



FCC TEST REPORT

for

MOTORCYCLE AND YACHT AUDIO SYSTEM
MODEL: MSM-2050A,MSM-2050B,MSW-2050A,MSW-2050B
Brand Name:ACTIWAY,WS

Test Report Number:
SZ100401B01-RP

Issued for

Shenzhen Actiway Electronics Co.,Ltd.
Bdg 2,Longwu Industrial Zone,Shangtang Village,Minzhi,Baoan
District,Shenzhen,P.R.C.

Issued by:

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.
No.10-1, Mingkeda Logistics Park, No.18 Huanguan South RD. Guan Ian Town,
Baoan District, Shenzhen China
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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	April 14, 2010	Initial Issue	ALL	Clinton Kao



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1 TEST CERTIFICATION

Product: MOTORCYCLE AND YACHT AUDIO SYSTEM
Model: MSM-2050A,MSM-2050B,MSW-2050A,MSW-2050B
Brand: ACTIWAY,MS
Tested: April 01~14, 2010
Applicant: **Shenzhen Actiway Electronics Co.,Ltd.**
Bdg 2,Longwu Industrial Zone,Shangtang Village,Minzhi,Baoan
District,Shenzhen,P.R.C.
Manufacturer: **Shenzhen Actiway Electronics Co.,Ltd.**
Bdg 2,Longwu Industrial Zone,Shangtang Village,Minzhi,Baoan
District,Shenzhen,P.R.C.

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
DEVIATION FROM APPLICABLE STANDARD	
None	

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 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.

Clinton Kao
Approved by:

Clinton Kao
Manager
Compliance Certification Service Inc.

Sunday Hu
Reviewed by:

Sunday Hu
Assistant manager
Compliance Certification Service Inc.



2 EUT DESCRIPTION

Product	MOTORCYCLE AND YACHT AUDIO SYSTEM
Trade Name	ACTIWAY
Model Number	MSM-2050A,MSM-2050B,MSW-2050A,MSW-2050B
Model Discrepancy	The electrical circuit designs of the above models are identical, only their item no.'s and outer decoration are different.
Serial Number	SZ100401B01-RP
Power Supply	DC3V powered by the battery
Frequency Range	433.92MHz
Modulation Technique	OOK
Number of Channels	1 Channel

Note: 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2. Remark: This submittal(s) (test report) is intended for FCC ID: YBM-MSM2050 filing to comply with Section 15.207, 15.209 and 15.231 of the FCC Part 15, Subpart C Rules.



3 TEST METHODOLOGY

3.1. DESCRIPTION OF TEST MODES

The EUT had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz(except for the Fundamental Frequency Spurious Emissions test), which worst case was in normal link mode,

For the above 1GHz Spurious Emissions test and the Fundamental Frequency Spurious Emissions test, the EUT was operating TX mode.

The field strength of spurious radiation emission was measured in the following position: EUT stand-up position (Y mode) and lie-down position (X, Z mode) The following data show only the worst case setup.

The worst case (X axis) was reported.



4 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2003, FCC CFR 15.207, FCC CFR 15.209 and 15.231.

4.1. 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.



5 SETUP OF EQUIPMENT UNDER TEST

5.1. 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.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	IPOD #1	MB748CH/A	YM91546MQY	N/A	APPLE	Shielded 2.00m	N/A
2	IPOD #2	MB748CH/A	YM91546MQY	N/A	APPLE	Shielded 2.00m	N/A
3	SD CARD	PR-SDR01G	88754939600	N/A	PANASONIC	N/A	N/A
4	MOTORCYCLE AND YACHT AUDIO SYSTEM (Receiver)	MSM-2050A	N/A	YBM-MSM 2050	DWG	N/A	N/A

Note:

- 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.

5.2. CONFIGURATION OF SYSTEM UNDER TEST

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



6 FACILITIES AND ACCREDITATIONS

6.1. FACILITIES

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

No.10-1, Mingkeda Logistics Park, No.18 Huanguan South RD. Guan Ian Town, Baoan District, Shenzhen China

The sites are constructed in conformance with the requirements of ANSI C63.4:2003, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
Taiwan	TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	FCC
Japan	VCCI
Canada	INDUSTRY CANADA
Taiwan	BSMI
Norway	Nemko

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	+/- 3.18dB
Radiated emissions	30MHz ~ 200MHz	+/- 3.79dB
	200MHz ~1000MHz	+/- 3.62dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.



