

**FCC PART 15 SUBPART C SECTION 15.247
&
RSS 247
TEST REPORT**

for

MODULAR TRANSMITTER

Model: ATWILC1000BM

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

Prepared by: _____

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DATE: SEPTEMBER 9, 2015

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

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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



GENERAL REPORT SUMMARY

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

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

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

Device Tested: Modular Transmitter
Model: ATWILC1000BM
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: July 8, 9, 10, & 13, 2015

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart C Sections 15.205, 15.207, 15.209, & 15.247.
RSS 247 & RSS GEN

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



SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart C Section 15.207 and RSS GEN
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, and RSS GEN
3	DTS Bandwidth	Complies with CFR Title 47 Part 15 Subpart C Section 15.247 and RSS 247
4	Maximum Peak Conducted Output Power	Complies with CFR Title 47 Part 15 Subpart C Section 15.247 and RSS 247
5	Maximum Peak Power Spectral Density Level In The Fundamental Emission	Complies with CFR Title 47 Part 15 Subpart C Section 15.247 and RSS 247
6	Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth)	Complies with CFR Title 47 Part 15 Subpart C Section 15.247 and RSS 247
7	Emissions in the Restricted Bands	Complies with CFR Title 47 Part 15 Subpart C Section 15.247 and RSS 247



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Modular Transmitter Model: ATWILC1000BM. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10 & C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT (equipment under test) hereafter, are within the specification limits defined by the Code of Federal Regulations Title 47, Part 15 Subpart C sections 15.207, 15.205, 15.209, 15.247, RSS GEN, and RSS 247.



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 Radutnuy Staff Applications Engineer

Compatible Electronics Inc.

Torey Oliver Test Technician
Jeff Klinger Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on July 8, 2015.

2.5 Disposition of the Test Sample

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

2.6 Abbreviations and Acronyms

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

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



3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2014	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.
RSS 247	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
RSS GEN	General Requirements for Compliance of Radio Apparatus
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



4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration

The Modular Transmitter Model: ATWILC1000BM (EUT) was setup in a tabletop configuration. The EUT was powered by a DC Supply (for Conducted Emissions the EUT was connected to a USB Power Adapter). The EUT was continuously transmitting a data stream. The EUT was checked in all axes and the X-Axis was found to be the worst case.

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

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

4.1.1 Photograph Test Configuration



4.1.2 Cable Construction and Termination

Cable 1

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 bundled.

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 bundled.

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.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	MODULAR TRANSMITTER(EUT)	ATMEL CORPORATION	ATWILC1000BM	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



5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	9/5/2014	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



6. TEST SITE DESCRIPTION

6.1 Test Facility Description

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

6.2 EUT Mounting, Bonding and Grounding

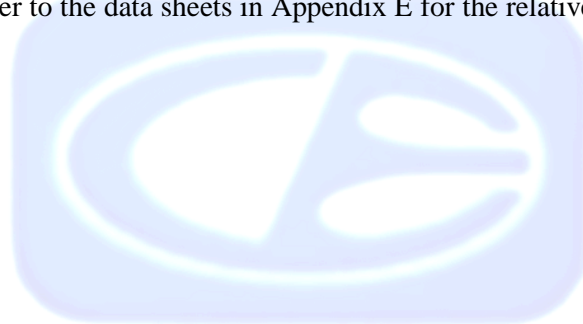
The EUT was mounted on a 1.0 by 1.5 by 0.8 meter high non-conductive table, which was placed on the ground plane.

For testing above 1 GHz the EUT was mounted 1.5 meters above 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.



7. CHARACTERISTICS OF THE TRANSMITTER

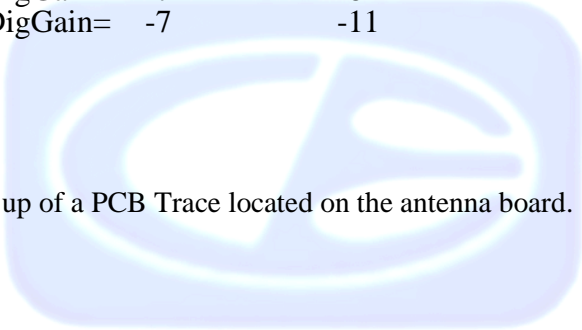
7.1 Channel Number and Frequencies

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 channels and the EUT uses DSSS modulation. Below are the channels and power settings:

	b Mode	g Mode	n Mode
1 == 2412 MHz DigGain=	-10	-12	-14
2 == 2417 MHz DigGain=	-7	-8	-8
3 == 2422 MHz DigGain=	-7	-8	-8
4 == 2427 MHz DigGain=	-7	-8	-8
5 == 2432 MHz DigGain=	-7	-8	-8
6 == 2437 MHz DigGain=	-7	-8	-8
7 == 2442 MHz DigGain=	-7	-8	-8
8 == 2447 MHz DigGain=	-7	-8	-8
9 == 2452 MHz DigGain=	-7	-8	-8
10 == 2457 MHz DigGain=	-7	-8	-8
11 == 2462 MHz DigGain=	-7	-11	-11

7.2 Antenna

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



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

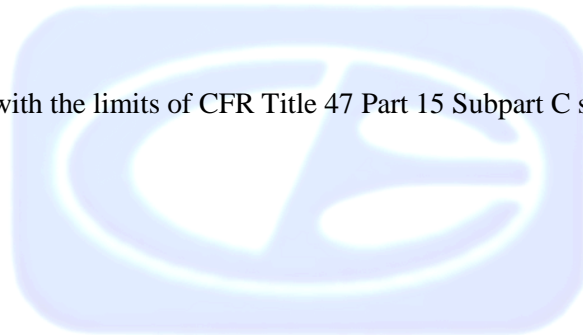
The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for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



8.1.2 Radiated Emissions (Spurious and Harmonics) Test

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

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

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

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

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

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

Test Results:

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



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 and RSS 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 and RSS 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 a minimum of 3 kHz and not > 100kHz and VBW 3 * RBW. A peak detector was used with the sweep time set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level within the RBW. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247 and RSS 247.



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 ≥ 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 and RSS 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 and RSS GEN.

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 and RSS 247.



9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The Modular Transmitter Model: ATWILC1000BM meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart C sections 15.205, 15.207, 15.209, 15.247, RSS GEN & RSS 247.



APPENDIX A

***LABORATORY ACCREDITATIONS AND
RECOGNITIONS***



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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

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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APPENDIX B

MODIFICATIONS TO THE EUT



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MODIFICATIONS TO THE EUT

There were no modifications made during testing.



APPENDIX C

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***



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ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Modular Transmitter
Model: ATWILC1000BM
S/N: None

No additional models were tested.



