



**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
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## Specification

### Peak Power Spectral Density Limits

**§15.247(e)** For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission

**RSS-210 §A8.2(2)** The transmitter power spectral density (into the antenna) shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

### Laboratory Measurement Uncertainty for Spectral Density

Measurement uncertainty

$\pm 1.33$  dB

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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#### 5.1.4. Maximum Permissible Exposure

**FCC, Part 15 Subpart C §15.247(i)**

**Industry Canada RSS-Gen §5.5**

#### Calculations for Maximum Permissible Exposure Levels

$$\text{Power Density} = P_d (\text{mW/cm}^2) = \text{EIRP} / (4\pi d^2)$$

$$\text{EIRP} = P * G$$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

$$\text{Numeric Gain} = 10 ^ (G (\text{dBi})/10)$$

The Fluke Networks Sensor4 has three transmitters operating in each band. It also has two similar radio's. The peak power in the table below is calculated by assuming a worst case scenario where all transmitters are operating simultaneously in the same channel and x2 the maximum power found in Section 5.1.2 Peak Output Power to take into account the two radio modules operating simultaneously in the same band.

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm<sup>2</sup>

The following table uses the highest antenna gain for each band.

Freq. Band (MHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power x 2 (mW)	Power Density (S) @ 20cm mW/cm <sup>2</sup>
2.4	External 2.0	1.58	+25.23	666.9	0.21
5.8	Integral 4.8	3.02	+21.12	263.7	0.16

**Note:** for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

#### Specification

#### Maximum Permissible Exposure Limits

**§15.247(i)** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency levels in excess of the Commission's guidelines.

**FCC §1.1310** Limit = 1mW / cm<sup>2</sup> from 1.310 Table 1

**RSS-Gen §5.5** Before equipment certification is granted, the applicable requirements of RSS-102 shall be met

#### Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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### 5.1.5. Conducted Spurious Emissions

**FCC, Part 15 Subpart C §15.247(d); 15.205; 15.209**

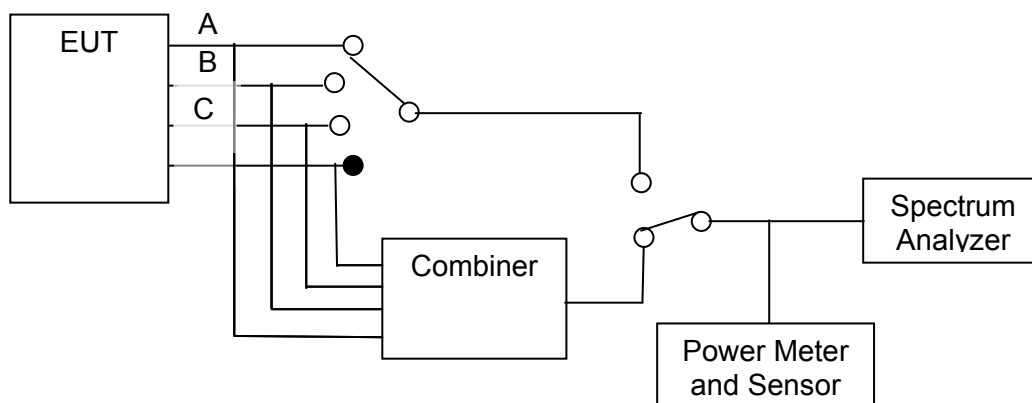
**Industry Canada RSS-210 §A8.5, §2.2**

**Industry Canada RSS-Gen 4.7**

#### **Test Procedure**

Conducted emissions were measured at a limit of 20 dB below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Emissions at the band edge were measured and recorded. Measurements were made while EUT was operating in transmit mode of operation at the appropriate center frequency.

#### **Test Measurement Set up**



Band-edge measurement test configuration

#### **Measurement Results of Conducted Spurious Emissions**

Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57 %    Pressure: 999 to 1012 mbar

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

**NOTE: KDB 662911 was implemented for Out-of-Band measurements. Where necessary Option (2) Measure and add 10 log (N) dB was implemented**



### Conducted Spurious Emission Results

Measurements were performed with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the band-edge measurements provided below are drawn on each plot.

TABLE OF RESULTS – 802.11b – Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-43.45	-7.81	-42.86	-8.91	-43.21	-8.45		
2437.000	30.00	26000.00	-43.84	-8.31	-43.42	-8.50	-43.23	-7.80		
2462.000	30.00	26000.00	-43.78	-9.85	-43.21	-9.30	-42.15	-8.19		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-30.06	-7.61	-31.64	-8.38	-32.21	-7.78		
2462.000	2483.50	-34.53	-8.51	-34.76	-8.24	-34.16	-7.37		

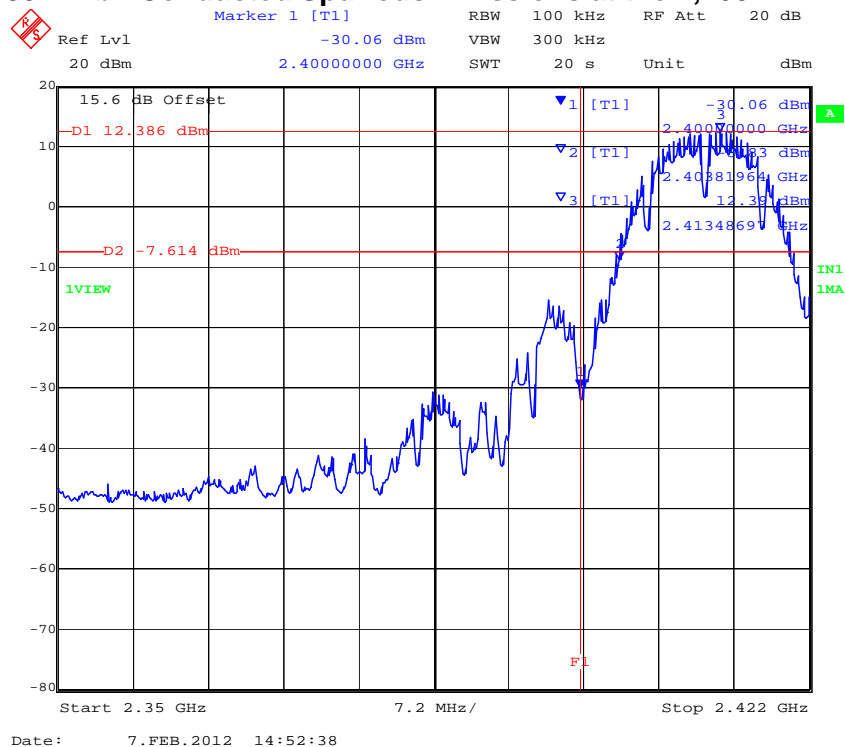
BE: Maximum Band edge emission found

<b>Measurement uncertainty:</b>	±2.81 dB
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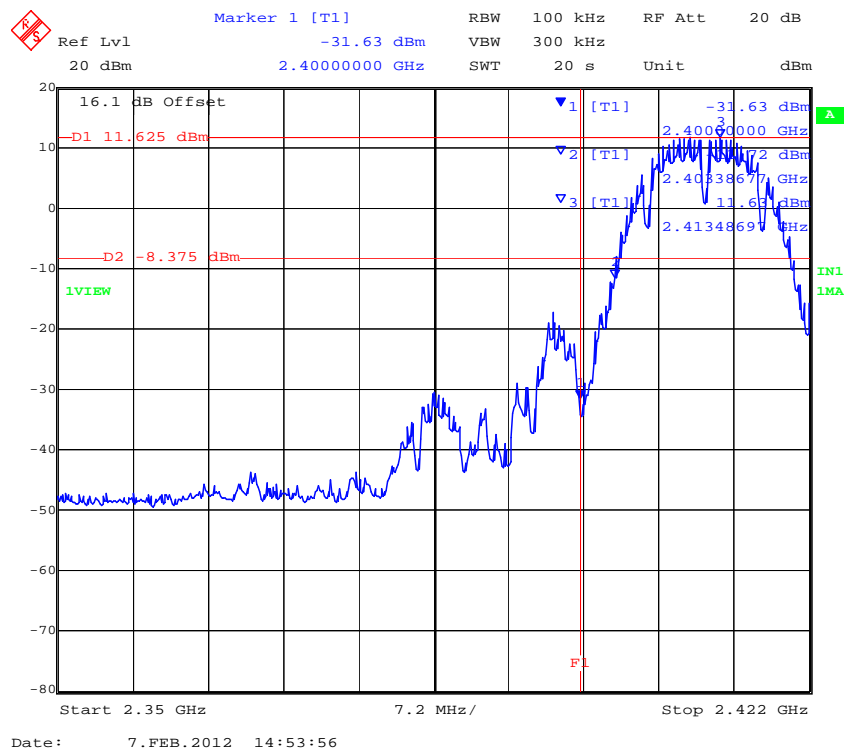
Note: Limit is based on 20dB down from fundamental emission



### PORT A 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge



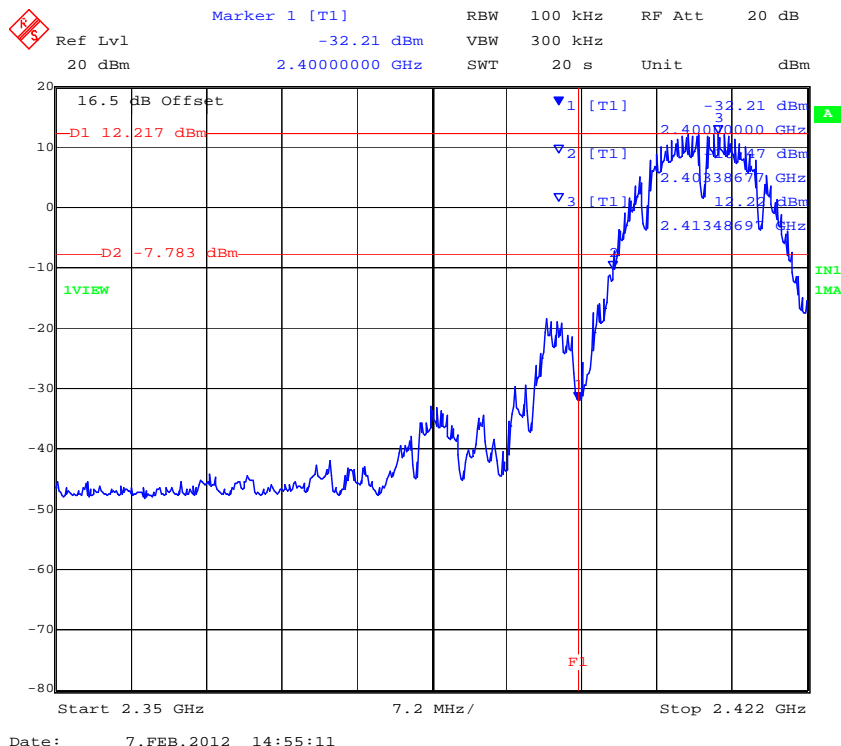
### PORT B 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge



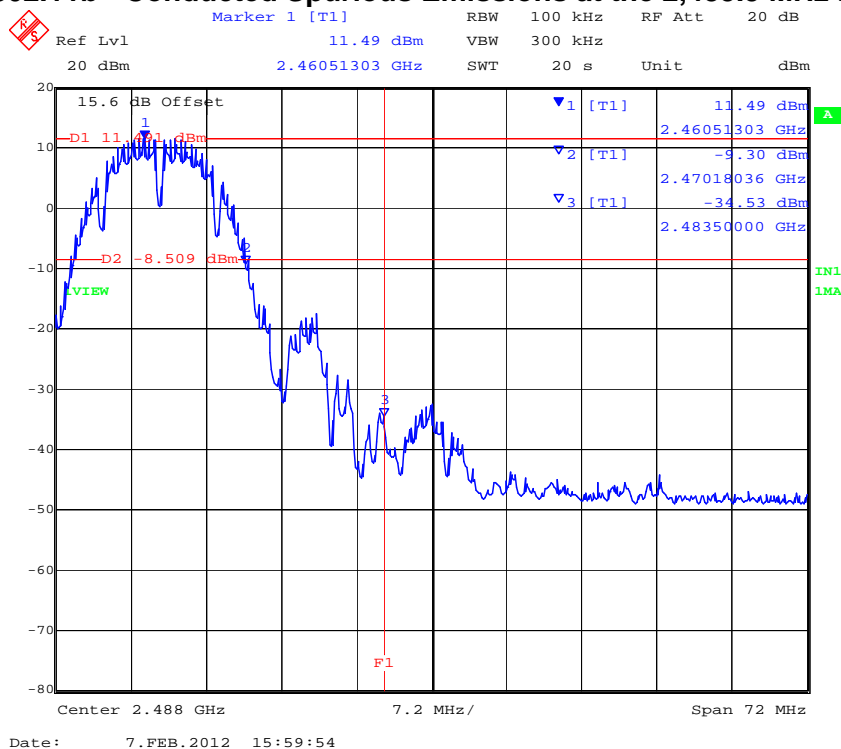
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### PORT C 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge



### PORT A 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge

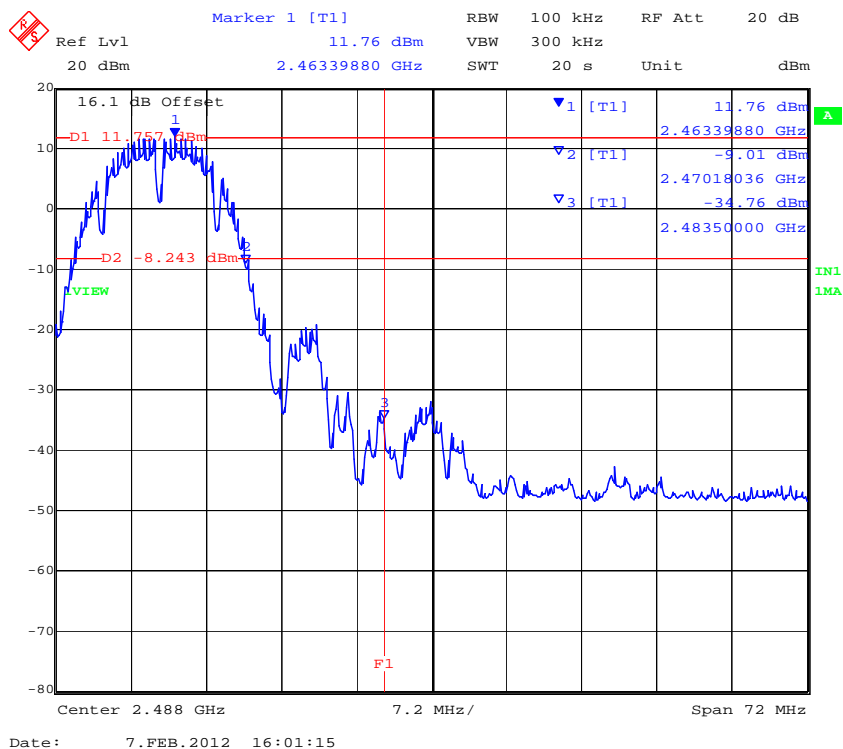


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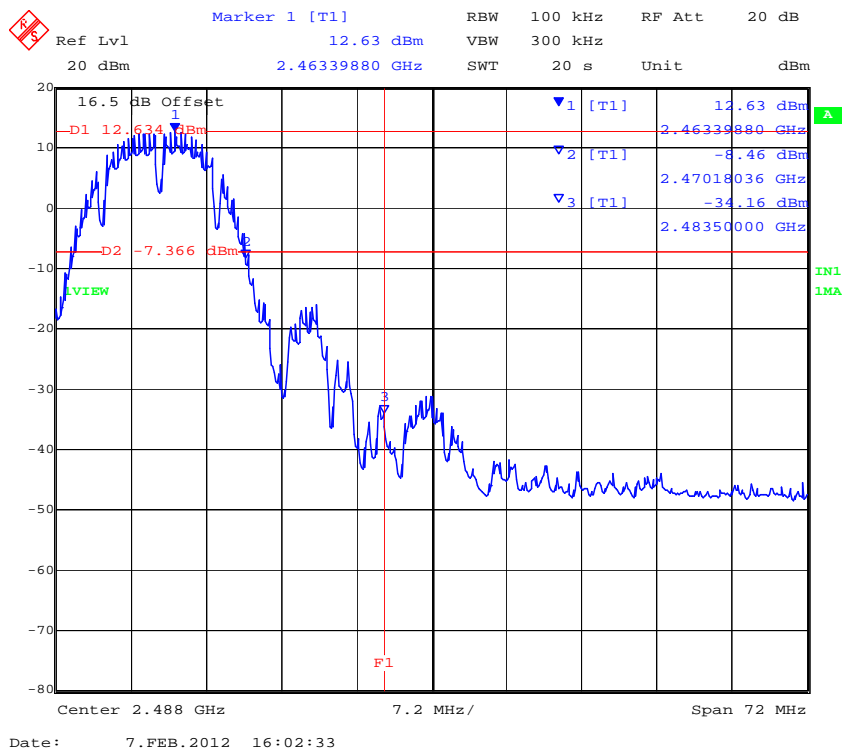


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### PORT B 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



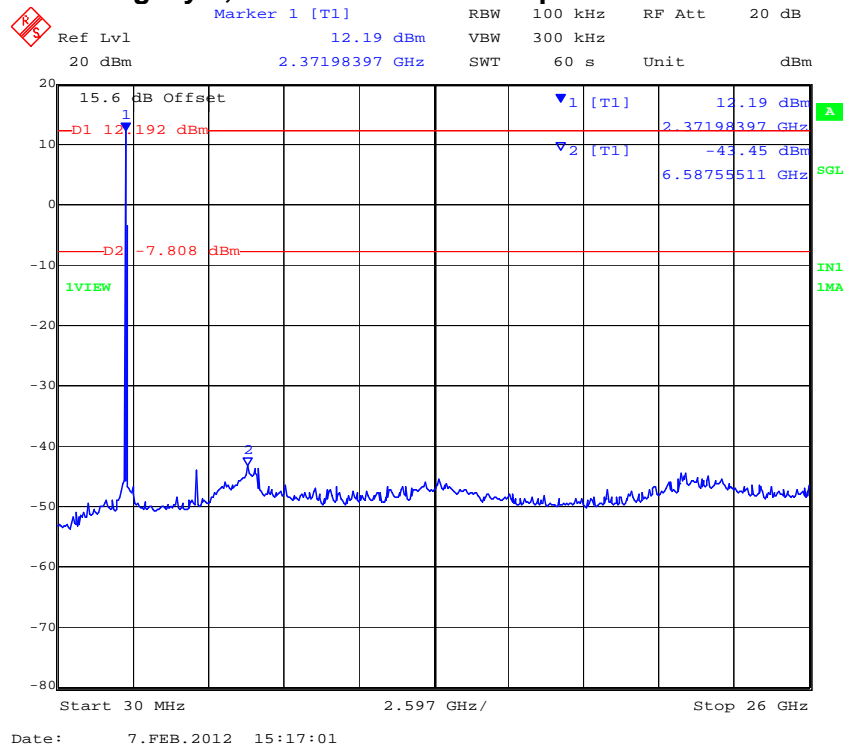
### PORT C 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



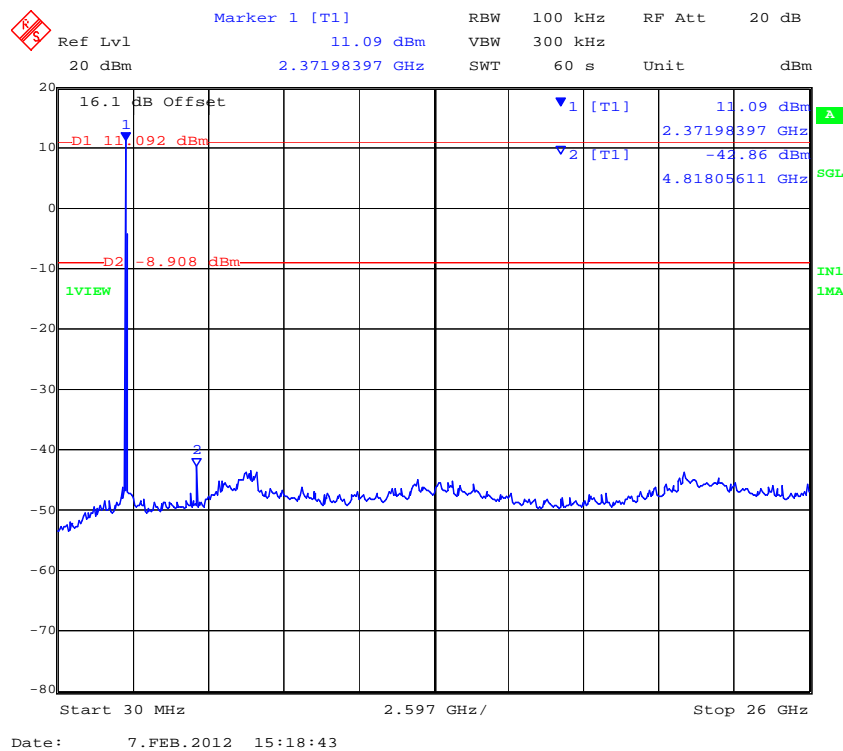
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### PORT A 802.11b-Legacy 2,412 MHz Conducted Spurious Emissions 0.30 to 26 GHz



### PORT B 802.11b-Legacy 2,412 MHz Conducted Spurious Emissions 0.30 to 26 GHz



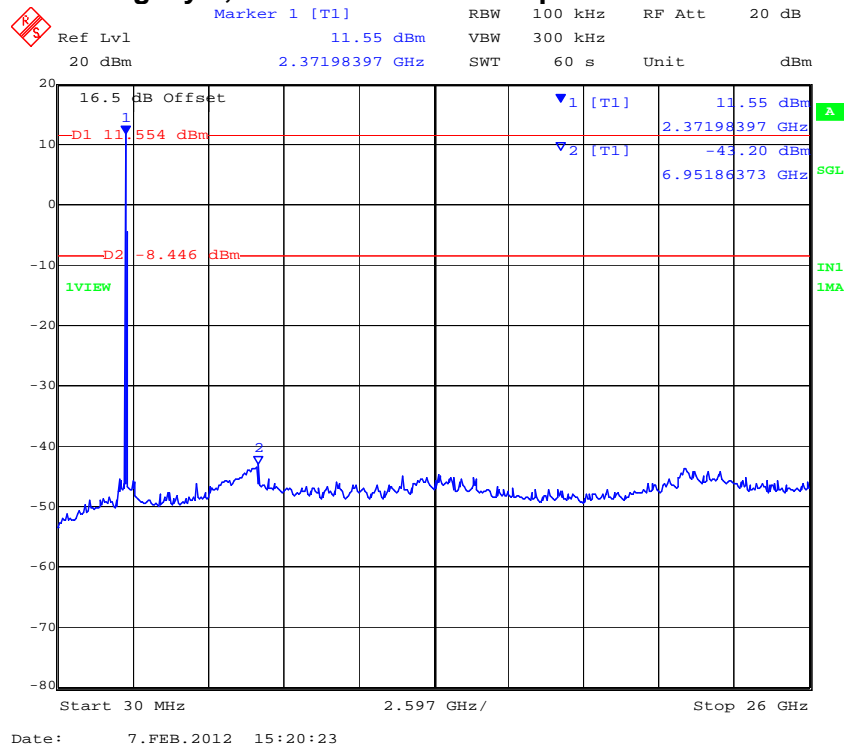
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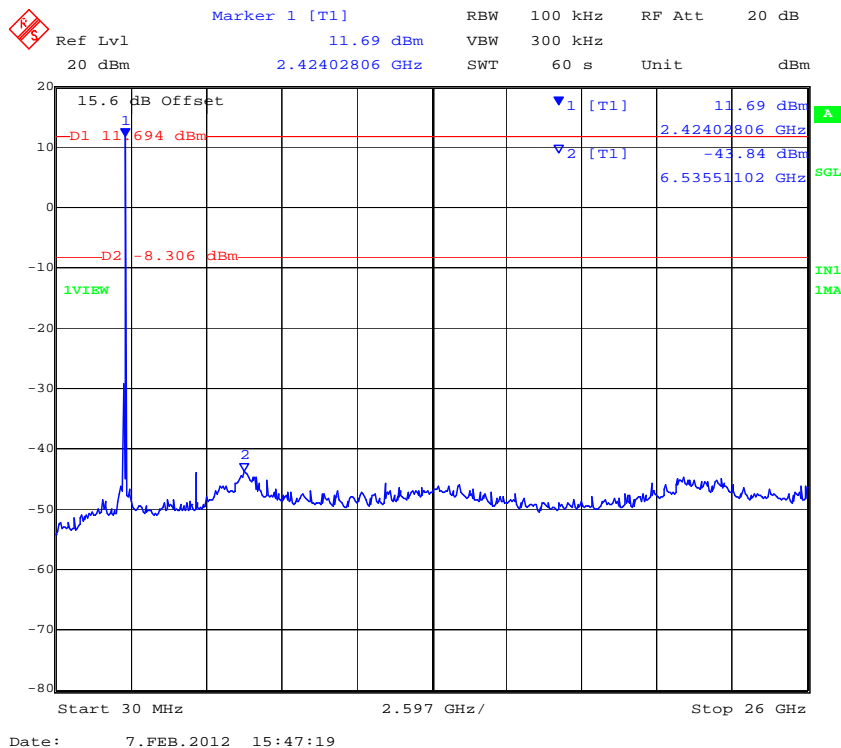
### PORT C 802.11b-Legacy 2,412 MHz Conducted Spurious Emissions 0.30 to 26 GHz



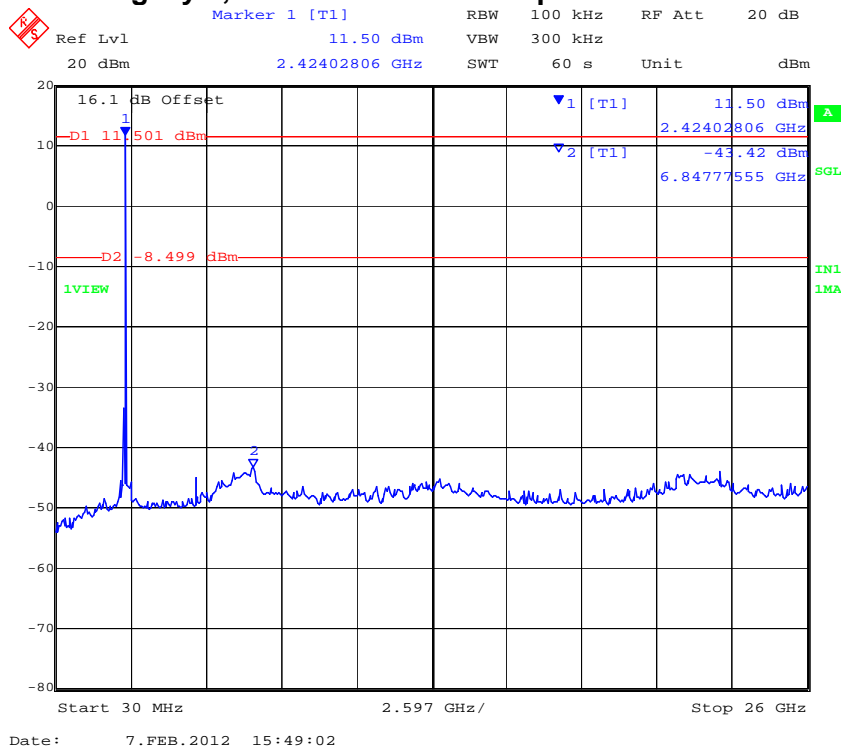
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### PORT A 802.11b-Legacy 2,437 MHz Conducted Spurious Emissions 0.30 to 26 GHz



### PORT B 802.11b-Legacy 2,437 MHz Conducted Spurious Emissions 0.30 to 26 GHz

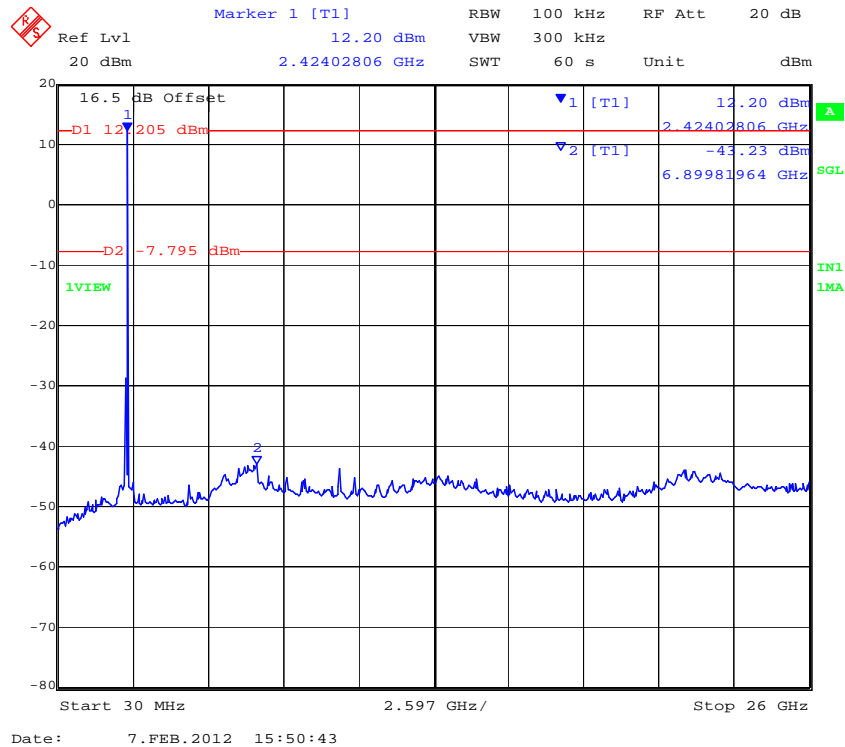


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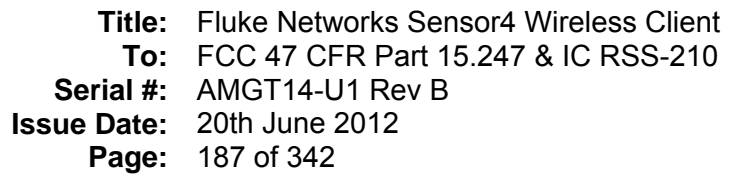


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### PORT C 802.11b-Legacy 2,437 MHz Conducted Spurious Emissions 0.30 to 26 GHz



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[illegible]

Marker 1 [T1]

RBW 100 kHz RF Att 20 dB

VBW 300 kHz

SWT 60 s Unit dBm

Ref Lvl 10.70 dBm

20 dBm 2.42402806 GHz

16.1 dB Offset

D1 10.702 dBm

D2 -9.298 dBm

1 [T1] 10.70 dBm

2 [T1] -43.21 dBm

2.42402806 GHz

6.95186373 GHz

1VIEW

Start 30 MHz

2.597 GHz/

Stop 26 GHz

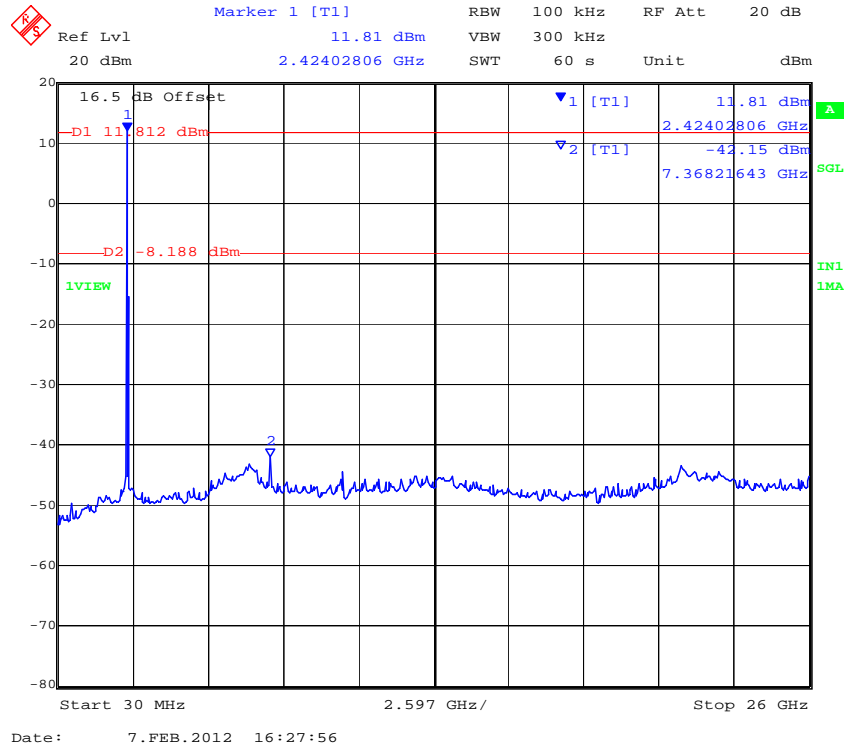
Date: 7.FEB.2012 16:26:14

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)



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### PORT C 802.11b–Legacy 2,462 MHz Conducted Spurious Emissions 0.30 to 26 GHz



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## Conducted Spurious Emission Results

### TABLE OF RESULTS – 802.11g Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-44.04	-12.86	-43.40	-12.65	-43.42	-11.45		
2437.000	30.00	26000.00	-43.46	-12.92	-43.26	-14.04	-42.61	-14.21		
2462.000	30.00	26000.00	-44.34	-13.60	-43.60	-13.06	-42.81	-12.74		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-14.40	-11.99	-16.81	-12.09	-15.39	-10.82		
2462.000	2483.50	-28.96	-13.04	-27.40	-12.73	-25.65	-11.28		

BE: Maximum Band edge emission found

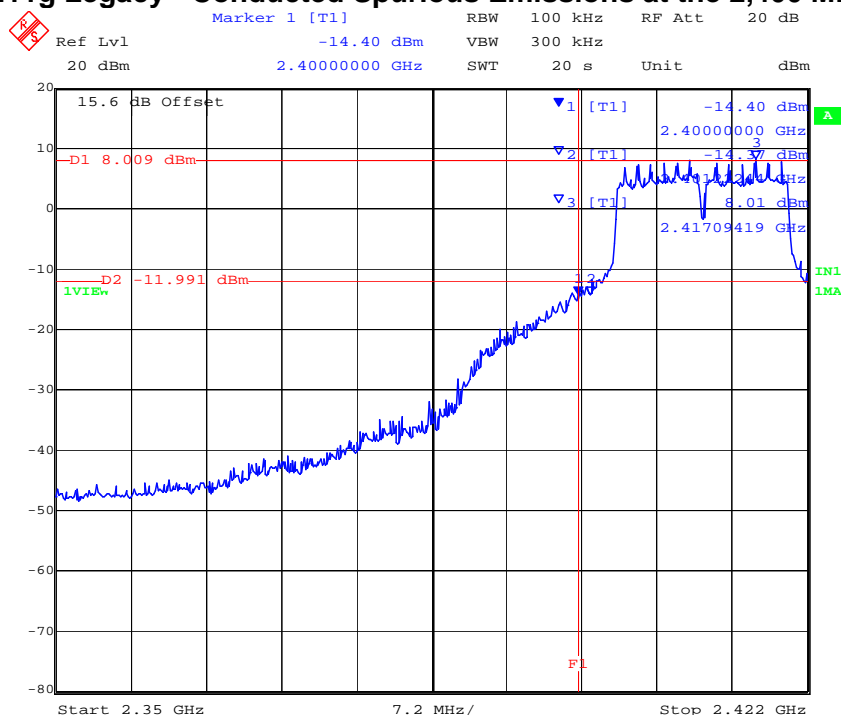
<b>Measurement uncertainty:</b>	±2.81 dB
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Note: Limit is based on 20dB down from fundamental emission

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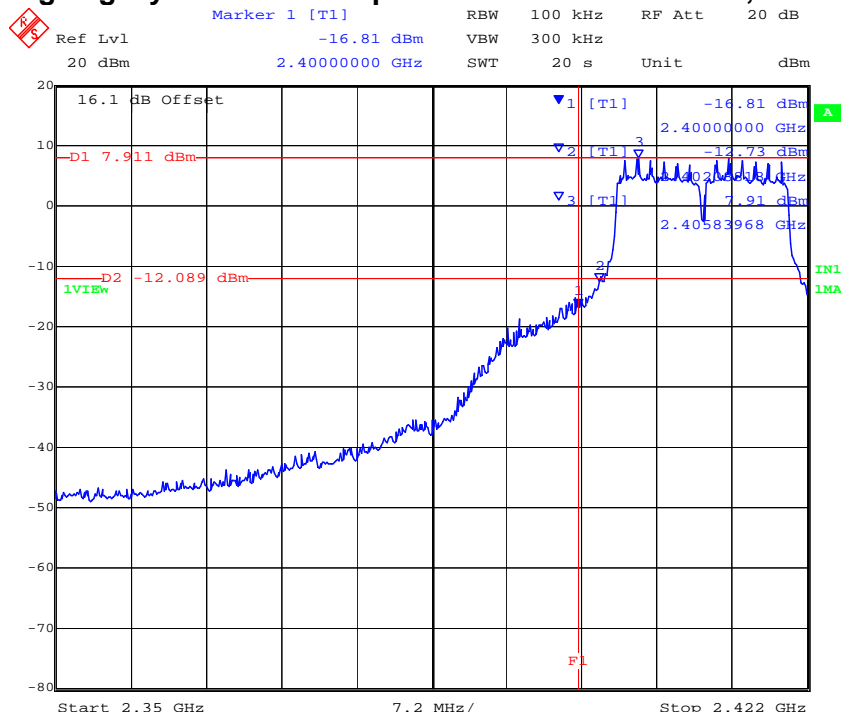


### PORT A 802.11g Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge



Date: 8.FEB.2012 08:40:43

### PORT B 802.11g Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge



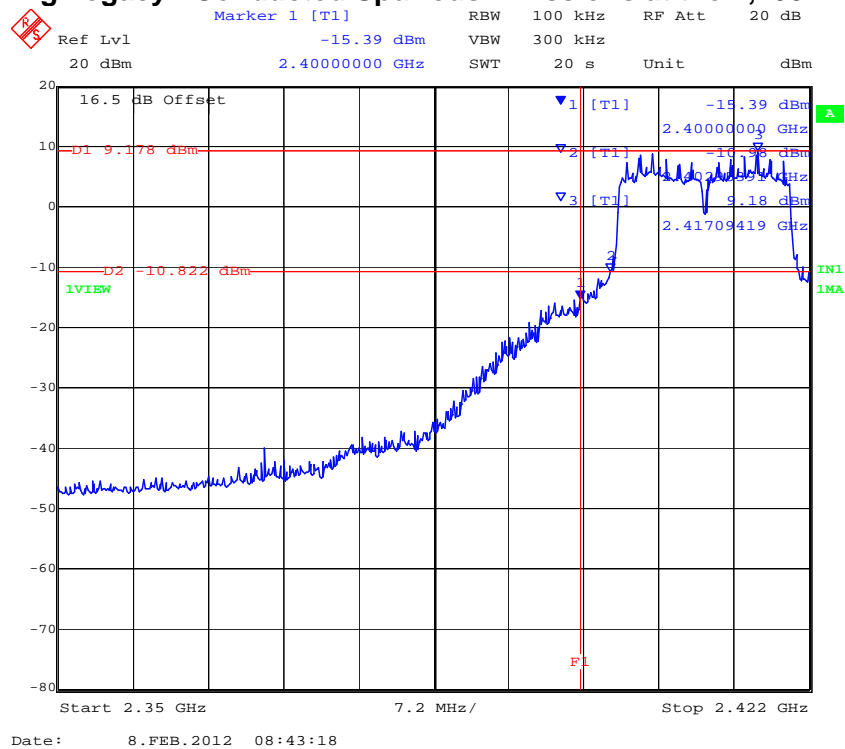
Date: 8.FEB.2012 08:42:02

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### PORT C 802.11g Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge



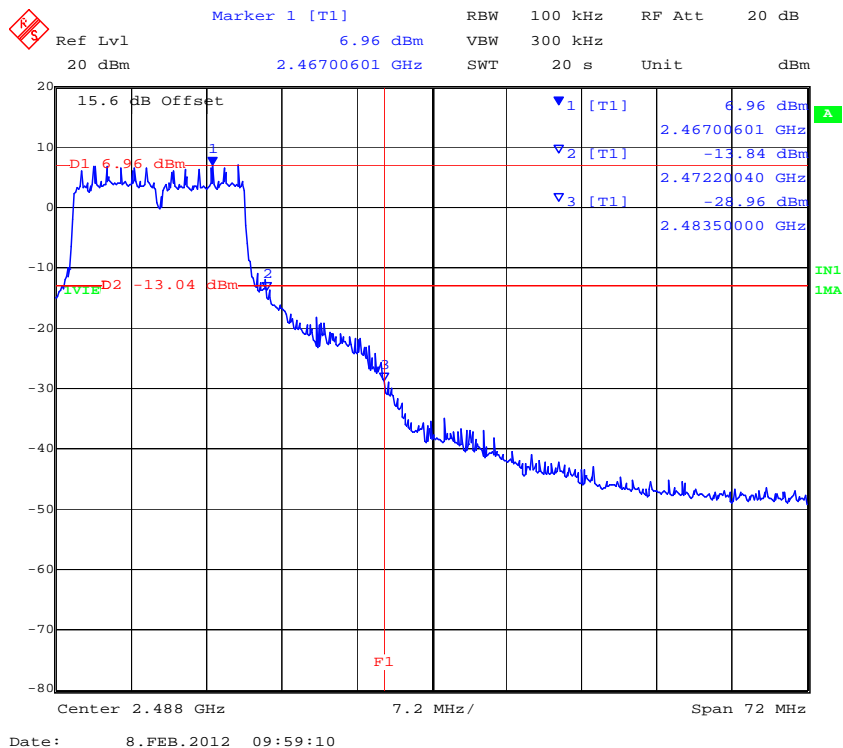
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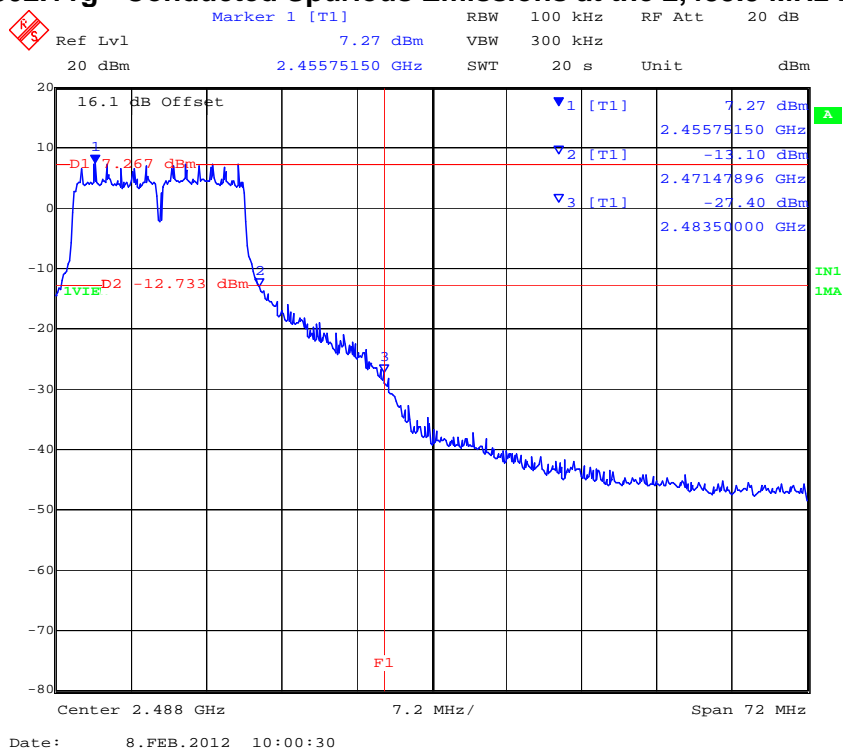


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### PORT A 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



### PORT B 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge

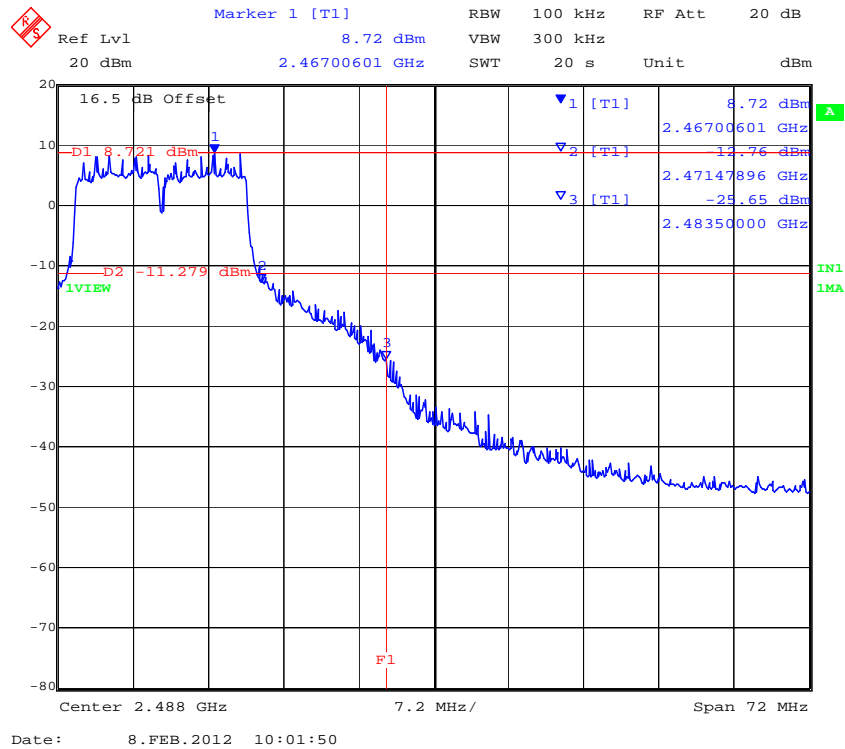


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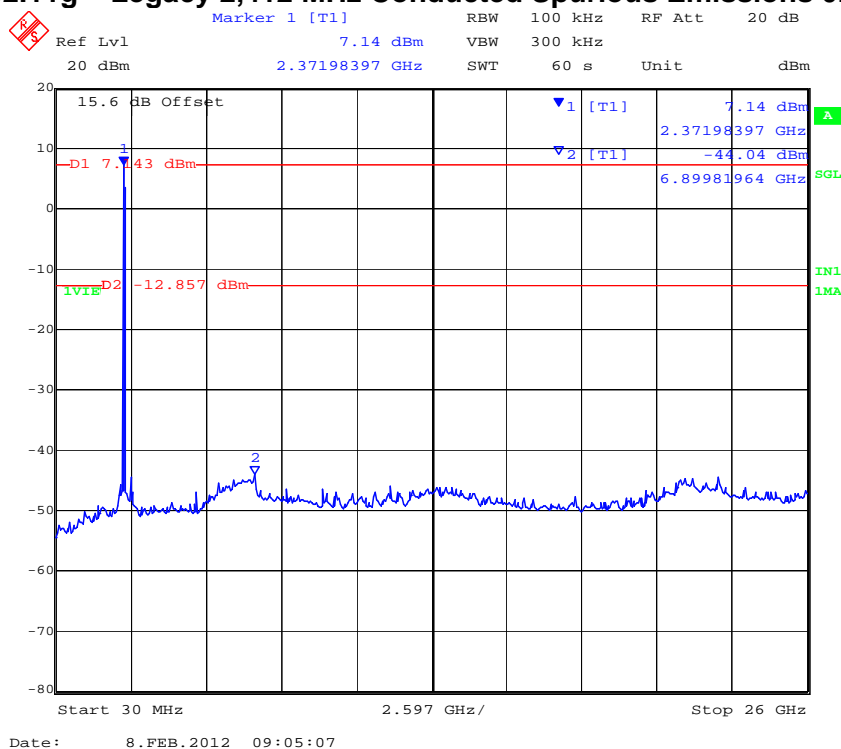
### PORT C 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



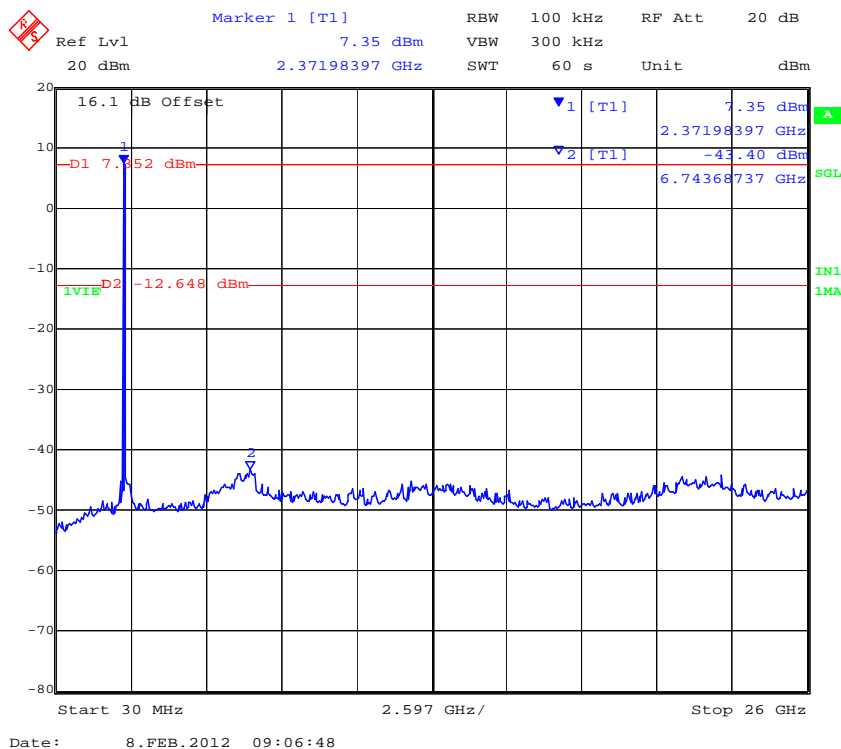
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### PORT A 802.11g – Legacy 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



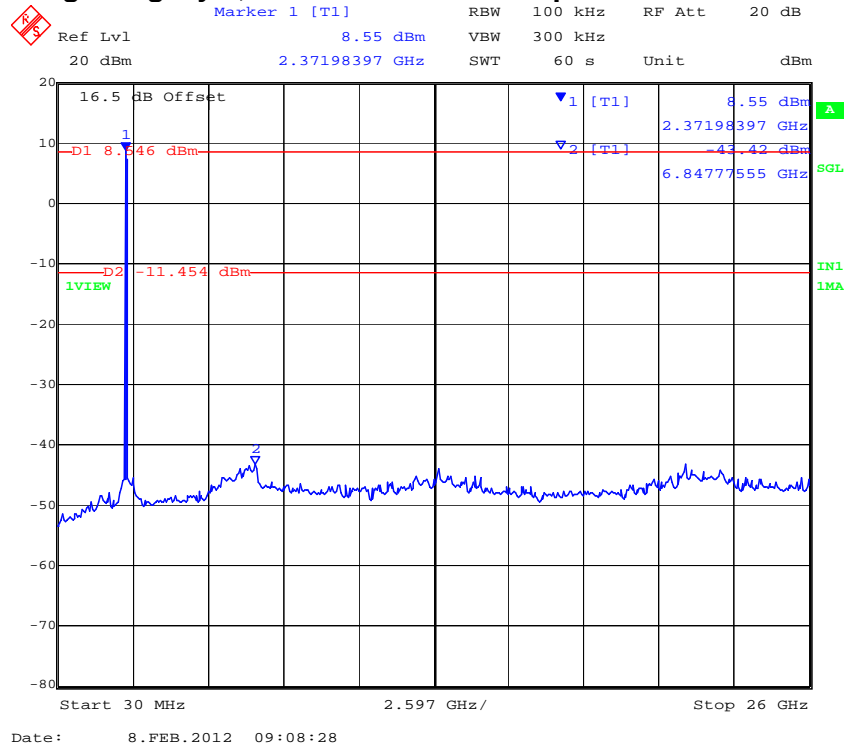
### PORT B 802.11g – Legacy 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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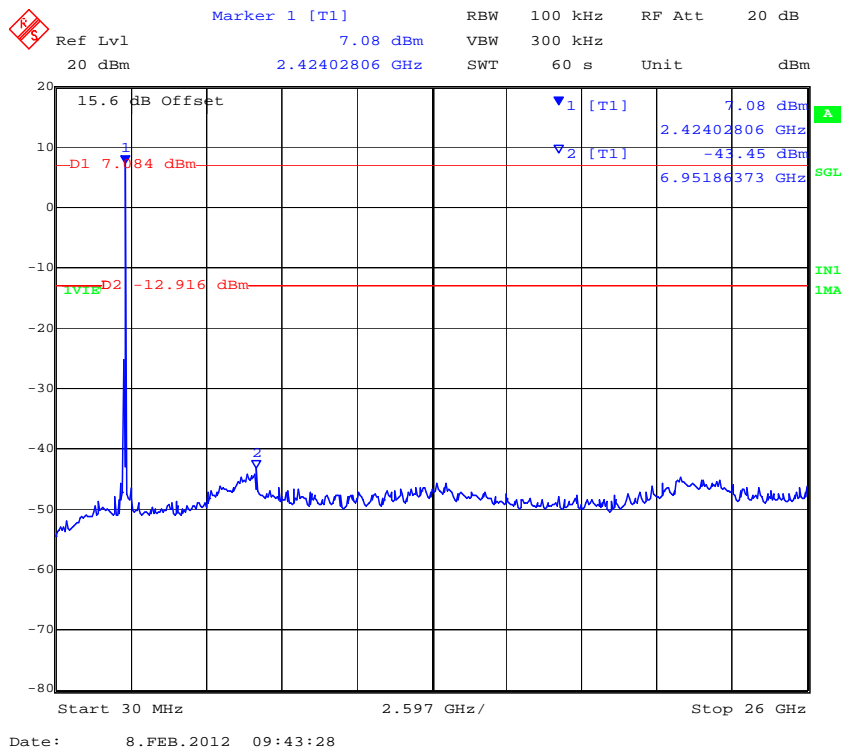
### PORT C 802.11g – Legacy 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



