Test Report of FCC Part 15 C for FCC Certificate

On Behalf of

Shenzhen Xinbond Technology Co., Ltd.

Product description:	Wireless Mouse
Model No.:	BD-8008(T)
	Remark: (T) refer to transmitter
FCC ID:	T94BD-8008T

Prepared for:	**Shenzhen Xinbond Technology Co., Ltd.**
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Issue Date:	December 09, 2007
Test Date:	December 01~07, 2007

Test by:	**Reviewed By:**
Kendy Wang	Tony Wu

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	**Shenzhen Xinbond Technology Co., Ltd.**
Address of applicant:	Xinbond Building, NO.10th, Honghualing Industrial Park, Longxi, Longgang, Shenzhen, China.
Manufacturer:	**Shenzhen Xinbond Technology Co., Ltd.**
Address of manufacturer:	Xinbond Building, NO.10th, Honghualing Industrial Park, Longxi, Longgang, Shenzhen, China.

EUT Description:	Wireless Mouse
Trade Name:	N/A
Model No.:	BD-8008(T)
	Remark: (T) refer to transmitter
Rated Voltage	DC 3V (2 x1.5V AAA battery) for Transmitter
Frequency range	27.045MHz
Number of channels	1
Channel Separation	None
Product Class:	Low Power Communication Device Transmitter
Measurement Procedure	ANSI C63.4-2003

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

1.2 Related Submittal(s) / Grant (s)

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

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.227 rules.

1.3 Test Methodology

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

1.4 Test Facility

All measurement required was performed at laboratory of Solid Industrial (Shenzhen) Co., Ltd. at 333 Bulong Highway Buji Longgang, Shenzhen, Guangdong, China.

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

FCC – Registration No.: 759397

Solid Industrial., 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 759397, Nov 04, 2003.

2. SYSTEM TEST CONFIGURATION

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

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 General Test Procedures

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

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

2.4 List of Measuring Equipments Used

Equipment	Manufacturer	Model No.	Last Cal	Calibration Period
EMC Analyzer	Agilent	E7402A	2007/11	1 year
EMI Test Receiver	R&S	ESS	2007/11	1 year
Receiver/ Spectrum Analyzer	R&S	ESCI	2007/11	1 year
Loop Antenna	R&S	HFH2-Z2	2007/11	1 year
RF Selector	TOYO	NS4901A	2007/11	1 year
Pre Amplifier	Anritsu	MH648A	2007/11	1 year
Bilog Antenna	CHASE	CBL6111A	N/A	N/A
Signal Generator	R&S	SMG	N/A	N/A
Turn Disc	HD	DS4150S	N/A	N/A
Power Reflection Meter	R&S	NAP	2007/11	1 year
RF Power Amplifier	TOYO	AS300SSS	2007/11	1 year
Isotropic Field Monitor	AR	FM2000	2007/11	1 year
Antenna Mast	HD	MA2400	N/A	1 year
Distortion Meter	HM-250	KNEWOOD	N/A	N/A
Synthesized Function Generator	FC110	YOKOGAWA	2007/11	1 year
Distortion Meter	MEGURO	MAK-6578A	2007/11	1 year
AM/FM Stereo Signal Generator	Panasonic	VP-8122A	2007/11	1 year
Oscilloscope	LEADER	LS1020	N/A	1 year
Function Generator	National	VP-7422A	N/A	N/A
Signal Generator	R&S	SMG	2007/11	1 year
Remote Controller	TOYO	MAC	2007/11	1 year
Fast Transient Burst Generator	SCHAFFENR	NSG3025	2007/11	1 year
AC Power Supply	KIKUSUI	PCR2000L	2007/11	1 year
Electrostatic Discharge Simulator	Noiseken	ESS-200AX	2007/11	1 year
AC Power Supply	KIKUSUI	PCR4000L	2007/11	1 year

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.207	Disturbance Voltage at The Mains Terminals	N/A, without AC power supply
15.227	Radiation Emission	Pass
15.227	Emissions within Band Edges	Pass

