

EMI TEST REPORT

On Model Name: IP Phone

Model Number: GXP1100/GXP1105

Brand Name: Grandstream

Prepared for Grandstream Networks, Inc

FCC ID Number: YZZGXP1100

According to FCC 47 CFR PART 15, SUBPART B

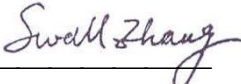
Test Report #: SHE-1106-10640-FCC

Prepared by: Sewen Guo

Reviewed by: Jawen Yin

QC Manager: Swall Zhang

Test Report Released by:


Swall Zhang

June 20, 2011

Date

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.

Test Site Location : Galanz

*25 South Ronggui Rd., Shunde, Foshan,
Guangdong, China*

Tel : 86-757-23612785

Fax : 86-757-23612537

Test Facility

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

- ***CNAL - LAB Code: L2244***

Galanz EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- ***FCC - Registration No.: 580210***

Galanz EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC was maintained in our files.

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List Attached Files

<i>Exhibit Type</i>	<i>File Description</i>	<i>File Name</i>
<i>Test Report</i>	<i>Test Report</i>	<i>YZZGXP1100_Test report.pdf</i>
<i>Operation Description</i>	<i>Technical Description</i>	<i>YZZGXP1100_operation description.pdf</i>
<i>External Photos</i>	<i>External Photos</i>	<i>YZZGXP1100_External Photos</i>
<i>Internal Photos</i>	<i>Internal Photos</i>	<i>YZZGXP1100_Internal Photos</i>
<i>Block Diagram</i>	<i>Block Diagram</i>	<i>YZZGXP1100_Block Diagram.pdf</i>
<i>Schematics</i>	<i>Circuit Diagram</i>	<i>YZZGXP1100_Schematics.pdf</i>
<i>ID Label/Location</i>	<i>Label and Location</i>	<i>YZZGXP1100_Label & Location.pdf</i>
<i>User Manual</i>	<i>User Manual</i>	<i>YZZGXP1100_User Manual.pdf</i>
<i>Test setup photos</i>	<i>Test setup photos</i>	<i>YZZGXP1100_Test Setup Photos</i>

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of EMC Compliance Management Group Test Lab this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products. The manufacturer has sole responsibility of continued compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

Administrative Data

Test Sample : *IP Phone*

Model Numbers : *GXP1100/GXP1105*

Model Tested : *GXP1105*

Receipt Date : *June 15, 2011*

Date Tested : *June 18, 2011*

Applicant : *Grandstream Networks, Inc*
: *5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*

Telephone : *+86-755-26014600*

Fax : *+86-755-26014601*

Manufacturer : *Grandstream Networks, Inc*
: *5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China*

Telephone : *+86-755-26014600*

Fax : *+86-755-26014601*

EUT Description

Grandstream Networks, Inc., Model number GXP1100/GXP1105 (referred to as the EUT in this report) is a IP Phone.

The EUT is an IP Phone and technical specifications of EUT as below:

<i>Parameter</i>		<i>Range</i>
<i>Basic parameters</i>	<i>Rated voltage</i>	<i>5VDC</i>
	<i>Rated Current</i>	<i>0.5A</i>
<i>I/O Ports</i>	<i>Ethernet Port</i>	<i>10/100Mbps RJ-45 Port for LAN connection, Integrated PoE(GXP1105 Only)</i>
	<i>Power Jack</i>	<i>5VDC Input Port</i>
	<i>Handset Jack</i>	<i>RJ9 Port</i>
<i>Adapter #1</i>	<i>Input</i>	<i>100-240VAC 50/60Hz 0.15A</i>
	<i>Output</i>	<i>5VDC, 800mA, 4.0W</i>
	<i>Model</i>	<i>SCF0500080A1BA</i>
<i>Adapter #2</i>	<i>Input</i>	<i>100-240VAC 50/60Hz 0.2A</i>
	<i>Output</i>	<i>5VDC, 800mA, 4.0W</i>
	<i>Model</i>	<i>AK00G-0500080UW</i>

NOTE: For more detailed informations or features please refer to user's manual of EUT.

EUT Derived

Model GXP1105 and GXP1100 have the same circuit function,electric parameters,PCB layout and appearance except the following table:

<i>Model name</i>	<i>GXP1105</i>	<i>GXP1100</i>
<i>POE module</i>	<i>With POE module</i>	<i>Without POE module</i>

Note :

- 1. Model of GXP1105 which integrates PoE circuit was chosen for the final testing.*
- 2. Adaptor #1 and adaptor #2 which are respectively used for the final testing.*

Test Summary

The Electromagnetic Compatibility requirements on model GXP1105 for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

Emission Tests				
Specifications	Description	Test Results	Test Point	Remark
<i>FCC Part 15.107 ANSI C63.4 - 2003</i>	<i>Conducted Emission</i>	<i>Passed</i>	<i>AC Input Port</i>	<i>Attachment 1</i>
<i>FCC Part 15.109 ANSI C63.4 - 2003</i>	<i>Radiated Emission</i>	<i>Passed</i>	<i>Enclosure</i>	<i>Attachment 2</i>

Test Mode Justification

Following modes were chosen for final test as described below.

For IP Call mode:

Connected EUT to another IP Phone by a RJ-45 signal line and established a call link by IP call function.

For PoE Mode:

Removed AC Adaptor of EUT, Let EUT powered by PoE mode and measured it.

For Connect to PC mode:

Connected EUT to a PC by a RJ-45 signal line and ping 192.168.0.163 -t to EUT.

EUT Exercise Software

No test software support this test.

Equipment Modification

Any modifications installed previous to testing by Grandstream Networks, Inc will be incorporated in each production model sold or leased in United States.

There were no modifications installed by EMC Compliance Management Group test personnel.

Test System Details

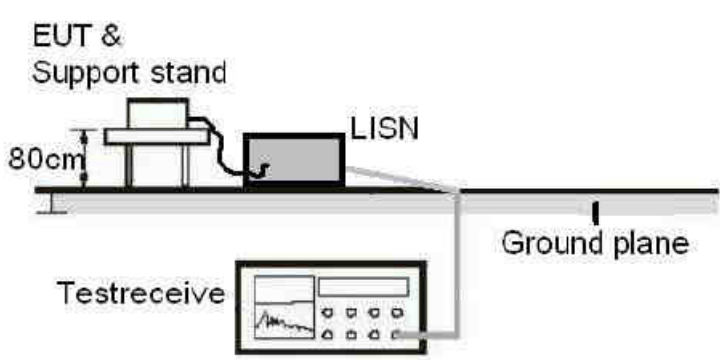
<i>EUT</i>			
Model Number:	<i>GXP1100/GXP1105</i>		
Model Tested:	<i>GXP1105</i>		
Description:	<i>IP Phone</i>		
Input:	<i>AC 120V/60Hz</i>		
Manufacturer:	<i>Grandstream Networks, Inc</i>		
<i>Support Equipment</i>			
<i>Description</i>	<i>Model Number</i>	<i>Serial Number</i>	<i>Manufacturer</i>
<i>Notebook PC</i>	<i>NC4000</i>	<i>CNU4122BCL</i>	<i>HP</i>
<i>Adapter Of Notebook PC</i>	<i>PPP009H</i>	<i>239427-003</i>	<i>HP</i>
<i>Mouse</i>	<i>MO32B0</i>	<i>23-033131</i>	<i>HP</i>
<i>Keyboard</i>	<i>SK-1788</i>	<i>N/A</i>	<i>LENOVO</i>
<i>Monitor</i>	<i>177V+</i>	<i>N/A</i>	<i>AOC</i>
<i>Adapter #1</i>	<i>SCF0500080A1BA</i>	<i>N/A</i>	<i>Mass</i>
<i>Adapter #2</i>	<i>AK00G-0500080UW</i>	<i>N/A</i>	<i>AK</i>

<i>Cable Description</i>					
<i>Description</i>	<i>From</i>	<i>To</i>	<i>Length (Meters)</i>	<i>Shielded (Y/N)</i>	<i>Ferrite (Y/N)</i>
<i>Adaptor Cord Of Notebook</i>	<i>AC Adaptor</i>	<i>Notebook PC</i>	<i>1.6</i>	<i>N</i>	<i>Y</i>
	<i>AC Plug</i>	<i>AC Adaptor</i>	<i>1.2</i>	<i>N</i>	<i>N</i>
<i>Mouse cord</i>	<i>Mouse</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>Keyboard cord</i>	<i>keyboard</i>	<i>Plug</i>	<i>1.2</i>	<i>N</i>	<i>Y</i>
<i>VGA cord</i>	<i>Notebook PC</i>	<i>Monitor</i>	<i>1.2</i>	<i>Y</i>	<i>Y</i>
<i>Adaptor #1 cord</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Adaptor #2 cord</i>	<i>EUT</i>	<i>Plug</i>	<i>1.8</i>	<i>N</i>	<i>N</i>
<i>Note: The "EUT" means "IP Phone".</i>					

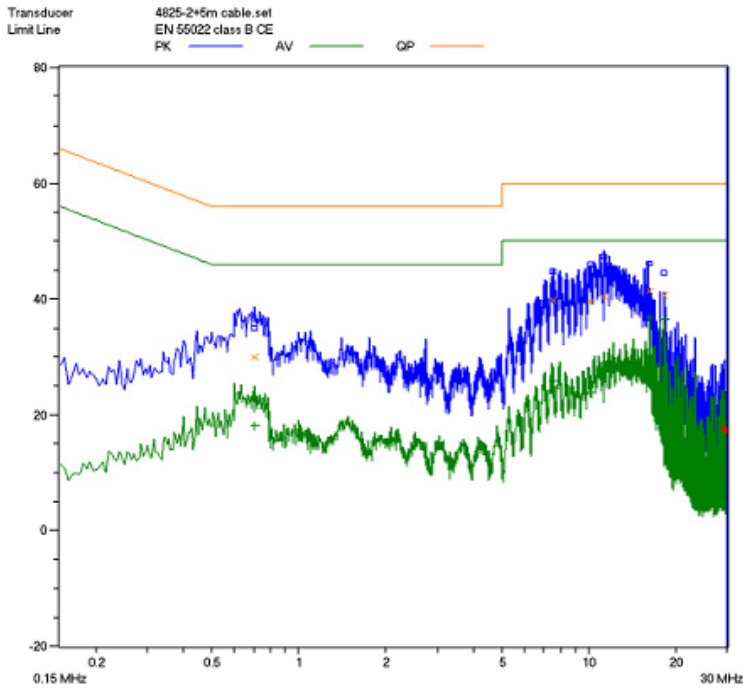
NOTE:

