Test Report

Product Name : 27MHz Mouse

Model No. : N737, N735

FCC ID. : O62N737

Applicant : Darfon Electronics Corp.

Address : 6, Feng-Shu Tsuen, Gueishan, Taoyuan 333, Taiwan, R.O.C.

Date of Receipt : May 26, 2006

Issued Date : July 05, 2006

Report No. : 066L001-RF-US-P03V01

Test Report Certification

Test Date : July 05, 2006
Report No.: 066L001-RF-US-P03V01

Accredited by NIST (NVLAP)
NVLAP Lab Code: 200533-0

Product Name	:	27MHz Mouse
Applicant	:	Darfon Electronics Corp.
Address	:	6, Feng-Shu Tsuen, Gueishan, Taoyuan 333, Taiwan, R.O.C.
Manufacturer	:	Darfon Eletronics (Suzhou) Co., Ltd.
Model No.	:	N737, N735
FCC ID.	:	O62N737
Rated Voltage	:	Battery 1.5V*2
Trade Name	:	Darfon for N737, BenQ for N735
Measurement Standard	:	FCC CFR Title 47 Part 15 Subpart C: 2005
Measurement Procedure	:	ANSI C63.4: 2003
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.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented By : Leven Huang
(Leven Huang)

Tested By : Tom Hsieh
(Tom Hsieh)

Approved By : George Chen
(George Chen)

NVLAP Lab Code: 200533-0

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	: 27MHz Mouse
Trade Name	: Darfon for N737, BenQ for N735
FCC ID.	: O62N737
Model No.	: N737, N735
EUT Voltage	: Battery 1.5V*2
Frequency Range	: 27.045MHz
Type of Modulation	: FSK
Type of antenna	: Loop antenna
Number of Channel	: 1
Channel Control	: N/A

Frequency of Each Channel:

Channel	Frequency
1	27.045 MHz

Note:

1. The EUT is a 27MHz Mouse used in household and office PC system or related application.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR Title 47 Part 15 Subpart C: 2005 Paragraph 15.227.

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

1.2. Operation Description

The EUT is a 27MHz Mouse used in household and office PC system.
The device adapts FSK modulation. The loop antenna provides diversity function to improve the transmitting function.

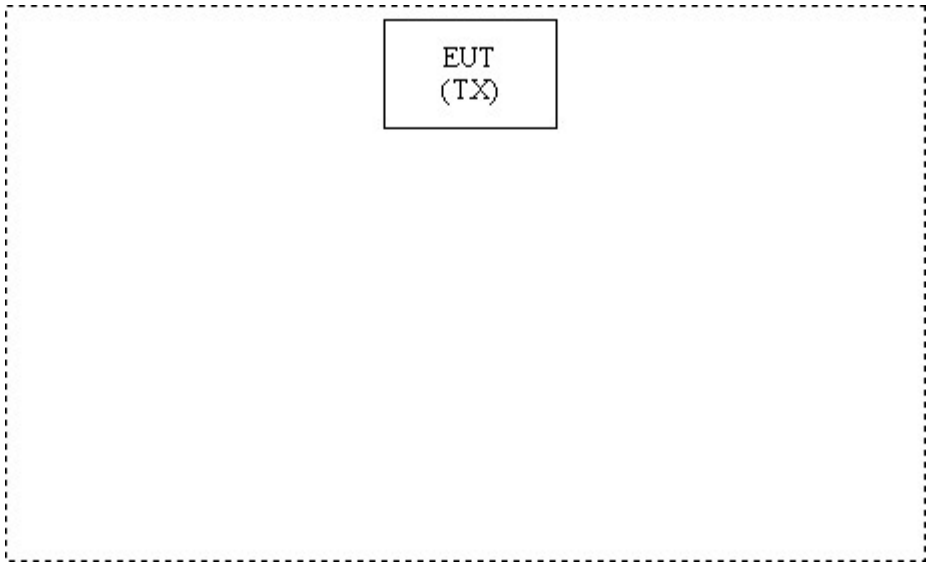
1.3. Test System Details

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

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
N/A					

Signal Cable Type	Signal cable Description
N/A	

1.4. Configuration of Test System



1.5. EUT Exercise Software

(1) Setup the EUT as shown in section 1.4.

(2) Press and hold the left and the middle button.

(3) Install the batteries.

(4) Check that the cursor moves circularly on the notebook.

