

**FCC PART 15 SUBPART C SECTION 15.247**
**TEST REPORT**
*for*
**MODULAR TRANSMITTER**
**Model: ATWINC3400**

Prepared for

 ATMEL CORPORATION  
 1 SPECTRUM POINTE DR., SUITE 225  
 LAKE FOREST, CA 92630

Prepared by: \_\_\_\_\_

TOREY OLIVER

Approved by: \_\_\_\_\_

MATT HARRISON

 COMPATIBLE ELECTRONICS INC.  
 20621 PASCAL WAY  
 LAKE FOREST, CALIFORNIA 92630  
 (949) 587-0400

 DATE: JUNE 16<sup>TH</sup>, 2015

REPORT BODY	APPENDICES					TOTAL
	A	B	C	D	E	
PAGES	19	2	2	15	93	133

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

## TABLE OF CONTENTS

<b>Section / Title</b>	<b>PAGE</b>
<b>GENERAL REPORT SUMMARY</b>	<b>4</b>
<b>1. PURPOSE</b>	<b>6</b>
<b>2. ADMINISTRATIVE DATA</b>	<b>7</b>
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample	7
2.6 Abbreviations and Acronyms	7
<b>3. APPLICABLE DOCUMENTS</b>	<b>8</b>
<b>4. DESCRIPTION OF TEST CONFIGURATION</b>	<b>9</b>
4.1 Description of Test Configuration	9
4.1.1 Photograph Test Configuration	9
4.1.2 Cable Construction and Termination	10
<b>5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT</b>	<b>11</b>
5.1 EUT and Accessory List	11
5.2 EMI Test Equipment	12
<b>6. TEST SITE DESCRIPTION</b>	<b>13</b>
6.1 Test Facility Description	13
6.2 EUT Mounting, Bonding and Grounding	13
6.3 Facility Environmental Characteristics	13
<b>7. CHARACTERISTICS OF THE TRANSMITTER</b>	<b>14</b>
7.1 Channel Number and Frequencies	14
7.2 Antenna	14
<b>8. TEST PROCEDURES</b>	<b>15</b>
8.1 RF Emissions	15
8.1.1 Conducted Emissions Test	15
8.1.2 Radiated Emissions (Spurious and Harmonics) Test	16
8.1.3 DTS Bandwidth	17
8.1.4 Maximum Peak Conducted Output Power	17
8.1.5 Maximum Peak Power Spectral Density Level In The Fundamental Emission	17
8.1.6 Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth)	18
8.1.7 Emissions in the Restricted Bands (Radiated)	18
8.1.8 Emissions Radiated Outside of the Fundamental Frequency Band	18
<b>9. TEST PROCEDURE DEVIATIONS</b>	<b>19</b>
<b>10. CONCLUSIONS</b>	<b>19</b>



## LIST OF APPENDICES

<b>APPENDIX</b>	<b>TITLE</b>
A	Laboratory Accreditations and Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Factors, Charts, and Photos <ul style="list-style-type: none"> <li>• Test Setup Diagrams</li> <li>• Antenna and Amplifier Factors</li> <li>• Radiated and Conducted Emissions Photos</li> </ul>
E	Radiated and Conducted Emissions Data Sheets

## LIST OF FIGURES

<b>FIGURE</b>	<b>TITLE</b>
1	Plot Map And Layout of Test Site Below 1GHz
2	Plot Map And Layout of Test Site Above 1GHz
3	Conducted Emissions Test Setup



## GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full with the written permission of Compatible Electronics.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Device Tested: Modular Transmitter  
Model: ATWINC3400  
S/N: None

Product Description: The EUT is a BLE and Wifi Wireless Shielded Module with a chip antenna.

Modifications: The EUT was not modified in order to comply with specifications.

Manufacturer: Atmel Corporation  
1 Spectrum Pointe Dr., Suite 225  
Lake Forest, CA 92630

Test Dates: May 18<sup>th</sup> -19<sup>th</sup>, 2015  
June 16<sup>th</sup> – 30<sup>th</sup>, 2015

Test Specifications: EMI requirements  
CFR Title 47, Part 15 Subpart C Sections 15.205, 15.207, 15.209, & 15.247.

Test Procedure: ANSI C63.4 & C63.10, and KDB 558074 D01 v03r03.



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

## SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart C Section 15.207
2	Radiated RF Emissions & Harmonics, 9 kHz – 25,000 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart C Sections 15.205 & 15.209
3	DTS Bandwidth	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
4	Maximum Peak Conducted Output Power	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
5	Maximum Peak Power Spectral Density Level In The Fundamental Emission	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
6	Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth)	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
7	Emissions in the Restricted Bands	Complies with CFR Title 47 Part 15 Subpart C Section 15.247



## 1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Modular Transmitter Model: ATWINC3400. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10 & C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT (equipment under test) hereafter, are within the specification limits defined by the Code of Federal Regulations Title 47, Part 15 Subpart C sections 15.207, 15.205, 15.209, & 15.247.



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## **2. ADMINISTRATIVE DATA**

### **2.1 Location of Testing**

The tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way Lake Forest, California 92630.

### **2.2 Traceability Statement**

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

### **2.3 Cognizant Personnel**

Atmel Corporation

Hassan Hashemi	Senior Director
----------------	-----------------

Compatible Electronics Inc.

Torey Oliver Matt Harrison	Test Technician Lab Manager
-------------------------------	--------------------------------

### **2.4 Date Test Sample was Received**

The test sample was received on May 18<sup>th</sup>, 2015.

### **2.5 Disposition of the Test Sample**

The test sample remains at Compatible Electronics as of the date of this test report.

### **2.6 Abbreviations and Acronyms**

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
PCB	Printed Circuit Board
TX	Transmit
RX	Receive



### 3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.
ANSI C63.10: 2009	American National Standard for Testing Unlicensed Wireless Devices
KDB 558074 D01 v03r03	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247



## 4. DESCRIPTION OF TEST CONFIGURATION

### 4.1 Description of Test Configuration

The Modular Transmitter Model: ATWINC3400 (EUT) was setup in a tabletop configuration. The EUT was powered by a DC Supply (for Conducted Emissions the EUT was connected to a USB Power Adapter). The EUT was continuously transmitting a data stream. The EUT was checked in all axes and the X-Axis was found to be the worst case.

The voltage was varied  $\pm$  15% and the transmitting signal amplitude and frequency did not vary.

It was determined that the emissions were at their highest level when the EUT was transmitting in the configuration described above for Radiated Emissions. The final radiated data was taken in the above configuration. Please see Appendix E for the test data.

#### 4.1.1 Photograph Test Configuration



#### 4.1.2 Cable Construction and Termination

##### Cable 1-2

These are 2 meter, un-shielded, round cables that connect the EUT to the DC Power Supply. The cables were hardwired into the EUT and have banana connectors at the DC Supply end. The cables were not bundled.

##### Cable 3

This is a 10 centimeter, un-shielded, round cables that connect the EUT to the EUT Control Board. The cable is hardwired into both ends of the cable. The cable was not bundled.

##### Cable 4

This is a 1 meter, foil shielded, USB cable that connect the EUT to the USB Power Adapter. The cable is hardwired into both ends of the cable. The cable was not bundled. The shield of the cable was terminated at the connectors.



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

## 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

### 5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	MODULAR TRANSMITTER(EUT)	ATMEL CORPORATION	ATWINC3400	N/A
2	DC SUPPLY	MPJA	0-30V / 0-5A	017687
3	EUT CONTROL BOARD	ATMEL CORPORATION	NONE	NONE
4	USB POWER ADAPTER (CONDUCTED EMISSIONS)	BELKIN	F8J052	NONE



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

## 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	9/3/2014	9/3/2015
Antenna, Loop	Com Power	AL-130	121049	12/06/2013	12/06/2015
Antenna, CombiLog	Com Power	AC-220	25857	5/21/2014	5/21/2016
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	7/1/2014	7/1/2016
Antenna, Horn 18-26 GHz	Com Power	AH-826	081033	NCR	NCR
Pre-Amp, 1-18GHz	Com Power	PAM-118A	551034	2/6/2015	2/6/2016
Pre-Amp, 18-40GHz	Com Power	PA-840	181289	6/16/2014	6/16/2016
LISN	Com Power	LI-215	191937	4/16/2015	4/16/2016
RF Peak Power Meter/Analyzer	Boonton	4500A	1282	12/2/2014	12/2/2015
Peak Power Sensor	Boonton	57318	3723	12/2/2014	12/2/2015
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	6/4/2015	6/4/2016
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A



## 6. TEST SITE DESCRIPTION

### 6.1 Test Facility Description

Please refer to section 2.1 and the figures in Appendix D of this report for test location.

### 6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 by 0.8 meter high non-conductive table, which was placed on the ground plane.

The EUT was grounded through the USB Cable.

### 6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## 7. CHARACTERISTICS OF THE TRANSMITTER

### 7.1 Channel Number and Frequencies

For BLE there are a total of 40 channels. The low channel is at 2402.0 MHz and the high channel is at 2480.0 MHz. There is approximately 2 MHz separation between channels and the EUT uses GFSK modulation. Below are the channels and power settings:

#### BLE Settings

Channels	Gain Settings		
37, 0-10 ==	DG= -6.9	PPA 6	PA 6
38, 11-24 ==	DG= -8	PPA 6	PA 6
25-36, 39 ==	DG= -6.9	PPA 6	PA 6

For Wifi there are a total of 11 channels. The low channel is at 2412.0 MHz and the high channel is at 2462.0 MHz. There is approximately 5 MHz separation between channels and the EUT uses DSSS modulation. Below are the channels and power settings:

#### 802.11b Wifi Settings

Channels	Frequency	Gain Settings		
1 -11 ==	2412 - 2462 MHz	DG= -12		

#### 802.11g Wifi Settings

Channels	Frequency	Gain Settings		
1 ==	2412 MHz	DG= -6	PPA 12	PA 15
2-10 ==	2417-2457 MHz	DG= -8	PPA 15	PA 18
11 ==	2462 MHz	DG= -10	PPA 15	PA 18

#### 802.11n Wifi Settings

Channels	Frequency	Gain Settings		
1 ==	2412 MHz	DG= -11		
2-10 ==	2417-2457 MHz	DG= -8		
11 ==	2462 MHz	DG= -11		

## 7.2 Antenna

The antenna is a chip antenna.



## 8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

### 8.1 RF Emissions

#### 8.1.1 Conducted Emissions Test

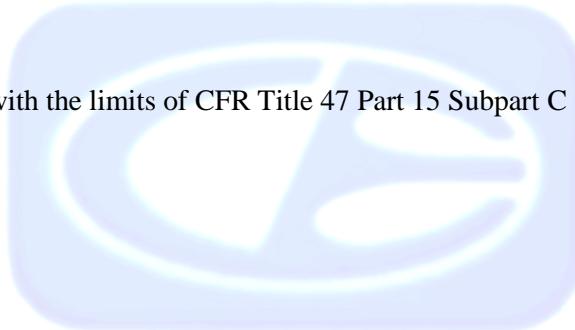
The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT received its power through the LISN, which was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the computer software. The final qualification data is located in Appendix E.

#### Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart C section 15.207.



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

### 8.1.2

### Radiated Emissions (Spurious and Harmonics) Test

The R&S receiver was used as a measuring meter. The receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. Amplifiers were used to increase the sensitivity of the instrument. There were two Microwave Preamplifier used for frequencies above 1 GHz.

For spurious emissions the quasi-peak detector was used for frequencies below 1GHz and the average detector was used for frequencies above 1 GHz.

For the radiated Harmonic emissions and Band Edges a linear average detector was used.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
.009 to .150	Active Loop Antenna	200 Hz
.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	100 kHz
1000 to 25000	Horn Antenna	1 MHz

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4, EN 50147-2, and CISPR 22. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters in both vertical and horizontal polarizations (for E field radiated field strength).

#### Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart C sections 15.205, 15.209, & 15.247.



### 8.1.3 DTS Bandwidth

The DTS Bandwidth was measured directly connected to the EMI Receiver using a RBW of 100 kHz and a VBW of 300 kHz. A peak detector and a max hold trace were used with auto sweep time. The trace was allowed to fully maximize. We measured the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. The automatic bandwidth measurement capability of the EMI Receiver was employed using the n dB bandwidth mode with n set to 6 dB. The final qualification data sheets are located in Appendix E.

#### Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247.

### 8.1.4 Maximum Peak Conducted Output Power

The maximum peak conducted output power was measured using a Peak Power Meter. The Peak Power Meter used a resolution bandwidth that is greater than the DTS bandwidth and a video bandwidth greater than 3 x RBW. The final qualification data sheets are located in Appendix E.

#### Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247.

### 8.1.5 Maximum Peak Power Spectral Density Level In The Fundamental Emission

The Maximum Peak Power Spectral Density Level in the Fundamental Emission was measured directly connected to the EMI Receiver. Tuned to the center frequency of the DTS channel and set the span to 1.5 times the DTS bandwidth. RBW was set to minimum 3 kHz but not > 100kHz and VBW 3 \* RBW. A peak detector was used with the sweep time set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level within the RBW. The final qualification data sheets are located in Appendix E.

#### Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247.



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

**8.1.6****Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth)**

The Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth) measurements were performed using the EMI Receiver directly connected to the EUT. A reference level was established by setting the instrument center frequency to DTS channel center frequency. The span was set to  $\geq$  1.5 times the DTS bandwidth. The RBW was 100 kHz and VBW 300 kHz. A peak detector was used with a sweep time set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the level and 20dB below that was the reference level. For Emission Level Measurement the center frequency and span were set to encompass the frequency range to be measured. RBW was set to 100 kHz and VBW to 300 kHz. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

**Test Results:**

The EUT complies with Part 15, Subpart C, Section 15.247.

**8.1.7****Emissions in the Restricted Bands (Radiated)**

The Emissions in the Restricted Bands measurement was performed using the EMI Receiver at a 3-meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E.

**Test Results:**

The EUT complies with Part 15 Subpart C, Section 15.205.

**8.1.8****Emissions Radiated Outside of the Fundamental Frequency Band**

The Band Edge measurement was performed using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low and high channels were tuned to during the low and high band edge tests. The final qualification data sheets are located in Appendix E.

**Test Results:**

The EUT complies with Part 15, Subpart C, Section 15.247.



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

## 9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

## 10. CONCLUSIONS

The Modular Transmitter Model: ATWINC3400 meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart C sections 15.205, 15.207, 15.209, & 15.247.



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

**APPENDIX A*****LABORATORY ACCREDITATIONS AND  
RECOGNITIONS***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## LABORATORY ACCREDITATIONS AND RECOGNITIONS



NVLAP LAB CODES 200063-0,  
200528-0, 200527-0

For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

### NVLAP listing links

Agoura Division - <http://ts.nist.gov/Standards/scopes/2000630.htm>

Brea Division - <http://ts.nist.gov/Standards/scopes/2005280.htm>

Silverado/Lake Forest Division - <http://ts.nist.gov/Standards/scopes/2005270.htm>



### ANSI listing

CETCB

<https://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4>



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

We are also certified/listed for IT products by the following country/agency:



### VCCI Listing, from VCCI site

[Enter "Compatible" in search form](http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html) [http://www.vcci.or.jp/vcci\\_e/activity/registration/setsubi.html](http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html)



### FCC Listing, from FCC OET site

[FCC test lab search](https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>



Compatible Electronics IC listing can be found at:  
<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

**APPENDIX B*****MODIFICATIONS TO THE EUT***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## MODIFICATIONS TO THE EUT

There were no modifications made during testing.



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**APPENDIX C*****ADDITIONAL MODELS COVERED  
UNDER THIS REPORT***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Modular Transmitter  
Model: ATWINC3400  
S/N: None

No additional models were tested.



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**APPENDIX D*****DIAGRAMS, FACTORS, CHARTS, AND PHOTOS***

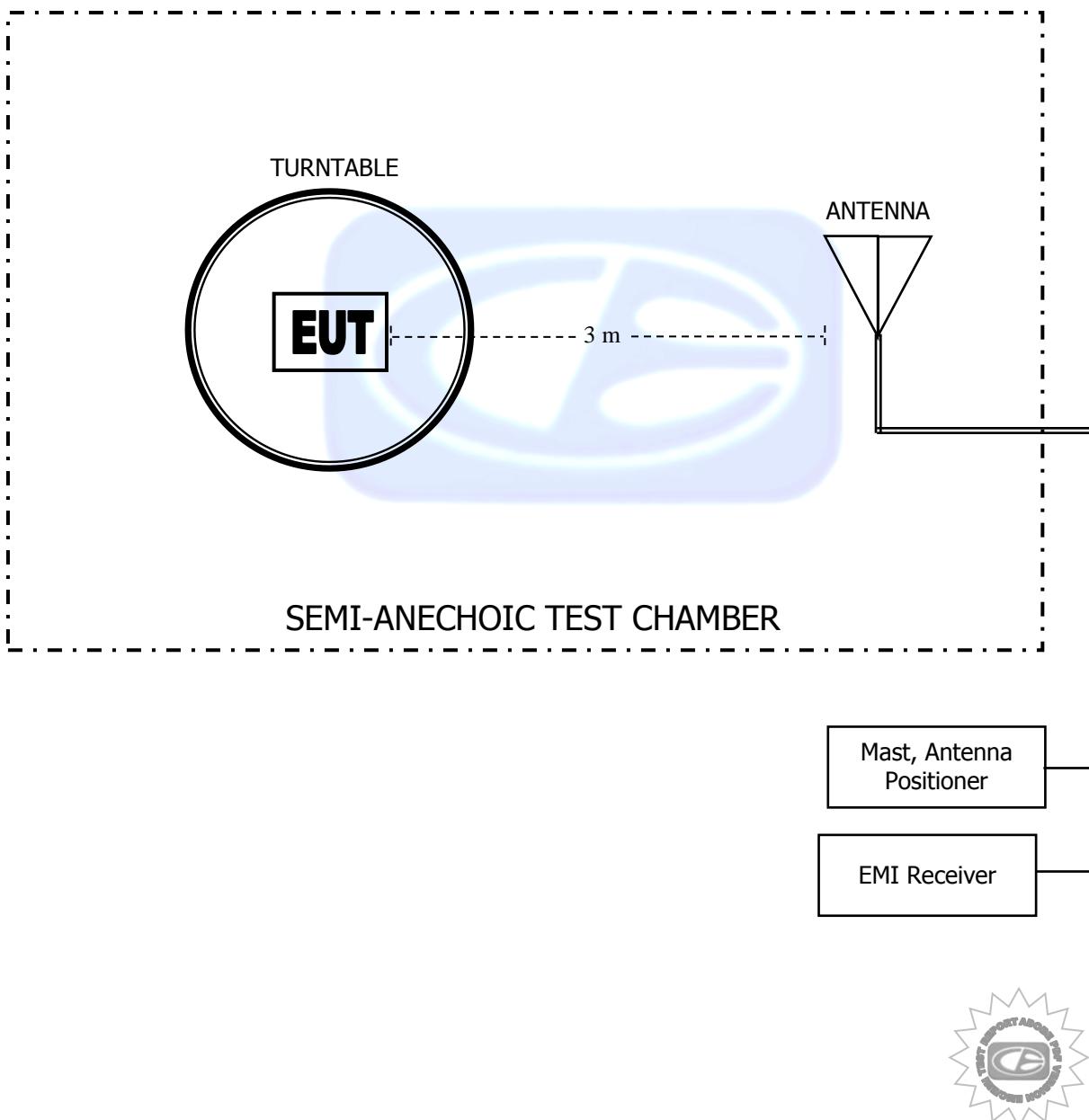
---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**FIGURE 1: PLOT MAP AND LAYOUT OF TEST SITE  
BELOW 1GHZ**

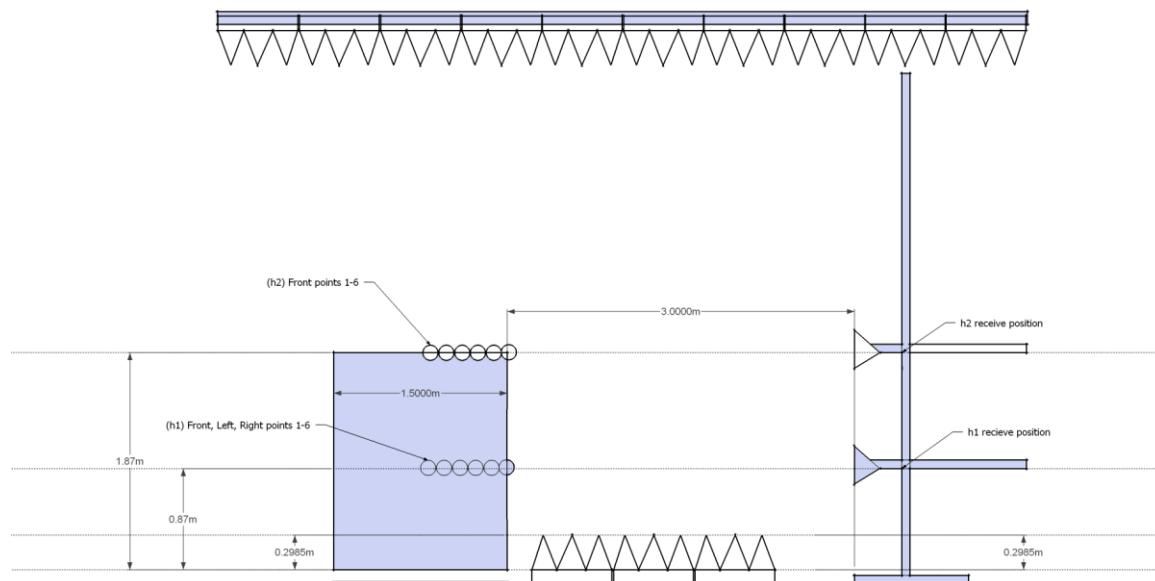
Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE  
ABOVE 1GHZ**



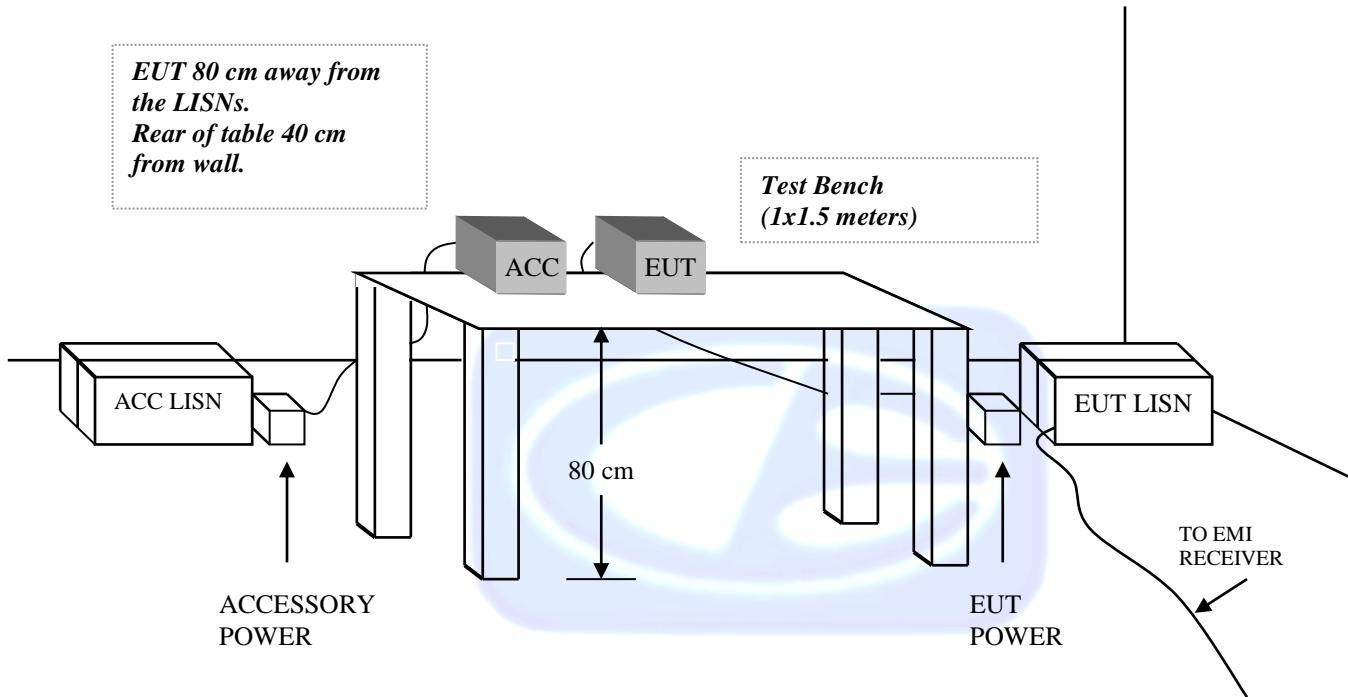
Brea Division  
 114 Olinda Drive  
 Brea, CA 92823  
 (714) 579-0500

Agoura Division  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

Silverado Division  
 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

Lake Forest Division  
 20621 Pascal Way  
 Lake Forest, CA 92630  
 (949) 587-0400

### **FIGURE 3: CONDUCTED EMISSIONS TEST SETUP**



# COM-POWER AL-130

## LOOP ANTENNA

S/N: 121049

CALIBRATION DUE: DECEMBER 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
<b>0.009</b>	-34.64	16.86	<b>0.8</b>	-36.32	15.18
<b>0.01</b>	-34.78	16.72	<b>0.9</b>	-36.22	15.28
<b>0.02</b>	-35.91	15.59	<b>1.0</b>	-36.22	15.28
<b>0.03</b>	-35.48	16.02	<b>2.0</b>	-35.91	15.59
<b>0.04</b>	-35.82	15.68	<b>3.0</b>	-35.91	15.59
<b>0.05</b>	-36.49	15.01	<b>4.0</b>	-36.01	15.49
<b>0.06</b>	-36.30	15.20	<b>5.0</b>	-35.80	15.70
<b>0.07</b>	-36.43	15.07	<b>6.0</b>	-36.00	15.50
<b>0.08</b>	-36.30	15.20	<b>7.0</b>	-35.90	15.60
<b>0.09</b>	-36.39	15.11	<b>8.0</b>	-35.70	15.80
<b>0.1</b>	-36.41	15.09	<b>9.0</b>	-35.70	15.80
<b>0.2</b>	-36.61	14.89	<b>10.0</b>	-35.60	15.90
<b>0.3</b>	-36.63	14.87	<b>15.0</b>	-36.52	14.98
<b>0.4</b>	-36.52	14.99	<b>20.0</b>	-35.75	15.75
<b>0.5</b>	-36.63	14.87	<b>25.0</b>	-37.78	13.72
<b>0.6</b>	-36.62	14.88	<b>30.0</b>	-38.62	12.88
<b>0.7</b>	-36.53	14.97			



**COM-POWER AC-220**
**LAB R - COMBILOG ANTENNA**
**S/N: 25857**
**CALIBRATION DUE: MAY 21, 2016**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
<b>30</b>	22.5	<b>160</b>	13.3
<b>35</b>	22.5	<b>180</b>	15.0
<b>40</b>	23.0	<b>200</b>	14.6
<b>45</b>	21.5	<b>250</b>	16.5
<b>50</b>	21.3	<b>300</b>	18.1
<b>60</b>	18.2	<b>400</b>	19.4
<b>70</b>	13.2	<b>500</b>	21.4
<b>80</b>	11.6	<b>600</b>	21.6
<b>90</b>	11.9	<b>700</b>	23.7
<b>100</b>	12.6	<b>800</b>	26.0
<b>120</b>	15.1	<b>900</b>	26.6
<b>140</b>	13.6	<b>1000</b>	28.5



# COM-POWER AH-118

## HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 1, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	30.1	9500	44.2
1500	29.2	10000	43.4
2000	31.6	10500	44.6
2500	35.5	11000	45.1
3000	33.7	11500	45.7
3500	36.0	12000	46.2
4000	35.4	12500	45.4
4500	35.5	13000	44.8
5000	40.1	13500	46.7
5500	37.8	14000	47.8
6000	39.0	14500	46.4
6500	39.9	15000	47.2
7000	40.4	15500	45.5
7500	44.4	16000	45.0
8000	44.1	16500	44.5
8500	43.1	17000	47.0
9000	43.0	17500	47.8
		18000	44.2



# COM-POWER PAM-118A

## 1-18GHz - PREAMPLIFIER

S/N: 551034

CALIBRATION DUE: FEBRUARY 6, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	36.77	5500	39.82
1000	38.63	6000	38.74
1100	38.72	6500	39.60
1200	38.97	7000	35.52
1300	38.59	7500	36.61
1400	39.18	8000	36.92
1500	38.71	8500	37.13
1600	39.28	9000	36.50
1700	39.25	9500	38.92
1800	39.06	10000	38.74
1900	40.34	11000	35.23
2000	40.07	12000	35.64
2500	39.69	13000	36.73
3000	40.94	14000	36.48
3500	40.41	15000	37.57
4000	40.44	16000	38.10
4500	41.20	17000	37.34
5000	39.35	18000	36.80



# COM-POWER PA-840

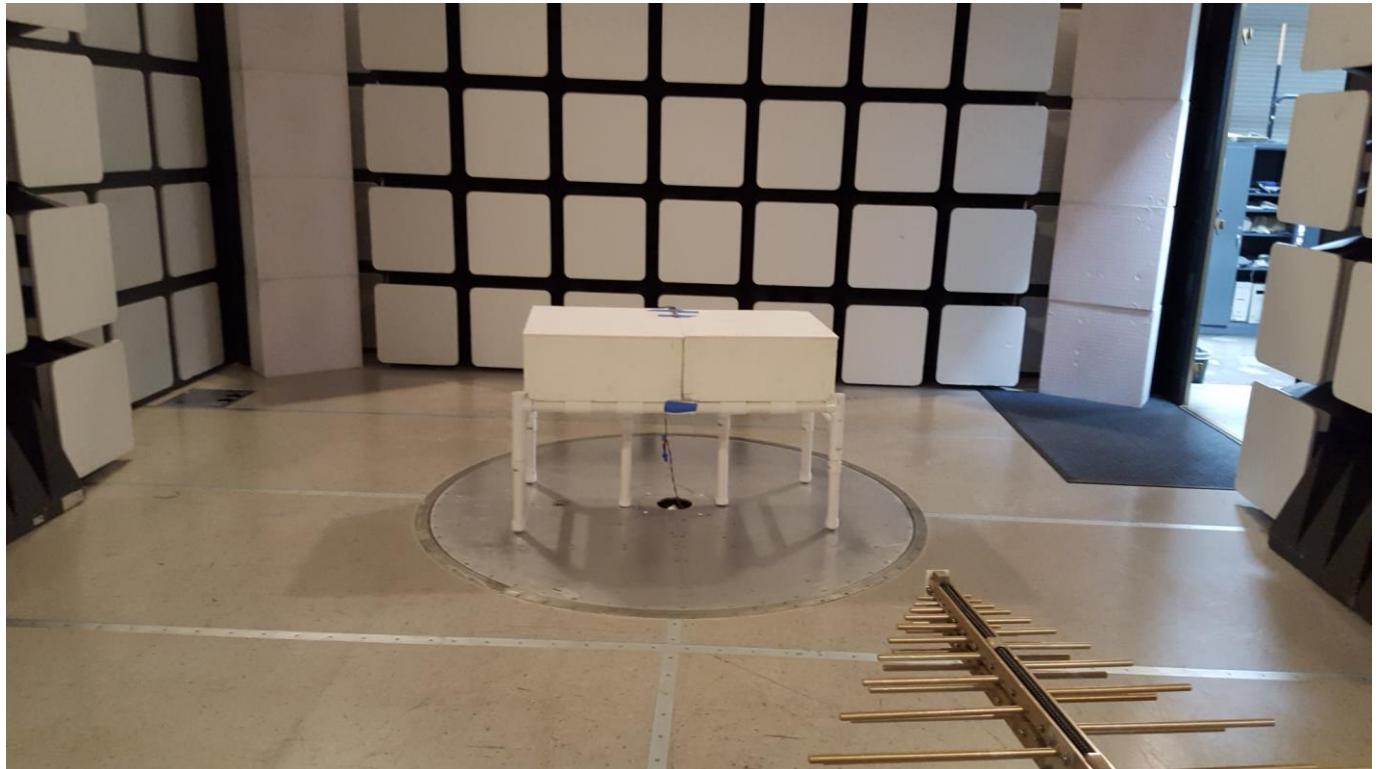
## 18-40 GHz PREAMPLIFIER

S/N: 181289

CALIBRATION DUE: JUNE 16, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	29.4	31500	28.2
19000	28.8	32000	28.6
20000	30.5	32500	28.8
21000	31.4	33000	28.2
22000	31.2	33500	27.7
23000	30.1	34000	27.2
24000	30.3	34500	28.2
25000	29.8	35000	27.3
26000	30.5	35500	27.2
26500	30.7	36000	27.2
27000	30.8	36500	27.5
27500	30.2	37000	27.0
28000	30.1	37500	26.7
28500	30.2	38000	26.2
29000	30.1	38500	26.5
29500	29.8	39000	26.3
30000	29.2	39500	26.9
30500	28.4	40000	27.6
31000	29.8		