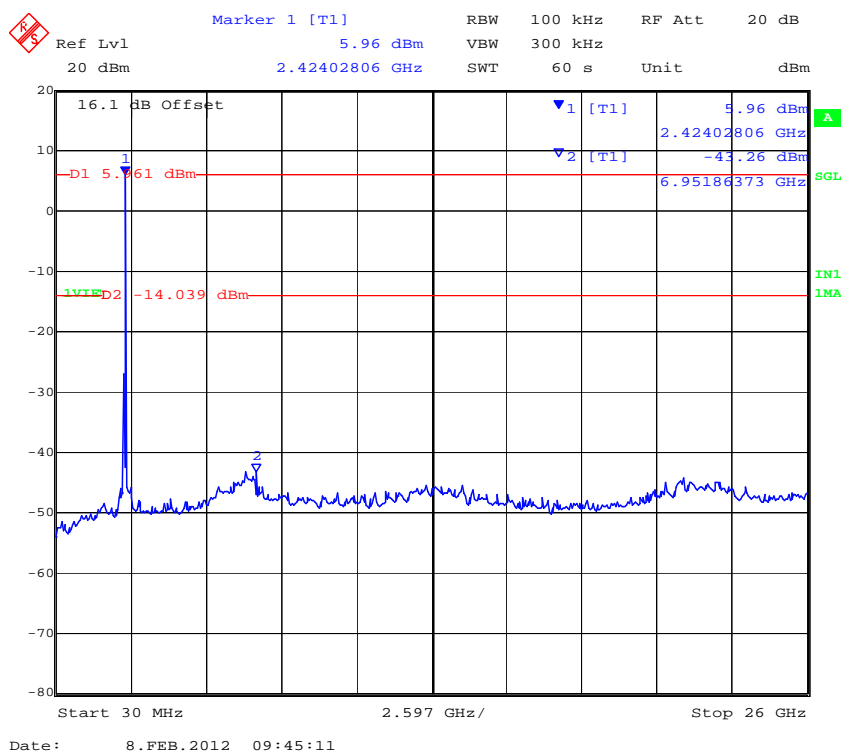
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### PORT A 802.11g-Legacy 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11g-Legacy 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz

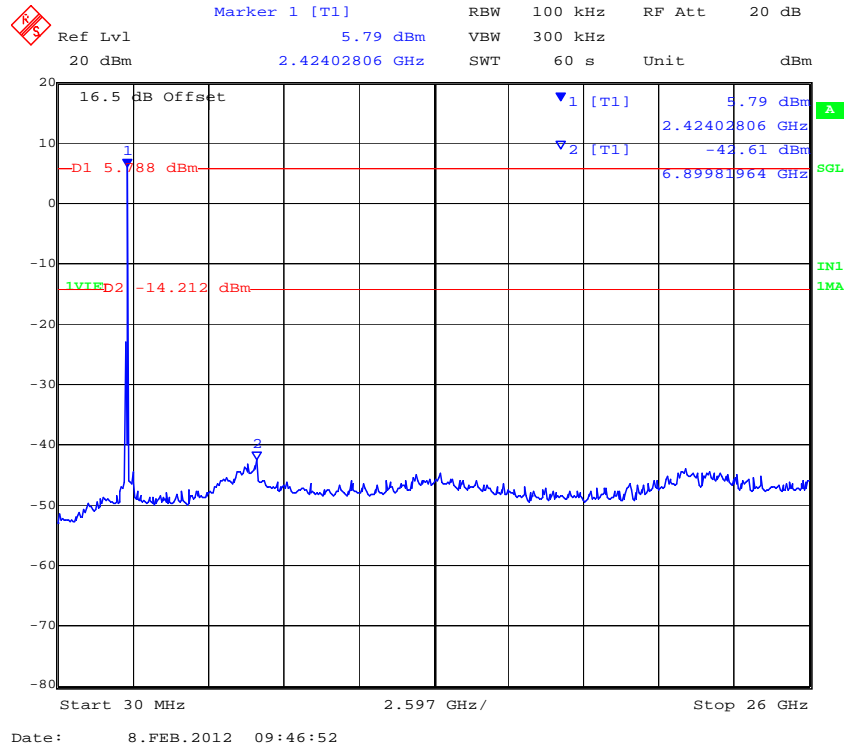


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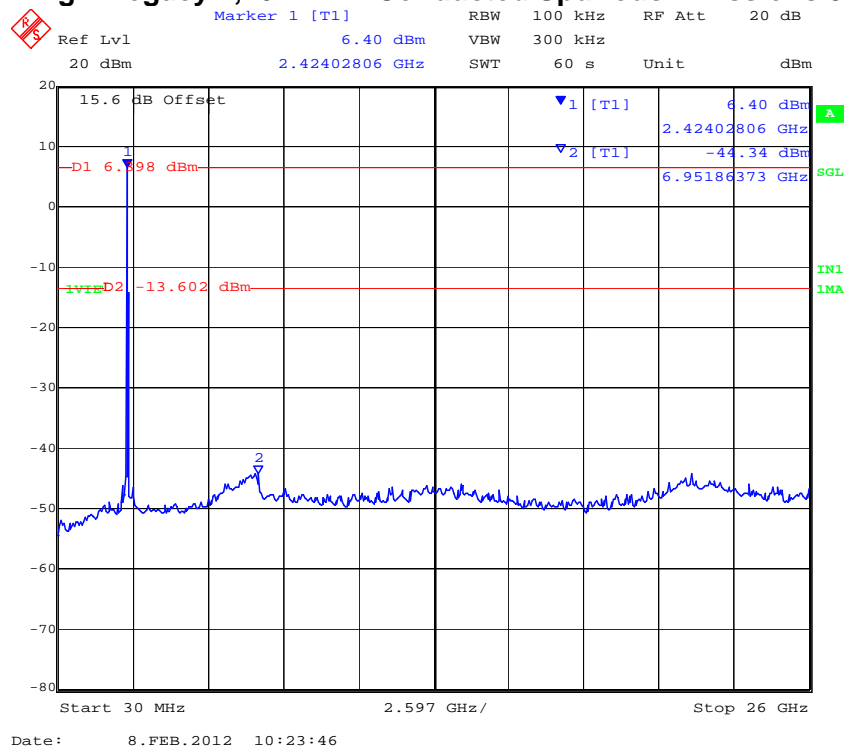
## PORT C 802.11g-Legacy 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



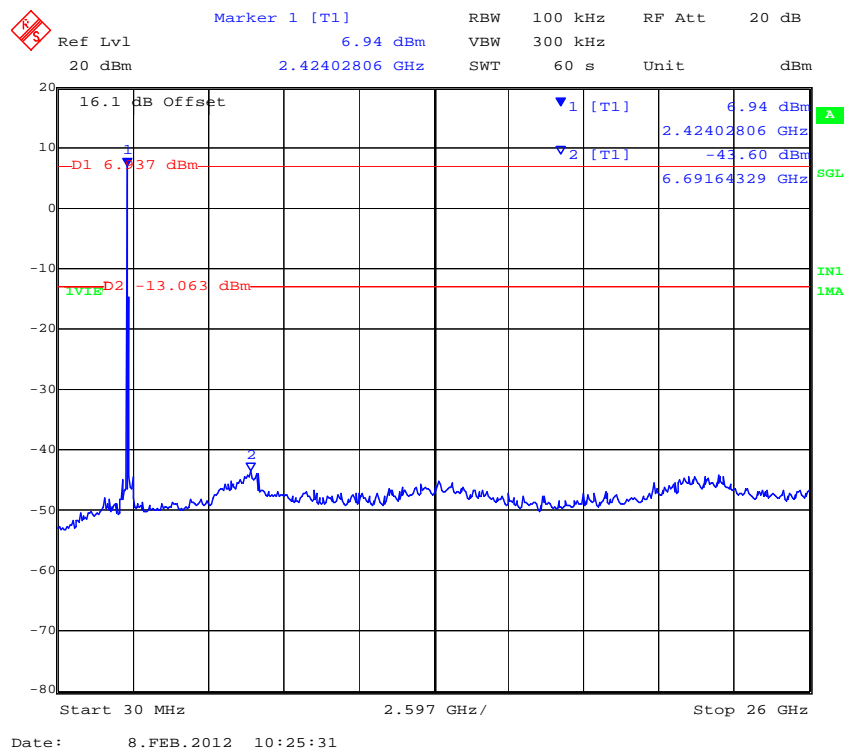
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### PORT A 802.11g – Legacy 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11g – Legacy 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz

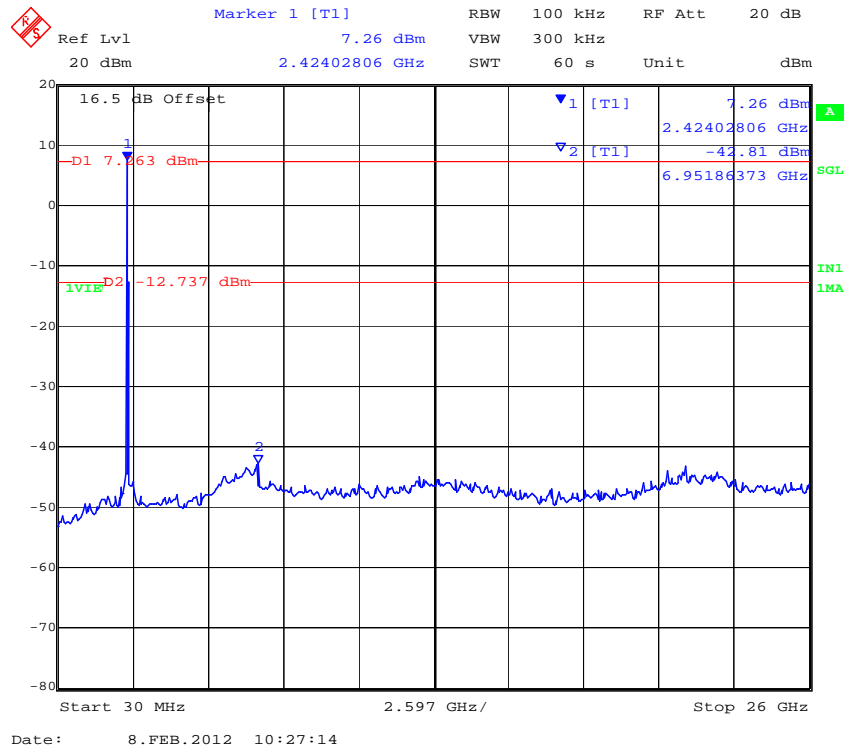


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### PORT C 802.11g – Legacy 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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## Conducted Spurious Emission Results

### TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-43.79	-15.23	-43.84	-13.21	-43.12	-11.23		
2437.000	30.00	26000.00	-42.73	-12.52	-42.22	-12.00	-42.98	-14.86		
2462.000	30.00	26000.00	-44.43	-14.25	-42.86	-12.56	-42.76	-14.97		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-14.40	-12.32	-14.67	-12.07	-15.62	-11.23		
2462.000	2483.50	-23.97	-12.72	-25.56	-12.31	-23.63	-11.04		

BE: Maximum Band edge emission found

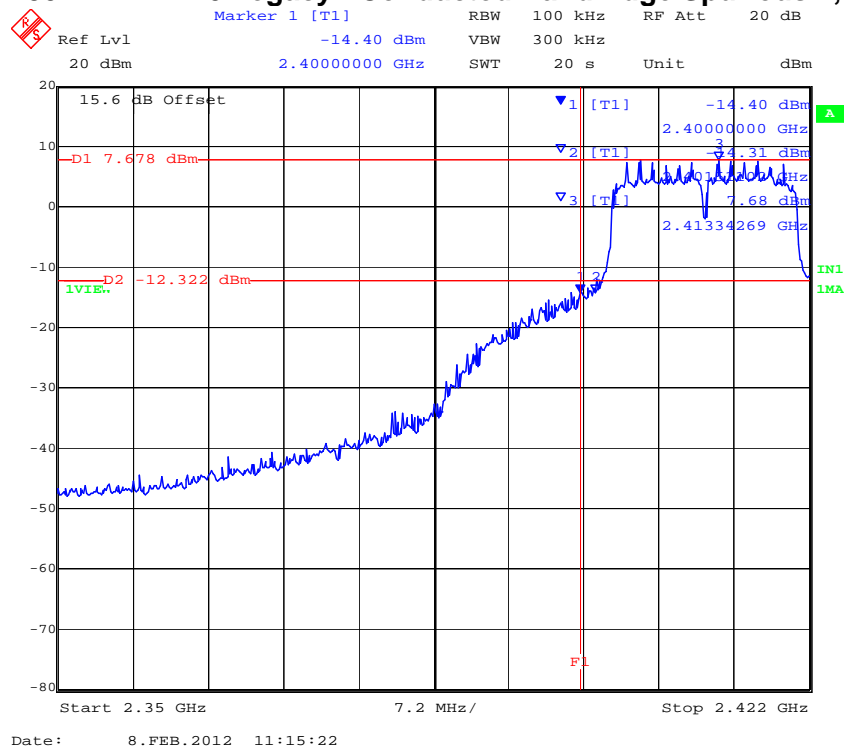
<b>Measurement uncertainty:</b>	±2.81 dB
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Note: Limit is based on 20dB down from fundamental emission

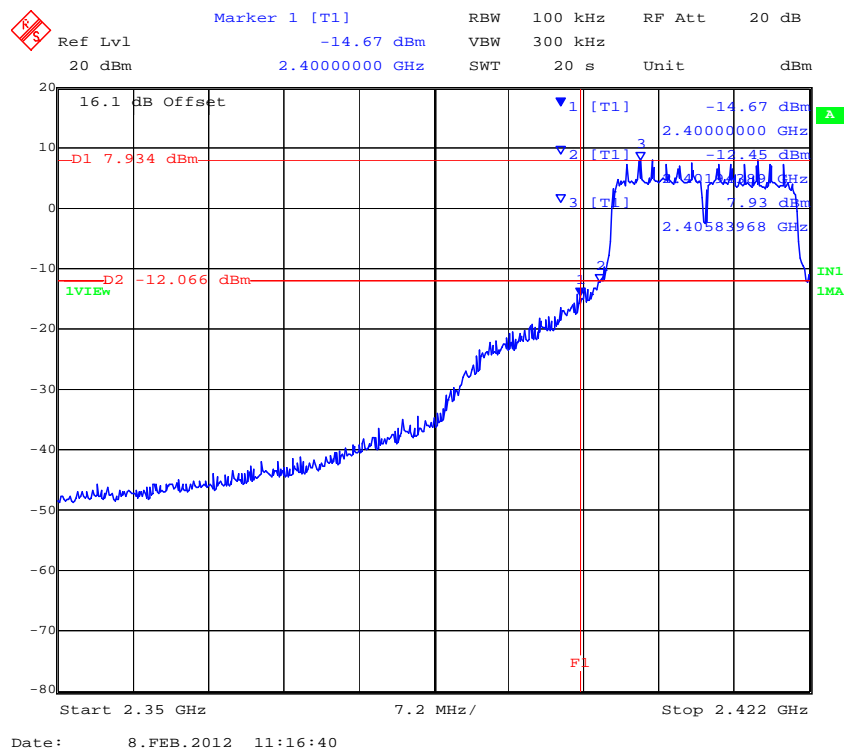


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
**Page:** 201 of 342

### PORT A 802.11n HT-20 Legacy - Conducted Band Edge Spurious 2,400 MHz



### PORT B 802.11n HT-20 Legacy - Conducted Band Edge Spurious 2,400 MHz

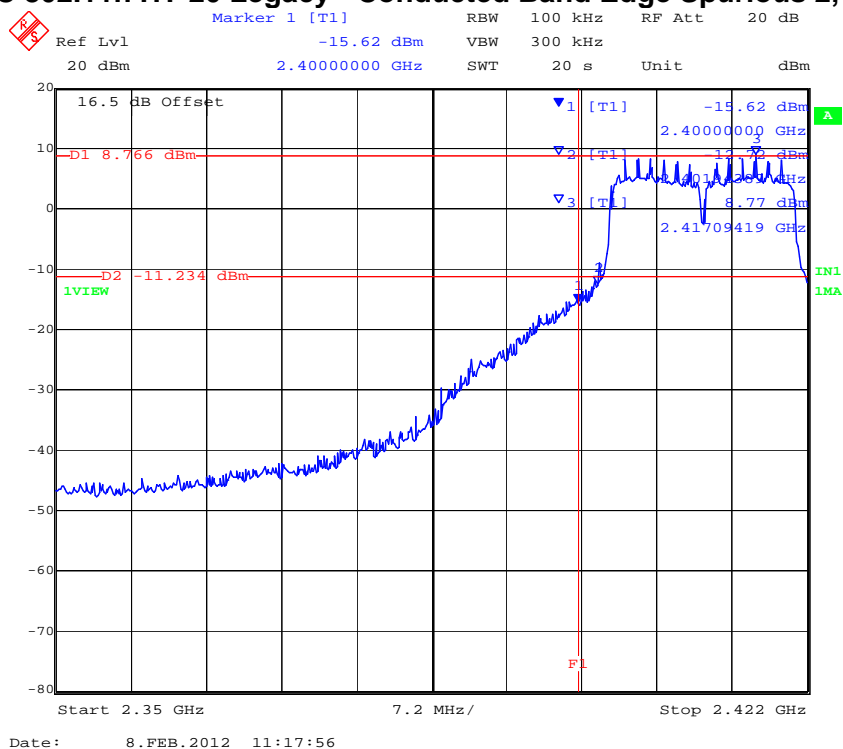


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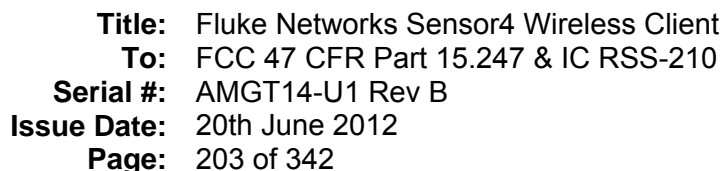


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
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### PORT C 802.11n HT-20 Legacy - Conducted Band Edge Spurious 2,400 MHz



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Ref Lvl 20 dBm

Marker 1 [T1] 7.28 dBm

RBW 100 kHz RF Att 20 dB

2.45575150 GHz

VBW 300 kHz

SWT 20 s Unit dBm

15.6 dB Offset

1 [T1] 7.28 dBm

2 [T1] -19.85 dBm

3 [T1] -23.97 dBm

2.47248898 GHz

2.48350000 GHz

12.719 dBm

Center 2.488 GHz

7.2 MHz/

Span 72 MHz

Date: 8.FEB.2012 12:30:31

Ref Lvl 20 dBm

Marker 1 [T1] 7.69 dBm

RBW 100 kHz

VBW 300 kHz

SWT 20 s

RF Att 20 dB

Unit dBm

16.1 dB Offset

D1 7.694 dBm

D2 -12.306 dBm

F1

Center 2.488 GHz

7.2 MHz/

Span 72 MHz

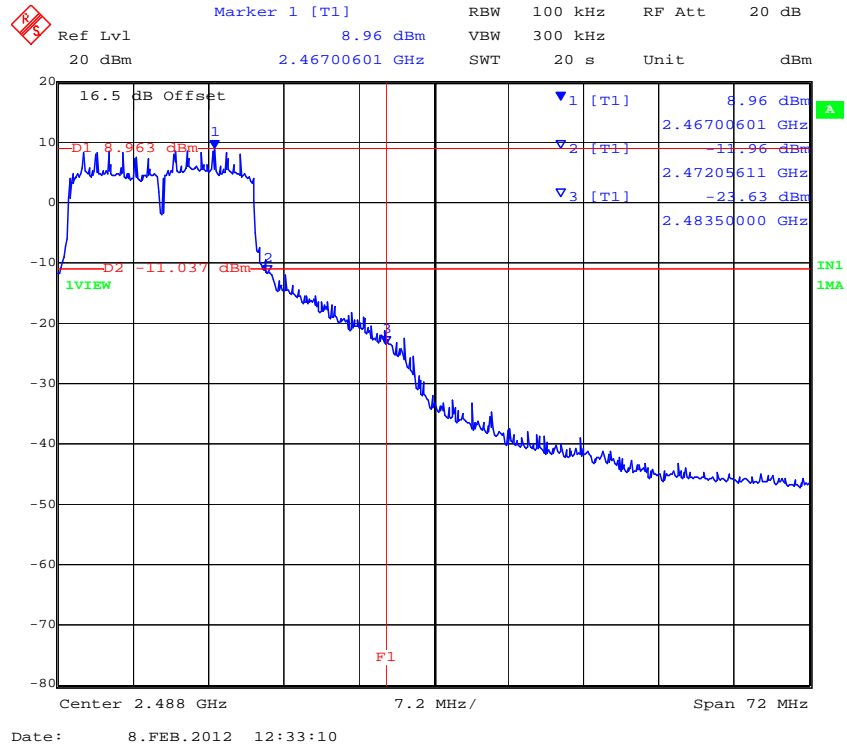
Date: 8.FEB.2012 12:31:52

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)



**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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**Issue Date:** 20th June 2012  
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### PORT C 802.11n HT-20 Conducted Spurious Emissions at 2,483.5 MHz Band Edge

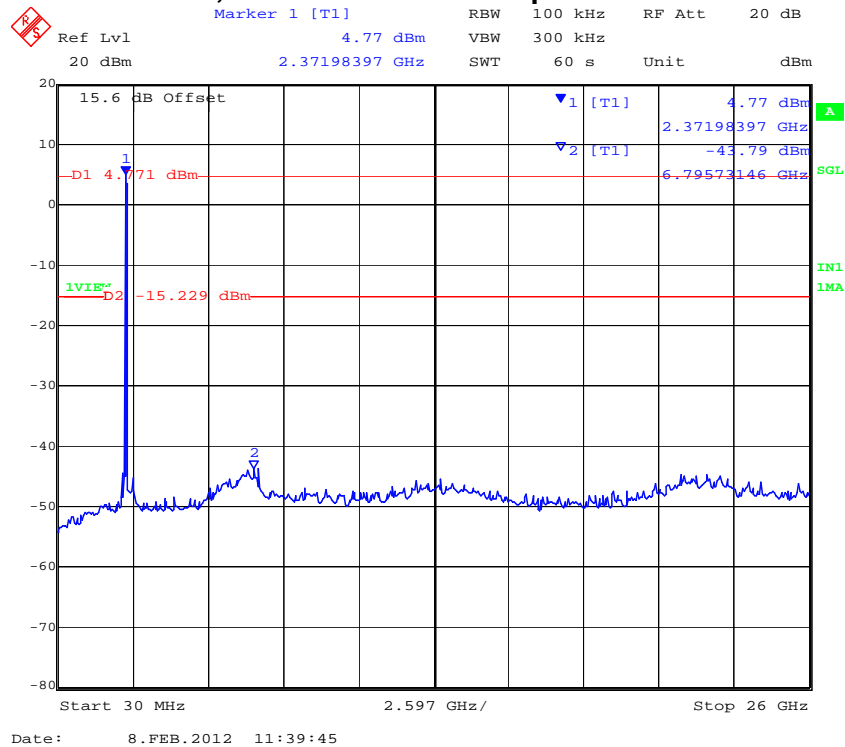


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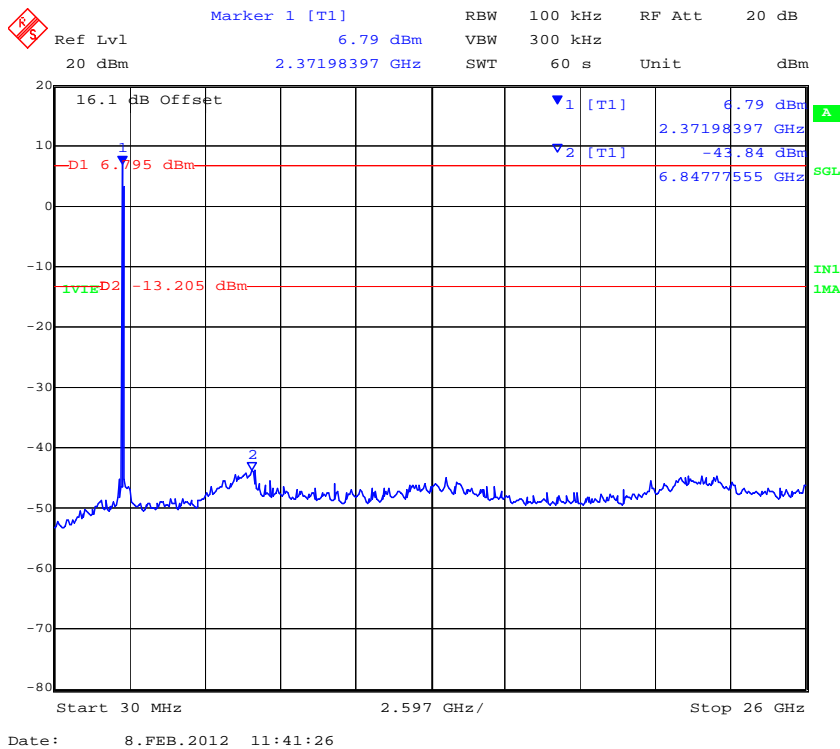


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
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### PORT A 802.11n HT-20 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-20 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz

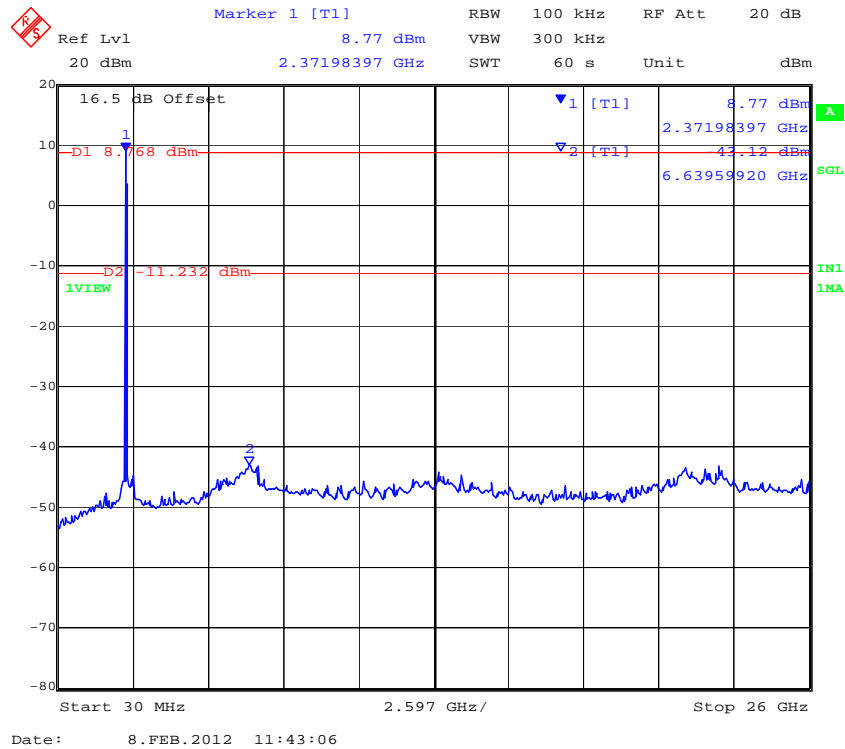


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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
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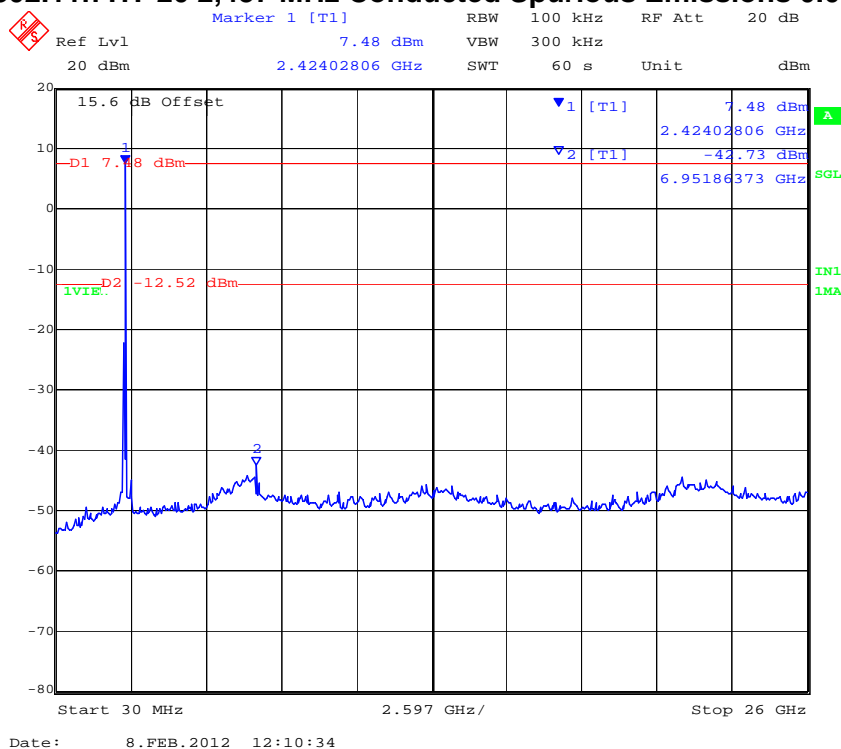
### PORT C 802.11n HT-20 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



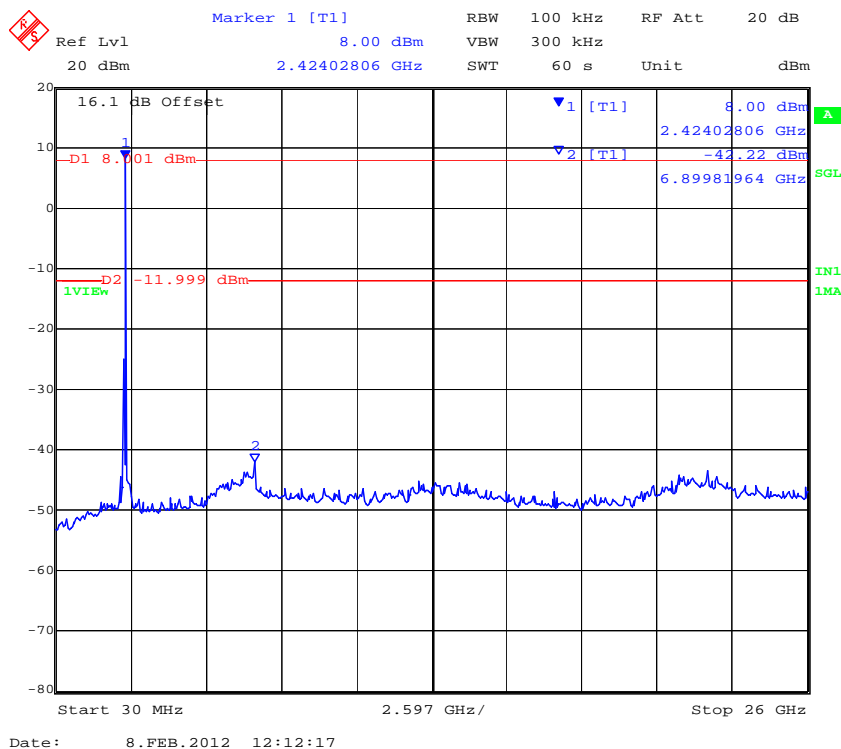
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### PORT A 802.11n HT-20 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-20 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



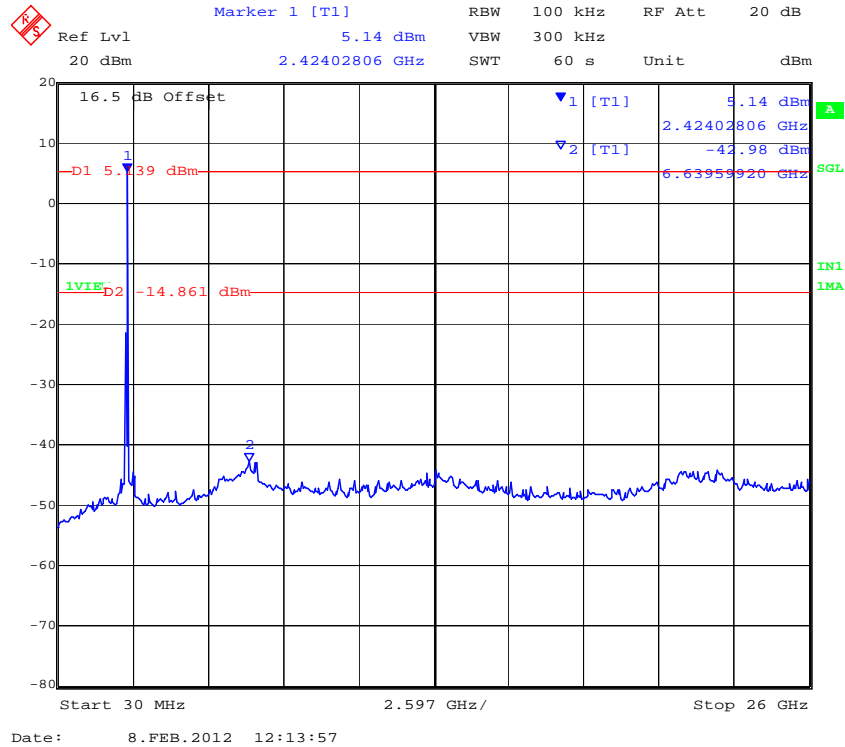
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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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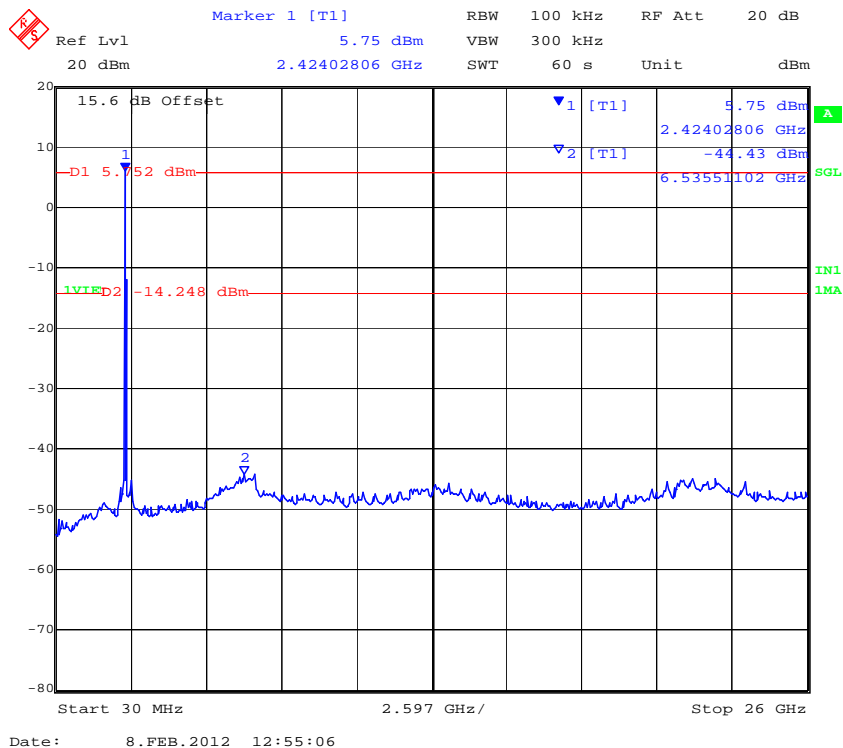
### PORT C 802.11n HT-20 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



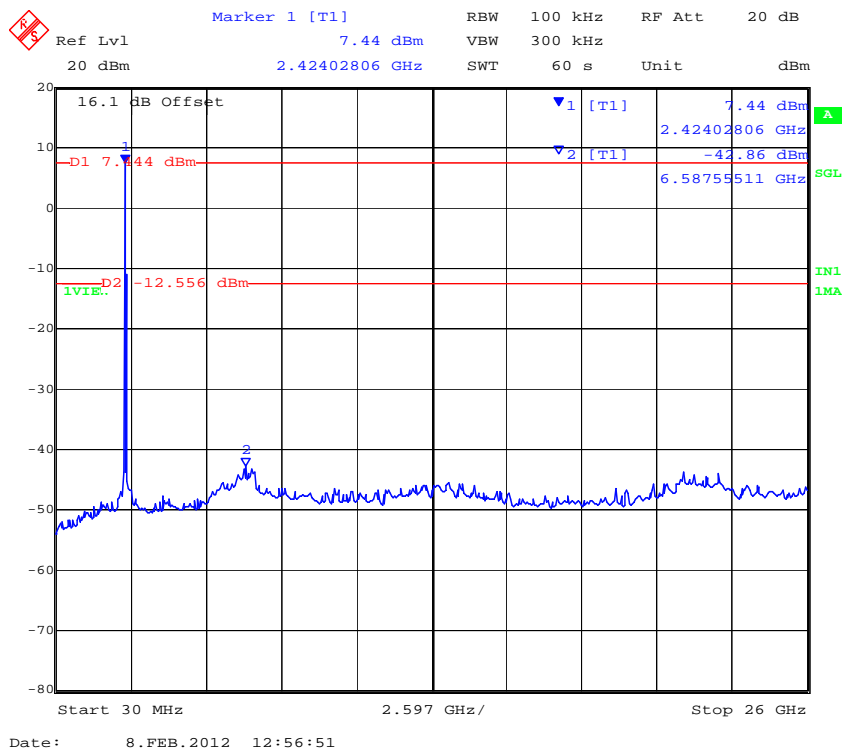
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### PORT A 802.11n HT-20 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz



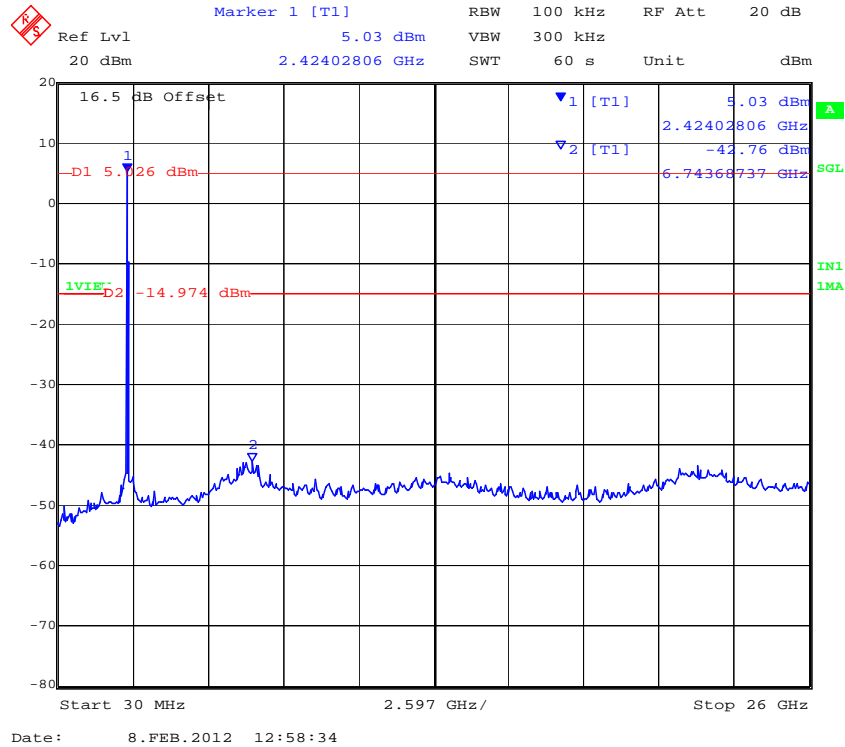
### PORT B 802.11n HT-20 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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**PORT C 802.11n HT-20 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



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## Conducted Spurious Emission Results

### TABLE OF RESULTS – 802.11n HT-40

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2422.000	30.00	26000.00	-44.10	-14.66	-43.64	-14.79	-42.76	-14.49		
2437.000	30.00	26000.00	-44.13	-14.65	-43.27	-14.71	-42.33	-14.58		
2452.000	30.00	26000.00	-44.35	-14.90	-43.28	-14.97	-42.67	-14.15		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2422.000	2400.00	-18.89	-14.49	-17.44	-14.78	-16.64	-14.19		
2452.000	2483.50	-19.95	-14.87	-22.45	-14.68	-20.17	-13.79		

BE: Maximum Band edge emission found

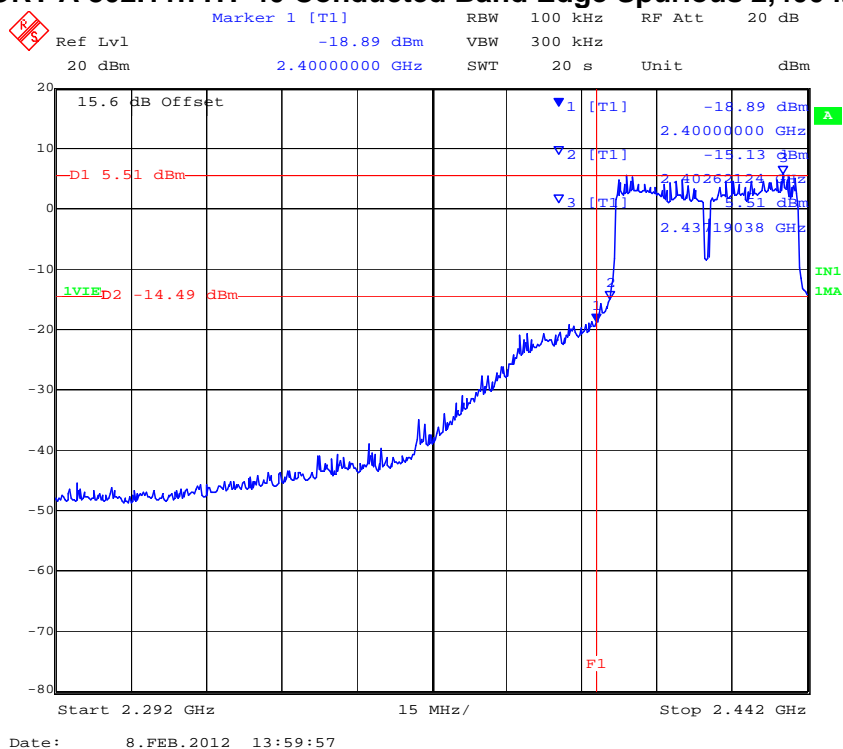
<b>Measurement uncertainty:</b>	±2.81 dB
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Note: Limit is based on 20dB down from fundamental emission

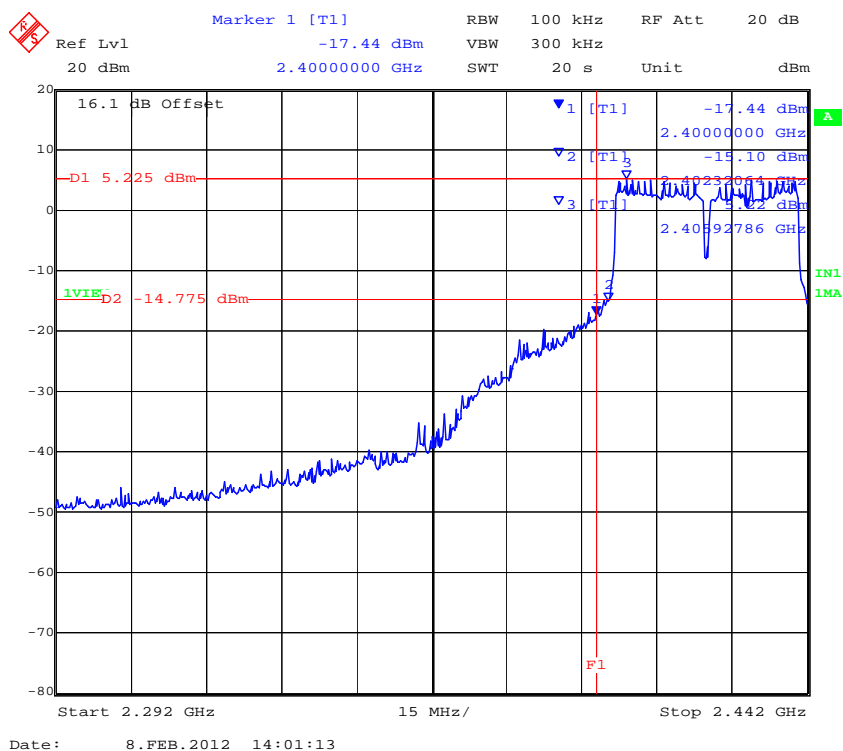


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
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### PORT A 802.11n HT-40 Conducted Band Edge Spurious 2,400 MHz



### PORT B 802.11n HT-40 Conducted Band Edge Spurious 2,400 MHz

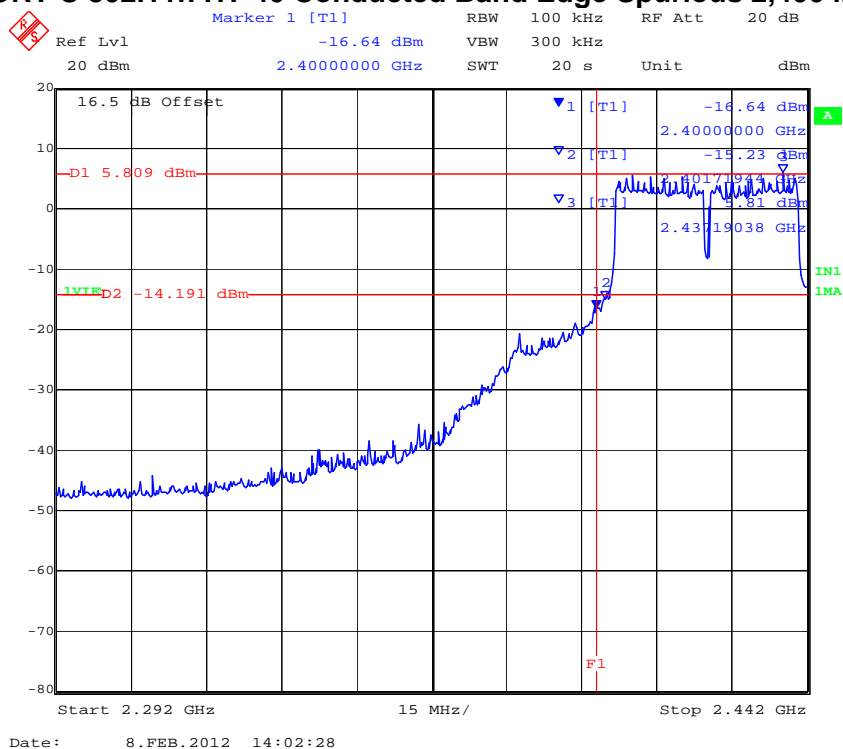


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11n HT-40 Conducted Band Edge Spurious 2,400 MHz

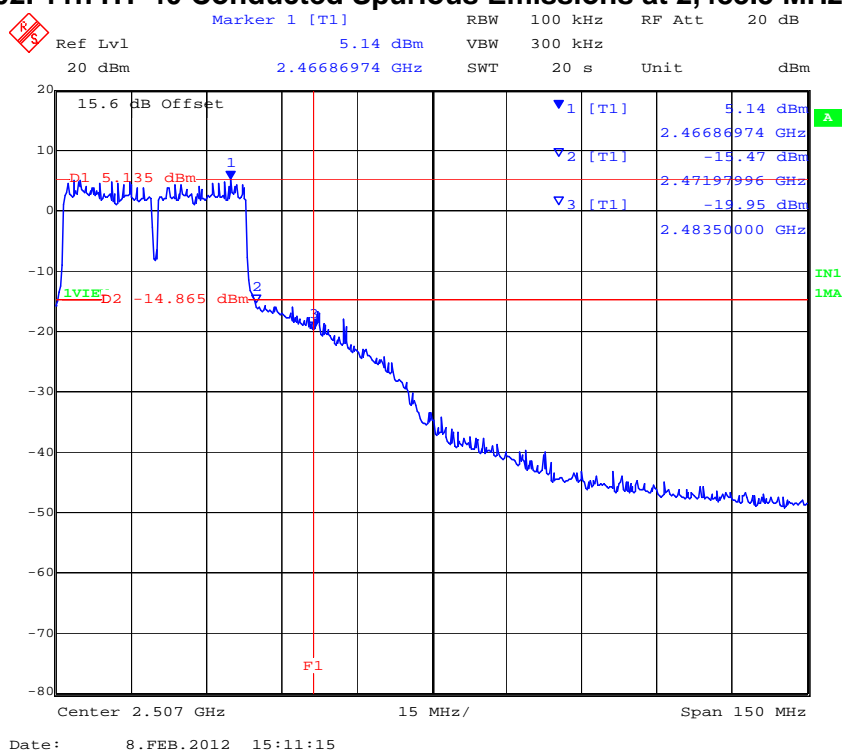


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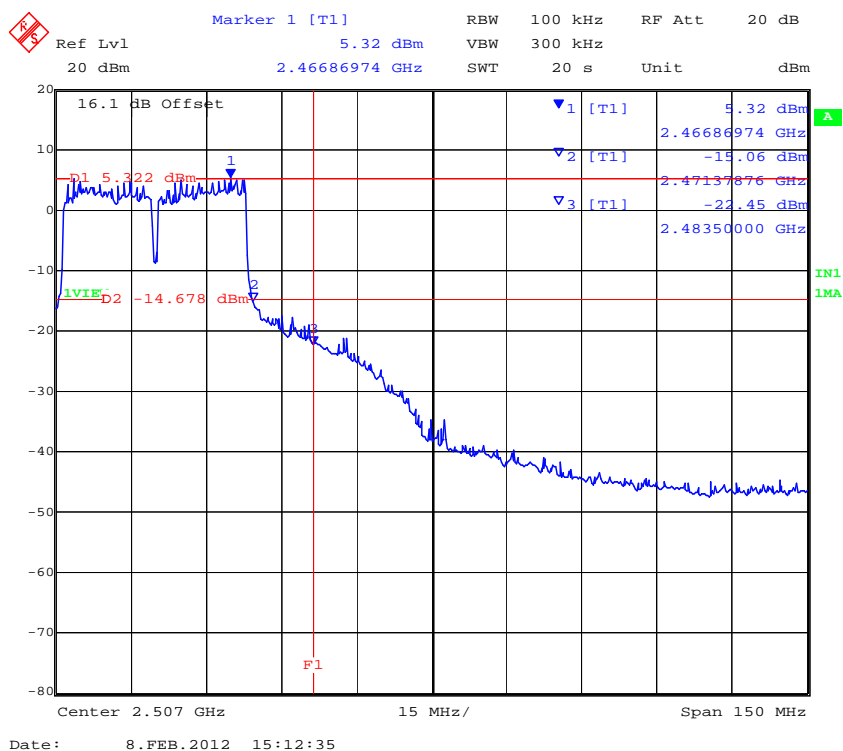


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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**Issue Date:** 20th June 2012  
**Page:** 214 of 342

### PORT A 802.11n HT-40 Conducted Spurious Emissions at 2,483.5 MHz Band Edge



### PORT B 802.11n HT-40 Conducted Spurious Emissions at 2,483.5 MHz Band Edge

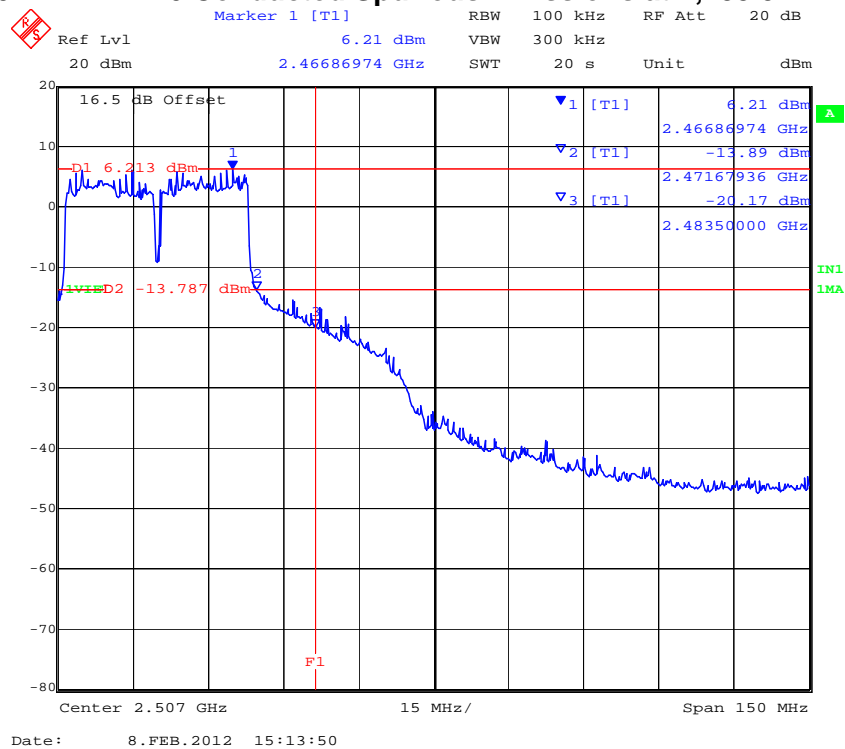


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11n HT-40 Conducted Spurious Emissions at 2,483.5 MHz Band Edge



