

## FCC TEST REPORT

On Model Name: IP Camera

Model Numbers: GXV3615W

Brand Name: Grandstream

FCC ID Number: YZZGXV3615W

Prepared for Grandstream Networks, Inc

Test Specification : FCC Part 15(2009), Subpart C

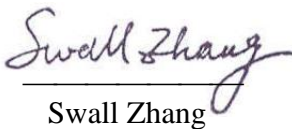
Test Report #: SHE-1011-10539-FCCID

Prepared by: May Wang

Reviewed by: Jawen Yin

QC Manager: Swall Zhang

Test Report Released by:

  
Swall Zhang

December 18, 2010

Date

### List of Attached Files

<i>Exhibit Type</i>	<i>File Description</i>	<i>File Name</i>
<i>Test Report</i>	<i>Test Report</i>	<i>YZZGXV3615W_ Test report.pdf</i>
<i>Operation Description</i>	<i>Technical Description</i>	<i>YZZGXV3615W_ operation description.pdf</i>
<i>External Photos</i>	<i>External Photos</i>	<i>YZZGXV3615W_ External Photos.pdf</i>
<i>Internal Photos</i>	<i>Internal Photos</i>	<i>YZZGXV3615W_ Internal Photos.pdf</i>
<i>Block Diagram</i>	<i>Block Diagram</i>	<i>YZZGXV3615W_ Block_Rev1 Diagram.pdf</i>
<i>Schematics</i>	<i>Circuit Diagram</i>	<i>YZZGXV3615W_ Schematics.pdf</i>
<i>ID Label/Location</i>	<i>Label Artwork and Location</i>	<i>YZZGXV3615W_ Label &amp; Location.pdf</i>
<i>User Manual</i>	<i>User Manual</i>	<i>YZZGXV3615W_ User Manual.pdf</i>
<i>Test setup photos</i>	<i>Test setup photos</i>	<i>YZZGXV3615W_ Test Setup Photos.pdf</i>

## **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.*

### **List of Test and Measurement Instruments**

<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibrated Untill</b>
<i>Spectrum Analyzer</i>	<i>R&amp;S</i>	<i>FSP30</i>	<i>100755</i>	<i>2011-11-30</i>
<i>EMI Receiver</i>	<i>SCHAFFNER</i>	<i>SMR4503</i>	<i>11725</i>	<i>2011-11-30</i>
<i>LISN</i>	<i>ETS</i>	<i>4825/2</i>	<i>1161</i>	<i>2011-11-30</i>
<i>Coaxial Cable</i>	<i>ATC</i>	<i>N/A</i>	<i>N/A</i>	<i>2011-11-30</i>
<i>Double-ridged Wave guide horn</i>	<i>ETS</i>	<i>3115</i>	<i>6587</i>	<i>2011-11-30</i>
<i>Amplifier</i>	<i>Agilent</i>	<i>83017A</i>	<i>MY39500438</i>	<i>2011-11-30</i>
<i>Band filter</i>	<i>ASI</i>	<i>82346</i>	<i>S06389</i>	<i>2011-11-30</i>
<i>Biconilog Antenna</i>	<i>ETS</i>	<i>3142C</i>	<i>00042672</i>	<i>2011-11-30</i>
<i>Semi-anechoic Chamber</i>	<i>ETS</i>	<i>N/A</i>	<i>N/A</i>	<i>2011-11-30</i>

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

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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 Camera*

*Model Name* : *GXV3615W*

*Model Tested* : *GXV3615W*

*Serial Number* : *Engineering Sample*

*Receipt Date of Test Item* : *December 3,2010*

*Date Tested* : *December 6, 2010 to December 16,2010*

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

*Tel* : *86-755-2601 4600*

*Fax* : *86-755-2601 4601*

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

*Tel* : *86-755-2601 4600*

*Fax* : *86-755-2601 4601*

## EUT Description

Grandstream Networks, Inc., model tested GXV3615W (referred to as the EUT in this report) is an IP Camera.

The EUT is an IP Camera built-in IEEE 802.11b/g/n adapter which operates in 2.4GHz ISM band and technical specifications of EUT as below:

Parameter		Range			
Basic parameters	Rated voltage	DC12V			
	Rated Current	0.5A			
802.11b/g/n Adapter Parameters	Operating band	2400-2483.5MHz			
	WIFI Module Voltage	+3V3 supply for WIFI module			
	Working Frequency of Each Channel	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
		001	2412	007	2442
		002	2417	008	2447
		003	2422	009	2452
		004	2427	010	2457
005		2432	011	2462	
006		2437	--	--	
Frequency of Number	IEEE 802.11b/g: 11 channels; 802.11n HT 20MHz: 11 channels; 802.11n HT 40MHz: 7 channels.				
Modulation Type	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM IEEE 802.11n H420: OFDM				
Data Rate	IEEE 802.11b: 1/2/5.5/11Mbps; IEEE 802.11g: 6/9/12/18/24/36/48/54Mbps; IEEE 802.11n HT20: 6.5/13/19.5/26/39/49.5/58.5/65Mbps; IEEE 802.11n HT40: 13/26/39/49.5/58.5/65/75/84Mbps				



	<i>Tranmit Power</i>	<table border="1"> <thead> <tr> <th><i>Operating mode</i></th> <th><i>Frequency Range (MHz)</i></th> <th><i>Output Power (dBm)</i></th> <th><i>Output Power (mW)</i></th> </tr> </thead> <tbody> <tr> <td><i>IEEE 802.11b</i></td> <td><i>2412-2462</i></td> <td><i>16±15%</i></td> <td><i>22.91-69.18</i></td> </tr> <tr> <td><i>IEEE 802.11g</i></td> <td><i>2412-2462</i></td> <td><i>12±15%</i></td> <td><i>10.47-23.99</i></td> </tr> <tr> <td><i>802.11n HT 20MHz</i></td> <td><i>2412-2462</i></td> <td><i>12±15%</i></td> <td><i>10.47-23.99</i></td> </tr> <tr> <td><i>802.11n HT 40MHz</i></td> <td><i>2422-2452</i></td> <td><i>12±15%</i></td> <td><i>10.47-23.99</i></td> </tr> </tbody> </table>	<i>Operating mode</i>	<i>Frequency Range (MHz)</i>	<i>Output Power (dBm)</i>	<i>Output Power (mW)</i>	<i>IEEE 802.11b</i>	<i>2412-2462</i>	<i>16±15%</i>	<i>22.91-69.18</i>	<i>IEEE 802.11g</i>	<i>2412-2462</i>	<i>12±15%</i>	<i>10.47-23.99</i>	<i>802.11n HT 20MHz</i>	<i>2412-2462</i>	<i>12±15%</i>	<i>10.47-23.99</i>	<i>802.11n HT 40MHz</i>	<i>2422-2452</i>	<i>12±15%</i>	<i>10.47-23.99</i>
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<i>Antenna Spec.</i>	<ol style="list-style-type: none"> <li>1. <i>Gain: 2dBi</i></li> <li>2. <i>Impedance: 50ohm</i></li> </ol>																					
<i>I/O Ports</i>	<i>Ethernet Port</i>	<i>1 RJ45 Port LAN 10M/100M b/s, Connected to PC or internet</i>																				
	<i>Audio Input</i>	<i>1 built-in MIC input</i>																				
	<i>Audio output</i>	<i>1 buit-in speaker output</i>																				
<i>AC/DC Adapter</i>	<i>Input</i>	<i>100-240VAC 50/60Hz,max 0.3A</i>																				
	<i>Output</i>	<i>12VDC,0.5A</i>																				
	<i>Model</i>	<i>EGTSA-120050WUY</i>																				

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

## **Test Summary**

The Electromagnetic Compatibility requirements on tested model GXV3615W for this test is 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.

Tested model GXV3615W has been tested to conform to the following parts of the Part 15( 2009) ,Subpart C as detailed below:

<b>FCC Rules</b>	<b>Requirement</b>	<b>Result</b>	<b>Remark</b>
§15.247(c)(1)(i); §15.203	Antenna Requirement	Compliant	Attachment 1
§15.207	Conducted Emission	Compliant	Attachment 2
§15.205(a); §15.209(a)	Radiated Emission	Compliant	Attachment 3
§15.247(b)	Maximum Peak Output Power	Compliant	Attachment 4
§15.247(a)(2)	Occupied Bandwidth	Compliant	Attachment 5
§15.247(d)	Edges Measurement	Compliant	Attachment 6
§15.247(e)	Power Spectral Density	Compliant	Attachment 7

### **Test Mode Applicability And Tested Channel Detail**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rate and antenna diversity.

Regards to the frequency band over 10MHz, the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.

Following mode and channels were chosen for final test as listed below.

For IEEE 802.11b/g mode and 802.11n HT20 mode:

Carried Frequency (MHz)	Channel	Duty Cycle	Data Rate (Mbps)	Modulation Type
2412	Channel Low	100%	IEEE 802.11b: 1Mbps IEEE 802.11g: 6Mbps IEEE 802.11n HT20: 6.5Mbps IEEE 802.11n HT40:13.5Mbps	IEEE 802.11b for DSSS, IEEE 802.11g and 802.11n HT20 For OFDM
2437	Channel Mid			
2462	Channel High			

For IEEE 802.11n HT40 mode:

Carried Frequency (MHz)	Channel Type&Number	Duty Cycle	Data Rate (Mbps)	Modulation Type
2422	Channel Low	100%	13.5Mbps	OFDM
2437	Channel Mid			
2452	Channel High			

### **EUT Exercise Software**

*During testing an exercise software which "QATEST.EXE" was provided by Grandstream Networks,Inc., runs on windows XP system and control IEEE 802.11b/g/n adapter operating on a continuous transmission mode and receive mode.*

**NOTE :**

*All test shall be performed at the max output level declared by client whose power level indicates "power level 18" in test software.*

### **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 for this EUT intended for grant.*

## Test System Details

<b>EUT</b>			
<b>Model Number:</b>	GXV3615W		
<b>Description:</b>	IP Camera		
<b>Manufacturer:</b>	Grandstream Networks, Inc		
<b>Input Voltage:</b>	120VAC/60Hz		
<b>Support Equipment</b>			
<b>Description</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Manufacturer</b>
Notebook	NC4000	CNU4122BCL	HP
AC/DC Adapter Of Notebook	PPP009H	239427-003	HP
AC/DC Adapter of EUT	EGTSA-12005WUY	N/A	TPI

<b>Cable Description</b>					
<b>Description</b>	<b>From</b>	<b>to</b>	<b>Length (Meters)</b>	<b>Shielded (Y/N)</b>	<b>Ferrite (Y/N)</b>
AC/DC Adapter Cord Of Notebook	Adapter	Notebook	1.6	N	Y
	Notebook	AC Plug	1.2	N	N
AC/DC Adapter of EUT	EUT	Plug	1.8	N	N
Note: The "EUT" means "IP Camera".					

**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 - Antenna Requirement**

### **§15.203 Requirements:**

*An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.*

### **§15.247(c) (1)(i) Requirements:**

*(i) Systems operating in the 2400-2483.5 MHz bands that are used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.*

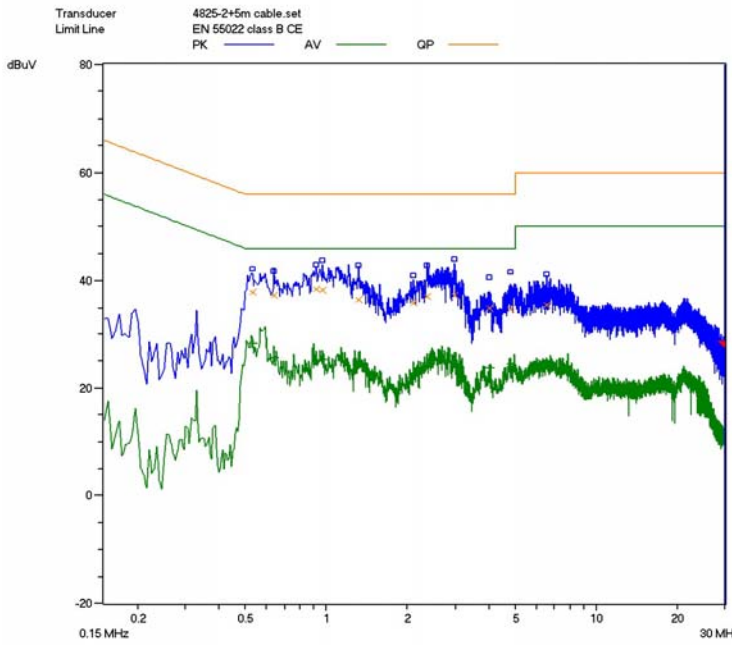
<i>FCC Section</i>	<i>FCC Rules</i>	<i>Conclusion</i>
<p><i>§15.203&amp; §15.207 (c) (1) (i)</i></p>	<p><i>Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.</i></p> <p><i>The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:</i></p> <ol style="list-style-type: none"> <li><i>1. The application (or intended use) of the EUT.</i></li> <li><i>2. The installation requirements of the EUT.</i></li> <li><i>3. The method by which the EUT will be marketed.</i></li> </ol>	<p><i>The maximal gain of the antenna is 2.0 dBi and use a unique connector.</i></p> <p><i>So the unit do meet requirement.</i></p>

**ATTACHMENT 2 - CONDUCTED EMISSION TEST RESULTS**

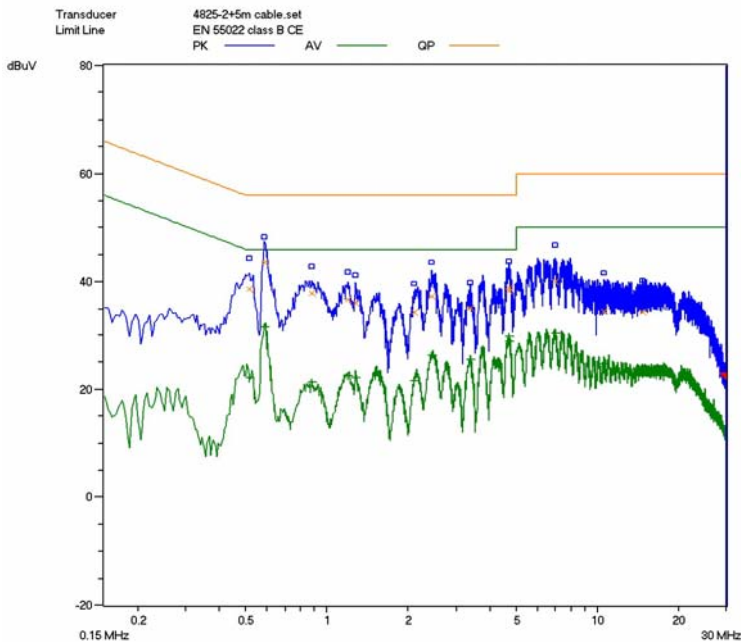
<b>CLIENT:</b>	GRANDSTREAM NETWORKS,INC.	<b>TEST STANDERD:</b>	Section 15.207
<b>MODEL NUMBERS:</b>	GXV3615W	<b>PRODUCT:</b>	IP Camera
<b>EUT MODEL:</b>	GXV3615W	<b>EUT DESIGNATION:</b>	Digital Transmission Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	None
<b>TESTED BY:</b>	May Wang	<b>DATE OF TEST:</b>	December 6, 2010
<b>TEST REFERENCE:</b>	ANSI C63.4: 2003		
<b>TEST PROCEDURE:</b>	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.		
<b>TEST SETUP</b>	<p>The diagram illustrates the test setup. It shows a table with a horizontal ground plane. On the table, there is a support stand holding the EUT (Equipment Under Test) at a height of 80 cm. A LISN (Line Impedance Stabilization Network) is connected to the EUT. A Testreceive device is connected to the LISN. The Testreceive device is shown with a screen displaying a waveform. The ground plane is connected to the Testreceive device.</p>		
<b>DESCRIPTIONS OF TEST MODE:</b>	Set to WIFI mode, communicate with notebook PC by wireless router nearby.		
<b>TESTED RANGE:</b>	150kHz to 30MHz		
<b>TEST VOLTAGE:</b>	120VAC/60Hz		
<b>RESULTS:</b>	The EUT meet the requirements of test reference for conducted emissions at AC input port.The test results relate only to the equipment under test provided by client.		
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by EMC Compliance Management Group (China) test personnel.		
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB		



**For WiFi Mode :**



**Line L Conducted Emission Graph**



**Line N Conducted Emission Graph**

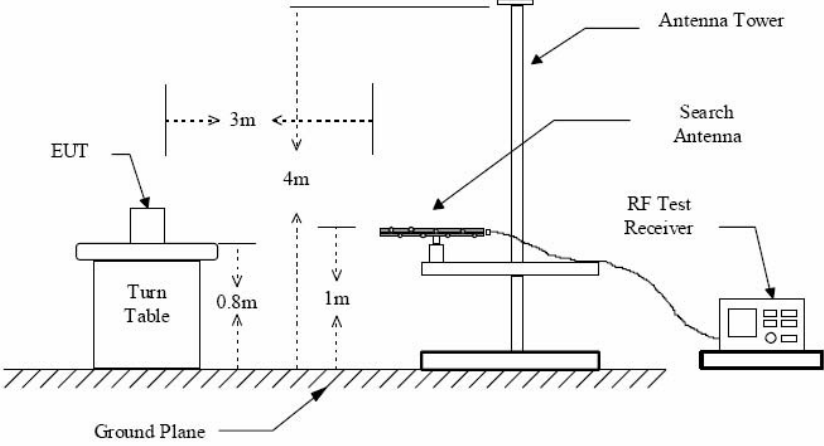
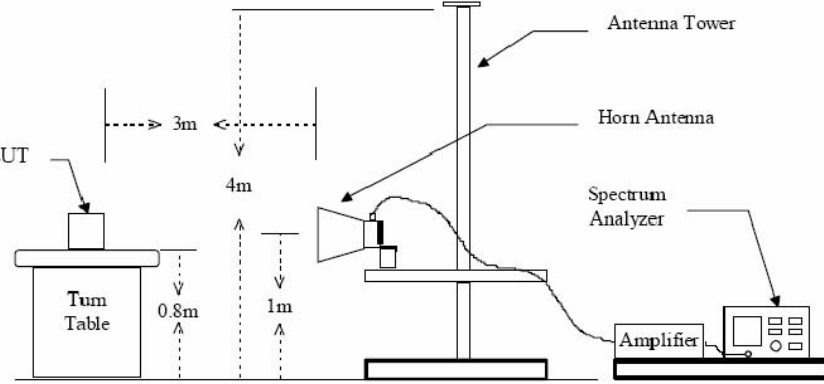
**Conducted Emission Test Data :**

<i>Line</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>
<b>WiFi Mode</b>								
L	0.530	38.0	56	-18.0	0.530	28.1	46	-17.9
L	0.920	38.5	56	-17.5	0.920	25.0	46	-21.0
L	0.9650	38.3	56	-17.7	0.9650	24.3	46	-21.7
L	1.3150	36.5	56	-19.5	1.3150	24.3	46	-21.7
L	2.3550	37.0	56	-19.0	2.3550	24.7	46	-21.3
L	2.9800	37.4	56	-18.6	2.9800	24.5	46	-21.5
N	0.5150	38.6	56	-17.4	0.5150	22.2	46	-23.8
N	0.5850	43.6	56	-12.4	0.5850	31.5	46	-14.5
N	0.8800	37.9	56	-18.1	0.8800	21.4	46	-24.6
N	4.6900	38.3	56	-17.7	4.6900	28.7	46	-17.3
N	6.9950	40.0	56	-16.0	6.9950	30.3	46	-15.7
N	10.5200	34.6	56	-21.4	10.5200	34.7	46	-11.3
<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>								

### ATTACHMENT 3- RADIATED EMISSION TEST

<b>CLIENT:</b>	GRANDSTREAM NETWORKS,INC.	<b>TEST STANDERD:</b>	Section 15.209(a), Section 15.205(a)
<b>MODEL NUMBERS:</b>	GXV3615W	<b>PRODUCT:</b>	IP Camera
<b>EUT MODEL:</b>	GXV3615W	<b>EUT DESIGNATION:</b>	Digital Transmission Device
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	None
<b>TESTED BY:</b>	May Wang	<b>DATE OF TEST:</b>	December 6, 2010
<b>TEST REFERENCE:</b>	ANSI C63.4: 2003		
<b>TEST PROCEDURE:</b>	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2003 for radiated emissions. An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber. Test procedure as follow:</p> <ol style="list-style-type: none"> <li>The EUT is placed on a turntable, which is 0.8 m above ground plane.The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.</li> <li>The EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.</li> <li>Maximum procedure was performed on the six highest emissions to ensure EUT compliance.</li> <li>And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.</li> <li>Repeat above procedures until the measurements for all frequencies are complete.</li> </ol>		
<b>DESCRIPTION OF TEST MODE</b>	<p><b>For below 1GHz:</b></p> <p>Set to WiFi mode, pre-scan all channels of the IEEE 802.11b/g/n, and found the 801.11b mode, channel 1 with data rate of 1Mbps which is worst case mode.</p> <p>So IEEE 802.11b mode,channel 1 with data rate of 1Mbps was chosen for the final test and recorded in report.</p> <p><b>For above 1GHz:</b></p> <p>Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations,data rate and antenna ports (if EUT with antenna diversity architecture). Following channels were chosen for the final test as listed below: 802.11b mode with data rate of 1Mbps,802.11g mode with data rate of 6Mbps,802.11n HT20 mode with data rate of 6.5Mbps and 802.11n HT40 mode with data rate of 13.5Mbps.</p>		

<b>MEASUREMENT SETUP:</b>	Measurement receiver shall be set as below:				
	Frequency (MHz)	Receive detector	RBW	VBW	Value
	30-1000	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1000	Peak	1MHz	1MHz	Peak
	Above 1000	Peak	1MHz	10Hz	average
<b>LIMITS:</b>	Section 15.209 limits as below:				
	<i>Other Frequency (MHz)</i>	<i>Field strength (uV/meter) dB uV/meter</i>			
	30-88	100	40.0		
	88-216	150	43.5		
	216-960	200	46.0		
Above 960	500	54.0			
	NOTE:				
	1) Field Strength (dBmV/m)= 20log Field Strength (mV/m).				
	2) In the emission tables above,the tighter limit applies at the band edge.				
<b>TESTED RANGE:</b>	30MHz to 25GHz				
<b>TEST VOLTAGE:</b>	120VAC/60Hz				
<b>RESULTS:</b>	According to the data in the following,the EUT complied with the FCC Part 15.209 &15.205. The test results relate only to the equipment under test provided by client.				

<p><b>TEST SETUP:</b></p>	<p style="text-align: center;">Figure 1 : Frequencies measured below 1 GHz configuration</p>  <p style="text-align: center;">Figure 2 : Frequencies measured above 1 GHz configuration</p>  <p>Note :For more detailed informations,please refer to test set up photo.</p>
<p><b>CHANGES OR MODIFICATIONS:</b></p>	<p>There were no modifications installed by EMC Compliance Management Group (China) test personnel.</p>
<p><b>M. UNCERTAINTY:</b></p>	<p>Freq. <math>\pm 2 \times 10^{-7} \times</math> Center Freq., Amp <math>\pm 2.6</math> dB</p>

**Radiated Emission Test Data (Below 1GHz):**

**For 802.11b mode, channel 1 with data rate of 1Mbps:**

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)
<b>Horizontal</b>							
40.640	0.02	16.8	/	5.88	22.7	40.0	-17.3
265.920	0.15	12.9	/	30.55	43.6	46.0	-2.4
322.960	0.16	13.4	/	12.94	26.5	46.0	-19.5
432.000	0.20	15.8	/	12.40	28.4	46.0	-17.6
720.000	0.39	20.7	/	13.61	34.7	46.0	-11.3
799.840	0.39	22.2	/	14.31	36.9	46.0	-9.1
<b>Vertical</b>							
41.120	0.02	16.8	/	19.68	36.5	40.0	-3.5
265.920	0.15	12.9	/	18.55	31.6	46.0	-14.4
307.920	0.16	13.7	/	7.64	21.5	46.0	-24.5
531.280	0.30	18.1	/	10.00	28.4	46.0	-17.6
584.720	0.30	19.0	/	11.40	30.7	46.0	-15.3
648.000	0.36	20.0	/	10.54	30.9	46.0	-15.1

**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) Other emission levels are too low against official limits that are not recorded.