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

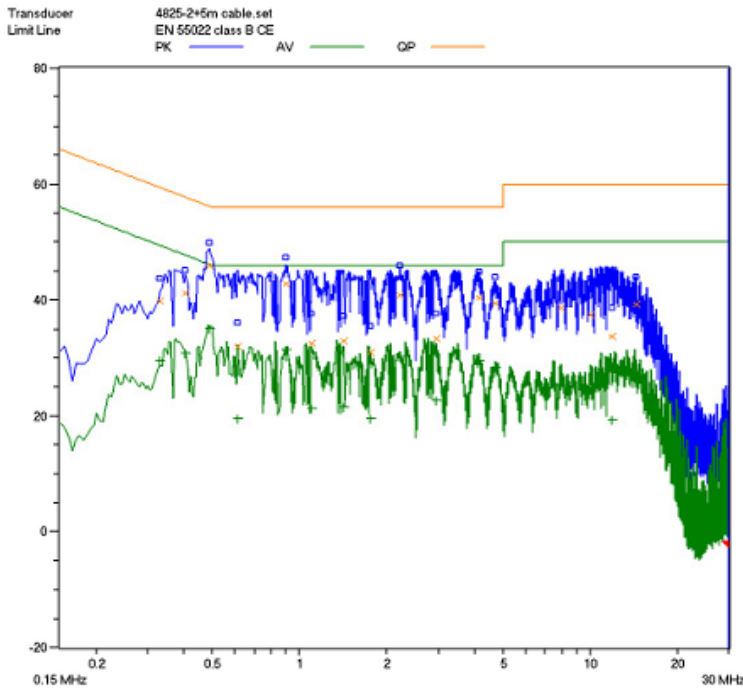
ATTACHMENT 1 – CONDUCTED EMISSION TEST RESULTS

CLIENT:	Grandstream Networks,Inc	TEST STANDERD:	FCC Part 15, Subpart B, Section 15.207
MODEL NUMBERS:	GXP1100/GXP1105	PRODUCT:	IP Phone
MODEL TESTED:	GXP1105	EUT DESIGNATION:	Commercial and Residential use
TEMPERATURE:	21°C	HUMIDITY:	56%
ATM PRESSURE:	101kPa	GROUNDING:	None
TESTED BY:	Sewen Guo	DATE OF TEST:	June 18, 2011
TEST REFERENCE:	ANSI C63.4- 2003		
TEST PROCEDURE:	The EUT was set up according to the guidelines of ANSI C63.4: 2003 for conducted emissions. The measurement was using a AMN on each line and an EMI receiver peak scan was made at the frequency measurement range. The six highest significant peaks were then marked, and these signals were then quasi-peaked and averaged.The frequency range investigated was from 150KHz to 30MHz.		
DESCRIPTION OF TEST MODE	Refer to test mode justification.		
TEST SET UP	 <p>The diagram illustrates the test setup. It shows an EUT (Equipment Under Test) and its support stand on a table. The stand is labeled 'EUT & Support stand' and has a height of '80cm'. The EUT is connected to a 'LISN' (Line Impedance Stabilization Network). The LISN is connected to a 'Testreceive' unit, which is shown as a rectangular device with a screen and buttons. The Testreceive unit is connected to a 'Ground plane'.</p>		
TESTED RANGE:	150kHz to 30MHz		
TEST VOLTAGE:	AC 120V/60Hz		
RESULTS:	The EUT meets the requirements of test reference for Conducted Emissions. The test results relate only to the equipment under test provided by client.		
Changes or Modifications:	There were no modifications installed by EMC Compliance Management Group test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB		

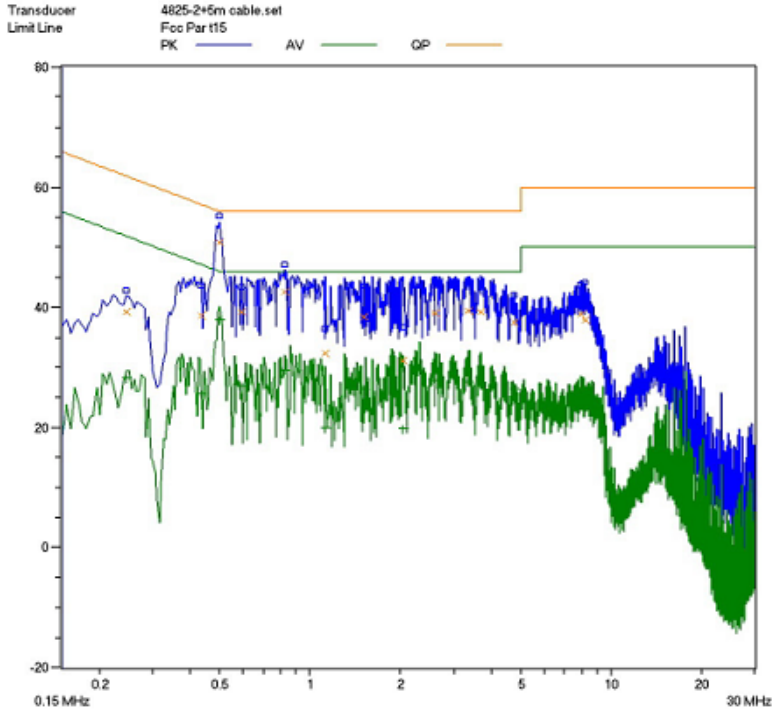
Adaptor #1:(mass)



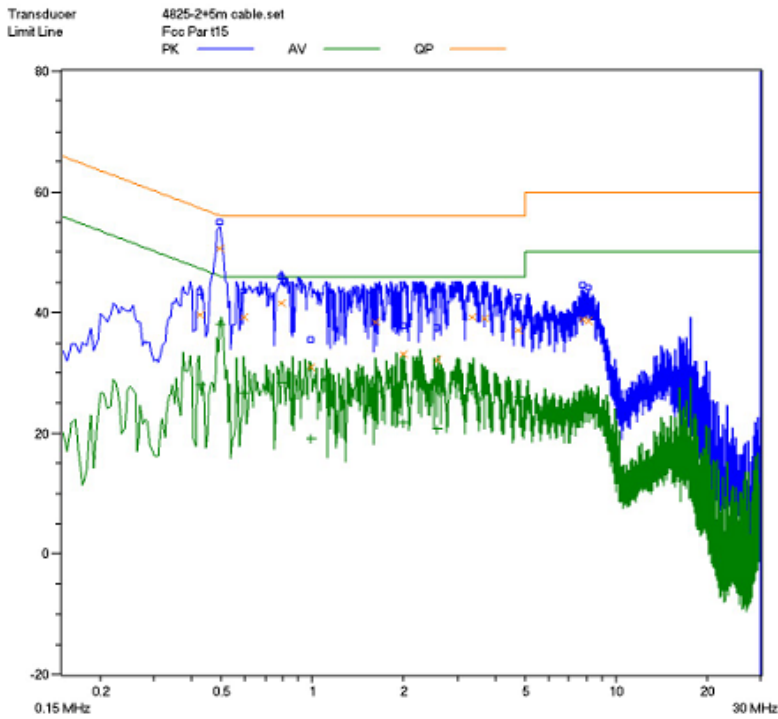
Line L Conducted Emission Graph -Connect to PC



