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# FCC 47 CFR PART 15 SUBPART B TEST REPORT

for

**47" LCD TV**

**MODEL: E470VLXXX; VIZIO E470VLXXX (The " X " in the model designation may be any alphanumeric character or blank.)**

**FCC ID: MDZ47LD500-UA**

Test Report Number:  
T100205102-D

Issued for

**Amtran Technology Co., Ltd.**

**17F, No. 268, Lien Chen Rd., Chung Ho City, Taipei County, Taiwan, 235 R.O.C.**

Issued By:

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Issued Date: March 2, 2010



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**Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 2, 2010	Initial Issue	ALL	Kosame Lin



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# 1 TEST RESULT CERTIFICATION

<b>Product:</b>	47" LCD TV
<b>Model:</b>	E470VLXXX; VIZIO E470VLXXX (The " X " in the model designation may be any alphanumeric character or blank.)
<b>Brand:</b>	AmTRAN; VIZIO
<b>Applicant:</b>	<b>Amtran Technology Co., Ltd.</b> 17F, No. 268, Lien Chen Rd., Chung Ho City, Taipei County, Taiwan, 235 R.O.C.
<b>Manufacturer:</b>	<b>1. Amtran Electronic Co., Ltd.</b> No. 225, Jinfeng Road, Suzhou New District, Suzhou, Jiangsu PRC. <b>2. SuZhou Raken Technology Co., Ltd.</b> No. 278, Mayun Rd., New District Su Zhou, China
<b>Tested:</b>	January 28 ~ February 22, 2010
<b>Test Voltage:</b>	120VAC, 60Hz

EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15 Subpart B (July 10, 2008), ICES-003 Issue 4 ANSI C63.4-2003	Conducted (Main Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

- Note:
1. The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
  2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Ethan Huang  
Section Manager

Reviewed by:

Stan Lin  
Supervisor



## 2 EUT DESCRIPTION

<b>Product</b>	47" LCD TV		
<b>Brand Name</b>	AmTRAN; VIZIO		
<b>Model</b>	E470VLXXX; VIZIO E470VLXXX (The " X " in the model designation may be any alphanumeric character or blank.)		
<b>Applicant</b>	Amtran Technology Co., Ltd.		
<b>Serial Number</b>	T100205102		
<b>Received Date</b>	February 5, 2010		
<b>EUT Power Rating</b>	100-240VAC, 50/60Hz		
<b>AC Power Cord Type</b>	Unshielded, 1.8m (Detachable)		
<b>LCD Panel Manufacturer</b>	LG Display	<b>Model</b>	LC470WUH
<b>Power Board Manufacturer</b>	Delta	<b>Model</b>	DPS-270DP XX (X=0-9 or A-Z or blank)
	LGIT	<b>Model</b>	PLHL-T945A

### I/O Port

I/O PORT TYPES	Q'TY	TESTED WITH
1. D-SUB Port	1	1
2. Audio Port (PC)	1	1
3. HDMI Port	3	2
4. AV Terminal Port (V/L/R)	1 Set	1 Set
5. Component Port (Y/Pb/Pr)	1 Set	1 Set
6. Audio Port (R/L)	3 Set	3 Set
7. Optical Port	1	1
8. Antenna Port	1	1
9. USB Port	1	1

**Note:**

1. The all model numbers (list on this report) are identical, just for marketing purpose only.
2. The means of "X" (The " X " in the model designation may be any alphanumeric character or blank.) on model number is just for marketing purpose only.
3. The EUT include one Remote Control for sale only.
4. Each and every port of EUT is connected to relevant peripherals except for one USB Port, which is in open loop state.
5. Client consigns only one model sample (Model number: E470VLXXX) to test. Therefore, testing Lab. just guarantees the units, which have been tested.

### 3 TEST METHODOLOGY

#### 3.1. DECISION OF FINAL TEST MODE

1. The following test mode(s) were scanned during the preliminary test:

Mode	D-SUB	HDMI 1	HDMI 2	HDMI 3	AV Terminal	Component	Antenna	Power Board	LCD Panel
1	1920 x 1080 / 60Hz	---	---	---	---	---	---	Delta	LG Display LC470WUH
2	1024 x 768 / 75Hz	---	---	---	---	---	---		
3	800 x 600 / 60Hz	---	---	---	---	---	---		
4	---	1080P	---	---	---	---	---		
5	---	---	1080P	---	---	---	---		
6	---	---	---	1080P	---	---	---		
7	---	---	---	720P	---	---	---		
8	---	---	---	480P	---	---	---		
9	---	---	---	---	AV	---	---		
10	---	---	---	---	---	Component	---		
11	1920 x 1080 / 60Hz	---	---	---	---	---	---	LGIT	

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Conducted Emission	<b>Mode 1, 11</b>
	Radiated Emission	<b>Mode 1, 11 For Below 1GHz</b> <b>Mode 1 For Above 1GHz (The difference of Mode 1 &amp; 11 is power Board, the main board is the same. So only test Mode 1)</b>

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

#### 3.2. EUT SYSTEM OPERATION

1	EMI test program was loaded and executed in “Windows XP” mode.
2	Data was sent to EUT filling the screen with upper case of “H” patterns.
3	Test program sequentially exercised all related I/O’s of Host PC and sent “H” patterns to all applicable output ports of Host PC.
4	Repeat 2 to 3.