7 FCC PART 15.231 REQUIREMENTS

7.1. 20 DB BANDWIDTH

LIMIT

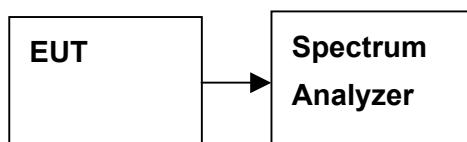
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated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

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/21/2010	03/21/2011

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

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

Frequency (MHz)	20 dB Bandwidth (kHz)	Limit (MHz)	Result
433.92	55.30	1.0848	PASS

Test Plot



Agilent 11:47:18 12 Apr 2010

R T

▲ Mkr1 -55.3 kHz
-0.09 dB

Ref 90 dB μ V

#Atten 0 dB

Peak
Log
10
dB/

DI
63.5
dB μ V
LgAv

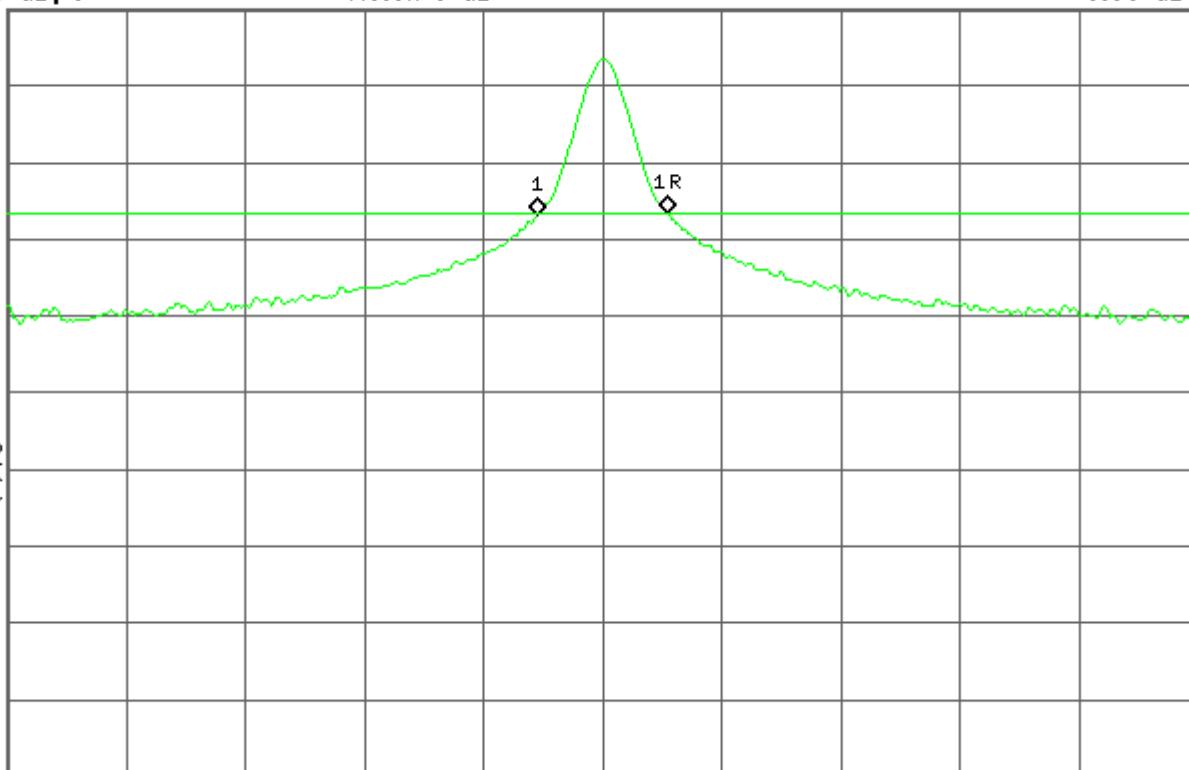
M1 S2
S3 FC

$\mathfrak{E}(f):$
 $f > 50k$
Swp

Start 433.644 8 MHz
#Res BW 10 kHz

#VBW 30 kHz

Stop 434.144 8 MHz
Sweep 4.8 ms (601 pts)





7.2. LIMIT OF TRANSMISSION TIME

LIMIT

According to 15.231 (e) limit for transmission time:

The devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

Or

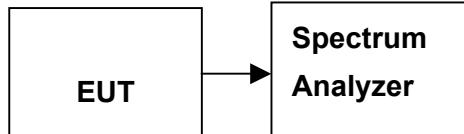
According to 15.231 (a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/21/2010	03/21/2011

