



TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: XE500T1C


FCC ID: A3LXE500T1C & A3LXE500T1C-N

Industry Canada Certification Number: 649E-XE500T1C & 649E-XE500T1CN

To: FCC Part 15.247: 2011 Subpart C, RSS-210 Issue 8 December 2010
& RSS-Gen Issue 3 December 2010

Test Report Serial No.:
RFI-RPT-RP89958JD04A V5.0

Version 5.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority Of John Newell, Group Quality Manager:		
Checked By:	Sarah Williams	
Signature:		
Date of Issue:	08 October 2012	

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields.

This report may not be reproduced other than in full, except with the prior written approval of RFI Global Services Ltd. The results in this report apply only to the sample(s) tested.

RFI Global Services Ltd
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number:2117901



This page has been left intentionally blank.

Table of Contents

1. Customer Information	4
2. Summary of Testing	5
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	6
2.4. Deviations from the Test Specification	6
3. Equipment Under Test (EUT)	7
3.1. Identification of Equipment Under Test (EUT)	7
3.2. Description of EUT	7
3.3. Maximum Output Power	7
3.4. Modifications Incorporated in the EUT	8
3.5. Additional Information Related to Testing	8
3.6. Support Equipment	9
4. Operation and Monitoring of the EUT during Testing	10
4.1. Operating Modes	10
4.2. Configuration and Peripherals	10
5. Measurements, Examinations and Derived Results	11
5.1. General Comments	11
5.2. Test Results	12
5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions	12
5.2.2. Receiver/Idle Mode Radiated Spurious Emissions	15
5.2.3. Transmitter AC Conducted Spurious Emissions	20
5.2.4. Transmitter 6 dB Bandwidth	23
5.2.5. Transmitter Occupied Bandwidth	28
5.2.6. Transmitter Power Spectral Density	33
5.2.7. Transmitter Maximum Peak Output Power	38
5.2.8. Transmitter Radiated Emissions	46
5.2.9. Transmitter Band Edge Radiated Emissions	52
6. Measurement Uncertainty	60
7. Report Revision History	61
8. Setup Photos	62

1. Customer Information












Company Name:	Samsung Electronics Co., Ltd.
Address:	416, Maetan-3Dong, Yeongtong-Gu, Suwon-City, Gyeonggi-Do, 443-742, Korea

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Specification Reference:	RSS-Gen Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-210 Issue 8 December 2010
Specification Title:	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	17 August 2012 to 25 August 2012

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.107(a)	RSS-Gen 7.2.4	Receiver/Idle Mode AC Conducted Emissions	
Part 15.109	RSS-Gen 4.10	Receiver/Idle Mode Radiated Spurious Emissions	
Part 15.207	RSS-Gen 7.2.4	Transmitter AC Conducted Emissions	
Part 15.247(a)(2)	RSS-Gen 4.6.2 RSS-210 A8.2(a)	Transmitter 6 dB Bandwidth	
N/A	RSS-Gen 4.6.1	Transmitter Occupied Bandwidth	
Part 15.247(e)	RSS-210 A8.2(b)	Transmitter Power Spectral Density	
Part 15.247(b)(3)	RSS-Gen 4.8 RSS-210 A8.4(4)	Transmitter Maximum Peak Output Power	
Part 15.247(d)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Radiated Emissions	
Part 15.247(d)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Band Edge Radiated Emissions	
Key to Results			
 = Complied  = Did not comply			

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices
Reference:	KDB 558074 D01 v01 1/18/2012
Title:	Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) devices operating Under §15.247

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Samsung
Model Name or Number:	XE500T1C
Serial Number:	HX2W91SC700004R (<i>Radiated sample</i>)
Hardware Version Number:	PV
Software Version Number:	Window OS
FCC ID:	A3LXE500T1C
FCC ID:	A3LXE500T1C-N
Industry Canada Certification Number:	649E-XE500T1C
Industry Canada Certification Number:	649E-XE500T1CN

Brand Name:	Samsung
Model Name or Number:	XE500T1C
Serial Number:	HX2W91SC700031T (<i>Conducted sample RF port</i>)
Hardware Version Number:	PV
Software Version Number:	Window OS
FCC ID:	A3LXE500T1C
FCC ID:	A3LXE500T1C-N
Industry Canada Certification Number:	649E-XE500T1C
Industry Canada Certification Number:	649E-XE500T1CN

Brand Name:	Chicony
Description:	AC Charger
Model Name or Number:	A12-040N1A
Serial Number:	CNS440001595DON825J00RA

3.2. Description of EUT

The equipment under test was a Tablet PC with *Bluetooth* and IEEE 802.11a,b,g,n operating in the 2.4 GHz and 5 GHz bands.

3.3. Maximum Output Power

Frequency Range (MHz)	Mode	Conducted Output Power (dBm)
2400 MHz to 2483.5 MHz	802.11b	15.6
2400 MHz to 2483.5 MHz	802.11g	16.3
2400 MHz to 2483.5 MHz	802.11n	14.6

3.4. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.5. Additional Information Related to Testing

Technology Tested:	IEEE 802.11a,b,g,n / Digital Transmission System		
Type of Unit:	Transceiver		
Modulation:	CCK, DBPSK, DQPSK, BPSK, QPSK, 16QAM, 64QAM		
Data Rates:	802.11b	1, 2, 5.5 & 11 Mbps	
	802.11g	6, 9, 12, 18, 24, 36, 48 & 54 Mbps	
	802.11n	6.5, 13, 19.5, 26, 39, 52, 58.5 & 65 Mbps	
Power Supply Requirement(s):	Nominal	12 VDC via 120 VAC 60 Hz adaptor	
Maximum Conducted Output Power:	16.3 dBm		
Antenna Gain:	3.48 dBi		
Channel Spacing:	20 MHz		
Transmit / Receive Frequency Range:	2400 MHz to 2483.5 MHz		
Transmit / Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	1	2412
	Middle	6	2437
	Top	11	2462

3.6. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	USIM
Brand Name:	Comprion
Model Name or Number:	Micro USIM

Description:	SD RAM
Brand Name:	San Disk
Model Name or Number:	8 GB

Description:	USB Hub
Brand Name:	Belkin
Model Name or Number:	F5U404-BLK
Serial Number:	D12-00047182

Brand Name:	Not stated
Description:	Micro USB to USB cable
Model Name or Number:	Not stated

Brand Name:	Not stated
Description:	HDMI cable
Model Name or Number:	Not stated

Description:	Cyclone Micro Media Player Adaptor
Brand Name:	Sumvision
Model Name or Number:	Cyclone Micro
Serial Number:	RFI Asset No. A1986

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Constantly transmitting at maximum power on the bottom, middle and top channels as required using the supported data rates/modulation schemes.
- Receive/Idle mode.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- The EUT supports 20 MHz channel bandwidth only. The Customer has declared the worst case data rates as:
 - 802.11b: 1 Mbps.
 - 802.11g: 6 Mbps.
 - 802.11n: 6.5 Mbps / MCS0.
- Controlled using a bespoke application on the EUT, by pressing sequence of buttons on the front panel display which placed the unit into test mode. The application was used to enable continuous transmission and receive mode and to select the test channels, data rates and modulation schemes as required.
- Receive/Idle tests: The 802.11 mode was active but not transmitting.
- Transmitter radiated spurious emissions final measurements were performed using the 802.11g 6 Mbps configuration as it was previously measured and found to produce the highest EIRP.
- Radiated emissions tests were performed with all unused ports terminated.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results**5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions****Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	23 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.107(a)
Industry Canada Reference:	RSS-Gen 7.2.4
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	45

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)**Results: Live / Quasi Peak**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.155	Live	51.0	65.8	14.8	Complied
0.168	Live	51.5	65.1	13.6	Complied
0.222	Live	42.0	62.7	20.7	Complied
14.361	Live	24.6	60.0	35.4	Complied
16.899	Live	32.3	60.0	27.7	Complied
19.280	Live	31.3	60.0	28.7	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.164	Live	37.9	55.3	17.4	Complied
0.168	Live	33.3	55.1	21.8	Complied
0.267	Live	28.4	51.2	22.8	Complied
14.028	Live	18.6	50.0	31.4	Complied
14.276	Live	23.3	50.0	26.7	Complied
19.284	Live	28.4	50.0	21.6	Complied

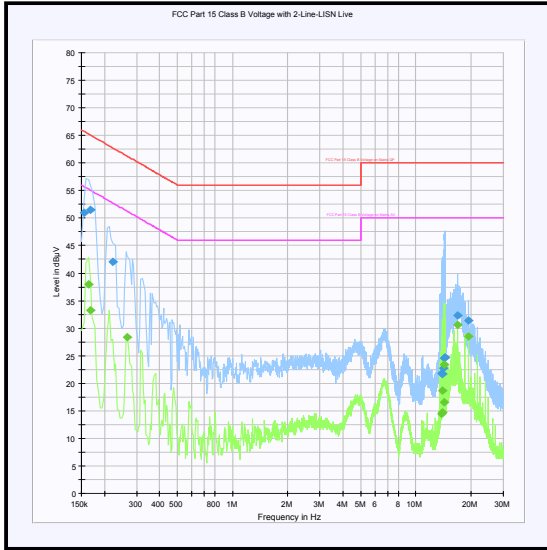
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.159	Neutral	52.1	65.5	13.4	Complied
0.168	Neutral	50.3	65.1	14.8	Complied
0.222	Neutral	40.7	62.7	22.0	Complied
14.267	Neutral	25.1	60.0	34.9	Complied
14.388	Neutral	26.6	60.0	33.4	Complied
17.025	Neutral	38.9	60.0	21.1	Complied

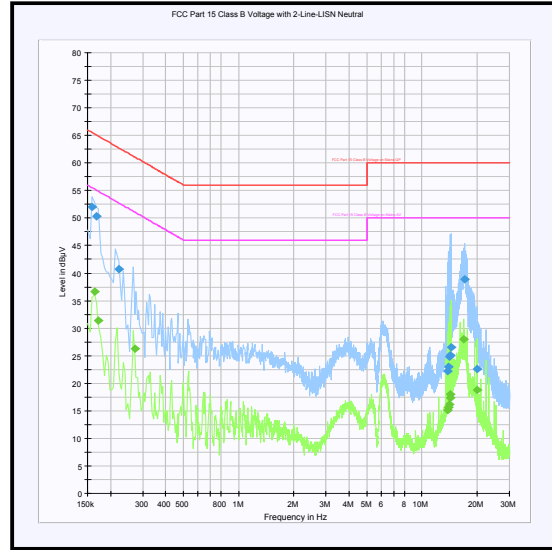
Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.164	Neutral	36.6	55.3	18.7	Complied
0.173	Neutral	31.3	54.8	23.5	Complied
0.272	Neutral	26.2	51.1	24.9	Complied
14.357	Neutral	17.9	50.0	32.1	Complied
16.962	Neutral	28.0	50.0	22.0	Complied
20.058	Neutral	18.7	50.0	31.3	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)



Live



Neutral

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Equipment Used:

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
M1263	EMI Test Receiver	ESIB 7	04 Apr 2013	12
A1830	Pulse Limiter	ESH3-Z2	25 Feb 2013	12
A649	Single Phase LISN	ESH3-Z5	19 Feb 2013	12

