

## FCC RADIO TEST REPORT

Applicant's company	Wistron NeWeb Corporation
Applicant Address	No. 10-1, Li-hsin Road I, Science-baded Industrial Park, Hsinchu 300, Taiwan, R.O.C.
FCC ID	NKRUPAST5
Manufacturer's company	Wistron NeWeb Corporation
Manufacturer Address	No. 10-1, Li-hsin Road I, Science-baded Industrial Park, Hsinchu 300, Taiwan, R.O.C.

Product Name	Satellite Radio PnP Receiver
Brand Name	SIRIUS
Model Name	ST5-TK1, ST5
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.239
Test Freq. Range	88 ~ 108MHz
Received Date	Jan. 30, 2008
Final Test Date	Feb. 04, 2008
Submission Type	Original Equipment



### Statement

**The device is only possible within the range 88.1-107.9MHz.**

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

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## 1. CERTIFICATE OF COMPLIANCE

Certificate No.: CB9702023

Product Name : Satellite Radio PnP Receiver  
Brand Name : SIRIUS  
Model Name : ST5-TK1, ST5  
Applicant : Wistron NeWeb Corporation  
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.239

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jan. 30, 2008 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

  
Wayne Hsu

SPORTON INTERNATIONAL INC.

## 2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
-	15.207	AC Power Line Conducted Emissions	-	-
4.1	15.239(b)	Field Strength of Fundamental Emissions	Complies	4.53 dB
4.2	15.239(a)	20dB Spectrum Bandwidth	Complies	-
4.3	15.239(c)	Radiated Emissions	Complies	1.43 dB
4.4	15.239(c)	Band Edge Emissions	Complies	8.23 dB
4.5	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Field Strength of Fundamental Emissions	±1.9dB	Confidence levels of 95%
20dB Spectrum Bandwidth	±8.5×10 <sup>-8</sup>	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated / Band Edge Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

### 3. GENERAL INFORMATION

#### 3.1. Product Details

Items	Description
Product Type	Low Power Communication Device (FM Transmitter)
Radio Type	Intentional Transmitter
Power Type	Cigarette Lighter Adapter
Interface Type	Antenna connect / Line OUT / Power / FM
Modulation	FM
Frequency Range	88 ~ 108MHz
Channel Number	100
Channel Band Width (99%)	129.32 kHz
Max. Field Strength	43.47 dBuV/m at 3m (Average)
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

#### 3.2. Accessories

Power	Brand	Model	Rating
Cigarette Lighter Adapter	SSL	EGH12-520150D-D	Input: 9-16VDC Output: 5.2VDC, 1.5A
Others			
Power	Brand	Model	
Docking Station 1	SIRIUS	SUPV1	
Docking Station 2	SIRIUS	UC8	
Suction Cup Mount, Remote Control			

#### 3.3. Table for Filed Antenna

Ant.	Description
1	Internal antenna (for FM transmitter)
2	External antenna (for FM transmitter) - connector: Audio Jack (2.5mm)
3	External antenna (for Satellite receiver)

Note: The EUT has two transmitting antennas. But there is only one will be used at the same time.

### 3.4. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency
88 ~ 108MHz	1	88.1 MHz
	2	88.3 MHz
	:	:
	50	97.9 MHz
	51	98.1 MHz
	52	98.3 MHz
	:	:
	99	107.7 MHz
	100	107.9 MHz

### 3.5. Table for Test Modes

Audio input adjusted to maximize emission for test. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Channel	Antenna
Field Strength of Fundamental Emissions 20dB Spectrum Bandwidth	CTX1 / Mode 4	1/51/100	1+3
Radiated Emissions 9kHz~30MHz	Normal Link / Mode 7	-	1+3
Radiated Emissions 30MHz~10 <sup>th</sup> Harmonic	Normal Link / Mode 7	-	1+3
Band Edge Emissions	CTX1 / Mode 4	1/100	1+3

#### Test Mode:

#### <For 30MHz~1GHz>

MODE 1: TX Ant.1,RX Ant without bundle of cable(cable is placed as S type), DOCK 1

MODE 2: TX Ant.1,RX Ant without bundle of cable(cable is placed as S type), DOCK 2

MODE 3: TX Ant.1,RX Ant with bundle of cable, DOCK 1

MODE 4: TX Ant.1,RX Ant with bundle of cable, DOCK 2

MODE 5: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant without bundle of cable(cable is placed as S type), DOCK 1

MODE 6: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant without bundle of cable(cable is placed as S type), DOCK 2

MODE 7: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant with bundle of cable, DOCK 1

MODE 8: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant with bundle of cable, DOCK 2

MODE 9: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant without bundle of cable(cable is placed as S type), DOCK 1

MODE 10: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant without bundle of

cable(cable is placed as S type), DOCK 2

MODE 11: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant with bundle of cable, DOCK 1

MODE 12: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant with bundle of cable, DOCK 2

Due to Mode 7 generated the worst test result, so it was recorded in this report.

#### <For 88~108MHz>

MODE 1: TX Ant.1,RX Ant without bundle of cable(cable is placed as S type), DOCK 1

MODE 2: TX Ant.1,RX Ant without bundle of cable(cable is placed as S type), DOCK 2

MODE 3: TX Ant.1,RX Ant with bundle of cable, DOCK 1

MODE 4: TX Ant.1,RX Ant with bundle of cable, DOCK 2

MODE 5: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant without bundle of cable(cable is placed as S type), DOCK 1

MODE 6: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant without bundle of cable(cable is placed as S type), DOCK 2

MODE 7: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant with bundle of cable, DOCK 1

MODE 8: TX Ant.2 without bundle of cable (cable is placed as S type), RX Ant with bundle of cable, DOCK 2

MODE 9: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant without bundle of cable(cable is placed as S type), DOCK 1

MODE 10: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant without bundle of cable(cable is placed as S type), DOCK 2

MODE 11: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant with bundle of cable, DOCK 1

MODE 12: TX Ant.2 without bundle of cable (cable is placed as Circuit type), RX Ant with bundle of cable, DOCK 2

Due to Mode 4 generated the worst test result, so it was recorded in this report.

Note: CTX1 =Continuously transmitting and audio modulating content a range of 100 to 5000 Hz.

### 3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.



### 3.7. Table for Multiple Listing & Existing Change

The brand/model names in the following table are all refer to the identical product.

Brand Name	Model Name	Manufacturer
SIRIUS	ST5-TK1	Accessories will be accompanied with ST5-TK1 package.
SIRIUS	ST5	Accessories will not be accompanied with ST5 package.