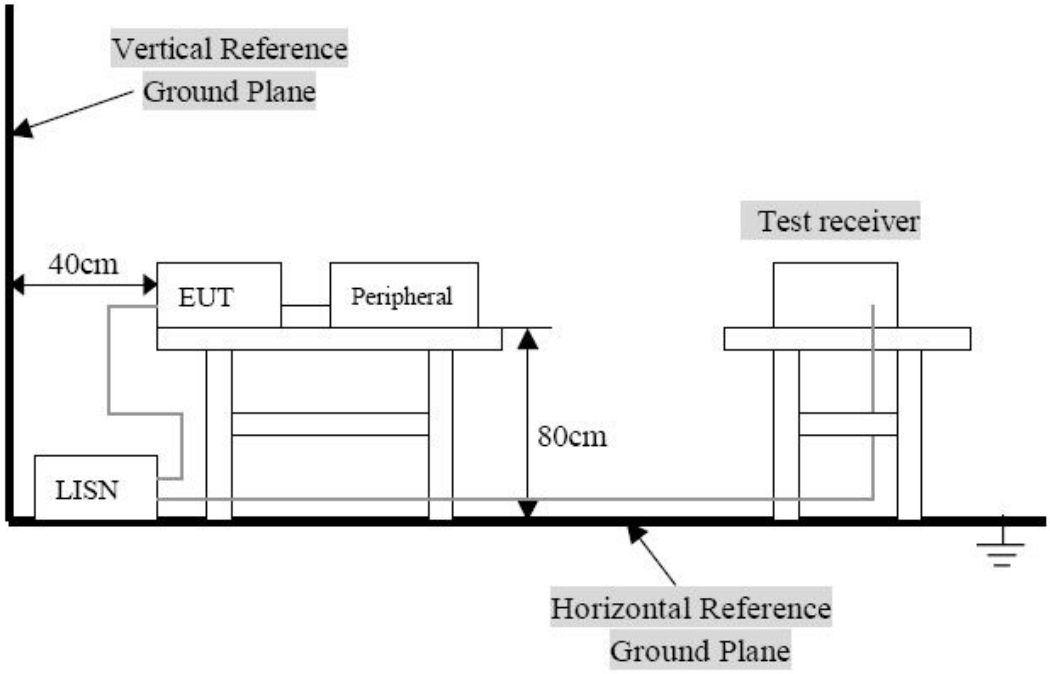
4. TEST OF CONDUCTED EMISSION

4.1 Applicable Standard

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

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

4.2 Test Setup Diagram



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

2. The EUT is exclused from investigation of Disturbance Voltage at The Mains Terminals, for it is powered by DC 3V (2 x1.5V AAA battery). According to the Section 15.207(d),measurement to demonstrate compliance with the limits of Disturbance Voltage at The Mains Terminals are not required to the devices which only employed bettary power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

5- RADIATED EMISSIONS

5.1 Limit of Radiated Emissions

Limit of Field Strength of Fundamental Emissions (FCC 47CFR 15.227):

Frequency Range (MHz)	Field Strength of Fundamental Emission (Peak) (μV/m)	Field Strength of Fundamental Emission (Average) (μV/m)
26.96-27.28	100,000μV/m **(100dBμV/m)**	10,000μV/m **(80dBμV/m)**

Limits of Spurious Emissions (FCC 47 CFR 15.209 Class B):

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
960 ~ 1000	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

5.2 Test Equipment Used

Equipment	Manufacturer	Model No.	Last Cal	Calibration Period
EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	2007/11	1 year
Loop Antenna	ROHDE & SCHWARZ	HFH2-Z2	2007/11	1 year
Ultra-Broadband Antenna	ROHDE & SCHWARZ	HL562	2007/11	1 year
RF Test Panel	ROHDE & SCHWARZ	TS / RSP	N/A	N/A
Turntable	ETS	2088	N/A	N/A
Antenna Mast	ETS	2075	N/A	N/A
RF Test Panel	R/S	TS / RSP	N/A	N/A

