



Test Report

Product Name : Bluetooth 2.0+ EDR Module
Model No. : MM300-C
FCC ID. : N89-MM300C

Applicant : CyberTAN Technology, Inc.
Address : 99 Park Avenue 3, Science Park Hsinchu 308,
Taiwan, R.O.C.

Date of Receipt : 2008/01/06
Issued Date : 2008/02/26
Report No. : 081090R-RFUSP06V01
Version : V1.0

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Test Report Certification

Issued Date : 2008/02/26

Report No. : 081090R-RFUSP06V01-1



Product Name : Bluetooth 2.0+ EDR Module
 Applicant : CyberTAN Technology, Inc.
 Address : 99 Park Avenue 3, Science Park Hsinchu 308, Taiwan, R.O.C.
 Manufacturer : Foxconn Technology Group- Ambit Microsystems
 (Zhongshan)LTD.
 Model No. : MM300-C
 FCC ID. : N89-MM300C
 Rated Voltage : AC 120 V / 60 Hz
 EUT Voltage : Power by PC
 Trade Name : CyberTAN
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247:2006
 Test Result : Complied

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : 

(Carol Tsai / Adm. Specialist)

Tested By : 

(Lucia Lu / Assistant Engineer)

Approved By : 

(Roy Wang / Manager)

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1. General Information

1.1. EUT Description

Product Name	Bluetooth 2.0+ EDR Module
Trade Name	CyberTAN
Model No.	MM300-C
Frequency Range	2402~2480MHz
Channel Number	79
Type of Modulation	FHSS
Channel Control	Manual
Antenna Type	Connector (PIFA)
Antenna Gain	2.51dBi

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00	2402 MHz	Channel 20	2422 MHz	Channel 40	2442 MHz	Channel 60	2462 MHz
Channel 01	2403 MHz	Channel 21	2423 MHz	Channel 41	2443 MHz	Channel 61	2463 MHz
Channel 02	2404 MHz	Channel 22	2424 MHz	Channel 42	2444 MHz	Channel 62	2464 MHz
Channel 03	2405 MHz	Channel 23	2425 MHz	Channel 43	2445 MHz	Channel 63	2465 MHz
Channel 04	2406 MHz	Channel 24	2426 MHz	Channel 44	2446 MHz	Channel 64	2466 MHz
Channel 05	2407 MHz	Channel 25	2427 MHz	Channel 45	2447 MHz	Channel 65	2467 MHz
Channel 06	2408 MHz	Channel 26	2428 MHz	Channel 46	2448 MHz	Channel 66	2468 MHz
Channel 07	2409 MHz	Channel 27	2429 MHz	Channel 47	2449 MHz	Channel 67	2469 MHz
Channel 08	2410 MHz	Channel 28	2430 MHz	Channel 48	2450 MHz	Channel 68	2470 MHz
Channel 09	2411 MHz	Channel 29	2431 MHz	Channel 49	2451 MHz	Channel 69	2471 MHz
Channel 10	2412 MHz	Channel 30	2432 MHz	Channel 50	2452 MHz	Channel 70	2472 MHz
Channel 11	2413 MHz	Channel 31	2433 MHz	Channel 51	2453 MHz	Channel 71	2473 MHz
Channel 12	2414 MHz	Channel 32	2434 MHz	Channel 52	2454 MHz	Channel 72	2474 MHz
Channel 13	2415 MHz	Channel 33	2435 MHz	Channel 53	2455 MHz	Channel 73	2475 MHz
Channel 14	2416 MHz	Channel 34	2436 MHz	Channel 54	2456 MHz	Channel 74	2476 MHz
Channel 15	2417 MHz	Channel 35	2437 MHz	Channel 55	2457 MHz	Channel 75	2477 MHz
Channel 16	2418 MHz	Channel 36	2438 MHz	Channel 56	2458 MHz	Channel 76	2478 MHz
Channel 17	2419 MHz	Channel 37	2439 MHz	Channel 57	2459 MHz	Channel 77	2479 MHz
Channel 18	2420 MHz	Channel 38	2440 MHz	Channel 58	2460 MHz	Channel 78	2480 MHz
Channel 19	2421 MHz	Channel 39	2441 MHz	Channel 59	2461 MHz		

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. Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Note:

1. This device is a Bluetooth 2.0+ EDR Module including a 2.4GHz BT receiving function, and transmitting function.
2. These test results on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regards to the frequency band operation; the lowest 、 middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. This device is a composite device in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 081090R-RFUSP01V02-A -1under Declaration of Conformity.

1.3. Test Mode

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-Test Mode	
EMI	Mode 1: Transmit
Final Test Mode	
EMI	Mode 1: Transmit

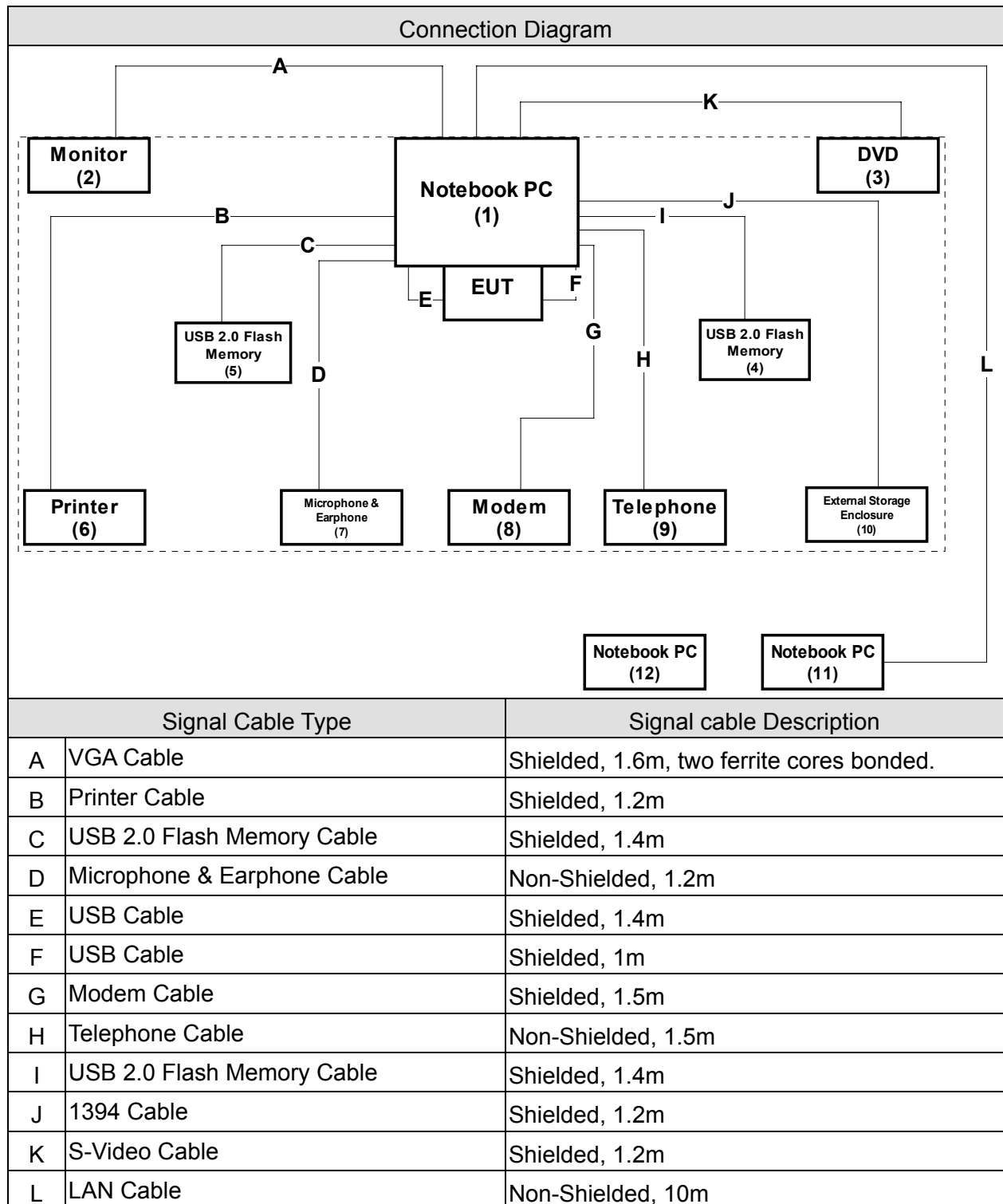
Emission	Mode 1
Conducted Emission	Yes
Peak Power Output	Yes
Radiated Emission	Yes
Band Edge	Yes
Channel of Number	Yes
Channel Separation	Yes
Occupied Bandwidth	Yes
Dwell Time	Yes

1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Notebook PC	HP	NX6320	CNU62D1F4K	DoC	Non-Shielded, 1.8m
2	Monitor	CHI MEI	A170E1-09	3UC120954HA0063	DoC	Non-Shielded, 1.8m
3	DVD	Panasonic	DVD-A120TN	9542160	DoC	Non-Shielded, 1.8m
4	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--
5	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--
6	Printer	HP	C2642A	TH86M1M34W	DoC	Non-Shielded, 0.7m
7	Microphone & Earphone	TOKTO	SX-MI	N/A	DoC	--
8	Modem	ACEEX	DM-1414	0102027535	DoC	Non-Shielded, 1.6m
9	Telephone	TENTEL	K-302	50721005000219	DoC	--
10	External Storage Enclosure	MACPOWER	Laureate Super 800	N/A	DoC	--
11	Notebook PC	HP	NX6320	CNU62D1F5Y	DoC	Non-Shielded, 1.8m
12	Notebook PC	HP	NX6320	CNU62D1F6F	DoC	Non-Shielded, 1.8m

1.5. Configuration of tested System



1.6. EUT Exercise Software

1	Setup the EUT and Notebook PC as shown on 1.5
2	Turn on the power of all equipment.
3	Notebook PC reads data from disk.
4	Data will be transmitting through EUT.
5	The transmitting status will be shown on the monitor.
6	Repeat the above procedure (4) to (5)

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 B 15.107 Conducted Emission	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output (FHSS)	15 - 35	26
Humidity (%RH)		25 - 75	51
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	54
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Of Number (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	53
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Channel Separation (FHSS)	15 - 35	26
Humidity (%RH)		25 - 75	51
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth (FHSS)	15 - 35	25
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Dwell Time (FHSS)	15 - 35	26
Humidity (%RH)		25 - 75	52
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description:

January 24, 2005 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 365520



Accredited by TAF
Accreditation Number: 1313
Effective through: December 27, 2010



Accredited by NVLAP
NVLAP Lab Code: 200347-0
Effective through: September 30, 2008



Site Name: Quietek Corporation
Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
TEL : 886-3-592-8858 / FAX : 886-3-592-8859
E-Mail : service@quietek.com

2. Conducted Emission

2.1. Test Equipment

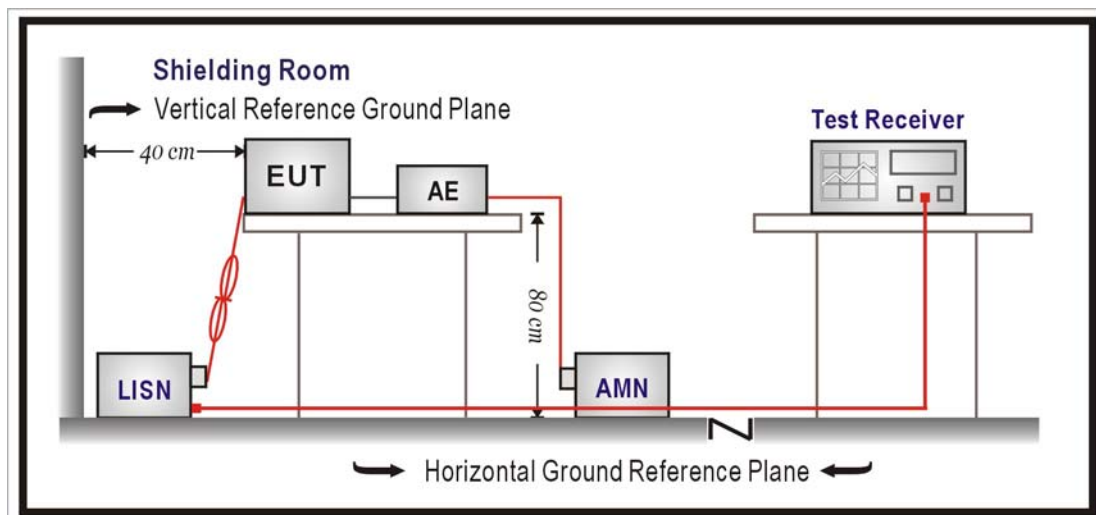
The following test equipment are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
4-Wire ISN	R & S	ENY 41	837032/001	2007/04/15
Artificial Mains Network	R & S	ENV4200	848411/010	2007/03/13
Double 2-Wire ISN	R & S	ENY 22	835354/008	2007/04/15
LISN	R & S	ESH3-Z5	825562/002	2007/03/31
Pulse Limiter	R & S	ZSH3Z2	357.8810.54	2007/07/19
Test Receiver	R & S	ESCS 30	100122	2007/02/21

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT was setup and tested according to ANSI C63.4, 2003.

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

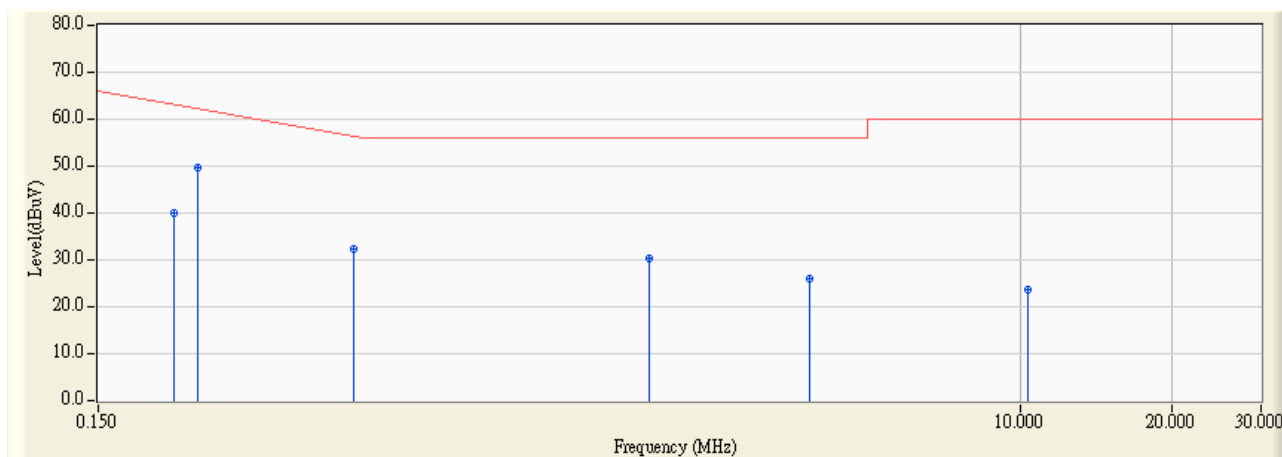
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2006

2.6. Test Result

Site : ShieldingRoom 2	Time : 2008/01/05 - 17:43
Limit : CISPR_B_00M_QP	Margin : 0
EUT : Bluetooth 2.0+ EDR Module	Probe : QTK-LISN-SR2 - Line1
Power : Power by PC	Note : BT-TX

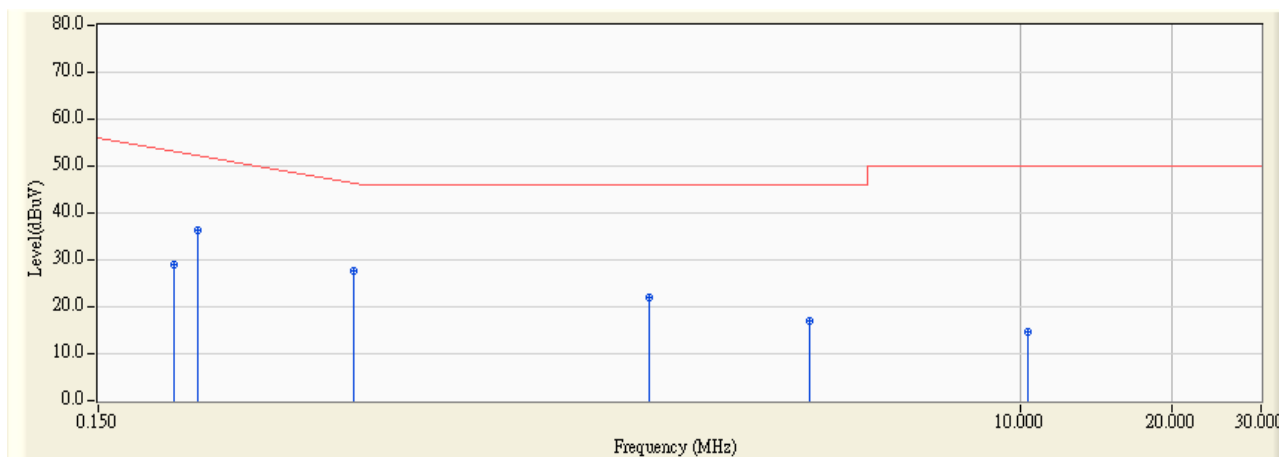


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.212	0.060	39.860	39.920	-24.309	64.229	QUASIPeAK
2	*	0.236	0.060	49.750	49.810	-13.733	63.543	QUASIPeAK
3		0.480	0.070	32.330	32.400	-24.171	56.571	QUASIPeAK
4		1.845	0.162	30.310	30.472	-25.528	56.000	QUASIPeAK
5		3.841	0.220	25.710	25.930	-30.070	56.000	QUASIPeAK
6		10.357	0.550	22.960	23.510	-36.490	60.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : ShieldingRoom 2	Time : 2008/01/05 - 17:43
Limit : CISPR_B_00M_AV	Margin : 0
EUT : Bluetooth 2.0+ EDR Module	Probe : QTK-LISN-SR2 - Line1
Power : Power by PC	Note : BT-TX

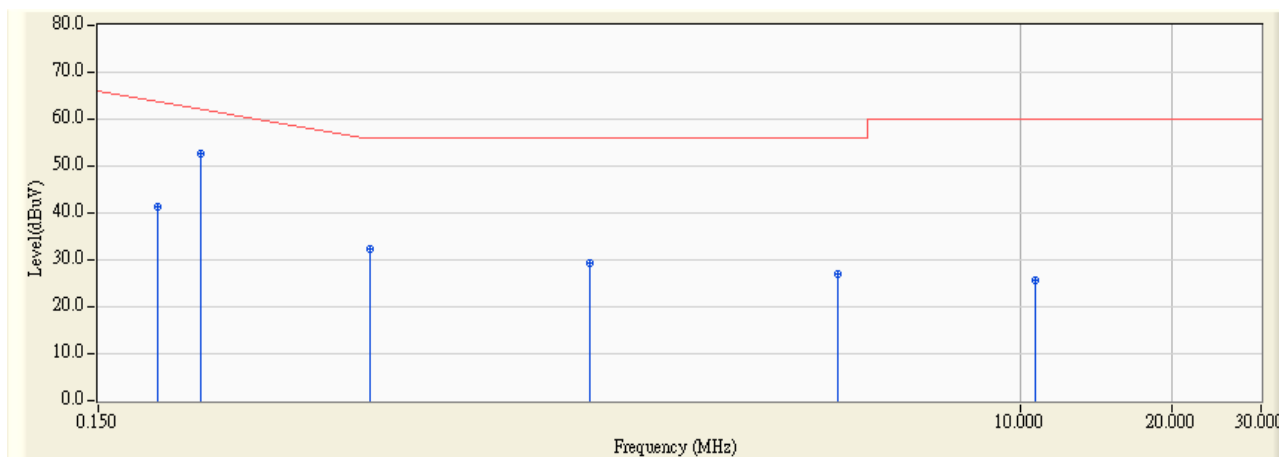


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.212	0.060	28.850	28.910	-25.319	54.229	AVERAGE
2	*	0.236	0.060	36.120	36.180	-17.363	53.543	AVERAGE
3		0.480	0.070	27.640	27.710	-18.861	46.571	AVERAGE
4		1.845	0.162	21.990	22.152	-23.848	46.000	AVERAGE
5		3.841	0.220	16.750	16.970	-29.030	46.000	AVERAGE
6		10.357	0.550	14.170	14.720	-35.280	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : ShieldingRoom 2	Time : 2008/01/05 - 17:46
Limit : CISPR_B_00M_QP	Margin : 0
EUT : Bluetooth 2.0+ EDR Module	Probe : QTK-LISN-SR2 - Line2
Power : Power by PC	Note : BT-TX

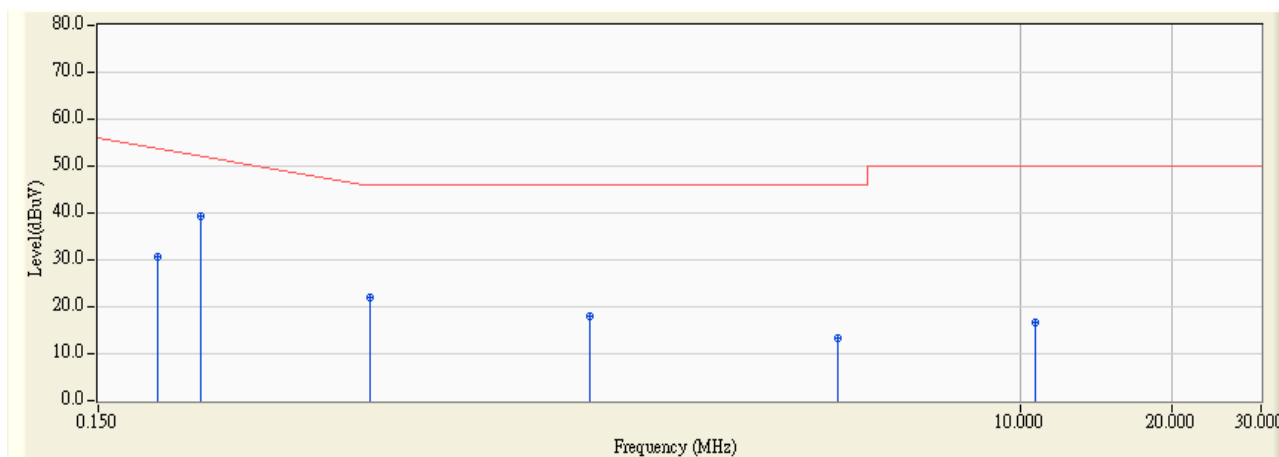


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.197	0.060	41.280	41.340	-23.317	64.657	QUASIPeAK
2	*	0.240	0.060	52.600	52.660	-10.769	63.429	QUASIPeAK
3		0.517	0.070	32.260	32.330	-23.670	56.000	QUASIPeAK
4		1.412	0.070	29.130	29.200	-26.800	56.000	QUASIPeAK
5		4.353	0.240	26.900	27.140	-28.860	56.000	QUASIPeAK
6		10.744	0.460	25.210	25.670	-34.330	60.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : ShieldingRoom 2	Time : 2008/01/05 - 17:46
Limit : CISPR_B_00M_AV	Margin : 0
EUT : Bluetooth 2.0+ EDR Module	Probe : QTK-LISN-SR2 - Line2
Power : Power by PC	Note : BT-TX



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.197	0.060	30.440	30.500	-24.157	54.657	AVERAGE
2	*	0.240	0.060	39.270	39.330	-14.099	53.429	AVERAGE
3		0.517	0.070	21.820	21.890	-24.110	46.000	AVERAGE
4		1.412	0.070	17.780	17.850	-28.150	46.000	AVERAGE
5		4.353	0.240	13.190	13.430	-32.570	46.000	AVERAGE
6		10.744	0.460	16.330	16.790	-33.210	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. Peak Power Output

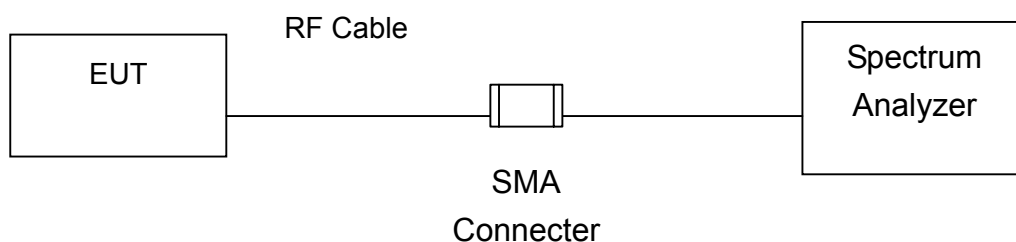
3.1. Test Equipment

The following test equipments are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R&S	FSP/ 100005	Oct., 2007
2	No.1 OATS			Sep., 2007

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2. Test Setup



3.3. Test procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

3.4. Limits

For frequency hopping systems operating in the 902-928 MHz band: 1 Watt for systems employing at least 50 hopping channels; and, 0.25 Watts for systems employing less than 50 hopping channels.

