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Report No.: SZEM130400170701

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FCC Test Report

Application No.: SZEM1304001707AV(GZEM1304001276AV)
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
Model No.: STT4-HDR
FCC ID: YWRSTT4-HDR
Standards: 47 CFR PART 15, Subpart B:2012
Date of Receipt: 2013-04-11
Date of Test: 2013-05-06 to 2013-05-30
Date of Issue: 2013-06-20

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.

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2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	47 CFR PART 15, Subpart B:2012	ANSI C63.4:2009	Class B	PASS
Conducted Emission (150kHz to 30MHz)	47 CFR PART 15, Subpart B:2012	ANSI C63.4:2009	Class B	PASS
Radiated Emission above 1 GHz	47 CFR PART 15, Subpart B:2012	ANSI C63.4:2009	Class B	PASS
Antenna Power (30 MHz to 960 MHz)	47 CFR PART 15, Subpart B:2012	Section 15.111	Class B	PASS
Output and Spurious conducted level at RF output terminal	47 CFR PART 15, Subpart B:2012	Section 15.115	Class B	PASS
Demonstration on internal preventing circuitry	47 CFR PART 15, Subpart B:2012	Section 15.115	Class B	PASS



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4 General Information

4.1 Details of E.U.T.

Power Supply: Input : AC 100-240V 50/60Hz 15W max
Test voltage: AC 120V 60Hz
DC 3.0V (2*1.5V "AAA" Size batteries) for remote control
AC cable: 150cm (Unshielded)
CH3 frequency range: 61.25-65.75MHz
CH4 frequency range: 67.25-71.75MHz

4.2 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Samsung Television	Samsung	2232MW
DELL Television	DELL	SP2208WFPt
USB stick	Color turn	UL4GHKXG

4.3 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.



4.4 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, Full-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, G-416, T-1153 and C-2383 respectively.

- **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 No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

4.5 Deviation from Standards

None.

4.6 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	2014-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2014-05-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	Coaxial cable	SGS	N/A	SEL0028	2014-05-29
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2013-10-24
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2014-05-16
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2013-10-24
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2013-10-24
9	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2013-10-24
10	Band filter	Amindeon	Asi 3314	SEL0094	2014-05-16
11	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2013-10-24

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2014-06-10
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2013-10-24
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2014-05-16
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2013-11-10
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2013-11-10
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2013-11-10
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2014-05-16
8	Coaxial Cable	SGS	N/A	SEL0025	2014-05-29





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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	2014-03-04
EMC0107	Coaxial Cable	SGS	2m	N/A	2013-07-29
EMC1704	Matching Pad	Rohde & Schwarz	RAM	100374	2013-10-05

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	2013-10-24
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2013-10-24
3	Barometer	ChangChun	DYM3	SEL0088	2014-05-17



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TS9980 test system					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ChangZhou ZhongYu	JB88	SEL0166	2014-06-10
2	Signal Generator 9 KHz ~ 2.2GHz	Rohde & Schwarz	SML02	SEL0143	2013-10-24
3	Signal Generator 9 KHz ~ 1.1GHz	Rohde & Schwarz	SML01	SEL0135	2013-10-24
4	Power Meter	Rohde & Schwarz	NRVS	SEL0144	2013-10-24
5	RF Level Meter	Rohde & Schwarz	URV35	SEL0137	2013-10-24
6	Audio Analyzer	Rohde & Schwarz	UPL	SEL0136	2013-10-24
7	RF-Amplifier 150KHz ~150MHz	BONN Elektronik	BSA1515-2 5	SEL0157	2014-05-16
8	Stripline Test Cell	Erika Fiedler	VDE0872	SEL0167	N/A
9	TV Test Transmitter	Rohde & Schwarz	SFM	SEL0159	2014-05-16
10	TV Generator Pal	Rohde & Schwarz	SGPF	SEL0138	2013-10-24
11	TV Generator Ntsc	Rohde & Schwarz	SGMF	SEL0140	2013-10-24
12	TV Generator Secam	Rohde & Schwarz	SGSF	SEL0139	2013-10-24
13	TV-Test Transmitter 0.3MHz ~ 3300MHz	Rohde & Schwarz	SFQ	SEL0142	2013-10-24
14	MPEG2 Measurement Generator	Rohde & Schwarz	DVG	SEL0141	2013-10-24
15	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0177	2014-02-21
16	Matching Pad	Rohde & Schwarz	RAM	SEL0146	N/A
17	Matching Pad	Rohde & Schwarz	RAM	SEL0148	N/A
18	Absorbing Clamp	Rohde & Schwarz	MDS21	SEL0158	2014-05-16
19	Coupling Set	Erika Fiedler	RCo, RCi, MC, AC, LC	SEL0149	N/A
20	Filters	Erika Fiedler	Sr, LBS	SEL0150	N/A
21	Matching Network	Erika Fiedler	MN, T1	SEL0151	N/A

6 Test Results

6.1 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: 47 CFR PART 15, Subpart 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 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.

6.1.1 E.U.T. Operation

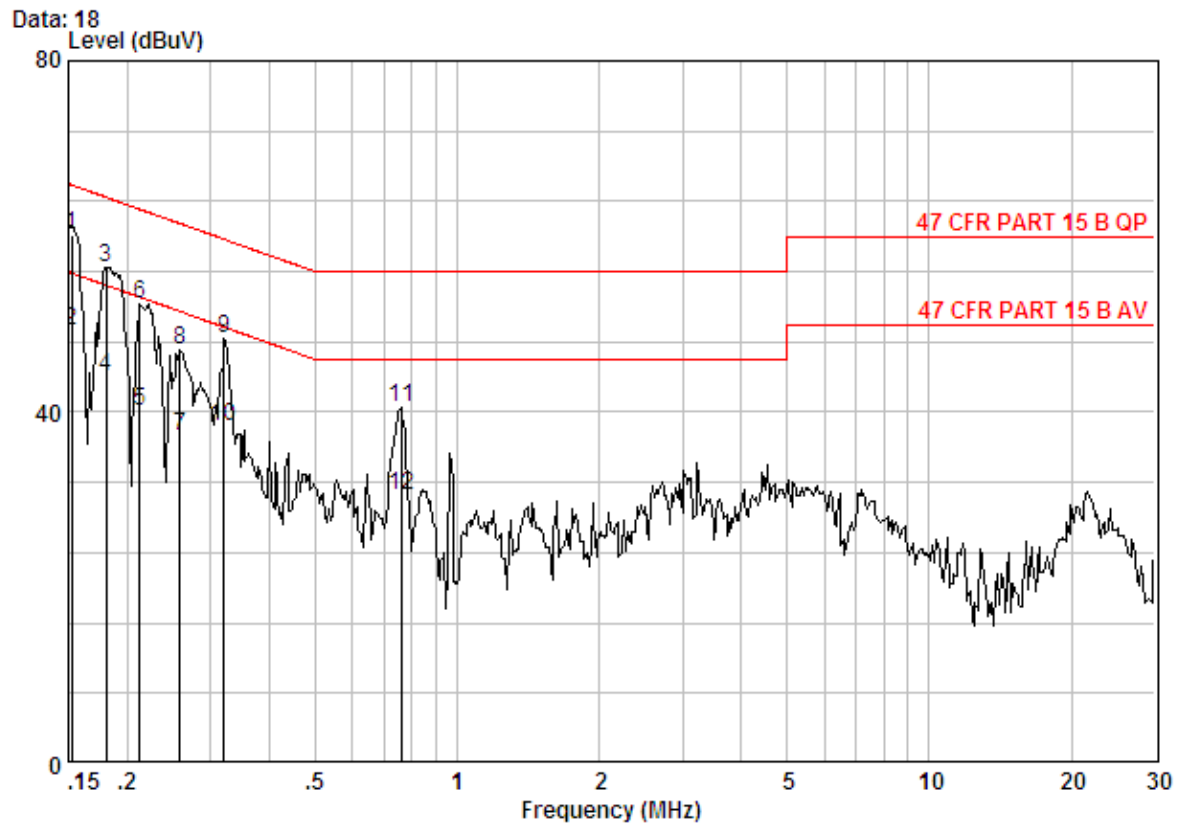
Operating Environment:
 Temperature: 26.0 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar
 EUT Operation: Test the EUT in DVB mode, (pre-test was performed at DVB mode, Play with USB stick mode and Record mode, completed test was conducted at DVB mode since it was the worst case.) keep EUT working with standard testing signal. Pretest performed at low, middle and high channel DVB signal input and CH3/CH4 output, AV output and HDMI output to find the worst case. The compliance test performed at middle channel DVB signal input and HDMI output since it was the worst case.

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.