**Note:** Test program is self-repeating throughout the test.



## 4 SETUP OF EQUIPMENT UNDER TEST

### 4.1. DESCRIPTION OF SUPPORT UNITS

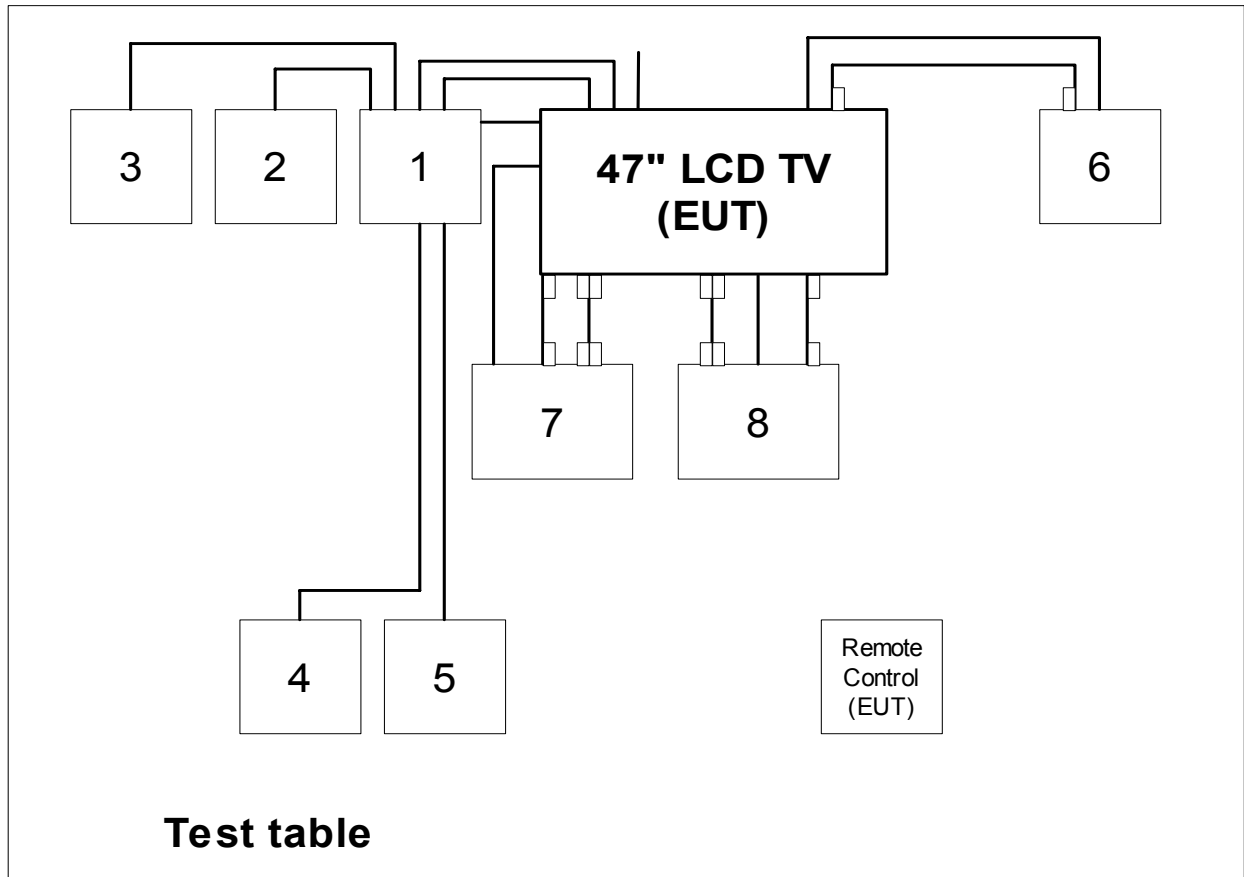
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	PC	DX-6120	SGH5330GK7	FCC DoC	HP	D-SUB Cable: Shielded, 1.8m with two cores Audio Cable: Unshielded, 1.8m with two cores HDMI Cable: Unshielded, 1.8m	Unshielded, 1.8m
2	Modem	DM-1414	304012263	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
3	Printer	STYLUS C60	DR3K041737	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
4	PS/2 Keyboard	Y-SJ17	SY528UK	FCC DoC	Logitech	Unshielded, 1.8m	N/A
5	PS/2 Mouse	M-S34	HCA25200078	DZL211029	Logitech	Unshielded, 1.8m	N/A
6	5.1 Amplifier	Z-5500	R805	FCC DoC	Logitech	Optical Cable: Unshielded, 1.0m Audio Cable: Unshielded, 1.8m x 2	Unshielded, 1.8m
7	DVD Player	DVD-S53	VC7KA001763 R	FCC DoC	Panasonic	HDMI Cable: Unshielded, 1.8m AV Terminal Cable: Unshielded, 1.8m x 3 Audio Cable: Unshielded, 1.8m x 2	Unshielded, 1.8m
8	DVD Player	DVP-NS975V	2030939	FCC DoC	SONY	HDMI Cable: Unshielded, 1.8m Component Cable: Unshielded, 1.8m x 3 Audio Cable: Unshielded, 1.8m x 2	Unshielded, 1.8m

**Note:** Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

**4.2. CONFIGURATION OF SYSTEM UNDER TEST**

1. PC	2. Modem	3. Printer
4. PS/2 Keyboard	5. PS/2 Mouse	6. 5.1 Amplifier
7. DVD Player	8. DVD Player	---







## 5 FACILITIES AND ACCREDITATIONS

### 5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at No. 81-1, Lane 210, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, Taiwan.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

### 5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

<b>Taiwan</b>	TAF
<b>USA</b>	A2LA

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

<b>Canada</b>	Industry Canada
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Taiwan</b>	BSMI
<b>USA</b>	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

### 5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	$\pm 1.7806$
Radiated emissions	30~200MHz	$\pm 3.8856$
	200~1000MHz	$\pm 3.8721$

*This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .*

*Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.*

*The acceptable measurement uncertainty value without requiring revision of the compliance statement is based on conducted and radiated emissions being less than  $U_{CISPR}$  which is 3.6dB and 5.2dB respectively. CCS values (called  $U_{Lab}$  in CISPR 16-4-2) is less than  $U_{CISPR}$  as shown in the table above. Therefore, MU need not be considered for compliance.*



## 6 CONDUCTED EMISSION MEASUREMENT

### 6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

**NOTE:**

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 6.2. TEST INSTRUMENTS

Conducted Emission Room # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCS30	845552/030	05/18/2010
LISN	R&S	ENV216	100074	12/09/2010
LISN	FCC	FCC-LISN-50/250- 16-2-07	06013	10/12/2010
Test S/W	CCS-3A1-CE			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. N.C.R = No Calibration Request.



### **6.3. TEST PROCEDURES** (please refer to measurement standard or CCS SOP PA-031)

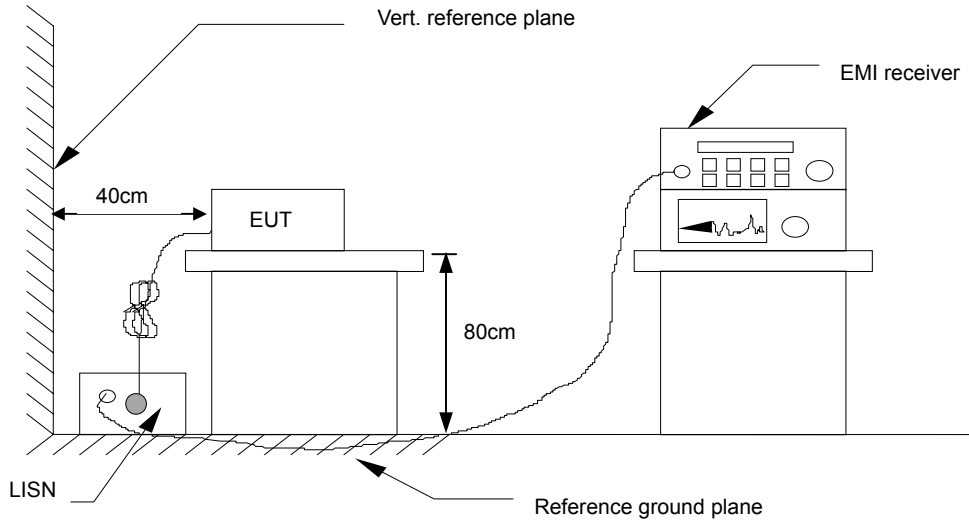
#### **Procedure of Preliminary Test**

- The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed by AC 120VAC/60Hz main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by from a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