Line N Conducted Emission Graph -Connect to PC

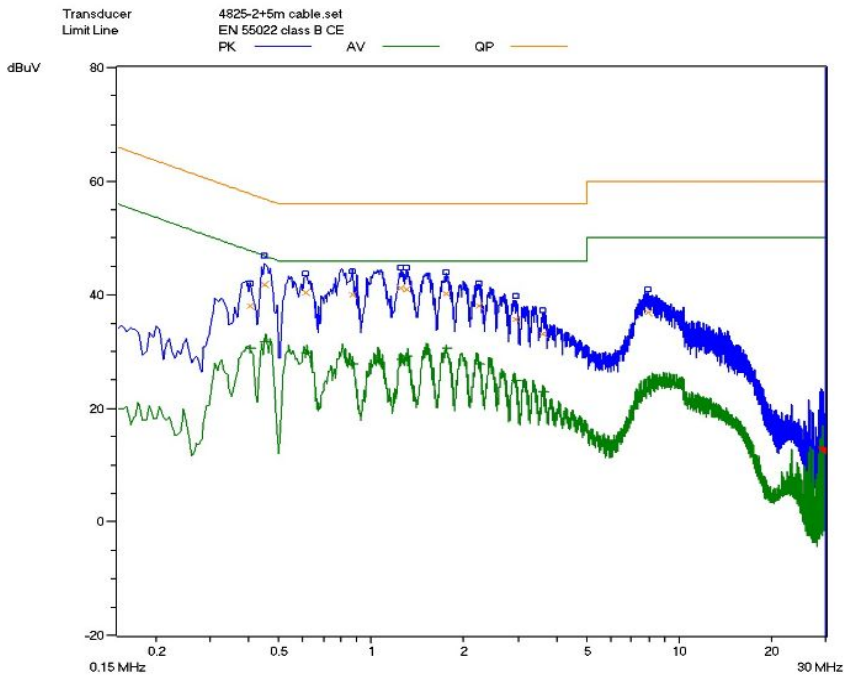


Line L Conducted Emission Graph -IP Call

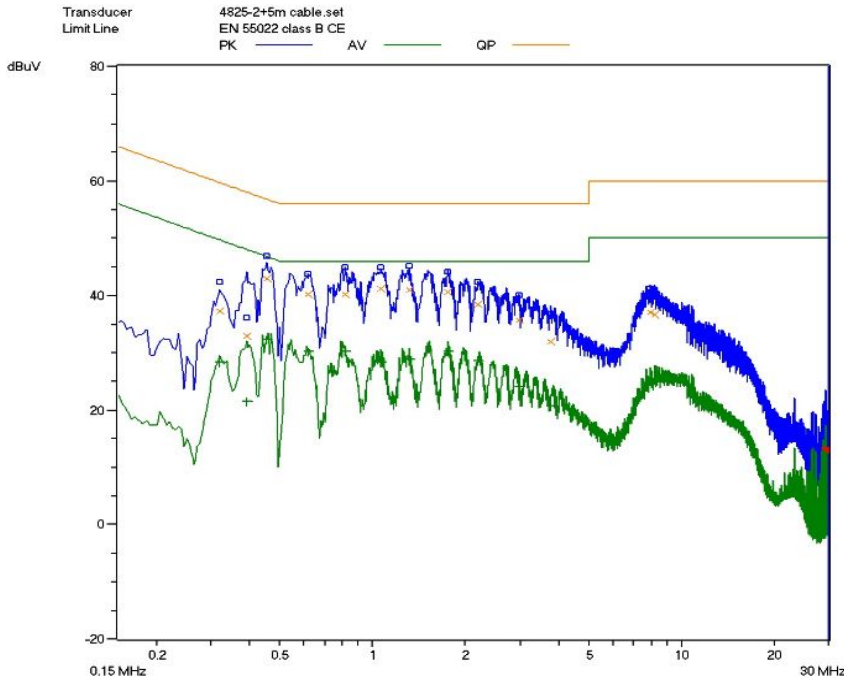


Line N Conducted Emission Graph -IP Call

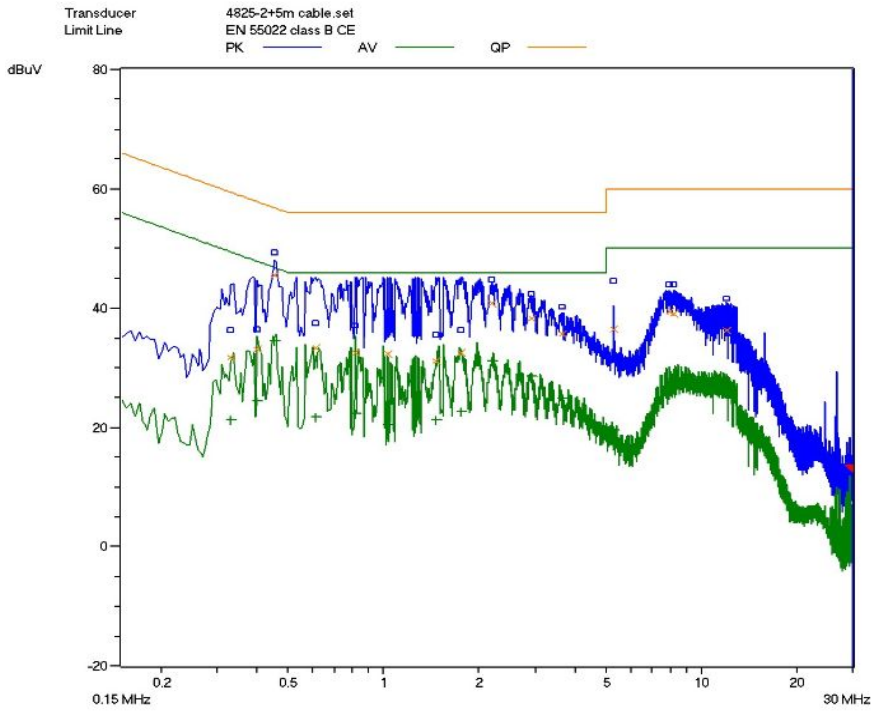
Adaptor #2: (AK)



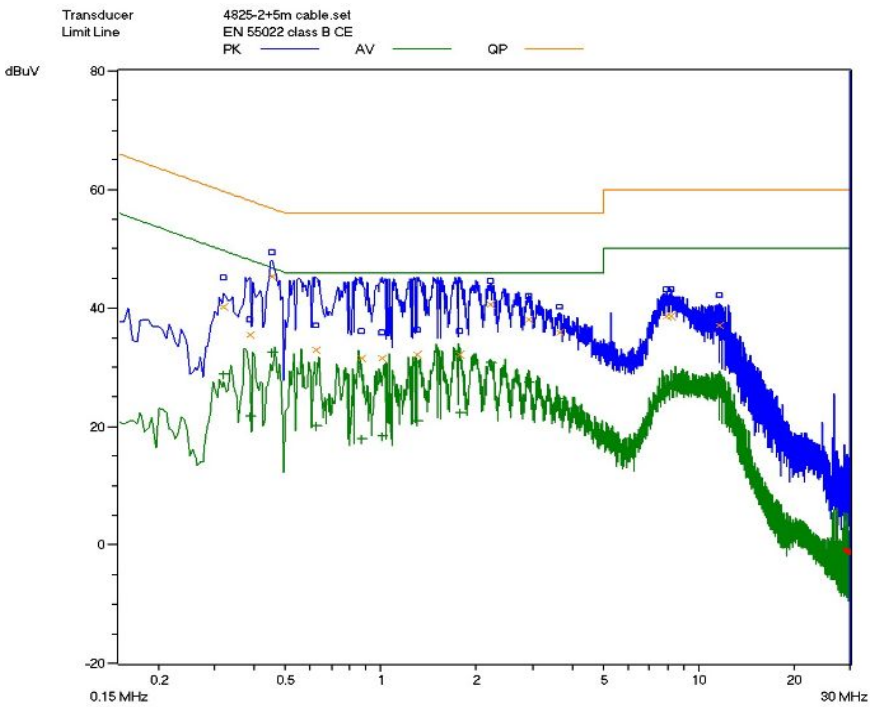
Line L Conducted Emission Graph -Connect to PC



Line N Conducted Emission Graph -Connect to PC



Line L Conducted Emission Graph -IP Call



Line N Conducted Emission Graph -IP Call

Test Data:
Adaptor #1 (Mass):

<i>Lines (L/N)</i>	<i>Frequency (MHz)</i>	<i>Corrected QP Level (dBuV)</i>	<i>Limits QP (dBuV)</i>	<i>Margin QP (dB)</i>	<i>Frequency (MHz)</i>	<i>Corrected AV Level (dBuV)</i>	<i>Limits AV (dBuV)</i>	<i>Margin QP (dB)</i>
Connec to PC Mode								
<i>L</i>	<i>0.3300</i>	<i>39.9</i>	<i>59.5</i>	<i>-19.6</i>	<i>0.3300</i>	<i>29.7</i>	<i>49.5</i>	<i>-19.8</i>
<i>L</i>	<i>0.4050</i>	<i>41.2</i>	<i>57.8</i>	<i>-16.6</i>	<i>0.4050</i>	<i>30.8</i>	<i>47.8</i>	<i>-17.0</i>
<i>L</i>	<i>0.4900</i>	<i>45.9</i>	<i>56.2</i>	<i>-10.3</i>	<i>0.4900</i>	<i>35.0</i>	<i>46.2</i>	<i>-11.0</i>
<i>N</i>	<i>0.3300</i>	<i>39.0</i>	<i>59.5</i>	<i>-20.5</i>	<i>0.3300</i>	<i>29.3</i>	<i>49.5</i>	<i>-20.2</i>
<i>N</i>	<i>0.4050</i>	<i>41.0</i>	<i>57.8</i>	<i>-16.8</i>	<i>0.4050</i>	<i>30.8</i>	<i>47.5</i>	<i>-16.7</i>
<i>N</i>	<i>0.4900</i>	<i>45.9</i>	<i>56.2</i>	<i>-10.3</i>	<i>0.4900</i>	<i>35.0</i>	<i>46.2</i>	<i>-11.0</i>
IP Call Mode								
<i>L</i>	<i>0.4950</i>	<i>50.6</i>	<i>56.1</i>	<i>-5.5</i>	<i>0.4905</i>	<i>38.2</i>	<i>46.1</i>	<i>-7.9</i>
<i>L</i>	<i>0.7900</i>	<i>41.5</i>	<i>56</i>	<i>-14.5</i>	<i>0.790</i>	<i>28.4</i>	<i>46</i>	<i>-17.6</i>
<i>L</i>	<i>3.3450</i>	<i>39.2</i>	<i>56</i>	<i>-16.8</i>	<i>3.3450</i>	<i>27.2</i>	<i>46</i>	<i>-18.8</i>
<i>N</i>	<i>0.4950</i>	<i>50.4</i>	<i>56.1</i>	<i>-5.7</i>	<i>0.4905</i>	<i>38.0</i>	<i>46.1</i>	<i>-8.1</i>
<i>N</i>	<i>0.7900</i>	<i>41.4</i>	<i>56</i>	<i>-14.6</i>	<i>0.790</i>	<i>28.3</i>	<i>46</i>	<i>-17.7</i>
<i>N</i>	<i>3.3450</i>	<i>39.0</i>	<i>56</i>	<i>-17.0</i>	<i>3.3450</i>	<i>27.0</i>	<i>46</i>	<i>-19.0</i>
<p>Note :</p> <p>1) All readings are using a bandwidth of 9 kHz, with a 500 ms sweep time. A video filter was not use.</p> <p>2) "QP" means "Quasi-Peak" values, "AV" means "Average" values.</p> <p>3) The other reading are too low against official limits that are not be recorded.</p>								


Adaptor #2(AK):


