

Test Report of FCC Part 15 C for FCC Certificate
On Behalf of
JUNDE INDUSTRIAL (SHENZHEN) LIMITED

Product description: Mobile Wireless Headset

Model No.: BTHS-03

FCC ID: VFU-BTHS-03

Prepared for: **JUNDE INDUSTRIAL (SHENZHEN) LIMITED**

Rm 406-407, 1st Building, Pengyi Garden, Bagua 2nd Rd., Futian,
Shenzhen, China

Prepared by: **Bontek Compliance Laboratory Ltd**

Rm 802~804, 8/F, Jinmin Bld., Zizhu 6th Rd., Zhuzi Lin, Futian,
Shenzhen 518040, P.R. China.

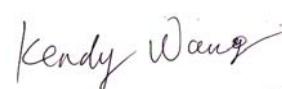
Tel: 86-755-82871080
Fax: 86-755-82871368

Issue Date: July 1, 2007

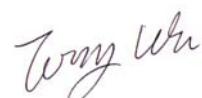
Test Date: June 25~30, 2007

Test by:

Reviewed By:



Kandy Wang



Tony Wu

TABLE OF CONTENTS

1. GENERAL INFORMATION	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
1.2 RELATED SUBMITTAL(S) / GRANT (S)	4
1.3 TEST METHODOLOGY	5
1.4 TEST FACILITY	5
2. SYSTEM TEST CONFIGURATION	6
2.1 EUT CONFIGURATION.....	6
2.2 EUT EXERCISE	6
2.3 GENERAL TEST PROCEDURES.....	6
2.4 LIST OF MEASURING EQUIPMENTS USED	7
3. SUMMARY OF TEST RESULTS.....	8
4. ANTENNA REQUIREMENT.....	9
4.1 STANDARD APPLICABLE	9
4.2 ANTENNA CONNECTED CONSTRUCTION.....	9
5. TEST OF CONDUCTED EMISSION.....	10
5.1 APPLICABLE STANDARD	10
5.2 TEST SETUP DIAGRAM	10
5.3 TEST RESULT	11
6. TEST OF HOPPING CHANNEL BANDWIDTH	12
6.1 APPLICABLE STANDARD	12
6.2 EUT SETUP	12
6.3 TEST EQUIPMENT LIST AND DETAILS.....	12
6.4 TEST PROCEDURE.....	12
6.5 TEST RESULT	12
7. TEST OF HOPPING CHANNEL SEPARATION.....	16
7.1 APPLICABLE STANDARD	16
7.2 EUT SETUP	16
7.3 TEST EQUIPMENT LIST AND DETAILS.....	16
7.4 TEST PROCEDURE.....	16
7.5 TEST RESULT	16
8. TEST OF NUMBER OF HOPPING FREQUENCY	20
8.1 APPLICABLE STANDARD	20
8.2 EUT SETUP	20
8.3 TEST EQUIPMENT LIST AND DETAILS.....	20
8.4 TEST PROCEDURE.....	20
8.5 TEST RESULT	20
9. TEST OF DWELL TIME OF EACH FREQUENCY	22
9.1 APPLICABLE STANDARD	22
9.2 EUT SETUP	22
9.3 TEST EQUIPMENT LIST AND DETAILS.....	22
9.4 TEST PROCEDURE.....	22
9.5 TEST RESULT	22
10. TEST OF MAXIMUM PEAK OUTPUT POWER	27
10.1 APPLICABLE STANDARD	27
10.2 EUT SETUP.....	27
10.3 TEST EQUIPMENT LIST AND DETAILS.....	27
10.4 TEST PROCEDURE	27
10.5 TEST RESULT	27

11. TEST OF BAND EDGES EMISSION.....	28
11.1 APPLICABLE STANDARD	28
11.2 EUT SETUP.....	28
11.3 TEST EQUIPMENT LIST AND DETAILS.....	29
11.4 TEST PROCEDURE	29
11.5 TEST RESULT	29
12. TEST OF SPURIOUS RADIATED EMISSION.....	32
12.1 APPLICABLE STANDARD	32
12.2 EUT SETUP.....	32
12.3 TEST EQUIPMENT LIST AND DETAILS.....	33
12.4 TEST PROCEDURE	33
12.5 TEST RESULT	34
HARMONICS.....	36

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant: **JUNDE INDUSTRIAL (SHENZHEN) LIMITED**
Address of applicant: Rm 406-407, 1st Building, Pengyi Garden, Bagua 2nd Rd.,
Futian, Shenzhen, China
Manufacturer: **ATI Electronics(Shenzhen) Co., Ltd.**
Address of manufacturer: 4/F, 1st Building, Baolu industrial Park, Shiyan Town,
Shenzhen, China

Equipment Under Test: Mobile Wireless Headset
Model No.: BTHS-03
Type of Modulation: FHSS
Frequency Band: 2402 MHz ~ 2480 MHz
Bluetooth Specification: V1.0 and V1.2 Compliant
Number of Channels: 32
Channel Bandwidth: 2 MHz
Range of operation: Max 10m line of sight
Antenna Type: Built-in Antenna
Temperature Range (Operating): -20 ~ 55 °C
Output Power Class: Class 2
Power Supply: 3.7 V from rechargeable battery & AC 120V from Adaptor

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.207, and 15.247 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

All measurement required was performed at laboratory of Shenzhen Huatongwei International Inspection Co., Ltd at Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China and SGS-CSTC Standards Technical Services Co., Ltd ShenZhen Branch EMC Lab at No.1 Workshop, M-10, Middle Section, Science&Technology Park, Shenzhen 518057, Cina

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 662850, November 17, 2003.

FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd ShenZhen Branch EMC Lab, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions The EUT is placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
For Radiated Spurious Emission (30~25GHz) test: SGS-CSTC Shenzhen Branch						
1	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100079	2007/6	1 year
2	Horn Antenna	R/S	CH14-H052	1091698	2007/6	1 year
3	3m Semi- Anechoic Chamber	ETS	N/A	N/A	2007/6	1 year
For other test: Shenzhen Huatongwei International Inspection Co., Ltd						
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2006/11	1 year
2	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100009	2006/11	1 year
3	Receiver/ Spectrum Analyzer	ROHDE & SCHWARZ	ESCI	100106	2006/11	1 year
4	Spectrum Analyzer	HP	8593EM	3536A00107	2006/11	1 year
5	Spectrum Analyzer	HP	7405	US39440156	2006/11	1 year
6	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2006/11	1 year
7	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2006/11	1 year
8	LISN	COM Power	LI-200	12212	2006/11	1 year
9	LISN	COM Power	LI-200	12019	2006/11	1 year
10	3m/5m Semi- Anechoic Chamber	ETS	N/A	N/A	2006/11	1 year
11	Ultra-Broadband Antenna	R/S	HL562	100015	2006/11	1 year
12	Horn Antenna	R/S	HF906	100039	2006/11	1 year
13	RF Test Panel	R/S	TS / RSP	335015/ 0017	N/A	N/A
14	Turntable	ETS	2088	2149	N/A	N/A
15	Antenna Mast	ETS	2075	2346	N/A	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.203/15.247(b)/(c)	Antenna Requirement	Pass
15.207	AC Power Line Conducted Emission	Pass
15.247(a)(1)	Hopping Channel Bandwidth	Pass
15.247(a)(1)	Hopping Channel Separation	Pass
15.247(a)(1)	Number of Hopping Frequency Used	Pass
15.247(a)(1)(iii)	Dwell Time of Each Frequency	Pass
15.247(b)(1)	Maximum Peak Output Power	Pass
15.247(d)	Band Edges Emission	Pass
15.247(d)	Spurious Radiated Emission	Pass

4. ANTENNA REQUIREMENT

4.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Section 15.247(b)/(c):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.2 Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement.

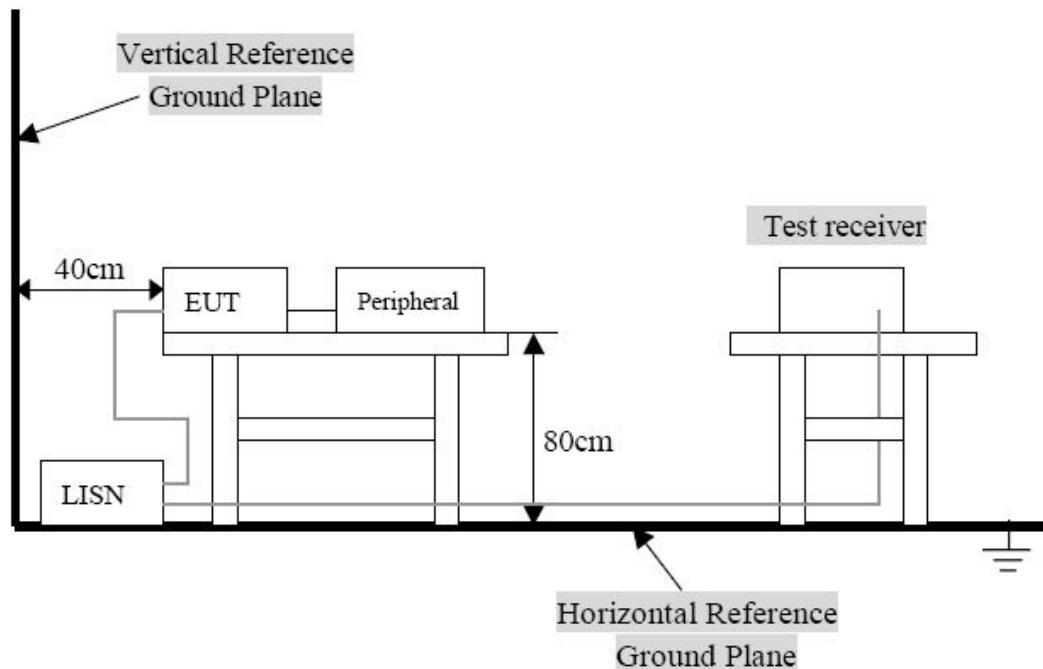
5. TEST OF CONDUCTED EMISSION

5.1 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

5.2 Test Setup Diagram



Remark: 1. The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC 15.207 limits.

