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FCC RADIO TEST REPORT

Applicant's company	**XAC Automation Corp.**
Applicant Address	4F., No. 30 Industry E. Road IX, Science-Based Industrial Park, Hsin-Chu, 300, Taiwan, R.O.C.
FCC ID	**MQT-C200**
Manufacturer's company	**XAC AUTOMATION（SUZHOU）CO.,LTD.**
Manufacturer Address	Standard Factory Building#2, Fuyang Industrial Zone, Fuyuan Road, Xiangcheng District, Suzhou City, Jiangsu Province, P.R. China.

Product Name	Contactless Reader
Brand Name	XAC
Model Name	C200
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.225
Test Freq. Range	13.553 ~ 13.567MHz
Received Date	Dec. 01, 2008
Final Test Date	Dec. 09, 2008
Submission Type	Original Equipment

Statement

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.

Testing Laboratory
1190

ILAC MRA

Table of Contents

History of This Test Report

Original Issue Date: Dec. 10, 2008

Report No.: FR8D0317

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No.: CB9712048

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Contactless Reader
Brand Name	:	XAC
Model Name	:	C200
Applicant	:	XAC Automation Corp.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.225

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 01, 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**
4.1	15.207	AC Power Line Conducted Emissions	Complies	10.78 dB
4.2	15.225(a)	Field Strength of Fundamental Emissions and Mask	Complies	65.86 dB
4.3	15.215(c)	20dB Spectrum Bandwidth	Complies	-
4.4	15.225(d)	Radiated Emissions	Complies	3.04 dB
4.5	15.225(d)	Band Edge Emissions	Complies	40.20 dB
4.6	15.225(e)	Frequency Stability	Complies	-
4.7	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	±0.8dB	Confidence levels of 95%
20dB Spectrum Bandwidth / Frequency Stability	$\pm 8.5 \times 10^{-8}$	Confidence levels of 95%
Radiated / Band Edge Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	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
Power Type	Power Adapter & USB interface
Modulation	ASK
Channel Number	1
Carrier Frequencies	13.56 MHz (CH 1)
Antenna	Internal Antenna (Without any antenna connector)

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	LEADER	MU12-2050200-A1	Input: 100-240VAC, 50/60Hz, 0.5A Output: 5VDC, 2A

3.3. Table for Test Modes

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
AC Power Line Conducted Emissions	Normal Link	1	1
Field Strength of Fundamental Emissions	CTX	1	1
20dB Spectrum Bandwidth	CTX	1	NA
Radiated Emissions 9kHz~30MHz Radiated Emissions 9kHz~10th Harmonic	CTX	1	1
Band Edge Emissions	CTX	1	1
Frequency Stability	Un-modulation	1	NA

Note: CTX=continuously transmitting

Test Mode:

Mode 1: USB Mode

Mode 2: RJ12 Mode

Mode 3: RS232 Mode

< Conduction > :

Cause "mode 1"generated the worst test result, it was reported as final data.

< Radiation > :

For Radiated Emissions test (30-1000MHz). The EUT was pre-tested above test mode. The worse Radiated Emission level was found in Mode 3. The final test was executed under test mode with higher emission and recorded in this report individually.

3.4. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
10CH01-HY	SAC	Hwa Ya	-	-	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4088	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

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

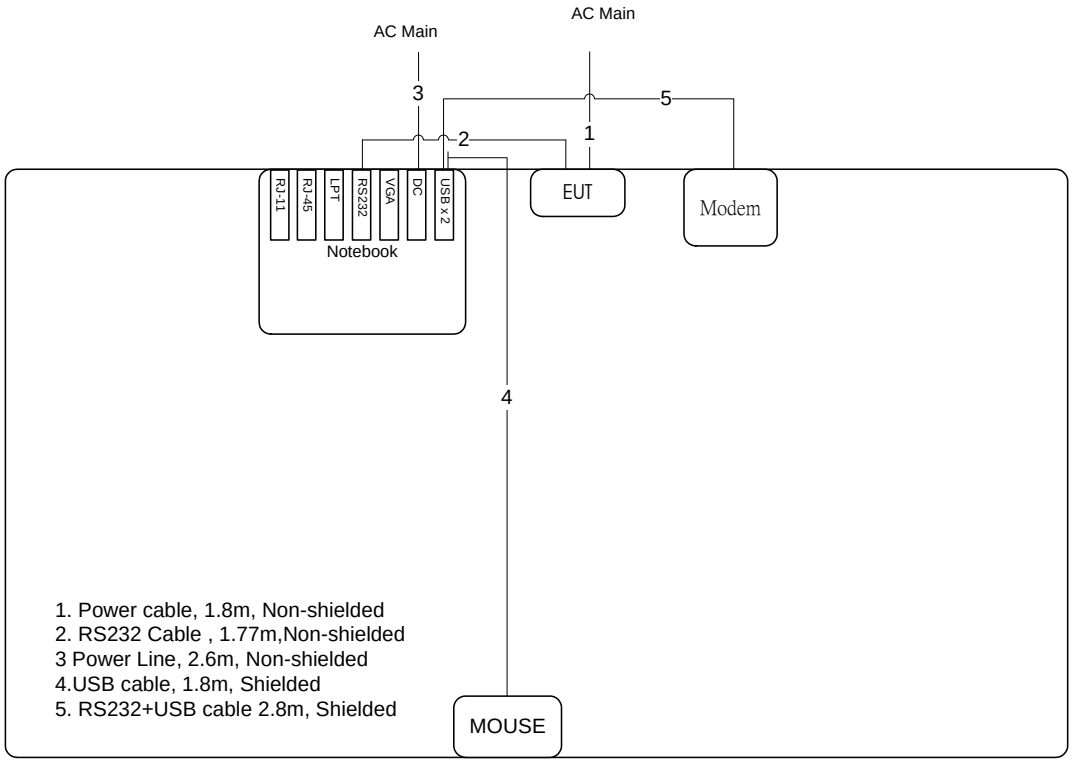
Please refer section 6 for Test Site Address.

3.5. Table for Supporting Units

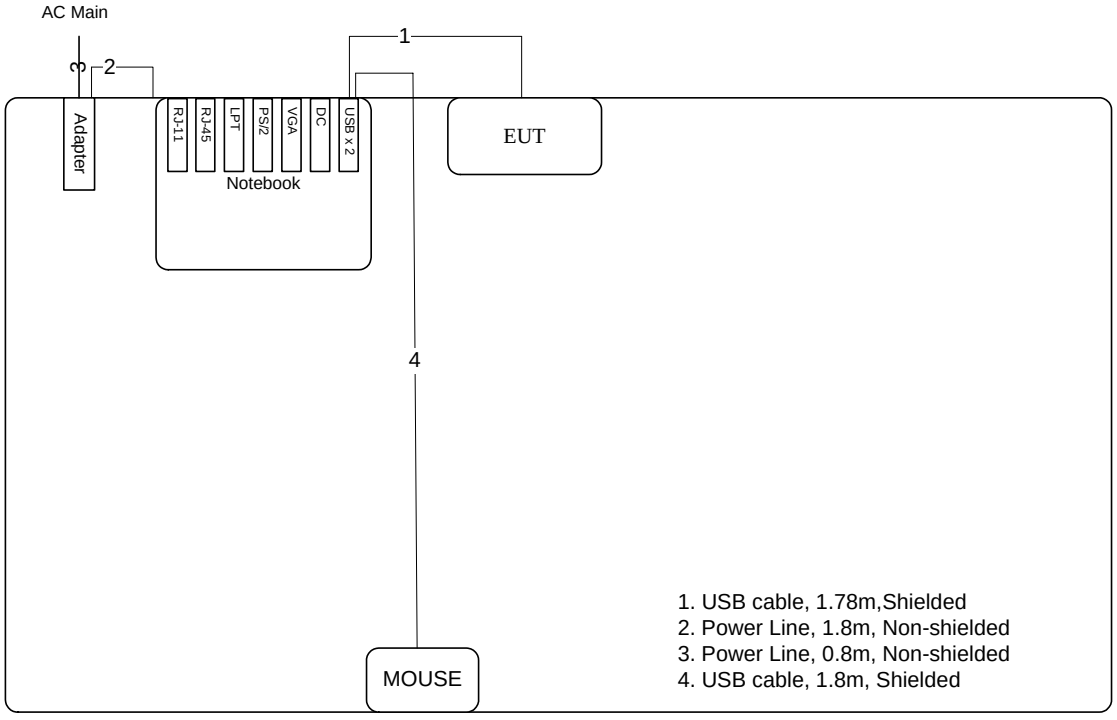
Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	E2K24GBRL
Modem	ACEEX	DM1414	IFAXDM1414
Mouse	HP	M-UAE96	DoC