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	21 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.109
Industry Canada Reference:	RSS-Gen 4.10
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	29
Relative Humidity (%):	35

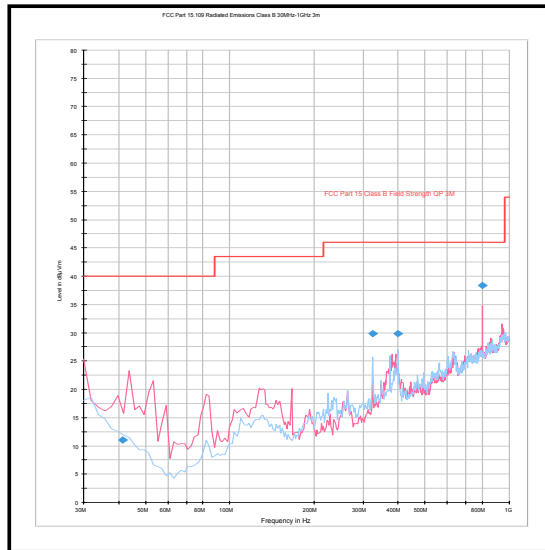
Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
41.486	Vertical	11.1	40.0	28.9	Complied
324.484	Horizontal	29.9	46.0	16.1	Complied
399.372	Horizontal	29.8	46.0	16.2	Complied
798.745	Vertical	38.3	46.0	7.7	Complied

Receiver/Idle Mode Radiated Spurious Emissions (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Test Equipment Used:

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
K0001	5m RSE Chamber	Rainford	31 Aug 2012	12
M1273	Test Receiver	ESIB 26	03 Feb 2013	12
A1834	Attenuator	8491B	29 Jan 2013	12
G0543	Amplifier	310N	15 Oct 2012	12
A553	Antenna	CBL6111A	15 Feb 2013	12

Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	22 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.109
Industry Canada Reference:	RSS-Gen 4.10
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range:	1 GHz to 12.5 GHz

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	44

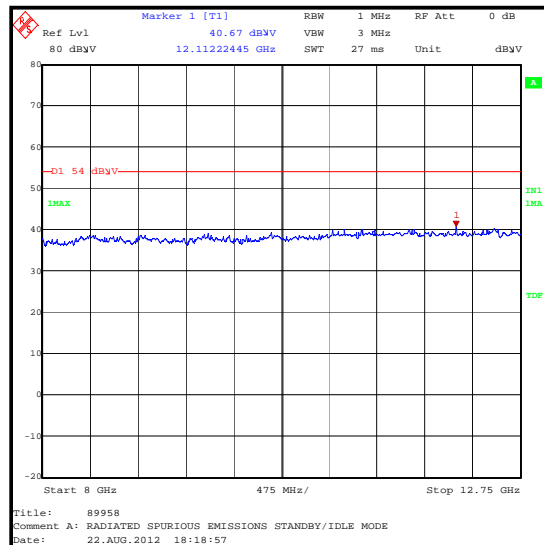
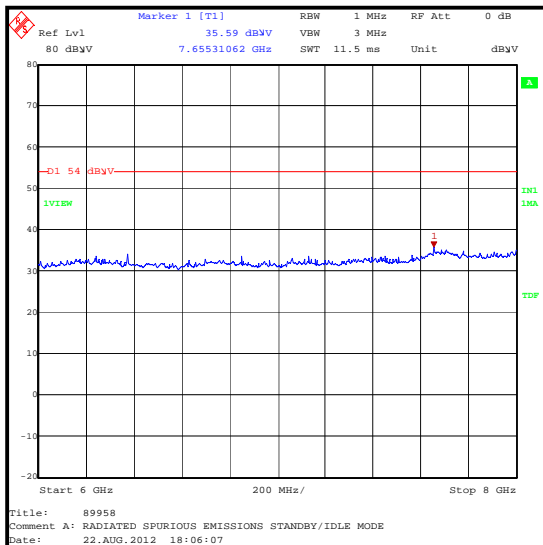
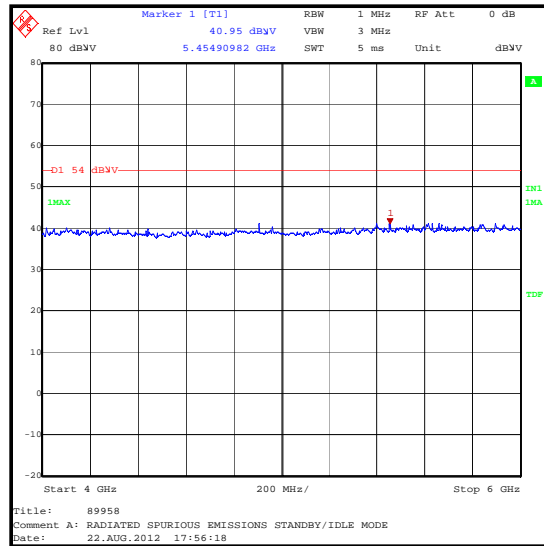
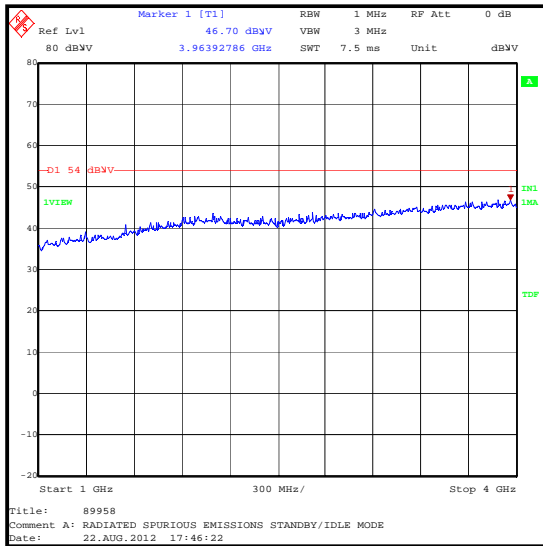
Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
3. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table below. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.

Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
3963.928	Vertical	46.7	54.0	7.3	Complied

Receiver/Idle Mode Radiated Spurious Emissions (continued)



Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Equipment Used:**

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
A253	Antenna	12240-20	09 Oct 2012	12
A254	Antenna	14240-20	09 Oct 2012	12
A255	Antenna	16240-20	09 Oct 2012	12
A1534	Pre Amplifier	8449B	09 Oct 2012	12
A1818	Antenna	3115	09 Oct 2012	12
K0002	3m RSE Chamber	N/A	09 Oct 2012	12
M1124	Test Receiver	ESIB 26	14 Aug 2013	12

5.2.3. Transmitter AC Conducted Spurious Emissions**Test Summary:**

Test Engineer:	Ian Watch	Test Date:	17 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.207
Industry Canada Reference:	RSS-Gen 7.2.4
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	36

Transmitter AC Conducted Spurious Emissions (continued)**Results: Live / Quasi Peak**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.155	Live	53.1	65.8	12.7	Complied
0.159	Live	54.2	65.5	11.3	Complied
0.164	Live	52.9	65.3	12.4	Complied
16.688	Live	37.0	60.0	23.0	Complied
16.845	Live	37.2	60.0	22.8	Complied
17.043	Live	37.2	60.0	22.8	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.172	Live	39.4	54.8	15.4	Complied
0.213	Live	31.4	53.1	21.7	Complied
14.150	Live	21.2	50.0	28.8	Complied
14.343	Live	15.3	50.0	34.7	Complied
18.519	Live	28.0	50.0	22.0	Complied

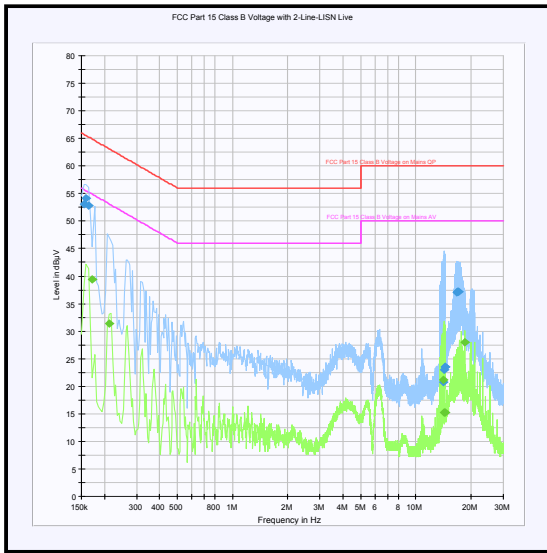
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.159	Neutral	52.1	65.5	13.4	Complied
14.339	Neutral	25.1	60.0	34.9	Complied
14.334	Neutral	25.0	60.0	35.0	Complied
14.361	Neutral	24.4	60.0	35.6	Complied
14.370	Neutral	24.6	60.0	35.4	Complied
14.447	Neutral	24.8	60.0	35.2	Complied

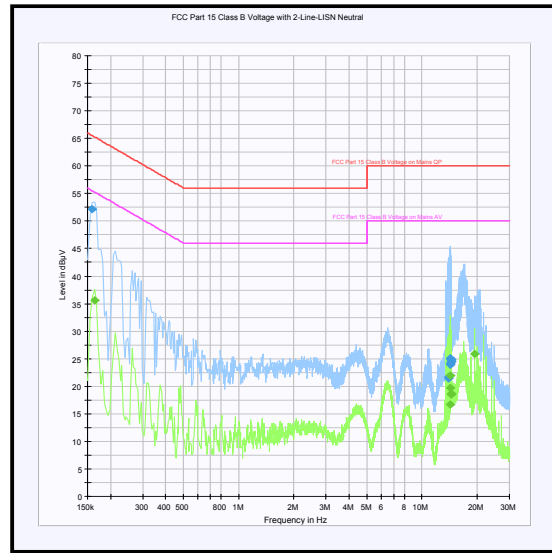
Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.164	Neutral	35.6	55.3	19.7	Complied
14.271	Neutral	22.0	50.0	28.0	Complied
14.348	Neutral	19.7	50.0	30.3	Complied
14.366	Neutral	18.5	50.0	31.5	Complied
14.456	Neutral	18.7	50.0	31.3	Complied
19.293	Neutral	25.9	50.0	24.2	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Equipment Used:

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
M1263	EMI Test Receiver	ESIB 7	04 Apr 2013	12
A1830	Pulse Limiter	ESH3-Z2	25 Feb 2013	12
A649	Single Phase LISN	ESH3-Z5	19 Feb 2013	12

5.2.4. Transmitter 6 dB Bandwidth**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	20 August 2012
Test Sample Serial Number:	HX2W91SC700031T		

FCC Reference:	Part 15.247(a)(2)
Industry Canada Reference:	RSS-Gen 4.6.2, RSS-210 A8.2(a)
Test Method Used:	FCC KDB 558074 Section 5.1.1

Environmental Conditions:

Temperature (°C):	29
Relative Humidity (%):	42

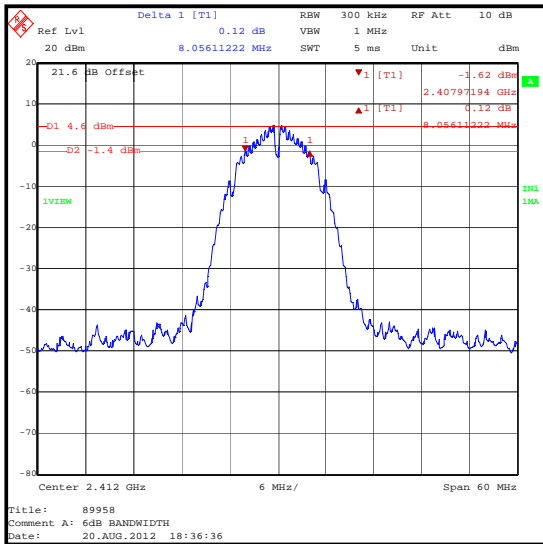
Note(s):

1. The customer declared the worst case data rates as:
 - o 802.11b: 1 Mbps.
 - o 802.11g: 6 Mbps.
 - o 802.11n: 6.5 Mbps / MCS0.