#### **Procedure of Final Test**

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

### 6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 6.5. DATA SAMPLE:

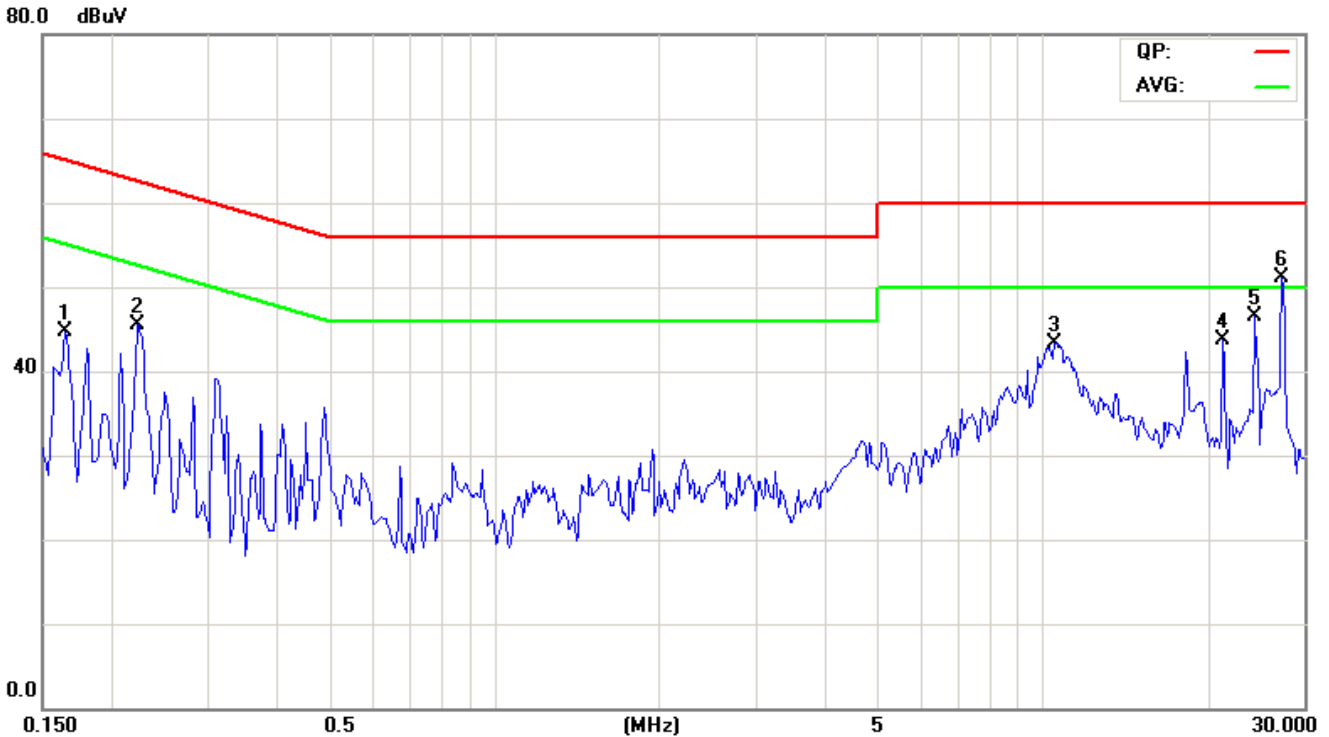
Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
x.xx	43.95	33.00	10.00	53.95	43.00	56.00	46.00	-2.05	-3.00	Pass

Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV) = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB  
 Correction Factor (dB) = LISN Factor + Cable Loss  
 Result (dBuV) = Raw reading converted to dBuV and CF added  
 Limit (dBuV) = Limit stated in standard  
 Margin (dB) = Result (dBuV) – Limit (dBuV)

### 6.6. TEST RESULTS

#### CCS Conduction Test 3

<b>Model No.</b>	E470VLXXX	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	25°C, 57% RH	<b>Test Mode</b>	Mode 1
<b>Tested by</b>	Ming Wu	<b>Line</b>	L1



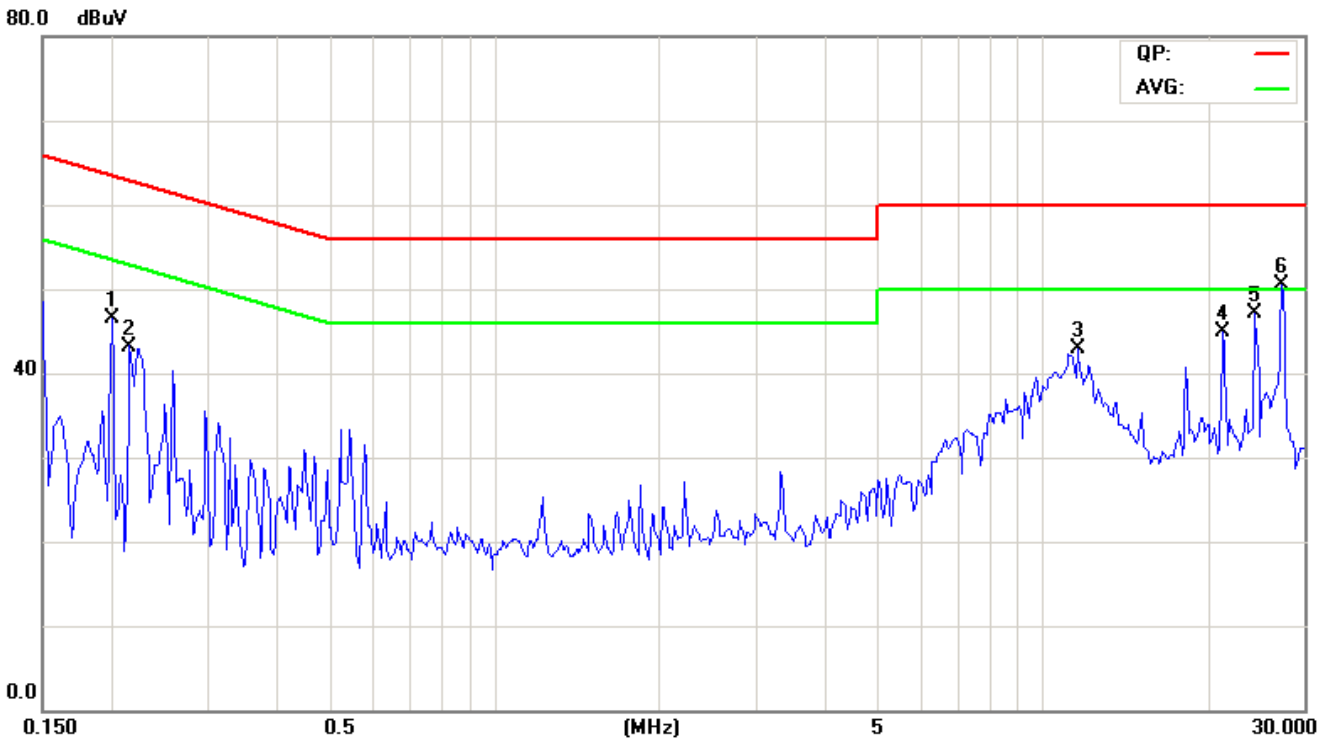
NO.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1656	34.50	16.20	9.68	44.18	25.88	65.18	55.18	-21.00	-29.30	Pass
2	0.2242	35.60	32.50	9.68	45.28	42.18	62.66	52.66	-17.38	-10.48	Pass
3	10.5367	29.63	23.83	10.17	39.80	34.00	60.00	50.00	-20.20	-16.00	Pass
4	21.3062	34.40	33.80	10.43	44.83	44.23	60.00	50.00	-15.17	-5.77	Pass
5*	24.3492	36.00	35.00	10.56	46.56	45.56	60.00	50.00	-13.44	-4.44	Pass
6	27.3922	37.70	34.60	10.57	48.27	45.17	60.00	50.00	-11.73	-4.83	Pass

