No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Telephone: +86 (0) 20 8215 5555
Fax: +86 (0) 20 8207 5059
Email: sgs_internet_operations@sgs.com

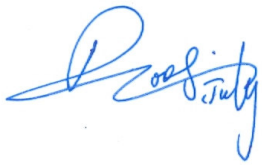
TEST REPORT

Application No. :	SZEMO080602571RF
Applicant/ Manufacture:	TCT Mobile Suzhou Limited
Factory:	BYD COMPANY LIMITED
FCC ID:	RAD901
Fundamental Carrier Frequency :	2.402GHz to 2.480GHz
Equipment Under Test (EUT):	
Name:	Bluetooth Mono Headset
Model:	OT-BM82
Trade mark:	ALCATEL
Standards:	FCC PART 15 Subpart C: 2007
Date of Receipt:	12 June 2008
Date of Test:	12 June to 09 July 2008
Date of Issue:	11 July 2008

Test Result :	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further detail.

Authorized Signature:



Robinson Lo
Manager

2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Antenna Requirement	FCC PART 15 :2007	Section 15.247 (c)	PASS
Occupied Bandwidth	FCC PART 15 :2007	Section 15.247 (a1)	PASS
Carrier Frequencies Separated	FCC PART 15 :2007	Section 15.247(a)(1)	PASS
Hopping Channel Number	FCC PART 15 :2007	Section 15.247(a)(1)(iii)	PASS
Dwell Time	FCC PART 15 :2007	Section 15.247(a)(1)(iii)	PASS
Pseudorandom Frequency Hopping Sequence	FCC PART 15 :2007	Section 15.247(a)(1)	PASS
Maximum Peak Output Power	FCC PART 15 :2007	Section 15.247(b)(1)	PASS
RF Exposure Compliance Requirement	FCC PART 15 :2007	15.247(b)(4)& TCB Exclusion List (7 July 2002)	PASS
Conducted Emission	FCC PART 15 :2007	Section 15.207	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2007	Section 15.209 &15.247(d)	PASS
Radiated Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2007	Section 15.209 &15.247(d)	PASS
Band Edges Measurement	FCC PART 15 :2007	Section 15.247 (d) &15.205	PASS

Remark:

The EUT was tested installing fully charged batteries.

3 Contents

4 General Information

4.1 Client Information

Applicant/ Manufacture:	TCT Mobile Suzhou Limited
Address of Applicant:	4/ F, South Building, No. 2966, Jinke Road, Zhangjiang High-Tech Park, Pudong, Shanghai, 201203, P. R. China
Factory:	BYD COMPANY LIMITED
Address of Factory:	Floor 2nd, assembly workshop, BYD Autobase, Shijing Industrial Park, Pingshan, Longgang Shenzhen, 518118, P. R. China

4.2 General Description of E.U.T.

Product Name:	Bluetooth Mono Headset
Model:	OT-BM82
Number of Channels	79 Channels
Channel Separation	1 MHz
Type of Modulation	FHSS (Frequency Hopping Spread Spectrum); Adaptive Frequency Hopping (AFH) is used.
Dwell time	Per channel is less than 0.4s.
Antenna Type	Integral
Speciality:	Bluetooth 2.0 with EDRpt
Power Supply:	Rechargeable Battery 3.7V inside Adapter: AC charge to DC Input 100-240V AC 50/60Hz 150Ma Output 5V DC 400mA PC Input 120V AC 60Hz Output USB 5.0VDC

4.3 Description of Support Units

Description	Manufacturer	Model No.
PC	IBM	2662
Coder	HengTong ELECTRON	HT4000
Printer	Canon	BJC-1000SP

4.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15 Subpart C: 2007. ANSI C63.4:2003. DA 00-705.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory. No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou. China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.

4.7 Test Facility

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

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services 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 282399. May 31. 2002. With the above and NVLAP's accreditation. SGS-CSTC is an authorized test laboratory for the DoC process.

5 Equipments Used during Test

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2007	15-06-2009
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	12-12-2007	11-12-2008
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	18-06-2008	17-06-2009
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0014	12-08-2007	11-08-2008
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	18-06-2008	17-06-2009
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0005	12-08-2007	11-08-2008
8	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	SEL0081	18-06-2008	17-06-2009
9	Band filter	Amindeon	82346	SEL0094	18-06-2008	17-06-2009

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	N/A	N/A
2	LISN	ETS-LINDGREN	3816/2	SEL0021	18-06-2008	17-06-2009
3	ISN	Rohde & Schwarz	ENY 22 1109	EMC0114	18-06-2008	17-06-2009
4	ISN	Rohde & Schwarz	ENY 41 1110	EMC0115	18-06-2008	17-06-2009
5	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	18-06-2008	17-06-2009
6	Coaxial Cable	SGS	N/A	SEL0024	18-06-2008	17-06-2009

6 Test Results

6.1 E.U.T. test conditions

Operating Environment:

Temperature: 25.0 °C

Humidity: 38-52 % RH

Atmospheric Pressure: 1010 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	14	2416	28	2430
1	2403	15	2417	29	2431
2	2404	16	2418	30	2432
3	2405	17	2419	31	2433
4	2406	18	2420	32	2434
5	2407	19	2421	33	2435
6	2408	20	2422	34	2436
7	2409	21	2423	35	2437
8	2410	22	2424	36	2438
9	2411	23	2425	37	2439
10	2412	24	2426	38	2440
11	2413	25	2427	39	2441
12	2414	26	2428	40	2442
13	2415	27	2429	41	2443

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	2444	55	2457	68	2470
43	2445	56	2458	69	2471
44	2446	57	2459	70	2472
45	2447	58	2460	71	2473
46	2448	59	2461	72	2474
47	2449	60	2462	73	2475
48	2450	61	2463	74	2476
49	2451	62	2464	75	2477
50	2452	63	2465	76	2478
51	2453	64	2466	77	2479
52	2454	65	2467	78	2480
53	2455	66	2468		
54	2456	67	2469		

Test frequency is the lowest channel: 0 channel(2402MHz), middle channel: 38 channel(2441MHz) and highest channel: 78 channel(2480MHz)

6.2 Antenna Requirement

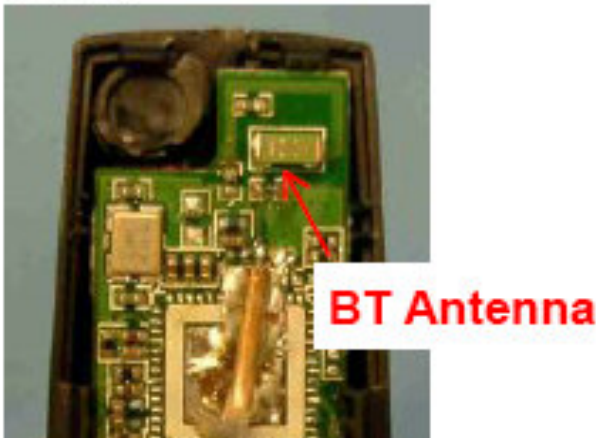
6.2.1 Standard requirement

15.203 requirement:
For intentional device. according to 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.
15.247(c) (1)(i) requirement:
(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed. point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted 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.

6.2.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -2.0dBi.

PWB



Test result: The unit does meet the FCC requirements.

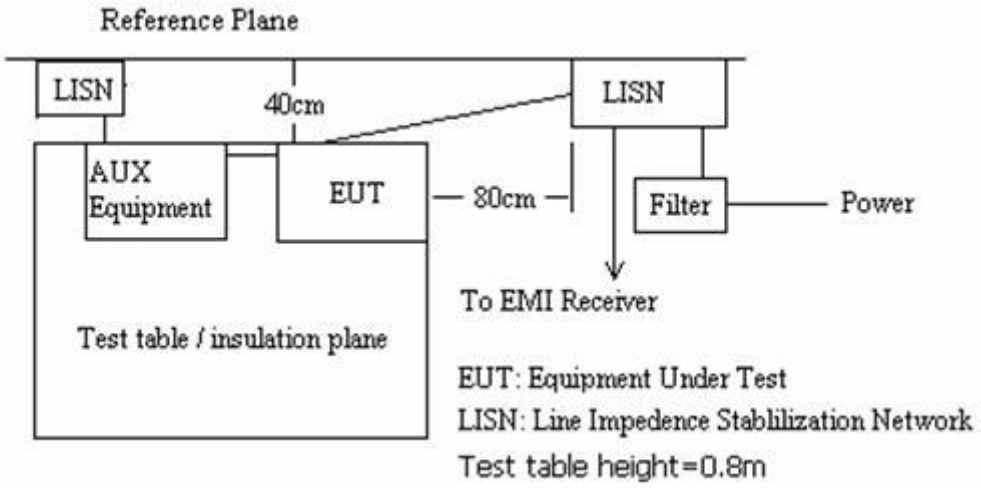
6.3 Conducted Emissions at Mains Terminals 150 kHz to 30MHz

Test Requirement:	FCC Part 15.207
Test Method:	ANSI C63.4
Test Date:	25 June 2008
Frequency Range:	150KHz to 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)
	Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit
EUT Operation:	Pretest the EUT in Bluetooth normal mode

An initial pre-scan was performed on the live and neutral lines with peak detector.