### 3.8. Table for Supporting Units

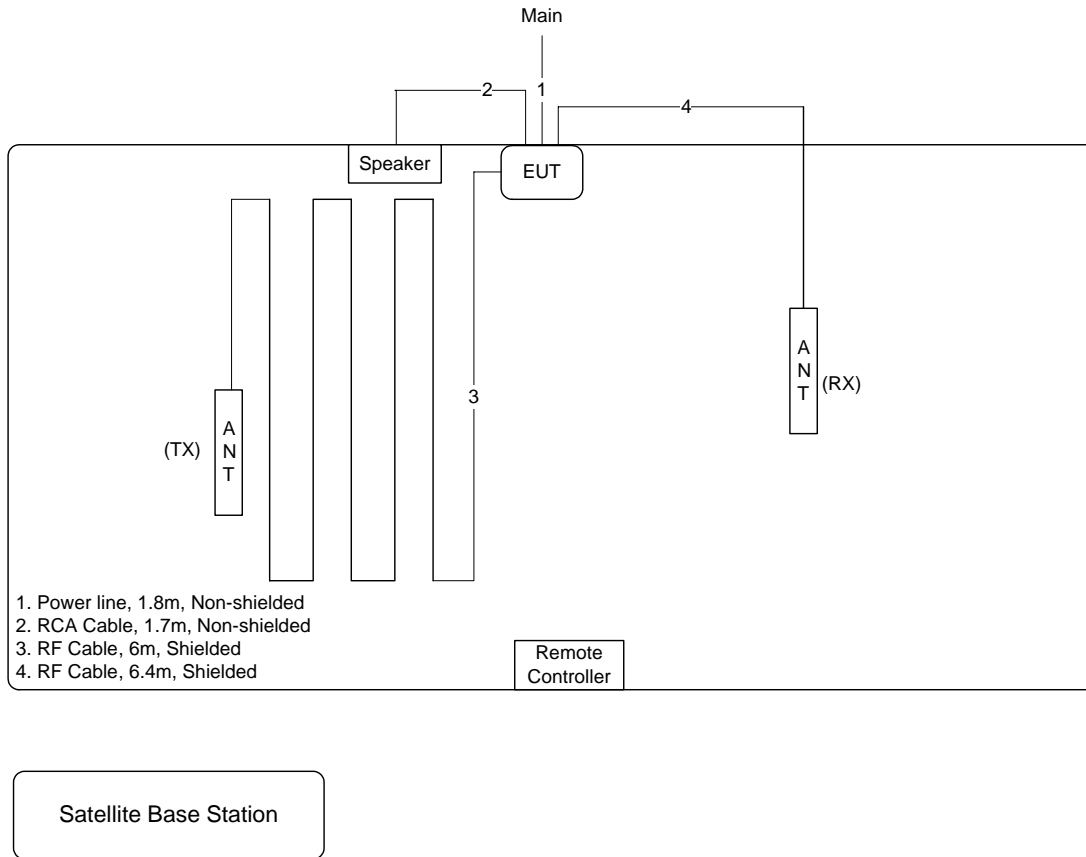
Support Unit	Brand	Model	FCC ID
Speaker	DELL	A215	DoC
Satellite base station	Rohde & Schearz	SMIQ06B	N/A

### 3.9. Test Configurations

#### 3.9.1. Radiation Emissions Test Configuration

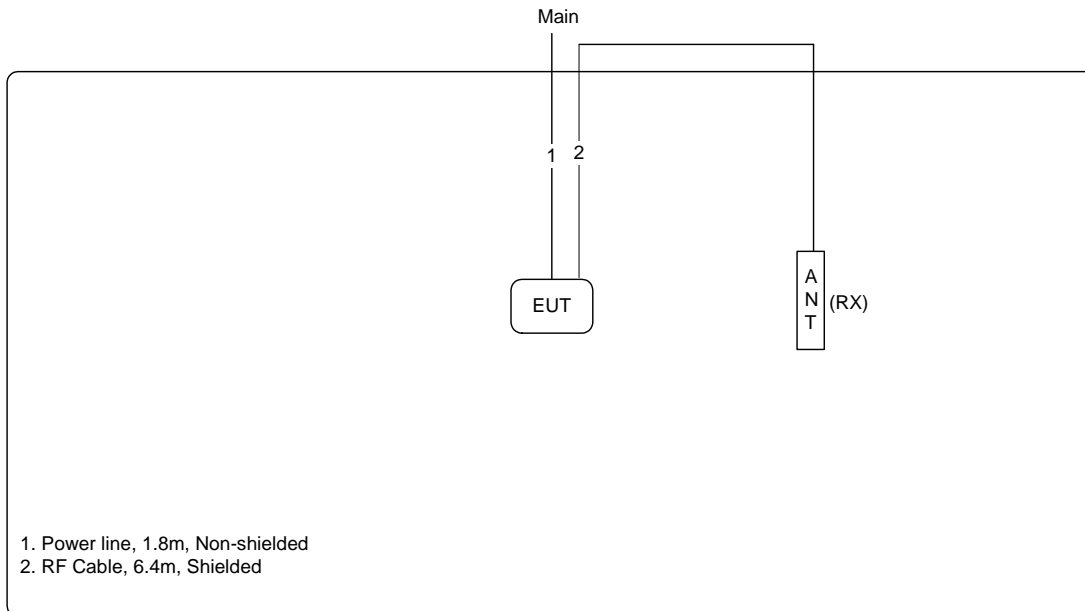
Test Mode: Mode 7

Test Configuration: 9kHz~1GHz



Test Mode: Mode 4

Test Configuration: 88~108MHz



Satellite Base Station

## 4. TEST RESULT

### 4.1. Field Strength of Fundamental Emissions Measurement

#### 4.1.1. Limit

The field strength of fundamental emissions shall comply with the following table.

Frequency Band (MHz)	Fundamental Emissions Limit (dBuV/m) at 3m
88~108	48 (Average)
88~108	68 (Peak)

#### 4.1.2. Measuring Instruments and Setting

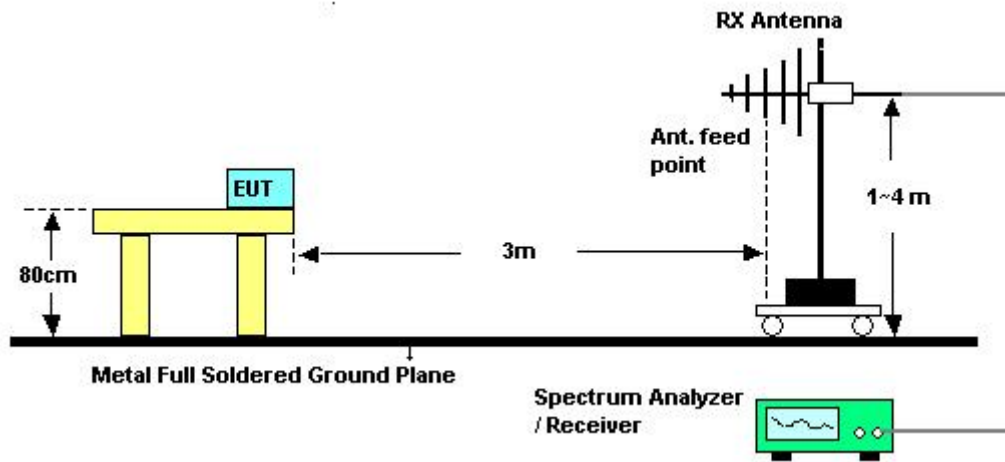
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	120 KHz
Detector	Peak / Average

#### 4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For Fundamental emissions, use the receiver to measure peak and average reading.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. 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.

