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Report No.: SZEM110500012301
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FCC Test Report

Application No.: SZEM1105000123AV

**Applicant/ Manufacturer/
Factory:** Sandmartin (Zhong Shan) Electronic Co., Ltd.

**Address of Applicant/
Manufacturer/ Factory:** 3rd Industrial Area Tan Zhou, Zhong Shan, Guangdong, China

Equipment Under Test (EUT):

EUT Name: Digital Video Broadcasting

Item No.: CTG4-HD

FCC ID: YWRCTG4-HD

Standards: FCC PART15 SUBPART B:2010

Date of Receipt: 2011-05-09

Date of Test: 2011-05-09 to 2011-10-09

Date of Issue: 2011-11-08

Test Result :	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory 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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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.

2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART B: 2010	ANSI C63.4:2009	Class B	PASS
Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B: 2010	ANSI C63.4:2009	Class B	PASS
Radiated Emission above 1 GHz	FCC PART 15, SUBPART B: 2010	ANSI C63.4:2009	Class B	PASS
Antenna Power (30 MHz to 1 GHz)	FCC PART 15, SUBPART B: 2010	Section 15.111	Class B	PASS
Output and Spurious conducted level at RF output terminal	FCC PART 15, SUBPART B: 2010	Section 15.115	Class B	PASS
Demonstration on internal preventing circuitry	FCC PART 15, SUBPART B: 2010	Section 15.115	Class B	PASS

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4 General Information

4.1 Details of E.U.T.

Power Supply: Input : AC 120V 60Hz 20W
Test voltage : AC 120V 60Hz

4.2 Description of Support Units

None.

4.3 Standards Applicable for Testing

The customer requested FCC tests for Digital Video Broadcasting.
The standard used was FCC PART 15, SUBPART B, CLASS B.

4.4 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 556682, March 16, 2011

- **Industry Canada (IC)**

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

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

5 Equipments Used during Test

RE in Chamber					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2012-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2012-03-11
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	Coaxial cable	SGS	N/A	SEL0028	2012-05-29
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2011-11-09
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2012-05-26
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2011-11-09
8	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2011-11-09
9	Band filter	Amindeon	Asi 3314	SEL0094	2012-05-26
10	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2011-11-09
11	EMI Test Receiver (9K-3GHz)	Rohde & Schwarz	ESCI	SEL0175	2012-05-26

CE AT & Antenna Power					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date (YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	N/A
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2011-11-24
EMC0107	Coaxial Cable	SGS	2m	N/A	2012-07-18
EMC1704	Matching Pad	Rohde & Schwarz	RAM	100374	2011-10-25

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2012-06-10
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2011-10-26
3	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2012-01-17
4	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2012-01-17
5	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2012-01-17
6	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2012-05-26
7	Coaxial Cable	SGS	N/A	SEL0024	2012-05-29

General used equipment					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0102 to SEL0103	2011-11-04
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2012-03-10
3	Barometer	ChangChun	DYM3	SEL0088	2012-05-18

TS9980 test system					
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date (yyyy-mm-dd)
SEL0166	Shielding Room	ChangZhou ZhongYu	JB88	N/A	2012-06-10
SEL0143	Signal Generator 9 KHz ~ 2.2GHz	Rohde & Schwarz	SML02	101112	2011-11-25
SEL0135	Signal Generator 9 KHz ~ 1.1GHz	Rohde & Schwarz	SML01	102281	2011-11-01
SEL0144	Power Meter	Rohde & Schwarz	NRVS	100839	2011-11-01
SEL0137	RF Level Meter	Rohde & Schwarz	URV35	100193	2011-10-21
SEL0136	Audio Analyzer	Rohde & Schwarz	UPL	100855	2011-11-01
SEL0157	RF-Amplifier 150KHz ~150MHz	BONN Elektronik	BSA1515-25	035527-02	2012-03-11
SEL0167	Stripline Test Cell	Erika Fiedler	VDE0872	N/A	N/A
SEL0159	TV Test Transmitter	Rohde & Schwarz	SFM	100117	2012-05-26
SEL0138	TV Generator Pal	Rohde & Schwarz	SGPF	100103	2011-11-01
SEL0140	TV Generator Ntsc	Rohde & Schwarz	SGMF	100025	2011-11-01
SEL0139	TV Generator Secam	Rohde & Schwarz	SGSF	100033	2011-11-01
SEL0142	TV-Test Transmitter 0.3MHz ~ 3300MHz	Rohde & Schwarz	SFQ	100353	2011-11-01
SEL0141	MPEG2 Measurement Generator	Rohde & Schwarz	DVG	100223	2011-11-01
SEL0177	Spectrum Analyzer	Rohde & Schwarz	FSP	838498-001	2012-01-04
SEL0146	Matching Pad	Rohde & Schwarz	RAM	100394	N/A
SEL0148	Matching Pad	Rohde & Schwarz	RAM	100395	N/A
SEL0158	Absorbing Clamp	Rohde & Schwarz	MDS21	100137	2012-05-26
SEL0149	Coupling Set	Erika Fiedler	RCo, RCi, MC, AC, LC	N/A	N/A
SEL0150	Filters	Erika Fiedler	Sr, LBS	N/A	N/A
SEL0151	Matching Network	Erika Fiedler	MN, T1	N/A	N/A

6 Test Results

6.1 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4
Frequency Range: 150kHz to 30MHz
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit
Class / Limit: Class B
Remark: All input terminals and connectors had terminated in the proper impedance during test.

Frequency range MHz	Class B Limits	
	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.

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55 % RH Atmospheric Pressure: 1004 mbar

EUT Operation: Test in DVB mode, (pre-test was performed at DVB mode, NTSC mode, record mode and play with USB stick mode , completed test was conducted at DVB mode since it was the worst case), keep the EUT working with standard testing signal, pretest performed at low, middle and high channels DVB signal input and CH3,CH4 channels output, completed test was conducted at middle channel DVB signal input and CH3 channel output, since no worst case was found.

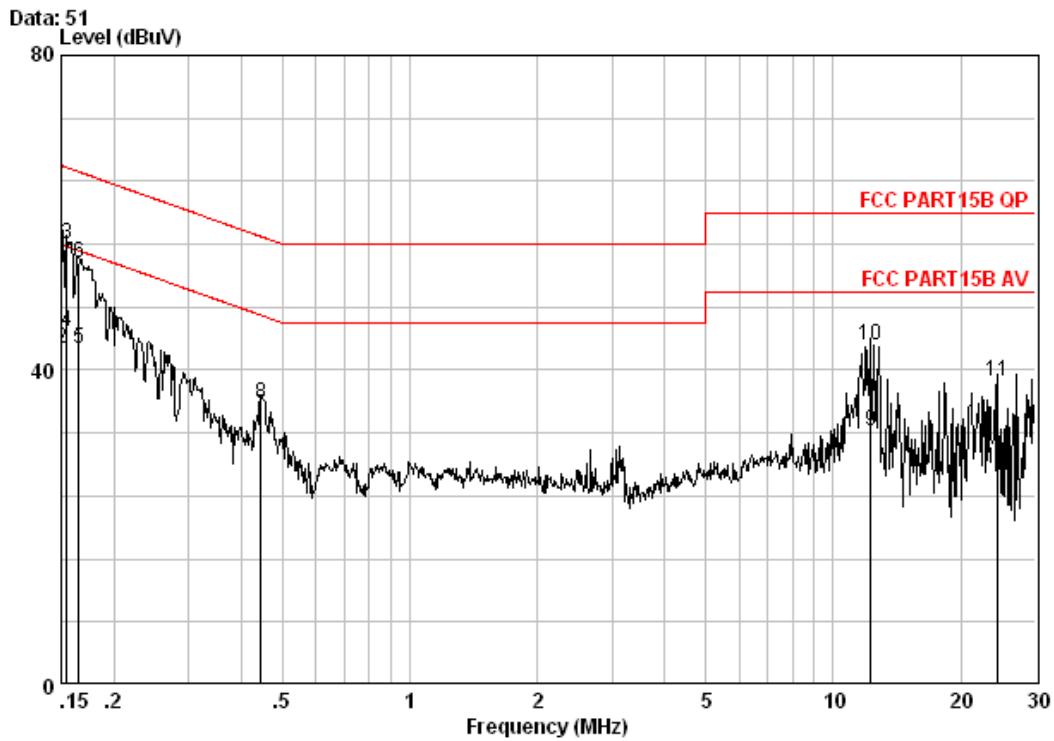
6.1.2 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

DVB mode

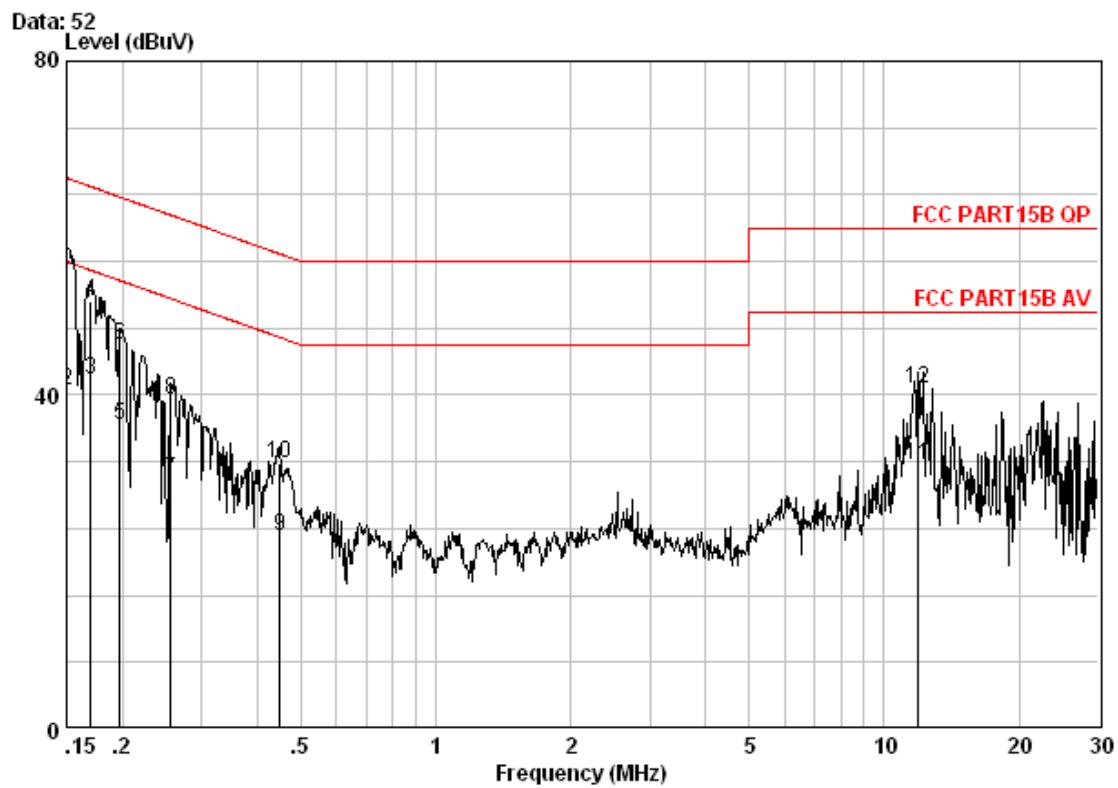
Neutral line:



