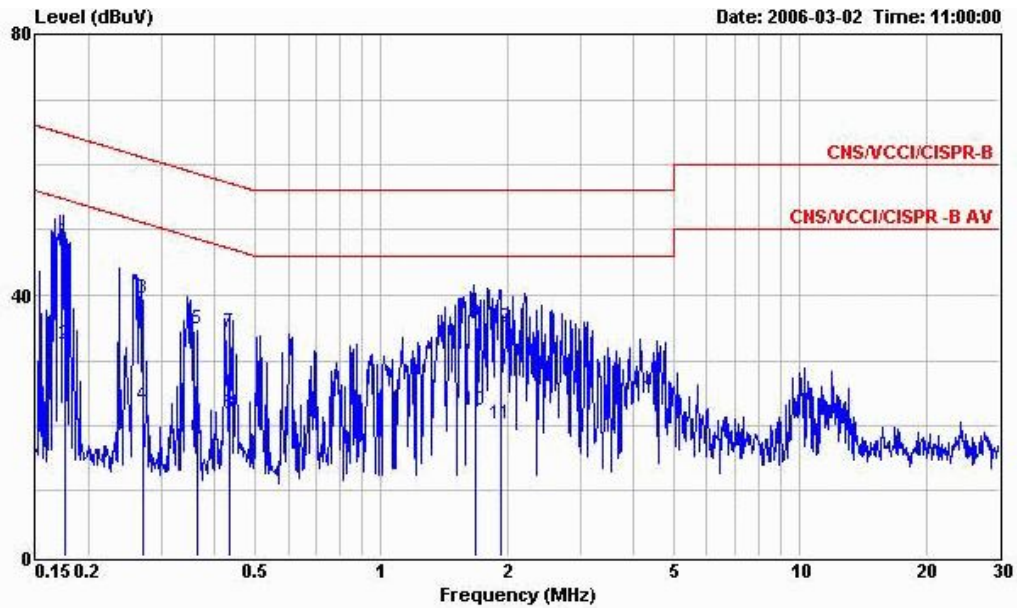
- Temperature: 25°C
- Relative Humidity: 62%
- Test Engineer : James

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



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

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



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

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

5.9 Radiated Emission Measurement

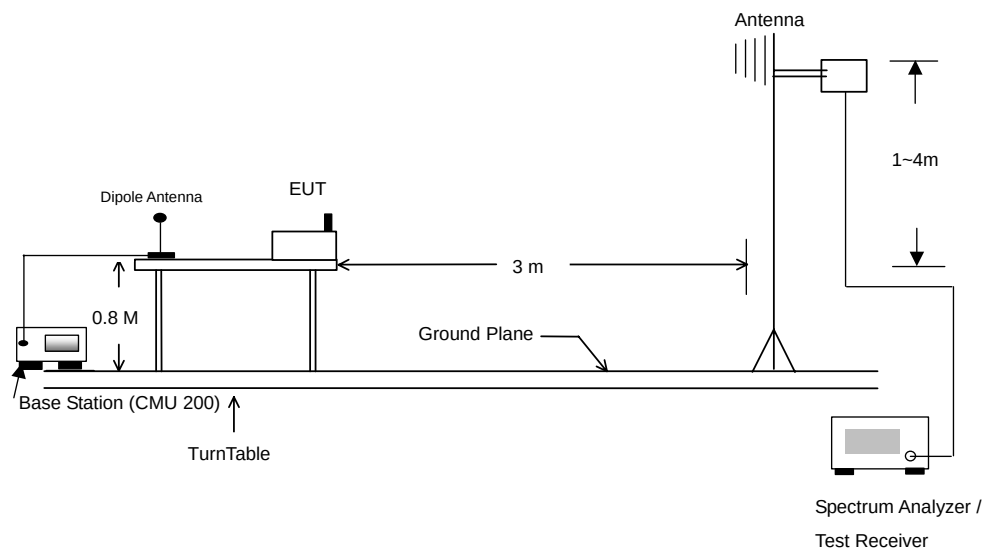
5.9.1 Measuring Instruments

As described in chapter 6 of this Report.

