



## **FCC 47 CFR PART 15 SUBPART C**

### **TEST REPORT**

**For**

**RF remote Control**

**Model: RC1884404/00; RC1884403/00**

**Trade Name: Echostar**

*Issued to*

**Philips Singapore Pte Ltd  
620A Lorong 1 Toa Payoh TP1 Bldg,  
Level 2 Singapore 319762**

*Issued by*

**Compliance Certification Services Inc.  
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,  
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## 1. TEST RESULT CERTIFICATION

**Applicant:** Philips Singapore Pte Ltd  
620A Lorong 1 Toa Payoh TP1 Bldg,  
Level 2 Singapore 319762

**Equipment Under Test:** RF remote Control

**Trade Name:** Echostar

**Model:** RC1884404/00; RC1884403/00

**Date of Test:** March 16, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted


### We hereby certify that:


The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.207, 15.209 and Part 15.231.

The test results of this report relate only to the tested sample identified in this report.

**Approved by:**

**Reviewed by:**

  
\_\_\_\_\_  
Jim Chang  
Section Manager of Linkou Laboratory  
Compliance Certification Services Inc.

  
\_\_\_\_\_  
Susan Su  
Section Manager of Linkou Laboratory  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	RF remote Control
<b>Trade Name</b>	Echostar
<b>Model Number</b>	RC1884404/00; RC1884403/00
<b>Model Difference</b>	RC1884403/00 (same hardware without RF module. IR Version)
<b>Power Supply</b>	Powered by battery (Rating: 6Vdc)
<b>Frequency Range</b>	369.5 ~ 394.3 MHz
<b>Number of Channels</b>	4 Channels (369.5MHz / 375.3MHz / 388.3MHz / 394.3MHz)
<b>Modulation Technique</b>	FSK
<b>Antenna Designation</b>	Integral antenna

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: RCSRC188EC filing to comply with Section 15.207, 15.209 and 15.231 of the FCC Part 15, Subpart C Rules.



### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4 (2001) and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.231.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.

### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

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

<sup>2</sup> Above 38.6

- (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.

### 3.5 DESCRIPTION OF TEST MODES

The EUT (model: RC1884404/00) had been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis) and laptop mode. The worst emission was found in lie-down position (X axis) and the worst case was recorded.



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

*Remark: Each piece of equipment is scheduled for calibration once a year.*

Open Area Test Site # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilnet	E4411B	MY41440314	N.C.R
Spectrum Analyzer	R&S	FSP30	100112	10/10/2007
EMI Test Receiver	R&S	ESVS30	828488/004	03/12/2008
Pre-Amplifier	Anritsu	MH648A	M18767	08/31/2007
Pre-Amplifier	MITEQ	AFS42-00102650-42-10P-42	924206	04/27/2007
Bilog Antenna	SCHWAZBECK	VULB9163	144	03/31/2007
Horn Antenna	EMCO	3115	00022250	04/16/2007
Loop Antenna	EMCO	6502	2356	N.C.R
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Site NSA	CCS	N/A	N/A	05/05/2007
Test S/W	LABVIEW (V 6.1)			

*Remark: The measurement uncertainty is less than +/- 4.5248dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*



## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☐ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☒ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.







All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

The test facilities used to perform Electromagnetic compatibility tests are registered or accredited by the organizations listed in the following table which includes the recognized scope specifically.

This accredited organization maintains A2LA accreditation to ISO/IEC 17025 for the specific test listed in A2LA Certificate # 0824-01.

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 No. 0824-01
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 93105, 90471
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	<b>VCCI</b> R-393/2316/725/1868 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328-2, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328-1, EN 300 328-2, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	 Testing Laboratory 0363
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	 IC 2324C-3 IC 2324C-5 IC 6106

**Note:** No part of this report may be used to claim or imply product endorsement by A2LA, TAF or other government agency.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Remark:** Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



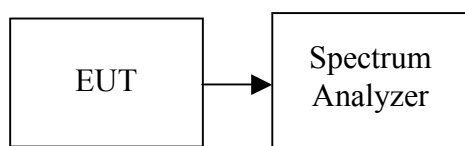
## 7. FCC PART 15.231 REQUIREMENTS

### 7.1 20 DB BANDWIDTH

#### LIMIT

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

#### Test Configuration



#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10 kHz and VBW is set 30kHz.