3.6. Test Configurations

3.6.1. Radiation Emissions Test Configuration



3.6.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the 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 below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

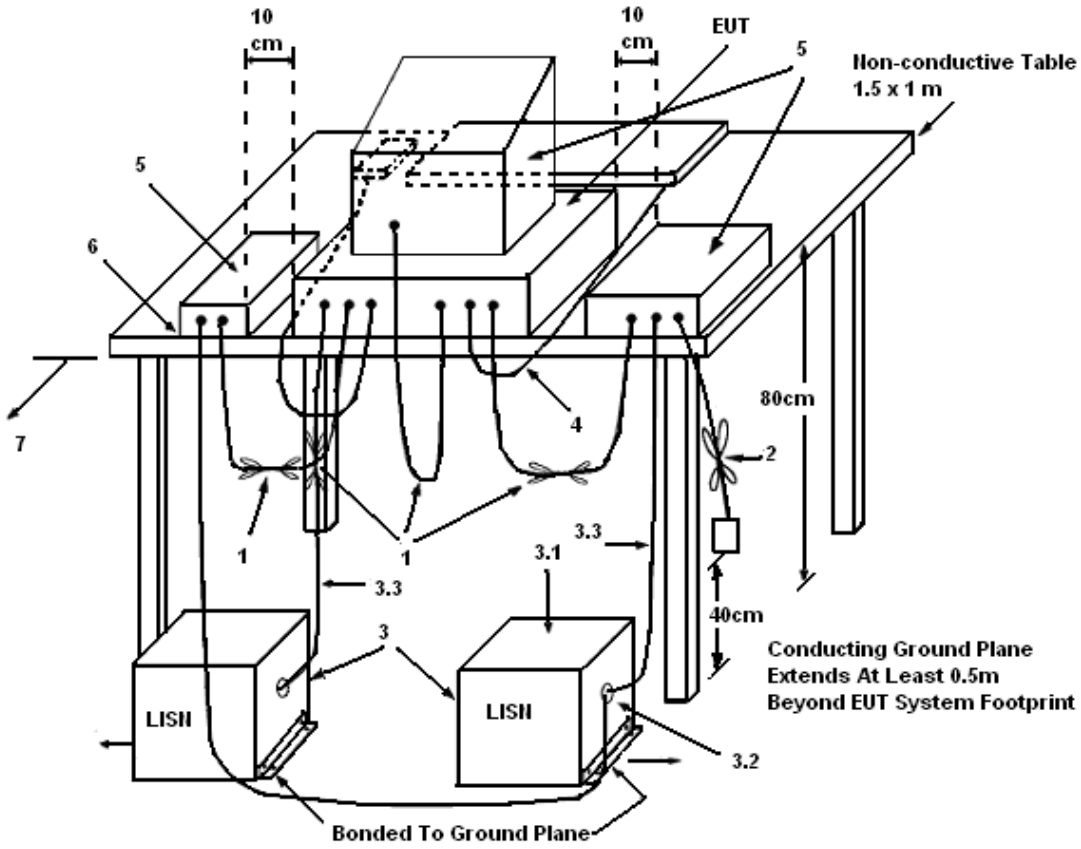
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

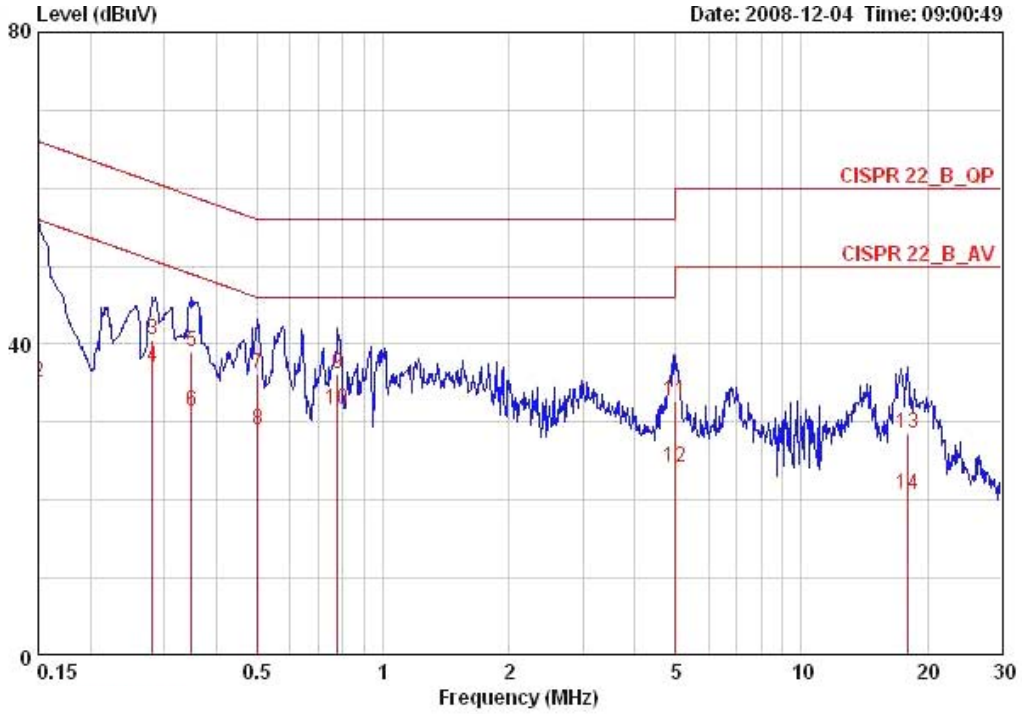
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

