



FCC Test Report

According to

47 CFR Part 15 Subpart C

Equipment : Mobile Printer

Trade Name : Prinstik

Model Name : PS950

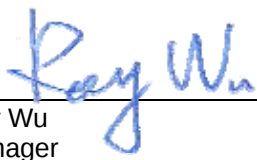
FCC ID : R37PS950

Filing Type : Certification

Applicant : DATAWIND INC

555 RENE LEVESQUE W., Suite 1130, MONTREAL,
QC, H2Z 1B1, CANADA

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- The data shown in this test report were carried out on Jul. 03, 2008 at **Sporton International Inc. LAB.**
- Report No.: FR860214, Report Version: Rev.01


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Report Version: Rev.01

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History of This Test Report

Report Issue Date: Jul. 31, 2008

Report No.	Description

1. General Description of Equipment under Test

1.1 Applicant

DATAWIND INC

555 RENE LEVESQUE W., Suite 1130, MONTREAL, QC, H2Z 1B1, CANADA

1.2 Manufacturer

Tool Quotes Limited

Rm 1704, Citi Corp Centre, 18 Whitfield Road, Causeway Bay, HK

1.3 Basic Description of Equipment under Test

AC Adapter	Brand Name	Kuantech (Shenzhen)
	Model Name	KSAFB0500100W1US
	Power Rating	I/P:100-240Vac, 50-60Hz, 0.15A; O/P: 5.0Vdc, 1.0A
	AC Power Cord Type	1.8 meter non-shielded cable without ferrite core
Battery	Brand Name	XIAMEN POWERLONG
	Model Name	OPM183-01B
	Power Rating	7.4Vdc, 550mAh
	Type	Li-ion

Remark: Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.

1.4 Feature of Equipment under Test

Product Feature & Specification			
DUT Type :	Mobile Printer		
Trade Name :	Prinstik		
Model Name :	PS950		
FCC ID :	R37PS950		
Tx Frequency :	2400 MHz ~ 2483.5 MHz		
Rx Frequency :	2400 MHz ~ 2483.5 MHz		
Number of Channels :	79		
Carrier Frequency of Each Channel :	2402+n*1 MHz; n=0~78		
Channel Spacing :	1 MHz		
Maximum Output Power to Antenna :	3.76 dBm		
Antenna Type :	Chip Antenna		
Antenna Gain :	1.36 dBi		
HW Version :	Rev 1.0		
SW Version :	081315		
Type of Modulation :	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK		
Function Type :	Transmitter	Transceiver	V
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.
- The data rate, 1Mbps, was chosen to being tested, due to the highest RF output power.

Channel	Frequency	Data Rate / Modulation		
		GFSK	$\pi/4$ -DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2400MHz	3.76 dBm	2.76 dBm	3.39 dBm
Ch39	2441MHz	3.44 dBm	1.95 dBm	2.72 dBm
Ch78	2480MHz	3.06 dBm	1.94 dBm	2.07 dBm

Bluetooth uses frequency hopping spread spectrum (FHSS) operation which also facilitates Bluetooth multiple access and coexistence among other types of wireless systems. The basic frequency-hopping pattern is a pseudo-random ordering of 79 channel frequencies in the ISM band and the hopping rate is nominally 1600 hops per second. The EDR modulation format uses one of two types of DPSK ($\pi/4$ -DQPSK or 8-DPSK) in the payload section of the packet. As shown in figure, the EDR packet begins using GFSK modulation during the access code and header portions of the packet but changes to DPSK modulation after the guard time. Changing to a DPSK format allows increased data rates of 2 Mb/s or 3 Mb/s.

- The EUT is programmed to transmit signal continuously for all testings.
- Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 25000 MHz.

2.2 Test Mode

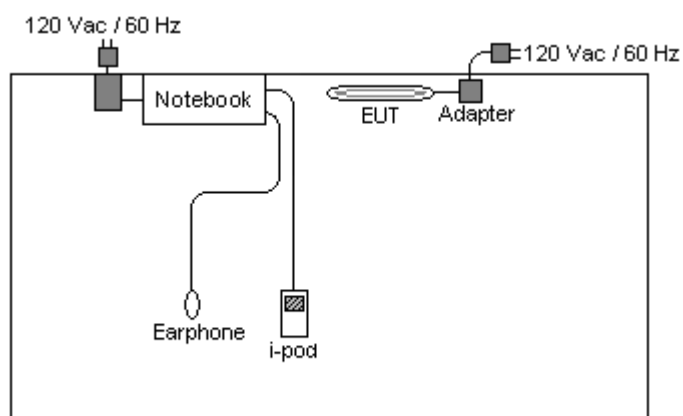
Test Item	Test Mode		
Radiated Emission / RF Conducted	Bluetooth Tx	Bluetooth Tx(EDR 2Mbps)	Bluetooth Tx(EDR 3Mbps)
	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz
	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz
	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz
Conducted Emission	Mode 1: BT Link Mode + Adapter		

2.3 Ancillary Equipment List

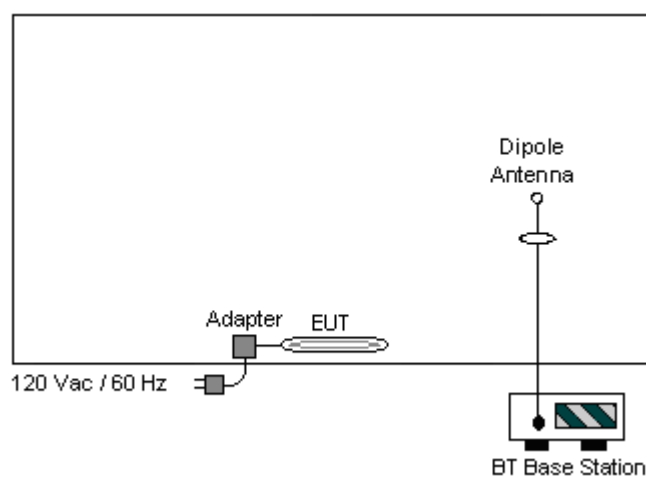
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	BT Base Station	Anritus	8852B	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	Dell	1501	QDS-BRCM1020	N/A	N/A
3.	Earphone	Sampo	EK-Y652CS	FCC DoC	Shielded, 1.8m	N/A
4.	i-pod	Apple	A1199	N/A	Shielded, 1.2 m	N/A

2.4 Connection Diagram of Test System

<Conducted Emission>



<Radiated Emission >



3. RF Utility

The programmed RF Utility is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testings.

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 : 886-3-328-4978
Test Site No : CO04-HY, 03CH06-HY
FCC Designation No : TW1022

4.1 Test Voltage

AC 120V / 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2003

4.3 Test Compliance

47 CFR Part 15 Subpart C

4.4 Frequency Range

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 25000 MHz

4.5 Test Distance

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

5. Test Data and Test Result

5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(1)(iii)	Hopping Channel Bandwidth	Pass
15.247(a)(1)	Hopping Channel Separation	Pass
15.247(a)(1)(iii)	Number of Hopping Frequency	Pass
15.247(a)(1)(iii)	Dwell Time of Each Frequency	Pass
15.247(b)(1)	Output Power	Pass
15.247(d)	100 KHz Bandwidth of Frequency Band Edges	Pass
15.209(a) 15.247(d)	Radiated Emission	Pass
15.203 15.247(b)(4)	Antenna Requirement	Pass

5.2 Band Edges Measurement

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 via a low lose cable.
2. Set both RBW and VBW of spectrum analyzer to 100 KHz with suitable frequency span including 100 KHz bandwidth from band edge.
3. The band edges was measured and recorded.

5.2.3 Test Result

- Application Type : Bluetooth
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

Test Result in Bluetooth lower band	:	PASS
Test Result in Bluetooth higher band	:	PASS

5.2.4 Note on Band Edge Emission
➤ Bluetooth(1Mbps)
CH00 (Horizontal)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2369.85	51.19	-22.81	74.00	51.15	31.83	3.89	35.68	100	0	Peak
2369.85	42.74	-11.26	54.00	42.70	31.83	3.89	35.68	100	60	Average

CH00 (Vertical)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2369.85	47.31	-26.69	74.00	47.27	31.83	3.89	35.68	100	0	Peak
2369.85	37.32	-16.68	54.00	37.28	31.83	3.89	35.68	100	1	Average

CH78 (Horizontal)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	61.06	-12.94	74.00	60.73	31.98	4.05	35.70	100	0	Peak
2483.50	50.37	-3.63	54.00	50.04	31.98	4.05	35.70	100	256	Average

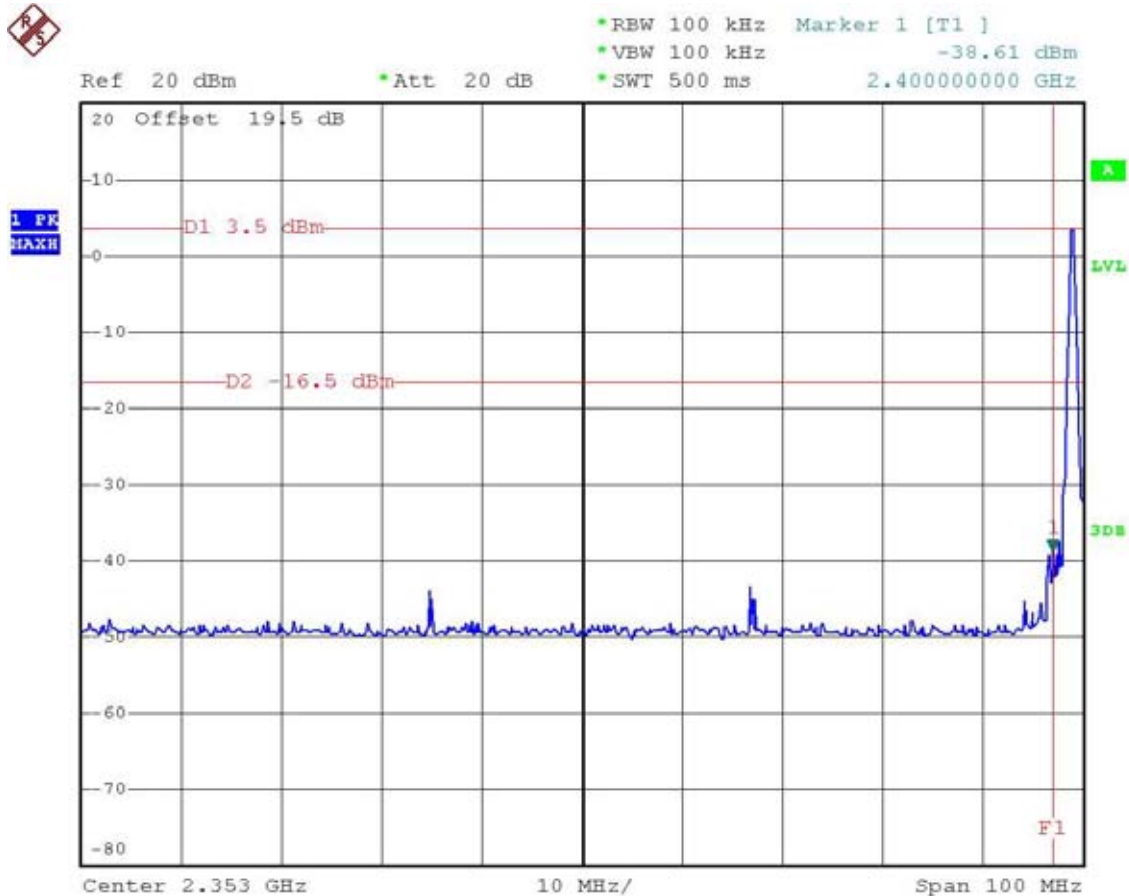
CH78 (Vertical)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	60.20	-13.80	74.00	59.87	31.98	4.05	35.70	100	0	Peak
2483.50	49.23	-4.77	54.00	48.90	31.98	4.05	35.70	100	1	Average

5.2.5 20dB Band Edge

Bluetooth

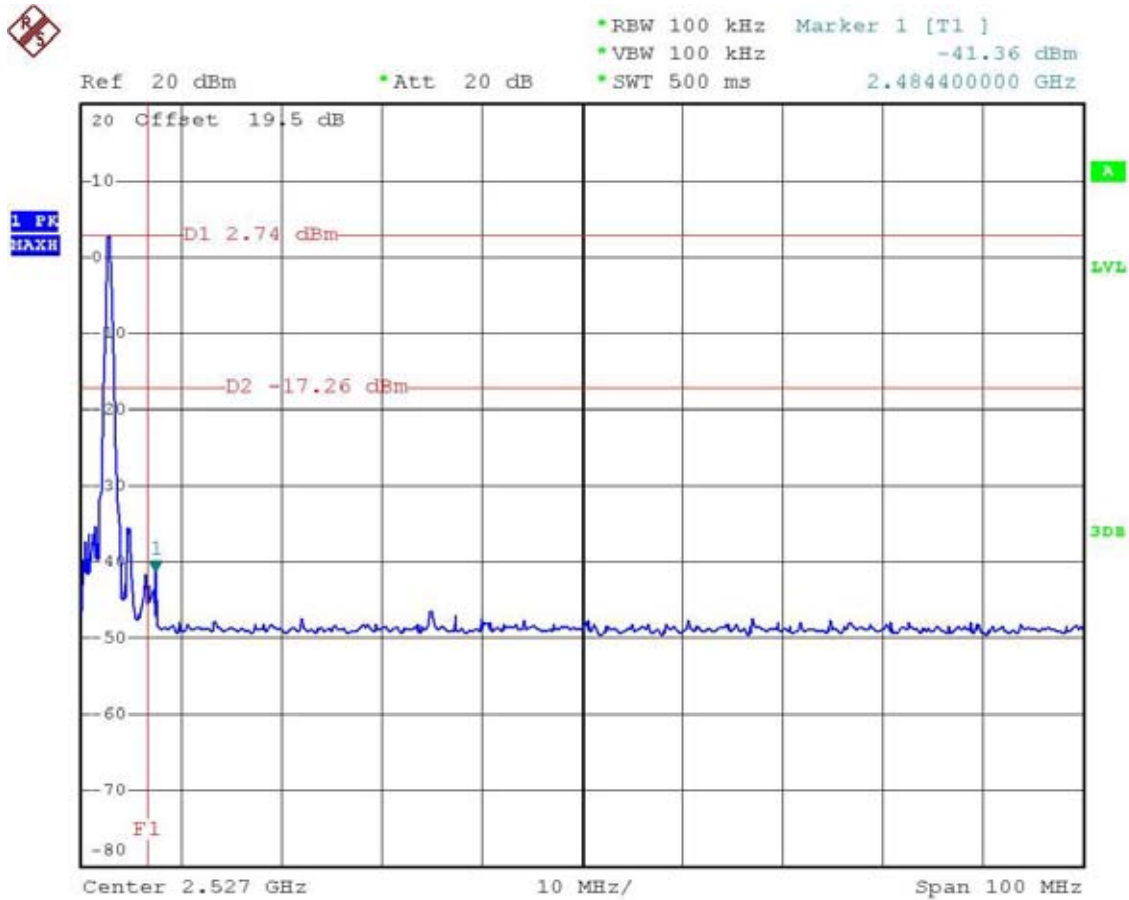
CH00



2nd comment ...

Date: 24.JUN.2008 20:25:45

CH78



2nd comment ...

Date: 24.JUN.2008 20:32:25

5.3 Hopping Channel Separation

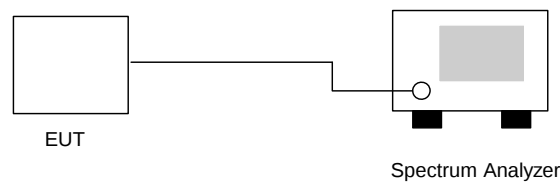
5.3.1 Measuring Instruments

As described in chapter 9 of this test report.

5.3.2 Test Procedure

1. The output of EUT was connected to the spectrum analyzer by a low loss cable..
2. Set RBW of spectrum analyzer to 30 KHz and VBW to 100 KHz.
3. The Hopping Channel Separation is defined as the channel is separated with the next channel.

5.3.3 Test Setup Layout



5.3.4 Test Result : The spectrum analyzer plots are attached as below

- Application Type : Bluetooth (1Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.004	0.600	Mode 1
39	2441	1.000	0.598	Mode 2
78	2480	1.004	0.600	Mode 3

Remark: Hopping Channel Separation shall be greater 2/3 of 20dB bandwidth.

- Application Type : Bluetooth EDR(2Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.811	Mode 4
39	2441	1.000	0.811	Mode 5
78	2480	1.000	0.808	Mode 6

Remark: Hopping Channel Separation shall be greater 2/3 of 20dB bandwidth.

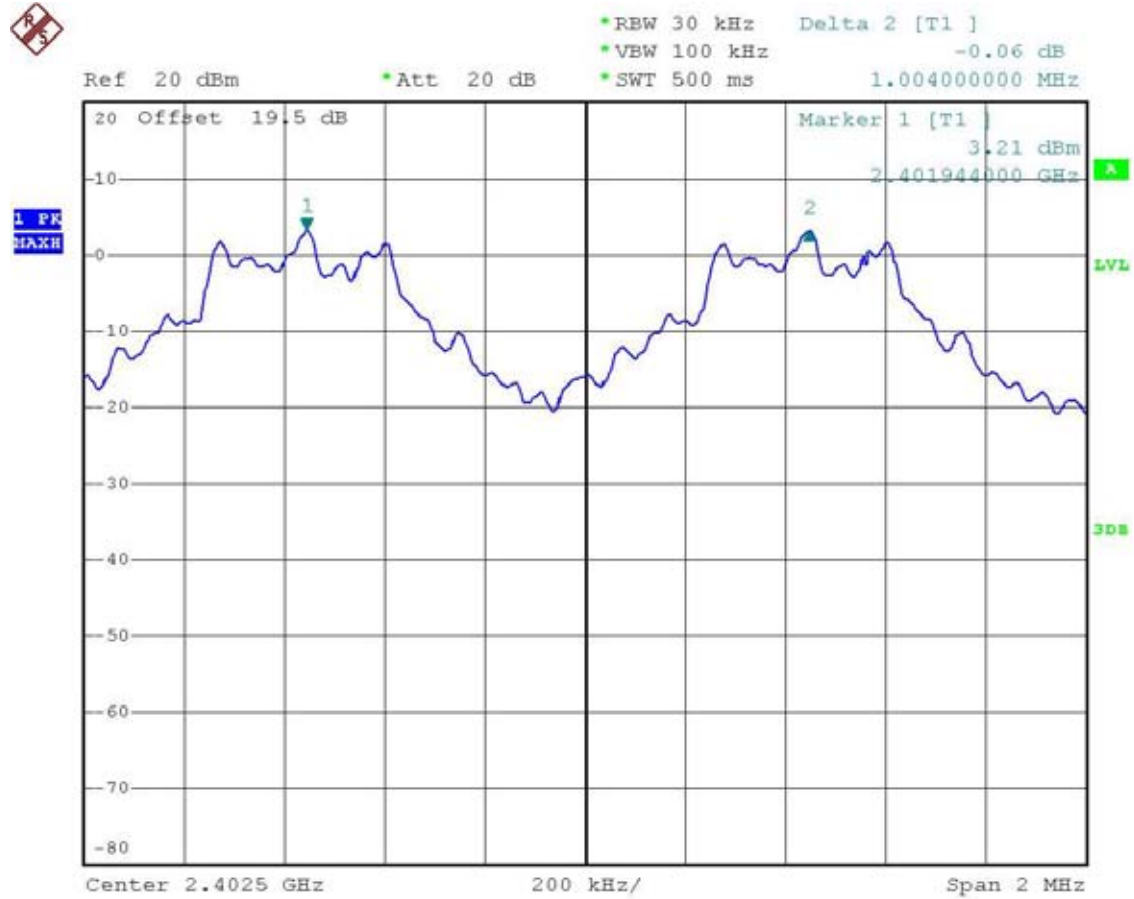
- Application Type : Bluetooth EDR(3Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.808	Mode 7
39	2441	1.000	0.805	Mode 8
78	2480	1.008	0.811	Mode 9

Remark: Hopping Channel Separation shall be greater 2/3 of 20dB bandwidth.

5.3.5 Hopping Channel Separation

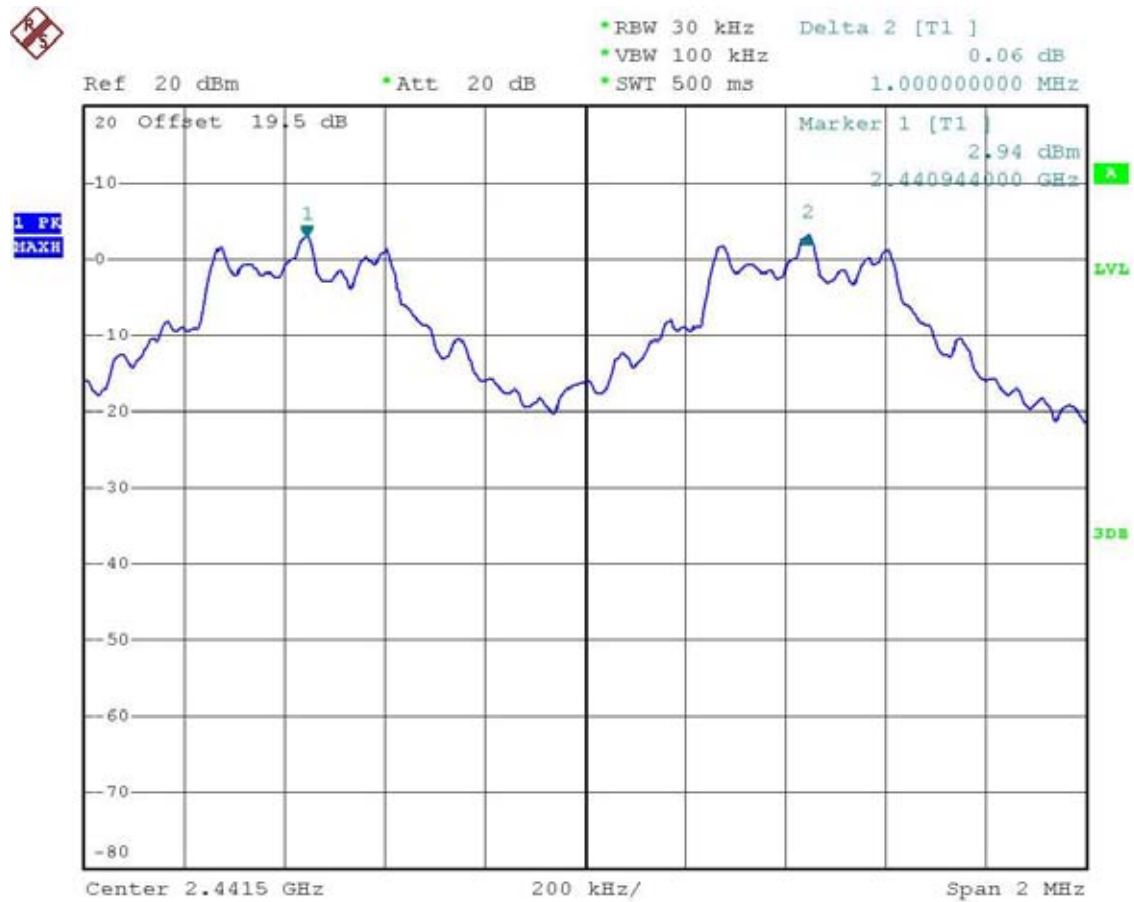
Mode 1



2nd comment ...

Date: 24.JUN.2008 20:45:56

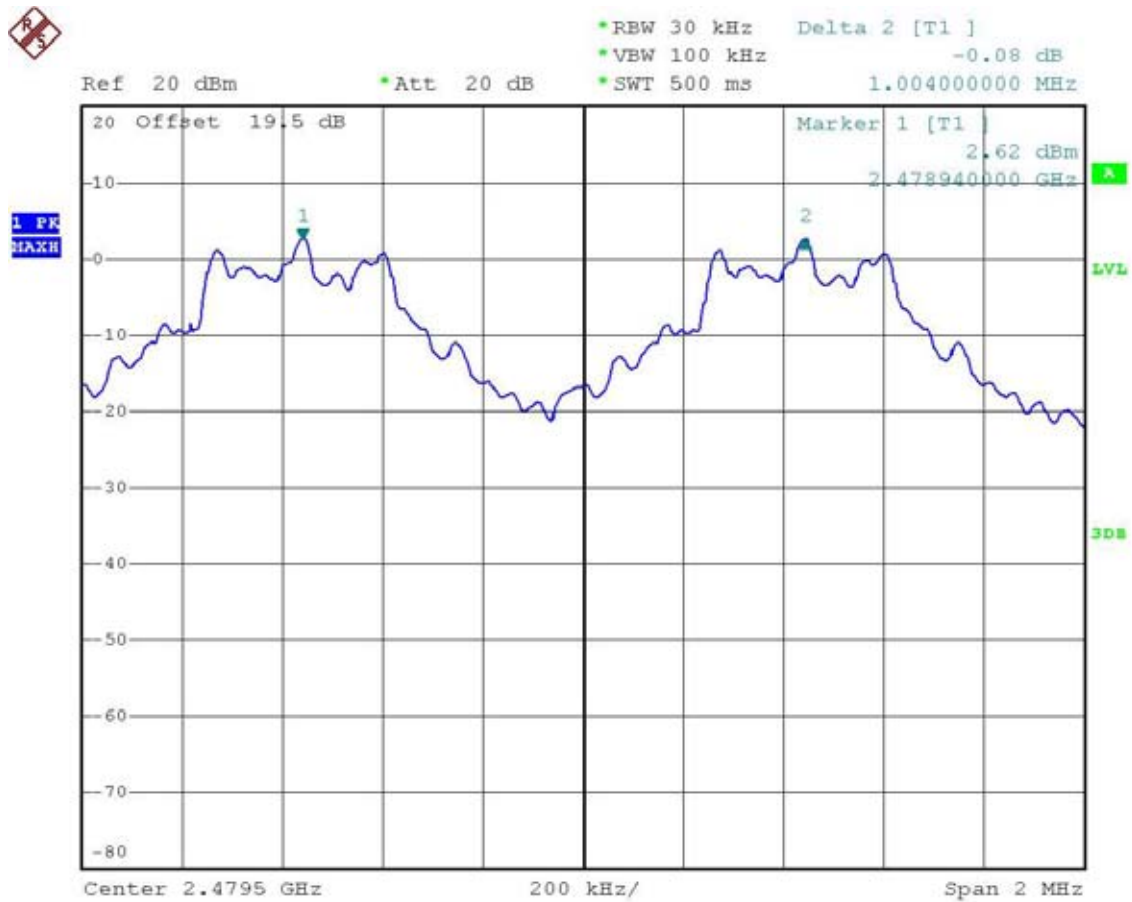
Mode 2



2nd comment ...

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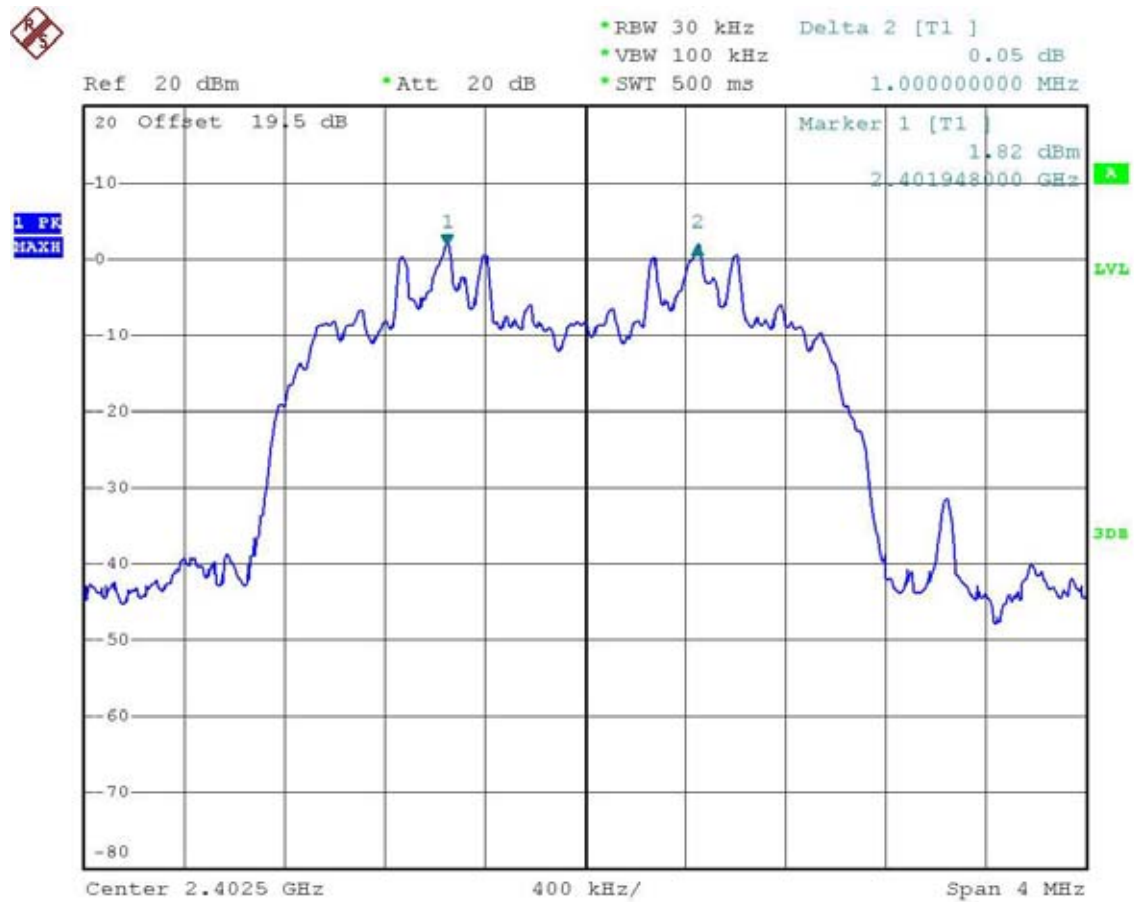
Mode 3



2nd comment ...

