



World Standardization Certification & Testing CO., LTD
World Standardization Safety and EMC Testing Centre

FCC CFR 47 PART 15 SUBPART C

TEST REPORT

Report Number: WSCT07120060E-RF

For

FM Transmitter

Model: 4FM915

Trade Name: N/A

Issued to

Daza Technology Electronics
Room 1410-1411, Block A Jiahe Bldg, Shennan Mid-r
Shenzhen

Issued by

WORLD STANDARDIZATION CERTIFICATION & TESTING CO., LTD.
1-2/F, DACHONG KEJI BUILDING NO.25 OF TONGGU ROAD,
NANSHAN DISTRICT, SHENZHEN. PRC
TEL: 86-755-26996142
FAX: 86-755-26996253

***Note:** This report shall not be reproduced except in full, without the written approval of World standardization Certification & Testing CO., LTD. This document may be altered or revised by World standardization Certification & Testing CO., LTD. personnel only, and shall be noted in the revision section of the document.*



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION	3
2. EUT DESCRIPTION	4
3. TEST METHODOLOGY	5
3.1 EUT CONFIGURATION	5
3.2 EUT EXERCISE	5
3.3 GENERAL TEST PROCEDURES	5
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS	6
3.5 DESCRIPTION OF TEST MODES	6
4. INSTRUMENT CALIBRATION	7
5. FACILITIES AND ACCREDITATIONS	8
5.1 FACILITIES	8
5.2 EQUIPMENT	8
5.3 LABORATORY ACCREDITATIONS AND LISTINGS	8
6. SETUP OF EQUIPMENT UNDER TEST	9
6.1 SETUP CONFIGURATION OF EUT	9
6.2 SUPPORT EQUIPMENT	9
7. FCC PART 15.239 REQUIREMENTS	10
7.1 20 dB BANDWIDTH	10
7.2 BAND EDGES MEASUREMENT	13
7.3 RADIATED EMISSIONS	16
7.4 POWERLINE CONDUCTED EMISSIONS	22
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP	24



1. TEST RESULT CERTIFICATION

Applicant: Daza Technology Electronics
Room 1410-1411, Block A Jiahe Bldg, Shennan Mid-r
Shenzhen

Equipment Under Test: FM Transmitter

Trade Name: N/A

Model: 4FM915

Date of Test: Januarv 5~11. 2008

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

The above equipment was tested by World Standardization Certification & Testing Co., Ltd. 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 15.239.

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

Approved by:

Kallen Wang/ General Manager

Tested By:

Sula Huang/ Testing Engineer



2. EUT DESCRIPTION

Product	FM Transmitter
Trade Name	N/A
Model	4FM915
Power Supply	DC12V
Operate Frequency	88.1-107.9MHz
Modulation Technique	FM
Number of Channels	199 Channel

Remark: *The product is a Transmitter. This submittal(s) (test report) is intended for FCC ID: UK3FM915 filing to comply with Section 15.239 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 and FCC CFR 47 Part 15 Subpart C.

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 calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 meters from the leading edge of the turntable.

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 7.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on a turntable, 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
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.

3.5 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition and tested 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). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

1kHz audio signal is used during the test.

The following test mode was scanned during the preliminary test:

Mode 1: ipod Play

After the preliminary scan, the following test mode was found to produce the highest emission level.

Mode 1: ipod Play



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 1-2/F, Dachong Science & Technology Building, No. 28 of Tonggu Road, Nanshan District, Shenzhen, PRC

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 LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by FCC. Oct 06.2007. The certificate registration number is 276008 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements.



