

# TEST REPORT

Your Ref:

Date: 19 Nov 2002

Our Ref: 56S020388/01

Page: 1 of 21



DID: 6885 1448

Fax: 6777 6409

**NOTE: This Report** is issued subject to the "Terms and Conditions Governing Technical Services" set out in the "Request for Technical Services" form. The terms and conditions governing the issue of this report are set out overleaf.

FORMAL REPORT ON TESTING IN ACCORDANCE WITH  
FCC Part 15C : 2002  
OF A  
**WIRELESS GAME CONTROLLER**  
[ MODEL : FT-GC1000 ]  
[ FCC IDs : QPPFTGC1000 & QPPFTGC1000A ]

**TEST FACILITY**

Telecoms & EMC, Testing Group, PSB Corporation Pte Ltd  
1 Science Park Drive, Singapore 118221

**FCC REG. NO.**

90937 (3m & 10m OATS)  
99142 (10m Anechoic Chamber)  
871638 (5m Anechoic Chamber)  
IC 4257 (10m Anechoic Chamber)

**IND. CANADA REG. NO.**

**PREPARED FOR**

FounTech Pte Ltd  
Blk 1020 Tai Seng Avenue  
#05-3510, Tai Seng Industrial Estate  
Singapore 534419

Tel : 65-6280 3506 Fax : 65-6281 7641

**JOB NUMBER**

56S020388

**TEST PERIOD**

4 Oct 2002 – 18 Nov 2002

**PREPARED BY**

A handwritten signature in black ink, appearing to read 'Lim Cher Hwee'.

Lim Cher Hwee  
Engineer

**APPROVED BY**

A handwritten signature in black ink, appearing to read 'Colin Gan'.

Colin Gan  
Assistance Vice President



Your product quality and safety mark



LA-2001-0212-A  
LA-2001-0213-F  
LA-2001-0214-E  
LA-2001-0215-B  
LA-2001-0216-G  
LA-2001-0217-G

The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme

**This Report is issued under the following conditions:**

1. Results of the testing/calibration in the form of a report will be issued immediately after the service has been completed or terminated.
2. Unless otherwise requested, a report shall contain only technical results. Analysis and interpretation of the results and professional opinion and recommendations expressed thereupon, if required, shall be clearly indicated and additional fee paid for, by the Client.
3. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that PSB Corporation approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that PSB Corporation in any way "guarantees" the later performance of the product/equipment.
4. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client, PSB Corporation therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
5. Additional copies of the report are available to the Client at an additional fee. No third party can obtain a copy of this report through PSB Corporation, unless the Client has authorised PSB Corporation in writing to do so.
6. PSB Corporation may at its sole discretion add to or amend the conditions of the report at the time of issue of the report and such report and such additions or amendments shall be binding on the Client.
7. All copyright in the report shall remain with PSB Corporation and the Client shall, upon payment of PSB Corporation's fees for the carrying out of the tests/calibrations, be granted a license to use or publish the report to the third parties subject to the terms and conditions herein, provided always that PSB Corporation may at its absolute discretion be entitled to impose such conditions on the license as it sees fit.
8. Nothing in this report shall be interpreted to mean that PSB Corporation has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.
9. This report shall not be reproduced wholly or in parts and no reference shall be made by the Client to PSB Corporation or to the report or results furnished by PSB Corporation in any advertisements or sales promotion.

TEST SUMMARY

PRODUCT DESCRIPTION

SUPPORTING  
EQUIPMENT LIST

EUT OPERATING  
CONDITION

TEST RESULTS

- |         |  |
|---------|--|
| ANNEX A | - TEST INSTRUMENTATION & GENERAL PROCEDURES                    |
| ANNEX B | - EUT PHOTOGRAPHS / DIAGRAMS                                   |
| ANNEX C | - USER MANUAL, TECHNICAL DESCRIPTION, BLOCK & CIRCUIT DIAGRAMS |
| ANNEX D | - FCC LABEL & POSITION   |

**TEST SUMMARY**

The product was tested in accordance with the customer's specifications.

**Test Results Summary**

<b>FCC Paragraphs</b>	<b>Descriptions</b>	<b>Pass / Fail</b>
15.207	Conducted Emissions	Pass
15.205	Radiated Emissions (Restricted Band Requirements)	Pass
15.209	Radiated Emissions (Spurious Emissions)	Pass
15.209	Band Edge Radiated Emissions (Spurious Emissions)	Pass
15.249	Radiated Emissions (Fundamental and Harmonics Emissions)	Pass

**Notes**

1. The conducted emissions, was applied only to the base hub unit which was connected to a playstation. The conducted emissions test was not applicable to the controller unit, which is a battery operated device.

2. Three channels as listed below from base hub and game controller units, which respectively represent the lower, middle and upper of the each unit transmission channels were chosen and tested.

<u>Transmit Channel</u>	<u>Base Hub Frequency (MHz)</u>	<u>Game Controller Frequency (MHz)</u>
Channel 1	902.7	925.5
Channel 5	903.5	926.3
Channel 10	904.5	927.3

3. The EUT is an Class B device when in non-transmitting state and meets the FCC Part15B Class B requirements.

**Modifications**

No modifications were done.

## PRODUCT DESCRIPTION

Description	: The Equipment Under Test (EUT) is an <b>Air Style Wireless Game Controller</b> . The game controller consists of two units, namely the Game controller and the Base Hub. The game controller is a hand held remote controller, which allows users to control the playstation remotely. The base hub, which connected to the playstation acts as a receiving signal unit for the game controller which itself also to transmit the control signal back to the game controller. Please refer to the user manual for details		
Manufacturer	: FounTech Pte Ltd		
Model Number	: FT-GC1000		
FCC ID	: QPPFTGC1000 (Game Controller) QPPFTGC1000A (Base Hub)		
Serial Number	: Nil		
Microprocessor	: FTViPS002BT & FTViMC003B (CPU) FTViWE001QT (RF Controller)		
Operating / Transmitting Frequency	<u>Transmit Channel</u>	<u>Base Hub Frequency (MHz)</u>	<u>Game Controller Frequency (MHz)</u>
	Channel 1	902.7	925.5
	Channel 2	902.9	925.7
	Channel 3	903.1	925.9
	Channel 4	903.3	926.1
	Channel 5	903.5	926.3
	Channel 6	903.7	926.5
	Channel 7	903.9	926.7
	Channel 8	904.1	926.9
	Channel 9	904.3	927.1
	Channel 10	904.5	927.3
Clock / Oscillator Frequency	: <u>Base Hub</u> 20MHz (RF controller) 20MHz (CPU)  <u>Game Controller</u> 12MHz (RF Controller) 12MHz (CPU)		
Modulation	: Frequency Shift Keying (FSK)		
Pulse Train Cycle	: 285.6µs (Base Hub and Game Controller)		
Port / Connectors	: 1 x Base Hub connector		
Rated Input Power	: 2 x 1.5 AA batteries (Game Controller) The Base Hub is drawing power from the playstation		

---

**SUPPORTING EQUIPMENT DESCRIPTION**

---

<b>Equipment Description</b> (Including Brand Name)	<b>Model, Serial &amp; FCC ID</b> <b>Number</b>	<b>Cable Description</b> (List Length, Type & Purpose)
Sony Playstation II	M/N : SCPH-30001 S/N : U4473663 FCC ID : DoC	2.0m unshielded power cable 2.4m RCA cable with loaded ferrite
Samsung Colour TV	M/N : CS-5377N S/N : 858631BHB00014W FCC ID : Nil	1.8m unshielded power cable

## EUT OPERATING CONDITIONS

The Air Style Wireless Game Controller was powered from 110V, 60Hz mains supply.