Site : Shielding Room
 Condition : FCC PART15B QP CE-20101216 NEUTRAL
 Job No. : 0123AV
 MODE : DVB

Freq	Cable	LISN	Read	Limit	Over	Over	
	Loss	Factor	Level				Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0	0.15000	0.04	9.60	48.00	57.64	66.00 -8.36 QP
2		0.15000	0.04	9.60	33.00	42.64	56.00 -13.36 Average
3	0	0.15485	0.04	9.60	46.36	56.00	65.74 -9.73 QP
4		0.15485	0.04	9.60	35.20	44.84	55.74 -10.90 Average
5		0.16501	0.04	9.60	33.10	42.74	55.21 -12.47 Average
6		0.16501	0.04	9.60	43.92	53.56	65.21 -11.65 QP
7		0.44443	0.06	9.60	24.50	34.16	46.98 -12.82 Average
8		0.44443	0.06	9.60	26.19	35.85	56.98 -21.13 QP
9		12.253	0.23	9.90	22.20	32.33	50.00 -17.67 Average
10		12.253	0.23	9.90	32.93	43.06	60.00 -16.94 QP
11		24.400	0.29	10.10	28.13	38.52	60.00 -21.48 QP
12		24.400	0.29	10.10	17.00	27.39	50.00 -22.61 Average

Live line



Site : Shielding Room
 Condition : FCC PART15B QP CE-20101216 LINE
 Job No. : 0123AV
 MODE : DVB

	Freq	Cable	LISN	Read	Limit	Over	Remark
		MHz	dB	dB	dBuV	dBuV	dB
1	0	0.15000	0.04	9.60	48.20	57.84	66.00 -8.16 QP
2		0.15000	0.04	9.60	31.00	40.64	56.00 -15.36 Average
3		0.16944	0.04	9.60	32.30	41.94	54.99 -13.05 Average
4		0.16944	0.04	9.60	41.57	51.21	64.99 -13.78 QP
5		0.19758	0.04	9.60	26.80	36.44	53.71 -17.27 Average
6		0.19758	0.04	9.60	36.27	45.91	63.71 -17.80 QP
7		0.25615	0.05	9.60	20.20	29.85	51.56 -21.71 Average
8		0.25615	0.05	9.60	29.79	39.44	61.56 -22.12 QP
9		0.44916	0.06	9.60	13.50	23.16	46.89 -23.73 Average
10		0.44916	0.06	9.60	22.15	31.81	56.89 -25.08 QP
11		11.933	0.23	9.88	21.40	31.52	50.00 -18.48 Average
12		11.933	0.23	9.88	30.61	40.72	60.00 -19.28 QP



6.2 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	FCC Part15 B
Test Method:	ANSI C63.4
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 960MHz 54.0 dB μ V/m above 960MHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit
Remark:	All input terminals and connectors had terminated in the proper impedance during test.

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55 % RH Atmospheric Pressure: 1004 mbar

EUT Operation: Test in DVB mode, keep the EUT working with standard testing signal, pretest performed at low, middle and high channels DVB signal input and CH3,CH4 channels output, completed test was conducted at middle channel DVB signal input and CH3 channel output, since no worst case was found.

Test in Play with USB stick mode, Keep EUT playing with USB stick.

Test in NTSC mode, keep the EUT working with standard testing signal, pretest performed at CH3 and CH4 channels, completed test was conducted at CH3 channel, since no worst case was found.

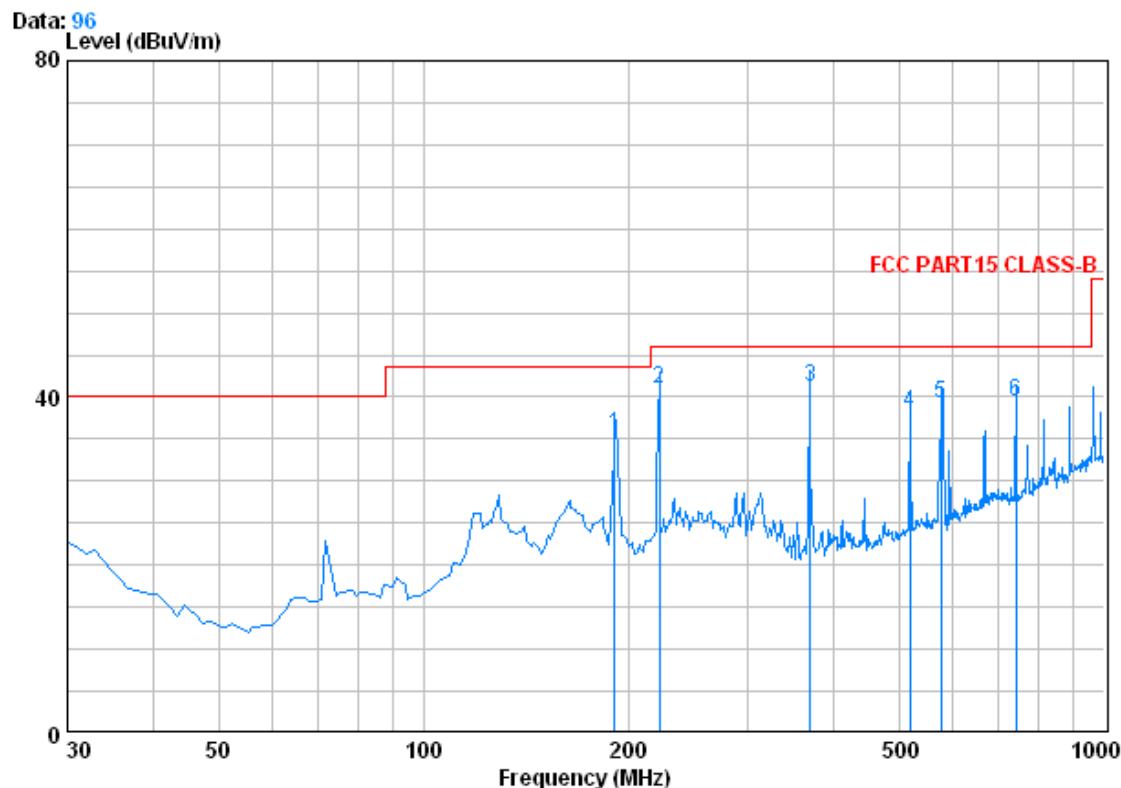
Test in record mode, keep EUT recording.

6.2.2 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

DVB mode

Horizontal



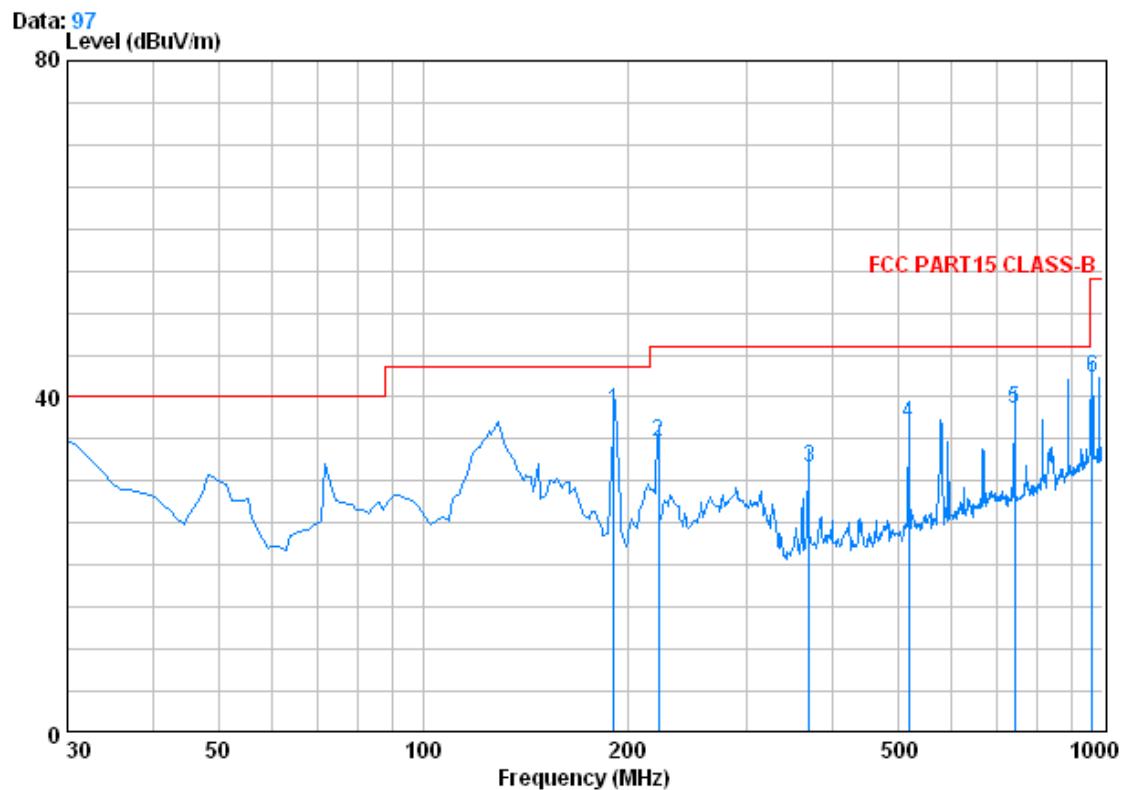
Condition : FCC PART15 CLASS-B 3m 0042673 HORIZONTAL

