



20 June 2011

Comat Electronic (Shenzhen) Co., Ltd
No.2 Lane 1, Xin'an 3rd 28 District Baoan
Shenzhen, Guangdong, China

Dear Xiaowen Zhang :

Enclosed you will find your file copy of a Part 15 report (FCC ID: RTX-CR703).

For your reference, TCB will normally take another 5 days for reviewing the report.
Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn Xing", with a long horizontal stroke extending to the right.

Shawn Xing
Manager

Enclosure

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com



Comat Electronic (Shenzhen) Co., Ltd

Application
For
Certification
(FCC ID: RTX-CR703)

2.4G wireless optical mouse

Model: S1

2.4GHz Transceiver

SZ11050257-3

Billy Li

20 June 2011

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results referenced from this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF No.: FCC 15C_PC_a
FCC ID: RTX-CR703

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

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INTERTEK TESTING SERVICES

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INTERTEK TESTING SERVICES

MEASUREMENT / TECHNICAL REPORT

Comat Electronic (Shenzhen) Co., Ltd – MODEL: S1

FCC ID: RTX-CR703

20 June 2011

This report concerns (check one:) Original Grant ☒ Class II Change ☐

Equipment Type: JBP-Class B Computing Device Peripheral

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-10 Edition] provision.

Report prepared by:

Shawn Xing
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INTERTEK TESTING SERVICES

List of attached file

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Request	request.pdf
Cover Letter	Letter of Agency	agency.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The Equipment under Test (EUT) is a 2.4G wireless USB dongle unit, model: S1 operating at 2.4GHz band. It is powered by PC USB port.

1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral.

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1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The Semi-anechoic chamber and conducted measurement facility used to collect the radiated data is **Interterk Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC.

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

The EUT was powered by PC USB Port during test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency range from 30MHz to 1GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

2.2 EUT Exercising Software

There was no special software to exercise the device.

2.3 Special Accessories

N/A

2.4 Equipment Modification

Any modifications installed previous to testing by Comat Electronic (Shenzhen) Co., Ltd will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

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2.6 Support Equipment List and Description

This product was tested in the following configuration:

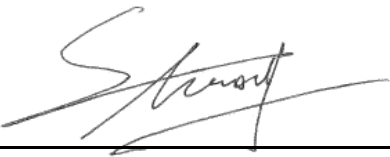
Refer List:

Description	Manufacturer	Model No.
Test PC	HP	2510P
Hard Disk	Smart.drive	HD3-SU2FW
USB Cable	Smart.drive	Length 155cm
1394 Cable	Smart.drive	Length 180cm

All the items listed under section 2.0 of this report are

Confirmed by:

Shawn Xing
Manager
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
Agent for Comat Electronic (Shenzhen) Co., Ltd



Signature

20 June 2011
Date

INTERTEK TESTING SERVICES

EXHIBIT 3

EMISSION RESULTS

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3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

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3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0dB μ V is obtained. The antenna factor of 7.4dB and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is 32dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{dB}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

$$PD = 0\text{dB}$$

$$AV = -10\text{dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8\mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
39.568 MHz (Data Transfer)

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

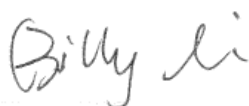
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3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 11.3dB margin (Data Transfer)

TEST PERSONNEL:



Signature

Billy Li Engineer

Typed / Printed Name

20 June 2011

Date

INTERTEK TESTING SERVICES

Company: Comat Electronic (Shenzhen) Co., Ltd

Date of Test: 20 June 2011

Model: S1

Worst Case Operating Mode: Data Transfer

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	39.568	35.8	20.0	12.9	28.7	40.0	-11.3
Horizontal	40.038	33.6	20.0	12.9	26.5	40.0	-13.5
Horizontal	46.254	34.7	20.0	10.7	25.4	40.0	-14.6
Vertical	56.238	38.6	20.0	8.2	26.8	40.0	-13.2
Vertical	59.650	34.8	20.0	7.8	22.6	40.0	-17.4
Vertical	62.238	36.1	20.0	7.4	23.5	40.0	-16.5

- NOTES:
1. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 2. Negative value in the margin column shows emission below limit.
 3. All emissions are below the QP limit.

