

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

Product Name : All Fiber Optic HDMI
Model Number : H3D-T6XX Series, H3D-JXXX Series,
 H3D-DXXX Series,
Trade Name : N/A
FCC ID : Y5MH3D-T6XX
Report Number : SZEE101119350604-1
Date : Jan. 12, 2011

Standards	Results
<input checked="" type="checkbox"/> FCC Part 15B: 2009	PASS

Prepared for:
RAINBOW FISH CORPORATION.LTD
No. 38 Longwu Hangzhou Industrial Park,
Zhuantang, Hangzhou, PR China 310024

Prepared by:
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CENTRE TESTING INTERNATIONAL CORPORATION

Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen

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N/A means not applicable.

1. CERTIFICATION INFORMATION

Applicant & Address: RAINBOW FISH CORPORATION.LTD
No. 38 Longwu Hangzhou Industrial Park,Zhuantang, Hangzhou,
PR China 310024

Manufacturer & Address: RAINBOW FISH CORPORATION.LTD
No. 38 Longwu Hangzhou Industrial Park,Zhuantang, Hangzhou,
PR China 310024

Type of Test: FCC Part 15 (Certification)

FCC ID: Y5MH3D-T6XX

Equipment Under Test: All Fiber Optic HDMI

Model Name: H3D-T6XX Series, H3D-JXXX Series, H3D-DXXX Series,

Test Model: H3D-T610

Trade Name: N/A

Serial Number: Not Applicable

Technical Data: DC 5V by PC USB port and HDMI port

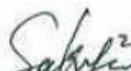
Date of test: Nov. 19, 2010 to Jan. 12, 2011

Condition of Test Sample: Normal

The above equipment was tested by Centre Testing International for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedure according to ANSI C63.4: 2003.

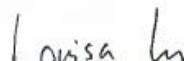
The test results of this report relate only to the tested sample identified in this report.

Prepared by :



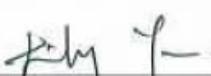
Saky Yan

Reviewed by :



Louisa Lu

Approved by :



Lily Yan

Supervisor



Date : Jan. 12, 2011



2. TEST SUMMARY

The EUT has been tested according to the following specifications:

Standard	Test Item	Test
FCC 15.107	Conducted Emission	Yes
FCC 15.109	Radiated Emission	Yes

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Radiated Emission	4.4

4. PRODUCT INFORMATION AND TEST SETUP

4.1. PRODUCT INFORMATION

Technical Data: DC 5V by PC USB port and HDMI port

The All Fiber Optic HDMI are H3D-T6XX, H3D-JXXX, H3D-DXXX, there are the same PCB structure and design. The Only difference is the color, enclosure, package and fiber length.

H3D means the product is mainly used for sending high definition and 3Dsignals.

T means this edition is used for indoor, such as homes and offices.

6 is the code of the RAINBOW FISH CORPORATION.LTD.

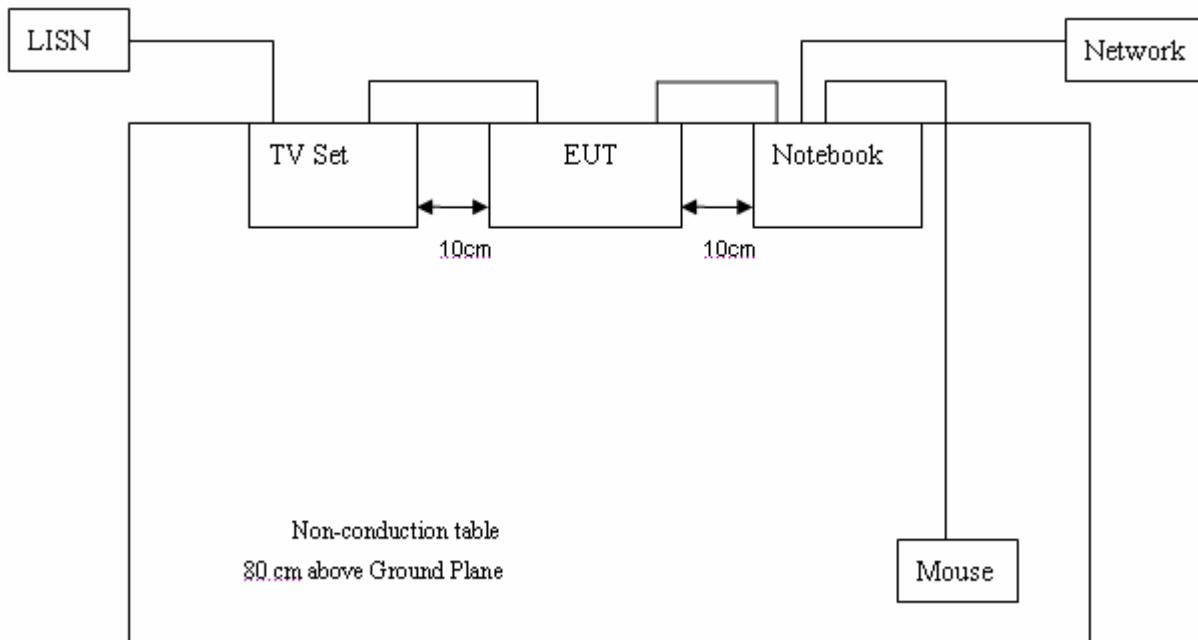
J means this edition is mainly used for outdoor, such as the Surveillance of an area, or a building. The enclosure and the package of fiber are different comparing with the indoor products.

