

FCC RF Test Report

APPLICANT : Getac Technology Corporation
EQUIPMENT : Notebook PC
BRAND NAME : Getac
MODEL NAME : B300
FCC ID : QYL305
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Spread Spectrum (DSS)

The product was received on Oct. 18, 2007 and completely tested on Nov. 17, 2007. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Roy Wu / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



TABLE OF CONTENTS

1. General Description of Equipment under Test	4
1.1 Applicant.....	4
1.2 Manufacturer	4
1.3 Feature of Equipment Under Test	4
2. Test Configuration of Equipment under Test	5
2.1 Test Manner	5
2.2 Test Mode	5
2.3 Ancillary Equipment List	5
2.4 Connection Diagram of Test System	5
3. RF Utility	7
4. General Information of Test	8
4.1 Test Voltage	8
4.2 Standard for Methods of Measurement	8
4.3 Test Compliance.....	8
4.4 Frequency Range	8
4.5 Test Distance.....	8
5. Test Data and Test Result	9
5.1 List of Measurements and Examinations	9
5.2 Band Edges Measurement	10
5.3 Hopping Channel Separation	14
5.4 Number of Hopping Frequency.....	18
5.5 Hopping Channel Bandwidth	20
5.6 Dwell Time of Each Frequency.....	24
5.7 Peak Output Power Measurement.....	32
5.8 Conducted Emission.....	37
5.9 Radiated Emission Measurement.....	40
5.10 Antenna Requirements	58
6. List of Measuring Equipments	59
7. Uncertainty Evaluation	60
Appendix A. Photographs of EUT	
Appendix B. Setup Photographs	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR980406-03C	Rev. 01	Initial issue of report	Apr. 07, 2010

1. General Description of Equipment under Test

1.1 Applicant

Getac Technology Corporation

5F., Building A, No. 209, Sec. 1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

1.2 Manufacturer

GeTAC Technology(Kunshan) LTD.

No. 269, 2nd Road, Export Processing Zone, Changjiang South Road, Kunshan, Jiangsu, P.R.C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Notebook PC
Brand Name	Getac
Model Name	B300
FCC ID	QYL305
Tx/Rx Frequency Range	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
Antenna Type	PIFA Antenna with gain -2.59 dBi
HW Version	R03
SW Version	R1.16
Type of Modulation	Bluetooth : GFSK
EUT Stage	Identical Prototype

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

2. Test Configuration of Equipment under Test

2.1 Test Manner

- a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- b. The highest RF output power's test modes were chosen for testing .

2.2 Test Mode

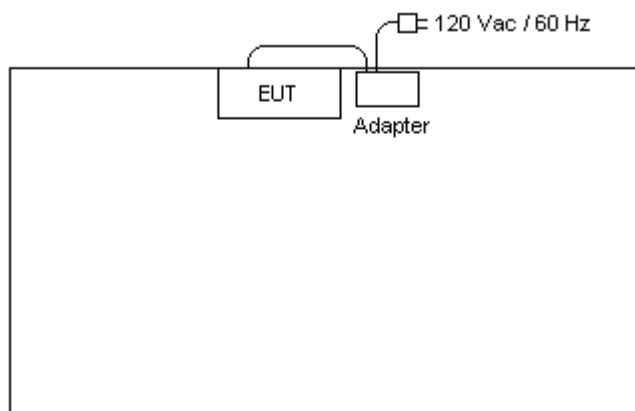
Application	Test Mode
Radiated Emission / RF Conducted	BT
	Mode 1:CH00_2402MHz
	Mode 2:CH39_2441MHz
	Mode 3:CH78_2480MHz
	Co-location
	Mode 4 : 802.11n(a) (BW 20M) Tx_Ch165 + BT Tx_Ch78
Conducted Emission	Mode 1: BT Link + WLAN Link + Adapter 1

2.3 Ancillary Equipment List

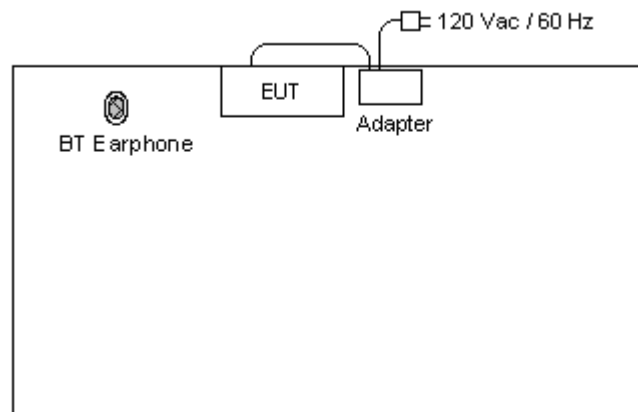
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Engotech	ET-BH111	PQY471087	N/A	N/A

2.4 Connection Diagram of Test System

<Radiated Emission>



<Conducted Emission>





3. RF Utility

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



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, 03CH04-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

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 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 100kHz 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 : BT
- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Engineer : Ken

- Test Result in BT lower band : PASS
- Test Result in BT higher band : PASS

**5.2.4 Note on Band Edge Emission :****➤ BT**

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
2390.000	44.31	-29.69	74.00	41.81	32.54	3.74	33.78	100	0	Peak
2390.000	33.50	-20.50	54.00	31.00	32.54	3.74	33.78	100	312	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
2390.000	44.74	-29.26	74.00	42.24	32.54	3.74	33.78	100	0	Peak
2390.000	33.08	-20.92	54.00	30.58	32.54	3.74	33.78	131	247	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
2483.500	57.51	-16.49	74.00	54.88	32.59	3.84	33.80	100	0	Peak
2483.500	48.29	-5.71	54.00	45.66	32.59	3.84	33.80	144	196	Average

CH78 (Vertical)

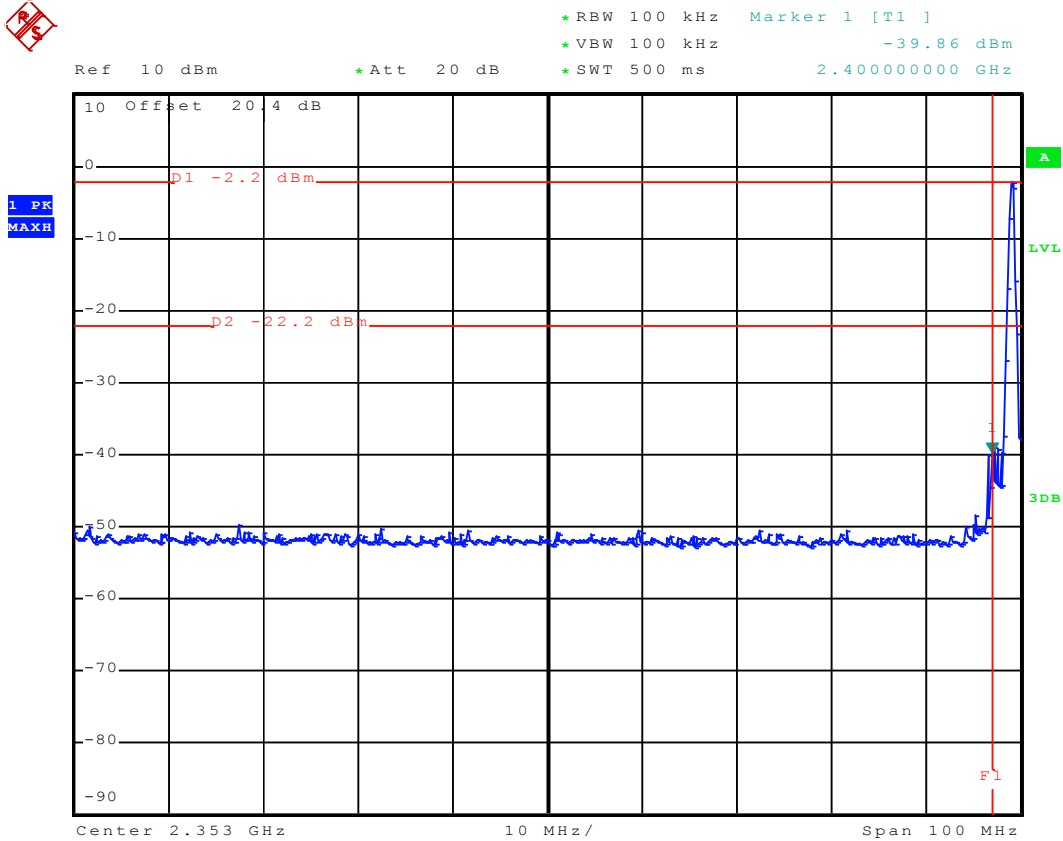
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.500	59.88	-14.12	74.00	57.25	32.59	3.84	33.80	100	0	Peak
2483.500	50.14	-3.86	54.00	47.51	32.59	3.84	33.80	144	150	Average



5.2.5 Band Edge

BT

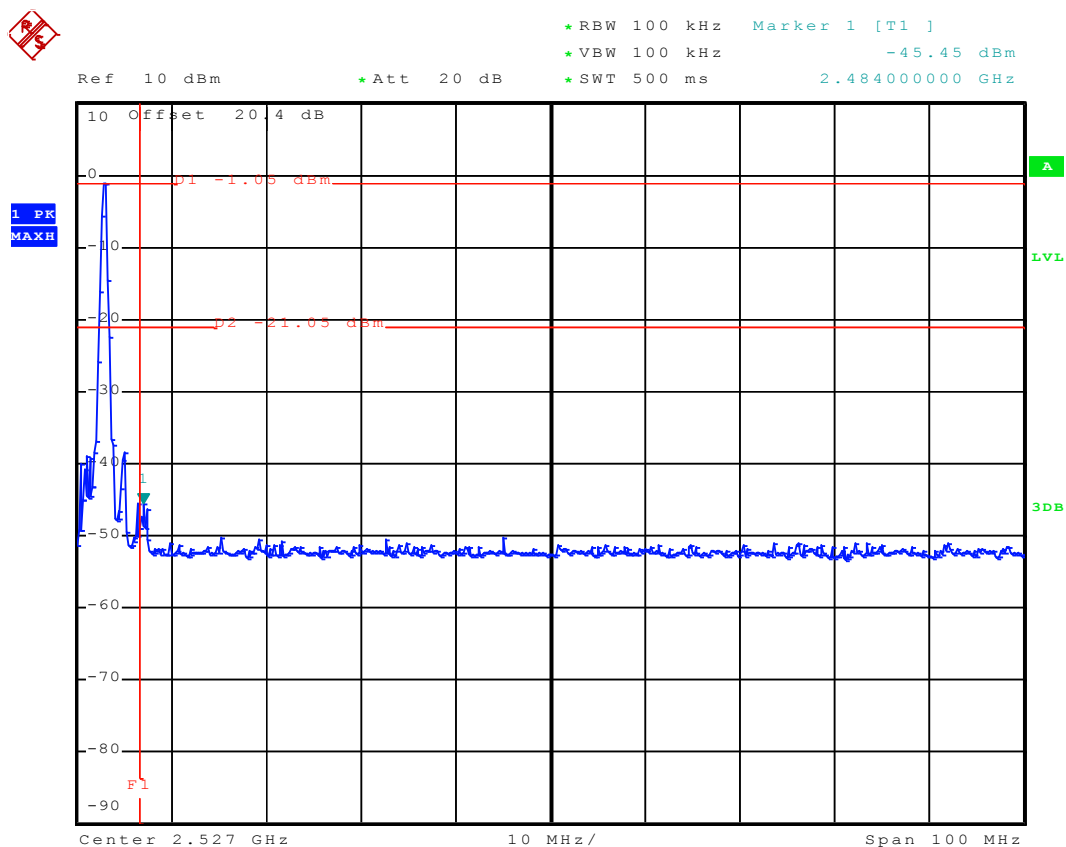
CH00



Date: 9.NOV.2007 17:48:24

BT

CH78



Date: 9 NOV 2007 17:51:56

5.3 Hopping Channel Separation

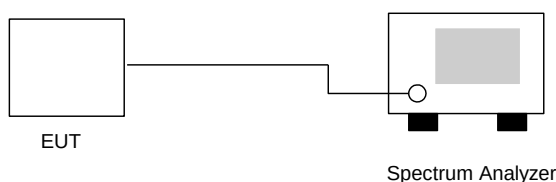
5.3.1 Measuring Instruments :

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 : BT
- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Enginner : Ken

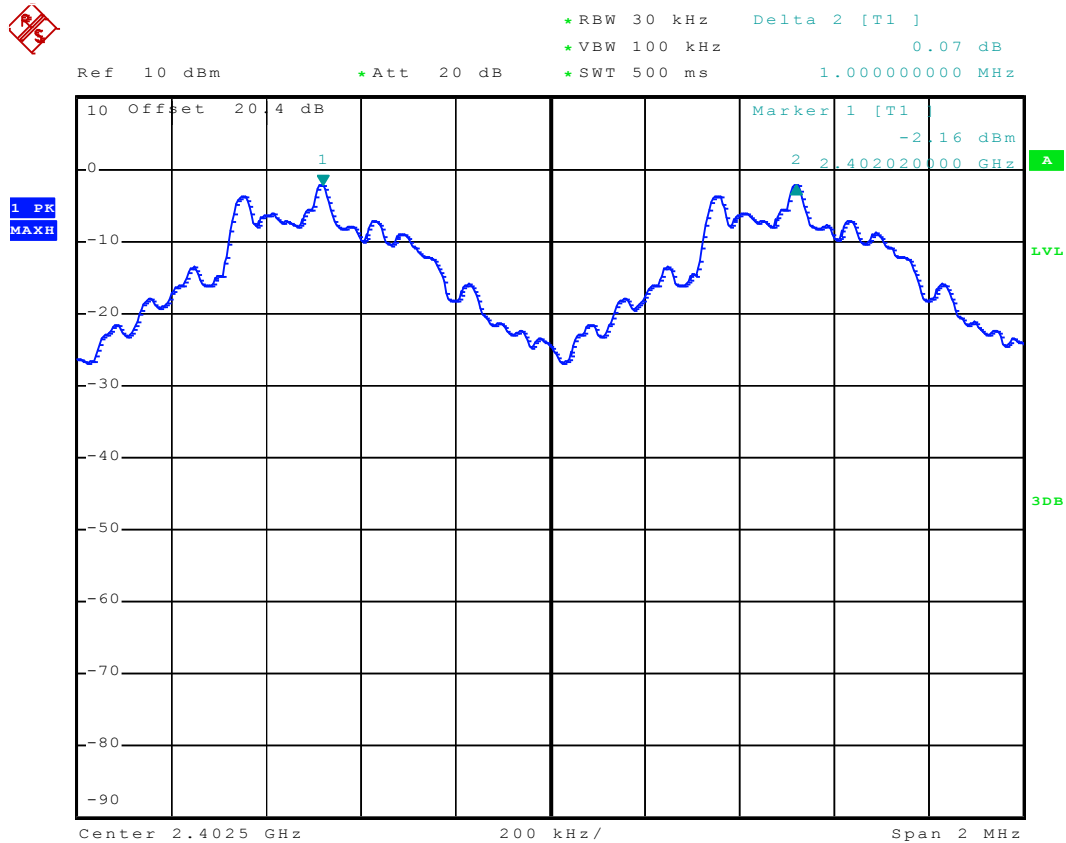
Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.546	Mode 1
39	2441	1.004	0.548	Mode 2
78	2480	1.004	0.556	Mode 3