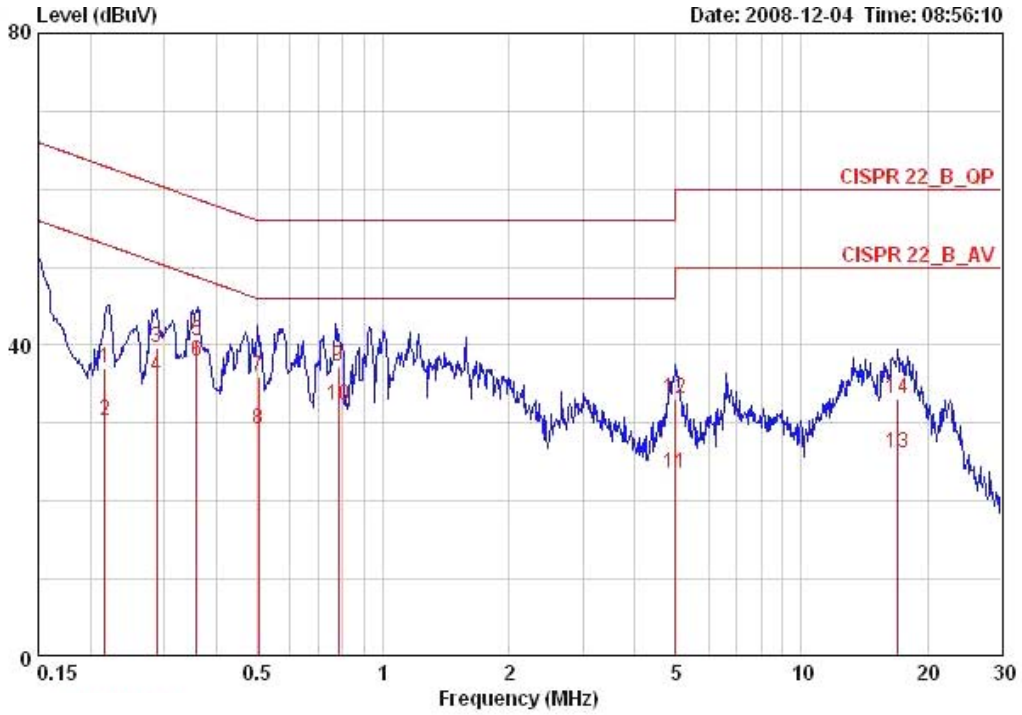
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23℃	Humidity	54%
Test Engineer	Peter Wu	Phase	Line
Configuration	Normal Link / Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15000	50.29	-15.71	66.00	50.01	0.08	0.20	QP
2	0.15000	35.15	-20.85	56.00	34.87	0.08	0.20	AVERAGE
3	0.28178	40.53	-20.23	60.76	40.29	0.04	0.20	QP
4	0.28178	36.98	-13.78	50.76	36.74	0.04	0.20	AVERAGE
5	0.34830	39.03	-19.97	59.00	38.80	0.03	0.20	QP
6	0.34830	31.43	-17.57	49.00	31.20	0.03	0.20	AVERAGE
7	0.50203	36.26	-19.74	56.00	36.03	0.03	0.20	QP
8	0.50203	29.10	-16.90	46.00	28.87	0.03	0.20	AVERAGE
9	0.77931	36.16	-19.84	56.00	35.93	0.03	0.20	QP
10	0.77931	31.66	-14.34	46.00	31.43	0.03	0.20	AVERAGE
11	5.005	32.71	-27.29	60.00	32.25	0.16	0.30	QP
12	5.005	24.12	-25.88	50.00	23.66	0.16	0.30	AVERAGE
13	17.944	28.55	-31.45	60.00	27.33	0.72	0.50	QP
14	17.944	20.68	-29.32	50.00	19.46	0.72	0.50	AVERAGE

Temperature	23℃	Humidity	54%
Test Engineer	Peter Wu	Phase	Neutral
Configuration	Normal Link / Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21687	37.16	-25.78	62.94	36.88	0.08	0.20	QP
2	0.21687	30.40	-22.54	52.94	30.12	0.08	0.20	AVERAGE
3	0.28782	39.58	-21.00	60.59	39.31	0.07	0.20	QP
4	0.28782	35.88	-14.70	50.59	35.61	0.07	0.20	AVERAGE
5	0.35866	40.55	-18.21	58.76	40.28	0.07	0.20	QP
6	0.35866	37.98	-10.78	48.76	37.71	0.07	0.20	AVERAGE
7	0.50483	36.00	-20.00	56.00	35.73	0.07	0.20	QP
8	0.50483	29.31	-16.69	46.00	29.04	0.07	0.20	AVERAGE
9	0.78222	37.23	-18.77	56.00	36.96	0.07	0.20	QP
10	0.78222	32.27	-13.73	46.00	32.00	0.07	0.20	AVERAGE
11	5.005	23.54	-26.46	50.00	23.04	0.20	0.30	AVERAGE
12	5.005	33.04	-26.96	60.00	32.54	0.20	0.30	QP
13	17.018	26.07	-23.93	50.00	24.90	0.67	0.50	AVERAGE
14	17.018	33.12	-26.88	60.00	31.95	0.67	0.50	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Field Strength of Fundamental Emissions and Mask Measurement

4.2.1. Limit

Field strength of fundamental emissions limit:

The field strength of fundamental emissions shall not exceed 15848 micorvolts/meter at 30 meters. The emissions limit in this paragraph is based on measurement instrumentation employing an QP detector.

Frequency Band (MHz)	Fundamental Emissions Limit (dBuV/m) at 10m
13.553 ~ 13.567MHz	103.08 (QP)

Mask limit:

Rules and specifications	CFR 47 Part 15 section 15.225(a)-(d)				
Description	Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1kHz for the band 13.553~13.567MHz				
Limit	Freq. of Emission (MHz)	Field Strength (uV/m) at 30m	Field Strength (dBuV/m) at 30m	Field Strength (dBuV/m) at 10m	Field Strength (dBuV/m) at 3m
	1.705~13.110	30	29.5	48.58	69.5
	13.110~13.410	106	40.5	59.58	80.5
	13.410~13.553	334	50.5	69.58	90.5
	13.553~13.567	15848	84.0	103.08	124.0
	13.567~13.710	334	50.5	69.58	90.5
	13.710~14.010	106	40.5	59.58	80.5
	14.010~30.000	30	29.5	48.58	69.5

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 receiver.

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	9 kHz
Detector	QP

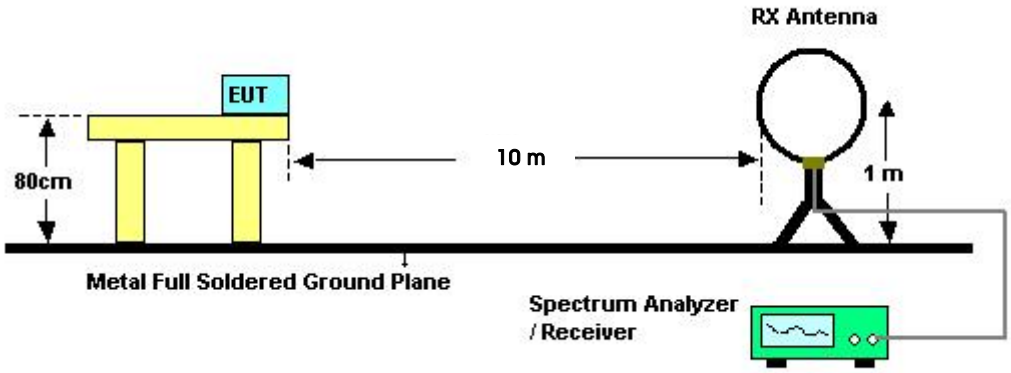
4.2.3. Test Procedures

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 loop receiving antenna mounted antenna tower was placed 10 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 receiving antenna was fixed at one meter above ground to find the maximum

emissions field strength.

4. For Fundamental emissions, use the receiver to measure QP reading.
5. 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.
6. Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1kHz for the band 13.553~13.567MHz.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

