

EMC TEST REPORT For FCC



Test Report No. : 2005050023
Date of Issue : May 24, 2005
FCC ID : PDLAV420W
Model/Type No. : AV420W and LA1421
Kind of Product : 42" TFT LCD TV
Applicant : ATEC CO., LTD.
Applicant Address : #1451-78, Seocho-Dong, Seocho-Gu, Seoul 137-867, Korea
Manufacturer : ATEC CO., LTD.
Manufacturer Address : #1451-78, Seocho-Dong, Seocho-Gu, Seoul 137-867, Korea
Contact Person : Ho-Jung, Hwang (Senior Research Engineer)
Telephone : +82-2-2190-5155
Received Date : May 16, 2005
Test period : Start : May 17, 2005 End : May 18, 2005
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

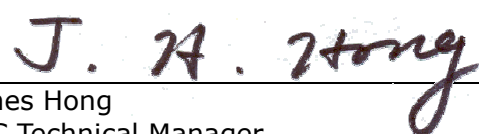
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Tested by

Reviewed by



Young-Joon, Park
EMC Test Engineer
Date: May 24, 2005



James Hong
EMC Technical Manager
Date: May 24, 2005

REPORT REVISION HISTORY

Date	Revision	Page No
May 24, 2005	Issued (2005050023)	All

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1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model AV420W.
- ☒ Tests performed on Model AV420W were considered to be representative of Model(s) LA1421.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 1221(W) by 304(D) by 731(H) ☒ mm ☐ inch
Mobility: ☐ Hand-held ☒ Table-top ☐ Built-in
☐ Traveling ☐ Floor-standing
Serial No.: Prototype

1.0.3 Electrical Ratings

Input: 100-240 Vac, 50/60 Hz, 253 W
Output: -

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 120 Vac
Frequency: 60 Hz

1.0.5 Clock & Other Frequencies Utilized

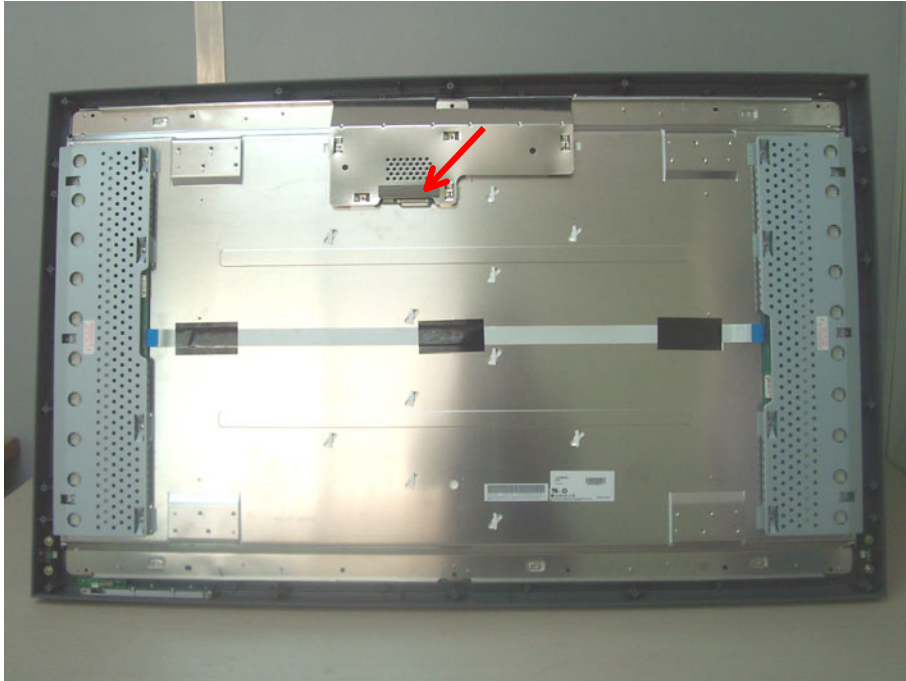
14.31818 MHz, 13.5 MHz, 27 MHz, 18.432 MHz

