

FCC TEST REPORT

CATEGORY : Mobile
PRODUCT NAME : 10.2" VGA MOBILE CINEMA MONITOR
FCC ID. : DVUTMX-R1000
FILING TYPE : Certification
BRAND NAME : ALPINE
MODEL NAME : TMX-R1000

APPLICANT : **ALPINE ELECTRONICS OF AMERICA, INC**
19145 Gramercy Place, Torrance, California 90501-1162

MANUFACTURER : **VERTEX PRECISION ELECTRONICS, INC.**
NO.188 Chung Yuan Rd., Chung-Li Industrial Park Chung-Li
Taiwan, R.O.C.

ISSUED BY : **SPORTON INTERNATIONAL INC.**
6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien,
Taiwan, R.O.C.

Statements:

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.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA and any agency of U.S. government.

The test equipments used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.



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HISTORY OF THIS TEST REPORT

Received Date: Jan. 12, 2005

Test Date: Apr. 8, 2005

Original Report Issue Date: Apr. 8, 2005

Report No.: FR511201

☒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



FCC ID: DVUTMX-R1000
Issued on Apr. 8, 2005

Report No.: FR511201

CERTIFICATE OF COMPLIANCE

with

47 CFR FCC Part 15 Subpart C

PRODUCT NAME : 10.2" VGA MOBILE CINEMA MONITOR

BRAND NAME : ALPINE

MODEL NAME : TMX-R1000

APPLICANT : **ALPINE ELECTRONICS OF AMERICA, INC**

19145 Gramercy Place, Torrance, California 90501-1162

MANUFACTURER : **VERTEX PRECISION ELECTRONICS, INC.**

NO.188 Chung Yuan Rd., Chung-Li Industrial Park Chung-Li
Taiwan, R.O.C.

I HEREBY CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4-2003 and all test are performed according to 47 CFR FCC Part 15 Subpart C. Testing was carried out on Apr. 8, 2005 at SPORTON International Inc. LAB.

A handwritten signature in blue ink, appearing to read 'Alan Lane', is written over a horizontal line.

Dr. Alan Lane

Vice General Manager
Sporton International Inc.



1. General Description of Equipment under Test

1.1. Applicant

ALPINE ELECTRONICS OF AMERICA, INC
19145 Gramercy Place, Torrance, California 90501-1162

1.2. Manufacturer

VERTEX PRECISION ELECTRONICS, INC.
NO.188 Chung Yuan Rd., Chung-Li Industrial Park Chung-Li Taiwan, R.O.C.

1.3. Basic Description of Equipment under Test

This product is a 10.2" VGA MOBILE CINEMA MONITOR with FM Audio transmitter wireless solution. The technical data has been listed on section "Features of Equipment under Test".

1.4. Features of Equipment under Test

EUT

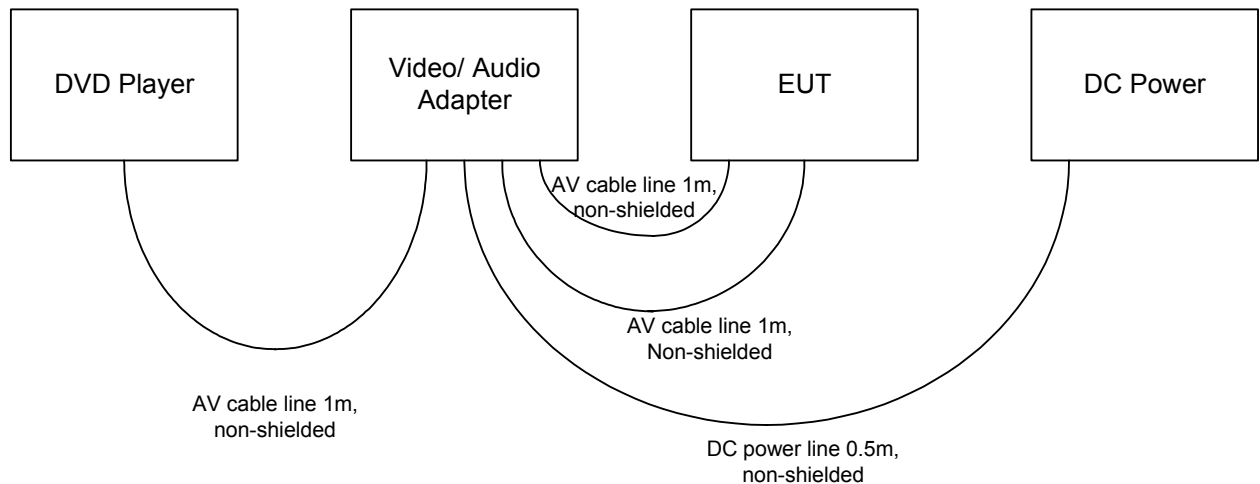
Items	Description
Type of Modulation	FM
Number of Channels	22
Frequency Band	88~108 MHz
Carrier Frequency	See section 1.5 for details
Antenna Type	Wire Antenna
Testing Duty Cycle	100.00%
Test Power Source	14.40V DC
Temperature Range (Operating)	-10 ~ 60 °C