**REMARKS:** L1 = Line One (Live Line)



CCS Conduction Test 3

<b>Model No.</b>	E470VLXXX	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	25°C, 57% RH	<b>Test Mode</b>	Mode 1
<b>Tested by</b>	Ming Wu	<b>Line</b>	L2



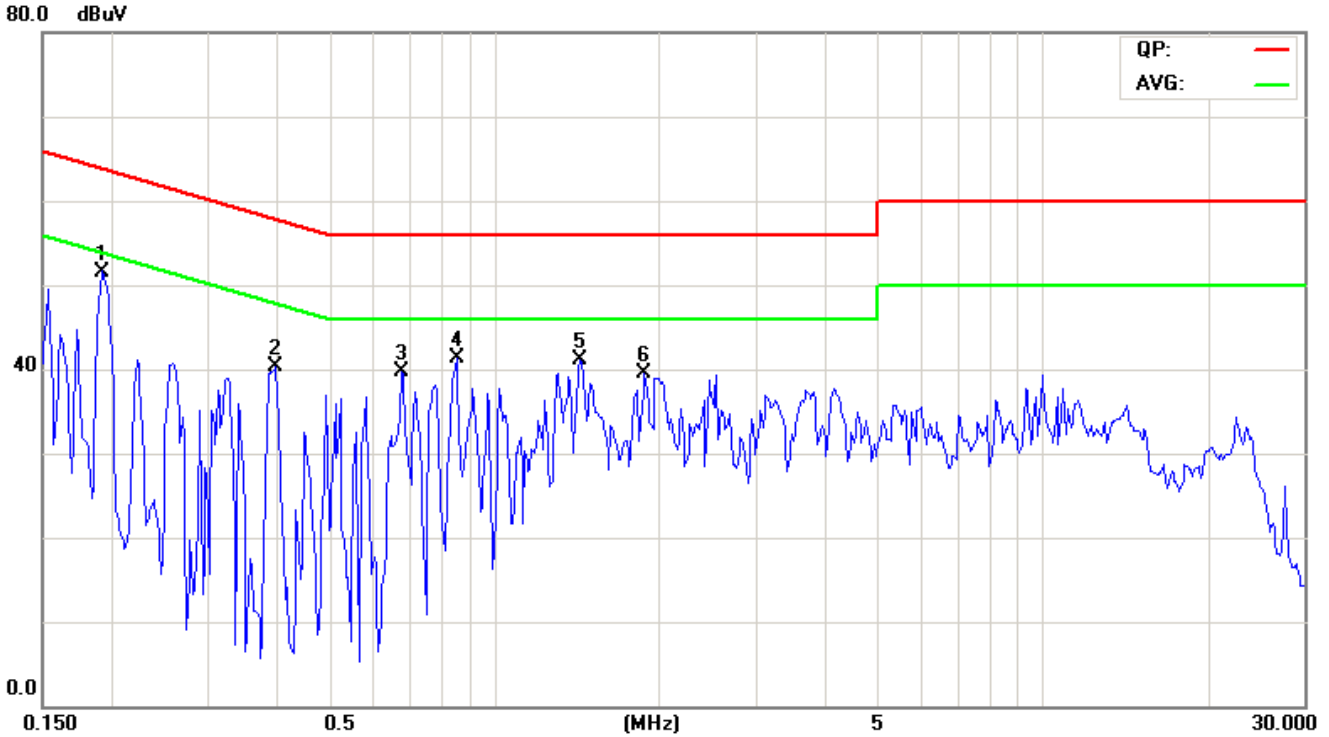
NO.	Frequency (MHz)	QuasiPeak		Correction factor (dB)	Average		QuasiPeak limit (dBuV)	Average		QuasiPeak margin (dB)	Average margin (dB)	Remark (Pass/Fail)
		reading (dBuV)	reading (dBuV)		result (dBuV)	result (dBuV)		limit (dBuV)	limit (dBuV)			
1	0.2008	31.50	20.30	9.68	41.18	29.98	63.58	53.58	-22.40	-23.60	Pass	
2	0.2164	35.90	33.10	9.68	45.58	42.78	62.96	52.96	-17.38	-10.18	Pass	
3	11.5758	27.70	21.60	10.20	37.90	31.80	60.00	50.00	-22.10	-18.20	Pass	
4	21.3062	33.87	33.27	10.43	44.30	43.70	60.00	50.00	-15.70	-6.30	Pass	
5*	24.3492	35.74	34.74	10.56	46.30	45.30	60.00	50.00	-13.70	-4.70	Pass	
6	27.3922	34.23	33.23	10.57	44.80	43.80	60.00	50.00	-15.20	-6.20	Pass	

REMARKS: L2 = Line Two (Neutral Line)