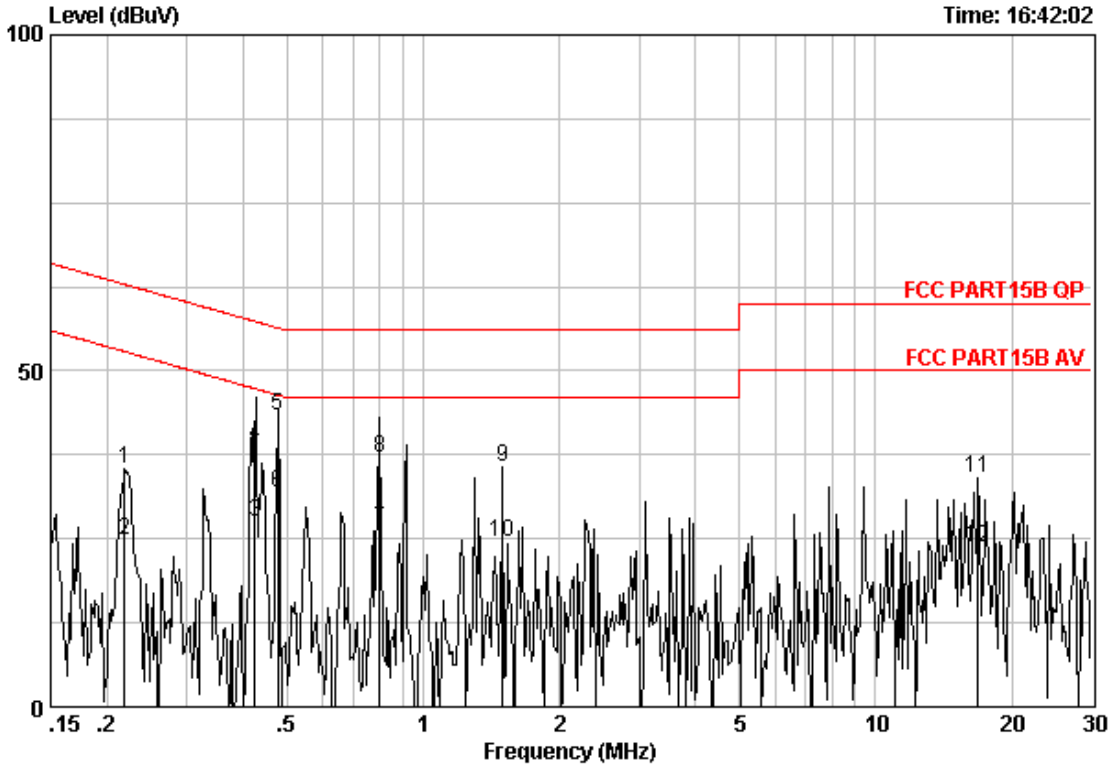
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Plan View of Test Setup



PC Connected Mode(PC power supply by 120V AC 60Hz)

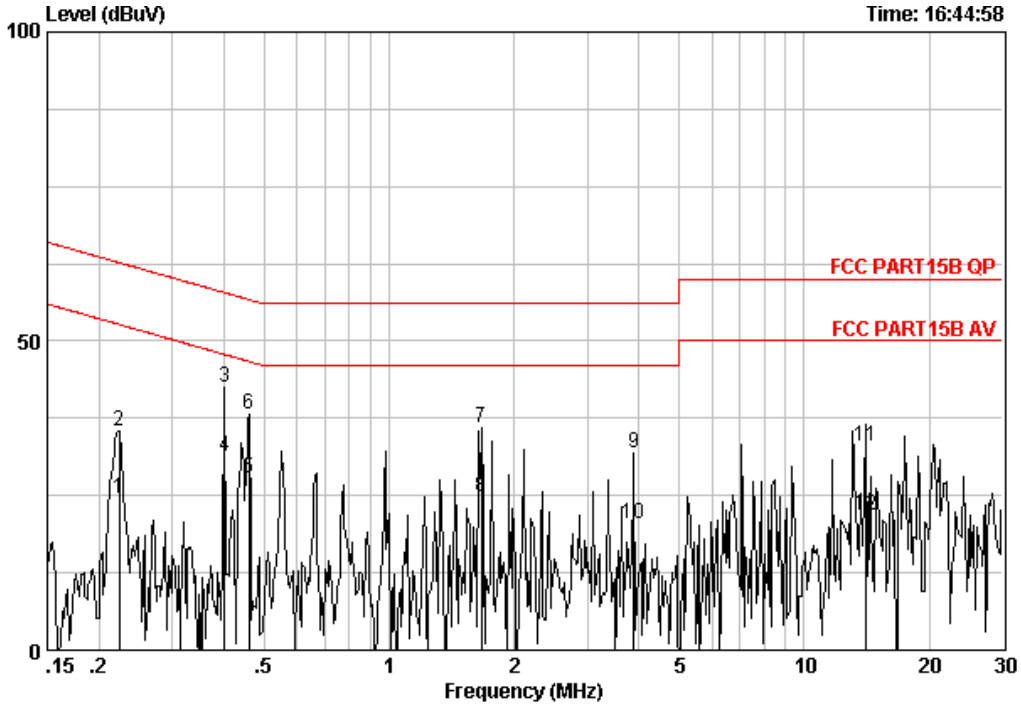
live line:



Site : Shielding Room
Condition : FCC PART15B QP CE LINE
EUT : Bluetooth Mono Headset
Job NO. : 2571RF
Test mode : USB charge
Test line : N/A

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.21851	-0.08	-0.04	35.47	35.35	62.88	-27.53	QP
2		0.21851	-0.08	-0.04	24.88	24.76	52.88	-28.12	Average
3		0.42373	0.00	-0.04	27.55	27.51	47.37	-19.87	Average
4		0.42373	0.00	-0.04	39.03	38.99	57.37	-18.39	QP
5	@	0.47612	0.00	-0.04	43.47	43.43	56.41	-12.98	QP
6		0.47612	0.00	-0.04	31.99	31.95	46.41	-14.46	Average
7		0.80023	0.04	-0.05	26.44	26.43	46.00	-19.57	Average
8		0.80023	0.04	-0.05	37.17	37.16	56.00	-18.84	QP
9		1.495	0.10	-0.06	35.75	35.79	56.00	-20.21	QP
10		1.495	0.10	-0.06	24.44	24.48	46.00	-21.52	Average
11		16.839	0.29	-0.56	34.27	34.00	60.00	-26.00	QP
12		16.839	0.29	-0.56	23.88	23.62	50.00	-26.38	Average

Neutral line:



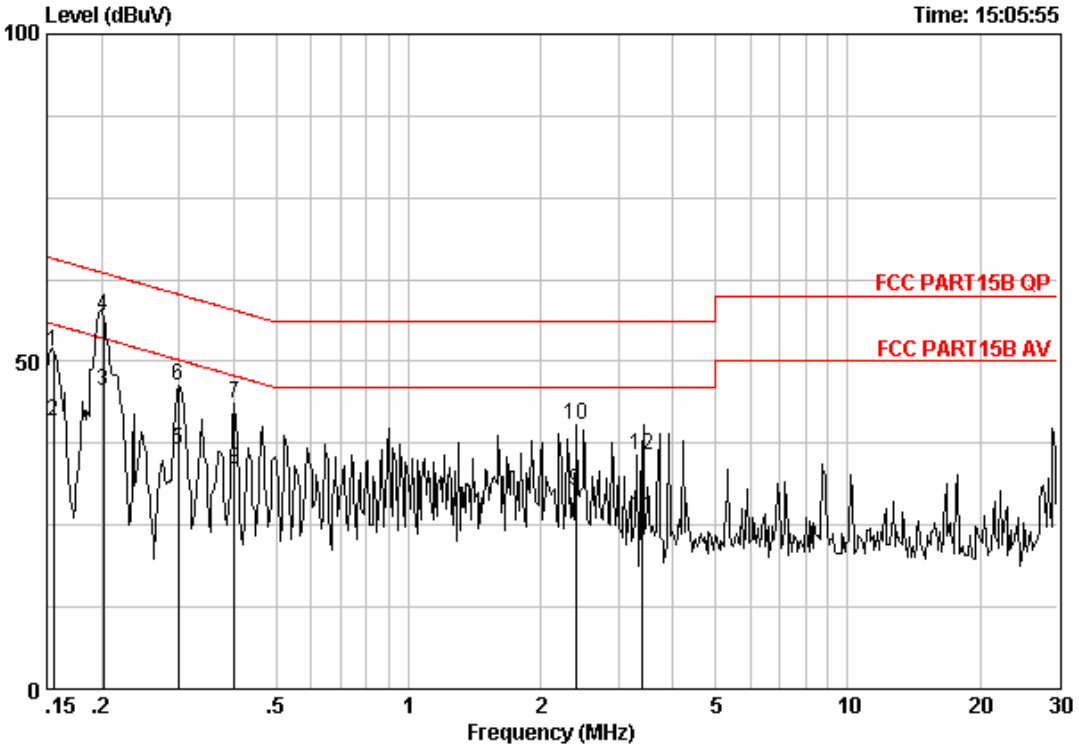
Site : Shielding Room
Condition : FCC PART15B QP CE NEUTRAL
EUT : Bluetooth Mono Headset
Job NO. : 2571RF
Test mode : USB charge
Test line : N/A

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.22319	-0.07	-0.04	24.55	24.44	52.70	-28.26	Average
2		0.22319	-0.07	-0.04	35.65	35.53	62.70	-27.17	QP
3	@	0.40187	0.00	-0.04	42.59	42.55	57.81	-15.26	QP
4		0.40187	0.00	-0.04	31.45	31.41	47.81	-16.40	Average
5		0.45878	0.00	-0.04	27.88	27.84	46.71	-18.87	Average
6		0.45878	0.00	-0.04	38.25	38.21	56.71	-18.50	QP
7		1.671	0.10	-0.06	35.81	35.85	56.00	-20.15	QP
8		1.671	0.10	-0.06	24.88	24.92	46.00	-21.08	Average
9		3.881	0.10	-0.09	31.90	31.90	56.00	-24.10	QP
10		3.881	0.10	-0.09	20.40	20.41	46.00	-25.59	Average
11		14.063	0.26	-0.44	33.03	32.86	60.00	-27.14	QP
12		14.063	0.26	-0.44	22.01	21.84	50.00	-28.16	Average

Remark: Level = Real Level + Cable loss + LISN factor

AC Adapter Charge(120V AC 60Hz)