D means this edition is manufactured base on the vendor's request.

XX means the length of the fiber.

4.2. TEST SETUP CONFIGURATION

See the following test setup block diagram and test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.



4.3. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	NOTEBOOK	DELL	Vostro 3400	29568050281	N/A	N/A
2.	LCD TV	PHILIPS	32PF7320193	BZ1A0627401425	N/A	1.5M
3.	Mouse	IBM	M028UOL	23-468157	Un-shielded1.2M	N/A

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5. FACILITIES AND ACCREDITATIONS

5.1. TEST FACILITY

All test facilities used to collect the test data are located at Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

5.2. TEST EQUIPMENT LIST

Instrumentation: The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

Equipment used during the tests:

Shielding Room No. 1 - Conducted Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESCI	100009	07/10/2011
LISN	ETS-LINDGREN	3850/2	00051952	04/09/2011
LISN	R&S	ENV216	100098	07/10/2011

3M Semi-anechoic Chamber - Radiated Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
Spectrum Analyzer	Agilent	E4440A	MY46185649	04/09/2011
Biconilog Antenna	ETS-LINGREN	3142C	00044562	07/31/2011
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	06/07/2011
Microwave Preamplifier	Agilent	8449B	3008A02425	N/A

5.3. LABORATORY ACCREDITATIONS AND LISTINGS

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

6. CONDUCTED EMISSION TEST

6.1. LIMITS

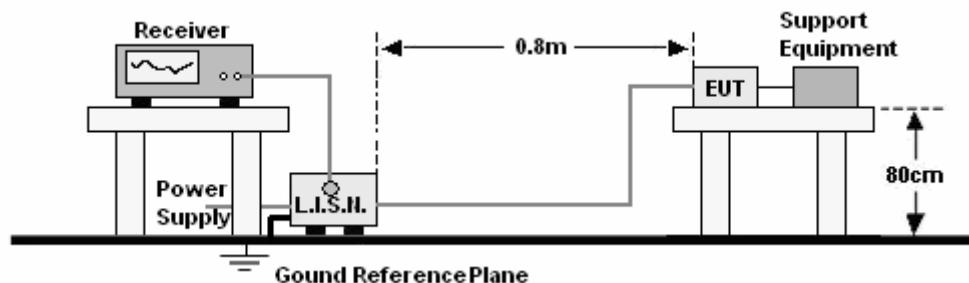
Limits for Class B digital devices

Frequency range (MHz)	Limits dB(µV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

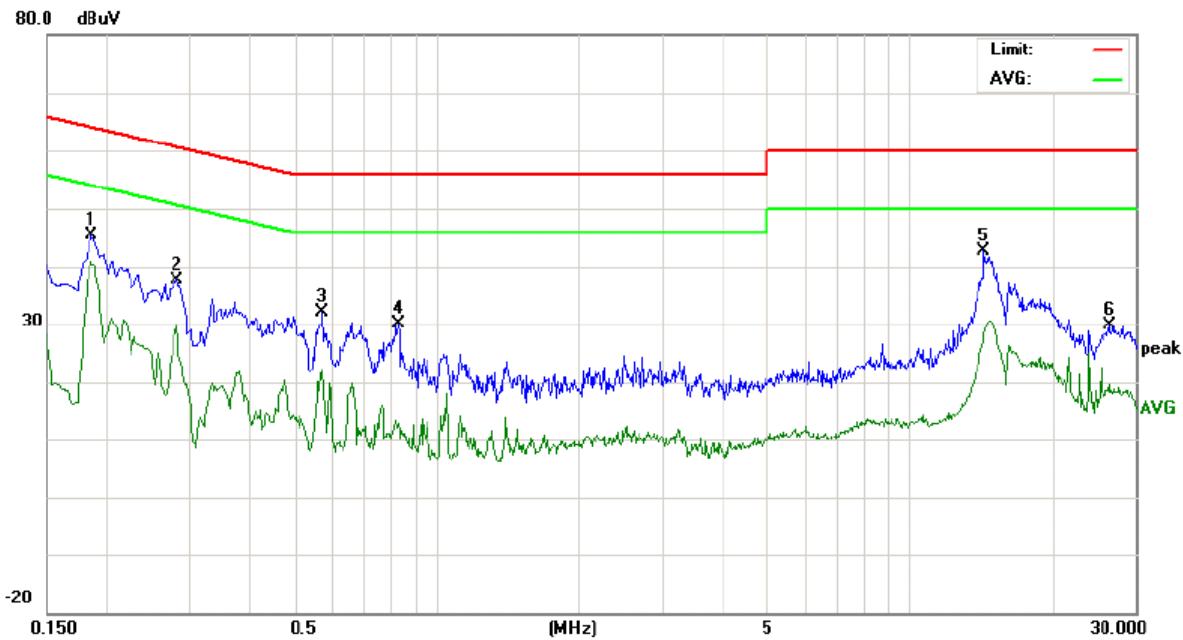
6.2. BLOCK DIAGRAM OF TEST SETUP



6.3. PROCEDURE OF CONDUCTED EMISSION TEST

- The EUT was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N.).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from EUT in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4. GRAPHS AND DATA