#### TEST RESULTS

*No non-compliance noted.*

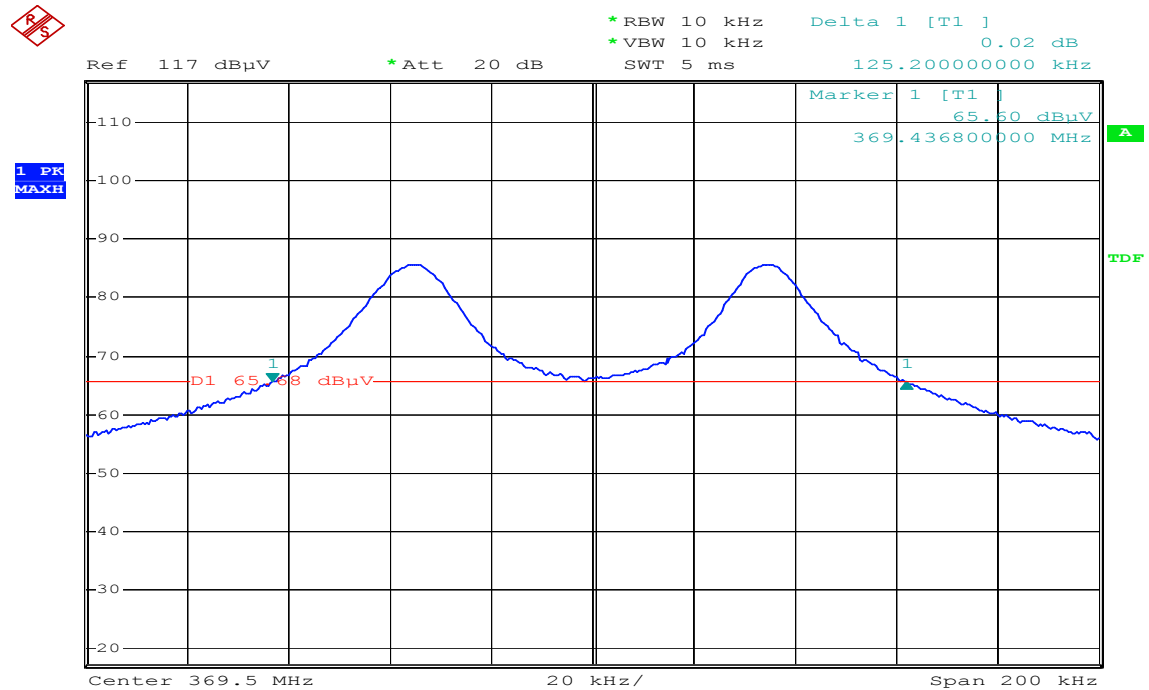
#### Test Data

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	Limit (MHz)	Result
Low	369.50	125.20	0.9238	PASS
Mid	375.30	124.80	0.9383	PASS
High	394.30	130.40	0.9858	PASS



