



FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment : Bluetooth Mini Keyboard

Trade Name : Chainpus

Model No. : BK300

FCC ID : SJP-CPBK300

Filing Type : Certification

Applicant : Chainpus Technology Co., Ltd.

No. 2-5, Shanzibian, Danshui Town, Taipei County, Taiwan 251, R.O.C.

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- The data shown in this test report were carried out on Apr. 05, 2006 at **Sporton International Inc. LAB.**
- Report No.: FR621302, Report Version: Rev. 01.

Dr. Daniel Lee
EMC/SAR Director

SPORTON International Inc.

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

SPORTON International Inc.

TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

Report Version: Rev. 01



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History of this test report

Report Issue Date: Apr. 11, 2006

Report No.	Description

1. General Description of Equipment under Test

1.1. Applicant

Chainpus Technology Co., Ltd.

No. 2-5, Shanzibian, Danshui Town, Taipei County, Taiwan 251, R.O.C.

1.2. Manufacturer

Chainpus Technology Co., Ltd.

Mu Lun Bei Huan Road Industrial Area, Chang Ping, Dong Guan, Guan Dong Province 52356(P.R.C.)

1.3. Basic Description of Equipment under Test

Equipment : Bluetooth Mini Keyboard
Trade Name : Chainpus
Model No. : BK300
FCC ID : SJP-CPBK300
Power Supply Type : From System

1.4. Feature of Equipment under Test

Product Feature & Specification				
1. Modulation Type/Data Rate	GFSK			
2. Frequency Range.	2400 MHz ~ 2483.5 MHz			
Number of Channels	79			
3. Carrier Frequency of each channel	2402+ n*1 MHz, n= 0~78			
4. Channel Spacing	1 MHz			
5. Maximum Output Power to Antenna (Normal condition)	0.01 dBm			
6. Type of Antenna Connector	N/A			
7. Antenna Type	Chip Antenna			
8. Antenna Gain	2 dBi			
9. Function Type	Transmitter		Transceiver	V
10. Power Rating (DC/AC , Voltage)	From System			

2. Test Configuration of Equipment under Test

2.1. Test Manner

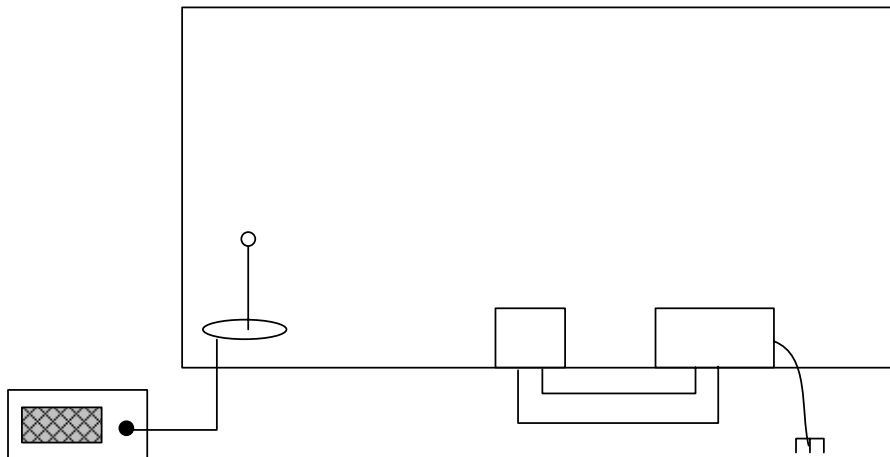
- The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- For spurious emission below 1GHz, only one channel of each application was tested because it is not related to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

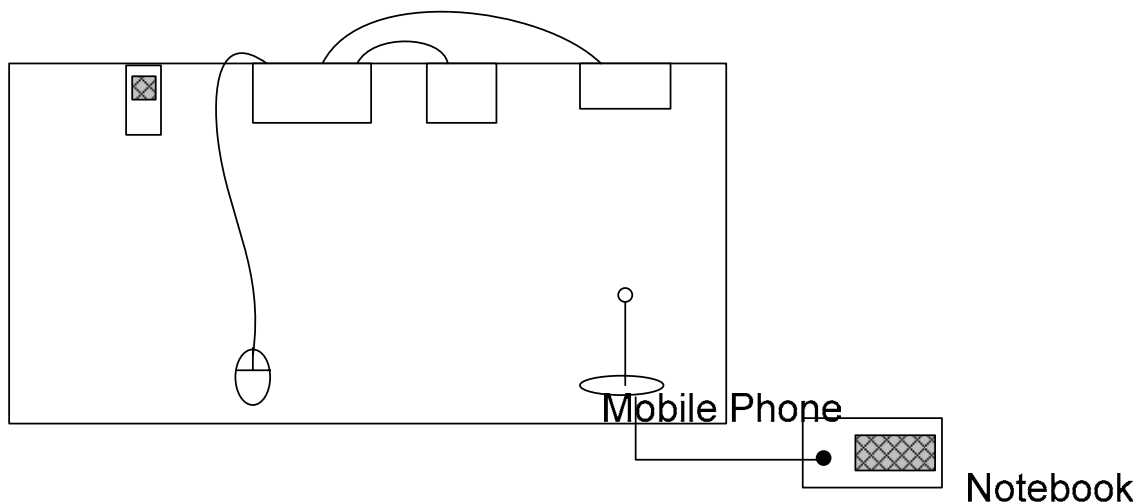
2.2. Test Mode

Application	Bluetooth
Radiated Emission and conducted test items	Mode 1: Tx_CH00_2402 MHz
	Mode 2: Tx_CH39_2441 MHz
	Mode 3: Tx_CH78_2480 MHz
Conducted Emission	Mode 1: BT Link + USB Charger

2.3. Connection Diagram of Test System

<Radiation Emission>



<Conduction Emission>

2.4. Ancillary Equipment List

Item	Equipment	Model No.	Power Cord
1.	Base Station (R&S)	CMU200	N/A
2.	Notebook (DELL)	D400	N/A
3.	USB Mouse (Microsoft)	B75-00093	Non-shielded, 1.8m
4.	Bluetooth Earphone (Free Style)	JD-100	N/A
5.	RS232 Cable	N/A	Aluminum Foil-shielded, 1.5m
6.	USB Cable	N/A	Weave-shielded, 1m, and 1.5m
7.	Mobile Phone (Siemens)	SXI (B92-DG115R)	N/A

Mouse



3. RF Utility

Programmed RF utility allows EUT links with base station to provide for Bluetooth continuous transmitting and receiving signal.



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

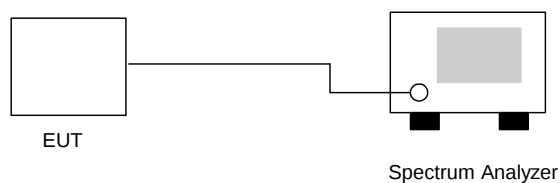
5.2.1. Measuring Instruments :

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

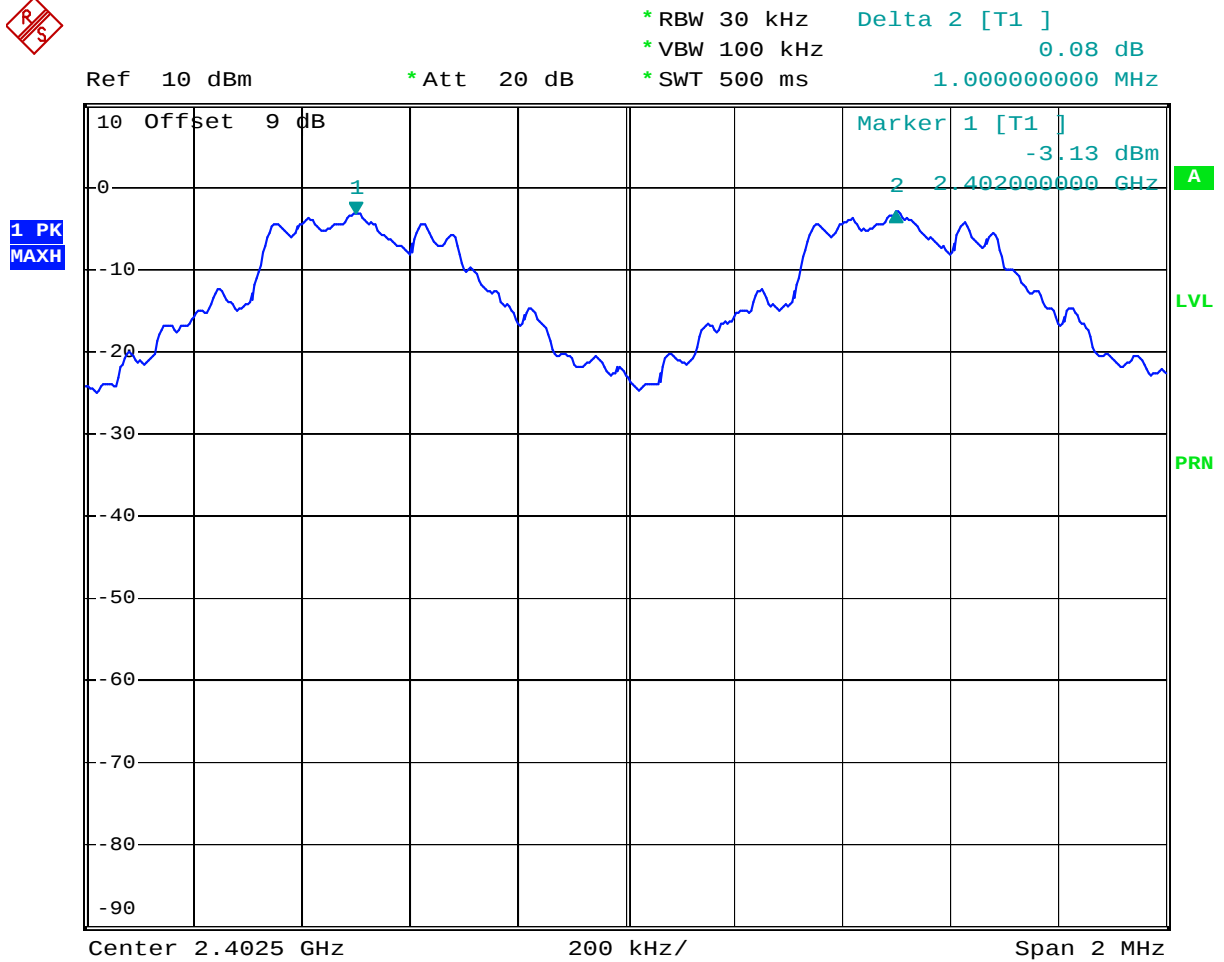
Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.939	Mode 1
39	2441	1.000	0.936	Mode 2
78	2480	1.000	0.933	Mode 3

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)



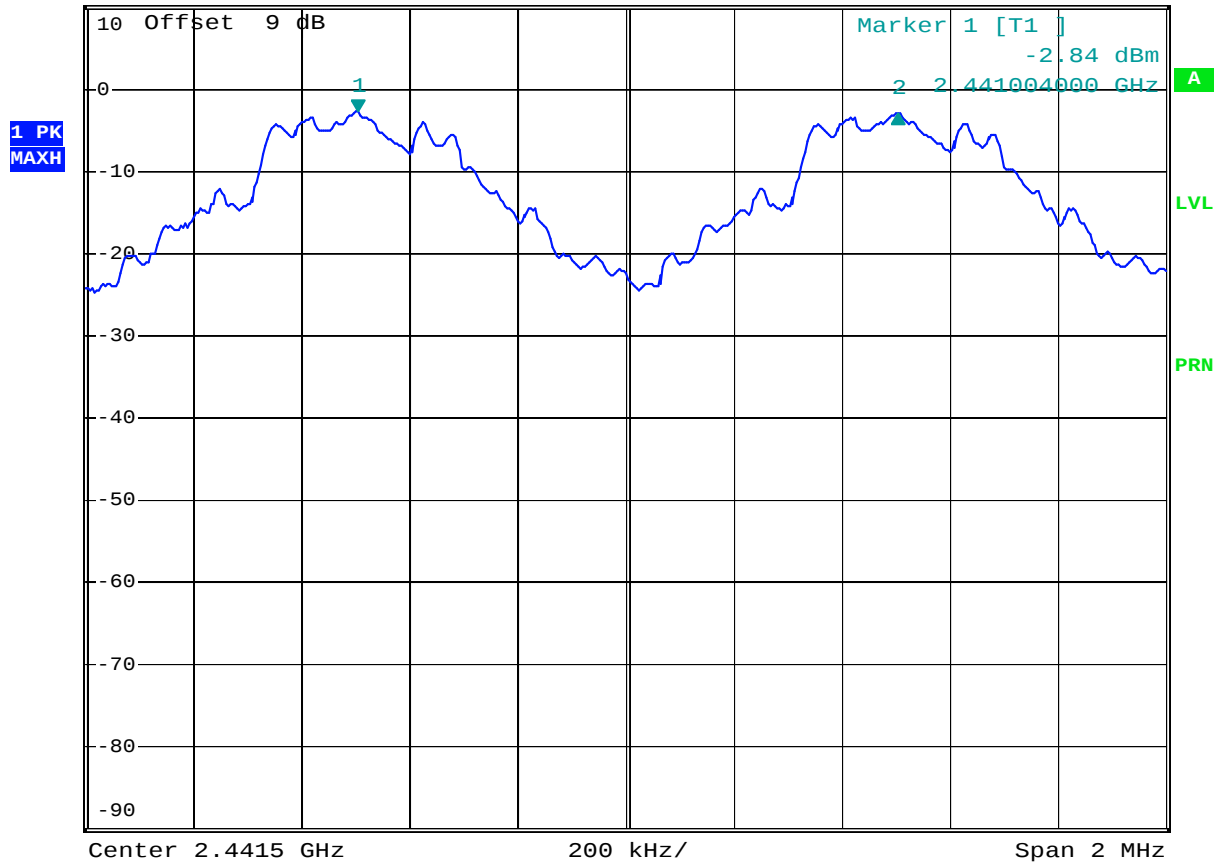
Date: 30.MAR.2006 00:17:01



Mode 2: CH39 (2441MHz)



Ref 10 dBm * Att 20 dB * RBW 30 kHz Delta 2 [T1]
* VBW 100 kHz -0.08 dB
* SWT 500 ms 1.000000000 MHz



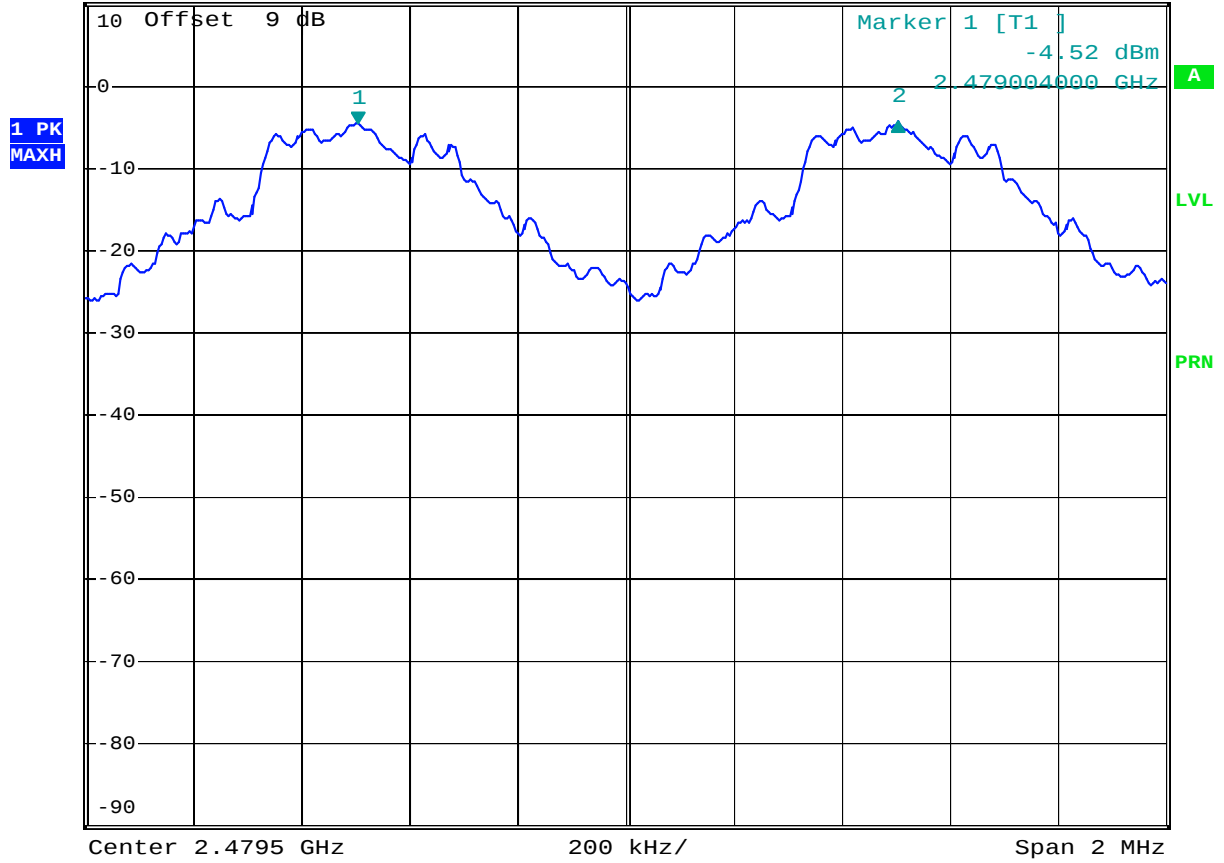
Date: 30.MAR.2006 00:17:28



Mode 3: CH78 (2480MHz)



Ref 10 dBm * Att 20 dB * RBW 30 kHz Delta 2 [T1]
* VBW 100 kHz 0.13 dB
* SWT 500 ms 1.000000000 MHz



Date: 30.MAR.2006 00:17:56

5.3. Number of Hopping Frequency

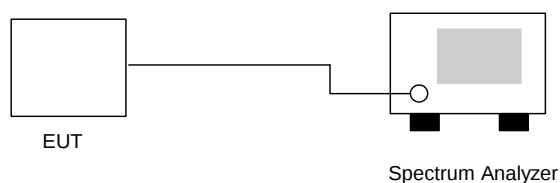
5.3.1. Measuring Instruments :

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 :

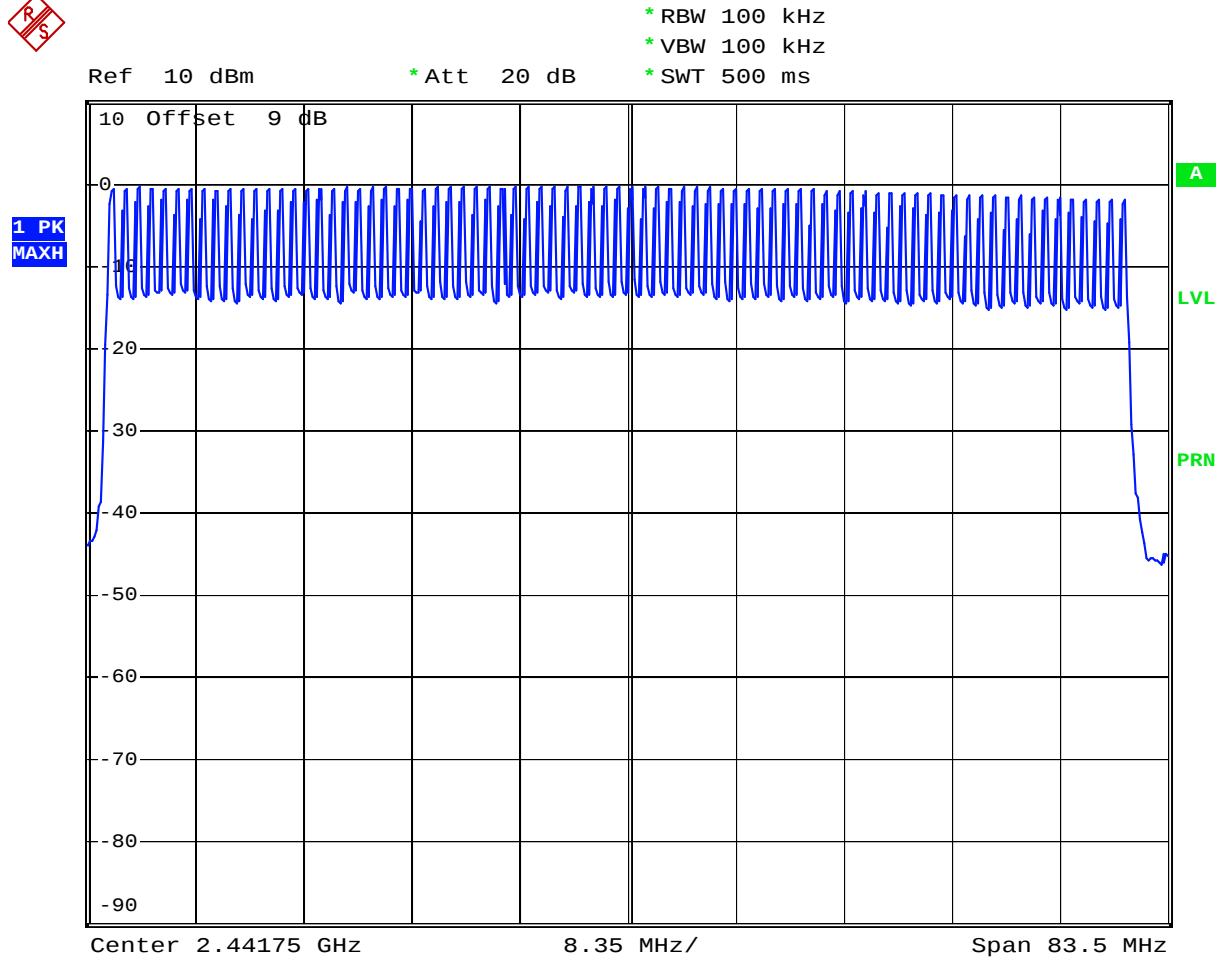


5.3.4. Test Result : See spectrum analyzer plots below

- 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: 30.MAR.2006 01:06:59

5.4 Hopping Channel Bandwidth

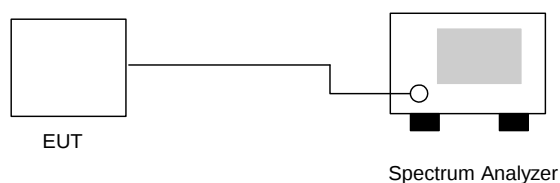
5.4.1 Measuring Instruments :