Neutral line:

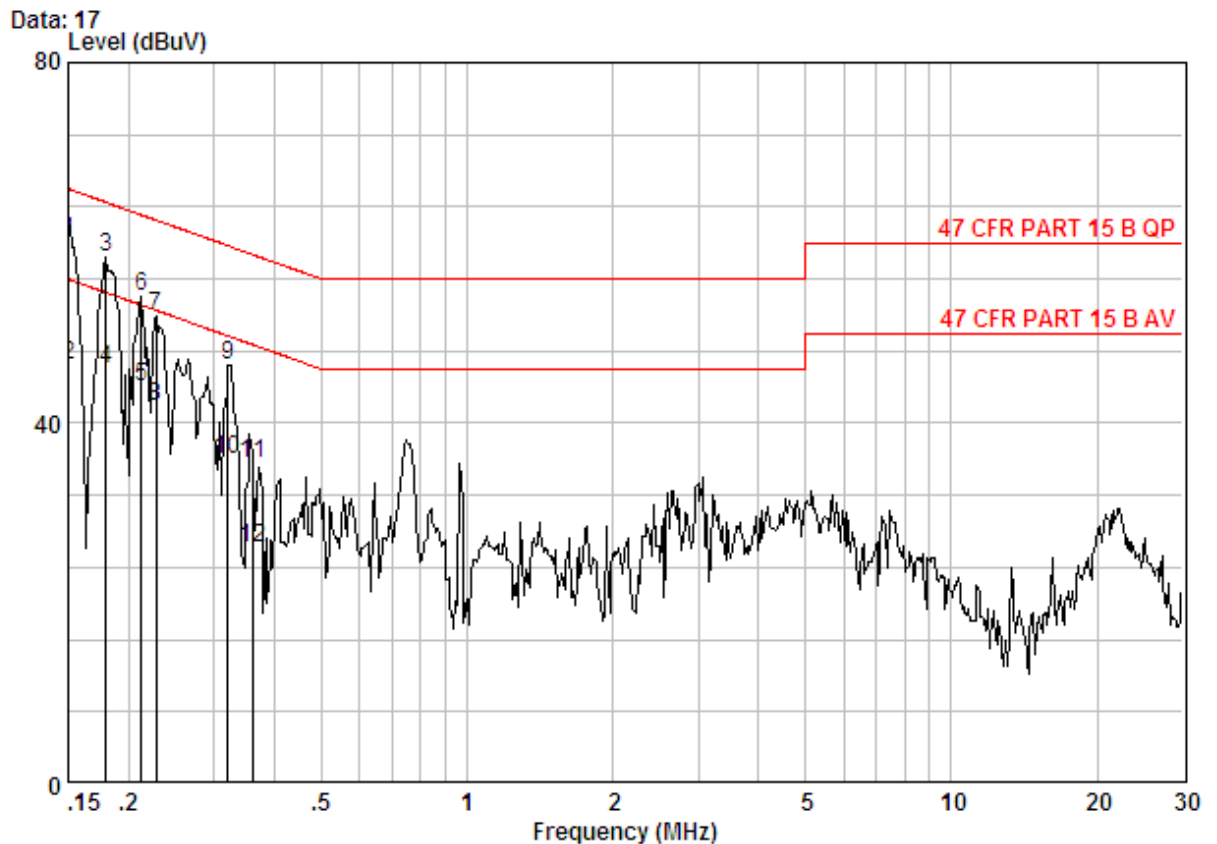


Site : Shielding Room
Condition : 47 CFR PART 15 B QP CE NEUTRAL
Job No. : 1707AV
Mode : DVB

	Freq	Cable	LISN	Read	Limit	Over	
	MHz	Loss	Factor	Level	Line	Limit	Remark
		dB		dBuV	dBuV	dBuV	dB
1 @	0.15240	0.02	9.70	50.46	60.18	65.87	-5.69 QP
2 @	0.15240	0.02	9.70	39.62	49.34	55.87	-6.53 Average
3	0.18056	0.02	9.70	46.75	56.47	64.46	-7.99 QP
4	0.18056	0.02	9.70	34.21	43.93	54.46	-10.53 Average
5	0.21279	0.02	9.70	30.36	40.08	53.10	-13.02 Average
6	0.21279	0.02	9.70	42.59	52.31	63.10	-10.78 QP
7	0.25888	0.02	9.70	27.61	37.33	51.47	-14.14 Average
8	0.25888	0.02	9.70	37.39	47.11	61.47	-14.36 QP
9	0.31999	0.01	9.72	38.73	48.46	59.71	-11.24 QP
10	0.31999	0.01	9.72	28.61	38.34	49.71	-11.36 Average
11	0.75894	0.02	9.80	30.76	40.58	56.00	-15.42 QP
12	0.75894	0.02	9.80	20.69	30.51	46.00	-15.49 Average



Live line



Site : Shielding Room
Condition : 47 CFR PART 15 B QP CE LINE
Job No. : 1707AV
Mode : DVB

	Freq	Cable Loss	LISN Factor	Read Level	Limit	Over	Remark
	MHz	dB	dB	dBuV	dBuV	Limit	dB
1 @	0.15000	0.02	9.70	50.50	60.22	66.00	-5.78 QP
2	0.15000	0.02	9.70	36.70	46.42	56.00	-9.58 Average
3 @	0.17961	0.02	9.70	48.79	58.51	64.50	-6.00 QP
4	0.17961	0.02	9.70	36.36	46.08	54.50	-8.42 Average
5	0.21279	0.02	9.70	34.26	43.98	53.10	-9.12 Average
6	0.21279	0.02	9.70	44.38	54.10	63.10	-8.99 QP
7	0.22797	0.02	9.70	42.07	51.79	62.52	-10.74 QP
8	0.22797	0.02	9.70	32.21	41.93	52.52	-10.59 Average
9	0.31999	0.01	9.72	36.71	46.45	59.71	-13.26 QP
10	0.31999	0.01	9.72	26.31	36.04	49.71	-13.66 Average
11	0.36146	0.01	9.76	25.83	35.61	58.69	-23.09 QP
12	0.36146	0.01	9.76	16.32	26.09	48.69	-22.60 Average



6.2 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	47 CFR PART 15, Subpart 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:	24.0 °C	Humidity:	50 % RH	Atmospheric Pressure:	1010 mbar
EUT Operation:	Test the EUT in DVB mode, keep EUT working with standard testing signal. Pretest performed at low, middle and high channel DVB signal input and CH3/CH4 output, AV output and HDMI output to find the worst case. The compliance test performed at middle channel DVB signal input and HDMI output since the worst case was found.				
	Test the EUT in Play with USB stick mode, keep EUT playing with USB stick, pretest CH3/CH4 output, AV output and HDMI output to find the worst case, the compliance test performed at HDMI output since the worst case was found.				
	Test the EUT in Record mode, keep EUT recording. pretest CH3/CH4 output, AV output and HDMI output to find the worst case, the compliance test performed at HDMI output since the worst case was found.				

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.