Tests	Description Of Operation																								
1. Conducted Emissions 2. Radiated Emissions	<p>The EUT was exercised by setting both the game controller and base hub to operate in the test mode which allowed a continuous exercising of a loaded game. In the test mode, the game controller is continuously transmitting the signal through the specified channel to the base hub, which is the receiving unit. The base hub did transmit back the control signal to the game controller via the specified channel upon receiving the signal from the game controller. The continuous communication between the two units enables a simulation of game playing scenario.</p> <p>Test Mode Transmit and Receive Frequency List:</p> <table><tr><th><u>Game Controller</u></th><th><u>Tx Frequency (MHz)</u></th><th><u>Rx Frequency (MHz)</u></th></tr><tr><td>Channel 1</td><td>925.5</td><td>902.7</td></tr><tr><td>Channel 5</td><td>926.3</td><td>903.5</td></tr><tr><td>Channel 10</td><td>927.3</td><td>904.5</td></tr></table> <table><tr><th><u>Base Hub</u></th><th><u>Tx Frequency (MHz)</u></th><th><u>Rx Frequency (MHz)</u></th></tr><tr><td>Channel 1</td><td>902.7</td><td>925.5</td></tr><tr><td>Channel 5</td><td>903.5</td><td>926.3</td></tr><tr><td>Channel 10</td><td>904.5</td><td>927.3</td></tr></table>	<u>Game Controller</u>	<u>Tx Frequency (MHz)</u>	<u>Rx Frequency (MHz)</u>	Channel 1	925.5	902.7	Channel 5	926.3	903.5	Channel 10	927.3	904.5	<u>Base Hub</u>	<u>Tx Frequency (MHz)</u>	<u>Rx Frequency (MHz)</u>	Channel 1	902.7	925.5	Channel 5	903.5	926.3	Channel 10	904.5	927.3
<u>Game Controller</u>	<u>Tx Frequency (MHz)</u>	<u>Rx Frequency (MHz)</u>																							
Channel 1	925.5	902.7																							
Channel 5	926.3	903.5																							
Channel 10	927.3	904.5																							
<u>Base Hub</u>	<u>Tx Frequency (MHz)</u>	<u>Rx Frequency (MHz)</u>																							
Channel 1	902.7	925.5																							
Channel 5	903.5	926.3																							
Channel 10	904.5	927.3																							

**FCC Part 15C (15.207) Conducted Emission Results**

Frequency (MHz)	AV Value (dB $\mu$ V)	AV Margin (dB)	Q-P Value (dB $\mu$ V)	Q-P Margin (dB)	Line	Channel
0.2374	51.4	-2.1	58.0	-5.5	Neutral	1
0.2993	49.6	-2.1	54.7	-7.0	Neutral	1
0.3153	47.4	-3.8	55.1	-6.1	Live	5
0.4712	33.5	-13.3	42.7	-14.1	Neutral	5
1.2979	18.2	-27.8	42.5	-13.5	Live	10
1.3269	15.0	-31.0	40.6	-15.4	Live	1

Tested By : DP

Notes

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. The conducted emissions test is only applicable to the base hub unit, which is powered from the playstation.
3. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
4. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
9kHz - 30MHz  
 RBW: 10kHz VBW: 30kHz
5. Conducted Emissions Measurement Uncertainty  
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is  $\pm 2.4$ dB.





**Conducted Emissions Setup (Front View)**



**Conducted Emissions Setup (Rear View)**

**FCC Part 15C (15.209) Radiated Emission (Spurious Emissions) Results**

Test Distance : 3m

Frequency (MHz)	Q-P Value (dB $\mu$ V/m)	Q-P Margin (dB)	Pol (H/V)	Channel	Height (m)	Azimuth (Degrees)
33.6600	30.2	-9.8	V	CH 10	1.08	225
331.7562	42.1	-3.9	H	CH 10	1.00	321
812.8030	36.2	-9.8	H	CH 10	1.06	195
884.7159	37.5	-8.5	H	CH 1	1.00	189
948.2815	42.1	-3.9	H	CH 10	1.00	170
958.4388	37.2	-8.9	H	CH 10	1.00	169

Tested By : DP

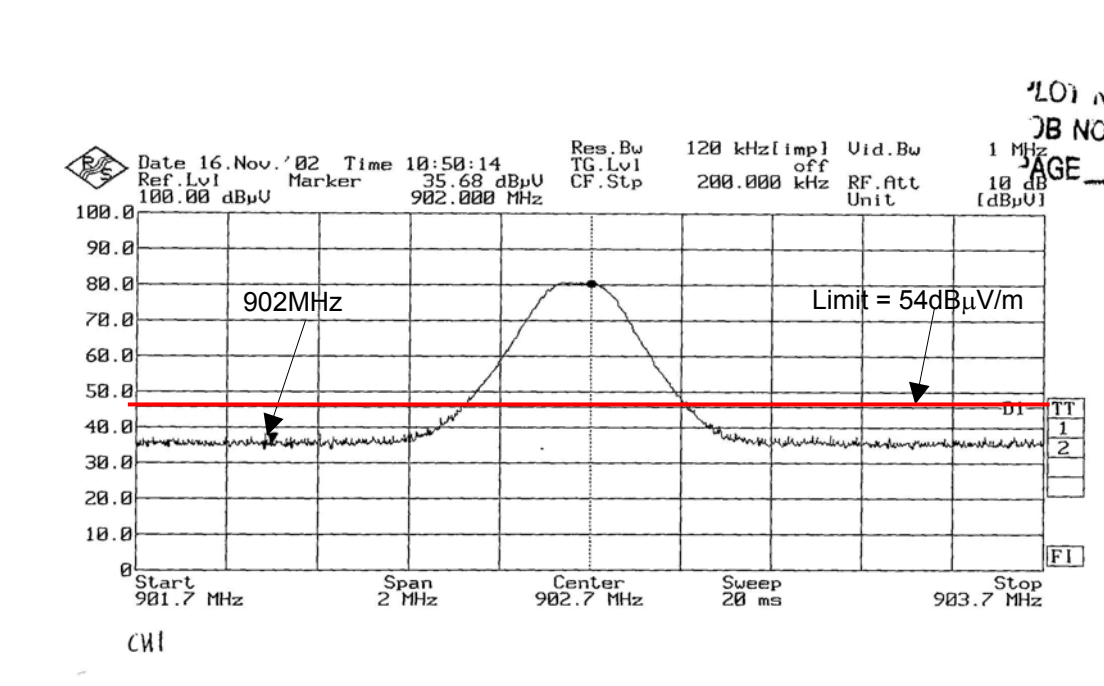
Notes

- All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
- A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz VBW: 1MHz  
>1GHz  
RBW: 1MHz VBW: 3MHz
- The upper frequency of radiated emission investigations were according to requirements stated in Section 15.33 (a) for intentional radiators & Section 15.33 (b) for unintentional radiators.
- The channel in the table refers to the transmit channel for both the game controller and base hub.
- Radiated Emissions Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is  $\pm 4.3$ dB (for EUTs < 0.5m X 0.5m X 0.5m).

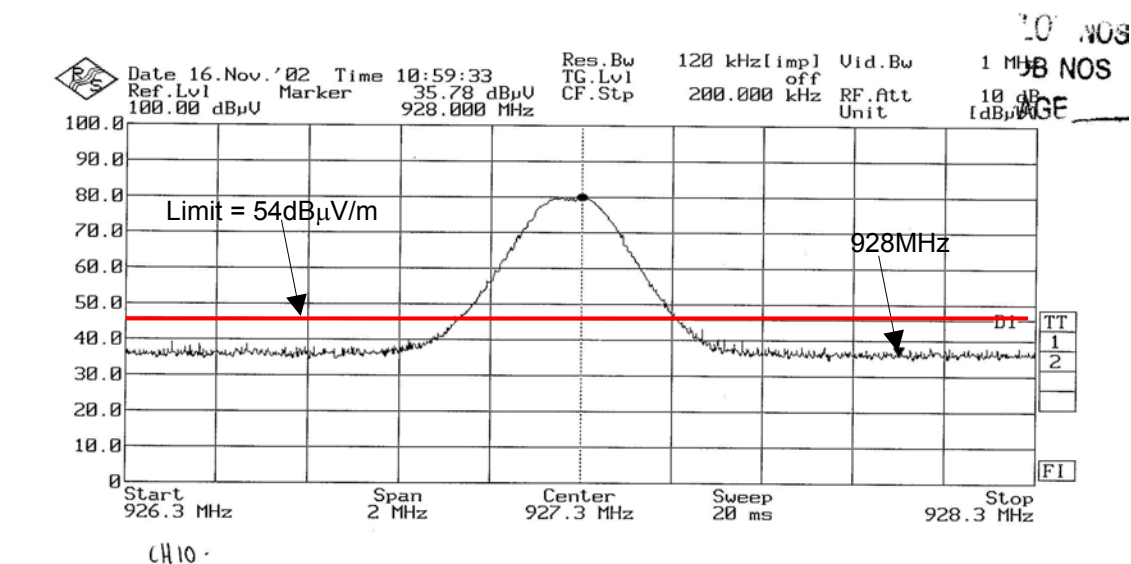
# **FCC Part 15C (15.209) Band Edge Radiated Emissions (Spurious Emissions) Results**

Test Distance : 3m

The plots below show the band edge transmissions for the Base Hub & Game Controller.