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	0.939	1.0	Mode 1
39	2441	0.936	1.0	Mode 2
78	2480	0.933	1.0	Mode 3



5.4.5 Hopping Channel Bandwidth

Mode 1: CH00 (2402MHz)



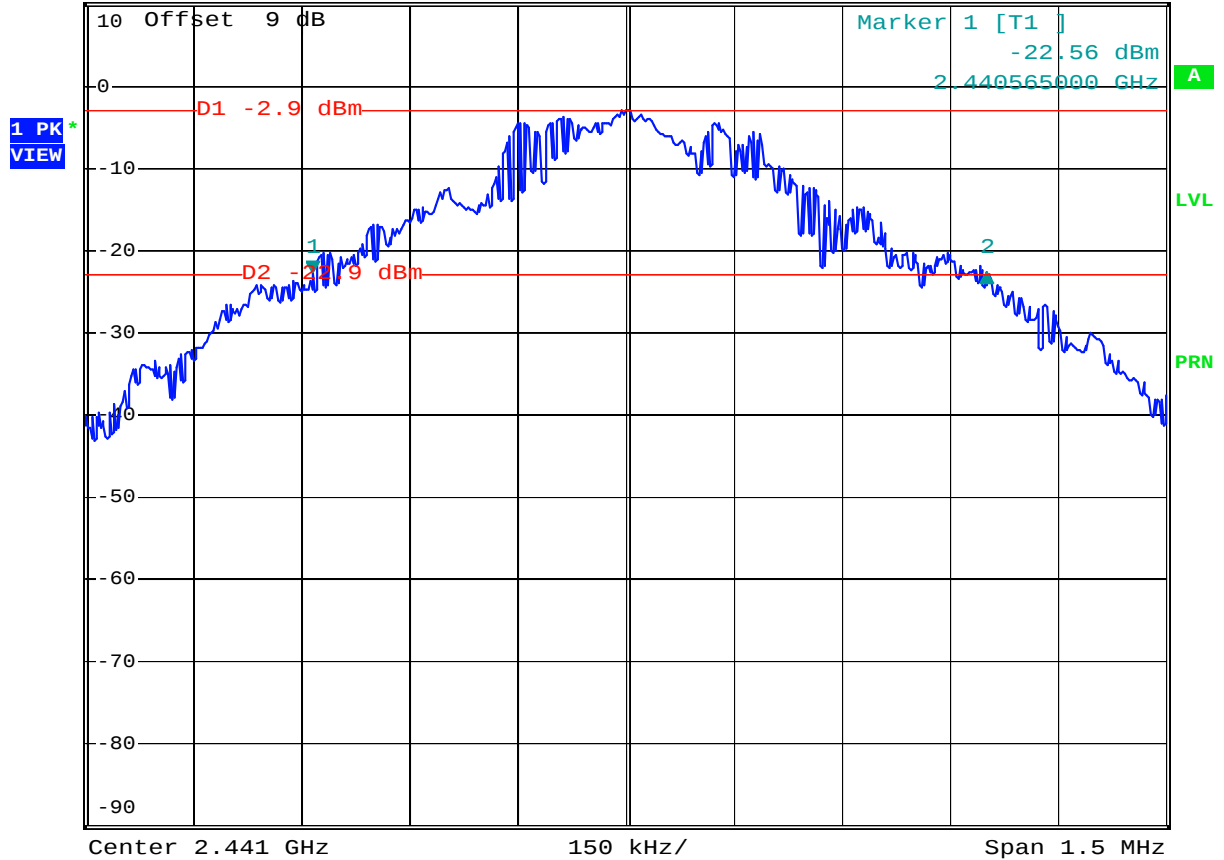
Date: 30.MAR.2006 00:08:56



Mode 2: CH39 (2441MHz)



Ref 10 dBm * Att 20 dB * RBW 30 kHz Delta 2 [T1]
* VBW 300 kHz -0.04 dB
* SWT 500 ms 936.000000000 kHz



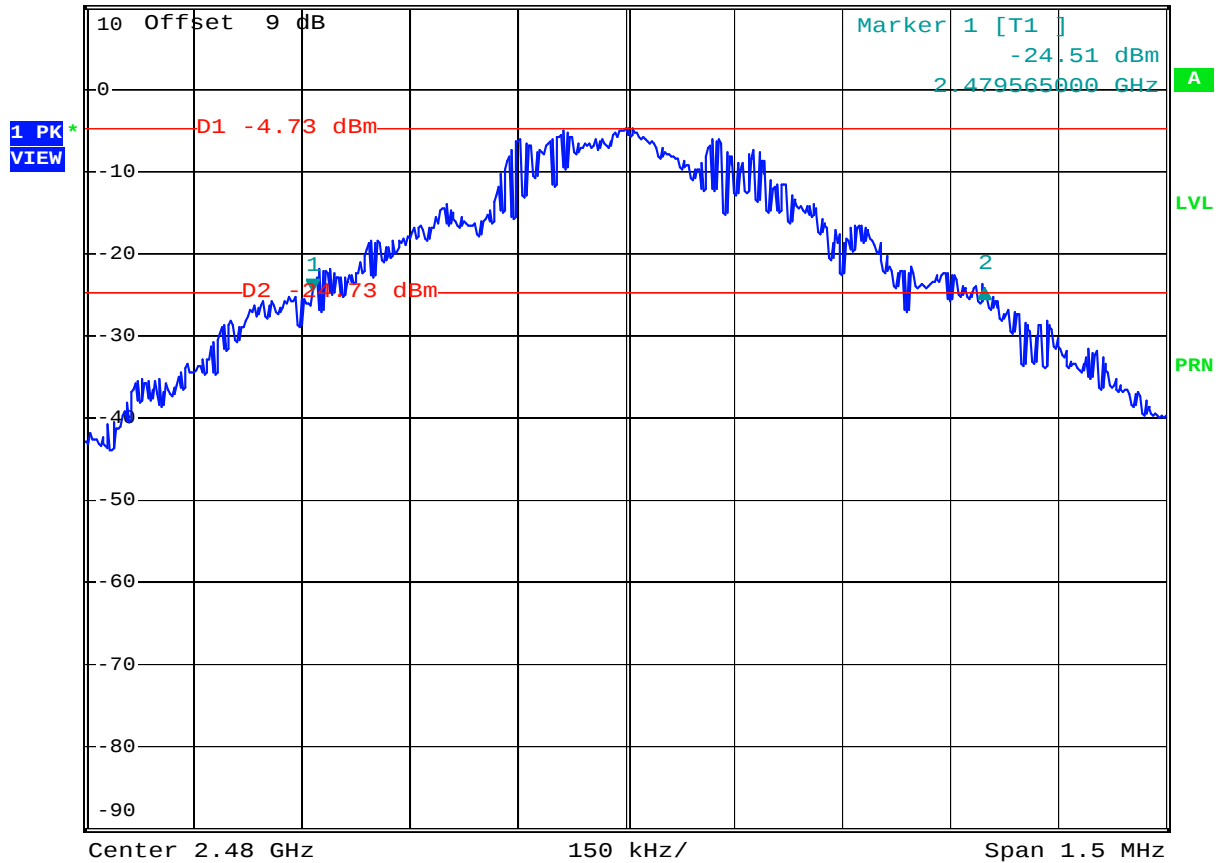
Date: 30.MAR.2006 00:10:38



Mode 3: CH78 (2480MHz)



Ref 10 dBm * Att 20 dB * RBW 30 kHz Delta 2 [T1]
* VBW 300 kHz 0.30 dB
* SWT 500 ms 933.000000000 kHz



Date: 30.MAR.2006 00:12:35

5.5 Dwell Time of Each Frequency

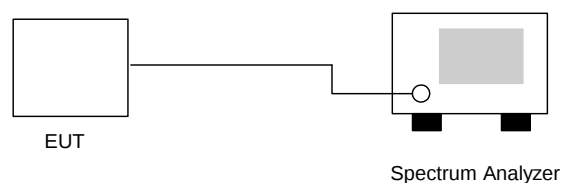
5.5.1 Measuring Instruments :

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	8.9	396	0.111	0.4
DH3	5.2	1670	0.274	0.4
DH5	3.1	2950	0.289	0.4

**CH39**

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.4	396	0.105	0.4
DH3	4.1	1670	0.216	0.4
DH5	3.2	2950	0.298	0.4

CH78

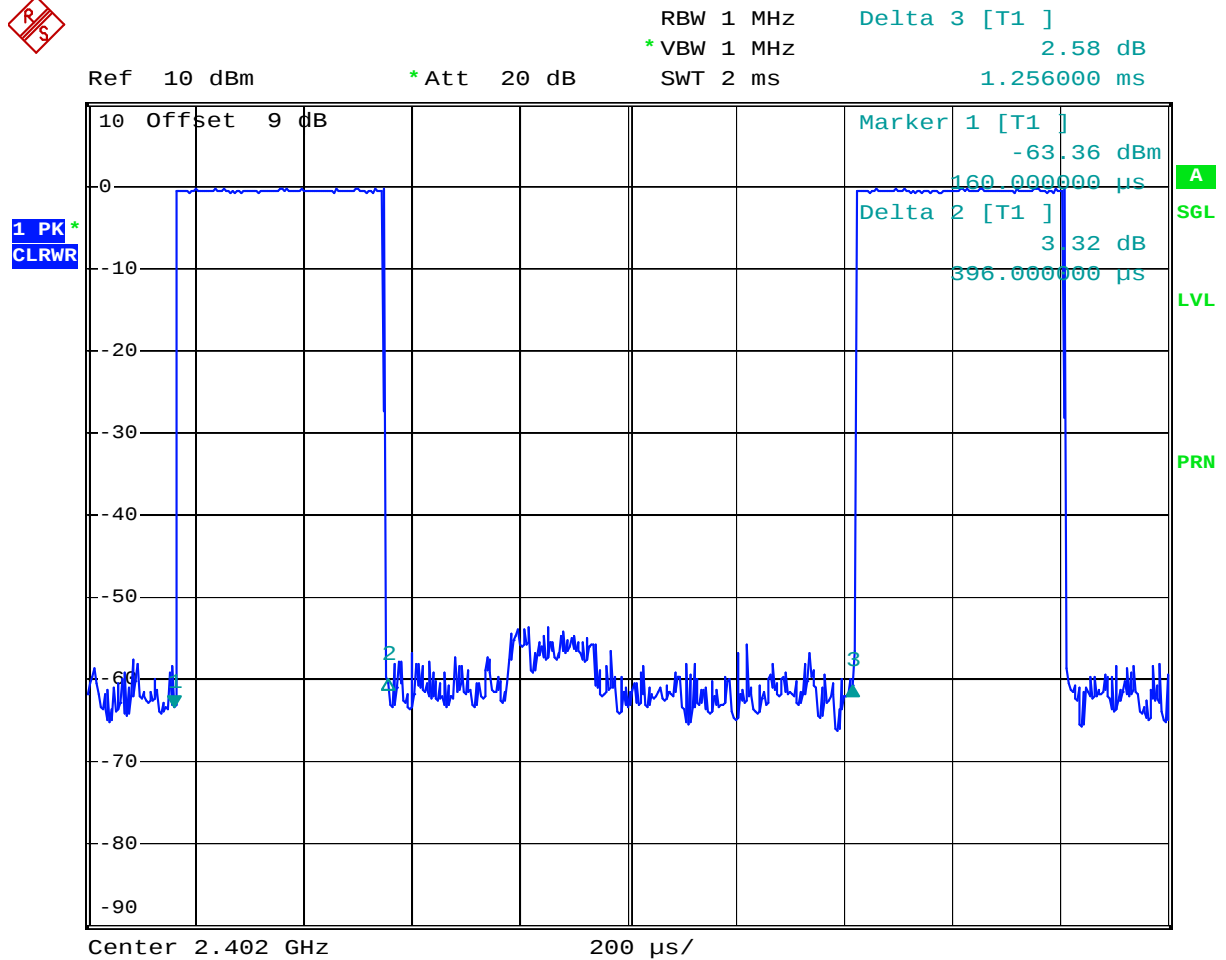
Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.2	400	0.104	0.4
DH3	4.5	1670	0.237	0.4
DH5	3.8	2950	0.354	0.4

Remark:

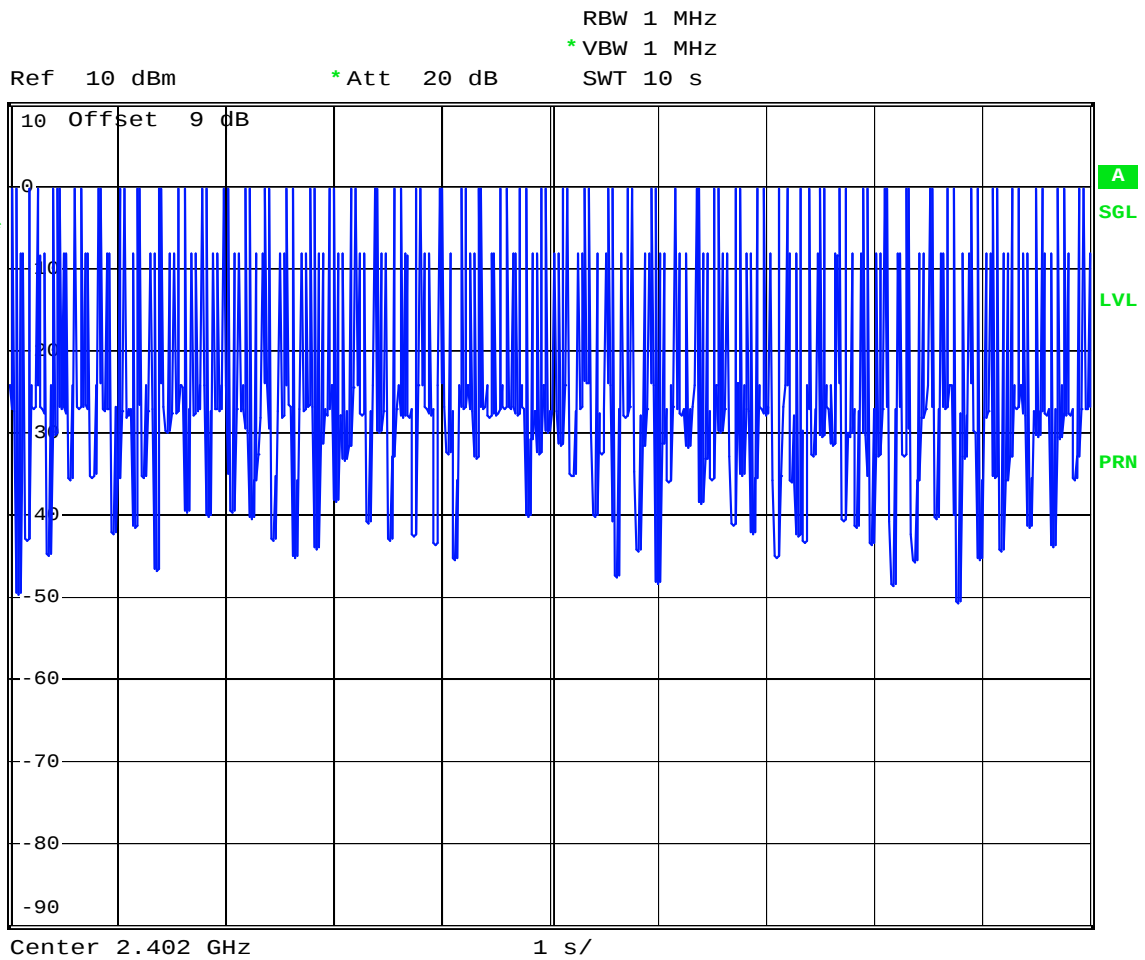
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

5.5.5 Dwell Time

DH1 (CH00)



