

**FCC PART 15 SUBPART C SECTION 15.247  
TEST REPORT***for***WIRELESS MODULE****Model: ATWINC1510-MR210PB**

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: SEPTEMBER 8, 2015

	REPORT	APPENDICES					TOTAL
	BODY	A	B	C	D	E	
PAGES	19	2	2	2	16	74	115

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

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

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19121 El Toro Road  
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(949) 589-0700

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20621 Pascal Way  
Lake Forest, CA 92630  
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**LIST OF APPENDICES**

APPENDIX	TITLE
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**

FIGURE	TITLE
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



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**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

## 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: Wireless Module  
Model: ATWINC1510-MR210PB  
S/N: None

Product Description: The EUT is an 802.11b, g, and n Wireless Shielded Module.

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: June 26, August 19, and September 1, 2, 2015

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

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



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**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**

<b>TEST</b>	<b>DESCRIPTION</b>	<b>RESULTS</b>
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 15.205



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**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

## 1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Wireless Module Model: ATWINC1510-MR210PB. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10. 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 and 15.247.



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**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  
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**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

Igor Radutny                      Staff Applications Engineer

Compatible Electronics Inc.

Torey Oliver                      Test Technician

Matt Harrison                    Lab Manager

Jeff Klinger                      Director of Engineering

**2.4 Date Test Sample was Received**

The test sample was received on June 26, 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



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

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2337 Troutdale Drive  
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(818) 597-0600

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20621 Pascal Way  
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**3. APPLICABLE DOCUMENTS**

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

<b>SPEC</b>	<b>TITLE</b>
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.10: 2013	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



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**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  
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#### 4. DESCRIPTION OF TEST CONFIGURATION

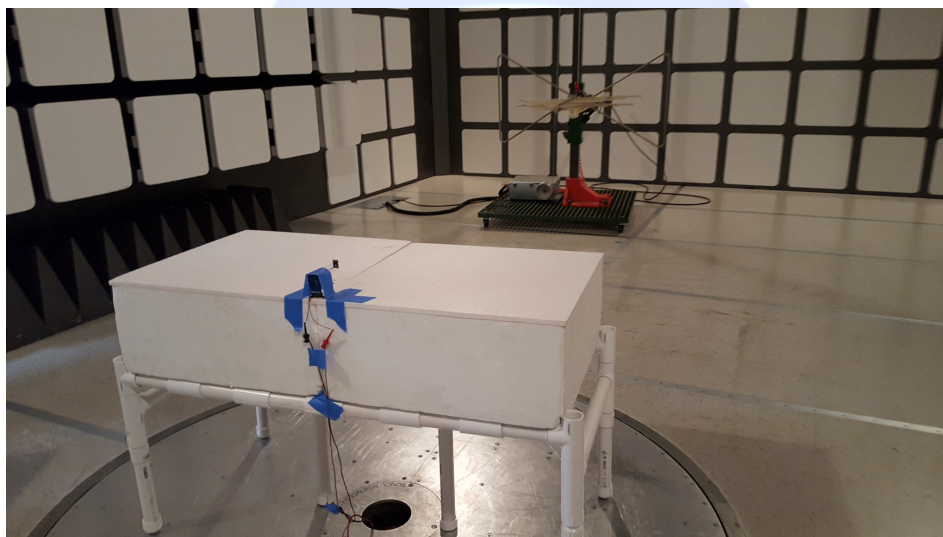
##### 4.1 Description of Test Configuration

The Wireless Module Model: ATWINC1510-MR210PB (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



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**4.1.2 Cable Construction and Termination****Cable 1**

This is a 2 meter, un-shielded, round cable that connects the EUT to the DC Power Supply. The cable is hardwired into the EUT and has a banana connector at the DC Supply end. The cable was not bundle.

**Cable 2**

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 bundle.

**Cable 3**

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.



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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

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20621 Pascal Way  
Lake Forest, CA 92630  
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**5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT****5.1 EUT and Accessory List**

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	WIRELESS MODULE(EUT)	ATMEL CORPORATION	ATWINC1510-MR210PB	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



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**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

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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	100172	9/5/2014	9/5/2015
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-118	443013	4/24/2014	4/24/2016
Pre-Amp, 1-18GHz	Com Power	PAM-118	443011	4/24/2014	4/24/2016
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	6/4/2014	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



**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

**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 for below 1GHz and 1.5 meters high for above 1GHz, which was placed on the ground plane.

The EUT was not grounded.

**6.3 Facility Environmental Characteristics**

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



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114 Olinda Drive  
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(714) 579-0500

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

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## 7. CHARACTERISTICS OF THE TRANSMITTER

### 7.1 Channel Number and Frequencies

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. The EUT has two modes of operation; Normal Current and Low Current. Below are the channels and power settings:

Normal Current	b Mode	g Mode	n Mode
1 == 2412 MHz DigGain= -9		DG= -12	DG= -13.5
2 == 2417 MHz DigGain= -8		DG= -7	DG= -8
3 == 2422 MHz DigGain= -8		DG= -7	DG= -8
4 == 2427 MHz DigGain= -8		DG= -7	DG= -8
5 == 2432 MHz DigGain= -8		DG= -7	DG= -8
6 == 2437 MHz DigGain= -8		DG= -7	DG= -8
7 == 2442 MHz DigGain= -8		DG= -7	DG= -8
8 == 2447 MHz DigGain= -8		DG= -7	DG= -8
9 == 2452 MHz DigGain= -8		DG= -7	DG= -8
10 == 2457 MHz DigGain= -8		DG= -7	DG= -8
11 == 2462 MHz DigGain= -8		DG= -10	DG= -11

Modulation Types Used:

802.11b: DQPSK, DBPSK, CCK  
802.11g/n: OFDM /64-QAM, 16-QAM, QPSK, BPSK

### 7.2 Antenna

The antenna is made up of a PCB Trace located on the antenna board.



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

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

**Silverado Division**  
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Lake Forest, CA 92630  
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**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**

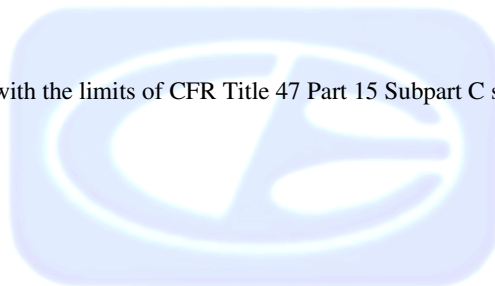
The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for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



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**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  
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### 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 and 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  
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### 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 3 kHz > 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.



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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**  
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### 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.



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

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

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

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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 Wireless Module Model: ATWINC1510-MR210PB 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 and 15.247.



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114 Olinda Drive  
Brea, CA 92823  
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Agoura, CA 91301  
(818) 597-0600

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

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**APPENDIX A**

***LABORATORY ACCREDITATIONS AND  
RECOGNITIONS***



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

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

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19121 El Toro Road  
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(949) 589-0700

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## 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>

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

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Agoura, CA 91301  
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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***



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

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

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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.



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

**Agoura Division**  
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Agoura, CA 91301  
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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  
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Silverado, CA 92676  
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## ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Wireless Module  
Model: ATWINC1510-MR210PB  
S/N: None

No additional models were tested.



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114 Olinda Drive  
Brea, CA 92823  
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**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**  
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**APPENDIX D**

***DIAGRAMS, FACTORS, CHARTS, AND PHOTOS***



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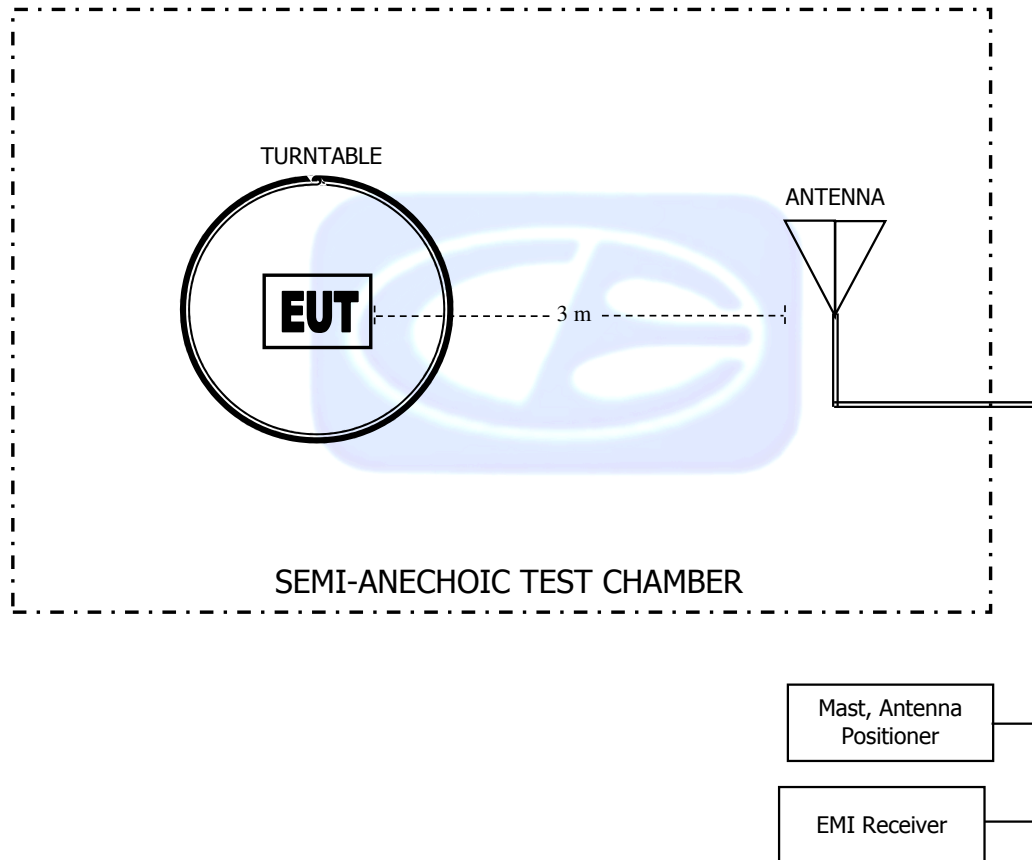
**Brea Division**  
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Brea, CA 92823  
(714) 579-0500

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2337 Troutdale Drive  
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(818) 597-0600

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19121 El Toro Road  
Silverado, CA 92676  
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**FIGURE 1: PLOT MAP AND LAYOUT OF TEST SITE  
BELOW 1GHZ**



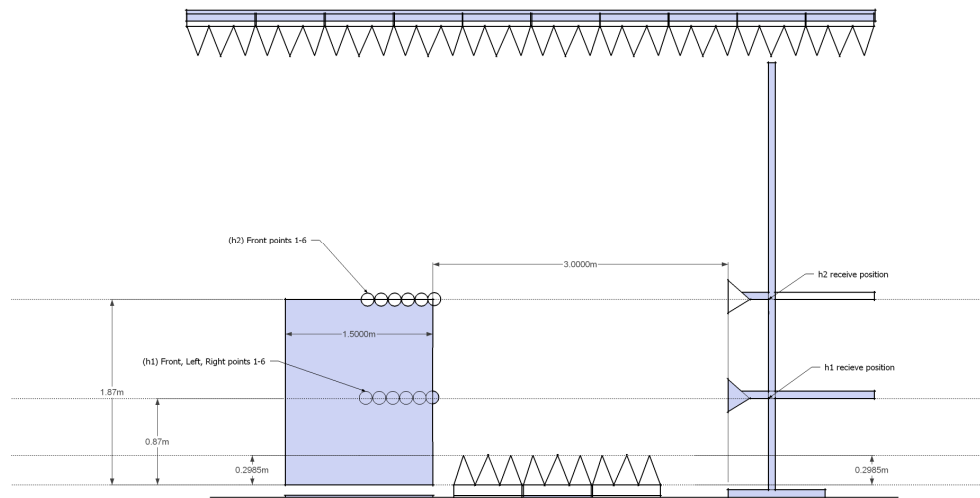
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Brea, CA 92823  
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2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

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

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



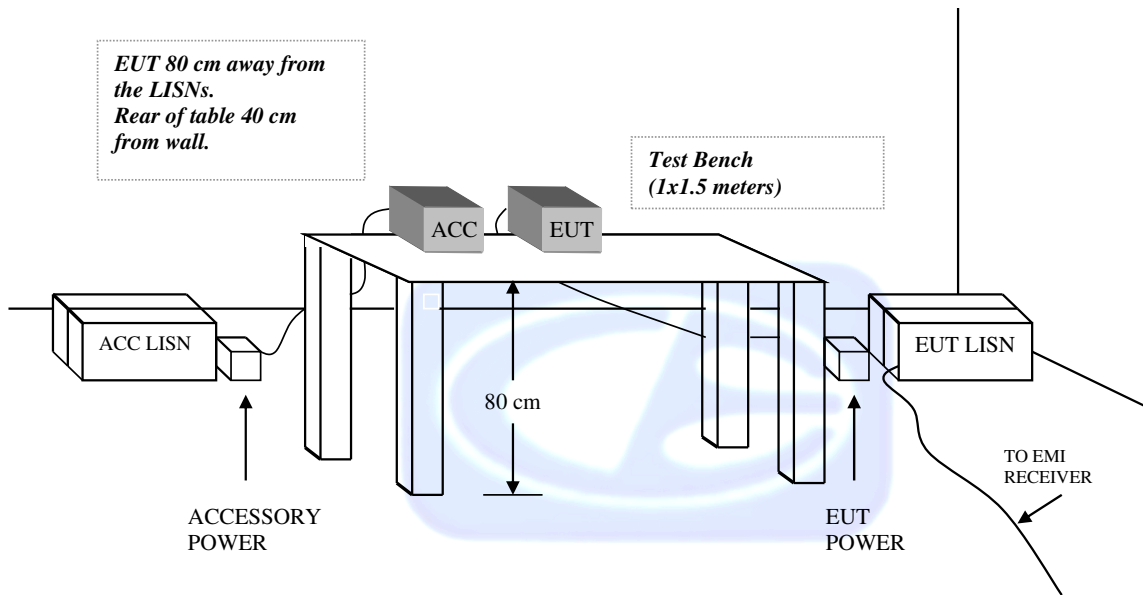
**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

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

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

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20621 Pascal Way  
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(949) 587-0400

**FIGURE 3: CONDUCTED EMISSIONS TEST SETUP**



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



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**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  
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(949) 587-0400

**COM-POWER AC-220****LAB R - COMBILOG ANTENNA**

S/N: 25857

CALIBRATION DUE: MAY 21, 2016

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
<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



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114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500**Agoura Division**  
2337 Troutdale Drive  
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(818) 597-0600**Silverado Division**  
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20621 Pascal Way  
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**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



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**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  
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Lake Forest, CA 92630  
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**COM-POWER PAM-118****1-18GHz - PREAMPLIFIER**

S/N: 443013

CALIBRATION DUE: APRIL 24, 2016

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
500	26.2	5500	25.3
1000	25.6	6000	25.0
1100	25.9	6500	24.7
1200	25.9	7000	23.6
1300	26.3	7500	23.3
1400	26.5	8000	23.7
1500	26.3	8500	24.0
1600	26.1	9000	24.3
1700	26.2	9500	24.1
1800	26.3	10000	23.7
1900	25.8	11000	24.2
2000	26.0	12000	23.2
2500	26.0	13000	22.8
3000	25.8	14000	22.6
3500	25.9	15000	22.9
4000	26.4	16000	22.3
4500	26.0	17000	22.6
5000	25.6	18000	23.9



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Brea, CA 92823  
(714) 579-0500**Agoura Division**  
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19121 El Toro Road  
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**COM-POWER PAM-118****1-18GHz - PREAMPLIFIER**

S/N: 443011

CALIBRATION DUE: April 24, 2016

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
0.500	27.2	7.000	23.8
1.000	26.6	7.500	23.9
1.500	27.0	8.000	24.4
2.000	27.0	8.500	25.2
2.500	27.4	9.500	26.2
3.000	27.6	10.000	25.8
3.500	27.5	11.000	25.5
4.000	27.3	12.000	25.4
4.500	27.3	13.000	25.1
5.000	27.5	14.000	24.6
5.500	26.3	15.000	24.1
6.000	26.1	16.000	25.1
6.500	25.4	17.000	25.2
		18.000	24.4



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Brea, CA 92823  
(714) 579-0500**Agoura Division**  
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Agoura, CA 91301  
(818) 597-0600**Silverado Division**  
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**COM-POWER PA-840****18-40 GHz PREAMPLIFIER**

S/N: 181289

CALIBRATION DUE: JUNE 16, 2016

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



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**FRONT VIEW**

ATMEL CORPORATION  
WIRELESS MODULE

Model: ATWINC1510-MR210PB  
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**  
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**REAR VIEW**

ATMEL CORPORATION  
WIRELESS MODULE  
Model: ATWINC1510-MR210PB  
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

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



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**FRONT VIEW**

ATMEL CORPORATION  
WIRELESS MODULE  
Model: ATWINC1510-MR210PB  
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

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



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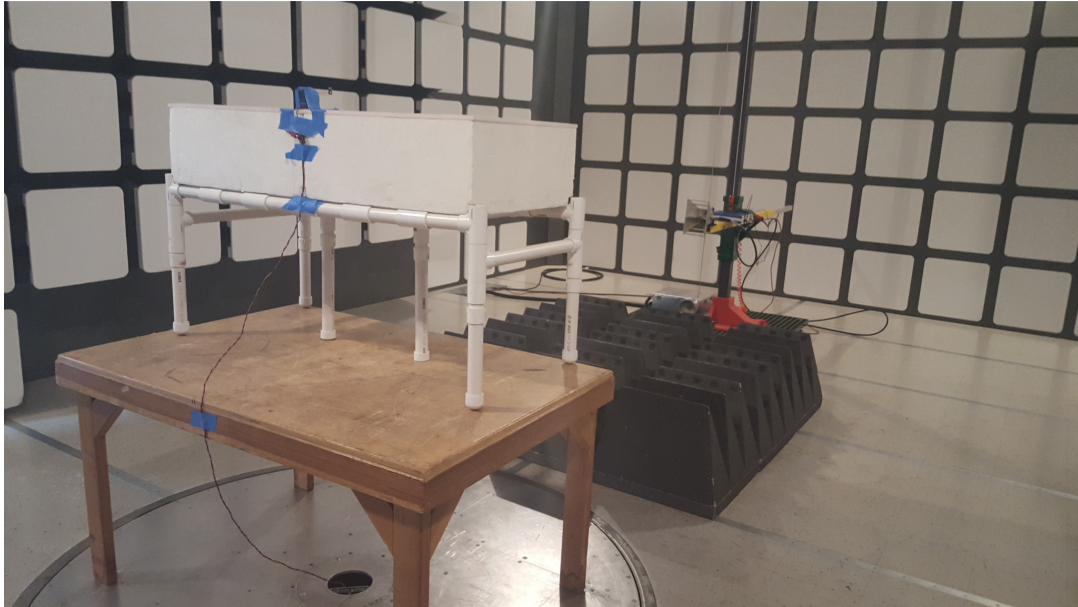
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**REAR VIEW**

ATMEL CORPORATION  
WIRELESS MODULE

Model: ATWINC1510-MR210PB  
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

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



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**FRONT VIEW**

ATMEL CORPORATION  
WIRELESS MODULE  
Model: ATWINC1510-MR210PB  
FCC SUBPART C - CONDUCTED EMISSIONS

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



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Brea, CA 92823  
(714) 579-0500

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Agoura, CA 91301  
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**REAR VIEW**

ATMEL CORPORATION  
WIRELESS MODULE  
Model: ATWINC1510-MR210PB  
FCC SUBPART C - CONDUCTED EMISSIONS

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



---

**Brea Division**  
114 Olinda Drive  
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**Agoura Division**  
2337 Troutdale Drive  
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(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***



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

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

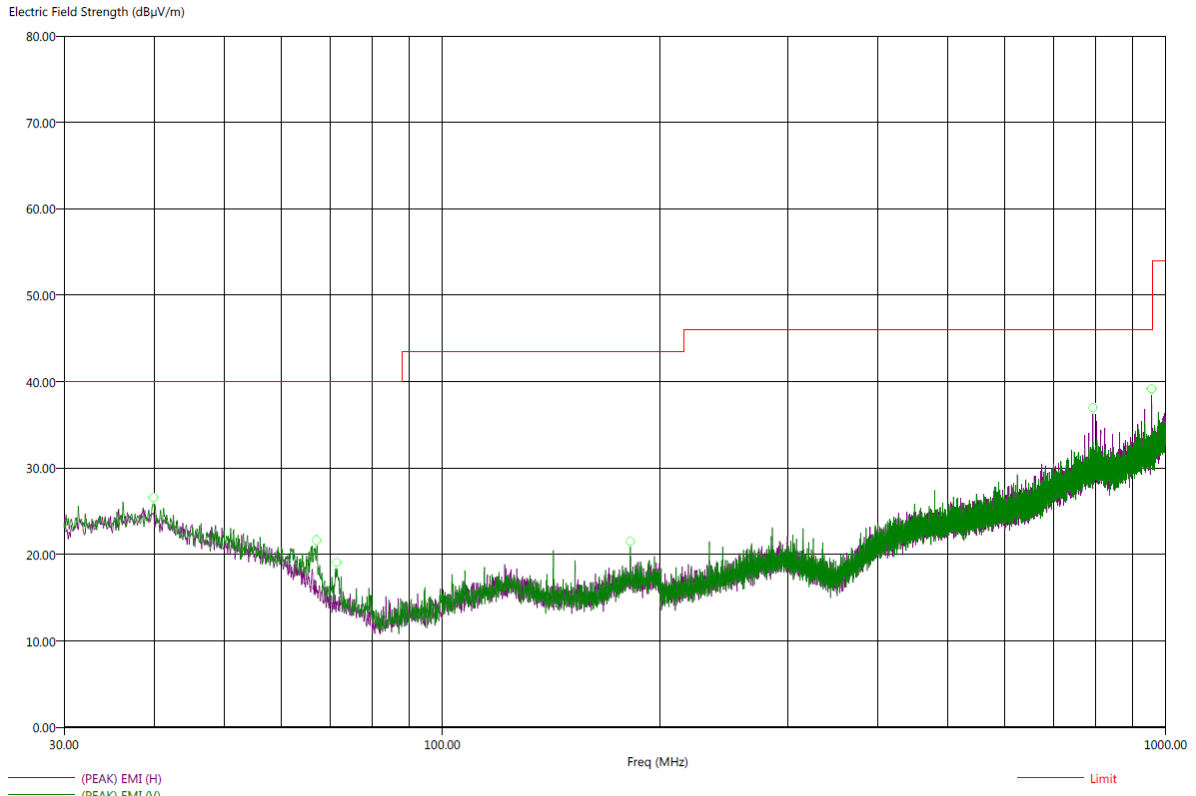
**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

