



**FCC 47 CFR PART 15 SUBPART C**

**TEST REPORT**

**For**

**PC media remote controller**

**Model : R-RD8**

**Issued for**

**Logitech Far East Ltd.**

**#2 Creation Rd, 4, Science-Based Ind. Park Hsinchu Taiwan, R.O.C.**

**Taiwan, R.O.C.**

**Issued by**

**Compliance Certification Services Inc.  
Hsinchu Lab.**

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# Test Report Certification

**Applicant** : Logitech Far East Ltd.  
**Address** : #2 Creation Rd, 4, Science-Based Ind. Park Hsinchu,  
 Taiwan, R.O.C.  
**Equipment Under Test** : PC media remote controller  
**Model** : R-RD8  
**Tested Date** : May 09 ~ 18, 2005

APPLICABLE STANDARD	
STANDARD	TEST RESULT
FCC Part 15 Subpart C (Section 15.227)	No non-compliance noted

Approved by:

*C. F. Wu*

C. F. Wu  
Manager of Hsinchu Laboratory  
Compliance Certification Services Inc.

Reviewed by:

May 23, 2005



*Alan Fan*  
Alan Fan  
Test Engineer of Hsinchu Laboratory  
Compliance Certification Services Inc.

May 23, 2005

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.



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## 1. EUT DESCRIPTION

### 1.1 DESCRIPTION OF EUT & POWER

<b>Product Name</b>	PC media remote controller
<b>Model Number</b>	R-RD8
<b>Operating Frequency</b>	27.095MHz, 27.145MHz
<b>Channel Number</b>	2
<b>Modulation Technique</b>	FSK
<b>Antenna Type</b>	Loop Antenna, Antenna Gain : 0dBi
<b>Power Source</b>	3VDC (Powered by AAA batteries × 2, Rating : 2 × 1.5VDC)



## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CRF 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.227.

## 3. FACILITIES AND ACCREDITATION

### SITE DESCRIPTION :

FCC Certificate NO. : 90585  
BSMI Certificate NO. : SL2-IN-E-0002  
NVLAP Lab Code : 200118-0  
CNLA Certificate NO. : CNLA-ZL97018E  
VCCI Certificate NO. : R-1189, C-1250  
TÜV Rheinland Certificate NO. : 10008375

NAME OF SITE : Compliance Certification Services Inc. Hsinchu Lab.  
SITE LOCATION : Rm.258, Bldg.17, NO.195 , Sec. 4, Chung Hsing Rd.,  
Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.



## 4. CALIBRATION AND UNCERTAINTY

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 1000 MHz	+/- 3.2 dB
Radiated Emission, 1 to 26.5 GHz	+/- 3.2 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%



## 5. DESCRIPTION OF TEST MODES

There are two channels have been tested as following:

Channel	Frequency
1	27.095MHz
2	27.145MHz

Note : There are three axes placement for test sample, after evaluated, Z-axis (worst case) are chosen as a representative.

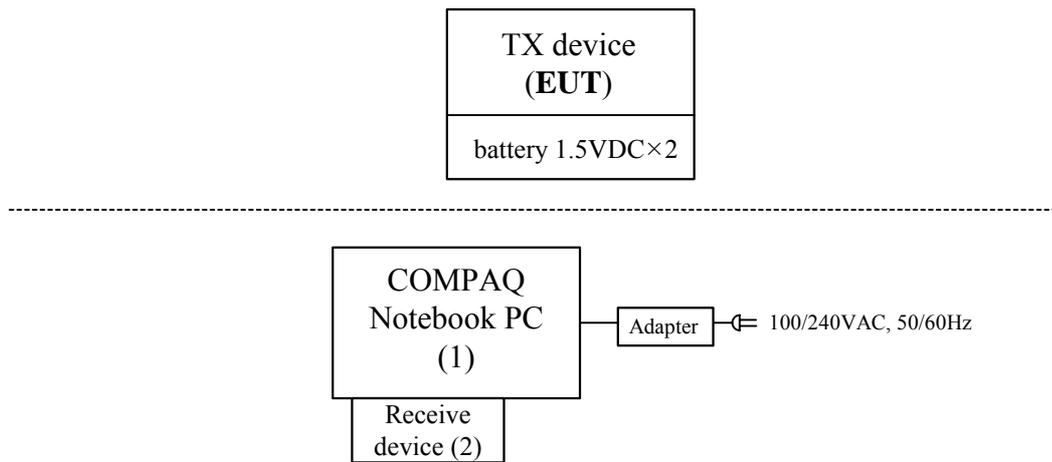


## 6. SETUP OF EQUIPMENT UNDER TEST

### SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	Input Power	Output Power
1	Notebook PC	COMPAQ	N800V	5Y31KSQZD1T J 1YR	18.5VDC,65W, 3.5A	-----
	Adapter	COMPAQ	PPP009L	4809672405	100~240VAC, 50/60Hz, 1.6A	18.5VDC, 65W 3.5A
2	Receive device	Logitech	C-UQ27	LZA43400161	5VDC(From USB interface of Notebook)	-----

### SETUP DIAGRAM FOR TESTS



The indicated numbers (1)(2), please refer to item 1.3



### **EUT OPERATING CONDITION**

1. Set up all computers like the setup diagram.
2. Power on all equipments.
3. Test Mode:
  - (1) After power on, please push **Rewind + Stop + Fast-Forward** at the same time before the LED is put off.
  - (2) Transmit modulated signal continuously:
    - a. Push **Zoom -** to enter channel 1 ( 27.095 MHz )
    - b. If you want to change channel to channel 2 ( 27.145 MHz ),push **Close** to escape Channel 1 , and then push **Zoom +** to enter channel 2 .
  - (3) Transmit unmodulated signal continuously:
    - a. Push **Close** to escape the former state.
    - b. Push button **2** ( channel 1 ) , or push **Rewind** ( channel 2 ).
4. All of the function are under run.
5. Start test.



## 7. APPLICABLE LIMITS AND TEST RESULTS

### 7.1 26dB BANDWIDTH

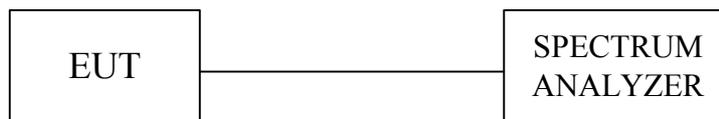
#### LIMIT

N/A

#### TEST EQUIPMENTS

Description & Manufacturer	Model No.	Serial No.	Date of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004

#### TEST SETUP



#### TEST PROCEDURE

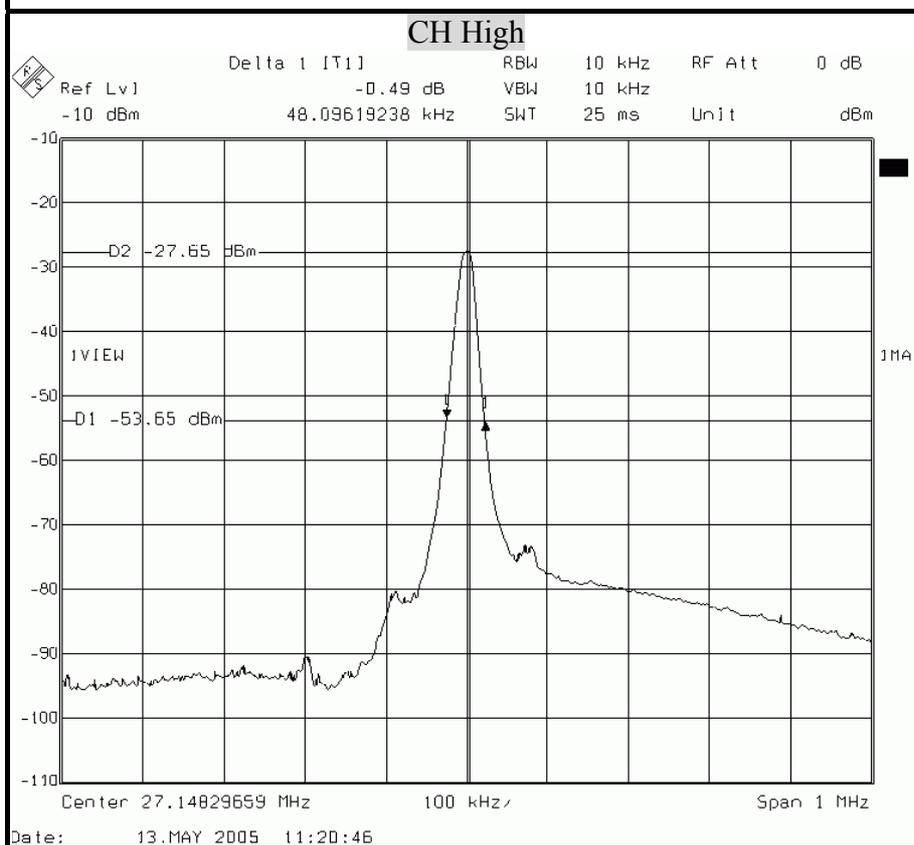
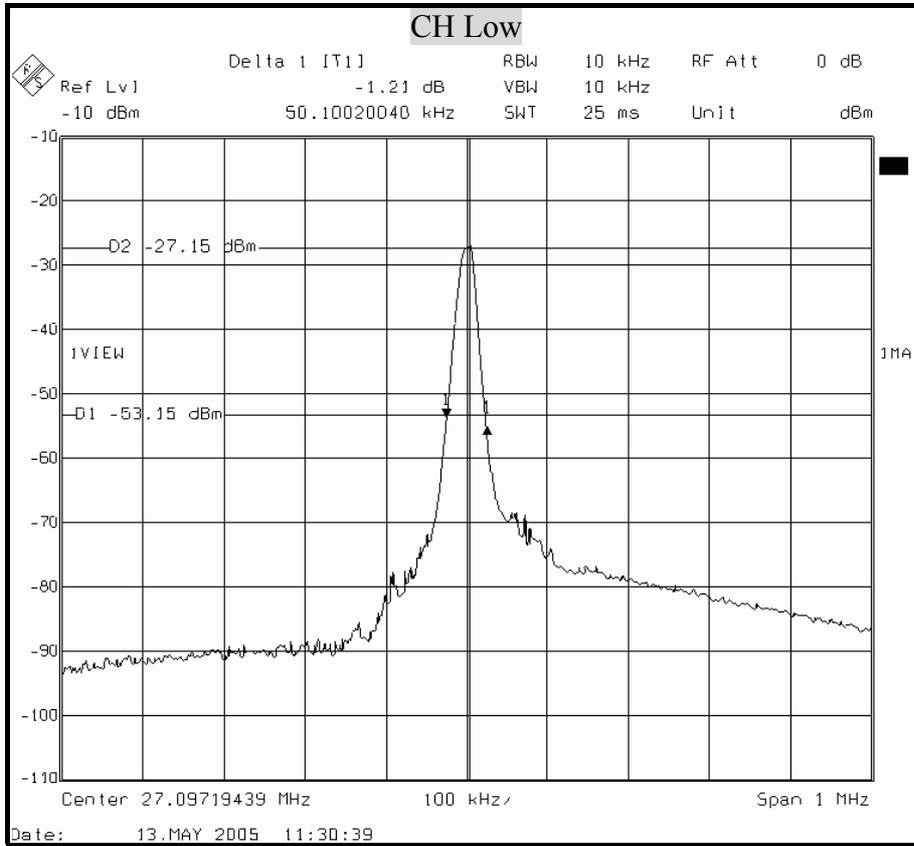
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10kHz, VBW = RBW, Span = 1MHz, Sweep = auto.
4. Mark the peak frequency and 26dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

#### TEST RESULTS

No non-compliance noted



**26dB BANDWIDTH**





## 7.2 RADIATED EMISSIONS

### LIMITS

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, However, operation within these frequency bands is permitted under other sections of this Part, e-g, Sections 15.231 and 15.241.

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

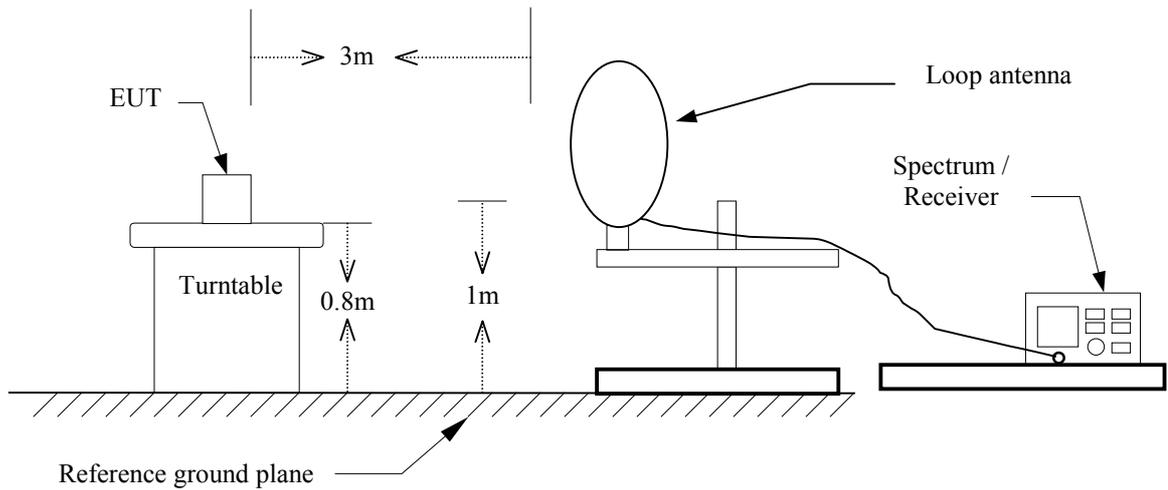
### **TEST EQUIPMENTS**

The following test equipments are utilized in making the measurements contained in this report.

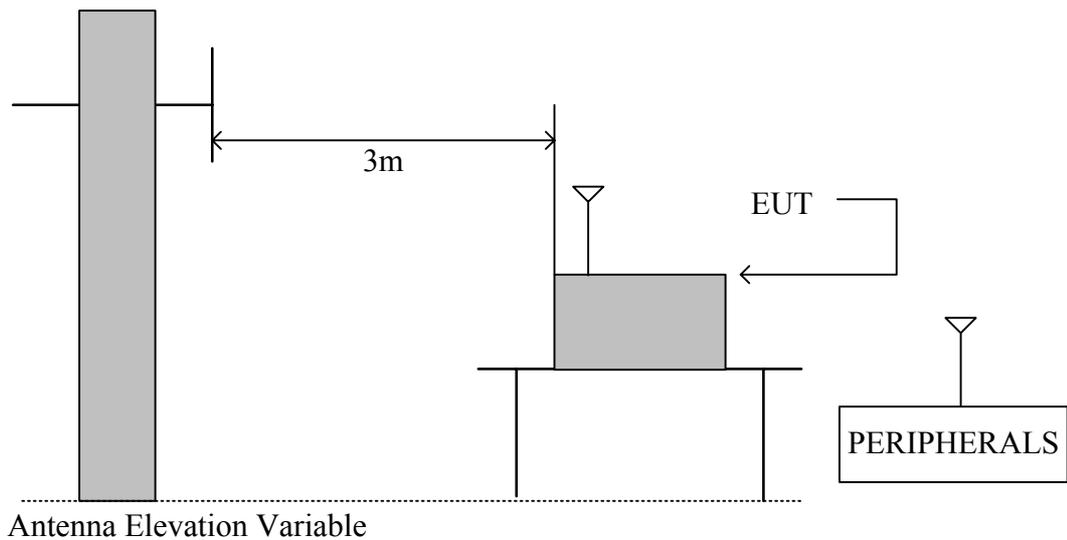
Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
CHASE BI-LOG ANTENNA	CBL6112B	2817	March 22, 2005	1 Year	FINAL
R/S SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004	1 Year	FINAL
R/S EMI TEST RECEIVER	ESCS 30	83548/008	September 05, 2004	1 Year	FINAL
Loop Antenna ETS-LINDGREN	6502	2356	June 15, 2004	1 Year	FINAL
OPEN SITE	-----	No.2	May 07, 2005	1 Year	FINAL
N TYPE COAXIAL CABLE	CHA9525	12	June 08, 2004	1 Year	FINAL
Horn Antenna	96001	2698	April 09, 2005	1 Year	FINAL
HP Pre-amplifier	8449B	3008A01471	November 24, 2004	1 Year	FINAL
HP High pass filter	84300/80038	002	CAL. ON USE	1 Year	FINAL

**TEST SETUP**

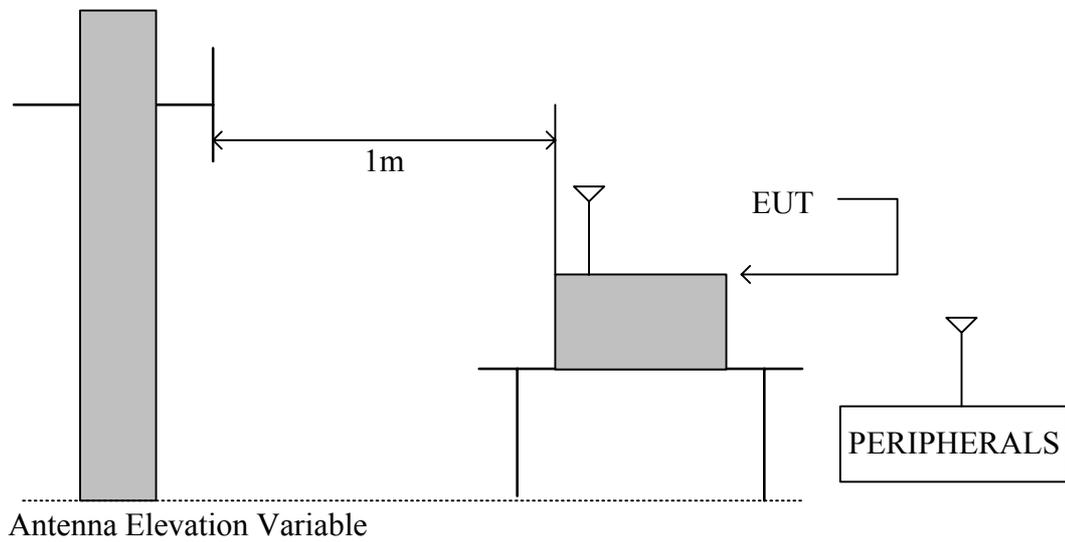
9kHz ~ 30MHz



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.





## **TEST PROCEDURE**

- 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. While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 1 meters away from the interference-receiving antenna
- 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 polarization 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 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 120 KHz 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 and 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.

## **TEST RESULTS**

No non-compliance noted

**7.2.1 RADIATED EMISSION**

Product Name	PC media remote controller	Test Date	2005/05/12
Model Name	R-RD8	Test By	Alan Fan
Mode	Low Channel 27.095MHz & High Channel 27.145MHz	TEMP&Humidity	24.3°C, 78%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Detector Mode (PK/AVG)	Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical			Horizontal	Vertical
27.095	9.20	0.97	57.50	62.10	PEAK	100.00	67.67	72.27
27.095	9.20	0.97	57.20	61.20	AVG	80.00	67.37	71.37
27.145	9.20	0.97	58.40	63.40	PEAK	100.00	68.57	73.57
27.145	9.20	0.97	58.10	63.10	AVG	80.00	68.27	73.27

REMARKS: 1. \*Undetectable  
2. Emission level (dBμV/M) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).

**7.2.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz**

Product Name	PC media remote controller	Test Date	2005/05/12
Model Name	R-RD8	Test By	Alan Fan
Mode	Low Channel 27.095MHz	TEMP&Humidity	24.3°C, 78%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
54.19	8.46	1.36	20.40	13.00	40.00	30.22	22.82
81.29	8.57	1.72	15.20	10.20	40.00	25.49	20.49
243.87	12.87	3.90	10.90	3.60	46.00	27.67	20.37
257.42	13.26	4.05	13.90	5.40	46.00	31.22	22.72
270.97	13.56	4.13	17.20	5.30	46.00	34.89	22.99
284.39	13.86	4.21	15.60	3.70	46.00	33.67	21.77
311.61	14.53	4.36	8.70	2.00	46.00	27.59	20.89
420.00	17.36	4.92	4.70	1.20	46.00	26.98	23.48

REMARKS: 1. \*Undetectable  
2. Emission level (dBμV/M) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).



Product Name	PC media remote controller	Test Date	2005/05/12
Model Name	R-RD8	Test By	Alan Fan
Mode	High Channel 27.145MHz	TEMP&Humidity	24.3°C, 78%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
54.29	8.44	1.36	20.20	13.60	40.00	30.00	23.40
81.44	8.60	1.72	12.40	12.30	40.00	22.73	22.63
244.33	12.88	3.91	8.30	2.80	46.00	25.10	19.60
257.90	13.27	4.06	14.40	5.00	46.00	31.73	22.33
271.48	13.57	4.13	14.60	3.60	46.00	32.31	21.31
285.00	13.87	4.21	14.70	3.00	46.00	32.78	21.08
312.20	14.54	4.37	6.20	2.00	46.00	25.11	20.91
420.79	17.37	4.92	3.70	1.20	46.00	25.99	23.49

REMARKS: 1. \*Undetectable

2. Emission level (dBμV/M) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).



### 7.3 POWERLINE CONDUCTED EMISSIONS

#### LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

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

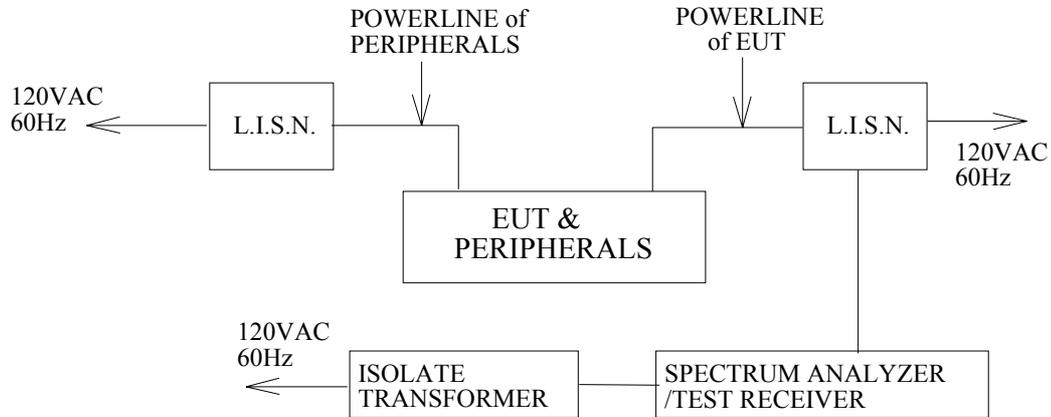
#### TEST EQUIPMENTS

The following test equipments are used during the conducted powerline tests :

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
HP SPECTRUM ANALYZER	8594E	3801A05627	April 28, 2005	1 Year	PRETEST
SOLAR ISOLATION TRANSFORMER	7032-1	N/A	N/A	N/A	FINAL
EMCO L.I.S.N.	3850/2	9311-1025 9401-1028	January 10, 2005 For Characteristic impedance	1 Year	FINAL
			January 10, 2005 For Insertion loss		
R & S TEST RECEIVER	ESHS30	838550/003	February 21, 2005	1 Year	FINAL
KEENE SHIELDED ROOM	5983	No.1	N/A	N/A	FINAL
R & S PULSE LIMIT	EHS3Z2	357.8810.52	July 10, 2004	1 Year	FINAL
N TYPE COAXIAL CABLE	-----	-----	July 10, 2004	1 Year	FINAL
50 $\Omega$ TERMINATOR	-----	-----	July 10, 2004	1 Year	FINAL



## TEST SETUP



## TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

## TEST RESULTS

No non-compliance noted

Since this EUT is battery powered, this test item is not applicable.