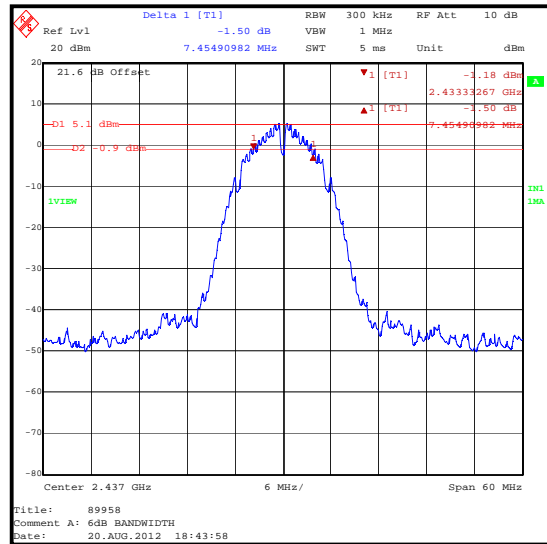
Transmitter 6 dB Bandwidth (continued)

Results: 802.11b / 20 MHz / 1 Mbps / DBPSK

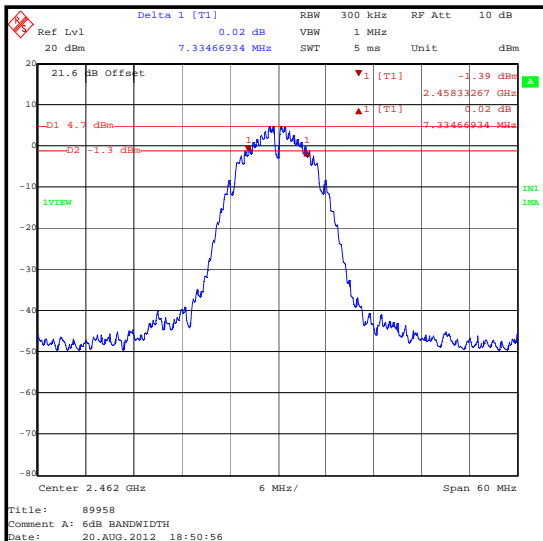
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	8.056	≥0.5	7.556	Complied
Middle	7.455	≥0.5	6.955	Complied
Top	7.335	≥0.5	6.835	Complied



Bottom Channel



Middle Channel

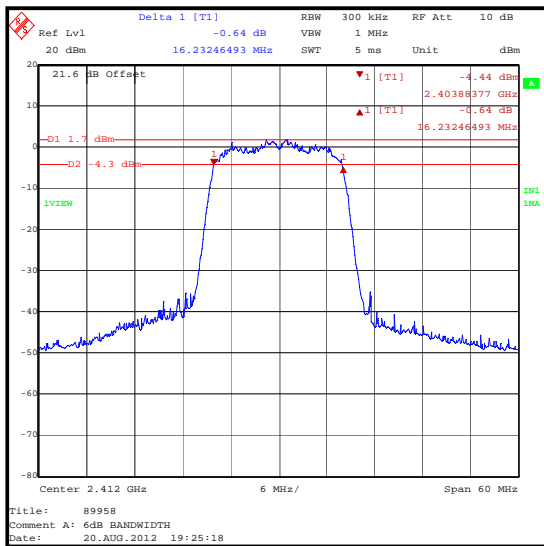


Top Channel

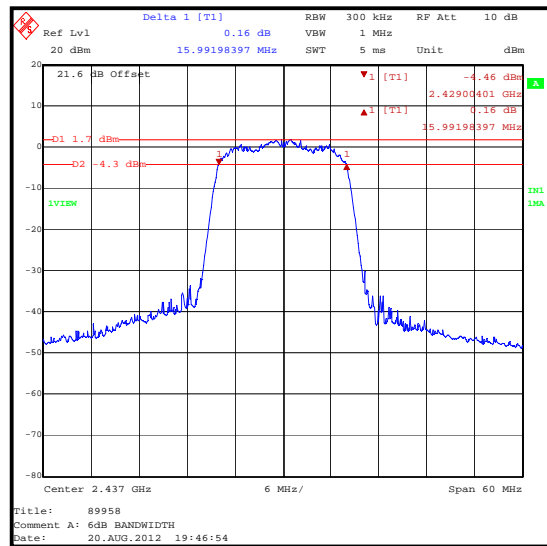
Transmitter 6 dB Bandwidth (continued)

Results: 802.11g / 20 MHz / 6 Mbps / BPSK

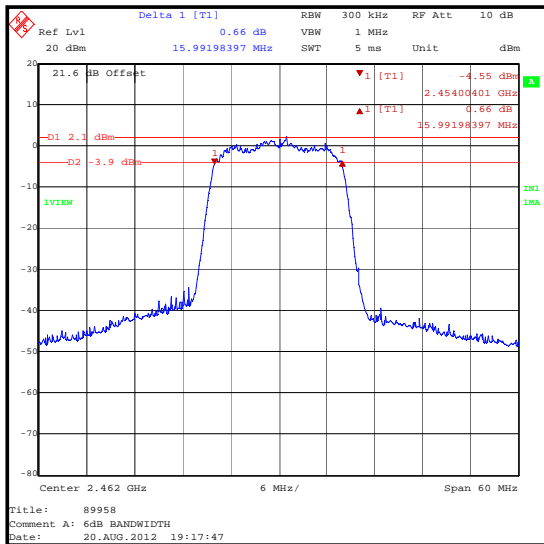
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.232	≥0.5	15.732	Complied
Middle	15.992	≥0.5	15.492	Complied
Top	15.992	≥0.5	15.492	Complied



Bottom Channel



Middle Channel

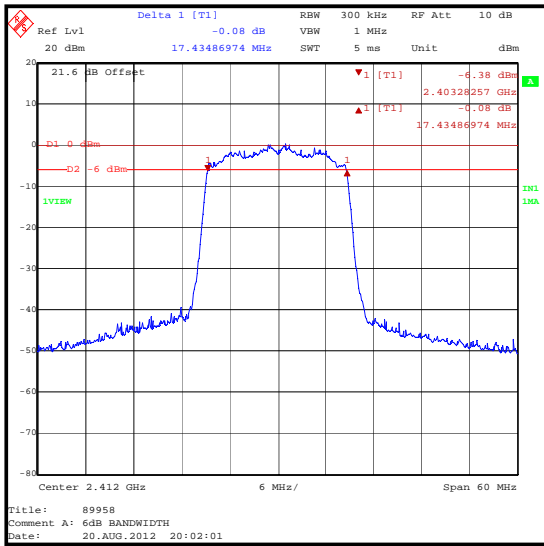


Top Channel

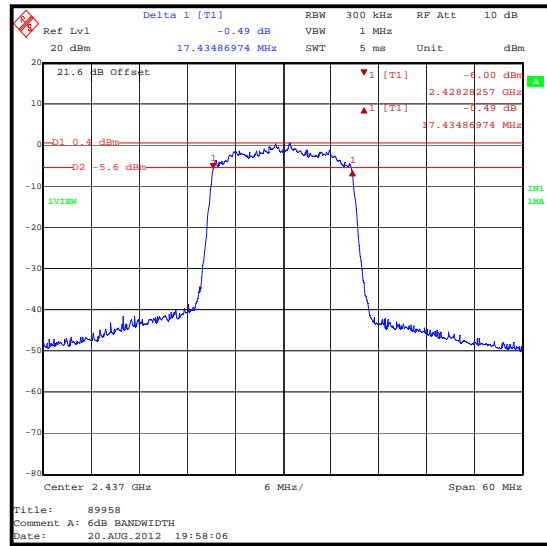
Transmitter 6 dB Bandwidth (continued)

Results: 802.11n / 20 MHz / 6.5 Mbps / MCS0 / BPSK

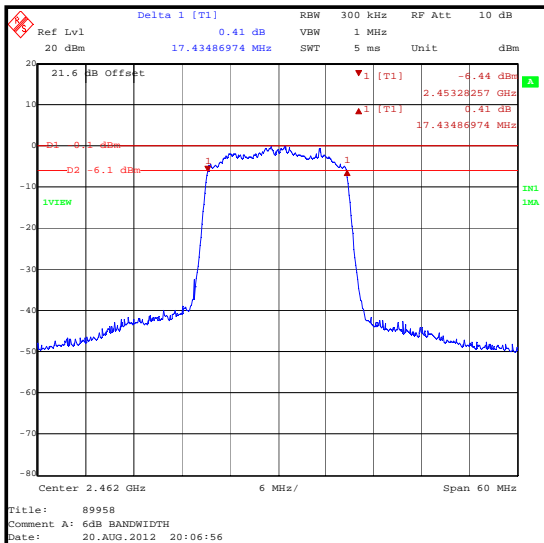
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.435	≥0.5	16.935	Complied
Middle	17.435	≥0.5	16.935	Complied
Top	17.435	≥0.5	16.935	Complied



Bottom Channel



Middle Channel



Top Channel

Transmitter 6 dB Bandwidth (continued)**Test Equipment Used:**

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
L1067	Test Receiver	ESIB 40	29 May 2013	12
A2142	Attenuator	AN18-20	25 May 2013	12

5.2.5. Transmitter Occupied Bandwidth**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	21 August 2012
Test Sample Serial Number:	HX2W91SC700031T		

FCC Reference:	N/A
Industry Canada Reference:	RSS-Gen 4.6.1
Test Method Used:	Tested using the occupied bandwidth function of a test receiver

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	42

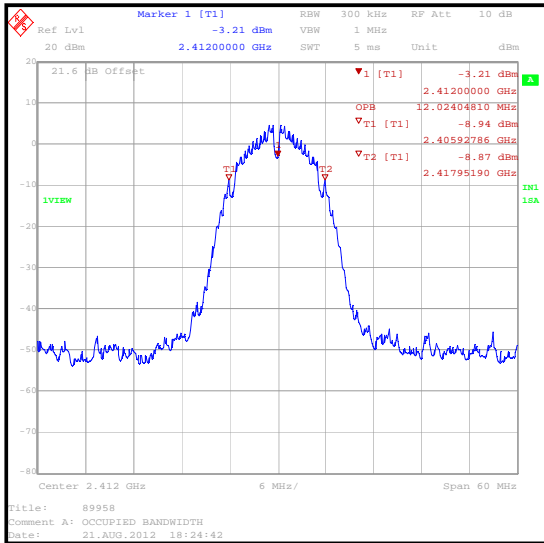
Note(s):

1. Occupied bandwidth (99% bandwidth) was measured using a test receiver occupied bandwidth function with the test receiver set to the appropriate bandwidth according to the channel width under test. Measurement bandwidths were set automatically by the test receiver.
2. The customer declared the worst case data rates as:
 - o 802.11b: 1 Mbps.
 - o 802.11g: 6 Mbps.
 - o 802.11n: 6.5 Mbps / MCS0.

