

TEST RESULT SUMMARY

**FCC Part 15 Subpart C Section 15.247
Industry Canada RSS-210 Issue 8**

AS/NZS 4268: 2012 (see page 3)

Radiated emissions of an 802.11 b/g/n module (with modular certification FCC ID: XF6-RS9110N1102, IC: 8407A-91101102) installed in model RE338096 GSIX integrated premium server with a new PCB antenna.

MANUFACTURER	Deere & Company One John Deere Place Moline IL 61265
DESCRIPTION OF EQUIPMENT	Wireless router for agricultural tractor
NAME OF EQUIPMENT	Multi-Functional Controller, Integrated Premium Vehicle Server (IPVS)
MODEL NUMBER(S) TESTED	RE338096
SERIAL NUMBER(S) TESTED	400009
TEST REPORT NUMBER	NC1303687.3 Rev B
TEST DATE(S)	25 April - 21 May 2013

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable requirements of FCC Part 15 Subpart C Section 15.247 "Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz", and Industry Canada RSS-210 Issue 8 "Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment".


It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

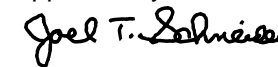
Date: 27 September 2013

Tested by:

Approved by:

Location: Taylors Falls MN
USA


Greg Jakubowski
Senior EMC Technician


Joel T Schneider
Senior EMC Engineer

Not Transferable

EMC TEST REPORT

Test Report No. NC1303687.3 Rev B Date of issue: 27 September 2013

Product Description Wireless router for agricultural tractor

Product Name Multi-Functional Controller, Integrated Premium Vehicle Server (IPVS)

Model No(s) Tested RE338096

Serial No(s) Tested 400009

Manufacturer Deere & Company

Address One John Deere Place
Moline IL 61265

Test Result Positive Negative

TÜV SÜD America's Oakwood Lab maintains A2LA accreditation to ISO/IEC 17025 for the specific tests listed in A2LA Certificate #2955.10 as an Electrical Testing Laboratory. A portion of the test results included in this report, however, are not covered by this accreditation. Testing performed at the Wild River Lab's are covered under NVLAP Accreditation #200696-0. This report shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal government.

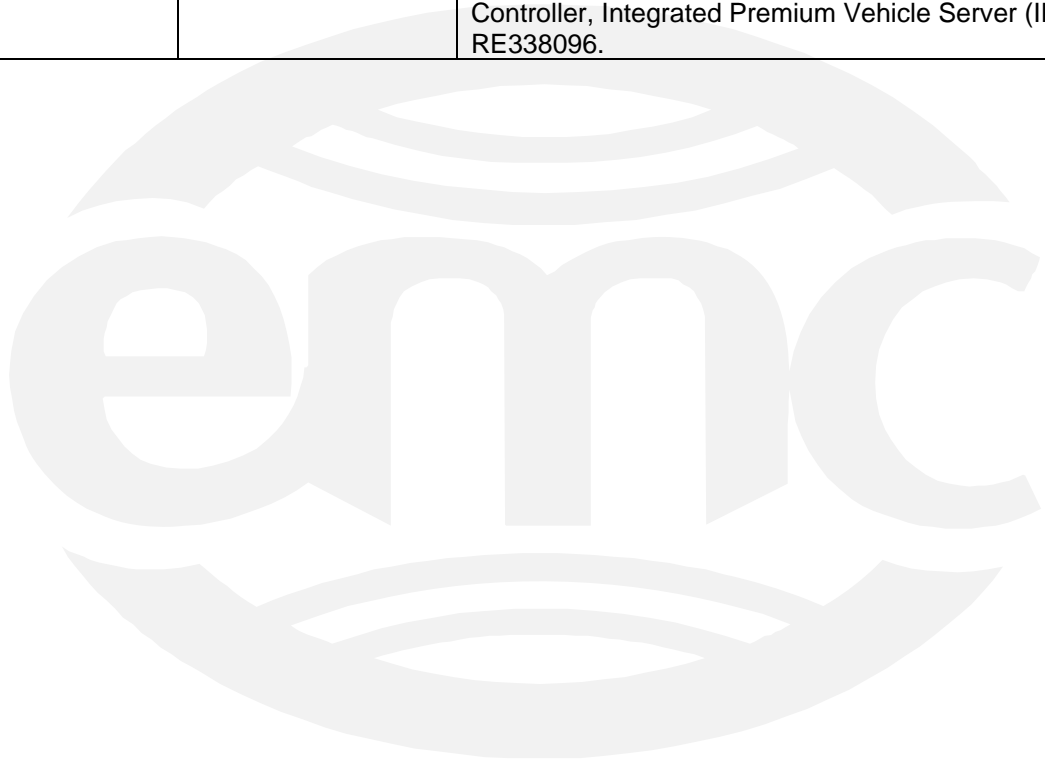
TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

TÜV SÜD America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	29	19 June 2013	Initial Release
A	29	27 August 2013	Page 1 and corresponding Test Result Summary: Changed company name from Phoenix International Corporation to Deere & Company. Changed address from 1750 NDSU Research Park Drive; Fargo ND 58102 to One John Deere Place, Moline IL 61265.
B	29	27 September 2013	Page 1 and corresponding Test Result Summary: Corrected the Equipment Name and Model Number to Multi-Functional Controller, Integrated Premium Vehicle Server (IPVS) and RE338096.



TEST REPORT CONTENTS

	Page(s)
Revision Record	<u>2</u>
Directory	<u>3</u>
Test Regulations	<u>4</u>
Environmental Conditions	<u>4</u>
Power Supply	<u>4</u>
Test Equipment Traceability	<u>4</u>
Test Information	
Antenna gain < 6 dBi	FCC §15.247(b)(4) <u>5 - 6</u>
Radiated Emissions	FCC §15.247(d), IC RSS-210 A8.5 <u>7 - 14</u>
Test-setup Photos	<u>15 - 17</u>
Equipment Under Test Information	<u>18</u>
General Remarks, Deviations, Summary	<u>19</u>
Appendix A	
Constructional Data Form	<u>20 - 27</u>
Appendix B	
Measurement Protocol	<u>28 - 29</u>

AS/NZS 4268
 Row 45A

Class of transmitter Digital modulation transmitters (see Note 5)
 This class of transmitter includes devices previously covered by the Spread Spectrum Devices Standard AS/NZS 4771:2000. Direct sequence spread spectrum devices fall under the class of digital modulation transmitters, along with other wideband digital modulation technologies such as OFDM. Frequency hopping spread spectrum devices fall under the class of frequency hopping transmitters. These classes derive from FCC Rules section 15.247; however different frequency limits and radiated power levels apply as in AS/NZS 4771:2000. In the case of transmitters operating in the frequency band 2400–2483.5 MHz the requirement also encompasses devices covered by AS/NZS 4771:2000 that meet the requirements of ETSI EN 300 328 V1.7.1. A compliant test report to ETSI EN 300 328 V1.7.1 shall be sufficient to show compliance of a transmitter or receiver with the requirements of this Standard (AS/NZS 4268). A compliant test report to FCC Rules section 15.247 with additional testing to acquit the variations to frequency limits and radiated power levels as detailed in this standard shall be sufficient to show compliance of a transmitter or receiver with the requirements of this Standard (AS/NZS 4268).