(5) Remove the notebook and start the tests.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

Accreditation on NVLAP
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

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2. Conducted Emission

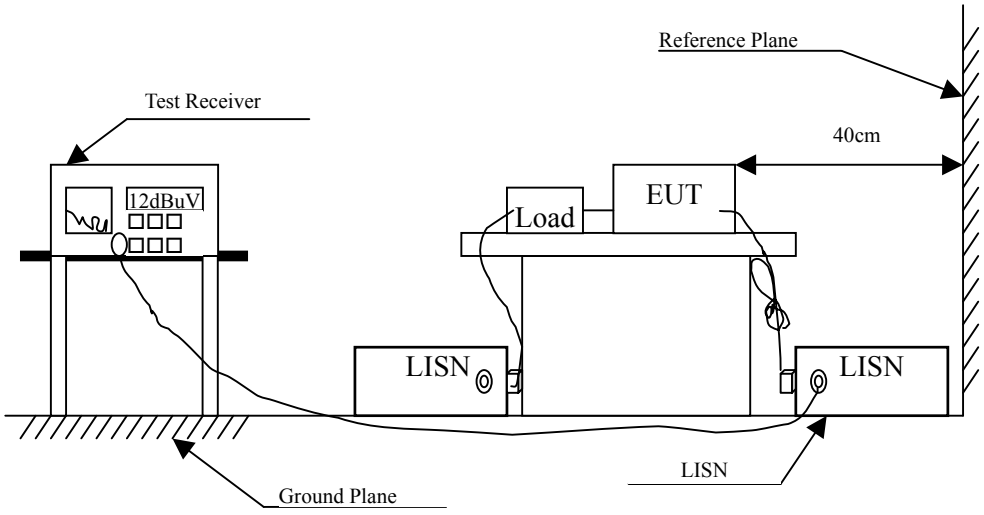
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/838251/001	May, 2006	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2006	EUT
3	L.I.S.N.	R & S	ENV 4200/833209/0023	May, 2006	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2006	
6	No.1 Shielded Room				

Note: All equipments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	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 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 refer 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 the interface cables must be changed according to ANSI C63.4: 2001 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Data of Conducted Emission

The EUT is powered by batteries. This test item is not performed

3. Radiated Emission

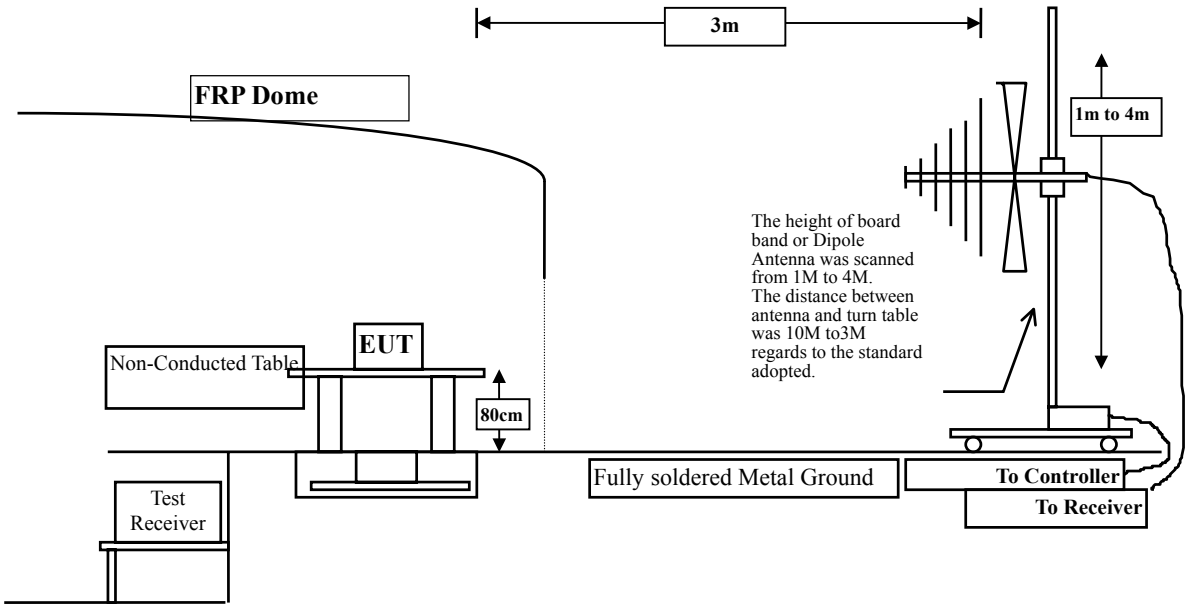
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2006
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2006
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2006
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2005
☐Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2005
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2006
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2006
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2005
☒Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2006
	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2006
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2006
	Horn Antenna	ETS	3115 / 0005-6160	July, 2006
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2006
	Broadband Antenna	Schwarzbeck	VULB9166 / 1085	April, 2006
	Loop Antenna	R&S	HFH2-Z2 / 833799/004	July, 2006