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



5.3.5 Hopping Channel Separation

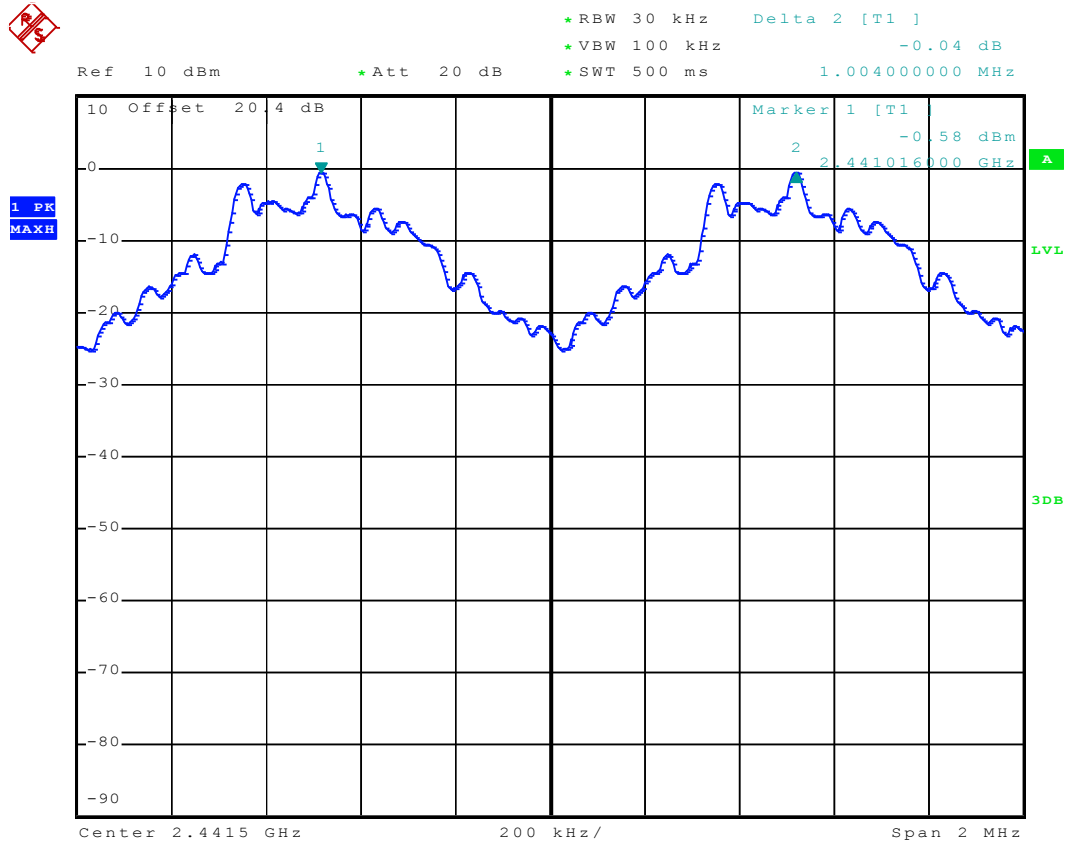
Mode 1



Date: 9.NOV.2007 17:55:07



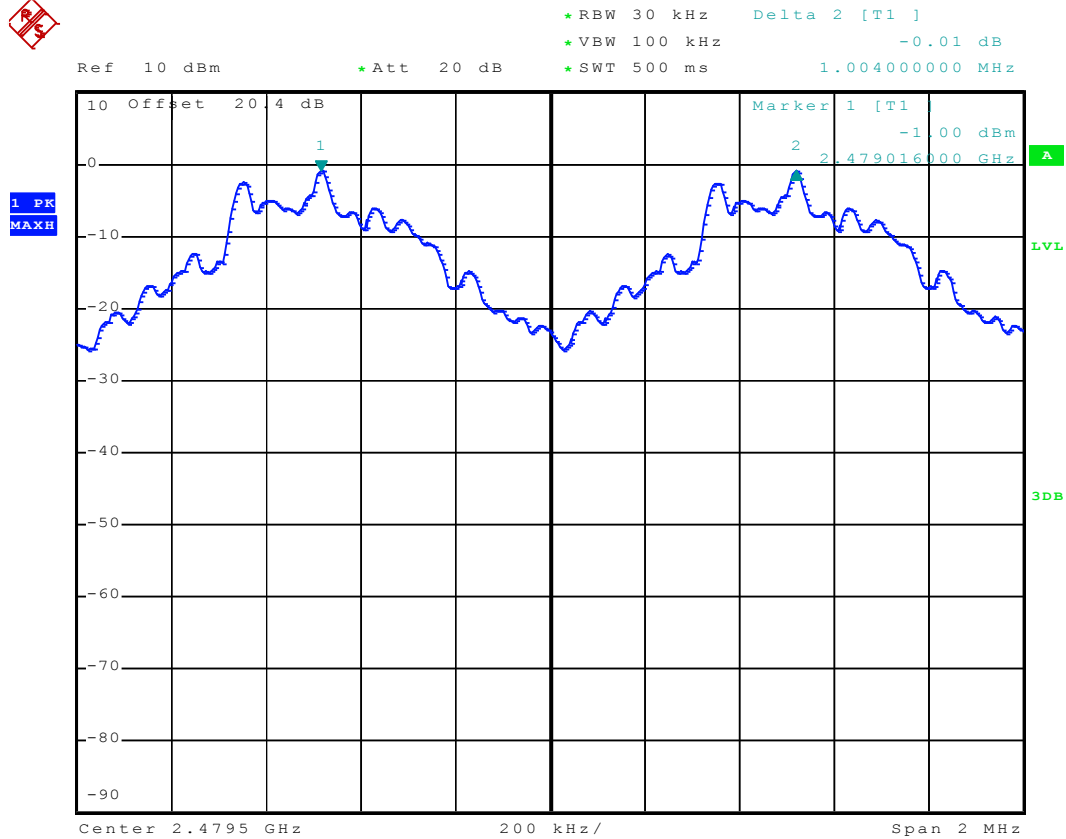
Mode 2



Date: 9.NOV.2007 17:56:39



Mode 3



Date: 9.NOV.2007 17:58:33

5.4 Number of Hopping Frequency

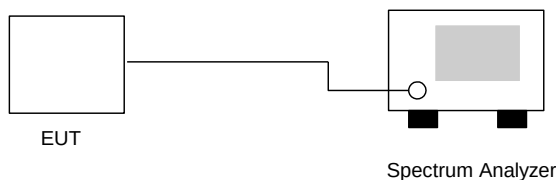
5.4.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.4.2 Test Procedure :

1. The output of EUT was connected to the spectrum analyzer by a low loss cable.
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.

5.4.3 Test Setup Layout :



5.4.4 Test Result : See spectrum analyzer plots below

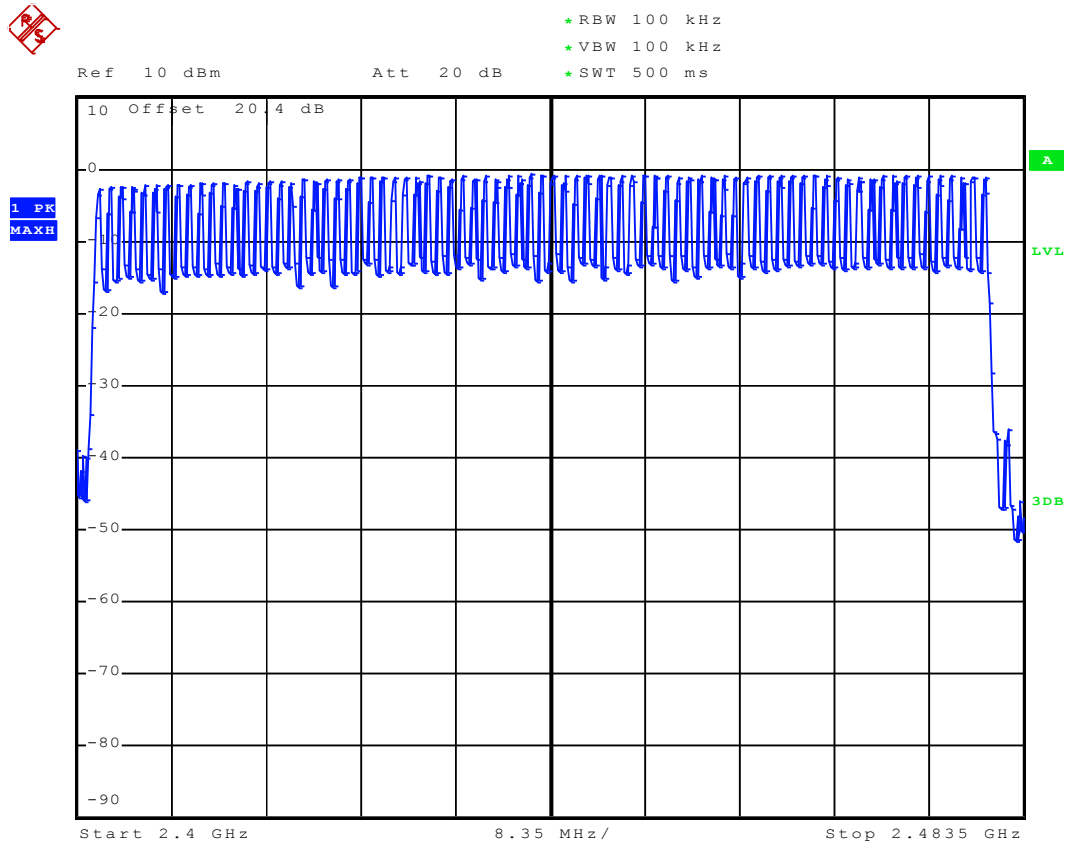
- Application Type : BT
- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Enginner : Ken

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



5.4.5 Number of Hopping Frequency

BT



Date: 9.NOV.2007 19:58:08

5.5 Hopping Channel Bandwidth

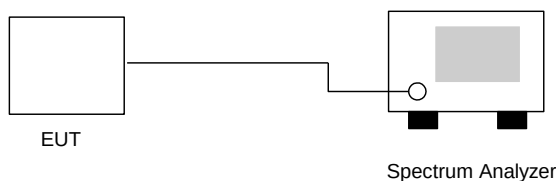
5.5.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.5.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer by a low loss cable.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 300kHz.
3. 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

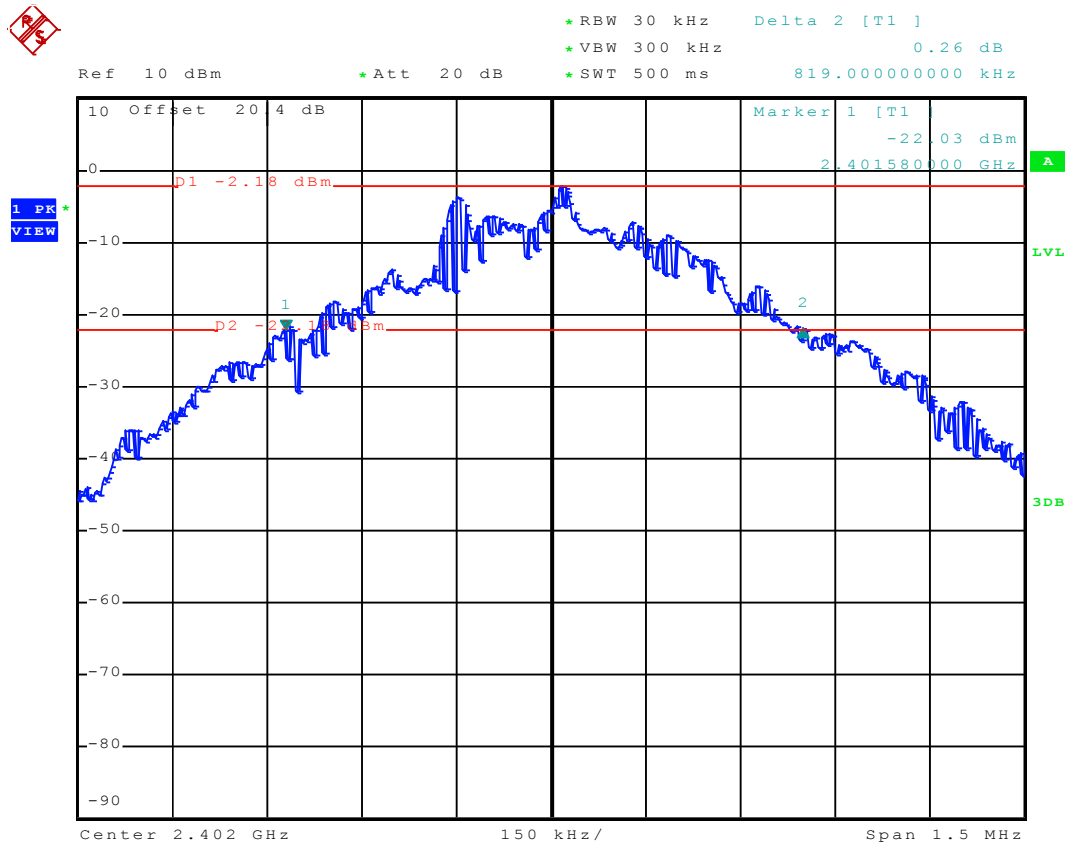
- Application Type : BT
- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Enginner : Ken

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	0.819	Mode 1
39	2441	0.822	Mode 2
78	2480	0.834	Mode 3