#### 4.1.4. Test Setup Layout



#### 4.1.5. Test Deviation

There is no deviation with the original standard.

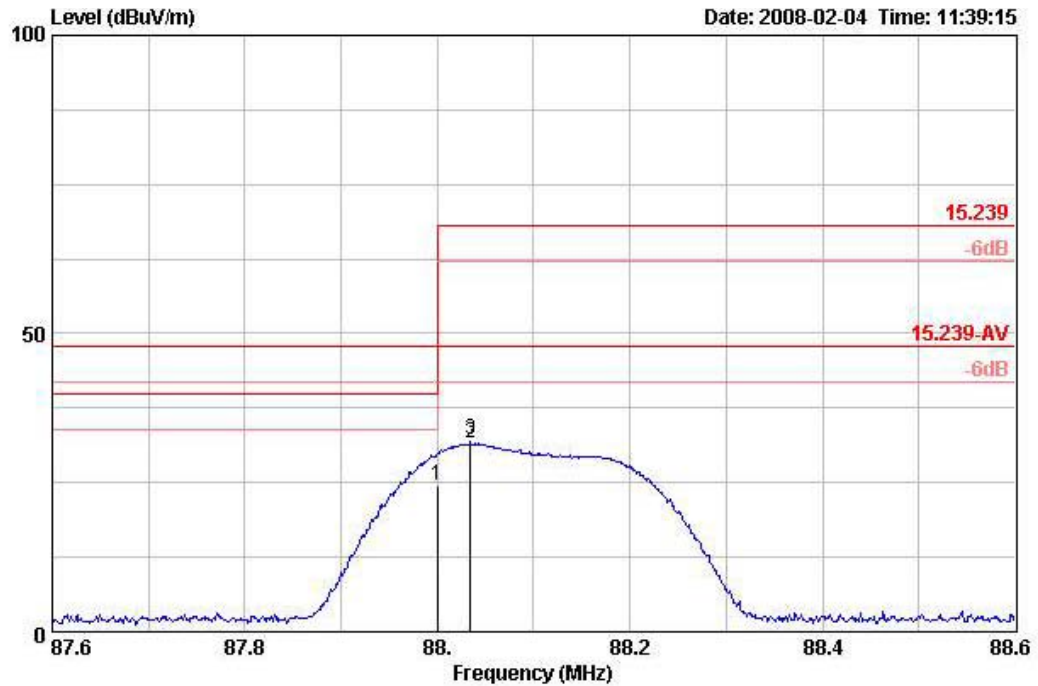
#### 4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

## 4.1.7. Test Result of Field Strength of Fundamental Emissions

Temperature	25.6°C	Humidity	56%
Test Engineer	Barry Chen	Configurations	Channel 1

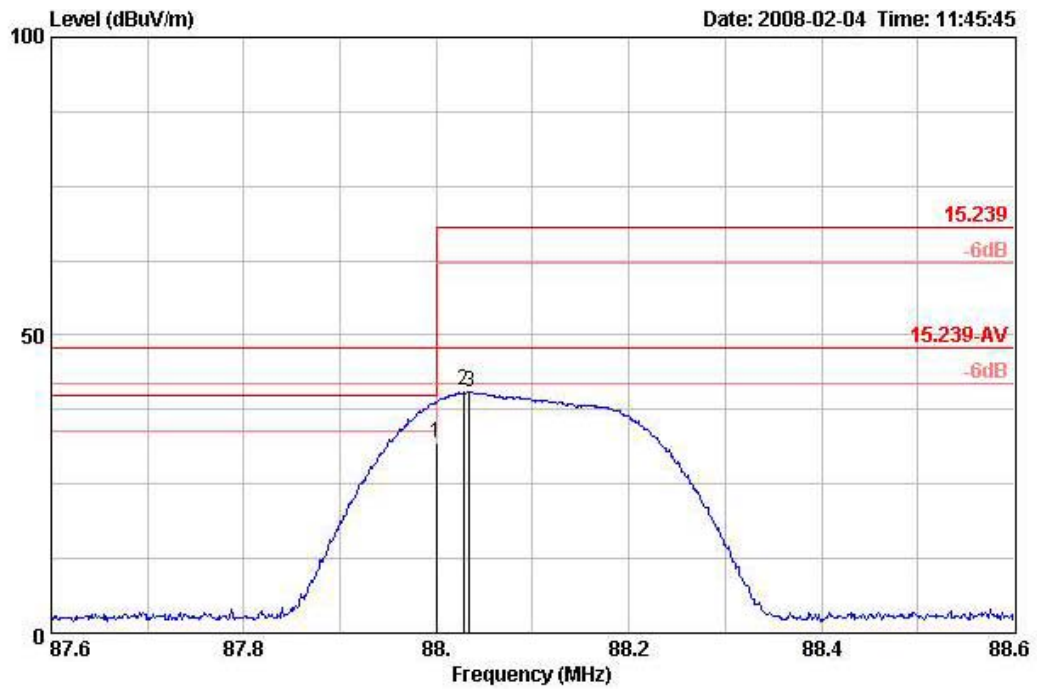
Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB		deg	cm	
2	88.034	31.53	-16.47	48.00	50.08	8.00	27.65	1.10 AVERAGE	131	400	HORIZONTAL
3	88.034	32.21	-35.79	68.00	50.76	8.00	27.65	1.10 PEAK	131	400	HORIZONTAL

Item 2, 3 are fundamental frequency at 88.1 MHz.

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
2	88.028	40.72	-27.28	68.00	59.27	8.00	27.65	1.10	PEAK	230	103	VERTICAL
3	88.034	40.39	-7.61	48.00	58.94	8.00	27.65	1.10	AVERAGE	230	103	VERTICAL

Item 2, 3 are fundamental frequency at 88.1 MHz.