**Radiated Emission Test Data (Above 1GHz):**

**802.11b mode/Low Channel: 2412MHz**

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)
<b>Peak Measurement</b>								
1034.00	1.39	23.9	33.6	44.1	52.41	74	-21.59	V
5896.00	3.87	35.4	31.6	48.4	40.73	74	-33.27	V
4808.00	3.26	33.5	32.0	54.16	49.40	74	-24.60	V
7392.00	5.32	36.2	30.5	51.39	40.37	74	-33.63	V
8320.52	4.67	35.8	29.9	51.13	40.56	74	-33.44	V
7250.00	4.67	36.0	30.5	60.47	50.3	74	-23.7	V
7018.0	4.67	36.2	30.5	51.12	40.75	74	-33.25	H
1272.0	6.2	37.9	33.6	57.95	47.45	74	-26.55	H
3210.0	2.57	31.5	32.1	44.27	42.30	74	-31.70	H
4808.0	3.26	32.9	32.0	53.4	49.24	74	-24.76	H
3212.0	3.26	32.2	32.1	43.66	40.30	74	-33.70	H
1272.5	1.71	23.9	33.6	39.57	47.56	74	-26.44	H

<i>Frequency (MHz)</i>	<i>Cable Loss(dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
1170.00	1.39	23.9	31.6	27.8	34.11	54	-19.89	V
1024.80	1.39	23.9	31.6	22.2	28.51	54	-25.49	V
4808.00	3.50	32.90	31.6	36.82	32.02	54	-21.98	V
7392.00	4.10	36.20	30.5	38.27	28.47	54	-25.53	V
6904.85	4.10	33.90	30.8	37.2	30.0	54	-24.00	V
5987.01	3.87	35.40	31.6	37.21	29.54	54	-24.46	V
7256.00	4.10	36.20	30.5	37.96	28.16	54	-25.84	H
4808.00	3.5	32.90	31.6	37.56	32.76	54	-21.24	H
3210.00	2.57	31.50	32.1	31.85	29.88	54	-24.12	H
1170.00	1.39	23.9	31.6	27.01	33.32	54	-20.68	H
5672.00	3.87	35.40	31.6	37.82	30.15	54	-23.85	H
4503.34	3.26	33.5	32.0	35.26	30.50	54	-23.50	H



**802.11b mode/Mid Channel: 2437MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
6984.00	4.10	33.90	30.8	48.42	41.22	74	-32.78	V
4876.00	3.26	33.5	32.0	48.07	43.31	74	-30.69	V
10792.00	7.20	37.8	30.0	56.49	41.49	74	-32.51	V
1034.00	1.39	23.9	31.6	46.56	52.87	74	-21.13	V
5320.00	3.50	32.9	31.6	49.8	45.00	74	-29.00	V
4502.30	3.26	33.5	32.0	44.97	40.21	74	-33.79	V
7018.00	4.10	36.20	30.5	49.94	40.14	74	-33.86	H
4876.00	3.26	33.5	32.0	47.93	43.17	74	-30.83	H
3244.00	2.57	31.50	32.1	44.43	42.46	74	-31.54	H
1544.00	1.71	26.1	33.6	42.31	48.10	74	-25.90	H
5461.00	3.50	32.9	31.6	49.93	45.13	74	-28.87	H
6473.00	4.10	33.90	30.8	52.43	45.23	74	-28.77	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
7392.00	4.10	36.20	30.5	38.3	28.50	54	-25.50	V
3278.00	2.57	31.50	32.1	31.23	29.26	54	-24.74	V
1170.00	1.39	23.9	31.6	27.72	34.03	54	-19.97	V
4876.00	3.26	33.5	32.0	34.64	29.88	54	-24.12	V
3554.00	2.67	32.2	32.1	28.40	25.63	54	-28.37	V
1257.00	1.39	23.9	31.6	28.70	35.01	54	-18.99	V
7018.00	4.10	36.20	30.5	37.92	28.12	54	-25.88	H
4876.00	3.26	33.5	32.0	34.05	29.29	54	-24.71	H
3244.00	2.57	31.50	32.1	31.17	29.20	54	-24.80	H
2224.00	2.01	28.00	33.0	29.21	32.20	54	-21.80	H
3526.20	2.67	32.2	32.1	38.17	35.40	54	-18.60	H
6934.00	4.10	33.90	30.8	33.50	26.30	54	-27.70	H

**802.11b mode/High Channel: 2462MHz**

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)
<b>Peak Measurement</b>								
4910.00	3.26	33.50	32.0	50.10	45.34	74	-28.66	V
3278.00	2.57	31.50	32.1	43.68	41.71	74	-32.29	V
1544.00	1.71	26.10	31.63	46.83	50.65	74	-23.35	V
7392.00	4.10	36.20	30.5	50.14	40.34	74	-33.66	V
5320.15	3.50	32.90	31.6	43.00	38.20	74	-35.80	V
6103.00	4.02	35.00	30.8	47.32	39.10	74	-34.90	V
4910.00	3.26	33.50	32.0	48.22	43.46	74	-30.54	H
3278.00	2.57	31.50	32.1	49.49	47.52	74	-26.48	H
1544.00	1.71	26.10	31.63	47.15	50.97	74	-23.03	H
7834.00	4.10	36.20	30.5	51.17	41.37	74	-32.63	H
6534.00	4.10	33.90	30.8	47.30	40.10	74	-33.90	H
5210.32	3.50	32.90	31.6	50.12	45.32	74	-28.68	H

<i>Frequency (MHz)</i>	<i>Cable Loss(dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
7392.00	4.10	36.20	30.50	38.45	28.65	54	-25.35	V
4910.00	3.26	33.5	32.00	33.93	29.17	54	-24.83	V
3278.00	2.57	31.5	32.10	31.16	29.19	54	-24.81	V
1170.00	1.39	23.9	31.60	27.75	34.06	54	-19.94	V
5220.00	3.50	32.9	31.60	34.90	30.10	54	-23.90	V
1232.00	1.39	23.9	31.60	28.74	35.05	54	-18.95	V
4910.00	3.26	33.5	32.00	34.40	29.64	54	-24.36	H
3278.00	2.57	31.5	32.10	32.93	30.96	54	-23.04	H
2224.00	2.01	28.00	33.00	28.87	31.86	54	-22.14	H
7392.00	4.10	36.20	30.50	38.90	29.10	54	-24.90	H
3550.00	2.67	32.20	32.10	34.87	32.10	54	-21.90	H
6230.00	4.02	35.00	30.80	38.32	30.10	54	-23.90	H

**For 802.11g mode/Low Channel: 2412MHz**

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)
<b>Peak Measurement</b>								
1034.00	1.39	23.9	31.6	46.01	52.32	74	-21.68	V
3210.00	2.57	31.5	32.1	44.58	42.61	74	-31.39	V
4808.00	3.26	33.5	32.0	46.41	41.65	74	-32.35	V
7120.00	4.10	36.20	30.5	50.37	40.57	74	-33.43	V
4905.00	3.26	33.5	32.0	47.32	42.56	74	-31.44	V
1250.00	1.39	23.9	31.6	48.69	55.00	74	-19.00	V
7256.00	4.10	36.20	30.5	50.92	41.12	74	-32.88	H
4808.00	3.26	33.5	32.0	48.33	43.57	74	-30.43	H
3210.00	2.57	31.5	32.1	47.7	45.73	74	-28.27	H
1544.00	1.71	26.1	33.6	44.61	50.40	74	-23.60	H
3350.12	2.57	31.5	32.1	48.47	46.50	74	-27.50	H
6825.00	4.10	33.90	30.8	47.4	40.20	74	-33.80	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
4908.00	3.26	33.5	32.0	34.06	29.3	54	-24.70	V
10248.00	7.2	37.8	30.0	35.62	20.62	54	-33.38	V
1170.00	1.39	23.9	31.6	28.15	34.46	54	-19.54	V
7426.00	4.10	36.20	30.5	38.26	28.46	54	-25.54	V
7500.00	5.32	36.00	30.5	38.40	27.58	54	-26.42	V
1800.00	1.71	26.1	33.6	26.41	32.20	54	-21.80	V
4808.00	3.26	33.5	32.0	33.93	29.17	54	-24.83	H
3210.00	2.57	31.5	32.1	31.89	29.92	54	-24.08	H
1714.00	1.71	26.1	33.6	28.00	33.79	54	-20.21	H
7256.00	4.10	36.20	30.5	37.95	28.15	54	-25.85	H
1860.00	1.71	26.1	33.6	29.21	35.00	54	-19.00	H
7005.00	4.10	36.20	30.5	38.80	29.00	54	-25.00	H

**For 802.11g mode /Mid Channel: 2437MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss(dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
4876.00	3.26	33.5	32.0	45.87	41.11	74	-32.89	V
3006.00	2.57	31.5	32.1	43.9	41.93	74	-32.07	V
1034.00	1.39	23.9	31.6	46.19	52.50	74	-21.50	V
7460.00	4.10	36.20	30.5	50.59	40.79	74	-33.21	V
7600.50	5.32	36.00	30.5	53.32	42.50	74	-31.5	V
3260.00	2.57	31.5	32.1	43.97	42.00	74	-32.00	V
4876.00	3.26	33.5	32.0	46.84	42.08	74	-31.92	H
3244.00	2.57	31.5	32.1	47.07	45.10	74	-28.90	H
1544.00	1.71	26.1	33.6	45.16	50.95	74	-23.05	H
7324.00	4.10	36.20	30.5	51.35	41.55	74	-32.45	H
7500.25	5.32	36.00	30.5	53.32	42.50	74	-31.50	H
3500.00	2.67	32.2	32.1	48.77	46.00	74	-28.00	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
4876.00	3.26	33.5	32.0	32.41	27.65	54	-26.35	V
3006.00	2.57	31.5	32.1	31.24	29.27	54	-24.73	V
1170.00	1.39	23.9	31.6	29.27	35.58	54	-18.42	V
7426.00	4.10	36.20	30.5	38.06	28.26	54	-25.74	V
7620.00	5.32	36.00	30.5	38.32	27.50	54	-26.50	V
1260.00	1.39	23.9	31.6	29.19	35.50	54	-18.50	V
7426.00	4.10	36.20	30.5	38.37	28.57	54	-25.43	H
4910.00	5.32	33.5	32.0	34.14	27.32	54	-26.68	H
3278.00	2.57	31.5	32.1	31.14	29.17	54	-24.83	H
1068.00	1.39	23.9	31.6	26.73	33.04	54	-20.96	H
1170.50	1.39	23.9	31.6	28.74	35.05	54	-18.95	H
7620.00	4.10	36.00	30.5	38.90	29.30	54	-24.70	H



**For 802.11g mode /High Channel: 2462MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Resding Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
4910.00	3.26	33.5	32.0	49.32	44.56	74	-29.44	V
3278.00	2.57	31.5	32.1	46.06	44.09	74	-29.91	V
1034.00	1.39	23.9	31.6	50.65	56.96	74	-17.04	V
7936.00	5.32	36.00	30.5	52.69	41.87	74	-32.13	V
7800.25	5.32	36.00	30.5	53.32	42.50	74	-31.5	V
3560.00	2.67	32.2	32.1	47.77	45.00	74	-29	V
7426.00	4.10	36.00	30.5	50.17	40.57	74	-33.43	H
4910.00	3.26	33.5	32.0	46.17	41.41	74	-32.59	H
3278.00	2.57	31.5	32.1	49.02	47.05	74	-26.95	H
1102.00	1.39	23.9	31.6	43.89	50.20	74	-23.8	H
1250.00	1.39	23.9	31.6	44.89	51.20	74	-22.8	H
3560.50	2.67	32.2	32.1	47.97	45.20	74	-28.8	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
7936.00	5.32	36.00	30.5	39.73	28.91	54	-25.09	V
4910.00	3.26	33.5	32.0	34.02	29.26	54	-24.74	V
3278.00	2.57	31.5	32.1	32.01	30.04	54	-23.96	V
1170.00	1.39	23.9	31.6	29.4	35.71	54	-18.29	V
3562.00	2.67	32.2	32.1	34.97	32.20	54	-21.80	V
4806.00	3.26	33.5	32.0	39.76	35.00	54	-19.00	V
7426.00	4.10	36.00	30.5	38.24	28.64	54	-25.36	H
4910.00	3.26	33.5	32.0	31.83	27.07	54	-26.93	H
3278.00	2.57	31.5	32.1	32.75	30.78	54	-23.22	H
1068.00	1.39	23.9	31.6	27.01	33.32	54	-20.68	H
1253.00	1.39	23.9	31.6	27.89	34.20	54	-19.80	H
7600.50	5.32	36.00	30.5	39.82	29.00	54	-25.00	H

**For 802.11n HT20 mode/Low Channel: 2412MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
7426.00	4.10	36.00	30.5	50.38	40.78	74	-33.22	V
4808.00	3.26	33.5	32.0	49.96	45.20	74	-28.80	V
3380.00	2.57	31.5	32.1	43.78	41.81	74	-32.19	V
1306.00	1.39	23.9	31.6	48.1	54.41	74	-19.59	V
1520.00	1.71	26.1	33.6	49.71	55.50	74	-18.5	V
4900.00	3.26	33.5	32.0	50.76	46.00	74	-28.00	V
7324.00	4.10	36.00	30.5	50.89	41.29	74	-32.71	H
4808.00	3.26	33.5	32.0	48.99	44.23	74	-29.77	H
3210.00	2.57	31.5	32.1	46.35	44.38	74	-29.62	H
1544.00	1.71	26.1	33.6	45.38	51.17	74	-22.83	H
3350.20	2.57	31.5	32.1	47.17	45.20	74	-28.80	H
7520.00	5.32	36.00	30.5	53.32	42.50	74	-31.50	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
8140.00	4.67	35.8	29.9	39.01	28.44	54	-25.56	V
3312.00	2.57	31.5	32.1	31.04	29.07	54	-24.93	V
1170.00	1.39	23.9	31.6	29.13	35.44	54	-18.56	V
4808.00	3.26	33.5	32.0	35.66	30.90	54	-23.10	V
4940.50	3.26	33.5	32.0	37.26	32.50	54	-21.50	V
1250.00	1.39	23.9	31.6	29.89	36.20	54	-17.80	V
4808.00	3.26	33.5	32.0	34.20	29.44	54	-24.56	H
3210.00	2.57	31.5	32.1	31.67	29.70	54	-24.30	H
1306.00	1.39	23.9	31.6	26.78	33.09	54	-20.91	H
7222.00	4.10	36.00	30.5	37.94	28.34	54	-25.66	H
7534.00	5.32	36.00	30.5	40.02	29.20	54	-24.8	H
3500.20	2.67	32.2	32.1	32.92	30.15	54	-23.85	H

**For 802.11n HT20 mode/Mid Channel: 2437MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
4876.00	3.26	33.5	32.0	46.57	41.81	74	-32.19	V
3312.00	2.57	31.5	32.1	43.70	41.73	74	-32.27	V
1034.00	1.39	23.9	31.6	50.89	57.20	74	-16.80	V
8140.00	4.67	35.8	29.9	51.63	41.06	74	-32.94	V
8250.00	4.67	35.8	29.9	53.07	42.50	74	-31.50	V
1259.00	1.39	23.9	31.6	51.69	58.00	74	-16.00	V
7460.00	4.10	36.00	30.5	50.97	41.37	74	-32.63	H
4876.00	3.26	33.5	32.0	47.78	43.02	74	-30.98	H
3346.00	2.57	31.5	32.1	44.53	42.56	74	-31.44	H
1306.00	1.39	23.9	31.6	43.07	49.38	74	-24.62	H
1450.00	1.39	23.9	31.6	42.04	48.35	74	-25.65	H
4874.00	3.26	33.5	32.0	49.96	45.20	74	-28.80	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
4876.00	3.26	33.5	32.0	34.28	29.52	54	-24.48	V
3312.00	2.57	31.5	32.1	31.18	29.21	54	-24.79	V
1034.00	1.39	23.9	31.6	31.02	37.33	54	-16.67	V
8140.00	4.67	35.8	29.9	39.01	28.44	54	-25.56	V
8200.00	4.67	35.8	29.9	39.57	29.00	54	-25.00	V
1400.50	1.39	23.9	31.6	32.19	38.50	54	-15.50	V
7426.00	4.10	36.00	30.5	38.22	28.62	54	-25.38	H
4876.00	3.26	33.5	32.0	32.69	27.93	54	-26.07	H
3244.00	2.57	31.5	32.1	31.68	29.71	54	-24.29	H
1170.00	1.39	23.9	31.6	27.11	33.42	54	-20.58	H
1252.00	1.39	23.9	31.6	27.89	34.20	54	-19.80	H
4900.00	3.26	33.5	32.0	32.76	28.00	54	-26.00	H

**For 802.11n HT20 mode/High Channel: 2462MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
7936.00	5.32	36.0	30.5	52.16	41.34	74	-32.66	V
3210.00	2.57	31.5	32.1	43.69	41.72	74	-32.28	V
1034.00	1.39	23.9	31.6	52.21	58.52	74	-15.48	V
4876.00	3.26	33.5	32.0	45.44	40.68	74	-33.32	V
3310.00	2.57	31.5	32.1	44.17	42.20	74	-31.80	V
1350.00	1.39	23.9	31.6	49.19	55.50	74	-18.50	V
7356.00	4.10	36.2	30.5	50.49	40.69	74	-33.31	H
5216.00	3.50	32.9	31.6	45.2	40.40	74	-33.60	H
3278.00	2.57	31.5	32.1	47.98	46.01	74	-27.99	H
1544.00	1.71	26.1	33.6	44.38	50.17	74	-23.83	H
1600.00	1.71	26.1	33.6	45.41	51.20	74	-22.80	H
3530.00	2.67	32.2	32.1	49.77	47.00	74	-27.00	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
7936.00	5.32	36.00	30.5	39.85	29.03	54	-24.97	V
4910.00	3.26	33.5	32.0	34.01	29.25	54	-24.75	V
3278.00	2.57	31.5	32.1	31.86	29.89	54	-24.11	V
1170.00	1.39	23.9	31.6	29.94	36.25	54	-17.75	V
1250.00	1.39	23.9	31.6	28.89	35.20	54	-18.80	V
3500.50	2.67	32.2	32.1	32.97	30.20	54	-23.80	V
7426.00	4.10	36.00	30.5	38.30	28.70	54	-25.30	H
3278.00	2.57	31.5	32.1	32.53	30.56	54	-23.44	H
1170.00	1.39	23.9	31.6	26.92	33.23	54	-20.77	H
4910.00	3.26	33.5	32.0	32.49	27.73	54	-26.27	H
1250.00	1.39	23.9	31.6	27.89	34.20	54	-19.80	H
7520.00	5.32	36.00	30.5	39.82	29.00	54	-25.00	H



**For 802.11n HT40 Mode/Low Channel: 2422MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
7460.00	4.10	36.00	30.5	50.22	40.62	74	-33.38	V
4842.00	3.26	33.5	32.0	46.55	41.79	74	-32.21	V
3006.00	2.57	31.5	32.1	44.07	42.10	74	-31.90	V
1034.00	1.39	23.9	31.6	50.8	57.11	74	-16.89	V
1200.00	1.39	23.9	31.6	51.89	58.20	74	-15.80	V
3150.00	2.57	31.5	32.1	44.97	43.00	74	-31.00	V
7222.00	4.10	36.00	30.5	50.15	40.55	74	-33.45	H
4842.00	3.26	33.5	32.0	46.89	42.13	74	-31.87	H
3210.00	2.57	31.5	32.1	46.82	44.85	74	-29.15	H
2224.00	2.01	28.0	33.0	47.75	50.74	74	-23.26	H
4920.00	3.26	33.5	32.0	49.76	45.00	74	-29.00	H
3250.00	2.57	31.5	32.1	46.97	45.00	74	-29.00	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
7460.00	4.10	36.00	30.5	38.21	28.61	54	-25.39	V
4842.00	3.26	33.5	32.0	25.39	20.63	54	-33.37	V
3006.00	2.57	31.5	32.1	31.5	29.53	54	-24.47	V
1034.00	1.39	23.9	31.6	31.46	37.77	54	-16.23	V
1150.00	1.39	23.9	31.6	31.69	38.00	54	-16.00	V
4820.50	3.26	33.5	32.0	25.76	21.00	54	-33.00	V
7426.00	4.10	36.00	30.5	38.16	28.56	54	-25.44	H
4842.00	3.26	33.5	32.0	25.27	20.51	54	-33.49	H
1442.00	1.39	23.9	31.6	27.59	33.90	54	-20.10	H
3210.00	2.57	31.5	32.1	31.54	29.57	54	-24.43	H
3500.20	2.67	32.2	32.1	31.33	28.56	54	-25.44	H
4900.00	3.26	33.5	32.0	25.76	21.00	54	-33.00	H

**For 802.11n HT40 mode/Mid Channel: 2437MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
4842.00	3.26	33.5	32.0	45.67	40.91	74	-33.09	V
1544.00	1.71	26.1	33.6	45.51	51.30	74	-22.70	V
1306.00	1.39	23.9	31.6	45.79	52.10	74	-21.90	V
7120.00	4.10	36.00	30.5	50.88	41.28	74	-32.72	V
1250.50	1.39	23.9	31.6	44.79	51.10	74	-22.90	V
1620.00	1.71	26.1	33.6	46.21	52.00	74	-22.00	V
8106.00	1.47	35.8	29.9	49.58	42.21	74	-31.79	H
4060.00	3.26	33.5	32.0	47.19	42.43	74	-31.57	H
3244.00	2.57	31.5	32.1	46.87	44.90	74	-29.10	H
1204.00	1.39	23.9	31.6	44.20	50.51	74	-23.49	H
1305.00	1.39	23.9	31.6	42.69	49.00	74	-25.00	H
3520.00	2.67	32.2	32.1	47.77	45.00	74	-29.00	H

<i>Frequency (MHz)</i>	<i>Cable Loss (dB)</i>	<i>Antenna Factor (dB)</i>	<i>Preamp Factor (dB)</i>	<i>Reading Level (dBuV/m)</i>	<i>Emission Level (dBuV/m)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>	<i>Antenna Polarization (H/V)</i>
<b>Average Measurement</b>								
7902.00	5.32	36.00	30.5	39.47	28.65	54	-25.35	V
4876.00	3.26	33.5	32.0	24.92	20.16	54	-33.84	V
1034.00	1.39	23.9	31.6	29.16	35.47	54	-18.53	V
1157.50	1.39	23.9	31.6	28.00	34.31	54	-19.69	V
1150.00	1.39	23.9	31.6	29.89	36.20	54	-17.80	V
4700.00	3.26	33.5	32.0	26.76	22.00	54	-32.00	V
7426.00	4.10	36.00	30.5	38.31	28.71	54	-25.29	H
4876.00	3.26	33.5	32.0	25.07	20.31	54	-33.69	H
3244.00	2.57	31.5	32.1	31.8	29.83	54	-24.17	H
1306.00	1.39	23.9	31.6	29.24	35.55	54	-18.45	H
1250.00	1.39	23.9	31.6	27.89	34.20	54	-19.80	H
4650.00	3.26	33.5	32.0	27.26	22.50	54	-31.50	H

**For 802.11n HT40 Mode/High Channel: 2452MHz**

<b>Frequency (MHz)</b>	<b>Cable Loss (dB)</b>	<b>Antenna Factor (dB)</b>	<b>Preamp Factor (dB)</b>	<b>Reading Level (dBuV/m)</b>	<b>Emission Level (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Antenna Polarization (H/V)</b>
<b>Peak Measurement</b>								
7732.00	5.32	36.00	30.5	51.99	41.17	74	-32.83	V
4774.00	3.26	33.5	32.0	44.83	40.07	74	-33.93	V
1531.50	1.71	26.1	33.6	46.51	52.30	74	-21.70	V
1034.00	1.39	23.9	31.6	48.43	54.74	74	-19.26	V
1200.50	1.39	23.9	31.6	48.69	55.00	74	-19.00	V
7800.50	5.32	36.00	30.5	52.82	42.00	74	-32.00	V
4604.00	3.26	33.5	32.0	45.91	41.15	74	-32.85	H
3244.00	2.57	31.5	32.1	48.87	46.90	74	-27.10	H
1544.00	1.71	26.1	33.6	44.93	50.72	74	-23.28	H
7426.00	4.10	36.00	30.5	51.00	41.40	74	-32.60	H
1600.20	1.71	26.1	33.6	46.21	52.00	74	-22.00	H
4500.50	3.26	33.5	32.0	46.76	42.00	74	-32.00	H

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)
<b>Average Measurement</b>								
7732.00	5.32	36.00	30.5	39.04	28.22	54	-25.78	V
4774.00	3.26	33.5	32.0	32.37	27.61	54	-26.39	V
1225.50	1.39	23.9	31.6	27.59	33.90	54	-20.10	V
1034.00	1.71	26.1	31.6	31.32	35.11	54	-18.89	V
1150.00	1.39	23.9	31.6	29.69	36.00	54	-18.00	V
1300.50	1.39	23.9	31.6	28.19	34.50	54	-19.50	V
7426.00	4.10	36.00	30.5	38.34	28.74	54	-25.26	H
3244.00	2.57	31.5	32.1	31.87	29.90	54	-24.10	H
1306.00	1.39	23.9	31.6	26.89	33.20	54	-20.80	H
4570.00	3.26	33.5	32.0	32.75	27.99	54	-26.01	H
1505.00	1.71	26.1	33.6	29.41	35.20	54	-18.80	H
3520.00	2.67	32.2	32.1	30.57	27.80	54	-26.20	H

**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) *According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.*
- c) *As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.*
- d) *The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.*

**§15.205(a) Requirement:**

*(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:*

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

**Conclusions :**

*The fundamental is not in a restricted band, and spurious emission in the restricted bands comply with the general emission limits of 15.209.*

**ATTACHMENT 4 – OCCUPIED BANDWIDTH TEST**

<b>CLIENT:</b>	GRANDSTREAM NETWORKS,INC.	<b>TEST STANDERD:</b>	Section 15.247(a)								
<b>MODEL NUMBERS:</b>	GXV3615W	<b>PRODUCT:</b>	IP Camera								
<b>EUT MODEL:</b>	GXV3615W	<b>EUT DESIGNATION:</b>	Digital Transmission Device								
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH								
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	None								
<b>TESTED BY:</b>	May Wang	<b>DATE OF TEST:</b>	December 7, 2010								
<b>TEST REFERENCE:</b>	ANSI C63.4:2003 and KDB558074										
<b>TEST PROCEDURE:</b>	The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB. Analyzer and the attached plot were taken. The EUT was set up to ANSI C63.4, 2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance with FCC 47CFR 15.247 requirements.										
<b>DESCRIPTIONS OF TEST MODE:</b>	<p>Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations,data rates and antenna ports (if EUT with antenna diversity architecture).</p> <p>Following channels were selected for the final test as listed below:</p> <p>802.11b mode with data rate of 1Mbps, 802.11g mode with data rate of 6Mbps,802.11n HT20 mode with data rate of 6.5Mbps and 802.11n HT40 mode with data rate of 13.5Mbps.</p>										
<b>EQUIPMENT SETUP</b>	<table border="1"> <thead> <tr> <th>Equipment Mode</th> <th>Spectrum Analyzer</th> </tr> </thead> <tbody> <tr> <td>Detector Function</td> <td>Peak</td> </tr> <tr> <td>RBW</td> <td>100KHz</td> </tr> <tr> <td>VBW</td> <td>300KHz</td> </tr> </tbody> </table>			Equipment Mode	Spectrum Analyzer	Detector Function	Peak	RBW	100KHz	VBW	300KHz
Equipment Mode	Spectrum Analyzer										
Detector Function	Peak										
RBW	100KHz										
VBW	300KHz										
<b>TEST VOLTAGE:</b>	120VAC/60Hz										
<b>RESULTS:</b>	The EUT meet the requirements of test reference for occupied bandwidth.The test results relate only to the equipment under test provided by client.										
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by EMC Compliance Management Group (China) test personnel.										
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB										



**Occupied Bandwidth Test Data:**

**For 802.11b Mode:**

<b>Channel Frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>	<b>Minimum Limit (MHz)</b>	<b>Pass/Fail</b>
2412	9.64	0.5	Pass
2437	9.12	0.5	Pass
2462	9.12	0.5	Pass

