



# FCC TEST REPORT

**REPORT NO.:** RF930212H04

**MODEL NO.:** C-X3B18

**RECEIVED:** Feb. 12, 2004

**TESTED:** Feb. 18 to 23, 2004

**APPLICANT:** LOGITECH INC.

**ADDRESS:** 6505 Kaiser Drive Fremont, CA 94555-3615

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien,  
Taiwan, R.O.C.

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# 1 CERTIFICATION

**PRODUCT :** Logitech ® Cordless Precision™ Controller for XBOX™  
**BRAND NAME :** Logitech  
**MODEL NO :** C-X3B18  
**TEST ITEM:** Engineering Sample  
**APPLICANT :** LOGITECH INC.  
**STANDARDS :** 47 CFR Part 15, Subpart C (15.249)  
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Feb. 18 to 23, 2004. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's characteristics under the conditions herein specified.

**PREPARED BY:** *Amanda Chu* , **DATE:** *Feb. 25, 2004*  
( Amanda Chu )

**APPROVED BY:** *Eric Lin* , **DATE:** *Feb. 25, 2004*  
( Eric Lin, Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Paragraph	Test Type	Result	Remark
15.207	Conducted Emission Test	PASS	Minimum passing margin is -13.94dB at 0.845MHz
15.249	Radiated Emission Test	PASS	Minimum passing margin is -8.90dB at 4960.00MHz
15.249	Band Edge Measurement	PASS	Meet the requirement of limit

**NOTE:** The information of measurement uncertainty is available upon the customer's request.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Logitech ® Cordless Precision™ Controller for XBOX™
<b>MODEL NO.</b>	C-X3B18
<b>POWER SUPPLY</b>	5.0VDC from Host equipment
<b>MODULATION TYPE</b>	GFSK
<b>MODULATION TECHNOLOGY</b>	FHSS
<b>CARRIER FREQUENCY OF EACH CHANNEL</b>	2402MHz ~ 2480MHz
<b>BANDWIDTH OF EACH CHANNEL</b>	1MHz
<b>NUMBER OF CHANNEL</b>	79
<b>ANTENNA TYPE</b>	Remote: PCB strip antenna. Host: Sheet metal inverted-F antenna.
<b>DATA CABLE</b>	XBOX USB Cable (shielded, 0.6m, with one core near to XOB)
<b>I/O PORTS</b>	NA
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

1. For more detailed feature description of the EUT, please refer to user's manual.

### 3.2 DESCRIPTION OF TEST MODES

Seventy-eight channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2431	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

**NOTE:**

1. Below 1 GHz, the channel 0, 39, and 78 were pre-tested in chamber. The channel 78, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 0, 39, and 78 were tested individually.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Logitech ® Cordless Precision™ Controller for XBOX™ . According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 15, Subpart C. (15.249)**  
**ANSI C63.4 :1992**

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

**NOTES:** The EUT is also considered as a kind of peripheral, because the connection to other Class B digital device or computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



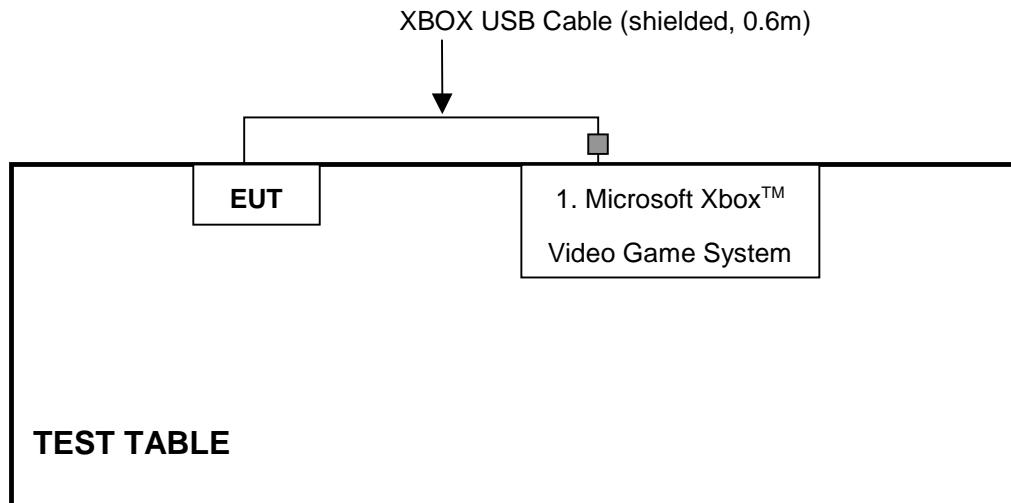
### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Microsoft Xbox™ Video Game System	MICROSOFT	XBOX	1038655-14003	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

**NOTE:** All power cords of the above support units are non shielded (1.8m).



**NOTE:** 1. Please refer to the photos of test configuration in Item 5 also.

## 4 TEST PROCEDURES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Notes:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Dec. 04, 2004
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 04, 2004
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 27, 2004
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2004
Terminator(for KYORITSU)	50	3	Apr. 11, 2004
Software	Cond-V2e	NA	NA

- 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. The test was performed in ADT Shielded Room No. A.  
 3. The VCCI Con A Registration No. is C-817.





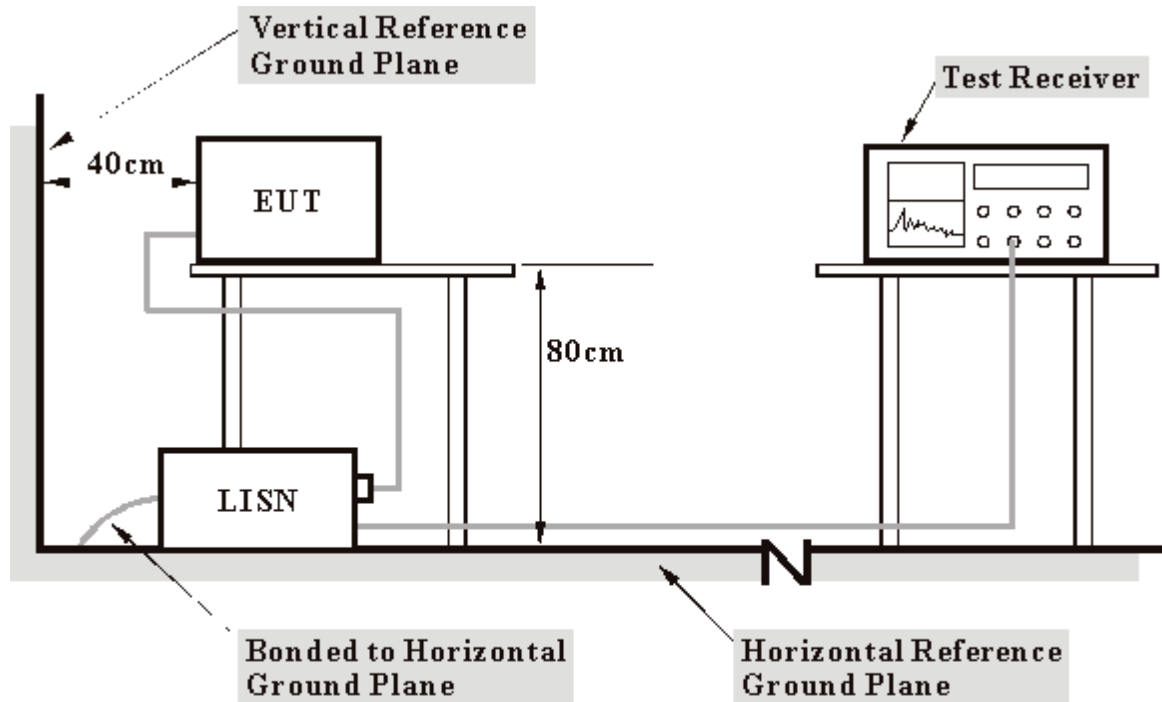
#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Connect the EUT to the support unit 1 (XBOX) which placed on a testing table.
- b. The support unit 1 (XBOX) ran a test program to enable EUT under transmission condition continuously at specific channel frequency.

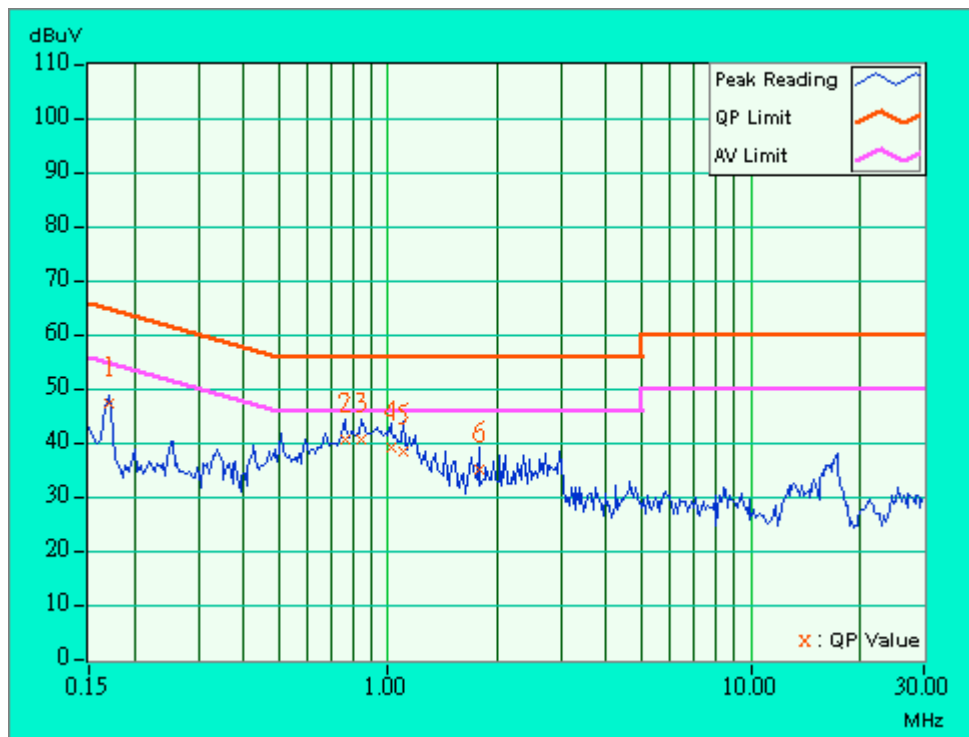


4.1.7 TEST RESULTS

<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X2B31		
<b>MODE</b>	Channel 0	<b>6DB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	15 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.20	47.18	-	47.38	-	64.98	54.98	-17.60	-
2	0.759	0.26	40.43	-	40.69	-	56.00	46.00	-15.31	-
3	0.849	0.27	40.45	-	40.72	-	56.00	46.00	-15.28	-
4	1.017	0.30	38.95	-	39.25	-	56.00	46.00	-16.75	-
5	1.103	0.30	38.27	-	38.57	-	56.00	46.00	-17.43	-
6	1.779	0.30	34.73	-	35.03	-	56.00	46.00	-20.97	-

- NOTES: (1) "\*\*": Undetectable  
 (2) Q.P. and AV. are abbreviations of quasi-peak and average.  
 (3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.  
 (4) The emission levels of other frequencies were very low against the limit.  
 (5) Correction Factor = Insertion loss + Cable loss  
 (6) Margin value = Emission level - Limit value

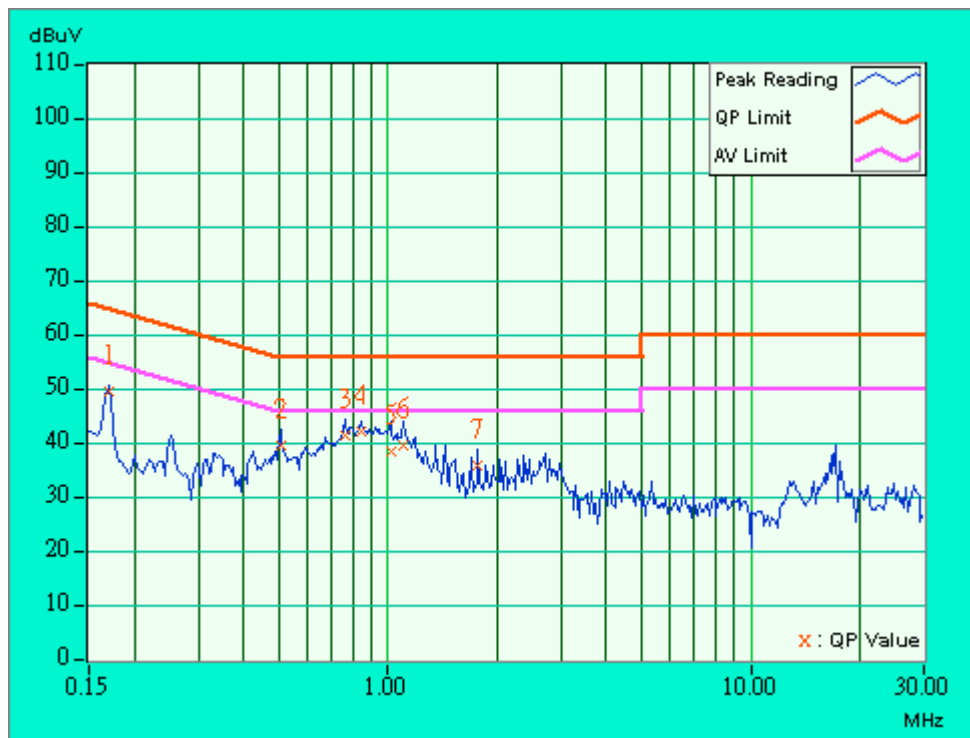




<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X2B31		
<b>MODE</b>	Channel 0	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	15 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.20	49.40	-	49.60	-	64.98	54.98	-15.38	-
2	0.505	0.22	39.17	-	39.39	-	56.00	46.00	-16.61	-
3	0.763	0.26	41.09	-	41.35	-	56.00	46.00	-14.65	-
<b>4</b>	<b>0.845</b>	<b>0.27</b>	<b>41.79</b>	-	<b>42.06</b>	-	<b>56.00</b>	<b>46.00</b>	<b>-13.94</b>	-
5	1.017	0.30	38.19	-	38.49	-	56.00	46.00	-17.51	-
6	1.099	0.30	39.39	-	39.69	-	56.00	46.00	-16.31	-
7	1.775	0.30	35.71	-	36.01	-	56.00	46.00	-19.99	-

- NOTES: (1) "": Undetectable  
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 (3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.  
 (4) The emission levels of other frequencies were very low against the limit.  
 (5) Correction Factor = Insertion loss + Cable loss  
 (6) Margin value = Emission level - Limit value

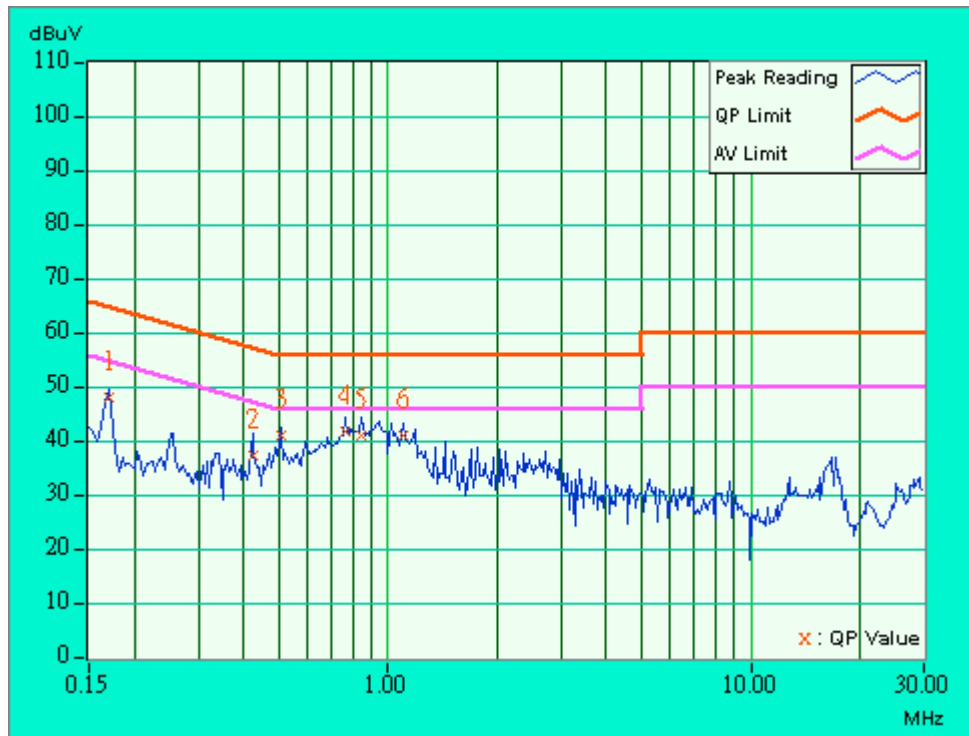




<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X2B31		
<b>MODE</b>	Channel 39	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	15 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.20	47.70	-	47.90	-	64.98	54.98	-17.08	-
2	0.423	0.20	37.03	-	37.23	-	57.38	47.38	-20.15	-
3	0.505	0.22	40.68	-	40.90	-	56.00	46.00	-15.10	-
4	0.759	0.26	41.49	-	41.75	-	56.00	46.00	-14.25	-
5	0.845	0.27	40.65	-	40.92	-	56.00	46.00	-15.08	-
6	1.099	0.30	40.74	-	41.04	-	56.00	46.00	-14.96	-

- NOTES: (1) "-": Undetectable  
 (2) Q.P. and AV. are abbreviations of quasi-peak and average.  
 (3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.  
 (4) The emission levels of other frequencies were very low against the limit.  
 (5) Correction Factor = Insertion loss + Cable loss  
 (6) Margin value = Emission level - Limit value

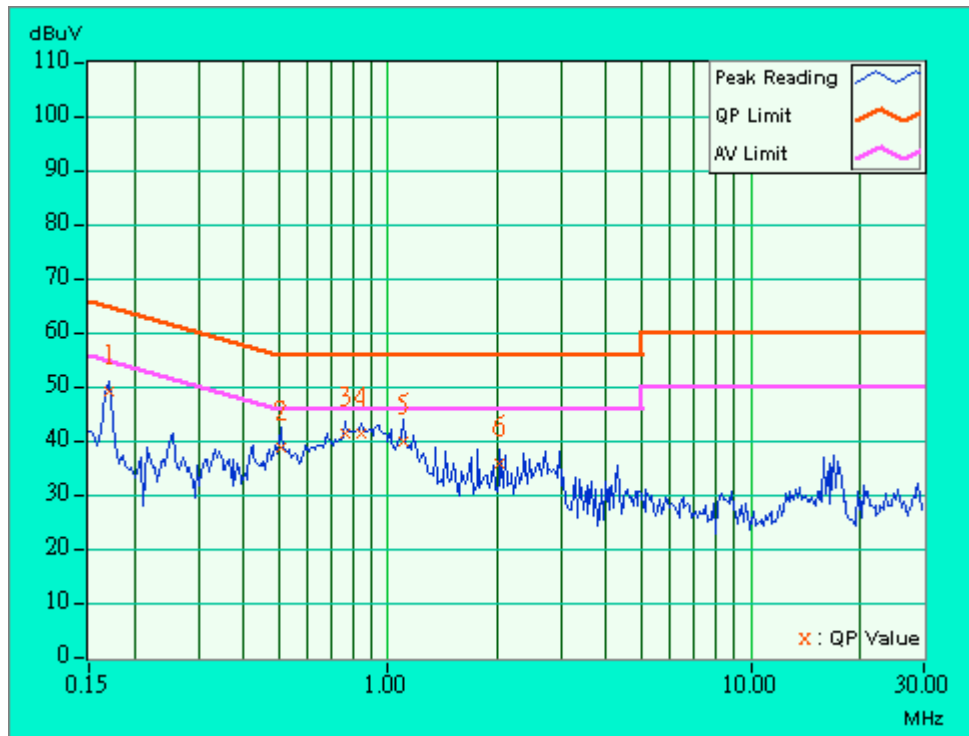




<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X2B31		
<b>MODE</b>	Channel 39	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	15 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.20	48.98	-	49.18	-	64.98	54.98	-15.80	-
2	0.505	0.22	38.45	-	38.67	-	56.00	46.00	-17.33	-
3	0.763	0.26	41.15	-	41.41	-	56.00	46.00	-14.59	-
4	0.849	0.27	41.05	-	41.32	-	56.00	46.00	-14.68	-
5	1.099	0.30	39.81	-	40.11	-	56.00	46.00	-15.89	-
6	2.029	0.30	35.66	-	35.96	-	56.00	46.00	-20.04	-

- NOTES: (1) "": Undetectable  
 (2) Q.P. and AV. are abbreviations of quasi-peak and average.  
 (3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.  
 (4) The emission levels of other frequencies were very low against the limit.  
 (5) Correction Factor = Insertion loss + Cable loss  
 (6) Margin value = Emission level - Limit value

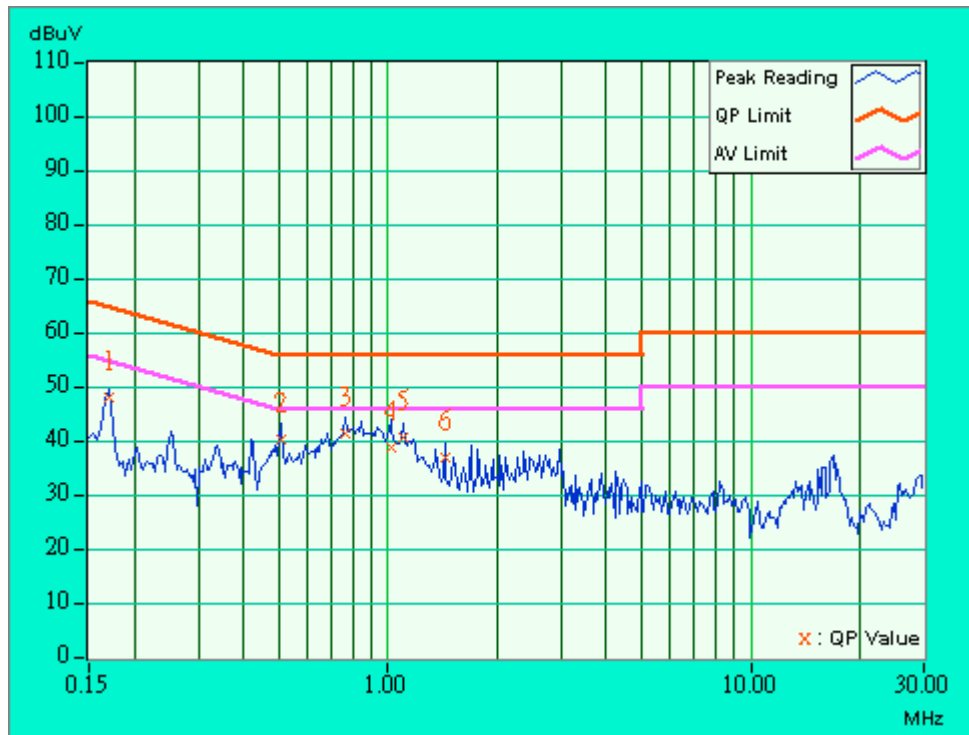




<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X2B31		
<b>MODE</b>	Channel 78	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	15 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.20	47.74	-	47.94	-	64.98	54.98	-17.04	-
2	0.505	0.22	40.12	-	40.34	-	56.00	46.00	-15.66	-
3	0.759	0.26	41.01	-	41.27	-	56.00	46.00	-14.73	-
4	1.017	0.30	38.59	-	38.89	-	56.00	46.00	-17.11	-
5	1.099	0.30	40.50	-	40.80	-	56.00	46.00	-15.20	-
6	1.439	0.30	36.59	-	36.89	-	56.00	46.00	-19.11	-

- NOTES: (1) "-": Undetectable  
 (2) Q.P. and AV. are abbreviations of quasi-peak and average.  
 (3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.  
 (4) The emission levels of other frequencies were very low against the limit.  
 (5) Correction Factor = Insertion loss + Cable loss  
 (6) Margin value = Emission level - Limit value

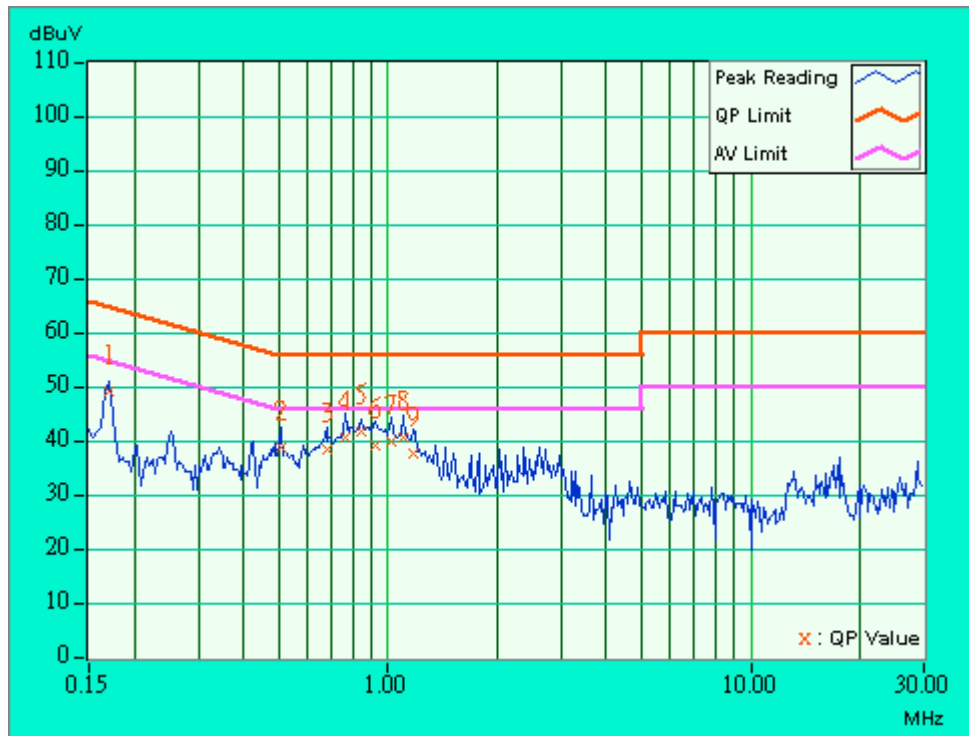




<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X2B31		
<b>MODE</b>	Channel 78	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>PHASE</b>	Neurral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	15 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.20	49.10	-	49.30	-	64.98	54.98	-15.68	-
2	0.505	0.22	38.77	-	38.99	-	56.00	46.00	-17.01	-
3	0.677	0.25	38.27	-	38.52	-	56.00	46.00	-17.48	-
4	0.759	0.26	40.51	-	40.77	-	56.00	46.00	-15.23	-
5	0.845	0.27	41.71	-	41.98	-	56.00	46.00	-14.02	-
6	0.927	0.29	38.86	-	39.15	-	56.00	46.00	-16.85	-
7	1.017	0.30	39.63	-	39.93	-	56.00	46.00	-16.07	-
8	1.099	0.30	40.58	-	40.88	-	56.00	46.00	-15.12	-
9	1.181	0.30	37.40	-	37.70	-	56.00	46.00	-18.30	-

- NOTES: (1) "x": Undetectable  
 (2) Q.P. and AV. are abbreviations of quasi-peak and average.  
 (3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.  
 (4) The emission levels of other frequencies were very low against the limit.  
 (5) Correction Factor = Insertion loss + Cable loss  
 (6) Margin value = Emission level - Limit value







## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.249 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)	
	Peak	Average
2400 ~ 2483.5	114	94

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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8590L	3467U00646	Jun. 29, 2004
*ADVANTEST Spectrum Analyzer	R3271A	85060311	Jun. 16, 2004
CHASE RF Pre_Amplifier	CPA9232	1056	May 12, 2004
*HP Pre_Amplifier	8449B	3008A01922	Oct. 13, 2004
*ROHDE & SCHWARZ Test Receiver	ESVS 30	841977/002	Sep. 17, 2004
*CHASE Broadband Antenna	CBL6112B	2798	Apr. 16, 2004
*Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 24, 2004
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170192	Feb. 16, 2005
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
*RF Switches	MP59B	1-5161-28698	Jul. 31, 2004
*RF Cable(CHASE)	CH A9525	Cable_OB_01	Jul. 31, 2004
*Software	AS60P8	NA	NA
*CHANCE MOST Antenna Tower	AT-100	CM-A007	NA
*CHANCE MOST Turn Table	TC-008	CM-T007	NA
*CORCOM AC Filter	MRI2030	024/019	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) 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 Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 3789-B.



#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

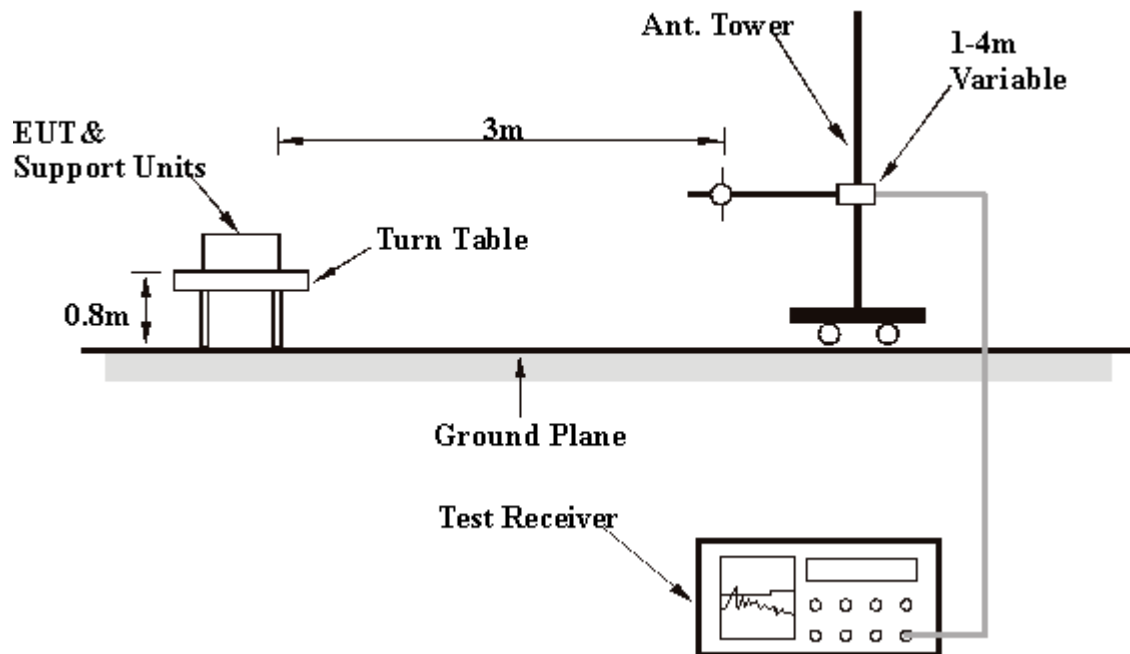
**NOTE:**

1. 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.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 4.2.6 TEST RESULTS

<b>EUT</b>	Logitech® Cordless Precision™ Controller for XBOX™	<b>MODEL</b>	C-X3B18
<b>MODE</b>	Channel 78	<b>FREQUENCY RANGE</b>	30 ~1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 68%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

**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	47.96	20.40 QP	40.00	-19.60	2.36 H	147	10.30	10.10
2	58.14	20.10 QP	40.00	-19.90	1.45 H	23	13.70	6.40
3	68.98	17.40 QP	40.00	-22.60	2.69 H	102	11.00	6.40
4	79.16	18.60 QP	40.00	-21.40	1.20 H	233	10.40	8.20
5	114.62	20.30 QP	43.50	-23.20	4.00 H	258	8.00	12.30
6	196.38	18.00 QP	43.50	-25.50	1.00 H	249	7.70	10.30
7	223.46	18.20 QP	46.00	-27.80	1.04 H	14	7.30	10.90
8	334.61	17.20 QP	46.00	-28.80	1.10 H	201	0.70	16.50

**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	47.96	21.30 QP	40.00	-18.70	1.28 V	299	11.20	10.10
2	68.98	19.20 QP	40.00	-20.80	1.56 V	210	12.80	6.40
3	79.16	21.50 QP	40.00	-18.50	1.24 V	20	13.30	8.20
4	118.67	20.60 QP	43.50	-22.90	1.20 V	189	8.10	12.50
5	134.69	19.70 QP	43.50	-23.80	1.45 V	230	7.00	12.70
6	196.58	19.70 QP	43.50	-23.80	1.36 V	200	9.40	10.30
7	296.38	21.80 QP	46.00	-24.20	1.24 V	250	6.40	15.40
8	334.67	20.30 QP	46.00	-25.70	1.04 V	263	3.80	16.50

- 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.



4.2.7 TEST RESULTS

<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X3B18		
<b>MODE</b>	Channel 0	<b>FREQUENCY RANGE</b>	1000~25000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	17 deg. C, 63%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

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	2315.00	58.10 PK	74.00	-15.90	1.10 H	69	28.50	29.60
1	2315.00	29.60 AV	54.00	-24.40	1.10 H	69	0.00	29.60
2	2367.00	56.50 PK	74.00	-17.50	1.08 H	359	26.80	29.70
2	2367.00	28.00 AV	54.00	-26.00	1.08 H	359	-1.70	29.70
3	*2402.00	90.30 PK			1.13 H	308	60.40	29.90
3	*2402.00	61.70 AV			1.13 H	308	31.90	29.90
4	4804.00	60.10 PK	74.00	-13.90	1.56 H	12	23.90	36.10
4	4804.00	31.50 AV	54.00	-22.50	1.56 H	12	-4.60	36.10
5	7206.00	63.50 PK	74.00	-10.50	1.56 H	280	21.90	41.60
5	7206.00	35.00 AV	54.00	-19.00	1.56 H	280	-6.60	41.60
6	9608.00	61.80 PK	74.00	-12.20	1.36 H	0	16.80	45.00
6	9608.00	33.30 AV	54.00	-20.70	1.36 H	0	-11.80	45.00

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	1210.00	39.30 PK	74.00	-34.70	1.46 V	100	12.70	26.50
2	2311.00	63.10 PK	74.00	-10.90	1.28 V	49	33.60	29.50
2	2311.00	34.60 AV	54.00	-19.40	1.28 V	49	5.10	29.50
3	2364.00	63.90 PK	74.00	-10.10	1.00 V	45	34.20	29.70
3	2364.00	35.30 AV	54.00	-18.70	1.00 V	45	5.70	29.70
4	2390.00	57.80 PK	74.00	-16.20	1.00 V	39	28.00	29.80
4	2390.00	29.30 AV	54.00	-24.70	1.00 V	39	-0.50	29.80
5	*2402.00	95.30 PK			1.00 V	49	65.40	29.90
5	*2402.00	66.80 AV			1.00 V	49	36.90	29.90
6	4804.00	59.10 PK	74.00	-14.90	1.02 V	13	23.00	36.10
6	4804.00	30.60 AV	54.00	-23.40	1.02 V	13	-5.60	36.10
7	7206.00	63.40 PK	74.00	-10.60	1.48 V	355	21.80	41.60
7	7206.00	34.90 AV	54.00	-19.10	1.48 V	355	-6.70	41.60
8	9608.00	64.00 PK	74.00	-10.00	1.33 V	60	19.00	45.00
8	9608.00	35.50 AV	54.00	-18.50	1.33 V	60	-9.60	45.00

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. Margin value = Emission level - Limit value
4. “ \* “ : Fundamental frequency
5. The other emission levels were very low against the limit.



<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X3B18		
<b>MODE</b>	Channel 39	<b>FREQUENCY RANGE</b>	1000~25000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	17 deg. C, 63%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

#### 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	*2441.00	88.20 PK			1.59 H	36	58.20	30.00
1	*2441.00	57.70 AV			1.59 H	36	27.70	30.00
2	2544.00	55.20 PK	74.00	-18.80	1.16 H	95	24.90	30.30
2	2544.00	26.70 AV	54.00	-27.30	1.16 H	95	-3.60	30.30
3	4882.00	63.00 PK	74.00	-11.00	1.54 H	259	26.50	36.50
3	4882.00	34.50 AV	54.00	-19.50	1.54 H	259	-2.00	36.50
4	7323.00	58.50 PK	74.00	-15.50	1.67 H	65	16.80	41.80
4	7323.00	30.00 AV	54.00	-24.00	1.67 H	65	-11.80	41.80
5	9764.00	57.30 PK	74.00	-16.70	1.19 H	323	12.70	44.60
5	9764.00	28.80 AV	54.00	-25.20	1.19 H	323	-15.80	44.60

#### 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	*2441.00	94.30 PK			1.21 V	43	64.30	30.00
1	*2441.00	65.80 AV			1.21 V	43	35.80	30.00
2	2544.00	62.20 PK	74.00	-11.80	1.13 V	179	31.90	30.30
2	2544.00	33.70 AV	54.00	-20.30	1.13 V	179	3.40	30.30
3	4882.00	63.80 PK	74.00	-10.20	1.62 V	3	27.30	36.50
3	4882.00	35.30 AV	54.00	-18.70	1.62 V	3	-1.20	36.50
4	7323.00	60.20 PK	74.00	-13.80	1.47 V	142	18.50	41.80
4	7323.00	31.70 AV	54.00	-22.30	1.47 V	142	-10.00	41.80
5	9763.00	60.40 PK	74.00	-13.60	1.25 V	146	15.80	44.60
5	9763.00	31.90 AV	54.00	-22.10	1.25 V	146	-12.70	44.60

#### 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. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.



<b>EUT</b>	Logitech ® Cordless Precision™ Controller for XBOX™		
<b>MODEL</b>	C-X3B18		
<b>MODE</b>	Channel 78	<b>FREQUENCY RANGE</b>	1000~25000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	17 deg. C, 63%RH, 980 hPa	<b>TESTED BY</b>	Tony Chen

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	*2480.00	88.10 PK			1.49 H	86	58.00	30.10
1	*2480.00	59.60 AV			1.49 H	86	29.50	30.10
2	2483.50	59.50 PK	74.00	-14.50	1.55 H	259	29.30	30.10
2	2483.50	31.00 AV	54.00	-23.00	1.55 H	259	0.80	30.10
3	2544.00	54.90 PK	74.00	-19.10	1.00 H	25	24.60	30.30
3	2544.00	26.40 AV	54.00	-27.60	1.00 H	25	-3.90	30.30
4	4960.00	63.00 PK	74.00	-11.00	1.57 H	162	26.10	36.80
4	4960.00	34.40 AV	54.00	-19.60	1.57 H	162	-2.40	36.80
5	7440.00	56.10 PK	74.00	-17.90	1.60 H	77	14.20	41.90
5	7440.00	27.60 AV	54.00	-26.40	1.60 H	77	-14.30	41.90
6	9920.00	57.50 PK	74.00	-16.50	1.10 H	357	13.30	44.20
6	9920.00	28.90 AV	54.00	-25.10	1.10 H	357	-15.20	44.20

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	*2480.00	94.20 PK			1.16 V	41	64.00	30.10
1	*2480.00	65.60 AV			1.16 V	41	35.50	30.10
2	2483.50	62.50 PK	74.00	-11.50	1.51 V	315	32.40	30.10
2	2483.50	34.00 AV	54.00	-20.00	1.51 V	315	3.90	30.10
3	2544.00	58.30 PK	74.00	-15.70	1.32 V	211	28.00	30.30
3	2544.00	29.80 AV	54.00	-24.20	1.32 V	211	-0.60	30.30
4	4960.00	65.10 PK	74.00	-8.90	1.27 V	288	28.30	36.80
4	4960.00	36.60 AV	54.00	-17.40	1.27 V	288	-0.20	36.80
5	7440.00	60.60 PK	74.00	-13.40	1.76 V	1	18.70	41.90
5	7440.00	32.10 AV	54.00	-21.90	1.76 V	1	-9.80	41.90
6	9920.00	60.20 PK	74.00	-13.80	1.00 V	334	16.10	44.20
6	9920.00	31.70 AV	54.00	-22.30	1.00 V	334	-12.50	44.20

**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. Margin value = Emission level - Limit value
4. “ \* “ : Fundamental frequency
5. The other emission levels were very low against the limit.



### 4.3 BAND EDGES MEASUREMENT

#### 4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

#### 4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation



#### 4.3.5 EUT OPERATING CONDITION

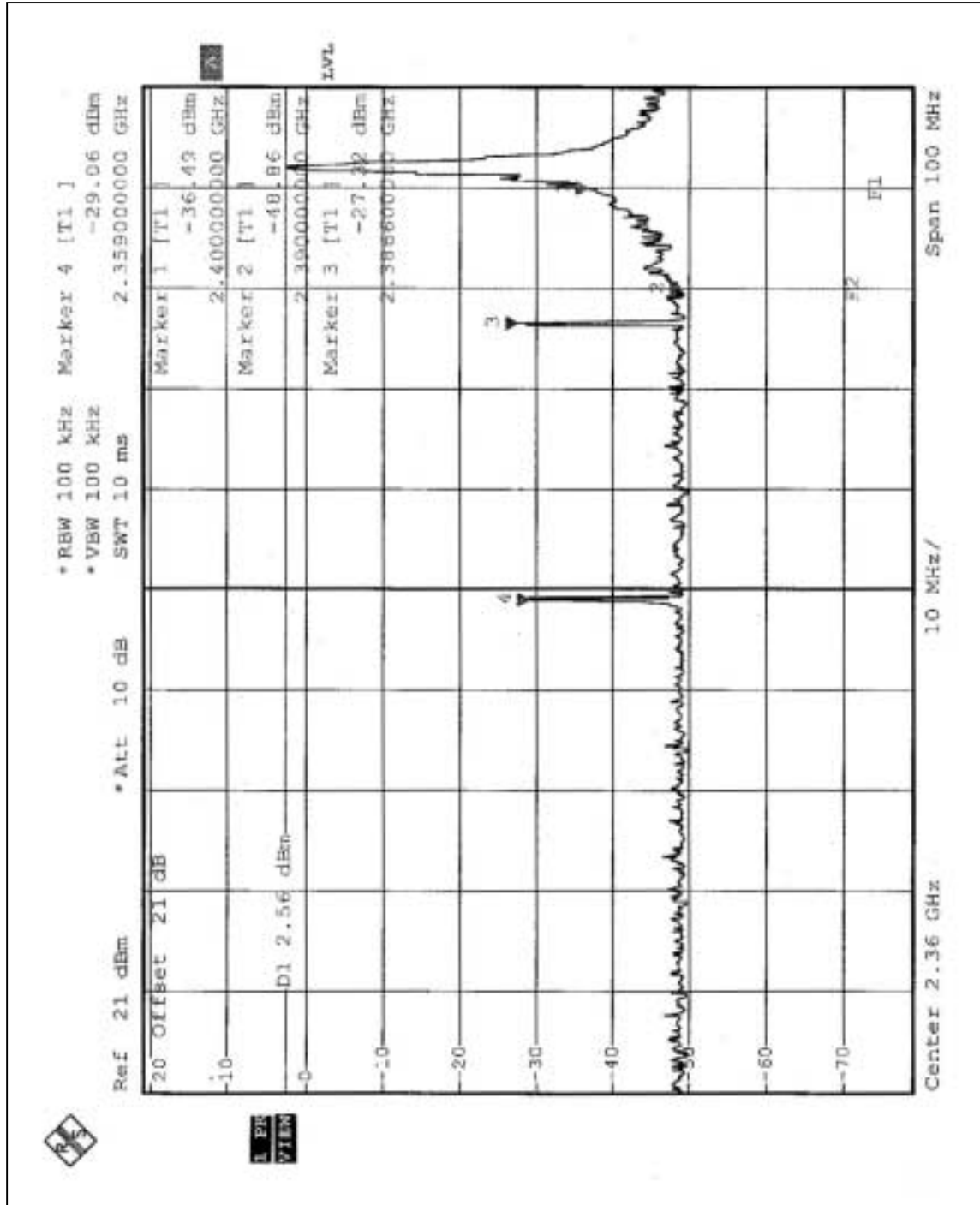
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

#### 4.3.6 TEST RESULTS

Emissions radiated outside of the specified frequency bands, please refer pages from 22 to 24 for met the requirement of the general radiated emission limits in § 15.209.

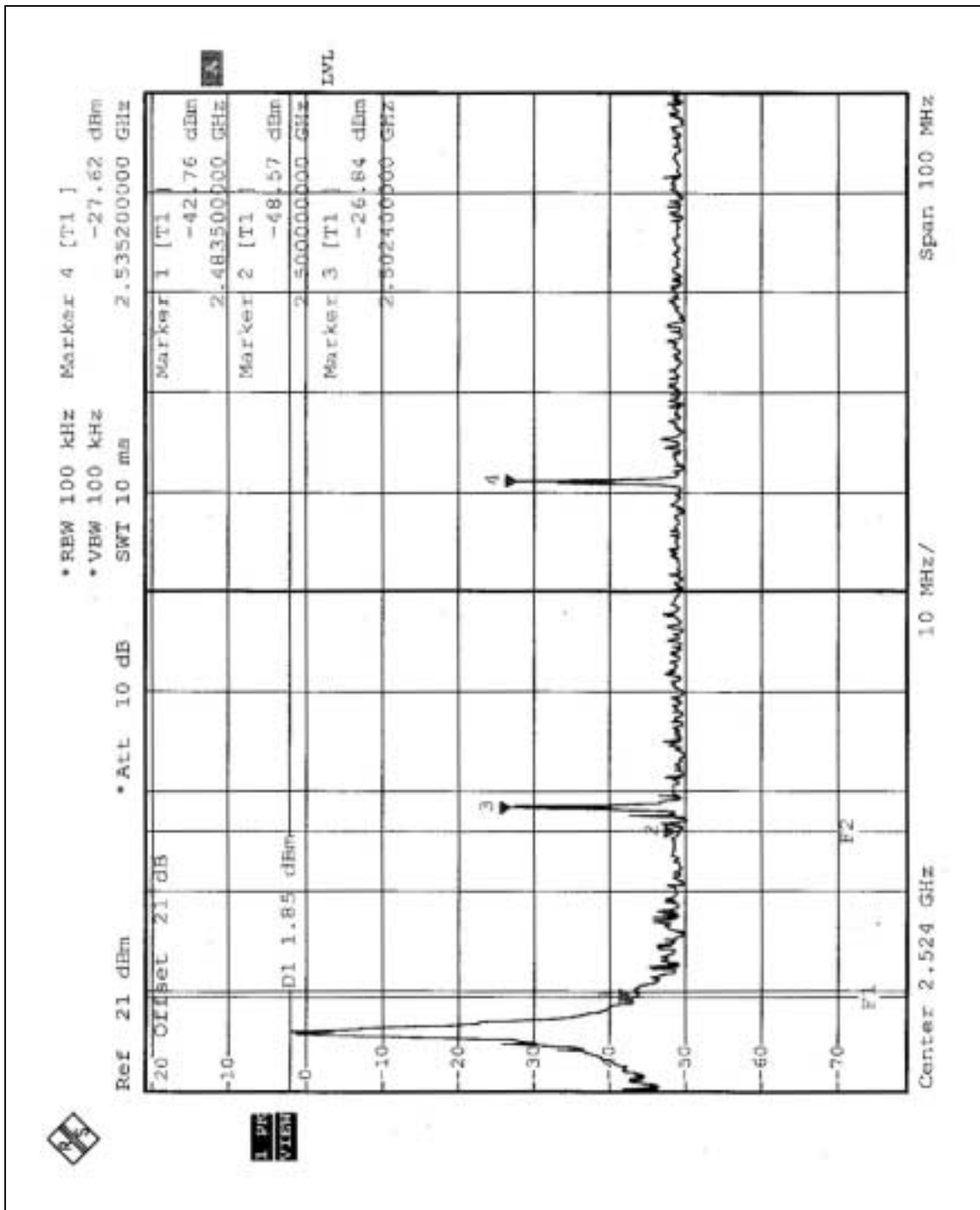


Static-CH 0

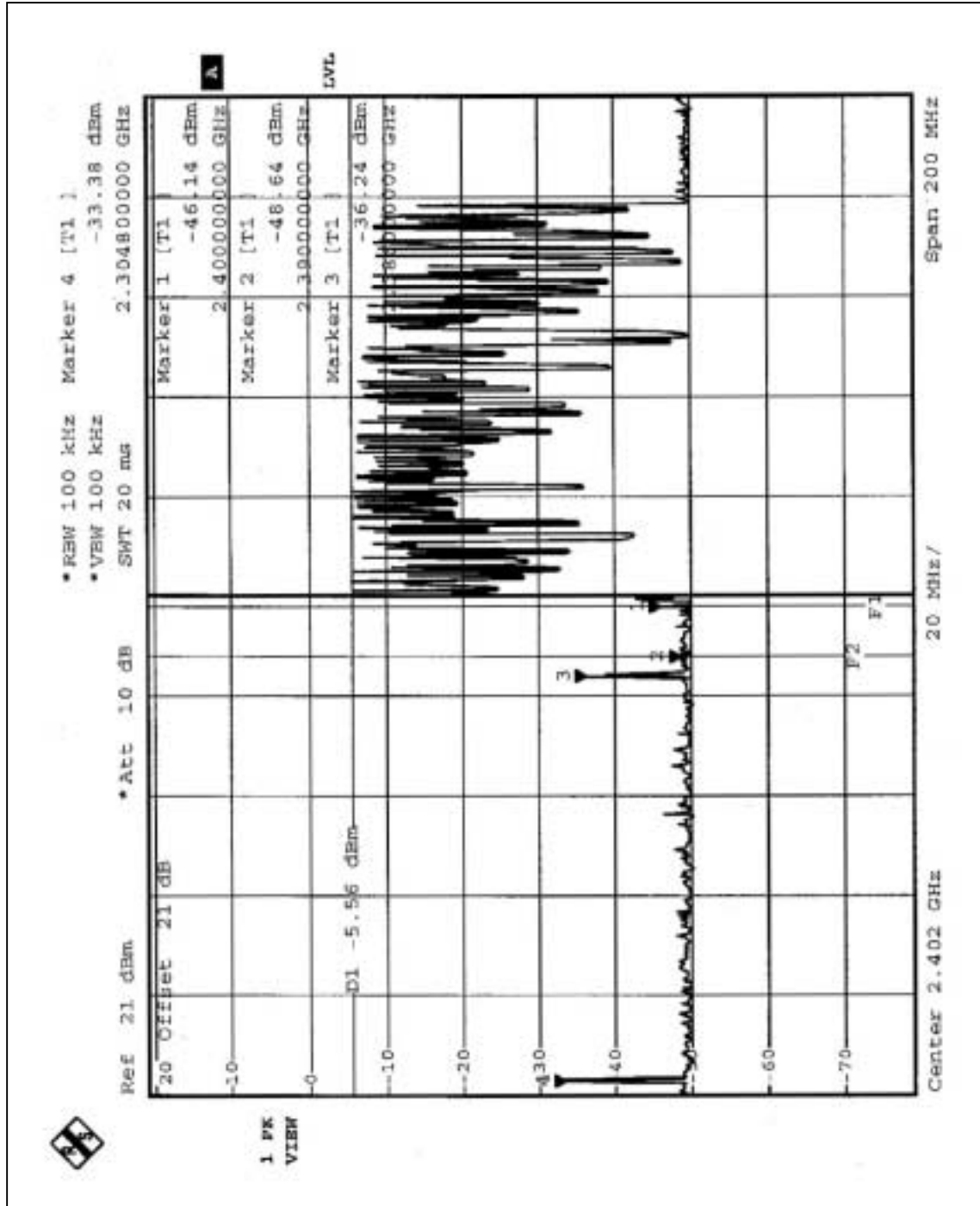




Static-CH 78

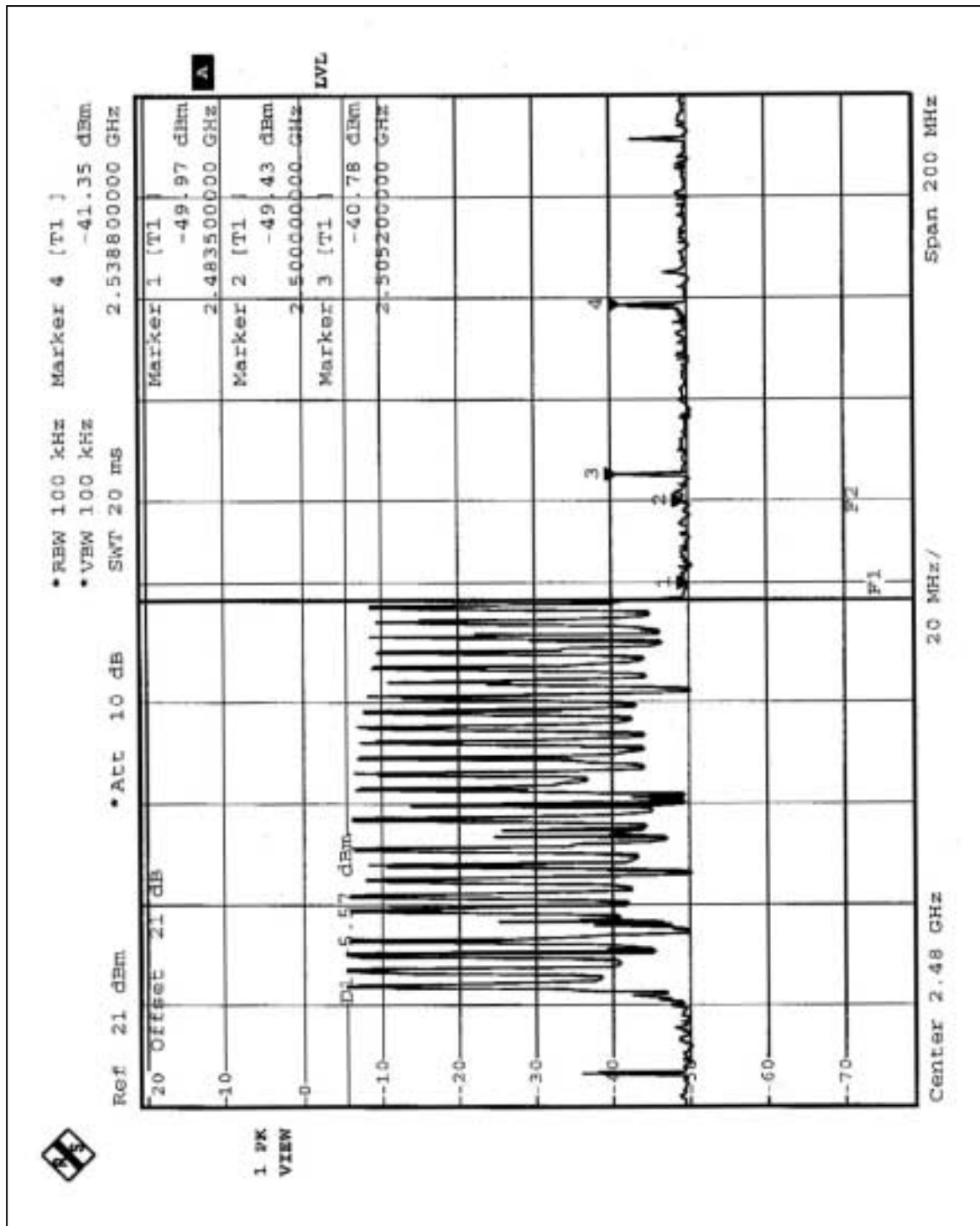


Dynamic-CH 0





Dynamic -CH 78



## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST



### 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:

<b>USA</b>	FCC, NVLAP, UL
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	CNLA, BSMI, DGT
<b>Netherlands</b>	Telefication
<b>Singapore</b>	PSB , GOST-ASIA(MOU)
<b>Russia</b>	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](http://www.adt.com.tw/index.5/phtml). If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180  
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343  
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Lab:**

Tel: 886-3-3183232  
Fax: 886-3-3185050

**Linko RF & Telecom Lab.**

Tel: 886-3-3270910  
Fax: 886-3-3270892

**Email:** [service@mail.adt.com.tw](mailto:service@mail.adt.com.tw)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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