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

Title: FCC 15.209  
 File: Radiated Pre-Scan 30-1000Mhz\_n.set  
 Operator: Matt Harrison  
 EUT Type: ATWINC1510B.  
 EUT Condition: Transmitting @ 802.11n, 2442 MHz, DigGain= -8.  
 Comments: Temp: 73f  
 Hum: 43%  
 3.3VDC

6/26/2015 10:54:48 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.**



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 (949) 589-0700

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

Title: FCC 15.209  
File: Radiated Final 30-1000Mhz\_g.set  
Operator: Matt Harrison  
EUT Type: ATWINC1510B.  
EUT Condition: Transmitting @ 802.11n, 2442 MHz, DigGain= -8  
Comments: Temp: 73f  
Hum: 43%  
3.3VDC

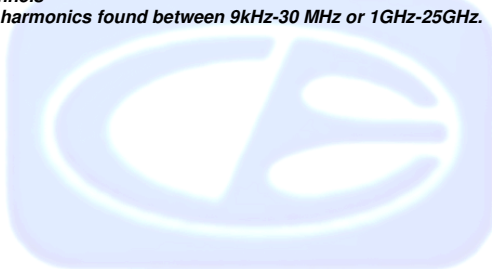
6/26/2015 11:05:23 AM  
Sequence: Final Measurements

**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)
39.90	-19.69	20.31	25.47	40.00	V	167.25	257.59	23.00	1.30
67.10	-24.40	15.60	21.18	40.00	V	161.25	149.00	14.62	0.79
71.50	-26.52	13.48	19.39	40.00	V	242.25	113.77	12.96	0.65
182.00	-26.15	17.37	22.21	43.52	V	166.75	110.07	14.96	1.29
793.70	-12.75	33.25	37.42	46.00	H	252.50	113.29	25.86	3.26
956.40	-6.85	39.15	41.73	46.00	H	281.25	166.91	27.11	3.59

*This was worst case for all modes and channels*

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



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Lake Forest, CA 92630  
(949) 587-0400

**APPENDIX E**

***CONDUCTED EMISSIONS DATA SHEETS***



---

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Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
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Agoura, CA 91301  
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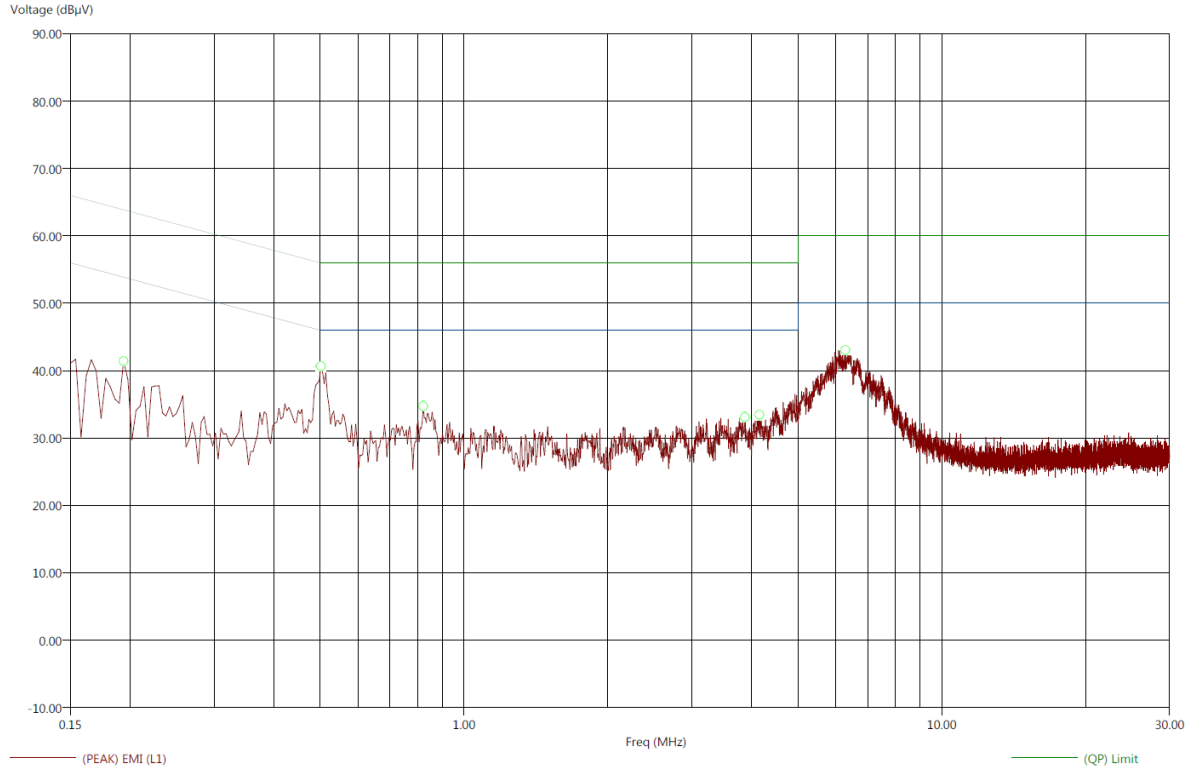
**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

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

Title: FCC 15.207  
File: Conducted Pre-Line\_n.set  
Operator: Matt Harrison  
EUT Type: ATWILC1510B.  
EUT Condition: Transmitting @ 802.11n, 2442 MHz, DigGain= -8.  
Comments: Connected to Control Board Powered By USB Adapter.  
Temp: 74f  
Hum: 48%  
USB Adapter: 120V 60Hz

7/10/2015 2:14:26 PM  
Sequence: Preliminary Scan

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



***This was worst case for all modes and channels***



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**Lake Forest Division**  
20621 Pascal Way  
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(949) 587-0400

Title: FCC 15.207 7/10/2015 2:19:40 PM  
 File: Conducted Final-Line\_n.set Sequence: Final Measurements  
 Operator: Matt Harrison  
 EUT Type: ATWILC1510B.  
 EUT Condition: Transmitting @ 802.11n, 2442 MHz, DigGain= -8.  
 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 (dBμV)	(QP) EMI (dBμV)	(PEAK) EMI (dBμV)	(AVG) Limit (dBμV)	(QP) Limit (dBμV)	Transducer (dB)	Cable (dB)
0.19	-35.32	-28.69	18.54	35.17	40.37	53.86	63.86	0.32	0.29
0.50	-17.37	-18.18	28.63	37.82	42.74	46.00	56.00	0.07	0.00
0.82	-24.62	-26.23	21.38	29.77	34.74	46.00	56.00	0.06	0.00
3.88	-27.32	-28.84	18.68	27.16	31.22	46.00	56.00	0.07	0.23
4.15	-25.60	-26.91	20.40	29.09	32.54	46.00	56.00	0.07	0.22
6.29	-21.51	-21.00	28.49	39.00	42.30	50.00	60.00	0.06	0.37

*This was worst case for all modes and channels*



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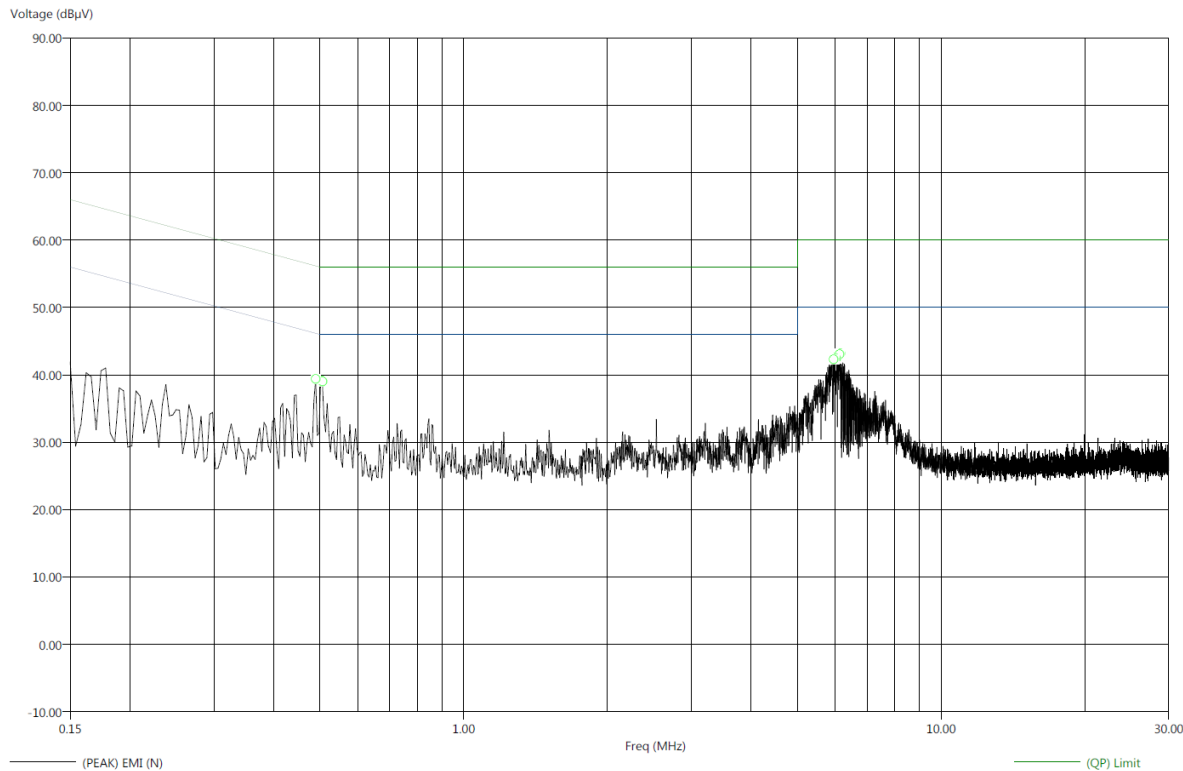
**Silverado Division**  
 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

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

Title: FCC 15.207  
File: Conducted Pre-Neutral\_n.set  
Operator: Matt Harrison  
EUT Type: ATWILC1000B.  
EUT Condition: Transmitting @ 802.11n, 2442 MHz, DigGain= -7.  
Comments: Connected to Control Board Powered By USB Adapter.  
Temp: 74f  
Hum: 48%  
USB Adapter: 120V 60Hz

7/10/2015 2:24:35 PM  
Sequence: Preliminary Scan

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



*This was worst case for all modes and channels*



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(714) 579-0500

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(818) 597-0600

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

**Lake Forest Division**  
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Lake Forest, CA 92630  
(949) 587-0400



Title: FCC 15.207  
File: Conducted Final-Neutral\_n.set  
Operator: Matt Harrison  
EUT Type: ATWILC1000B.  
EUT Condition: Transmitting @ 802.11n, 2442 MHz, DigGain= -7.  
Comments: Connected to Control Board Powered By USB Adapter.  
Temp: 74f  
Hum: 48%  
USB Adapter: 120V 60Hz

7/10/2015 2:27:42 PM  
Sequence: Final Measurements

**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)
0.49	-23.24	-23.40	22.93	32.77	39.56	46.17	56.17	0.06	0.01
0.51	-20.17	-19.53	25.83	36.47	41.23	46.00	56.00	0.06	0.00
5.97	-30.38	-23.25	19.62	36.75	42.21	50.00	60.00	0.07	0.33
6.04	-30.67	-23.16	19.33	36.84	42.36	50.00	60.00	0.07	0.34
6.13	-28.45	-21.81	21.55	38.19	42.75	50.00	60.00	0.07	0.35
6.15	-28.25	-21.83	21.75	38.17	43.17	50.00	60.00	0.07	0.35

*This was worst case for all modes and channels*



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***DTS BANDWIDTH***



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

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

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## 802.11b MODE

**FCC 15.247**

Company: Atmel Corporation Date: 9/1/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510B-MR210PB Test ENG: Torey Oliver  
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	12.12	500.00	11624.25	Peak	
2442	12.22	500.00	11724.45	Peak	
2462	12.22	500.00	11724.45	Peak	



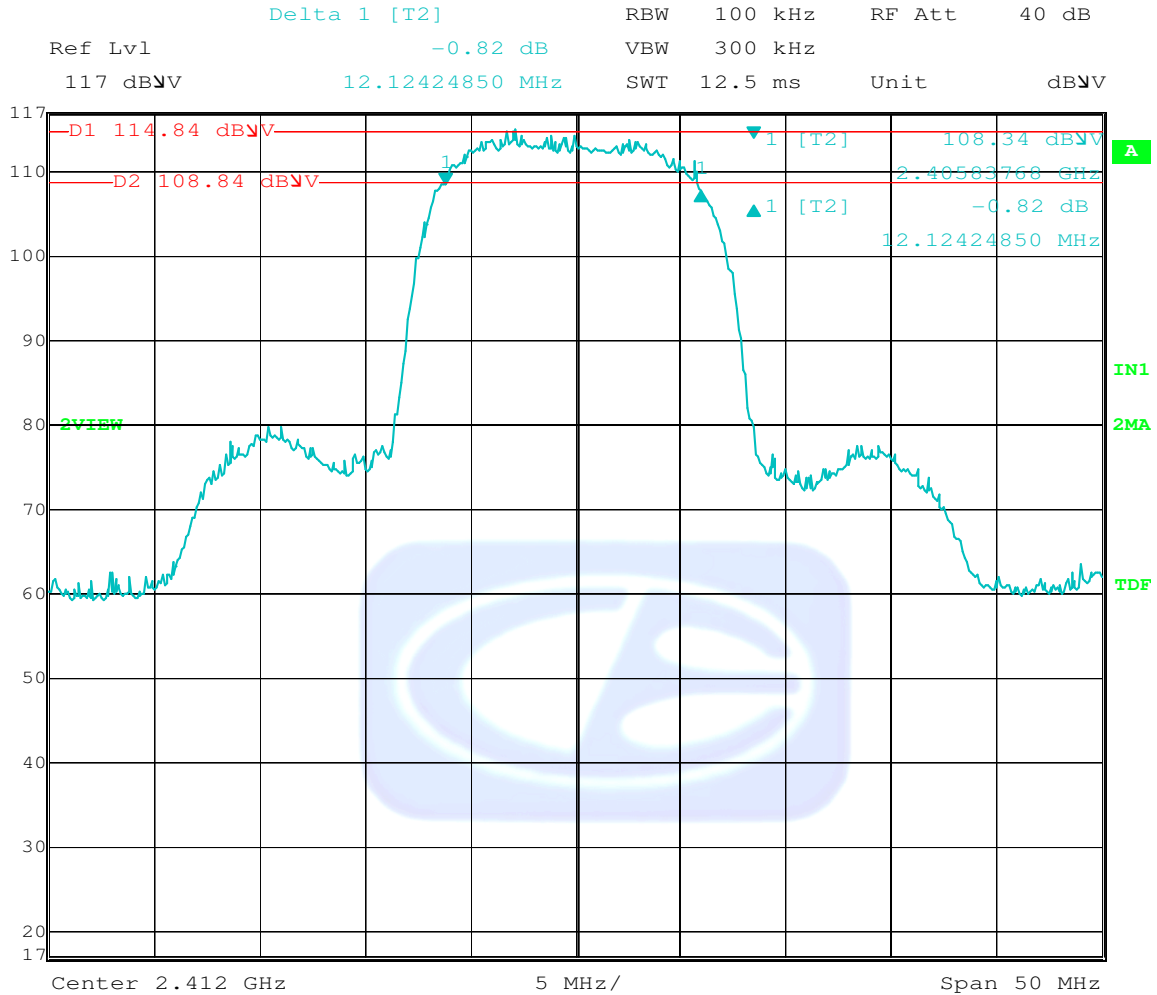
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**Lake Forest Division**  
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(949) 587-0400



Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth Low Channel 2412Mhz B mode  
 Date: 2.SEP.2015 01:13:59

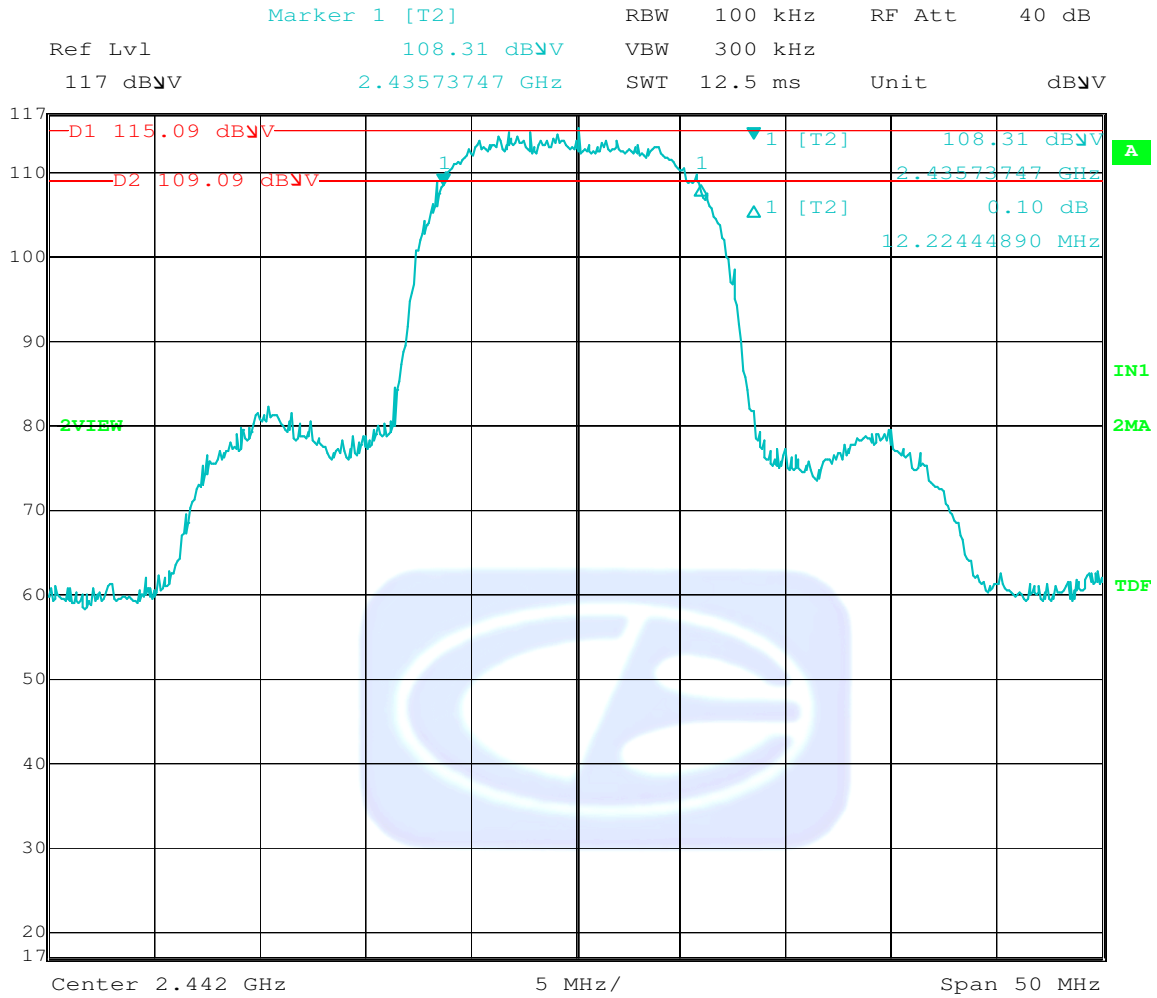


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**Lake Forest Division**  
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 (949) 587-0400



Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth Mid Channel 2442Mhz B mode  
 Date: 2.SEP.2015 01:08:04

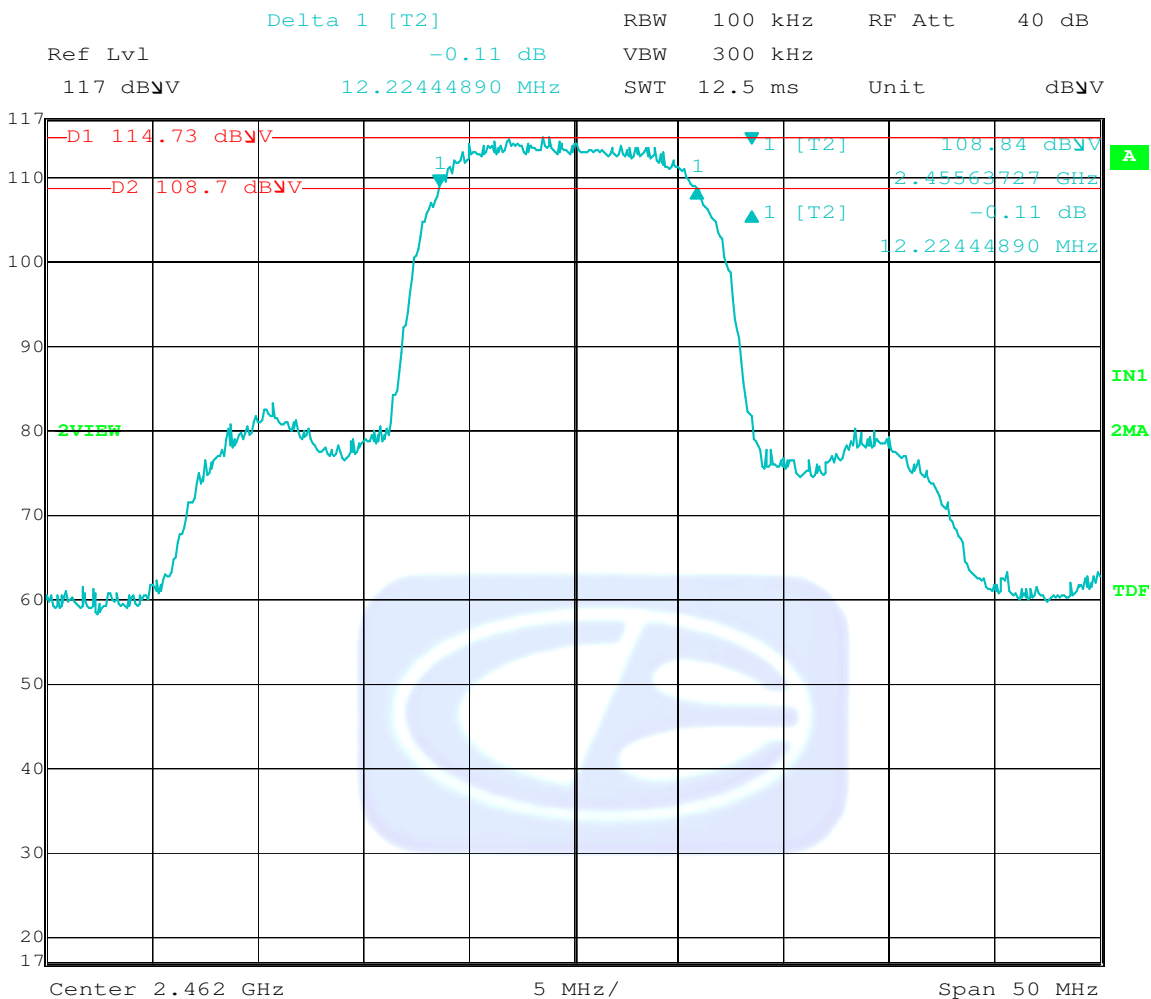


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 (949) 589-0700

**Lake Forest Division**  
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Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth High Channel 2462Mhz B mode  
 Date: 2.SEP.2015 00:59:31