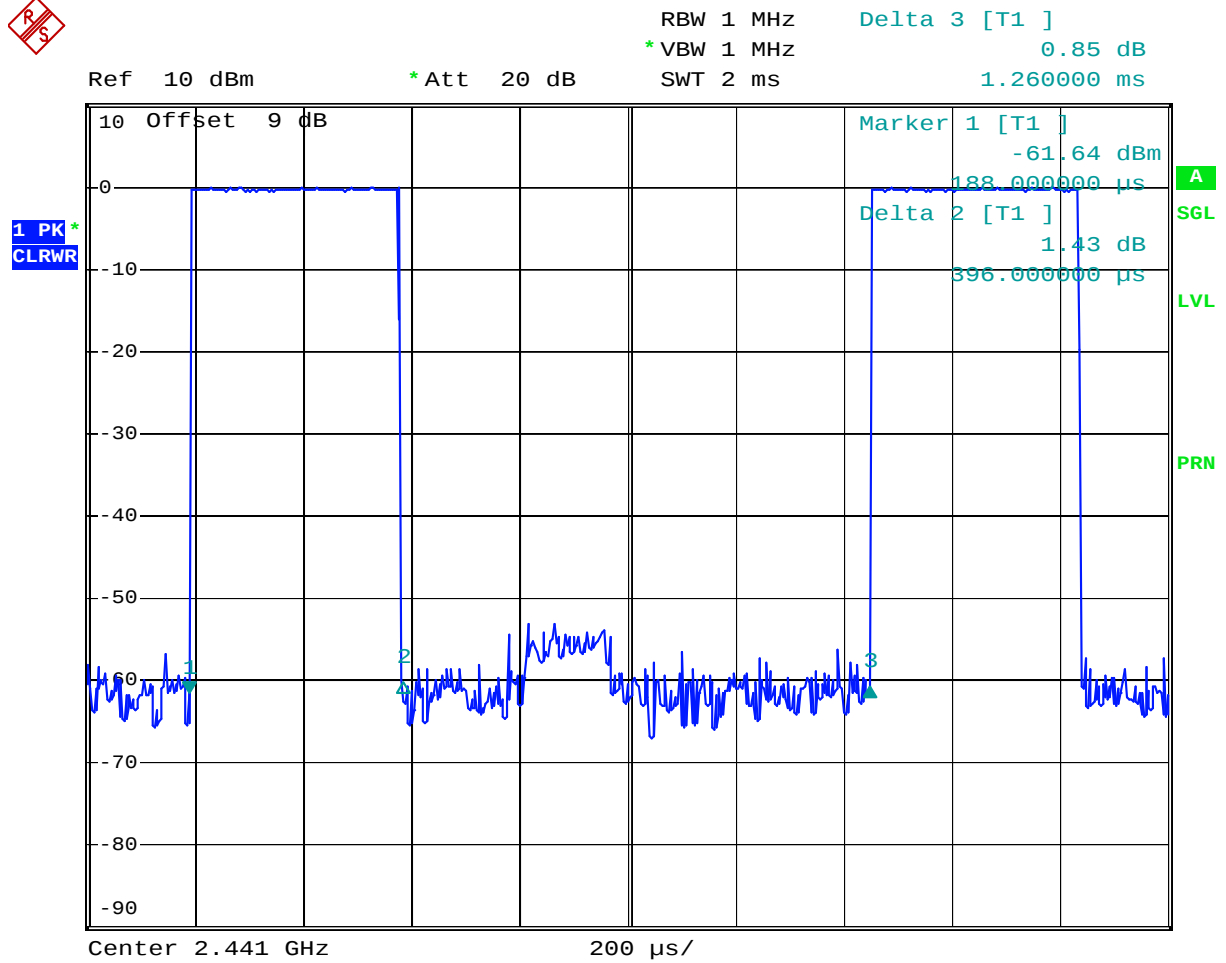
Date: 30.MAR.2006 00:25:51



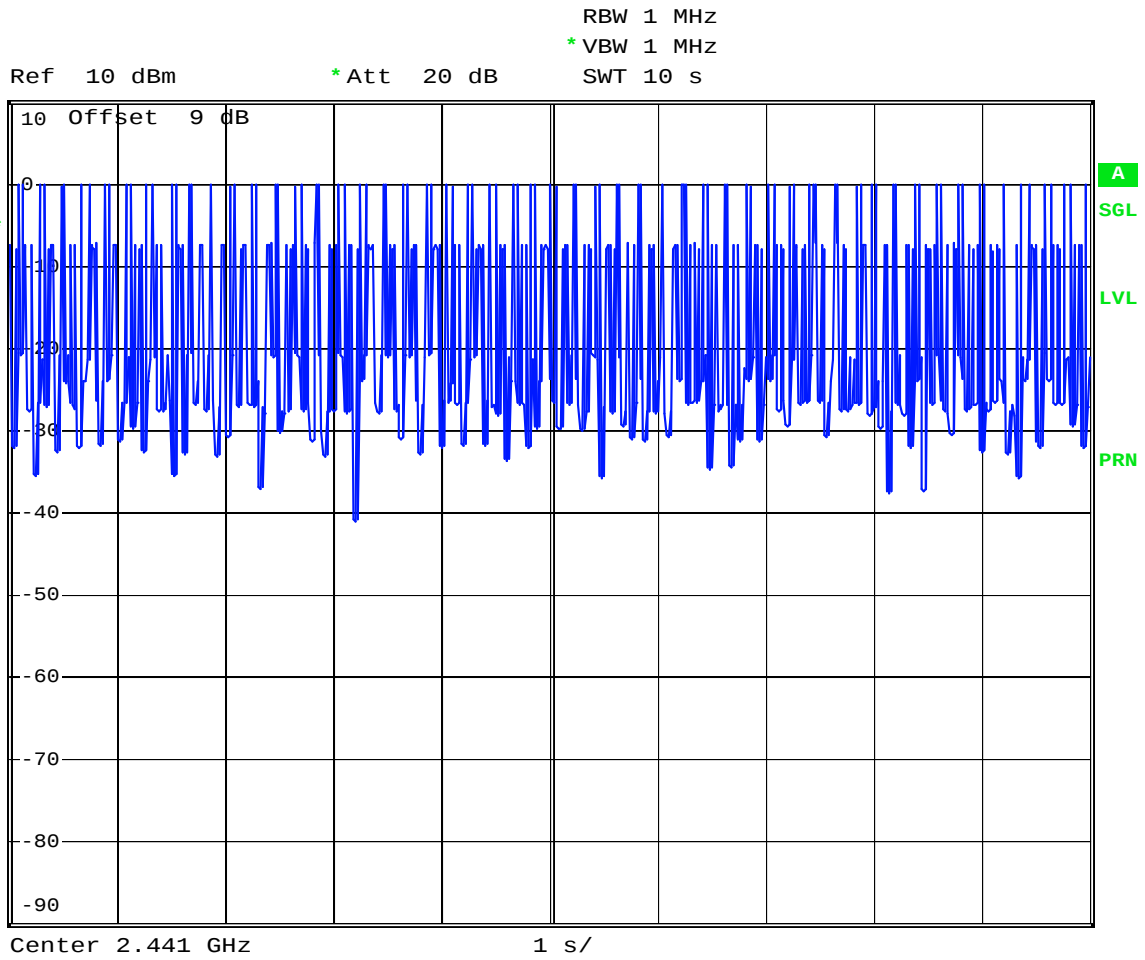
Date: 30.MAR.2006 00:43:26



DH1 (CH39)



Date: 30.MAR.2006 00:26:55



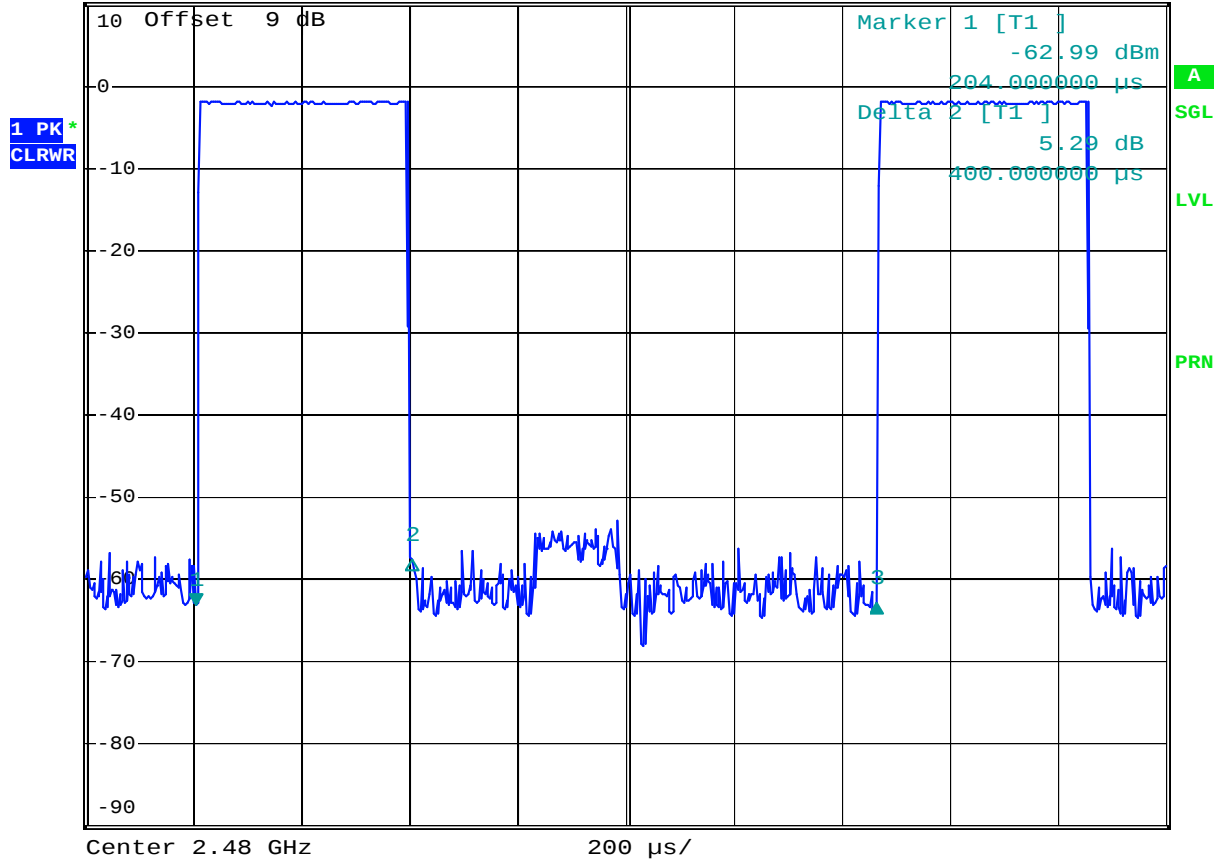
Date: 30.MAR.2006 00:44:58



DH1 (CH78)



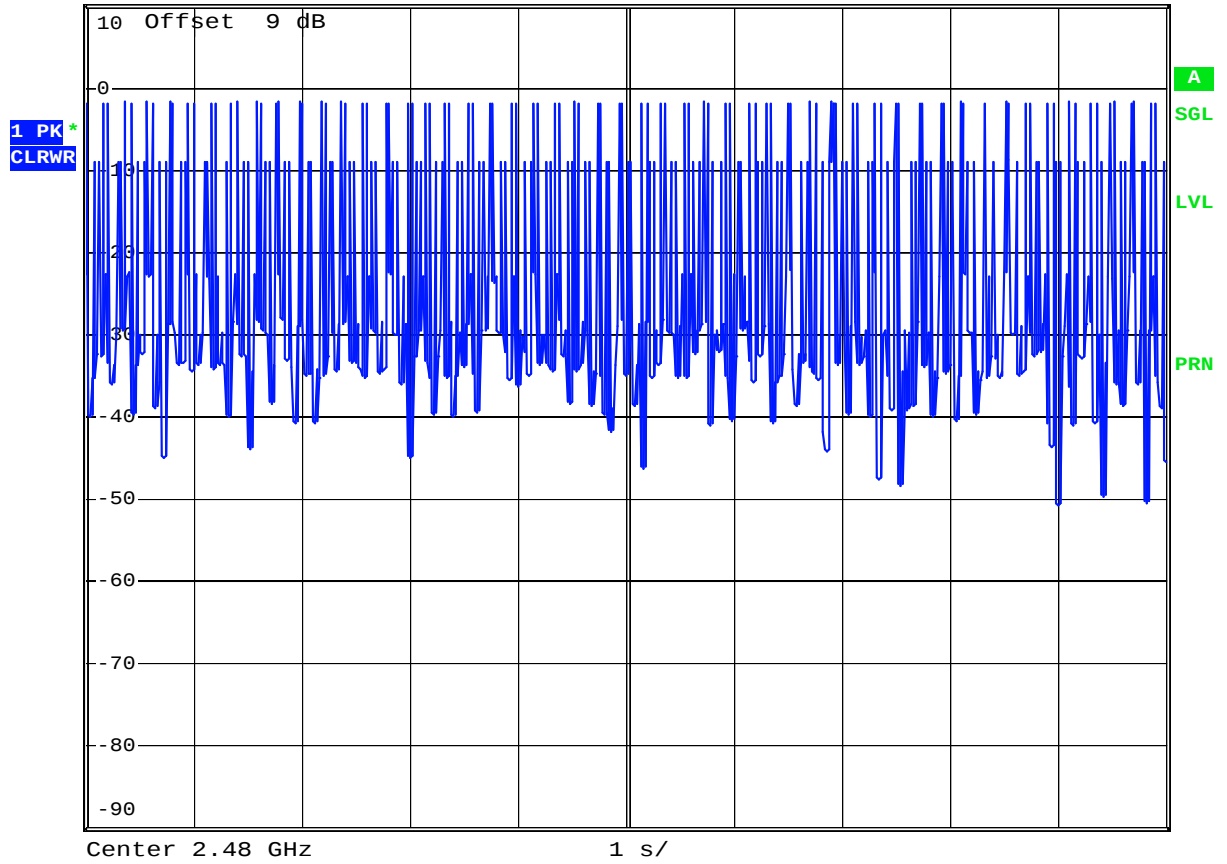
Ref 10 dBm * Att 20 dB RBW 1 MHz Delta 3 [T1] 0.20 dB
* VBW 1 MHz SWT 2 ms 1.260000 ms



Date: 30.MAR.2006 00:27:54



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



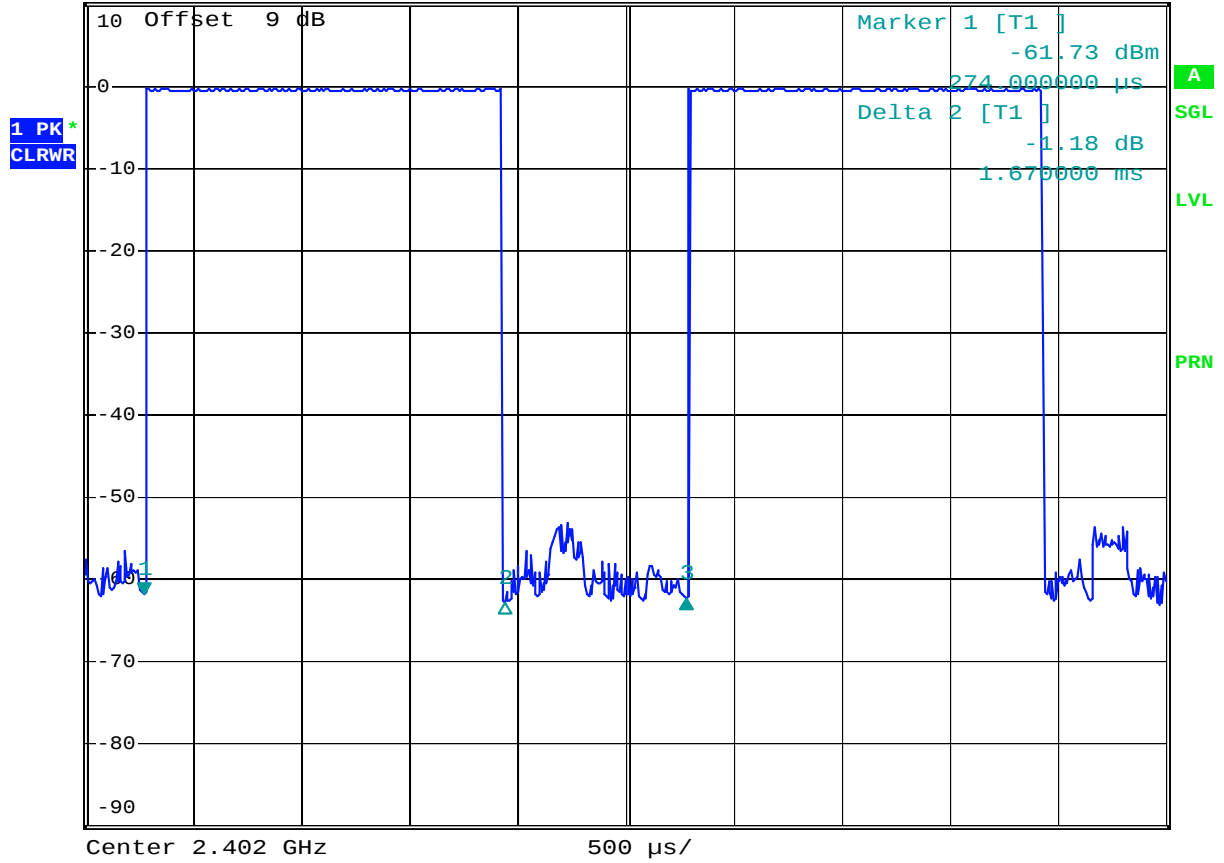
Date: 30.MAR.2006 00:45:25



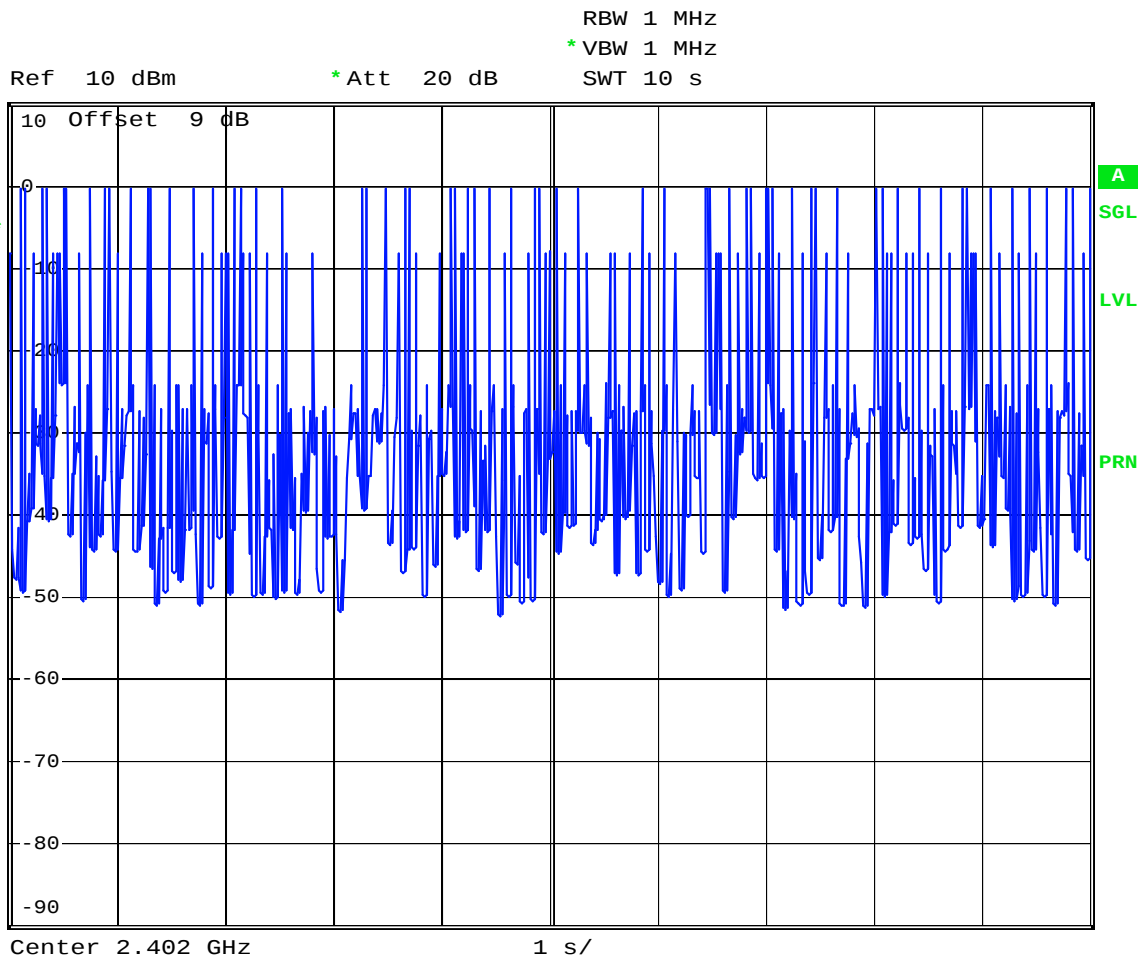
DH3 (CH00)



Ref 10 dBm * Att 20 dB RBW 1 MHz Delta 3 [T1] -0.48 dB
* VBW 1 MHz SWT 5 ms 2.510000 ms