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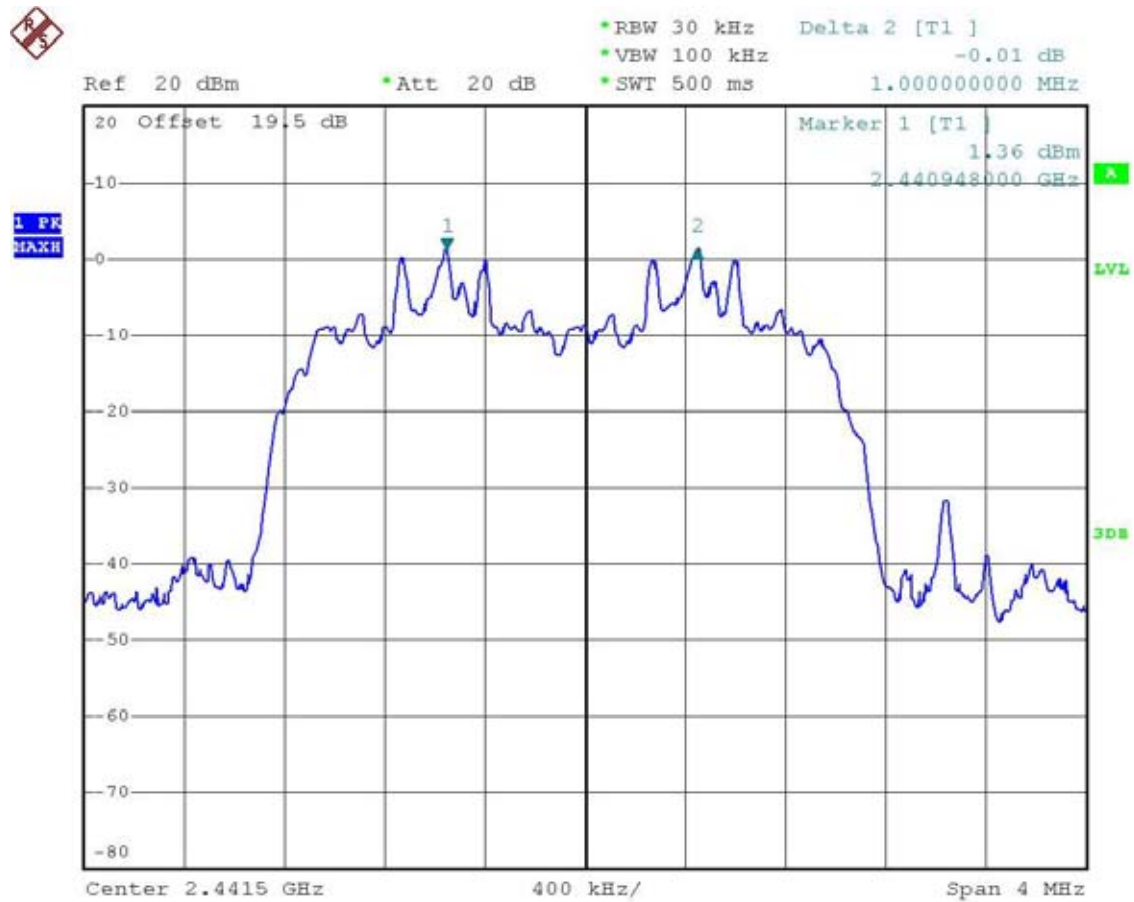
Mode 4



2nd comment ...

Date: 24.JUN.2008 20:39:44

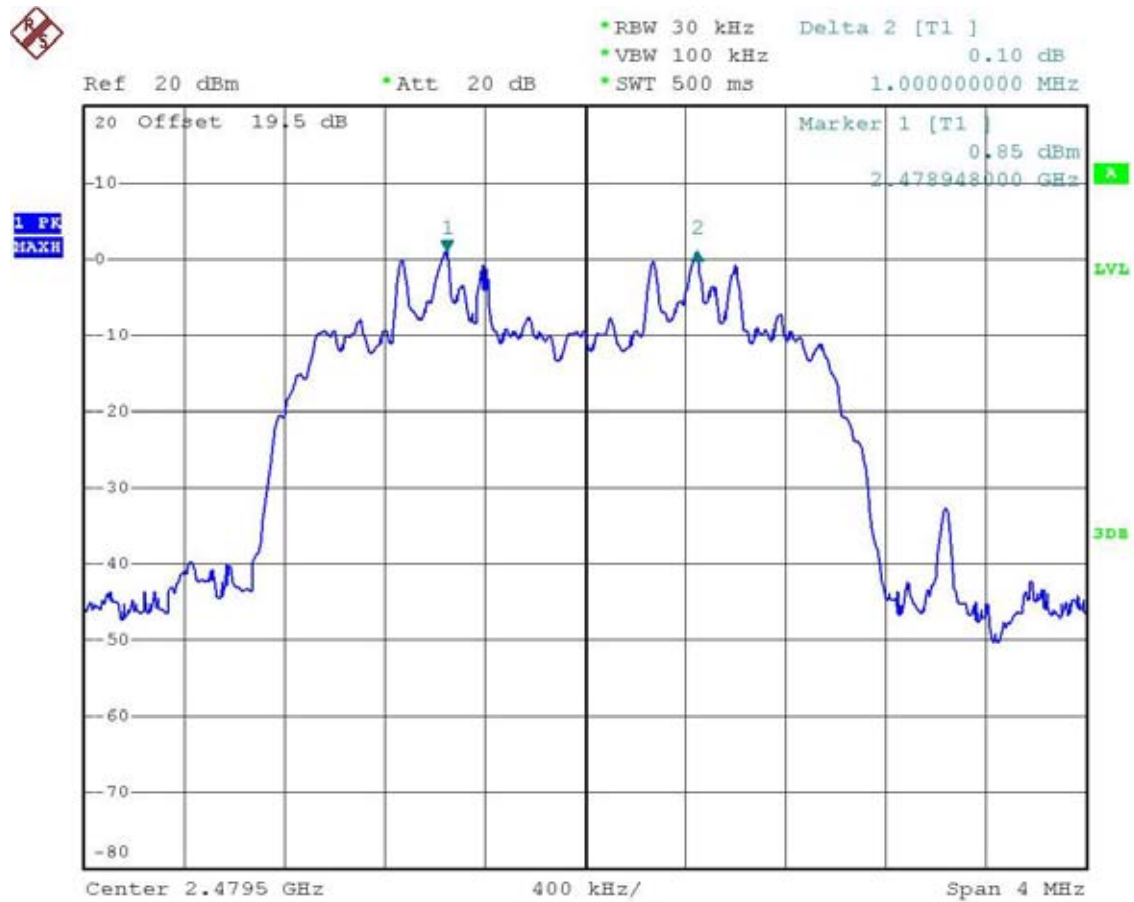
Mode 5



2nd comment ...

Date: 24.JUN.2008 20:40:19

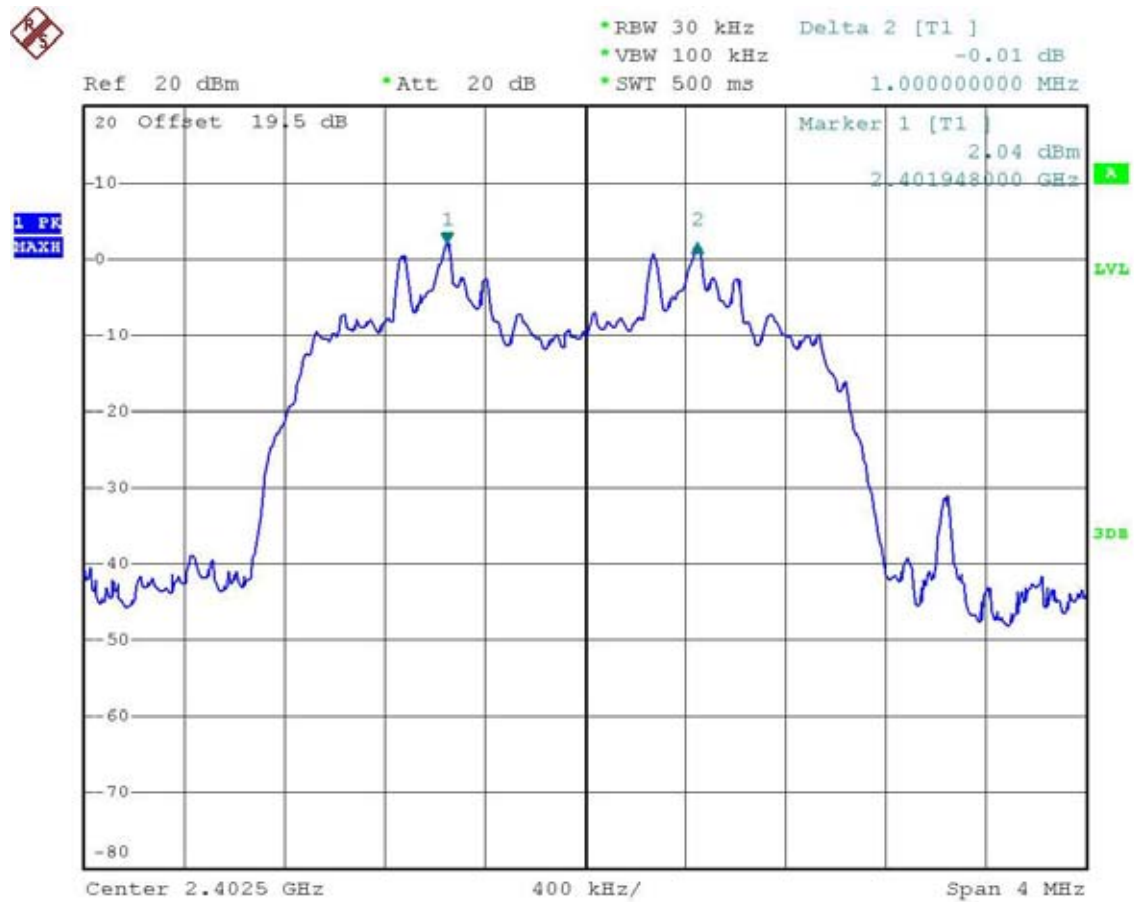
Mode 6



2nd comment ...

Date: 24.JUN.2008 20:40:52

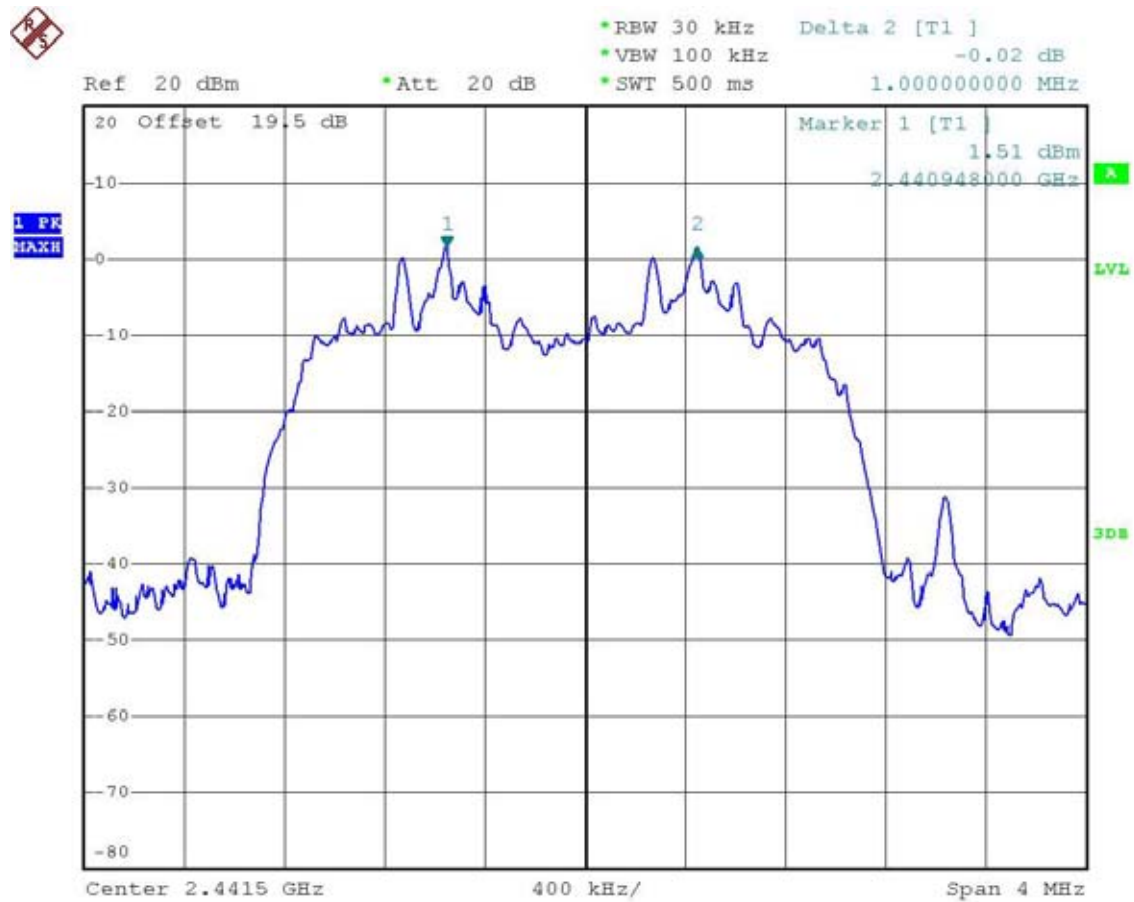
Mode 7



2nd comment ...

Date: 24.JUN.2008 20:41:36

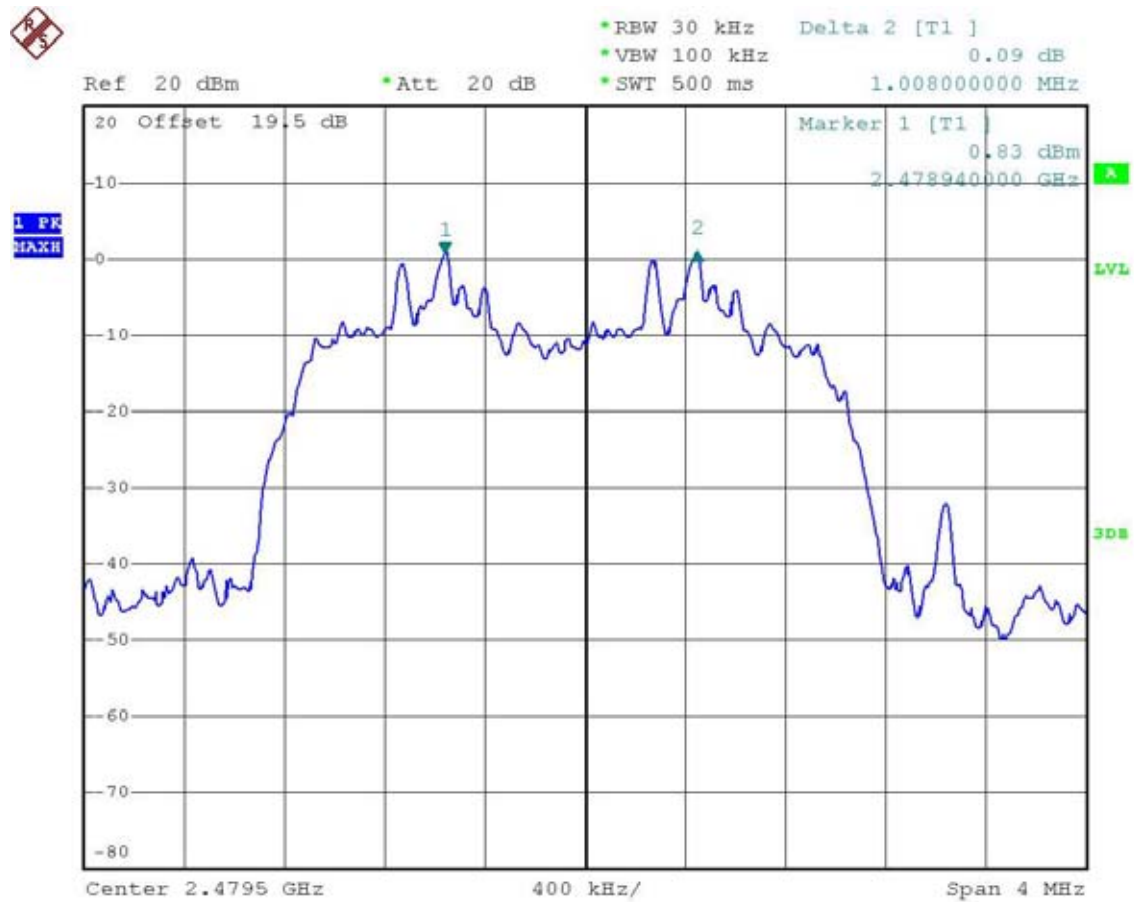
Mode 8



2nd comment ...

Date: 24.JUN.2008 20:42:43

Mode 9



2nd comment ...

Date: 24.JUN.2008 20:45:09

5.4 Number of Hopping Frequency

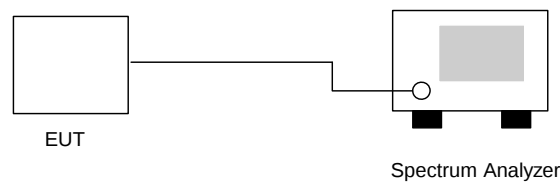
5.4.1 Measuring Instruments

As described in chapter 9 of this test report.

5.4.2 Test Procedure

- a. The output of EUT was connected to the spectrum analyzer by a low loss cable.
- b. Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.
- c. The number of hopping frequency used is defined as the device has the numbers of total channel.

5.4.3 Test Setup Layout



5.4.4 Test Result : See spectrum analyzer plots below

- Application Type : Bluetooth (1Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

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

- Application Type : Bluetooth EDR(2Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

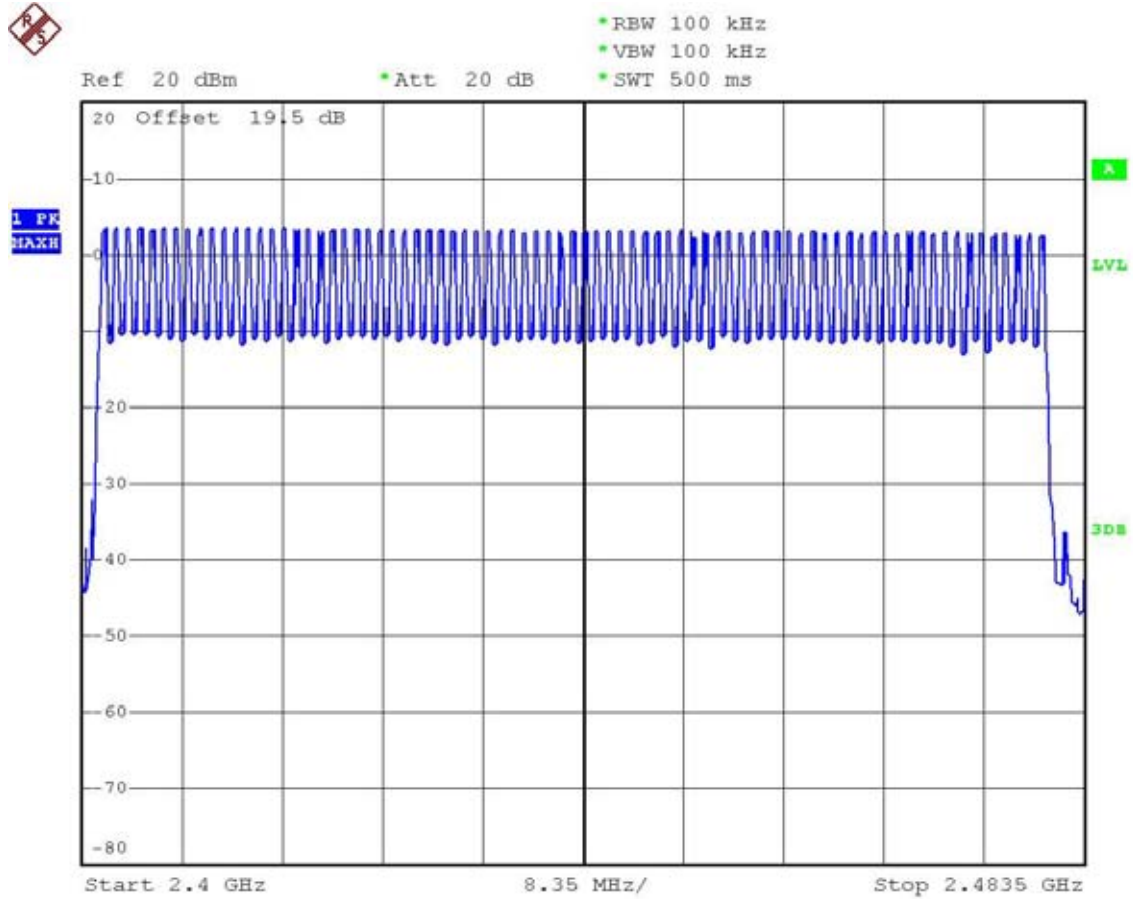
Number of Hopping Frequency (Channel)	Limits (Channel)
79	15

- Application Type : Bluetooth EDR(3Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

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

5.4.5 Number of Hopping Frequency

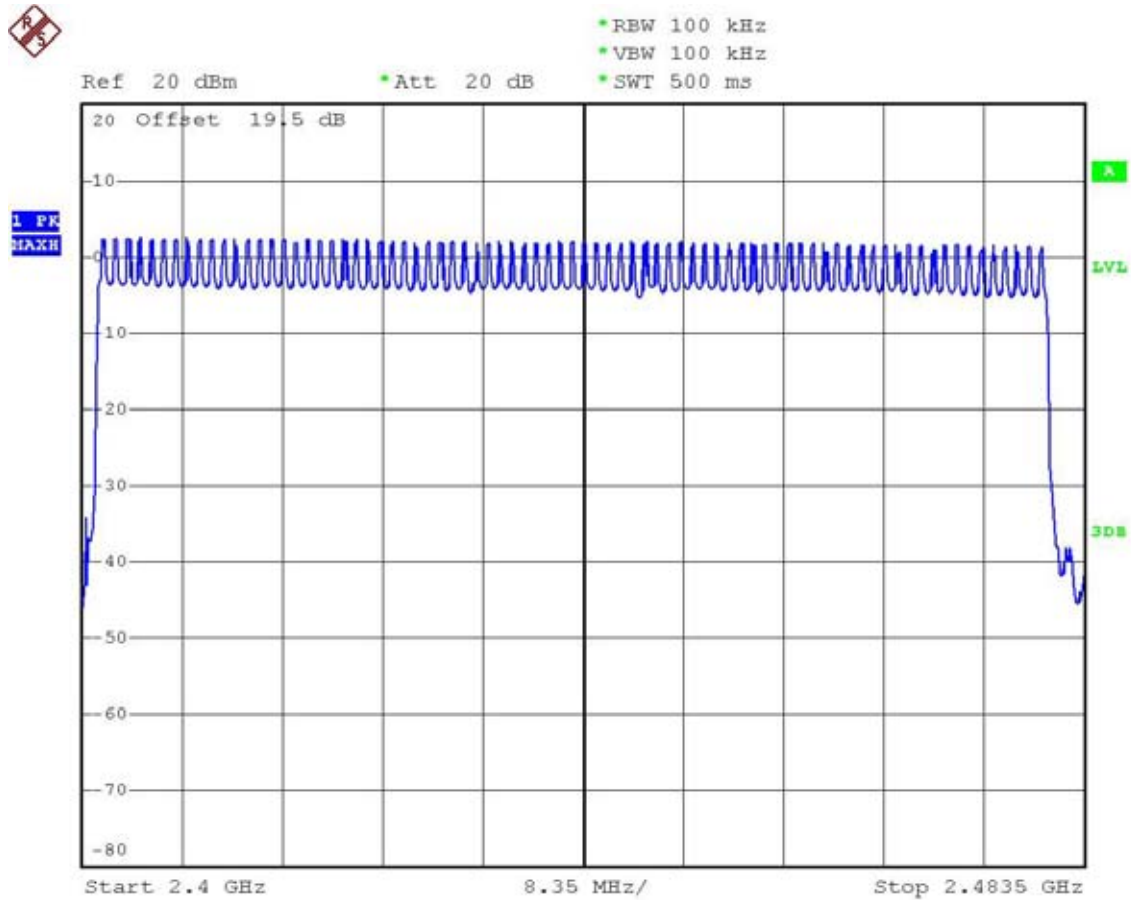
Bluetooth (1Mbps)



2nd comment ...

Date: 24.JUN.2008 20:55:11

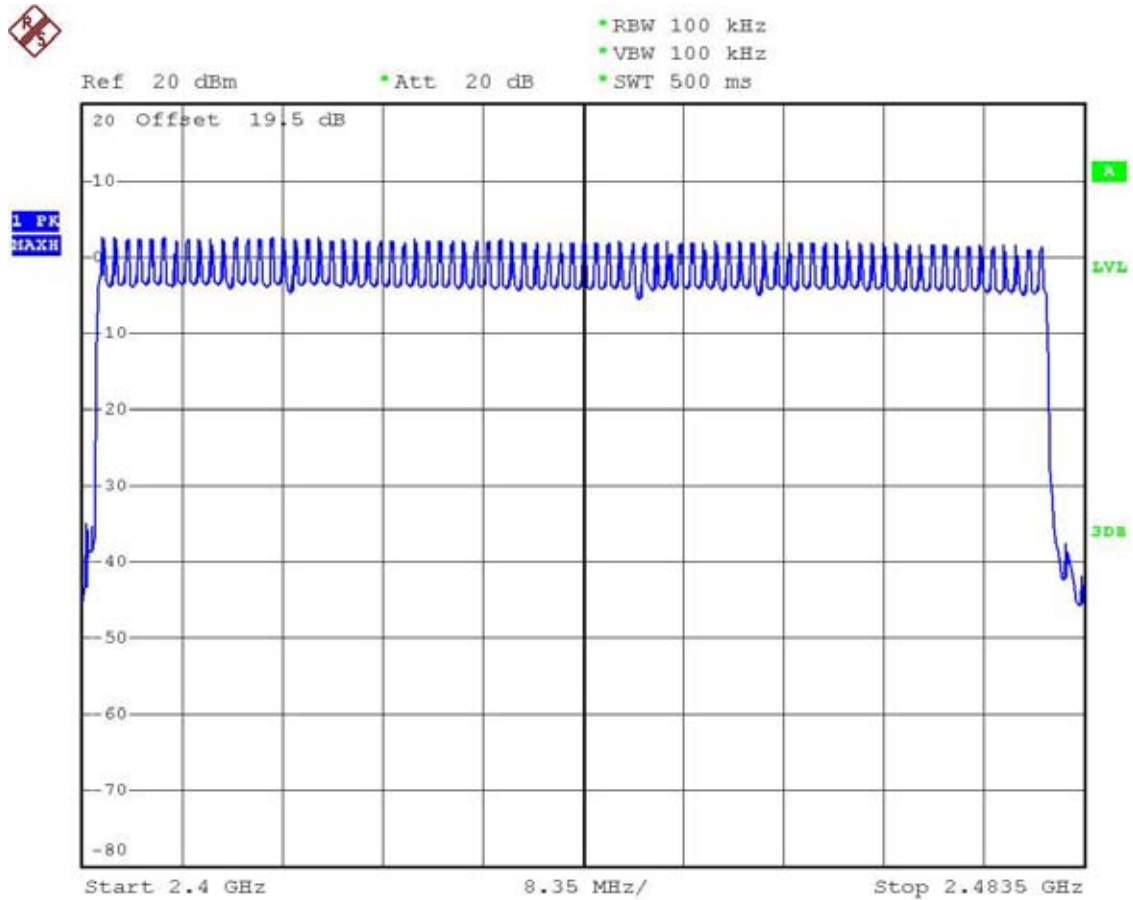
Bluetooth EDR(2Mbps)



2nd comment ...