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

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	iPod Player	apple	nano	N/A	N/A	N/A	N/A
2.	DC Power supply(DC12V)	EUROGLOBE	EG4D-12	N/A	N/A	Un-shielded, 0.5m	N/A

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 15.239 REQUIREMENTS

7.1 20 dB BANDWIDTH

LIMIT

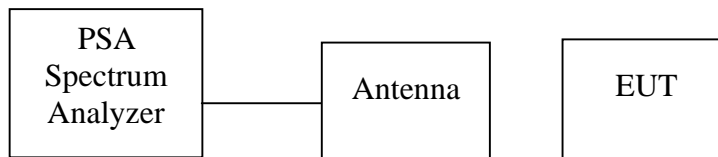
N/A

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. 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 = 200kHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

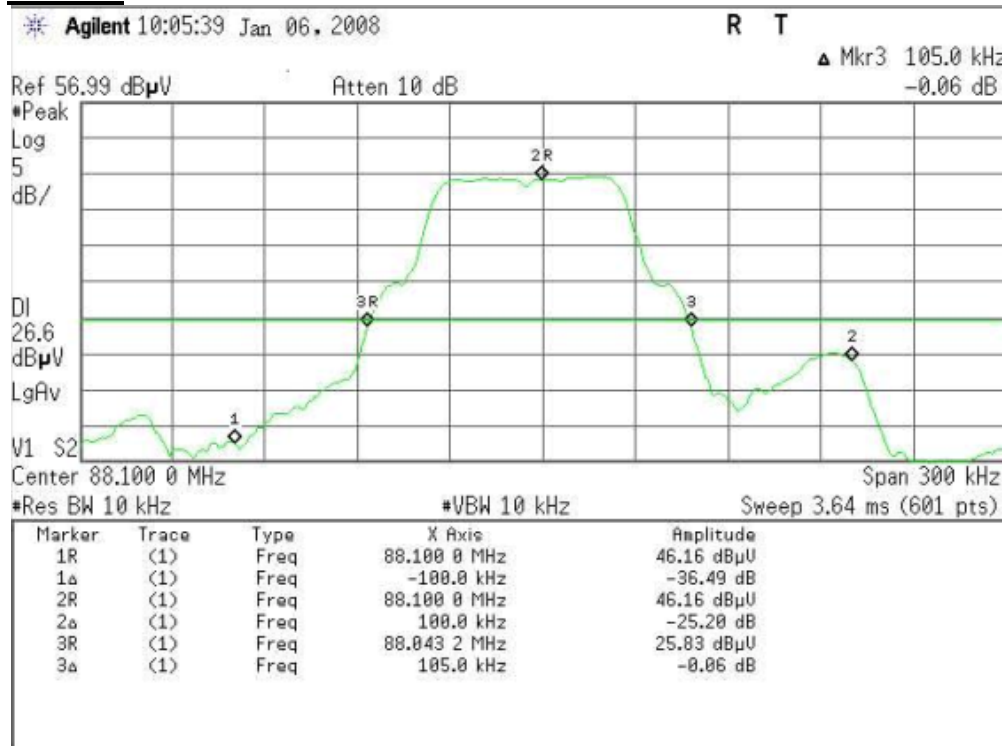
No non-compliance noted

Test Data

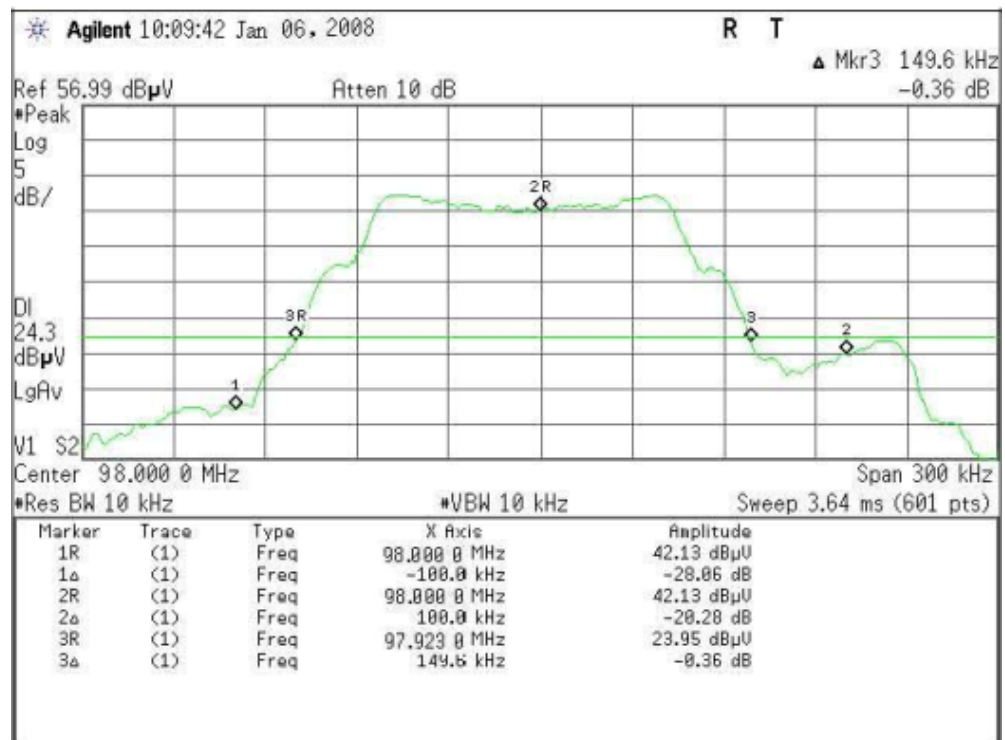
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	88.1	105.0	200	PASS
Mid	98.0	149.6	200	PASS
High	107.9	137.5	200	PASS