CCS Conduction Test 3

<b>Model No.</b>	E470VLXXX	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	25°C, 57% RH	<b>Test Mode</b>	Mode 11
<b>Tested by</b>	Ming Wu	<b>Line</b>	L1



NO.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark (Pass/Fail)
1*	0.1930	41.82	39.12	9.68	51.50	48.80	63.90	53.91	-12.40	-5.11	Pass
2	0.4000	29.52	21.22	9.68	39.20	30.90	57.85	47.85	-18.65	-16.95	Pass
3	0.6773	31.02	18.82	9.58	40.60	28.40	56.00	46.00	-15.40	-17.60	Pass
4	0.8531	33.41	26.01	9.59	43.00	35.60	56.00	46.00	-13.00	-10.40	Pass
5	1.4391	31.07	19.57	9.63	40.70	29.20	56.00	46.00	-15.30	-16.80	Pass
6	1.8805	31.61	24.61	9.69	41.30	34.30	56.00	46.00	-14.70	-11.70	Pass

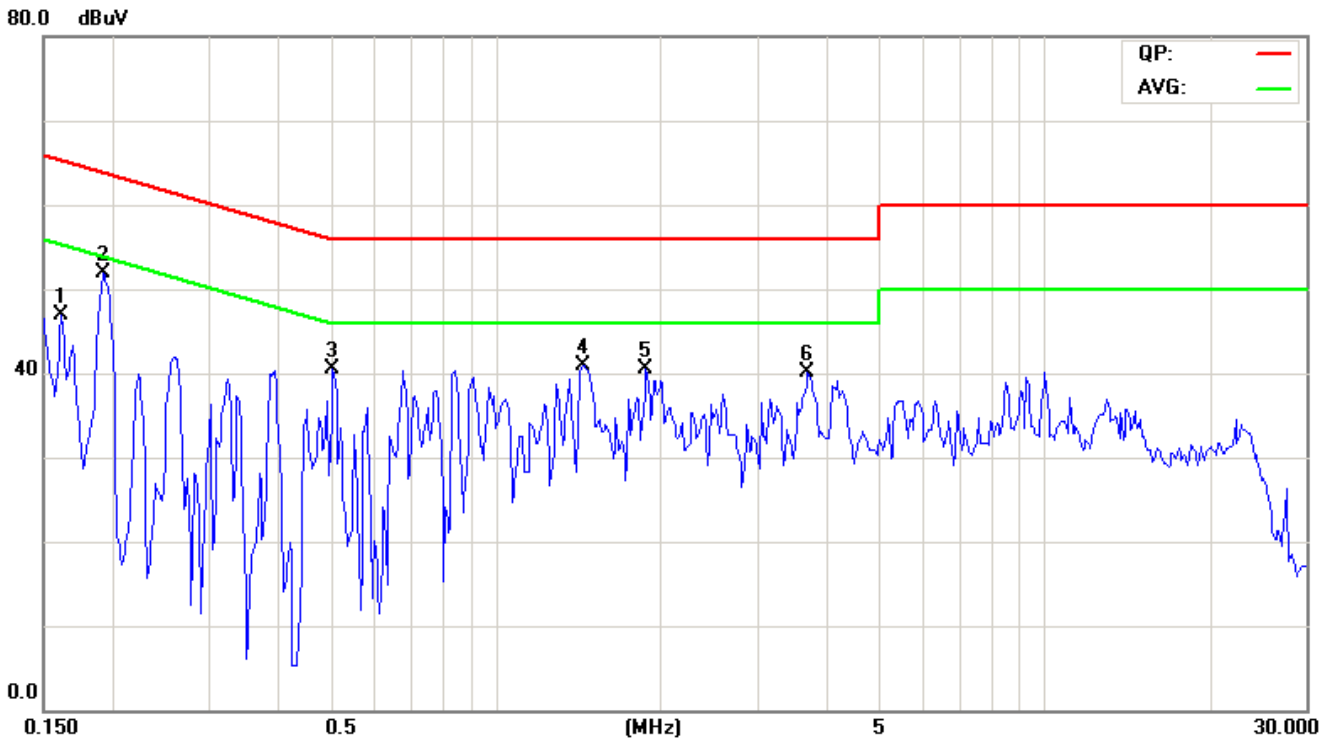
REMARKS: L1 = Line One (Live Line)





CCS Conduction Test 3

<b>Model No.</b>	E470VLXXX	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	25°C, 57% RH	<b>Test Mode</b>	Mode 11
<b>Tested by</b>	Ming Wu	<b>Line</b>	L2



NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1	0.1617	38.51	23.31	9.69	48.20	33.00	65.37	55.38	-17.17	-22.38	Pass
2*	0.1930	42.11	40.11	9.69	51.80	49.80	63.90	53.91	-12.10	-4.11	Pass
3	0.5055	31.01	23.71	9.59	40.60	33.30	56.00	46.00	-15.40	-12.70	Pass
4	1.4469	30.16	13.96	9.64	39.80	23.60	56.00	46.00	-16.20	-22.40	Pass
5	1.8844	30.71	23.71	9.69	40.40	33.40	56.00	46.00	-15.60	-12.60	Pass
6	3.7164	29.08	19.78	9.72	38.80	29.50	56.00	46.00	-17.20	-16.50	Pass

**REMARKS:** L2 = Line Two (Neutral Line)



## 7 RADIATED EMISSION MEASUREMENT

### 7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	dBuV/m (At 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

Frequency (MHZ)	Class A (dBuV/m) (At 3m)		Class B (dBuV/m) (At 3m)	
	Average	Peak	Average	Peak
Above 960	60	80	54	74

**NOTE:** (1) The lower limit shall apply at the transition frequencies.  
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

### 7.2. TEST INSTRUMENTS

Open Area Test Site # 1				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	ADVANTEST	R3261C	81720301	N.C.R
EMI Test Receiver	R&S	ESVS20	838804/004	03/11/2010
Pre-Amplifier	HP	8447D	2944A09173	04/14/2010
Bilog Antenna	TESEQ	CBL 6112D	23189	06/19/2010
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
RF Switch	Anritsu	MP59B	M54367	N.C.R
Site NSA	CCS	N/A	N/A	03/06/2010
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.7)			

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. N.C.R = No Calibration Request.



3 Meter Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilnet	E4407B	MY44212679	12/28/2010
Pre-Amplifier	HP	8449B	3008A00965	12/31/2010
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	05/24/2010
Horn Antenna	EMCO	3115	9602-4659	04/16/2010
Horn Antenna	EMCO	3116	00026370	10/15/2010
Site VSWR	SIDT EUROPE	9x6x6	N/A	02/27/2011
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Test S/W	CCS-3A1RE			

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. N.C.R = No Calibration Request.