<i>Lines (L/N)</i>	<i>Frequency (MHz)</i>	<i>Corrected QP Level (dBuV)</i>	<i>Limits QP (dBuV)</i>	<i>Margin QP (dB)</i>	<i>Frequency (MHz)</i>	<i>Corrected AV Level (dBuV)</i>	<i>Limits AV (dBuV)</i>	<i>Margin QP (dB)</i>
Connec to PC Mode								
<i>L</i>	<i>0.4050</i>	<i>42.1</i>	<i>57.8</i>	<i>-15.7</i>	<i>0.4050</i>	<i>30.6</i>	<i>47.8</i>	<i>-17.2</i>
<i>L</i>	<i>0.4500</i>	<i>46.9</i>	<i>56.9</i>	<i>-10</i>	<i>0.4500</i>	<i>31.9</i>	<i>46.9</i>	<i>-15</i>
<i>L</i>	<i>2.2400</i>	<i>42.0</i>	<i>56</i>	<i>-14</i>	<i>2.2400</i>	<i>27.8</i>	<i>46</i>	<i>-18.2</i>
<i>N</i>	<i>0.3200</i>	<i>42.4</i>	<i>59.7</i>	<i>-17.3</i>	<i>0.3200</i>	<i>28.4</i>	<i>49.7</i>	<i>-21.3</i>
<i>N</i>	<i>0.8150</i>	<i>45.0</i>	<i>56</i>	<i>-11</i>	<i>0.8150</i>	<i>30.2</i>	<i>46</i>	<i>-15.8</i>
<i>N</i>	<i>2.9700</i>	<i>40.0</i>	<i>56</i>	<i>-16</i>	<i>2.9700</i>	<i>24.1</i>	<i>46</i>	<i>-21.9</i>
IP Call Mode								
<i>L</i>	<i>0.3300</i>	<i>36.3</i>	<i>59.5</i>	<i>-23.2</i>	<i>0.3300</i>	<i>21.3</i>	<i>49.5</i>	<i>-28.2</i>
<i>L</i>	<i>1.0250</i>	<i>36.5</i>	<i>56</i>	<i>-19.5</i>	<i>1.0250</i>	<i>20.6</i>	<i>46</i>	<i>-25.4</i>
<i>L</i>	<i>5.3000</i>	<i>44.6</i>	<i>60</i>	<i>-15.4</i>	<i>5.3000</i>	<i>19.5</i>	<i>50</i>	<i>-30.5</i>
<i>N</i>	<i>0.3850</i>	<i>38.1</i>	<i>58.2</i>	<i>-20.1</i>	<i>0.3850</i>	<i>21.8</i>	<i>48.2</i>	<i>-26.4</i>
<i>N</i>	<i>1.7650</i>	<i>36.2</i>	<i>56</i>	<i>-19.8</i>	<i>1.7650</i>	<i>22.3</i>	<i>46</i>	<i>-23.7</i>
<i>N</i>	<i>3.6350</i>	<i>40.2</i>	<i>56.</i>	<i>-15.8</i>	<i>3.6350</i>	<i>24.6</i>	<i>46</i>	<i>-21.4</i>
<p><i>Note :</i></p> <p>4) <i>All readings are using a bandwidth of 9 kHz, with a 500 ms sweep time. A video filter was not use.</i></p> <p>5) <i>“QP” means “Quasi-Peak” values, “AV” means “Average” values.</i></p> <p>6) <i>The other reading are too low against official limits that are not be recorded.</i></p>								

Test Equipment List:

<i>Test Equipment</i>	<i>Model No.</i>	<i>Manufacturer</i>	<i>Serial No.</i>	<i>Last Cal.</i>	<i>Cal. Interval</i>
<i>Receiver</i>	<i>SMR4503</i>	<i>SCHAFFNER</i>	<i>11725</i>	<i>2010.07.08</i>	<i>2011.07.08</i>
<i>Line impedance stabilization network</i>	<i>4825/2</i>	<i>ETS</i>	<i>1161</i>	<i>2010.07.08</i>	<i>2011.07.08</i>

Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.

SIGNED BY: 
ENGINEER

REVIEWED BY: 
SENIOR ENGINEER



Conducted Emission Test Set-up -Connect to PC

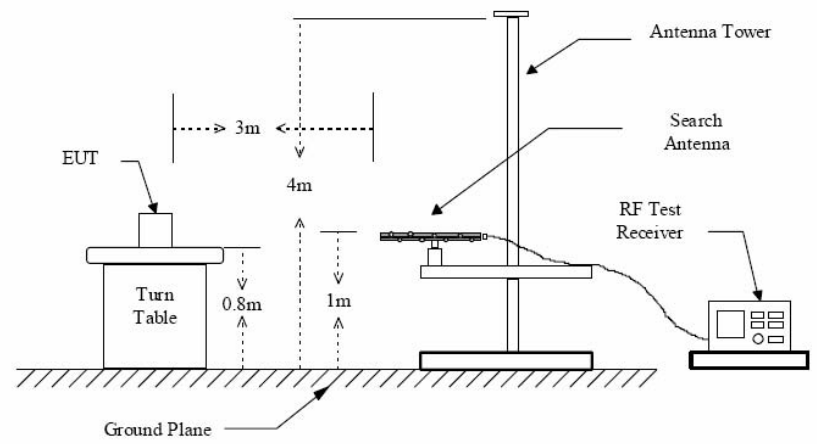
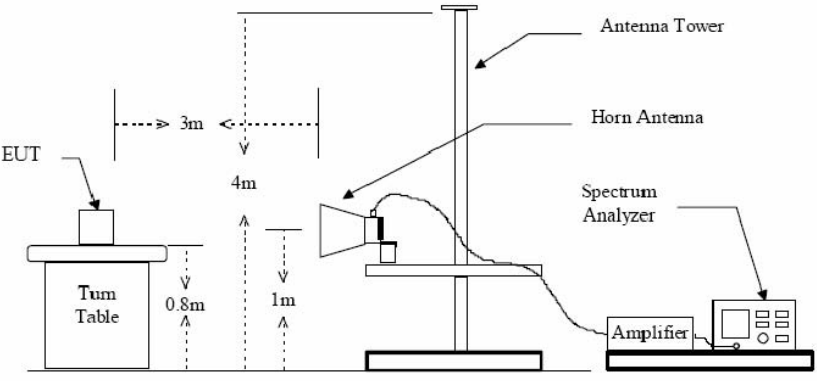


Conducted Emission Test Set-up-IP Call

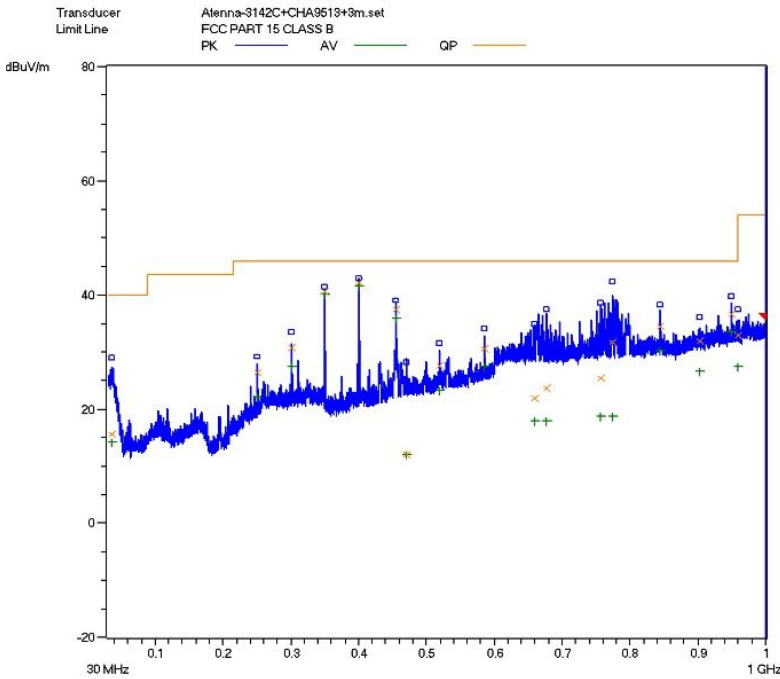
ATTACHMENT 2 – RADIATED EMISSION MEASUREMENT

CLIENT:	Grandstream Networks, Inc	TEST STANDERD:	FCC Part 15, Subpart B, Section 15.209
MODEL NUMBERS:	GXP1100/GXP1105	PRODUCT:	IP Phone
EUT MODEL:	GXP1105	EUT DESIGNATION:	Commercial and Residential use
TEMPERATURE:	23°C	HUMIDITY:	47%RH
ATM PRESSURE:	101.0kPa	GROUNDING:	None
TESTED BY:	Sewen Guo	DATE OF TEST:	Jun 18, 2011
TEST REFERENCE:	ANSI C63.4: 2003		
TEST PROCEDURE:	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2003 for radiated emissions.</p> <p>An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber. signal discrimination was then performed and the significant peaks marked. these peaks were then quasi-peaked in the frequency range of 30 MHz to 1GHz and average and peak in the frequency range of 1GHz to 9GHz at an anechoic chamber.</p> <p>The following data lists the significant emission frequencies, measured levels, correction factors (including cable and antenna correction factors), and the corrected readings against the limits. Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG</p> <p>Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain</p>		
TEST MODE	Refer to test mode justification.		
TESTED RANGE:	The EUT highest operated frequency is 208MHz for DSP module, so test frequency range is from 30MHz to 2.08GHz		
TEST VOLTAGE:	AC 120V/60Hz		
RESULTS:	The EUT meet the requirements of test reference for radiated emissions. The test results relate only to the equipment under test provided by client.		

Continue on to next page...