Base Hub Transmission at Channel 1 (902.7MHz)



Game Controller Transmission at Channel 10 (927.3MHz)

Tested By : DP

**FCC Part 15C (15.209) Band Edge Radiated Emissions (Spurious Emissions) Results****Notes**

1. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz      VBW: 1MHz  
>1GHz  
RBW: 1MHz      VBW: 3MHz

**FCC Part 15C (15.249) Radiated Emission Results (Fundamental Frequency Radiation)**

Test Distance : 3m

Channel / Frequency (MHz)	Q-P Value (dB $\mu$ V/m)	Q-P Margin (dB)	Pol (H/V)	Height (m)	Azimuth (Degrees)	Unit
1 / 902.7	81.6	-12.4	H	1.01	234	Base Hub
1 / 925.5	79.7	-14.3	H	1.00	258	Game Controller
5 / 903.5	81.2	-12.8	H	1.00	232	Base Hub
5 / 926.3	79.1	-14.9	H	1.00	240	Game Controller
10 / 904.5	81.4	-12.6	H	1.00	236	Base Hub
10 / 927.3	80.0	-14.0	H	1.00	257	Game Controller

Tested By : DP

Notes

1. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
2. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz VBW: 1MHz  
>1GHz  
RBW: 1MHz VBW: 3MHz
3. Radiated Emissions Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is  $\pm 4.3$ dB (for EUTs < 0.5m X 0.5m X 0.5m).

**FCC Part 15C (15.249) Radiated Emission Results (Harmonics Frequency Radiation)**

Test Distance : 3m

Frequency (GHz)	Peak Value (dB $\mu$ V/m)	Average Value (dB $\mu$ V/m)	Average Margin (dB)	Pol (H/V)	Height (m)	Azimuth (Degrees)	Unit
2708.0870	52.1	34.9	-19.1	H	1.00	332	Base Hub
2776.4870	52.2	35.4	-18.6	H	1.01	168	Game Controller
2710.5140	52.1	34.9	-19.1	H	1.00	135	Base Hub
2778.8600	53.0	35.3	-18.7	H	1.00	239	Game Controller
2713.4204	52.0	34.9	-19.1	H	1.00	134	Base Hub
2781.4230	52.3	35.3	-18.7	V	1.01	248	Game Controller

Tested By : DP

Notes

- The worst case harmonic emissions were tabulated. The rest of harmonic emissions were found to be insignificant.
- A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz VBW: 1MHz  
>1GHz  
RBW: 1MHz VBW: 3MHz
- The peak emissions above 1GHz show compliance to the requirement stated in Section 15.35 (b).
- Radiated Emissions Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is  $\pm 4.3$ dB (for EUTs < 0.5m X 0.5m X 0.5m).

**FCC Part 15C (15.205) Radiated Emissions (Restricted Band Requirements) Results**

EUT Transmit Channel : 1  
Test Distance : 3m

Restricted Band (MHz)	Limit (dB $\mu$ V/m)	Channel 1		
		Frequency (MHz)	PK / Q-P (dB $\mu$ V/m)	Average (dB $\mu$ V/m)
37.5 - 38.25	40.0	Nil	-	-
73 - 74.6	40.0	Nil	-	-
74.8 - 75.2	40.0	Nil	-	-
108 - 121.94	43.5	109.2231	28.6 (QP)	-
	43.5	115.0199	29.0 (QP)	-
	43.5	120.8167	31.6 (QP)	-
	43.5	Nil	-	-
123 - 138	43.5	124.6812	33.0 (QP)	-
	43.5	130.4780	31.0 (QP)	-
	43.5	134.3426	31.3 (QP)	-
149.9 - 150.05	43.5	Nil	-	-
156.52475 - 156.52525	43.5	Nil	-	-
156.7 - 156.9	43.5	Nil	-	-
162.0125 - 167.17	43.5	163.3266	25.0 (QP)	-
167.72 - 173.2	43.5	172.9880	23.7 (QP)	-
240 - 285	46.0	242.9602	30.5 (QP)	-
	46.0	258.0079	30.0 (QP)	-
	46.0	269.6015	27.3 (QP)	-
	46.0	279.2629	27.0 (QP)	-
322 - 335.4	46.0	327.6993	28.5(QP)	-
	46.0	331.7620	41.4(QP)	-
399.9 - 410	46.0	Nil	-	-
608 - 614	46.0	611.6100	31.0 (QP)	-
960 - 1240	54.0	982.6100	33.6 (QP)	-
	54.0	996.1400	32.9 (QP)	-
1300 - 1427	54.0	Nil	-	-
1435 - 1626.5	54.0	1474.5180	49.2 (PK)	44.0
1645.5 - 1646.5	54.0	Nil	-	-
1660 - 1710	54.0	1705.1792	44.6 (PK)	-
1718.8 - 1722.2	54.0	Nil	-	-
2200 - 2300	54.0	2293.9587	49.9 (PK)	32.3
2310 - 2390	54.0	2359.2240	52.5 (PK)	44.4
2483.5 - 2500	54.0	Nil	-	-
2655 - 2900	54.0	Nil	-	-
3260 - 3267	54.0	Nil	-	-
3332 - 3339	54.0	Nil	-	-
3345.8 - 3358	54.0	Nil	-	-
3600 - 4400	54.0	Nil	-	-
4500 - 5150	54.0	Nil	-	-
5350 - 5460	54.0	Nil	-	-
7250 - 7750	54.0	Nil	-	-
8025 - 8500	54.0	Nil	-	-
9000 - 9200	54.0	Nil	-	-
9300 - 9500	54.0	Nil	-	-

Notes

1. The Nil in the frequency column indicates no emissions were found in the band of interest and showed compliance to the limits as specified in section 15.209. The emissions were merely the noise floor.
2. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
 RBW: 120kHz                  VBW: 1MHz  
>1GHz  
 RBW: 1MHz                  VBW: 3MHz
3. Radiated Emissions Measurement Uncertainty  
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is  $\pm 4.3\text{dB}$  (for EUTs < 0.5m X 0.5m X 0.5m).



