Excellence in Compliance Testing

Certification Test Report

FCC ID: S4MGRG3-18-B

FCC Rule Part: 15.247

ACS Report Number: 09-0230-15C

Manufacturer: **TeraHop Networks, Inc.**
Model(s): **GR2100a**

Test Begin Date: June 29, 2009
Test End Date: August 4, 2009

Report Issue Date: August 31, 2009

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612-0

This report is not be used to claim certification, approval, or endorsement by NVLAP, NIST or any government agency.

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This report contains 21 pages

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1.0 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations.

1.2 Product Description

The GR2100a Gateway Router (GR) unit serves as the point of data connection to and from clusters of remotes sensor nodes (RSN) in a TeraHop moveable wireless sensor network via a 2.4GHz radio.

The GR2100a also contains two single modular approved backhaul 802.11a radios used to interconnect multiple gateways, to connect to a Gateway Server (GS), and to provide a Wi-Fi access point for the system. The 802.11a radios are certified under FCC ID: SWX-XR5.

Manufacturer Information:
TeraHop Networks Incorporated
1225 Old Alpharetta Road Suite 210
Alpharetta, GA 30005

Test Sample Serial Number(s): 6

Test Sample Condition:
Test sample was provided in good working order with no visible defects.

Detailed photographs of the EUT are filed separately with this filing.

1.3 Test Methodology and Considerations

For radiated emissions, including band edge, two orientations representative of the final installation were tested; EUT laying flat (X-Position) and the EUT upright (Y-Position). Representative data for both positions are included in this report.

Radiated intermodulation testing was also performed for all simultaneously transmitting antennas which include (2) 802.11a modules FCC ID: SWX-XR5.

The GR2100a is designed for automotive use. The power supply input is 12VDC hence it cannot be directly connected to the AC mains under any conditions. The testing was performed using a sealed lead acid battery 33AH (Mfr. Werker, model # WKA12-33C) which is the typical application. A charger (mfr. HDM, model # 1210E-115) was used to keep the battery topped off.

2.0 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions
5015 B.U. Bowman Drive
Buford, GA 30518
Phone: (770) 831-8048
Fax: (770) 831-8598

2.2 Laboratory Accreditations/Recognitions/Certifications

The Semi-Anechoic Chamber Test Site, Open Area Test Site (OATS) and Conducted Emissions Site have been fully described, submitted to, and accepted by the FCC, Industry Canada and the Japanese Voluntary Control Council for Interference by information technology equipment. In addition, ACS is compliant to ISO/IEC 17025 as certified by the National Institute of Standards and Technology under their National Voluntary Laboratory Accreditation Program. The following certification numbers have been issued in recognition of these accreditations and certifications:

FCC Registration Number: 894540
Industry Canada Lab Code: IC 4175A-1
VCCI Member Number: 1831

- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

NVLAP Lab Code: 200612-0

2.3 Radiated Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of a 20' x 30' x 18' shielded enclosure. The chamber is lined with Toyo Ferrite Grid Absorber, model number FFG-1000. The ferrite tile grid is 101 x 101 x 19mm thick and weighs approximately 550 grams. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber.

The turntable is 150cm in diameter and is located 160cm from the back wall of the chamber. The chamber is grounded via 1 - 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is all steel, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Behind the turntable is a 3' x 6' x 4' deep shielded pit used for support equipment if necessary. The pit is equipped with 1 - 4" PVC chases from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3-1 below:

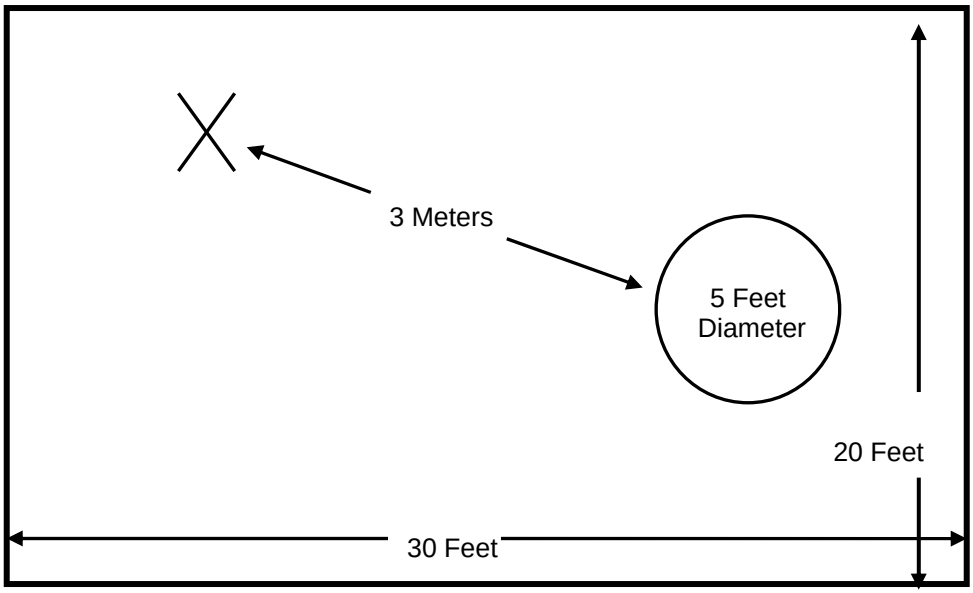


Figure 2.3-1: Semi-Anechoic Chamber Test Site

2.3.2 Open Area Tests Site (OATS)

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 - 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 - 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 2.3-2 below:

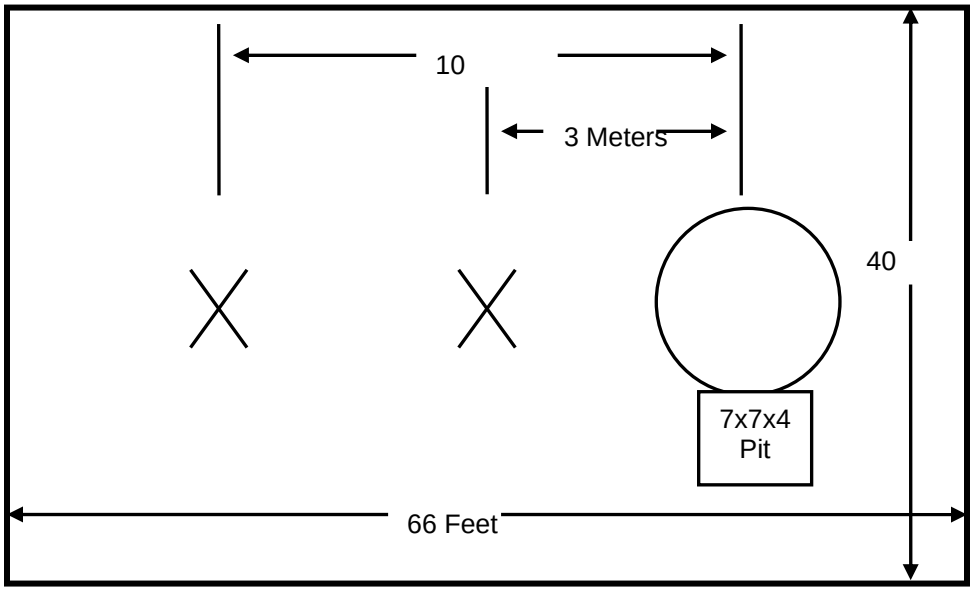


Figure 2.3-2: Open Area Test Site

2.4 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 8' solid aluminum horizontal group reference plane (GRP) bonded every 3" to an 8' X 8' vertical ground plane.