Site site #1 Phase: **L1** Temperature: 22

Limit: FCC Class B Conduction (QP) Power: AC 120V/60Hz Humidity: 55 %

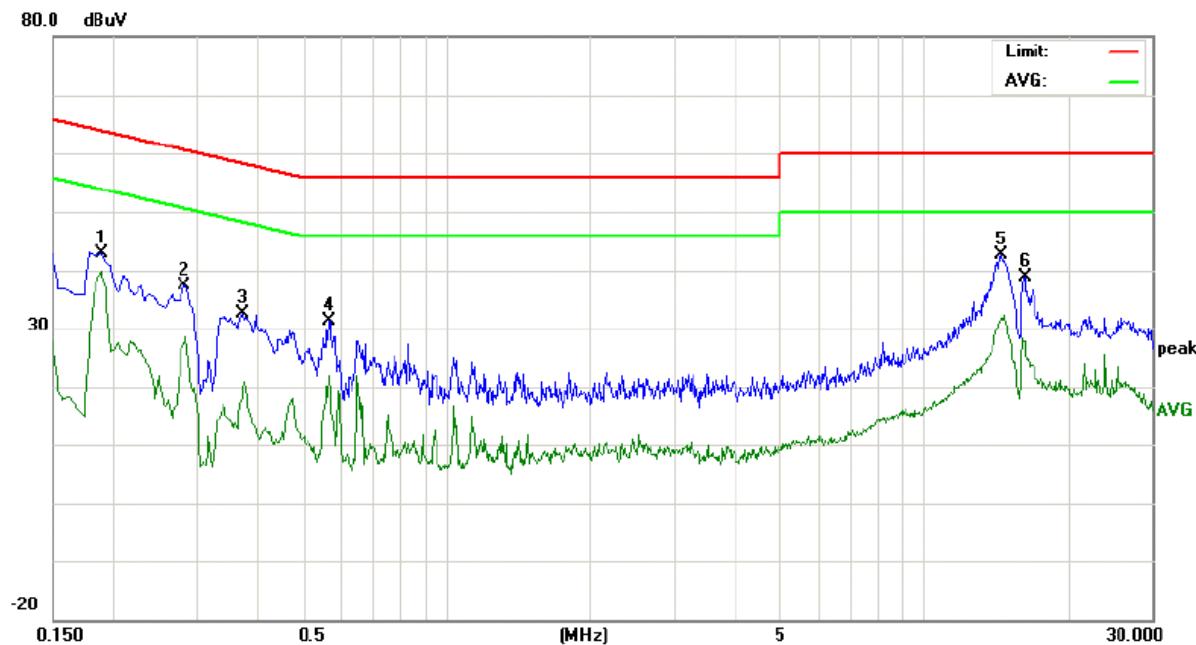
EUT: All Fiber Optic HDMI

M/N: H3D-T610

Mode: Normal

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor		Measurement (dBuV)			Limit (dBuV)			Margin (dB)	
		MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F
1	0.1860	35.49		31.04	9.80	45.29		40.84	64.21	54.21	-18.92	-13.37	P	
2	0.2819	27.70		19.96	9.81	37.51		29.77	60.76	50.76	-23.25	-20.99	P	
3	0.5740	22.37		12.20	9.82	32.19		22.02	56.00	46.00	-23.81	-23.98	P	
4	0.8340	20.22		3.07	9.85	30.07		12.92	56.00	46.00	-25.93	-33.08	P	
5	14.4340	32.49		18.15	10.05	42.54		28.20	60.00	50.00	-17.46	-21.80	P	
6	26.4180	19.41		9.32	10.36	29.77		19.68	60.00	50.00	-30.23	-30.32	P	



Site site #1

Phase: *N*

Temperature: 22

Limit: FCC Class B Conduction (QP)

Power: AC 120V/60Hz

Humidity: 55 %

EUT: All Fiber Optic HDMI

M/N: H3D-T610

Mode: Normal

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
		MHz	Peak	QP	Avg	dB	peak	QP	Avg	QP	Avg	QP	Avg	P/F
1	0.1900	33.00		29.99	9.81	42.81		39.80	64.03	54.03	-21.22	-14.23	P	
2	0.2819	27.59		17.63	9.81	37.40		27.44	60.76	50.76	-23.36	-23.32	P	
3	0.3740	22.92		8.25	9.81	32.73		18.06	58.41	48.41	-25.68	-30.35	P	
4	0.5700	21.49		12.11	9.82	31.31		21.93	56.00	46.00	-24.69	-24.07	P	
5	14.5260	32.48		21.73	10.05	42.53		31.78	60.00	50.00	-17.47	-18.22	P	
6	16.2380	28.87		17.74	10.06	38.93		27.80	60.00	50.00	-21.07	-22.20	P	