1.5. Table for Carrier Frequencies

Channel	Frequency
01	88.1 MHz
02	88.3 MHz
:	:
21	92.3 MHz
22	92.5 MHz

2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System



2.2. The Test Mode Description

1. According to ANSI C63.4-2003: If frequency range of EUT is more than 10 MHz, we have to test the lowest, and highest channels of EUT.
2. AC conduction emission is independent of channel selection, and only channel 22 with FM modulation was tested.

2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	FCC ID
DC Power Supply	epe	EP3000	DoC
DVD Player	SONY	DVP-S545D	DoC

3. General Information of Test

3.1. Test Facility

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
: TEL 886-3-327-3456
: FAX 886-3-318-0055
Test Site No : 03CH03-HY

3.2. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.

ANSI C63.4-2003

47 CFR FCC Part 15 Subpart C

3.3. Frequency Range Investigated

Radiated emission test: from 30 MHz to 10th carrier harmonic

3.4. Test Distance

The test distance of radiated emission (30MHz~1GHz) test from antenna to EUT is 3 M.

The test distance of radiated emission (1GHz~10th carrier harmonic) test from antenna to EUT is 3 M.

3.5. Test Software

Executed "DVD Program" to play digital audio and video signal.

At the same time, executed one self test program to keep sending signals.

4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47 CFR FCC Part 15 Subpart C			
Paragraph	FCC Rule	Description of Test	Result
5.1	15.239(b)	Maximum Field Strength of Fundamental	Pass
5.2	15.239(a)	Emission Bandwidth	Pass
5.3	15.207	AC Power Line Conducted Emission	Pass
5.4	15.239(c)	Spurious Radiated Emission	Pass
5.5	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Test of Maximum Field Strength of Fundamental

5.1.1. Applicable Standard

Section 15.239(b): The field strength of fundamental emissions shall not exceed 250 microvolts/meter at 3 meters (measurement instrumentation employing an average detector).

5.1.2. Measuring Instruments

Item 1~17 of the table is on section 6.

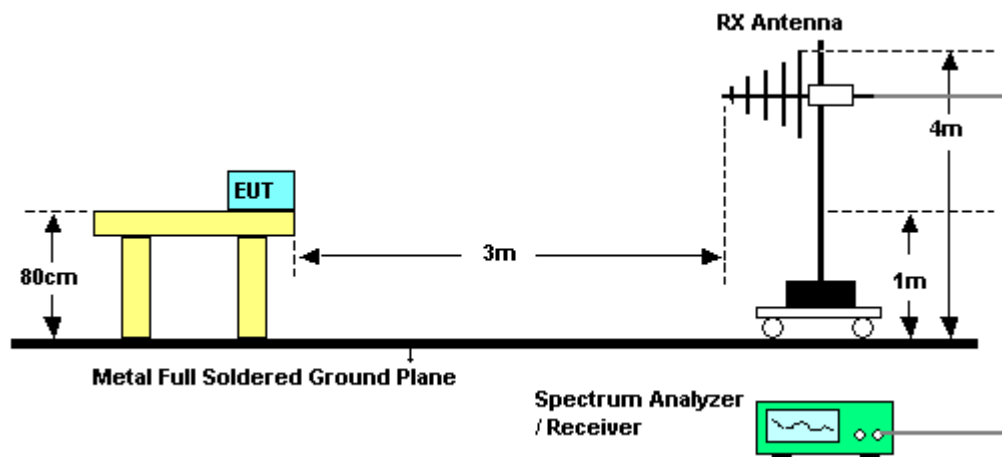
5.1.3. Description of Major Test Instruments Setting