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

TEST CONFIGURATION



TEST PROCEDURE

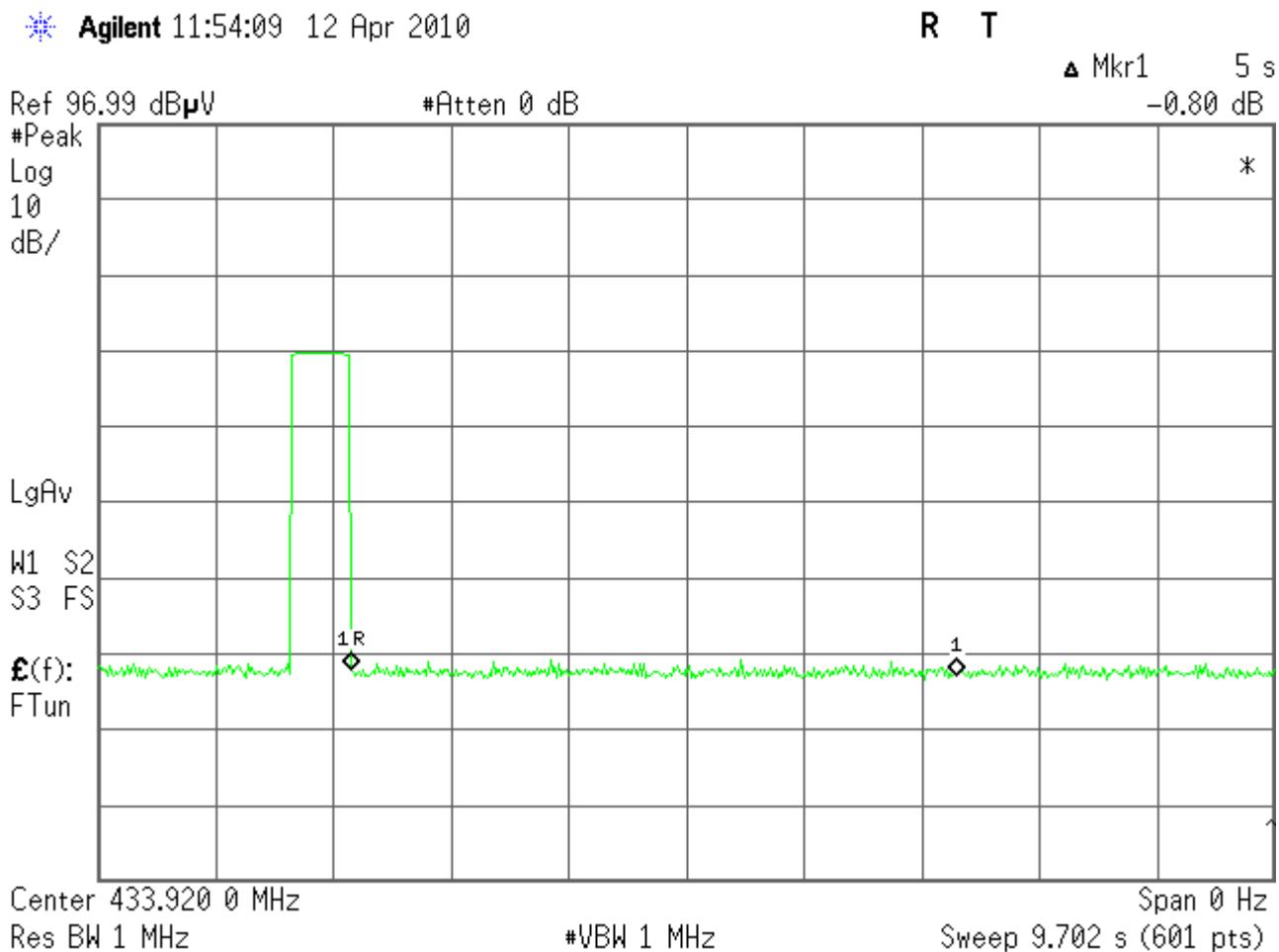
The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 1MHz.



TEST RESULTS

No non-compliance noted

Test Plot



Note: From above test plot we can know that:

The duration of each transmission=5s \leq 5second .
and meet the 15.231(a).



