



FCC 47 CFR PART 15 Subpart C

TEST REPORT

For

5.1 CH WIRELESS HOME THEATER SYSTEM

Model: RF-6656

Trade Name: WINNER

Issued to

**WINNER GROUP LTD
CHANGFU ROAD, GAOLI INDUSTRIAL DISTRICT, TANGXIA TOWN,
DONGGUAN CITY, GUANGDONG, CHINA**

Issued by

**COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.
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1. TEST RESULT CERTIFICATION

Applicant: WINNER GROUP LTD
CHANGFU ROAD, GAOLI INDUSTRIAL DISTRICT, TANGXIA
TOWN, DONGGUAN CITY, GUANGDONG, CHINA

Equipment Under Test: 5.1 CH WIRELESS HOME THEATER SYSTEM

Trade Name: WINNER

Model: RF-6656

Date of Test: April 04-25, 2006

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 (Shenzhen) 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 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.249.

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

Approved by:

Clinton. Kao / EMC Manager
COMPLIANCE CERTIFICATION
SERVICES (SHENZHEN) INC.

Tested By:

Henry Ding / Engineer

Reviewed By:

Eric. Wong/ Assistant manager
COMPLIANCE CERTIFICATION
SERVICES (SHENZHEN) INC.



2. EUT DESCRIPTION

Product	5.1 CH WIRELESS HOME THEATER SYSTEM
Trade Name	WINNER
Model Number	RF-6656
Model Discrepancy	N/A
Power Supply	AC120V/60Hz
Frequency Range	2410 ~ 2473 MHz
Modulation Technique	FHSS
Number of Channels	32 Channels
Antenna Specification	Printed PCB Antennna Gain: 0.87 dBi (max)

Remark: This submittal(s) (test report) is intended for FCC ID: T4WWINNER060403 filing to comply with Section 15.207, 15.209, 15.249 (FCC Part 15, Subpart C Rules.)



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.249.

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.

According to its specifications, the EUT must comply with the requirements of the Section 15.107 and 15.109 under the FCC Rules Part 15 Subpart B and Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

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 MODIFICATION

N/A

3.5 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
¹ 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	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² 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.

3.6 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering mode for compliance testing.

Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.



4. 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.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

No. 5, Jinao industrial park, No.35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China

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 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200577-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.



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
DVD Player	PIONEER	DV-6500A	N/A	CECP002086CN	N/A	Unshielded 1.8m

Remark:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.249 REQUIREMENTS

7.1 BAND EDGES MEASUREMENT

LIMIT

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

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

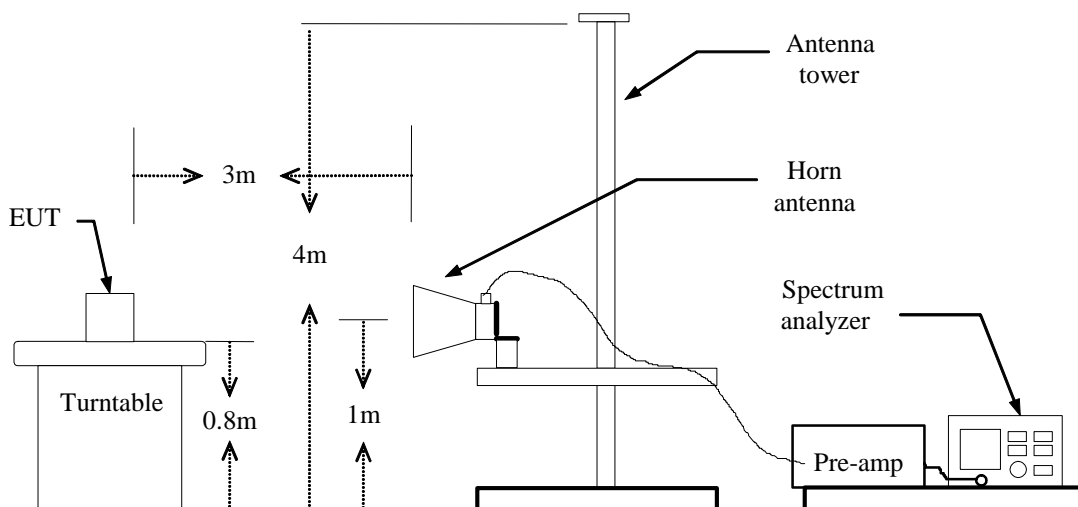
2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2007

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

Test Configuration





TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the 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 emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