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 20621 Pascal Way  
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 (949) 587-0400

## 802.11g MODE

**FCC 15.247**

Company: Atmel Corporation Date: 9/1/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: Torey Oliver  
Mode: 802.11g

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

DTS Bandwidth

Freq. (MHz)	Measured BW (MHz)	Limit Min (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	16.53	500.00	16033.07	Peak	
2442	16.33	500.00	15832.67	Peak	
2462	16.33	500.00	15832.67	Peak	

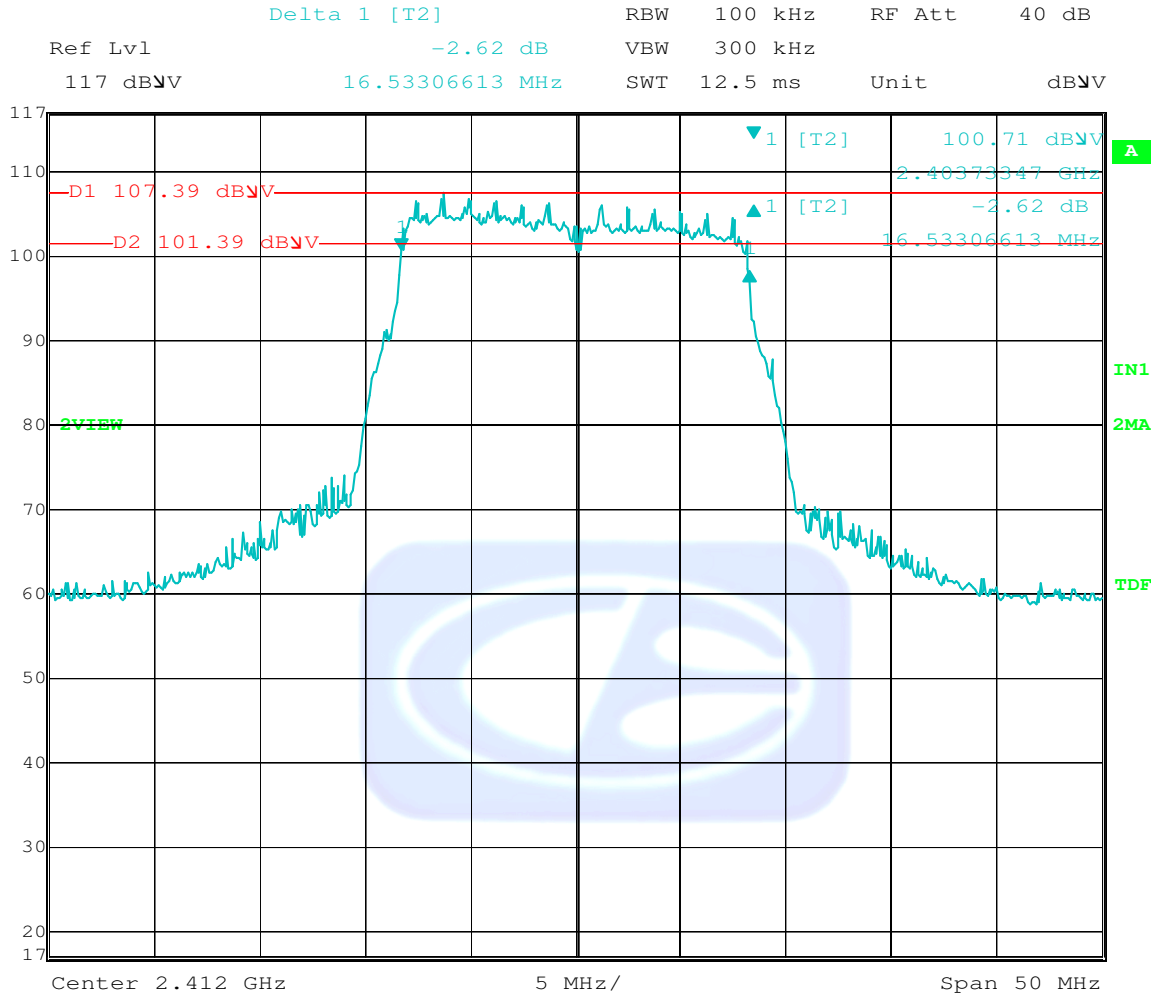


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Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth Low Channel 2412Mhz G mode  
 Date: 2.SEP.2015 01:23:51



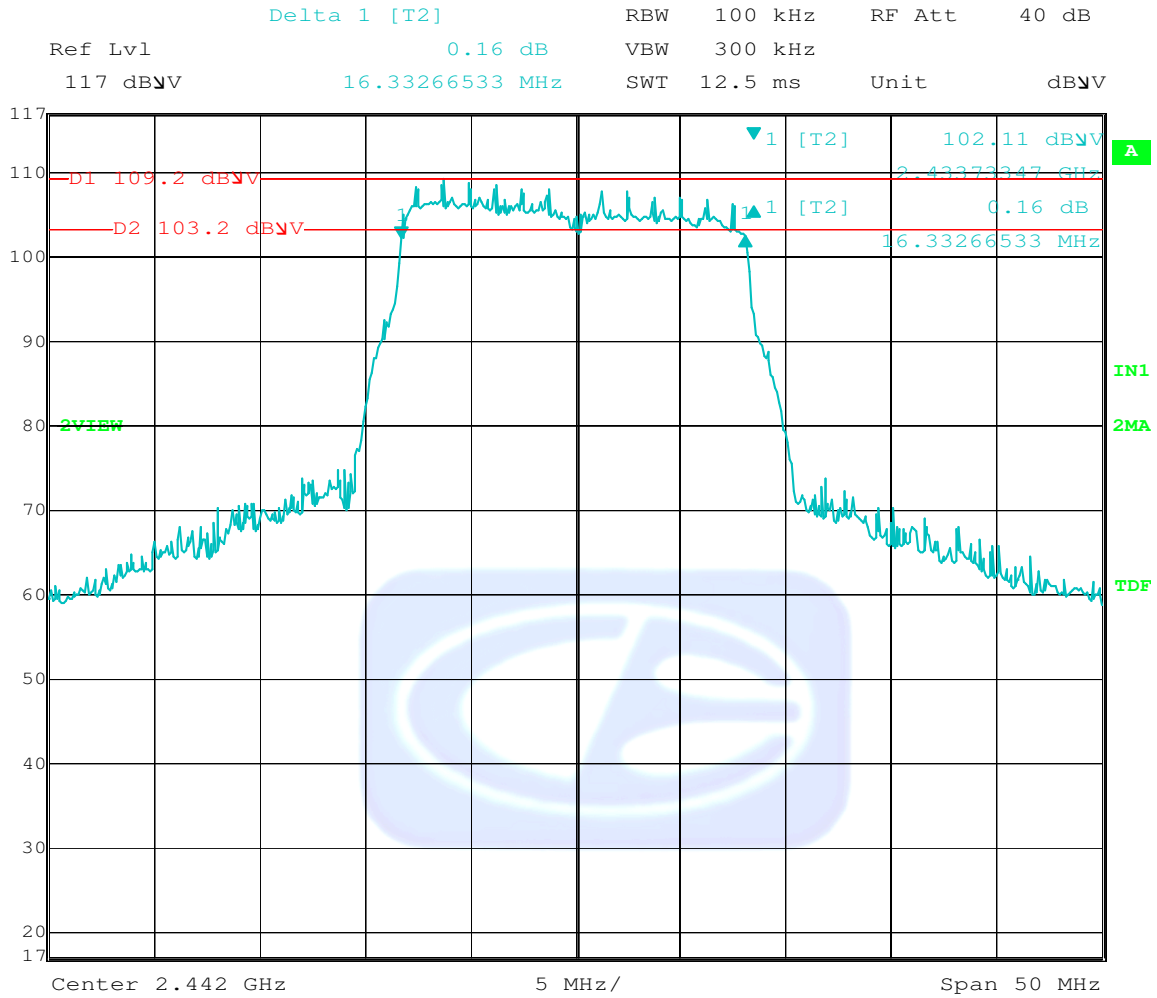
**Brea Division**  
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Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth Mid Channel 2442Mhz G mode  
 Date: 2.SEP.2015 01:25:53

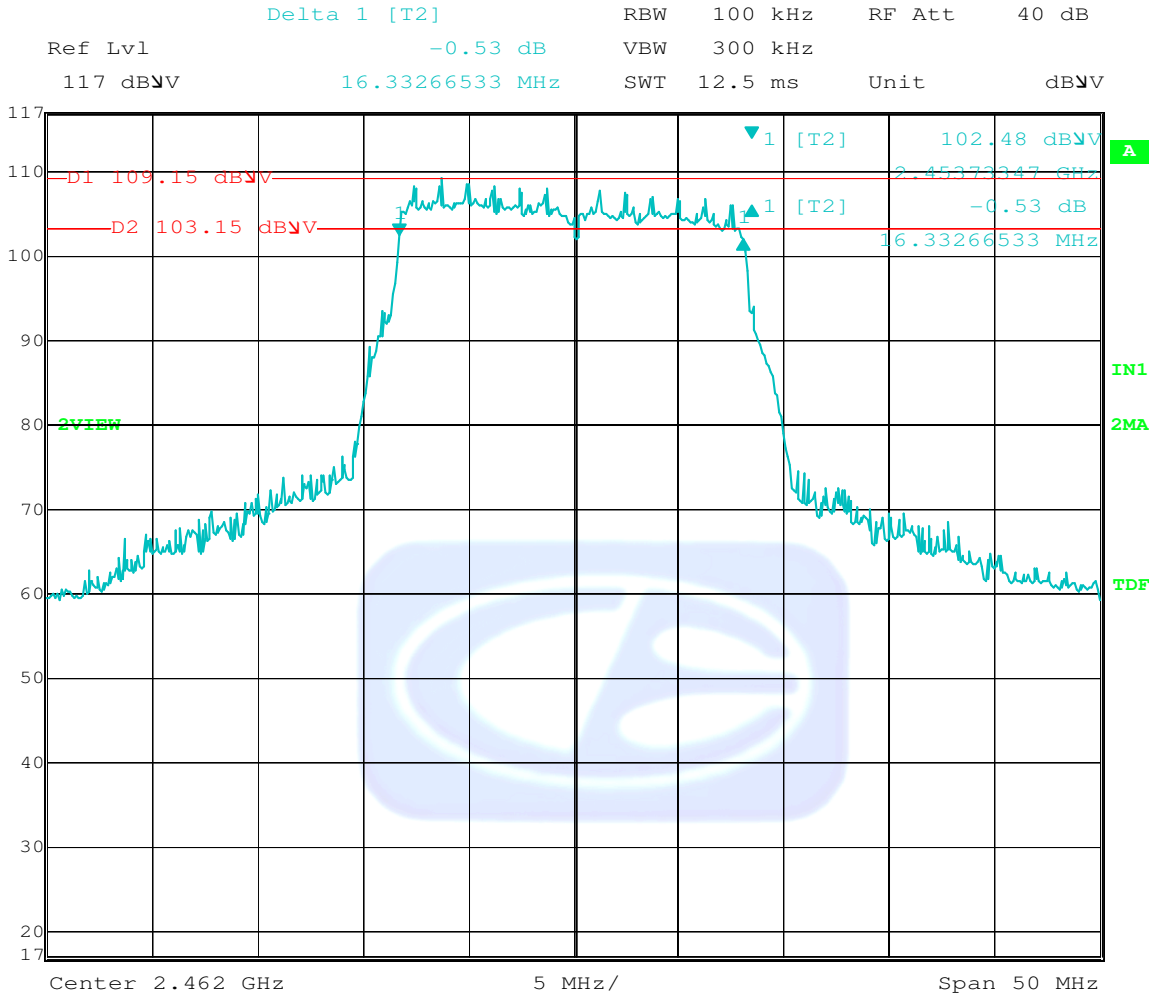


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**Lake Forest Division**  
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 Lake Forest, CA 92630  
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Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth High Channel 2462Mhz G mode  
 Date: 2.SEP.2015 01:28:51



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 20621 Pascal Way  
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 (949) 587-0400

## 802.11n MODE

**FCC 15.247**

Company: Atmel Corporation Date: 9/1/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: Torey Oliver  
Mode: 802.11n

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

DTS Bandwidth

Freq. (MHz)	Measured BW (MHz)	Limit (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	17.54	500.00	17035.07	Peak	
2442	17.54	500.00	17035.07	Peak	
2462	17.54	500.00	17035.07	Peak	

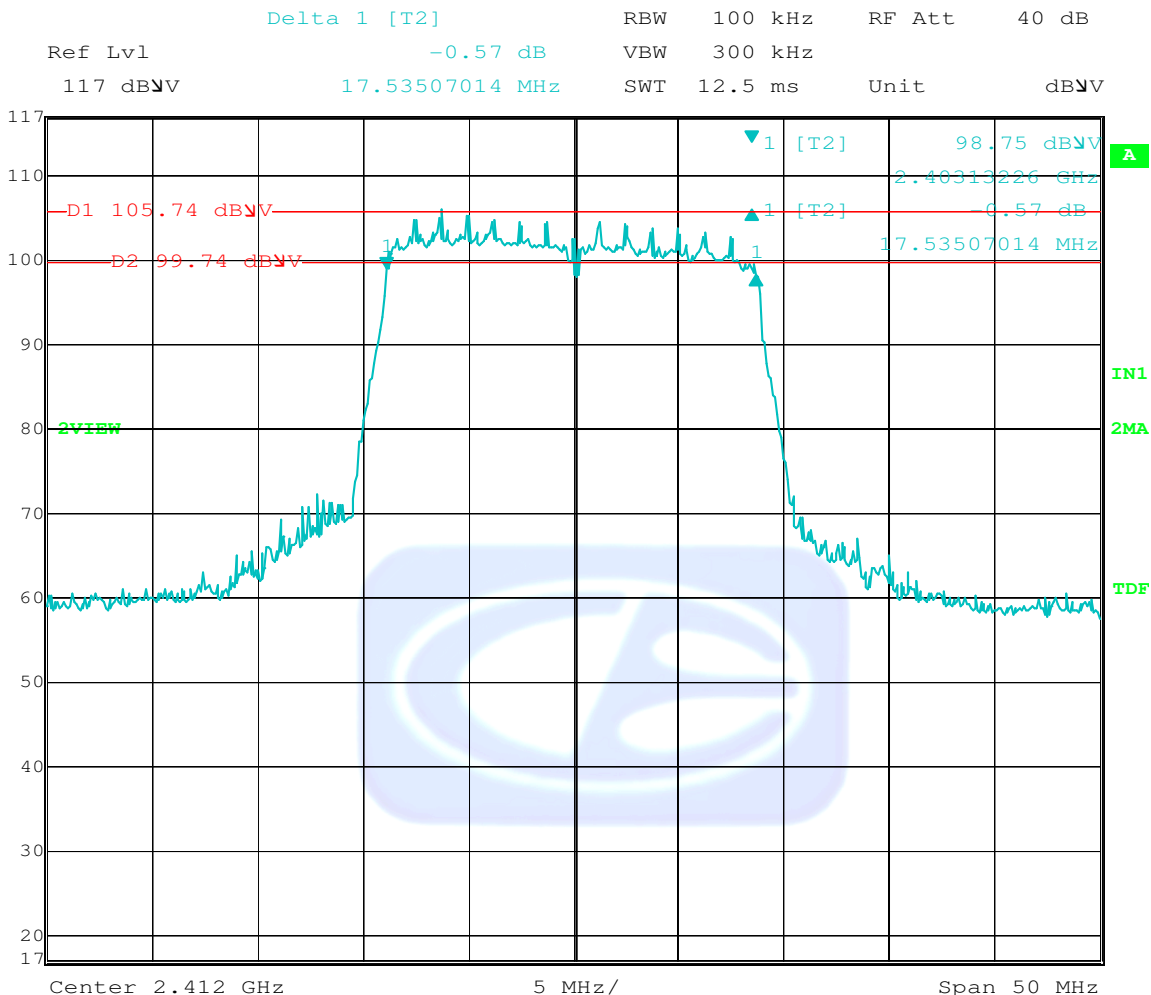


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Brea, CA 92823  
(714) 579-0500

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Agoura, CA 91301  
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Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth Low Channel 2412Mhz N mode  
 Date: 2.SEP.2015 01:57:34

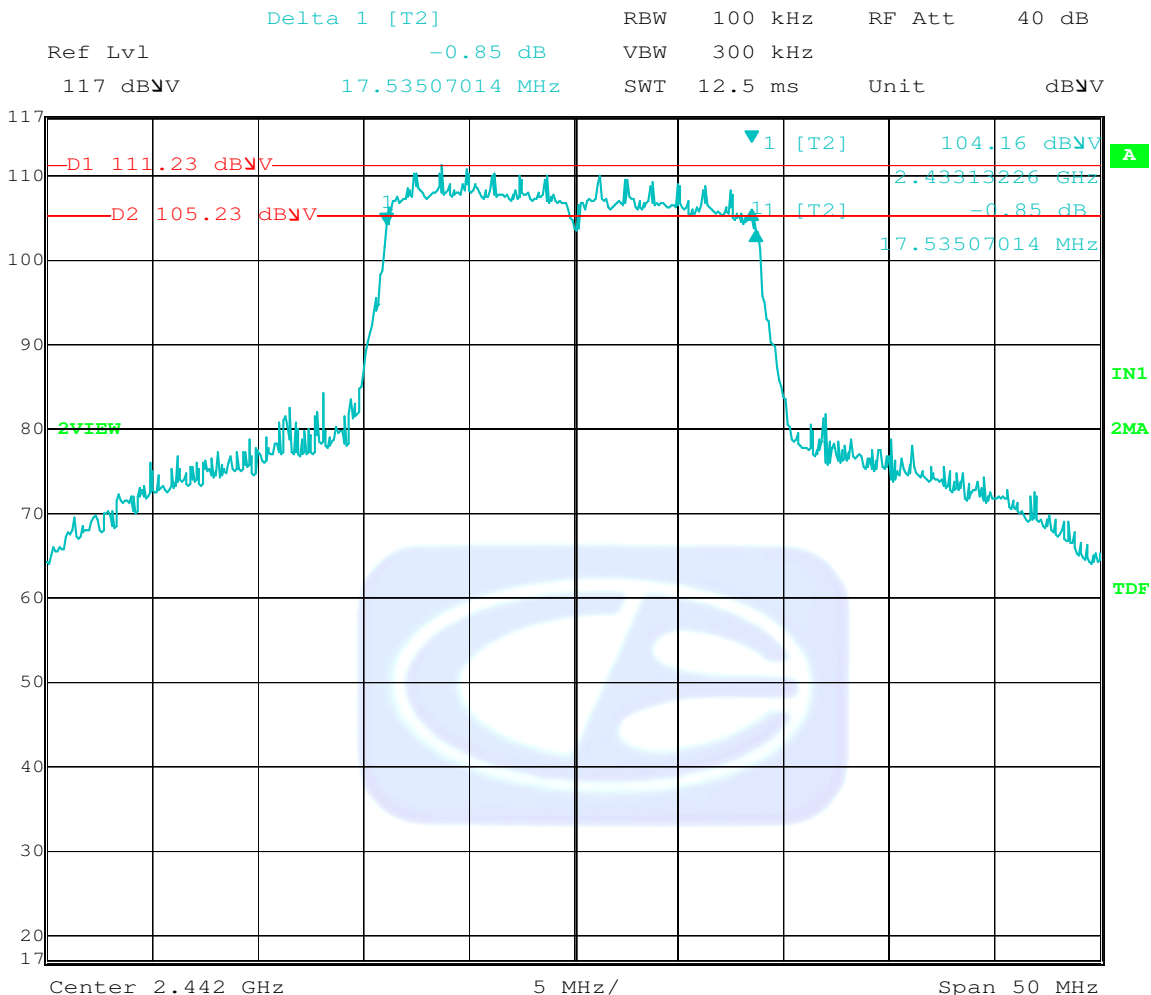


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 Lake Forest, CA 92630  
 (949) 587-0400



Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth Mid Channel 2442Mhz N mode  
 Date: 2.SEP.2015 01:51:03

