Spectrum Research & Testing Lab., Inc. No. 101-10, Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan, Taiwan, R.O.C.	**TEST REPORT**	Reference No.: A061031101 Report No.: FCCA061018101-01 Page:1 of 24 Date: Nov. 07, 2006

Product Name:	Mini Wireless Optical Mouse
Model No.:	SD-E01903-ABK-1, SD-E01502-BBK-1
Applicant:	Sonnenschein Ind. Co., Ltd. 14F-3, No. 137, Sec. 1, Fushing S. Rd., Taipei, Taiwan R.O.C
Date of Receipt:	Oct. 18, 2006
Finished date of Test:	Oct. 26, 2006
Applicable Standards:	47 CFR Part 15, Subpart C ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

This report compared to original Report No.: FCCA061018101 issued on Nov. 06, 2006 differs in Model number and Applicant. We regard it as a serial report and quote original all test data.

Tested By : Lily Yang (Lily Yang) , Date: 2006/11/07

Approved By : (Johnson Ho, Director) , Date: 11/07/2006

NVLAP®

FCC ID: SLQ-E01903-ABK-1

Lab Code: 200099-0

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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- The report must not be used by the applicant to claim that the product is endorsed by NVLAP, TÜV, NEMKO and SRT.
- The NVLAP logo applies only to the applicable standards specified in this report.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC (3V) from battery was used during the test for EUT transmitting part.
- AC 230V /50 Hz from support units was used during the test for EUT receiving part.
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2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Mini Wireless Optical Mouse
MODEL NO.	SD-E01903-ABK-1, SD-E01502-BBK-1
POWER REQUIREMENTS	DC 3.0V, 0.045A
FREQUENCY BAND	27MHz
CARRIER FREQUENCY	27.145 MHz
CHANNEL SPACING	10KHz
CHANNEL BANDWIDTH	10MHz
RF OUTPUT POWER	-17dBm~-37dBm
MODULATION TYPE	FSK
DUTY CYCLE	Up to 100%
NUMBER OF CHANNEL	1
BIT RATE OF TRANSMISSION	2.5Kbps
MODE OF OPERATION	Simplex
ANTENNA TYPE	Loop Antenna

NOTE :

1. The difference of SD-E01903-ABK-1and SD-E01502-BBK-1 is in packing boxes.
2. The EUT has 2 model numbers with difference as below:

(1) SD-E01903-ABK-1：wireless mini mouse + receiver。

(2) 2.SD-E01502-BBK-1：wireless mini mouse + wireless keypad + receiver

For more detailed features, please refer to the manufacturer's specification or User's Manual.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID/DOC	REMARK
N/A				

2.3 DESCRIPTION OF TEST MODE

The EUT was tested with a Notebook PC under TX and Link collocation.

So, we test conducted emission for mode 1, radiated emission for two modes below and band edge for mode 2.

Mode	EUT collocation
1	Link
2	TX

2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003 and CISRP22: 2003+A1: 2004. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DOC	CABLE
1	Monitor	SAMSUNG	700IFT	DOC	1.8m unshielded power cord 1.5m shielded data cable
2	1394HDD	TERASYS	F12-U	N/A	1.2m shielded data cable
3	Printer	EPSON	STYLUS C20SX	N/A	1.5m unshielded power cord 1.5m shielded data cable
4	Keyboard	ACER	6511-UV	DOC	1.5m unshielded data cable
5	Notebook	Compaq	Presario B2000	N/A	1.8m unshielded power cord

NOTE : For the actual test configuration, please refer to the photos of testing.

3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product and to be connected with a PC system for normal use. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C

ANSI C63.4: 2003

All tests have been performed and recorded as per the above standards.