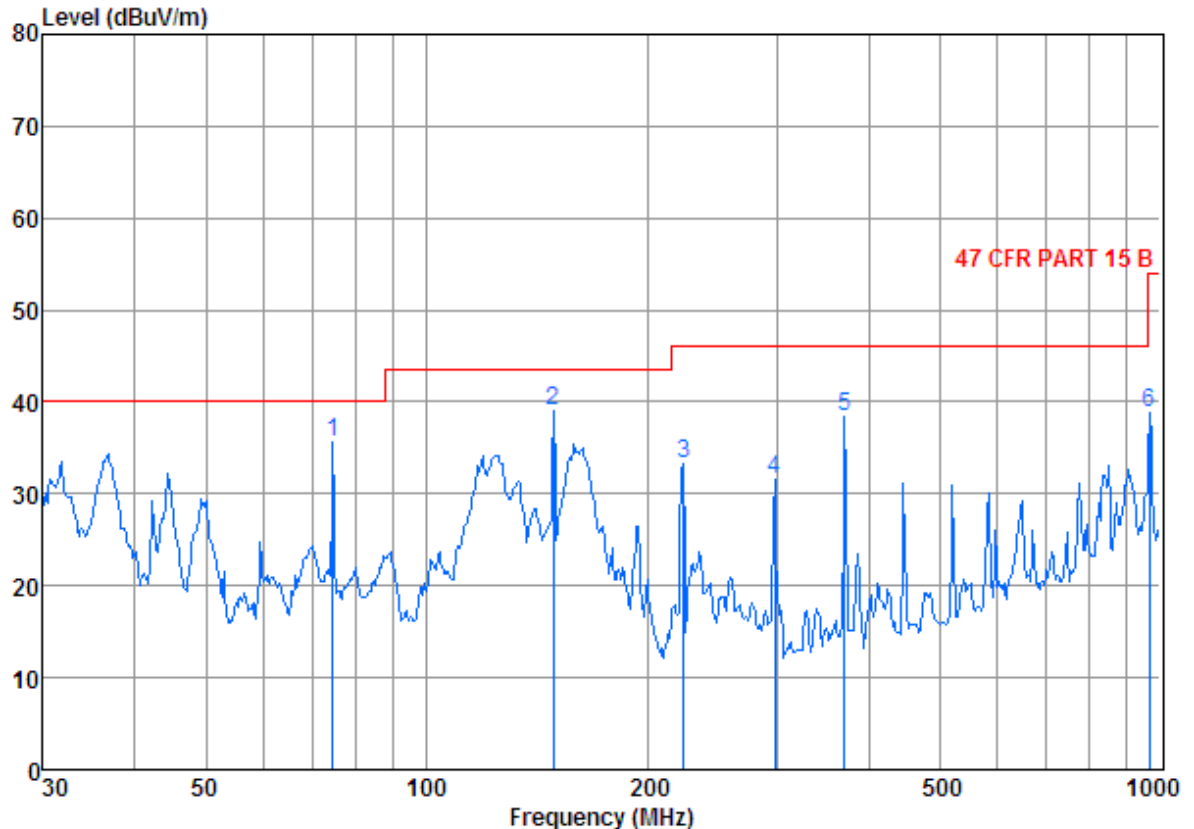


30MHz to 1GHz

DVB mode

Horizontal

Data: 3



Condition: 47 CFR PART 15 B 3m 3142C NEW HORIZONTAL

Job No. : 1707AV

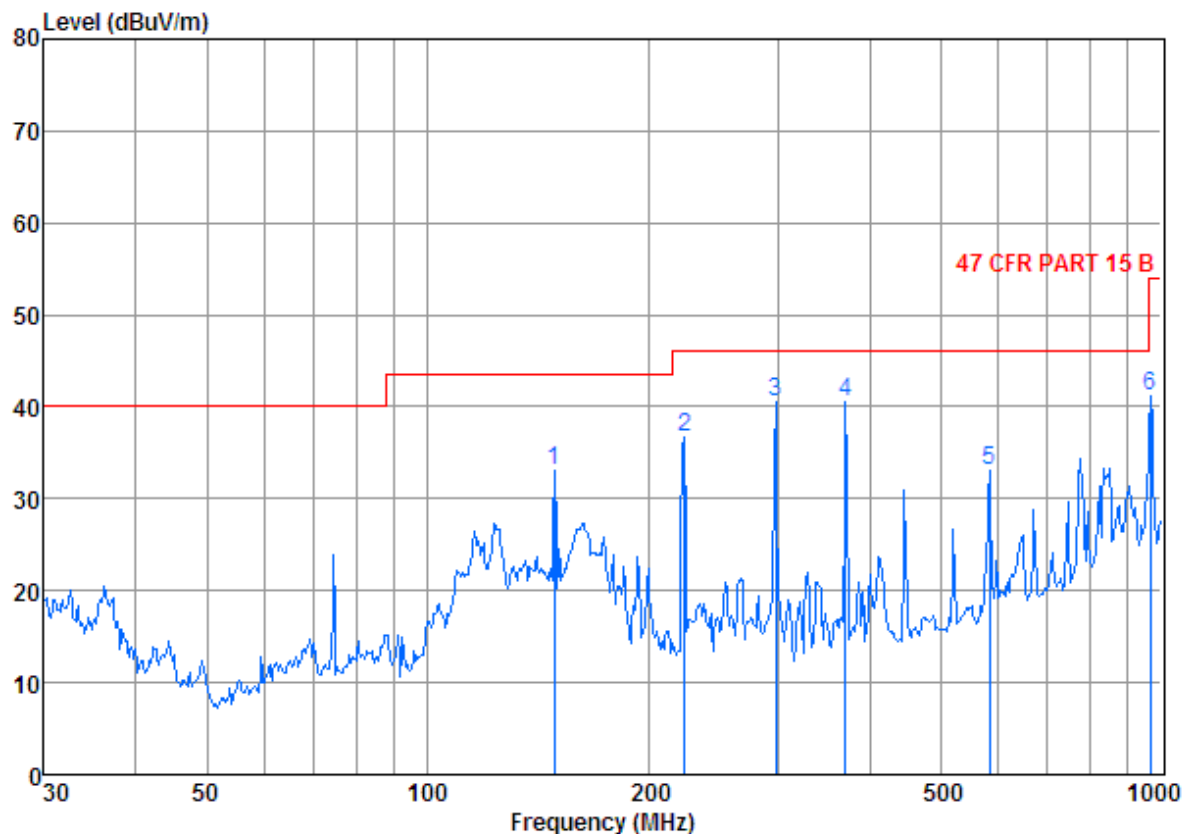
Mode : DVB

		CableAntenna Preamp			Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	74.396	0.93	4.54	27.24	57.48	35.71	40.00	-4.29
2	148.963	1.32	9.23	26.91	55.41	39.05	43.50	-4.45
3	223.733	1.54	7.40	26.62	51.02	33.34	46.00	-12.66
4	298.268	1.89	9.62	26.41	46.53	31.63	46.00	-14.37
5	370.702	2.12	11.34	26.93	51.95	38.48	46.00	-7.52
6	965.542	3.67	21.13	26.47	40.40	38.73	54.00	-15.27



Vertical

Data: 4



Condition: 47 CFR PART 15 B 3m 3142C NEW VERTICAL

Job No. : 1707AV

Mode : DVB

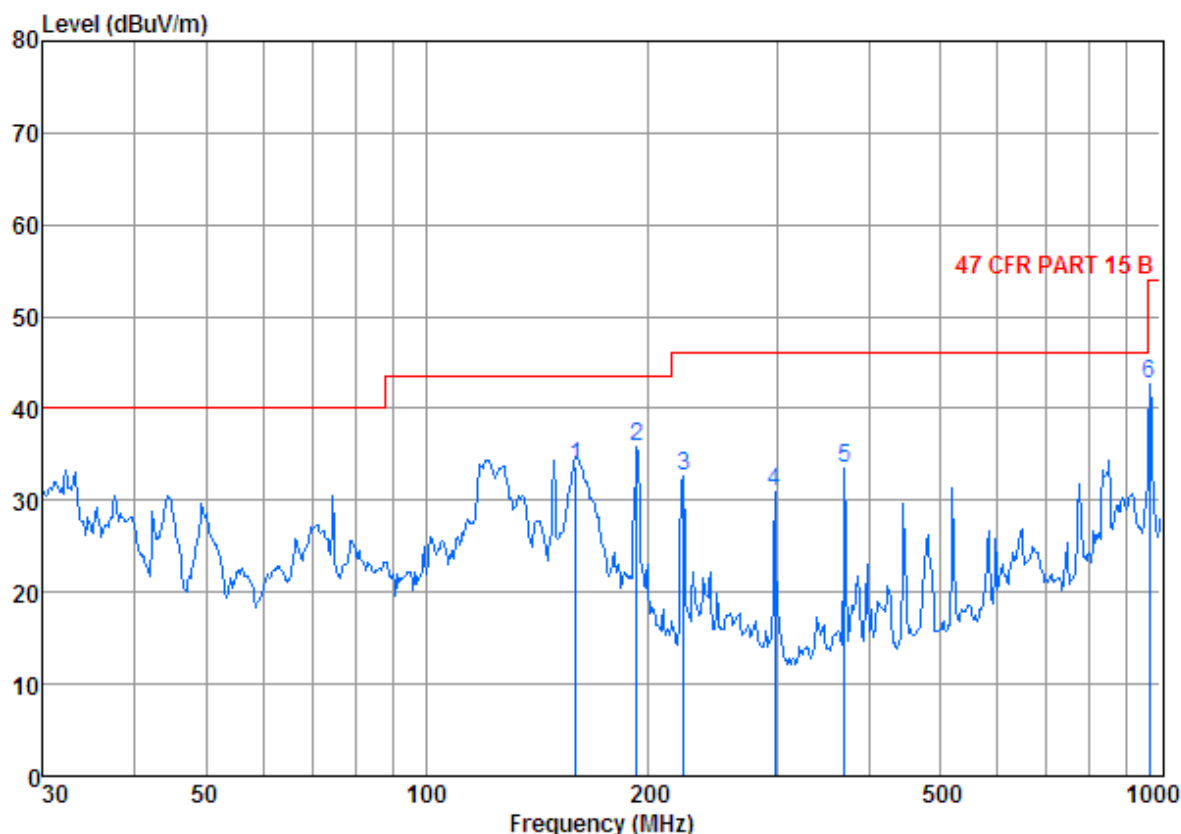
	Freq	Cable	Antenna	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	148.963	1.32	9.23	26.91	49.32	32.96	43.50	-10.54
2	223.733	1.54	7.40	26.62	54.29	36.61	46.00	-9.39
3	298.268	1.89	9.62	26.41	55.47	40.57	46.00	-5.43
4	370.702	2.12	11.34	26.93	54.01	40.54	46.00	-5.46
5	582.743	2.68	15.26	27.57	42.80	33.17	46.00	-12.83
6	965.542	3.67	21.13	26.47	42.81	41.14	54.00	-12.86