APPENDIX D

DIAGRAMS, FACTORS, CHARTS, AND PHOTOS



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

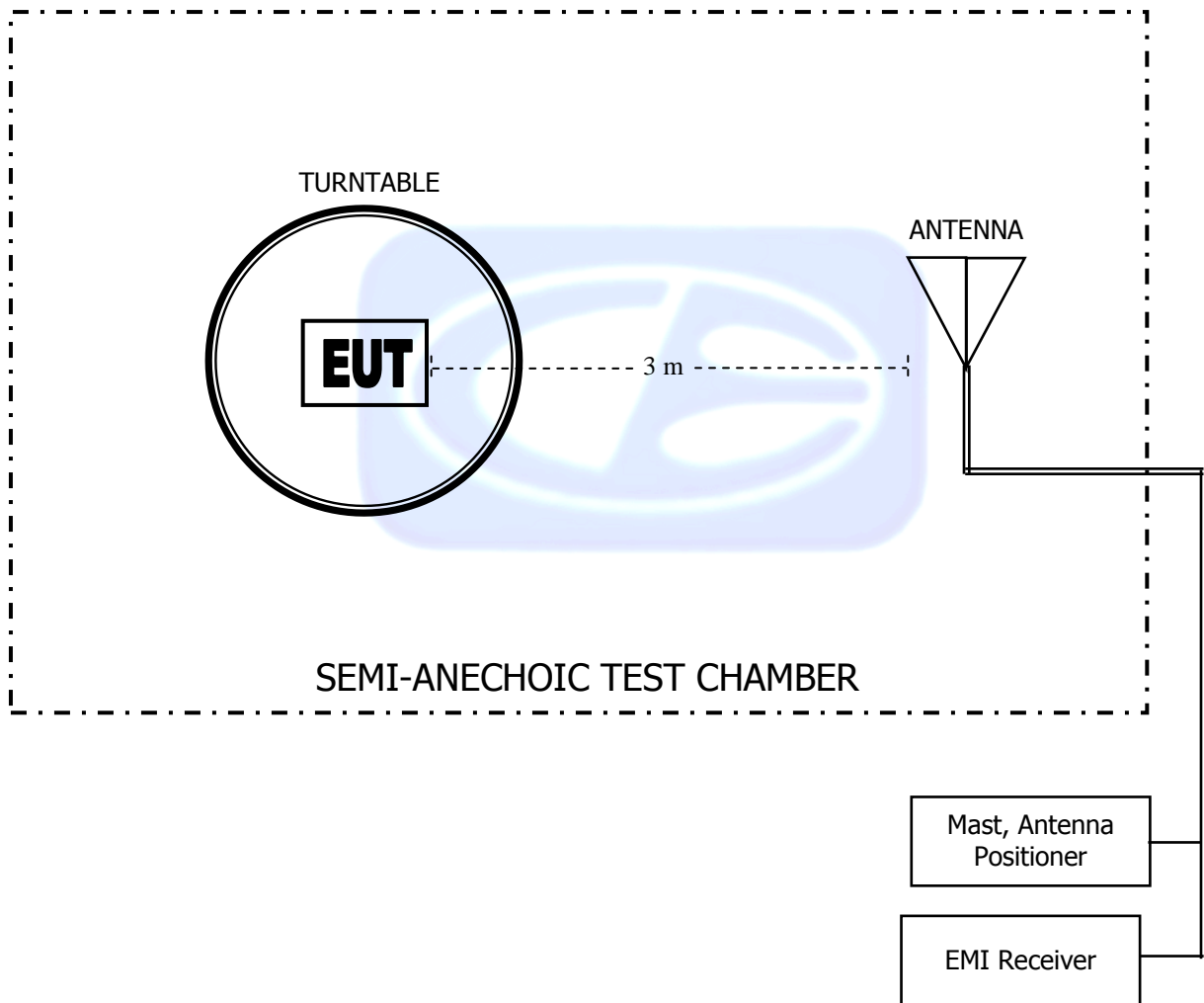


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE ABOVE 1GHZ

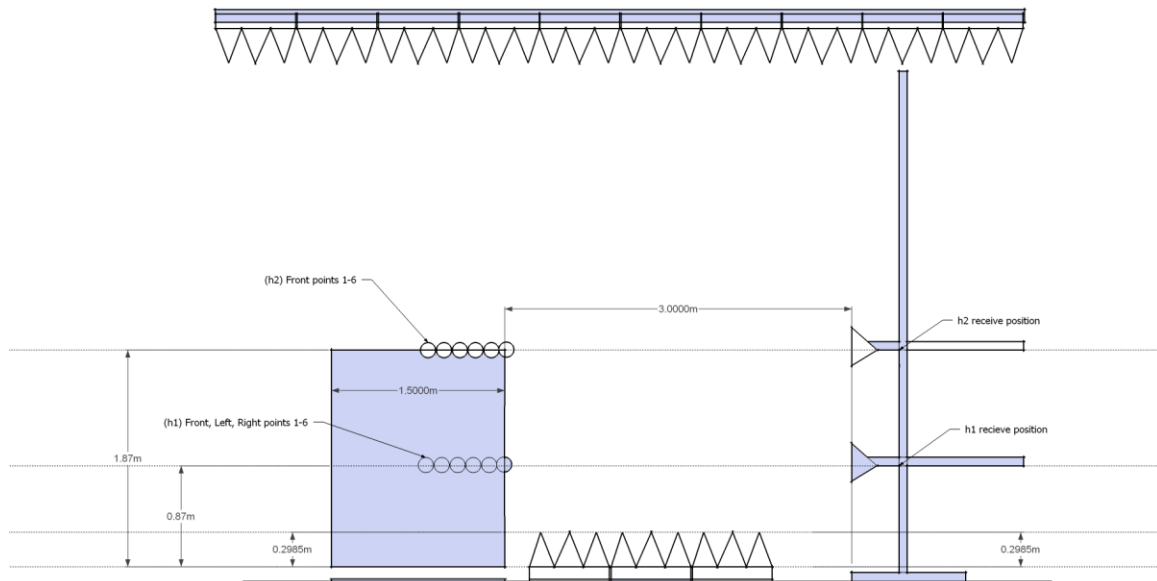
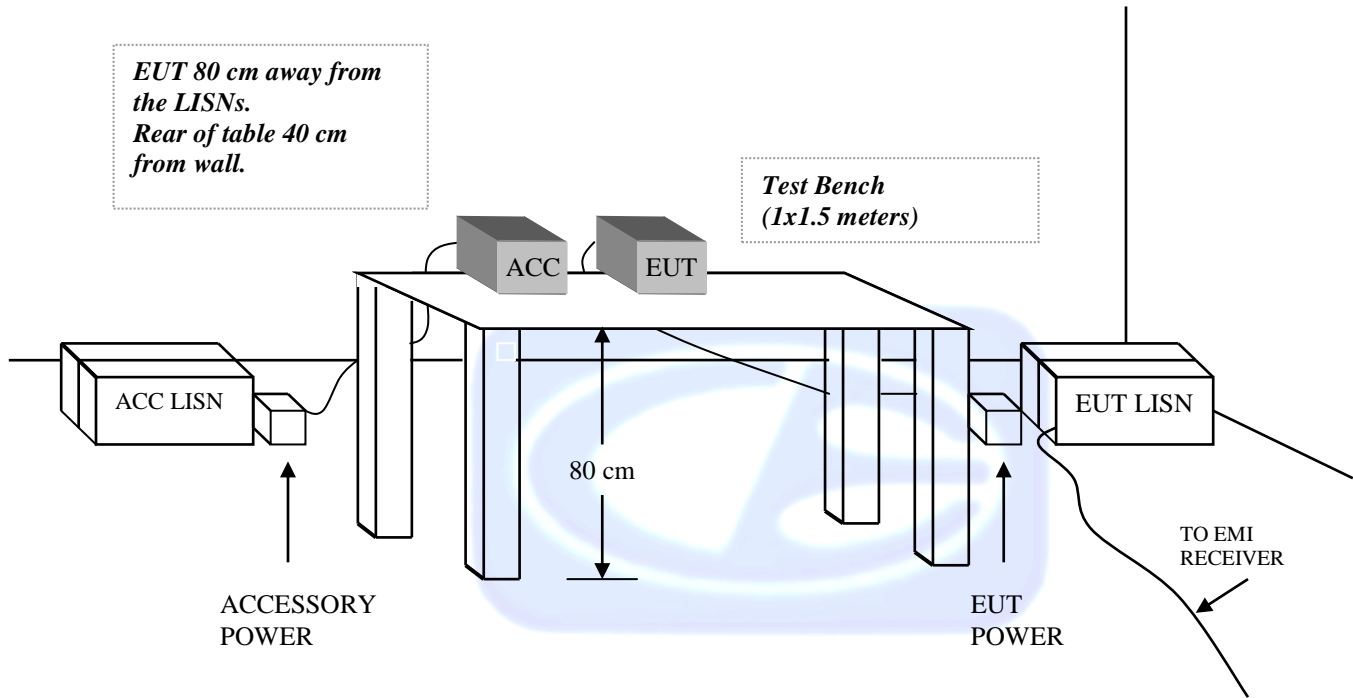


FIGURE 3: CONDUCTED EMISSIONS TEST SETUP



COM-POWER AL-130**LOOP ANTENNA**

S/N: 121049

CALIBRATION DUE: DECEMBER 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
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			



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

S/N: 25857

CALIBRATION DUE: MAY 21, 2016

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



COM-POWER AH-118**HORN ANTENNA**

S/N: 071250

CALIBRATION DUE: JULY 1, 2016

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



COM-POWER PAM-118**1-18GHz - PREAMPLIFIER**

S/N: 443013

CALIBRATION DUE: APRIL 24, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
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



COM-POWER PAM-118**1-18GHz - PREAMPLIFIER**

S/N: 443011

CALIBRATION DUE: April 24, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
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