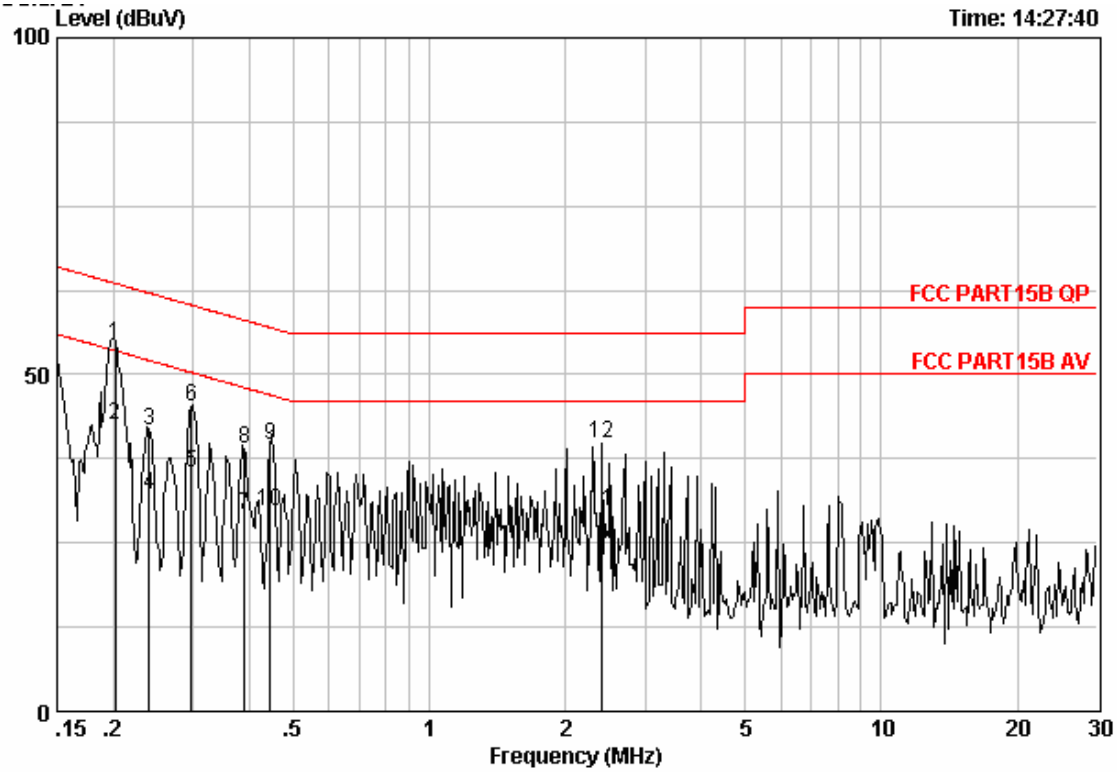
live line:



Site : Shielding Room
Condition : FCC PART15B QP CE LINE
EUT : Bluetooth Mono Headset
Job NO. : 2571RF
Test line : N/A

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.15567	0.04	-0.05	51.39	51.38	65.69	-14.31	QP
2		0.15567	0.04	-0.05	40.99	40.98	55.69	-14.71	Average
3		0.20200	0.04	-0.04	45.40	45.40	53.53	-8.13	Average
4	@	0.20200	0.04	-0.04	56.90	56.90	63.53	-6.63	QP
5		0.29869	0.05	-0.04	36.51	36.52	50.28	-13.76	Average
6		0.29869	0.05	-0.04	46.19	46.20	60.28	-14.08	QP
7		0.40187	0.06	-0.04	43.57	43.59	57.81	-14.23	QP
8		0.40187	0.06	-0.04	33.54	33.55	47.81	-14.26	Average
9		2.396	0.13	-0.07	30.21	30.27	46.00	-15.73	Average
10		2.396	0.13	-0.07	40.38	40.44	56.00	-15.56	QP
11		3.399	0.15	-0.08	26.01	26.08	46.00	-19.92	Average
12		3.399	0.15	-0.08	35.60	35.67	56.00	-20.33	QP

Neutral line:



Site : Shielding Room
Condition : FCC PART15B QP CE NEUTRAL
EUT : Bluetooth Mono Headset
Job no : 2571RF
Test mode : On
Test Line : N/A

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1 @	0.20200	0.04	-0.04	54.40	54.40	63.53	-9.13	QP
2	0.20200	0.04	-0.04	42.60	42.60	53.53	-10.93	Average
3	0.24037	0.04	-0.04	41.72	41.73	62.08	-20.36	QP
4	0.24037	0.04	-0.04	32.02	32.02	52.08	-20.06	Average
5	0.29711	0.05	-0.04	35.54	35.55	50.32	-14.77	Average
6	0.29711	0.05	-0.04	45.19	45.20	60.32	-15.12	QP
7	0.38929	0.06	-0.04	29.02	29.04	48.08	-19.04	Average
8	0.38929	0.06	-0.04	38.91	38.93	58.08	-19.15	QP
9	0.44443	0.06	-0.04	39.61	39.63	56.98	-17.35	QP
10	0.44443	0.06	-0.04	29.65	29.67	46.98	-17.31	Average
11	2.396	0.13	-0.07	29.65	29.71	46.00	-16.29	Average
12	2.396	0.13	-0.07	39.68	39.74	56.00	-16.26	QP

TEST RESULTS: The unit does meet the FCC requirements.

6.4 Occupied Bandwidth

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247 & DA 00-705

Test Date: 30 June 2008

Test Status: Test in fixing operating frequency at lowest, Middle, highest channel.

Test Procedure:

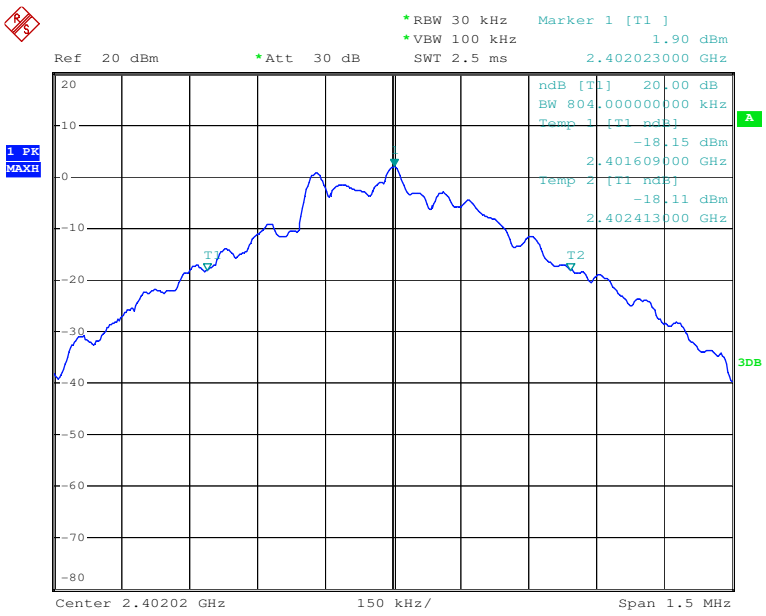
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel;
3. Set the spectrum analyzer: RBW >= 1% of the 20dB bandwidth (set 30kHz). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points or 99% bandwidth.

Test result:

Test Channel	bandwidth
Low	804kHz
Middle	804kHz
High	801kHz

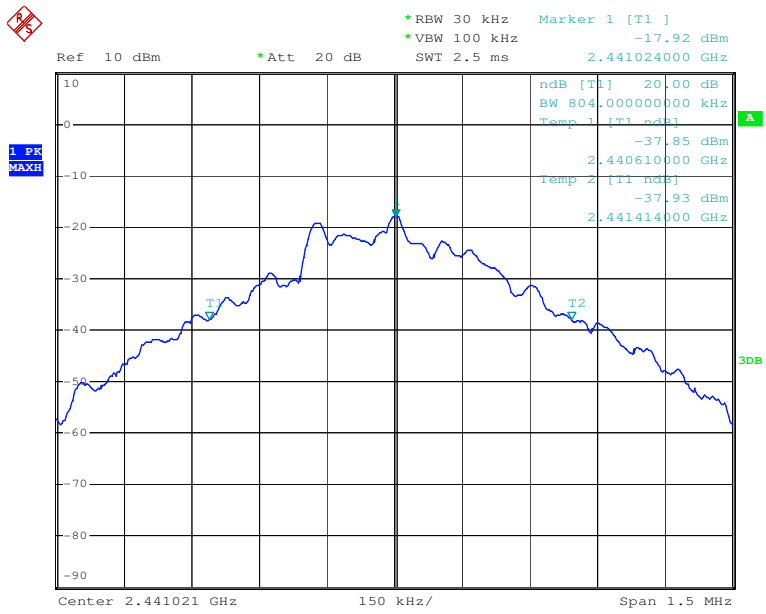
Result plot as follows:

Lowest Channel:



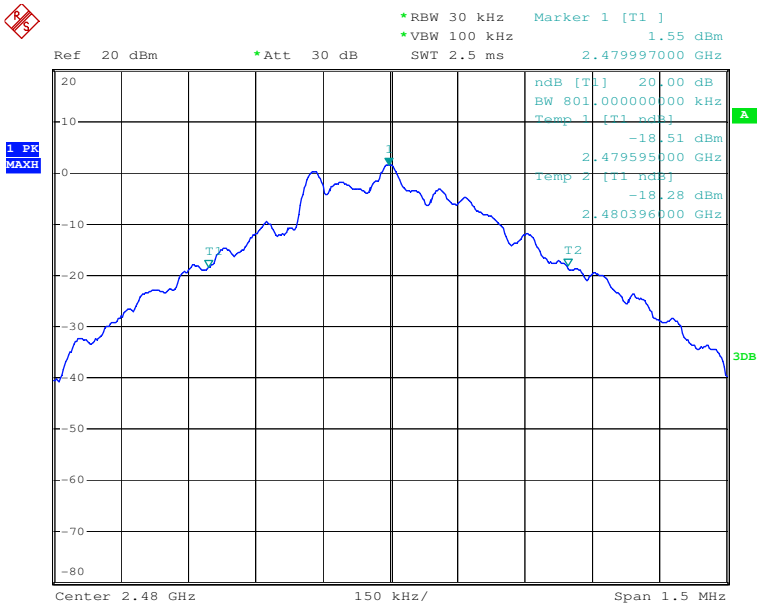
Date: 22.JUN.2008 00:48:19

Middle Channel:



Date: 22.JUN.2008 01:06:44

Highest Channel:



Date: 22.JUN.2008 01:47:08

6.5 Carrier Frequencies Separated

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247 & DA 00-705

Test Date: 02 July 2008

Test requirements: Regulation 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. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test Status: Test in hopping transmitting operating mode.