**For 802.11g Mode:**

<b>Channel Frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>	<b>Minimum Limit (MHz)</b>	<b>Pass/Fail</b>
2412	16.50	0.5	Pass
2437	16.43	0.5	Pass
2462	16.50	0.5	Pass

**For 802.11n HT20 Mode:**

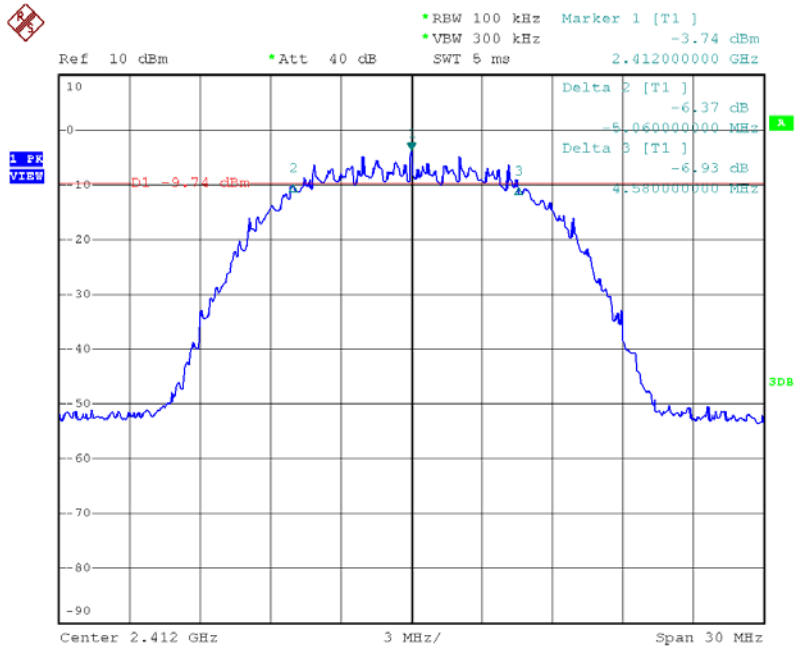
<b>Channel Frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>	<b>Minimum Limit (MHz)</b>	<b>Pass/Fail</b>
2412	16.98	0.5	Pass
2437	17.16	0.5	Pass
2462	17.52	0.5	Pass

**For 802.11n HT40 Mode:**

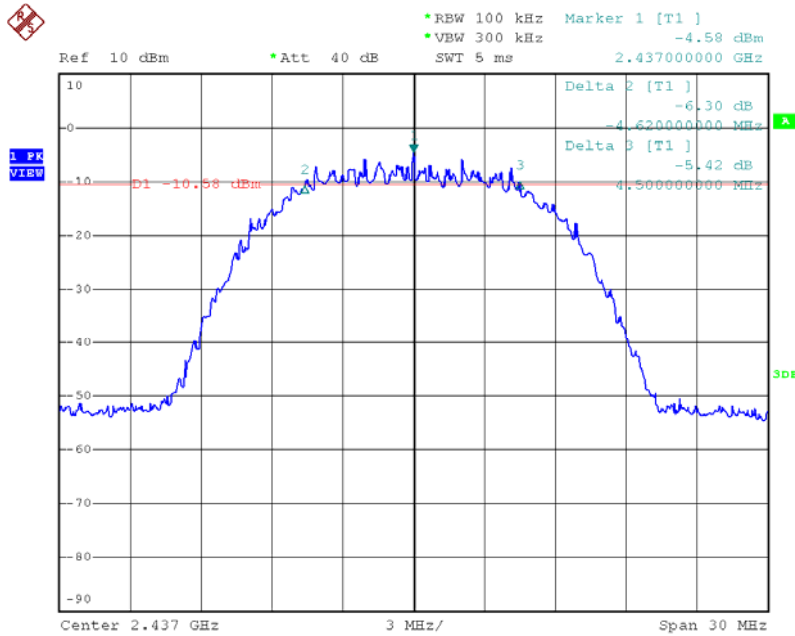
<b>Channel Frequency (MHz)</b>	<b>6dB Bandwidth (MHz)</b>	<b>Minimum Limit (MHz)</b>	<b>Pass/Fail</b>
2422	35.52	0.5	Pass
2437	35.42	0.5	Pass
2452	35.23	0.5	Pass

**For 802.11b Mode:**

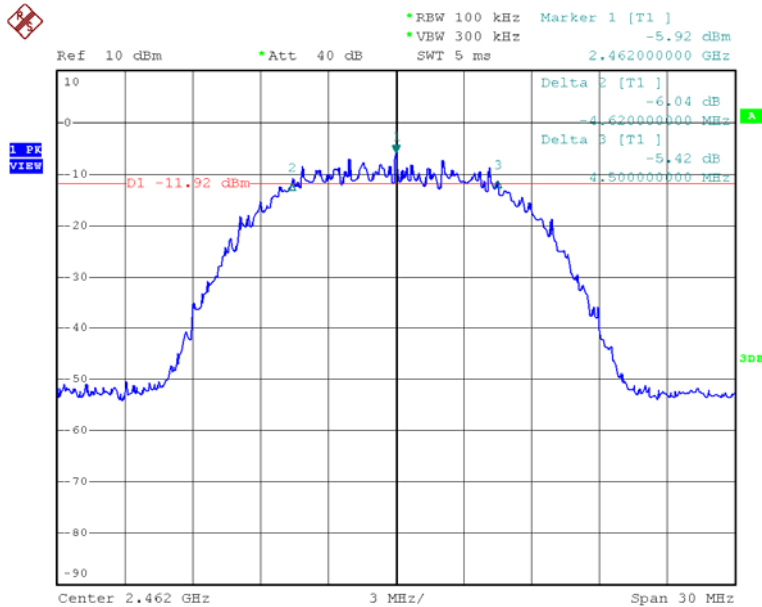
**Low Channel:2412MHz**



**Mid Channel:2437MHz**

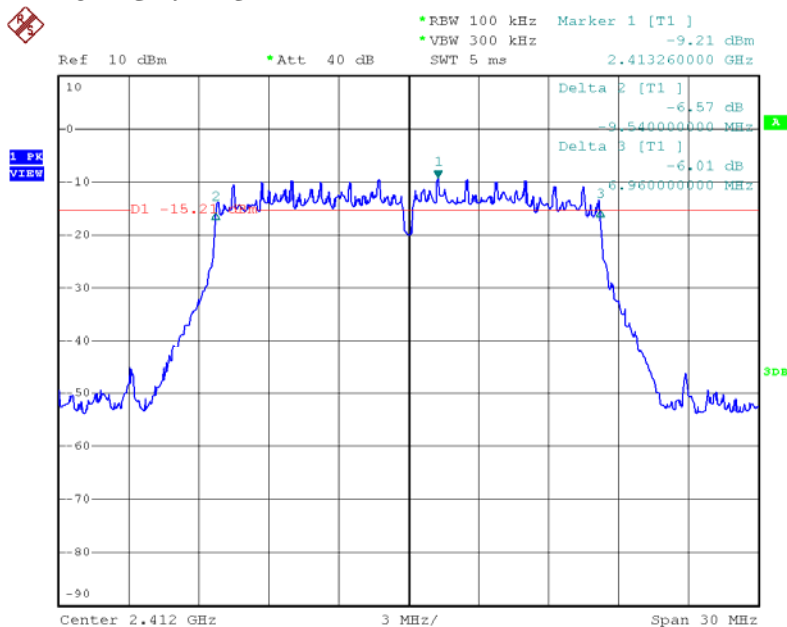


## High Channel:2462MHz

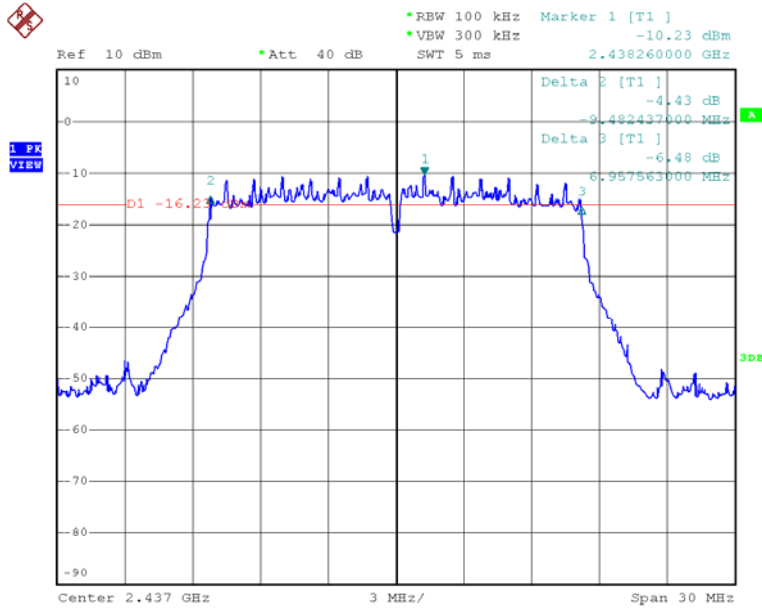


For 802.11g Mode:

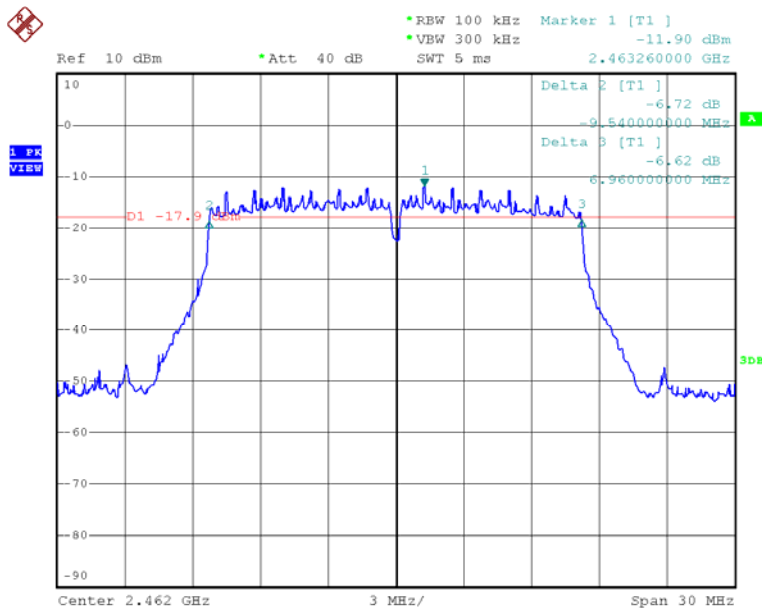
## Low Channel:2412MHz



### Mid Channel:2437MHz

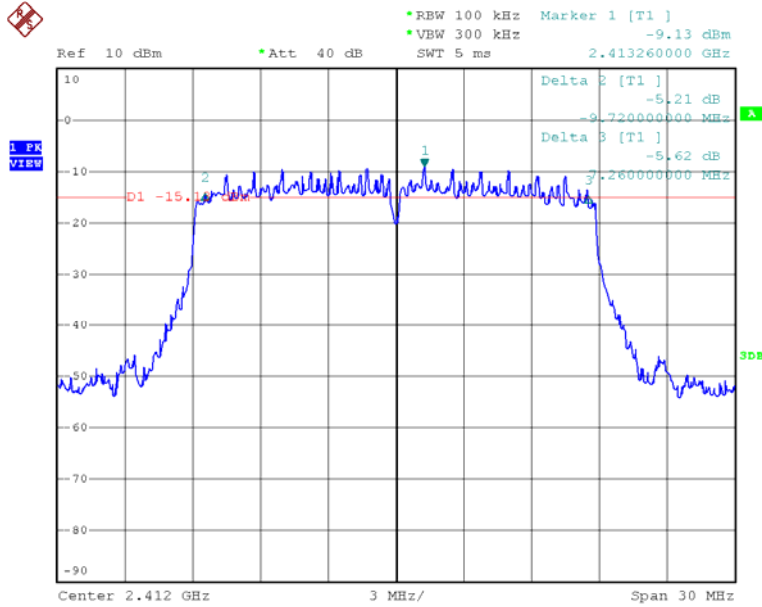


### High Channel:2462MHz

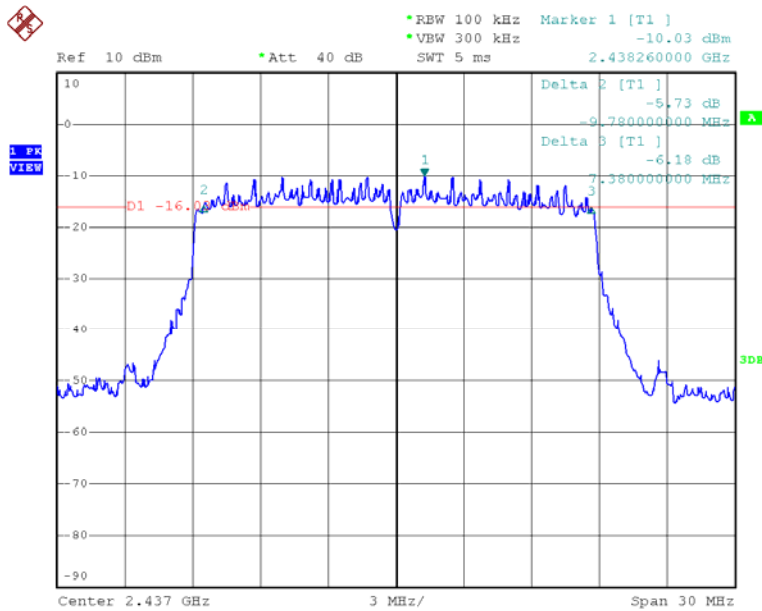


**For 802.11n HT20 Mode:**

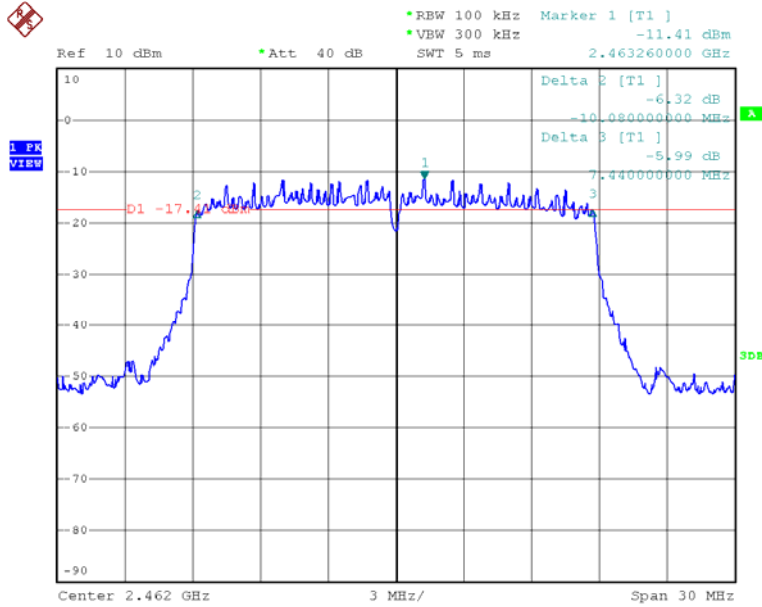
**Low Channel:2412MHz**



**Mid Channel:2437MHz**

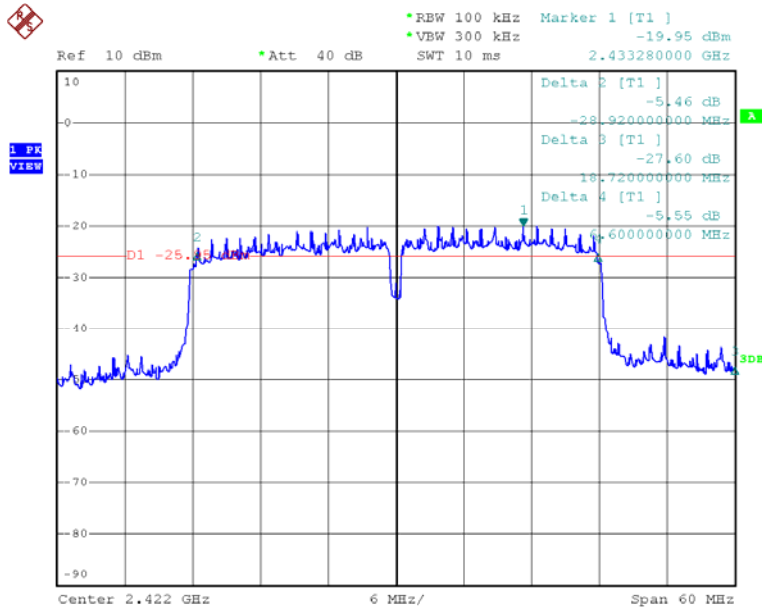


## High Channel:2462MHz

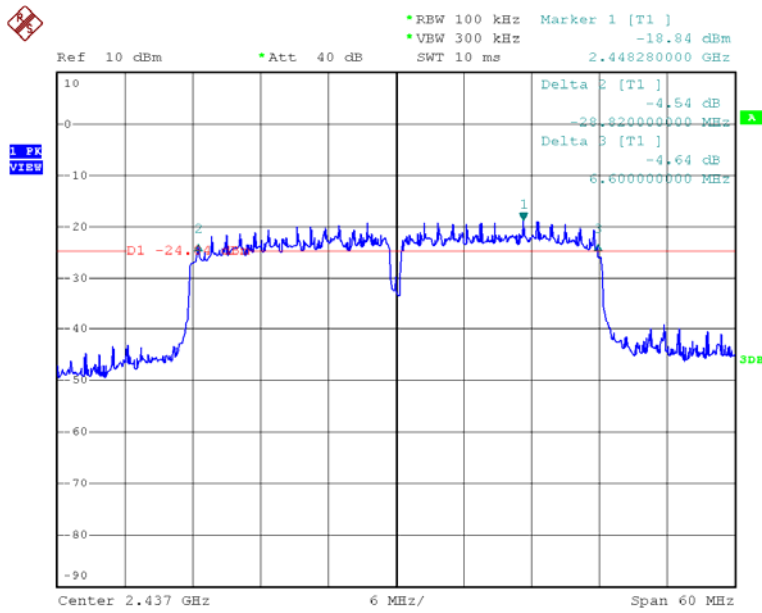


For 802.11n HT40 Mode:

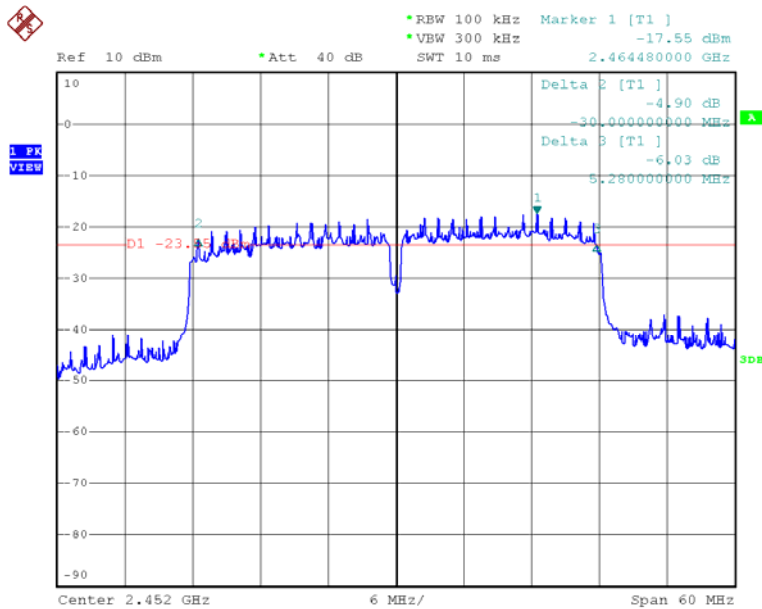
## Low Channel:2422MHz



### Mid Channel:2437MHz



### High Channel:2452MHz



**ATTACHMENT 5- MAXIMUM PEAK OUTPUT POWER**

<b>CLIENT:</b>	GRANDSTREAM NETWORKS,INC.	<b>TEST STANDERD:</b>	Section 15.247(b)								
<b>MODEL NUMBERS:</b>	GXV3615W	<b>PRODUCT:</b>	IP Camera								
<b>EUT MODEL:</b>	GXV3615W	<b>EUT DESIGNATION:</b>	Digital Tansmission Device								
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH								
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	None								
<b>TESTED BY:</b>	May Wang	<b>DATE OF TEST:</b>	December 6, 2010								
<b>TEST REFERENCE:</b>	ANSI C63.4:2003 and KDB558074										
<b>TEST PROCEDURE:</b>	The EUT was set up to ANSI C63.4:2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.										
<b>DESCRIPTIONS OF TEST MODE:</b>	<p>Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations,data rates and antenna ports (if EUT with antenna diversity architecture). Following channels were selected for the final test as listed below:</p> <p>802.11b mode with data rate of 1Mbps, 802.11g mode with data rate of 6Mbps,802.11n HT20 mode with data rate of 6.5Mbps and 802.11n HT40 mode with data rate of 13.5Mbps.</p>										
<b>MEASUREMENT EQUIPMENT SET</b>	<p>Spectrum analyzer was set as below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Equipment Mode</th> <th>Spectrum Analyzer</th> </tr> </thead> <tbody> <tr> <td>Detector Function</td> <td>Peak</td> </tr> <tr> <td>RBW</td> <td>1MHz</td> </tr> <tr> <td>VBW</td> <td>1MHz</td> </tr> </tbody> </table>			Equipment Mode	Spectrum Analyzer	Detector Function	Peak	RBW	1MHz	VBW	1MHz
Equipment Mode	Spectrum Analyzer										
Detector Function	Peak										
RBW	1MHz										
VBW	1MHz										
<b>TESTED RANGE:</b>	N/A										
<b>TEST VOLTAGE:</b>	120VAC/60Hz										
<b>RESULTS:</b>	The EUT meet the requirements of test reference for maximum peak output power.the worst-case mode is 802.11b mode with data rate 1Mbps in channel 1.The test results relate only to the equipment under test provided by client.										
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by EMC Compliance Management Group (China) test personnel.										
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB.										



**Maximum Peak Output Power Test Data:**

**For 802.11b Mode :**

<b>Channel Frequency (MHz)</b>	<b>Peak Output Power(dBm)</b>	<b>Cable Loss (Db)</b>	<b>Power Level (dBm)</b>	<b>Limit</b>	<b>Margin</b>
2412	12.98	2.00	<b>* 14.98</b>	30.00	-15.02
2437	11.63	2.00	13.63	30.00	-16.37
2462	10.43	2.00	12.43	30.00	-17.57

**For 802.11g Mode :**

<b>Channel Frequency (MHz)</b>	<b>Peak Output Power(dBm)</b>	<b>Cable Loss (Db)</b>	<b>Power Level (dBm)</b>	<b>Limit</b>	<b>Margin</b>
2412	12.96	2.00	<b>* 14.96</b>	30.00	-15.04
2437	12.73	2.00	14.73	30.00	-15.27
2462	11.51	2.00	13.51	30.00	-16.49

**For 802.11n HT20 Mode :**

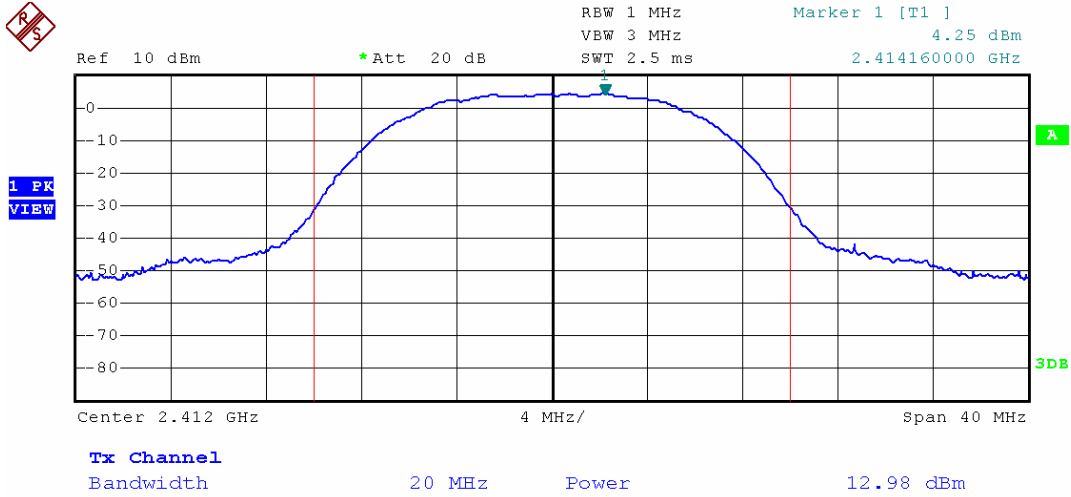
<b>Channel Frequency (MHz)</b>	<b>Peak Output Power(dBm)</b>	<b>Cable Loss (Db)</b>	<b>Power Level (dBm)</b>	<b>Limit</b>	<b>Margin</b>
2412	12.50	2.00	<b>* 14.50</b>	30.00	-15.50
2437	12.00	2.00	14.00	30.00	-16.00
2462	10.63	2.00	12.63	30.00	-17.37