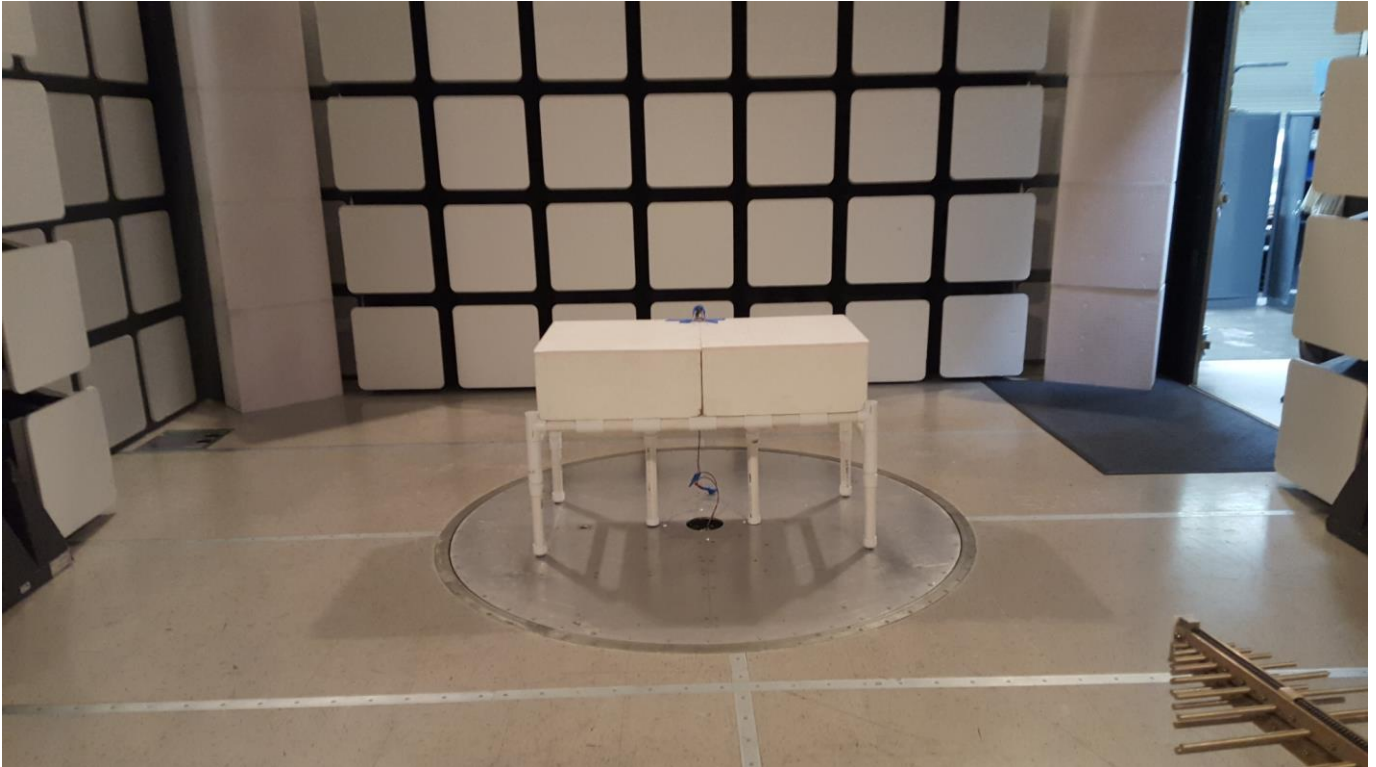
COM-POWER PA-840**18-40 GHz PREAMPLIFIER**

S/N: 181289

CALIBRATION DUE: JUNE 16, 2016

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



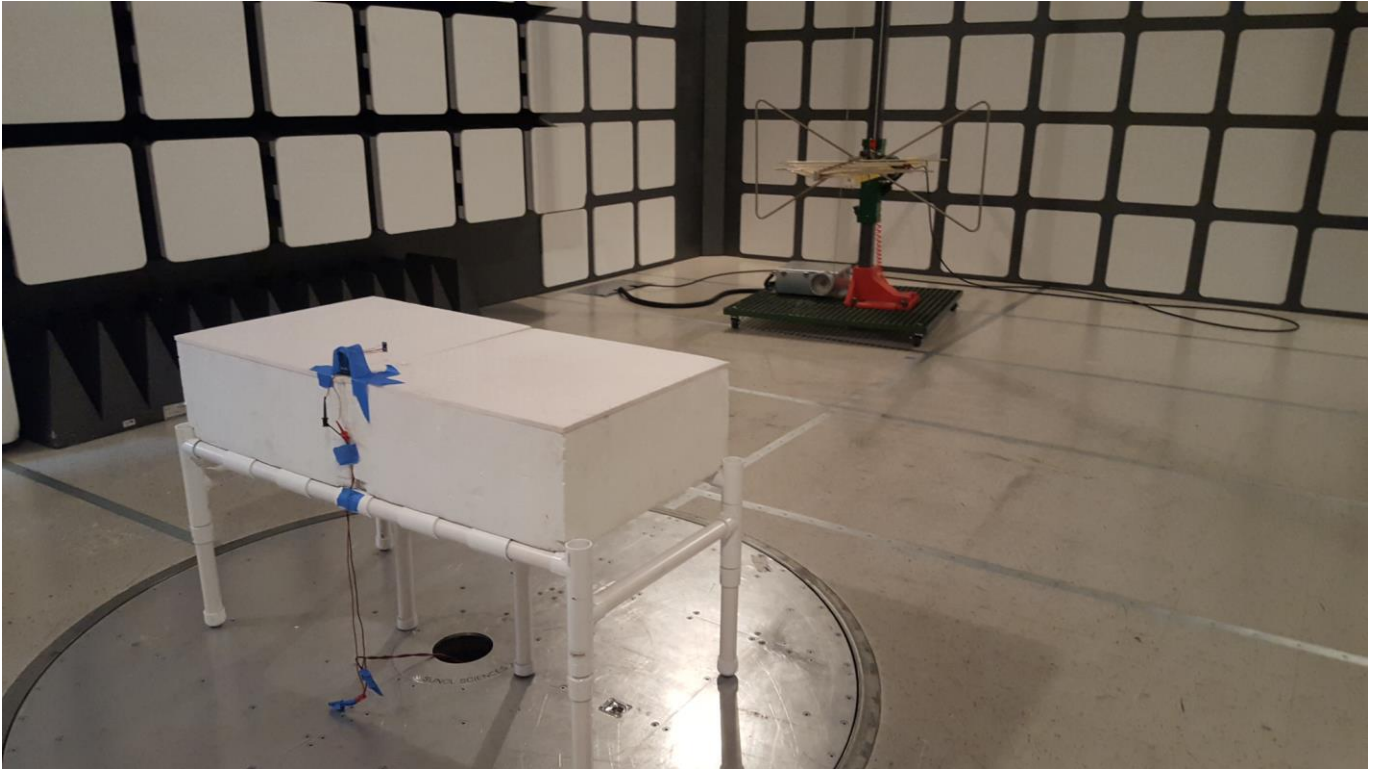


FRONT VIEW

ATMEL CORPORATION
MODULAR TRANSMITTER
Model: ATWILC1000BM
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