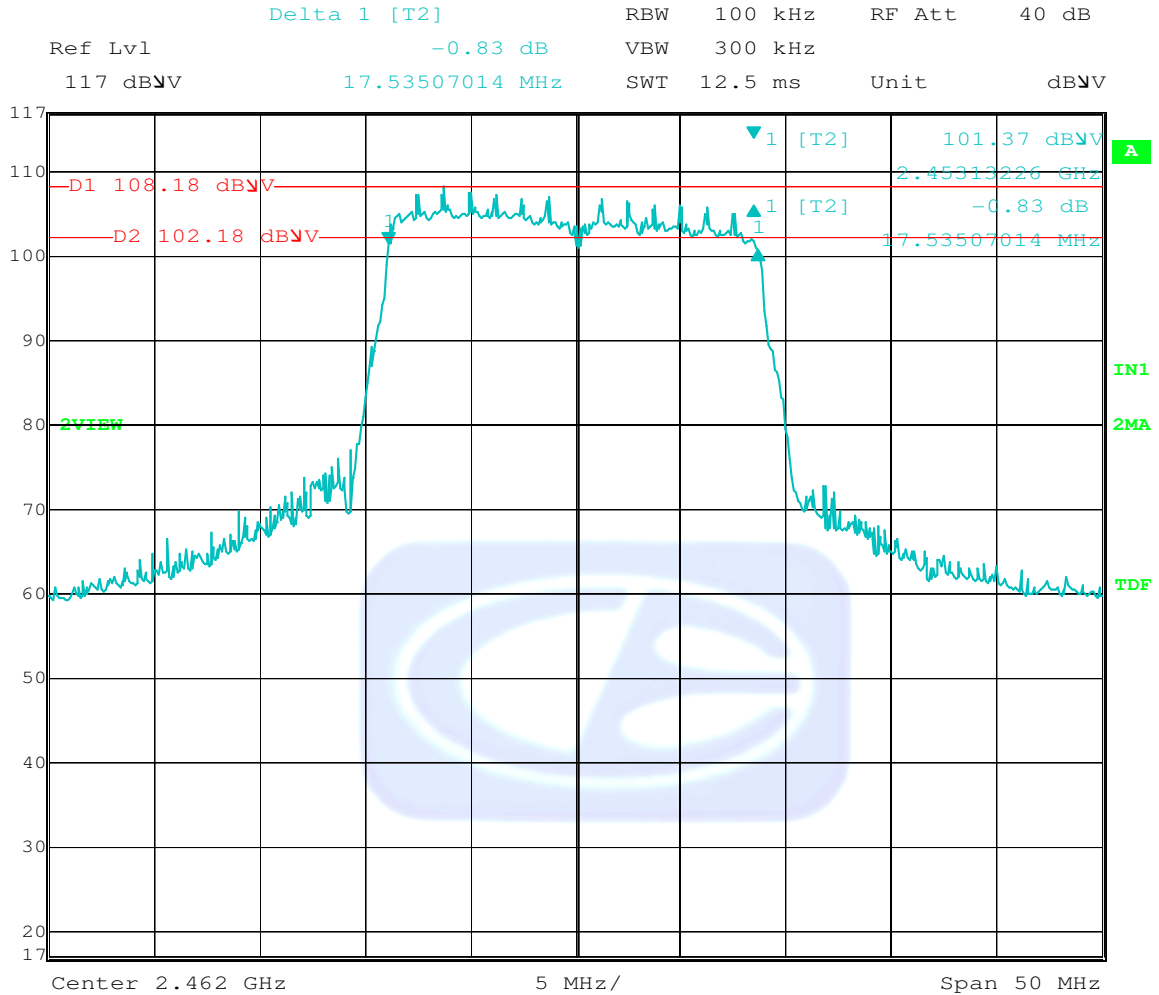


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 Agoura, CA 91301  
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Title: ATWINC1510B-MR210PB  
 Comment A: DTS Bandwidth High Channel 2462Mhz N mode  
 Date: 2.SEP.2015 01:35:38



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***MAXIMUM PEAK CONDUCTED OUTPUT POWER***

***DATA SHEETS***



---

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

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510B-MR210PB Test ENG: Torey Oliver  
Mode: 802.11b

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

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	16.83	30.00	-13.17	Avg	DigGain= -9
2442	17.71	30.00	-12.29	Avg	DigGain= -8
2462	17.73	30.00	-12.27	Avg	DigGain= -8



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

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: Torey Oliver  
Mode: 802.11g

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

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	10.94	30.00	-19.06	Avg	DigGain= -12
2442	15.81	30.00	-14.19	Avg	DigGain= -7
2462	12.97	30.00	-17.03	Avg	DigGain= -10



**Brea Division**  
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**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****802.11n Mode****FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: Torey Oliver  
Mode: 802.11n

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

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	20.66	30.00	-9.34	Peak	DigGain= -13.5
2442	23.15	30.00	-6.85	Peak	DigGain= -8
2462	22.28	30.00	-7.72	Peak	DigGain= -11



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

***DATA SHEETS***



---

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## PEAK POWER SPECTRAL DENSITY

### *802.11b Mode*

**FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510B-MR210PB Test ENG: Torey Oliver  
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	-0.61	8.00	-8.61	Peak	DigGain = -9
2442	-0.07	8.00	-8.07	Peak	DigGain = -8
2462	-0.27	8.00	-8.27	Peak	DigGain = -8

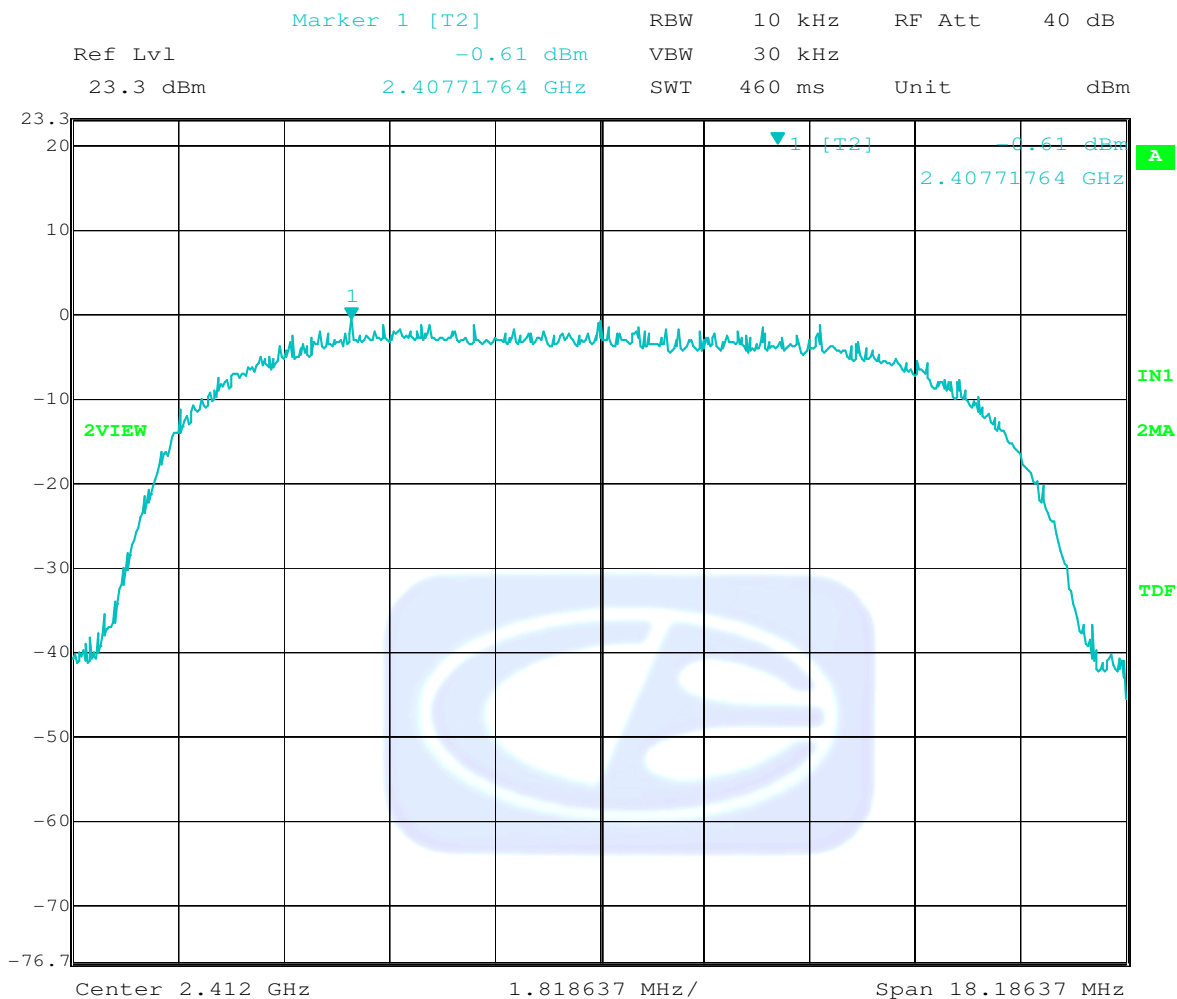


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(949) 587-0400



Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density Low Channel B Mode  
 Date: 2.SEP.2015 18:35:08

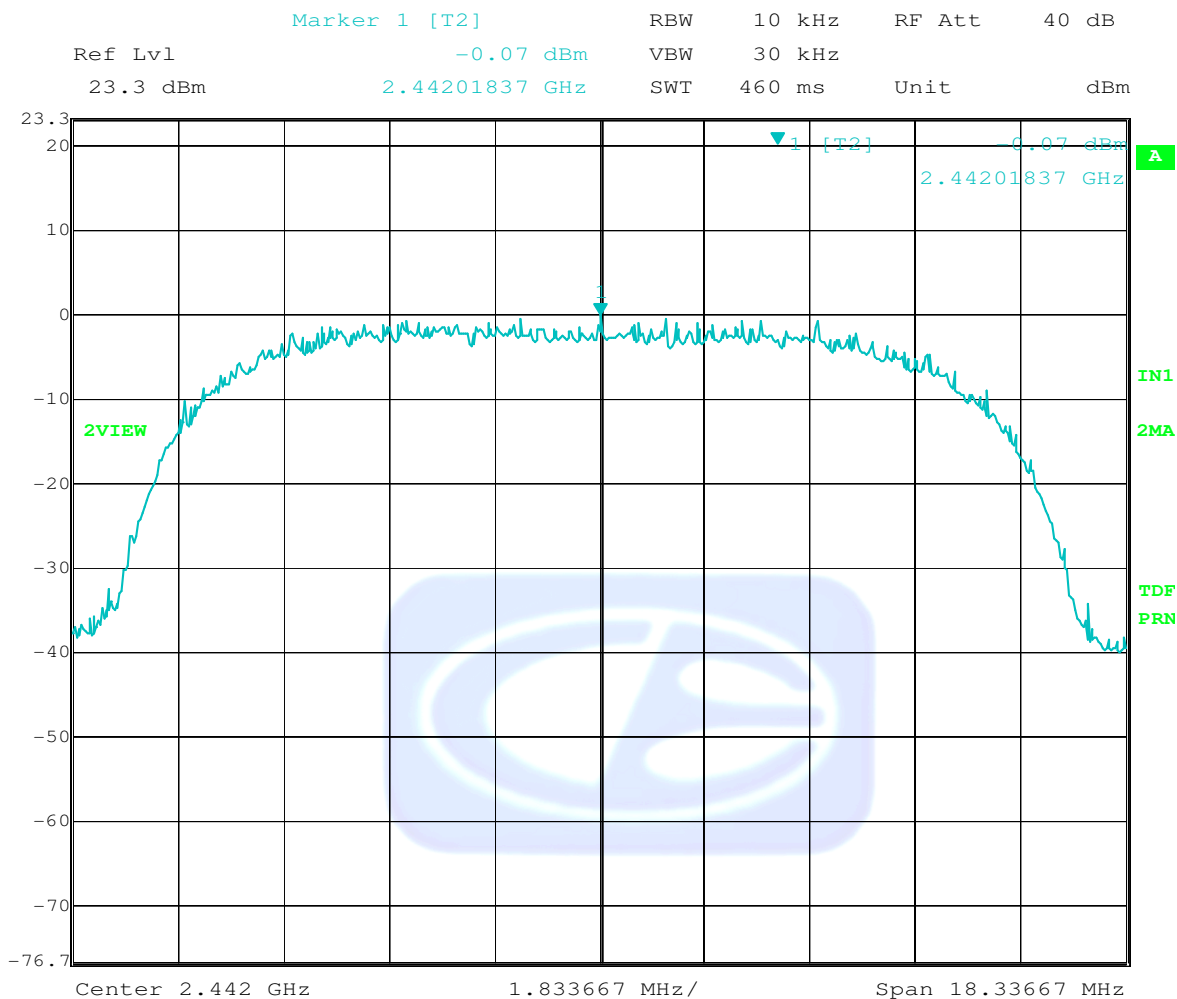


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 (949) 587-0400



Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density Mid Channel B Mode  
 Date: 2.SEP.2015 18:18:36

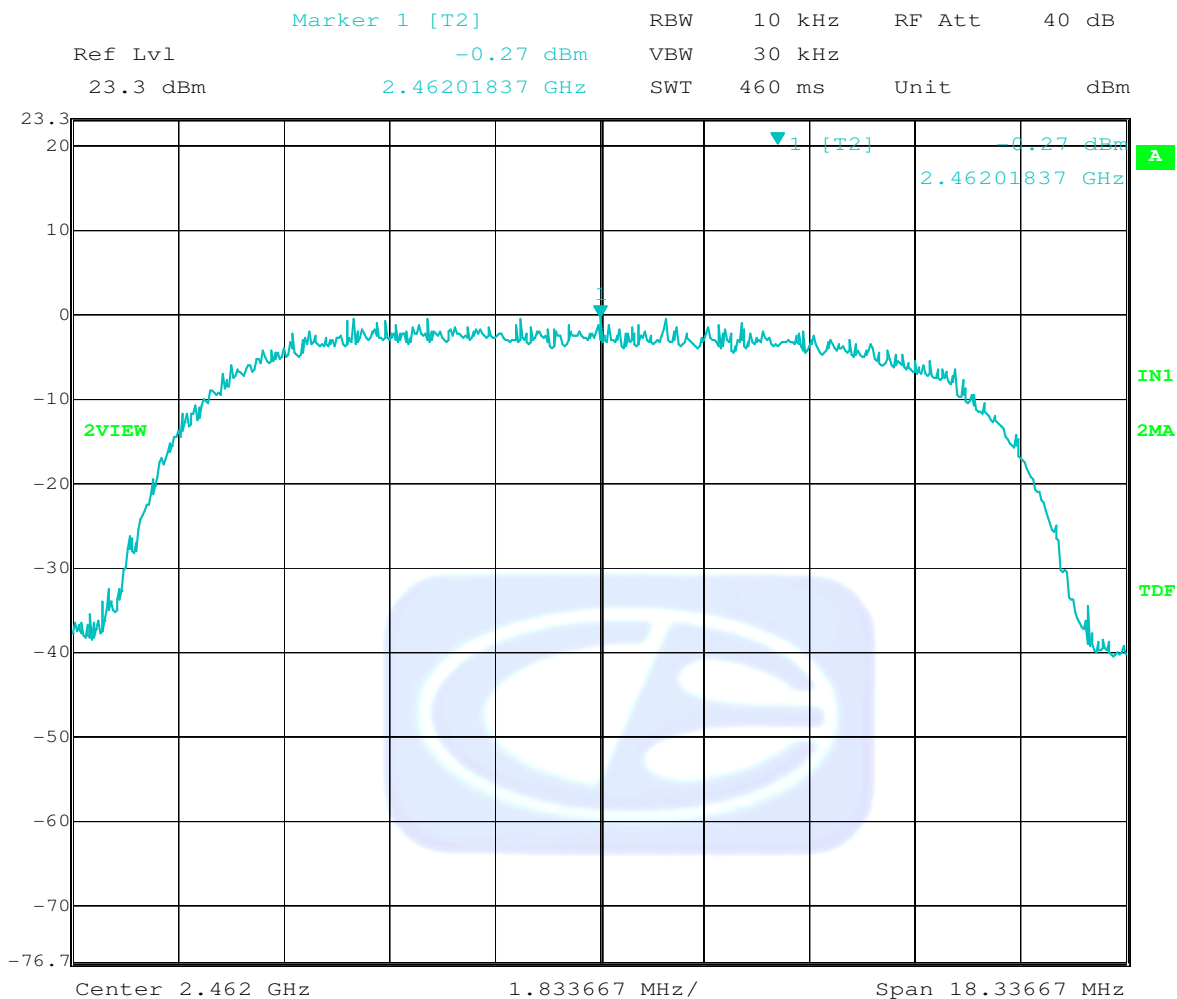


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Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density High Channel B Mode  
 Date: 2.SEP.2015 18:20:20



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## PEAK POWER SPECTRAL DENSITY

### *802.11g Mode*

**FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: Torey Oliver  
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	-5.89	8.00	-13.89	Peak	DigGain= -12
2442	-1.88	8.00	-9.88	Peak	DigGain= -7
2462	-5.89	8.00	-13.89	Peak	DigGain= -10



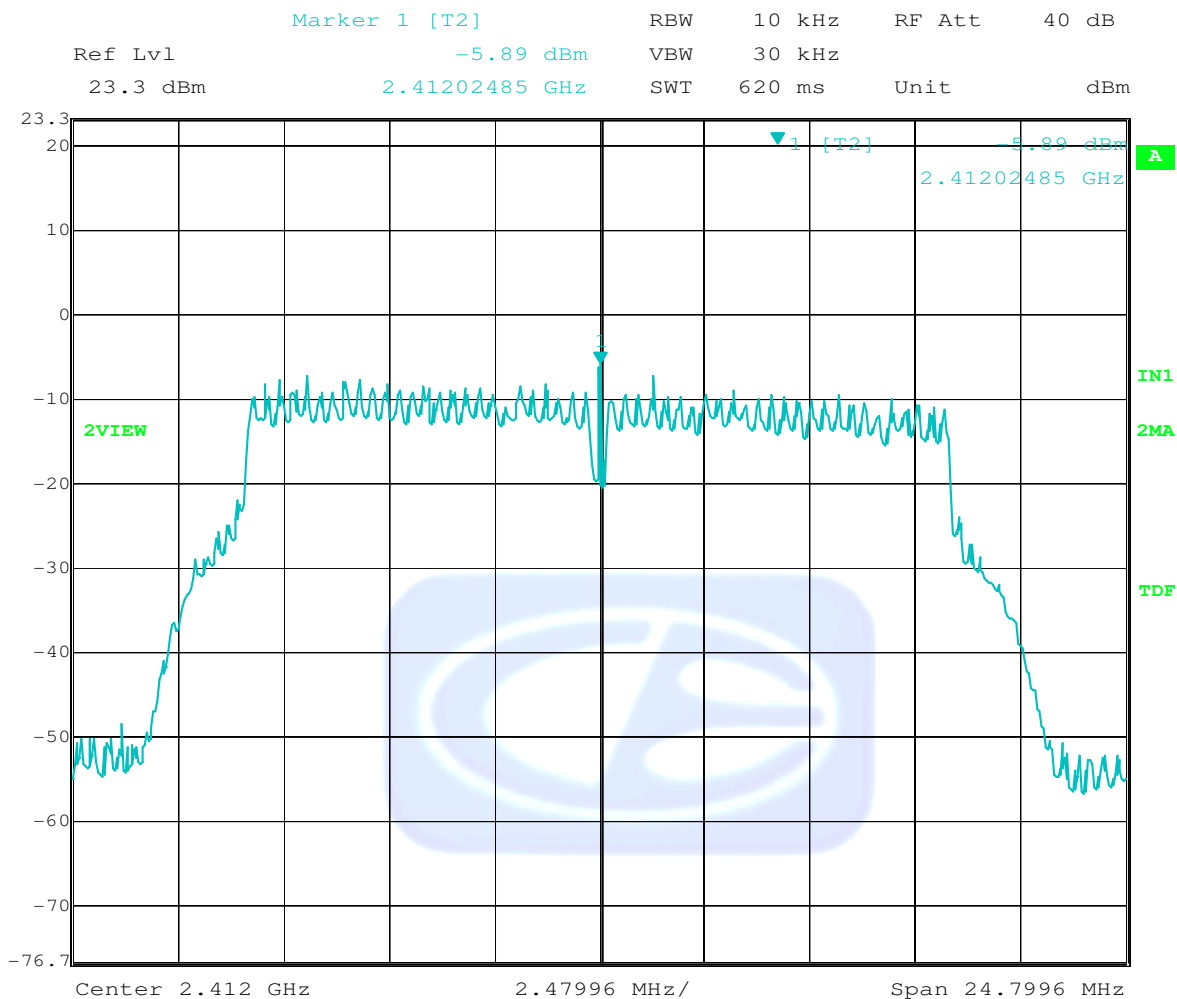
**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

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(949) 587-0400





Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density Low Channel G Mode  
 Date: 2.SEP.2015 18:37:31