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

3.2. Test Setup



3.3. Limits

➢ FCC Part 15 Subpart C Paragraph 15.227 Limit

FCC Part 15 Subpart C Paragraph 15.227 Limits		
Fundamental Frequency MHz	Field strength of fundamental	
	uV/m	dBuV/m
26.96-27.28	10000	80.0

Remarks :

1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. 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. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

➢ Frequencies in restricted band are complied to limits on Paragraph 15.209.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks : 1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

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 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.
Radiated emissions were invested over the frequency range from 30MHz to1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 3 meters.
The frequency range from 30MHz to 10th harminics is checked.
Below 30MHz the magnetic loop antenna was used.

3.5. Uncertainty

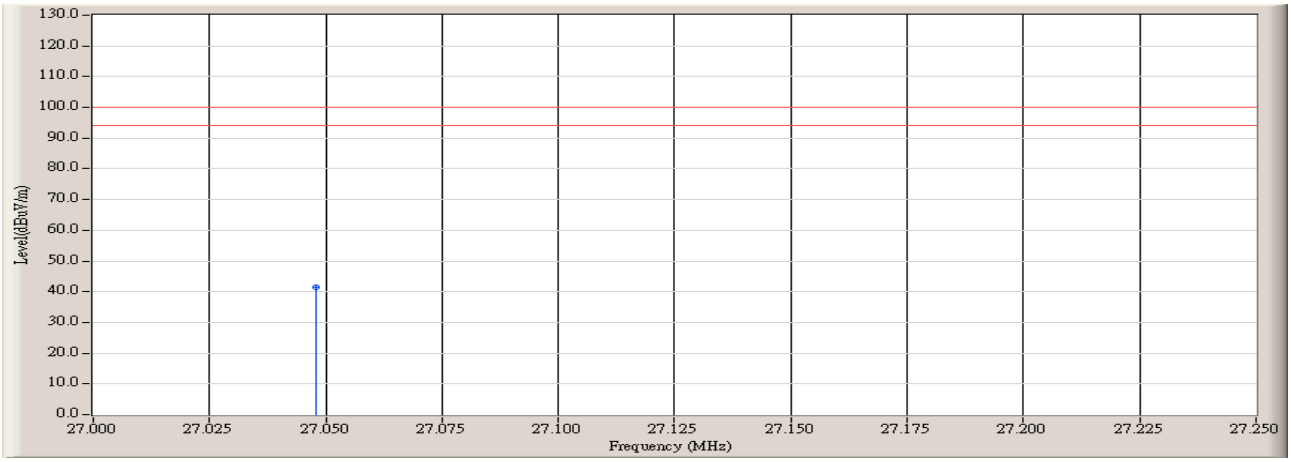
± 3.19 dB

3.6. Test Data of Radiated Emission

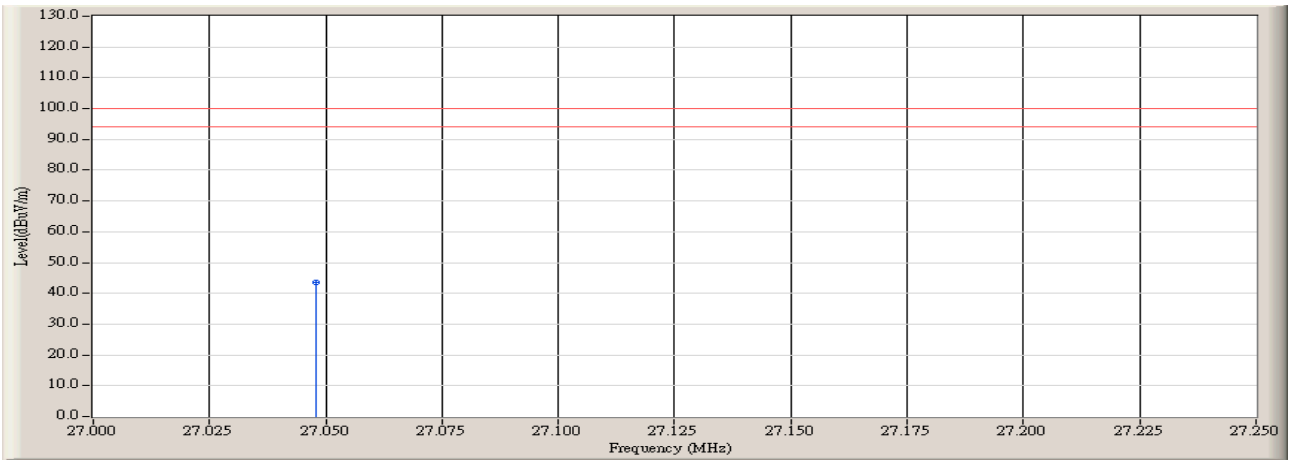
Product : 27MHz Mouse
Test Item : Fundamental Radiated Emission
Test Site : No.3 OATS
Test Voltage : Battery 1.5V*2
Test Mode : Mode 1: Transmitter (27.045MHz)