Permitted operating frequency band (MHz) (lower limit exclusive, upper limit inclusive) 2 400 to 2 483.5

Maximum EIRP 4 W

Transmitter spurious emissions (EIRP) Refer to Note 4.

In any 100 kHz bandwidth outside the frequency band in which the transmitter is operating, the power 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.

Other requirements Refer to Notes 2 and 3.

The radiated peak power spectral density in any 3 kHz is limited to 25 mW per 3 kHz.

The minimum 6 dB bandwidth shall be at least 500 kHz.

EMC TEST REGULATIONS:

The tests were performed according to the following regulations:

- FCC Part 15 Subpart C Sections 15.247(b)(4) & (d) ^{1,2}
- Industry Canada RSS-210 Issue 8 Section A8.5 ^{1,3}

¹ Testing covered under A2LA Certificate #2955.10

² Testing covered under NVLAP Accreditation #200696-0

³ Prior version of Test Method is listed on NVLAP Lab Code #100271-0 Scope of Accreditation; Scope Expansion has been/is being requested.

⁴ Test Method not covered under A2LA Certificate #2955.10, Scope Expansion has been/is being requested.

ENVIRONMENTAL CONDITIONS IN THE LAB

	<u>Actual</u>
Temperature:	: 22-24°C
Atmospheric pressure	: 98-99 kPa
Relative Humidity	: 36-48%

POWER SUPPLY UTILIZED

Power supply system : 14 VDC

TEST EQUIPMENT

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

SIGN EXPLANATIONS

- not applicable
- applicable.

Antenna gain
 FCC 15.247(b)(4)

Test summary

The requirements are: - MET - NOT MET
 The PCB antenna, in the direction of maximum gain, is 1 dBi

Test location

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab Medium Test Site (Open Area Test Site)

Test equipment

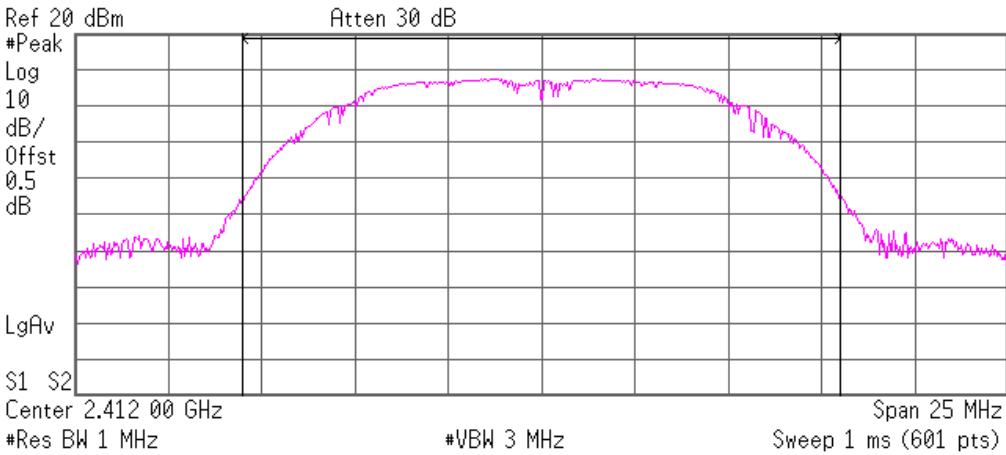
TUV ID	Model	Manufacturer	Description	Serial	Cal Due
OWLE02074	3115	EMCO	Ridge Guide Antenna	2504	07-Mar-14
WRLE03371	E4440A	Agilent	Spectrum Analyzer	MY43362222	06-Nov-13
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	18-Dec-13
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	18-Dec-13

Test limit
 6 dBi

Test data

Conducted channel power

* Agilent 16:06:25 Apr 25, 2013



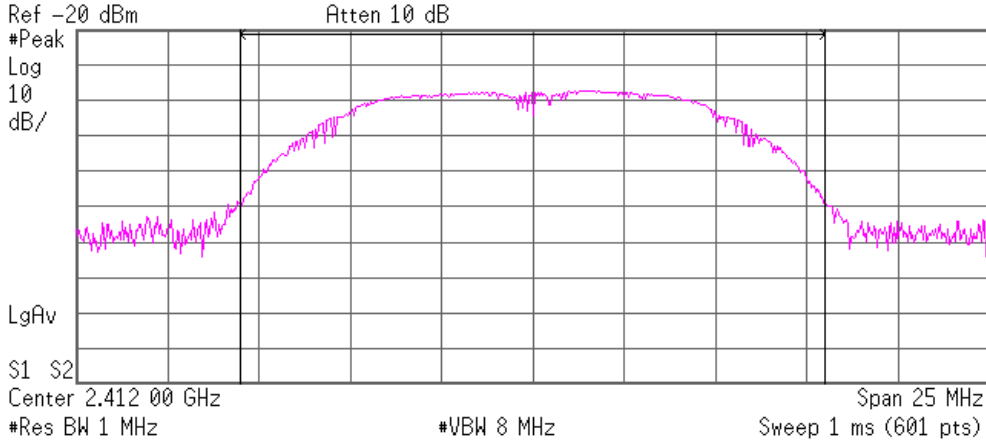
Channel Power
 16.08 dBm /16.0000 MHz

Power Spectral Density
 -55.97 dBm/Hz

Radiated channel power at 3 meters

Fundamental maximized (EUT rotated 360 degrees, measurement antenna vertical & horizontal, 1 – 4 meters high)

* Agilent 11:30:12 Apr 30, 2013



Channel Power

-28.80 dBm /16.0000 MHz

Power Spectral Density

-100.84 dBm/Hz

$-28.8\text{dBm} + 107 = 78.2\text{dBuV} + 28.3\text{dB ACF} + 5.8\text{dB coax attenuation} = 112.3\text{dBuV/m @ 3m}$
 $112.3\text{ dBuV/m @ 3m} - 95.2 = 17.1\text{ dBm} / 16\text{ MHz EIRP}$
Antenna gain = $17.1\text{ dBm} - 16.1\text{ dBm} = 1.0\text{ dBi}$



Maximum Unwanted Emission Levels
FCC 15.247(d), IC RSS-210 A8.5

Test summary

The requirements are: ■ - MET □ - NOT MET

Testing was performed in accordance with FCC KDB Publication 558074 and ANSI C63.4: 2009.