For frequency hopping systems in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1Watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watt.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

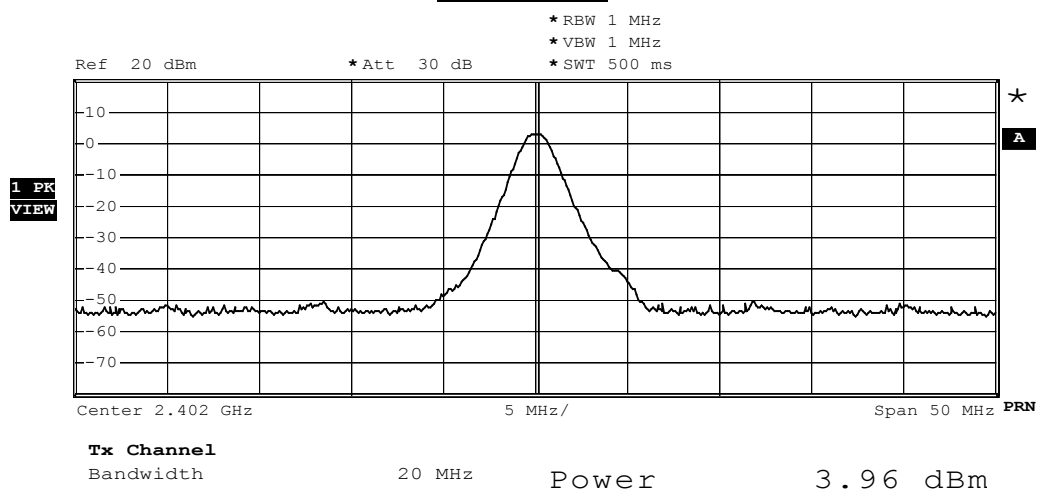
3.6. Test Result

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	3.96	1Watt= 30 dBm	Pass

Channel 00



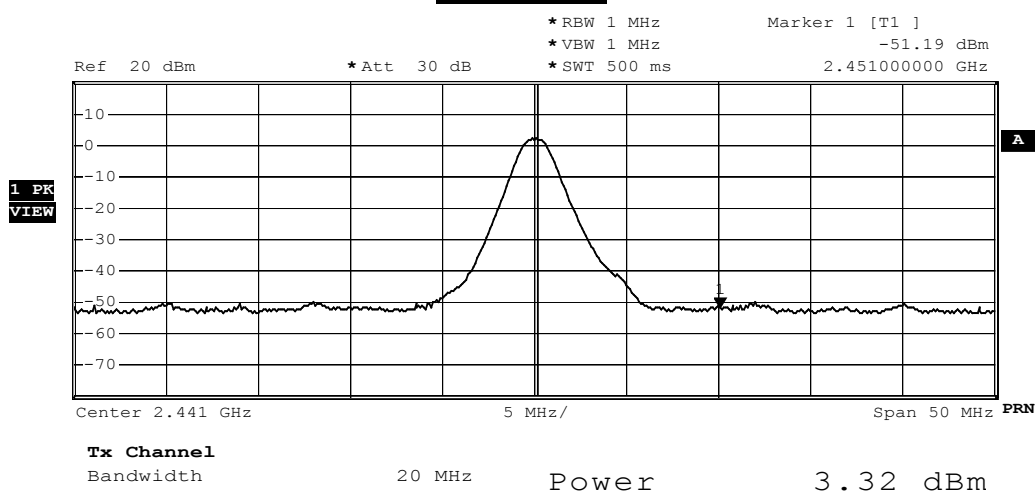
Date: 6.JAN.2008 02:58:40

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	3.32	1Watt= 30 dBm	Pass

Channel 39



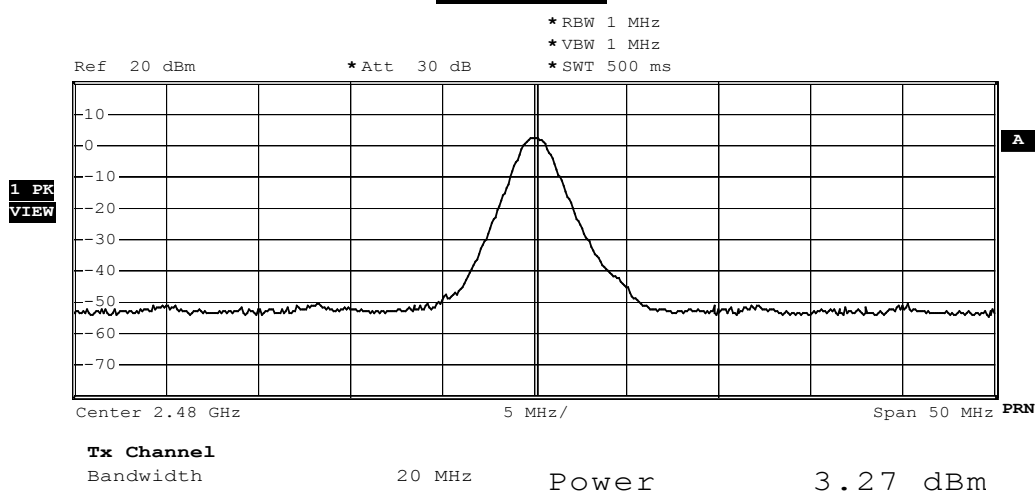
Date: 6.JAN.2008 04:43:59

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	3.27	1Watt= 30 dBm	Pass

Channel 78



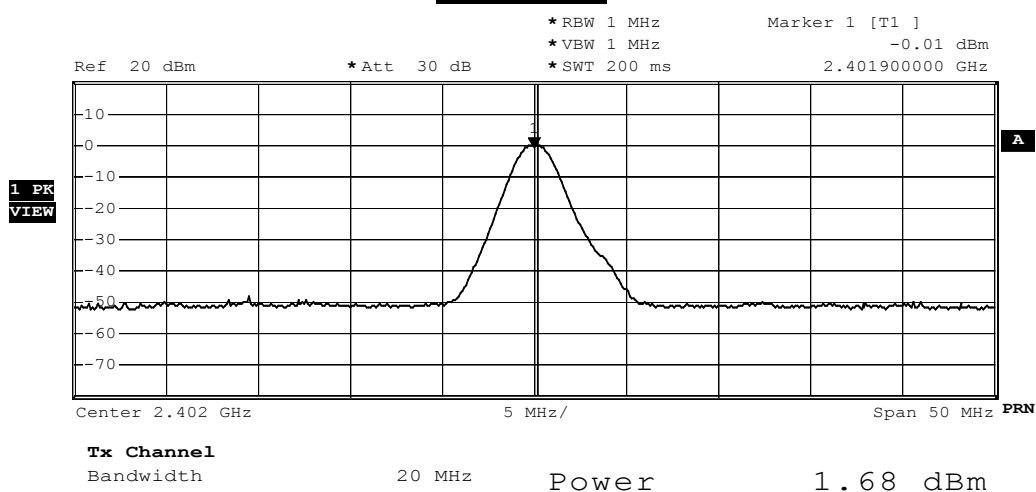
Date: 6.JAN.2008 03:02:29

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	1.68	1Watt= 30 dBm	Pass

Channel 00



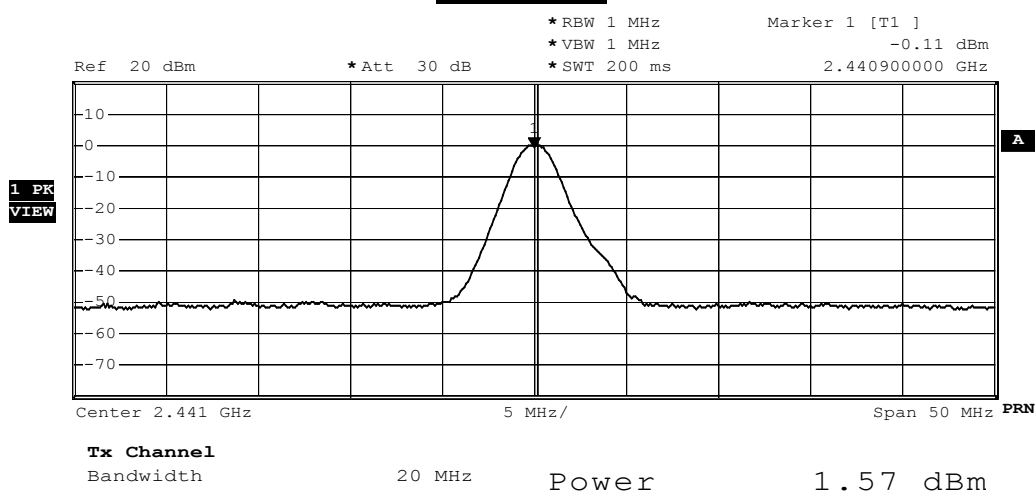
Date: 7.JAN.2008 01:26:07

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	1.57	1Watt= 30 dBm	Pass

Channel 39

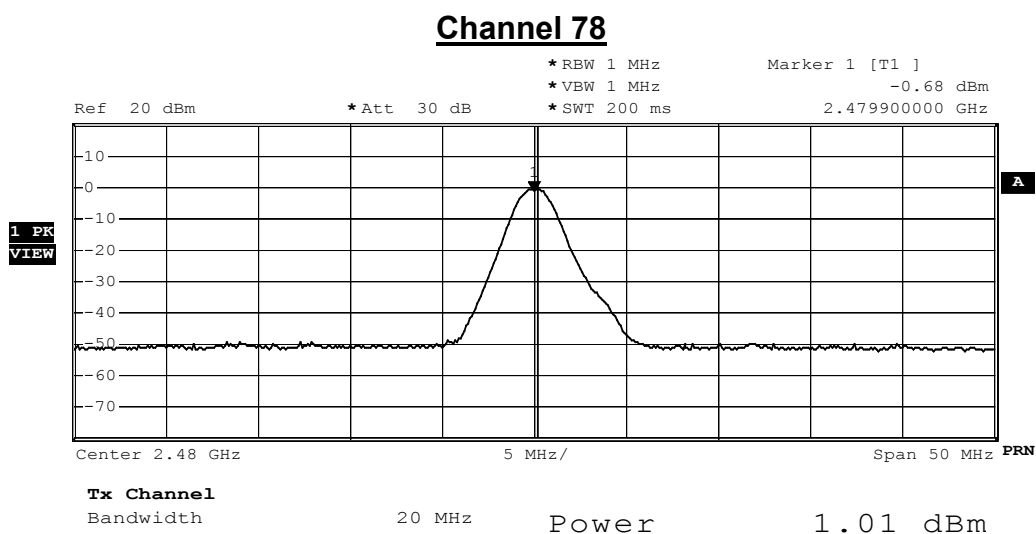


Date: 7.JAN.2008 01:28:52

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480	1.01	1Watt= 30 dBm	Pass



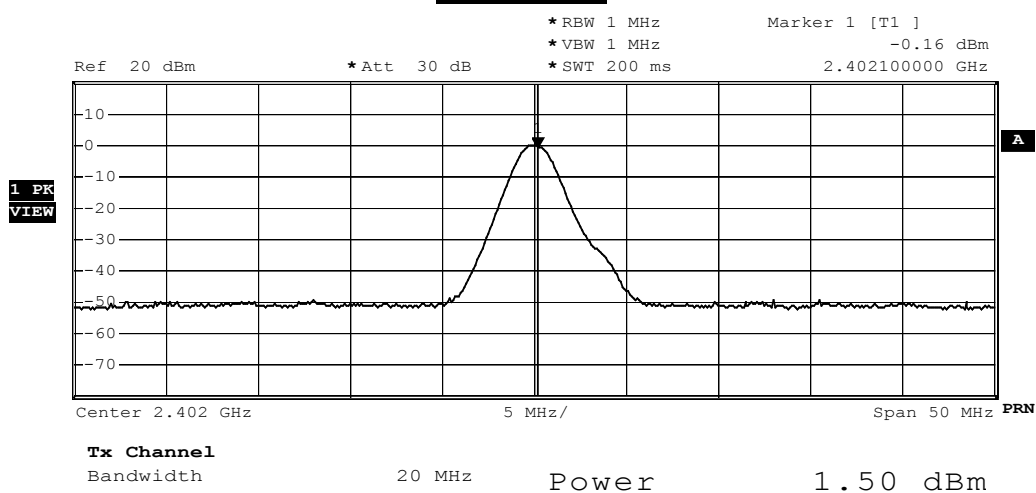
Date: 7.JAN.2008 01:31:59

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	1.50	1Watt= 30 dBm	Pass

Channel 00



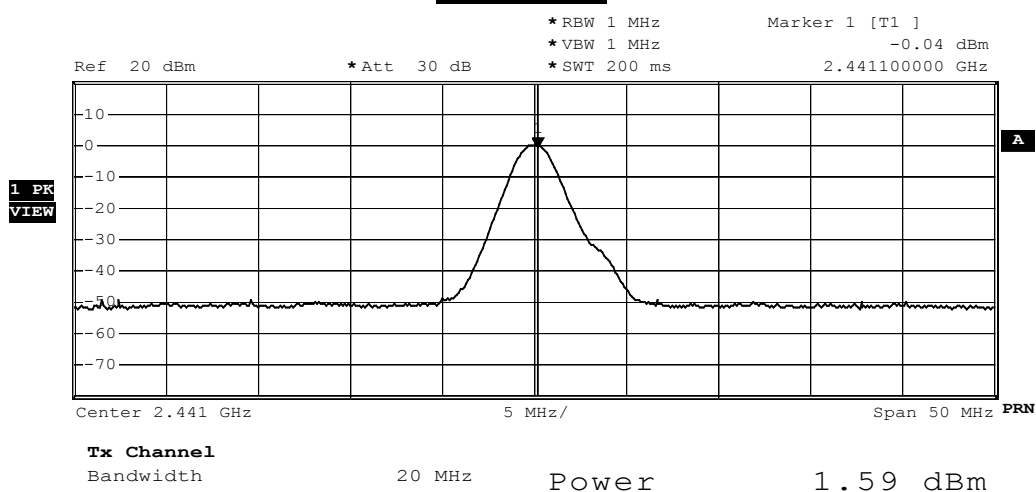
Date: 7.JAN.2008 01:27:04

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
39	2441	1.59	1Watt= 30 dBm	Pass

Channel 39



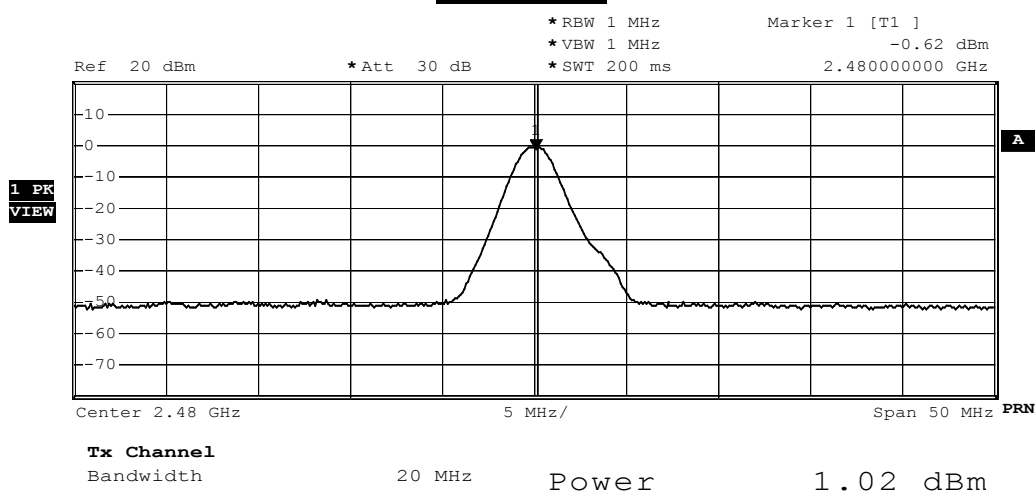
Date: 7.JAN.2008 01:30:00

Product	Bluetooth 2.0+ EDR Module		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
78	2480.	1.02	1Watt= 30 dBm	Pass

Channel 78



Date: 7.JAN.2008 01:33:26

4. Radiated Emission

4.1. Test Equipment

The following test equipment are used during the test:

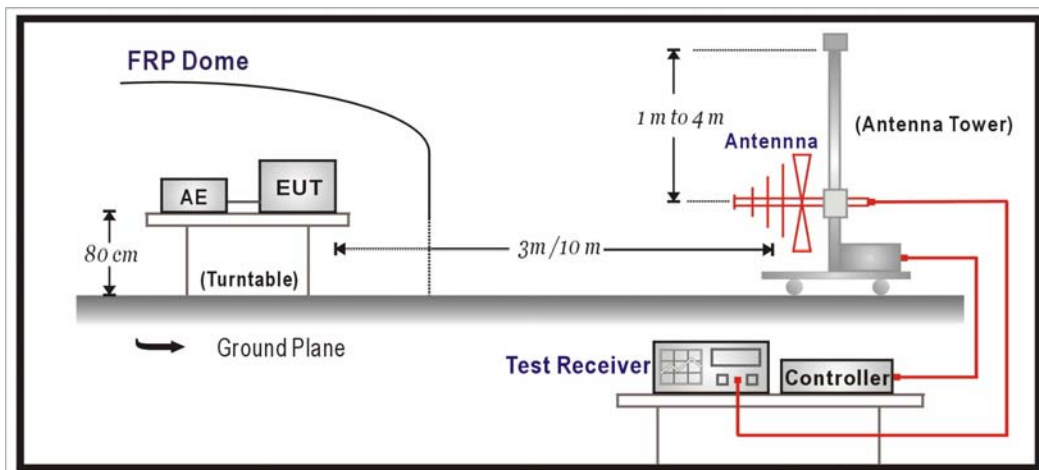
Radiated Emission / Site1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2895	2007/09/03
Horn Antenna	Electro Metrics	EM-6961	103325	2007/03/15
Pre-Amplifier	HP	8449B	3008A01123	2007/11/15
Pre-Amplifier	Quietek	AP-025C	N/A	N/A
Spectrum Analyzer	R & S	FSP40	100005	2007/08/25
Spectrum Analyzer	Advantest	R3162	120300649	2006/11/24
Test Receiver	R & S	ESCS 30	825442/017	2008/02/13

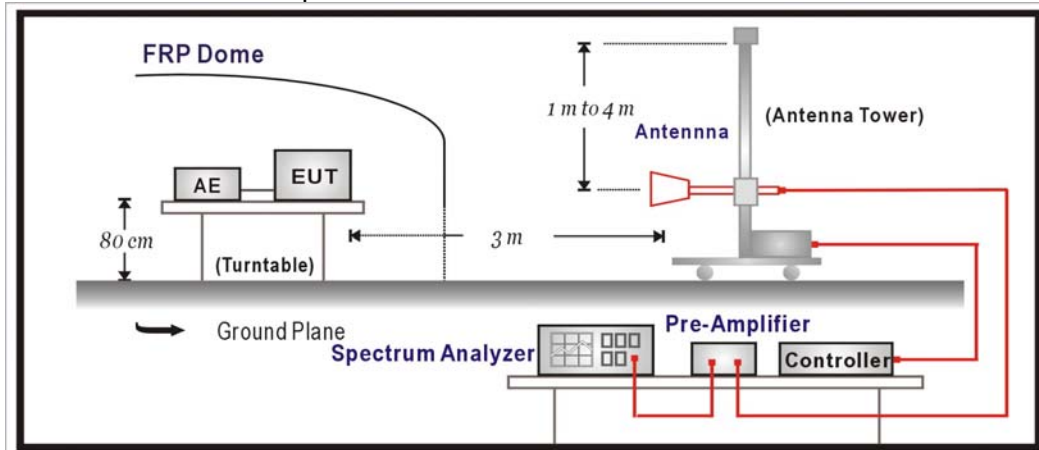
- Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. "N/A" Ca1.Date is used to Pre-test, not final test.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m	dBuV/m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit. The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

4.6. Test Result

30MHz-1GHz Spurious

Product	Bluetooth 2.0+ EDR Module				
Test Item	Radiated Emission				
Test Mode	Mode 1: Transmit				
Date of Test	2008/02/21	Test Site	No.1 OATS		

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit dBuV/m
Horizontal					
31.944	3.144	25.190	28.334	-11.666	40.000
269.098	-7.085	33.261	26.176	-19.824	46.000
473.206	2.161	25.823	27.984	-18.016	46.000
580.120	5.370	24.504	29.874	-16.126	46.000
665.651	1.750	28.467	30.217	-15.783	46.000
865.872	4.750	26.943	31.693	-14.307	46.000
Vertical					
271.042	-12.170	37.754	25.584	-20.416	46.000
377.956	-1.210	29.271	28.061	-17.939	46.000
665.651	-2.858	31.302	28.444	-17.556	46.000
780.341	5.743	25.795	31.538	-14.462	46.000
941.683	8.727	25.086	33.813	-12.187	46.000

Note:

1. All Reading Levels below 1GHz are Quasi-Peak value.
2. "■", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Harmonic & Spurious:

Product	Bluetooth 2.0+ EDR Module		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/21	Test Site	No.1 OATS

CH00

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit dBuV/m	Average Limit dBuV/m
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Horizontal

Peak Detector:

4804.260	3.899	44.110	48.009	-25.991	74.000	54.00
7206.860	11.364	37.460	48.824	-25.176	74.000	54.00
9608.640	15.954	33.190	49.144	-24.856	74.000	54.00
12010.640	17.385	32.740	50.125	-23.875	74.000	54.00

Average Detector:

--

Vertical

Peak Detector:

4804.150	3.899	42.770	46.669	-27.331	74.000	54.00
7206.880	11.778	39.630	51.408	-22.592	74.000	54.00
9608.550	14.738	38.980	53.718	-20.282	74.000	54.00
12010.530	17.364	32.640	50.004	-23.996	74.000	54.00

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	Bluetooth 2.0+ EDR Module		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/21	Test Site	No.1 OATS

CH39

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit dBuV/m	Average Limit dBuV/m
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Horizontal

Peak Detector:

4882.280	4.169	45.270	49.439	-24.561	74.000	54.00
7322.750	11.667	39.480	51.147	-22.853	74.000	54.00
9763.900	16.461	35.200	51.661	-22.339	74.000	54.00
12206.410	17.950	34.570	52.520	-21.480	74.000	54.00

Average Detector:

--

Vertical

Peak Detector:

4882.160	4.168	46.770	50.938	-23.062	74.000	54.00
7322.630	12.314	40.360	52.674	-21.326	74.000	54.00
9763.810	14.935	36.320	51.255	-22.745	74.000	54.00
12205.140	17.533	32.370	49.903	-24.097	74.000	54.00

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	Bluetooth 2.0+ EDR Module		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/21	Test Site	No.1 OATS

CH78

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit dBuV/m	Average Limit dBuV/m
--------------------	---------------------------	----------------------------	------------------------------	----------------	-------------------------	----------------------------

Horizontal

Peak Detector:

4960.330	4.428	44.990	49.418	-24.582	74.000	54.00
7440.010	12.001	40.060	52.061	-21.939	74.000	54.00
9919.940	16.975	36.100	53.075	-20.925	74.000	54.00
12400.210	18.520	31.750	50.270	-23.730	74.000	54.00

Average Detector:

--

Vertical

Peak Detector:

4960.260	4.428	48.450	52.878	-21.122	74.000	54.00
7440.010	12.884	40.836	53.720	-20.280	74.000	54.00
9919.870	15.134	35.580	50.714	-23.286	74.000	54.00
12400.140	17.722	34.040	49.762	-24.238	74.000	54.00

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

5. RF Conducted Emission

5.1. Test Equipment

The following test equipments are used during the test:

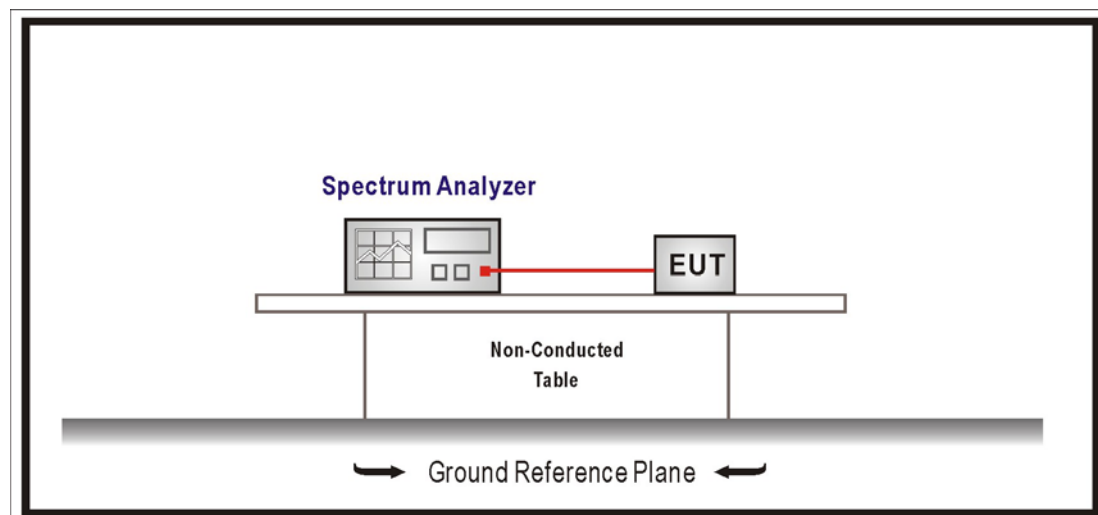
RF Conducted Measurement:				
Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2007
2	No.1 OATS			Sep., 2007

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

2. Mark "X" test instruments are used to measure the final test results.

5.2. Test Setup

RF Conducted Measurement:



5.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. 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)).