Date: 24.JUN.2008 21:01:38

Bluetooth EDR(3Mbps)



2nd comment ...

Date: 24.JUN.2008 21:07:02

5.5 Hopping Channel Bandwidth

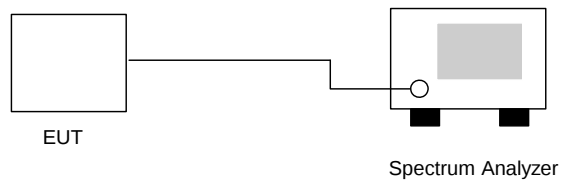
5.5.1 Measuring Instruments

As described in chapter 9 of this test report.

5.5.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer by a low loss cable.
- Set RBW of spectrum analyzer to 30 KHz and VBW to 300 KHz.
- The Hopping Channel bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

5.5.3 Test Setup Layout



5.5.4 Test Result : See spectrum analyzer plots below

- Application Type : Bluetooth (1Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	0.900	Mode 1
39	2441	0.897	Mode 2
78	2480	0.900	Mode 3

- Application Type : Bluetooth EDR(2Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

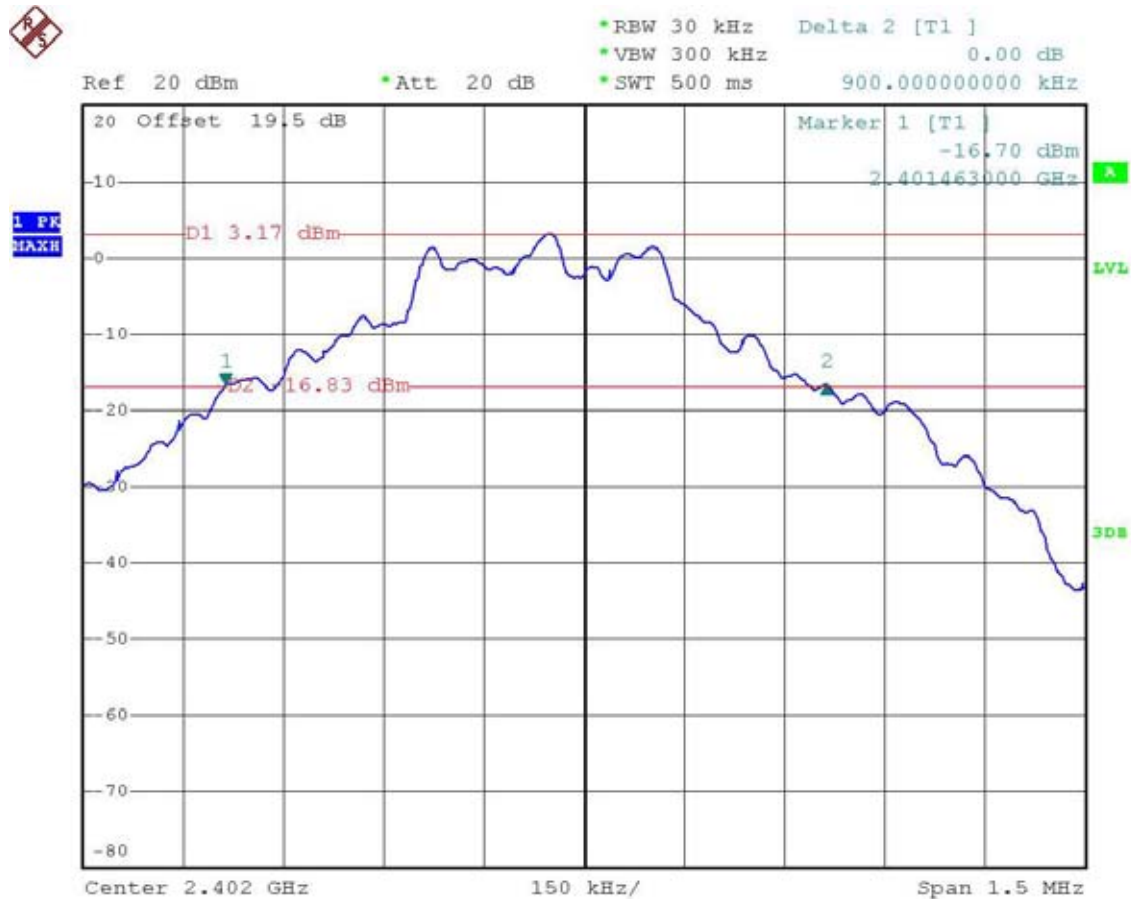
Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	1.216	Mode 4
39	2441	1.216	Mode 5
78	2480	1.212	Mode 6

- Application Type : Bluetooth EDR(3Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	1.212	Mode 7
39	2441	1.208	Mode 8
78	2480	1.216	Mode 9

5.5.5 Hopping Channel Bandwidth

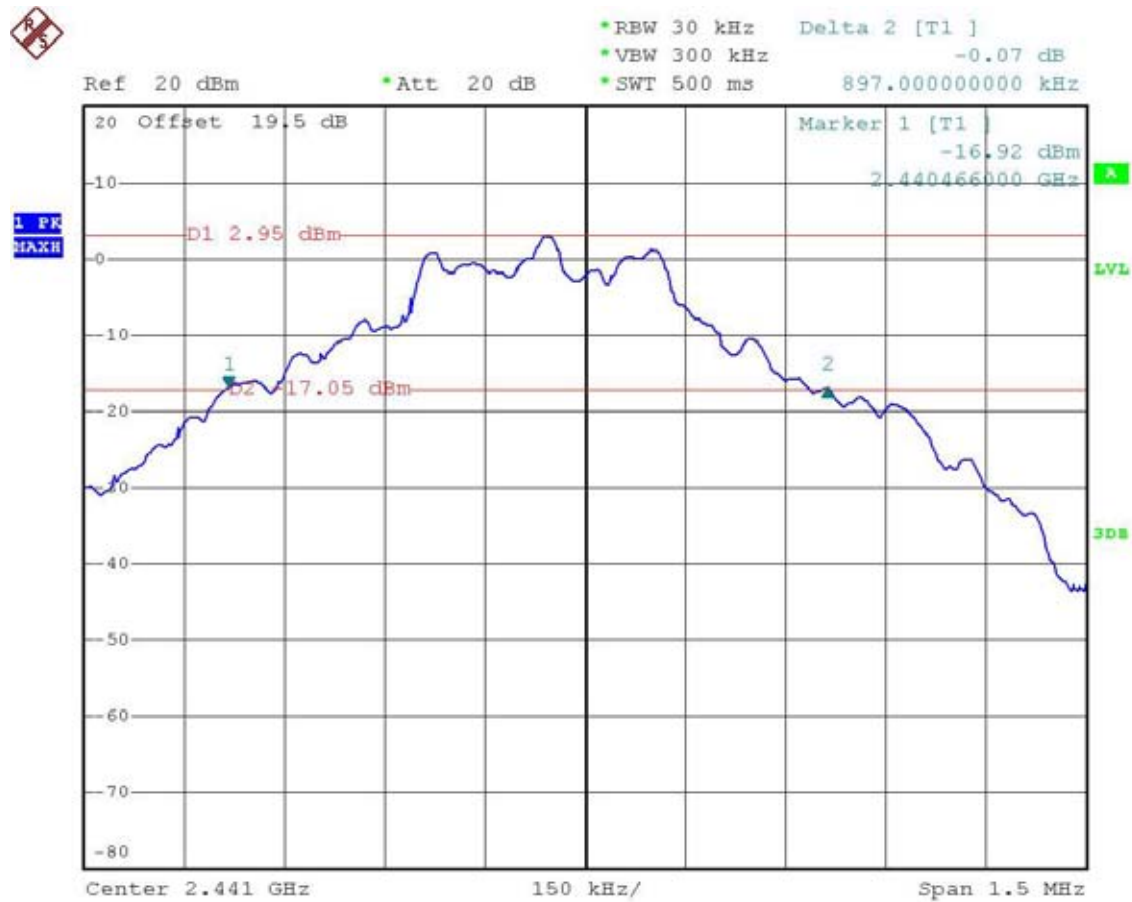
Mode 1



2nd comment ...

Date: 24.JUN.2008 20:06:15

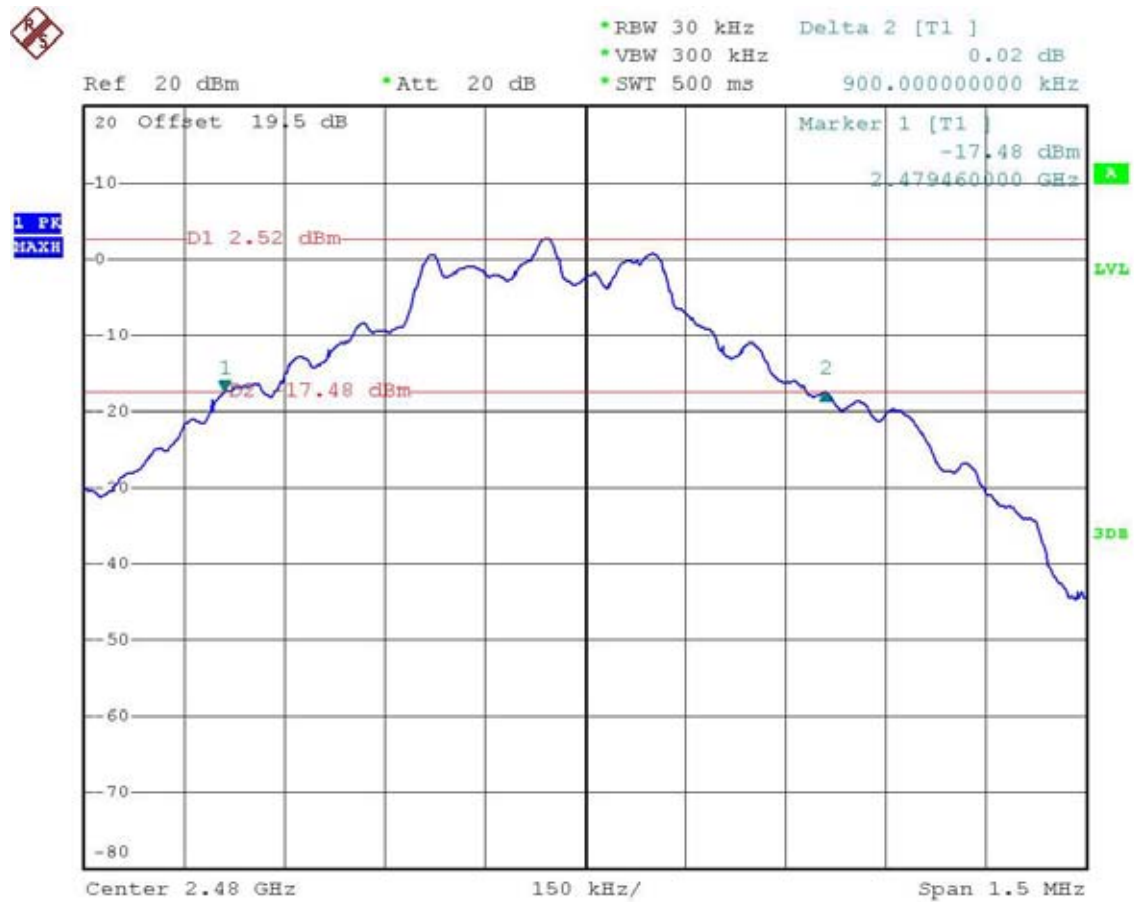
Mode 2



2nd comment ...

Date: 24.JUN.2008 20:08:07

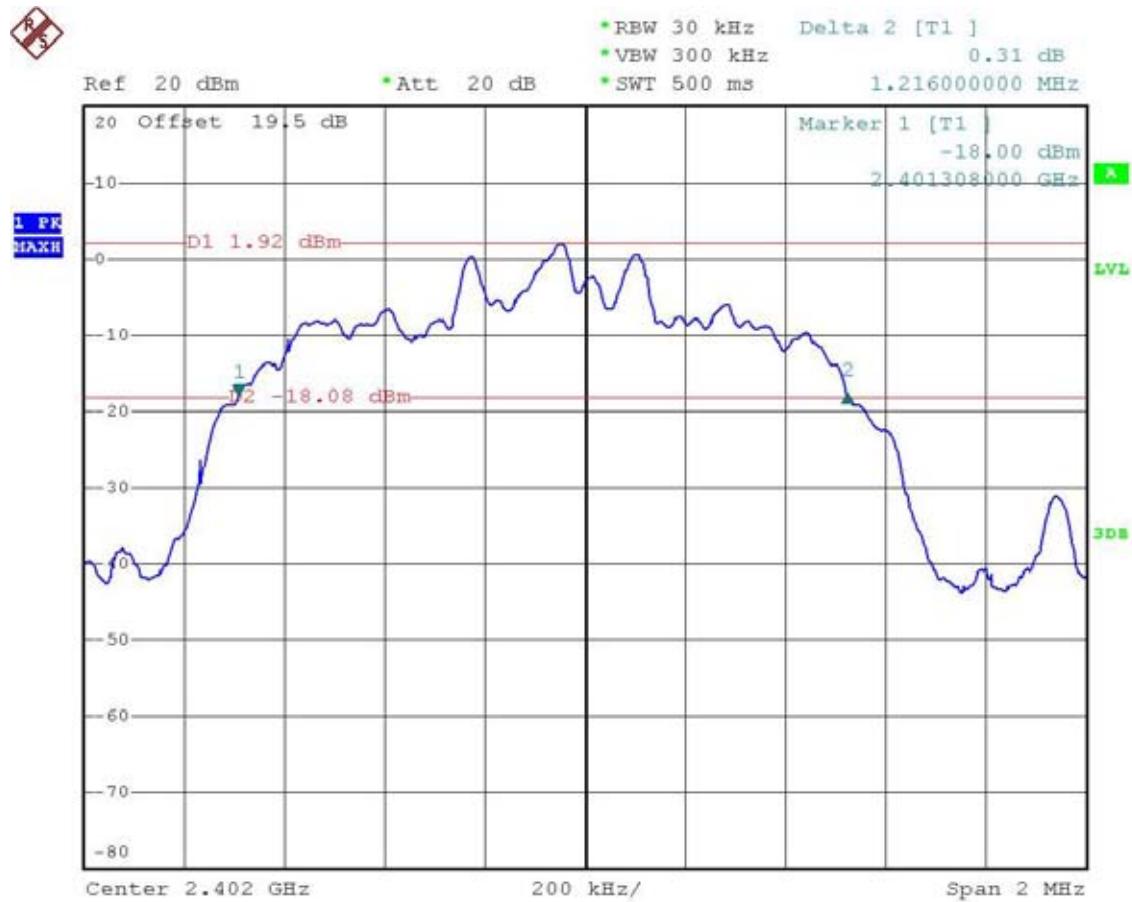
Mode 3



2nd comment ...

Date: 24.JUN.2008 20:09:16

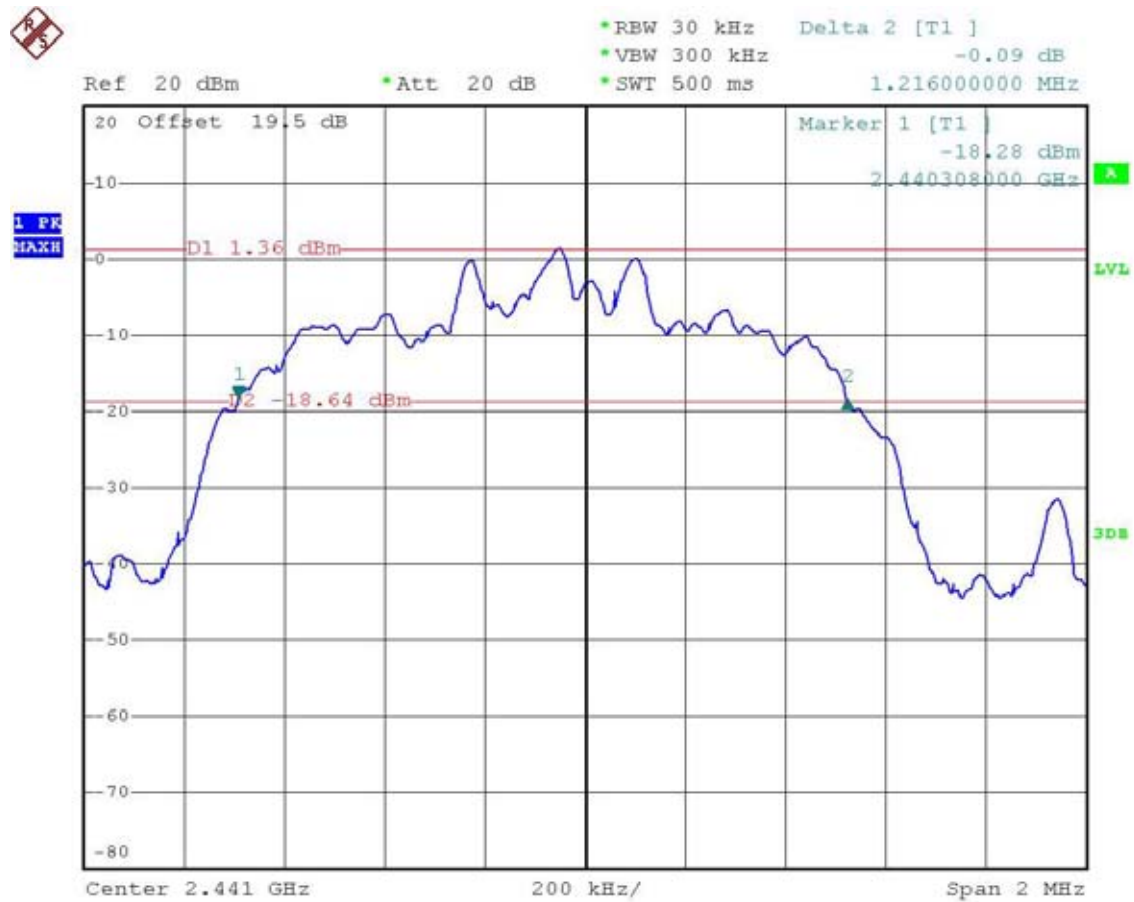
Mode 4



2nd comment ...

Date: 24.JUN.2008 20:11:03

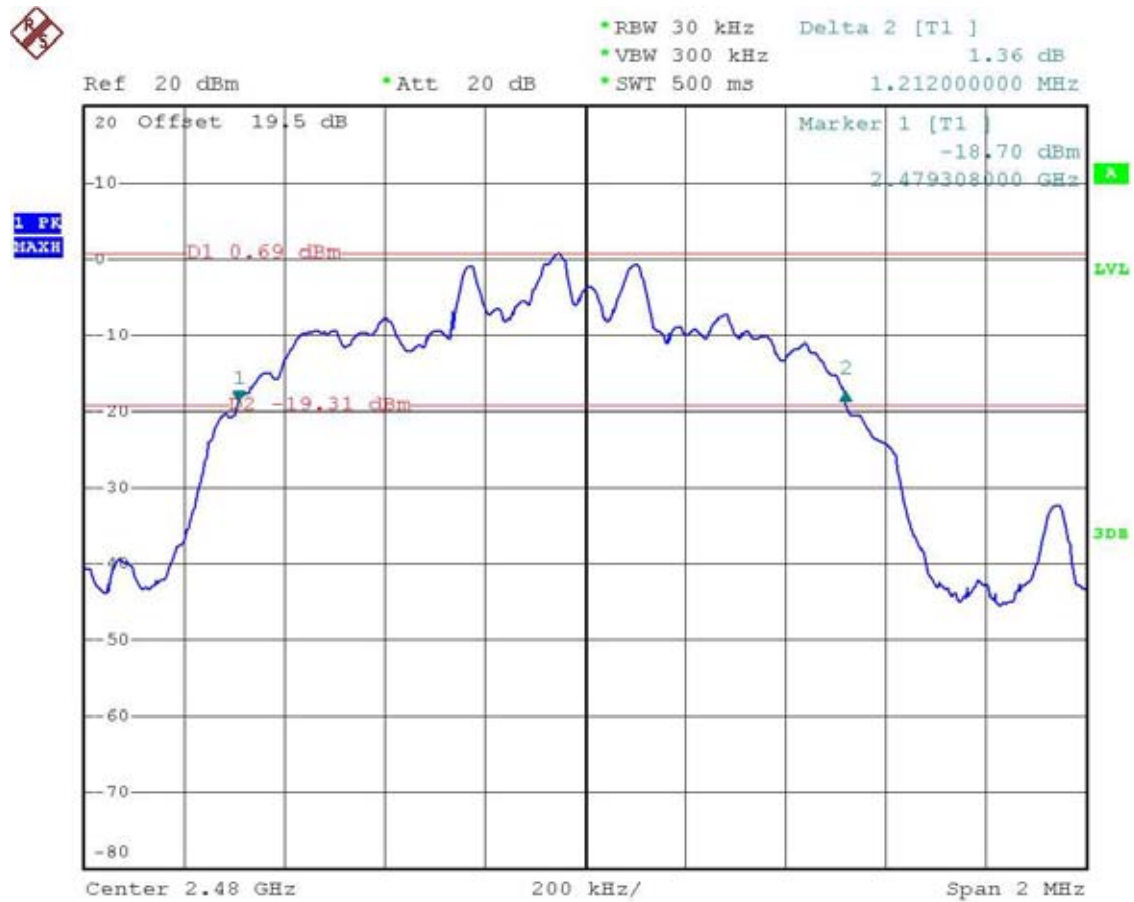
Mode 5



2nd comment ...

Date: 24.JUN.2008 20:12:07

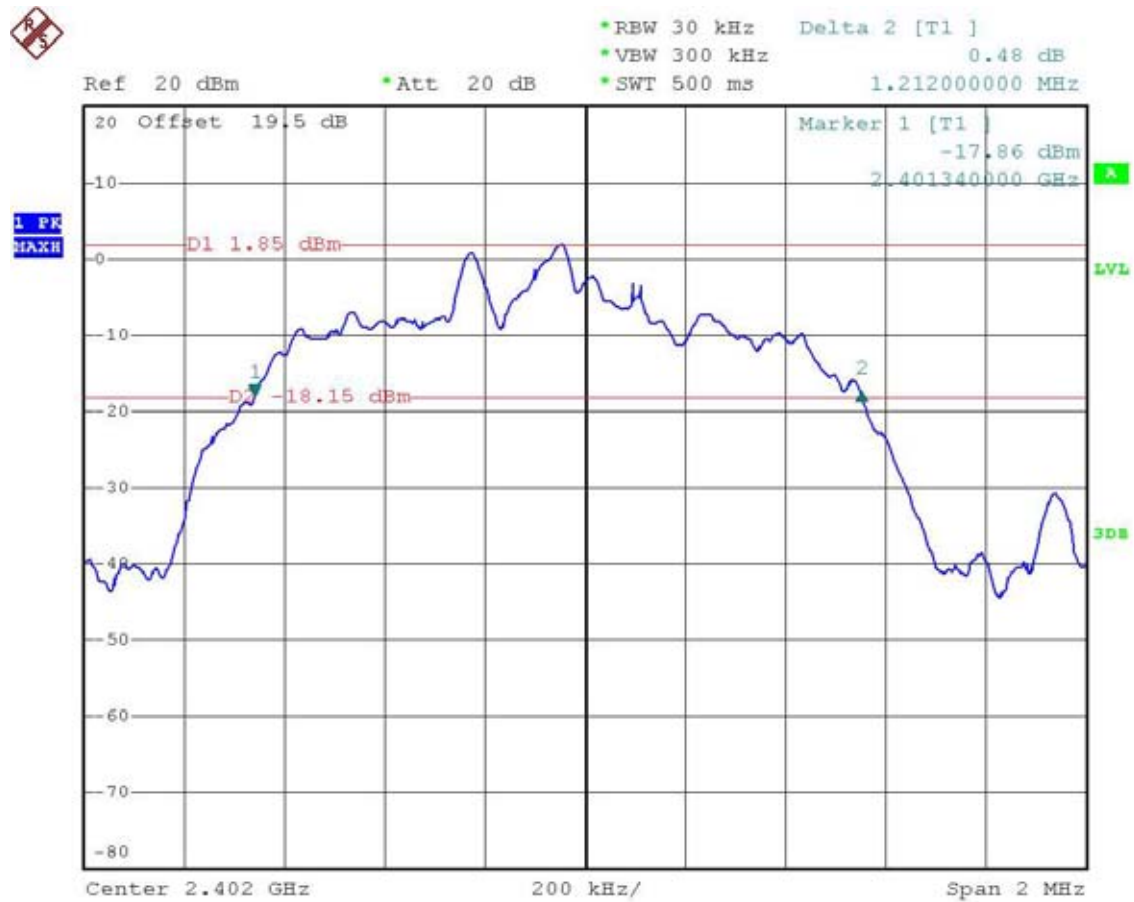
Mode 6



2nd comment ...

Date: 24.JUN.2008 20:13:25

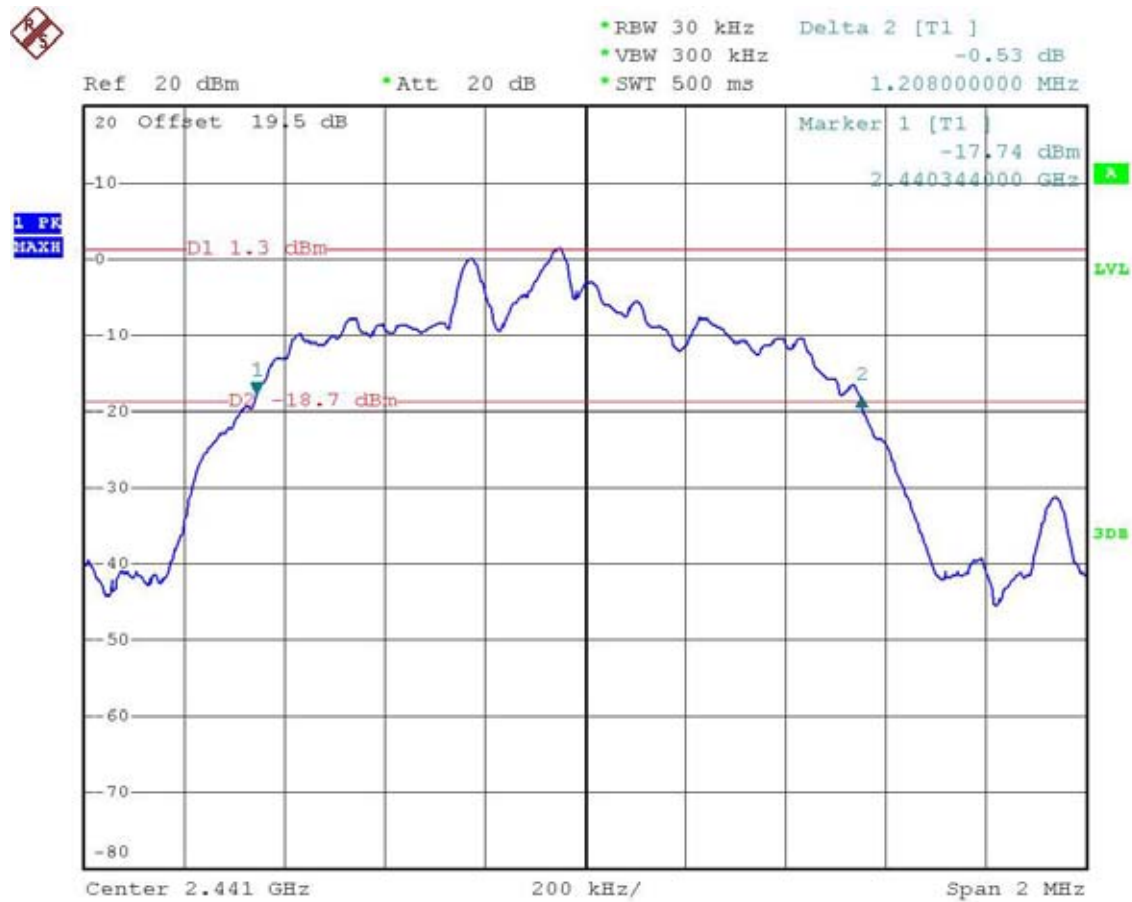
Mode 7



2nd comment ...