Maximum unwanted conducted emission is on file with the FCC.

Maximum unwanted average radiated emission above 1 GHz is 43.46 dBµV/m (148.9 µV/m) at 3 meters with average detector at 1.375 GHz.

Maximum unwanted peak radiated emission above 1 GHz is 48.47 dBµV/m (265.1 µV/m) at 3 meters with peak detector at 4.824 GHz.

Maximum unwanted QP radiated emission into a restricted frequency band below 1 GHz is 44.46 dBµV/m (167.1 µV/m) at 3 meters with QP detector at 972 MHz

Maximum unwanted QP radiated emission below 1 GHz is 38.67 dBµV/m (85.8 µV/m) at 3 meters with QP detector at 375.006 MHz

Test location

- - Oakwood Lab (Open Area Test Site)
- - Wild River Lab Large Test Site (Open Area Test Site)

Test distance – radiated emissions

- - 3 meters
- - 0.3 meters

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE03995	EM-6917B	Electro-Metrics	Biconicalog Periodic	151	07-Jun-13
WRLE02673	85662A	Hewlett-Packard	Analyzer Display	2152A03687	30-May-13
WRLE03294	8566B	Hewlett-Packard	Spectrum Analyzer	2349A03098	30-May-13
OWLE02684	85650A	Hewlett-Packard	Quasi-Peak Adapter	2521A01006	28-Jun-13
WRLE02670	8447D	Hewlett-Packard	Preamplifier	2443A03954	Code B 11-Jan-14
WRLE03997	EWT-14-0066	EWT	2.4 GHz Notch filter	E2	Code B 08-Jan-14
WRLE10863	N/A	TÜV SÜD America Inc	Test Companion Software Version 3.4.71	N/A	Code Y
WRLE10527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B 08-Jan-14
WRLE03229	3115	Electro-Mechanics (EMCO)	Ridge Guide Antenna	2483	16-Aug-13
WRLE03978	SL26-3010	Phase One Microwave	Amplifier 18-26.5 GHz	0005	Code B 02-Jan-14
OWLE03996	SAS-572	A.H. Systems	STD Gain Horn	183	Code Y
WRLE03371	E4440A	Agilent	Spectrum Analyzer	MY43362222	06-Nov-13

Code B = Calibration verification performed internally. Code Y = Calibration not required when used with other calibrated equipment

Test limits;

Conducted out of band emissions -20 dBc

Radiated emissions into restricted bands, Subpart B Class B

Frequency (MHz)	Field strength (µV/meter)	Field strength (dBµV/meter)
30 - 88	100, QP	40.0
88 - 216	150, QP	43.5
216 - 960	200, QP	46.0
Above 960	500, QP	54.0
> 1000	500, AV 5000, PK	54.0 74.0

Unwanted radiated emissions including restricted frequency bands

Measurement summary for limit2: FCC 15.247 >1GHz 3m av (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC 15.247 >1GHz 3m av
1.375 GHz	52.99 Av	3.44 / 25.78 / 38.88 / 0.12	43.46	V / 1.00 / 0	-10.54
4.824 GHz	40.75 Av	6.99 / 33.16 / 40.72 / 1.05	41.22	V / 1.33 / 274	-12.78
2.268 GHz	49.71 Av	4.7 / 28.1 / 42.33 / 0.74	40.92	V / 1.00 / 90	-13.08
3.726 GHz	43.45 Av	6.0 / 31.9 / 41.56 / 1.12	40.92	V / 1.00 / 142	-13.08
1.134 GHz	50.3 Av	3.15 / 26.32 / 39.43 / 0.1	40.45	H / 1.00 / 135	-13.55
4.874 GHz	40.06 Av	7.02 / 33.24 / 40.76 / 0.0	39.56	V / 1.30 / 276	-14.44
4.924 GHz	38.29 Av	7.06 / 33.31 / 40.79 / 0.0	37.87	V / 1.34 / 278	-16.13

Average measurements made with 1 MHz RBW/10 Hz VBW, rf absorbing material on OATS floor between eut and antenna

- 4.824 GHz reading – Channel 1, 1 Mb/s
- 4.874 GHz reading – Channel 6, 1 Mb/s
- 1.375 GHz reading – Channel 1, 1 Mb/s
- 3.726 GHz reading – Channel 1, 7.2 Mb/s

Measurement summary for limit1: FCC 15.247 >1G 3m pk (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 >1G 3m pk
4.824 GHz	48.0 Pk	6.99 / 33.16 / 40.72 / 1.05	48.47	V / 1.33 / 274	-25.53
4.874 GHz	48.1 Pk	7.02 / 33.24 / 40.76 / 0.0	47.6	V / 1.30 / 276	-26.4
1.375 GHz	56.25 Pk	3.44 / 25.78 / 38.88 / 0.12	46.72	V / 1.00 / 0	-27.28
4.924 GHz	46.1 Pk	7.06 / 33.31 / 40.79 / 0.0	45.68	V / 1.34 / 278	-28.32
3.726 GHz	48.0 Pk	6.0 / 31.9 / 41.56 / 1.12	45.47	V / 1.00 / 142	-28.53
2.268 GHz	54.15 Pk	4.7 / 28.1 / 42.33 / 0.74	45.36	V / 1.00 / 90	-28.64
1.134 GHz	53.65 Pk	3.15 / 26.32 / 39.43 / 0.1	43.8	H / 1.00 / 135	-30.2

Peak measurements made with 1 MHz RBW/1 MHz VBW, rf absorbing material on OATS floor between eut and antenna

Spurious emissions scan 1 - 25 GHz
Fundamental set on channels 1, 6, & 11 (low, mid, high). Continuous on. Maximum power (GC 55)
Data rates are 1, 6, & 7.5 Mbps (worst case determined during original module testing)
1 Mbps = 802.11b protocol, 6Mbps = 802.11g, 7.2 Mbps = 802.11n
Worst case of 3 orthogonal positions is flat per run 6