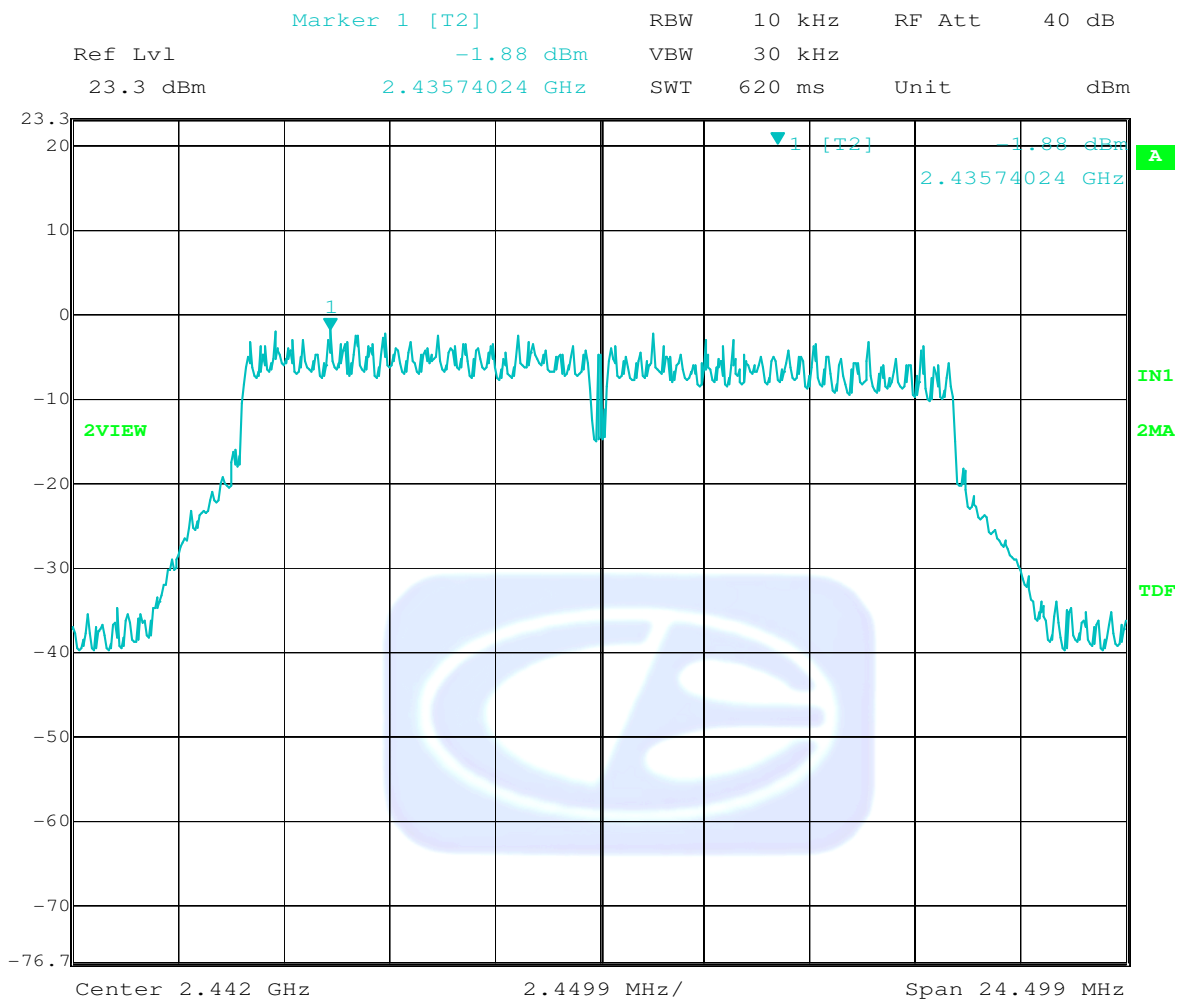


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Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density Mid Channel G Mode  
 Date: 2.SEP.2015 18:45:14

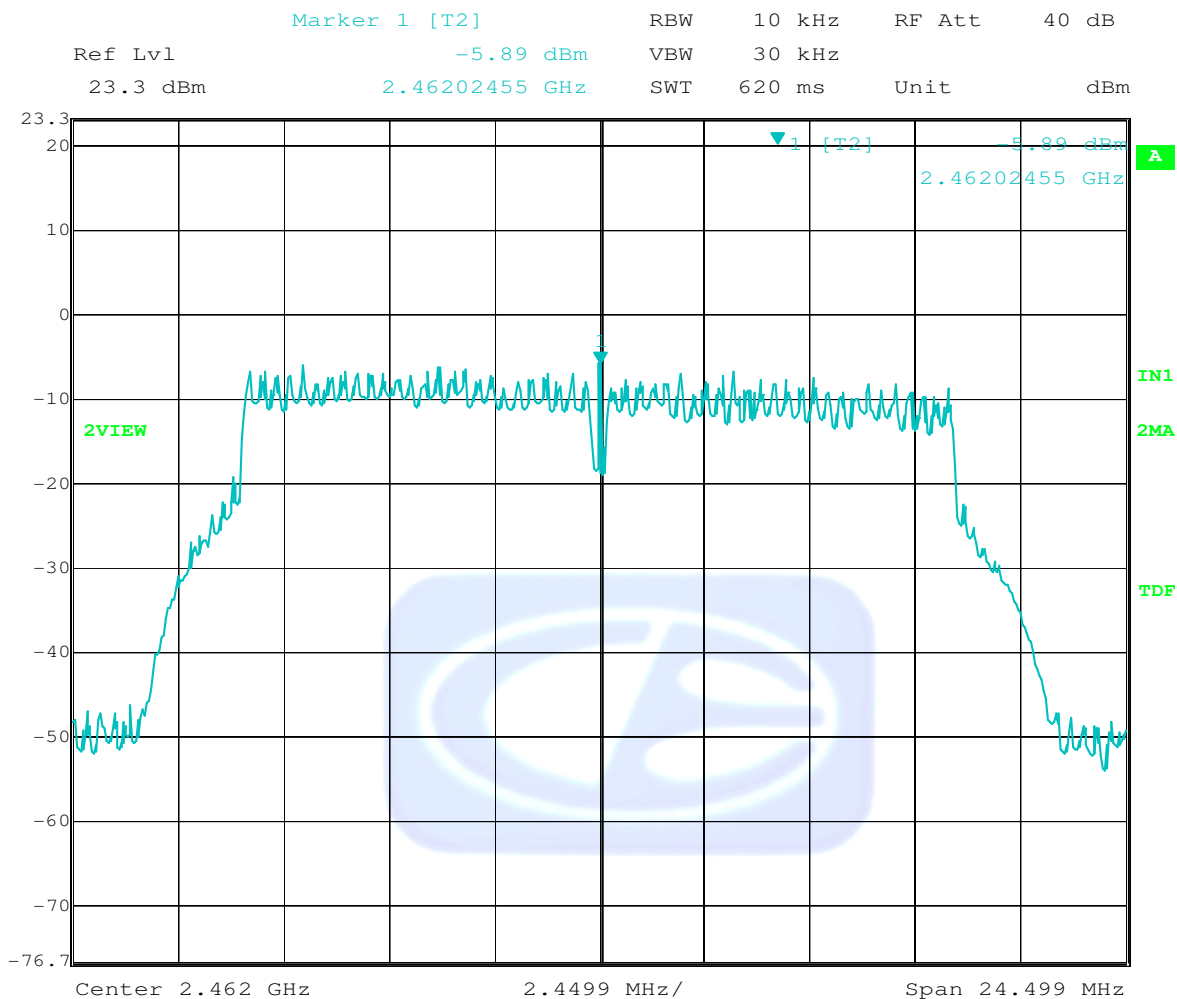


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Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density High Channel G Mode  
 Date: 2.SEP.2015 18:51:27



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## PEAK POWER SPECTRAL DENSITY

### *802.11n Mode*

**FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: Torey Oliver  
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	-6.08	8.00	-14.08	Peak	DigGain = -13.5
2442	-3.66	8.00	-11.66	Peak	DigGain = -8
2462	-6.14	8.00	-14.14	Peak	DigGain = -11

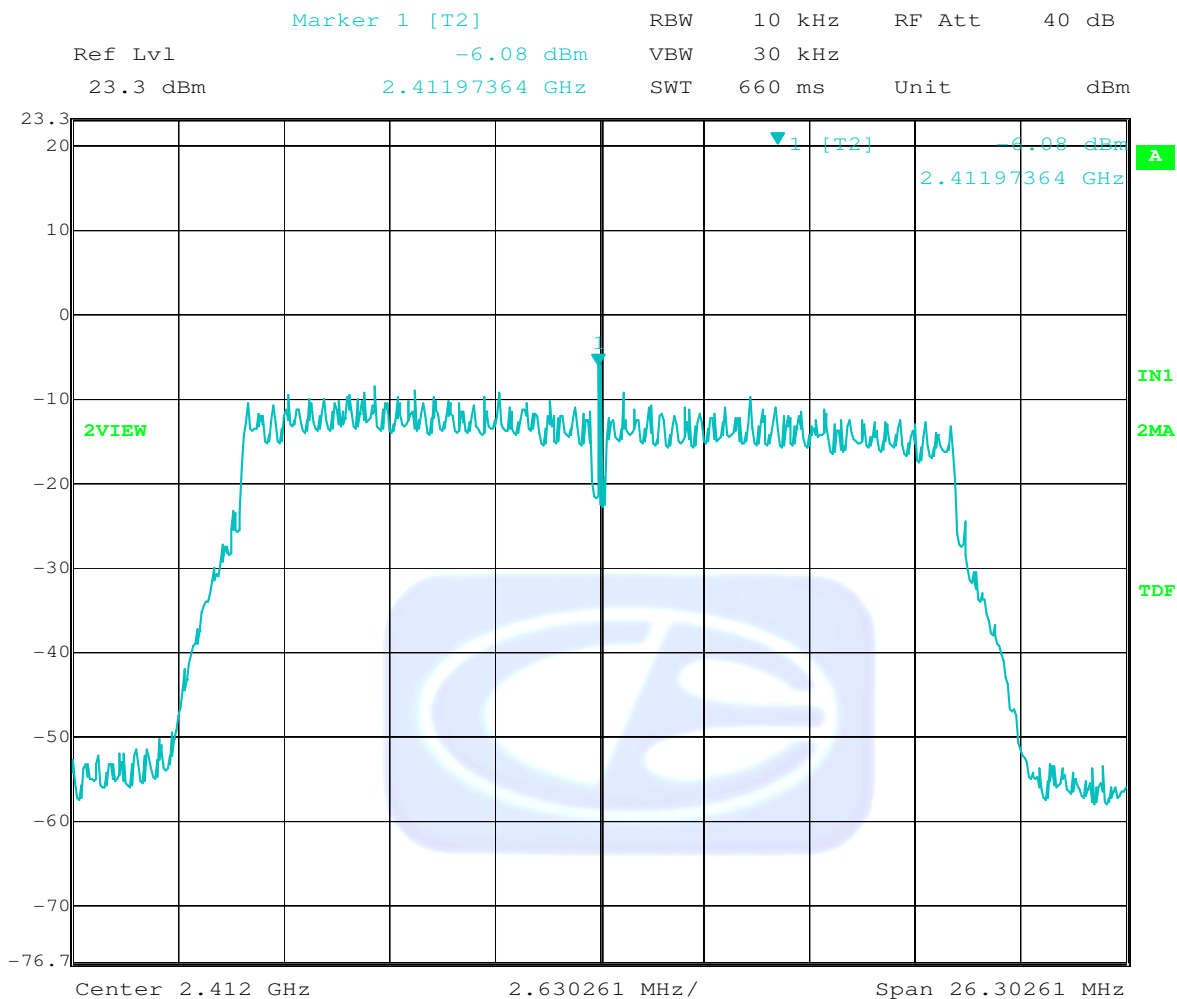


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(714) 579-0500

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19121 El Toro Road  
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Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density Low Channel N Mode  
 Date: 2.SEP.2015 19:08:37

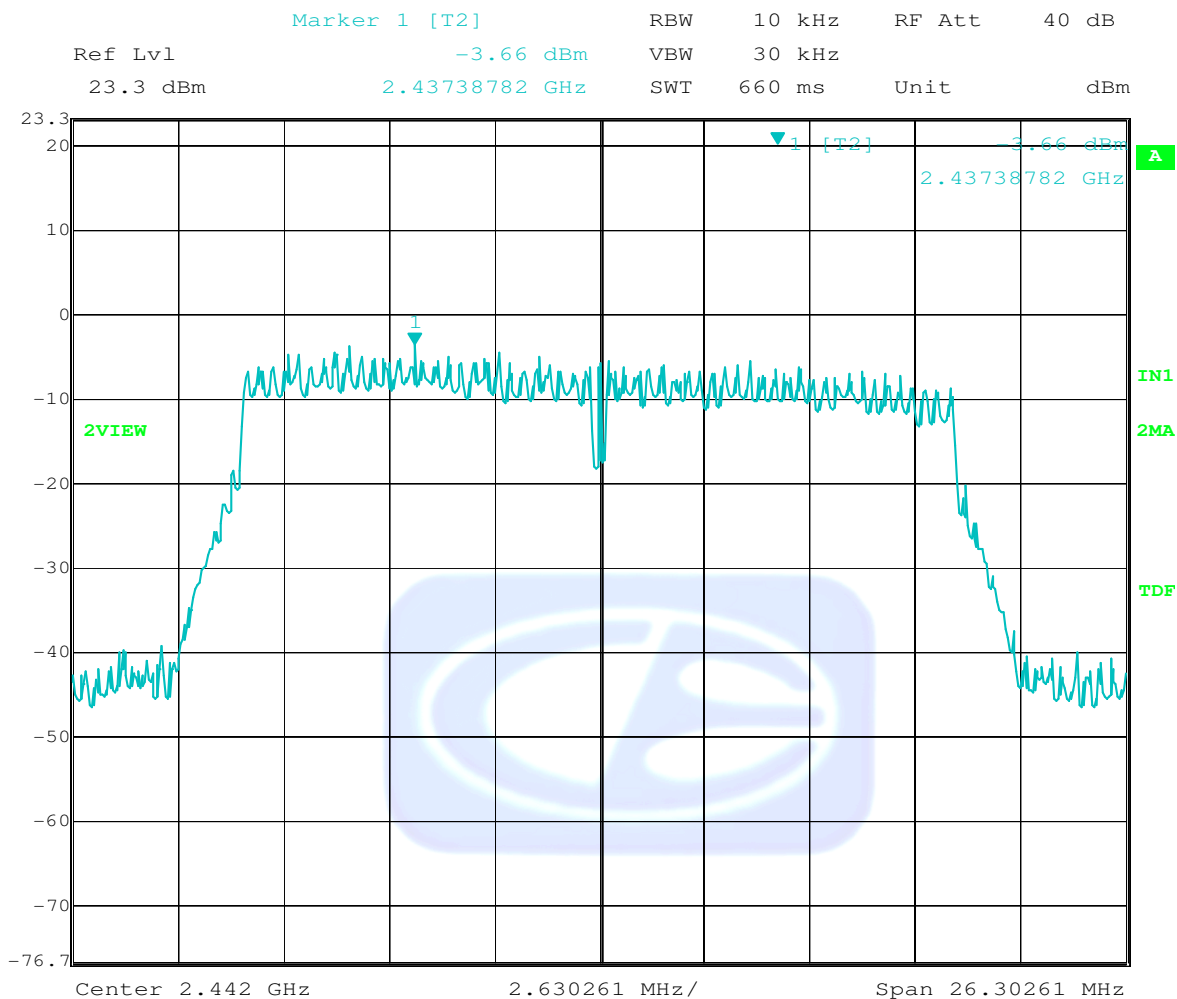


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Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density Mid Channel N Mode  
 Date: 2.SEP.2015 19:02:55

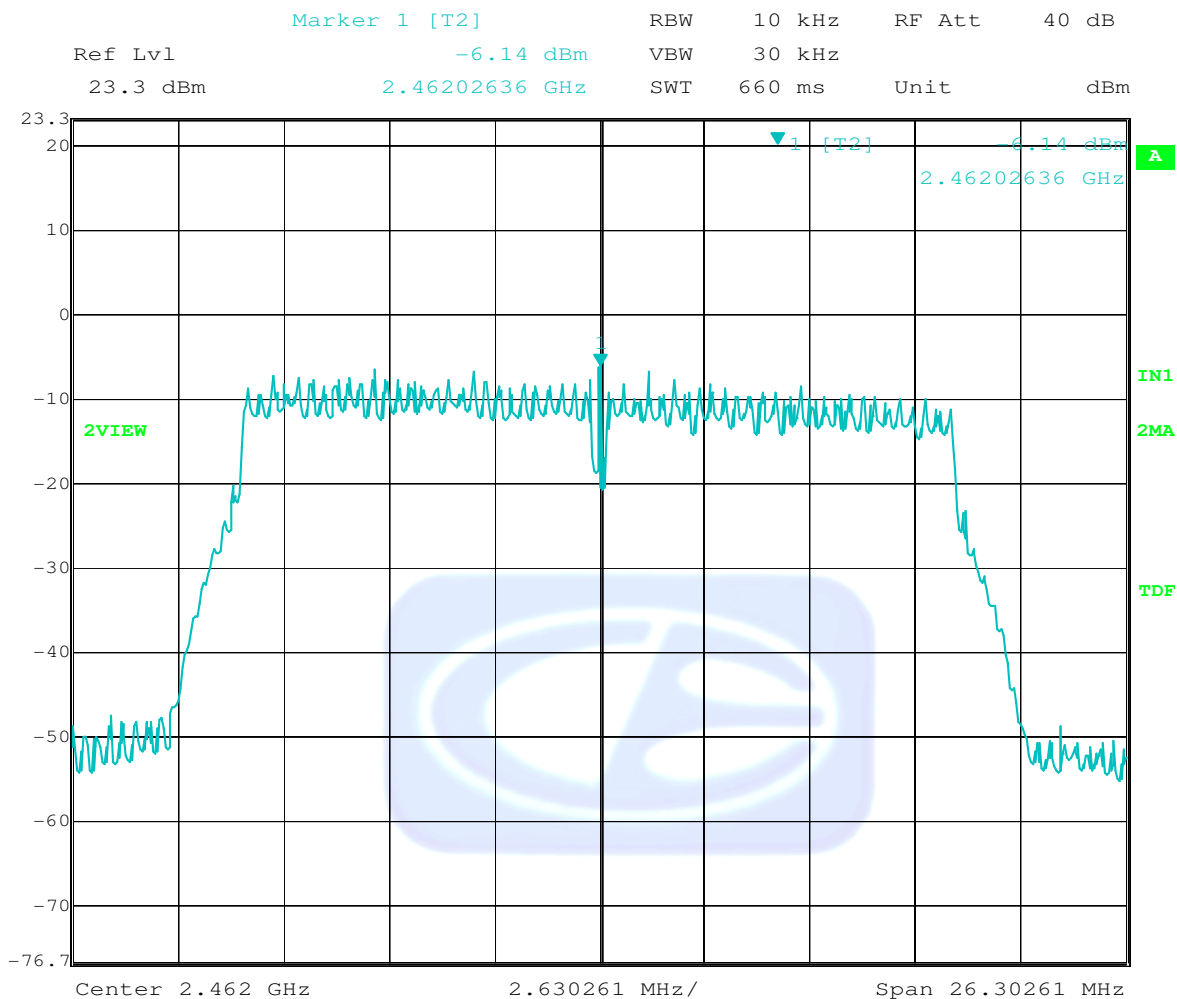


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Title: ATWINC1510B-MR210PB  
 Comment A: Power Spectral Density High Channel N Mode  
 Date: 2.SEP.2015 19:00:16



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***HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY  
BANDS (IN 100KHZ BANDWIDTH) / CONDUCTED***

***DATA SHEETS***



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

**Agoura Division**  
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## ***HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS***

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

**FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: T. Oliver

Freq. (MHz)	Level (dBuV)	Limit	Margin	Peak / QP / Avg	Comments
9848	68.17	95.59	-27.42	Peak	High Channel
9768	67.81	95.49	-27.68	Peak	Mid Channel
9648	66.55	95.44	-28.89	Peak	Low Channel

**Worst case for all b mode measurements**



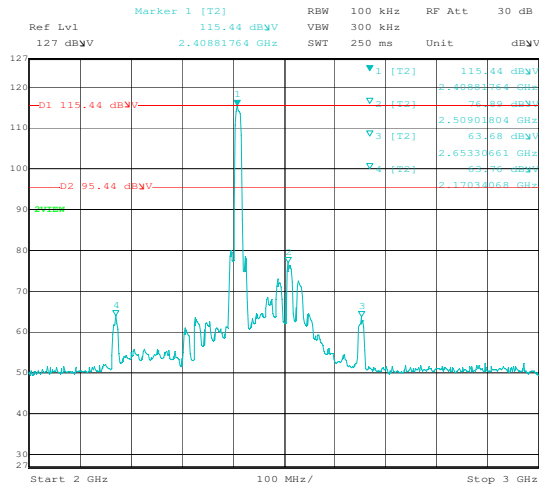
**Brea Division**  
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Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
2337 Troutdale Drive  
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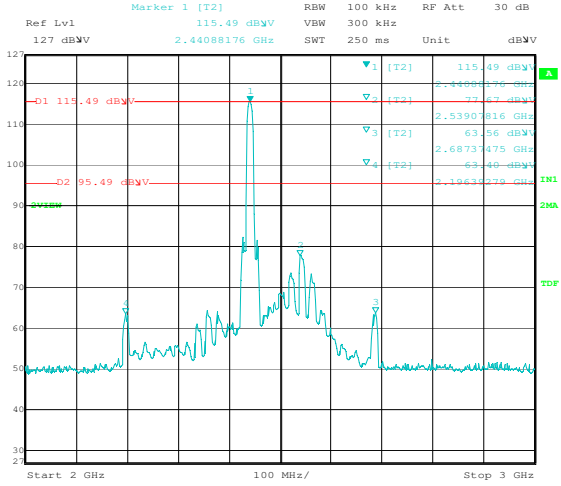
**Silverado Division**  
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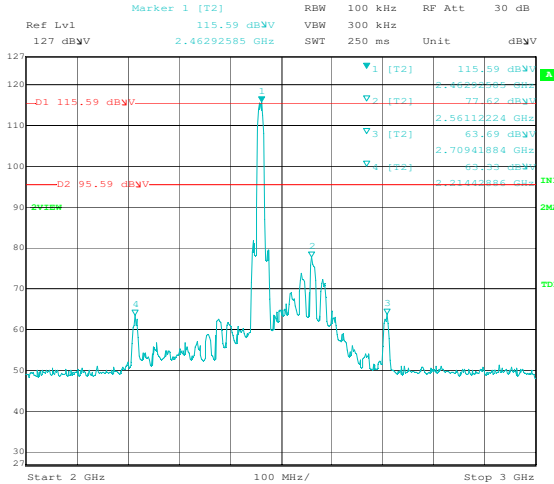
## 802.11b Mode Reference Level Measurements



Title: ATWINC1510B-MR210PB  
 Comment A: Conducted Spurious Low Channel B Mode  
 Date: 2.SEP.2015 23:57:42



Title: ATWINC1510B-MR210PB  
 Comment A: Conducted Spurious Mid Channel B Mode  
 Date: 2.SEP.2015 23:43:08



Title: ATWINC1510B-MR210PB  
 Comment A: Conducted Spurious High Channel B Mode  
 Date: 3.SEP.2015 00:07:50