7. RADIATED EMISSIONS MEASUREMENT

7.1. LIMITS

Limits for Class B digital devices

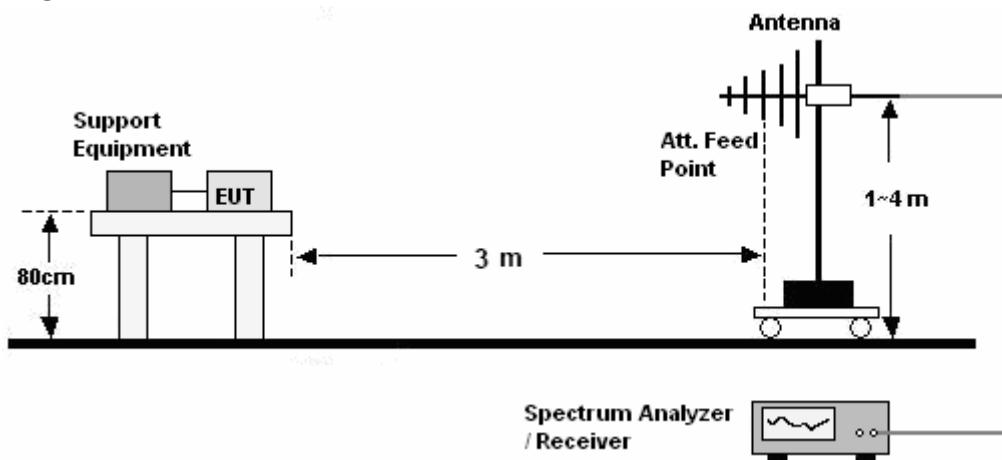
Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

NOTE: 1. The lower limit shall apply at the transition frequency.

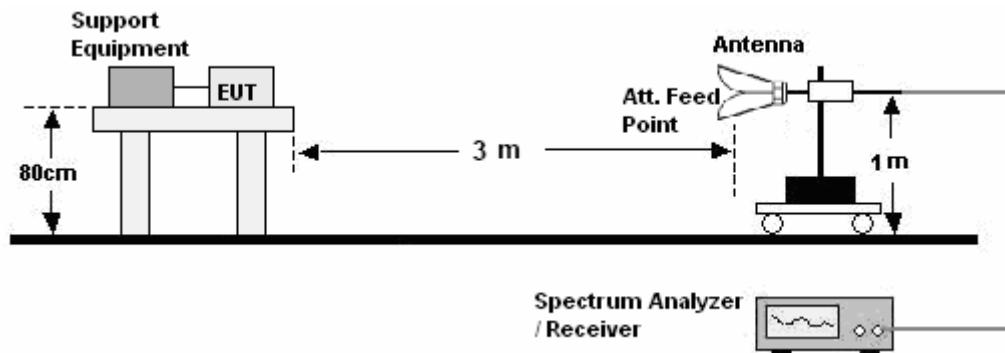
2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP

30MHz ~ 1GHz:



Above 1GHz:



7.3. PROCEDURE OF RADIATED EMISSION TEST

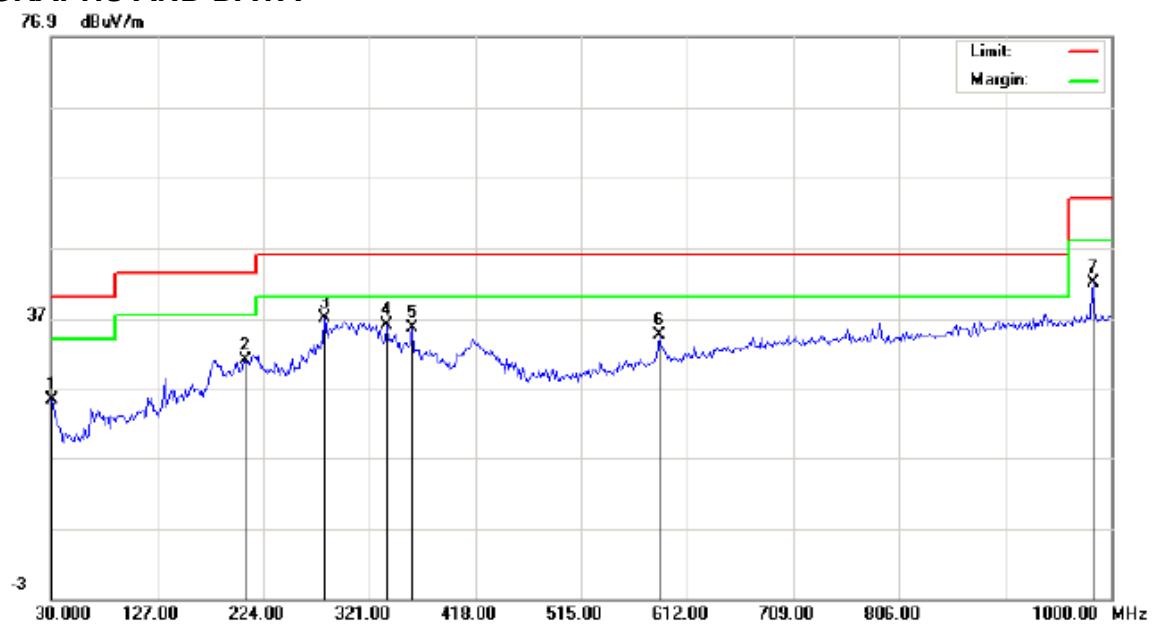
30MHz ~ 1GHz:

- a. The EUT was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

- a. The EUT was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

7.4. GRAPHS AND DATA



Site site #1

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation

Power: DC 5V By PC USB Port

Humidity: 60 %

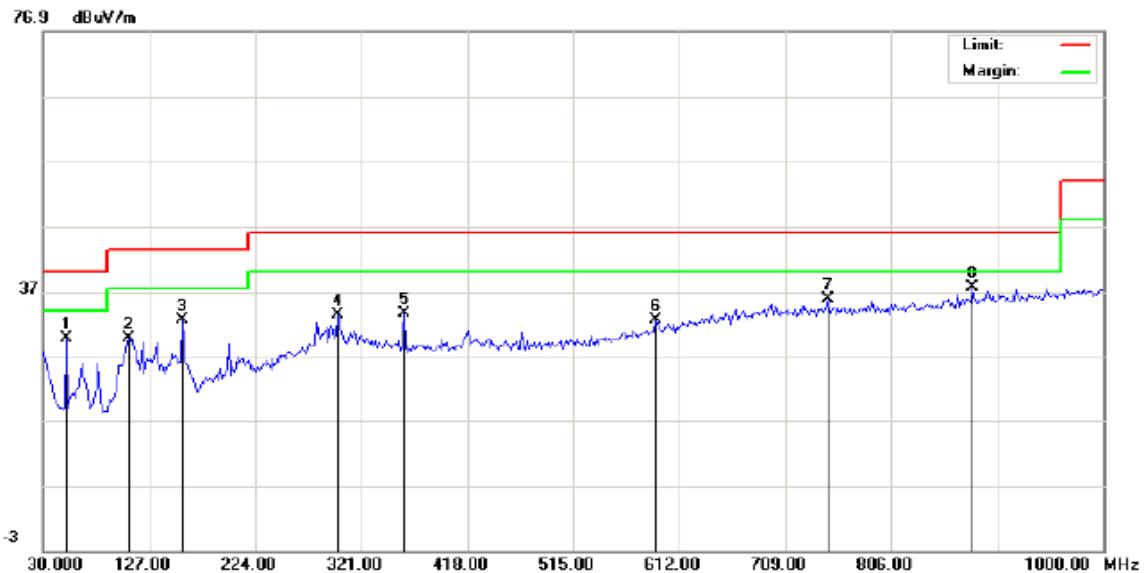
EUT: All Fiber Optic HDMI

M/N: H3D-T610

Mode: Normal

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor			Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)	
		MHz	Peak	QP	Avg	dB	peak	QP	Avg	QP	Avg	QP	Avg	P/F
1	30.0000	7.83				17.63	25.46			40.00		-14.54		P
2	207.8333	18.92				12.15	31.07			43.50		-12.43		P
3	280.5833	21.95				15.06	37.01			46.00		-8.99		P
4	337.1667	19.09				16.98	36.07			46.00		-9.93		P
5	359.8000	17.98				17.68	35.66			46.00		-10.34		P
6	586.1333	12.76				21.88	34.64			46.00		-11.36		P
7	983.8333	14.36				27.61	41.97			54.00		-12.03		P



Site site #1
Limit: FCC Class B 3M Radiation
EUT: All Fiber Optic HDMI
M/N: H3D-T610
Mode: Normal
Note:

Polarization: **Vertical**
Power: DC 5V By PC USB Port

Temperature: 26
Humidity: 60 %

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor			Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)	
		Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	51.0167	20.86			9.03	29.89			40.00		-10.11		P	
2	107.6000	19.98			9.92	29.90			43.50		-13.60		P	
3	157.7167	21.49			11.10	32.59			43.50		-10.91		P	
4	299.9833	17.61			15.83	33.44			46.00		-12.56		P	
5	359.8000	15.86			17.68	33.54			46.00		-12.46		P	
6	590.9833	10.71			21.99	32.70			46.00		-13.30		P	
7	747.8000	10.91			24.91	35.82			46.00		-10.18		P	
8	880.3667	11.16			26.35	37.51			46.00		-8.49		P	

Remark 1: The test data above 1GHz are much lower than the limit, and they are not recorded.

Remark 2: Below 1GHz: The correct factor = cable loss+ antenna factor.