1.1 Model Differences

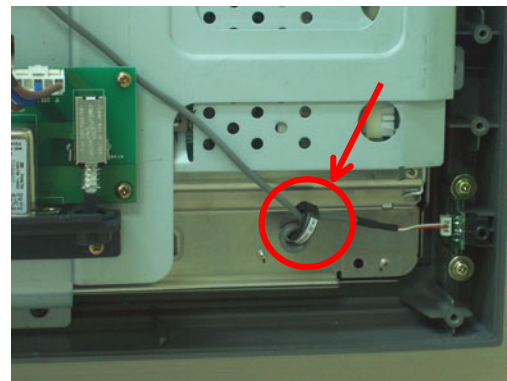
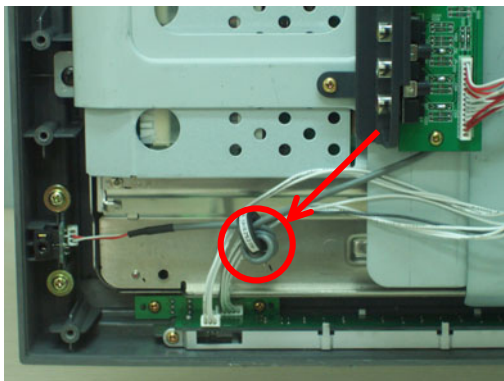
AV420W and LA1421 are identical to each other only except for model designations for the marketing purpose.

1.2 Device Modifications

The following modifications were necessary for compliance:



Gasket is inserted additionally.



Ferrite Cores are inserted additionally.

Manufacturer	Part No.
S.C.E	TC18A152A

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
Headphone	-	-	-	-
Personal Computer	Hewlett-Packard Company	PD1059P	-	DoC
Keyboard (PS/2 type)	CHCONY ELECTRONICS(MAINLAND CHINA)CO. LTD	KB-0133	B55680FGA0985M	DoC
Mouse (PS/2 type)	Microsoft Corporation	Wheel Mouse 3.0 PS/2 Compatible	4917597-0	DoC
Mouse (USB type)	SAMSUNG	OMS3CB	0303009881	DoC
Mouse (Serial type)	SAMSUNG	BASM1	4476257-20000	DoC

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	EUT Power Cable, Unshielded	No	1.8	Connect to AC power
2	Headphone Cable, Unshielded	No	2.1	Between the EUT and Headphone
3	DVI Cable, Shielded	Yes	1.5	Between the EUT and PC
4	RGB Cable, Shielded	Yes	1.5	Between the EUT and PC
5	PC Audio Input Cable, Unshielded	No	1.5	Between the EUT and PC
6	S-Video Cable, Shielded	No	1.8	Unterminated (only cable)
7	Composite Cable, Unshielded	No	1.8	Unterminated (only cable)
8	RS-232C Cable, Unshielded	No	1.5	Unterminated (only cable)
9	Video Input Cable 1, Unshielded	No	1.8	Unterminated (only cable)
10	Audio Input Cable, Unshielded	No	1.8	Unterminated (only cable)
11	Antenna Cable, Shielded	No	10	Unterminated (only cable)
12	Video Input Cable 2, Unshielded	No	1.8	Unterminated (only cable)
13	Video Out Cable, Shielded	No	1.5	Unterminated (only cable)
14	Mouse cable, Shielded	No	1.5	USB type
15	Mouse cable, Shielded	No	2.1	Serial type
16	Mouse cable, Shielded	No	1.5	PS/2 type
17	Keyboard cable, Shielded	No	1.5	PS/2 type
18	AC power cable, Unshielded	No	1.8	Connect to AC power