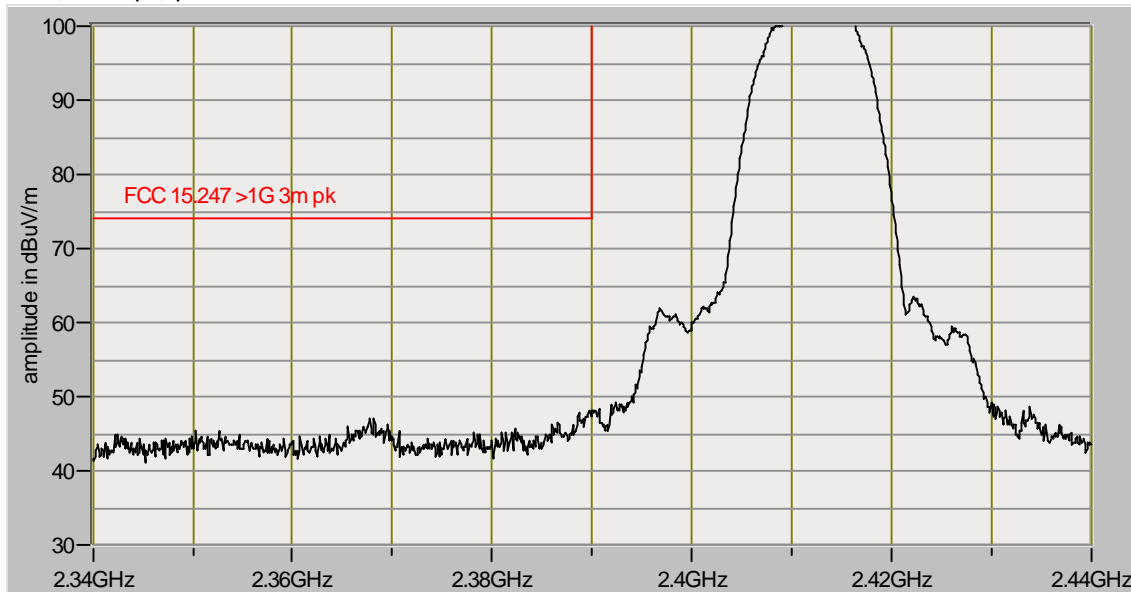
Measurement summary for limit1: FCC 15.209 <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.209 <1GHz 3m
375.006 MHz	48.93 Qp	1.85 / 15.18 / 27.32 / 0.03	38.67	V / 2.03 / 5	-7.33
972.0 MHz	45.11 Qp	2.99 / 22.96 / 26.68 / 0.09	44.46	H / 1.15 / 192	-9.54
400.014 MHz	42.3 Qp	1.91 / 15.9 / 27.39 / 0.04	32.76	V / 1.80 / 0	-13.24
350.022 MHz	41.15 Qp	1.78 / 14.7 / 27.23 / 0.03	30.43	V / 2.03 / 5	-15.57
625.027 MHz	34.4 Qp	2.46 / 19.9 / 27.19 / 0.06	29.63	V / 1.00 / 180	-16.37
216.011 MHz	44.6 Qp	1.41 / 10.87 / 27.31 / 0.02	29.59	V / 1.00 / 270	-16.41
384.006 MHz	37.85 Qp	1.87 / 15.44 / 27.35 / 0.03	27.85	V / 2.03 / 5	-18.15
408.012 MHz	36.2 Qp	1.93 / 15.74 / 27.32 / 0.04	26.59	V / 1.80 / 180	-19.41
550.02 MHz	31.9 Qp	2.28 / 18.5 / 27.11 / 0.05	25.62	H / 1.80 / 0	-20.38
358.422 MHz	34.75 Qp	1.8 / 14.7 / 27.26 / 0.03	24.02	V / 2.03 / 5	-21.98
168.011 MHz	33.95 Qp	1.22 / 8.9 / 27.44 / 0.01	16.65	V / 1.00 / 0	-26.85

Radiated band edge, 3m distance

Test Report #:	NC1303687	Test area:	LTS		
EUT model #:	RE338096	Date:	21 May 2013		
EUT serial #:	400009	EUT power:	14Vdc	Temp:	23°C
Test Method:	FCC Pt 15 subpart C	Air press.:	98.0 kPa		
Customer:	John Deere	Rel. Humidity:	48 %		
EUT Description:	GSIX integrated premium server				
Notes:	802.11b = 1Mbps, 802.11g = 6Mbps, 802.11n=7.2Mbps. Max power, GC 55.				