### **7.3. TEST PROCEDURES** (please refer to measurement standard or CCS SOP PA-031)

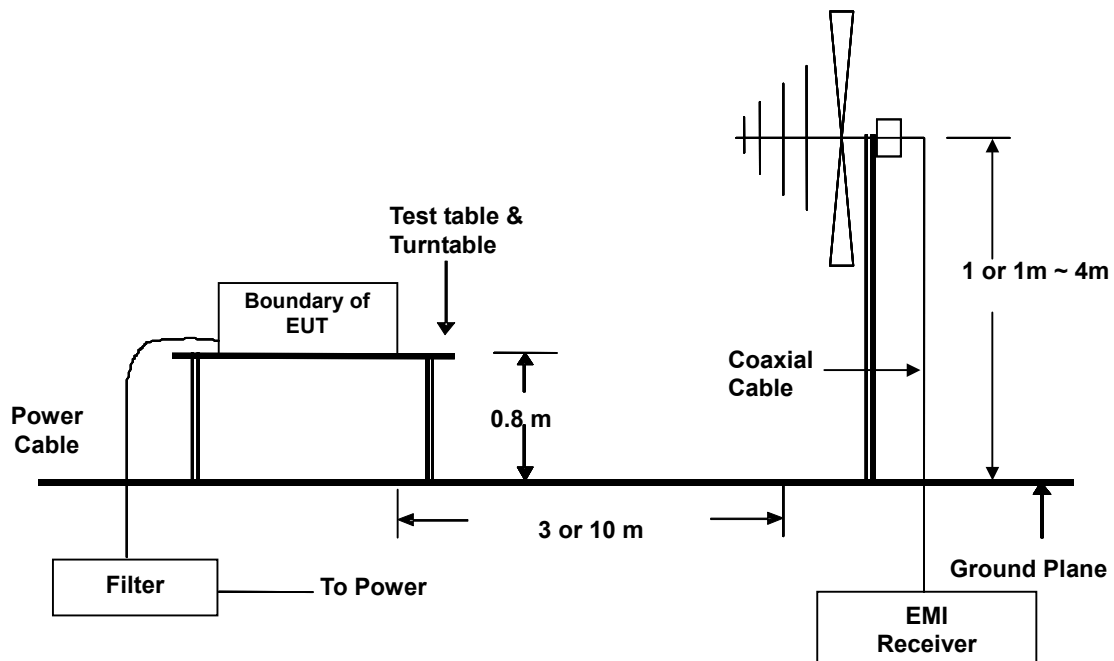
#### **Procedure of Preliminary Test**

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC 120VAC/60Hz power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

#### **Procedure of Final Test**

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 or 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

### 7.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 7.5. DATA SAMPLE:

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
xx.xx	16.49	9.86	26.35	30.00	-3.65	116.00	101.00	QP

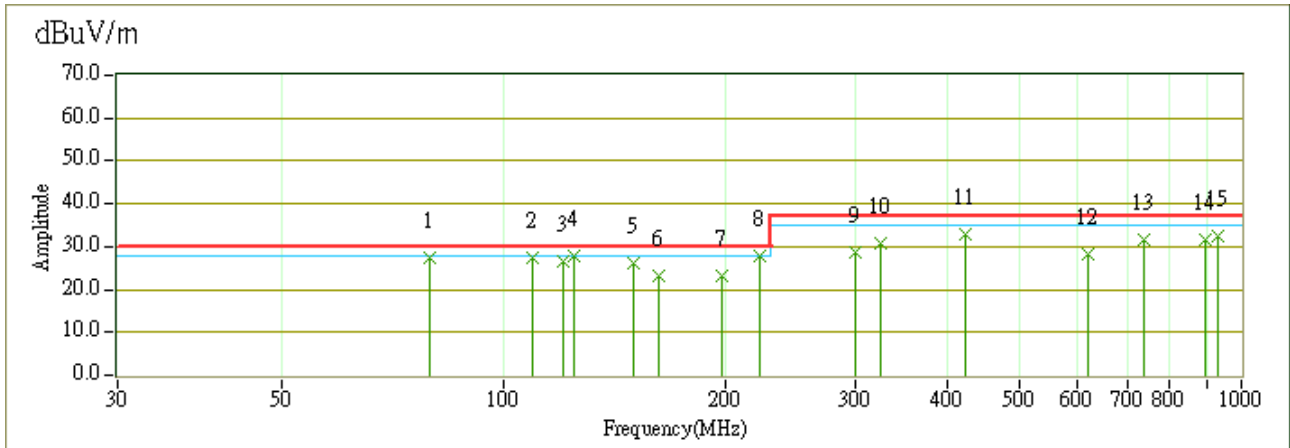
Above 1GHz

Frequency MHz	Corr. Factor (dB/m)	Reading		Result		Limit		Margin	
		Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dB)	Peak (dB)
xxxx.xxx	-4.35	49.81	58.74	45.46	54.39	54.00	74.00	-8.54	-19.61

- Frequency (MHz) = Emission frequency in MHz
- Reading (dBuV) = Uncorrected Analyzer / Receiver reading
- Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
- Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
- Limit (dBuV/m) = Limit stated in standard
- Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
- Q.P. = Quasi-Peak

**7.6. TEST RESULTS**

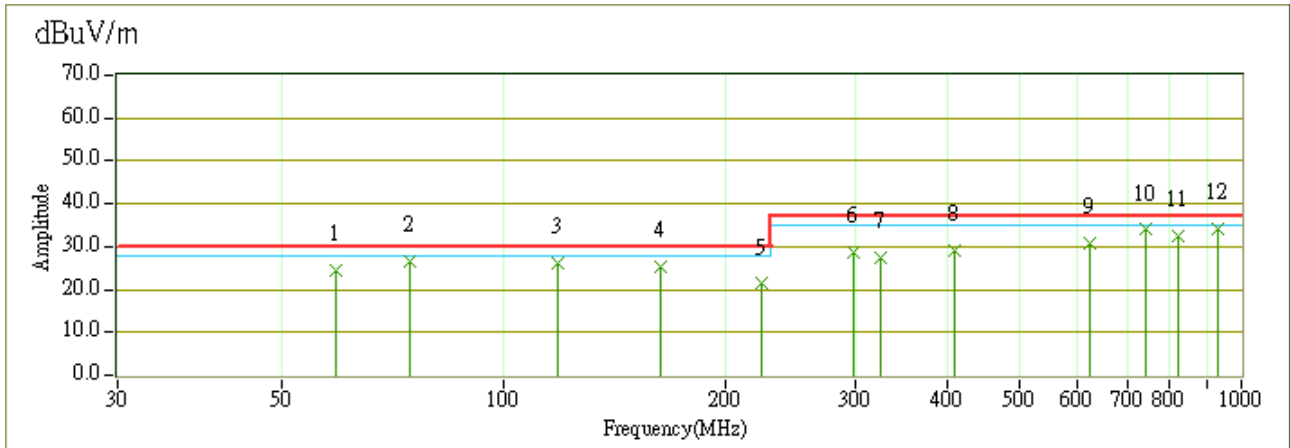
<b>Model No.</b>	E470VLXXX	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 56% RH	<b>6dB Bandwidth</b>	120 kHz
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	10m
<b>Detector Function:</b>	Quasi-peak.	<b>Tested by</b>	Ming Wu