The site is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 4.1.3-1:

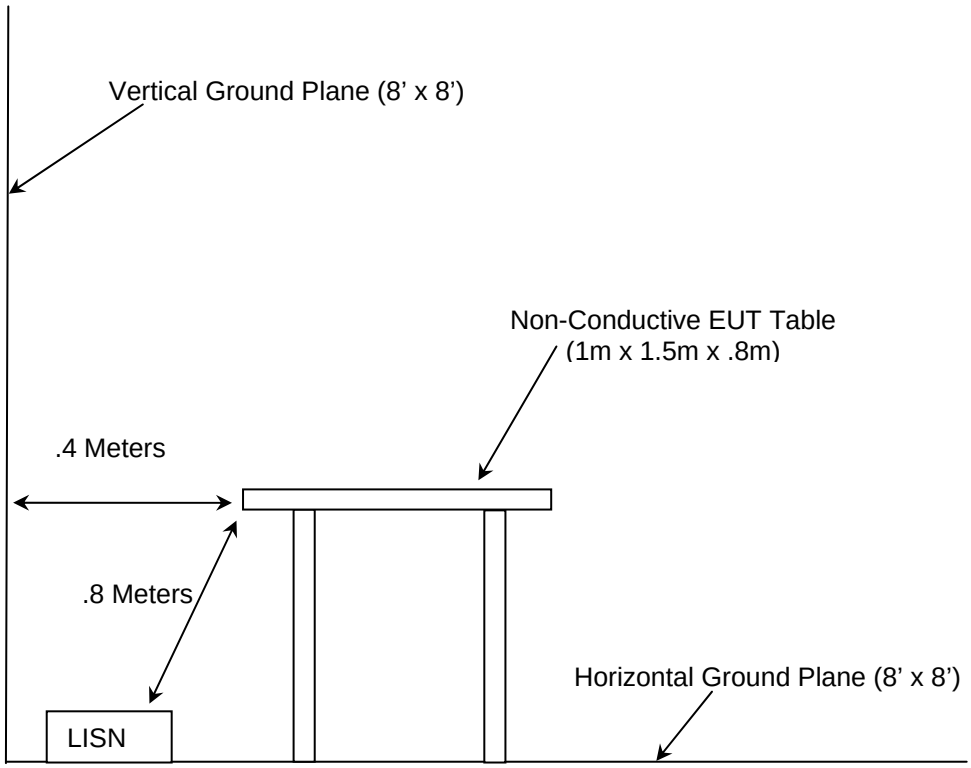


Figure 2.4-1: AC Mains Conducted EMI Site

3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9KHz to 40GHz
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2009
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2009
- FCC KDB Publication No. 558074 - Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247), March 2005

4.0 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

Equipment Calibration Information					
ACS#	**Mfg.**	**Eq. type**	**Model**	**S/N**	**Cal. Due**
1	Rohde & Schwarz	Spectrum Analyzers	ESMI - Display	833771/007	09-19-2009
2	Rohde & Schwarz	Spectrum Analyzers	ESMI-Receiver	839587/003	09-19-2009
22	Agilent	Amplifiers	8449B	3008A00526	10-22-2009
25	Chase	Antennas	CBL6111	1043	08-22-2009
30	Spectrum Technologies	Antennas	DRH-0118	970102	05-08-2010
152	EMCO	LISN	3825/2	9111-1905	03-25-2010
167	ACS	Cable Set	Chamber EMI Cable Set	167	02-06-2010 (See Note1)
168	Hewlett Packard	Attenuators	11947A	44829	02-10-2010 (See Note2)
283	Rohde & Schwarz	Spectrum Analyzers	FSP40	1000033	09-19-2009
291	Florida RF Cables	Cables	SMRE-200W-12.0-SMRE	None	11-24-2009 (See Note1)
292	Florida RF Cables	Cables	SMR-290AW-480.0-SMR	None	11-24-2009 (See Note1)
321	Hewlett Packard	Amplifiers	HPC 8447D	1937A02809	10-08-2009
324	ACS	Cables	Belden	8214	07-15-2010 (See Note1)
329	A.H. Systems	Antenna	SAS-571	721	08-04-2010
338	Hewlett Packard	Amplifier	8449B	3008A01111	10-22-2009
340	Aeroflex/Weinschel	Attenuators	AS-20	7136	10-22-2009 (See Note2)
422	Florida RF	Cables	SMS-200AW-72.0-SMR	805	02-05-2010 (See Note1)
432	Microwave Circuits	Filters	H3G020G4	264066	07-17-2010 (See Note1)

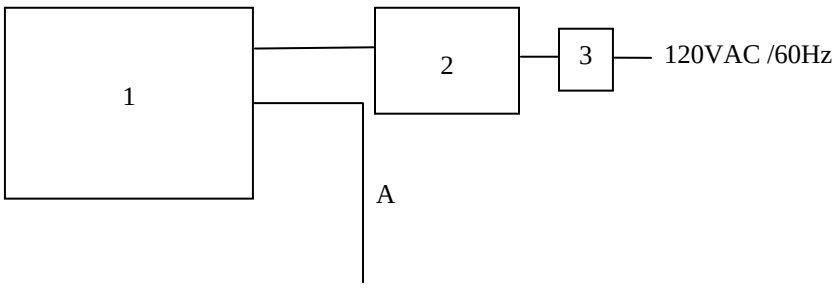
Note1: Items characterized on an annual cycle. The date shown indicates the next characterization due date.
Note2: Items verified on an annual cycle. The date shown indicates the next verification due date.

5.0 SUPPORT EQUIPMENT

Table 5-1: Support Equipment

Item	Equipment Type	Manufacturer	Model Number	Serial Number
1	EUT	TeraHop Networks, Inc.	GR2100a	#6
2	12V Lead Acid Battery	Werker	WKA12-33C	NA
3	Power Suuply	HDM	1210E-115	NA

6.0 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM



A – 35' RJ45 unshielded cable extending outside chamber enclosure terminated to PC used for EUT programming.

Figure 6-1: EUT Test Setup

*Note: The GR2100a is designed for automotive use. The power supply input is 12VDC hence it cannot be directly connected to the AC mains under any conditions. The testing was performed using a sealed lead acid battery 33AH (Mfr. Werker, model # WKA12-33C) which is the typical application. A charger (mfr. HDM, model # 1210E-115) was used to keep the battery topped off.

7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement - FCC Section 15.203

The GR2100a utilizes detachable antennas via MCX connectors thus satisfying the requirements of Part 15.203 for unique antenna coupling.

7.2 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 7.2.2

7.2.1 Test Methodology

The GR2100a is a battery operated device used in vehicular applications therefore AC power line conducted emissions is not applicable.

7.3 Radiated Emissions – FCC: Section 15.109(Unintentional Radiation) IC: RSS-210 2.6

7.3.1 Test Methodology

Radiated emissions tests were performed over the frequency range of 30MHz to 12.5GHz. Measurements of the radiated field strength were made at a distance of 3m from the boundary of the equipment under test (EUT) and the receiving antenna. The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. Radiated measurements above 30MHz and below 1GHz were made with the Spectrum Analyzer's resolution bandwidth set to 120 KHz using a Quasi-peak detector. Above 1GHz, peak and average measurements are taken with the RBW and VBW were set to 1MHz and 3MHz respectively.