5.3 EUT Setup

Radiated Measurement Setup

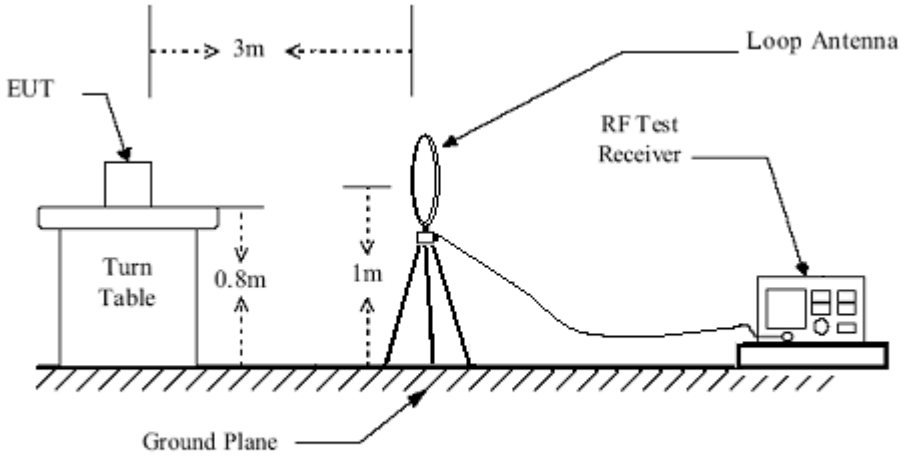


Figure 2 : Frequencies measured below 30 MHz configuration

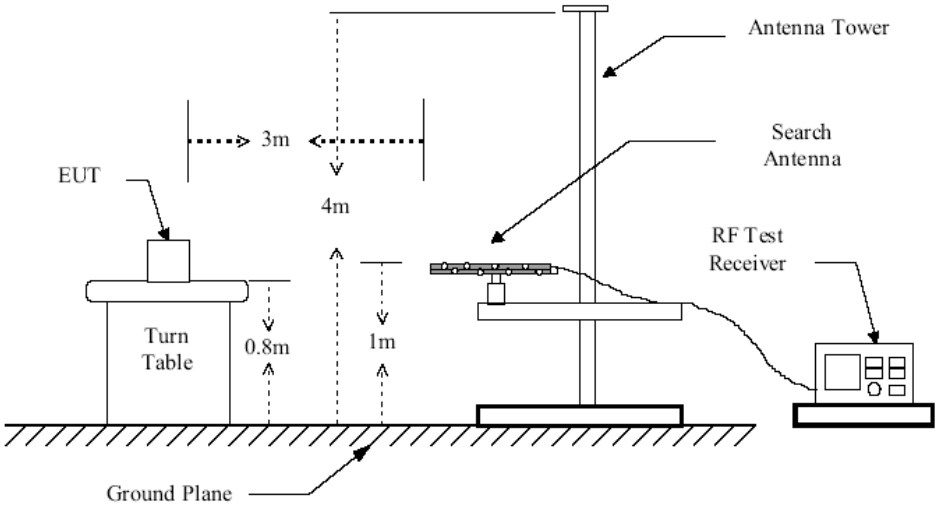


Figure 1 : Frequencies measured below 1 GHz configuration

5.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

1). Configure the EUT according to ANSI C63.4:2003.

2). The EUT was placed on the top of the turntable 0.8 meter above ground.

3). The receiving antenna was placed 3 meters far away from the turntable.

4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). For Spurious Emissions test, The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

6). For Field Strength of Fundamental Emissions test, Positioned the loop antenna with its plane vertical at the specified distance of 3 meters between its center and the EUT. The center of the loop antenna is set with 1m above the grounded plane. Then rotated about its vertical axis for finding out the maximum emission level of the EUT.