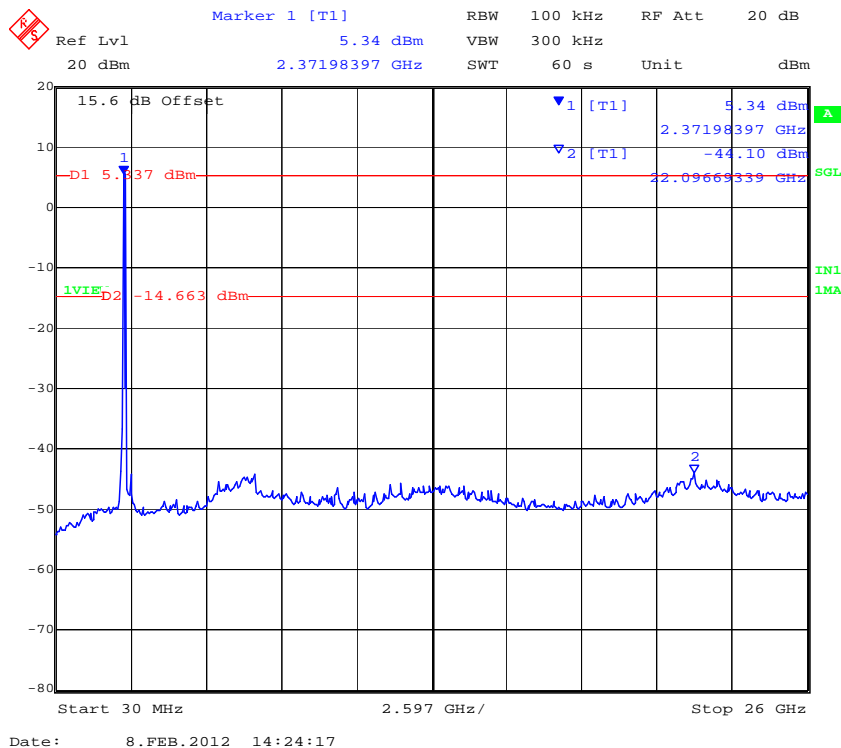
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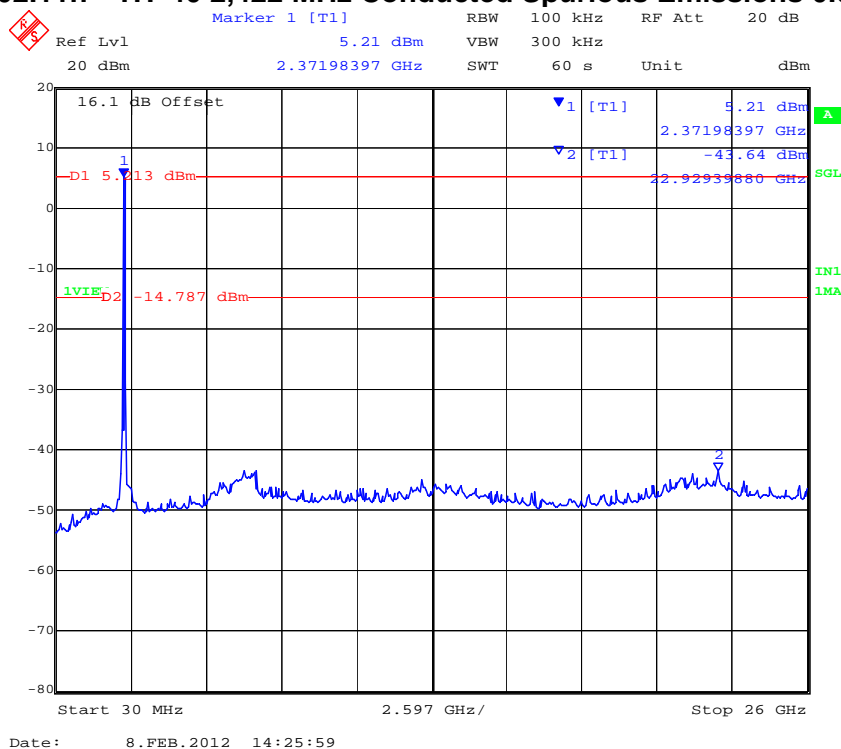


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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**Issue Date:** 20th June 2012  
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### PORT A 802.11n – HT-40 2,422 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n – HT-40 2,422 MHz Conducted Spurious Emissions 0.03 – 26 GHz

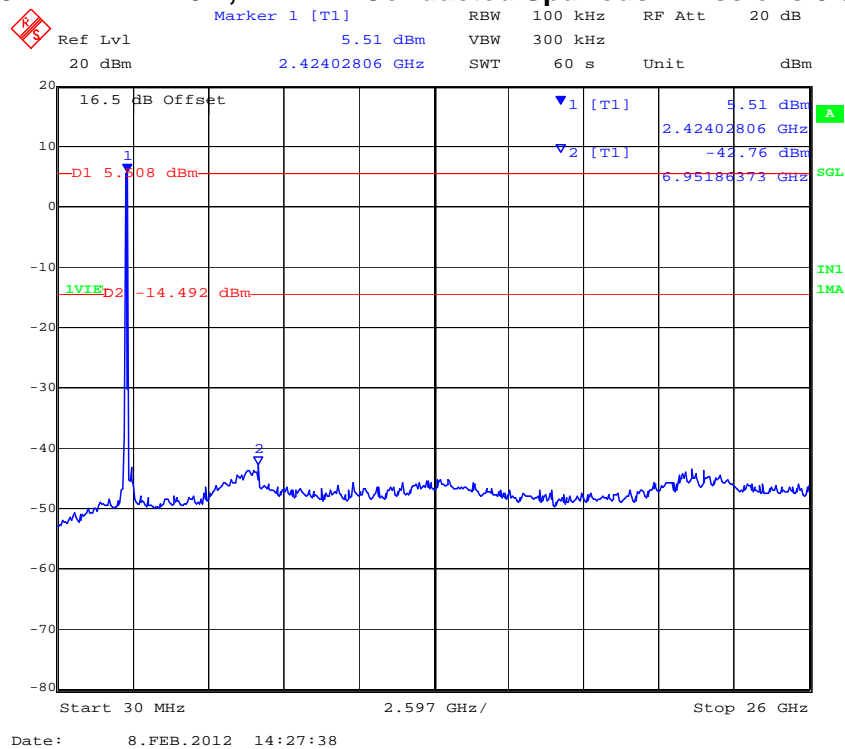


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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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### PORT C 802.11n – HT-40 2,422 MHz Conducted Spurious Emissions 0.03 – 26 GHz

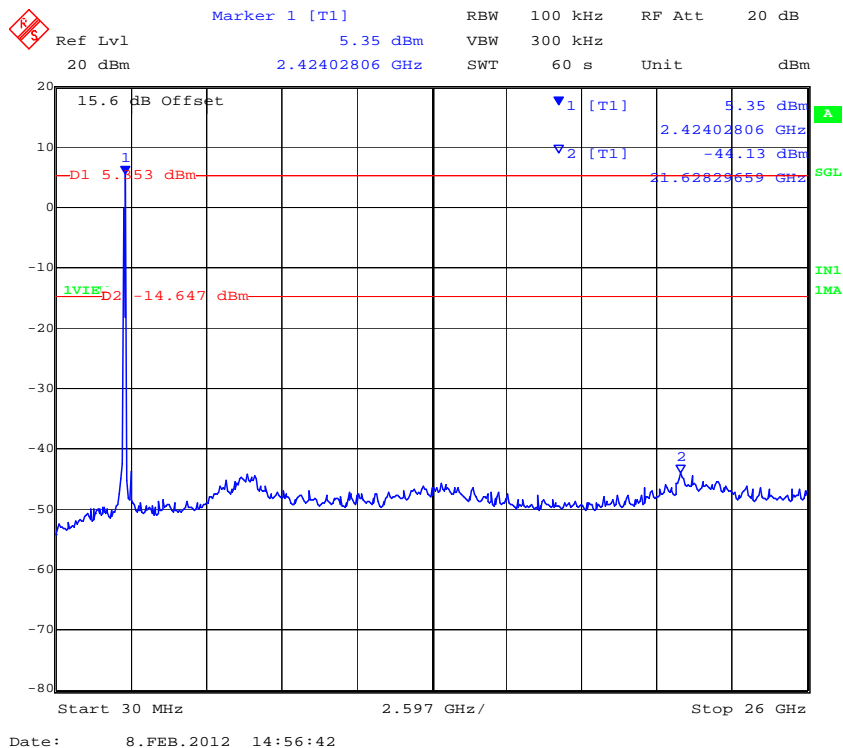


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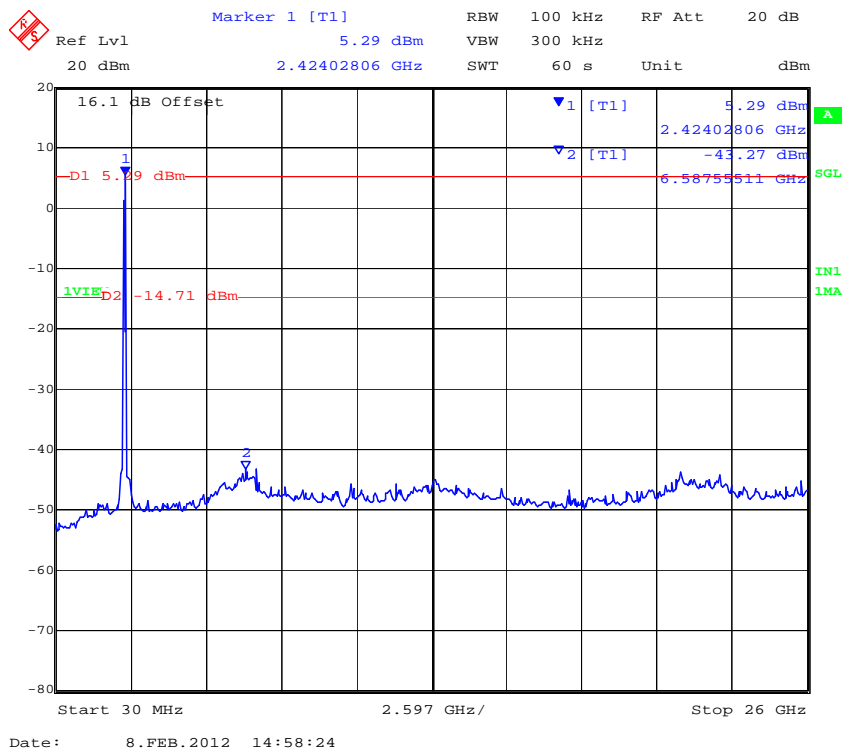


**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT A 802.11n HT-40 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-40 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz

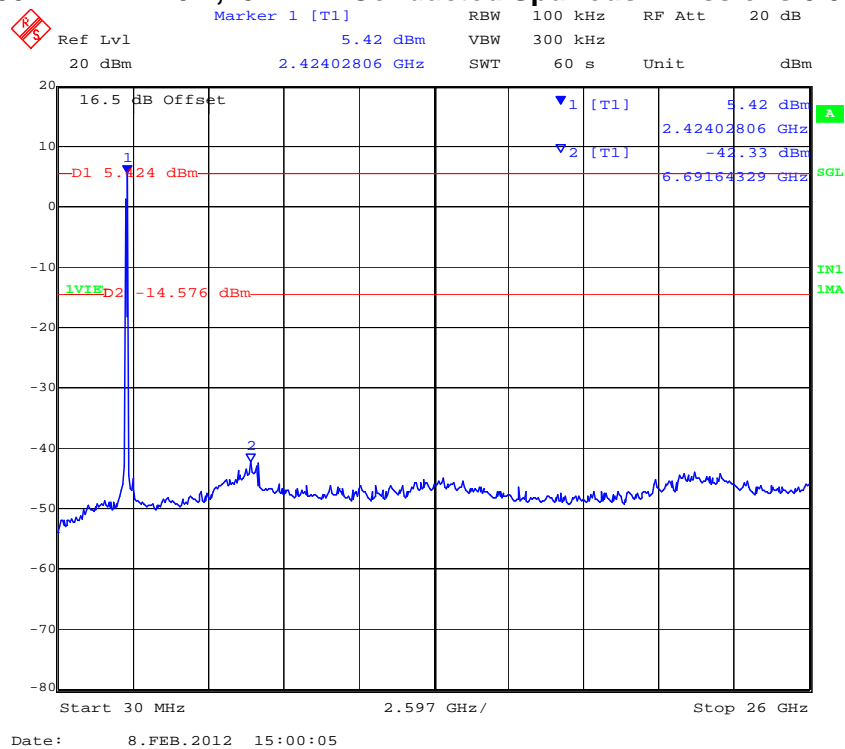


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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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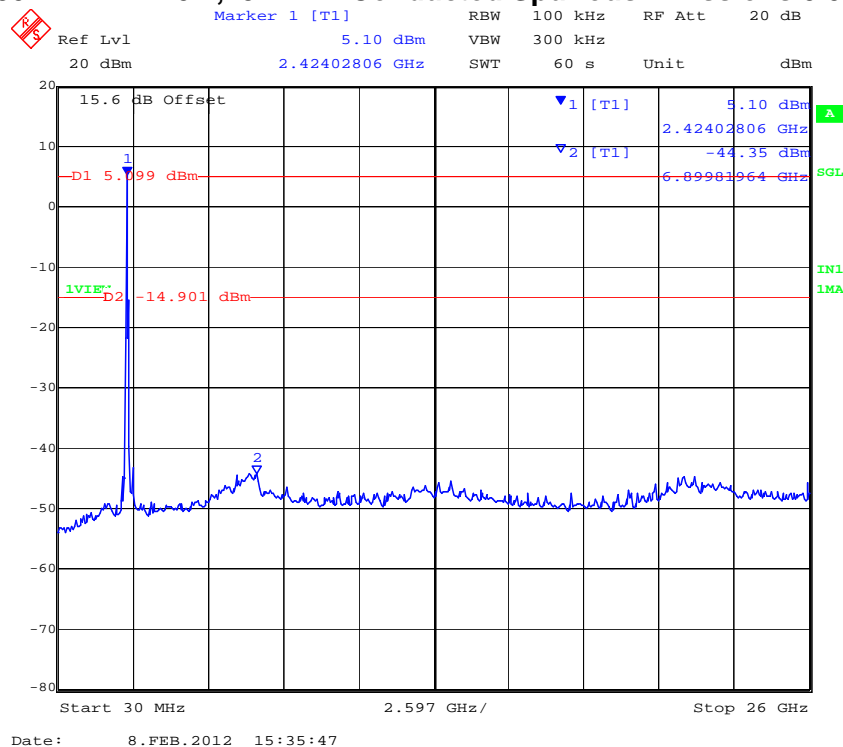
### PORT C 802.11n HT-40 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



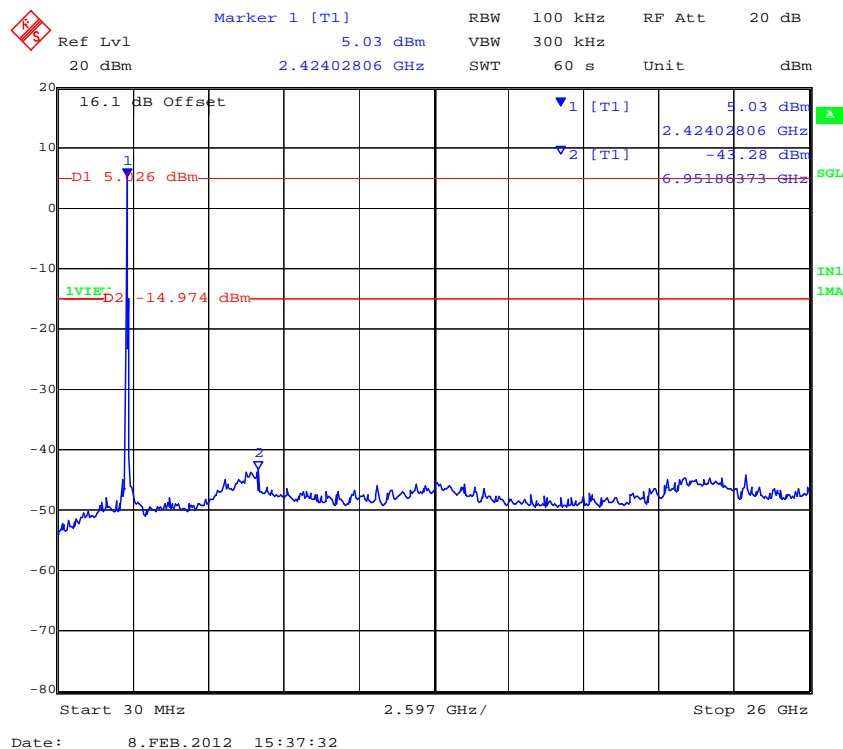
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### PORT A 802.11n HT-40 2,452 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-40 2,452 MHz Conducted Spurious Emissions 0.03 – 26 GHz

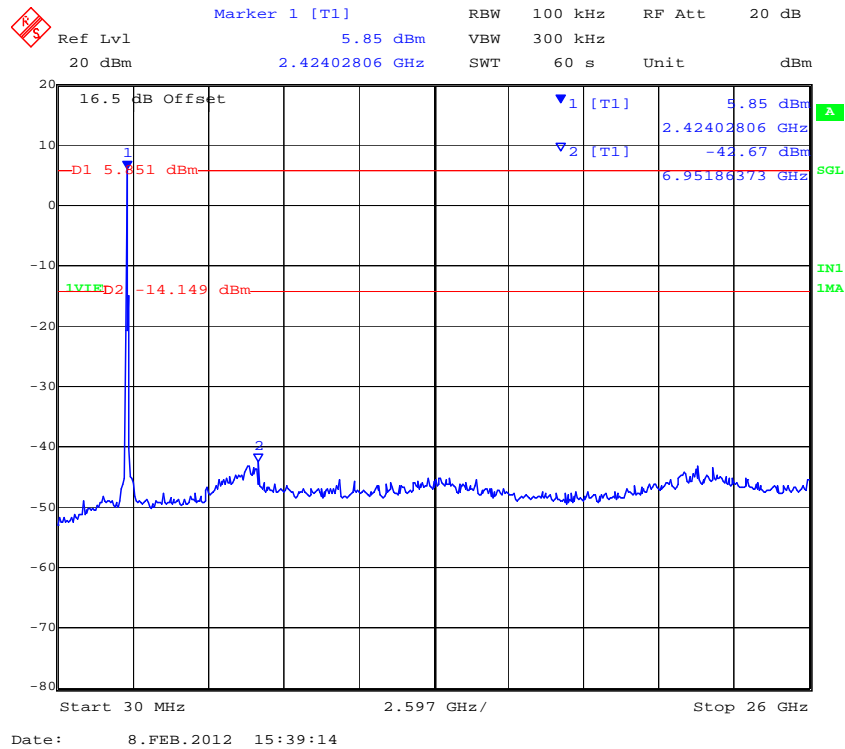


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT A 802.11n HT-40 2,452 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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## Conducted Spurious Emission Results

### TABLE OF RESULTS – 802.11a Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5745.000	30.00	26000.00	-42.01	-15.67	-42.18	-13.92	-47.36	-14.71		
5785.000	30.00	26000.00	-42.17	-17.39	-42.56	-12.77	-45.49	-15.26		
5825.000	30.00	26000.00	-41.74	-16.29	-42.88	-13.63	-46.41	-14.56		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5745.000	5725.00	-29.02	-15.26	-19.17	-12.11	-27.50	-14.82		
5825.000	5850.00	-37.61	-15.32	-24.42	-12.83	-29.56	-14.17		

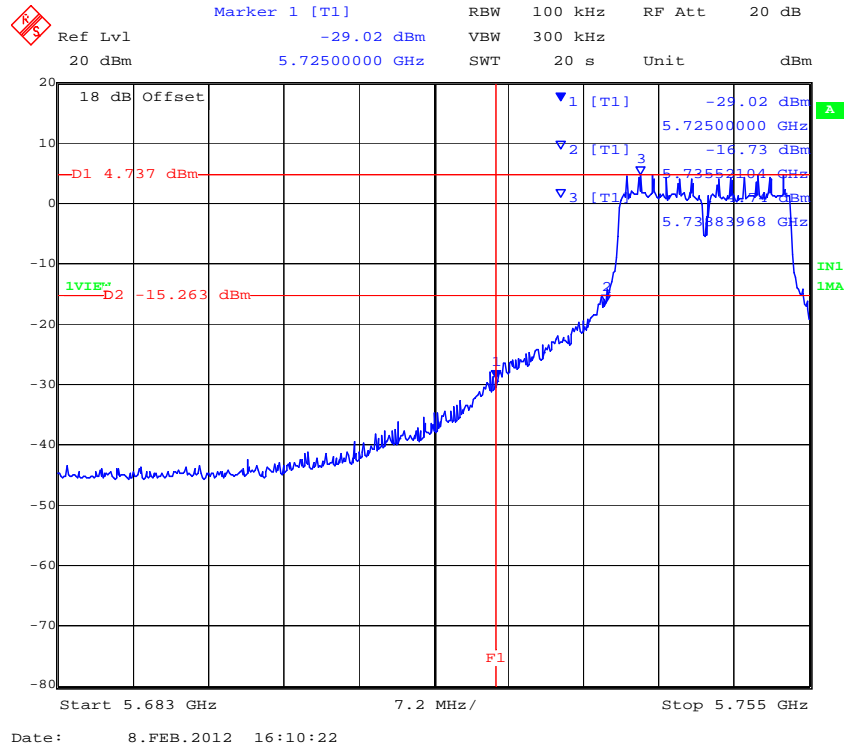
BE: Maximum Band edge emission found

<b>Measurement uncertainty:</b>	±2.81 dB
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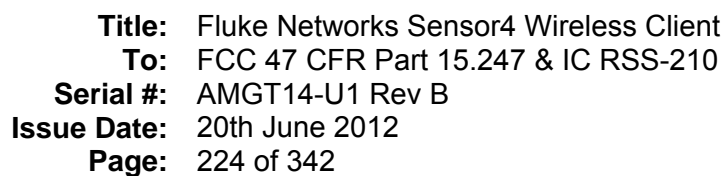
Note: Limit is based on 20dB down from fundamental emission



### PORT A 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz







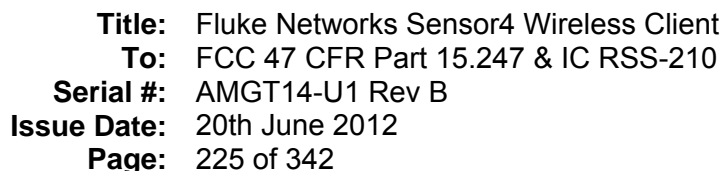
RBW 100 kHz RF Att 10 dB  
 VBW 300 kHz  
 Unit dBm  
 Ref Lvl -27.50 dBm  
 19.5 dBm 5.7250000 GHz  
 SWT 20 s

19.5 dB Offset  
 D1 5.182 dBm  
 D2 -14.818 dBm  
 F1  
 1 [T1] -27.50 dBm 5.7250000 GHz  
 2 [T1] -16.29 dBm 5.7352108 GHz  
 3 [T1] -14.10 dBm 5.7399399 GHz  
 IN1  
 IMA

Start 5.683 GHz 7.2 MHz/ Stop 5.755 GHz

Date: 8.FEB.2012 16:12:55

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Ref Lvl 20 dBm

Marker 1 [T1] 4.68 dBm

RBW 100 kHz

VBW 300 kHz

SWT 20 s

RF Att 20 dB

Unit dBm

18 dB Offset

1 4.68 dBm

2 19.71 dBm

3 37.61 dBm

5.81745291 GHz

5.83404609 GHz

5.85000000 GHz

VIEW

D2 -15.318 dBm

F1

Center 5.851 GHz

7.2 MHz/

Span 72 MHz

Date: 8.FEB.2012 17:21:42

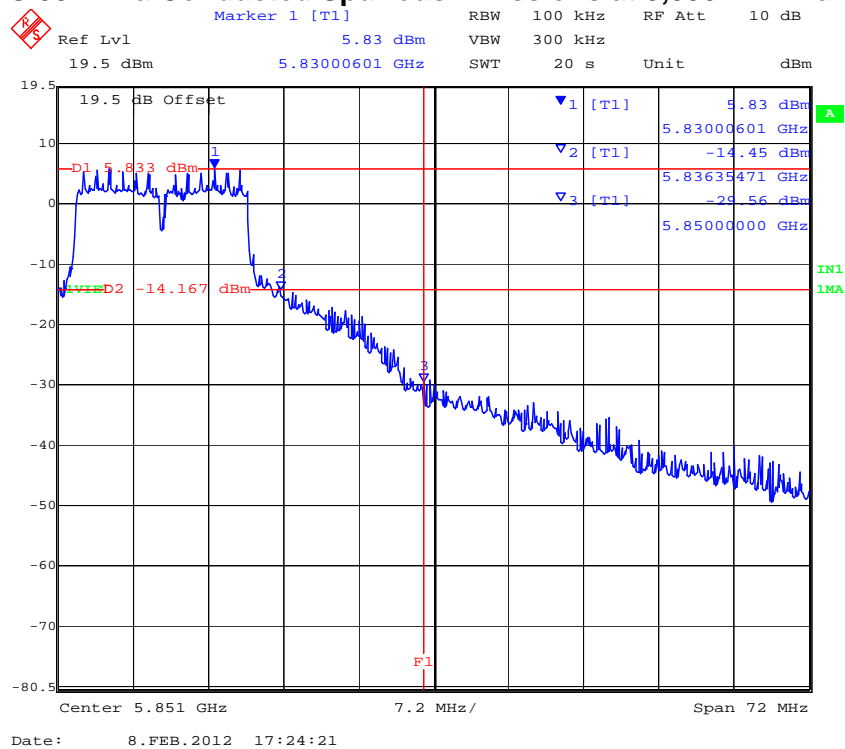
[illegible]

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)



**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11a Conducted Spurious Emissions at 5,850 MHz Band Edge

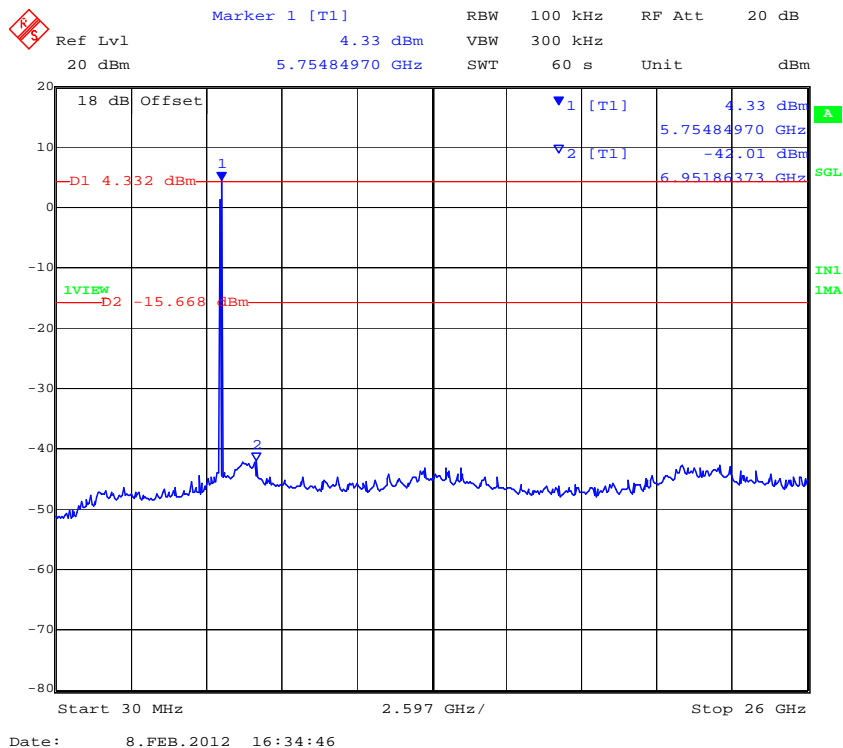


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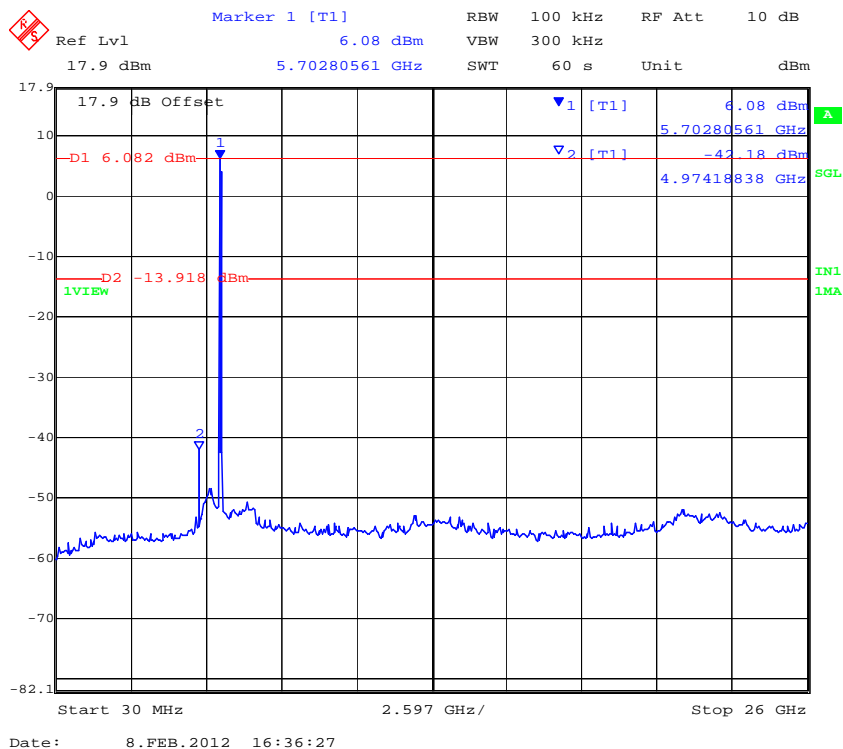


**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT A 802.11a – Legacy 5,745 MHz Conducted Spurious Emissions 0.03 – 40 GHz



### PORT B 802.11a – Legacy 5,745 MHz Conducted Spurious Emissions 0.03 – 40 GHz

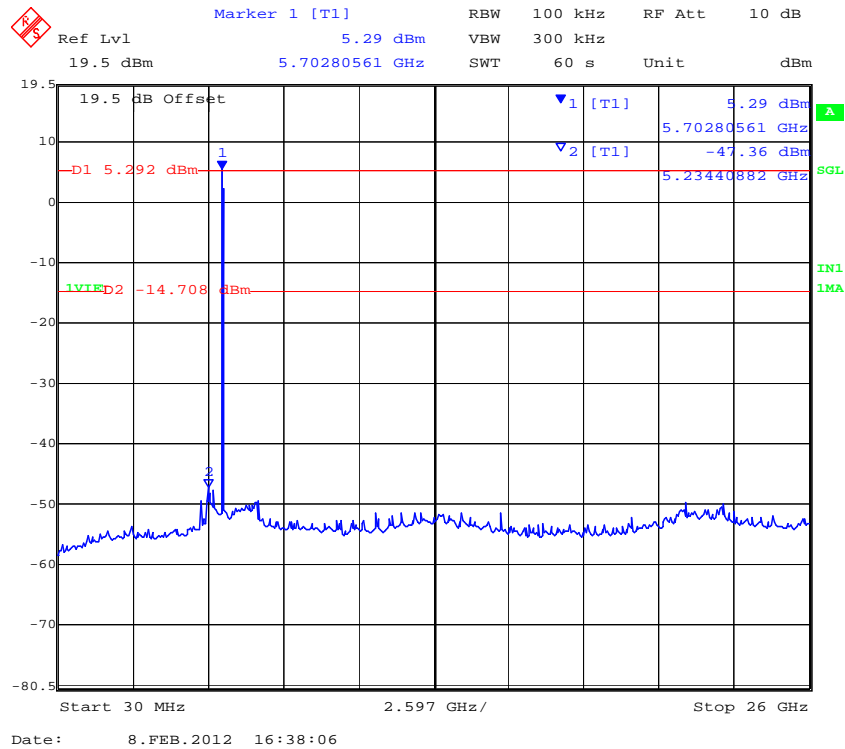


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11a – Legacy 5,745 MHz Conducted Spurious Emissions 0.03 – 40 GHz

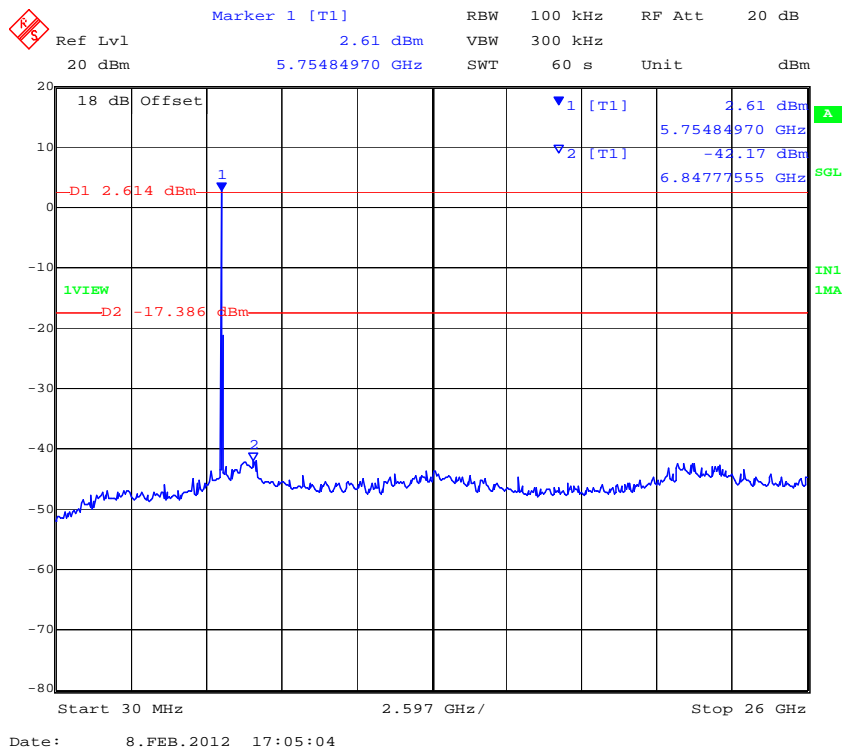


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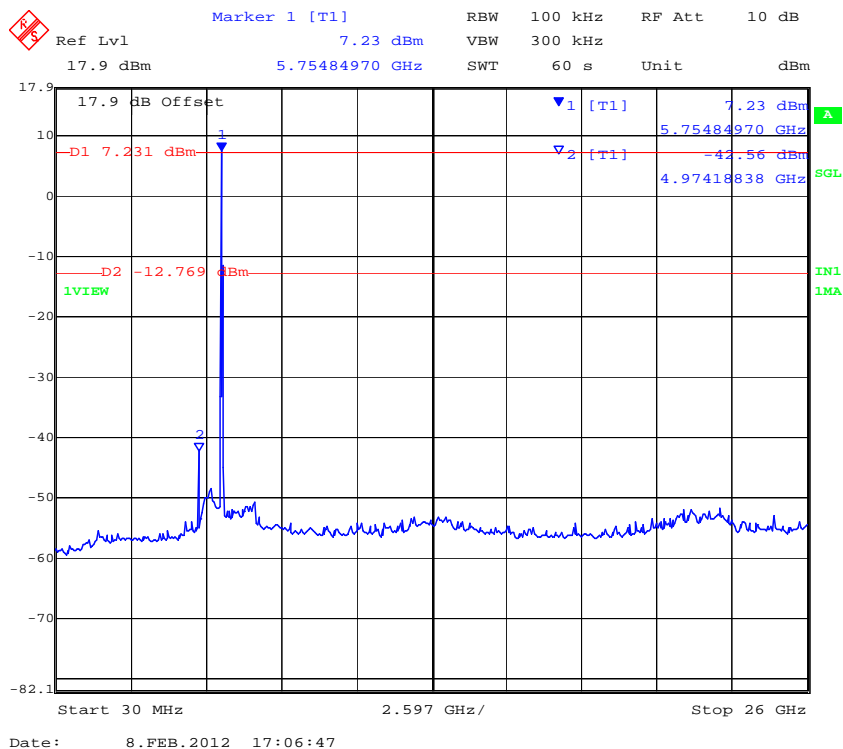


**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
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### PORT A 802.11a – Legacy 5,785 MHz Conducted Spurious Emissions 0.03 – 40 GHz



### PORT B 802.11a – Legacy 5,785 MHz Conducted Spurious Emissions 0.03 – 40 GHz

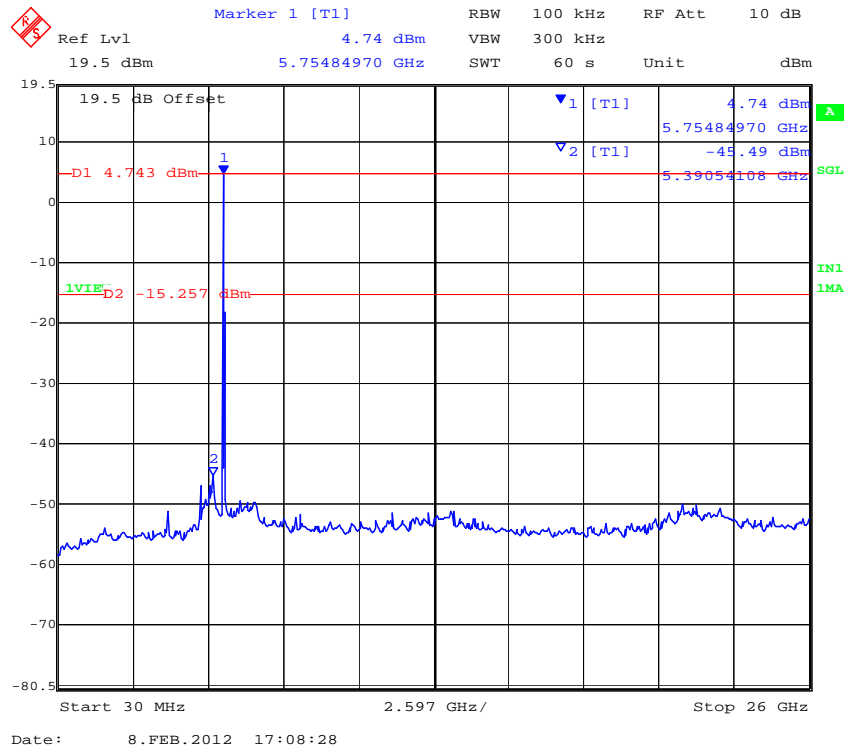


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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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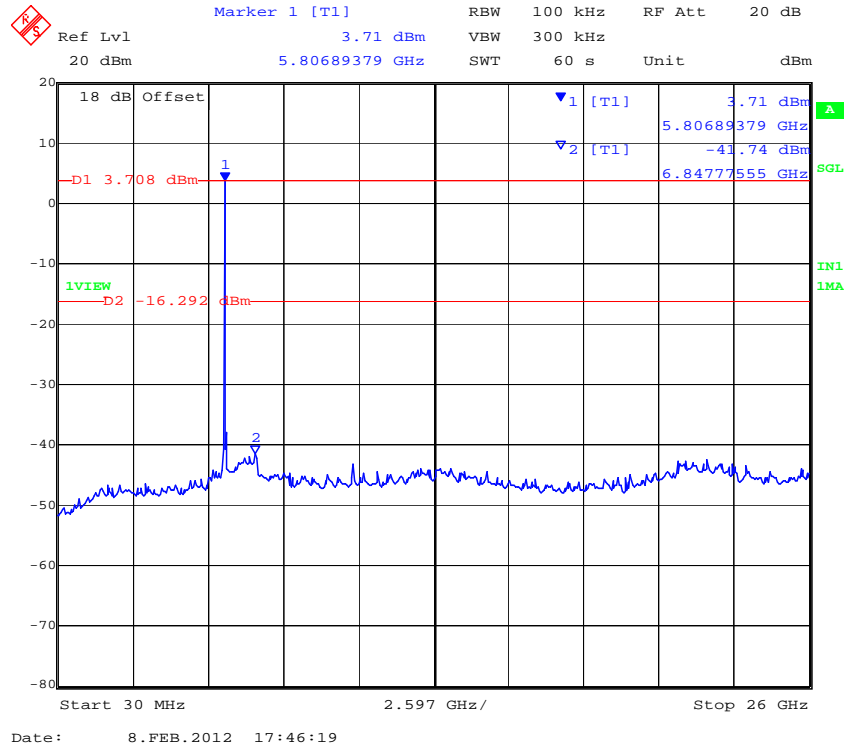
### PORT C 802.11a – Legacy 5,785 MHz Conducted Spurious Emissions 0.03 – 40 GHz



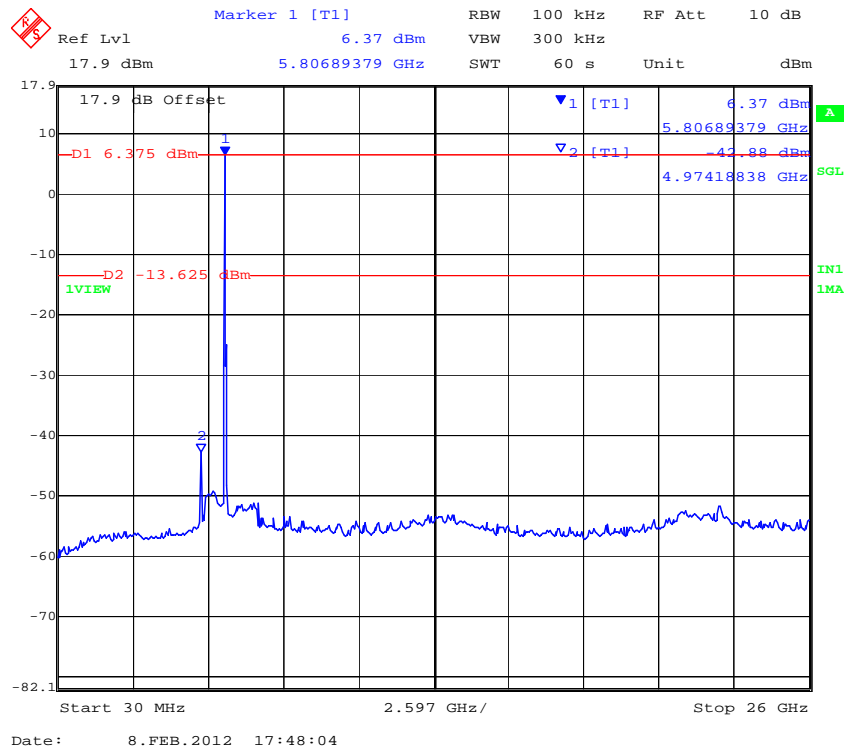
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### PORT A 802.11a – Legacy 5,825 MHz Conducted Spurious Emissions 0.03 – 40 GHz



### PORT B 802.11a – Legacy 5,825 MHz Conducted Spurious Emissions 0.03 – 40 GHz



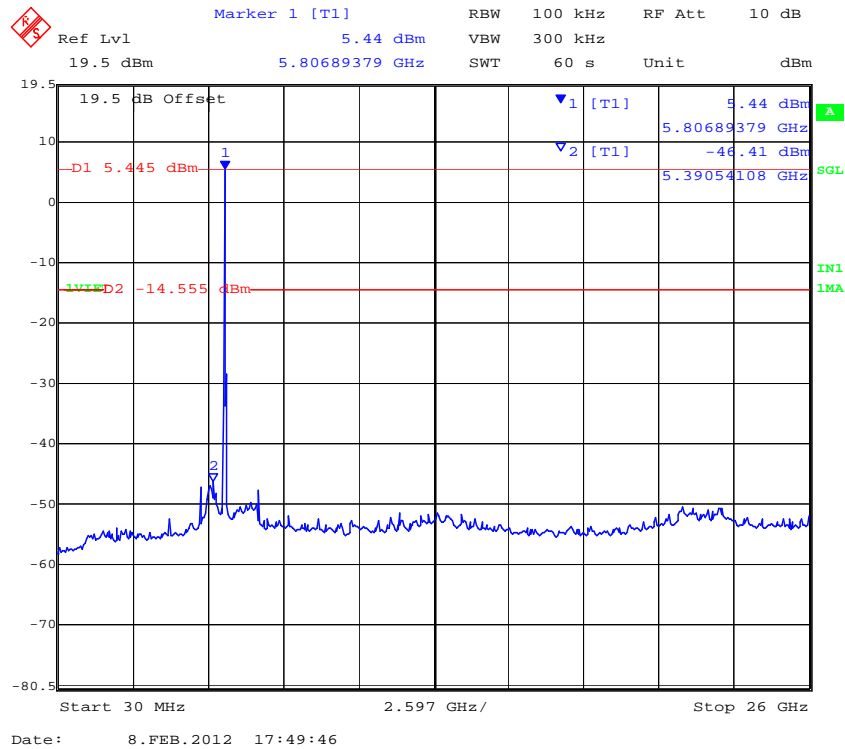
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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11a – Legacy 5,825 MHz Conducted Spurious Emissions 0.03 – 40 GHz



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## Conducted Spurious Emission Results

TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5745.000	30.00	26000.00	-42.13	-16.64	-45.29	-13.40	-46.12	-15.53		
5785.000	30.00	26000.00	-41.92	-15.46	-42.53	-13.07	-46.31	-14.74		
5825.000	30.00	26000.00	-41.27	-16.25	-42.01	-13.76	-46.68	-15.45		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5745.000	5725.00	-28.19	-15.61	-19.84	-12.42	-27.35	-15.02		
5825.000	5850.00	-35.33	-15.22	-21.88	-12.48	-28.90	-14.25		

BE: Maximum Band edge emission found

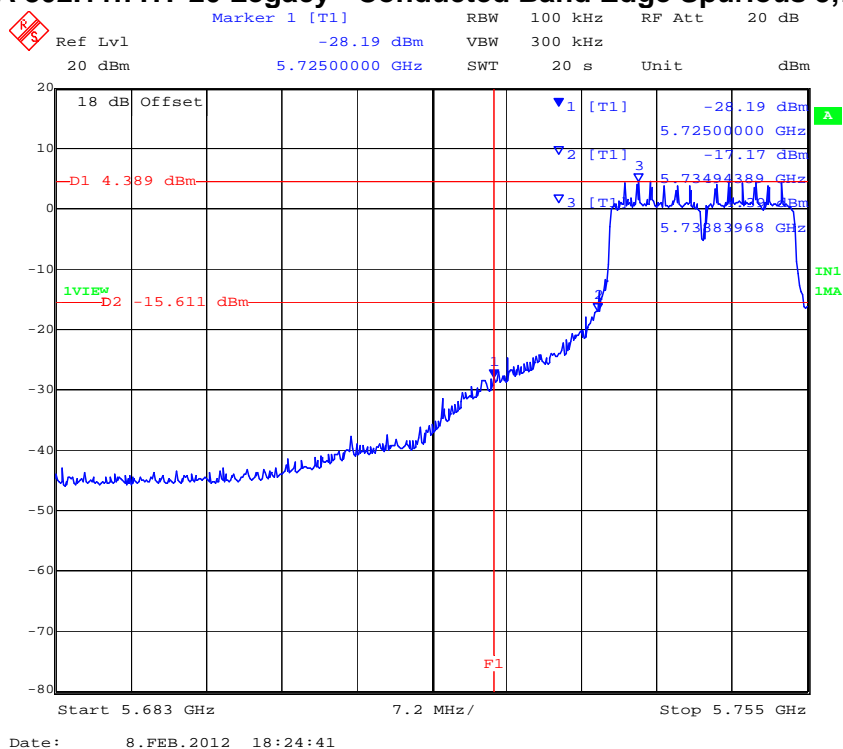
<b>Measurement uncertainty:</b>	±2.81 dB
---------------------------------	----------

Note: Limit is based on 20dB down from fundamental emission

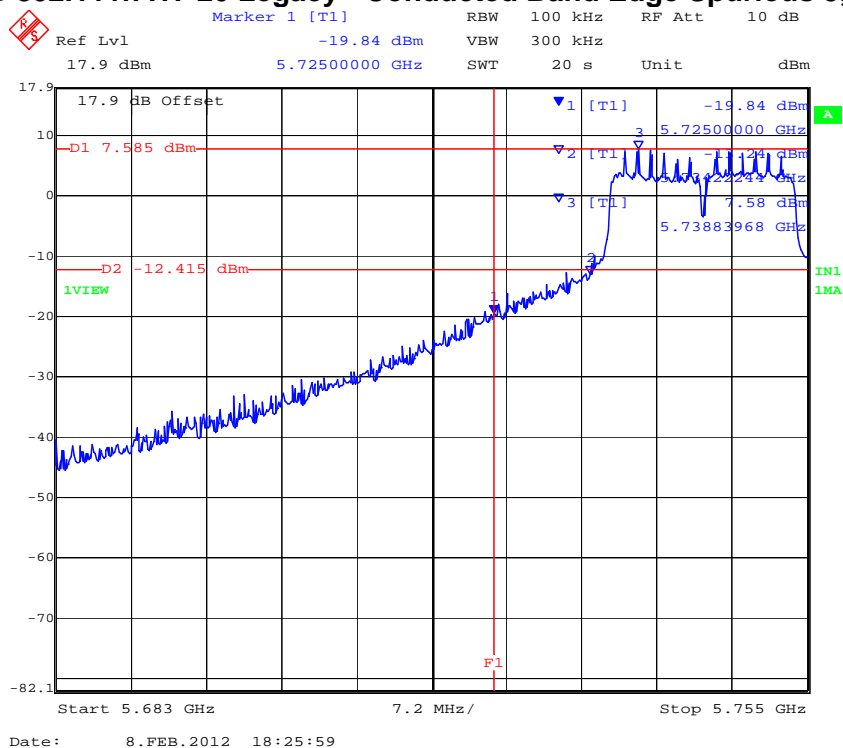


**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT A 802.11n HT-20 Legacy - Conducted Band Edge Spurious 5,725 MHz



### PORT B 802.11n HT-20 Legacy - Conducted Band Edge Spurious 5,725 MHz

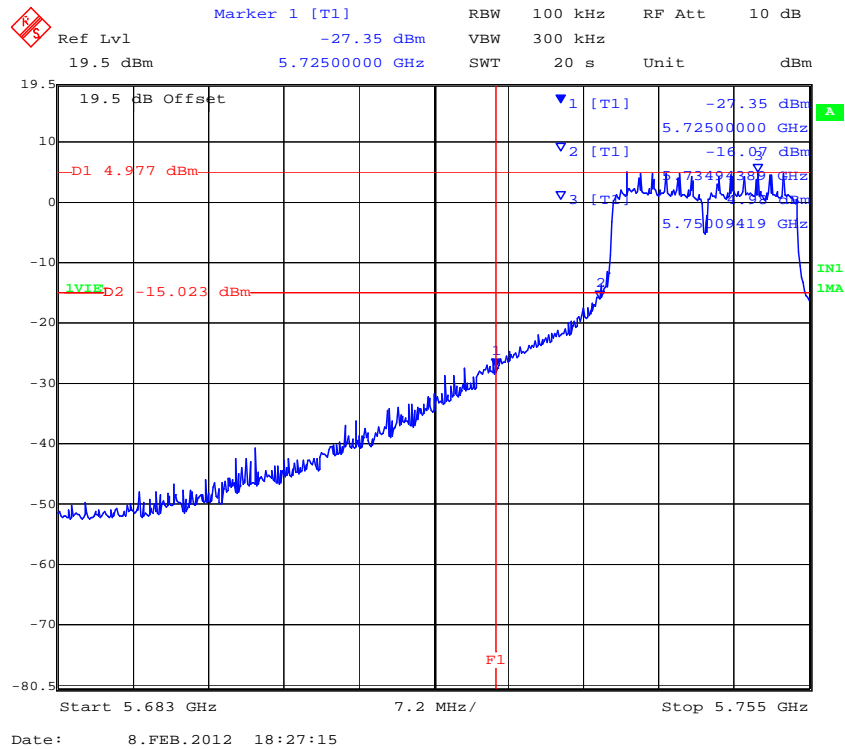


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11n HT-20 Legacy - Conducted Band Edge Spurious 5,725 MHz