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

### ***802.11g Mode***

**FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: T. Oliver

Freq. (MHz)	Level (dBuV)	Limit	Margin	Peak / QP / Avg	Comments
9848.00	71.72	89.88	-18.16	Peak	High Channel
9648.00	67.81	90.11	-22.30	Peak	Low Channel
9768.00	69.05	92.20	-23.15	Peak	Mid Channel

Worst case for all g mode measurements



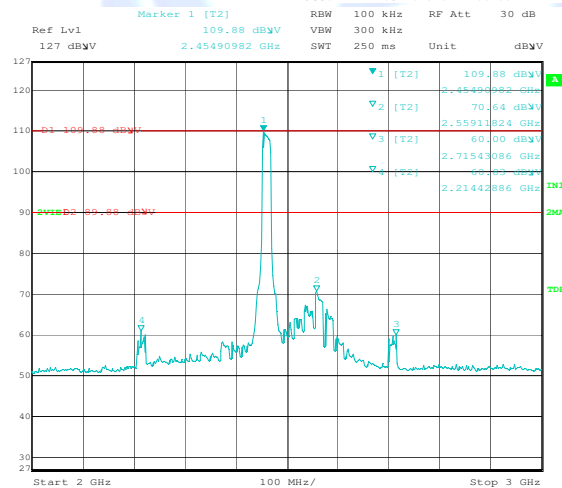
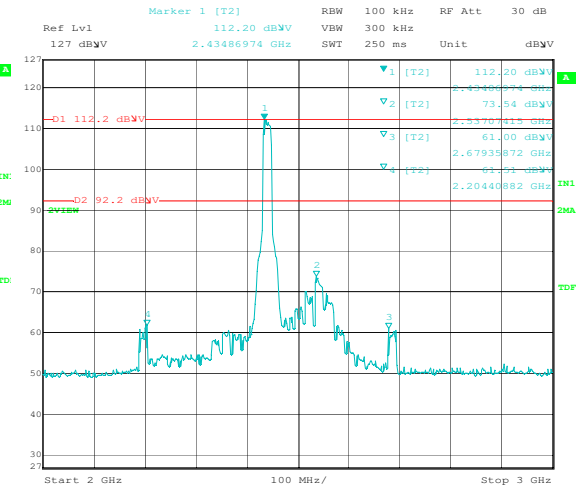
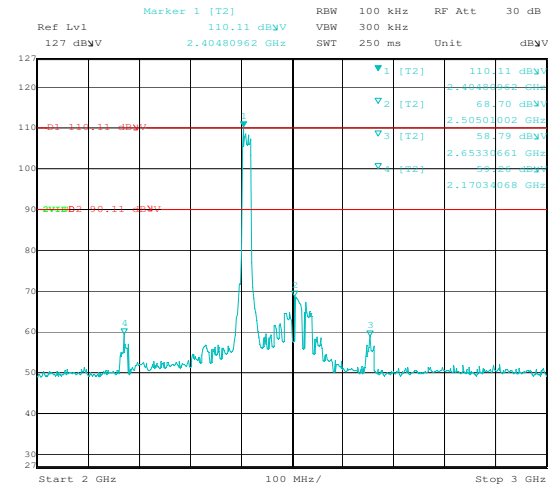
**Brea Division**  
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## 802.11g Mode Reference Level Measurements



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

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

**FCC 15.247**

Company: Atmel Corporation Date: 9/2/2015  
EUT: Modular Transmitter Lab: R  
Model: ATWINC1510-MR210PB Test ENG: T. Oliver

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Limit</b>	<b>Margin</b>	<b>Peak / QP / Avg</b>	<b>Comments</b>
9848.00	72.27	88.66	-16.39	Peak	High Channel
9648.00	68.55	90.95	-22.40	Peak	Low Channel
9768.00	70.04	94.65	-24.61	Peak	Mid Channel



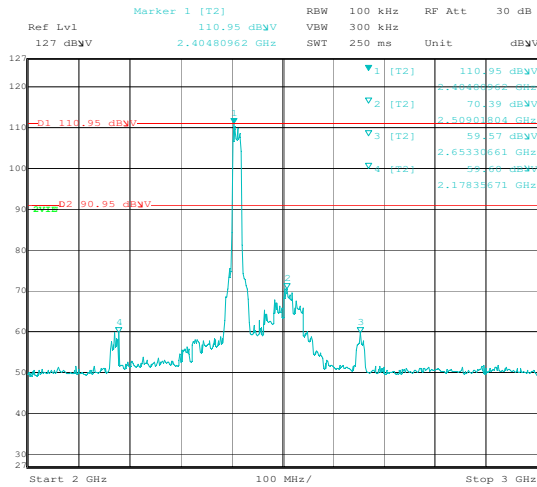
**Brea Division**  
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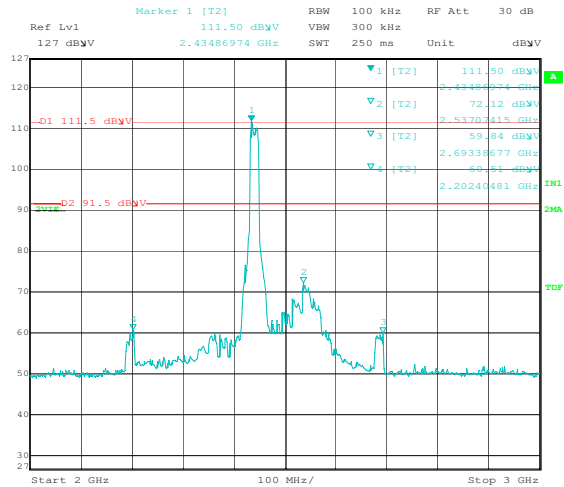
**Silverado Division**  
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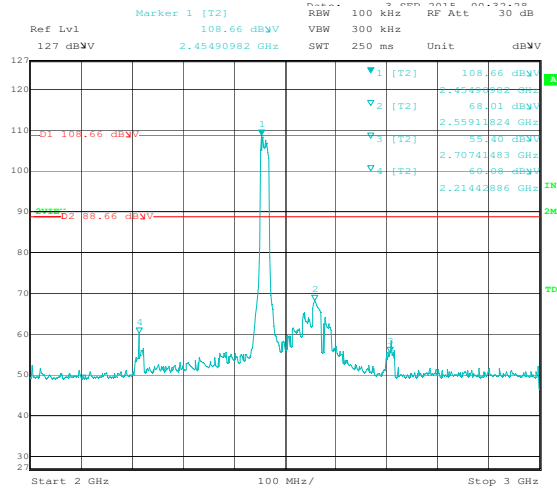
## 802.11n Mode Reference Level Measurements



Title: ATWINC1510B-MR210PB  
 Comment A: Conducted Spurious Low Channel N Mode  
 Date: 3.SEP.2015 00:41:27



Title: ATWINC1510B-MR210PB  
 Comment A: Conducted Spurious Mid Channel N Mode  
 Date: 3.SEP.2015 00:42:15



Title: ATWINC1510B-MR210PB  
 Comment A: Conducted Spurious High Channel N Mode  
 Date: 3.SEP.2015 00:22:28



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***EMISSIONS IN RESTRICTED FREQUENCY BANDS (RADIATED  
FIELD STRENGTH)  
DATA SHEETS***



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## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11b Mode, Low Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11b, DigGain= -9

Date: 8/19/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	54.02	H	73.98	-19.96	Peak	2.00	219	In Restricted Band
4824.00	39.39	H	53.98	-14.59	Avg	2.00	219	
12060.00	64.00	H	73.98	-9.98	Peak	1.90	318	In Restricted Band
12060.00	52.00	H	53.98	-1.98	Avg	1.90	318	
14472.00	63.73	H	73.98	-10.25	Peak	1.82	357	In Restricted Band
14472.00	50.82	H	53.98	-3.16	Avg	1.82	357	
19296.00	--	H	73.98	--	Peak	--	--	In Restricted Band
19296.00	--	H	53.98	--	Avg	--	--	No Emissions Found
4824.00	52.73	V	73.98	-21.25	Peak	1.68	222	In Restricted Band
4824.00	38.30	V	53.98	-15.68	Avg	1.68	222	
12060.00	63.40	V	73.98	-10.58	Peak	1.99	274	In Restricted Band
12060.00	51.56	V	53.98	-2.42	Avg	1.99	274	
14472.00	63.34	V	73.98	-10.64	Peak	1.37	121	In Restricted Band
14472.00	50.56	V	53.98	-3.42	Avg	1.37	121	
19296.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19296.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance  
 3 meter



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 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 802.11b Mode, Mid Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11b, DigGain= -8

Date: 9/2/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	54.34	H	73.98	-19.64	Peak	1.13	0	
4884.00	39.86	H	53.98	-14.12	Avg	1.13	0	In Restricted Band
7326.00	--	H	73.98	--	Peak	--	--	No Emissions Found
7326.00	--	H	53.98	--	Avg	--	--	In Restricted Band
12210.00	61.98	H	73.98	-12.00	Peak	1.94	335	
12210.00	48.28	H	53.98	-5.70	Avg	1.94	335	In Restricted Band
19536.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	H	53.98	--	Avg	--	--	In Restricted Band
4884.00	54.87	V	73.98	-19.11	Peak	2.29	224	
4884.00	40.76	V	53.98	-13.22	Avg	2.29	224	In Restricted Band
7326.00	--	V	73.98	--	Peak	--	--	No Emissions Found
7326.00	--	V	53.98	--	Avg	--	--	In Restricted Band
12210.00	64.05	V	73.98	-9.93	Peak	2.04	262	
12210.00	51.75	V	53.98	-2.23	Avg	2.04	262	In Restricted Band
19536.00	--	V	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	V	53.98	--	Avg	--	--	In Restricted Band

Test distance  
 3 meter



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 114 Olinda Drive  
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 20621 Pascal Way  
 Lake Forest, CA 92630  
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## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11b Mode, High Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11b, DigGain= -8

Date: 9/2/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	51.99	H	73.98	-21.99	Peak	1.01	36	In Restricted Band
4924.00	38.82	H	53.98	-15.16	Avg	1.01	36	
7386.00	--	H	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	H	53.98	--	Avg	--	--	No Emission Found
12310.00	60.18	H	73.98	-13.80	Peak	1.21	200	In Restricted Band
12310.00	47.60	H	53.98	-6.38	Avg	1.21	200	
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	50.71	V	73.98	-23.27	Peak	2.12	234	In Restricted Band
4924.00	37.85	V	53.98	-16.13	Avg	2.12	234	
7386.00	--	V	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	V	53.98	--	Avg	--	--	No Emission Found
12310.00	64.39	V	73.98	-9.59	Peak	1.14	275	In Restricted Band
12310.00	51.75	V	53.98	-2.23	Avg	1.14	275	
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



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 114 Olinda Drive  
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 19121 El Toro Road  
 Silverado, CA 92676  
 (949) 589-0700

**Lake Forest Division**  
 20621 Pascal Way  
 Lake Forest, CA 92630  
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## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11g Mode, Low Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11g, DigGain=-12

Date: 9/2/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	--	H	73.98	--	Peak	--	--	In Restricted Band
4824.00	--	H	53.98	--	Avg	--	--	No Emissions Found
12060.00	62.79	H	73.98	-11.19	Peak	2.06	344	In Restricted Band
12060.00	53.37	H	53.98	-0.61	Avg	2.06	344	
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	--	V	73.98	--	Peak	--	--	In Restricted Band
4824.00	--	V	53.98	--	Avg	--	--	No Emissions Found
12060.00	60.38	V	73.98	-13.60	Peak	2.07	265	In Restricted Band
12060.00	48.88	V	53.98	-5.10	Avg	2.07	265	
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



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 114 Olinda Drive  
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 19121 El Toro Road  
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 20621 Pascal Way  
 Lake Forest, CA 92630  
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## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11g Mode, Mid Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11g, DigGain=-7

Date: 9/2/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	53.40	H	73.98	-20.58	Peak	1.99	228	In Restricted Band
4884.00	38.62	H	53.98	-15.36	Avg	1.99	228	
7326.00	--	H	73.98	--	Peak	--	--	No Emissions Found
7326.00	--	H	53.98	--	Avg	--	--	In Restricted Band
12210.00	60.93	H	73.98	-13.05	Peak	1	186	In Restricted Band
12210.00	47.85	H	53.98	-6.13	Avg	1	186	
19536.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	H	53.98	--	Avg	--	--	In Restricted Band
4884.00	53.15	V	73.98	-20.83	Peak	2.2	228	In Restricted Band
4884.00	37.89	V	53.98	-16.09	Avg	2.2	228	
7326.00	--	V	73.98	--	Peak	--	--	No Emissions Found
7326.00	--	V	53.98	--	Avg	--	--	In Restricted Band
12210.00	64.76	V	73.98	-9.22	Peak	1.07	263	In Restricted Band
12210.00	51.67	V	53.98	-2.31	Avg	1.07	263	
19536.00	--	V	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	V	53.98	--	Avg	--	--	In Restricted Band

Test distance  
 3 meter



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 114 Olinda Drive  
 Brea, CA 92823  
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 19121 El Toro Road  
 Silverado, CA 92676  
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 20621 Pascal Way  
 Lake Forest, CA 92630  
 (949) 587-0400

## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11g Mode, High Channel, Horizontal & Vertical

**FCC 15.247**

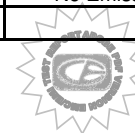
Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11g, DigGain=-10

Date: 9/2/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	--	H	73.98	--	Peak	--	--	In Restricted Band
4924.00	--	H	53.98	--	Avg	--	--	No Emissions Found
7386.00	--	H	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	H	53.98	--	Avg	--	--	No Emissions Found
12310.00	60.93	H	73.98	-13.05	Peak	1.87	358	In Restricted Band
12310.00	48.16	H	53.98	-5.82	Avg	1.87	358	
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	--	V	73.98	--	Peak	--	--	In Restricted Band
4924.00	--	V	53.98	--	Avg	--	--	No Emissions Found
7386.00	--	V	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	V	53.98	--	Avg	--	--	No Emissions Found
12310.00	63.67	V	73.98	-10.31	Peak	2.1	292	In Restricted Band
12310.00	49.63	V	53.98	-4.35	Avg	2.1	292	
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

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 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 802.11n Mode, Low Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11n, DigGain= -13.5

Date: 9/2/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	--	H	73.98	--	Peak	--	--	In Restricted Band
4824.00	--	H	53.98	--	Avg	--	--	No Emissions Found
12060.00	62.03	H	73.98	-11.95	Peak	2.05	17	In Restricted Band
12060.00	53.44	H	53.98	-0.54	Avg	2.05	17	
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	--	V	73.98	--	Peak	--	--	In Restricted Band
4824.00	--	V	53.98	--	Avg	--	--	No Emissions Found
12060.00	58.78	V	73.98	-15.20	Peak	2.15	268	In Restricted Band
12060.00	46.22	V	53.98	-7.76	Avg	2.15	268	
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



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## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11n Mode, Mid Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11n, DigGain= -8

Date: 9/1/2015  
 Lab: R  
 Test ENG: T. Oliver

**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	47.10	H	73.98	-26.88	Peak	1.6	182	In Restricted Band
4884.00	31.44	H	53.98	-22.54	Avg	1.6	182	
7326.00	51.88	H	73.98	-22.10	Peak	4.00	210	
7326.00	39.08	H	53.98	-14.90	Avg	4.00	210	In Restricted Band
12210.00	57.41	H	73.98	-16.57	Peak	1.04	344	In Restricted Band
12210.00	43.56	H	53.98	-10.42	Avg	1.04	344	
19536.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	H	53.98	--	Avg	--	--	In Restricted Band
4884.00	44.79	V	73.98	-29.19	Peak	2.55	236	In Restricted Band
4884.00	31.32	V	53.98	-22.66	Avg	2.55	236	
7326.00	52.25	V	73.98	-21.73	Peak	1.38	188	
7326.00	39.07	V	53.98	-14.91	Avg	1.38	188	In Restricted Band
12210.00	59.88	V	73.98	-14.10	Peak	2.01	267	In Restricted Band
12210.00	45.90	V	53.98	-8.08	Avg	2.01	267	
19536.00	--	V	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	V	53.98	--	Avg	--	--	In Restricted Band

Test distance  
 3 meter



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## HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 802.11n Mode, High Channel, Horizontal & Vertical

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510PB  
 Mode: 802.11n, DigGain= -11

Date: 9/1/2015  
 Lab: R  
 Test ENG: T. Oliver

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	--	H	73.98	--	Peak	--	--	In Restricted Band
4924.00	--	H	53.98	--	Avg	--	--	No Emissions Found
7386.00	--	H	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	H	53.98	--	Avg	--	--	No Emissions Found
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	--	V	73.98	--	Peak	--	--	In Restricted Band
4924.00	--	V	53.98	--	Avg	--	--	No Emissions Found
7386.00	--	V	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	V	53.98	--	Avg	--	--	No Emissions Found
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



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



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

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

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19121 El Toro Road  
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Lake Forest, CA 92630  
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## 802.11b Mode

### BAND EDGES- VERTICAL

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510B-MR210PB  
 Mode: 802.11b

Date: 8/19/2015  
 Lab: R  
 Test ENG: Matt Harrison

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

Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	111.64	V	--	--	Peak	1.6	360	Fundamental of High Channel <b>X-Axis, DigGain=-9, 11Mbps</b>
2396.09	87.19	V	91.64	-4.45	Delta	1.6	360	From Peak
2385.19	64.58	V	73.98	-9.40	Peak	1.6	360	<b>No Marker Delta Method Used</b>
2385.19	46.57	V	53.98	-7.41	Avg	1.6	360	<b>X-Axis, DigGain=-9, 11Mbps</b>
2462.00	113.38	V	--	--	Peak	1.29	276	Fundamental of High Channel
2488.00	62.60	V	73.98	-11.38	Peak	1.29	276	<b>No Marker Delta Method Used</b>
2488.00	47.00	V	53.98	-6.98	Avg	1.29	276	<b>X-Axis, DigGain=-8, 11Mbps</b>

Test distance  
 3 meter



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

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 2337 Troutdale Drive  
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Lake Forest Division  
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## BAND EDGES- HORIZONTAL

### FCC 15.247

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510B-MR210PB  
 Mode: 802.11b

Date: 8/19/2015  
 Lab: R  
 Test ENG: Matt Harrison

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

Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	109.38	H	--	--	Peak	1.6	130	Fundamental of High Channel <b>X-Axis, DigGain=-9, 11Mbps</b>
2396.75	84.00	H	89.38	-5.38	Delta	1.6	130	From Peak
2383.92	60.97	H	73.98	-13.01	Peak	1.6	130	<b>No Marker Delta Method Used</b>
2383.92	43.36	H	53.98	-10.62	Avg	1.6	130	<b>X-Axis, DigGain=-9, 11Mbps</b>
2462.00	110.18	H	--	--	Peak	2	128	Fundamental of High Channel
2486.90	60.18	H	73.98	-13.80	Peak	2	128	<b>No Marker Delta Method Used</b>
2486.90	45.32	H	53.98	-8.66	Avg	2	128	<b>X-Axis, DigGain=-8, 11Mbps</b>

Test distance  
 3 meter



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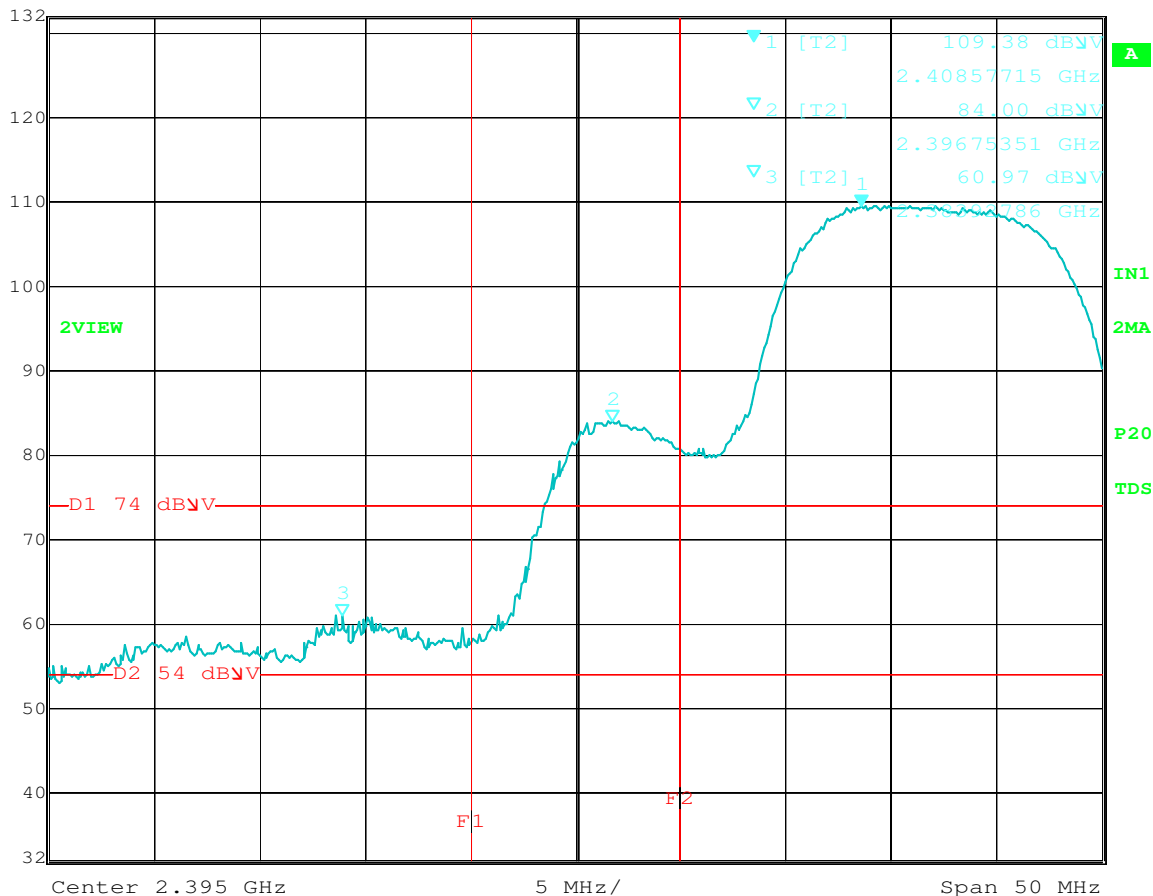
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

