



Test Report

Product Name : IEEE 802.11b/g Bluetooth 2.0+
EDR MiniCard
Model No. : MM210-M
FCC ID. : N89-MM230M

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-RFUSP06V01-2
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-RFUSP06V01-2



Product Name : IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard
 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. : MM210-M
 FCC ID. : N89-MM230M
 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.

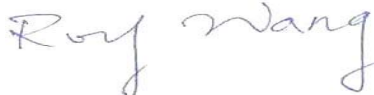
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Documented By : 

(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	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard
Trade Name	CyberTAN
Model No.	MM210-M
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 an IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard including a 2.4GHz BT/WLAN 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 –2 under 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

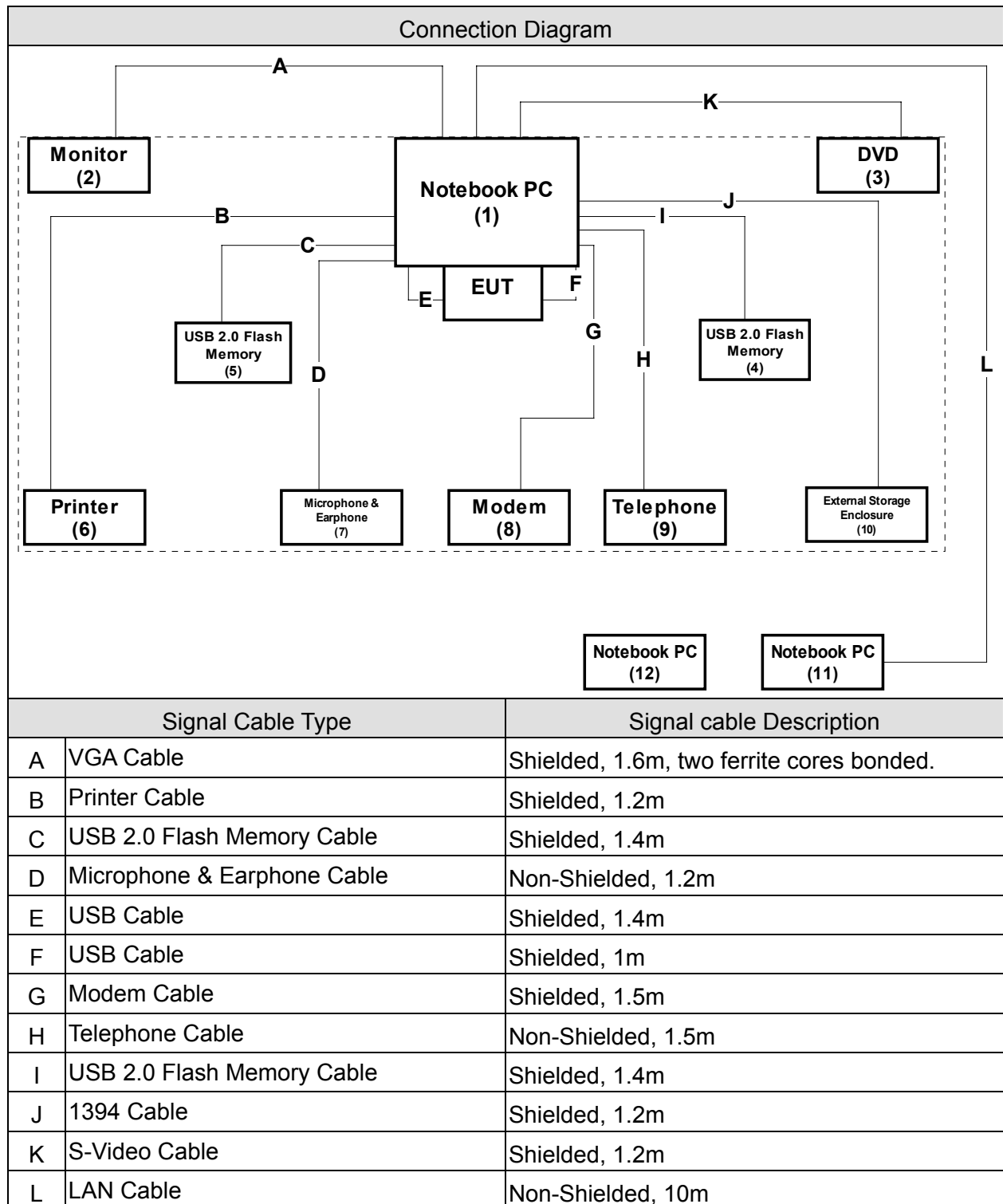
Emission	Mode 1
Conducted Emission	Yes
Peak Power Output	Yes
Radiated Emission	Yes
Band Edge	Yes
Channel of Number	Yes
Channel Separation	Yes
Occupied Bandwidth	Yes
Dwell Time	Yes