1.4 Test Software

- ☐ EMC Test V 1.0
☒ Display Test Patterns – V1.5
☐ Ping.exe
☐ Not applicable

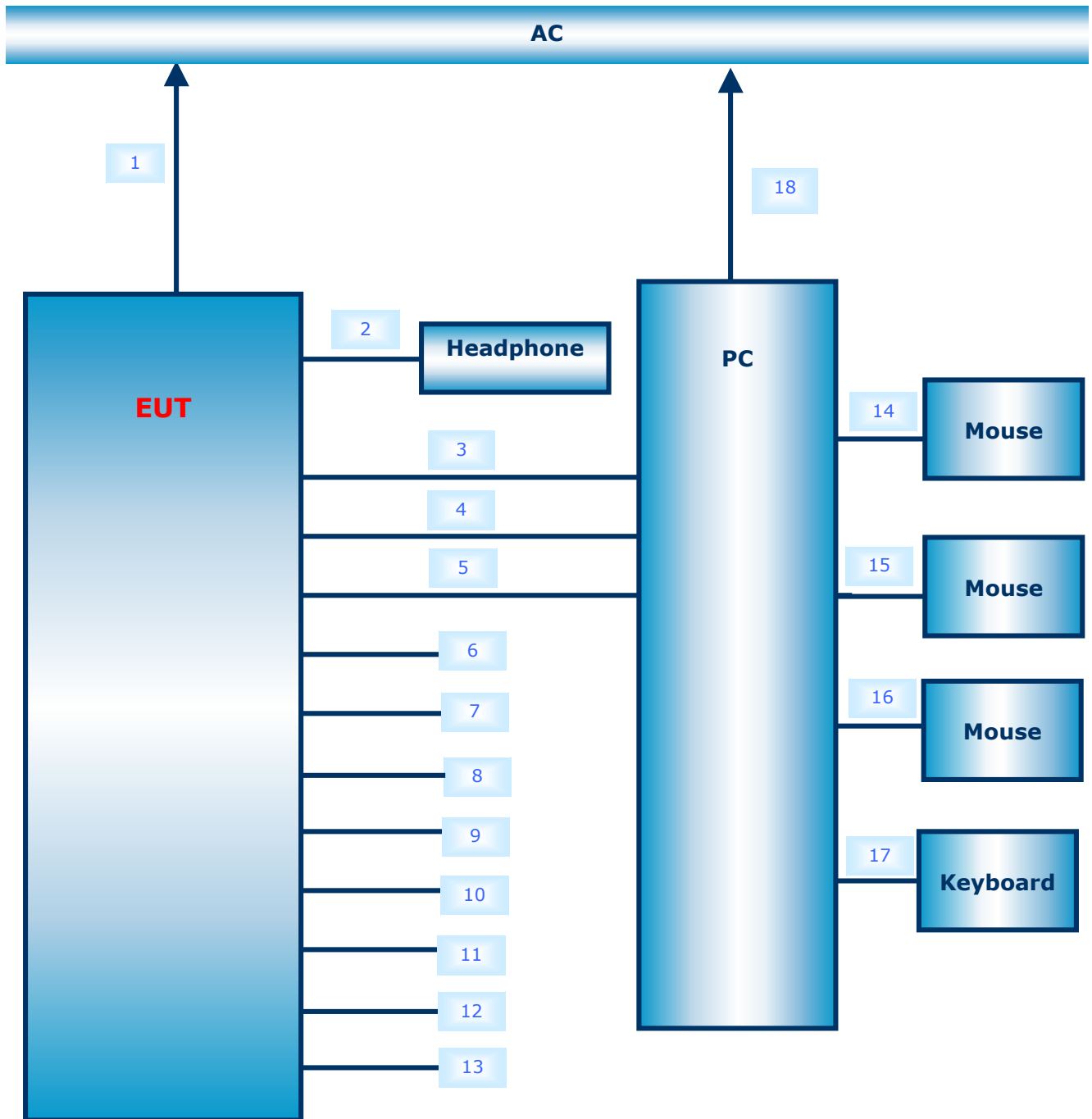
1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

- ☐ Standby
☐ Display circles pattern
☒ Practice operation – Resolution : 1360 x 768 @ 60 Hz
☒ Scrolling 'H' (EMI)
☐ Display color bar (EMS)

During testing, the EUT was connected to a PC via a DVI port and a RGB port.
(Digital mode and Analog mode)

1.6 Configuration



1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.8 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.9 Measurement Procedure






Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)
Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-2001 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.10 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
International	KOLAS	EMC	 NO-119
Europe	GLAS	EMC EN 55011, EN 55022, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 50130-4, EN 55024, EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	 No.13000796-02

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

- | | | |
|--|----------------------------------|---|
| <input type="checkbox"/> EN 61000-6-3:2001 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 61000-6-4:2001 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 50083-2:2001 | | |
| <input type="checkbox"/> EN 55011:1998 +A1:1999 | <input type="checkbox"/> Group 1 | <input type="checkbox"/> Group 2 |
| | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55011:1998 +A1:1999 +A2:2002 | <input type="checkbox"/> Group 1 | <input type="checkbox"/> Group 2 |
| | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55013:1990 +A12:1994 +A13:1996 +A14:1999 | | |
| <input type="checkbox"/> EN 55013:2001 | | |
| <input type="checkbox"/> EN 55014-1:2000 | | |
| <input type="checkbox"/> EN 55014-1:2000 +A1:2001 | | |
| <input type="checkbox"/> EN 55015:2000 | | |
| <input type="checkbox"/> EN 55015:2000 +A1:2001 | | |
| <input type="checkbox"/> EN 55022:1994 +A1:1995 +A2:1997 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55022:1998 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55022:1998 +A1:2000 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55022:1998 +A1:2000 +A2:2003 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 61000-3-2:2000 | | |
| <input type="checkbox"/> EN 61000-3-3:1995 +A1:2001 | | |
| <input type="checkbox"/> VCCI V-3/2004.04 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> AS/NZS 3548:1995 +A1:1997 +A2:1997 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> FCC Part 15 Subpart B | <input type="checkbox"/> Class A | <input checked="" type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> CISPR 22:1997 | <input type="checkbox"/> Class A | <input checked="" type="checkbox"/> Class B |
| The unit was tested to CISPR 22 and complied with the alternate methods allowed by FCC under paragraphs 15.107 and 15.109. | | |
| <input type="checkbox"/> CISPR 22:1997 +A1:2000 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |

2.1 Conducted Voltage Emissions

Test Date

May 18, 2005

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2006-02-01
<input checked="" type="checkbox"/>	LISN	EMCO	3825/2	9607-2574	2005-09-03
<input checked="" type="checkbox"/>	LISN	EMCO	3825/2	9409-2246	2005-09-03

Frequency Range of Measurement

150 kHz to 30 MHz

Test Results

The requirements are:

[Analog mode]

☒ MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark
0.25	45.2	6.6	Average

[Digital mode]

☒ MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark
0.25	44.3	7.5	Average

☐ NOT MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark

☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date

May 17, 2005

Test Location

☒ Testing was performed at a test distance of 10 meter Open Area Test Site

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008	2005-11-15
<input checked="" type="checkbox"/>	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2005-05-21
<input type="checkbox"/>	Biconical Antenna	EMCO	3110	9202-1510	2006-04-13
<input type="checkbox"/>	Log-periodic Antenna	EMCO	3146	9607-4567	2006-04-08

Frequency Range of Measurement

30 MHz to 1 GHz

Test Results

The requirements are:

[Analog mode]

☒ MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
425.31	33.8	3.2	Quasi-peak

[Digital mode]

☒ MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
425.31	33.2	3.8	Quasi-peak

☐ NOT MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark

☐ NOT APPLICABLE

Remarks

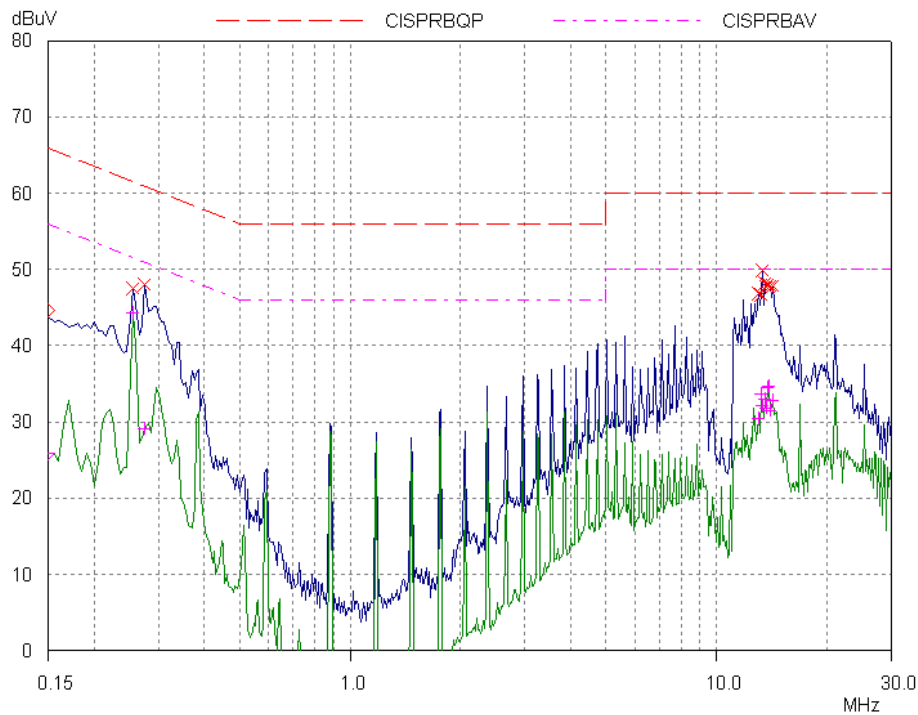
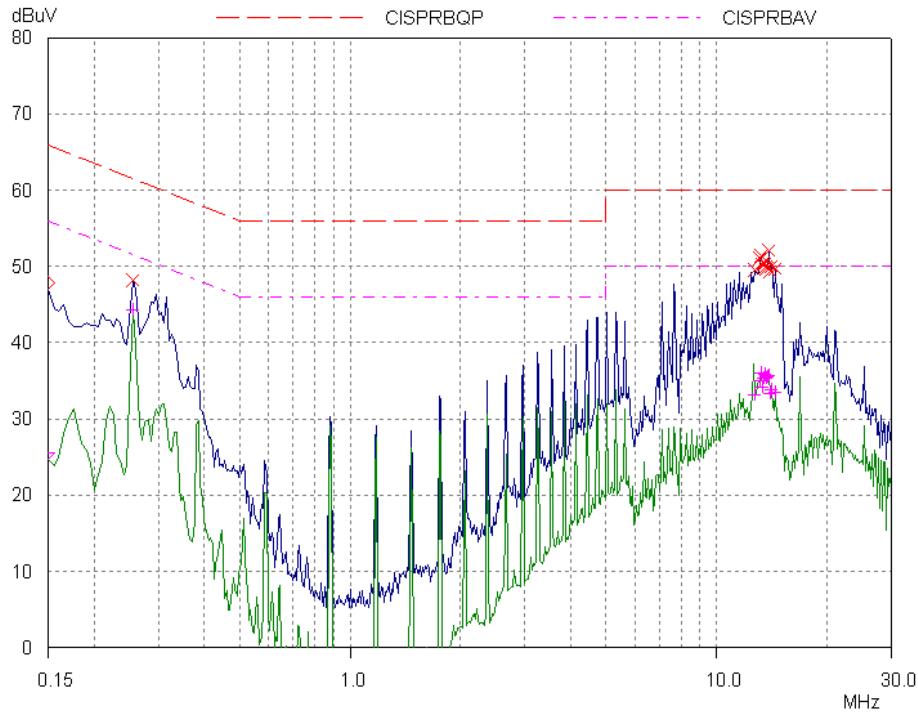
See Appendix A for test data