4. CONDUCTED EMISSION TEST

4.1 CONDUCTED EMISSION LIMIT

FREQUENCY (MHz)	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.5 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

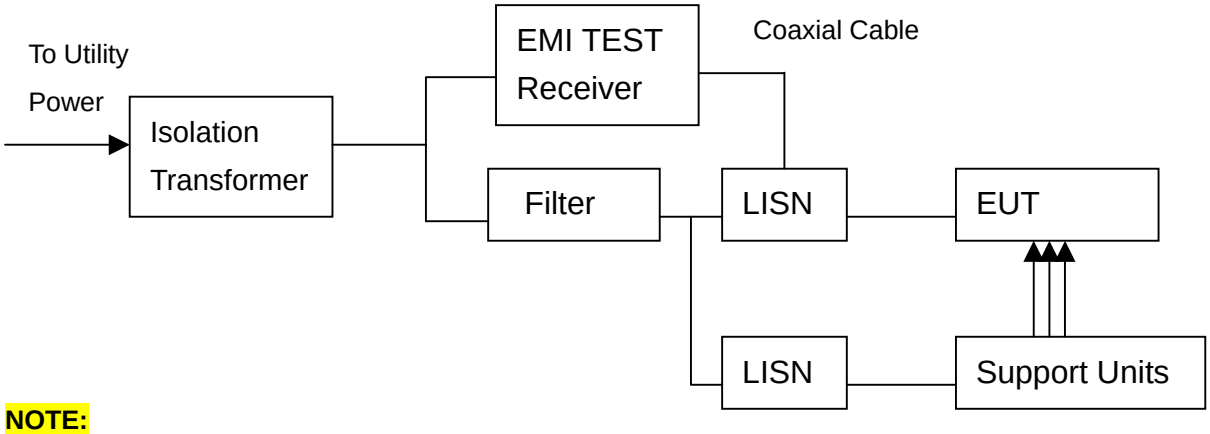
4.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz TO 2750 MHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2007 ETC
LISN (for EUT)	50 μH, 50 ohm	SOLAR ELECTRONICS	8012-50-R-24-BNC / 924839	OCT. 2007 ETC
LISN (for Peripheral)	50μH, 50 ohm	SOLAR ELECTRONICS	9252-50-R-24-BNC / 951318	OCT. 2007 ETC
50 ohm TERMINATOR	50 ohm	HP	11593A/2	OCT. 2007 ETC
COAXIAL CABLE	3m	SUNCITY	J400/ 3M	NOV. 2007 SRT
ISOLATION TRANSFORMER	N/A	APC	AFC-11015/ F102040016	N/A
FILTER	2 LINE, 30A	FIL.COIL	FC-943/ 771	N/A
GROUND PLANE	2.3M (H) x 2.4M (W)	SRT	N/A	N/A
GROUND PLANE	2.4M (H) x 2.4M (W)	SRT	N/A	N/A

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.3 TEST SETUP



NOTE:

1. The EUT was put on a wooden table with 0.8m height above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.
3. The serial no. of the LISN connected to EUT is 951318.
4. The serial no. of the LISN connected to support units is 924839.

4.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4: 2003 and CISRP22:2003+A1:2004. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50μH as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.
First, Find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

4.5 EUT OPERATING CONDITION

Technical characteristics test for Tx

1. Set the transmitter part of EUT under transmission condition continuously at the specific channel frequency.

Technical characteristics test for Rx

2. Under Windows XP run “EMI TEST”, “XCOPY” and “WINFCC” program and Notebook sent "H" pattern or accessed the following peripherals directly or via EUT:

- Color Monitor
- Keyboard
- EUT (TX)
- Printer
- HDD

4.6 TEST RESULT

Temperature:	23°C	Humidity:	60 %RH
Ferquency Range:	0.15 – 30 MHz	Tested Mode 1:	Link
Receiver Detector:	Q.P. and AV.	Tested By:	Lily Yang
		Tested Date:	Oct. 24, 2006