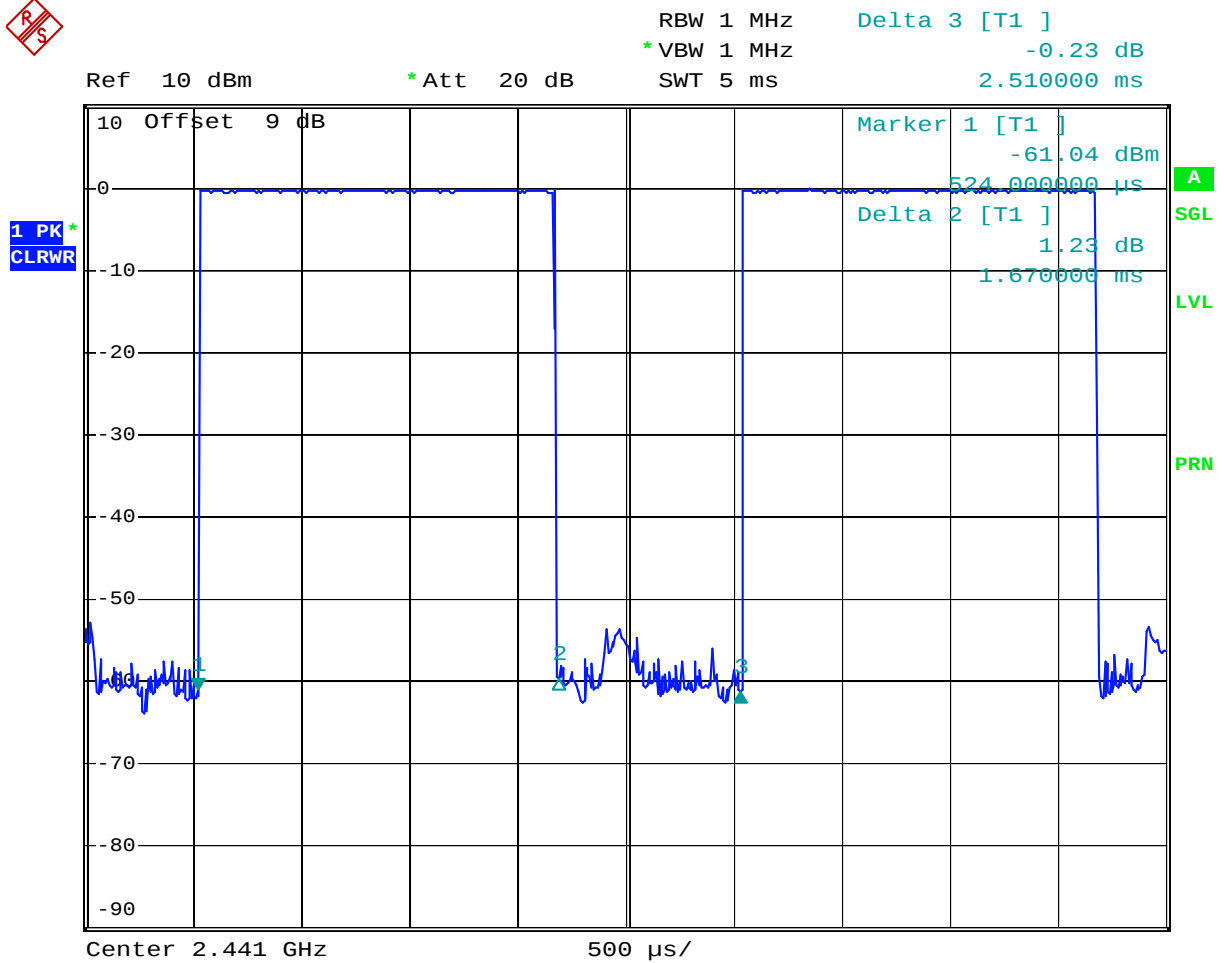
Date: 30.MAR.2006 00:28:44



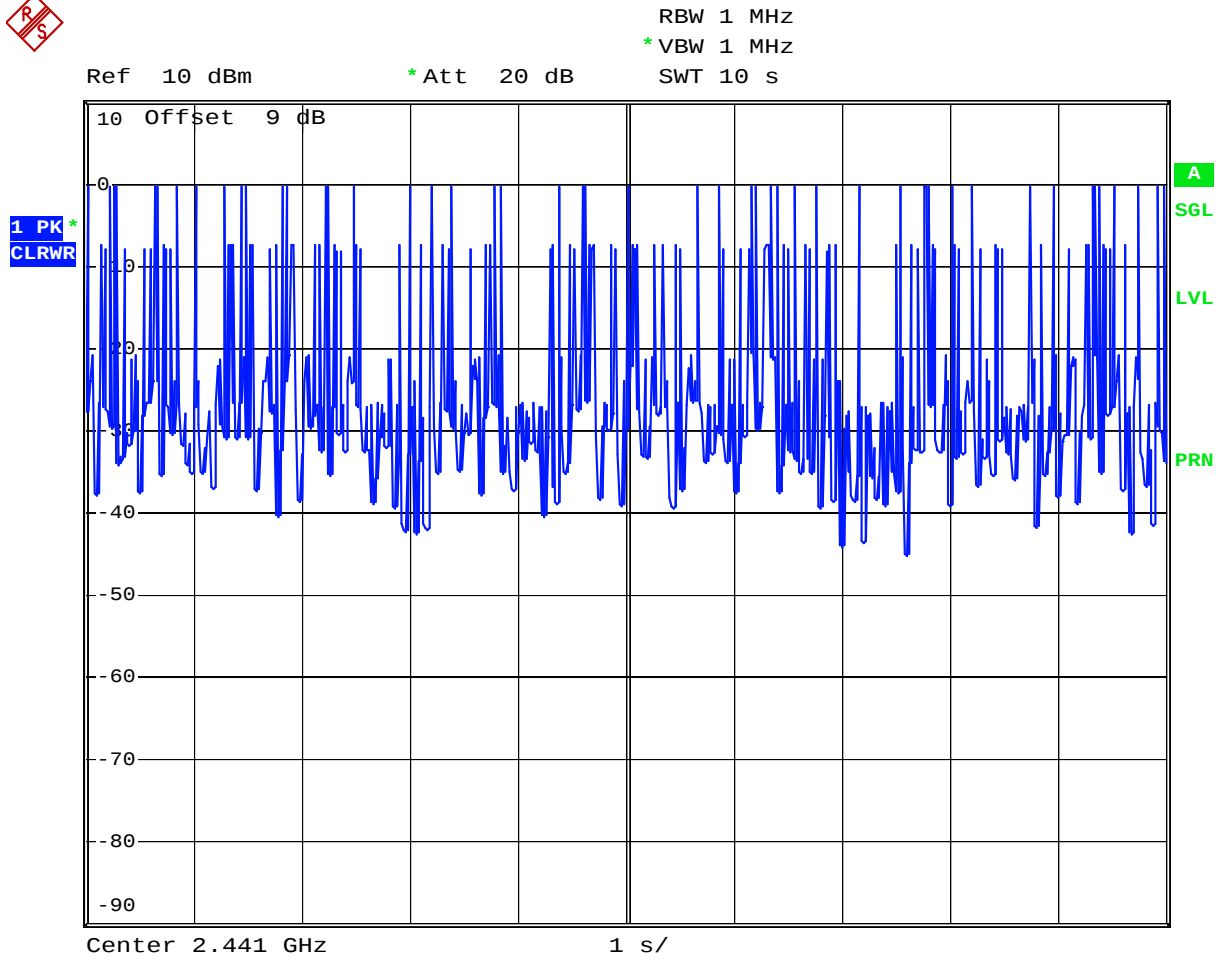
Date: 30.MAR.2006 00:46:06



DH3 (CH39)



Date: 30.MAR.2006 00:29:17



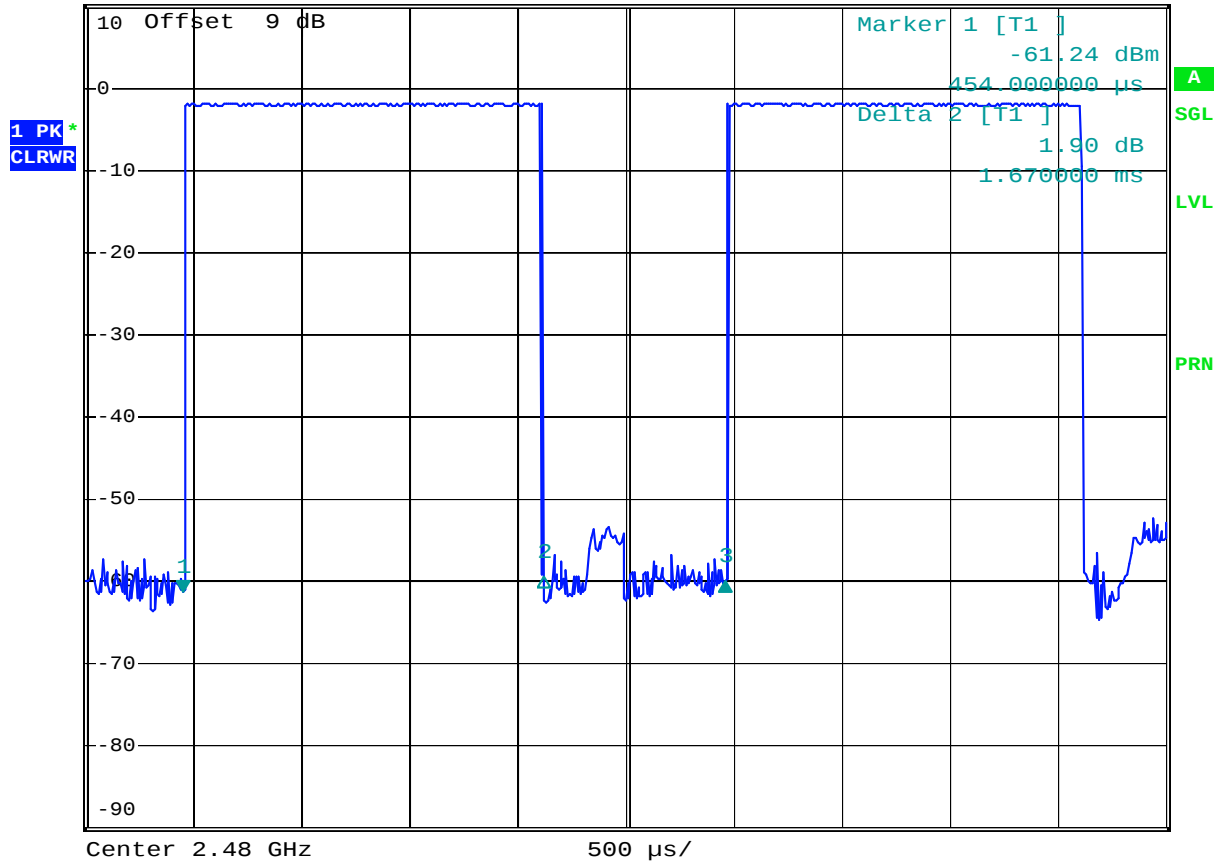
Date: 30.MAR.2006 00:46:32



DH3 (CH78)



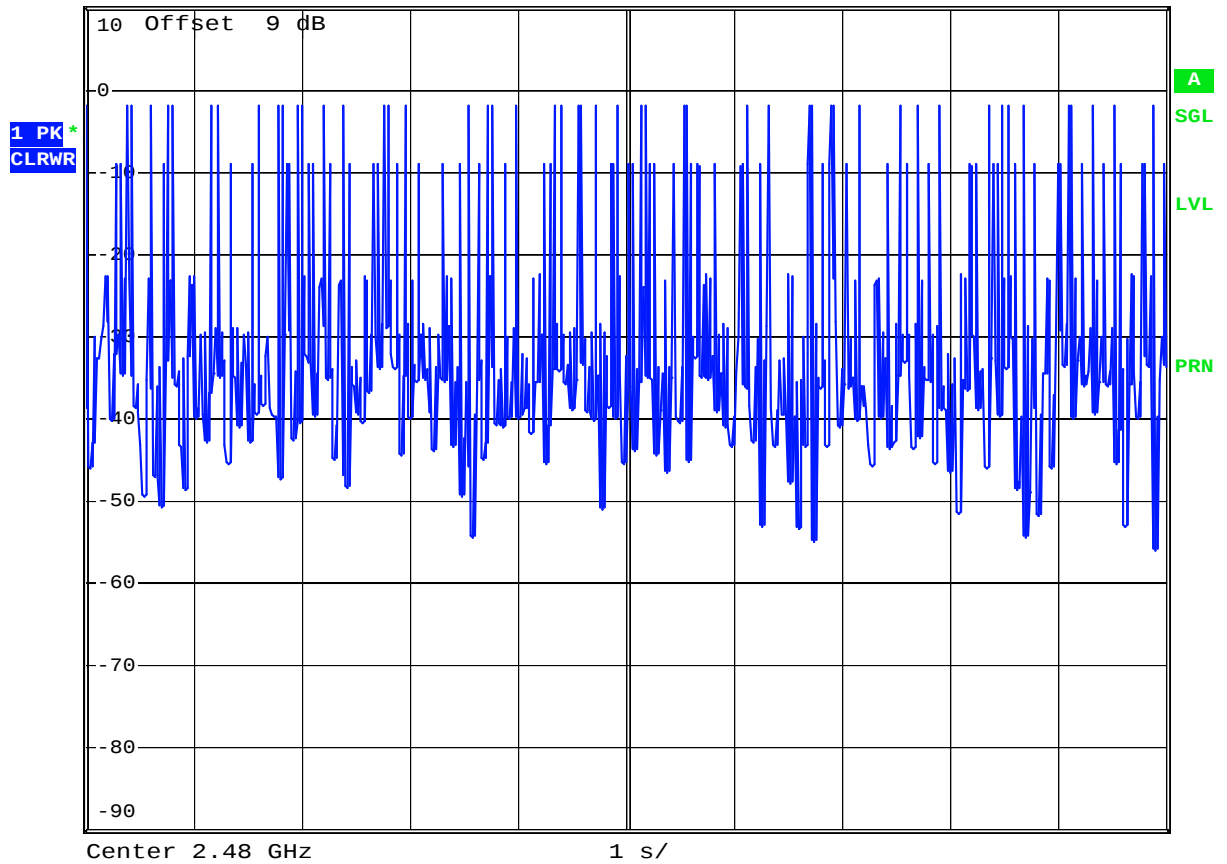
Ref 10 dBm * Att 20 dB RBW 1 MHz Delta 3 [T1] 1.34 dB
* VBW 1 MHz SWT 5 ms 2.510000 ms



Date: 30.MAR.2006 00:30:04



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



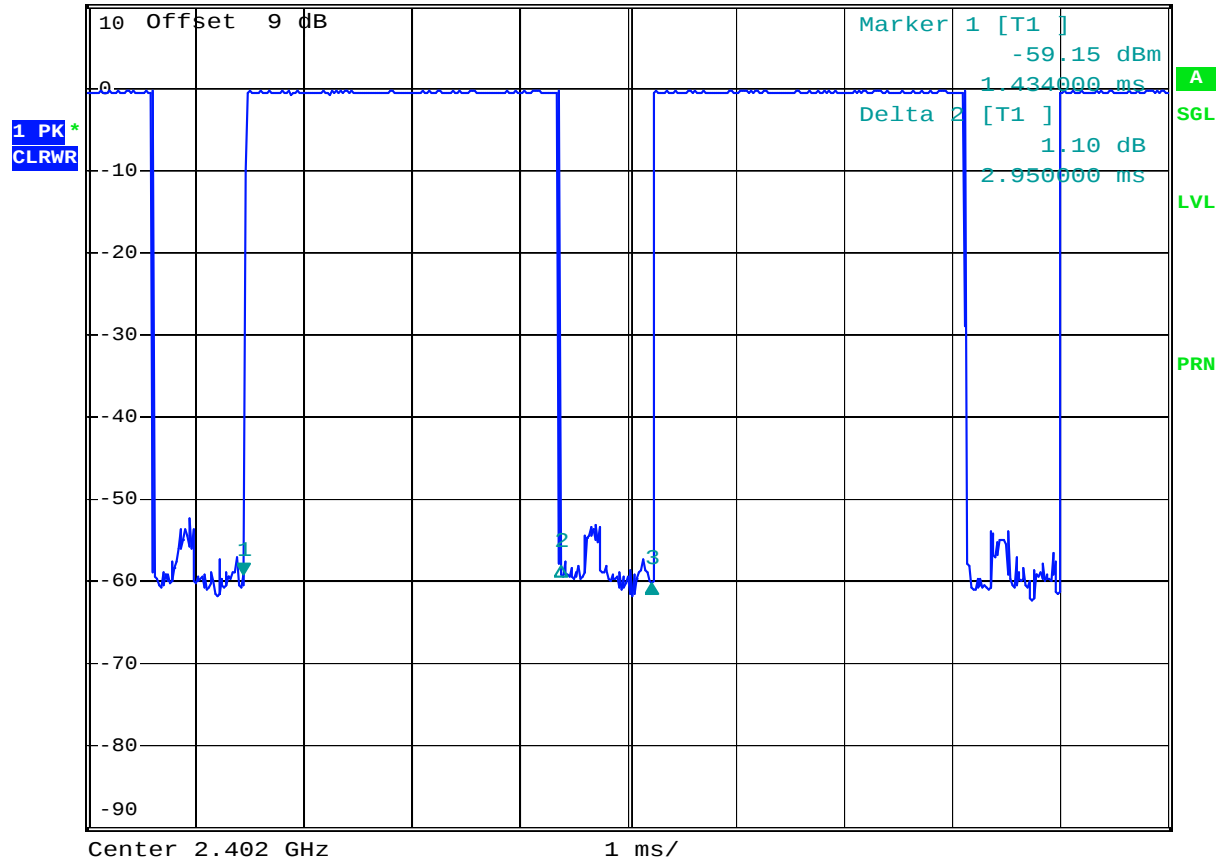
Date: 30.MAR.2006 00:47:03



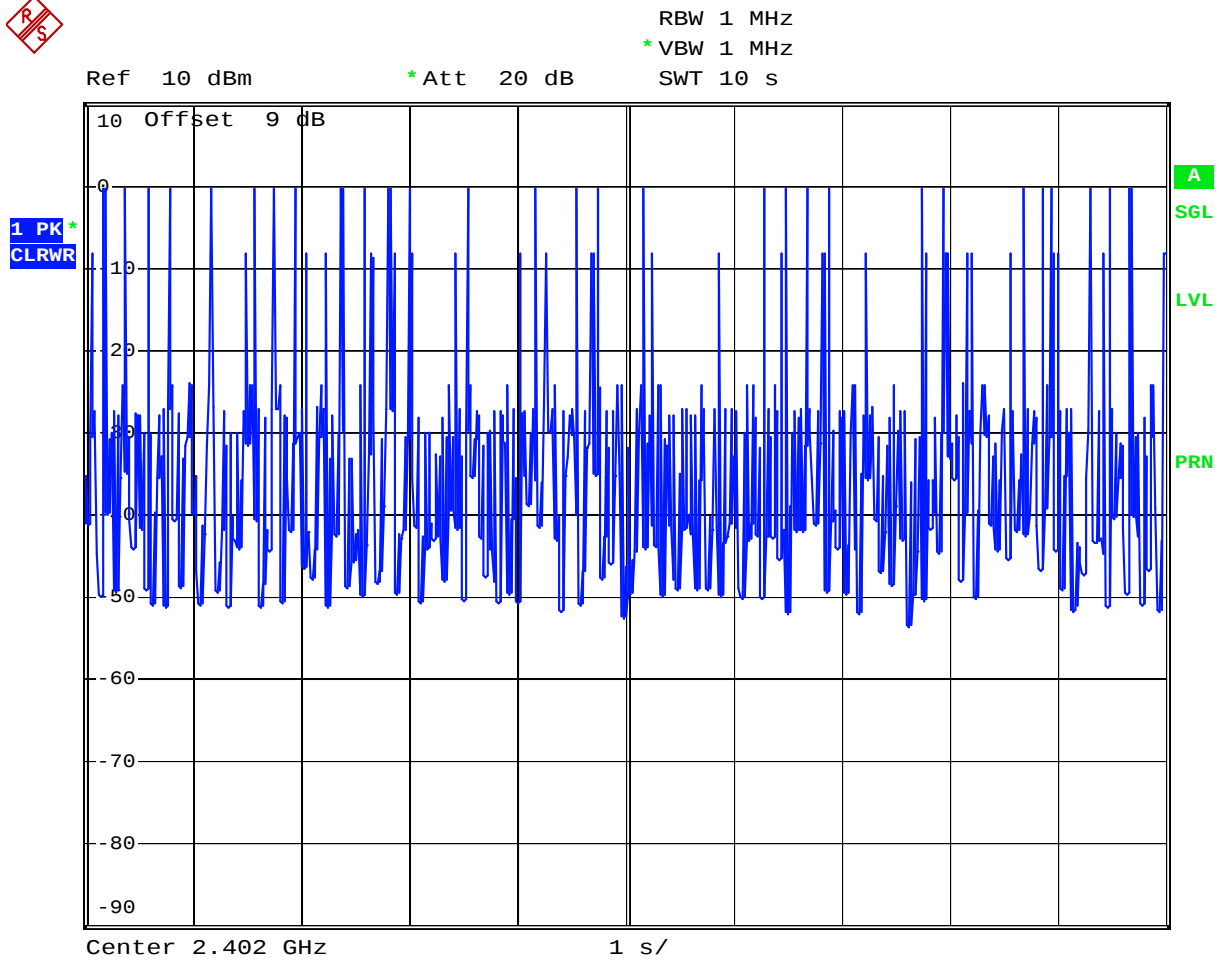
DH5 (CH00)



Ref 10 dBm * Att 20 dB RBW 1 MHz Delta 3 [T1]
* VBW 1 MHz -0.97 dB
SWT 10 ms 3.790000 ms