Play with USB stick mode

Horizontal

Data: 1



Condition: 47 CFR PART 15 B 3m 3142C NEW HORIZONTAL

Job No. : 1707AV

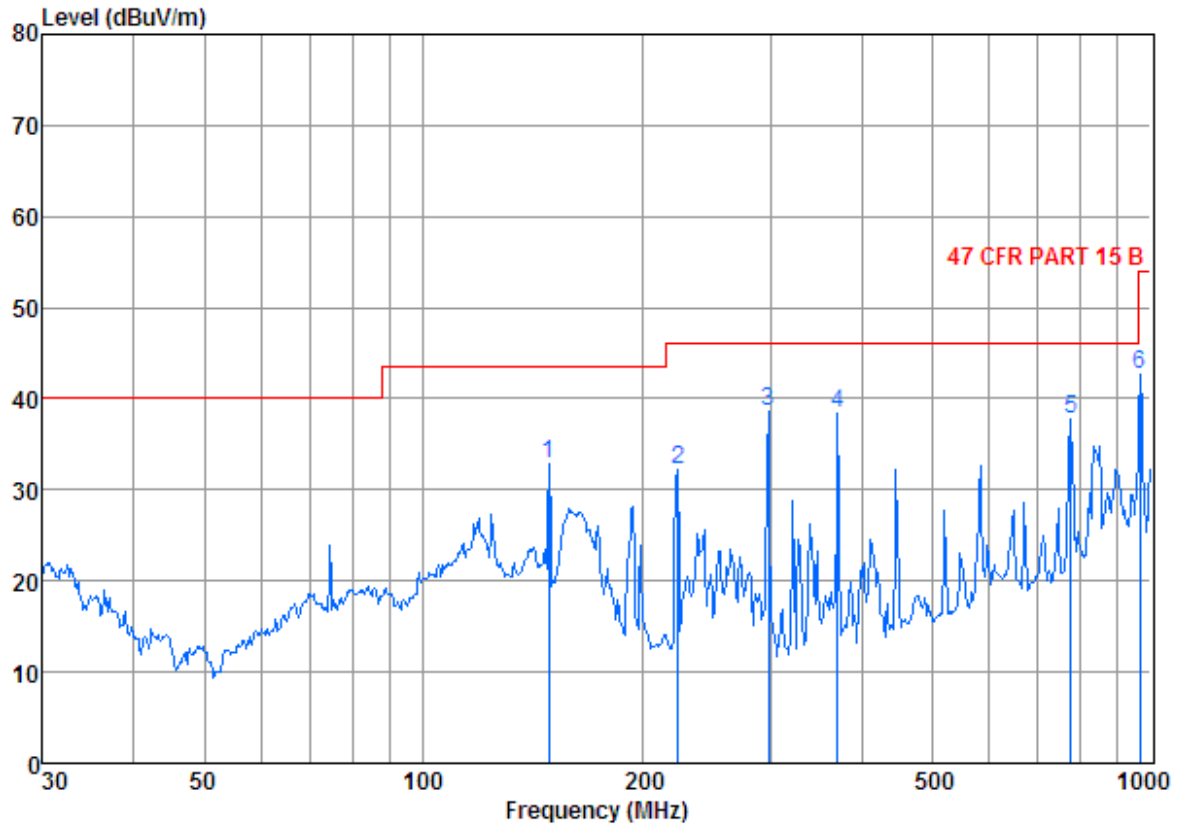
Mode : Play with USB stick

		CableAntenna		Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	159.784	1.34	9.50	26.86	49.75	33.73	43.50	-9.77
2	193.095	1.39	6.97	26.73	54.25	35.88	43.50	-7.62
3	223.733	1.54	7.40	26.62	50.40	32.72	46.00	-13.28
4	298.268	1.89	9.62	26.41	45.93	31.03	46.00	-14.97
5	370.702	2.12	11.34	26.93	46.95	33.48	46.00	-12.52
6	965.542	3.67	21.13	26.47	44.25	42.58	54.00	-11.42



Vertical

Data: 2



Condition: 47 CFR PART 15 B 3m 3142C NEW VERTICAL

Job No. : 1707AV

Mode : Play with USB stick

		CableAntenna Preamp			Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	148.963	1.32	9.23	26.91	49.20	32.84	43.50	-10.66
2	223.733	1.54	7.40	26.62	49.86	32.18	46.00	-13.82
3	298.268	1.89	9.62	26.41	53.47	38.57	46.00	-7.43
4	370.702	2.12	11.34	26.93	51.97	38.50	46.00	-7.50
5	776.878	3.14	17.92	27.32	44.01	37.75	46.00	-8.25
6	965.542	3.67	21.13	26.47	44.38	42.71	54.00	-11.29