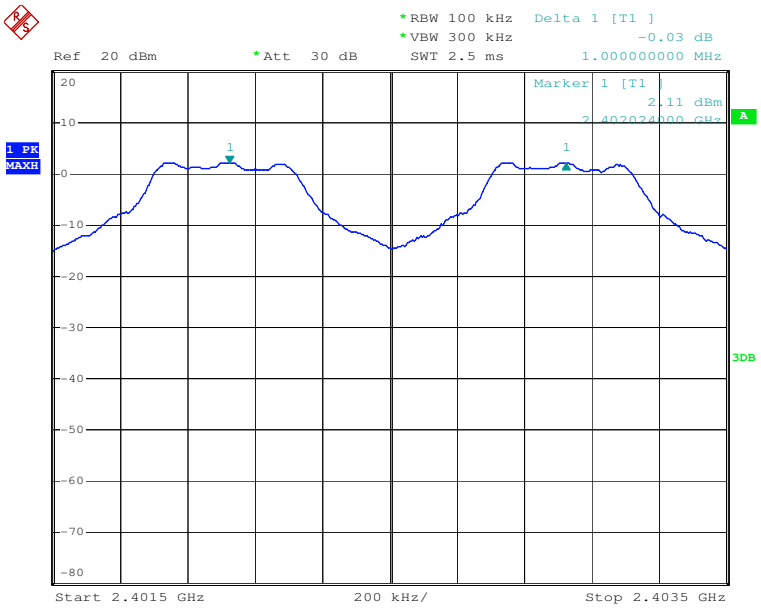
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW >= 1% of the span (set 100 kHz). VBW >= RBW , Span = 6MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

Test result:

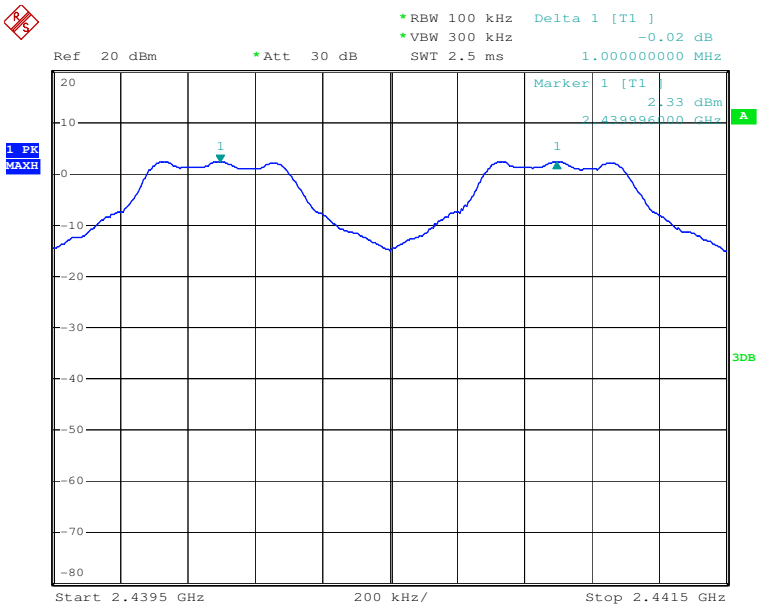
Test Channel	Carrier Frequencies Separated	PASS/FAIL
Lower Channels (channel 0 and channel 1)	1.000MHz	Pass
Middle Channels (channel 39 and channel 40)	1.020MHz	Pass
Upper Channels (channel 77 and channel 78)	0.996MHz	Pass
Remark: Preset in Bluetooth normal mode and the limit in normal mode is maximum 20dB channel bandwidth 804KHz. So report the normal mode data.		

1. Lowest Channels: **Carrier Frequencies Separated**



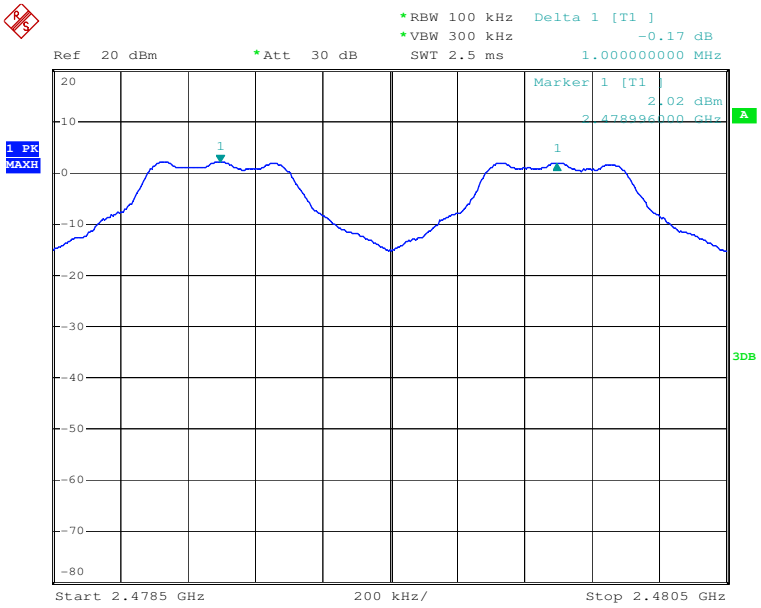
Date: 22.JUN.2008 00:53:40

2. Middle Channels: **Carrier Frequencies Separated**



Date: 22.JUN.2008 02:01:23

3. Highest Channels: **Carrier Frequencies Separated**



Date: 22.JUN.2008 01:49:38

Test result: The unit does meet the FCC requirements.

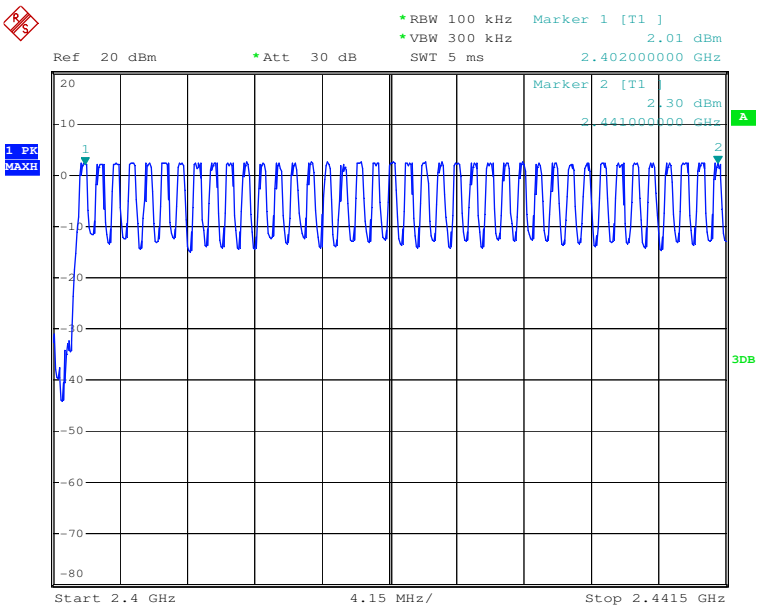
6.6 Hopping Channel Number

Test Requirement:	FCC Part15 C
Test Method:	Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date:	July 04 2008
Requirements:	Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Status:	Test in hopping transmitting operating mode.

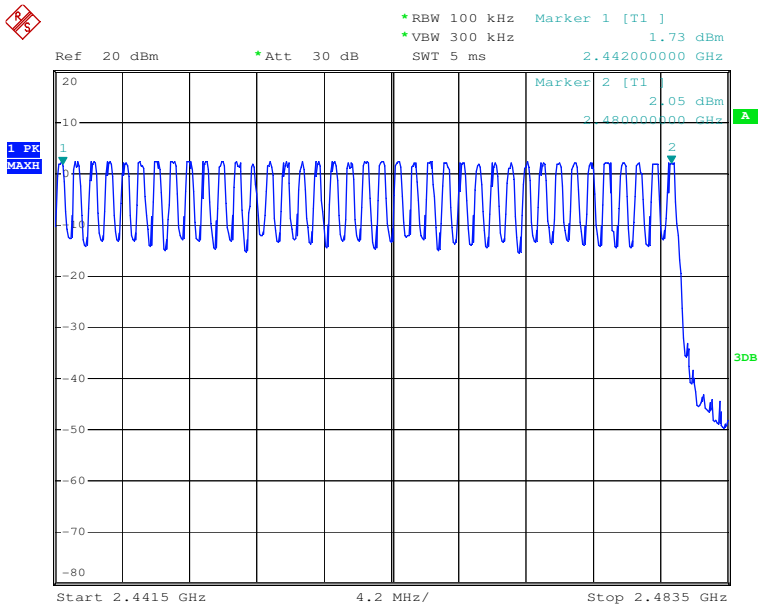
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

Test result: Total channels are 79 channels.



Date: 22.JUN.2008 02:09:41



Date: 22.JUN.2008 02:12:43

Test result: The unit does meet the FCC requirements.

6.7 Dwell Time

Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date:	08 July 2008
Test requirements:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Status:	Test in hopping transmitting operating mode.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Set RBW = 1MHz and VBW = 1MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

Pretest the Bluetooth normal mode

Test Result:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

1. **Channel 0:** 2.402GHz

   Dwell time = 43 x 170us=0.00731s

2. **Channel 38:** 2.441GHz

   Dwell time = 38 x 170us=0.00646s

3. **Channel 78:** 2.480GHz

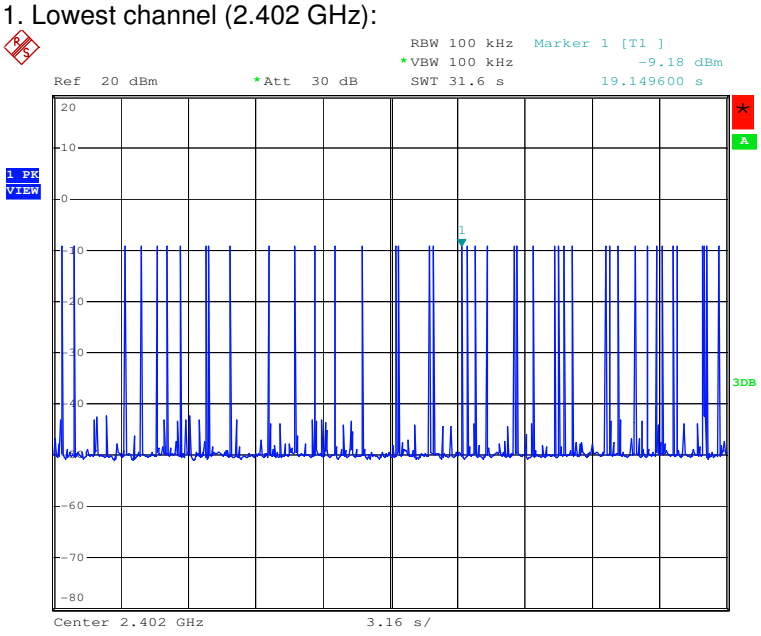
   Dwell time = 49 x 170us=0.00833s

The results are not greater than 0.4 seconds.

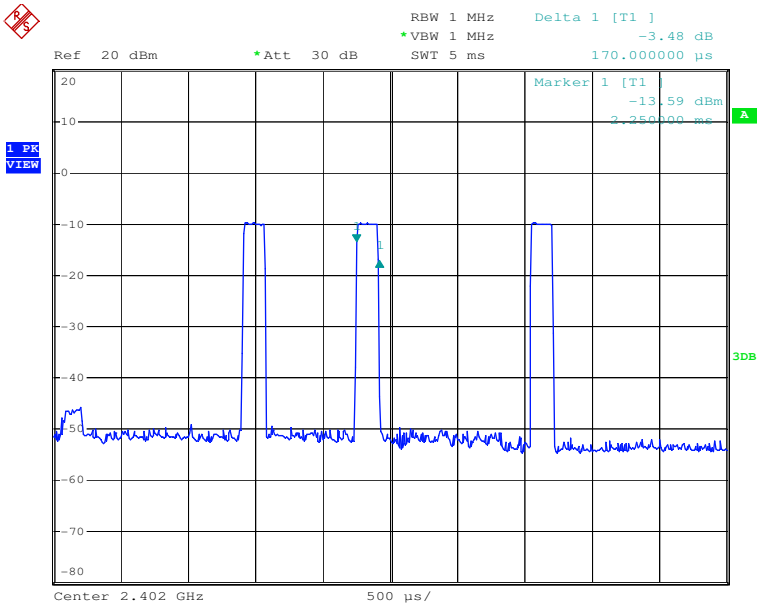
The unit does meet the FCC requirements.

Please refer the graph as below:

1. Lowest channel (2.402 GHz):

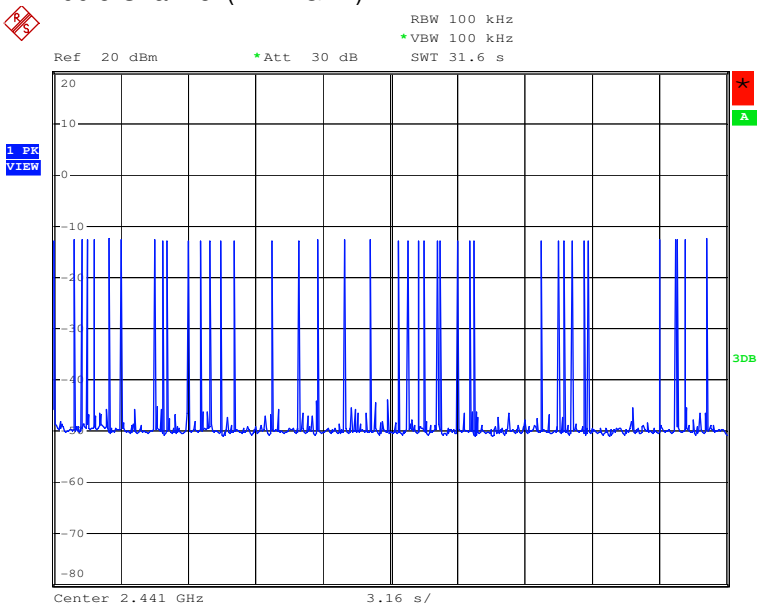


Date: 22.JUN.2008 18:10:56

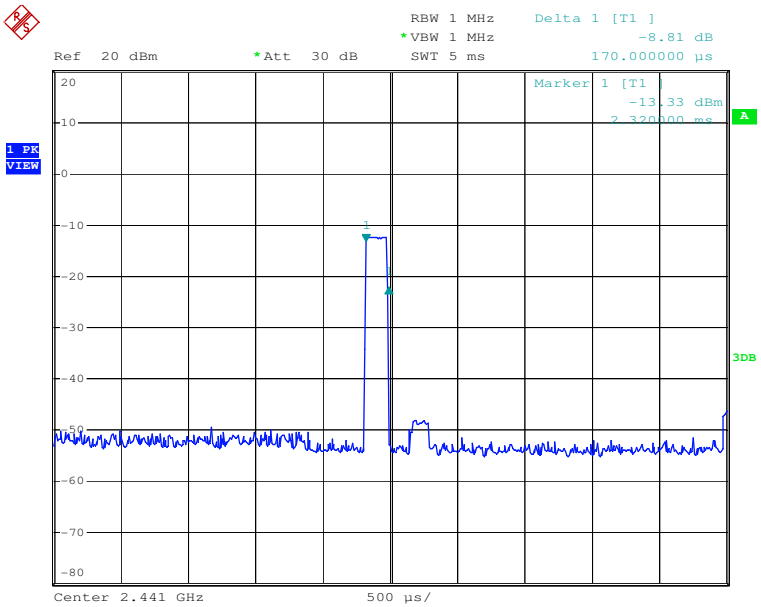


Date: 22.JUN.2008 18:15:12

2. Middle Channel (2.441GHz)

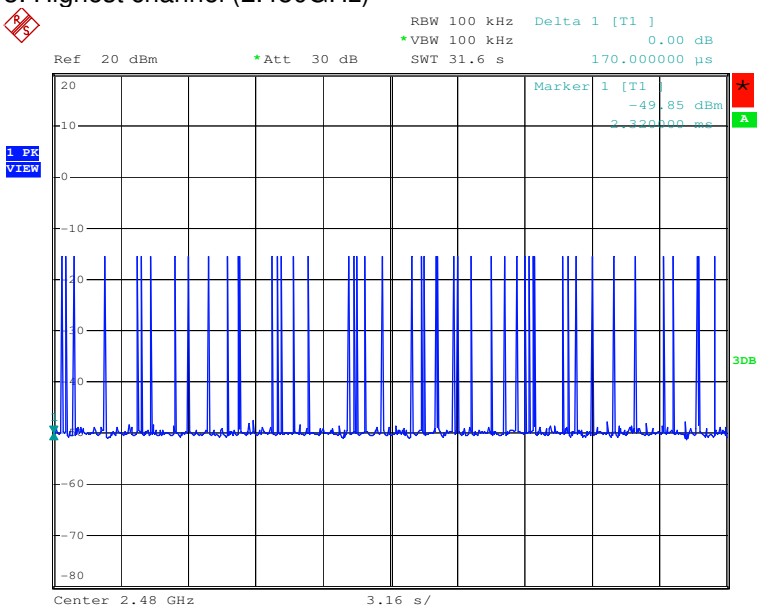


Date: 22.JUN.2008 18:18:37

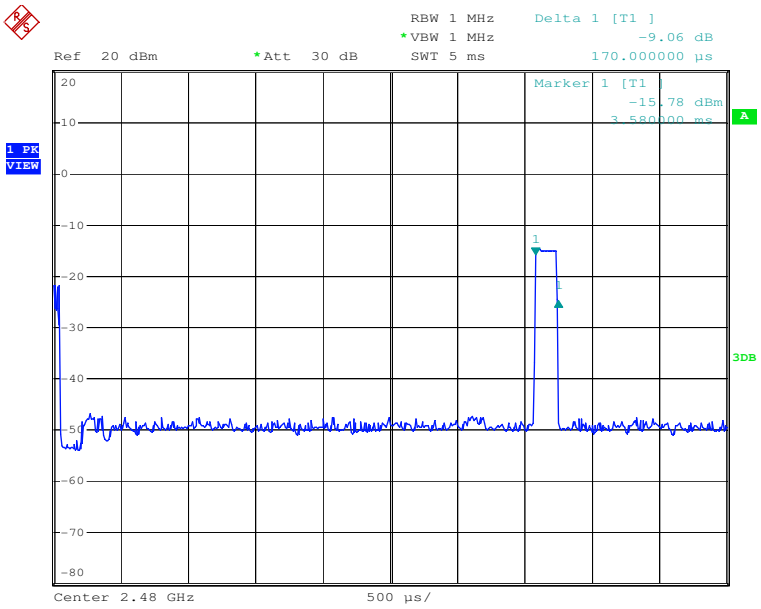


Date: 22.JUN.2008 18:28:44

3. Highest channel (2.480GHz)



Date: 22.JUN.2008 18:50:16



Date: 22.JUN.2008 18:27:22

6.8 Pseudorandom Frequency Hopping Sequence

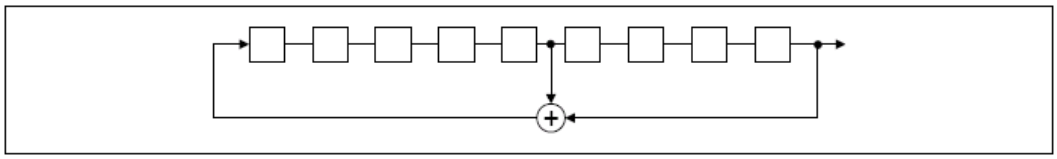
6.8.1 Standard requirement

15.247(a)(1) requirement:
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. Alternatively. frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.8.2 EUT Pseudorandom Frequency Hopping Sequence

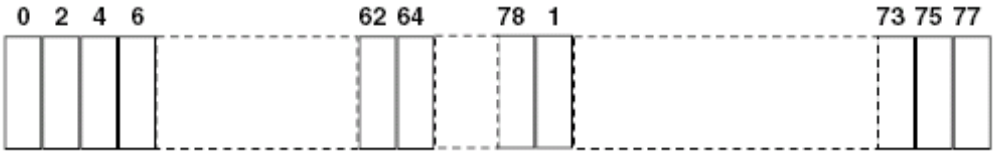
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: 2^9 -1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

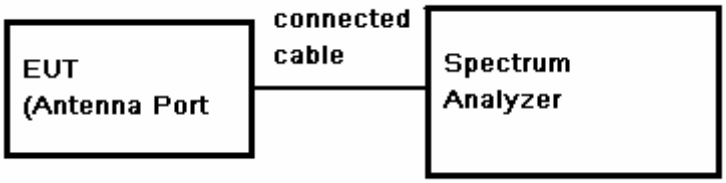


Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

6.9 Maximum Peak Output Power

Test Requirement:	FCC Part 15.247 & DA 00-705
Test Method:	Base on ANSI 63.4.
Test Date:	16 March 2008
Test Limit:	Regulation 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 all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result "Hopping channel number" of this document. The 1 watt (30.0dBm) limit applies.
Test mode:	Test in fixing frequency transmitting mode.
Test Configuration:	



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 1 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

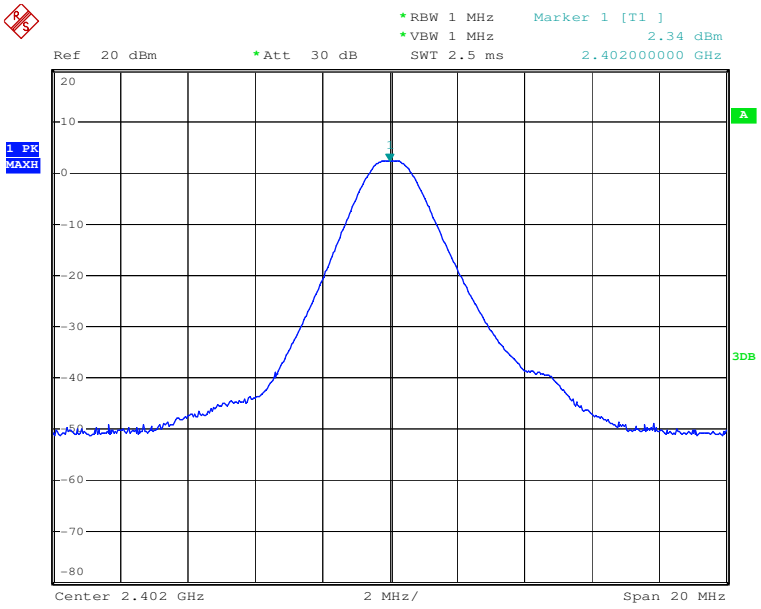
Test Result:

Test Channel	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Lowest	2.402	2.34	0.20	2.54	30.0	24.92
Middle	2.441	1.32	0.20	1.52	30.0	26.96
Highest	2.480	1.82	0.20	2.02	30.0	25.96

Test result: The unit does meet the FCC requirements.

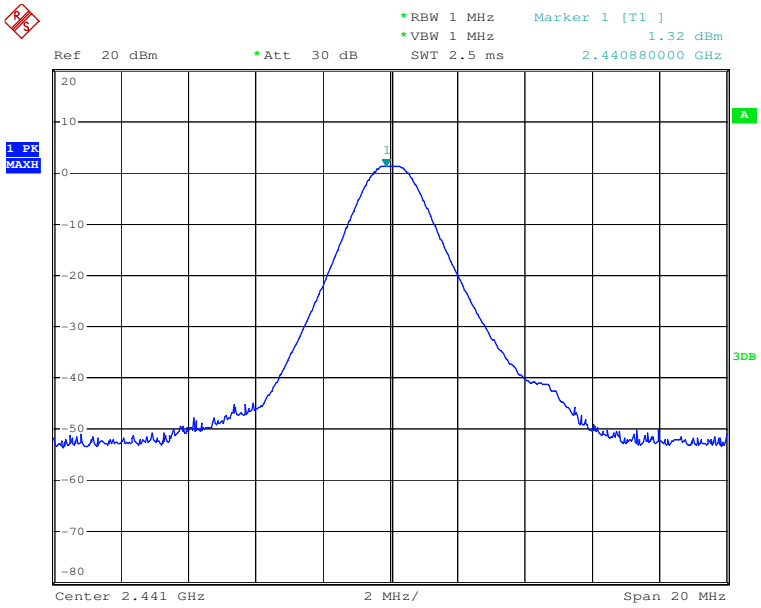
Test result plot as follows:

Lowest Channel:



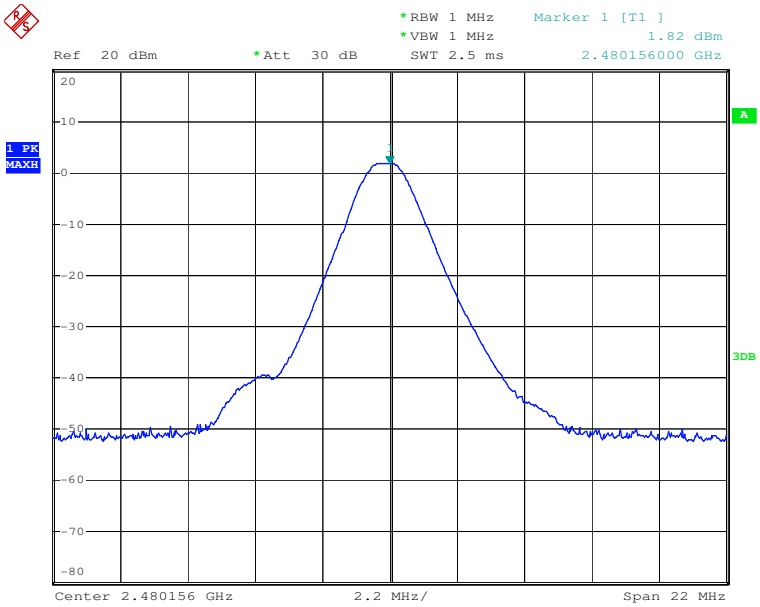
Date: 22.JUN.2008 00:45:53

Middle Channel:



Date: 22.JUN.2008 01:04:43

Highest Channel:



Date: 22.JUN.2008 01:45:49

6.10 RF Exposure Compliance Requirement

6.10.1 Standard requirement

15.247(b)(4) requirement:
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section. if transmitting antennas of directional gain greater than 6 dBi are used. the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1). (b)(2). and (b)(3) of this section. as appropriate. by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TCB Exclusion List (7 July 2002)

Exposure category	low threshold	high threshold
general population	(60/*f*GHz) mW. $d < 2.5$ cm (120/*f*GHz) mW. $d \geq 2.5$ cm	(900/*f*GHz) mW. $d < 20$ cm
occupational	(375/*f*GHz) mW. $d < 2.5$ cm (900/*f*GHz) mW. $d \geq 2.5$ cm	(2250/*f*GHz) mW. $d < 20$ cm

6.10.2 EUT RF Exposure

The Max Conducted Peak Output Power is **-0.56dBm(0.88mW)** in channel **0**;
The best case gain of the antenna is -2.0dBi..
-2.0dB logarithmic terms convert to numeric result is nearly 0.63.
According to the formula. calculate the EIRP test result:

EIRP= P x G = 1.8 mW x 0.63 = 1.1 mW ①
SAR requirement:
S= 60 / f(GHz) = 60/2.4 = 25 mW ② ;
① < ②.
So the SAR report is not required.

6.11 Radiated Spurious Emissions

Test Requirement:	FCC 15.247(d) & 15.209
Test Method:	ANSI C63.4 section 8 & 13
Test Date:	14 July 2008
Test Status:	Test lowest channel, Middle, highest channel.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
	Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz – 1000 MHz). 1MHz resolution bandwidth and Peak and Average-Peak detector apply (1000 MHz – 25GHz).
	Receive antenna scan height 1 m – 4 m. polarization Vertical / Horizontal
15.209 Limit:	40.0 dBμV/m between 30MHz & 88MHz
	43.5 dBμV/m between 88MHz & 216MHz
	46.0 dBμV/m between 216MHz & 960MHz
	54.0 dBμV/m above 960MHz
15.247(d) limit:	(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, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration:

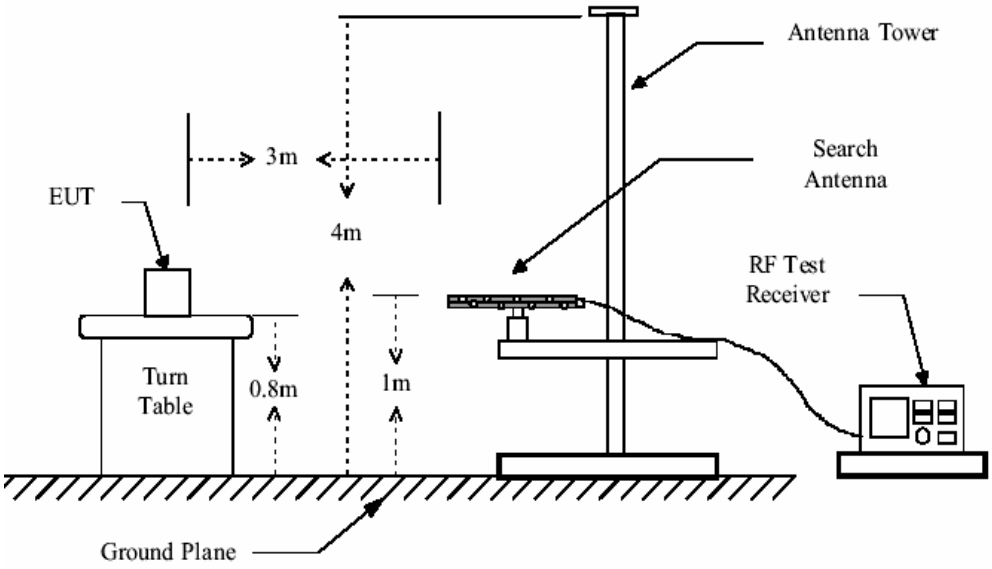


Figure 1. 30MHz to 1GHz radiated emissions test configuration

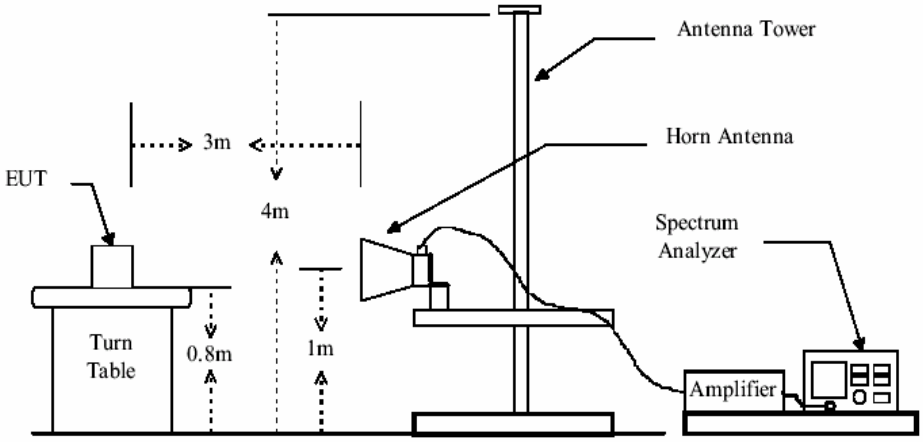


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure: The procedure used was ANSI Standard C63.4-2001. The receiver was scanned from 30MHz to 25GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

6.11.1 Harmonic and other spurious emissions

6.11.1.1 Test in low Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
47.60	0.80	12.76	25.25	41.73	30.04	40.00	Vertical
30.00	0.60	24.40	25.50	30.21	29.71	40.00	Horizontal

1~25 GHz Harmonics & Spurious Emissions.

Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4804	2.7	34.04	45.4	63.1	54.44	74	Vertical
9602	3.46	36.99	42.22	58.42	56.65	74	Vertical
12152	3.83	38.89	43.5	53.67	52.89	74	Vertical
4804	2.7	34.04	45.4	58.15	49.49	74	Horizontal
7273	3.15	36.21	44.44	55.48	50.4	74	Horizontal
9636	3.46	37.01	42.19	50.39	48.67	74	Horizontal

1~25 GHz Harmonics & Spurious Emissions.

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
7222	3.15	36.29	44.49	51.17	46.12	54	Vertical
9602	3.46	36.99	42.22	46.02	44.25	54	Vertical
12152	3.83	38.89	43.5	46.33	45.55	54	Vertical
4804	2.7	34.04	45.4	56.84	48.18	54	Horizontal
7273	3.15	36.21	44.44	49.28	44.2	54	Horizontal
9636	3.46	37.01	42.19	45.93	44.21	54	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

6.11.1.2 Test in middle Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
135.730	13.1	0.85	24.40	32.10	21.70	43.50	Vertical
135.730	13.1	0.85	24.40	31.80	21.40	43.50	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
7341	3.16	36.06	44.37	53. 67	48.52	74	Vertical
9738	3.47	37.08	42.09	50.42	48.88	74	Vertical
12152	3.83	38.89	43.5	51.18	50.4	74	Vertical
4859	2.72	34.03	45.41	65.87	57.21	74	Horizontal
7341	3.16	36.06	44.37	54.29	49.14	74	Horizontal
9738	3.47	37.08	42.09	50.97	49.43	74	Horizontal

1~25 GHz Harmonics & Spurious Emissions.

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
7341	3.16	36.06	44.37	48.95	43.8	54	Vertical
9738	3.47	37.08	42.09	42.62	41.08	54	Vertical
12152	3.83	38.89	43.5	42.43	41.65	54	Vertical
4859	2.72	34.03	45.41	59.11	50.45	54	Horizontal
7341	3.16	36.06	44.37	49.32	44.17	54	Horizontal
9738	3.47	37.08	42.09	42.78	41.24	54	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

6.11.1.3 Test in high Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
249.200	15.25	1.19	24.40	32.90	25.00	46.00	Vertical
249.190	15.25	1.19	24.40	38.50	30.50	46.00	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
7426	3.18	35.91	44.28	55.52	50.33	74	Vertical
9925	3.49	37.23	41.92	50.28	49.08	74	Vertical
12373	3.86	39.01	43.78	49.47	48.56	74	Vertical
4960	2.74	34.01	45.44	62.84	54.15	74	Horizontal
7392	3.17	35.99	44.32	53.48	48.32	74	Horizontal
9925	3.49	37.23	41.92	50.71	49.51	74	Horizontal

1~25 GHz Harmonics & Spurious Emissions.

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
7426	3.18	35.91	44.28	47.23	42.04	54	Vertical
9925	3.49	37.23	41.92	43.67	42.47	54	Vertical
12373	3.86	39.01	43.78	47.35	46.44	54	Vertical
4960	2.74	34.01	45.44	58.3	49.61	54	Horizontal
7392	3.17	35.99	44.32	48.01	42.85	54	Horizontal
9925	3.49	37.23	41.92	44.5	43.3	54	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Remark:

1). N/A: For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 3rd harmonic.

2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

4) pretest the Bluetooth normal mode

Test result: The unit does meet the FCC requirements.

6.11.2 Radiated Emissions which fall in the restricted bands

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	Base on ANSI 63.4
Test Date:	10 July 2008
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; 54.0 dBμV/m above 960MHz.
Detector:	Peak for pre-scan: 100kHz resolution bandwidth and 100kHz video bandwidth within 1GHz. 1MHz resolution bandwidth and 1MHz video bandwidth above 1GHz

Test Result:
Pretest the Bluetooth normal mode.

1. Low Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2390.000	27.88	4.65	34.30	60.82	42.04	59.05	40.27
2483.500	28.74	4.80	34.73	57.65	38.72	56.46	37.53

2. Middle Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2390.000	27.88	4.65	34.30	57.86	39.68	56.09	37.91
2483.500	28.74	4.80	34.73	53.41	34.71	52.22	33.52

3. High Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2390.000	27.88	4.65	34.30	55.85	39.86	54.08	38.09
2483.500	28.74	4.80	34.73	59.86	44.58	58.67	43.39

Remark: No any other emission which fall in restricted bands can be detected and be reported.

The unit does meet the FCC requirements.

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

6.12 Band Edges Requirement

Test Requirement:	FCC Part 15 C
Test Method:	Based on ANSI 63.4
	Operation within the band 2400 – 2483.5 MHz
Test Date:	10 July 2008
Requirements:	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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Method of Measurement:	Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 300 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

Normal mode:

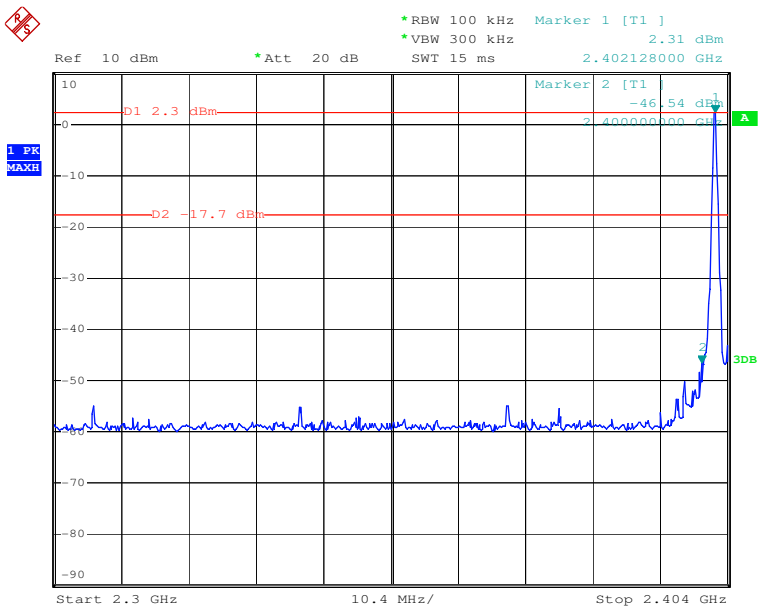
The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB.

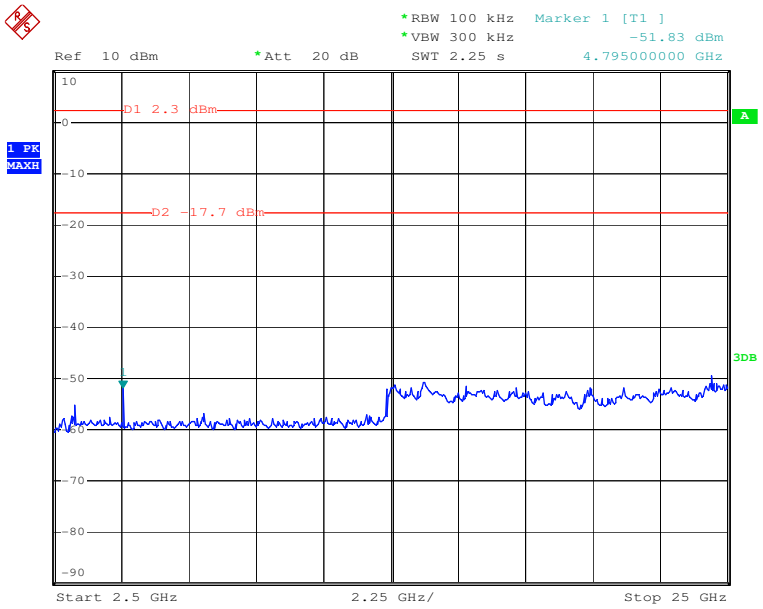
The Upper Edges attenuated more than 20dB.

The graph as below. represents the emissions take for this device.

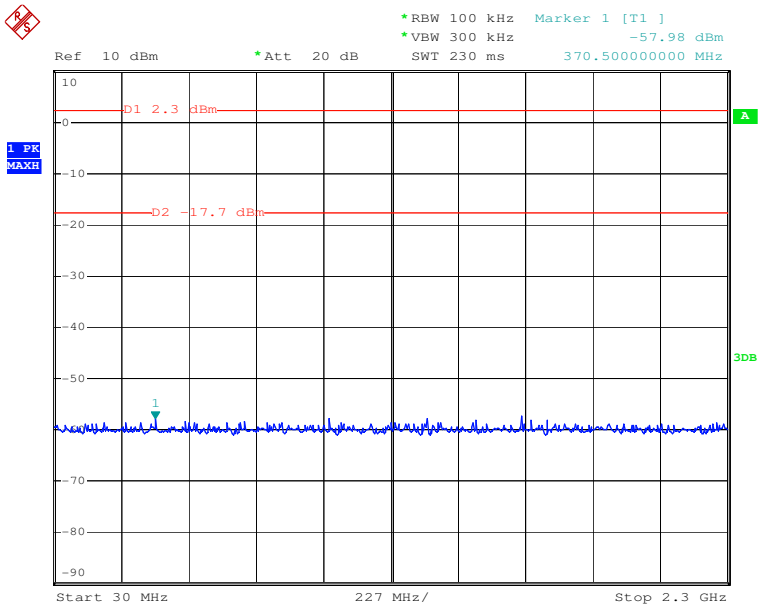
Lowest Channel:



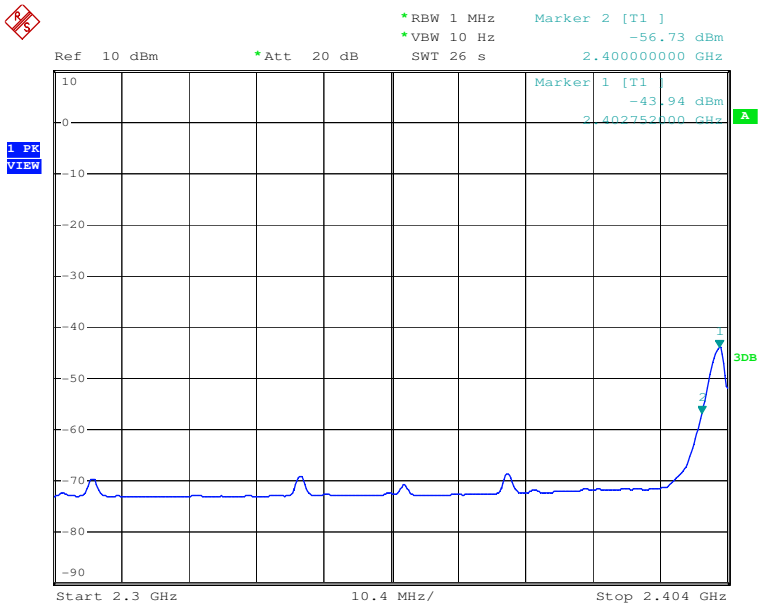
Date: 22.JUN.2008 00:58:05



Date: 22.JUN.2008 00:59:40

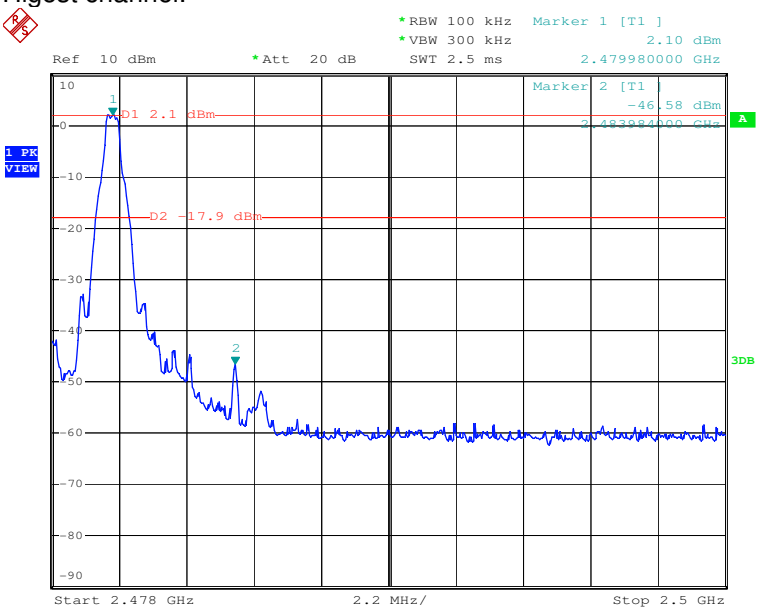


Date: 22.JUN.2008 00:58:52

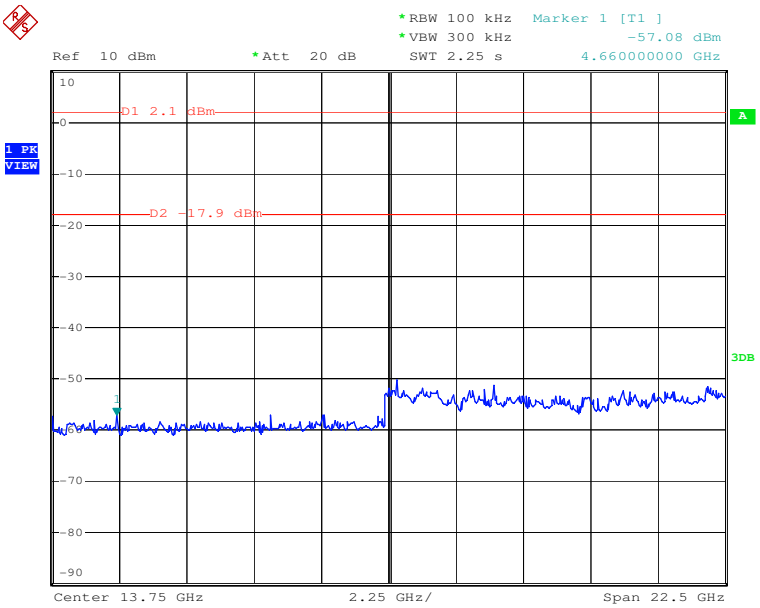


Date: 22.JUN.2008 01:02:29

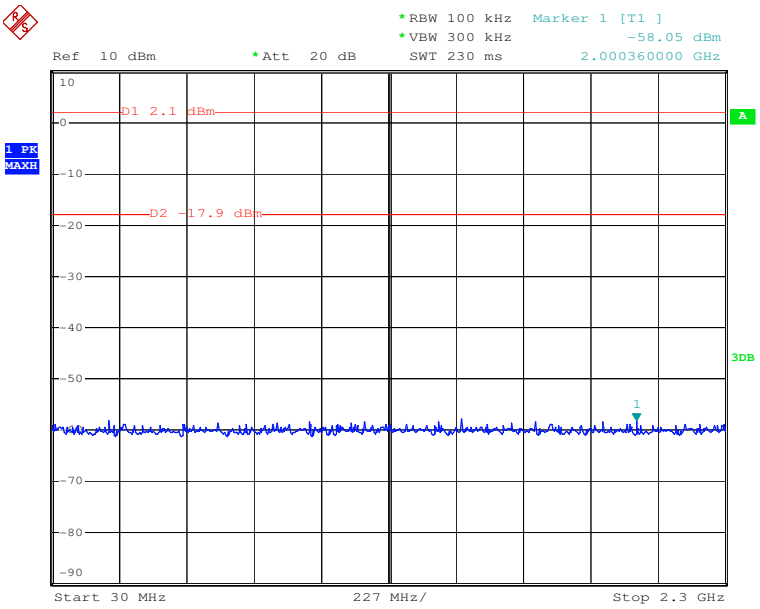
Higest channel:



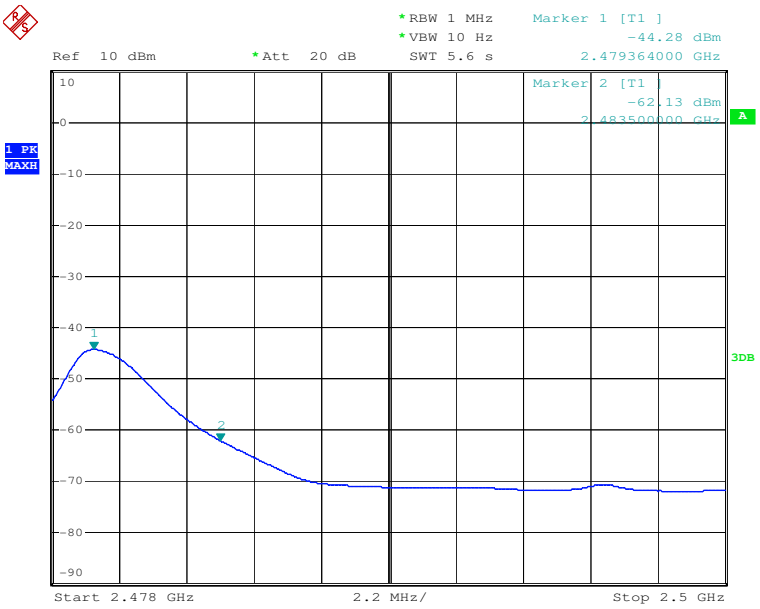
Date: 22.JUN.2008 01:52:57



Date: 22.JUN.2008 01:56:12



Date: 22.JUN.2008 01:53:40



Date: 22.JUN.2008 01:57:27