7.3. DUTY CYCLE

LIMIT

According to 15.35 (c) limit for duty cycle:

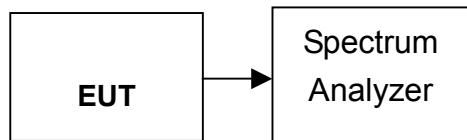
As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/21/2010	03/21/2011

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

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=1MHz, Span = 0Hz, Adjust Sweep = 300ms
5. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

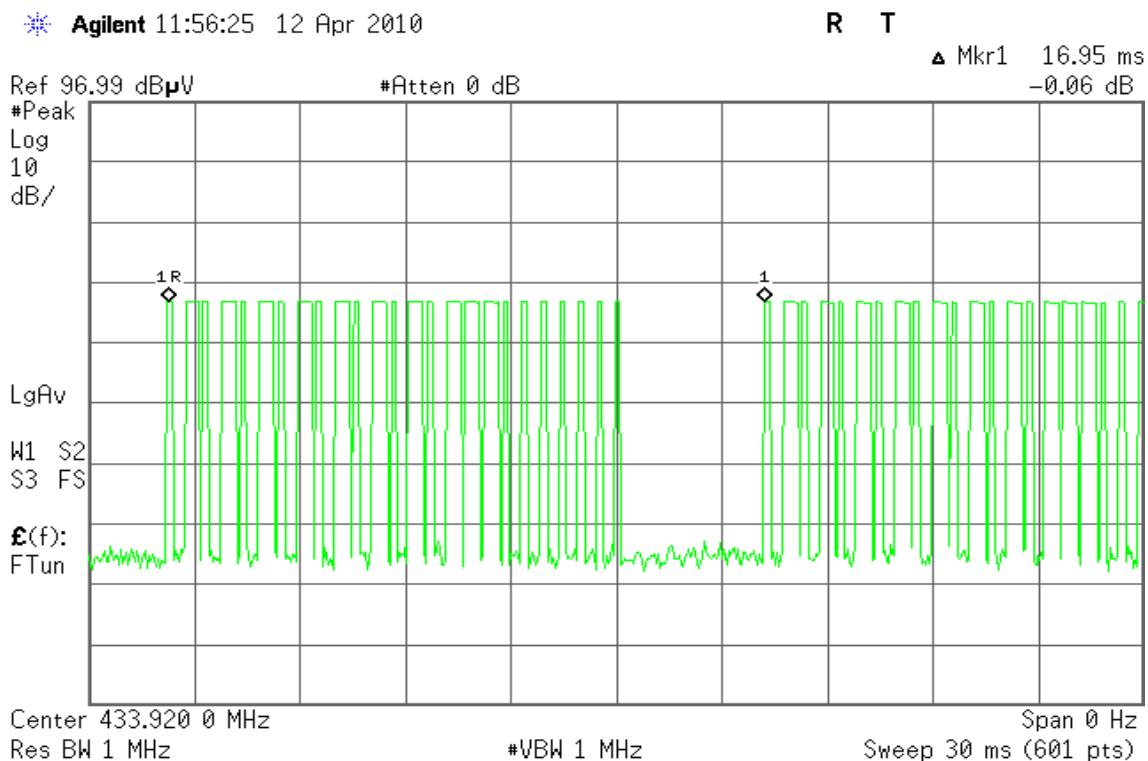
No non-compliance noted

Test Data

Ton+off = 16.95ms (which exceeds 0.1 seconds, and use the formula Ton/100ms to calculate the duty-cycle correction factor)

Ton = 0.400ms * 10 + 0.141ms * 15 = 6.115ms

Duty Cycle Correction Factor = 20 * log (Ton / Ton+off) = 20 * log (6.115/16.95) = -8.85dB