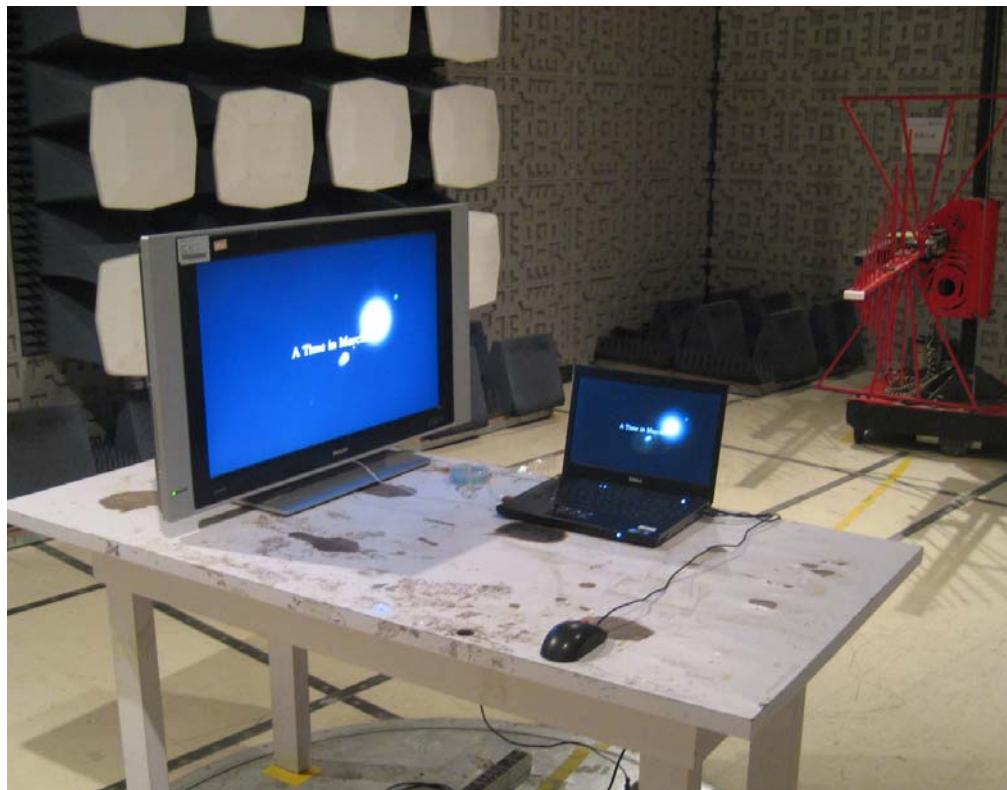
For Example: for 299.9833MHz, cable loss is 1.93dB and the antenna factor is 13.9dB/m.
So, The correct factor = cable loss+ antenna factor = $1.93+13.9 = 15.83$ dB

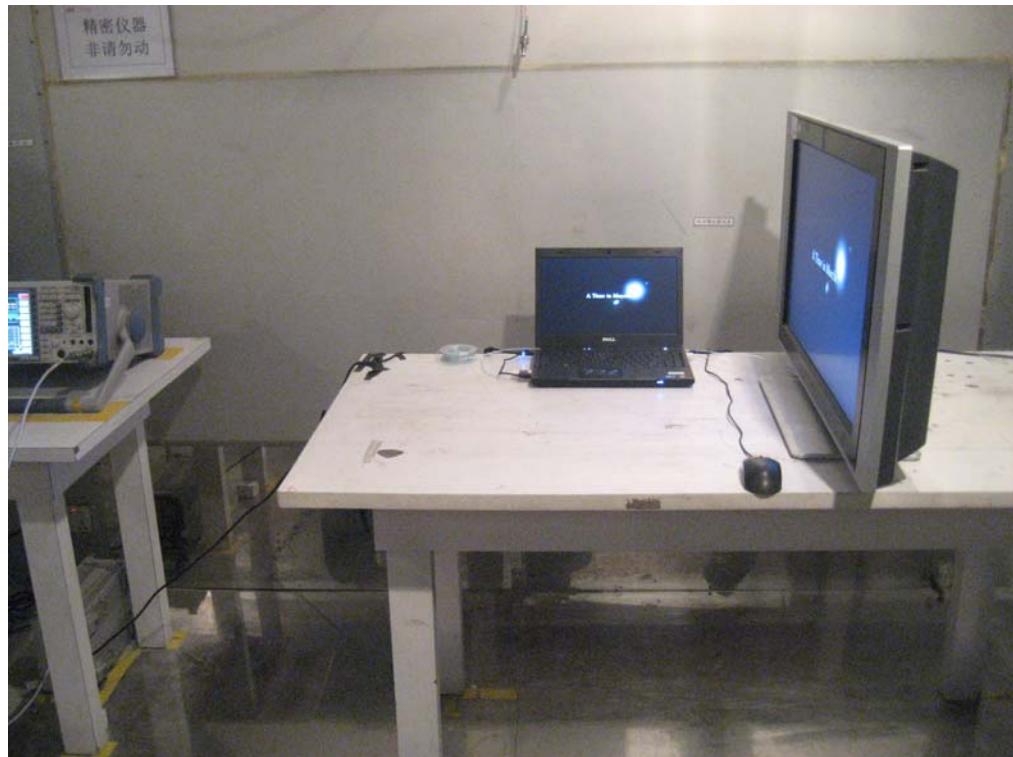
Above 1GHz: The correct factor = cable loss+ antenna factor -amplifier factor.