Test Plot

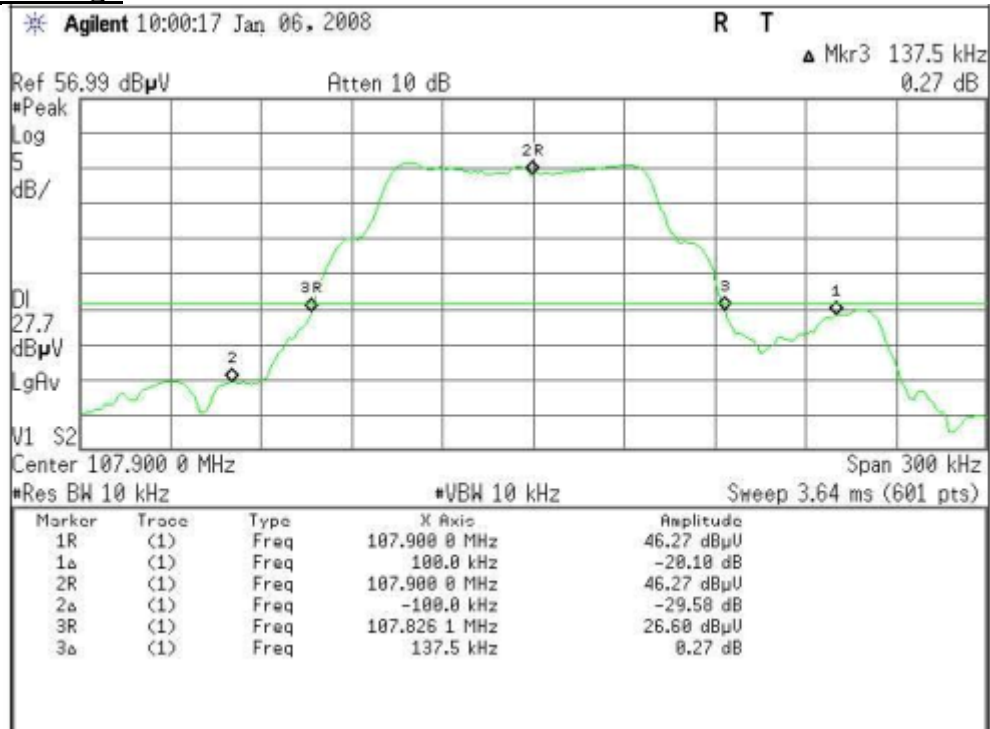
CH Low



CH Mid



CH High





7.2 BAND EDGES MEASUREMENT

LIMIT

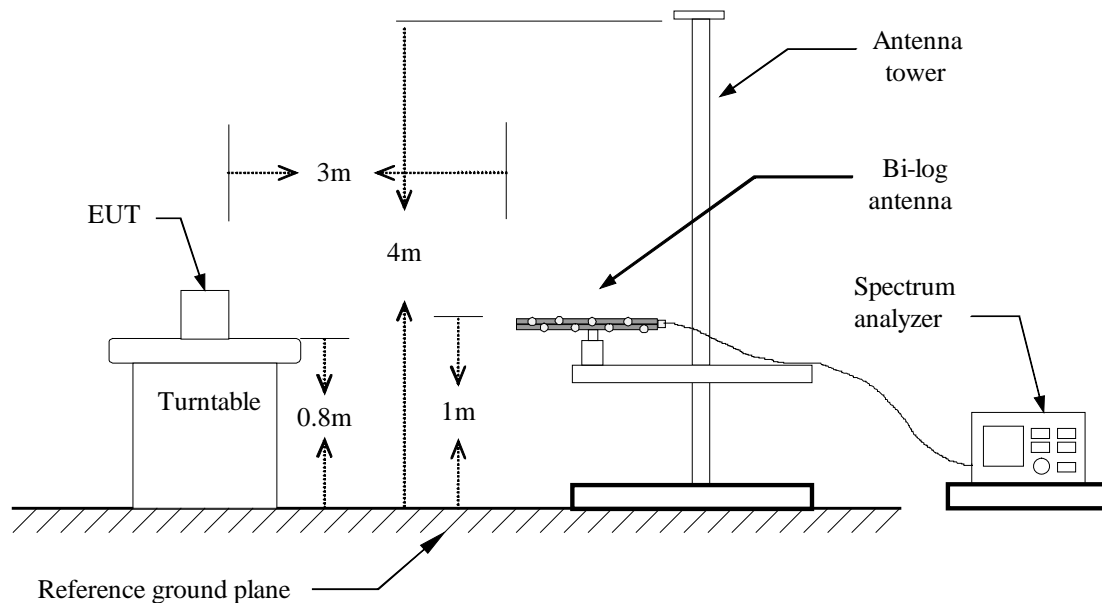
According to §15.239(a), emissions from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88-108MHz.

MEASUREMENT EQUIPMENT USED

966 RF CHAMBER 2				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/06/2008
EMI Test Receiver	R&S	ESCI	100005	04/15/2008
Pre Amplifier	HP	HP8447E	2945A02715	04/15/2008
Antenna	Sunol Sciences Corporation	JB3	A021907	05/11/2008
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	04/15/2008
System-Controller	CC-C-1F	MF7802080	N/A	N/A
Turn Table	EMCO	2081-1.21	N/A	N/A
Antenna Tower	CT	N/A	N/A	N/A
RF Comm. Test set	HP	8920B	US36142090	04/15/2008
Site NSA	C&C	N/A	N/A	04/9/2008

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

Test Configuration



TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 1 and measurement the turn on the EUT. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100kHz and 100kHz respectively with a convenient frequency span including 200kHz bandwidth of the emission.
4. Mark the bandwidth of 200kHz points and plot the graph on spectrum analyzer.
5. Repeat the procedures until all measured frequencies were complete.