5.5 Test Result

Temperature (℃) : 22~23	EUT: Wireless Mouse
Humidity (%RH): 50~54	M/N: BD-8008(T)
Barometric Pressure (mbar): 950~1000	Operation Condition: Continuous Transmitting

Fundamental Emission Test Data

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
27.0454	73.4	65.9	100	26.6	34.1
Average Measurement					
27.0453	67.9	60.4	80	12.1	19.6

Remark: **Duty Cycle Correction**

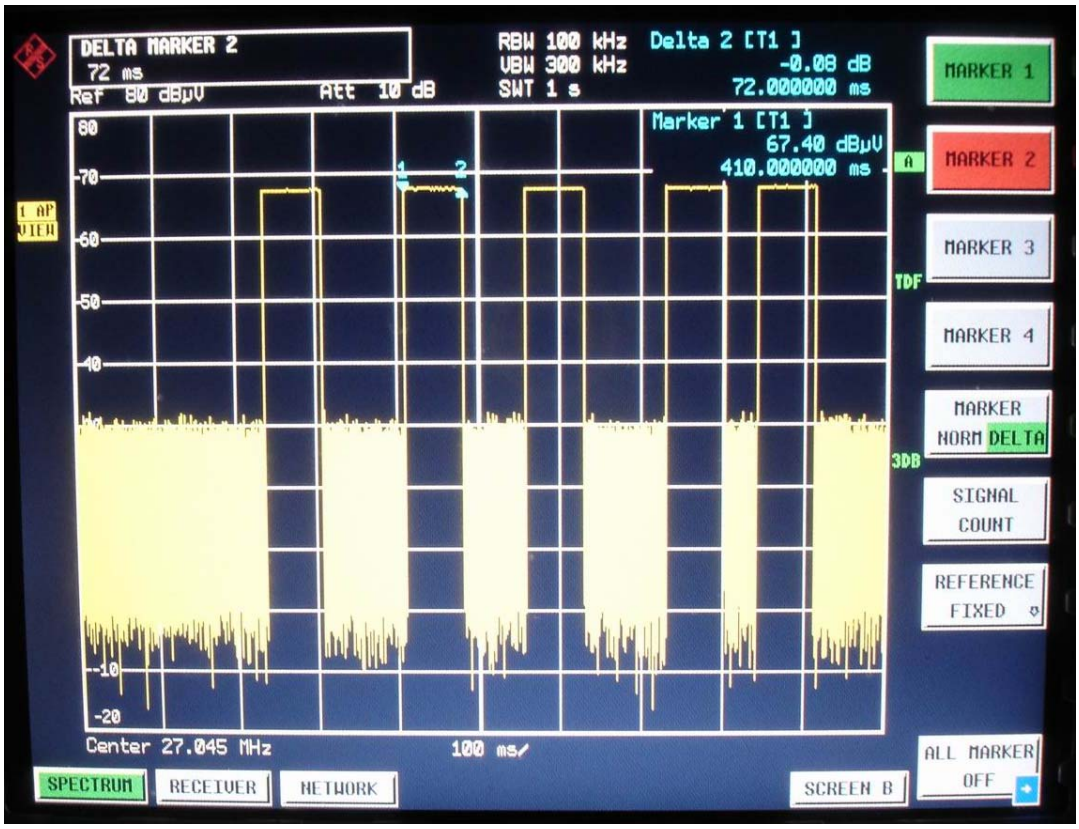
Each function key sends a different series of characters, but each packet period (676 msec) never exceeds a series of 5 pulses (72 msec). Assuming any pulses may be obtained due to encoding the worst case transmit duty cycle would be considered 5x72 msec per 676 msec =53% duty cycle.