2. The EUT was connected to a 120 VAC/ 60Hz power source

5.3 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH): 50~54	M/N: BTHS-03
Barometric Pressure (mbar): 950~1000	Operation Condition: Charging Mode

Frequency (MHz)	Reading Q.P.(dB μ V)	Reading AVG(dB μ V)	Limit Q.P.(dB μ V)	Limit AVG(dB μ V)	Margin Q.P.(dB μ V)	Margin AVG(dB μ V)	Line
0.274	32.93	44.26	60.98	50.98	28.05	6.72	L
0.413	38.00	44.02	57.60	47.60	19.60	3.58	L
0.546	34.84	43.32	56.00	46.00	21.16	2.68	L
0.822	34.84	43.65	56.00	46.00	21.16	2.35	L
1.065	42.44	-----	56.00	46.00	13.56	-----	L
2.540	42.31	-----	56.00	46.00	13.56	-----	L
4.430	41.62	-----	56.00	46.00	14.38	-----	L

0.269	56.24	44.26	61.16	51.16	4.92	6.90	N
0.410	54.63	44.32	57.64	47.64	3.01	3.32	N
0.549	48.18	44.11	56.00	46.00	7.82	1.89	N
0.694	45.67	43.10	56.00	46.00	10.33	2.90	N
1.396	44.61	-----	56.00	46.00	11.39	-----	N
3.681	45.92	43.02	56.00	46.00	10.08	2.98	N
4.549	45.42	42.98	56.00	46.00	10.58	3.02	N

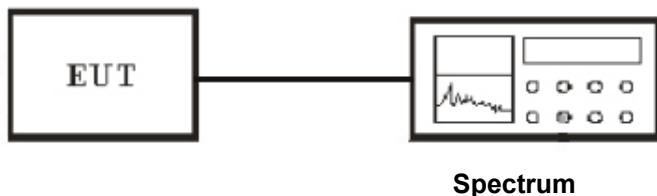
Remark: 1. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Qusia-Peak detector and Average detector.
 2. “-----” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.
 3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10KHz;
 The IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9KHz;
 4. L = Live Line, N= Neutral Line

6. Test of Hopping Channel Bandwidth

6.1 Applicable Standard

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.4.

6.4 Test Procedure

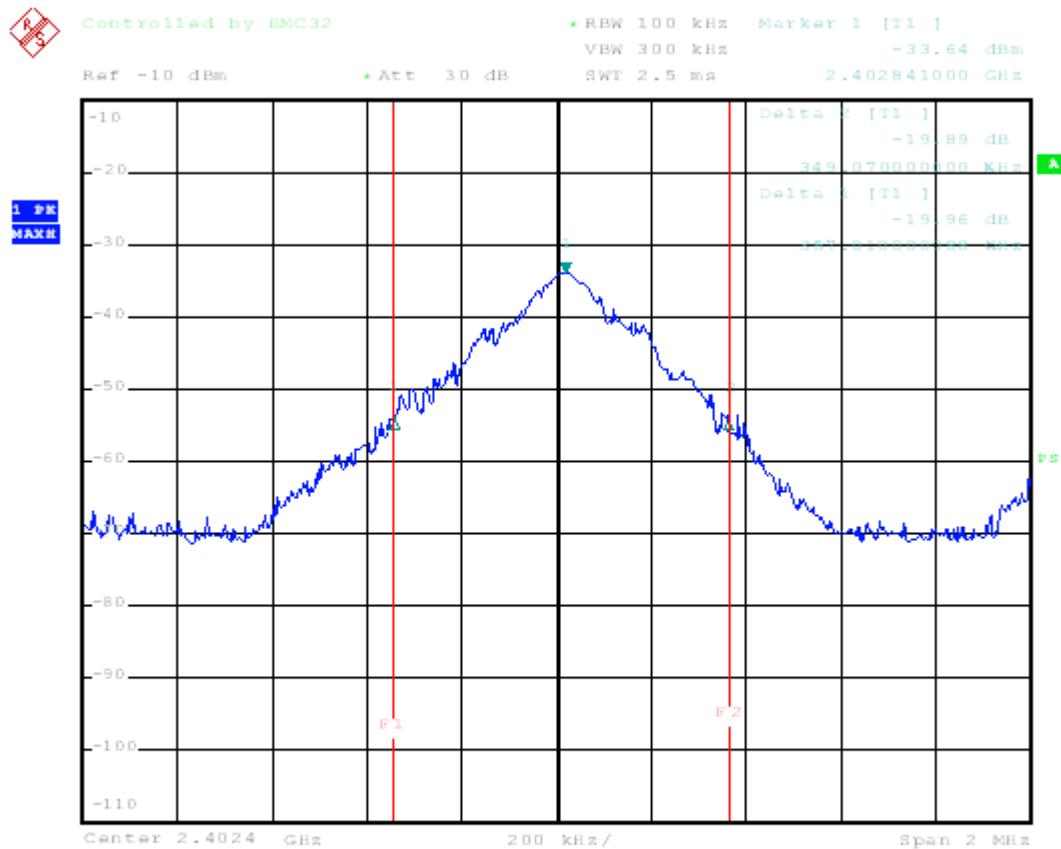
1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 30KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The spectrum width with level higher than 20dB below the peak level.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

6.5 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH): 50~54	M/N: BTHS-03
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx/Rx Mode

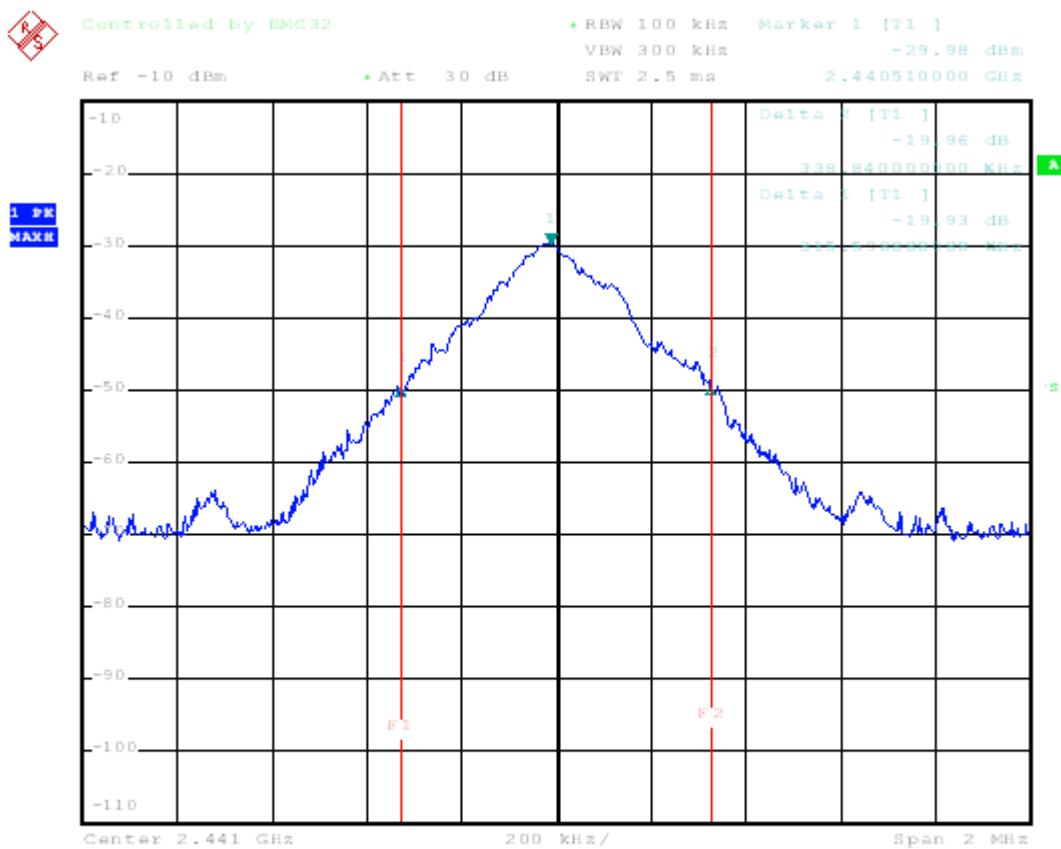
Modulation Type	Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Min. Limit (kHz)
FHSS	LOW	2402.84	706	>25
FHSS	MID	2440.50	653	>25
FHSS	HIG	2480.41	713	>25

Channel Low :