**For 802.11n HT40 Mode :**

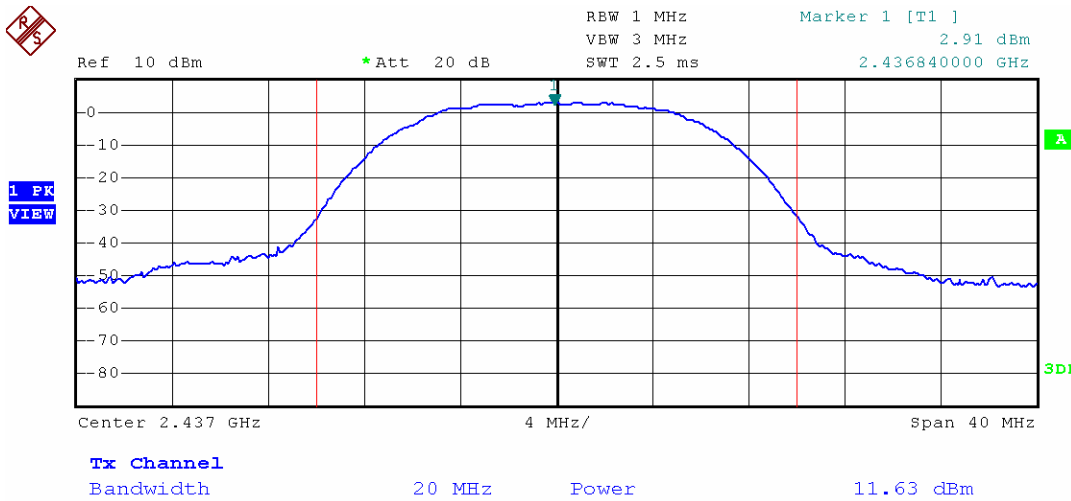
<b>Channel Frequency (MHz)</b>	<b>Peak Output Power(dBm)</b>	<b>Cable Loss (Db)</b>	<b>Power Level (dBm)</b>	<b>Limit</b>	<b>Margin</b>
2422	11.73	2.00	<b>* 13.73</b>	30.00	-16.27
2437	11.41	2.00	13.41	30.00	-16.59
2452	11.13	2.00	13.13	30.00	-16.87

**For 802.11b Mode:**

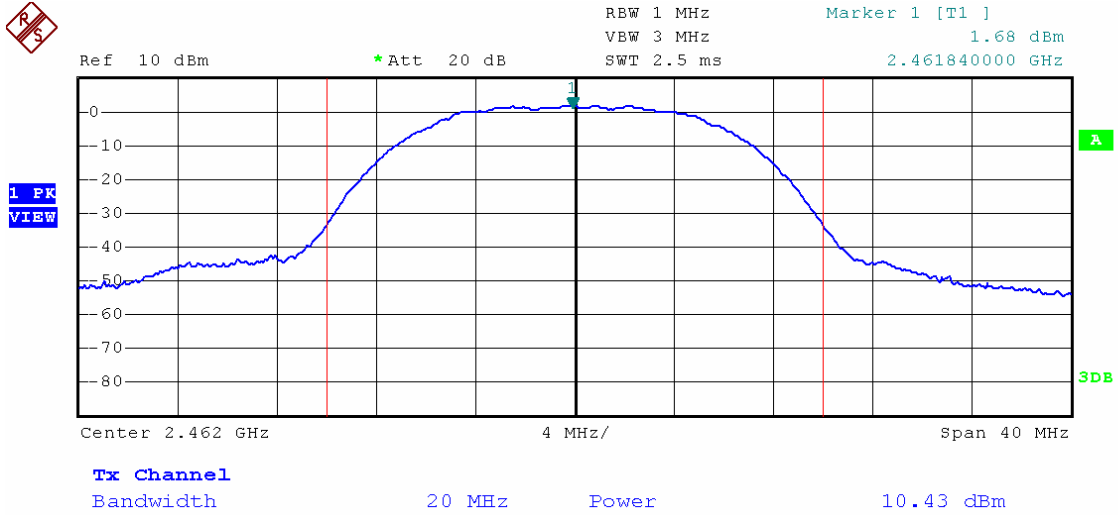
**Low Channel:2412MHz**



**Mid Channel:2437MHz**

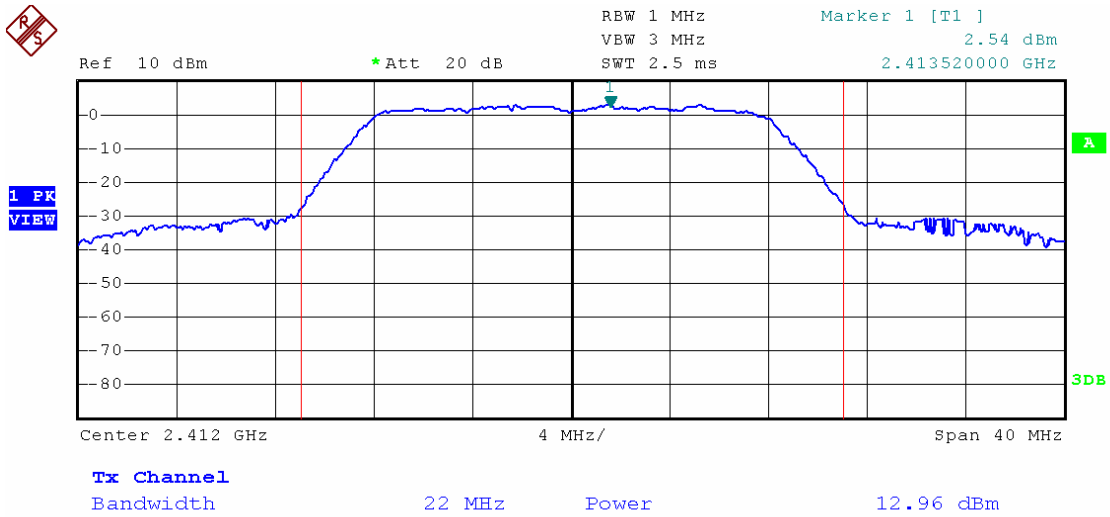


## High Channel: 2462 MHz

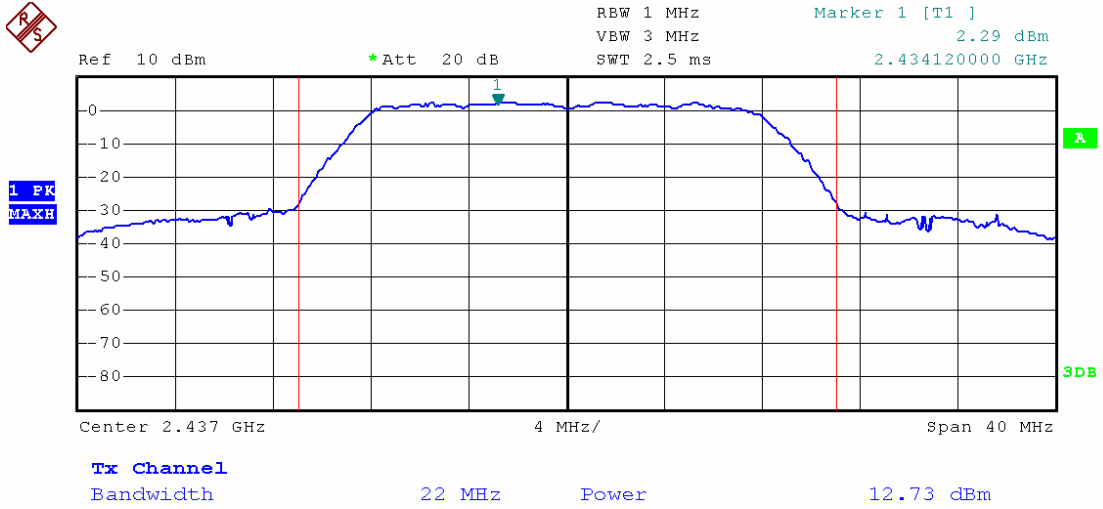


## For 802.11g Mode:

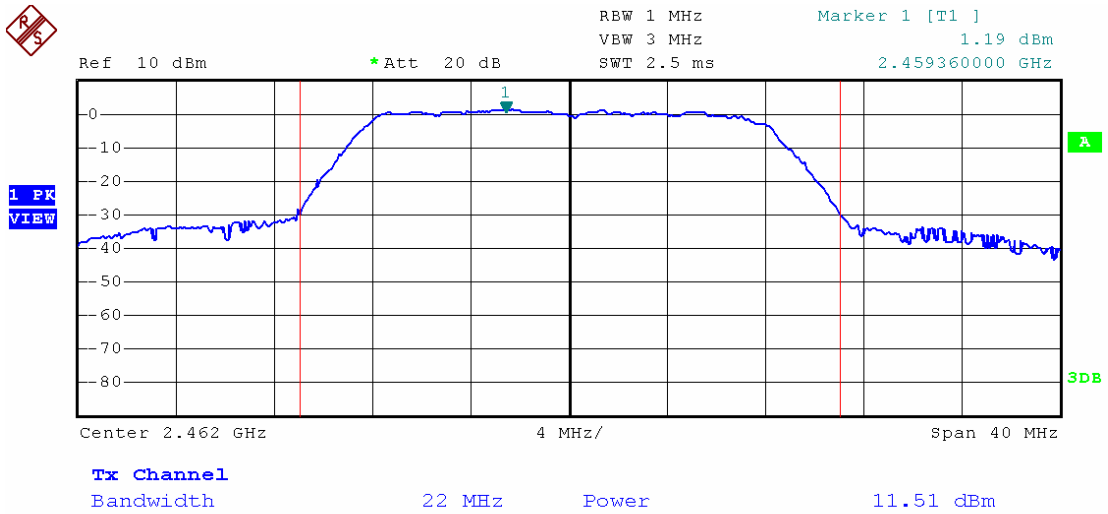
## Low Channel: 2412 MHz



### Mid Channel:2437MHz

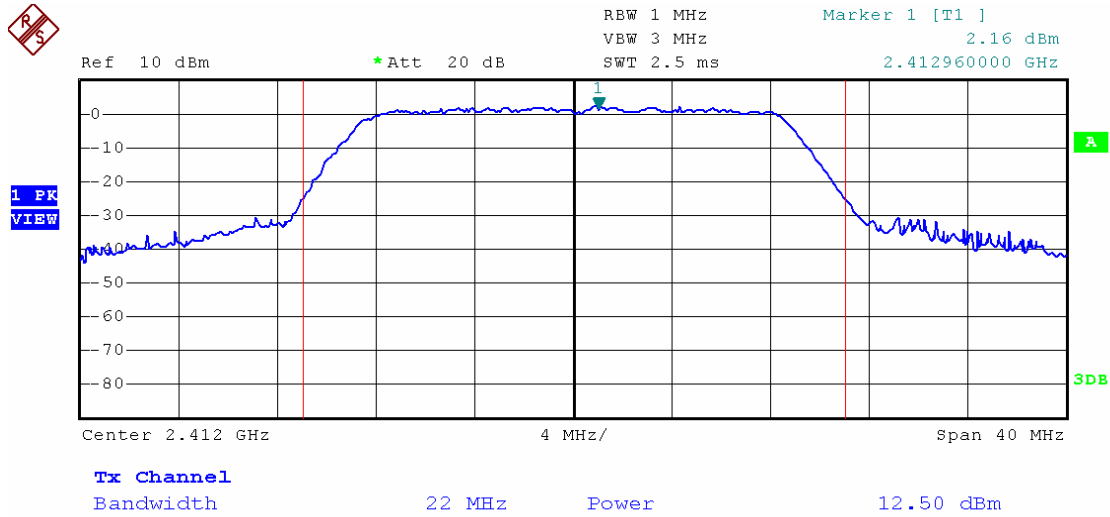


### High Channel:2462MHz

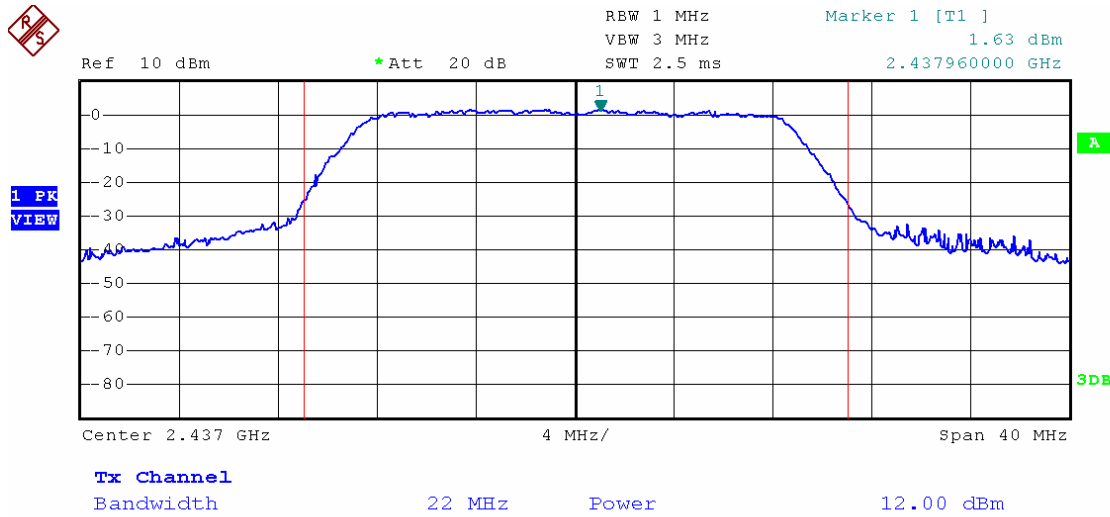


**For 802.11n HT20 Mode:**

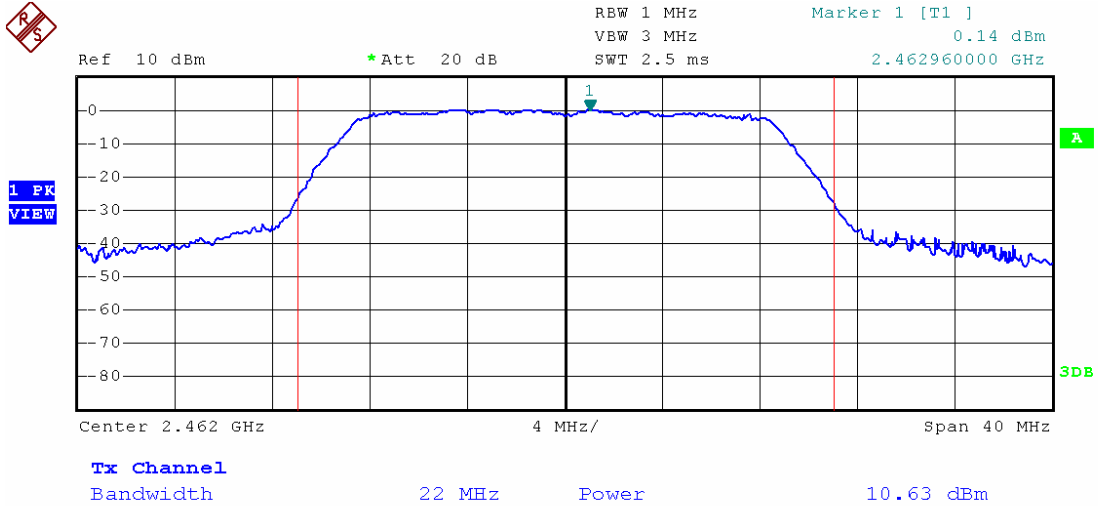
**Low Channel:2412MHz**



**Mid Channel:2437MHz**

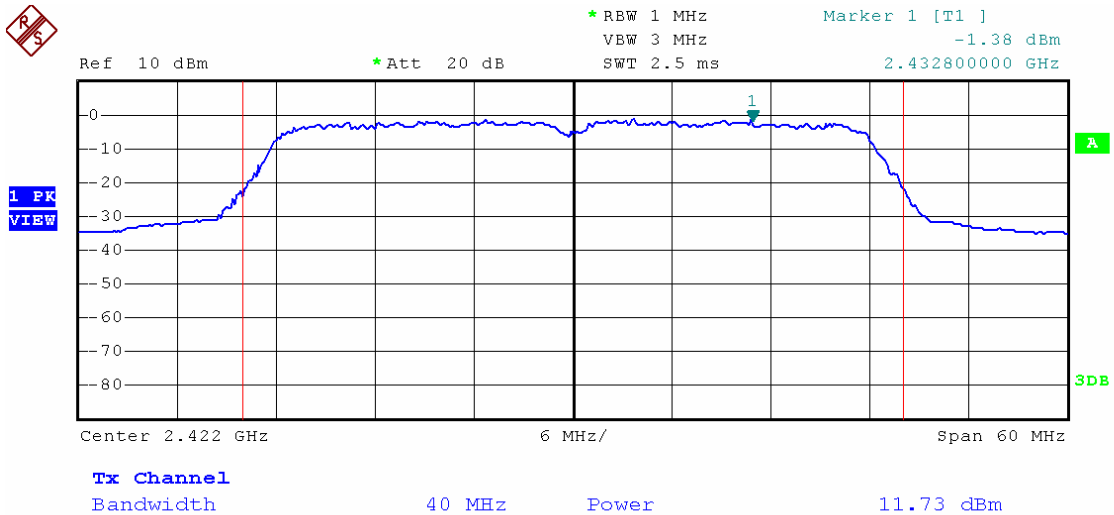


## High Channel:2462MHz

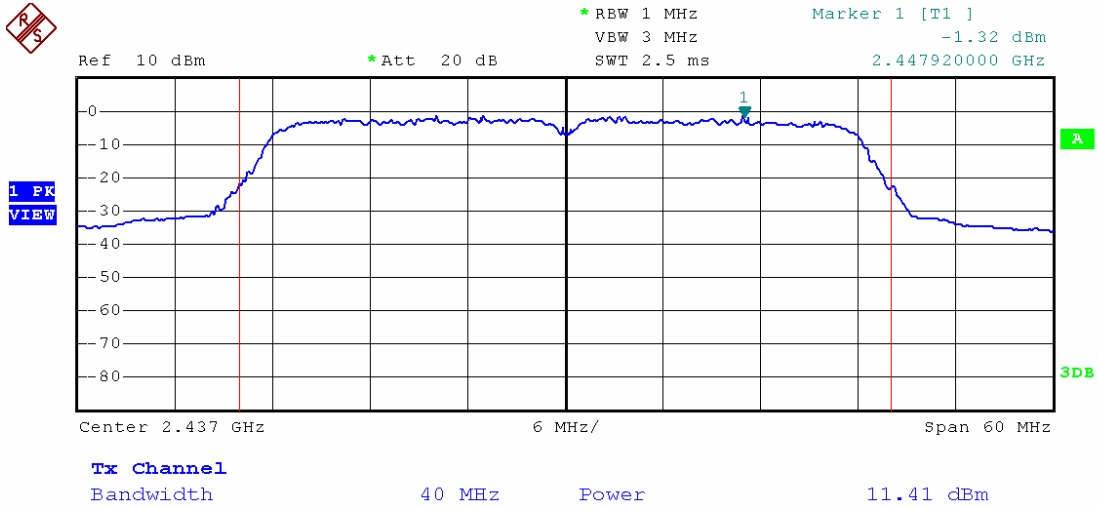


## For 802.11n HT40 Mode:

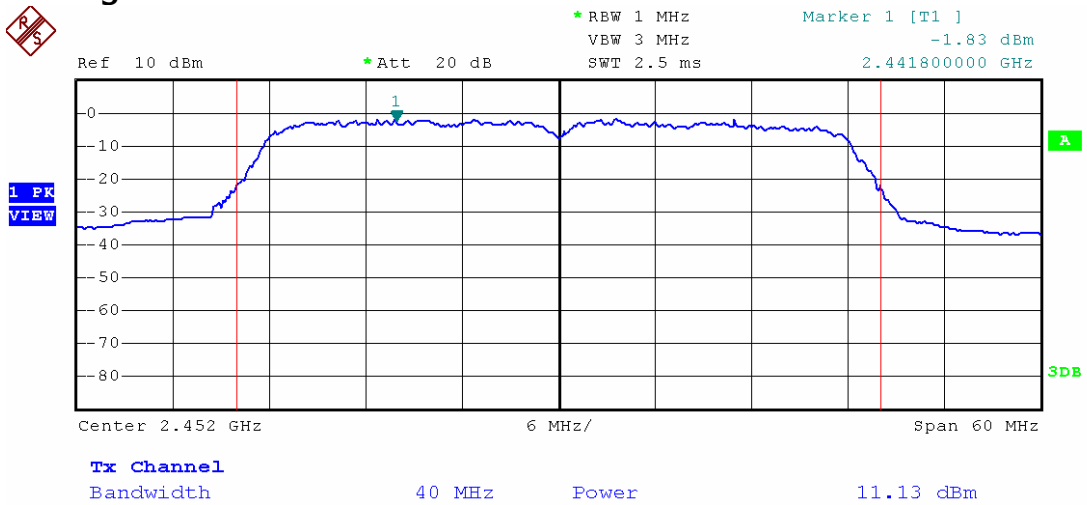
## Low Channel:2422MHz



### Mid Channel:2437MHz



### High Channel:2452MHz



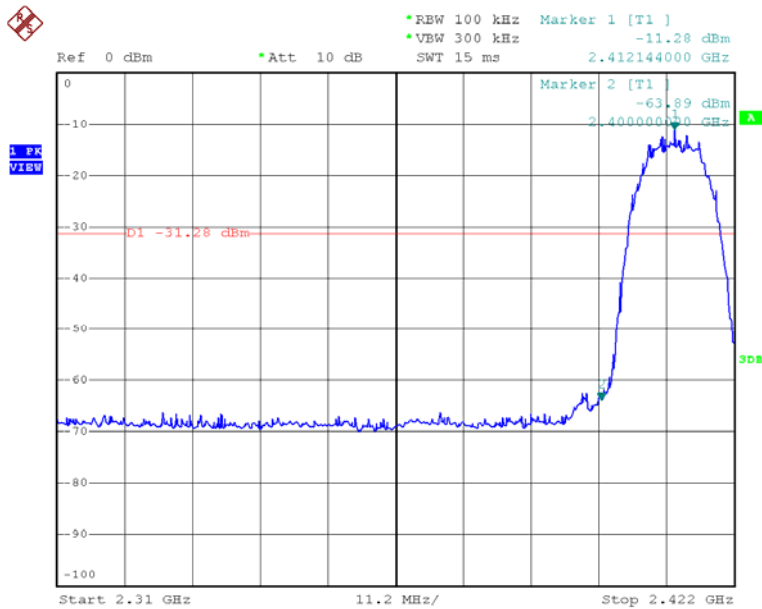
**ATTACHMENT 6 – BAND EDGES TEST**

<b>CLIENT:</b>	GRANDSTREAM NETWORKS,INC.	<b>TEST STANDERD:</b>	Section 15.247(d)								
<b>MODEL NUMBERS:</b>	GXV3615W	<b>PRODUCT:</b>	IP Camera								
<b>EUT MODEL:</b>	GXV3615W	<b>EUT DESIGNATION:</b>	Digital Transmission Device								
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH								
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	None								
<b>TESTED BY:</b>	May Wang	<b>DATE OF TEST:</b>	December 7, 2010								
<b>TEST REFERENCE:</b>	ANSI C63.4:2003 and KDB558074										
<b>TEST PROCEDURE:</b>	<p><b>Requirement:</b> 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.</p> <p><b>Test Procedures:</b> The EUT was set up as ANSI C63.4:2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.</p>										
<b>DESCRIPTIONS OF TEST MODE:</b>	Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations,data rates and antenna ports (if EUT with antenna diversity architecture). Following channels were chosen for the final test as listed below: 802.11b mode with data rate of 1Mbps, 802.11g mode with data rate of 6Mbps,802.11n HT20 mode with data rate of 6.5Mbps and 802.11n HT40 mode with data rate of 13.5Mbps.										
<b>EQUIPMENT SETUP</b>	<p>Spectrum analyzer shall be set as below:</p> <table border="1"> <thead> <tr> <th>Equipment Mode</th> <th>Spectrum Analyzer</th> </tr> </thead> <tbody> <tr> <td>Detector Function</td> <td>Peak Mode</td> </tr> <tr> <td>RBW</td> <td>100KHz</td> </tr> <tr> <td>VBW</td> <td>300KHz</td> </tr> </tbody> </table>			Equipment Mode	Spectrum Analyzer	Detector Function	Peak Mode	RBW	100KHz	VBW	300KHz
Equipment Mode	Spectrum Analyzer										
Detector Function	Peak Mode										
RBW	100KHz										
VBW	300KHz										
<b>TEST VOLTAGE:</b>	120VAC/60Hz										
<b>RESULTS:</b>	The EUT meet the requirements of test reference for band edges.The test results relate only to the equipment under test provided by client.										
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by EMC Compliance Management Group (China) test personnel.										
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB.										