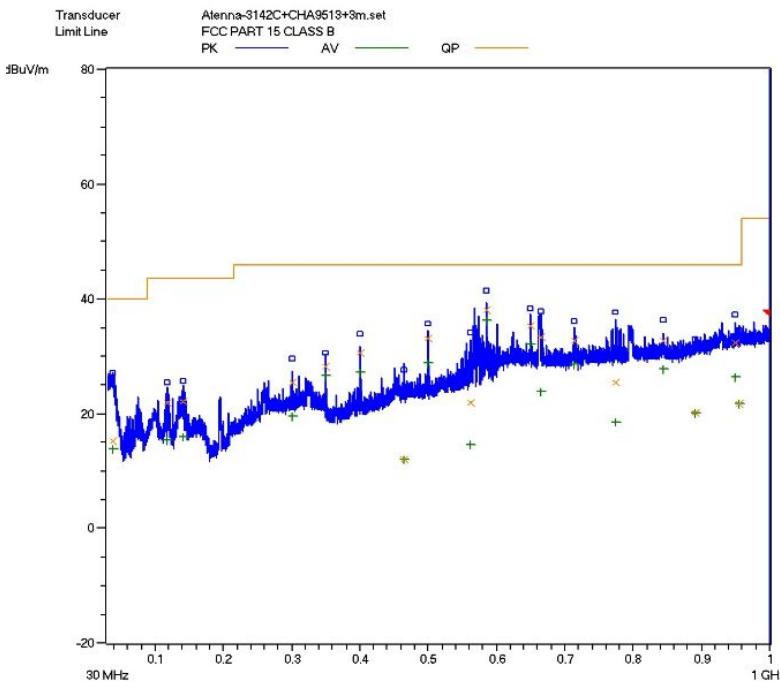
<p>TEST SET-UP</p>	<p>Figure 1 : Frequencies measured below 1 GHz configuration</p> 
	<p>Figure 2 : Frequencies measured above 1 GHz configuration</p> 
<p>CHANGES OR MODIFICATIONS:</p>	<p>There were no modifications installed by EMC Compliance Management Group. test personnel.</p>
<p>M. UNCERTAINTY:</p>	<p>Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB</p>

Adaptor #1(Mass)
Horizontal:



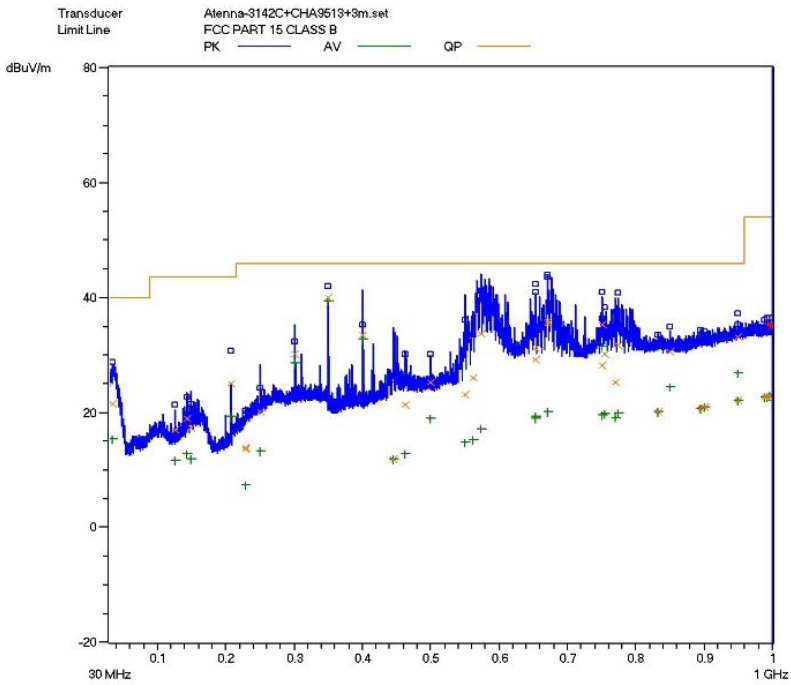
Radiated Emission Test Plot—Connect to PC Mode

Vertical:



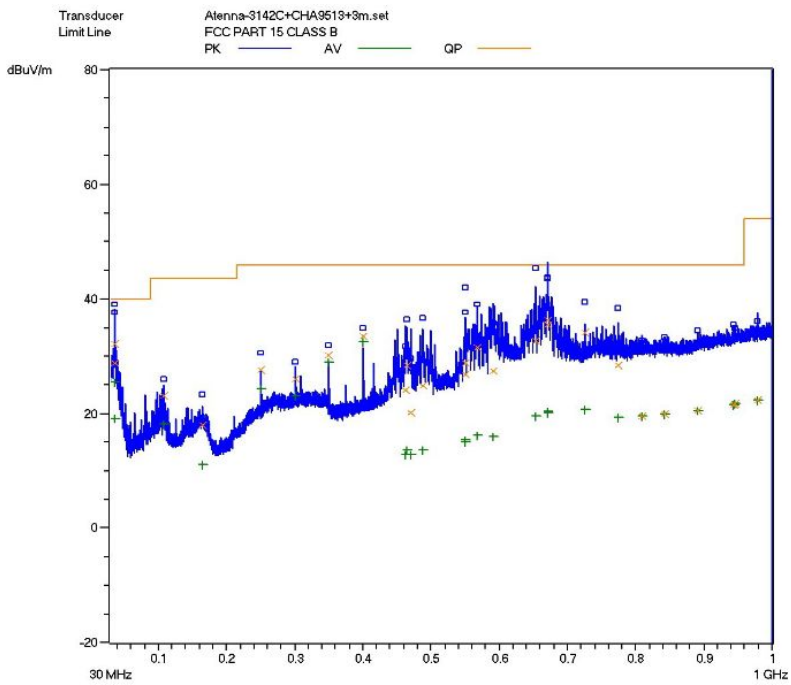
Radiated Emission Test Plot—Connect to PC Mode

Horizontal:



Radiated Emission Test Plot-IP Call Mode

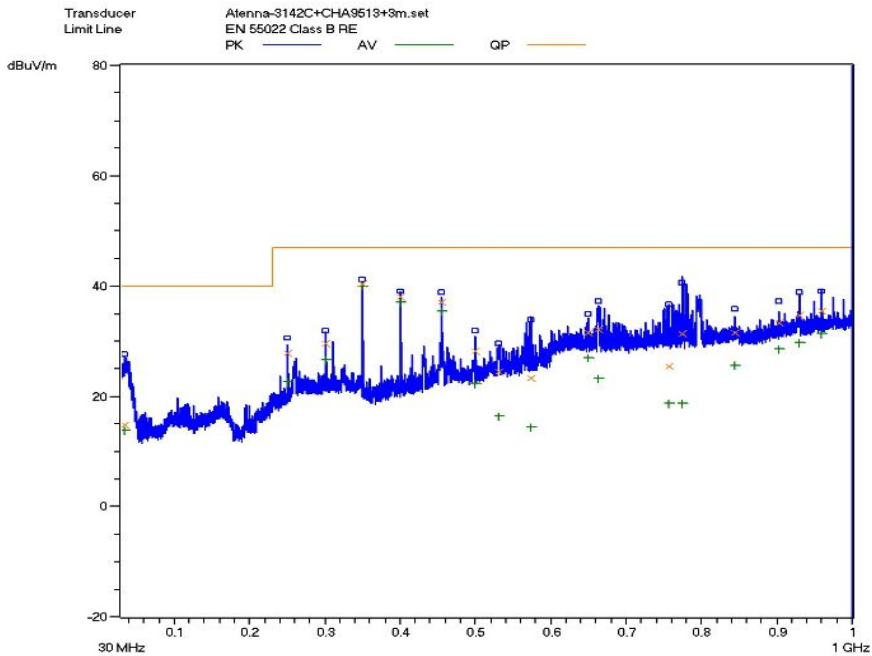
Vertical:



Radiated Emission Test Plot -IP Call Mode

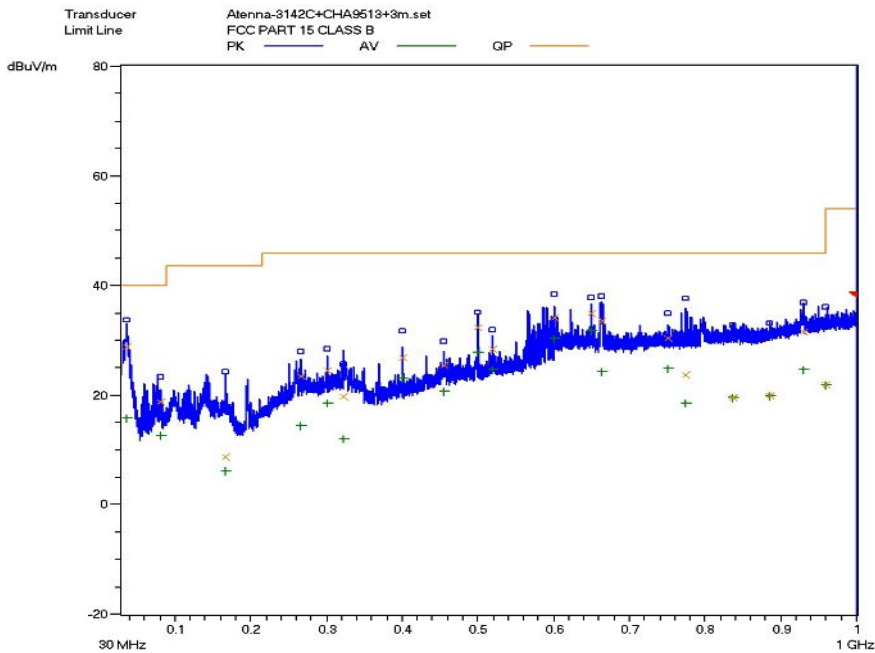
Adaptor #2:(AK)

Horizontal:



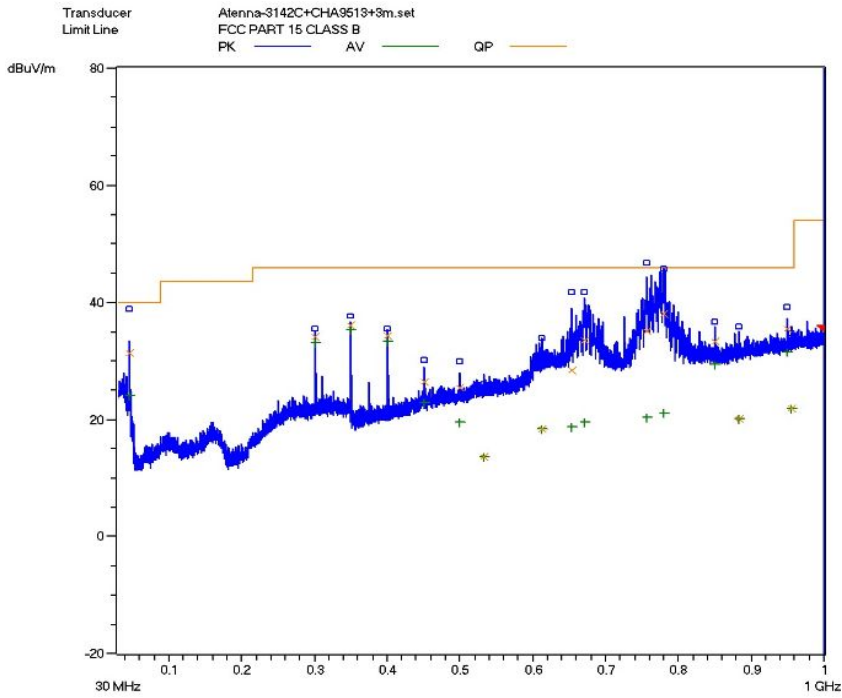
Radiated Emission Test Plot—Connect to PC Mode

Vertical:



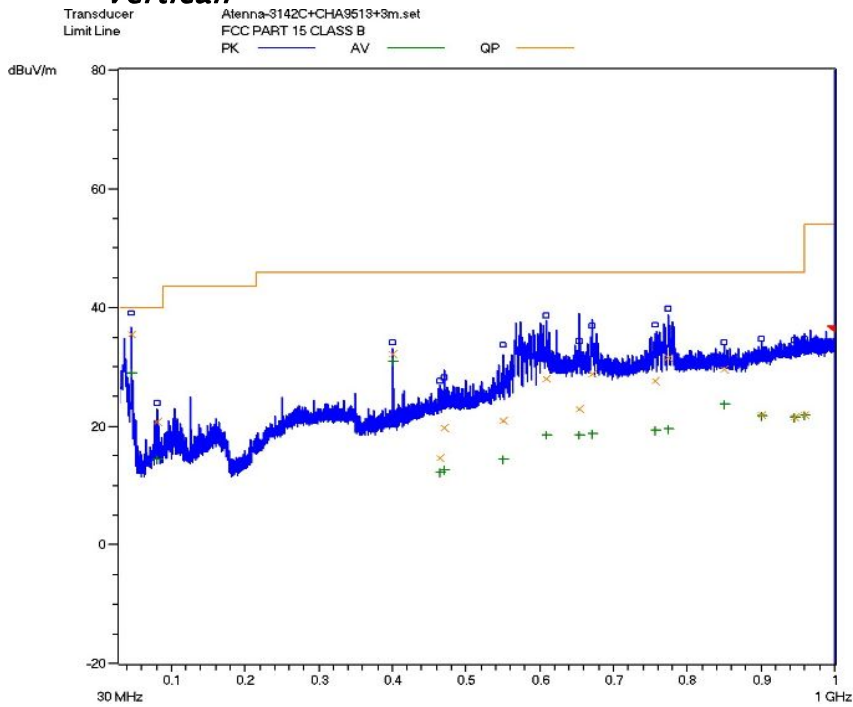
Radiated Emission Test Plot—Connect to PC Mode

Horizontal:



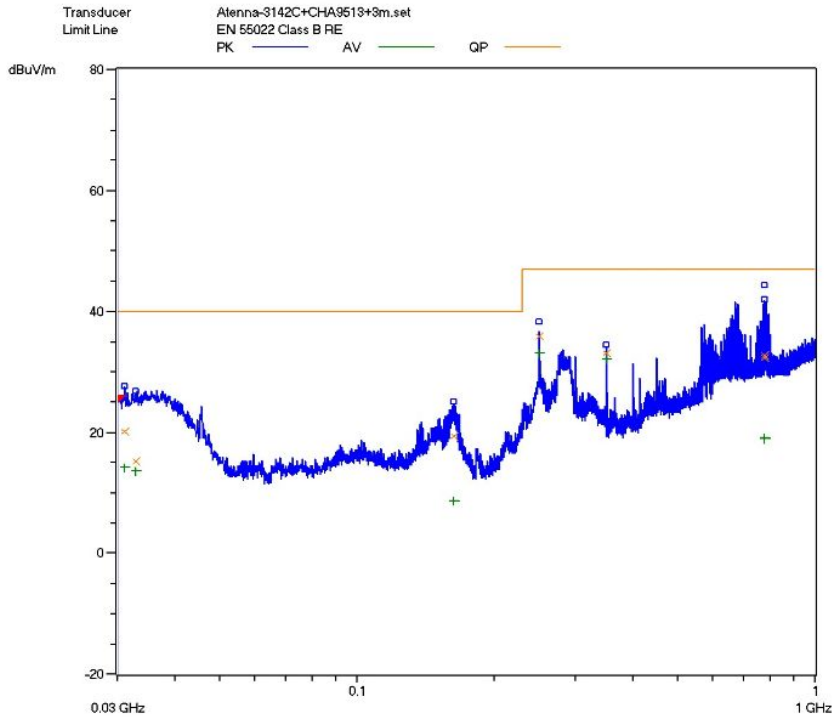
Radiated Emission Test Plot-IP Call Mode

Vertical:



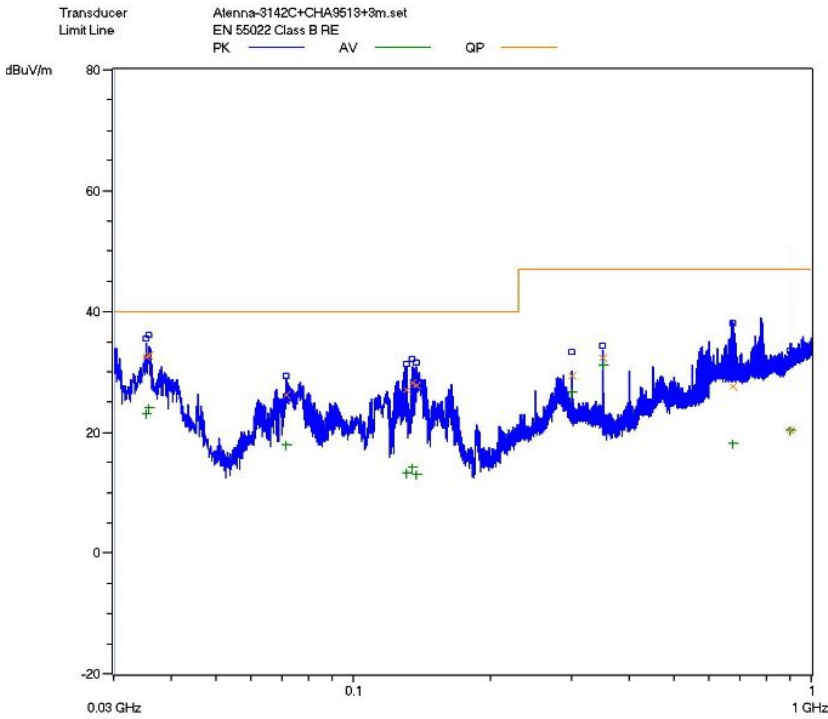
Radiated Emission Test Plot -IP Call Mode

Horizontal:



Radiated Emission Test Plot - PoE Mode

Vertical:



Radiated Emission Test Plot - PoE Mode

Test Data:

Adaptor #1(Mass):

Below 1GHz:

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level QP (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>
<i>Connect to PC Mode:</i>							
Horizontal							
36.160	0.06	16.8	/	12.24	29.1	40	-10.9
250.00	0.22	11.4	/	17.58	29.2	46	-16.8
300.00	0.25	13.6	/	19.75	33.6	46	-12.4
Vertical							
38.56	0.05	12.8	/	14.15	27.0	40	-13.0
117.68	0.13	7.6	/	17.67	25.4	43.5	-18.1
141.20	0.76	7.7	/	17.14	25.6	43.5	-17.9

Note:

- a) All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 60 s sweep time. A video filter was not used.
- b) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: $Emission\ Level = Reading\ Level + Antenna\ Factor + Cable\ Loss - Preamplifier\ Factor$.
- c) The other emission levels are 20dB below the official limits that are not reported.

Above 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
<i>Connect to PC Mode:</i>								
Peak Measurement								
1.170	1.12	24.5	-34.45	-12.6	47.47	74	-26.53	H
2.046	1.58	27.5	-37.37	-23.43	43.02	74	-30.98	H
1.860	1.31	26.7	-37.37	-24.04	41.34	74	-32.66	H
1.170	1.12	24.5	-34.45	-13.19	46.88	74	-27.12	V
1.856	1.30	26.3	-37.37	-23.56	41.41	74	-32.59	V
1.860	1.31	26.7	-37.37	-25.43	39.95	74	-34.05	V
Average Measurement								
1.170	1.12	24.5	-34.45	-31.51	28.56	54	-25.44	H
1.346	1.23	24.7	-35.60	-36.51	25.02	54	-28.98	H
1.860	1.31	26.7	-37.37	-43.05	22.33	54	-31.67	H
1.170	1.12	24.5	-34.45	-32.79	27.28	54	-26.72	V
1.856	1.30	26.3	-37.37	-43.11	21.86	54	-32.14	V
1.860	1.31	26.7	-37.37	-45.26	20.12	54	-33.88	V

Note:

- a) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- b) The limits shown are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz above 1GHz.
- c) The other emission levels are 20dB below the official limits that are not reported.

Below 1GHz:

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level QP (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>
<i>IP Call Mode:</i>							
Horizontal							
653.3600	0.40	18.6	/	22.1	41.1	46	-4.9
653.5200	0.40	18.6	/	23.4	42.4	46	-3.6
750.0800	0.45	19.8	/	20.75	41.0	46	-5.0
Vertical							
35.6000	0.06	13.3	/	21.84	35.2	40	-4.8
653.3600	0.40	18.6	/	22.2	41.2	46	-4.8
670.6400	0.40	18.9	/	22.4	41.7	46	-4.3

Note:

- a) All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 60 s sweep time. A video filter was not used.
- b) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- c) The other emission levels are 20dB below the official limits that are not reported.

Above 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamplifier Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
Peak Measurement								
1.170	1.12	24.5	-34.45	-12.87	47.20	74	-26.8	H
2.046	1.58	27.5	-37.37	-23.7	42.75	74	-31.25	H
1.860	1.31	26.7	-37.37	-23.04	42.34	74	-31.66	H
1.170	1.12	24.5	-34.45	-12.97	47.10	74	-26.9	V
1.856	1.30	26.3	-37.37	-22.76	42.21	74	-31.79	V
1.860	1.31	26.7	-37.37	-25.37	40.01	74	-33.99	V
Average Measurement								
1.170	1.12	24.5	-34.45	-32.18	27.89	54	-26.11	H
1.346	1.23	24.7	-35.60	-41.59	24.86	54	-29.14	H
1.860	1.31	26.7	-37.37	-42.81	22.57	54	-31.43	H
1.170	1.12	24.5	-34.45	-33.05	27.02	54	-26.98	V
1.856	1.30	26.3	-37.37	-42.87	22.10	54	-31.9	V
1.860	1.31	26.7	-37.37	-44.81	20.57	54	-33.43	V

Note:

- a) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- b) The limits shown are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz above 1GHz.
- c) The other emission levels are 20dB below the official limits that are not reported.

Adaptor #2:(AK)

Below 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamplifier Factor (dB)	Reading Level QP (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Connect to PC Mode:							
Horizontal							
34.640	0.06	16.2	/	11.34	27.6	40	-12.4
250.000	0.22	11.4	/	18.98	30.6	47	-16.4
300.000	0.25	13.6	/	18.55	32.4	47	-14.6
Vertical							
35.600	0.06	16.3	/	15.47	28.9	40	-11.1
81.200	0.1	5.5	/	17.7	23.3	40	-16.7
166.000	0.17	9.9	/	14.33	24.4	43.5	-19.1

Note:

- d) All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 60 s sweep time. A video filter was not used.
- e) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- f) The other emission levels are 20dB below the official limits that are not reported.

Above 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
Peak Measurement								
1.170	1.12	24.5	-34.45	-12.95	47.12	74	-26.88	H
2.046	1.58	27.5	-37.37	-23.35	43.10	74	-30.9	H
1.860	1.31	26.7	-37.37	-23.49	41.89	74	-32.11	H
1.170	1.12	24.5	-34.45	-13.37	46.70	74	-27.3	V
1.856	1.30	26.3	-37.37	-22.96	42.01	74	-31.99	V
1.860	1.31	26.7	-37.37	-24.27	41.11	74	-32.89	V
Average Measurement								
1.170	1.12	24.5	-34.45	-33.06	27.01	54	-26.99	H
1.346	1.23	24.7	-35.60	-37.03	24.50	54	-29.5	H
1.860	1.31	26.7	-37.37	-42.28	23.10	54	-30.9	H
1.170	1.12	24.5	-34.45	-33.05	27.02	54	-26.98	V
1.856	1.30	26.3	-37.37	-43.07	21.90	54	-32.1	V
1.860	1.31	26.7	-37.37	-44.68	20.70	54	-33.3	V

Note:

- a) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: $Emission\ Level = Reading\ Level + Antenna\ Factor + Cable\ Loss - Preamplifier\ Factor$.
- b) The limits shown are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz above 1GHz.
- c) The other emission levels are 20dB below the official limits that are not reported.

Below 1GHz:

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level QP (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>
<i>IP Call Mode:</i>							
Horizontal							
757.28	0.45	19.6	/	14.95	35.0	46	-11.0
780.24	0.46	20.0	/	17.54	38.0	46	-8.0
850.08	0.50	20.7	/	15.4	36.6	46	-9.4
Vertical							
45.76	0.06	10.0	/	25.44	35.5	40	-4.5
670.24	0.40	18.6	/	17.9	36.9	46	-9.1
774.56	0.46	20.1	/	19.24	39.8	46	-6.2

Note:

- d) All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 60 s sweep time. A video filter was not used.
- e) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: $Emission\ Level = Reading\ Level + Antenna\ Factor + Cable\ Loss - Preamplifier\ Factor$.
- f) The other emission levels are 20dB below the official limits that are not reported.

Above 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
<i>IP Call Mode:</i>								
Peak Measurement								
1.170	1.12	24.5	-34.45	-13.07	47.00	74	-27.0	H
2.046	1.58	27.5	-37.37	-23.51	42.91	74	-31.09	H
1.860	1.31	26.7	-37.37	-23.08	42.30	74	-31.7	H
1.170	1.12	24.5	-34.45	-12.97	47.10	74	-26.9	V
1.856	1.30	26.3	-37.37	-22.67	42.30	74	-31.7	V
1.860	1.31	26.7	-37.37	-24.58	40.8	74	-33.2	V
Average Measurement								
1.170	1.12	24.5	-34.45	-33.07	27.00	54	-27.0	H
1.346	1.23	24.7	-35.60	-38.63	22.90	54	-31.1	H
1.860	1.31	26.7	-37.37	-43.08	22.30	54	-31.7	H
1.170	1.12	24.5	-34.45	-32.97	27.10	54	-26.9	V
1.856	1.30	26.3	-37.37	-42.67	22.30	54	-31.7	V
1.860	1.31	26.7	-37.37	-44.58	20.80	54	-33.2	V

Note:

- a) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- b) The limits shown are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz above 1GHz.
- c) The other emission levels are 20dB below the official limits that are not reported.

Below 1GHz:

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level QP (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>
PoE Mode:							
Horizontal							
163.12	0.17	9.7	/	15.13	25.0	40	-15.0
775.04	0.45	20.2	/	16.55	37.2	47	-9.8
775.12	0.45	20.2	/	21.45	42.1	47	-4.9
Vertical							
35.68	0.06	14.1	/	21.84	36.0	40	-4.0
676.48	0.40	18.5	/	19.1	38.0	47	-9.0
902.00	0.52	21	/	11.98	33.5	47	-13.5

Note:

- a) All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 60 s sweep time. A video filter was not used.
- b) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: $Emission\ Level = Reading\ Level + Antenna\ Factor + Cable\ Loss - Preamplifier\ Factor$.
- c) The other emission levels are 20dB below the official limits that are not reported.

Above 1GHz:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Preamp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
PoE Mode:								
Peak Measurement								
1.170	1.12	24.5	-34.45	-12.75	47.32	74	-26.68	H
2.046	1.58	27.5	-37.37	-23.55	42.90	74	-31.1	H
1.860	1.31	26.7	-37.37	-24.28	41.10	74	-32.9	H
1.170	1.12	24.5	-34.45	-12.97	47.10	74	-26.9	V
1.856	1.30	26.3	-37.37	-23.47	41.50	74	-32.5	V
1.860	1.31	26.7	-37.37	-25.18	40.20	74	-33.8	V
Average Measurement								
1.170	1.12	24.5	-34.45	-33.57	26.50	54	-27.5	H
1.346	1.23	24.7	-35.60	-36.51	25.02	54	-28.98	H
1.860	1.31	26.7	-37.37	-43.41	21.97	54	-32.03	H
1.170	1.12	24.5	-34.45	-32.55	27.52	54	-26.48	V
1.856	1.30	26.3	-37.37	-42.87	22.10	54	-31.9	V
1.860	1.31	26.7	-37.37	-45.08	20.30	54	-33.7	V

Note:

- a) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows: Emission Level = Reading Level + Antenna Factor + Cable Loss - Preamplifier Factor.
- b) The limits shown are based on Peak value and Average value detector above 1GHz, the bandwidth of Test Receiver was set at 1MHz above 1GHz.
- c) The other emission levels are 20dB below the official limits that are not reported.

Test Equipment List:

<i>Test Equipment</i>	<i>Model No.</i>	<i>Manufacturer</i>	<i>Serial No.</i>	<i>Last Cal.</i>	<i>Cal. Due</i>
<i>Receiver</i>	<i>SMR4503</i>	<i>SCHAFFNER</i>	<i>11725</i>	<i>2010.07.08</i>	<i>2011.07.07</i>
<i>Double-ridged Wave guide horn</i>	<i>3115</i>	<i>ETS</i>	<i>6587</i>	<i>2010.08.02</i>	<i>2011.08.01</i>
<i>Microwave system amplifier</i>	<i>83017A</i>	<i>Agilent</i>	<i>MY39500438</i>	<i>2010.07.11</i>	<i>2011.07.10</i>
<i>Biconilog Antenna</i>	<i>3142C</i>	<i>ETS</i>	<i>00042672</i>	<i>2010.09.28</i>	<i>2011.09.27</i>
<i>Band-pass Filter</i>	<i>BRM50702</i>	<i>Micro-Tronic</i>	<i>S/N-030</i>	<i>2010.11.30</i>	<i>2011.11.29</i>
<i>Spectrum Analyzer</i>	<i>FSP30</i>	<i>R&S</i>	<i>100755</i>	<i>2010.11.30</i>	<i>2011.11.29</i>
<i>Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.</i>					

SIGNED BY:



ENGINEER

REVIEWED BY:

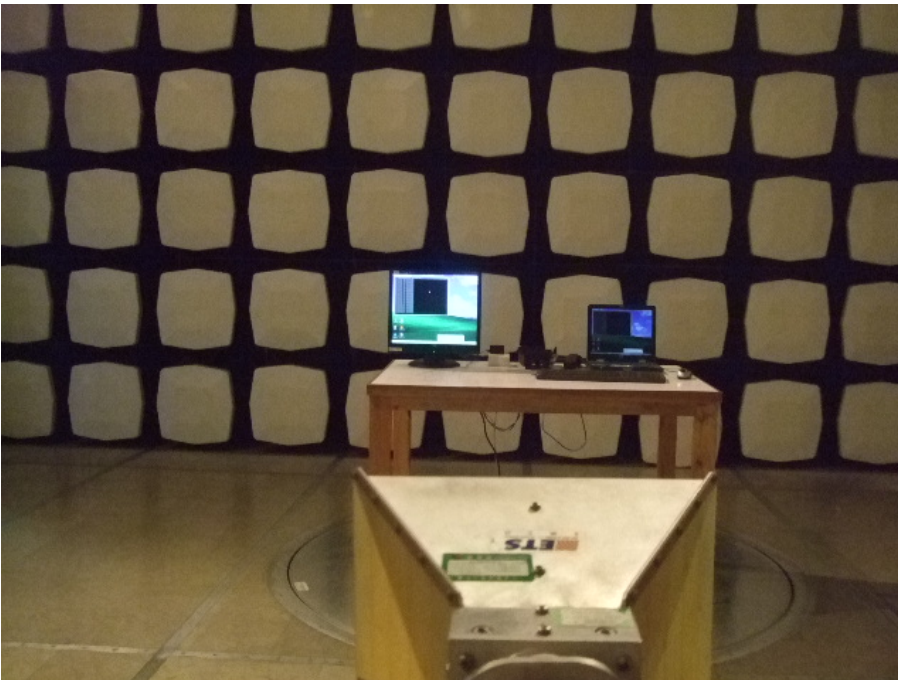


SENIOR ENGINEER

Connect to PC:

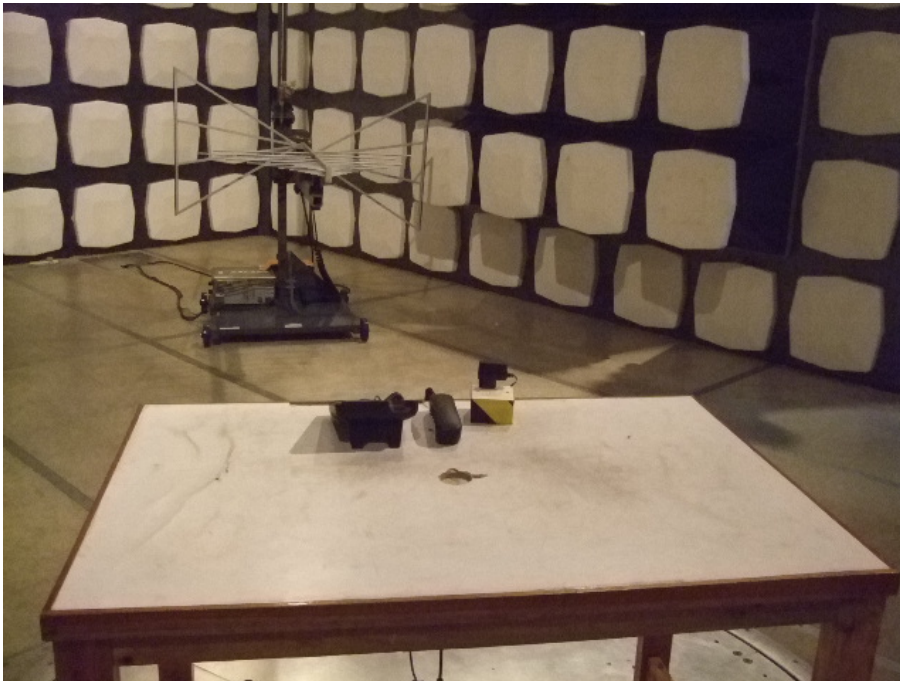


Radiated Emission Test Set-up(Below 1GHz)

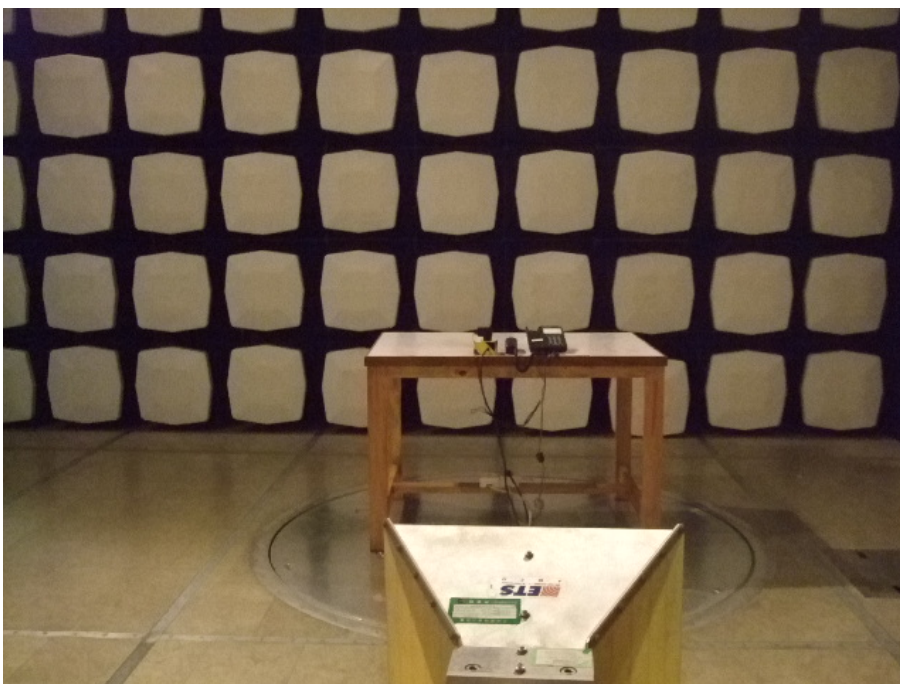


Radiated Emission Test Set-up(Above 1GHz)

IP Call Mode:

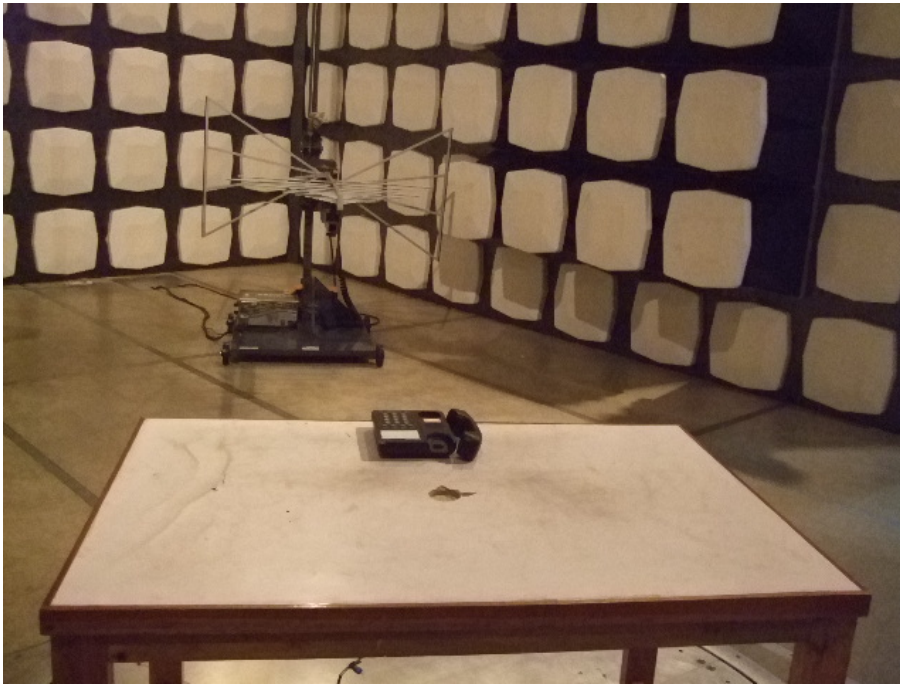


Radiated Emission Test Set-up(Below 1GHz)

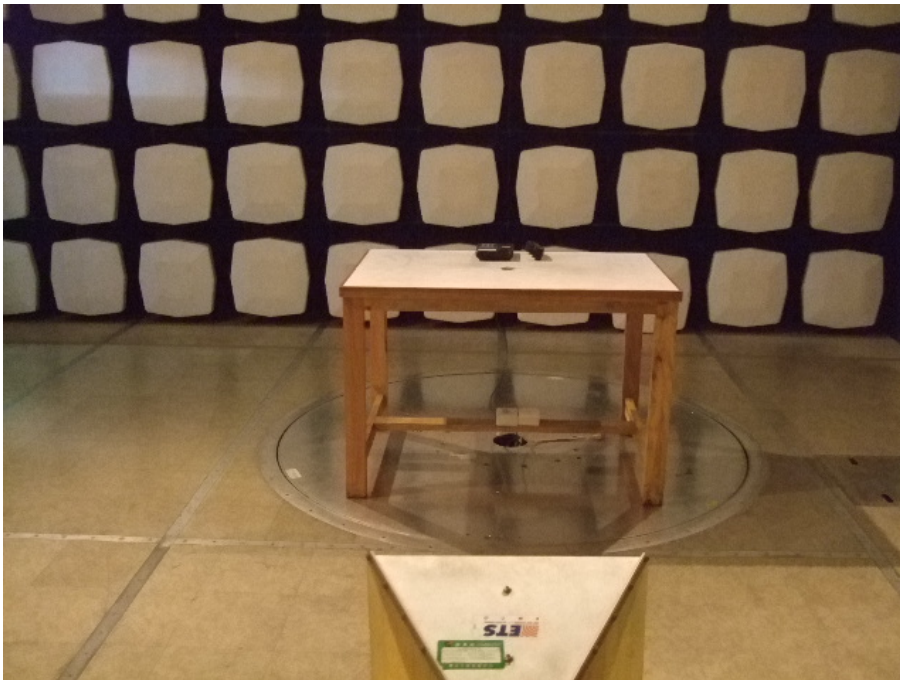


Radiated Emission Test Set-up(Above 1GHz)

PoE Mode:



Radiated Emission Test Set-up(Below 1GHz)



Radiated Emission Test Set-up(Above 1GHz)