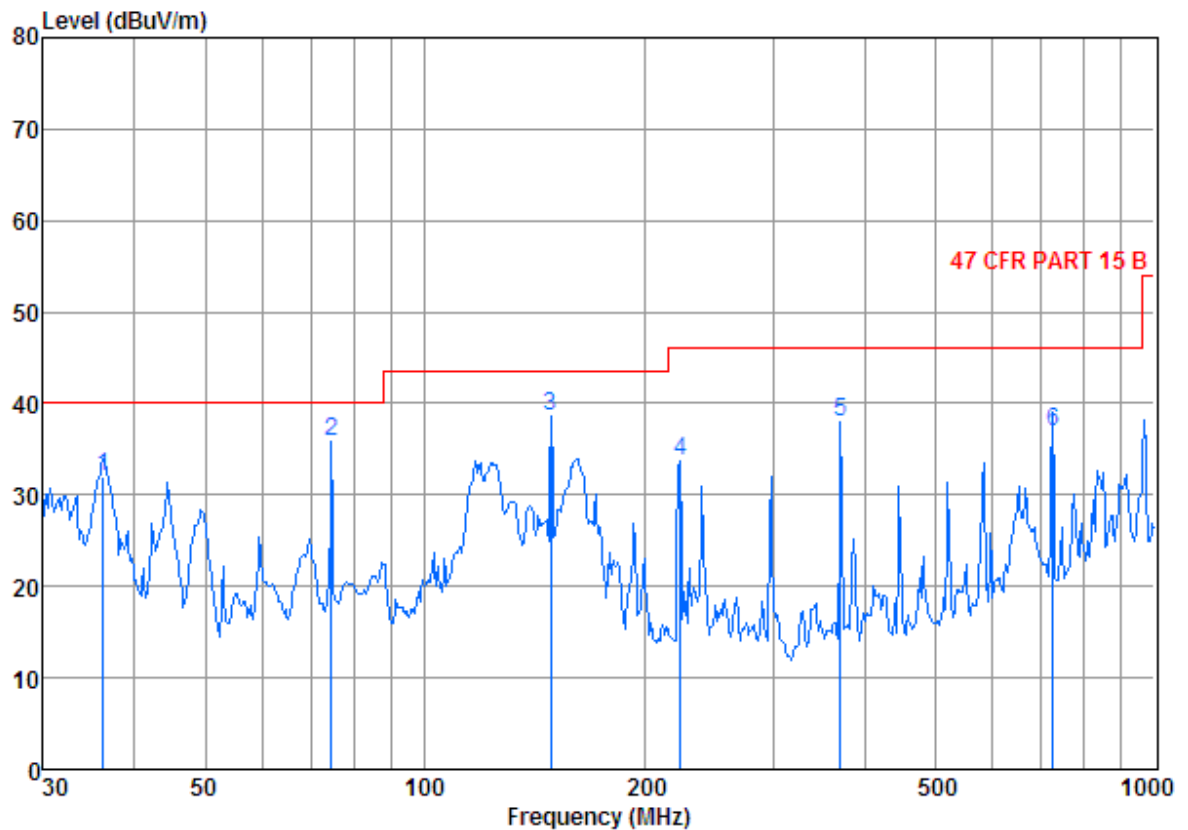




Record mode

Horizontal

Data: 5



Condition: 47 CFR PART 15 B 3m 3142C NEW HORIZONTAL

Job No. : 1707AV

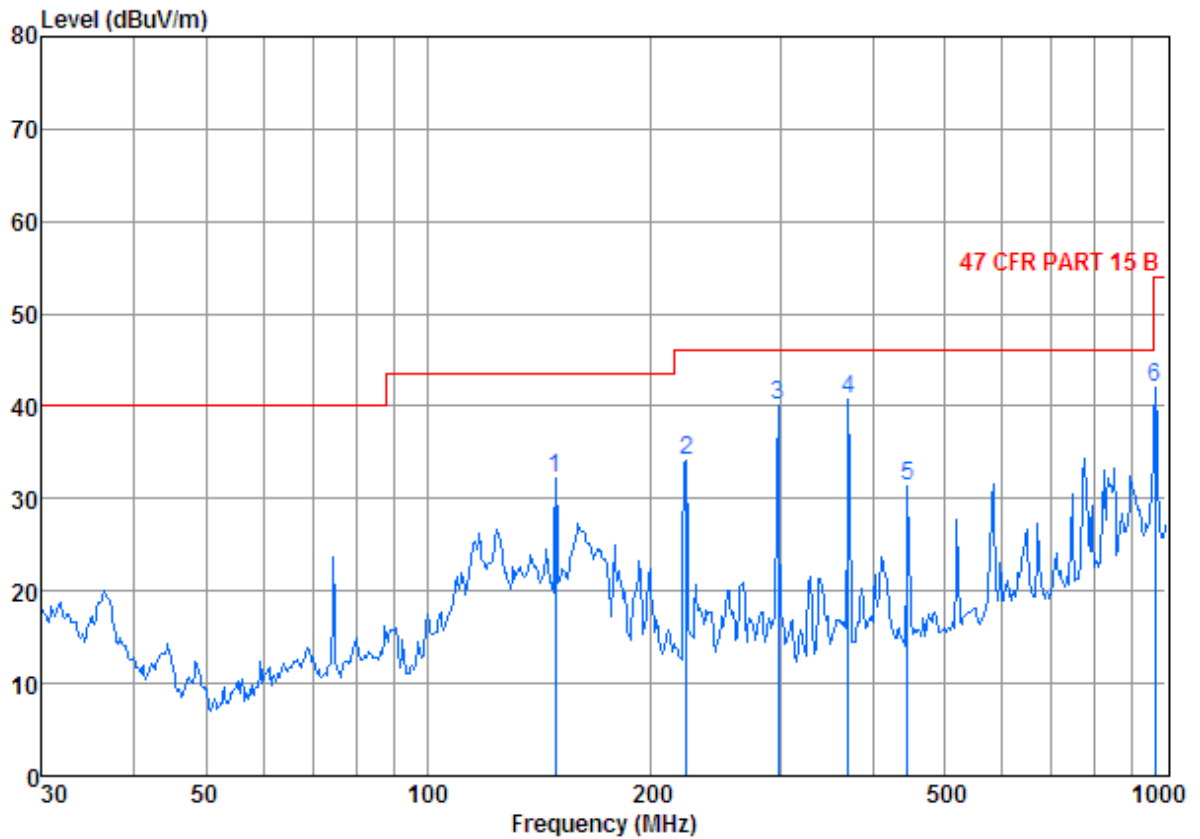
Mode : Record

		CableAntenna		Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	36.254	0.60	12.83	27.33	45.92	32.02	40.00	-7.98
2	74.396	0.93	4.54	27.24	57.59	35.82	40.00	-4.18
3	148.963	1.32	9.23	26.91	54.90	38.54	43.50	-4.96
4	223.733	1.54	7.40	26.62	51.45	33.77	46.00	-12.23
5	370.702	2.12	11.34	26.93	51.54	38.07	46.00	-7.93
6	724.261	2.98	17.05	27.38	44.31	36.96	46.00	-9.04



Vertical

Data: 6



Condition: 47 CFR PART 15 B 3m 3142C NEW VERTICAL

Job No. : 1707AV

Mode : Record

		CableAntenna		Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	148.963	1.32	9.23	26.91	48.64	32.28	43.50	-11.22
2	223.733	1.54	7.40	26.62	51.81	34.13	46.00	-11.87
3	298.268	1.89	9.62	26.41	54.96	40.06	46.00	-5.94
4	370.702	2.12	11.34	26.93	54.16	40.69	46.00	-5.31
5	446.414	2.40	12.67	27.42	43.79	31.44	46.00	-14.56
6	965.542	3.67	21.13	26.47	43.79	42.12	54.00	-11.88



6.3 Radiated Emissions above 1 GHz

Test Requirement: 47 CFR PART 15, Subpart B

Test Method: ANSI C63.4

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: 24.0 °C

Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: Test the EUT in DVB mode, keep EUT working with standard testing signal. Pretest performed at low, middle and high channel DVB signal input and CH3/CH4 output, AV output and HDMI output to find the worst case. The compliance test performed at middle channel DVB signal input and HDMI output since the worst case was found.

Test the EUT in Play with USB stick mode, keep EUT playing with USB stick, pretest CH3/CH4 output, AV output and HDMI output to find the worst case, the compliance test performed at HDMI output since the worst case was found.

Test the EUT in Record mode, keep EUT recording. pretest CH3/CH4 output, AV output and HDMI output to find the worst case, the compliance test performed at HDMI output since the worst case was found.