Power Line Measured: Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.171	0.30	45.34	21.19	45.64	21.49	64.89	54.89	-19.25	-33.40
0.177	0.30	57.12	29.78	57.42	30.08	64.61	54.61	-7.19	-24.53
0.874	0.19	36.72	29.79	36.91	29.98	56.00	46.00	-19.09	-16.02
1.299	0.14	36.52	23.39	36.66	23.53	56.00	46.00	-19.34	-22.47
1.457	0.15	34.86	22.01	35.01	22.16	56.00	46.00	-20.99	-23.84
22.308	0.39	31.78	25.41	32.17	25.80	60.00	50.00	-27.83	-24.20

Power Line Measured: Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.195	0.30	57.66	38.37	57.96	38.67	63.80	53.80	-5.84	-15.13
0.198	0.30	57.44	39.15	57.74	39.45	63.68	53.68	-5.94	-14.23
1.162	0.14	35.30	19.00	35.44	19.14	56.00	46.00	-20.56	-26.86
1.398	0.15	35.30	21.51	35.45	21.66	56.00	46.00	-20.55	-24.34
1.447	0.15	34.28	19.35	34.43	19.50	56.00	46.00	-21.57	-26.50
10.664	0.23	31.06	25.10	31.29	25.33	60.00	50.00	-28.71	-24.67

NOTE :

1. Measurement uncertainty is +/-3dB
2. Emission level = Reading value + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies were very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

5. RADIATED EMISSION TEST

5.1 RADIATED EMISSION LIMIT

FCC Part 15, Subpart C Section 15.227.

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)	
		PEAK	AVERAGE
26.96 - 27.28	3	100.0	80.0

FCC Part 15, Subpart B Section 15.209.

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

NOTE :

1. In the emission tables above , the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antemma, and the closest point of any part of the device or system.

CISPR 22:2003+A1: 2004 limits of radiated emission measurement for frequency below 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBμV/m	dBμV/m
30 – 230	40	30
230 - 1000	47	37

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).

5.2 TEST EQUIPMENT

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

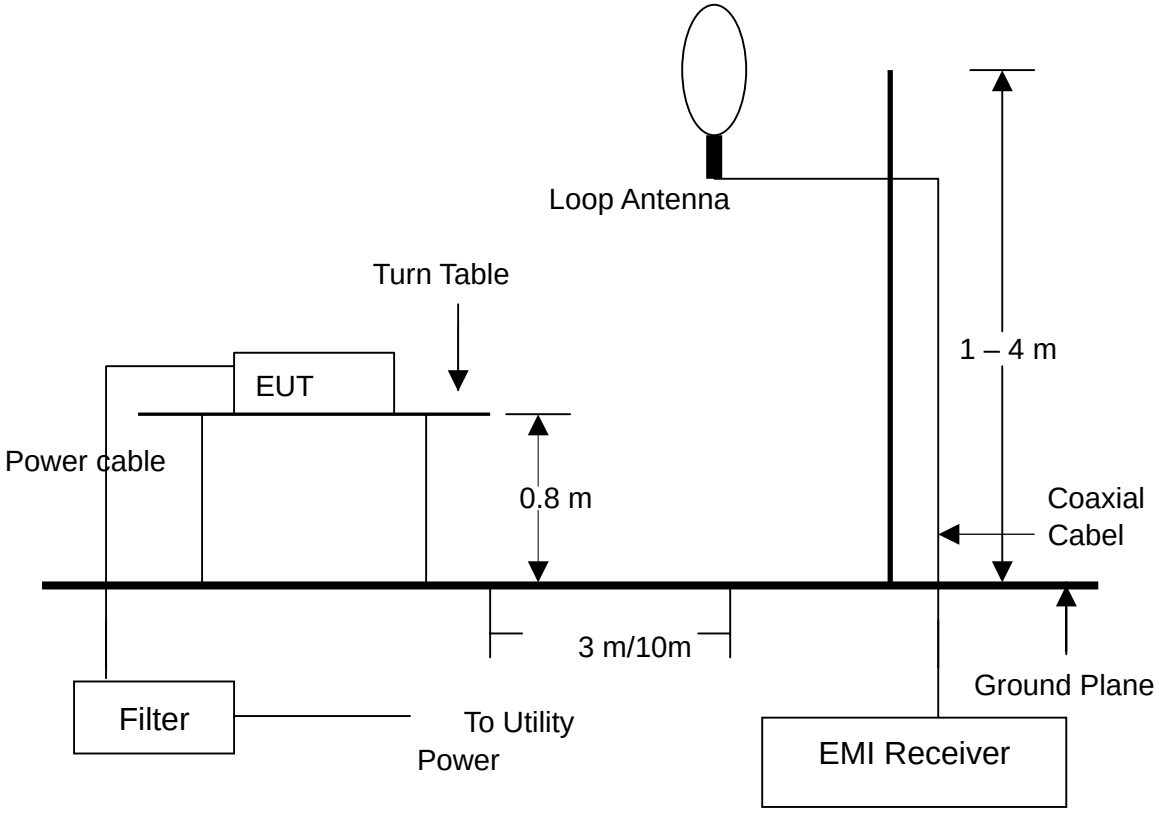
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	20 MHz TO 1000 MHz	ROHDE & SCHWARZ	ESVS30/ 841997/003	NOV. 2007 ETC
LOOP ANTENNA	9 KHz TO 30 MHz	R&S	HFH2-Z2/1162 1/2	JAN, 2007 SRT
BI-LOG ANTENNA	25 MHz TO 2 GHz	EMCO	3142/ 9701-1124	NOV. 2007 SRT
OATS	3 – 10 M MEASUREMENT	SRT	SRT-1	APR. 2007 SRT
COAXIAL CABLE	25M	SUNCITY	J400/ 25M	AUG. 2007 SRT
FILTER	2 LINE, 30A	FIL.COIL	FC-943/ 869	N/A
FREQUENCY CONVERTER	N/A	APC	AFC-1KW/ 860612	NOV. 2007 SRT