Test Engineer: Billy Li

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3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration
at
0.198 MHz

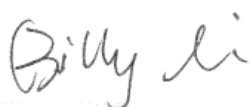
For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

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3.5 Conducted Emission Data

Judgement: Passed by 16.9 dB margin

TEST PERSONNEL:



Signature

Billy Li, Project Engineer

Typed/Printed Name

20 June 2011

Date

INTERTEK TESTING SERVICES

Company: Comat Electronic (Shenzhen) Co., Ltd

Date of Test: 20 June 2011

Model: S1

Worst Case Operating Mode: Data Transfer

Table 2
Conducted Emissions

Live Line Data

Frequency (MHz)	Quasi-Peak		Average	
	Disturbance level dB(μ V)	Permitted limit dB(μ V)	Disturbance level dB(μ V)	Permitted limit dB(μ V)
0.1980	46.4	63.7	34.0	53.7
0.398	31.8	57.9	25.3	47.9
0.534	33.7	56.0	25.9	46.0
2.010	29.7	56.0	20.2	46.0
4.470	27.6	56.0	16.5	46.0
21.994	28.9	60.0	23.7	50.0

Neutral Line Data

Frequency (MHz)	Quasi-Peak		Average	
	Disturbance level dB(μ V)	Permitted limit dB(μ V)	Disturbance level dB(μ V)	Permitted limit dB(μ V)
0.198	46.8	63.7	34.5	53.7
0.266	39.1	61.2	29.4	51.2
0.466	35.9	56.6	28.8	46.6
0.862	30.9	56.0	22.4	46.0
2.438	30.9	56.0	20.3	46.0
21.514	29.6	60.0	24.2	50.0

Test Engineer: Billy Li

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

INTERTEK TESTING SERVICES

4.0 **Equipment Photographs**

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

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EXHIBIT 5

PRODUCT LABELLING

INTERTEK TESTING SERVICES

5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

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EXHIBIT 6

TECHNICAL SPECIFICATIONS

INTERTEK TESTING SERVICES

6.0 **Technical Specifications**

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf.

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EXHIBIT 7

INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold / leased in the United States.

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EXHIBIT 8

MISCELLANEOUS INFORMATION

INTERTEK TESTING SERVICES

8.0 **Miscellaneous Information**

This miscellaneous information includes emission measuring procedure.

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8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of computer peripheral operating under Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2003.

The computer peripheral equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in QP mode from the frequency band 30MHz to 1GHz and RBW setting is 120kHz. Detector function for conducted emissions are in QP & AV mode and IFBW setting is 9kHz from the frequency band 150kHz to 30MHz.

For radiated emission, the frequency range scanned is 30MHz to 1GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

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8.1 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

Conducted measurements are made as described in ANSI C63.4 – 2003.

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EXHIBIT 9

CONFIDENTIALITY REQUEST

INTERTEK TESTING SERVICES

9.0 **Confidentiality Request**

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

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EXHIBIT 10

TEST EQUIPMENT LIST

INTERTEK TESTING SERVICES

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	15-Mar-2010	15-Sep-2011
SZ185-01	EMI Receiver	R&S	ESCI	100547	08-Mar-2011	08-Mar-2012
SZ061-08	Horn Antenna	ETS	3115	00092346	15-Mar-2010	15-Sep-2011
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	08-Mar-2011	08-Mar-2012
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	08-Mar-2011	08-Mar-2012
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	06-Mar-2011	06-Mar-2012
SZ062-02	RF Cable	RADIAL	RG 213U	--	16-Sep-2010	16-Sep-2011
SZ062-06	RF Cable	RADIAL	0.04-26.5GHz	--	16-Sep-2010	16-Sep-2011
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	--	16-Sep-2010	16-Sep-2011
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	12-Nov-2010	12-Nov-2011
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	12-Nov-2010	12-Nov-2011
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	12-Nov-2010	12-Nov-2011
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Sep-2010	16-Sep-2011