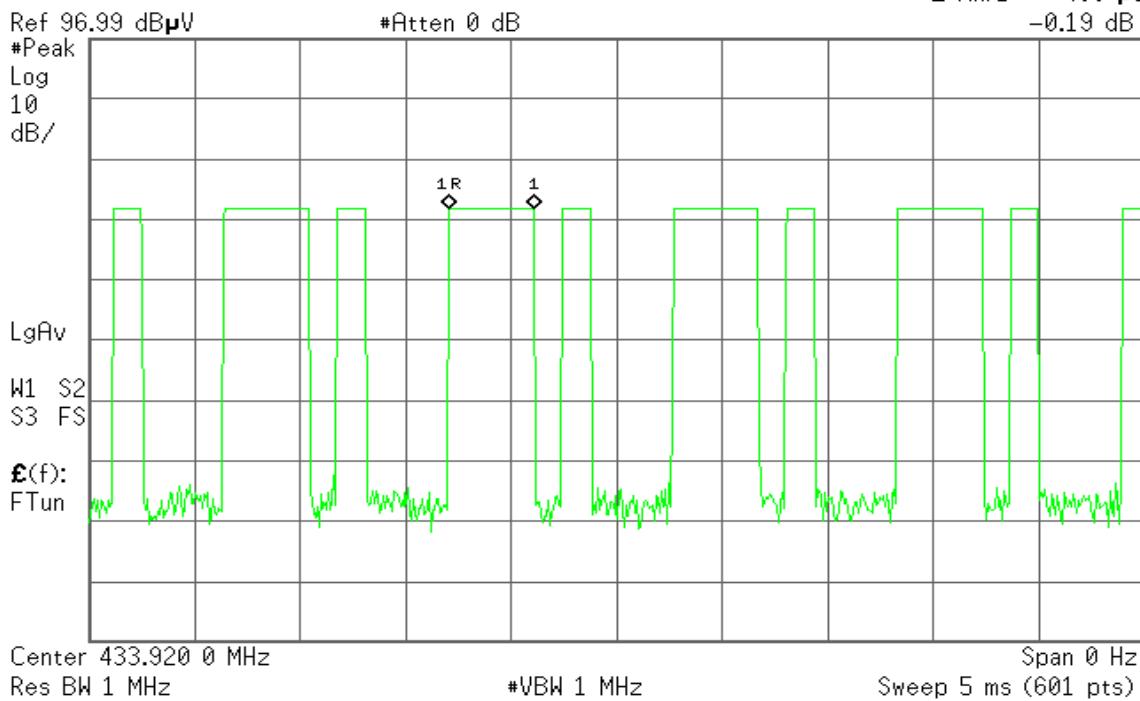
Test Plot



* Agilent 11:58:27 12 Apr 2010

R T

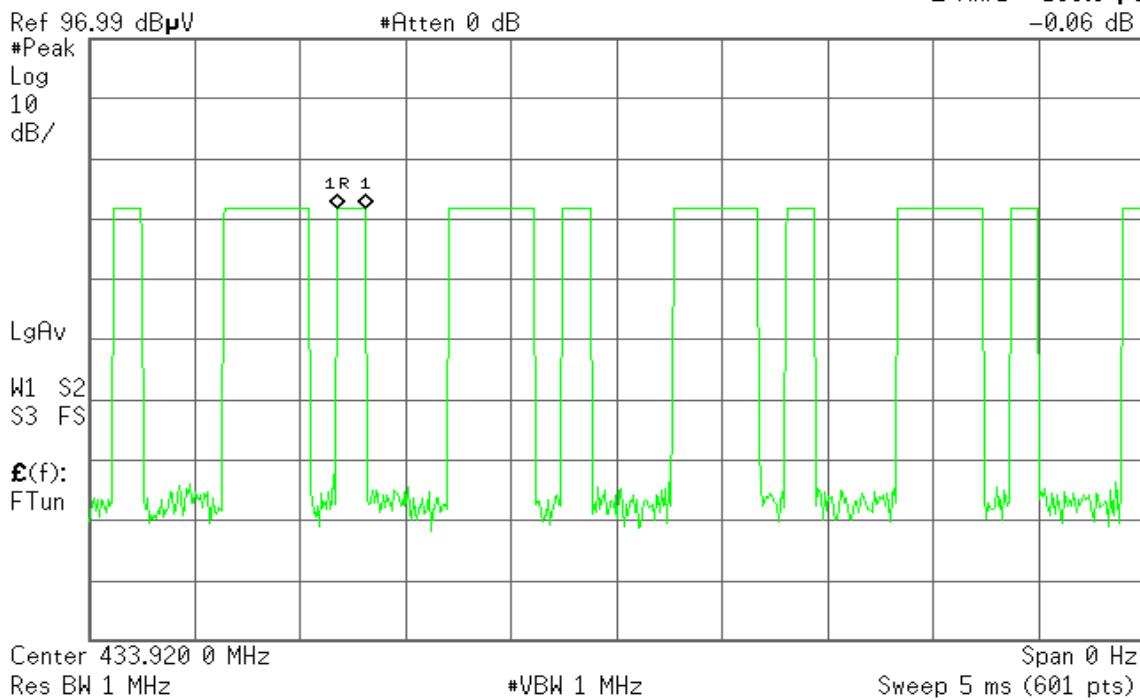
▲ Mkr1 400 μ s
-0.19 dB



* Agilent 11:59:11 12 Apr 2010

R T

▲ Mkr1 133.3 μ s
-0.06 dB





7.4. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

7.4.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.207(a), except as shown in paragraphs (b) and (c) of 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 μ 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 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

NOTE:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) 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.