APPENDIX A – TEST DATA

Conducted Voltage Emissions

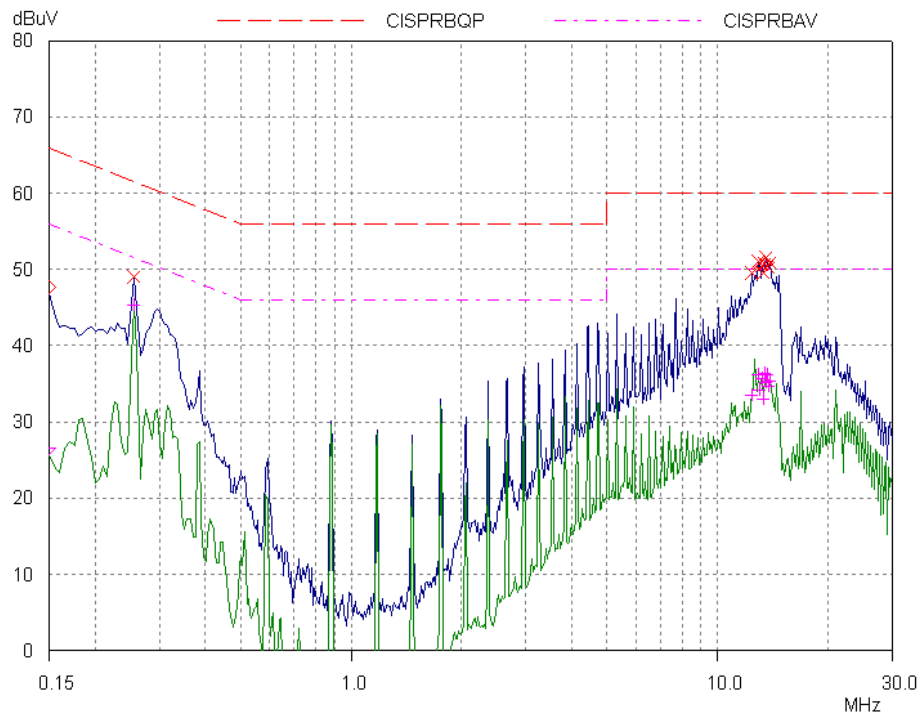
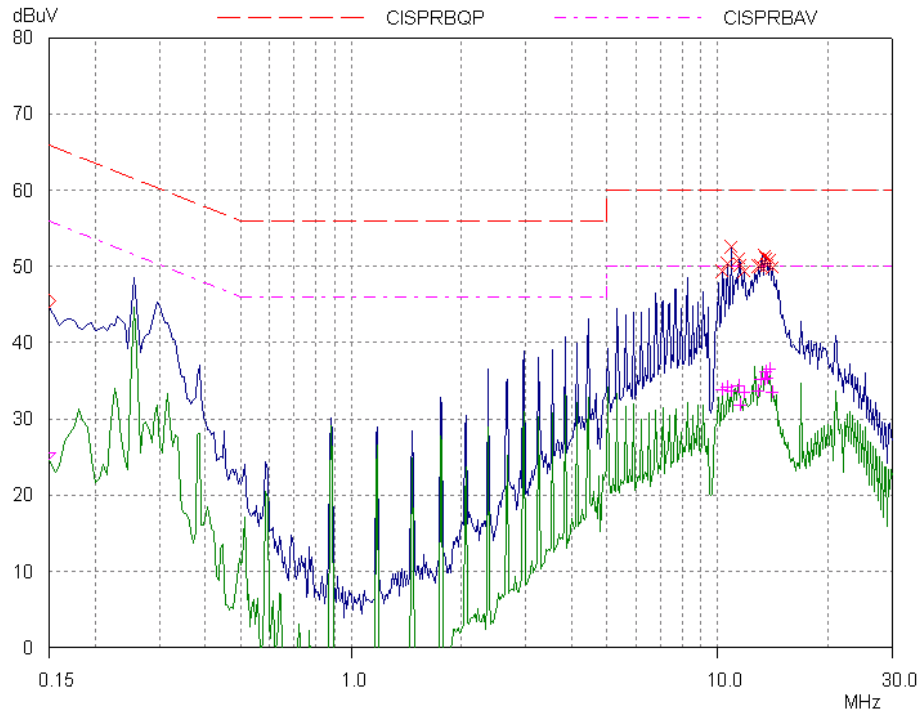
[Analog mode]