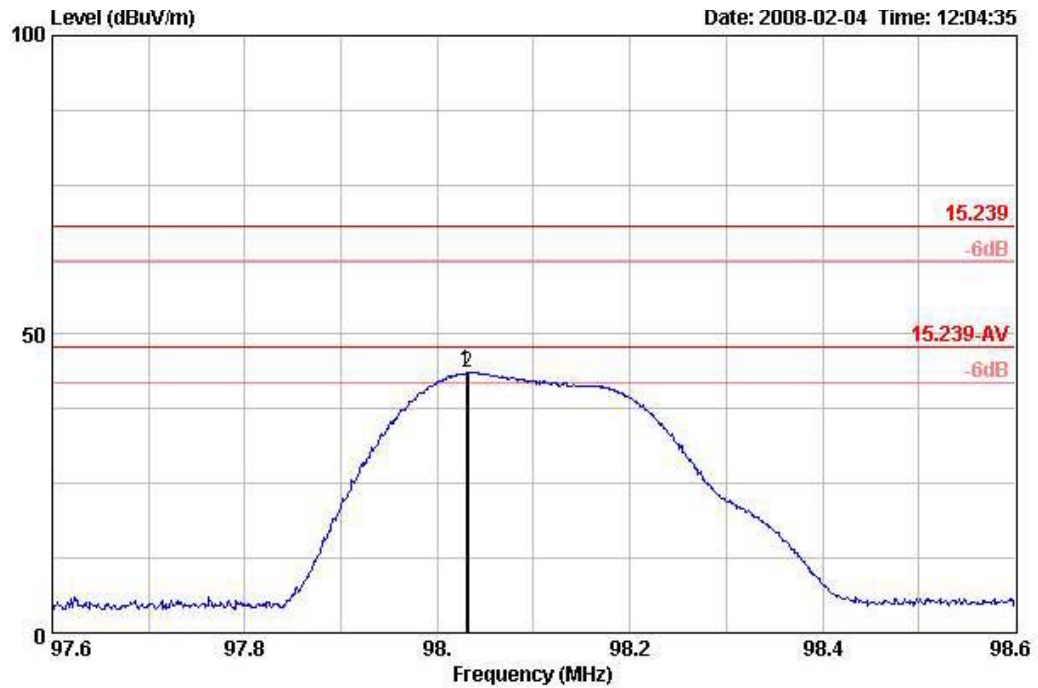
Note:

Emission level (dBUV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Temperature	25.6°C	Humidity	56%
Test Engineer	Barry Chen	Configurations	Channel 51

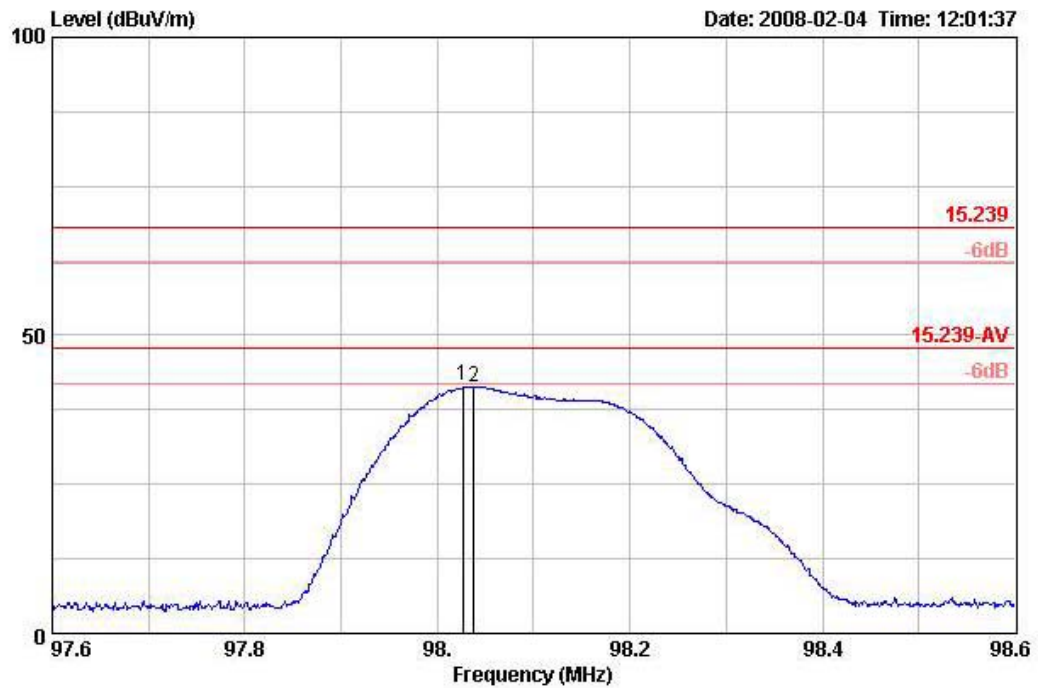
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
1	98.030	43.74	-24.26	68.00	60.24	9.95	27.61	1.16	PEAK	287	400	HORIZONTAL
2 !	98.032	43.47	-4.53	48.00	59.97	9.95	27.61	1.16	AVERAGE	287	400	HORIZONTAL



Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
1	98.026	41.65	-26.35	68.00	58.15	9.95	27.61	1.16	PEAK	140	145	VERTICAL
2	98.038	41.27	-6.73	48.00	57.77	9.95	27.61	1.16	AVERAGE	140	150	VERTICAL

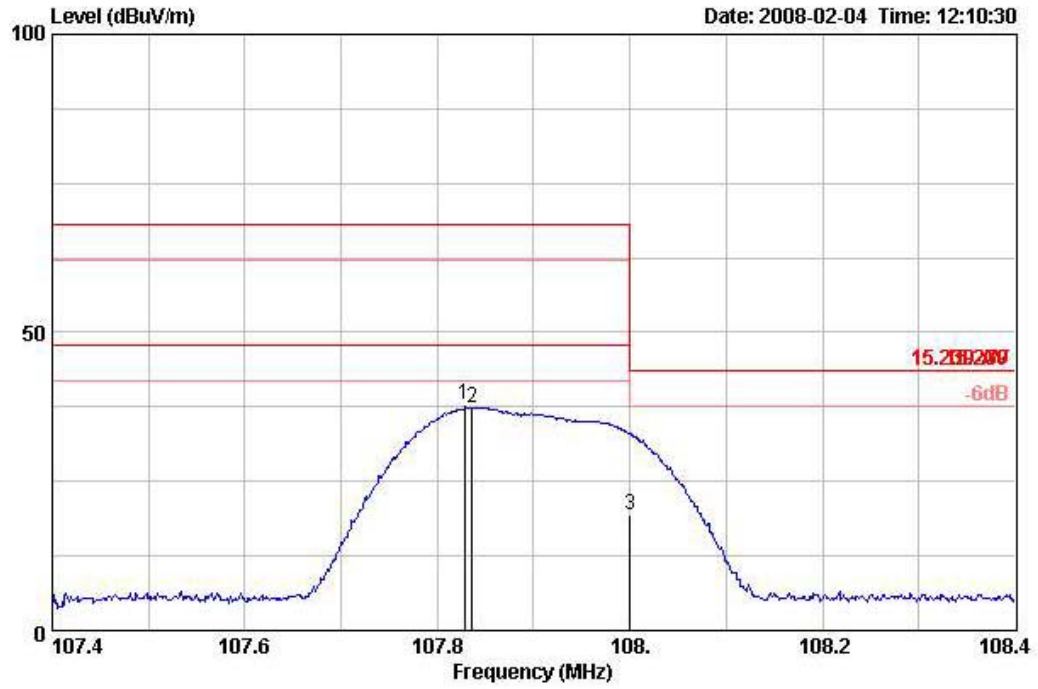
Note:

Emission level (dBUV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Temperature	25.6°C	Humidity	56%
Test Engineer	Barry Chen	Configurations	Channel 100

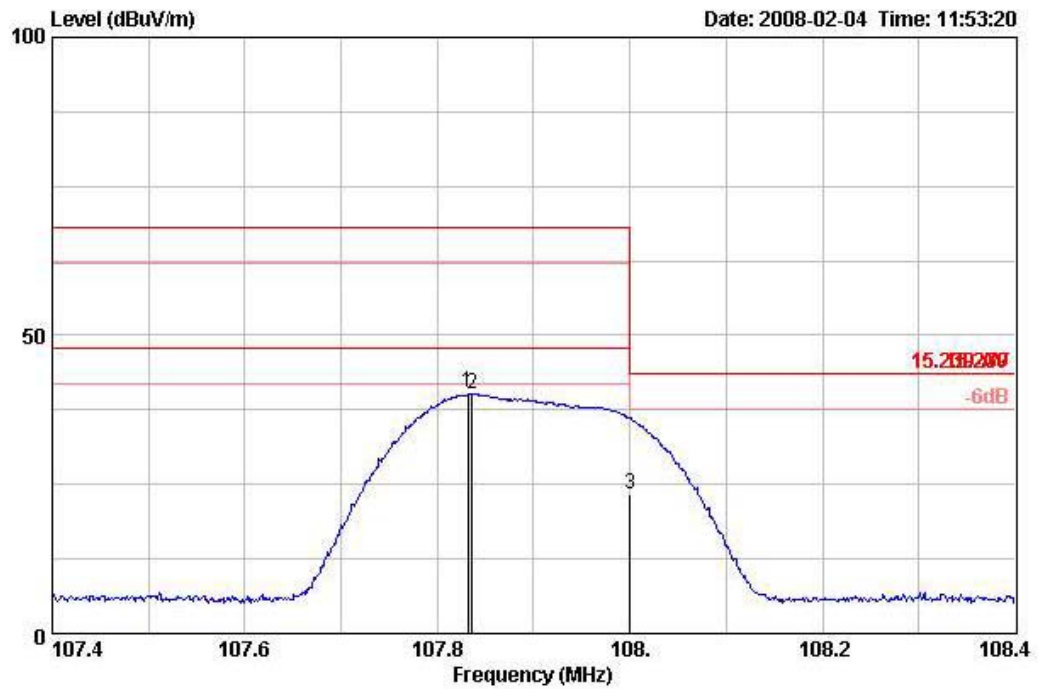
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		deg	cm	
1	107.828	38.00	-30.00	68.00	53.24	11.12	27.56	1.20	PEAK	279	100	HORIZONTAL
2	107.836	37.39	-10.61	48.00	52.63	11.12	27.56	1.20	AVERAGE	279	100	HORIZONTAL

Item 1, 2 are fundamental frequency at 107.9 MHz.

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		deg	cm	
1	107.832	40.43	-27.57	68.00	55.67	11.12	27.56	1.20	PEAK	188	358	VERTICAL
2	107.836	40.08	-7.92	48.00	55.32	11.12	27.56	1.20	AVERAGE	188	358	VERTICAL

Item 1, 2 are fundamental frequency at 107.9 MHz.

Note:

Emission level (dBUV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

## 4.2. 20dB Spectrum Bandwidth Measurement

### 4.2.1. Limit

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency.

### 4.2.2. Measuring Instruments and Setting

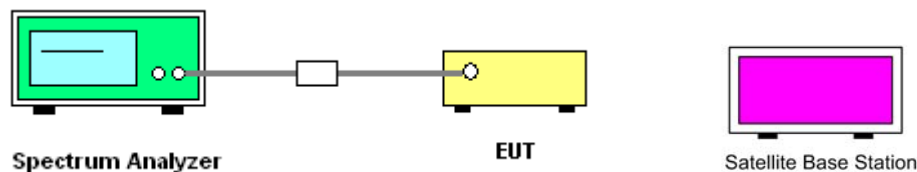
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RB	10 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. Check for a Bandwidth test with audio input CTX1 (100Hz~5kHz) at maximum.
3. The resolution bandwidth of 10 kHz and the video bandwidth of 30 kHz were used.
4. Measured the spectrum width with power higher than 20dB below carrier.

### 4.2.4. Test Setup Layout



### 4.2.5. Test Deviation

There is no deviation with the original standard.

### 4.2.6. EUT Operation during Test

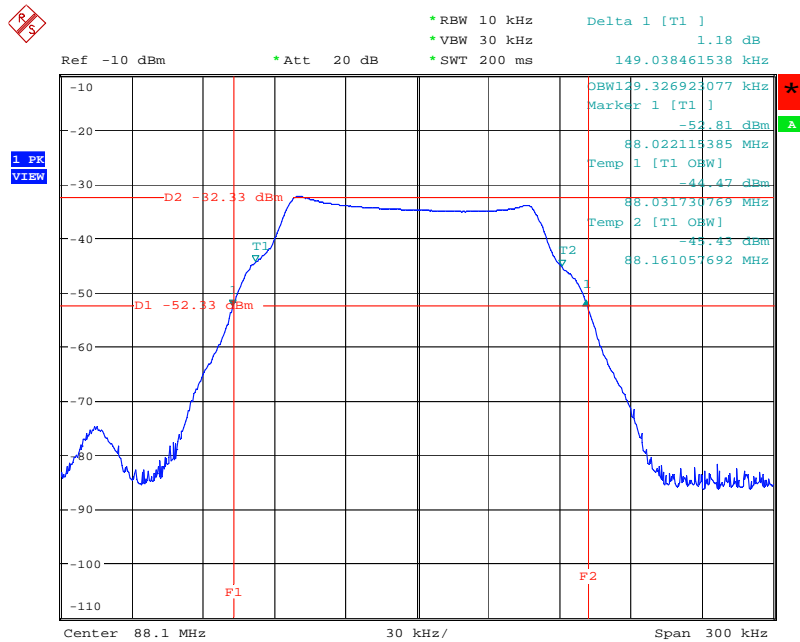
Input source through the Satellite Base Station continuously transmitter maximum audio input to EUT.