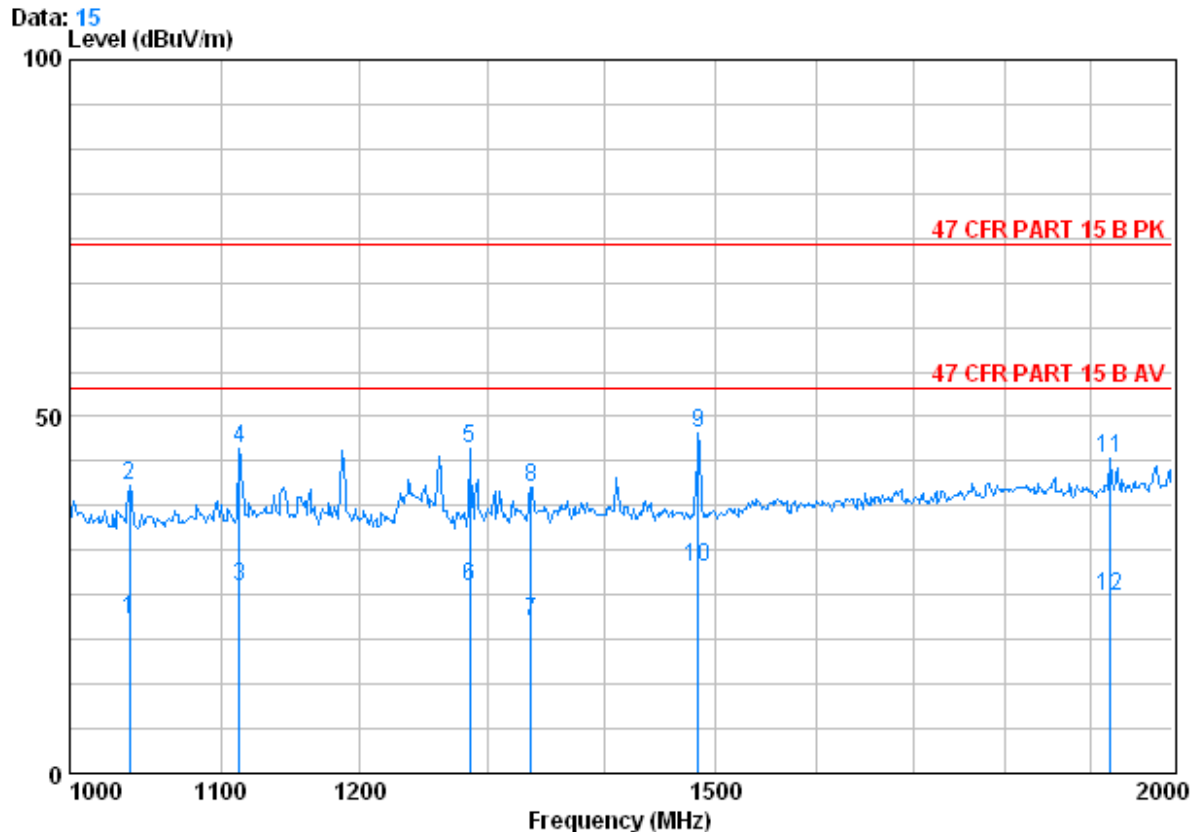
6.3.2 Measurement Data



Above 1GHz

DVB mode

Horizontal



Condition : 47 CFR PART 15 B PK 3m HORIZONTAL

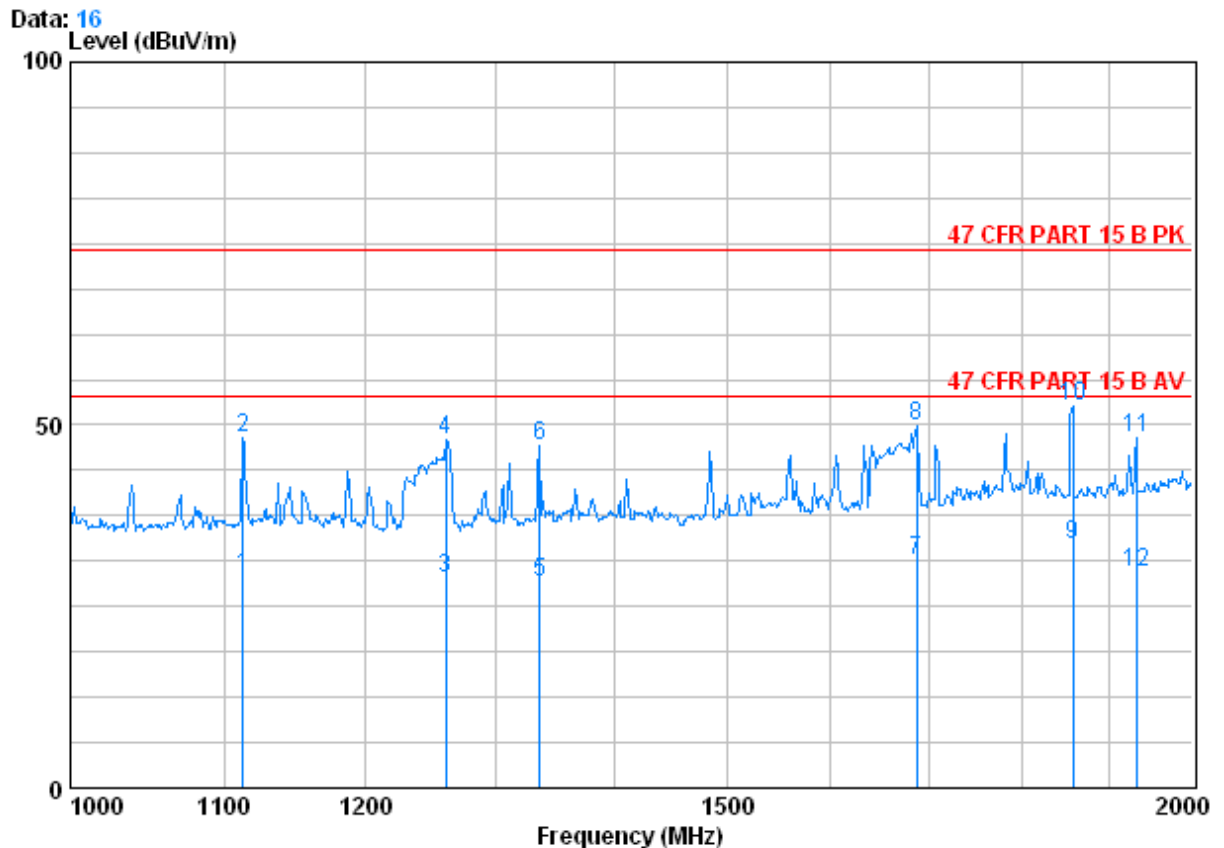
Job NO: : 1707AV

MODE: : DVB

		CableAntenna			Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1038.139	2.22	27.26	39.16	31.25	21.58	54.00	-32.42	Average
2	1038.139	2.22	27.26	39.16	50.13	40.46	74.00	-33.54	Peak
3	1112.650	2.27	27.42	39.19	35.62	26.12	54.00	-27.88	Average
4	1112.650	2.27	27.42	39.19	55.00	45.49	74.00	-28.51	Peak
5	1286.098	2.37	27.73	39.26	54.64	45.48	74.00	-28.52	Peak
6	1286.098	2.37	27.73	39.26	35.21	26.05	54.00	-27.95	Average
7	1336.074	2.41	27.82	39.29	30.26	21.20	54.00	-32.80	Average
8	1336.074	2.41	27.82	39.29	49.09	40.04	74.00	-33.96	Peak
9	1484.524	2.50	28.10	39.35	56.47	47.72	74.00	-26.28	Peak
10	1484.524	2.50	28.10	39.35	37.51	28.76	54.00	-25.24	Average
11	1922.522	2.79	31.18	39.54	49.75	44.18	74.00	-29.82	Peak
12	1922.522	2.79	31.18	39.54	30.28	24.72	54.00	-29.28	Average



Vertical



Condition : 47 CFR PART 15 B PK 3m VERTICAL

Job NO: : 1707AV

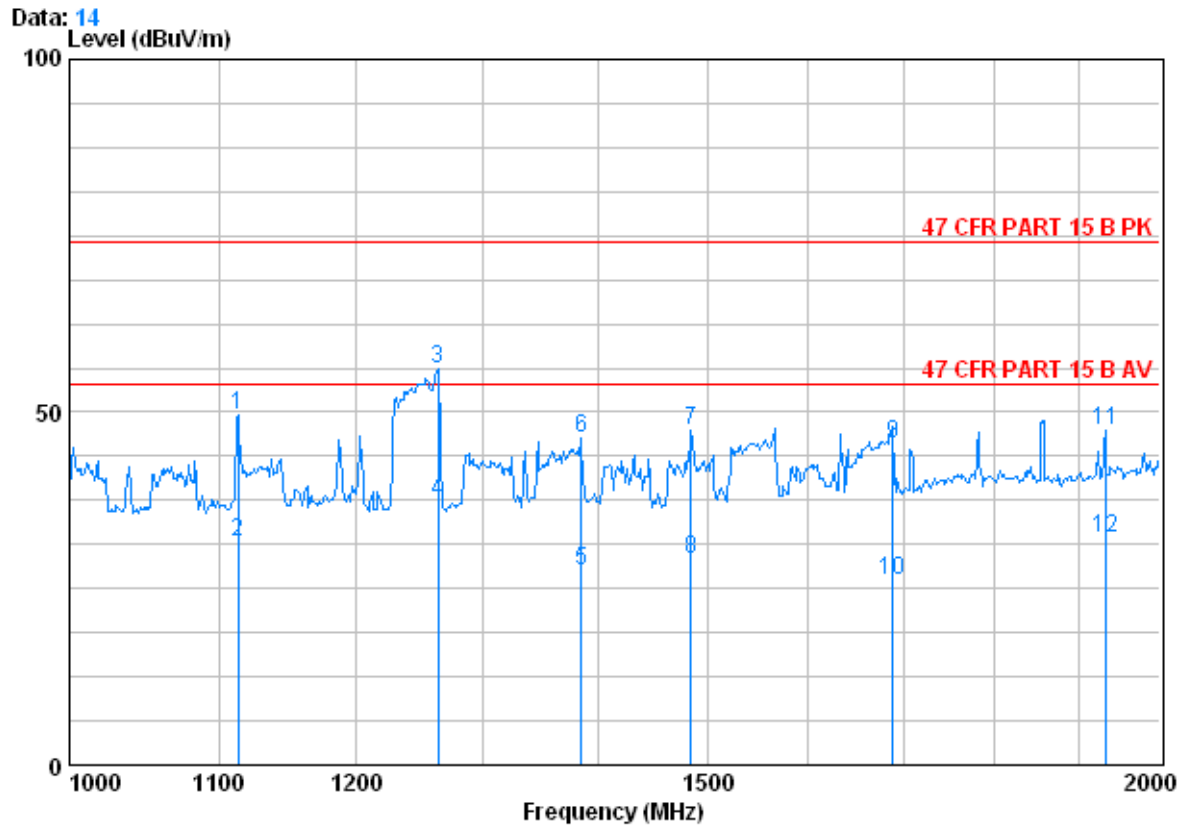
MODE: : DVB

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1112.650	2.27	27.42	39.19	38.65	29.15	54.00	-24.85	Average
2	1112.650	2.27	27.42	39.19	57.75	48.25	74.00	-25.75	Peak
3	1261.377	2.36	27.67	39.25	37.98	28.75	54.00	-25.25	Average
4	1261.377	2.36	27.67	39.25	57.30	48.08	74.00	-25.92	Peak
5	1336.074	2.41	27.82	39.29	37.52	28.46	54.00	-25.54	Average
6	1336.074	2.41	27.82	39.29	56.14	47.08	74.00	-26.92	Peak
7	1686.462	2.64	29.46	39.43	38.56	31.22	54.00	-22.78	Average
8	1686.462	2.64	29.46	39.43	57.07	49.73	74.00	-24.27	Peak
9	1858.321	2.74	30.69	39.51	39.65	33.58	54.00	-20.42	Average
10	1858.321	2.74	30.69	39.51	58.58	52.51	74.00	-21.49	Peak
11	1931.873	2.79	31.31	39.54	53.68	48.24	74.00	-25.76	Peak
12	1931.873	2.79	31.31	39.54	35.23	29.79	54.00	-24.21	Average