**FRONT VIEW**

ATMEL CORPORATION  
MODULAR TRANSMITTER  
Model: ATWINC3400  
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

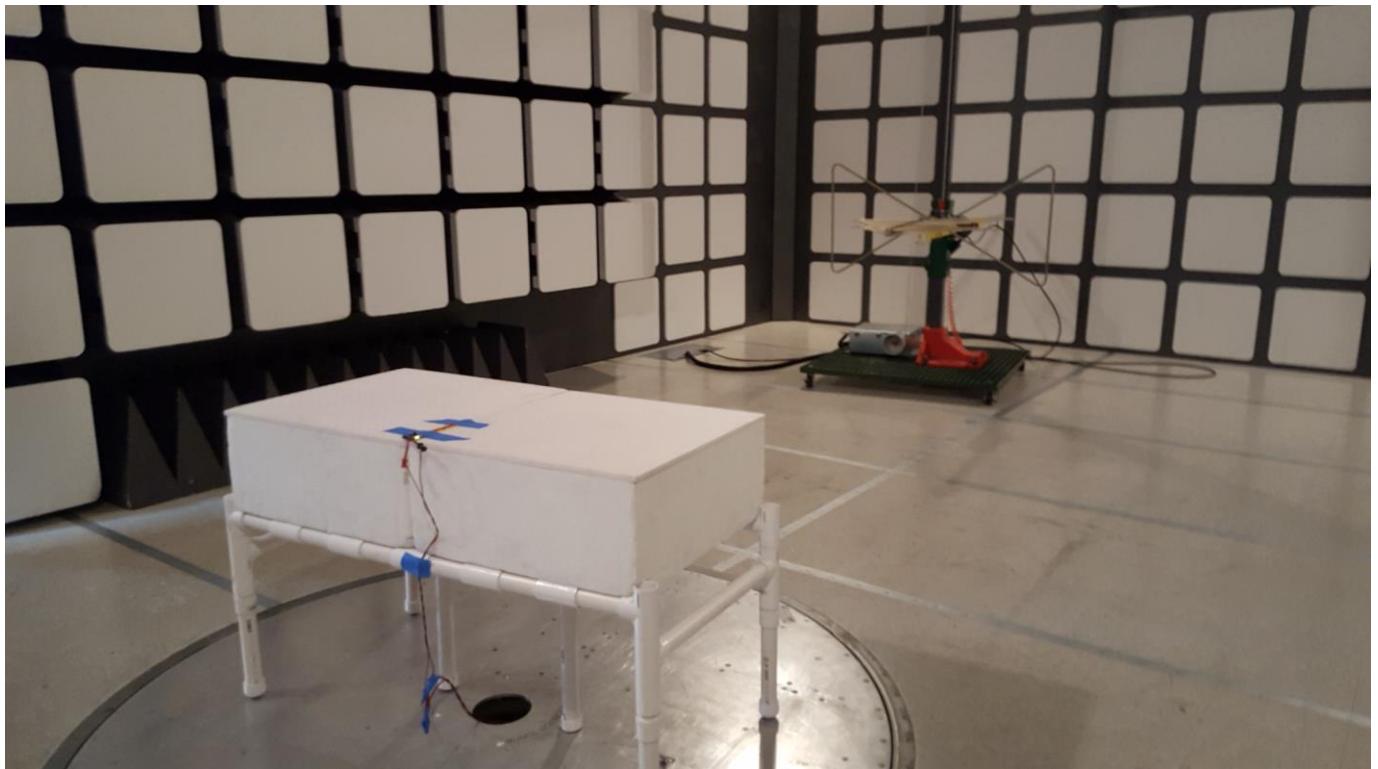
---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**REAR VIEW**

ATMEL CORPORATION  
MODULAR TRANSMITTER  
Model: ATWINC3400  
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**FRONT VIEW**

ATMEL CORPORATION  
MODULAR TRANSMITTER  
Model: ATWINC3400  
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**REAR VIEW**

ATMEL CORPORATION  
MODULAR TRANSMITTER  
Model: ATWINC3400  
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**FRONT VIEW**

ATMEL CORPORATION  
MODULAR TRANSMITTER  
Model: ATWINC3400  
FCC SUBPART C - CONDUCTED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**REAR VIEW**

ATMEL CORPORATION  
MODULAR TRANSMITTER  
Model: ATWINC3400  
FCC SUBPART C - CONDUCTED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**APPENDIX E*****RADIATED EMISSIONS DATA SHEETS***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

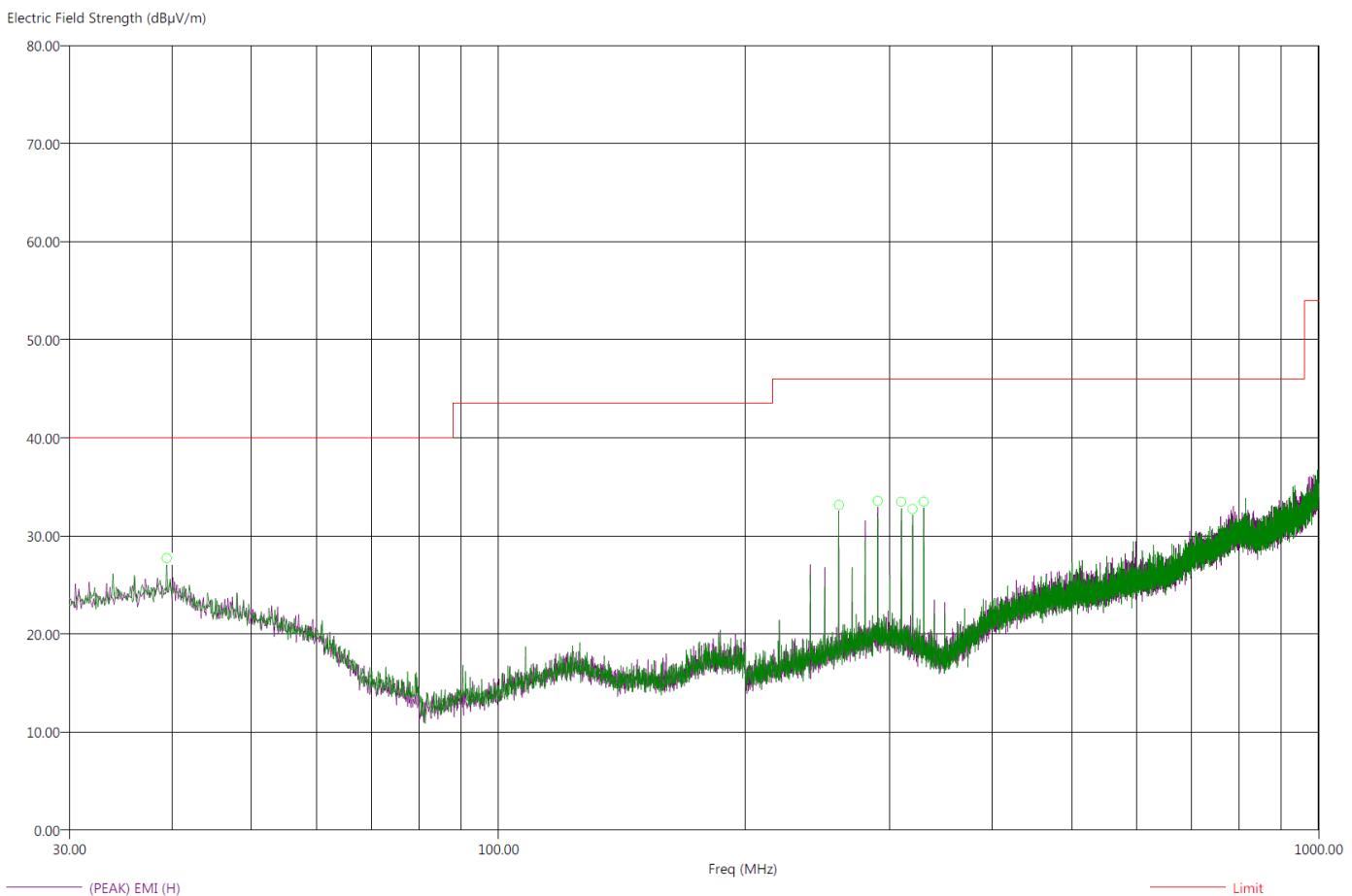
Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

Title: FCC 15.209  
 File: Radiated Pre-Scan 30-1000Mhz\_b.set  
 Operator: Matt Harrison  
 EUT Type: ATWINC3400.  
 EUT Condition: Transmitting @ 802.11b, 2442 MHz.  
 Comments: Temp: 73f  
 Hum: 43%  
 3.3VDC

5/19/2015 10:42:08 AM  
 Sequence: Preliminary Scan

**Compatible Electronics, Inc. FAC-3 (Lab R)**


*This was worst case for all modes and channels*  
*There were no radiated emissions besides harmonics found between 9kHz-30 MHz or 1GHz-25GHz.*



Brea Division	Agoura Division	Silverado Division	Lake Forest Division
114 Olinda Drive Brea, CA 92823 (714) 579-0500	2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	19121 El Toro Road Silverado, CA 92676 (949) 589-0700	20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400

Title: FCC 15.209  
 File: Radiated Final 30-1000Mhz\_b.set  
 Operator: Matt Harrison  
 EUT Type: ATWINC3400.  
 EUT Condition: Transmitting @ 802.11b, 2442 MHz.  
 Comments: Temp: 73f  
 Hum: 43%  
 3.3VDC

5/19/2015 10:59:13 AM  
 Sequence: Final Measurements

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dB $\mu$ V/m)	(PEAK) EMI (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer(dB)	Cable(dB)
39.40	-19.75	20.25	25.25	40.00	V	156.00	156.10	22.95	1.27
260.00	-15.06	30.94	33.06	46.00	H	92.75	120.52	16.84	1.81
290.00	-12.41	33.59	35.13	46.00	H	257.50	99.98	17.80	2.04
310.00	-13.44	32.56	34.12	46.00	V	0.00	229.89	17.57	1.98
320.00	-11.63	34.37	35.94	46.00	V	167.75	177.23	17.06	1.96
330.00	-10.27	35.73	36.85	46.00	H	267.00	101.47	16.56	1.94

*This was worst case for all modes and channels*

*There were no radiated emissions besides harmonics found between 9kHz-30 MHz or 1GHz-25GHz.*



**APPENDIX E*****CONDUCTED EMISSIONS DATA SHEETS***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

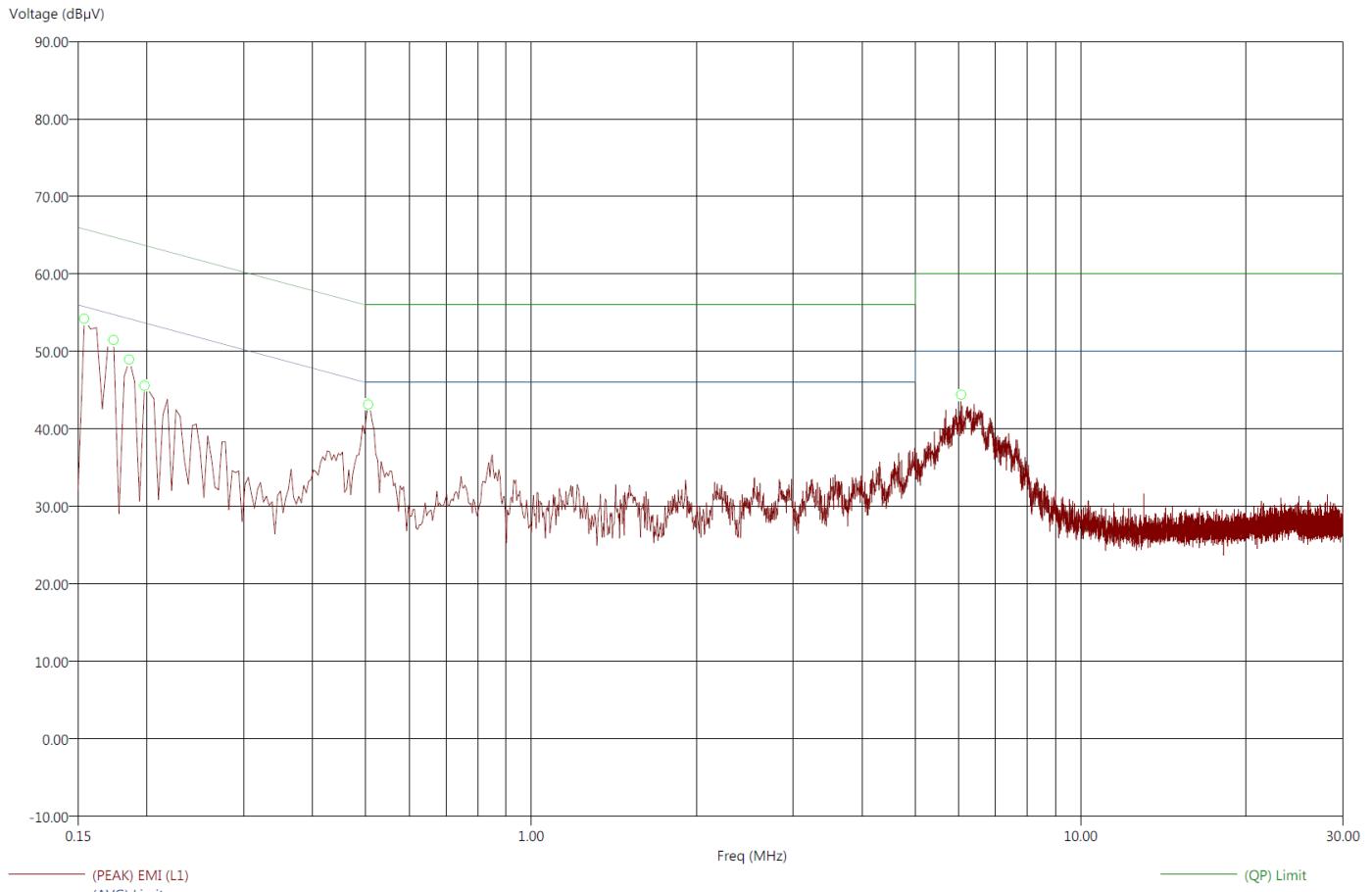
Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

Title: FCC 15.207  
 File: Conducted Pre-Line.set  
 Operator: Matt Harrison  
 EUT Type: Wireless Module, ATWINC3400.  
 EUT Condition: Transmitting @ 802.11b, 2442 MHz.  
 Comments: Connected to Control Board Powered By USB Adapter.  
 Temp: 74f  
 Hum: 48%  
 USB Adapter: 120V 60Hz

5/19/2015 2:12:11 PM  
 Sequence: Preliminary Scan

### Compatible Electronics, Inc. FAC-3 (LAB R)



Title: FCC 15.207

5/19/2015 2:14:49 PM

File: Conducted Final-Line.set

Sequence: Final Measurements

Operator: Matt Harrison

EUT Type: Wireless Module, ATWINC3400.

EUT Condition: Transmitting @ 802.11b, 2442 MHz.

Comments: Connected to Control Board Powered By USB Adapter.

Temp: 74f

Hum: 48%

USB Adapter: 120V 60Hz

**Compatible Electronics, Inc. FAC-3 (LAB R)**

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dB $\mu$ V)	(QP) EMI (dB $\mu$ V)	(PEAK) EMI (dB $\mu$ V)	(AVG) Limit (dB $\mu$ V)	(QP) Limit (dB $\mu$ V)	Transducer (dB)	Cable (dB)
0.15	-29.48	-18.36	26.30	47.42	56.45	55.78	65.78	0.44	0.19
0.17	-30.95	-19.63	23.82	45.13	53.60	54.77	64.77	0.38	0.24
0.19	-31.89	-19.24	22.32	44.98	52.47	54.21	64.21	0.35	0.27
0.20	-31.93	-21.50	21.77	42.19	51.60	53.69	63.69	0.32	0.30
0.51	-13.94	-15.37	32.06	40.63	43.61	46.00	56.00	0.02	0.00
6.06	-21.37	-21.13	28.63	38.87	45.92	50.00	60.00	0.03	0.34

*This was worst case for all modes and channels*


Title: FCC 15.207

5/19/2015 2:20:26 PM

File: Conducted

Pre-Neutral.set Sequence: Preliminary Scan

Operator: Matt Harrison

EUT Type: Wireless Module, ATWINC3400.

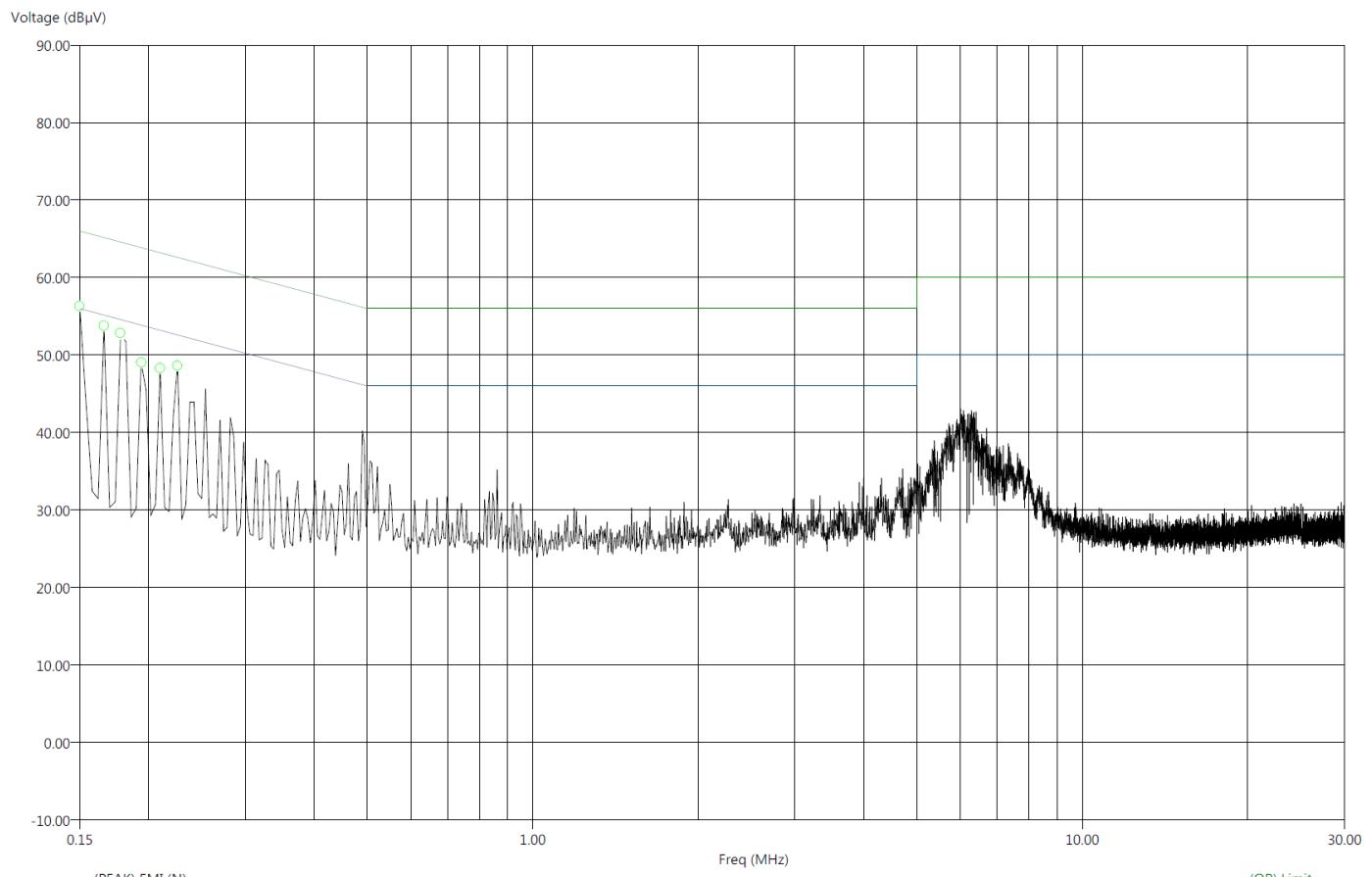
EUT Condition: Transmitting @ 802.11b, 2442 MHz.

Comments: Connected to Control Board Powered By USB Adapter.

Temp: 74f

Hum: 48%

USB Adapter: 120V 60Hz

**Compatible Electronics, Inc. FAC-3 (LAB R)**


Brea Division  
 114 Olinda Drive  
 Brea, CA 92823  
 (714) 579-0500

Agoura Division  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

Silverado Division  
 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

Lake Forest Division  
 20621 Pascal Way  
 Lake Forest, CA 92630  
 (949) 587-0400

Title: FCC 15.207

5/19/2015 2:23:06 PM

File: Conducted

Final-Neutral.set Sequence: Final Measurements

Operator: Matt Harrison

EUT Type: Wireless Module, ATWINC3400.

EUT Condition: Transmitting @ 802.11b, 2442 MHz.

Comments: Connected to Control Board Powered By USB Adapter.

Temp: 74f

Hum: 48%

USB Adapter: 120V 60Hz

**Compatible Electronics, Inc. FAC-3 (LAB R)**

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dB $\mu$ V)	(QP) EMI (dB $\mu$ V)	(PEAK) EMI (dB $\mu$ V)	(AVG) Limit (dB $\mu$ V)	(QP) Limit (dB $\mu$ V)	Transducer (dB)	Cable (dB)
0.15	-29.13	-16.07	26.87	49.93	56.54	56.00	66.00	0.44	0.18
0.17	-29.58	-17.46	25.58	47.70	54.82	55.16	65.16	0.39	0.22
0.18	-29.98	-18.16	24.59	46.42	54.84	54.58	64.58	0.36	0.25
0.19	-30.90	-19.42	22.96	44.45	53.37	53.86	63.86	0.32	0.29
0.21	-31.20	-21.35	22.00	41.85	50.05	53.21	63.21	0.28	0.28
0.23	-30.12	-23.14	22.47	39.46	49.17	52.60	62.60	0.25	0.26

*This was worst case for all modes and channels*


***DTS BANDWIDTH******DATA SHEETS***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## DTS BANDWIDTH

### BLE Mode

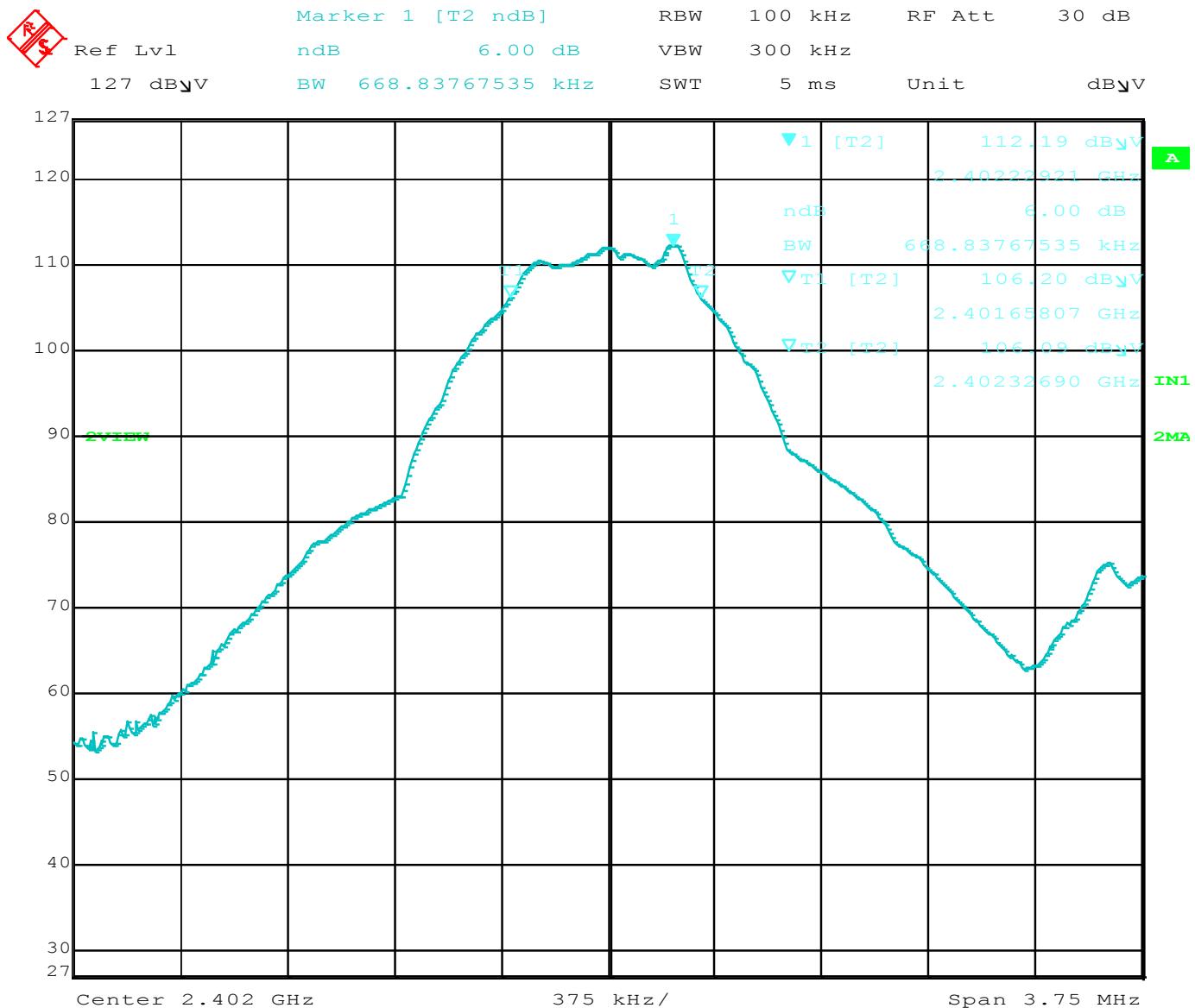
**FCC 15.247**

Company: Atmel Corporation    Date: 6/25/2015  
 EUT: Modular Transmitter    Lab: R  
 Model: ATWINC3400    Test ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**
**DTS Bandwidth**

Freq. (MHz)	Measured BW (kHz)	Limit (Min) (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2402	668.84	500.00	168.84	Peak	
2440	668.84	500.00	168.84	Peak	
2480	668.84	500.00	168.84	Peak	



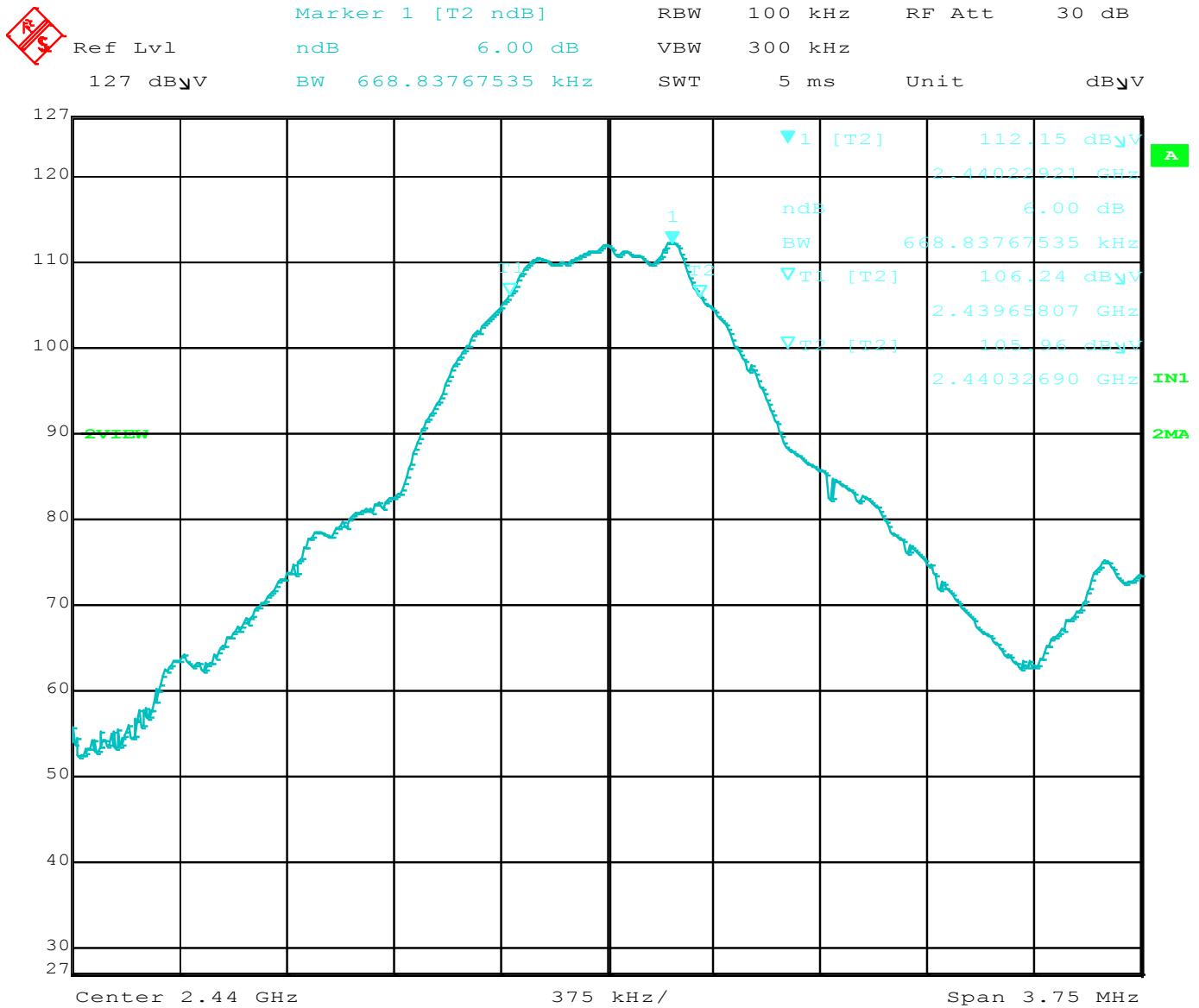


Title: (BT).

Comment A: DTS BW, Low Channel.