NOTE:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.
2. The Open Area Test Site (SRT-1) is registered by FCC with No. 90957 and VCCI with No. R-1081.
3. The Open Area Test Site (SRT-2) is registered by FCC with No. 98458 and VCCI with No. R-1168.

5.3 TEST SET-UP

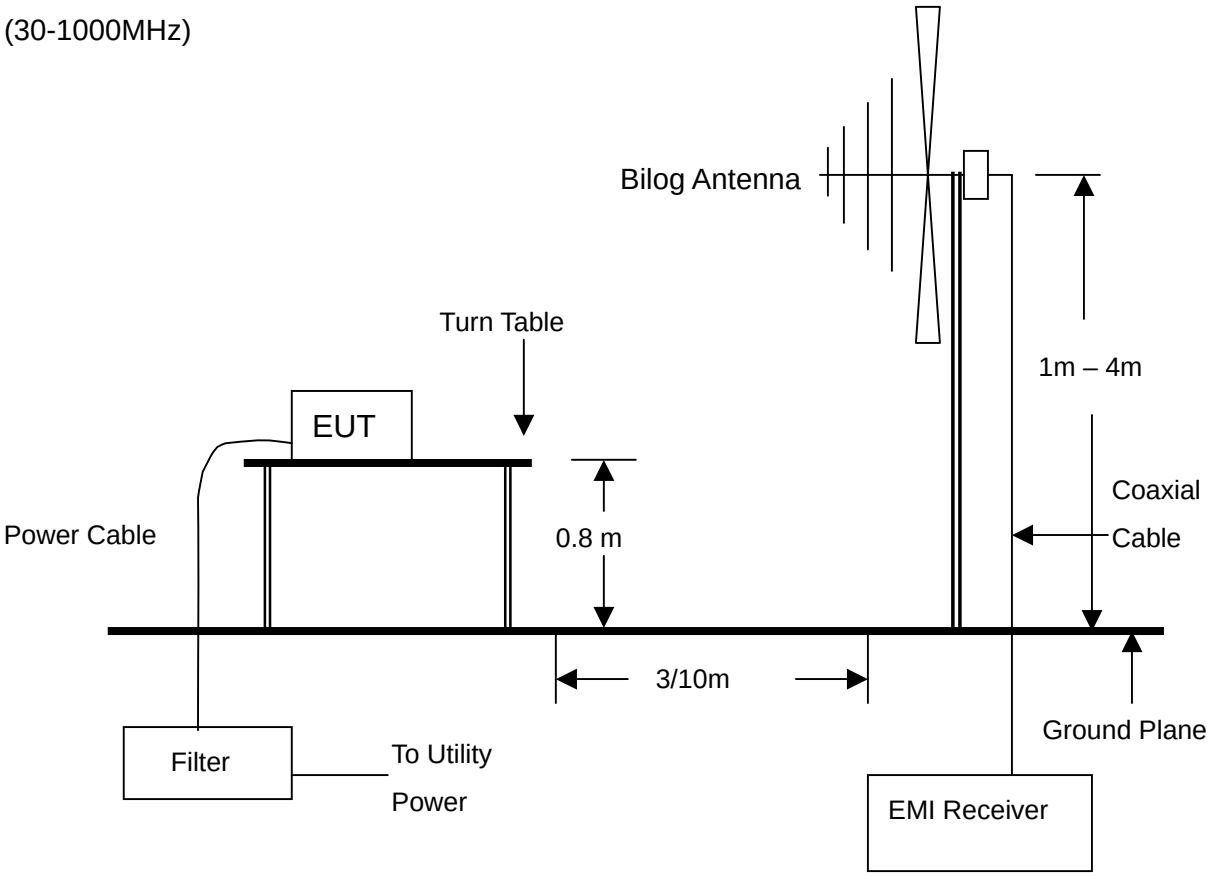
(Below 30MHz)



NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.

(30-1000MHz)



NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.

5.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003+A1: 2004. The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. Users operated the EUT system in all typical methods. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.
First, Find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

5.5 EUT OPERATING CONDITION

Same as section 4.5 of this report.

5.6 RADIATED EMISSION TEST RESULT

Temperature:	25°C	Humidity:	65 %RH
Ferquency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode 1:	Link
Tested Date:	Oct. 26, 2006	Tested By:	Lily Yang

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
79.3600	1.10	7.70	2.6	11.4	40.0	-28.6	78.4	3.9
185.0500	2.10	9.10	7.8	19.0	43.5	-24.5	157.2	3.8
275.4100	2.60	13.20	6.4	22.2	46.0	-23.8	126.4	1.8