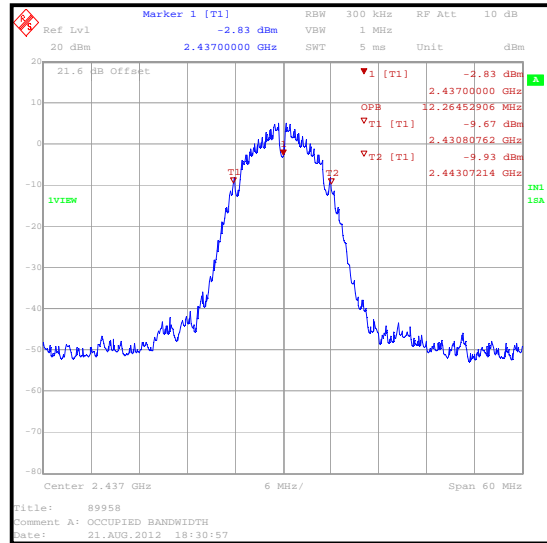
Transmitter Occupied Bandwidth (continued)

Results: 802.11b / 20 MHz / 1 Mbps / DBPSK

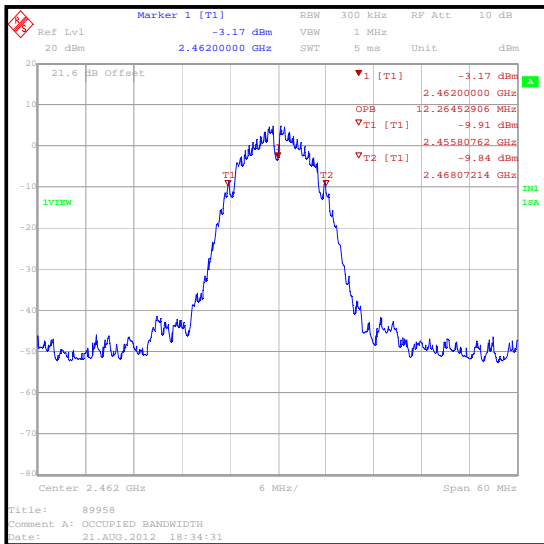
Channel	Occupied Bandwidth (MHz)
Bottom	12.024
Middle	12.265
Top	12.265



Bottom Channel



Middle Channel

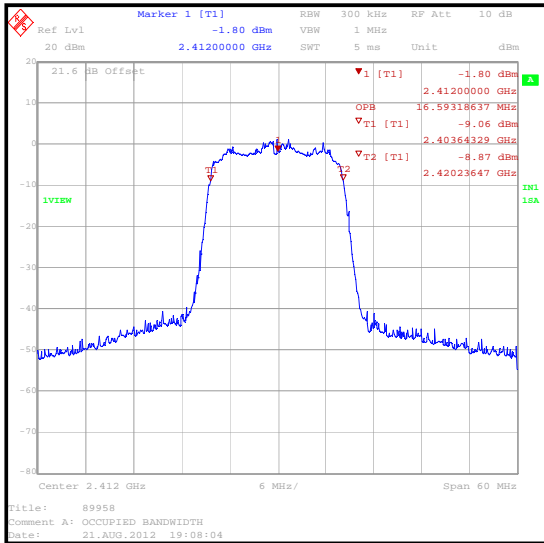


Top Channel

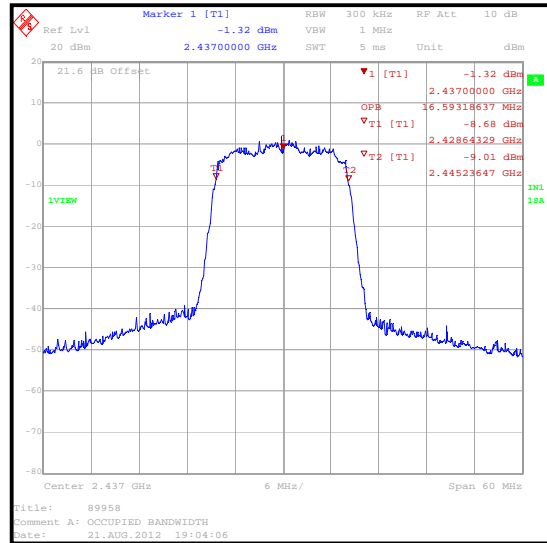
Transmitter Occupied Bandwidth (continued)

Results: 802.11g / 20 MHz / 6 Mbps / BPSK

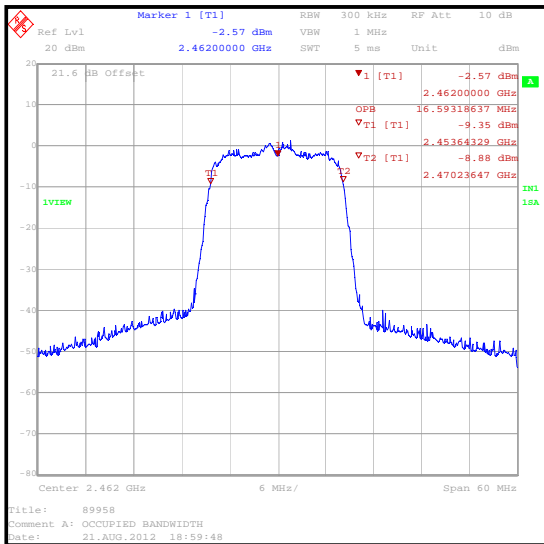
Channel	Occupied Bandwidth (MHz)
Bottom	16.593
Middle	16.593
Top	16.593



Bottom Channel



Middle Channel

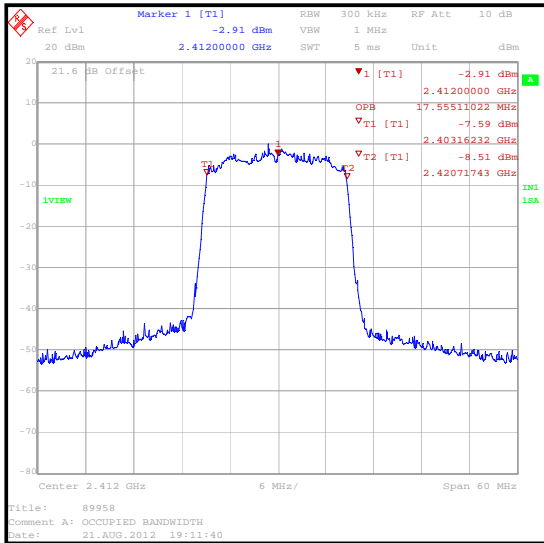


Top Channel

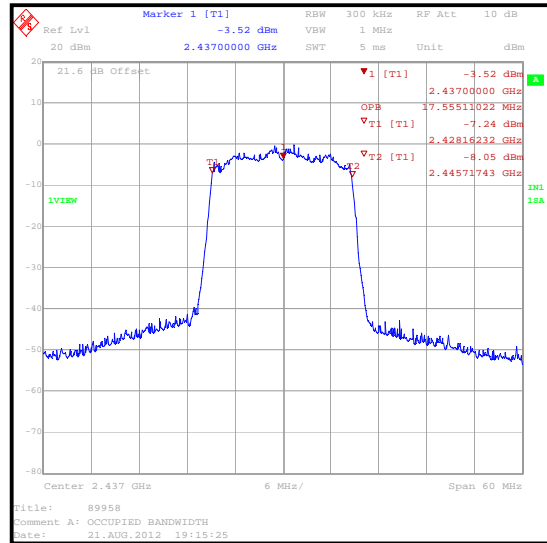
Transmitter Occupied Bandwidth (continued)

Results: 802.11n / 20 MHz / 6.5 Mbps / MCS0 / BPSK

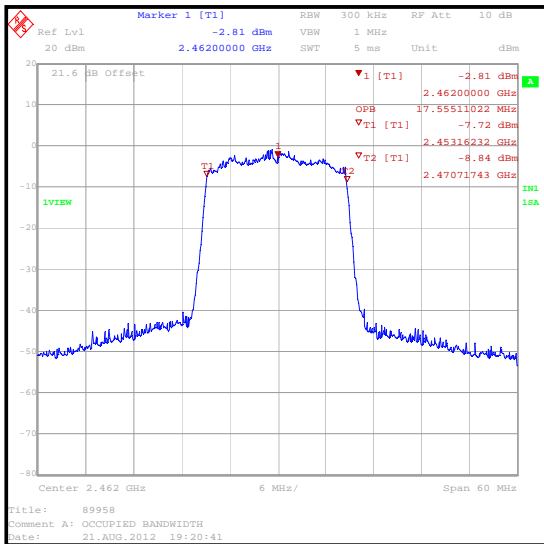
Channel	Occupied Bandwidth (MHz)
Bottom	17.555
Middle	17.555
Top	17.555



Bottom Channel



Middle Channel



Top Channel

Transmitter Occupied Bandwidth (continued)**Test Equipment Used:**

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
M1263	Test Receiver	ESIB 7	04 Apr 2013	12
A2142	Attenuator	AN18-20	25 May 2013	12

5.2.6. Transmitter Power Spectral Density**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	21 August 2012
Test Sample Serial Number:	HX2W91SC700031T		

FCC Reference:	Part 15.247(e)
Industry Canada Reference:	RSS-210 A8.2(b)
Test Method Used:	KDB 558074 Section 5.3.1

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	43

Note(s):