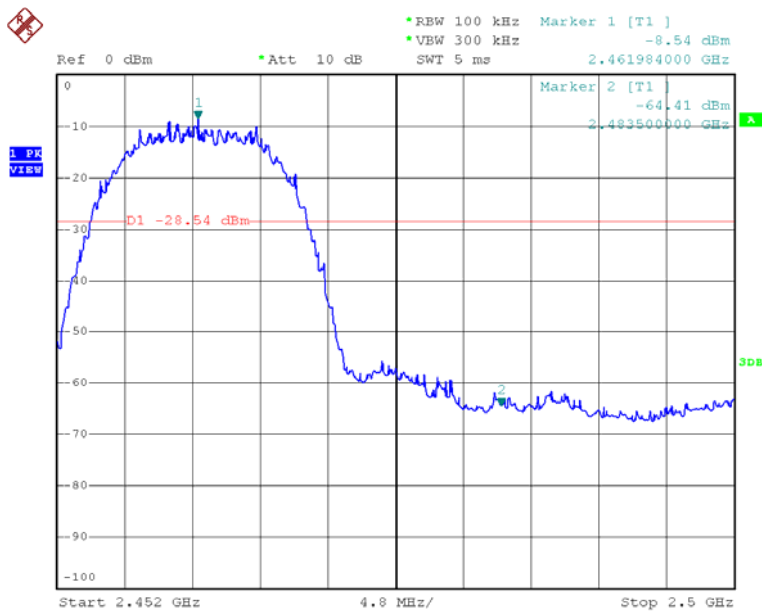


**For 802.11b Mode:**

**Conducted Band Edge Test Plot: 2412MHz**



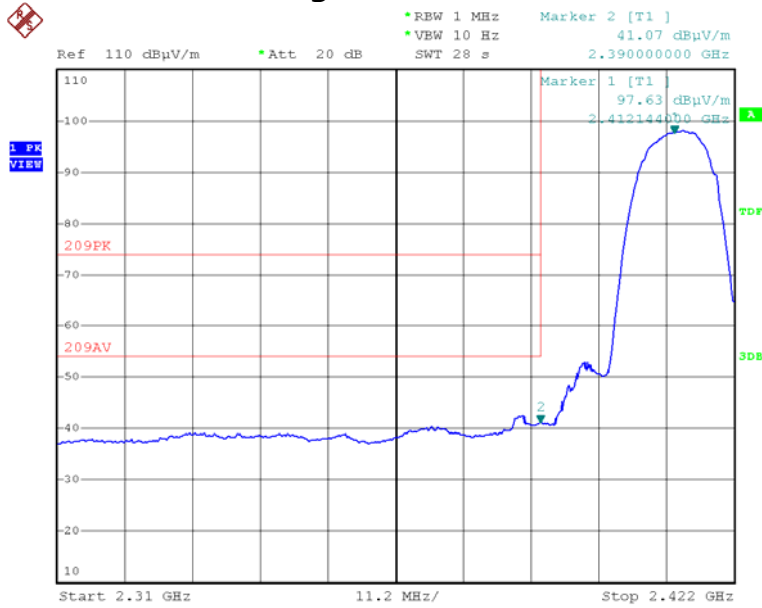
**Conducted Band Edge Test Plot: 2462MHz**



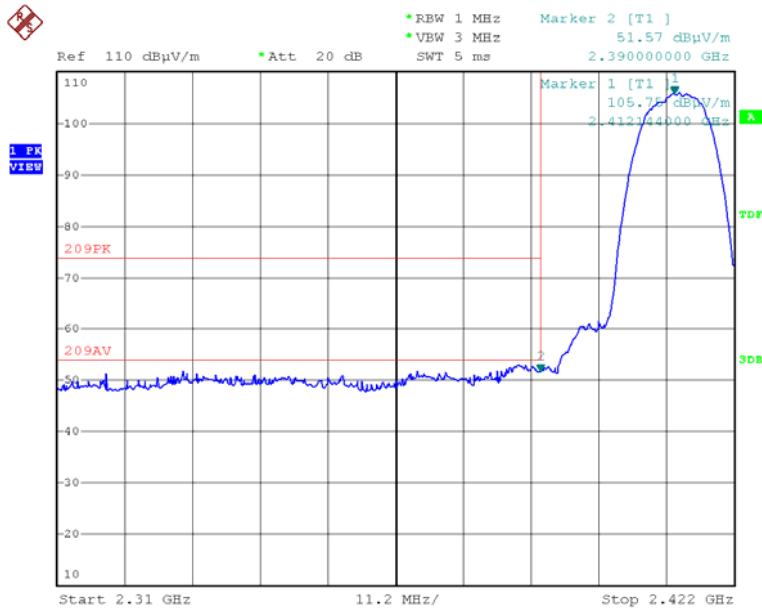
**Radiated Band Edge Test Plot :2412MHz**

FCC Test Report #: SHE-1011-10539-FCCID  
Prepared for Grandstream Networks, Inc.  
Prepared by EMC Compliance Management Group

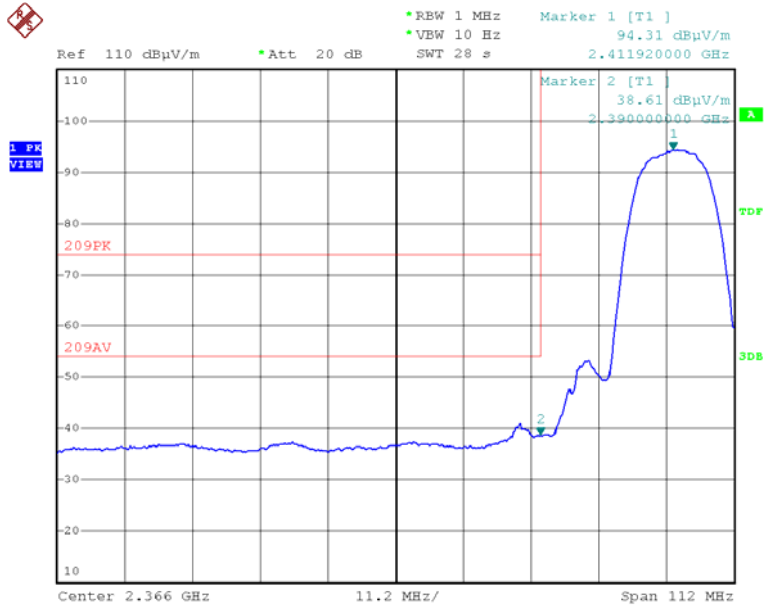
### Horizontal-Average



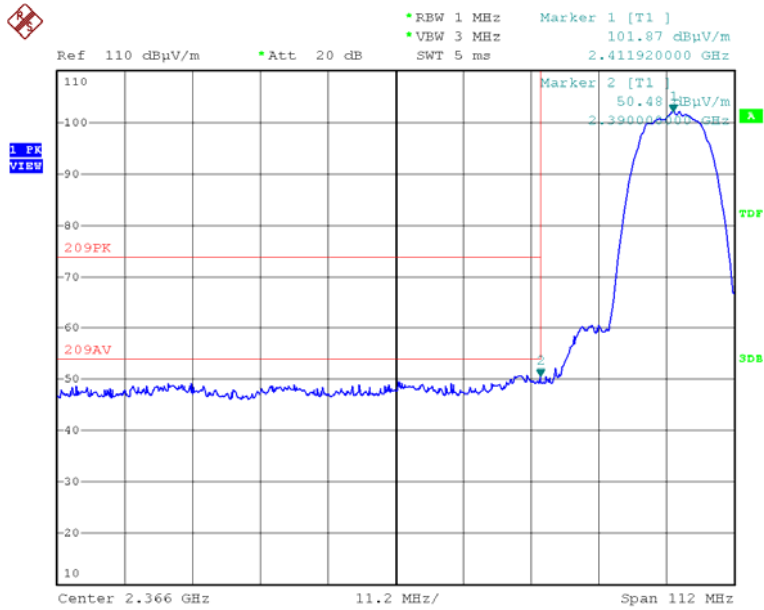
### Horizontal-Peak



### Vertical- Average

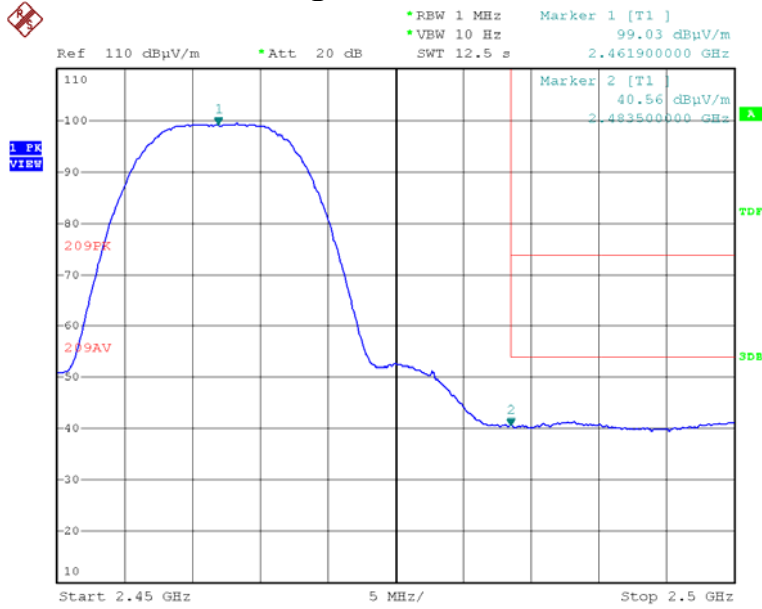


### Vertical-Peak

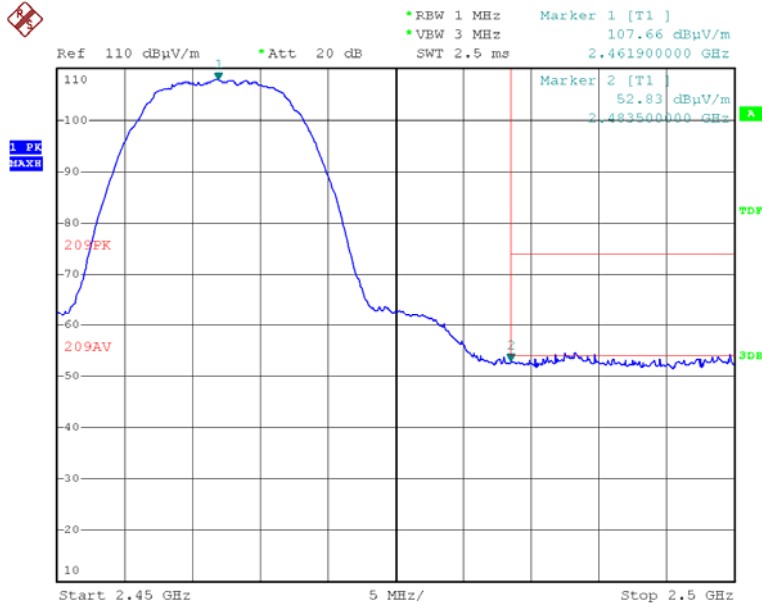


## Radiated Band Edge Test Plot:2462MHz

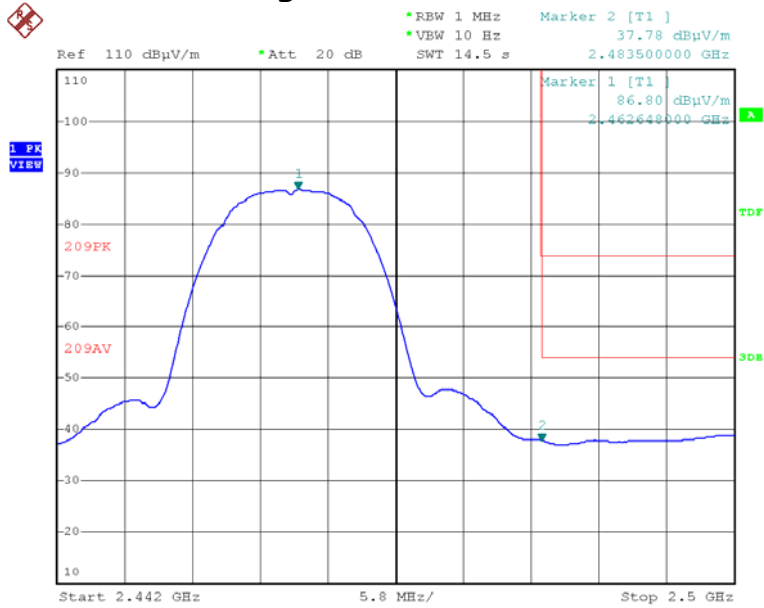
### Horizontal-Average



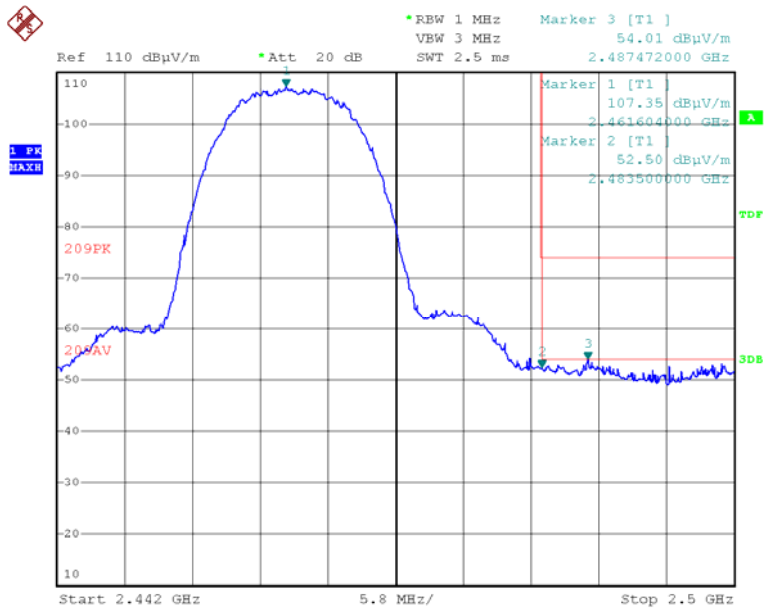
### Horizontal-Peak



### Vertical- Average

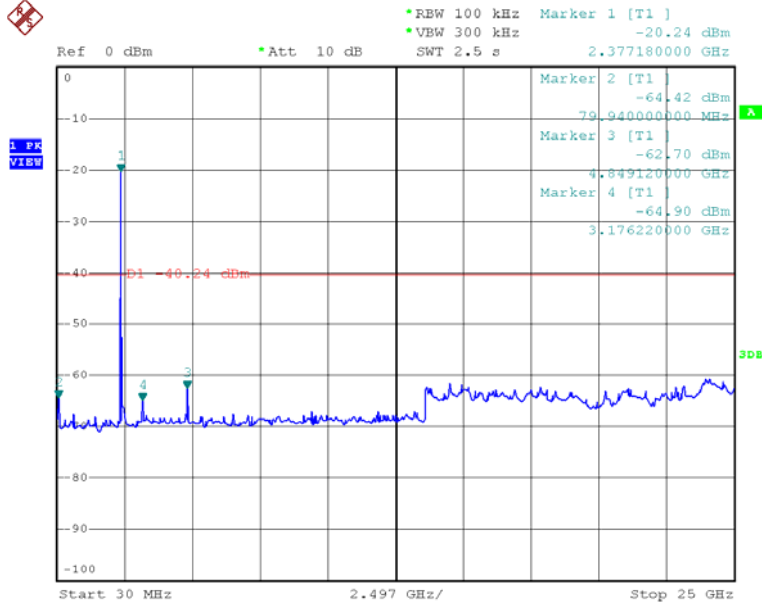


### Vertical- Peak

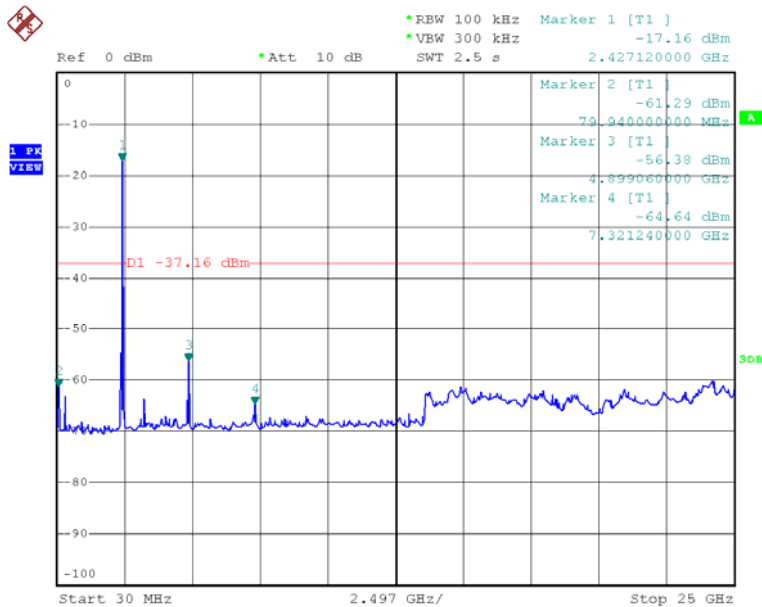


## Conducted Spurious Emission Test Plot

### Low Channel:2412MHz



### Mid Channel:2437MHz

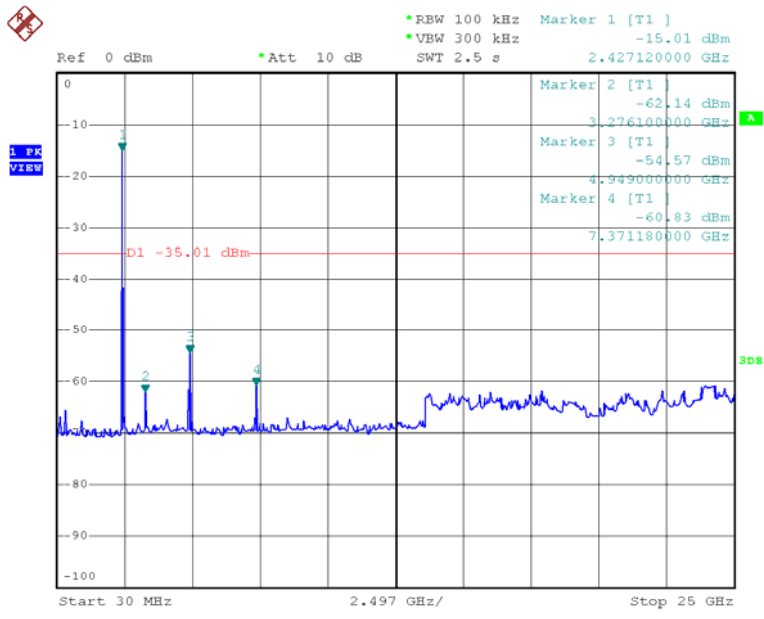


### High Channel:2462MHz

FCC Test Report #: SHE-1011-10539-FCCID

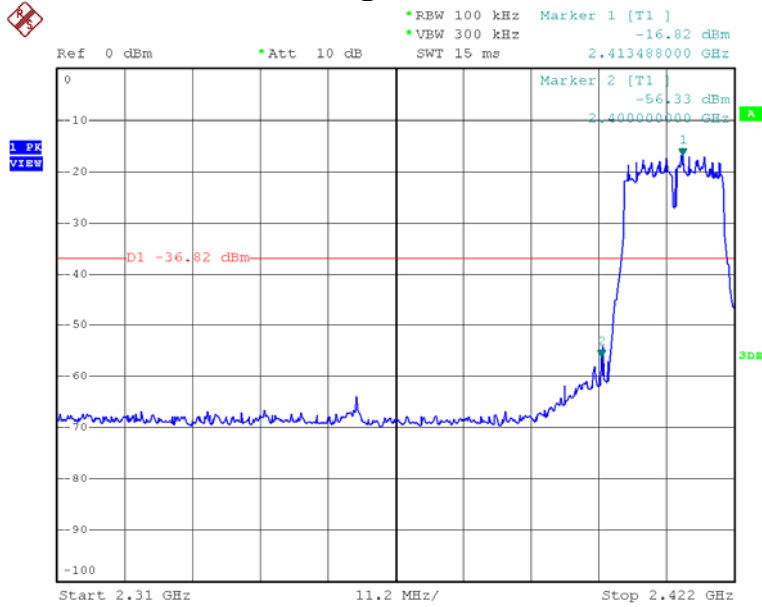
Prepared for Grandstream Networks, Inc.

Prepared by EMC Compliance Management Group

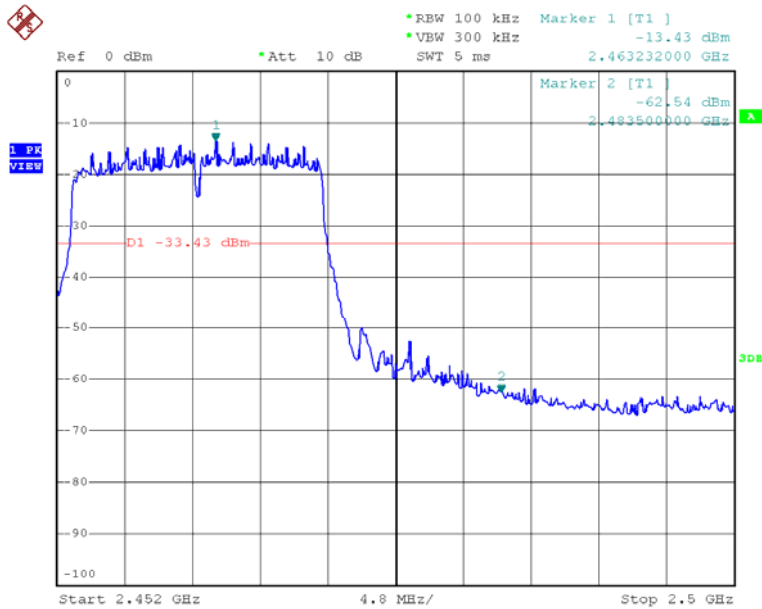


**For 802.11g Mode:**

**Conducted Band Edge Test Plot: 2412MHz**



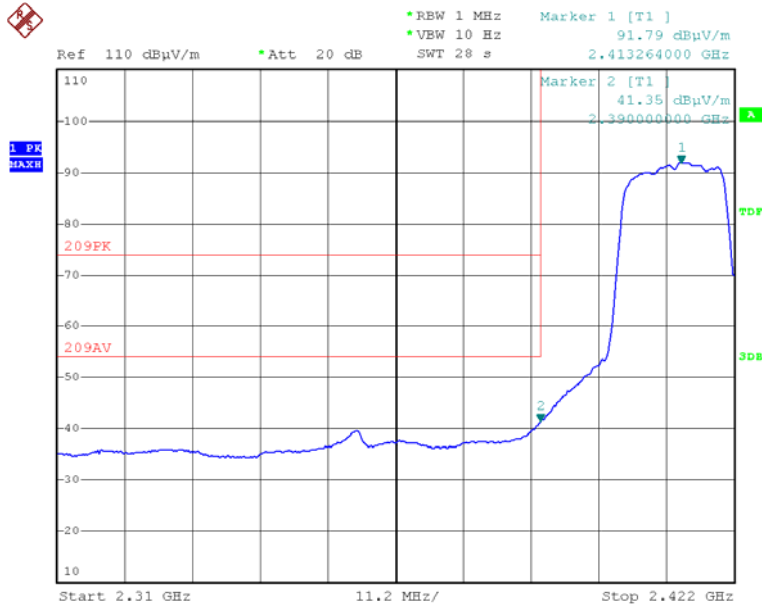
**Conducted Band Edge Test Plot: 2462MHz**