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



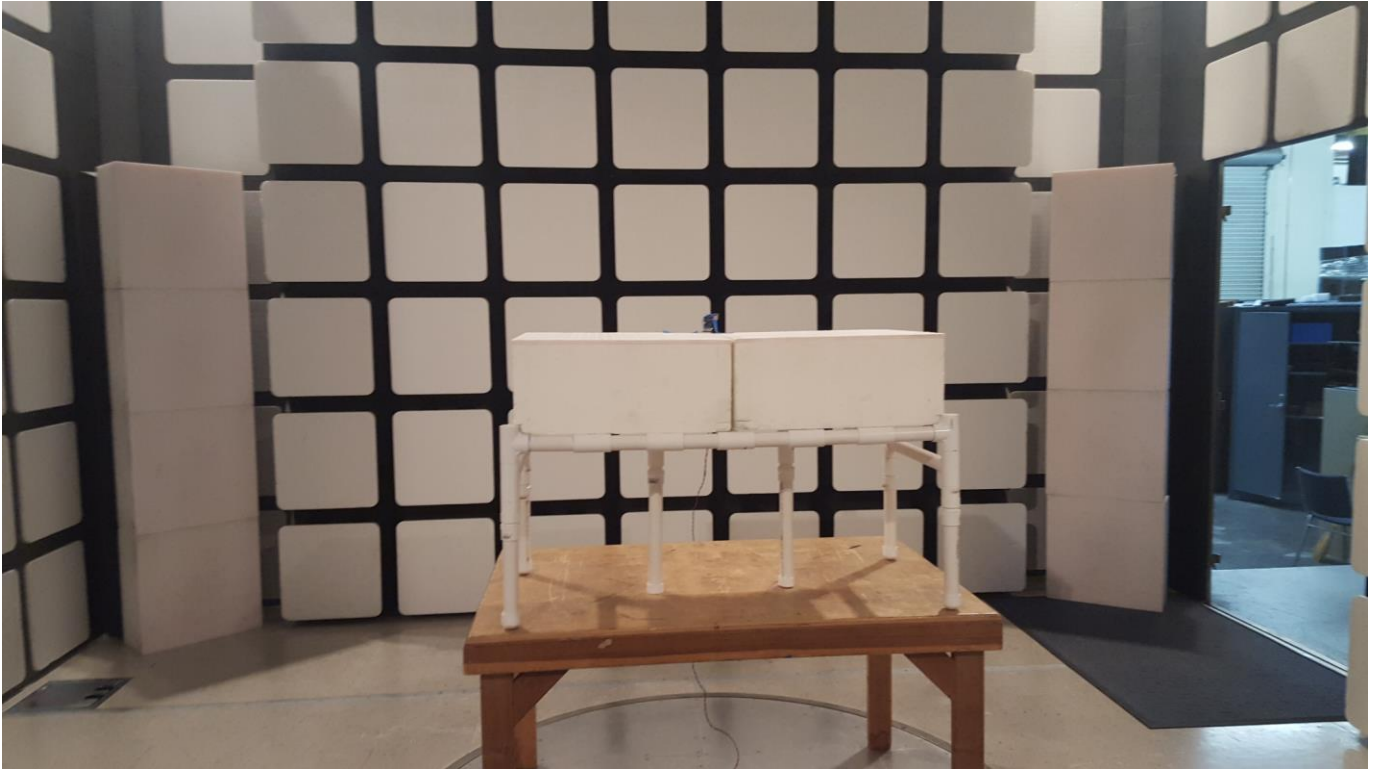


REAR VIEW

ATMEL CORPORATION
MODULAR TRANSMITTER
Model: ATWILC1000BM
FCC SUBPART C - RADIATED EMISSIONS < 1GHz

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





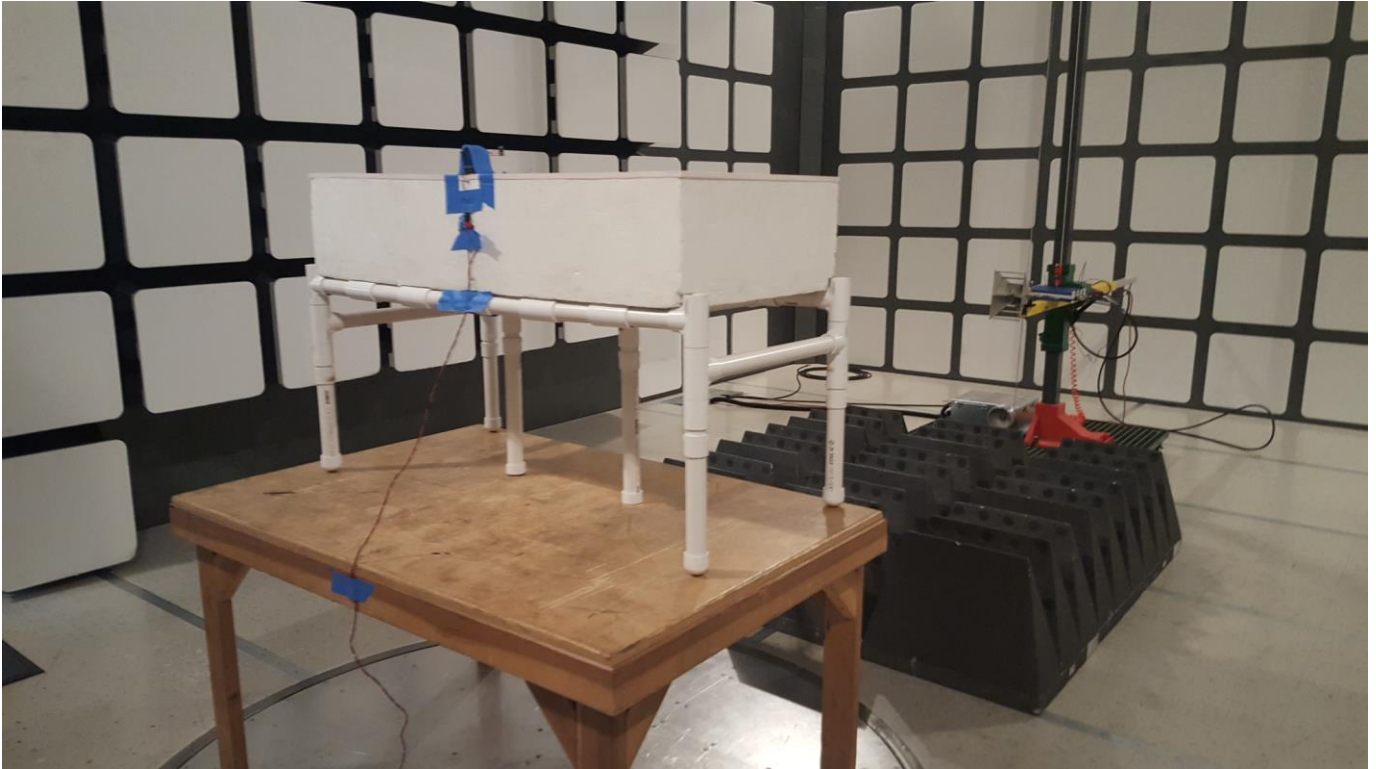
FRONT VIEW

ATMEL CORPORATION
MODULAR TRANSMITTER
Model: ATWILC1000BM

FCC SUBPART C - RADIATED EMISSIONS > 1GHz

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





REAR VIEW

ATMEL CORPORATION
MODULAR TRANSMITTER
Model: ATWILC1000BM
FCC SUBPART C - RADIATED EMISSIONS > 1GHz

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



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

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

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

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



FRONT VIEW

ATMEL CORPORATION
MODULAR TRANSMITTER
Model: ATWILC1000BM
FCC SUBPART C - CONDUCTED EMISSIONS

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

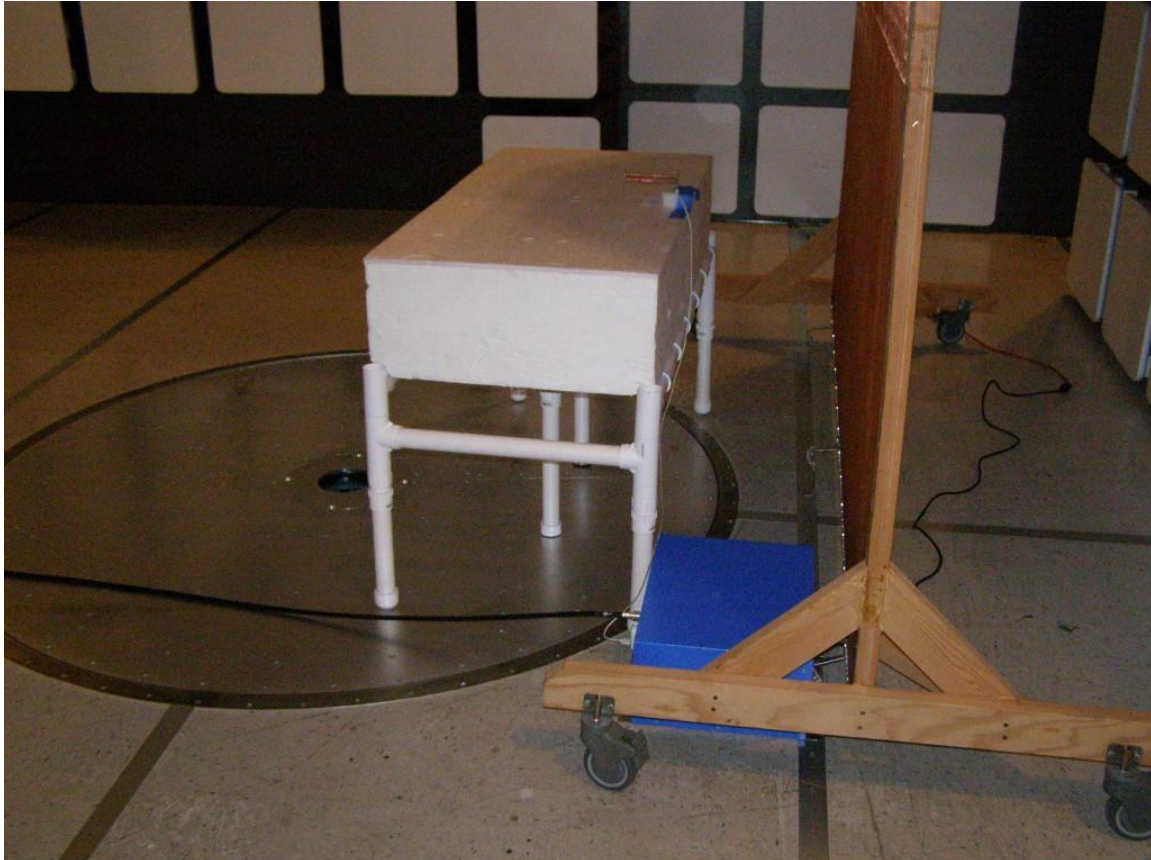


Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

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

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

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



REAR VIEW

ATMEL CORPORATION
MODULAR TRANSMITTER
Model: ATWILC1000BM
FCC SUBPART C - CONDUCTED EMISSIONS

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



Brea Division
114 Olinda Drive
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Agoura Division
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Silverado Division
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20621 Pascal Way
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(949) 587-0400