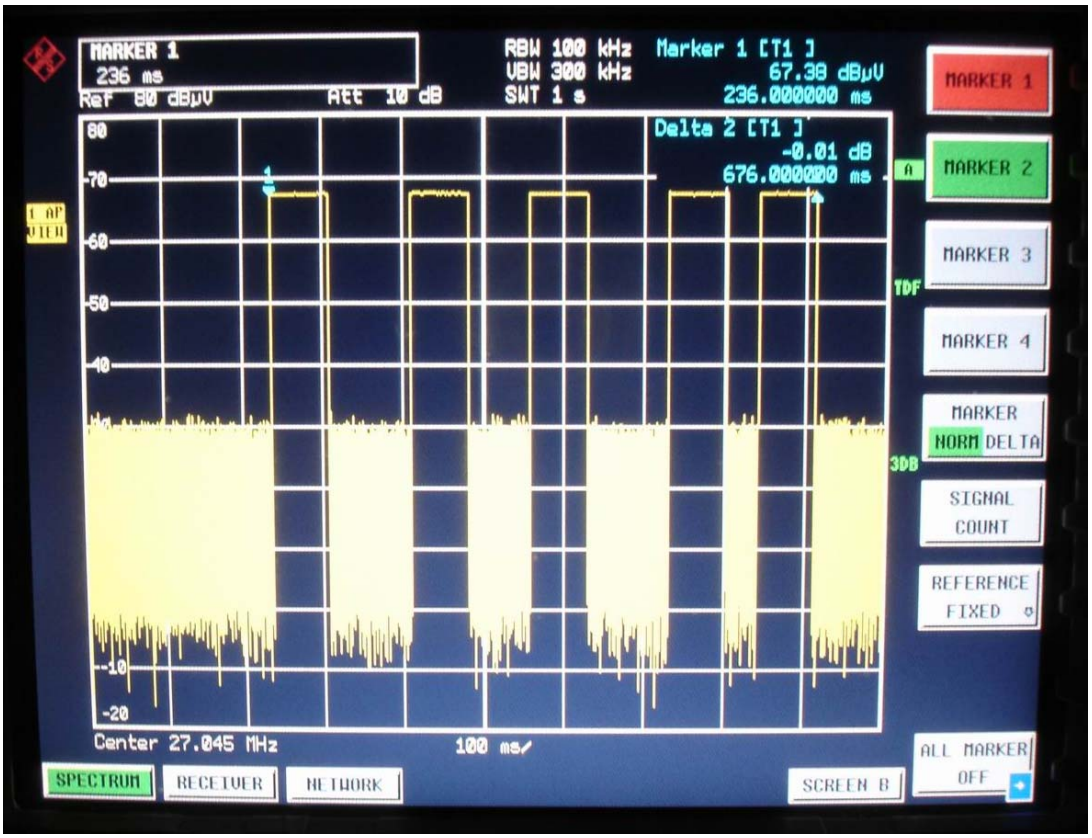
Duty Cycle Correction = 20Log(0.53) = -5.51dB
The following figures show the characteristics of the pulse train for one of these functions.

So, the Vertical Radiation(average)= 73.4+20*log(0.53)=67.89(dBμV/m)
Horizontal Radiation(average) = 65.9+20*log(0.74)=60.39(dBμV/m)

The following Figures show the characteristics of the pulse train for one of these functions.

Result: The field strength of any emission within the operation band did not exceed 80(dBμV/m) for average value or 100 dB(dBμV/m)for peak value.


DELTA MARKER 2
72 ms
Ref 80 dBµV
Att 10 dB
RBW 100 kHz
VBW 300 kHz
SWT 1 s
Delta 2 [T1]
-0.08 dB
72.000000 ms
Marker 1 [T1]
67.40 dBµV
410.000000 ms
MARKER 1
MARKER 2
MARKER 3
MARKER 4
MARKER NORM DELTA
SIGNAL COUNT
REFERENCE FIXED
ALL MARKER OFF
Center 27.045 MHz
100 ms/
SPECTRUM
RECEIVER
NETWORK
SCREEN B


MARKER 1
236 ms
Ref 80 dBµV
Att 10 dB
RBW 100 kHz
VBW 300 kHz
SWT 1 s
Marker 1 [T1]
67.38 dBµV
236.000000 ms
Delta 2 [T1]
-0.01 dB
676.000000 ms
MARKER 1
MARKER 2
MARKER 3
MARKER 4
MARKER NORM DELTA
SIGNAL COUNT
REFERENCE FIXED
ALL MARKER OFF
Center 27.045 MHz
100 ms/
SPECTRUM
RECEIVER
NETWORK
SCREEN B

