

TEST REPORT

Report No.: 20183REM.101**TEST NAME: ELECTROMAGNETIC COMPATIBILITY TESTS**

Product : **BLUETOOTH WIRELESS HUB**
Trade Mark : **LOGITECH**
Model/ type Ref. : **C-BQ16A**
Manufacturer : **SUZHOU LOGITECH ELECTRONICS CO., LTD**
Requested by : **LOGITECH EUROPE, S.A.**
Other identification of the product : **Prototype**
Standard(s) : **ELECTROMAGNETIC EMISSION.**
- FCC Rules and Regulations 47 CFR Part 15, Subpart C
(2003/07/22 Ed.); Continuous Conducted Emission (Class B).

This test report includes 1 annex and therefore, the total number of pages is 11.

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Date: 2004-09-21	Test operator: Rafael López 	Revised by: Date: 22-SEP-2004 Antonio Rojas Area Manager 	Approved by: Date: 22-SEP-2004 Francisco Broissin Division Director P.A. 	AGY-734636-0000.A0 Page: 1 of 7
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INDEX

1. COMPETENCE AND GUARANTEES	3
2. GENERAL CONDITIONS	3
3. CHARACTERISTICS OF THE TEST	3
3.1. SERVICES REQUESTED	3
3.2. REQUIREMENTS AND METHOD.....	4
4. IDENTIFICATION DATA SUPPLIED BY THE APPLICANT.....	4
4.1. APPLICANT	4
4.2. TEST SAMPLES SUPPLIER	4
4.3. IDENTIFICATION OF ITEM/ITEMS TESTED.....	4
5. USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS....	5
5.1. USAGE OF SAMPLES	5
5.2. TESTING PERIOD	5
5.3. ENVIROMENTAL CONDITIONS	5
6. TEST RESULTS	6
6.1. RESULTS FOR ELECTROMAGNETIC EMISSION	6
7. REMARKS AND COMMENTS.....	7
8. SUMMARY.....	7

ANNEXES OF RESULTS

A. MEASURING RESULTS FOR ELECTROMAGNETIC EMISSIONS.....	4 PAGES
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1. COMPETENCE AND GUARANTEES

This certificate of conformity was issued in accordance with the decision N° 3/2000 of the Joint Committee established under the Agreement on Mutual Recognition between the European Community and the United States of America. By this decision, CETECOM can act as Conformity Assessment Body (CAB) on Electromagnetic Compatibility. This Certificate applies to the samples listed at technical reports.

CETECOM is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, CETECOM has a calibration and maintenance programme for its measurement equipment.

CETECOM guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at CETECOM at the time of performance of the test.

CETECOM is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

2. GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of CETECOM.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of CETECOM and the Accreditation Bodies.

3. CHARACTERISTICS OF THE TEST

3.1. SERVICES REQUESTED

The ordered services were to carry out the following tests:

1. Continuous conducted emission, power leads:
Standard: FCC Rules and Regulations 47 CFR Part 15
Limit: Class B
Method: FCC Rules and Regulations 47 CFR Part 15, Subpart C

Report No.: 20183REM.101		Page: 3 of 7
Date: 2004-09-21		AGY-734636-0000.A0

3.2. REQUIREMENTS AND METHOD

The test has been carried out according to the following documents and standards:

1. FCC Rules and Regulations 47 CFR Part 15, Subpart B: Limits and methods of measurements for radio frequency devices. Unintentional radiators.

The testing procedures used are:

1. PEEM001: Medida de la tensión perturbadora en bornes de alimentación según EN 55022.

Uncertainty (factor k=2) was calculated according to the following CETECOM's internal documents:

1. PODT000: Procedimiento para el cálculo de incertidumbres de medida
2. FEM12_07: Formato de cálculo de incertidumbre a aplicar en la medida de la tensión perturbadora en bornes de alimentación según EN 55022.

4. IDENTIFICATION DATA SUPPLIED BY THE APPLICANT

Identification data included in this section has been supplied by the client.

4.1. APPLICANT

Name / Company: Logitech Europe, S.A.