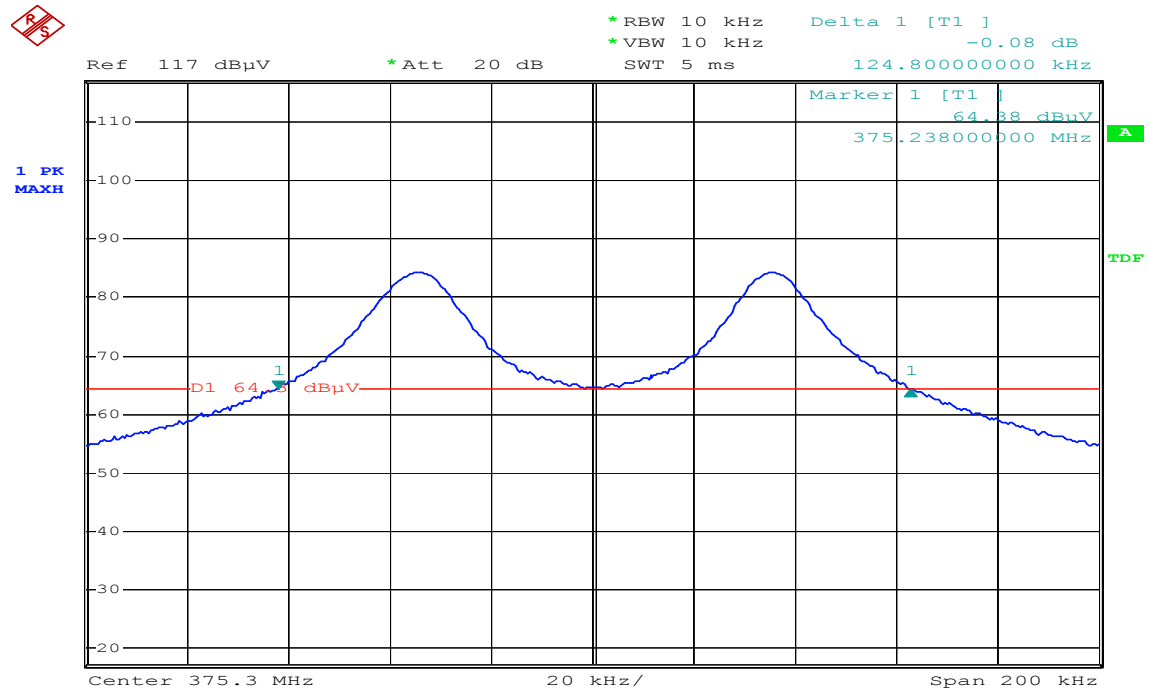
## Test Plot

### 20dB Bandwidth (CH Low)



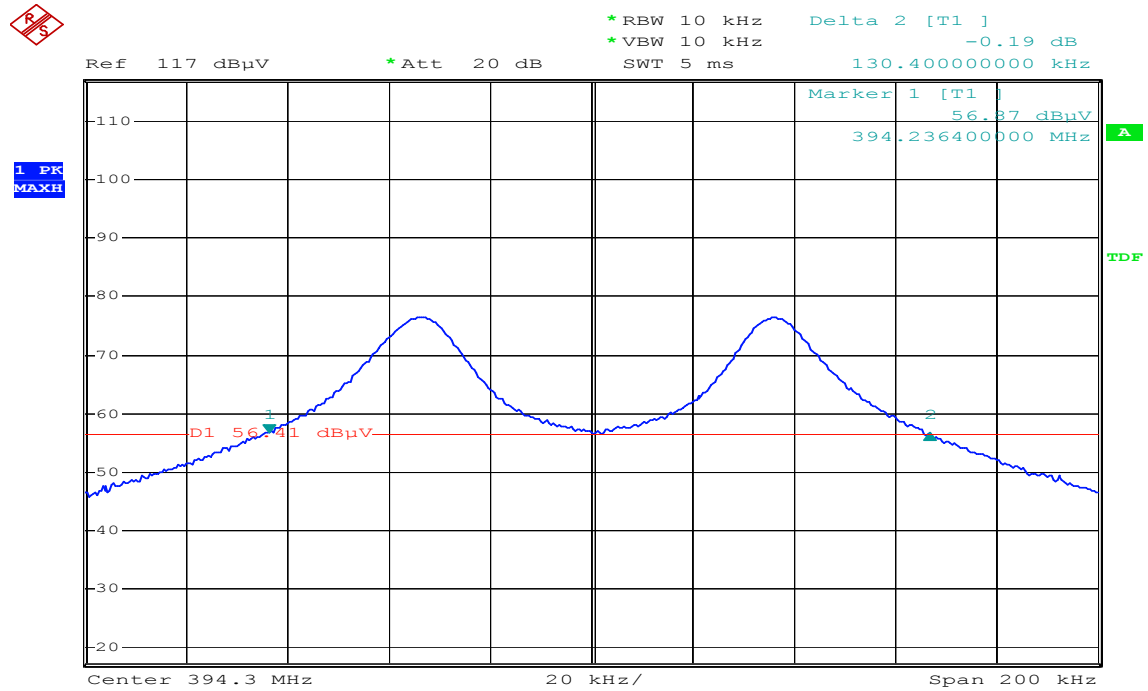
Date: 17.MAR.2007 09:54:01

### 20dB Bandwidth (CH Mid)



Date: 17.MAR.2007 09:56:56

### 20dB Bandwidth (CH High)



Date: 17.MAR.2007 10:06:49

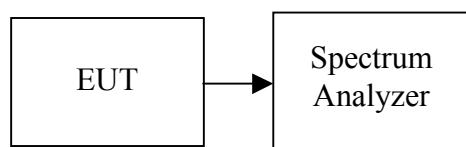


## 7.2 LIMIT OF TRANSMISSION TIME

### LIMIT

According to 15.231 (a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

### Test Configuration



### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 100kHz.