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	79.64	44.00	-16.48	27.52	30.00	-2.48	194.90	100.00	QP
2	109.63	39.34	-11.94	27.40	30.00	-2.60	0.00	100.00	QP
3	120.36	37.80	-11.07	26.73	30.00	-3.27	38.60	100.00	QP
4	124.42	39.00	-11.15	27.84	30.00	-2.16	360.00	100.00	QP
5	149.95	38.62	-12.49	26.12	30.00	-3.88	360.00	100.00	QP
6	162.50	36.72	-13.55	23.17	30.00	-6.83	0.00	100.00	QP
7	197.89	36.22	-13.00	23.22	30.00	-6.78	345.60	100.00	QP
8	223.10	40.20	-12.22	27.98	30.00	-2.02	360.00	100.00	QP
9	300.07	35.55	-6.93	28.62	37.00	-8.38	198.90	400.00	QP
10	325.00	37.31	-6.66	30.65	37.00	-6.35	0.00	302.00	QP
11	421.60	36.53	-3.83	32.70	37.00	-4.30	0.00	198.10	QP
12	621.30	28.00	0.37	28.37	37.00	-8.63	254.30	100.00	QP
13	739.30	29.51	1.93	31.45	37.00	-5.55	0.00	100.00	QP
14	892.30	28.16	3.51	31.67	37.00	-5.33	68.60	100.00	QP
15	931.22	27.70	4.92	32.62	37.00	-4.38	0.00	100.00	QP

**REMARKS:** The other emission levels were very low against the limit.

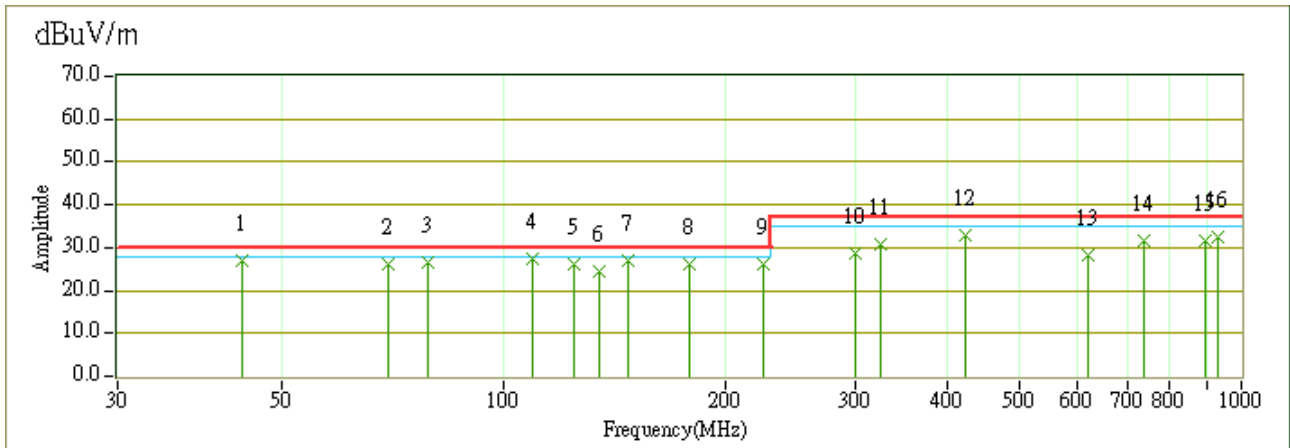
<b>Model No.</b>	E470VLXXX	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 56% RH	<b>6dB Bandwidth</b>	120 kHz
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	10m
<b>Detector Function:</b>	Quasi-peak.	<b>Tested by</b>	Ming Wu



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	59.39	42.91	-18.54	24.37	30.00	-5.63	354.50	400.00	QP
2	74.59	43.79	-17.32	26.47	30.00	-3.53	309.40	400.00	QP
3	118.38	37.42	-11.20	26.22	30.00	-3.78	0.00	400.00	QP
4	163.11	38.96	-13.56	25.40	30.00	-4.60	360.00	400.00	QP
5	223.80	33.50	-12.20	21.30	30.00	-8.70	82.90	400.00	QP
6	298.80	35.62	-6.97	28.65	37.00	-8.35	0.00	400.00	QP
7	325.20	34.00	-6.65	27.35	37.00	-9.65	0.00	302.60	QP
8	408.91	33.39	-4.22	29.17	37.00	-7.83	360.00	197.10	QP
9	621.60	30.53	0.37	30.90	37.00	-6.10	35.50	122.20	QP
10	740.50	31.99	1.96	33.95	37.00	-3.05	360.00	100.00	QP
11	819.10	29.55	2.85	32.40	37.00	-4.60	0.00	100.00	QP
12	931.50	29.20	4.93	34.13	37.00	-2.87	224.00	100.00	QP

**REMARKS:** The other emission levels were very low against the limit.

<b>Model No.</b>	E470VLXXX	<b>Test Mode</b>	Mode 11
<b>Environmental Conditions</b>	25°C, 56% RH	<b>6dB Bandwidth</b>	120 kHz
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	10m
<b>Detector Function:</b>	Quasi-peak.	<b>Tested by</b>	Ming Wu