666.6370	4.00	22.50	3.3	29.8	46.0	-16.2	10.9	1.1
729.3700	4.20	22.60	4.9	31.7	46.0	-14.3	197.2	3.0
934.0400	4.80	21.50	2.1	28.4	46.0	-17.6	87.6	2.5

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
79.4700	1.10	7.70	4.4	13.2	40.0	-26.8	68.4	1.4
112.3450	1.40	11.00	3.5	15.9	43.5	-27.6	117.9	1.2
191.0200	2.10	8.80	5.2	16.1	43.5	-27.4	171.2	1.1
666.2170	4.00	22.50	4.2	30.7	46.0	-15.3	24.8	1.2
733.1450	4.20	22.50	5.1	31.8	46.0	-14.2	112.5	1.0
800.0750	4.40	21.20	2.2	27.8	46.0	-18.2	164.2	1.3

NOTE :

1. Measurement uncertainty is +/-2dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	25°C	Humidity:	65 %RH
Ferquency Range:	30 - 1000 MHz	Measured Distance:	3m
Receiver Detector:	PK & AV	Tested Mode 2:	TX (Fundamental Frequency)
Tested By:	Lily Yang		
Tested Date:	Oct. 26, 2006		

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
27.15(F)	0.03	20.20	13.4(PK)	33.70	100.0	-66.30
27.15(F)	0.03	20.20	12.7(AV)	32.93	80.0	-47.07

NOTE :

1. Measurement uncertainty is less than +/- 2dB
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss
4. The field strength of other emission frequencies were very low against the limit.
5. (F) : Fundamental frequency of transmitter.