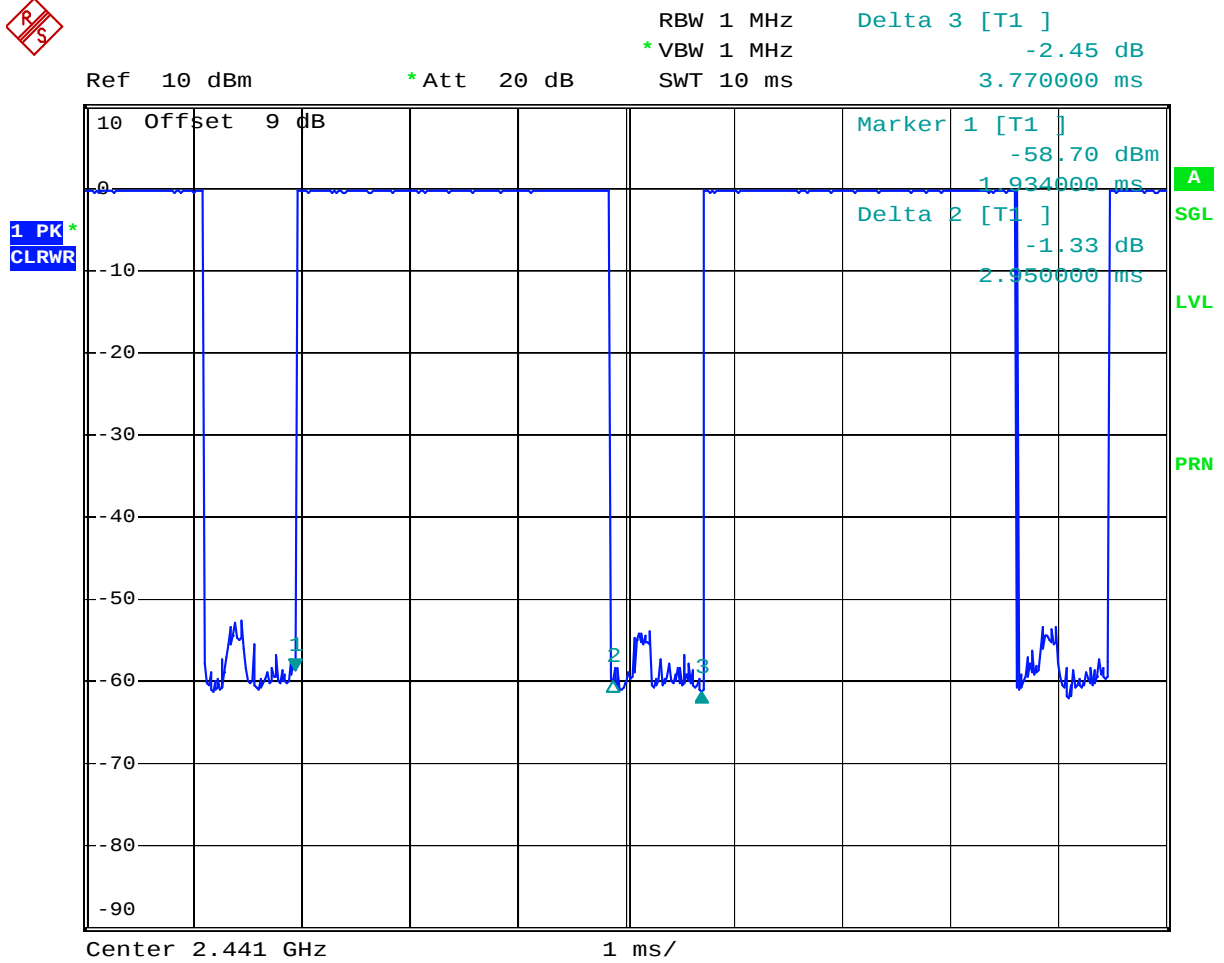
Date: 30.MAR.2006 00:38:31



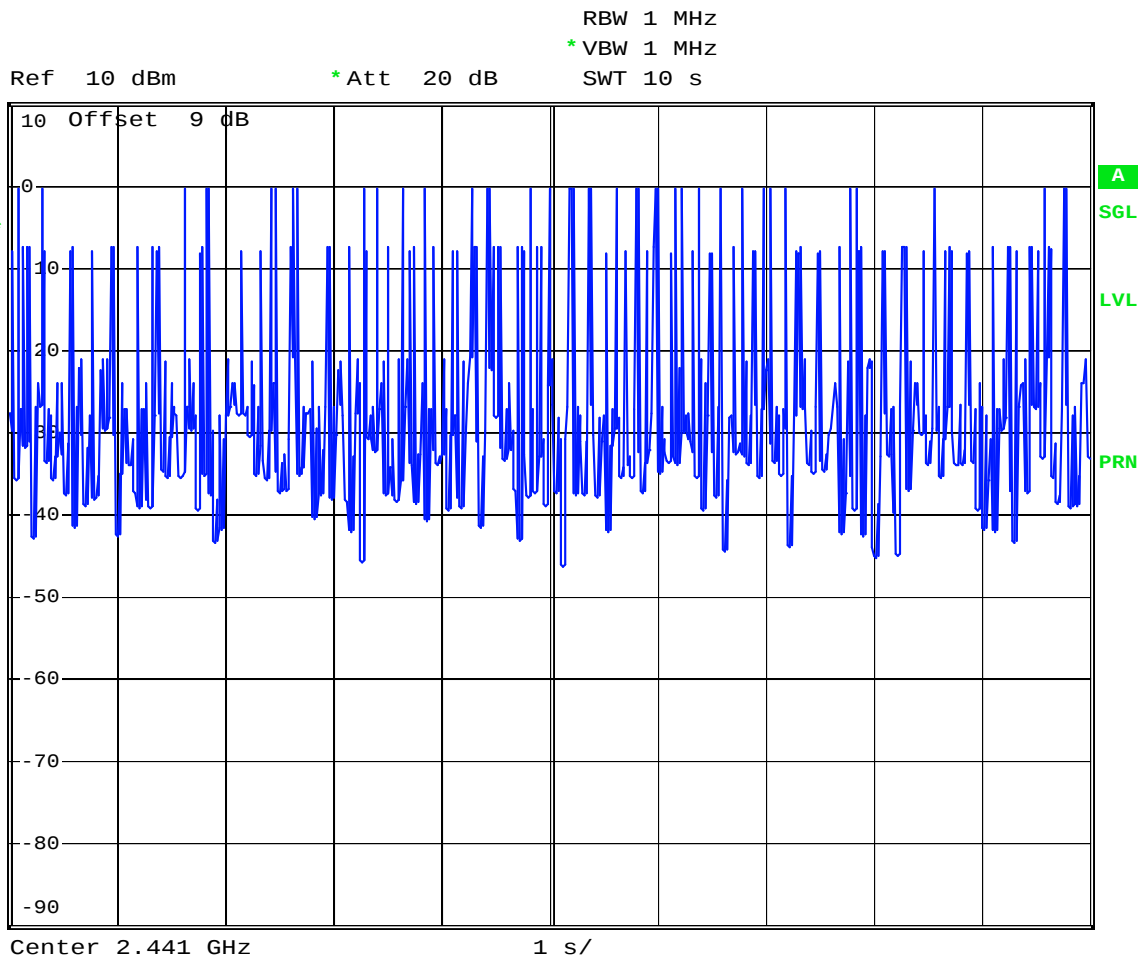
Date: 30.MAR.2006 00:47:48



DH5 (CH39)



Date: 30.MAR.2006 00:31:45



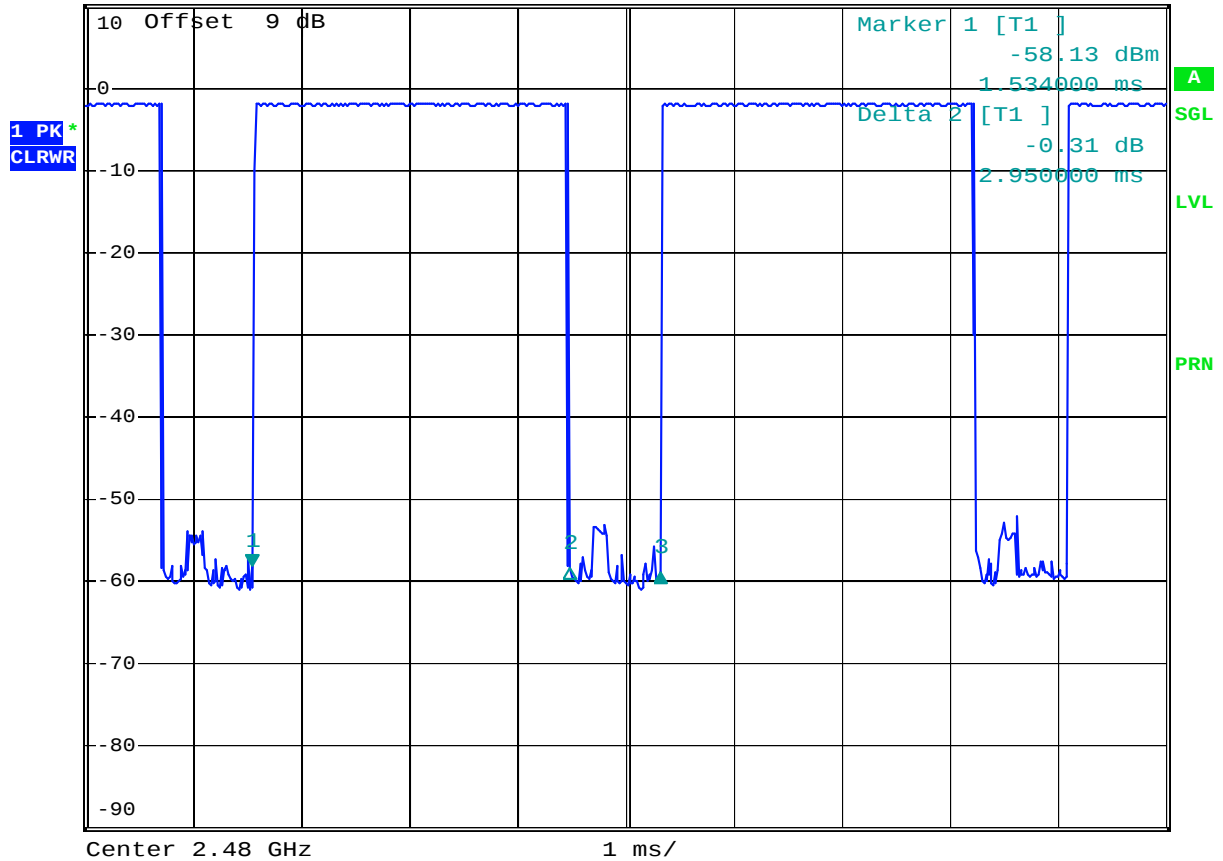
Date: 30.MAR.2006 00:48:16



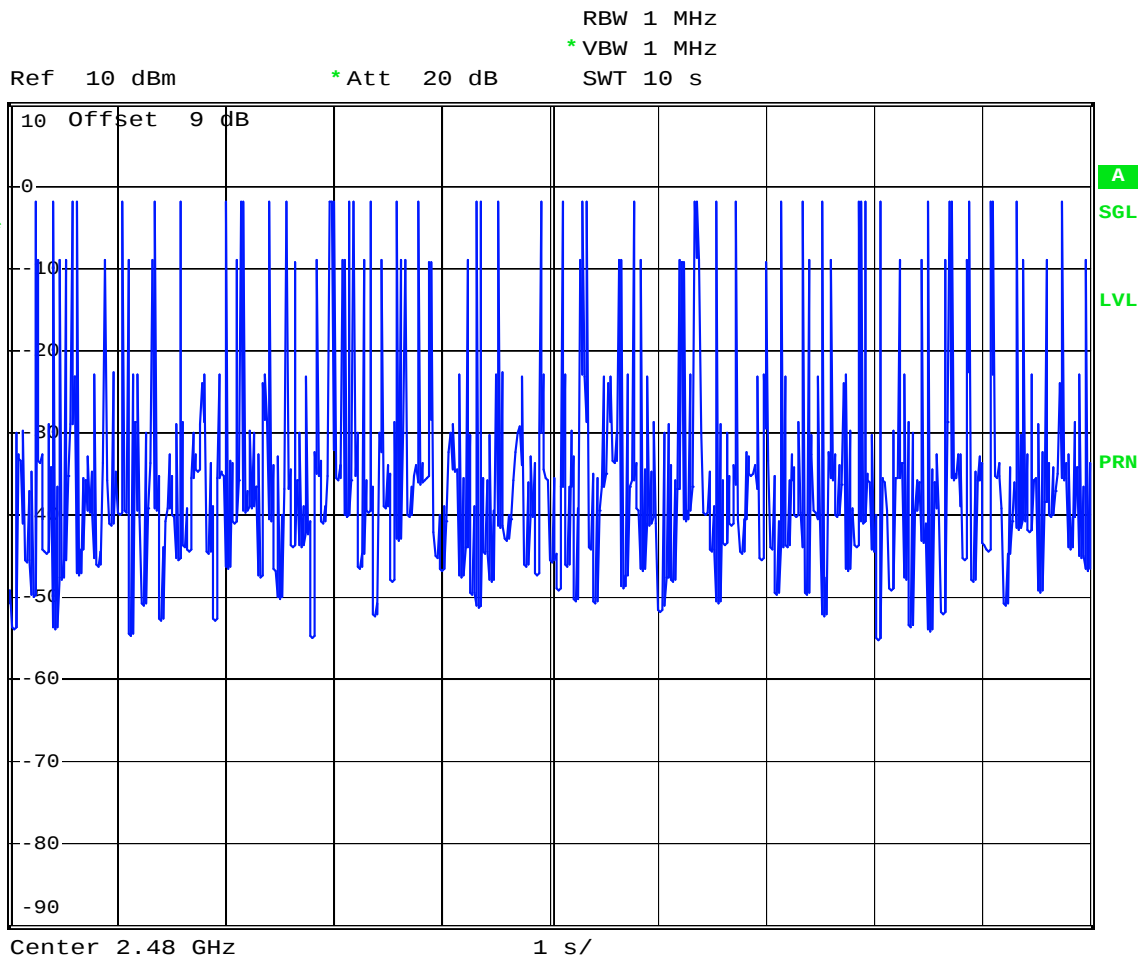
DH5 (CH78)



Ref 10 dBm * Att 20 dB RBW 1 MHz Delta 3 [T1]
* VBW 1 MHz SWT 10 ms -0.90 dB
3.790000 ms



Date: 30.MAR.2006 00:32:28



Date: 30.MAR.2006 00:48:59

5.6 Output Power

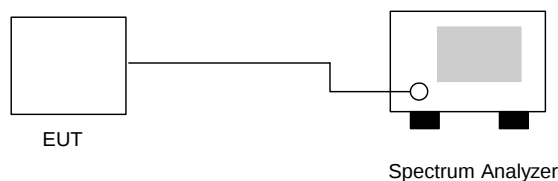
5.6.1 Measuring Instruments :

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	-0.22	1W/30 dBm	Mode 1
39	2441	0.01	1W/30 dBm	Mode 2
78	2480	-1.62	1W/30 dBm	Mode 3

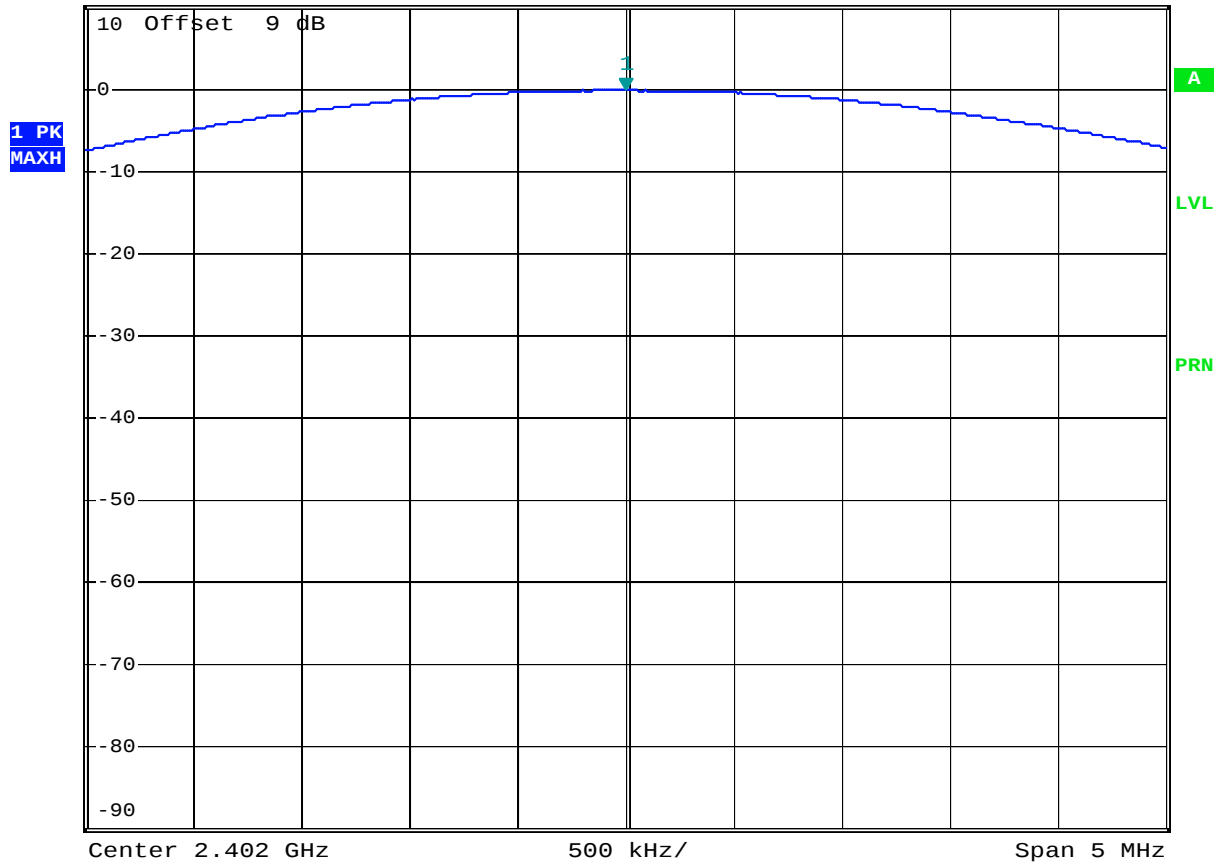


5.6.5 Output Power

Mode 1: CH00 (2402MHz)



Ref 10 dBm * Att 20 dB * RBW 3 MHz * VBW 3 MHz * SWT 500 ms Marker 1 [T1] -0.22 dBm 2.402000000 GHz



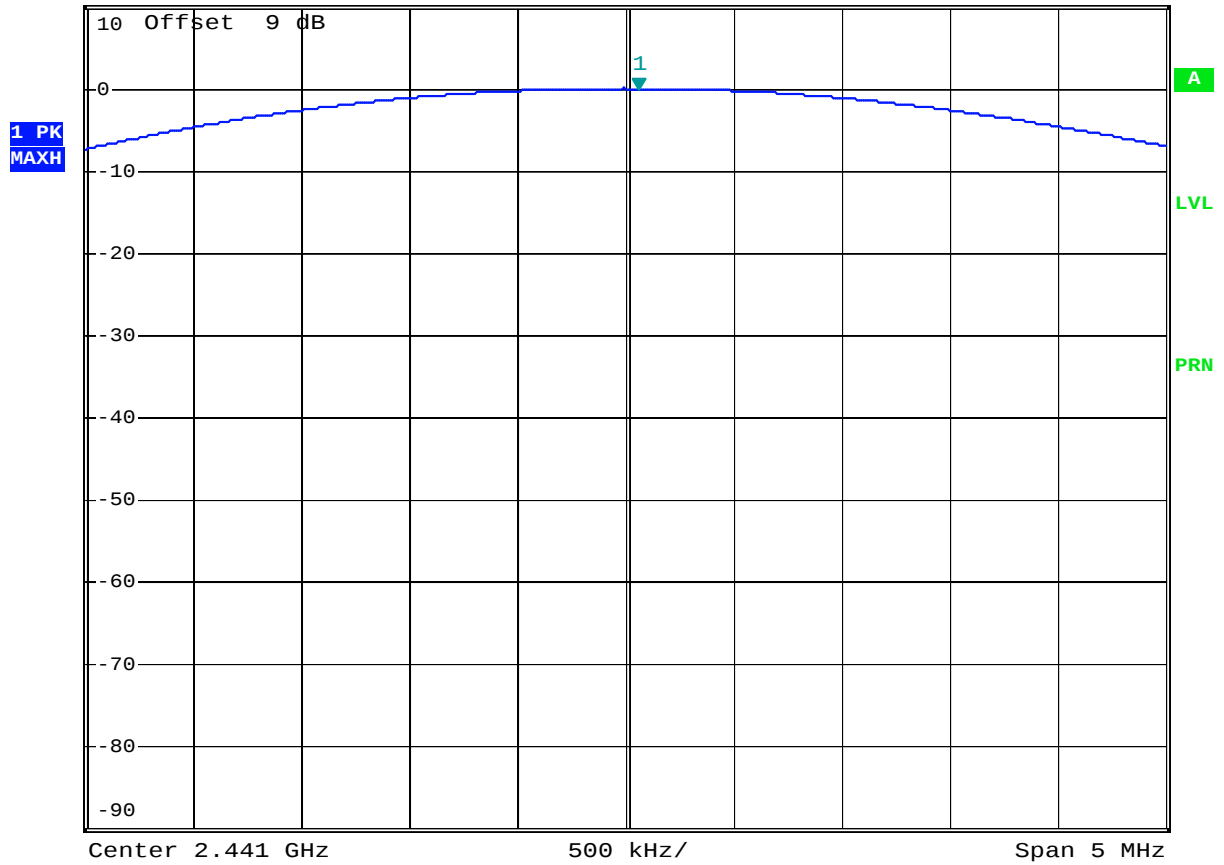
Date: 29.MAR.2006 23:12:04



Mode 2: CH39 (2441MHz)



Ref 10 dBm * Att 20 dB * RBW 3 MHz Marker 1 [T1] 0.01 dBm
* VBW 3 MHz 2.441060000 GHz
* SWT 500 ms