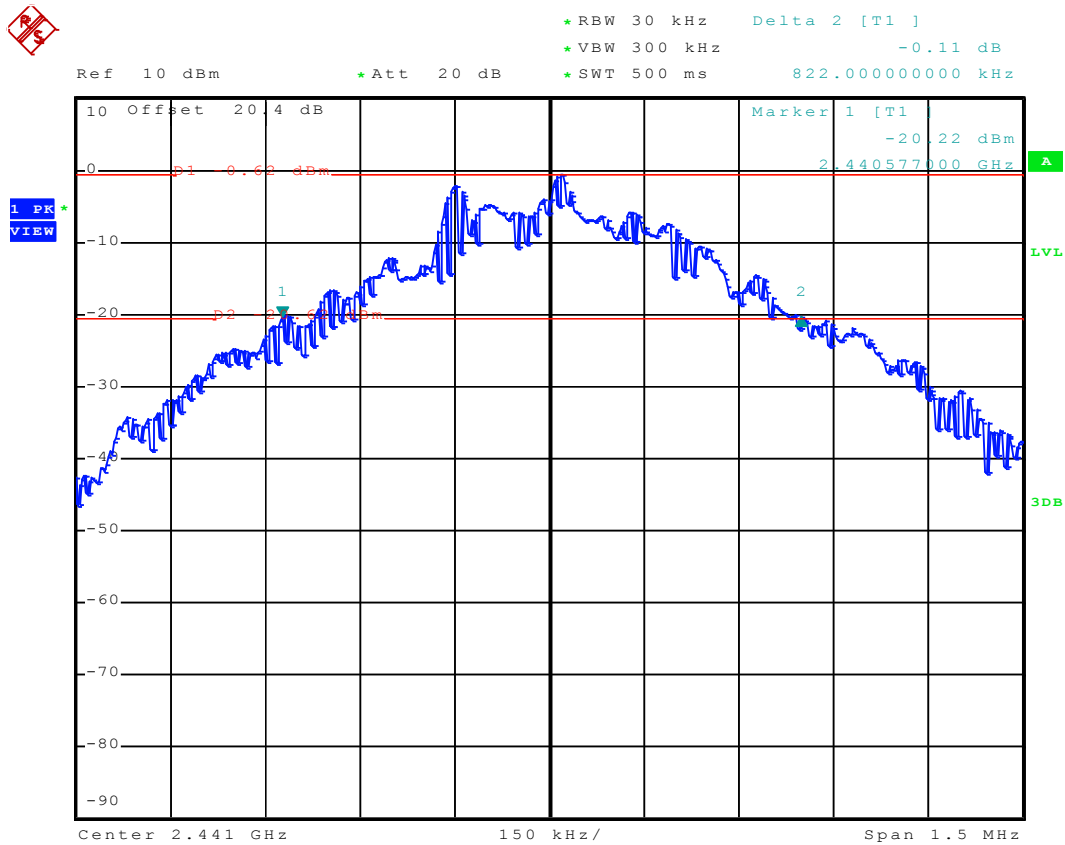
5.5.5 Hopping Channel Bandwidth

Mode 1



Date: 9.NOV.2007 17:41:14

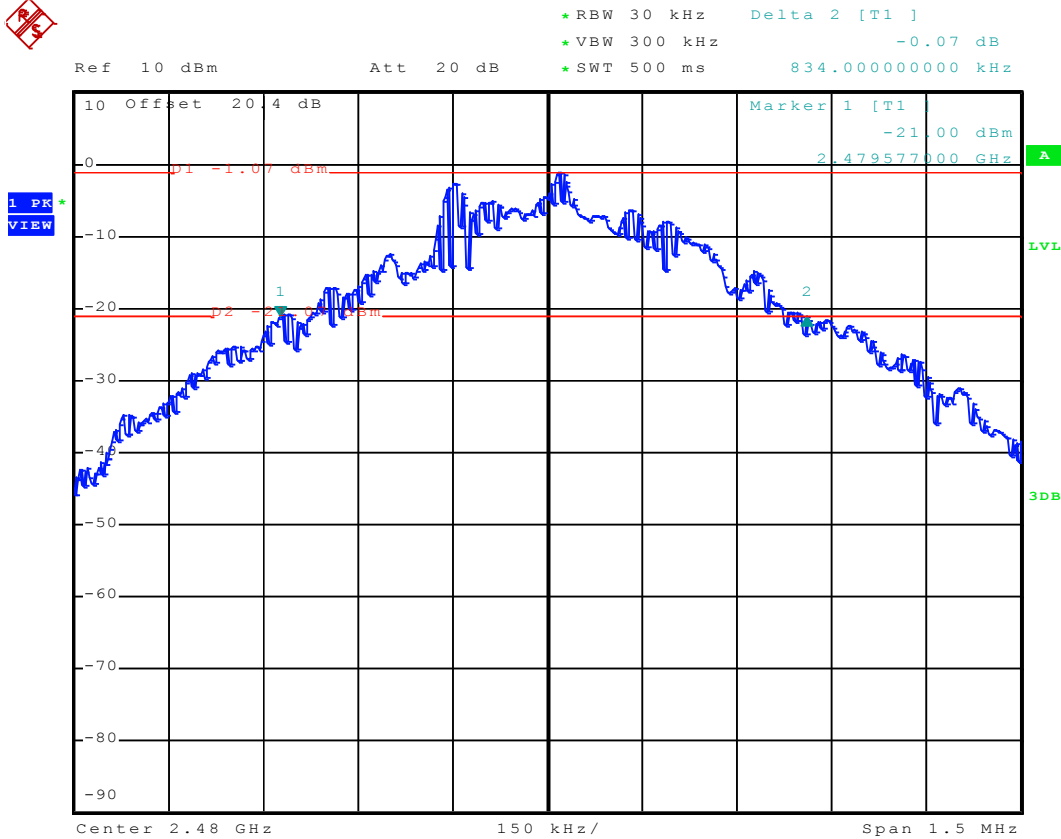
Mode 2



Date: 9 NOV 2007 17:38:19



Mode 3



Date: 9.NOV.2007 20:01:12

5.6 Dwell Time of Each Frequency

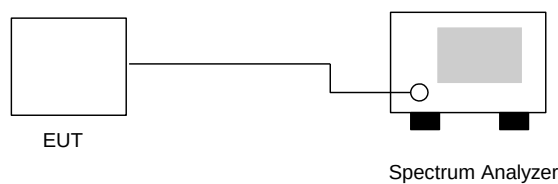
5.6.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.6.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer by a low loss cable.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
4. The calculate equals $79 * 0.4 * (1600/79) * t$ (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 : BT
- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Enginner : Ken

CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	10	464	0.147	0.4
DH3	5	1730	0.273	0.4
DH5	3.4	3020	0.324	0.4

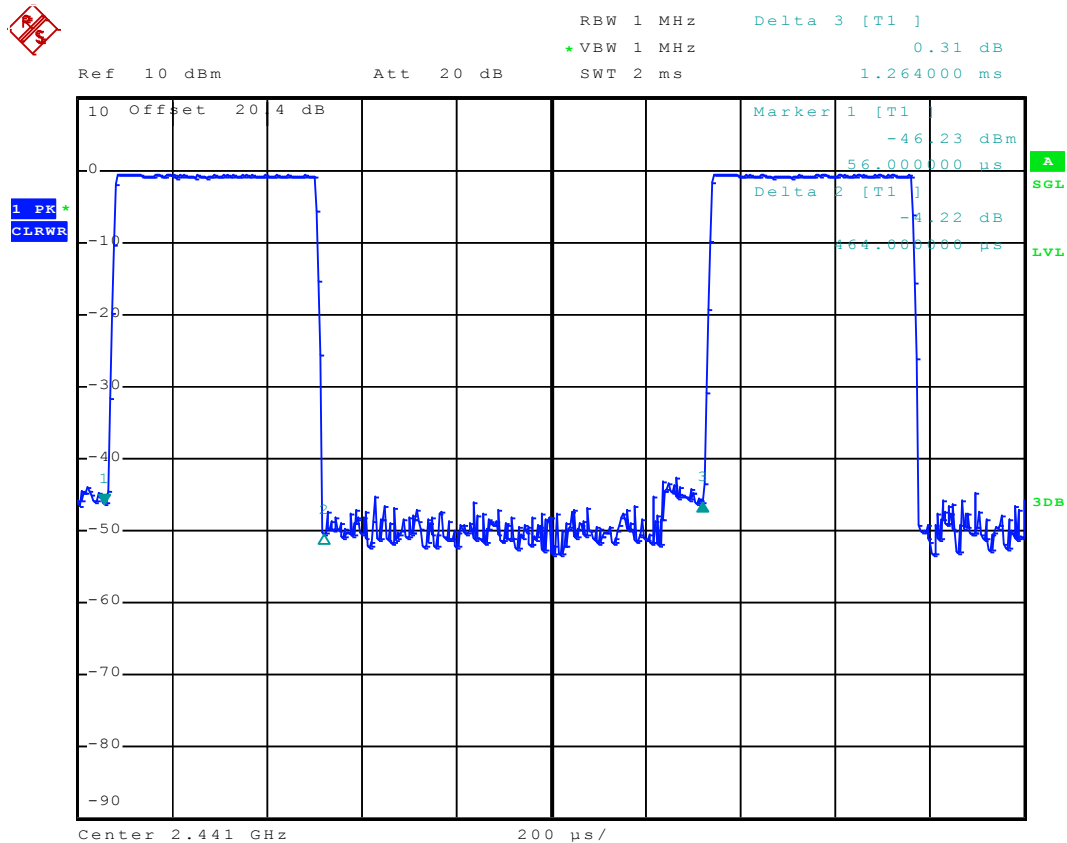
※ Remark:

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)

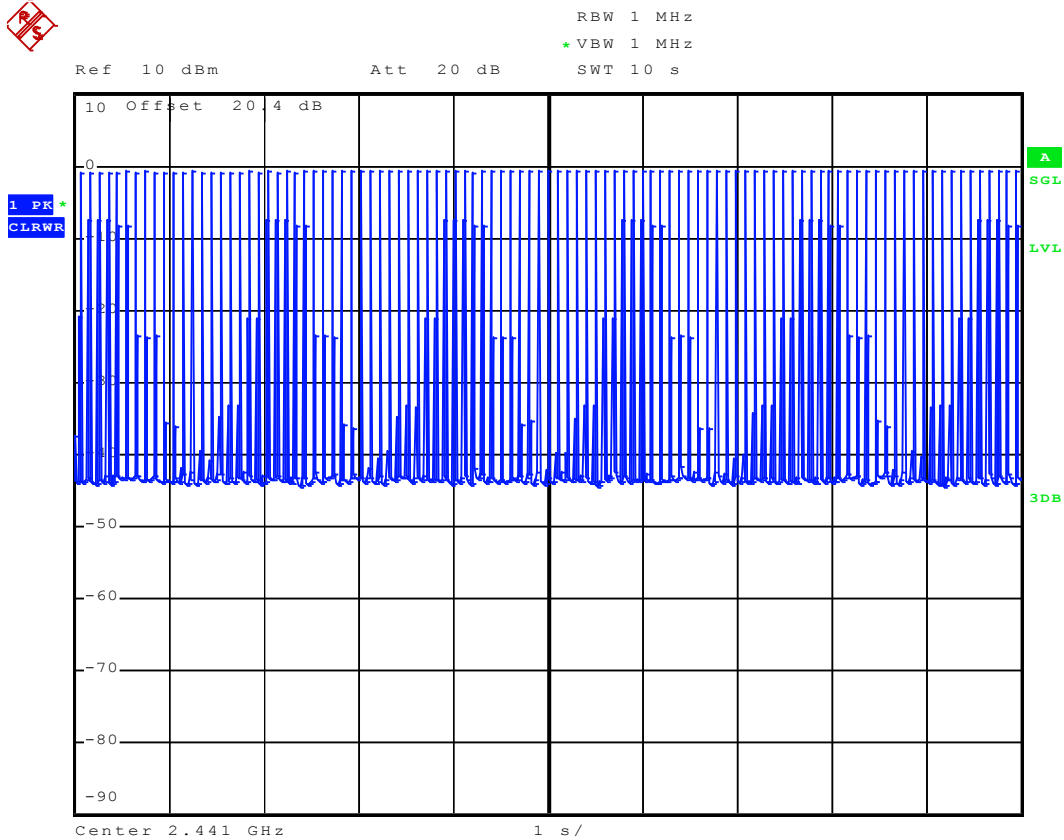


5.6.5 Dwell Time

BT_DH1 (CH39)



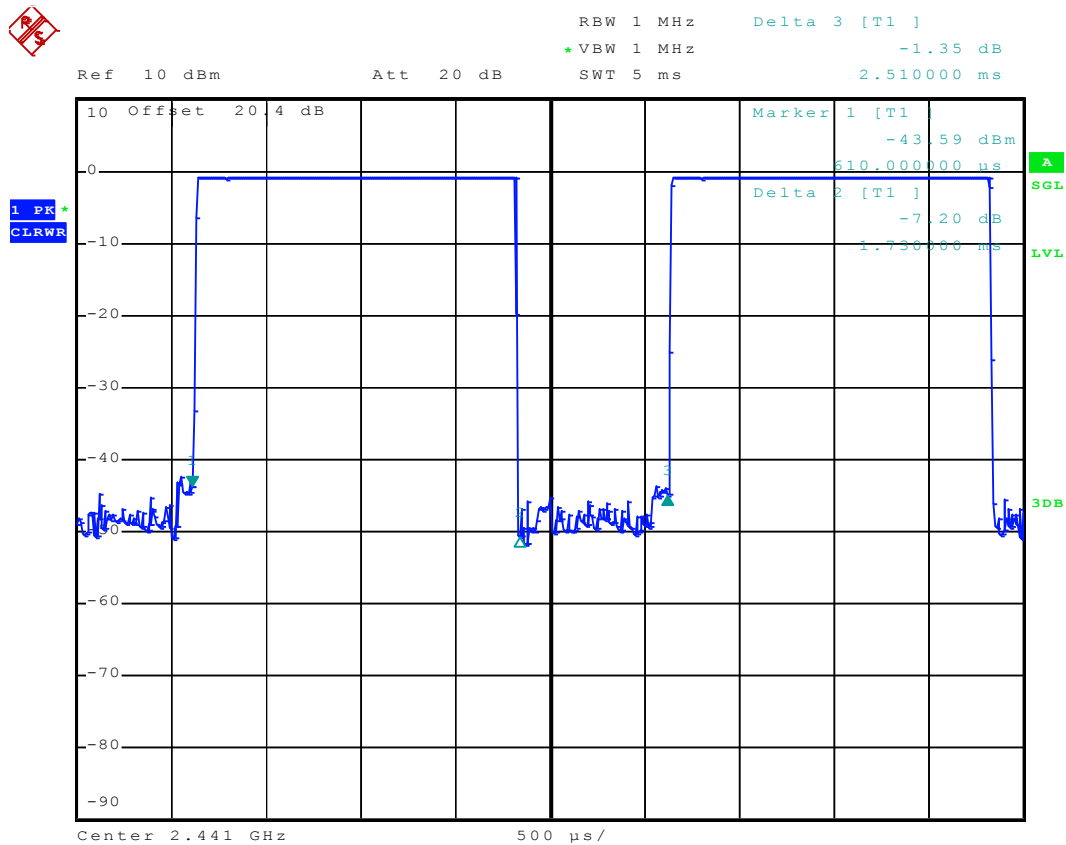
Date: 9.NOV.2007 20:11:54



Date: 9.NOV.2007 19:51:55



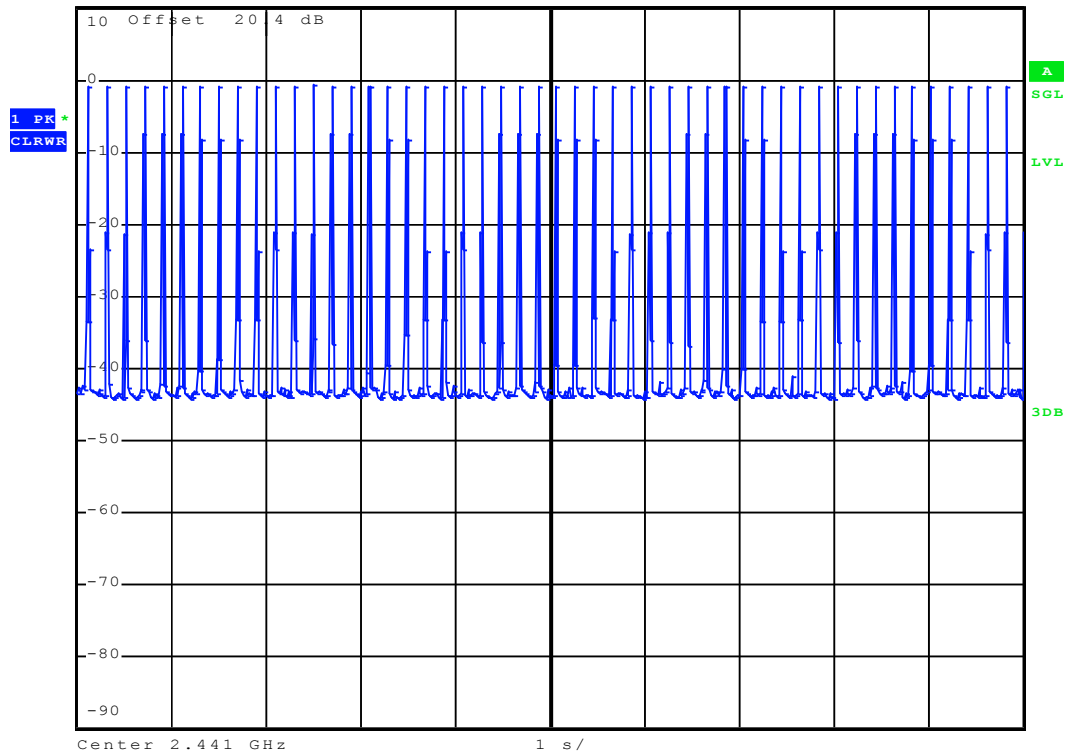
BT_DH3 (CH39)



Date: 9.NOV.2007 19:46:11



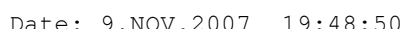
Ref 10 dBm Att 20 dB RBW 1 MHz
*VBW 1 MHz SWT 10 s