4.2.7. Test Result of 20dB Spectrum Bandwidth

Temperature	25.6°C	Humidity	56%
Test Engineer	Sam Lee	Configurations	Channel 1/51/100

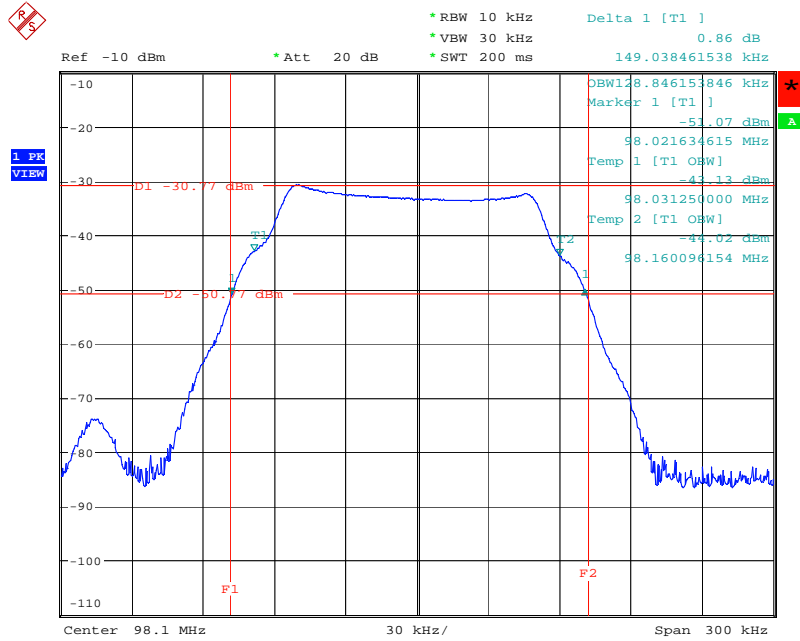
Frequency	20dB BW (kHz)	99% OBW (kHz)	Frequency range (MHz) $f_L > 88\text{MHz}$	Frequency range (MHz) $f_H < 108\text{MHz}$	Test Result
88.1 MHz	149.03	129.32	88.0221	-	Complies
98.1 MHz	149.03	128.84	-	-	Complies
107.9 MHz	146.63	126.44	-	107.8240	Complies

20 dB/99% Bandwidth Plot on 88.1 MHz



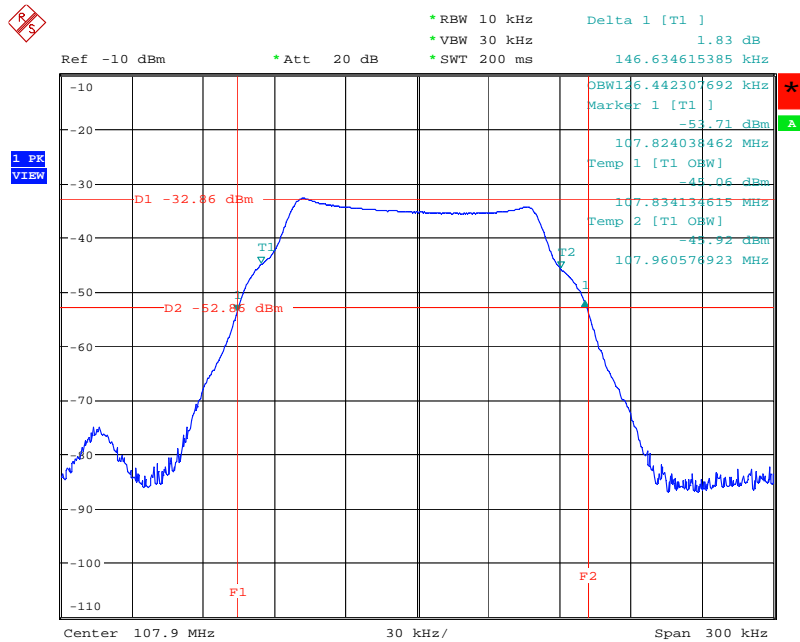
Date: 4.FEB.2008 11:05:17

### 20 dB/99% Bandwidth Plot on 98.1 MHz



Date: 4.FEB.2008 11:07:08

### 20 dB/99% Bandwidth Plot on 107.9 MHz



Date: 4.FEB.2008 11:08:43

### 4.3. Radiated Emissions Measurement

#### 4.3.1. Limit

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

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### 4.3.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

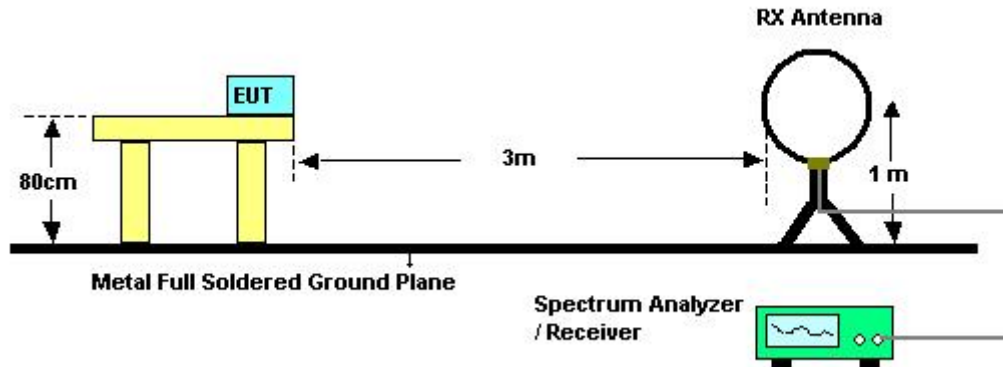
#### 4.3.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. Then audio input adjusted to maximize emission for test. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. 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.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

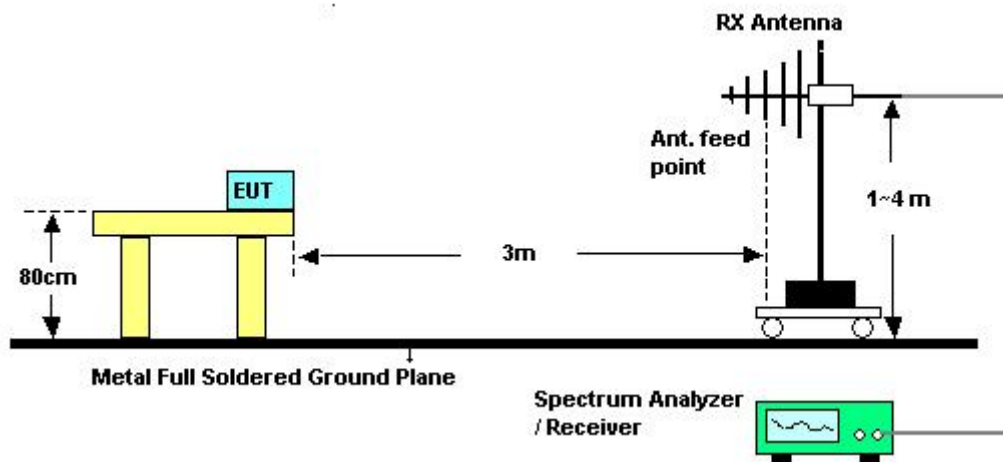


#### 4.3.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



#### 4.3.5. Test Deviation

There is no deviation with the original standard.