Ch 1, 1 Mbps, peak



RBW 1 MHz

VBW 1 MHz

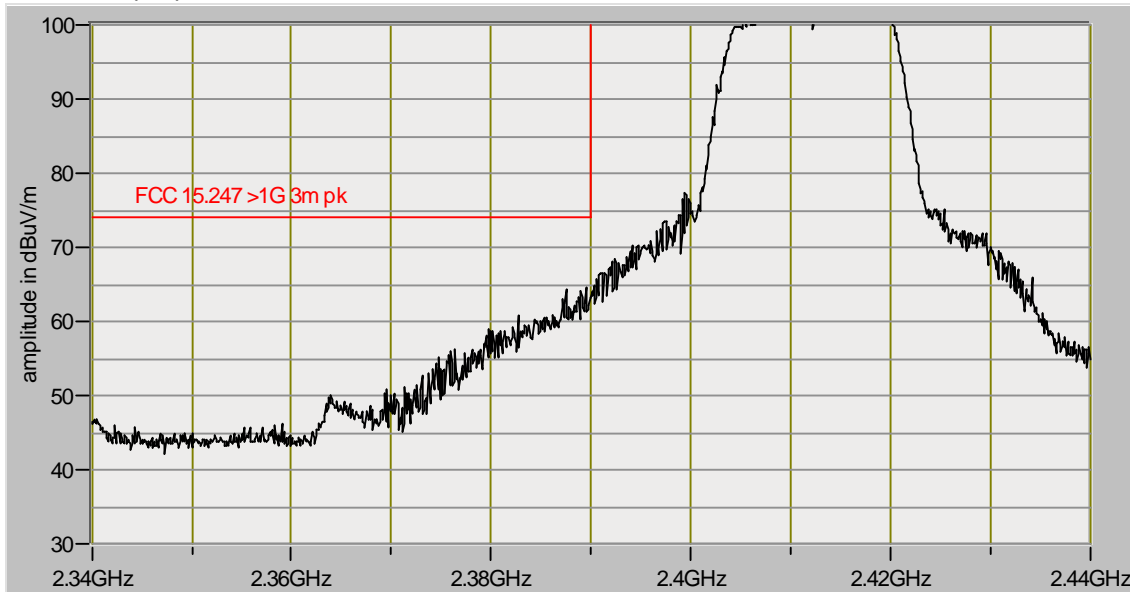
Ch 1, 1 Mbps, avg



RBW 1 MHz

VBW 10 Hz

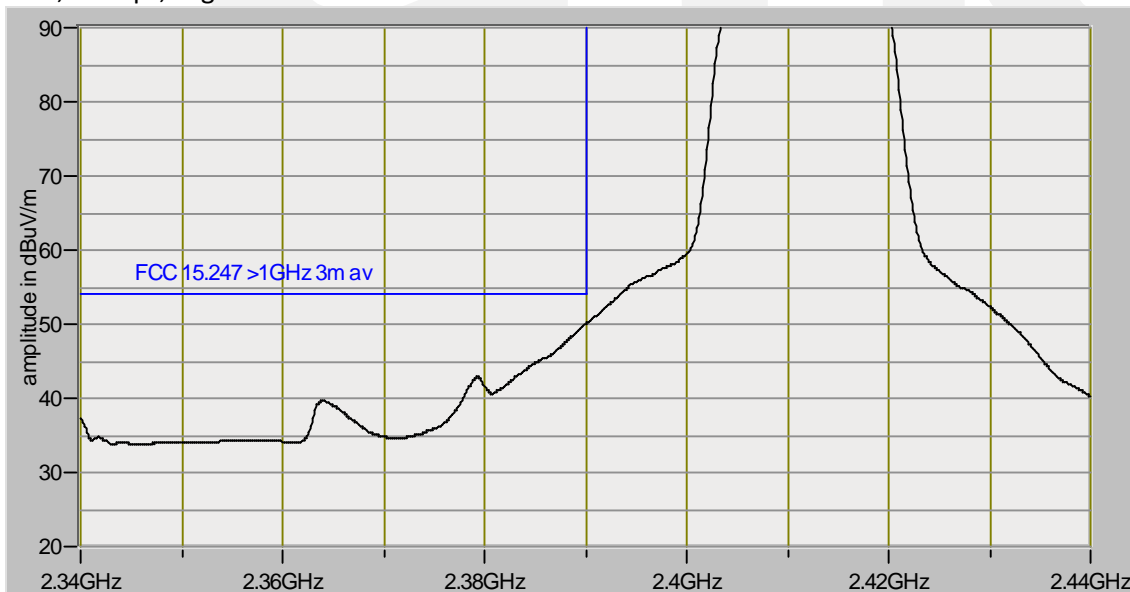
Ch 1, 6 Mbps, peak



RBW 1 MHz

VBW 1 MHz

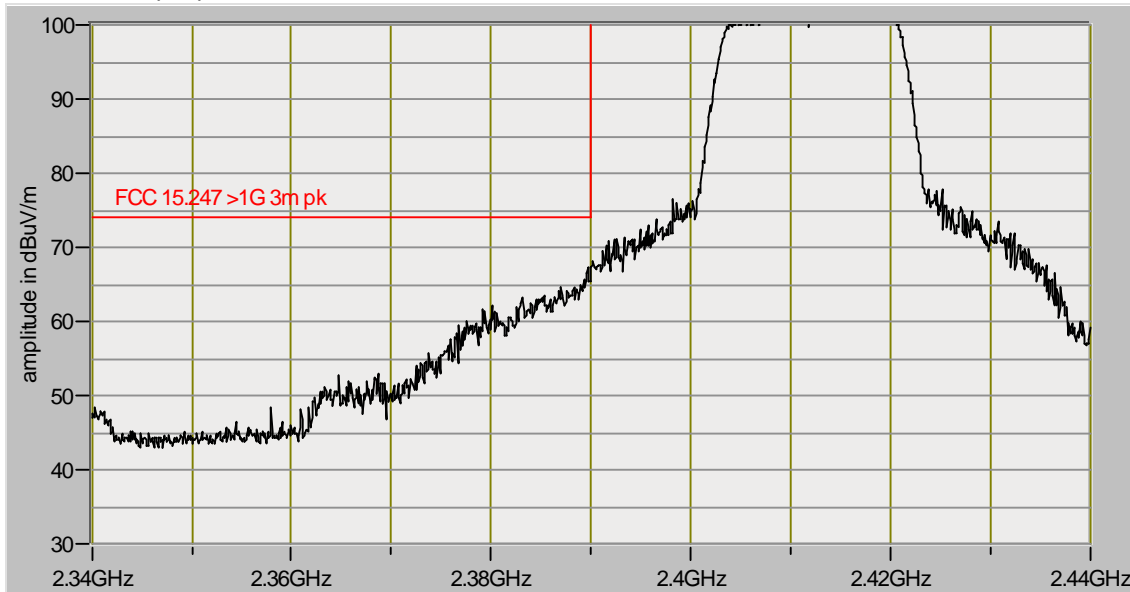
Ch 1, 6 Mbps, avg



RBW 1 MHz

VBW 10 Hz

Ch 1, 7.2 Mbps, peak



RBW 1 MHz

VBW 1 MHz

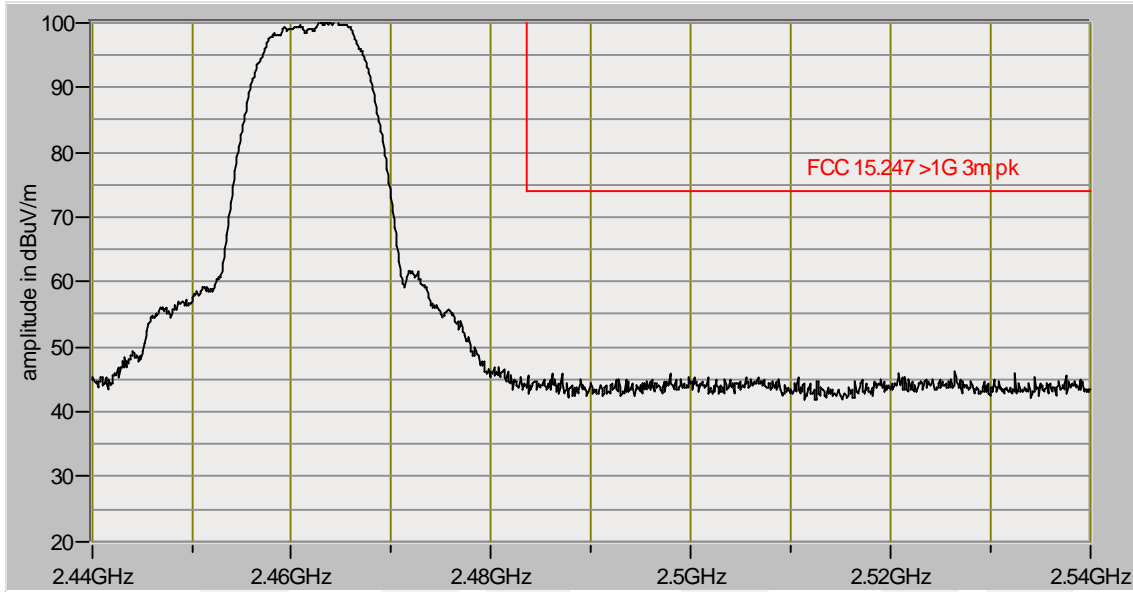
Ch 1, 7.2 Mbps, avg



RBW 1 MHz

VBW 10 Hz

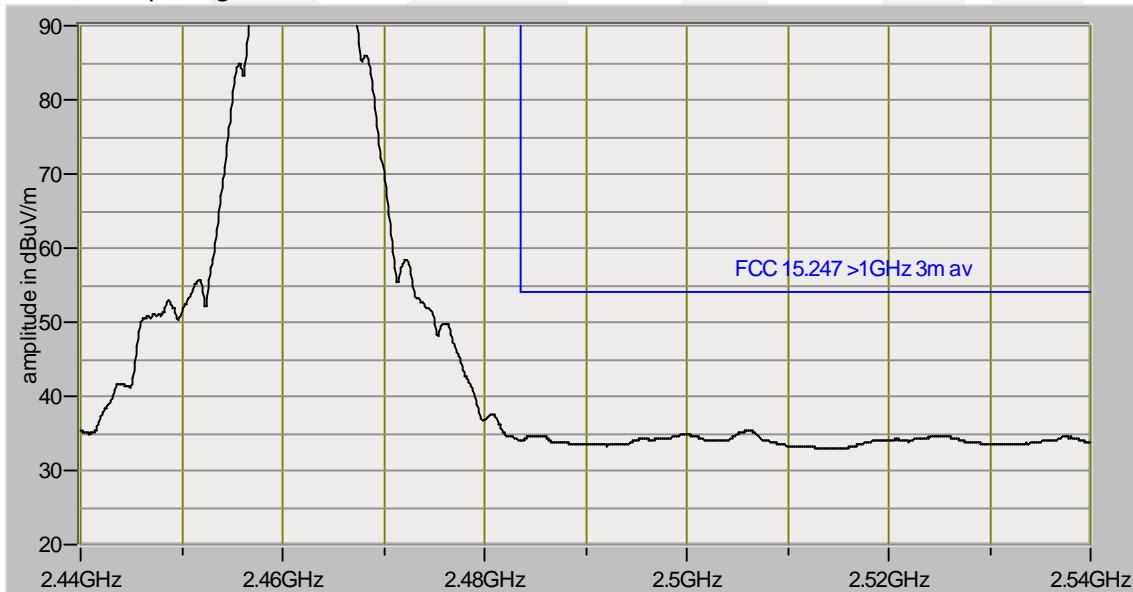
Ch 11, 1 Mbps, peak



RBW 1 MHz

VBW 1 MHz

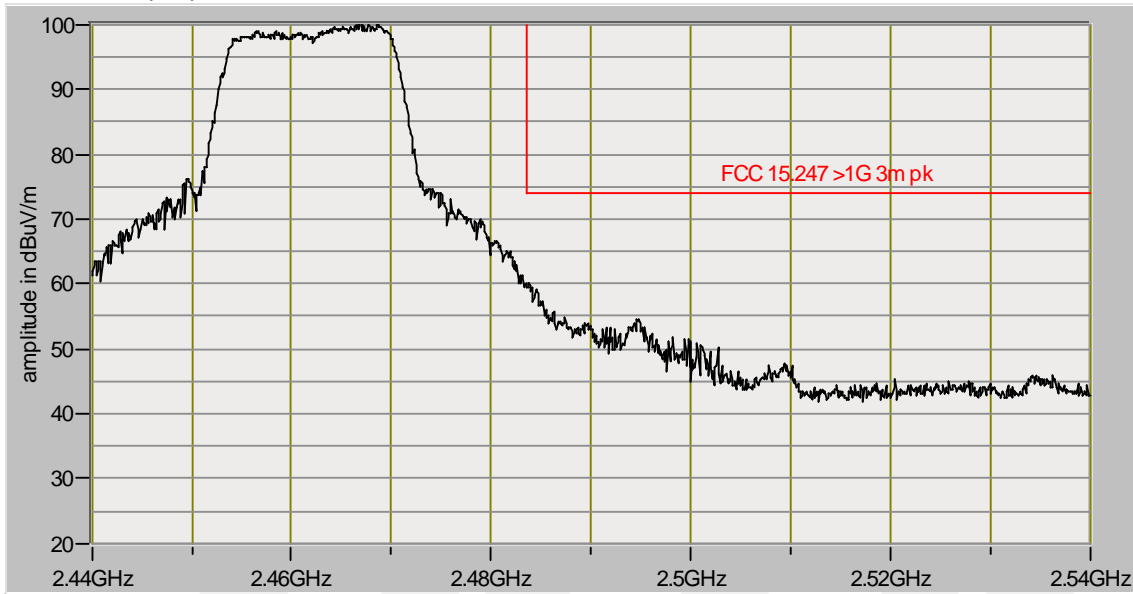
Ch 11, 1 Mbps, avg



RBW 1 MHz

VBW 10 Hz

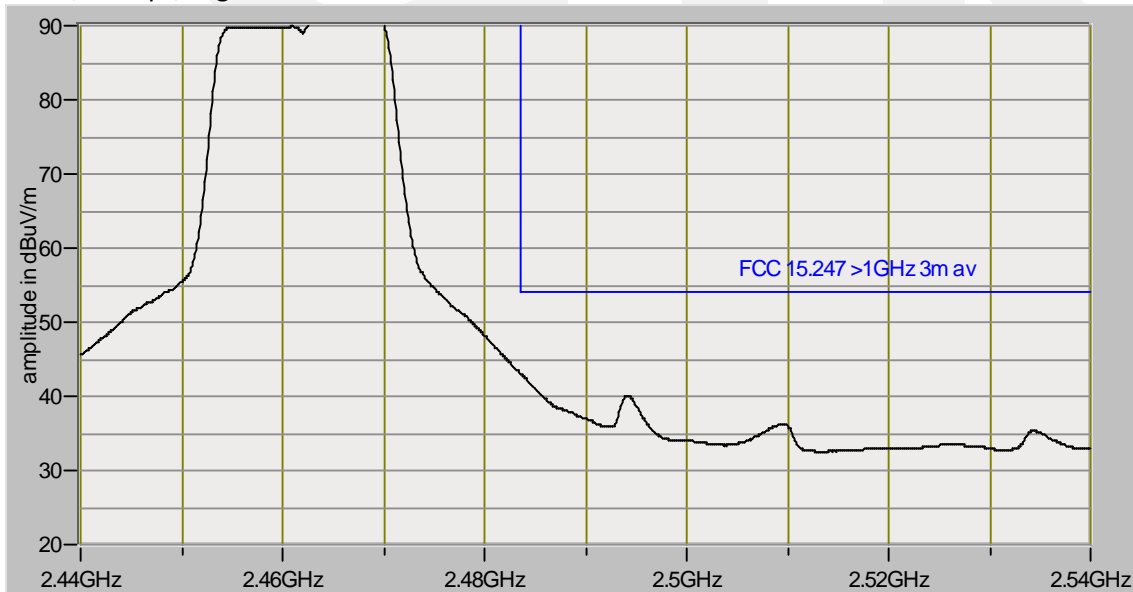
Ch 11, 6 Mbps, peak



RBW 1 MHz

VBW 1 MHz

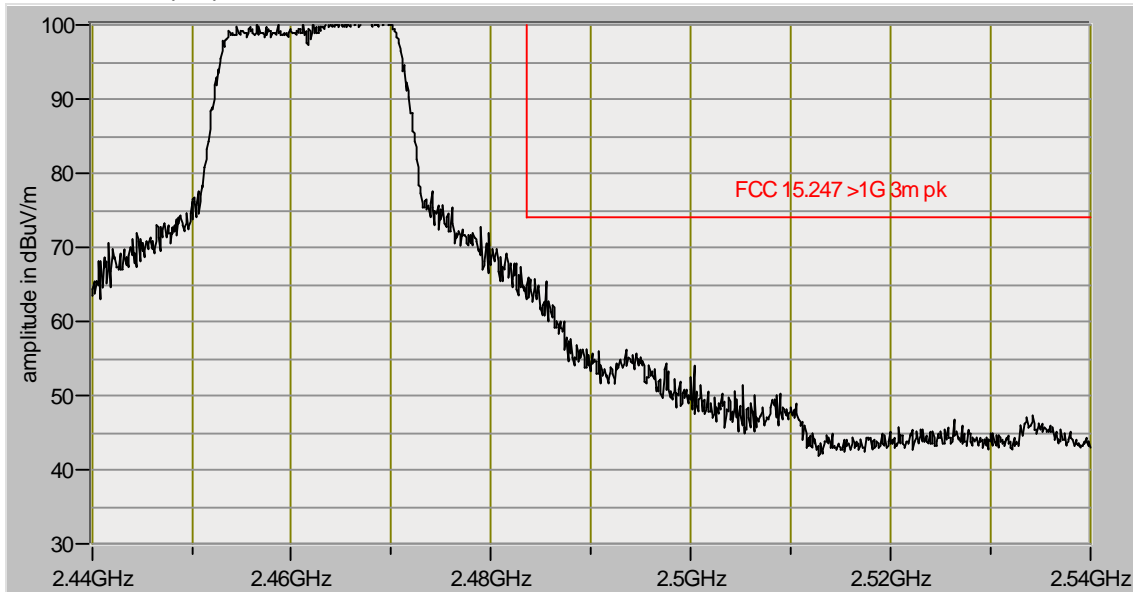
Ch 11, 6 Mbps, avg



RBW 1 MHz

VBW 10 Hz

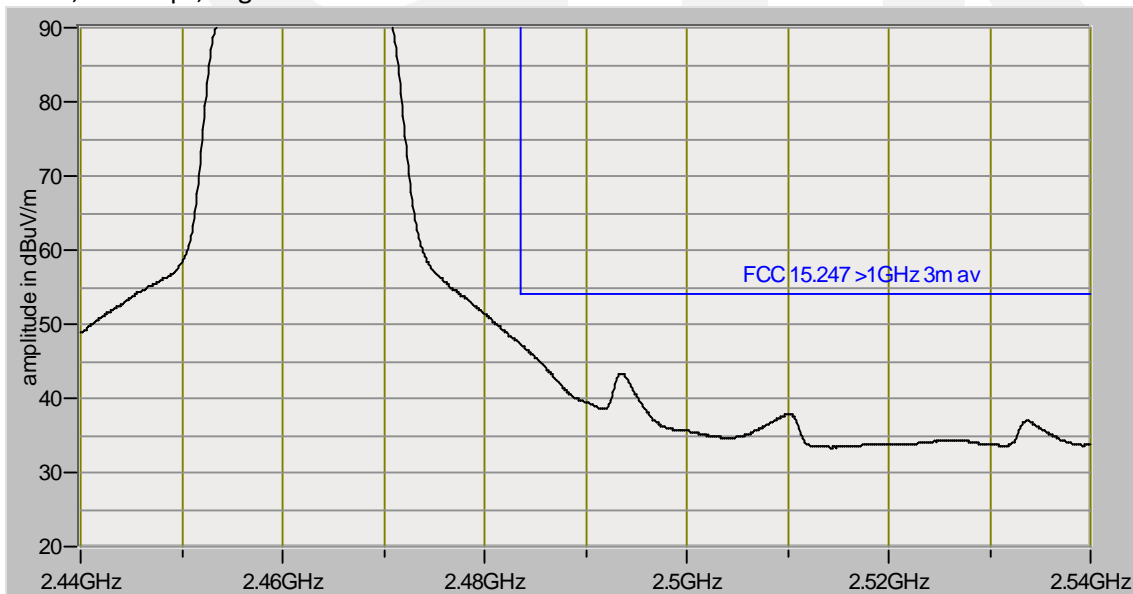
Ch 11, 7.2 Mbps, peak



RBW 1 MHz

VBW 1 MHz

Ch 11, 7.2 Mbps, avg



RBW 1 MHz

VBW 10 Hz

Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during emissions testing:

- Standby
- Test program (H - Pattern)
- Test program (color bar)