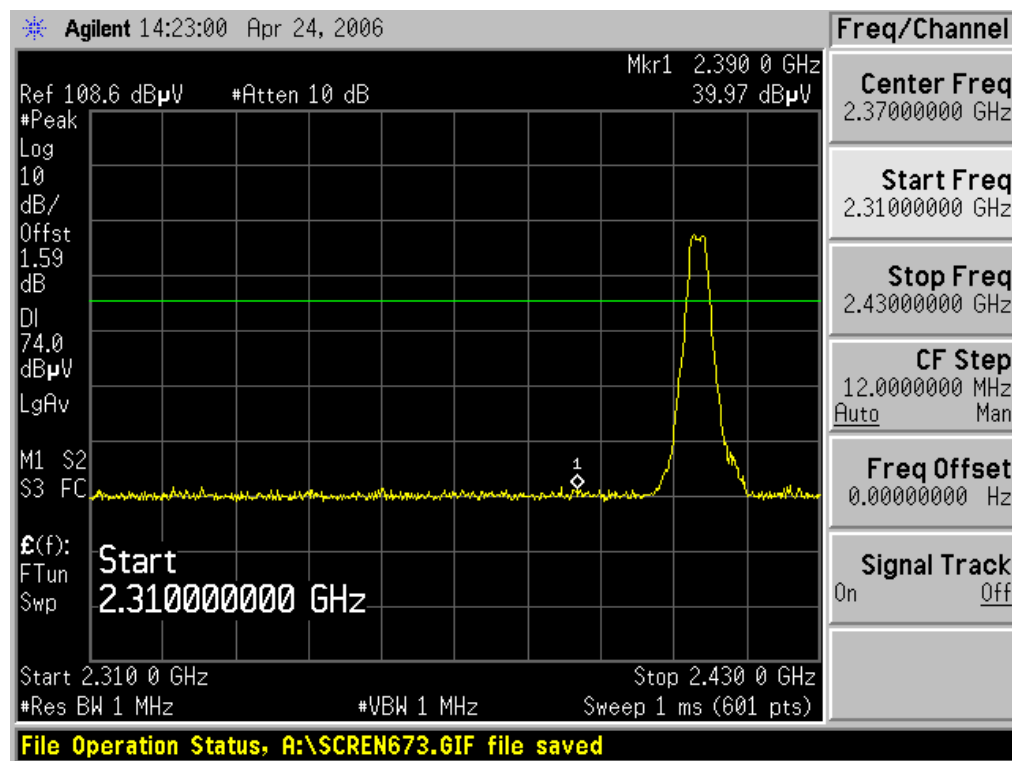
Refer to attach spectrum analyzer data chart.



Band Edges (CH Low)

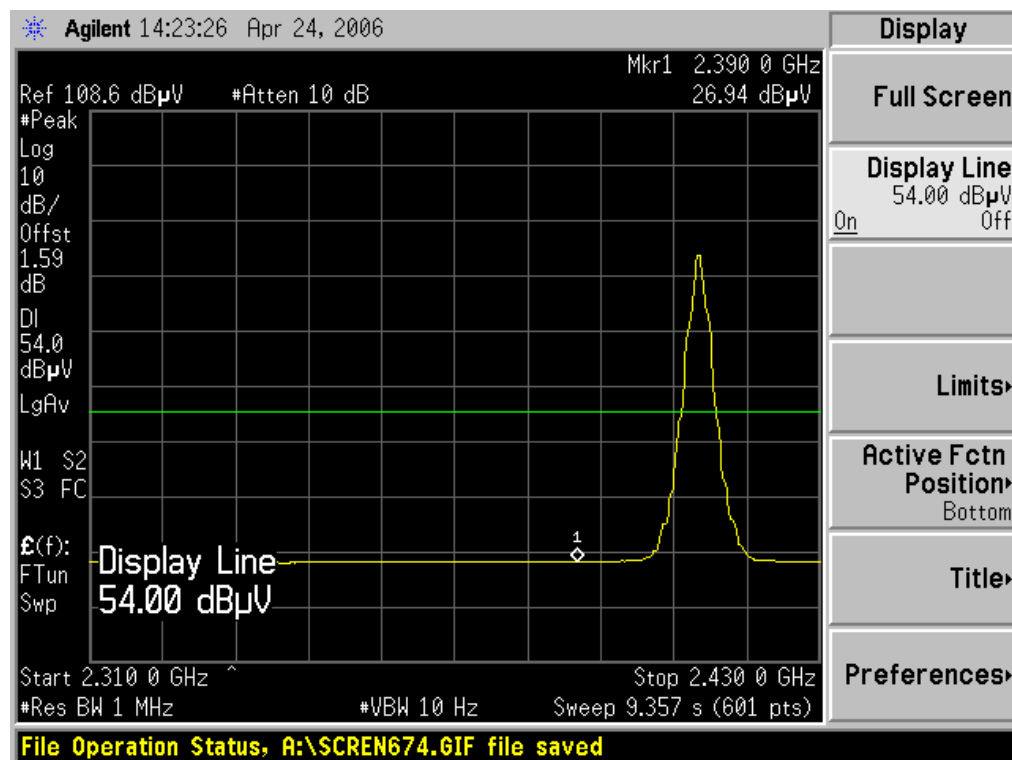
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