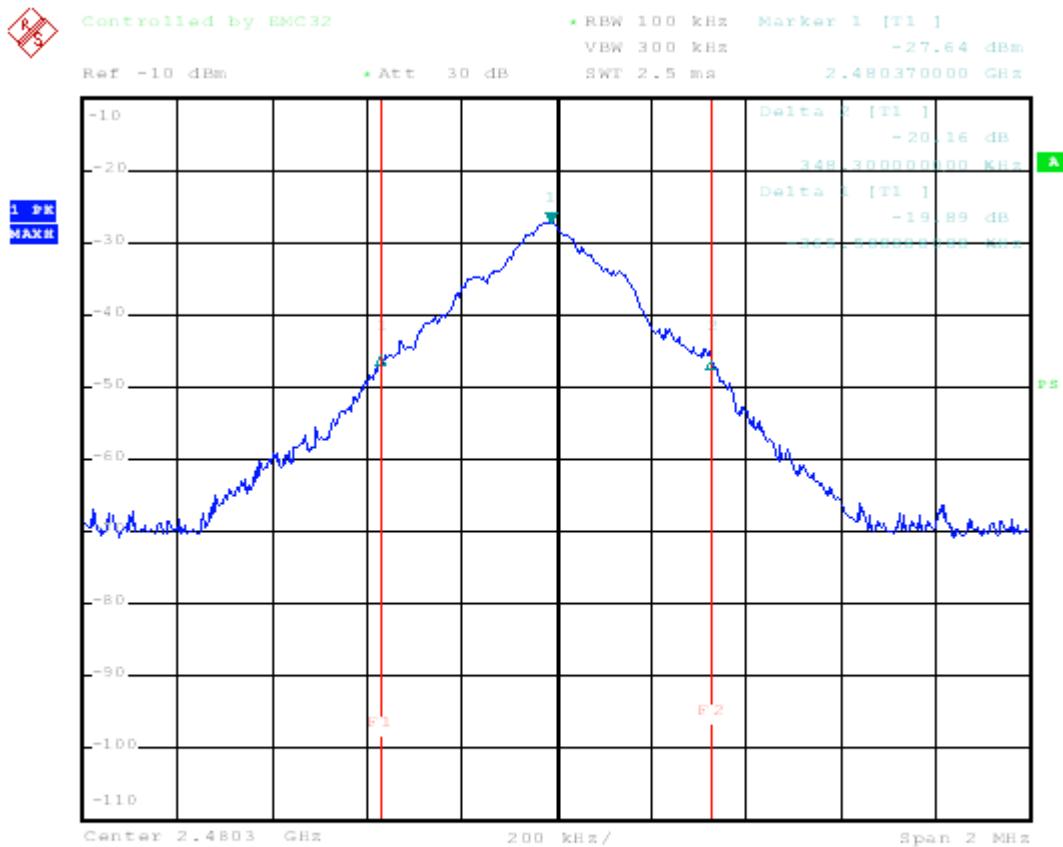
Date: 26.JUN.2007 14:23:10

Channel MID :



Date: 26.JUN.2007 14:36:58

Channel HIG :



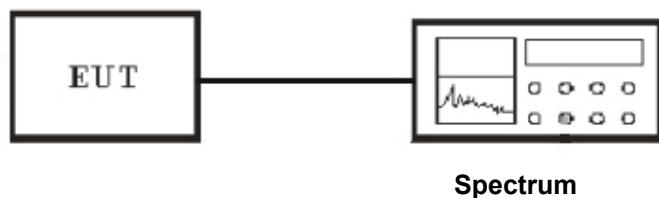
Date: 26.JUN.2007 14:28:43

7. Test of Hopping Channel Separation

7.1 Applicable Standard

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

7.2 EUT Setup



7.3 Test Equipment List and Details

See section 2.4.

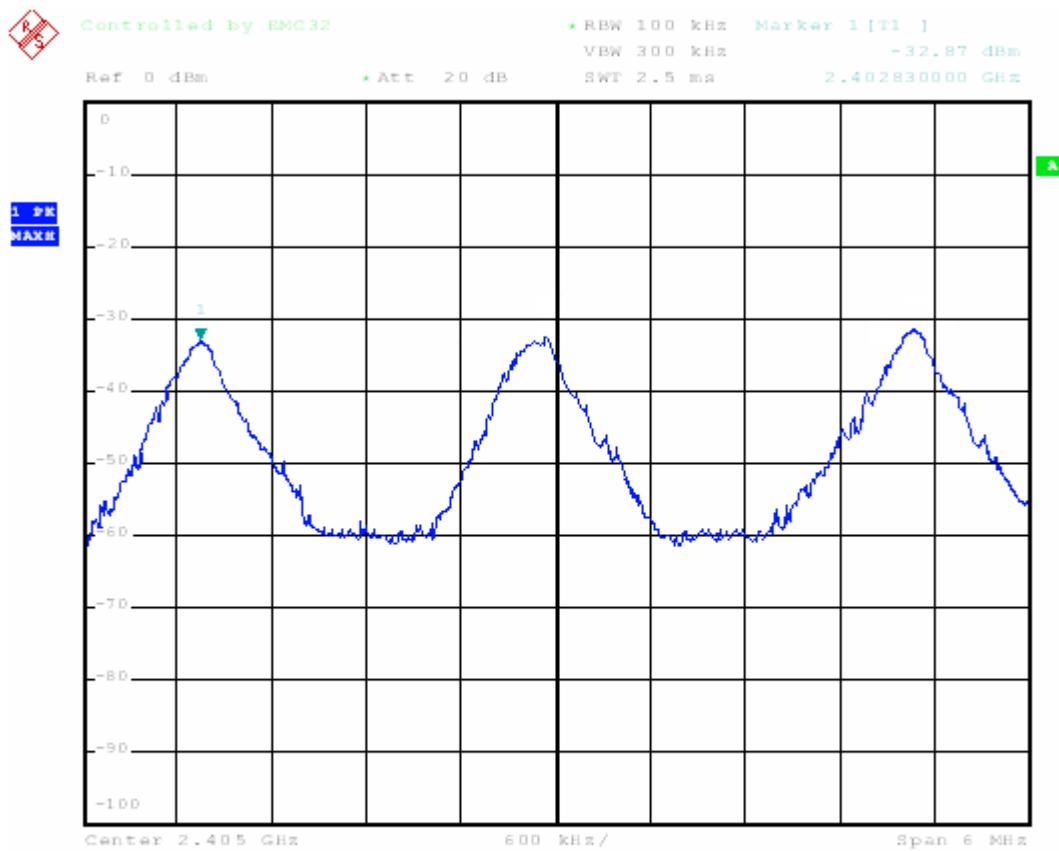
7.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The Hopping Channel Separation is defined as the separation between 2 neighboring hopping frequencies.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

7.5 Test Result

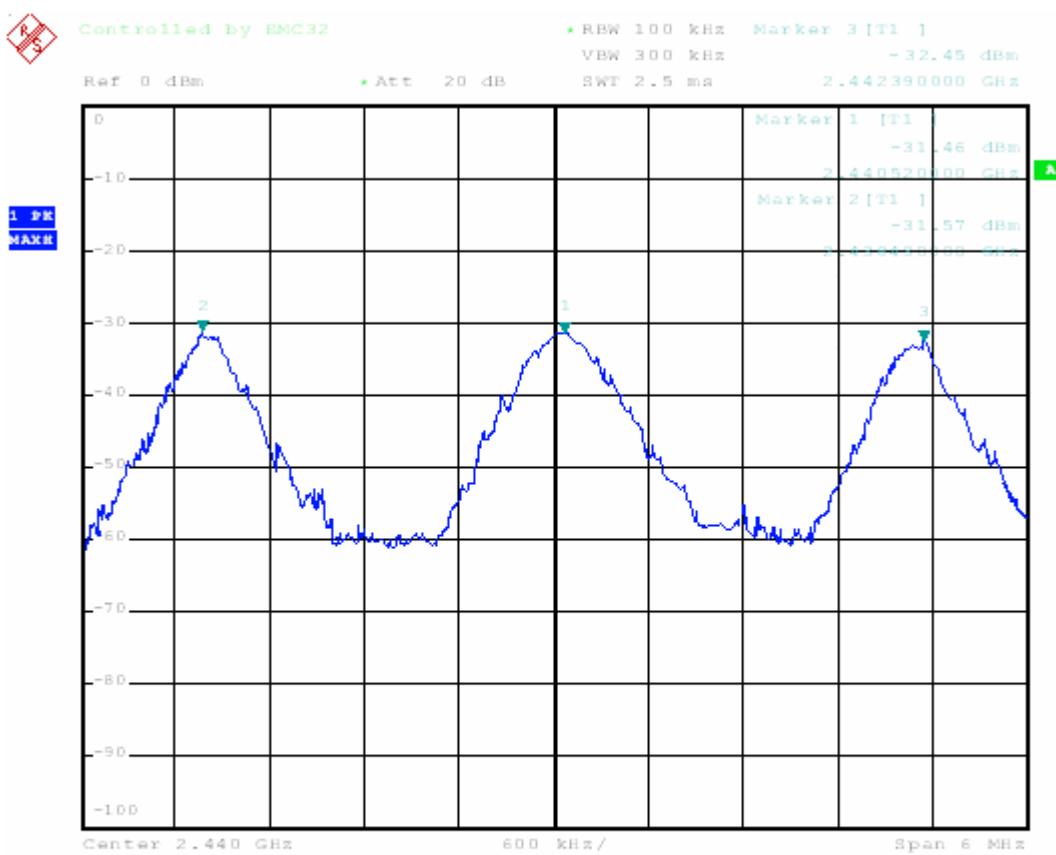
Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH) : 50~54	M/N: BTHS-03
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Channel Low :