Date: 9.NOV.2007 19:50:47

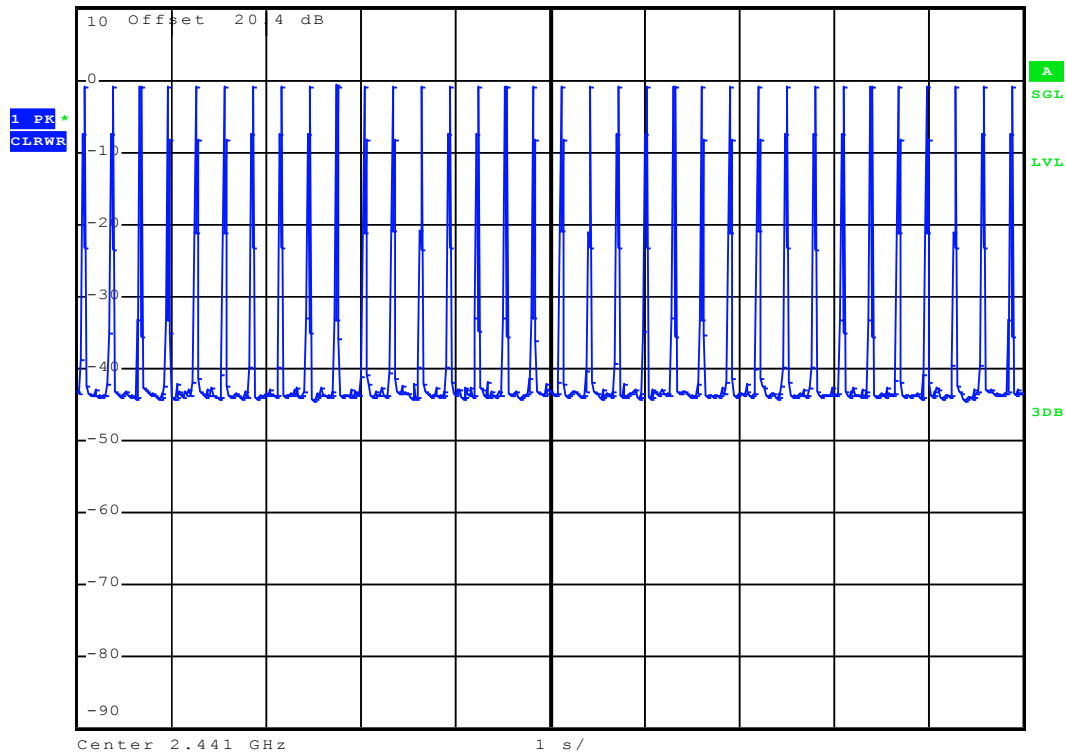


BT_DH5 (CH39)





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



Date: 9.NOV.2007 19:49:48

5.7 Peak Output Power Measurement

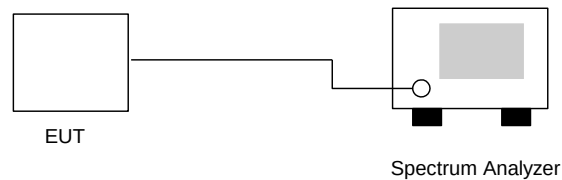
5.7.1 Measuring Instruments :

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 BT 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 : BT
- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Enginner : Ken

BT

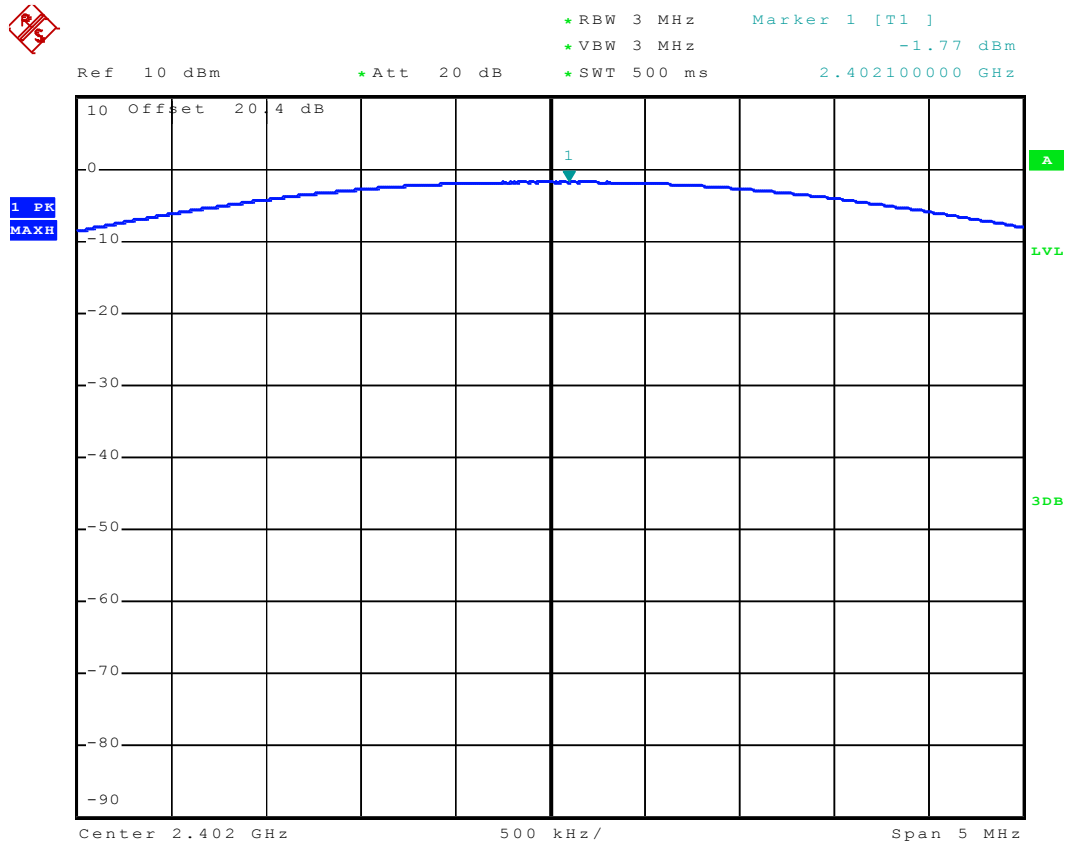
Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	-1.77	1W / 30dBm
39	2441	-0.21	1W / 30dBm
78	2480	-0.69	1W / 30dBm



5.7.5 Output Power

BT

Mode : CH00 (2402MHz)

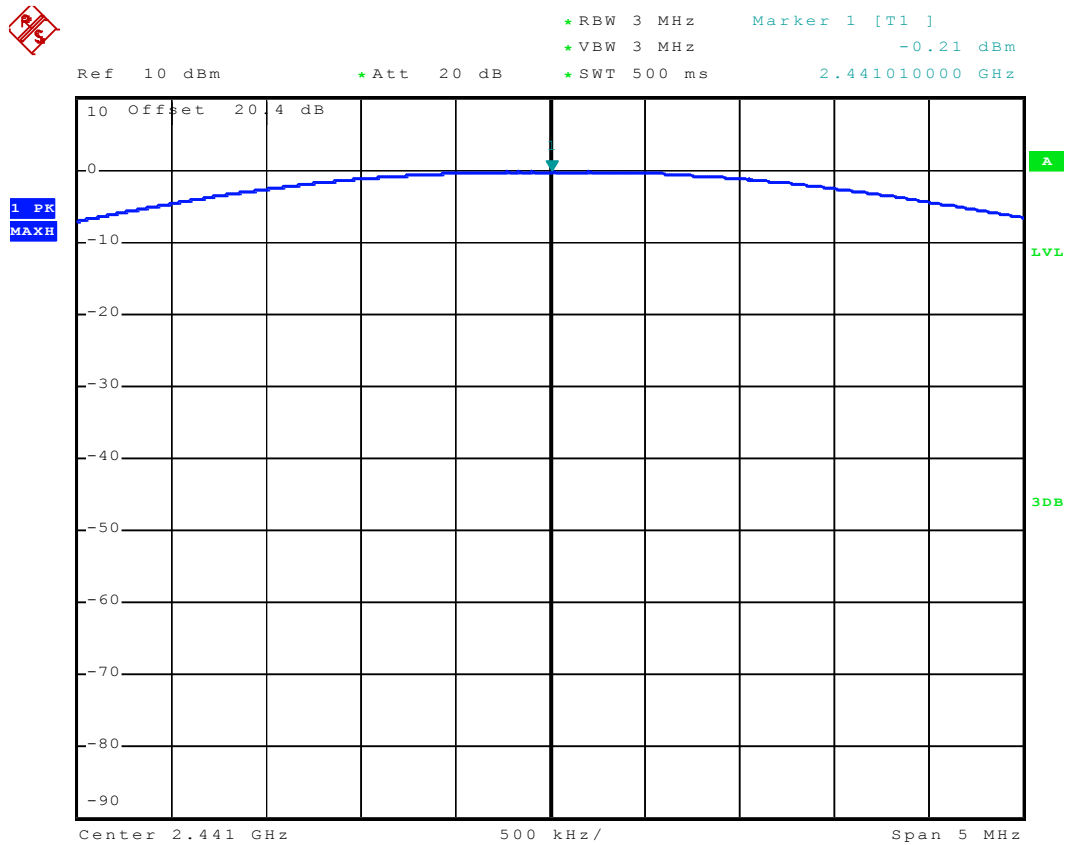


Date: 9.NOV.2007 17:31:47



BT

Mode : CH39 (2441MHz)

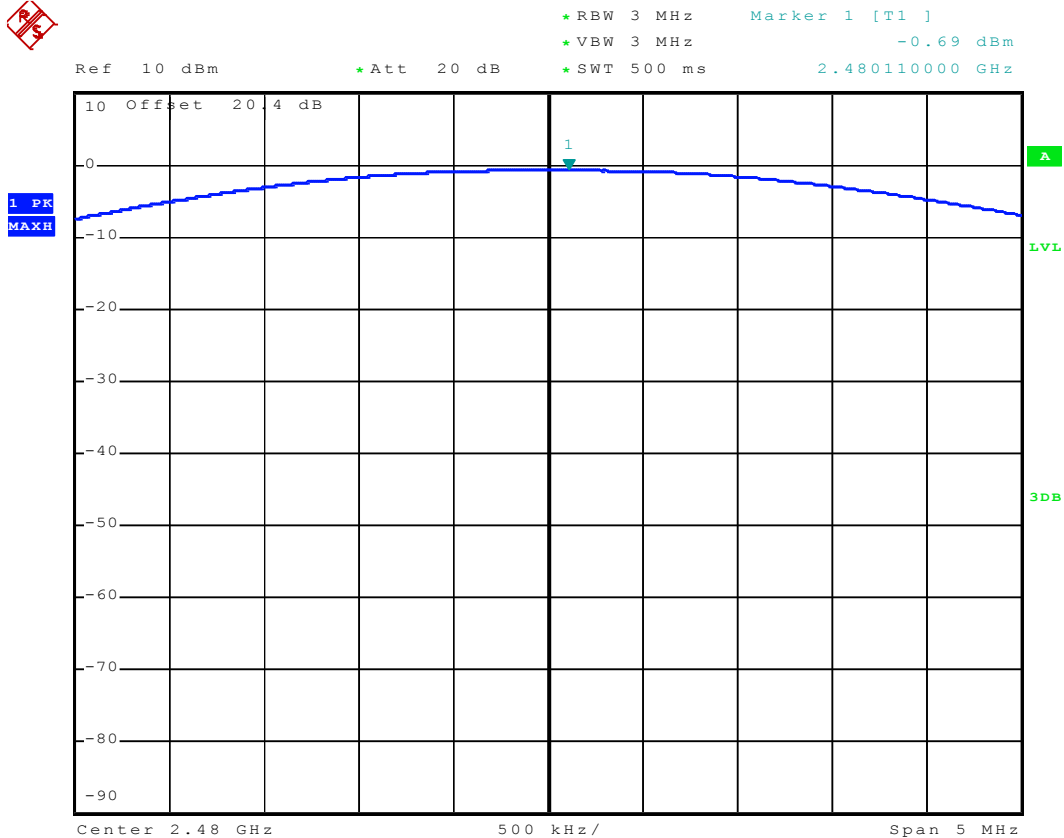


Date: 9.NOV.2007 17:30:10



BT

Mode : CH78 (2480MHz)



Date: 9.NOV.2007 17:32:45

5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

The receiver setting :

150 KHz ~ 30 MHz	Detector : Quasi – Peak and Average Bandwidth : 9 KHz
------------------	--

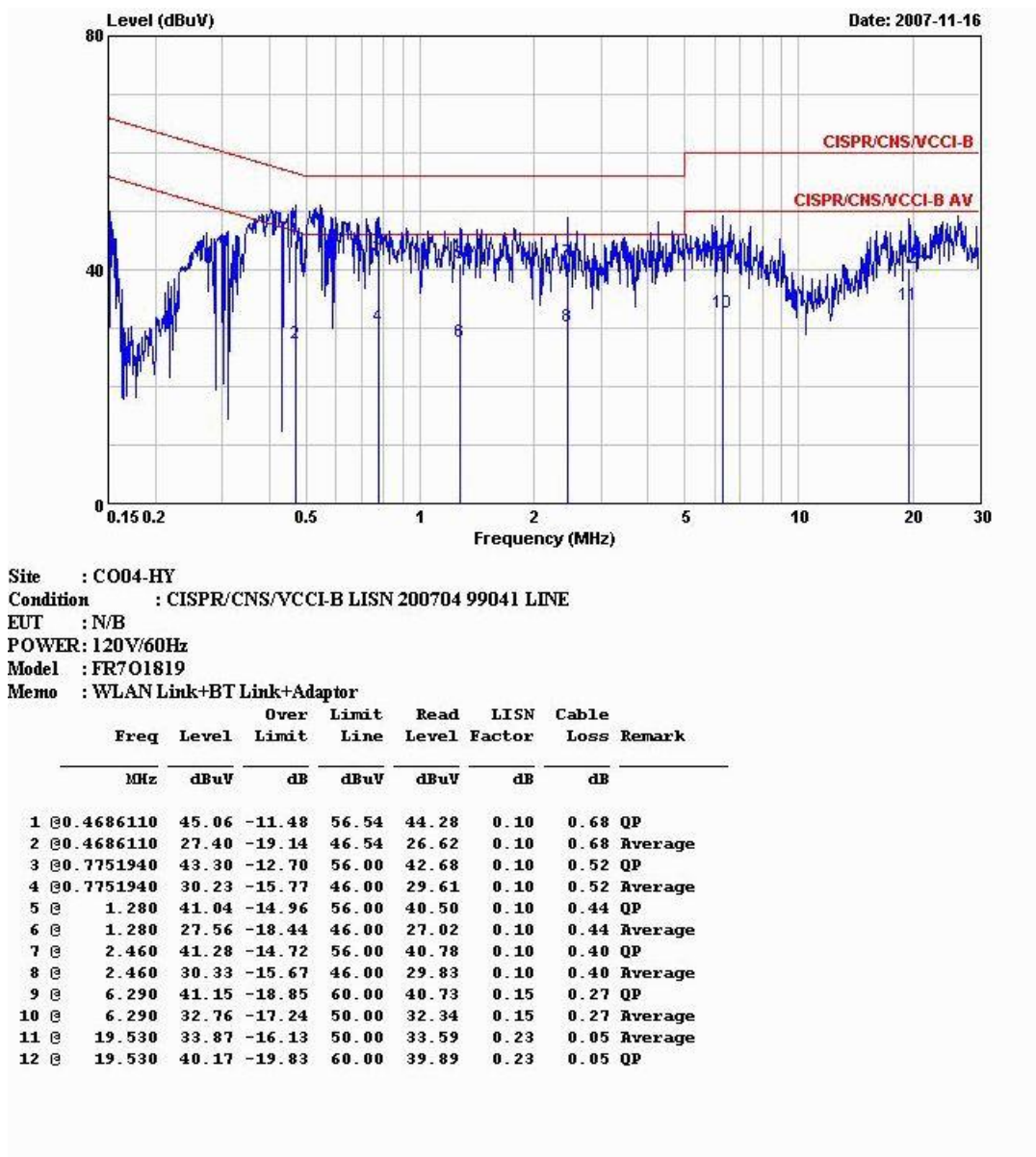
5.8.2 Test Procedures :