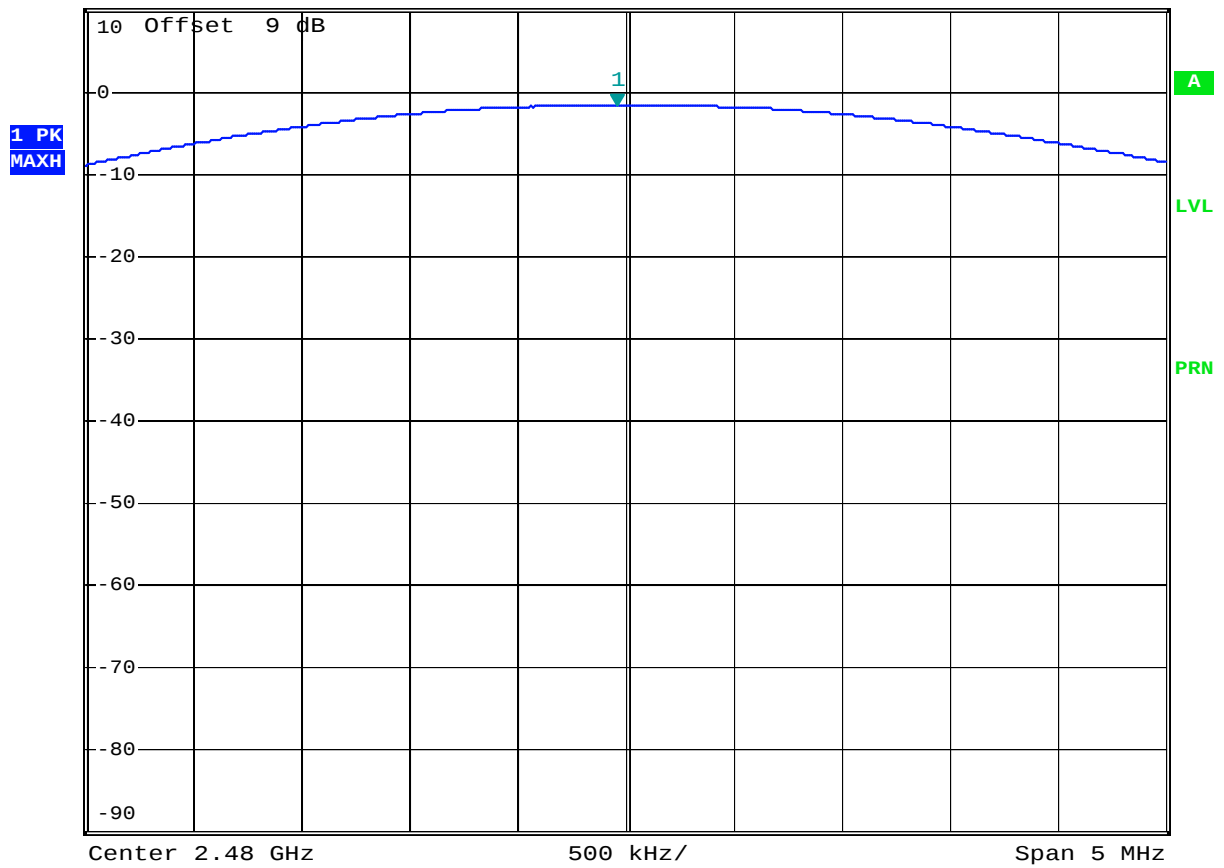
Date: 29.MAR.2006 23:12:31



Mode 3: CH78 (2480MHz)



Ref 10 dBm * Att 20 dB * RBW 3 MHz * VBW 3 MHz * SWT 500 ms Marker 1 [T1] -1.62 dBm 2.479960000 GHz



Date: 29.MAR.2006 23:12:57

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	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	Mode
2390.00	60.17	-13.83	74.00	60.88	30.48	35.46	4.26	200	0	Peak
2390.00	38.77	-15.23	54.00	39.48	30.48	35.46	4.26	106	355	Average

CH00 (Vertical)

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	Mode
2390.00	52.47	-21.53	74.00	53.18	30.48	35.46	4.26	199	360	Peak
2390.00	38.58	-15.42	54.00	39.29	30.48	35.46	4.26	124	239	Average

**CH78 (Horizontal)**

Frequency	Level	Over	Limit	Read	Antenna	Preamp	Cable	Ant	Table	Detect
(MHz)	(dBuV/m)	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos	Mode
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2483.50	72.07	-1.93	74.00	72.81	30.41	35.51	4.36	200	0	Peak
2483.50	44.53	-9.47	54.00	45.27	30.41	35.51	4.36	102	352	Average

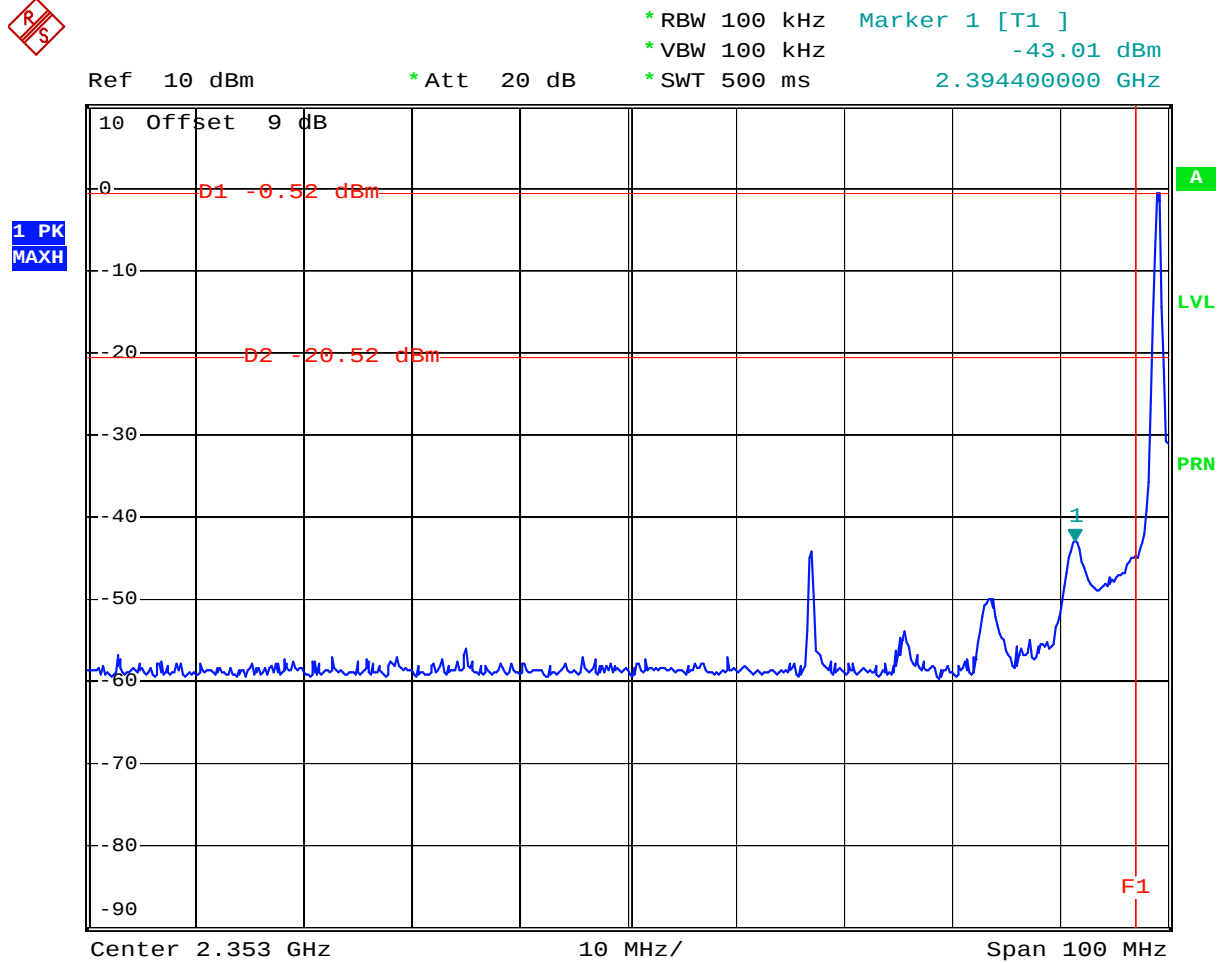
CH78 (Vertical)

Frequency	Level	Over	Limit	Read	Antenna	Preamp	Cable	Ant	Table	Detect
(MHz)	(dBuV/m)	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos	Mode
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2483.50	62.61	-11.39	74.00	63.35	30.41	35.51	4.36	200	360	Peak
2483.50	41.90	-12.10	54.00	42.64	30.41	35.51	4.36	123	237	Average



5.7.5 Frequency Band Edge

Mode 1: CH00 (2402 MHz)



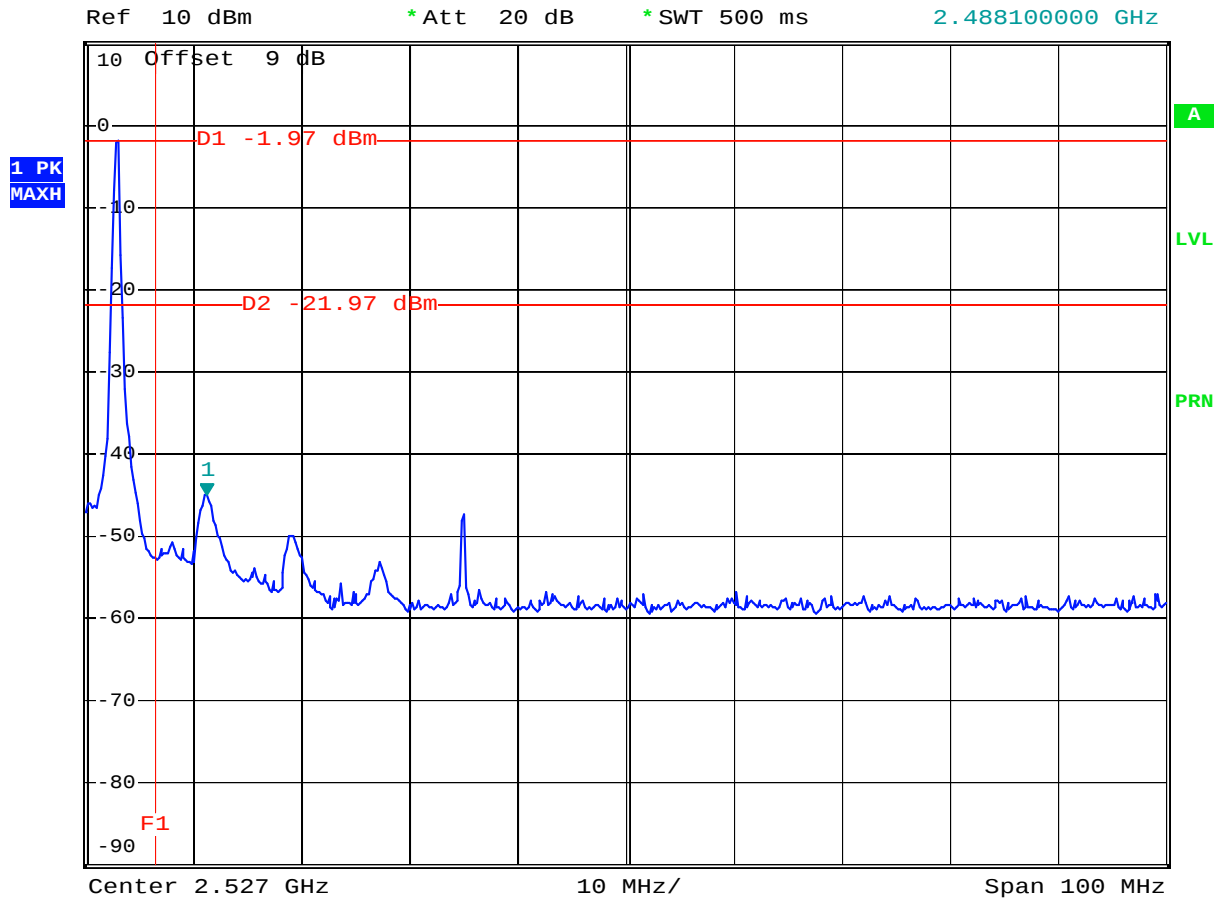
Date: 30.MAR.2006 00:15:59



Mode 3: CH78 (2480 MHz)



* RBW 100 kHz Marker 1 [T1]
* VBW 100 kHz -44.91 dBm
* SWT 500 ms 2.488100000 GHz



Date: 30.MAR.2006 00:14:52



5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

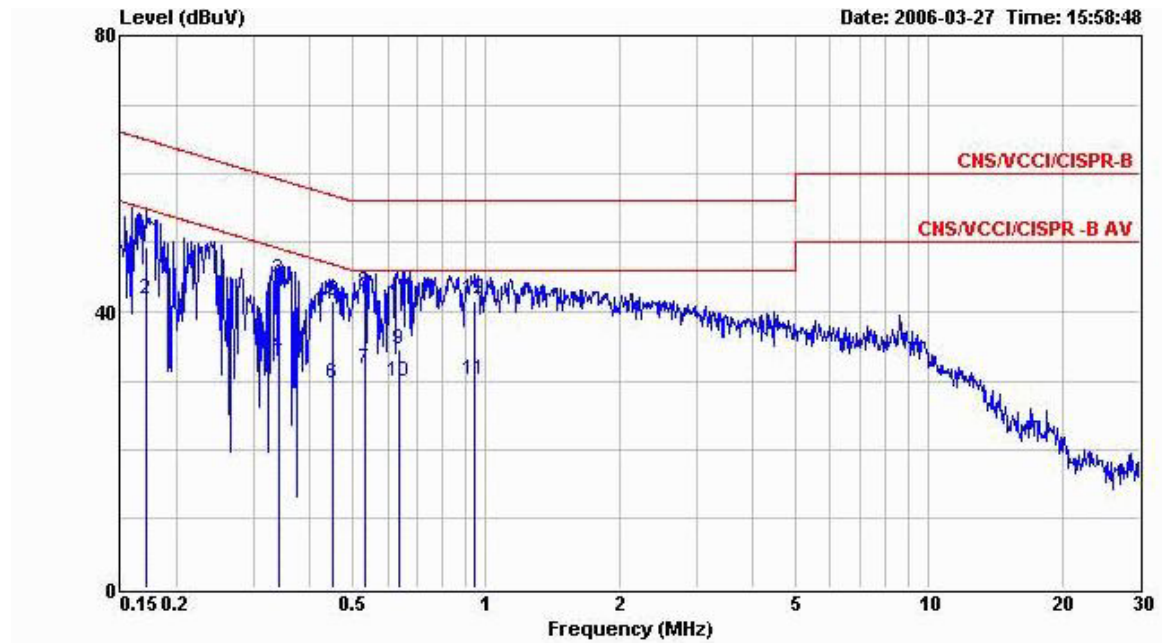
5.8.2 Test Procedures :

- 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

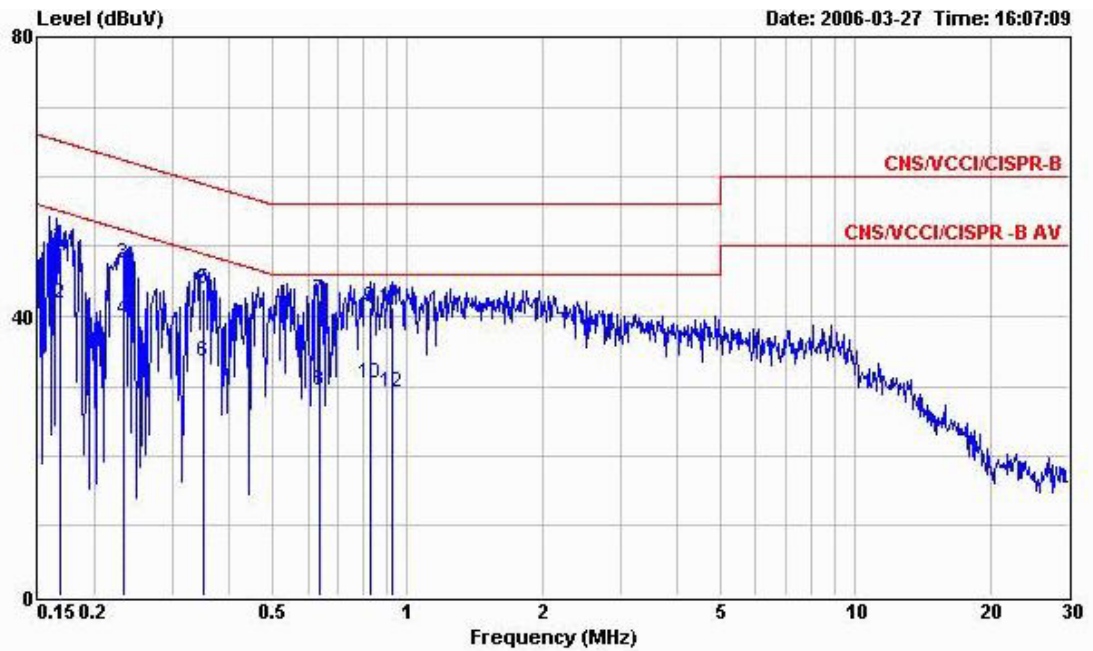
- Temperature: 24°C
- Relative Humidity: 52%
- Test Engineer: James

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



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2001/004 200505 LINE
EUT : Bluetooth mini keyboard
Power : 120V/60Hz(FROM NOTEBOOK)
Model : FD621302
Memo : BT LINK+USB CHARGER
Memo :
Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.170	49.26	-15.68	64.94	49.08	0.06	0.12	QP
2	0.170	41.74	-13.20	54.94	41.56	0.06	0.12	Average
3	0.341	44.62	-14.56	59.18	44.49	0.06	0.07	QP
4	0.341	33.79	-15.39	49.18	33.66	0.06	0.07	Average
5	0.452	41.66	-15.18	56.84	41.52	0.07	0.07	QP
6	0.452	29.65	-17.19	46.84	29.51	0.07	0.07	Average
7	0.535	31.72	-14.28	46.00	31.57	0.08	0.07	Average
8	0.535	42.95	-13.05	56.00	42.80	0.08	0.07	QP
9	0.634	34.63	-21.37	56.00	34.47	0.08	0.08	QP
10	0.634	29.91	-16.09	46.00	29.75	0.08	0.08	Average
11	0.943	30.03	-15.97	46.00	29.82	0.11	0.10	Average
12	0.943	41.90	-14.10	56.00	41.69	0.11	0.10	QP



Site : CO01-HY
 Condition : CNS/VCCI/CISPR-B 2001/004 200505 NEUTRAL
 EUT : Bluetooth mini keyboard
 Power : 120V/60Hz(FROM NOTEBOOK)
 Model : FD621302
 Memo : BT LINK+USB CHARGER
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.168	50.14	-14.94	65.08	49.91	0.11	0.12	QP
2	0.168	41.71	-13.37	55.08	41.48	0.11	0.12	Average
3	0.233	47.60	-14.76	62.36	47.38	0.11	0.11	QP
4	0.233	39.39	-12.97	52.36	39.17	0.11	0.11	Average
5	0.351	43.87	-15.08	58.95	43.69	0.11	0.07	QP
6	0.351	33.44	-15.51	48.95	33.26	0.11	0.07	Average
7	0.637	42.36	-13.64	56.00	42.11	0.17	0.08	QP
8	0.637	29.45	-16.55	46.00	29.20	0.17	0.08	Average
9	0.826	41.30	-14.70	56.00	41.01	0.20	0.09	QP
10	0.826	30.36	-15.64	46.00	30.07	0.20	0.09	Average
11	0.923	41.35	-14.65	56.00	41.03	0.22	0.10	QP
12	0.923	29.22	-16.78	46.00	28.90	0.22	0.10	Average