5.9.2 Test Procedures

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

5.9.3 Typical Test Setup Layout of Radiated Emission

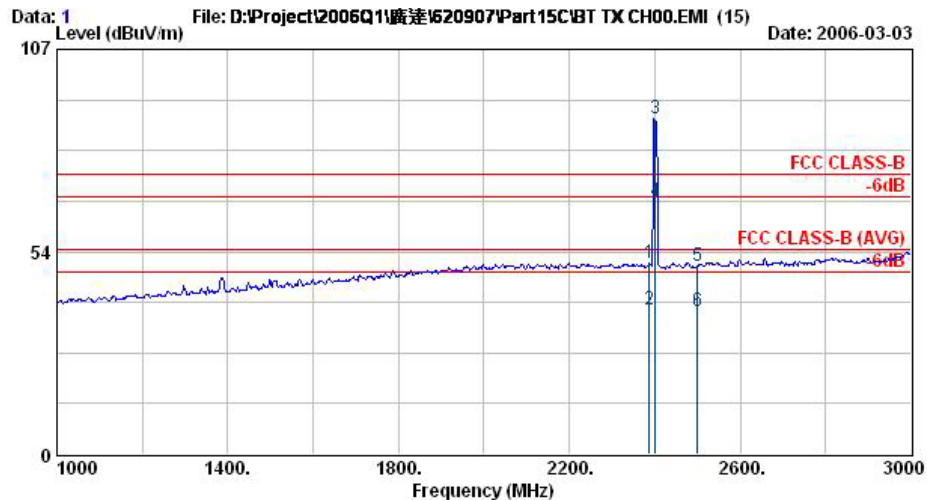




5.9.4 Test Data

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

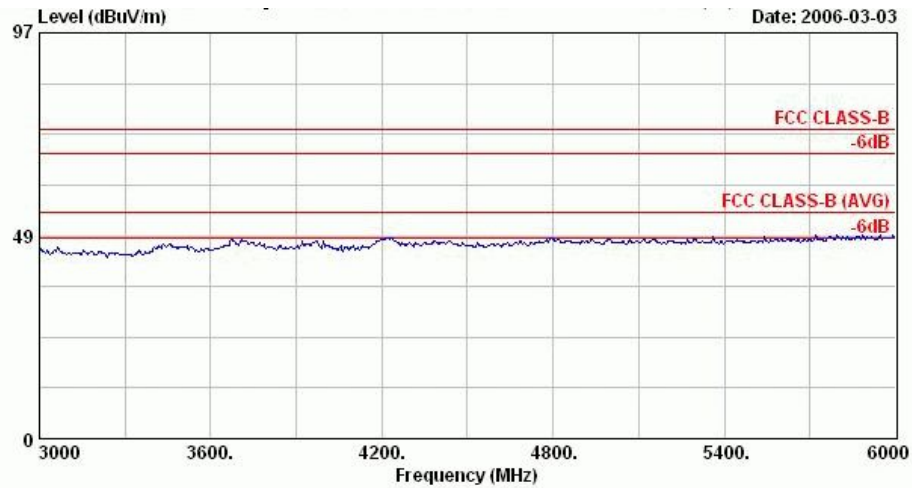
■ The test that passed at the minimum margin was marked by the frame in the following test record



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

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

Remark: #3 and #4 Fundamental Signal

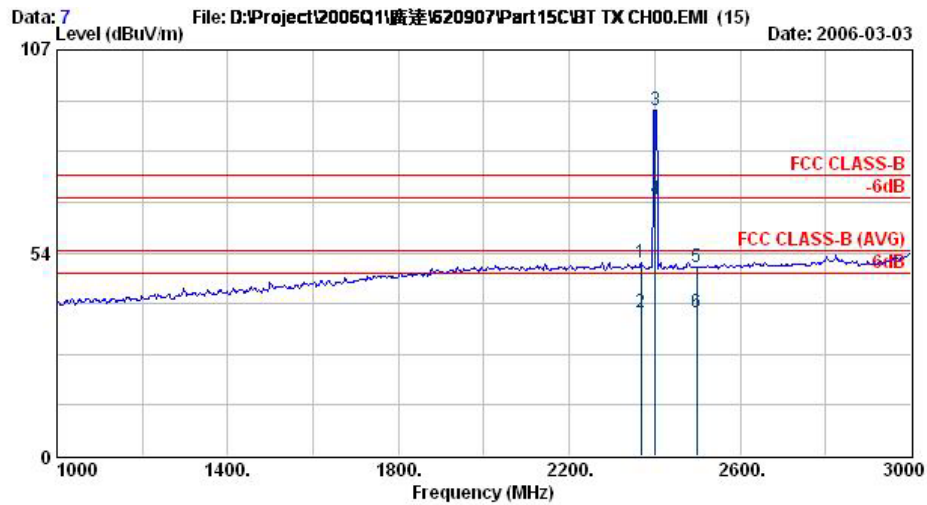


Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch00,2402Mhz
Plane : E1



- Test Mode : Mode 1
- Polarization : Vertical

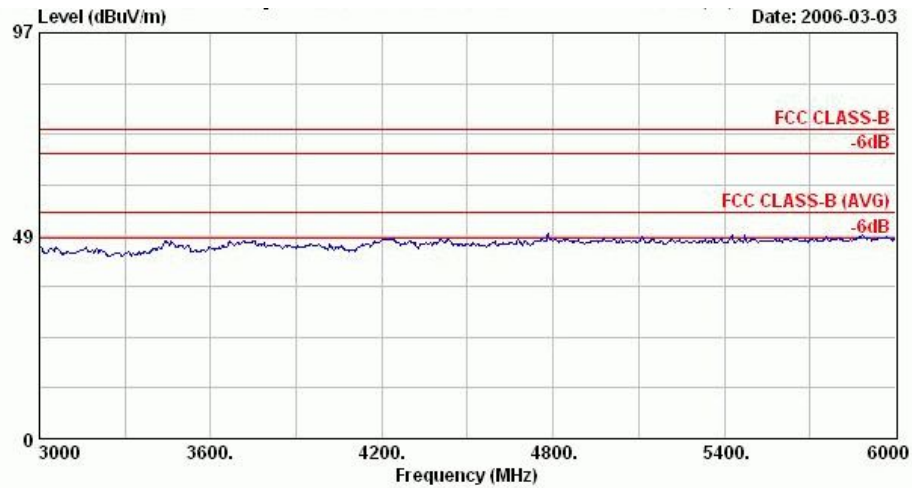
The test that passed at minimum margin was marked by the frame in the following table.