TEST RESULTS

**FCC Part 15C (15.205) Radiated Emissions (Restricted Band Requirements) Results**

EUT Transmit Channel : 5  
Test Distance : 3m

Restricted Band (MHz)	Limit (dB $\mu$ V/m)	Channel 5		
		Frequency (MHz)	PK / Q-P (dB $\mu$ V/m)	Average (dB $\mu$ V/m)
37.5 - 38.25	40.0	Nil	-	-
73 - 74.6	40.0	Nil	-	-
74.8 - 75.2	40.0	Nil	-	-
108 - 121.94	43.5	109.2200	28.6 (QP)	-
	43.5	115.0200	29.0 (QP)	-
	43.5	117.7998	30.3 (QP)	-
	43.5	Nil	-	-
123 - 138	43.5	124.6812	32.6 (QP)	-
	43.5	130.4800	30.9 (QP)	-
	43.5	134.3400	31.0 (QP)	-
149.9 - 150.05	43.5	Nil	-	-
156.52475 - 156.52525	43.5	Nil	-	-
156.7 - 156.9	43.5	Nil	-	-
162.0125 - 167.17	43.5	163.3300	24.6 (QP)	-
167.72 - 173.2	43.5	172.9900	23.6 (QP)	-
240 - 285	46.0	242.5500	30.0 (QP)	-
	46.0	254.1400	28.6 (QP)	-
	46.0	258.0100	30.6 (QP)	-
	46.0	331.7580	41.9 (QP)	-
322 - 335.4	46.0	406.7900	30.0 (QP)	-
399.9 - 410	46.0	611.6100	34.3 (QP)	-
608 - 614	54.0	982.6100	30.6 (QP)	-
960 - 1240	54.0	996.1400	33.0 (QP)	-
	54.0	1179.5040	47.5 (PK)	44.5
	54.0	1326.6932	44.6 (PK)	-
	54.0	1474.5191	49.2 (PK)	44.2
1300 - 1427	54.0	Nil	-	-
1435 - 1626.5	54.0	Nil	-	-
1645.5 - 1646.5	54.0	Nil	-	-
1660 - 1710	54.0	Nil	-	-
1718.8 - 1722.2	54.0	1719.1200	44.9 (PK)	-
2200 - 2300	54.0	2250.9960	49.2 (PK)	-
2310 - 2390	54.0	2359.2190	51.9 (PK)	44.1
2483.5 - 2500	54.0	Nil	-	-
2655 - 2900	54.0	Nil	-	-
3260 - 3267	54.0	Nil	-	-
3332 - 3339	54.0	Nil	-	-
3345.8 - 3358	54.0	Nil	-	-
3600 - 4400	54.0	Nil	-	-
4500 - 5150	54.0	Nil	-	-
5350 - 5460	54.0	Nil	-	-
7250 - 7750	54.0	Nil	-	-
8025 - 8500	54.0	Nil	-	-
9000 - 9200	54.0	Nil	-	-
9300 - 9500	54.0	Nil	-	-

Notes

1. The Nil in the frequency column indicates no emissions were found in the band of interest and showed compliance to the limits as specified in section 15.209. The emissions were merely the noise floor.
2. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz          VBW: 1MHz  
>1GHz  
RBW: 1MHz          VBW: 3MHz
3. Radiated Emissions Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is  $\pm 4.3\text{dB}$  (for EUTs < 0.5m X 0.5m X 0.5m).

**FCC Part 15C (15.205) Radiated Emissions (Restricted Band Requirements) Results**

EUT Transmit Channel : 10  
Test Distance : 3m

Restricted Band (MHz)	Limit (dB $\mu$ V/m)	Channel 10		
		Frequency (MHz)	PK / Q-P (dB $\mu$ V/m)	Average (dB $\mu$ V/m)
37.5 - 38.25	40.0	37.7300	24.3 (QP)	-
73 - 74.6	40.0	Nil	-	-
74.8 - 75.2	40.0	Nil	-	-
108 - 121.94	43.5	109.2200	26.6 (QP)	-
	43.5	118.8800	26.6 (QP)	-
123 - 138	43.5	124.6800	30.6 (QP)	-
	43.5	134.3400	30.3 (QP)	-
149.9 - 150.05	43.5	Nil	-	-
156.52475 - 156.52525	43.5	Nil	-	-
156.7 - 156.9	43.5	Nil	-	-
162.0125 - 167.17	43.5	163.3300	24.7 (QP)	-
167.72 - 173.2	43.5	172.9900	23.7 (QP)	-
240 - 285	46.0	242.5500	30.0 (QP)	-
	46.0	246.4100	25.3 (QP)	-
	46.0	258.0100	30.6 (QP)	-
	46.0	279.2600	26.0 (QP)	-
322 - 335.4	46.0	323.9680	28.1(QP)	-
	46.0	331.7562	42.1(QP)	-
399.9 - 410	46.0	406.7900	31.3 (QP)	-
608 - 614	46.0	611.6100	32.3 (QP)	-
960 - 1240	54.0	982.6100	31.0 (QP)	-
	54.0	996.1400	33.3 (QP)	-
	54.0	1179.5177	47.2 (PK)	42.9
	54.0	1185.2600	42.9 (PK)	-
1300 - 1427	54.0	1398.4100	41.9 (PK)	-
1435 - 1626.5	54.0	1474.5230	49.2 (PK)	44.7
1645.5 - 1646.5	54.0	Nil	-	-
1660 - 1710	54.0	1677.2900	44.6(PK)	-
1718.8 - 1722.2	54.0	Nil	-	-
2200 - 2300	54.0	2223.1100	49.2 (PK)	-
2310 - 2390	54.0	2359.2261	53.5 (PK)	44.1
2483.5 - 2500	54.0	Nil	-	-
2655 - 2900	54.0	Nil	-	-
3260 - 3267	54.0	Nil	-	-
3332 - 3339	54.0	Nil	-	-
3345.8 - 3358	54.0	Nil	-	-
3600 - 4400	54.0	Nil	-	-
4500 - 5150	54.0	Nil	-	-
5350 - 5460	54.0	Nil	-	-
7250 - 7750	54.0	Nil	-	-
8025 - 8500	54.0	Nil	-	-
9000 - 9200	54.0	Nil	-	-
9300 - 9500	54.0	Nil	-	-

Notes

1. The Nil in the frequency column indicates no emissions were found in the band of interest and showed compliance to the limits as specified in section 15.209. The emissions were merely the noise floor.
2. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
 RBW: 120kHz                  VBW: 1MHz  
>1GHz  
 RBW: 1MHz                  VBW: 3MHz
3. Radiated Emissions Measurement Uncertainty  
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is  $\pm 4.3\text{dB}$  (for EUTs < 0.5m X 0.5m X 0.5m).



**Radiated Emissions Setup (Front View)**



**Radiated Emissions Setup (Rear View)**

**ANNEX A**

**TEST INSTRUMENTATION & GENERAL PROCEDURES**

# TEST INSTRUMENTATION & GENERAL PROCEDURES

## ANNEX A

### 3m OATS Test Instrumentation (Conducted EMI)

<u>Instrument</u>	<u>Model</u>	<u>S/No</u>	<u>Cal Due Date</u>
R&S Test Receiver (9kHz-30MHz)	ESH3	862301/005	17 Jul 2003
R&S Pulse Limiter	ESH3-Z2	357.8810.52	12 Apr 2003
EMCO LISN (for EUT) – LISN4	3816/2	9602-1036	14 Jun 2003
Solar Electronic Current Probe	6741-1	911317	15 Apr 2003
Telecom Impedance Stabilization Network	FCC-TLISN-T4	20084	28 Aug 2003

×
×
×
×

### 5m Anechoic Chamber Test Instrumentation (RF Radiated EMI)

<u>Instrument</u>	<u>Model</u>	<u>S/No</u>	<u>Cal Due Date</u>
R&S Test Receiver (20Hz – 26.5GHz) – ESMI2	ESMI	829214/006 829550/001	22 Jul 2003
HP Preamplifier (for ESMI2, 0.01-3GHz) – PA8	87405A	3950M00373	16 Apr 2003
MITEQ Preamplifier (0.1-26.5GHz) – PA10	NSP2650-N	728230	9 Apr 2003
Schaffner Bilog Antenna – BL8	CBL6143	5044	15 May 2003
EMCO Horn Antenna – H15	3115	0003-6088	18 Jul 2003

×
×
×
×
×

## TEST INSTRUMENTATION & GENERAL PROCEDURES

## ANNEX A

### CONDUCTED EMISSIONS TEST DESCRIPTION

#### Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another LISN.

#### Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. Both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line.