Date: 24.JUN.2008 20:15:08

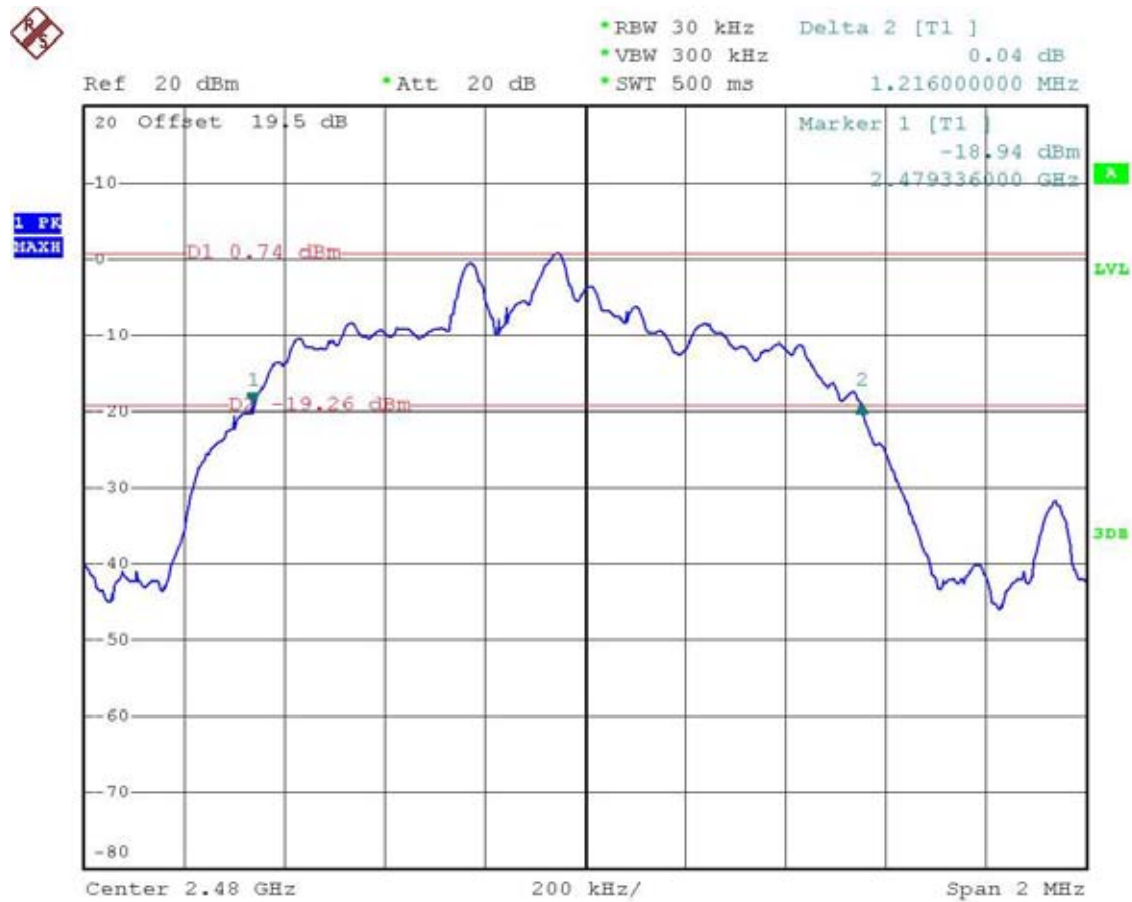
Mode 8



2nd comment ...

Date: 24.JUN.2008 20:19:27

Mode 9



2nd comment ...

Date: 24.JUN.2008 20:20:56

5.6 Dwell Time of Each Frequency

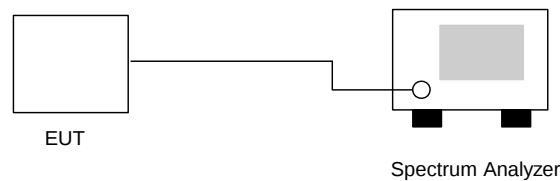
5.6.1 Measuring Instruments

As described in chapter 9 of this test report.

5.6.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer by a low loss cable.
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- The calculate $= 79 * 0.4 * (1600/79) * t$ (t = the time duration of one single pulse)

5.6.3 Test Setup Layout



5.6.4 Test Result : See spectrum analyzer plots below

- Application Type : Bluetooth (1Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	9	532	0.151	0.4
DH3	4.6	1792	0.260	0.4
DH5	3.8	3112	0.374	0.4

- Application Type : Bluetooth EDR(2Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.9	556	0.156	0.4
DH3	5	1826	0.289	0.4
DH5	3.8	3106	0.373	0.4

- Application Type : Bluetooth EDR(3Mbps)
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

CH39

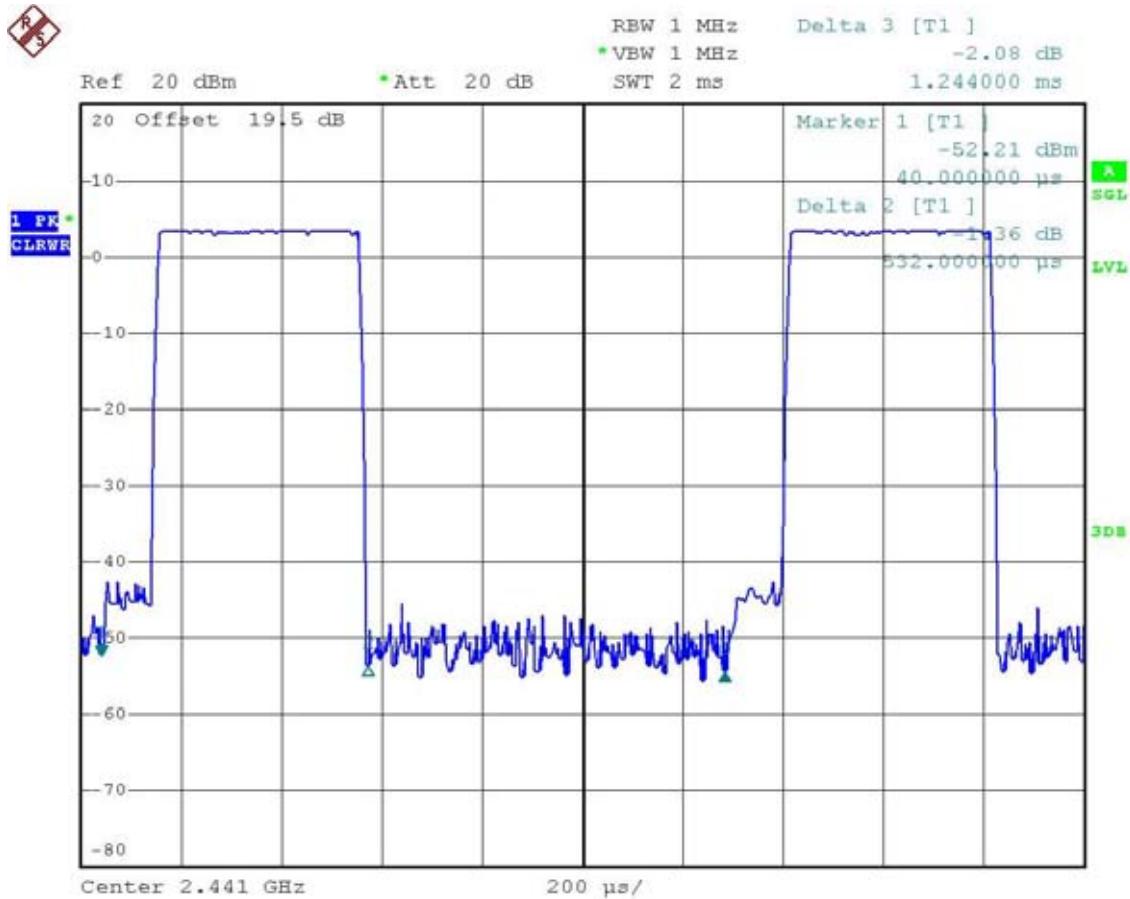
Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.9	544	0.153	0.4
DH3	4.8	1794	0.272	0.4
DH5	2.9	3114	0.285	0.4

Remark:

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

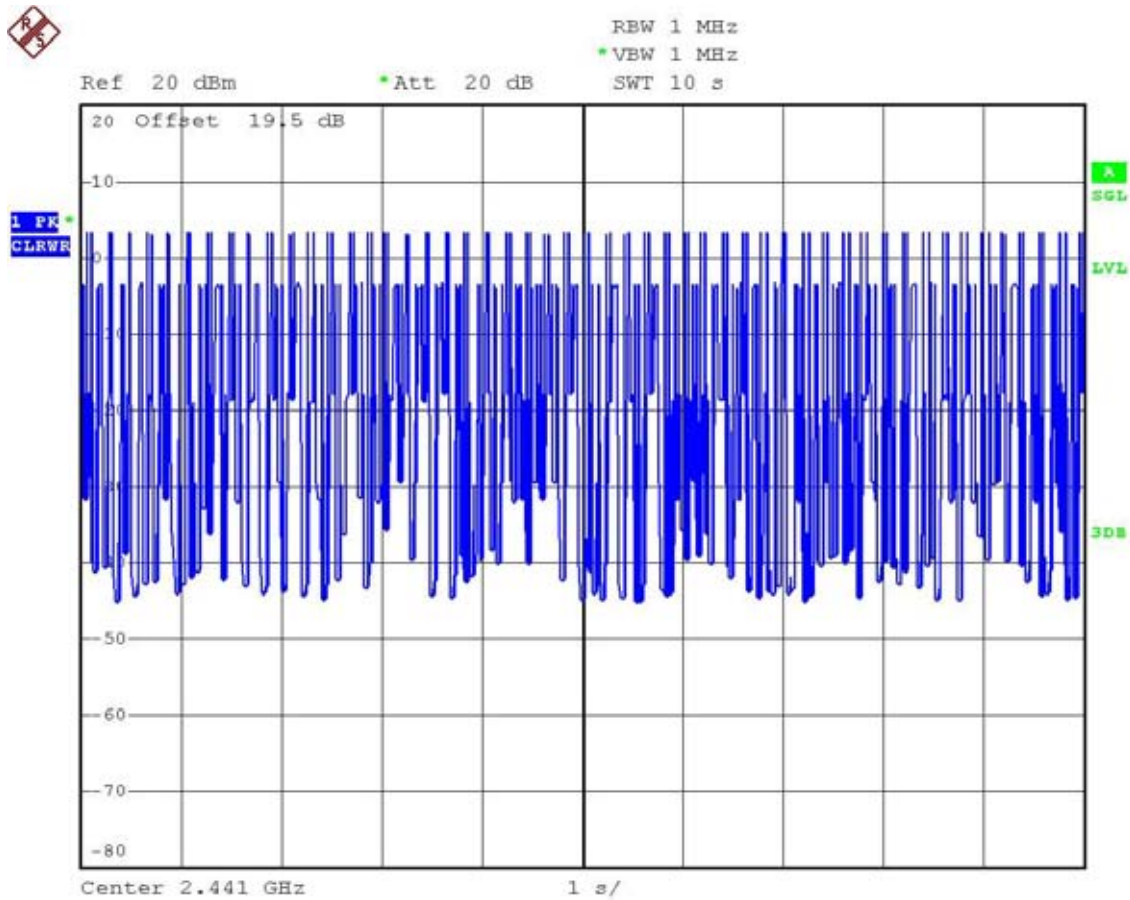
5.6.5 Dwell Time

DH1 (CH39)



2nd comment ...

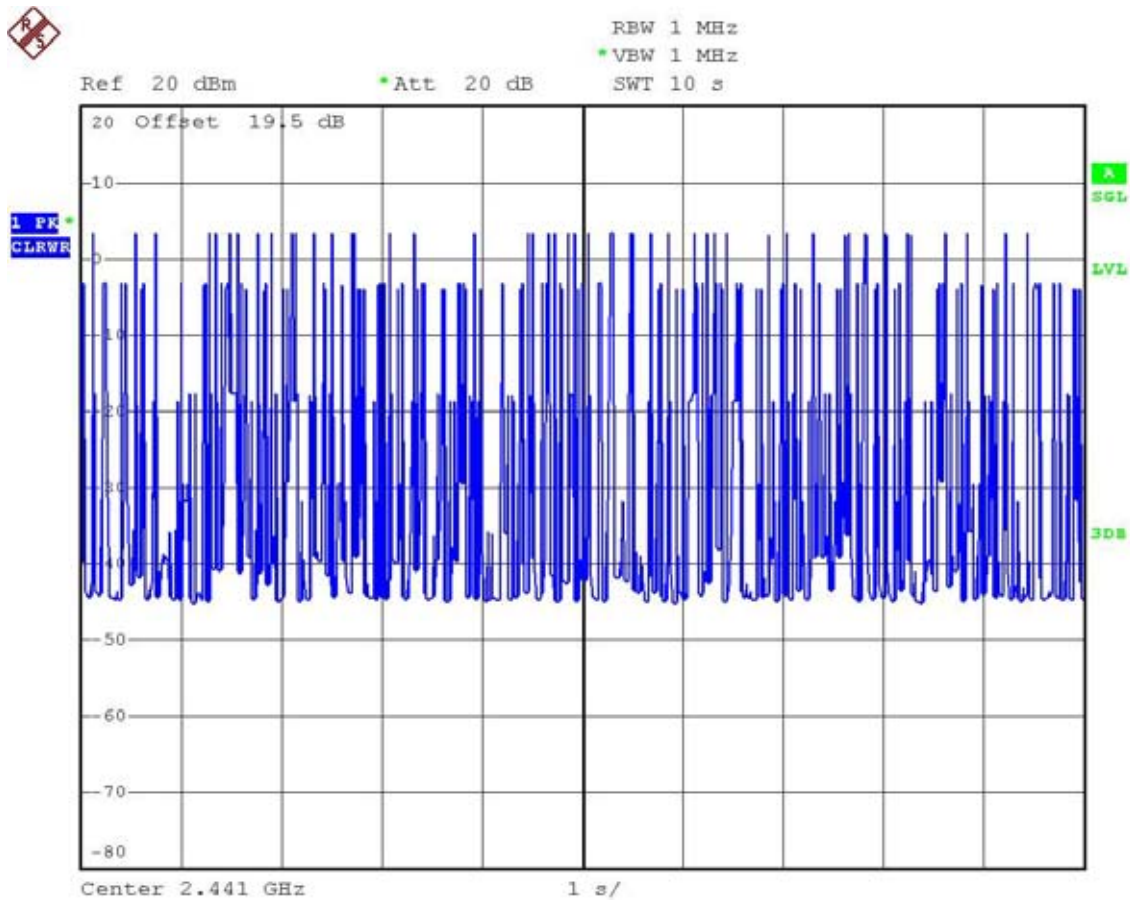
Date: 24.JUN.2008 12:40:10



2nd comment ...

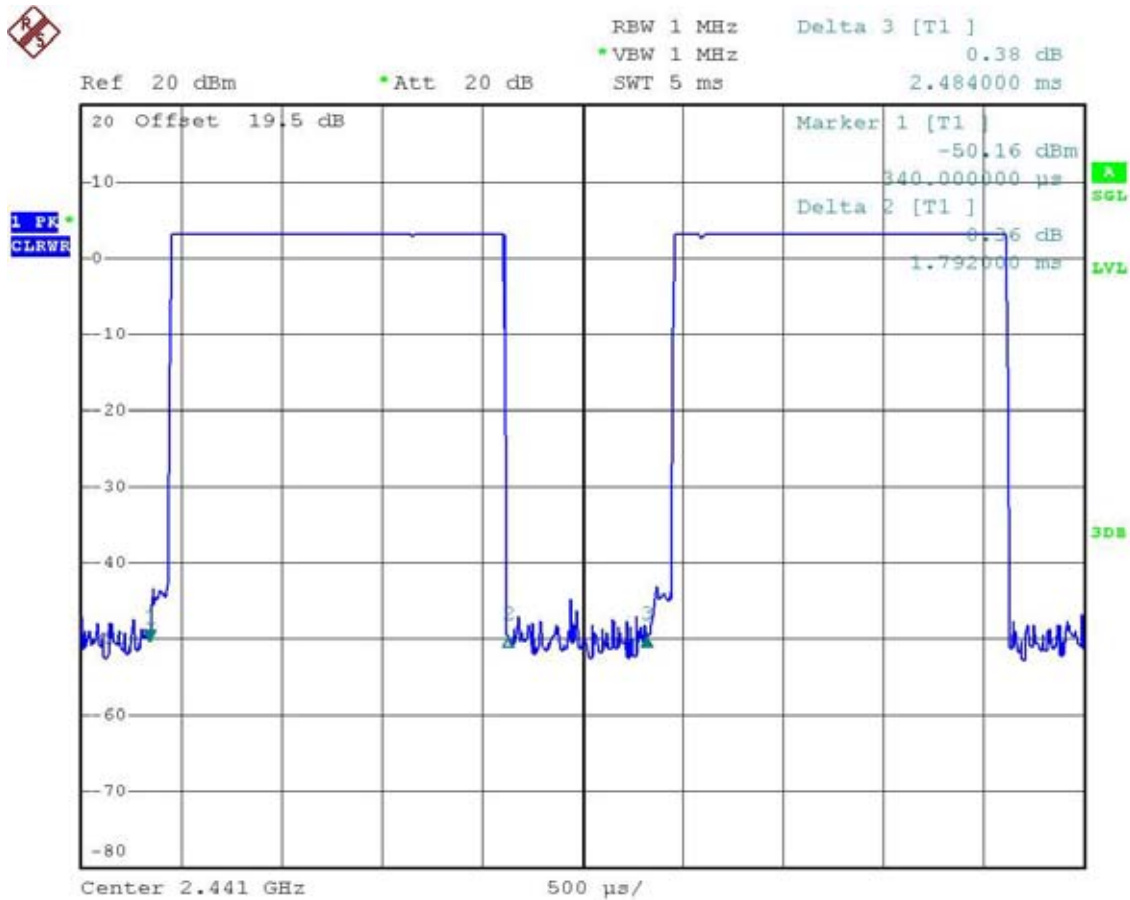
Date: 24.JUN.2008 12:42:16

DH3 (CH39)



2nd comment ...

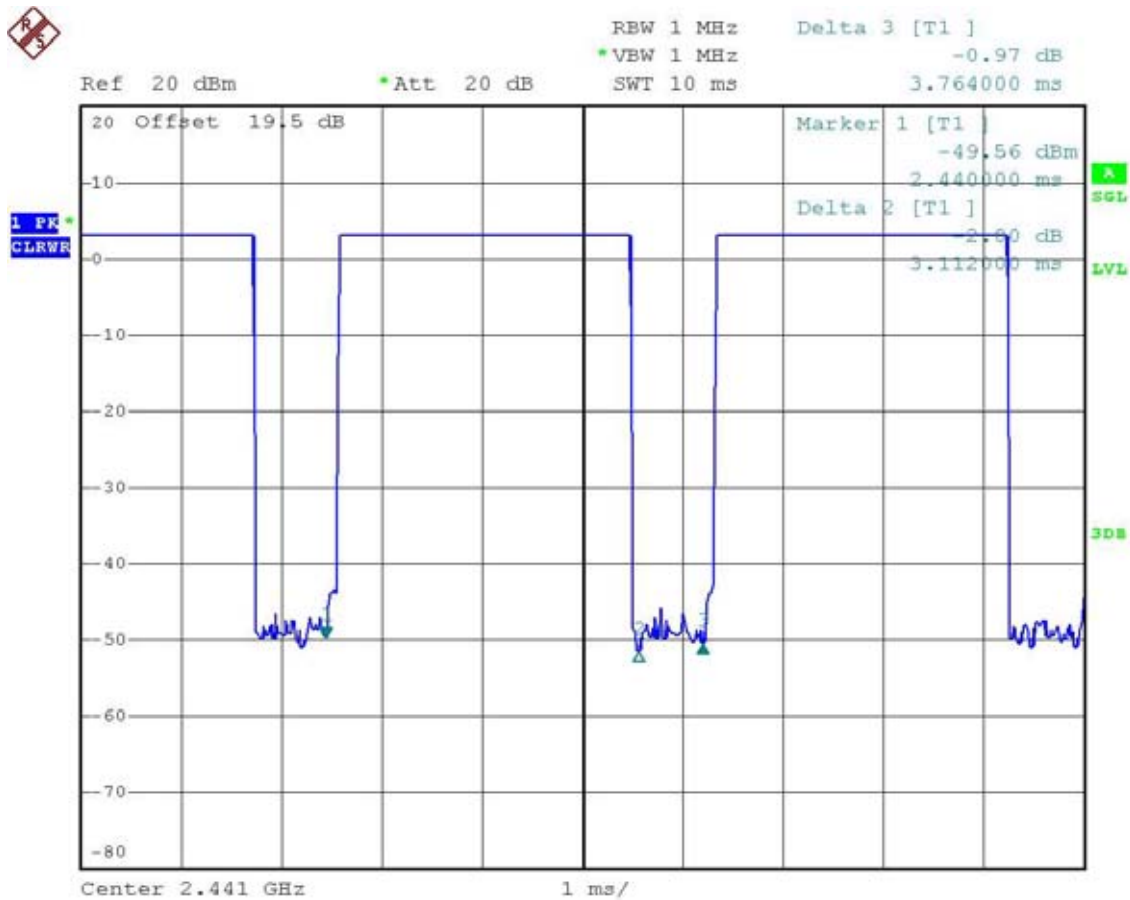
Date: 24.JUN.2008 12:42:39



2nd comment ...

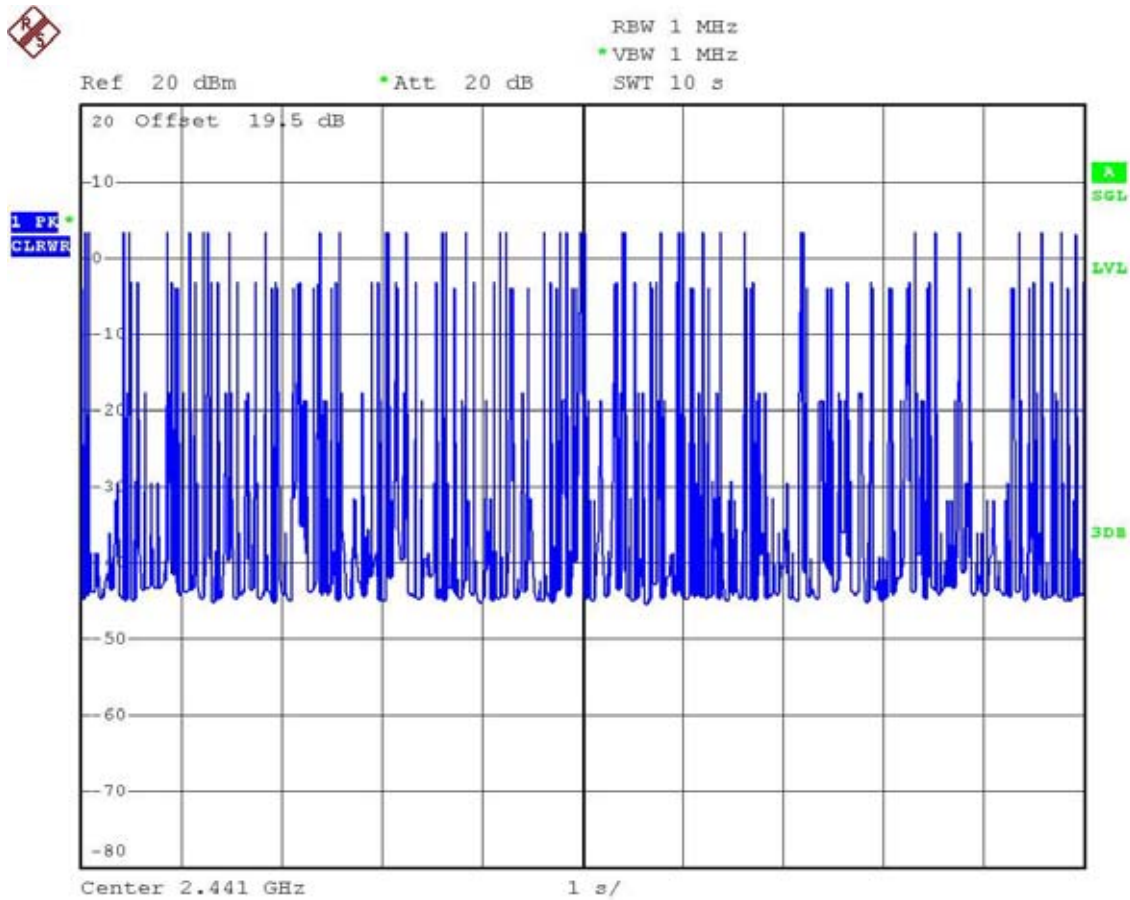
Date: 24.JUN.2008 12:40:55

DH5 (CH39)



2nd comment ...

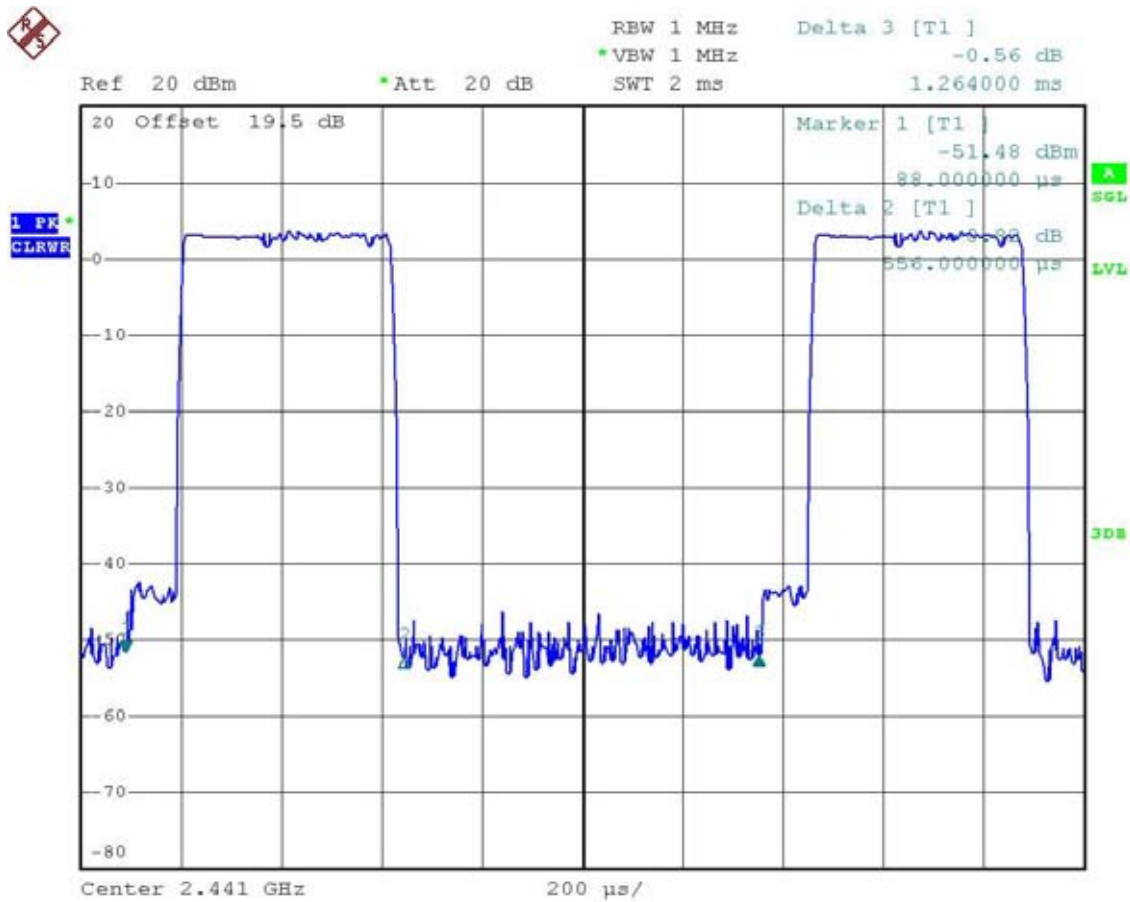
Date: 24.JUN.2008 12:41:41



2nd comment ...