7.3.2 Test Results

Results of the test are given in Table 7.3.2-1.

Table 7.3.2-1: Radiated Emissions Tabulated Data

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
131.999	---------	44.26	V	-12.58	---------	31.68	--------	43.5	---------	11.82
329.988	---------	45.60	H	-9.90	---------	35.70	--------	46.0	---------	10.30
351.973	---------	43.52	H	-9.00	---------	34.52	--------	46.0	---------	11.48
395.982	---------	47.33	V	-8.32	---------	39.01	--------	46.0	---------	6.99
433.318	---------	43.65	H	-7.33	---------	36.32	--------	46.0	---------	9.68
527.998	---------	40.57	V	-5.24	---------	35.33	--------	46.0	---------	10.67
726.022	---------	34.68	V	-1.64	---------	33.04	--------	46.0	---------	12.96

7.4 6dB & 99% Bandwidth – FCC Section 15.247(a)(2) IC: RSS-210 A8.2(a)

7.4.1 Test Methodology

The 6dB bandwidth was measured in accordance with the FCC KDB Publication No. 558074 "Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)". The RBW of the spectrum analyzer was set to 100 kHz and VBW 300 kHz. Span was set large enough to capture the entire emissions and >> RBW.

The 99% occupied bandwidth was also measured in accordance to the measurement guidelines provided by Industry Canada (The Measurement of Occupied Bandwidth).

7.4.2 Test Results

Results are shown below in table 7.4.2-1 and figure 7.4.2-1 to 7.4.2-6:

Table 7.4.2-1: 6dB and 99% Bandwidth

Frequency [MHz]	6dB Bandwidth [kHz]	99% Bandwidth [kHz]
2402	748.0	1524.0
2450	776.0	1536.0
2478	752.0	1532.0