Job No. : 0123TX

Mode : DVB

Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	191.020	1.39	10.11	26.73	50.80	35.56	43.50	-7.94
2	222.060	1.53	11.34	26.62	54.78	41.03	46.00	-4.97
3	369.500	2.12	15.87	26.93	50.05	41.11	46.00	-4.89
4	517.910	2.62	18.34	27.67	44.80	38.09	46.00	-7.91
5	576.110	2.68	19.16	27.57	44.89	39.15	46.00	-6.85
6	741.980	3.03	21.67	27.36	42.01	39.35	46.00	-6.65

Vertical



Condition : FCC PART15 CLASS-B 3m 0042673 VERTICAL

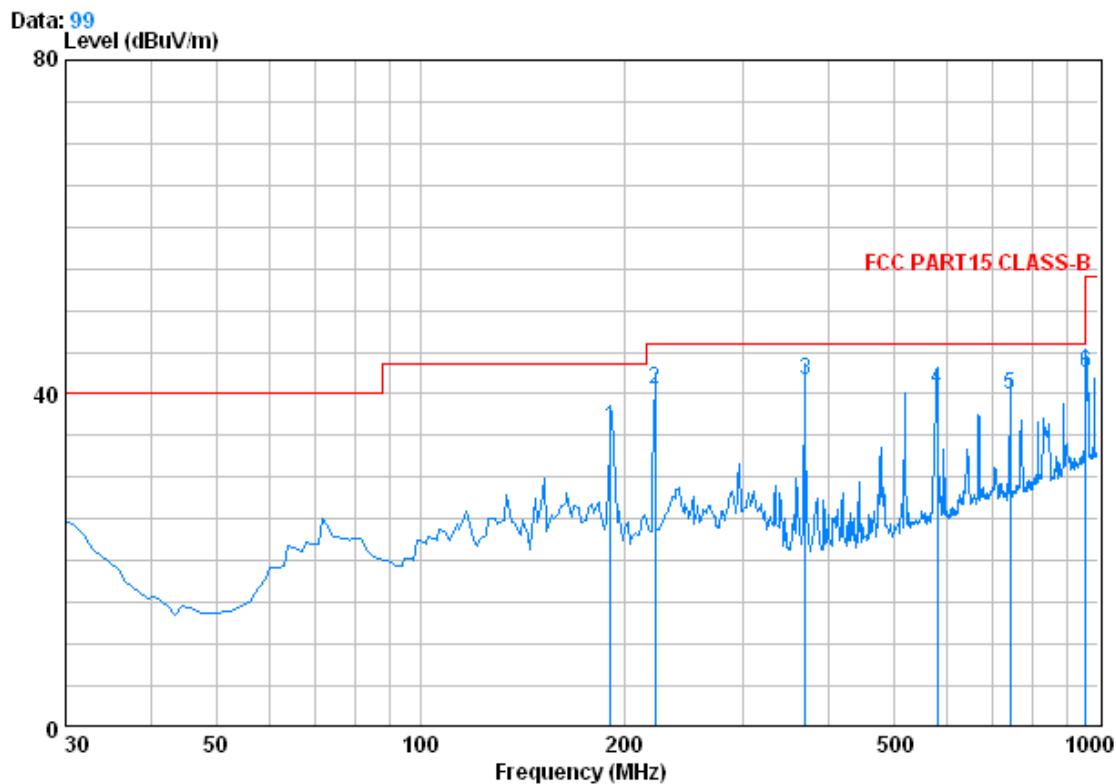
Job No. : 0123TX

Mode : DVB

Freq	Cable		Antenna	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	0	191.020	1.39	10.11	26.73	53.58	38.34	43.50	-5.16
2		222.060	1.53	11.34	26.62	48.38	34.63	46.00	-11.37
3		369.500	2.12	15.87	26.93	40.65	31.72	46.00	-14.28
4		517.910	2.62	18.34	27.67	43.61	36.90	46.00	-9.10
5		741.980	3.03	21.67	27.36	41.32	38.66	46.00	-7.34
6		964.110	3.67	23.70	26.47	41.33	42.22	54.00	-11.78

Play with USB stick mode

Horizontal



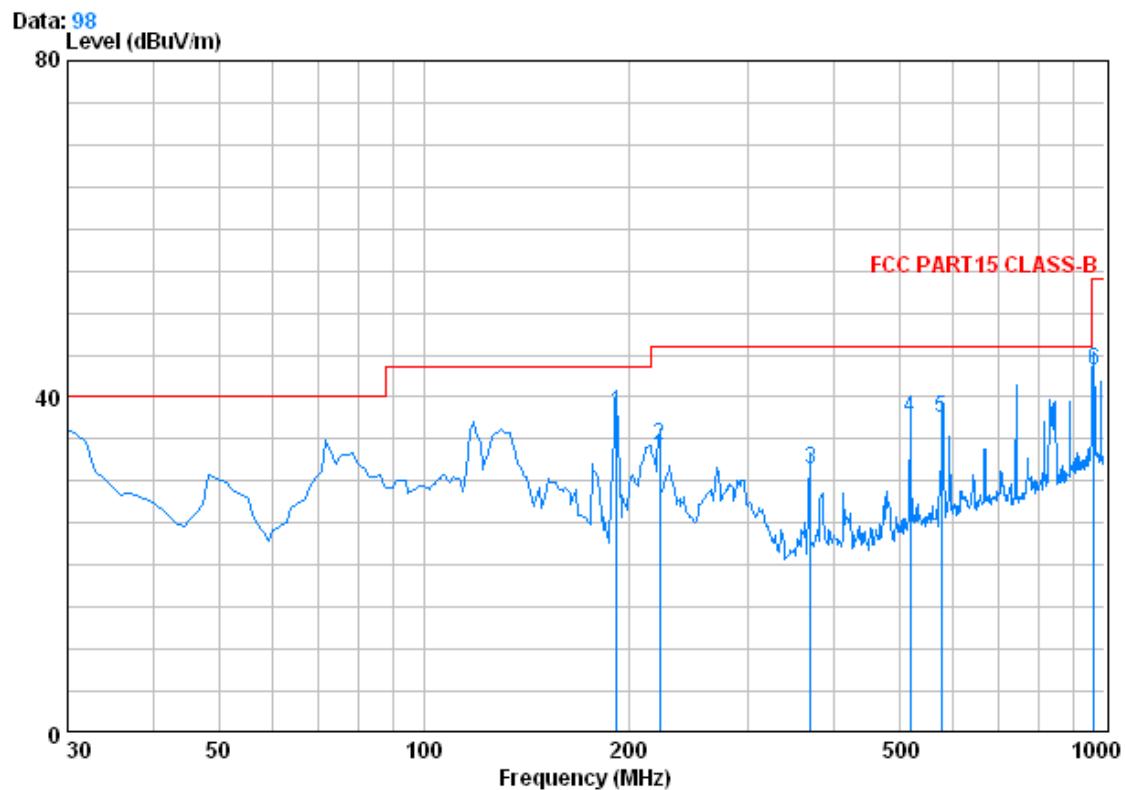
Condition : FCC PART15 CLASS-B 3m 0042673 HORIZONTAL

Job No. : 0123TX

Mode : Play with USB stick

Freq	Cable	Antenna	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level	Level	Line	Limit	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	191.020	1.39	10.11	26.73	51.25	36.01	43.50	-7.49
2	222.060	1.53	11.34	26.62	54.28	40.52	46.00	-5.48
3	369.500	2.12	15.87	26.93	50.59	41.65	46.00	-4.35
4	579.020	2.68	19.22	27.57	46.32	40.64	46.00	-5.36
5	741.980	3.03	21.67	27.36	42.47	39.81	46.00	-6.19
6	959.260	3.66	23.60	26.51	41.67	42.43	46.00	-3.57

Vertical



Condition : FCC PART15 CLASS-B 3m 0042673 VERTICAL

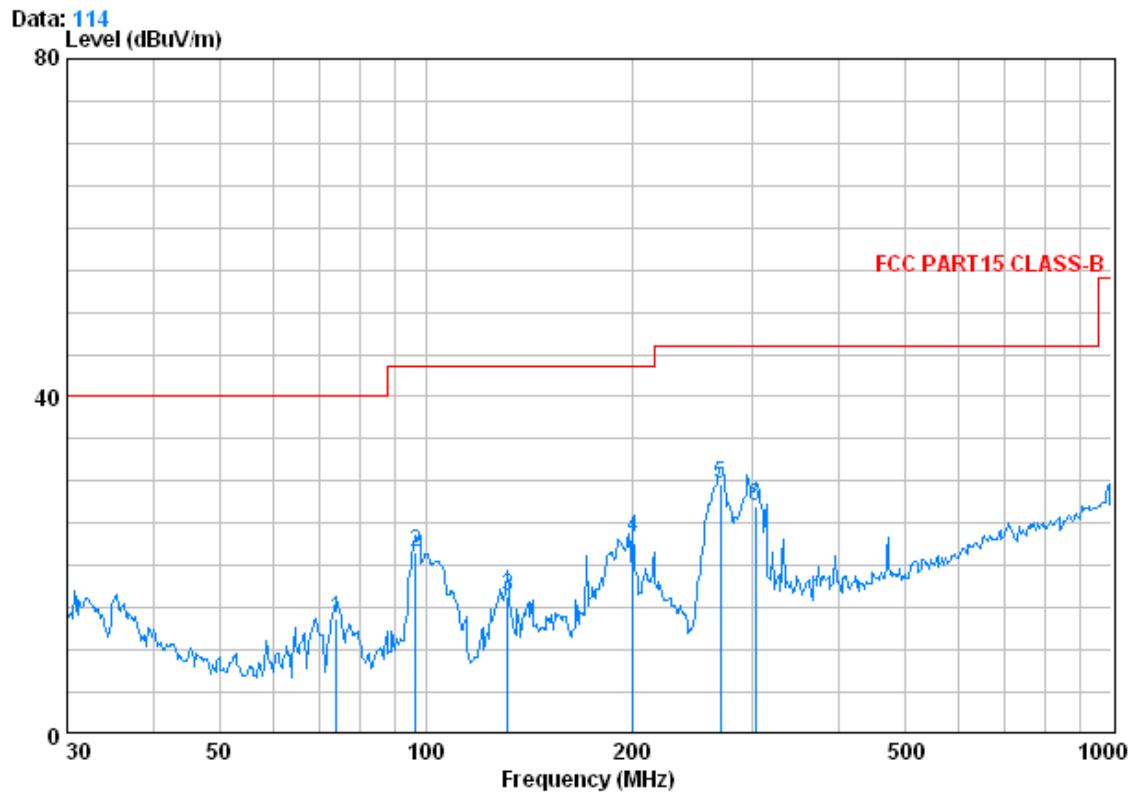
Job No. : 0123TX

Mode : Play with USB stick

Freq	Cable	Antenna	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	191.990	1.39	10.12	26.73	53.45	38.23	43.50	-5.27
2	222.060	1.53	11.34	26.62	48.03	34.28	46.00	-11.72
3	369.500	2.12	15.87	26.93	40.34	31.41	46.00	-14.59
4	517.910	2.62	18.34	27.67	44.10	37.39	46.00	-8.61
5	576.110	2.68	19.16	27.57	43.21	37.48	46.00	-8.52
6	964.110	3.67	23.70	26.47	42.35	43.25	54.00	-10.75