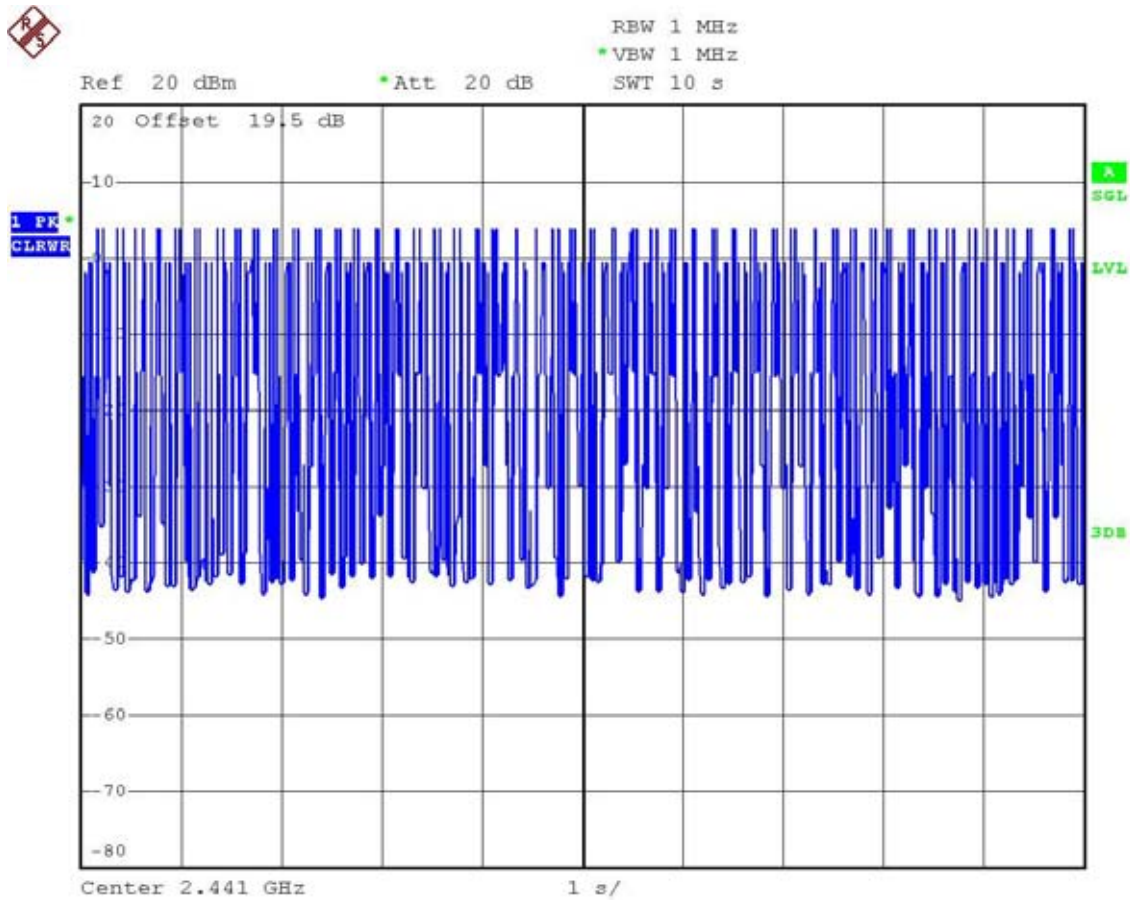
Date: 24.JUN.2008 12:43:02

2DH1 (CH39)



2nd comment ...

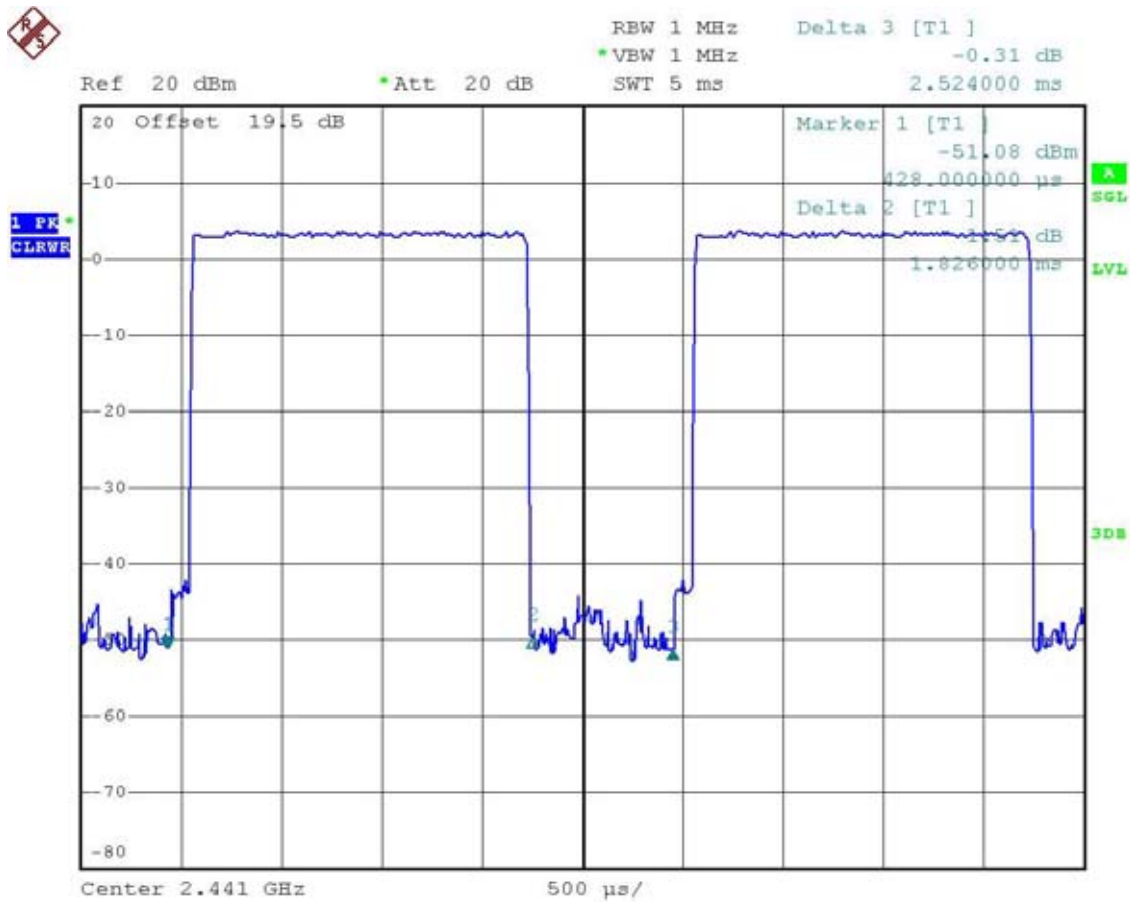
Date: 24.JUN.2008 12:44:03



2nd comment ...

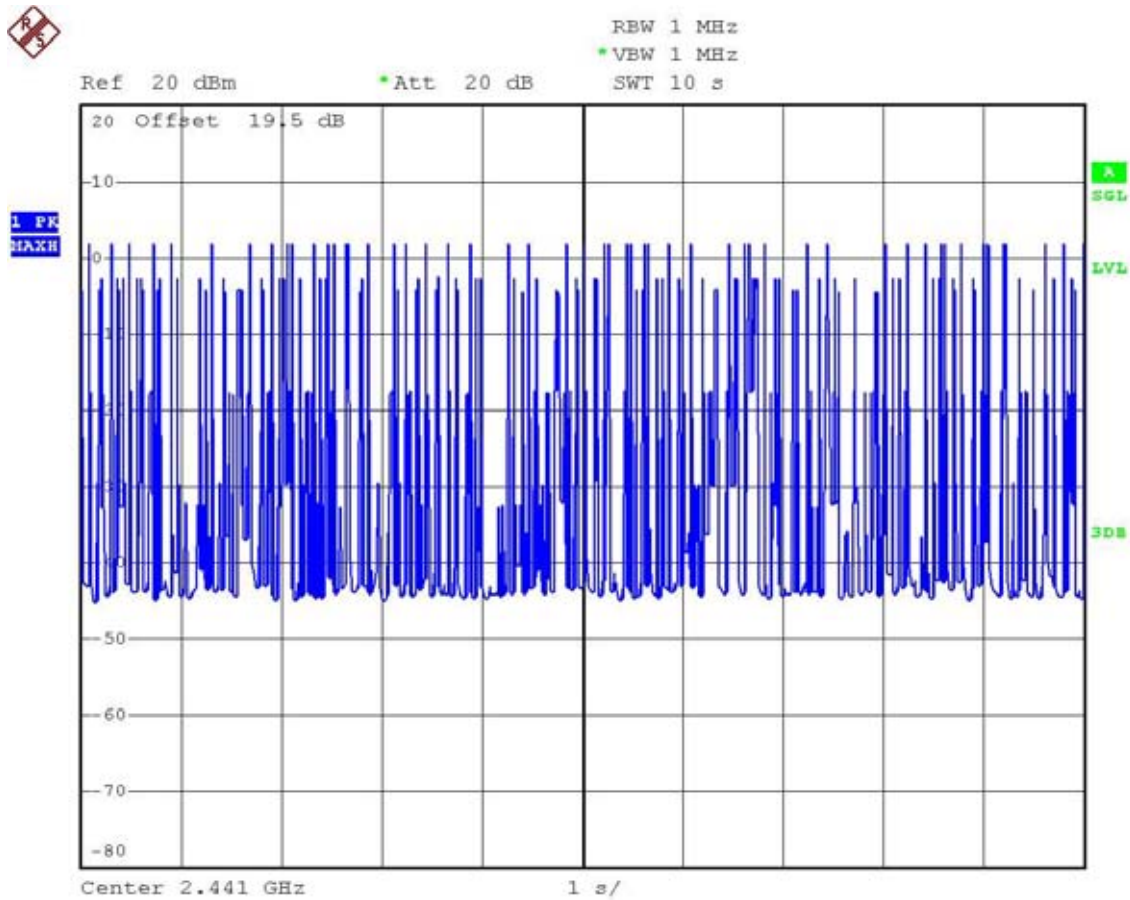
Date: 24.JUN.2008 12:50:15

2 DH3 (CH39)



2nd comment ...

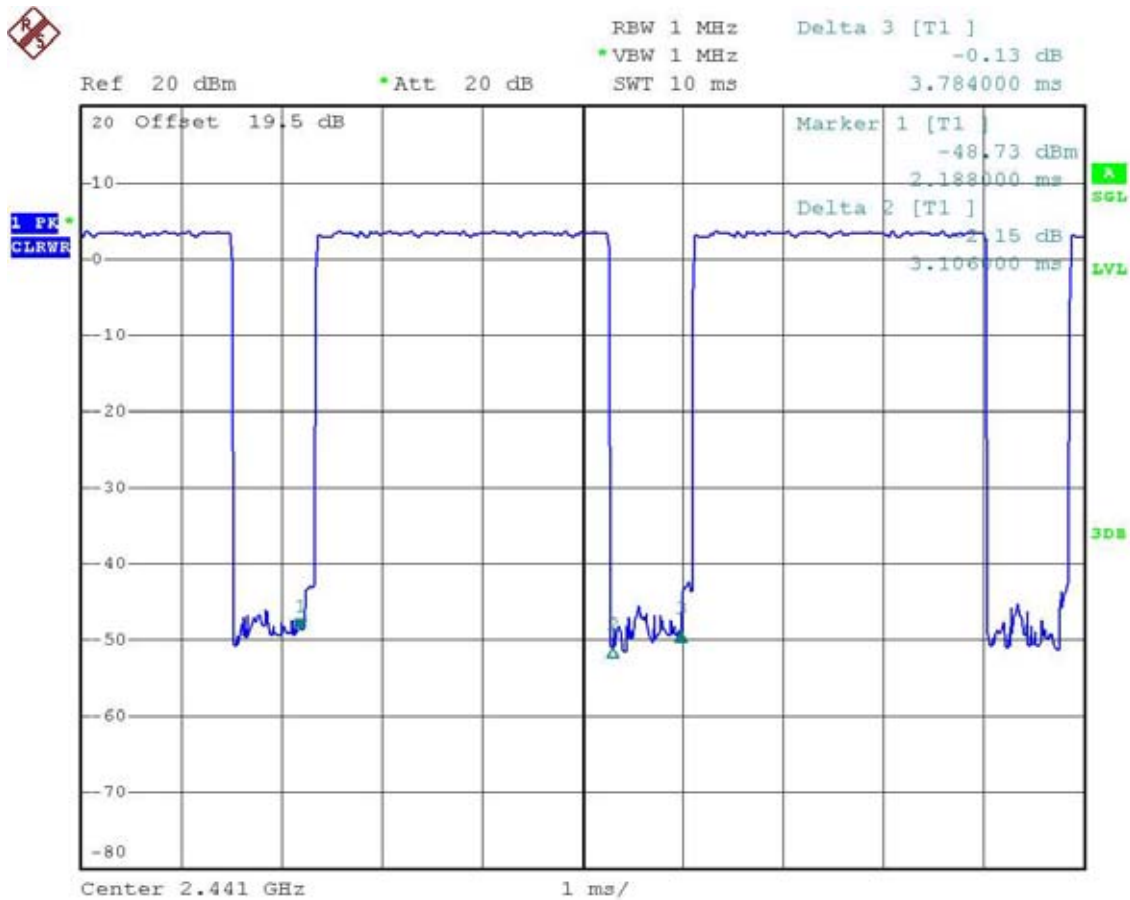
Date: 24.JUN.2008 12:45:47



2nd comment ...

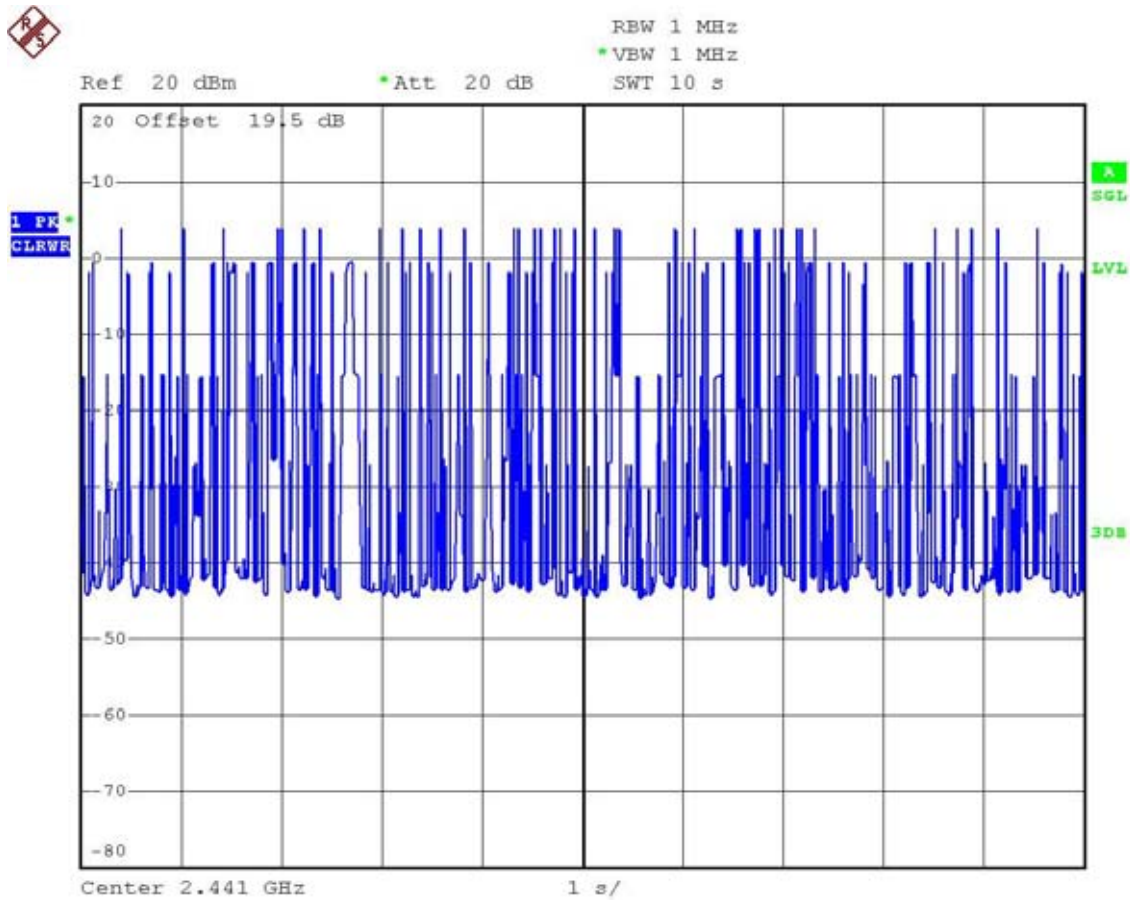
Date: 24.JUN.2008 21:13:44

2 DH5 (CH39)



2nd comment ...

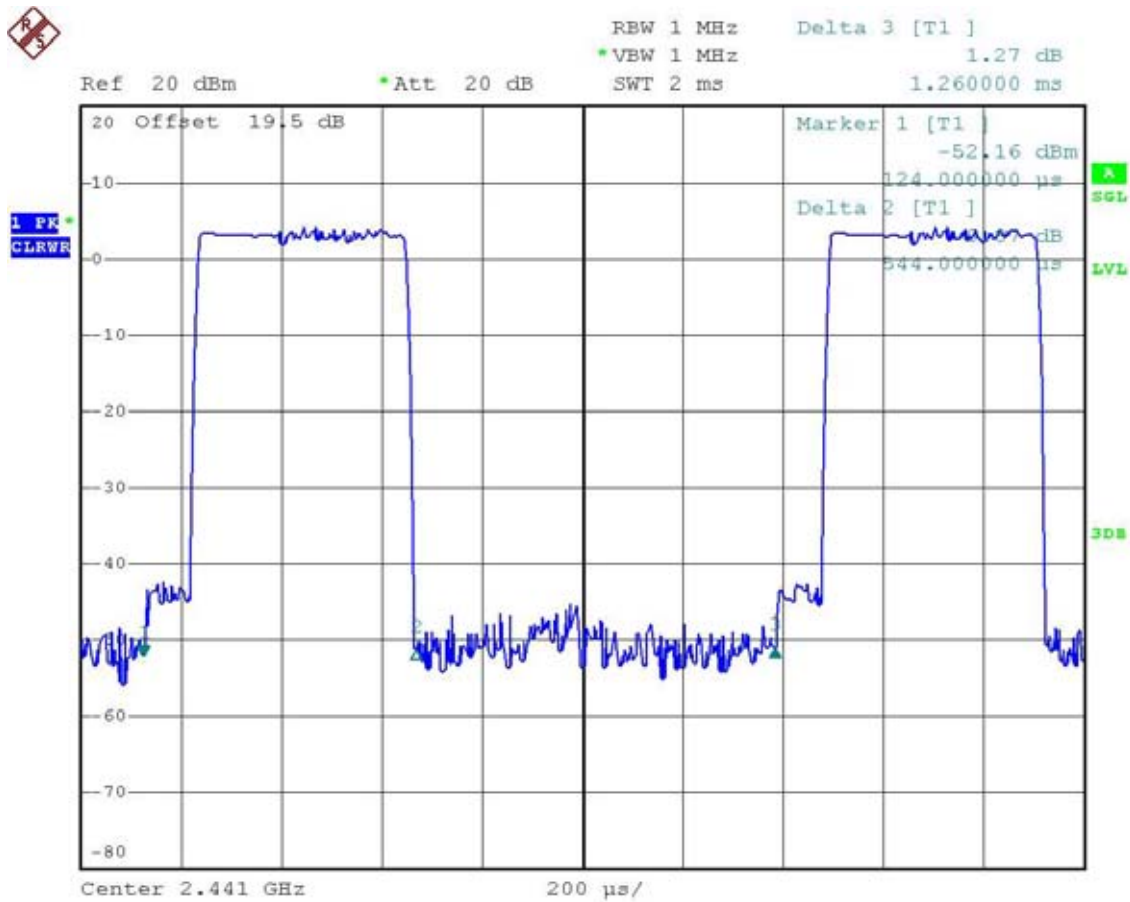
Date: 24.JUN.2008 12:46:32



2nd comment ...

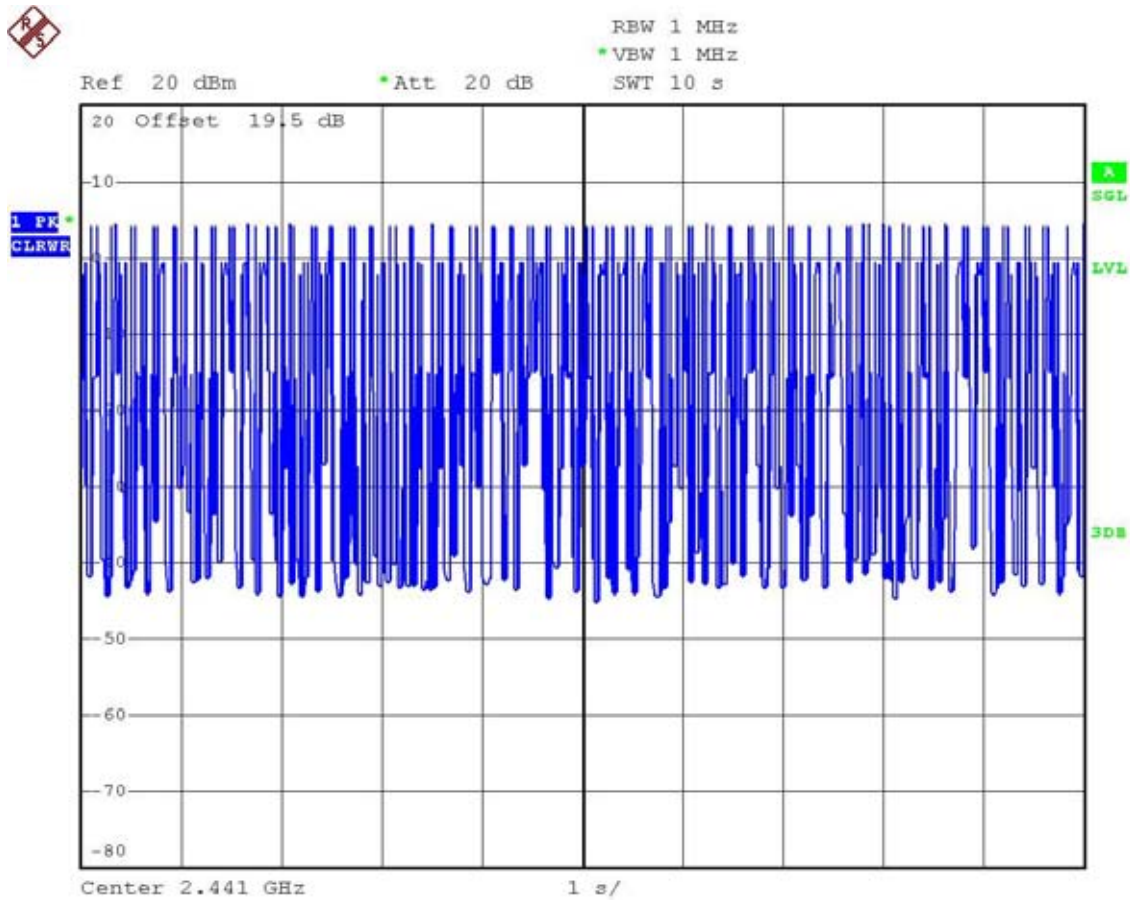
Date: 24.JUN.2008 12:51:09

3DH1 (CH39)



2nd comment ...

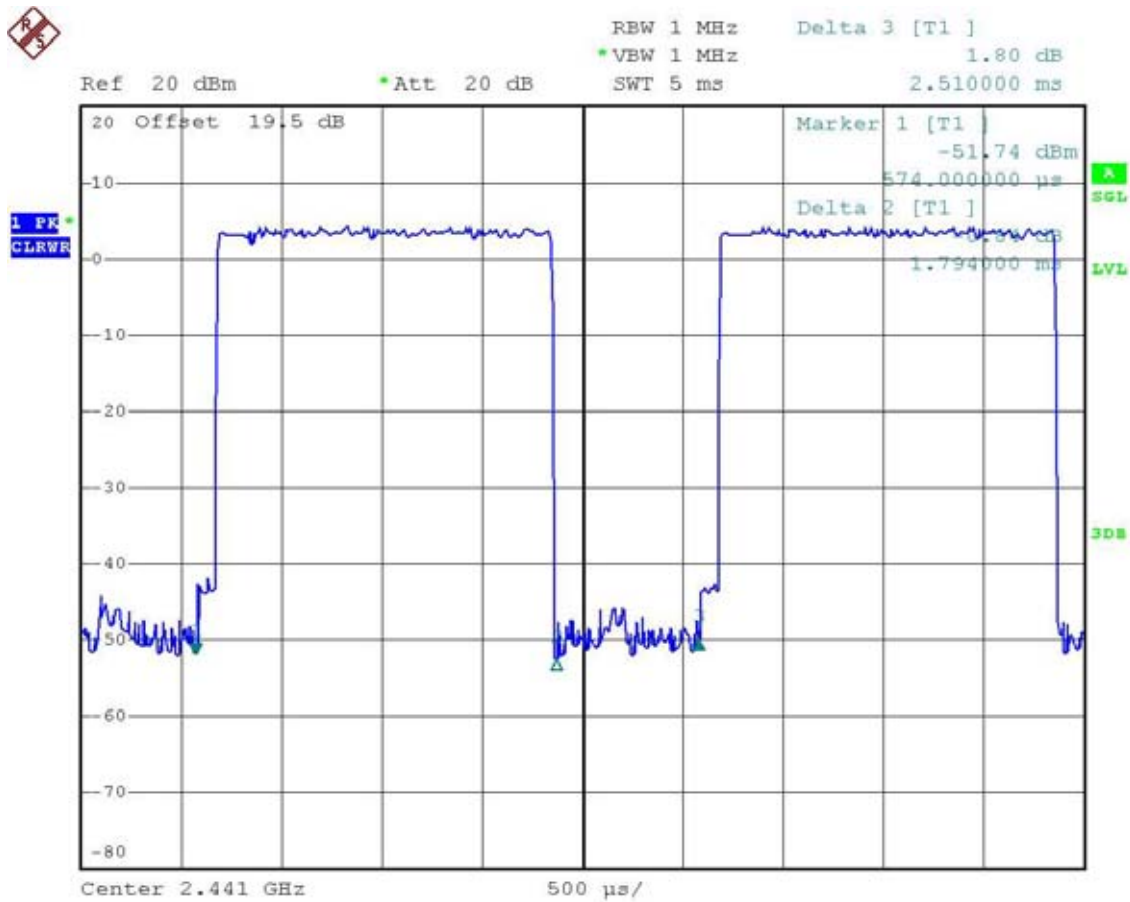
Date: 24.JUN.2008 12:47:24



2nd comment ...

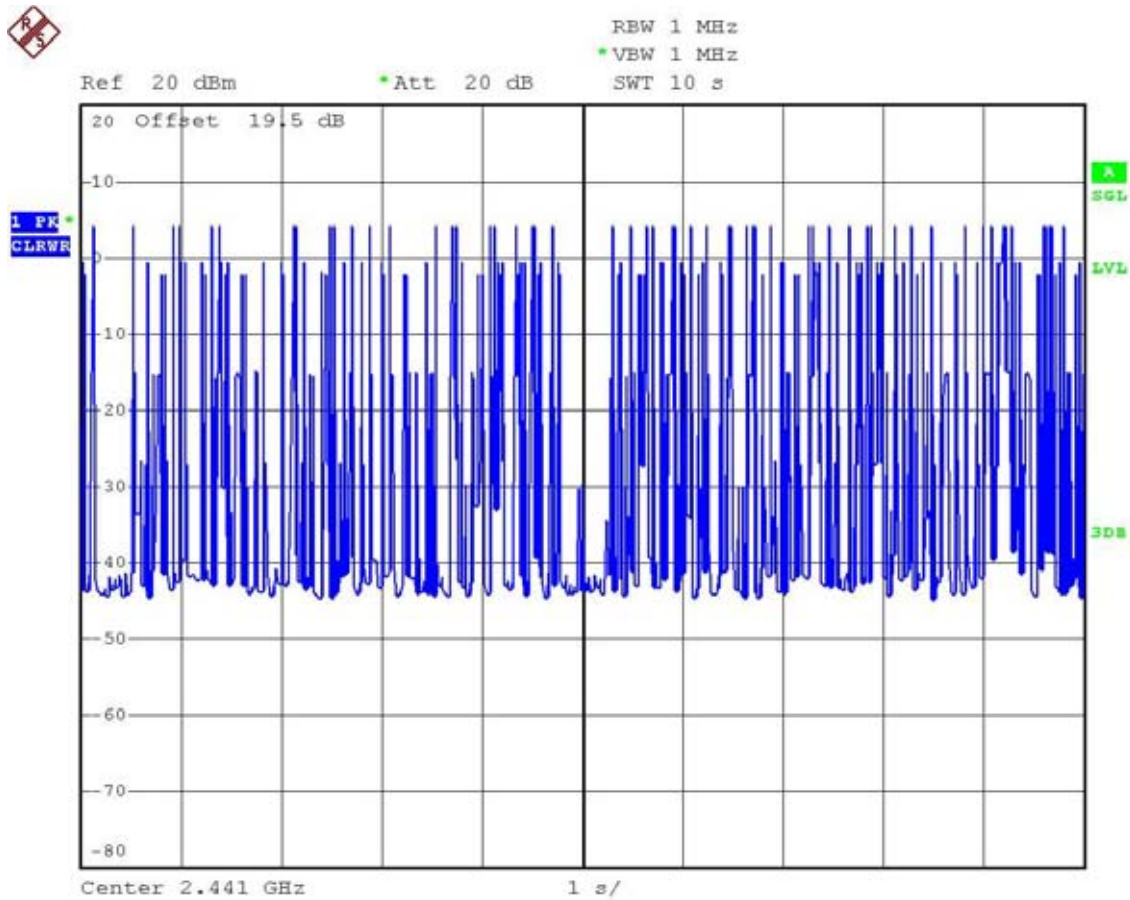
Date: 24.JUN.2008 12:51:35

3DH3 (CH39)



2nd comment ...