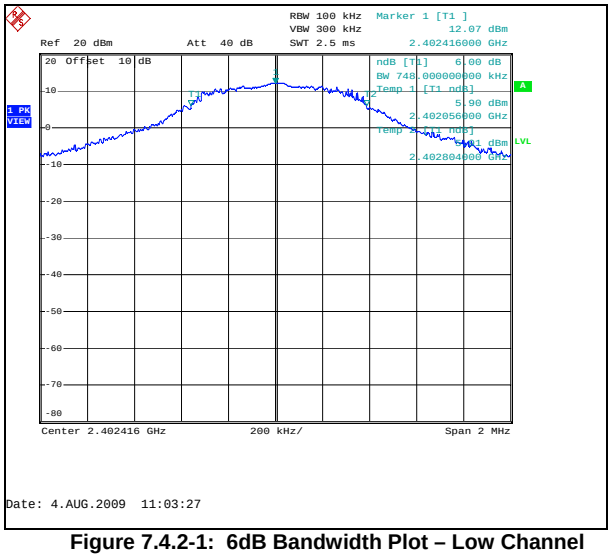


Figure 7.4.2-1: 6dB Bandwidth Plot – Low Channel

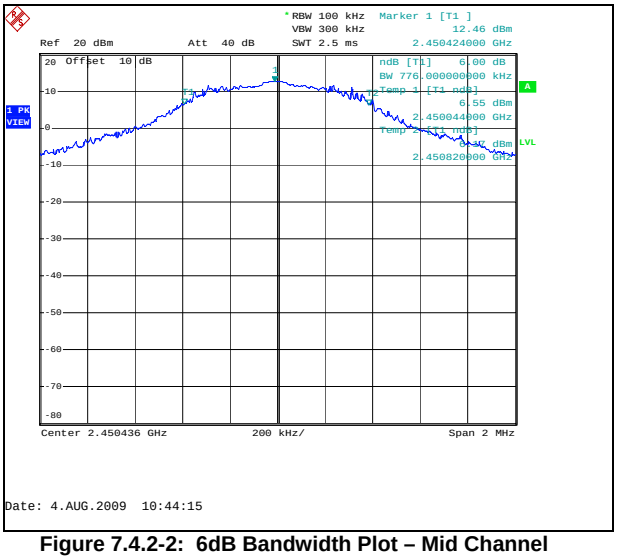


Figure 7.4.2-2: 6dB Bandwidth Plot – Mid Channel

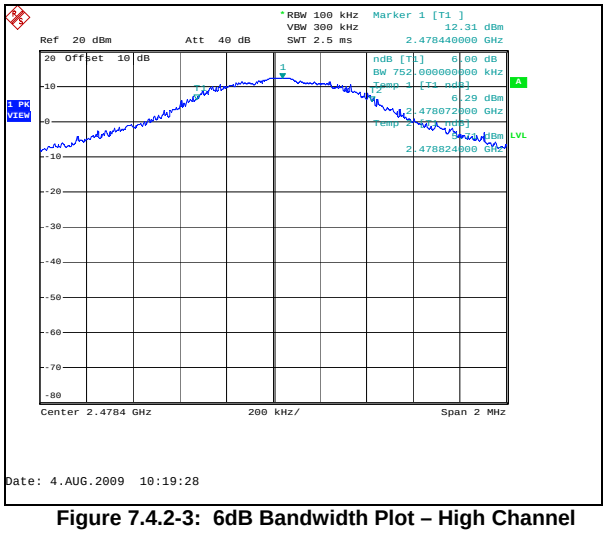


Figure 7.4.2-3: 6dB Bandwidth Plot – High Channel

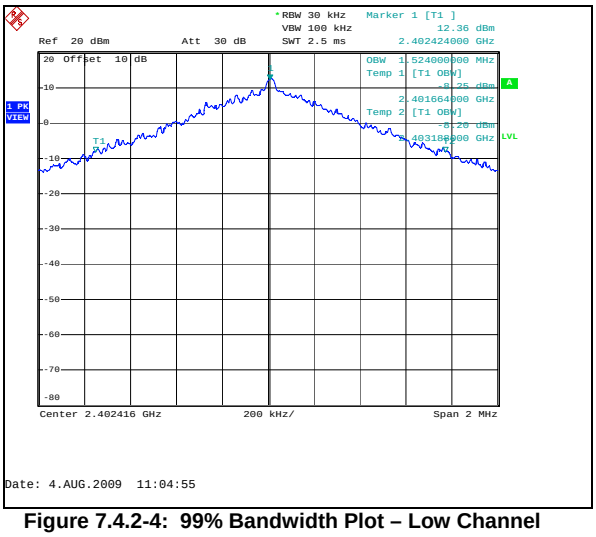


Figure 7.4.2-4: 99% Bandwidth Plot – Low Channel

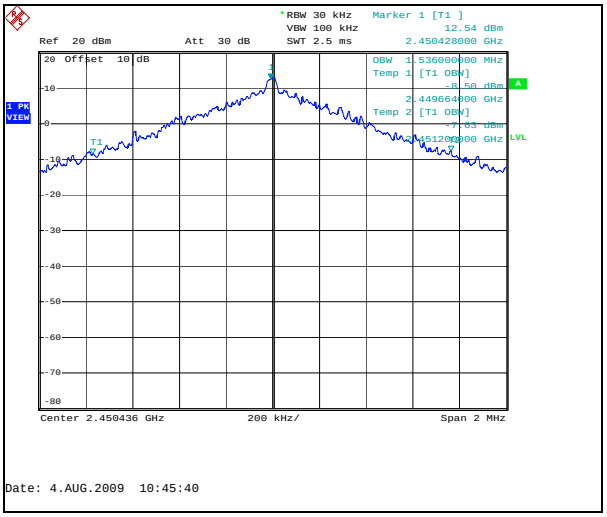


Figure 7.4.2-5: 99% Bandwidth Plot – Mid Channel

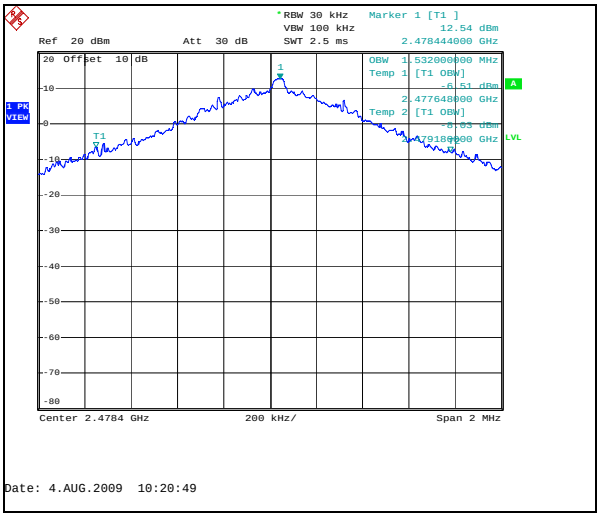


Figure 7.4.2-6: 99% Bandwidth Plot – High Channel

7.5 Peak Output Power Requirement - FCC Section 15.247(b)(3) IC: RSS-210 A8.4(4)

7.5.1 Test Methodology

The Peak Output Power was measured in accordance with the FCC KDB Publication No. 558074 "Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)" Power Option 1. The RF output of the equipment under test was directly connected to the input of the spectrum analyzer.

Data was collected with the EUT operating at maximum power.

7.5.2 Test Results

Results are shown below in Table 7.5.2-1 and Figures 7.5.2-1 to 7.5.2-3.

Table 7.5.2-1: Peak Output Power

Frequency (MHz)	Output Power (dBm)
2402	12.38
2450	12.74
2478	12.68

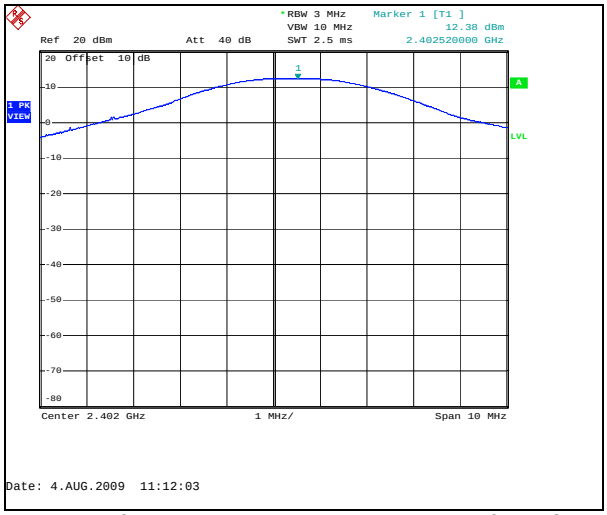


Figure 7.5.2-1: Output power – Low Channel

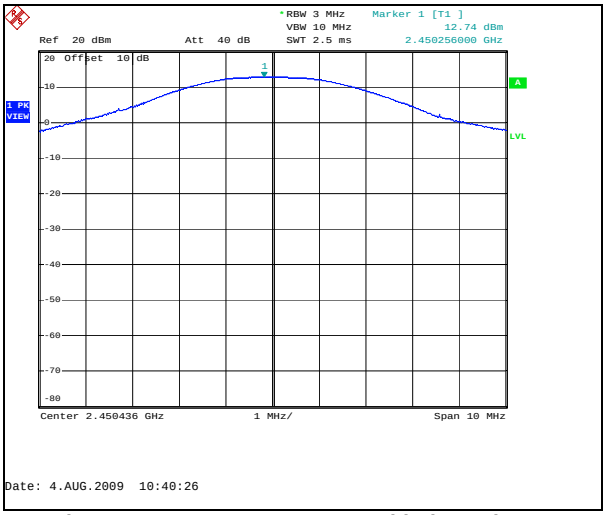


Figure 7.5.2-2: Output power – Mid Channel

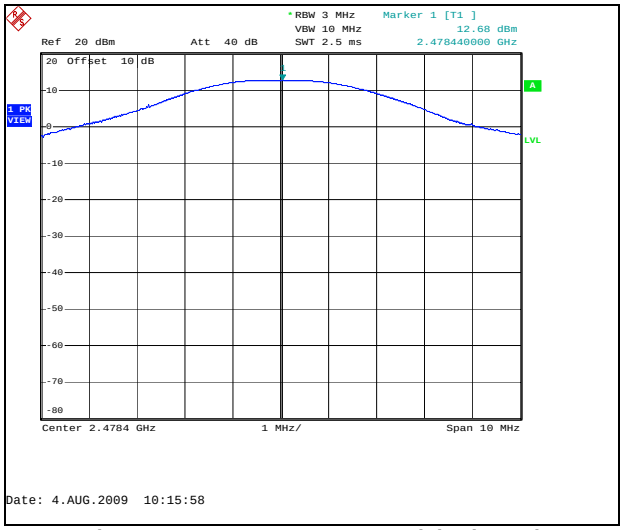


Figure 7.5.2-3: Output power – High Channel

7.6 Band-Edge Compliance and Spurious Emissions - FCC Section 15.247(d) IC: RSS-210 2.6, A8.5

7.6.1 Band-Edge Compliance of RF Emissions

7.6.1.1 Test Methodology

The EUT was investigated at the low and high channels of operation to determine band-edge compliance. Because the upper band-edge coincides with a restricted band, band-edge compliance for the upper band-edge was determined using the radiated mark-delta method as outlined in FCC DA 00-705. The radiated field strength of the fundamental emission was first determined and then the mark-delta method was used to determine the field strength of the band-edge emissions.

The lower band-edge compliance was determined using the marker-delta method in which the radio frequency power that is produced by the EUT is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power.

7.6.1.2 Test Results

Upper band-edge compliance is displayed in Tables 7.6.1.2-1 to 7.6.1.2-2 and Figures 7.6.1.2-1 – 7.6.1.2-8.

Low channel band-edge compliance is displayed in Figure 7.6.1.2-9.