5.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

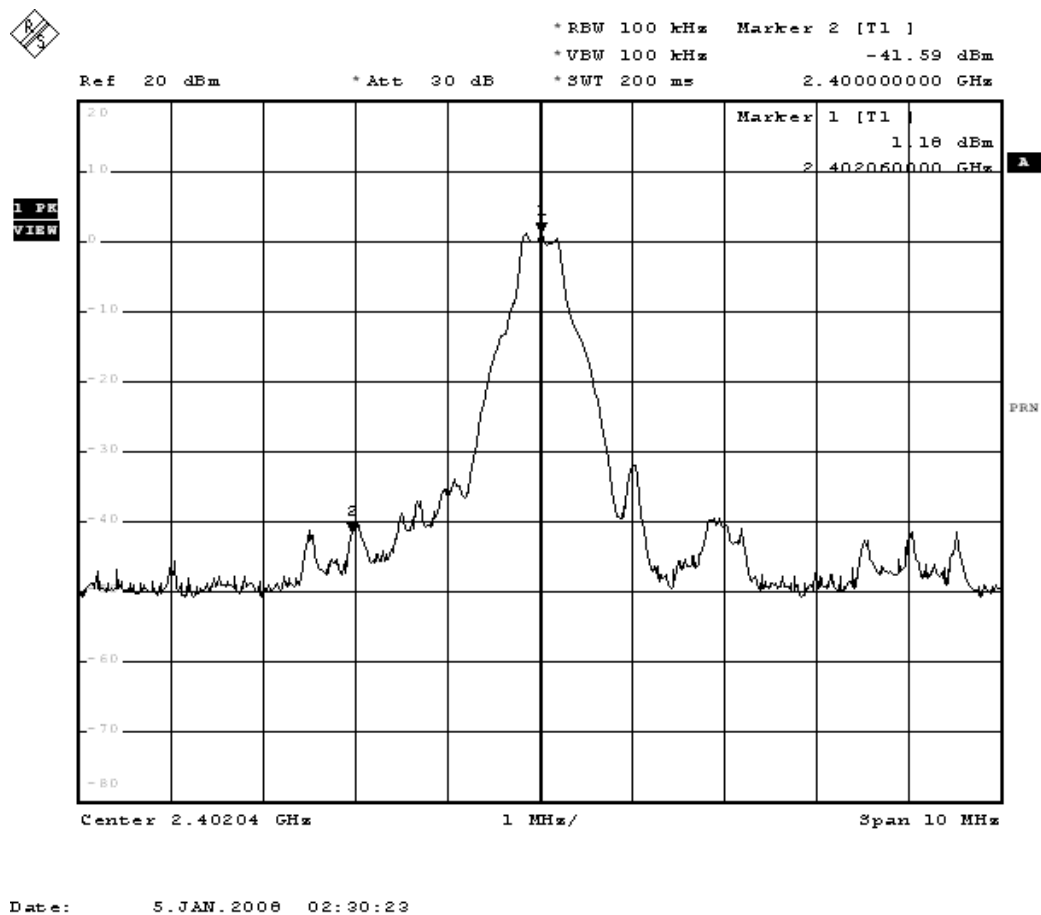
5.6. Test Result

Product	Bluetooth 2.0+ EDR Module		
Test Item	RF Conducted Emissions		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/05	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1	2402	>20	Pass

Figure Channel 1:

Channel 1

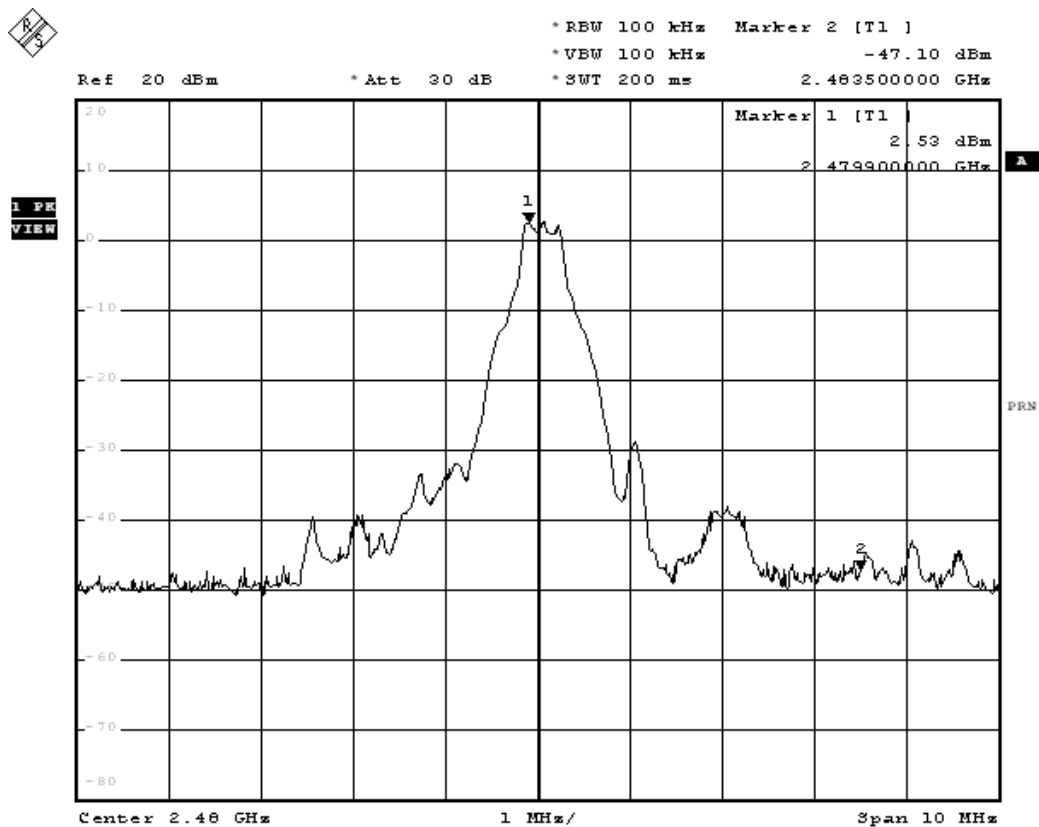


Product	Bluetooth 2.0+ EDR Module		
Test Item	RF Conducted Emissions		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/05	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
78	2480	>20	Pass

Figure Channel 1:

Channel 78



Date: 5.JAN.2008 02:35:37

6. Band Edge

6.1. Test Equipment

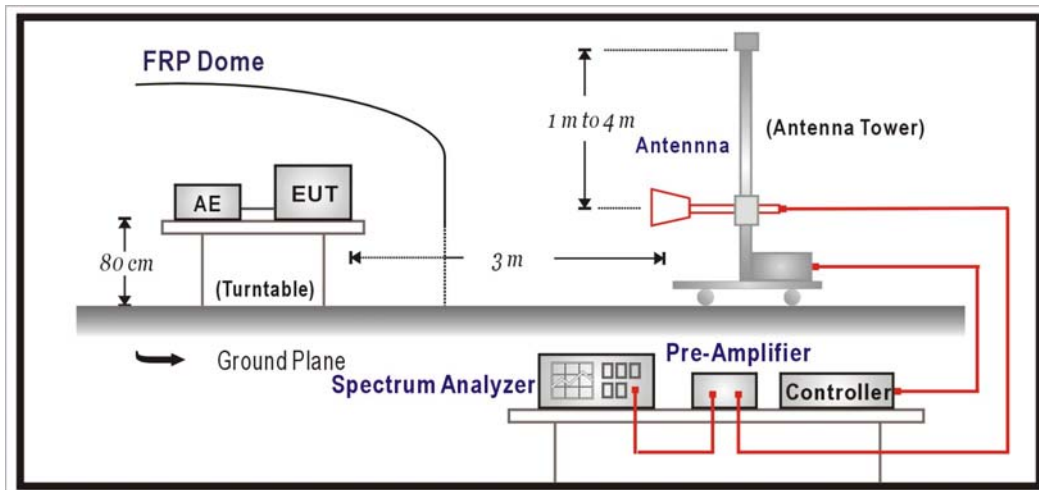
The following test equipments are used during the test:

RF Radiated Measurement:					
Item	Equipment		Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2007
2	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2007
3		Loop Antenna	R & S	HFH2-Z2 / 833799/004	Sep., 2007
4		BiconiLog Antenna	Schwarzbeck	VULB 9166 / 1061	Sep., 2007
5		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2007
6	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Sep., 2007
7	No.1 OATS				Sep., 2007

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

6.2. Test Setup

RF Radiated Measurement:



6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

6.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

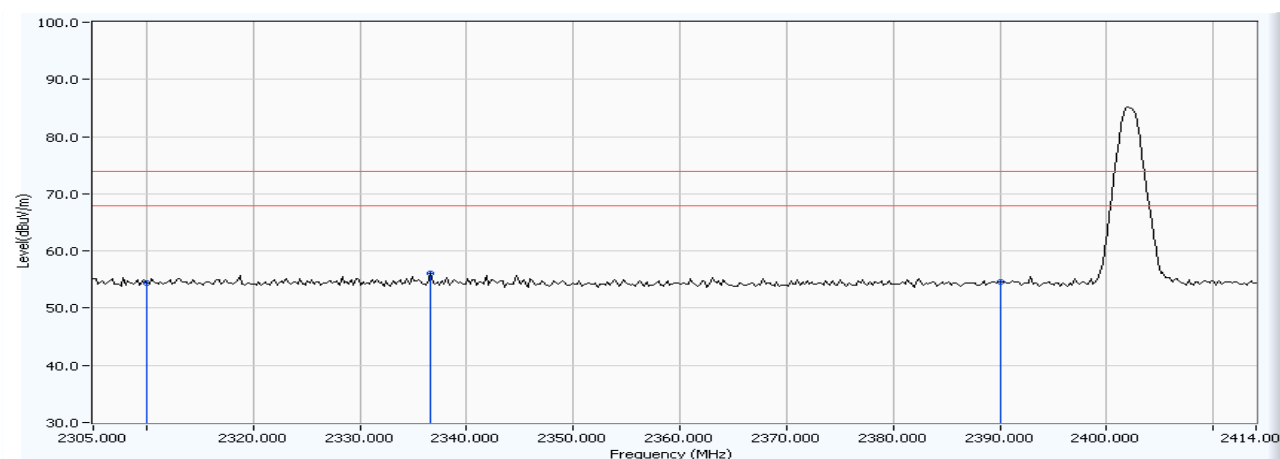
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

6.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

6.6. Test Result

Site : QuieTek Site1	Time : 2008/01/04 - 20:32
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - HORIZONTAL
Power : Power by PC	Note : BT-CH00

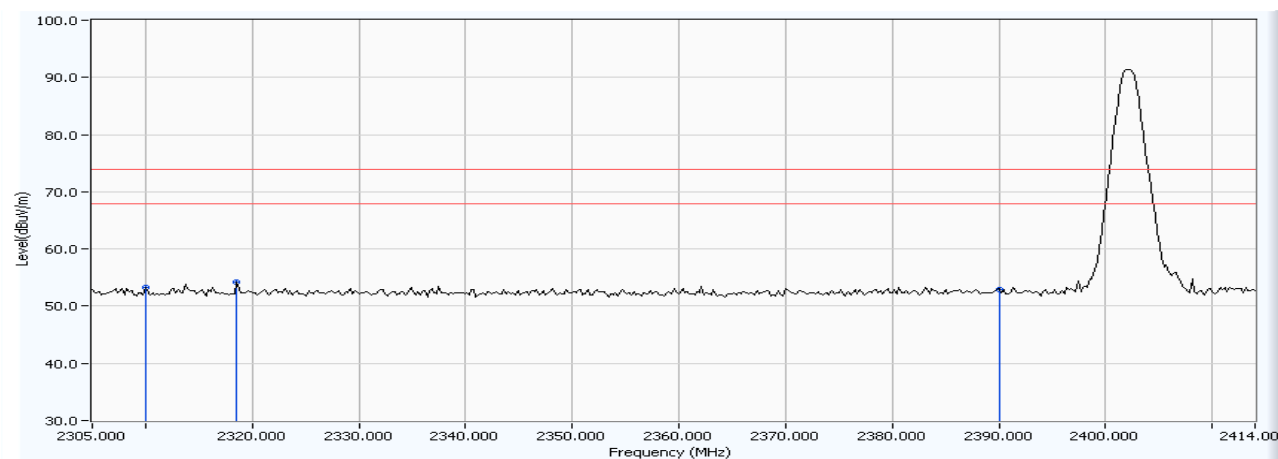


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2310.000	30.412	23.990	54.401	-19.599	74.000	54.00	PEAK
2	*	2336.610	30.448	25.552	56.001	-17.999	74.000	54.00	PEAK
3		2390.000	30.543	23.996	54.539	-19.461	74.000	54.00	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:22
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - VERTICAL
Power : Power by PC	Note : BT-CH00

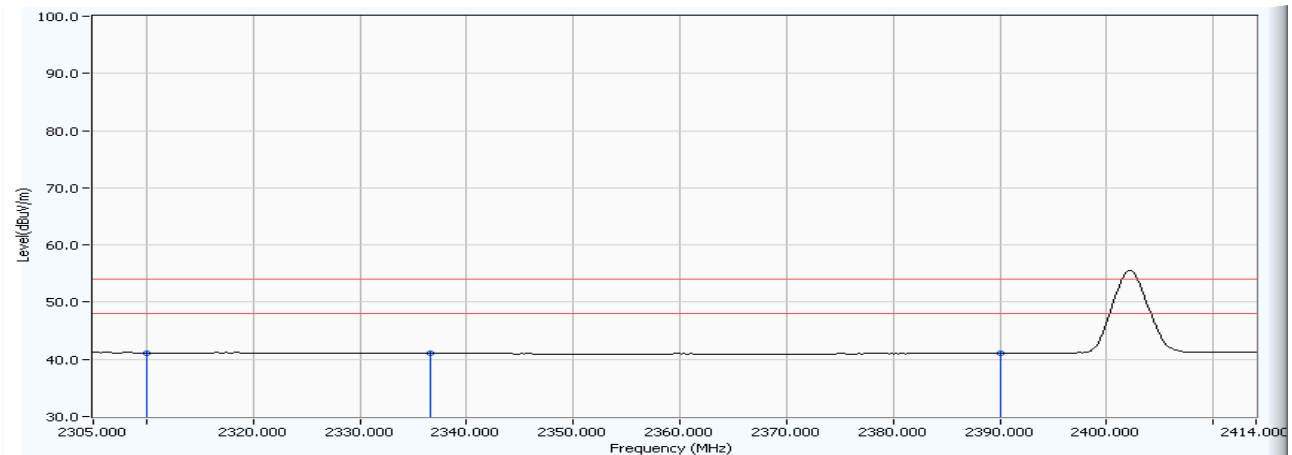


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2310.000	28.433	24.768	53.201	-20.799	74.000	54.00	PEAK
2	*	2318.516	28.458	25.730	54.188	-19.812	74.000	54.00	PEAK
3		2390.000	28.724	24.260	52.984	-21.016	74.000	54.00	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:33
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - HORIZONTAL
Power : Power by PC	Note : BT-CH00

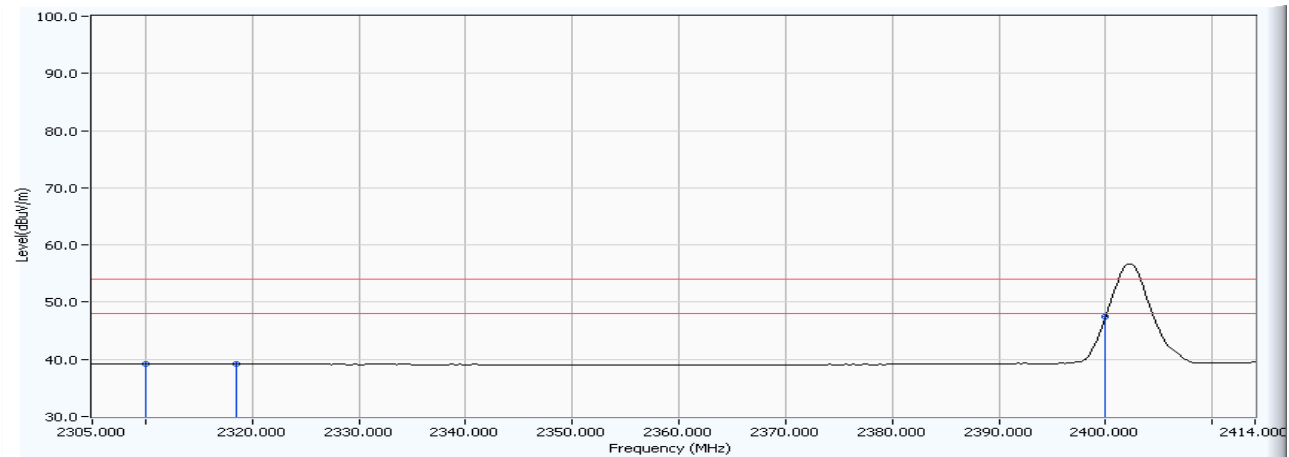


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2310.000	30.412	10.724	41.135	-12.865	74.000	54.00	AVERAGE
2	*	2336.610	30.448	10.579	41.028	-12.972	74.000	54.00	AVERAGE
3		2390.000	30.543	10.560	41.103	-12.897	74.000	54.00	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:25
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - VERTICAL
Power : Power by PC	Note : BT-CH00

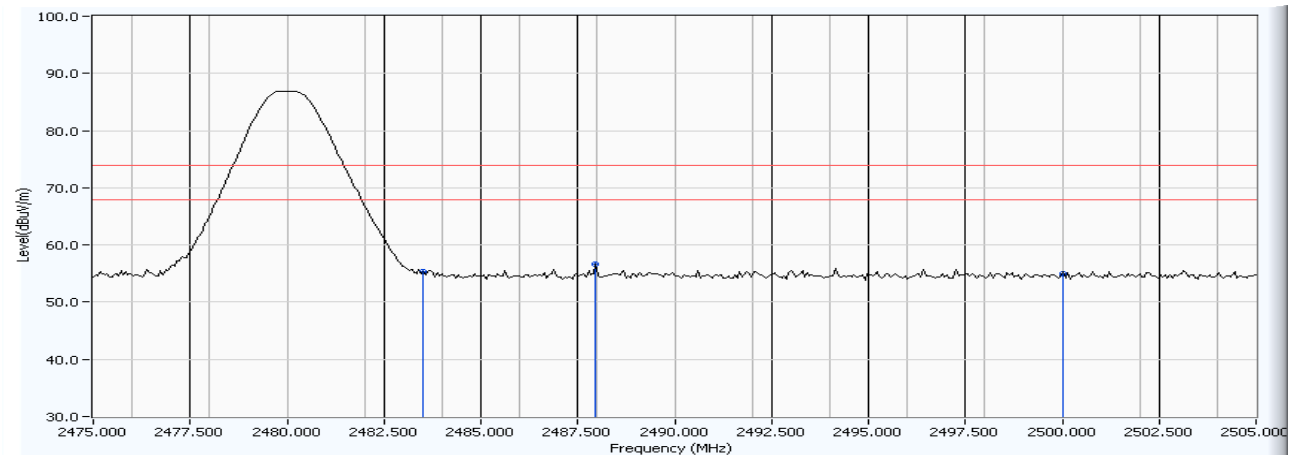


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2310.000	28.433	10.744	39.177	-14.823	74.000	54.00	AVERAGE
2	*	2318.516	28.458	10.685	39.143	-14.857	74.000	54.00	AVERAGE
3		2400.000	28.765	18.686	47.451	-6.549	74.000	54.00	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:43
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - HORIZONTAL
Power : Power by PC	Note : BT-CH78

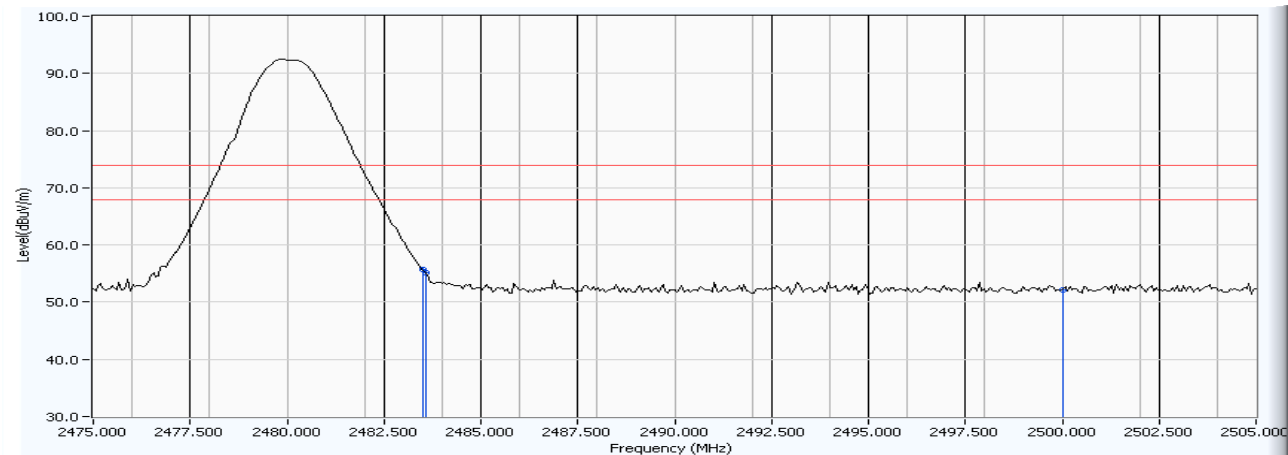


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2483.500	30.696	24.570	55.265	-18.735	74.000	54.00	PEAK
2	*	2487.960	30.700	25.987	56.688	-17.312	74.000	54.00	PEAK
3		2500.000	30.722	24.265	54.987	-19.013	74.000	54.00	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:52
Limit : FCC_SpartC_15.247_H_03M_PK	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - VERTICAL
Power : Power by PC	Note : BT-CH78