### TEST RESULTS

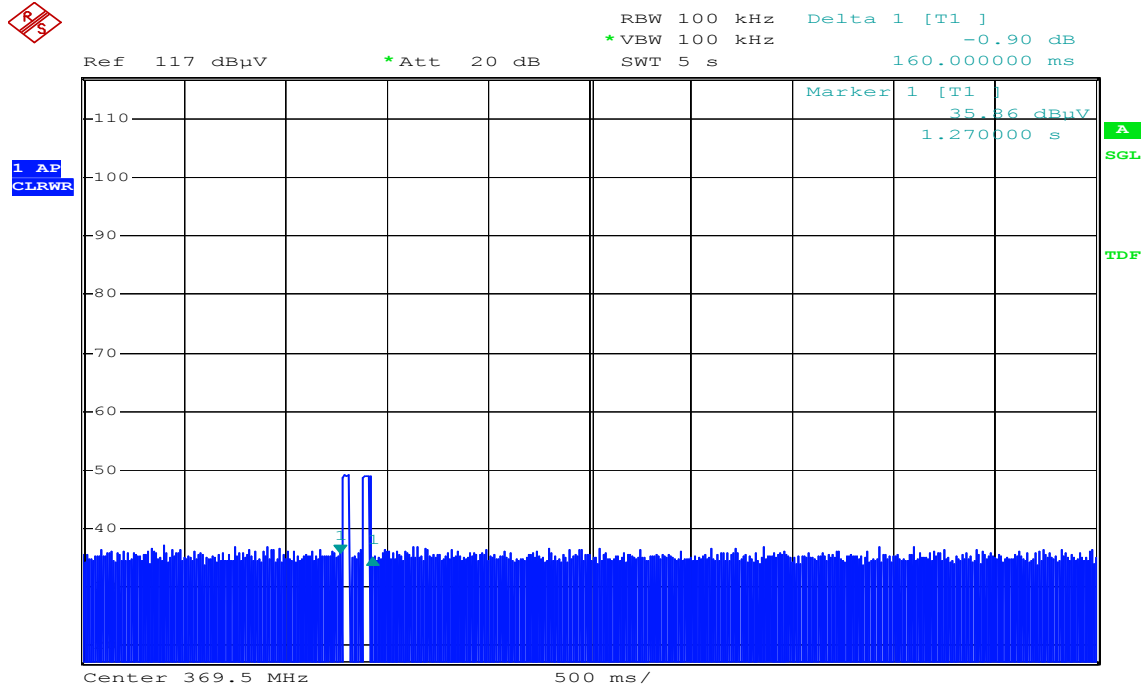
*No non-compliance noted.*

### Test Data

Frequency (MHz)	Transmission time (ms)	Limit (Second)	Result
369.50	160.00	5.00	PASS



## Test Plot



Date: 17.MAR.2007 10:11:07

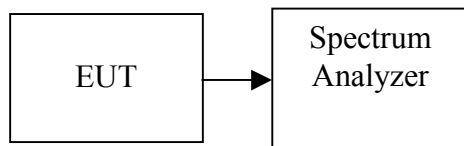


### 7.3 DUTY CYCLE

#### LIMIT

Nil (No dedicated limit specified in the Rules)

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in 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 center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100kHz, Span = 0Hz, Adjust Sweep = 280ms.
5. Repeat above procedures until all frequency measured were complete.