#### Sample Calculation Example

At 20 MHz	limit = 250 μV = 47.96 dBμV
Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.2 dB	
Q-P reading obtained directly from EMI Receiver = 40 dBμV (Calibrated for system losses)	
Therefore, Q-P margin = 40 - 47.96 = -7.96	i.e. <b>7.96 dB below limit</b>



## TEST INSTRUMENTATION & GENERAL PROCEDURES

## ANNEX A

### RADIATED EMISSIONS TEST DESCRIPTION (5m ANC)

#### Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table as shown in Annex B.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

#### Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst frequencies.
3. The test was carried out at the selected frequency points obtained from the prescan. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
  - a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
  - b. The EUT was then rotated to the direction that gave the maximum emission.
  - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point that above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from 30MHz to 10GHz, using the Biconical antenna for frequencies up to 200MHz, the Log-periodic antenna for frequencies above 200MHz to 1GHz, and the Horn antenna above 1GHz.

#### Sample Calculation Example

At 300 MHz	limit = 200 $\mu$ V/m = 46 dB $\mu$ V/m
Log-periodic antenna factor & cable loss at 300 MHz = 18.511 dB	
Q-P reading obtained directly from EMI Receiver = 40 dB $\mu$ V/m (Calibrated level including antenna factors & cable losses)	
Therefore, Q-P margin = 40 - 46 = -6	i.e. <b>6 dB below limit</b>