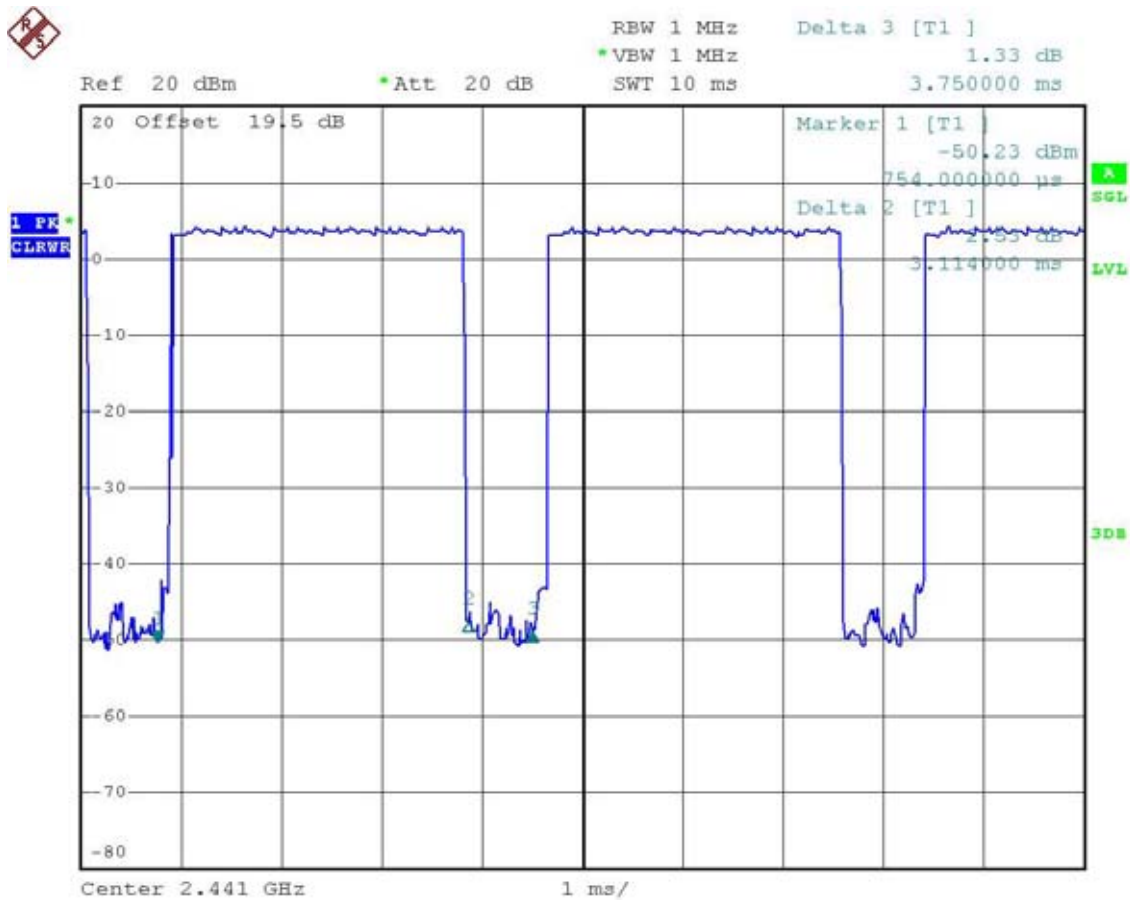
Date: 24.JUN.2008 12:47:49



2nd comment ...

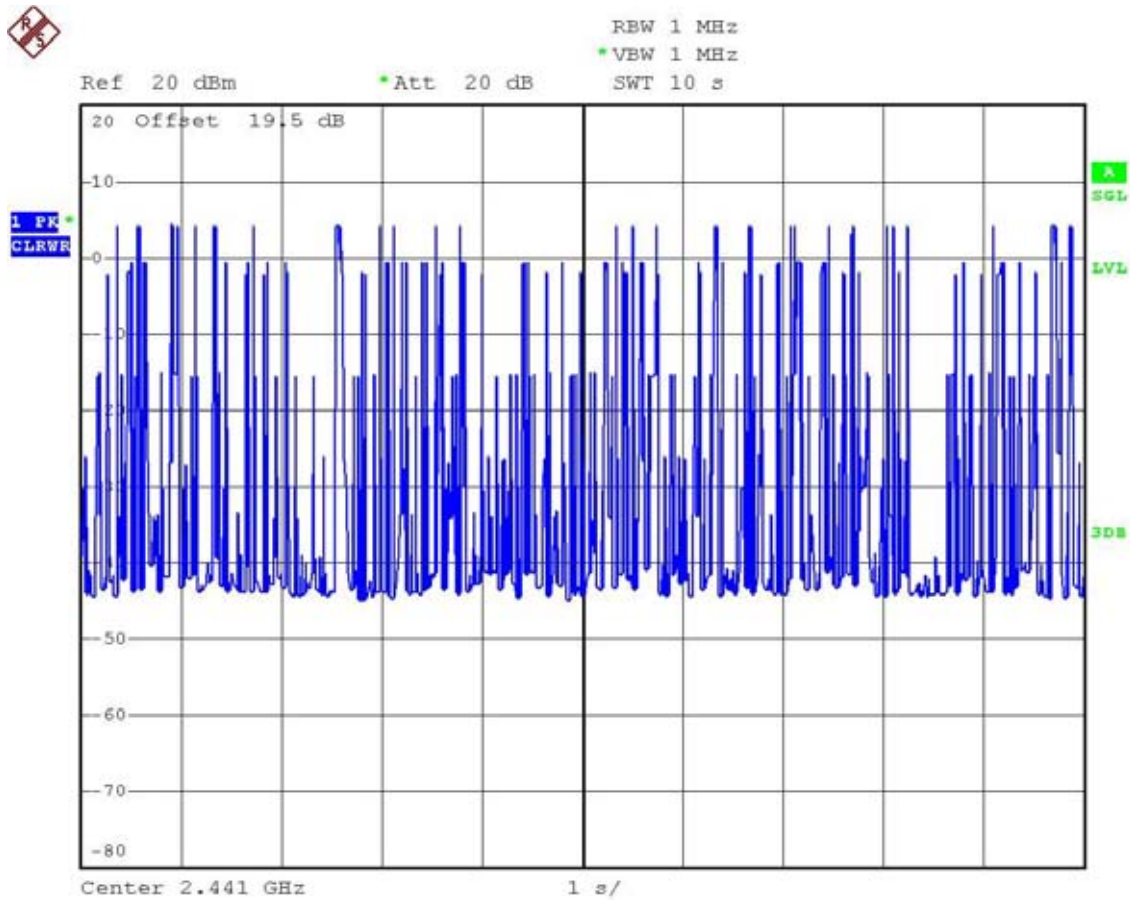
Date: 24.JUN.2008 12:52:17

3DH5 (CH39)



2nd comment ...

Date: 24.JUN.2008 12:48:21



2nd comment ...

Date: 24.JUN.2008 12:52:39

5.7 Peak Output Power Measurement

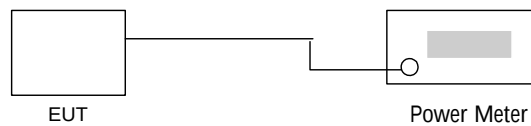
5.7.1 Measuring Instruments

As described in chapter 6 of this test report.

5.7.2 Test Procedure

The antenna port (RF output) of the EUT was connected to the input (RF input) of a spectrum analyzer for Bluetooth measurement. RBW and VBW are set to 3MHz. The cable loss has been offset before testing.

5.7.3 Test Setup Layout



5.7.4 Test Result

- Application Type : Bluetooth
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer : Darren

▪ Bluetooth(1Mbps)

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	3.76	1W/30 dBm
39	2441	3.44	1W/30 dBm
78	2480	3.06	1W/30 dBm

▪ Bluetooth EDR(2Mbps)

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	2.76	1W/30 dBm
39	2441	1.95	1W/30 dBm
78	2480	1.94	1W/30 dBm

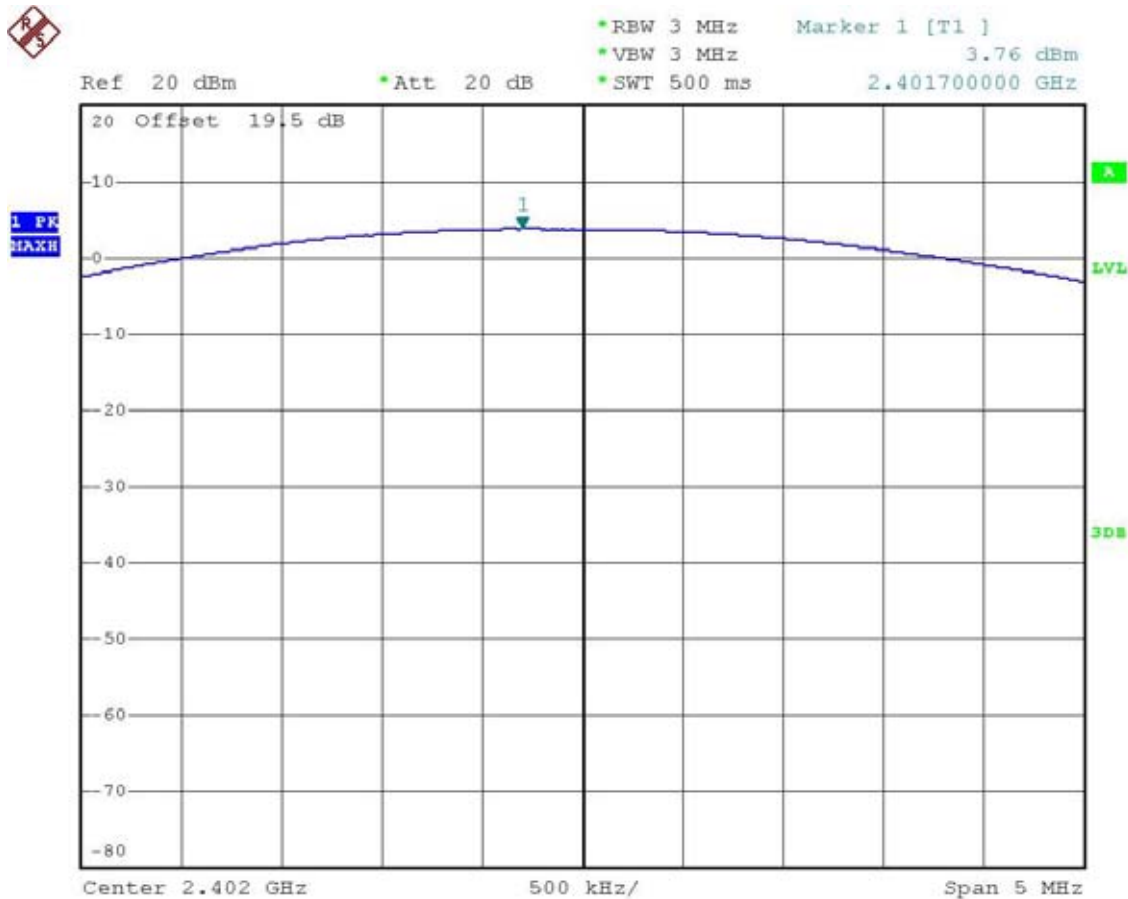
▪ Bluetooth EDR(3Mbps)

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	3.39	1W/30 dBm
39	2441	2.72	1W/30 dBm
78	2480	2.07	1W/30 dBm

5.7.5 Output Power

Bluetooth(1Mbps)

Mode : CH00 (2402MHz)

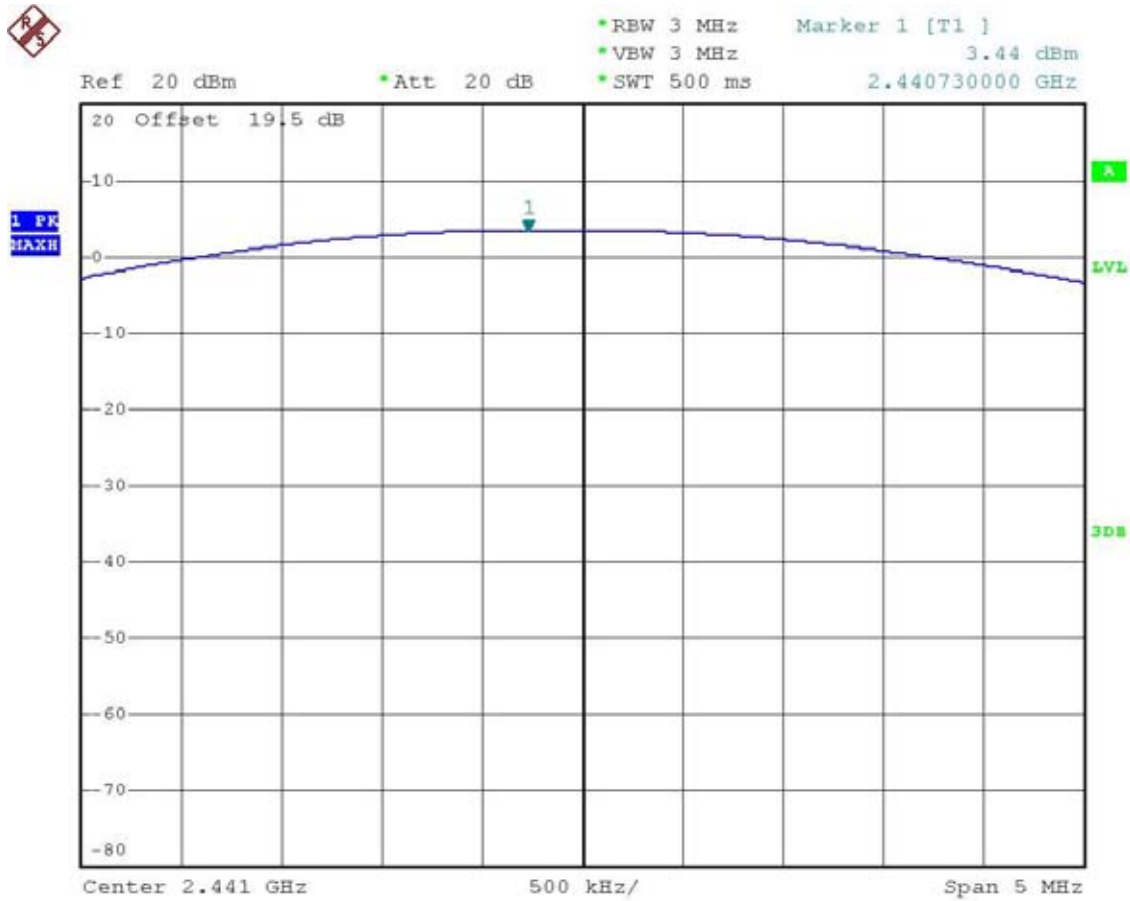


2nd comment ...

Date: 24.JUN.2008 15:21:59

Bluetooth(1Mbps)

Mode : CH39 (2441MHz)

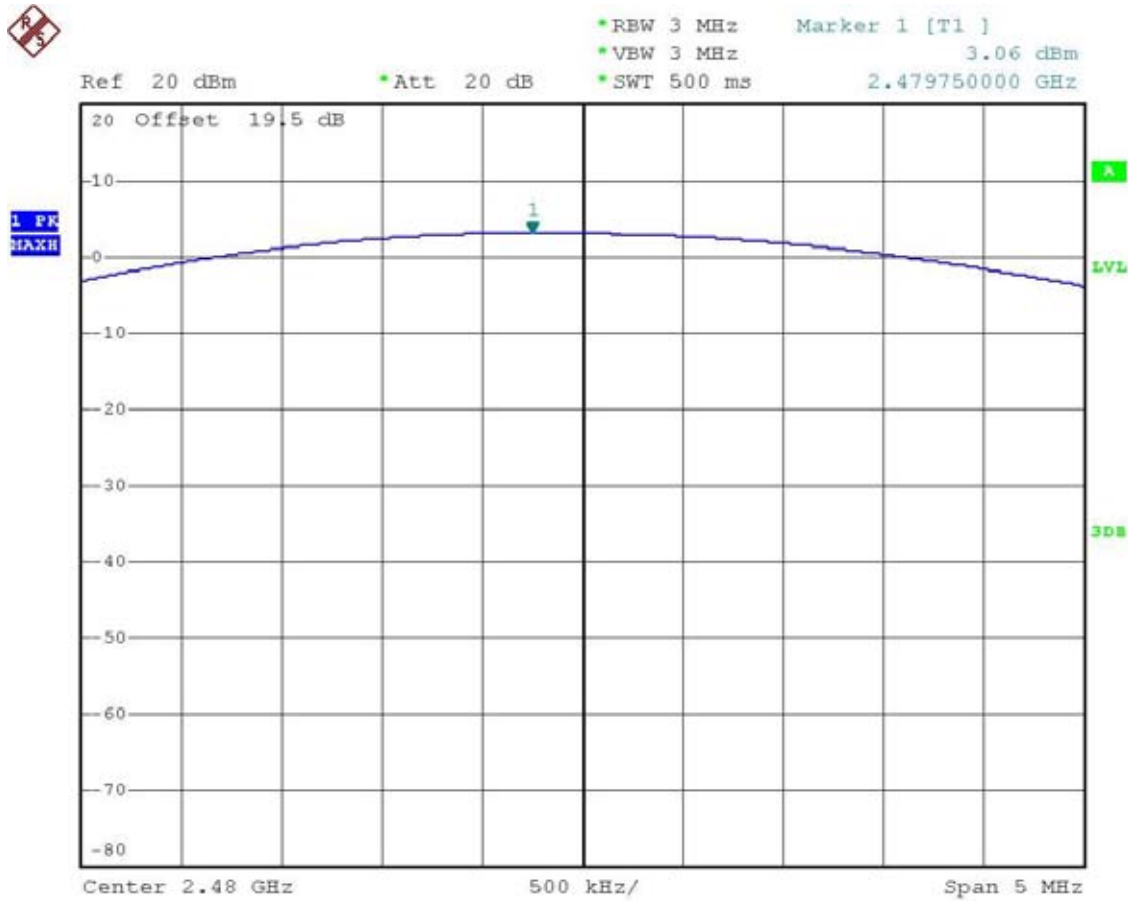


2nd comment ...

Date: 24.JUN.2008 15:23:10

Bluetooth(1Mbps)

Mode : CH78 (2480MHz)

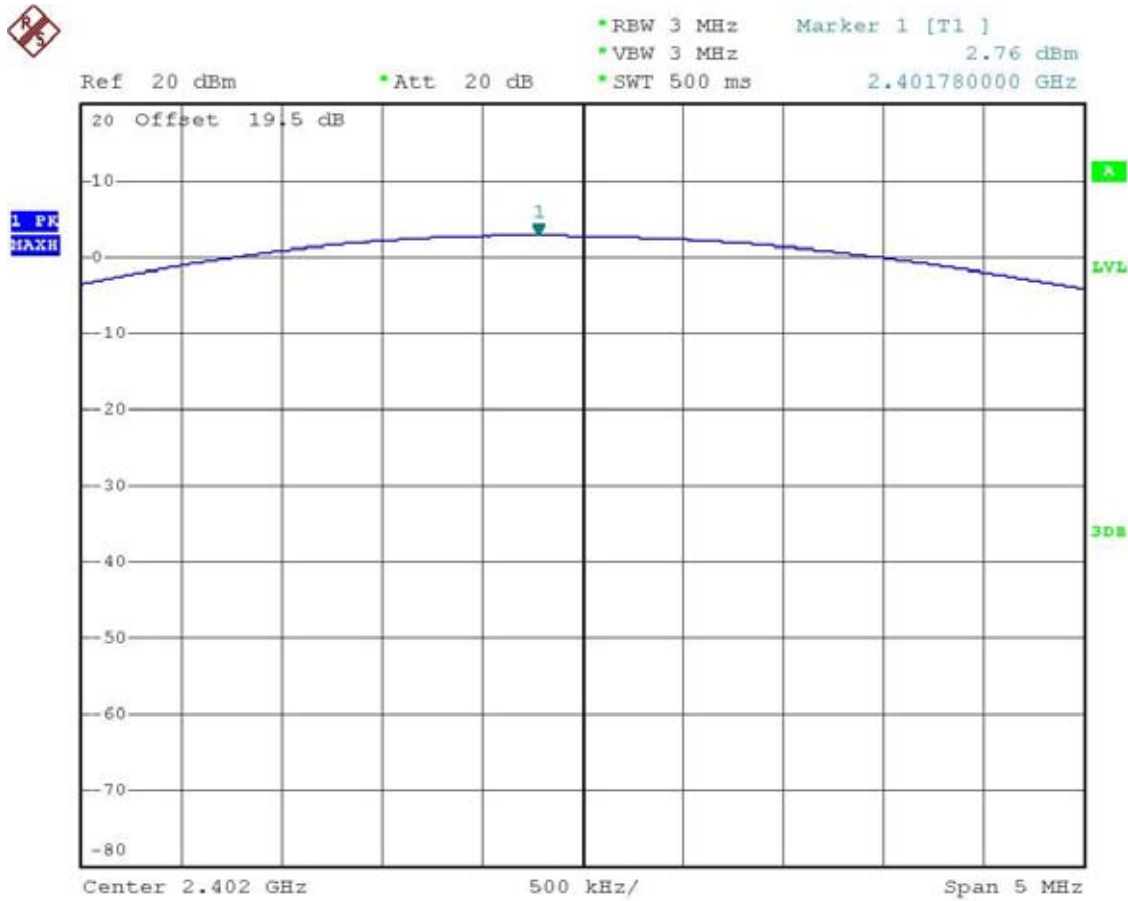


2nd comment ...

Date: 24.JUN.2008 15:24:24

Bluetooth(2Mbps)

Mode : CH00 (2402MHz)

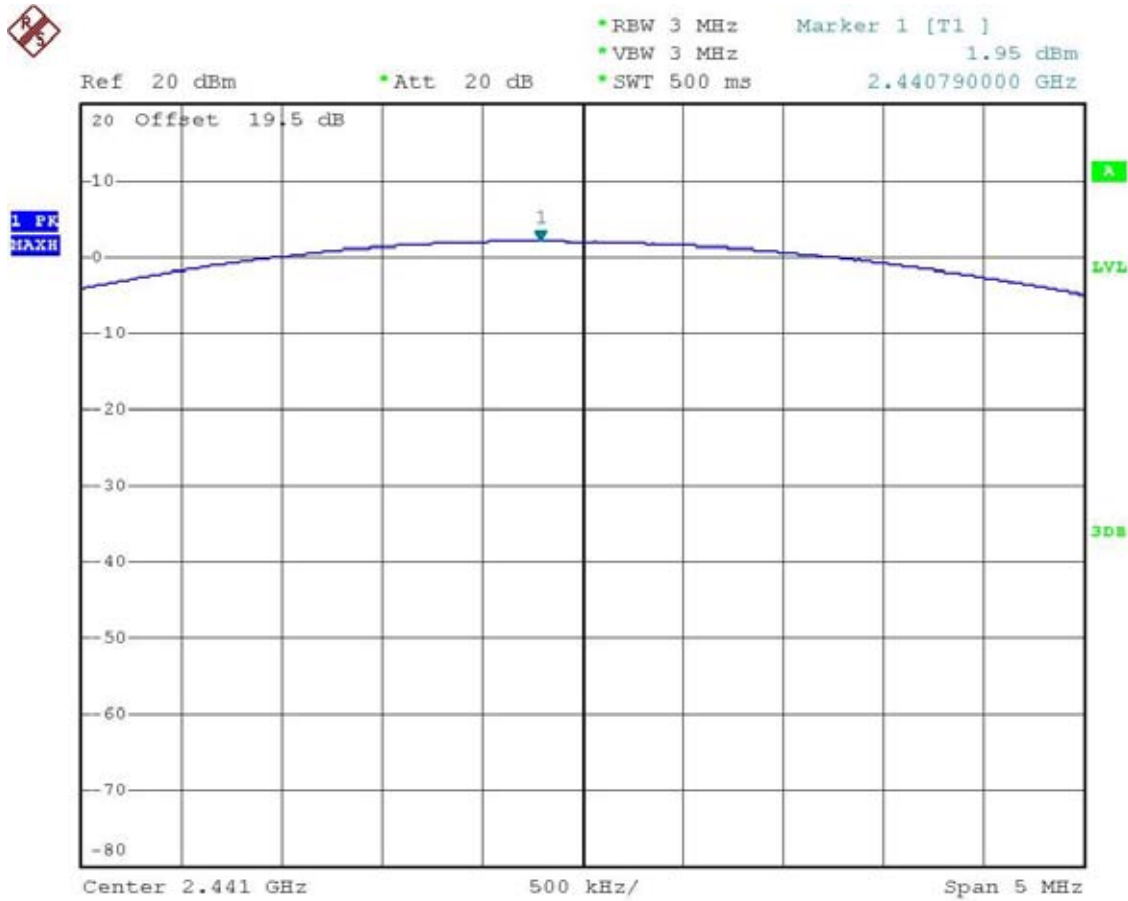


2nd comment ...

Date: 24.JUN.2008 15:26:04

Bluetooth(2Mbps)

Mode : CH39 (2441MHz)

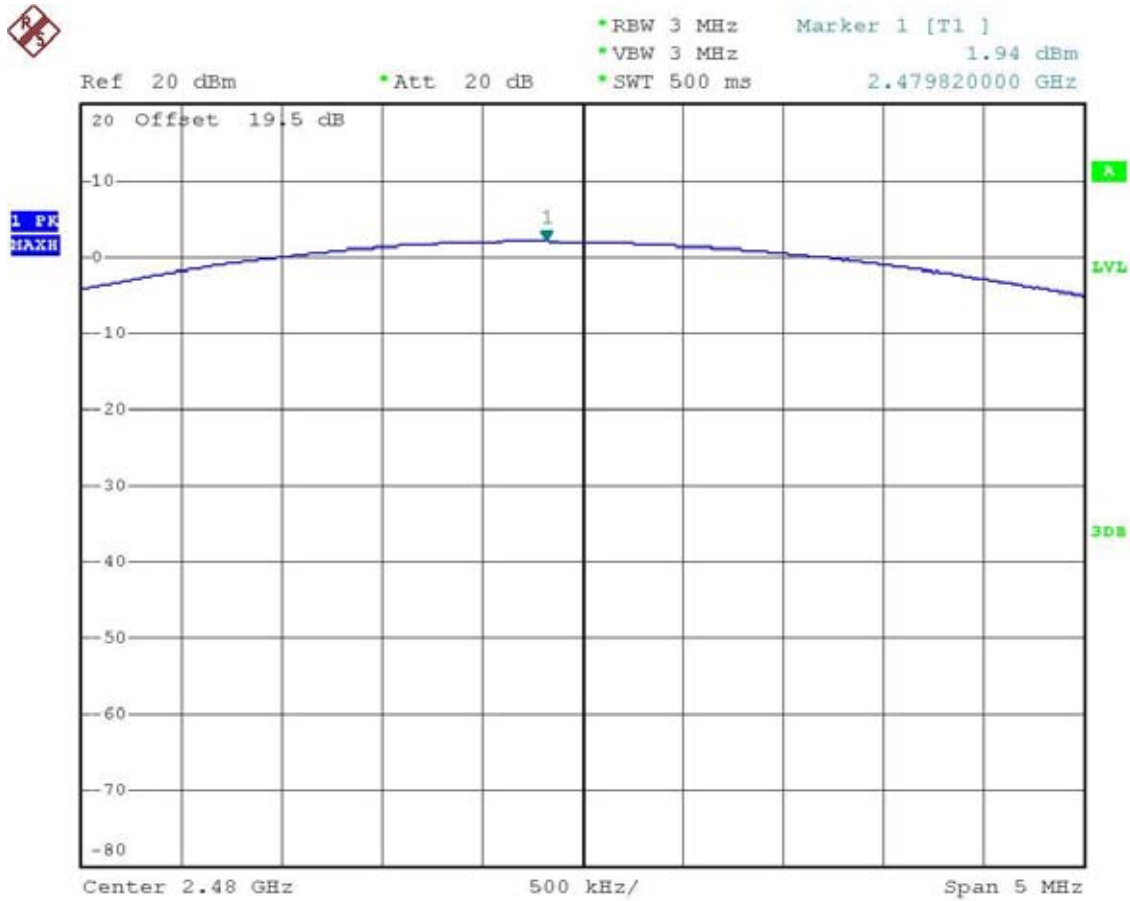


2nd comment ...