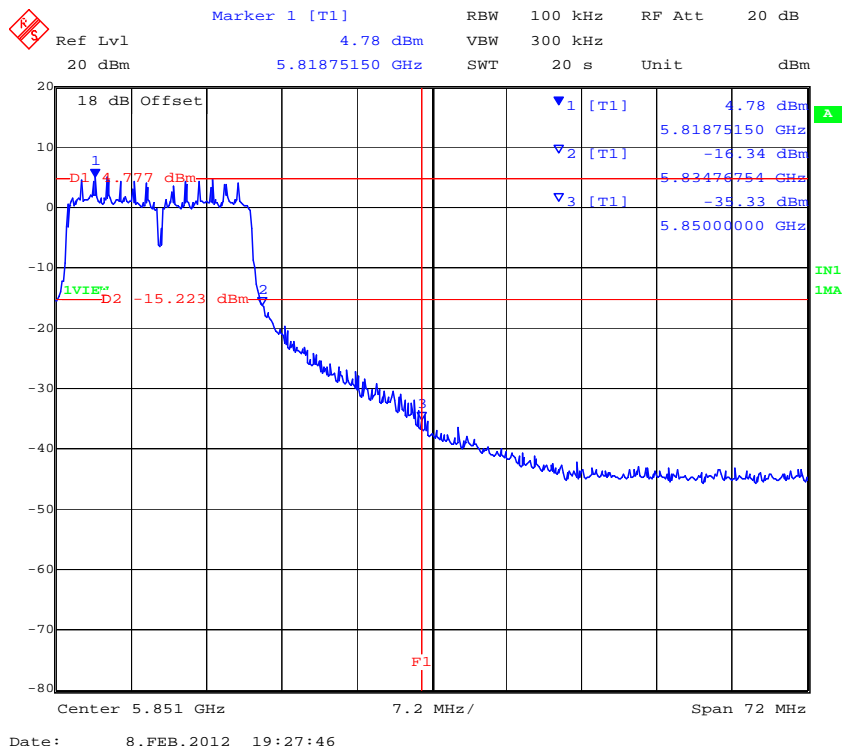


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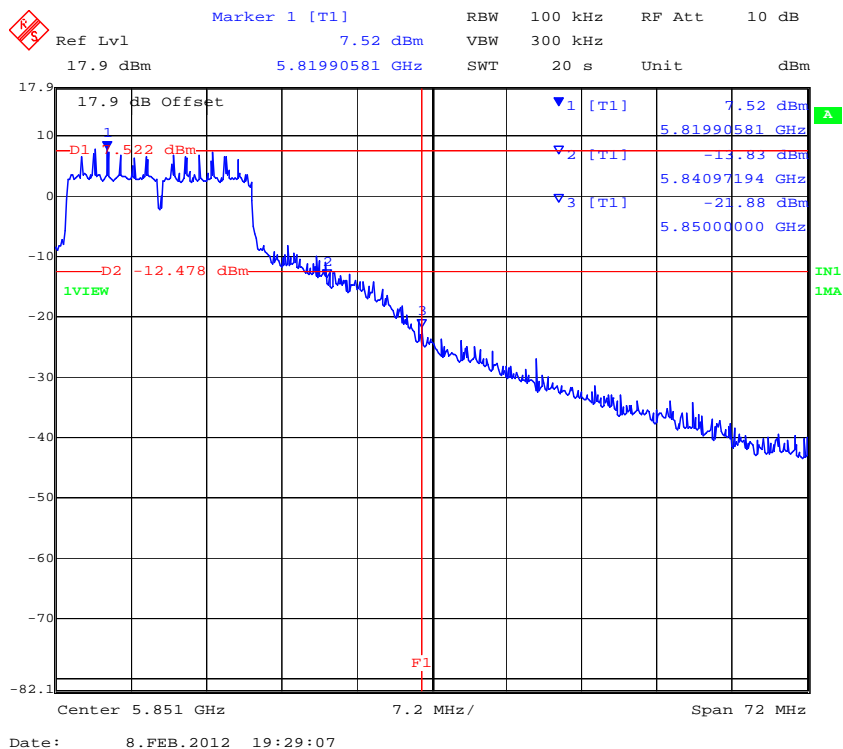


**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT A 802.11n HT-20 Conducted Spurious Emissions at 5,850 MHz Band Edge



### PORT B 802.11n HT-20 Conducted Spurious Emissions at 5,850 MHz Band Edge

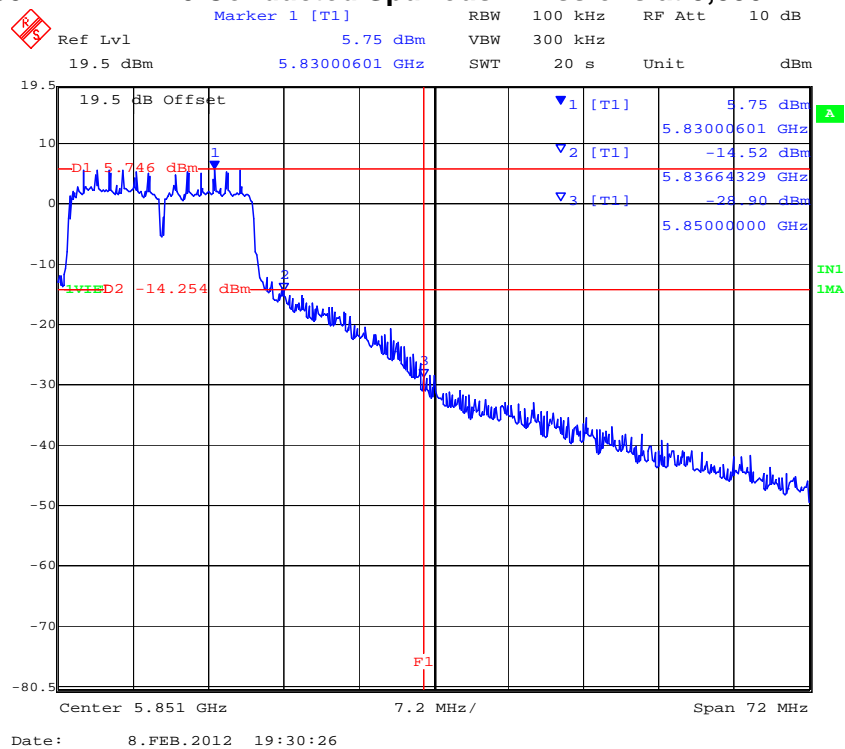


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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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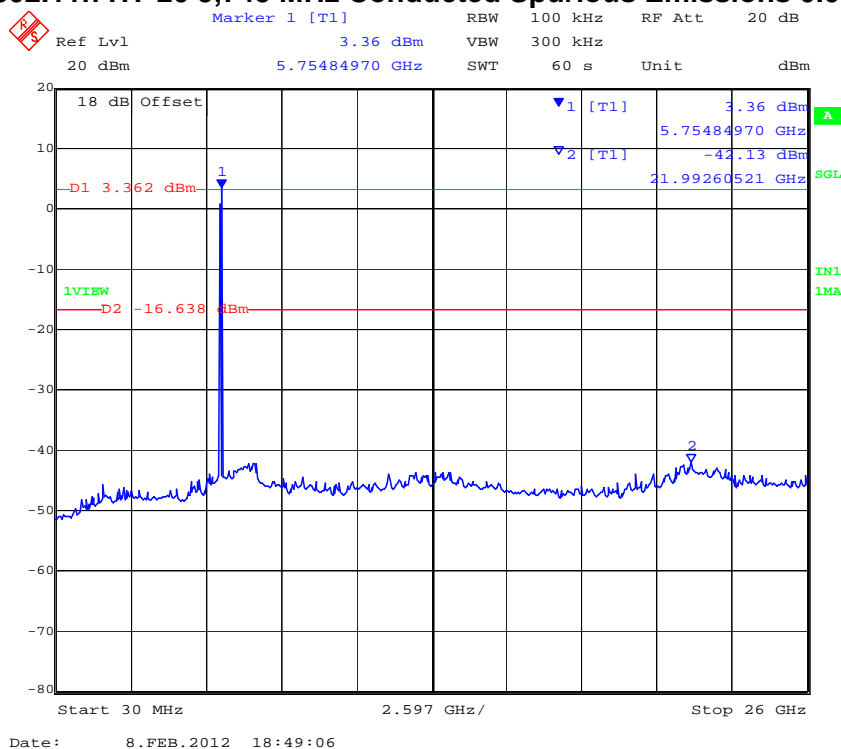
### PORT C 802.11n HT-20 Conducted Spurious Emissions at 5,850 MHz Band Edge



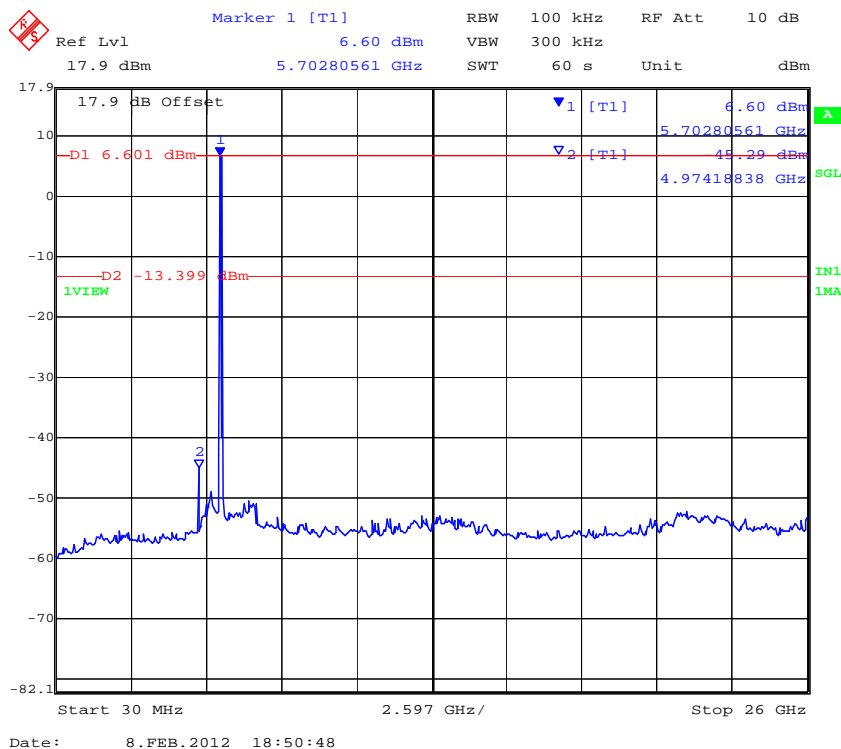
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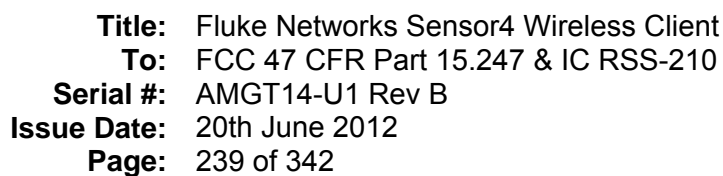
### PORT A 802.11n HT-20 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-20 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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Marker 1 [T1]

Ref Lvl 19.5 dBm

4.47 dBm

5.70280561 GHz

RBW 100 kHz

VBW 300 kHz

RF Att 10 dB

SWT 60 s

Unit dBm

19.5 dB Offset

1 [T1] 4.47 dBm 5.70280561 GHz

2 [T1] -46.12 dBm 5.28645291 GHz

D1 4.473 dBm

D2 -15.527 dBm

VIEW

Start 30 MHz

2.597 GHz/

Stop 26 GHz

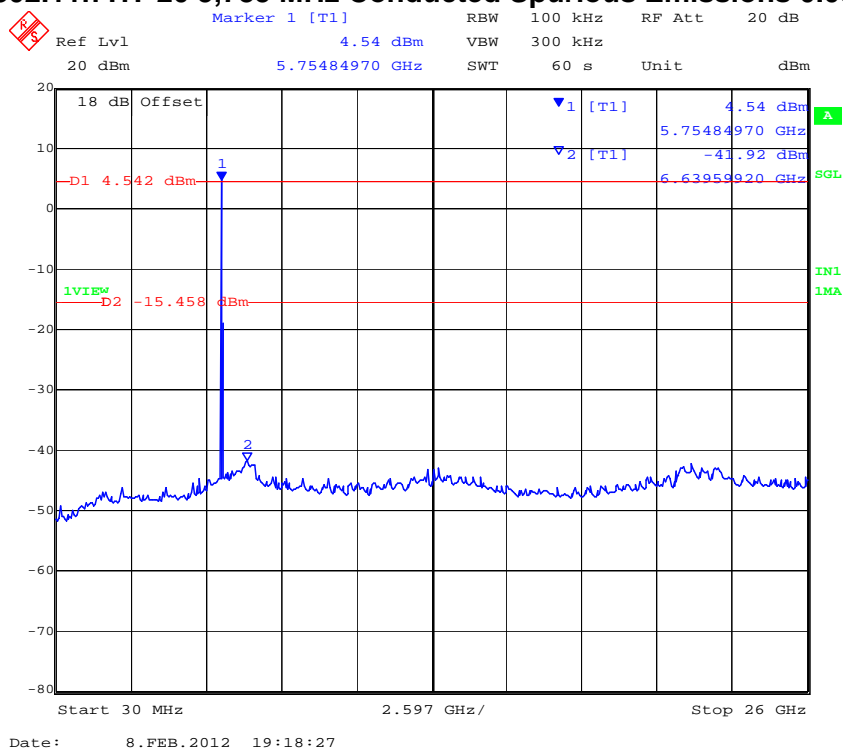
Date: 8.FEB.2012 18:52:28

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)

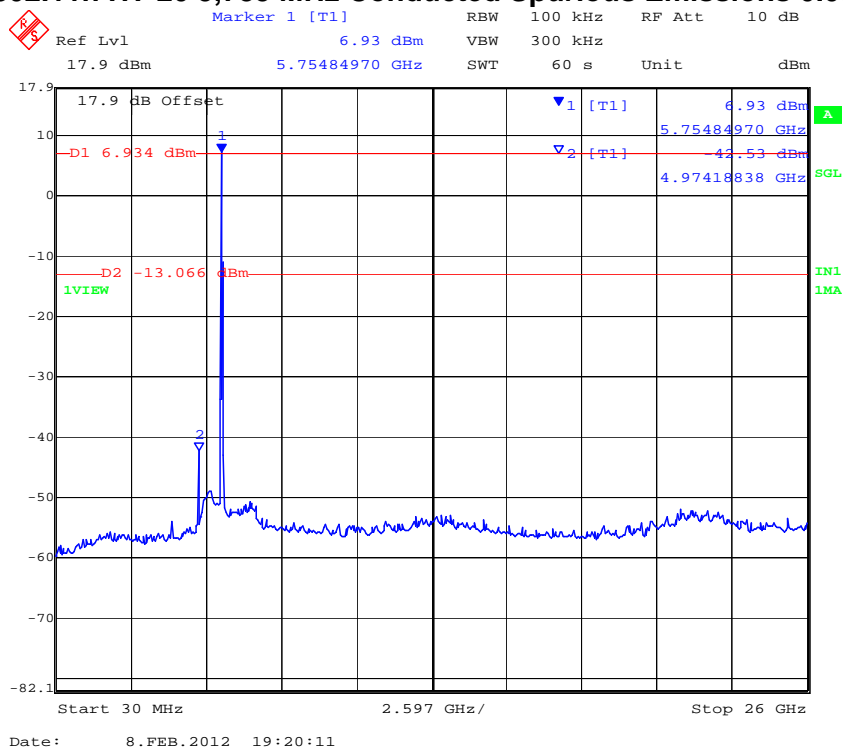




### PORT A 802.11n HT-20 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-20 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz

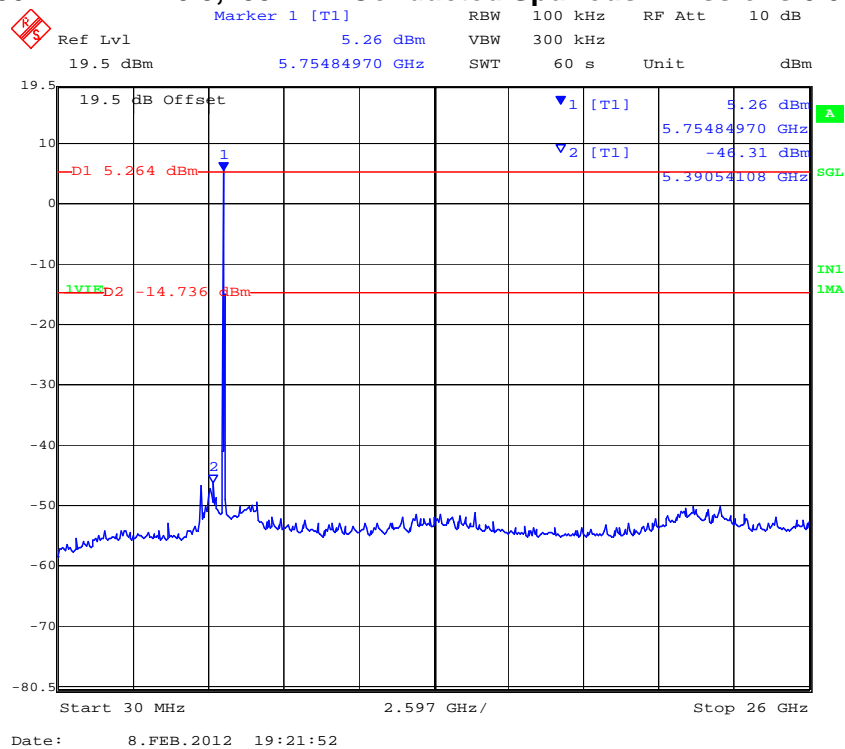


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**Title:** Fluke Networks Sensor4 Wireless Client  
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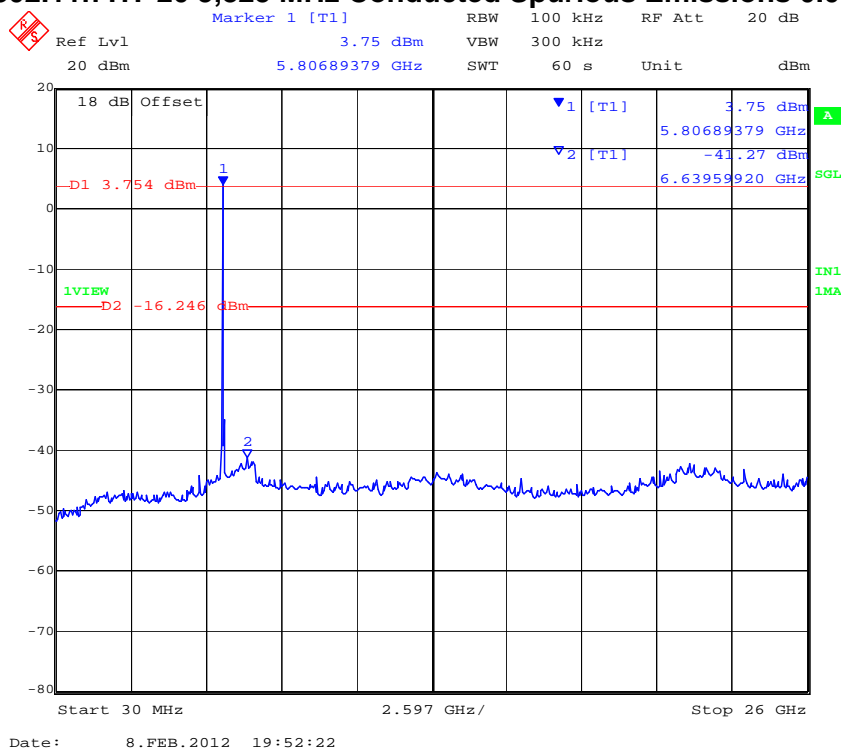
### PORT C 802.11n HT-20 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz



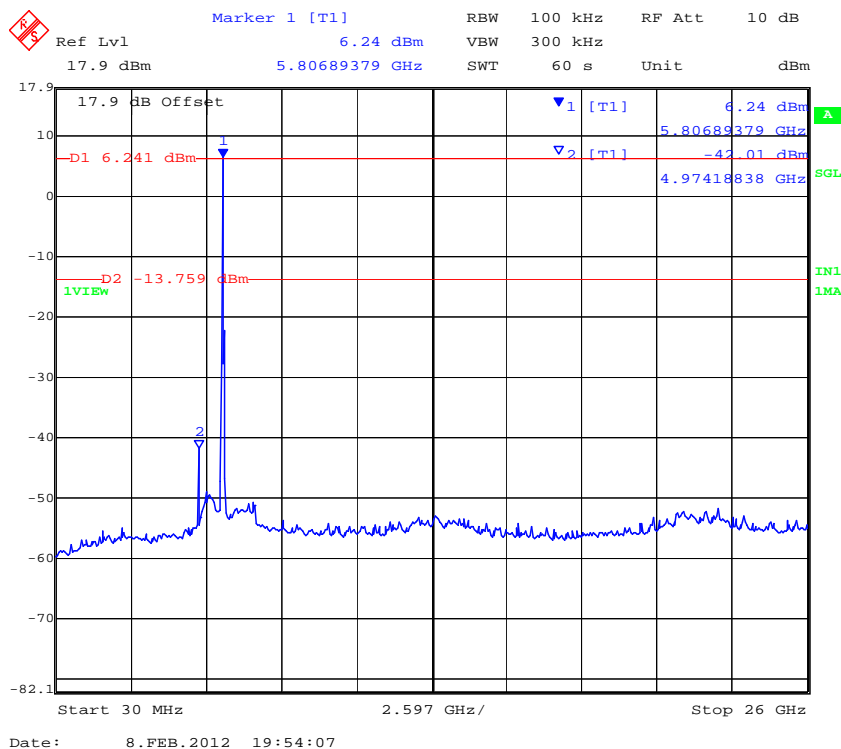
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### PORT A 802.11n HT-20 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-20 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz

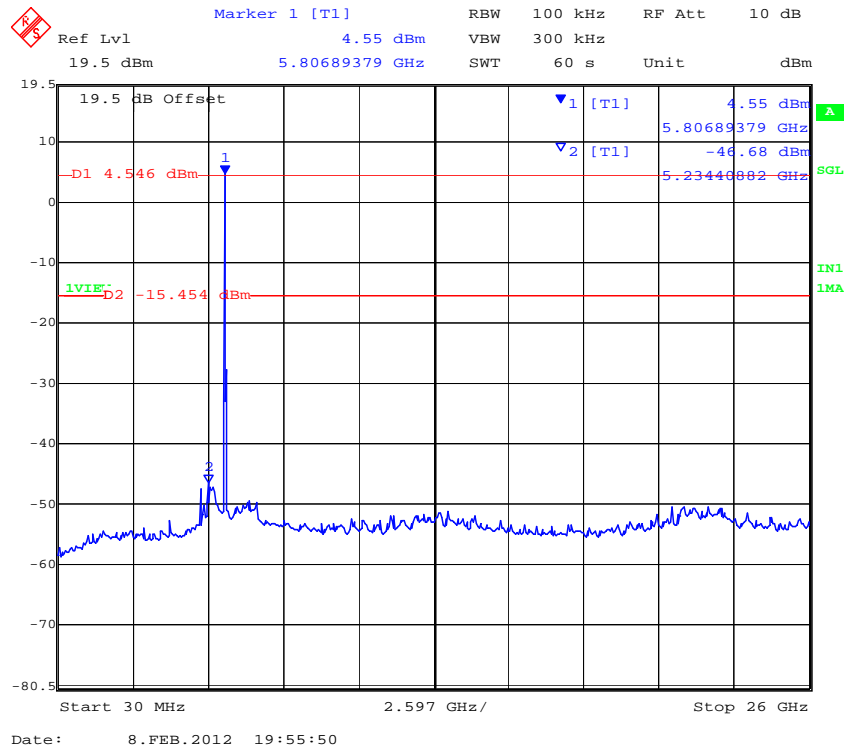


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11n HT-20 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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## Conducted Spurious Emission Results

### TABLE OF RESULTS – 802.11n HT-40

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A		dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5755.000	30.00	26000.00	-41.24	-19.13	-45.44	-17.08	-45.89	-18.89		
5795.000	30.00	26000.00	-41.31	-19.53	-42.26	-15.60	-45.44	-17.82		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5755.000	5725.00	-28.26	-18.62	-20.33	-15.15	-24.77	-17.71		
5795.000	5850.00	-41.08	-17.88	-29.40	-15.40	-39.84	-17.05		

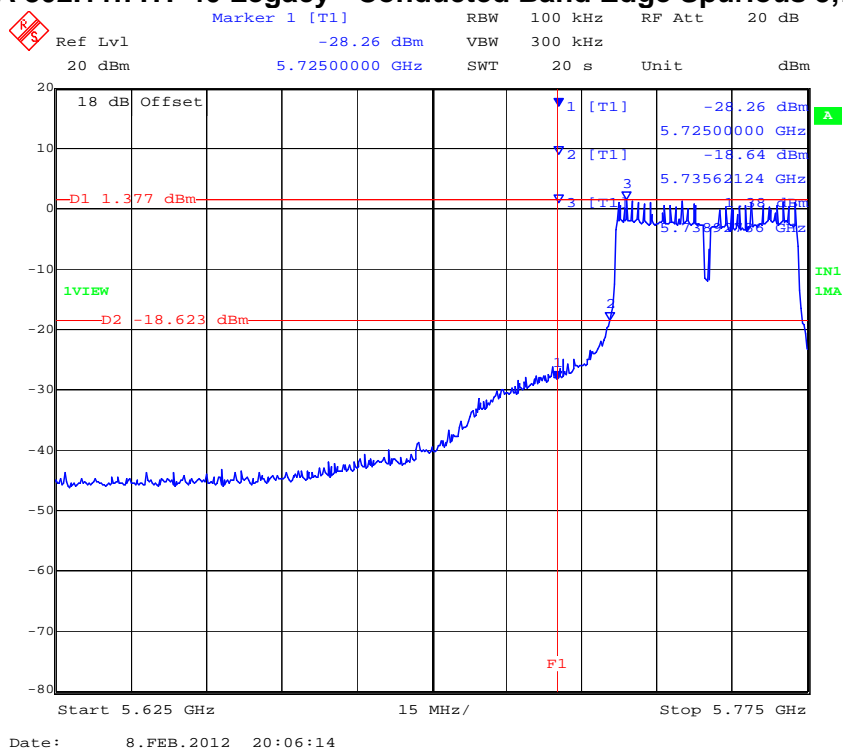
BE: Maximum Band edge emission found

<b>Measurement uncertainty:</b>	±2.81 dB
---------------------------------	----------

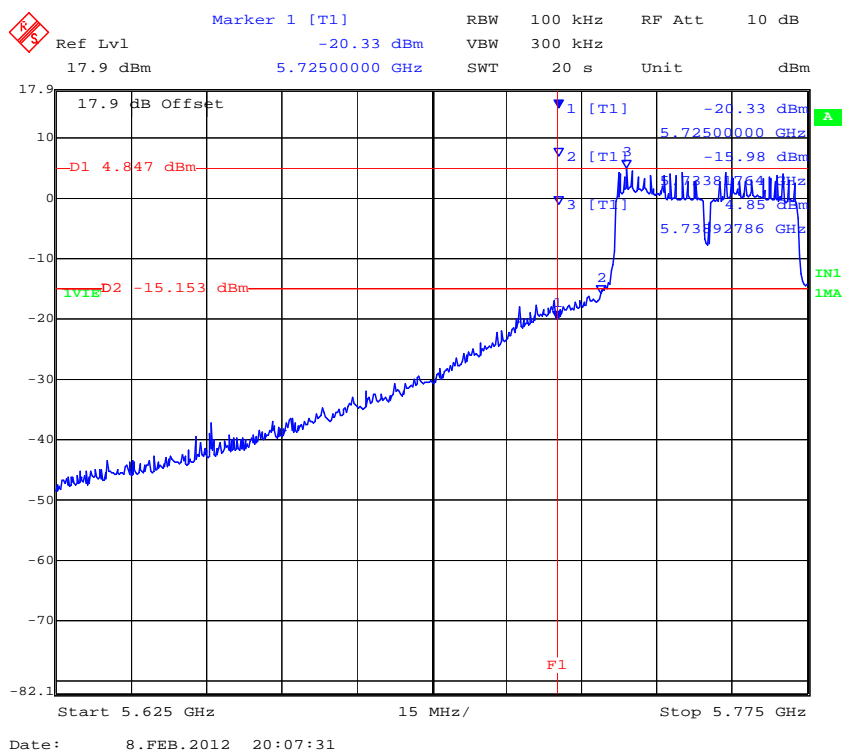
Note: Limit is based on 20dB down from fundamental emission



### PORT A 802.11n HT-40 Legacy - Conducted Band Edge Spurious 5,725 MHz



### PORT B 802.11n HT-40 Legacy - Conducted Band Edge Spurious 5,725 MHz

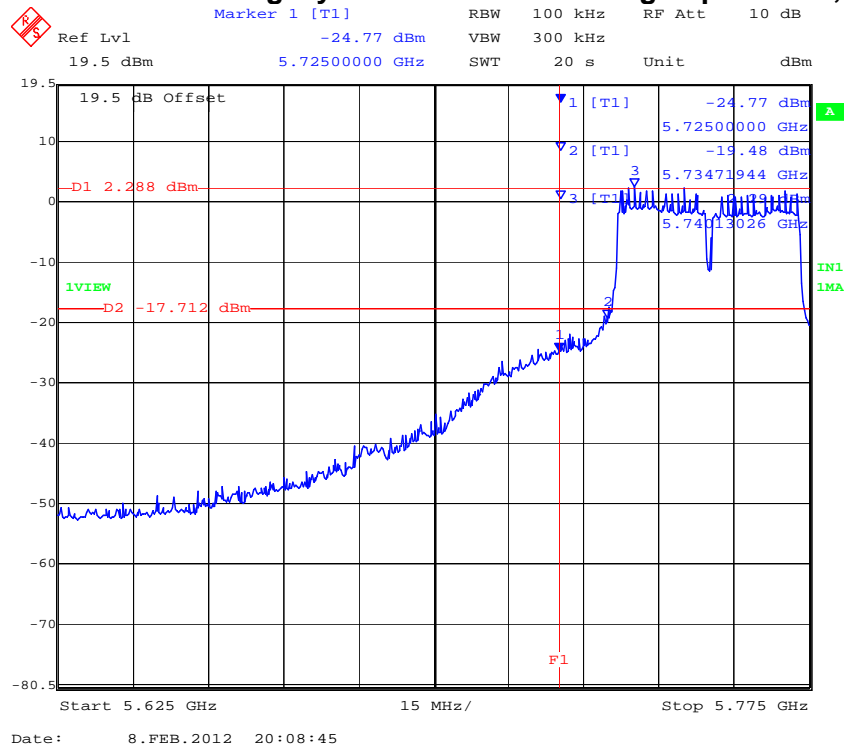


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**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT C 802.11n HT-40 Legacy - Conducted Band Edge Spurious 5,725 MHz

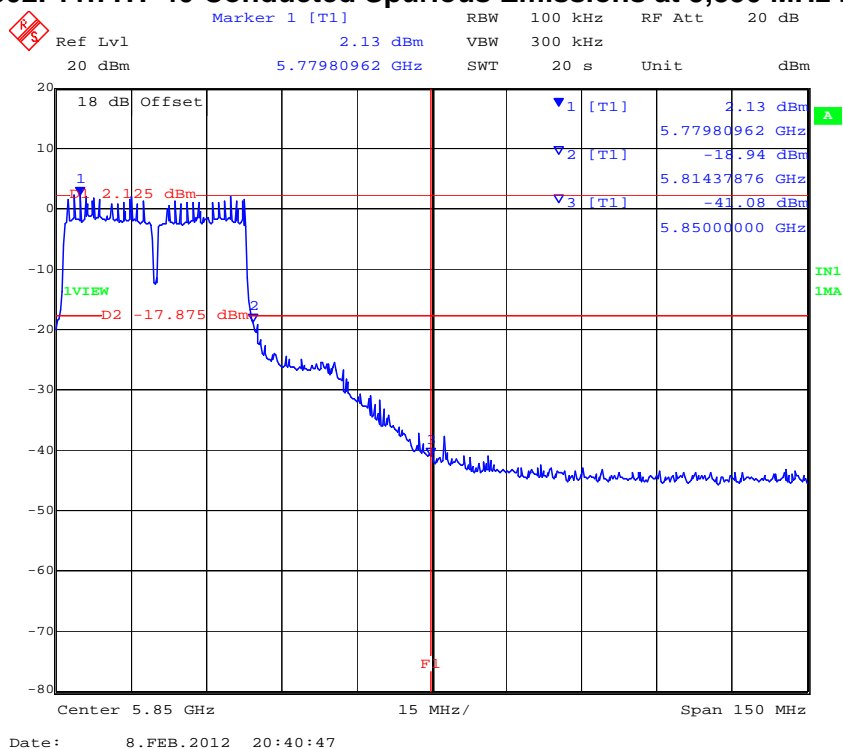


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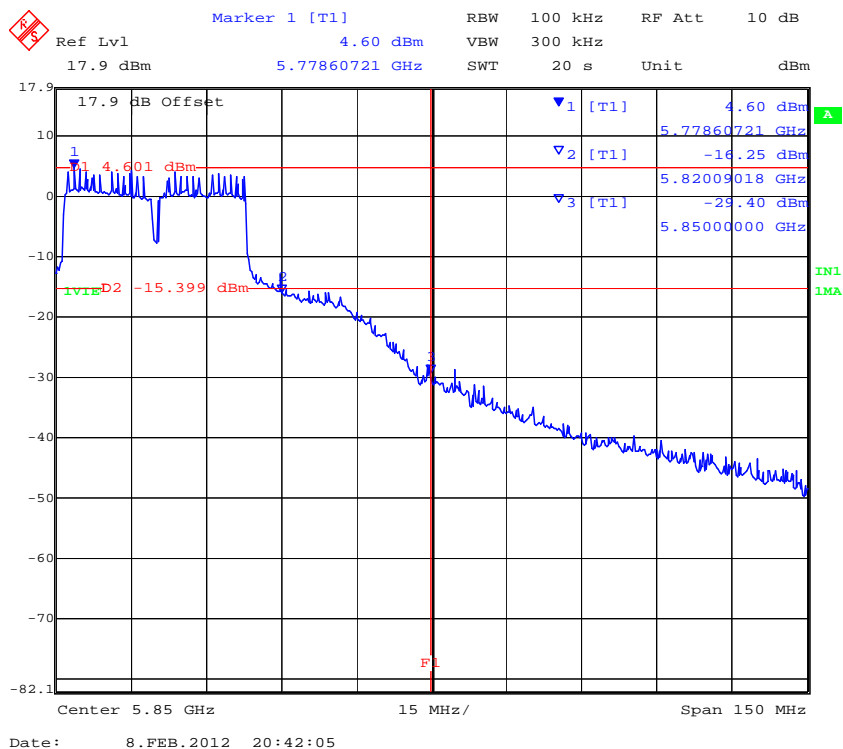


**Title:** Fluke Networks Sensor4 Wireless Client  
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### PORT A 802.11n HT-40 Conducted Spurious Emissions at 5,850 MHz Band Edge



### PORT B 802.11n HT-40 Conducted Spurious Emissions at 5,850 MHz Band Edge



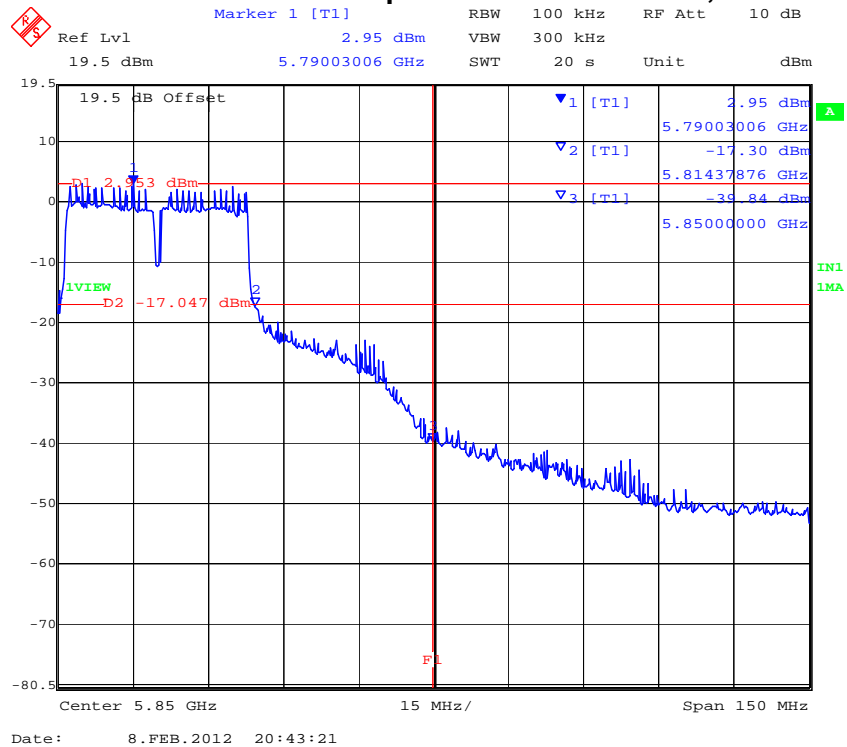
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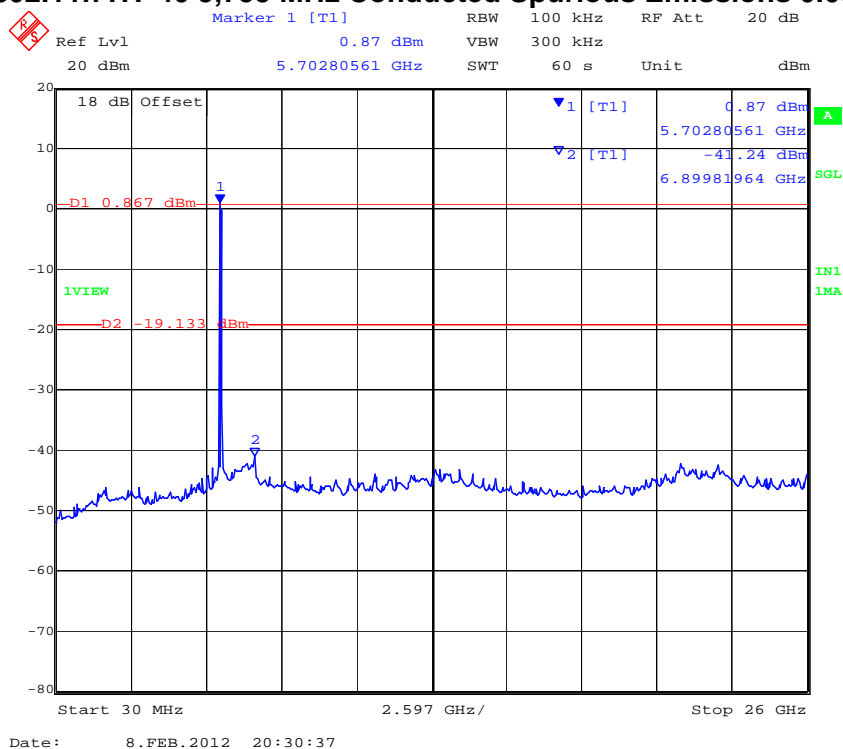
### PORT C 802.11n HT-40 Conducted Spurious Emissions at 5,850 MHz Band Edge



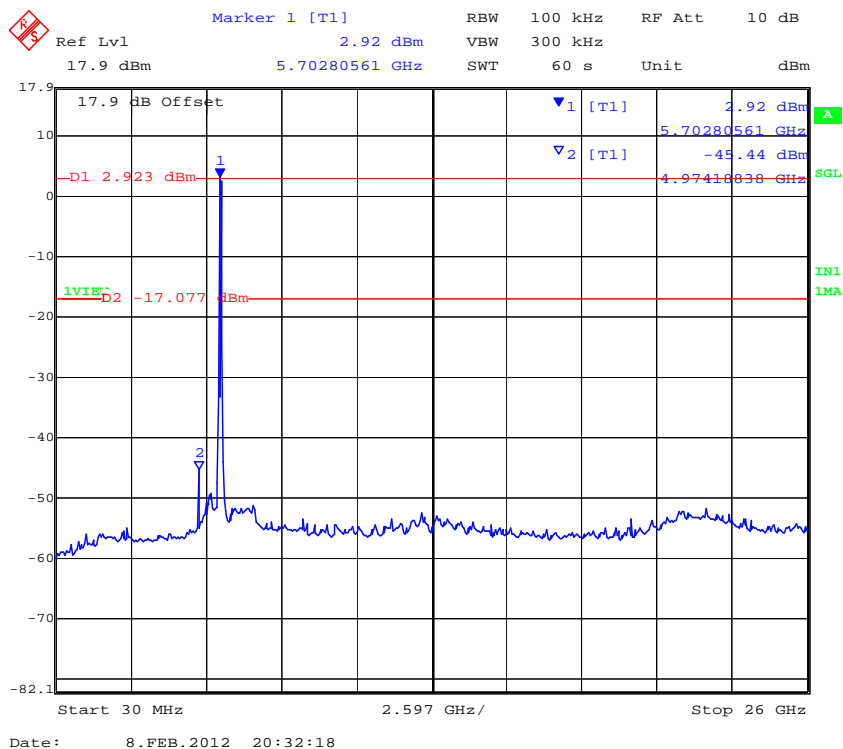
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### PORT A 802.11n HT-40 5,755 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-40 5,755 MHz Conducted Spurious Emissions 0.03 – 26 GHz

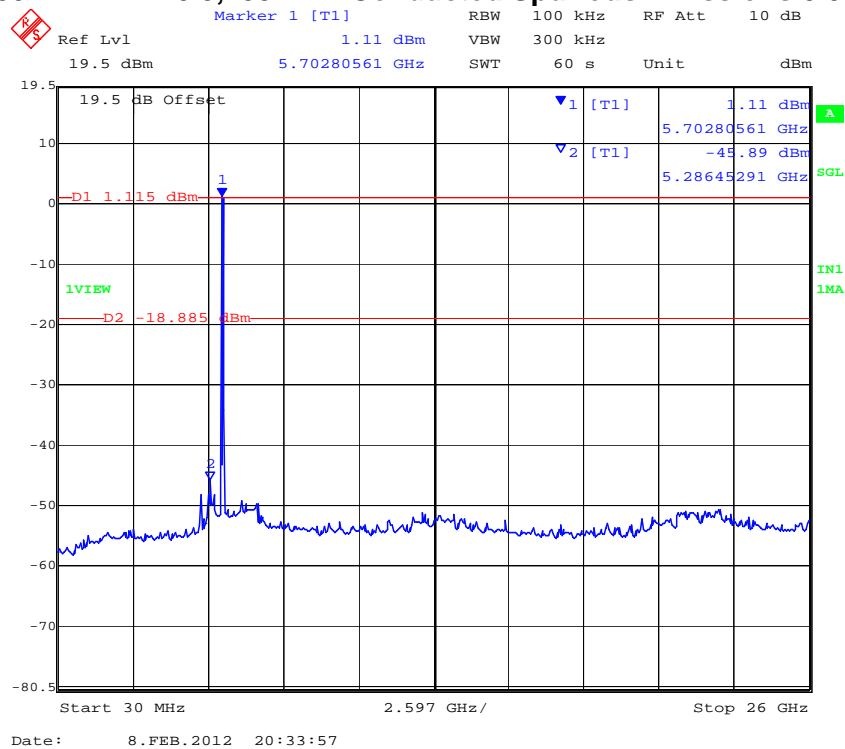


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**Title:** Fluke Networks Sensor4 Wireless Client  
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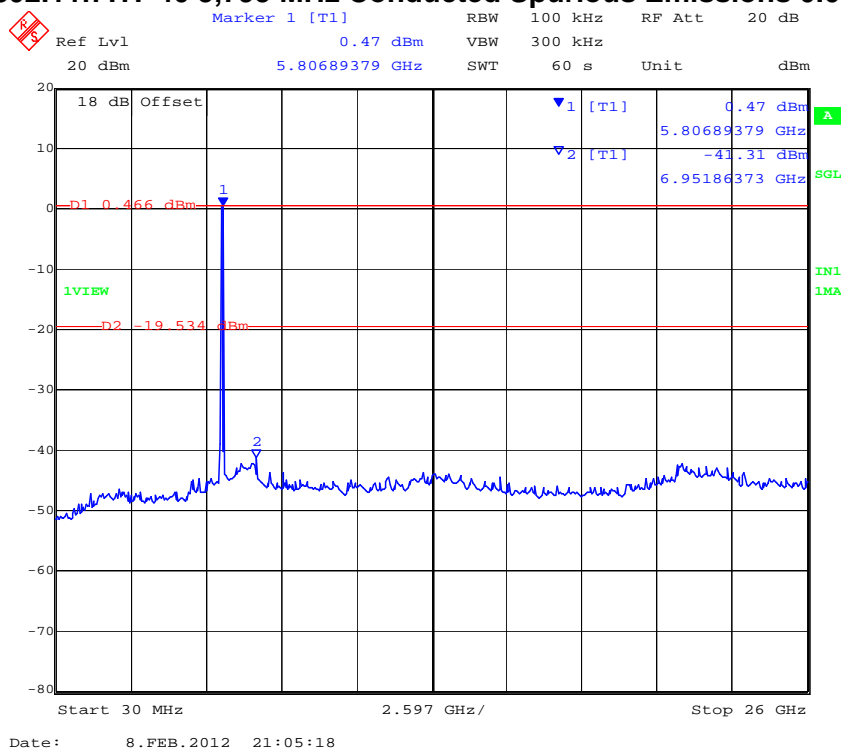
### PORT C 802.11n HT-40 5,755 MHz Conducted Spurious Emissions 0.03 – 26 GHz



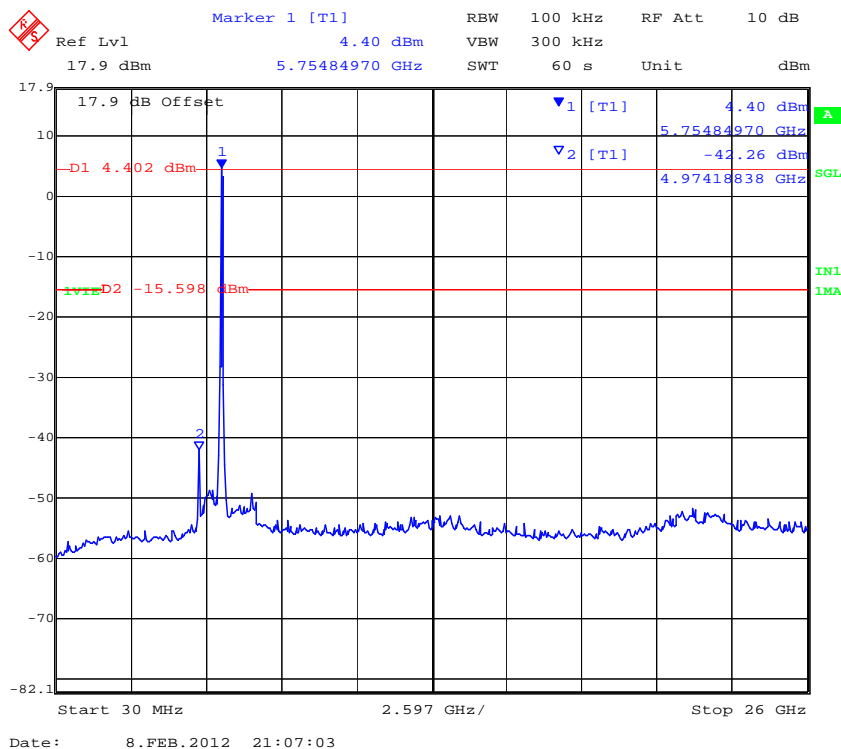
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### PORT A 802.11n HT-40 5,795 MHz Conducted Spurious Emissions 0.03 – 26 GHz



### PORT B 802.11n HT-40 5,795 MHz Conducted Spurious Emissions 0.03 – 26 GHz

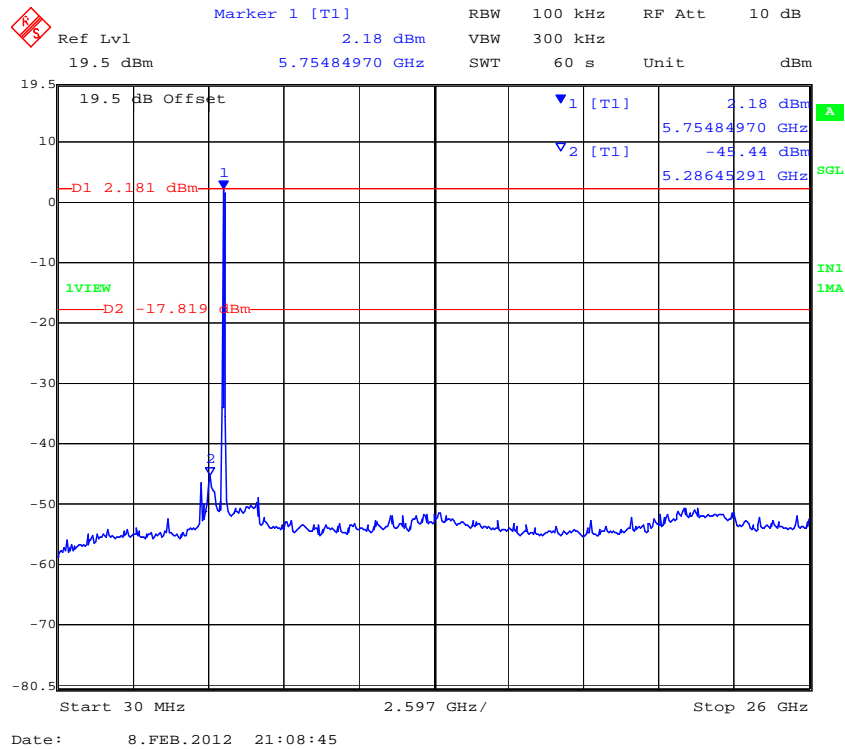


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### PORT C 802.11n HT-40 5,795 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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## Specification

### Limits Band-Edge

Lower Limit Band-edge	Upper Limit Band-edge	Limit below highest level of desired power
2,400 MHz	2,483.5 MHz	≥ 20 dB
5725 MHz	5850 MHz	

**§15.247(d) and RSS-210 §A8.5** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

#### §15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

**RSS-210 §A8.5** If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

#### RSS-Gen §4.7

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz, whichever is the lowest frequency, to the 5<sup>th</sup> harmonic of the highest frequency generated without exceeding 40 GHz.

### Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB
-------------------------	----------

### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0088, 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117.