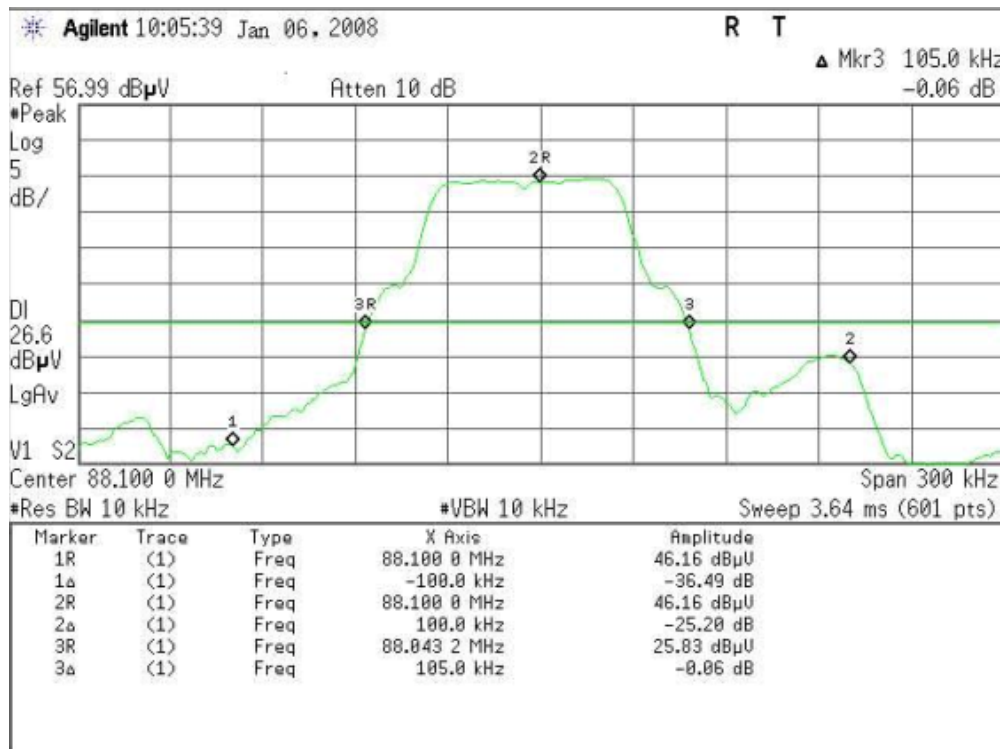
TEST RESULTS

Refer to attach spectrum analyzer data chart.

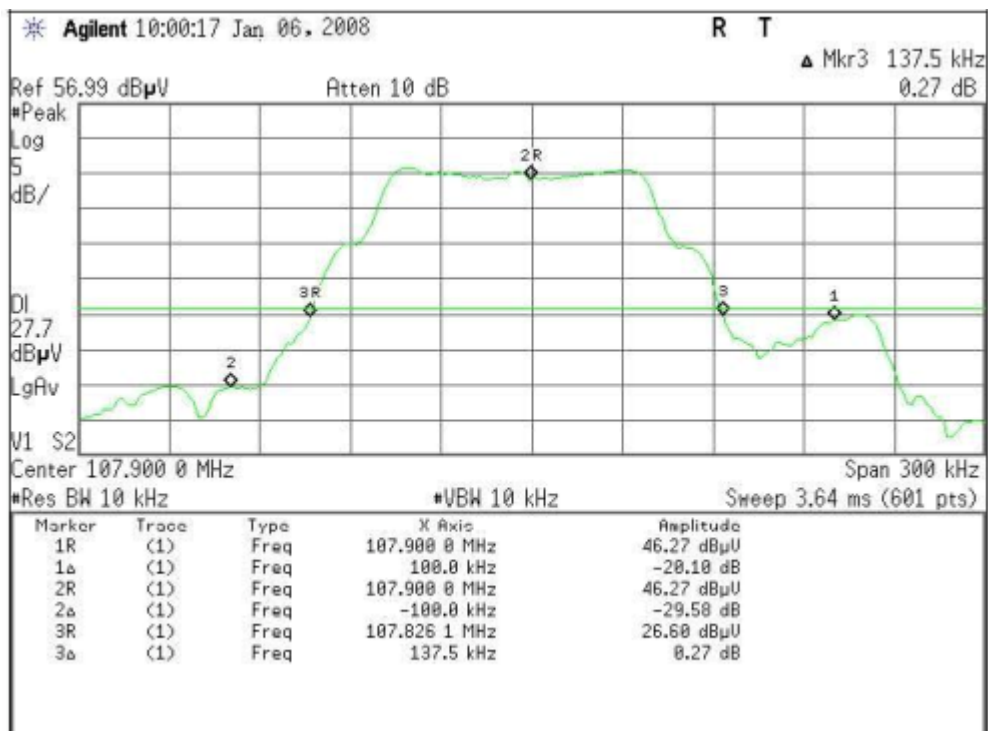
(PS: EUT is programmed and in case end-user press the frequency change button on the device, the channel will be changed within the lowest channel is 88.1MHz and the highest channel is 107.9MHz, - the tuning range is inside the 88-108MHz band.)