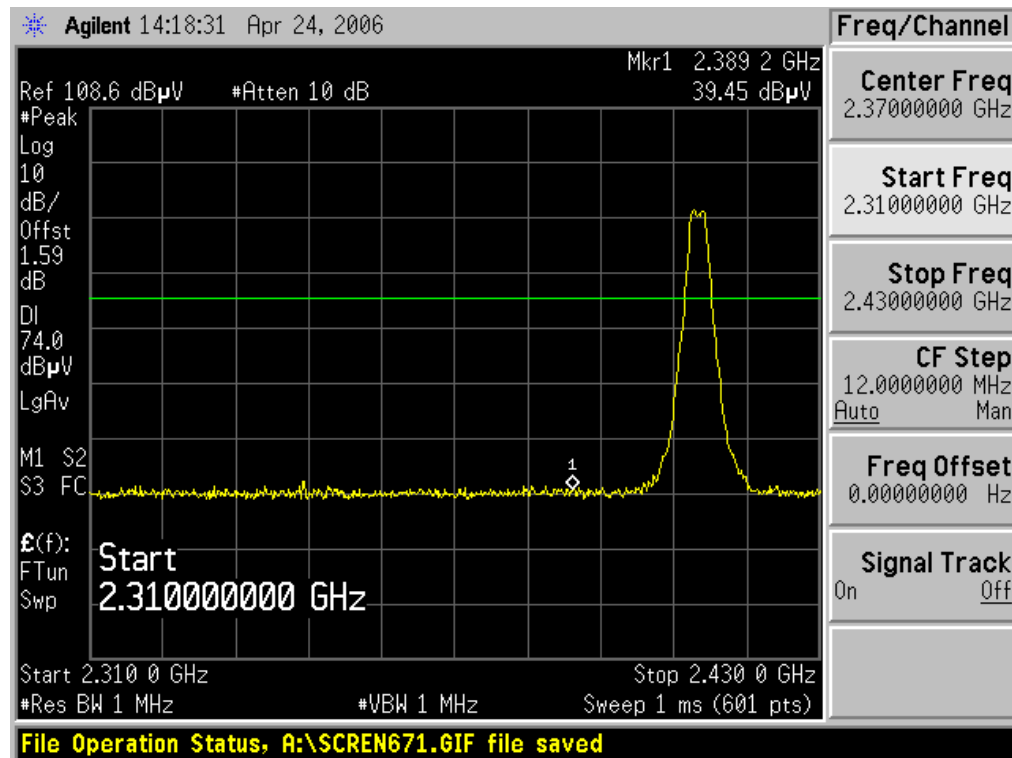
Polarity: Vertical





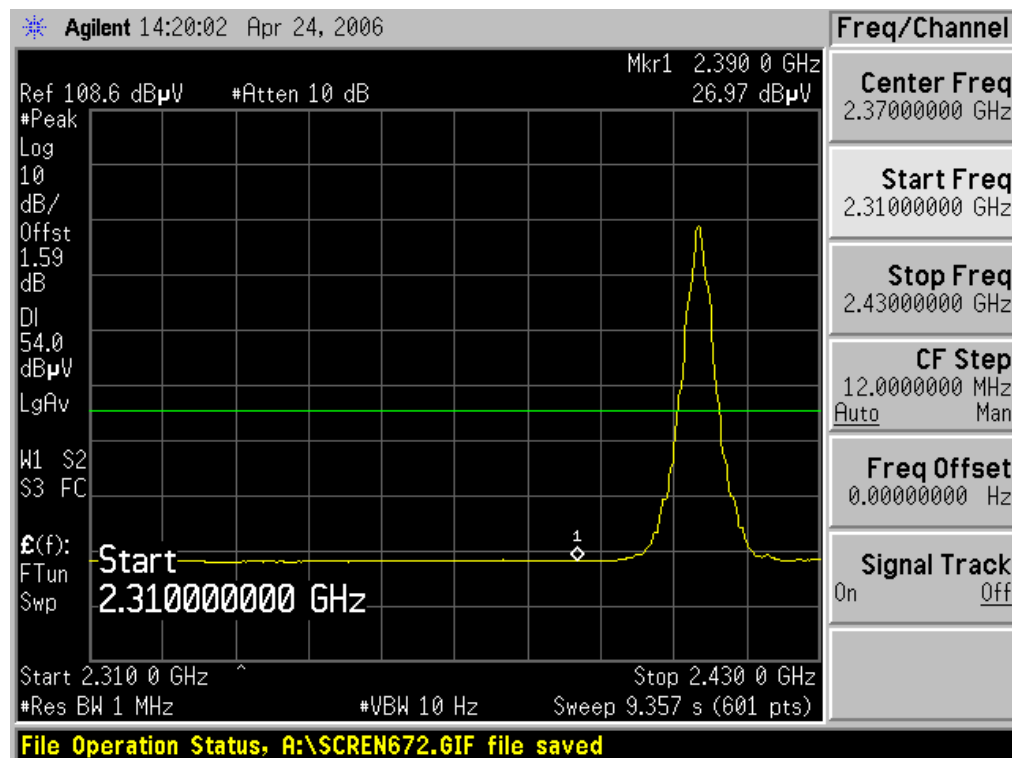
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal

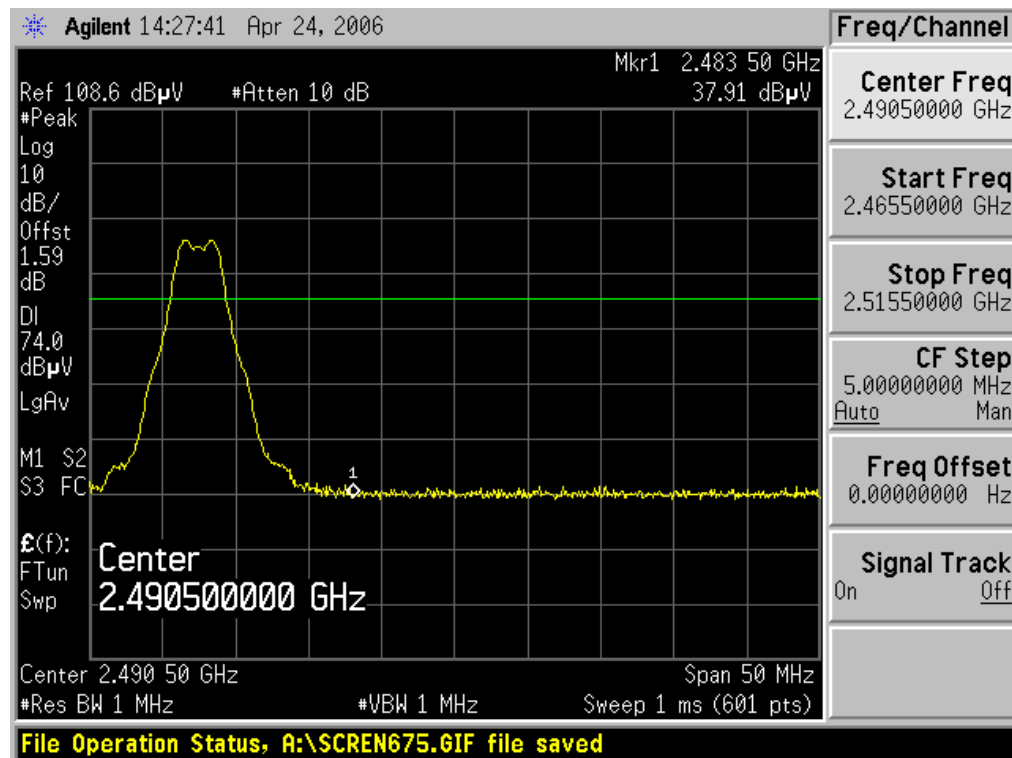




Band Edges (TX/CH High)

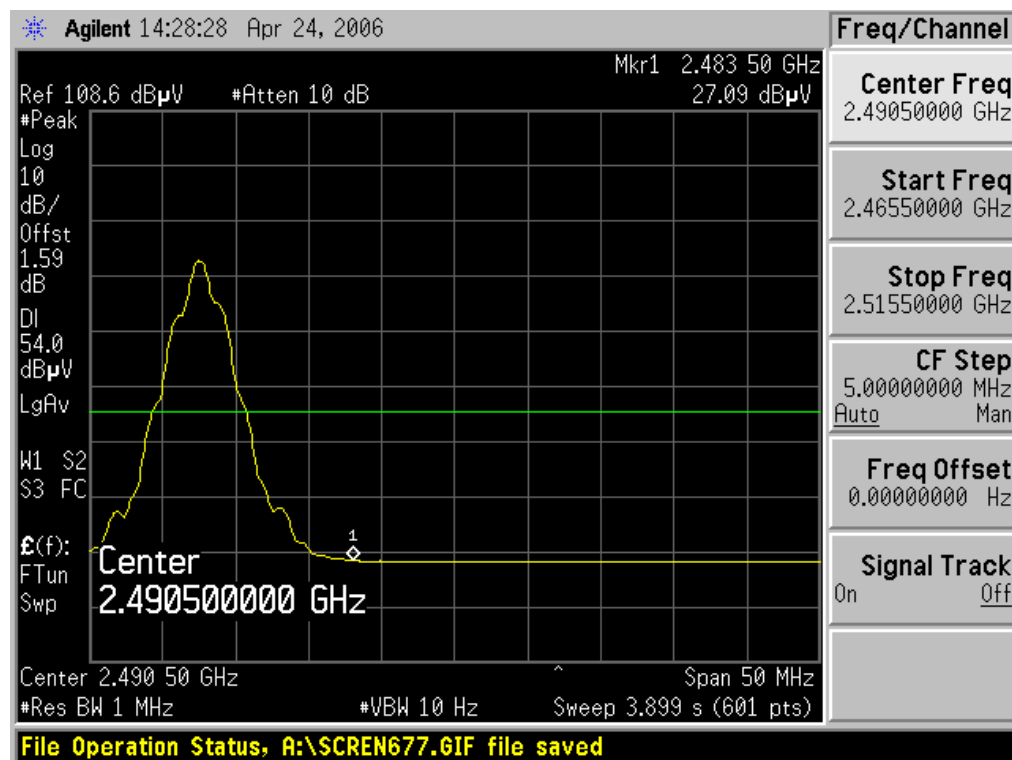
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