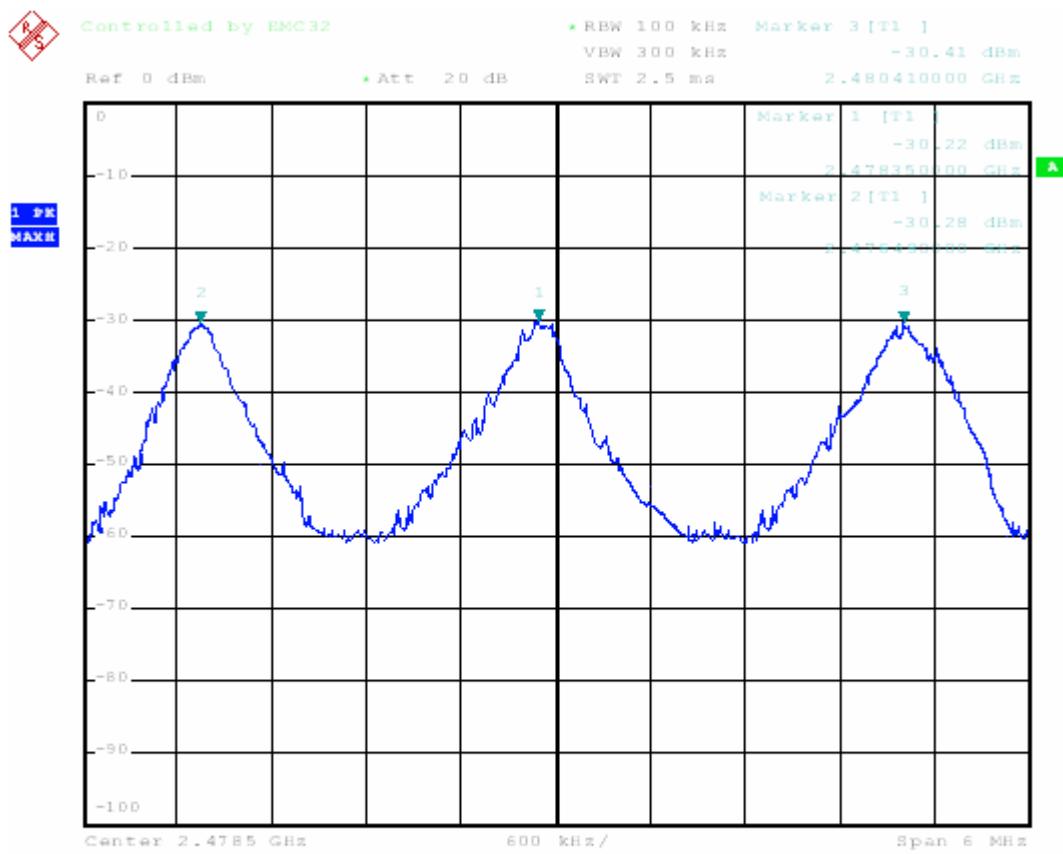
Date: 27.JUN.2007 17:26:12

Channel MID :



Date: 27.JUN.2007 17:32:18

Channel HIG :



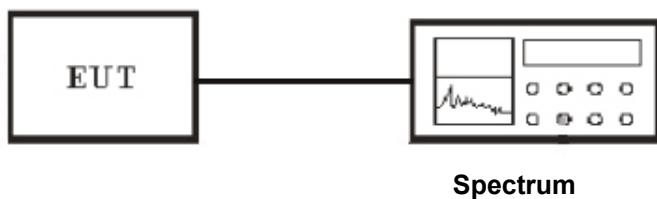
Date: 27.JUN.2007 17:39:25

8. Test of Number of Hopping Frequency

8.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 15 non-overlapping hopping channels. Frequency hopping system which use fewer than 75 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping system may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

8.2 EUT Setup



8.3 Test Equipment List and Details

See section 2.4.

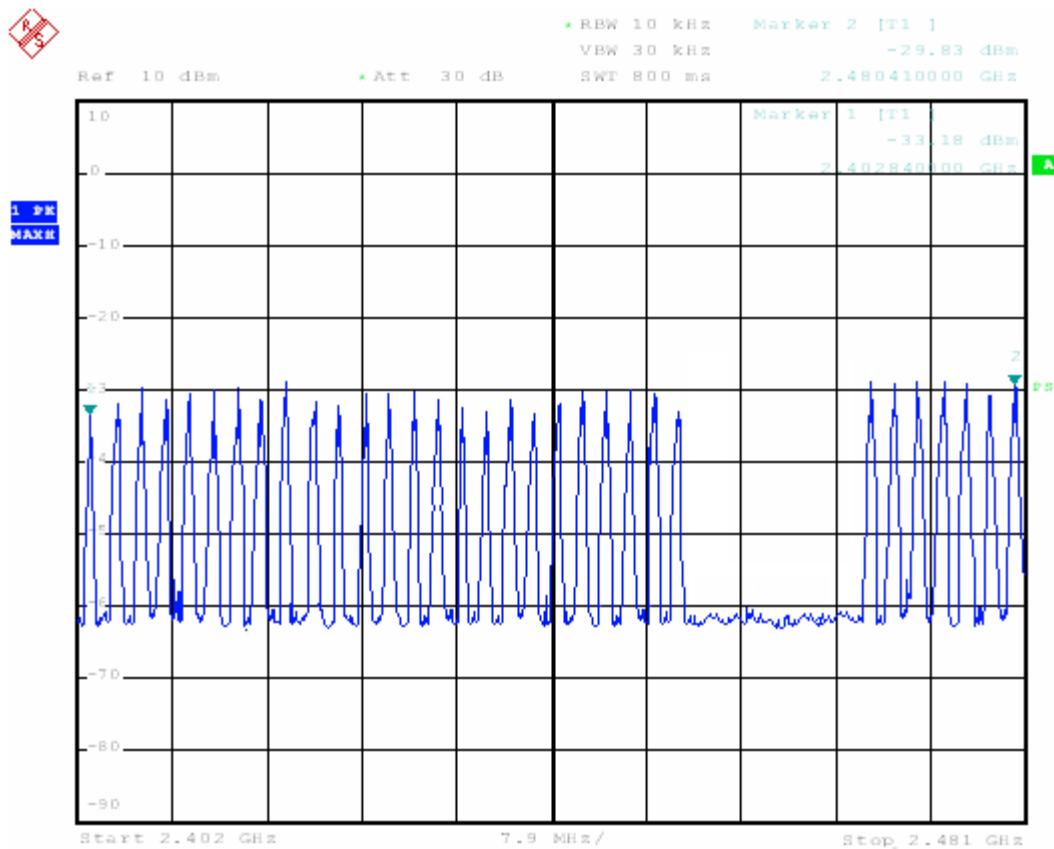
8.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. Observe frequency hopping in 2400MHz~2483.5MHz, there are at least 32 non-overlapping channels.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

8.5 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH) : 50~54	M/N: BTHS-03
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Modulation Type	Frequency (MHz)	Number of Hopping Channel (Channels)	Min. Limit (kHz)
FHSS	2402.8~2480.40	32	>15



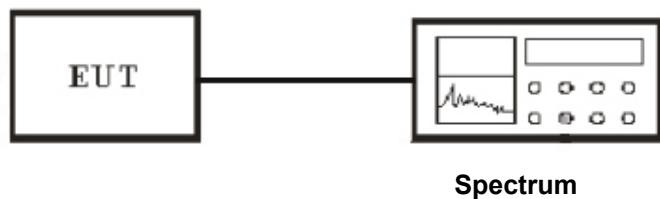
Date: 27.JUN.2007 17:24:09

9. Test of Dwell Time of Each Frequency

9.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4seconds multiplied by the number of hopping channels employed.

9.2 EUT Setup



9.3 Test Equipment List and Details

See section 2.4.

9.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 1000kHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is more than once pulse time.
4. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
5. Measure the maximum time duration of one single pulse.

9.5 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH) : 50~54	M/N: BTHS-03
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Modulation Type	Channel No.	Frequency (MHz)	Dwell Time (ms)	Limit (ms)
FHSS	LOW	2402.84	20.4	400
FHSS	MID	2440.50	20.2	400
FHSS	HIG	2480.41	19.6	400

The period is $0.4(\text{Sec}) * 31(\text{Channels}) = 12.4\text{sec}$

$12.4(\text{Sec}) * 10(\text{hoping/sec}) = 124(\text{hops})$

Per one period of On time is: 0.165ms(Channel Low) , 0.163ms (Channel MID), 0.158ms(Channel HIG)

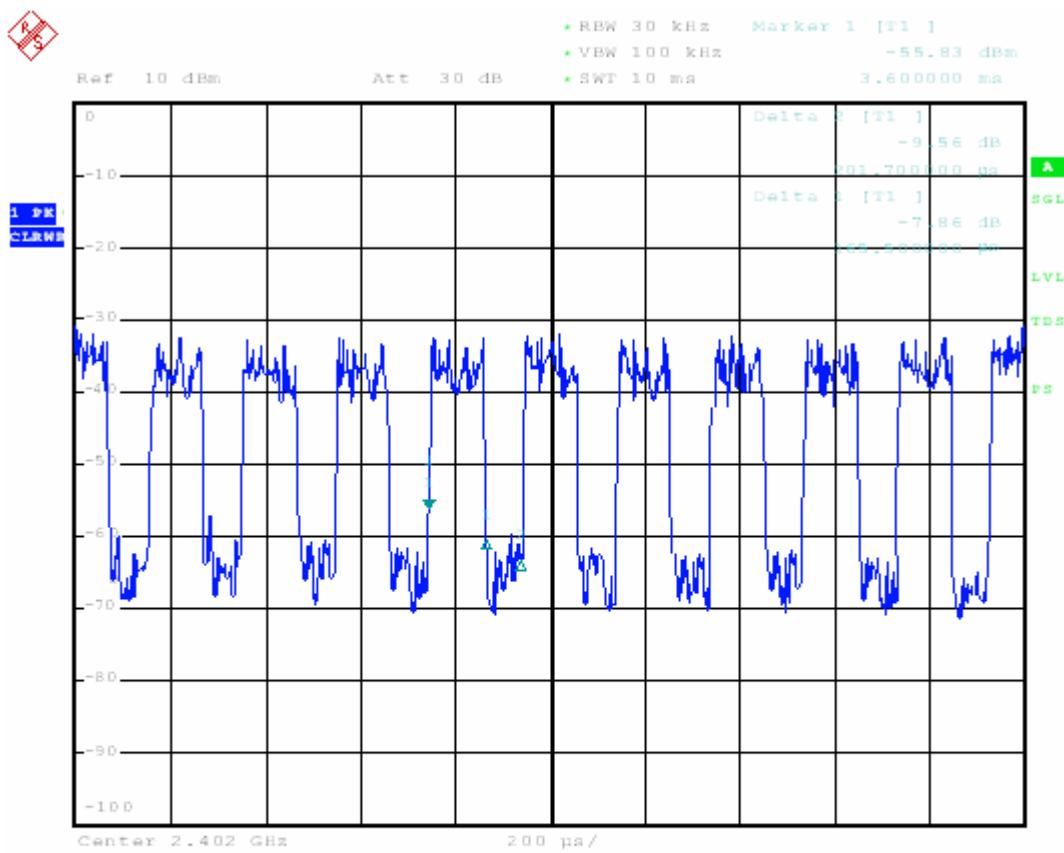
The Result is:

Channel Low the dwell time is $0.165 * 124 = 20.4\text{ms}$

Channel MID the dwell time is $0.163 * 124 = 20.2\text{ms}$

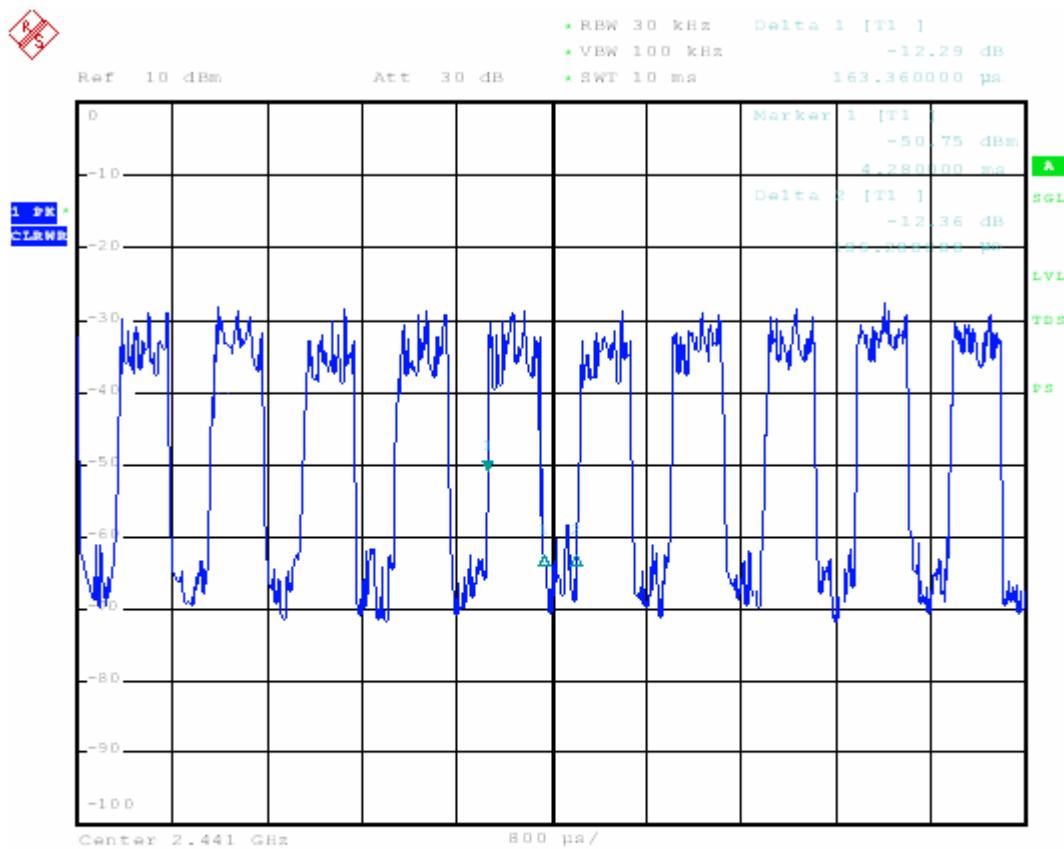
Channel HIG the dwell time is $0.158 * 124 = 19.6\text{ms}$

Channel Low :



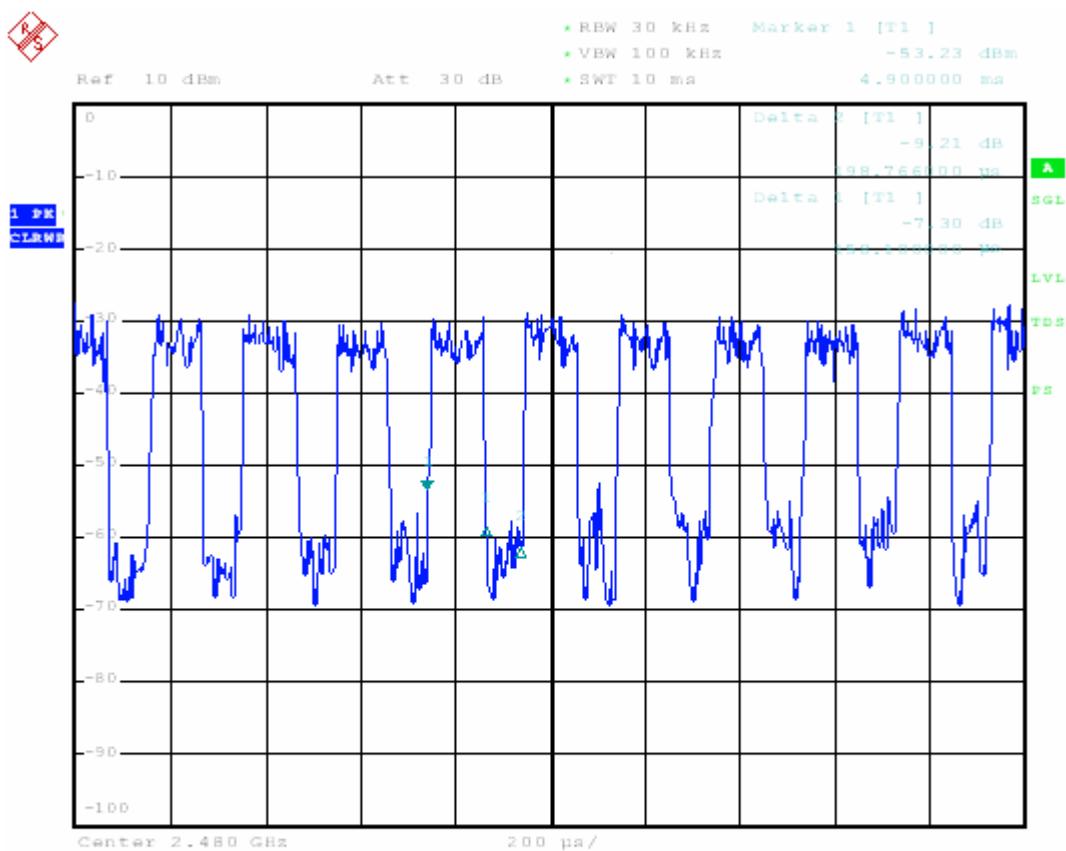
Date: 28.JUN.2007 9:33:53

Channel MID :



Date: 28.JUN.2007 9:36:38

Channel HIG :



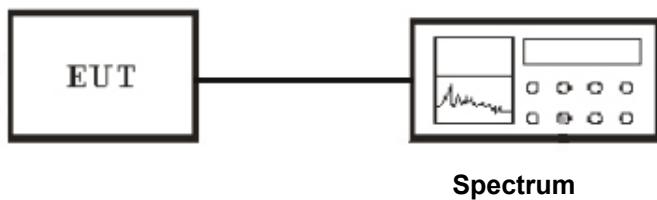
Date: 28.JUN.2007 9:40:29

10. Test of Maximum Peak Output Power

10.1 Applicable Standard

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels and The maximum peak output power shall not exceed 1 watt. For all other frequency hopping systems in this frequency band, The maximum peak output power shall not exceed 0.125 watt.

10.2 EUT Setup



10.3 Test Equipment List and Details

See section 2.4.

10.4 Test Procedure

1. The transmitter output was connected to the peak power meter and recorded the peak value.
2. Peak power meter parameter set to auto attenuator and filter is the same as.
3. Repeated the 1 for the middle and highest channel of the EUT.

10.5 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH) : 50~54	M/N: BTHS-03
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Modulation Type	Channel No.	Frequency (MHz)	Output Power (dBm)	Limits (dBm)	Margin (dB)
FHSS	Low	2402.84	-33.2	20.9	54.1
FHSS	MID	2440.50	-30.1	20.9	51.0
FHSS	HIG	2480.39	-27.5	20.9	48.4

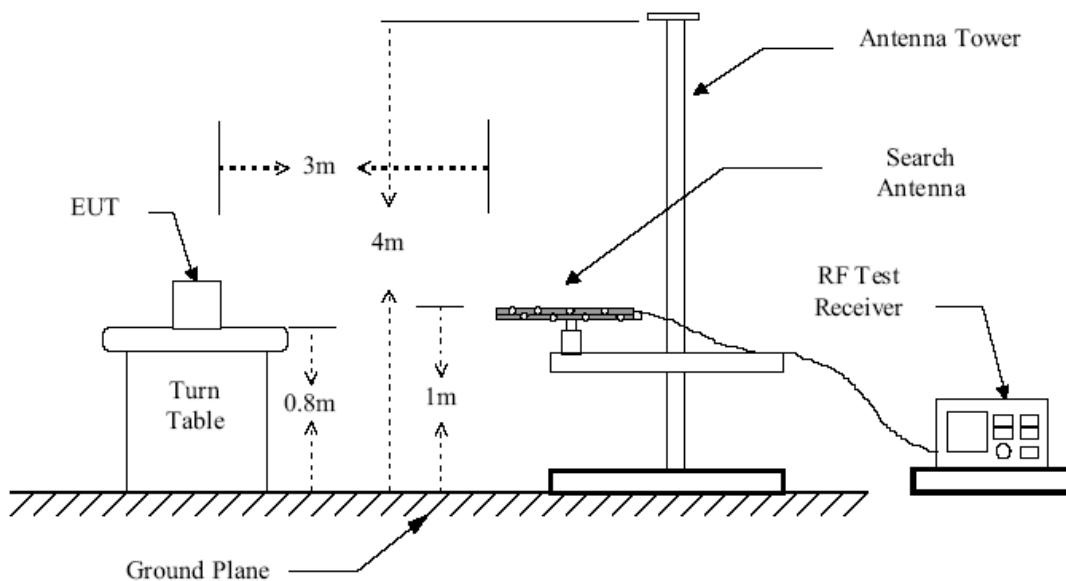
11. Test of Band Edges Emission

11.1 Applicable Standard

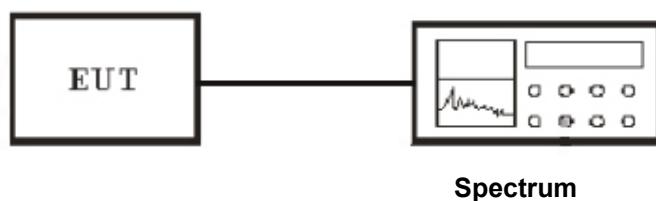
Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

11.2 EUT Setup

Radiated Measurement Setup



Conducted Measurement Setup



11.3 Test Equipment List and Details

See section 2.4.