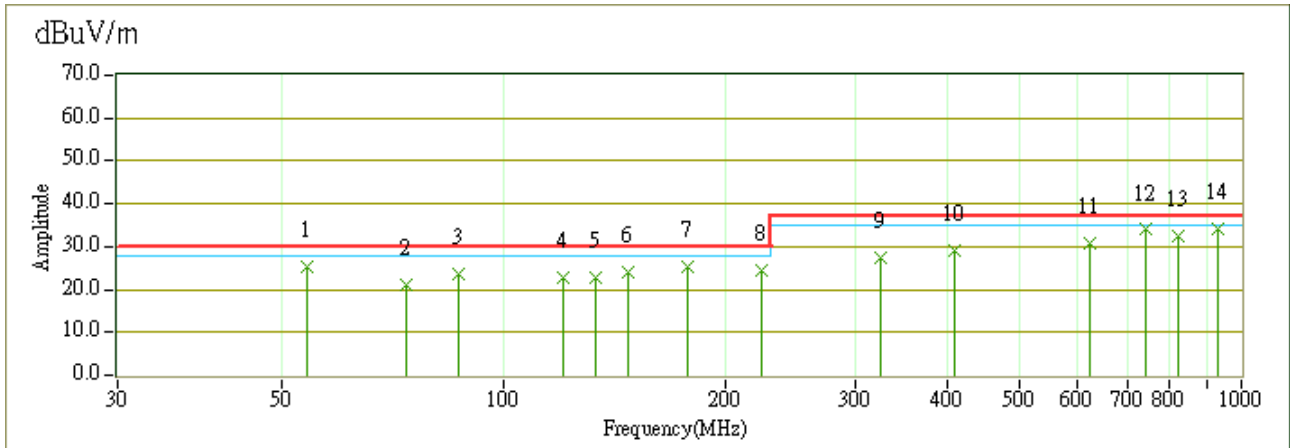


No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	44.14	41.45	-14.48	26.97	30.00	-3.03	211.10	100.00	Peak
2	69.68	44.13	-18.11	26.02	30.00	-3.98	358.10	100.00	Peak
3	78.88	43.16	-16.61	26.55	30.00	-3.45	356.90	100.00	Peak
4	109.32	39.18	-11.96	27.22	30.00	-2.78	9.80	100.00	Peak
5	124.92	37.20	-11.17	26.03	30.00	-3.97	9.80	100.00	QP
6	134.53	36.00	-11.37	24.63	30.00	-5.37	360.00	100.00	QP
7	147.86	39.10	-12.28	26.82	30.00	-3.18	360.00	100.00	QP
8	179.14	40.17	-13.82	26.35	30.00	-3.65	14.00	100.00	Peak
9	225.30	38.27	-12.12	26.15	30.00	-3.85	149.40	100.00	Peak
10	300.07	35.55	-6.93	28.62	37.00	-8.38	198.90	400.00	Peak
11	325.00	37.31	-6.66	30.65	37.00	-6.35	0.00	302.00	Peak
12	421.60	36.53	-3.83	32.70	37.00	-4.30	0.00	198.10	Peak
13	621.30	28.00	0.37	28.37	37.00	-8.63	254.30	100.00	Peak
14	739.30	29.51	1.93	31.45	37.00	-5.55	0.00	100.00	Peak
15	892.30	28.16	3.51	31.67	37.00	-5.33	68.60	100.00	Peak
16	931.22	27.70	4.92	32.62	37.00	-4.38	0.00	100.00	Peak

**REMARKS:** The other emission levels were very low against the limit.



<b>Model No.</b>	E470VLXXX	<b>Test Mode</b>	Mode 11
<b>Environmental Conditions</b>	25°C, 56% RH	<b>6dB Bandwidth</b>	120 kHz
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	10m
<b>Detector Function:</b>	Quasi-peak.	<b>Tested by</b>	Ming Wu



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	54.17	42.65	-17.45	25.20	30.00	-4.80	358.90	400.00	Peak
2	74.00	38.59	-17.42	21.17	30.00	-8.83	187.50	400.00	Peak
3	86.88	38.71	-15.19	23.52	30.00	-6.48	244.40	400.00	Peak
4	120.48	33.97	-11.07	22.90	30.00	-7.10	122.30	400.00	Peak
5	133.44	34.05	-11.35	22.70	30.00	-7.30	164.20	400.00	Peak
6	147.78	36.30	-12.28	24.02	30.00	-5.98	202.20	400.00	Peak
7	178.14	39.00	-13.80	25.20	30.00	-4.80	272.10	400.00	QP
8	223.36	36.53	-12.21	24.32	30.00	-5.68	106.40	400.00	QP
9	325.20	34.00	-6.65	27.35	37.00	-9.65	0.00	302.60	Peak
10	408.91	33.39	-4.22	29.17	37.00	-7.83	360.00	197.10	Peak
11	621.60	30.53	0.37	30.90	37.00	-6.10	35.50	122.20	Peak
12	740.50	31.99	1.96	33.95	37.00	-3.05	360.00	100.00	Peak
13	819.10	29.55	2.85	32.40	37.00	-4.60	0.00	100.00	Peak
14	931.50	29.20	4.93	34.13	37.00	-2.87	224.00	100.00	QP

**REMARKS:** The other emission levels were very low against the limit.



<b>Model No.</b>	E470VLXXX	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 56% RH	<b>Test Frequency Range</b>	1000MHz ~ 3000MHz
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	3m
<b>Detector Function:</b>	Peak/Average	<b>Tested By</b>	Bill Cheng

Frequency MHz	Corr. Factor (dBuV/m)	Reading		Result		Limit		Margin	
		Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dB)	Peak (dB)
1251.033	-8.17	--	57.29	--	49.12	54.00	74.00	--	-24.88
1600.000	-6.13	--	56.98	--	50.85	54.00	74.00	--	-23.15
1862.500	-4.51	--	53.54	--	49.03	54.00	74.00	--	-24.97
2050.000	-3.48	--	52.64	--	49.16	54.00	74.00	--	-24.84
3112.500	0.82	--	48.94	--	49.76	54.00	74.00	--	-24.24
4350.000	5.60	--	45.51	--	51.11	54.00	74.00	--	-22.89

- REMARKS:**
1. The other emission levels were very low against the limit.
  2. "--", means the average measurement was not performed when the measured peak data under the limit of average detection.



<b>Model No.</b>	E470VLXXX	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	25°C, 56% RH	<b>Test Frequency Range</b>	1000MHz ~ 3000MHz
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	3m
<b>Detector Function:</b>	Peak/Average	<b>Tested By</b>	Bill Cheng

Frequency MHz	Corr. Factor (dBuV/m)	Reading		Result		Limit		Margin	
		Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dB)	Peak (dB)
1475.000	-6.89	--	56.85	--	49.96	54.00	74.00	--	-24.04
1727.174	-5.35	--	56.61	--	51.26	54.00	74.00	--	-22.74
2037.500	-3.53	--	54.00	--	50.47	54.00	74.00	--	-23.53
2462.500	-2.05	--	53.03	--	50.98	54.00	74.00	--	-23.02
3112.500	0.82	--	49.55	--	50.37	54.00	74.00	--	-23.63
3562.500	2.40	--	48.45	--	50.85	54.00	74.00	--	-23.15

- REMARKS:**
1. The other emission levels were very low against the limit.
  2. "--", means the average measurement was not performed when the measured peak data under the limit of average detection.