- Test program (customer specific)
- Practice operation
- Normal Operating Mode
- Fundamental set on channels 1, 6, & 11 (low, mid, high). Continuous on. Maximum power (GC 55)

Data rates are 1, 6, & 7.5 Mbps (worst case determined during original module testing)

1 Mbps = 802.11b protocol, 6Mbps = 802.11g, 7.2 Mbps = 802.11n

Configuration of the device under test:

- See Constructional Data Form and Block Diagram in Appendix A
- See Product Information Form in Appendix B

GENERAL REMARKS:

None

Modifications required to pass:

- None
- As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

- None
- As indicated in the Test Plan

SUMMARY:

The requirements according to the technical regulations are

- met and the equipment under test does fulfill the general approval requirements.
- **not** met and the equipment under test does **not** fulfill the general approval requirements.

EUT Received Date: 25 April 2013
Condition of EUT: Normal
Testing Start Date: 25 April 2013
Testing End Date: 21 May 2013

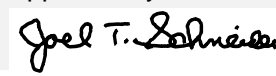
TÜV SÜD AMERICA INC

Tested by:



Greg Jakubowski
Senior EMC Technician

Approved by:



Joel T Schneider
Senior EMC Engineer

Appendix A

Constructional Data Form



Form



EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company: Deere & Company
Address: One John Deere Place
Moline IL 61265
Contact: Orrin West Position: System Engineer
Phone: 701/552-8537 Fax: 701/552-8592
E-mail Address: westorrib@johndeere.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description Wireless Router
EUT Name Multi-Functional Controller, Integrated Premium Vehicle Server (IPVS)
Model No.: RE338096 Serial No.: 400009
Product Options: One or two 10" monitors
Configurations to be tested: With two 10" monitors

Equipment Modification (If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)

Modifications since last test: _____
Modifications made during test: _____

Form



EMC Test Plan and Constructional Data Form

Test Objective(s): Please indicate the tests to be performed, entering the applicable standard(s) where noted.