APPENDIX E

RADIATED EMISSIONS DATA SHEETS



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

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

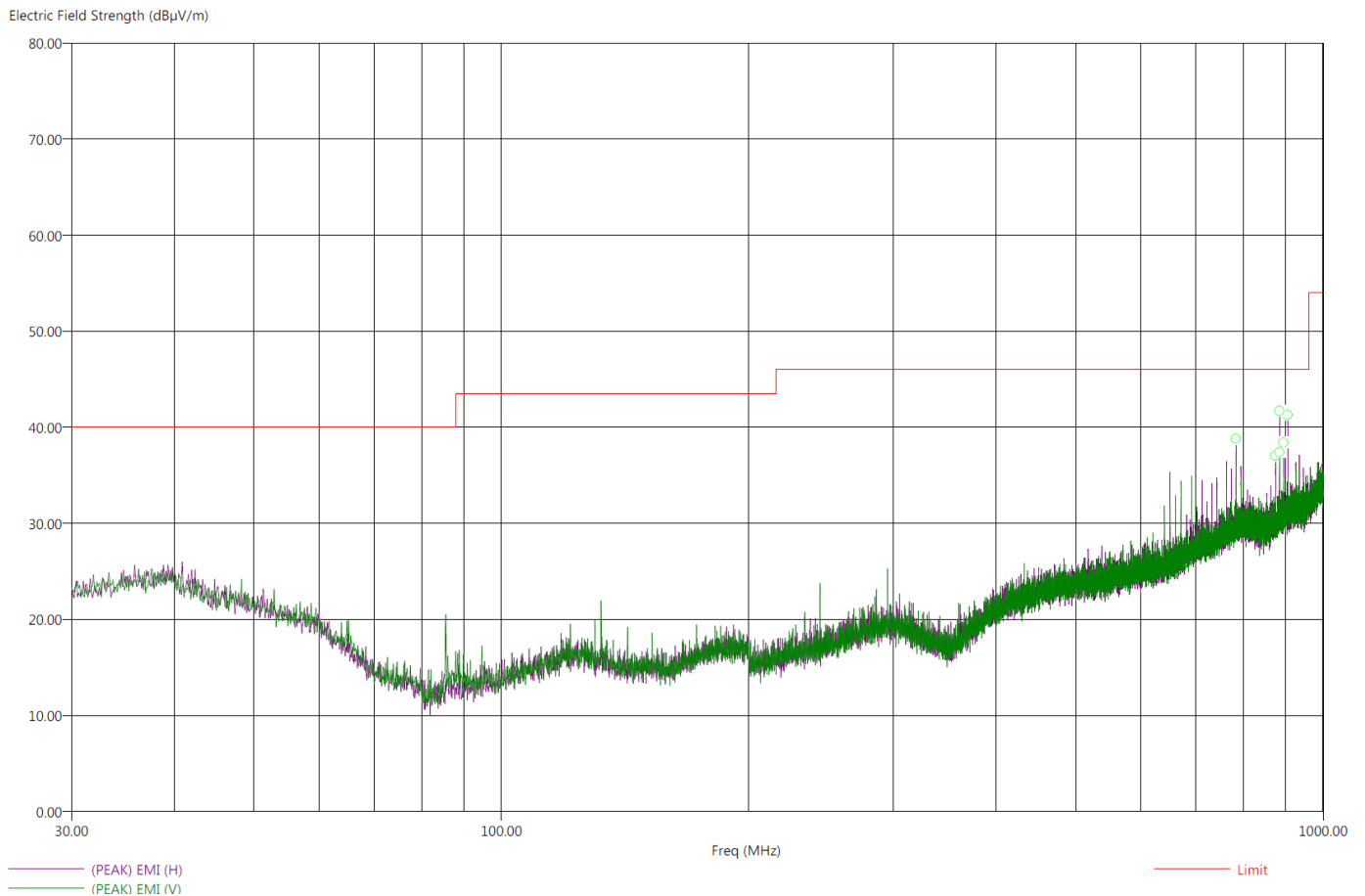
Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

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

Title: FCC 15.209
 File: Radiated Pre-Scan 30-1000Mhz_G.set
 Operator: Matt Harrison
 EUT Type: Wireless Module: ATWILC1000.
 EUT Condition: Transmitting 802.11g, 2442MHz, DigGain= -8.
 Comments: Connected to DC Supply.
 Temp: 74f
 Hum: 45%
 5VDC

7/9/2015 2:48:17 PM
 Sequence: Preliminary Scan

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



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



Brea Division
 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 Final 30-1000Mhz_G.set
 Operator: Matt Harrison
 EUT Type: Wireless Module: ATWILC1000.
 EUT Condition: Transmitting 802.11g, 2442MHz.
 Comments: Connected to DC Supply.
 Temp: 74f
 Hum: 45%
 5VDC

7/9/2015 3:10:05 PM
 Sequence: Final Measurements

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

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer(dB)	Cable(dB)
783.50	-10.68	35.32	39.04	46.00	H	279.25	212.94	25.64	3.20
875.10	-5.78	40.22	43.14	46.00	H	222.75	111.50	26.30	2.91
885.30	-1.76	44.24	45.79	46.00	H	218.75	105.41	26.43	3.07
885.30	-9.08	36.92	39.64	46.00	V	-0.25	100.52	26.43	3.07
895.50	-2.81	43.19	46.18	46.00	H	242.75	100.52	26.55	3.23
905.60	-3.43	42.57	44.34	46.00	H	244.00	99.74	26.63	3.32

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



APPENDIX E

CONDUCTED EMISSIONS DATA SHEETS



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

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

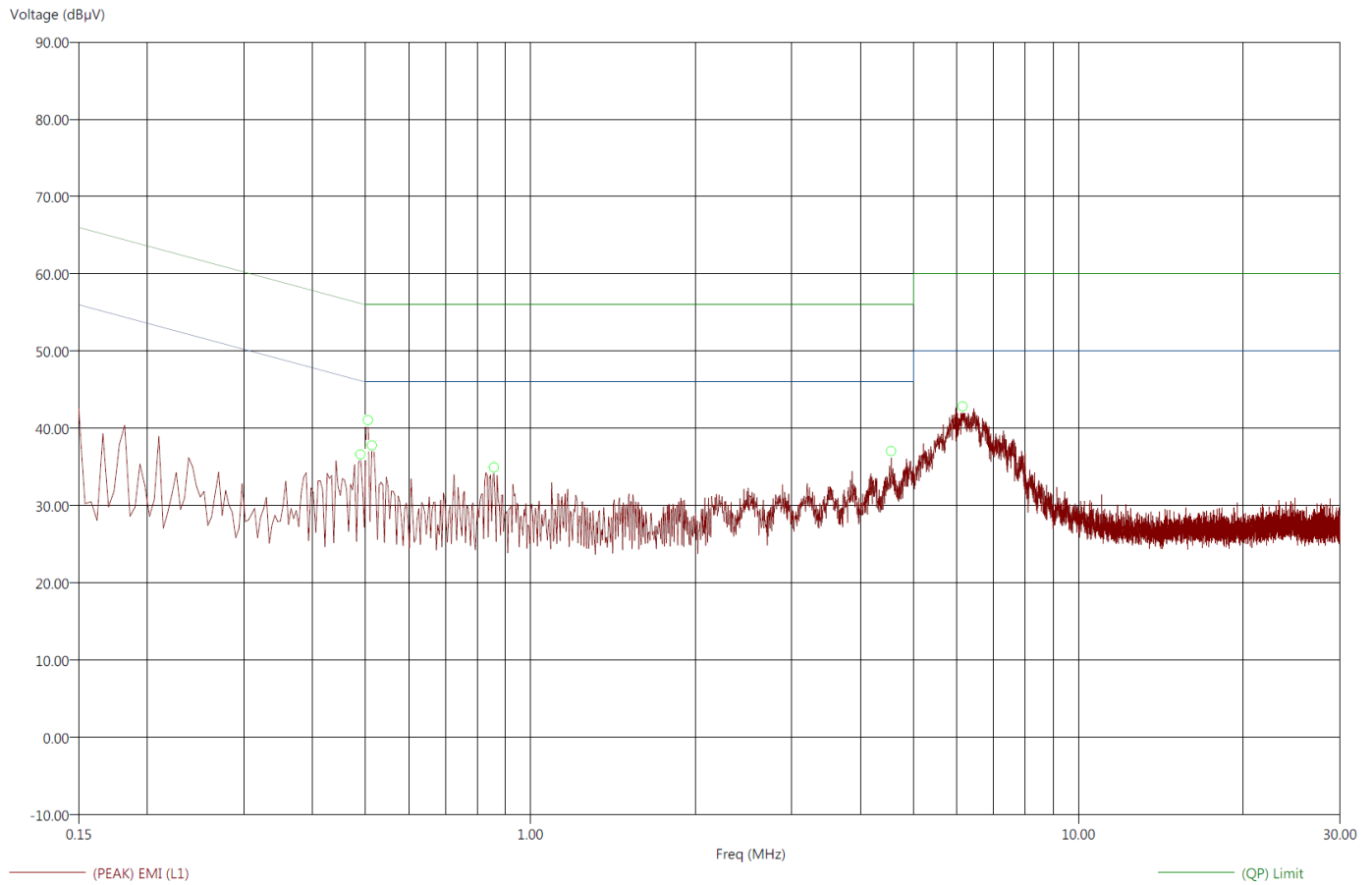
Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