- Test Receiver : R&S ESCS 30
- Attenuation : 10 dB
- Start Frequency : 88 MHz
- Stop Frequency : 108 MHz
- IF Bandwidth : 120 kHz

5.1.4. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. 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 emission field strength of both horizontal and vertical polarization.
4. For carrier field strength emission, 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 carrier field strength emission, use 9kHz RBW of Receiver for reading under average and peak detector.

5.1.5. Test Setup Layout



**5.1.6. Test Criteria**

All test results complied with the requirements of 15.239(b). Measurement Uncertainty is 2.26dB.

5.1.7. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Wayne Hsu

Channel No.	Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Detector
01	88.1 MHz	45.43	-2.52	47.95	62.99	Average
01	88.1 MHz	46.23	-21.72	67.95	63.79	Peak
22	92.5 MHz	45.05	-2.90	47.95	62.82	Average
22	92.5 MHz	46.81	-21.14	67.95	64.66	Peak

Note:

Correct Factor = Antenna Factor + Cable Loss - Preamp Factor.

Read Level = Level of Receiver or Spectrum.

Level = Read Level + Correct Factor.

5.2. Test of Emission Bandwidth

5.2.1. Applicable Standard

Section 15.239(a): Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency.

5.2.2. Measuring Instruments

Item 7 of the table is on section 6.

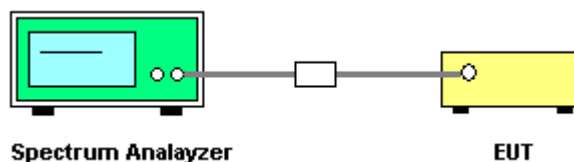
5.2.3. Description of Major Test Instruments Setting

- Spectrum Analyzer : R&S FSP40
- Attenuation : Auto
- Center Frequency : Carrier frequency
- Span Frequency : Suitable for observe
- RB : 10 kHz
- VB : 10 kHz

5.2.4. Test Procedures

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 1% of occupied bandwidth
3. Set the 99% occupied bandwidth function to measure the bandwidth of EUT.

5.2.5. Test Setup Layout



5.2.6. Test Criteria

All test results complied with the requirements of 15.239(a). Measurement Uncertainty is 1×10^{-5} .