#### TEST RESULTS

*No non-compliance noted.*

#### Test Data

DUTY CYCLE =  $20\text{Log} ( \text{ON TIME} / \text{ALL TIME} )$

DUTY CYCLE =  $20\text{Log} ( 17.68 \text{ ms} / 100.80 \text{ ms} )$

DUTY CYCLE = -15.12 dBuV

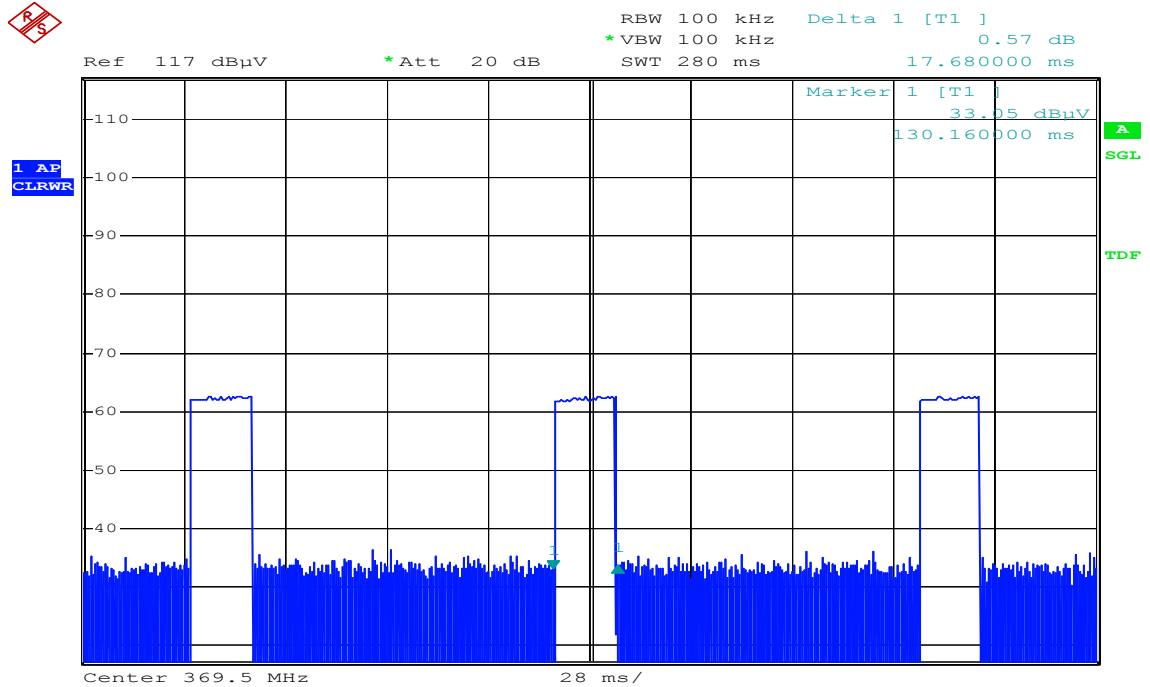




## Test Plot

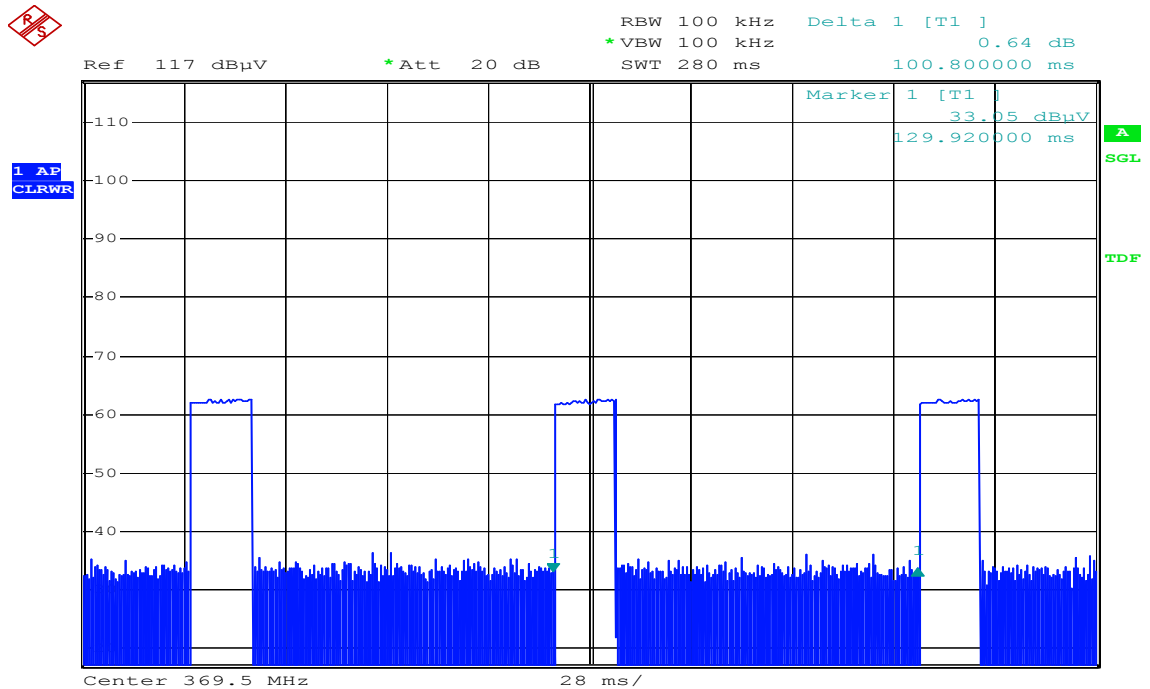
### Duty Cycle

### (On time)



Date: 17.MAR.2007 10:14:02

### (Total Time)



Date: 17.MAR.2007 10:14:55



## 7.4 RADIATED EMISSIONS

### LIMIT

1. 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 (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