Temperature:	25°C	Humidity:	65 %RH
Ferquency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode 2:	TX (Harmonic Frequency)
Tested Date:	Jun. 10, 2006	Tested By:	Lily Yang

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
53.8900	0.90	6.80	2.4	10.1	40.0	-29.9	295	3.6
80.8900	1.10	7.90	2.4	11.4	40.0	-28.6	276	3.9
107.8900	1.30	10.90	2.6	14.8	43.5	-28.7	256	2.3
134.8900	1.60	11.70	2.5	15.8	43.5	-27.7	112	1.8

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
54.1780	0.90	6.80	2.2	9.9	40.0	-30.1	89.1	2.4
80.8900	1.10	7.90	2.4	11.4	40.0	-28.6	125	1.0
107.8900	1.30	10.90	2.8	15.0	43.5	-28.5	141	1.0
134.8900	1.60	11.70	2.3	15.6	43.5	-27.9	156	3.9

NOTE :

1. Measurement uncertainty is +/-2dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies was very low against the limit.

Temperature:	25°C	Humidity:	65 %RH
Ferquency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode 2:	TX (spurious emission)
Tested Date:	Oct. 26, 2006	Tested By:	Lily Yang

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Ant. Pol. (H/V)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
82.2700	1.10	8.10	H	2.5	11.7	40.0	-28.3	102	3.9
166.6670	1.70	10.70	H	2.2	14.6	43.5	-28.9	198	3.9
879.7200	4.60	20.80	H	2.2	27.6	46.0	-18.4	342	1.4
619.7600	3.80	21.10	V	2.3	27.2	46.0	-18.8	194	2.4
913.5650	4.70	21.00	V	2.2	27.9	46.0	-18.1	174	3.9

NOTE :

1. Measurement uncertainty is +/-2dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies was very low against the limit.

6. BAND EDGE

6.1 BAND EDGE LIMIT

The field strength of any emissions, which appear outside of this band, shall not exceed the general radiated emission limits in Section 15.209.

6.2 TEST EQUIPMENT

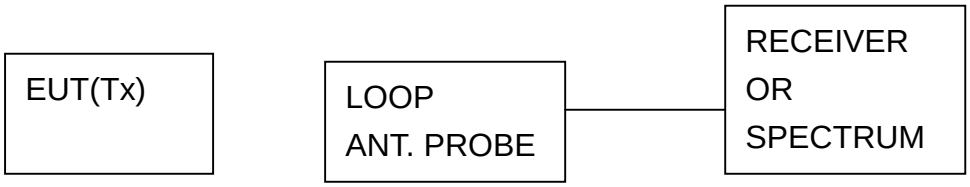
The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9 kHz TO 7GHz	ROHDE & SCHWARZ	FSP7/ 839511/010	MAY 2007 R&S

NOTE:

The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

6.3 TEST SET-UP



6.4 TEST PROCEDURE

A specific loop antenna was connected to receiver to detect the EUT's power level.
The Receiver displayed the EUT's power level and printed out the plot of measurement.