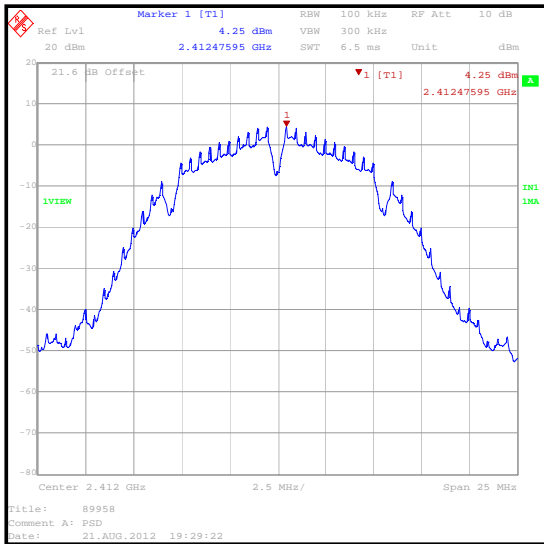
1. Transmitter Power Spectral Density tests in all bands were performed using a test receiver in accordance with FCC KDB 558074 Section 5.3.1 Measurement Procedure PKSPD.
2. The customer declared the worst case data rates as:
 - o 802.11b: 1 Mbps.
 - o 802.11g: 6 Mbps.
 - o 802.11n: 6.5 Mbps / MCS0.
3. A 20 dB attenuator and RF cable were used to connect the measurement equipment to the EUT. The combined cable and attenuator loss was measured prior to performing the measurements and the loss compensation incorporated into the measurement results.
4. The EUT was transmitting at 100% duty cycle.
5. In accordance with FCC KDB 558074 Section 5.3.1, the measurements were performed using a 100 kHz resolution bandwidth. A Band Width Correction Factor of 15.2 dB was then subtracted from the combined results to convert from a level measured in 100 kHz bandwidth as the limit is specified in a 3 kHz bandwidth. The correction factor (BWCF) was calculated as shown below:

$$10 \log_{10} (3 \text{ kHz} / 100 \text{ kHz}) = -15.2 \text{ dB}$$

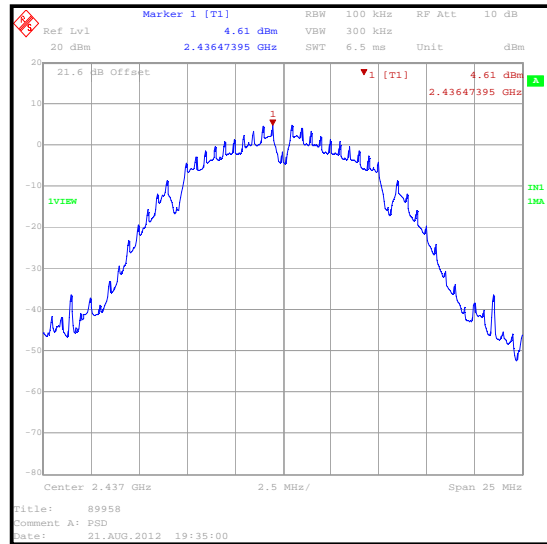
Transmitter Power Spectral Density (continued)

Results: 802.11b / 20 MHz / 1 Mbps / DBPSK

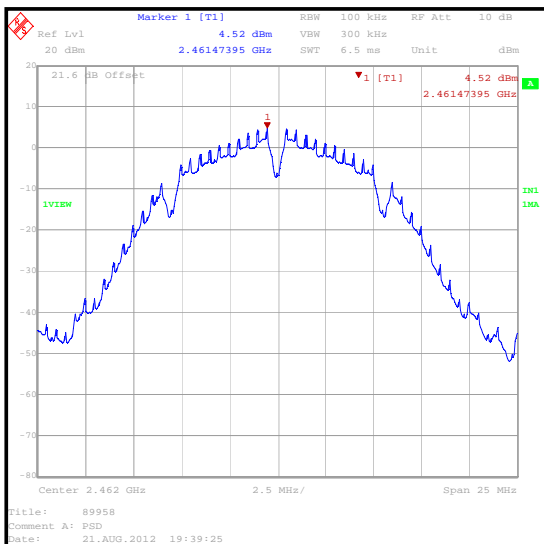
Channel	PSD (dBm / 100 kHz)	PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	4.3	-10.9	8.0	18.9	Complied
Middle	4.6	-10.6	8.0	18.6	Complied
Top	4.5	-10.7	8.0	18.7	Complied



Bottom Channel



Middle Channel

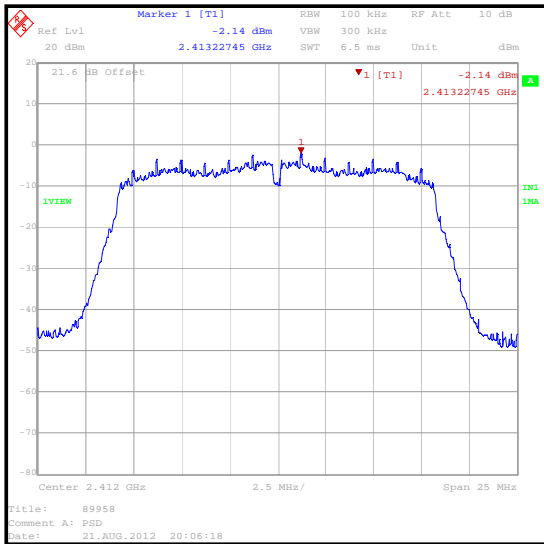


Top Channel

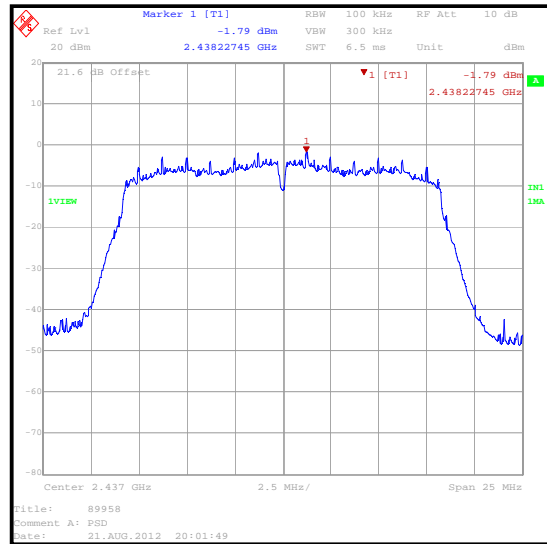
Transmitter Power Spectral Density (continued)

Results: 802.11g / 20 MHz / 6 Mbps / BPSK

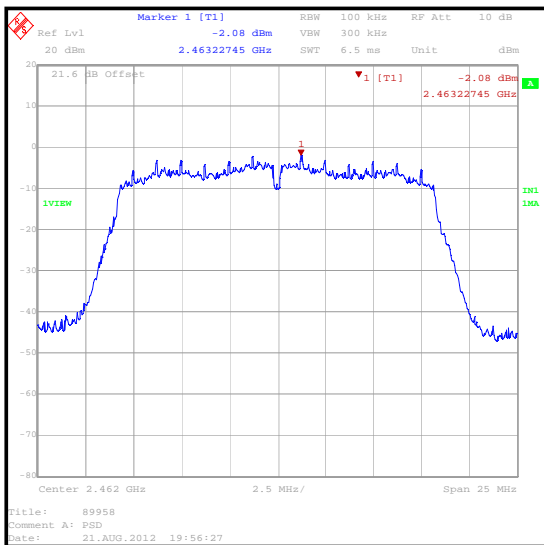
Channel	PSD (dBm / 100 kHz)	PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-2.1	-17.3	8.0	25.3	Complied
Middle	-1.8	-17.0	8.0	25.0	Complied
Top	-2.1	-17.3	8.0	25.3	Complied



Bottom Channel



Middle Channel

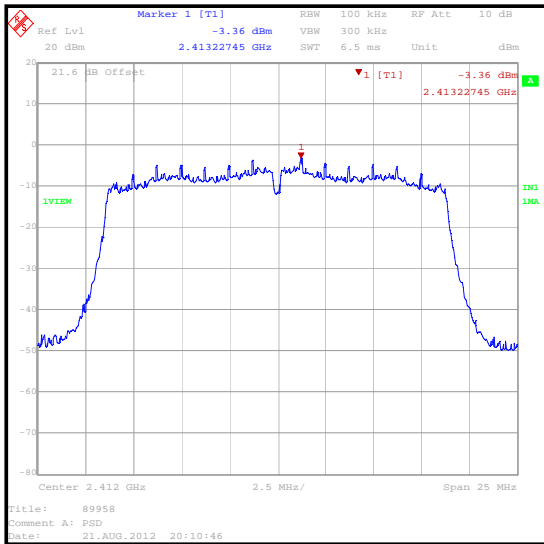


Top Channel

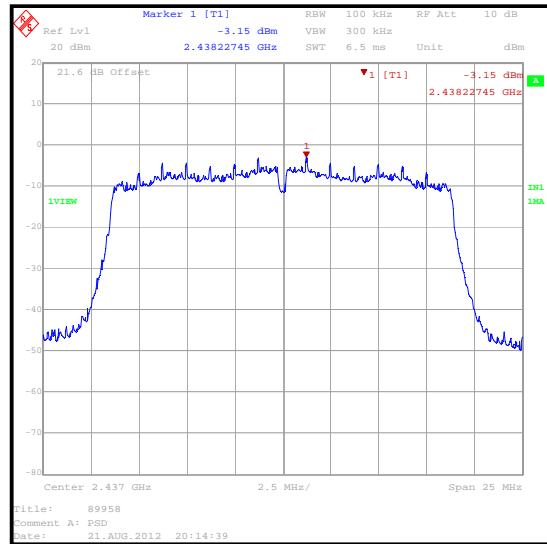
Transmitter Power Spectral Density (continued)

Results: 802.11n / 20 MHz / 6.5 Mbps / BPSK / MCS0

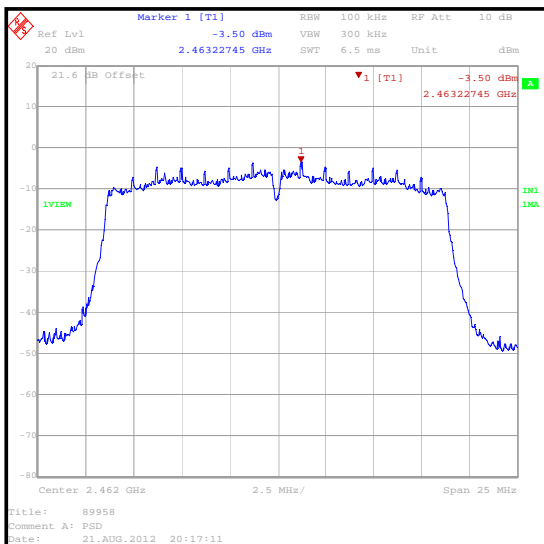
Channel	PSD (dBm / 100 kHz)	PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
Bottom	-3.4	-18.6	8.0	26.6	Complied
Middle	-3.2	-18.4	8.0	26.4	Complied
Top	-3.5	-18.7	8.0	26.7	Complied



Bottom Channel



Middle Channel



Top Channel

Transmitter Power Spectral Density (continued)**Test Equipment Used:**

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
M1263	Test Receiver	ESIB 7	04 Apr 2013	12
A2142	Attenuator	AN18-20	25 May 2013	12
M199	Power Meter	NRVS	07 Jun 2013	12
M1267	Thermal Power Sensor	NRV-Z52	07 Jun 2013	12
G085	CW Generator	83650L	09 Nov 2012	24

5.2.7. Transmitter Maximum Peak Output Power**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	20 August 2012
Test Sample Serial Number:	HX2W91SC700031T		

FCC Reference:	Part 15.247(b)(3)
Industry Canada Reference:	RSS-Gen 4.8, RSS-210 A8.4(4)
Test Method Used:	KDB 558074 Section 5.2.1.2

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	48

Note(s):

1. Conducted power tests in all bands were performed using a test receiver in accordance with FCC KDB 558074 Section 5.2.1.2. Measurement Procedure PK2.
2. The customer declared the worst case data rates as:
 - o 802.11b: 1 Mbps.
 - o 802.11g: 6 Mbps.
 - o 802.11n: 6.5 Mbps / MCS0
3. The combined cable and attenuator loss was measured prior to performing the measurements and the loss compensation incorporated into the measurement results.