Band Edges (CH Low)

88.1MHz



107.9MHz



7.3 RADIATED EMISSIONS

LIMIT

1. The field strength of any emission within this band (section 15.239 frequency between 88 MHz –108 MHz) shall not exceed 250 microvolts /meter at 3 meters. (48dB μ V/m at 3m) 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(Intentional Radiators general limit), as below.

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
1.705-30	30	30
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)
1.705-30	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

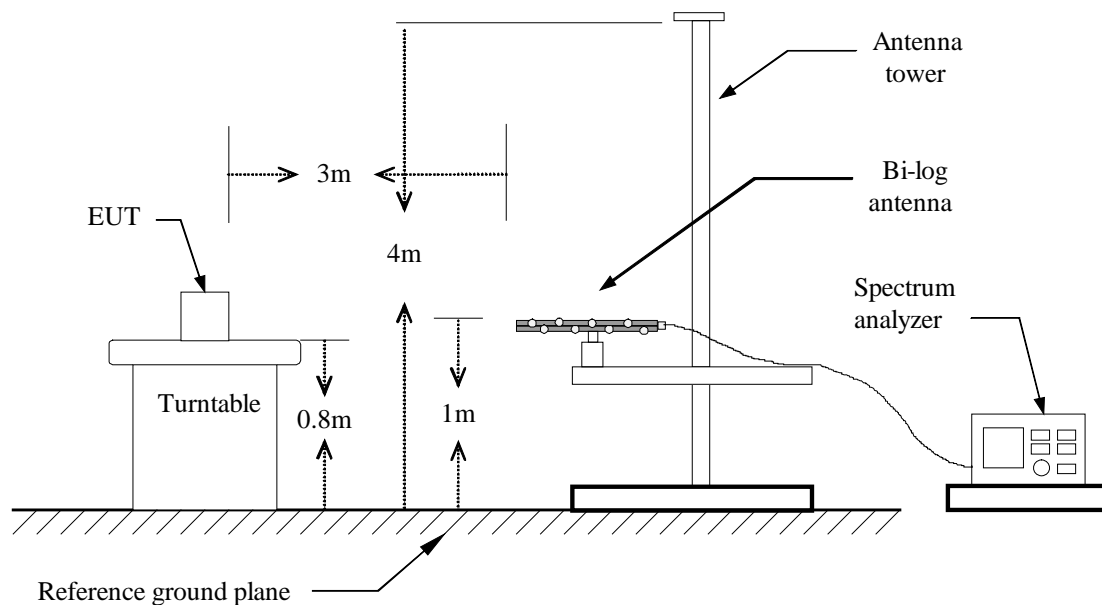
MEASUREMENT EQUIPMENT USED

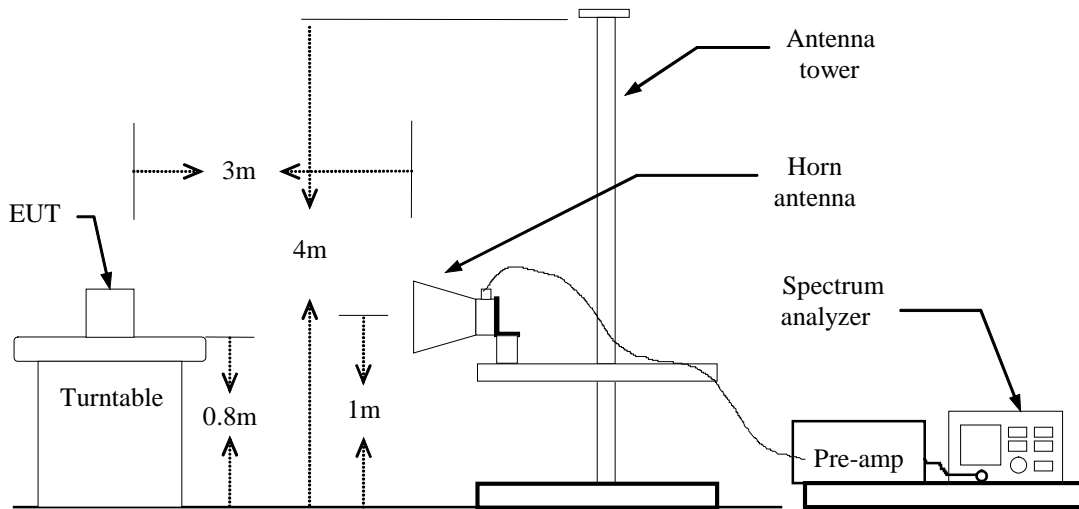
966 RF CHAMBER 2				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/06/2008
EMI Test Receiver	R&S	ESCI	100005	04/15/2008
Pre Amplifier	HP	HP8447E	2945A02715	04/15/2008
Antenna	Sunol Sciences Corporation	JB3	A021907	05/11/2008
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	04/15/2008
System-Controller	CC-C-1F	MF7802080	N/A	N/A
Turn Table	EMCO	2081-1.21	N/A	N/A
Antenna Tower	CT	N/A	N/A	N/A
RF Comm. Test set	HP	8920B	US36142090	04/15/2008
Site NSA	C&C	N/A	N/A	04/9/2008