**ANNEX B**

**TEST PHOTOGRAPHS / DIAGRAMS**

EUT PHOTOGRAPHS



Game Controller - Front View



Game Controller - Rear View

EUT PHOTOGRAPHS



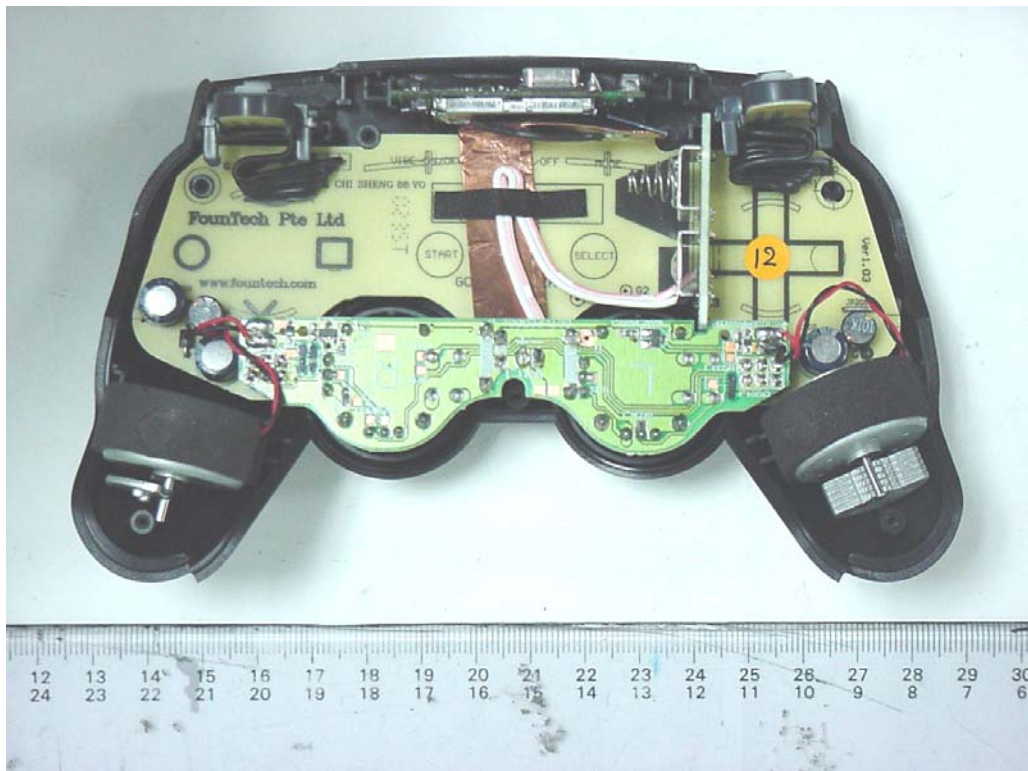
Base Hub – Front View



Base Hub – Rear View



EUT PHOTOGRAPHS



Game Controller – Internal View



Game Controller – Top Housing Internal View

EUT PHOTOGRAPHS

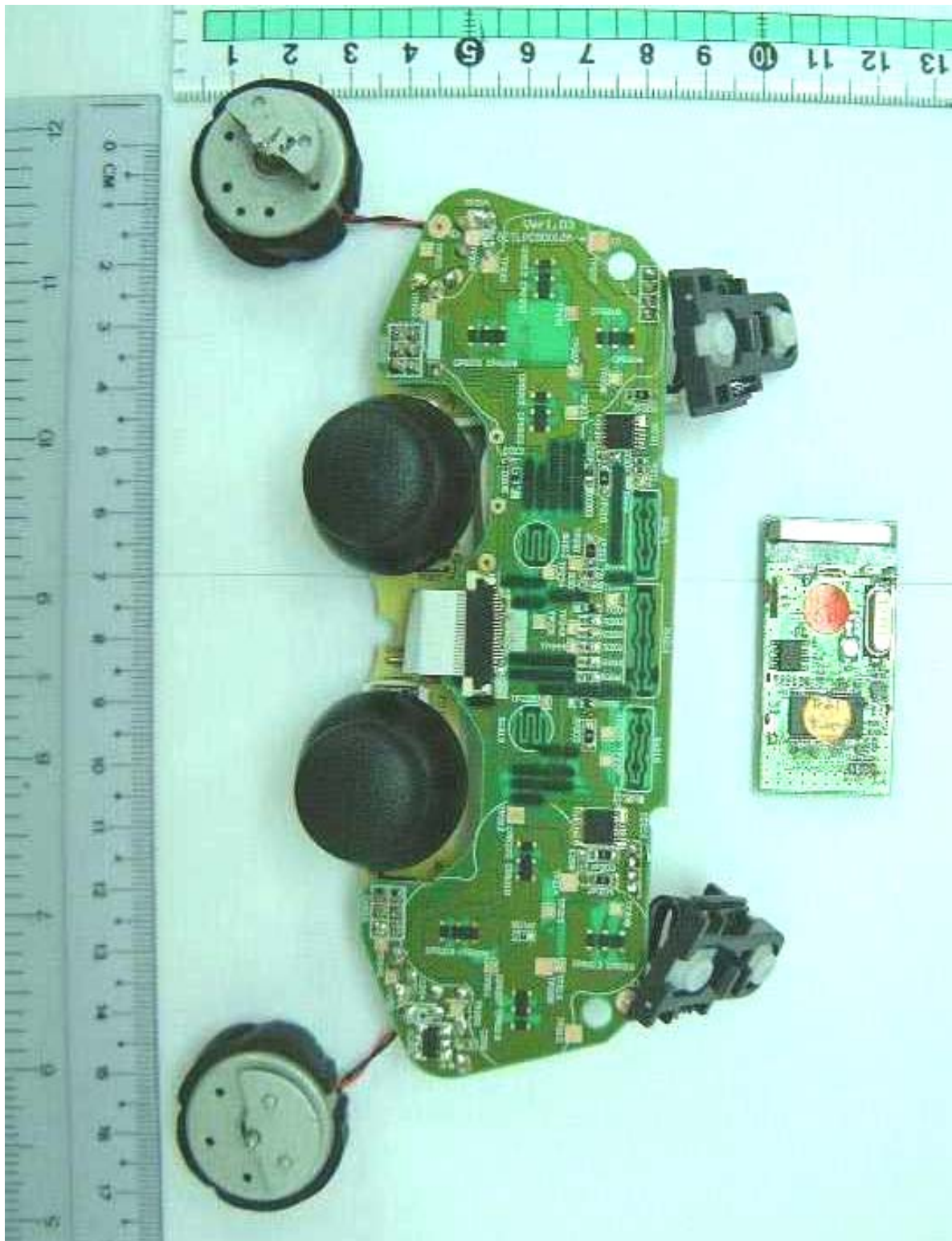


Game Controller – Bottom Housing Internal View



Base Hub – Internal View

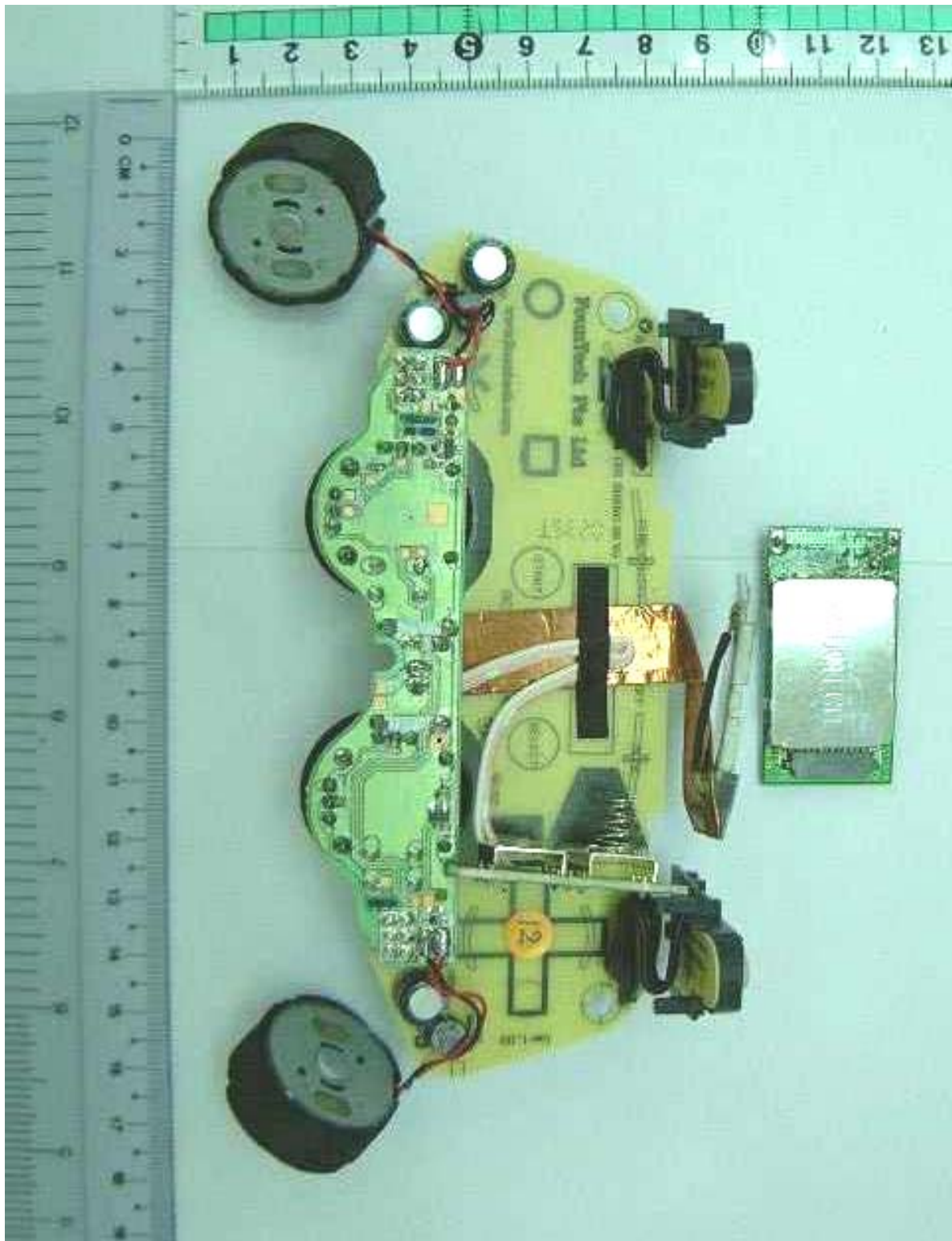