7.4.2. TEST INSTRUMENTS

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
ESCI EMI TEST RECEIV.ESCI	ROHDE&SCHWARZ	1166.5950 03	100783	03/21/2010	03/21/2011
LISN	FCC	FCC-LISN-50-50-2-M	01068	03/21/2010	03/21/2011
LISN	EMCO	3825/2	8901-1459	03/21/2010	03/21/2011
CDN	FCC	FCC-TLISN-T4	20182	03/21/2010	03/21/2011
CDN	FCC	FCC-TLISN-T8-02	20183	03/21/2010	03/21/2011
CDN	FCC	FCC-TLISN-T4-02	20382	03/21/2010	03/21/2011
CDN	FCC	FCC-TLISN-T4-02	20383	03/21/2010	03/21/2011
CDN	FCC	FCC-801-T8-RJ45	04030	03/21/2010	03/21/2011
Current Probe	STODDART AIRCRAFT	91550-1	345-73	03/21/2010	03/21/2011

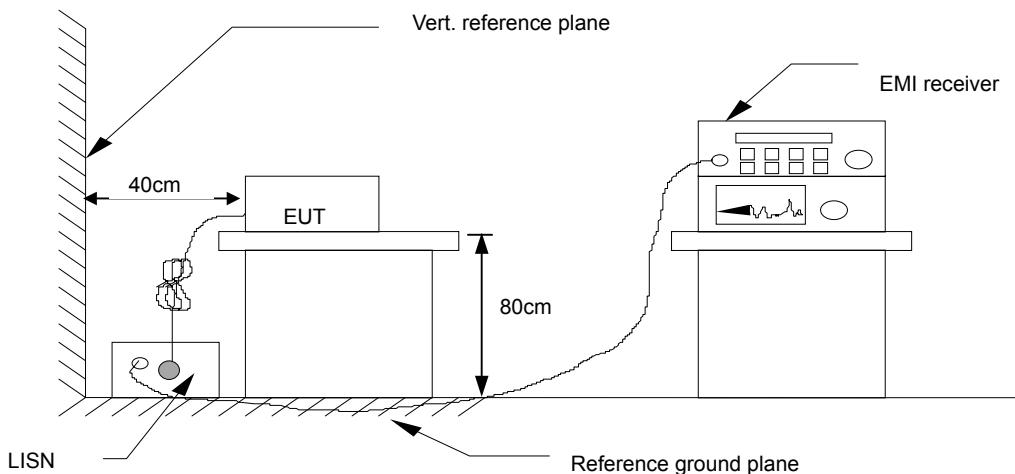
NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.



7.4.3. TEST PROCEDURES (please refer to measurement standard)

- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

7.4.4. TEST SETUP



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

7.4.5. Data Sample:

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
x.xx	50.27	49.16	48.17	65.47	55.47	-16.31	-7.30	L

Freq. = Emission frequency in MHz
RAW dBuV = Uncorrected Analyzer/Received Reading +INSERTION LOSS of LISN+CABLE LOSS+pulse limiter loss
Q.P. Limit dBuV = Limit stated in standard
AVG Limit dBuV = Limit stated in standard
Q.P. Margin dB = Q.P. RAW (dBuV) –Q.P. Limit (dBuV)
AVG Margin dB = AVG RAW (dBuV) –AVG Limit (dBuV)
Note = Current carrying line of reading
Q.P.: =Quasi-Peak

7.4.6. TEST RESULTS

Not applicable, since the EUT is powered by the battery.



7.5. RADIATED EMISSIONS

7.5.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

1. According to §15.231(b), In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Field (MHz)	Strength of Field Strength of Frequency (microvolts/meter)	Fundamental Spurious Emissions (microvolts/meter)
40.66 – 40.70	2,250	225
70 – 130	1,250	125
130 – 174	1,250 to 3,750 **	125 to 375 **
174 – 260	3,750	375
260 – 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12,500	1,250

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 – 40.70	2,250	225
70 – 130	1,250	125
130 – 174	1,250 to 3,750 **	125 to 375 **
174 – 260	3,750	375
260 – 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12,500	1,250

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu\text{V/m}$ at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

2. 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.