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.25	0.1	0.1	N	61.8	48.8	49.0	12.8	51.8	45.0	45.2	6.6
10.83	0.1	0.2	H	60.0	52.3	52.6	7.4	50.0	33.3	33.6	16.4
11.41	0.1	0.2	H	60.0	50.7	51.0	9.0	50.0	34.0	34.3	15.7
12.90	0.2	0.2	N	60.0	50.6	51.0	9.0	50.0	35.7	36.1	13.9
13.38	0.2	0.2	H	60.0	50.9	51.3	8.7	50.0	34.7	35.1	14.9
13.48	0.2	0.2	H	60.0	50.7	51.1	8.9	50.0	35.8	36.2	13.8
13.78	0.2	0.2	N	60.0	50.5	50.9	9.1	50.0	34.9	35.3	14.7



[Digital mode]

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.25	0.1	0.1	N	61.8	47.3	47.5	14.3	51.8	44.1	44.3	7.5
13.05	0.2	0.2	H	60.0	50.6	51.0	9.0	50.0	34.5	34.9	15.1
13.20	0.2	0.2	H	60.0	50.9	51.3	8.7	50.0	35.7	36.1	13.9
13.42	0.2	0.2	H	60.0	50.0	50.4	9.6	50.0	34.8	35.2	14.8
13.65	0.2	0.2	H	60.0	49.6	50.0	10.0	50.0	35.0	35.4	14.6
13.79	0.2	0.2	H	60.0	51.6	52.0	8.0	50.0	35.2	35.6	14.4
14.10	0.2	0.2	H	60.0	49.6	50.0	10.0	50.0	33.3	33.7	16.3



[Digital mode]

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
173.12	14.7	H	2.0	7.1	2.5	30.0	24.2	5.8
199.82	15.8	H	2.3	7.2	2.8	30.0	25.8	4.2
340.49	15.9	H	1.8	12.2	3.5	37.0	31.6	5.4
425.31	15.2	V	4.0	14.1	3.9	37.0	33.2	3.8
456.83	12.6	H	2.0	14.8	4.1	37.0	31.5	5.5
510.20	10.6	V	1.0	15.7	4.3	37.0	30.6	6.4
934.51	3.7	H	4.0	21.0	6.1	37.0	30.8	6.2