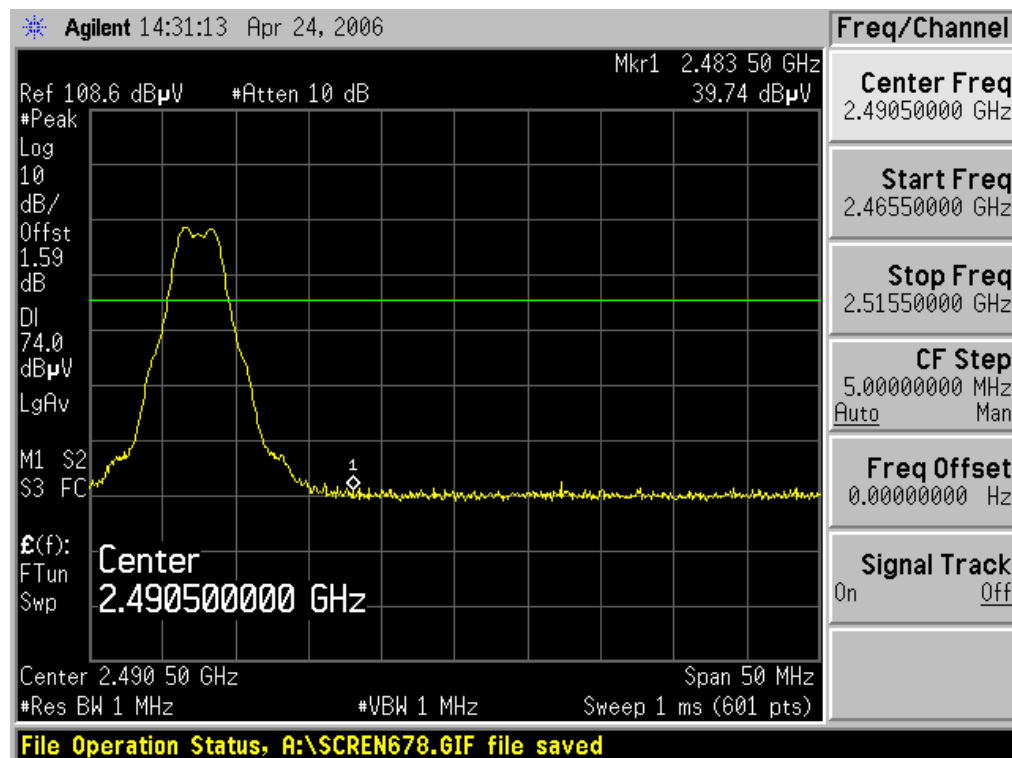
Polarity: Vertical





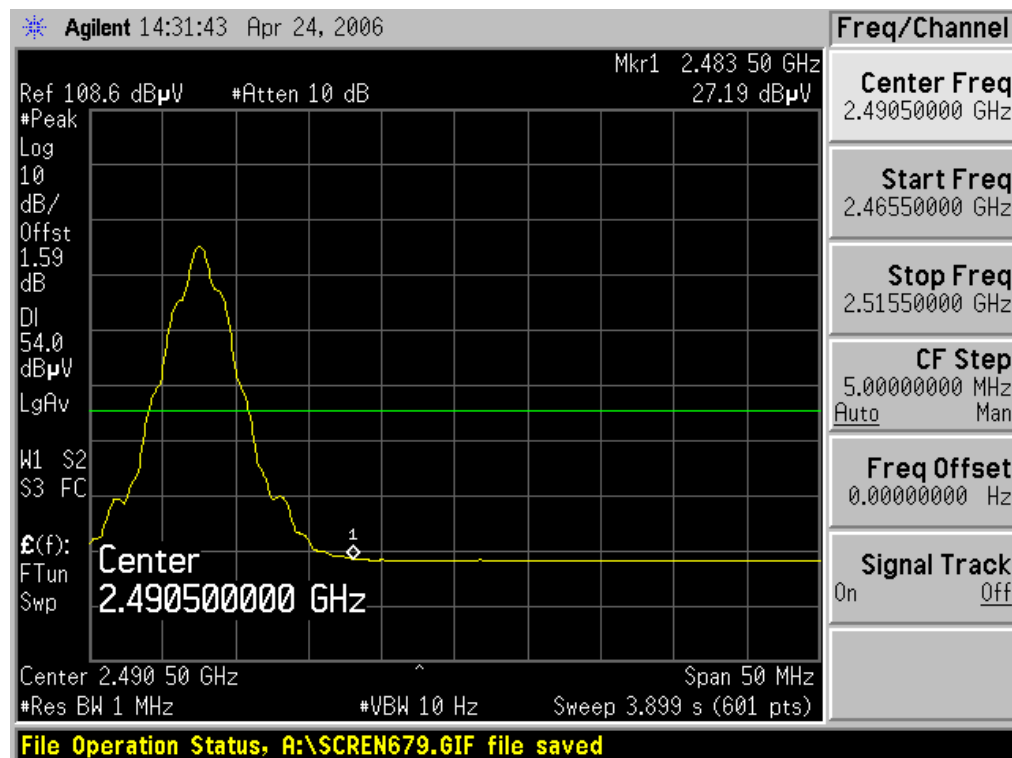
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal





7.2 SPURIOUS EMISSION

LIMIT

1. In the section 15.249(a):

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μ V/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

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

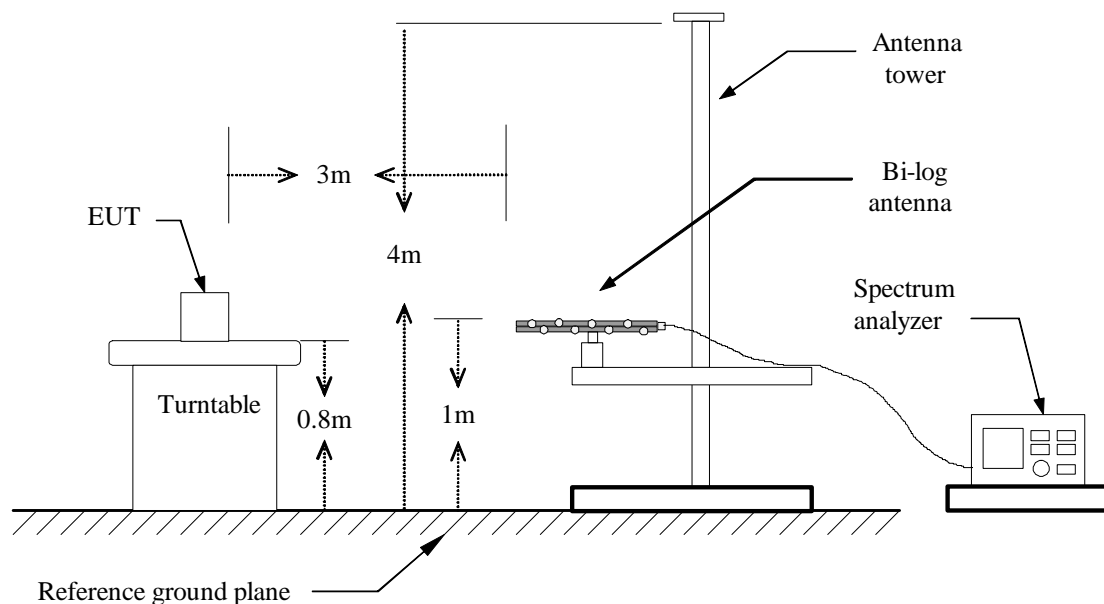
MEASUREMENT EQUIPMENT USED

966 RF CHAMBER 2				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/08/2007
EMI Test Receiver	R&S	ESCI	1166.5950 03	01/13/2007
Pre-Amplifier	MITEQ	N/A	AFS42-00102650-42-10P-42	02/14/2007
Bilog Antenna	SCHWAZBECK	CBL6143	5082	06/09/2006
Turn Table	EMCO	2081-1.21	N/A	N.C.R
Antenna Tower	CT	N/A	N/A	N.C.R
Controller	CT	N/A	N/A	N.C.R
RF Comm. Test set	HP	8920B	US36142090	N.C.R
Site NSA	C&C	N/A	N/A	09/06/2006
Horn Antenna	TRC	N/A	N/A	03/04/2007