Polarity	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)
Peak Detector							
X	27.048	0.270	41.080	41.350	-58.650	100.000	80.000
Y	27.048	0.270	43.190	43.460	-56.540	100.000	80.000
Z	27.048	0.270	43.320	43.590	-56.410	100.000	80.000

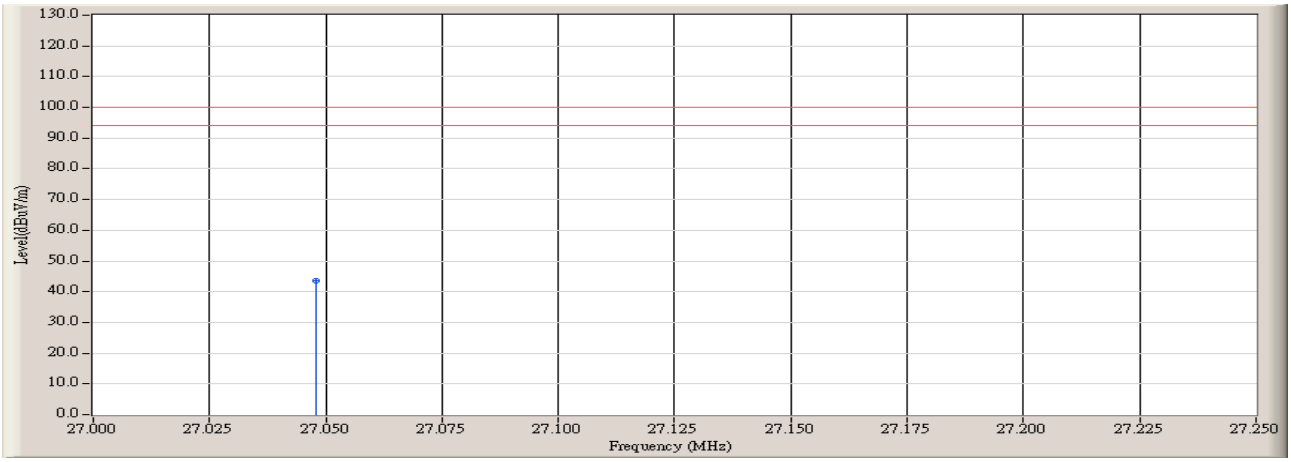
Polarity X



Polarity Y



Polarity Z



Note:

1. Below 30MHz, the magnetic loop antenna was used.
2. Only fundamental frequency is shown on the test report.
3. For those measured radiated emissions below 30MHz, not shown above, mean they are below the limit.
4. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain

5.

Product : 27MHz Mouse
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Voltage : Battery 1.5V*2
Test Mode : Mode 1: Transmitter (27.045 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
*54.090	7.482	20.600	28.082	-11.918	40.000
81.135	9.033	15.200	24.233	-15.767	40.000
108.180	12.939	13.500	26.440	-17.060	43.500
135.225	12.724	12.300	25.024	-18.476	43.500
162.270	10.523	11.600	22.123	-21.377	43.500
189.315	9.331	6.900	16.231	-27.269	43.500

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier Gain

Product : 27MHz Mouse
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Voltage : Battery 1.5V*2
Test Mode : Mode 1: Transmitter (27.045 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical					
*54.090	7.163	12.100	19.263	-20.737	40.000
81.135	8.589	9.100	17.689	-22.311	40.000
108.180	11.554	8.600	20.155	-23.345	43.500
135.225	11.848	7.800	19.648	-23.852	43.500
162.270	9.715	7.100	16.815	-26.685	43.500
189.315	9.512	6.000	15.512	-27.988	43.500