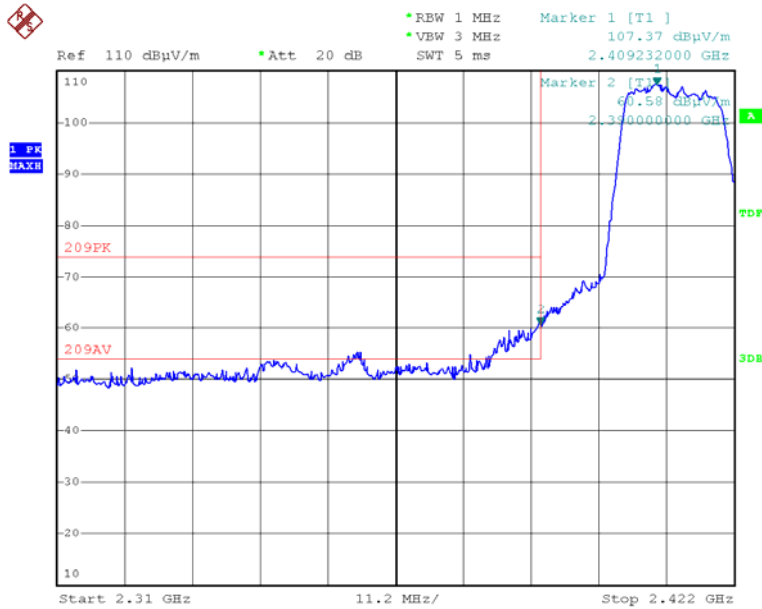


## Radiated Band Edge Test Plot :2412MHz

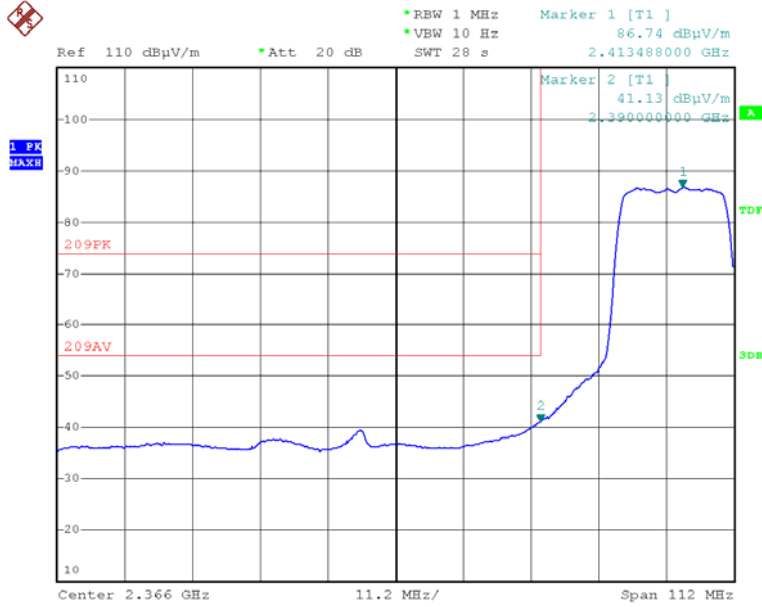
### Horizontal- Average



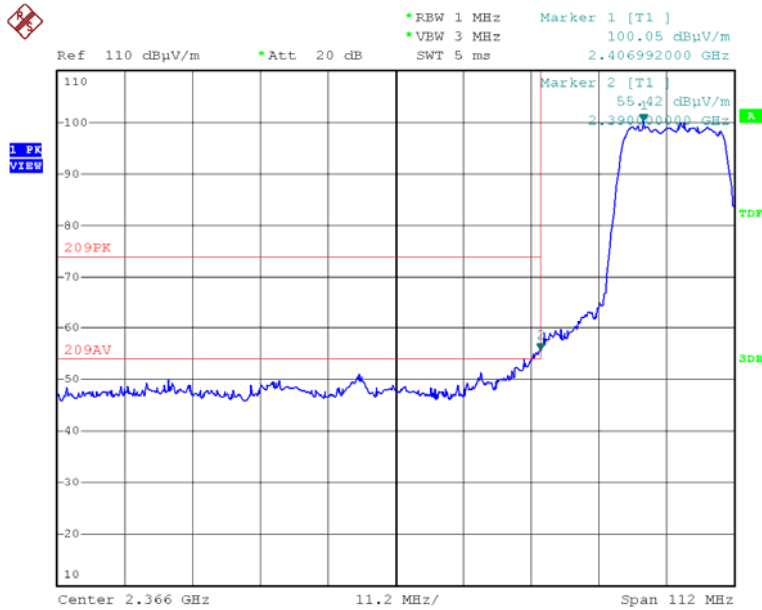
### Horizontal-Peak



## Vertical-Average

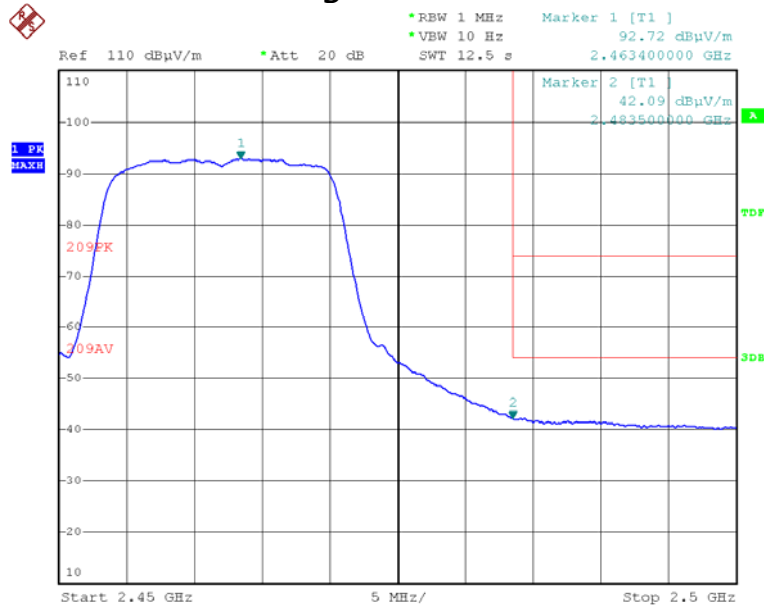


## Vertical-Peak

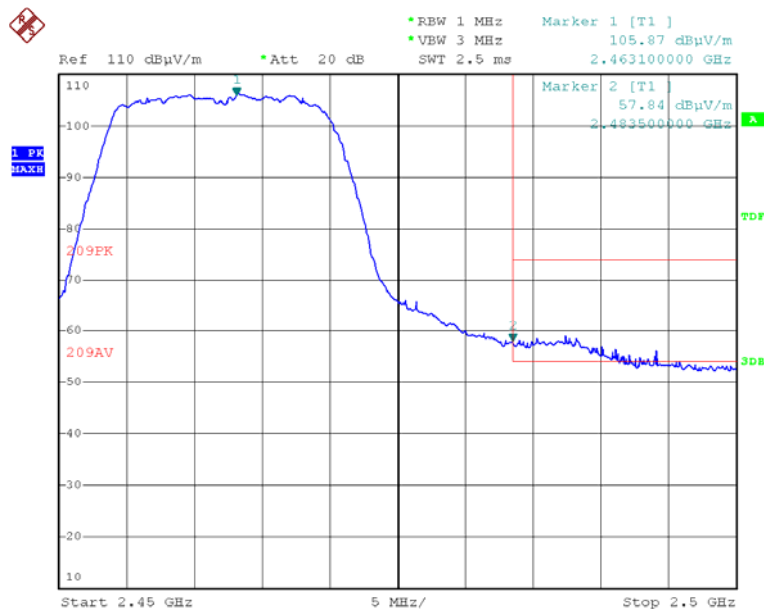


## Radiated Band Edge Test Plot:2462MHz

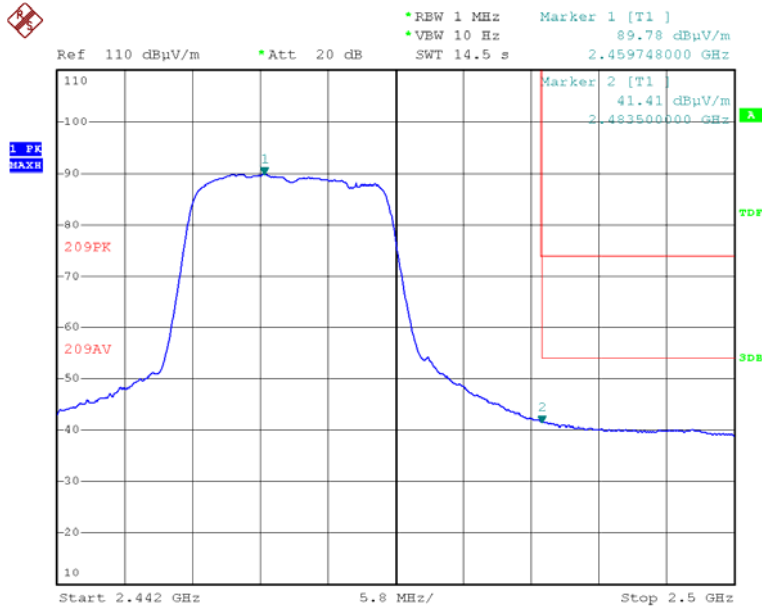
### Horizontal- Average



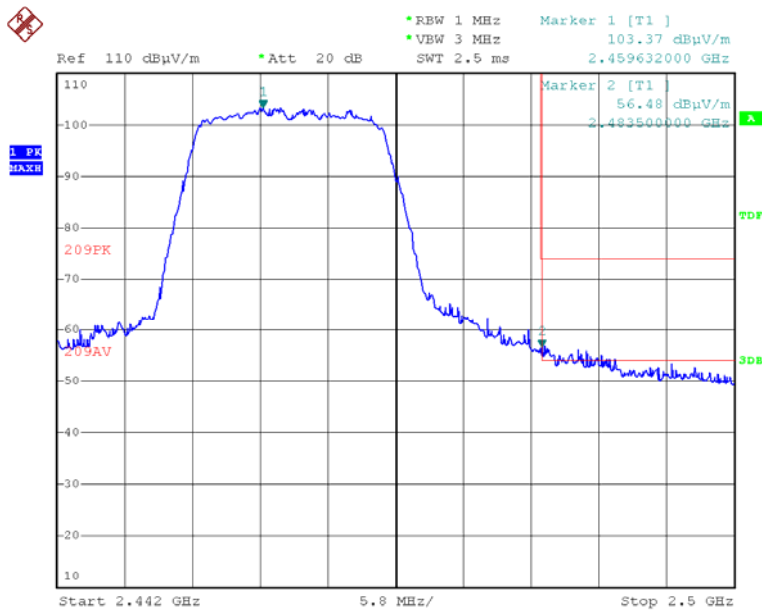
### Horizontal-Peak



## Vertical- Average

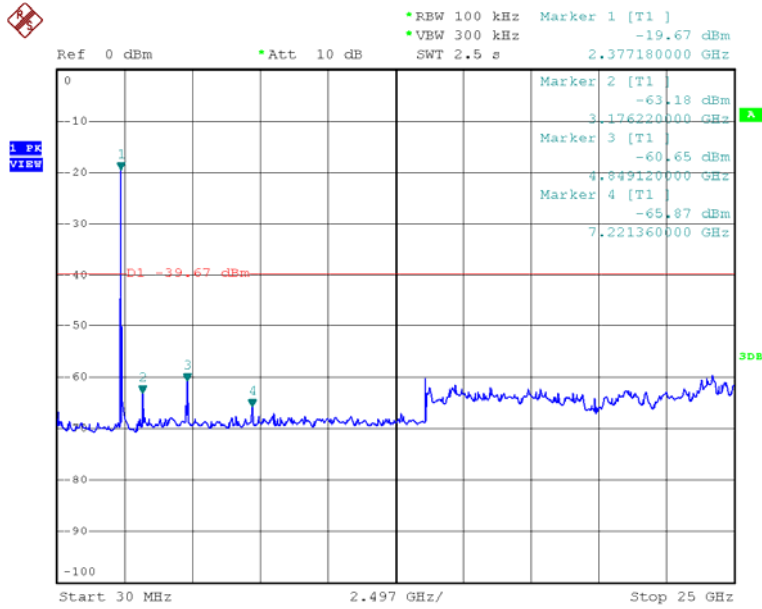


## Vertical-Peak

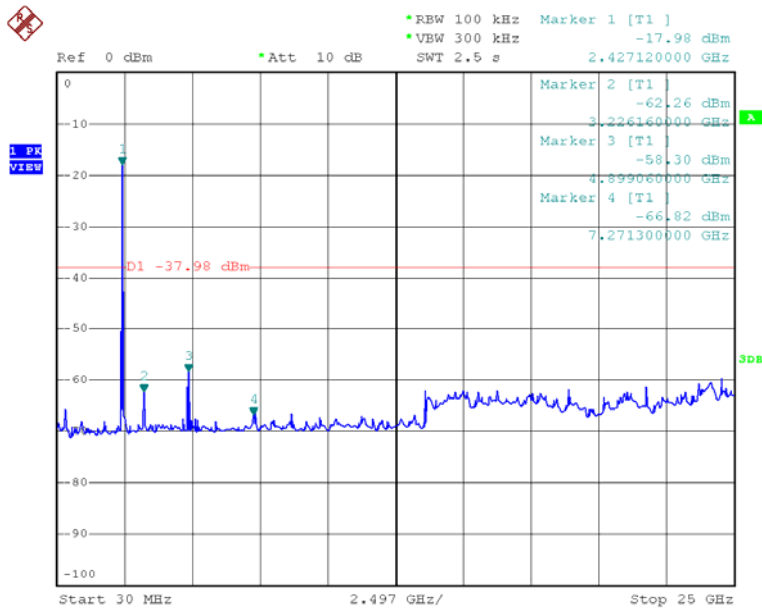


## Conducted Spurious Emission Test Plot

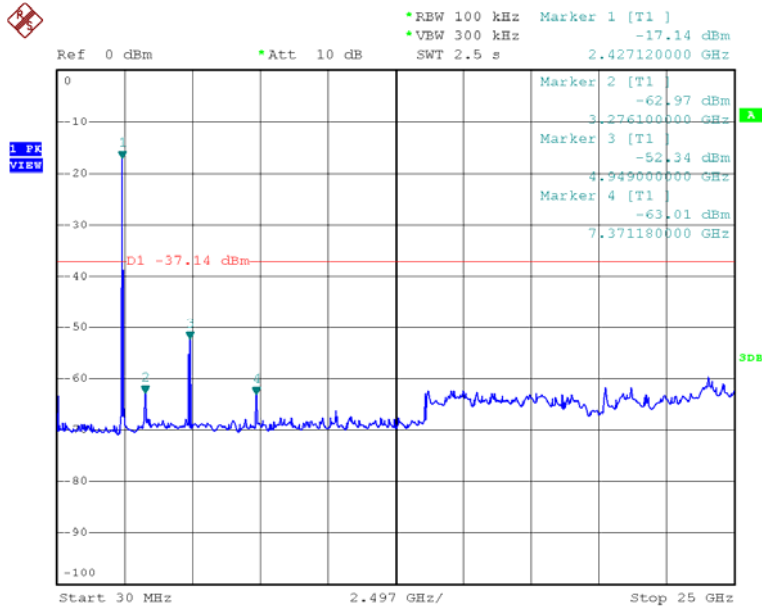
### Low Channel:2412MHz



### Mid Channel:2437MHz

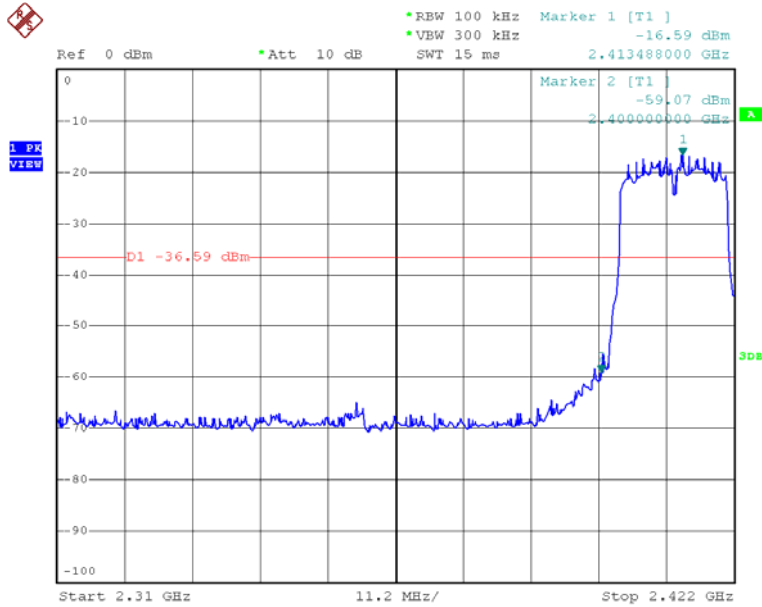


## High Channel:2462MHz

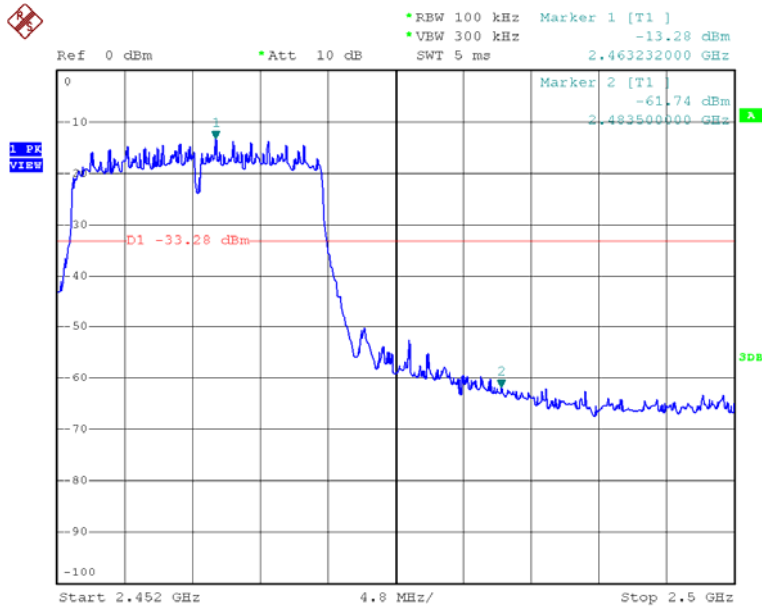


**For 802.11n HT20 Mode:**

**Conducted Band Edge Test Plot: 2412MHz**

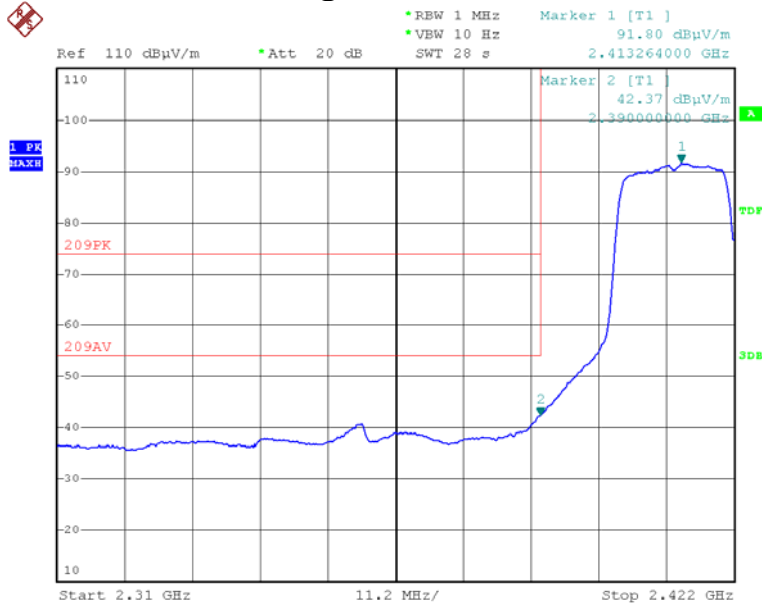


**Conducted Band Edge Test Plot: 2462MHz**

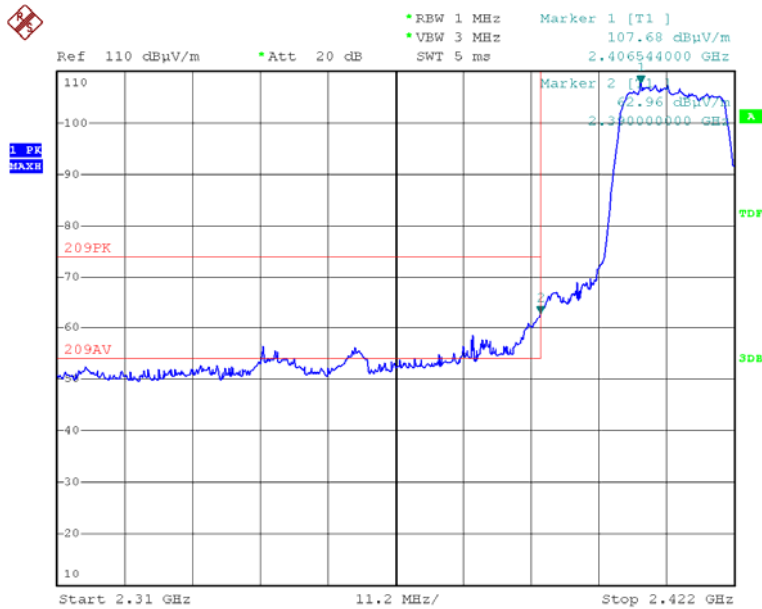


## Radiated Band Edge Test Plot :2412MHz

### Horizontal- Average

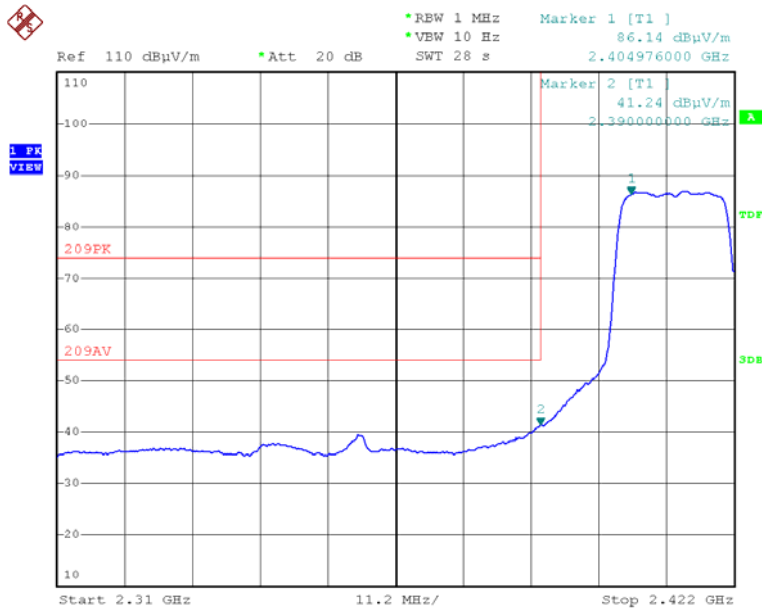


### Horizontal-Peak

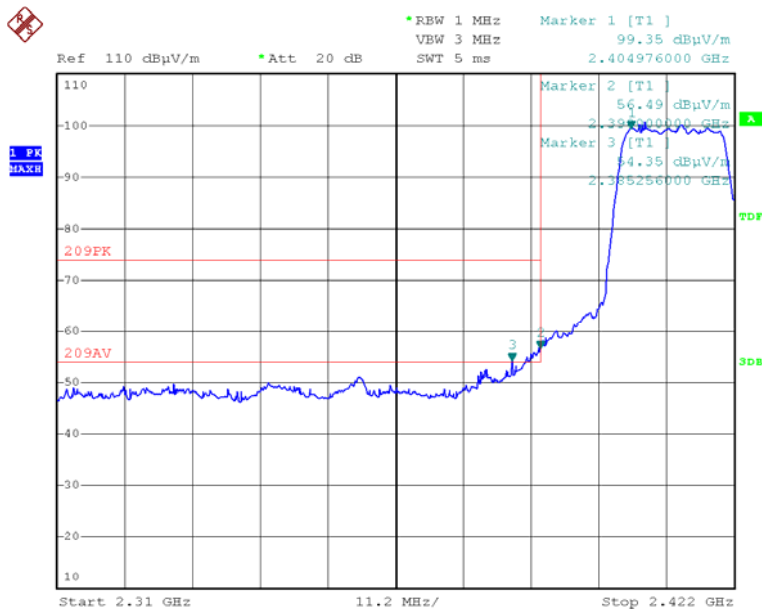




### Vertical-Average

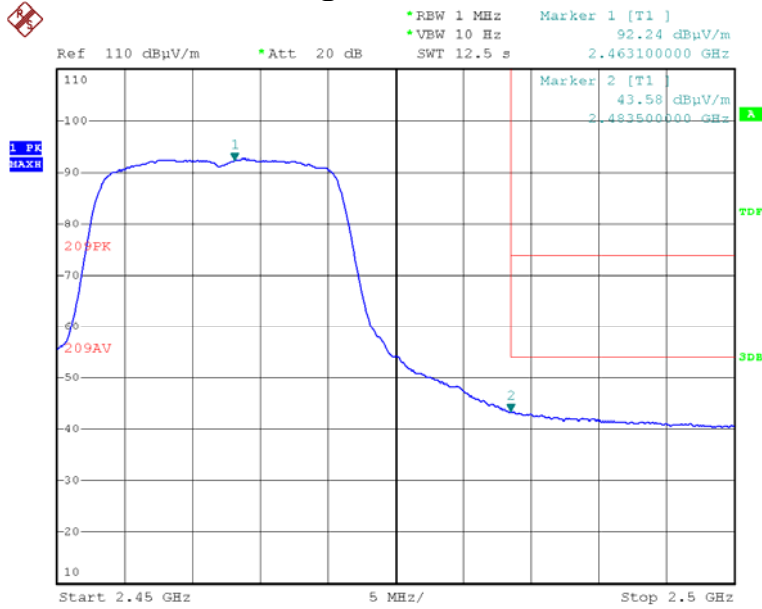


### Vertical-Peak

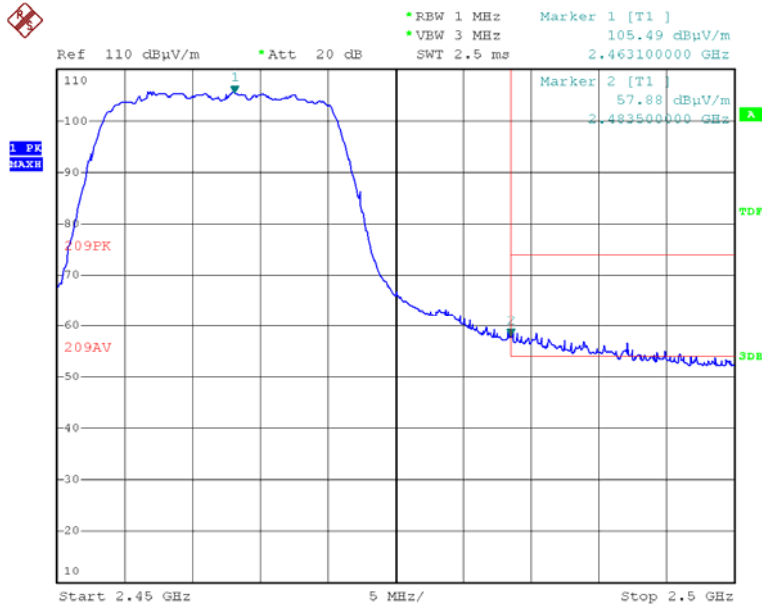


## Radiated Band Edge Test Plot:2462MHz

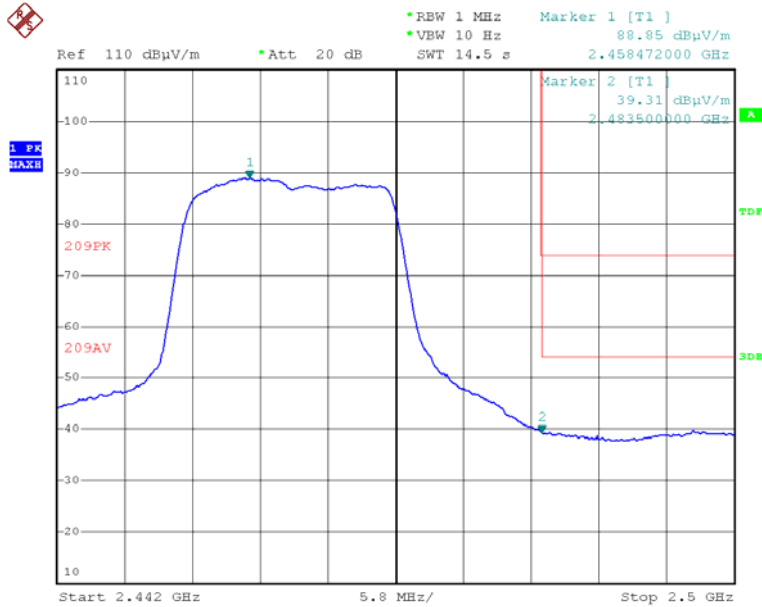
### Horizontal- Average



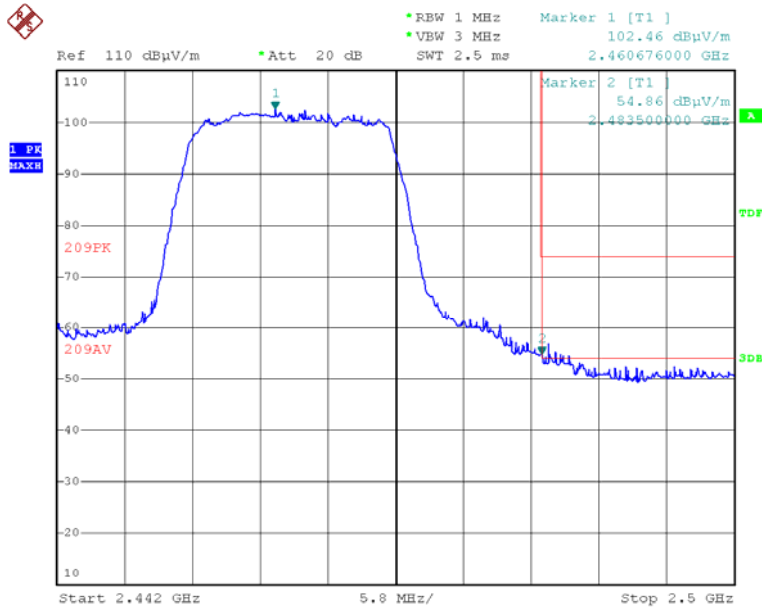
### Horizontal-Peak



## Vertical- Average

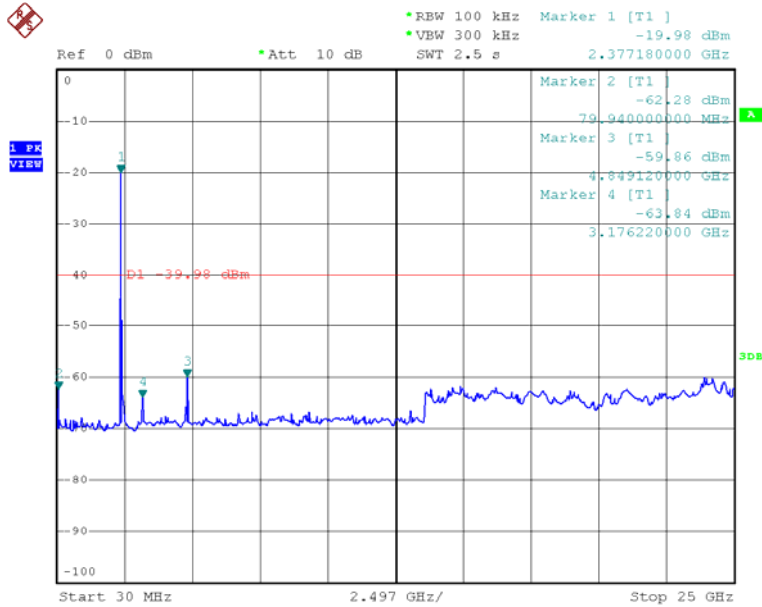


## Vertical-Peak

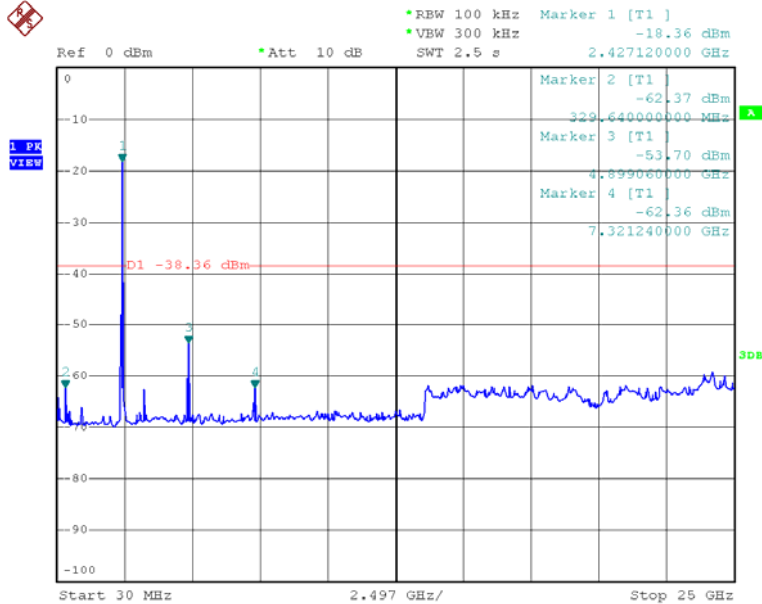


## Conducted Spurious Emission Test Plot

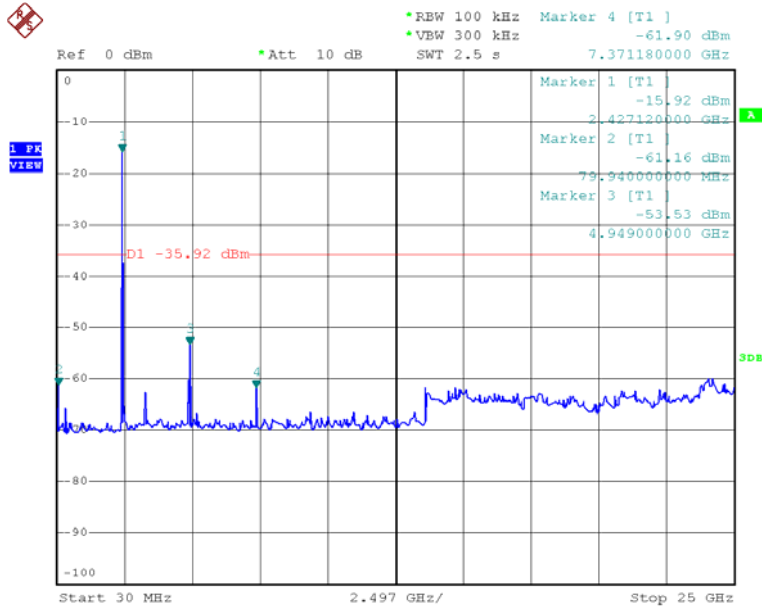
### Low Channel:2412MHz



### Mid Channel:2437MHz

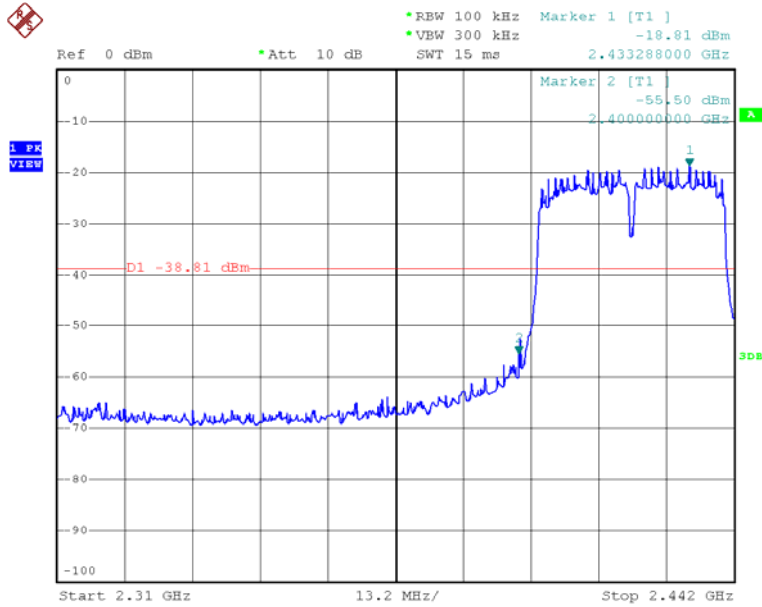


## High Channel:2462MHz

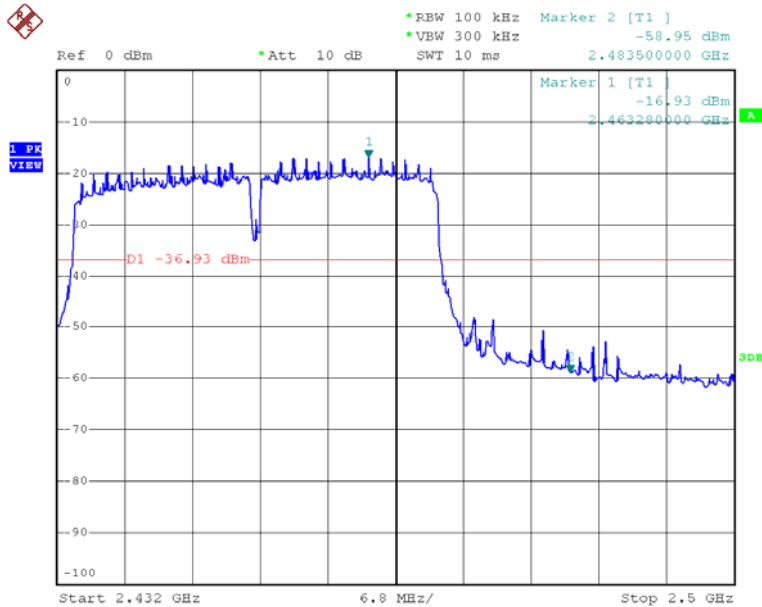


**For 802.11n HT40 Mode:**

**Conducted Band Edge Test Plot: 2422MHz**

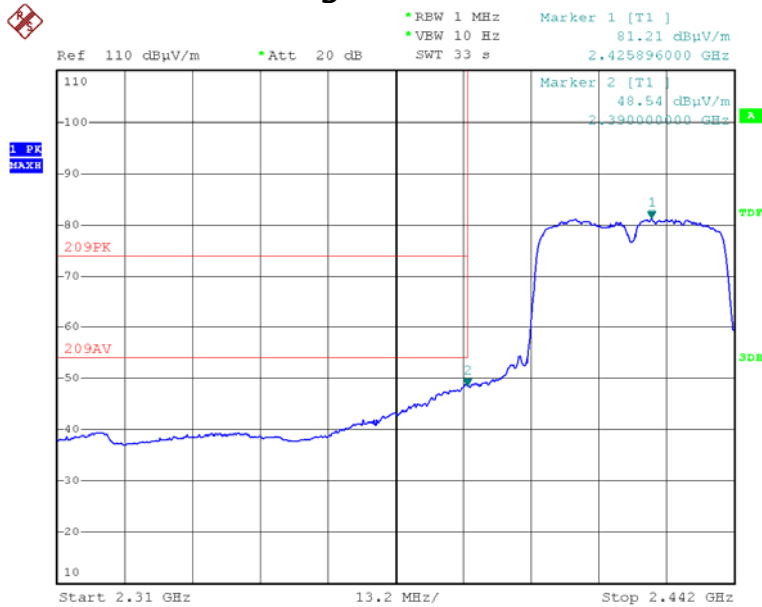


**Conducted Band Edge Test Plot: 2452MHz**

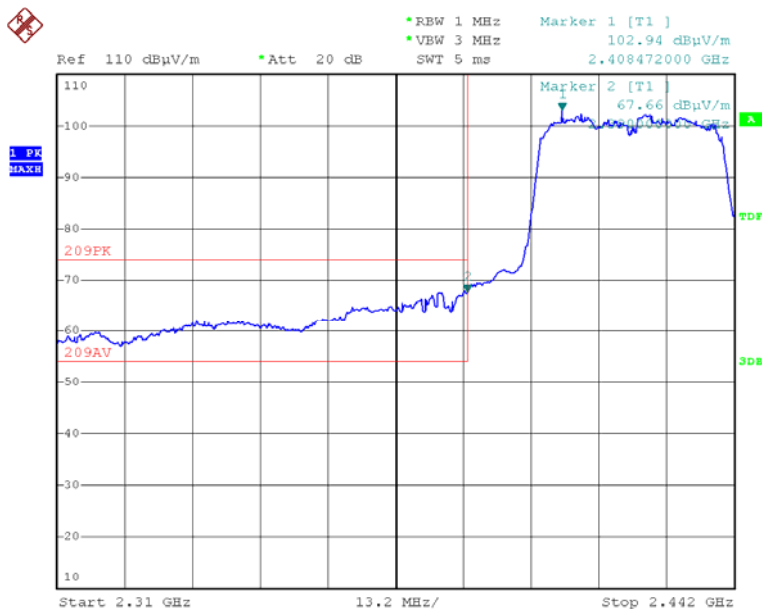


## Radiated Band Edge Test Plot :2422MHz

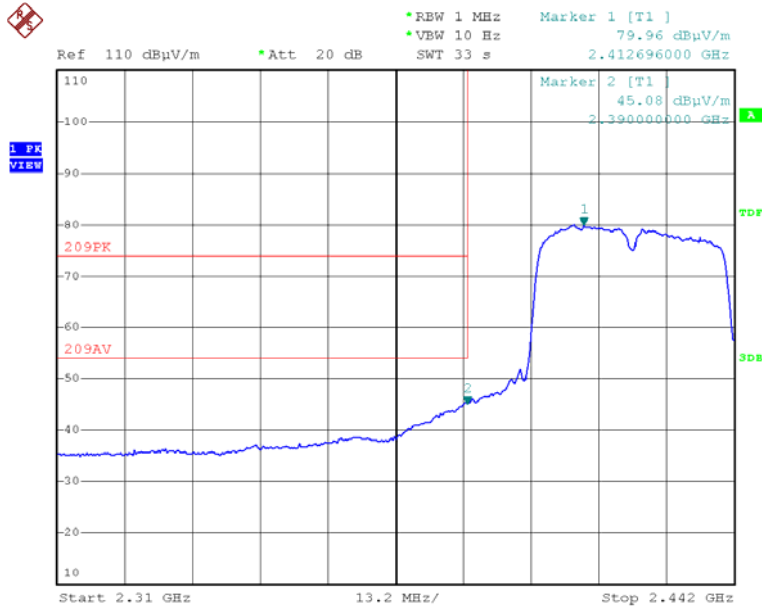
### Horizontal- Average



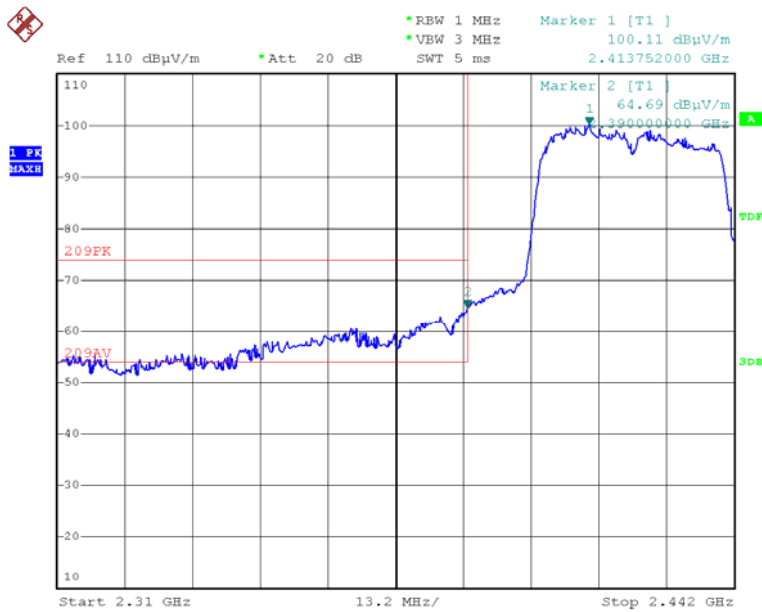
### Horizontal-Peak



## Vertical- Average



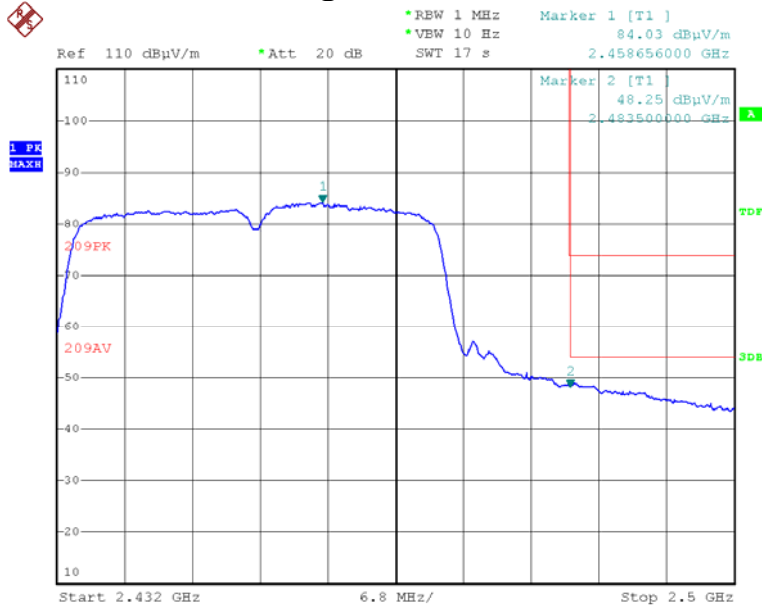
## Vertical-Peak



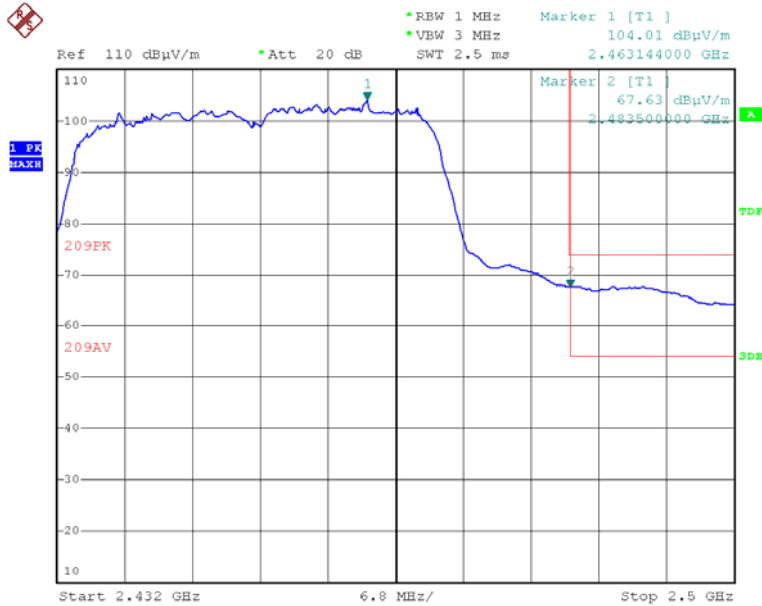


## Radiated Band Edge Test Plot :2452MHz

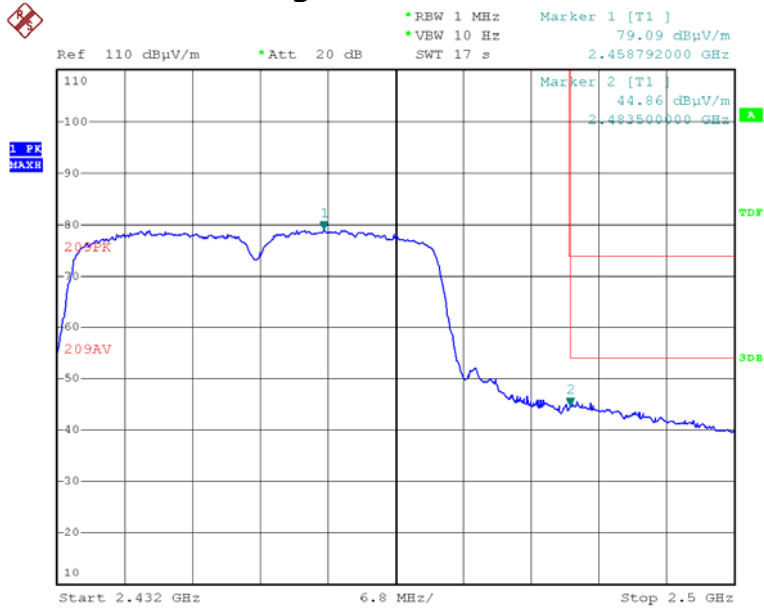
### Horizontal- Average



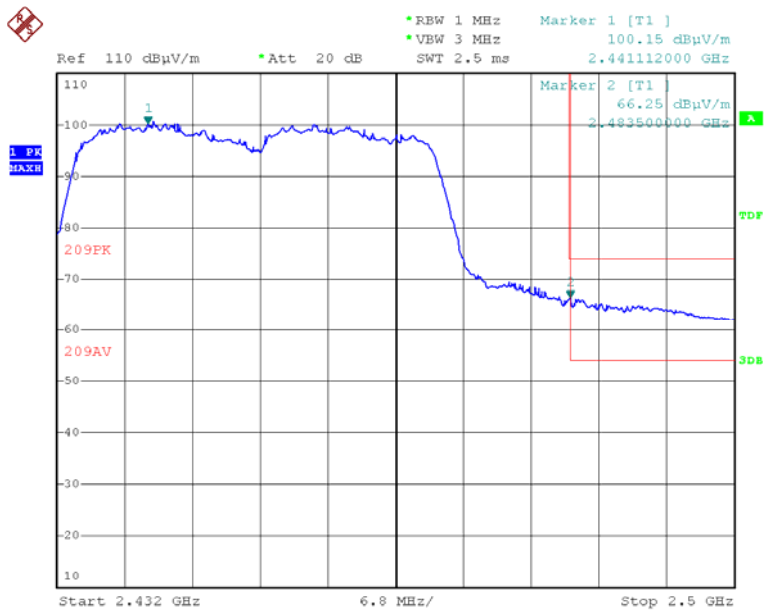
### Horizontal-Peak



## Vertical-Average

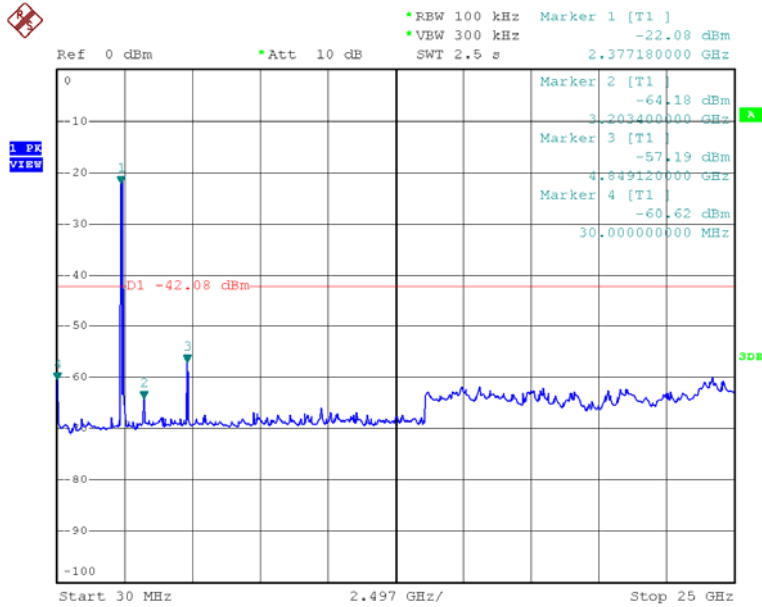


## Vertical-Peak

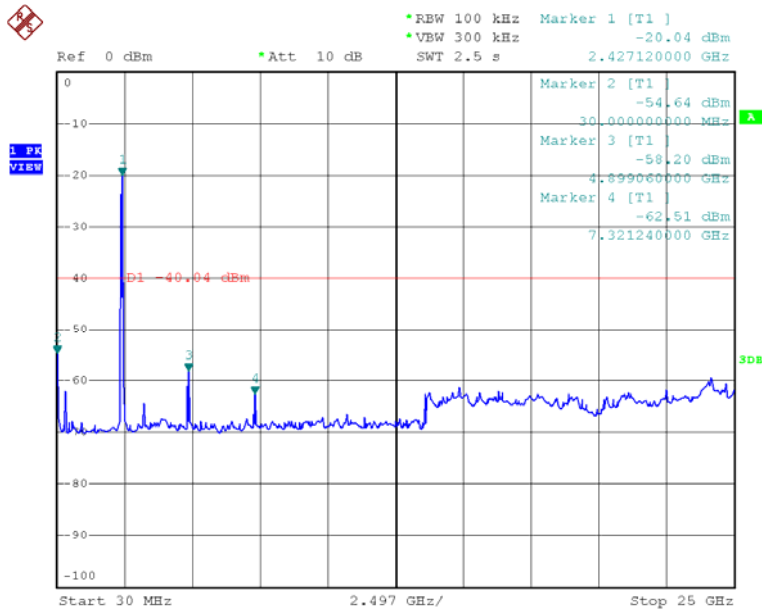