#### 5.1.6. Radiated Emissions

##### **Transmitter Radiated Spurious Emissions (above 1 GHz); Peak Field Strength Measurements; and Radiated Band Edge Measurements – Restricted Bands**

**FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209**

**Industry Canada RSS-210 §A8.5, §2.2, §2.6**

**Industry Canada RSS-Gen §4.7**

#### **Test Procedure**

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

#### **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

For example:

Given receiver input reading of 51.5 dB $\mu$ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

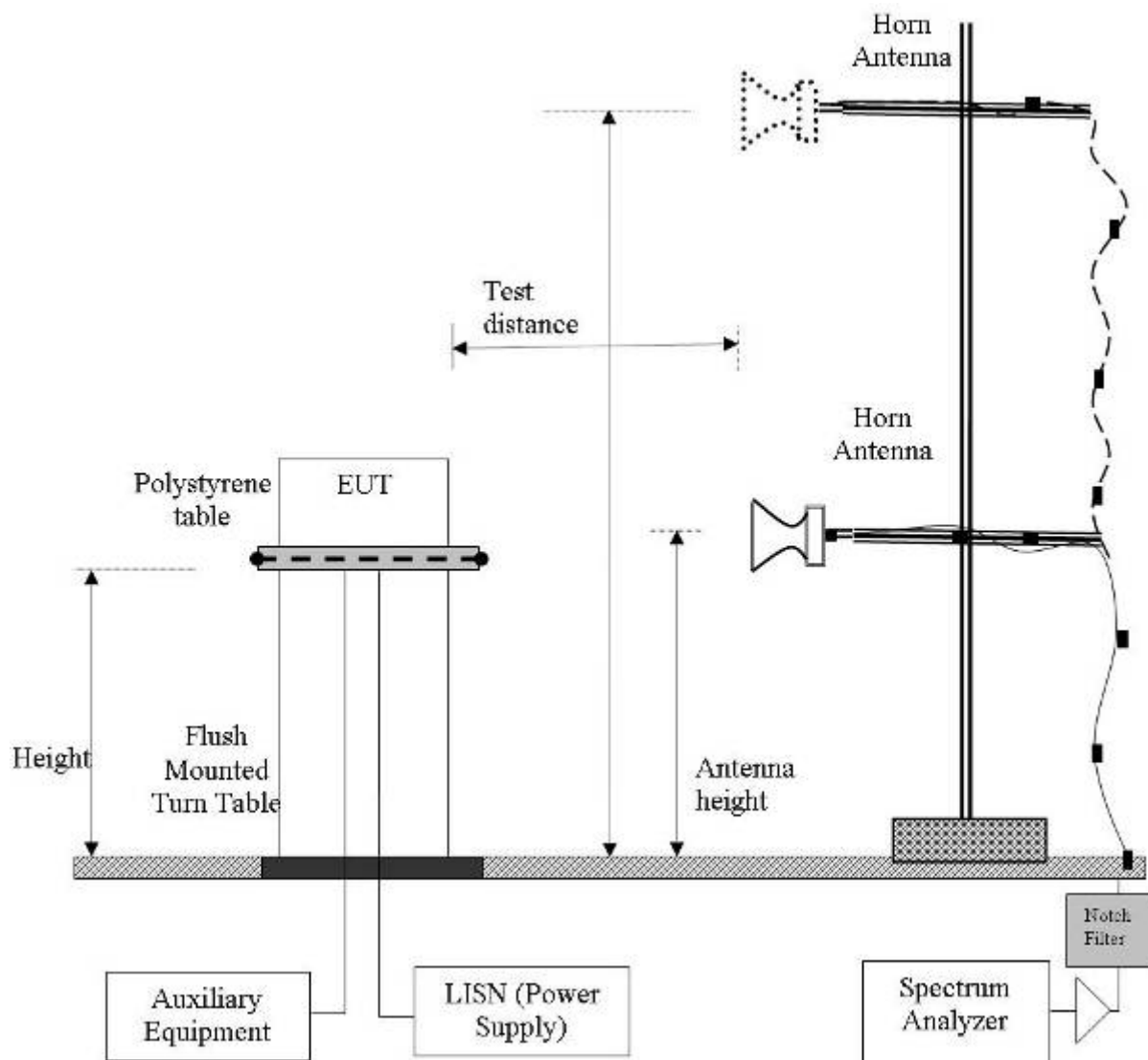
Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (}\mu\text{V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

## Radiated Emission Measurement Setup – Above 1 GHz

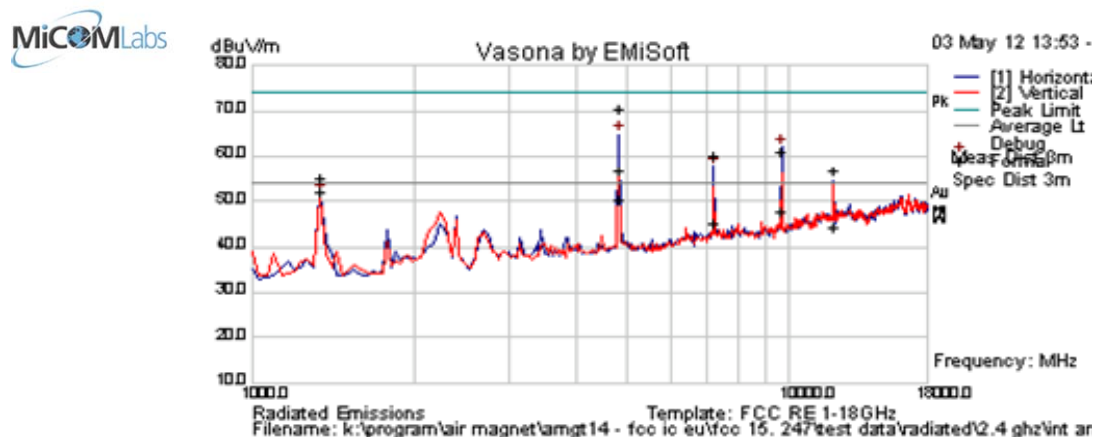


**NOTE:** KDB 662911 was implemented for Out-of-Band measurements. Where necessary Option (2) Measure and add 10 log (N) dB was implemented



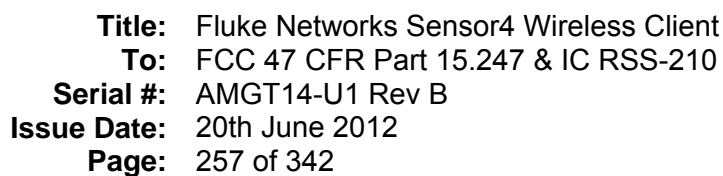
### 5.1.6.1. 2.4 GHz Integral Antenna

<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	SB
<b>Variant</b>	802.11b; 1 Mbs	<b>Temp (°C)</b>	22
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	17 reduced to 14	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	integral	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>	antenna positions inside chassis were moved		
<b>Test Notes 2</b>			



### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
9648.056	58.1	6.3	-3.5	60.9	Peak Max	H	102	225	74.0	-13.2	Pass	NRB
4824.008	75.9	4.5	-9.7	70.7	Peak Max	H	116	176	74.0	-3.4	Pass	RB
7234.629	60.4	5.4	-5.8	60.0	Peak Max	H	106	163	74.0	-14.0	Pass	NRB
12061.883	52.5	6.9	-2.5	56.9	Peak Max	H	98	188	74.0	-17.1	Pass	RB
1349.960	66.9	2.3	-14.0	55.2	Peak Max	H	98	27	74	-18.8	Pass	RB
4824.078	55.4	4.5	-9.7	50.2	Average Max	H	116	176	54	-3.8	Pass	RB
1349.960	63.6	2.3	-14.0	51.9	Average Max	H	98	27	54.0	-2.1	Pass	RB
7234.629	45.5	5.4	-5.8	45.1	Average Max	H	106	163	54.0	-9.0	Pass	NRB
12061.883	39.7	6.9	-2.5	44.2	Average Max	H	98	188	54.0	-9.8	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												



Ref Lvl 100.5 dBV  
 Marker 1 [T1] 57.76 dBV  
 2.38599198 GHz  
 RBW 1 MHz  
 VBW 1 MHz  
 SWT 20 s  
 Unit dBV

-8.7 dB Offset  
 D1 74 dBV  
 D2 54 dBV  
 1VIEW  
 2VIEW

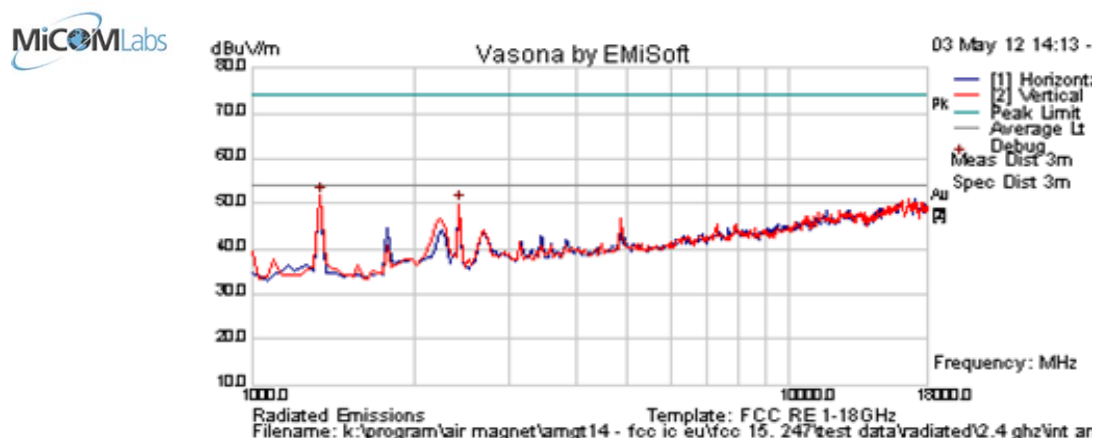
1 [T1] 57.76 dBV  
 2.38599198 GHz  
 2 [T2] 52.58 dBV  
 2.38631263 GHz

Start 2.31 GHz  
 8 MHz/  
 Stop 2.39 GHz

Date: 3.MAY.2012 11:06:46

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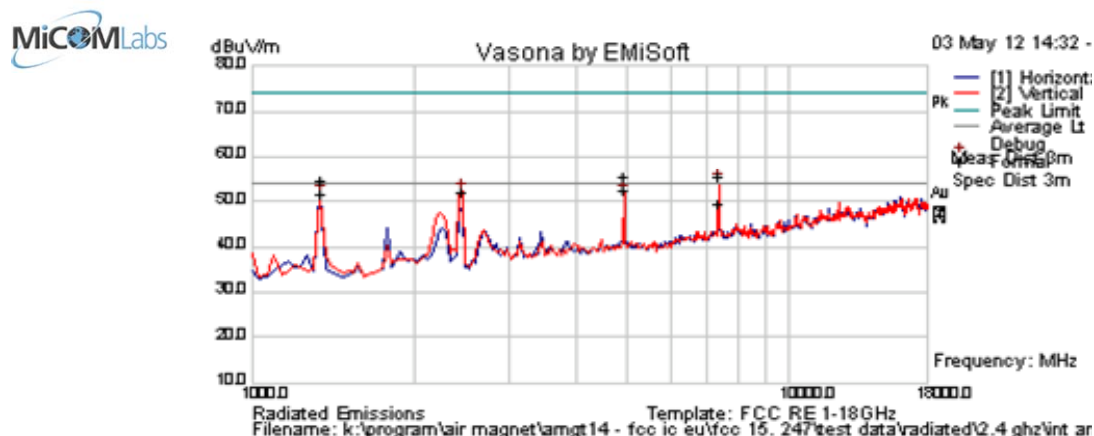
Test Freq.	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	20	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1	antenna positions inside chassis were moved		
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1349.960	66.9	2.3	-14.0	55.2	Peak Max	H	98	27	74	-18.8	Pass	RB
1349.960	63.6	2.3	-14.0	51.9	Average Max	H	98	27	54.0	-2.1	Pass	RB
2430.862	58.5	3.0	-11.6	49.9	Peak [Scan]	V	150	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	17	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1	antenna positions inside chassis were moved		
Test Notes 2			

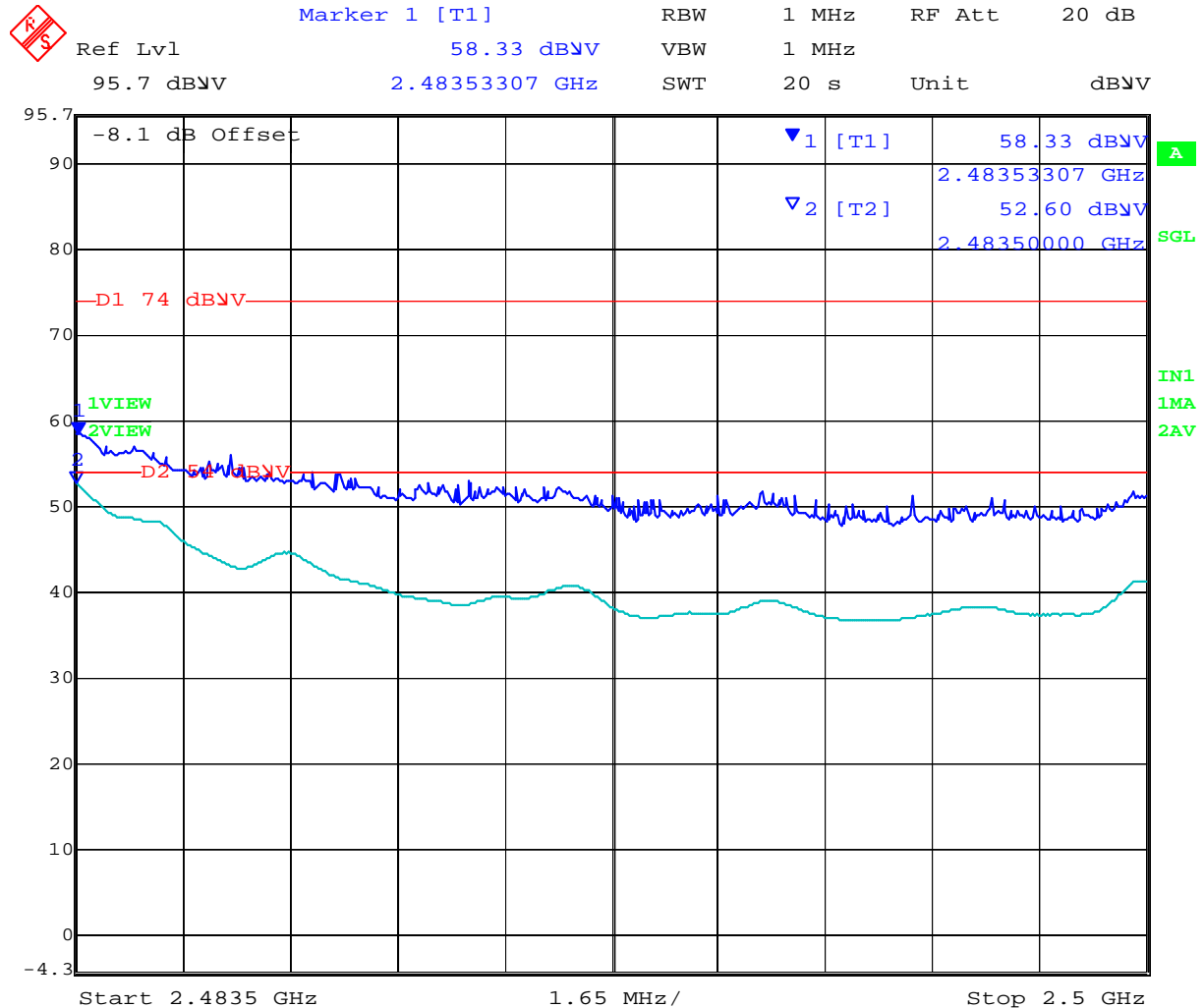


#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
7387.255	55.4	5.5	-5.5	55.4	Peak Max	V	142	265	74	-18.6	Pass	RB
4924.128	60.5	4.6	-9.8	55.3	Peak Max	V	151	190	74.0	-18.7	Pass	RB
1350.020	66.2	2.3	-14.0	54.5	Peak Max	H	100	23	74.0	-19.5	Pass	RB
7387.255	49.5	5.5	-5.5	49.5	Average Max	V	142	265	54.0	-4.5	Pass	RB
4924.128	57.6	4.6	-9.8	52.4	Average Max	V	151	190	54.0	-1.6	Pass	RB
1350.020	63.2	2.3	-14.0	51.5	Average Max	H	100	23	54	-2.5	Pass	RB
2464.930	60.6	3.0	-11.5	52.1	Peak [Scan]	V	100	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												



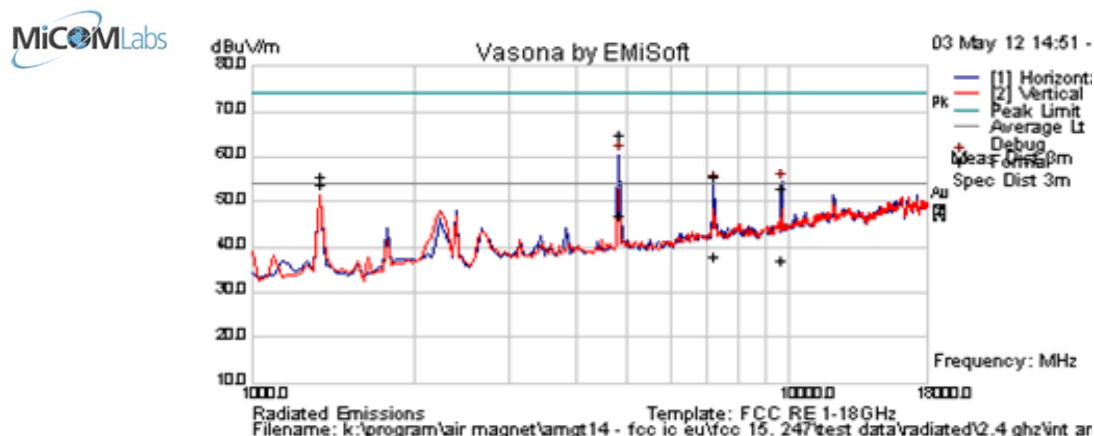
## Band Edge



Date: 3.MAY.2012 11:56:08

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Test Freq.	2412 MHz	Engineer	SB
Variant	802.11g; 6 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	13	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			

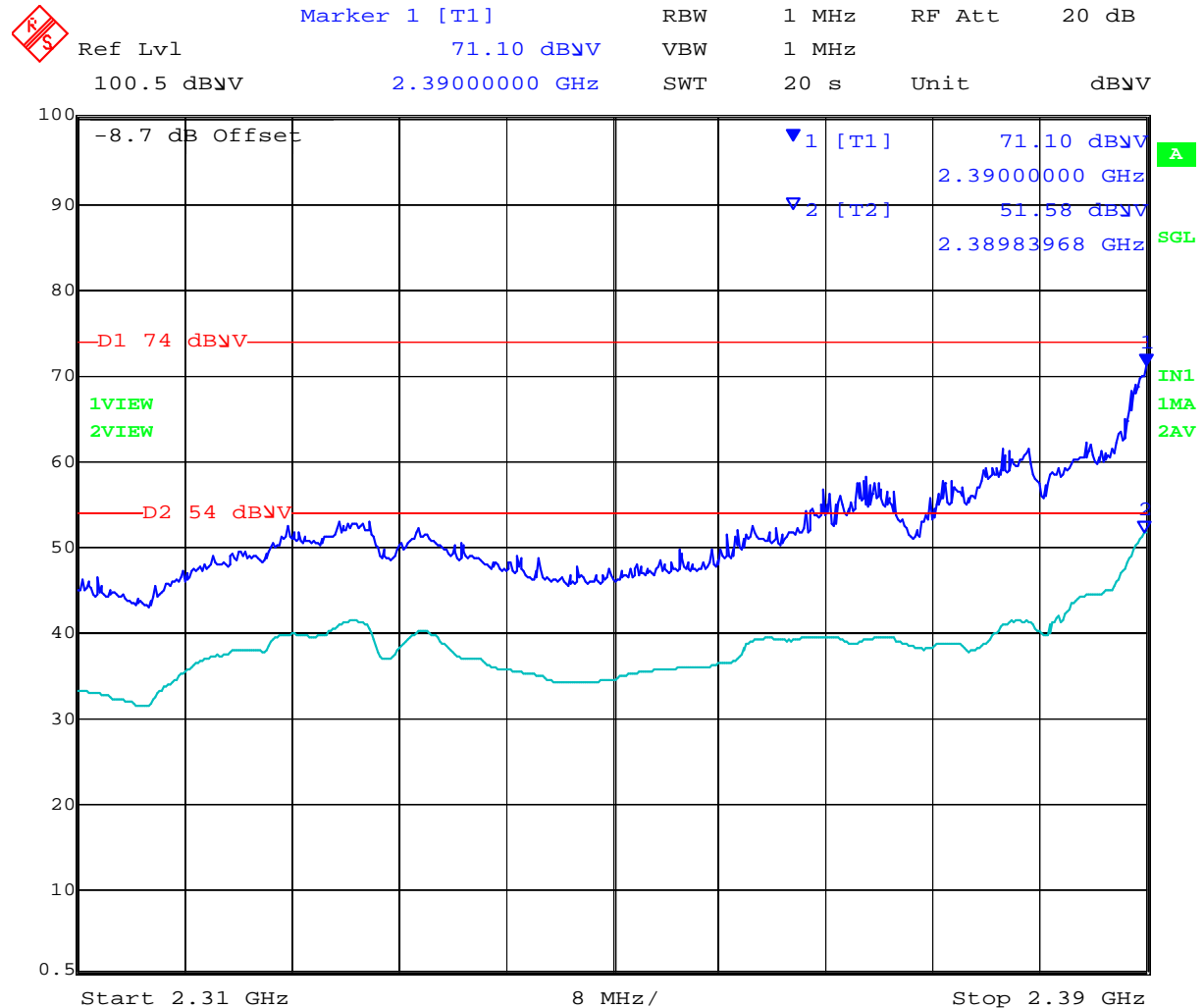


#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4826.693	70.0	4.5	-9.7	64.8	Peak Max	H	115	232	74.0	-9.2	Pass	RB
9656.192	50.2	6.3	-3.6	53.0	Peak Max	H	119	238	74.0	-21.0	Pass	RB
7241.122	56.1	5.4	-5.8	55.7	Peak Max	H	142	192	74.0	-18.3	Pass	RB
1349.920	67.4	2.3	-14.0	55.7	Peak Max	V	111	42	74.0	-18.3	Pass	RB
4826.693	52.1	4.5	-9.7	46.9	Average Max	H	115	232	54.0	-7.1	Pass	RB
9656.192	34.3	6.3	-3.6	37.1	Average Max	H	119	238	54.0	-16.9	Pass	RB
7241.122	38.2	5.4	-5.8	37.8	Average Max	H	142	192	54.0	-16.2	Pass	RB
1349.920	65.6	2.3	-14.0	53.9	Average Max	V	111	42	54.0	-0.1	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												



## Band Edge



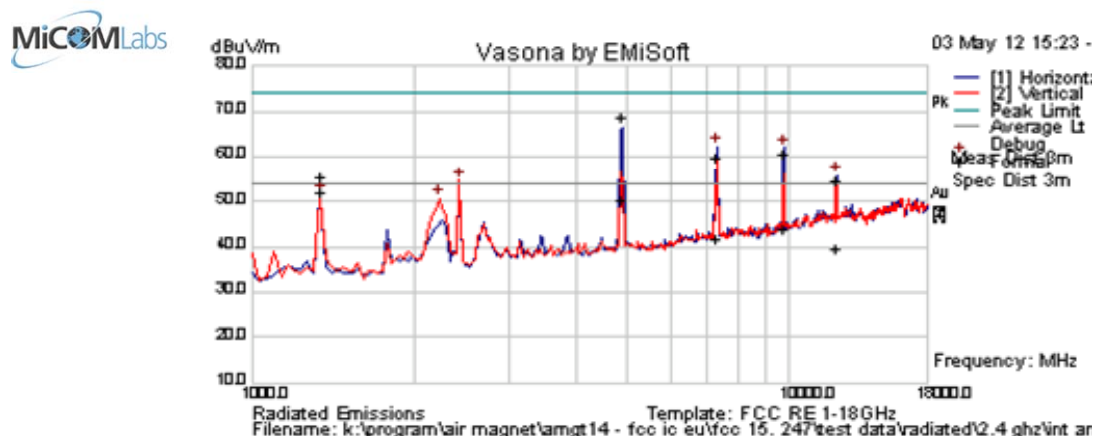
Date: 3.MAY.2012 11:11:16

Output power reduction required (Power = 13)



**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11g; 6 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	20 to 17	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4871.583	74.1	4.5	-9.7	68.9	Peak Max	H	170	182	74	-5.1	Pass	RB
7309.820	60.2	5.4	-5.7	60.0	Peak Max	H	98	216	74	-14.1	Pass	RB
9753.908	58.2	6.4	-3.7	60.8	Peak Max	H	119	161	74	-13.2	Pass	RB
12182.445	49.9	7.0	-2.2	54.7	Peak Max	H	130	189	74	-19.3	Pass	RB
1350.000	67.4	2.3	-14.0	55.7	Peak Max	H	94	22	74	-18.3	Pass	RB
4871.583	55.4	4.5	-9.7	50.2	Average Max	H	170	182	54	-3.8	Pass	RB
7309.820	42.2	5.4	-5.7	41.9	Average Max	H	98	216	54	-12.1	Pass	RB
9753.908	41.3	6.4	-3.7	43.9	Average Max	H	119	161	54	-10.1	Pass	RB
12182.445	34.7	7.0	-2.2	39.5	Average Max	H	130	189	54	-14.5	Pass	RB
1350.000	63.8	2.3	-14.0	52.1	Average Max	H	94	22	54	-1.9	Pass	RB
2430.862	63.5	3.0	-11.6	54.9	Peak [Scan]	V	150	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

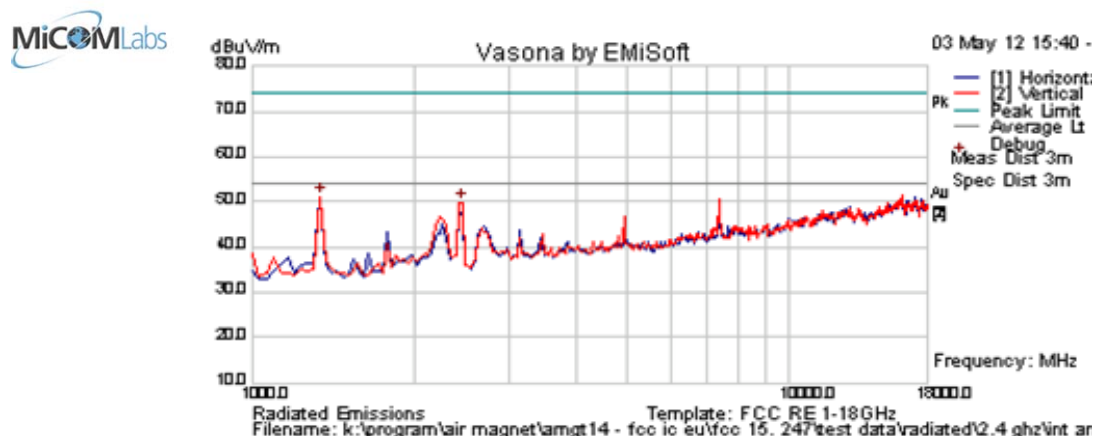
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**Title:** Fluke Networks Sensor4 Wireless Client  
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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11g; 6 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	13	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



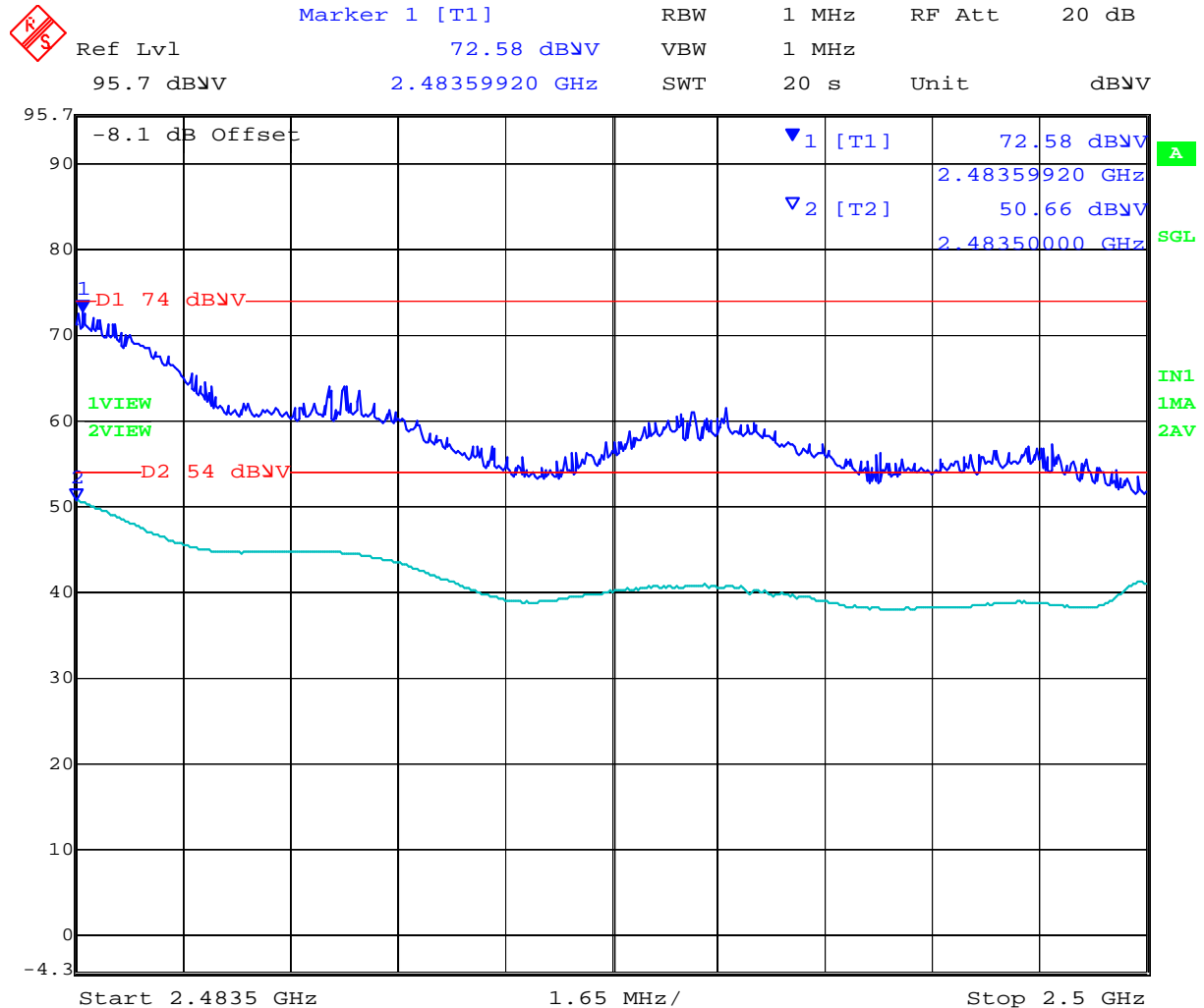
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1349.960	66.9	2.3	-14.0	55.2	Peak Max	H	98	27	74	-18.8	Pass	RB
1349.960	63.6	2.3	-14.0	51.9	Average Max	H	98	27	54.0	-2.1	Pass	RB
2464.930	58.4	3.0	-11.5	49.9	Peak [Scan]	V	150	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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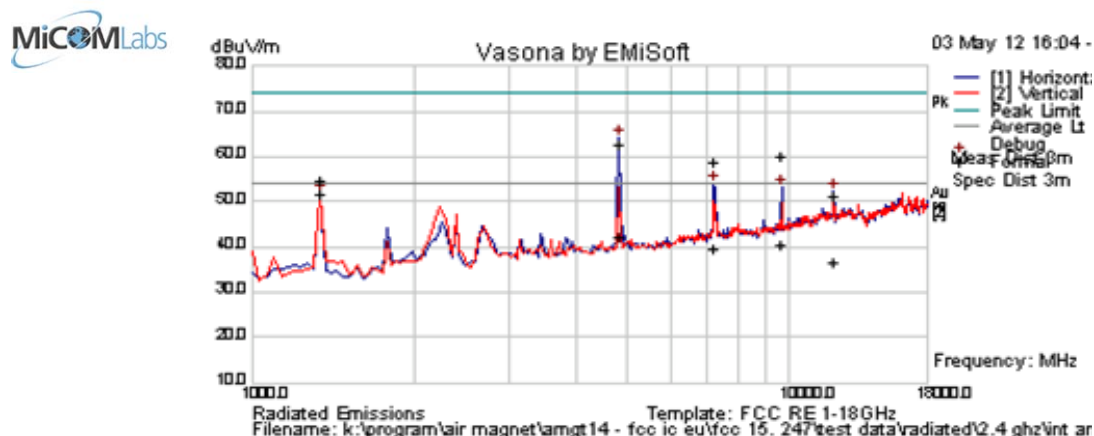
## Band Edge



Date: 3.MAY.2012 12:00:13

Output power reduction required (Power = 13)

Test Freq.	2412 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	14	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4827.335	67.9	4.5	-9.7	62.7	Peak Max	H	98	194	74.0	-11.3	Pass	RB
7246.012	59.5	5.4	-5.8	59.1	Peak Max	H	99	175	74.0	-14.9	Pass	RB
9666.132	57.6	6.3	-3.6	60.3	Peak Max	H	100	148	74.0	-13.7	Pass	RB
12087.134	46.6	7.0	-2.5	51.1	Peak Max	H	124	306	74.0	-22.9	Pass	RB
1350.000	66.4	2.3	-14.0	54.7	Peak Max	H	98	27	74.0	-19.3	Pass	RB
4827.335	47.6	4.5	-9.7	42.4	Average Max	H	98	194	54.0	-11.6	Pass	RB
7246.012	39.8	5.4	-5.8	39.4	Average Max	H	99	175	54.0	-14.6	Pass	RB
9666.132	37.7	6.3	-3.6	40.5	Average Max	H	100	148	54.0	-13.6	Pass	RB
12087.134	32.2	7.0	-2.5	36.7	Average Max	H	124	306	54.0	-17.3	Pass	RB
1350.000	63.2	2.3	-14.0	51.5	Average Max	H	98	27	54.0	-2.5	Pass	RB

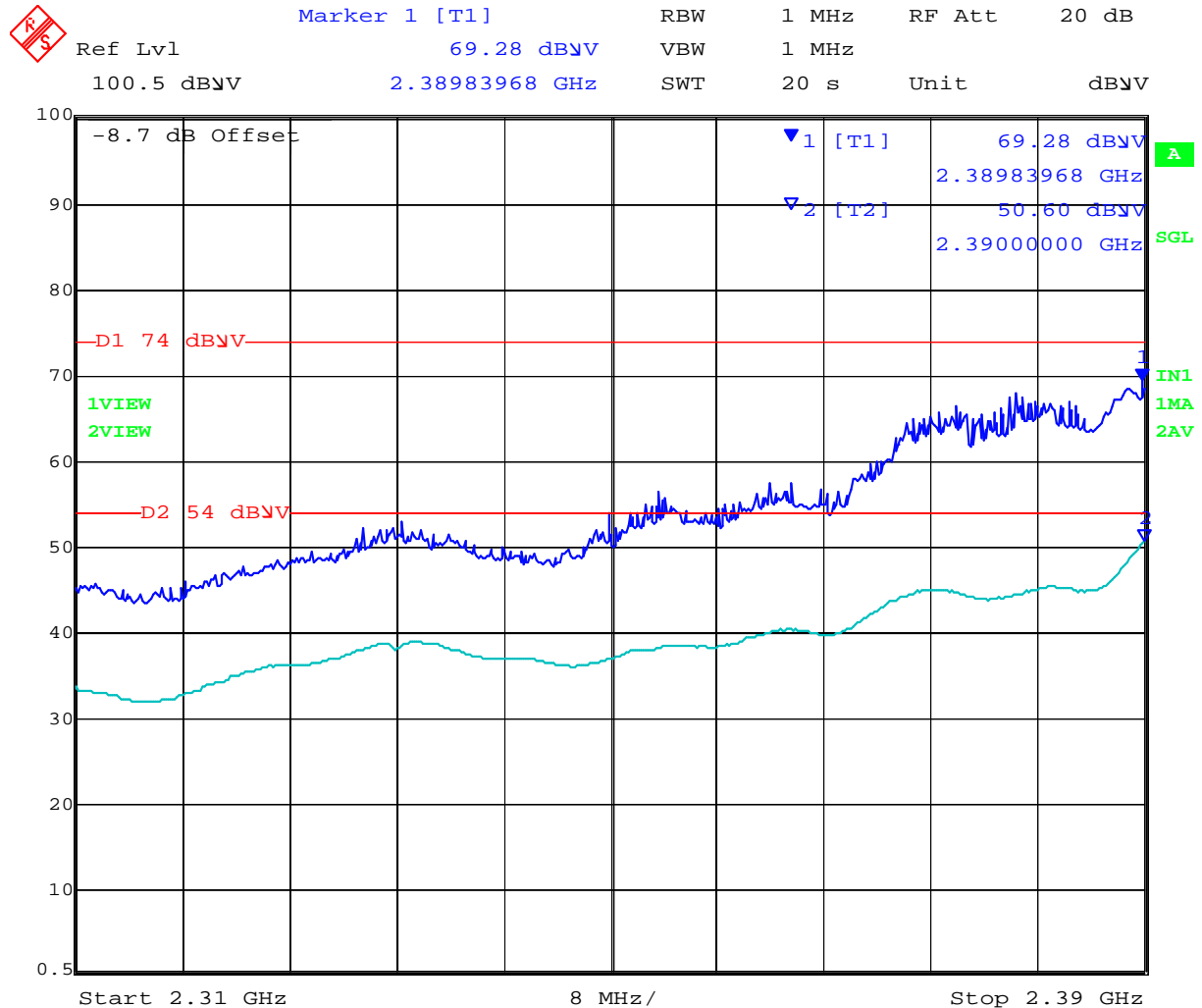
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

\* Evaluated as 1600 MHz, RB Emission See Evaluation

RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak



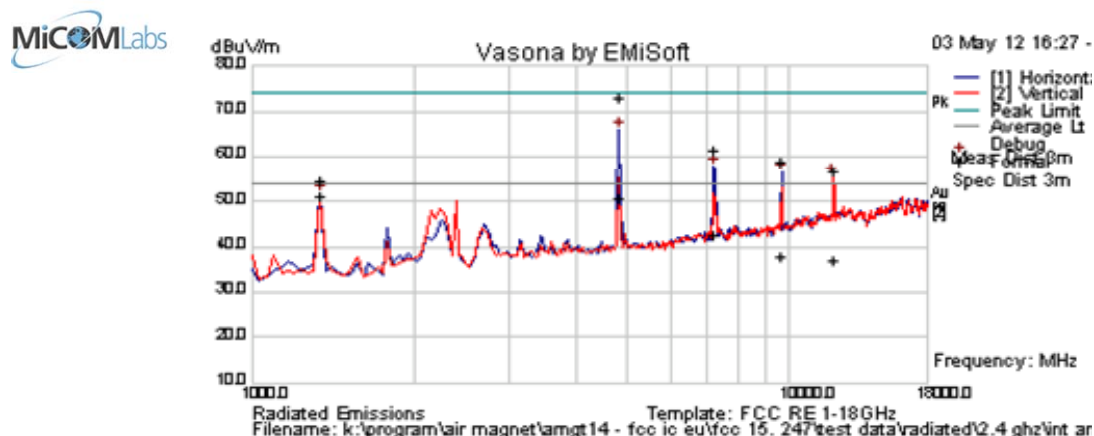
## Band Edge



Date: 3.MAY.2012 11:43:29

Output power reduction required (Power = 14)

Test Freq.	2437 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	20 to 17	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4827.174	78.1	4.5	-9.7	72.9	Peak Max	H	142	199	74	-1.1	Pass	RB
7238.557	61.8	5.4	-5.8	61.4	Peak Max	H	98	167	74	-12.6	Pass	RB
9672.224	56.3	6.3	-3.6	59.0	Peak Max	H	170	163	74	-15.0	Pass	RB
12094.669	52.1	7.0	-2.4	56.6	Peak Max	V	130	249	74	-17.4	Pass	RB
1349.960	66.2	2.3	-14.0	54.5	Peak Max	H	99	19	74	-19.5	Pass	RB
4827.174	56.1	4.5	-9.7	50.9	Average Max	H	142	199	54	-3.1	Pass	RB
7238.557	42.9	5.4	-5.8	42.5	Average Max	H	98	167	54	-11.5	Pass	RB
9672.224	35.1	6.3	-3.6	37.8	Average Max	H	170	163	54	-16.2	Pass	RB
12094.669	32.4	7.0	-2.4	36.9	Average Max	V	130	249	54	-17.1	Pass	RB
1349.960	62.9	2.3	-14.0	51.2	Average Max	H	99	19	54	-2.8	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

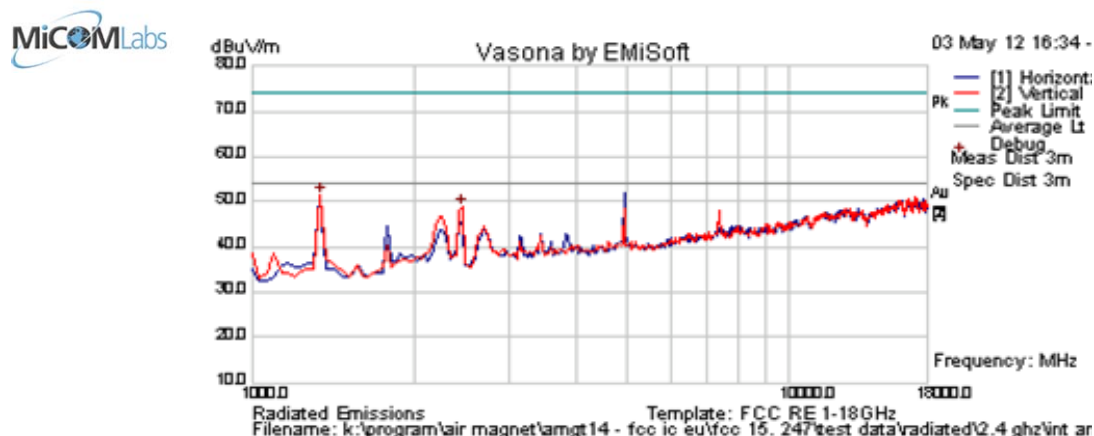
\* Evaluated as 1600 MHz, RB Emission See Evaluation

RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak



**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	12	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



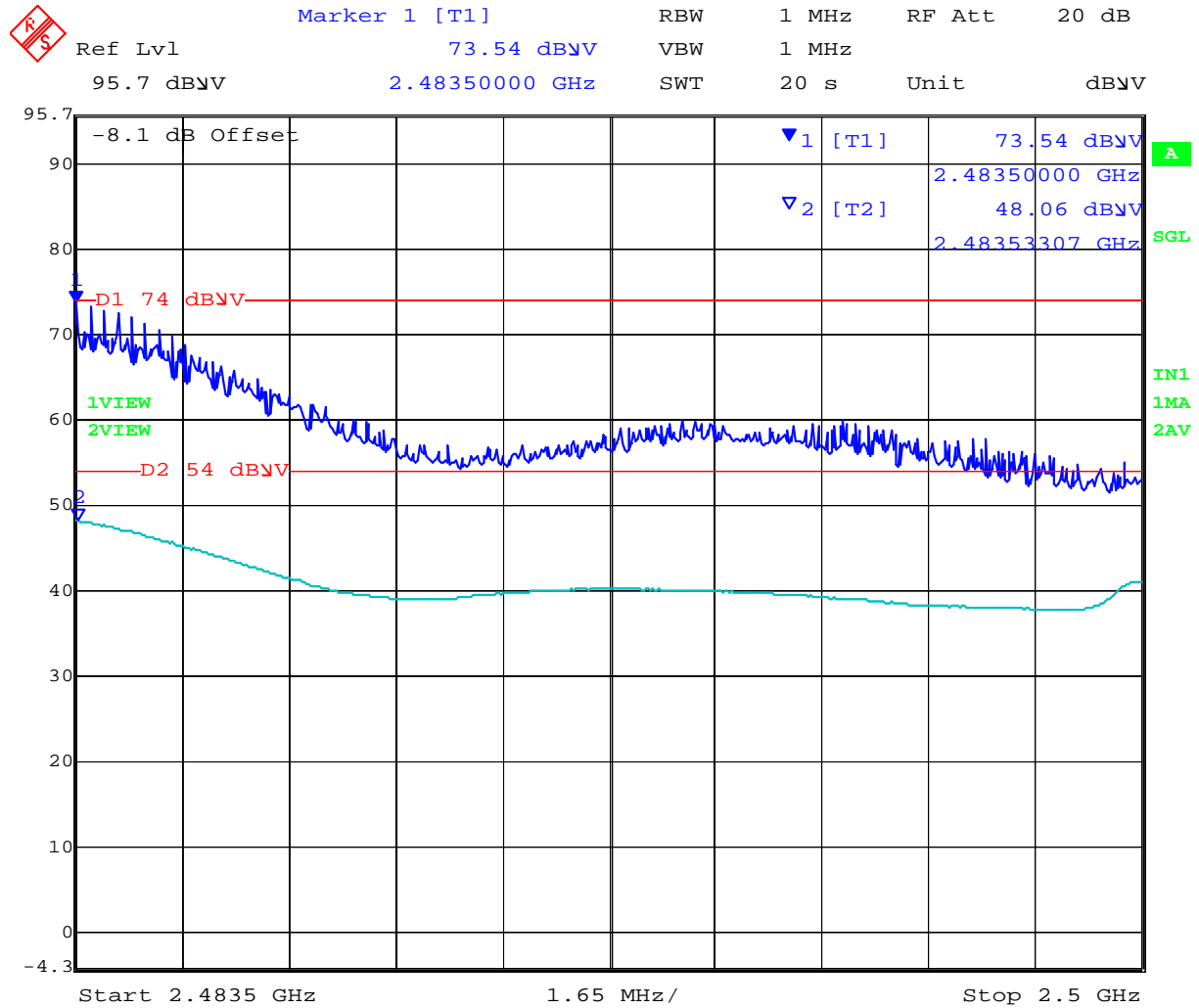
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1349.960	66.9	2.3	-14.0	55.2	Peak Max	H	98	27	74	-18.8	Pass	RB
1349.960	63.6	2.3	-14.0	51.9	Average Max	H	98	27	54.0	-2.1	Pass	RB
2464.930	57.2	3.0	-11.5	48.7	Peak [Scan]	V	200	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
* Evaluated as 1600 MHz, RB Emission See Evaluation												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band Edge



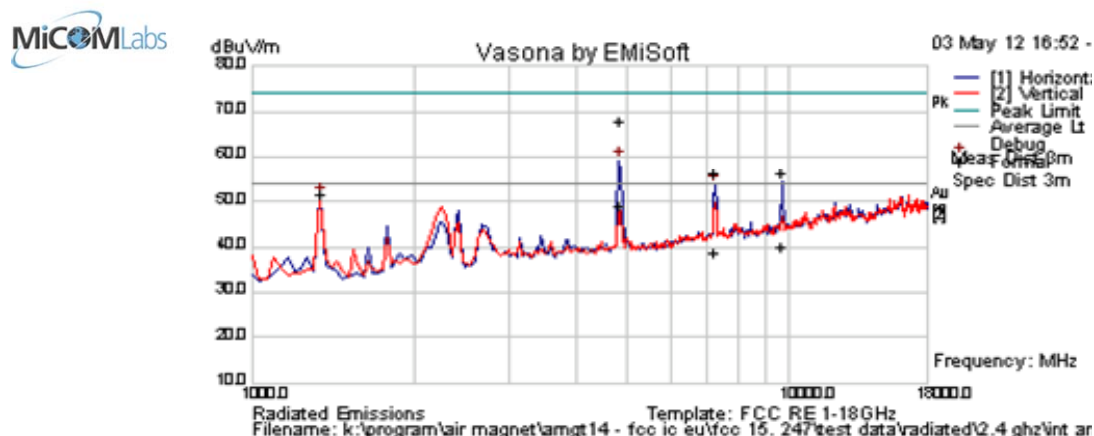
Date: 3.MAY.2012 12:03:15

Output power reduction required (Power = 12)



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Test Freq.	2422 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	14	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4837.435	73.3	4.5	-9.7	68.1	Peak Max	H	133	191	74.0	-5.9	Pass	RB
9678.717	53.7	6.3	-3.6	56.4	Peak Max	H	99	146	74.0	-17.6	Pass	RB
7274.790	56.5	5.4	-5.8	56.1	Peak Max	H	98	156	74.0	-17.9	Pass	RB
4837.435	54.1	4.5	-9.7	48.9	Average Max	H	133	191	54.0	-5.1	Pass	RB
9678.717	37.3	6.3	-3.6	40.0	Average Max	H	99	146	54.0	-14.0	Pass	RB
7274.790	39.3	5.4	-5.8	39.0	Average Max	H	98	156	54.0	-15.0	Pass	RB
1340.681	63.0	2.3	-13.9	51.4	Peak [Scan]	H	100	0	54.0	-2.6	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

\* Evaluated as 1600 MHz, RB Emission See Evaluation

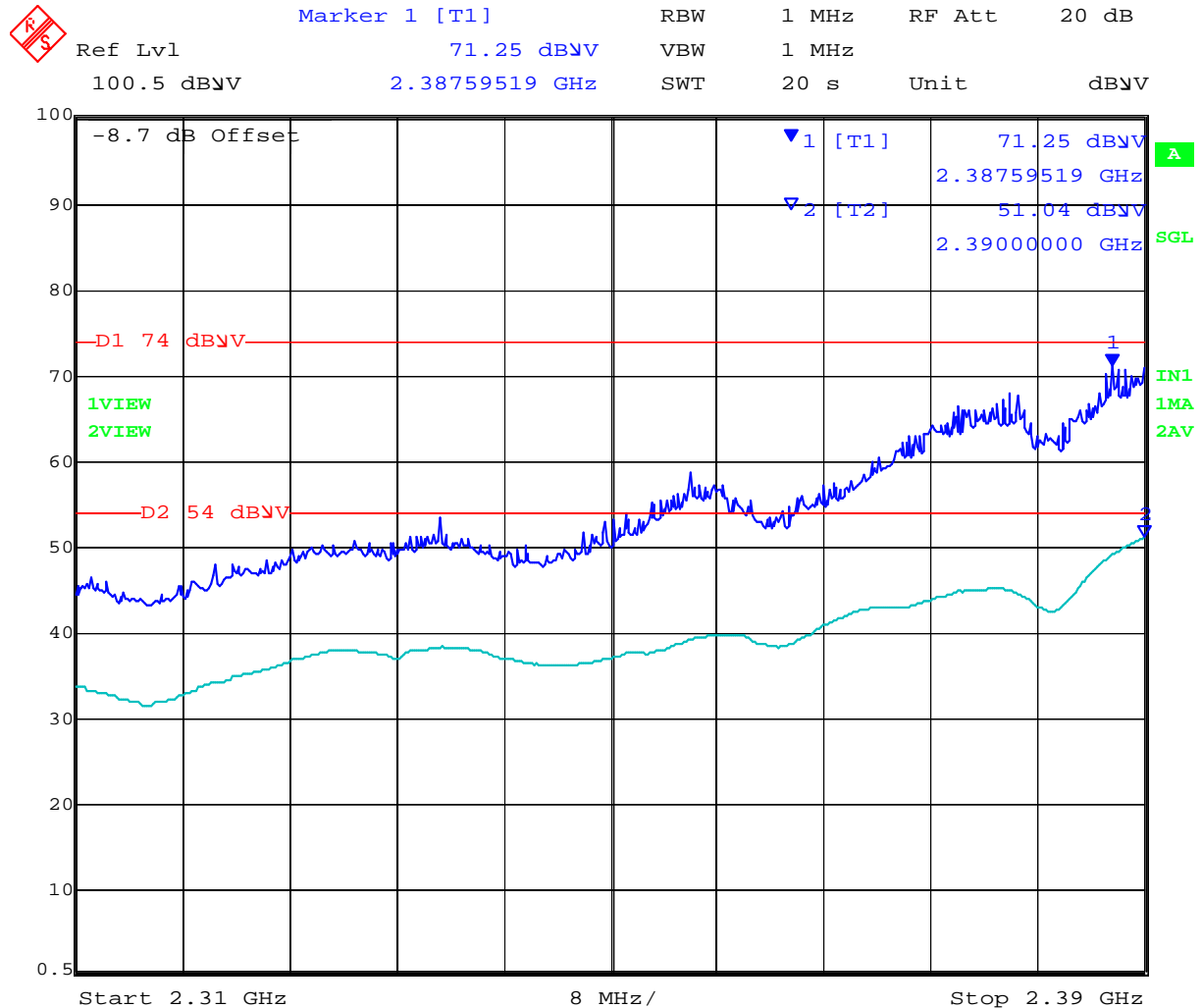
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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## Band Edge



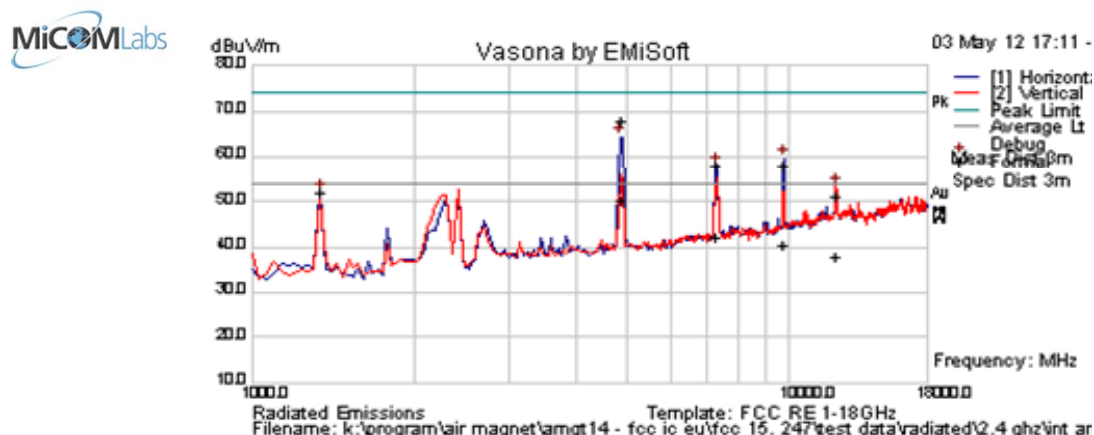
Date: 3.MAY.2012 11:21:36

Output power reduction required (Power = 14)



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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	20	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

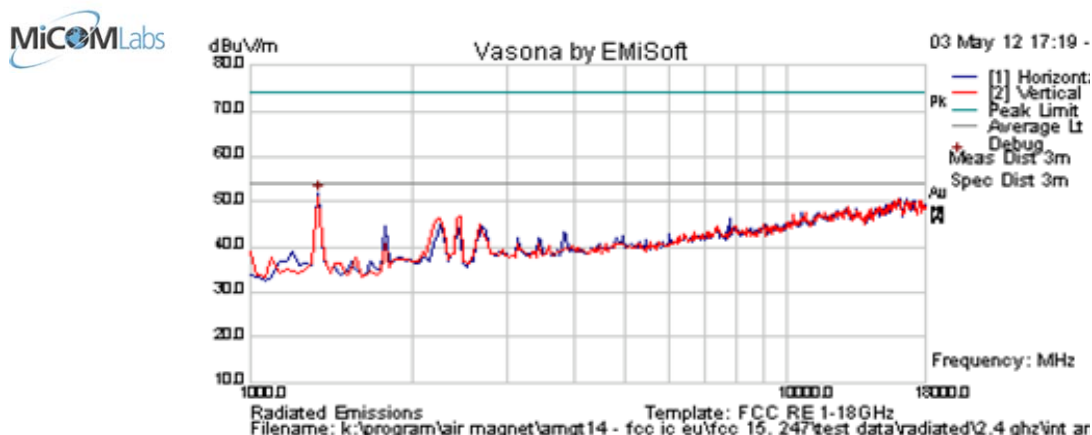
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4868.136	73.2	4.5	-9.7	68.0	Peak Max	H	102	185	74	-6.1	Pass	RB
9753.267	55.2	6.4	-3.7	57.9	Peak Max	H	114	153	74	-16.1	Pass	RB
7319.118	58.3	5.4	-5.7	58.1	Peak Max	H	106	148	74	-15.9	Pass	RB
12177.555	46.6	7.0	-2.2	51.4	Peak Max	V	124	88	74	-22.6	Pass	RB
4868.136	55.6	4.5	-9.7	50.5	Average Max	H	102	185	54	-3.6	Pass	RB
9753.267	37.7	6.4	-3.7	40.3	Average Max	H	114	153	54	-13.7	Pass	RB
7319.118	42.3	5.4	-5.7	42.1	Average Max	H	106	148	54	-11.9	Pass	RB
12177.555	33.0	7.0	-2.2	37.8	Average Max	V	124	88	54	-16.2	Pass	RB
1340.681	63.8	2.3	-13.9	52.2	Peak [Scan]	H	100	0	54	-1.8	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
* Evaluated as 1600 MHz, RB Emission See Evaluation												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2452 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	12	Press. (mBars)	1010
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