For Example: for 4000MHz, cable loss is 5.7dB , the antenna factor is 33.8dB/m and
amplifier factor is 30dB

So, The correct factor = cable loss+ antenna factor -amplifier factor.
 $= 5.7+33.8-30 = 9.5$ dB

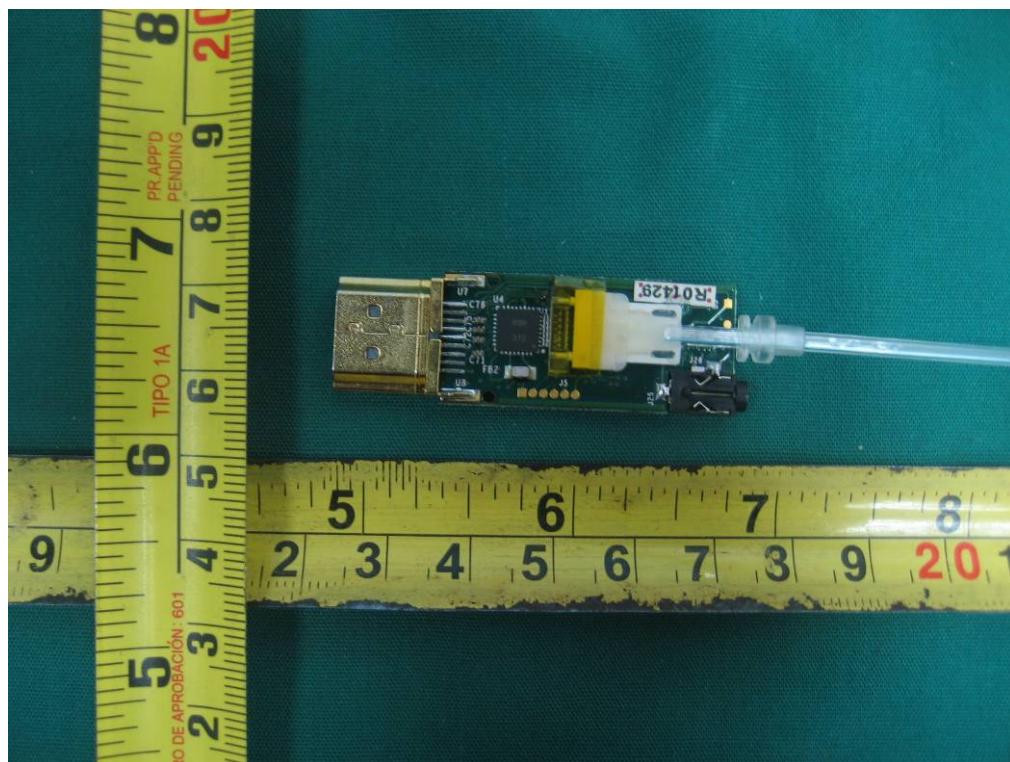
Measurement (peak) = Reading Level (peak) + correct factor

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP**TEST SETUP OF RADIATED EMISSION**