EUT PHOTOGRAPHS



Game Controller – PCB View 1



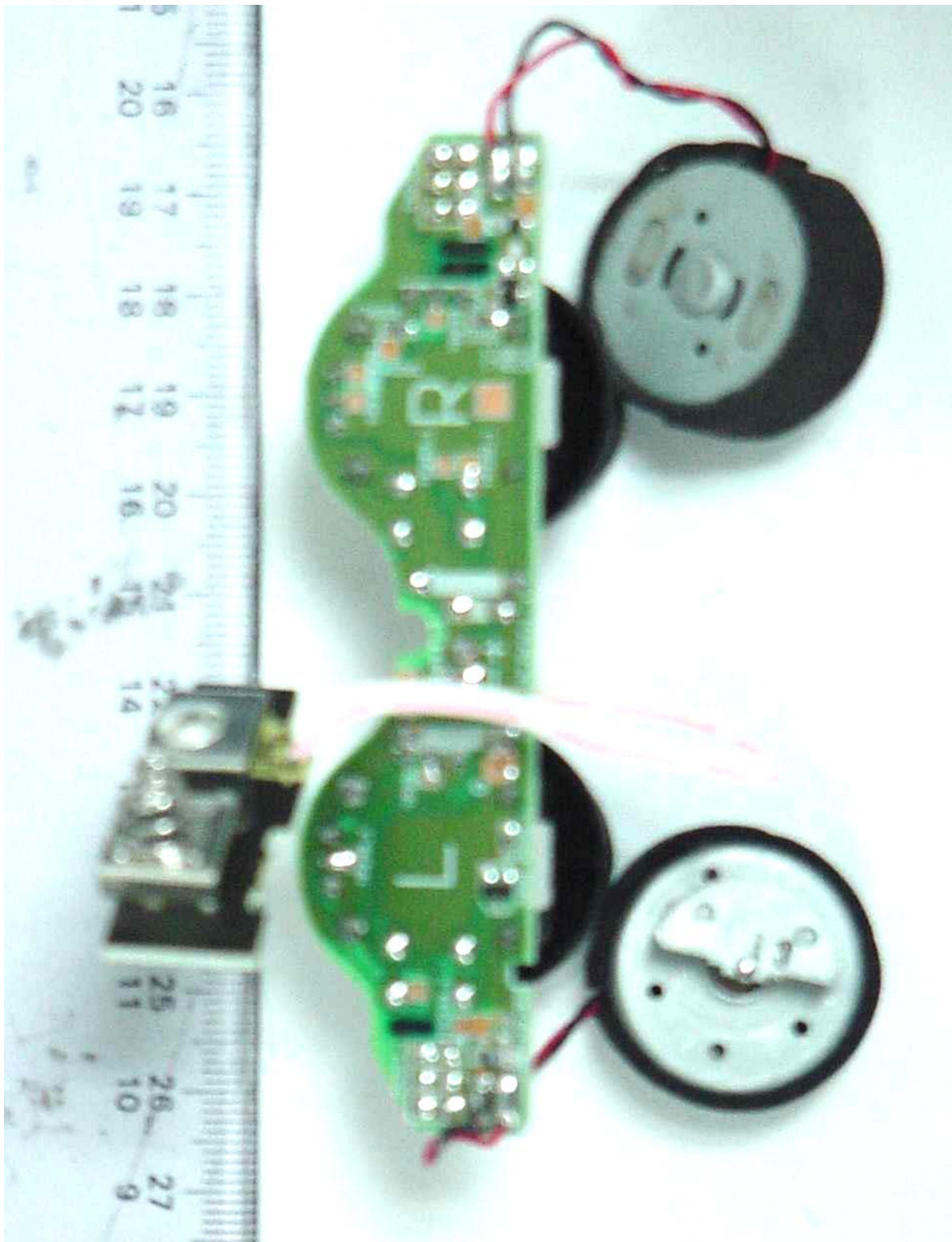
EUT PHOTOGRAPHS



Game Controller – PCB View 2

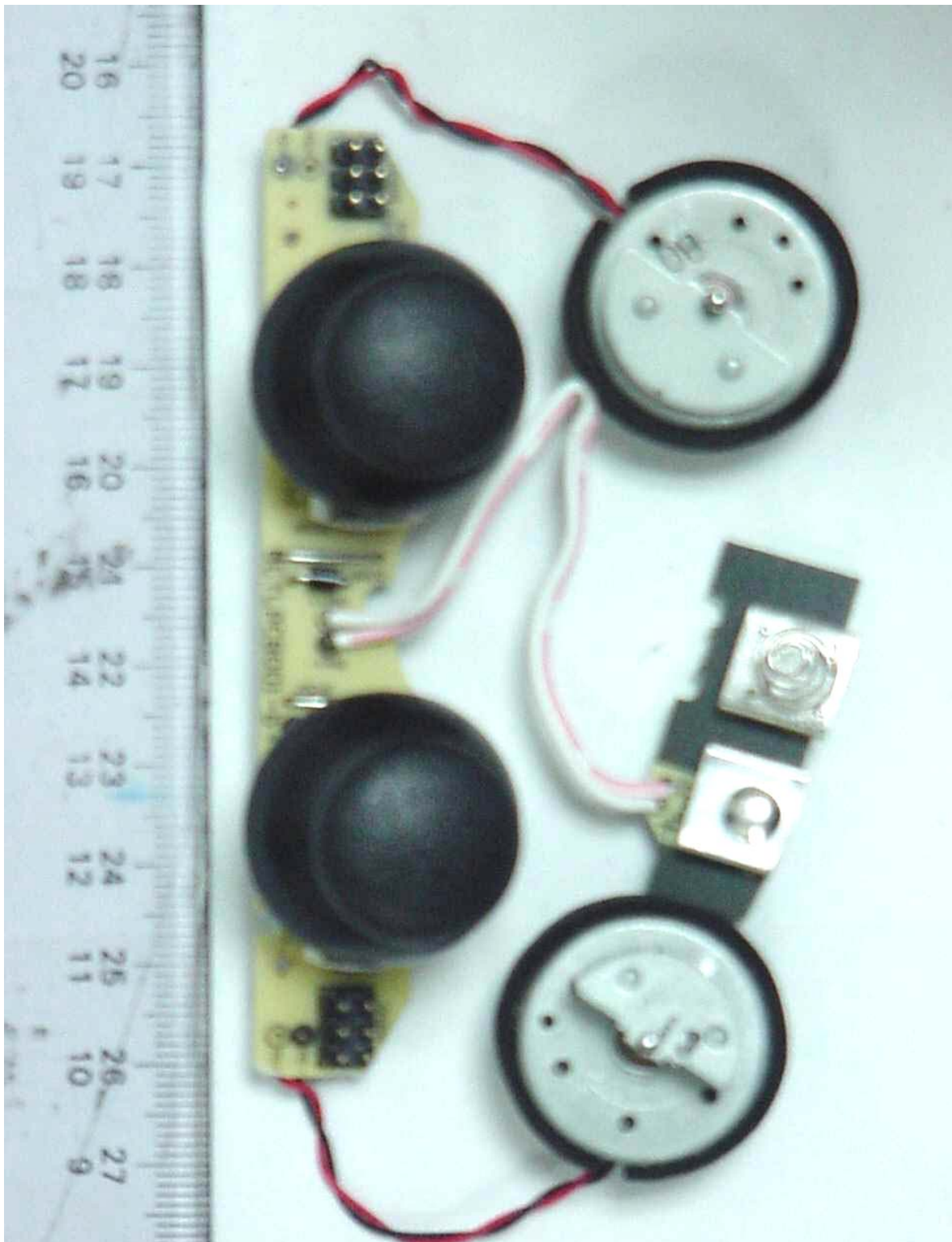


EUT PHOTOGRAPHS



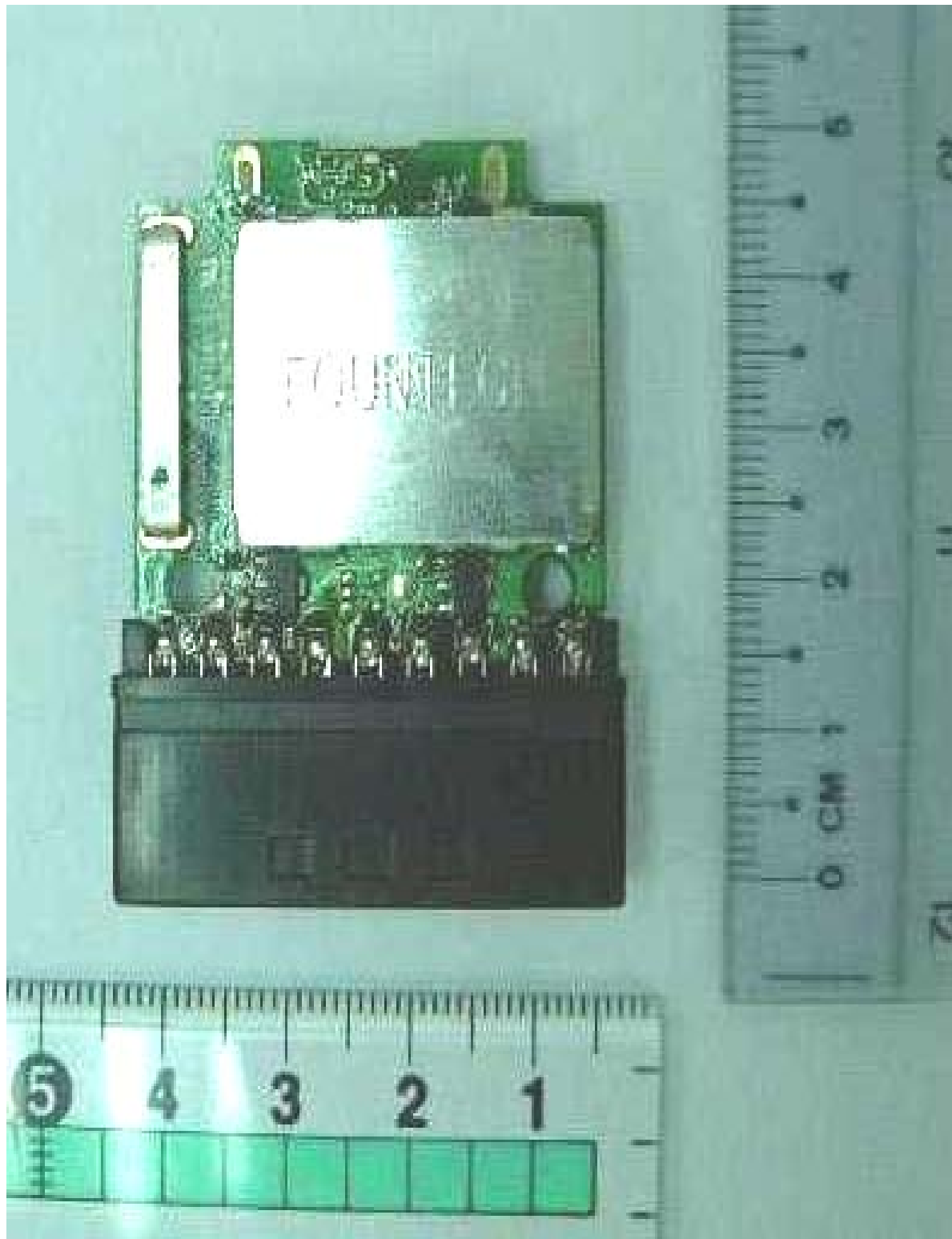
Game Controller – PCB View 3

EUT PHOTOGRAPHS



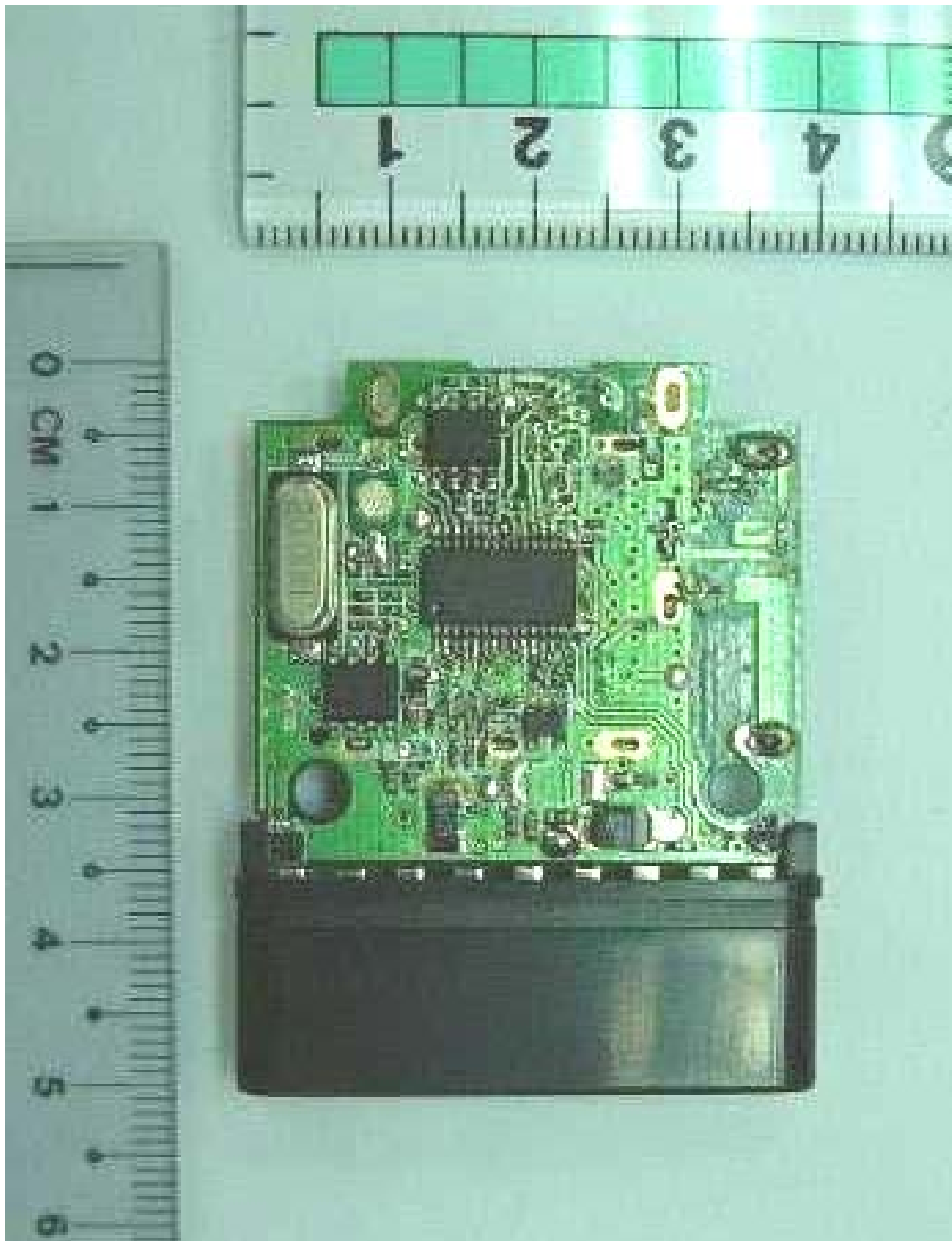
Game Controller – PCB View 4

EUT PHOTOGRAPHS



Base Hub – PCB View 1

EUT PHOTOGRAPHS



Base Hub – PCB View 2

**ANNEX C**

**USER MANUAL  
TECHNICAL DESCRIPTION  