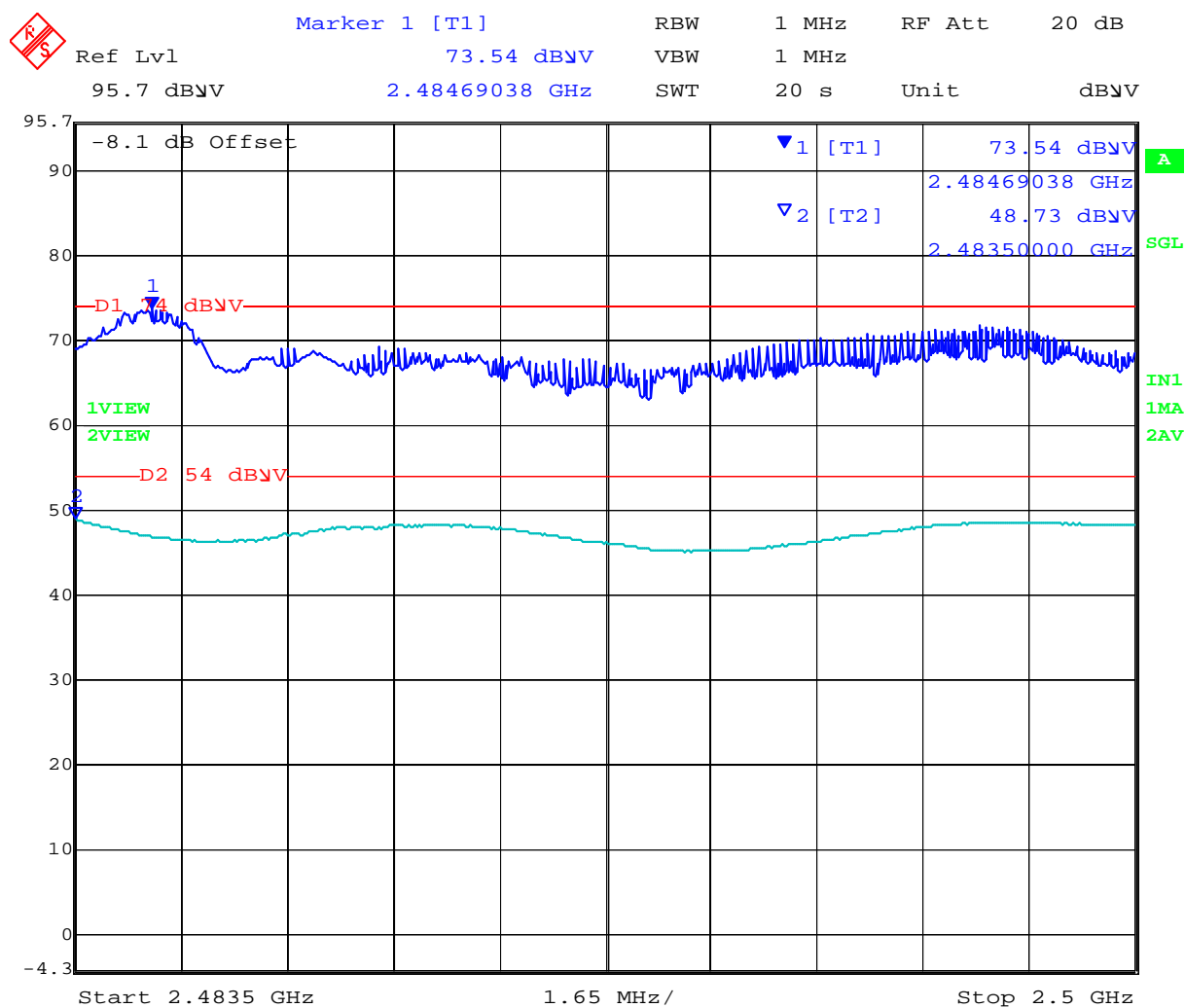
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1349.960	66.9	2.3	-14.0	55.2	Peak Max	H	98	27	74	-18.8	Pass	RB
1349.960	63.6	2.3	-14.0	51.9	Average Max	H	98	27	54.0	-2.1	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band Edge

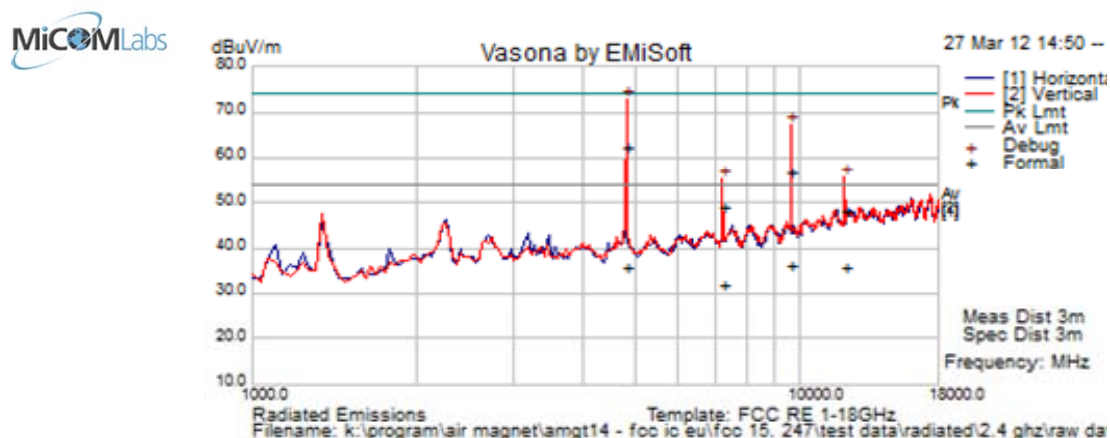


Date: 3.MAY.2012 12:10:24

Output power reduction required (Power = 12)

### 5.1.6.2. 2.4 GHz External Antenna

<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	SB
<b>Variant</b>	802.11b; 1 Mbs	<b>Temp (°C)</b>	22
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	14 reduced to 13	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	external	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

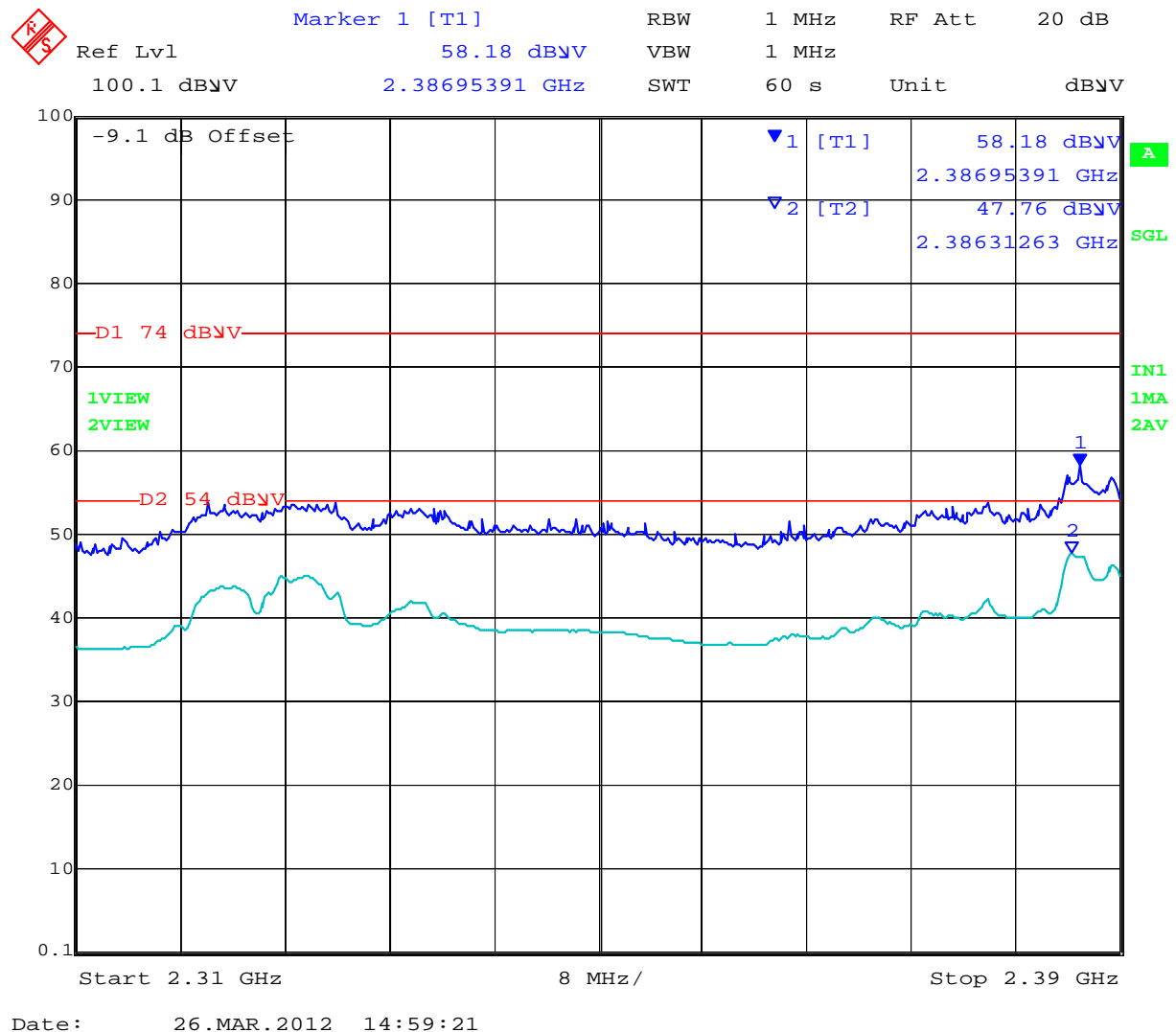
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4823.998	67.6	4.5	-9.7	62.4	Peak Max	V	103	-2	74.0	-11.6	Pass	RB
9647.996	53.8	6.3	-3.5	56.6	Peak Max	V	152	0	74.0	-17.4	Pass	NRB
12057.114	44.0	6.9	-2.5	48.4	Peak Max	V	194	332	74.0	-25.6	Pass	RB
7236.673	49.6	5.4	-5.8	49.2	Peak Max	V	178	179	74.0	-24.8	Pass	RB
4823.998	40.9	4.5	-9.7	35.7	Average Max	V	103	-2	54.0	-18.3	Pass	RB
9647.996	33.5	6.3	-3.5	36.3	Average Max	V	152	0	54.0	-17.7	Pass	NRB
12057.114	31.3	6.9	-2.5	35.7	Average Max	V	194	332	54.0	-18.3	Pass	RB
7236.673	32.2	5.4	-5.8	31.8	Average Max	V	178	179	54.0	-22.2	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

Note: The scan peak above was set for power = 14 which was too high. Reduction to power = 13 saw a drop in emission amplitude by approximately 10 dB.



## Band-Edge

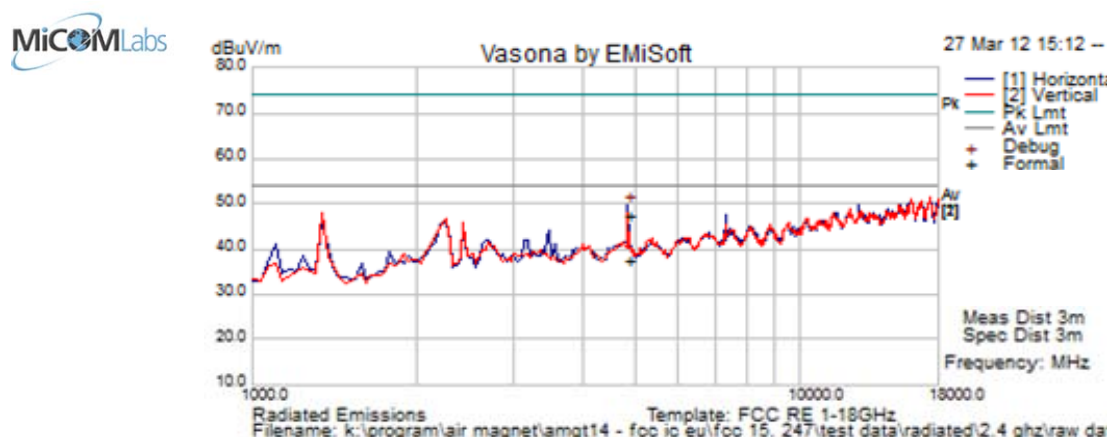


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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	1010
Antenna	external	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

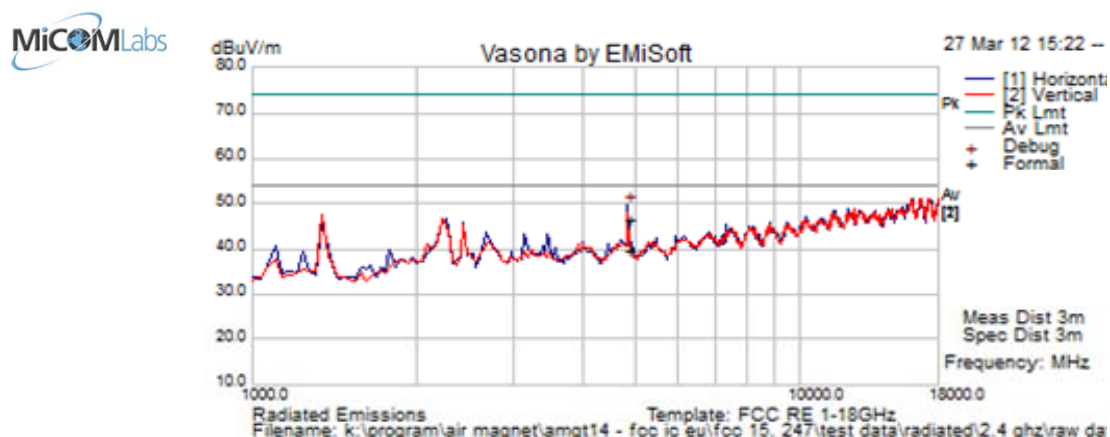
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4873.998	52.4	4.5	-9.7	47.3	Peak Max	H	99	332	74	-26.8	Pass	RB
4873.998	42.8	4.5	-9.7	37.6	Average Max	H	99	332	54	-16.4	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Title:** Fluke Networks Sensor4 Wireless Client  
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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	17	Press. (mBars)	1010
Antenna	external	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

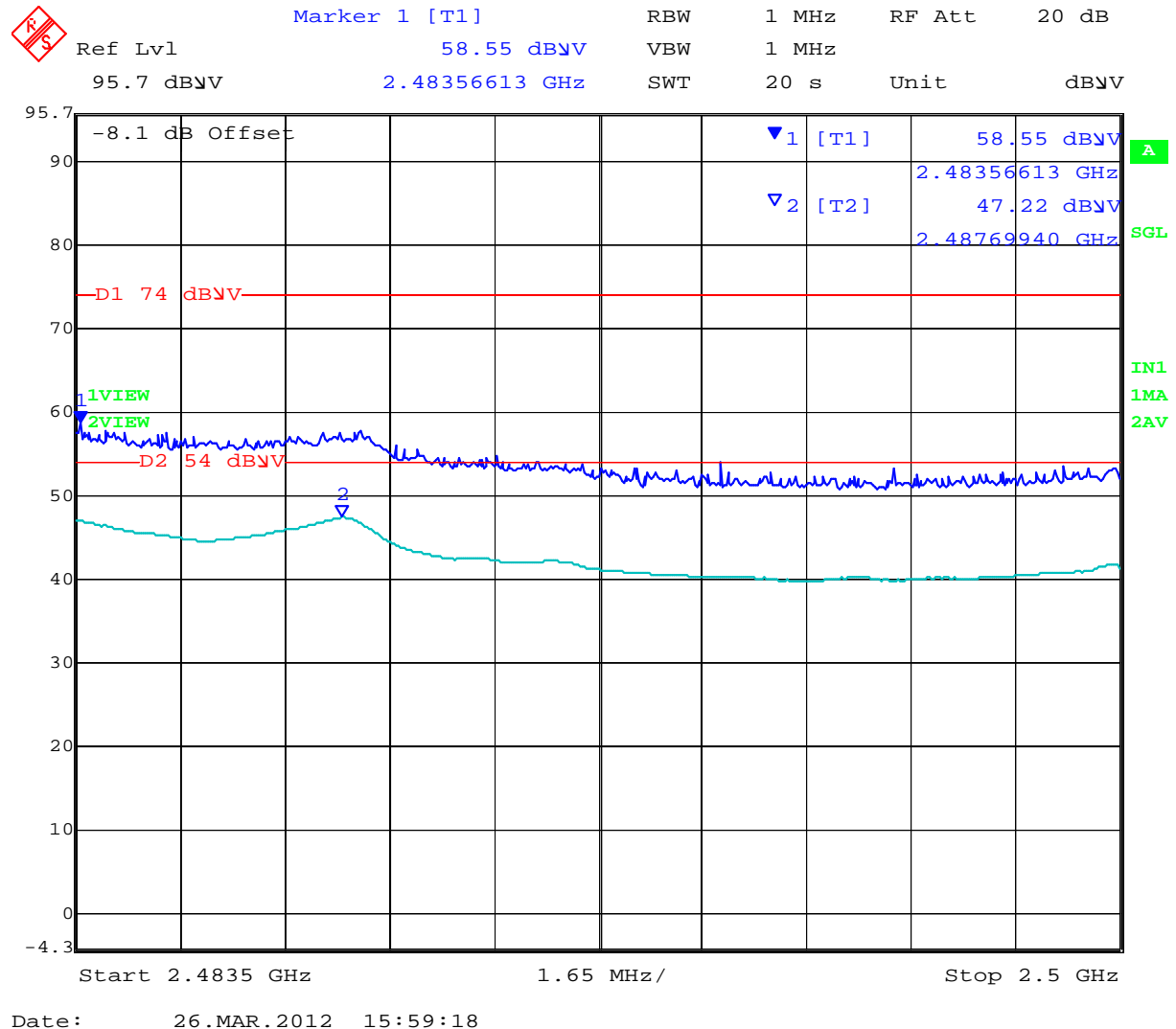
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4873.967	51.8	4.5	-9.7	46.6	Peak Max	H	99	188	74	-27.4	Pass	RB
4873.967	44.9	4.5	-9.7	39.7	Average Max	H	99	188	54.0	-14.4	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-edge

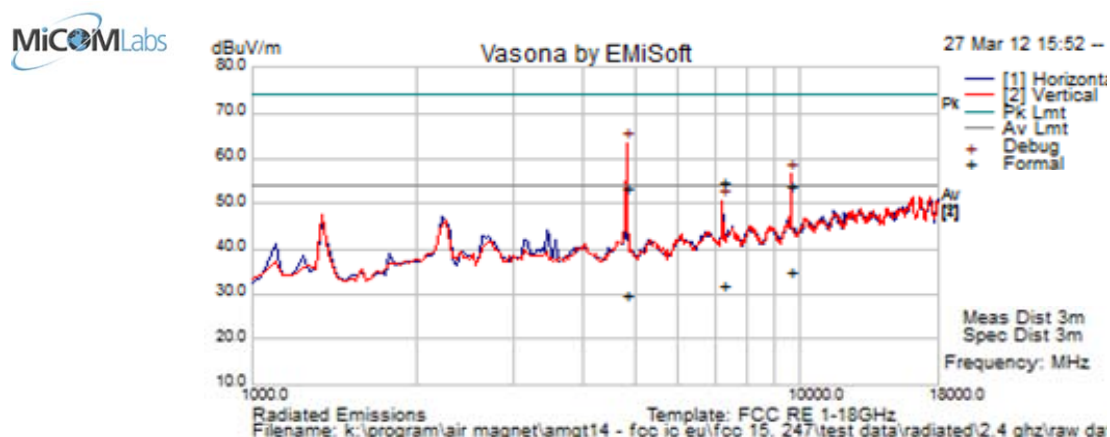


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Test Freq.	2412 MHz	Engineer	SB
Variant	802.11g; 6 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	13	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			

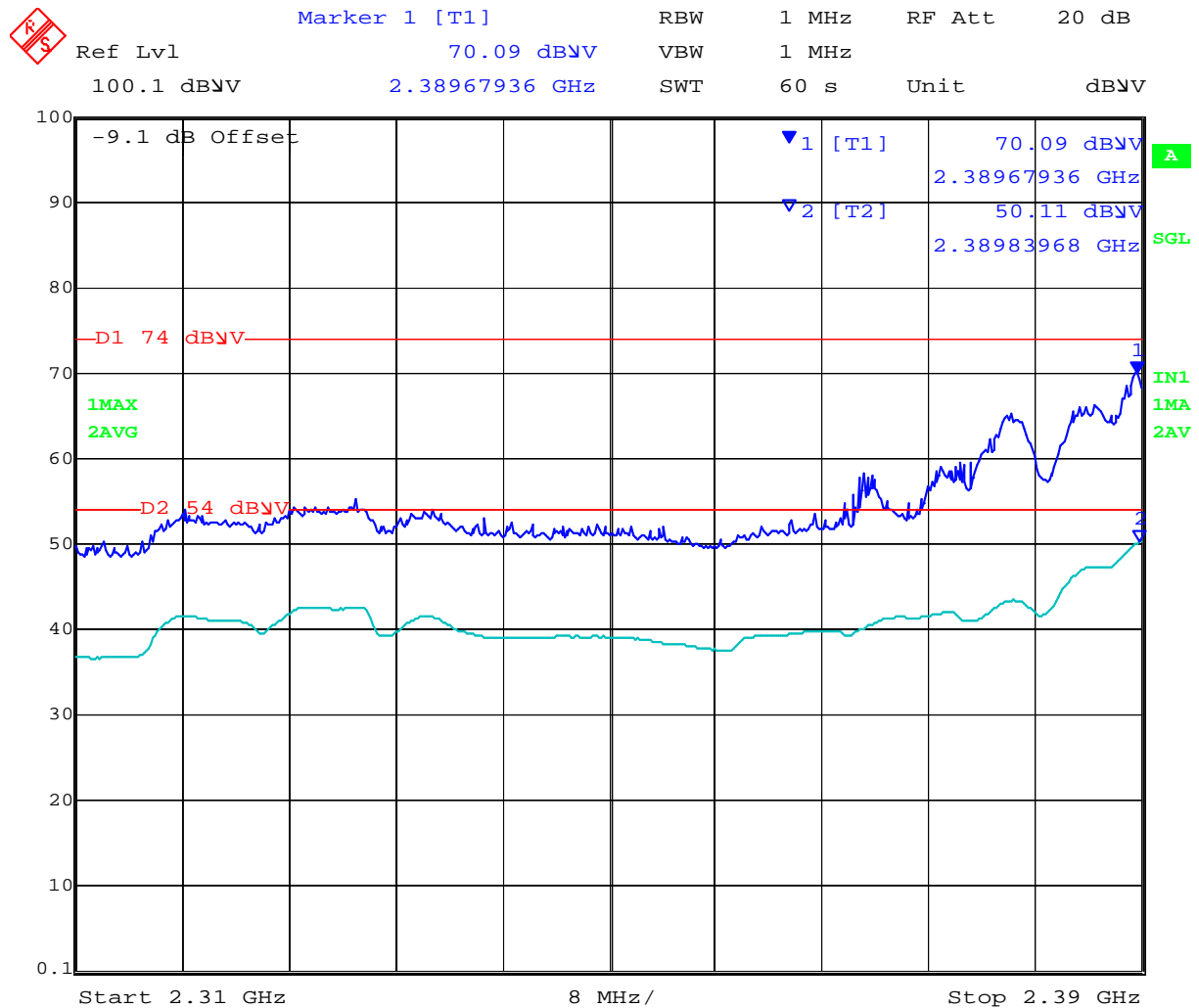


#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4821.643	58.5	4.5	-9.7	53.2	Peak Max	V	201	75	74.0	-20.8	Pass	RB
9650.501	50.8	6.3	-3.5	53.6	Peak Max	V	100	0	74.0	-20.4	Pass	NRB
7233.868	55.0	5.4	-5.8	54.6	Peak Max	H	153	0	74.0	-19.4	Pass	RB
4821.643	35.0	4.5	-9.7	29.8	Average Max	V	201	75	54.0	-24.2	Pass	RB
9650.501	31.9	6.3	-3.5	34.7	Average Max	V	100	0	54.0	-19.3	Pass	NRB
7233.868	32.4	5.4	-5.8	32.0	Average Max	H	153	0	54.0	-22.0	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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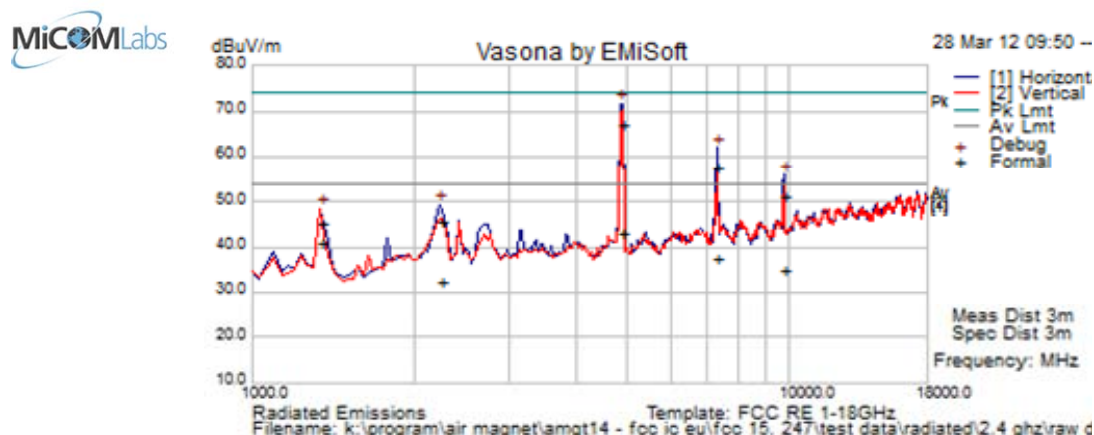
Date: 26.MAR.2012 13:42:09

Output power reduction required (Power = 13)



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<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	SB
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	22
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	15	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	ext ant	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

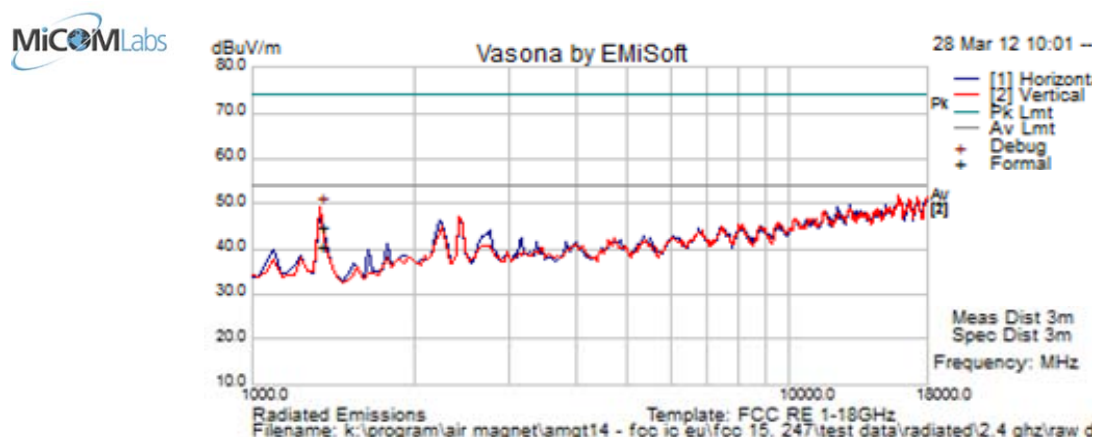
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4872.445	72.3	4.5	-9.7	67.1	Peak Max	H	127	0	74	-7.0	Pass	RB
7309.820	58.0	5.4	-5.7	57.8	Peak Max	H	190	70	74	-16.2	Pass	RB
9758.717	48.5	6.4	-3.7	51.1	Peak Max	H	162	150	74	-22.9	Pass	NRB
2243.287	54.5	2.9	-11.8	45.5	Peak Max	H	192	0	74	-28.5	Pass	RB
1350.088	57.0	2.3	-14.0	45.3	Peak Max	V	116	209	74	-28.7	Pass	RB
4872.445	48.3	4.5	-9.7	43.1	Average Max	H	127	0	54	-11.0	Pass	RB
7309.820	37.7	5.4	-5.7	37.4	Average Max	H	190	70	54	-16.6	Pass	RB
9758.717	32.4	6.4	-3.7	35.0	Average Max	H	162	150	54	-19.0	Pass	NRB
2243.287	41.3	2.9	-11.8	32.3	Average Max	H	192	0	54	-21.7	Pass	RB
1350.088	52.6	2.3	-14.0	40.9	Average Max	V	116	209	54	-13.1	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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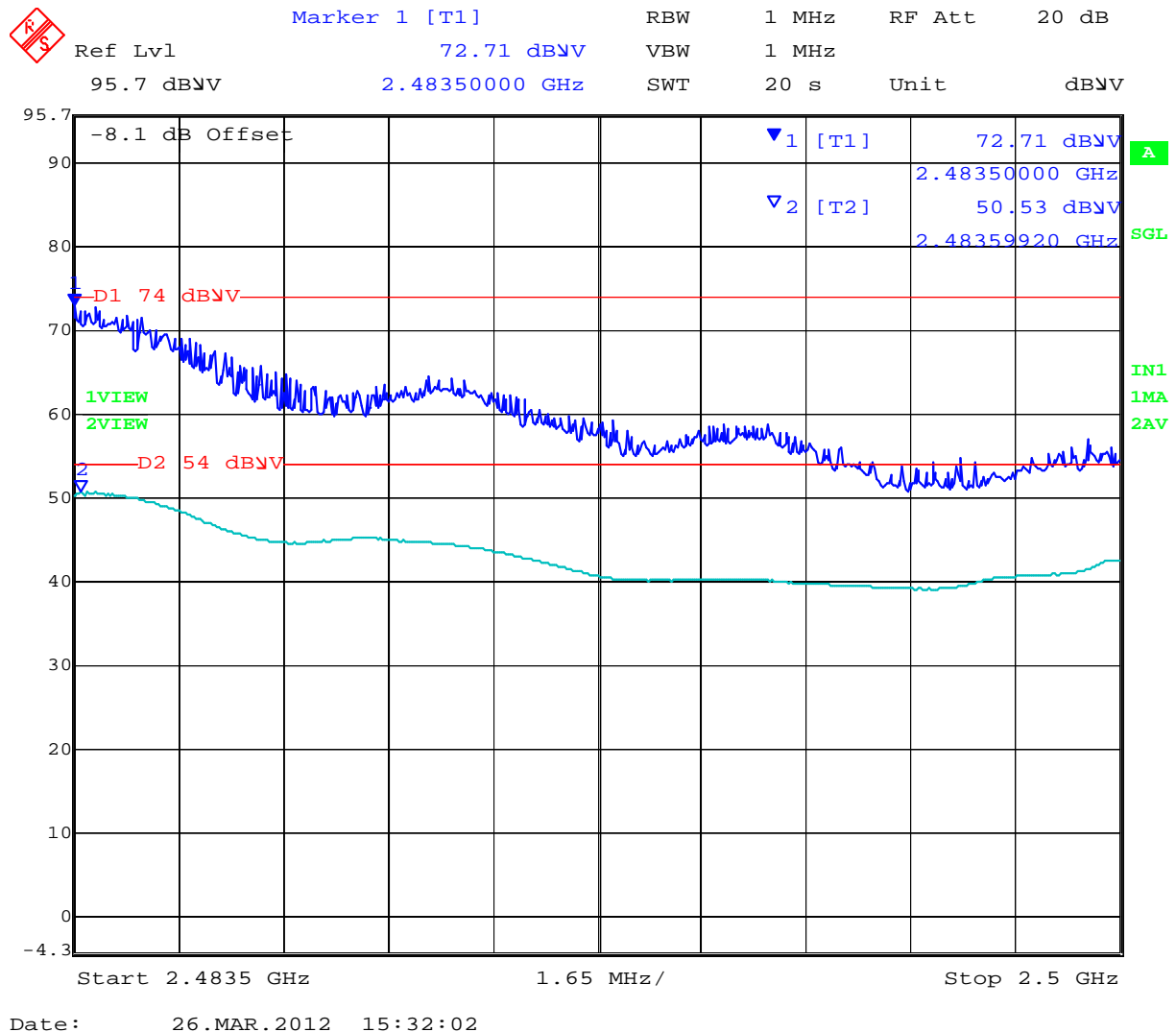
Test Freq.	2462 MHz	Engineer	SB
Variant	802.11g; 6 Mbs	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	13	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1350.050	56.6	2.3	-14.0	44.9	Peak Max	V	117	209	74	-29.1	Pass	RB
1350.050	52.1	2.3	-14.0	40.4	Average Max	V	117	209	54.0	-13.6	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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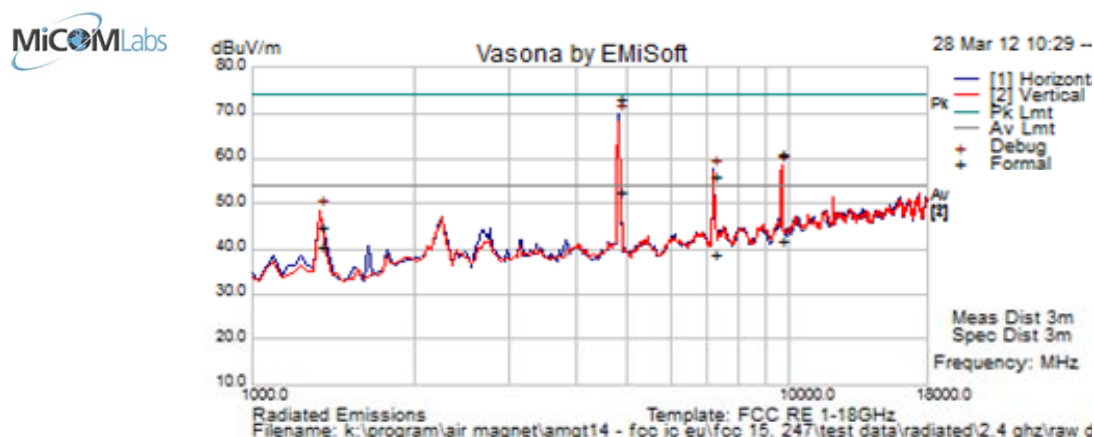


Output power reduction required (Power = 13)



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<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	SB
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	22
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	14	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	ext ant	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



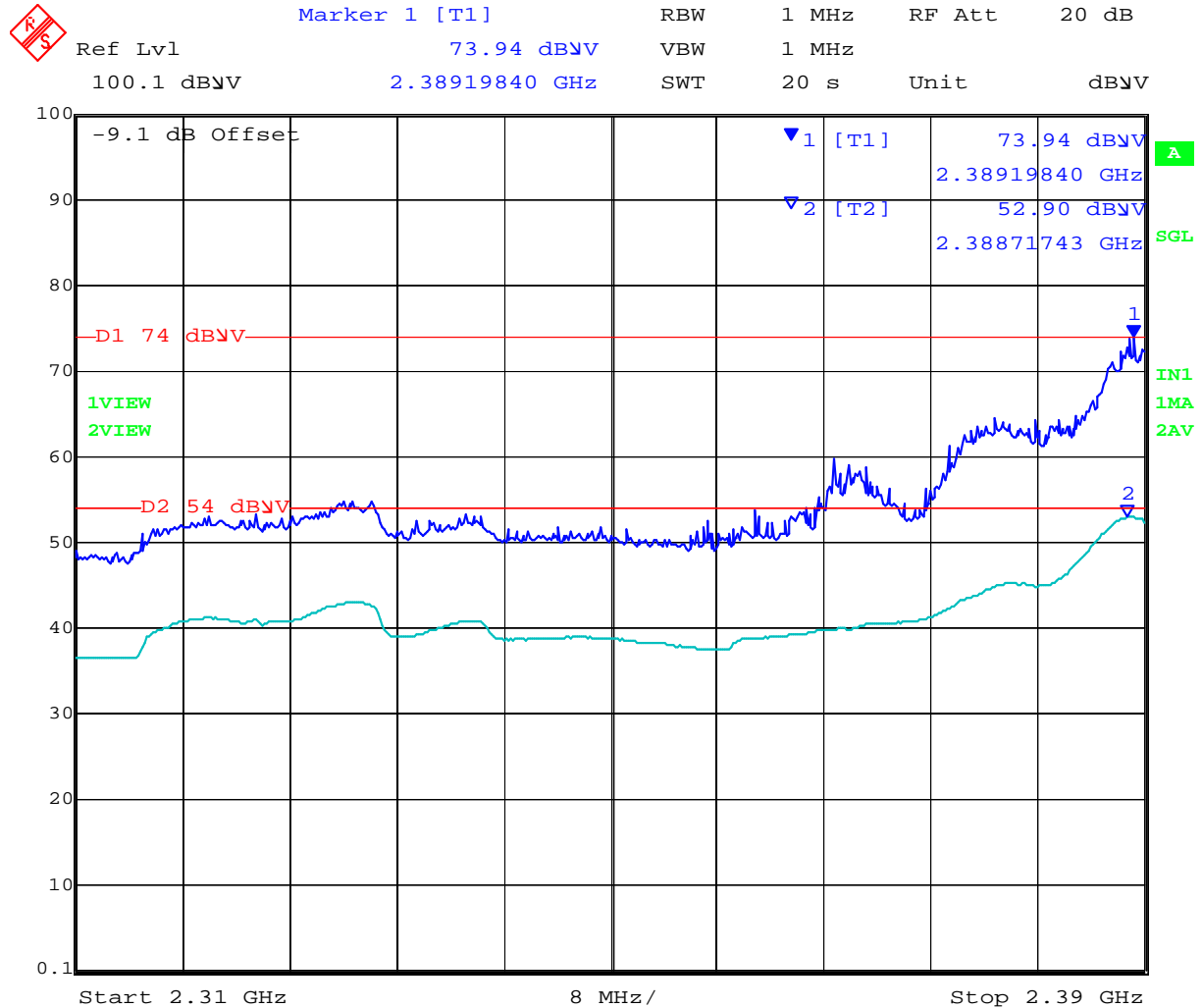
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4832.365	78.4	4.5	-9.7	73.2	Peak Max	H	118	192	74.0	-0.8	Pass	RB
9653.307	58.1	6.3	-3.5	60.9	Peak Max	V	118	268	74.0	-13.2	Pass	NRB
7231.363	56.3	5.4	-5.8	55.9	Peak Max	H	146	360	74.0	-18.1	Pass	RB
1349.931	56.6	2.3	-14.0	44.9	Peak Max	V	116	211	74.0	-29.1	Pass	RB
4832.365	57.6	4.5	-9.7	52.4	Average Max	H	118	192	54.0	-1.6	Pass	RB
9653.307	39.0	6.3	-3.5	41.8	Average Max	V	118	268	54.0	-12.2	Pass	NRB
7231.363	39.3	5.4	-5.8	38.9	Average Max	H	146	360	54.0	-15.1	Pass	RB
1349.931	52.3	2.3	-14.0	40.6	Average Max	V	116	211	54.0	-13.4	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
* Evaluated as 1600 MHz, RB Emission See Evaluation												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-Edge



Date: 26.MAR.2012 15:03:50

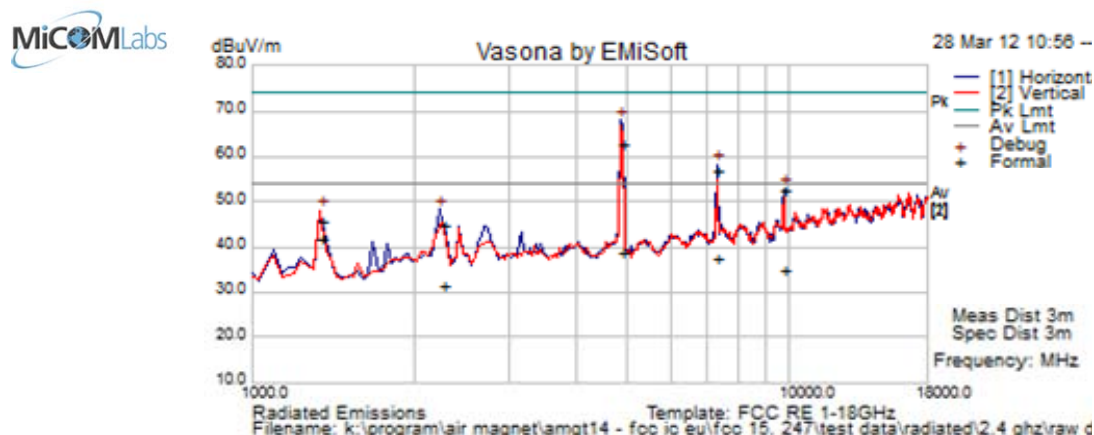
Output power reduction required (Power = 14)





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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	16	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4882.966	68.0	4.5	-9.7	62.8	Peak Max	H	98	0	74	-11.2	Pass	RB
7321.042	56.9	5.4	-5.7	56.7	Peak Max	H	98	-2	74	-17.3	Pass	RB
9766.132	49.9	6.4	-3.7	52.6	Peak Max	H	144	296	74	-21.5	Pass	NRB
2270.341	53.7	2.9	-11.8	44.8	Peak Max	H	111	335	74	-29.2	Pass	RB
1350.050	57.3	2.3	-14.0	45.6	Peak Max	V	116	208	74	-28.4	Pass	RB
4882.966	43.8	4.5	-9.7	38.6	Average Max	H	98	0	54	-15.4	Pass	RB
7321.042	37.7	5.4	-5.7	37.5	Average Max	H	98	-2	54	-16.5	Pass	RB
9766.132	32.4	6.4	-3.7	35.0	Average Max	H	144	296	54	-19.0	Pass	NRB
2270.341	40.4	2.9	-11.8	31.5	Average Max	H	111	335	54	-22.5	Pass	RB
1350.050	53.4	2.3	-14.0	41.7	Average Max	V	116	208	54	-12.3	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

\* Evaluated as 1600 MHz, RB Emission See Evaluation

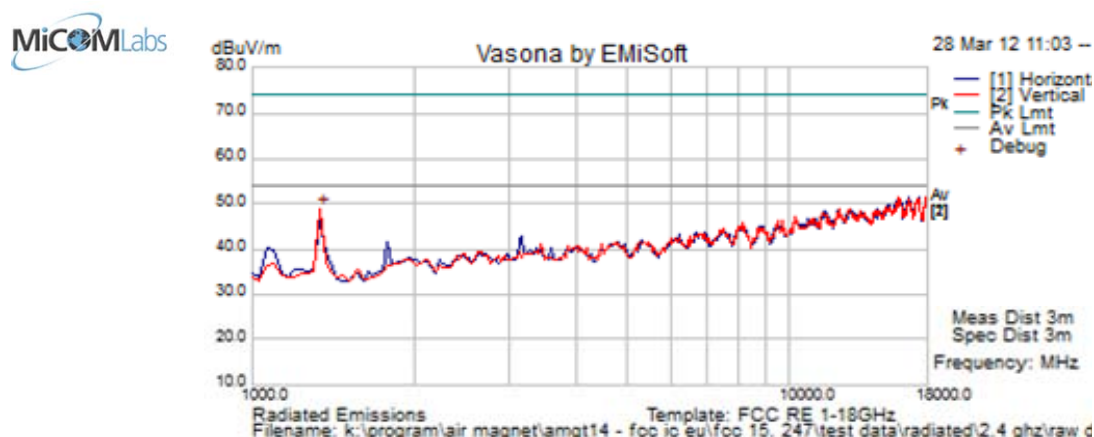
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	14	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



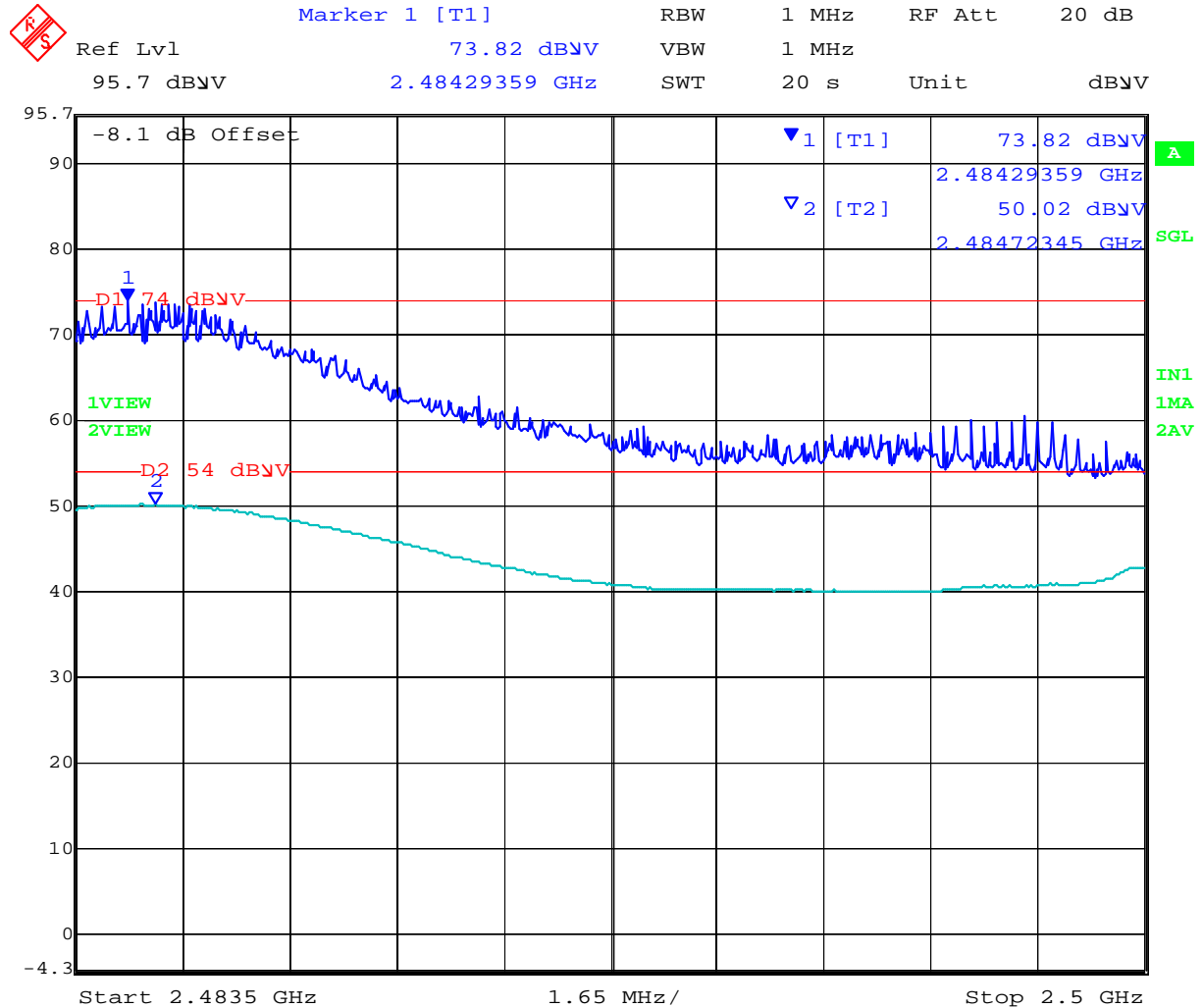
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1350.088	57.0	2.3	-14.0	45.3	Peak Max	V	116	209	74	-28.7	Pass	RB
1350.088	52.6	2.3	-14.0	40.9	Average Max	V	116	209	54	-13.1	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission * Evaluated as 1600 MHz, RB Emission See Evaluation RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-Edge



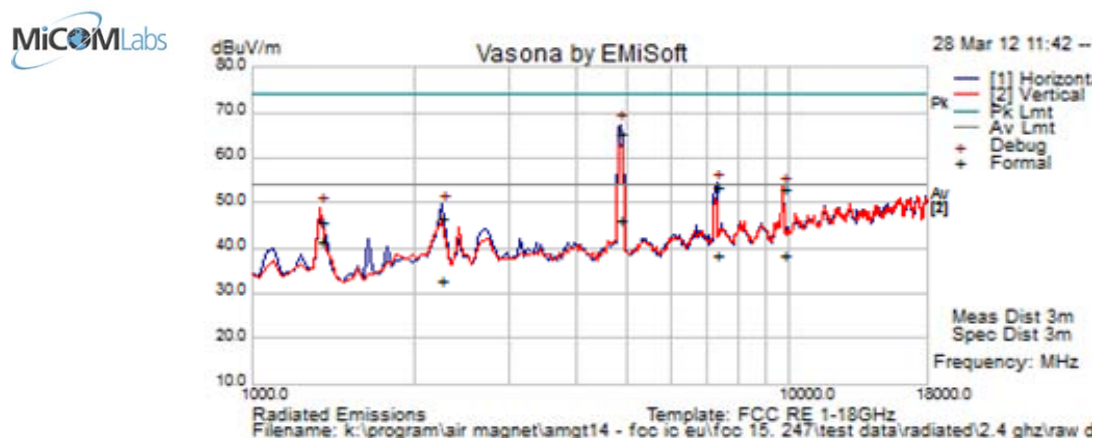
Date: 26.MAR.2012 15:18:58

Output power reduction required (Power = 13)



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Test Freq.	2422 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	13	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



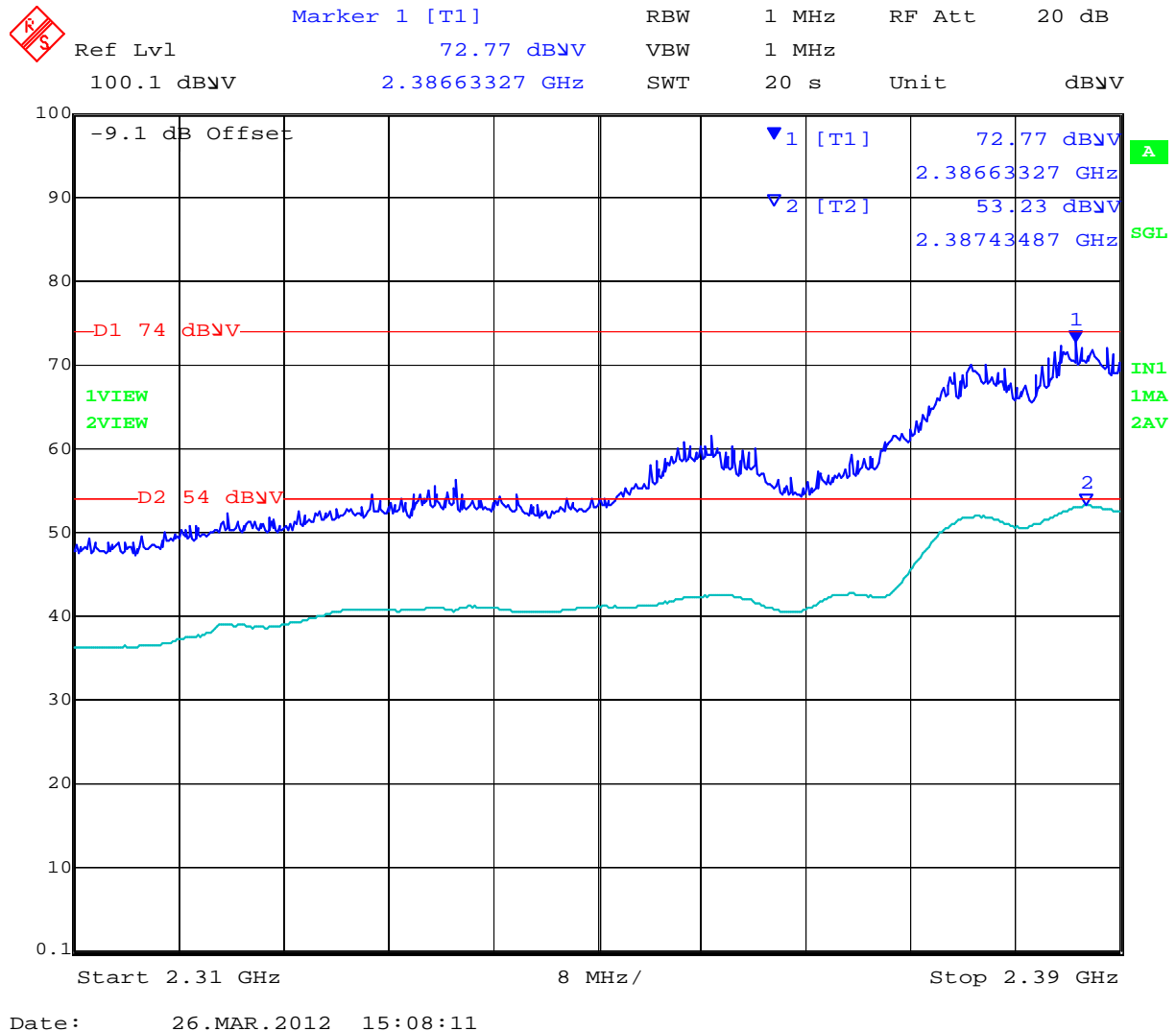
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4849.599	70.4	4.5	-9.7	65.2	Peak Max	H	201	203	74.0	-8.8	Pass	RB
7278.958	53.5	5.4	-5.8	53.2	Peak Max	H	183	-1	74.0	-20.8	Pass	RB
9721.443	50.4	6.3	-3.7	53.0	Peak Max	V	99	0	74.0	-21.0	Pass	NRB
2249.900	55.4	2.9	-11.8	46.5	Peak Max	H	113	0	74.0	-27.5	Pass	RB
1349.962	57.1	2.3	-14.0	45.4	Peak Max	V	116	209	74.0	-28.6	Pass	RB
4849.599	51.3	4.5	-9.7	46.2	Average Max	H	201	203	54.0	-7.9	Pass	RB
7278.958	38.8	5.4	-5.8	38.5	Average Max	H	183	-1	54.0	-15.5	Pass	RB
9721.443	35.8	6.3	-3.7	38.5	Average Max	V	99	0	54.0	-15.5	Pass	NRB
2249.900	41.6	2.9	-11.8	32.7	Average Max	H	113	0	54	-21.3	Pass	RB
1349.962	53.2	2.3	-14.0	41.5	Average Max	V	116	209	54	-12.6	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
* Evaluated as 1600 MHz, RB Emission See Evaluation												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-Edge

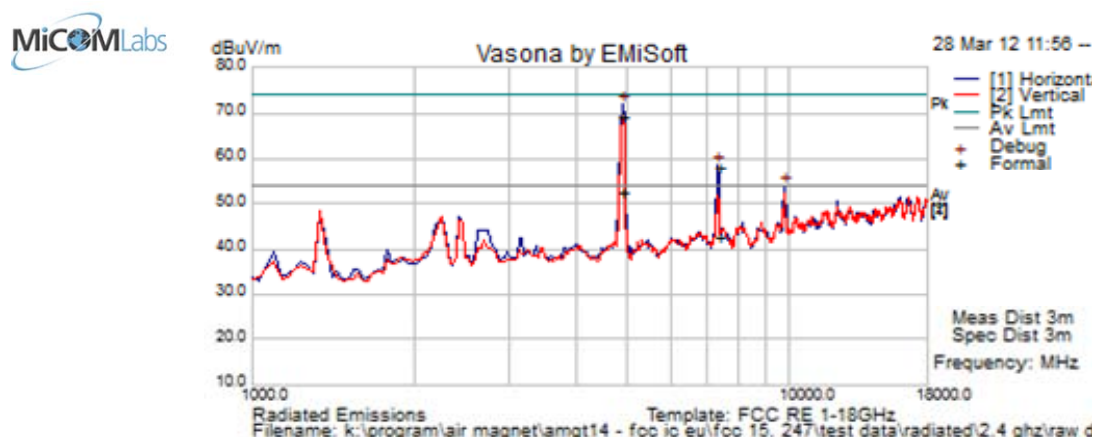


Output power reduction required (Power = 13)



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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	16	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4885.972	74.2	4.5	-9.7	69.0	Peak Max	H	201	79	74	-5.0	Pass	RB
7352.505	58.2	5.5	-5.6	58.1	Peak Max	H	158	-2	74	-15.9	Pass	RB
4885.972	57.7	4.5	-9.7	52.5	Average Max	H	201	79	54	-1.6	Pass	RB
7352.505	42.7	5.5	-5.6	42.5	Average Max	H	158	-2	54	-11.5	Pass	RB
9755.511	51.0	6.4	-3.7	53.7	Peak [Scan]	H	100	0				NRB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

\* Evaluated as 1600 MHz, RB Emission See Evaluation

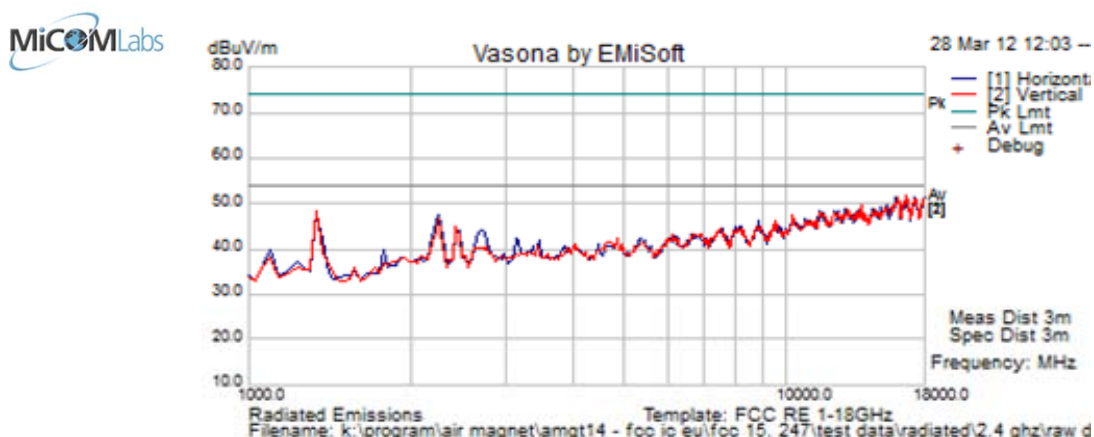
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	2452 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	13	Press. (mBars)	1010
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



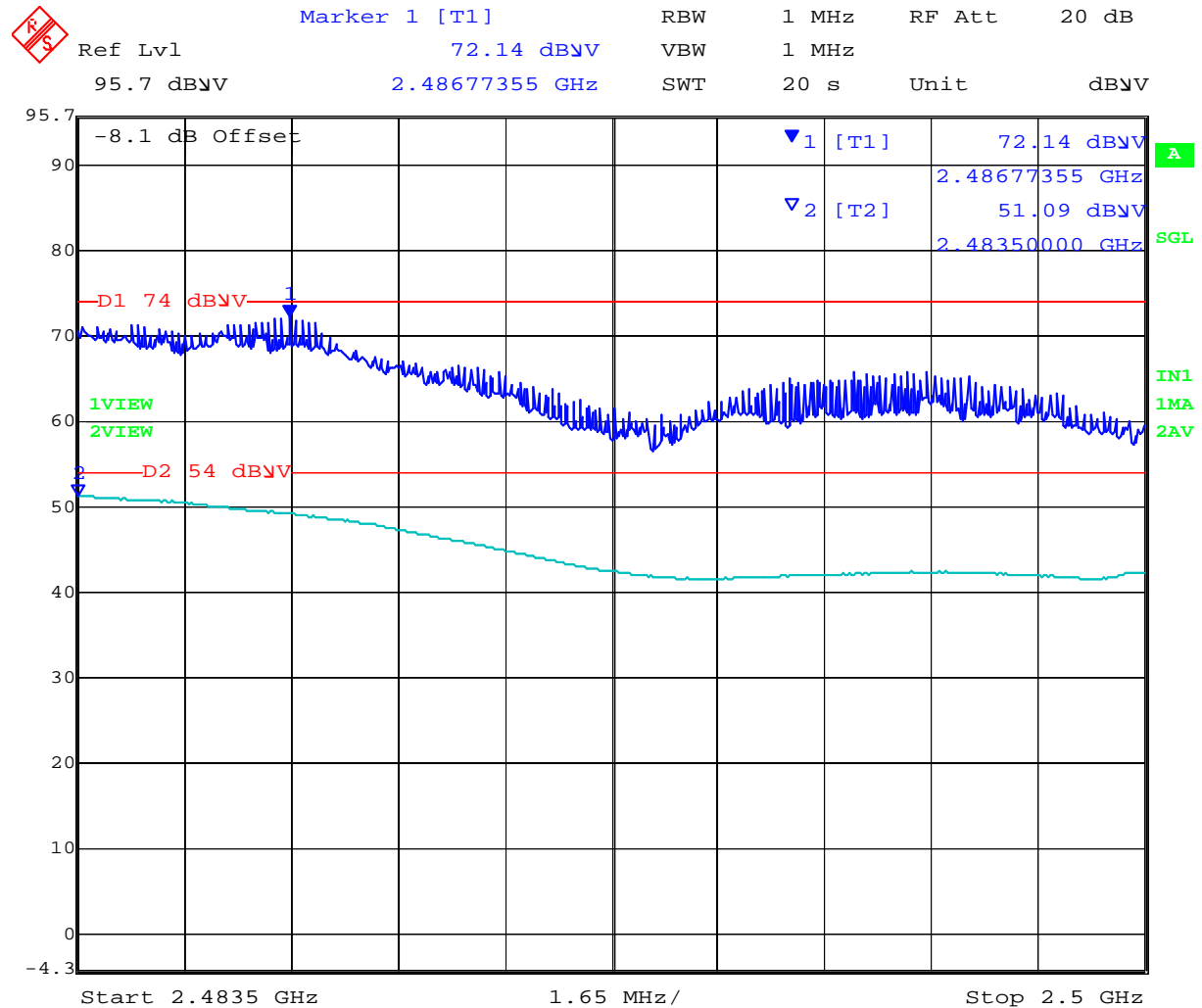
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-Edge



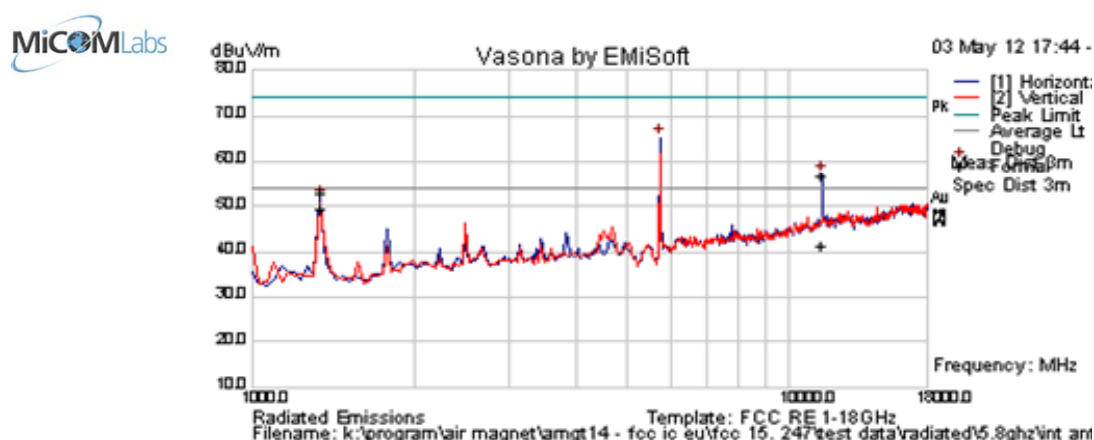
Date: 26.MAR.2012 15:13:52

Output power reduction required (Power = 13)



### 5.1.6.3. 5.8 GHz Integral Antenna

<b>Test Freq.</b>	5745 MHz	<b>Engineer</b>	SB
<b>Variant</b>	802.11a; 6.0 Mbs	<b>Temp (°C)</b>	22.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	36
<b>Power Setting</b>	20	<b>Press. (mBars)</b>	1004
<b>Antenna</b>	integral	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



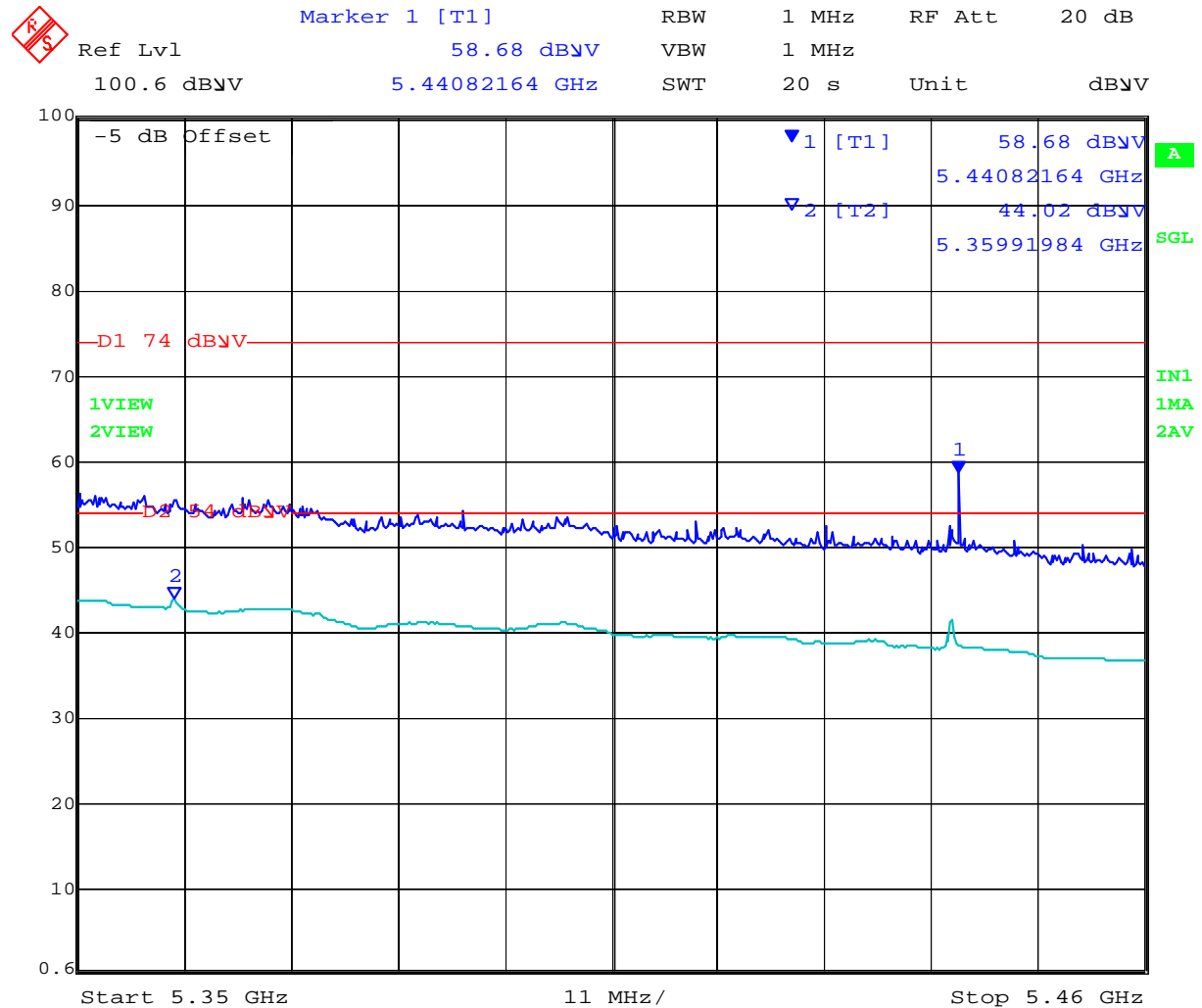
### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11492.425	51.9	6.8	-2.0	56.7	Peak Max	H	106	361	74.0	-17.3	Pass	RB
1349.96	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11492.425	36.7	6.8	-2.0	41.5	Average Max	H	106	361	54	-12.5	Pass	RB
1349.960	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5735.471	70.1	4.8	-9.5	65.3	Peak [Scan]	H	150	0				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak



## Band-Edge



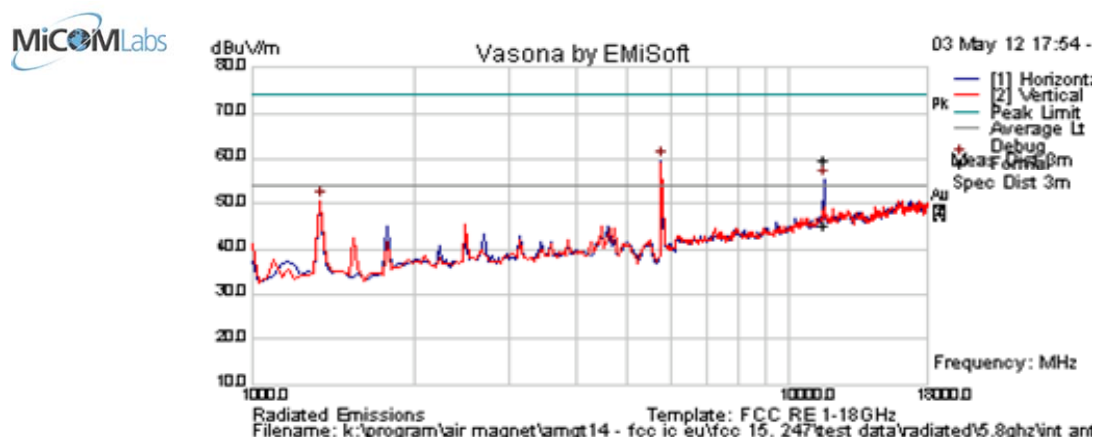
Date: 3.MAY.2012 12:23:12

Maximum output power (Power = 20)



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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11a; 6.0 Mbs	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

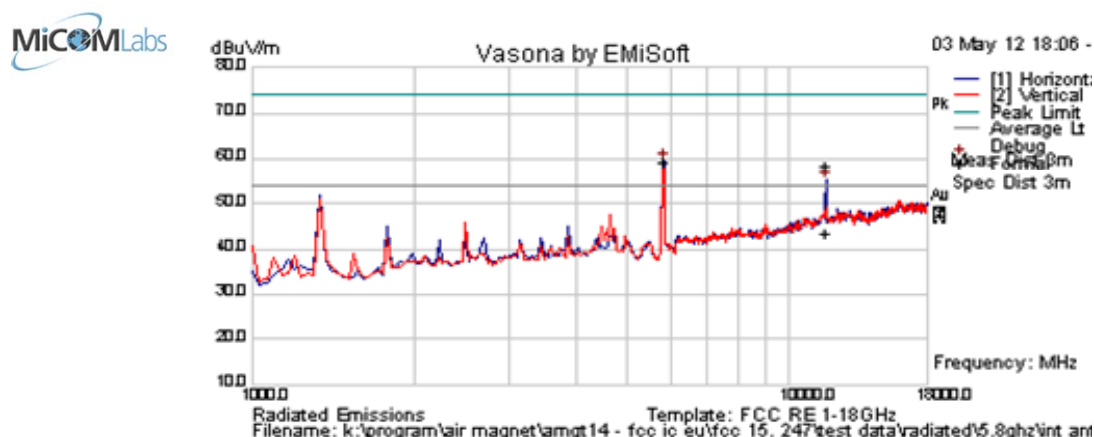
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11570.260	55.1	6.8	-2.0	59.9	Peak Max	H	136	361	74.0	-14.1	Pass	RB
1349.76	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11570.26	40.2	6.8	-2.0	45.0	Average Max	H	136	361	54.0	-9.0	Pass	RB
1349.76	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5769.539	64.4	4.8	-9.5	59.7	Peak [Scan]	H	100	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11a; 6.0 Mbs	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

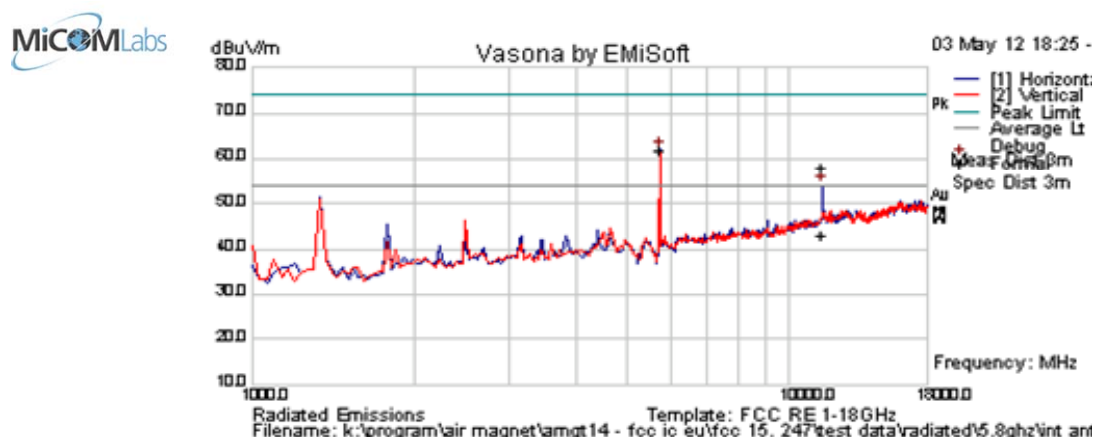
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11650.822	53.8	6.8	-2.3	58.4	Peak Max	H	114	312	74.0	-15.6	Pass	RB
1350.96	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11650.822	38.9	6.8	-2.3	43.5	Average Max	H	114	312	54.0	-10.5	Pass	RB
1350.96	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5837.675	63.8	4.8	-9.3	59.4	Peak [Scan]	H	200	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5745 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



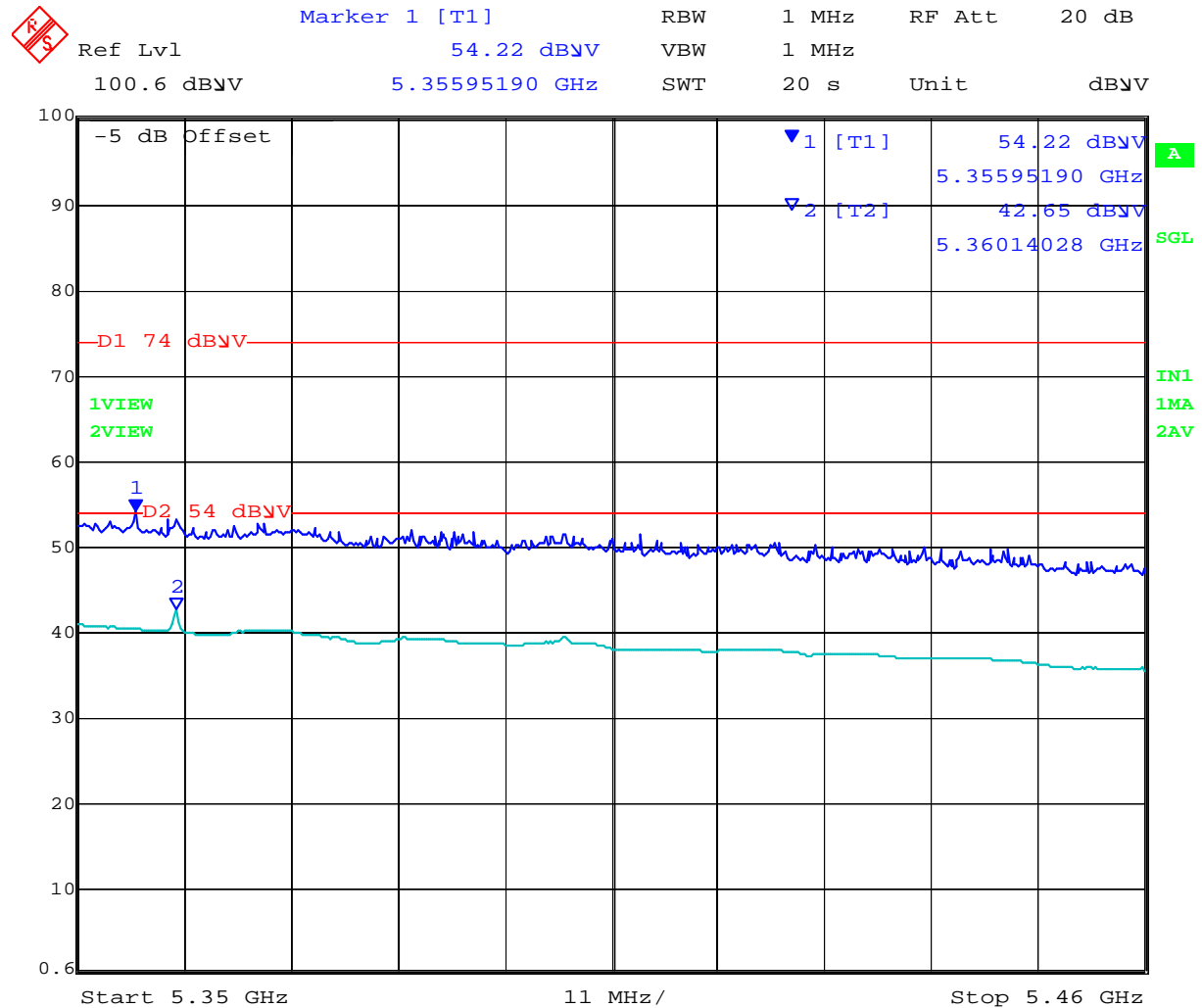
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11493.467	53.3	6.8	-2.0	58.1	Peak Max	H	128	0	74.0	-15.9	Pass	RB
1347.96	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11493.467	38.2	6.8	-2.0	43.1	Average Max	H	128	0	54.0	-10.9	Pass	RB
1347.960	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5735.471	66.8	4.8	-9.5	62.0	Peak [Scan]	H	150	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-Edge



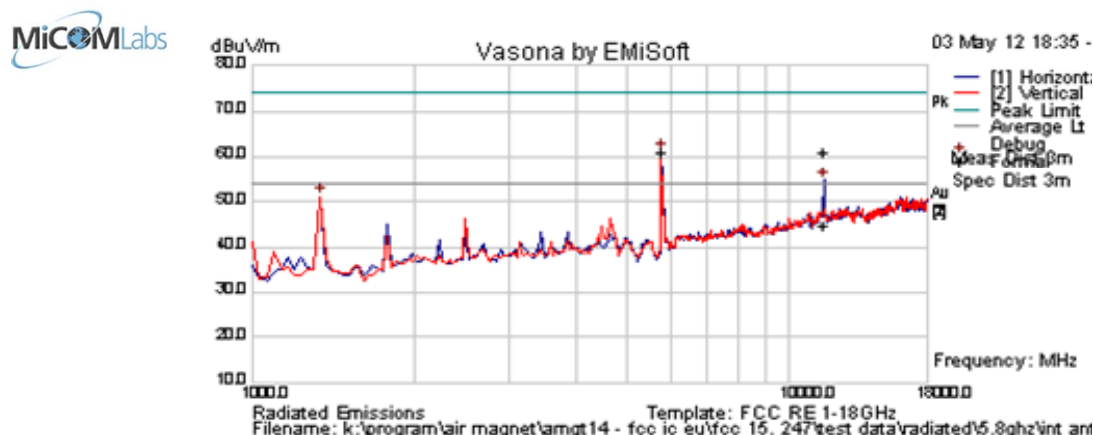
Date: 3.MAY.2012 12:26:48

Maximum output power (Power = 20)



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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

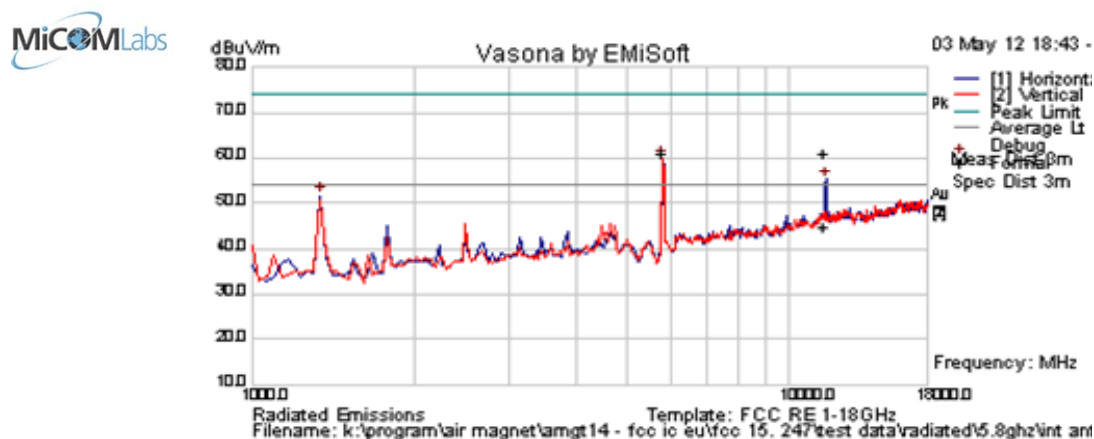
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11569.699	56.1	6.8	-2.0	60.9	Peak Max	H	99	1	74.0	-13.1	Pass	RB
1348.96	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11569.699	39.9	6.8	-2.0	44.7	Average Max	H	99	1	54.0	-9.3	Pass	RB
1348.96	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5769.539078	65.7	4.8	-9.5	61.0	Peak [Scan]	H	200	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11651.822	53.8	6.8	-2.3	58.4	Peak Max	H	114	312	74.0	-15.6	Pass	RB
1350.96	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11651.822	38.9	6.8	-2.3	43.5	Average Max	H	114	312	54.0	-10.5	Pass	RB
1350.96	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5803.607	64.4	4.8	-9.4	59.8	Peak [Scan]	V	150	0				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

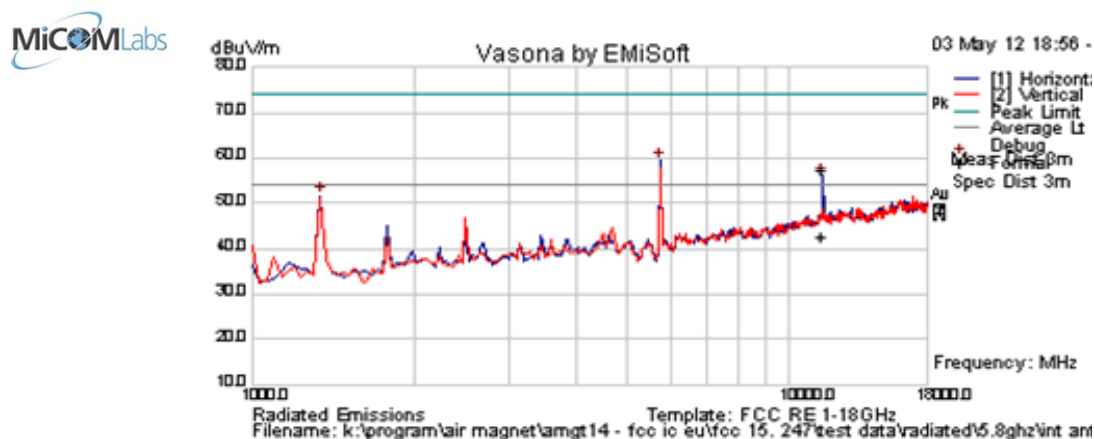
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Test Freq.	5755 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

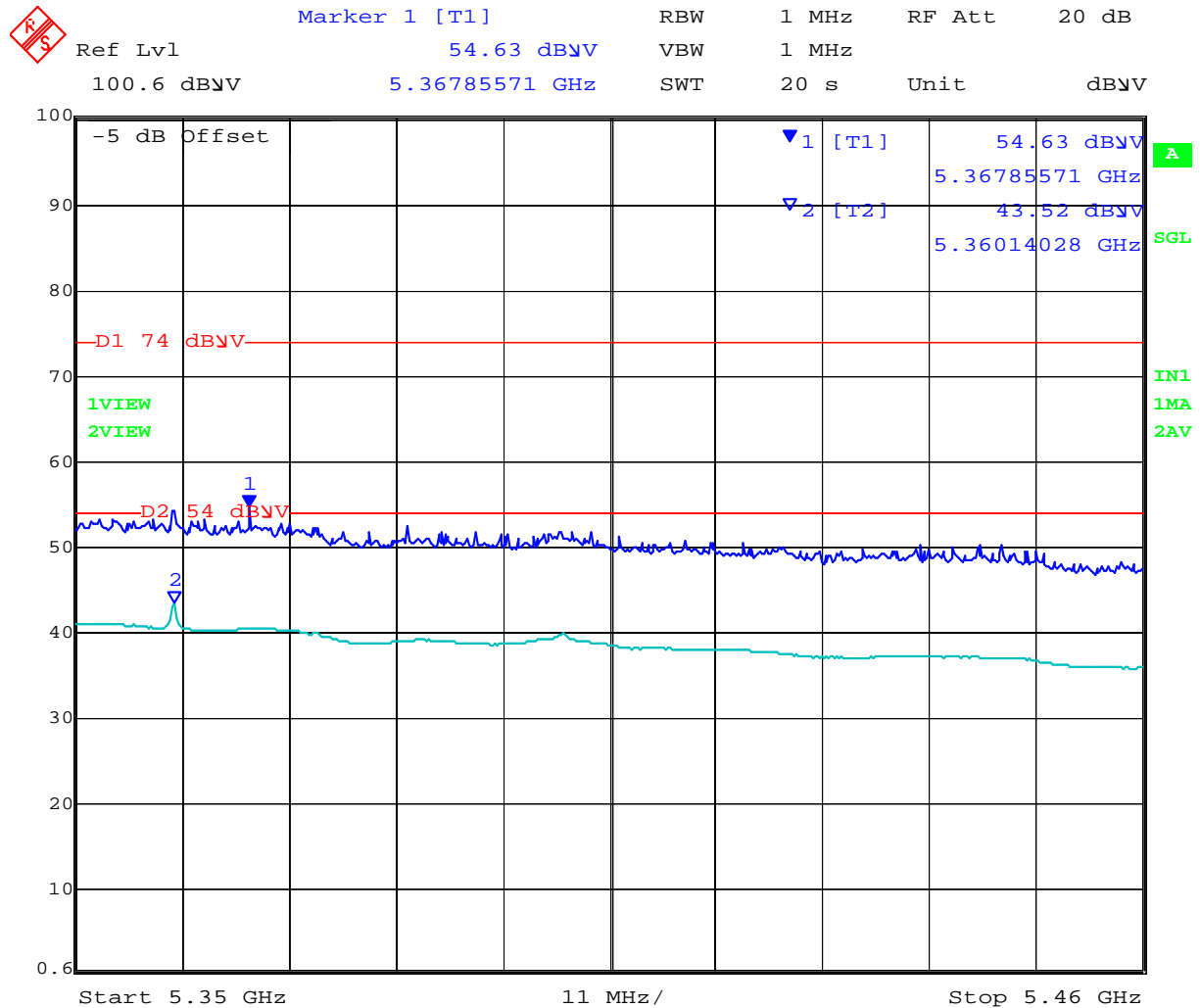
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11509.900	52.1	6.8	-1.9	57.0	Peak Max	H	117	360	74.0	-17.0	Pass	RB
1347.77	64.7	2.3	-14.0	53.0	Peak Max	H	104	17	74.0	-21.0	Pass	RB
11509.9	37.7	6.8	-1.9	42.6	Average Max	H	117	360	54.0	-11.4	Pass	RB
1347.77	61.1	2.3	-14.0	49.4	Average Max	H	104	17	54	-4.6	Pass	RB
5735.471	64.3	4.8	-9.5	59.5	Peak [Scan]	H	200	0				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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## Band-Edge



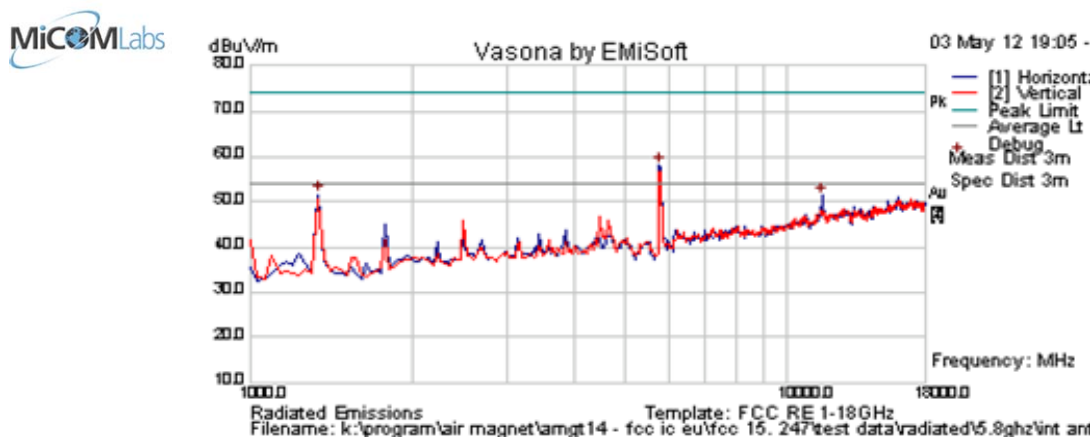
Date: 3.MAY.2012 12:27:52

Maximum output power (Power = 20)



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Test Freq.	5795 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



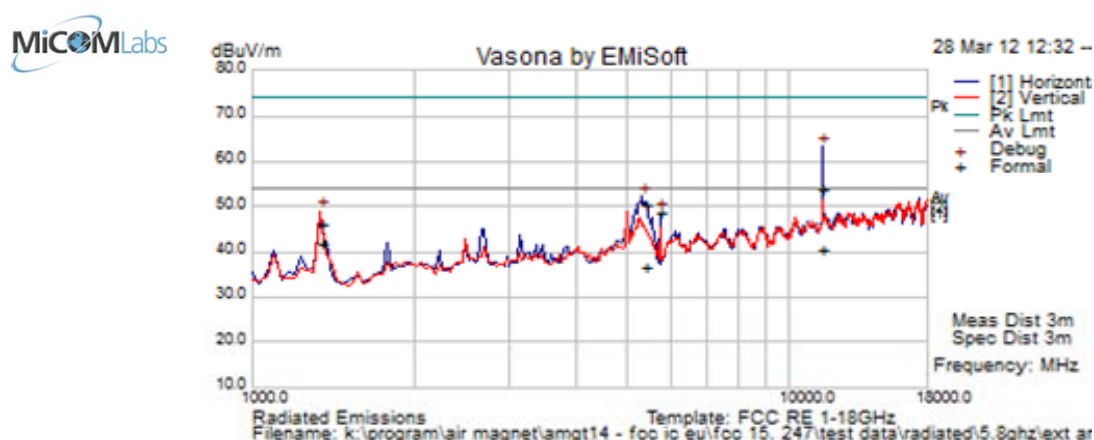
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.539	62.8	4.8	-9.5	58.1	Peak [Scan]	H	200	0				FUND
1340.681363	63.2	2.3	-13.9	51.6	Peak [Scan]	H	100	0	54.0	-2.4	Pass	RB
11595.190	46.7	6.8	-2.1	51.4	Peak [Scan]	H	100	0	54	-2.6	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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#### 5.1.6.4. 5.8 GHz External Antenna

Test Freq.	5745 MHz	Engineer	SB
Variant	802.11a; 6.0 Mbs	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			

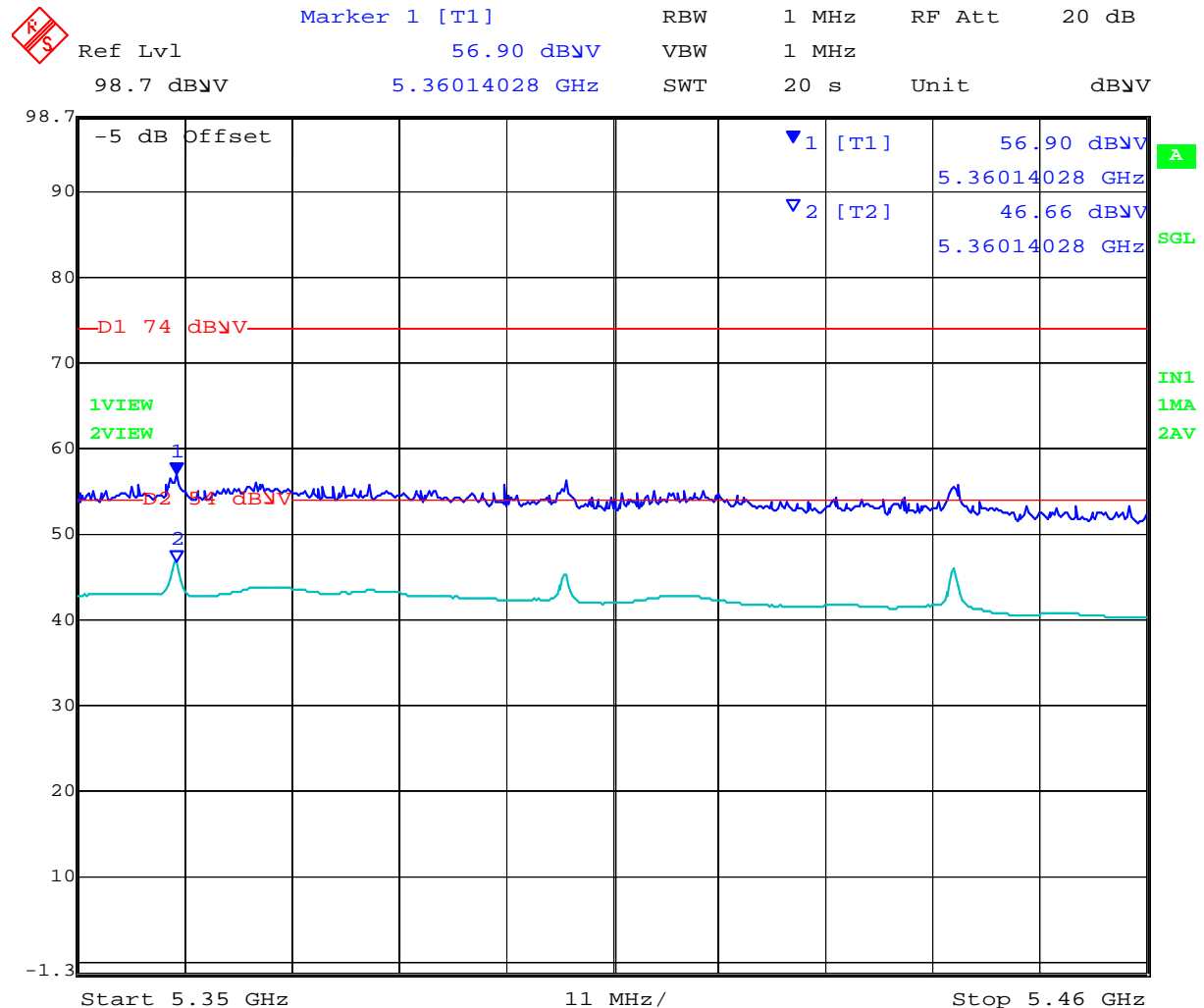


#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11496.869	49.0	6.8	-2.0	53.9	Peak Max	H	99	19	74.0	-20.2	Pass	RB
5401.202	55.2	4.6	-9.6	50.2	Peak Max	H	99	223	74.0	-23.8	Pass	RB
1349.944	57.9	2.3	-14.0	46.2	Peak Max	V	99	211	74	-27.8	Pass	RB
11496.869	35.5	6.8	-2.0	40.4	Average Max	H	99	19	54	-13.6	Pass	RB
5401.202	41.8	4.6	-9.6	36.8	Average Max	H	99	223	54	-17.2	Pass	RB
1349.944	53.6	2.3	-14.0	42.0	Average Max	V	99	211	54	-12.1	Pass	RB
5735.471	53.4	4.8	-9.5	48.6	Peak [Scan]	H	100	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												



## Band-Edge



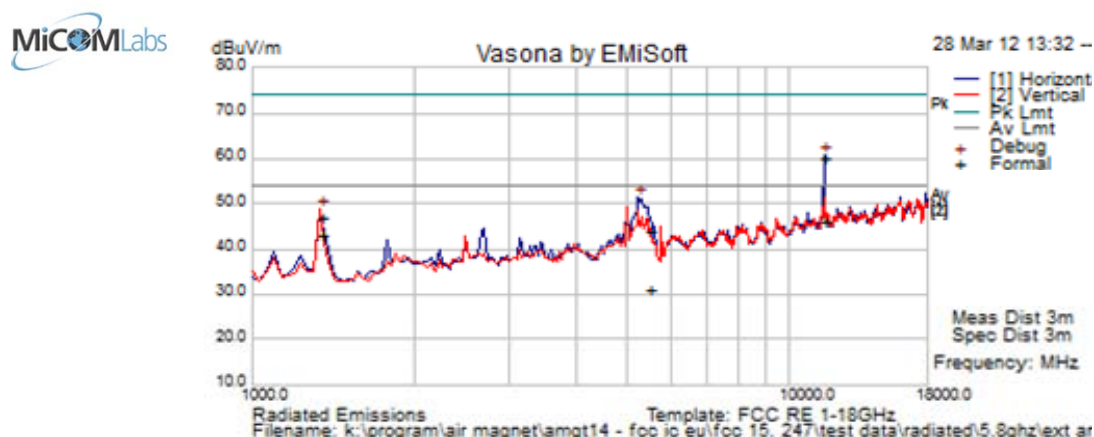
Date: 26.MAR.2012 16:11:14

Maximum output power (Power = 20)



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<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	SB
<b>Variant</b>	802.11a; 6.0 Mbs	<b>Temp (°C)</b>	22.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	36
<b>Power Setting</b>	20	<b>Press. (mBars)</b>	1004
<b>Antenna</b>	ext ant	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11569.902	55.4	6.8	-2.0	60.2	Peak Max	H	98	362	74.0	-13.8	Pass	RB
5470.541	48.9	4.6	-9.7	43.8	Peak Max	H	104	0	74.0	-30.2	Pass	RB
1349.950	58.7	2.3	-14.0	47.0	Peak Max	V	121	0	74	-27.0	Pass	RB
11569.902	41.2	6.8	-2.0	46.0	Average Max	H	98	362	54	-8.0	Pass	RB
5470.541	36.0	4.6	-9.7	30.9	Average Max	H	104	0	54	-23.1	Pass	RB
1349.950	54.8	2.3	-14.0	43.1	Average Max	V	121	0	54	-10.9	Pass	RB

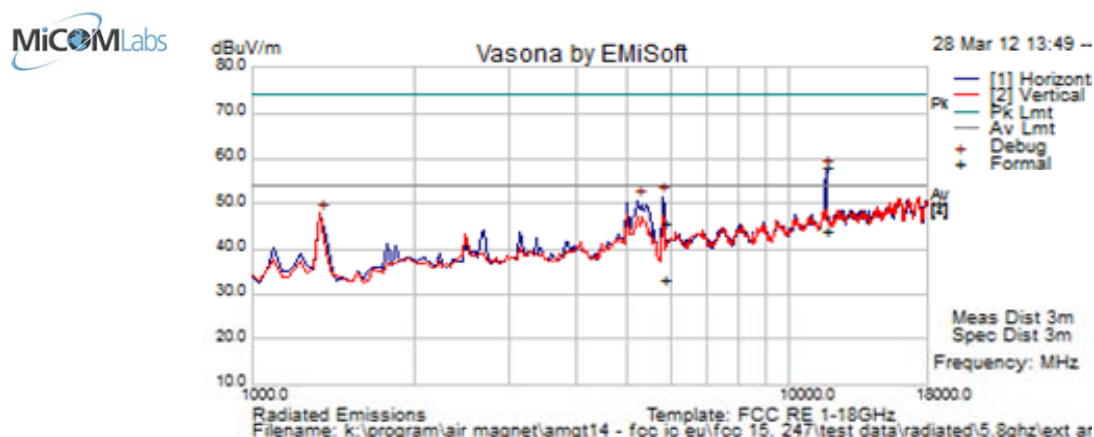
**Legend:** TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11a; 6.0 Mbs	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11649.800	53.7	6.8	-2.3	58.2	Peak Max	H	104	361	74.0	-15.8	Pass	RB
5828.357	50.1	4.8	-9.3	45.6	Peak Max	H	98	208	74.0	-28.4	Pass	RB
1349.950	58.7	2.3	-14.0	47.0	Peak Max	V	121	0	74	-27.0	Pass	RB
11649.800	39.5	6.8	-2.3	44.1	Average Max	H	104	361	54	-9.9	Pass	RB
5828.357	37.9	4.8	-9.3	33.4	Average Max	H	98	208	54	-20.6	Pass	RB
1349.950	54.8	2.3	-14.0	43.1	Average Max	V	121	0	54	-10.9	Pass	RB

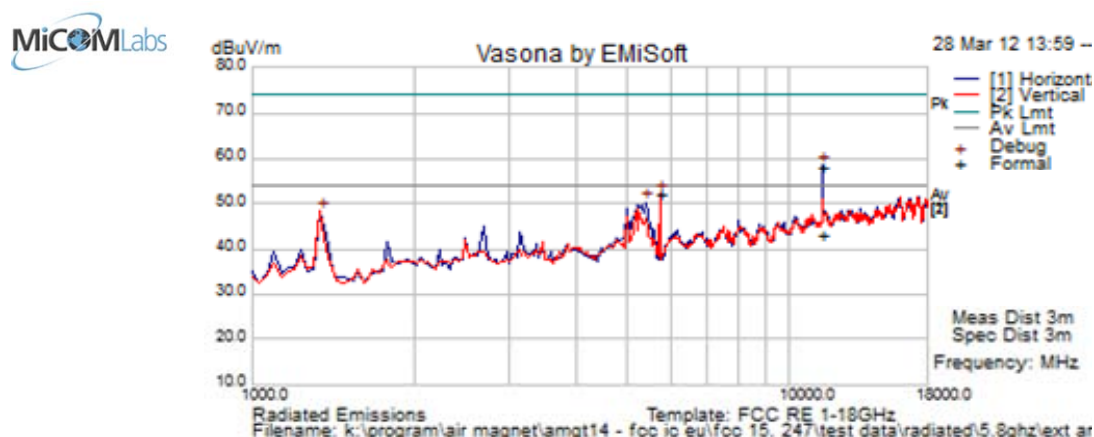
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	5745 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



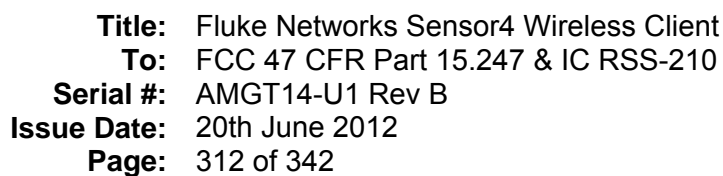
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11491.232	53.4	6.8	-2.0	58.2	Peak Max	H	116	322	74.0	-15.8	Pass	RB
5470.541	48.9	4.6	-9.7	43.8	Peak Max	H	104	0	74.0	-30.2	Pass	RB
1349.950	58.7	2.3	-14.0	47.0	Peak Max	V	121	0	74	-27.0	Pass	RB
11491.232	38.4	6.8	-2.0	43.3	Average Max	H	116	322	54.0	-10.8	Pass	RB
5470.541	36.0	4.6	-9.7	30.9	Average Max	H	104	0	54	-23.1	Pass	RB
1349.950	54.8	2.3	-14.0	43.1	Average Max	V	121	0	54	-10.9	Pass	RB
5735.471	57.0	4.8	-9.5	52.2	Peak [Scan]	H	150	0				FUND

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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The screenshot displays a Spectrum Analyzer interface. At the top, a control panel shows settings: Ref Lvl (98.7 dBμV), Marker 1 [T1] (56.87 dBμV, 5.35991984 GHz), RBW (1 MHz), VBW (1 MHz), RF Att (20 dB), and Unit (dBμV). The main display area shows two traces: 1VIEW (blue) and 2VIEW (cyan). The 1VIEW trace has two markers: Marker 1 [T1] at 56.87 dBμV, 5.35991984 GHz and Marker 2 [T2] at 47.48 dBμV, 5.36014028 GHz. A red horizontal line is labeled D1 74 dBμV. The 2VIEW trace shows a peak at the same frequency as Marker 1. The x-axis is labeled Start 5.35 GHz, 11 MHz/, and Stop 5.46 GHz. The y-axis ranges from -1.3 to 98.7 dBμV. On the right side, there are green labels: A, SGL, IN1, 1MA, and 2AV.