Table 7.6.1.2-1: Upper Band-edge Measurements X-Position – Marker Delta Method

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Fundamental Field Strength (dBuV/m)		Delta-Marker (dB)	Band-edge Field Strength (dBuV/m)		Margin to Limit (dBuV/m) 74	54
	pk	avg	(H/V)	(dB)	pk	avg		pk	avg	pk	avg
2478.45	111.30	----------	H	1.34	112.64	----------	47.73	64.91	----------	9.09	---------
2478.45	----------	104.78	H	1.34	---------	106.12	57.54	----------	48.58	---------	5.42
2478.45	111.28	----------	V	1.34	112.62	----------	48.14	64.48	----------	9.52	---------
2478.45	----------	105.04	V	1.34	---------	106.38	58.4	----------	47.98	---------	6.02

Table 7.6.1.2-2: Upper Band-edge Measurements Y-Position – Marker Delta Method

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Fundamental Field Strength (dBuV/m)		Delta-Marker (dB)	Band-edge Field Strength (dBuV/m)		Margin to Limit (dBuV/m) 74	54
	pk	avg	(H/V)	(dB)	pk	avg		pk	avg	pk	avg
2478.45	115.90	----------	H	-4.19	111.71	----------	47.13	64.58	---------	9.42	---------
2478.45	----------	109.70	H	-4.19	---------	105.51	57.69	----------	47.82	---------	6.18
2478.45	115.09	----------	V	-4.19	110.90	----------	45.99	64.91	---------	9.09	---------
2478.45	----------	108.67	V	-4.19	---------	104.48	59.45	----------	45.03	---------	8.97