V.A.T. Registration number / Passport number: N/A

Address: ZI Moulin du Choc, Romanel Sur Morges **P.C.:** 11222

Country: Switzerland

Telephone: +41 (0)21 863 50 67

Fax: +41 (0)21 863 53 33

Contact person: Pascal Bornel

4.2. TEST SAMPLES SUPPLIER

The same as the applicant.

Samples undergoing test have been selected by: **Logitech Europe, S.A.**

4.3. IDENTIFICATION OF ITEM/ITEMS TESTED

Product: Bluetooth wireless hub

Trade mark: Logitech **Model:** C-BQ16A

Manufacturer: Suzhou Logitech Electronics Co., LTD

Country of manufacture: P. R. C.

Manufacture site address: No. 168, Bin He Rd, Standard Plant, Suzhou City.

Other identification remarks : Prototype.

Description: Wireless Hub for cordless Keyboard, Numpad and Mouse and using Bluetooth technology.

Report No.:
20183REM.101

Date: 2004-09-21

Page: 4 of 7

AGY-734636-0000.A0

5. USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS

5.1. USAGE OF SAMPLES

Sample S/01 is composed of the following elements:

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
20183/22	Battery charger	Bluetooth	---	08/06/2004

During the tests were used next ancillary equipment:

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
20183/02	Bluetooth mouse	MX900	851977	08/06/2004
-	Portable PC	PS610E-NGYSC-SP	13123012G	08/06/04

Different samples were used in the following way:

1. Sample S/01 has undergone to the following test(s):

1. Continuous conducted emission, power leads

5.2. TESTING PERIOD

The performed test started on 2004/09/16 and finished on 2004/09/16.

The tests have been performed at CETECOM.

5.3. ENVIROMENTAL CONDITIONS

Environmental conditions:

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 80 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

Report No.:
20183REM.101

Date: 2004-09-21

Page: 5 of 7

AGY-734636-0000.A0

In the semianechoic chamber (21 meters x 11 meters x 8 meters), the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 30 °C
Relative humidity	Min. = 45 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 30 °C
Relative humidity	Min. = 45 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

6. TEST RESULTS

Abbreviations used in the VERDICT column of the following tables are:

P	Pass
F	Fail
NA	not applicable
NM	not measured

6.1. RESULTS FOR ELECTROMAGNETIC EMISSION

See Annex: A

MEASURING RESULTS FOR ELECTROMAGNETIC EMISSION	VERDICT			
	NA	P	F	NM
Continuous conducted emission, power leads. Class B. (On sample 01)		P		

Report No.: 20183REM.101		Page: 6 of 7
Date: 2004-09-21		AGY-734636-0000.A0

7. REMARKS AND COMMENTS

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1 GHz is $I = \pm 3,1$ dB for quasi-peak measurements, $I = \pm 2,9$ dB for peak measurements ($k = 2$) and from 1 to 12,75 GHz is $I = \pm 4,04$ dB for average measurements. And for average measurements from 1 to 12,75 GHz the uncertainty $I = \pm 4,04$ dB and from 12,75 GHz to 25 GHz is 4,21 dB.

7.1. SUMMARY

Considering the results of the performed test, stated in annex A, the item under test is **IN COMPLIANCE** with the specifications listed in section 3.1 “TEST REQUESTED”.

NOTE: The results presented in this Test Report apply only to the particular item under test established in section “4.3. IDENTIFICATION OF ITEM/ITEMS TESTED” of this document, as presented for test on the date(s) shown in section 5, “USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS”.

Report No.: 20183REM.101		Page: 7 of 7
Date: 2004-09-21		AGY-734636-0000.A0

ANNEX A

MEASURING RESULTS FOR ELECTROMAGNETIC EMISSION

For the sample under test, named S/01 and, that was formed by the elements described in the clause “Identification of the tested item/items” of this test report.