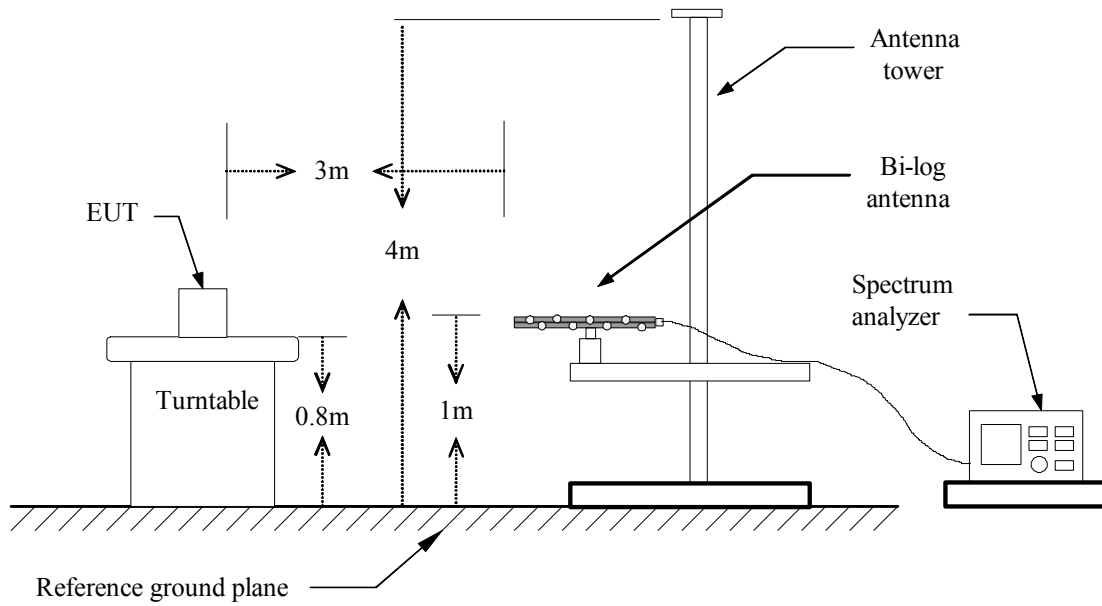
**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections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

2. In the above emission table, the tighter limit applies at the band edges.

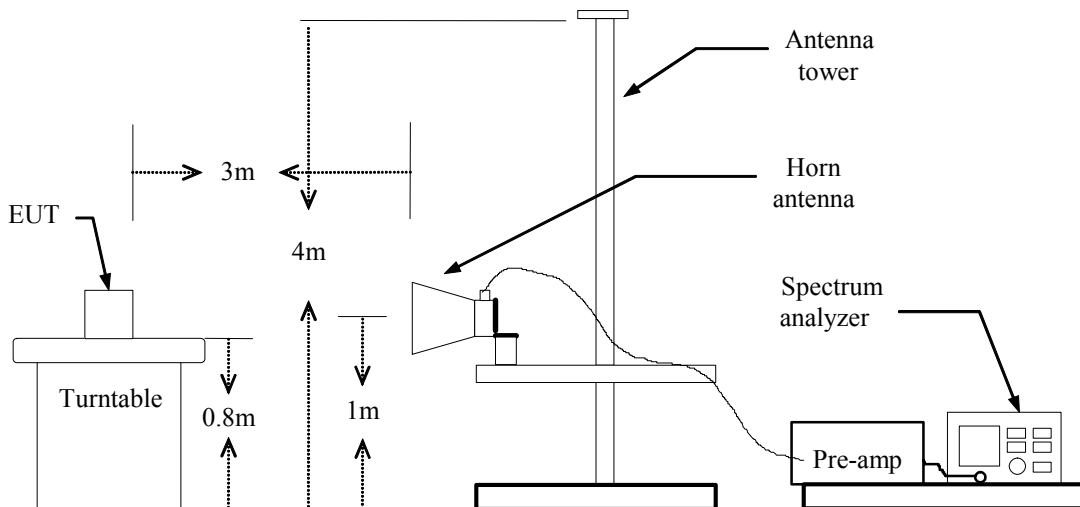
Frequency (Hz)	Field Strength ( $\mu$ V/m at 3-meter)	Field Strength (dB $\mu$ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

