FCC TEST REPORT

REPORT NO. : RF931101A01
MODEL NO. : MORFA2UO, 5187-8682
RECEIVED : Nov. 1, 2004
TESTED : Nov. 5, 2004
ISSUED: Nov. 9, 2004

APPLICANT : PRIMAX ELECTRONICS LTD.

ADDRESS : No. 669, Ruey Kuang Road, Neihu, Taipei, Taiwan. R.O.C.

ISSUED BY : Advance Data Technology Corporation

LAB ADDRESS : No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION : No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

ACCREDITED
No. 2177-01

CNLA
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ILAC MRA

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1 CERTIFICATION

PRODUCT NAME :	Gen1 SS Wireless Rechargeable Mouse
MODEL NO. 1:	MORFA2UO (Brand: PRIMAX)
MODEL NO. 2:	5187-8682 (Brand: HP)
APPLICANT :	PRIMAX ELECTRONICS LTD.
TESTED :	Nov. 5, 2004
TEST SAMPLE :	ENGINEERING SAMPLE
STANDARDS :	FCC Part 15, Subpart C (15.227) ANSI C63.4-2003

The above equipment (model: MORFA2UO) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Annie Chang , **DATE:** Nov. 9, 2004
(Annie Chang)

TECHNICAL ACCEPTANCE : , **DATE:** Nov. 9, 2004
Responsible for EMI (Arthur Lin)

APPROVED BY : , **DATE:** Nov. 9, 2004
(Cody Chang, Deputy Manager)

2 SUMMARY OF TEST RESULTS

After estimating all the combination of every test mode and channel, the result shown as below is the worst case.

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD PARAGRAPH	**TEST TYPE**	**RESULT**	**REMARK**
15.207	Conducted Emission Test	NA	Power supply is 3Vdc from one battery
15.227	Radiated Emission Test	PASS	Minimum passing margin is -10.71 dB at 705.77 MHz

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

MEASUREMENT	UNCERTAINTY
Radiated emissions	3.86 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Gen1 SS Wireless Rechargeable Mouse
MODEL NO	MORFA2UO
POWER SUPPLY	3Vdc from one battery for transmitter
MODULATION TYPE	FSK
CARRIER FREQUENCY OF EACH CHANNEL	27.045 MHz
BANDWIDTH OF EACH CHANNEL	NA
MAXIMUM FIELD STRENGTH	119.26 μV/m @ 3m
NUMBER OF CHANNEL	1
ANTENNA TYPE	Loop antenna
DATA CABLE	NA
I/O PORTS	NA

NOTE:

1. The EUT is a transmitter part of Gen1 SS Wireless Rechargeable Mouse.
2. The EUT has two model names, which are identical to each other except for their brand name only for marketing differentiation as following:

BRAND	MODEL NO.
PRIMAX	MORFA2UO
HP	5187-8682

From above models, model no.: **MORFA2UO** was selected as the representative model for the test and therefore only its test data was recorded in this report.

3. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

One channel was provided to this EUT.

Channel	Frequency
1	27.045MHz

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of a Gen1 SS Wireless Rechargeable Mouse. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

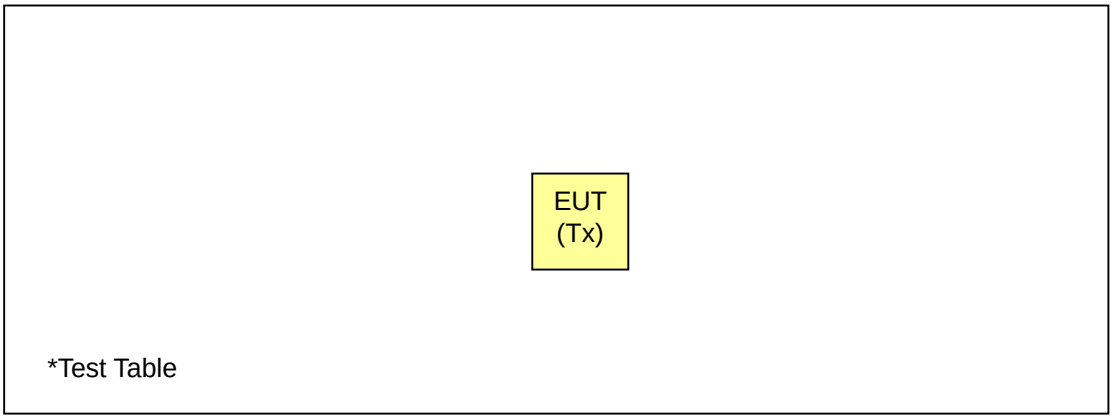
FCC Part 15, Subpart C (15.227)
ANSI C63.4-2003

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

3.4 DESCRIPTION OF SUPPORT UNITS

NA

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST PROCEDURE AND RESULT

4.1 CONDUCTED EMISSION MEASUREMENT

NA

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.227 the field strength of Emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m)	
26.96~27.28	Peak	Average
	100	80