5.9 Radiated Emission Measurement

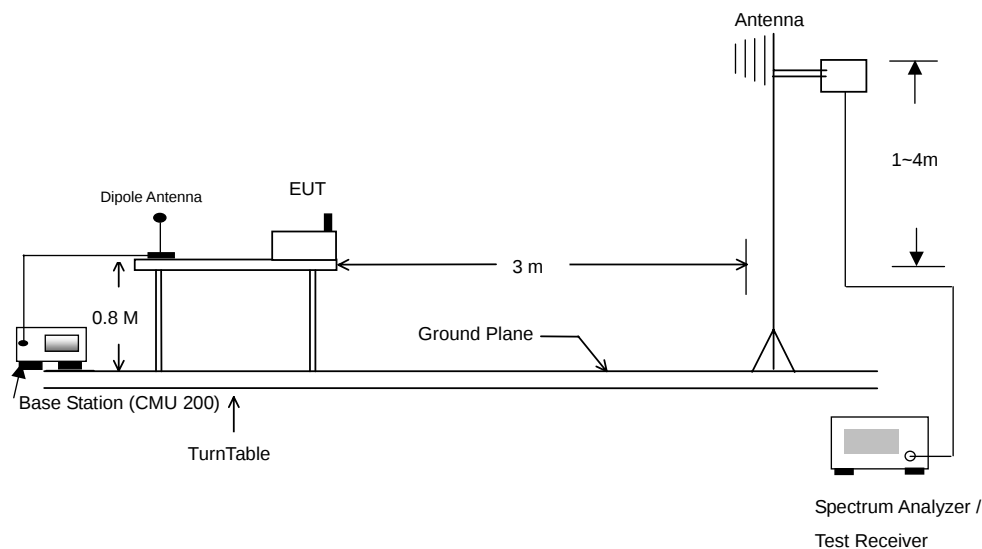
5.9.1 Measuring Instruments

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

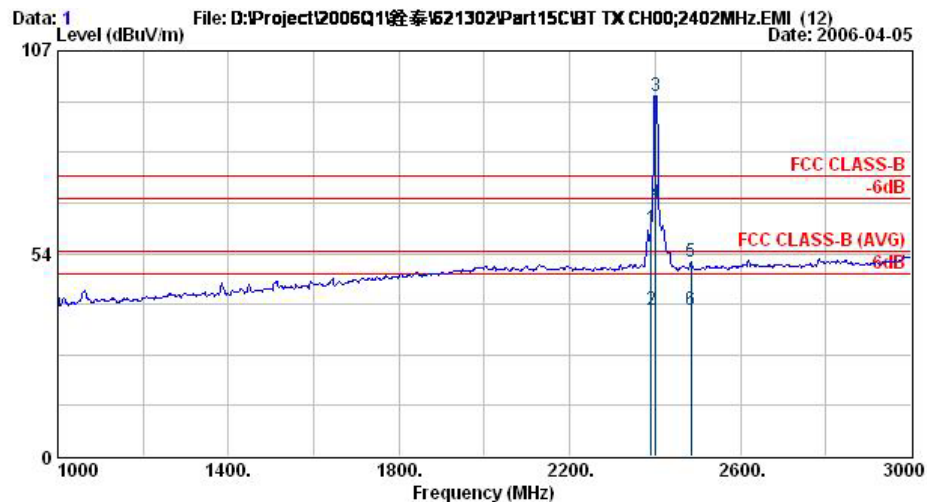




5.9.4 Test Data

- Temperature : 25°C
- Relating Humidity : 52%
- Test Enginner : Lious
- Test Mode : Mode 1
- Polarization : Horizontal

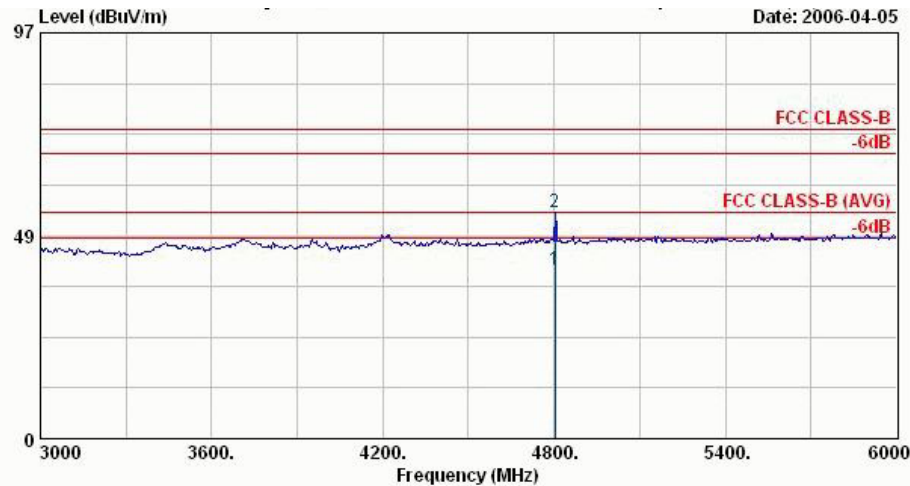
■ The test that passed at the minimum margin was marked by the frame in the following test record



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH00;2402MHz

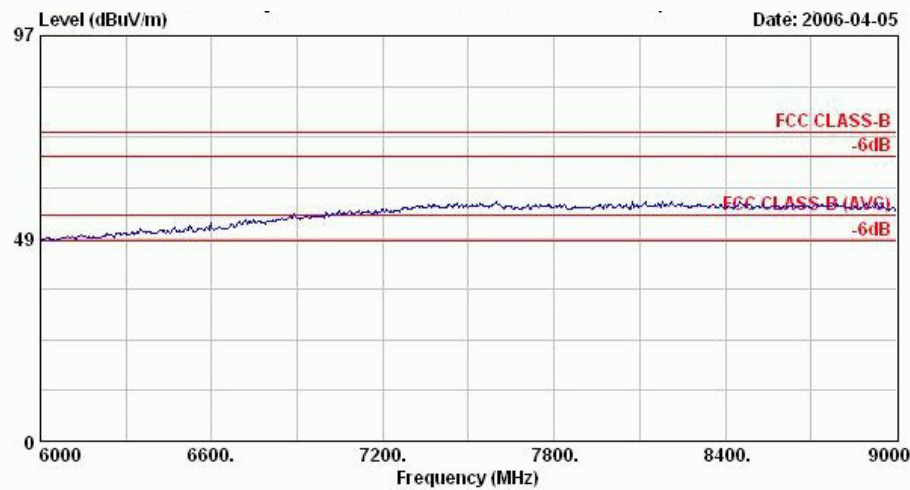
	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	2390.00	60.17	-13.83	74.00	60.88	30.48	35.46	4.26	200	0 Peak
2	2390.00	38.77	-15.23	54.00	39.48	30.48	35.46	4.26	106	355 Average
3 @	2402.00	95.01			95.72	30.48	35.46	4.26	200	0 Peak
4 X	2402.00	66.66			67.37	30.48	35.46	4.26	106	355 Average
5	2484.00	51.22	-22.78	74.00	51.96	30.41	35.51	4.36	200	0 Peak
6	2484.00	38.65	-15.35	54.00	39.39	30.41	35.51	4.36	106	355 Average

Remark: #3 and #4 Fundamental Signal.



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH00,2402MHz

	Freq	Level	Over	Limit	ReadAntenna	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	4804.00	40.33	-13.67	54.00	37.06	33.16	36.10	6.21	100	320 Average
2	4804.00	54.04	-19.96	74.00	50.77	33.16	36.10	6.21	200	0 Peak

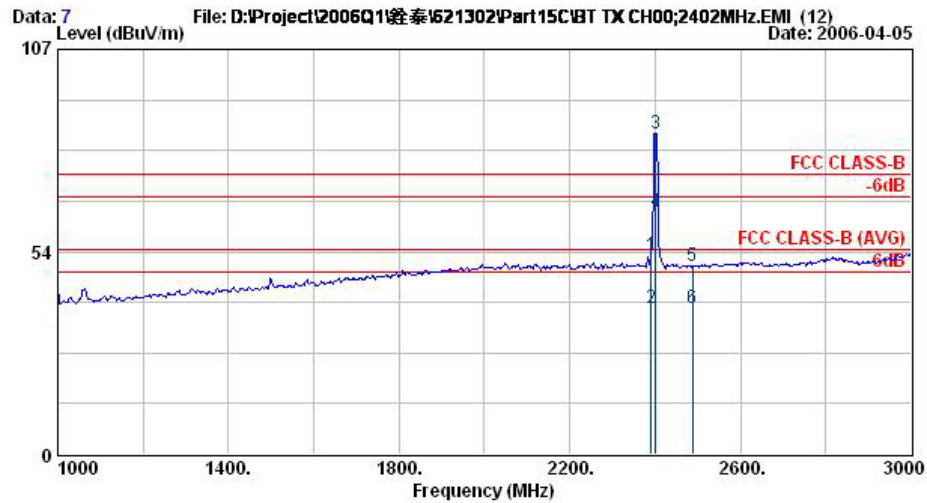


Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH00,2402MHz



- Test Mode : Mode 1
- Polarization : Vertical

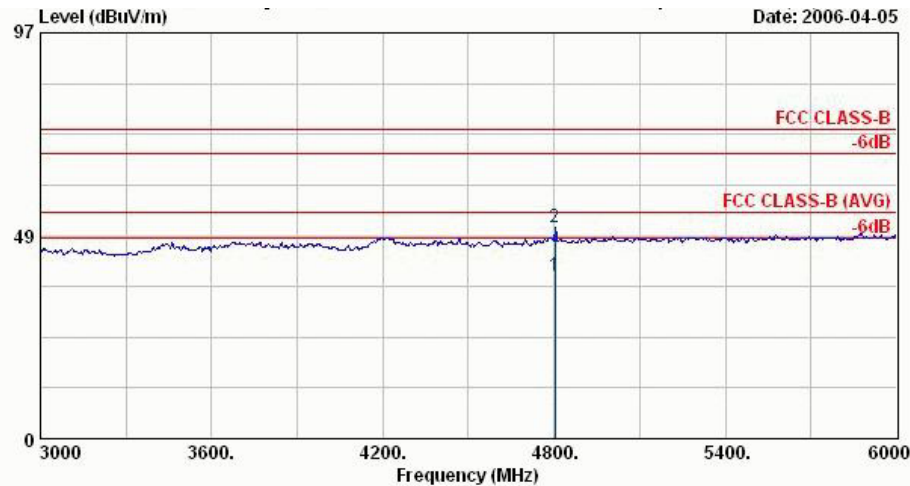
■ The test that passed at minimum margin was marked by the frame in the following table.



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH00,2402MHz

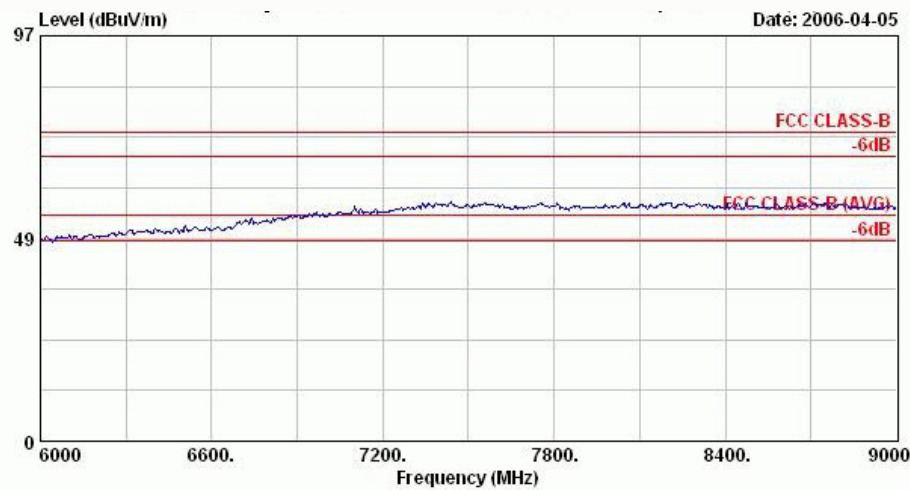
	Freq	Level	Over Limit	Limit Line	ReadAntenna	Preamp	Cable	Ant	Table		
	MHz	dBuV/m	dB	dBuV/m	Level	Factor	Factor	Loss	Pos	Pos	Remark
					dBuV	dB/m	dB	dB	cm	deg	
1	2390.00	52.47	-21.53	74.00	53.18	30.48	35.46	4.26	199	360	Peak
2	2390.00	38.58	-15.42	54.00	39.29	30.48	35.46	4.26	124	239	Average
3 X	2402.00	84.87			85.59	30.48	35.46	4.26	199	360	Peak
4 X	2402.00	64.02			64.73	30.48	35.46	4.26	124	239	Average
5	2488.00	49.83	-24.17	74.00	50.58	30.40	35.51	4.36	199	360	Peak
6	2488.00	38.58	-15.42	54.00	39.33	30.40	35.51	4.36	124	239	Average

Remark: #3 and #4 Fundamental Signal.



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH00,2402MHz

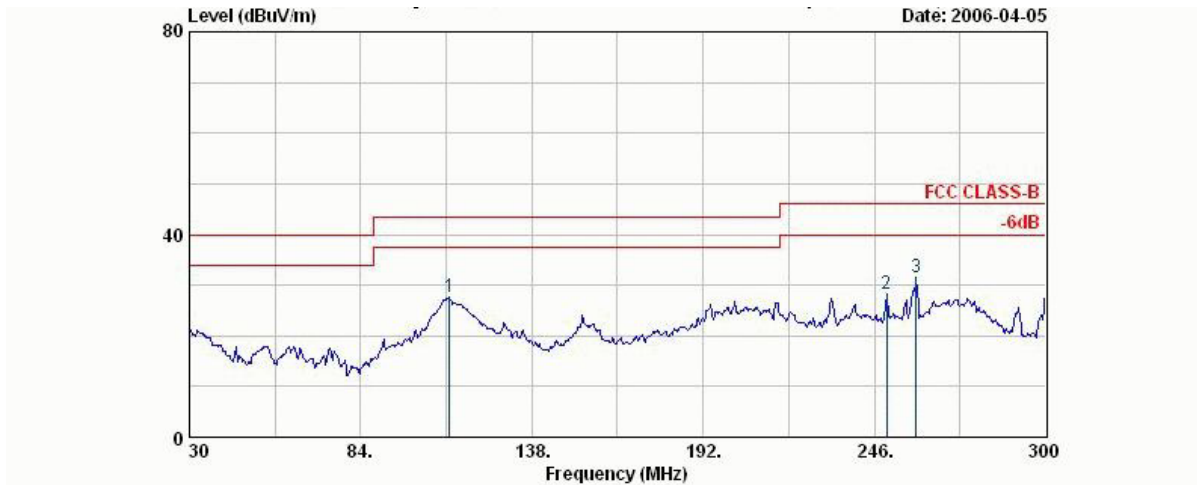
	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	4804.00	39.10	-14.90	54.00	35.83	33.16	36.10	6.21	100	203
2	4804.00	50.60	-23.40	74.00	47.33	33.16	36.10	6.21	200	360



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH00,2402MHz

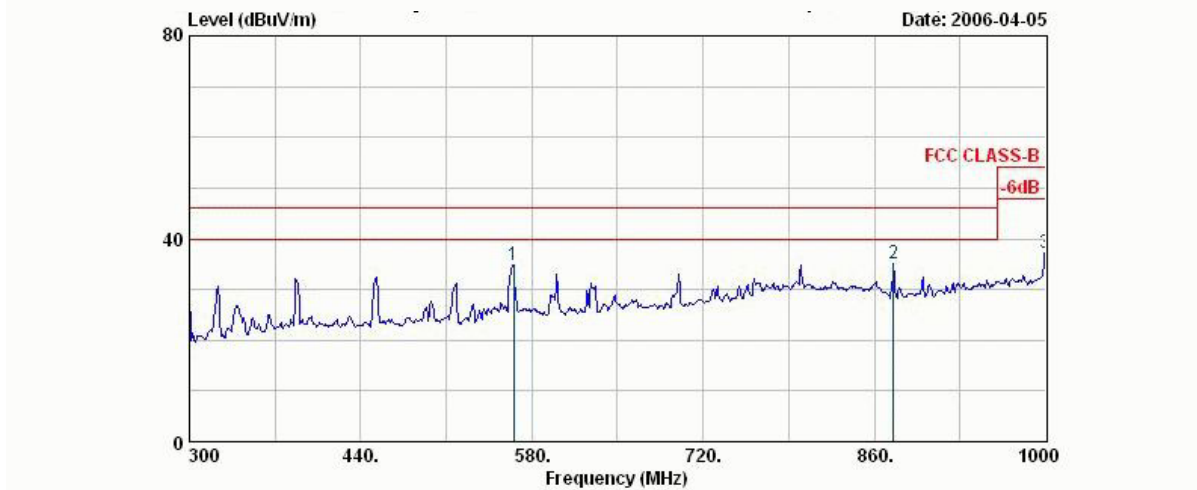
- Test Mode : Mode 2
- Polarization : Horizontal

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



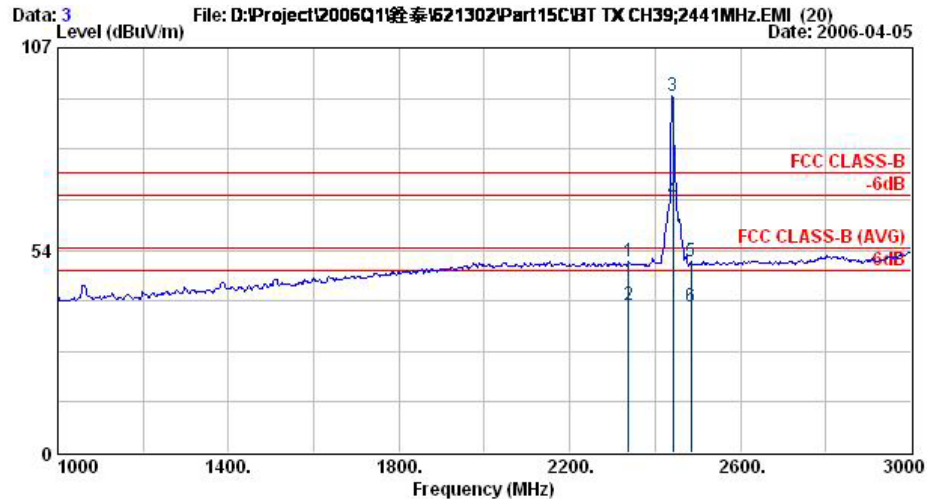
Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 HORIZONTAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH39,2441MHz

	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	112.08	27.64	-15.86	43.50	44.26	11.93	31.09	2.55	400	0 Peak
2	249.78	28.21	-17.79	46.00	43.47	11.73	30.92	3.93	400	0 Peak
3 @	259.23	31.65	-14.35	46.00	45.88	12.78	31.03	4.02	113	186 Peak



Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 HORIZONTAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH39,2441MHz

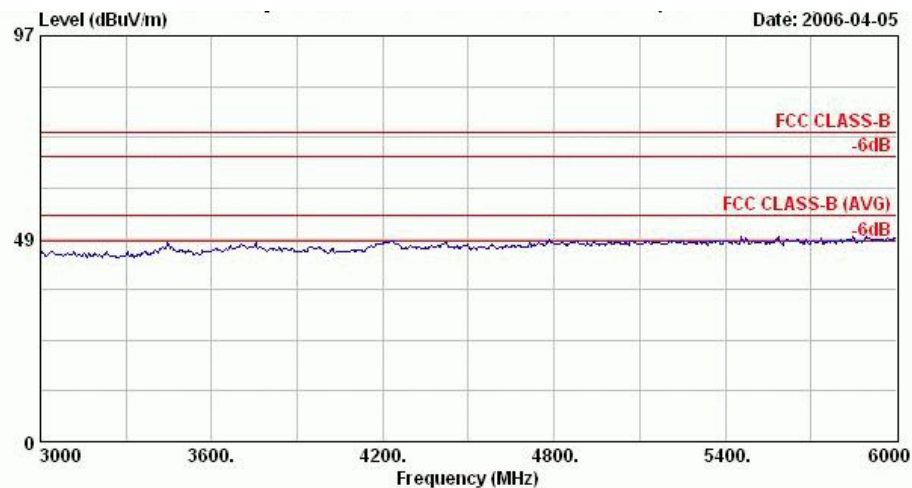
	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	565.30	34.86	-11.14	46.00	40.93	18.46	30.68	6.15	100	0 Peak
2 @	875.40	35.00	-11.00	46.00	37.32	20.42	30.56	7.83	142	227 Peak
3	1000.00	37.27	-16.73	54.00	36.51	22.97	30.63	8.42	100	0 Peak



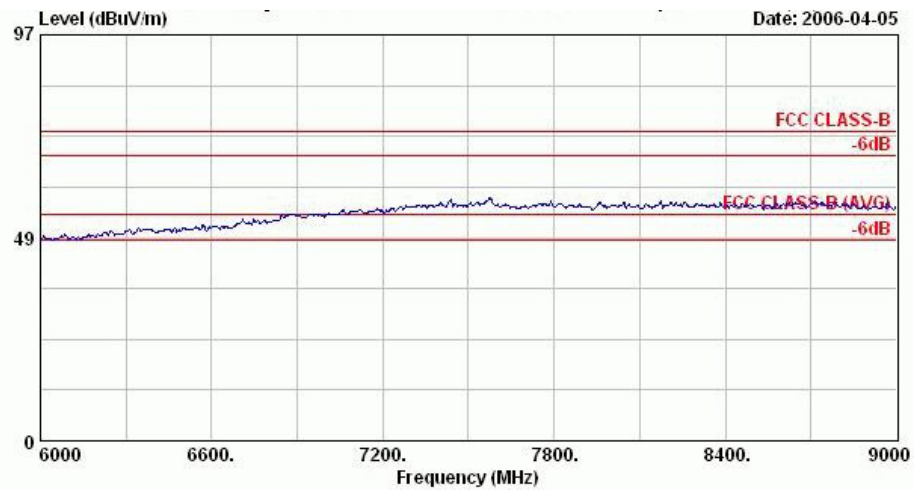
Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH39,2441MHz

	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	2338.00	50.63	-23.37	74.00	51.34	30.52	35.40	4.17	200	0 Peak
2	2338.00	38.82	-15.18	54.00	39.53	30.52	35.40	4.17	104	355 Average
3 @	2441.00	94.27			95.01	30.44	35.47	4.29	200	0 Peak
4 @	2441.00	66.87			67.60	30.44	35.49	4.33	104	355 Average
5	2484.00	50.46	-23.54	74.00	51.20	30.41	35.51	4.36	200	0 Peak
6	2484.00	38.65	-15.35	54.00	39.39	30.41	35.51	4.36	104	355 Average

Remark: #3 and #4 Fundamental Signal.