ANNEX A CONTENTS:

1. - CONTINUOUS CONDUCTED EMISSION, POWER LEADS ON THE SAMPLE S/01.....	2
2. - GRAPH RESULTS	2

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1. - CONTINUOUS CONDUCTED EMISSION, POWER LEADS ON THE SAMPLE S/01

LIMITS OF INTERFERENCE

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart C (2003/07/22 Ed.) in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit (dBmV)	
	Quasi-peak	Average
0,15 to 0,5	66-56	56-46
0,5 to 5	56	46
5 to 30	60	50

TEST METHOD

According to Part 15, Subpart C of FCC Rules (2003/07/22 Ed.)

OPERATING MODES OF EUT

Different tested operating modes (OM)

- OM#01: EUT ON. Link active.

TEST RESULTS

CCmmnnxx: CC, Conduction condition^o; mm: sample number; nn: operation mode; xx: wire.

- OM#01.

CDmmnnxx	Description	Result
CC01010N	Interference voltage on N wire	PASS
CC0101L1	Interference voltage on L1 wire	PASS

2. - GRAPH RESULTS

See next pages.

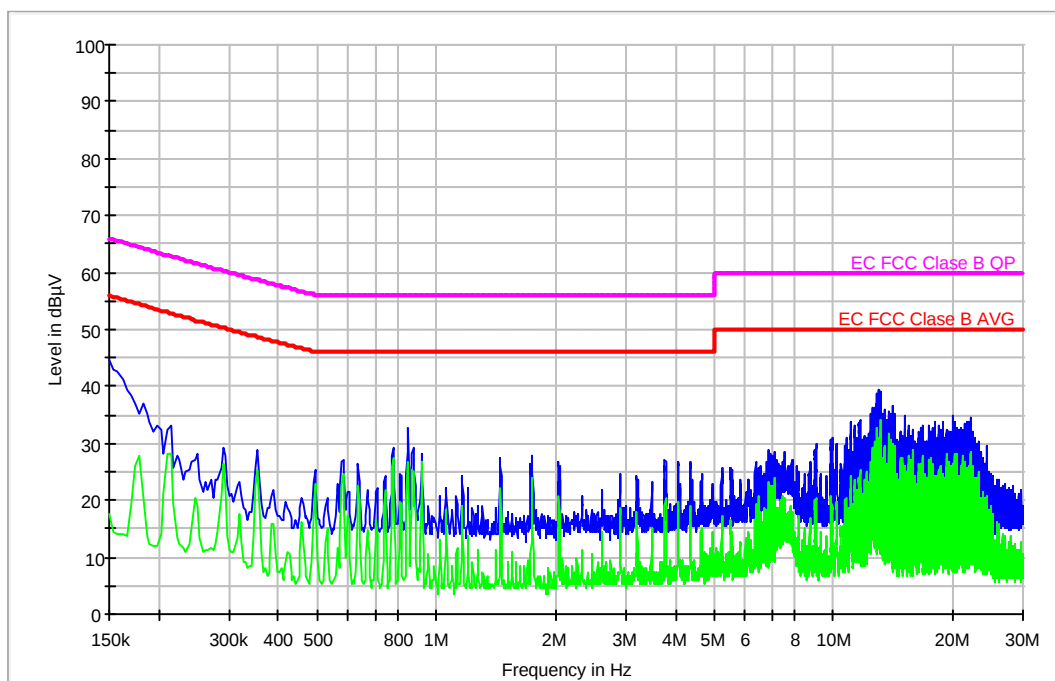
Continuous conducted emission: CC01010N (Peak)

EMC32 Report

Test Information

Proyecto:	20184iem.004
Empresa:	LOGITECH
Muestra:	M/01
Modo operacion:	MO#01
Fecha:	2004-09-27 12:00
Setup:	EMI conducted
Description	EUT ON. LINK ACTIVED.

EC FCC Clase B ESIB26 CC



Continuous conducted emission: CC0101L1 (Peak)

EMC32 Report

Test Information

Proyecto:	20183iem.004
Empresa:	LOGITECH
Muestra:	M/01
Modo operacion:	MO#01
Fecha:	2004-09-27 12:02
Setup:	EMI conducted
Description	EUT ON. LINK ACTIVED.

EC FCC Clase B ESIB26 CC