Play with USB stick mode

Horizontal



Condition : 47 CFR PART 15 B PK 3m HORIZONTAL

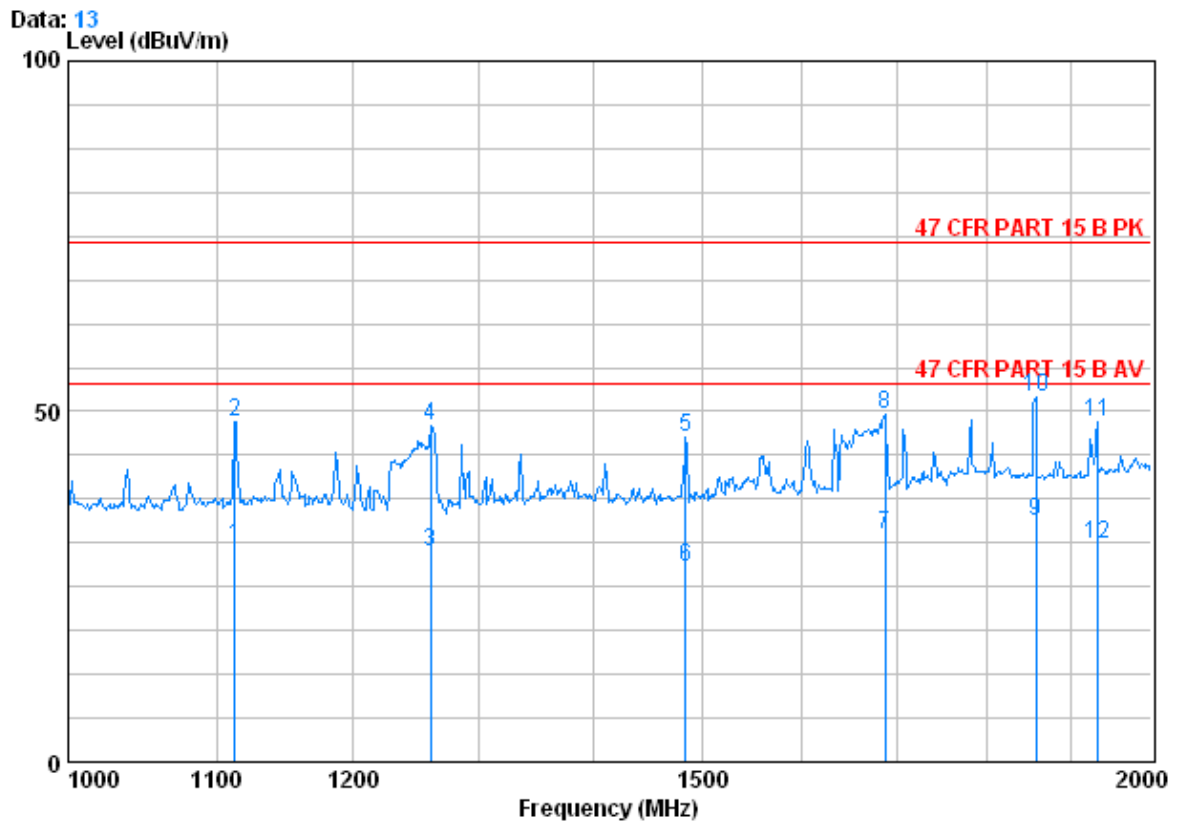
Job NO: : 1707AV

MODE: : Play with USB stick

	Freq	Cable	Antenna	Preamp	Read	Limit	Over	
		Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1113.422	2.27	27.42	39.19	59.02	49.52	74.00	-24.48 Peak
2 @	1113.422	2.27	27.42	39.19	40.98	31.48	54.00	-22.52 Average
3 @	1264.003	2.36	27.70	39.25	65.45	56.26	74.00	-17.74 Peak
4 @	1264.003	2.36	27.70	39.25	46.65	37.45	54.00	-16.55 Average
5	1385.109	2.44	27.91	39.30	36.58	27.63	54.00	-26.37 Average
6	1385.109	2.44	27.91	39.30	55.20	46.26	74.00	-27.74 Peak
7	1484.524	2.50	28.10	39.35	56.05	47.30	74.00	-26.70 Peak
8	1484.524	2.50	28.10	39.35	37.85	29.10	54.00	-24.90 Average
9	1687.632	2.64	29.46	39.43	52.76	45.43	74.00	-28.57 Peak
10	1687.632	2.64	29.46	39.43	33.58	26.24	54.00	-27.76 Average
11	1931.873	2.79	31.31	39.54	52.94	47.50	74.00	-26.50 Peak
12 @	1931.873	2.79	31.31	39.54	37.56	32.12	54.00	-21.88 Average



Vertical



Condition : 47 CFR PART 15 B PK 3m VERTICAL

Job NO: : 1707AV

MODE: : Play with USB stick

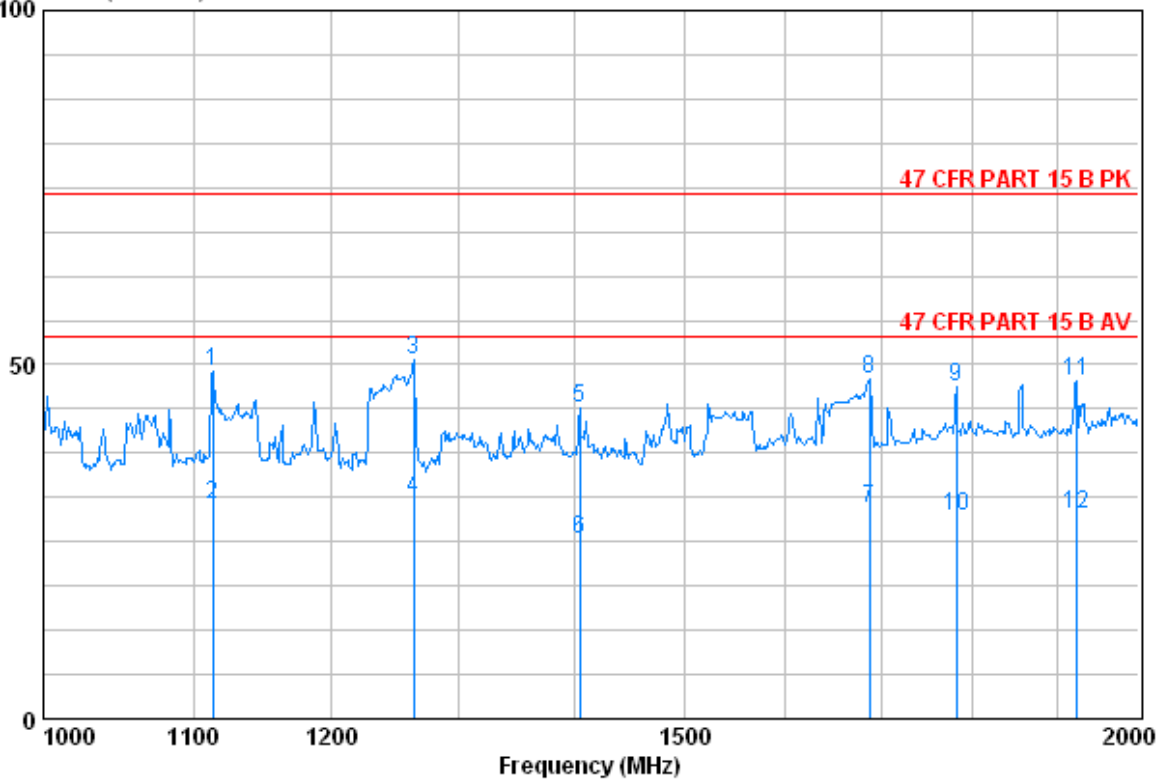
	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Limit	Over	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1112.650	2.27	27.42	39.19	40.21	30.71	54.00	-23.29 Average
2	1112.650	2.27	27.42	39.19	57.99	48.49	74.00	-25.51 Peak
3	1261.377	2.36	27.67	39.25	39.21	29.98	54.00	-24.02 Average
4	1261.377	2.36	27.67	39.25	57.18	47.95	74.00	-26.05 Peak
5	1484.524	2.50	28.10	39.35	55.21	46.46	74.00	-27.54 Peak
6	1484.524	2.50	28.10	39.35	36.58	27.83	54.00	-26.17 Average
7 0	1686.462	2.64	29.46	39.43	39.86	32.52	54.00	-21.48 Average
8	1686.462	2.64	29.46	39.43	57.03	49.69	74.00	-24.31 Peak
9 0	1858.321	2.74	30.69	39.51	40.40	34.33	54.00	-19.67 Average
10 0	1858.321	2.74	30.69	39.51	58.15	52.07	74.00	-21.93 Peak
11	1931.873	2.79	31.31	39.54	53.95	48.51	74.00	-25.49 Peak
12 0	1931.873	2.79	31.31	39.54	36.54	31.10	54.00	-22.90 Average