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

Test Data

Operation Mode: Ipod play/CH Low **Test Date:** January 9, 2008
Temperature: 25°C **Tested by:** Sula
Humidity: 70 % 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)
88.10	V	Peak	67.54	-22.24	45.30	48.00	-2.70
65.55	V	Peak	50.80	-24.28	26.52	40.00	-13.48
109.65	V	Peak	48.80	-22.16	26.64	43.50	-16.86
450.50	V	Peak	44.35	-13.79	30.56	46.00	-15.44
479.66	V	Peak	44.12	-13.27	30.85	46.00	-15.15
88.10	H	Peak	61.94	-22.24	39.70	48.00	-8.30
109.65	H	Peak	52.52	-22.16	30.36	43.50	-13.14
395.66	H	Peak	53.60	-14.51	39.09	46.00	-6.91
426.00	H	Peak	53.04	-14.11	38.93	46.00	-7.07
720.00	H	Peak	44.50	-8.75	35.75	46.00	-10.25

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.*



World Standardization Certification & Testing CO., LTD
World Standardization Safety and EMC Testing Centre

Operation Mode: Ipod play/CH Mid **Test Date:** January 9, 2008
Temperature: 25°C **Tested by:** Sula
Humidity: 70 % 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)
98.00	V	Peak	67.14	-22.16	44.98	48.00	-3.02
66.90	V	Peak	51.13	-24.20	26.93	40.00	-13.07
133.50	V	Peak	50.26	-22.74	27.52	43.50	-15.98
333.83	V	Peak	45.25	-15.72	29.53	46.00	-16.47
479.66	V	Peak	45.29	-13.27	32.02	46.00	-13.98
98.00	H	Peak	64.29	-22.16	42.13	48.00	-5.87
111.45	H	Peak	54.03	-22.28	31.75	43.50	-11.75
289.65	H	Peak	52.33	-17.33	35.00	46.00	-11.00
333.83	H	Peak	56.12	-15.72	40.40	46.00	-5.60
395.66	H	Peak	55.47	-14.51	40.96	46.00	-5.04
437.66	H	Peak	52.53	-13.96	38.57	46.00	-7.43

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.



Operation Mode: Ipod Play / CH High **Test Date:** January 9, 2008
Temperature: 25°C **Tested by:** Sula
Humidity: 70 % RH **Polarity:** Ver. / Hor.

107.85	V	Peak	65.40	-22.05	43.35	48.00	-4.65
64.65	V	Peak	50.93	-24.32	26.61	40.00	-13.39
431.86	V	Peak	55.28	-14.32	40.96	46.00	-5.04
437.47	V	Peak	45.58	-13.16	32.42	46.00	-13.58
107.85	H	Peak	64.20	-22.05	42.15	48.00	-5.85
270.78	H	Peak	56.63	-16.85	39.78	46.00	-6.22
323.84	H	Peak	57.65	-15.38	42.27	46.00	-3.73
431.86	H	Peak	57.03	-14.61	42.42	46.00	-3.58
468.33	H	Peak	53.58	-13.85	39.73	46.00	-6.27
486.57	H	Peak	54.05	-13.11	40.94	46.00	-5.06

Remark:

1. Measuring frequencies from 30 MHz to the 1.1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1100MHz 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 1GHz was 1MHz.