Date: 25.JUN.2015 15:10:02



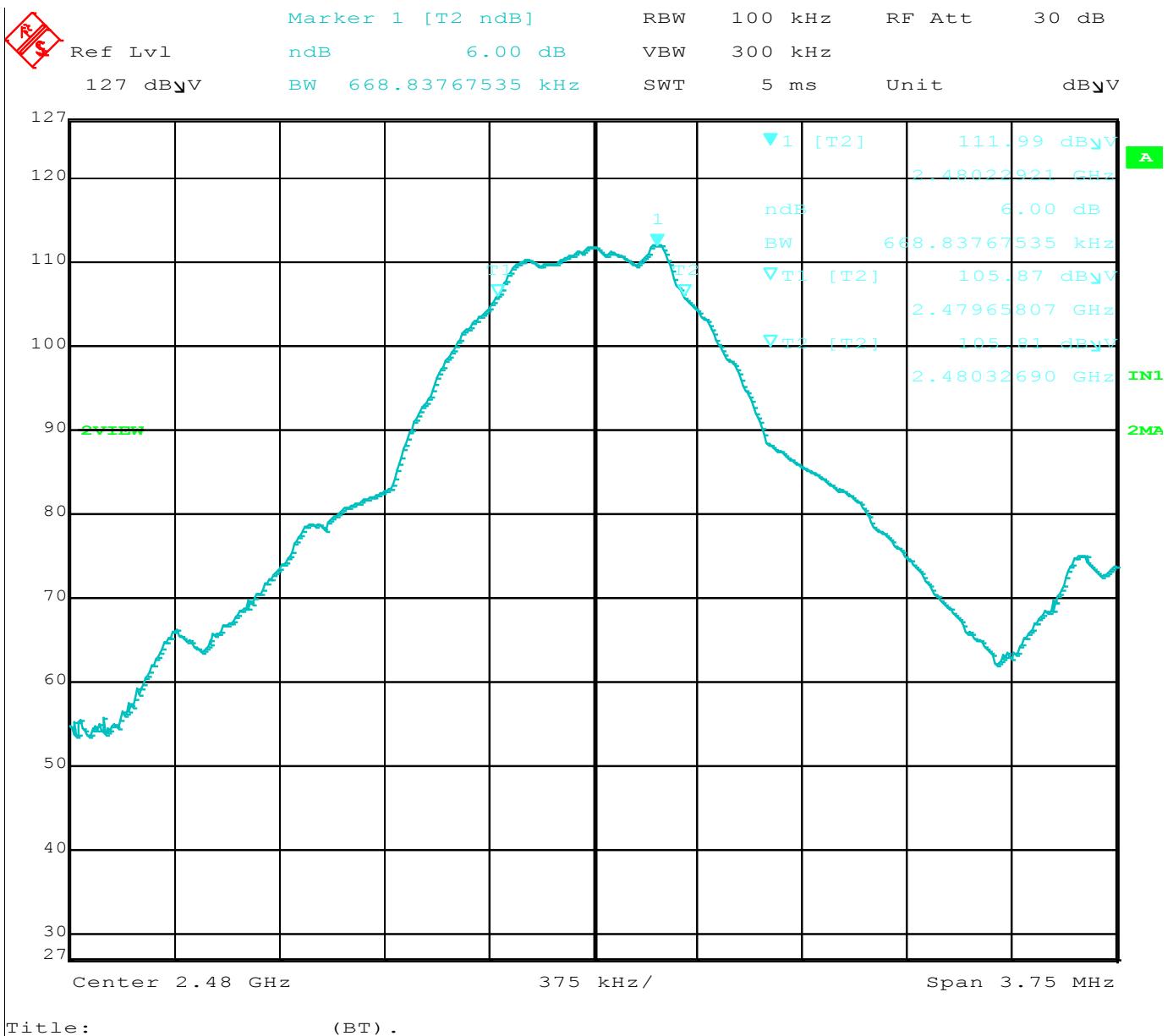


Title: (BT) .

Comment A: DTS BW, Mid Channel.

Date: 25.JUN.2015 15:12:21





## DTS BANDWIDTH

### 802.11b Mode

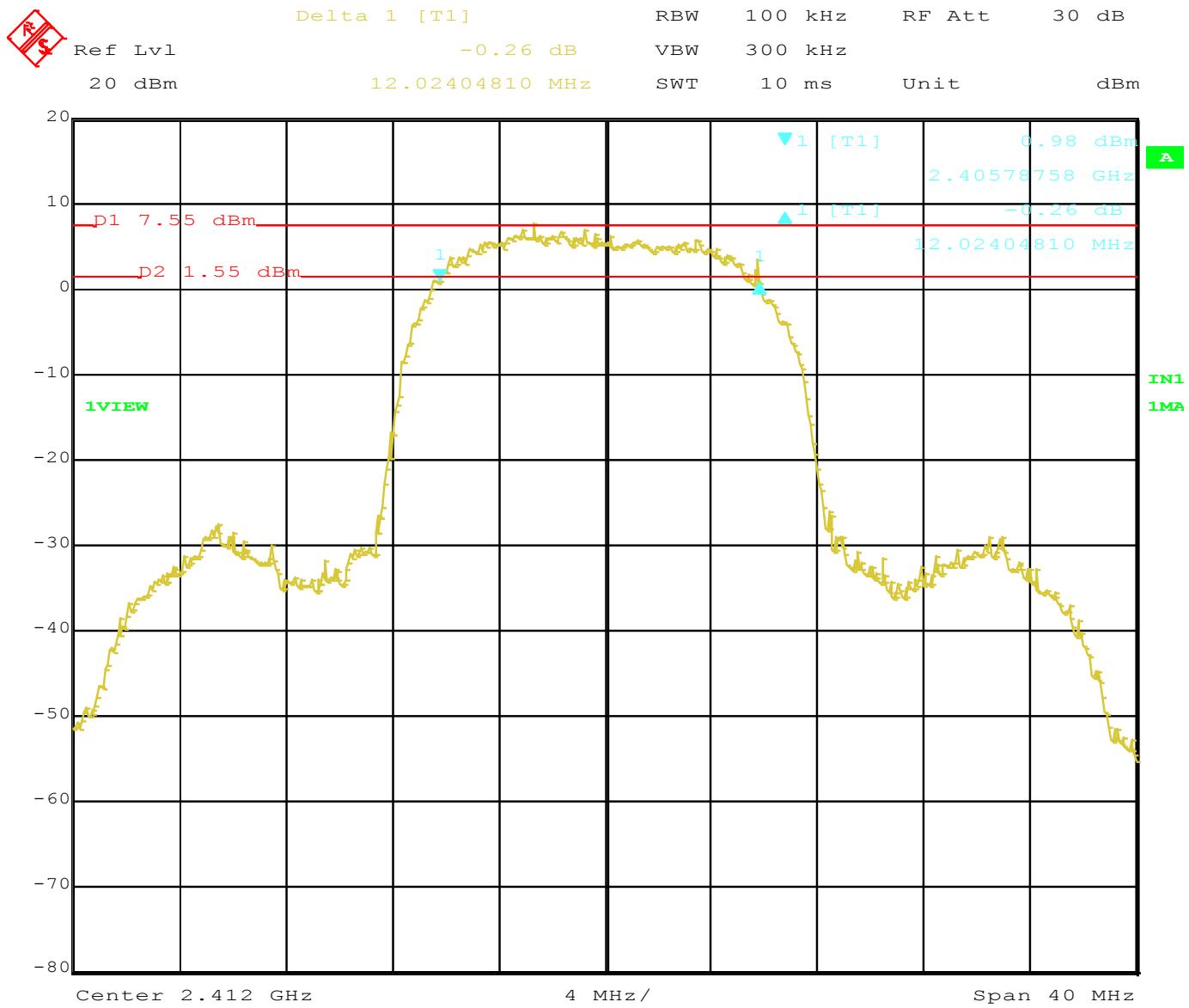
**FCC 15.247**

Company:	Atmel Corporation	Date:	5/19/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11b		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**
**DTS Bandwidth**

Freq. (MHz)	Measured BW (kHz)	Limit (Min) (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	12024.05	500.00	11524.05	Peak	
2442	11382.77	500.00	10882.77	Peak	
2462	11182.36	500.00	10682.36	Peak	



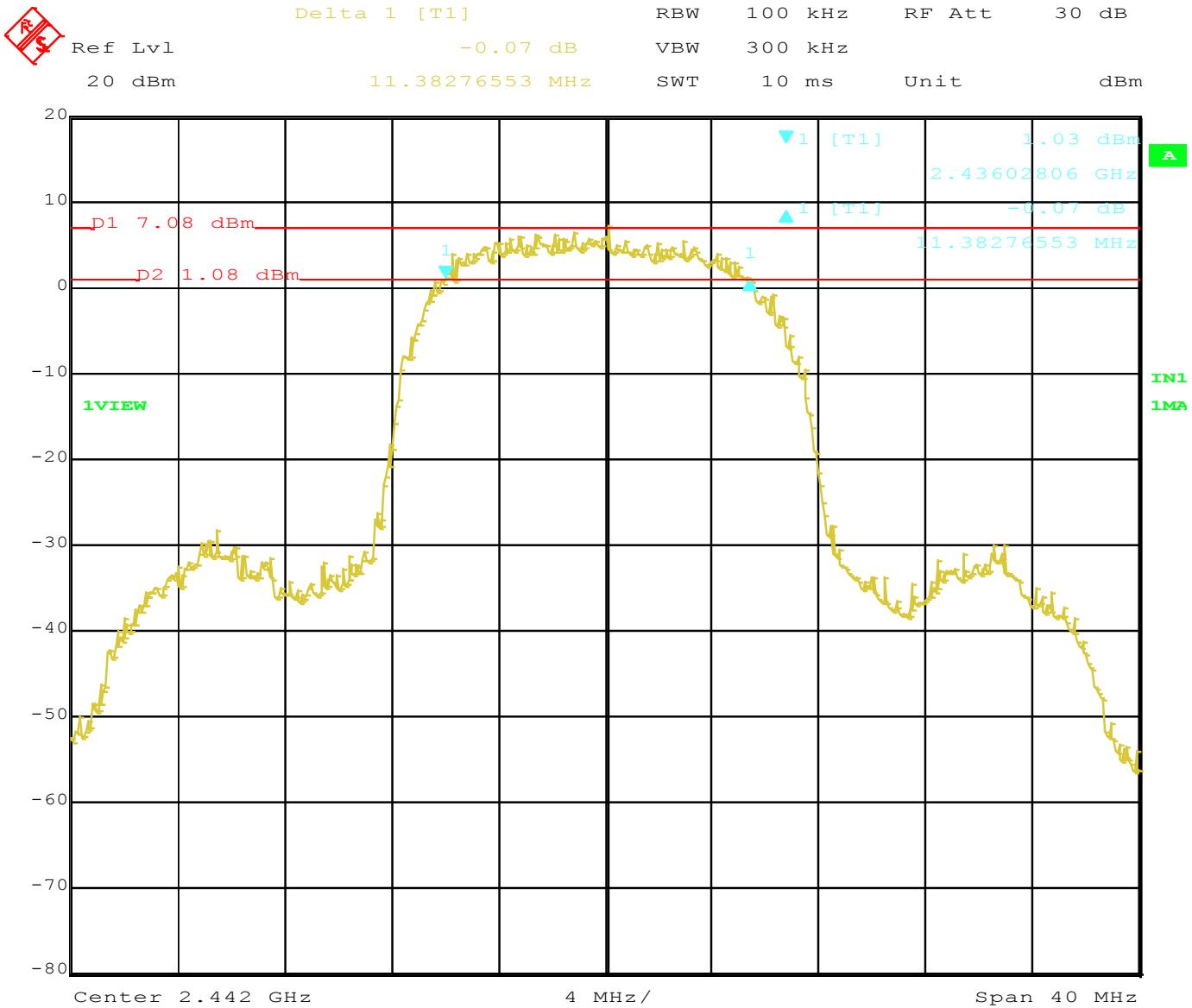


Title:

Comment A: DTS BW, 802.11b, 2412MHz.

Date: 19.MAY.2015 15:17:05



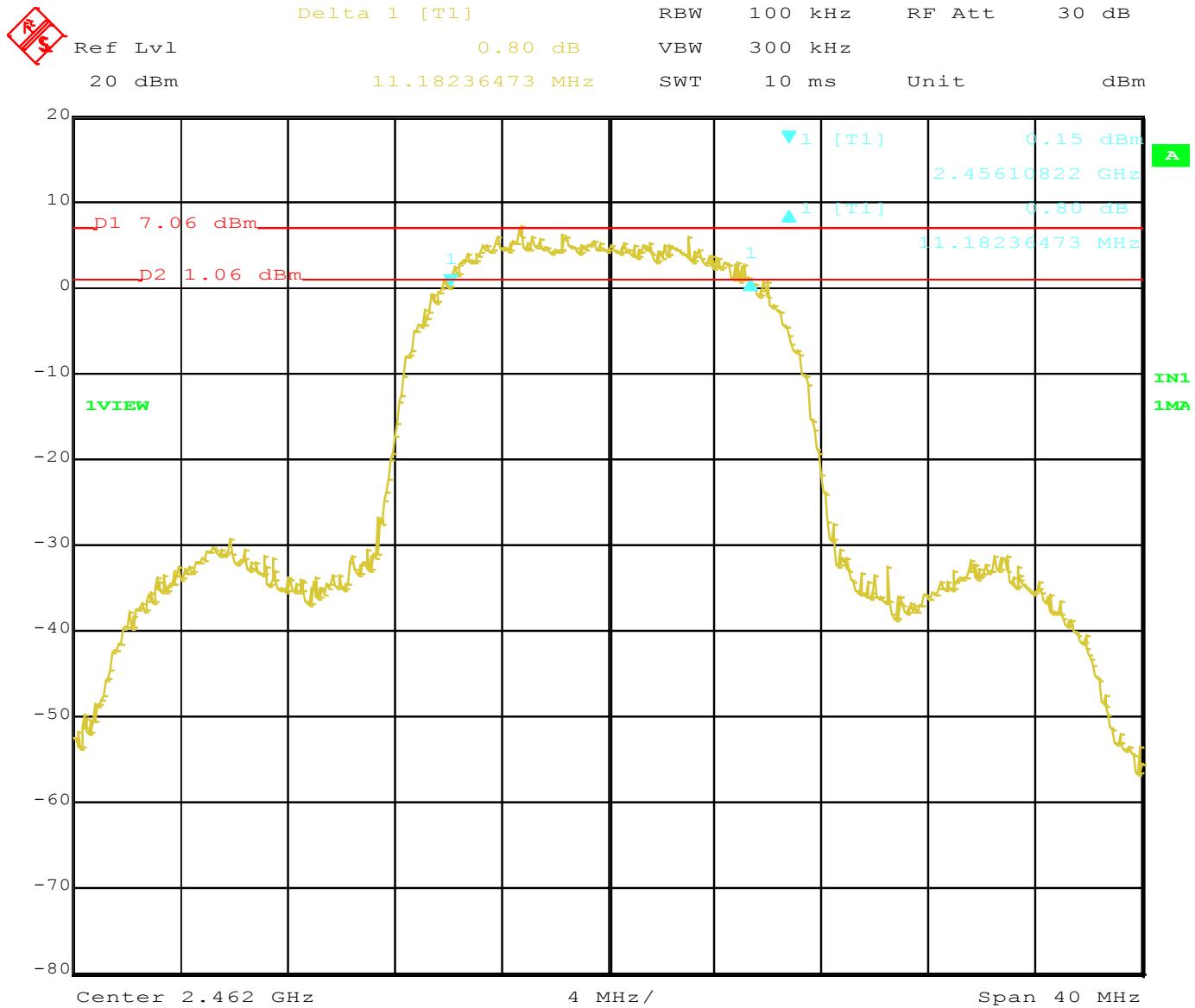


Title:

Comment A: DTS BW, 802.11b, 2442MHz.

Date: 19.MAY.2015 15:20:00





Title: .  
 Comment A: DTS BW, 802.11b, 2442MHz.  
 Date: 19.MAY.2015 15:23:59



## DTS BANDWIDTH

### 802.11g Mode

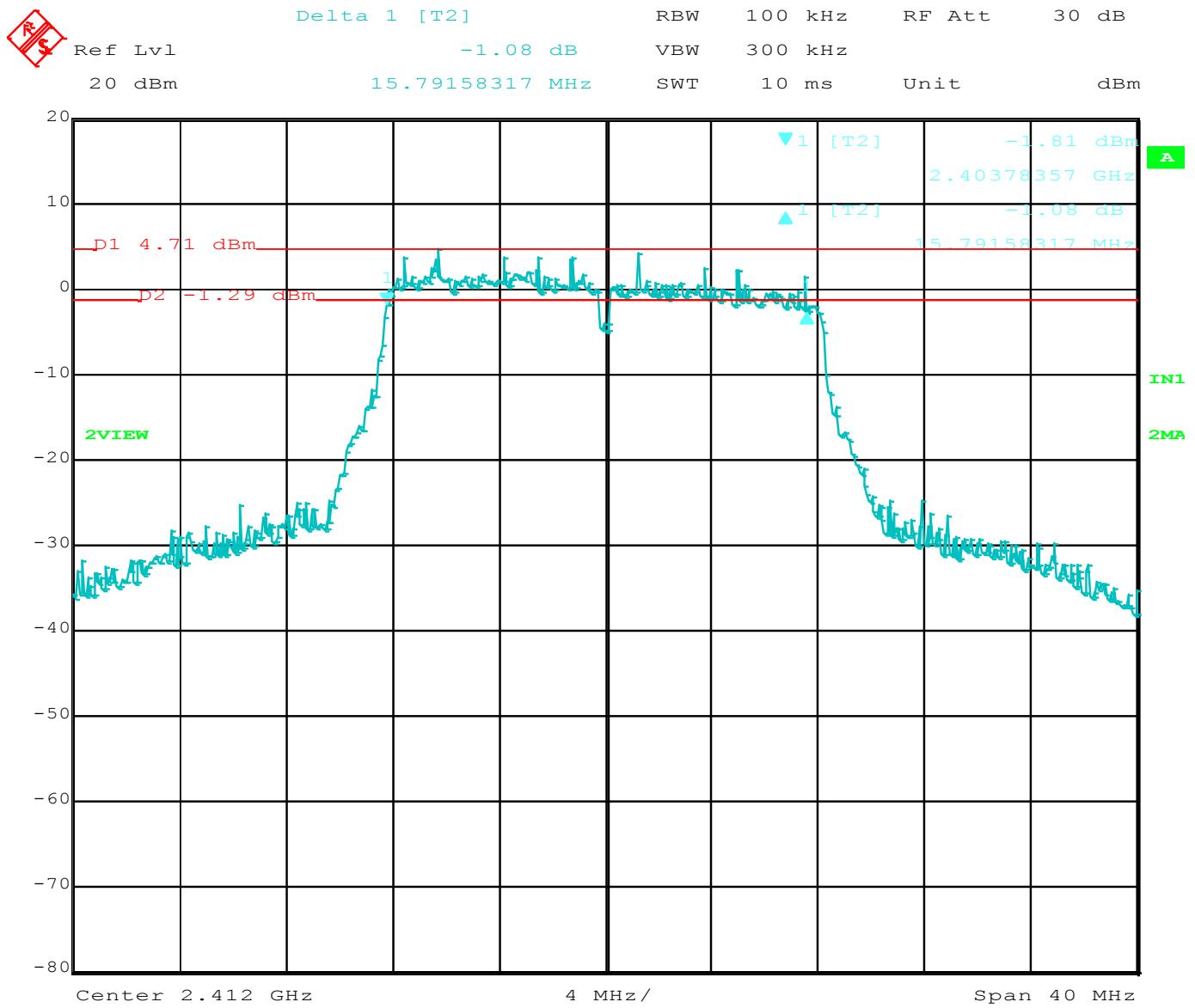
**FCC 15.247**

Company:	Atmel Corporation	Date:	5/19/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11g		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**
**DTS Bandwidth**

Freq. (MHz)	Measured BW (kHz)	Limit (Min) (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	15791.58	500.00	15291.58	Peak	
2442	15951.90	500.00	15451.90	Peak	
2462	15911.82	500.00	15411.82	Peak	



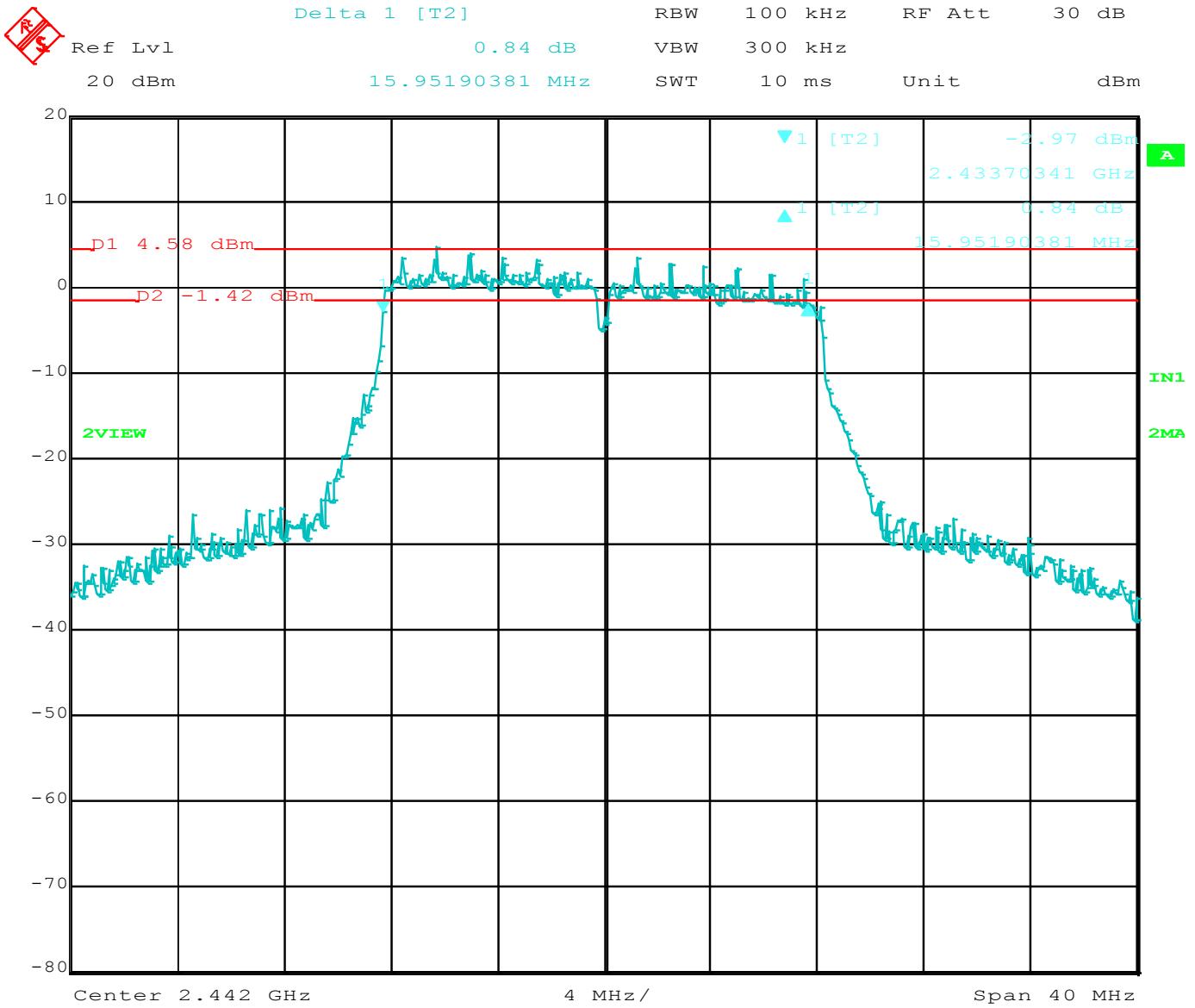


Title:

Comment A: DTS BW, 802.11g, 2412MHz.

Date: 19.MAY.2015 15:25:48



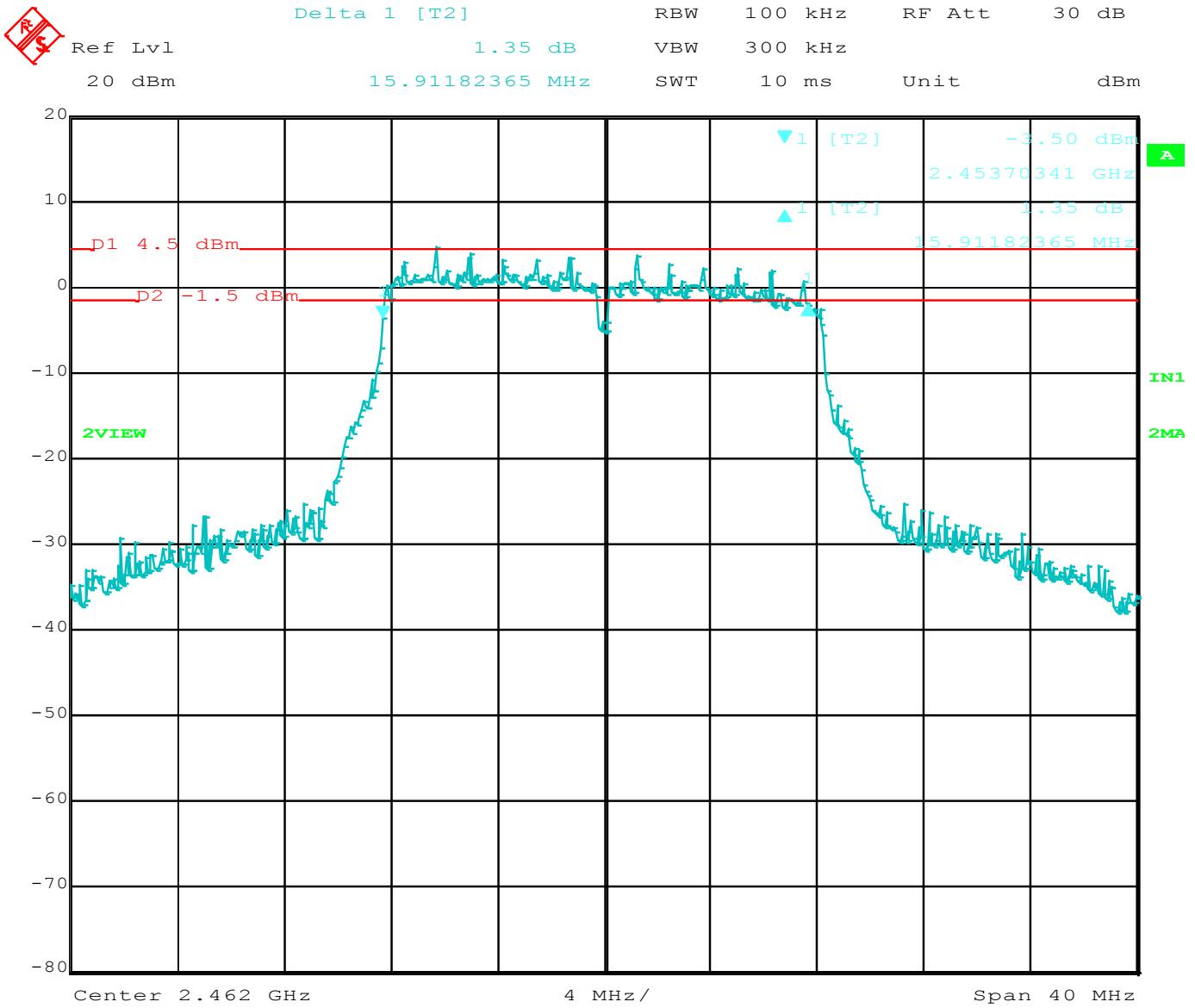


Title:

Comment A: DTS BW, 802.11g, 2442MHz.

Date: 19.MAY.2015 15:27:38





Title:

Comment A: DTS BW, 802.11g, 2462MHz.

Date: 19.MAY.2015 15:29:33



## DTS BANDWIDTH

### 802.11n Mode

**FCC 15.247**

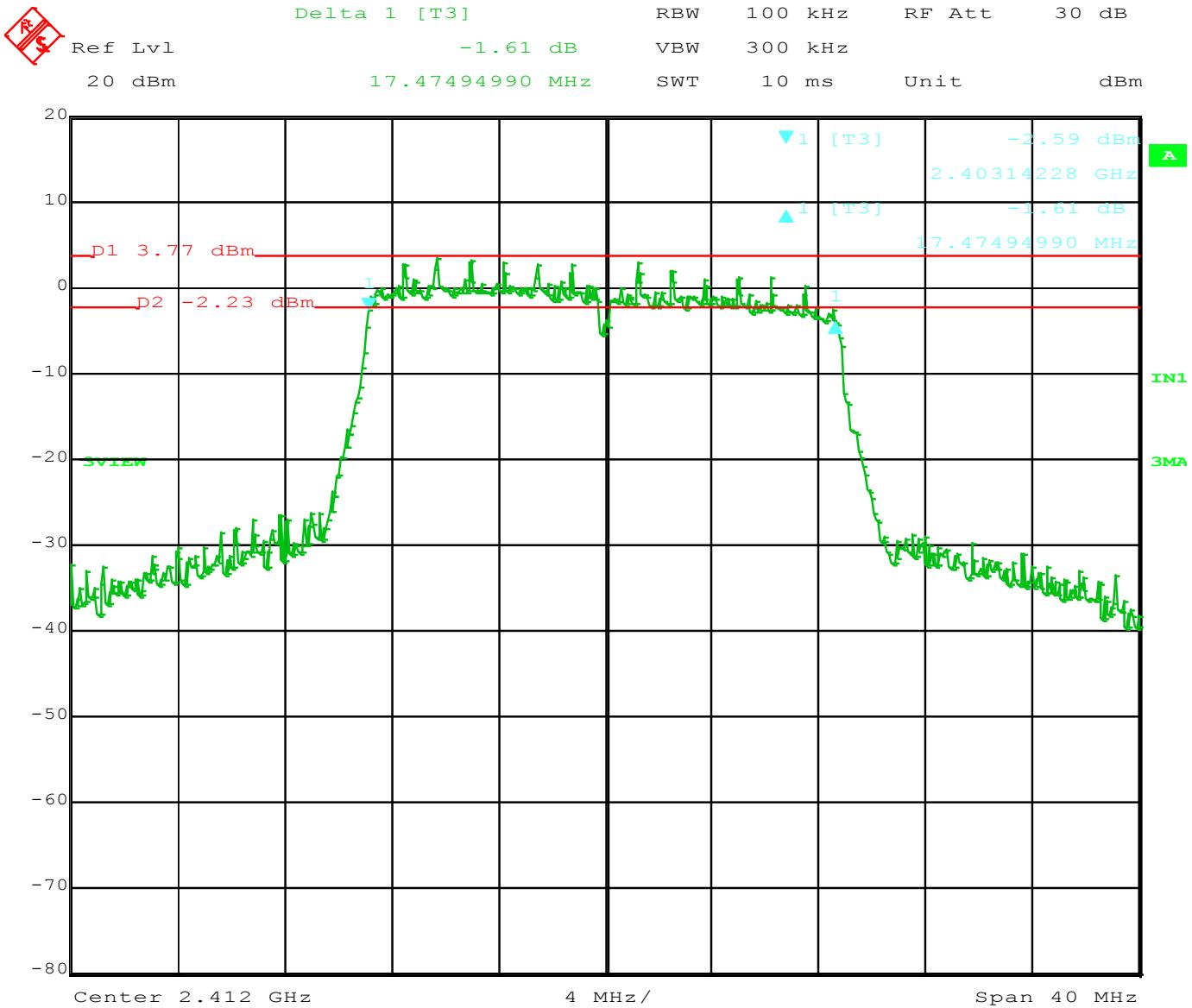
Company:	Atmel Corporation	Date:	5/19/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11n		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

**DTS Bandwidth**

Freq. (MHz)	Measured BW (kHz)	Limit (Min) (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	17474.95	500.00	16974.95	Peak	
2442	16673.35	500.00	16173.35	Peak	
2462	16553.11	500.00	16053.11	Peak	



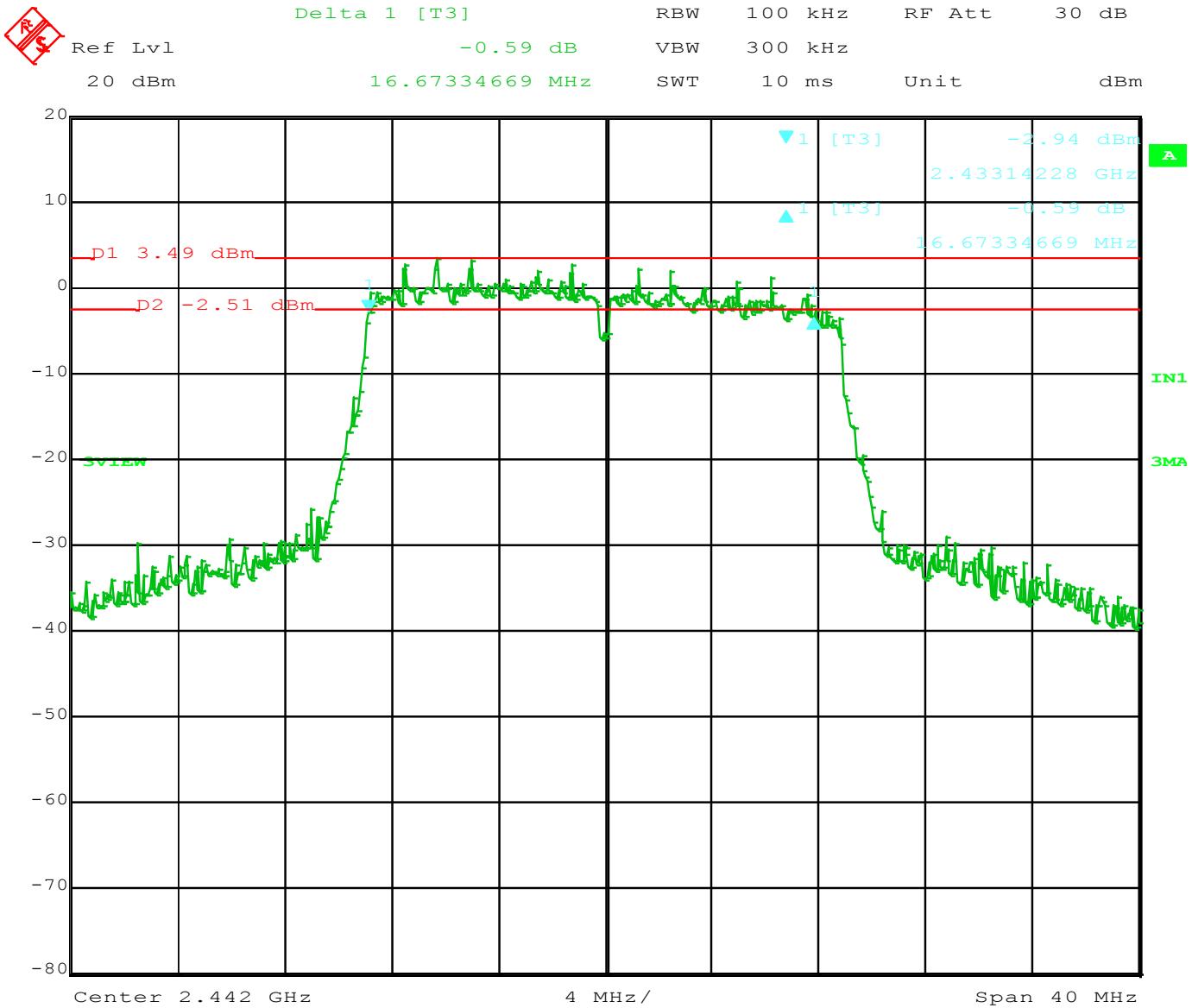


Title:

Comment A: DTS BW, 802.11n, 2412MHz.