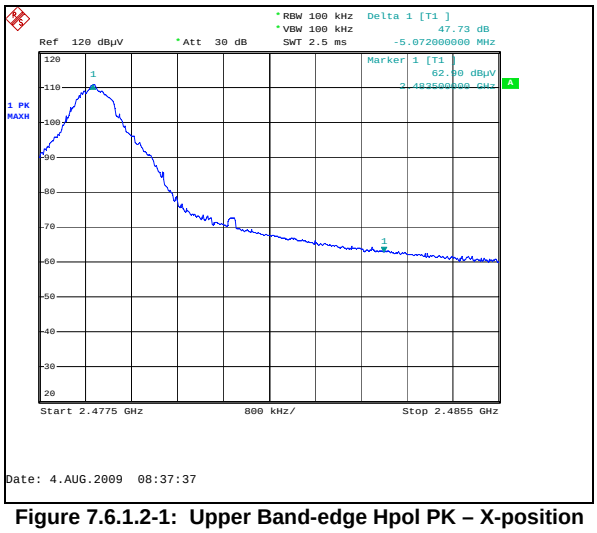


Figure 7.6.1.2-1: Upper Band-edge Hpol PK – X-position

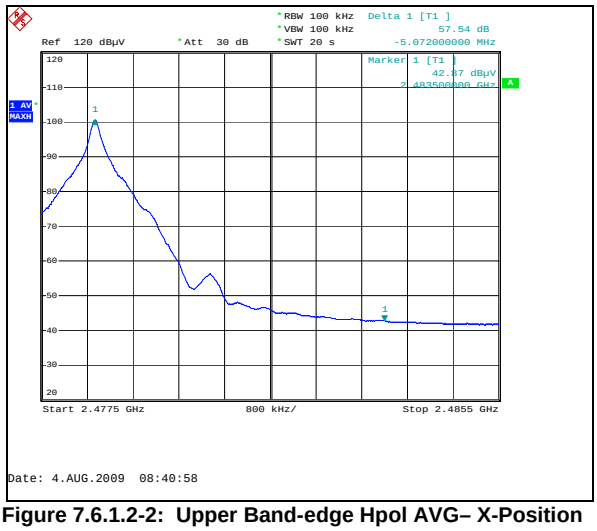


Figure 7.6.1.2-2: Upper Band-edge Hpol AVG– X-Position

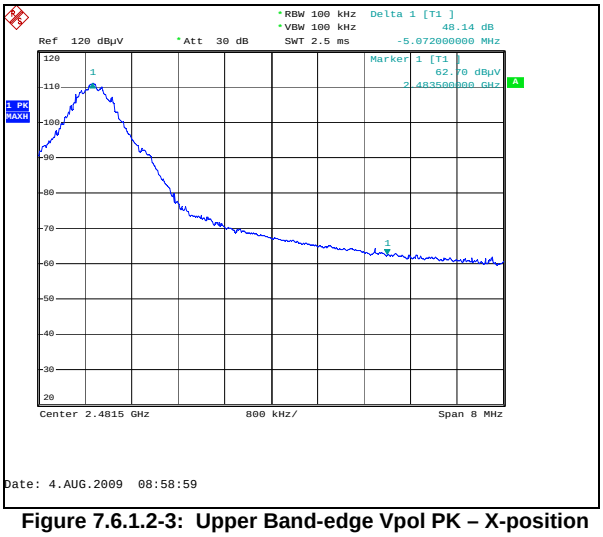


Figure 7.6.1.2-3: Upper Band-edge Vpol PK – X-position

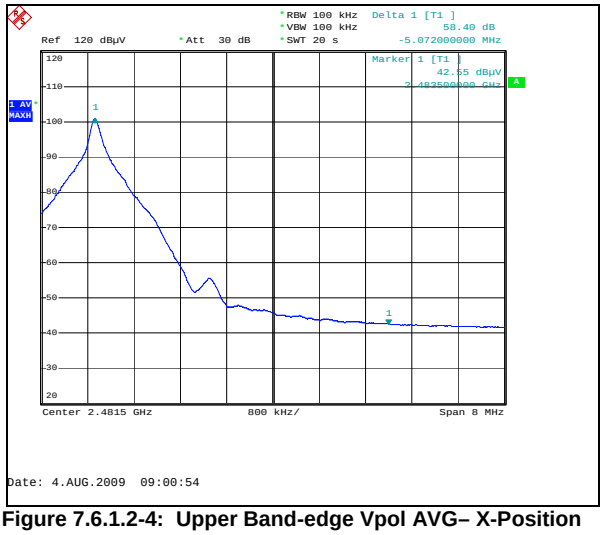


Figure 7.6.1.2-4: Upper Band-edge Vpol AVG– X-Position

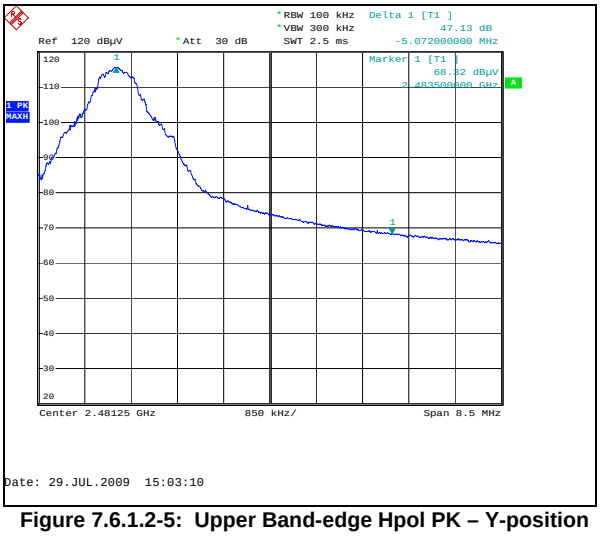


Figure 7.6.1.2-5: Upper Band-edge Hpol PK – Y-position

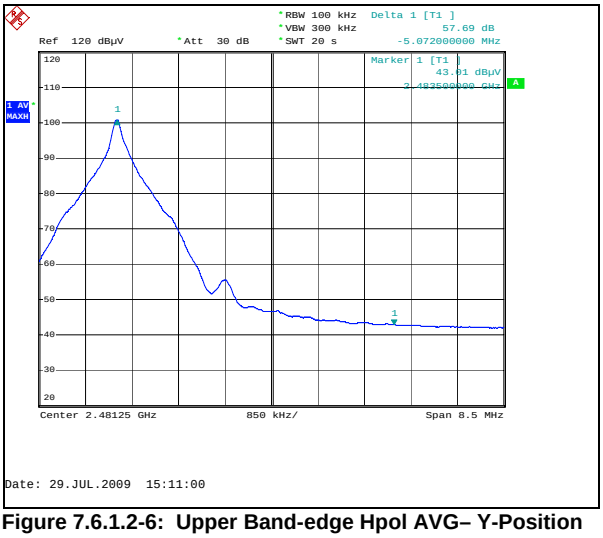


Figure 7.6.1.2-6: Upper Band-edge Hpol AVG– Y-Position

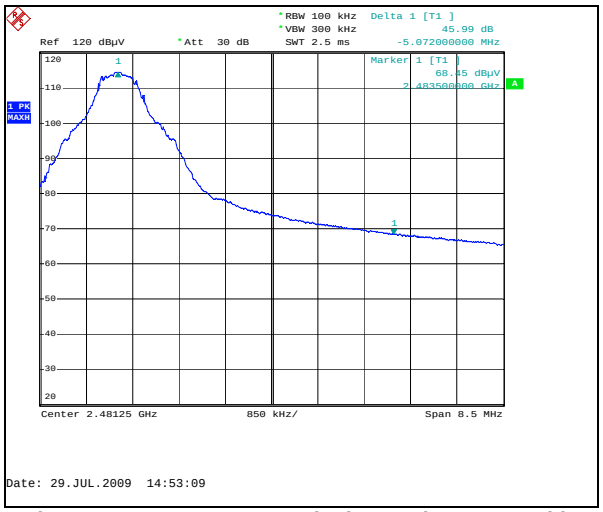


Figure 7.6.1.2-7: Upper Band-edge Vpol PK – Y-position

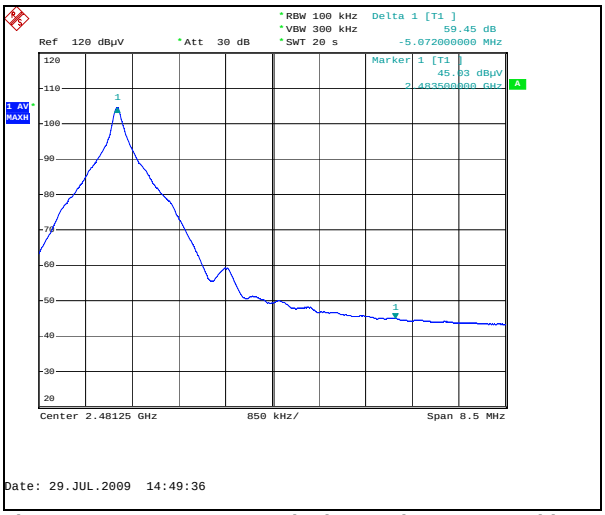


Figure 7.6.1.2-8: Upper Band-edge Vpol AVG– Y-Position

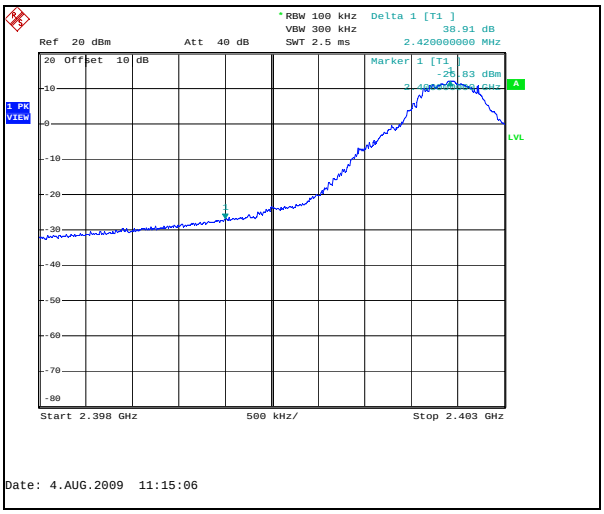


Figure 7.6.1.2-9: Lower Band-edge

7.6.2 RF Conducted Spurious Emissions

7.6.2.1 Test Methodology

The RF Conducted Spurious Emissions were measured in accordance with the FCC KDB Publication No. 558074 “Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)”. The RF output of the equipment under test was directly connected to the input of the Spectrum Analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 25GHz, 10 times the highest fundamental frequency. For each measurement, the spectrum analyzer’s RBW was set to 100 kHz and the VBW was set to 300 kHz. The peak detector and Max Hold function of the analyzer were utilized.

7.6.2.2 Test Results

In a 100 kHz bandwidth, the radio frequency power that was produced by the EUT emissions is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power. RF Conducted Emissions are displayed in Figures 7.6.2.2-1 through 7.6.2.2-9.