Record mode

Horizontal

Data: 18
Level (dBuV/m)



Condition : 47 CFR PART 15 B PK 3m HORIZONTAL

Job NO: : 1707AV

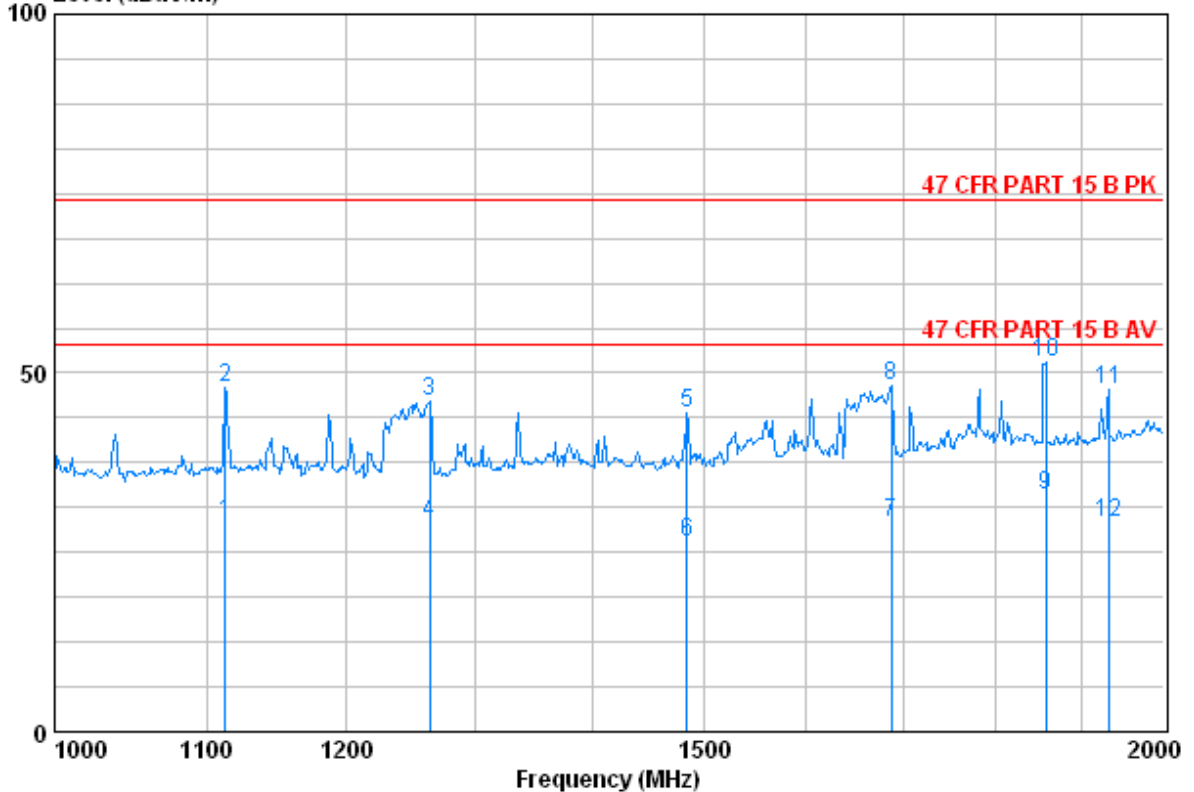
MODE: : Record

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1113.422	2.27	27.42	39.19	58.44	48.94	74.00	-25.06	Peak
2	1113.422	2.27	27.42	39.19	39.65	30.15	54.00	-23.85	Average
3	1264.003	2.36	27.70	39.25	59.80	50.61	74.00	-23.39	Peak
4 @	1264.003	2.36	27.70	39.25	40.21	31.01	54.00	-22.99	Average
5	1404.445	2.45	27.94	39.31	52.91	44.00	74.00	-30.00	Peak
6	1404.445	2.45	27.94	39.31	34.21	25.30	54.00	-28.70	Average
7	1686.462	2.64	29.46	39.43	36.98	29.64	54.00	-24.36	Average
8	1686.462	2.64	29.46	39.43	55.27	47.94	74.00	-26.06	Peak
9	1782.621	2.70	30.20	39.47	53.40	46.82	74.00	-27.18	Peak
10	1782.621	2.70	30.20	39.47	35.21	28.63	54.00	-25.37	Average
11	1922.522	2.79	31.18	39.54	53.28	47.72	74.00	-26.28	Peak
12	1922.522	2.79	31.18	39.54	34.56	29.00	54.00	-25.00	Average



Vertical

Data: 17
Level (dBuV/m)



Condition : 47 CFR PART 15 B PK 3m VERTICAL
Job NO: : 1707AV
MODE: : Record

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1112.650	2.27	27.42	39.19	38.65	29.15	54.00	-24.85	Average
2	1112.650	2.27	27.42	39.19	57.56	48.06	74.00	-25.94	Peak
3	1264.003	2.36	27.70	39.25	55.32	46.12	74.00	-27.88	Peak
4	1264.003	2.36	27.70	39.25	38.25	29.05	54.00	-24.95	Average
5	1484.524	2.50	28.10	39.35	53.28	44.53	74.00	-29.47	Peak
6	1484.524	2.50	28.10	39.35	35.24	26.49	54.00	-27.51	Average
7	1686.462	2.64	29.46	39.43	36.58	29.24	54.00	-24.76	Average
8	1686.462	2.64	29.46	39.43	55.63	48.29	74.00	-25.71	Peak
9 @	1858.321	2.74	30.69	39.51	38.96	32.89	54.00	-21.11	Average
10 @	1858.321	2.74	30.69	39.51	57.48	51.41	74.00	-22.59	Peak
11	1931.873	2.79	31.31	39.54	53.26	47.82	74.00	-26.18	Peak
12	1931.873	2.79	31.31	39.54	34.56	29.12	54.00	-24.88	Average



6.4 Antenna Power, 30 MHz to 960 MHz

Test Requirement: 47 CFR PART 15, Subpart B
Test Method: Setion 15.111
Test Voltage: 120V AC, 60Hz
Frequency Range: 30 MHz to 960 MHz
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: 1020 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, AV output and HDMI output, completed test was conducted at middle channel DVB signal input and HDMI output, since no worst case was found.

6.4.2 Measurement Data

Frequency	Transducer	Receiver QP Reading	Receiver QP Level	Limit	Margin
(MHz)	(dB)	(dB μ V)	(dB μ V)	(dB μ V)	(dB)
129.850	22.3	13.1	35.4	51.8	-16.4
236.522	22.4	12.4	34.8	51.8	-17.0
359.161	22.5	6.9	29.4	51.8	-22.4
449.511	22.8	4.0	26.8	51.8	-25.0
596.516	22.9	3.2	26.1	51.8	-25.7





6.5 Output and Spurious conducted level at RF output terminal

Test Requirement: 47 CFR PART 15, Subpart B
Test Method: Setion 15.115
Test Voltage: 120V AC, 60Hz
Frequency Range: 4.6 MHz to 1 GHz
Class / Limit: 69.54dBuV for Video
56.53dBuV for Audio
39.55dBuV for others
Detector: RMS RBW=100kHz VBW=300kHz
Remark : Test with a 75/50 ohm converter.
Limit=20log(0.003)+120=69.54 dBμV for Video
Limit=20log(0.000671)+120=56.53 dBμV for Audio
Limit=20log(0.000095)+120=39.55 dBμV for Others

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55% RH Atmospheric Pressure: 1020 mbar

EUT Operation: Test the EUT in DVB mode, (pre-test was performed at DVB mode, Play with USB stick mode and Record 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.

6.5.2 Measurement Data



Video

Frequency	Level	Limit	Margin
(MHz)	(dBμV)	(dBμV)	(dB)
61.25	66.82	69.54	-3.72
37.09	24.25	39.55	-15.30
84.11	24.36	39.55	-15.17
223.24	23.12	39.55	-16.44
450.99	21.21	39.55	-17.35
801.28	22.25	39.55	-16.30
979.01	20.23	39.55	-18.38

Audio

Frequency	Level	Limit	Margin
(MHz)	(dBμV)	(dBμV)	(dB)
65.75	52.76	56.53	-3.87
39.33	24.22	39.55	-14.32
88.96	25.35	39.55	-13.20
219.45	25.15	39.55	-14.50
422.09	23.25	39.55	-15.20
822.18	20.25	39.55	-18.12
966.74	23.22	39.55	-15.32



6.6 Demonstration on internal preventing circuitry

Test Requirement: 47 CFR PART 15, Subpart B
Test Method: Setion 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: 1020 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, AV output and HDMI output, completed test was conducted at middle channel DVB signal input and HDMI output, since no worst case was found.

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.