Field strength limits are at the distance of 3 meters, Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any Emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Preamplifier	8447D	2432A03504	Jun. 3, 2005
***** HP Preamplifier	8449B	3008A01924	Sep. 19, 2005
***** HP Preamplifier	8449B	3008A01638	Sep. 30, 2005
SCHWARZBECK Tunable Dipole Antenna	VHA 9103	NA	Oct. 29, 2005
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* ROHDE & SCHWARZ TEST RECEIVER	ESI7	836697/012	Nov. 05, 2005
Schwarzbeck Antenna	VULB 9168	137	Feb. 27, 2005
Schwarzbeck Antenna	VHBA 9123	480	Feb. 18, 2005
***** EMCO Horn Antenna	3115	6714	Oct. 28, 2005
***** EMCO Horn Antenna	3115	9312-4192	Feb. 28, 2005
ADT. Turn Table	TT100	0306	NA
ADT. Tower	AT100	0306	NA
Software	ADT_Radiated_V6	NA	NA
TIMES RF cable	LL142	CABLE-CH6-01	Apr. 16, 2005

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. "*" = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Chamber No. 6.
5. The Industry Canada Reference No. IC 3789-6.

4.2.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected Emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

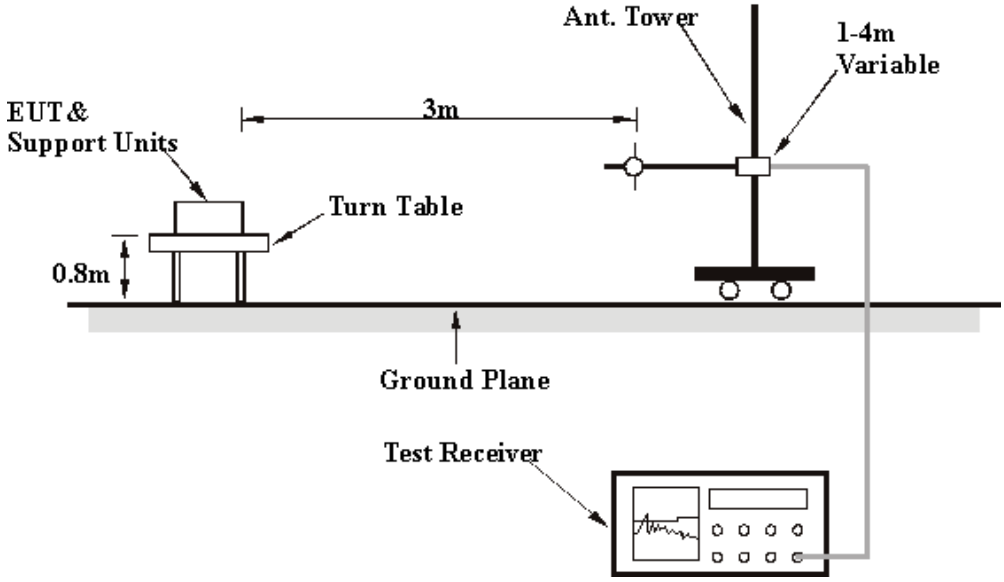
f. If the Emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the Emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

4.2.4 DEVATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item in this test report - Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITION

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

4.2.7 TEST RESULTS

EUT	Gen1 SS Wireless Rechargeable Mouse	**MODEL**	MORFA2UO
INPUT POWER	3 Vdc	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 68% RH, 991 hPa	**DETECTOR FUNCTION**	Peak / Quasi-Peak
TESTED BY	Jamison Chan		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*27.05	44.38 PK	100.00	-55.62	2.10 H	189	36.98	7.40
2	*27.05	41.53 QP	80.00	-38.47	2.10 H	189	34.13	7.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*27.05	39.30 PK	100.00	-60.70	1.00 V	100	31.90	7.40
2	*27.05	36.77 QP	80.00	-43.23	1.00 V	100	29.37	7.40

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other Emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. ”∗”= Fundamental frequency.

EUT	Gen1 SS Wireless Rechargeable Mouse	**MODEL**	MORFA2UO
INPUT POWER	3 Vdc	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 68% RH, 991 hPa	**DETECTOR FUNCTION**	Quasi-Peak
TESTED BY	Jamison Chan		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	54.79	22.09 QP	40.00	-17.91	3.00 H	136	8.56	13.54
2	**705.77**	**35.29 QP**	**46.00**	**-10.71**	**1.00 H**	**106**	**11.91**	**23.38**
3	745.64	30.19 QP	46.00	-15.81	1.00 H	256	5.56	24.63
4	799.53	30.62 QP	46.00	-15.38	1.00 H	256	5.76	24.86
5	854.50	29.08 QP	46.00	-16.92	1.00 H	244	3.48	25.60
6	901.92	29.04 QP	46.00	-16.96	2.00 H	256	3.28	25.77

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	705.77	29.20 QP	46.00	-16.80	1.50 V	10	5.81	23.38
2	797.38	27.09 QP	46.00	-18.91	1.50 V	214	2.23	24.86
3	850.19	28.28 QP	46.00	-17.72	4.00 V	88	2.69	25.59
4	887.91	27.70 QP	46.00	-18.30	3.00 V	40	2.01	25.70
5	926.71	28.49 QP	46.00	-17.51	2.00 V	196	2.26	26.23
6	959.04	28.02 QP	46.00	-17.98	1.50 V	220	1.37	26.65

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other Emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST

6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.