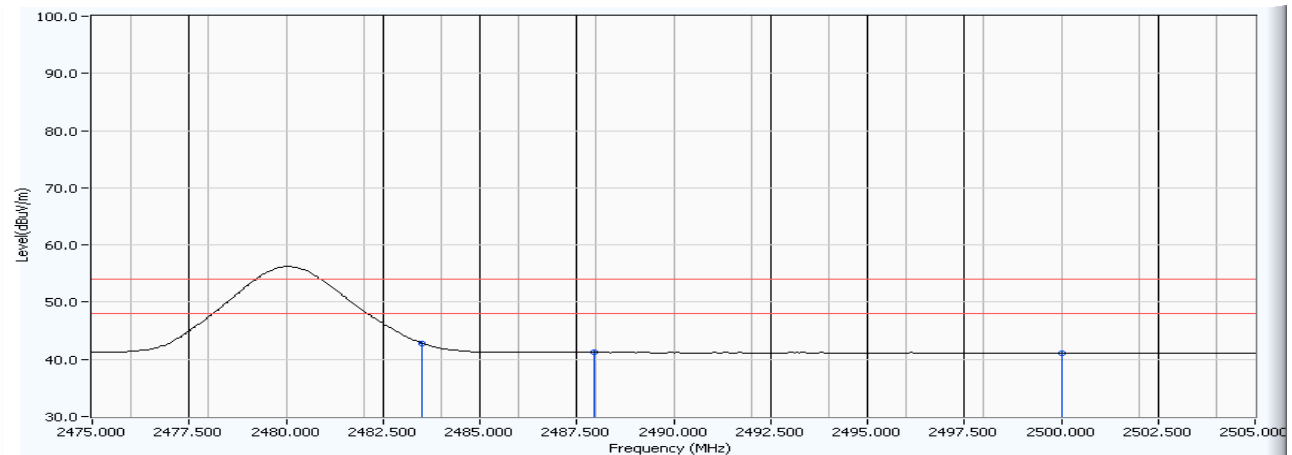


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2483.500	29.064	26.649	55.712	-18.288	74.000	54.00	PEAK
2	*	2483.580	29.064	26.056	55.119	-18.881	74.000	54.00	PEAK
3		2500.000	29.114	23.037	52.151	-21.849	74.000	54.00	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:45
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - HORIZONTAL
Power : Power by PC	Note : BT-CH78

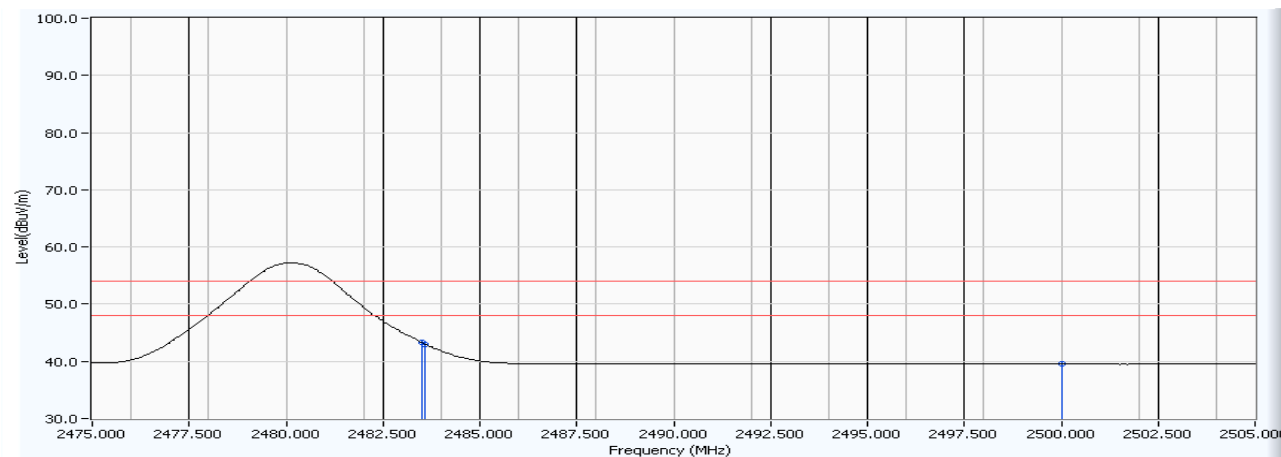


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2483.500	30.696	12.087	42.782	-11.218	74.000	54.00	AVERAGE
2	*	2487.960	30.700	10.476	41.177	-12.823	74.000	54.00	AVERAGE
3		2500.000	30.722	10.342	41.064	-12.936	74.000	54.00	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site : QuieTek Site1	Time : 2008/01/04 - 20:53
Limit : FCC_SpartC_15.247_H_03M_AV	Margin : 6
EUT : Bluetooth 2.0+ EDR Module	Probe : CB3_FCC_1-18G(2007) - VERTICAL
Power : Power by PC	Note : BT-CH78



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector Type
1		2483.500	29.064	14.228	43.291	-10.709	74.000	54.00	AVERAGE
2	*	2483.580	29.064	13.954	43.017	-10.983	74.000	54.00	AVERAGE
3		2500.000	29.114	10.401	39.515	-14.485	74.000	54.00	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

7. Number of hopping frequency

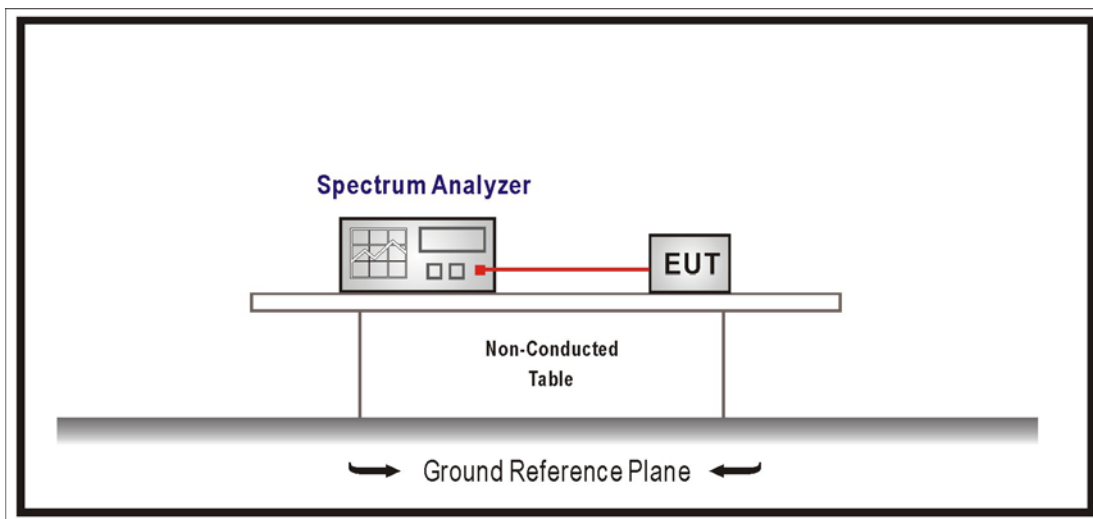
7.1. Test Equipment

The following test equipments are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2007
2	No.1 OATS			Sep., 2007

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

7.2. Test Setup



7.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

For frequency hopping systems operating in the 2400-2483.5 MHz bands, which use fewer than 75 hopping frequencies, may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = the frequency band of operation

$RBW \geq 1\%$ of the span , $VBW \geq RBW$

Sweep = auto, Detector function = peak, Trace = max hold

7.5. Test Specification

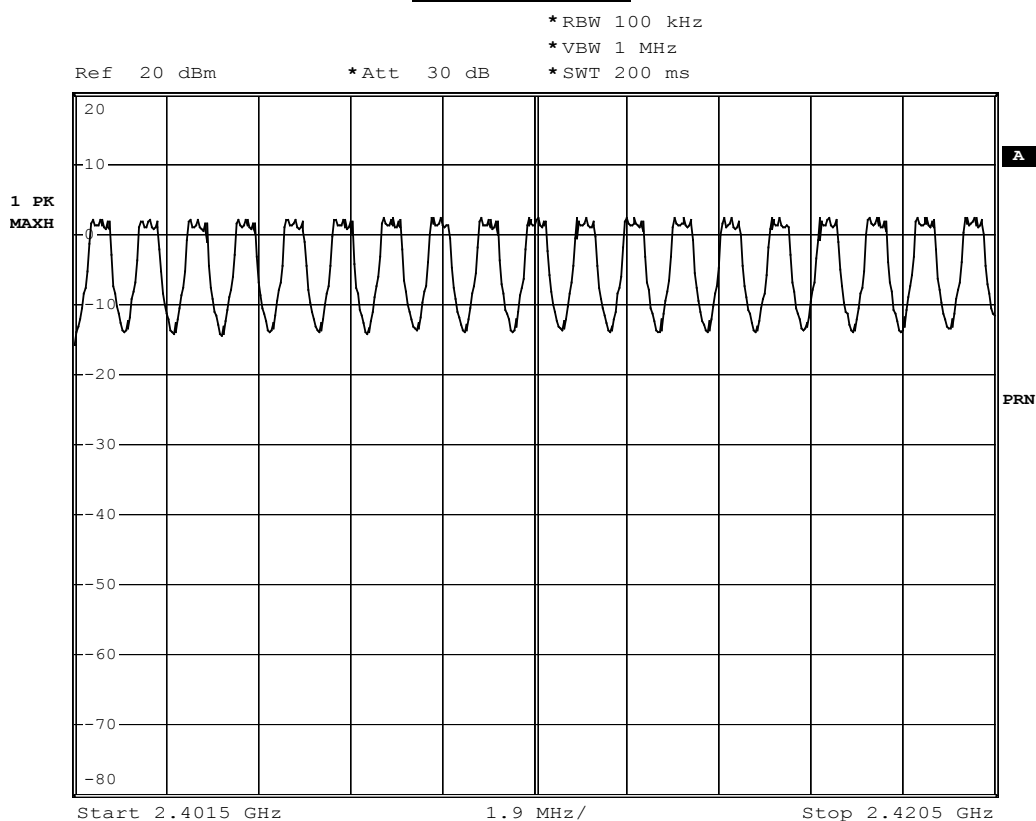
According to FCC Part 15 Subpart C Paragraph 15.247: 2006

7.6. Test Result

Product	Bluetooth 2.0+ EDR Module		
Test Item	Number of hopping frequency		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

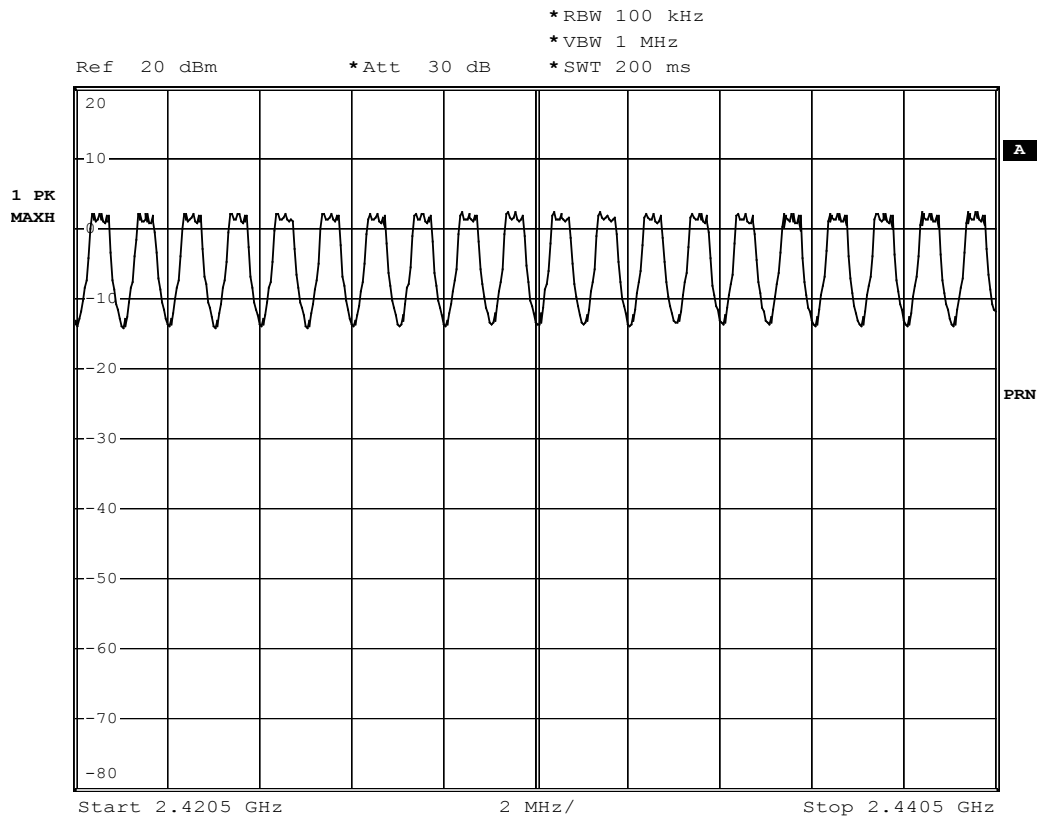
Frequency Range (MHz)	Measure Level (Hopping Channel)	Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

2402-2420MHz



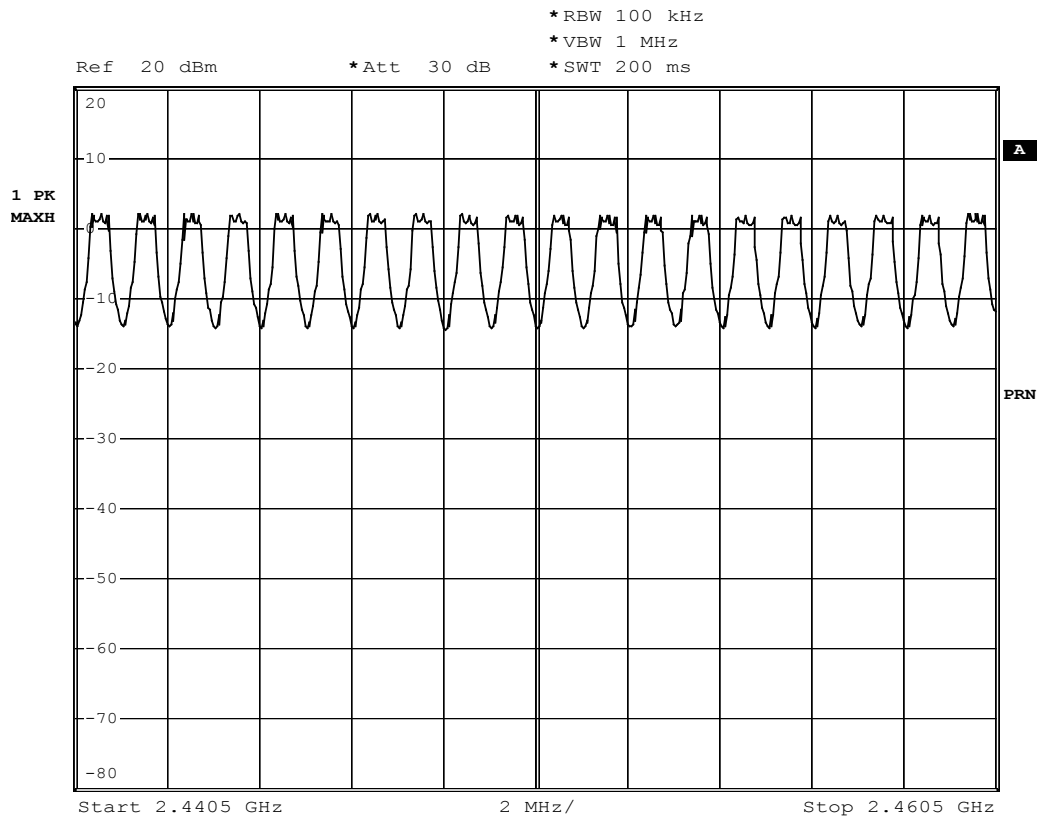
Date: 6.JAN.2008 06:51:53

2421-2440MHz



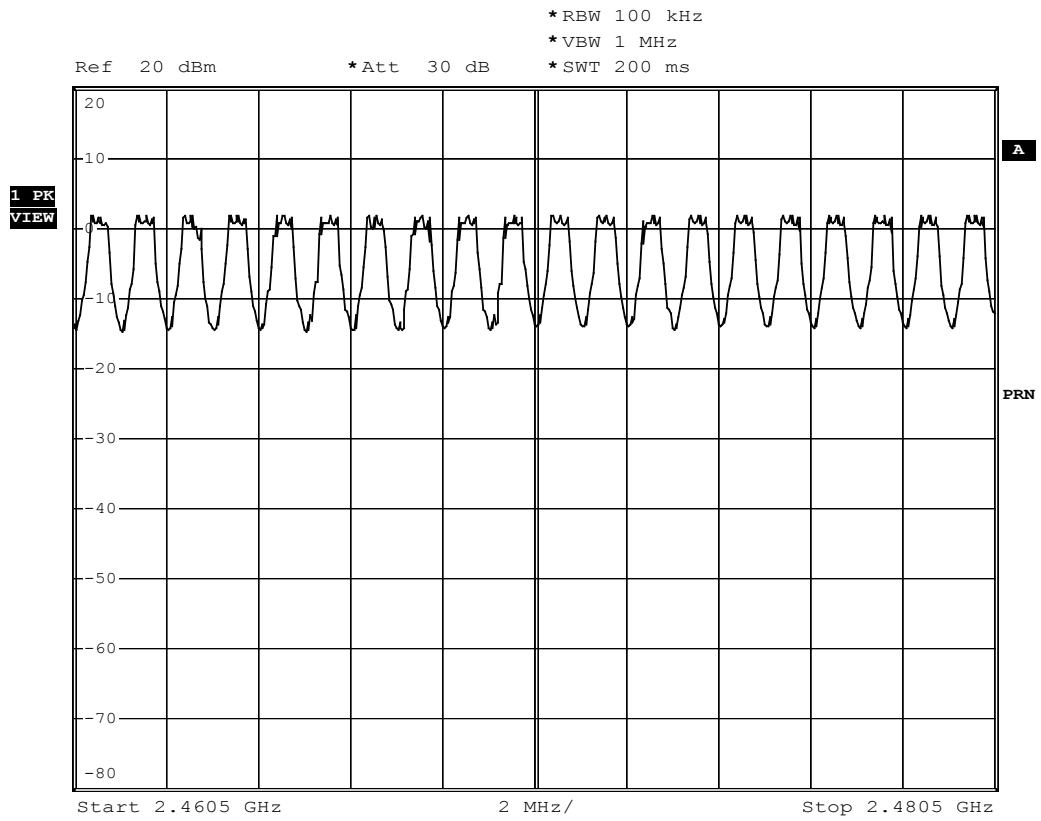
Date: 6.JAN.2008 06:56:27

2441-2460MHz



Date: 6.JAN.2008 06:58:48

2461-2480MHz



Date: 6.JAN.2008 07:02:21

8. Carrier Frequency Separation

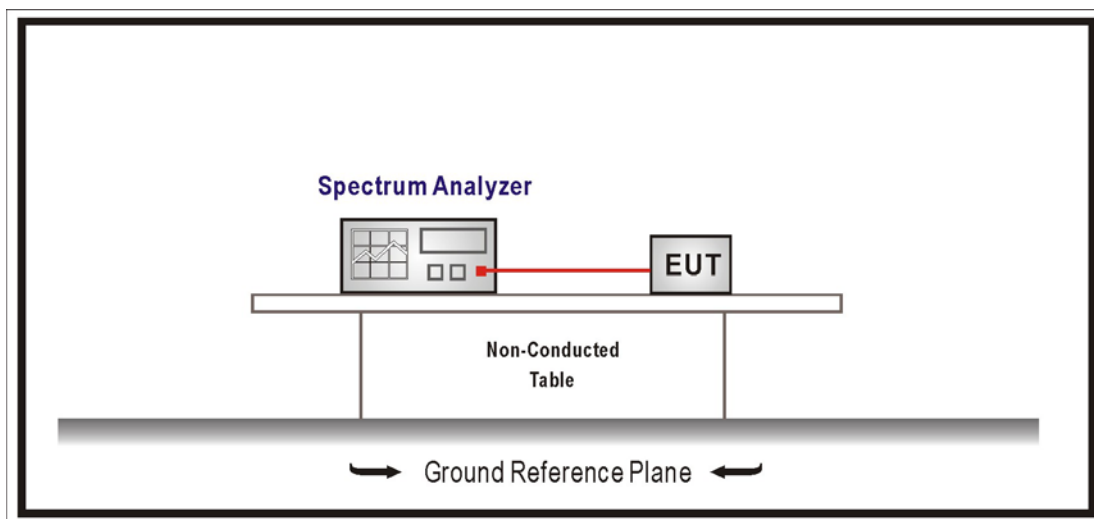
8.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2007
2	No.1 OATS			Sep., 2007

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

8.2. Test Setup



8.3. Limits

For 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.

8.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = wide enough to capture the peaks of two adjacent channels

Resolution Bandwidth (RBW) $\geq$ 1% of the span, VBW $\geq$ RBW

Sweep = auto, Detector function = peak, Trace = max hold

8.5. Test Specification

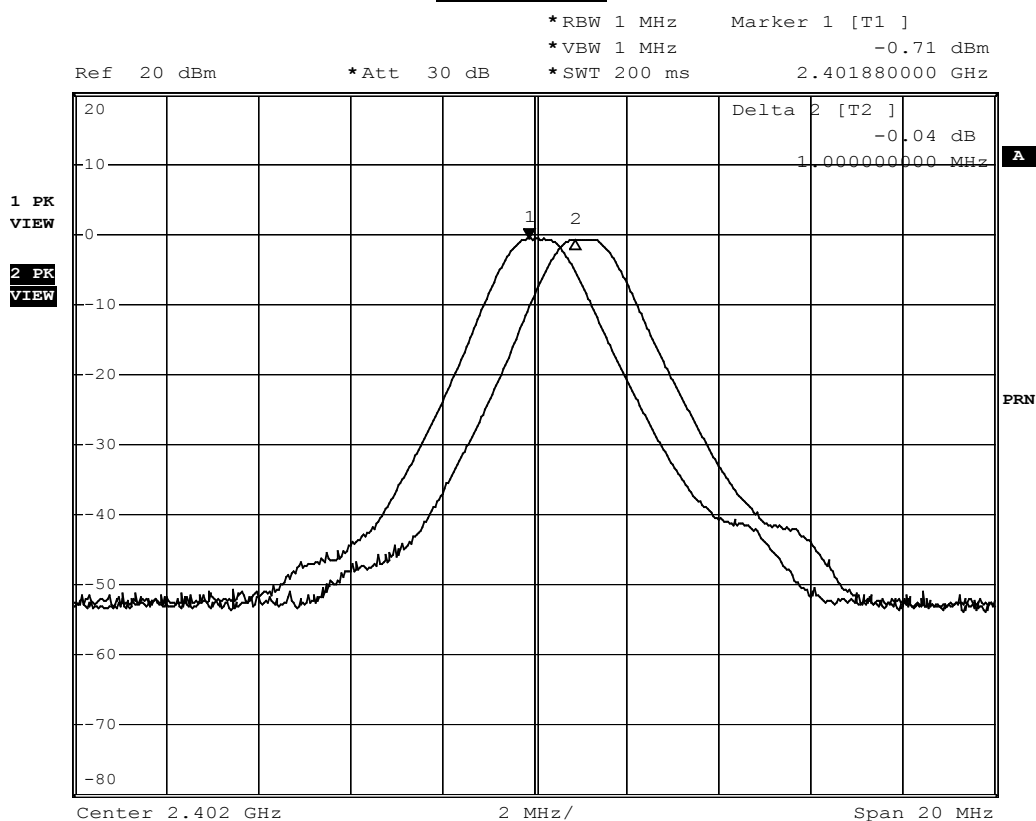
According to FCC Part 15 Subpart C Paragraph 15.247: 2006

8.6. Test Result

Product	Bluetooth 2.0+ EDR Module		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402.00	1000	>830	Pass

Channel 00

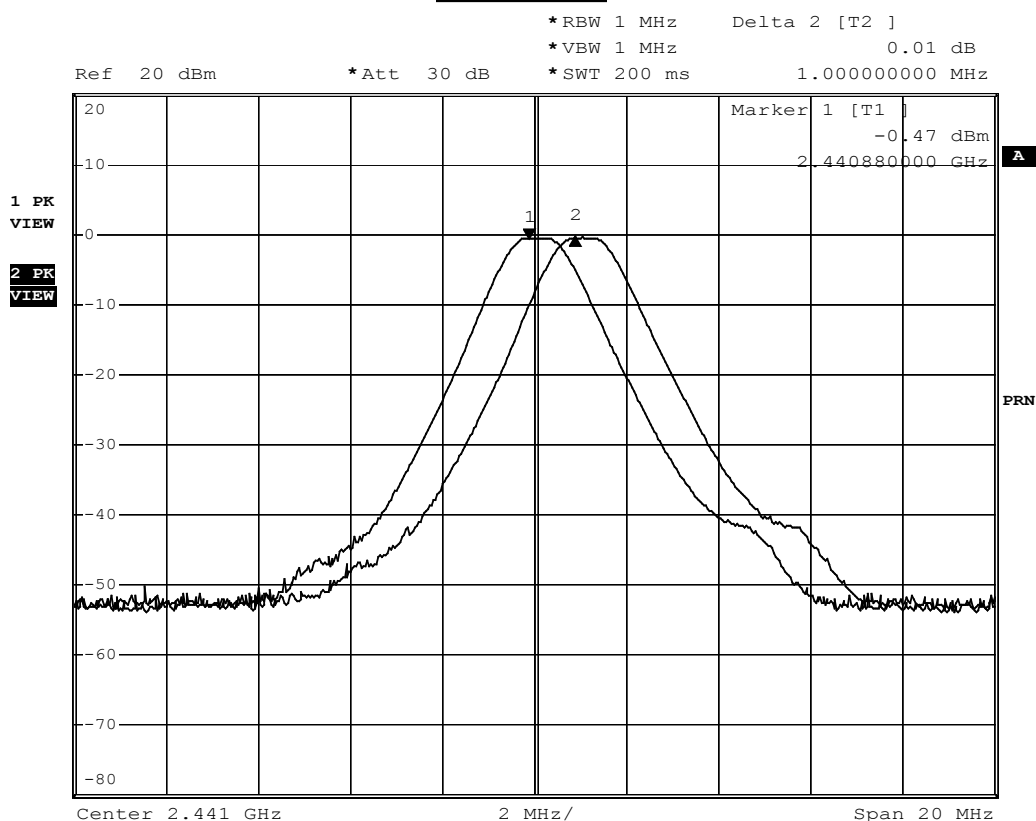


Date: 7.JAN.2008 03:25:44

Product	Bluetooth 2.0+ EDR Module		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
39	2441.00	1000	>830	Pass

Channel 39

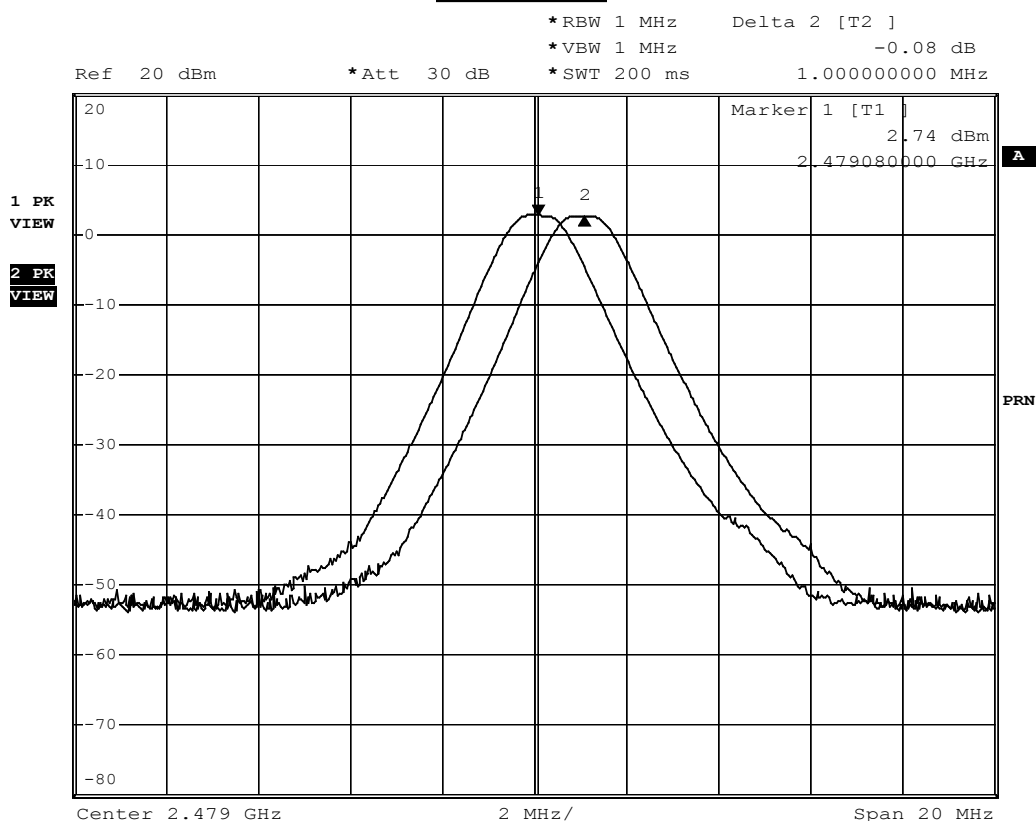


Date: 7.JAN.2008 03:23:07

Product	Bluetooth 2.0+ EDR Module		
Test Item	Carrier Frequency Separation		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
78	2480.00	1000	>820	Pass

Channel 78



Date: 7.JAN.2008 03:27:27

9. Occupied Bandwidth

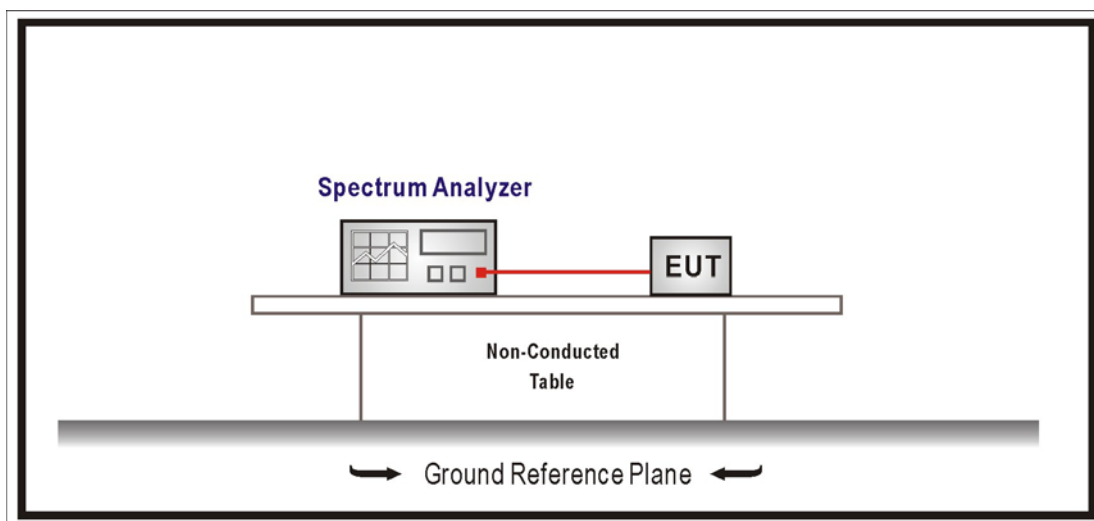
9.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2007
2	No.1 OATS			Sep., 2007

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

9.2. Test Setup



9.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

For frequency hopping systems operating in the 5725-5850 MHz bands. The maximum 20 dB bandwidth of the hopping channel is 1 MHz.

For 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.

9.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20 dB bandwidth, VBW $\geq$ RBW

Sweep = auto, Detector function = peak, Trace = max hold

The EUT should be transmitting at its maximum data rate.

9.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

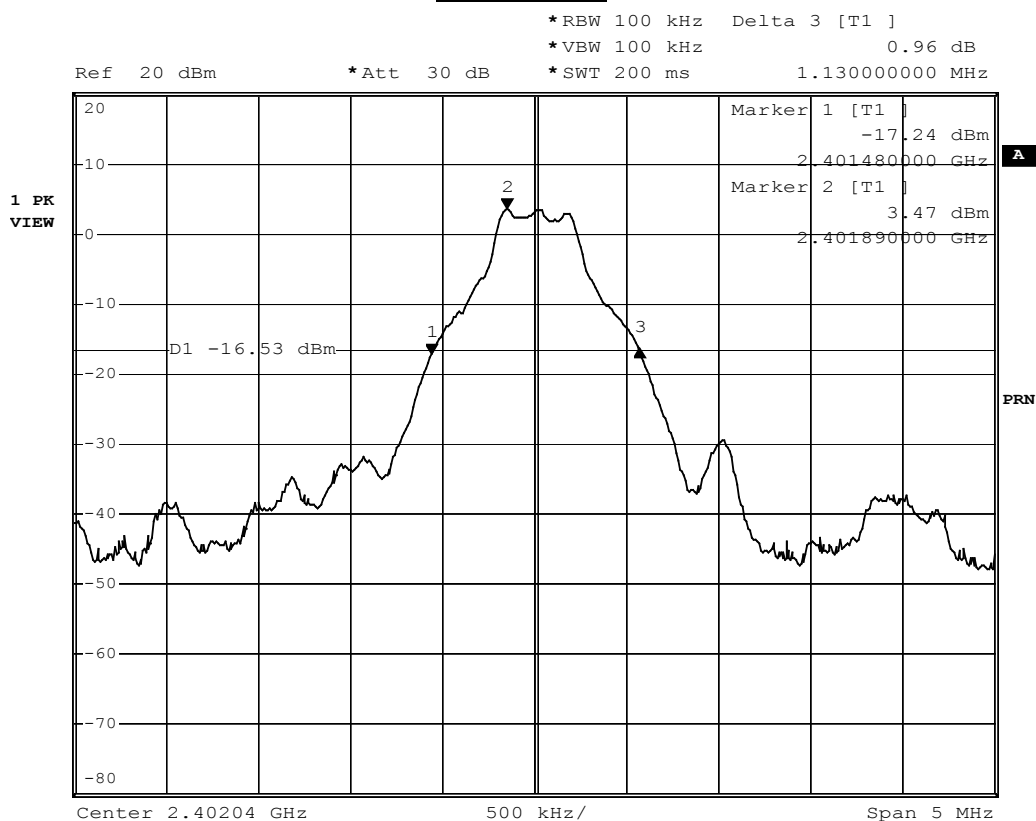
9.6. Test Result

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402.00	1.13	--	Pass

Channel 00



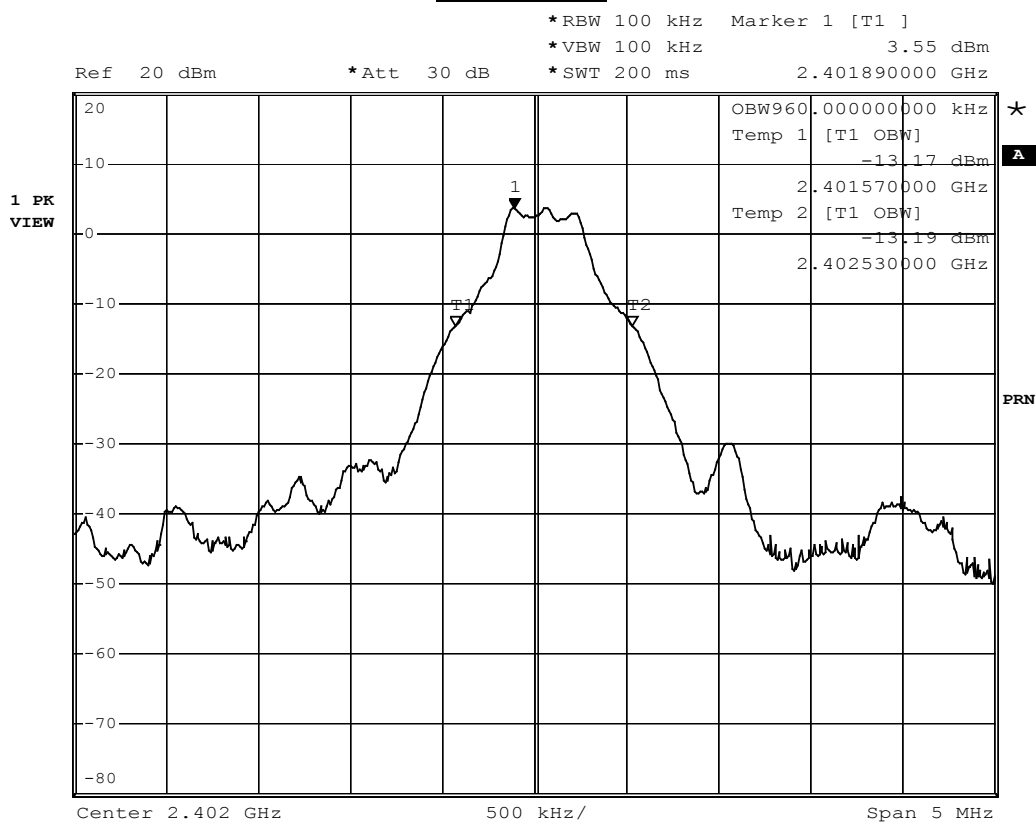
Date: 7.JAN.2008 00:11:16

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402.00	960	--	Pass

Channel 00



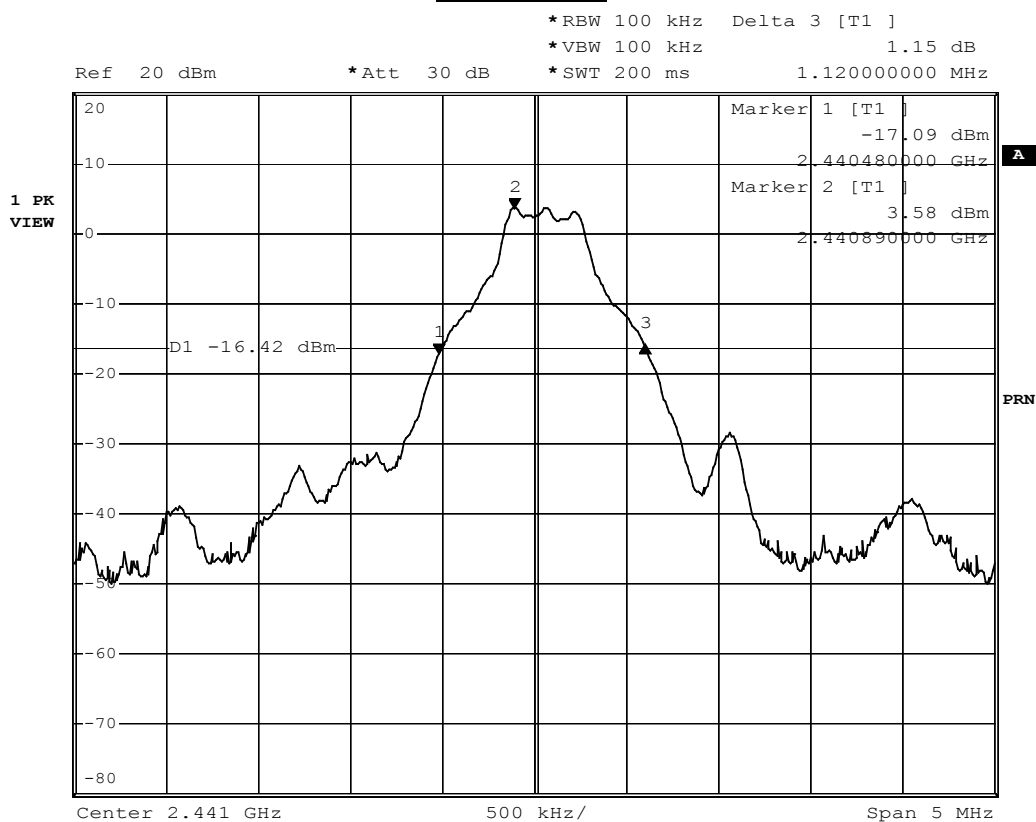
Date: 7.JAN.2008 00:24:49

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441.00	1.12	--	Pass

Channel 39



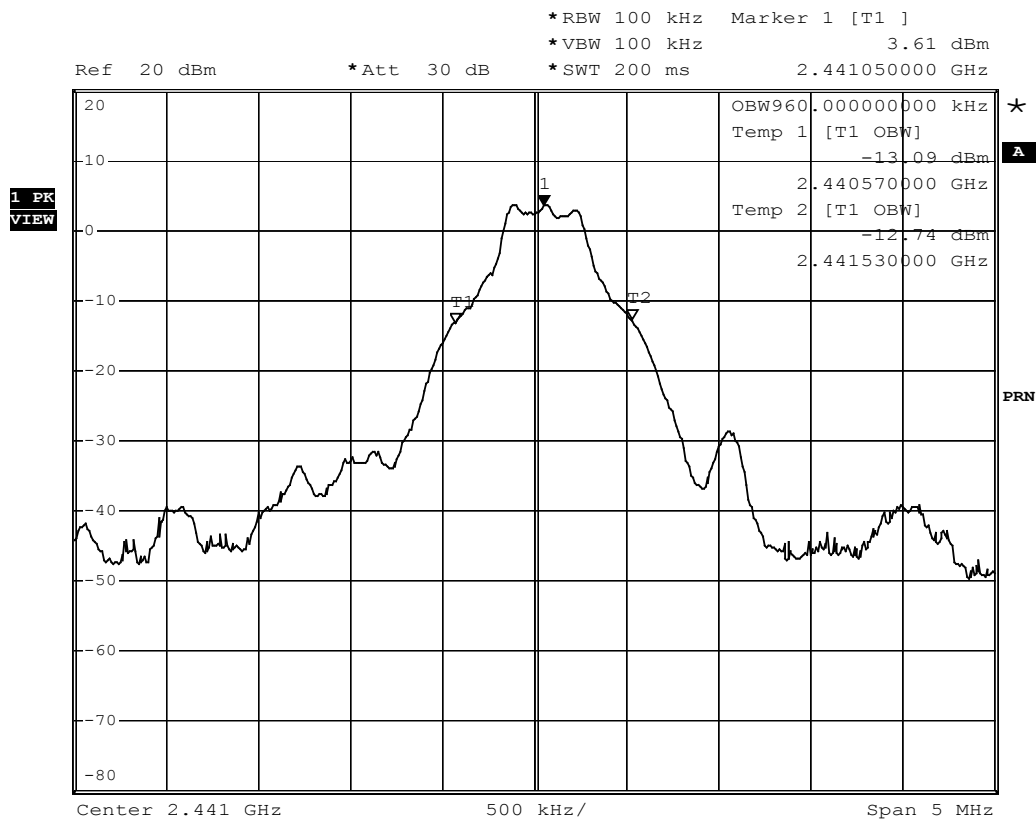
Date: 7.JAN.2008 00:13:38

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
39	2441.00	960	--	Pass

Channel 39



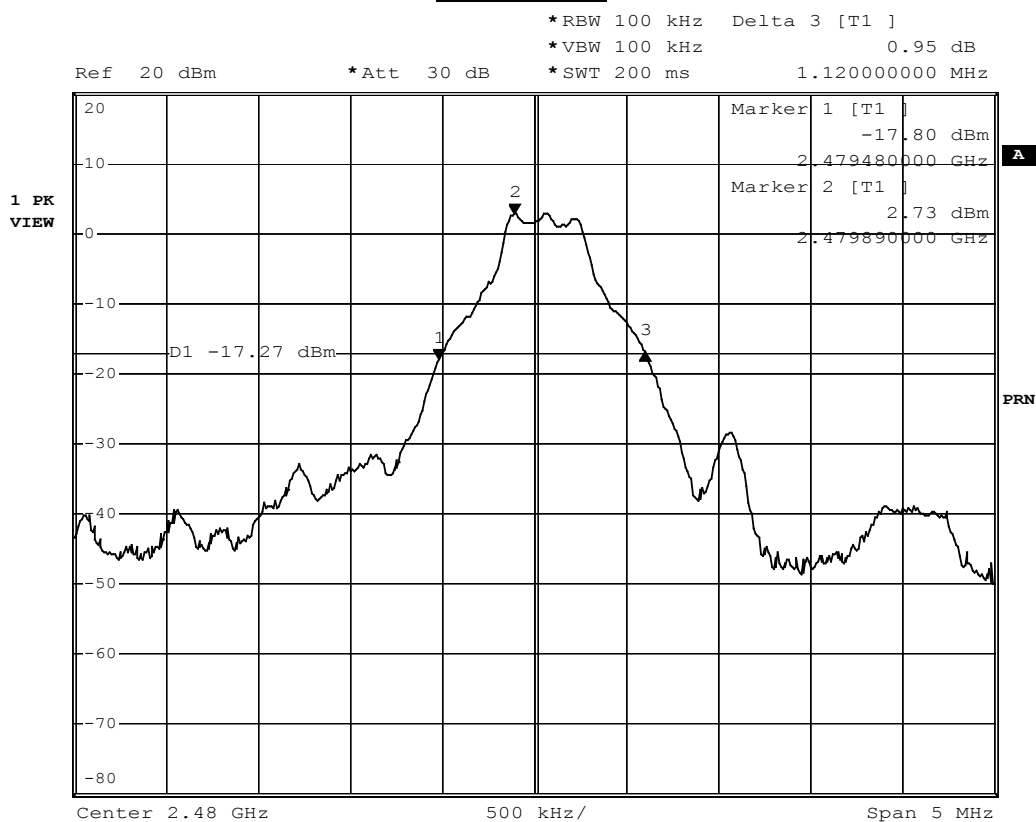
Date: 7.JAN.2008 00:25:47

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480.00	1.12	--	Pass

Channel 78



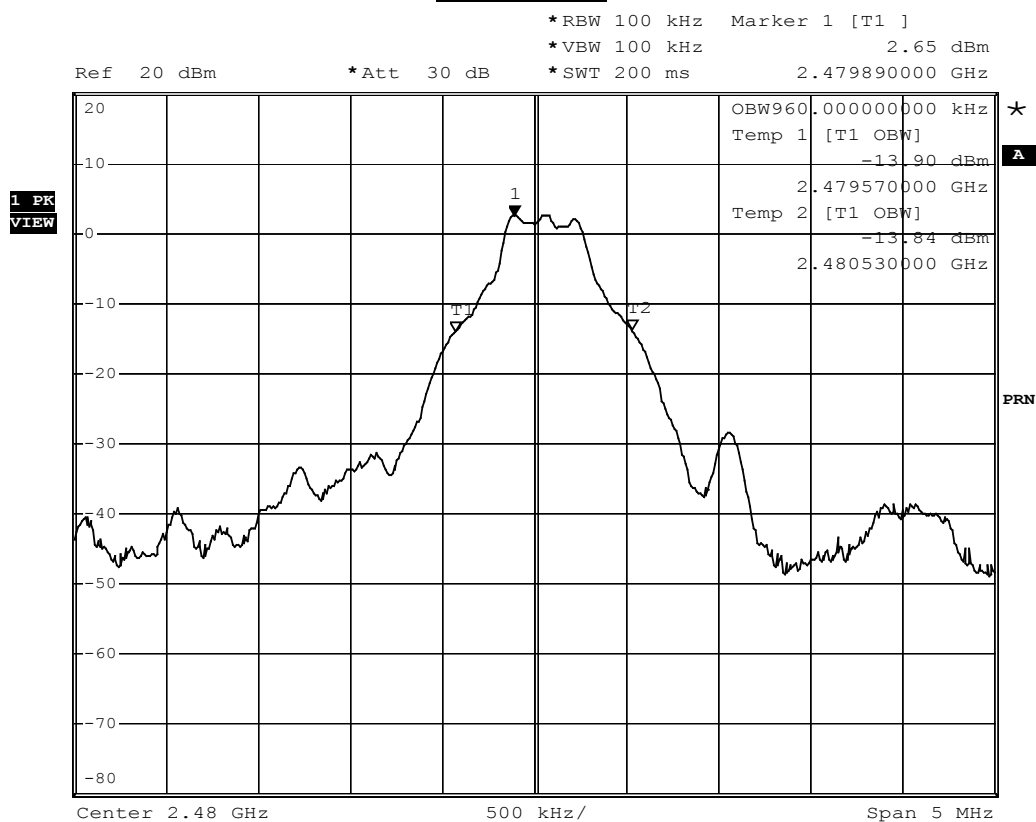
Date: 7.JAN.2008 00:15:19

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
78	2480.00	960	--	Pass

Channel 78



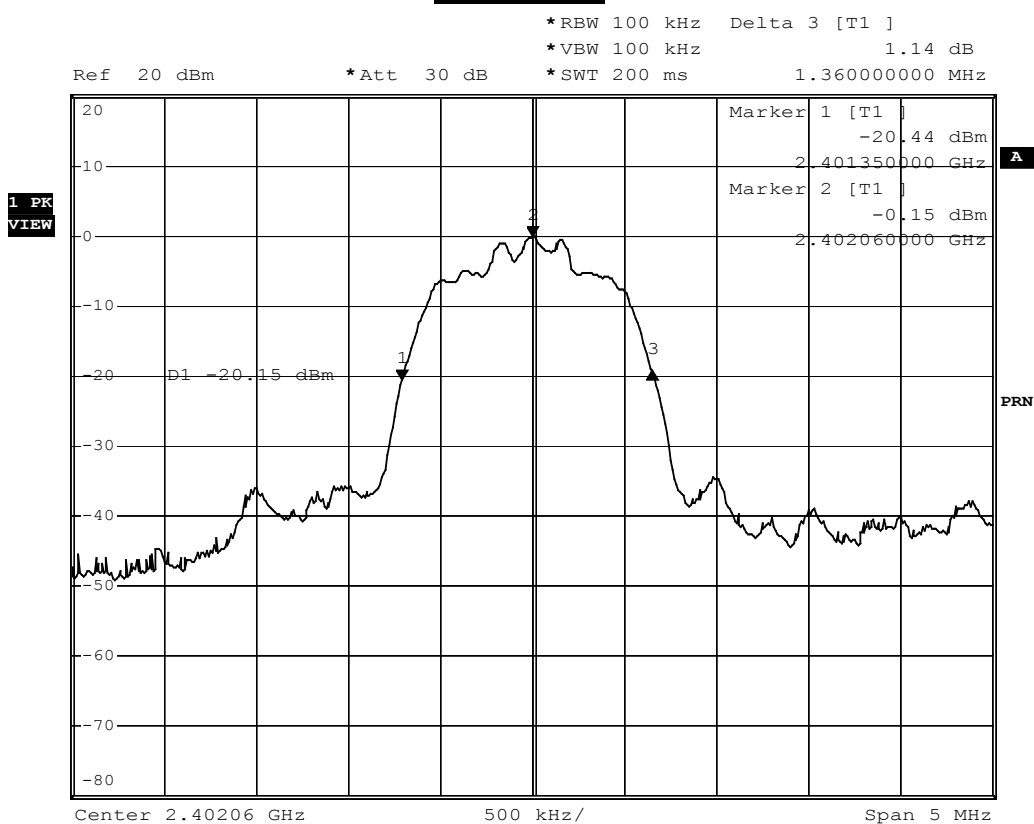
Date: 7.JAN.2008 00:26:38

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402.00	1.36	--	Pass

Channel 00



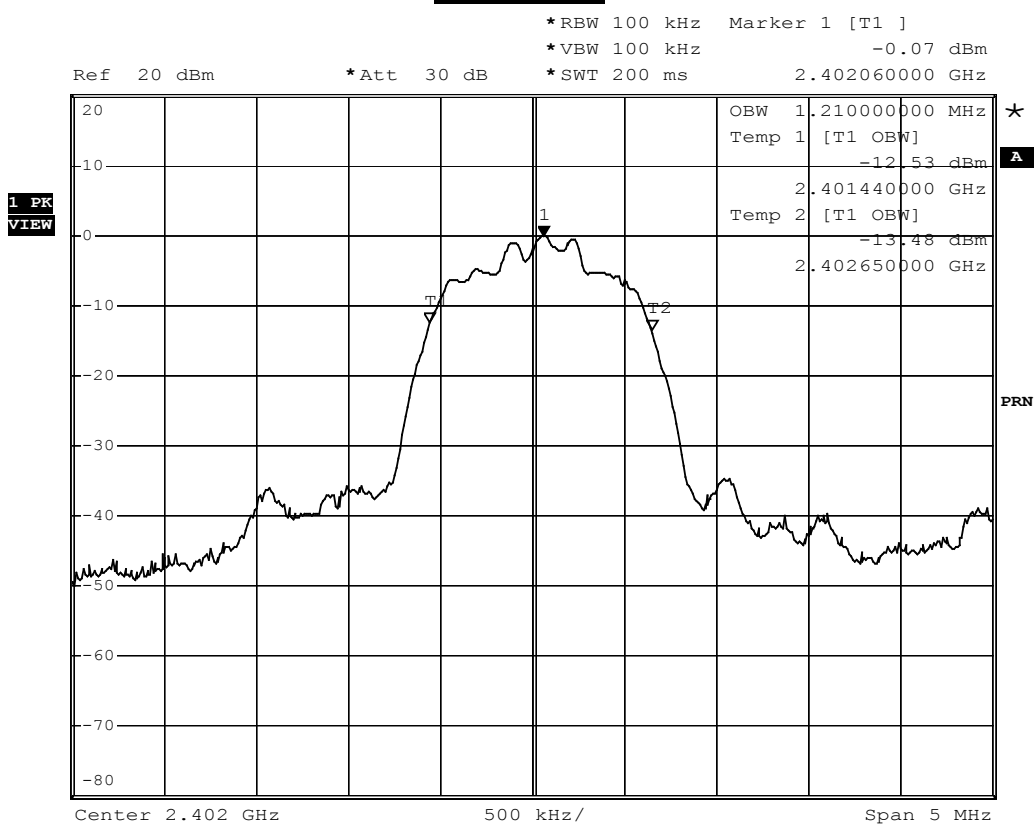
Date: 7.JAN.2008 00:50:44

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402.00	1210	--	Pass

Channel 00



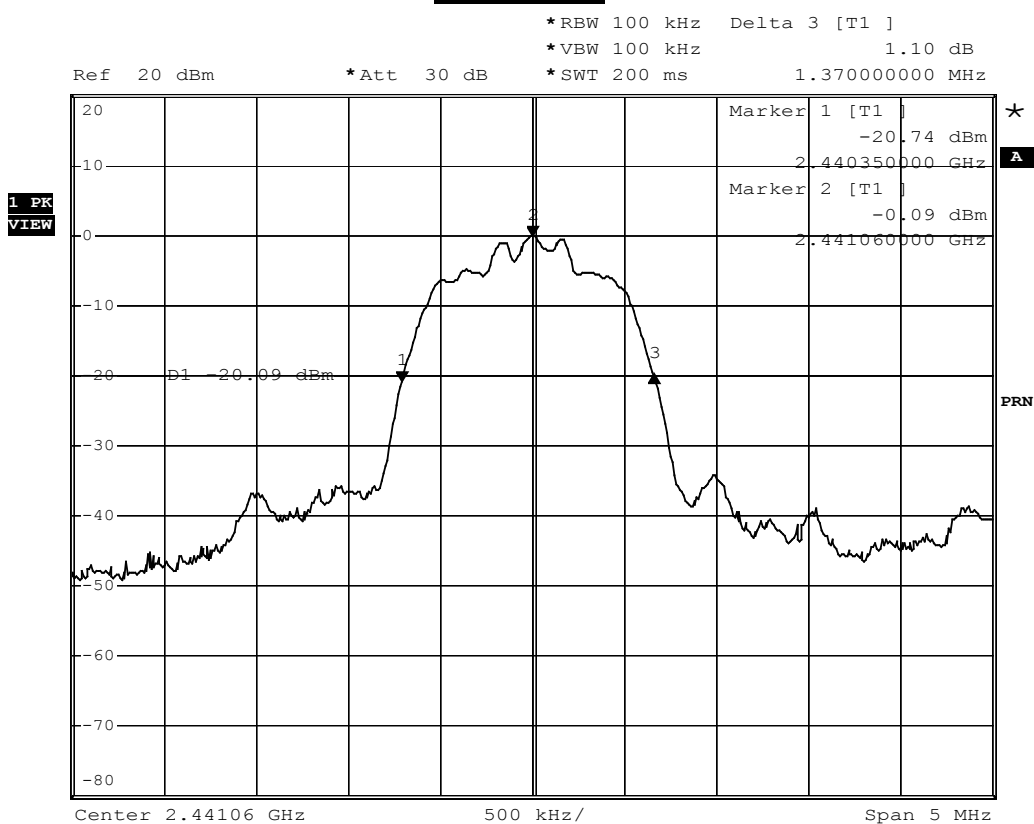
Date: 7.JAN.2008 00:33:00

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441.00	1.37	--	Pass

Channel 39



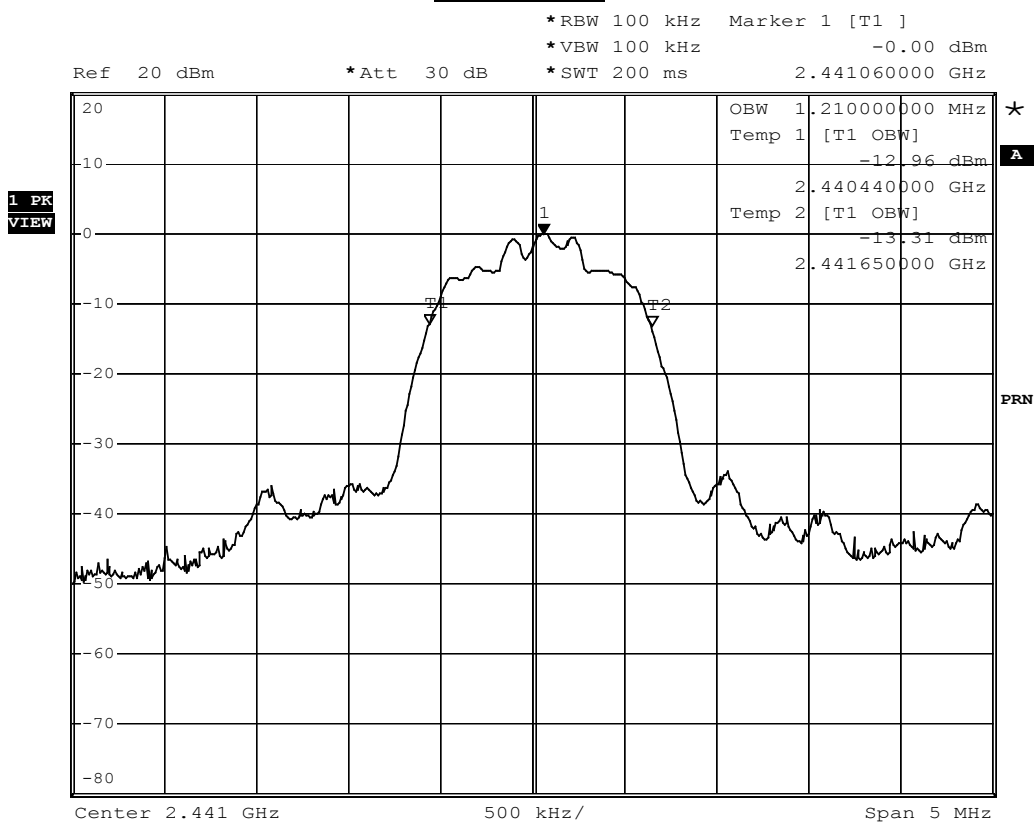
Date: 7.JAN.2008 00:54:29

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
39	2441.00	1210	--	Pass

Channel 39



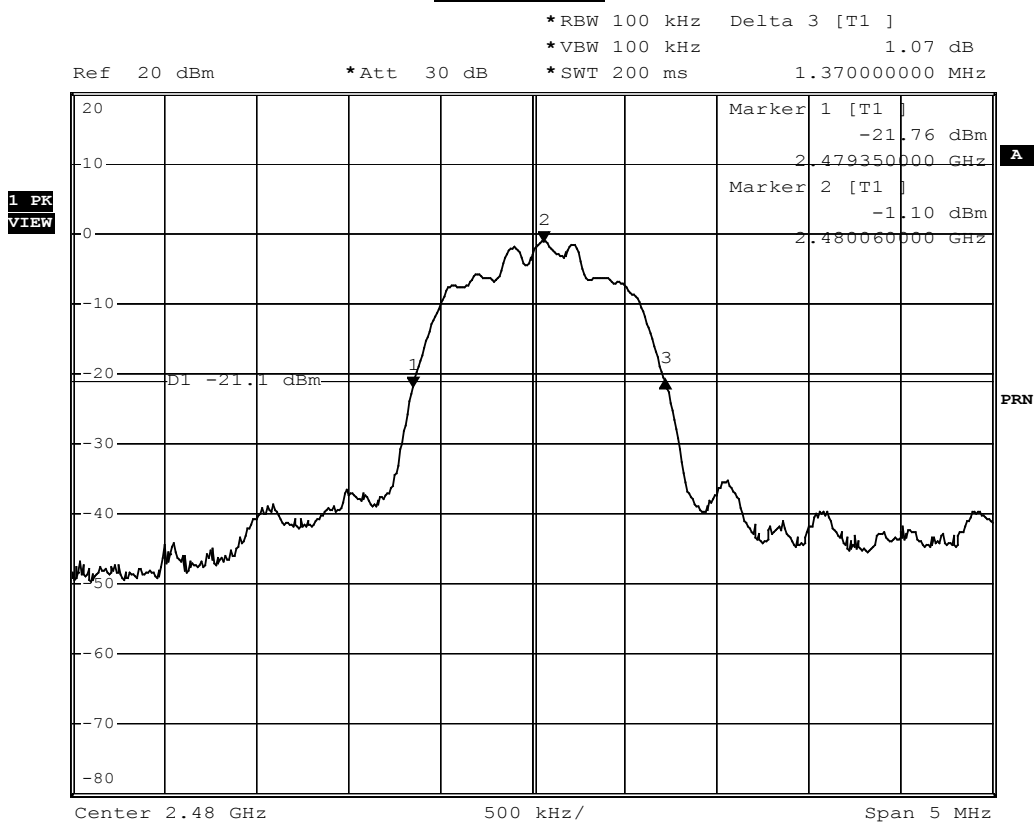
Date: 7.JAN.2008 00:36:03

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480.00	1.37	--	Pass

Channel 78



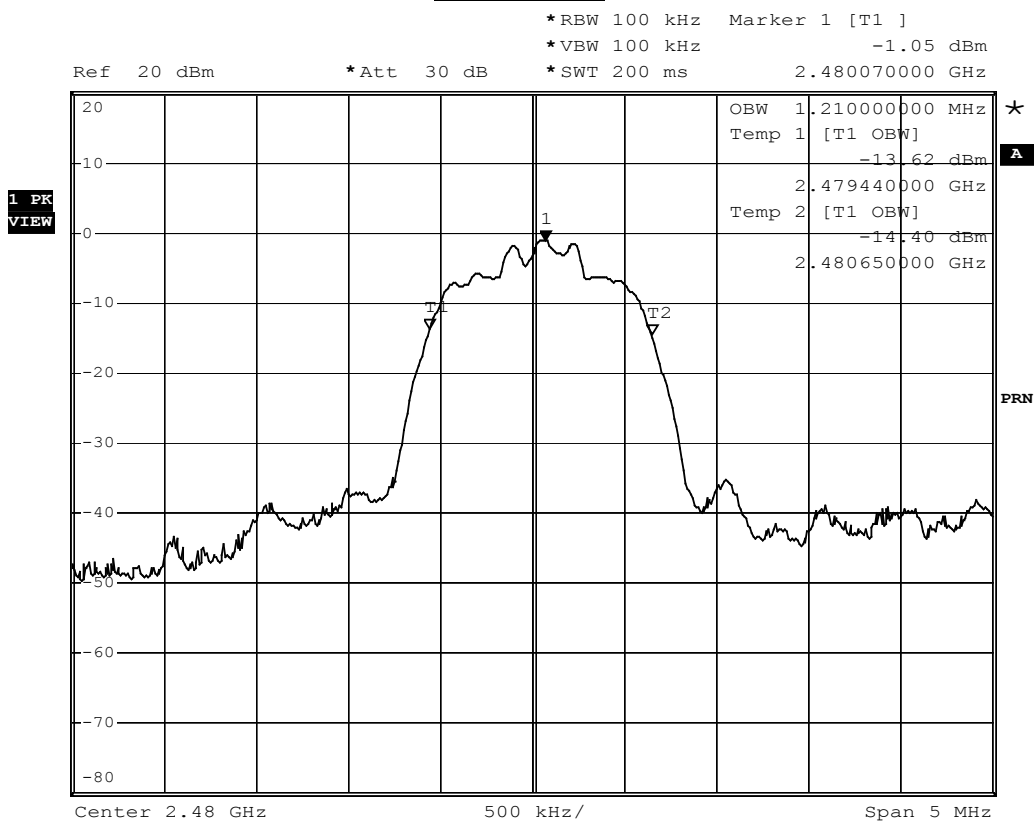
Date: 7.JAN.2008 00:57:36

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

2M-pi/4DQPSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
78	2480.00	1210	--	Pass

Channel 78



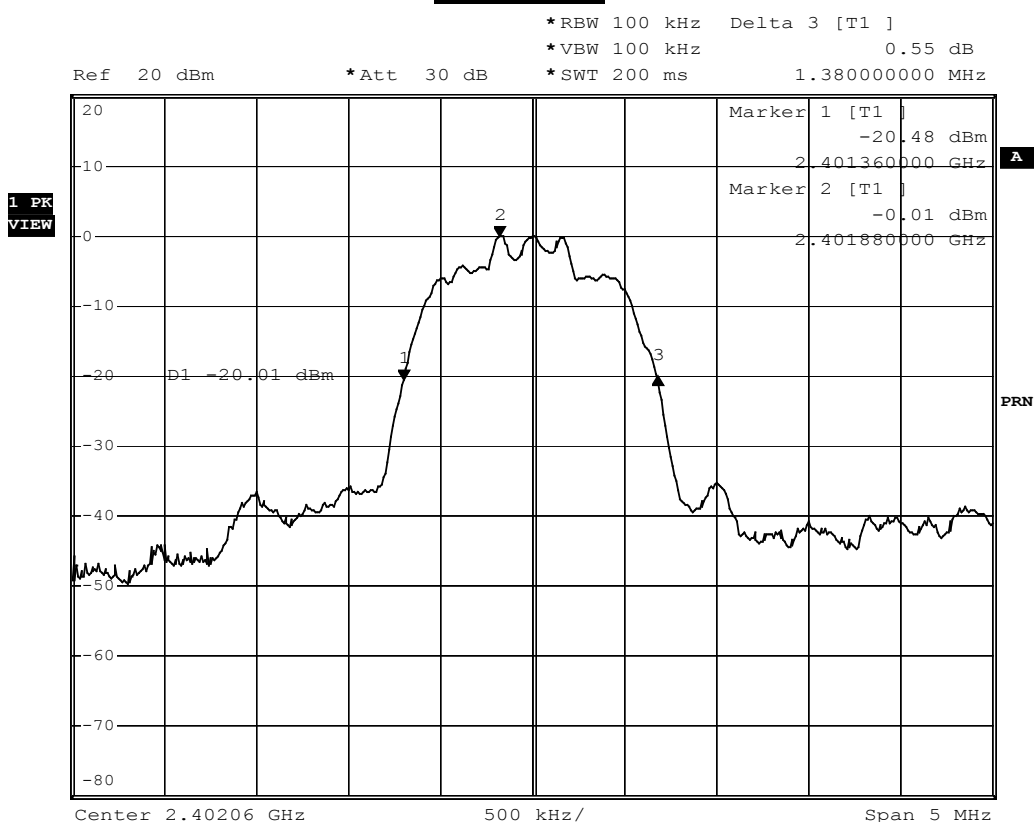
Date: 7.JAN.2008 00:38:14

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
00	2402.00	1.38	--	Pass

Channel 00



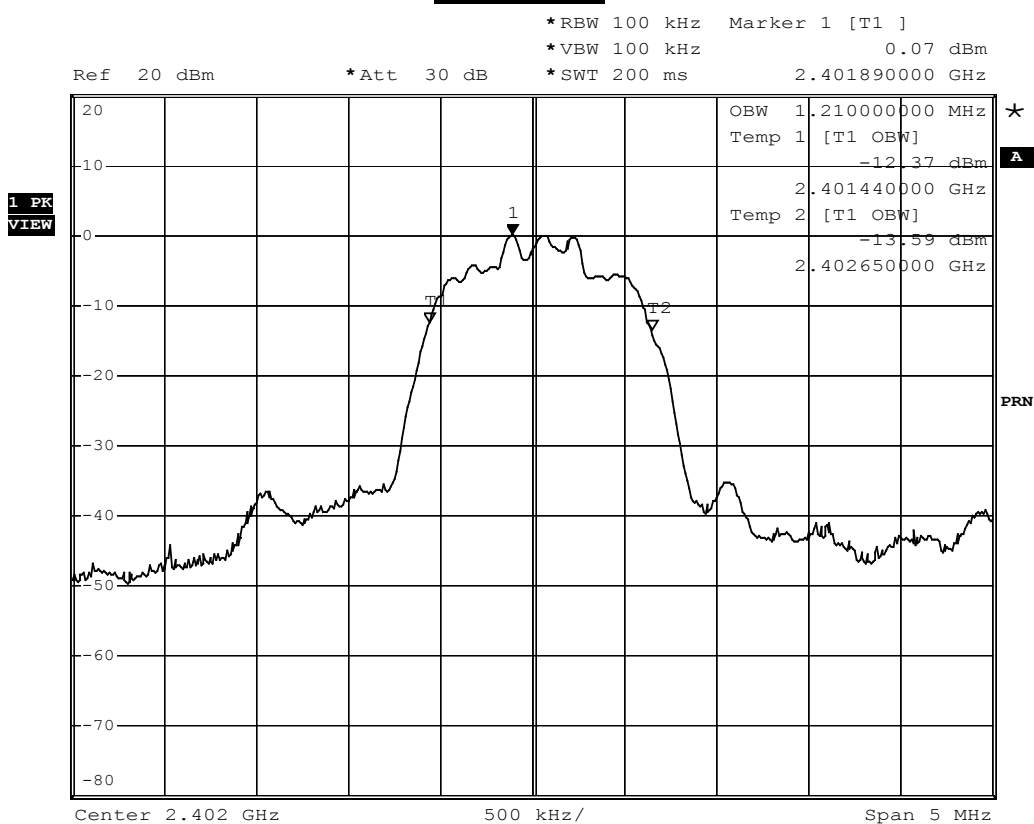
Date: 7.JAN.2008 00:52:25

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
00	2402.00	1210	-	Pass

Channel 00



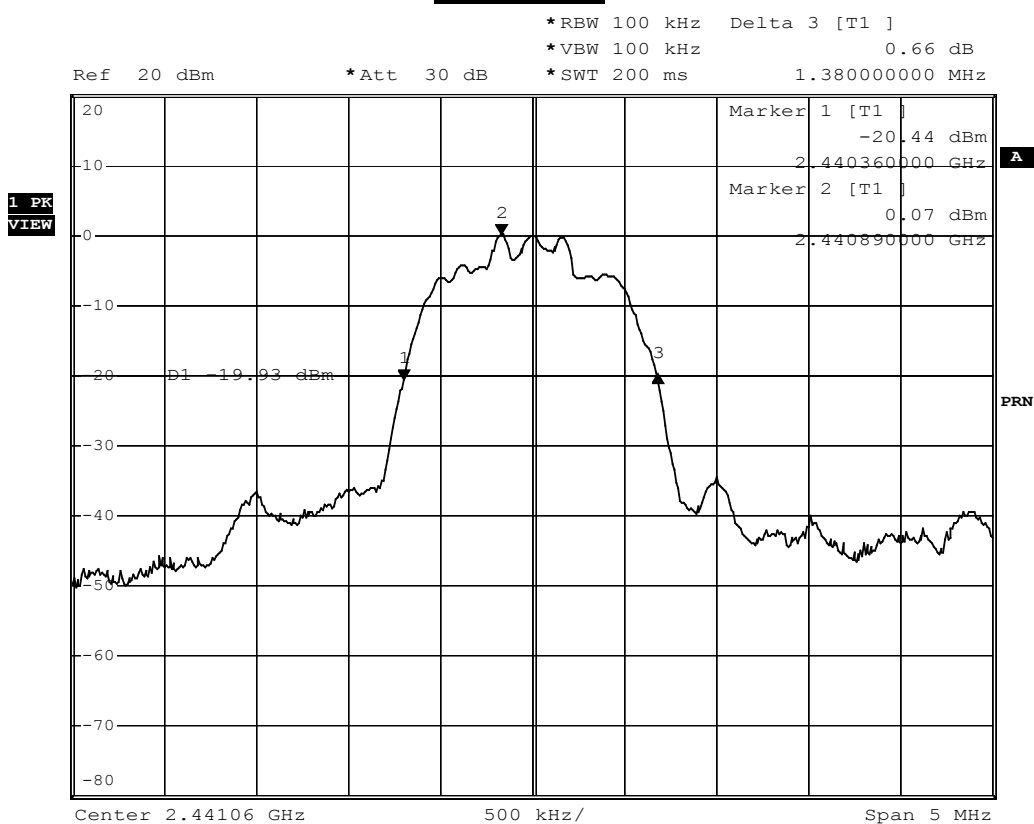
Date: 7.JAN.2008 00:34:03

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
39	2441.00	1.38	--	Pass

Channel 39



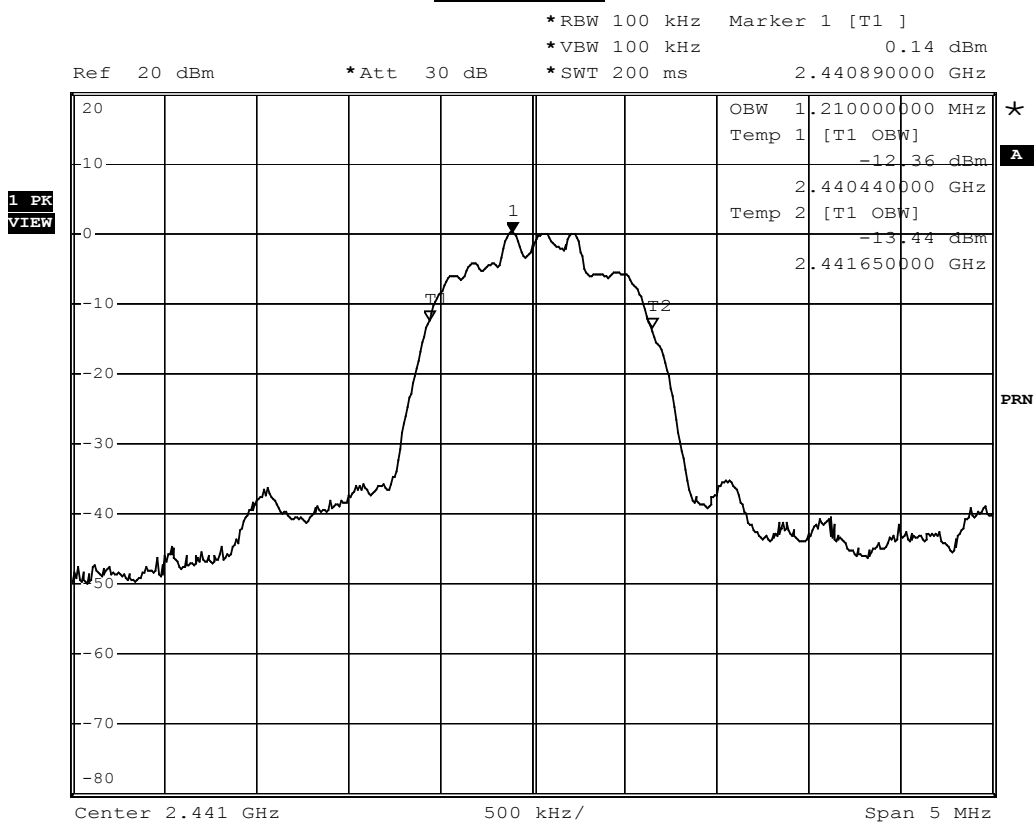
Date: 7.JAN.2008 00:55:54

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
39	2441.00	1210	-	Pass

Channel 39



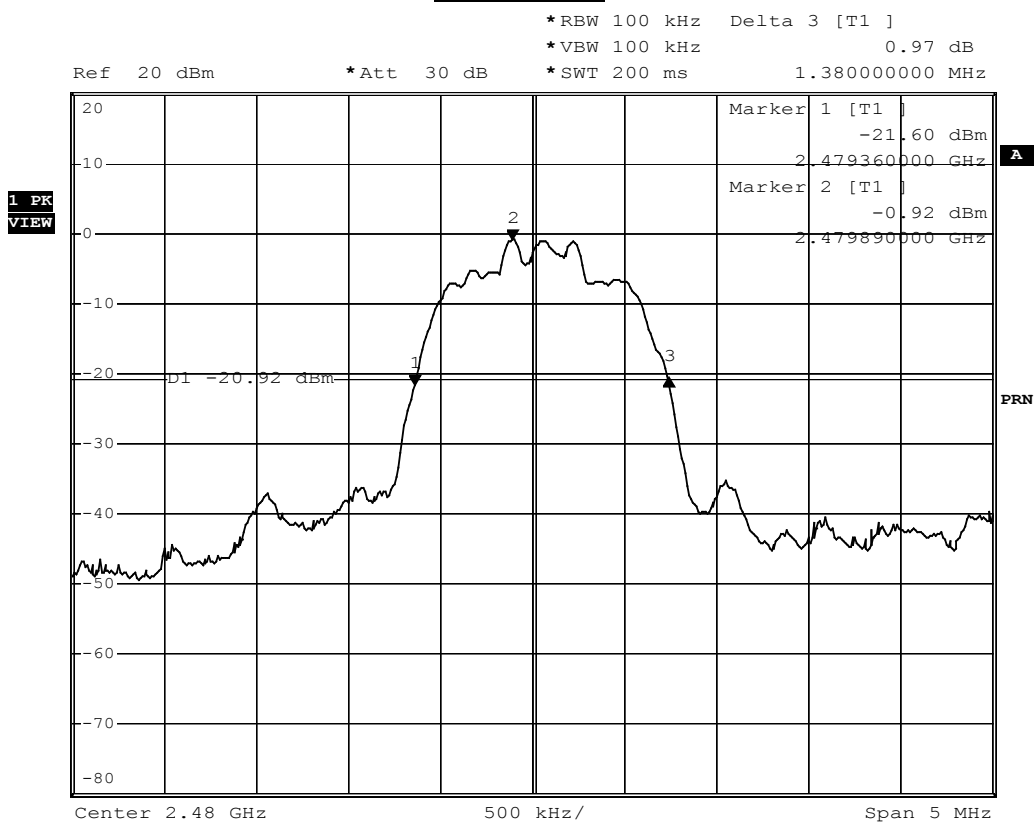
Date: 7.JAN.2008 00:36:58

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
78	2480.00	1.38	--	Pass

Channel 78



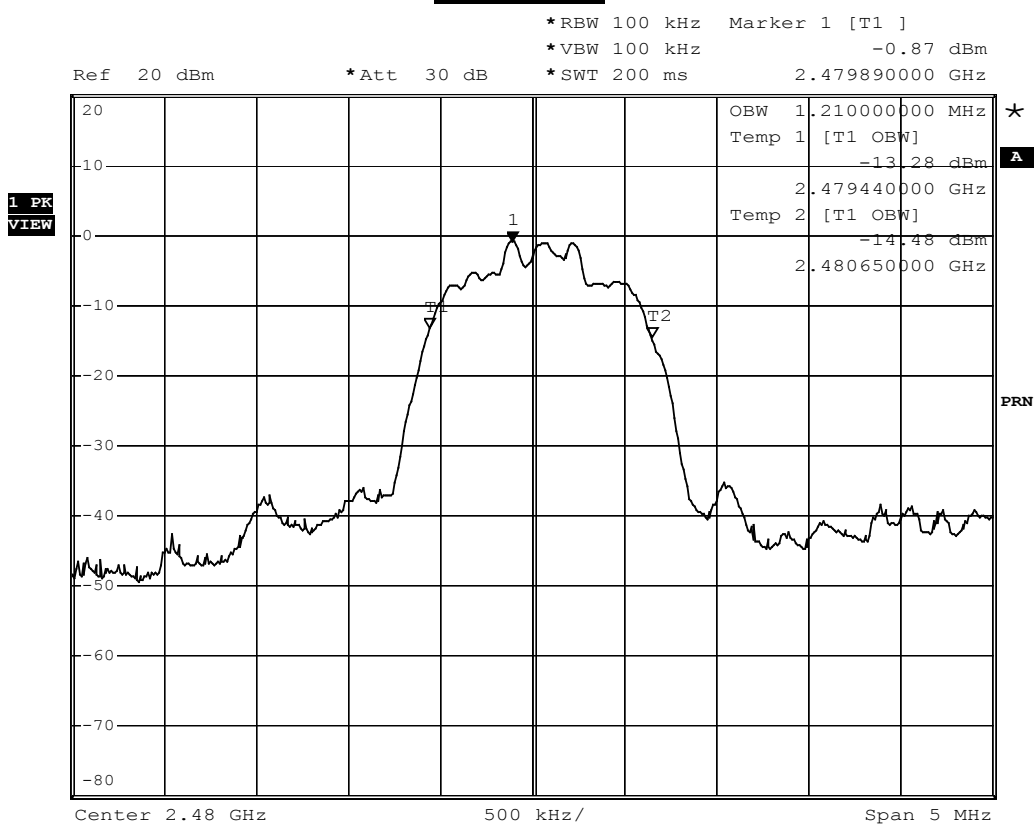
Date: 7.JAN.2008 00:59:17

Product	Bluetooth 2.0+ EDR Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/07	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type (99%)

Channel No.	Frequency (MHz)	Measure Level (kHz)	Limit (kHz)	Result
78	2480.00	1210	-	Pass

Channel 78



Date: 7.JAN.2008 00:40:06

10. Dwell Time

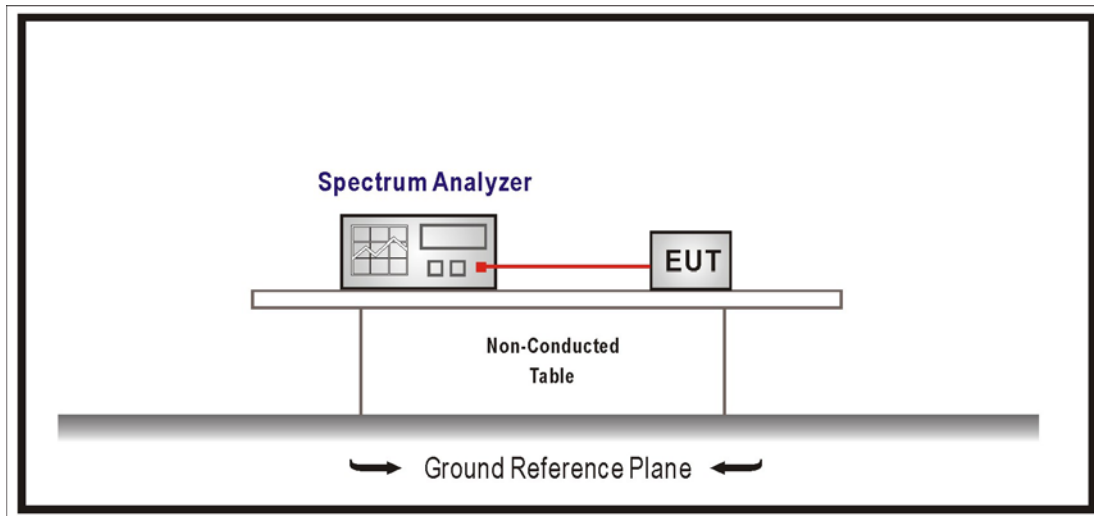
10.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2007
2	No.1 OATS			Sep., 2007

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

10.2. Test Setup



10.3. Limits

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. For frequency hopping systems operating in the 2400-2483.5 MHz bands. 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. For frequency hopping systems operating in the 5725-5850 MHz bands. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

10.4. Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements

Span = zero span, centered on a hopping channel

RBW = 1 MHz, VBW $\geq$ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak, Trace = max hold

10.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

10.6. Test Result

Product	Bluetooth 2.0+ EDR Module		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

Occupancy Time of Frequency Hopping System-DH 1

A) 2402MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $16/20\text{msec} = 800 / \text{sec}$

The Maximum Occupancy Time Within 31.6sec: $0.0004 \times (800/79) \times 31.6 = 0.128\text{sec}$.

B) 2441MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $16/20\text{msec} = 800 / \text{sec}$

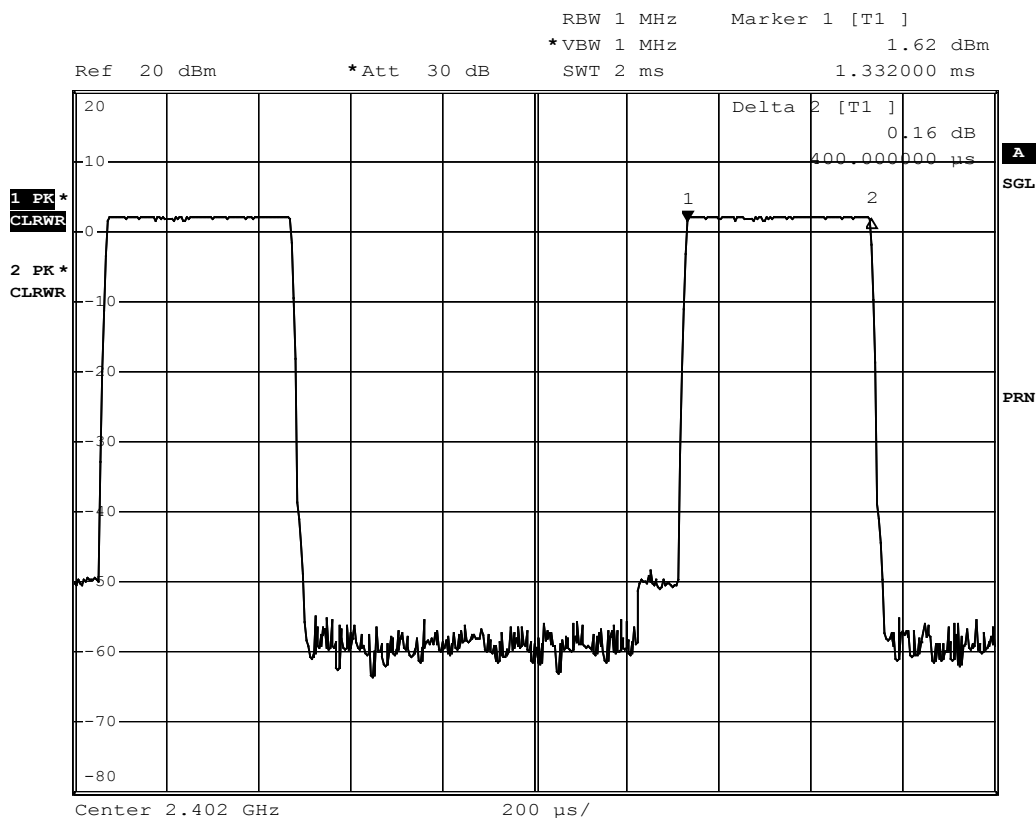
The Maximum Occupancy Time Within 31.6sec: $0.0004 \times (800/79) \times 31.6 = 0.128\text{sec}$.

C) 2480MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $16/20\text{msec} = 800 / \text{sec}$

The Maximum Occupancy Time Within 31.6sec: $0.0004 \times (800/79) \times 31.6 = 0.128\text{sec}$.

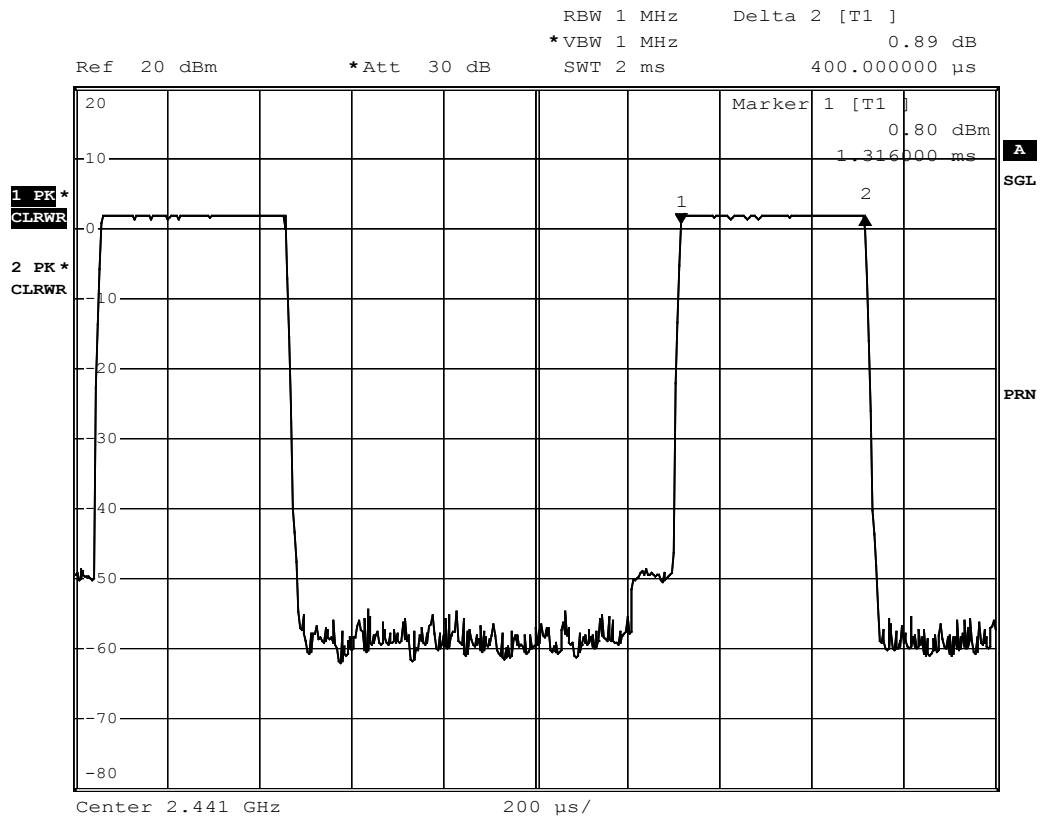
Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard .

Hop rate-2402MHz



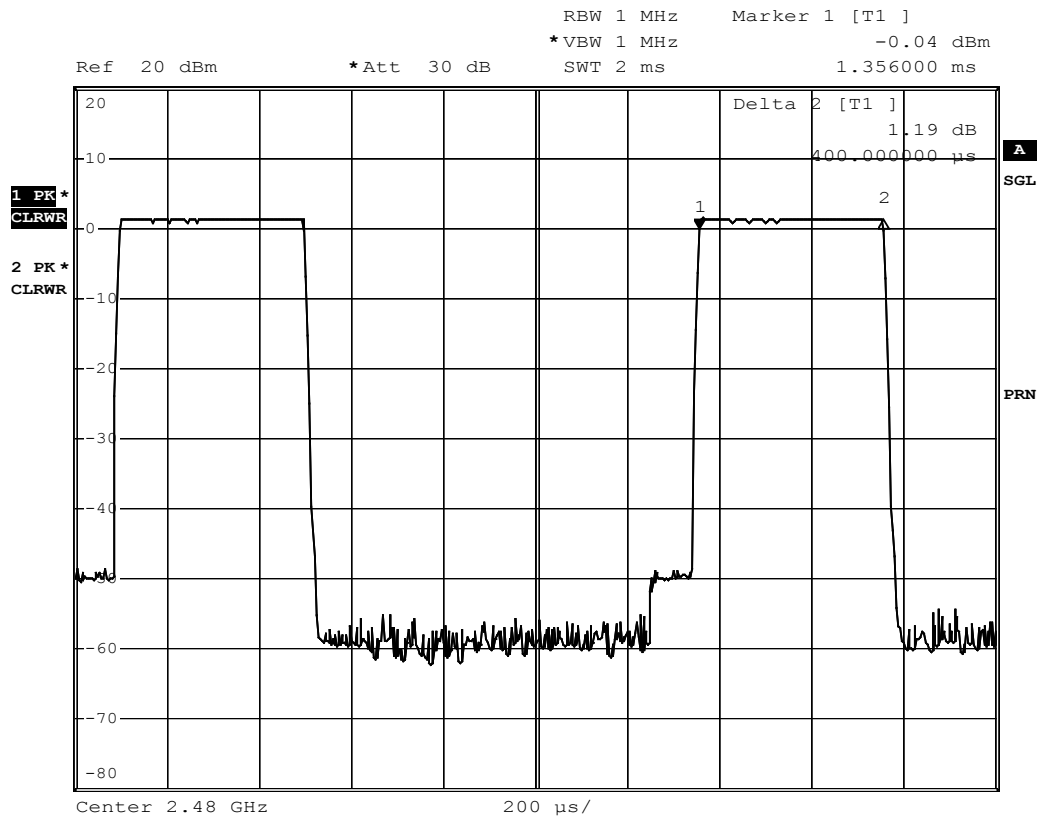
Date: 6.JAN.2008 05:55:47

Hop rate-2441MHz



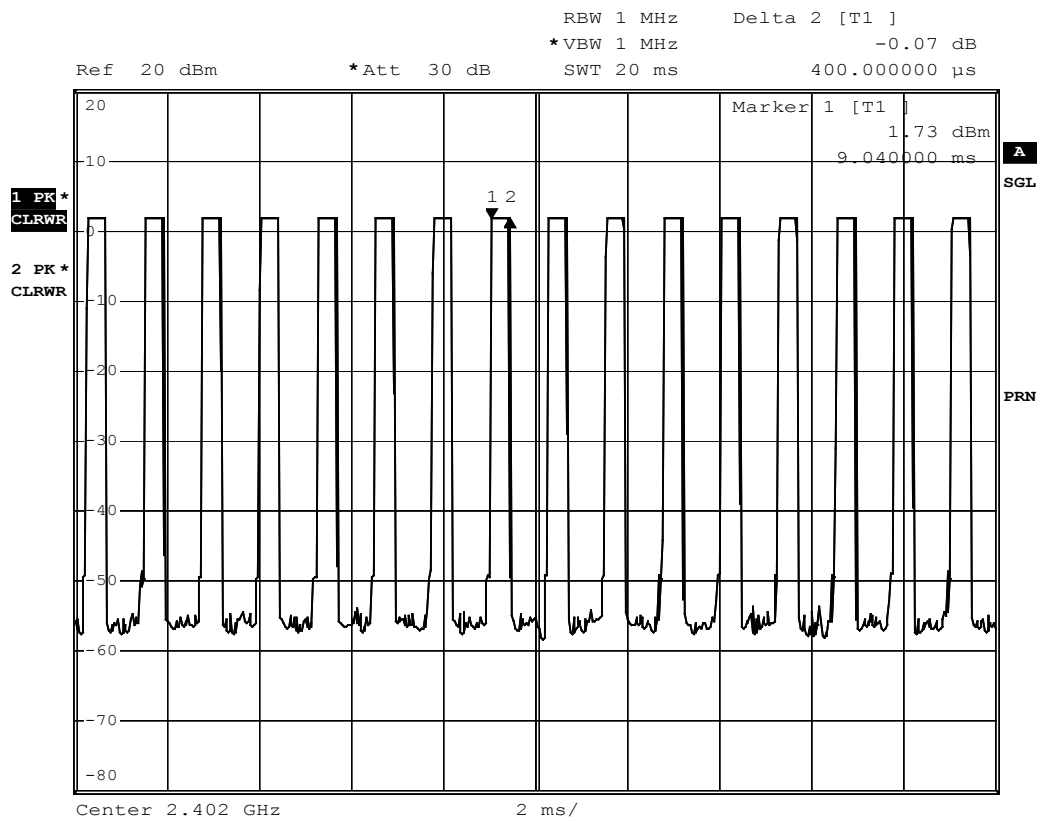
Date: 6.JAN.2008 06:09:04

Hop rate-2480MHz



Date: 6.JAN.2008 06:12:55

Time slot length



Date: 6.JAN.2008 05:46:44

Note: Dwell time=time slot length * hop rate / number of hopping channels * period

Product	Bluetooth 2.0+ EDR Module		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

Occupancy Time of Frequency Hopping System-DH 3

A) 2402MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $8/20\text{msec} = 400 / \text{sec}$

The Maximum Occupancy Time Within 31.6sec: $0.00165 \times (400/79) \times 31.6 = 0.264\text{sec}$.