7.4 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
EMI Test Receiver	ROHDE&SCHWARZ	ESCS30	100343	04/15/2008
LISN	AFJ	LS16	16010222119	04/02/2008
LISN	Meestec	AN3016	04/10040	04/02/2008

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



World Standardization Certification & Testing CO., LTD
World Standardization Safety and EMC Testing Centre

Operation Mode: Ipod play **Test Date:** January 9, 2008
Temperature: 24°C **Tested by:** Sula
Humidity: 68 % RH **Polarity:** L/N

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
0.365	22.78	---	---	59.86	49.86	---	-27.08	L1
0.491	25.32	---	---	56.25	46.25	---	-20.93	L1
0.617	26.33	---	---	56.00	46.00	---	-19.67	L1
0.735	23.93	---	---	56.00	46.00	---	-22.07	L1
0.917	18.78	---	---	56.00	46.00	---	-27.22	L1
1.121	14.65	---	---	56.00	46.00	---	-31.35	L1
0.298	21.78	---	---	61.76	51.76	---	-29.98	L2
0.413	24.55	---	---	58.48	48.48	---	-23.93	L2
0.494	25.70	---	---	56.15	46.15	---	-20.45	L2
0.606	26.96	---	---	56.00	46.00	---	-19.04	L2
0.687	26.41	---	---	56.00	46.00	---	-19.59	L2
0.921	19.22	---	---	56.00	46.00	---	-26.78	L2

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

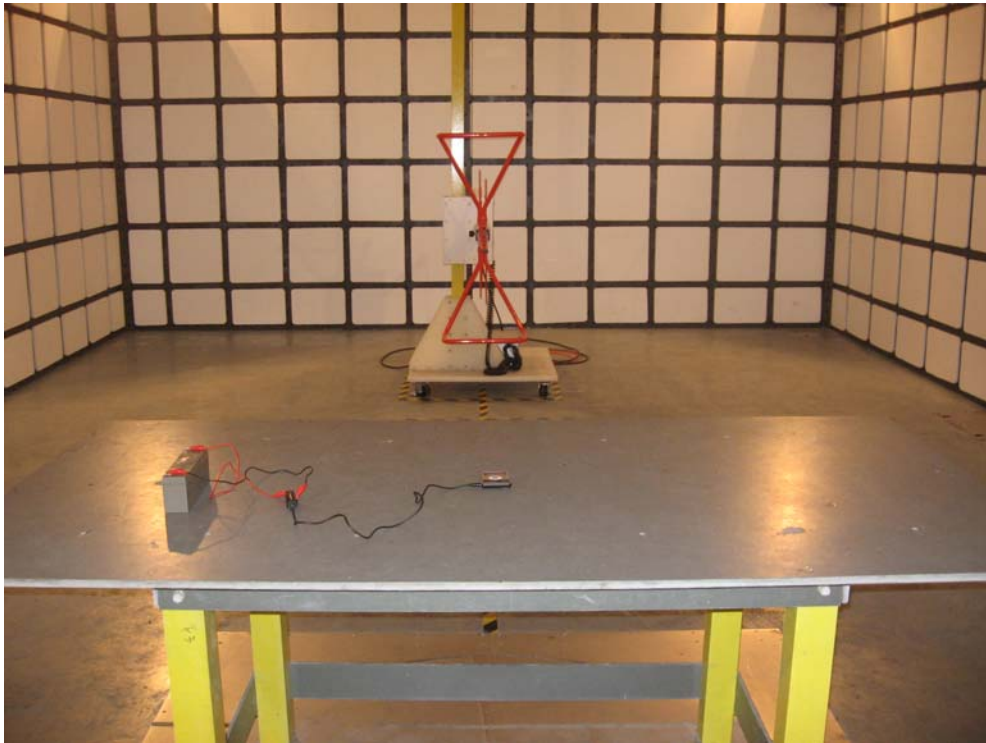
***NOTE: “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.*

APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

Radiated Emission Set up Photos

Test Mode: iPod Play



Power line Conducted Emission Set up Photos