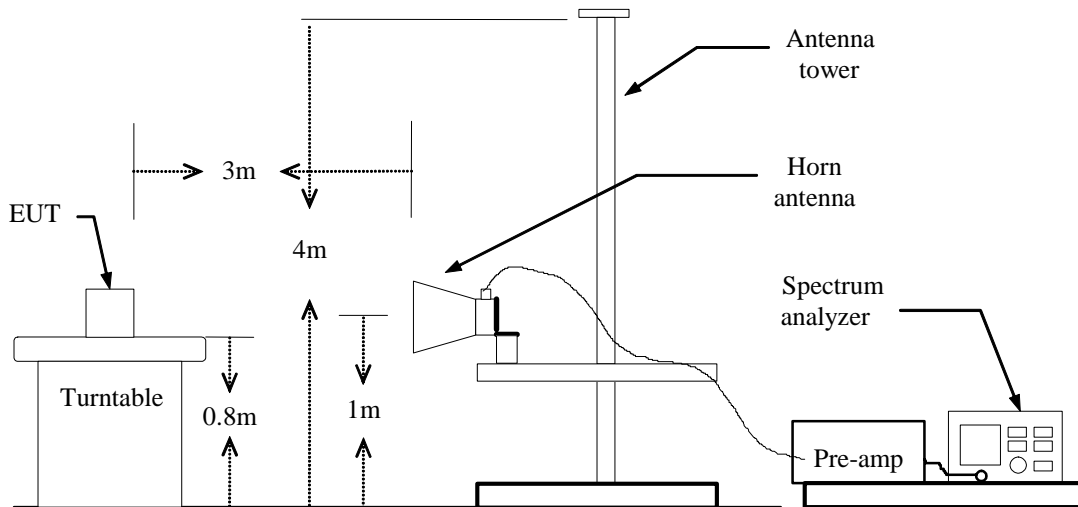
Remark: Each piece of equipment is scheduled for calibration once a year.

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:** April 03, 2006**Temperature:** 25°C**Tested by:** Henry**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)
184.575	V	Peak	29.00	11.96	40.96	43.50	-2.54
406.750	V	Peak	22.99	17.37	40.36	46.00	-5.64
480.250	V	Peak	25.50	17.13	42.63	46.00	-3.37
595.750	V	Peak	20.43	22.50	42.93	46.00	-3.07
627.250	V	Peak	19.36	23.46	42.82	46.00	-3.18
692.000	V	Peak	15.58	27.02	42.60	46.00	-3.40
243.300	H	Peak	28.90	13.66	42.56	46.00	-3.44
373.500	H	Peak	22.32	16.04	38.36	46.00	-7.64
480.250	H	Peak	18.97	17.13	36.10	46.00	-9.90
541.500	H	Peak	14.02	24.41	38.43	46.00	-7.57
627.250	H	Peak	13.19	23.46	36.65	46.00	-9.35
676.250	H	Peak	10.21	27.69	37.90	46.00	-8.10

Notes:

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. 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.

**Operation Mode:** TX/ CH Mid**Test Date:** April 03, 2006**Temperature:** 25°C**Tested by:** Henry**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)
184.575	V	Peak	28.96	11.96	40.92	43.50	-2.58
406.750	V	Peak	24.02	17.37	41.39	46.00	-4.61
480.250	V	Peak	24.22	17.13	41.35	46.00	-4.65
595.750	V	Peak	20.21	22.50	42.71	46.00	-3.29
627.250	V	Peak	19.61	23.46	43.07	46.00	-2.93
688.500	V	Peak	15.06	27.18	42.24	46.00	-3.76
140.025	H	Peak	23.40	12.19	35.59	43.50	-7.91
243.300	H	Peak	28.46	13.66	42.12	46.00	-3.88
270.975	H	Peak	22.59	15.91	38.50	46.00	-7.50
373.500	H	Peak	22.78	16.04	38.82	46.00	-7.18
406.750	H	Peak	26.48	17.37	43.85	46.00	-2.15
541.500	H	Peak	13.63	24.41	38.04	46.00	-7.96

Notes:

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. 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.

**Operation Mode:** TX/ CH High**Test Date:** April 03, 2006**Temperature:** 25°C**Tested by:** Henry**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)
65.100	V	Peak	22.66	14.95	37.61	40.00	-2.39
89.400	V	Peak	25.47	9.96	35.43	43.50	-8.07
184.575	V	Peak	29.02	11.96	40.98	43.50	-2.52
243.300	V	Peak	24.21	13.66	37.87	46.00	-8.13
333.250	V	Peak	19.74	19.63	39.37	46.00	-6.63
480.250	V	Peak	25.11	17.13	42.24	46.00	-3.76
406.750	H	Peak	26.58	17.37	43.95	46.00	-2.05
480.250	H	Peak	18.65	17.13	35.78	46.00	-10.22
517.000	H	Peak	15.62	20.93	36.55	46.00	-9.45
541.500	H	Peak	13.29	24.41	37.70	46.00	-8.30
627.250	H	Peak	14.86	23.46	38.32	46.00	-7.68
676.250	H	Peak	10.11	27.69	37.80	46.00	-8.20