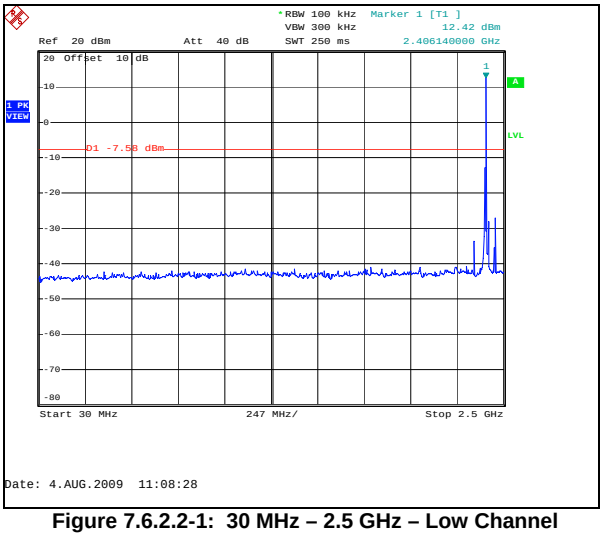


Figure 7.6.2.2-1: 30 MHz – 2.5 GHz – Low Channel

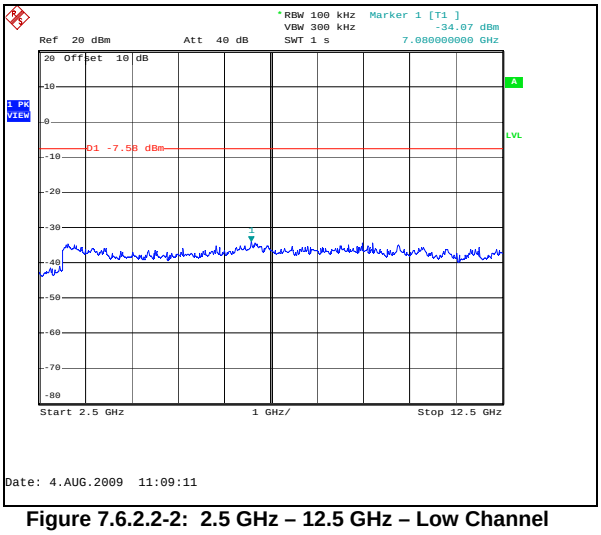


Figure 7.6.2.2-2: 2.5 GHz – 12.5 GHz – Low Channel

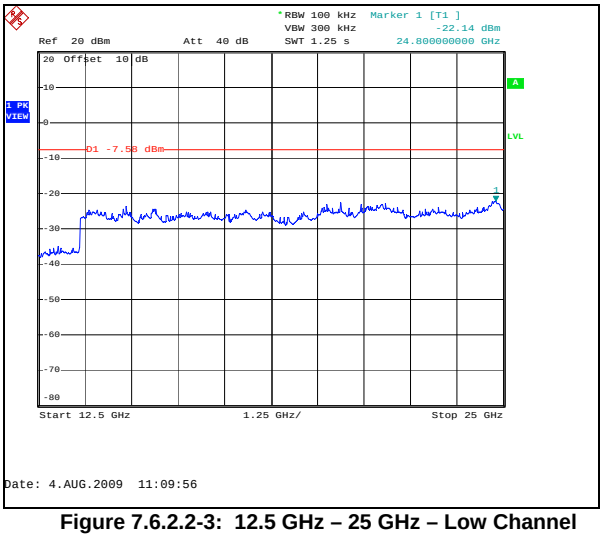


Figure 7.6.2.2-3: 12.5 GHz – 25 GHz – Low Channel

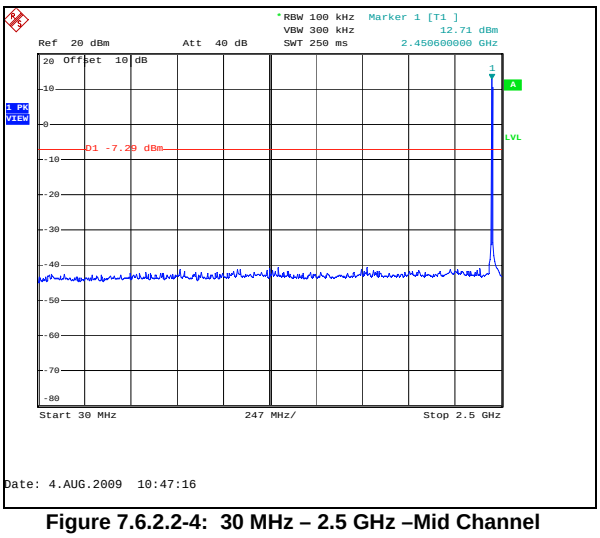


Figure 7.6.2.2-4: 30 MHz – 2.5 GHz –Mid Channel

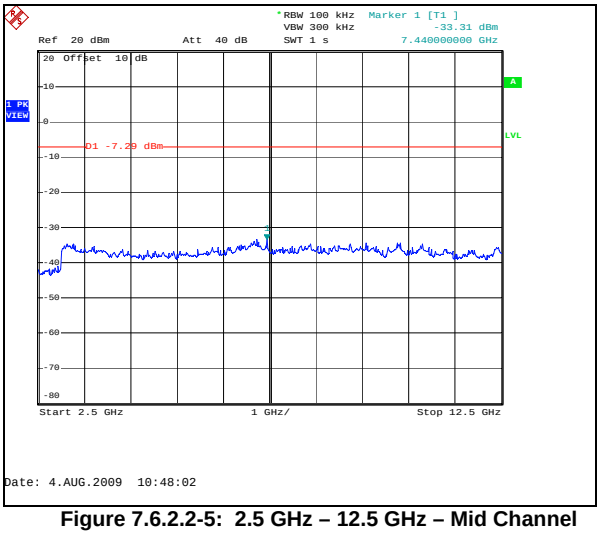


Figure 7.6.2.2-5: 2.5 GHz – 12.5 GHz – Mid Channel

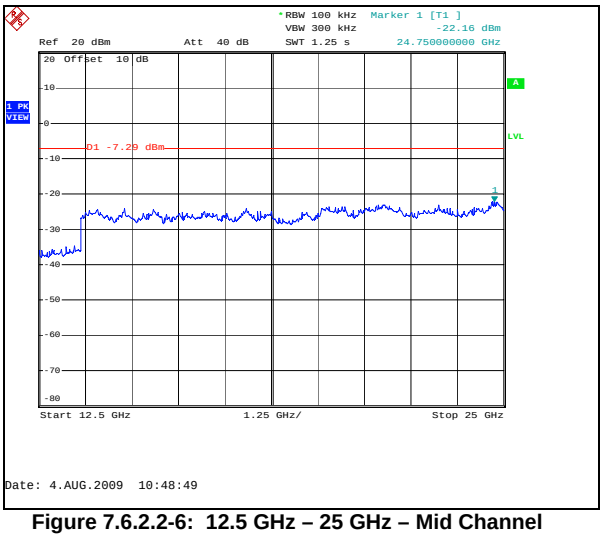


Figure 7.6.2.2-6: 12.5 GHz – 25 GHz – Mid Channel

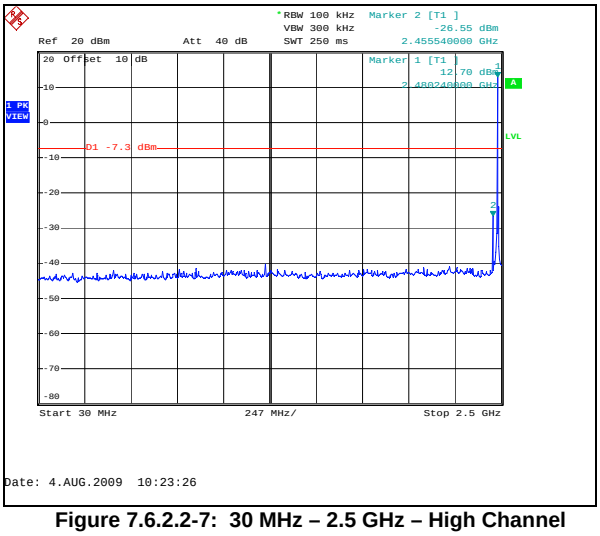


Figure 7.6.2.2-7: 30 MHz – 2.5 GHz – High Channel

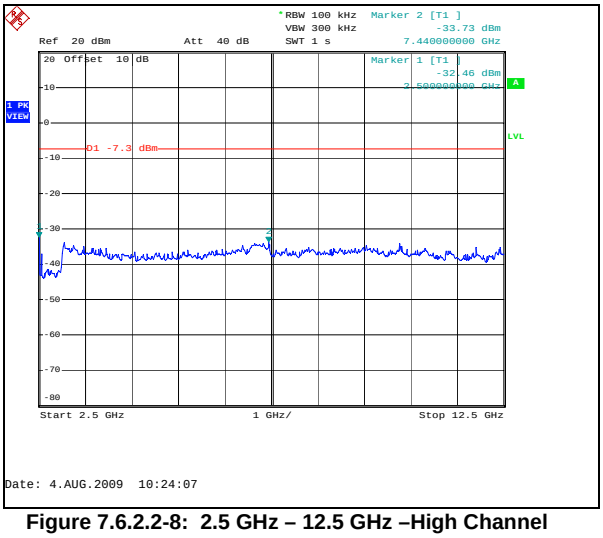


Figure 7.6.2.2-8: 2.5 GHz – 12.5 GHz –High Channel

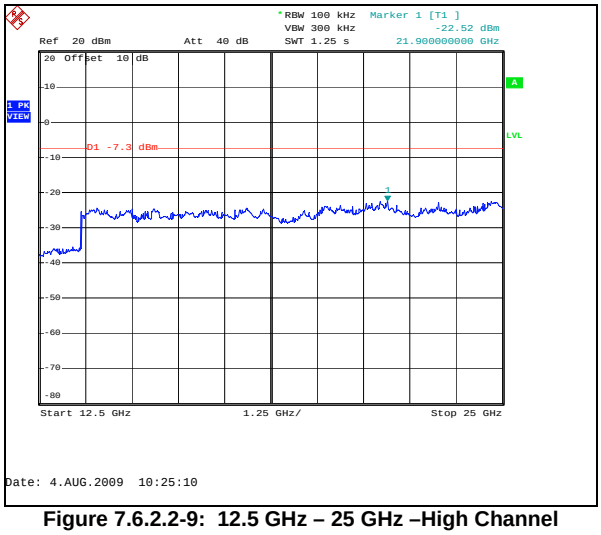


Figure 7.6.2.2-9: 12.5 GHz – 25 GHz –High Channel

7.6.3 Radiated Spurious Emissions (Restricted Bands) - FCC Section 15.205 IC: RSS-210 2.6

7.6.3.1 Test Methodology

Using the procedures set forth in the FCC KDB Publication No. 558074 "Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)", radiated emissions tests were made over the frequency range of 30MHz to 25GHz, 10 times the highest fundamental frequency. Each emission found to be in a restricted band as defined by section 15.205, was compared to the radiated emission limits as defined in section 15.209.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000MHz, peak and average measurements made with RBW and VBW of 1 MHz and 3 MHz respectively.

7.6.3.2 Test Results

Radiated spurious emissions are reported in Tables 7.6.3.2-1 to 7.6.3.2-2.

Table 7.6.3.2-1: Radiated Spurious Emissions – X-Position

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Middle Channel										
4900.9	49.28	39.04	H	3.53	52.81	42.57	74.0	54.0	21.19	11.43
4900.9	46.12	35.00	V	3.53	49.65	38.53	74.0	54.0	24.35	15.47
High Channel										
4956.9	46.91	34.58	H	9.18	56.09	43.76	74.0	54.0	17.91	10.24