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

**Lake Forest Division**  
 20621 Pascal Way  
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## LOWER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	109.38 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.40857715 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510.  
 Comment A: LBE, b mode, Horizontal.  
 Date: 19.AUG.2015 08:09:26



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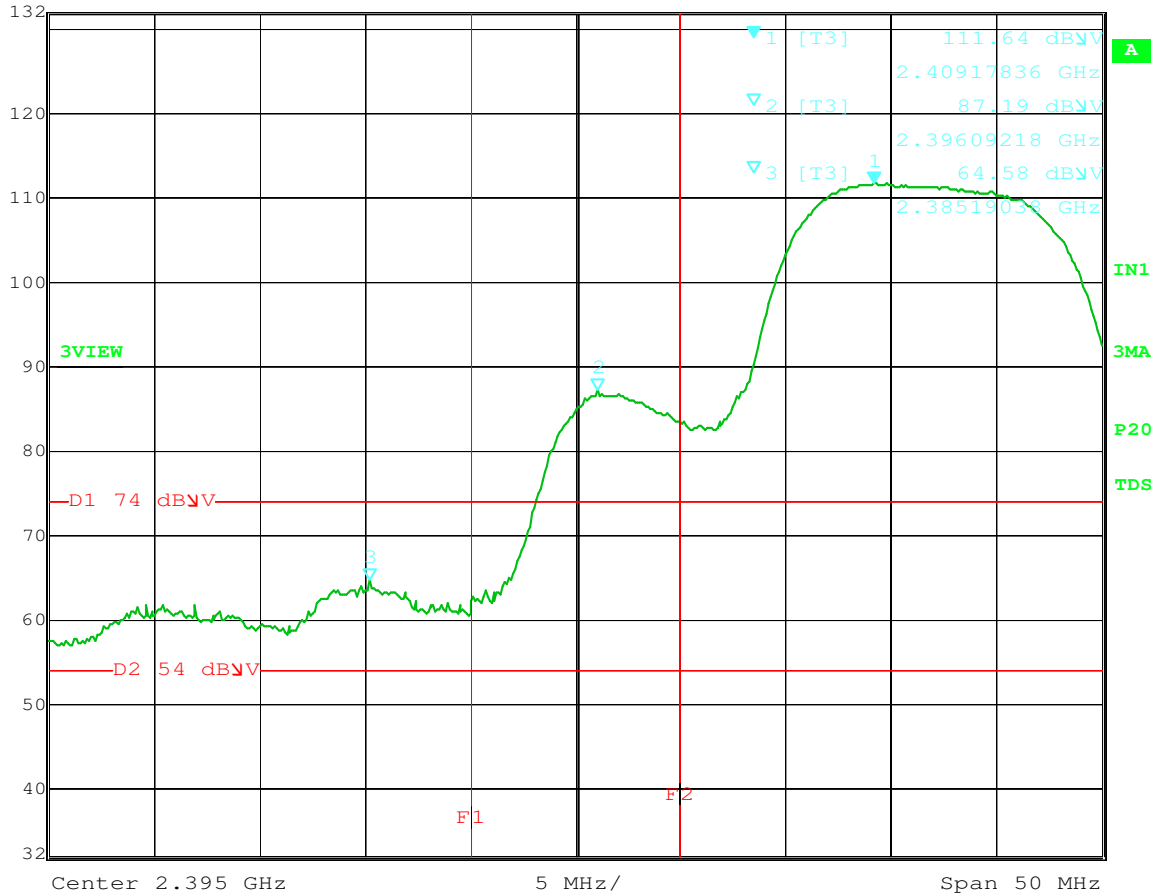
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

**Silverado Division**  
 19121 El Toro Road  
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**Lake Forest Division**  
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**LOWER BAND EDGE**  
**(Vertical)**

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	111.64 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.40917836 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: LBE, b mode, Vertical.  
 Date: 19.AUG.2015 08:17:23



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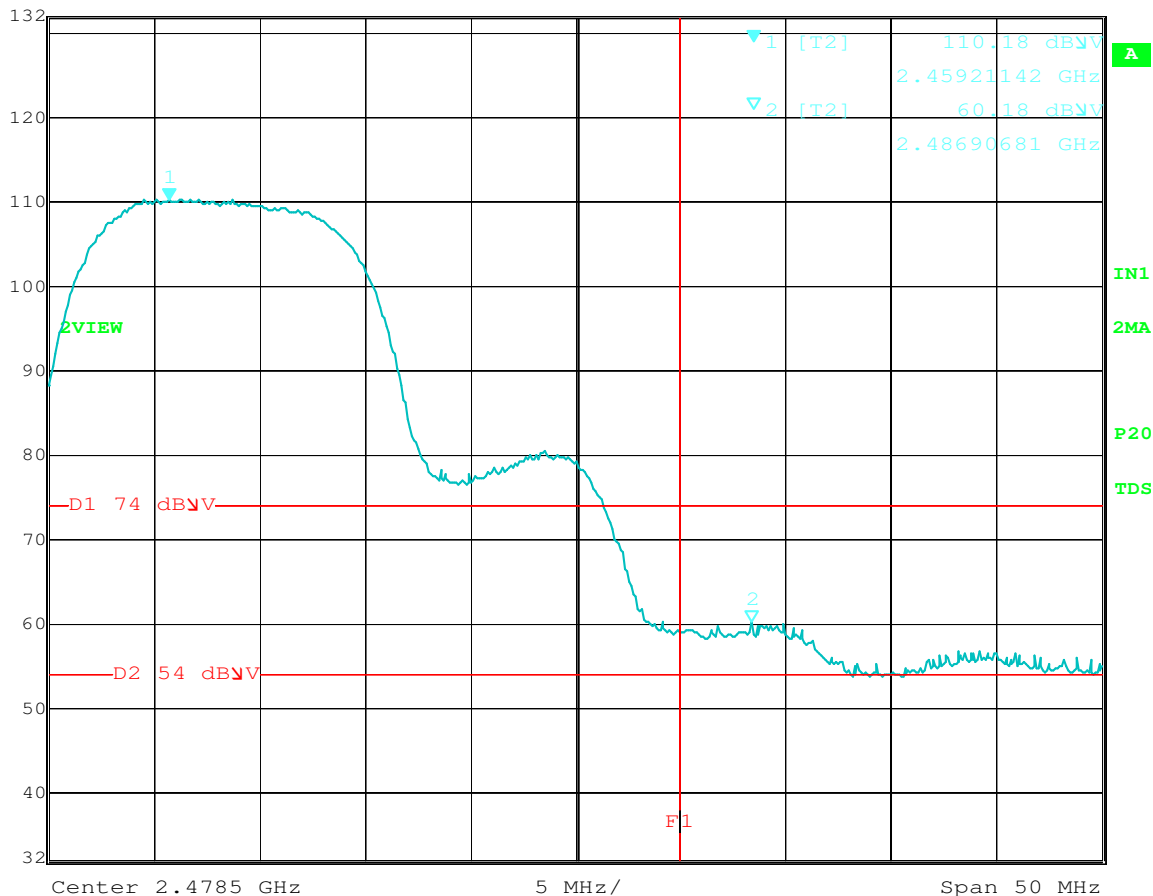
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

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

**Lake Forest Division**  
 20621 Pascal Way  
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 (949) 587-0400

## UPPER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	110.18 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.45921142 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: UBE, b mode, Horizontal.  
 Date: 19.AUG.2015 09:43:23



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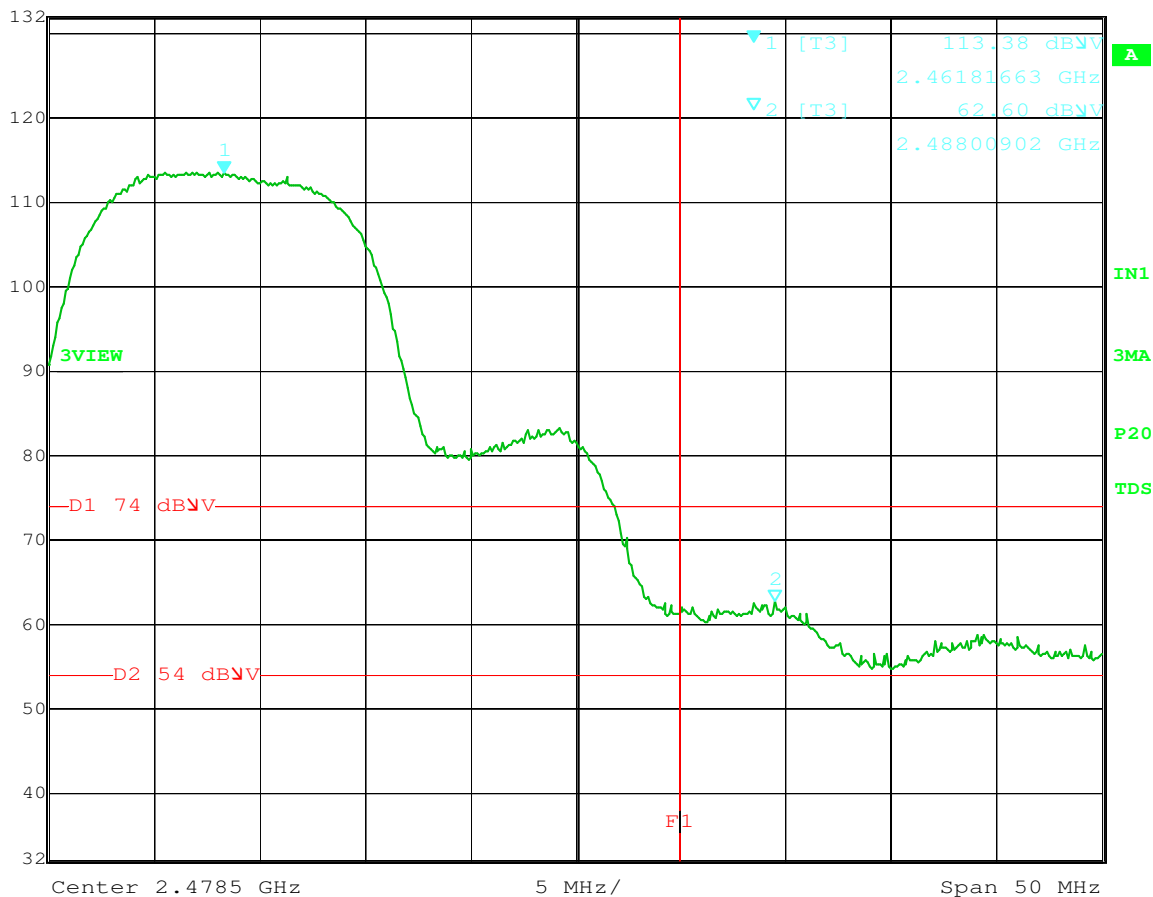
**Agoura Division**  
 2337 Troutdale Drive  
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 (818) 597-0600

**Silverado Division**  
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 (949) 589-0700

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## UPPER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
		132 dBμV	113.38 dBμV	VBW	3 MHz	
		72 dBμV	2.46181663 GHz	SWT	5 ms	Unit



Title: ATWINC1510-MR210PB.  
 Comment A: UBE, b mode, Vertical.  
 Date: 19.AUG.2015 09:39:37



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 20621 Pascal Way  
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 (949) 587-0400

## 802.11g Mode

### BAND EDGES- VERTICAL

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510-MR210PB  
 Mode: 802.11g

Date: 8/19/2015  
 Lab: R  
 Test ENG: Matt Harrison

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

Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	107.26	V	--	--	Peak	1.58	0	Fundamental of High Channel
								<b>X-Axis, DigGain=-12, 6Mbps</b>
2399.25	83.91	V	87.26	-3.35	Delta	1.58	0	From Peak
2389.79	73.12	V	73.98	-0.86	Peak	1.58	0	No Marker Delta Method Used
2389.79	50.01	V	53.98	-3.97	Avg	1.58	0	<b>X-Axis, DigGain=-12, 6Mbps</b>
2462.00	108.73	V	--	--	Peak	1.26	283	Fundamental of High Channel
2483.70	71.32	V	73.98	-2.66	Peak	1.26	283	No Marker Delta Method Used
2483.70	48.28	V	53.98	-5.70	Avg	1.26	283	<b>X-Axis, DigGain=-10, 6Mbps</b>

Test distance  
 3 meter



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**Lake Forest Division**  
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## BAND EDGES- HORIZONTAL

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510-MR210PB  
 Mode: 802.11g

Date: 8/19/2015  
 Lab: R  
 Test ENG: Matt Harrison

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

Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	104.68	H	--	--	Peak	1.6	132	Fundamental of High Channel
								<b>X-Axis, DigGain=-12, 6Mbps</b>
2399.69	81.22	H	84.68	-3.46	Delta	1.6	132	From Peak
2389.79	71.06	H	73.98	-2.92	Peak	1.6	132	No Marker Delta Method Used
2389.79	47.71	H	53.98	-6.27	Avg	1.6	132	<b>X-Axis, DigGain=-12, 6Mbps</b>
2462.00	106.25	H	--	--	Peak	1.36	169	Fundamental of High Channel
2483.70	69.73	H	73.98	-4.25	Peak	1.36	169	No Marker Delta Method Used
2483.70	46.24	H	53.98	-7.74	Avg	1.36	169	<b>X-Axis, DigGain=-10, 6Mbps</b>

Test distance  
 3 meter



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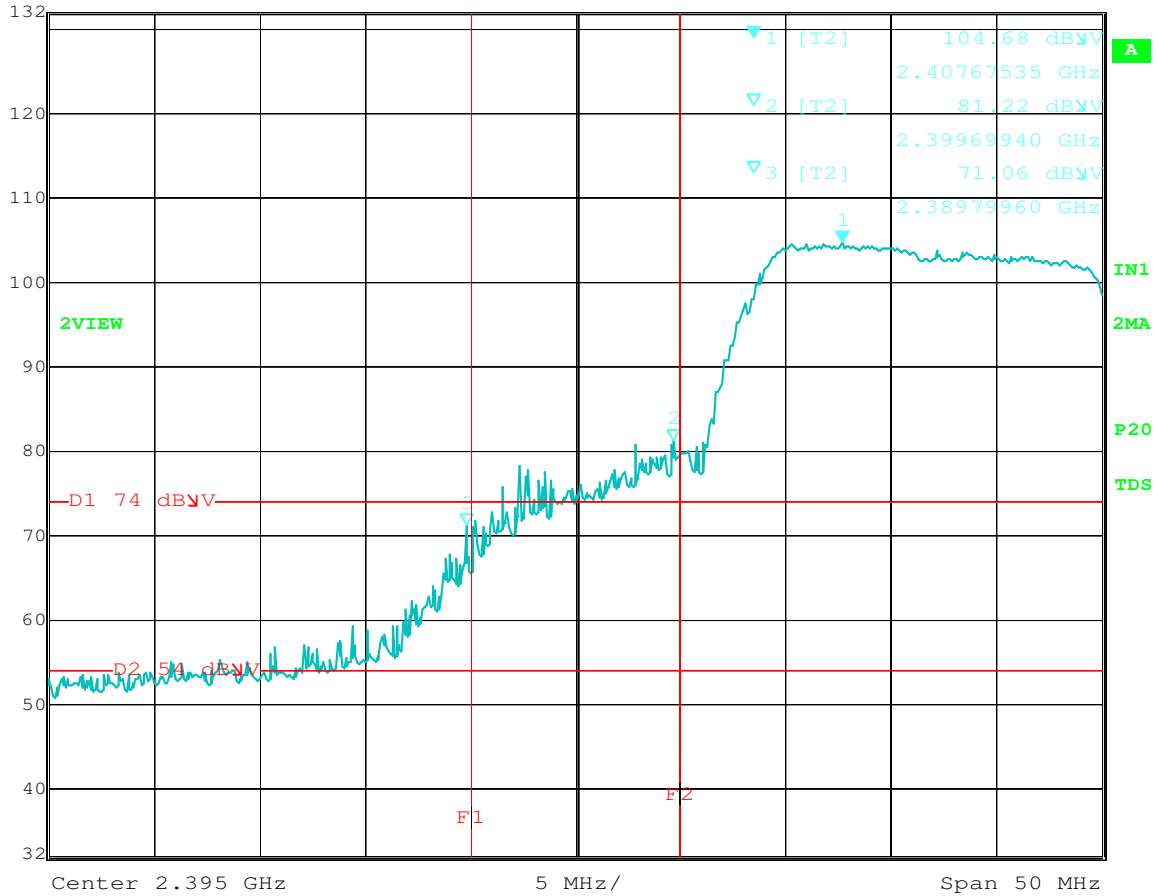
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
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**Silverado Division**  
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**Lake Forest Division**  
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**LOWER BAND EDGE**  
**(Horizontal)**

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	132 dBμV	104.68 dBμV	VBW	3 MHz		
	72 dBμV	2.40767535 GHz	SWT	5 ms	Unit	dBμV



Title: ATWINC1510-MR210PB.  
 Comment A: LBE, g mode, Horizontal.  
 Date: 19.AUG.2015 08:42:38



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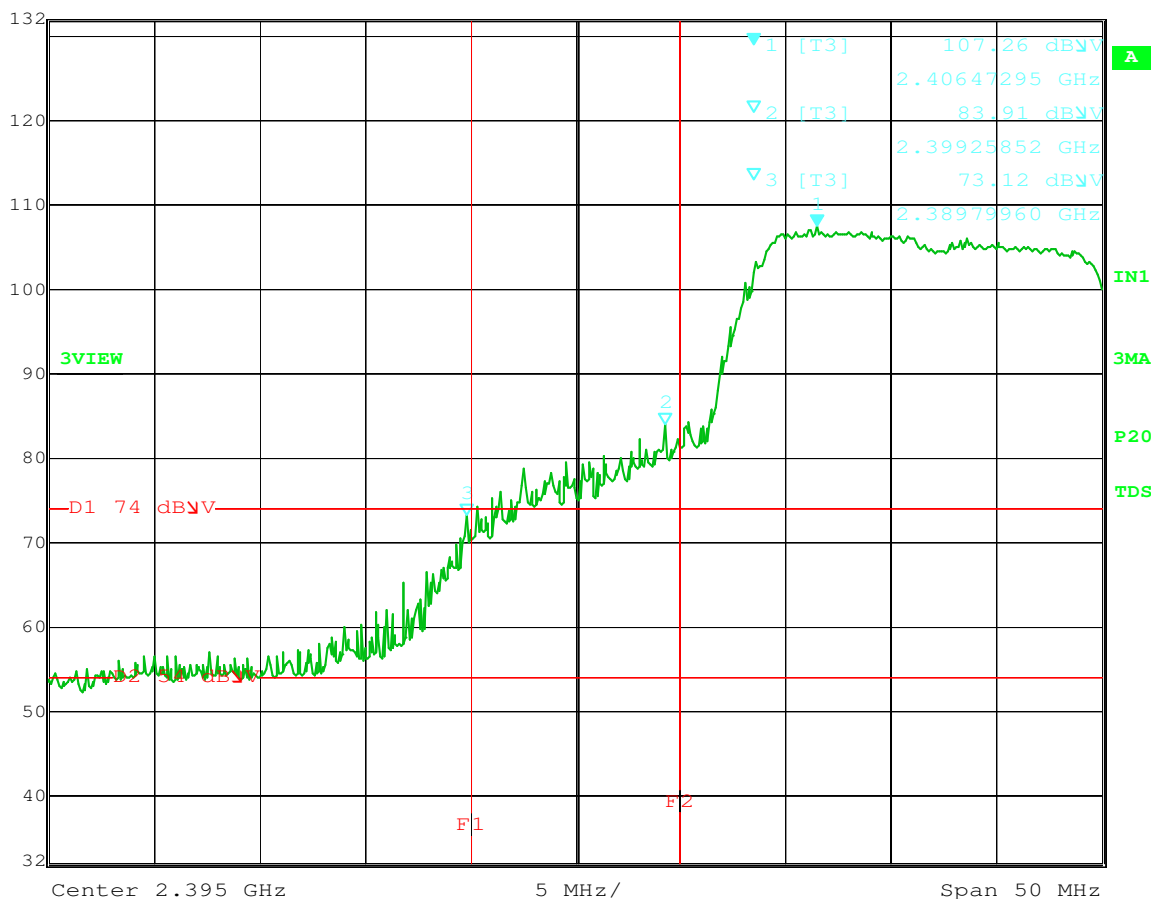
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

**Silverado Division**  
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**Lake Forest Division**  
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## LOWER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	107.26 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.40647295 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: LBE, g mode, Vertical.  
 Date: 19.AUG.2015 08:40:21



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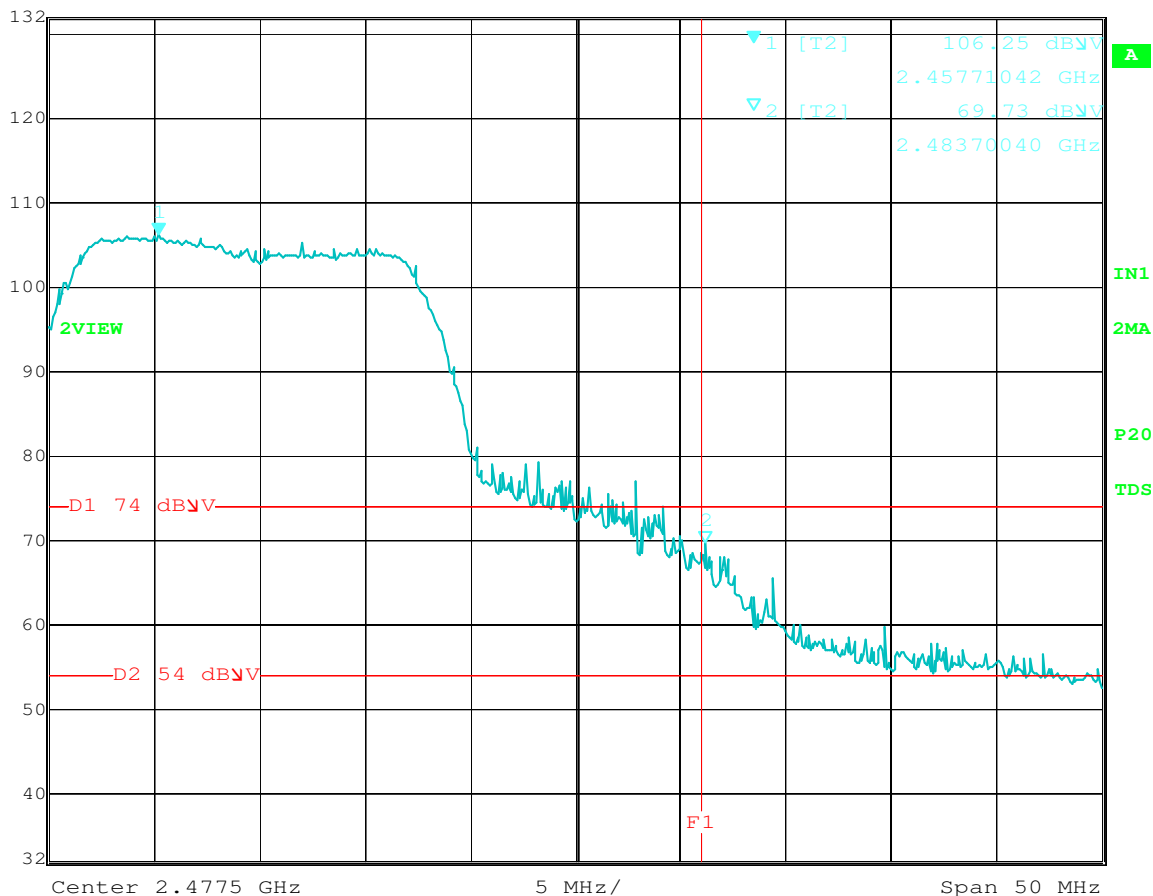
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

