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FEDERAL COMMUNICATIONS COMMISSION

Registration number: 282399

Report No.: GZEM101000234301

Page: 1 of 31


FCC ID: YWRDCM4-HD

TEST REPORT

Application No.:	GZEM1010002343AV
Applicant:	Sandmartin(Zhong Shan) Electronic Co., Ltd.
FCC ID:	YWRDCM4-HD
Equipment Under Test (EUT):	
EUT Name:	Digital Video Broadcasting
Item No.:	DCM4-HD
Standards:	FCC PART 15 SUBPART B:2009
Date of Receipt:	2010-10-15
Date of Test:	2010-11-01 to 2010-12-06
Date of Issue:	2010-12-22
Test Result :	Pass*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Stephen Guo
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2010-12-22		Original

Authorized for issue by:			
Tested By			2010-11-01 to 2010-12-06
	(Yam Shan) /Project Engineer		Date
Prepared By			2010-12-15
	(Millie Li) /Clerk		Date
Checked By			2010-12-22
	(Guitar Huang) /Reviewer		Date



3 Test Summary

Electromagnetic Interference (EMI)				
Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150 KHz to 30 MHz)	FCC PART 15 SUBPART B:2009	ANSI C63.4:2009	Class B	PASS
Radiated Emission (30 MHz to 1 GHz)	FCC PART 15 SUBPART B:2009	ANSI C63.4:2009	Class B	PASS
Radiated Emission above 1 GHz	FCC PART 15 SUBPART B:2009	N/A	Class B	N/A
Antenna Power (30 MHz to 1 GHz)	FCC PART 15 SUBPART B:2009	Section 15.111	Class B	PASS
Output and Spurious conducted level at RF output terminal	FCC PART 15 SUBPART B:2009	Section 15.115	Class B	PASS
Demonstration on internal preventing circuitry	FCC PART 15 SUBPART B:2009	Section 15.115	Class B	PASS
Remark : EUT: In this whole report EUT means Equipment Under Test. N/A: Not applicable, please refer to section 7.3 of this report for details.				



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5 General Information

5.1 Client Information

Applicant: Sandmartin(Zhong Shan) Electronic Co., Ltd.
Address of Applicant: 3rd Industrial Area, Tanzhou, Zhongshan, Guangdong, China

5.2 General Description of E.U.T.

EUT Name: Digital Video Broadcasting
Item No.: DCM4-HD

5.3 Details of E.U.T.

Power Supply: AC 120V, 60Hz
DC (2 x 1.5V size 'AAA' batteries) for remote controller
Power Cord: 1.5 m x 2 wires unscreened AC mains cable

5.4 Description of Support Units

The EUT has been tested with associated equipment as follows.

Description	Manufacturer	Model No.	SN/Certificate NO
Flash Disk	Kingston	DTI/2GB	CH 092908
Flash Disk	Kingston	DTI/1GB	CH 042007
SD Memory Card	SanDisk	128MB	AK0531802339D
MiniSD Memory Card	SanDisk	1024MB	BB063010TE
Headphone	COBY	C V-230	N/A
Headphone	Philips	N/A	N/A
Ipod classic	Apple	MB147CH	JQ74121YMV
Ipod classic	Apple	A1137	JQ63803RV9M
Ipod classic	Apple	A1137	5Z50163JXUY
Ipod shuffle	Apple	A1137	YM601DN0SZB
Ipod touch	Apple	A1288	1B9070RW203
Iphone	Apple	A1203	87810HJBWH8
Iphone 3GS	Apple	A1303	579C-A1303A
Television	TCL	1475S	N/A
Color monitor	Samsung	225MS	N/A

5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC (Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

- **Industry Canada (Registration No.: 4620B-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460 and C-2584)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460 and C-2584 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IEC 61010-1:2006-10 and Rules of procedure IEC 61010-2:2006-10, and the relevant IEC CB-Scheme Operational documents.



5.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.



6 Equipment Used during Test

Conducted Emission						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	N/A	N/A
EMC0118	Two-line v-netwok	R&S	ENV216	100359	2010-09-25	2011-09-25
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2009-11-24	2010-11-24
EMC0107	Coaxial Cable	SGS	2m	N/A	2009-11-25	2010-11-25
EMC0106	Voltage Probe	SGS	N/A	N/A	N/A	N/A
EMC0120	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	20550	2010-01-25	2011-01-25
EMC0121	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	20549	2010-01-25	2011-01-25
EMC0122	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	20548	2010-01-25	2011-01-25

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2010-09-06	2011-09-06
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2010-01-25	2011-01-25
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	10036	2010-06-02	2011-06-02
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	2009-12-09	2010-12-09
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2009-12-20	2010-12-20
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2009-12-20	2010-12-20
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2010-09-11	2011-09-11
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2010-01-25	2011-01-25
EMC0049	Amplifier	Agilent	8447D	2944A10862	2010-04-21	2011-04-21
EMC0075	310N Amplifier	Sonoma	310N	272683	2010-10-25	2011-10-25
EMC0523	Active Loop Antenna	EMCO	6502	42963	2010-11-17	2011-11-17
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2010-05-17	2011-05-17



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CE AT & Antenna Power						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	N/A	N/A
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2009-11-24	2010-11-24
EMC0107	Coaxial Cable	SGS	2m	N/A	2009-11-25	2010-11-25
EMC1704	Matching Pad	Rohde & Schwarz	RAM	100374	2010-09-22	2011-09-22
EMC1705	Matching Pad	Rohde & Schwarz	RAM	100394	2010-09-22	2011-09-22

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2009-12-16	2010-12-16
EMC0007	DMM	Fluke	73	70671122	2009-12-16	2010-12-16



7 Emission Test Results

7.1 Conducted Emissions Mains Terminals, 150 KHz to 30MHz

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4
Test Voltage: 120V AC, 60Hz
Test Date: 2010-11-01
Frequency Range: 150KHz to 30MHz
Detector: Peak for pre-scan
Quasi-Peak and Average at frequency with maximum peak
(9 kHz resolution bandwidth)
Class / Limit: Class B

Frequency range MHz	Class B 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 limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		
NOTE 2: The lower limit is applicable at the transition frequency.		

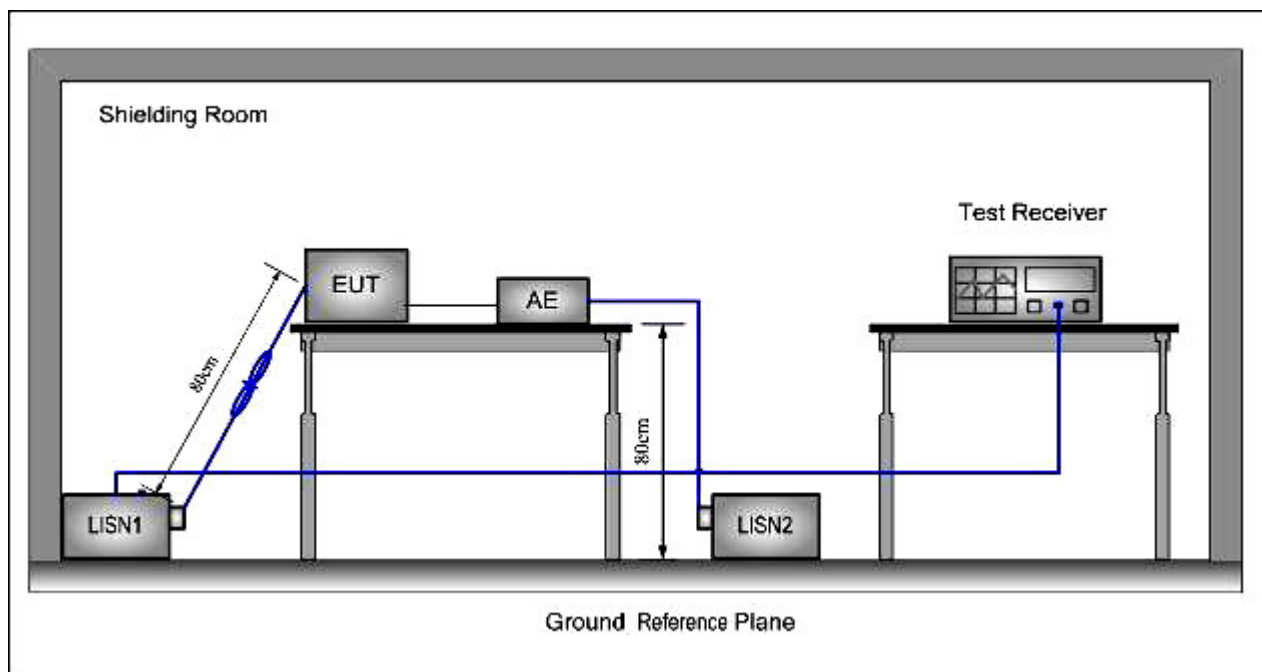
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C Humidity: 57 %RH Atmospheric Pressure: 1003 mbar

EUT Operation: Pre-test the EUT in DVB-C mode and NTSC mode, USB disk Play mode and PPV mode to find the worst case, compliance test the EUT in DVB-C mode as the worst case was found.

7.1.2 Test Setup and Procedure



1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

7.1.3 Measurement Data

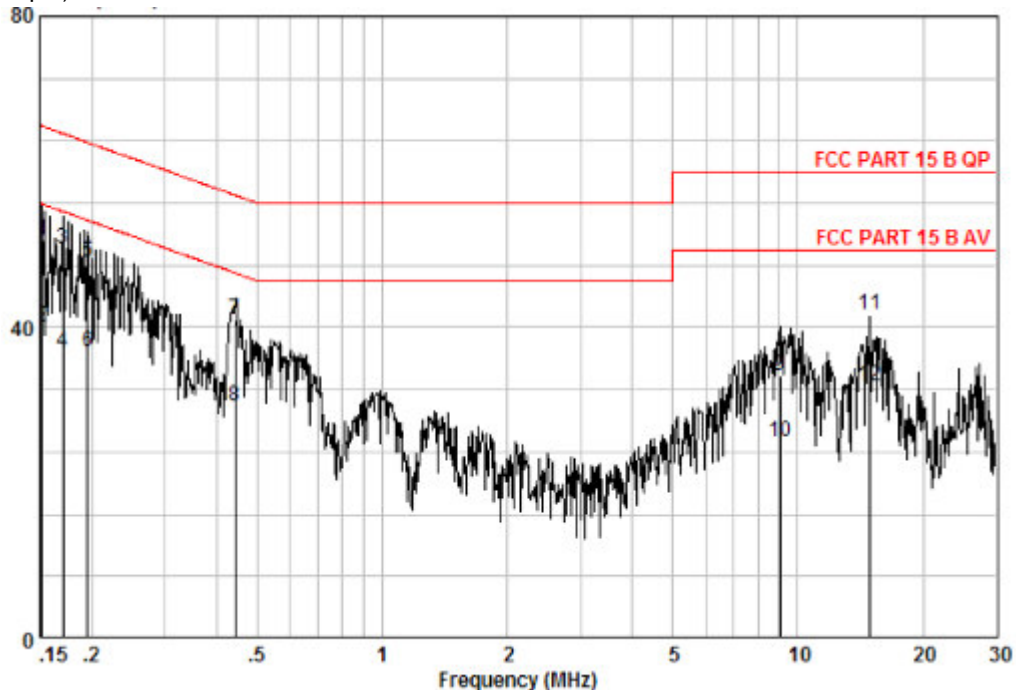
Pre-scan was performed with peak detected on both live and neutral cable. Quasi-peak & average measurements were performed at the frequencies which maximum peak emission level was detected.

Please see the attached Quasi-peak and Average test results.

Live Line:

Peak Scan:

Level (dBμV)



Quasi-peak and Average measurement

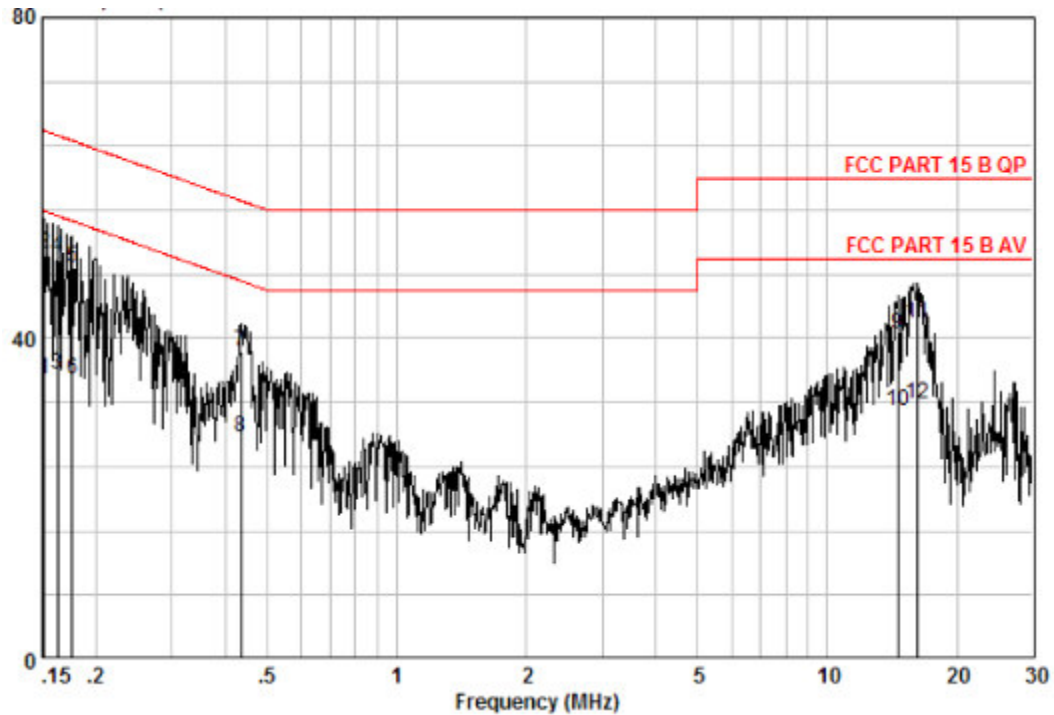
Freq	Read	Cable	LISN	Limit	Over	
MHz	Level	Loss	Factor	Line	Limit	Remark
	dBμV	dB	dB	dBμV	dB	
0.152	41.62	0.06	9.62	51.30	-14.61	QP
0.152	30.39	0.06	9.62	40.07	-15.84	AVERAGE
0.170	40.32	0.09	9.62	50.03	-14.91	QP
0.170	27.02	0.09	9.62	36.73	-18.21	AVERAGE
0.195	38.55	0.12	9.62	48.29	-15.51	QP
0.195	27.06	0.12	9.62	36.80	-17.00	AVERAGE
0.442	31.30	0.04	9.61	40.96	-16.07	QP
0.442	20.12	0.04	9.61	29.78	-17.25	AVERAGE
9.059	23.85	0.17	9.73	33.75	-26.25	QP
9.059	15.40	0.17	9.73	25.30	-24.70	AVERAGE
14.907	31.49	0.30	9.83	41.62	-18.38	QP
14.907	22.27	0.30	9.83	32.40	-17.60	AVERAGE

Level = Read Level + LISN Factor + Cable Loss.

Neutral Line:

Peak Scan:

Level (dBμV)



Quasi-peak and Average measurement:

Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
MHz	dBμV	dB	dB	dBμV	dBμV	dB	
0.152	25.12	0.06	9.64	34.82	55.91	-21.09	AVERAGE
0.152	40.82	0.06	9.64	50.52	65.91	-15.39	QP
0.162	25.79	0.08	9.63	35.50	55.34	-19.84	AVERAGE
0.162	40.38	0.08	9.63	50.09	65.34	-15.25	QP
0.176	39.16	0.10	9.63	48.89	64.68	-15.79	QP
0.176	25.11	0.10	9.63	34.84	54.68	-19.84	AVERAGE
0.435	28.78	0.04	9.63	38.45	57.15	-18.70	QP
0.435	18.08	0.04	9.63	27.75	47.15	-19.40	AVERAGE
14.594	30.35	0.29	9.88	40.52	60.00	-19.48	QP
14.594	20.70	0.29	9.88	30.87	50.00	-19.13	AVERAGE
16.140	31.66	0.34	9.91	41.91	60.00	-18.09	QP
16.140	21.66	0.34	9.91	31.91	50.00	-18.09	AVERAGE

Level = Read Level + LISN Factor + Cable Loss.



7.2 Radiated Emissions, 30MHz to 1GHz

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4
Test Voltage: 120V AC, 60Hz
Test Date: 2010-11-26
Frequency Range: 30MHz to 1GHz
Measurement Distance: 3 m
Detector: Peak for pre-scan
Quasi-Peak if maximised peak within 6dB of limit
(120 kHz resolution bandwidth)
Class / Limit: Class B

Frequency range MHz	Quasi-peak limits dB (μV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54
At transitional frequencies the lower limit applies.	

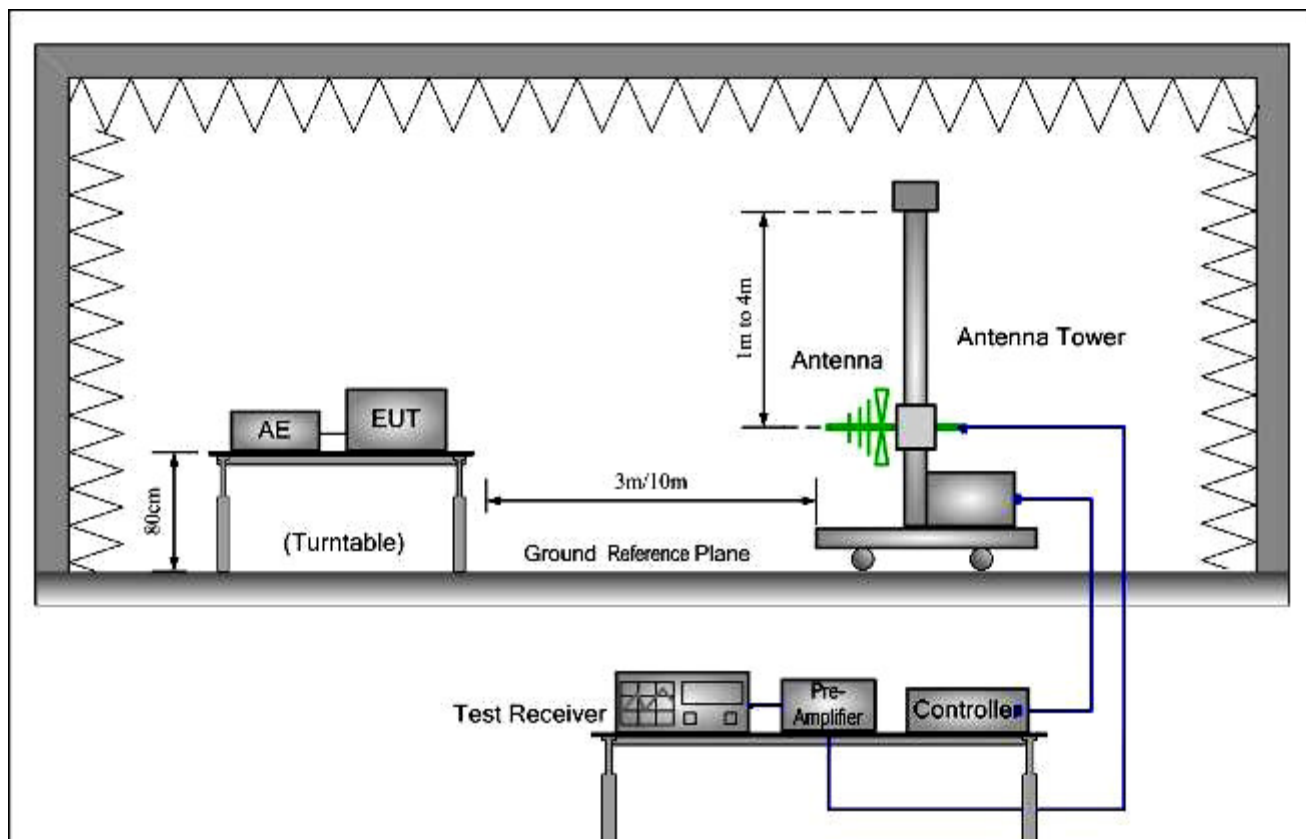
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C Humidity: 53 %RH Atmospheric Pressure: 1005 mbar

EUT Operation: Test the EUT in DVB-C mode (pre-test in all channels, compliance test in channel 21 as the worst case), NTSC mode (pre-test in all channels, compliance test in channel 2 as the worst case), USB disk Play mode and PPV mode.

7.2.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. Biconical and log periodic antenna was used for the frequency range from 30MHz to 1GHz
3. The EUT was connected to AC power source through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.



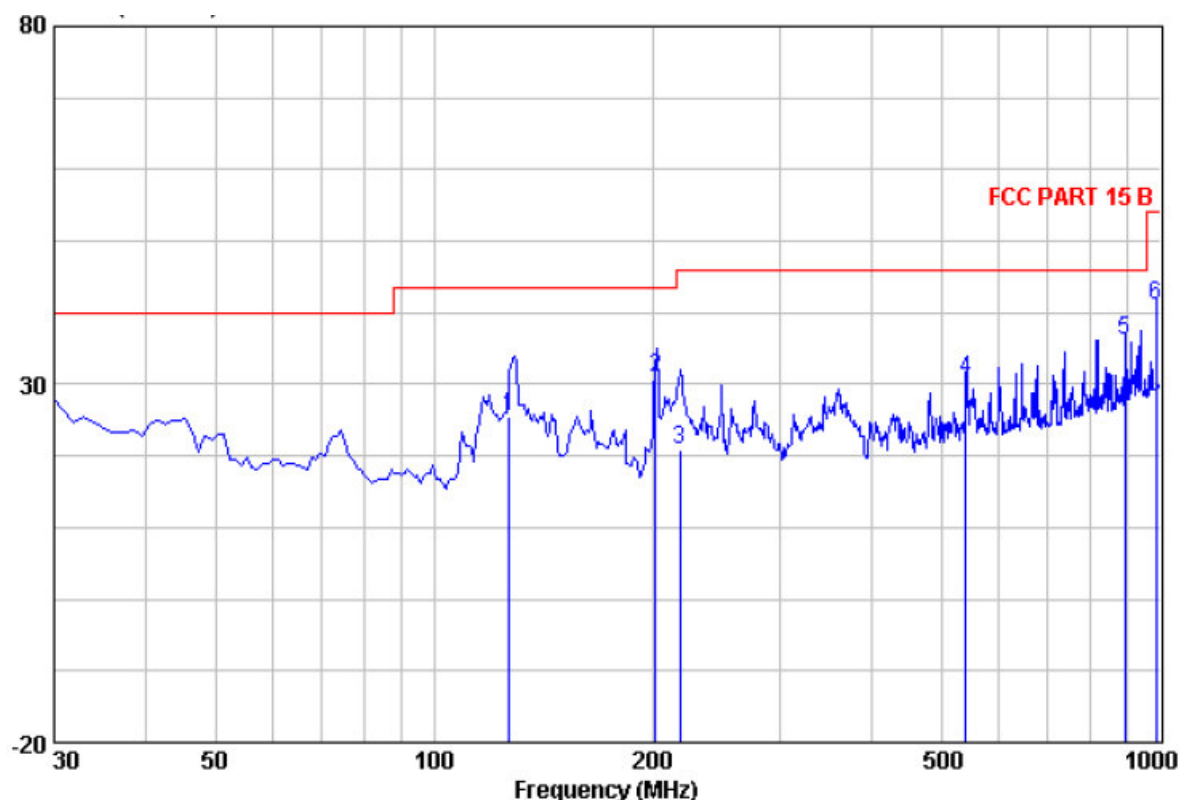
7.2.3 Measurement Data

DVB-C mode

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	Remark
MHz	Level	Factor	Loss	Factor	dBμV/m	Line	Limit	
	dBμV	dB/m	dB	dB		dBμV/m	dB	
127.000	40.50	11.76	0.90	27.53	25.63	43.50	-17.87	QP
201.690	46.90	9.98	1.30	27.24	30.95	43.50	-12.55	QP
218.180	36.43	10.40	1.30	27.20	20.92	46.00	-25.08	QP
539.250	40.05	16.91	2.00	28.18	30.78	46.00	-15.22	QP
894.270	41.24	19.09	2.60	26.79	36.15	46.00	-9.85	QP
987.390	44.61	20.55	2.80	26.92	41.04	54.00	-12.96	QP

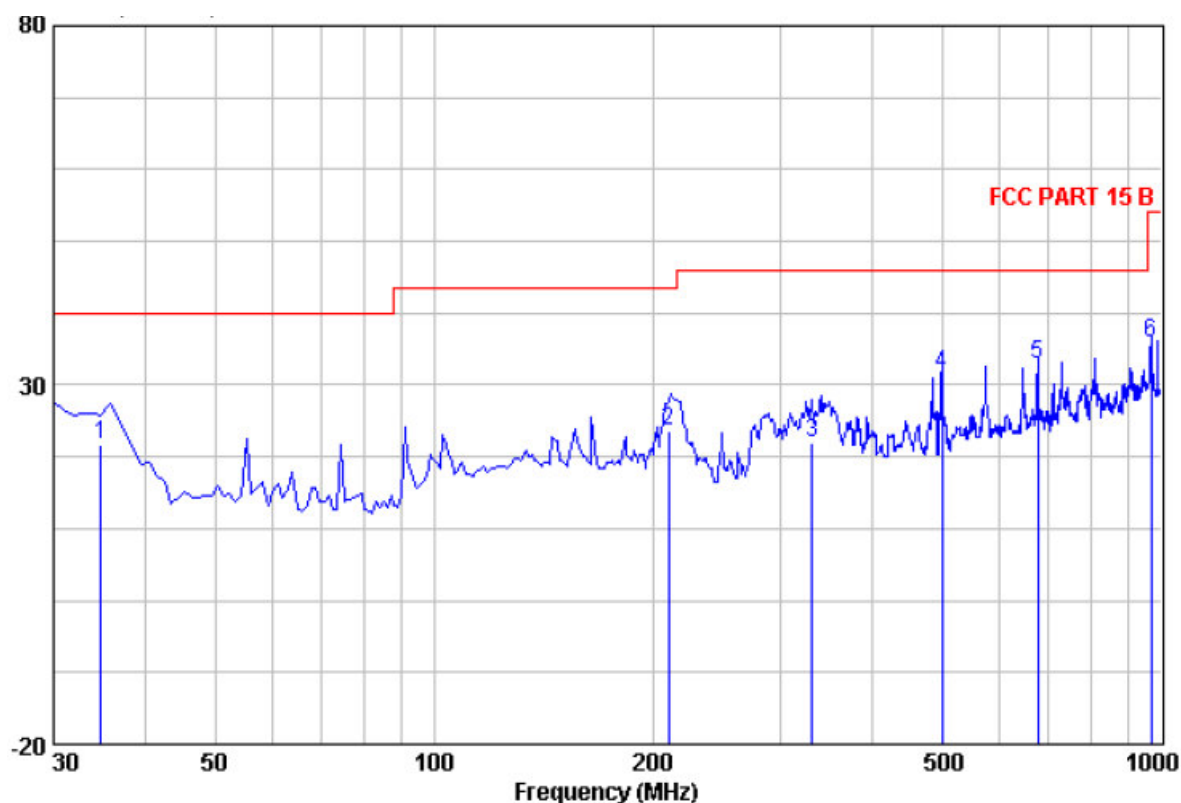
Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
34.850	29.06	20.07	0.50	27.91	21.73	40.00	-18.27	QP
210.420	39.23	10.23	1.30	27.22	23.55	43.50	-19.95	QP
330.700	34.35	13.26	1.60	27.31	21.91	46.00	-24.09	QP
499.480	42.25	15.30	2.00	28.04	31.51	46.00	-14.49	QP
676.020	40.55	18.03	2.40	27.99	32.99	46.00	-13.01	QP
967.020	39.92	20.20	2.70	26.87	35.95	54.00	-18.05	QP

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.

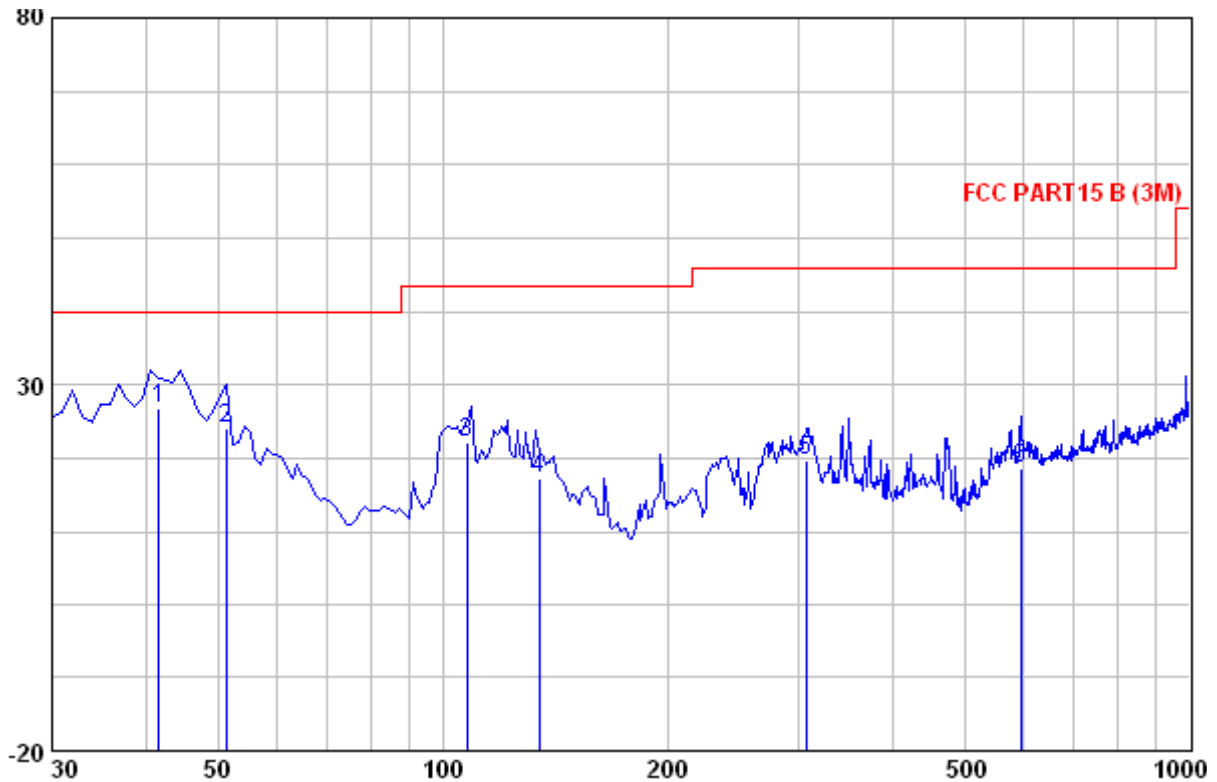


NTSC mode

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Limit Line	Level	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
41.640	44.01	11.88	0.60	29.50	40.00	26.99	-13.01	QP
51.340	45.50	7.53	0.70	29.51	40.00	24.23	-15.77	QP
107.600	39.68	11.32	0.90	29.70	43.50	22.20	-21.30	QP
134.760	34.68	11.30	1.00	29.70	43.50	17.28	-26.22	QP
306.450	34.86	12.84	1.60	29.60	46.00	19.70	-26.30	QP
594.540	27.19	18.50	2.40	29.40	46.00	18.69	-27.31	QP

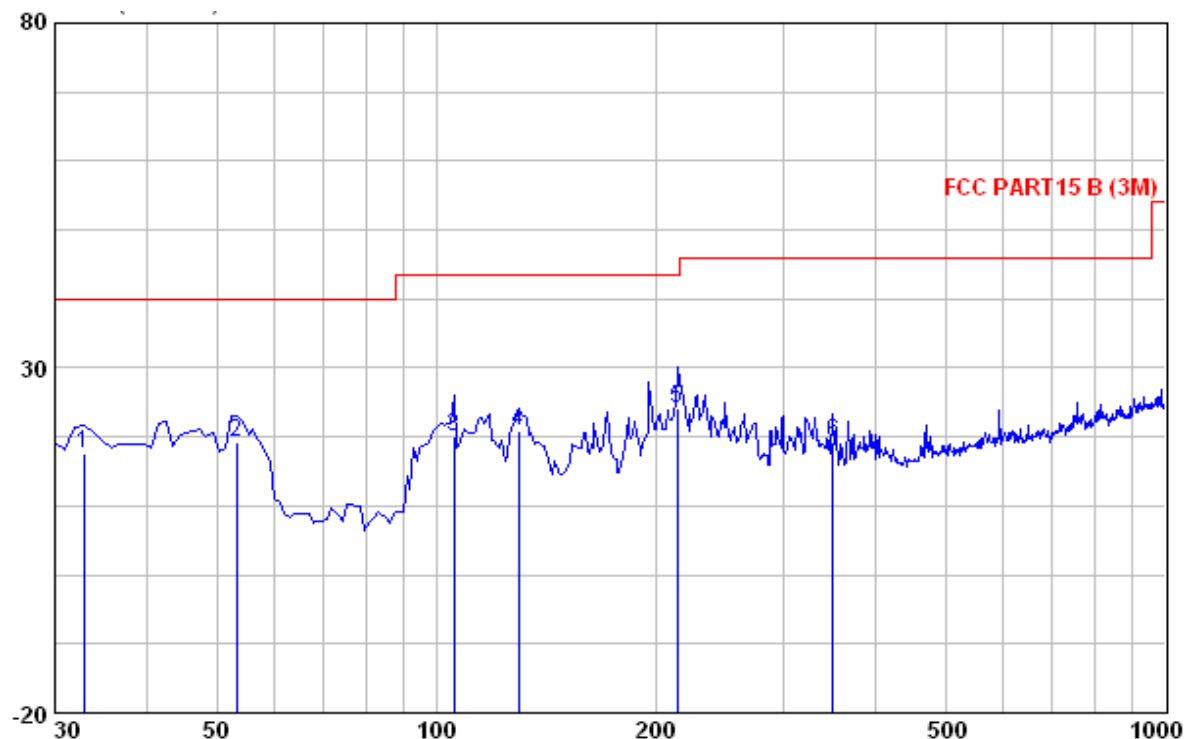
Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Limit Line	Over Level	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
32.910	30.14	16.69	0.40	29.50	40.00	17.72	-22.28	QP
53.280	41.03	6.90	0.70	29.52	40.00	19.11	-20.89	QP
105.660	37.77	11.17	0.90	29.70	43.50	20.14	-23.36	QP
129.910	37.91	11.80	0.90	29.70	43.50	20.91	-22.59	QP
214.300	42.96	9.35	1.30	29.52	43.50	24.10	-19.40	QP
350.100	32.82	14.30	1.70	29.60	46.00	19.22	-26.78	QP

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.

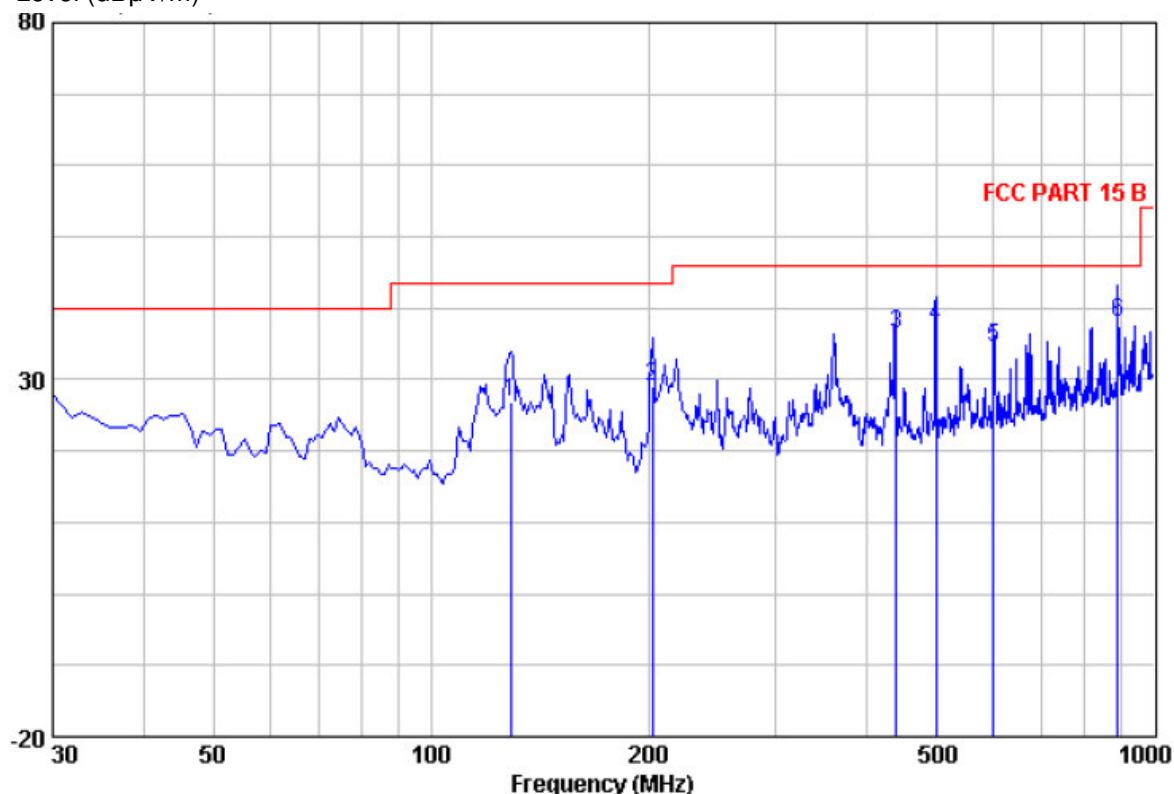


USB Disk Play mode

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
128.940	41.72	11.76	1.00	27.52	26.96	43.50	-16.54	QP
202.660	44.90	9.98	1.30	27.24	28.94	43.50	-14.56	QP
439.340	47.40	15.10	1.80	27.88	36.42	46.00	-9.58	QP
499.480	48.24	15.30	2.00	28.04	37.50	46.00	-8.50	QP
600.360	42.78	17.80	2.20	28.37	34.41	46.00	-11.59	QP
890.390	43.25	19.09	2.60	26.82	38.12	46.00	-7.88	QP

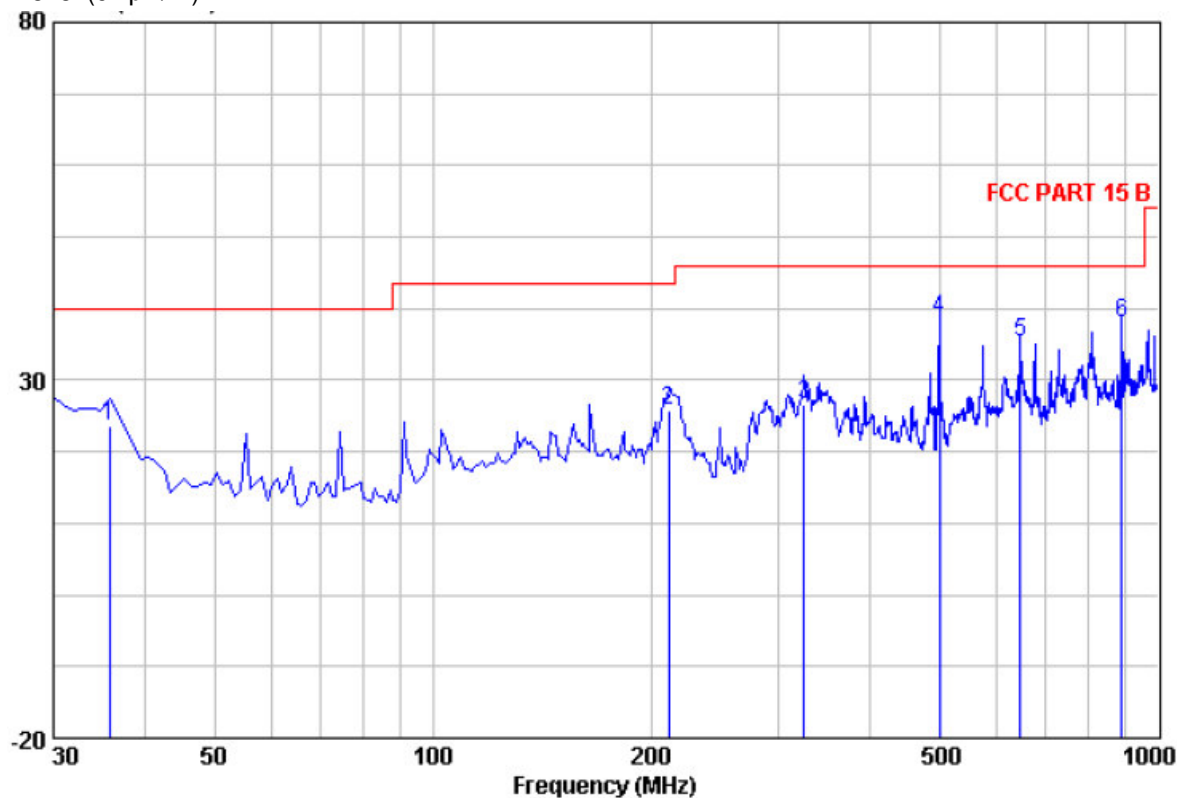
Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Horizontal:

Peak scan

Level (dB μ V/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
MHz	dB μ V	dB/m	dB	dB	dB μ V/m	dB μ V/m	dB	
35.820	30.84	20.07	0.50	27.91	23.50	40.00	-16.50	QP
211.390	41.40	10.23	1.30	27.22	25.72	43.50	-17.78	QP
324.880	39.04	13.22	1.60	27.27	26.59	46.00	-19.41	QP
499.480	49.25	15.30	2.00	28.04	38.51	46.00	-7.49	QP
644.980	43.45	17.93	2.20	28.14	35.44	46.00	-10.56	QP
891.360	43.21	19.09	2.60	26.79	38.11	46.00	-7.89	QP

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.

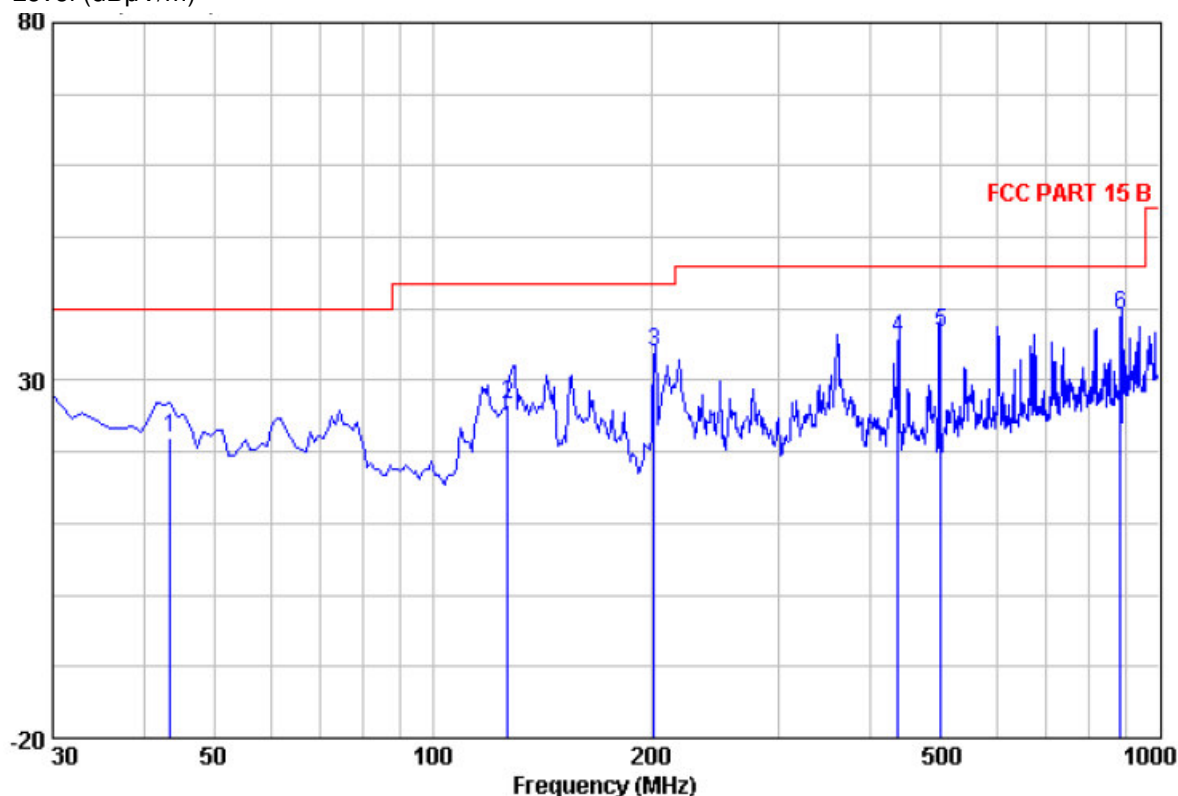


PPV mode

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
43.580	39.64	9.60	0.60	27.90	21.94	40.00	-18.06	QP
127.000	41.50	11.76	0.90	27.53	26.63	43.50	-16.87	QP
201.690	49.90	9.98	1.30	27.24	33.95	43.50	-9.55	QP
437.400	46.77	15.06	1.80	27.88	35.75	46.00	-10.25	QP
501.420	47.38	15.42	2.00	28.05	36.76	46.00	-9.24	QP
885.540	44.26	19.09	2.60	26.85	39.10	46.00	-6.90	QP

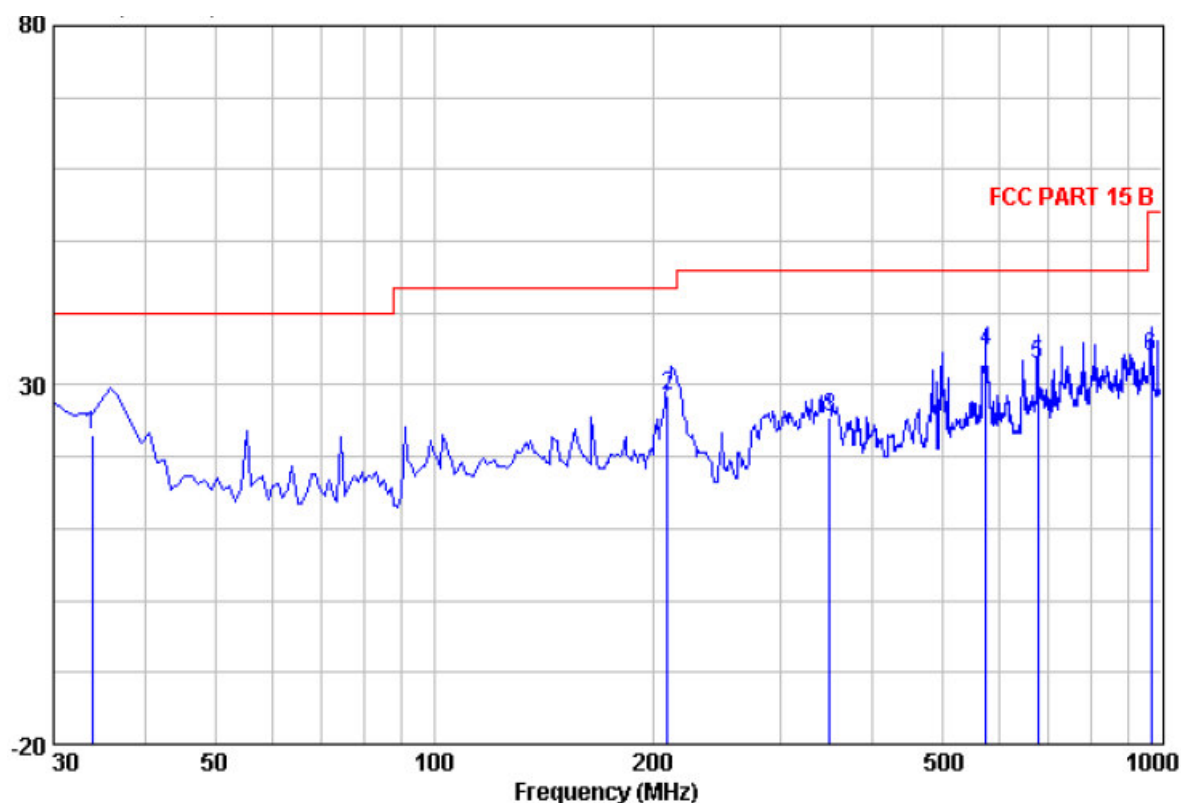
Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBμV	dB/m	dB	dB	dBμV/m	dBμV/m	dB	
33.880	28.12	22.23	0.50	27.90	22.95	40.00	-17.05	QP
209.450	44.29	10.15	1.30	27.22	28.52	43.50	-14.98	QP
350.100	37.89	13.43	1.70	27.45	25.57	46.00	-20.43	QP
573.200	43.30	17.59	2.10	28.30	34.69	46.00	-11.31	QP
676.020	40.55	18.03	2.40	27.99	32.99	46.00	-13.01	QP
967.020	37.92	20.20	2.70	26.87	33.95	54.00	-20.05	QP

Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.



7.3 Radiated Emissions above 1 GHz

Test Requirement: FCC Part15 B
Frequency Range: 1GHz to 40GHz
Measurement Distance: 3 m
Class / Limit: Class B
Test Date: N/A: See Remark Below

Remark:

There is no need for Radiated Emissions (above 1G) test to be performed on this product in accordance with FCC Part 15: 2009 because the highest internal source is less than 108 MHz.

For further details, please refer to Subject B section 15.33 (b) (1) of FCC Part 15 which states:

The spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement Range (MHz)
Below 1.705	30
1.705 to 108	1000
108 to 500	2000
500 to 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

7.4 Antenna Power, 30 MHz to 1 GHz

Test Requirement:	FCC PART 15, SUBPART B
Test Method:	Section 15.111
Test Voltage:	120V AC, 60Hz
Test Date:	2010-11-09
Frequency Range:	30 MHz to 1 GHz
Class / Limit:	Class B / 2 nW at 75 ohm terminal.
Detector:	Quasi-peak

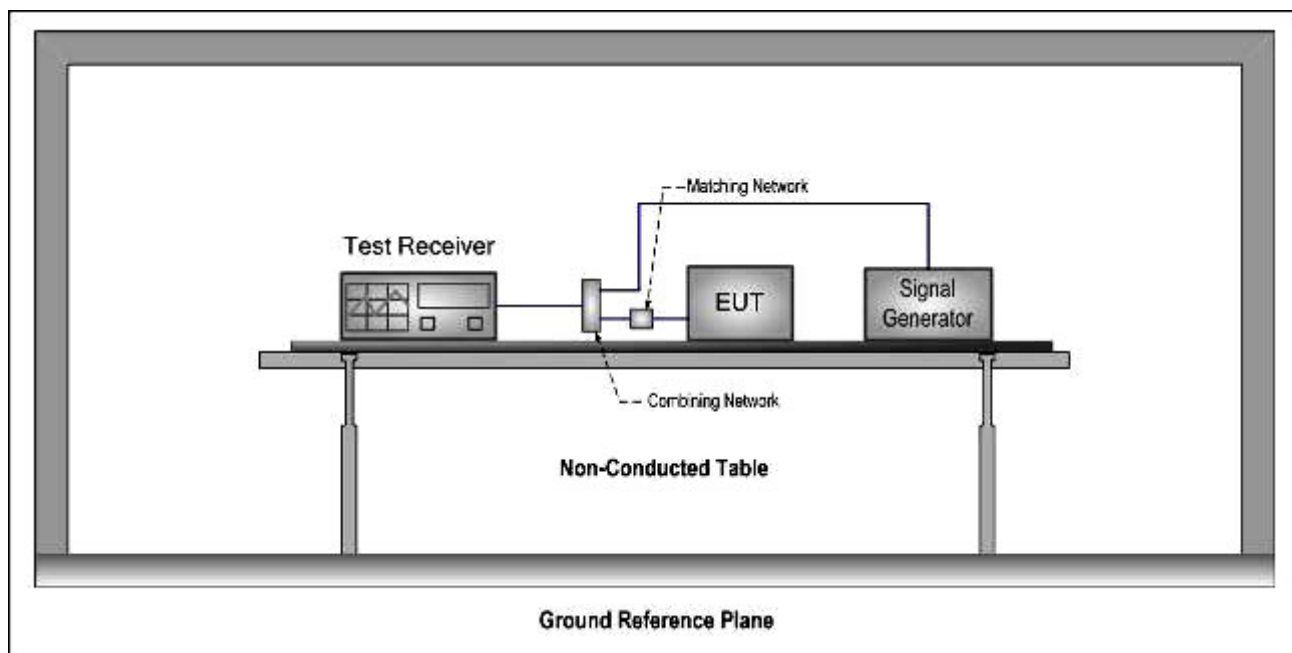
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 21.0 °C Humidity: 50% RH Atmospheric Pressure: 1008 mbar

EUT Operation: Test the EUT in DVB-C mode (pre-test in all channels, compliance test in channel 21 as the worst case), NTSC mode (pre-test in all channels, compliance test in channel 2 as the worst case).

7.4.2 Test Setup and Procedure



1. The antenna terminals of the EUT and the auxiliary signal generator are connected to the measuring set by means of coaxial cables and a resistive combining network having a minimum attenuation of 6dB.
2. The matching network is connected between the antenna terminals of the EUT and combining network to match the nominal impedance requirement.
3. The EUT was set to achieve the maximum disturbance.



7.4.3 Measurement Data

DVB-C mode:

Frequency (MHz)	Transducer (dB)	Receiver QP Reading (dBμV)	Receiver QP Level (dBμV)	Limit (dBμV)	Margin (dB)
123.450	22.1	14.5	36.6	51.8	15.2
245.650	22.3	13.8	36.1	51.8	15.7
326.100	22.4	3.5	26.3	51.8	25.5
465.660	22.4	2.0	24.4	51.8	27.4
543.500	22.4	4.1	26.5	51.8	25.3
652.200	22.3	1.8	24.3	51.8	27.5

NTSC mode:

Frequency (MHz)	Transducer (dB)	Receiver QP Reading (dBμV)	Receiver QP Level (dBμV)	Limit (dBμV)	Margin (dB)
145.34	22.2	12.3	34.5	51.8	17.3
243.43	22.6	14.6	37.2	51.8	14.6
345.33	22.4	6.30	28.7	51.8	23.1
467.34	22.4	4.50	26.9	51.8	24.9
576.34	22.4	5.20	27.6	51.8	24.2
687.22	22.3	2.60	24.9	51.8	26.9

Remark:

Effective limit voltage at 75ohm impedance: Ext (P X R) =387.3μV

Effective limit in dBμV=51.8dBμV

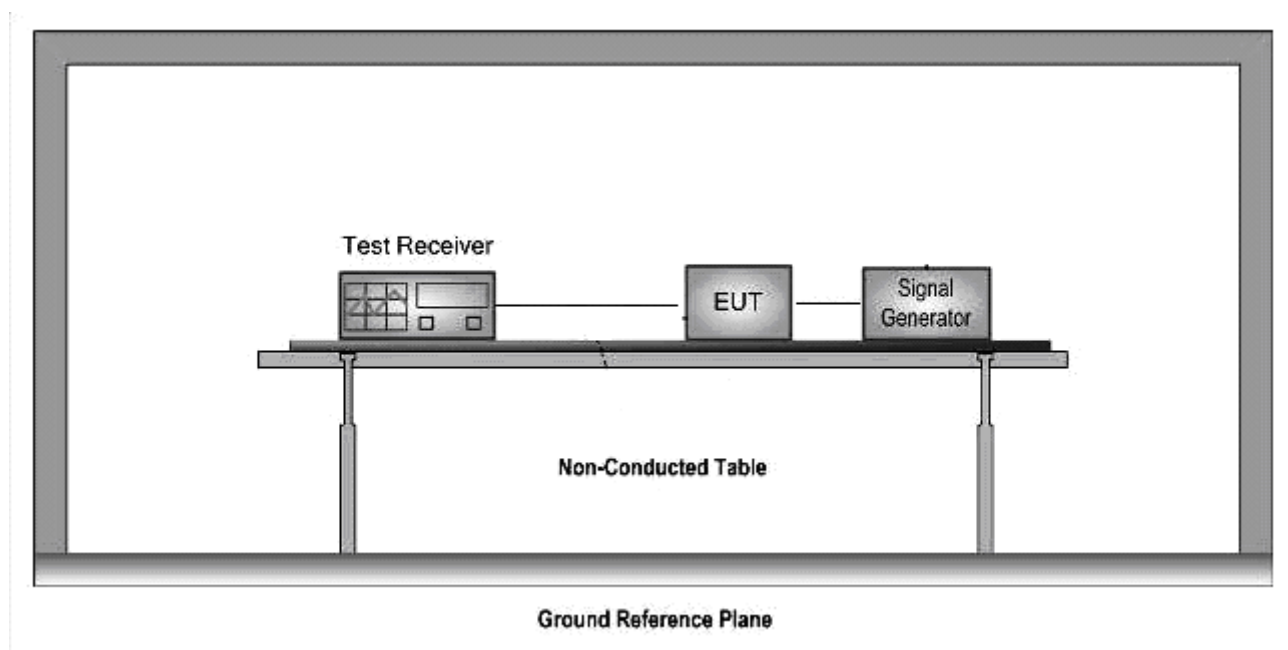
7.5 Output and Spurious conducted level at RF output terminal

Test Requirement: FCC PART 15, SUBPART B
 Test Method: Section 15.115
 Test Voltage: 120V AC, 60Hz
 Test Date: 2010-12-06
 Frequency Range: 4.6 MHz to 1 GHz
 Class / Limit: Class B
 70dBuV for Video and Antenna terminal
 57dBuV for Audio terminal
 Detector: RMS

7.5.1 E.U.T. Operation

Operating Environment:
 Temperature: 21.0 °C Humidity: 50 % RH Atmospheric Pressure: 1008 mbar
 EUT Operation: Pre-test the EUT in DVB-C mode and NTSC mode to find the worse case, compliance test the EUT in DVB-C mode as the worse case was found.

7.5.2 Test Setup and Procedure





1. Measurements shall be made of the levels of the aural carrier, visual carrier, and all spurious emissions for each TV channel on which the device operates.
2. Connect the output cable of the EUT to the measuring instrument using the length of interconnecting cable provided with the TV interface device, recommended in the instruction manual, or normally employed by the consumer. When the output cable is coaxial cable, measurements shall be made by direct connection to the measuring instrument with proper impedance matching between the measuring instrument and the EUT. If the output cable is a 300 Ω (twin-lead) transmission line, measurements are to be made through an appropriate balun with connecting cables kept as short as practical. It may be necessary to connect a high-gain, low-noise amplifier between the EUT and the measuring instrument to increase the signal-to-noise ratio of the signals being measured.
3. Support the cable between the EUT and the measuring instrument in a straight horizontal line so it has at least 75 cm clearance from any conducting surface. Terminate all unused inputs and outputs on the EUT antenna transfer switch with the proper impedance.
4. Turn on the EUT and allow a sufficient period of time for the unit to warm up to its normal operating condition. Provide the EUT with a typical signal consistent with normal operation. For each channel on which the device operates and in each mode in which the device operates, measure and record the level the video carrier, audio carrier, the three highest spurious emissions above the video carrier, and the three highest spurious emissions below the video carrier over the frequency range specified in the individual equipment requirements.



7.5.3 Measurement Data

For Antenna terminal:

Frequency (MHz)	Transducer (dB)	Receiver RMS Reading (dBμV)	Receiver RMS Level (dBμV)	Limit (dBμV)	Margin (dB)
5.54	0.4	14.5	14.9	70	-55.1
15.34	0.5	13.8	14.3	70	-55.7
26.98	0.6	16.3	16.9	70	-53.1
543.50	0.3	18.4	18.7	70	-51.3
653.78	0.4	14.6	15.0	70	-55.0
783.23	0.7	13.5	14.2	70	-55.8
474.00	0.4	15.1	15.5	70	-54.5

For Video terminal:

Frequency (MHz)	Transducer (dB)	Receiver RMS Reading (dBμV)	Receiver RMS Level (dBμV)	Limit (dBμV)	Margin (dB)
5.54	0.4	16.4	16.8	70	-53.2
15.34	0.5	12.5	13.0	70	-57.0
26.98	0.6	15.3	15.9	70	-54.1
543.50	0.3	14.3	14.6	70	-55.4
653.78	0.4	14.6	15.0	70	-55.0
783.23	0.7	15.8	16.5	70	-53.5
474.00	0.4	12.3	12.7	70	-57.3

For Audio terminal:

Frequency (MHz)	Transducer (dB)	Receiver RMS Reading (dBμV)	Receiver RMS Level (dBμV)	Limit (dBμV)	Margin (dB)
5.54	0.4	14.3	14.7	57	-42.3
15.34	0.5	13.8	14.3	57	-42.7
26.98	0.6	14.2	14.8	57	-42.2
543.50	0.3	15.8	16.1	57	-40.9
653.78	0.4	16.3	16.7	57	-40.3
783.23	0.7	14.5	15.2	57	-41.8
474.00	0.4	12.9	13.3	57	-43.7

7.6 Demonstration on internal preventing circuitry

Test Requirement: FCC PART 15, SUBPART B
 Test Method: Section 15.115
 Test Voltage: 120V AC, 60Hz
 Test Date: 2010-12-06
 Class / Limit: Class B
 Video input signal levels in the range of 1V to 5V

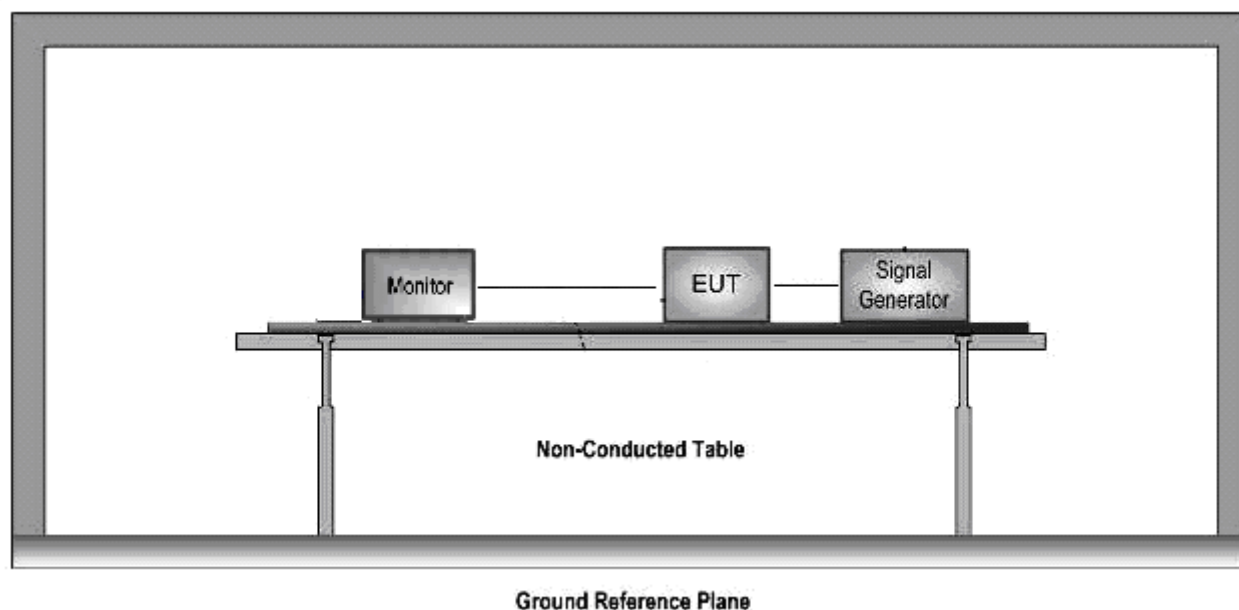
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 21.0 °C Humidity: 50 % RH Atmospheric Pressure: 1008 mbar

EUT Operation: Pre-test the EUT in DVB-C mode and NTSC mode to find the worse case, compliance test the EUT in DVB-C mode as the worse case was found.

7.6.2 Test Setup and Procedure





1. A TV interface device, including a cable system terminal device, shall incorporate circuitry to automatically prevent emanations from the device from exceeding the technical specifications in this Part. These circuits shall be adequate to accomplish their functions when the TV interface device is presented, if applicable, with video input signal levels in the range of one to five volts; this requirement is not applicable to a TV interface device that uses a built-in signal source and has no provisions for the connection of an external signal source. For devices that contain provisions for an external signal source but do not contain provisions for the input of an external baseband signal, e.g., some cable system terminal devices, compliance with the provisions of this paragraph shall be demonstrated with a radio frequency input signal of 0 to 25 dBmV.

7.6.3 Measurement

While the antenna port input with video signal levels in the range of one to five volts, there without anything noises appeared on the monitor, and the EUT was operated normally.

--End of Report--