Harmonics & Spurious Emission

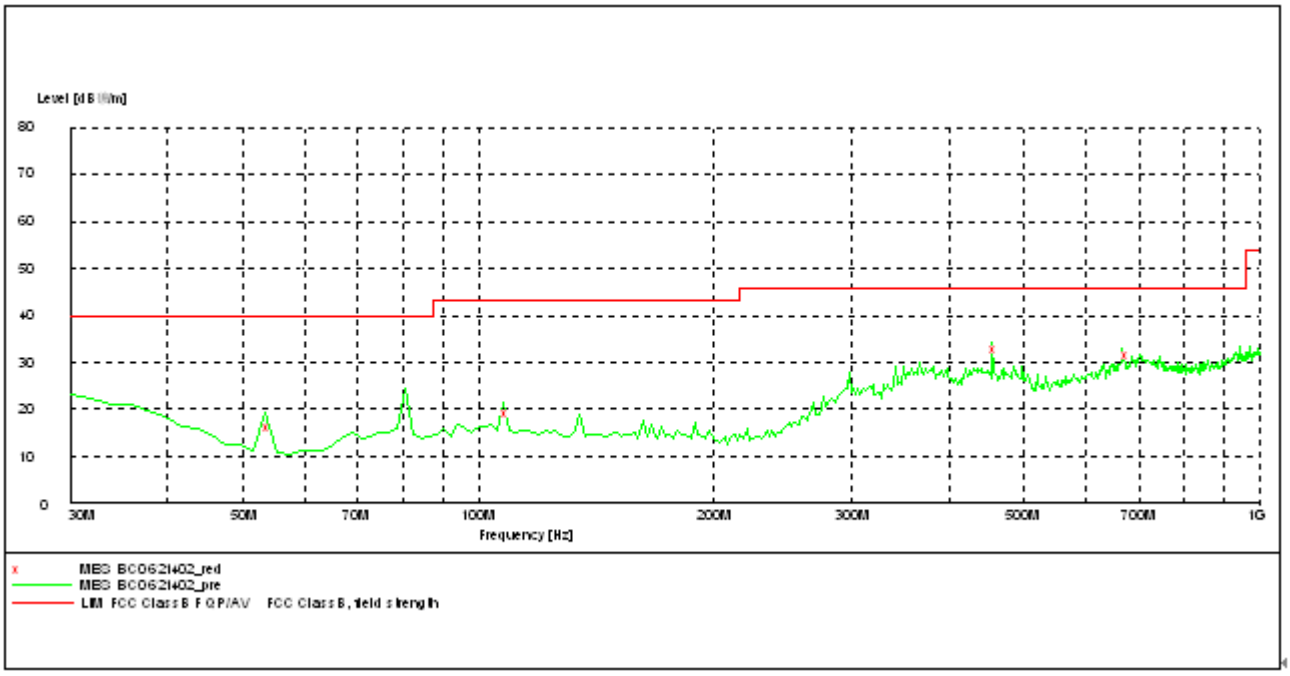
RADIATED EMISSION TEST DATA

EUT: Wireless Mouse
Operating Condition: Continuous Transmitting
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: DC 3V
Comment: Polarisation:H
Start of Test: 12/05/07 / 5:51:34PM

SWEEP TABLE: "test (30M-1G)"

Short Description: Field Strength

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562new



MEASUREMENT RESULT: "BCT1205402_red QP"

12/05/07 5:57PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.326653	17.20	12.3	53.0	35.8	QP	160.0	179.00	HORIZONTAL
107.755511	19.75	11.7	53.0	33.2	QP	160.0	179.00	HORIZONTAL
455.711423	32.60	20.2	71.0	38.4	QP	150.0	135.00	HORIZONTAL
675.398798	30.97	26.2	53.0	22.0	QP	150.0	99.00	HORIZONTAL