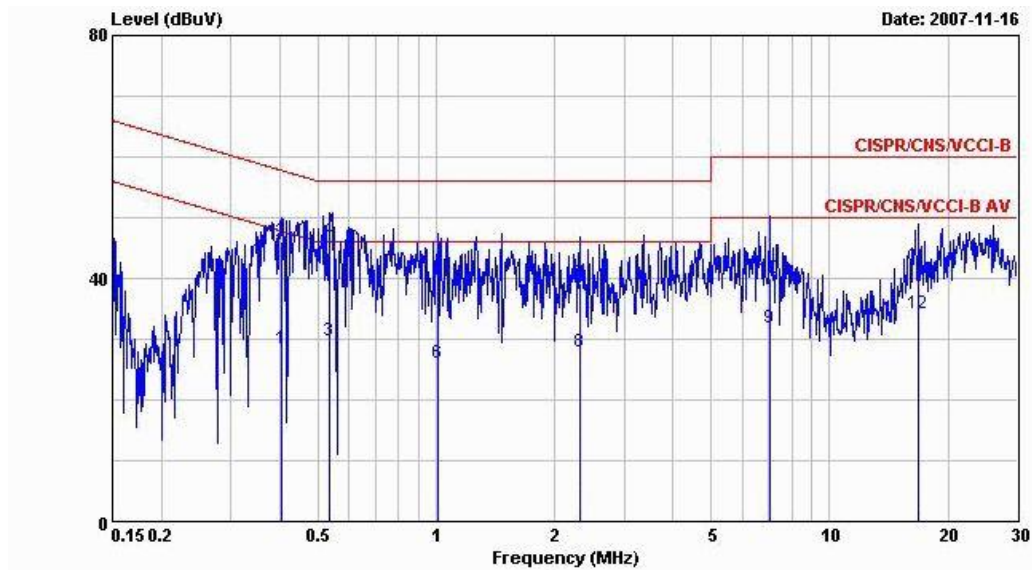
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of a line impedance stabilization network (LISN).
- c. All the support units are connected to the other LISN.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

- Temperature : 25~26°C
- Relative Humidity : 49~51%
- Test Enginner : Ken
- Test Mode : Mode 1

■ 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 200704 99041 NEUTRAL
 EUT : N/B
 POWER: 120V/60Hz
 Model : FR701819
 Memo : WLAN Link+BT Link+Adaptor

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.4040020	28.40	-19.37	47.77	27.57	0.10	0.73	Average
2	@0.4040020	46.07	-11.70	57.77	45.24	0.10	0.73	QP
3	@0.5349810	29.63	-16.37	46.00	28.89	0.10	0.64	Average
4	@0.5349810	46.41	-9.59	56.00	45.67	0.10	0.64	QP
5	@1.010	40.07	-15.93	56.00	39.53	0.10	0.44	QP
6	@1.010	26.15	-19.85	46.00	25.61	0.10	0.44	Average
7	@2.310	39.29	-16.71	56.00	38.76	0.12	0.41	QP
8	@2.310	28.02	-17.98	46.00	27.49	0.12	0.41	Average
9	@7.020	31.84	-18.16	50.00	31.32	0.26	0.26	Average
10	@7.020	40.10	-19.90	60.00	39.58	0.26	0.26	QP
11	@16.840	41.99	-18.01	60.00	41.59	0.30	0.10	QP
12	@16.840	34.32	-15.68	50.00	33.92	0.30	0.10	Average

5.9 Radiated Emission Measurement

5.9.1 Measuring Instruments

As described in chapter 6 of this Report.

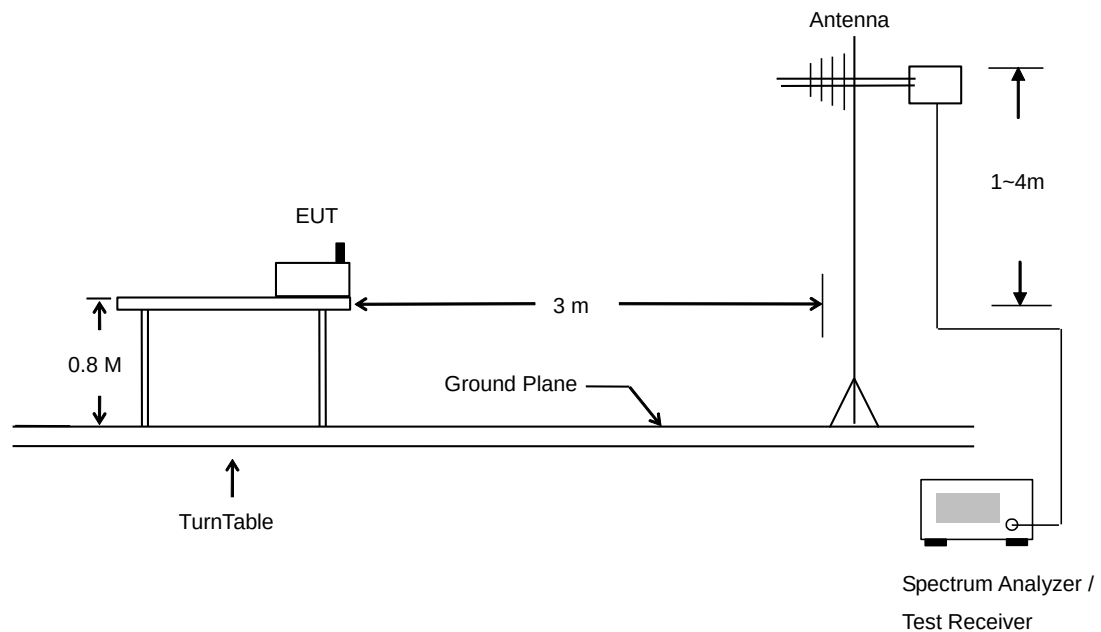
The spectrum analyzer setting :

30 ~ 1000 MHz	Detector : Quasi – Peak Bandwidth : 120 KHz
1 ~ 25 GHz	Detector : Peak and Average Bandwidth : 1 MHz

5.9.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- 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.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- 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.
- 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.

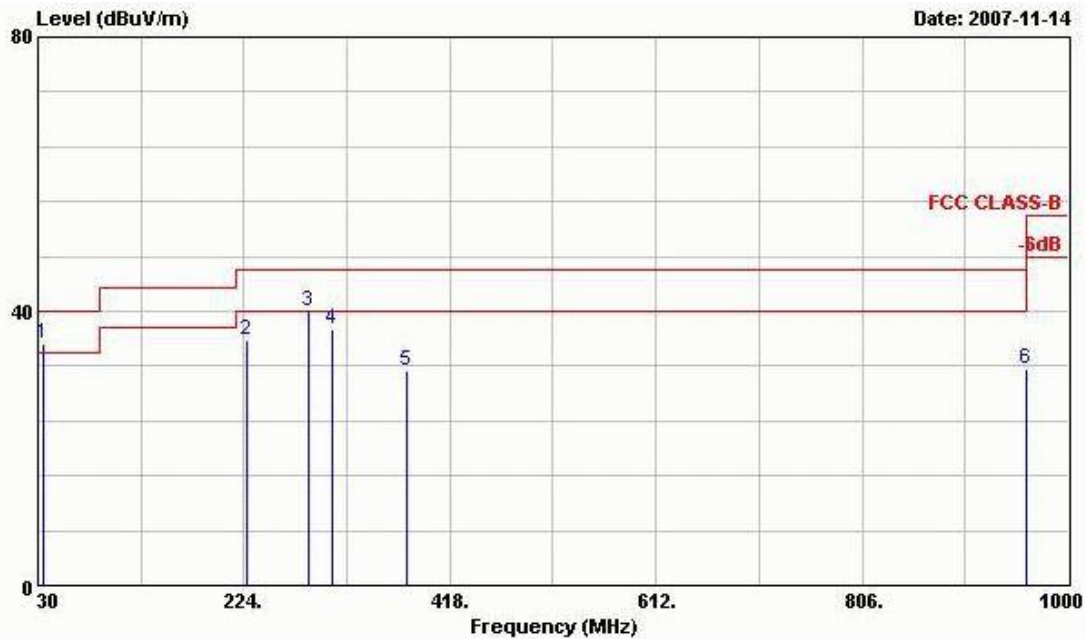
5.9.3 Typical Test Setup Layout of Radiated Emission



5.9.4 Test Data

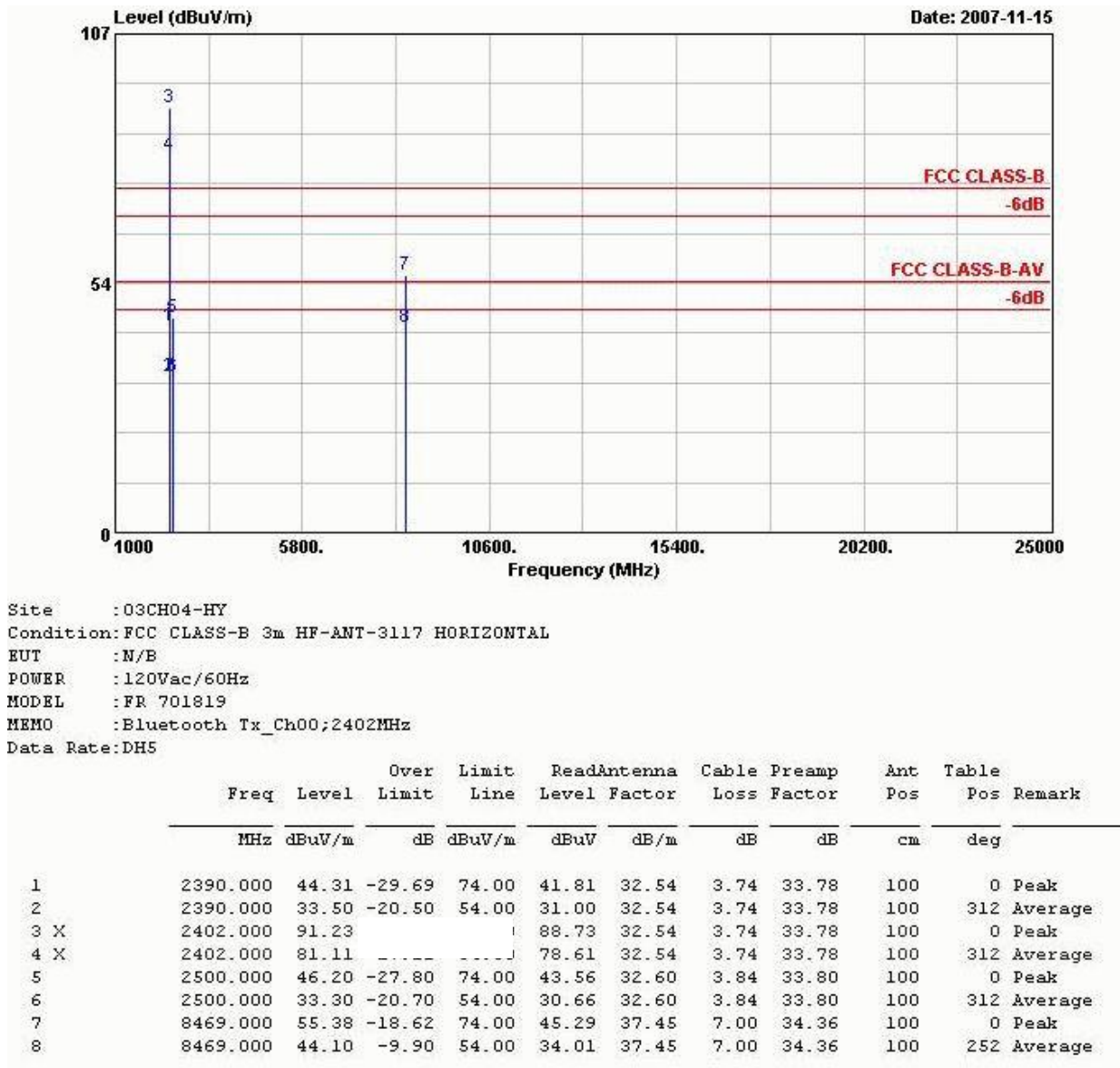
- Temperature : 25~26℃
- Relating Humidity : 49~51%
- Test Enginner : Derek
- Test Mode : Mode 1
- Polarization : Horizontal

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



Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 HORIZONTAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : Bluetooth Tx_Ch00;2402MHz
Data Rate: DH5

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 !	35.130	35.39	-4.61	40.00	46.45	16.29	0.91	28.26	100	157 Peak
2	226.020	35.82	-10.18	46.00	50.88	10.72	1.97	27.75	---	---
3 !	284.340	40.06	-5.94	46.00	53.12	12.39	2.18	27.63	---	---
4	307.000	37.33	-8.67	46.00	50.14	12.58	2.26	27.65	---	---
5	377.000	31.24	-14.76	46.00	41.90	14.98	2.49	28.14	---	---
6	960.100	31.71	-22.29	54.00	31.37	25.04	3.99	28.68	---	---

