



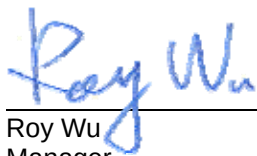
FCC Test Report

According to

47 CFR Part 15 Subpart C

Equipment : MOTOROKR
Trade Name : Motorola
Model No. : EQ7
FCC ID : IHDT6JL1
Filing Type : Certification
Applicant : MOTOROLA, INC.
600 N U.S. HIGH WAY 45 Libertyville, IL 60048, U.S.A.

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- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**
- The data shown in this test report were carried out on Feb. 20, 2008 at **Sporton International Inc. LAB.**
- Report No.: FR821318, Report Version: Rev. 02.


Roy Wu
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: Mar. 03, 2008

Report No.	Description



1. General Description of Equipment under Test

1.1. Applicant

MOTOROLA, INC.

600 N U.S. HIGH WAY 45 Libertyville, IL 60048, U.S.A.

1.2. Manufacturer

MERRY ELECTRONIC CO., LTD.

50 Mei Bao Road, Dalang Industrial Park, Dalang, BaoAn, Shen zhen, China

1.3. Basic Description of Equipment under Test

Equipment		MOTOROKR
Trade Name		Motorola
Model Name		EQ7
FCC ID		IHDT6JL1
AC Adapter	Brand Name	LEADER ELECTRONICS INC.
	Model Name	NU20-5120125-13
	Power Rating	I/P:100-240Vac, 50-60Hz, 1.0A; O/P: 12Vdc, 1.25mA
	AC Power Cord Type	1.9 meter non-shielded cable without ferrite core
Audio Line	Brand Name	WECO
	Model Name	8-VC X3.5STM-M 6FT
	Signal Line Type	1.8 meter shielded cable without ferrite core

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	MOTOROKR		
Trade Name	Motorola		
Model Name	EQ7		
FCC ID	IHDT6JL1		
Tx Frequency	Bluetooth : 2400 MHz ~ 2483.5 MHz		
Rx Frequency	Bluetooth : 2400 MHz ~ 2483.5 MHz		
Number of Channels	Bluetooth : 79		
Carrier Frequency of Each Channel	Bluetooth : 2402+n*1 MHz; n=0~78		
Channel Spacing	Bluetooth : 1 MHz		
Maximum Output Power to Antenna	Bluetooth : 10.4 dBm		
Type of Antenna Connector	N/A		
Antenna Type	Bluetooth : PCB print		
Antenna Gain	Bluetooth : -3 dBi		
Type of Modulation	Bluetooth : GFSK		
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 EUT is programmed to transmit signal continuously for all tests.
- Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.

2.2. Test Mode

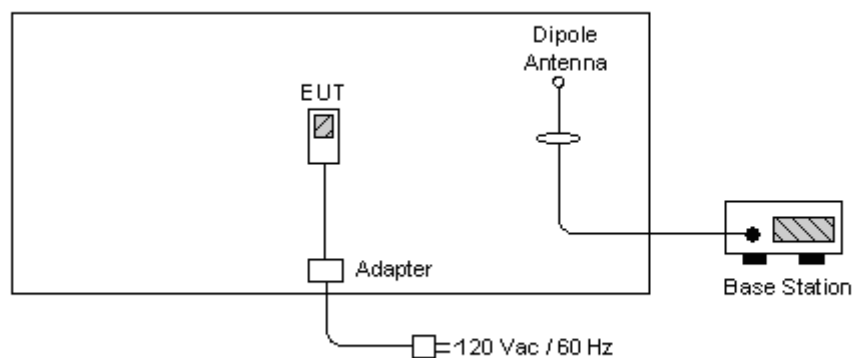
Application	Bluetooth
Radiated Emission / RF Conducted	Mode 1: Tx_CH00_2402 MHz Mode 2: Tx_CH39_2441 MHz Mode 3: Tx_CH78_2480 MHz
Conducted Emission	Mode 1: BT Link Mode

2.3. Ancillary Equipment List

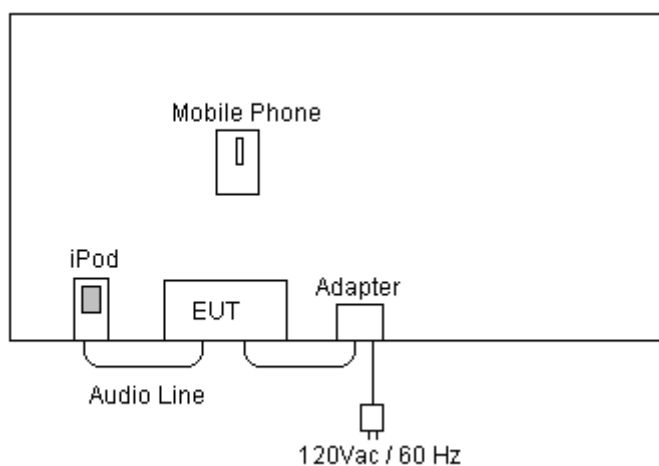
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable / Power Cord
1.	BT Base Station	Anritus	8852A	N/A	Unshielded, 1.8m
2.	Mobile Phone	Sony Ericsson	W660i	PY7A3022071	N/A
3.	iPod	Apple	A1199	DoC	Shielded, 1.2m

2.4. Connection Diagram of Test System

<Radiated Emission>



<Conducted Emission>





3. RF Utility

The EUT is in BT Link mode with mobile phone for conducted emission or in BT continuous Tx Mode controlled by base station simulator for radiation emission.



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 : CO01-HY, 03CH06-HY

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

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

The Emission Mode: Bluetooth

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. Hopping Channel Separation

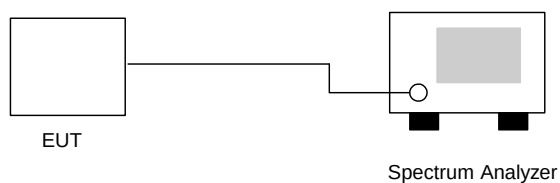
5.2.1. Measuring Instruments :

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: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

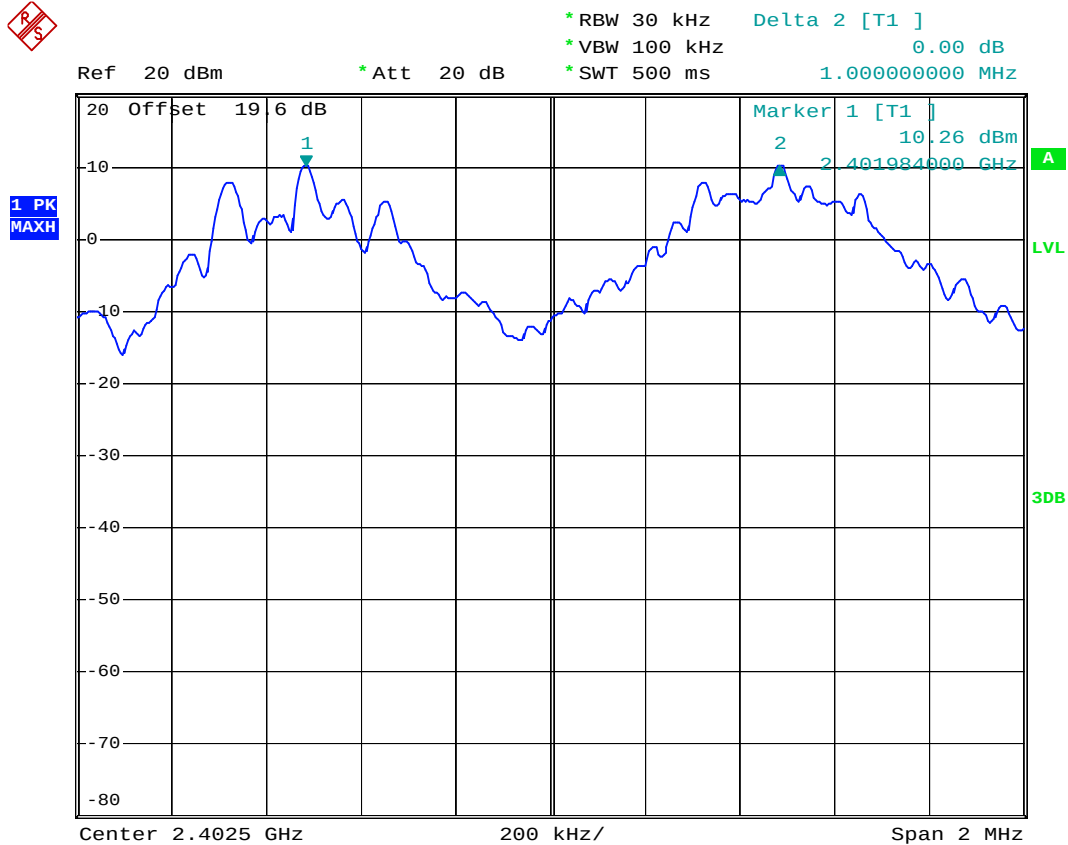
Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.625	Mode 1
39	2441	1.000	0.624	Mode 2
78	2480	1.004	0.625	Mode 3

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



5.2.5. Hopping Channel Separation

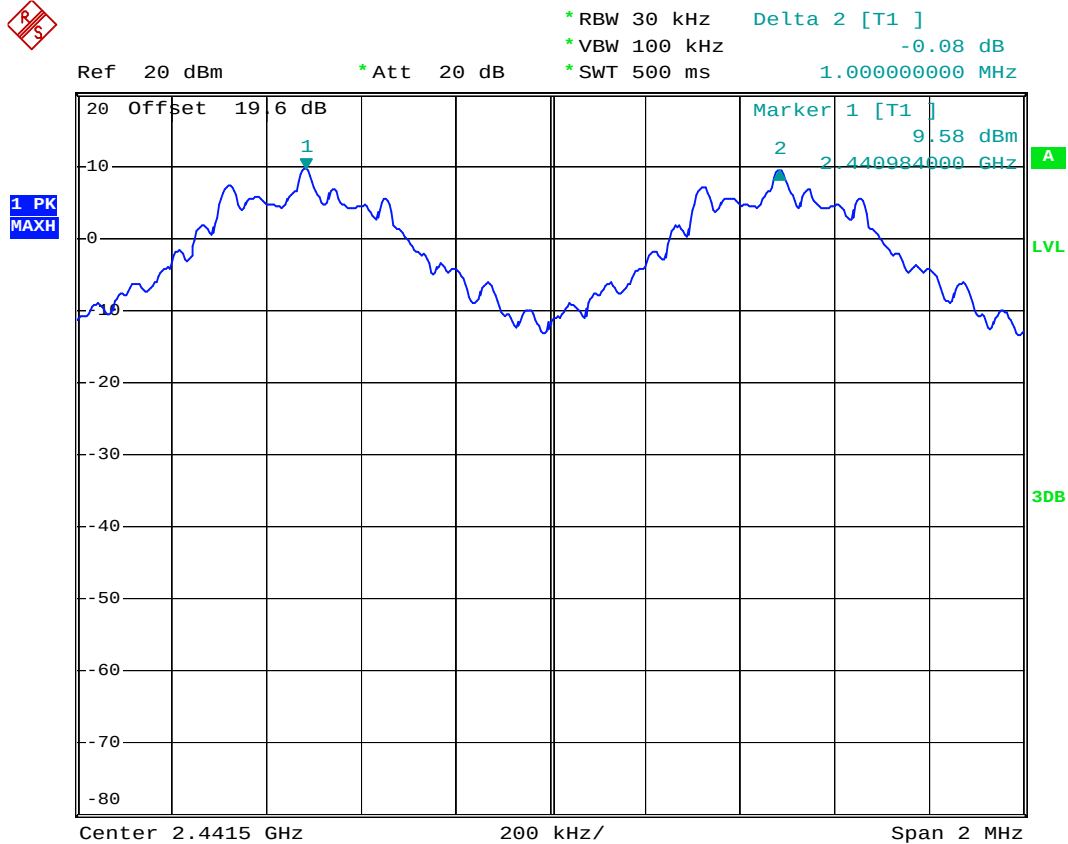
Mode 1: CH00 (2402MHz)



Date: 19.FEB.2008 14:47:12



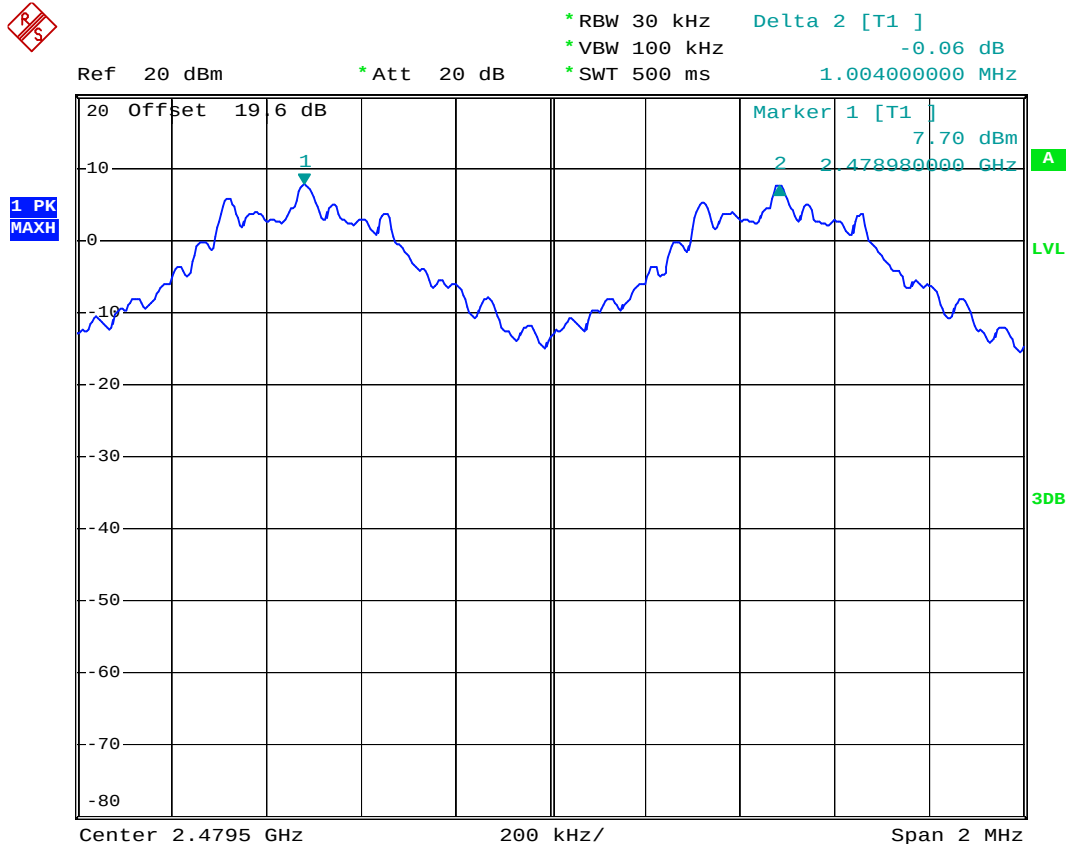
Mode 2: CH39 (2441MHz)