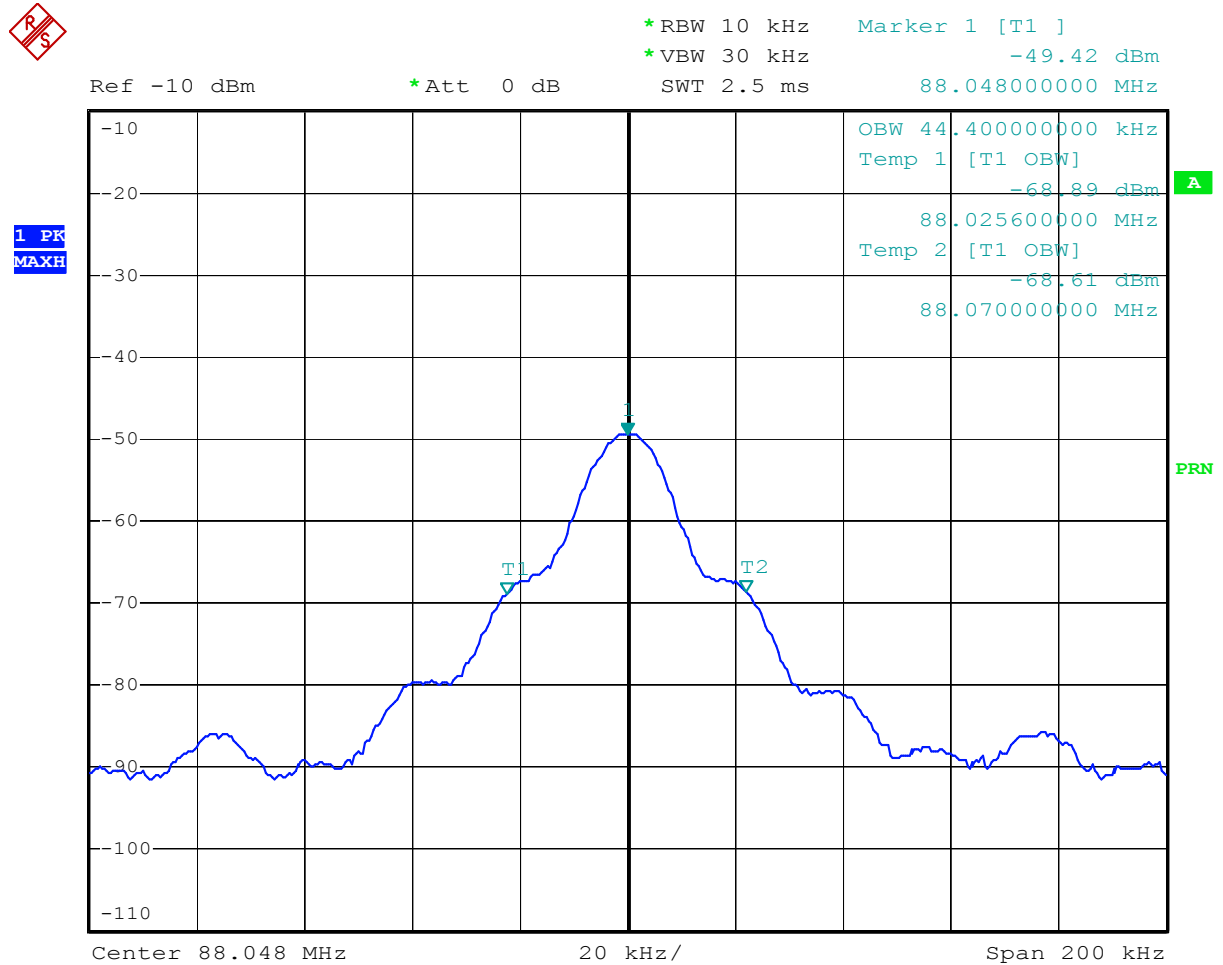
5.2.7. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Wayne Hsu

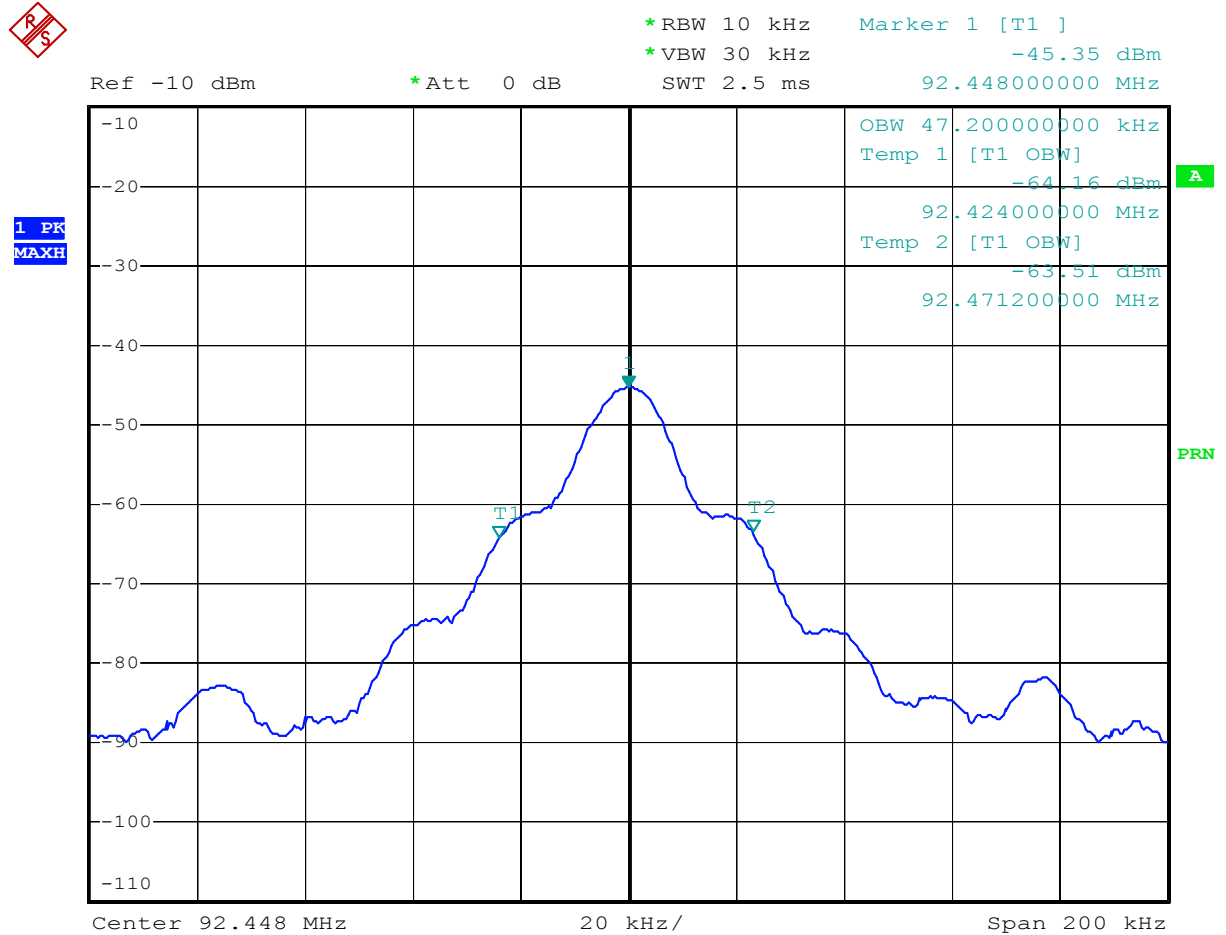
Channel	Frequency (MHz)	Bandwidth (kHz)	Max. Limit (kHz)
01	88.1 MHz	44.4kHz	200
22	92.5 MHz	47.2KHz	200