NTSC mode

Horizontal



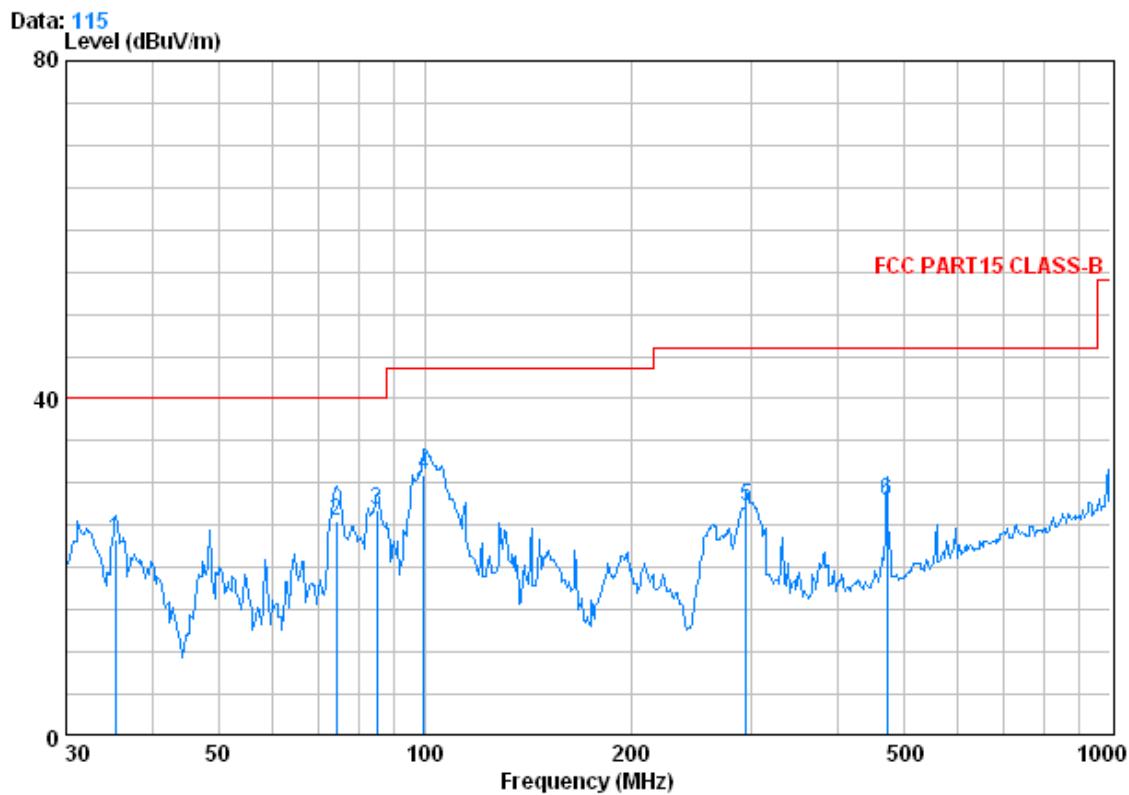
Condition : FCC PART15 CLASS-B 3m 0042673 HORIZONTAL

Job No. : 0123AV

Mode : NTSC

Freq	Cable		Antenna		Preamp	Read	Limit	Over
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	74.135	0.93	7.26	27.24	32.81	13.75	40.00	-26.25
2	96.775	1.17	8.98	27.20	38.61	21.55	43.50	-21.95
3	131.758	1.28	7.78	27.00	34.28	16.34	43.50	-27.16
4	200.688	1.40	10.24	26.70	38.42	23.37	43.50	-20.13
5	269.428	1.77	12.68	26.48	41.72	29.69	46.00	-16.31
6	302.481	1.91	13.99	26.42	37.47	26.94	46.00	-19.06

Vertical



Condition : FCC PART15 CLASS-B 3m 0042673 VERTICAL

Job No. : 0123AV

Mode : NTSC

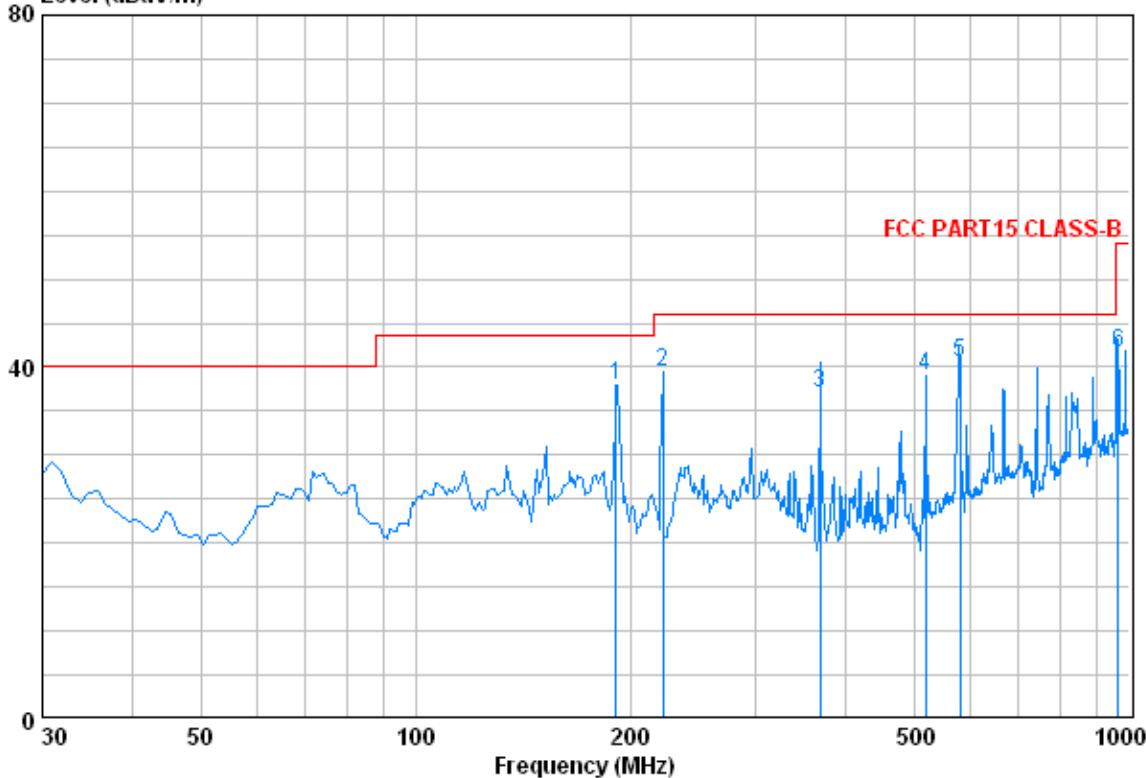
Freq	Cable		Antenna		Preamp		Read		Limit	Over
	Loss	Factor	Factor	Factor	Level	Level	Line	Limit		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m			dB
1	35.375	0.60	12.85	27.34	37.12	23.23	40.00	-16.77		
2 0	74.396	0.93	7.28	27.24	44.62	25.60	40.00	-14.40		
3 0	85.298	1.10	8.26	27.22	44.57	26.71	40.00	-13.29		
4 0	99.878	1.20	9.09	27.20	47.91	30.99	43.50	-12.51		
5	294.114	1.87	13.63	26.42	38.11	27.19	46.00	-18.81		
6	472.176	2.50	17.74	27.56	35.14	27.81	46.00	-18.19		

Record mode

Horizontal

Data: 193

Level (dBuV/m)