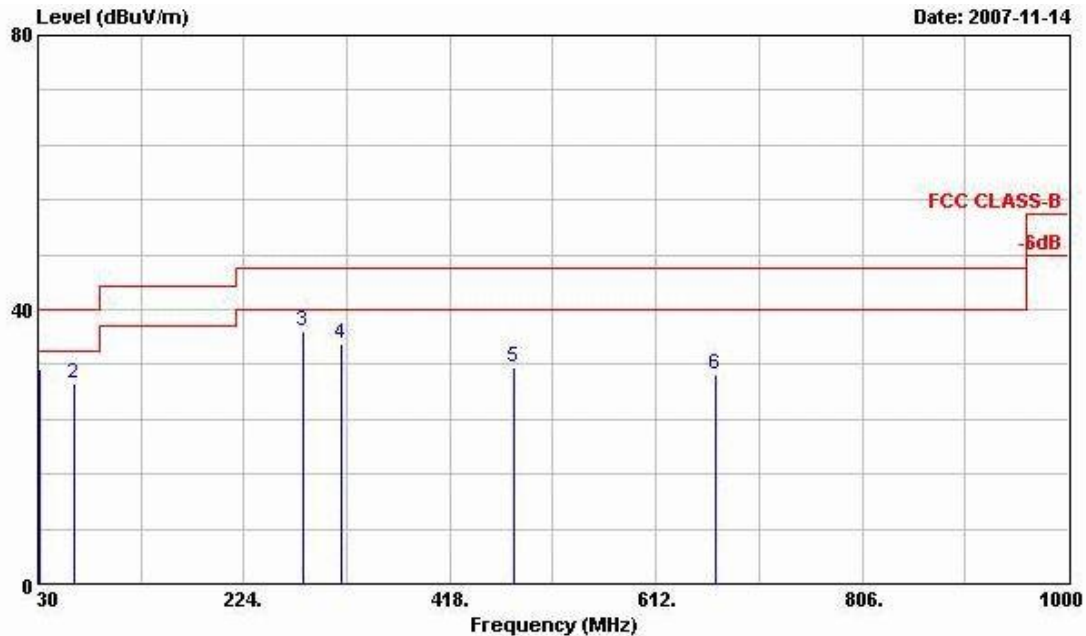


Remark: #3 and #4 Fundamental Signal



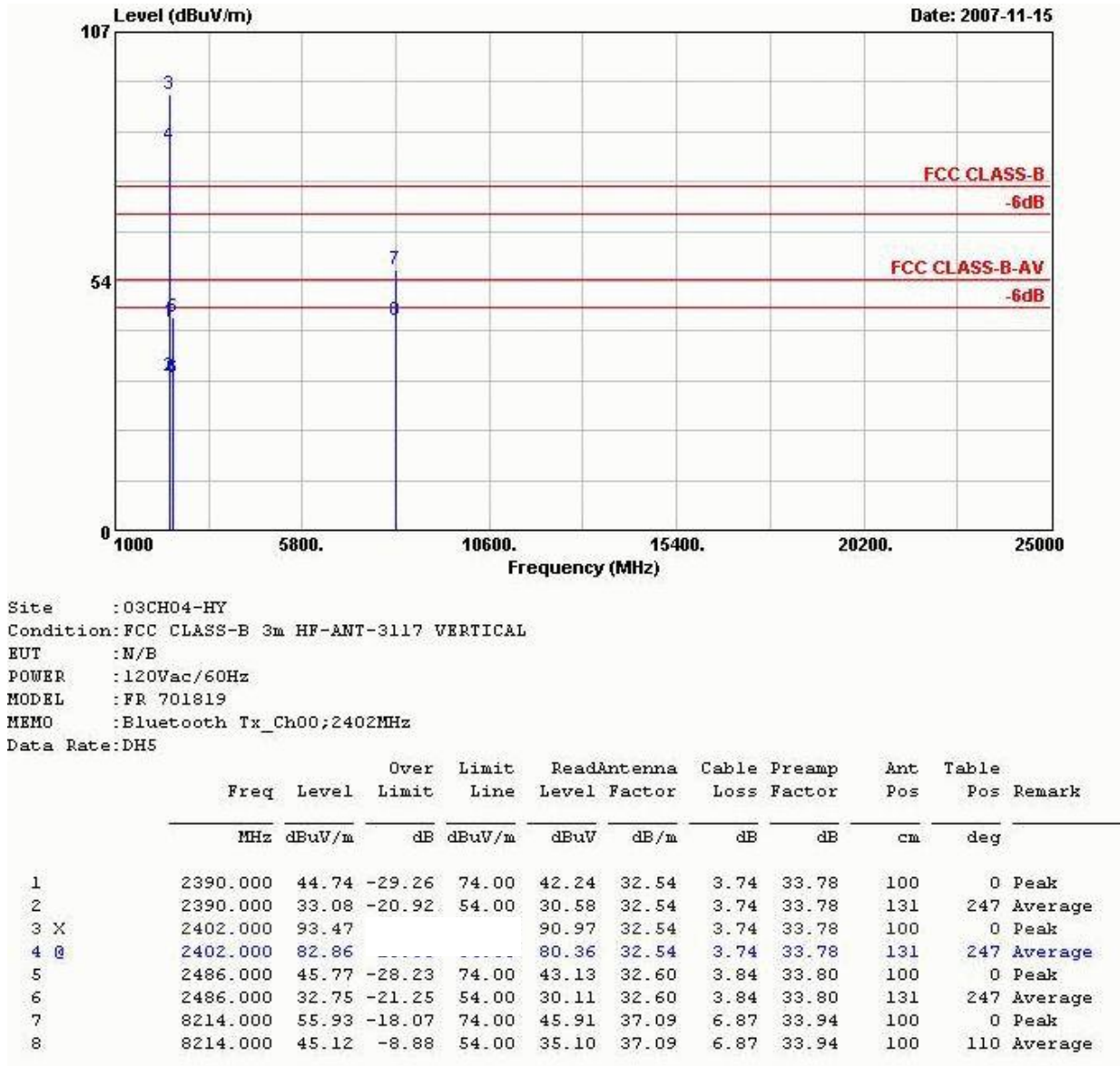
- Polarization : Vertical

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



Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 VERTICAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : Bluetooth Tx_Ch00;2402MHz
Data Rate: DH5

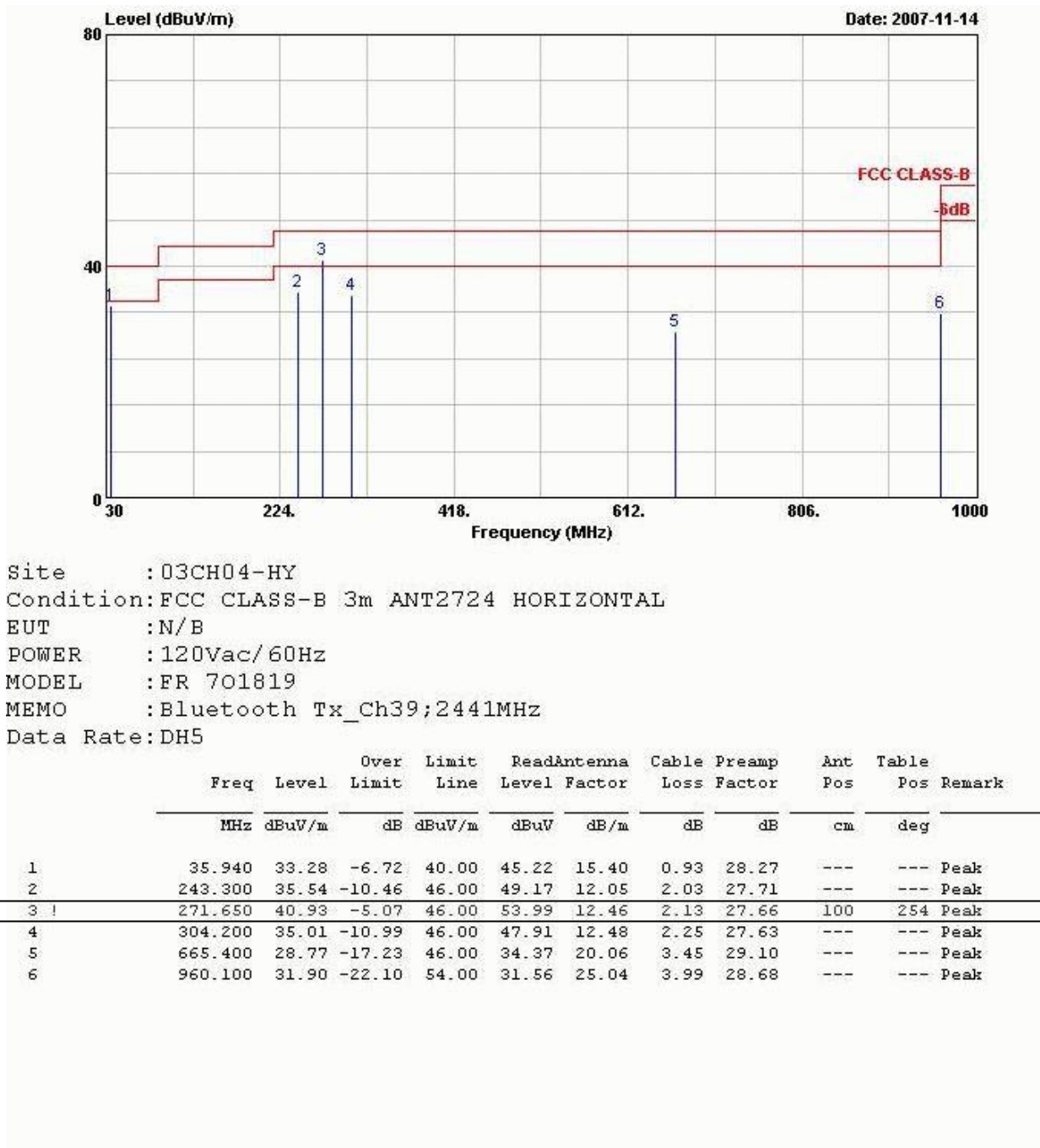
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	31.080	31.26	-8.74	40.00	42.27	16.36	0.88	28.25	100	58 Peak
2	64.020	29.21	-10.79	40.00	52.05	4.29	1.14	28.27	---	---
3	280.020	36.87	-9.13	46.00	49.93	12.41	2.17	27.64	---	---
4	315.400	34.97	-11.03	46.00	47.54	12.84	2.29	27.70	---	---
5	478.500	31.61	-14.39	46.00	41.03	16.65	2.77	28.85	---	---
6	668.200	30.63	-15.37	46.00	36.22	20.06	3.45	29.10	---	---

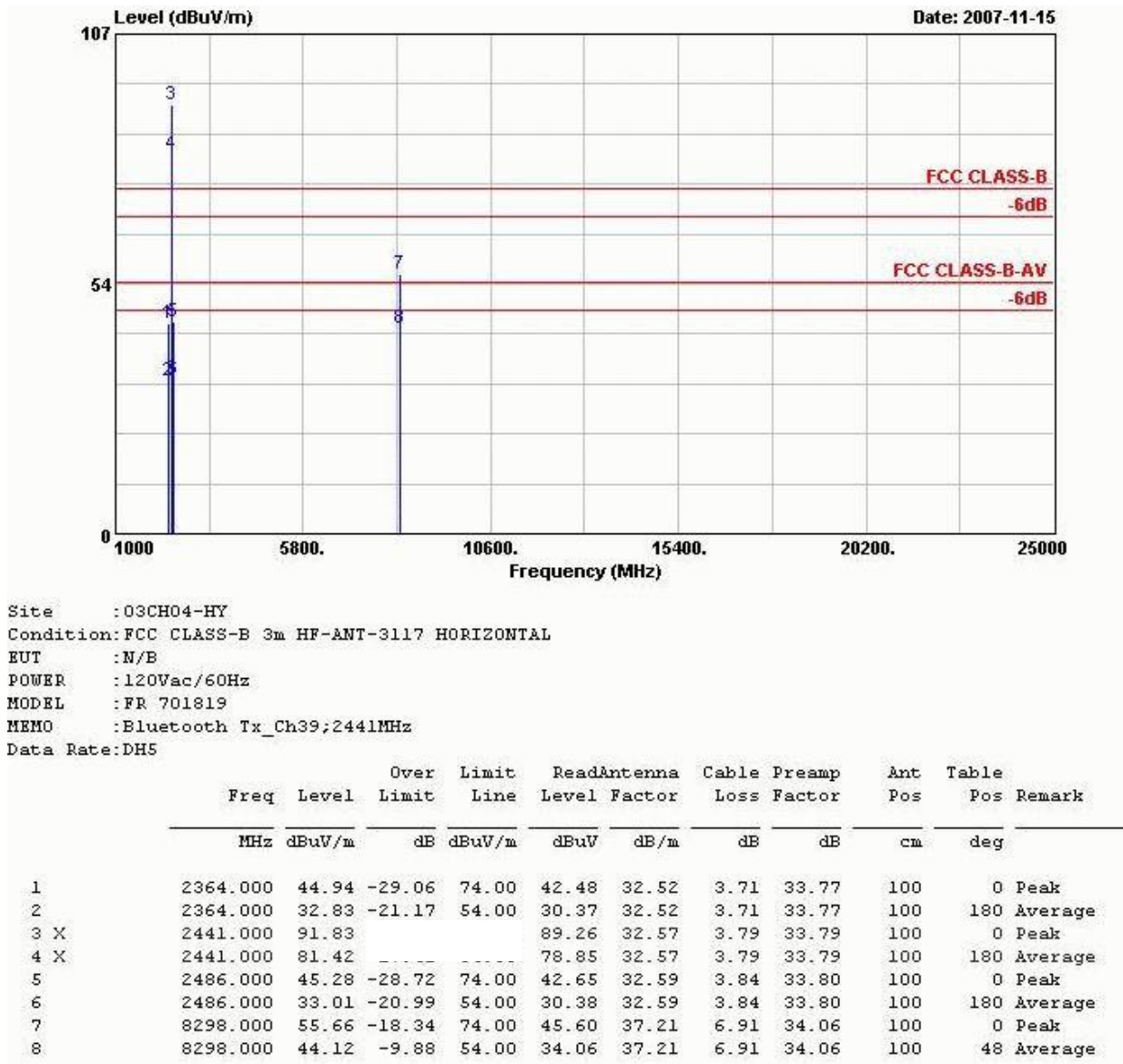


Remark: #3 and #4 Fundamental Signal

- Test Mode : Mode 2
- Polarization : Horizontal

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



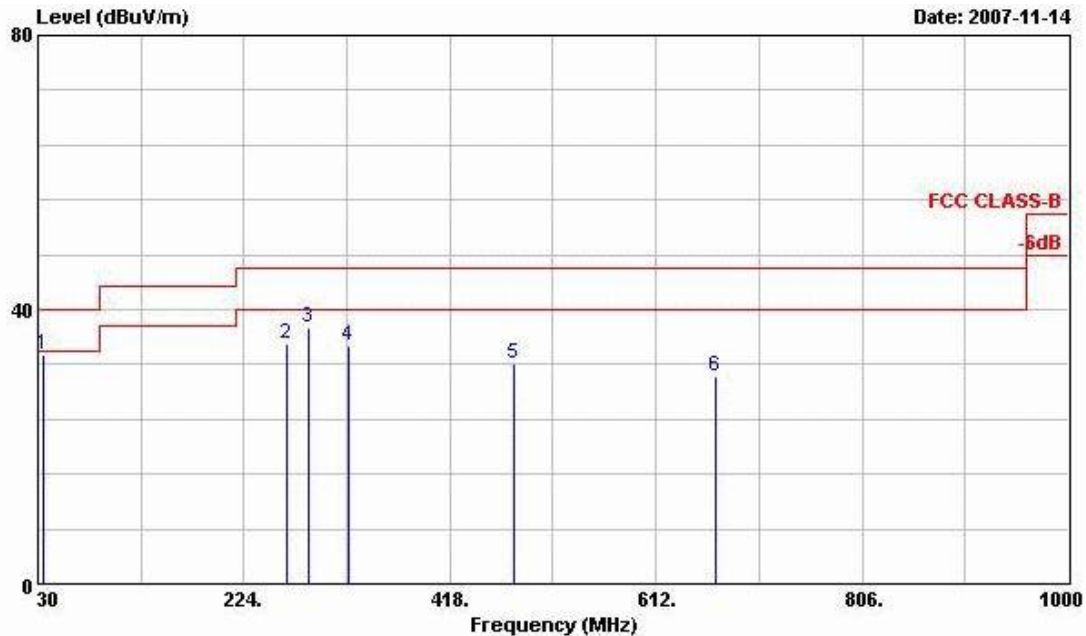


Remark: #3 and #4 Fundamental Signal



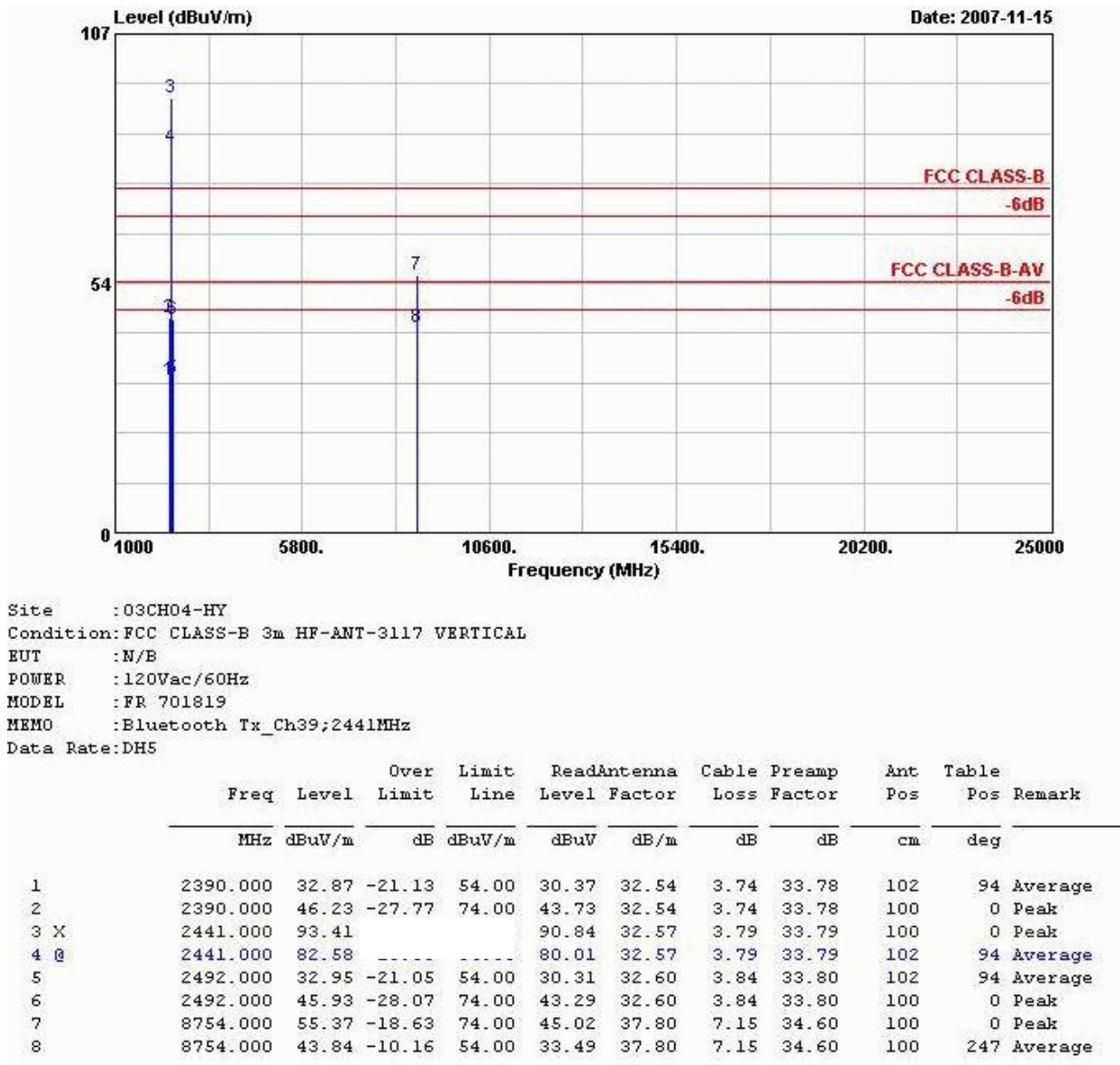
- Polarization : Vertical

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



Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 VERTICAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : Bluetooth Tx_Ch39;2441MHz
Data Rate: DH5