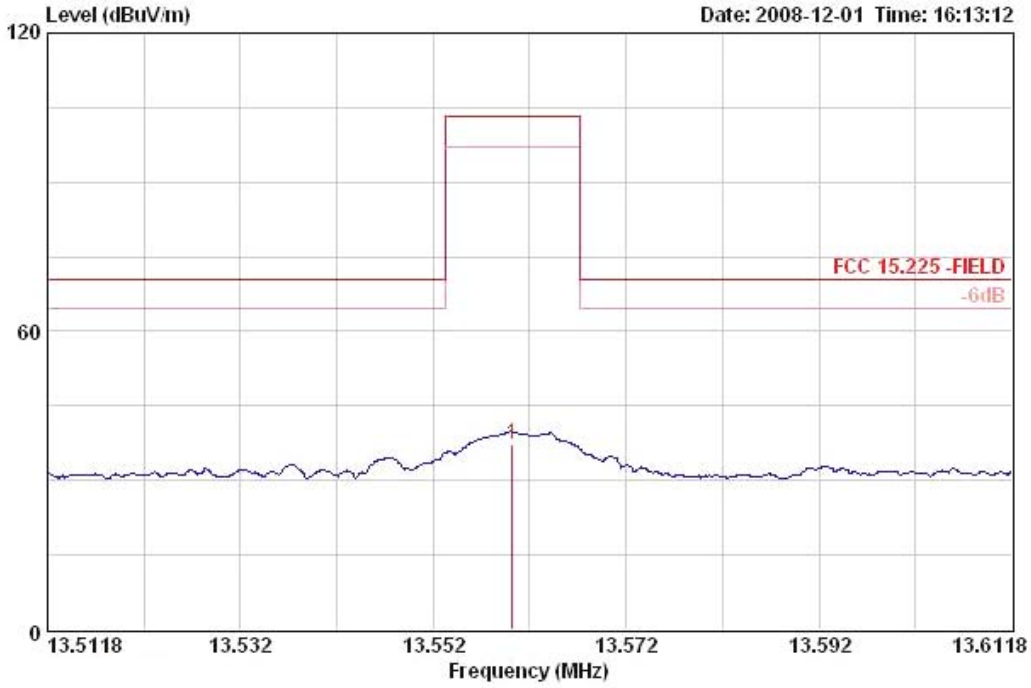
4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Field Strength of Fundamental Emissions

Temperature	22℃	Humidity	65%
Test Engineer	Sam Chen	Configurations	Channel 1

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m) at 10m	Remark
13.56 MHz	37.22	-65.86	103.08	QP



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m	
1	13.560	37.22	-65.86	103.08	43.74	28.20	1.38	20.30	QP

Note:

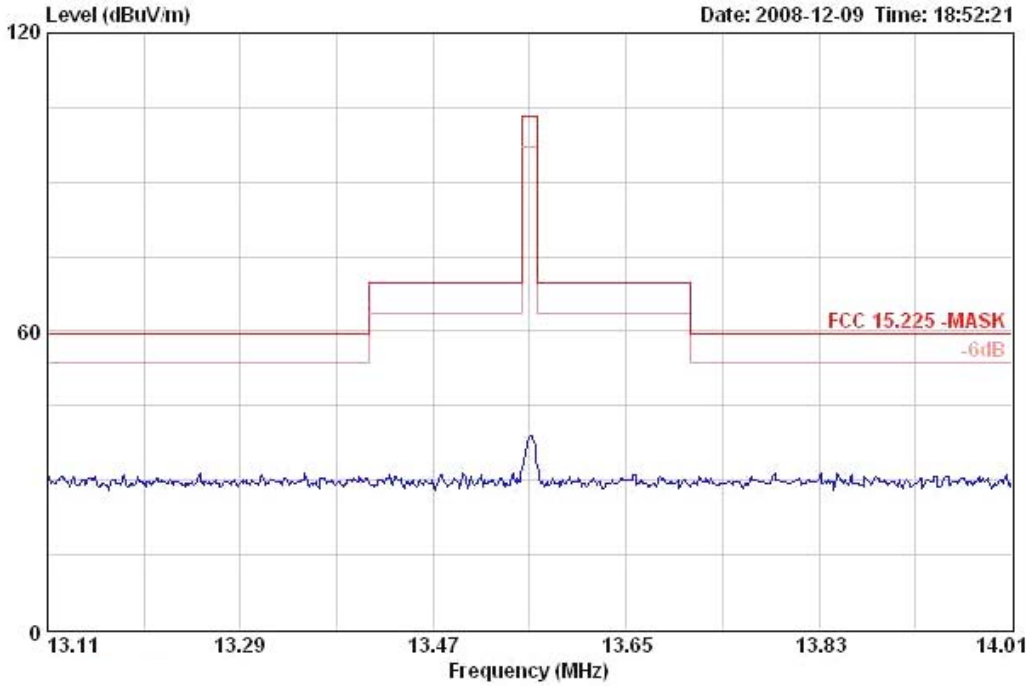
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

4.2.8. Test Result of Mask

Temperature	22℃	Humidity	65%
Test Engineer	Sam Chen	Configurations	Channel 1



Note:

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

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

4.3. 20dB Spectrum Bandwidth Measurement

4.3.1. Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 ~ 13.567MHz).

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.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RB	1 kHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

4.3.4. Test Setup Layout

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

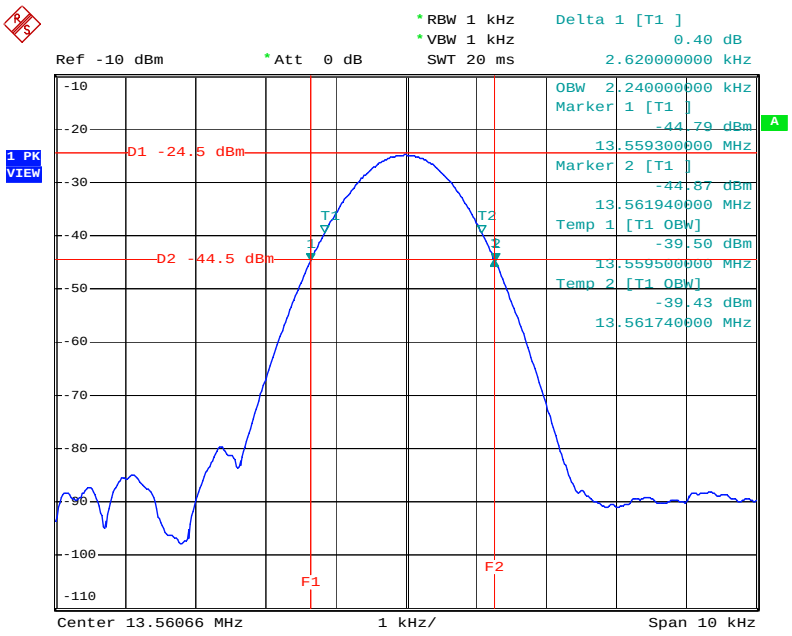
The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 20dB Spectrum Bandwidth

Temperature	22℃	Humidity	65%
Test Engineer	Sam Chen	Configurations	Channel 1

Frequency	20dB BW (kHz)	99% OBW (kHz)	Frequency range (MHz) f_L>13.553MHz	Frequency range (MHz) f_H<13.567MHz	Test Result
13.56 MHz	2.62	2.24	13.560778	13.560778	Complies

20 dB/99% Bandwidth Plot on 13.56 MHz



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4.4. Radiated Emissions Measurement

4.4.1. Limit

The field strength of any emissions which appear outside of 13.553 ~ 13.567MHz 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

4.4.2. Measuring Instruments and Setting

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

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

4.4.3. Test Procedures

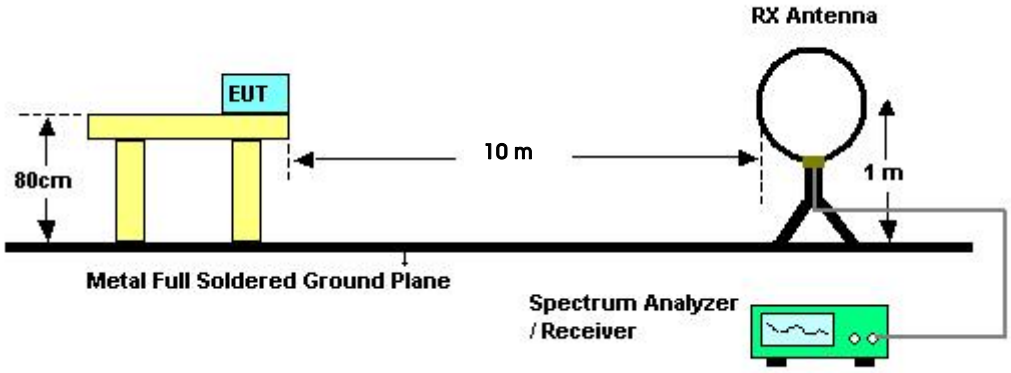
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
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.