Date: 24.JUN.2008 15:26:56

Bluetooth(2Mbps)

Mode : CH78 (2480MHz)

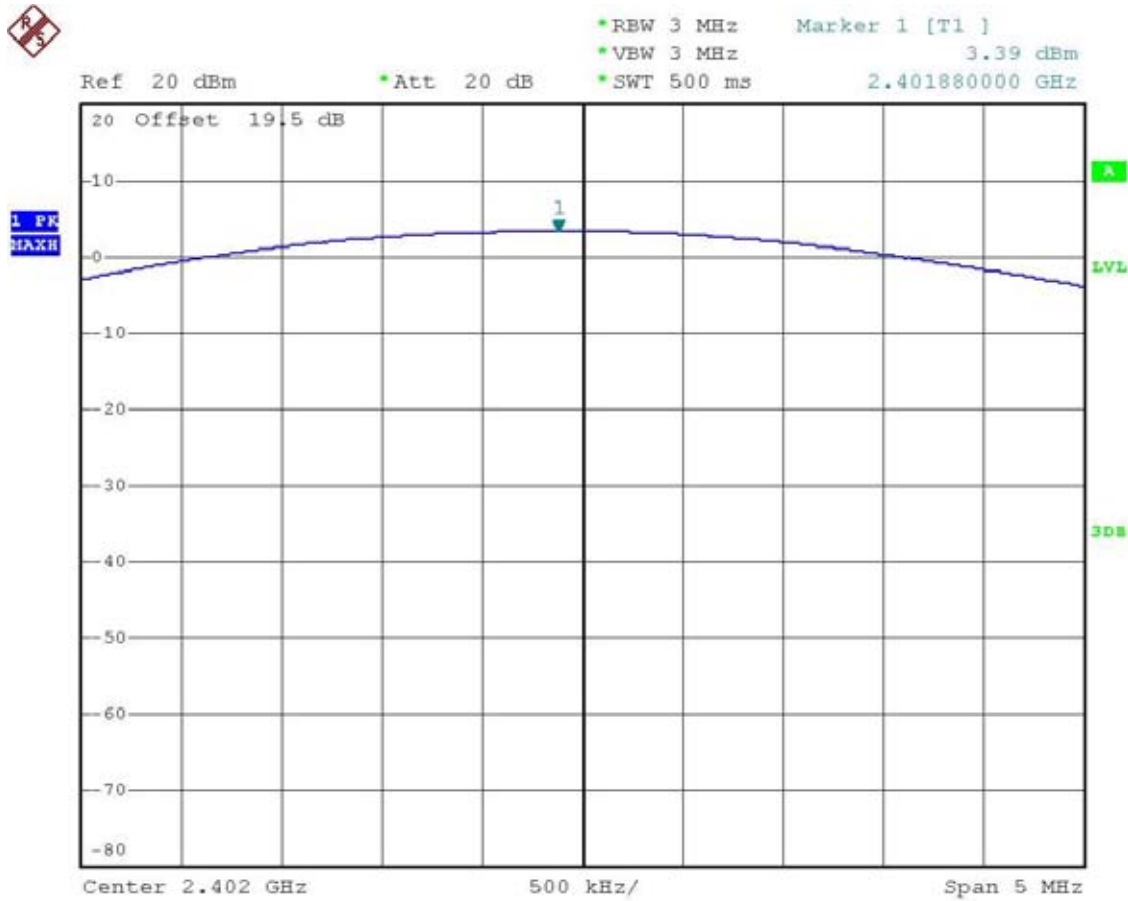


2nd comment ...

Date: 24.JUN.2008 16:50:28

Bluetooth(3Mbps)

Mode : CH00 (2402MHz)

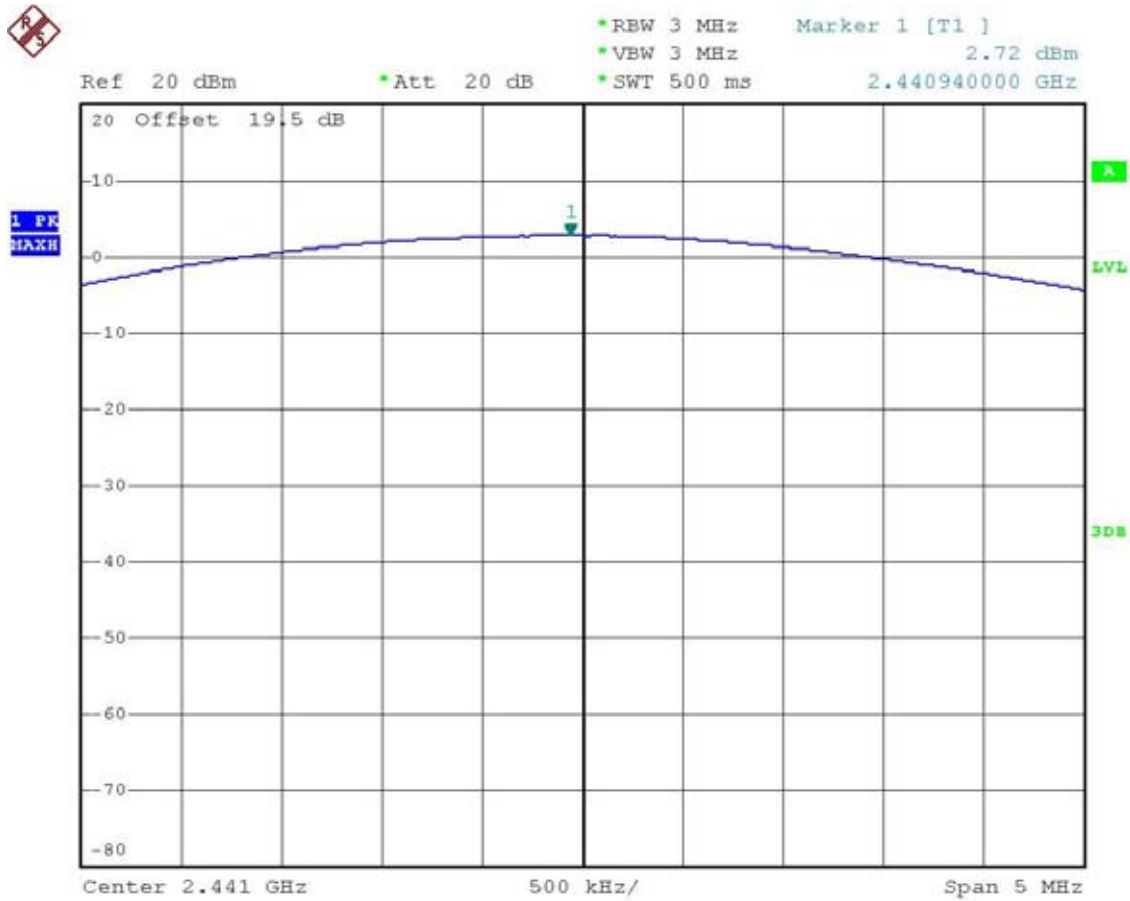


2nd comment ...

Date: 24.JUN.2008 16:51:03

Bluetooth(3Mbps)

Mode : CH39 (2441MHz)

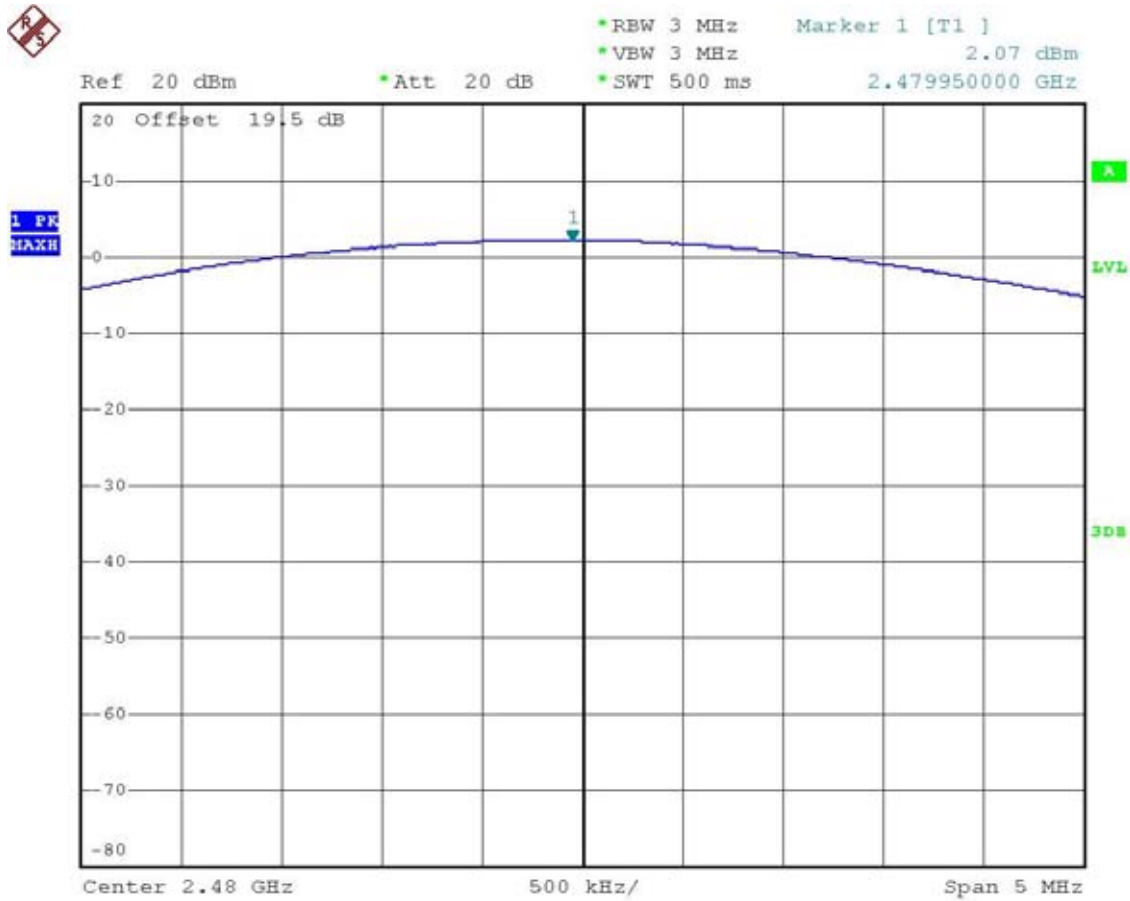


2nd comment ...

Date: 24.JUN.2008 16:51:54

Bluetooth(3Mbps)

Mode : CH78 (2480MHz)



2nd comment ...

Date: 24.JUN.2008 16:53:42

5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

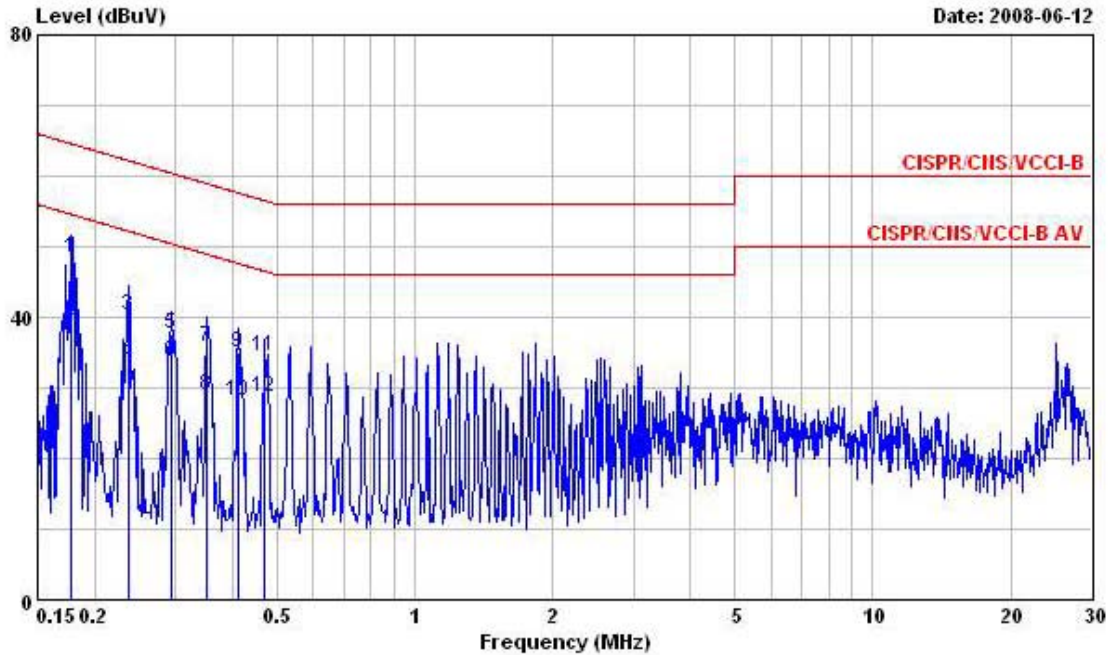
5.8.2 Test Procedures

1. 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.
2. Connect EUT to the power port of a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 KHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.8.3 Test Data

- Test Mode : Mode 1
- Temperature : 29~30
- Relative Humidity : 33~34%
- Test Engineer: Darren
- Test Condition : Line

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

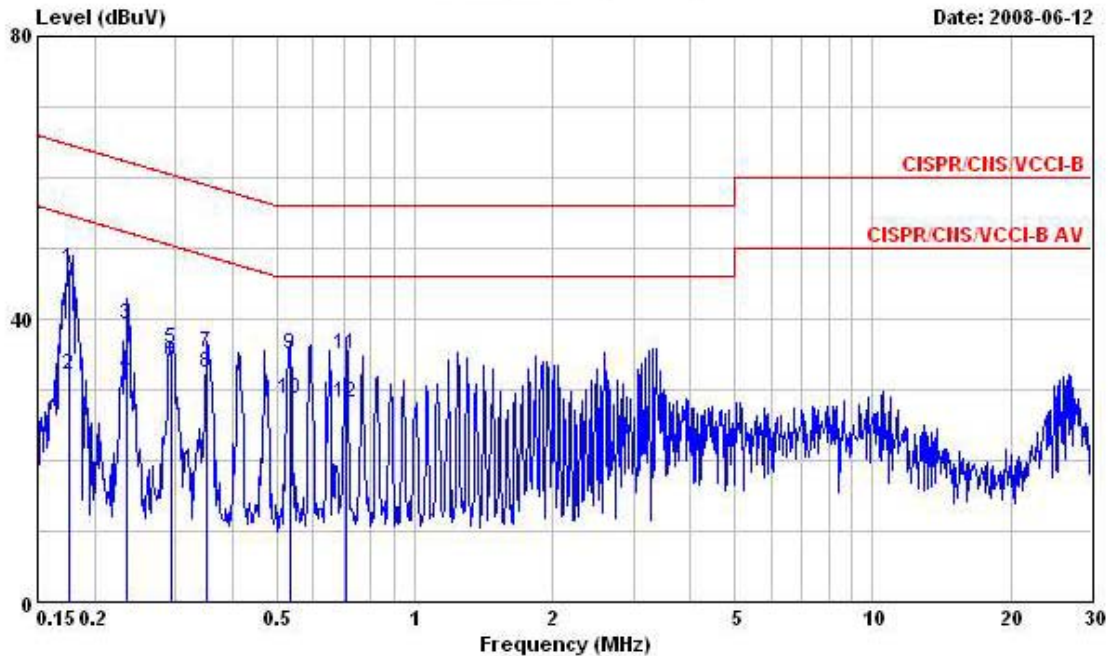


Site : CO04-HY
Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 LINE
EUT : Printer
POWER: 120V/60Hz
Model : FR860214
Memo : Model

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.1767760	48.37	-16.27	64.64	48.26	0.09	0.02	QP
2	0.1767760	39.45	-15.19	54.64	39.34	0.09	0.02	Average
3	0.2378380	40.25	-21.92	62.17	40.13	0.09	0.03	QP
4	0.2378380	33.38	-18.79	52.17	33.26	0.09	0.03	Average
5	0.2939830	37.56	-22.85	60.41	37.42	0.10	0.04	QP
6	0.2939830	33.80	-16.61	50.41	33.66	0.10	0.04	Average
7	0.3520120	35.84	-23.07	58.91	35.69	0.10	0.05	QP
8	0.3520120	29.03	-19.88	48.91	28.88	0.10	0.05	Average
9	0.4104750	34.97	-22.67	57.64	34.81	0.10	0.06	QP
10	0.4104750	28.09	-19.55	47.64	27.93	0.10	0.06	Average
11	0.4711010	34.52	-21.97	56.49	34.37	0.10	0.05	QP
12	0.4711010	28.71	-17.78	46.49	28.56	0.10	0.05	Average

- Test Condition: Neutral

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



Site : CO04-HY

Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 NEUTRAL

EUT : Printer

POWER: 120V/60Hz

Model : FR860214

Memo : Model

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1758420	47.00	-17.68	64.68	46.90	0.08	0.02	QP
2	0.1758420	32.18	-22.50	54.68	32.08	0.08	0.02	Average
3	0.2353310	39.32	-22.94	62.26	39.21	0.08	0.03	QP
4	0.2353310	32.22	-20.04	52.26	32.11	0.08	0.03	Average
5	0.2939830	35.82	-24.59	60.41	35.69	0.09	0.04	QP
6	0.2939830	33.89	-16.52	50.41	33.76	0.09	0.04	Average
7	0.3520120	35.22	-23.69	58.91	35.08	0.09	0.05	QP
8	0.3520120	32.37	-16.54	48.91	32.23	0.09	0.05	Average
9	0.5321540	35.06	-20.94	56.00	34.91	0.10	0.05	QP
10	0.5321540	28.63	-17.37	46.00	28.48	0.10	0.05	Average
11	0.7084240	35.00	-21.00	56.00	34.86	0.10	0.04	QP
12	0.7084240	28.28	-17.72	46.00	28.14	0.10	0.04	Average

5.9 Radiated Emission Measurement

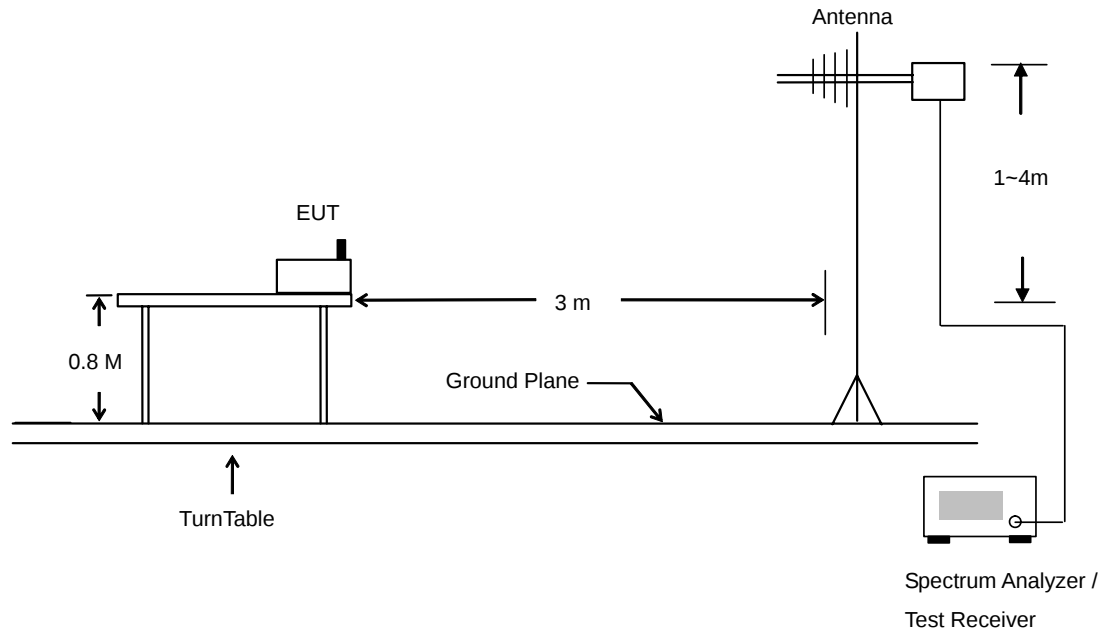
5.9.1 Measuring Instruments

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.

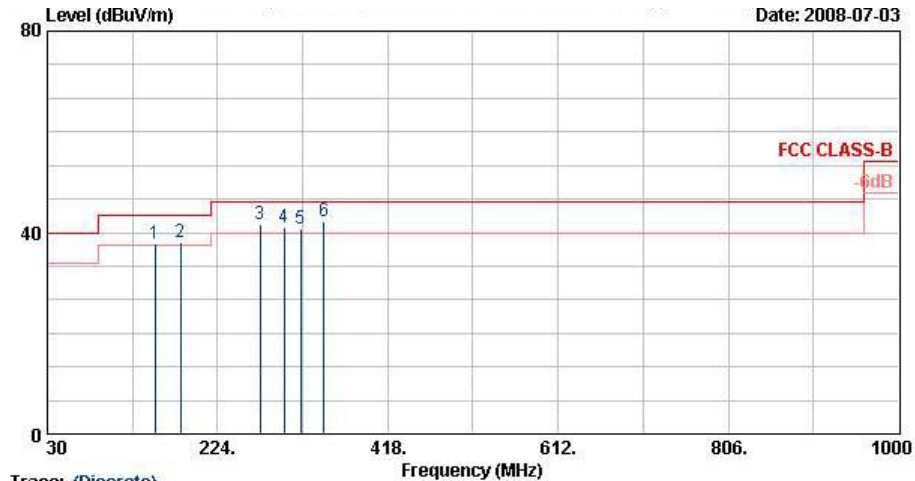
5.9.3 Typical Test Setup Layout of Radiated Emission



5.9.4 Test Data

- Test Mode : Mode 1
- Temperature : 26~29
- Relating Humidity : 49~58%
- Test Engineer : Sun
- Polarization : Horizontal (30MHz-1GHz)

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

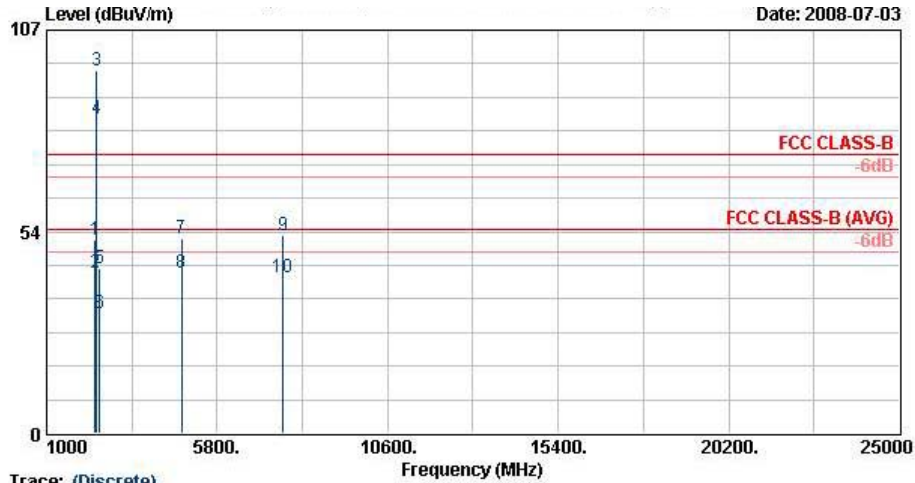


Site : 03CH06-RY
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
 EUT : Printer
 Power : 120Vac/60Hz
 Model : FR 860214
 Mode : Mode 1
 Data Rate : DHS

	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 !	152.58	37.71	-5.79	43.50	58.50	10.35	0.60	31.73	---	---	Peak
2 !	181.74	38.14	-5.36	43.50	60.19	9.43	0.60	32.08	---	---	Peak
3 !	272.73	41.74	-4.26	46.00	60.30	12.69	0.70	31.95	---	---	Peak
4 !	300.00	41.06	-4.94	46.00	59.30	13.21	0.70	32.15	---	---	Peak
5 !	318.90	40.81	-5.19	46.00	58.28	13.71	0.80	31.97	---	---	Peak
6 !	344.80	42.32	-3.68	46.00	58.88	14.37	0.80	31.73	100	121	Peak

- Polarization : Horizontal (1GHz-25GHz)

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



Trace: (Discrete)

Site : 03CH06-HV

Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL

EUT : Printer

Power : 120Vac/60Hz

Model : FR 860214

Mode : Mode 1

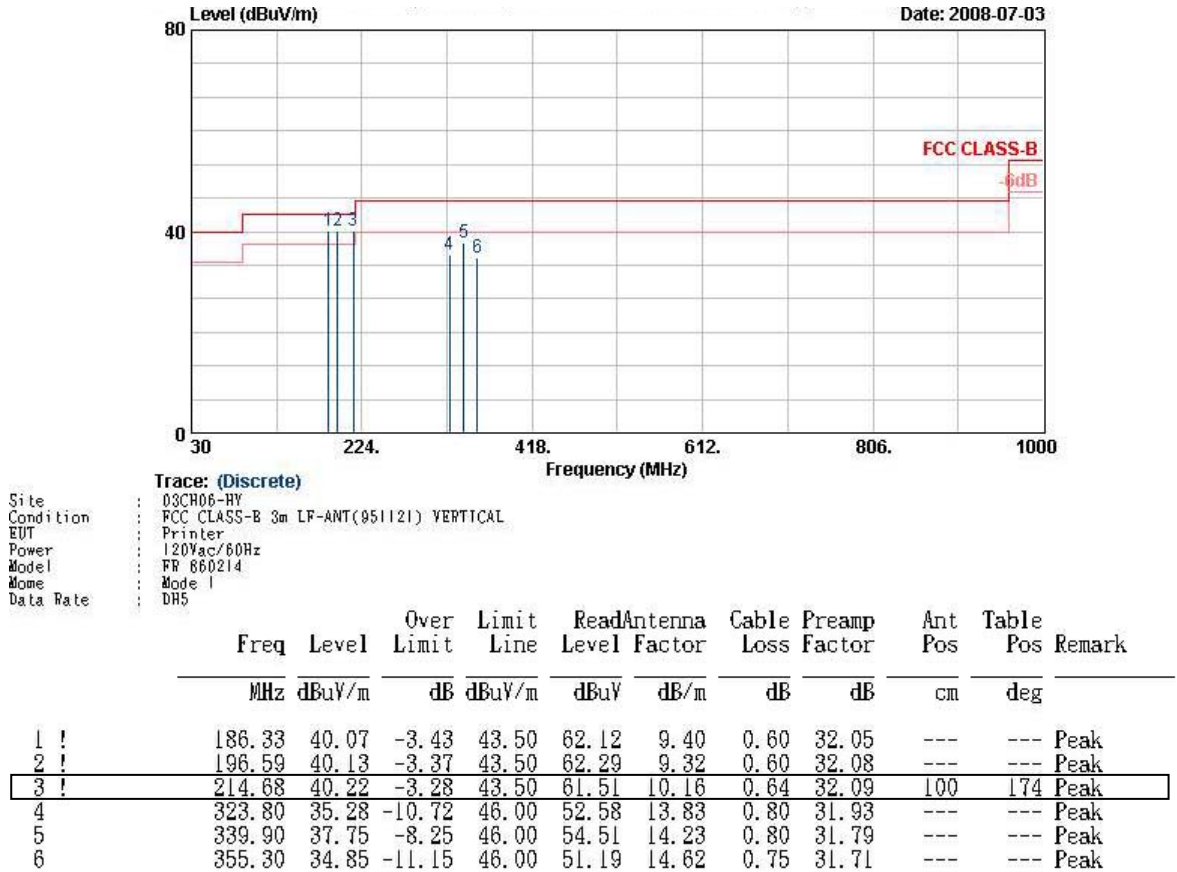
Data Rate : DHS

	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/m	dB	dB	cm	deg
1	2369.85	51.19	-22.81	74.00	51.15	31.83	3.89	35.68	100	0 Peak
2	2369.85	42.74	-11.26	54.00	42.70	31.83	3.89	35.68	100	60 Average
3 X	2402.00	96.24			96.12	31.88	3.92	35.68	100	0 Peak
4 @	2402.00	83.44			83.34	31.86	3.92	35.68	100	60 Average
5	2500.00	43.95	-30.05	74.00	43.60	32.00	4.05	35.70	100	0 Peak
6	2500.00	31.78	-22.22	54.00	31.43	32.00	4.05	35.70	100	60 Average
7	4806.00	51.52	-22.48	74.00	47.31	34.12	5.77	35.68	100	0 Peak
8	4806.00	42.56	-11.44	54.00	38.35	34.12	5.77	35.68	100	53 Average
9	7656.00	52.70	-21.30	74.00	45.96	35.63	7.34	36.23	100	0 Peak
10	7656.00	41.49	-12.51	54.00	34.75	35.63	7.34	36.23	100	223 Average

Remark: #3 and #4 are Fundamental Signals.