	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	35.130	33.35	-6.65	40.00	44.41	16.29	0.91	28.26	100	46 Peak
2	263.820	35.07	-10.93	46.00	48.14	12.50	2.10	27.67	---	---
3	285.420	37.35	-8.65	46.00	50.41	12.39	2.19	27.63	---	---
4	321.700	34.64	-11.36	46.00	47.00	13.08	2.31	27.75	---	---
5	478.500	32.17	-13.83	46.00	41.59	16.65	2.77	28.85	---	---
6	668.200	30.21	-15.79	46.00	35.80	20.06	3.45	29.10	---	---

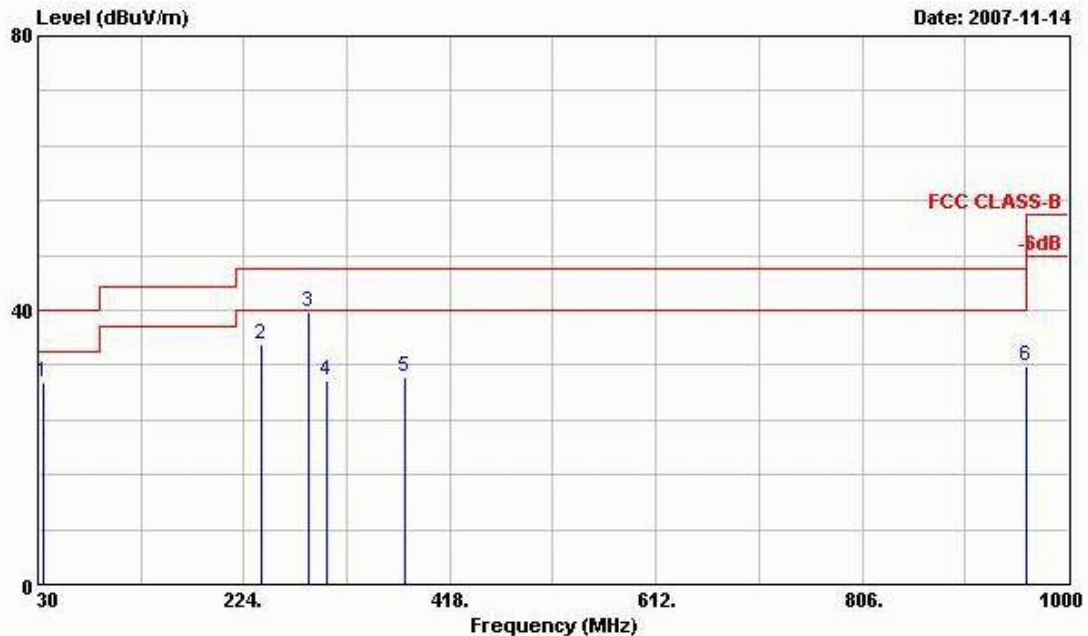


Remark: #3 and #4 Fundamental Signal



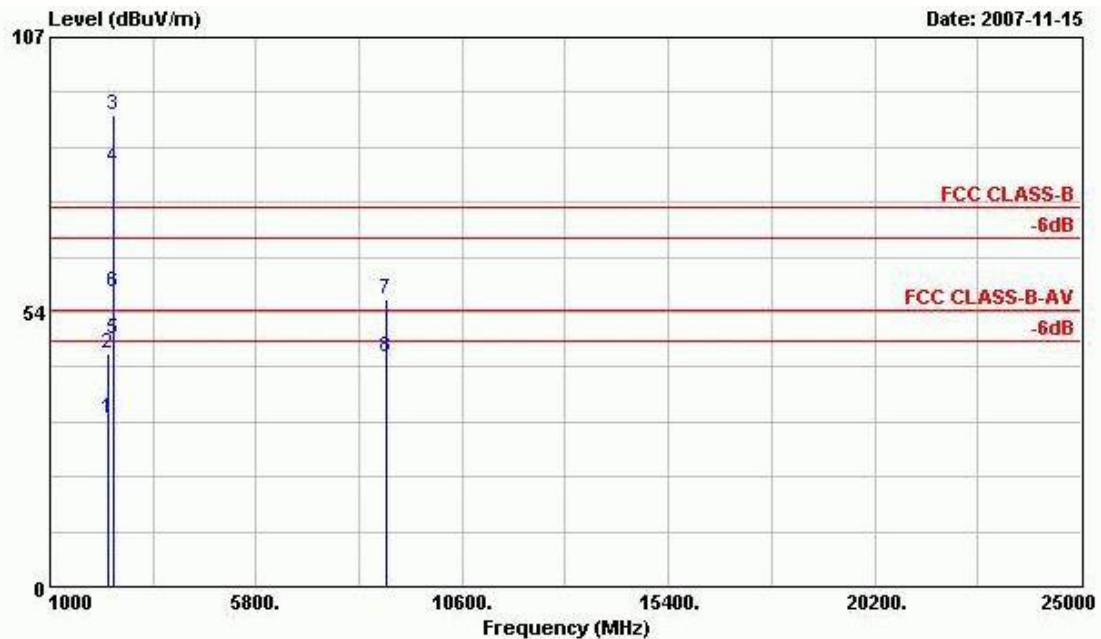
- Test Mode : Mode 3
- Polarization : Horizontal

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



Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 HORIZONTAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : Bluetooth Tx_Ch78;2480MHz
Data Rate: DH5

	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	35.940	29.57	-10.43	40.00	41.51	15.40	0.93	28.27	---	---	Peak
2	240.330	34.95	-11.05	46.00	48.82	11.83	2.02	27.72	---	---	Peak
3	285.690	39.66	-6.34	46.00	52.72	12.38	2.19	27.63	100	121	Peak
4	302.100	29.78	-16.22	46.00	42.74	12.41	2.25	27.61	---	---	Peak
5	374.900	30.31	-15.69	46.00	41.03	14.92	2.49	28.13	---	---	Peak
6	960.100	31.91	-22.09	54.00	31.57	25.04	3.99	28.68	---	---	Peak



Site : 03CH04-HY
Condition: FCC CLASS-B 3m HF-ANT-3117 HORIZONTAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : Bluetooth Tx_Ch78;2480MHz
Data Rate: DH5

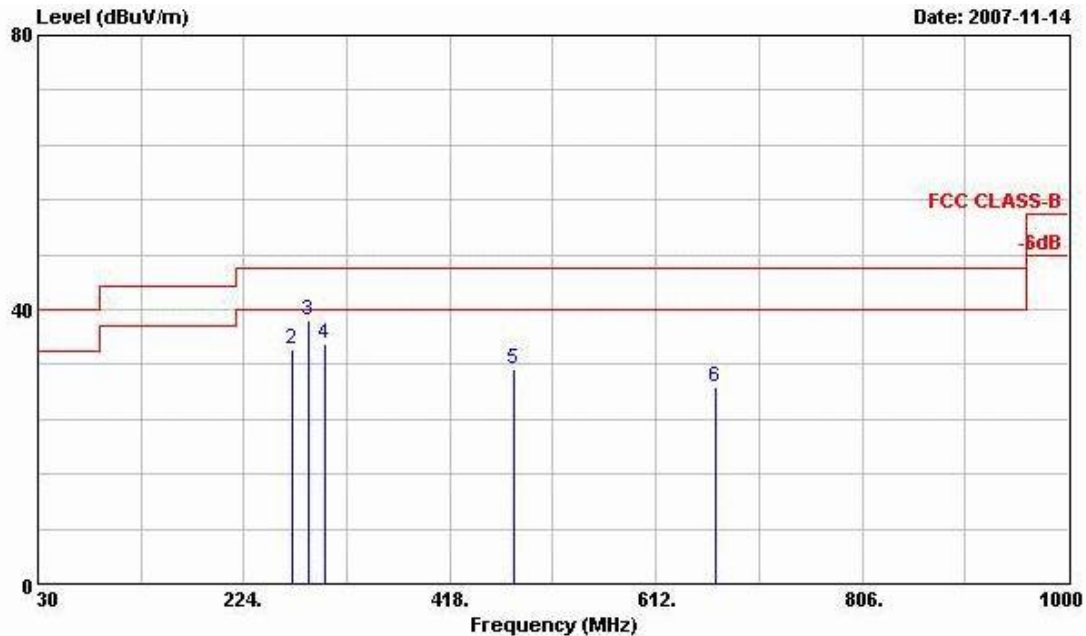
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	2358.000	32.81	-21.19	54.00	30.35	32.52	3.71	33.77	144	186 Average
2	2358.000	45.33	-28.67	74.00	42.87	32.52	3.71	33.77	100	0 Peak
3 @	2480.000	91.87			89.24	32.59	3.84	33.80	100	0 Peak
4 @	2480.000	81.54			78.91	32.59	3.84	33.80	144	186 Average
5 @	2483.500	48.29	-5.71	54.00	45.66	32.59	3.84	33.80	144	186 Average
6	2483.500	57.51	-16.49	74.00	54.88	32.59	3.84	33.80	100	0 Peak
7	8817.000	55.99	-18.01	74.00	45.59	37.88	7.18	34.66	100	0 Peak
8	8817.000	44.58	-9.42	54.00	34.18	37.88	7.18	34.66	100	178 Average

Remark: #3 and #4 Fundamental Signal



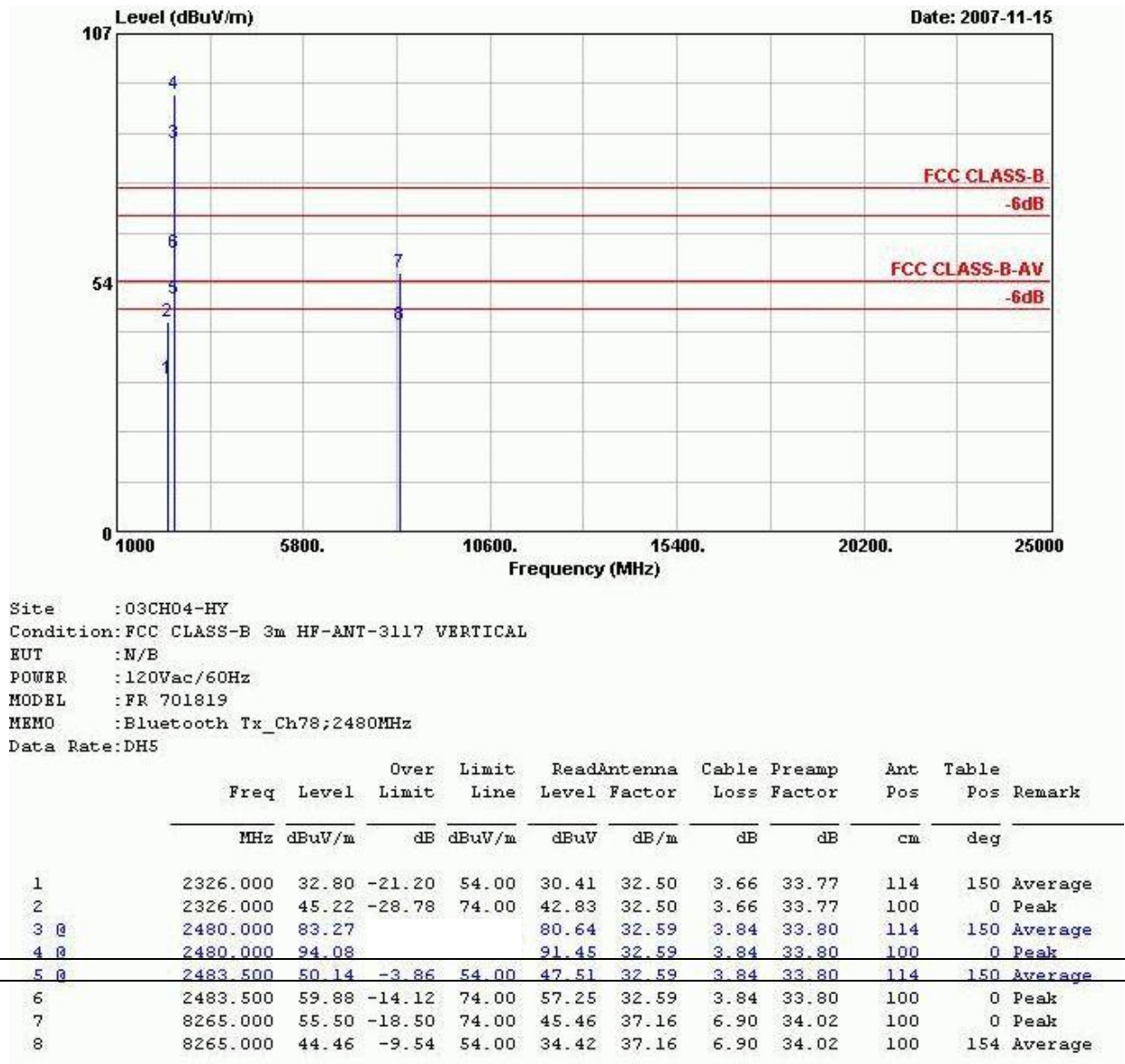
- Polarization : Vertical

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



Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 VERTICAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : Bluetooth Tx_Ch78;2480MHz
Data Rate: DH5

	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	30.540	32.43	-7.57	40.00	43.45	16.36	0.87	28.25	100	174 Peak
2	269.490	34.33	-11.67	46.00	47.40	12.47	2.13	27.66	---	---
3	284.610	38.31	-7.69	46.00	51.37	12.39	2.18	27.63	---	---
4	300.000	35.02	-10.98	46.00	48.07	12.31	2.24	27.60	---	---
5	478.500	31.27	-14.73	46.00	40.69	16.65	2.77	28.85	---	---
6	668.200	28.60	-17.40	46.00	34.19	20.06	3.45	29.10	---	---