- | | |
|---|--|
| <input type="checkbox"/> EMC Directive 2004/108/EC (EMC)
Std: _____ | <input type="checkbox"/> FCC: Class <input type="checkbox"/> A <input type="checkbox"/> B Part _____ |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC)
Std: _____ | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC)
Std: _____ | <input type="checkbox"/> BSMI: Class <input type="checkbox"/> A <input type="checkbox"/> B (Separate Report) |
| | <input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| | <input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B |
- Electrical Safety:
 IEC 60950-1:2005/A1:2009
 Information Technology equipment -
 Safety-Part 1: General requirements
 EN 60950-1:2006/A12:2011
 International Compliance on the GSIX
 HW Premium Server with Wifi
 Module:
 South Africa - ICASA
 Ukraine - UkrSepro CoC
 EMC Testing:
 GSIX HW Premium Server with two
 10" montors:
 United States:
 FCC Part 1 Subpart C - Intentional
 Radiators - 15.247 Operation within
 the bands 902-928 Mhz, 2400-2483.5
 Mhz, and 5725-5850 Mhz
 Canada:
 RSS-Gen, RSS-210
 Europe:
 EN 301 489-17 V2.2.1
 EN 300 328 V1.8.1
 UN ECER Regulation No. 10
 Australia / New Zealand:
 AN/NZS 4268:2012
 Japan:
 ARIB STANDARD ARIB STD-T66
 VERSION 3.5
 Testing on the GSIX HW Value
 Server with one 7" monitor:
 UN ECER Regulation No. 10 radiated
 emissions and radiated immunity
- _____ Other: _____
- Vehicle Directive - 2004/104/EC (EMC)
 Other Vehicle Std: _____
- Ag Directive *2009/64/EC (EMC)
- FDA Reviewers Guidance for Premarket
 Notification Submissions (EMC)

Form



EMC Test Plan and Constructional Data Form

Third Party Certification (contact TÜV for quote), if applicable (*Signature on last page required).

<input type="checkbox"/> Attestation of Compliance (AoC)*	<input type="checkbox"/> EMC Certification (used with Octagon Mark)*
<input type="checkbox"/> Statement of Compliance (SoC, previously CoC)* - All aspects of the essential requirements were assessed	
Protection Class (Req'd for AoC, SoC, EMC Cert. N/A for vehicles) <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III (Press F1 when field is selected to show additional information on Protection Class.)	
<input checked="" type="checkbox"/> FCC / TCB Certification	<input type="checkbox"/> Taiwan Certification
<input checked="" type="checkbox"/> Industry Canada / FCB Certification	<input type="checkbox"/> Korean Certification
<input checked="" type="checkbox"/> e-Mark Certification	

Attendance

Test will be: Attended by the customer Unattended by the customer

Failure - Complete this section if testing will not be attended by the customer.

If a failure occurs, TÜV SÜD America should:

- Call contact listed above, if not available then stop testing. (After hrs phone): _____
- Continue testing to complete test series.
- Continue testing to define corrective action.
- Stop testing.

EUT Specifications and Requirements

Length: _____ Width: _____ Height: _____ Weight: _____

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 13.8V (battery) (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: DC

Current (Amps/phase(max)): 5 Current (Amps/phase(nominal)): 2.5

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
Agricultural tractor

EUT Power Cable

<input type="checkbox"/> Permanent	OR	<input checked="" type="checkbox"/> Removable	Length (in meters): <u>>=3</u>
<input type="checkbox"/> Shielded	OR	<input checked="" type="checkbox"/> Unshielded	
<input type="checkbox"/> Not Applicable			

Form



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EUT Interface Ports and Cables																
Type	Analog		Digital		During Test		Qty	Shielding		Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent	
					Active	Passive		Yes	No							Type
EXAMPLE:																
RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DisplayPort for Monitors	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	Foil over braid		HSA-II to HSA-II	Characteristic Impedance	>=3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
USB	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid		HSA-II to USB type A	Characteristic Impedance	>=3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ethernet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid		HSA-II to RJ-45	Characteristic Impedance	>=3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CAN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Twisted pair		Metallized 9-pin D-sub	120 ohm resistor	>=3	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>

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EUT Software.

Revision Level:

Description:

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

- 1.

- 2.

- 3.

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #

Form



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Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)
 This information is required for FCC & Taiwan testing.

<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>

Oscillator Frequencies

<i>Manufacturer</i>	<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>

Power Supply

<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

Power Line Filters

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>

Critical EMI Components (Capacitors, ferrites, etc.)

<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>

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EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

Authorization (Signature Required if a Third Party Certification is checked on pg 1)

Customer authorization to perform tests
according to this test plan.

Date

Test Plan/CDF Prepared By (please print)

Date

Appendix B

Measurement Protocol





MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emission testing is performed according to the procedures in ANSI C63.4-2009, FCC KDB Publication 558074, the article "The Measurement of Occupied Bandwidth" by Industry Canada's certification bureau, & FCC Public Notice DA 02-2138.

Measurement Uncertainty

The test system for conducted emissions – AC lines is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ± 1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Conducted Emissions

Final measurement levels are determined by connecting the antenna port of the DUT to a spectrum analyzer input via coaxial adapters, high frequency coax, and attenuators as necessary. The loss created by the interconnect apparatus is offset by settings within the analyzer. Specific analyzer settings are determined by the procedures throughout this report.

Radiated Emissions

The spectrum analyzer uses a quasi-peak detector for frequencies up to and including 1 GHz. For measurements above 1 GHz, peak and average detectors are used. The bandwidths used are equal to or greater than 100 Hz from 9 kHz to 150 kHz, 9 kHz from 150 kHz to 30 MHz, 100 kHz from 30 MHz to 1000 MHz, and 1 MHz from 1 GHz to 40 GHz. Video bandwidths are at least three times greater than the IF bandwidth. Average measurements above 1 GHz are also achieved using a peak detector with 1 MHz RBW and 10 Hz VBW.

The final level, in dB μ V/m, equals the reading from the spectrum analyzer (Level dB μ V), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data. Intentional radiators are rotated through 3 orthogonal axes to determine the test position yielding the maximum emission levels.

Example:

FREQ (MHz)	LEVEL (dB μ V)	CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL (dB μ V/m)	POL/HGT/AZ (m) (deg)	DELTA1
60.80	42.5Qp +	1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.