Table 7.6.3.2-2: Radiated Spurious Emissions – Y-Position

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Middle Channel										
4900.84	46.70	35.25	H	3.53	50.23	38.78	74.0	54.0	23.77	15.22
4900.84	47.55	37.34	V	3.53	51.08	40.87	74.0	54.0	22.92	13.13
High Channel										
4956.9	47.46	36.78	V	3.74	51.20	40.52	74.0	54.0	22.80	13.48

7.6.3.3 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T = Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
R_U = Uncorrected Reading
R_C = Corrected Level
AF = Antenna Factor
CA = Cable Attenuation
AG = Amplifier Gain
DC = Duty Cycle Correction Factor

Example Calculation: Peak

Corrected Level: 49.28 + 3.53 = 52.81dBuV/m
Margin: 74dBuV/m – 52.81dBuV/m = 21.19dB

Example Calculation: Average

Corrected Level: 39.04 + 3.53 – 0 = 42.57dBuV
Margin: 54dBuV – 42.57dBuV = 11.43dB

7.7 Peak Power Spectral Density- FCC Section 15.247(e) IC: RSS-210 A8.2(b)

7.7.1 Test Methodology

The power spectral density was measured in accordance with the FCC KDB Publication No. 558074 "Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)". The emission peaks within the pass band were located and zoomed in on. The spectrum analyzer RBW was set to 3 kHz and VBW 10 kHz. Span was adjusted to 100 kHz and the sweep time was calculated to be 34s (Span/3 kHz).

7.7.2 Test Results

Results are shown below in table 7.7.2-1 and figures 7.7.2-1 – 7.7.2-3:

Table 7.7.2-1: Peak Power Spectral Density

Frequency (MHz)	PSD Level (dBm)
2402	3.45
2450	3.46
2478	3.70

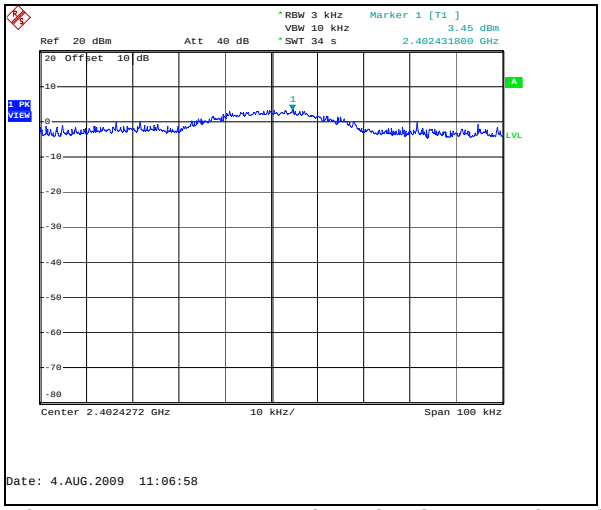


Figure 7.7.2-1: Power Spectral Density Plot – Low Channel

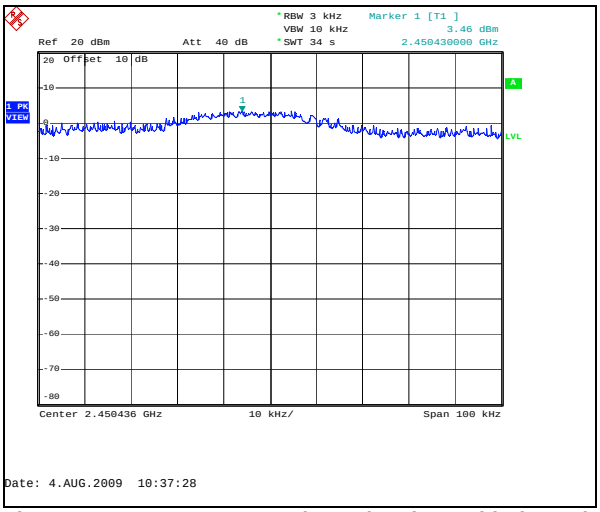


Figure 7.7.2-2: Power Spectral Density Plot – Mid Channel

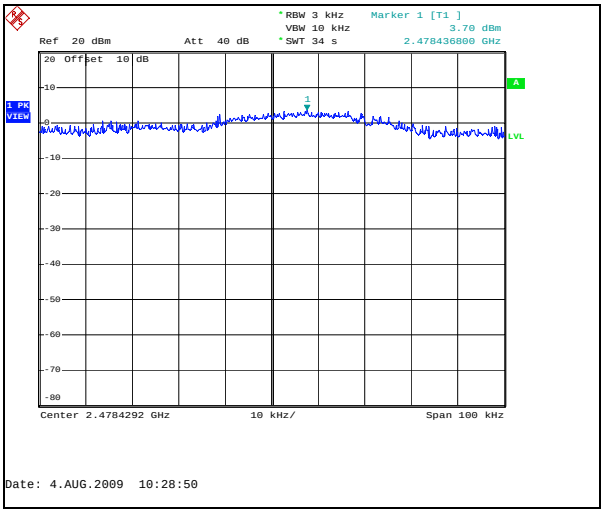


Figure 7.7.2-3: Power Spectral Density Plot – High Channel

8.0 CONCLUSION

In the opinion of ACS, Inc. the GR2100a, manufactured by TeraHop Networks, Inc. meets the requirements of FCC Part 15 subpart C.

END REPORT