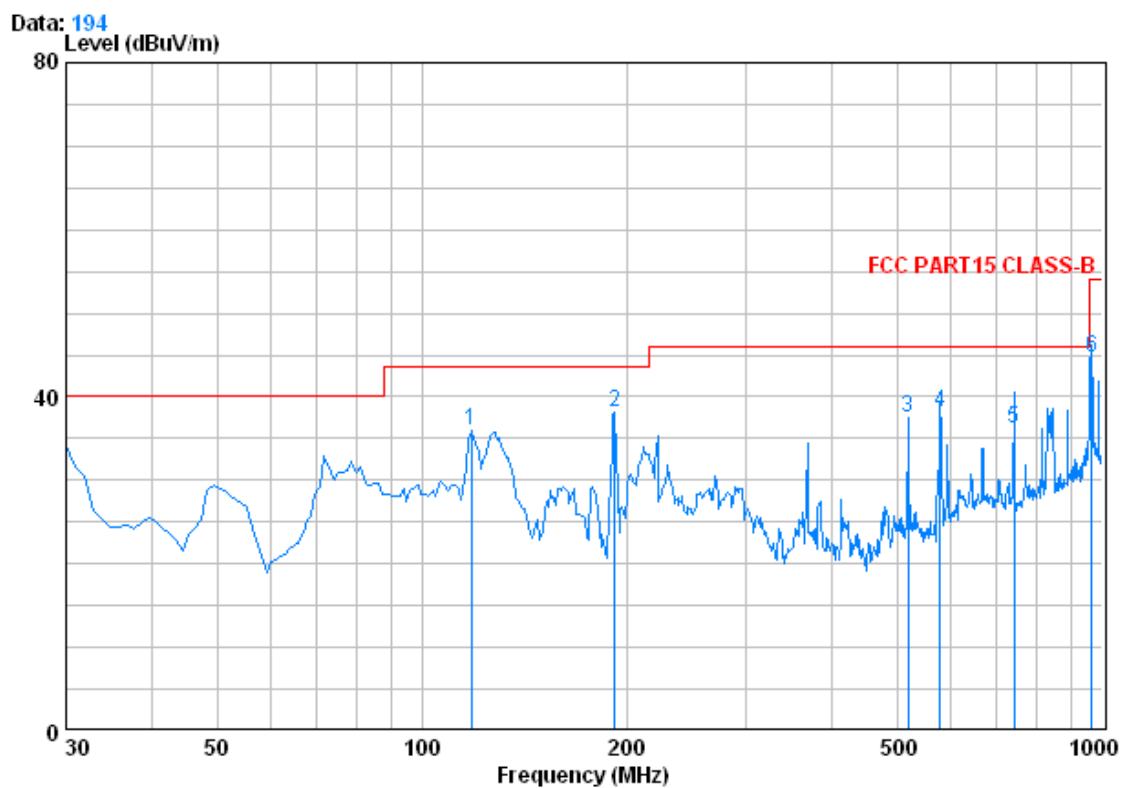
Condition : FCC PART15 CLASS-B 3m 0042673 HORIZONTAL

Job No. : 0123TX

Mode : Record

Freq	Cable	Antenna	Preamp	Read	Limit	Over		
	MHz	Loss	Factor	Level	Level	Line	Limit	
	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	191.020	1.39	10.11	26.73	53.25	38.01	43.50	-5.49
2	222.060	1.53	11.34	26.62	53.28	39.52	46.00	-6.48
3	368.530	2.11	15.84	26.93	46.04	37.07	46.00	-8.93
4	517.910	2.62	18.34	27.67	45.78	39.07	46.00	-6.93
5	579.020	2.68	19.22	27.57	46.32	40.64	46.00	-5.36
6	965.080	3.67	23.70	26.47	40.70	41.60	54.00	-12.40

Vertical



Condition : FCC PART15 CLASS-B 3m 0042673 VERTICAL

Job No. : 0123TX

Mode : Record

Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level		Limit Line	Over Limit
				Level	Level		
1	118.270	1.25	8.02	27.08	53.83	36.02	43.50
2	191.990	1.39	10.12	26.73	53.45	38.23	43.50
3	517.910	2.62	18.34	27.67	44.10	37.39	46.00
4	577.080	2.68	19.16	27.57	43.87	38.14	46.00
5	741.010	3.03	21.67	27.36	38.74	36.08	46.00
6	965.080	3.67	23.70	26.47	43.81	44.71	54.00

6.3 Radiated Emissions above 1 GHz

Test Requirement: FCC Part15 B
Frequency Range: 1GHz to 40GHz
Measurement Distance: 3 m
Class / Limit: Class B

Detector:	Frequency	Detector	RBW	VBW	Remark
Above 1GHz	Peak	1MHz	1MHz	Peak Value	
	Peak	1MHz	10Hz	Average Value	

Test Date: N/A: See Remark Below

Remark:

All input terminals and connectors had terminated in the proper impedance during test.

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

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55% RH Atmospheric Pressure: 1004 mbar

EUT Operation: Test in DVB mode, Keep EUT working with standard testing signal, pretest performed at low, middle and high channels DVB signal input and CH3,CH4 channels output, completed test was conducted at middle channel DVB signal input and CH3 channel output, since no worst case was found.

Test in Play with USB stick mode, Keep EUT playing with USB stick.

Test in NTSC mode, keep the EUT working with standard testing signal, pretest performed at CH3 and CH4 channels, completed test was conducted at CH3 channel, since no worst case was found.

Test in record mode, keep EUT recording.

6.3.2 Measurement Data



DVB mode

Horizontal

Data: 4

Level (dBuV/m)

100

50

0

FCC PART15(>1G) PK

FCC PART15 (>1G) AV

1000

1200

1500

2000

5000

Frequency (MHz)

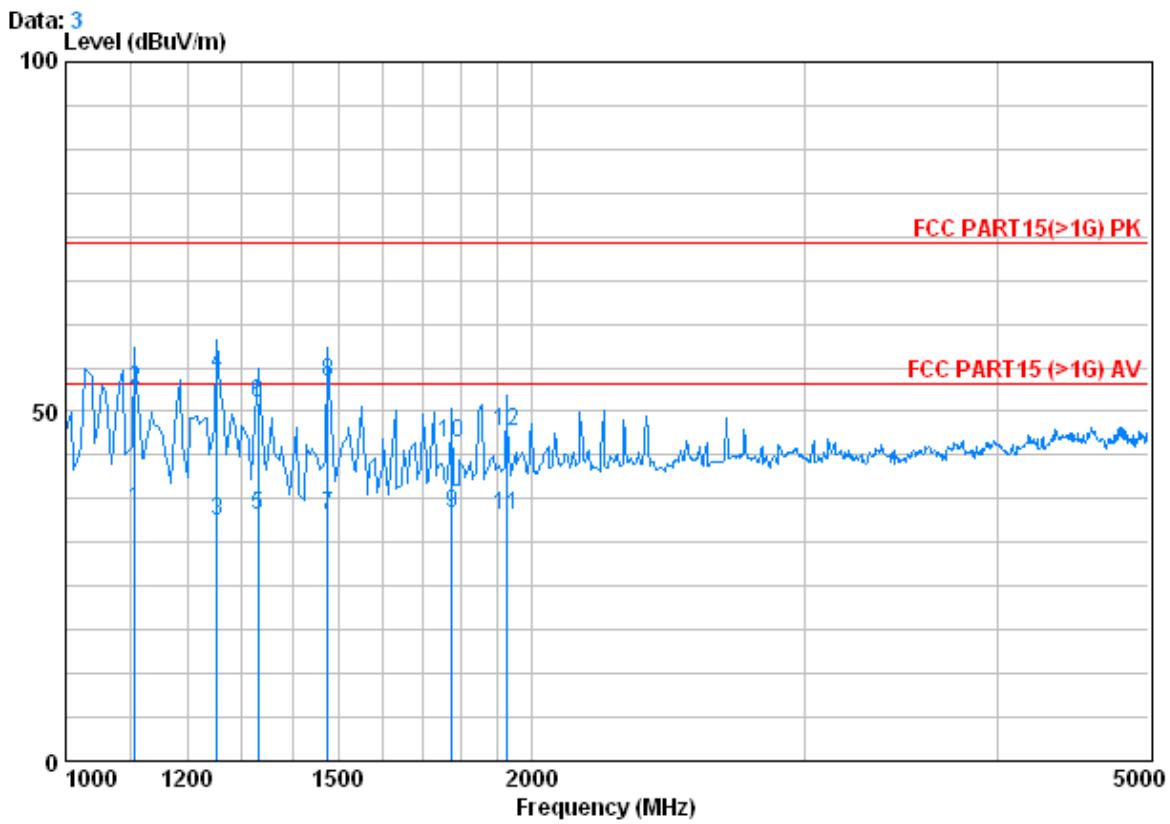
Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 0123AV

Mode : DVB

Freq	Cable	Antenna	Preamp	Read	Limit	Over	Remark	
	Loss	Factor	Factor	Level	Level	Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1108.000	2.27	27.39	39.19	45.09	35.56	54.00	-18.44 Average
2	1108.000	2.27	27.39	39.19	65.09	55.56	74.00	-18.44 Peak
3	1252.000	2.36	27.67	39.25	48.63	39.42	54.00	-14.58 Average
4	1252.000	2.36	27.67	39.25	62.63	53.42	74.00	-20.58 Peak
5	1332.000	2.41	27.82	39.28	49.48	40.43	54.00	-13.57 Average
6	1332.000	2.41	27.82	39.28	64.48	55.43	74.00	-18.57 Peak
7	1476.000	2.50	28.07	39.34	45.42	36.64	54.00	-17.36 Average
8	1476.000	2.50	28.07	39.34	61.42	52.64	74.00	-21.36 Peak
9	1776.000	2.70	30.20	39.47	42.07	35.49	54.00	-18.51 Average
10	1776.000	2.70	30.20	39.47	58.07	51.49	74.00	-22.51 Peak
11	1856.000	2.74	30.69	39.51	41.31	35.24	54.00	-18.76 Average
12	1856.000	2.74	30.69	39.51	56.31	50.24	74.00	-23.76 Peak

Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

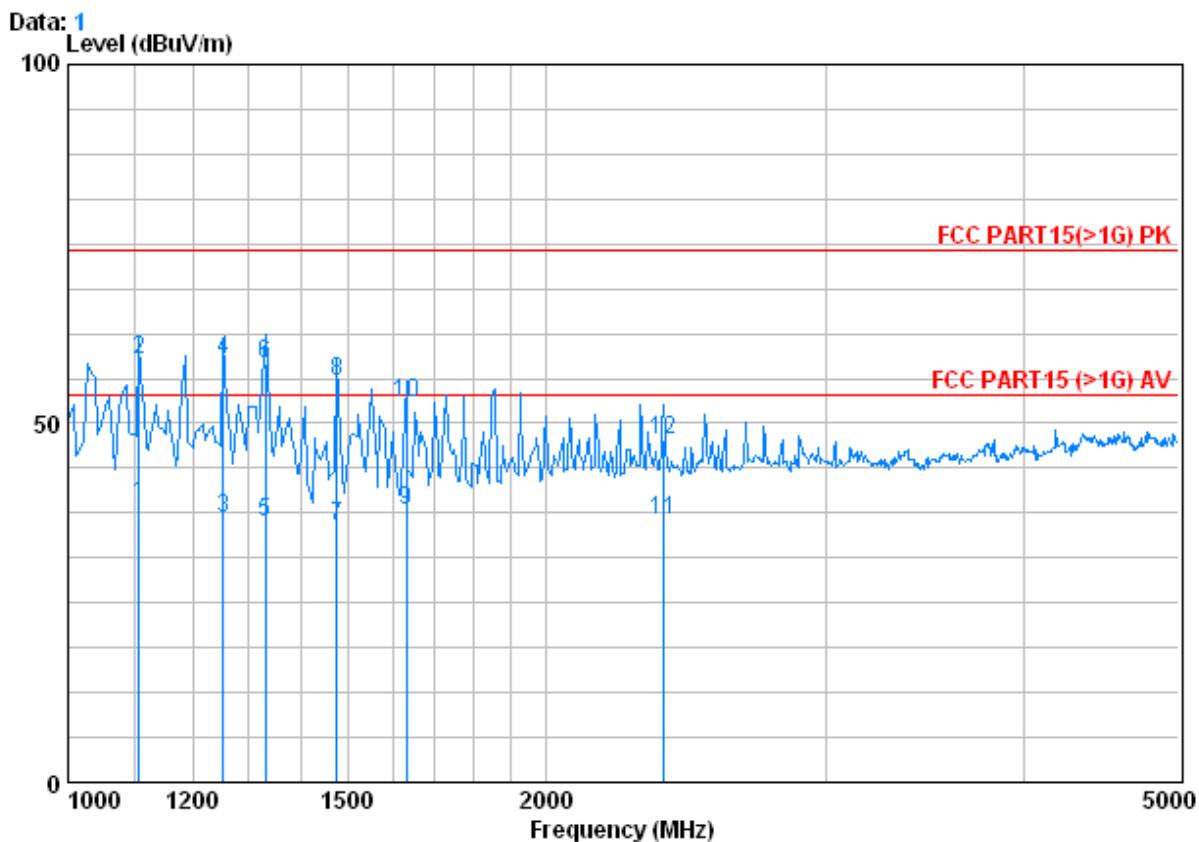
Job No. : 0123AV

Mode : DVB

Freq	Cable		Antenna	Preamp	Read	Limit	Over	Remark
	MHz	dB	Loss	Factor	Level			
1	1108.000	2.27	27.39	39.19	45.57	36.03	54.00	-17.97 Average
2	1108.000	2.27	27.39	39.19	62.57	53.03	74.00	-20.97 Peak
3	1252.000	2.36	27.67	39.25	43.49	34.27	54.00	-19.73 Average
4	1252.000	2.36	27.67	39.25	64.49	55.27	74.00	-18.73 Peak
5	1332.000	2.41	27.82	39.28	44.31	35.26	54.00	-18.74 Average
6	1332.000	2.41	27.82	39.28	60.31	51.26	74.00	-22.74 Peak
7	1476.000	2.50	28.07	39.34	43.98	35.20	54.00	-18.80 Average
8	1476.000	2.50	28.07	39.34	62.98	54.20	74.00	-19.80 Peak
9	1776.000	2.70	30.20	39.47	41.97	35.39	54.00	-18.61 Average
10	1776.000	2.70	30.20	39.47	51.97	45.39	74.00	-28.61 Peak
11	1924.000	2.79	31.18	39.54	40.80	35.24	54.00	-18.76 Average
12	1924.000	2.79	31.18	39.54	52.80	47.24	74.00	-26.76 Peak

Play with USB stick mode

Horizontal



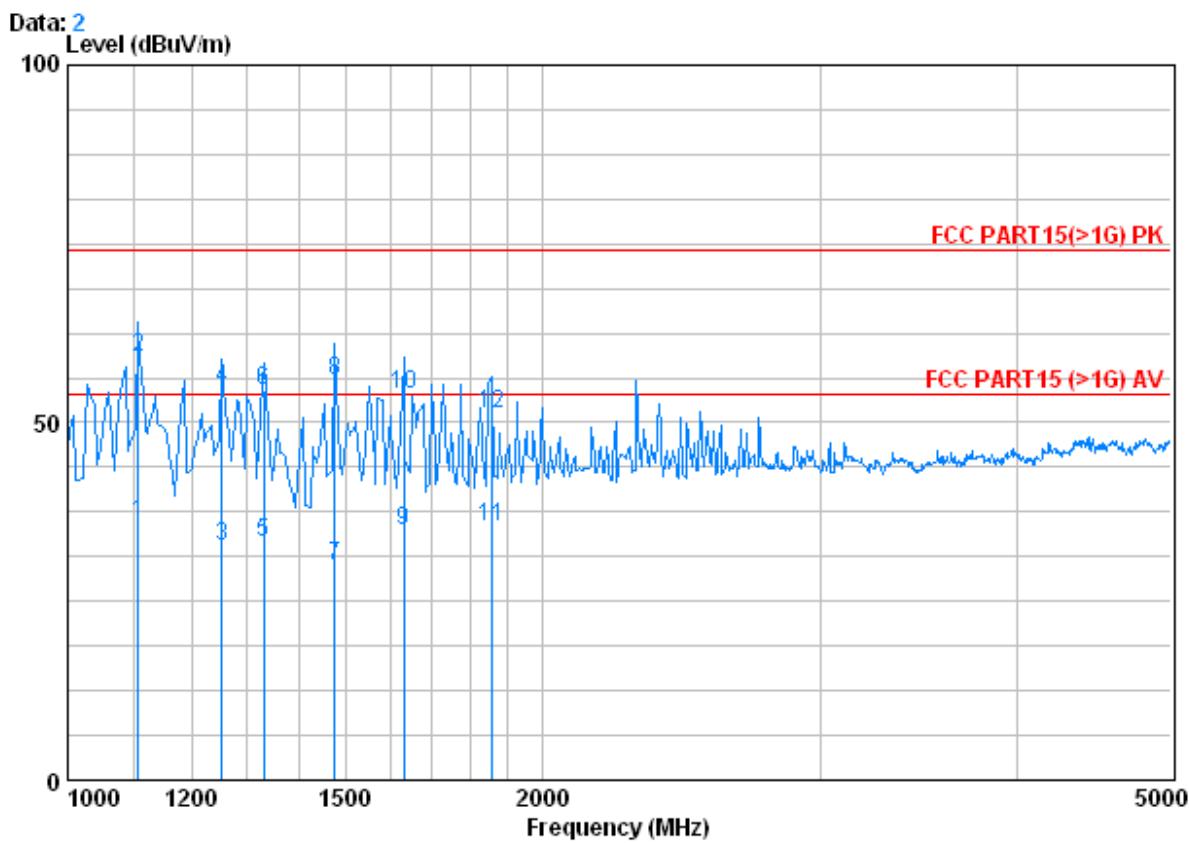
Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 0123AV

Mode : Play with USB stick

Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Limit	Remark	
								dB	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m		
1	1108.000	2.27	27.39	39.19	48.27	38.74	54.00	-15.26	Average
2	1108.000	2.27	27.39	39.19	68.27	58.74	74.00	-15.26	Peak
3	1252.000	2.36	27.67	39.25	46.08	36.86	54.00	-17.14	Average
4	1252.000	2.36	27.67	39.25	68.08	58.86	74.00	-15.14	Peak
5	1332.000	2.41	27.82	39.28	45.37	36.32	54.00	-17.68	Average
6	1332.000	2.41	27.82	39.28	67.37	58.32	74.00	-15.68	Peak
7	1476.000	2.50	28.07	39.34	44.58	35.80	54.00	-18.20	Average
8	1476.000	2.50	28.07	39.34	64.58	55.80	74.00	-18.20	Peak
9	1632.000	2.60	29.09	39.41	45.48	37.76	54.00	-16.24	Average
10	1632.000	2.60	29.09	39.41	60.48	52.76	74.00	-21.24	Peak
11	2368.000	2.98	32.45	39.84	41.02	36.61	54.00	-17.39	Average
12	2368.000	2.98	32.45	39.84	52.02	47.61	74.00	-26.39	Peak

Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

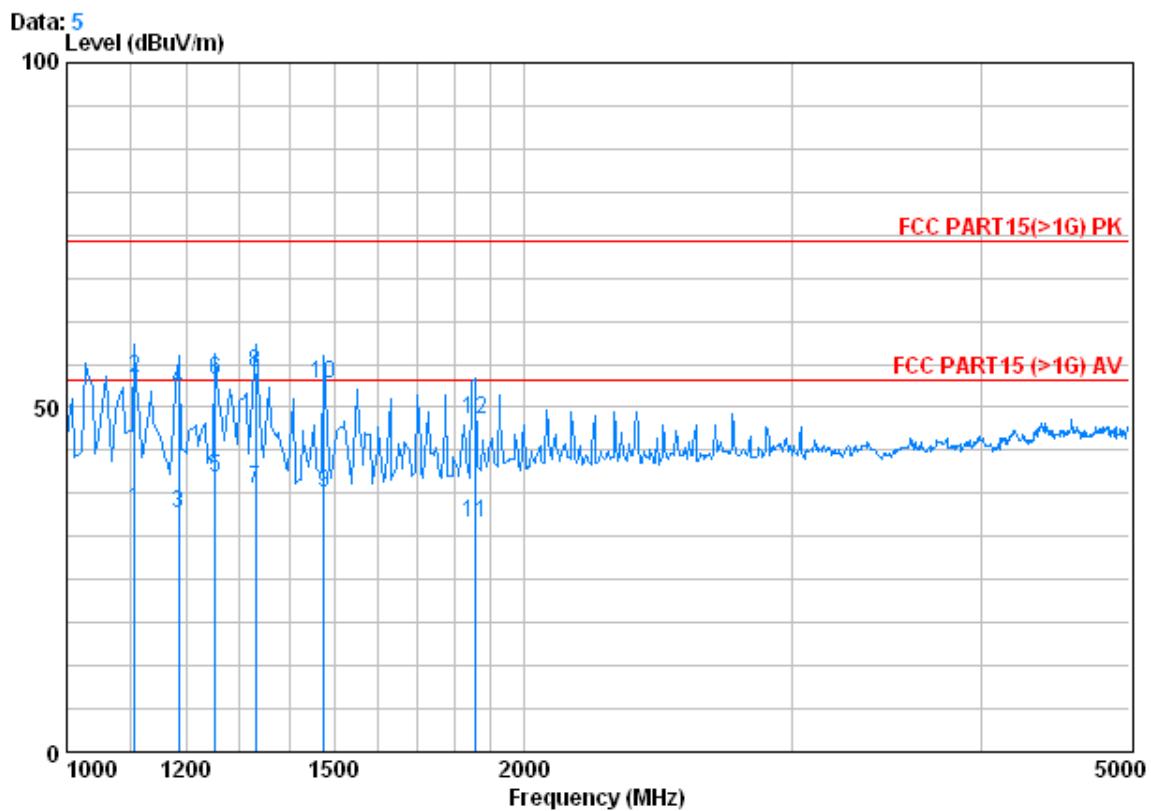
Job No. : 0123AV

Mode : Play with USB stick

	Freq	Cable	Antenna	Preamp	Read	Limit	Over	Remark
		Loss	Factor	Factor	Level	Level	Line	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1108.000	2.27	27.39	39.19	45.62	36.09	54.00	-17.91 Average
2	1108.000	2.27	27.39	39.19	68.62	59.09	74.00	-14.91 Peak
3	1252.000	2.36	27.67	39.25	42.02	32.80	54.00	-21.20 Average
4	1252.000	2.36	27.67	39.25	64.02	54.80	74.00	-19.20 Peak
5	1332.000	2.41	27.82	39.28	42.42	33.37	54.00	-20.63 Average
6	1332.000	2.41	27.82	39.28	63.42	54.37	74.00	-19.63 Peak
7	1476.000	2.50	28.07	39.34	38.69	29.92	54.00	-24.08 Average
8	1476.000	2.50	28.07	39.34	64.69	55.92	74.00	-18.08 Peak
9	1632.000	2.60	29.09	39.41	42.72	35.00	54.00	-19.00 Average
10	1632.000	2.60	29.09	39.41	61.72	54.00	74.00	-20.00 Peak
11	1856.000	2.74	30.69	39.51	41.42	35.35	54.00	-18.65 Average
12	1856.000	2.74	30.69	39.51	57.42	51.35	74.00	-22.65 Peak

NTSC

Horizontal



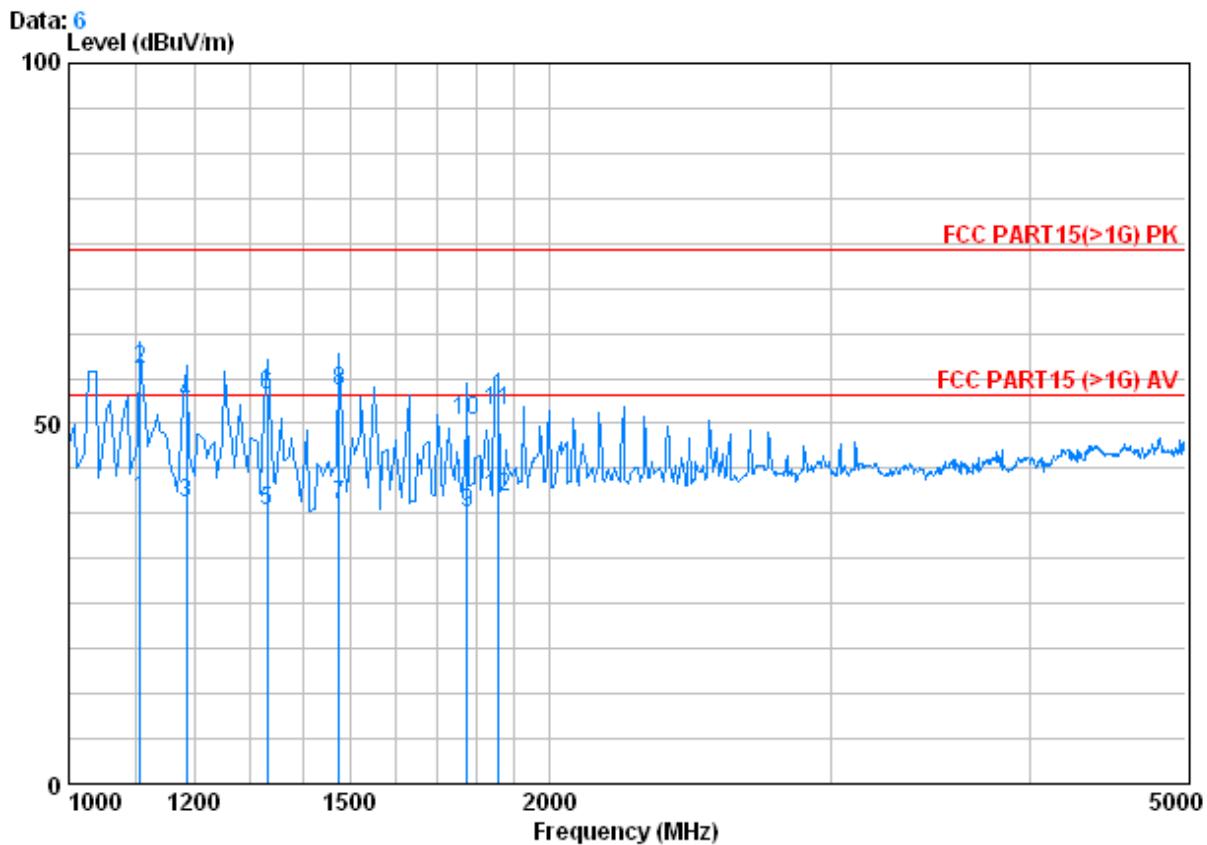
Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 0123AV

Mode : NTSC

Freq	Cable	Antenna	Preamp	Read	Limit	Over	Remark	
	Loss	Factor	Factor	Level	Level	Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1108.000	2.27	27.39	39.19	44.71	35.17	54.00	-18.83
2	1108.000	2.27	27.39	39.19	63.71	54.17	74.00	-19.83
3	1184.000	2.32	27.54	39.22	43.95	34.59	54.00	-19.41
4	1184.000	2.32	27.54	39.22	61.95	52.59	74.00	-21.41
5	1252.000	2.36	27.67	39.25	49.12	39.90	54.00	-14.10
6	1252.000	2.36	27.67	39.25	63.12	53.90	74.00	-20.10
7	1332.000	2.41	27.82	39.28	47.19	38.14	54.00	-15.86
8	1332.000	2.41	27.82	39.28	64.19	55.14	74.00	-18.86
9	1476.000	2.50	28.07	39.34	46.30	37.52	54.00	-16.48
10	1476.000	2.50	28.07	39.34	62.30	53.52	74.00	-20.48
11	1856.000	2.74	30.69	39.51	39.34	33.27	54.00	-20.73
12	1856.000	2.74	30.69	39.51	54.34	48.27	74.00	-25.73

Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL

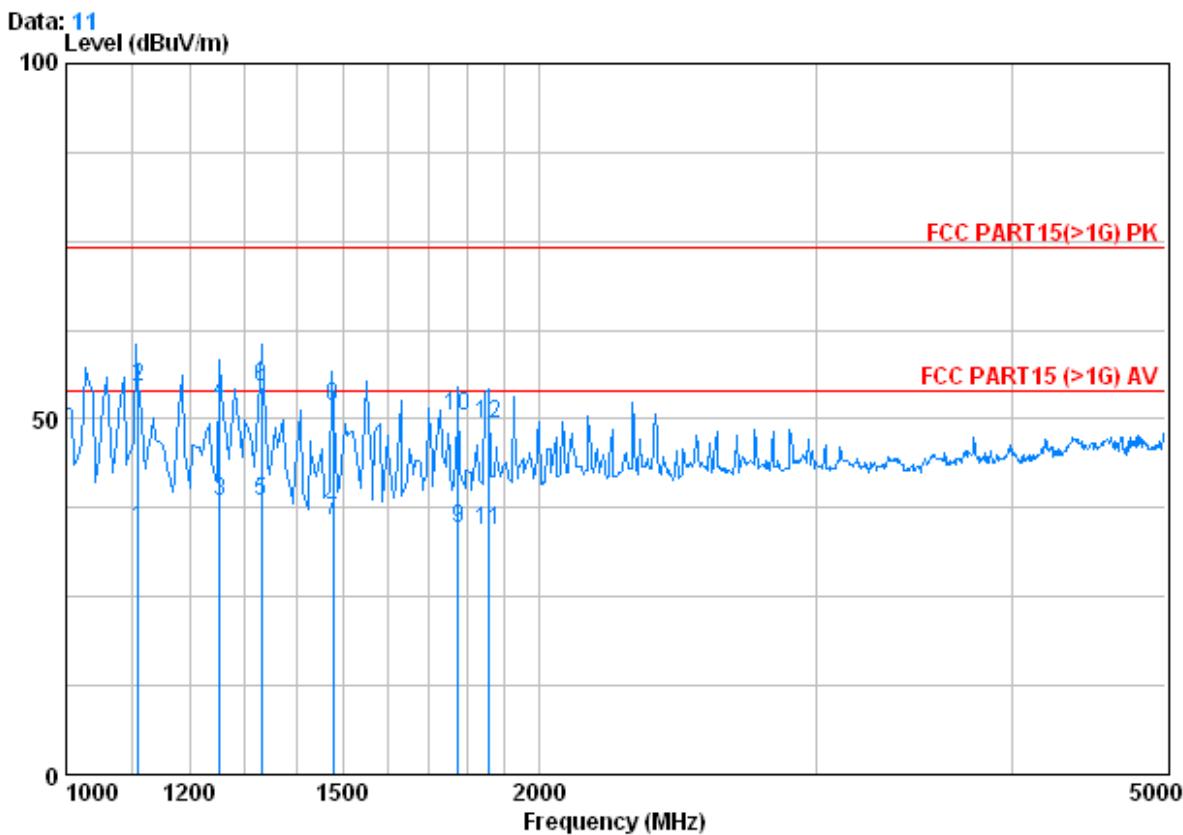
Job No. : 0123AV

Mode : NTSC

	Freq	Cable	Antenna	Preamp	Read	Limit	Over	Remark
		Loss	Factor	Factor	Level	Level	Line	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 0	1108.000	2.27	27.39	39.19	48.91	39.38	54.00	-14.62 Average
2	1108.000	2.27	27.39	39.19	66.91	57.38	74.00	-16.62 Peak
3 0	1184.000	2.32	27.54	39.22	48.28	38.92	54.00	-15.08 Average
4	1184.000	2.32	27.54	39.22	62.28	52.92	74.00	-21.08 Peak
5	1332.000	2.41	27.82	39.28	46.96	37.91	54.00	-16.09 Average
6	1332.000	2.41	27.82	39.28	62.96	53.91	74.00	-20.09 Peak
7	1476.000	2.50	28.07	39.34	47.41	38.63	54.00	-15.37 Average
8	1476.000	2.50	28.07	39.34	63.41	54.63	74.00	-19.37 Peak
9	1776.000	2.70	30.20	39.47	44.05	37.47	54.00	-16.53 Average
10	1776.000	2.70	30.20	39.47	57.05	50.47	74.00	-23.53 Peak
11	1856.000	2.74	30.69	39.51	57.91	51.84	74.00	-22.16 Peak
12 0	1856.000	2.74	30.69	39.51	45.91	39.84	54.00	-14.16 Average