BLOCK & CIRCUIT DIAGRAMS**

(Please refer to manufacturer for details)

**ANNEX D**

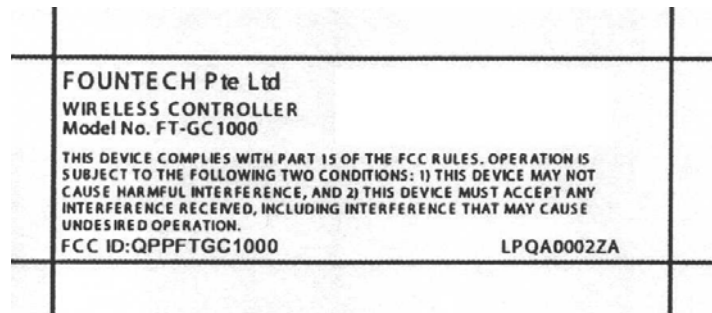
**FCC LABEL & POSITION**

## FCC LABEL & POSITION

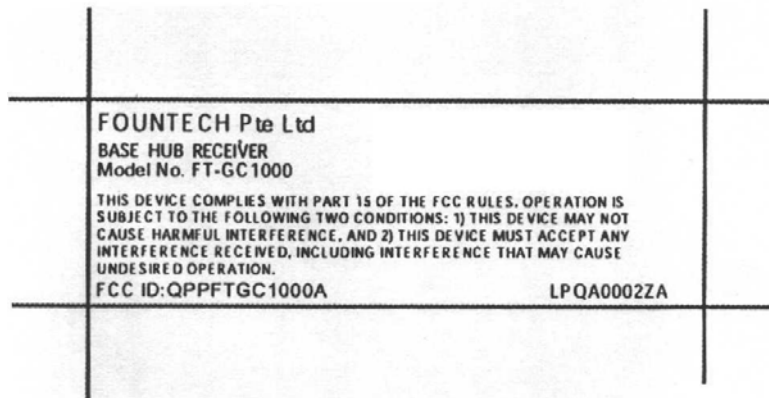
## ANNEX D

### Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.



**Sample Label- Game Controller**

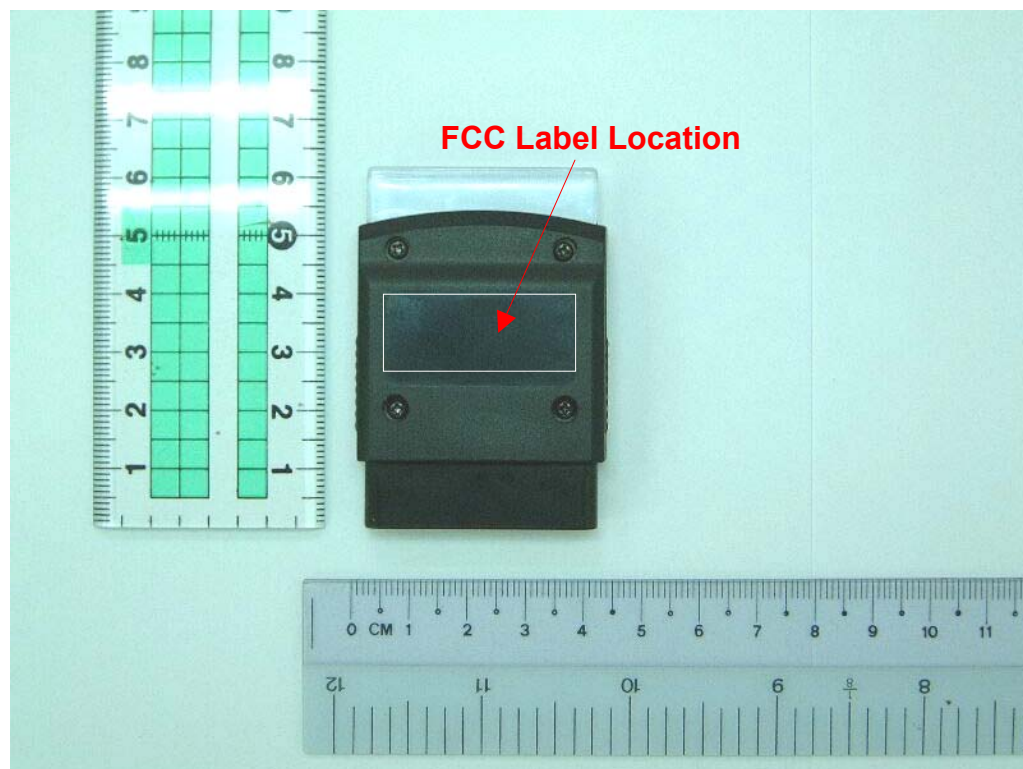


**Sample Label- Base Hub**





**Physical Location of Label on Game Controller**



**Physical Location of Label on Base Hub**