11.4 Test Procedure

Conducted Measurement

1. The transmitter is set to the lowest channel.
2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
3. Set both RBW and VBW of spectrum analyzer to 100KHz with convenient frequency span including 100MHz bandwidth from lower band edge. Then detector set to peak and max hold this trace.
4. The lowest band edges emission was measured and recorded.
5. The transmitter set to the highest channel and repeated 2~4.

Radiated Measurement

1. Configure the EUT according to ANSI C63.4.
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For band edge emission, use 10Hz VBW and 1MHz RBW for reading under AV and use 1MHz VBW and 1MHz RBW for reading under PK.

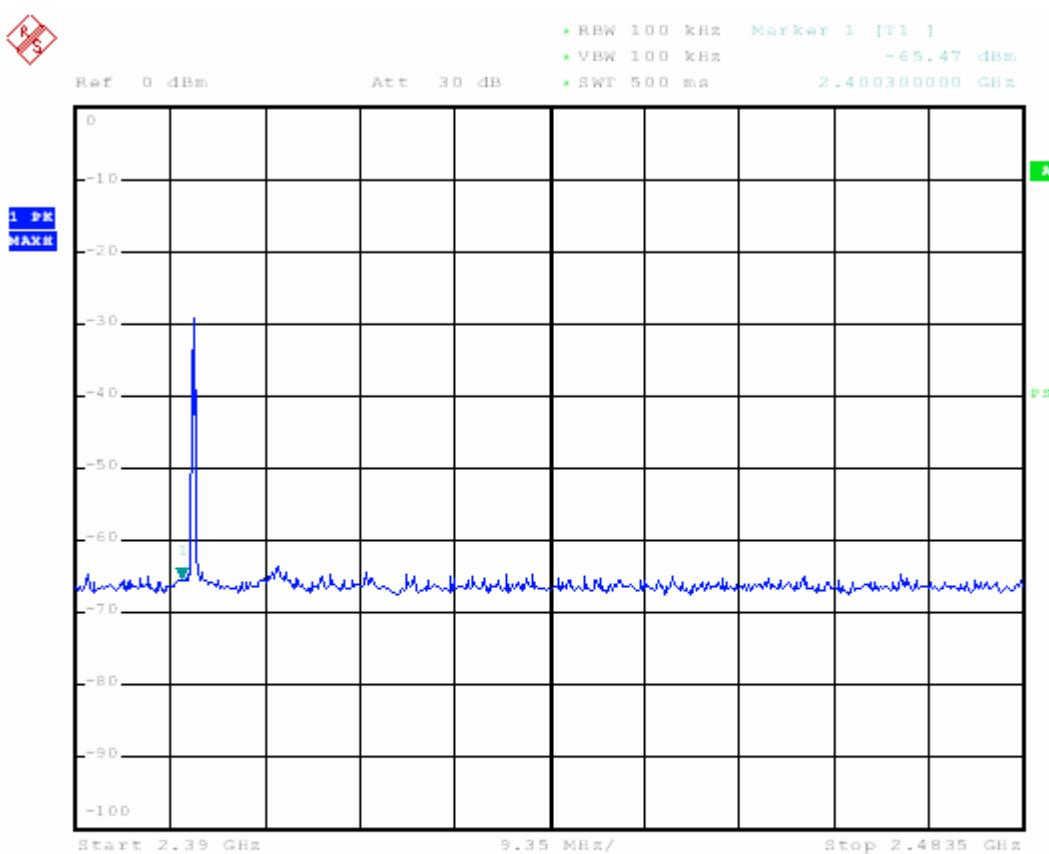
11.5 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH) : 50~54	M/N: BTHS-03
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

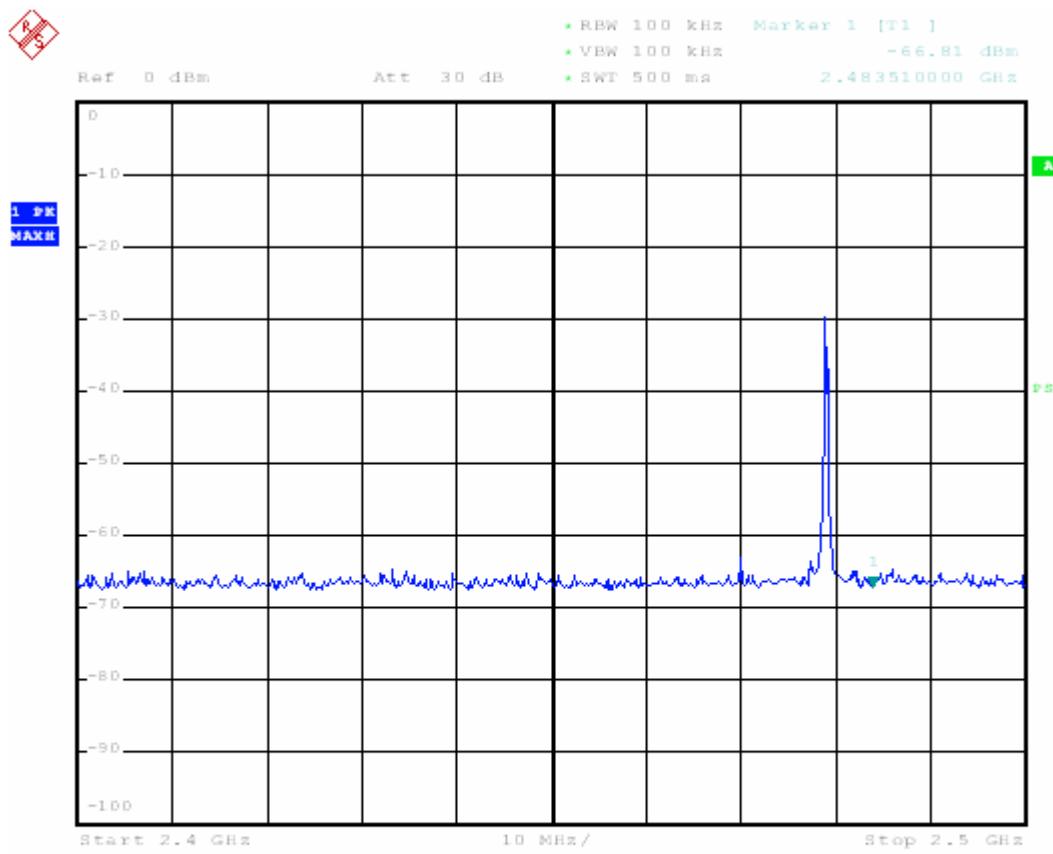
Radiated Test Result

Frequency (MHz)	Antenna Polarization	Emission Read Value (dB μ V/m)	Limits (dB μ V/m)
<2400	H	24.2	54
>2483.5	H	23.1	54