Modulation Type: **FM** (Channel 01) :



Date: 25.MAR.2005 17:29:07

Modulation Type: **FM** (Channel 22) :

Date: 25.MAR.2005 17:30:49

5.3. Test of AC Power Line Conducted Emission

The power source of the EUT is DC 14.4V. There is no need to test AC conduction emission.

5.4. Test of Spurious Radiated Emission

5.4.1. Applicable Standard

Section 15.239(c): The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in Section 15.209.

5.4.2. Measuring Instruments

Please reference item 1~17 in chapter 6 for the instruments used for testing.

5.4.3. Description of Major Test Instruments Setting

- Spectrum Analyzer : R&S FSP40
 - Attenuation : Auto
 - Start Frequency : 1000 MHz
 - Stop Frequency : 10th carrier harmonic
 - RB / VB : 1 MHz / 1MHz for Peak
 - RB / VB : 1 MHz / 10Hz for Average
- Test Receiver : R&S ESCS 30
 - Attenuation : Auto
 - Start Frequency : 30 MHz
 - Stop Frequency : 1000 MHz
 - RB : 120 KHz for QP or PK

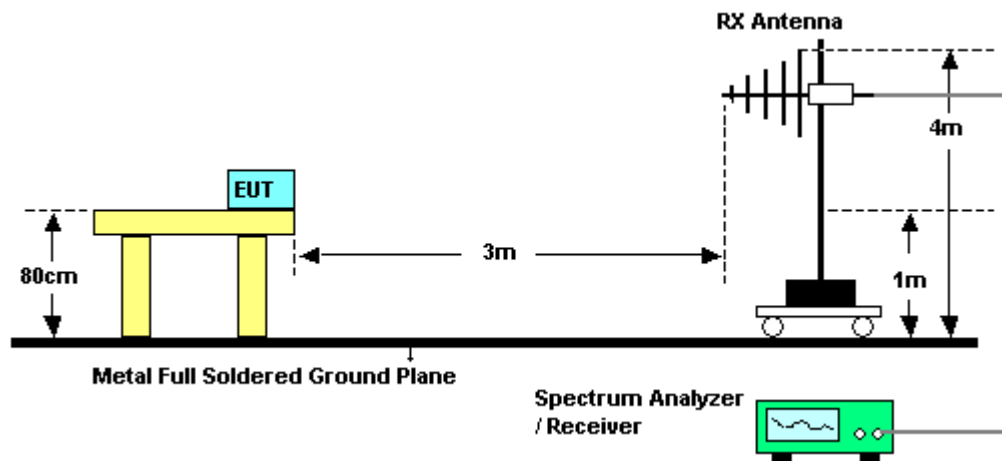
5.4.4. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. 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.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, 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.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. If the emission 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 and average method for above the 1GHz. the reported.

11. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission 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.

5.4.5. Test Setup Layout



5.4.6. Test Criteria

All test results complied with the requirements of 15.239(c). Measurement Uncertainty is 2.26dB.

5.4.7. Test Results for CH 01 / 88.1 MHz

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Wayne Hsu

(A) Polarization: Horizontal

Freq	Level	Over Limit	Read Level	Limit Line	Factor	Remark
MHz	dBuV/m	dB	dBuV	dBuV/m	dB	
71.310	36.03	-3.97	52.84	40.00	-16.81	Peak
85.590	38.64	-1.36	55.99	40.00	-17.35	QP
186.230	36.77	-6.73	47.47	43.50	-10.70	Peak
314.400	40.84	-5.16	51.07	46.00	-10.23	Peak
377.600	40.27	-5.73	47.98	46.00	-7.71	Peak
404.000	39.88	-6.12	47.83	46.00	-7.95	Peak

(B) Polarization: Vertical

Freq	Level	Over Limit	Read Level	Limit Line	Factor	Remark
MHz	dBuV/m	dB	dBuV	dBuV/m	dB	
71.310	36.03	-3.97	52.84	40.00	-16.81	Peak
85.590	38.64	-1.36	55.99	40.00	-17.35	QP
186.230	36.77	-6.73	47.47	43.50	-10.70	Peak
314.400	37.18	-8.82	47.41	46.00	-10.23	Peak
377.600	36.13	-9.87	43.84	46.00	-7.71	Peak
688.000	40.92	-5.08	44.74	46.00	-3.82	Peak

Note:

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

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

5.4.8. Test Results for CH 22 / 92.5 MHz

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Wayne Hsu

(A) Polarization: Horizontal

Freq	Level	Over Limit	Read Level	Limit Line	Factor	Remark
MHz	dBuV/m	dB	dBuV	dBuV/m	dB	
85.590	38.72	-1.28	56.07	40.00	-17.35	QP
128.940	39.34	-4.16	52.97	43.50	-13.63	Peak
171.780	40.04	-3.46	51.07	43.50	-11.03	Peak
314.400	40.08	-5.92	50.31	46.00	-10.23	Peak
377.600	39.81	-6.19	47.52	46.00	-7.71	Peak
404.000	39.91	-6.09	47.86	46.00	-7.95	Peak

(B) Polarization: Vertical

Freq	Level	Over Limit	Read Level	Limit Line	Factor	Remark
MHz	dBuV/m	dB	dBuV	dBuV/m	dB	
42.750	35.09	-4.91	49.28	40.00	-14.19	Peak
85.590	38.43	-1.57	55.78	40.00	-17.35	QP
171.780	36.12	-7.38	47.15	43.50	-11.03	Peak
314.400	37.18	-8.82	47.41	46.00	-10.23	Peak
377.600	36.13	-9.87	43.84	46.00	-7.71	Peak
688.000	40.92	-5.08	44.74	46.00	-3.82	Peak