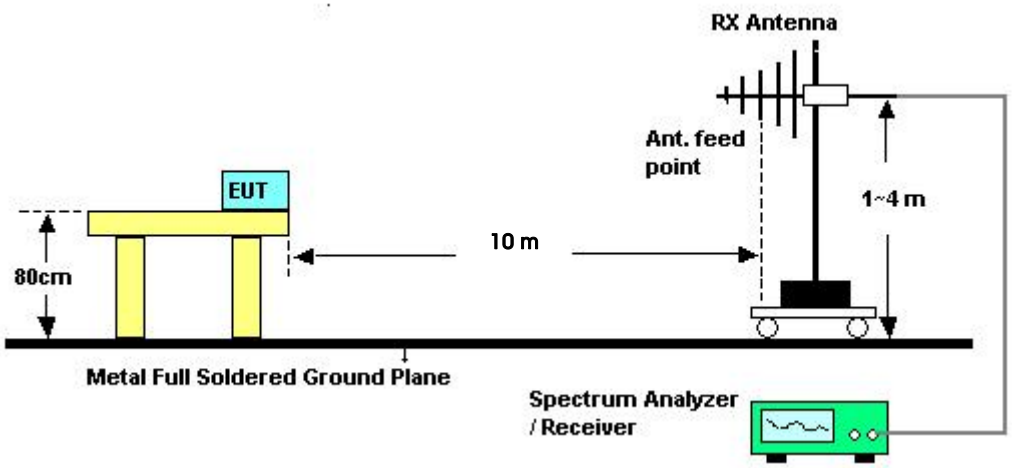
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.4.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



4.4.5. Test Deviation

There is no deviation with the original standard.

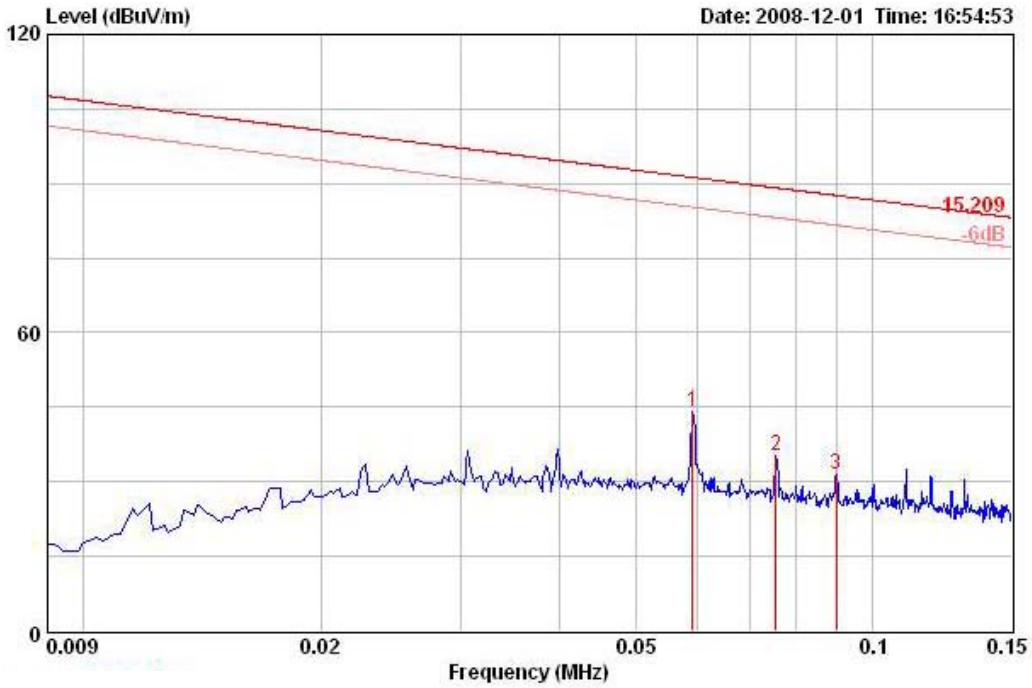
4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	23℃	Humidity	54%
Test Engineer	Peter Wu	Configurations	Channel 1

9kHz~150kHz



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m	
1	0.05906	44.24	-47.02	91.26	50.84	27.90	1.00	20.30	Peak
2	0.07541	35.24	-53.90	89.14	41.84	27.90	1.00	20.30	Peak
3	0.08993	31.39	-56.22	87.61	38.09	27.90	1.00	20.20	Peak

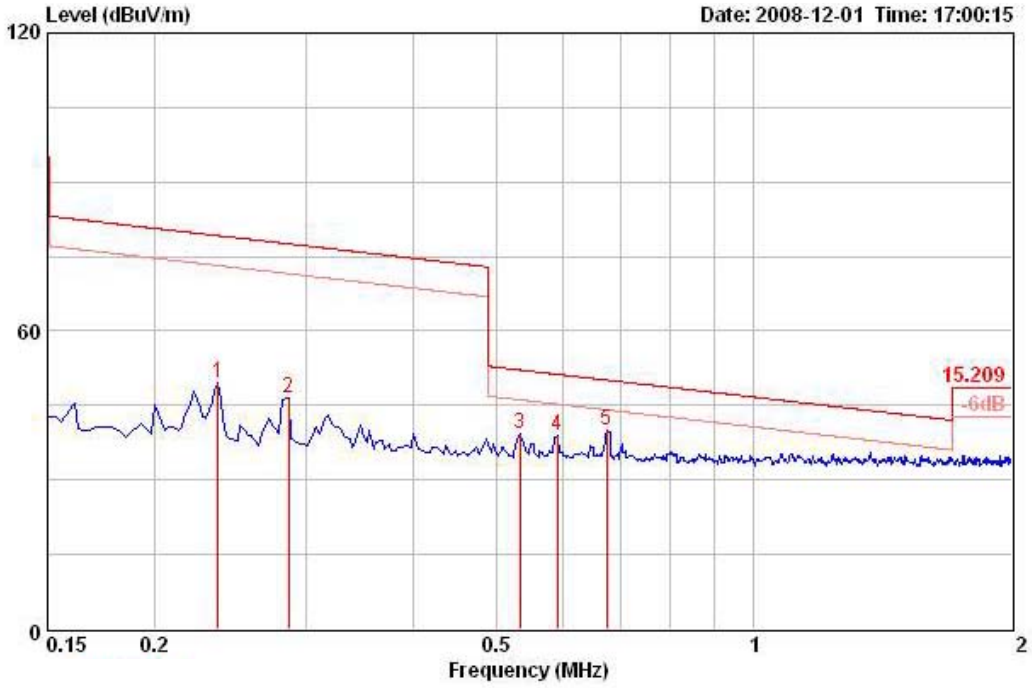
Note:

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 (specific distance / test distance) (dB);