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain

4. Band Edge

4.1. Test Equipment

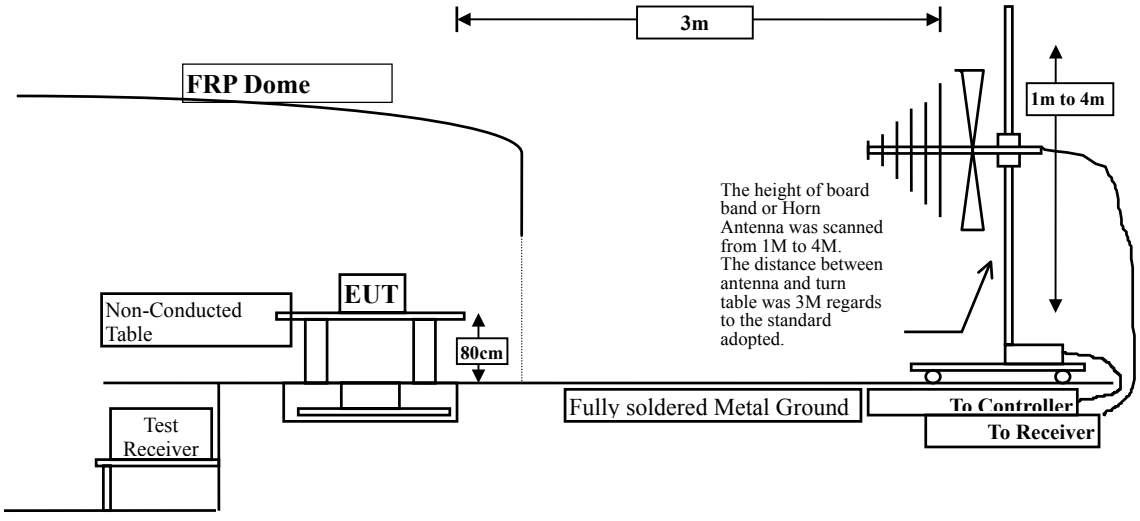
The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☐Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2006
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2006
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2006
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2005
☐Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2005
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2006
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2006
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2005
☒Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2006
	Spectrum Analyzer	HP	E4407B / US39440758	May, 2006
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2006
	Broadband Antenna	Schwarzbeck	VULB9166/1085	April, 2006
	Horn Antenna	ETS	3115 / 0005-6160	July, 2006
	Loop Antenna	R&S	HFH2-Z2/833799/004	July, 2006
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2006

Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

RF Radiated Measurement:



4.3. Limit

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)).

4.4. Test Procedure

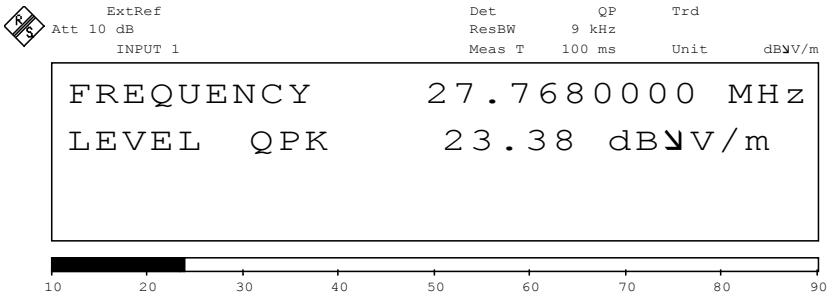
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 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.
The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field dtrength of harmonics measurement.
The bandwidth below 30MHz setting on the field strength meter is 10 kHz

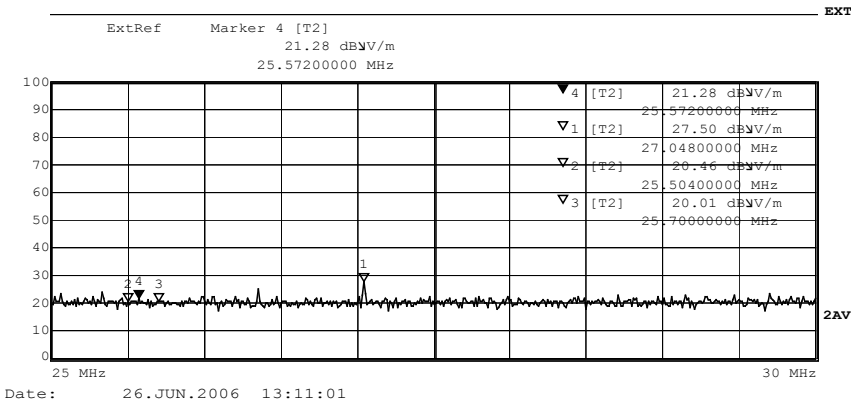
4.5. Test Result of Band Edge

Product : 27MHz Mouse
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (27.045 MHz)