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## UPPER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	106.25 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.45771042 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: UBE, g mode, Horizontal.  
 Date: 19.AUG.2015 09:27:21



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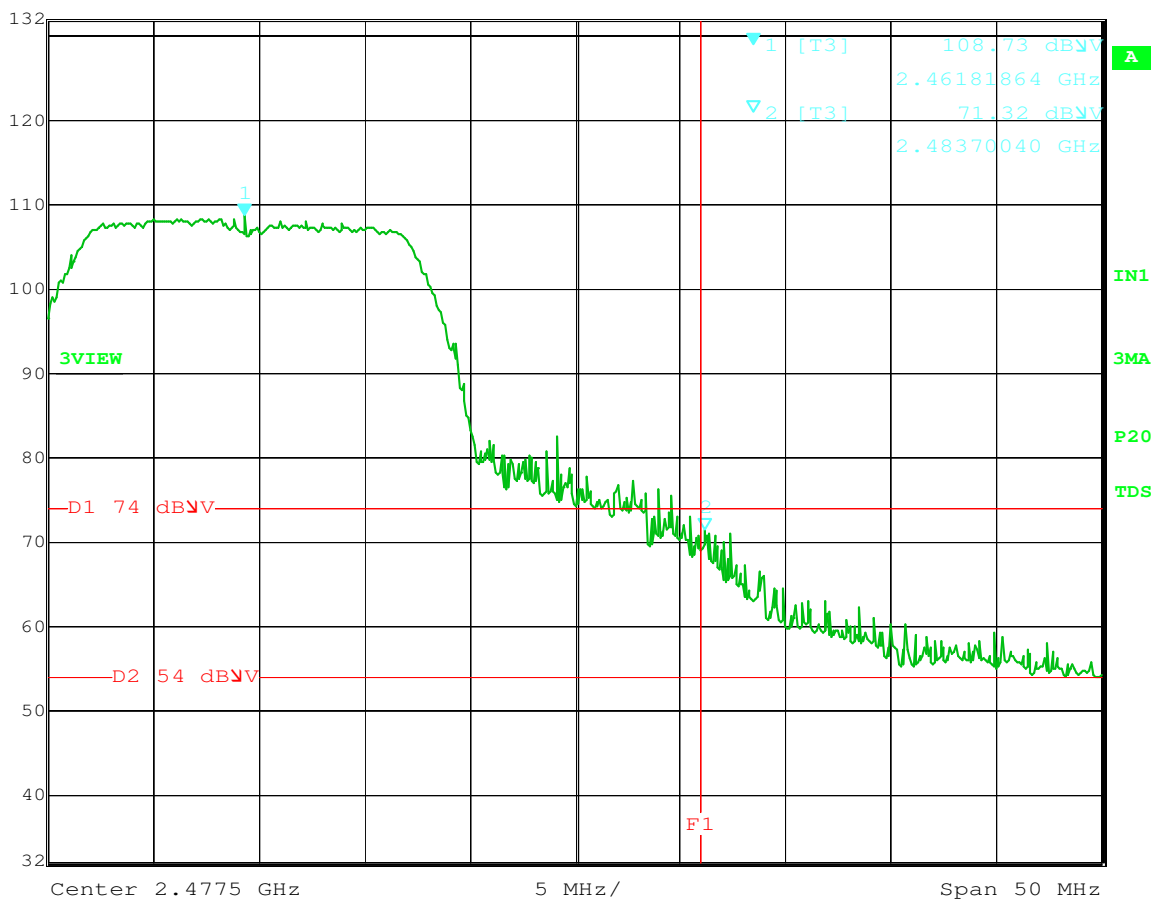
**Agoura Division**  
 2337 Troutdale Drive  
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 (818) 597-0600

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## UPPER BAND EDGE (Vertical)

R S	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	108.73 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.46181864 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: UBE, g mode, Vertical.  
 Date: 19.AUG.2015 09:34:12



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

## 802.11n Mode

### BAND EDGES- VERTICAL

**FCC 15.247**

Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510-MR210PB  
 Mode: 802.11n

Date: 8/19/2015  
 Lab: R  
 Test ENG: Matt Harrison

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

Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	105.91	V	--	--	Peak	1.6	0	Fundamental of High Channel
								<b>X-Axis, DigGain=-13.5, MCS0</b>
2398.65	81.40	V	85.91	-4.51	Delta	1.6	0	From Peak
2389.79	70.13	V	73.98	-3.85	Peak	1.6	0	No Marker Delta Method Used
2389.79	48.94	V	53.98	-5.04	Avg	1.6	0	<b>X-Axis, DigGain=-13.5, MCS0</b>
2462.00	107.76	V	--	--	Peak	1.27	285	Fundamental of High Channel
2484.40	69.15	V	73.98	-4.83	Peak	1.27	285	No Marker Delta Method Used
2484.40	45.96	V	53.98	-8.02	Avg	1.27	285	<b>X-Axis, DigGain=-11, MCS0</b>

Test distance  
 3 meter



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 20621 Pascal Way  
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## BAND EDGES- HORIZONTAL

**FCC 15.247**

 Company: Atmel Corporation  
 EUT: Modular Transmitter  
 Model: ATWINC1510-MR210PB  
 Mode: 802.11n

 Date: 8/19/2015  
 Lab: R  
 Test ENG: Matt Harrison

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

Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	104.62	H	--	--	Peak	1.58	130	Fundamental of High Channel <b>X-Axis, DigGain=-13.5, MCS0</b>
2399.65	78.62	H	84.62	-6.00	Delta	1.58	130	From Peak
2390.00	69.48	H	73.98	-4.50	Peak	1.58	130	<b>No Marker Delta Method Used</b>
2390.00	47.14	H	53.98	-6.84	Avg	1.58	130	<b>X-Axis, DigGain=-13.5, MCS0</b>
2462.00	104.64	H	--	--	Peak	1.7	135	Fundamental of High Channel
2483.80	68.48	H	73.98	-5.50	Peak	1.7	135	<b>No Marker Delta Method Used</b>
2483.80	44.78	H	53.98	-9.20	Avg	1.7	135	<b>X-Axis, DigGain=-11, MCS0</b>

 Test distance  
 3 meter

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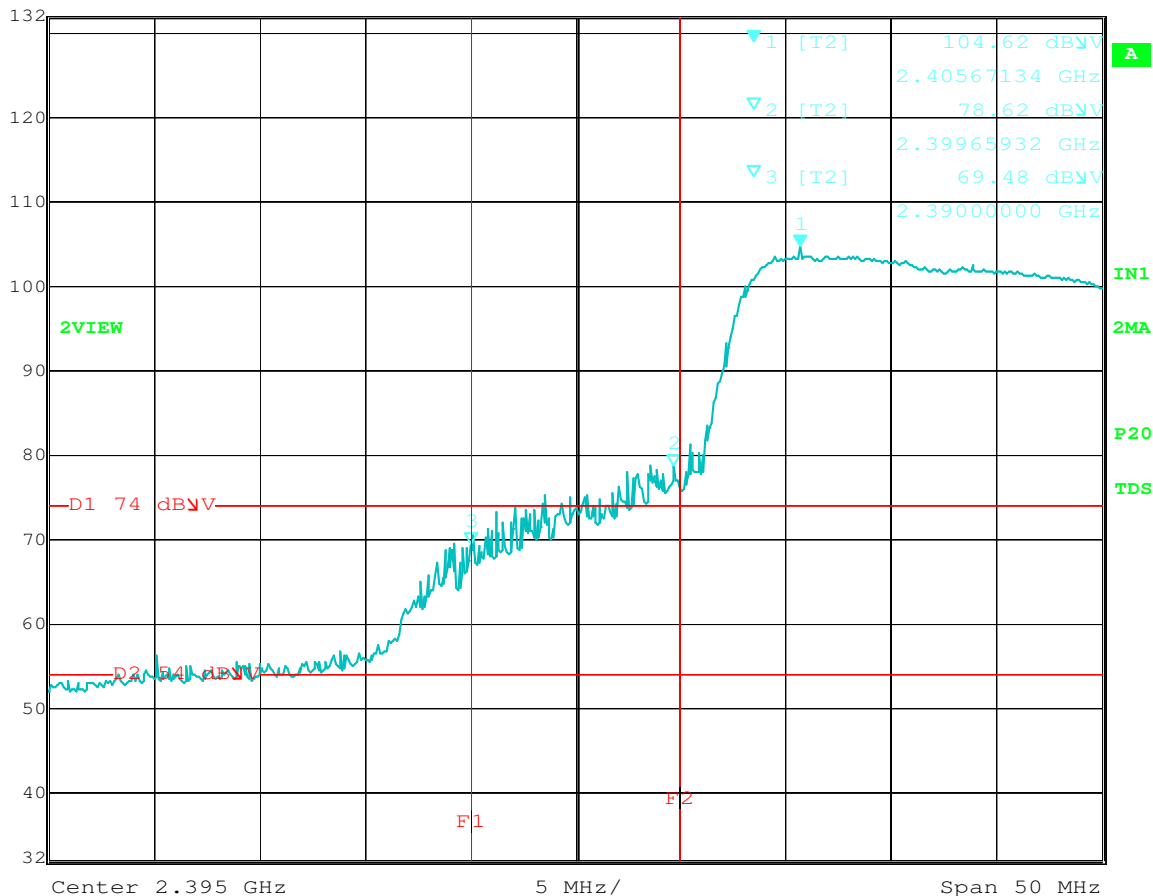
**Agoura Division**  
 2337 Troutdale Drive  
 Agoura, CA 91301  
 (818) 597-0600

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## LOWER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	104.62 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.40567134 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: LBE, n mode, Horizontal.  
 Date: 19.AUG.2015 08:48:49



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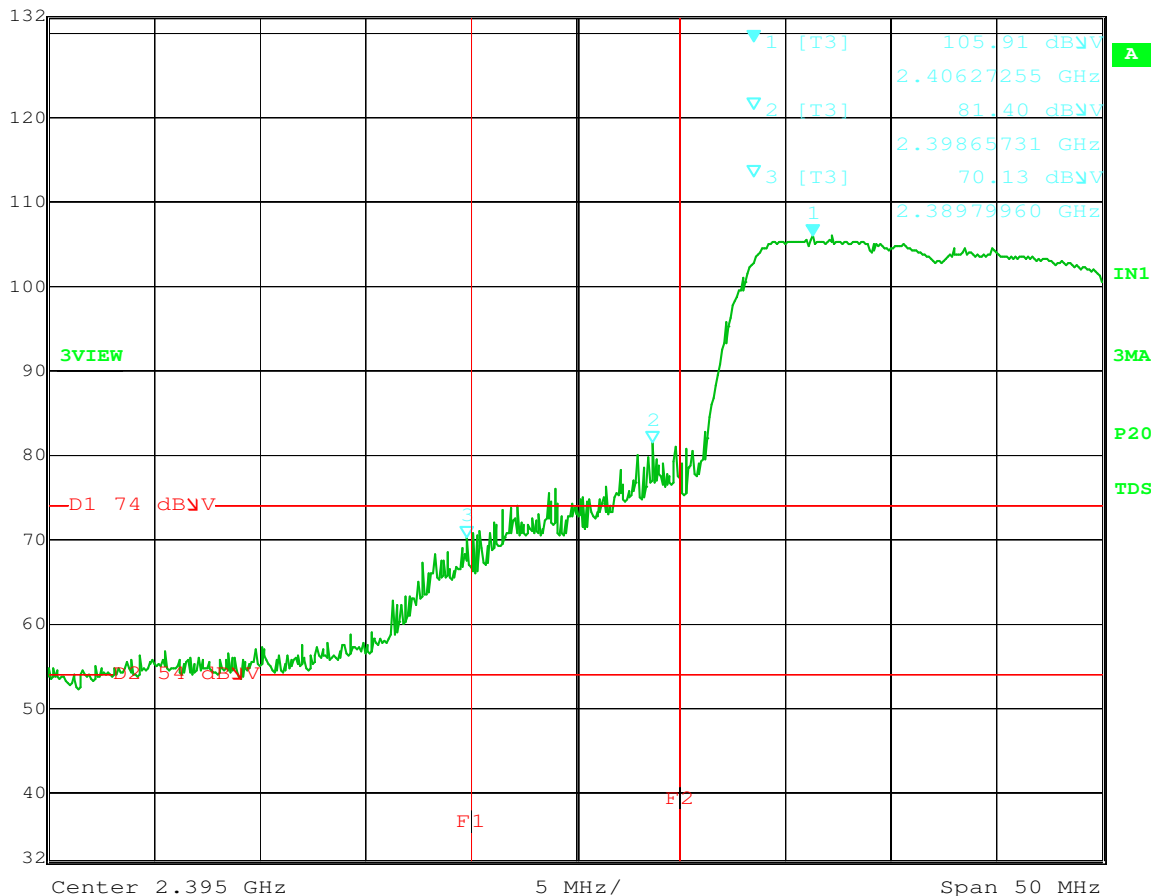
**Silverado Division**  
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**Lake Forest Division**  
 20621 Pascal Way  
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## LOWER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	132 dBμV	105.91 dBμV	VBW	3 MHz		
	72 dBμV	2.40627255 GHz	SWT	5 ms	Unit	dBμV



Title: ATWINC1510-MR210PB.  
 Comment A: LBE, n mode, Vertical.  
 Date: 19.AUG.2015 08:52:55



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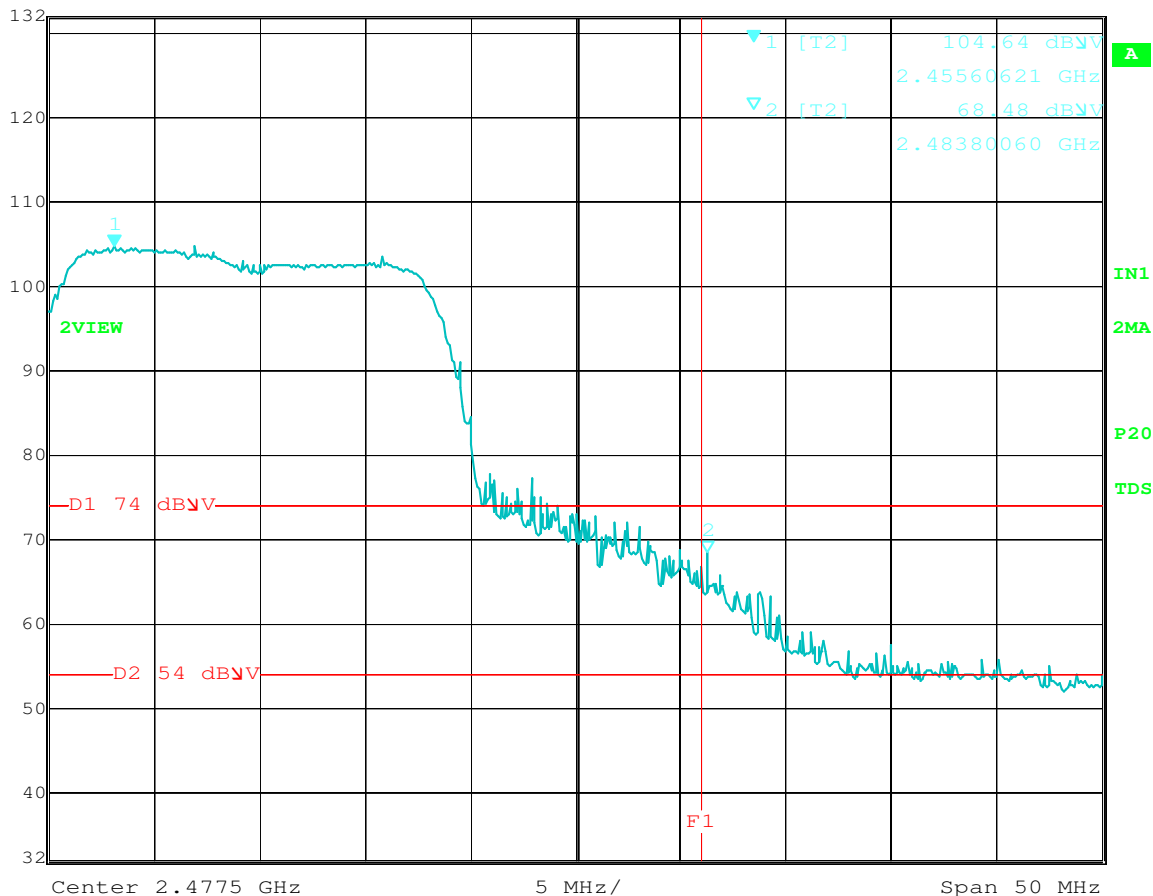
**Agoura Division**  
 2337 Troutdale Drive  
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**UPPER BAND EDGE**  
**(Horizontal)**

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	104.64 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.45560621 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: UBE, n mode, Horizontal.  
 Date: 19.AUG.2015 09:23:02



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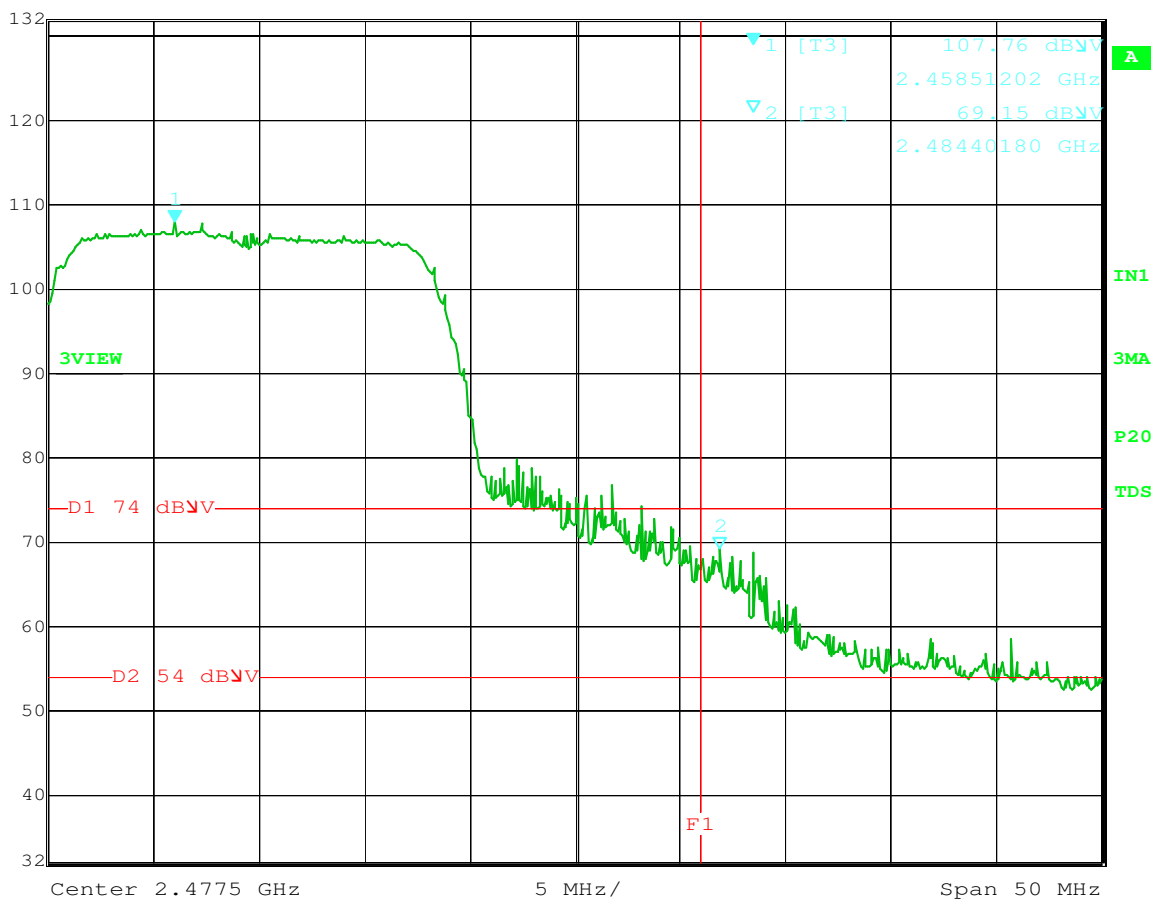
**Agoura Division**  
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## UPPER BAND EDGE (Vertical)

R S	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	132 dB $\mu$ V	107.76 dB $\mu$ V	VBW	3 MHz		
	72 dB $\mu$ V	2.45851202 GHz	SWT	5 ms	Unit	dB $\mu$ V



Title: ATWINC1510-MR210PB.  
 Comment A: UBE, n mode, Vertical.  
 Date: 19.AUG.2015 09:13:39



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