Date: 26.MAR.2012 16:12:45

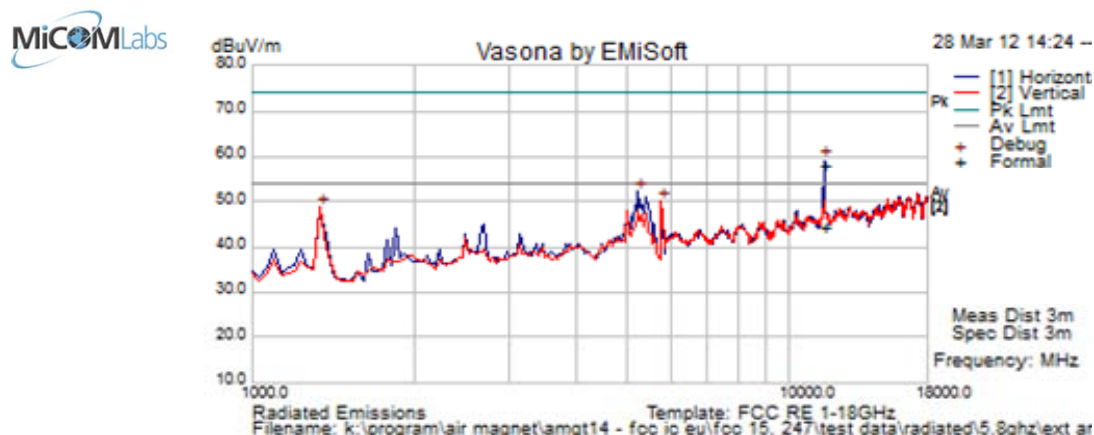
Maximum output power (Power = 20)

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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11572.269	53.3	6.8	-2.0	58.1	Peak Max	H	98	360	74.0	-16.0	Pass	RB
11572.269	39.4	6.8	-2.0	44.2	Average Max	H	98	360	54.0	-9.8	Pass	RB
5470.541	48.9	4.6	-9.7	43.8	Peak Max	H	104	0	74.0	-30.2	Pass	RB
1349.950	58.7	2.3	-14.0	47.0	Peak Max	V	121	0	74	-27.0	Pass	RB
11572.269	39.4	6.8	-2.0	44.2	Average Max	H	98	360	54.0	-9.8	Pass	RB
5470.541	36.0	4.6	-9.7	30.9	Average Max	H	104	0	54	-23.1	Pass	RB
1349.950	54.8	2.3	-14.0	43.1	Average Max	V	121	0	54	-10.9	Pass	RB
5769.539	54.7	4.8	-9.5	50.0	Peak [Scan]	V	150	0				FUND

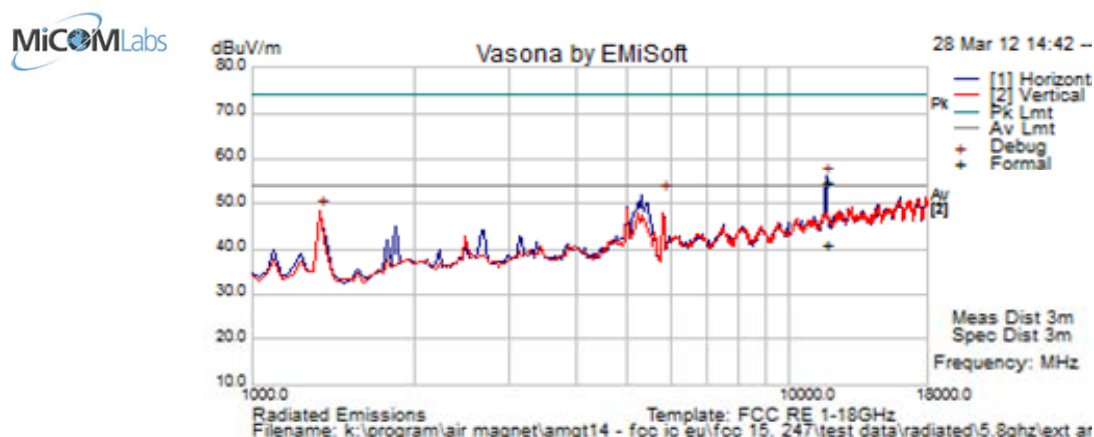
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

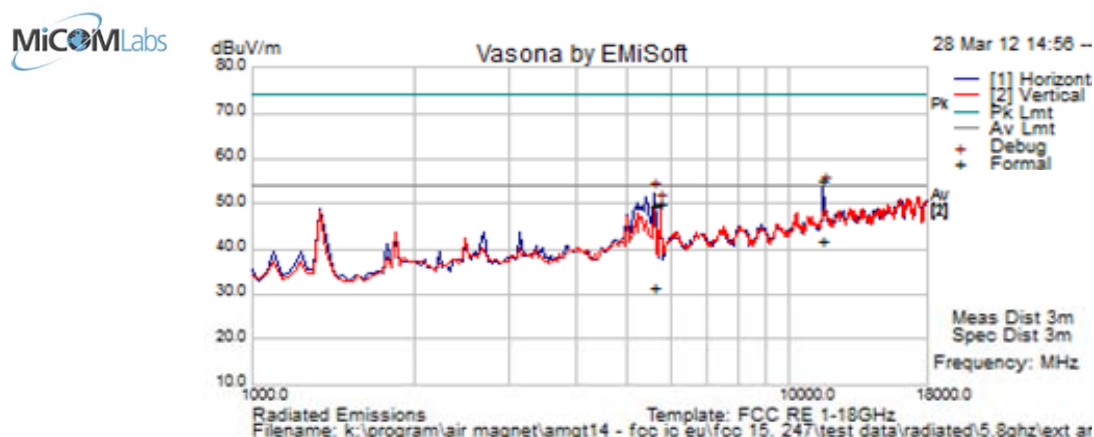
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11652.806	50.1	6.8	-2.3	54.6	Peak Max	H	149	0	74.0	-19.4	Pass	RB
1349.950	58.7	2.3	-14.0	47.0	Peak Max	V	121	0	74	-27.0	Pass	RB
11652.806	36.2	6.8	-2.3	40.8	Average Max	H	149	0	54.0	-13.2	Pass	RB
1349.950	54.8	2.3	-14.0	43.1	Average Max	V	121	0	54	-10.9	Pass	RB
5823.246	56.5	4.8	-9.3	52.0	Peak [Scan]	H	100	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5755 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna	ext ant	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



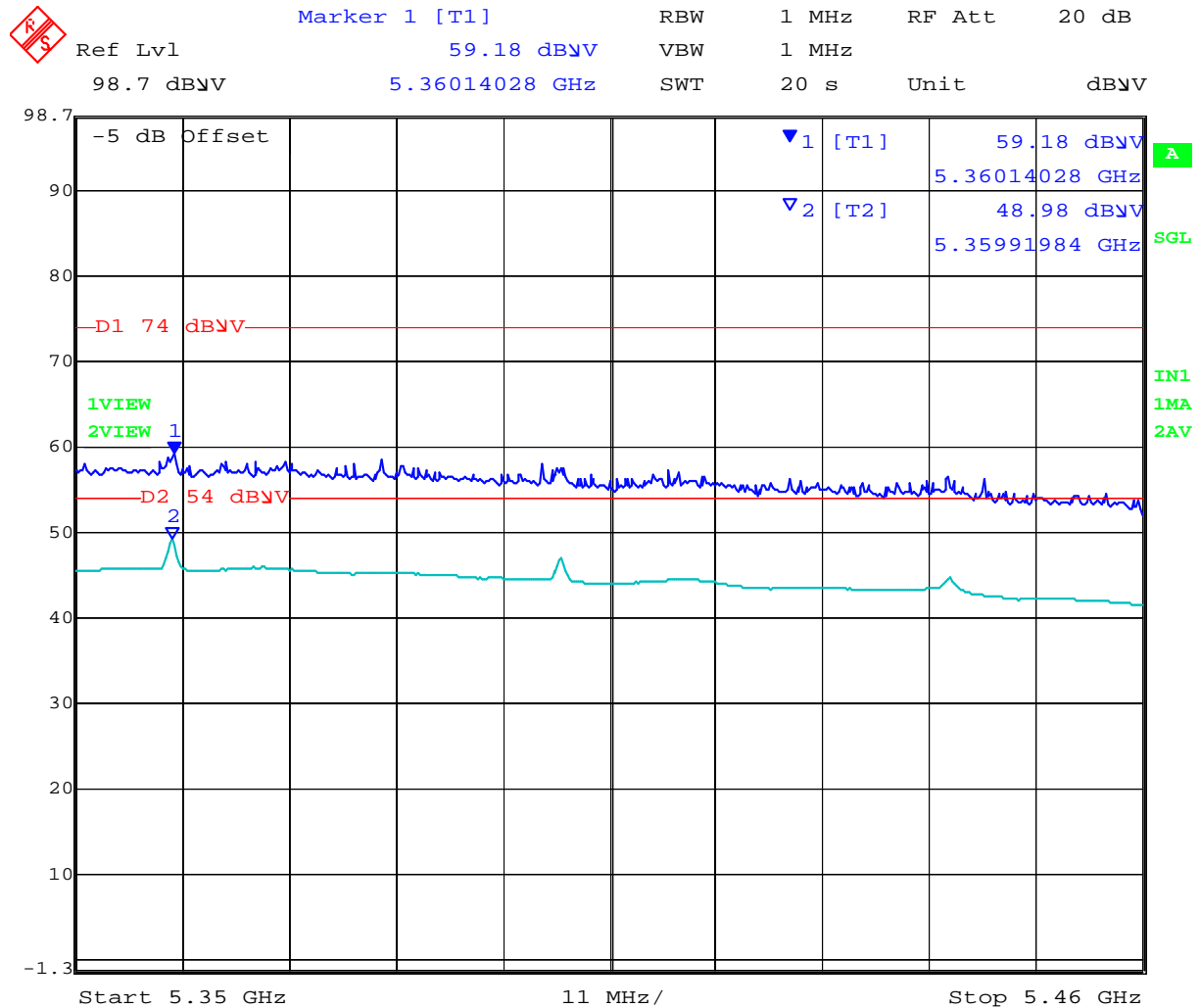
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11511.272	50.2	6.8	-1.9	55.1	Peak Max	H	98	361	74.0	-18.9	Pass	RB
5591.784	54.7	4.7	-9.7	49.7	Peak Max	H	173	86	74.0	-24.4	Pass	RB
11511.272	36.7	6.8	-1.9	41.5	Average Max	H	98	361	54	-12.5	Pass	RB
5591.784	36.5	4.7	-9.7	31.4	Average Max	H	173	86	54	-22.6	Pass	RB
5735.471	54.9	4.8	-9.5	50.1	Peak [Scan]	V	100	0				FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Band-Edge



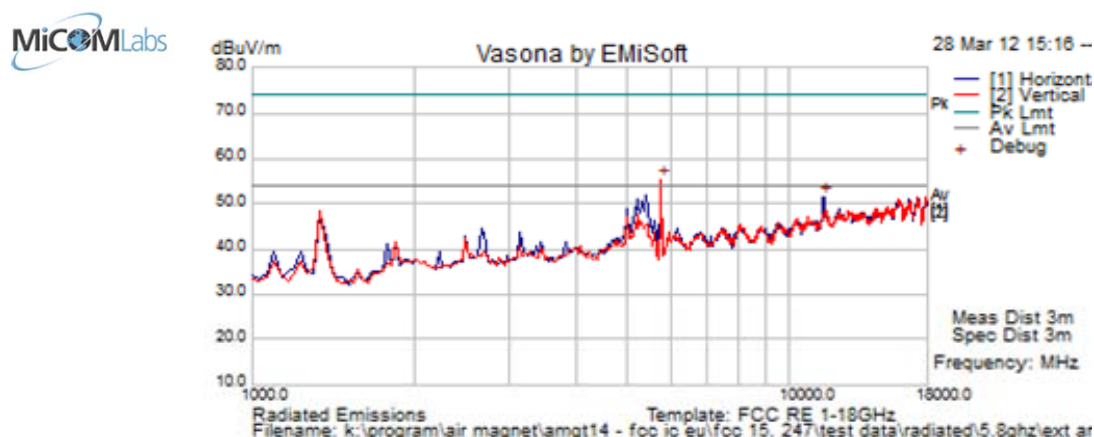
Date: 26.MAR.2012 16:14:56

Maximum output power (Power = 20)



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Test Freq.	5795 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	22.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	20	Press. (mBars)	1004
Antenna		Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.539	60.1	4.8	-9.5	55.4	Peak [Scan]	V	150	0				FUND
11561.122	46.8	6.8	-2.0	51.6	Peak [Scan]	H	100	0	54.0	-2.4	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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## Specification Limits

**FCC §15.247(d) and RSS-210 §A8.5** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### **FCC §15.247(d)**

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

**IC RSS-210 §A8.5** If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

### **IC RSS-Gen §4.7**

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5<sup>th</sup> harmonic of the highest frequency generated without exceeding 40 GHz.

**FCC §15.205 (a)** Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

**FCC §15.205 (a)** Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**FCC §15.209 (a)** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.



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**§15.209 (a) Limit Matrix**

Frequency(MHz)	Field Strength ( $\mu\text{V/m}$ )	Field Strength (dB $\mu\text{V/m}$ )	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

**Laboratory Measurement Uncertainty for Radiated Emissions**

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

**Traceability**

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

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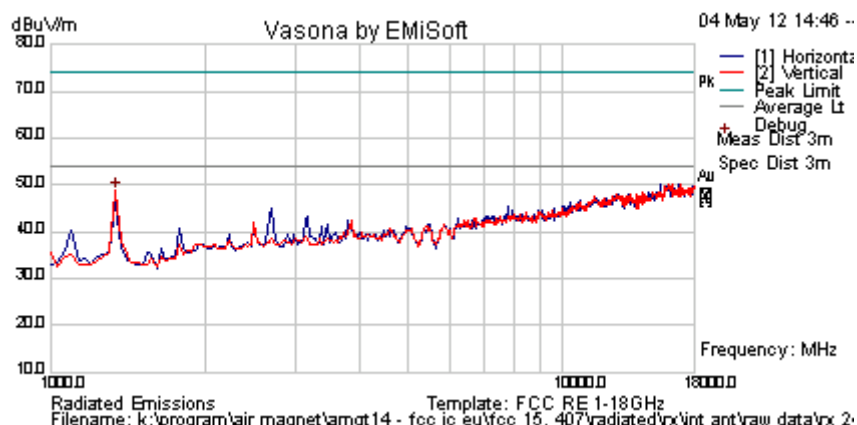


### 5.1.6.5. Receiver Radiated Emissions

#### 2.4 GHz Operational Mode

Integral antenna

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	SB
<b>Variant</b>	Receive in Test Utility	<b>Temp (°C)</b>	21
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	39
<b>Power Setting</b>	Not Applicable in Receive Mode	<b>Press. (mBars)</b>	1003
<b>Antenna</b>	Integral antenna		
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

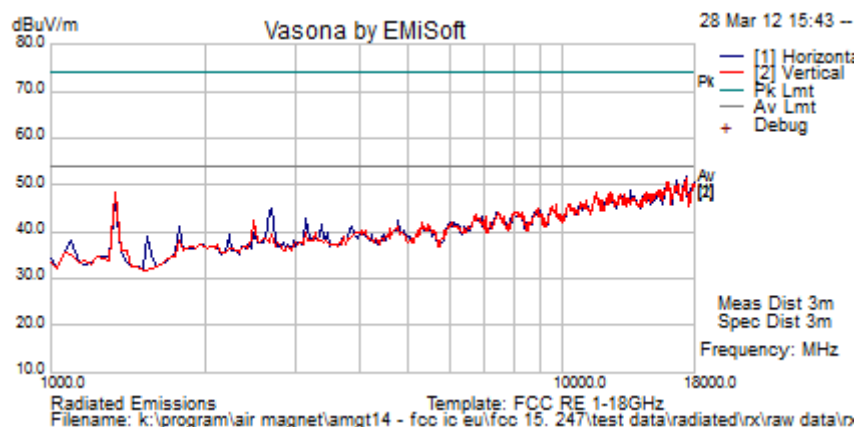
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1340.681	60.4	2.3	-13.9	48.8	Peak [Scan]	V	100	0	54	-5.3	Pass	
Legend: RB = Restricted Band; NRB = Non-Restricted Band; FUND = Fundamental Freq. BE = Emission in Restricted Band Nearest Transmission Band Edge;												



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#### External antenna

Test Freq.	2412 MHz	Engineer	SB
Variant	Receive in Test Utility	Temp (°C)	21
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	39
Power Setting	Not Applicable in Receive Mode	Press. (mBars)	1003
Antenna	External Antenna		
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Receiver Emissions Within 6dB of limit.												
Legend: RB = Restricted Band; NRB = Non-Restricted Band; FUND = Fundamental Freq.												
BE = Emission in Restricted Band Nearest Transmission Band Edge;												

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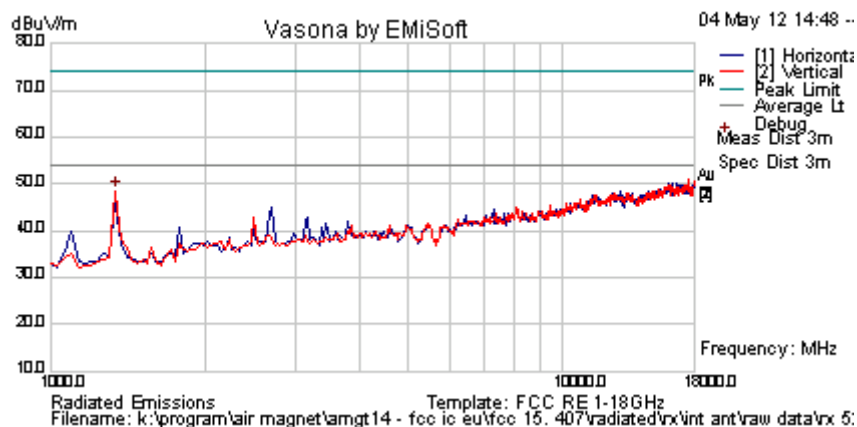


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## 5.8 GHz Operational Mode

Integral antenna

Test Freq.	5745 MHz	Engineer	SB
Variant	Receive in Test Utility	Temp (°C)	21
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	39
Power Setting	Not Applicable in Receive Mode	Press. (mBars)	1003
Antenna	Integral antenna		
Test Notes 1			
Test Notes 2			



### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1340.681	60.2	2.3	-13.9	48.6	Peak [Scan]	V	100	0	54	-5.4	Pass	
Legend: RB = Restricted Band; NRB = Non-Restricted Band; FUND = Fundamental Freq. BE = Emission in Restricted Band Nearest Transmission Band Edge;												

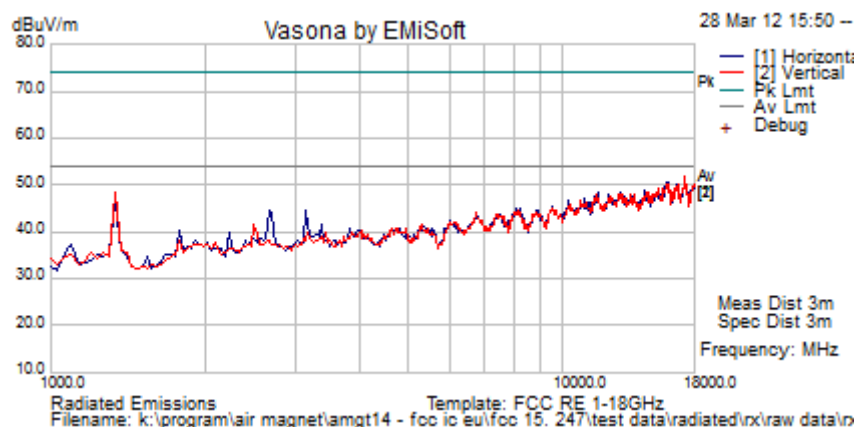
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#### External antenna

Test Freq.	5745 MHz	Engineer	SB
Variant	Receive in Test Utility	Temp (°C)	21
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	39
Power Setting	Not Applicable in Receive Mode	Press. (mBars)	1003
Antenna	External antenna		
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No Receiver Emissions Within 6dB of limit.												
Legend: RB = Restricted Band; NRB = Non-Restricted Band; FUND = Fundamental Freq.												
BE = Emission in Restricted Band Nearest Transmission Band Edge;												

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#### 5.1.6.6. Radiated Spurious Emissions (30M-1 GHz)

**FCC, Part 15 Subpart C §15.205/ §15.209**  
**Industry Canada RSS-210 §2.2**

##### Test Procedure

Testing 30M-1 GHz was performed in a 3-meter anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed. The anechoic chamber test set-up is identified in Section 6 Test Set-Up Photographs.

The EUT had two methods of powering on ac/dc converter and Power over Ethernet (POE). Both modes were tested for emissions below 1GHz.

##### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

$$FS = R + AF + CORR$$

where:

FS = Field Strength

R = Measured Receiver Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

For example:

Given a Receiver input reading of 51.5dB $\mu$ V; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3\text{dB}\mu\text{V/m}$$

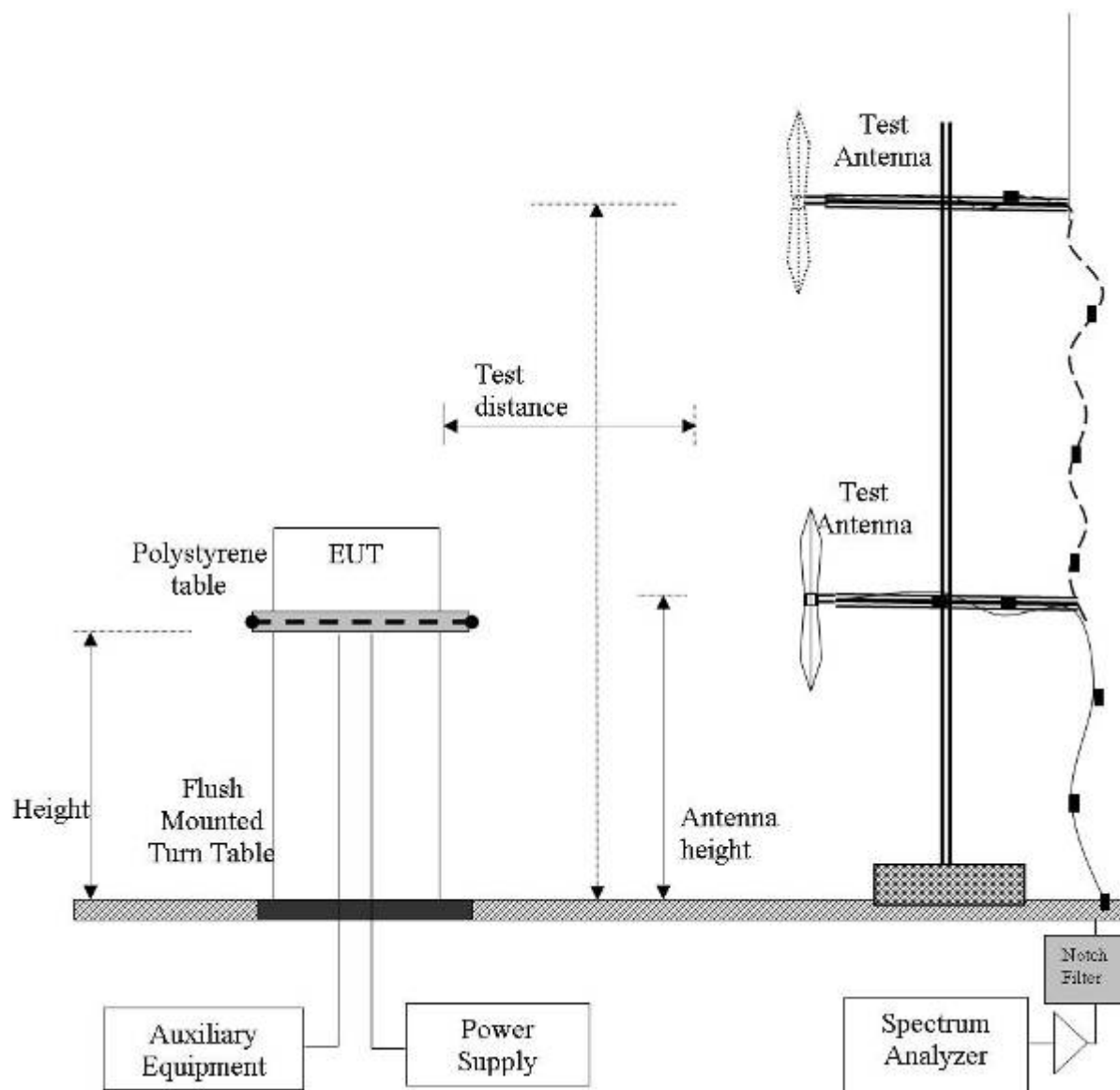
Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (}\mu\text{V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100\mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250\mu\text{V/m}$$

### Radiated Emission Measurement Setup – Below 1 GHz



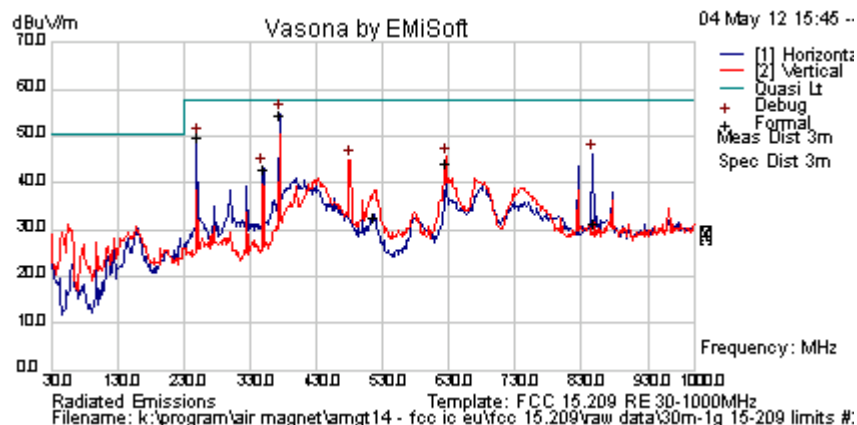
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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
**Page:** 326 of 342

#### Ferrites clamped-on antenna cables

Test Freq.	2437 MHz	Engineer	SB
Variant	Digital Emissions	Temp (°C)	19.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	35
Power Setting	20	Press. (mBars)	1004
Antenna	external ant		
Test Notes 1			
Test Notes 2	ac/dc adaptor 110Vac 60 Hz		



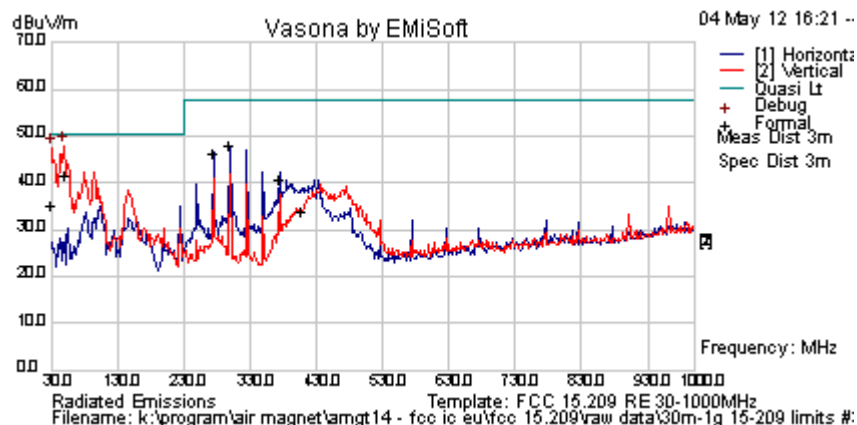
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
375.020	64.5	5.4	-15.4	54.5	Quasi Max	H	208	184	57.5	-3.0	Pass	
249.984	64.0	4.9	-19.0	49.8	Quasi Max	H	104	167	57.5	-7.7	Pass	
850.080	32.8	7.0	-8.3	31.5	Quasi Max	H	251	273	57.5	-26.1	Pass	
624.985	49.1	6.3	-11.0	44.4	Quasi Max	V	187	342	57.5	-13.1	Pass	
516.381	39.6	5.9	-12.7	32.8	Quasi Max	V	155	159	57.5	-24.7	Pass	
350.016	53.3	5.3	-15.7	42.8	Quasi Max	H	98	187	57.5	-14.7	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency												
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band												

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### Ferrites clamped-on antenna cables

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	SB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	35
<b>Power Setting</b>	20	<b>Press. (mBars)</b>	1004
<b>Antenna</b>	external ant		
<b>Test Notes 1</b>			
<b>Test Notes 2</b>	POE 110Vac 60 Hz		



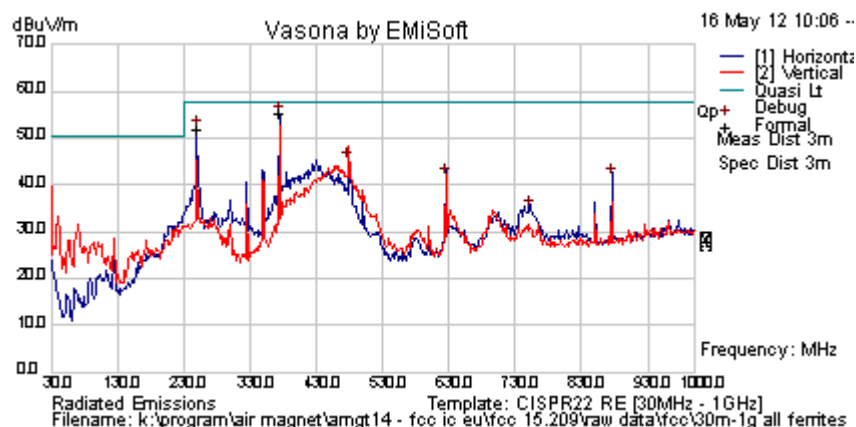
### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
49.816	61.1	3.7	-23.1	41.7	Quasi Max	V	139	184	50.5	-8.8	Pass	
30.001	41.5	3.5	-9.7	35.3	Quasi Max	V	132	201	50.5	-15.2	Pass	
299.982	59.9	5.1	-17.2	47.8	Quasi Max	H	103	29	57.5	-9.7	Pass	
274.980	58.8	5.0	-17.4	46.4	Quasi Max	H	101	3	57.5	-11.1	Pass	
374.979	50.6	5.4	-15.4	40.6	Quasi Max	H	212	3	57.5	-16.9	Pass	
409.043	42.9	5.5	-14.5	33.9	Quasi Max	H	223	178	57.5	-23.6	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency												
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band												



### Ferrites removed from antenna cables

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	SB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	35
<b>Power Setting</b>	20	<b>Press. (mBars)</b>	1004
<b>Antenna</b>	external ant		
<b>Test Notes 1</b>	All ferrites removed except for one which is located on the cable to the dedicated RX Ant		
<b>Test Notes 2</b>	ac/dc adaptor 110Vac 60 Hz		

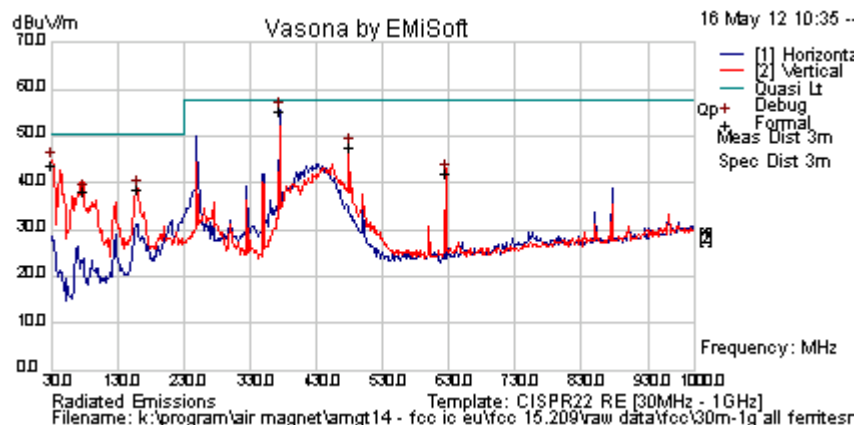


### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
375.018	65.2	5.4	-15.4	55.2	Quasi Max	H	208	12	57.5	-2.3	Pass	
249.993	66.2	4.9	-19.0	52.0	Quasi Max	H	122	178	57.5	-5.5	Pass	
478.140	52.3	5.8	-12.9	45.2	Peak [Scan]	H	122	178	57.5	-12.3	Pass	
624.888	46.4	6.3	-11.0	41.8	Peak [Scan]	H	122	178	57.5	-15.8	Pass	
753.135	37.5	6.7	-9.4	34.8	Peak [Scan]	H	122	178	57.5	-22.7	Pass	
875.483	42.8	7.1	-8.1	41.8	Peak [Scan]	H	122	178	57.5	-15.7	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency												
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band												

### Ferrites removed from antenna cables

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	SB
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum.(%)</b>	35
<b>Power Setting</b>	20	<b>Press. (mBars)</b>	1004
<b>Antenna</b>	external ant		
<b>Test Notes 1</b>	All ferrites removed except for one which is located on the cable to the dedicated RX Ant		
<b>Test Notes 2</b>	POE 110Vac 60 Hz		



### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
375.006	65.2	5.4	-15.4	55.3	Quasi Max	H	98	212	57.5	-2.2	Pass	
30.628	50.6	3.5	-10.3	43.8	Quasi Max	V	98	360	50.5	-6.7	Pass	
479.055	54.5	5.8	-12.9	47.5	Peak [Scan]	V	98	0	57.5	-10.1	Pass	
624.709	46.6	6.3	-11.0	41.9	Peak [Scan]	V	98	0	57.5	-15.6	Pass	
79.470	57.6	3.9	-23.5	38.0	Peak [Scan]	V	98	0	50.5	-12.5	Pass	
160.950	53.0	4.4	-18.8	38.6	Peak [Scan]	V	98	0	50.5	-11.9	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency												
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band												

## Specification

### Limits

**§15.205 (a)** Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

**§15.205 (a)** Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**§15.209 (a)** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

### §15.209 (a) and RSS-Gen §2.2 Limit Matrix

Frequency(MHz)	Field Strength ( $\mu\text{V/m}$ )	Field Strength (dB $\mu\text{V/m}$ )	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

### Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
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### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

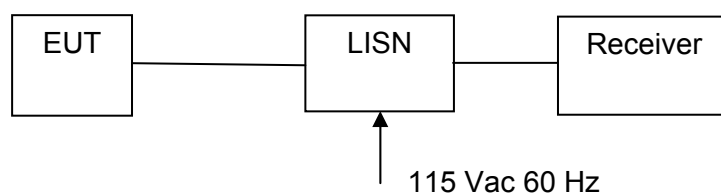
#### 5.1.7. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

**FCC, Part 15 Subpart C §15.207**  
**Industry Canada RSS-Gen §7.2.2**

##### **Test Procedure**

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

##### **Test Measurement Set up**



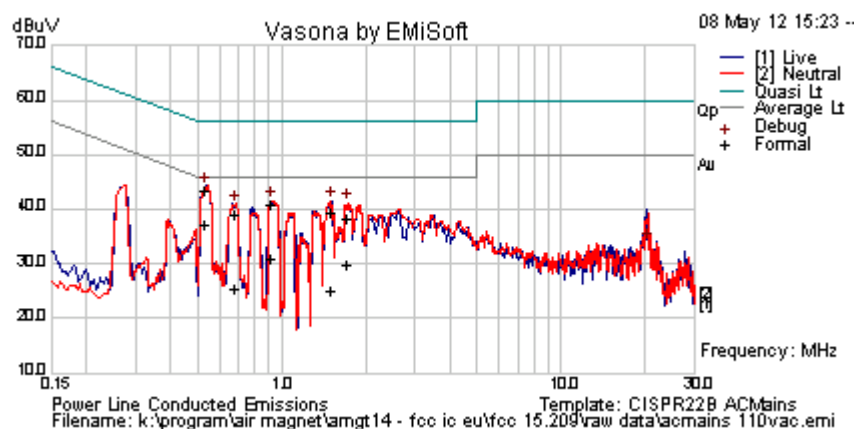
Measurement set up for AC Wireline Conducted Emissions Test

##### **Measurement Results for AC Wireline Conducted Emissions (150 kHz – 30 MHz)**

Ambient conditions.

Temperature: 17 to 23 °C      Relative humidity: 31 to 57 %      Pressure: 999 to 1012 mbar

Test Freq.	N/A	Engineer	SB
Variant	AC Line Emissions	Temp (°C)	19.5
Freq. Range	0.150 MHz - 30 MHz	Rel. Hum.(%)	35
Power Setting	20	Press. (mBars)	1004
Antenna	N/A		
Test Notes 1			
Test Notes 2	Ac adaptor 110Vac 60 Hz		



### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.535	33.4	9.9	0.1	43.4	Quasi Peak	Neutral	56	-12.6	Pass	
1.502	29.4	10.0	0.1	39.5	Quasi Peak	Neutral	56	-16.5	Pass	
0.926	30.8	9.9	0.1	40.8	Quasi Peak	Neutral	56	-15.2	Pass	
1.734	28.4	10.0	0.1	38.5	Quasi Peak	Neutral	56	-17.5	Pass	
0.686	29.2	10.0	0.1	39.2	Quasi Peak	Neutral	56	-16.8	Pass	
0.535	27.2	9.9	0.1	37.2	Average	Neutral	46	-8.8	Pass	
1.502	14.9	10.0	0.1	25.0	Average	Neutral	46	-21.0	Pass	
0.926	20.9	9.9	0.1	30.9	Average	Neutral	46	-15.1	Pass	
1.734	19.9	10.0	0.1	30.1	Average	Neutral	46	-16.0	Pass	
0.686	15.6	10.0	0.1	25.6	Average	Neutral	46	-20.4	Pass	
20.594	22.7	10.5	0.8	34.0	Peak [Scan]	Neutral	50	-16.0	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency										
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band										

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## Specification

### Limit

**§15.207 (a)** Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu\Omega$  line impedance stabilization network (LISN), see §15.207 (a) matrix below. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

### RSS-Gen §7.2.2

The radio frequency voltage that is conducted back into the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The tighter limit applies at the frequency range boundaries.

### §15.207 (a) and RSS-Gen §7.2.2 Limit Matrix

The lower limit applies at the boundary between frequency ranges

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency

### Laboratory Measurement Uncertainty for Conducted Emissions

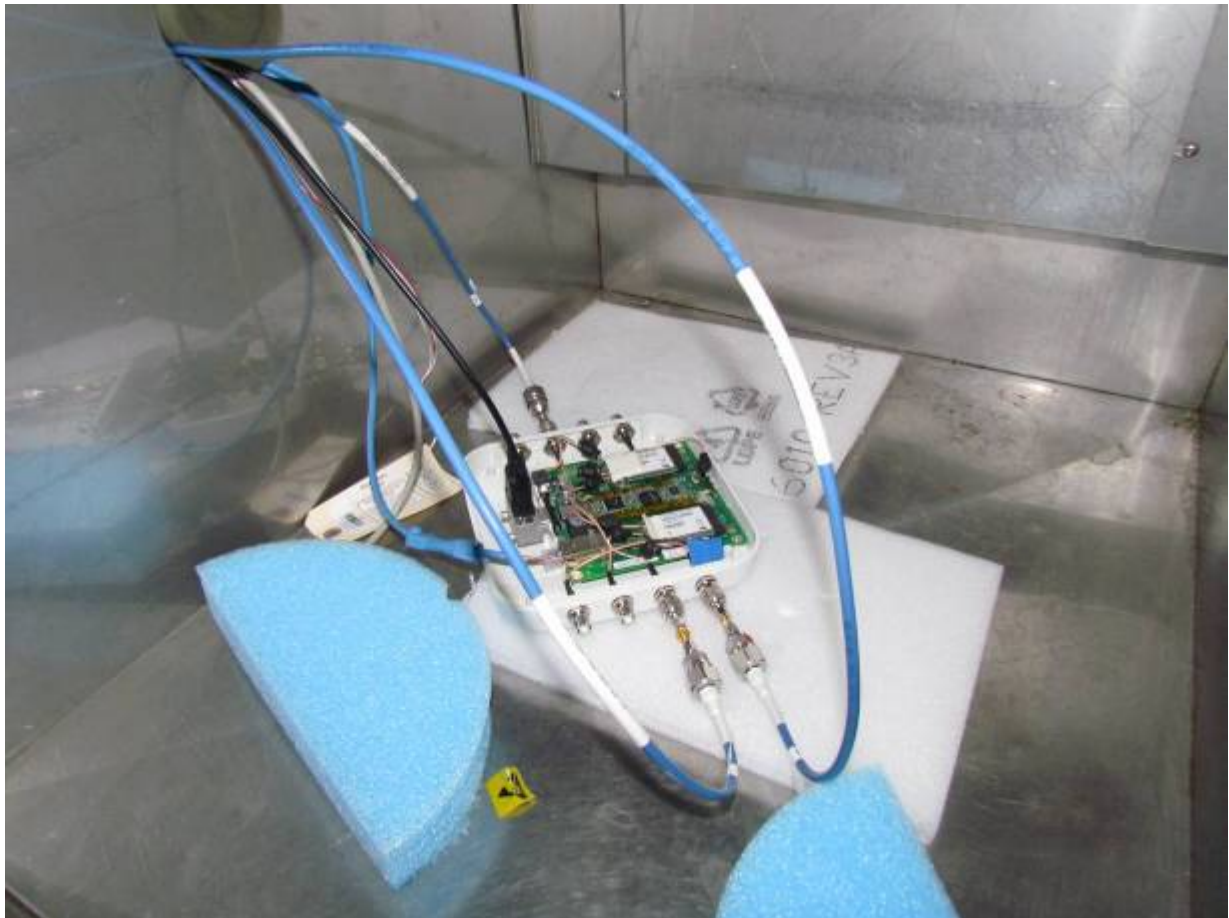
Measurement uncertainty	$\pm 2.64$ dB
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### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'	0158, 0184, 0287, 0190, 0293, 0307

## 6. PHOTOGRAPHS

### 6.1. Conducted Test Setup

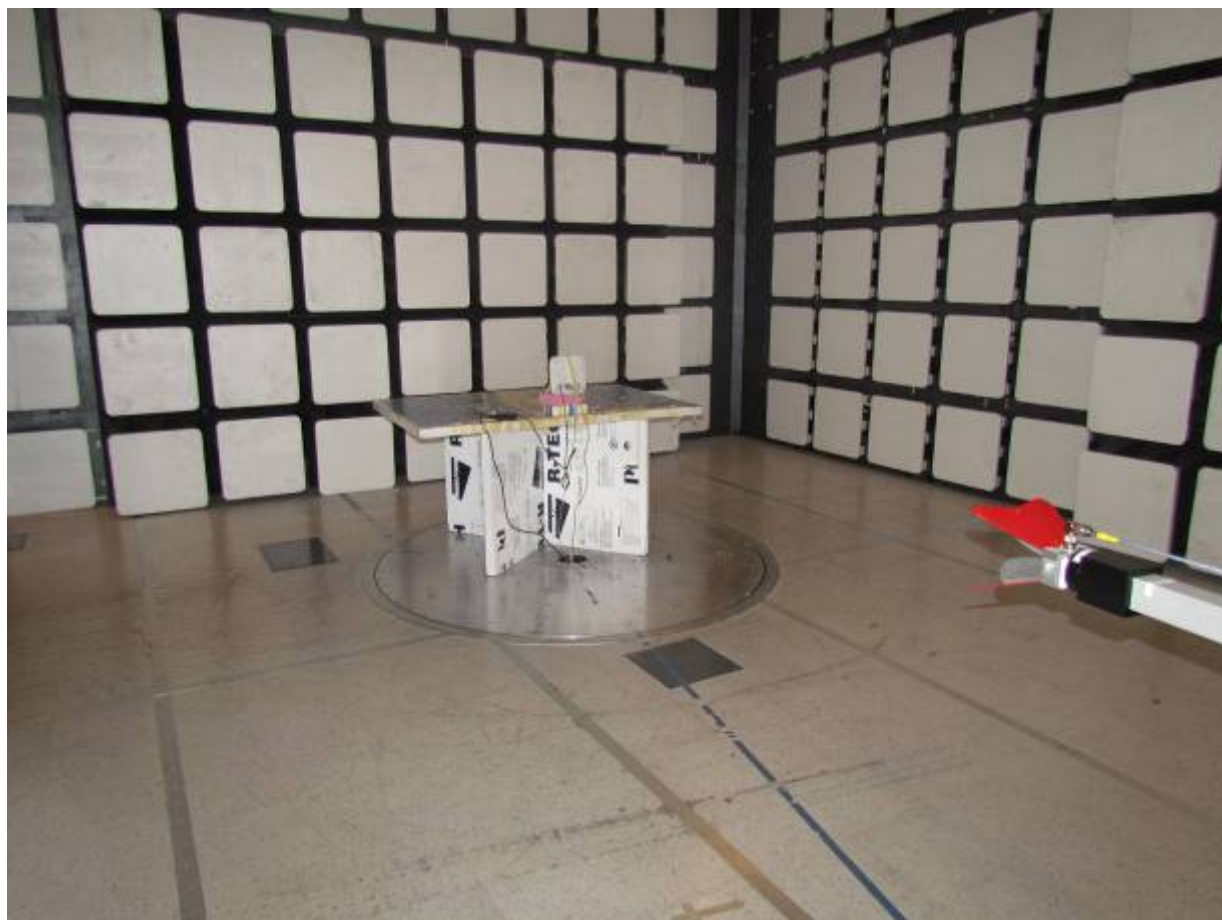


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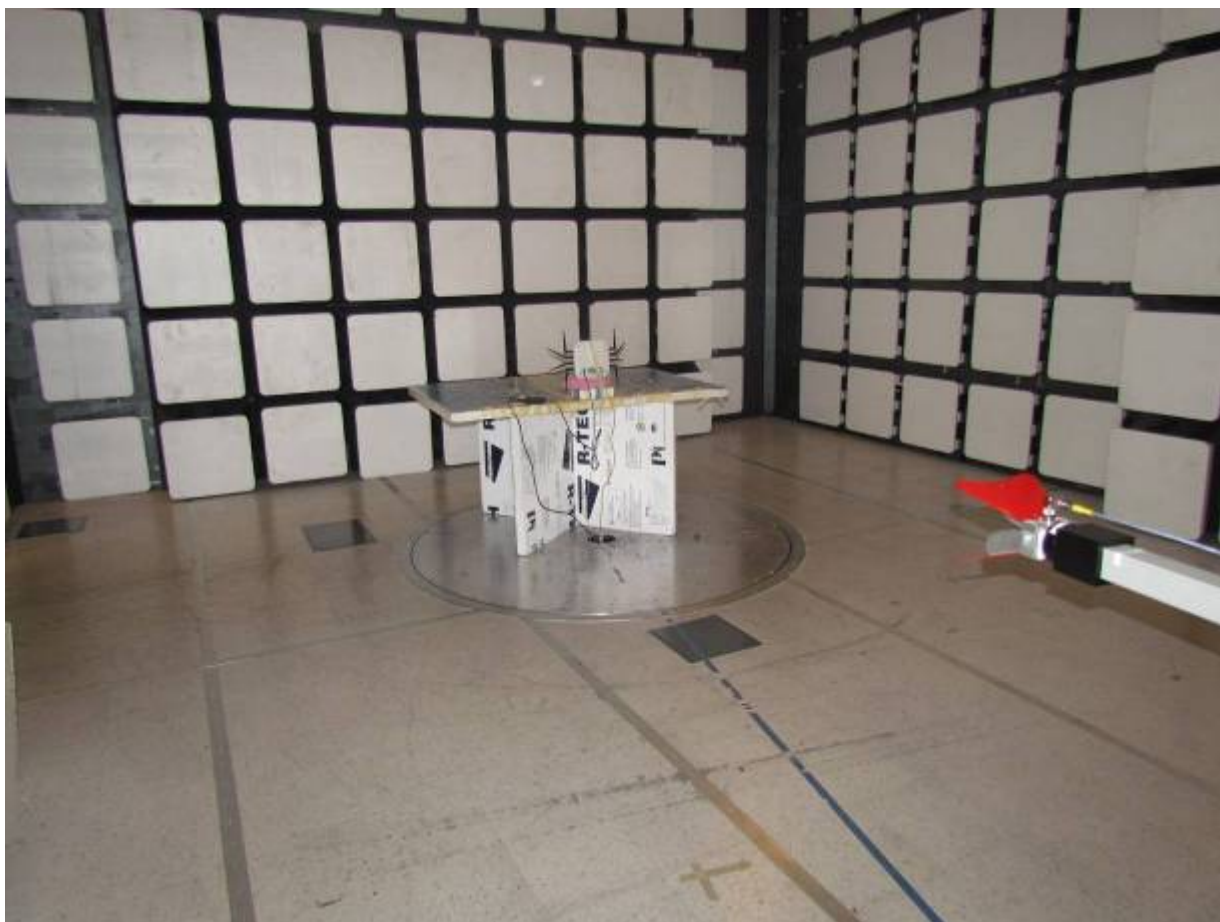


## 6.2. Radiated Test Setup > 1 GHz (Integral Antenna)

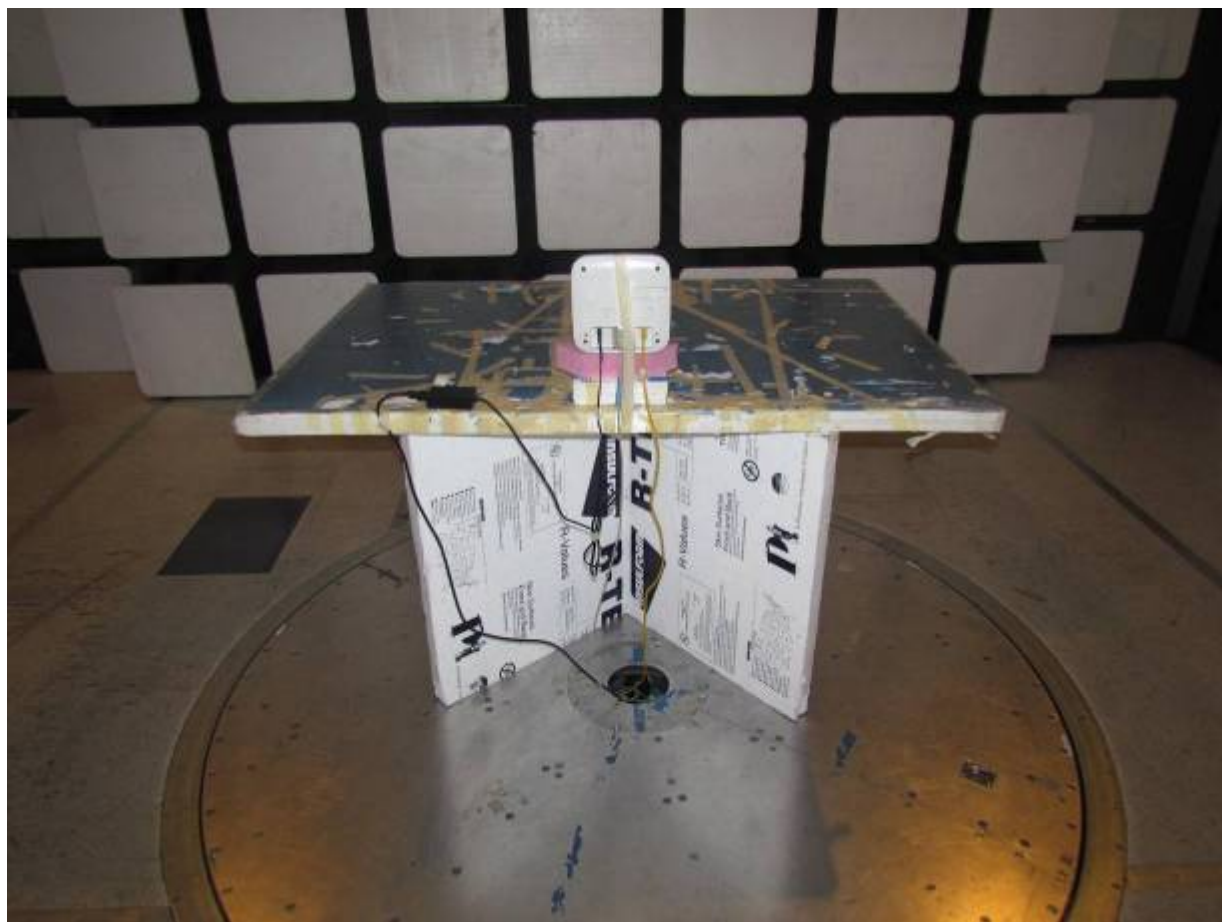




### 6.3. Radiated Test Setup > 1 GHz (External Antenna)



#### 6.4. Radiated Test Table-top Setup (Integral Antenna)



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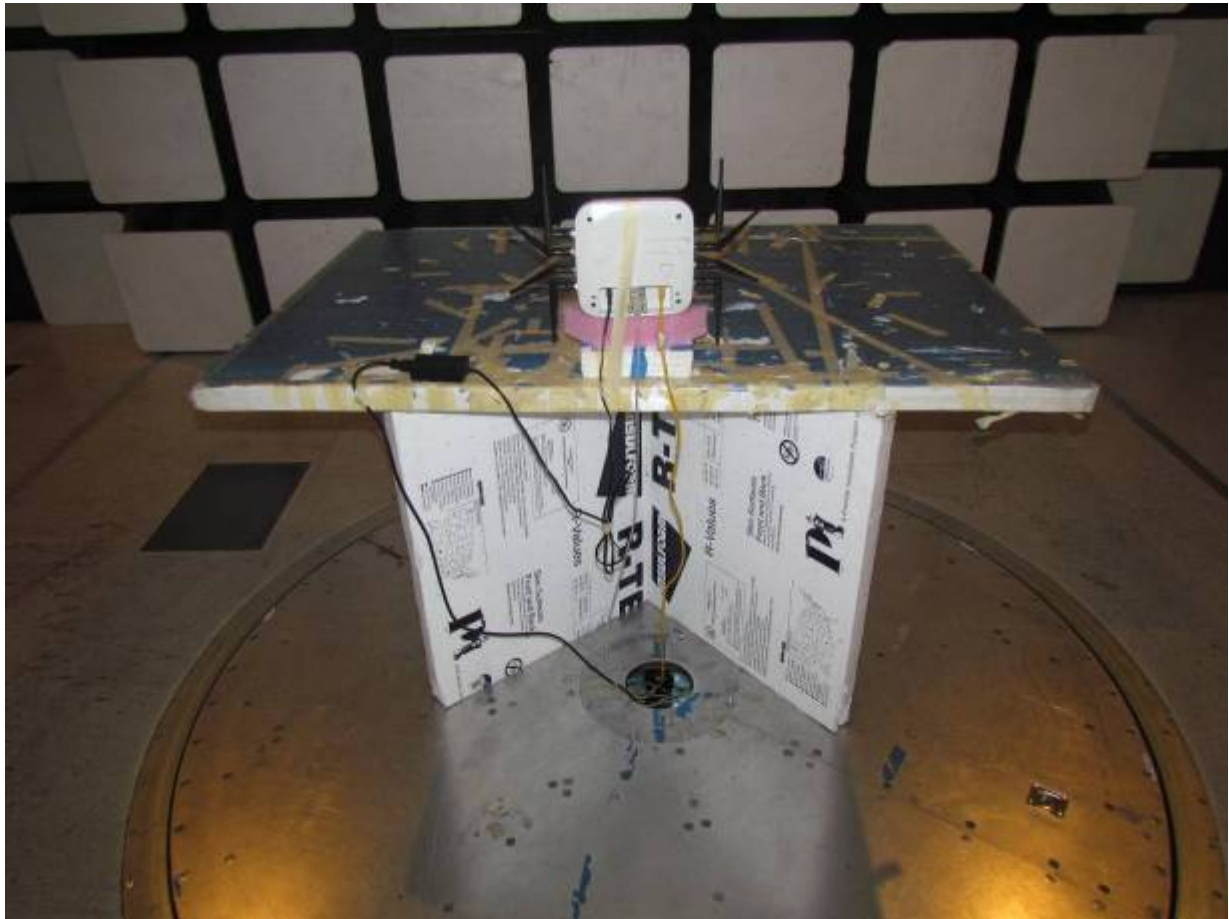
## 6.5. Radiated Test Setup < 1 GHz (External Antenna)



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## 6.6. Radiated Test Table-top Setup (External Antenna)





## 6.7. ac Wireline Emissions



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**Title:** Fluke Networks Sensor4 Wireless Client  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** AMGT14-U1 Rev B  
**Issue Date:** 20th June 2012  
**Page:** 341 of 342

## 7. TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #
0088	Spectrum Analyzer	Hewlett Packard	8564E	3410A00141
0134	Amplifier	Com Power	PA 122	181910
0158	Barometer /Thermometer	Control Co.	4196	E2846
0287	EMI Receiver	Rhode & Schwartz	ESIB 40	100201
0252	SMA Cable	Megaphase	Sucoflex 104	None
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787- 3G03G0	209089-001
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181- 3G0300	209092-001
0313	Coupler	Hewlett Packard	86205A	3140A01285
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623
0070	Power Meter	Hewlett Packard	437B	3125U11552
0116	Power Sensor	Hewlett Packard	8485A	3318A19694
0117	Power Sensor	Hewlett Packard	8487D	3318A00371
0184	Pulse Limiter	Rhode & Schwartz	ESH3Z2	357.8810.52
0190	LISN	Rhode & Schwartz	ESH3Z5	836679/006
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001
0301	5.6 GHz Notch Filter	Micro-Tronics	RBC50704	001
0302	5.25 GHz Notch Filter	Micro-Tronics	BRC50703	002
0303	5.8 GHz Notch Filter	Micro-Tronics	BRC50705	003
0304	2.4GHzHz Notch Filter	Micro-Tronics	--	001
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002
0335	1-18GHz Horn Antenna	ETS- Lindgren	3117	00066580
0337	Amplifier	MiCOM Labs	--	--
0338	Antenna	Sunol Sciences	JB-3	A052907

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