#### 4.3.6. EUT Operation during Test

Input source through the Satellite Base Station continuously transmitter maximum audio input to EUT.

#### 4.3.7. Results of Radiated Emissions (9kHz~30MHz)

<b>Temperature</b>	25.6°C	<b>Humidity</b>	56%
<b>Test Engineer</b>	Barry Chen	<b>Configurations</b>	Normal Link / Mode 7

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

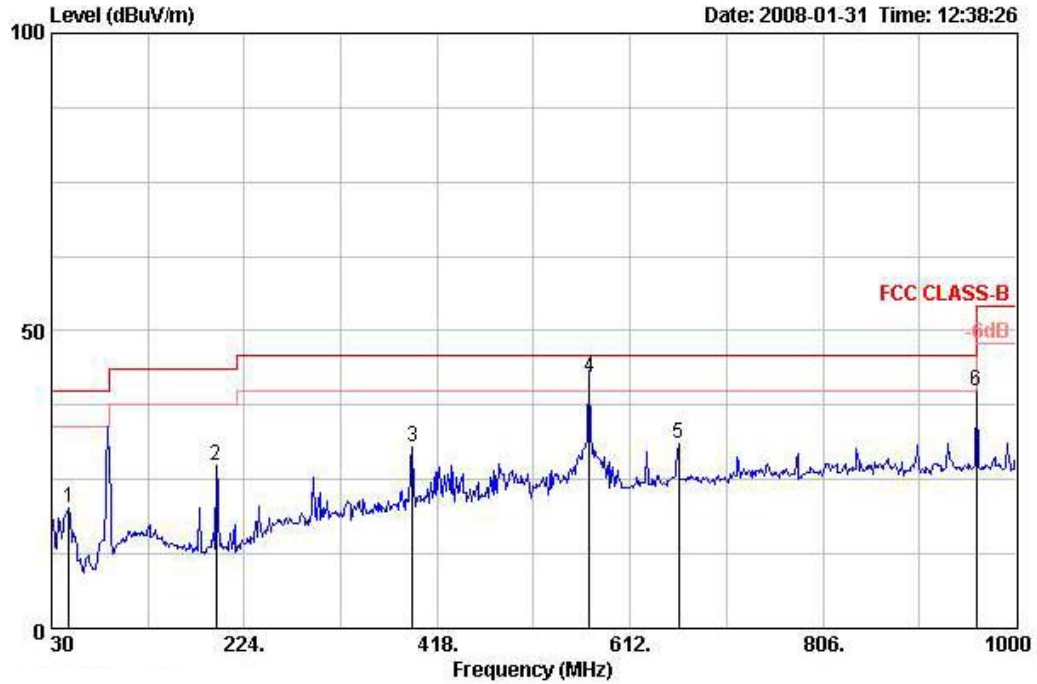
Distance extrapolation factor =  $40 \log(\text{specific distance} / \text{test distance})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.3.8. Results for Radiated Emissions (30MHz~10<sup>th</sup> Harmonic)

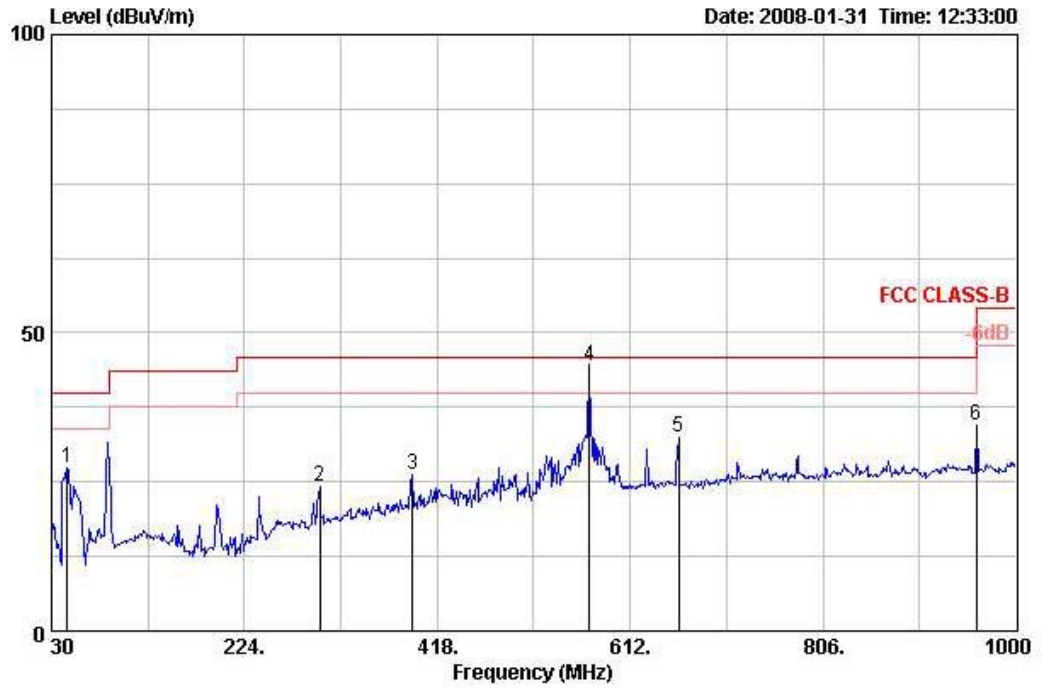
Temperature	25.6°C	Humidity	56%
Test Engineer	Barry Chen	Configurations	Normal link / Mode 7

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
1	47.460	20.14	-19.86	40.00	38.26	8.98	27.80	0.70	Peak	0	100	HORIZONTAL
2	195.870	27.49	-16.01	43.50	44.03	8.90	27.12	1.68	Peak	0	100	HORIZONTAL
3	392.780	30.41	-15.59	46.00	40.16	15.52	27.55	2.29	Peak	0	100	HORIZONTAL
4 !	571.260	42.22	-3.78	46.00	48.82	18.66	28.10	2.84	QP	47	100	HORIZONTAL
5	660.500	31.05	-14.95	46.00	36.71	18.92	28.04	3.46	Peak	0	100	HORIZONTAL
6	960.230	40.02	-13.98	54.00	42.89	20.66	27.16	3.62	Peak	0	100	HORIZONTAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		deg	cm	
1	45.520	27.27	-12.73	40.00	44.82	9.55	27.80	0.70	Peak	0	400	VERTICAL
2	299.660	24.32	-21.68	46.00	36.22	12.90	26.90	2.10	Peak	0	400	VERTICAL
3	392.780	26.27	-19.73	46.00	36.01	15.52	27.55	2.29	Peak	0	400	VERTICAL
4	571.260	44.57	-1.43	46.00	51.17	18.66	28.10	2.84	QP	143	100	VERTICAL
5	660.500	32.46	-13.54	46.00	38.12	18.92	28.04	3.46	Peak	0	400	VERTICAL
6	960.230	34.46	-19.54	54.00	37.34	20.66	27.16	3.62	Peak	0	400	VERTICAL

#### 4.4. Band Edge Emissions and Tuning Range of FM transmitter Measurement

##### 4.4.1. Limit

Band edge emissions outside of the frequency bands shown in below table. Check the tuning range of FM transmitter.