Harmonics & Spurious Emission

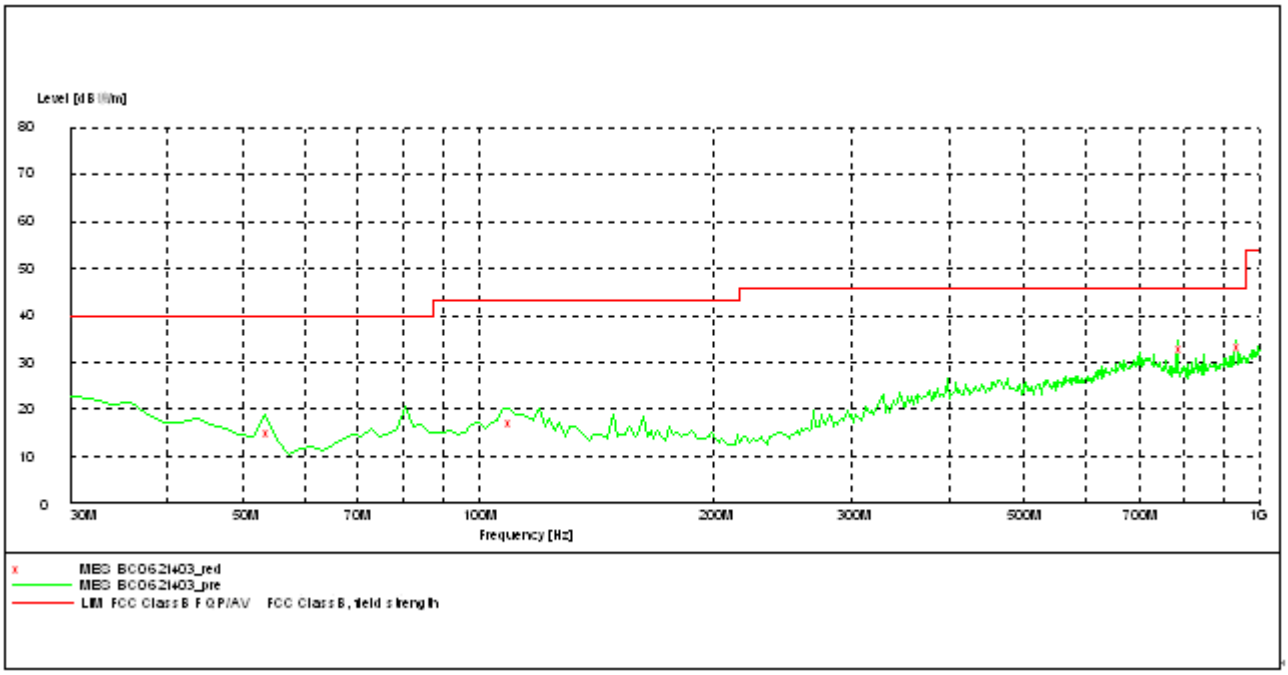
RADIATED EMISSION TEST DATA

EUT: Wireless Mouse
Operating Condition: Continuous Transmitting
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: DC 3V
Comment: Polarisation:V
Start of Test: 12/05/07 / 5:59:23PM

SWEEP TABLE: "test (30M-1G)"

Short Description: Field Strength

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562new



MEASUREMENT RESULT: " BCT1205403_red QP"

12/05/07 6:03PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.326653	15.13	8.3	53.0	37.9	QP	160.0	180.00	VERTICAL
107.755511	17.95	11.7	53.0	35.0	QP	160.0	180.00	VERTICAL
784.228457	32.70	24.1	53.0	20.3	QP	210.0	82.00	VERTICAL
933.907816	33.68	26.1	71.0	37.3	QP	210.0	242.00	VERTICAL

6- EMISSIONS WITHIN BAND EDGES

6.1 Limit of Emissions within Band Edges

According to the section 15.227 of FCC Part 15 Subpart C, The field strength of any emission within this band shall not exceed 10,000 microvolts/ meter at 3 meter. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

6.2 Test Equipment Used

Equipment	Manufacturer	Model No.	Last Cal	Calibration Period
Loop Antenna	ROHDE & SCHWARZ	HFH2-Z2	2007/11	1 year
Spectrum Analyzer	ADVANTEST	R3263	2007/11	1 year
EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	2007/11	1 year
RF Test Panel	ROHDE & SCHWARZ	TS / RSP	N/A	N/A
Turntable	ETS	2088	N/A	N/A
Antenna Mast	ETS	2075	N/A	N/A