Conducted Test Result



Date: 28.JUN.2007 16:36:21



Date: 28.JUN.2007 16:19:24

12. Test of Spurious Radiated Emission

12.1 Applicable Standard

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

12.2 EUT Setup

Radiated Measurement Setup

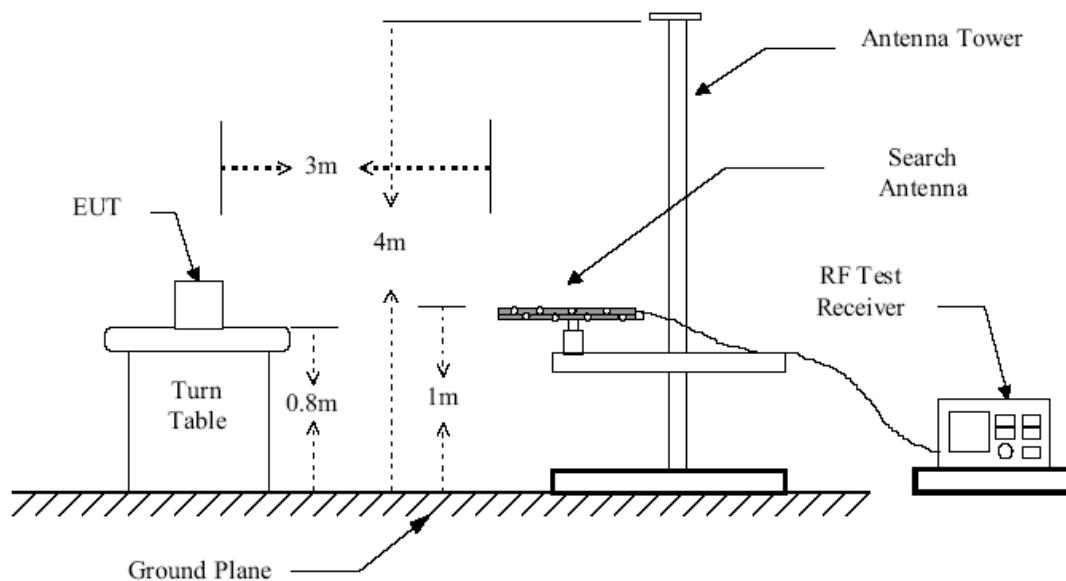


Figure 1 : Frequencies measured below 1 GHz configuration

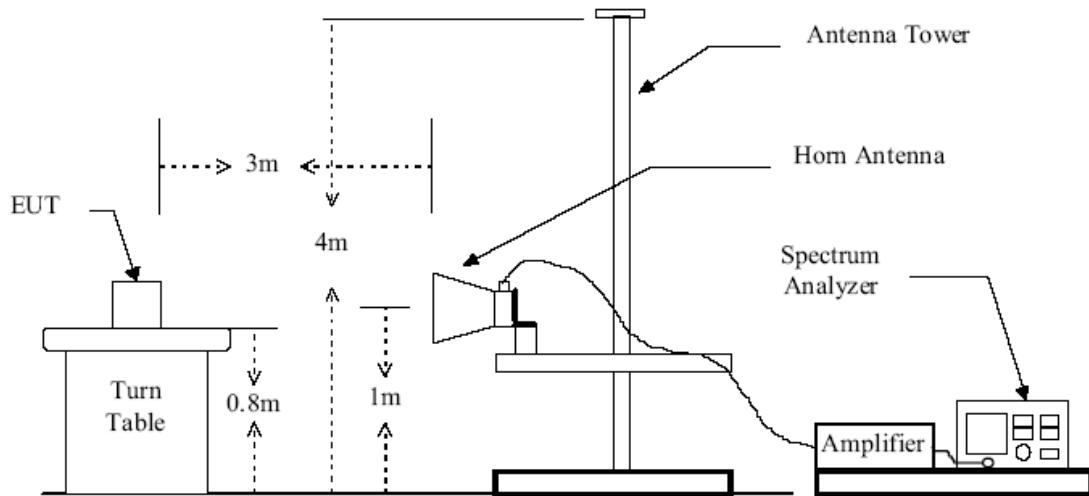
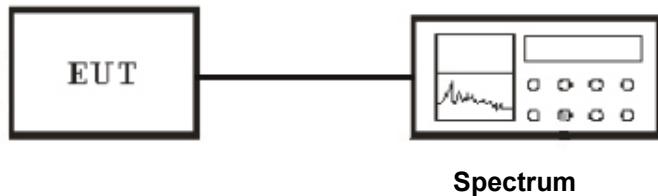


Figure 2 : Frequencies measured above 1 GHz configuration

Conducted Measurement Setup



12.3 Test Equipment List and Details

See section 2.4.

12.4 Test Procedure

Radiated Measurement

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

Conducted Measurement

1. For emission above 1GHz, conducted measurement method is used.
2. The transmitter is set to the lowest channel.
3. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
4. Set RBW to 1 MHz and VBW to 3 MHz, Then detector set to peak and max hold this trace.
5. The lowest band edges emission was measured and recorded.
6. The transmitter set to the highest channel and repeated 2~4.

12.5 Test Result

Temperature (°C) : 22~23	EUT: Mobile Wireless Headset
Humidity (%RH) : 50~54	M/N: BTHS-03
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx & ChargingMode

Spurious Emission (30~1000MHz)

Maximum Frequency (MHz)	Polarity and Level				Limit	Margin
	Polarity	Value dB μ V/m	Transd	Result dB μ V/m		
72.68	V	47.37	11.72	35.65	40	4.35
131.85	V	38.40	13.14	25.26	43.5	18.24
185.20	V	38.13	13.82	24.31	43.5	19.19
677.96	V	36.21	17.29	18.92	46	27.08
785.63	V	35.24	18.50	16.74	46	29.26
72.68	H	55.20	19.01	36.19	40	3.81
131.85	H	41.89	14.67	27.22	43.5	16.28
367.56	H	38.67	13.51	25.16	46	20.84
542.16	H	36.20	17.42	18.78	46	27.22
680.87	H	37.60	17.71	19.89	46	26.11
785.63	H	34.97	18.23	16.74	46	29.26
Remark: Transd.=Antenna Factor+Cable Loss+Pre-amplifier						

Harmonics

Channel HIG						
Maximum Frequency (MHz)	Polarity and Level				Limit	Margin
	Polarity	Value dB μ V/m	Transd	Result dB μ V/m	dB μ V/m	dB μ V/m
4960.78	H	49.3	24.1	25.2	54.0	28.8
4960.78	V	50.2	24.5	25.7	54.0	28.3
7441.17	H	49.8	24.6	25.2	54.0	28.8
7441.17	V	52.4	24.8	27.6	54.0	26.4
9921.56	H	46.2	27.7	18.5	54.0	35.5
9921.56	V	50.6	28.2	22.4	54.0	31.6
12401.95	---	---	---	---	---	---
14882.34	---	---	---	---	---	---
17362.73	---	---	---	---	---	---
19843.12	---	---	---	---	---	---
22323.51	---	---	---	---	---	---
24803.90	---	---	---	---	---	---

Remark: 1. Transd.=Antenna Factor+Cable Loss+Pre-amplifier
 2. Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Channel MID						
Maximum Frequency (MHz)	Position and Level				Limit	Margin
	Polarity	Value dB μ V/m	Transd	Result dB μ V/m	dB μ V/m	dB μ V/m
4881	H	48.3	24.1	24.2	54.0	29.8
4881	V	49.2	24.6	24.6	54.0	29.4
7321.5	H	50.7	24.9	25.8	54.0	28.2
7321.5	V	51.0	24.7	26.3	54.0	27.7
9762	H	46.2	27.5	18.7	54.0	35.3
9762	V	47.3	28	19.3	54.0	34.7
12202.5	---	---	---	---	---	---
14643	---	---	---	---	---	---
17083.5	---	---	---	---	---	---
19524	---	---	---	---	---	---
21964.5	---	---	---	---	---	---

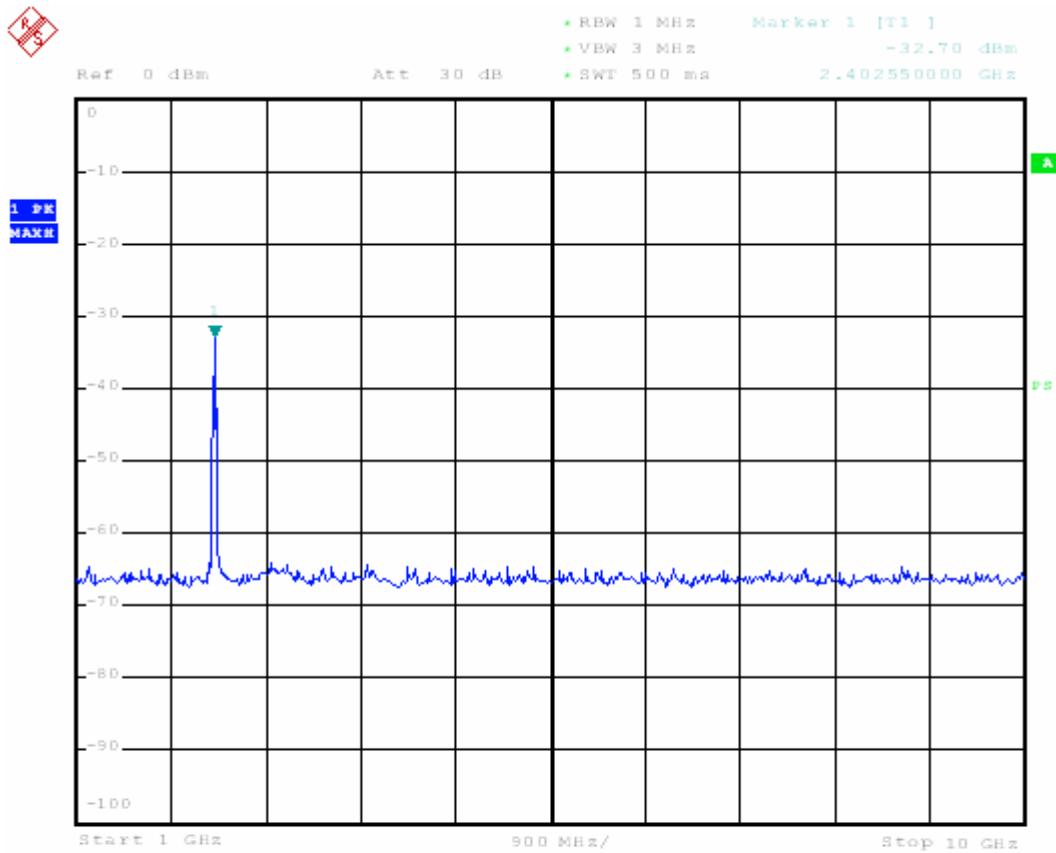
24405	---	---	---	---	---	---
Remark: 1. Transd.=Antenna Factor+Cable Loss+Pre-amplifier 2. Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.						