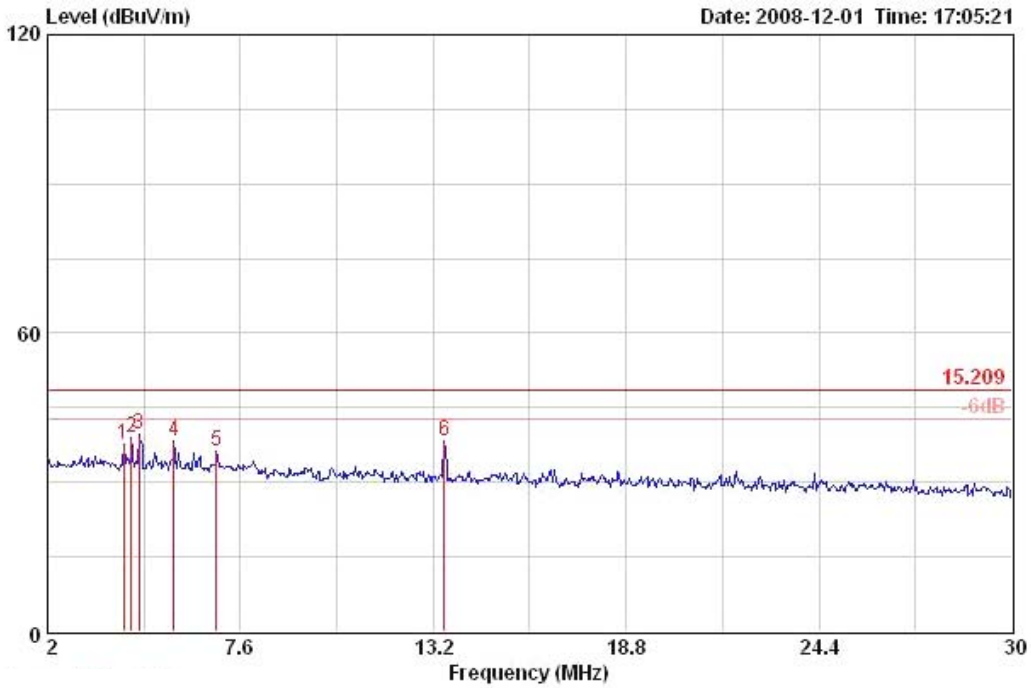
Limit line = specific limits (dBuV) + distance extrapolation factor.

150kHz~2MHz



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m	
1	0.23695	49.72	-29.48	79.20	56.22	27.90	1.00	20.40	Peak
2	0.28690	46.45	-31.09	77.54	52.95	27.90	1.00	20.40	Peak
3	0.53295	39.17	-12.99	52.16	45.76	27.93	1.03	20.30	Peak
4	0.59030	38.82	-12.45	51.27	45.42	27.93	1.03	20.30	Peak
5	0.67355	40.08	-10.04	50.12	46.68	27.93	1.03	20.30	Peak

2MHz ~30MHz

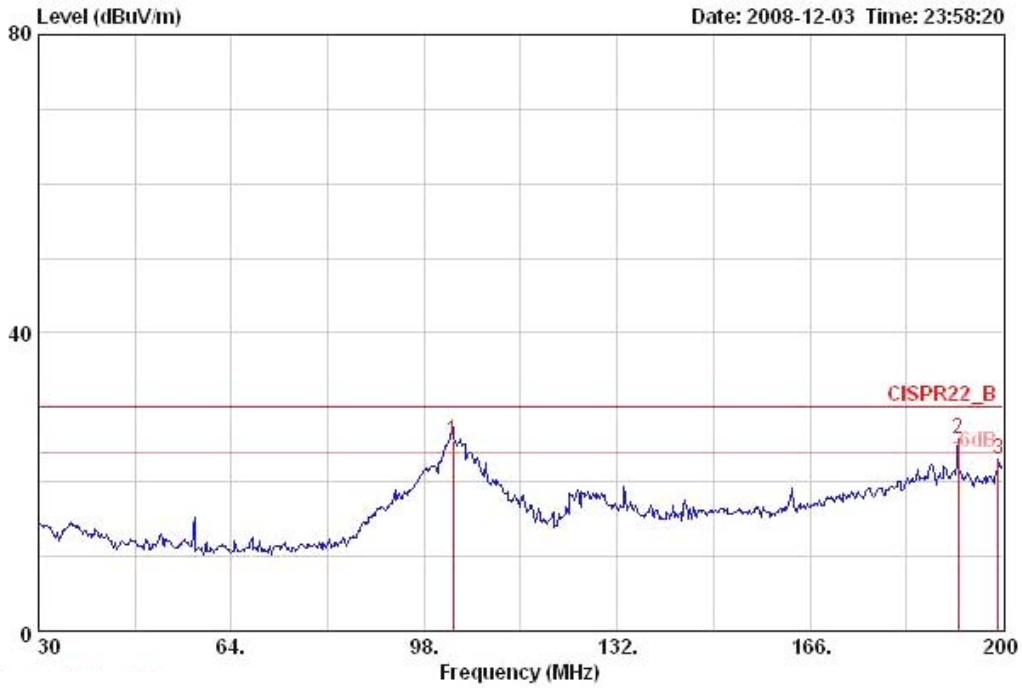


	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m	
1	4.212	37.60	-11.03	48.63	44.29	28.00	1.11	20.20	Peak
2	4.436	38.84	-9.79	48.63	45.53	28.00	1.11	20.20	Peak
3	4.660	39.69	-8.94	48.63	46.38	28.03	1.14	20.20	Peak
4	5.668	38.17	-10.46	48.63	44.86	28.05	1.17	20.20	Peak
5	6.900	36.29	-12.34	48.63	42.97	28.08	1.19	20.20	Peak
6	13.508	38.15	-10.48	48.63	44.68	28.18	1.36	20.30	Peak

4.4.8. Results for Radiated Emissions (30MHz~1GHz)

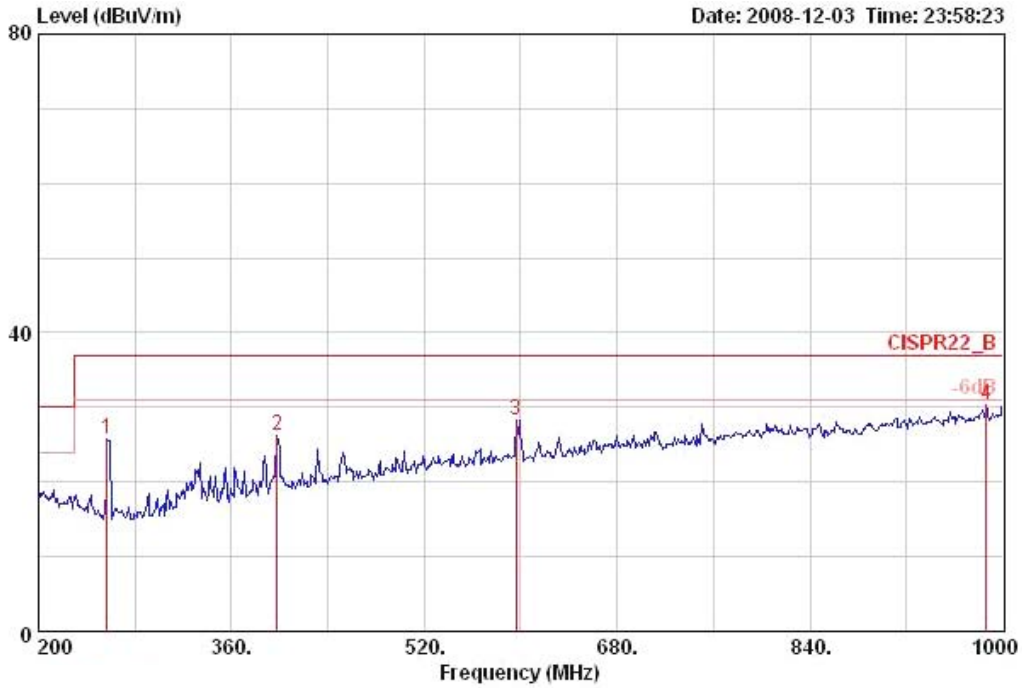
Temperature	23℃	Humidity	54%
Test Engineer	Peter Wu	Configurations	Channel 1