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

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

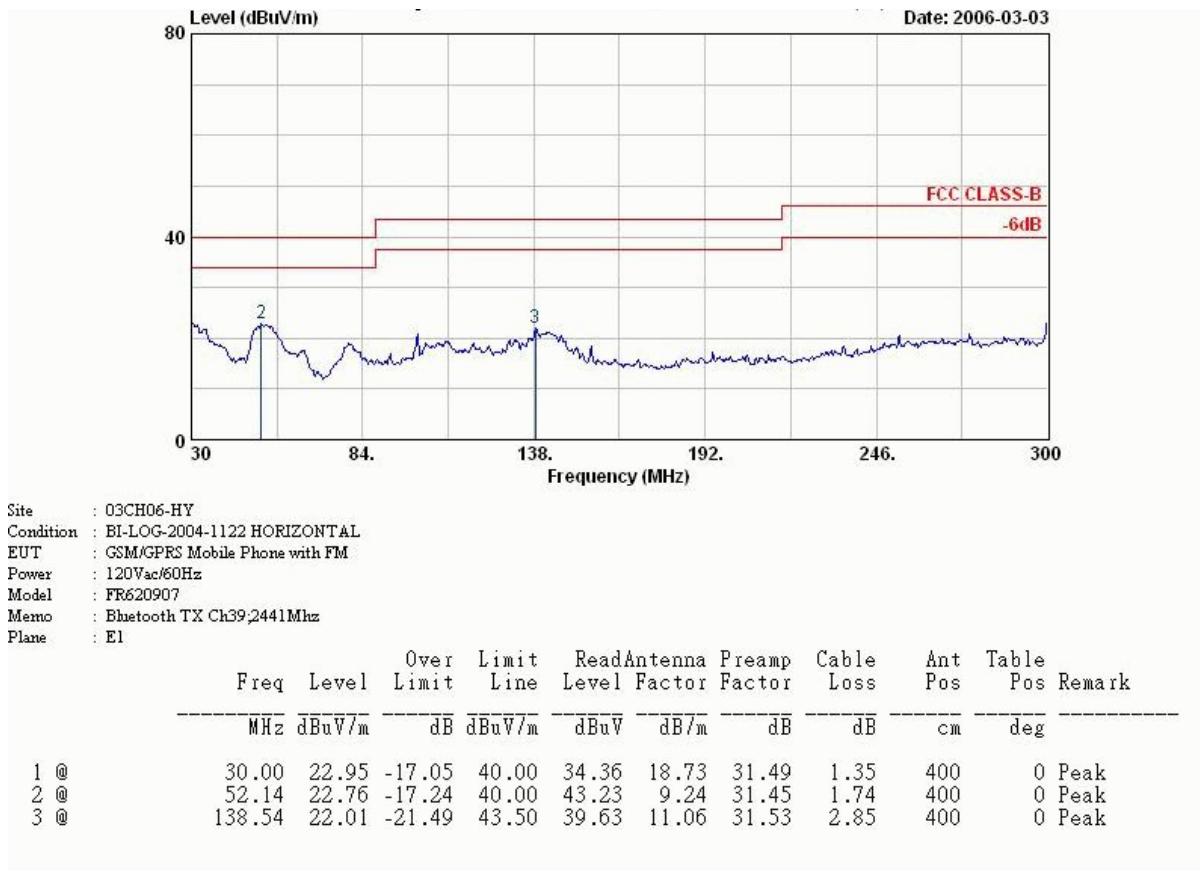
Remark: #3 and #4 Fundamental Signal

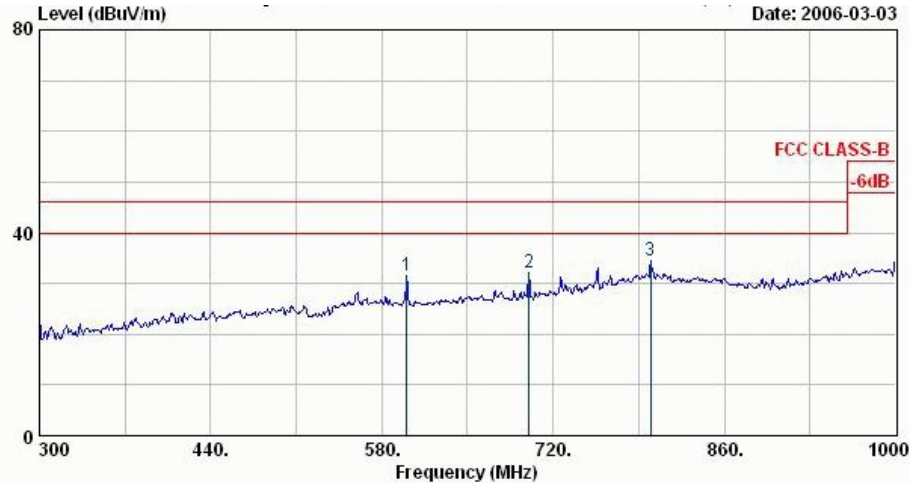


Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch00,2402Mhz
Plane : E1

- Test Mode : Mode 2
- Polarization : Horizontal

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

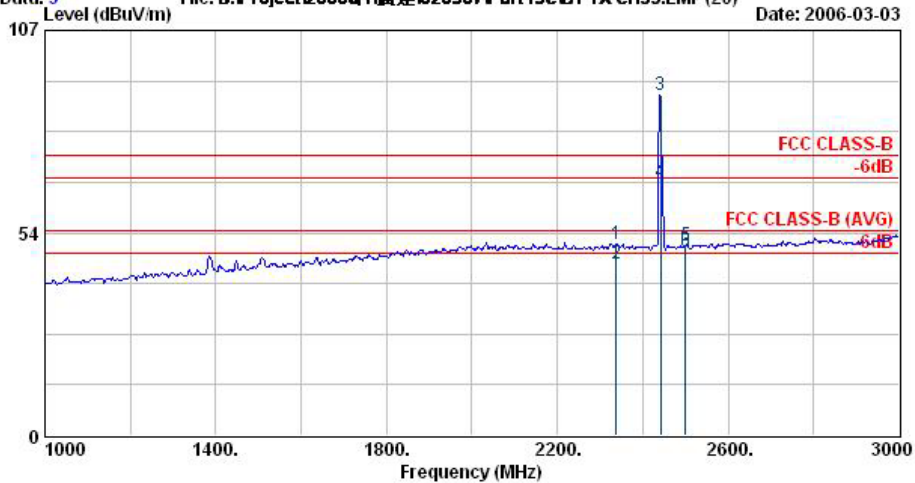




Site : 03CH06-HY
Condition : BI-LOG-2004-1122 HORIZONTAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch39,2441Mhz
Plane : E1