## Conducted Spurious Emission Test Plot

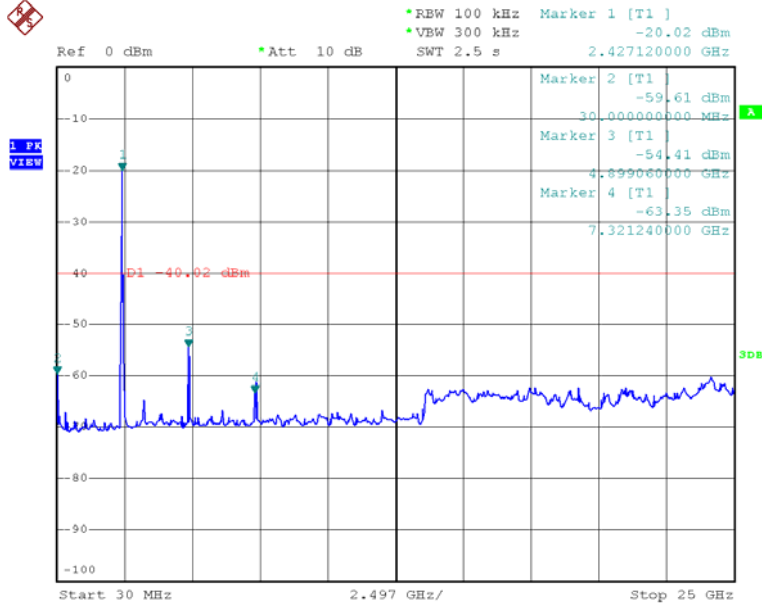
### Low Channel:2422MHz



### Mid Channel:2437MHz



## High Channel:2452MHz



**ATTACHMENT 7 – PEAK POWER SPECTRAL DENSITY TEST**

<b>CLIENT:</b>	GRANDSTREAM NETWORKS,INC.	<b>TEST STANDERD:</b>	Section 15.247(d)												
<b>MODEL NUMBERS:</b>	GXV3615W	<b>PRODUCT:</b>	IP Camera												
<b>EUT MODEL:</b>	GXV3615W	<b>EUT DESIGNATION:</b>	Digital Transmission Device												
<b>TEMPERATURE:</b>	23°C	<b>HUMIDITY:</b>	47%RH												
<b>ATM PRESSURE:</b>	101.0kPa	<b>GROUNDING:</b>	None												
<b>TESTED BY:</b>	May Wang	<b>DATE OF TEST:</b>	November 26, 2010												
<b>TEST REFERENCE:</b>	ANSI C63.4 and KDB Publication No. 558074 for DSSS.														
<b>TEST PROCEDURE:</b>	Regulation 15.247(d) for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.The EUT was set transmitting continuously and force selection of output power level and channel number. We'd observed that the peak levels aren't greater than +8dBm limit. The EUT was set up as ANSI C63.4, 2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.														
<b>DESCRIPTIONS OF TEST MODE:</b>	Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations,data rates and antenna ports (if EUT with antenna diversity architecture). Following channels were selected for the final test as listed below: 802.11b mode with data rate of 1mbps, 802.11g mode with data rate of 6mbps,802.11n ht20 mode with data rate of 6.5mbps and 802.11n ht40 mode with data rate of 13.5mbps.														
<b>EQUIPMENT SETUP</b>	Spectrum analyzer shall be set as below: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Equipment Mode</th> <th>Spectrum Analyzer</th> </tr> </thead> <tbody> <tr> <td>Detector Function</td> <td>Peak</td> </tr> <tr> <td>RBW</td> <td>3KHz</td> </tr> <tr> <td>VBW</td> <td>10KHz</td> </tr> <tr> <td>Span</td> <td>300KHz</td> </tr> <tr> <td>Sweep Time</td> <td>100S</td> </tr> </tbody> </table>			Equipment Mode	Spectrum Analyzer	Detector Function	Peak	RBW	3KHz	VBW	10KHz	Span	300KHz	Sweep Time	100S
Equipment Mode	Spectrum Analyzer														
Detector Function	Peak														
RBW	3KHz														
VBW	10KHz														
Span	300KHz														
Sweep Time	100S														
<b>TEST VOLTAGE:</b>	120VAC/60Hz														
<b>RESULTS:</b>	The EUT meet the requirements of test reference for power spectral density.The test results relate only to the equipment under test provided by client.														
<b>CHANGES OR MODIFICATIONS:</b>	There were no modifications installed by EMC Compliance Management Group (China) test personnel.														
<b>M. UNCERTAINTY:</b>	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp $\pm 2.6$ dB.														