Date: 19.FEB.2008 14:48:03



Mode 3: CH78 (2480MHz)



Date: 19.FEB.2008 14:49:20

5.3. Number of Hopping Frequency

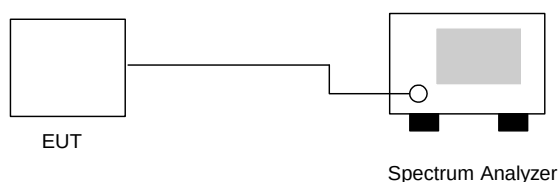
5.3.1. Measuring Instruments :

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 :



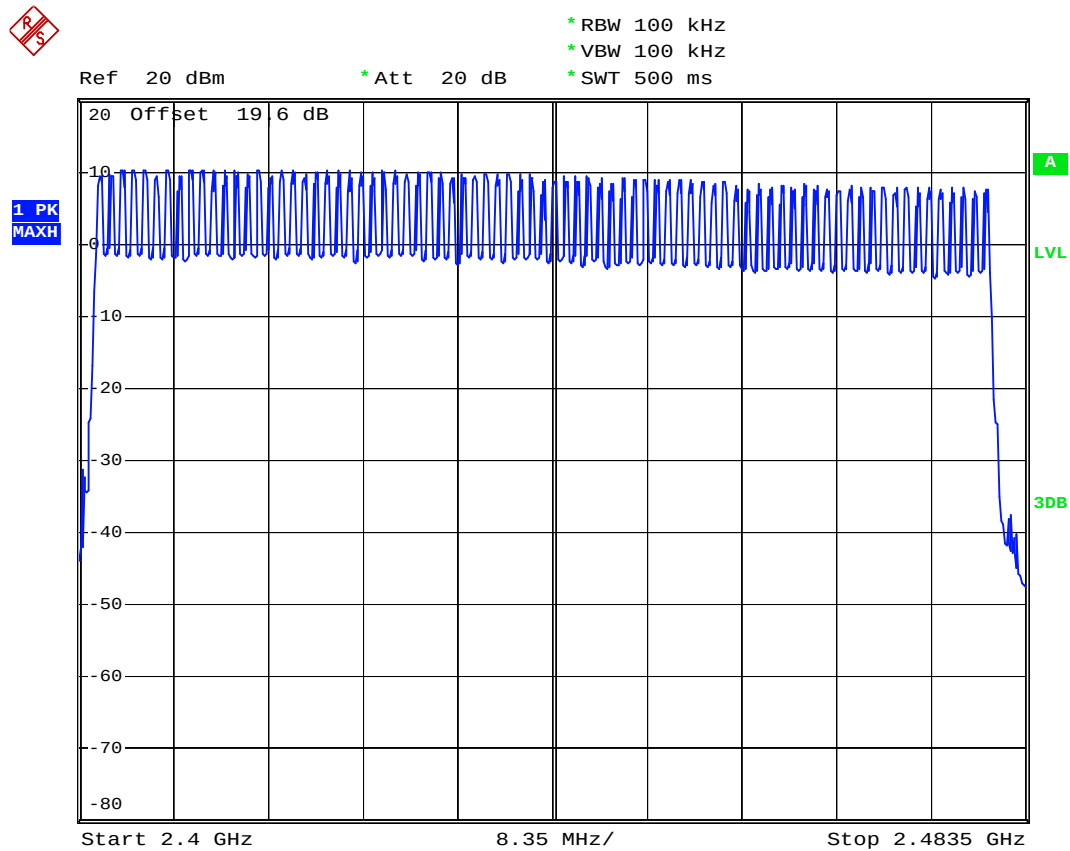
5.3.4. Test Result : See spectrum analyzer plots below

- Temperature: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

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



5.3.5. Number of Hopping Frequency



Date: 19.FEB.2008 15:04:23

5.4 Hopping Channel Bandwidth

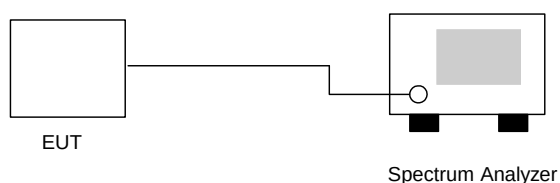
5.4.1 Measuring Instruments :

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

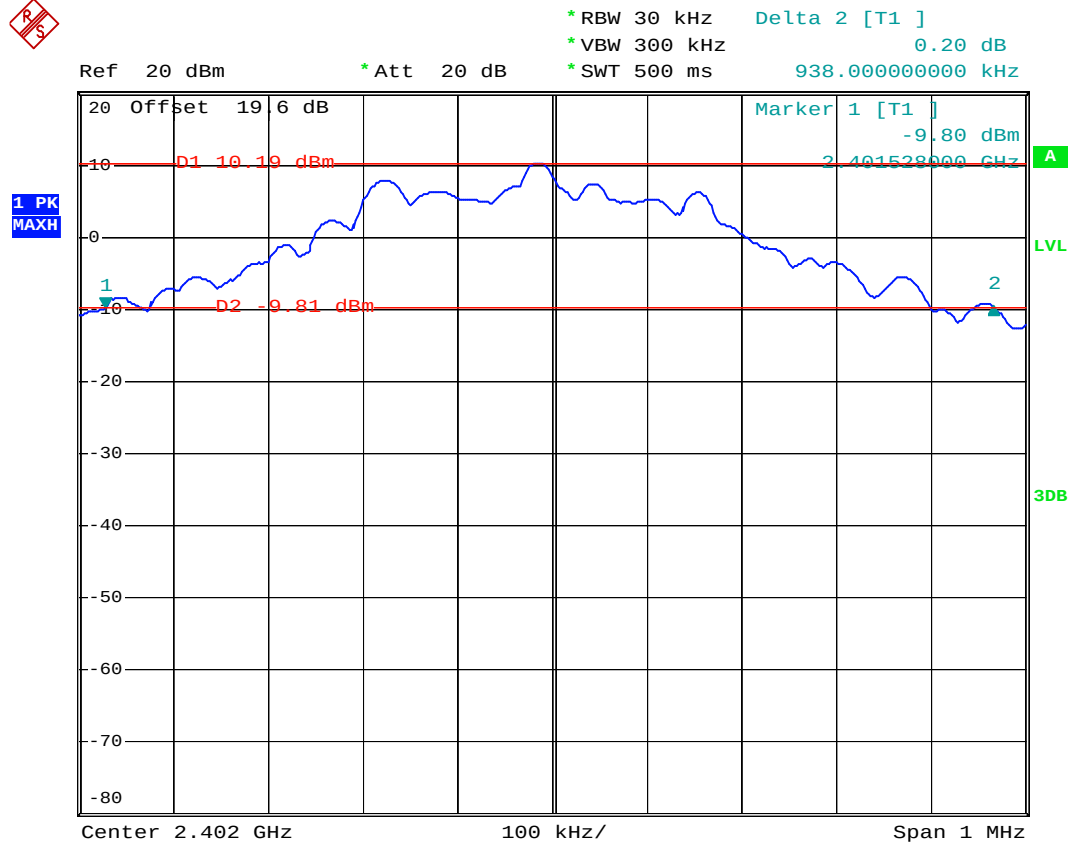
- Temperature: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.938	1.0	Mode 1
39	2441	0.936	1.0	Mode 2
78	2480	0.938	1.0	Mode 3



5.4.5 Hopping Channel Bandwidth

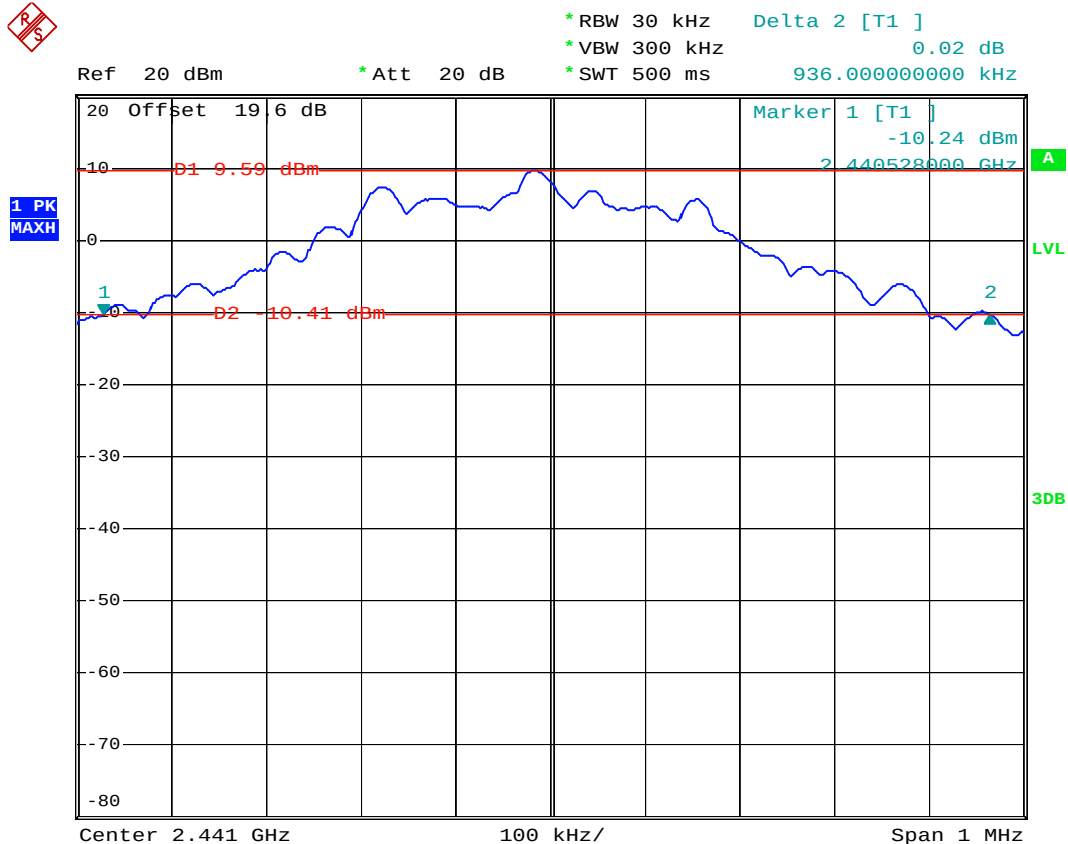
Mode 1: CH00 (2402MHz)



Date: 19.FEB.2008 14:39:29



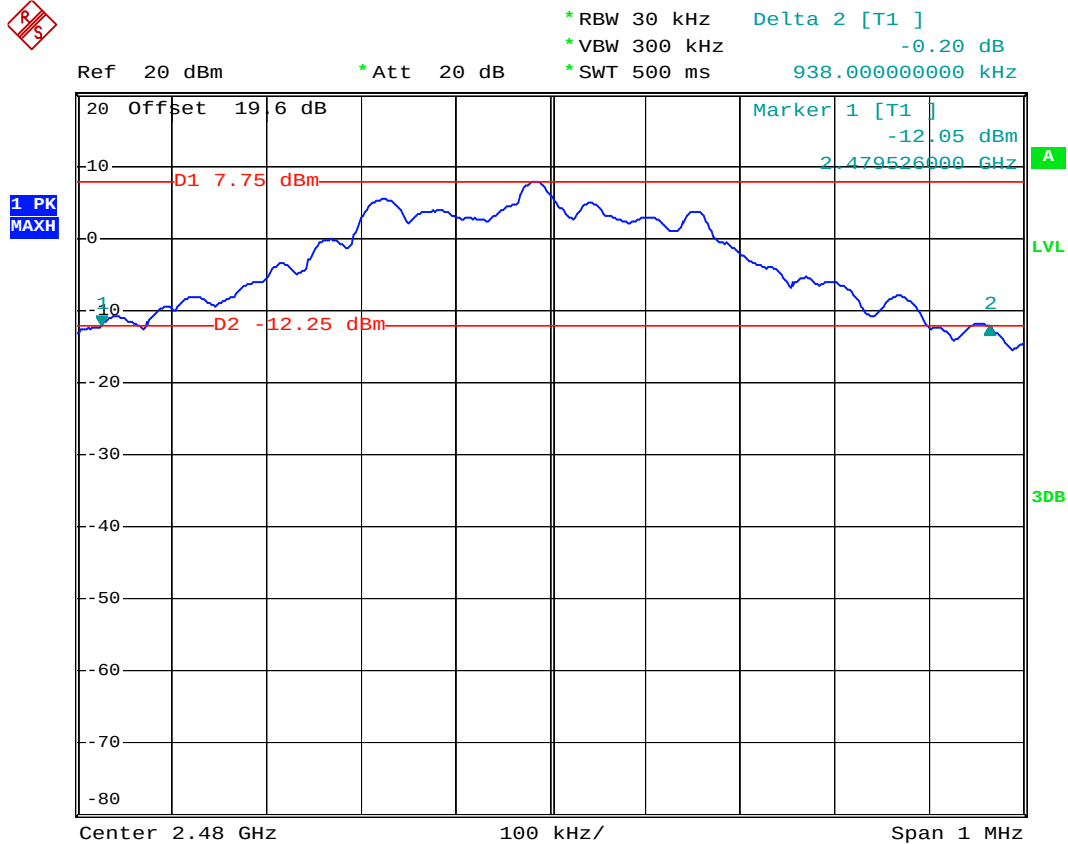
Mode 2: CH39 (2441MHz)



Date: 19.FEB.2008 14:40:46



Mode 3: CH78 (2480MHz)



Date: 19.FEB.2008 14:43:42

5.5 Dwell Time of Each Frequency within a 30 Seconds Period

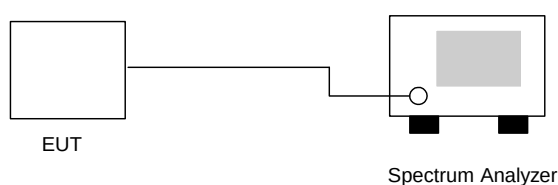
5.5.1 Measuring Instruments :

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 = $30 \times (1600/79) \times t$ (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: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

Ch39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.1	560	0.143	0.4
DH3	4.5	1820	0.259	0.4
DH5	3.2	3100	0.313	0.4