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

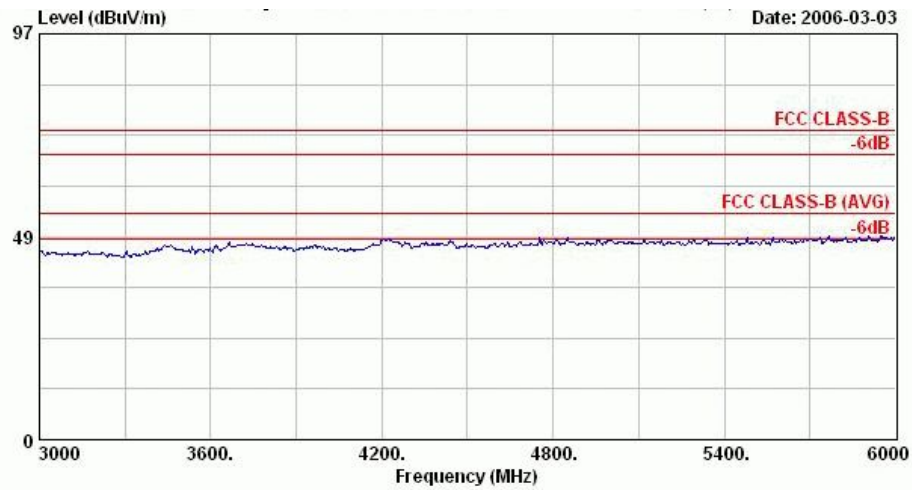
Data: 3 File: D:\Project\2006Q1\廣達\620907\Part15\BT TX CH39.EMI (20)