Maximum Frequency (MHz)	Polarity and Level				Limit	Margin
	Polarity	Value dB μ V/m	Transd	Result dB μ V/m	dB μ V/m	dB μ V/m
4805.68	H	48.0	24.2	23.8	54.0	30.2
4805.68	V	49.5	24.4	25.1	54.0	28.9
7208.52	H	48.6	24.6	24.0	54.0	30
7208.52	V	50.0	24.8	25.2	54.0	28.8
9611.36	H	49.7	27.5	22.2	54.0	31.8
9611.36	V	50.4	28.1	22.3	54.0	31.7
12014.20	---	---	---	---	---	---
14417.04	---	---	---	---	---	---
16819.88	---	---	---	---	---	---
19222.72	---	---	---	---	---	---
21625.56	---	---	---	---	---	---
24028.40	---	---	---	---	---	---

Remark: 1. Transd.=Antenna Factor+Cable Loss+Pre-amplifier
 2. Datas of measurement within this frequency range shown “ - ” in the table above
 means the reading of emissions are attenuated more than 20dB below the
 permissible limits or the field strength is too small to be measured.

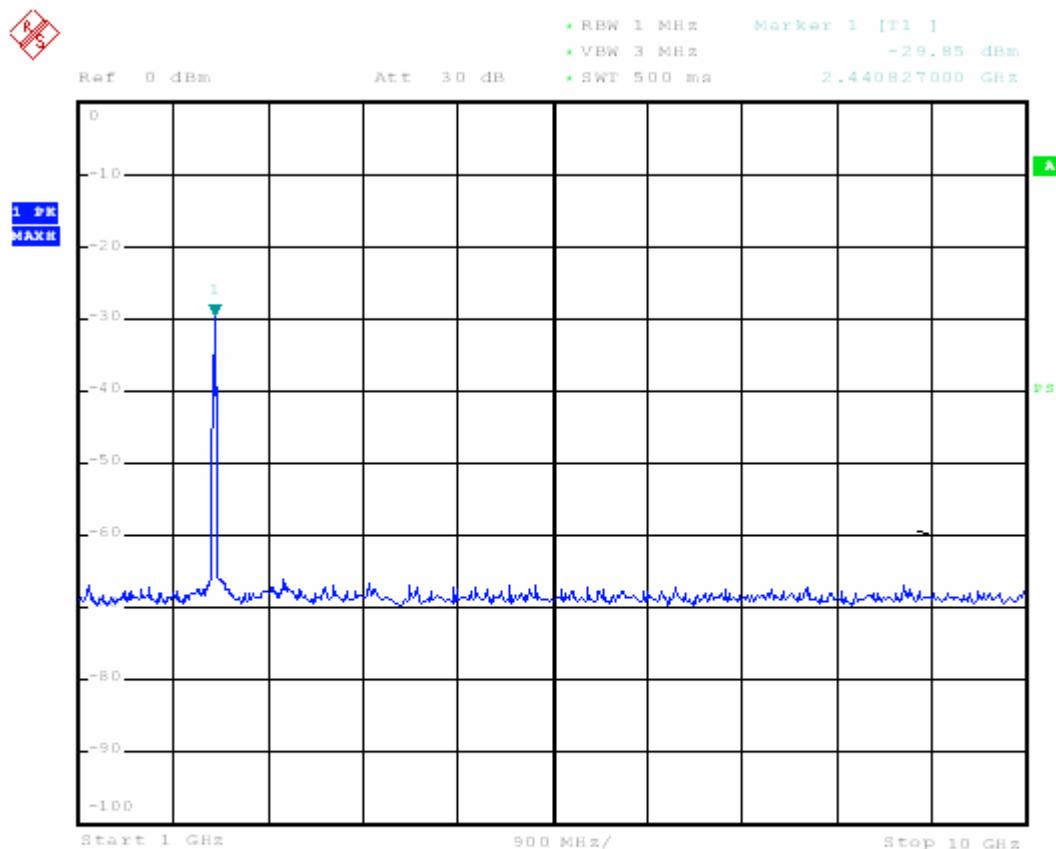
CONDUCTED TEST RESULT(1~10GHz)

Channel Low :



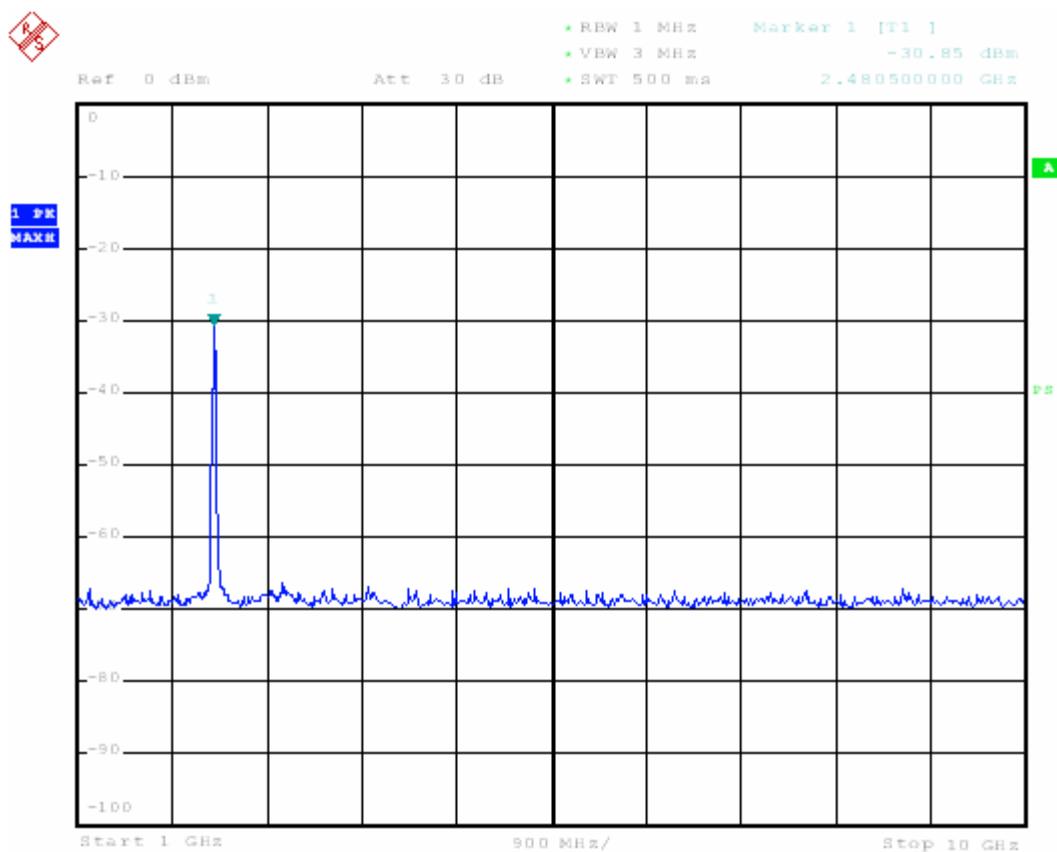
Date: 28.JUN.2007 19:10:24

Channel MID :



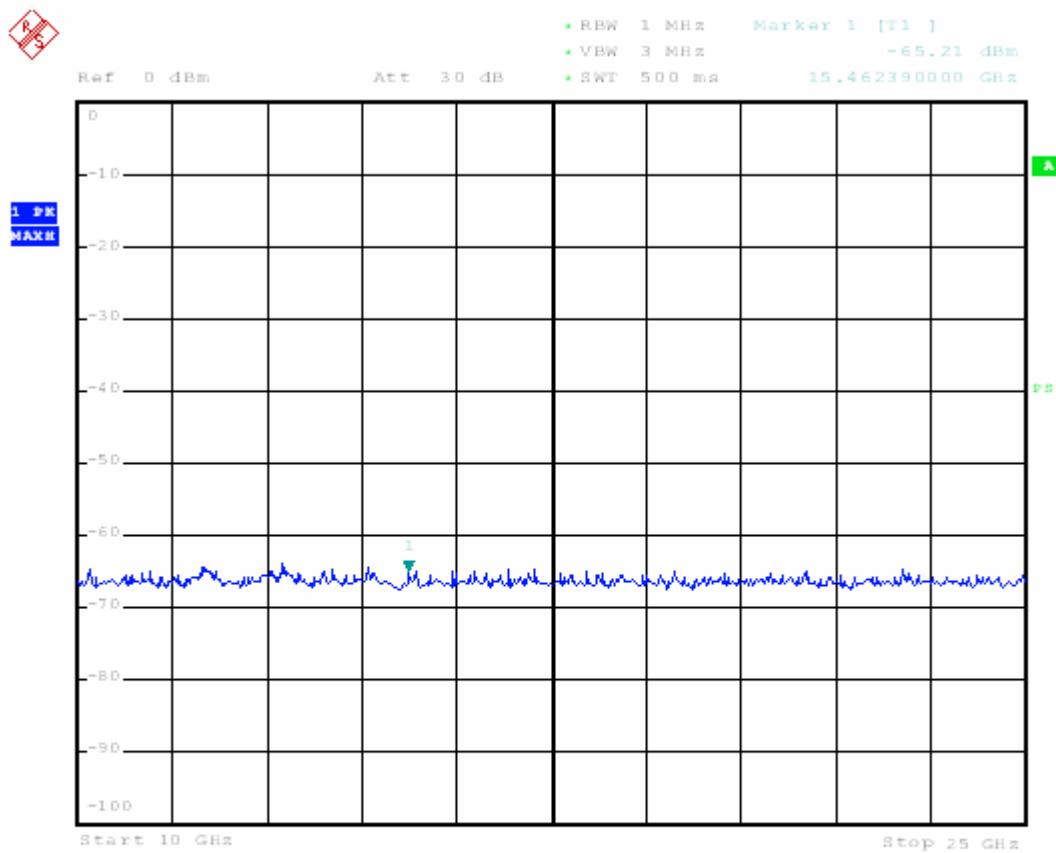
Date: 28.JUN.2007 19:17:48

Channel HIG :



Date: 28.JUN.2007 19:06:45

CONDUCTED TEST RESULT (10~25GHz)



Date: 28.JUN.2007 19:28:04