B) 2441MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $8/20\text{msec} = 400 / \text{sec}$

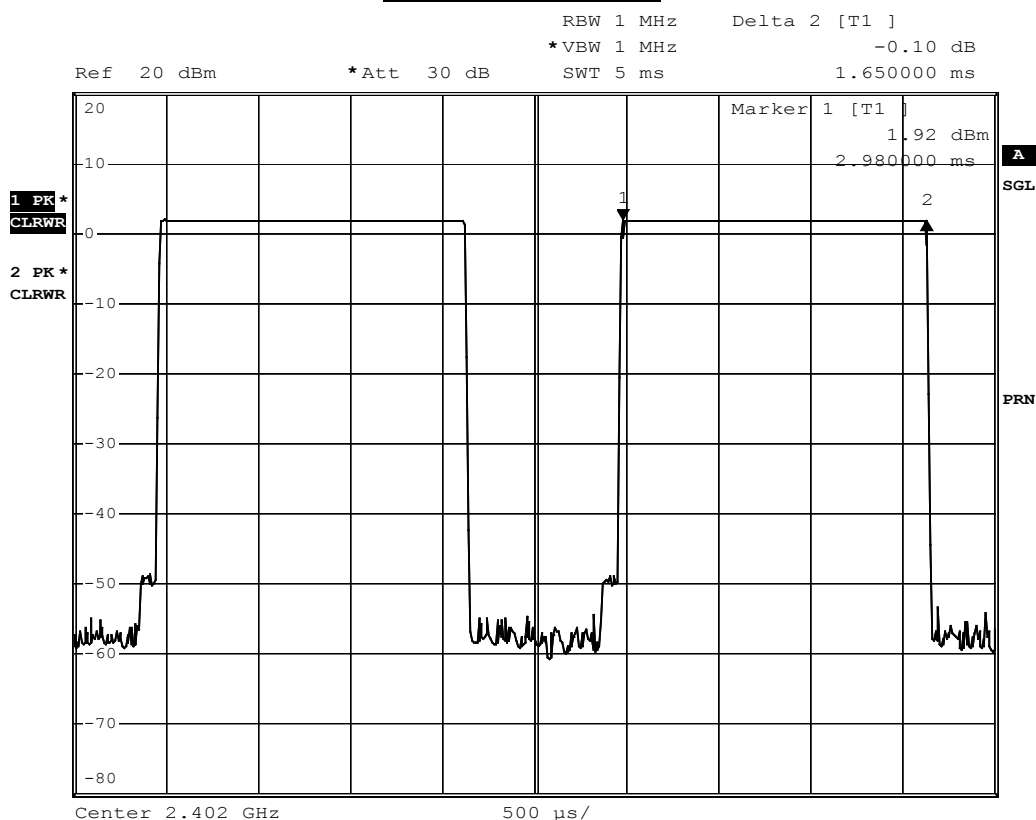
The Maximum Occupancy Time Within 31.6sec: $0.00166 \times (400/79) \times 31.6 = 0.2656\text{sec}$.

C) 2480MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $8/20\text{msec} = 400 / \text{sec}$

The Maximum Occupancy Time Within 31.6sec: $0.00165 \times (400/79) \times 31.6 = 0.264\text{sec}$.

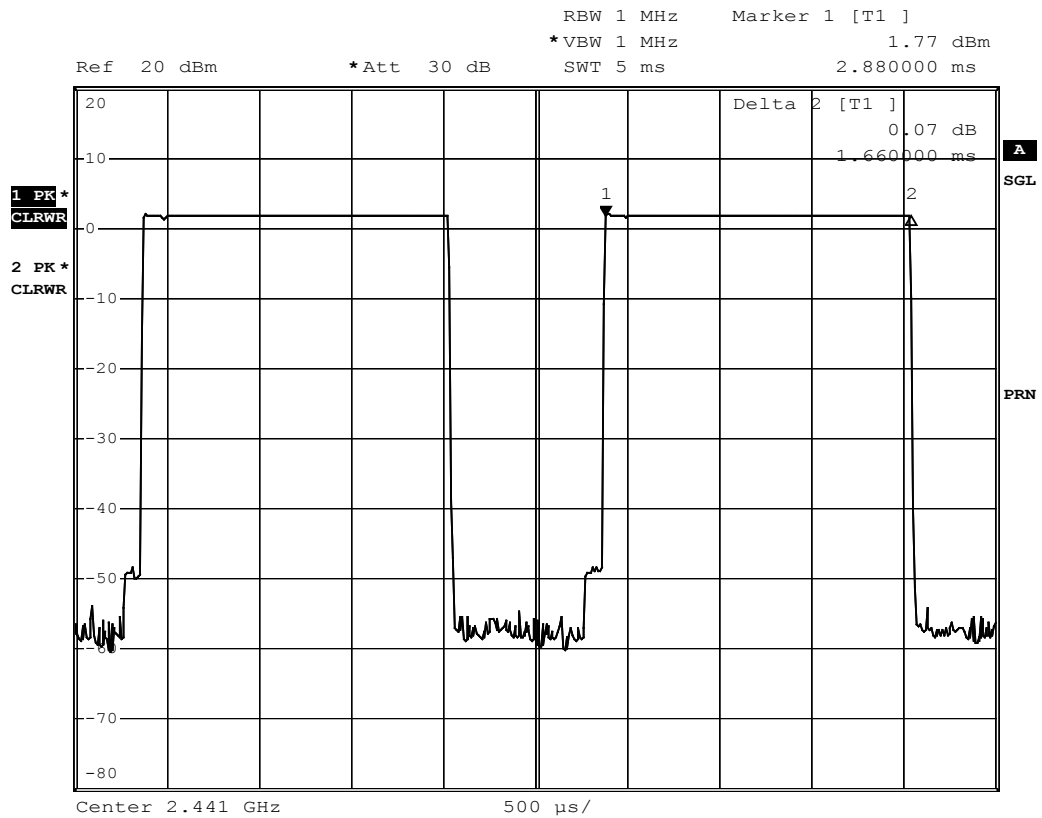
Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard .

Hop rate-2402MHz



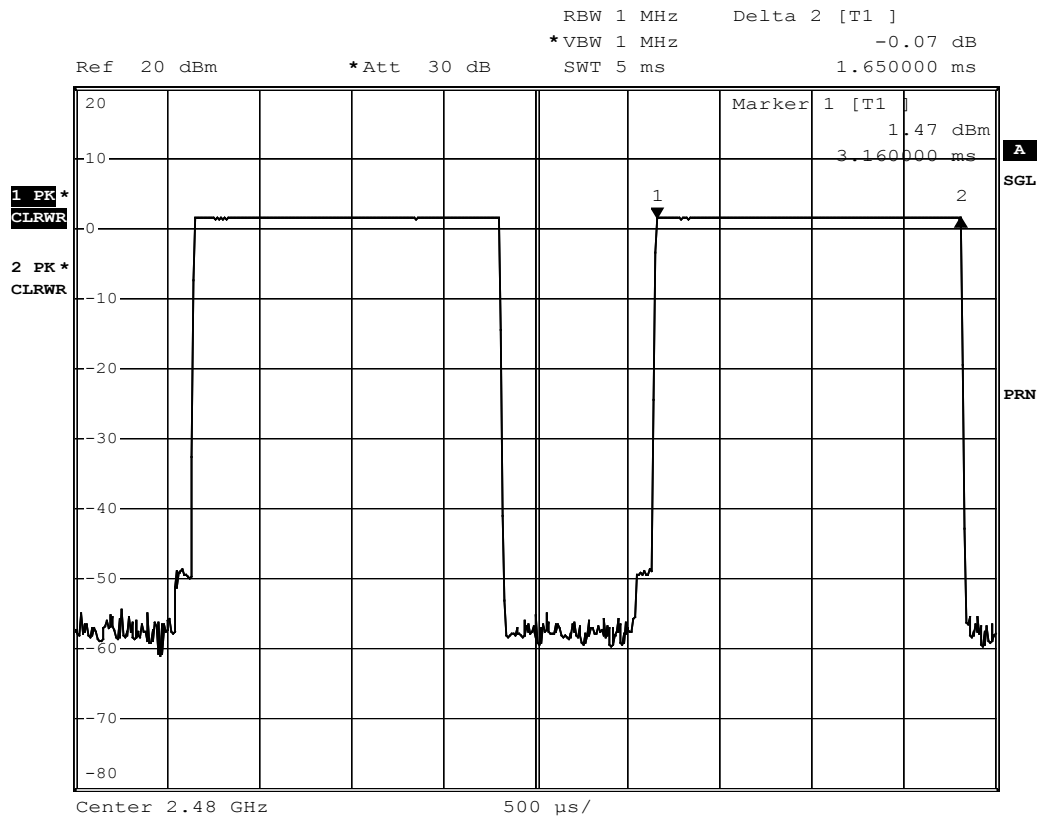
Date: 6.JAN.2008 05:53:50

Hop rate-2441MHz



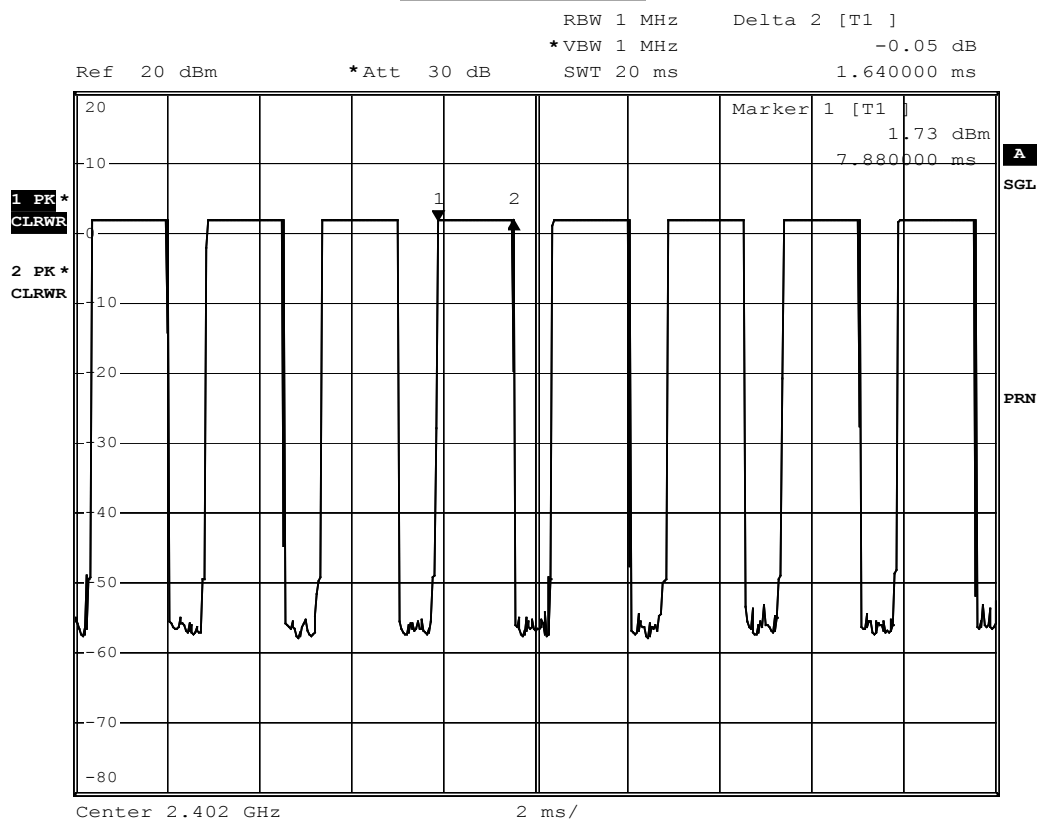
Date: 6.JAN.2008 06:07:37

Hop rate-2480MHz



Date: 6.JAN.2008 06:14:21

Time slot length



Date: 6.JAN.2008 05:47:52

Note: Dwell time=time slot length * hop rate / number of hopping channels * period

Product	Bluetooth 2.0+ EDR Module		
Test Item	Dwell Time		
Test Mode	Mode 1: Transmit		
Date of Test	2008/01/06	Test Site	No.1 OATS

Occupancy Time of Frequency Hopping System-DH 5

A) 2402MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $5/20\text{msec} = 250 / \text{sec}$

The Maximum Occupancy Time Within 31.6sec: $0.00292 \times (250/79) \times 31.6 = 0.292\text{sec}$.

B) 2441MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $5/20\text{msec} = 250 / \text{sec}$

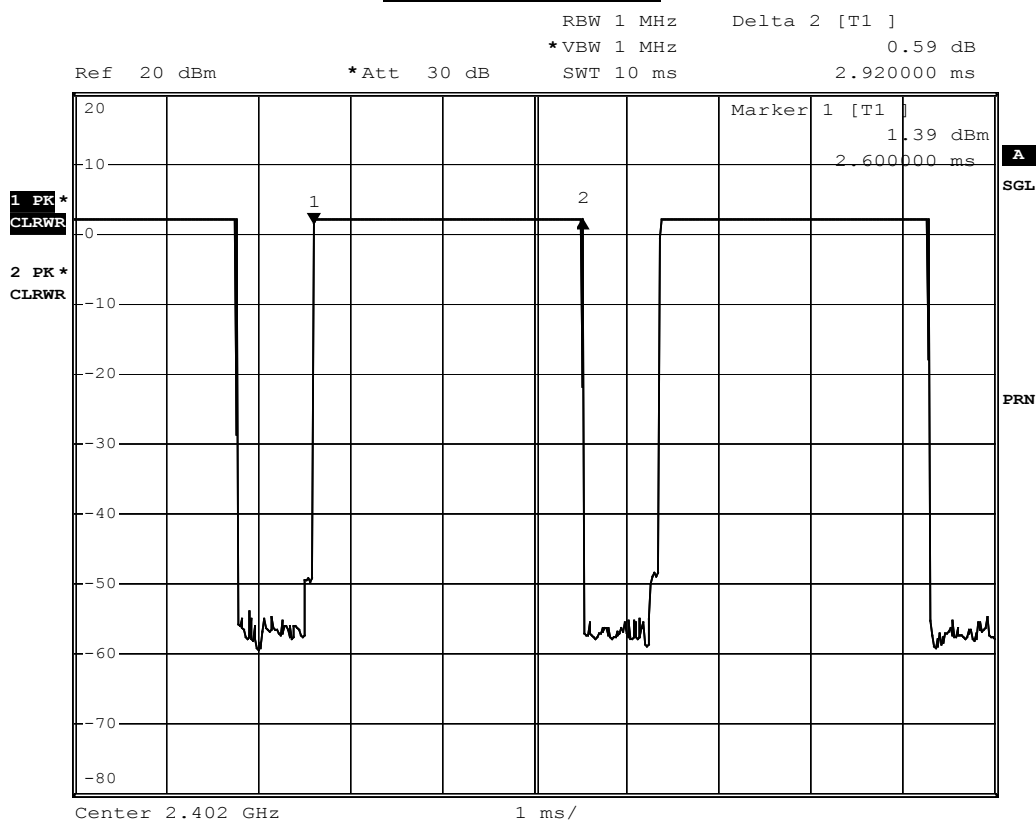
The Maximum Occupancy Time Within 31.6sec: $0.00292 \times (250/79) \times 31.6 = 0.292\text{sec}$.

C) 2480MHz Test Time Period: $0.4 \times 79 = 31.6\text{sec}$, Hopping Times Within 1sec: $5/20\text{msec} = 250 / \text{sec}$

The Maximum Occupancy Time Within 31.6sec: $0.0029 \times (250/79) \times 31.6 = 0.29\text{sec}$.

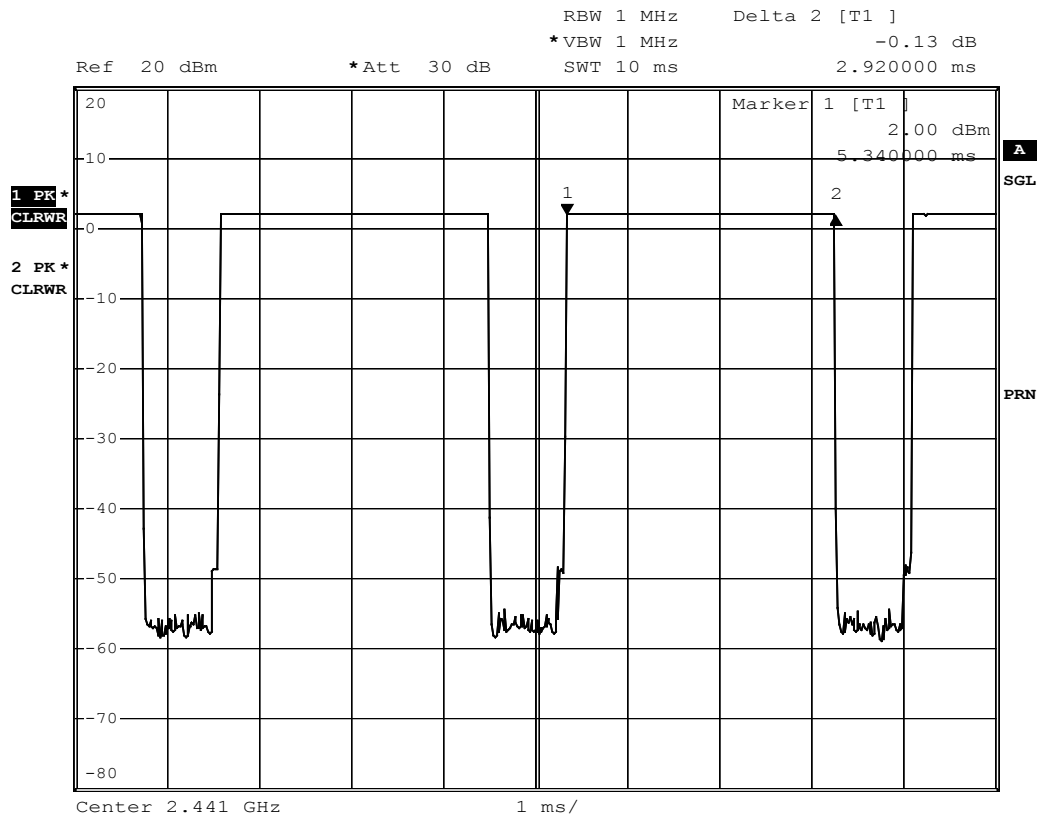
Test Result: The Average Occupancy Time of Each Highest , Middle and Lowest Channel Is Less Than 0.4sec , And Corresponds to The Standard .

Hop rate-2402MHz



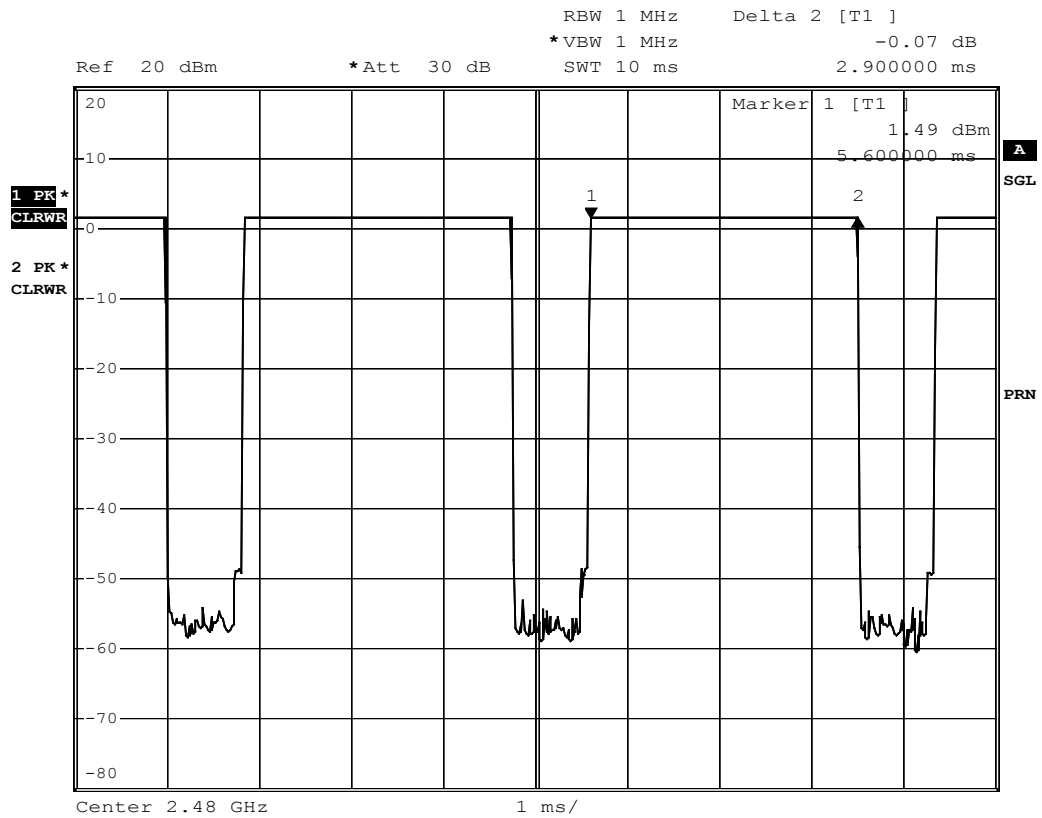
Date: 6.JAN.2008 05:51:40

Hop rate-2441MHz



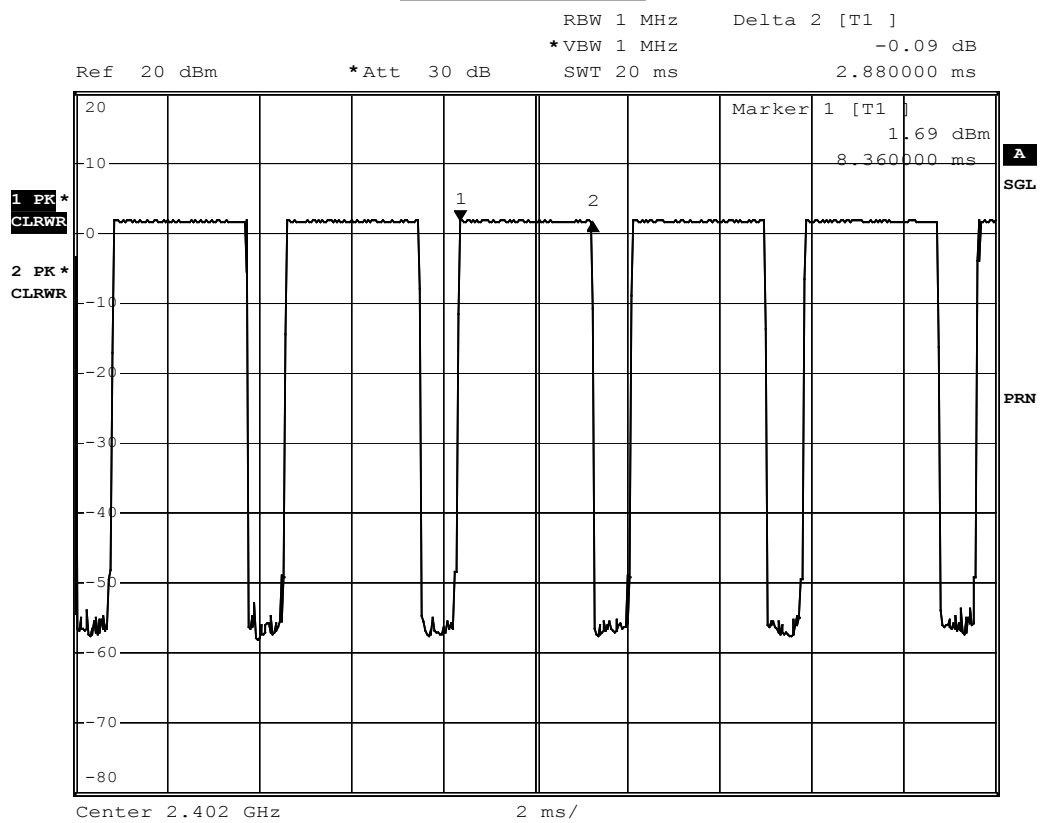
Date: 6.JAN.2008 06:06:01

Hop rate-2480MHz



Date: 6.JAN.2008 06:16:10

Time slot length



Date: 6.JAN.2008 05:49:10

Note: Dwell time=time slot length * hop rate / number of hopping channels * period