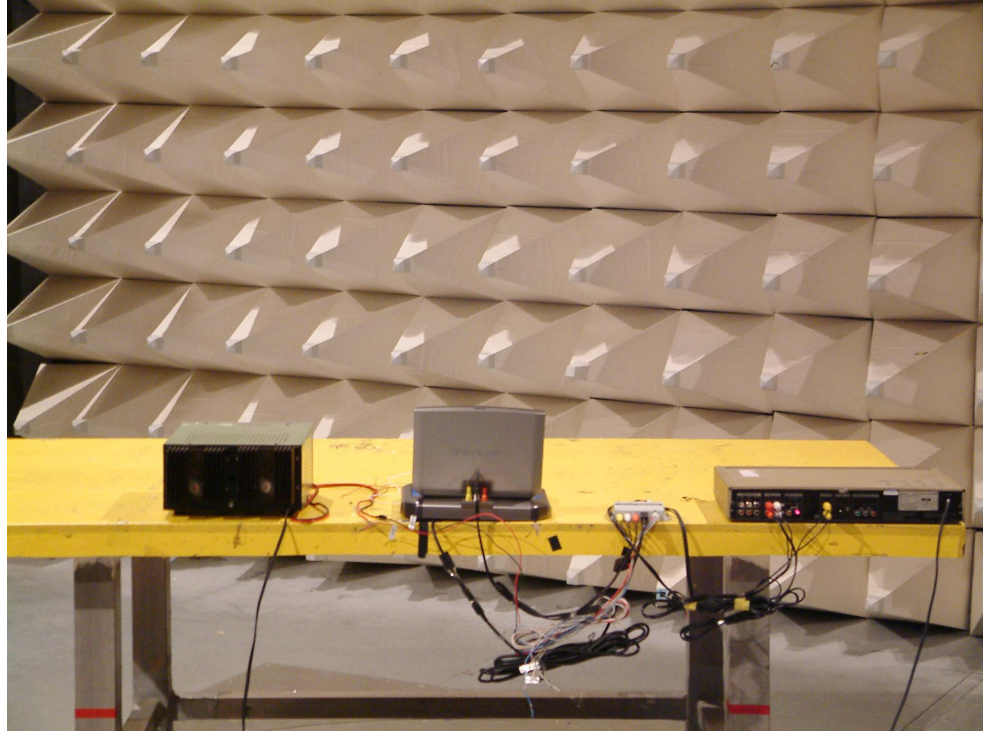
Note:

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

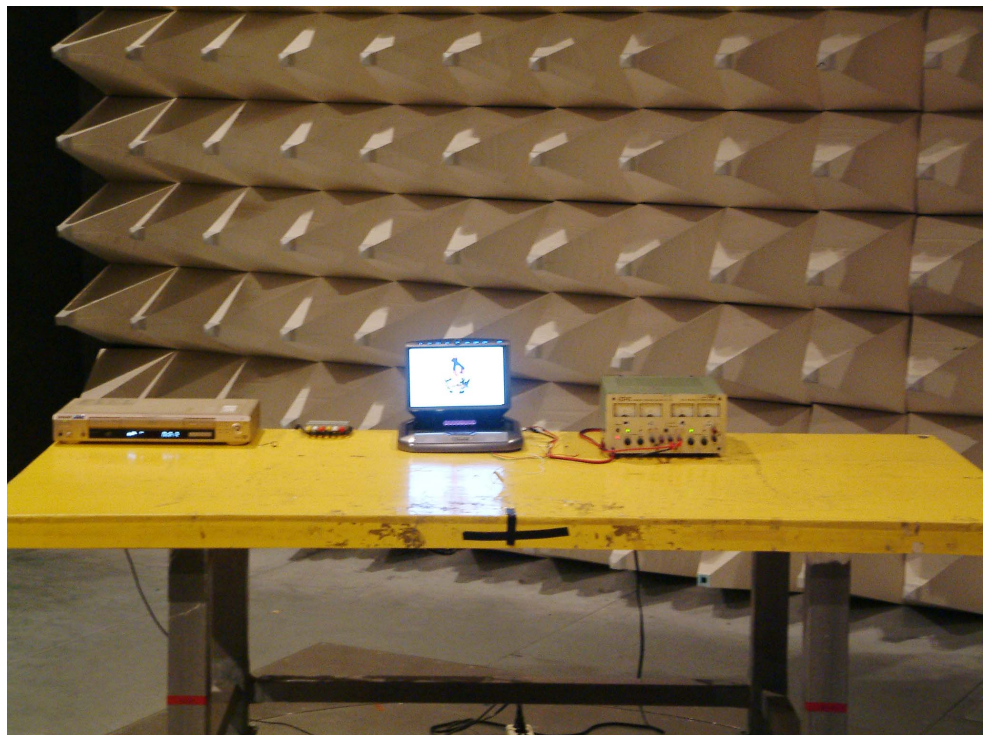
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.4.9. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW





5.5. Antenna Requirements

5.5.1. Standard Applicable

Section 15.203: 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 a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

5.5.2. Antenna Connected Construction

There is no antenna connector for wire antenna.