Horizontal



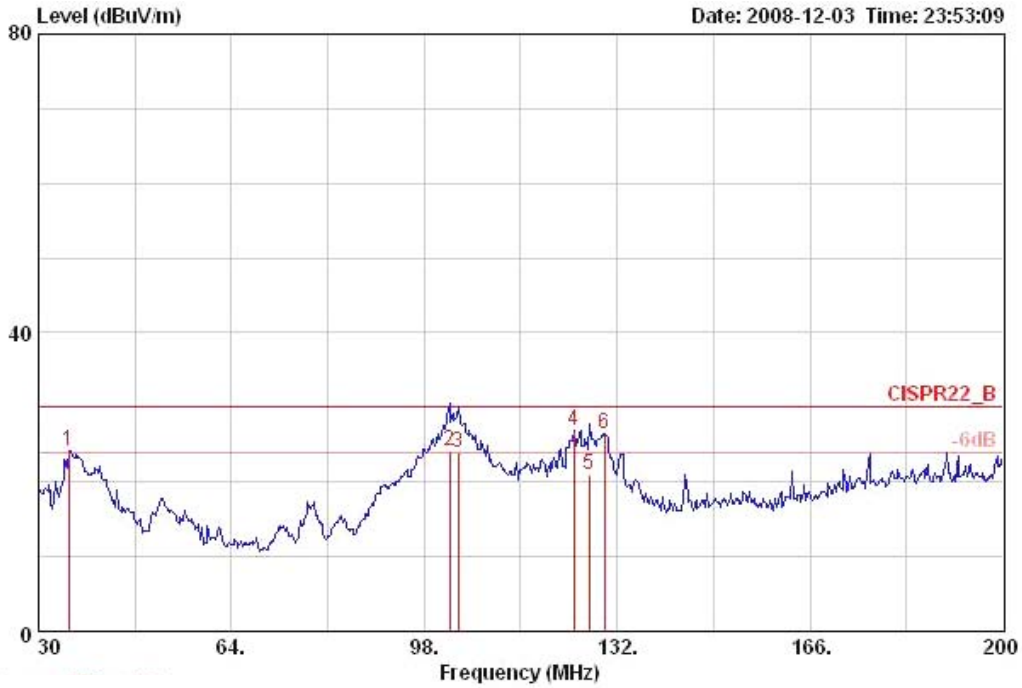
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg	
1 @	103.100	25.51	-4.49	30.00	39.80	27.95	3.74	9.92	QP	400	200	HORIZONTAL
2 @	192.180	25.81	-4.19	30.00	33.82	27.29	5.25	14.02	Peak	---	---	HORIZONTAL
3	199.150	22.92	-7.08	30.00	30.42	27.42	5.43	14.50	Peak	---	---	HORIZONTAL

Horizontal



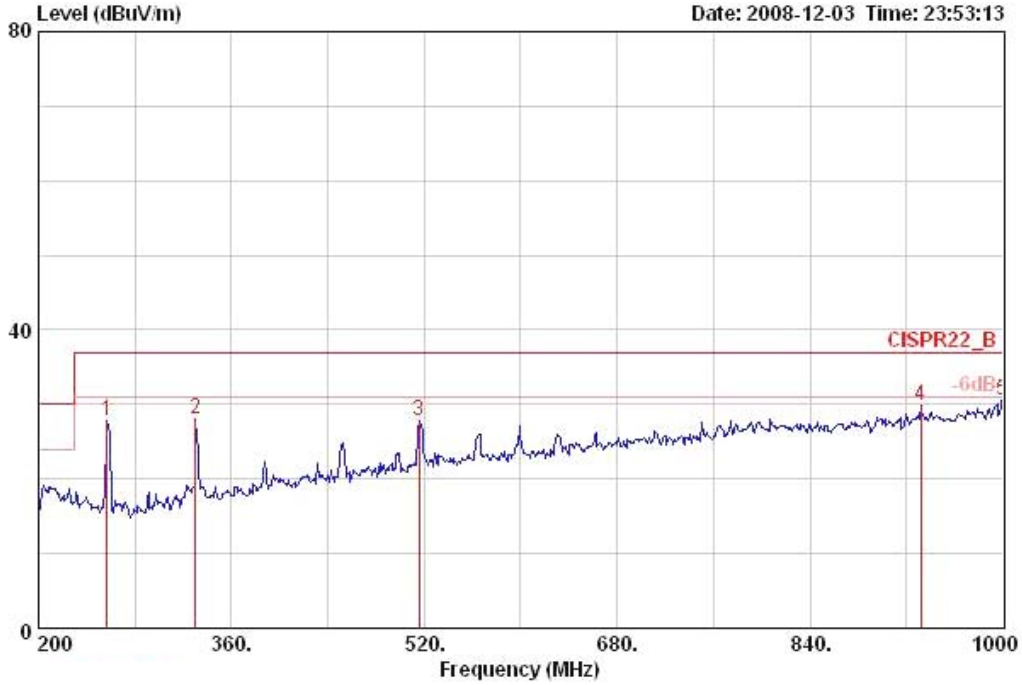
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg	
1	256.800	25.67	-11.33	37.00	37.12	27.19	2.98	12.76	Peak	---	---	HORIZONTAL
2	397.600	26.17	-10.83	37.00	34.66	28.10	3.81	15.80	Peak	---	---	HORIZONTAL
3	596.000	28.31	-8.69	37.00	32.58	28.39	4.67	19.44	Peak	---	---	HORIZONTAL
4	986.400	30.23	-6.77	37.00	28.13	26.60	6.11	22.59	Peak	---	---	HORIZONTAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg	
1 !	35.270	24.09	-5.91	30.00	38.75	28.50	2.00	11.84	Peak	---	---	VERTICAL
2 !	102.420	24.18	-5.82	30.00	38.50	27.95	3.74	9.89	QP	100	222	VERTICAL
3	103.950	23.87	-6.13	30.00	38.10	27.94	3.76	9.95	QP	100	220	VERTICAL
4 @	124.350	26.96	-3.04	30.00	39.65	27.84	4.19	10.97	Peak	100	230	VERTICAL
5	127.070	21.04	-8.96	30.00	33.50	27.79	4.27	11.06	QP	100	230	VERTICAL
6 @	129.790	26.47	-3.53	30.00	38.73	27.74	4.35	11.12	Peak	---	---	VERTICAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg	
1	256.800	27.78	-9.22	37.00	39.23	27.19	2.98	12.76	Peak	---	---	VERTICAL
2	330.400	28.01	-8.99	37.00	38.10	27.43	3.38	13.97	Peak	---	---	VERTICAL
3	516.000	27.79	-9.21	37.00	33.83	28.43	4.29	18.09	Peak	---	---	VERTICAL
4	932.000	29.86	-7.14	37.00	28.49	26.70	6.09	21.99	Peak	---	---	VERTICAL
5	1000.000	30.60	-6.40	37.00	28.35	26.58	6.09	22.74	Peak	---	---	VERTICAL

Note:

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

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

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

4.5. Band Edge Emissions Measurement

4.5.1. Limit

Band edge emissions outside of the frequency bands shown in below table.

Outside Frequency Band Edge	Limit (dBuV/m) at 10m
Low band edge	69.58 (QP)
High band edge	69.58 (QP)

4.5.2. 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	9 KHz
Detector	QP

4.5.3. Test Procedures

The test procedure is the same as section 4.2.3, only the freqeuncy range investigated is limited to 2MHz around bandedges.

4.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.2.4.