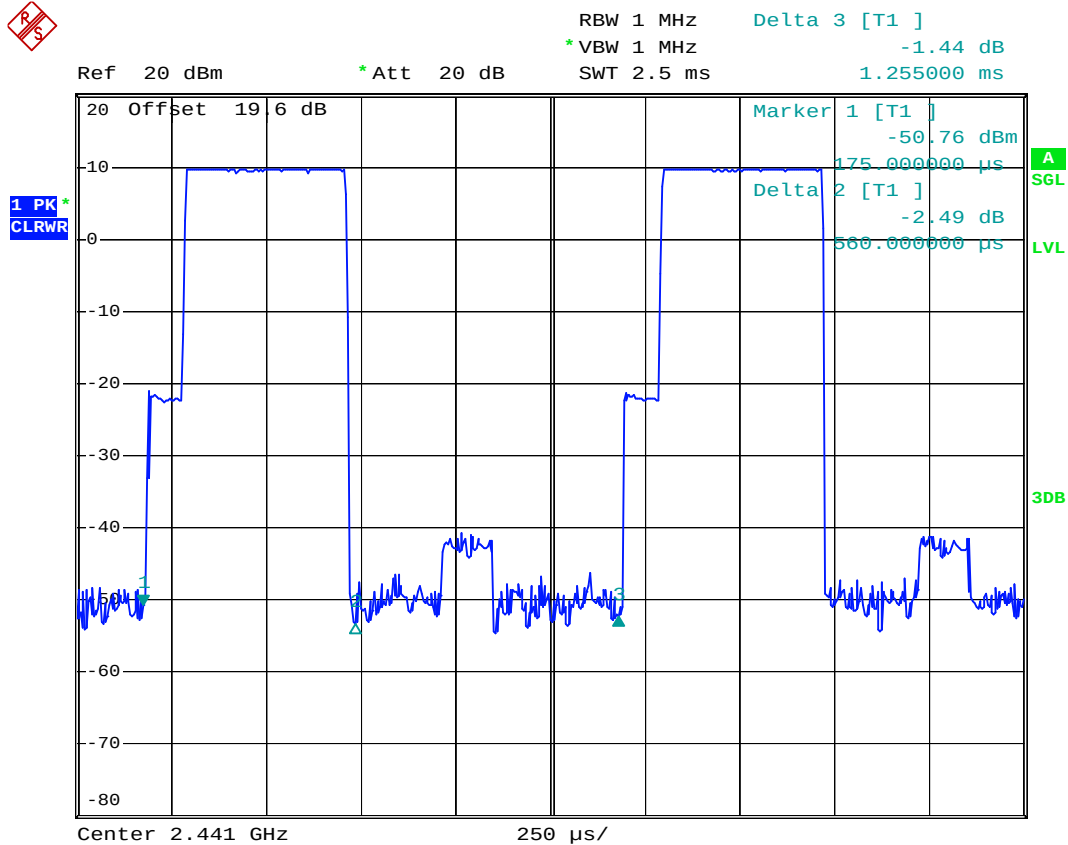
※ Remark:

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

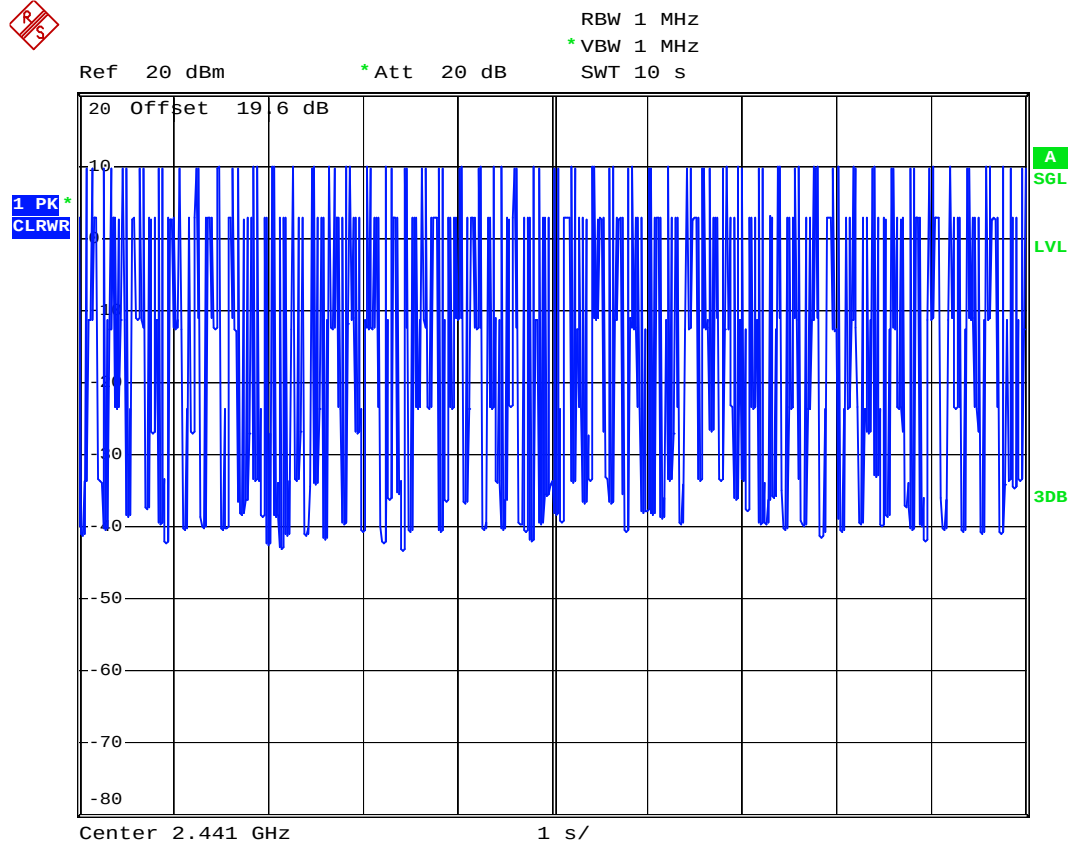
DH1 (CH39)



Date: 19.FEB.2008 14:50:46



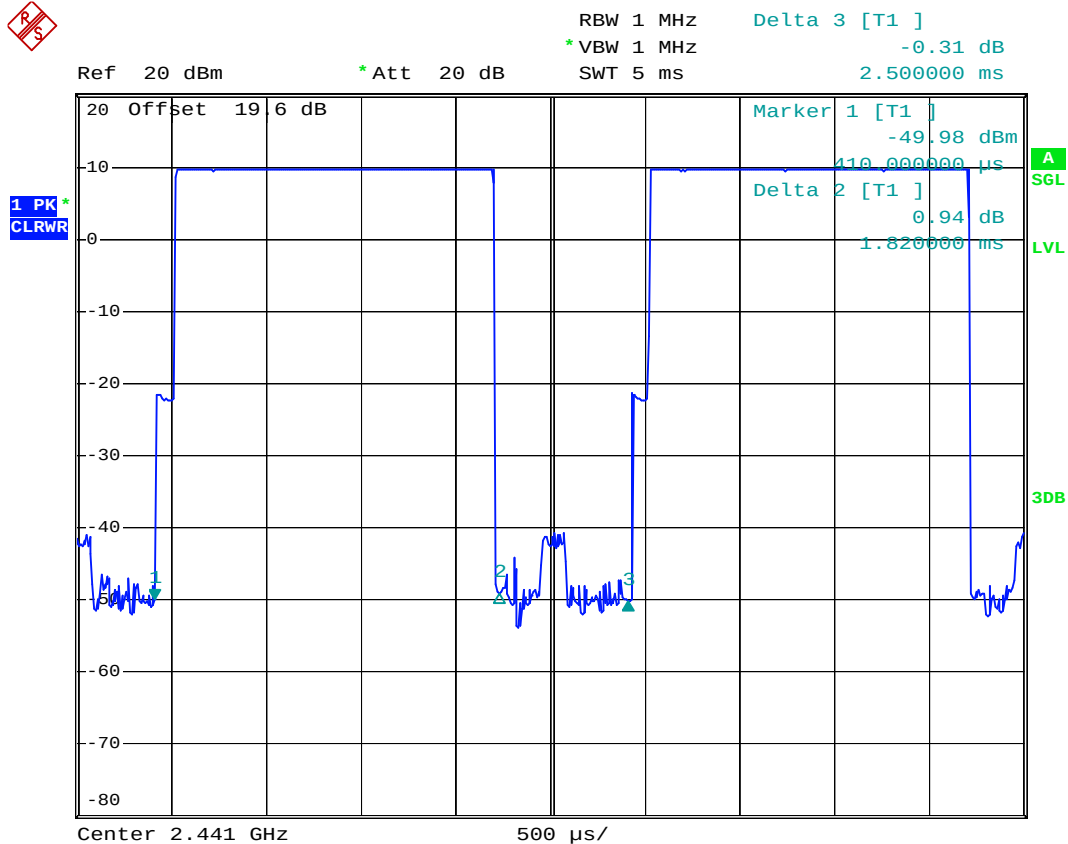
DH1 (CH39)



Date: 19.FEB.2008 14:57:01



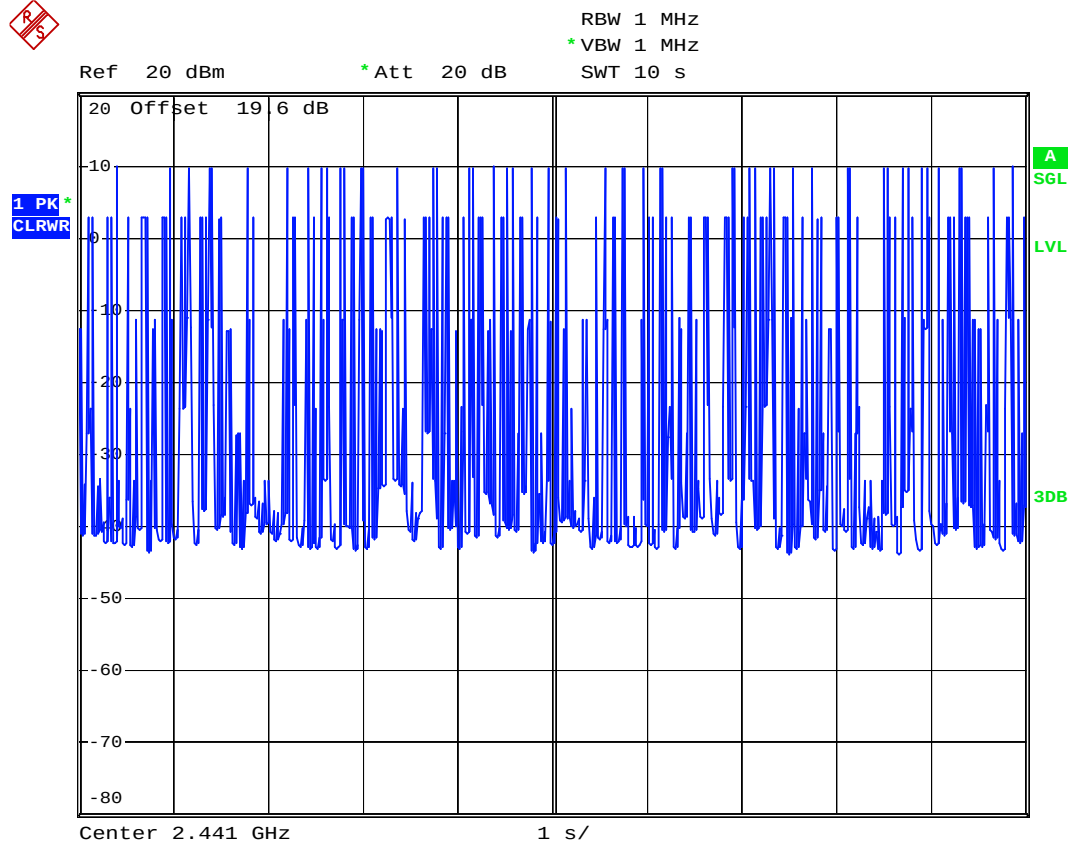
DH3 (CH39)



Date: 19.FEB.2008 14:55:14



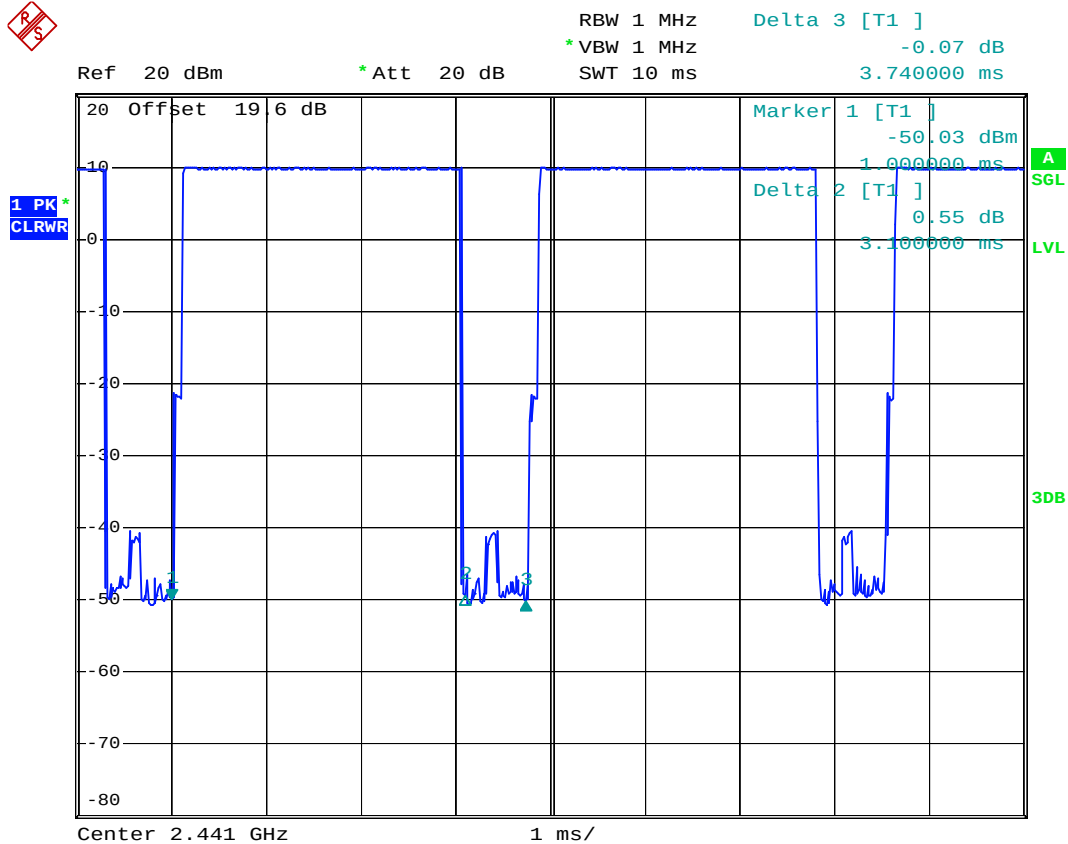
DH3 (CH39)