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

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

7/10/2015 11:32:01 AM
Sequence: Preliminary Scan

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



This was worst case for all modes and channels



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

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

7/10/2015 11:35:00 AM
 Sequence: Final Measurements

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)
0.49	-20.81	-21.61	25.36	34.56	37.93	46.17	56.17	0.06	0.01
0.51	-17.49	-17.84	28.51	38.16	41.14	46.00	56.00	0.07	0.00
0.51	-19.18	-18.89	26.82	37.11	40.76	46.00	56.00	0.07	0.00
0.86	-24.45	-25.50	21.55	30.50	34.67	46.00	56.00	0.06	0.00
4.56	-24.52	-25.78	21.48	30.22	33.78	46.00	56.00	0.07	0.21
6.16	-20.69	-19.99	29.31	40.01	43.26	50.00	60.00	0.06	0.35

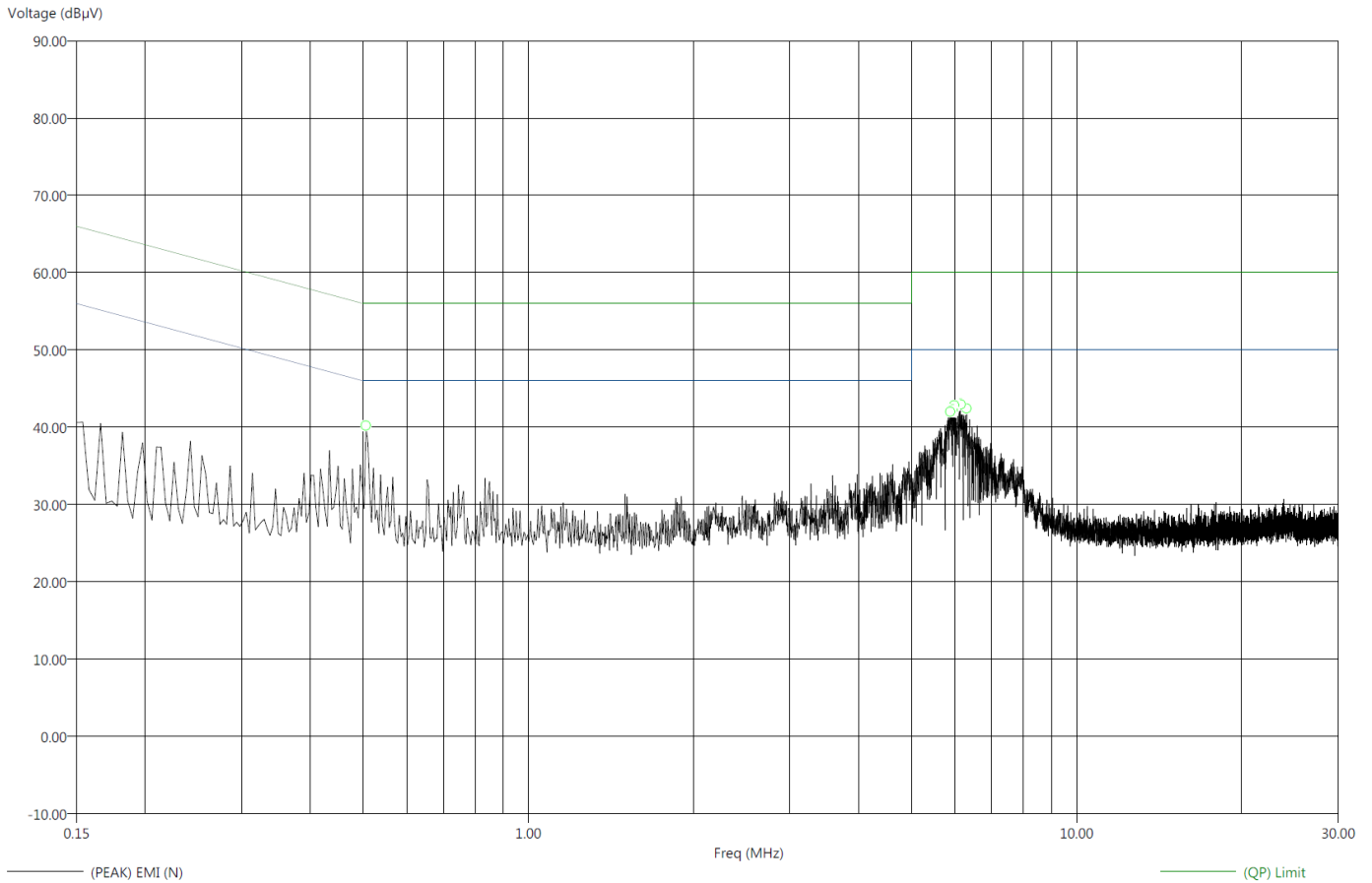
This was worst case for all modes and channels



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

7/10/2015 11:37:57 AM
Sequence: Preliminary Scan

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



This was worst case for all modes and channels



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

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

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

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

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

7/10/2015 11:41:04 AM
 Sequence: Final Measurements

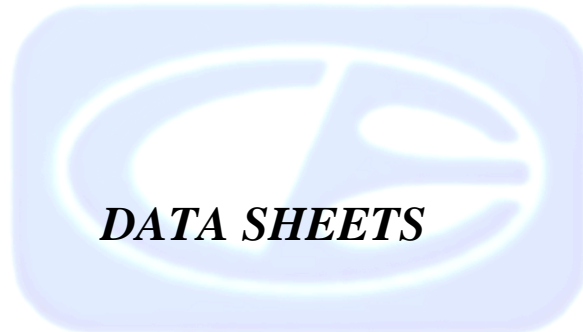
Compatible Electronics, Inc. FAC-3 (LAB R)

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)
0.51	-20.24	-19.62	25.76	36.38	41.67	46.00	56.00	0.06	0.00
5.89	-28.92	-22.44	21.08	37.56	41.86	50.00	60.00	0.08	0.32
5.94	-29.82	-22.95	20.18	37.05	43.60	50.00	60.00	0.08	0.32
5.98	-30.10	-23.43	19.90	36.57	42.61	50.00	60.00	0.07	0.33
6.15	-28.29	-22.08	21.71	37.92	43.35	50.00	60.00	0.07	0.35
6.31	-29.59	-24.47	20.41	35.53	40.59	50.00	60.00	0.07	0.37

This was worst case for all modes and channels



DTS BANDWIDTH



DATA SHEETS



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

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

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

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

802.11b MODE

DTS BANDWIDTH

FCC 15.247

Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11b

Date: 7/10/2015
Lab: R
Test ENG: M. Harrison

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

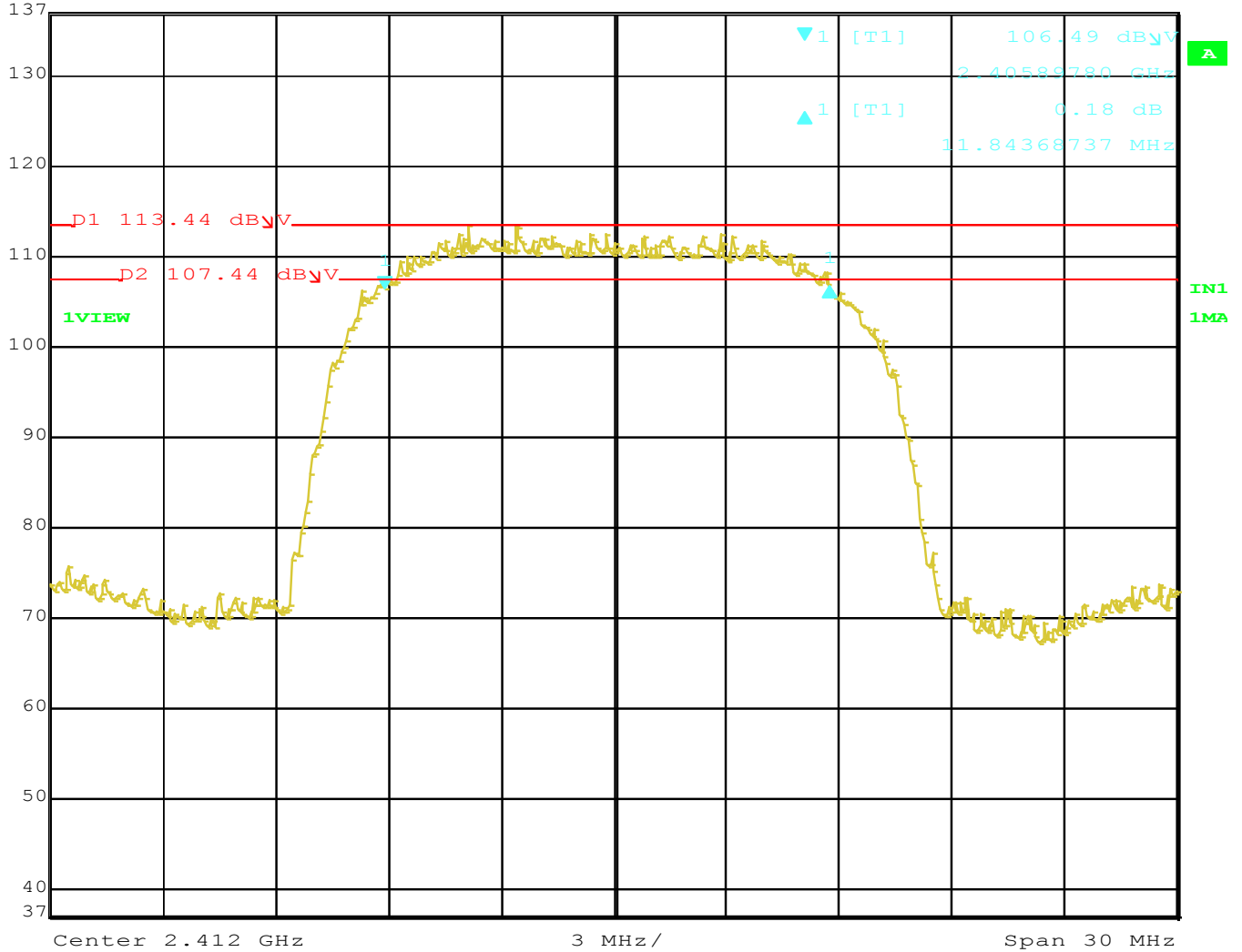
DTS Bandwidth

Freq. (MHz)	Measured BW (kHz)	Limit Min (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	11843.69	500.00	11343.69	Peak	
2442	11783.57	500.00	11283.57	Peak	
2462	11442.89	500.00	10942.89	Peak	





Delta 1 [T1] RBW 100 kHz RF Att 40 dB
 Ref Lvl 0.18 dB VBW 300 kHz
 137 dBμV 11.84368737 MHz SWT 7.5 ms Unit dBμV

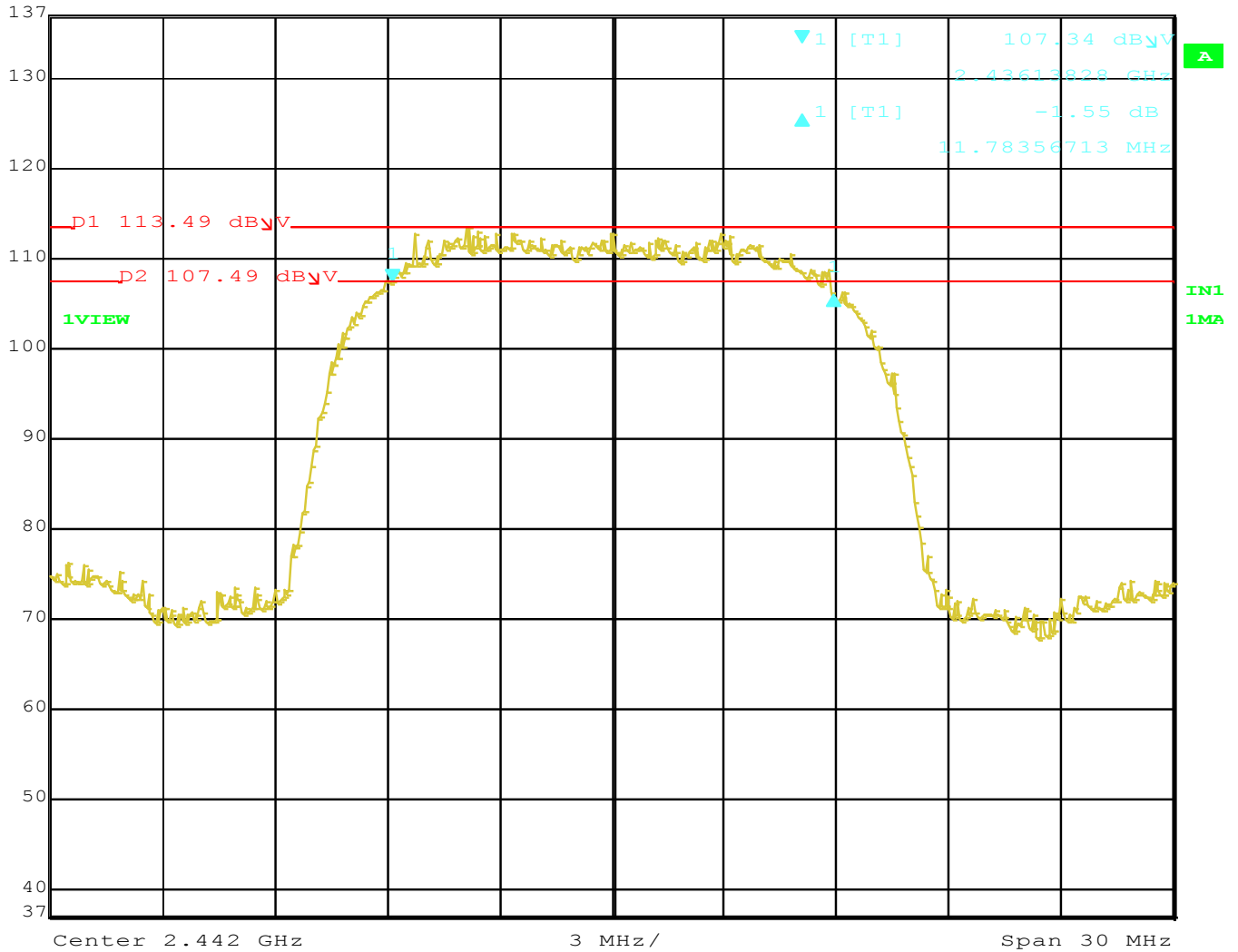


Title: ATWILC1000.
 Comment A: DTS BW, 802.11b, 2412MHz.
 Date: 10.JUL.2015 15:42:35





	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
Ref Lvl	-1.55 dB	VBW	300 kHz		
137 dB μ V	11.78356713 MHz	SWT	7.5 ms	Unit	dB μ V



Title: ATWILC1000.
 Comment A: DTS BW, 802.11b, 2442MHz.
 Date: 10.JUL.2015 15:43:47