**Peak Power Spectral Density Test Data:**

**For 802.11b Mode:**

Channel Frequency (MHz)	Power Spectral Density (dBm)	Cable Loss (dB)	Power Spectral Density Level (dBm)	Maximum Limit (dBm)	Margin (dB)
2412	-20.28	2.0	-18.28	8.00	-26.28
2437	-22.03	2.0	-20.03	8.00	-28.03
2462	-23.36	2.0	-21.36	8.00	-28.36

**For 802.11g Mode:**

Channel Frequency (MHz)	Power Spectral Density (dBm)	Cable Loss (dB)	Power Spectral Density Level (dBm)	Maximum Limit (dBm)	Margin (dB)
2412	-26.05	2.0	-24.05	8.00	-32.05
2437	-26.38	2.0	-24.38	8.00	-32.38
2462	-28.10	2.0	-26.10	8.00	-34.10

**For 802.11n HT20 Mode:**

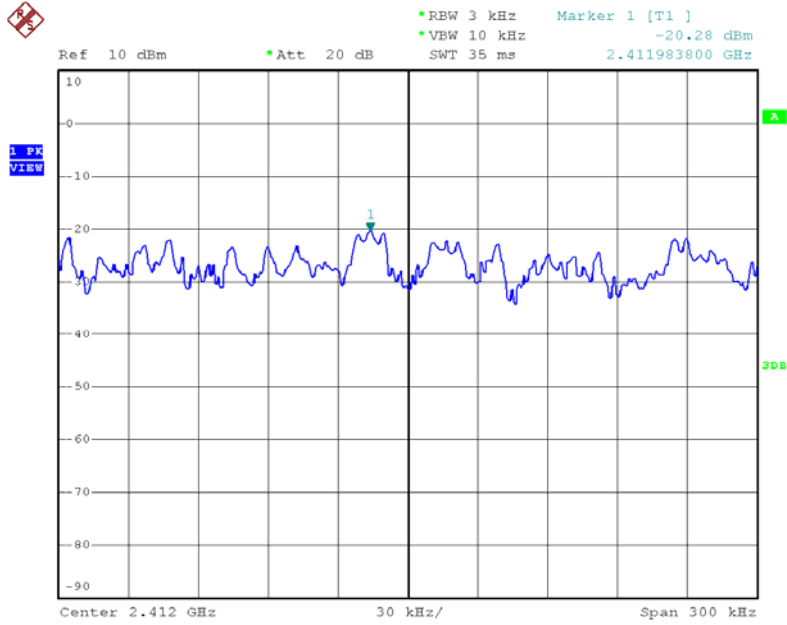
Channel Frequency (MHz)	Power Spectral Density (dBm)	Cable Loss (dB)	Power Spectral Density Level (dBm)	Maximum Limit (dBm)	Margin (dB)
2412	-25.27	2.0	-23.27	8.00	-31.27
2437	-24.63	2.0	-22.63	8.00	-30.63
2462	-26.49	2.0	-24.49	8.00	-32.49

**For 802.11n HT40 Mode:**

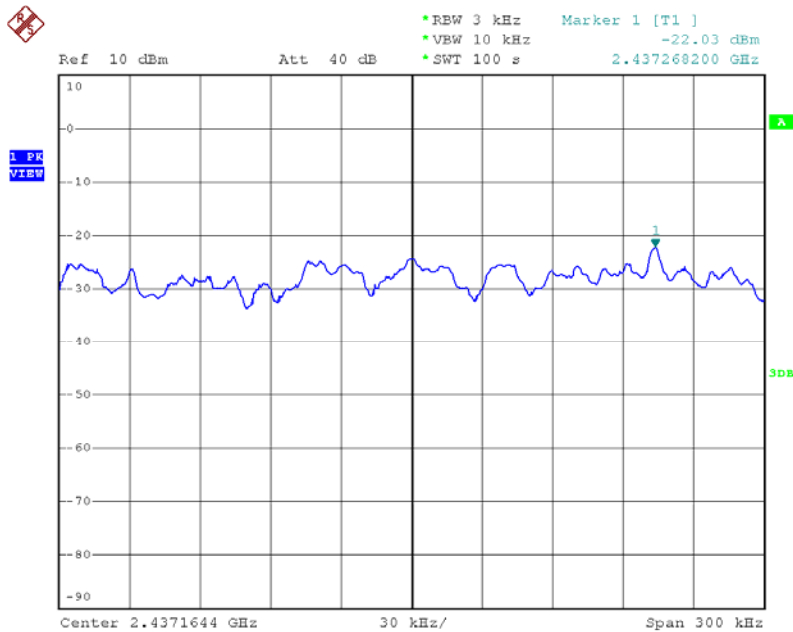
Channel Frequency (MHz)	Power Spectral Density (dBm)	Cable Loss (dB)	Power Spectral Density Level (dBm)	Maximum Limit (dBm)	Margin (dB)
2412	-29.72	2.0	-27.72	8.00	-35.72
2437	-30.0	2.0	-28.0	8.00	-36.00
2452	-31.4	2.0	-29.4	8.00	-37.40

**For 802.11b Mode:**

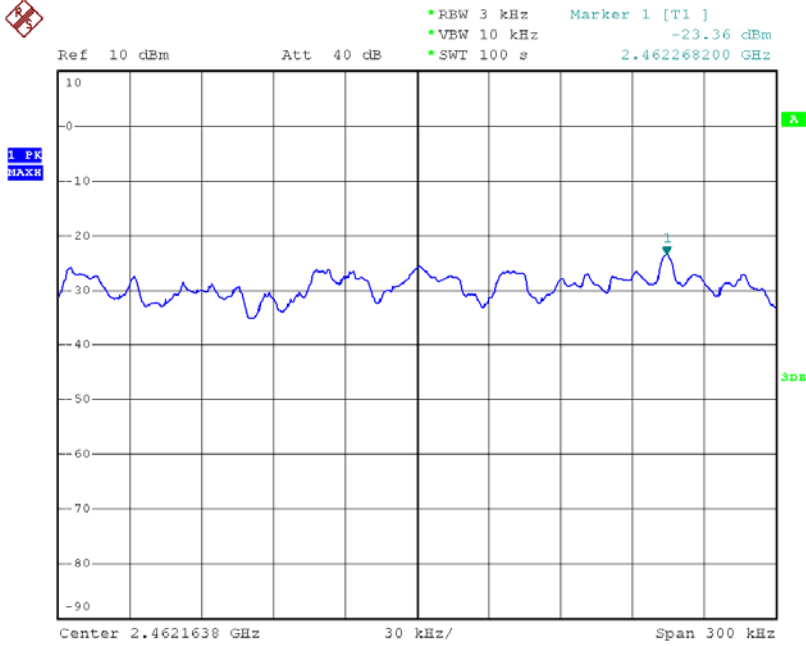
**Low Channel:2412MHz**



**Mid Channel:2437MHz**

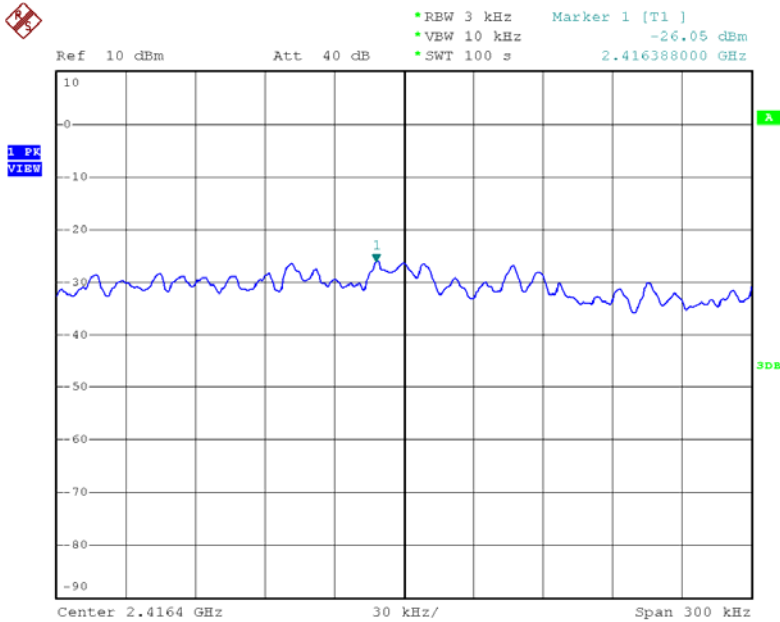


### High Channel:2462MHz



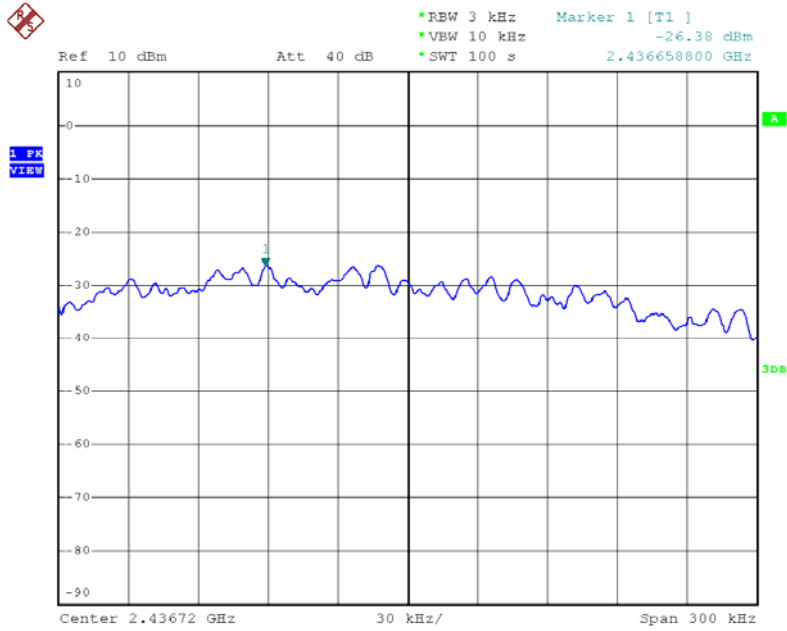
For 802.11g Mode:

### Low Channel:2412MHz

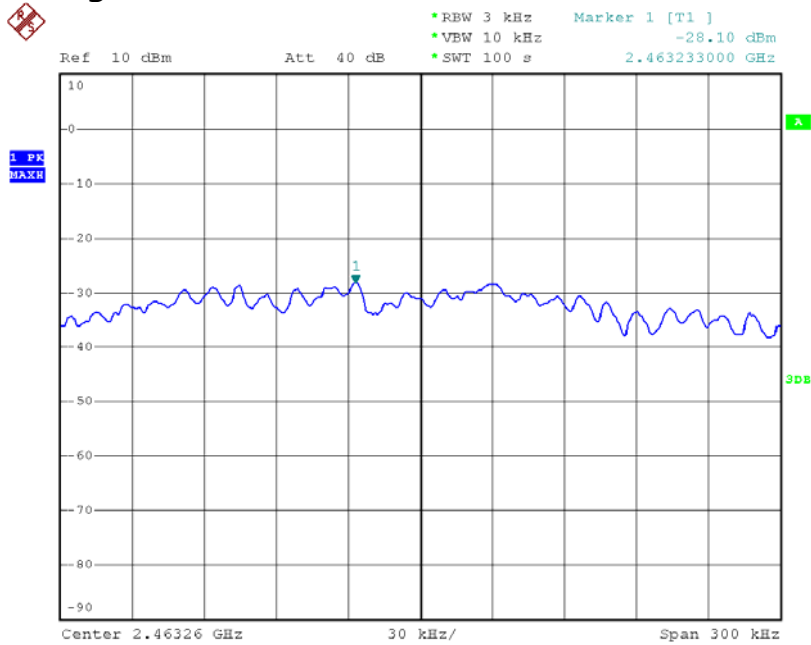




### Mid Channel:2437MHz

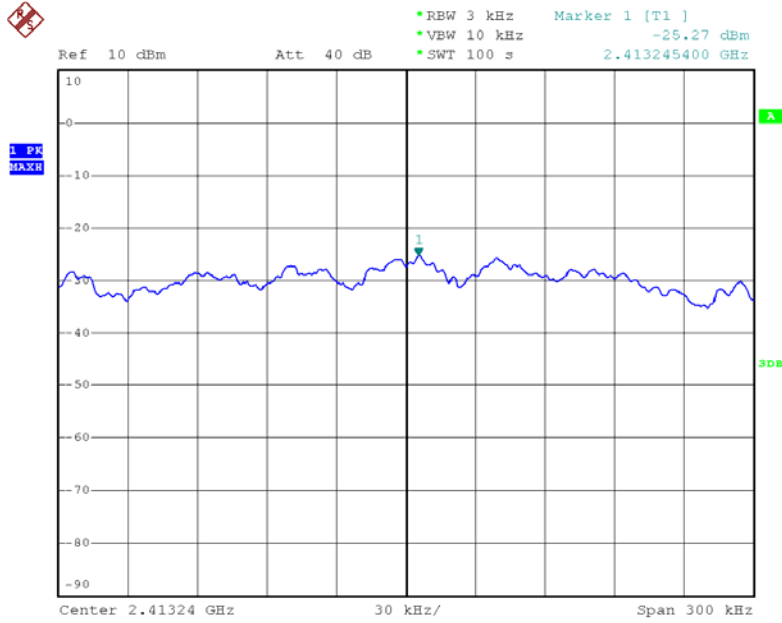


### High Channel:2462MHz

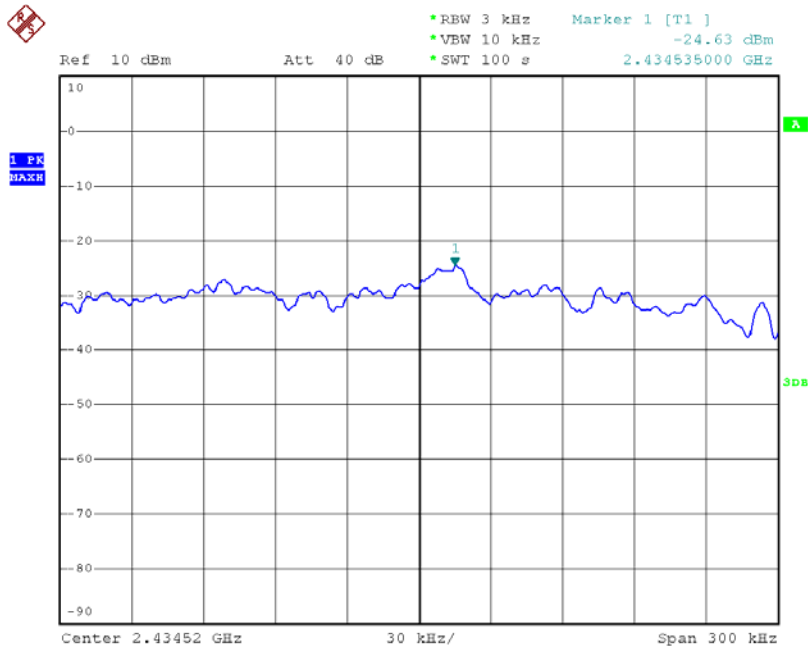


**For 802.11n HT20 Mode:**

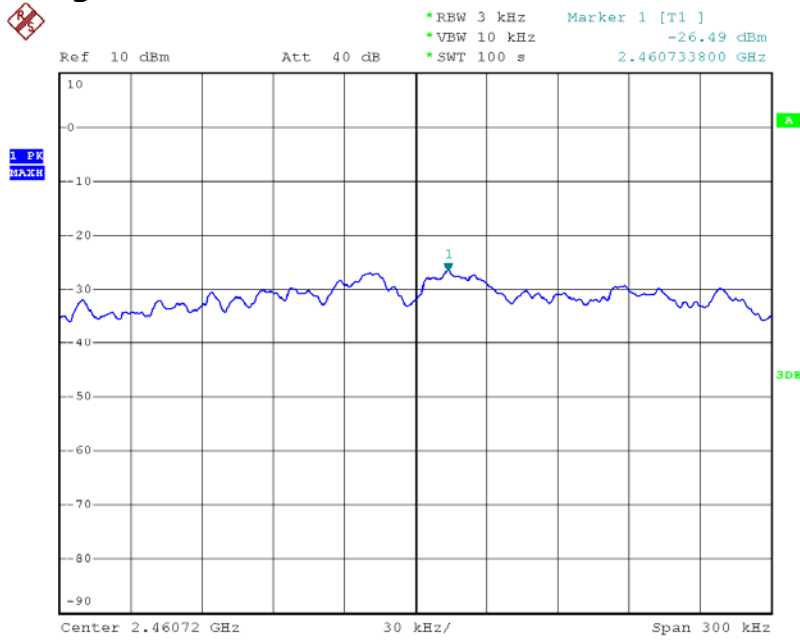
**Low Channel:2412MHz**



**Mid Channel:2437MHz**

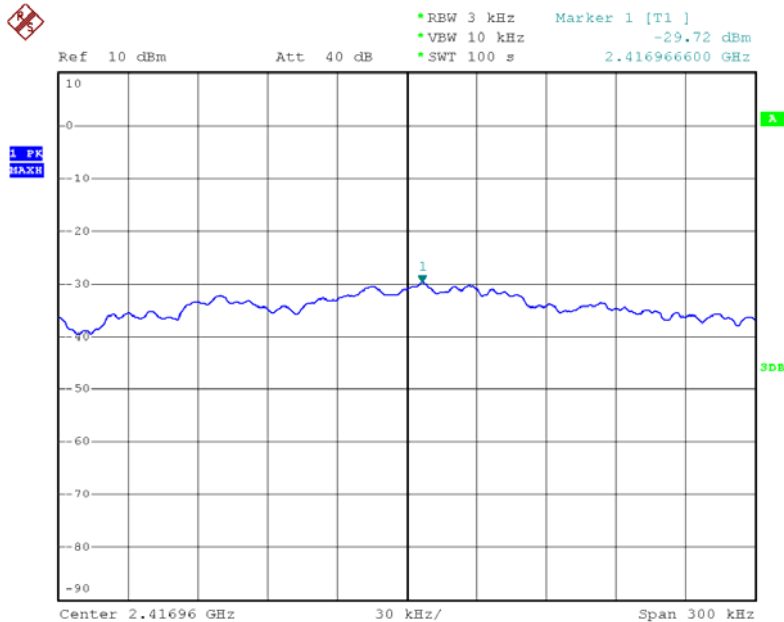


### High Channel:2462MHz

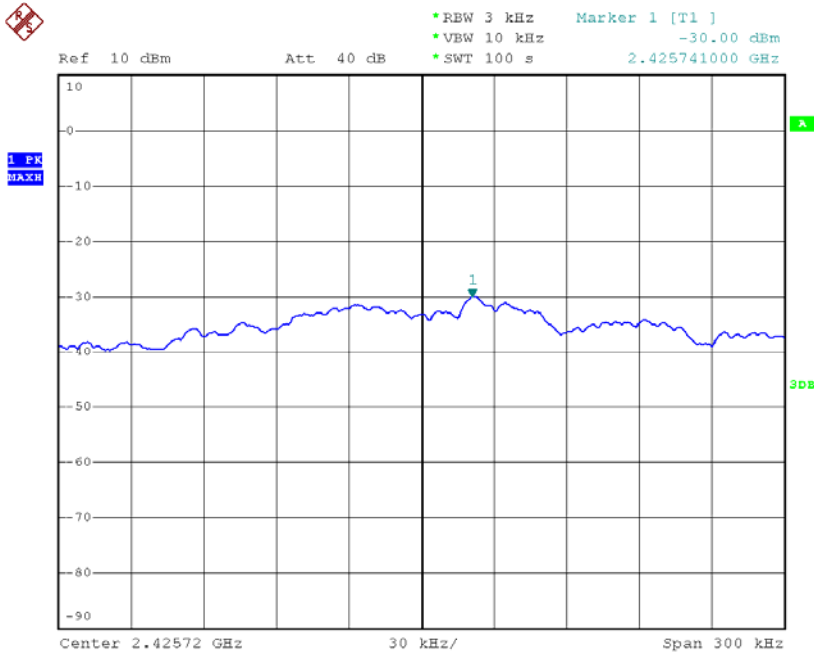


For 802.11n HT40 Mode:

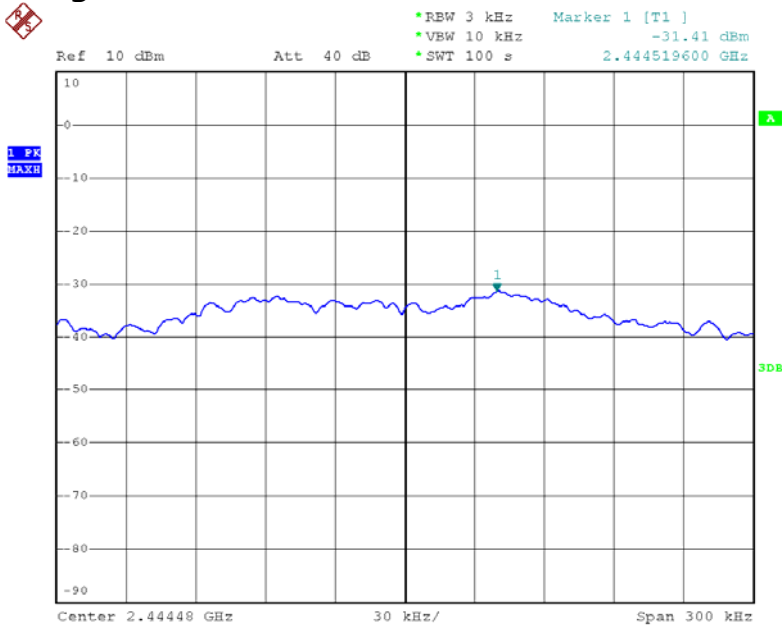
### Low Channel:2422MHz



### Mid Channel:2437MHz



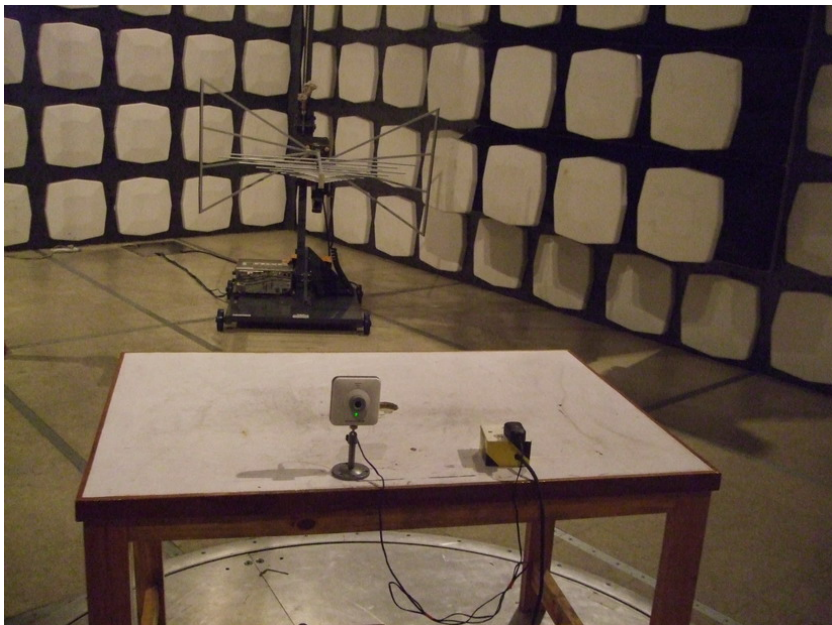
### High Channel:2452MHz



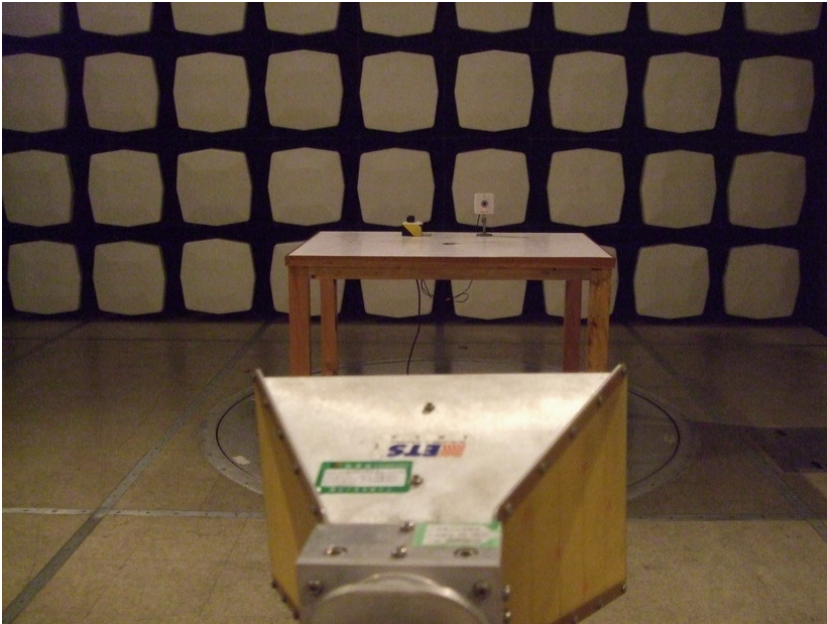
**ATTACHMENT TEST SET-UP PHOTOGRAPH**



***Conducted Emission Test Set-up***



***Radiated Emission Test Set-up -below 1GHz***



***Radiated Emission Test Set-up - Above 1GHz***