Notes:

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. 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:** April 03, 2006**Temperature:** 25°C**Tested by:** Henry**Humidity:** 56 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2410.00	V	89.57	---	1.52	91.09	---	---	94.00	-2.91	FUND.
2223.33	V	34.46	---	0.55	35.01	---	74.00	54.00	-18.99	Peak
2650.00	V	34.11	---	0.29	34.40	---	74.00	54.00	-19.60	Peak
4816.66	V	---	35.29	6.08	---	41.37	74.00	54.00	-12.63	AVG
N/A										
2410.00	H	89.73	---	1.52	91.25	---	---	94.00	-2.75	FUND.
1210.00	H	36.16	---	-2.12	34.04	---	54.00	-19.96	Peak	Peak
1986.66	H	34.40	---	0.24	34.64	---	54.00	-19.36	Peak	Peak
4816.66	H	---	36.16	6.08	---	42.24	54.00	-11.76	AVG	AVG
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

**Operation Mode:** TX / CH Mid**Test Date:** April 03, 2006**Temperature:** 25°C**Tested by:** Henry**Humidity:** 56 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2446.66	V	88.12	---	1.27	89.39	---	---	94.00	-4.61	FUND.
2356.66	V	39.24	---	1.33	40.57	---	74.00	54.00	-13.43	Peak
2760.00	V	38.80	---	0.46	39.26	---	74.00	54.00	-14.74	Peak
4891.66	V	---	33.29	6.84	---	40.13	74.00	54.00	-13.87	AVG
N/A										
2446.66	H	87.41	---	1.27	88.68	---	---	94.00	-5.32	FUND.
1036.66	H	41.97	---	-2.22	39.75	---	74.00	54.00	-14.25	Peak
2736.66	H	38.78	---	0.43	39.21	---	74.00	54.00	-14.79	Peak
4891.66	H	44.47	---	6.84	51.31	---	74.00	54.00	-2.69	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

**Operation Mode:** TX / CH High**Test Date:** April 03, 2006**Temperature:** 25°C**Tested by:** Henry**Humidity:** 56 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2473.33	V	88.39	---	1.09	89.48	---	---	94.00	-4.52	FUND.
2353.33	V	34.83	---	1.31	36.14	---	74.00	54.00	-17.86	Peak
2646.66	V	35.04	---	0.29	35.33	---	74.00	54.00	-18.67	Peak
4950.00	V	---	33.73	7.43	---	41.16	74.00	54.00	-12.84	AVG
N/A										
2473.33	H	88.47	---	1.09	89.56	---	---	94.00	-4.44	FUND.
2420.00	H	34.57	---	1.45	36.02	---	74.00	54.00	-17.98	Peak
2656.66	H	34.62	---	0.31	34.93	---	74.00	54.00	-19.07	Peak
4941.66	H	---	34.68	7.35	---	42.03	74.00	54.00	-11.97	AVG
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms



7.3 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 μ 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.

MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site G				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESCI EMI TEST RECEIV.ESCI	ROHDE&SCHWARZ	1166.5950 03	100088	02/08/2007
LISN	EMCO	3825/2	1371	02/08/2007
LISN	EMCO	3825/2	8901-1459	02/08/2007

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

Test Configuration

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

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

No non-compliance noted

**Test Data****Test Mode:** Normal

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.209	66.87	59.20	31.54	64.31	54.31	-5.11	-22.77	L1
0.339	53.01	42.52	24.21	60.60	50.60	-18.08	-26.39	L1
0.424	45.38	---	---	58.16	48.16	---	-2.78	L1
9.751	41.39	---	---	60.00	50.00	---	-8.61	L1
15.282	40.96	---	---	60.00	50.00	---	-9.04	L1
17.575	44.85	---	---	60.00	50.00	---	-5.15	L1
0.205	72.70	61.06	28.86	64.41	54.41	-3.35	-25.55	L2
0.335	53.95	43.90	17.19	60.70	50.70	-16.80	-33.51	L2
1.592	42.88	---	---	56.00	46.00	---	-3.12	L2
9.751	38.09	---	---	60.00	50.00	---	-11.91	L2
15.507	41.45	---	---	60.00	50.00	---	-8.55	L2
17.575	52.04	48.30	42.69	60.00	50.00	-11.70	-7.31	L2

Remark:

- 1. The measuring frequencies range between 0.15 MHz and 30 MHz.*
- 2. The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.*
- 3. “---” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.*
- 4. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9KHz.*
- 5. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST





RADIATED EMISSION TEST