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. Peak Power Output

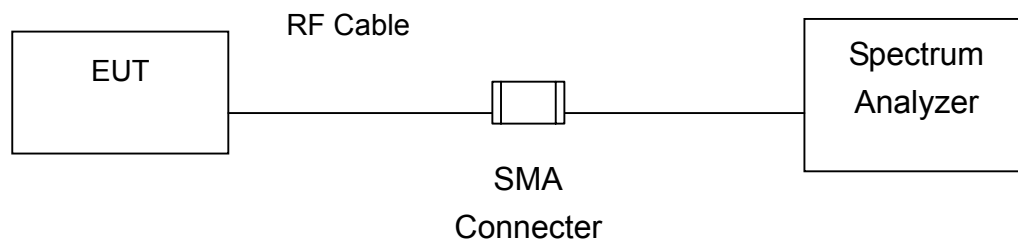
2.1. Test Equipment

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.

2.2. Test Setup



2.3. 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

2.4. 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.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

2.6. Test Result

Product	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/25	Test Site	No.1 OATS

1M-GFSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	3.83	1Watt= 30 dBm	Pass
39	2441	3.21	1Watt= 30 dBm	Pass
78	2480	3.08	1Watt= 30 dBm	Pass

Product	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard		
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	1.60	1Watt= 30 dBm	Pass
39	2441	1.47	1Watt= 30 dBm	Pass
78	2480	1.13	1Watt= 30 dBm	Pass

Product	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/25	Test Site	No.1 OATS

3M-8DPSK Modulation, PRBS Packet Type

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	1.73	1Watt= 30 dBm	Pass
39	2441	1.43	1Watt= 30 dBm	Pass
78	2480.	1.05	1Watt= 30 dBm	Pass

3. Radiated Emission

3.1. Test Equipment

The following test equipment are used during the test:

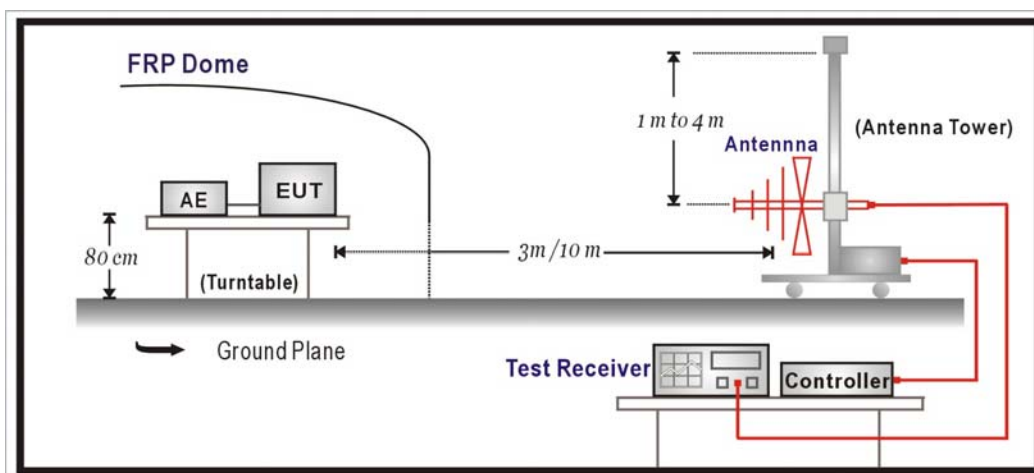
Radiated Emission / Site1

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	2007/02/13

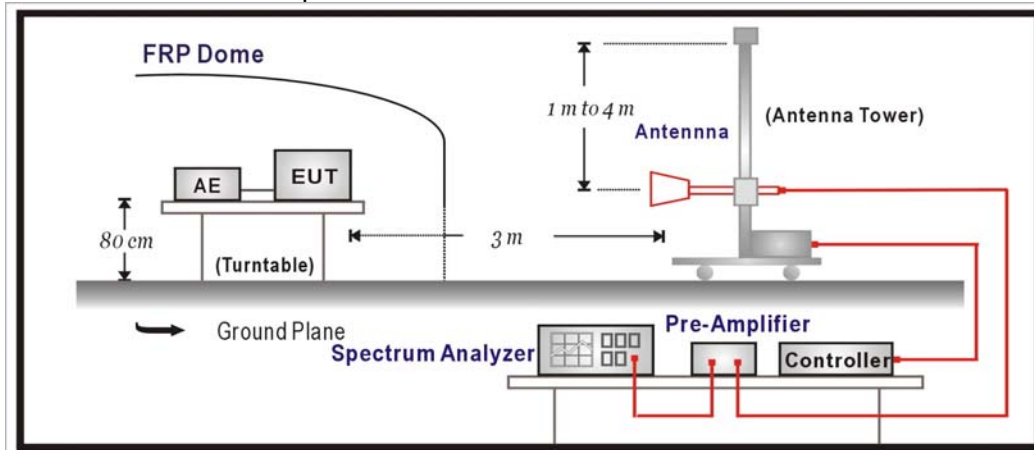
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. "N/A" Ca1.Date is used to Pre-test, not final test.

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



3.3. 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.

3.4. 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.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2006

3.6. Test Result

30MHz-1GHz Spurious

Product	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard				
Test Item	Radiated Emission				
Test Mode	Mode 1: Transmit				
Date of Test	2008/02/25	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	23.920	27.064	-12.936	40.000
269.098	-7.085	36.521	29.436	-16.564	46.000
473.206	2.161	24.043	26.204	-19.796	46.000
580.120	5.370	23.454	28.824	-17.176	46.000
665.651	1.750	29.157	30.907	-15.093	46.000
865.872	4.750	26.243	30.993	-15.007	46.000
Vertical					
271.042	-12.170	42.584	30.414	-15.586	46.000
377.956	-1.210	29.231	28.021	-17.979	46.000
665.651	-2.858	34.058	31.200	-14.800	46.000
780.341	5.743	25.716	31.459	-14.541	46.000
941.683	8.727	25.595	34.322	-11.678	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	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/25	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	42.620	46.519	-27.481	74.000	54.00
7206.860	11.364	37.867	49.231	-24.769	74.000	54.00
9608.640	15.954	33.060	49.014	-24.986	74.000	54.00
12010.640	17.385	33.221	50.606	-23.394	74.000	54.00

Average Detector:

--

Vertical

Peak Detector:

4804.150	3.899	39.872	43.771	-30.229	74.000	54.00
7206.880	11.778	40.031	51.809	-22.191	74.000	54.00
9608.550	14.738	36.163	50.901	-23.099	74.000	54.00
12010.530	17.364	36.363	53.727	-20.273	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	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/25	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	43.977	48.146	-25.854	74.000	54.00
7322.750	11.667	35.974	47.641	-26.359	74.000	54.00
9763.900	16.461	36.689	53.150	-20.850	74.000	54.00
12206.410	17.950	33.537	51.487	-22.513	74.000	54.00

Average Detector:

--

Vertical

Peak Detector:

4882.160	4.168	47.473	51.641	-22.359	74.000	54.00
7322.630	12.314	37.112	49.426	-24.574	74.000	54.00
9763.810	14.935	36.279	51.214	-22.786	74.000	54.00
12205.140	17.533	33.704	51.237	-22.763	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	IEEE 802.11b/g Bluetooth 2.0+ EDR MiniCard		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2008/02/25	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
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Horizontal

Peak Detector:

4960.330	4.428	46.340	50.768	-23.232	74.000	54.00
7440.010	12.001	36.479	48.480	-25.520	74.000	54.00
9919.940	16.975	36.303	53.278	-20.722	74.000	54.00
12400.210	18.520	31.948	50.468	-23.532	74.000	54.00

Average Detector:

--

Vertical

Peak Detector:

4960.260	4.428	48.314	52.742	-21.258	74.000	54.00
7440.010	12.884	40.302	53.186	-20.814	74.000	54.00
9919.870	15.134	35.776	50.910	-23.090	74.000	54.00
12400.140	17.722	34.647	52.369	-21.631	74.000	54.00

Average Detector:

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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.