Date: 19.FEB.2008 14:57:52



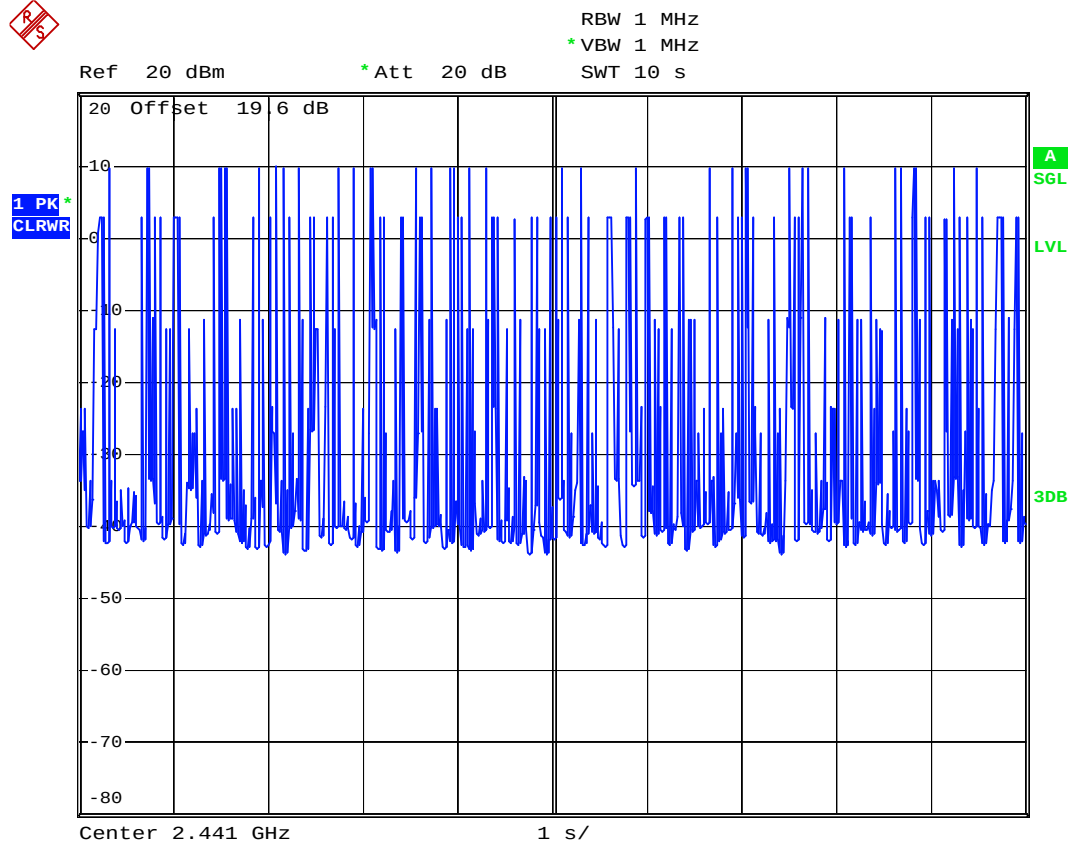
DH5 (CH39)



Date: 19.FEB.2008 14:55:51



DH5 (CH39)



Date: 19.FEB.2008 14:56:32

5.6 Output Power

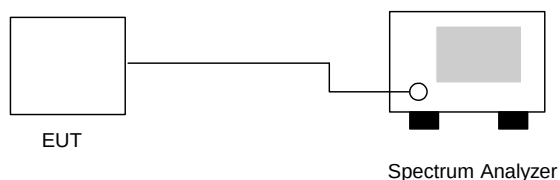
5.6.1 Measuring Instruments :

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

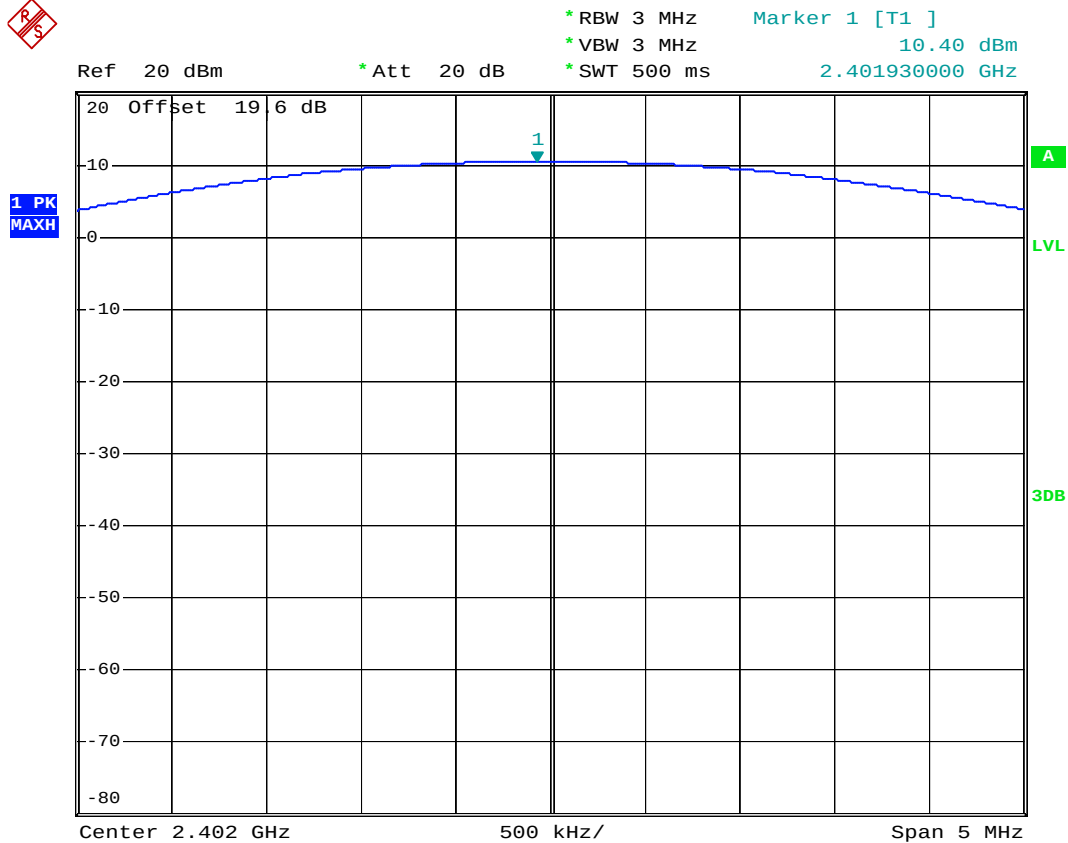
- Temperature: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt / dBm)	Plot Ref. No.
00	2402	10.4	1W / 30dBm	Mode 1
39	2441	9.93	1W / 30dBm	Mode 2
78	2480	7.9	1W / 30dBm	Mode 3



5.6.5 Output Power

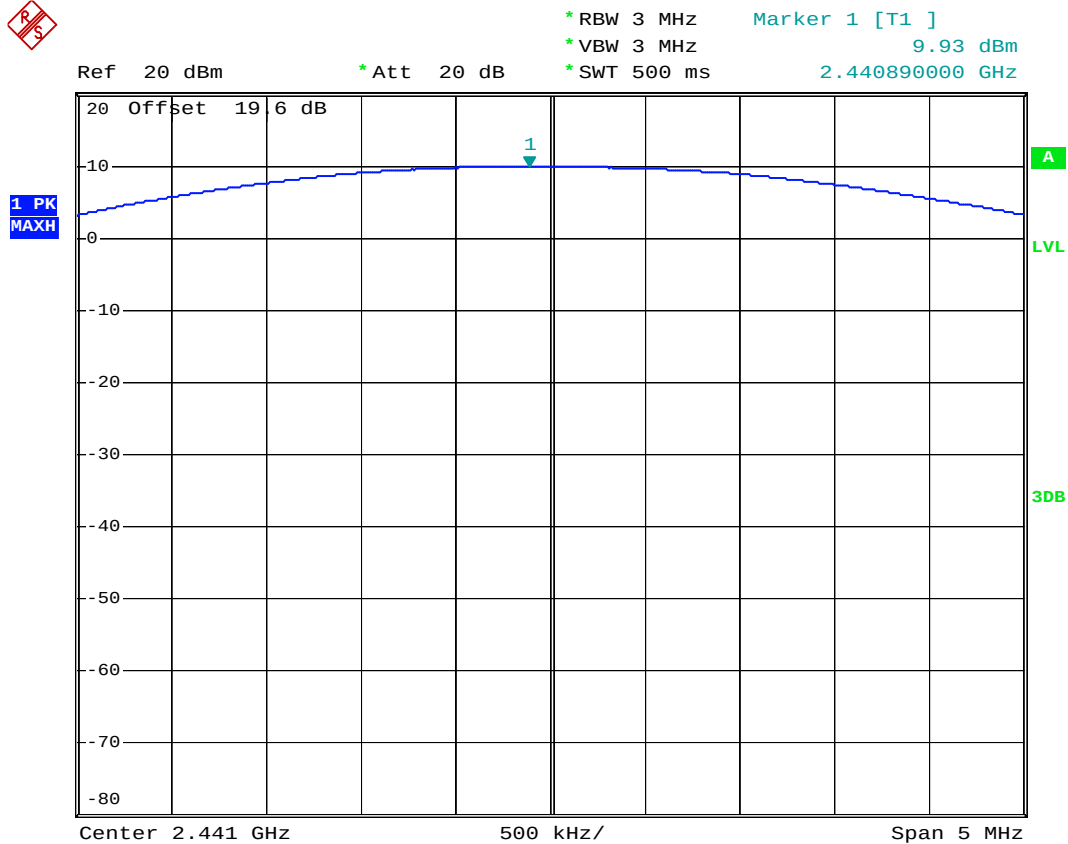
Mode 1: CH00 (2402MHz)



Date: 19.FEB.2008 14:12:57



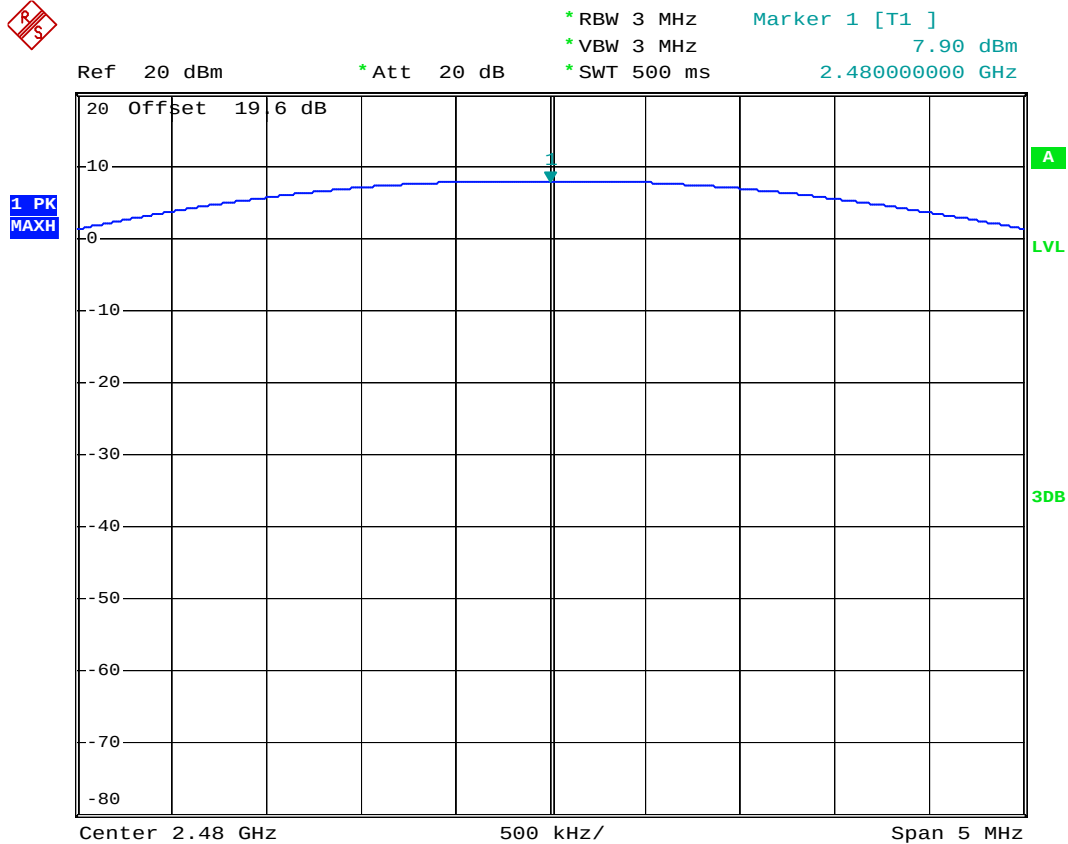
Mode 2: CH39 (2441MHz)



Date: 19.FEB.2008 14:18:02



Mode 3: CH78 (2480MHz)



Date: 19.FEB.2008 14:18:29



5.7 100kHz Bandwidth of Frequency Band Edges

5.7.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.7.2 Test Procedure :

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

5.7.3 Test Result :

- Temperature: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

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	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Detect Mode
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2390.00	56.71	-17.29	74.00	56.61	31.86	3.92	35.68	100	0	Peak
2390.00	16.64	-37.36	54.00	16.54	31.86	3.92	35.68	100	305	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 48.44 dB

Peak band edge at 2390.00 MHz with RBW = VBW = 1MHz = 105.15 dBuV/m – 48.44 dB = 56.71 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.0031 x 3.2) = -40.07

Average band edge = Peak band edge + Duty factor = 56.71 dBuV/m – 40.07 dB = 16.64 dBuV/m

CH00 (Vertical)

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Detect Mode
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2385.81	56.36	-17.64	74.00	56.26	31.86	3.92	35.68	100	0	Peak
2385.81	16.29	-37.71	54.00	16.19	31.86	3.92	35.68	100	237	Average

Remark:

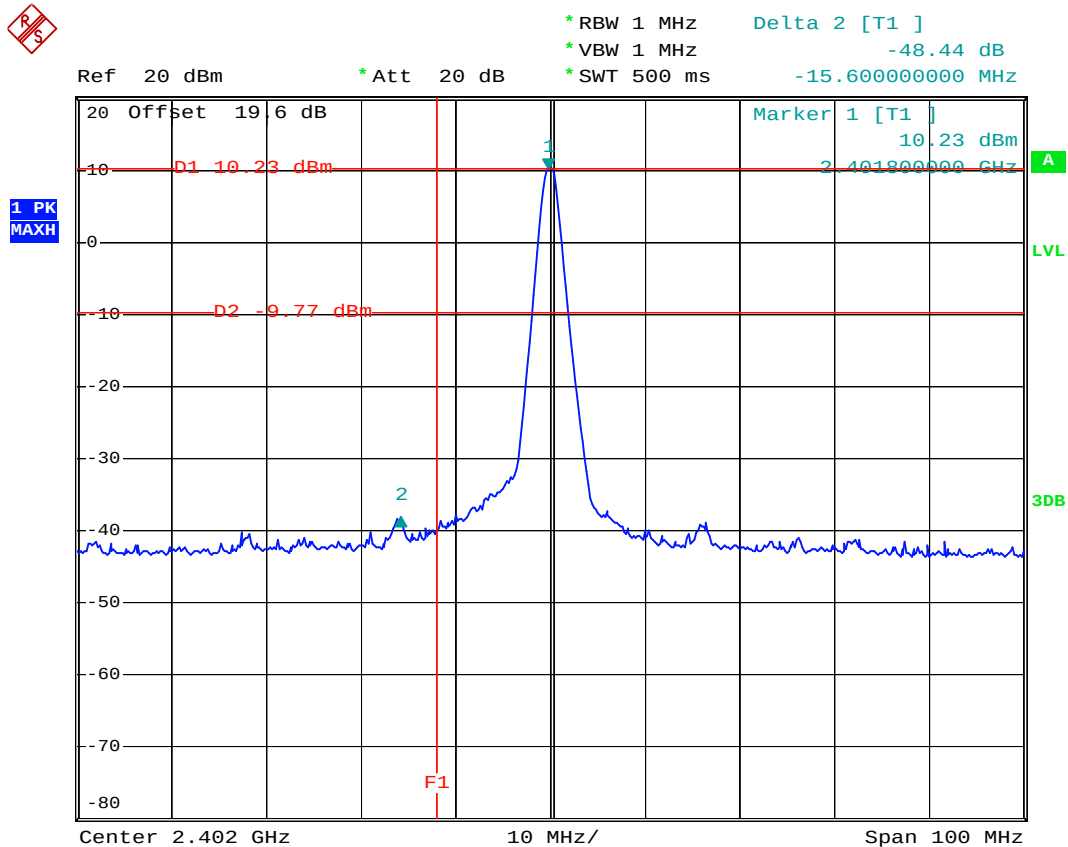
<Delta Marker>

Delta marker at 1% RBW of span = 48.44 dB

Peak band edge at 2485.81 MHz with RBW = VBW = 1MHz = 104.8 dBuV/m – 48.44 dB = 56.36 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.0031 x 3.2) = -40.07

Average band edge = Peak band edge + Duty factor = 56.36 dBuV/m – 40.07 dB = 16.29 dBuV/m



Date: 20.FEB.2008 22:47:47

Conducted Band Edge Emission for CH00



CH78 (Horizontal)

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Detect Mode
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2483.50	68.59	-5.41	74.00	68.26	31.98	4.05	35.70	100	0	Peak
2483.50	28.52	-25.48	54.00	28.19	31.98	4.05	35.70	100	256	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 38.46 dB

Peak band edge at 2483.50 MHz with RBW = VBW = 1MHz = 107.05 dBuV/m – 38.46 dB = 68.59 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.0031 x 3.2) = -40.07

Average band edge = Peak band edge + Duty factor = 68.59 dBuV/m – 40.07 dB = 28.52 dBuV/m

CH78 (Vertical)

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Detect Mode
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	(cm)	(deg)	
2483.50	66.74	-7.26	74.00	66.41	31.98	4.05	35.70	100	0	Peak
2483.50	26.67	-27.33	54.00	26.34	31.98	4.05	35.70	100	237	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 38.46 dB

Peak band edge at 2483.50 MHz with RBW = VBW = 1MHz = 105.2 dBuV/m – 38.46 dB = 66.74 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.0031 x 3.2) = -40.07

Average band edge = Peak band edge + Duty factor = 66.74 dBuV/m – 40.07 dB = 26.67 dBuV/m



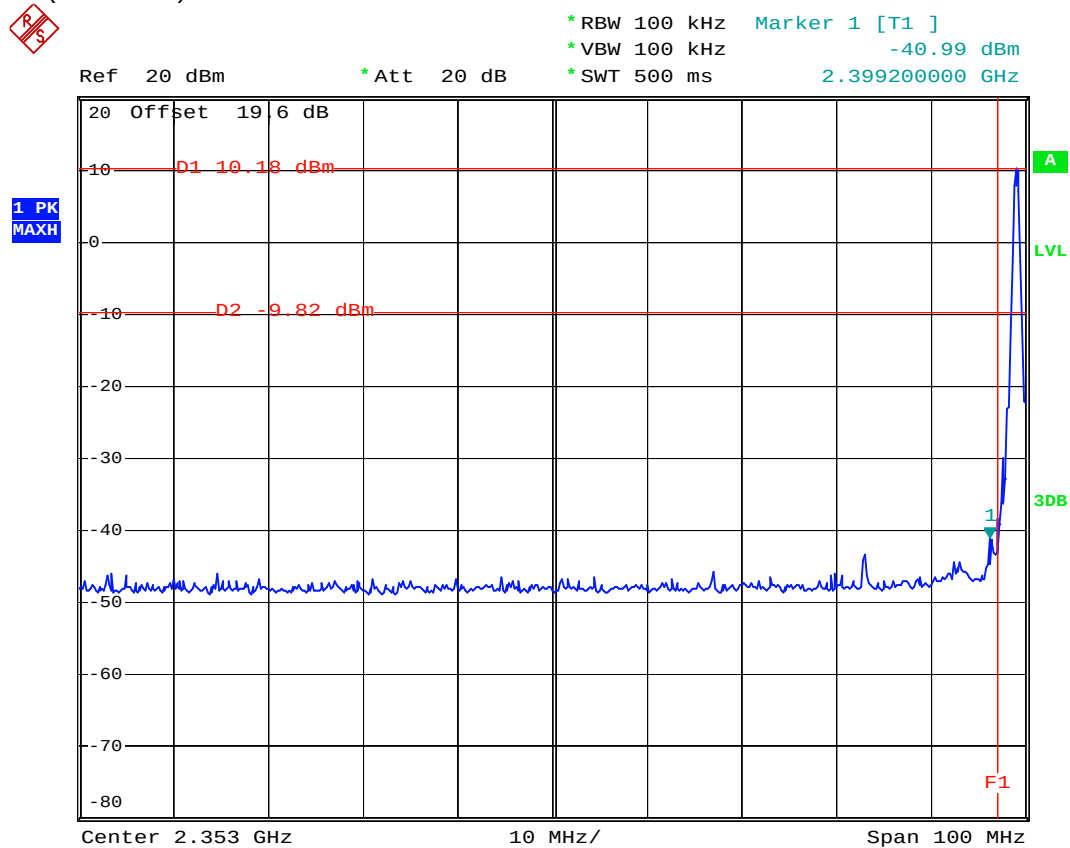
Report No. : FR821318



Conducted Band Edge Emission for CH78



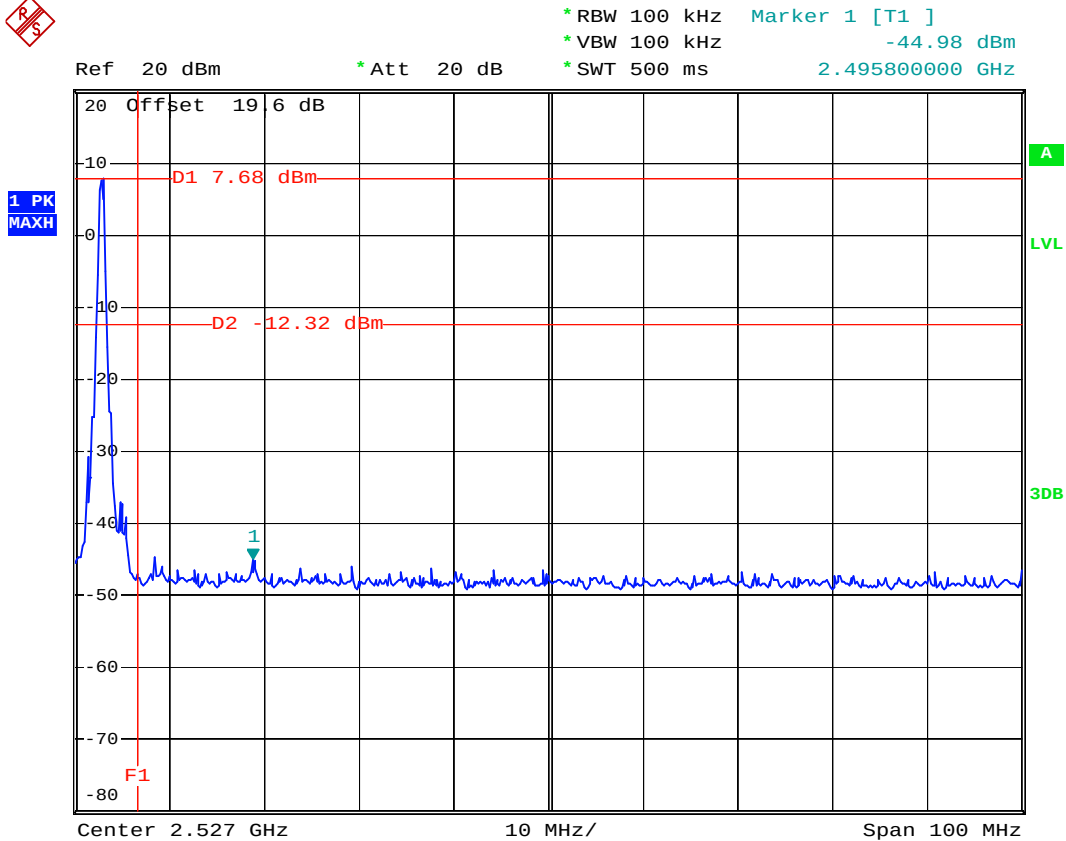
CH00 (2402 MHz)



Date: 19.FEB.2008 14:46:24



CH78 (2480 MHz)



Date: 19.FEB.2008 14:45:00

5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

5.8.2 Test Procedures :

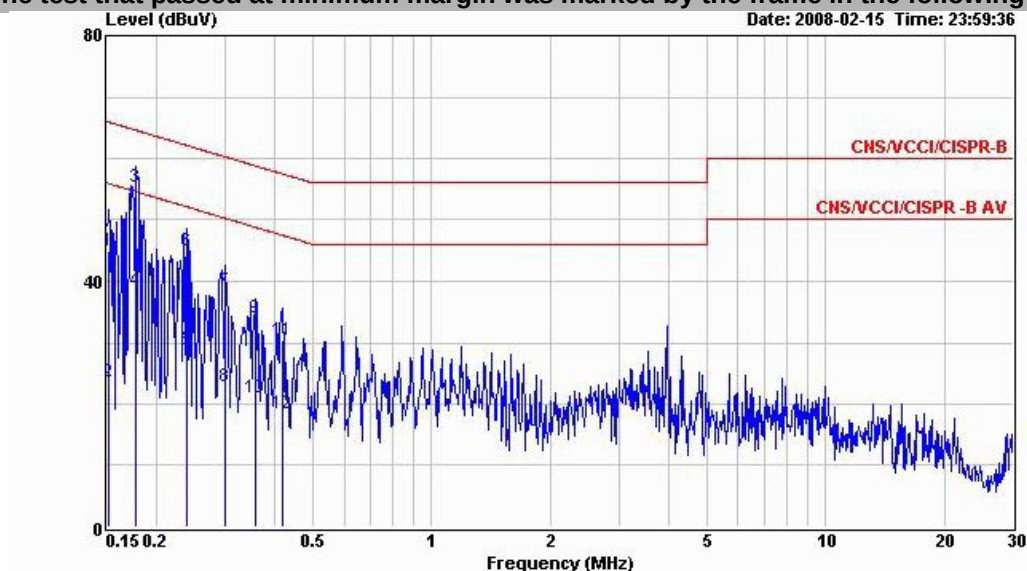
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network (LISN).
- c. All the support units are connected to the other LISN.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



5.8.3 Test Data Test Mode 1

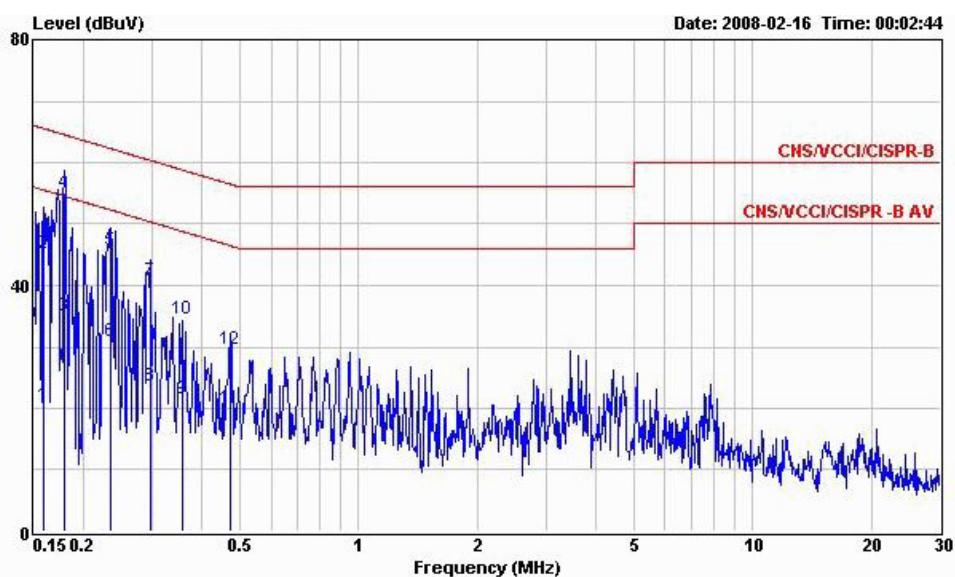
- Temperature: 24~24°C
- Relative Humidity: 50~56%
- Test Engineer : Sun

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



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2001/004 200604 LINE
EUT : Bluetooth Speaker
Power : 120Vac/60Hz
Model : FR 821318
Memo : BT Link + Adaptor + I-Pod

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	44.99	-20.90	65.89	44.79	0.10	0.10	QP
2	0.152	23.55	-32.34	55.89	23.35	0.10	0.10	Average
3	0.178	55.38	-9.20	64.58	55.19	0.10	0.09	QP
4	0.178	38.35	-16.23	54.58	38.16	0.10	0.09	Average
5	0.239	28.79	-23.34	52.13	28.60	0.10	0.09	Average
6	0.239	44.97	-17.16	62.13	44.78	0.10	0.09	QP
7	0.299	38.46	-21.81	60.27	38.26	0.10	0.10	QP
8	0.299	22.79	-27.48	50.27	22.59	0.10	0.10	Average
9	0.358	34.13	-24.64	58.77	33.92	0.10	0.11	QP
10	0.358	21.12	-27.65	48.77	20.91	0.10	0.11	Average
11	0.417	30.50	-27.01	57.51	30.28	0.10	0.12	QP
12	0.417	18.33	-29.18	47.51	18.11	0.10	0.12	Average