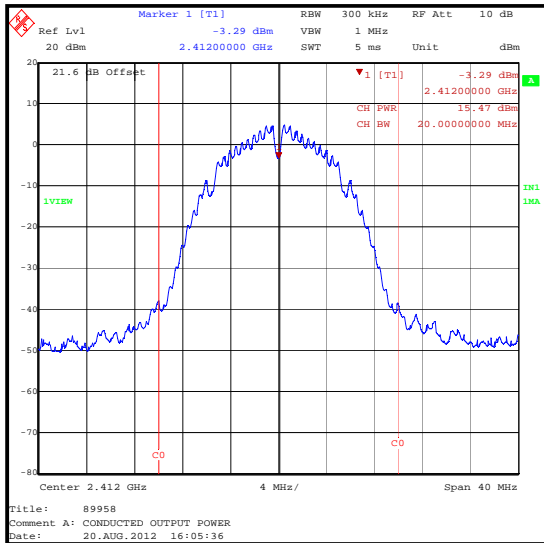
Transmitter Maximum Peak Output Power (continued)**Results: 802.11b / 20 MHz / 1 Mbps / DBPSK**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	15.5	30.0	14.5	Complied
Middle	15.6	30.0	14.4	Complied
Top	15.6	30.0	14.4	Complied

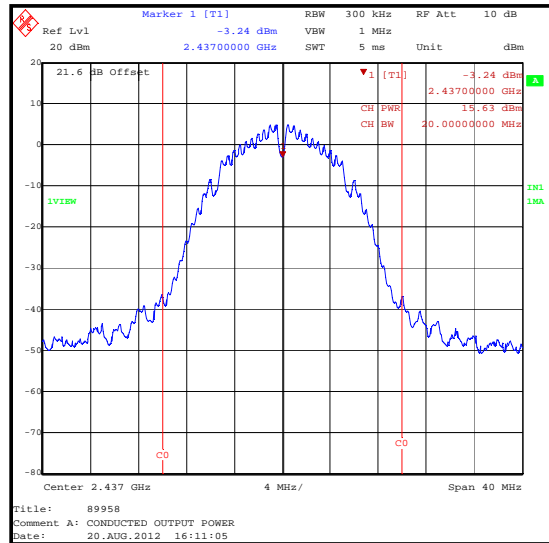
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	15.5	3.48	18.98	36.0	17.02	Complied
Middle	15.6	3.48	19.08	36.0	16.92	Complied
Top	15.6	3.48	19.08	36.0	16.92	Complied

Transmitter Maximum Peak Output Power (continued)

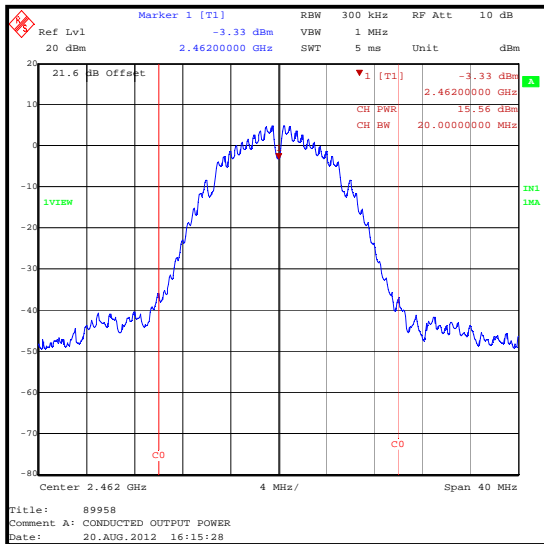
Results: 802.11b / 20 MHz / 1 Mbps / DBPSK



Bottom Channel



Middle Channel



Top Channel

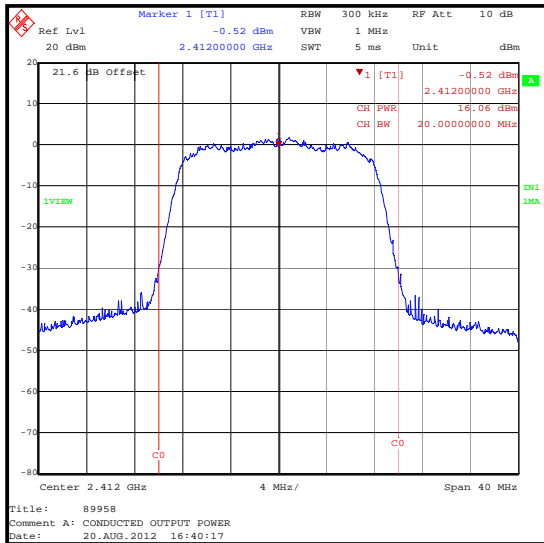
Transmitter Maximum Peak Output Power (continued)**Results: 802.11g / 20 MHz / 6 Mbps / BPSK**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	16.1	30.0	13.9	Complied
Middle	16.3	30.0	13.7	Complied
Top	16.1	30.0	13.9	Complied

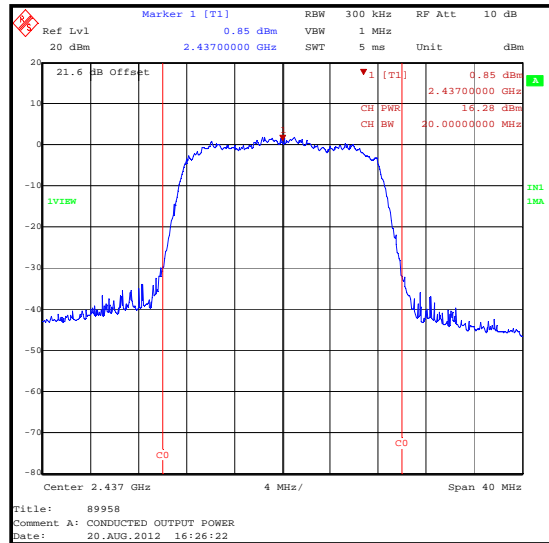
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	16.1	3.48	19.58	36.0	16.42	Complied
Middle	16.3	3.48	19.78	36.0	16.22	Complied
Top	16.1	3.48	19.58	36.0	16.42	Complied

Transmitter Maximum Peak Output Power (continued)

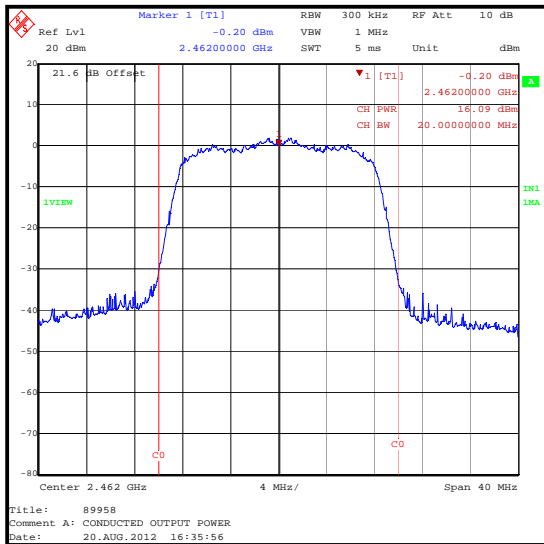
Results: 802.11g / 20 MHz / 6 Mbps / BPSK



Bottom Channel



Middle Channel



Top Channel

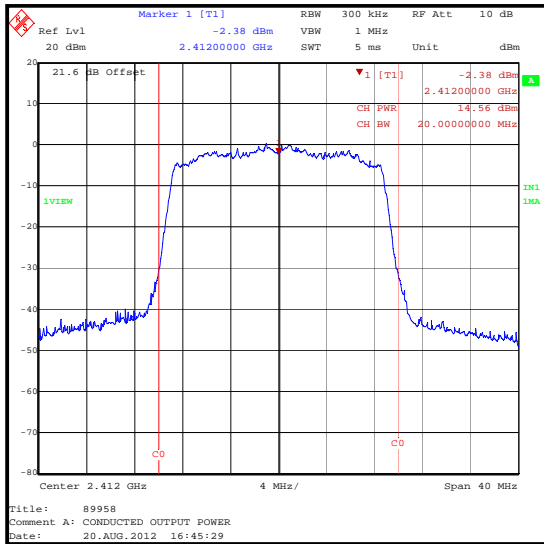
Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 20 MHz / 6.5 Mbps / BPSK / MCS0**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	14.6	30.0	15.4	Complied
Middle	14.6	30.0	15.4	Complied
Top	14.5	30.0	15.5	Complied

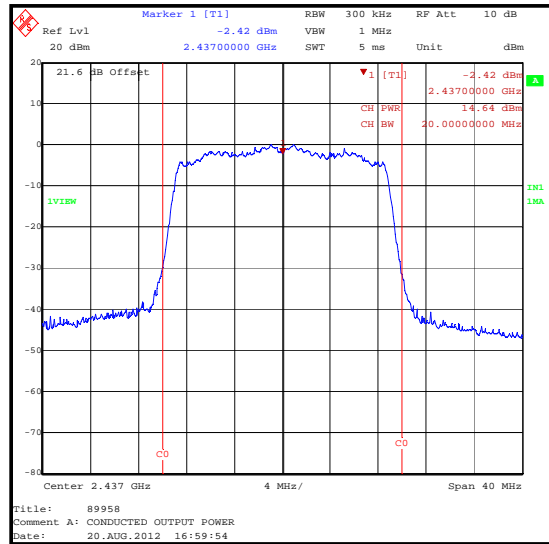
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	14.6	3.48	18.08	36.0	17.92	Complied
Middle	14.6	3.48	18.08	36.0	17.92	Complied
Top	14.5	3.48	17.98	36.0	18.02	Complied

Transmitter Maximum Peak Output Power (continued)

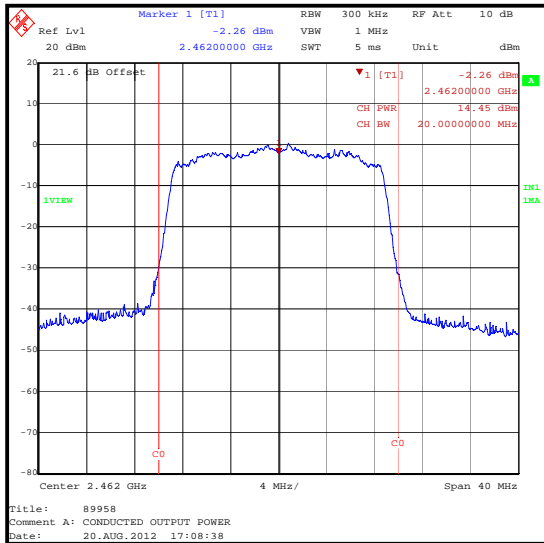
Results: 802.11n / 20 MHz / 6.5 Mbps / BPSK / MCS0



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Peak Output Power (continued)**Test Equipment Used:**

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
L1067	Test Receiver	ESIB 40	29 May 2013	12
A2142	Attenuator	AN18-20	25 May 2013	12
M199	Power Meter	NRVS	07 Jun 2013	12
M1267	Thermal Power Sensor	NRV-Z52	07 Jun 2013	12
G085	CW Generator	83650L	09 Nov 2012	24