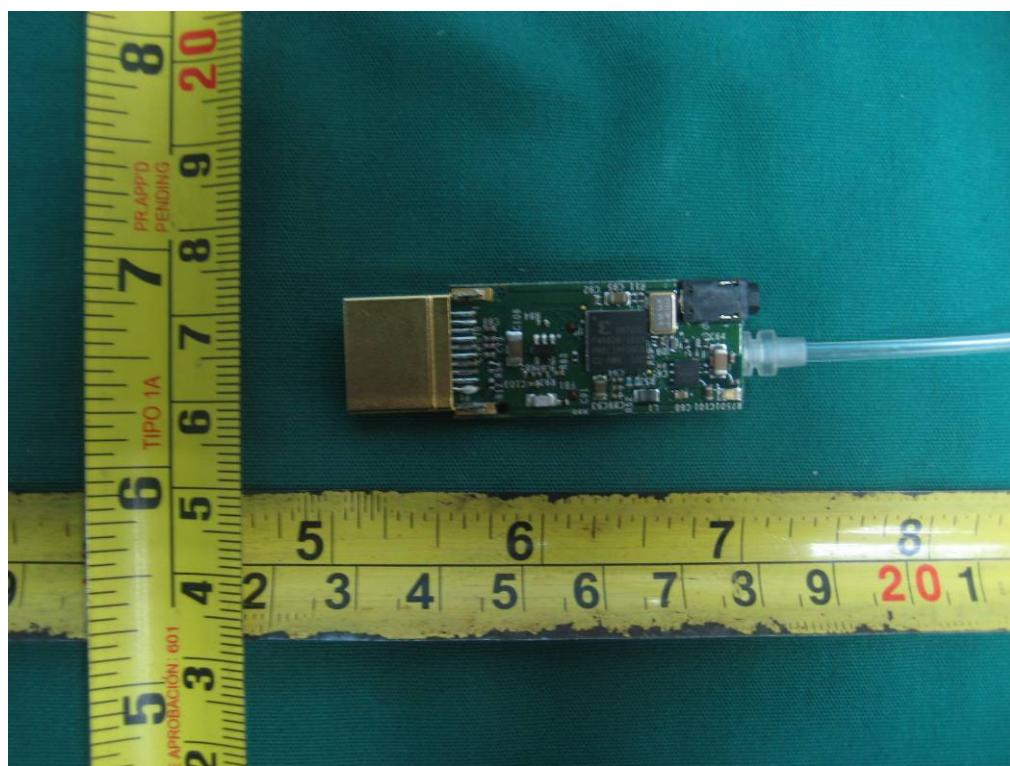
**TEST SETUP OF CONDUCTED EMISSION**

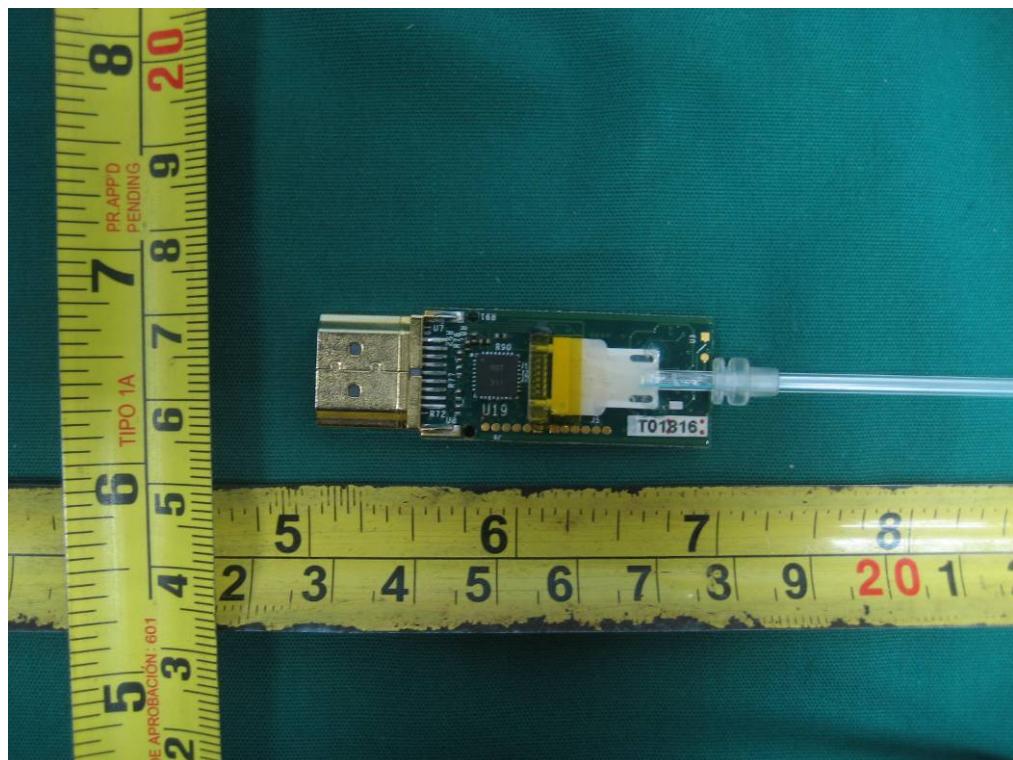
APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT

View of EUT

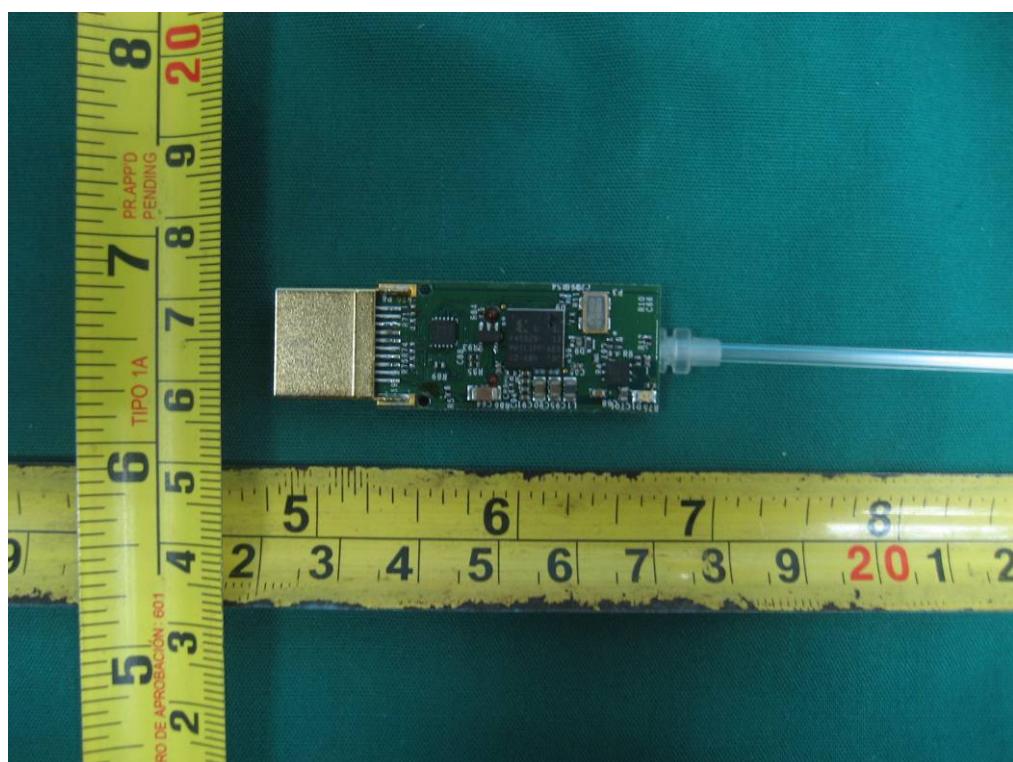
APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT

Uncovered View of EUT-1(RX)





Uncovered View of EUT-3(TX)



Uncovered View of EUT-4(TX)

----- End of report -----