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL
EUT : Bluetooth Speaker
Power : 120Vac/60Hz
Model : FR 821318
Memo : BT Link + Adaptor + I-Pod

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.159	20.43	-35.09	55.52	20.24	0.10	0.09	Average
2	0.159	45.32	-20.20	65.52	45.13	0.10	0.09	QP
3	0.179	35.15	-19.38	54.53	34.96	0.10	0.09	Average
4	0.179	54.98	-9.55	64.53	54.79	0.10	0.09	QP
5	0.234	45.70	-16.61	62.31	45.51	0.10	0.09	QP
6	0.234	30.79	-21.52	52.31	30.60	0.10	0.09	Average
7	0.296	40.77	-19.58	60.35	40.57	0.10	0.10	QP
8	0.296	23.55	-26.80	50.35	23.35	0.10	0.10	Average
9	0.357	21.49	-27.31	48.80	21.28	0.10	0.11	Average
10	0.357	34.60	-24.20	58.80	34.39	0.10	0.11	QP
11	0.474	19.95	-26.49	46.44	19.72	0.10	0.13	Average
12	0.474	29.61	-26.83	56.44	29.38	0.10	0.13	QP

5.9 Radiated Emission Measurement

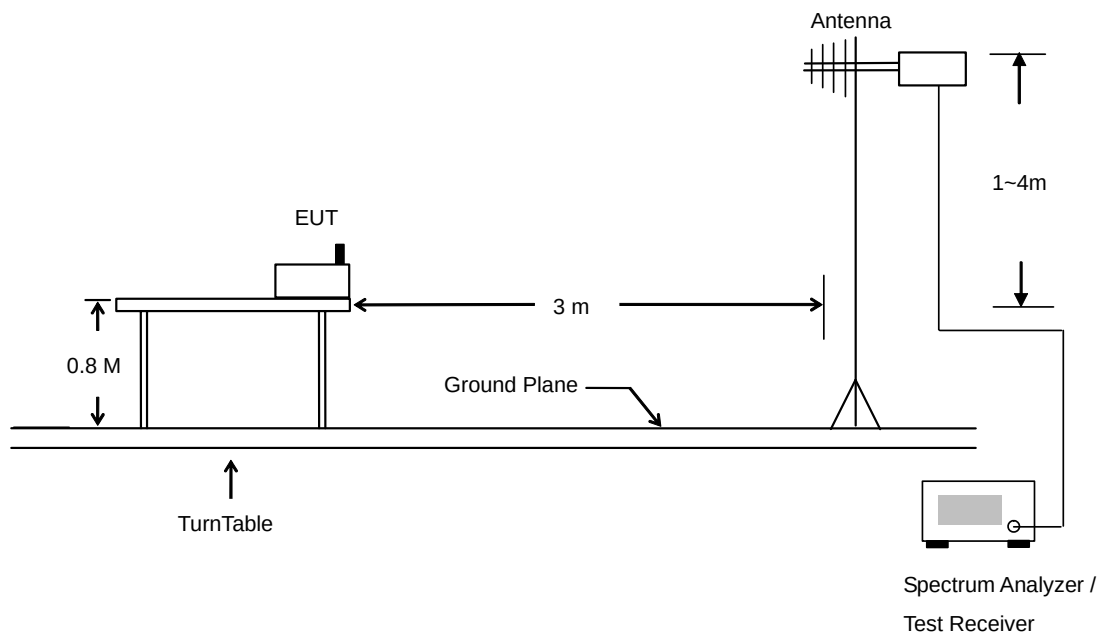
5.9.1 Measuring Instruments

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

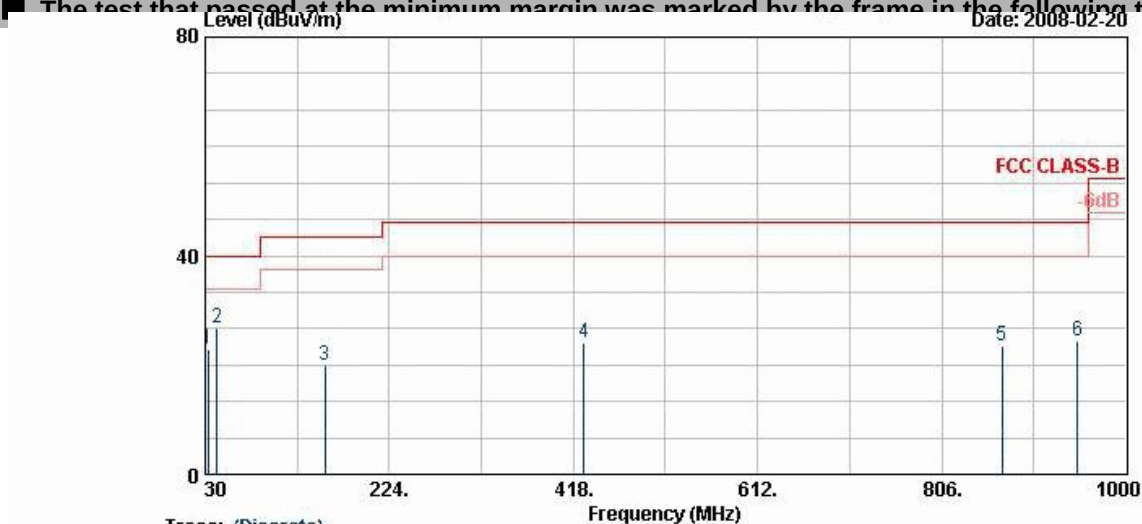




5.9.4 Test Data

- Temperature : 24~25°C
- Relating Humidity : 50~51%
- Test Engineer : Derek
- Test Mode : Mode 1
- Polarization : Horizontal

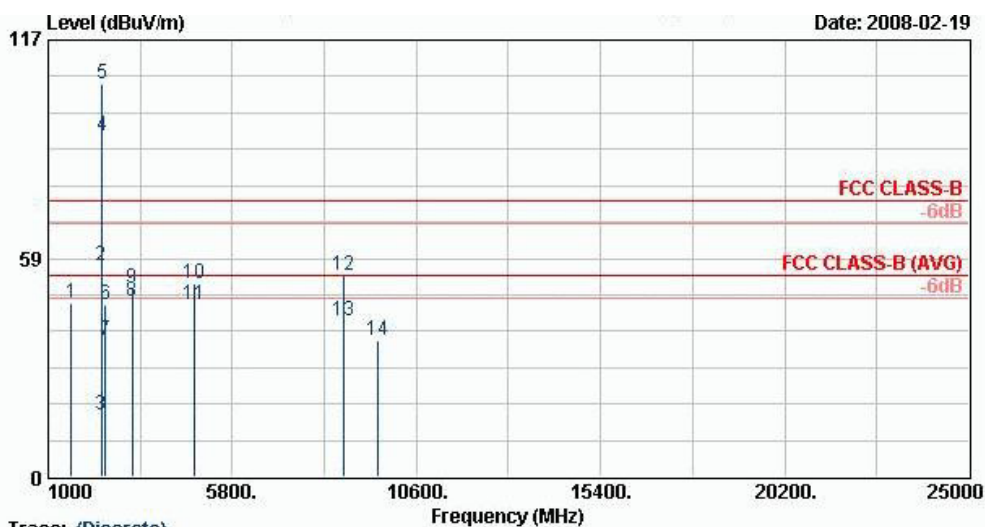
The test that passed at the minimum margin was marked by the frame in the following table



Trace: (Discrete)

Site : 03CH06-RY
 Condition : FCC CLASS-B 3m LF-ANT(051121) HORIZONTAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : BT Tx_Ch00 ; 2402MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	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	33.24	22.94	-17.06	40.00	38.47	17.54	0.30	33.38	---	---	Peak
2	42.69	26.76	-13.24	40.00	47.59	12.02	0.30	33.15	100	122	Peak
3	156.09	20.00	-23.50	43.50	42.68	10.24	0.60	33.52	---	---	Peak
4	428.80	23.96	-22.04	46.00	40.06	16.24	0.80	33.14	---	---	Peak
5	869.80	23.59	-22.41	46.00	34.70	20.32	1.30	32.73	---	---	Peak
6	948.90	24.26	-21.74	46.00	34.63	20.87	1.20	32.45	---	---	Peak



Trace: (Discrete)

Site : 03CH06-RV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : BT Tx_Ch00 ; 2402MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	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	1598.00	46.44	-27.56	74.00	51.02	28.26	2.93	35.77	100	0 Peak
2	2390.00	56.71	-17.29	74.00	56.61	31.86	3.92	35.68	100	0 Peak
3	2390.00	16.64	-37.36	54.00	16.54	31.86	3.92	35.68	100	305 Average
4 @	2402.00	91.52	-22.48	74.00	91.42	31.86	3.92	35.68	100	305 Average
5 @	2402.00	105.15	-22.48	74.00	105.06	31.86	3.92	35.68	100	0 Peak
6	2500.00	46.06	-27.94	74.00	45.71	32.00	4.05	35.70	100	0 Peak
7	2500.00	36.32	-17.68	54.00	35.97	32.00	4.05	35.70	100	305 Average
8 @	3201.00	46.76	-7.24	54.00	45.04	32.88	4.70	35.86	100	287 Average
9	3201.00	50.37	-23.63	74.00	48.65	32.88	4.70	35.86	100	0 Peak
10	4806.00	51.73	-22.27	74.00	47.52	34.12	5.77	35.68	100	0 Peak
11 @	4806.00	46.12	-7.88	54.00	41.91	34.12	5.77	35.68	100	181 Average
12	8691.00	53.91	-20.09	74.00	46.86	36.06	7.42	36.42	100	0 Peak
13	8691.00	41.57	-12.43	54.00	34.52	36.06	7.42	36.42	100	128 Average
14	9606.00	36.66	-37.34	74.00	75.61	-10.16	7.93	36.72	100	0 Peak