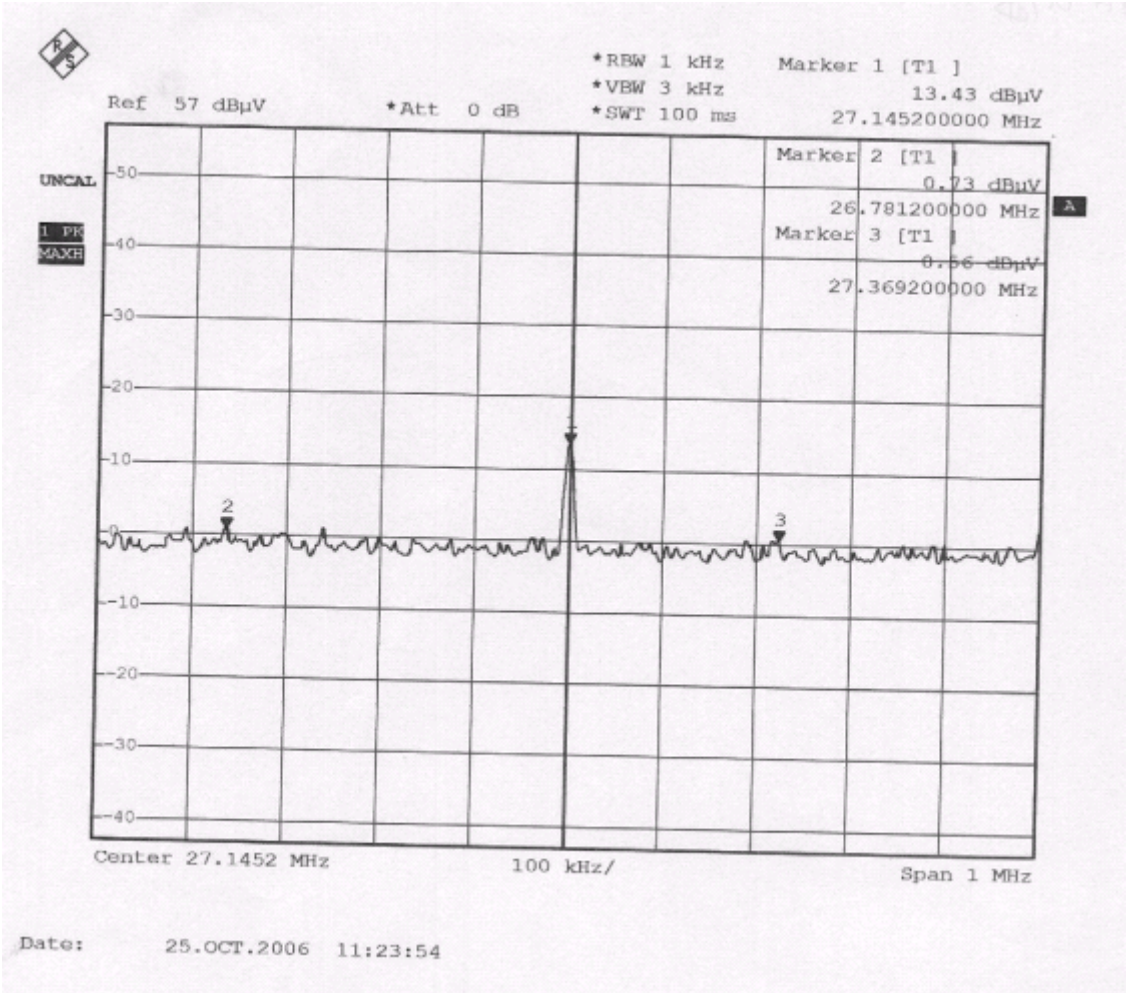
6.5 EUT OPERATING CONDITION

Set the EUT under transmission condition continuously at specific channel frequency.

6.6 BAND EDGE TEST RESULT

Temperature:	25 °C	Humidity:	55 %RH
Receiver Detector:	Peak	Tested By:	Lily Yang
Test Result:	Pass	Tested Date:	Oct. 26, 2006

1. Measurement uncertainty is +/-0.6dB.



7. PHOTOS OF TESTING

- Conducted emission test –Mode 1: Link

- Radiated emission test–Mode 1: Link

Radiated emission test – Mode 2: TX (Below 30MHz)

Radiated emission test – Mode 2: TX (Below 1GHz)

8. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction