

EMI TEST REPORT

Product Name: Enterprise Router&Wireless Access Point Manager

Model Number: GWN7000

Brand Name: Grandstream

Prepared for Grandstream Networks, Inc.

FCC ID : YZZGWN7000

Classification: Part 15 Class B Computing Device Peripheral(JBP)

According to FCC 47 CFR Part 15, Subpart B



Test Report #: SHE-1604-11478-FCC

Prepared by: Nancy **ECMG**
Nancy Han /Assistant Company Name

Reviewed by: Jawen Yin **ECMG**
Jawen Yin/ Senior Engineer Company Name

QC Manager: Swall Zhang **ECMG**
Swall Zhang/QC Manager Company Name

Test Report Released by: Swall Zhang **ECMG**
Swall Zhang Date June 18th, 2016

Verdict

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

Revision History

Rev.	Issue date	Revision	Revised by
01	06/18/2016	Initial review	Jawen Yin
/	/	/	/

Test Location

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

Test Site Location:

Shenzhen General Testing & Inspection Technology Co., Ltd.

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Tel:

(86)-755- 27559792

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Accreditation Bodies

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

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.:9783A on Aug, 2011.

FCC-Registration No.: 214666

Shenzhen GTI Technology Co., Ltd. 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 214666, Sep 19, 2011

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List Attached Files

Exhibit Type	File Description	File Name
<i>Test Report</i>	<i>Test Report</i>	YZZGWN7000 _Test Report.pdf
<i>Operation Description</i>	<i>Technical Description</i>	YZZGWN7000 _Operation description.pdf
<i>External Photos</i>	<i>External Photos</i>	YZZGWN7000 _External Photos
<i>Internal Photos</i>	<i>Internal Photos</i>	YZZGWN7000 _Internal Photos
<i>Block Diagram</i>	<i>Block Diagram</i>	YZZGWN7000 _Block Diagram.pdf
<i>Schematics</i>	<i>Circuit Diagram</i>	YZZGWN7000 _Schematics.pdf
<i>ID Label/Location</i>	<i>Label and Location</i>	YZZGWN7000 _Label & Location.pdf
<i>User Manual</i>	<i>User Manual</i>	YZZGWN7000 _User Manual.pdf
<i>Test setup photos</i>	<i>Test set-up photos</i>	YZZGWN7000 _Test Set-up Photos

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of ECMG Electronic Technical Testing Corp (Shenzhen) 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 : Enterprise Router&Wireless Access Point Manager

Model Numbers : GWN7000

Model Tested : GWN7000

Date of Receipt : April 18th, 2016

Date Tested : April 21st to 25th, 2016

Applicant : Grandstream Networks, Inc.

Address : 126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

Telephone : +1 (617) 566-9300

Fax : +1 (617) 249-1987

Manufacturer : Grandstream Networks, Inc.

Address : 126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

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Factory : Grandstream Networks, Inc.

Address : 126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

Telephone : +1 (617) 566-9300

Fax : +1 (617) 249-1987

EUT Description

Grandstream Networks, Inc. Model Tested GWN7000 (referred to as the EUT in this report) is an Enterprise Router & Wireless Access Point Manager.

Technical specifications are as belows:

Parameter		Ranges
<i>Basic parameters</i>	<i>Rated voltage</i>	12.0V
	<i>Rated Current</i>	2.0A
<i>I/O Ports</i>	<i>WAN Ports</i>	<i>2 x autosensing 10/100/1000 Base-T WAN Ports</i>
	<i>NET &LAN port</i>	<ul style="list-style-type: none"> ◆ <i>1 x auto-sensing 10/100/1000 Base-T configurable NET Port</i> ◆ <i>4 x auto-sensing 10/100/1000 Base-T LAN Ports</i>
	<i>DC Power Jack</i>	<i>Power port to connect to power adaptor</i>
	<i>RESET</i>	<i>1 x Reset Pinhole</i>
	<i>USB</i>	<i>2 x USB 2.0 ports</i>
<i>Power Adapter</i>	<i>Input</i>	<i>AC 100-240 V 50/60 Hz 0.6A</i>
	<i>Output</i>	<i>DC 12V, 2.0A</i>
	<i>Model</i>	<i>NBS24J120200HU</i>
	<i>Brand name</i>	<i>Mass power</i>
	<i>Input</i>	<i>100-240VAC 50/60Hz 1.0A</i>
	<i>Output</i>	<i>DC 12V, 2.0A</i>
	<i>Model</i>	<i>F24US1200200A</i>
	<i>Brand name</i>	<i>SUNLIGHT</i>

For other informations &features please refer to user's manual of EUT.

Frequency Range Of Radiated Measurements

(b) For unintentional radiators:

(1) Except as otherwise indicated in paragraphs (b)(2) or (b)(3) of this section, for an unintentional radiator, including a digital device, 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:

<i>Highest frequency generated or used in the device or on which the device operates or tunes (MHz)</i>	<i>Upper frequency of measurement range (MHz)</i>
<i>Below 1.705</i>	<i>30.</i>
<i>1.705-108</i>	<i>1000.</i>
<i>108-500</i>	<i>2000.</i>
<i>500-1000</i>	<i>5000.</i>
<i>Above 1000</i>	<i>5th harmonic of the highest frequency or 40 GHz, whichever is lower.</i>

Note: Since the highest frequency operated of the EUT is 368MHz, so upper frequency of radiated emission test is up to 2GHz as per §15.33(b)(1).

Test Summary

The Electromagnetic Compatibility requirements on model GWN7000 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 -2014</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 -2014</i>	<i>Radiated Emission</i>	<i>Passed</i>	<i>Enclosure</i>	<i>Attachment 2</i>

Test Mode Justification

Pre-Scan has been conducted to determine the worst-case from all possible combination between available operation mode .Following mode(s) was (were) selected for the final test as listed below:

<i>Pre-Test Mode</i>	
<i>EMI Test Mode</i>	<i>Mode 1: Communication with PC& Enterprise Router & Wireless Access Point Manager + Mass Power</i>
	<i>Mode 2: Communication with PC& Enterprise Router & Wireless Access Point Manager + Sunlight Power</i>
	<i>Mode 3: PoE Mode</i>
<i>Final Test Mode</i>	
<i>EMI Test Mode</i>	<i>Mode 1: Communication with PC& Enterprise Router & Wireless Access Point Manager + Mass Power</i>
	<i>Mode 2: Communication with PC& Enterprise Router & Wireless Access Point Manager + Sunlight Power</i>
	<i>Mode 3: PoE Mode</i>

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 ECMG Electronic Technical Testing Corp (Shenzhen).

EUT Sample Photos

EUT Model: GWN7000



EUT- Front View



EUT- Rear View



EUT- Bottom View



EUT- Left Side View



EUT- Right Side View



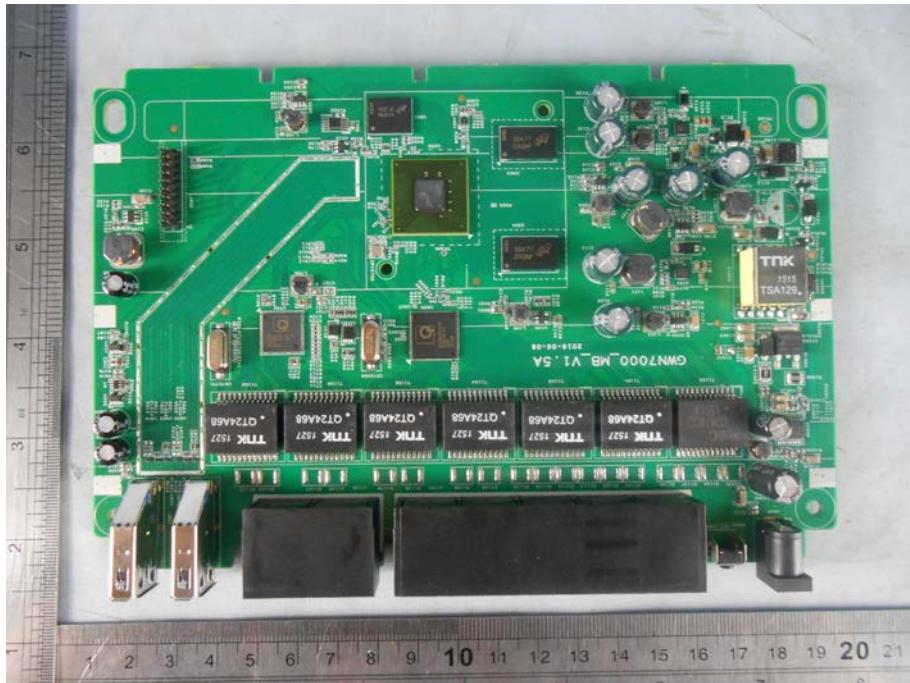
Power Adapter View (Manufacturer: Mass power)



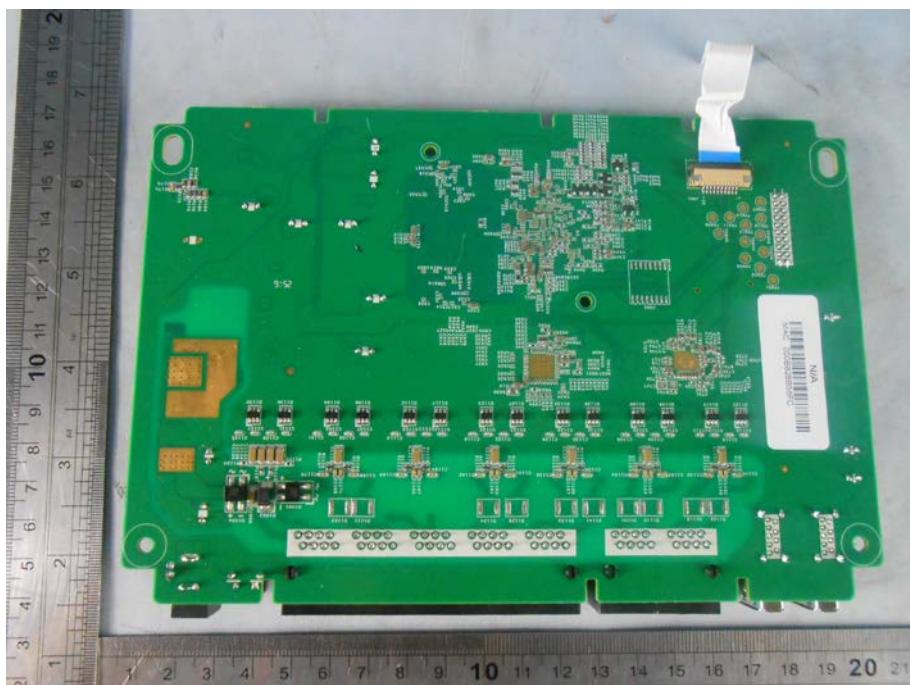
Power Adapter View (Manufacturer: Sunlight)



EUT-Uncovered View



Mainboard-Top view



Mainboard-Bottom view

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Prepared for Grandstream Networks, Inc.

Prepared by ECMG Electronic Technical Testing Corp (Shenzhen)

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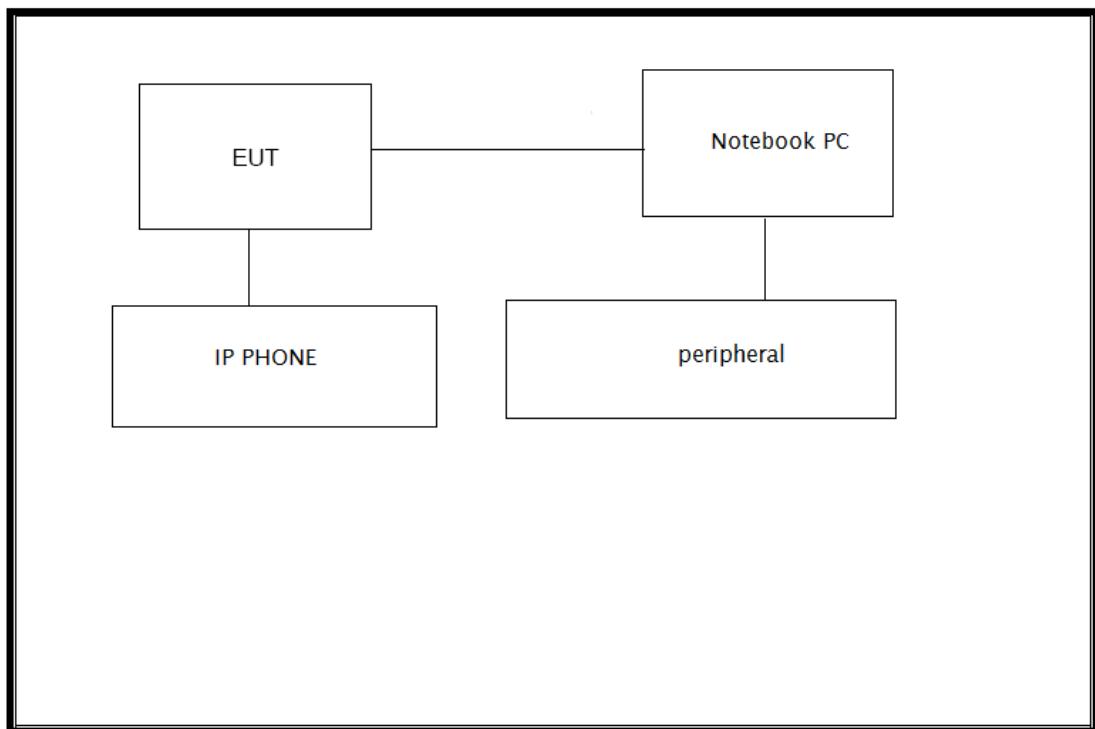
Test System Details

EUT				
<i>Model Number:</i>	<i>GWN7000</i>			
<i>Description:</i>	<i>Enterprise Router & Wireless Access Point Manager</i>			
<i>Manufacturer:</i>	<i>Grandstream Networks, Inc.</i>			
<i>Input Voltage:</i>	<i>DC 12V</i>			
Support Equipment				
<i>Description</i>	<i>Model Number</i>	<i>Serial Number</i>	<i>Certificate</i>	<i>Manufacturer</i>
<i>Notebook PC</i>	<i>T400</i>	<i>6475</i>	<i>DoC</i>	<i>IBM</i>
<i>Monitor</i>	<i>U2142M</i>	<i>/</i>	<i>DoC</i>	<i>DELL</i>
<i>Mouse</i>	<i>N889</i>	<i>/</i>	<i>DoC</i>	<i>DELL</i>
<i>IP Phone x2pcs</i>	<i>E129</i>	<i>49126</i>	<i>FCC ID:TYM-E129</i>	<i>AVAYA</i>

Cable Description						
<i>Cable No.</i>	<i>Type of Cable</i>	<i>From</i>	<i>To</i>	<i>Length (Meters)</i>	<i>Shielded (Y/N)</i>	<i>Ferrite (Y/N)</i>
1	<i>VGA Cable</i>	<i>Notebook PC</i>	<i>Monitor</i>	1.2	Y	Y
2	<i>Mouse cable</i>	<i>Notebook PC</i>	<i>Mouse</i>	1.2	N	Y
3	<i>RJ-45 Cable</i>	<i>EUT</i>	<i>Notebook PC</i>	1.5	N	N
4	<i>RJ-45 Cable x 2pcs</i>	<i>EUT</i>	<i>IP Phone</i>	2.0	N	N
5	<i>Power Adapter Cable</i>	<i>EUT</i>	<i>AC Plug</i>	1.5	N	N

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.

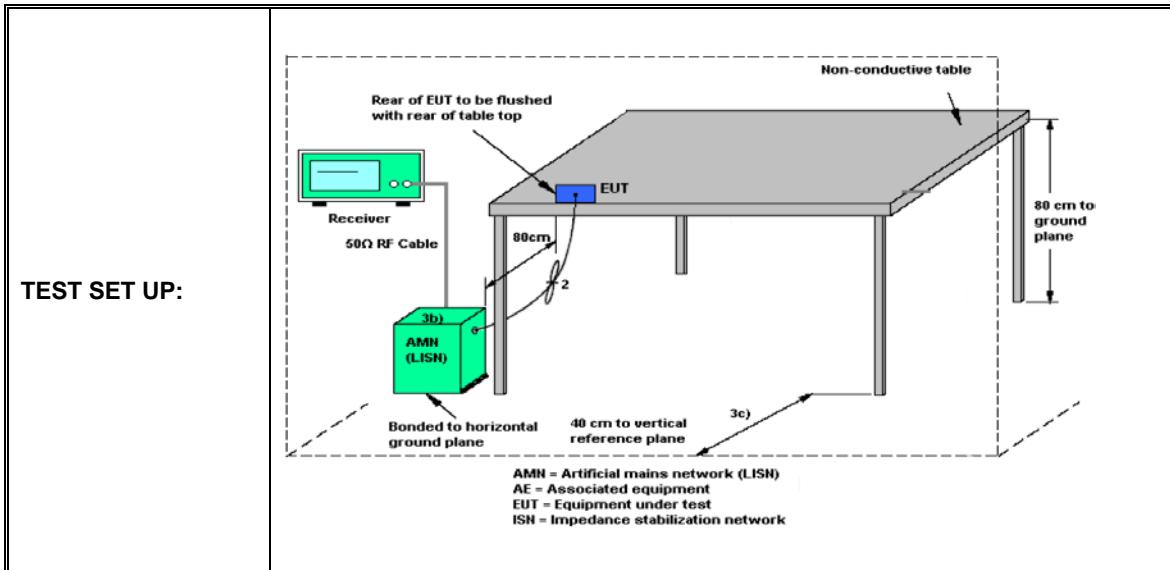
Configuration of Tested System



ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

CLIENT:	Grandstream Networks, Inc.	TEST STANDERD:	Section 15.107
MODEL NUMBERS:	GWN7000	PRODUCT:	Enterprise Router & Wireless Access Point Manager
MODEL TESTED:	GWN7000	EUT DESIGNATION:	Home or Office
TEMPERATURE:	22°C	HUMIDITY:	48%
ATM PRESSURE:	103kPa	GROUNDING:	None
TESTED BY:	Alex Yu	DATE OF TEST:	April 21 th , 2016
TEST REFERENCE:	ANSI C63.4- 2014		
TEST PROCEDURE:	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2014 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.</p> <p>The frequency range investigated was from 150KHz to 30MHz.</p> <p>Corrected Amplitude & Margin Calculation.</p> <p>The basic equation as follow:</p> $VC = VR + AC + VDF;$ <p>Herein,</p> <p>VC: corrected voltage amplitude</p> <p>VR: reading voltage amplitude</p> <p>AC: attenuation caused by cable loss</p> <p>VDF: voltage division factor of AMN or ISN.</p> <p>The “Margin” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit.</p> <p>The equation for margin calculation is as follows:</p> $\text{Margin} = \text{Limit} - \text{Corrected Amplitude}.$		
TEST MODE:	Mode 1,Mode 2		
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 ECMG Electronic Technical Testing Corp(Shenzhen) test personnel.		
M. UNCERTAINTY:	The maximum measurement uncertainty is evaluated as: 150KHz~30MHz: 3.2dB. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.		

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EMI Receiver Set-up:

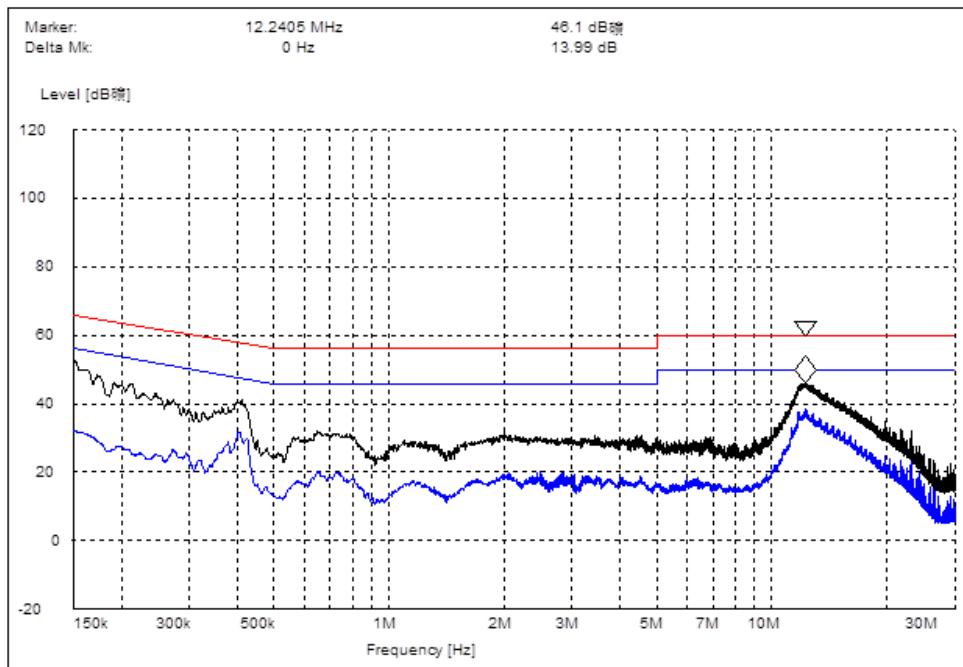
Frequency [MHz]	IF B/W
0.15 - 30	9KHz

Conducted Emission Limit:

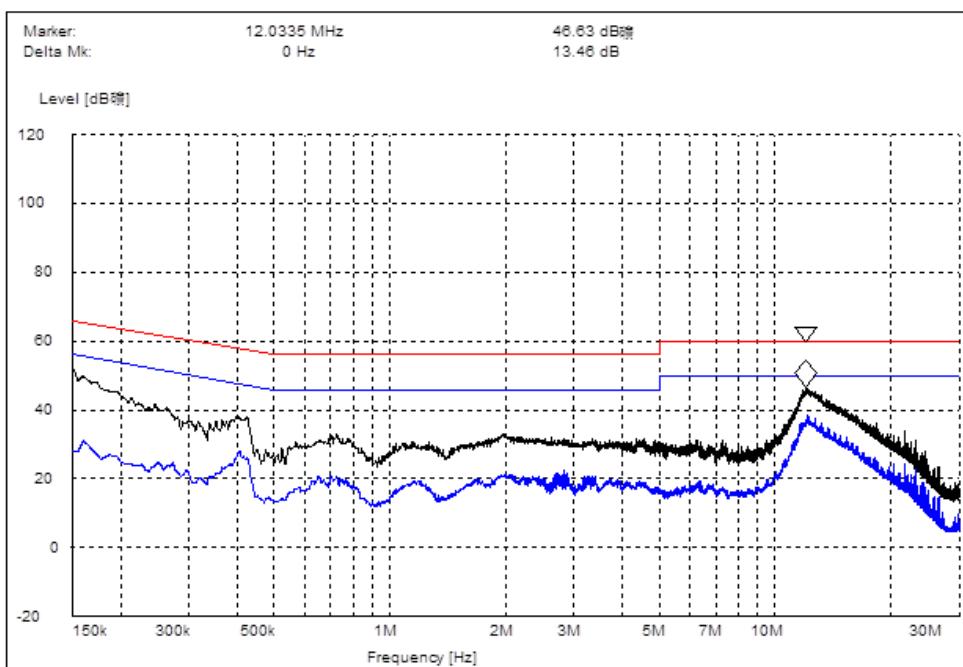
Frequency [MHz]	Field strength [dBuV]	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

Mode 1: (Mass Power)

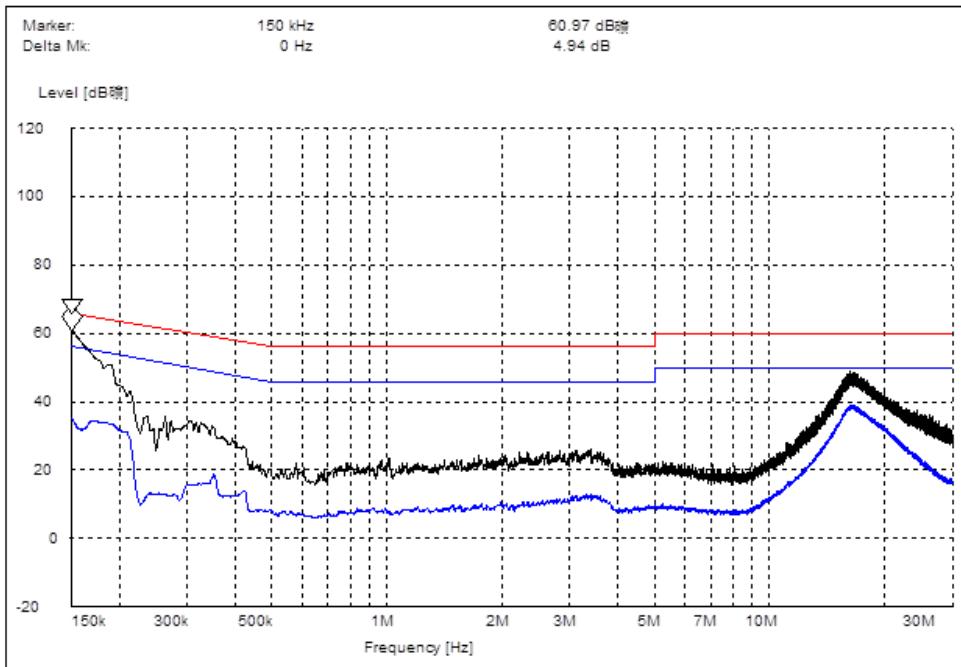


Line L Conducted Emission Graph

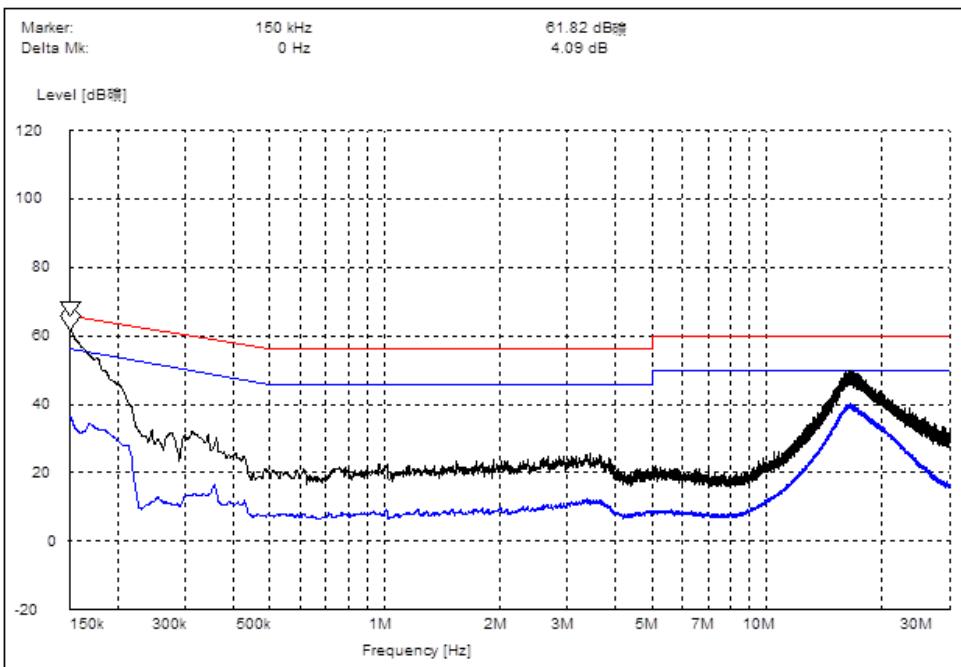


Line N Conducted Emission Graph

Mode 2:(Sunlight Power)



Line L Conducted Emission Graph



Line N Conducted Emission Graph

Test Data:**Mode 1:**

Lines	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AVE Level (dBuV)	Limits AVE (dBuV)	Margin AVE (dB)
L	0.465	44.5	56.6	-12.1	0.465	33.8	46.4	-12.6
L	0.480	44.8	56.3	-11.5	0.480	34.2	46.3	-12.1
L	12.241	46.1	60	-13.9	12.405	38.4	50	-11.6
N	0.475	40.8	56.4	-15.6	0.475	26.9	46.4	-19.5
N	0.480	40.4	56.3	-15.9	0.480	27.0	46.3	-19.3
N	12.036	46.6	60	-13.4	12.405	38.7	50	-11.3

Note:

1) All readings are using a bandwidth of 9 kHz, with a 500 ms sweep time. A video filter was not used.

2) Other emission levels are too low against official limit that are not reported.

Mode 2:

Lines	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Frequency (MHz)	Corrected AVE Level (dBuV)	Limits AVE (dBuV)	Margin AVE (dB)
L	0.150	61.0	66	-5.0	0.150	49.1	56	-6.9
L	0.465	44.6	56.6	-12.0	0.465	32.4	46.6	-14.2
L	0.470	44.3	56.5	-12.2	0.470	42.0	46.5	-4.5
N	0.150	62.0	66	-4.0	0.150	40.9	47.3	-6.4
N	0.475	42.4	56.4	-14.0	0.475	30.4	46.4	-16.0
N	0.925	39.6	56.0	-16.4	0.925	27.7	46.0	-18.3

Note:

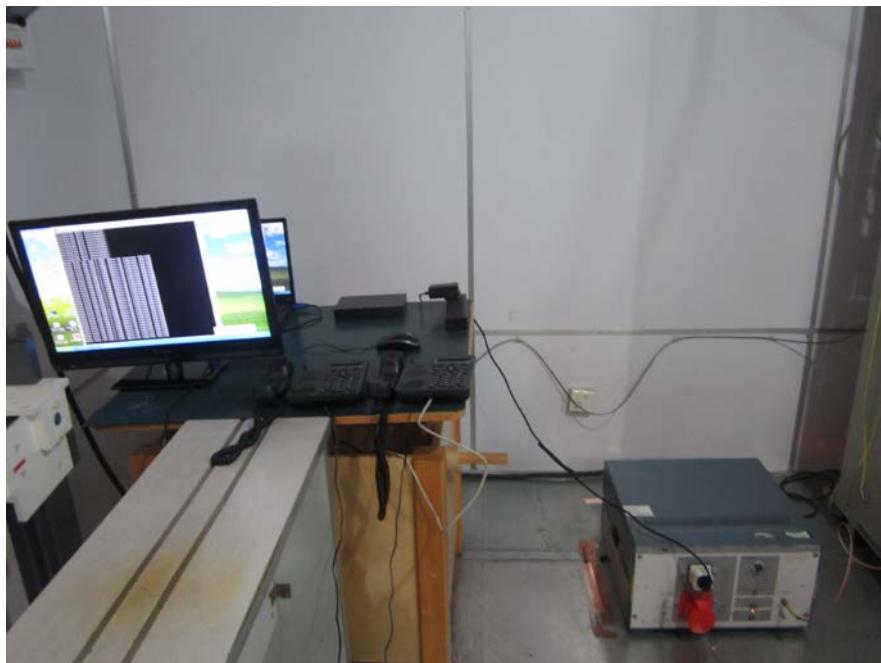
1) All readings are using a bandwidth of 9 kHz, with a 500 ms sweep time. A video filter was not used.

2) Other emission levels are too low against official limit 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. Interval</i>
EMI Test Receiver	ESIB-26	R&S	100174	2015.11.19	2016.11.18
Line impedance stabilization network	ESH2-Z5	R&S	10091	2015.11.19	2016.11.18
<i>Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.</i>					

TESTED BY:**ENGINEER****REVIEWED BY:****SENIOR ENGINEER**



Conducted Emission Test Set-up -Front view



Conducted Emission Test Set-up -Rear view

ATTACHMENT 2 – RADIATED EMISSION MEASUREMENT

CLIENT:	Grandstream Networks, Inc.	TEST STANDERD:	Section 15.109
MODEL NUMBERS:	GWN7000	PRODUCT:	Enterprise Router & Wireless Access Point Manager
EUT MODEL:	GWN7000	EUT DESIGNATION:	Home or Office
TEMPERATURE:	22°C	HUMIDITY:	47%RH
ATM PRESSURE:	103.0kPa	GROUNDING:	None
TESTED BY:	Alex Yu	DATE OF TEST:	April 25 th , 2016
TEST REFERENCE:	ANSI C63.4: 2014		
TEST PROCEDURE:	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2014 for radiated emissions. 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 2GHz 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</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p>		
TEST MODE:	Mode 1,Mode 2,Mode 3		
TESTED RANGE:	30 to 2000MHz		
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.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen). Test personnel.		
M. UNCERTAINTY:	<p>The maximum measurement uncertainty is evaluated as :</p> <p>30~1000MHz: 4.7dB; 1~2GHz: 4.5dB.</p> <p>This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.</p>		

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EMI Receiver Set-up:

Frequency [MHz]	RBW	VBW	Detector
0.009-0.015	200Hz	1KHz	Quasi-peak
0.015-30	9KHz	30kHz	Quasi-peak
30-1000	120KHz	300KHz	Quasi-peak
Above 1GHz	1MHz	3MHz	Peak
	1MHz	10Hz	AVerage

Note 1: In the emission table above, the tighter limit applies at the band edges.

Note 2: (d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz.

Radiated emission limits in these three bands are based on measurements employing an average detector.

Radiated Emission Limit:

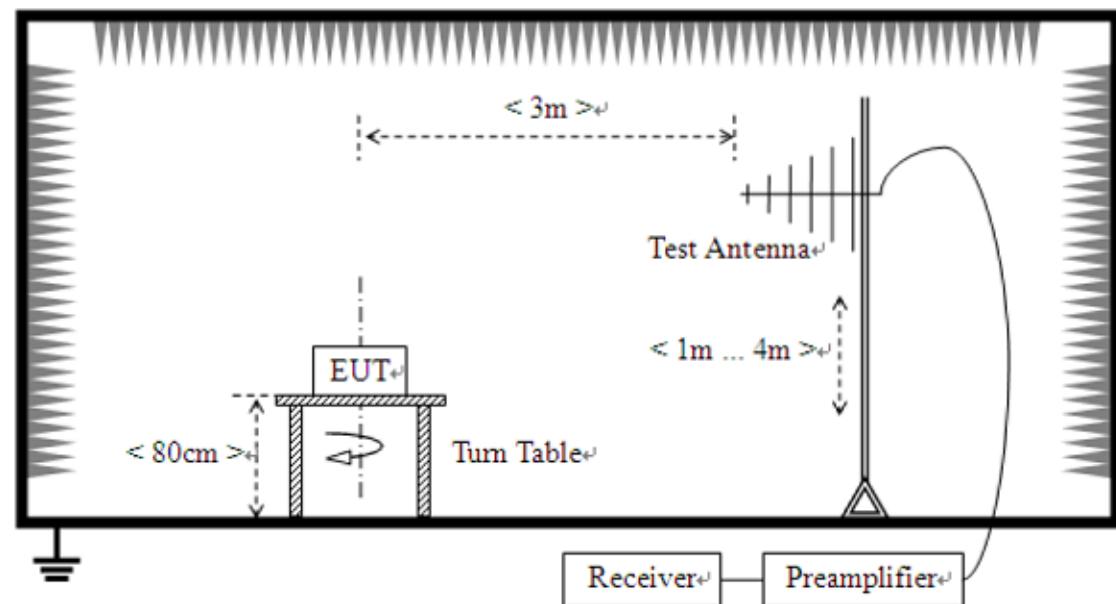
FCC Part 15 Subpart B&C Paragraph 15.109&15.209			
Frequency [MHz]	Field strength [V/m]	Limit@3m (dB μ V/m)	Distance [Meters]
0.009-0.490	2400/F(KHz)	128.5~93.8	300
0.490-1.705	24000/F(KHz)	73.8~63.0	30
1.705-30	30	69.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Note 1: The lower limit shall apply at the transition frequency.

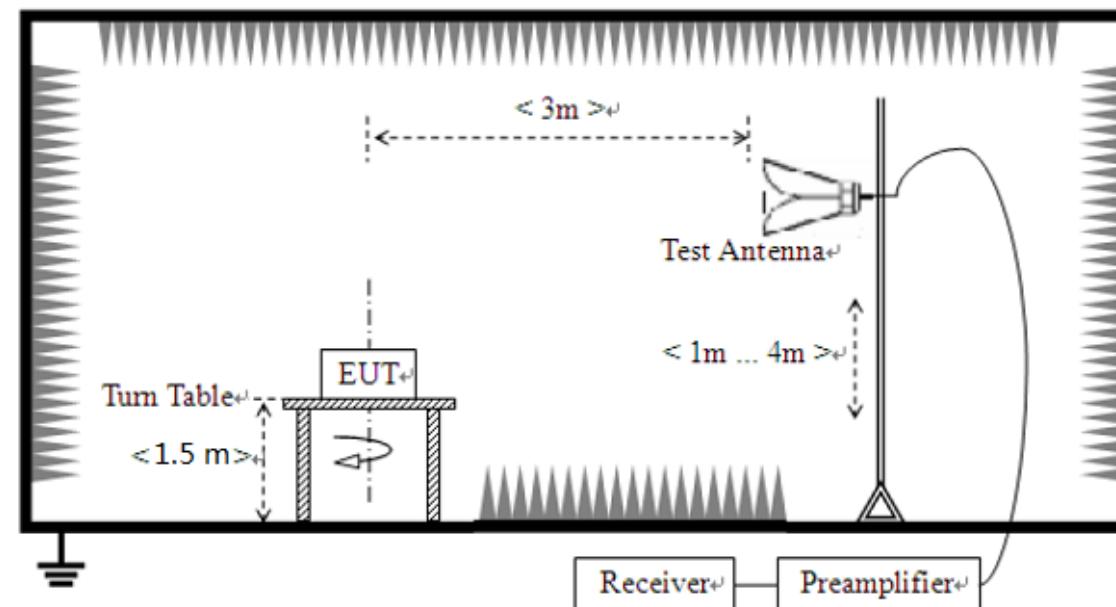
Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dB μ V/m) = 20 log E field strength (uV/m)

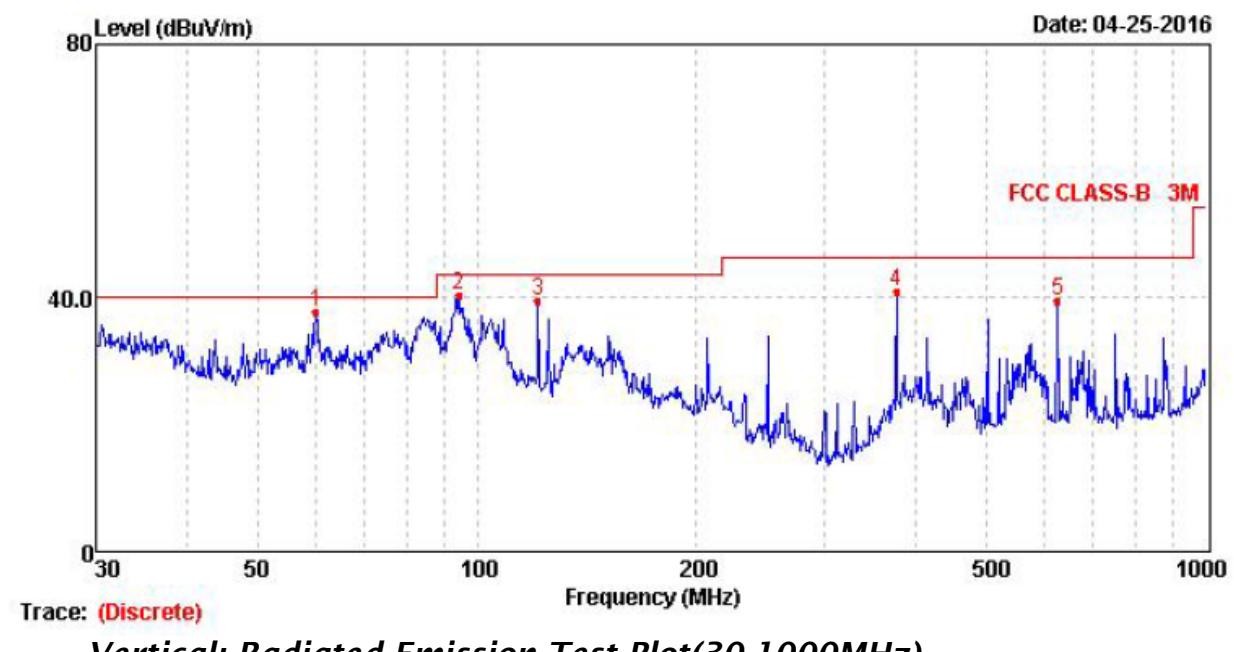
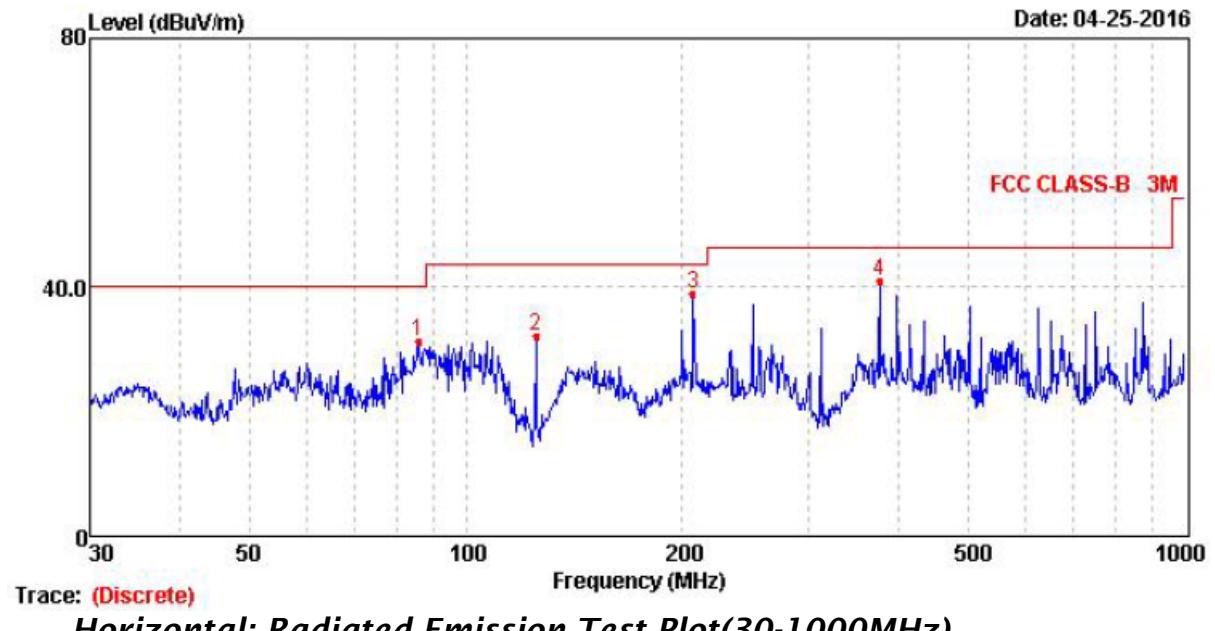
Frequency measured at 30MHz to 1000MHz:



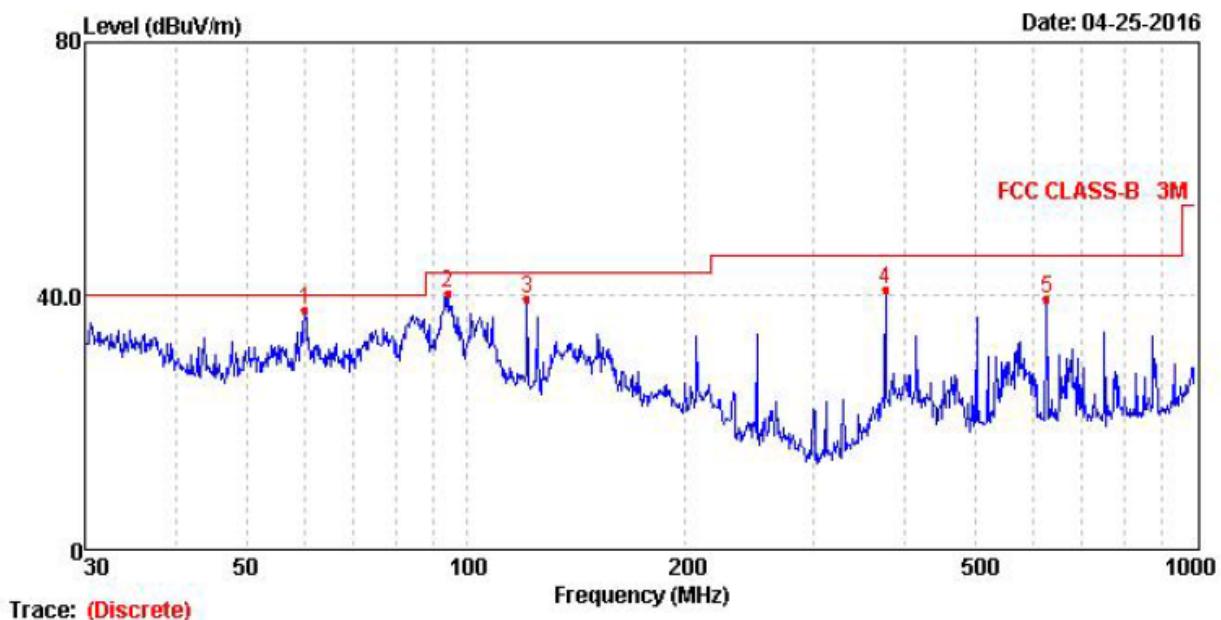
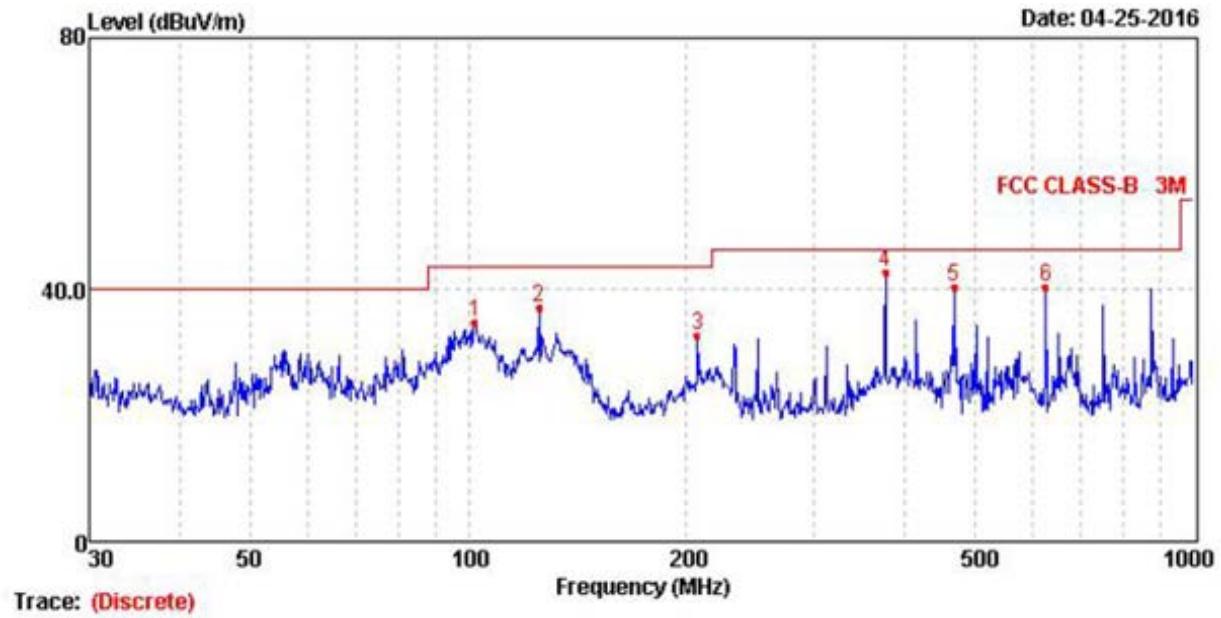
Frequency measured at Above 1GHz:



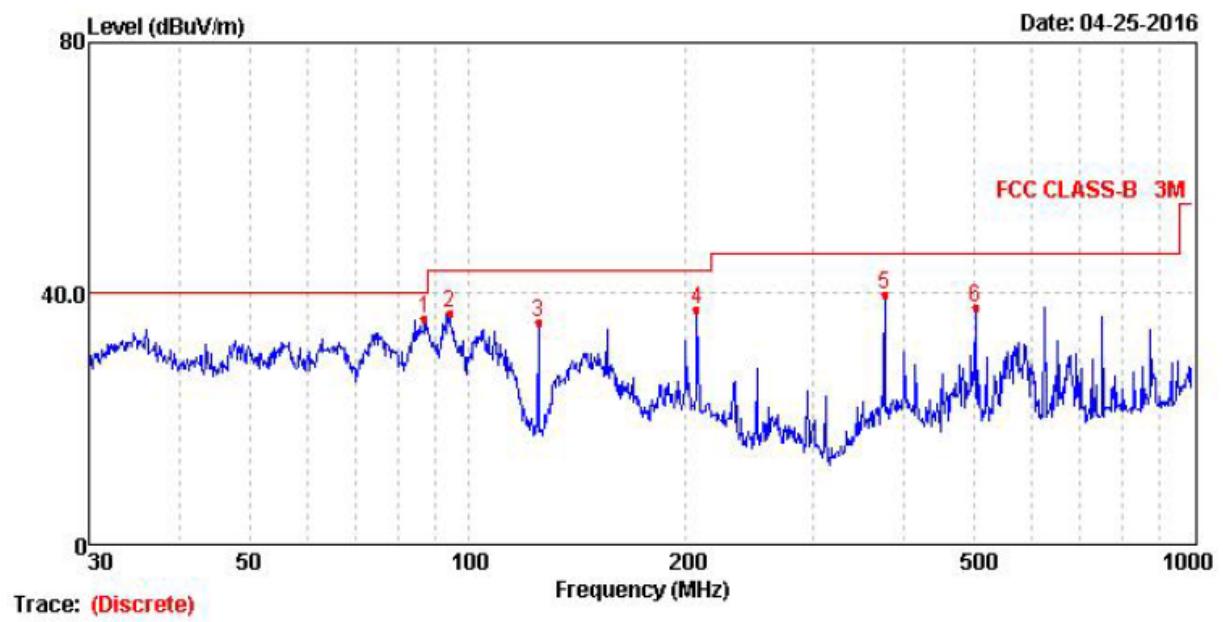
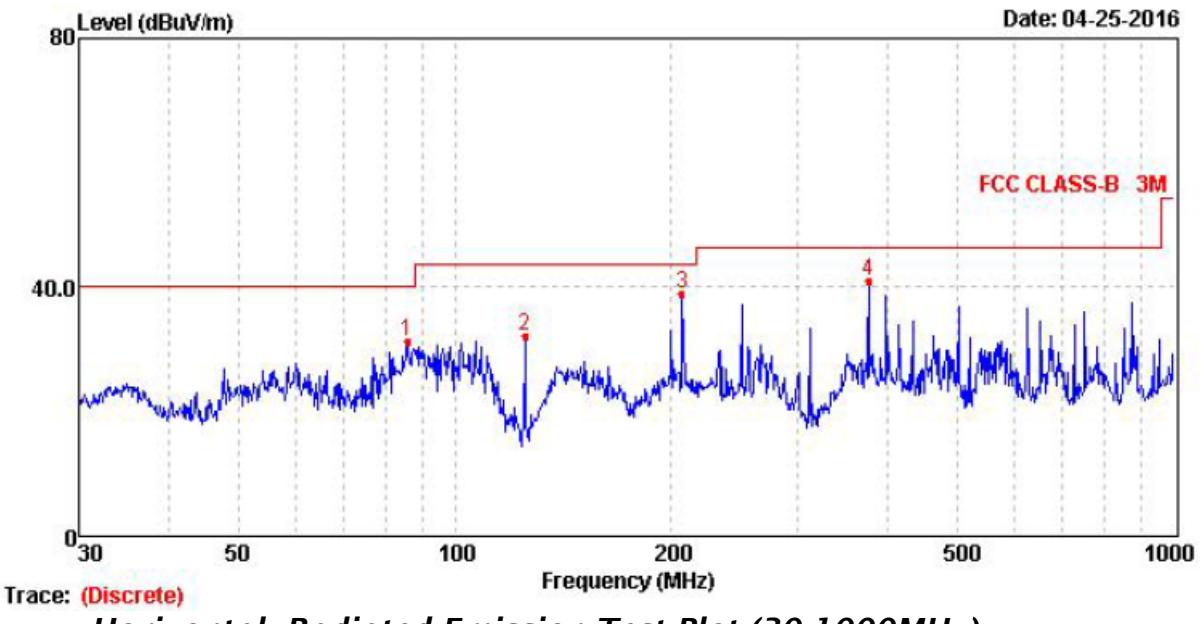
Mode 1:



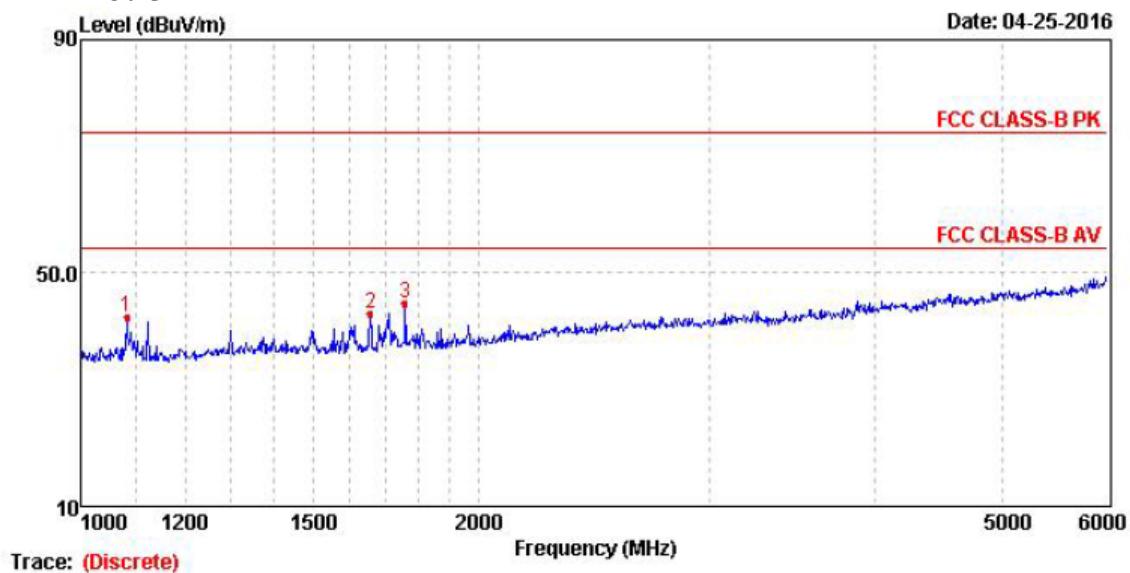
Mode 2:



Mode 3:



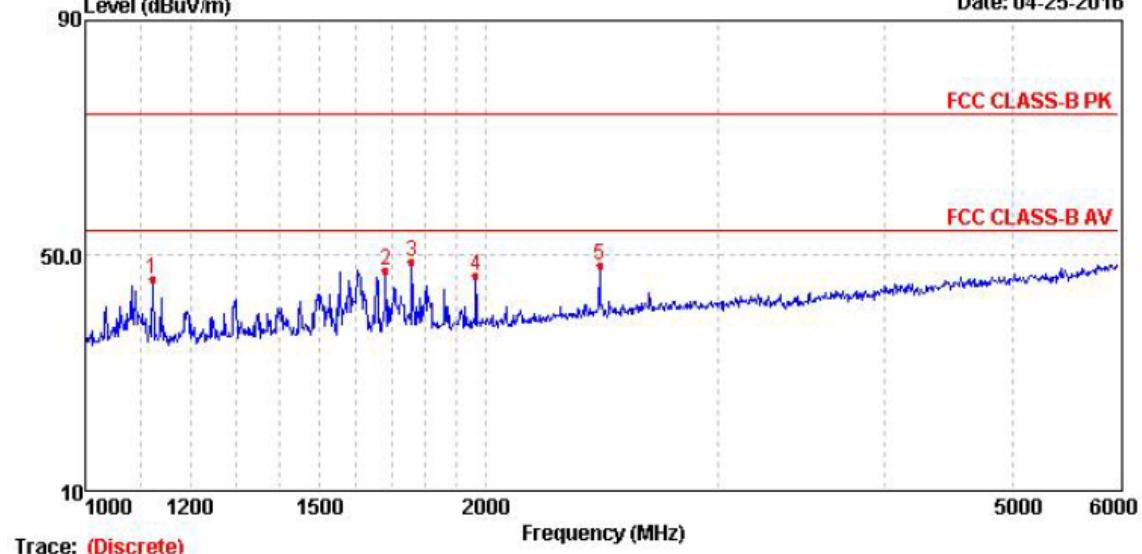
Mode 1:



Data: 14

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Date: 04-25-2016



Test Data:**Mode 1&Below 1GHz:**

Frequency (MHz)	Polarization (H/V)	Factor (dB)	Reading Level QP (dBuV/m)	Emission Level QP (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)
102.00	H	-19.32	55.04	35.72	43.5	-7.78
375.94	H	-14.17	55.72	41.55	46	-4.45
625.08	H	-9.94	48.96	39.02	46	-6.98
/	/	/	/	/	/	/
/	/	/	/	/	/	/
/	/	/	/	/	/	/
60.07	V	-19.27	56.50	37.23	40	-2.77
87.42	V	-20.66	59.17	38.51	40	-1.49
94.43	V	-19.89	59.52	39.63	43.5	-3.87
125.01	V	-18.75	57.90	39.15	43.5	-4.35
/	/	/	/	/	/	/
/	/	/	/	/	/	/

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

Mode 2&Below 1GHz:

Frequency (MHz)	Polarization (H/V)	Factor (dB)	Reading Level QP (dBuV/m)	Emission Level QP (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)
102.00	H	-19.32	53.73	34.41	43.5	-9.09
125.01	H	-18.75	55.76	37.01	43.5	-6.49
375.94	H	-14.17	56.80	42.63	46	-3.37
/	/	/	/	/	/	/
/	/	/	/	/	/	/
/	/	/	/	/	/	/
60.07	V	-19.27	56.50	37.38	40	-2.62
94.43	V	-19.89	59.90	40.01	43.5	-3.49
121.12	V	-18.69	57.82	39.13	43.5	-4.37
375.94	V	-14.17	54.82	40.65	46	-5.35
/	/	/	/	/	/	/
/	/	/	/	/	/	/

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

Mode 3&Below 1GHz:

Frequency (MHz)	Polarization (H/V)	Factor (dB)	Reading Level QP (dBuV/m)	Emission Level QP (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)
85.90	H	-20.80	51.76	30.96	40	-9.04
125.01	H	-19.75	50.54	31.79	43.5	-11.71
207.12	H	-17.82	56.56	38.74	43.5	-4.76
375.94	H	-14.17	54.81	40.64	46	-5.36
/	/	/	/	/	/	/
/	/	/	/	/	/	/
60.07	V	-19.27	56.50	37.38	40	-2.62
94.43	V	-19.89	59.90	40.01	43.5	-3.49
121.12	V	-18.69	57.82	39.13	43.5	-4.37
375.94	V	-14.17	54.82	40.65	46	-5.35
/	/	/	/	/	/	/
/	/	/	/	/	/	/

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

Mode 1 & Above 1GHz:

Frequency (MHz)	Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarization (H/V)
Peak Measurement						
1083.97	-14.85	57.02	42.17	74	-31.83	H
1657.44	-13.45	56.03	42.58	74	-31.42	H
1761.55	-13.15	57.53	44.38	74	-29.62	H
/	/	/	/	/	/	/
1684.39	-13.42	60.69	47.27	74	-26.73	V
1761.55	-13.15	61.70	48.55	74	-25.45	V
2440.73	-10.01	58.18	48.17	74	-25.83	V
/	/	/	/	/	/	/
Average Measurement						
1083.97	-14.85	45.33	30.48	54	-23.52	H
1657.44	-13.45	46.03	32.58	54	-21.42	H
1761.55	-13.15	47.53	34.38	54	-19.62	H
/	/	/	/	/	/	/
1684.39	-13.42	50.69	37.27	54	-16.73	V
1761.55	-13.15	51.70	38.55	54	-15.45	V
2440.73	-10.01	48.18	38.17	54	-15.83	V
/	/	/	/	/	/	/

Note:

1. 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.
2. 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.
3. The other emission levels are 20dB below the official limits that are not reported.

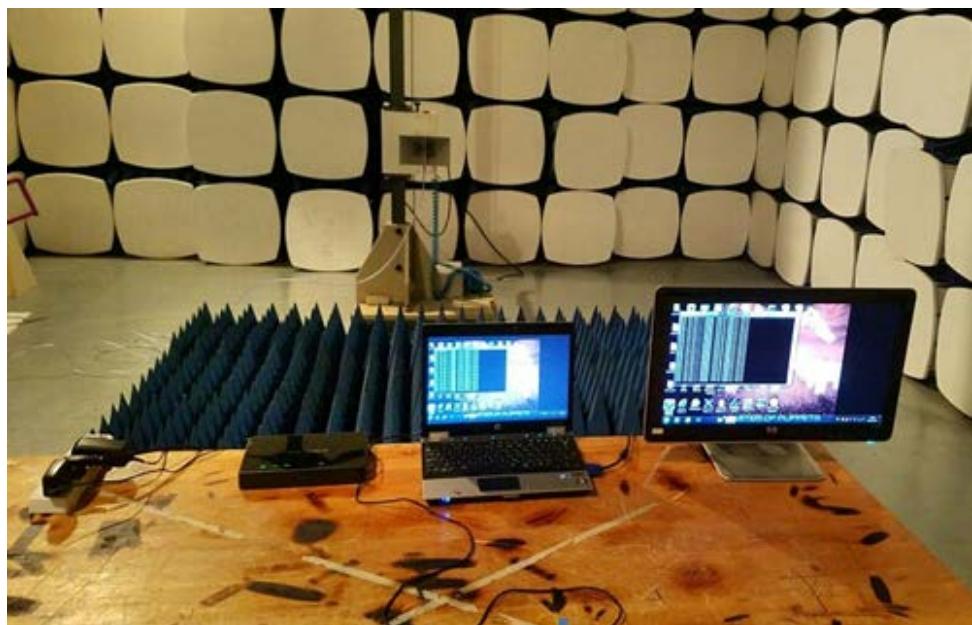
Test Equipment List:

Test Equipment	Manufacturer	Model	Cal. Interval	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI7	1 year	100967	2017.01.04
Bilog Antenna	Schwarzbeck	CBL6141A	1 year	4180	2017.01.07
Horn Antenna	Schwarzbeck	BBHA 9120D	1 year	647	2017.01.04
Low Noise Pre-Amplifier	HP	8447D	1 year	1937A03050	2017.01.04
Low Noise Pre-Amplifier	EMCI	EMC051835	1 year	980075	2017.01.04

TESTED BY:**ENGINEER****REVIEWED BY:****SENIOR ENGINEER**



Radiated Emission Test Set-up(30-1000MHz)



Radiated Emission Test Set-up(Above 1GHz)

※※※ ***End Of Report*** ※※※