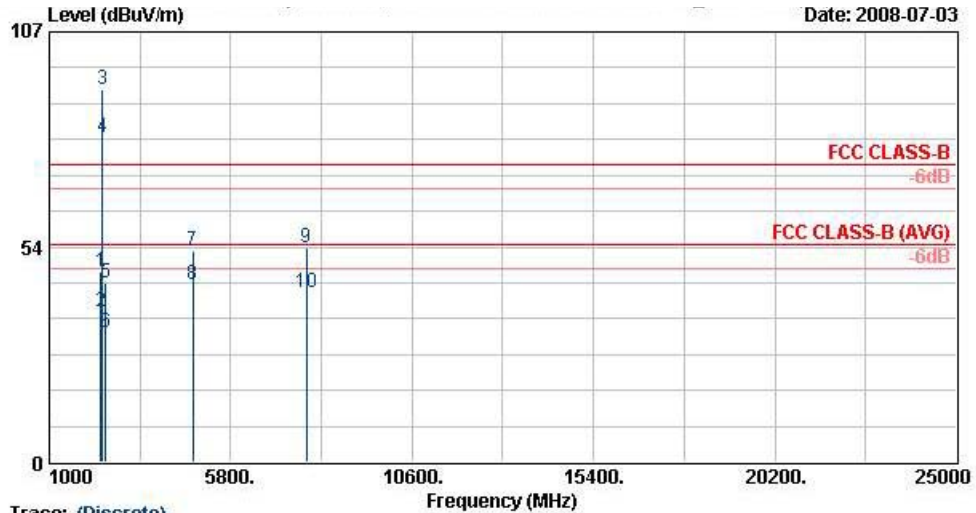
- Polarization : Vertical (30MHz-1GHz)

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



- Polarization : Vertical (1GHz-25GHz)

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



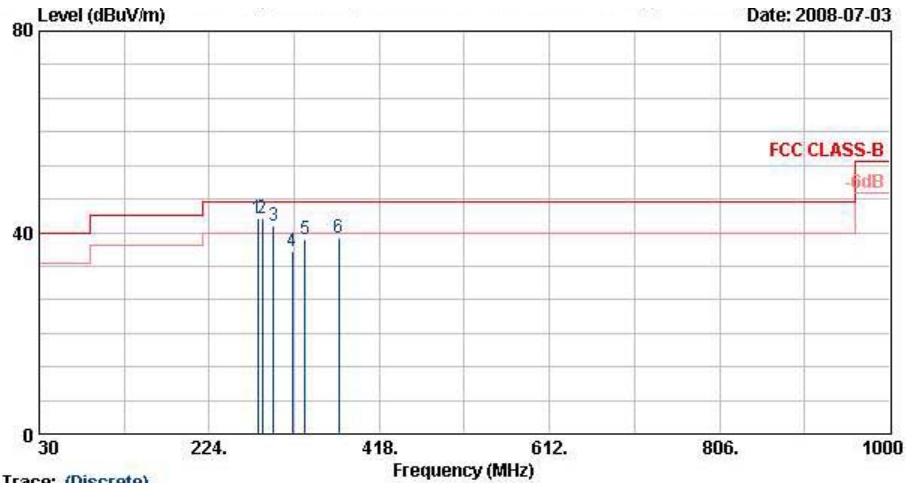
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : Printer
Power : 120Vac/60Hz
Model : FR 860214
Mode : Mode 1
Data Rate : DH5

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2369.85	47.31	-26.69	74.00	47.27	31.83	3.89	35.68	100	0	Peak
2	2369.85	37.32	-16.68	54.00	37.28	31.83	3.89	35.68	100	1	Average
3 X	2402.00	92.51			92.39	31.88	3.92	35.68	100	0	Peak
4 @	2402.00	80.58			80.48	31.86	3.92	35.68	100	1	Average
5	2500.00	44.49	-29.51	74.00	44.14	32.00	4.05	35.70	100	0	Peak
6	2500.00	32.20	-21.80	54.00	31.85	32.00	4.05	35.70	100	1	Average
7	4806.00	52.38	-21.62	74.00	48.17	34.12	5.77	35.68	100	0	Peak
8	4806.00	44.30	-9.70	54.00	40.09	34.12	5.77	35.68	100	329	Average
9	7812.00	53.35	-20.65	74.00	46.52	35.66	7.42	36.26	100	0	Peak
10	7812.00	42.23	-11.77	54.00	35.40	35.66	7.42	36.26	100	106	Average

Remark: #3 and #4 are Fundamental Signals.

- Test Mode : Mode 2
- Temperature : 26~29
- Relative Humidity : 49~58%
- Test Engineer: Sun
- Polarization : Horizontal (30MHz-1GHz)

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

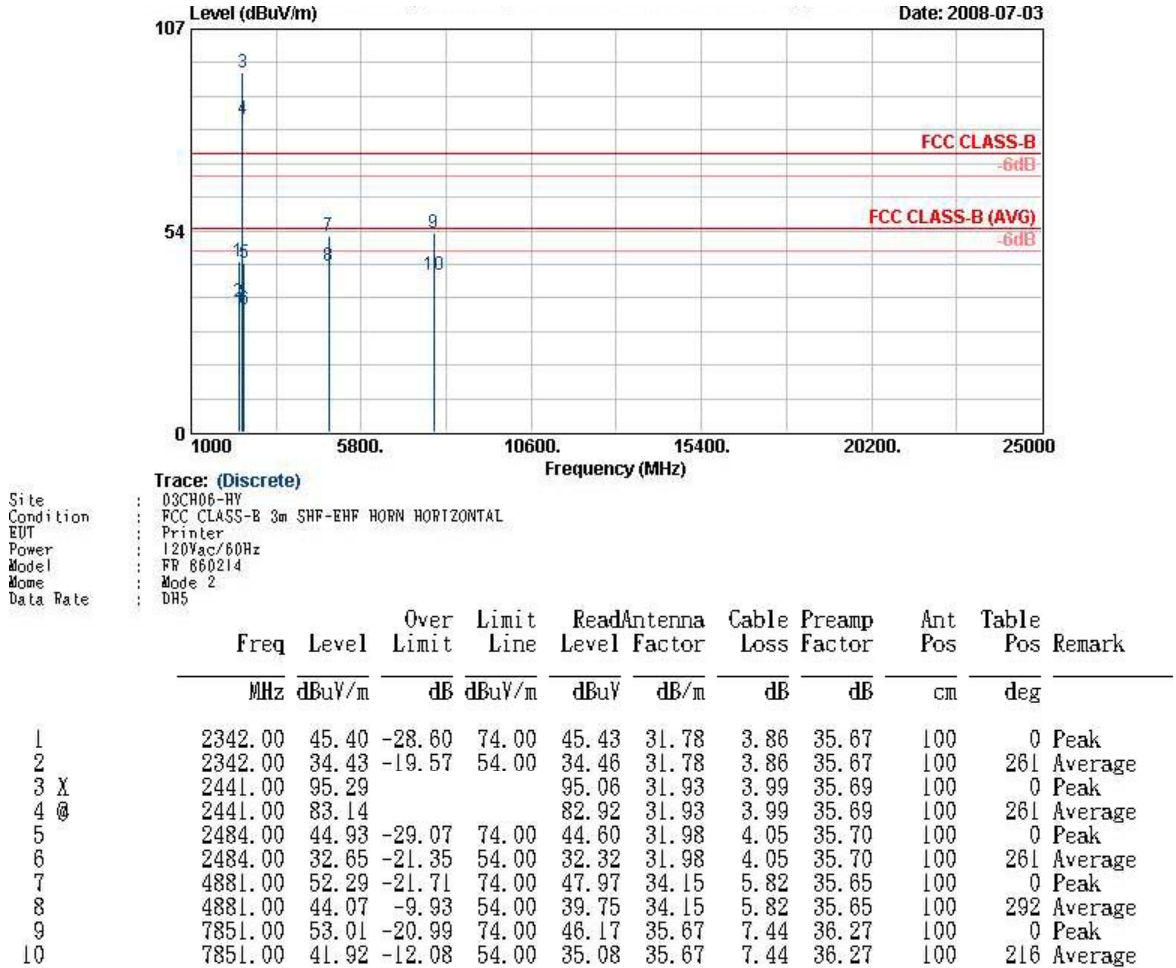


Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
 EUT : Printer
 Power : 120Vac/60Hz
 Model : FR 860214
 Mode : Mode 2
 Data Rate : DHS

	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 !	279.48	42.87	-3.13	46.00	61.35	12.82	0.70	32.00	---	---	Peak
2 !	284.88	42.88	-3.12	46.00	61.29	12.93	0.70	32.04	100	291	Peak
3 !	297.03	41.40	-4.60	46.00	59.67	13.15	0.70	32.13	---	---	Peak
4	318.90	36.19	-9.81	46.00	53.66	13.71	0.80	31.97	---	---	Peak
5	332.90	38.55	-7.45	46.00	55.55	14.05	0.80	31.85	---	---	Peak
6	371.40	39.05	-6.95	46.00	54.98	15.04	0.81	31.78	---	---	Peak

- Polarization : Horizontal (1GHz-25GHz)

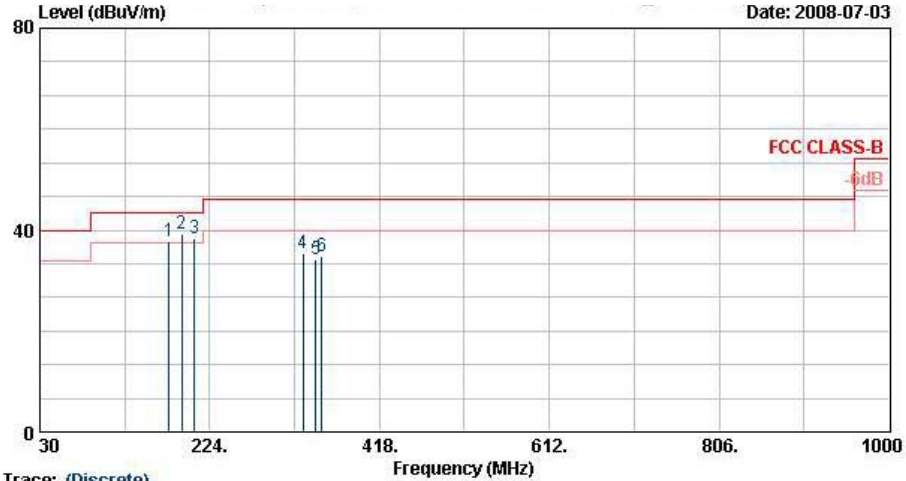
■ The test that passed at minimum margin was marked by the boldface in the following table.



Remark: #3 and #4 are Fundamental Signals.

- Polarization : Vertical (30MHz-1GHz)

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

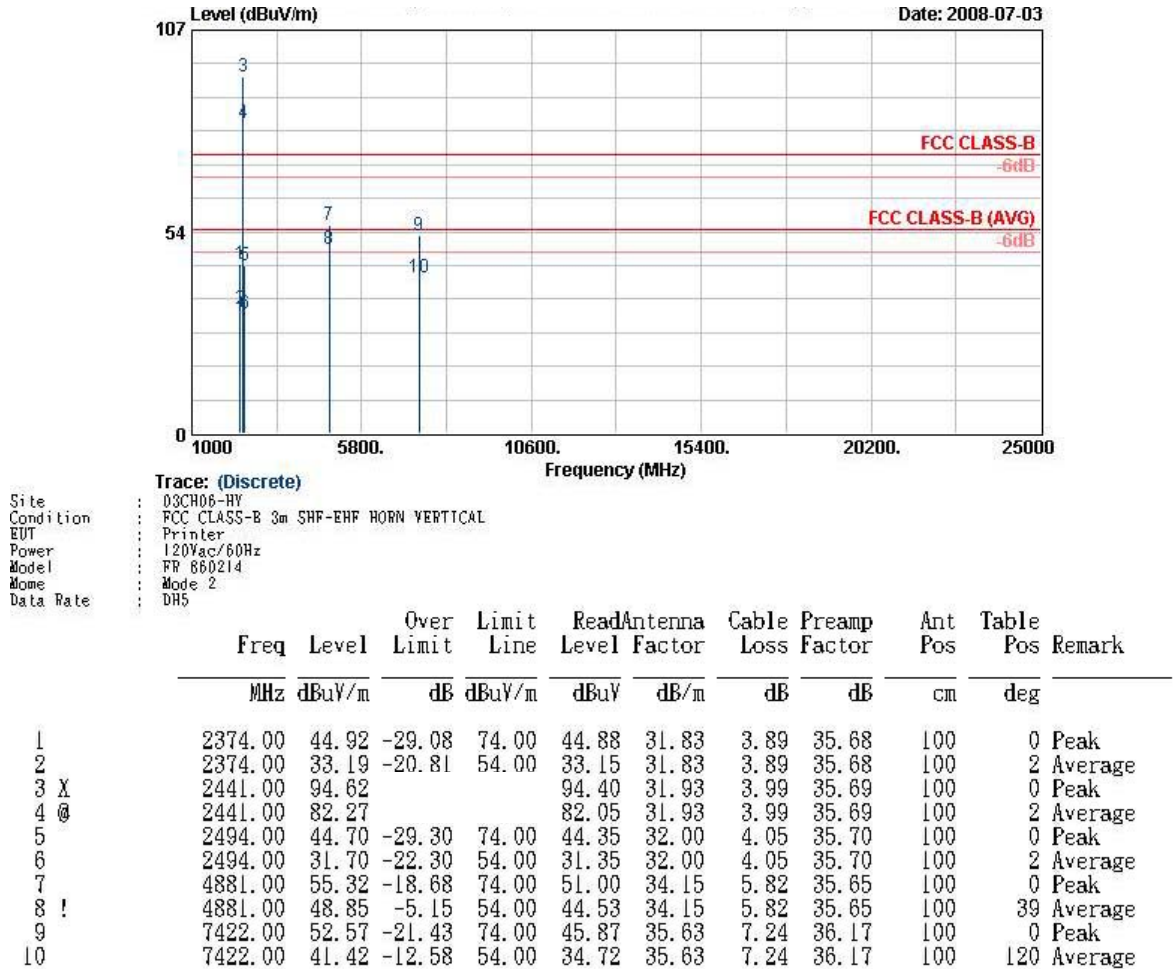


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LP-ANT(951121) VERTICAL
 EUT : Printer
 Power : 120Vac/60Hz
 Model : FR 860214
 Mode : Mode 2
 Data Rate : DHS

	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 !	177.69	37.87	-5.63	43.50	59.67	9.63	0.60	32.04	---	---	Peak
2 !	191.73	39.40	-4.10	43.50	61.48	9.36	0.60	32.04	100	92	Peak
3 !	206.58	38.37	-5.13	43.50	60.25	9.70	0.60	32.18	---	---	Peak
4	330.80	35.36	-10.64	46.00	52.43	14.00	0.80	31.87	---	---	Peak
5	344.80	34.31	-11.69	46.00	50.87	14.37	0.80	31.73	---	---	Peak
6	351.80	34.71	-11.29	46.00	51.08	14.55	0.78	31.70	---	---	Peak

- Polarization : Vertical (1GHz-25GHz)

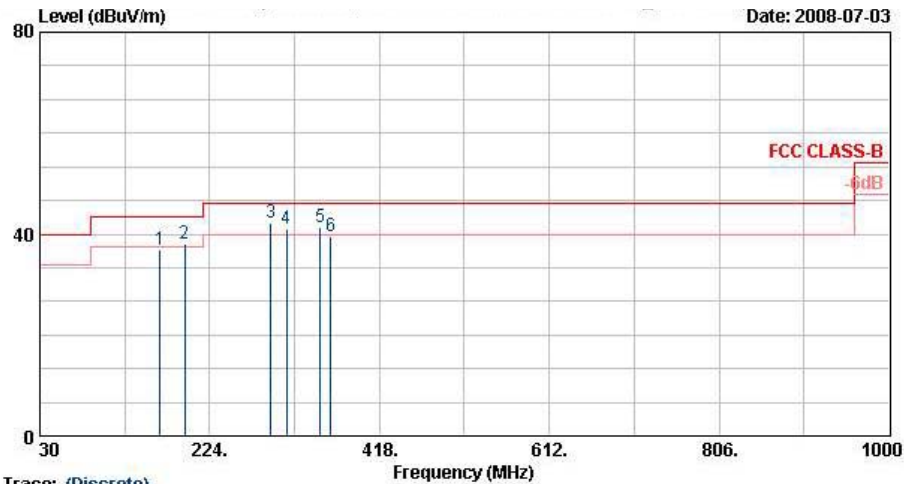
■ The test that passed at minimum margin was marked by the boldface in the following table.



Remark: #3 and #4 are Fundamental Signals.

- Test Mode : Mode 3
- Temperature : 26~29
- Relative Humidity : 49~58%
- Test Engineer: Sun
- Polarization : Horizontal (30MHz-1GHz)

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

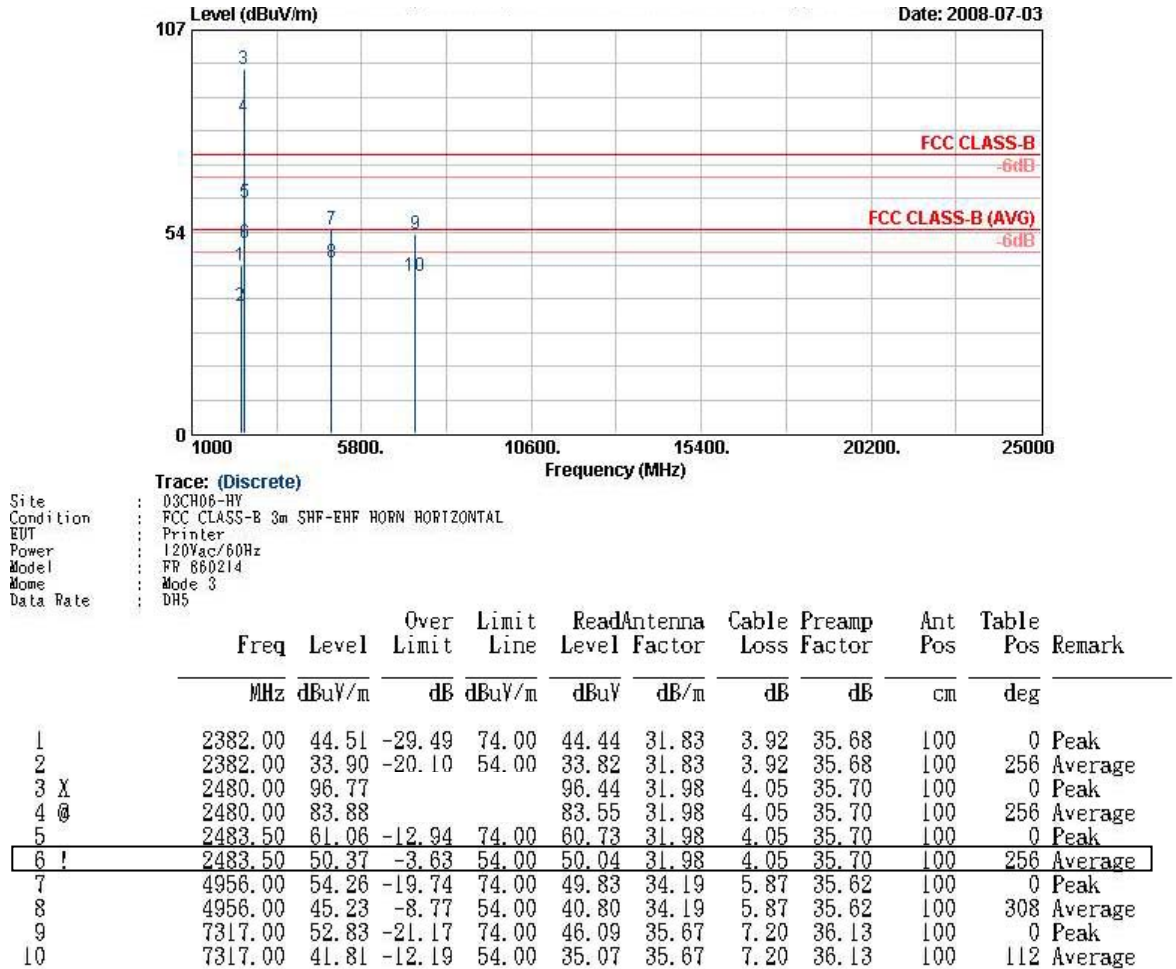


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(051121) HORIZONTAL
 EUT : Printer
 Power : 120Vac/60Hz
 Model : FR 860214
 Mode : Mode 3
 Data Rate : DHS

	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	167.43	36.78	-6.72	43.50	58.11	9.96	0.60	31.90	---	---	Peak
2 !	195.78	38.21	-5.29	43.50	60.35	9.33	0.60	32.07	---	---	Peak
3 !	294.06	42.13	-3.87	46.00	60.44	13.10	0.70	32.11	100	126	Peak
4 !	311.90	40.94	-5.06	46.00	58.64	13.53	0.80	32.04	---	---	Peak
5 !	350.40	41.35	-4.65	46.00	57.74	14.50	0.80	31.69	---	---	Peak
6	362.30	39.43	-6.57	46.00	55.63	14.82	0.73	31.74	---	---	Peak

- Polarization : Horizontal (1GHz-25GHz)

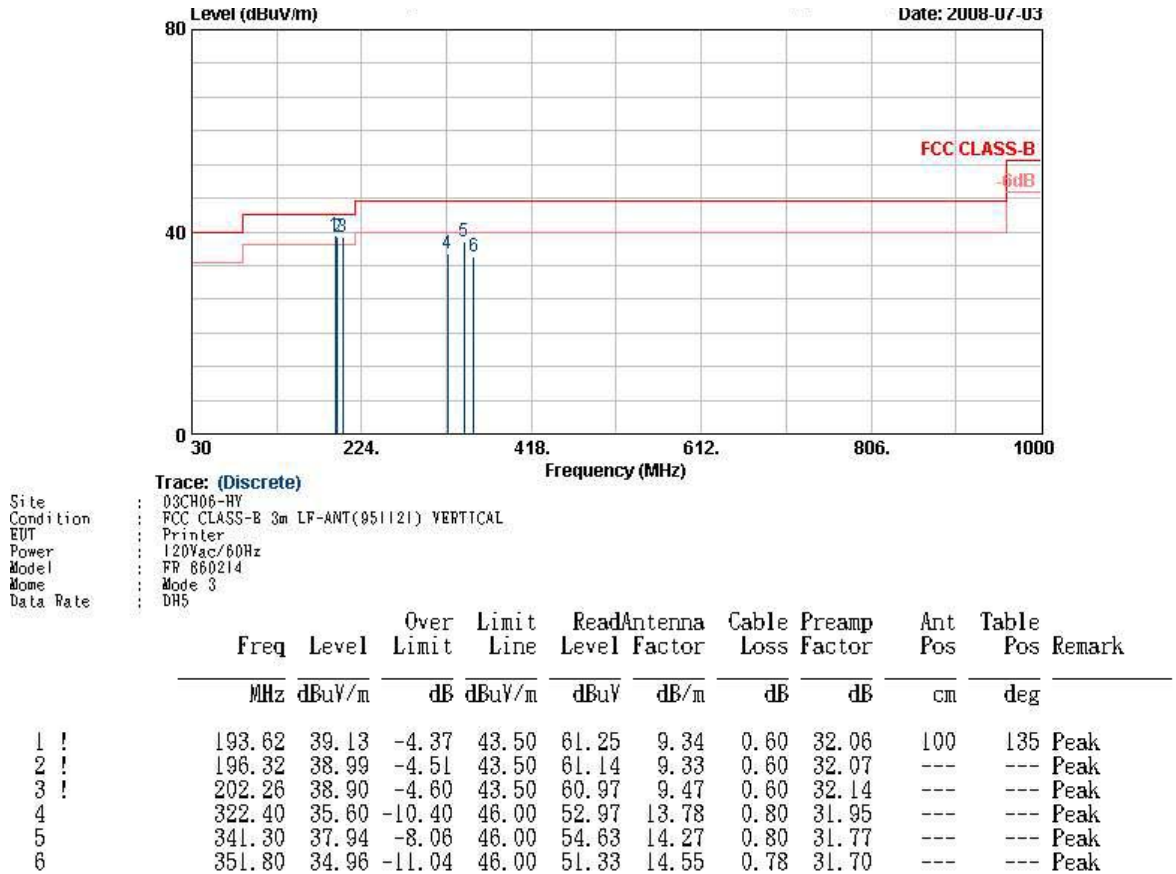
■ The test that passed at minimum margin was marked by the boldface in the following table.



Remark: #3 and #4 are Fundamental Signals.

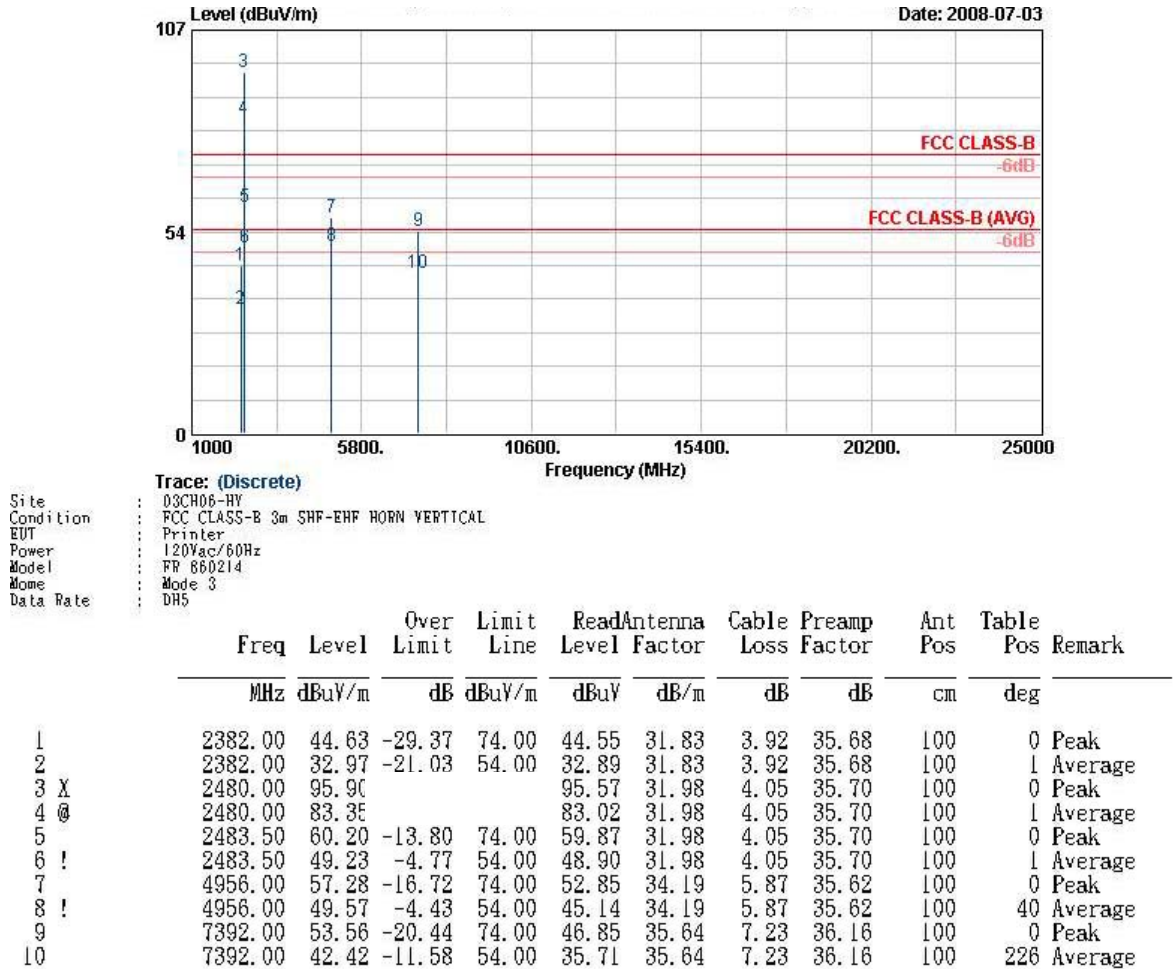
- Polarization : Vertical (30MHz-1GHz)

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



- Polarization : Vertical (1GHz-25GHz)

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



Remark: #3 and #4 are Fundamental Signals.

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 antennas used in this product is Chip Antenna for Bluetooth and it is considered to meet antenna requirement of FCC.

5.10.3 Antenna Gain

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

6. List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100359	9kHz – 2.75GHz	Mar. 03, 2008	Mar. 02, 2009	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2008	Mar. 29, 2009	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2008	Mar. 21, 2009	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2008	Apr. 19, 2009	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz – 30MHz	Mar. 27, 2008	Mar. 26, 2009	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	N/A	Conduction (CO04-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211028	9KHz-26.5GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 2007	Jul. 25, 2008	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Dec. 01, 2007	Nov. 30, 2008	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00075962	1G~18G	Aug. 29, 2007	Aug. 28, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-251	14G - 40G	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 22, 2007	Nov. 21, 2008	Radiation (03CH06-HY)
Pre Amplifier	EMEC	PA303	PA303-SMA-059	100K~3GHz	Nov. 26, 2007	Nov. 25, 2008	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	103937	Third-Band	Oct. 19, 2007	Oct. 18, 2008	Radiation (03CH06-HY)

7. Uncertainty Evaluation

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

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 (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.11	Normal(k=2)	0.06
Antenna factor calibration	0.91	Normal(k=2)	0.46
Cable loss calibration	0.12	Normal(k=2)	0.06
Pre Amplifier Gain calibration	0.15	Normal(k=2)	0.08
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.52	Rectangular	0.88
Mismatch	+0.45/-0.48	U-shaped	0.33
Combined standard uncertainty Uc(y)	1.30		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.60		

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

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 $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U = 2U_c(y)$	4.72				

The measured result is : $y \text{ dBuV} \pm U \text{ dB}$
for a level of confidence of approximately 95% , ($k = 2$)

Appendix A. Photographs of EUT

Please refer to Sporton report number EP860214 as below.