Date: 19.MAY.2015 15:33:24



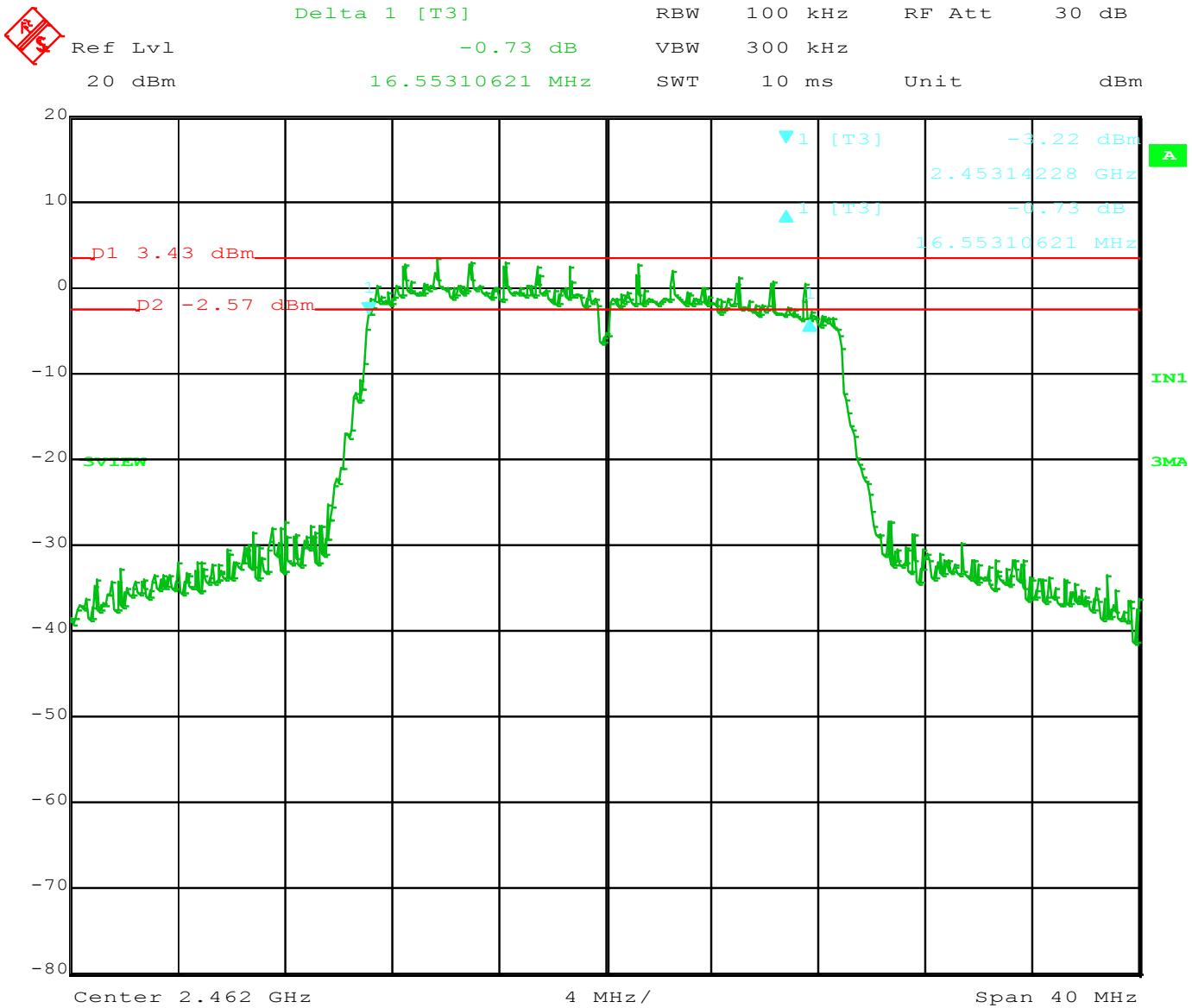


Title:

Comment A: DTS BW, 802.11n, 2442MHz.

Date: 19.MAY.2015 15:34:40




**Title:**

Comment A: DTS BW, 802.11n, 2462MHz.

Date: 19.MAY.2015 15:39:12



***MAXIMUM PEAK CONDUCTED OUTPUT POWER******DATA SHEETS***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## **MAXIMUM PEAK CONDUCTED OUTPUT POWER**

### **BLE Mode**

**FCC 15.247**

Company: Atmel Corporation      Date: 6/25/2015  
 EUT: Modular Transmitter      Lab: R  
 Model: ATWINC3400      Test ENG: M. Harrison  
 Mode: BLE

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2402	6.69	30.00	-23.31	Peak	PPA= 6, PA= 6, DG = -6.9
2440	6.13	30.00	-23.87	Peak	PPA= 6, PA= 6, DG = -8
2480	7.14	30.00	-22.86	Peak	PPA= 6, PA= 6, DG = -6.9



**MAXIMUM PEAK CONDUCTED OUTPUT POWER**
**802.11b Mode**
**FCC 15.247**

Company:	Atmel Corporation	Date:	5/18/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11b		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	20.98	30.00	-9.02	Peak	DigGain= -12
2442	20.90	30.00	-9.10	Peak	DigGain= -12
2462	20.71	30.00	-9.29	Peak	DigGain= -12



## **MAXIMUM PEAK CONDUCTED OUTPUT POWER**

### **802.11g Mode**

**FCC 15.247**

Company:	Atmel Corporation	Date:	6/16/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11g		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	22.36	30.00	-7.64	Peak	DigGain= -6, PPA = 12, PA = 15
2442	23.22	30.00	-6.78	Peak	DigGain= -8, PPA= 15, PA =18
2462	23.21	30.00	-6.79	Peak	DigGain= -10, PPA= 15, PA =18



**MAXIMUM PEAK CONDUCTED OUTPUT POWER**
**802.11n Mode**
**FCC 15.247**

Company:	Atmel Corporation	Date:	5/19/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11n		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	23.13	30.00	-6.87	Peak	DigGain= -11
2442	23.66	30.00	-6.34	Peak	DigGain= -8
2462	23.00	30.00	-7.00	Peak	DigGain= -11



***MAXIMUM PEAK POWER SPECTRAL DENSITY LEVEL IN THE  
FUNDAMENTAL EMISSION*****DATA SHEETS**

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

# PEAK POWER SPECTRAL DENSITY

## BLE Mode

**FCC 15.247**

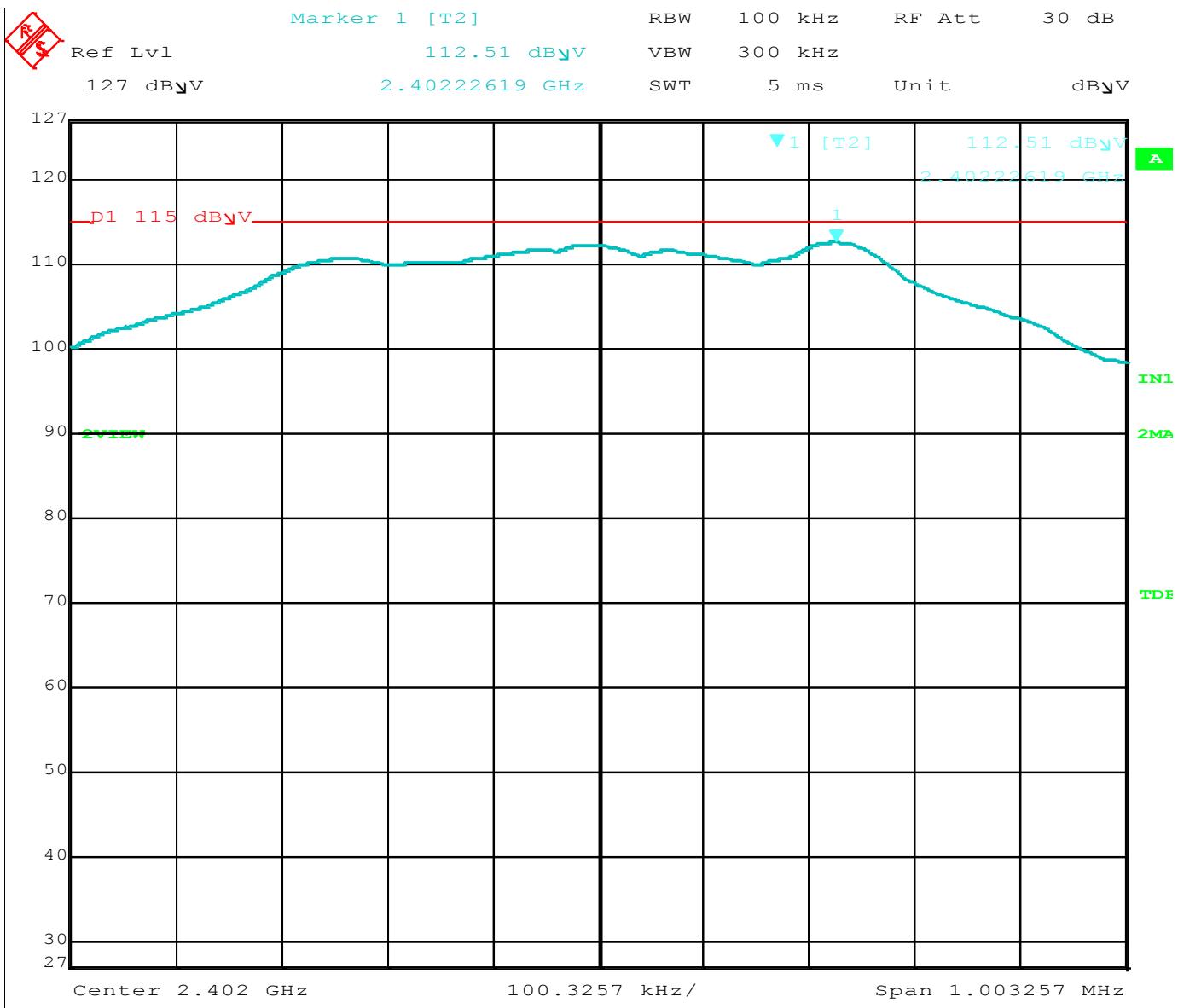
Company: Atmel Corporation      Date: 6/25/2015  
 EUT: Modular Transmitter      Lab: R  
 Model: ATWINC3400      Test ENG: M. Harrison

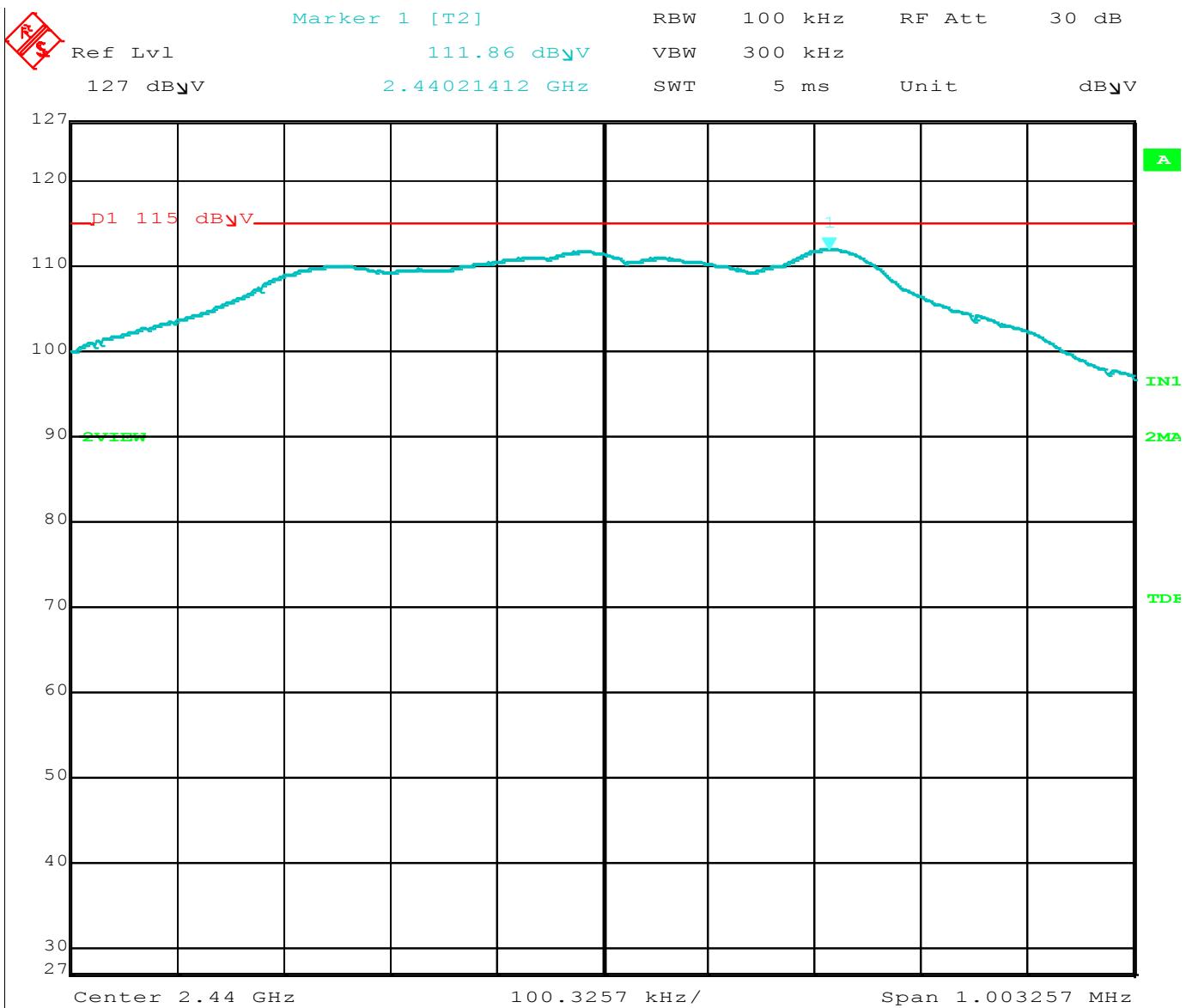
**Compatible Electronics, Inc. FAC-3 ( Lab R )**

DTS Bandwidth

Freq. (MHz)	Peak (dBuV)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Comments
2402	112.51	115.00	-2.49	Peak	
2440	111.86	115.00	-3.14	Peak	
2480	112.31	115.00	-2.69	Peak	





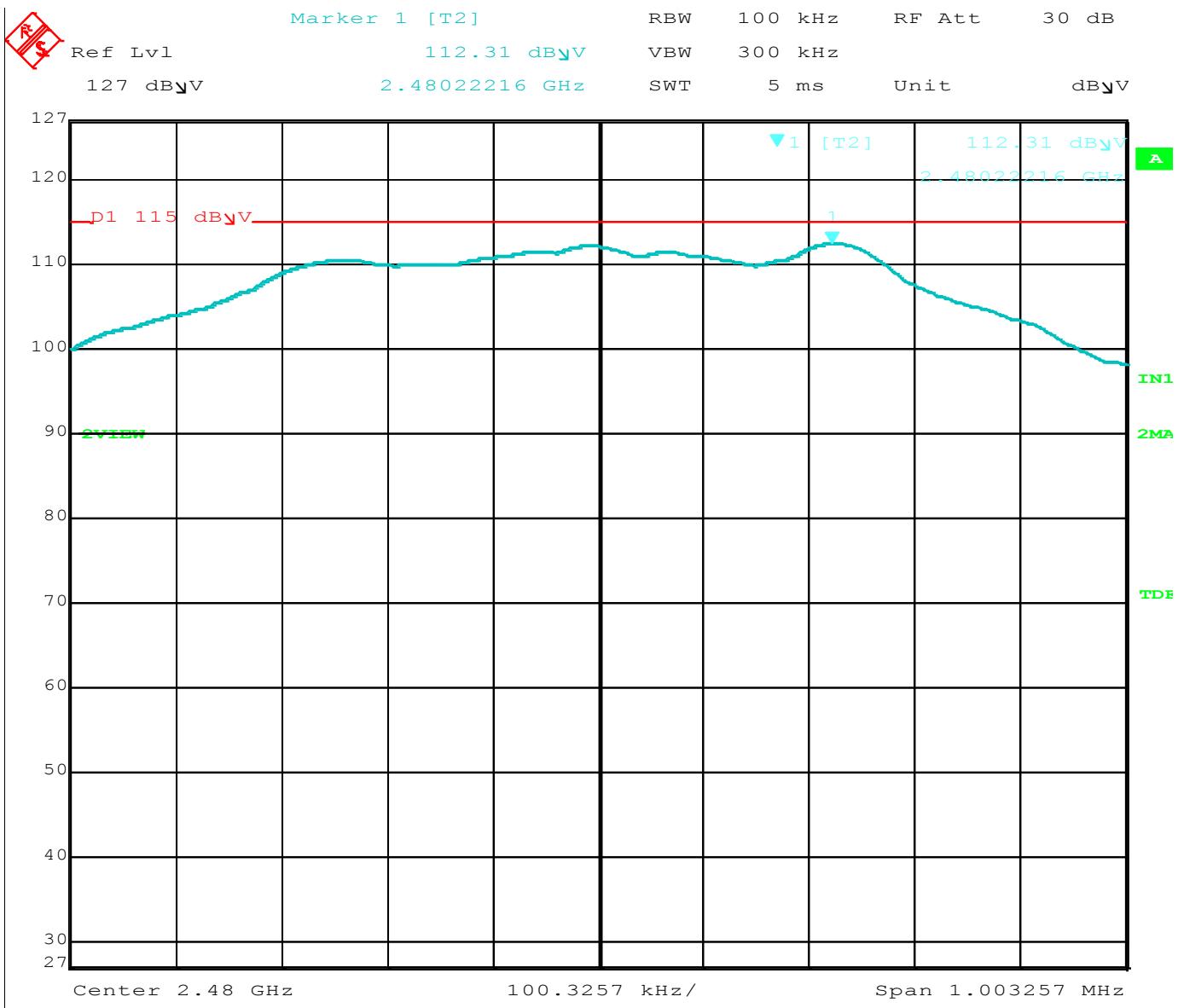


Title:

Comment A: PSD, Mid Channel.

Date: 30.JUN.2015 10:21:25





Title: (BT).  
 Comment A: PSD, High Channel.  
 Date: 25.JUN.2015 15:19:39



# PEAK POWER SPECTRAL DENSITY

## 802.11b Mode

**FCC 15.247**

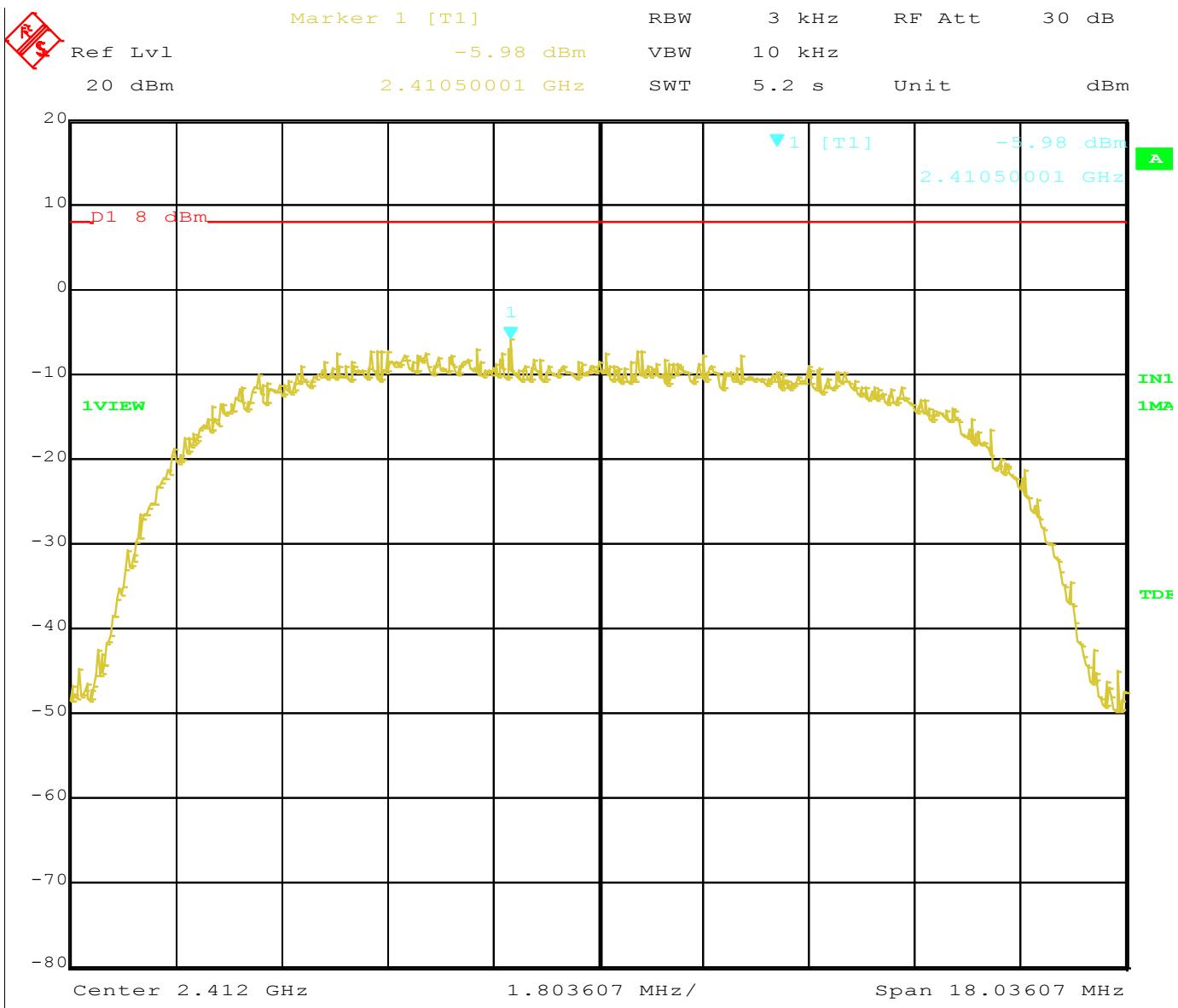
Company:	Atmel Corporation	Date:	5/19/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11b		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

DTS Bandwidth

Freq. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	-5.98	8.00	-13.98	Peak	
2442	-7.14	8.00	-15.14	Peak	
2462	-7.28	8.00	-15.28	Peak	



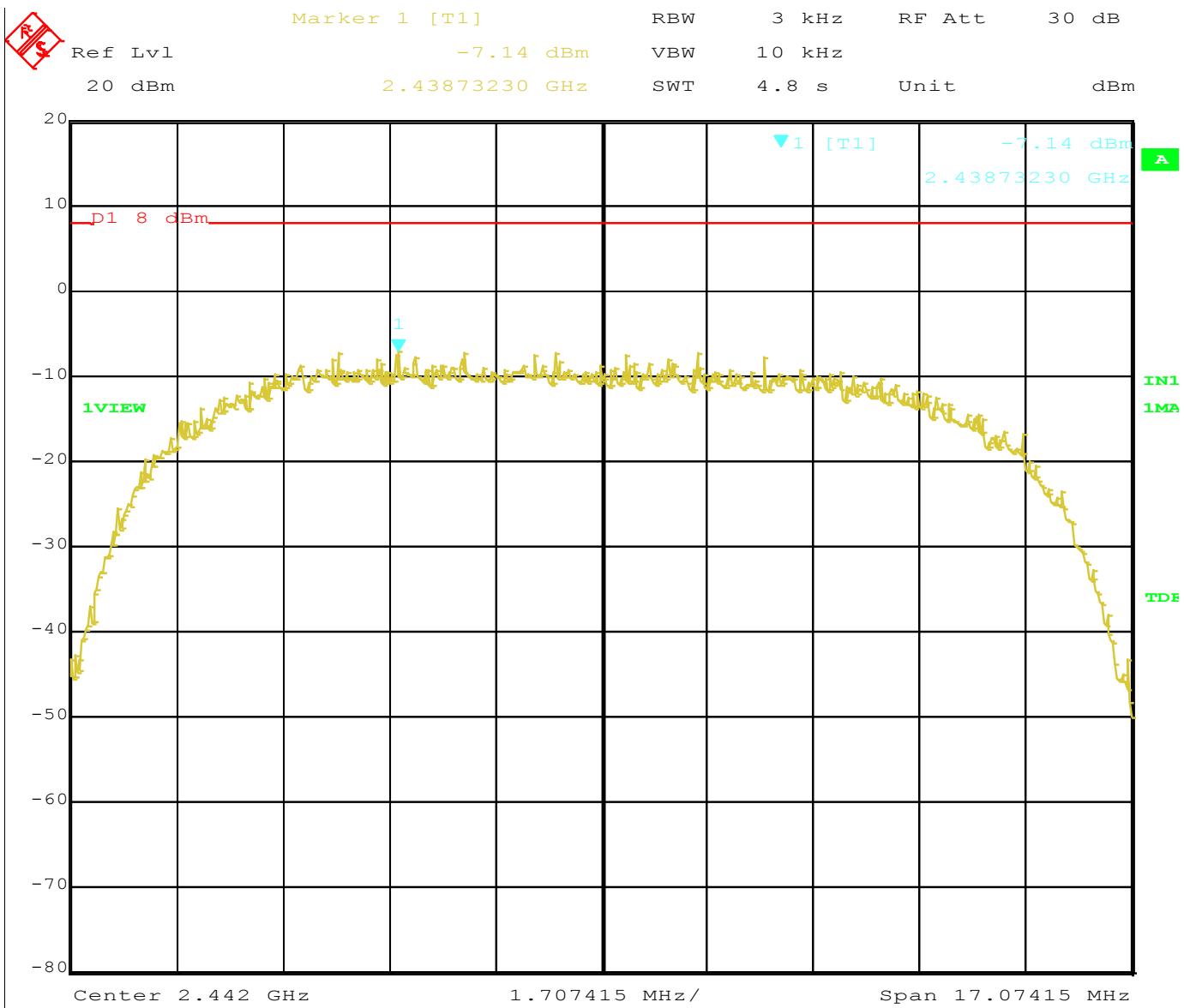


Title:

Comment A: PSD, 802.11b, 2412MHz.

Date: 19.MAY.2015 15:44:54



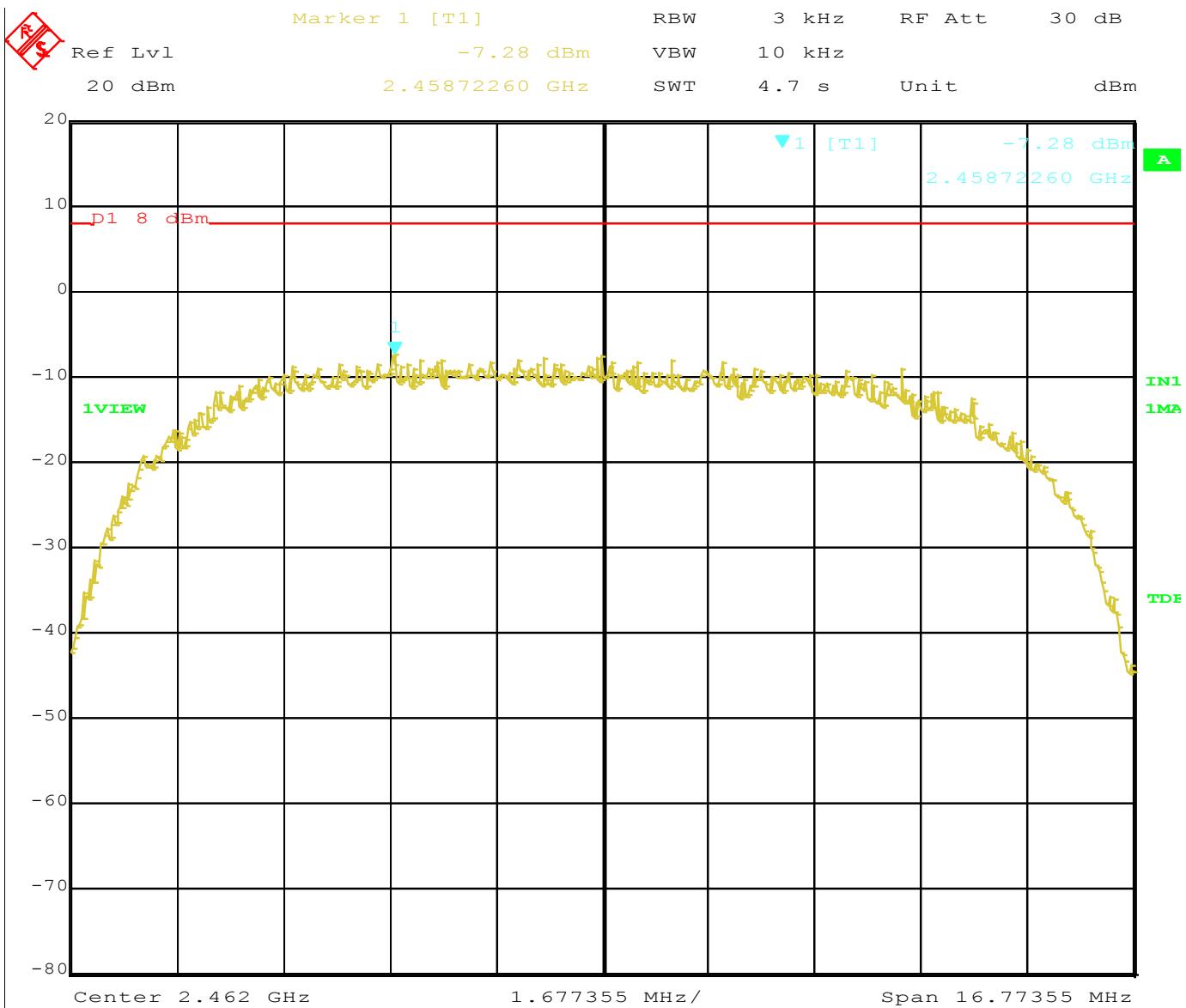


Title:

Comment A: PSD, 802.11b, 2442MHz.

Date: 19.MAY.2015 15:46:51





Title:

Comment A: PSD, 802.11b, 2462MHz.

Date: 19.MAY.2015 15:48:02



# PEAK POWER SPECTRAL DENSITY

## 802.11g Mode

**FCC 15.247**

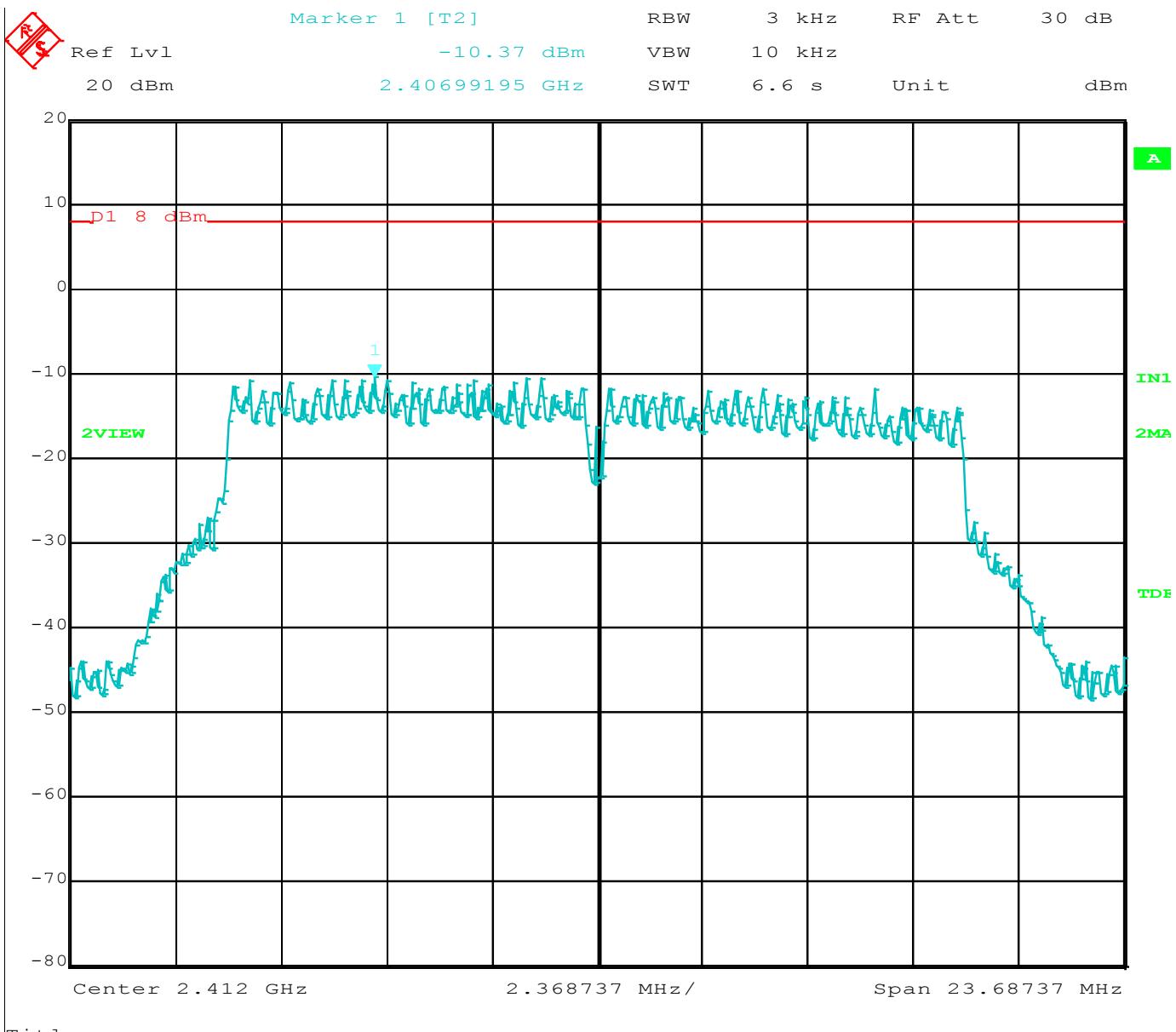
Company: Atmel Corporation      Date: 5/19/2015  
 EUT: Modular Transmitter      Lab: R  
 Model: ATWINC3400      Test ENG: M. Harrison  
 Mode: 802.11g

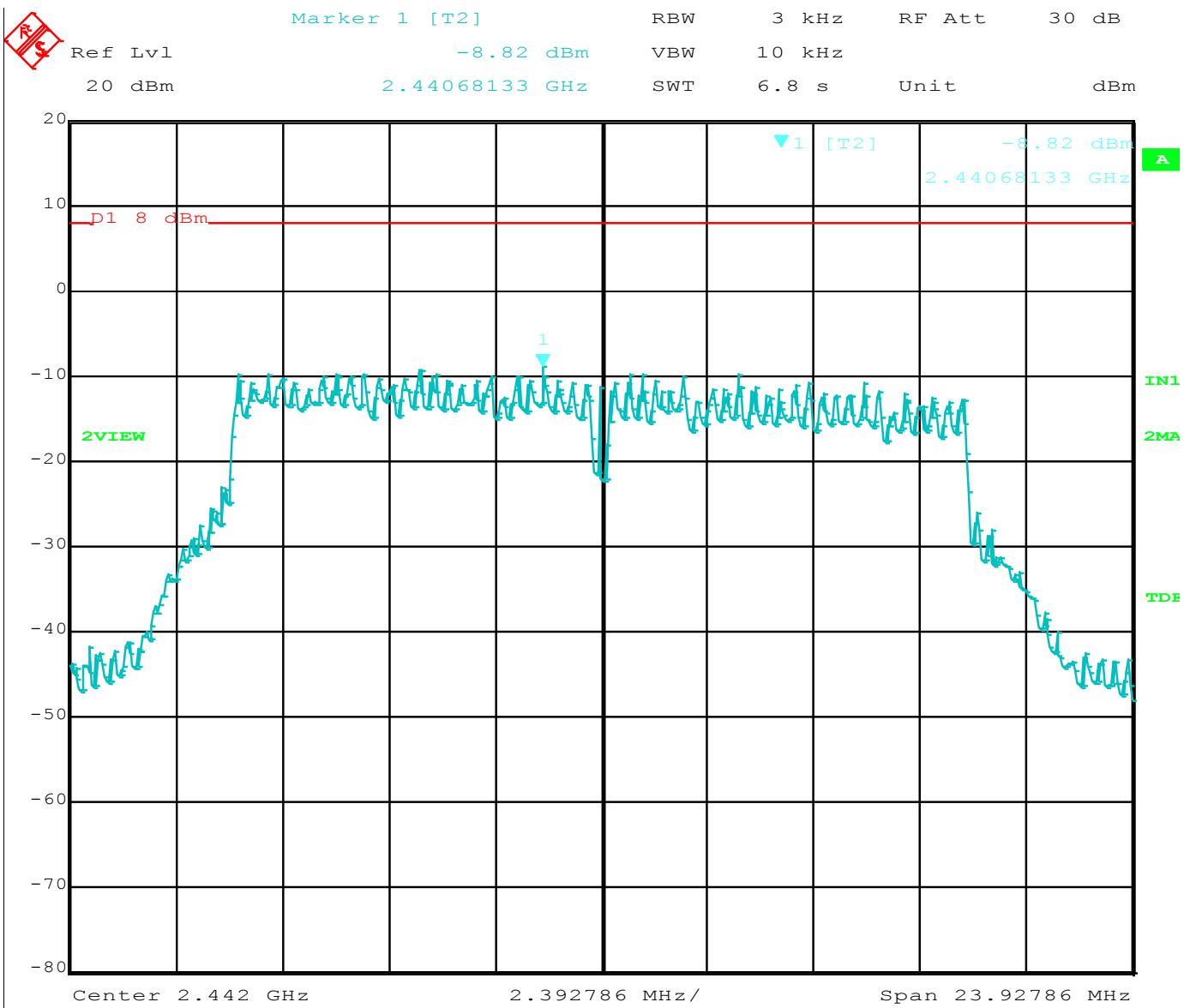
**Compatible Electronics, Inc. FAC-3 ( Lab R )**

DTS Bandwidth

Freq. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	-10.37	8.00	-18.37	Peak	
2442	-8.82	8.00	-16.82	Peak	
2462	-9.40	8.00	-17.40	Peak	





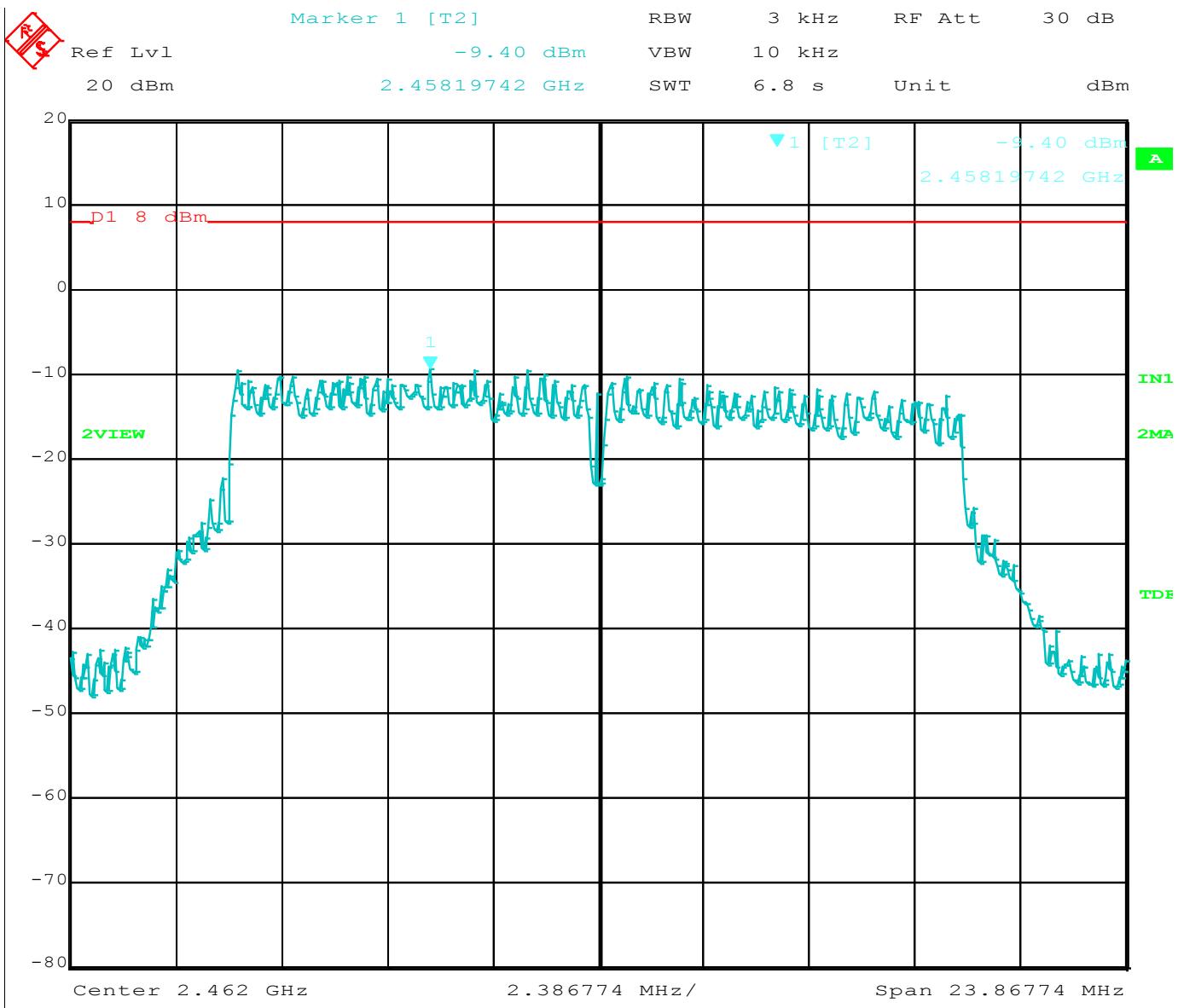


Title:

Comment A: PSD, 802.11g, 2442MHz.

Date: 19.MAY.2015 15:52:32





Title:

Comment A: PSD, 802.11g, 2462MHz.

Date: 19.MAY.2015 15:53:40



# PEAK POWER SPECTRAL DENSITY

## 802.11n Mode

**FCC 15.247**

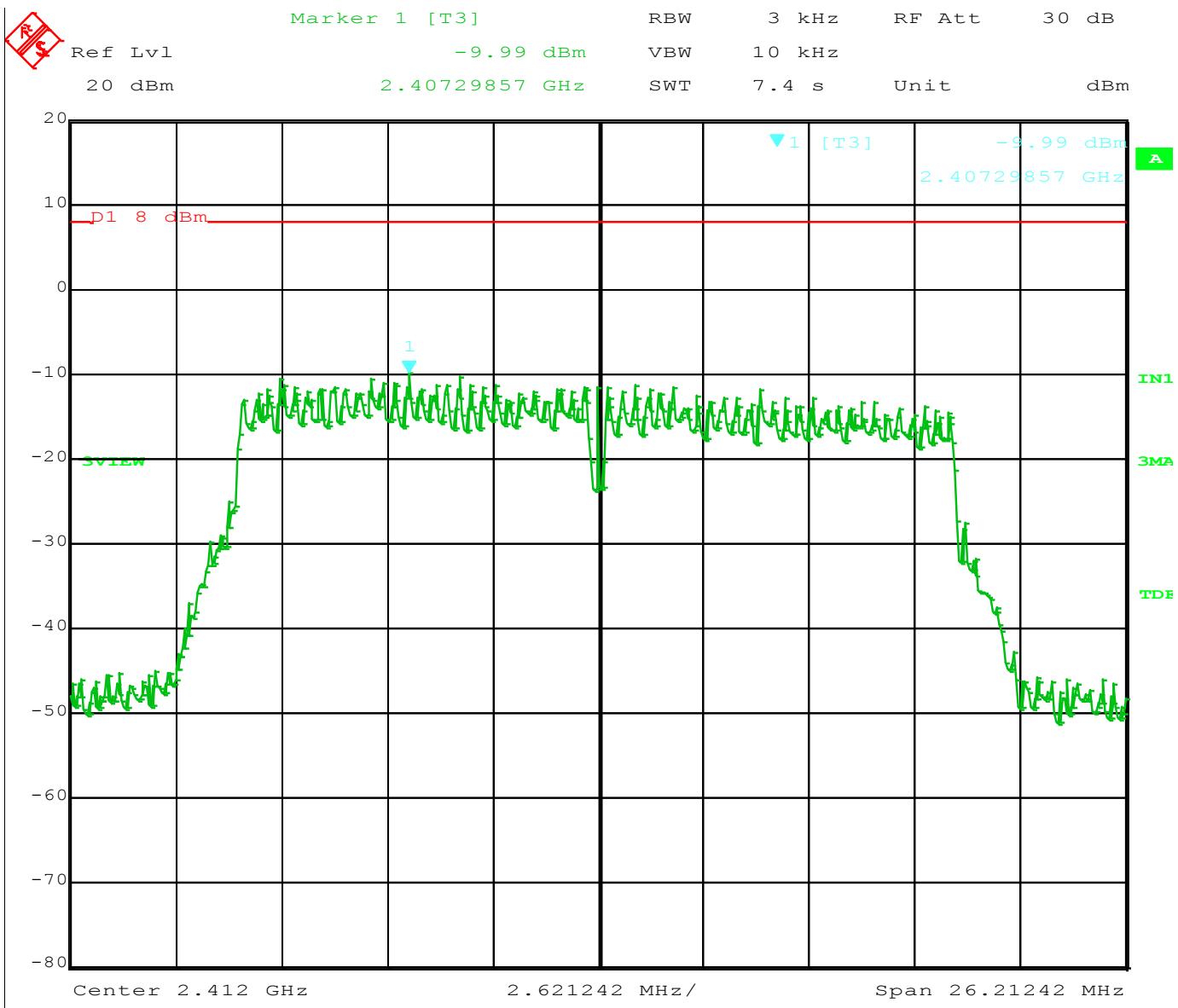
Company:	Atmel Corporation	Date:	6/16/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	M. Harrison
Mode:	802.11n		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

DTS Bandwidth

Freq. (MHz)	Peak (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	-9.99	8.00	-17.99	Peak	
2442	-7.41	8.00	-15.41	Peak	
2462	-9.98	8.00	-17.98	Peak	



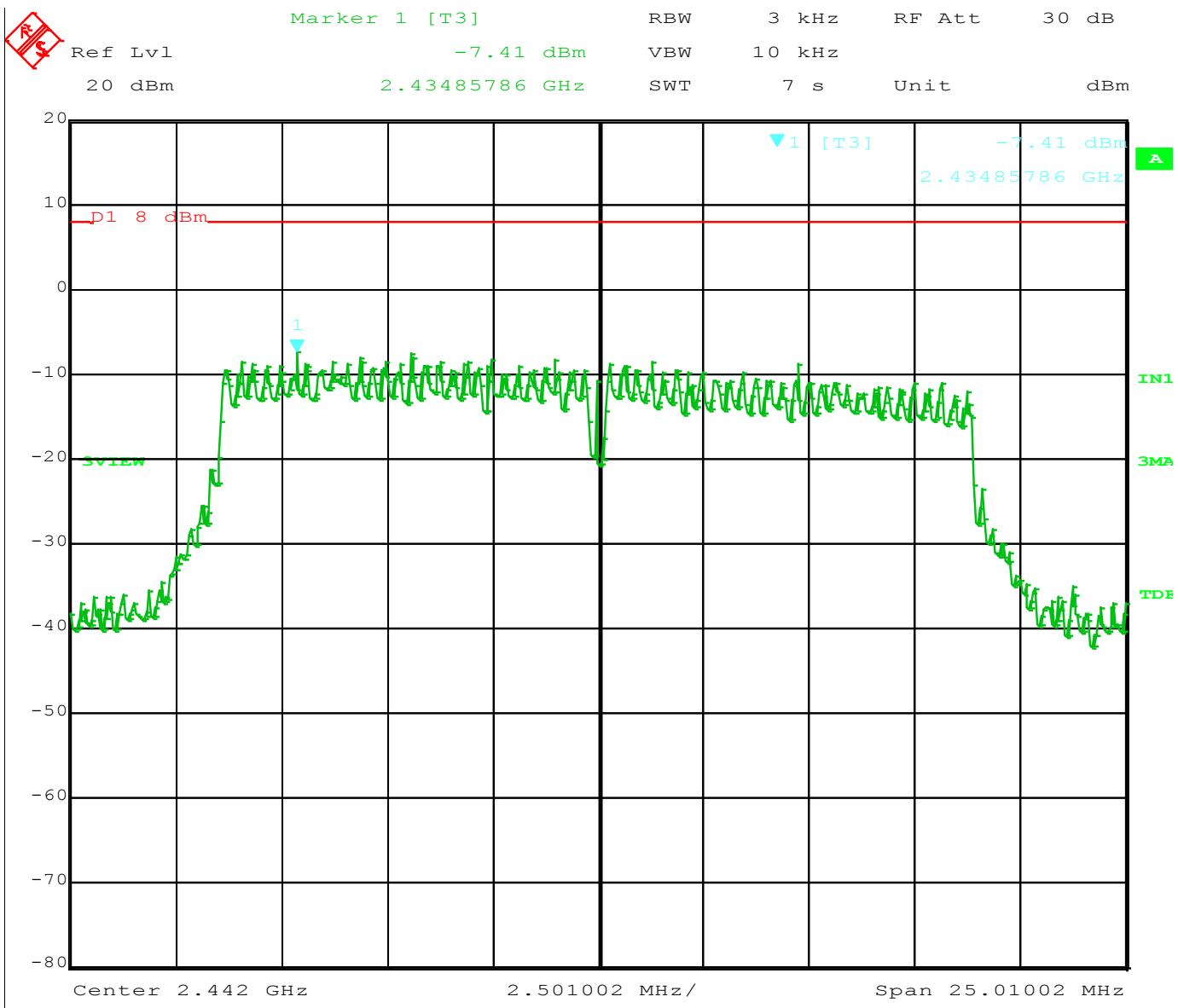


Title:

Comment A: PSD, 802.11n, 2412MHz, DG=-11, PPA=15, PA=18.

Date: 16.JUN.2015 18:16:49



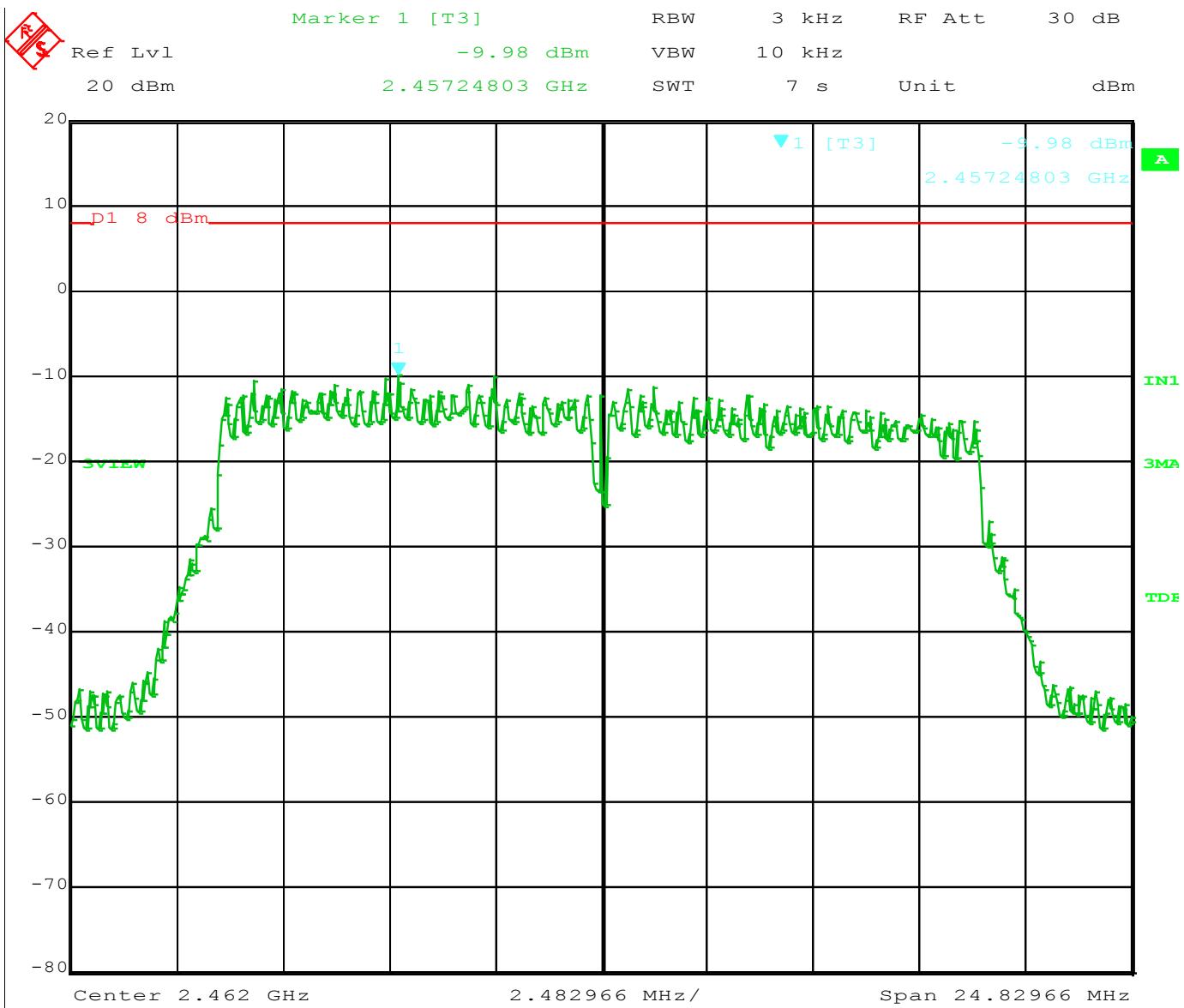


Title:

Comment A: PSD, 802.11n, 2442MHz, DG=-8, PPA=15, PA=18.

Date: 16.JUN.2015 18:15:20





Title:

Comment A: PSD, 802.11n, 2462MHz, DG=-11, PPA=15, PA=18.

Date: 16.JUN.2015 18:13:51



## ***EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS***

### ***BLE Mode***

**FCC 15.247**

Company:	Atmel Corporation	Date:	6/25/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	Matt Harrison
Mode:	BLE		

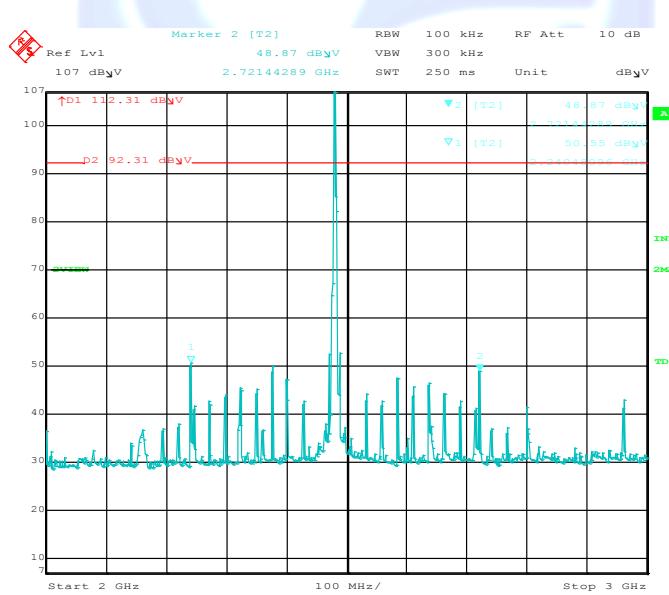
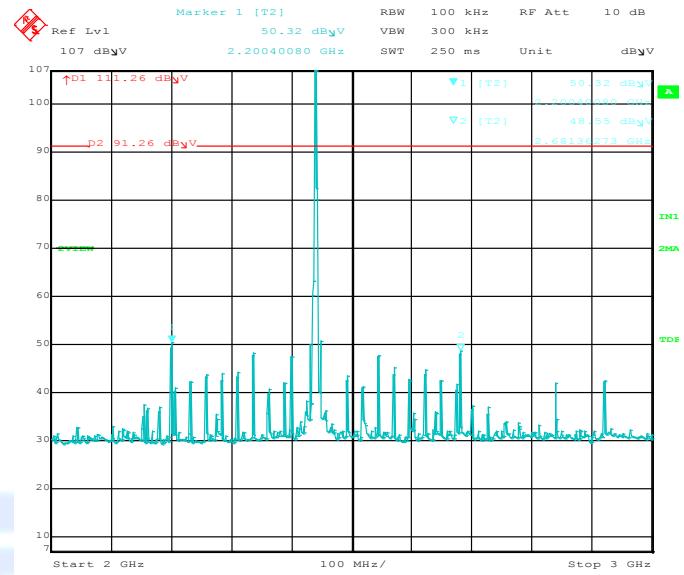
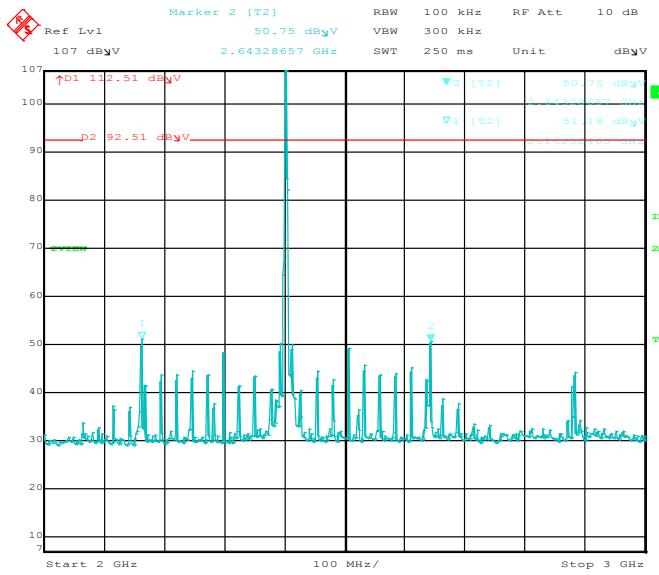
**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Peak / QP / Avg	Comments
7206.00	64.58	92.51	-27.93	Peak	Low Channel
9760.00	60.65	91.26	-30.61	Peak	Mid Channel
9920.00	60.65	92.31	-31.66	Peak	High Channel

**Worst case for all BLE mode measurements**


## BLE Mode

### Reference Level Measurements



Brea Division  
 114 Olinda Drive  
 Brea, CA 92823  
 (714) 579-0500

Agoura Division  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

Silverado Division  
 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

Lake Forest Division  
 20621 Pascal Way  
 Lake Forest, CA 92630  
 (949) 587-0400

## ***EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS***

### ***802.11b Mode***

**FCC 15.247**

Company:	Atmel Corporation	Date:	5/19/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	Matt Harrison
Mode:	802.11b		

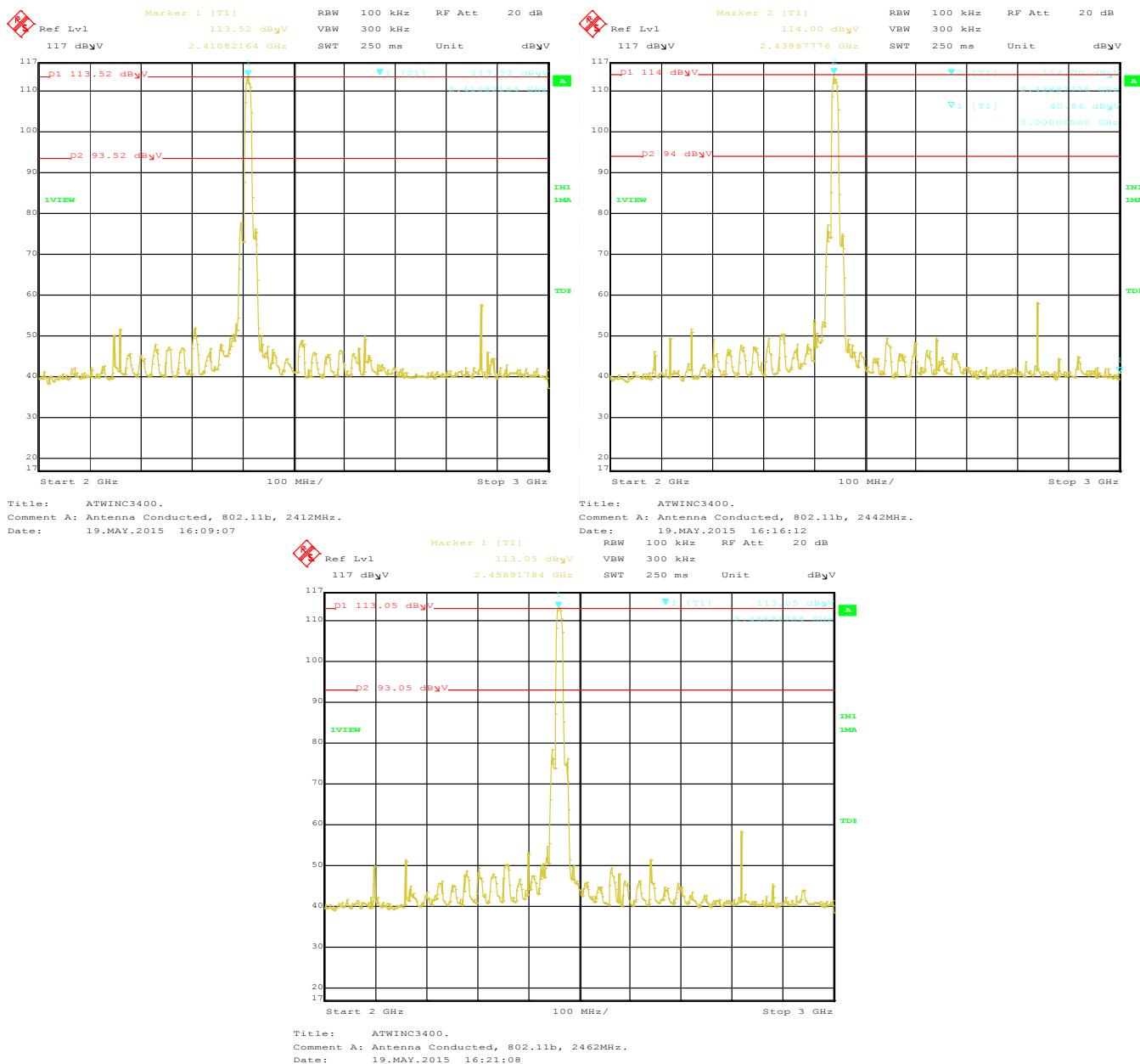
**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Comments
7236.00	71.85	93.52	-21.67	Peak	Low Channel
9768.00	70.74	94.00	-23.26	Peak	Mid Channel
9848.00	69.59	93.05	-23.46	Peak	High Channel

**Worst case for all B mode measurements**


## 802.11b Mode

### Reference Level Measurements



Brea Division  
 114 Olinda Drive  
 Brea, CA 92823  
 (714) 579-0500

Agoura Division  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

Silverado Division  
 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

Lake Forest Division  
 20621 Pascal Way  
 Lake Forest, CA 92630  
 (949) 587-0400

## *EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS*

### *802.11g Mode*

**FCC 15.247**

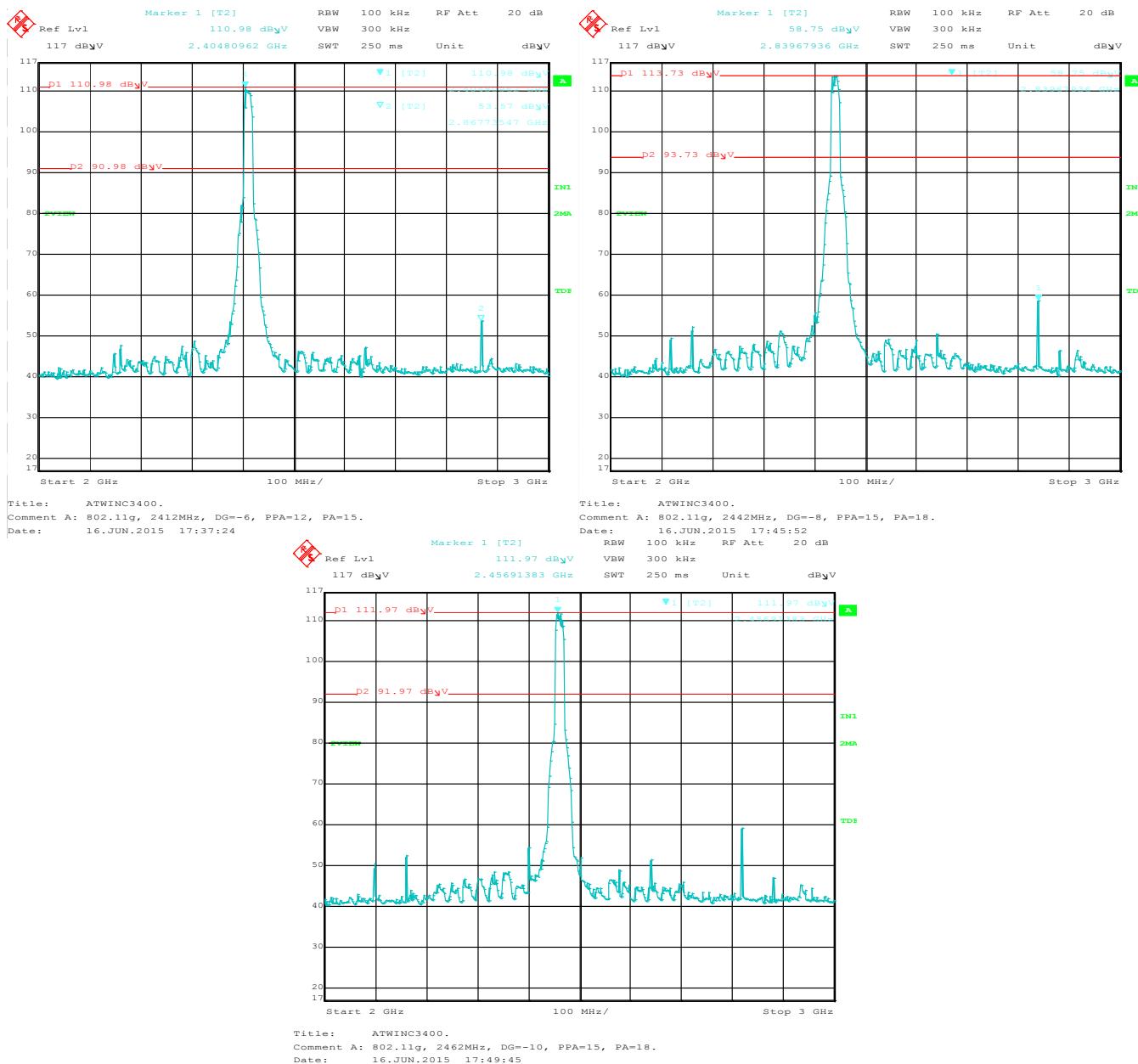
Company:	Atmel Corporation	Date:	6/16/2015
EUT:	Modular Transmitter	Lab:	R
Model:	ATWINC3400	Test ENG:	Matt Harrison
Mode:	802.11g		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Comments
7236.00	67.75	90.98	-23.23	Peak	Low Channel
9848.00	66.17	91.97	-25.80	Peak	High Channel
9648.00	62.37	90.98	-28.61	Peak	Low Channel

**Worst case for all G mode measurements**


## 802.11g Mode Reference Level Measurements



Brea Division  
 114 Olinda Drive  
 Brea, CA 92823  
 (714) 579-0500

Agoura Division  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

Silverado Division  
 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

Lake Forest Division  
 20621 Pascal Way  
 Lake Forest, CA 92630  
 (949) 587-0400

## ***EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS***

### ***802.11n Mode***

#### **FCC 15.247**

Company:	Atmel	Date:	6/16/2015
EUT:	WIFI module	Lab:	R
Model:	ATWINC3400	Test ENG:	Matt Harrison
Mode:	802.11n		

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
9848.00	66.20	91.54	-25.34	Peak	High Channel
7236.00	66.04	91.57	-25.53	Peak	Low Channel
9648.00	64.71	91.57	-26.86	Peak	Low Channel

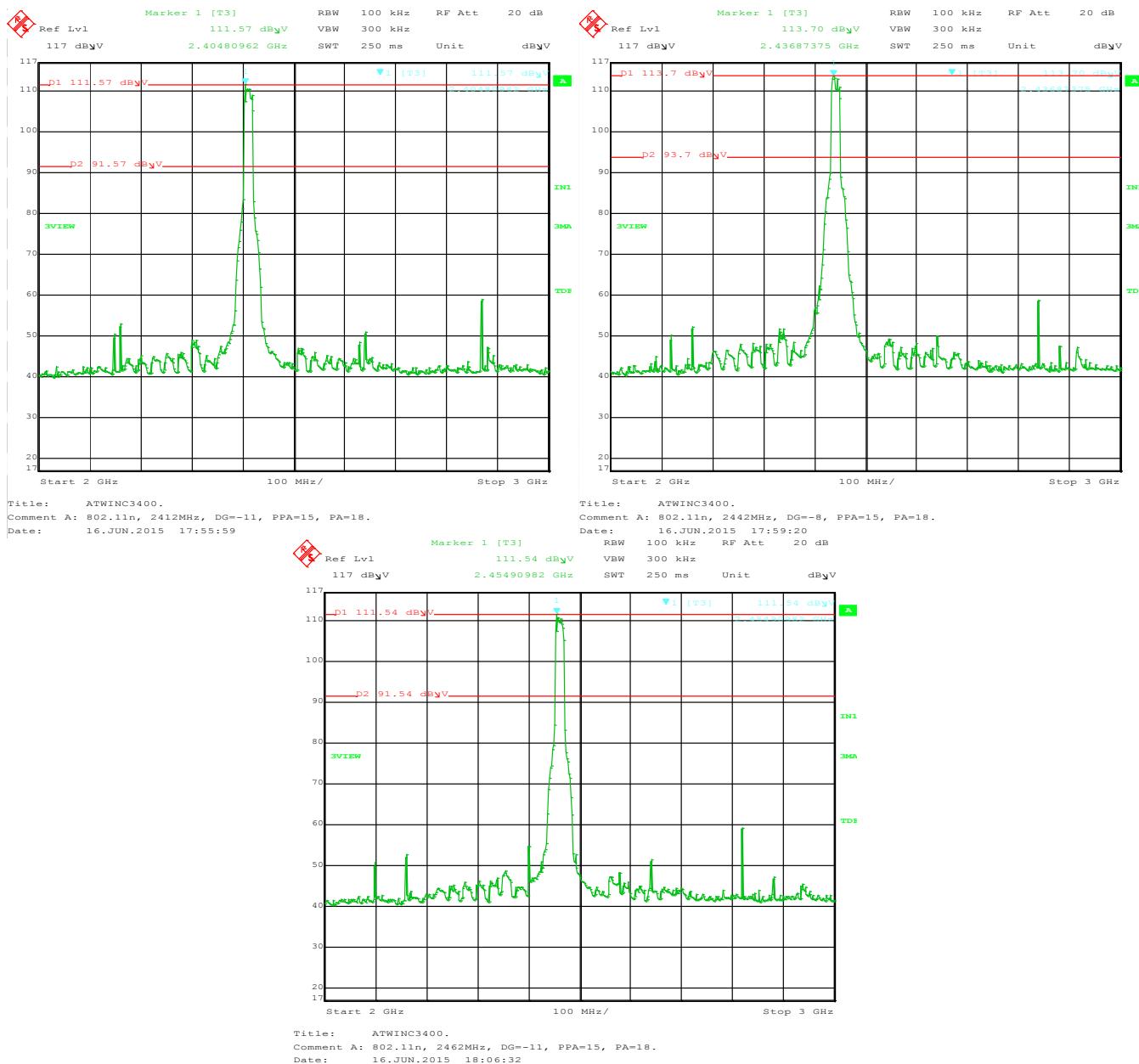
#### **Worst case for all N mode measurements**



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

## 802.11n Mode

### Reference Level Measurements



## ***HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS***



**DATA SHEETS**



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## ***Low Channel, Horizontal & Vertical BLE Mode***

**FCC 15.249**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/23/2015  
 Lab: R  
 Test

 Model: ATWINC3400  
 Mode: BLE

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804.00	60.89	H	73.98	-13.09	Peak	1.35	204	In Restricted Band
4804.00	52.14	H	53.98	-1.84	Avg	1.35	204	
12010.00		H	73.98		Peak			In Restricted Band
12010.00		H	53.98		Avg			No emissions found
19216.00		H	73.98		Peak			In Restricted Band
19216.00		H	53.98		Avg			No emissions found
4804.00	54.13	V	73.98	-19.85	Peak	1.66	173	In Restricted Band
4804.00	42.50	V	53.98	-11.48	Avg	1.66	198	
12010.00		V	73.98		Peak			In Restricted Band
12010.00		V	53.98		Avg			No emissions found
19216.00		V	73.98		Peak			In Restricted Band
19216.00		V	53.98		Avg			No emissions found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## *Mid Channel, Horizontal & Vertical*

### **BLE Mode**

**FCC 15.249**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Model: ATWINC3400  
 Mode: BLE

 Date: 6/30/2015  
 Lab: R

Test

ENG: M.Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880.00	56.42	H	73.98	-17.56	Peak	1.13	162	In Restricted Band
4880.00	45.13	H	53.98	-8.85	Avg	1.13	162	
7320.00	61.66	H	73.98	-12.32	Peak	1.00	189	In Restricted Band
7320.00	53.67	H	53.98	-0.31	Avg	1.00	189	
12200.00		H	73.98		Peak			In Restricted Band
12200.00		H	53.98		Avg			No emissions found
19520.00		H	73.98		Peak			In Restricted Band
19520.00		H	53.98		Avg			
4880.00	50.33	V	73.98	-23.65	Peak	1.17	152	In Restricted Band
4880.00	38.04	V	53.98	-15.94	Avg	1.17	152	
7320.00	60.26	V	73.98	-13.72	Peak	1.5	188	In Restricted Band
7320.00	51.56	V	53.98	-2.42	Avg	1.5	188	
12200.00		V	73.98		Peak			In Restricted Band
12200.00		V	53.98		Avg			No emissions found
19520.00		V	73.98		Peak			In Restricted Band
19520.00		V	53.98		Avg			No emissions found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **High Channel, Horizontal & Vertical**

### **BLE Mode**

**FCC 15.249**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC3400  
 Mode: BLE

Date: 6/30/2015  
 Lab: R  
 Test ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	62.12	H	73.98	-11.86	Peak	2.03	194	In Restricted Band
4960.00	53.34	H	53.98	-0.64	Avg	2.03	194	
7440.00	56.29	H	73.98	-17.69	Peak	1	146	In Restricted Band
7440.00	43.37	H	53.98	-10.61	Avg	1	146	
12400.00		H	73.98		Peak			In Restricted Band
12400.00		H	53.98		Avg			No emissions found
19840.00		H	73.98		Peak			In Restricted Band
19840.00		H	53.98		Avg			No emissions found
22320.00		H	73.98		Peak			In Restricted Band
22320.00		H	53.98		Avg			No emissions found
4960.00	60.38	V	73.98	-13.60	Peak	1	195	In Restricted Band
4960.00	49.41	V	53.98	-4.57	Avg	1	195	
7440.00	60.82	V	73.98	-13.16	Peak	1.46	165	In Restricted Band
7440.00	50.65	V	53.98	-3.33	Avg	1.46	165	
12400.00		V	73.98		Peak			In Restricted Band
12400.00		V	53.98		Avg			No emissions found
19840.00		V	73.98		Peak			In Restricted Band
19840.00		V	53.98		Avg			No emissions found
22320.00		V	73.98		Peak			In Restricted Band
22320.00		V	53.98		Avg			No emissions found

Test distance  
3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **Low Channel, Horizontal & Vertical**

### **802.11b Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Model: ATWINC3400  
 Mode: 802.11b

Date: 5/18/2015

Lab: R

Test

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4824.00	58.54	H	73.98	-15.44	Peak	1.08	155	In Restricted Band
4824.00	51.57	H	53.98	-2.41	Avg	1.08	155	
12060.00	51.44	H	73.98	-22.54	Peak	1.17	32	In Restricted Band
12060.00	39.71	H	53.98	-14.27	Avg	1.17	32	
14472.00		H	73.98		Peak			In Restricted Band
14472.00		H	53.98		Avg			No Emissions Found
19296.00		H	73.98		Peak			In Restricted Band
19296.00		H	53.98		Avg			No Emissions Found
4824.00	57.04	V	73.98	-16.94	Peak	1.61	172	In Restricted Band
4824.00	50.20	V	53.98	-3.78	Avg	1.61	172	
12060.00	52.47	V	73.98	-21.51	Peak	1.08	179	In Restricted Band
12060.00	39.35	V	53.98	-14.63	Avg	1.04	179	
14472.00		V	73.98		Peak			In Restricted Band
14472.00		V	53.98		Avg			No Emissions Found
19296.00		V	73.98		Peak			In Restricted Band
19296.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## *Mid Channel, Horizontal & Vertical*

### **802.11b Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Model: ATWINC3400  
 Mode: 802.11b

 Date: 5/18/2015  
 Lab: R  
 Test

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4884.00	60.42	H	73.98	-13.56	Peak	1.01	196	In Restricted Band
4884.00	52.64	H	53.98	-1.34	Avg	1.01	196	
7326.00	62.90	H	73.98	-11.08	Peak	1.00	192	In Restricted Band
7326.00	51.37	H	53.98	-2.61	Avg	1.00	192	
12210.00	52.71	H	73.98	-21.27	Peak	1.36	35	In Restricted Band
12210.00	39.86	H	53.98	-14.12	Avg	1.36	35	
19536.00		H	73.98		Peak			In Restricted Band
19536.00		H	53.98		Avg			No emissions found
4884.00	56.98	V	73.98	-17.00	Peak	1.37	177	In Restricted Band
4884.00	48.85	V	53.98	-5.13	Avg	1.37	177	
7326.00	61.70	V	73.98	-12.28	Peak	1.32	187	In Restricted Band
7326.00	50.63	V	53.98	-3.35	Avg	1.32	187	
12210.00	51.94	V	73.98	-22.04	Peak	1.07	181	In Restricted Band
12210.00	40.30	V	53.98	-13.68	Avg	1.07	181	
19536.00		V	73.98		Peak			In Restricted Band
19536.00		V	53.98		Avg			No emissions found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **High Channel, Horizontal & Vertical**

### **802.11b Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Model: ATWINC3400  
 Mode: 802.11b

 Date: 5/19/2015  
 Lab: R  
 Test

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4924.00	53.83	H	73.98	-20.15	Peak	1.08	198	In Restricted Band
4924.00	40.89	H	53.98	-13.09	Avg	1.08	198	
7386.00	63.66	H	73.98	-10.32	Peak	1.06	191	In Restricted Band
7386.00	52.96	H	53.98	-1.02	Avg	1.06	191	
12310.00	53.33	H	73.98	-20.65	Peak	1	360	In Restricted Band
12310.00	41.79	H	53.98	-12.19	Avg	1	360	
19696.00		H	73.98		Peak			In Restricted Band
19696.00		H	53.98		Avg			No Emissions Found
22158.00		H	73.98		Peak			In Restricted Band
22158.00		H	53.98		Avg			No Emissions Found
4924.00	50.46	V	73.98	-23.52	Peak	1.71	180	In Restricted Band
4924.00	37.32	V	53.98	-16.66	Avg	1.71	180	
7386.00	62.04	V	73.98	-11.94	Peak	1.45	188	In Restricted Band
7386.00	51.39	V	53.98	-2.59	Avg	1.45	188	
12310.00	53.57	V	73.98	-20.41	Peak	1.07	180	In Restricted Band
12310.00	40.94	V	53.98	-13.04	Avg	1.07	180	
19696.00		V	73.98		Peak			In Restricted Band
19696.00		V	53.98		Avg			No Emissions Found
22158.00		V	73.98		Peak			In Restricted Band
22158.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **Low Channel, Horizontal & Vertical**

### **802.11g Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/15/2015  
 Lab: R  
 Test

 Model: ATWINC3400  
 Mode: 802.11g

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4824.00	69.36	H	73.98	-4.62	Peak	1.11	200.00	In Restricted Band
4824.00	53.74	H	53.98	-0.24	Avg	1.11	200.00	
12060.00		H	73.98		Peak			In Restricted Band
12060.00		H	53.98		Avg			No Emissions Found
14472.00		H	73.98		Peak			In Restricted Band
14472.00		H	53.98		Avg			No Emissions Found
19296.00		H	73.98		Peak			In Restricted Band
19296.00		H	53.98		Avg			No Emissions Found
4824.00	62.04	V	73.98	-11.94	Peak	1.60	187.00	In Restricted Band
4824.00	43.91	V	53.98	-10.07	Avg	1.60	187.00	
12060.00		V	73.98		Peak			In Restricted Band
12060.00		V	53.98		Avg			No Emissions Found
14472.00		V	73.98		Peak			In Restricted Band
14472.00		V	53.98		Avg			No Emissions Found
19296.00		V	73.98		Peak			In Restricted Band
19296.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## *Mid Channel, Horizontal & Vertical*

### **802.11g Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/16/2015  
 Lab: R

 Model: ATWINC3400  
 Mode: 802.11g

 Test  
 ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4884.00	73.68	H	73.98	-0.30	Peak	1.21	197	In Restricted Band
4884.00	52.61	H	53.98	-1.37	Avg	1.21	197	
7326.00	60.42	H	73.98	-13.56	Peak	1.24	330	In Restricted Band
7326.00	48.94	H	53.98	-5.04	Avg	1.24	330	
12210.00	61.23	H	73.98	-12.75	Peak	1.00	33	In Restricted Band
12210.00	48.37	H	53.98	-5.61	Avg	1.00	33	
19536.00		H	73.98		Peak			In Restricted Band
19536.00		H	53.98		Avg			No Emissions Found
4884.00	72.37	V	73.98	-1.61	Peak	1.63	177	In Restricted Band
4884.00	51.33	V	53.98	-2.65	Avg	1.63	177	
7326.00	63.00	V	73.98	-10.98	Peak	1.44	185	In Restricted Band
7326.00	51.54	V	53.98	-2.44	Avg	1.44	185	
12210.00	59.34	V	73.98	-14.64	Peak	1.00	182	In Restricted Band
12210.00	46.97	V	53.98	-7.01	Avg	1.00	182	
19536.00		V	73.98		Peak			In Restricted Band
19536.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **High Channel, Horizontal & Vertical**

### **802.11g Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/16/2015  
 Lab: R

 Model: ATWINC3400  
 Mode: 802.11g

 Test  
 ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4924.00	64.61	H	73.98	-9.37	Peak	1.22	203.00	In Restricted Band
4924.00	43.43	H	53.98	-10.55	Avg	1.22	203.00	
7386.00	65.27	H	73.98	-8.71	Peak	1.00	194.00	In Restricted Band
7386.00	53.70	H	53.98	-0.28	Avg	1.00	194.00	
12310.00		H	73.98		Peak			In Restricted Band
12310.00		H	53.98		Avg			No Emissions Found
19696.00		H	73.98		Peak			In Restricted Band
19696.00		H	53.98		Avg			No Emissions Found
22158.00		H	73.98		Peak			In Restricted Band
22158.00		H	53.98		Avg			No Emissions Found
4924.00	59.84	V	73.98	-14.14	Peak	1.39	161.00	In Restricted Band
4924.00	49.61	V	53.98	-4.37	Avg	1.39	161.00	
7386.00	64.24	V	73.98	-9.74	Peak	1.43	187.00	In Restricted Band
7386.00	52.64	V	53.98	-1.34	Avg	1.43	187.00	
12310.00		V	73.98		Peak			In Restricted Band
12310.00		V	53.98		Avg			No Emissions Found
19696.00		V	73.98		Peak			In Restricted Band
19696.00		V	53.98		Avg			No Emissions Found
22158.00		V	73.98		Peak			In Restricted Band
22158.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



Brea Division 114 Olinda Drive Brea, CA 92823 (714) 579-0500	Agoura Division 2337 Troutdale Drive Agoura, CA 91301 (818) 597-0600	Silverado Division 19121 El Toro Road Silverado, CA 92676 (949) 589-0700	Lake Forest Division 20621 Pascal Way Lake Forest, CA 92630 (949) 587-0400
---	---	---	---

# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **Low Channel, Horizontal & Vertical**

### **802.11n Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/1/2015  
 Lab: R  
 Test

 Model: ATWINC3400  
 Mode: 802.11n

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4824.00	67.79	H	73.98	-6.19	Peak	1.10	203	In Restricted Band
4824.00	45.74	H	53.98	-8.24	Avg	1.10	203	
12060.00	59.39	H	73.98	-14.59	Peak	1.11	0	In Restricted Band
12060.00	46.59	H	53.98	-7.39	Avg	1.11	0	
14472.00		H	73.98		Peak			In Restricted Band
14472.00		H	53.98		Avg			No Emissions Found
19296.00		H	73.98		Peak			In Restricted Band
19296.00		H	53.98		Avg			No Emissions Found
4824.00	65.66	V	73.98	-8.32	Peak	1.89	167	In Restricted Band
4824.00	41.68	V	53.98	-12.30	Avg	1.89	167	
12060.00	56.13	V	73.98	-17.85	Peak	3.23	94	In Restricted Band
12060.00	43.61	V	53.98	-10.37	Avg	3.23	94	
14472.00		V	73.98		Peak			In Restricted Band
14472.00		V	53.98		Avg			No Emissions Found
19296.00		V	73.98		Peak			In Restricted Band
19296.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## *Mid Channel, Horizontal & Vertical*

### **802.11n Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/16/2015  
 Lab: R  
 Test

 Model: ATWINC3400  
 Mode: 802.11n

ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4884.00	73.49	H	73.98	-0.49	Peak	1.33	198	In Restricted Band
4884.00	51.90	H	53.98	-2.08	Avg	1.33	198	
7326.00	64.21	H	73.98	-9.77	Peak	1.02	189	In Restricted Band
7326.00	52.99	H	53.98	-0.99	Avg	1.02	189	
12210.00	59.22	H	73.98	-14.76	Peak	1.01	156	In Restricted Band
12210.00	46.84	H	53.98	-7.14	Avg	1.01	156	
19536.00		H	73.98		Peak			In Restricted Band
19536.00		H	53.98		Avg			No Emissions Found
4884.00	72.38	V	73.98	-1.60	Peak	2.05	179	
4884.00	49.97	V	53.98	-4.01	Avg	2.05	179	In Restricted Band
7326.00	64.90	V	73.98	-9.08	Peak	1.83	178	
7326.00	53.36	V	53.98	-0.62	Avg	1.83	178	In Restricted Band
12210.00	59.22	V	73.98	-14.76	Peak	1.41	182	
12210.00	46.36	V	53.98	-7.62	Avg	1.41	182	In Restricted Band
19536.00		V	73.98		Peak			In Restricted Band
19536.00		V	53.98		Avg			No Emissions Found

Test distance

3 meter



# **HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS**

## **High Channel, Horizontal & Vertical**

### **802.11n Mode**

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter

 Date: 6/16/2015  
 Lab: R

 Model: ATWINC3400  
 Mode: 802.11n

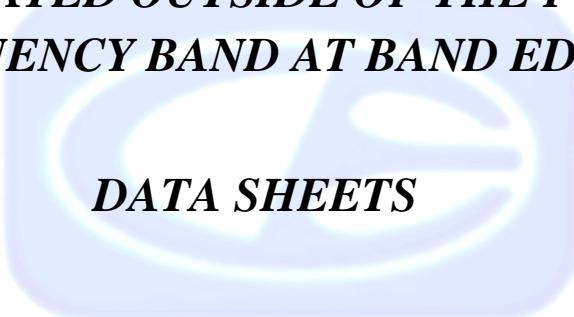
 Test  
 ENG: M. Harrison

**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4924.00	60.07	H	73.98	-13.91	Peak	1.51	157.00	In Restricted Band
4924.00	39.15	H	53.98	-14.83	Avg	1.51	157.00	
7386.00	64.23	H	73.98	-9.75	Peak	1.00	194.00	In Restricted Band
7386.00	52.27	H	53.98	-1.71	Avg	1.00	194.00	
12310.00		H	73.98		Peak			In Restricted Band
12310.00		H	53.98		Avg			No Emissions Found
19696.00		H	73.98		Peak			In Restricted Band
19696.00		H	53.98		Avg			No Emissions Found
22158.00		H	73.98		Peak			In Restricted Band
22158.00		H	53.98		Avg			No Emissions Found
4924.00	61.99	V	73.98	-11.99	Peak	1.85	190.00	In Restricted Band
4924.00	52.62	V	53.98	-1.36	Avg	1.85	190.00	
7386.00	63.21	V	73.98	-10.77	Peak	1.72	186.00	In Restricted Band
7386.00	50.31	V	53.98	-3.67	Avg	1.72	186.00	
12310.00		V	73.98		Peak			In Restricted Band
12310.00		V	53.98		Avg			No Emissions Found
19696.00		V	73.98		Peak			In Restricted Band
19696.00		V	53.98		Avg			No Emissions Found
22158.00		V	73.98		Peak			In Restricted Band
22158.00		V	53.98		Avg			No Emissions Found

 Test distance  
 3 meter


***EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL  
FREQUENCY BAND AT BAND EDGES***



**DATA SHEETS**



---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## BAND EDGES- VERTICAL

### *BLE Mode*

**FCC 15.247**

Company: Atmel Corporation

Date: 6/30/2015

EUT: Modular Transmitter

Lab: R

Test

Model: ATWINC3400

ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 ( Lab R )

Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402.00	93.61	V	--	--	Peak	1	140	Fundamental of High Channel
2400.00	70.53	V	73.61	-3.08	Delta	1	140	From Peak
2380.83	53.62	V	73.98	-20.36	Peak	1	140	No Marker Delta Method Used
2380.83	38.07	V	53.98	-15.91	Avg	1	140	
2480.00	92.81	V	--	--	Peak	1	140	Fundamental of High Channel
2483.50	53.79	V	73.98	-20.19	Peak	1	140	No Marker Delta Method Used
2483.50	38.82	V	53.98	-15.16	Avg	1	140	

Test Distance

3 Meters



## **BAND EDGES- HORIZONTAL**

### *BLE Mode*

FCC 15.247

Company: Atmel Corporation  
EUT: Modular Transmitter  
Model: ATWINC3400

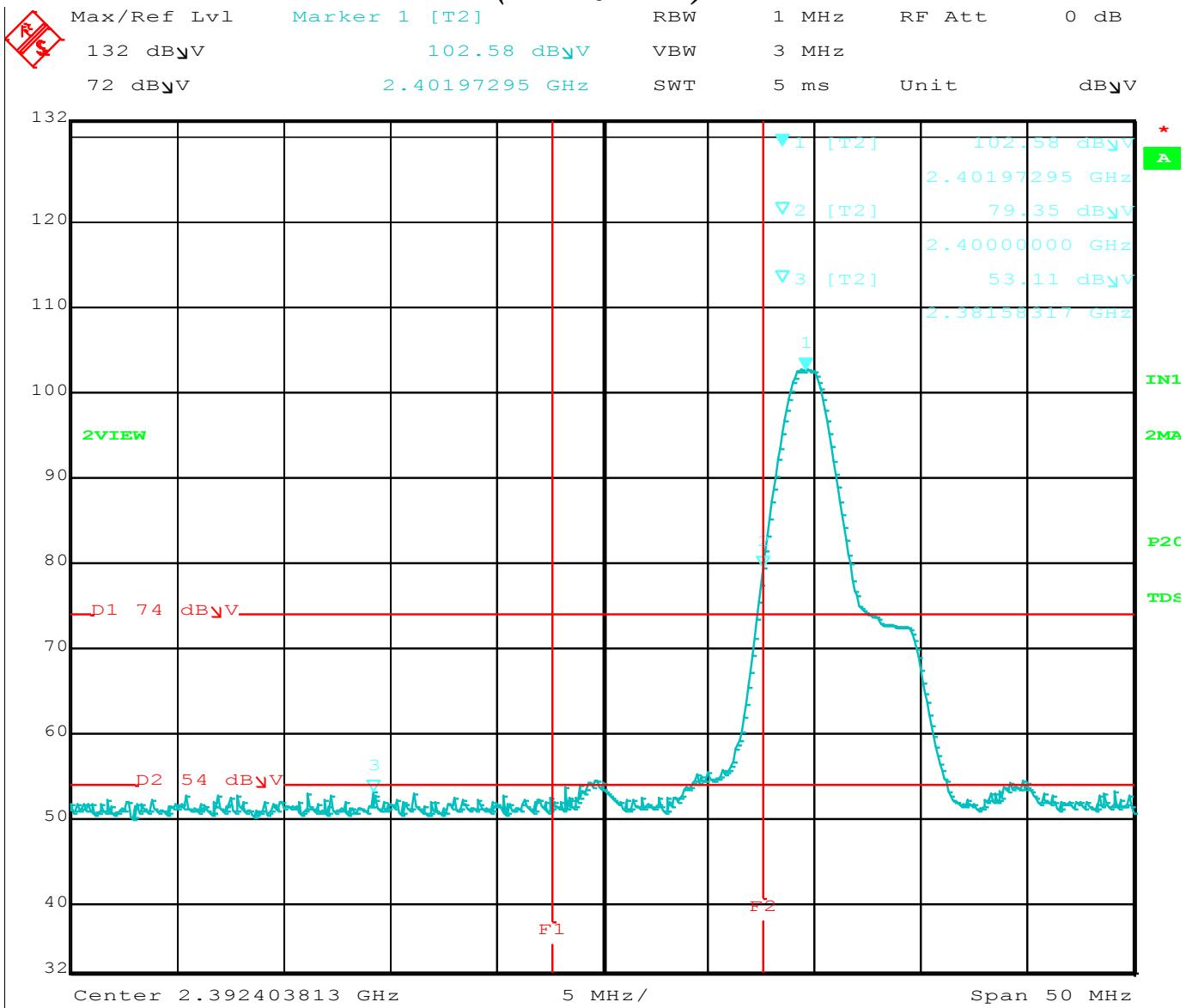
Date: 6/30/2015  
Lab: R  
Test  
ENG: Matt Harrison

Compatible Electronics, Inc. FAC-3 ( Lab R )

Test Distance  
3 Meters



## LOWER BAND EDGE (Horizontal)



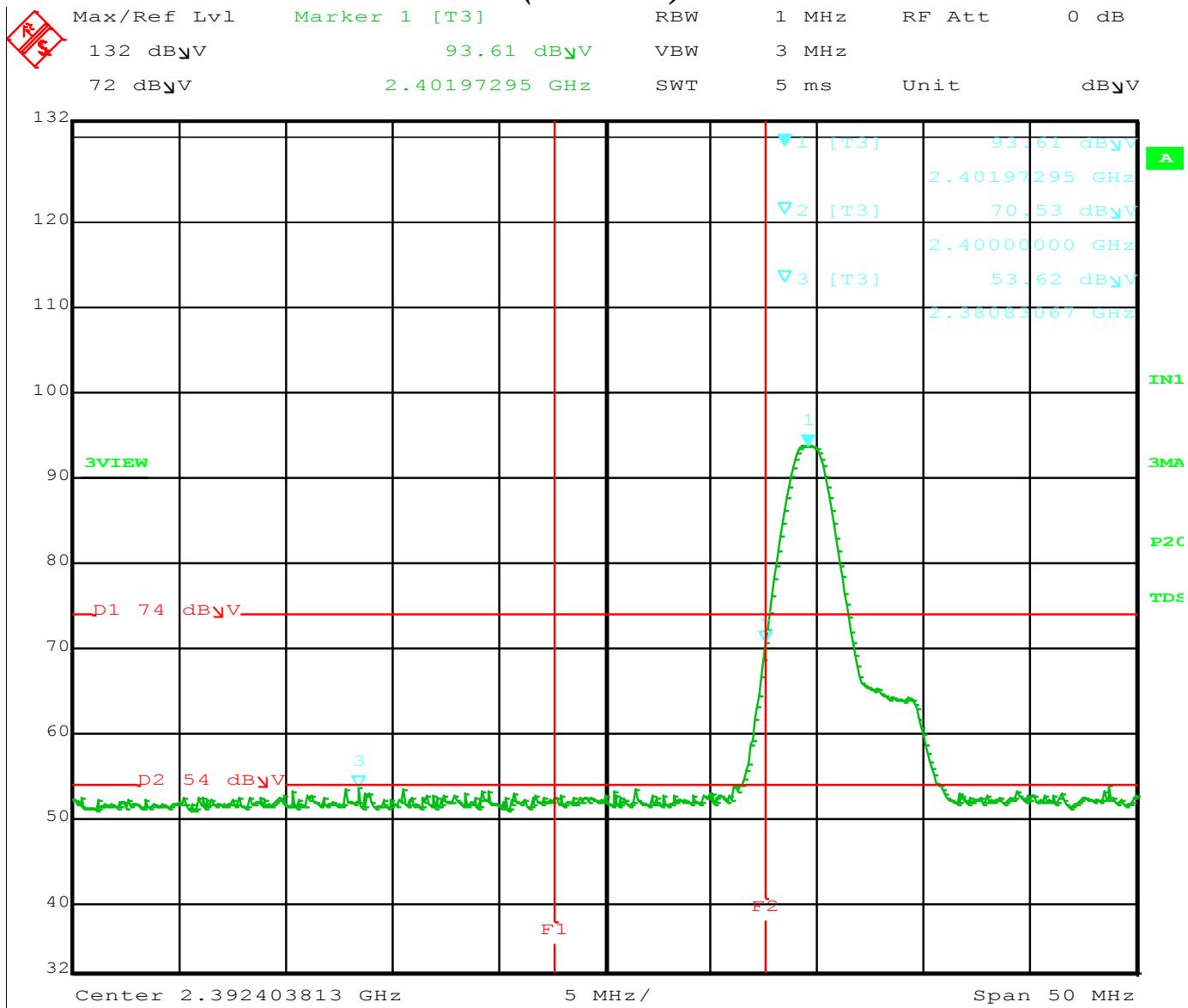
Title: -

Comment A: LBE, Horizontal.

Date: 30.JUN.2015 10:39:45



## LOWER BAND EDGE (Vertical)



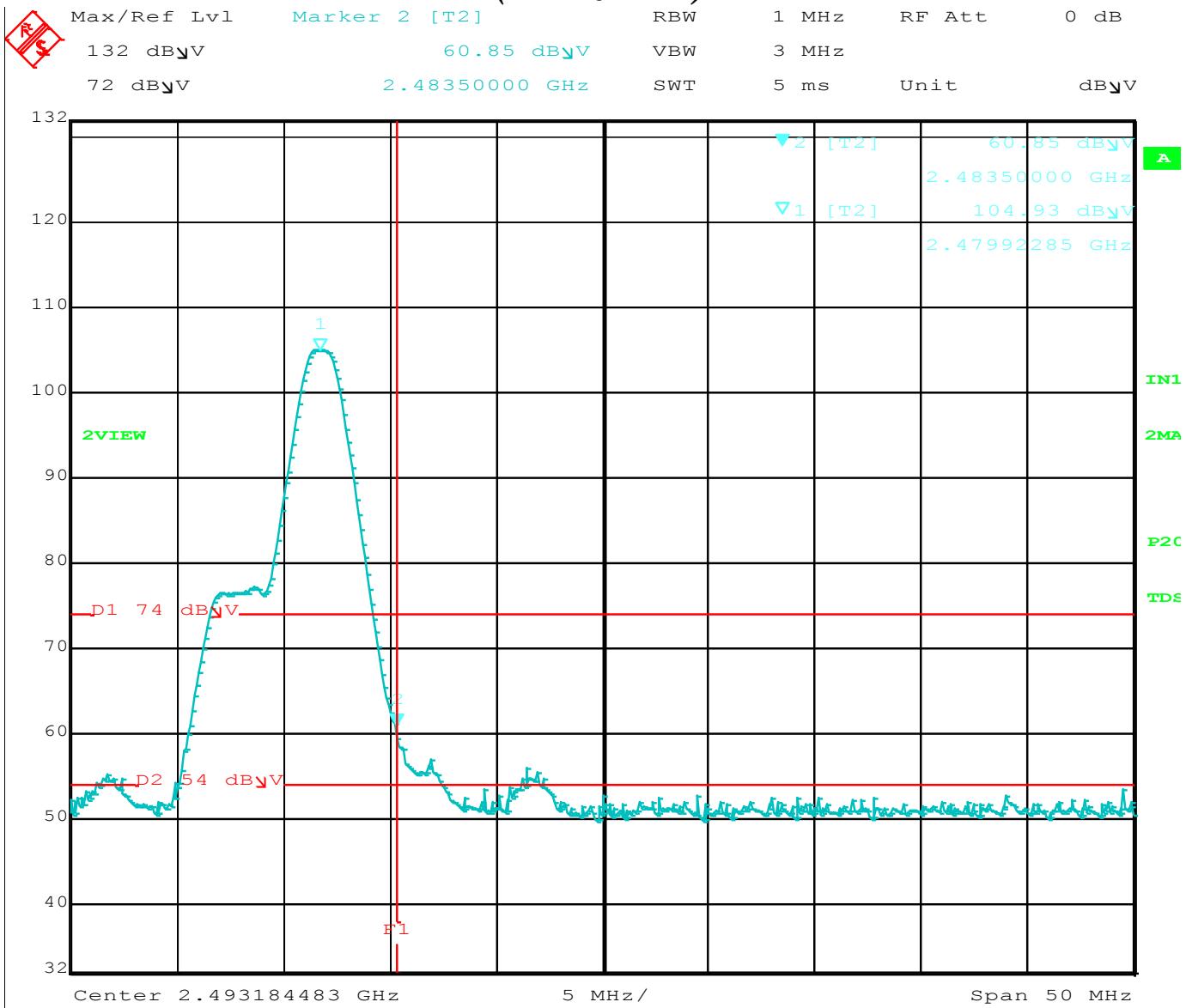
Title:

Comment A: LBE, Vertical.

Date: 30.JUN.2015 10:45:33



## UPPER BAND EDGE (Horizontal)



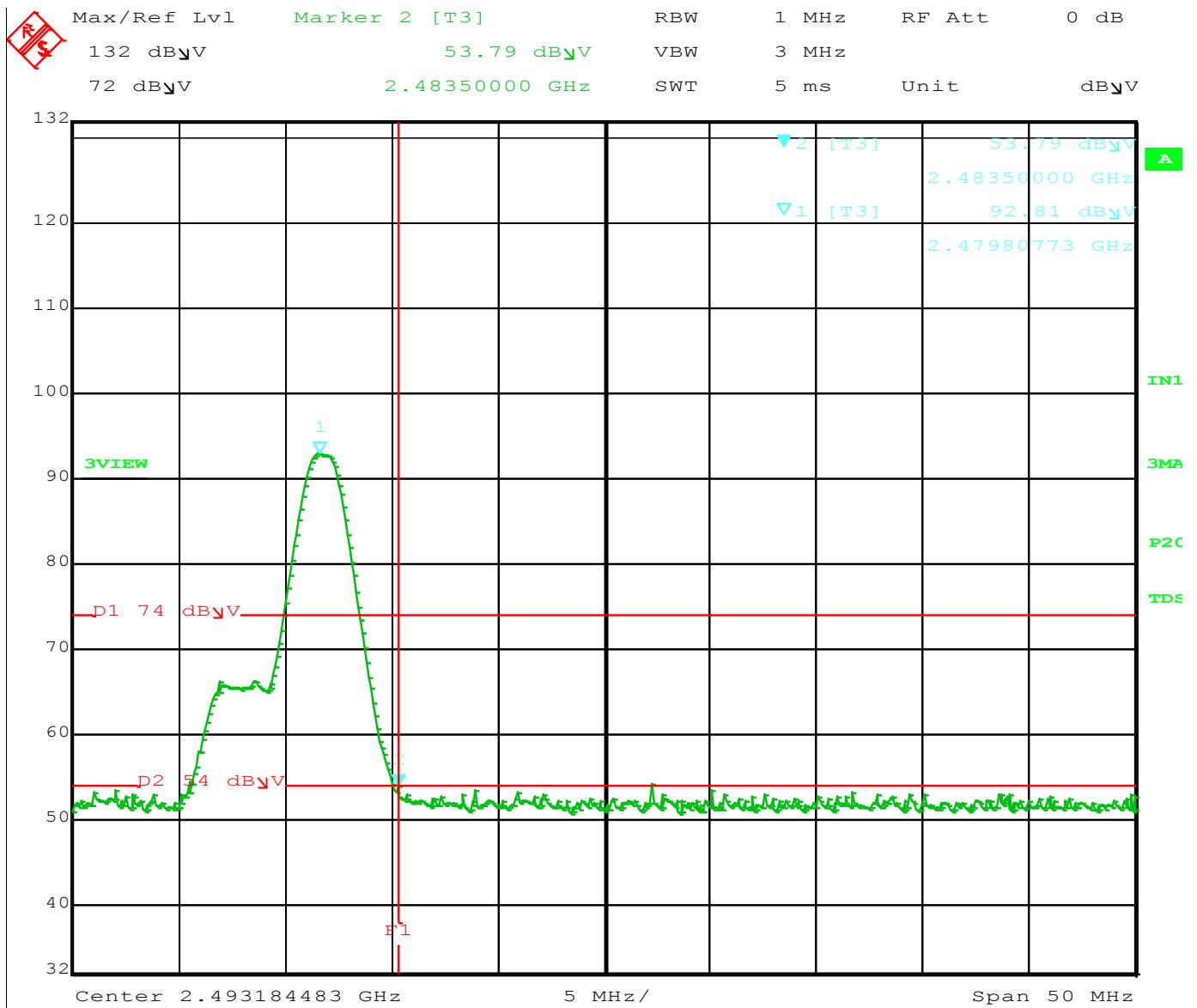
Title: -

Comment A: UBE, Horizontal.

Date: 30.JUN.2015 11:08:30



## UPPER BAND EDGE (Vertical)



Title: \_\_\_\_\_.

Comment A: UBE, Vertical.

Date: 30.JUN.2015 11:10:16



## BAND EDGES- VERTICAL

### *802.11b Mode*

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter

Date: 5/18/2015  
 Lab: R

Model: ATWINC3400  
 Mode: 802.11b

Test  
 ENG: Matt Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	106.35	V	--	--	Peak	1.44	180	Fundamental of High Channel
2396.67	70.92	V	86.35	-15.43	Delta	1.44	180	From Peak
2389.91	53.78	V	73.98	-20.20	Peak	1.4	180	<b>No</b> Marker Delta Method Used
2389.91	48.18	V	53.98	-5.80	Avg	1.4	180	
2462.00	109.07	V	--	--	Peak	1.77	180	Fundamental of High Channel
2496.28	54.04	V	73.98	-19.94	Peak	1.77	180	<b>No</b> Marker Delta Method Used
2496.28	48.17	V	53.98	-5.81	Avg	1.77	180	

Test Distance  
 3 Meters



## BAND EDGES- HORIZONTAL

### *802.11b Mode*

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter

Model: ATWINC3400  
 Mode: 802.11b

Date: 5/18/2015  
 Lab: R  
 Test  
 ENG: Matt Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

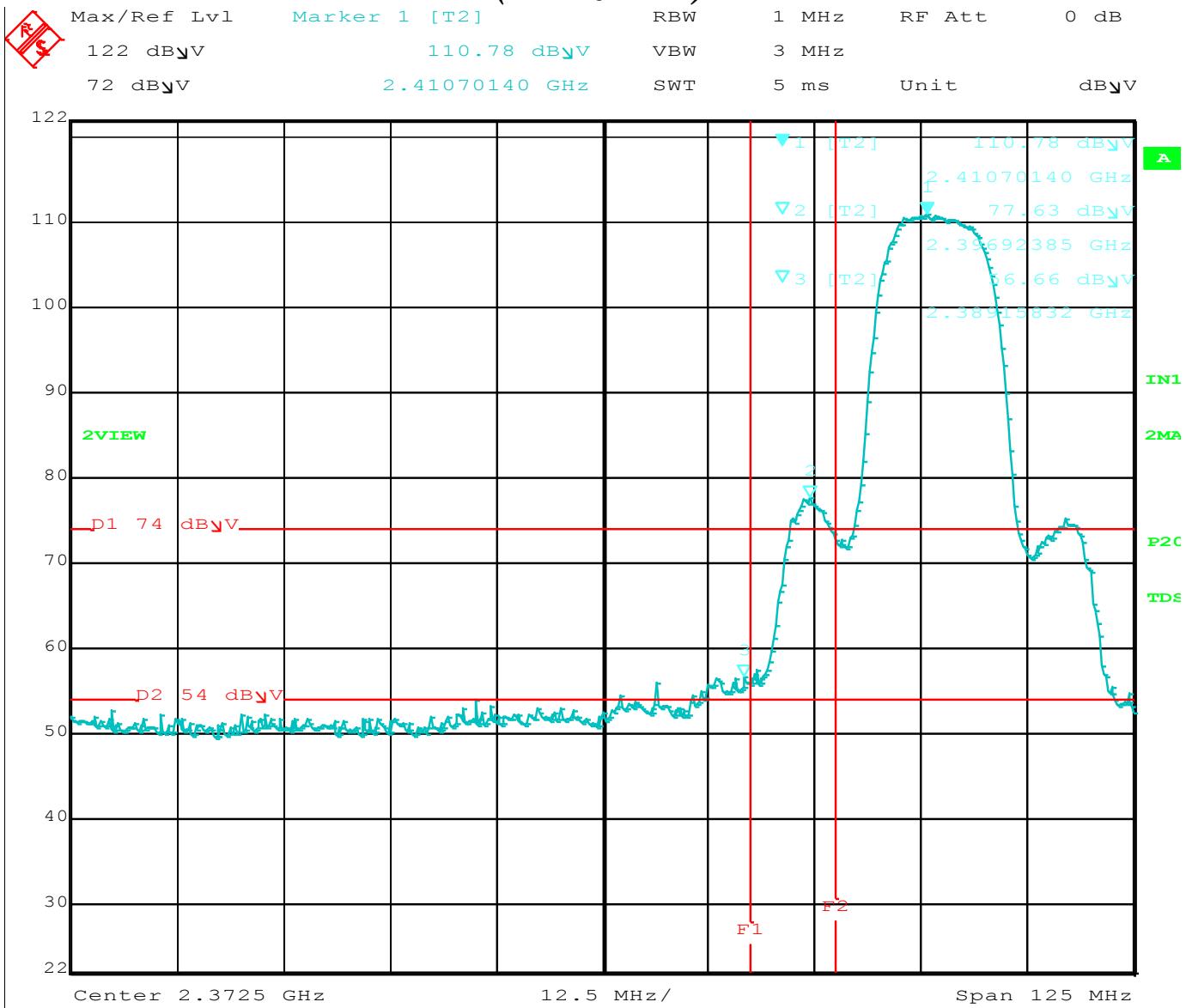
Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	110.78	H	--	--	Peak	1	210	Fundamental of High Channel
2396.92	77.63	H	90.78	-13.15	Delta	1	210	From Peak
2389.16	56.66	H	73.98	-17.32	Peak	1	210	No Marker Delta Method Used
2389.16	48.48	H	53.98	-5.50	Avg	1	210	
2462.00	112.08	H	--	--	Peak	1	210	Fundamental of High Channel
2486.26	54.34	H	73.98	-19.64	Peak	1	210	No Marker Delta Method Used
2486.26	48.28	H	53.98	-5.70	Avg	1	210	

Test Distance

3 Meters



## LOWER BAND EDGE (Horizontal)



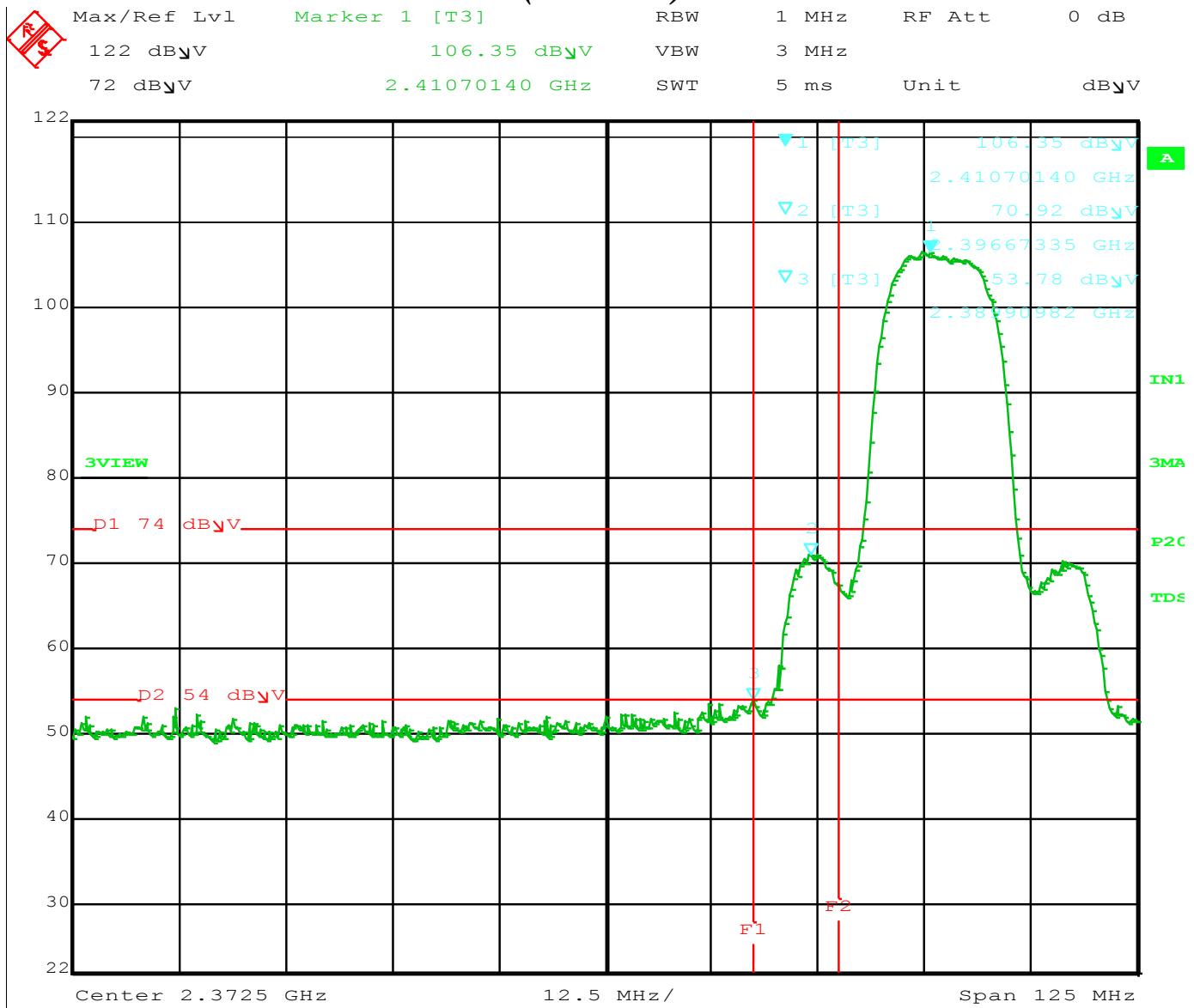
Title:

Comment A: LBE, 802.11b, Horizontal.

Date: 18.MAY.2015 12:54:26



## LOWER BAND EDGE (Vertical)



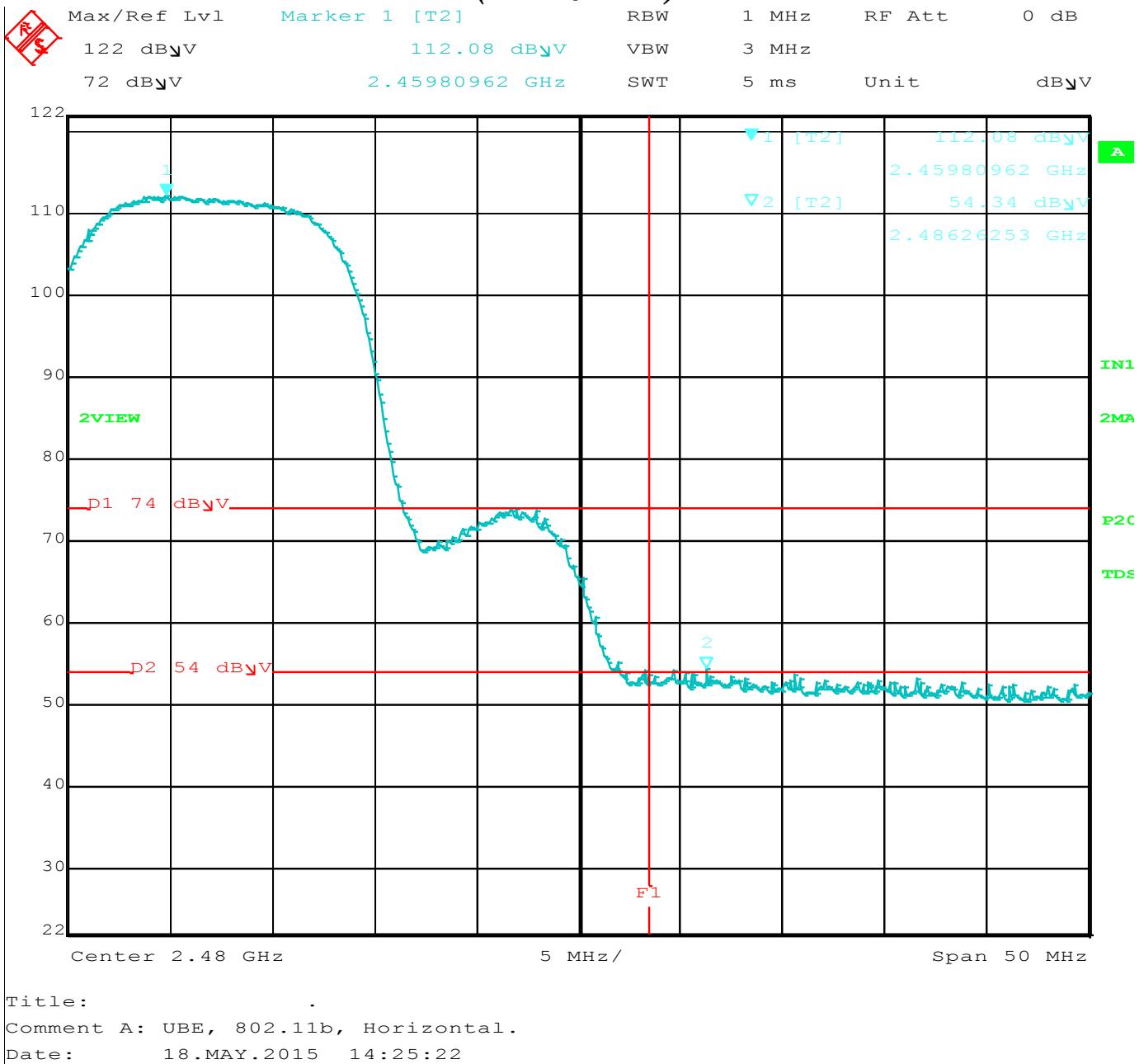
Title:

Comment A: LBE, 802.11b, Vertical.

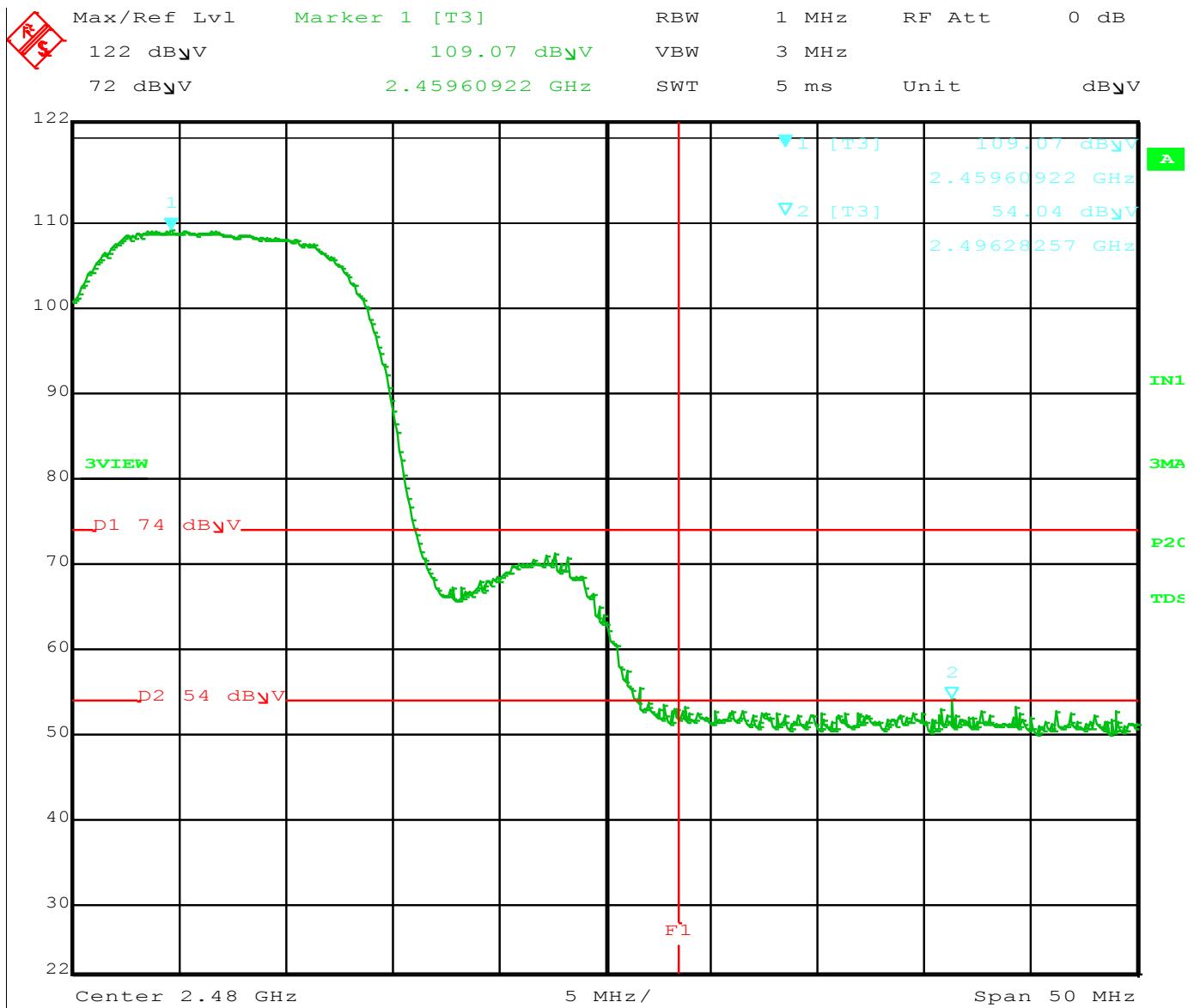
Date: 18.MAY.2015 13:14:24



## UPPER BAND EDGE (Horizontal)



## UPPER BAND EDGE (Vertical)



Title: \_\_\_\_\_.

Comment A: UBE, 802.11b, Vertical.