Outside Frequency Band Edge	Limit (dBuV/m) at 3m
Below 88MHz	40.0 (QP)
Above 108MHz	43.5 (QP)

##### 4.4.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameter	Setting
Center Frequency	Fundamental Frequency
RB	120 KHz
Detector	QP or Peak

##### 4.4.3. Test Procedures

1. The test procedure is the same as section 4.1.3; only the frequency range investigated is limited to 2MHz around band Edges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

##### 4.4.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.1.4

##### 4.4.5. Test Deviation

There is no deviation with the original standard.

##### 4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Band Edge and Fundamental Emissions

<b>Temperature</b>	25.6°C	<b>Humidity</b>	56%
<b>Test Engineer</b>	Barry Chen	<b>Configurations</b>	Channel 1, 100

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
1	88.000	31.77	-8.23	40.00	50.32	8.00	27.65	1.10	QP	230	103	VERTICAL

Item 1 is Band Edge.

Channel 100

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Table Pos	Ant Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		deg	cm	
3	108.000	23.41	-20.09	43.50	38.65	11.12	27.56	1.20	QP	188	358	VERTICAL

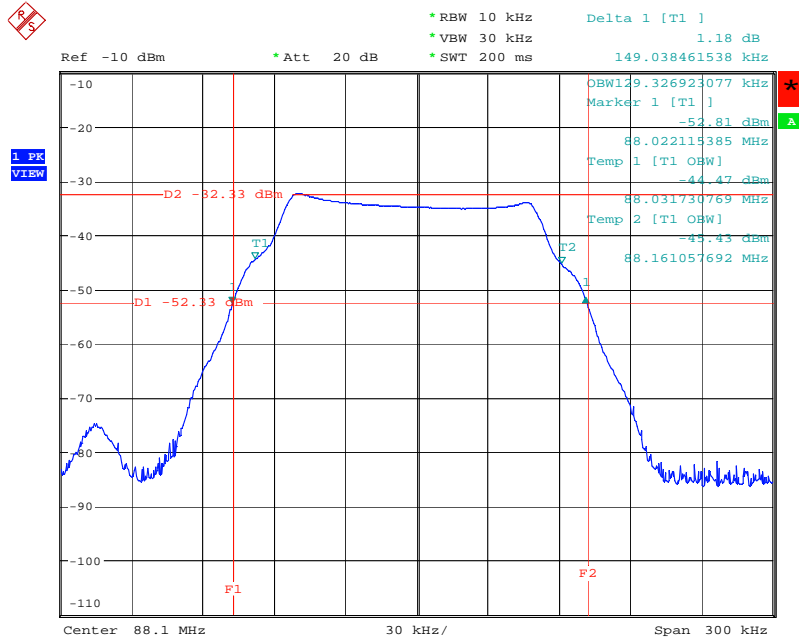
Item 3 is Band Edge.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

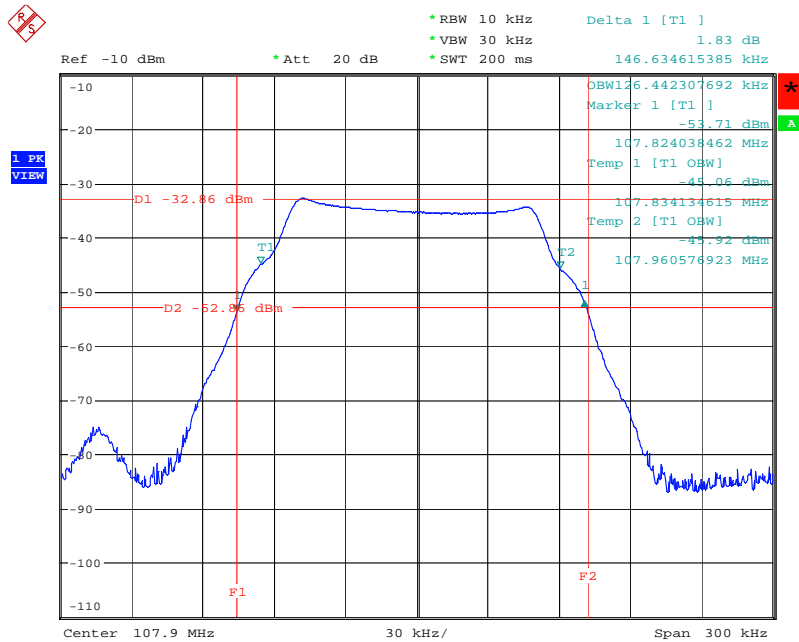
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

### Low Band Edge Plot on 88.1 MHz



Date: 4.FEB.2008 11:05:17

### High Band Edge Plot on 107.9 MHz



Date: 4.FEB.2008 11:08:43

## 4.5. Antenna Requirements

### 4.5.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### 4.5.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.



## 5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2007	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan 14 2008	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jun. 07, 2007	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100305	9 kHz - 40 GHz	Sep. 27, 2007	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz - 1 GHz	Jul. 21, 2007	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 04, 2007	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan.18, 2008	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 03, 2007	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 - 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Jan. 10, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2007	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Jan. 14, 2008	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Jan. 04, 2008	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Jan. 04, 2008	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2007	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2007	Conducted (TH01-HY)


Note: Calibration Interval of instruments listed above is one year.

Note: \*Calibration Interval of instruments listed above is two year.

## 6. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 <sup>nd</sup> Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

## 7. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-070110

財團法人全國認證基金會  
Taiwan Accreditation Foundation


### Certificate of Accreditation

This is to certify that

**Sporton International Inc.**  
**EMC & Wireless Communications Laboratory**  
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,  
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2007 to January 09, 2010
Accredited Scope	: Testing Field, see described in the Appendix Accreditation Program for Designated Testing Laboratory for Commodities Inspection
Specific Accreditation Program	: Accreditation Program for Telecommunication Equipment Testing Laboratory



Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : January 10, 2007

P1, total 9 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.