4.5.5. Test Deviation

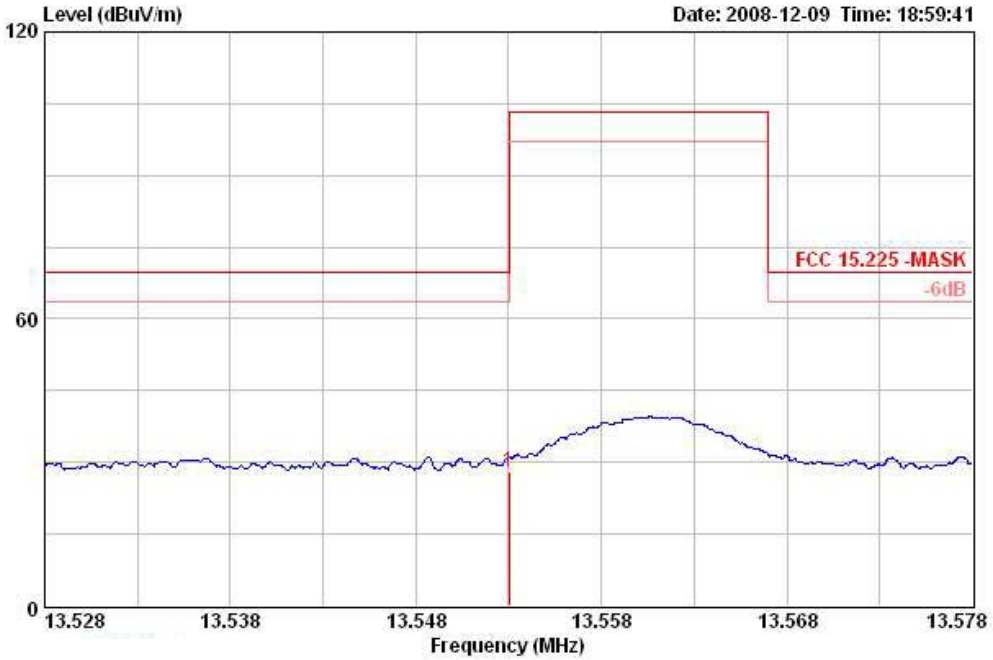
There is no deviation with the original standard.

4.5.6. EUT Operation during Test

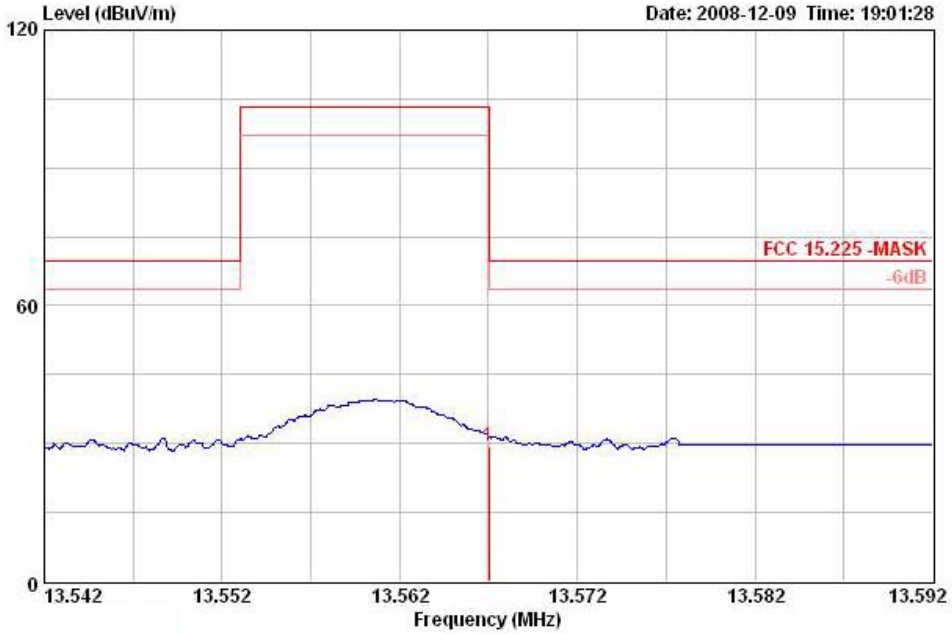
The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Temperature	22℃	Humidity	56%
Test Engineer	Sam Chen	Configurations	Channel 1



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m	
1 @	13.553	28.05	-41.53	69.58	34.56	28.20	1.39	20.30	QP



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m	
1 @	13.567	29.38	-40.20	69.58	35.89	28.20	1.39	20.30	QP

Note:

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

4.6. Frequency Stability Measurement

4.6.1. Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.6.2. Measuring Instruments and Setting

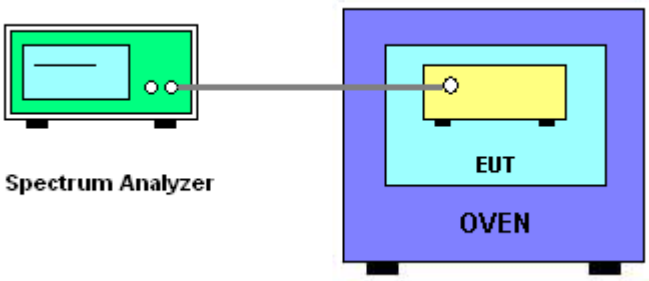
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	1 kHz
VB	1 kHz
Sweep Time	Auto

4.6.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 1 kHz, VBW = 1 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc $\times$ 10^6 ppm and the limit is less than ±100ppm.
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -20°C~50°C.

4.6.4. Test Setup Layout



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

4.6.7. Test Result of Frequency Stability

Temperature	22℃	Humidity	56%
Test Engineer	Sam Chen	Configurations	Channel 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	13.56 MHz
126.50	13.560600
110.00	13.560500
93.50	13.560700
Max. Deviation (MHz)	**0.000700**
Max. Deviation (ppm)	**51.62**

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(℃)	13.56 MHz
-20	13.560778
-10	13.560723
0	13.560771
10	13.560821
20	13.560821
30	13.560721
40	13.560721
50	13.560618
Max. Deviation (MHz)	**0.000821**
Max. Deviation (ppm)	**60.55**

4.7. Antenna Requirements

4.7.1. 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.

4.7.2. Antenna Connector Construction

Please refer to section 3.1 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
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Mar. 03, 2008	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2008	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2008	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2008	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN ST08	21653	9kHz –30MHz	Mar. 27, 2008	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 28, 2008*	Radiation (03CH03-HY)
10m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-10M	10CH01-HY	30MHz~1GHz 10m, 3m	Apr. 14, 2008	Radiation (10CH01-HY)
Spectrum Analyzer	R&S	FSP7	838858/013	9kHz – 7GHz	Feb. 13, 2008	Radiation (10CH01- HY)
Receiver	R&S	ESI7	838496/009	9kHz-7GHz	Jan. 29, 2008	Radiation (10CH01-HY)
Amplifier	Agilent	8447D	2944A10825	100kHz – 1.3GHz	May 24, 2008	Radiation (10CH01-HY)
Amplifier	Agilent	8447D	2944A10826	100kHz – 1.3GHz	May 29, 2008	Radiation (10CH01-HY)
Biconical Antenna	Schwarz beck	VHBB 9124	286	30MHz –200MHz	Aug. 07, 2008	Radiation (10CH01-HY)
Log Antenna	Schwarzbeck	VUSLP 9111	206	200MHz -1GHz	Aug. 07, 2008	Radiation (10CH01-HY)
Turn Table	HD	DT 60 RPS	1513/004/00	0 ~ 360 degree	N/A	Radiation (10CH01-HY)
Antenna Mast	HD	MA240	240/556/00	1 m - 4 m	N/A	Radiation (10CH01-HY)
Antenna Mast	HD	MA240	240/559/00	1 m - 4 m	N/A	Radiation (10CH01-HY)
RF Cable-R10m	BELDEN	RG8/U	CB023-INSIDE	30MHz~1GHz	Nov. 30, 2008	Radiation (10CH01-HY)
RF Cable-R10m	Suhner Switzerland + Rosenberger	RG223/U + UAA220A-0	CB022-DOOR	30MHz~1GHz	Nov. 30, 2008	Radiation (10CH01-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Jan. 10, 2008	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jul. 11, 2008	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 11, 2008	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 30, 2008*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2008	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Jul. 18, 2008	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2008	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2008	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Dec. 14, 2008	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 10, 2008	Conducted (TH01-HY)
Oscilloscope	Tektonix	TDS380	B016197	400MHz/ 2GS/s	Jun. 27, 2008	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 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 728, 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
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection 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.