3. 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



7.5.2. TEST INSTRUMENTS

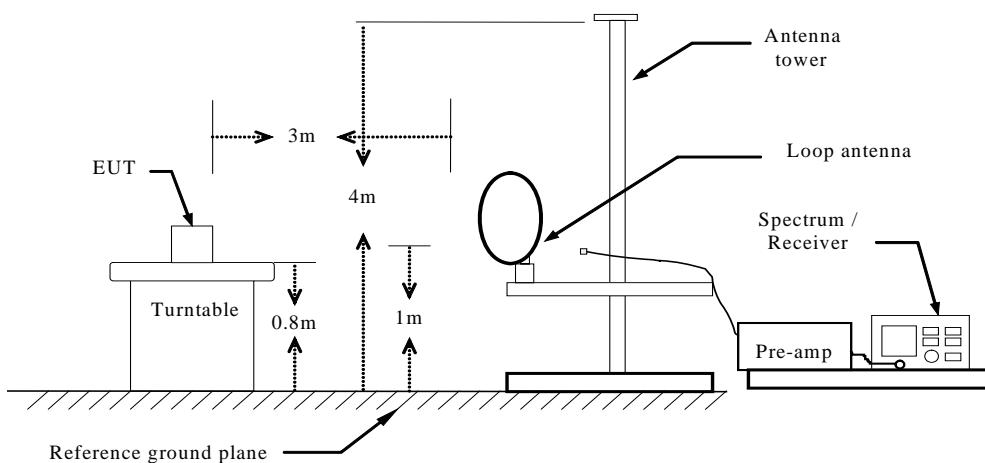
Radiated Emission Test Site 966 (2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/21/2010	03/21/2011
Amplifier	Mini-Circuits	ZKL-1R5	S8399500744	03/21/2010	03/21/2011
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
High Noise Amplifier	Agilent	8449B	3008A01838	05/29/2009	05/29/2010
Bilog Antenna	SCHAFFNER	CBL6143	5082	06/26/2009	06/26/2010
Horn Antenna	SCHWARZBECK	BBHA9120D	D286	03/19/2010	03/19/2011
Signal Generator	Anritsu	MG3694A	#050125	03/21/2010	03/21/2011
Horn Antenna	TRC	HA0301	N/A	03/19/2010	03/19/2011
Loop Antenna	ARA	PLA-1030/B	1029	03/19/2010	03/19/2011
Power Sensor	Anritsu	MA2491A	030619	03/21/2010	03/21/2011

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

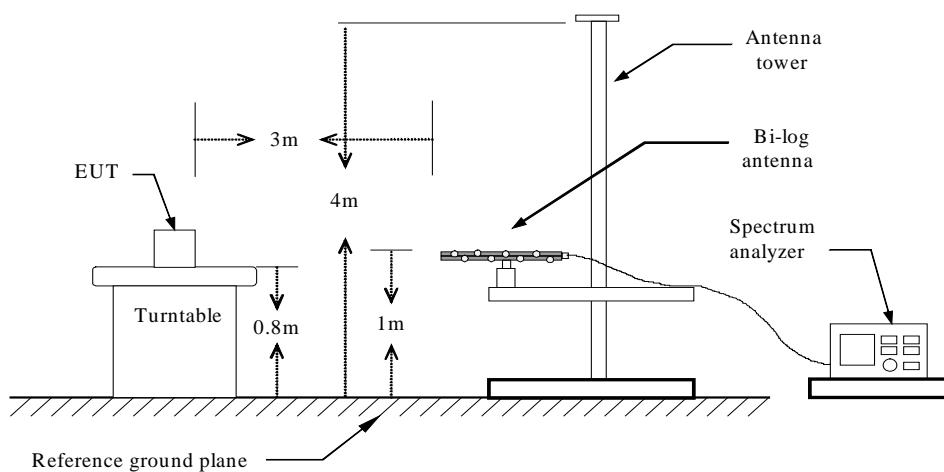
2. N.C.R = No Calibration Required.

7.5.2.1. TEST SETUP

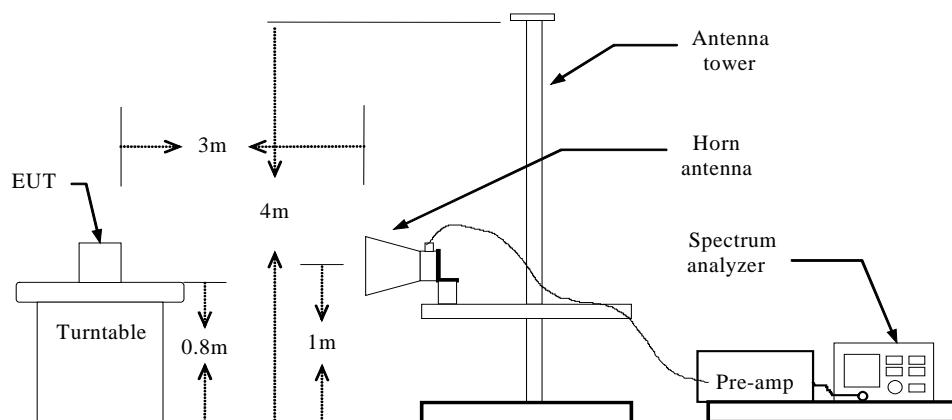
Below 30MHz



Below 1 GHz



Above 1 GHz



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



7.5.2.2. 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.