6.3 Test Procedure

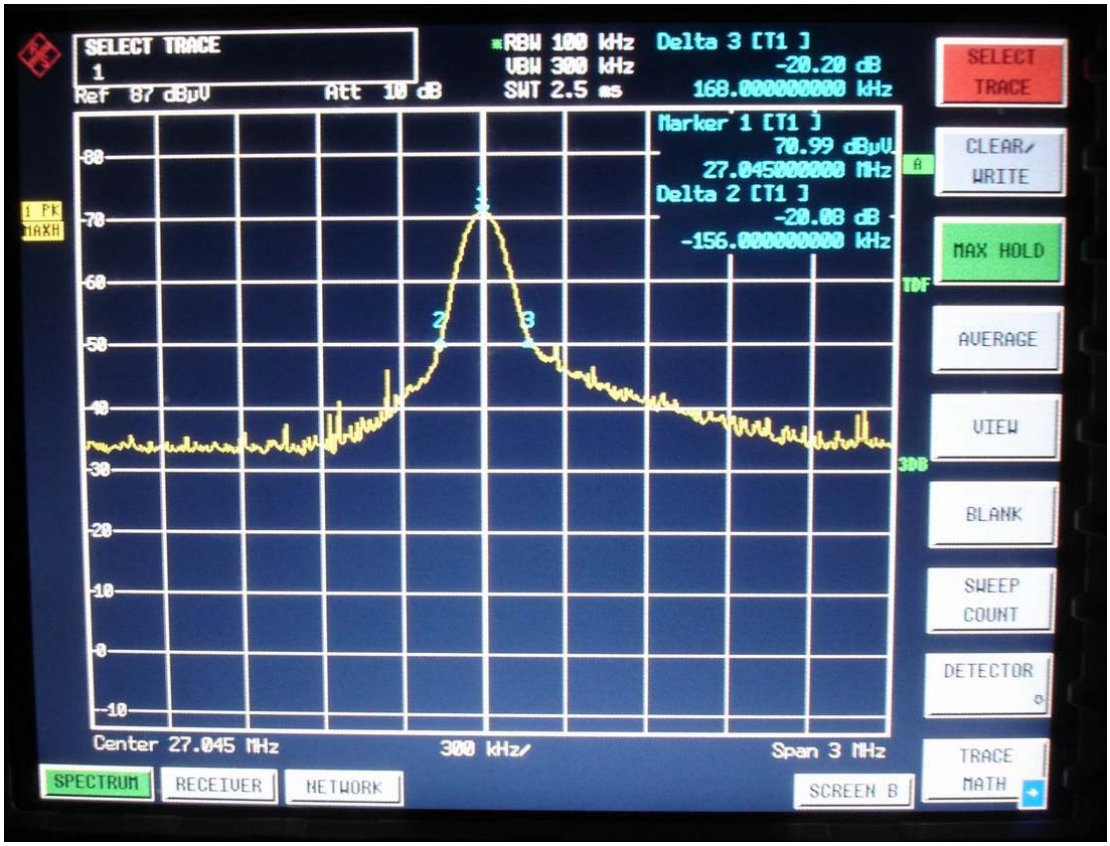
Positioned the loop antenna with its plane vertical at the specified distance of 3 meters between its center and the EUT. The center of the loop antenna is set with 1m above the grounded plane. Then rotated about its vertical axis for finding out the maximum emission level of the EUT. (Details refer to the relevant sections of the standard ANSI C63.4-2003 'Methods of Measurement of Radio Noise Emissions from Low –Voltage Electrical and Electronic Equipment in the Range of 9KHz to 40GHz'.)

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

6.4 Emissions within Band Edges Test Result

Temperature (℃) : 22~23	EUT: Wireless Mouse
Humidity (%RH): 50~54	M/N: BD-8008(T)
Barometric Pressure (mbar): 950~1000	Operation Condition: Continuous Transmitting

Test plots see following:


SELECT TRACE
1
Ref 87 dBµV
Att 10 dB
*RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
Delta 3 [T1]
-20.20 dB
168.000000000 kHz
Marker 1 [T1]
70.99 dBµV
27.045000000 MHz
Delta 2 [T1]
-20.08 dB
-156.000000000 kHz
1 PK
MAXH
80
70
60
50
40
30
20
10
0
-10
Center 27.045 MHz
300 kHz/
Span 3 MHz
SPECTRUM
RECEIVER
NETWORK
SCREEN B
SELECT TRACE
CLEAR/ WRITE
MAX HOLD
AVERAGE
VIEW
BLANK
SWEEP COUNT
DETECTOR
TRACE MATH