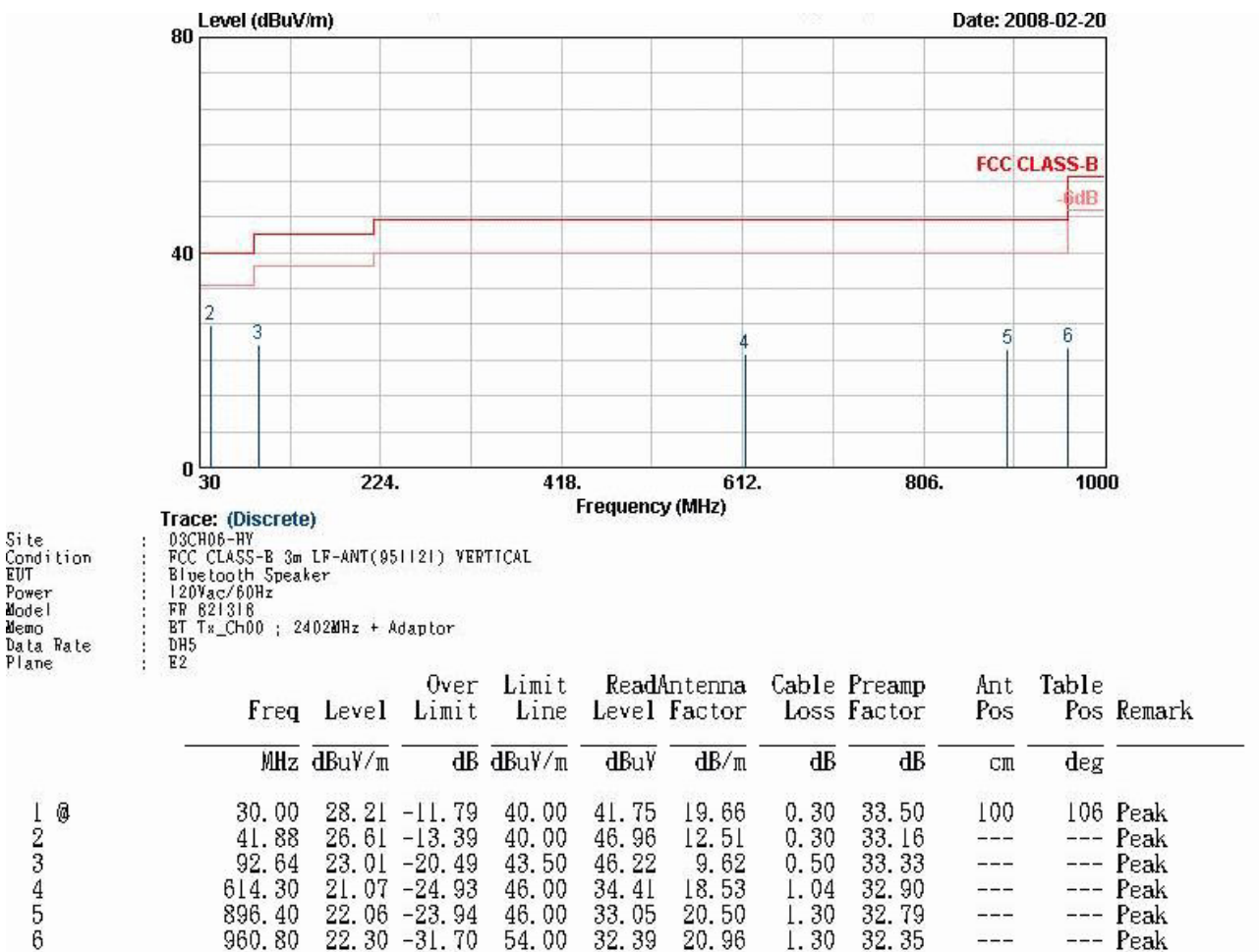
Remark: 1. #4 and #5 Fundamental Signal

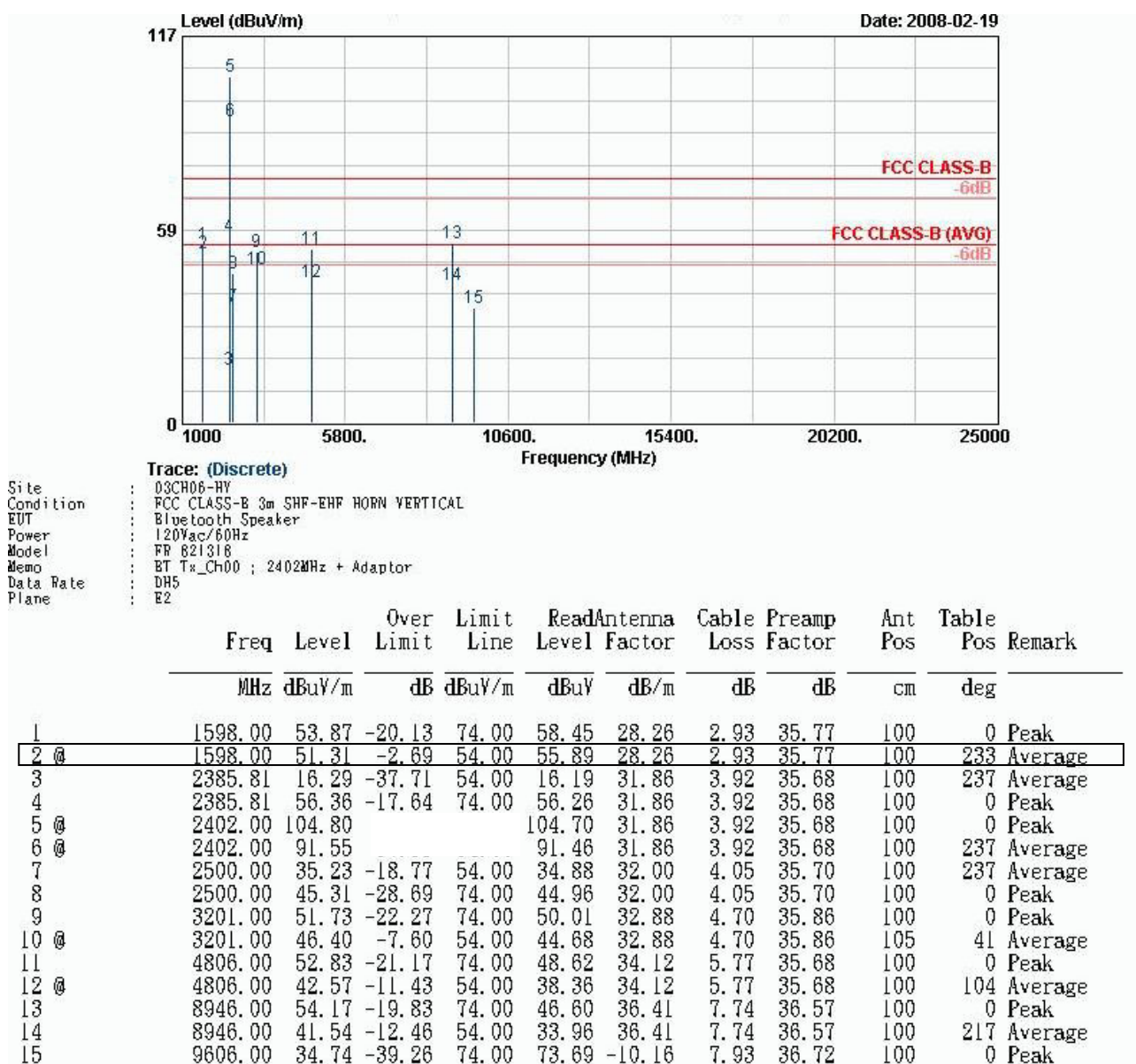
2. There's no more obvious spurious emission except the listings above.



- Test Mode : Mode 1
- Polarization : Vertical

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





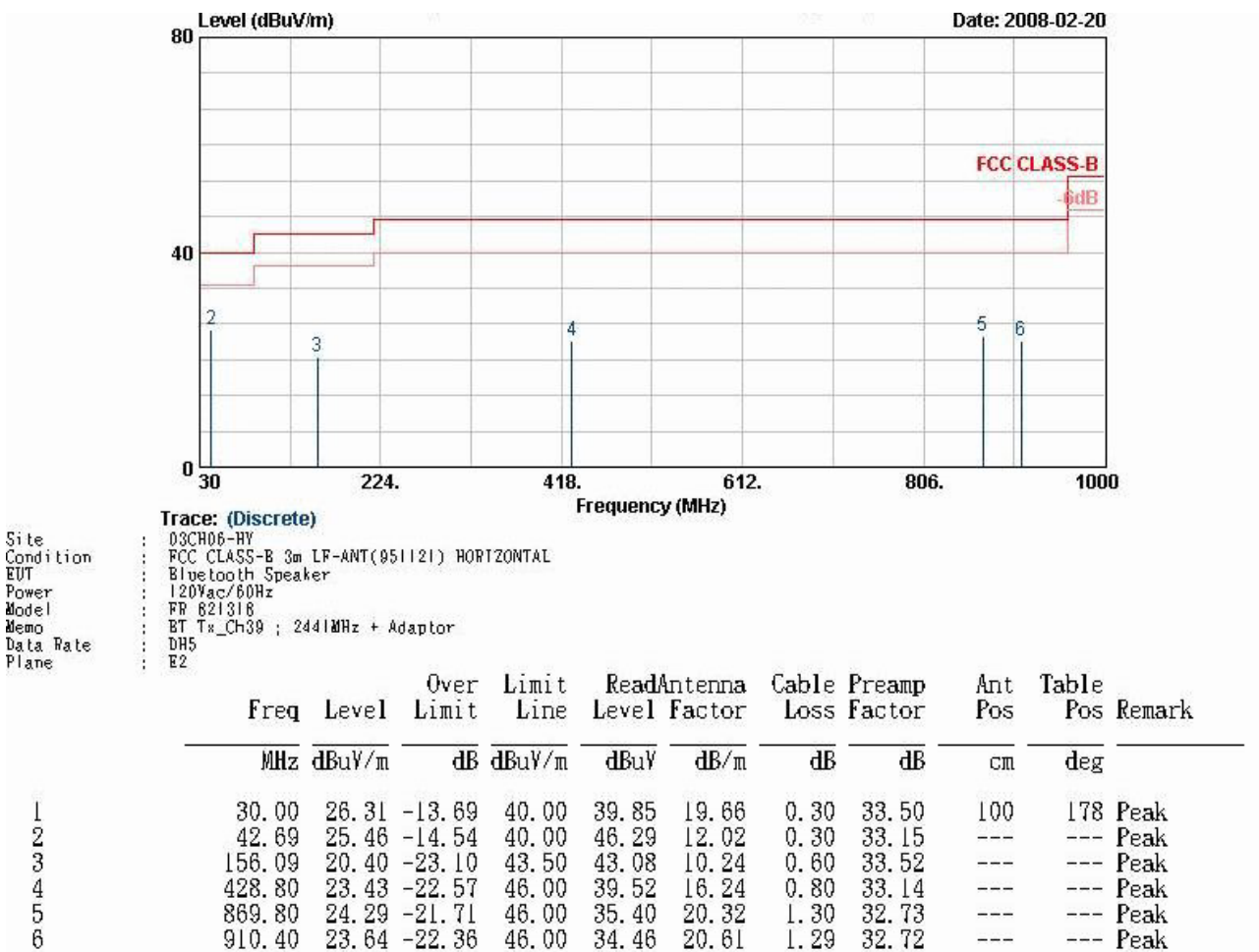
Remark: 1. #5 and #6 Fundamental Signal

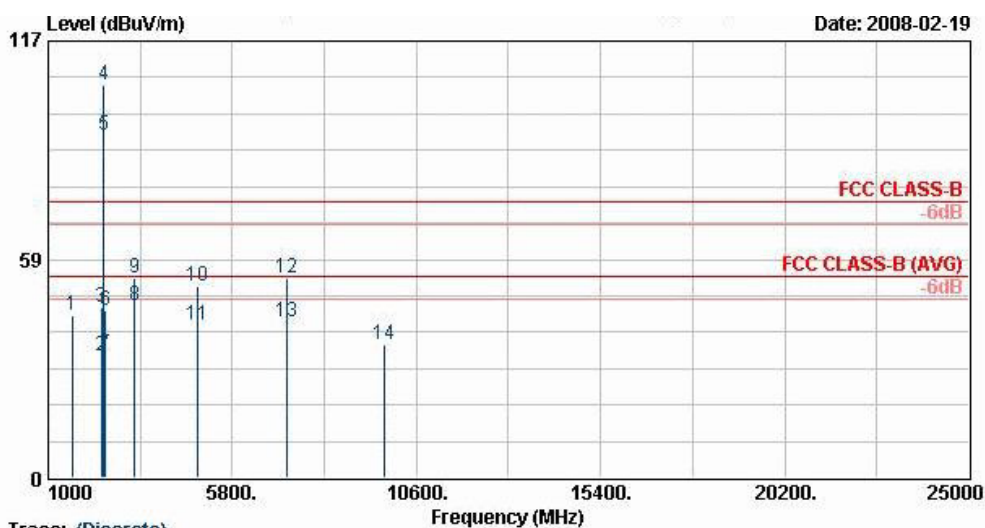
2. There's no more obvious spurious emission except the listings above.



- Test Mode : Mode 2
- Polarization : Horizontal

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





Trace: (Discrete)

Site : 03CH06-RV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : BT Tx_Ch39 ; 2441MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	1628.00	43.31	-30.69	74.00	47.59	28.51	2.96	35.75	100	0 Peak
2	2390.00	32.68	-21.32	54.00	32.58	31.86	3.92	35.68	128	247 Average
3	2390.00	45.71	-28.29	74.00	45.61	31.86	3.92	35.68	100	0 Peak
4 X	2441.00	105.29			105.07	31.93	3.99	35.69	100	0 Peak
5 @	2441.00	91.90			91.68	31.93	3.99	35.69	128	247 Average
6	2484.00	44.83	-29.17	74.00	44.50	31.98	4.05	35.70	100	0 Peak
7	2484.00	33.16	-20.84	54.00	32.83	31.98	4.05	35.70	128	247 Average
8	3252.00	46.15	-7.85	54.00	44.33	32.90	4.77	35.85	104	72 Average
9	3252.00	53.68	-20.32	74.00	51.86	32.90	4.77	35.85	100	0 Peak
10	4881.00	51.52	-22.48	74.00	47.20	34.15	5.82	35.65	100	0 Peak
11	4881.00	40.67	-13.33	54.00	36.35	34.15	5.82	35.65	100	204 Average
12	7206.00	53.58	-20.42	74.00	46.78	35.72	7.17	36.08	100	0 Peak
13	7206.00	41.54	-12.46	54.00	34.74	35.72	7.17	36.08	100	117 Average
14	9762.00	35.50	-38.50	74.00	74.09	-9.83	8.00	36.76	100	0 Peak

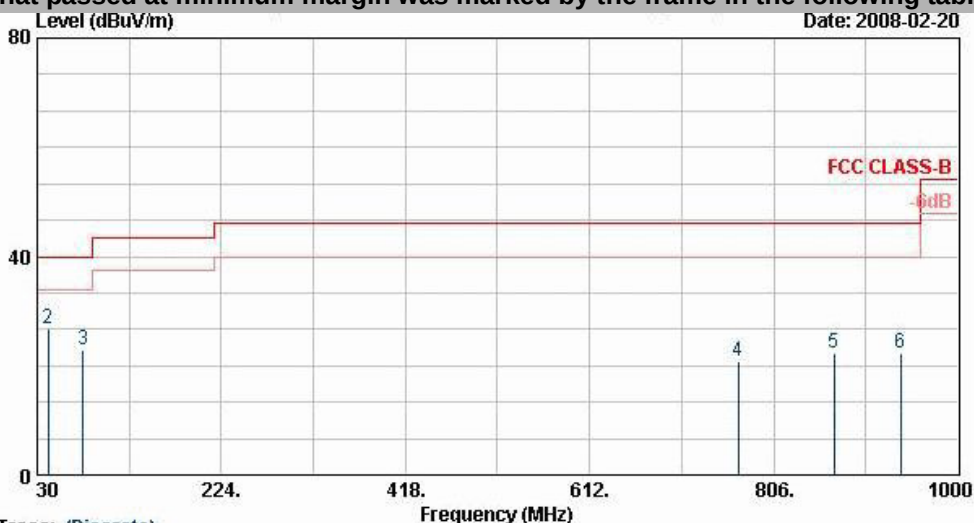
Remark: 1. #4 and #5 Fundamental Signal

2. There's no more obvious spurious emission except the listings above.



- Test Mode : Mode 2
- Polarization : Vertical

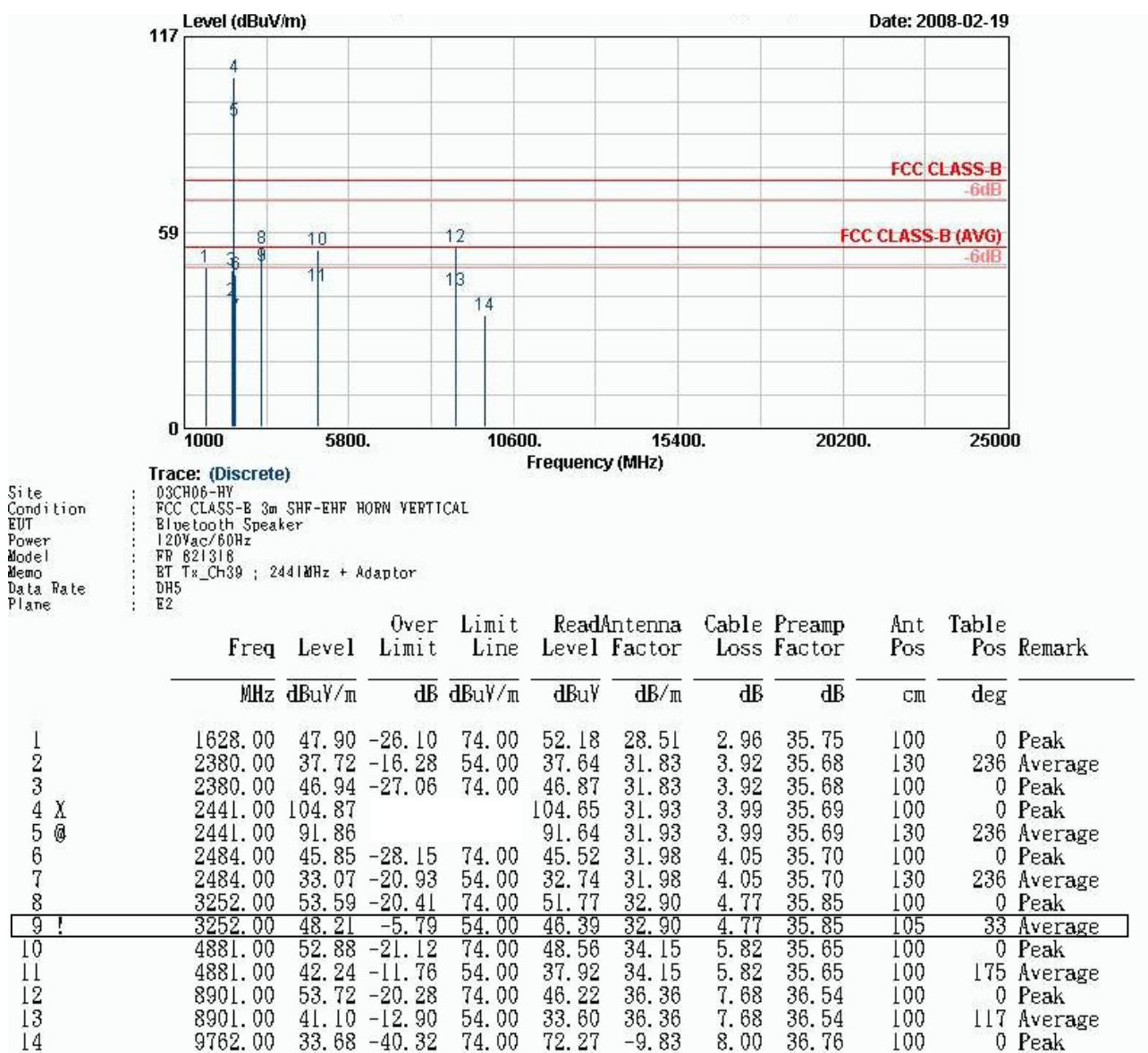
■ The test that passed at minimum margin was marked by the frame in the following table.



Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : BT Tx_Ch39 ; 2441MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	28.13	-11.87	40.00	41.67	19.66	0.30	33.50	100	166	Peak
2	41.88	26.77	-13.23	40.00	47.12	12.51	0.30	33.16	---	---	Peak
3	78.33	23.03	-16.97	40.00	48.59	7.41	0.47	33.44	---	---	Peak
4	768.30	20.67	-25.33	46.00	32.80	19.52	1.10	32.76	---	---	Peak
5	869.80	22.23	-23.77	46.00	33.34	20.32	1.30	32.73	---	---	Peak
6	939.80	22.43	-23.57	46.00	32.92	20.81	1.20	32.51	---	---	Peak



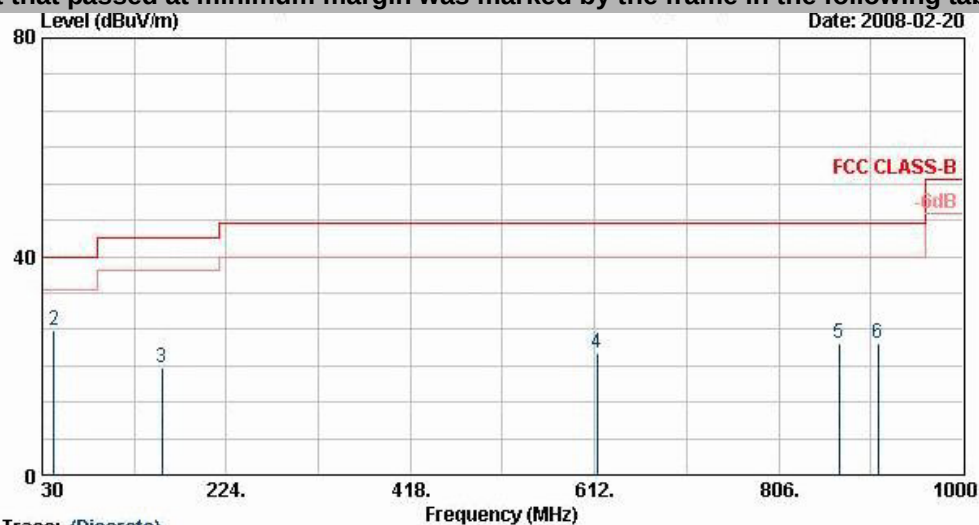
Remark: 1. #4 and #5 Fundamental Signal

2. There's no more obvious spurious emission except the listings above.



- Test Mode : Mode 3
- Polarization : Horizontal

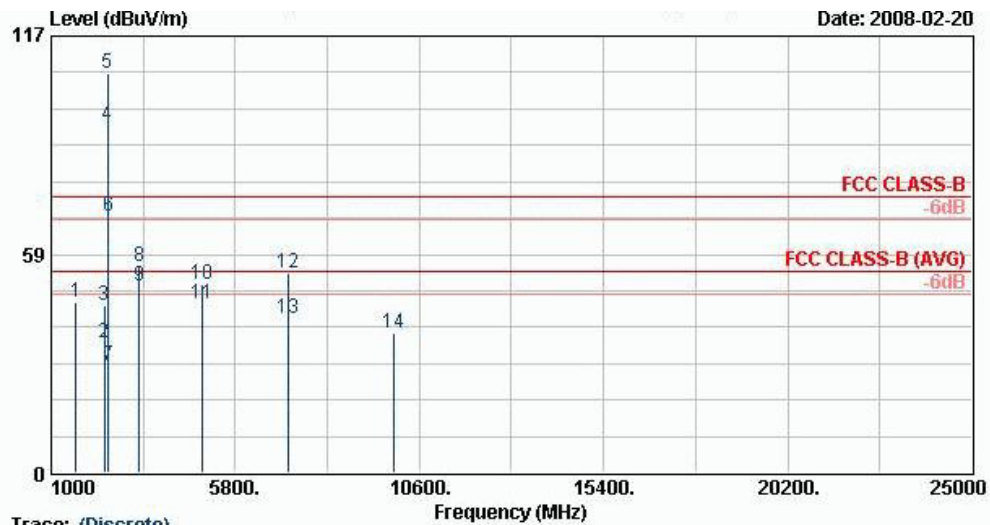
■ The test that passed at minimum margin was marked by the frame in the following table.



Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : BT Tx_Ch78 ; 2480MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	26.41	-13.59	40.00	39.95	19.66	0.30	33.50	100	117	Peak
2	42.69	26.35	-13.65	40.00	47.18	12.02	0.30	33.15	---	---	Peak
3	156.09	19.64	-23.86	43.50	42.32	10.24	0.60	33.52	---	---	Peak
4	614.30	22.33	-23.67	46.00	35.67	18.53	1.04	32.90	---	---	Peak
5	869.80	24.19	-21.81	46.00	35.30	20.32	1.30	32.73	---	---	Peak
6	910.40	24.08	-21.92	46.00	34.91	20.61	1.29	32.72	---	---	Peak



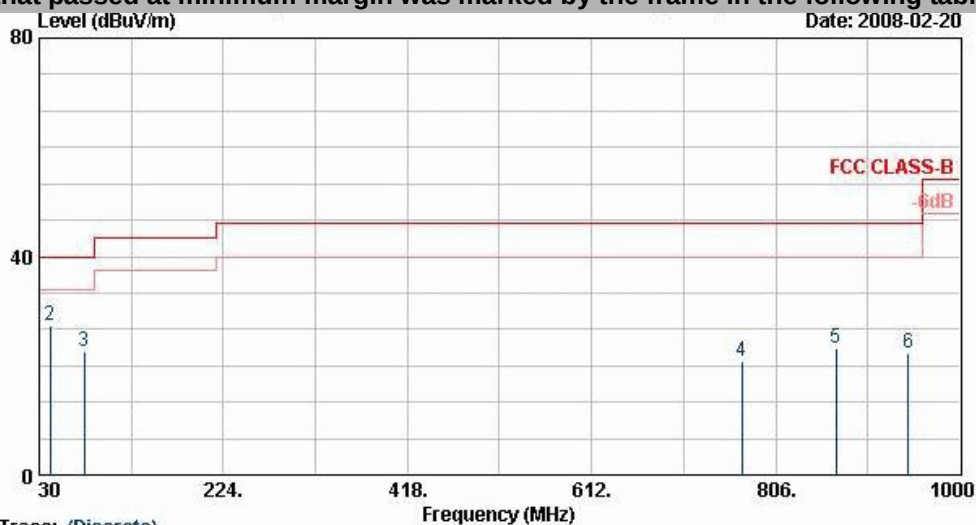
	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1652.00	45.89	-28.11	74.00	50.00	28.64	2.99	35.74	100	0	Peak
2	2382.00	34.77	-19.23	54.00	34.69	31.83	3.92	35.68	130	256	Average
3	2382.00	44.96	-29.04	74.00	44.88	31.83	3.92	35.68	100	0	Peak
4 @	2480.00	93.16			92.83	31.98	4.05	35.70	130	256	Average
5 X	2480.00	107.05			106.72	31.98	4.05	35.70	100	0	Peak
6 !	2483.50	68.59	-5.41	74.00	68.26	31.98	4.05	35.70	100	0	Peak
7	2483.50	28.52	-25.48	54.00	28.19	31.98	4.05	35.70	100	256	Average
8	3306.00	55.12	-18.88	74.00	53.20	32.92	4.84	35.84	100	0	Peak
9 !	3306.00	49.87	-4.13	54.00	47.95	32.92	4.84	35.84	103	268	Average
10	4956.00	50.56	-23.44	74.00	46.12	34.19	5.87	35.62	100	0	Peak
11	4956.00	45.04	-8.96	54.00	40.61	34.19	5.87	35.62	100	41	Average
12	7197.00	53.68	-20.32	74.00	46.89	35.72	7.16	36.08	100	0	Peak
13	7197.00	41.14	-12.86	54.00	34.35	35.72	7.16	36.08	100	198	Average
14	9921.00	37.23	-36.77	74.00	75.43	-9.48	8.07	36.79	100	0	Peak

Remark: 1. #4 and #5 Fundamental Signal
2. There's no more obvious spurious emission except the listings above.



- Test Mode : Mode 3
- Polarization : Vertical

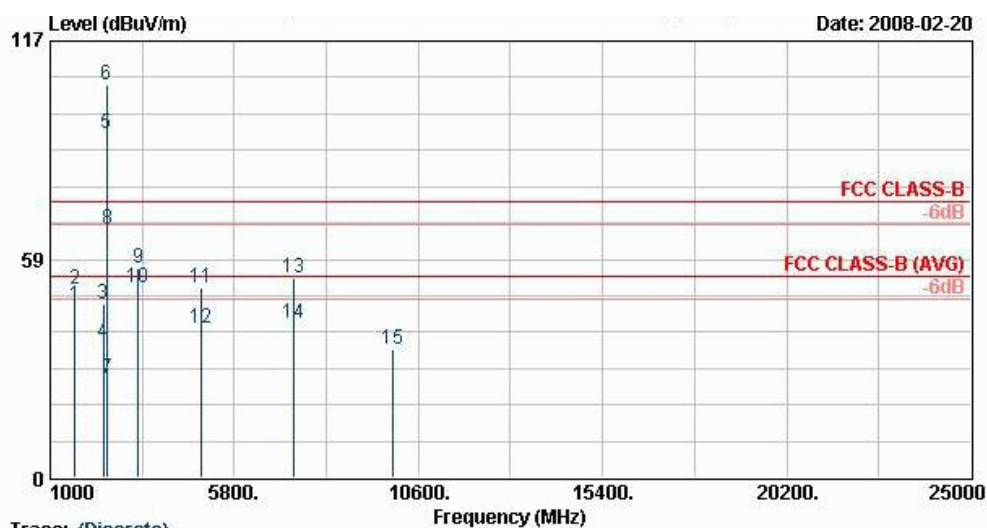
■ The test that passed at minimum margin was marked by the frame in the following table.



Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : ET Tx_Ch78 ; 2480MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	27.77	-12.23	40.00	41.31	19.66	0.30	33.50	100	241	Peak
2	41.88	27.23	-12.77	40.00	47.58	12.51	0.30	33.16	---	---	Peak
3	77.79	22.73	-17.27	40.00	48.39	7.35	0.45	33.47	---	---	Peak
4	770.40	20.79	-25.21	46.00	32.89	19.54	1.10	32.74	---	---	Peak
5	869.80	23.10	-22.90	46.00	34.21	20.32	1.30	32.73	---	---	Peak
6	945.40	22.20	-23.80	46.00	32.61	20.85	1.20	32.47	---	---	Peak



Trace: (Discrete)

Site : 03CH06-RV
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 EUT : Bluetooth Speaker
 Power : 120Vac/60Hz
 Model : FR 821318
 Memo : BT Tx_Ch78 ; 2480MHz + Adaptor
 Data Rate : DH5
 Plane : E2

	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	1652.00	46.25	-7.75	54.00	50.36	28.64	2.99	35.74	100	226	Average
2	1652.00	50.32	-23.68	74.00	54.43	28.64	2.99	35.74	100	0	Peak
3	2382.00	46.66	-27.34	74.00	46.58	31.83	3.92	35.68	100	0	Peak
4	2382.00	36.04	-17.96	54.00	35.96	31.83	3.92	35.68	129	237	Average
5 X	2480.00	92.30			91.97	31.98	4.05	35.70	129	237	Average
6 X	2480.00	105.20			104.86	31.98	4.05	35.70	100	0	Peak
7	2483.50	26.67	-27.33	54.00	26.34	31.98	4.05	35.70	100	237	Average
8	2483.50	66.74	-7.26	74.00	66.41	31.98	4.05	35.70	100	0	Peak
9	3306.00	56.10	-17.90	74.00	54.18	32.92	4.84	35.84	100	0	Peak
10 !	3306.00	50.85	-3.15	54.00	48.93	32.92	4.84	35.84	107	28	Average
11	4956.00	50.91	-23.09	74.00	46.48	34.19	5.87	35.62	100	0	Peak
12	4956.00	39.87	-14.13	54.00	35.44	34.19	5.87	35.62	100	125	Average
13	7362.00	53.42	-20.58	74.00	46.68	35.66	7.22	36.14	100	0	Peak
14	7362.00	41.21	-12.79	54.00	34.48	35.66	7.22	36.14	100	121	Average
15	9921.00	34.36	-39.64	74.00	72.55	-9.48	8.07	36.79	100	0	Peak

Remark: 1. #5 and #6 Fundamental Signal

2. There's 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 PCB print antenna without connector. 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 Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz – 2.75GHz	Jul. 14, 2007	Jul. 13, 2008	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/004	9kHz – 30MHz	Mar. 29, 2007	Mar. 28, 2008	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz – 30MHz	Mar. 30, 2007	Mar. 29, 2008	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. 03, 2007	Dec. 02, 2008	Conduction (CO01-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	N/A	Conduction (CO01-HY)
Impedance Stabilization Network	SCHAFFNER	T400	21653	150kHz – 230MHz	Mar. 28, 2007	Mar. 27, 2008	Conduction (CO01-HY)
Impedance Stabilization Network	SCHAFFNER	T400	23342	150kHz – 230MHz	Mar. 05, 2007	Mar. 04, 2008	Conduction (CO01-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	Com-Power	AH118	071025	1G~18G	Jun. 04, 2007	Jun. 03, 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)
PreAmplifier	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%, ($k = 2$)