## **Test Configuration**

### **Below 1 GHz**



### **Above 1 GHz**





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
Below 1GHz:  
RBW=100kHz / VBW=300kHz / Sweep=AUTO  
Above 1GHz:  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**TEST RESULTS****Below 1 GHz****Operation Mode:** TX / CH Low**Test Date:** March 16 2007**Temperature:** 26°C**Tested by:** George Kuo**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
369.50	V	Peak	58.49	17.18	74.67	98.39	-23.72
369.48	V	Peak	21.18	17.16	38.34	46.00	-7.66
522.53	V	Peak	18.54	20.05	38.59	46.00	-7.41
640.95	V	Peak	11.97	22.04	34.01	46.00	-11.99
740.15	V	Peak	12.24	22.72	34.96	46.00	-11.04
864.19	V	Peak	6.13	24.45	30.58	46.00	-15.42
951.42	V	Peak	8.92	25.33	34.25	46.00	-11.75
369.40	H	Peak	66.78	17.18	85.96	98.39	-12.43
369.50	H	Peak	18.88	17.16	36.04	46.00	-9.96
520.82	H	Peak	14.74	20.01	34.75	46.00	-11.25
631.40	H	Peak	15.00	21.95	36.95	46.00	-9.05
740.04	H	Peak	18.31	22.71	41.02	46.00	-4.98
844.80	H	Peak	10.85	24.23	35.08	46.00	-10.92
960.19	H	Peak	7.62	25.43	33.05	54.00	-20.95

***Remark:***

- Measuring frequencies from 30 MHz to the 1GHz.*
- Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
- Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
- The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

**Below 1 GHz****Operation Mode:** TX / CH Mid**Test Date:** March 16 2007**Temperature:** 26°C**Tested by:** George Kuo**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
375.20	V	Peak	54.36	17.93	72.29	98.63	-26.34
369.42	V	Peak	21.08	17.16	38.24	46.00	-7.76
522.68	V	Peak	18.56	20.05	38.61	46.00	-7.39
641.09	V	Peak	12.02	22.04	34.06	46.00	-11.94
740.00	V	Peak	12.32	22.71	35.03	46.00	-10.97
864.18	V	Peak	6.19	24.45	30.64	46.00	-15.36
950.96	V	Peak	8.26	25.33	33.59	46.00	-12.41
375.20	H	Peak	66.68	17.93	84.61	98.63	-14.02
369.45	H	Peak	18.52	17.16	35.68	46.00	-10.32
521.95	H	Peak	14.21	20.04	34.25	46.00	-11.75
631.38	H	Peak	14.86	21.95	36.81	46.00	-9.19
740.02	H	Peak	18.29	22.71	41.00	46.00	-5.00
843.93	H	Peak	10.74	24.22	34.96	46.00	-11.04
960.99	H	Peak	7.58	25.43	33.01	54.00	-20.99

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.

**Below 1 GHz****Operation Mode:** TX / CH High**Test Date:** March 16 2007**Temperature:** 26°C**Tested by:** George Kuo**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
394.20	V	Peak	44.27	18.01	62.28	99.40	-37.12
396.52	V	Peak	20.29	17.69	37.98	46.00	-8.02
522.62	V	Peak	17.60	20.05	37.65	46.00	-8.35
641.08	V	Peak	11.88	22.04	33.92	46.00	-12.08
740.09	V	Peak	11.86	22.72	34.58	46.00	-11.42
863.93	V	Peak	5.75	24.45	30.20	46.00	-15.80
951.41	V	Peak	8.55	25.33	33.88	46.00	-12.12
394.20	H	Peak	58.24	18.01	76.25	99.40	-23.15
369.55	H	Peak	18.85	17.16	36.01	46.00	-9.99
519.92	H	Peak	13.27	19.99	33.26	46.00	-12.74
630.97	H	Peak	14.04	21.95	35.99	46.00	-10.01
740.09	H	Peak	18.24	22.72	40.96	46.00	-5.04
844.68	H	Peak	9.83	24.22	34.05	46.00	-11.95
960.94	H	Peak	7.66	25.43	33.09	54.00	-20.91

***Remark:***

- 1. Measuring frequencies from 30 MHz to the 1GHz.*
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
- 3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
- 4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