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

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

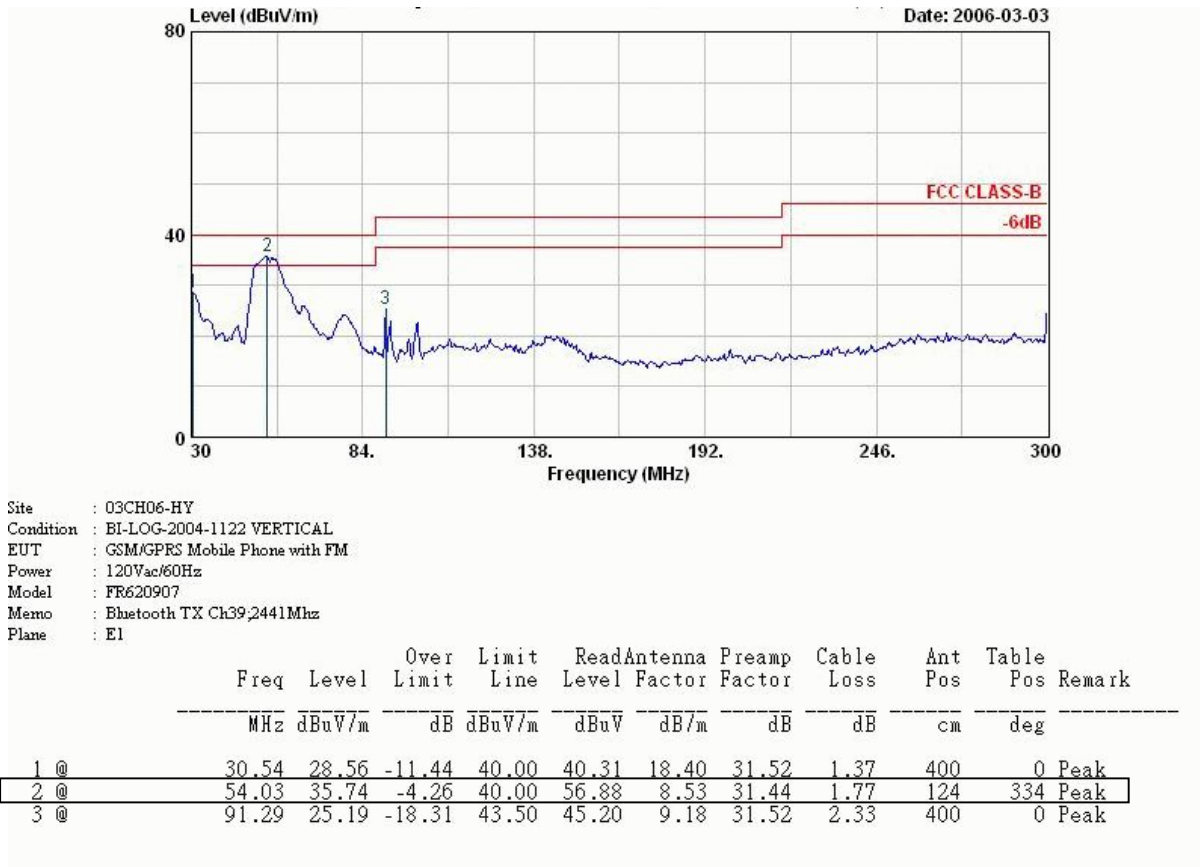
Remark: #3 and #4 Fundamental Signal

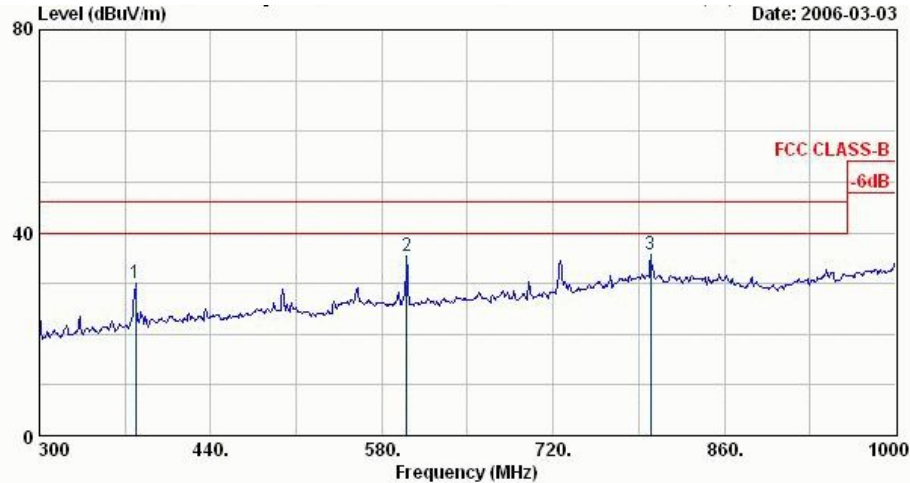


Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch39,2441Mhz
Plane : E1

- Test Mode : Mode 2
- Polarization : Vertical

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

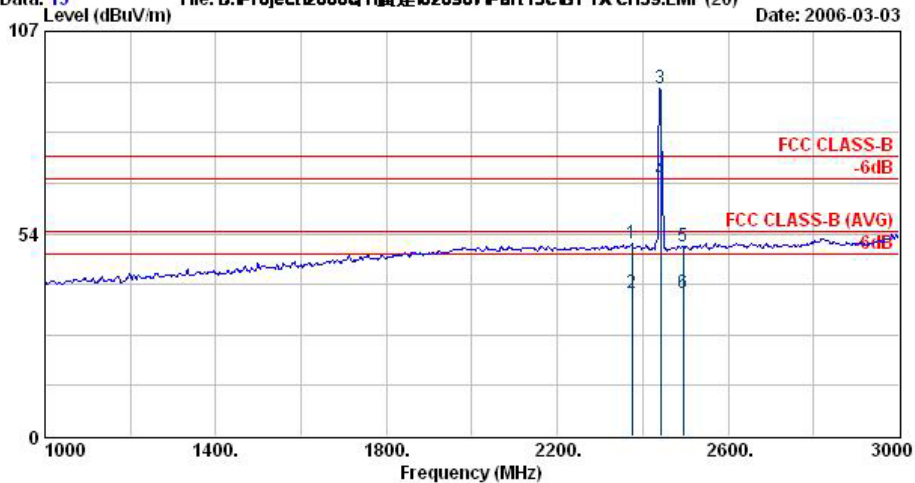




Site : 03CH06-HY
Condition : BI-LOG-2004-1122 VERTICAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch39,2441Mhz
Plane : E1

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

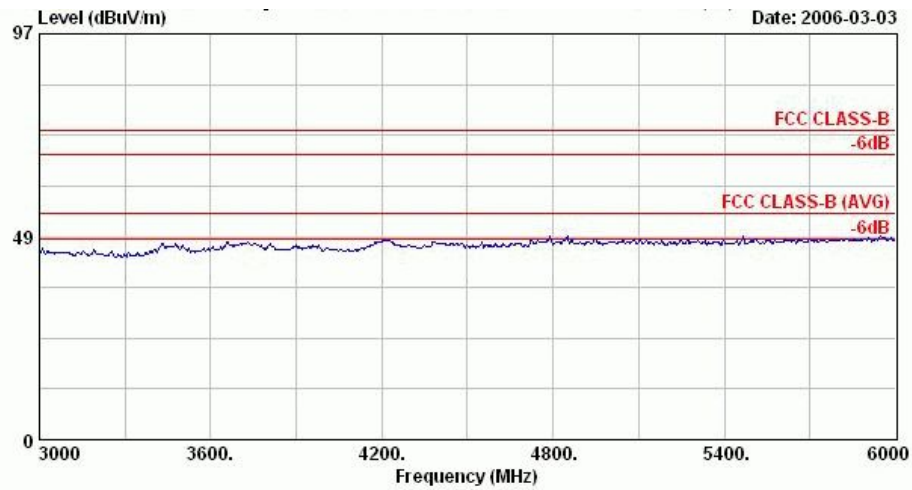
Data: 13 File: D:\Project\2006Q1\廣達620907\Part15C\BT TX CH39.EMI (20)



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

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

Remark: #3 and #4 Fundamental Signal

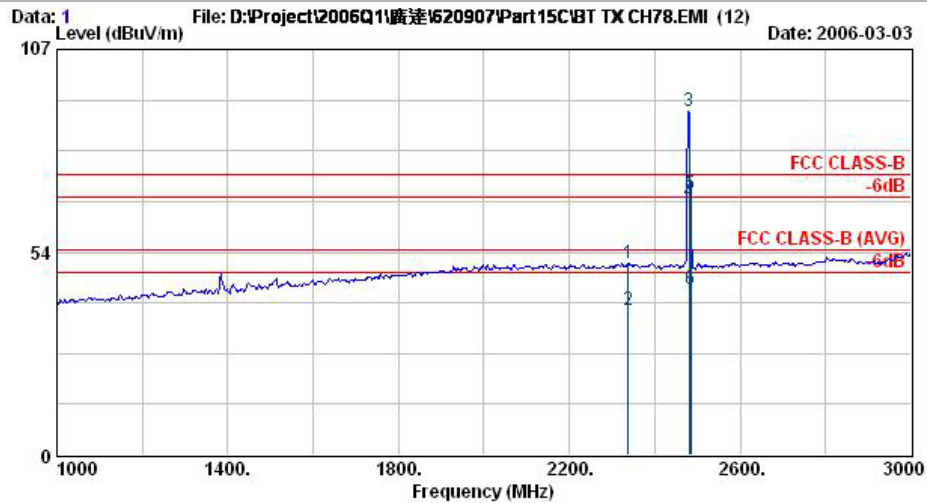


Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch39,2441Mhz
Plane : E1



- Test Mode : Mode 3
- Polarization : Horizontal

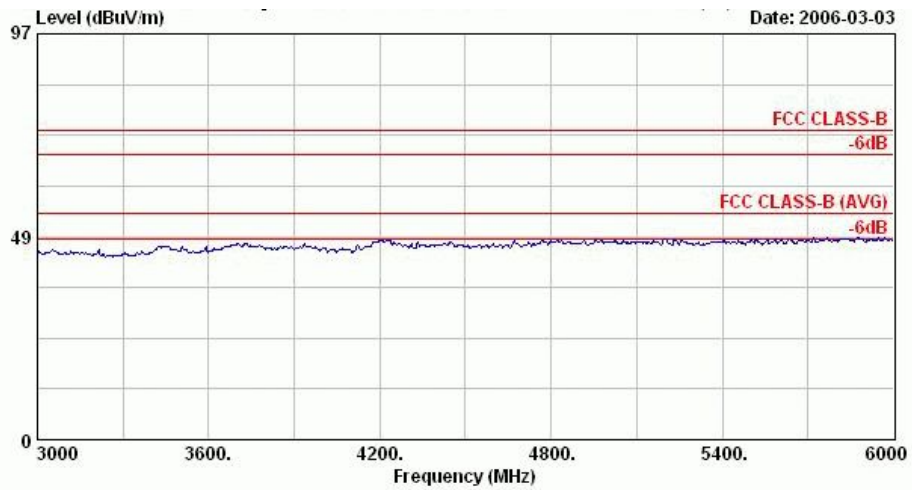
The test that passed at minimum margin was marked by the frame in the following table.



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

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

Remark: #3 and #4 Fundamental Signal.

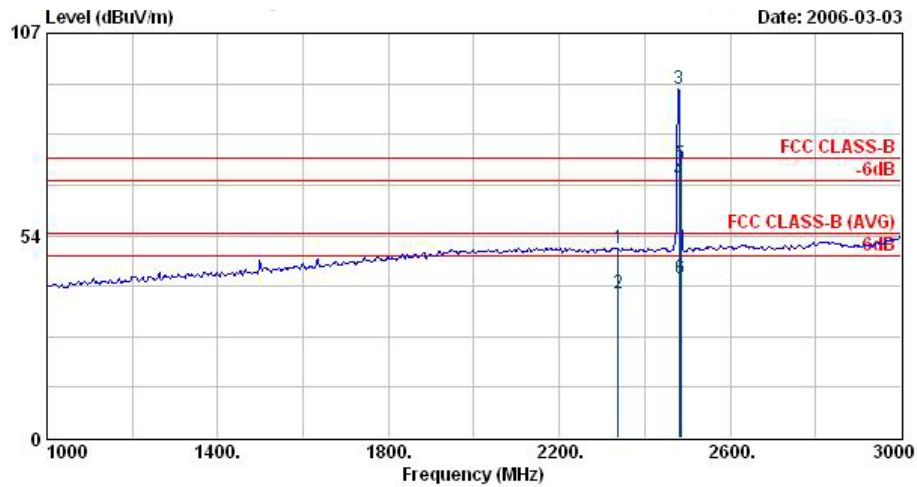


Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch78,2480Mhz
Plane : E1



- Test Mode : Mode 3
- Polarization : Vertical

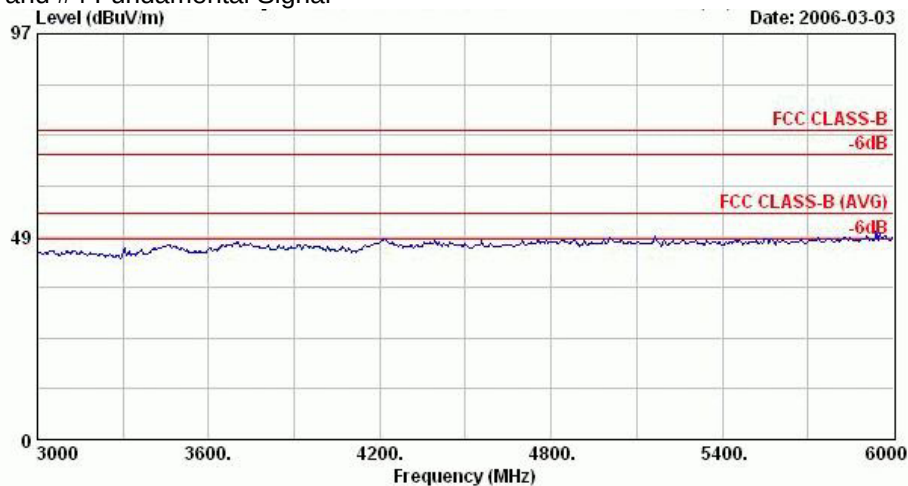
The test that passed at minimum margin was marked by the frame in the following table.



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

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

Remark: #3 and #4 Fundamental Signal



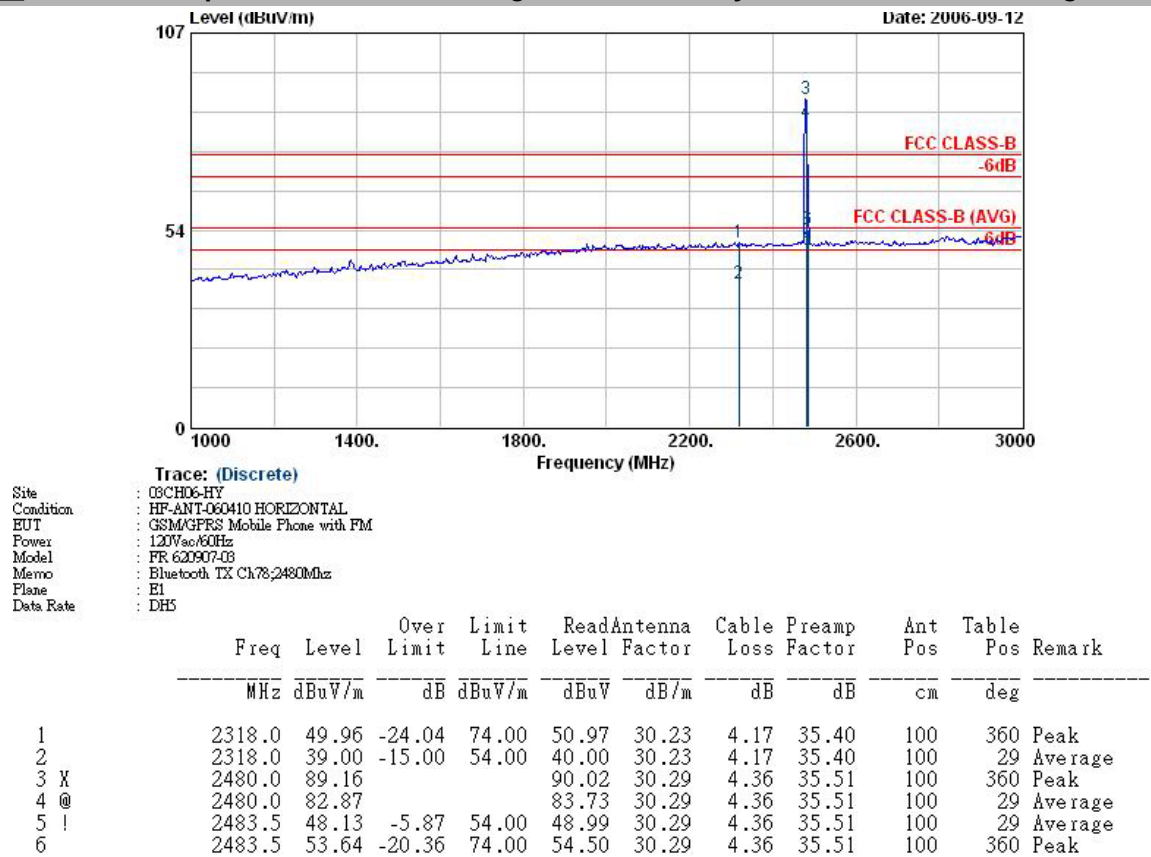
Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : GSM/GPRS Mobile Phone with FM
Power : 120Vac/60Hz
Model : FR620907
Memo : Bluetooth TX Ch78,2480Mhz
Plane : E1