5.2.8. Transmitter Radiated Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	25 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.247(d) & 15.209(a)
Industry Canada Reference:	RSS-Gen 4.9, RSS-210 A8.5
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

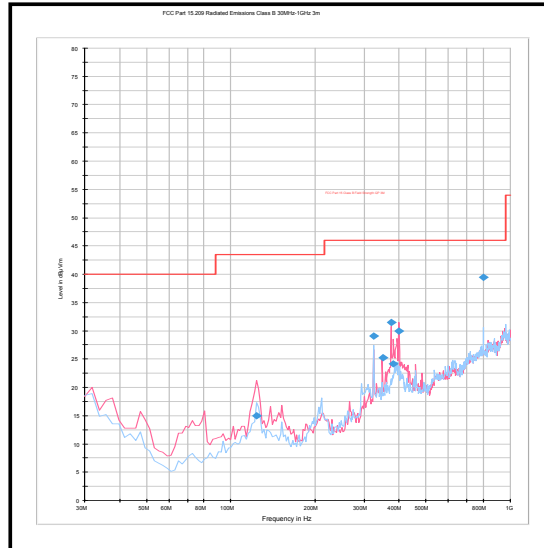
Temperature (°C):	25
Relative Humidity (%):	48

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss
2. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
3. All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: Top Channel / 802.11g / 20 MHz / 6 Mbps / BPSK

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
324.494	Horizontal	29.1	46.0	16.9	Complied

Transmitter Radiated Emissions (continued)

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Test Equipment Used:

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
K0001	5 m Semi-Anechoic Chamber	N/A	31 Aug 2012	12
M1273	Test Receiver	ESIB 26	03 Feb 2013	12
A1834	Attenuator	8491B	29 Jan 2013	12
G0543	Amplifier 9KHz - 1GHz	310N	15 Oct 2012	12
A553	Bi-log Antenna	CBL6111A	15 Feb 2012	12

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	22 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.247(d) & 15.209(a)
Industry Canada Reference:	RSS-Gen 4.9, RSS-210 A8.5
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 25 GHz

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	42

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. The emission shown at 2462 MHz on the 1 GHz to 4 GHz plot is the EUT fundamental.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Radiated Emissions (continued)**Results: Bottom Channel / 802.11g / 20 MHz / 6 Mbps / BPSK / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4823.585	Horizontal	48.8	74.0	25.2	Complied
7237.788	Horizontal	56.3	74.0	17.7	Complied

Results: Bottom Channel / 802.11g / 20 MHz / 6 Mbps / BPSK / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4823.585	Horizontal	33.3	54.0	20.7	Complied
7237.788	Horizontal	39.3	54.0	14.7	Complied

Results: Middle Channel / 802.11g / 20 MHz / 6 Mbps / BPSK / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4877.067	Horizontal	48.0	74.0	26.0	Complied
7312.437	Horizontal	56.9	74.0	17.1	Complied

Results: Middle Channel / 802.11g / 20 MHz / 6 Mbps / BPSK / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4877.067	Horizontal	33.5	54.0	20.5	Complied
7312.437	Horizontal	39.7	54.0	14.3	Complied

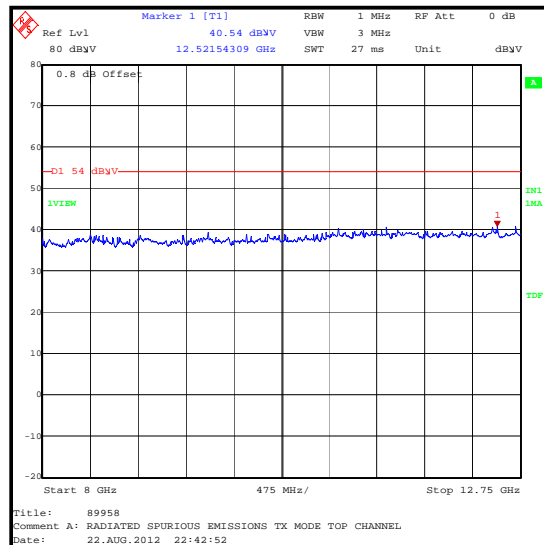
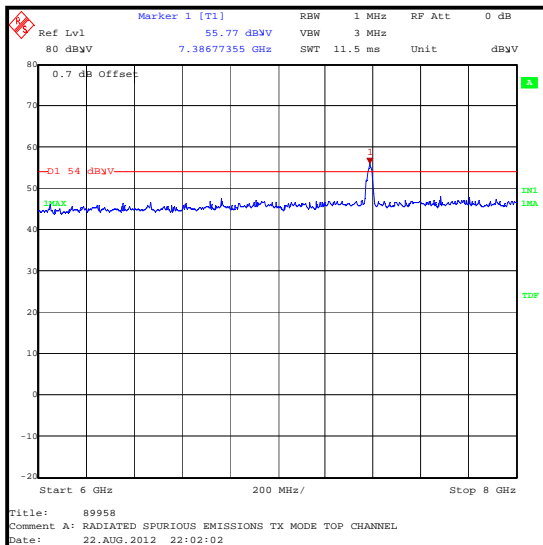
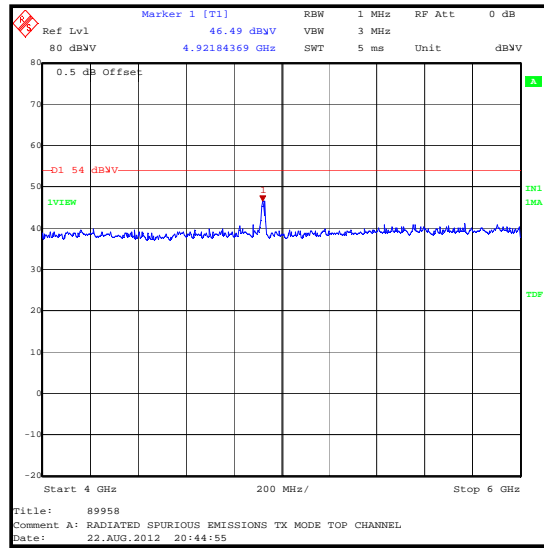
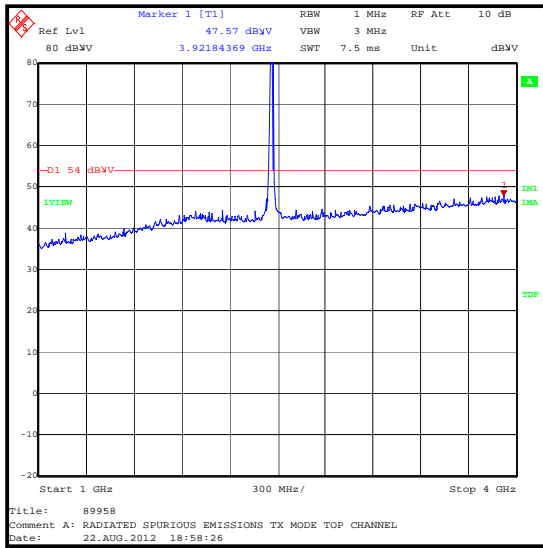
Results: Top Channel / 802.11g / 20 MHz / 6 Mbps / BPSK / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4922.407	Horizontal	49.1	74.0	24.9	Complied
7386.774	Horizontal	56.4	74.0	17.6	Complied

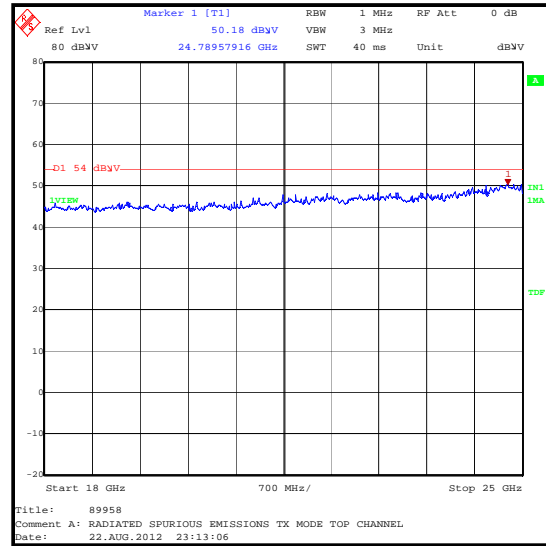
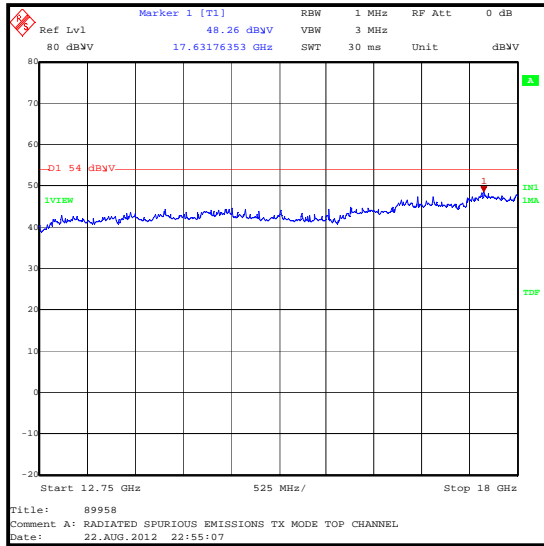
Results: Top Channel / 802.11g / 20 MHz / 6 Mbps / BPSK / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4922.407	Horizontal	33.6	54.0	20.4	Complied
7386.774	Horizontal	40.2	54.0	13.8	Complied

Transmitter Radiated Emissions (continued)



Transmitter Radiated Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Equipment Used:

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
A253	Antenna	12240-20	09 Oct 2012	12
A254	Antenna	14240-20	09 Oct 2012	12
A255	Antenna	16240-20	09 Oct 2012	12
A256	Antenna	18240-20	09 Oct 2012	12
A436	Antenna	20240-20	09 Oct 2012	12
A1534	Pre Amplifier	8449B	09 Oct 2012	12
A1818	Antenna	3115	09 Oct 2012	12
A1975	High Pass Filter	AFH-03000	15 Mar 2013	12
K0002	3m RSE Chamber	Rainford	09 Oct 2012	12
M1124	Test Receiver	ESIB 26	14 Aug 2013	12

5.2.9. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	22 August 2012
Test Sample Serial Number:	HX2W91SC700004R		

FCC Reference:	Part 15.247(d) & 15.209(a)
Industry Canada Reference:	RSS-Gen 4.9, RSS-210 A8.5
Test Method Used:	FCC KDB 558074 D01 Section 5.4 ANSI C63.10 Sections 6.3 and 6.6

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	42

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. Measurements were performed on the worst case data rates declared by the customer:
 - o 802.11b: 1 Mbps.
 - o 802.11g: 6 Mbps.
 - o 802.11n: 6.5 Mbps / MCS0
3. * -20 dBc limit.