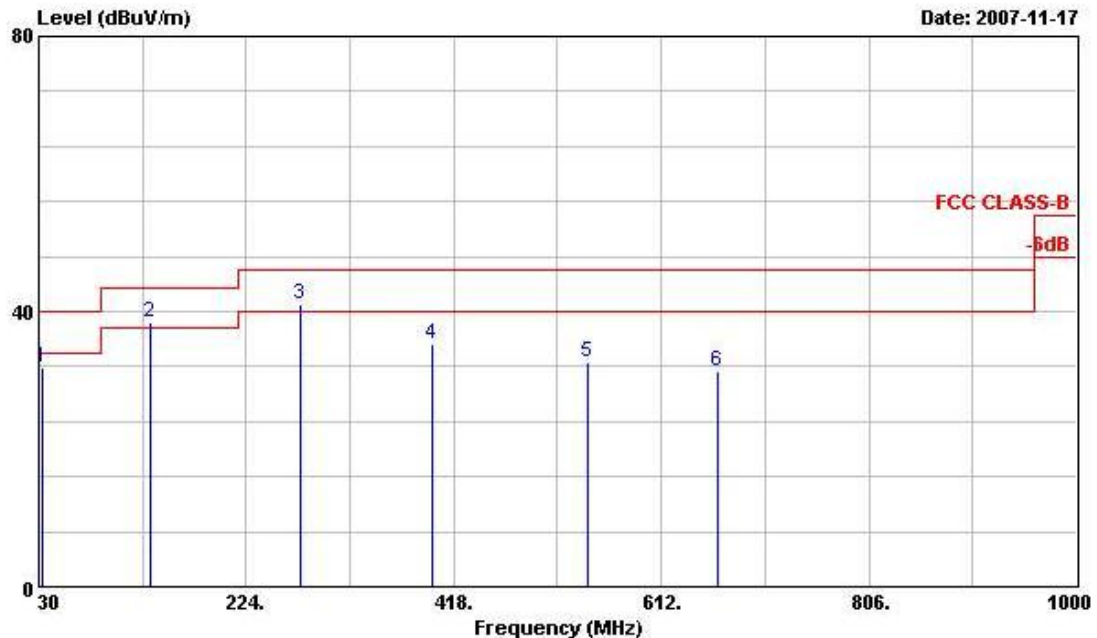


Remark: #3 and #4 Fundamental Signal



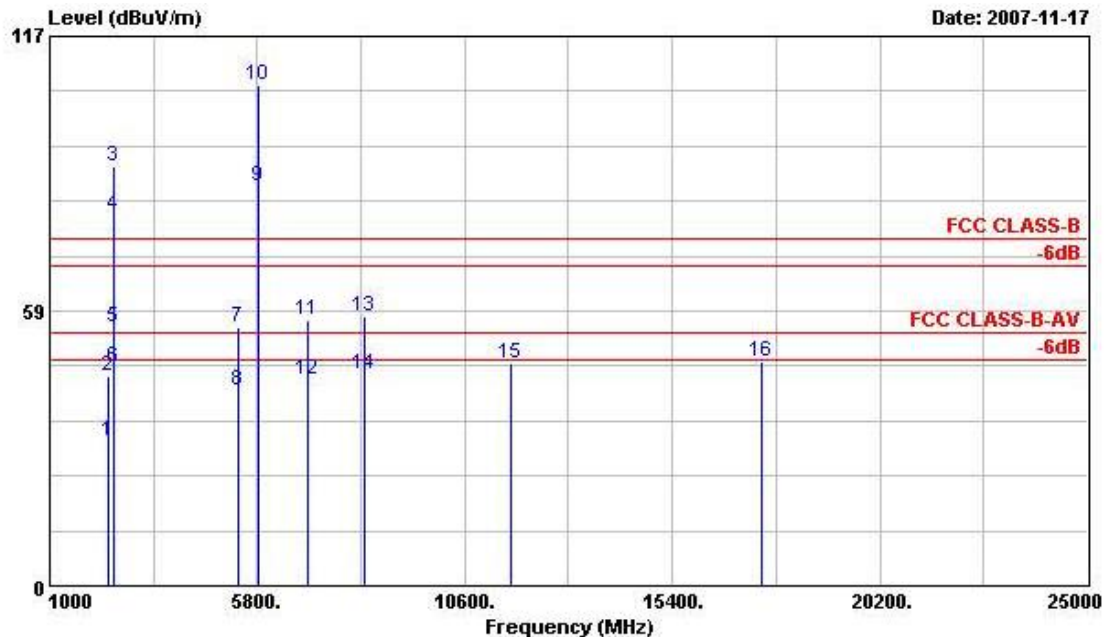
- Test Mode : Mode 4
- Polarization : Horizontal

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



Site : 03CH04-HY
Condition: FCC CLASS-B 3m ANT2724 HORIZONTAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : 11n(a)Tx(20M)_Ch165+BT Tx_Ch78 + Adaptor
Data Rate: WLAN:36 BT:DH5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	32.970	31.87	-8.13	40.00	42.91	16.33	0.90	28.26	---	---	Peak
2	134.490	38.29	-5.21	43.50	53.74	11.02	1.59	28.06	---	---	Peak
3	273.810	40.97	-5.03	46.00	54.03	12.45	2.14	27.65	100	184	Peak
4	397.300	35.29	-10.71	46.00	45.32	15.68	2.57	28.28	---	---	Peak
5	542.900	32.52	-13.48	46.00	40.40	18.19	2.97	29.04	---	---	Peak
6	665.400	31.31	-14.69	46.00	36.91	20.06	3.45	29.10	---	---	Peak



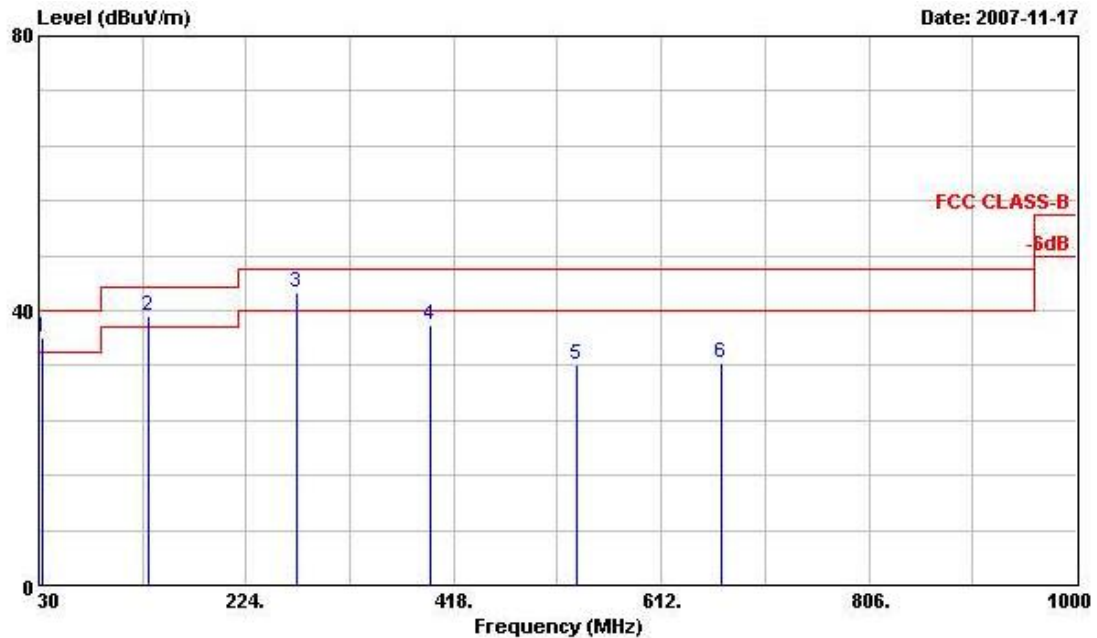
Site : 03CH04-HY
Condition: FCC CLASS-B 3m HF-ANT-10094 HORIZONTAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : 11ln(a)Tx(20M)_Ch165+BT Tx_Ch78 + Adaptor
Data Rate: WLAN:36 BT:DH5

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	2340.000	30.70	-23.30	54.00	30.26	30.52	3.69	33.77	100	97 Average
2	2340.000	44.68	-29.32	74.00	44.24	30.52	3.69	33.77	100	0 Peak
3 X	2480.000	89.36			88.99	30.32	3.84	33.80	100	0 Peak
4 X	2480.000	79.03			78.66	30.32	3.84	33.80	100	97 Average
5	2483.500	55.07	-18.93	74.00	54.70	30.32	3.84	33.80	100	0 Peak
6	2483.500	46.53	-7.47	54.00	46.16	30.32	3.84	33.80	100	97 Average
7	5340.000	54.92	-19.08	74.00	47.58	35.50	6.00	34.16	100	0 Peak
8	5340.000	41.72	-12.28	54.00	34.38	35.50	6.00	34.16	100	61 Average
9 X	5825.000	84.89			77.01	35.90	6.02	34.04	100	61 Average
10 X	5825.000	106.45			98.57	35.90	6.02	34.04	100	0 Peak
11	6966.000	56.56	-17.44	74.00	43.71	39.02	6.35	32.52	100	0 Peak
12	6966.000	44.03	-9.97	54.00	31.18	39.02	6.35	32.52	100	61 Average
13	8278.000	57.49	-16.51	74.00	45.11	39.50	6.90	34.02	100	0 Peak
14	8278.000	45.11	-8.89	54.00	32.73	39.50	6.90	34.02	100	145 Average
15	11658.000	47.22	-26.78	74.00	84.82	-11.10	7.86	34.36	100	0 Peak
16	17481.000	47.91	-26.09	74.00	84.09	-12.12	9.64	33.71	100	0 Peak

Remark: #3, #4, #9 and #10 Fundamental Signal

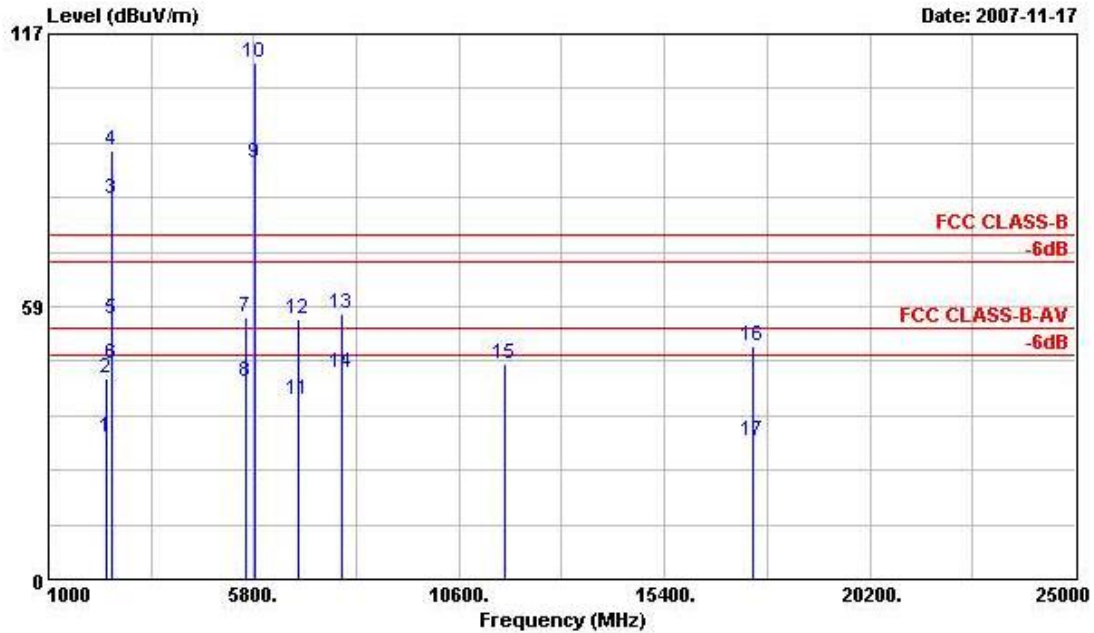
- Polarization : Vertical

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



Site : 03CH04-HY
 Condition: FCC CLASS-B 3m ANT2724 VERTICAL
 EUT : N/B
 POWER : 120Vac/60Hz
 MODEL : FR 701819
 MEMO : 11n(a)Tx(20M)_Ch165+BT Tx_Ch78 + Adaptor
 Data Rate: WLAN:36 BT:DH5

	Freq	Level	Over	Limit	ReadAntenna	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 !	32.970	36.01	-3.99	40.00	47.05	16.33	0.90	28.26	---	--- Peak
2 !	133.140	39.15	-4.35	43.50	54.44	11.20	1.58	28.07	---	--- Peak
3 !	270.570	42.60	-3.40	46.00	55.67	12.46	2.13	27.66	100	214 Peak
4	396.600	37.82	-8.18	46.00	47.88	15.65	2.57	28.28	---	--- Peak
5	533.800	32.04	-13.96	46.00	40.24	17.90	2.94	29.03	---	--- Peak
6	668.200	32.39	-13.61	46.00	37.98	20.06	3.45	29.10	---	--- Peak



Site : 03CH04-HY
Condition: FCC CLASS-B 3m HF-ANT-10094 VERTICAL
EUT : N/B
POWER : 120Vac/60Hz
MODEL : FR 701819
MEMO : 11ln(a)Tx(20M)_Ch165+BT Tx_Ch78 + Adaptor
Data Rate: WLAN:36 BT:DH5

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	2350.000	30.60	-23.40	54.00	30.16	30.52	3.69	33.77	100	88 Average
2	2350.000	42.98	-31.02	74.00	42.54	30.52	3.69	33.77	100	0 Peak
3 X	2480.000	81.55			81.18	30.32	3.84	33.80	100	88 Average
4 X	2480.000	92.03			91.66	30.32	3.84	33.80	100	0 Peak
5	2483.500	55.77	-18.23	74.00	55.40	30.32	3.84	33.80	100	0 Peak
6	2483.500	46.25	-7.75	54.00	45.88	30.32	3.84	33.80	100	88 Average
7	5622.000	56.13	-17.87	74.00	48.42	35.77	6.02	34.08	100	0 Peak
8	5622.000	42.17	-11.83	54.00	34.46	35.77	6.02	34.08	100	13 Average
9 X	5825.000	89.30			81.42	35.90	6.02	34.04	100	13 Average
10 @	5825.000	110.83			102.95	35.90	6.02	34.04	100	0 Peak
11	6854.000	38.39	-15.61	54.00	30.51	35.90	6.02	34.04	100	13 Average
12	6854.000	55.85	-18.15	74.00	43.75	38.39	6.31	32.61	100	0 Peak
13	7878.000	56.94	-17.06	74.00	44.40	39.48	6.71	33.65	100	0 Peak
14	7878.000	44.40	-9.60	54.00	31.86	39.48	6.71	33.65	100	284 Average
15	11649.000	46.37	-27.63	74.00	84.02	-11.14	7.86	34.36	100	0 Peak
16	17469.000	49.90	-24.10	74.00	86.06	-12.07	9.62	33.71	100	0 Peak
17	17469.000	29.62	-24.38	54.00	65.78	-12.07	9.62	33.71	100	168 Average

Remark: #3, #4, #9 and # 10 Fundamental Signal



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 PIFA antenna for BT 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 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. 01, 2007	Feb. 29, 2008	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2007	Mar. 30, 2008	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2007	Mar. 21, 2008	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2007	Apr. 19, 2008	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz – 30MHz	Mar. 09, 2007	Mar. 08, 2008	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	N/A	Conduction (CO04-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	N/A	Conduction (CO04-HY)
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH04-HY	30 MHz - 1 GHz 3m	Oct. 29, 2007	Oct. 28, 2008	Radiation (03CH04-HY)
Amplifier	HP	87405A	3950M00135	10MHz - 3 GHz	Mar. 02, 2007	Mar. 01, 2008	Radiation (03CH04-HY)
Spectrum Analyzer	R&S	FSP30	100792	9 kHz – 30GHz	Dec. 13, 2006	Dec. 12, 2007	Radiation (03CH04-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2724	30 MHz - 1 GHz	Aug. 13, 2007	Aug. 12 2008	Radiation (03CH04-HY)
Turn Table	HD	Deis HD 2000	420/610	0 - 360 degree	N/A	N/A	Radiation (03CH04-HY)
Antenna Mast	Chaintek	3000	N/A	1 m - 4 m	N/A	N/A	Radiation (03CH04-HY)
RF Cable-R03m	Suhner Switzerland + RFIDEN	RG223/U +RG8/U	CB024	30 MHz - 1 GHz	Sep. 20, 2007	Sep. 19, 2008	Radiation (03CH04-HY)
Isolation Transformer	Erika FiedLer OHG	D-65396 Walluf	N/A	45 MHz – 2.15 GHz 30dB	N/A	N/A	Radiation (03CH04-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	0.11	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 (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 $U_c(y)$	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 EP980406-03 as below.