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

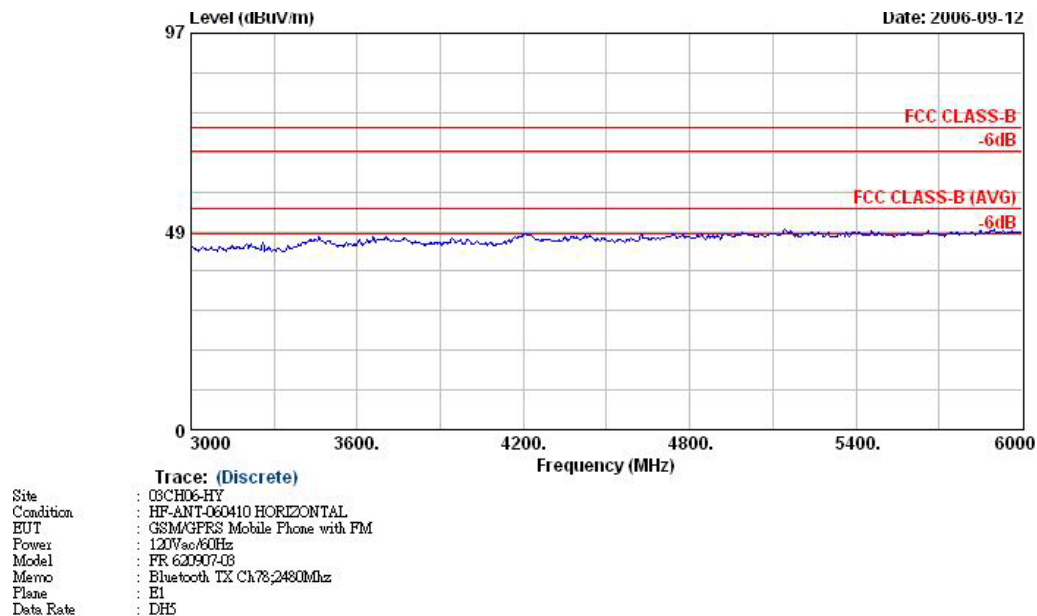


- Test Mode : Mode 4
- Polarization : Horizontal

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



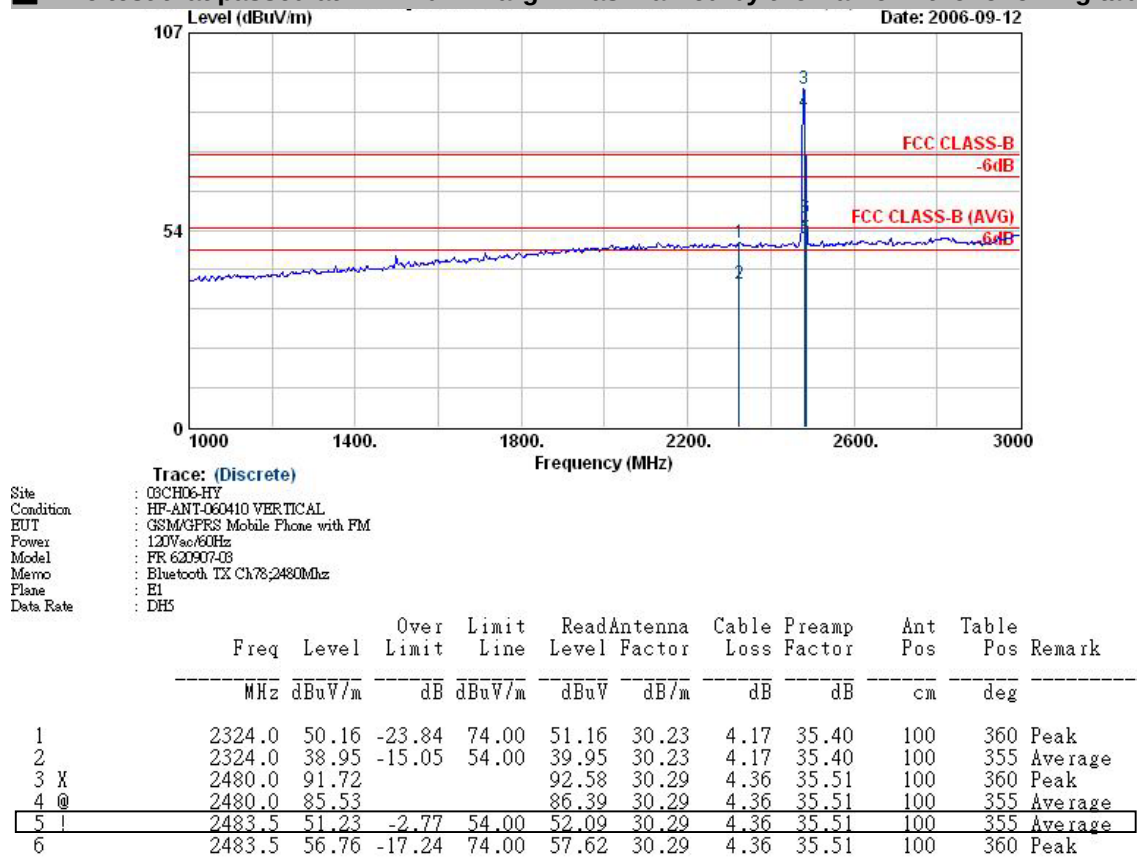
Remark: #3 and #4 Fundamental Signal



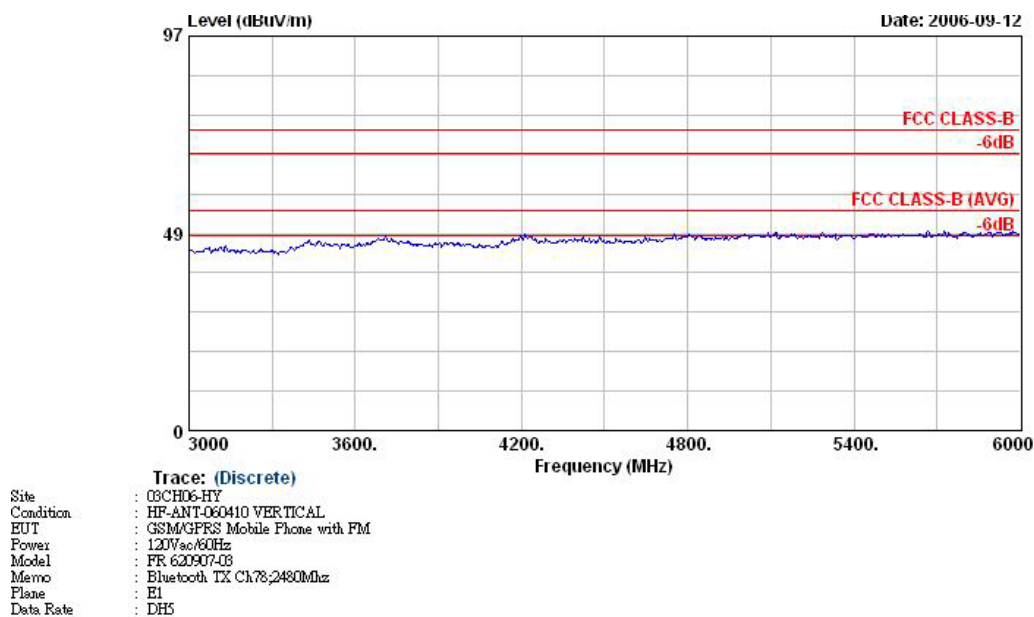


- Test Mode : Mode 4
- Polarization : Vertical

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



Remark: #3 and #4 Fundamental Signal



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



5.10 Antenna Requirements

5.10.1 Standard Applicable

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

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

5.10.2 Antenna Connected Construction

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

5.10.3 Antenna Gain

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

6. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	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	SCHWARZBEC K	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
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				