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11b / 20 MHz / 1 Mbps / DBPSK / Peak**

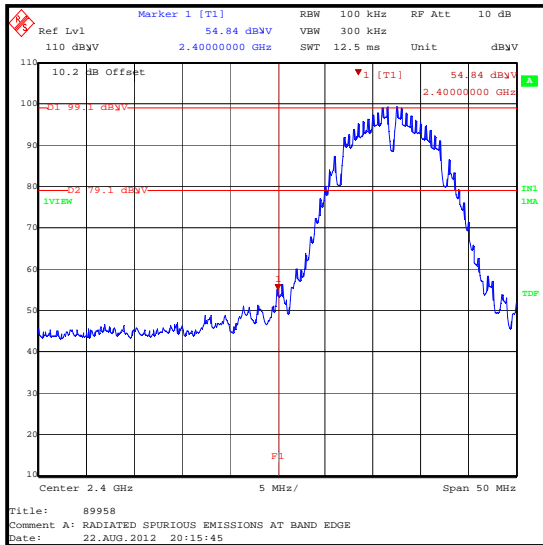
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	54.8	79.1*	24.3	Complied
2483.5	54.9	74.0	19.1	Complied
2484.853	55.8	74.0	18.2	Complied

Results: 802.11b / 20 MHz / 1 Mbps / DBPSK / Average

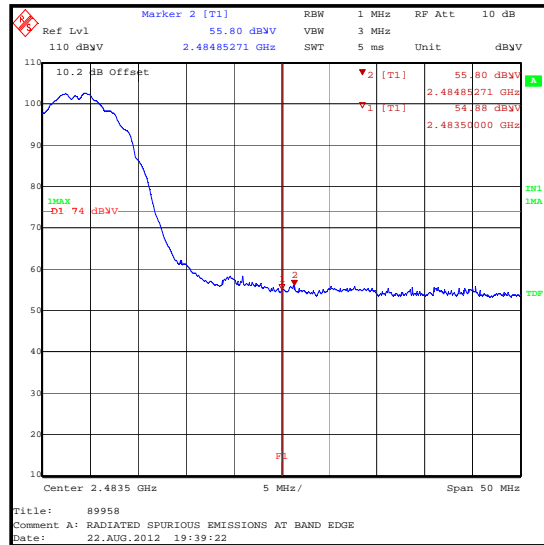
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	41.0	54.0	13.0	Complied
2489.061	42.9	54.0	11.1	Complied

Transmitter Band Edge Radiated Emissions (continued)

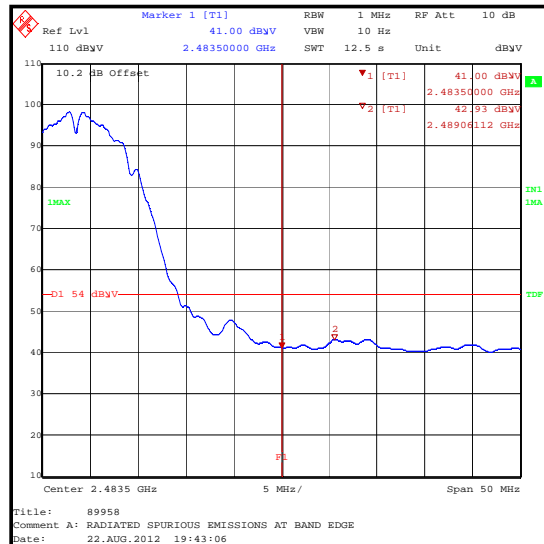
Results: 802.11b / 1 Mbps / DBPSK



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11g / 20 MHz / 6 Mbps / BPSK / Peak**

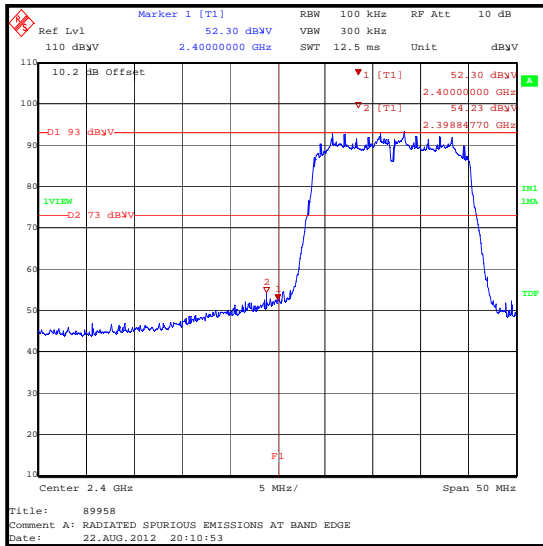
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2398.848	54.2	73.0*	18.8	Complied
2400	52.3	73.0*	20.7	Complied
2483.5	58.8	74.0	15.2	Complied
2484.853	60.4	74.0	13.6	Complied

Results: 802.11g / 20 MHz / 6 Mbps / BPSK / Average

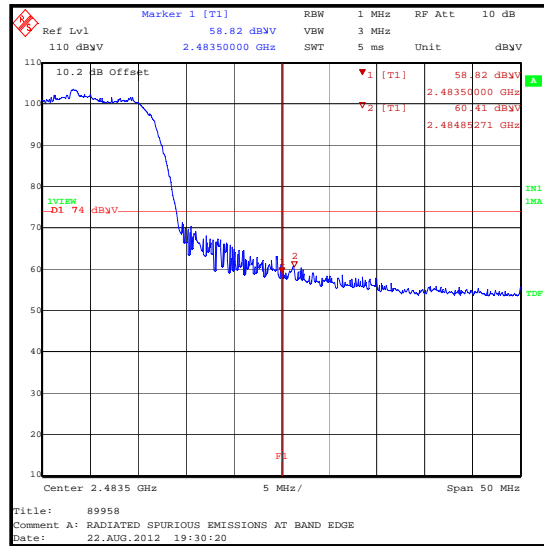
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	42.1	54.0	11.9	Complied

Transmitter Band Edge Radiated Emissions (continued)

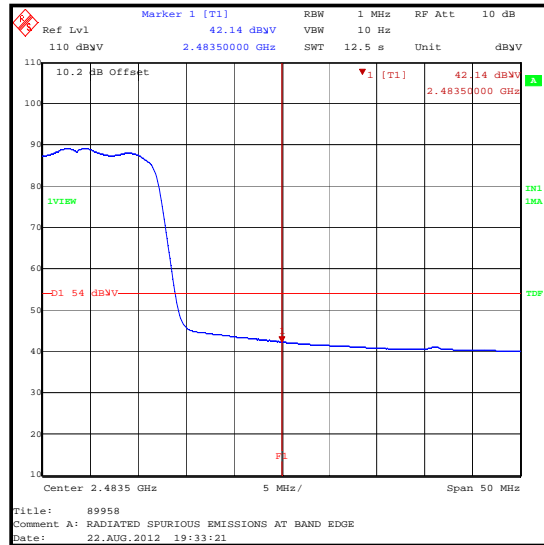
Results: 802.11g / 6 Mbps / BPSK



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 20 MHz / 6.5 Mbps / MCS0 / BPSK / Peak**

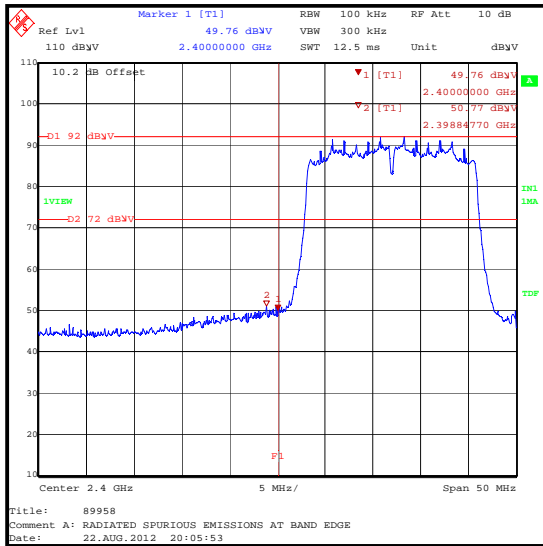
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2398.848	50.8	72.0*	21.2	Complied
2400	49.8	72.0*	22.2	Complied
2483.5	58.5	74.0	15.5	Complied

Results: 802.11n / 20 MHz / 6.5 Mbps / MCS0 / BPSK / Average

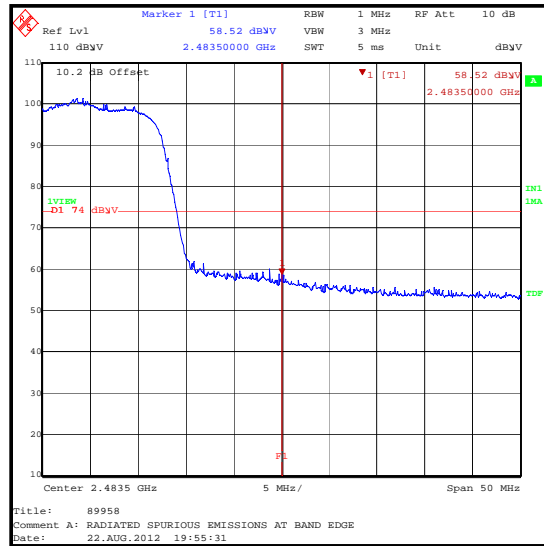
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	42.3	54.0	11.7	Complied

Transmitter Band Edge Radiated Emissions (continued)

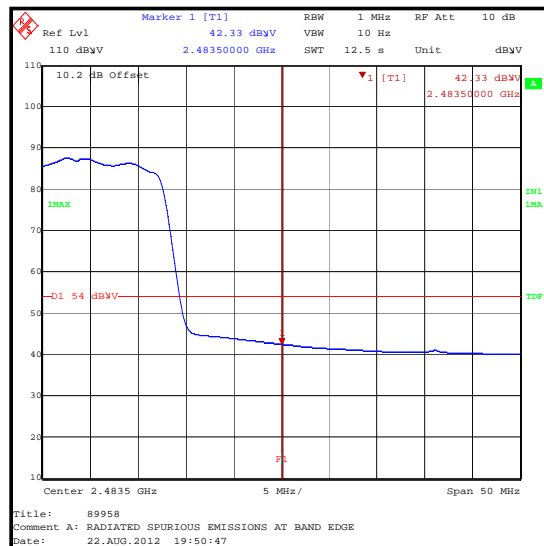
Results: 802.11n / 20 MHz / 6.5 Mbps / MCS0 / BPSK



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)**Test Equipment Used:**

RFI ID	Instrument Description	Model Number	Calibration Due	Calibration Interval (Months)
A1396	Attenuator	6810.17.B	06 Jul 2013	12
A1534	Pre Amplifier	8449B	09 Oct 2012	12
A1818	Antenna	3115	09 Oct 2012	12
K0002	3m RSE Chamber	N/A	09 Oct 2012	12
M1124	Test Receiver	ESIB 26	14 Aug 2013	12

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Conducted Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±0.28 dB
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±0.28 dB
6 dB Bandwidth	2.4 GHz to 2.4835 GHz	95%	±0.92 ppm
Occupied Bandwidth	2.4 GHz to 2.4835 GHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 26.5 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	7	3.1 & 3.2	Updates requested by Customer
3.0	-	-	Added setup photos and power versus frequency table
4.0	-	-	FCC ID updated
5.0	-	-	Update highest data rate to worst case data rate throughout