Record mode

Horizontal



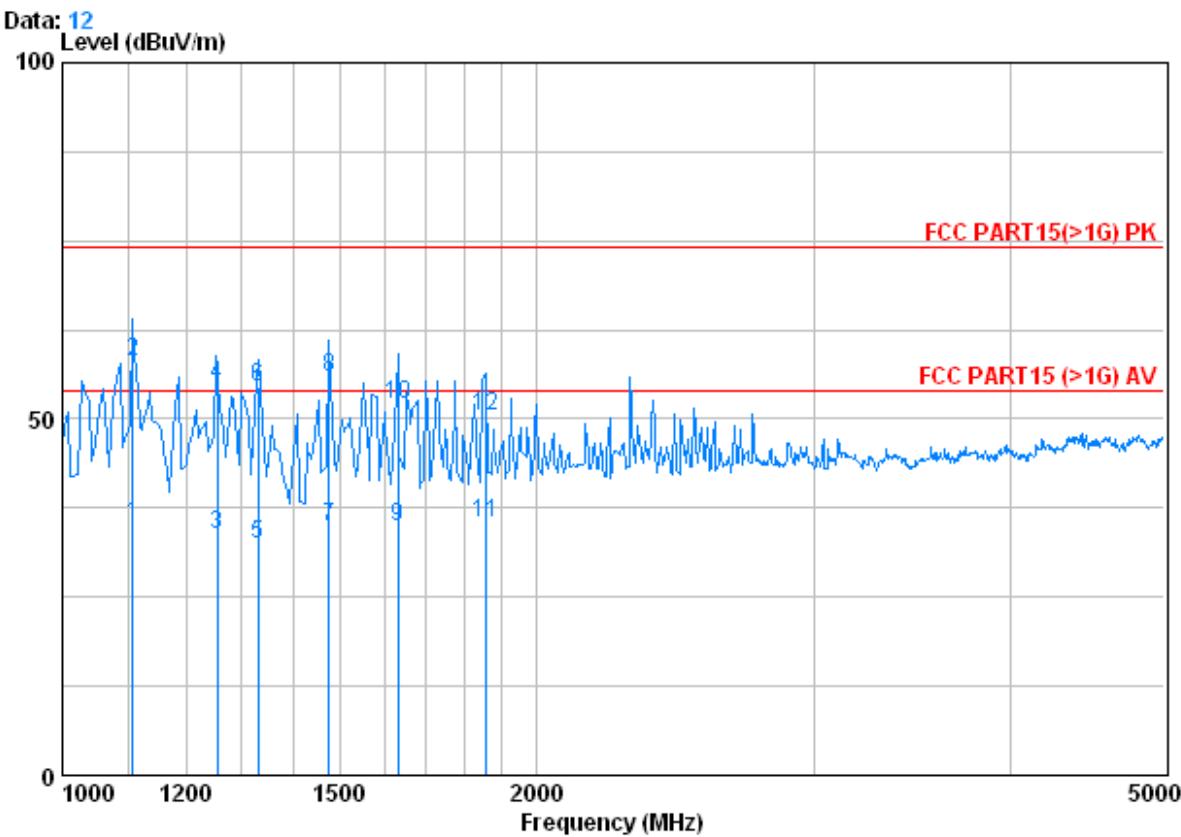
Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 0123AV

Mode : Record

Freq	Cable	Antenna	Preamp	Read	Limit	Over	Remark	
	Loss	Factor	Factor	Level	Level	Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1112.000	2.27	27.42	39.19	44.06	34.56	54.00	-19.44 Average
2	1112.000	2.27	27.42	39.19	64.06	54.56	74.00	-19.44 Peak
3	1252.000	2.36	27.67	39.25	47.63	38.42	54.00	-15.58 Average
4	1252.000	2.36	27.67	39.25	61.63	52.42	74.00	-21.58 Peak
5	1332.000	2.41	27.82	39.28	47.48	38.43	54.00	-15.57 Average
6	1332.000	2.41	27.82	39.28	63.48	54.43	74.00	-19.57 Peak
7	1478.000	2.50	28.07	39.34	44.42	35.64	54.00	-18.36 Average
8	1478.000	2.50	28.07	39.34	60.42	51.64	74.00	-22.36 Peak
9	1776.000	2.70	30.20	39.47	41.07	34.49	54.00	-19.51 Average
10	1776.000	2.70	30.20	39.47	57.07	50.49	74.00	-23.51 Peak
11	1858.000	2.74	30.69	39.51	40.31	34.24	54.00	-19.76 Average
12	1858.000	2.74	30.69	39.51	55.31	49.24	74.00	-24.76 Peak

Vertical



Condition : FCC PART15(>1G) PK 3m VERTICAL
 Job No. : 0123AV
 Mode : Record

	Freq	Cable			Antenna	Preamp	Read	Limit	Over	Line	Limit	Remark
		Loss	Factor	Factor	Level	Level	dBuV					
	MHz	dB	dB/m	dB								
1	1108.000	2.27	27.39	39.19	44.62	35.09	54.00	-18.91	Average			
2	1108.000	2.27	27.39	39.19	67.62	58.09	74.00	-15.91	Peak			
3	1254.000	2.36	27.67	39.25	43.02	33.80	54.00	-20.20	Average			
4	1254.000	2.36	27.67	39.25	64.02	54.80	74.00	-19.20	Peak			
5	1332.000	2.41	27.82	39.28	41.42	32.37	54.00	-21.63	Average			
6	1332.000	2.41	27.82	39.28	63.42	54.37	74.00	-19.63	Peak			
7	1476.000	2.50	28.07	39.34	43.69	34.92	54.00	-19.08	Average			
8	1476.000	2.50	28.07	39.34	64.69	55.92	74.00	-18.08	Peak			
9	1634.000	2.60	29.09	39.41	42.72	35.00	54.00	-19.00	Average			
10	1634.000	2.60	29.09	39.41	59.72	52.00	74.00	-22.00	Peak			
11	1857.000	2.74	30.69	39.51	41.42	35.35	54.00	-18.65	Average			
12	1857.000	2.74	30.69	39.51	56.42	50.35	74.00	-23.65	Peak			

6.4 Antenna Power, 30 MHz to 1 GHz

Test Requirement: FCC PART 15, SUBPART B
Test Method: Section 15.111
Test Voltage: 120V AC, 60Hz
Frequency Range: 30 MHz to 1 GHz
Class / Limit: Class B / 2 nW at 75 ohm terminal.
Detector: Quasi-peak
Remark: Limit voltage at 75ohm impedance = $20\log \sqrt{(P \times R)} = 51.8 \text{ dB}\mu\text{V}$

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55 % RH Atmospheric Pressure: 1004 mbar
EUT Operation: Test in DVB mode(pre-test was performed at DVB mode and NTSC mode, completed test was conducted at DVB mode since it was the worst case), keep the EUT working with standard testing signal, pretest performed at low, middle and high channels DVB signal input and CH3,CH4 channels output, completed test was conducted at middle channel DVB signal input and CH3 channel out, since no worst case was found.

6.4.2 Measurement Data

Frequency (MHz)	Transducer (dB)	Receiver QP Reading (dB) μ V	Receiver QP Level (dB) μ V	Limit (dB) μ V	Margin (dB)
126.850	22.2	13.5	35.7	51.8	-16.1
231.320	22.1	12.7	34.8	51.8	-17
346.161	22.3	6.6	28.9	51.8	-22.9
455.510	22.4	3.3	25.7	51.8	-26.1
569.512	22.4	2.4	24.8	51.8	-27

6.5 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
Frequency Range:	4.6 MHz to 1 GHz
Class / Limit:	69.54dB _u V for Video 56.53dB _u V for Audio 39.55dB _u V for others
Detector:	RMS RBW=100kHz VBW=300kHz
Remark :	Test with a 75/50 ohm converter. Limit=20log(0.003)+120=69.54 dB _u V for Video Limit=20log(0.000671)+120=56.53 dB _u V for Audio Limit=20log(0.000095)+120=39.55 dB _u V for Others

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55 % RH Atmospheric Pressure: 1004 mbar

EUT Operation: Test in NTSC mode(pre-test was performed at DVB mode and NTSC mode, completed test was conducted at NTSC mode since it was the worst case), keep the EUT working with standard testing signal, pretest performed at CH3 and CH4 channels, completed test was conducted at CH3 channel, since no worst case was found.

6.5.2 Measurement Data



Video

Frequency (MHz)	Level (dB μ V)	Limit (dB μ V)	Margin (dB)
61.25	66.22	69.54	-3.32
35.65	34.62	39.55	-4.93
85.23	35.25	39.55	-4.30
203.45	32.11	39.55	-7.44
409.57	34.87	39.55	-4.68
857.56	33.44	39.55	-6.20
975.33	31.24	39.55	-8.40

Audio

Frequency (MHz)	Level (dB μ V)	Limit (dB μ V)	Margin (dB)
56.75	51.86	56.53	-4.67
43.24	34.42	39.55	-5.13
76.56	31.43	39.55	-8.12
346.54	32.87	39.55	-6.68
675.25	34.45	39.55	-5.10
798.76	32.46	39.55	-7.09
890.34	31.63	39.55	-7.92

6.6 Demonstration on internal preventing circuitry

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

6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55% RH Atmospheric Pressure: 1004 mbar
EUT Operation: Test in DVB mode, keep the EUT working with standard testing signal, performed at low, middle and high channels DVB signal input and CH3,CH4 channels output.
Test in NTSC mode, keep the EUT working with standard testing signal, pretest performed at CH3 and CH4 channels.

6.6.2 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.