7.5.2.3. Data Sample:

Below 1 GHz

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Remark) (dBuV)	Correction Factor (dB/m)	Result (Remark) (dBuV/m)	Limit (Peak) (dBuV/m)	Margin (dB)	Remark
xxx	V	12.12	10.21	22.33	40.00	-17.67	Peak

Above 1 GHz

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
xxx	V	65.45	63.00	-11.12	54.33	51.88	74.00	54.00	-2.12	AVG

Frequency (MHz)

= Emission frequency in MHz

Ant.Pol. (H/V)

= Antenna polarization

Reading (dBuV)

= Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m)

= Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m)

= Reading (dBuV) + Correction Factor (dB/m)

Limit (dBuV/m)

= Limit stated in standard

Margin (dB)

= Remark Result (dBuV/m) – Limit (dBuV/m)

Peak

= Peak Reading

QP

= Quasi-peak Reading

AVG

= Average Reading

**7.5.2.4. TEST RESULTS****Operation Mode: NORMAL****Test Date:** March 16, 2010**Temperature:** 25°C**Tested by:** Sunday Hu**Humidity:** 49 % RH**Polarity:** Ver. / Hor.**Below 1 GHz**

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)
35.85	V	Peak	41.03	-16.12	24.91	40.00	-15.09
62.85	V	Peak	36.21	-19.80	16.41	40.00	-23.59
96.15	V	Peak	42.34	-20.31	22.03	43.50	-21.47
99.75	V	Peak	41.16	-20.35	20.81	43.50	-22.69
468.00	V	Peak	36.16	-9.87	26.29	46.00	-19.71
868.17	V	Peak	37.55	-2.69	34.86	46.00	-11.14
35.85	H	Peak	40.99	-16.12	24.87	40.00	-15.13
216.75	H	Peak	43.21	-17.29	25.92	46.00	-20.08
487.83	H	Peak	35.62	-9.49	26.13	46.00	-19.87
542.66	H	Peak	34.22	-8.70	25.52	46.00	-20.48
651.16	H	Peak	34.07	-5.23	28.84	46.00	-17.16
868.16	H	Peak	40.50	-2.69	37.81	46.00	-8.19

**Remark: No emission found between lowest internal used/generated frequency to 30 MHz.

Notes:

1. Measuring frequencies from 9kHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30MHz to 1GHz 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.



Fundamental:

Freq. (MHz)	Ant. Pol (H/V)	Reading (Peak) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Duty Cycle Correction Factor (dB)	Result (Average/ Quasi-peak) (dBuV/m)	Limit (dBuV/ m)	Margin (dB)	Remark
433.92	V	63.97	-10.64	53.33	---	---	100.83	-47.50	Peak
433.92	V	63.97	-10.64	53.33	-8.85	44.48	80.83	-36.35	Average
<hr/>									
433.92	H	83.50	-10.64	72.86	---	---	100.83	-27.97	Peak
433.92	H	83.50	-10.64	72.86	-8.85	64.01	80.83	-16.82	Average

Remark: 1. Average Result =Peak result +Duty cycle correction factor
2. Peak Result=peak reading+ Correction Factor
3. Correction Factor= Cable Loss + Antenna Gain –Amplifier Gain

Above 1 GHz

Operation Mode: TX **Test Date:** March 16, 2010
Temperature: 25°C **Humidity:** 44 % RH
Tested by: Sunday Hu

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)				
2170.00	V	54.72	---	-4.79	49.93	---	74.00	---	-24.07	Peak
2603.33	V	50.48	37.29	-3.19	53.67	40.48	74.00	54.00	-13.52	Average
5850.00	V	45.70	---	5.26	50.96	---	74.00	---	-23.04	Peak
N/A										
2603.33	H	48.82	---	-3.19	45.63	---	74.00	---	-28.37	Peak
4000.00	H	45.49	---	1.66	47.15	---	74.00	---	-26.85	Peak
5083.33	H	45.63	---	3.27	48.90	---	74.00	---	-25.10	Peak
N/A										

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average 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) = Remark result (dBuV/m) – Average limit (dBuV/m).