5.5.3. Test Criteria

All test results complied with the requirements of 15.203.

6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100174	9 KHz – 2.75 GHz	Feb. 15, 2005	Conduction (CO04-HY)
2	LISN	MessTec	NNB-2/16Z	2001/004	9 KHz – 30 MHz	Jun. 09, 2004	Conduction (CO04-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	99041	9 KHz – 30 MHz	Apr. 27, 2004	Conduction (CO04-HY)
4	EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
5	RF Cable-CON	UTIFLEX	3102-26886-4	CB044	9KHz~30MHz	Apr. 21, 2004	Conduction (CO04-HY)
6	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
7	Spectrum analyzer	R&S	FSP40	100004	9KHz~40GHz	Aug. 21, 2005	Radiation (03CH03-HY)
8	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 03, 2005	Radiation (03CH03-HY)
9	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz – 200MHz	Jul. 22, 2005	Radiation (03CH03-HY)
10	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 22, 2005	Radiation (03CH03-HY)
11	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 01, 2005	Radiation (03CH03-HY)
12	Amplifier	MITEQ	AFS44	879981	1GHz~26.5GHz	Jul. 21, 2005	Radiation (03CH03-HY)
13	Horn Antenna	EMCO	3115	6821	1GHz – 18GHz	Sep. 10, 2005	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
16	Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 08, 2005	Radiation (03CH03-HY)
17	RF Cable-HIGH	SUCOFLES	106	SN30094/6	1GHz~29.5GHz	Mar. 06, 2005	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.

7. Company Profile

SPORTON Lab. was established in 1986 with one shielded room: the first private EMI test facility, offering local manufacturers an alternative EMI test facility apart from ERSO. In 1988, one 3M and 10M/3M open area test site were setup and also obtained official accreditation from FCC, VCCI and NEMKO. In 1993, a Safety laboratory was founded and obtained accreditation from UL of USA, CSA of Canada and TUV (Rhineland & PS) of Germany. In 1995, one EMC lab, including EMI and EMS test facilities was setup. In 1997, SPORTON Group has provided financial expense to relocate the headquarter to Orient Scientific Park in Taipei Hsien to offer more comprehensive, more qualified and better service to local suppliers and manufactures. In 1999, Safety Group and Component Group were setup. In 2001, SPORTON has established 3M/10M chamber in Hwa Ya Technology Park.

7.1. Certificate of Accreditation

Taiwan	BSMI, CNLA, DGT
USA	FCC, NVLAP, UL
EU	Nemko, TUV
Japan	VCCI
Canada	Industry Canada

7.2. Test Location

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 02-2696-2468 FAX : 02-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 03-327-3456 FAX : 03-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 02-2601-1640 FAX : 02-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 02-2631-4739 FAX : 02-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 02-8227-2020 FAX : 02-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 02-2794-8886 FAX : 02-2794-9777

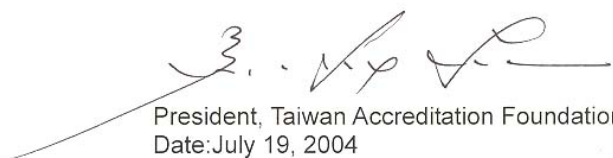
8. CNLA Certificate of Accreditation

Test Lab. : Sporton International Inc.
Accreditation Number : 1190
Originally Accredited : 2003/12/15
Effective Period : 2003/12/15~2006/12/14
Accredited Scope : 47 CFR FCC Part 15 Subpart C (9kHz~40GHz)



Taiwan Accreditation Foundation
Chinese National Laboratory Accreditation
Certificate of Accreditation

Accreditation Criteria: ISO 17025
Accreditation Number: 1190
Organization/Laboratory: EMC & Wireless Communications Laboratory, Sporton International Inc.
Originally Accredited: December 15, 2003
Effective Period: December 15, 2003 To December 14, 2006
Accredited Scope: Electrical Testing Field, 7 items, details shown in the following pages.
Specific Accreditation Program: Recognition and Approval of Designated Laboratory for Commodities Inspection


President, Taiwan Accreditation Foundation
Date: July 19, 2004

(This document is invalid unless accompanied by all 4 pages)

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