RF Radiated Measurement: (Peak Detector)

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)
25.572	0.260	21.280	21.540	-28.000	49.540





5. Occupied Bandwidth

5.1. Test Equipment

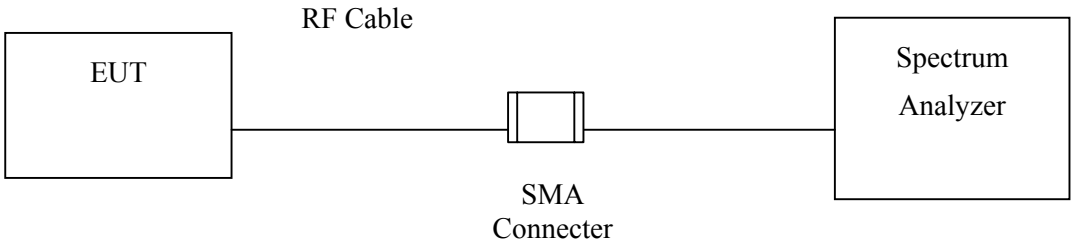
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	HP	E4407B / US39440758	May, 2006

Note: 1. All equipments are calibrated every one year.

2. The test instruments mark by "X" are used to measure the final test results.

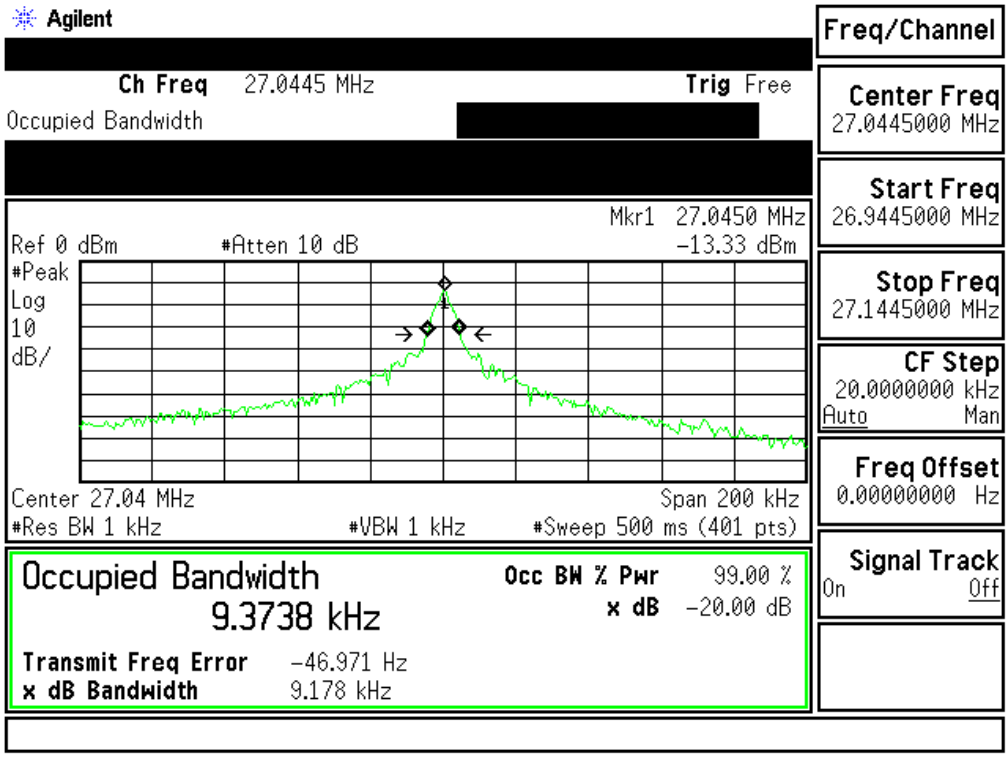
5.2. Test Setup



5.3. Test Result of Occupied Bandwidth

Product : 27MHz Mouse
Test Item : Occupied Bandwidth Data
Test Site : No.3 Shielded Room
Test Mode : Mode 1: Transmitter (27.045 MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)
1	27.045	9.3738



6. EMI Reduction Method During Compliance Testing

No modification was made during testing.