Date: 18.MAY.2015 14:29:42



## BAND EDGES- VERTICAL

### *802.11g Mode*

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC3400  
 Mode: 802.11g

Date: 6/16/2015  
 Lab: R  
 Test ENG: Matt Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	106.06	V	--	--	Peak	1.87	180	Fundamental of High Channel
2397.67	81.26	V	86.06	-4.80	Delta	1.87	180	From Peak
2389.65	71.16	V	73.98	-2.82	Peak	1.87	180	No Marker Delta Method Used
2389.65	48.27	V	53.98	-5.71	Avg	1.87	180	
2462.00	108.19	V	--	--	Peak	1.76	180	Fundamental of High Channel
2483.60	71.62	V	73.98	-2.36	Peak	1.76	180	No Marker Delta Method Used
2483.60	51.05	V	53.98	-2.93	Avg	1.76	180	

Test distance

3 meter



## BAND EDGES- HORIZONTAL

### *802.11g Mode*

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC3400  
 Mode: 802.11g

Date: 6/16/2015  
 Lab: R  
 Test ENG: Matt Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

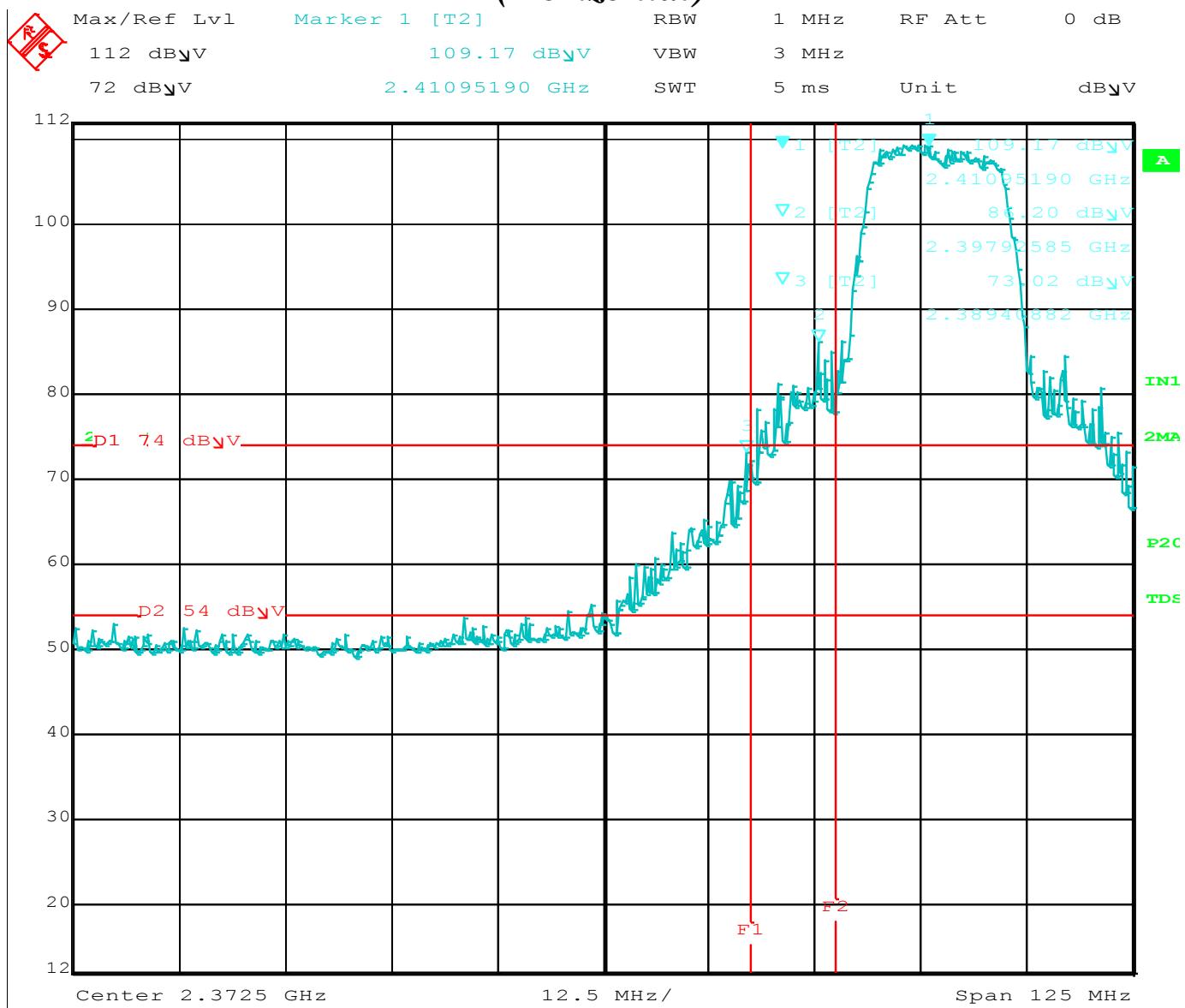
Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	109.17	H	--	--	Peak	1	210	Fundamental of High Channel
2397.92	86.20	H	89.17	-2.97	Delta	1	210	From Peak
2389.40	73.02	H	73.98	-0.96	Peak	1	210	No Marker Delta Method Used
2389.40	53.90	H	53.98	-0.08	Avg	1	210	
2462.00	110.69	H	--	--	Peak	1	210	Fundamental of High Channel
2483.75	72.37	H	73.98	-1.61	Peak	1	210	No Marker Delta Method Used
2483.75	51.93	H	53.98	-2.05	Avg	1	210	

Test distance

3 meter



## LOWER BAND EDGE (Horizontal)



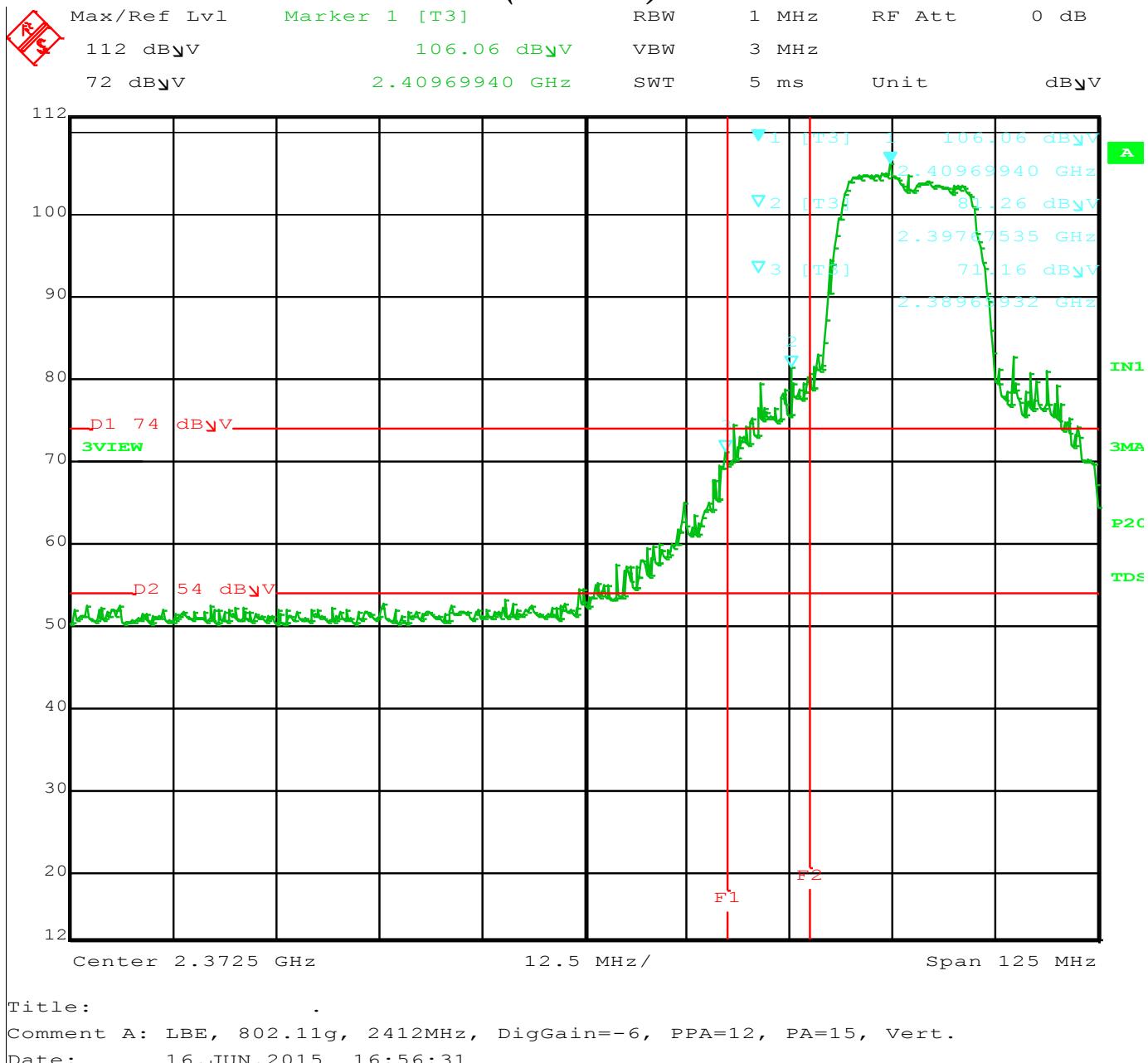
Title:

Comment A: LBE, 802.11g, 2412MHz, DigGain= -6, PPA= 12, PA=15.

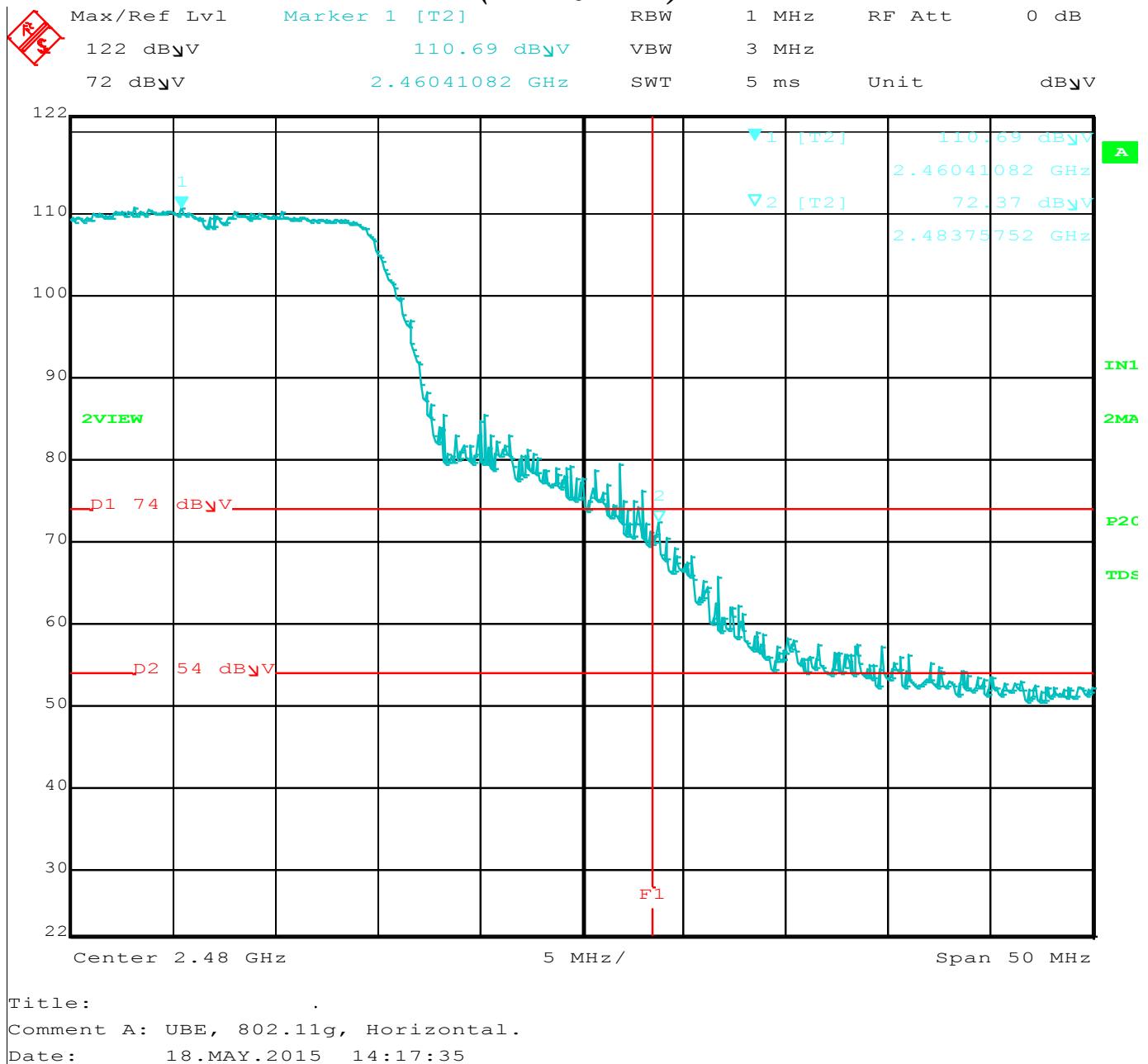
Date: 16.JUN.2015 16:47:47



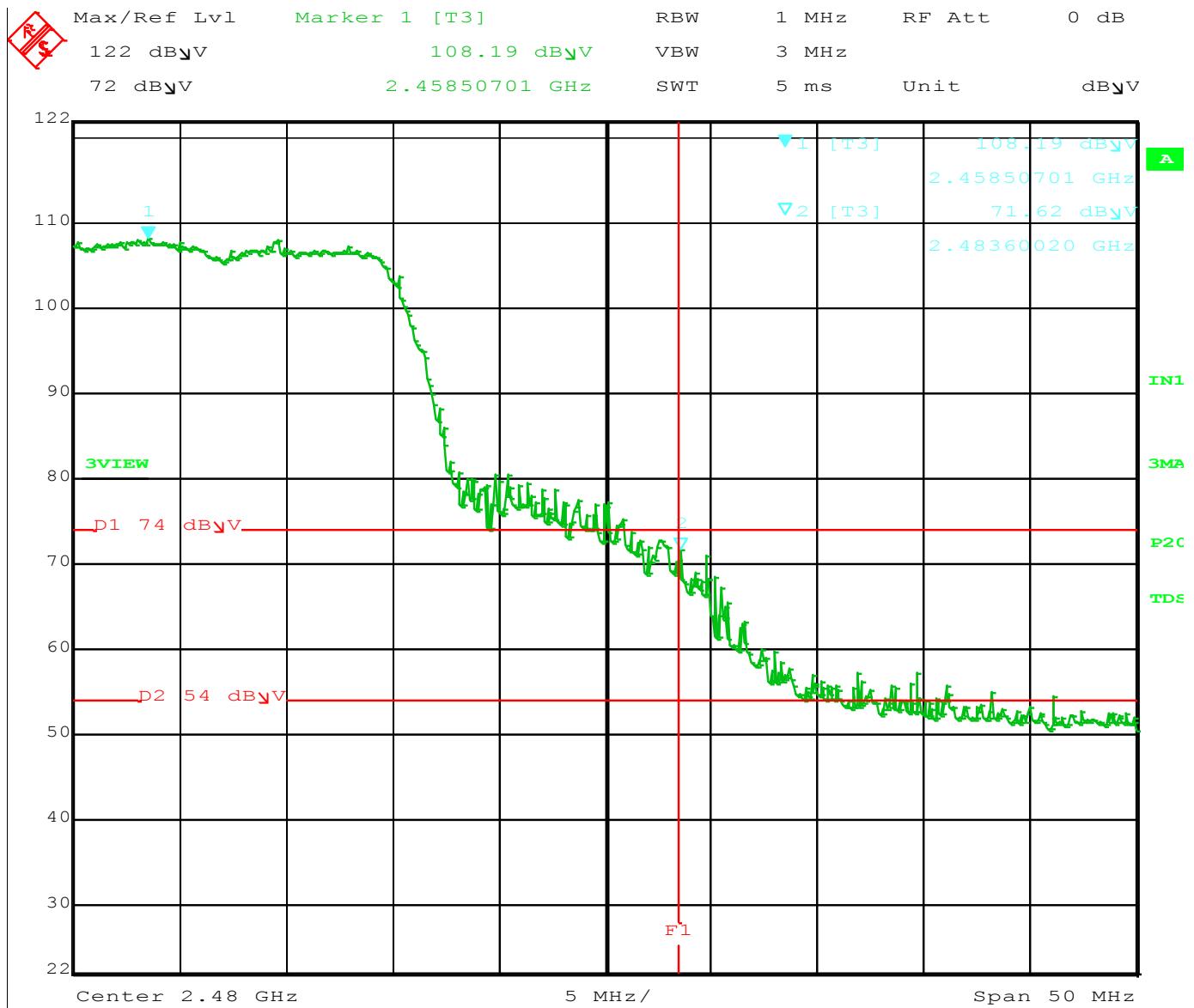
## LOWER BAND EDGE (Vertical)



## UPPER BAND EDGE (Horizontal)



## UPPER BAND EDGE (Vertical)



Title: \_\_\_\_\_.

Comment A: UBE, 802.11g, Vertical.

Date: 18.MAY.2015 14:21:47



## BAND EDGES- VERTICAL

### *802.11n Mode*

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter

Model: ATWINC3400  
 Mode: 802.11n

Date: 5/18/2015  
 Lab: R  
 Test  
 ENG: Matt Harrison

**Compatible Electronics, Inc. FAC-3 ( Lab R )**

Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	104.09	V	--	--	Peak	1.45	180	Fundamental of High Channel
2398.49	80.21	V	84.09	-3.88	Delta	1.45	180	From Peak
2389.49	69.85	V	73.98	-4.13	Peak	1.45	180	<b>No</b> Marker Delta Method Used
2389.49	50.47	V	53.98	-3.51	Avg	1.45	180	
2462.00	107.58	V	--	--	Peak	1.8	180	Fundamental of High Channel
2483.50	69.81	V	73.98	-4.17	Peak	1.8	180	<b>No</b> Marker Delta Method Used
2483.50	50.46	V	53.98	-3.52	Avg	1.8	180	

Test distance  
 3 meter



## BAND EDGES- HORIZONTAL

### *802.11n Mode*

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter

Model: ATWINC3400  
 Mode: 802.11n

Date: 5/18/2015  
 Lab: R  
 Test  
 ENG: Matt Harrison

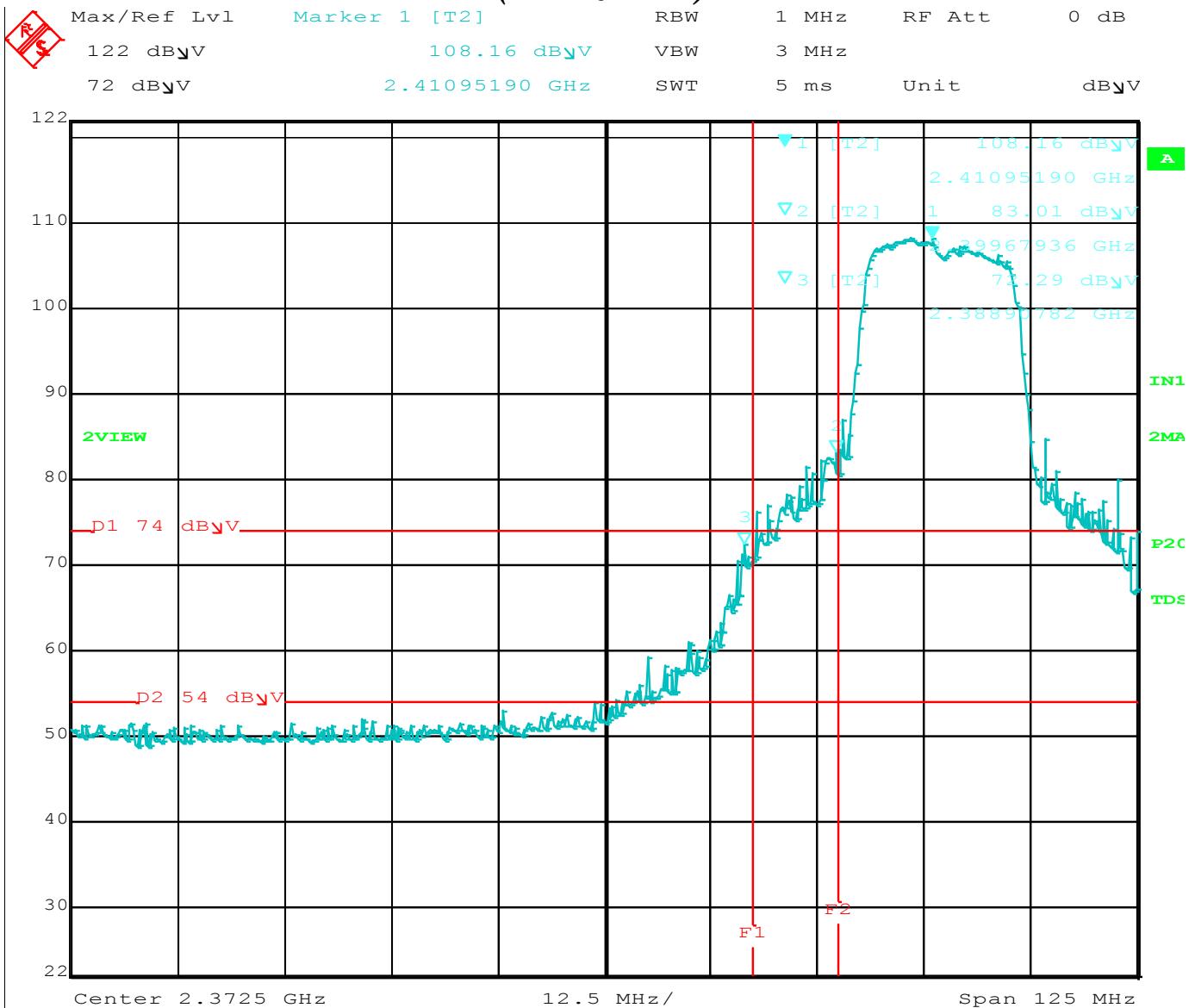
Compatible Electronics, Inc. FAC-3 ( Lab R )

Freq. (MHz)	Level (dB $\mu$ V)	Pol	Limit (dB $\mu$ V)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	108.16	H	--	--	Peak	1	210	Fundamental of High Channel
2399.68	83.01	H	88.16	-5.15	Delta	1	210	From Peak
2388.91	72.29	H	73.98	-1.69	Peak	1	210	No Marker Delta Method Used
2388.91	52.11	H	53.98	-1.87	Avg	1	210	
2462.00	109.75	H	--	--	Peak	1	210	Fundamental of High Channel
2484.70	73.25	H	73.98	-0.73	Peak	1	210	No Marker Delta Method Used
2484.70	50.38	H	53.98	-3.60	Avg	1	210	

Test distance  
 3 meter



## LOWER BAND EDGE (Horizontal)



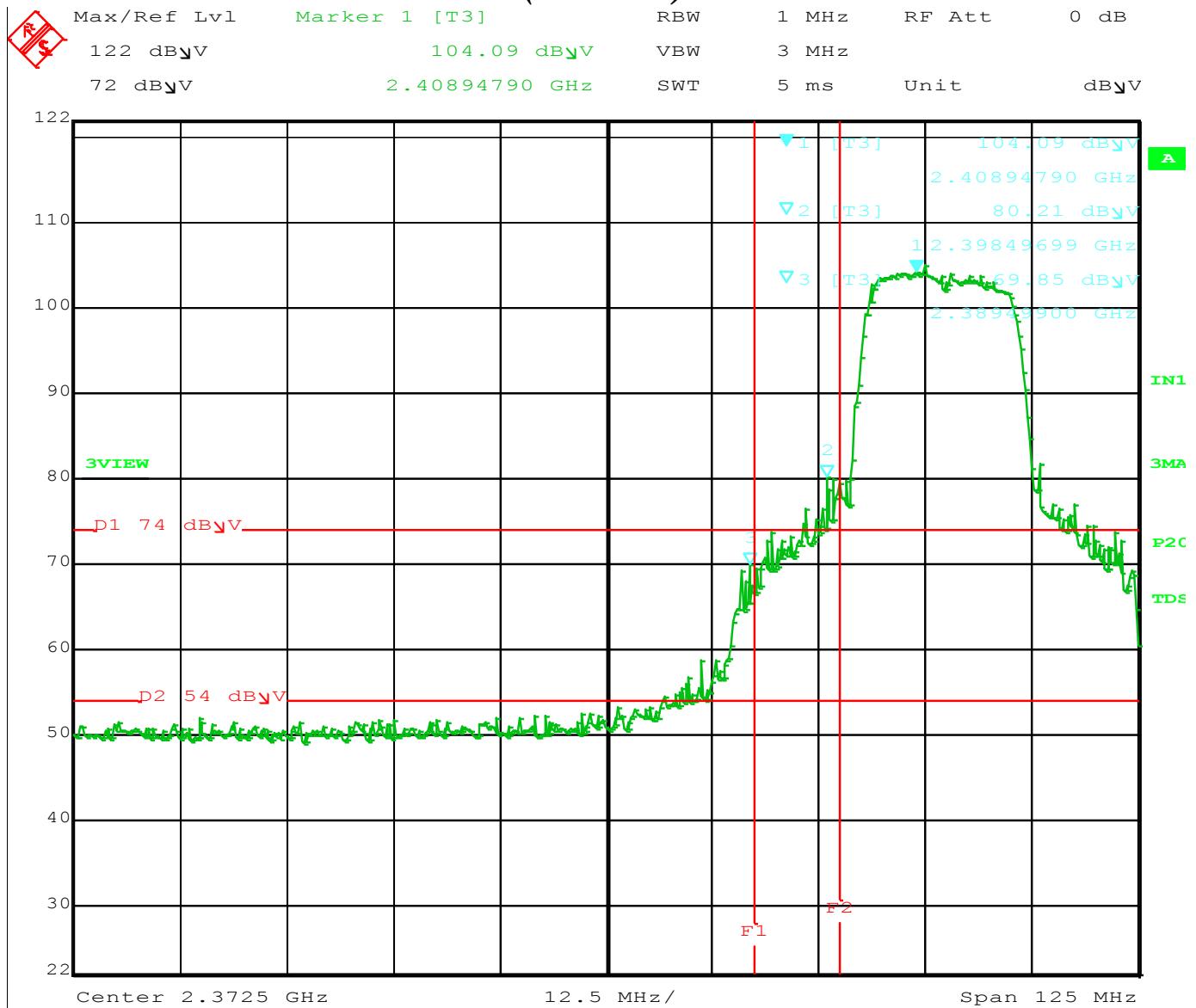
Title: -

Comment A: LBE, 802.11n, Horizontal.

Date: 18.MAY.2015 13:54:40



## LOWER BAND EDGE (Vertical)



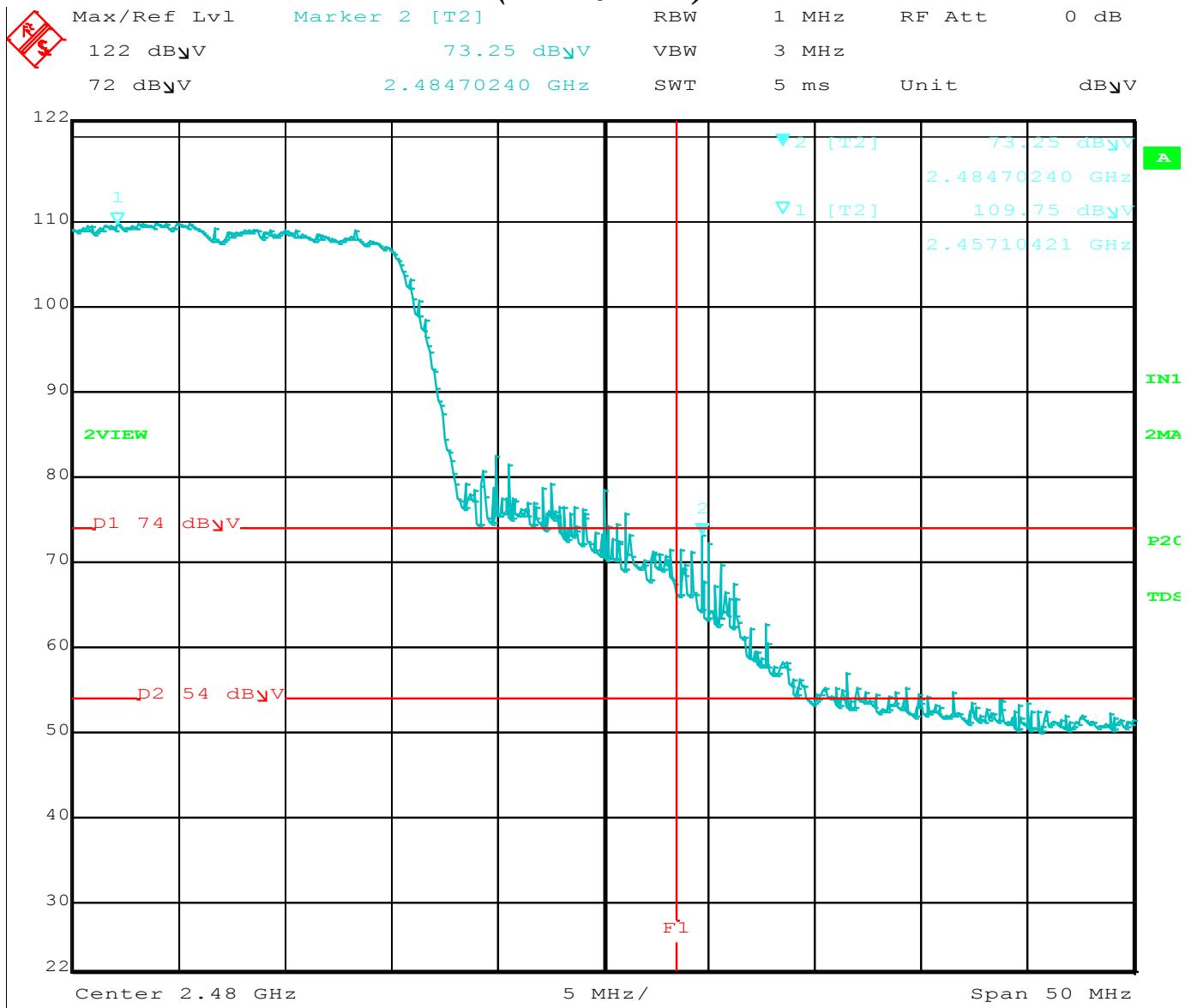
Title:

Comment A: LBE, 802.11n, Vertical.

Date: 18.MAY.2015 13:59:48



## UPPER BAND EDGE (Horizontal)



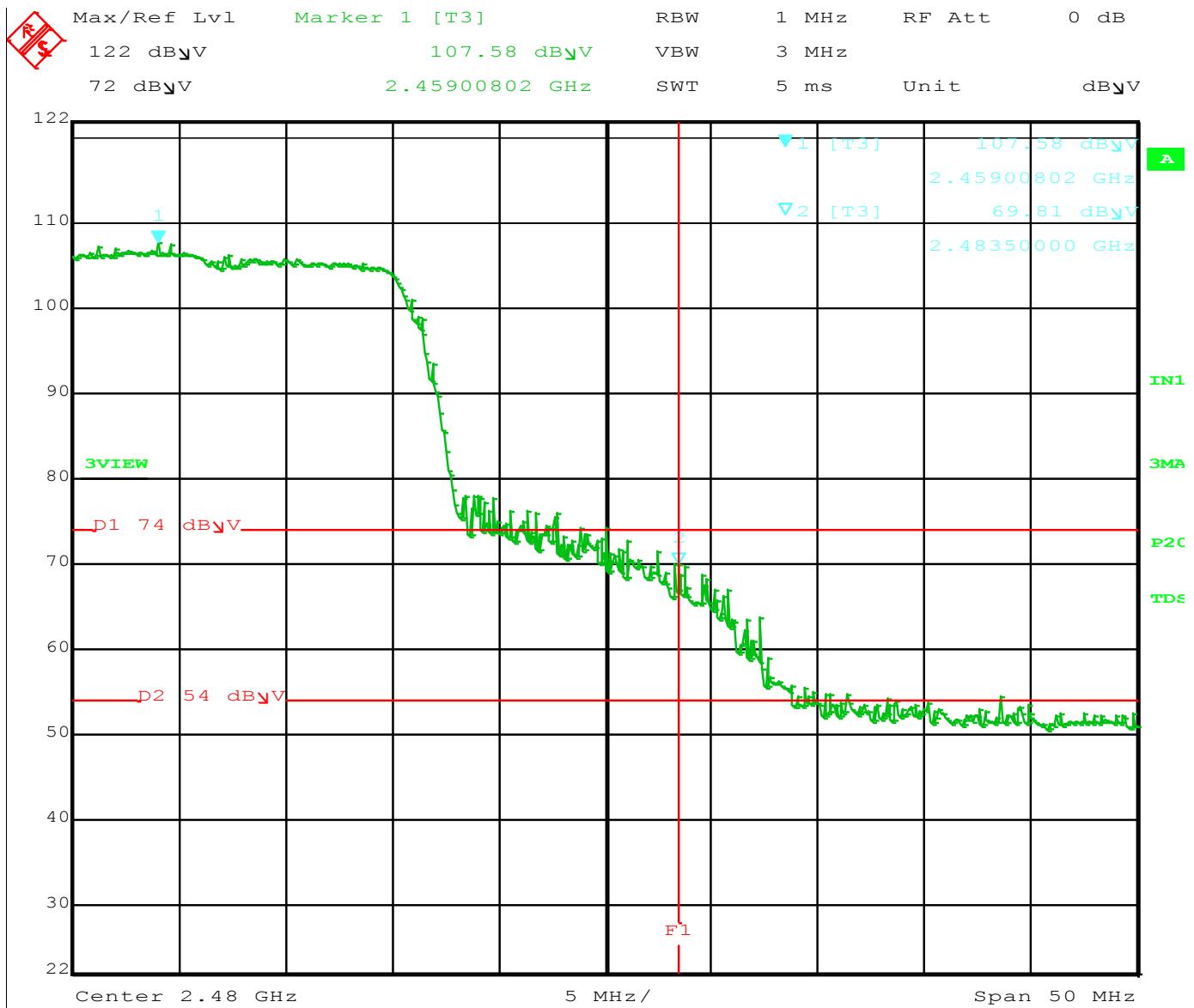
Title:

Comment A: UBE, 802.11n, Horizontal.

Date: 18.MAY.2015 14:06:42



## UPPER BAND EDGE (Vertical)



Title: .

Comment A: UBE, 802.11n, Vertical.

Date: 18.MAY.2015 14:09:28