**Above 1 GHz****Operation Mode:** TX / CH Low**Test Date:** March 16 2007**Temperature:** 20°C**Tested by:** George Kuo**Humidity:** 59% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result		Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	Average (dBuV/m)				
1108.00	V	48.79	---	-10.20	38.59	---	74.00	54.00	-15.41	Peak
1848.00	V	51.52	---	-6.40	45.12	---	74.00	54.00	-8.88	Peak
2216.00	V	43.07	---	-5.04	38.03	---	74.00	54.00	-15.97	Peak
2556.00	V	43.65	---	-4.14	39.50	---	74.00	54.00	-14.50	Peak
4060.00	V	45.98	---	1.19	47.18	---	74.00	54.00	-6.82	Peak
4800.00	V	45.13	---	1.81	46.95	---	74.00	54.00	-7.05	Peak
5540.00	V	42.71	---	3.44	46.15	---	74.00	54.00	-7.85	Peak
1108.00	H	51.26	---	-10.20	41.06	---	74.00	54.00	-12.94	Peak
1848.00	H	53.31	---	-6.40	46.91	---	74.00	54.00	-7.09	Peak
4060.00	H	44.12	---	1.19	45.32	---	74.00	54.00	-8.68	Peak
4430.00	H	46.22	---	0.97	47.19	---	74.00	54.00	-6.81	Peak
4800.00	H	44.11	---	1.81	45.93	---	74.00	54.00	-8.07	Peak
5540.00	H	41.81	---	3.44	45.25	---	74.00	54.00	-8.75	Peak

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Result (Remark) (dBuV/m) – Quasi-peak limit (dBuV/m).



**Above 1 GHz****Operation Mode:** TX / CH Mid**Test Date:** March 16 2007**Temperature:** 20°C**Tested by:** George Kuo**Humidity:** 59% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result		Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	Average (dBuV/m)				
1124.00	V	50.85	---	-10.13	40.73	---	74.00	54.00	-13.27	Peak
1880.00	V	50.47	---	-6.22	44.26	---	74.00	54.00	-9.74	Peak
4130.00	V	43.76	---	1.15	44.91	---	74.00	54.00	-9.09	Peak
4880.00	V	43.95	---	2.05	46.00	---	74.00	54.00	-8.00	Peak
5630.00	V	42.21	---	3.60	45.81	---	74.00	54.00	-8.19	Peak
N/A	V									
1124.00	H	54.92	---	-10.13	44.79	---	74.00	54.00	-9.21	Peak
1876.00	H	52.11	---	-6.24	45.87	---	74.00	54.00	-8.13	Peak
4130.00	H	43.40	---	1.15	44.55	---	74.00	54.00	-9.45	Peak
4880.00	H	43.95	---	2.05	46.00	---	74.00	54.00	-8.00	Peak
5630.00	H	43.38	---	3.60	46.98	---	74.00	54.00	-7.02	Peak
N/A	H									

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Result (Remark) (dBuV/m) – Quasi-peak limit (dBuV/m).

**Above 1 GHz****Operation Mode:** TX / CH Mid**Test Date:** March 16 2007**Temperature:** 20°C**Tested by:** George Kuo**Humidity:** 59% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result		Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	Average (dBuV/m)				
1972.00	V	48.87	---	-5.69	43.18	---	74.00	54.00	-10.82	Peak
4730.00	V	46.66	---	1.61	48.26	---	74.00	54.00	-5.74	Peak
5130.00	V	43.06	---	2.65	45.71	---	74.00	54.00	-8.29	Peak
5520.00	V	43.17	---	3.40	46.57	---	74.00	54.00	-7.43	Peak
N/A	V									
	V									
1184.00	H	48.58	---	-9.85	38.73	---	74.00	54.00	-15.27	Peak
1972.00	H	47.06	---	-5.69	41.37	---	74.00	54.00	-12.63	Peak
4340.00	H	47.02	---	1.03	48.05	---	74.00	54.00	-5.95	Peak
4730.00	H	44.39	---	1.61	45.99	---	74.00	54.00	-8.01	Peak
N/A	H									
	H									

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Result (Remark) (dBuV/m) – Quasi-peak limit (dBuV/m).



## 7.5 POWERLINE CONDUCTED EMISSIONS

### **LIMIT**

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### **Test Configuration**

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### **Test Procedure**

Not applicable (Since the EUT is powered by battery)

### **TEST RESULTS**

Not applicable (Since the EUT is powered by battery)