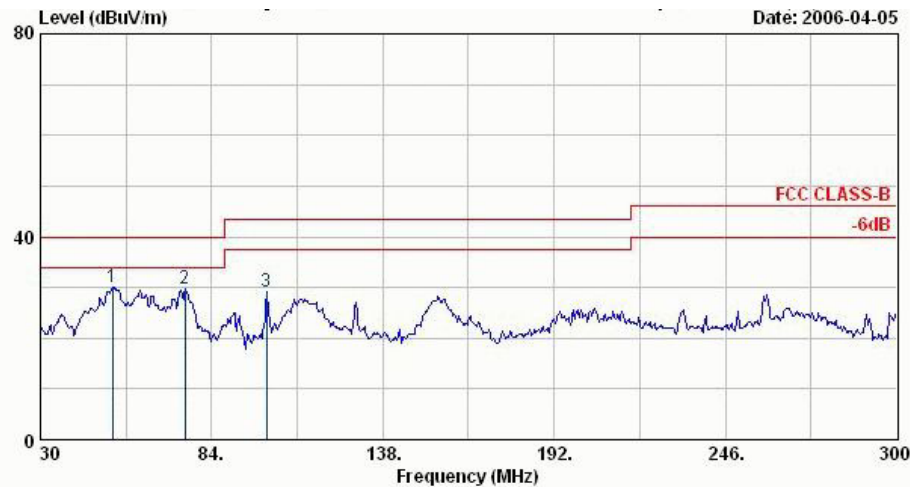
Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH39,2441MHz



Site : 03CH06-HY
 Condition : HF-ANT-071025-940201 HORIZONTAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH39,2441MHz

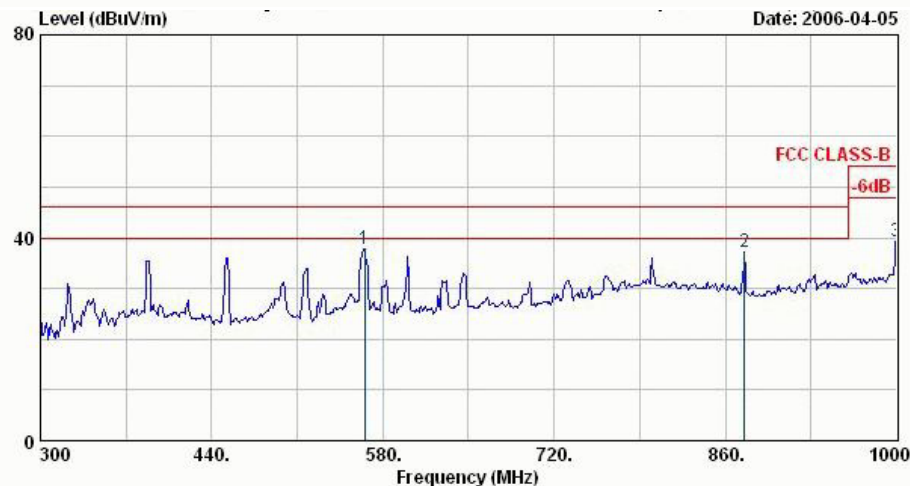
- Test Mode : Mode 2
- Polarization : Vertical

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



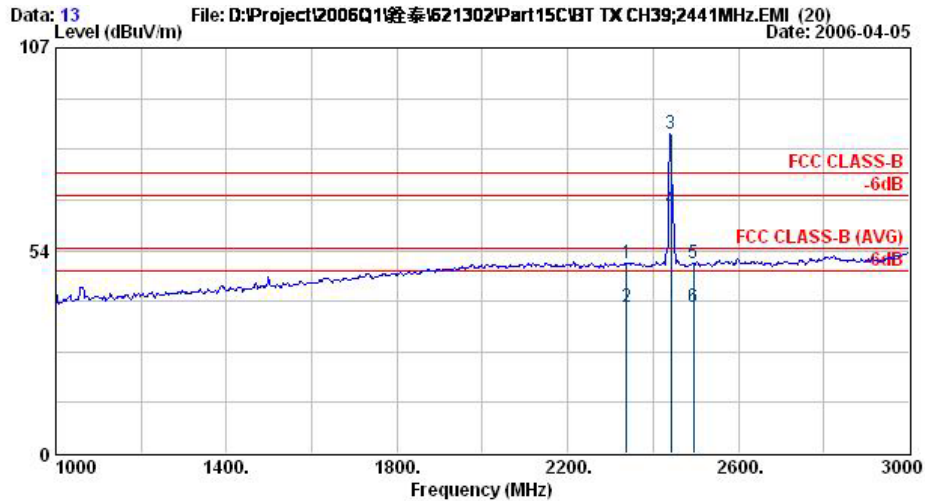
Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 VERTICAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH39,2441MHz

	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 @	52.68	30.11	-9.89	40.00	50.58	9.24	1.74	106	235	Peak
2 @	75.63	29.71	-10.29	40.00	52.52	6.70	2.10	400	0	Peak
3 @	101.28	29.24	-14.26	43.50	47.49	10.57	2.46	400	0	Peak



Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 VERTICAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH39,2441MHz

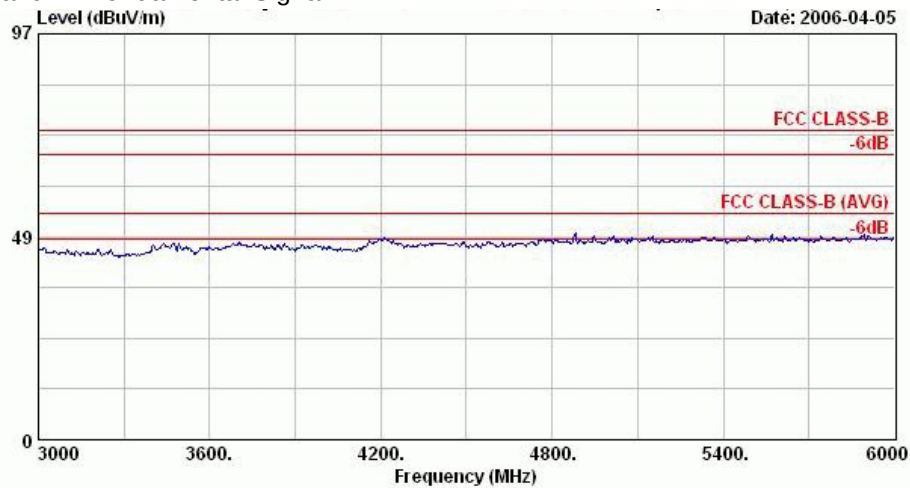
	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	565.30	37.84	-8.16	46.00	43.91	18.46	6.15	117	304	Peak
2 @	875.40	37.16	-8.84	46.00	39.47	20.42	7.83	100	0	Peak
3	1000.00	39.13	-14.87	54.00	38.37	22.97	8.42	100	0	Peak



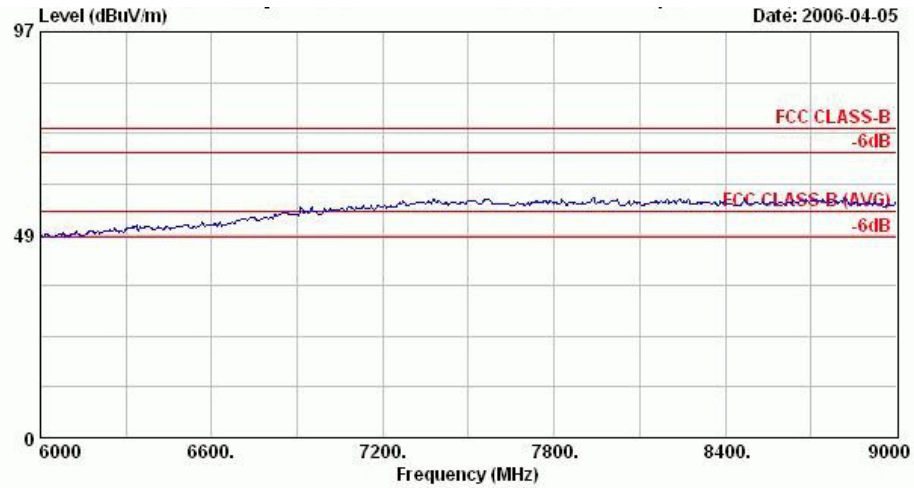
Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH39,2441MHz

	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	2338.00	50.29	-23.71	74.00	51.00	30.52	35.40	4.17	8995	360 Peak
2	2338.00	38.75	-15.25	54.00	39.46	30.52	35.40	4.17	121	236 Average
3 @	2441.00	84.30			85.04	30.44	35.47	4.29	8995	360 Peak
4 @	2441.00	64.52			65.25	30.44	35.49	4.33	121	236 Average
5	2494.00	50.06	-23.94	74.00	50.80	30.40	35.53	4.39	8995	360 Peak
6	2494.00	38.44	-15.56	54.00	39.18	30.40	35.53	4.39	121	236 Average

Remark: #3 and #4 Fundamental Signal.



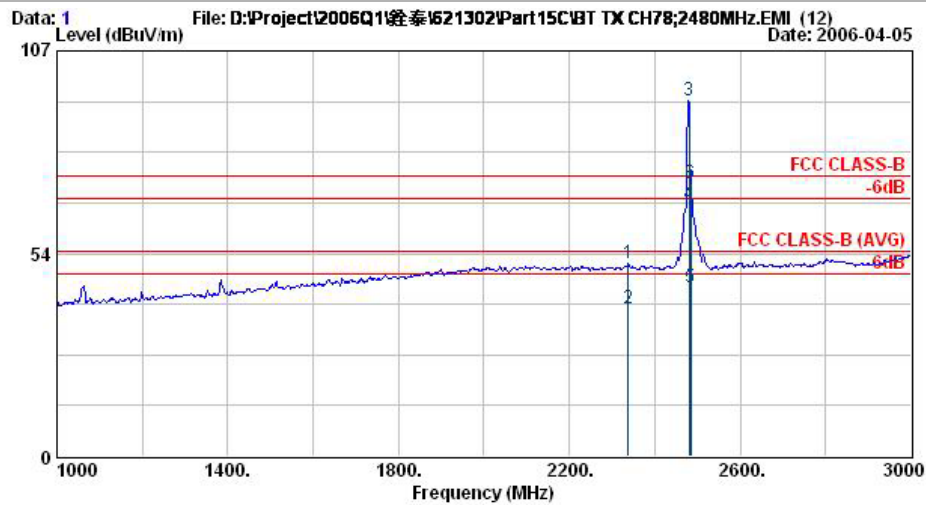
Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH39,2441MHz



Site : 03CH06-HY
 Condition : HF-ANT-071025-940201 VERTICAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH39,2441MHz

- Test Mode : Mode 3
- Polarization : Horizontal

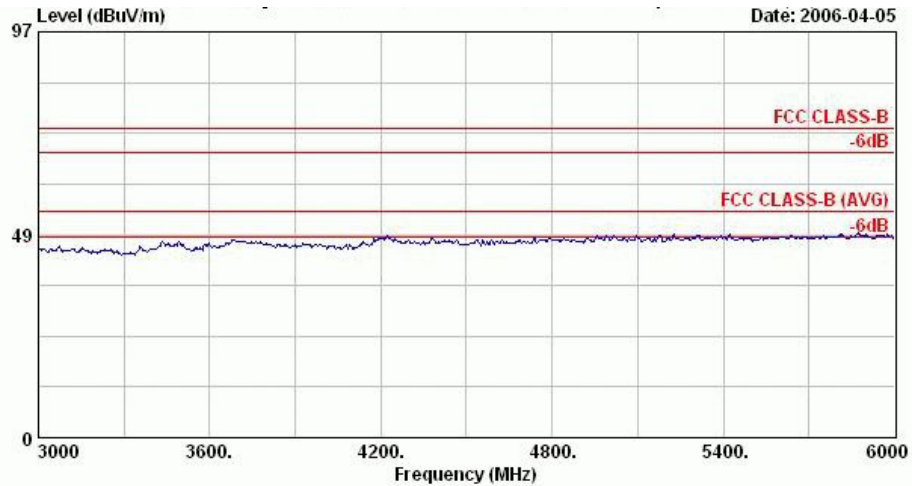
■ The test that passed at minimum margin was marked by the frame in the following table.



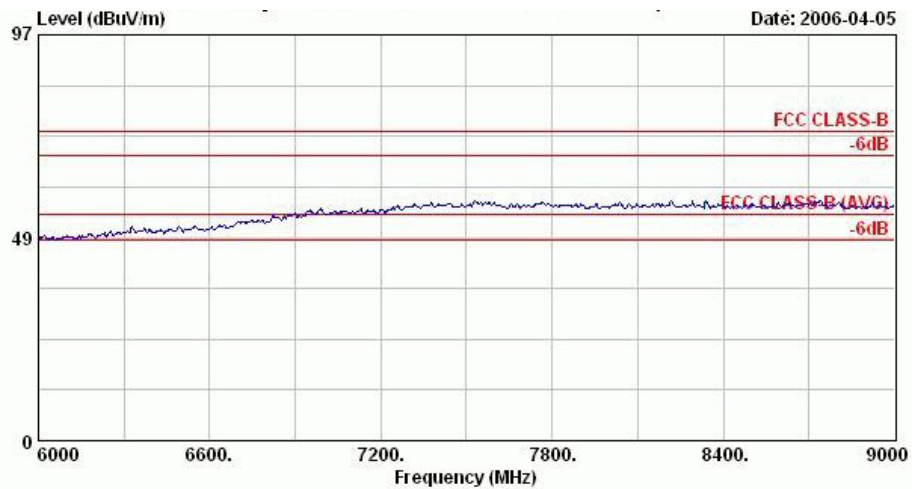
Site : 03CH06-HY
Condition : HF-ANT-071025-940201 HORIZONTAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH78,2480MHz

	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	2338.00	50.78	-23.22	74.00	51.49	30.52	35.40	200	0	Peak
2	2338.00	38.83	-15.17	54.00	39.54	30.52	35.40	102	352	Average
3 @	2480.00	93.84			94.58	30.41	35.51	200	0	Peak
4 X	2480.00	66.30			67.04	30.41	35.51	102	352	Average
5	2483.50	44.53	-9.47	54.00	45.27	30.41	35.51	102	352	Average
6 !	2483.50	72.07	-1.93	74.00	72.81	30.41	35.51	200	0	Peak

Remark: #3 and #4 Fundamental Signal.



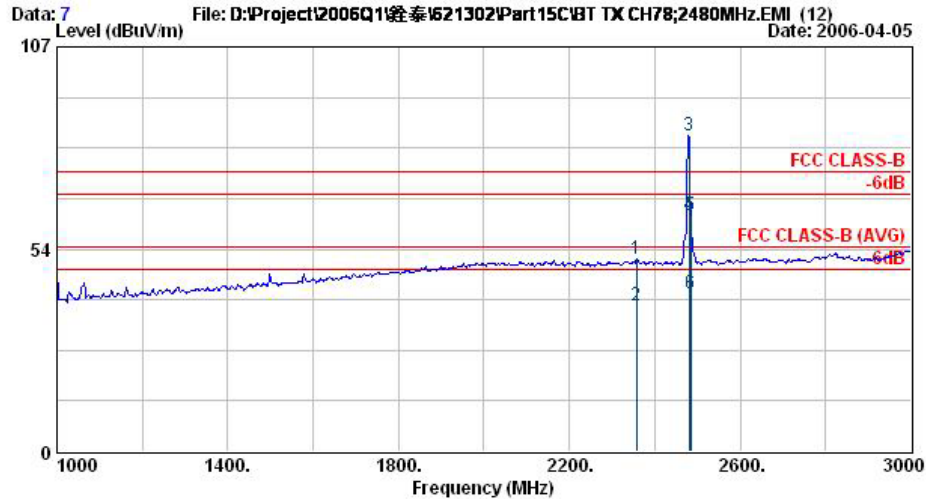
Site : 03CH06-HY
 Condition : HF-ANT-071025-940201 HORIZONTAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
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Site : 03CH06-HY
 Condition : HF-ANT-071025-940201 HORIZONTAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH78,2480MHz

- Test Mode : Mode 3
- Polarization : Vertical

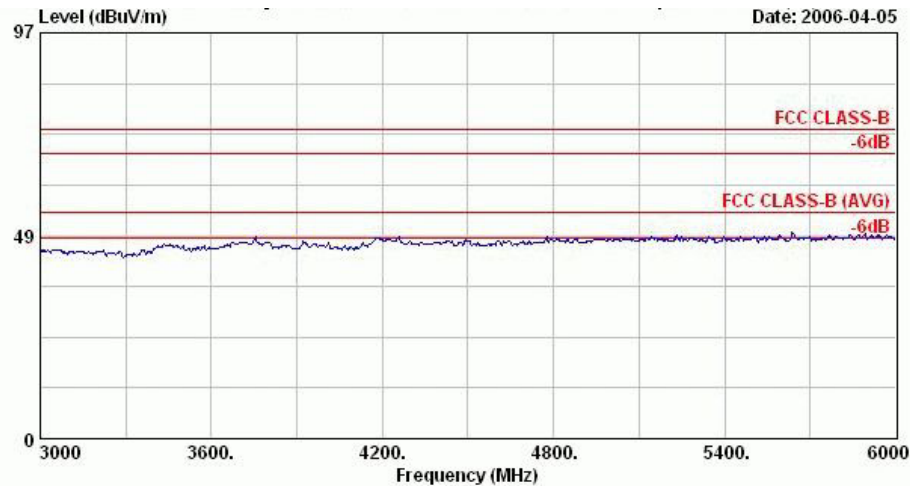
■ The test that passed at minimum margin was marked by the frame in the following table.



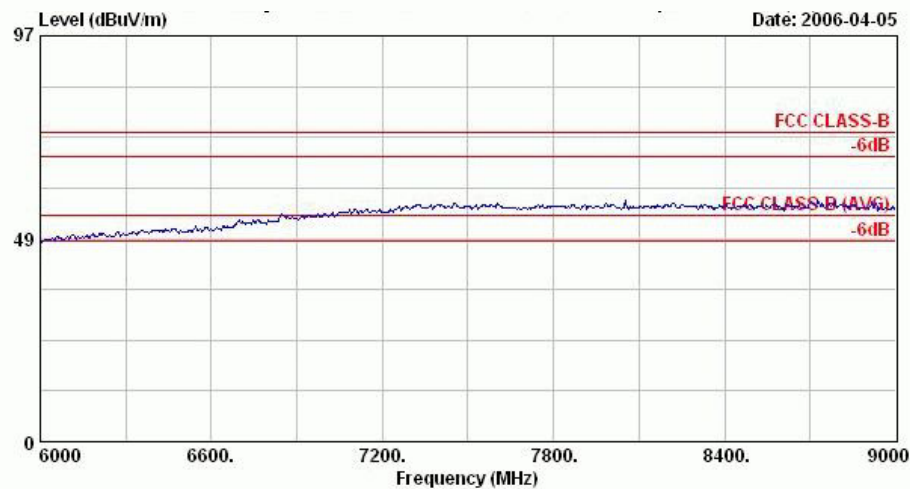
Site : 03CH06-HY
 Condition : HF-ANT-071025-940201 VERTICAL
 EUT : Bluetooth mini keyboard
 Power : From Notebook
 Model : FR621302
 Memo : BT TX CH78;2480MHz

	Freq	Level	Over	Limit	ReadAntenna	Preampl	Cable	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level Factor	Factor	Loss	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	2358.00	50.93	-23.07	74.00	51.64	30.51	35.42	4.20	200	360 Peak
2	2358.00	38.69	-15.31	54.00	39.40	30.51	35.42	4.20	123	237 Average
3 X	2480.00	83.72			84.45	30.41	35.51	4.36	200	360 Peak
4 X	2480.00	62.48			63.22	30.41	35.51	4.36	123	237 Average
5	2483.50	62.61	-11.39	74.00	63.35	30.41	35.51	4.36	200	360 Peak
6	2483.50	41.90	-12.10	54.00	42.64	30.41	35.51	4.36	123	237 Average

Remark: #3 and #4 Fundamental Signal.



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH78,2480MHz



Site : 03CH06-HY
Condition : HF-ANT-071025-940201 VERTICAL
EUT : Bluetooth mini keyboard
Power : From Notebook
Model : FR621302
Memo : BT TX CH78,2480MHz

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 Chip antenna without connector and it is considered to meet antenna requirement of FCC.

5.10.3 Antenna Gain

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

6. List of Measuring Equipments Used

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

7. Uncertainty Evaluation

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

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
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				