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

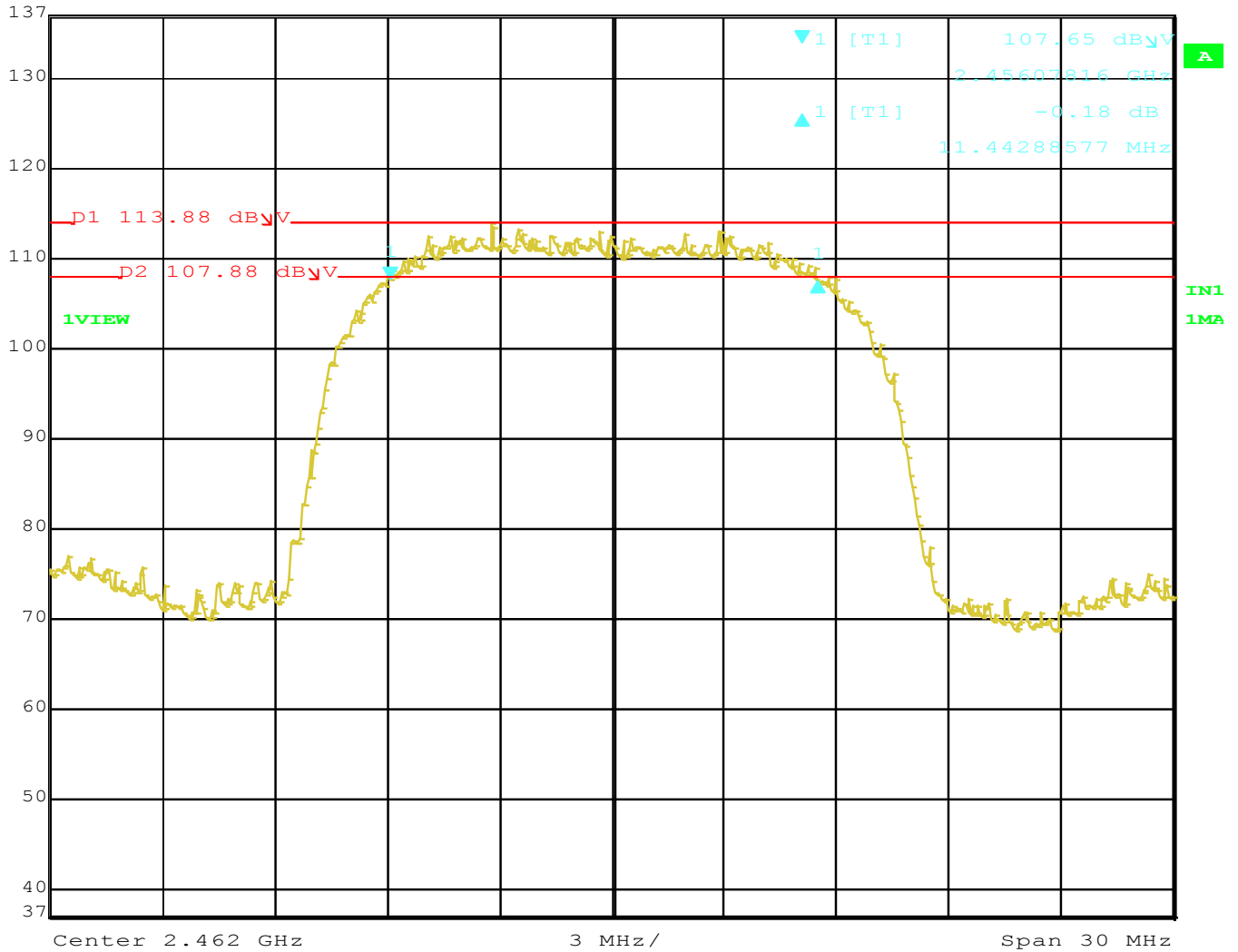
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

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



	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
Ref Lvl	-0.18 dB	VBW	300 kHz		
137 dB μ V	11.44288577 MHz	SWT	7.5 ms	Unit	dB μ V



Title: ATWILC1000.
 Comment A: DTS BW, 802.11b, 2462MHz.
 Date: 10.JUL.2015 15:44:56



802.11g MODE

FCC 15.247

Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11g

Date: 7/10/2015
Lab: R
Test ENG: M. Harrison

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

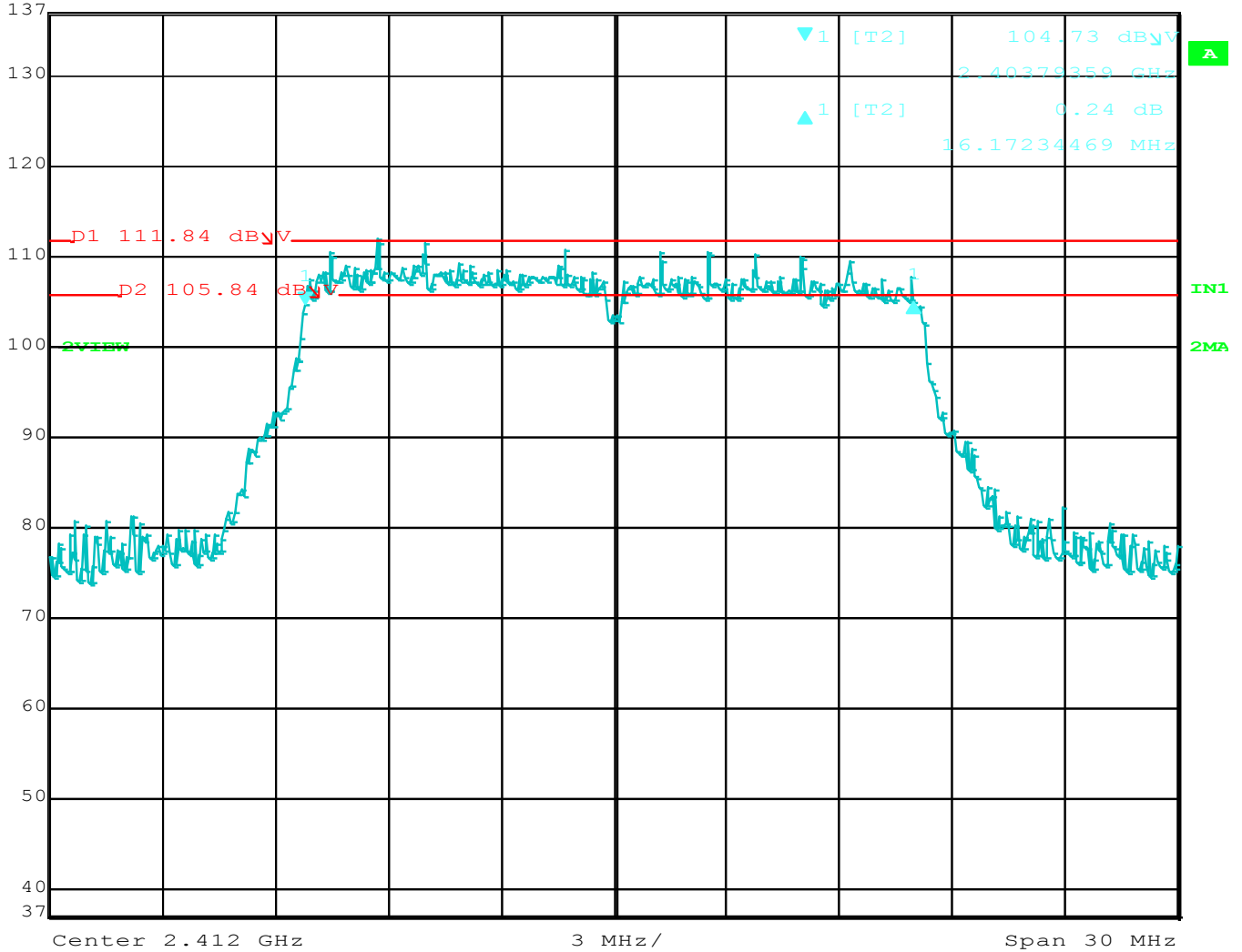
DTS Bandwidth

Freq. (MHz)	Measured BW (kHz)	Limit Min (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	16172.34	500.00	15672.34	Peak	
2442	16172.34	500.00	15672.34	Peak	
2462	16252.51	500.00	15752.51	Peak	





Delta 1 [T2] RBW 100 kHz RF Att 40 dB
 Ref Lvl 0.24 dB VBW 300 kHz
 137 dBμV 16.17234469 MHz SWT 7.5 ms Unit dBμV

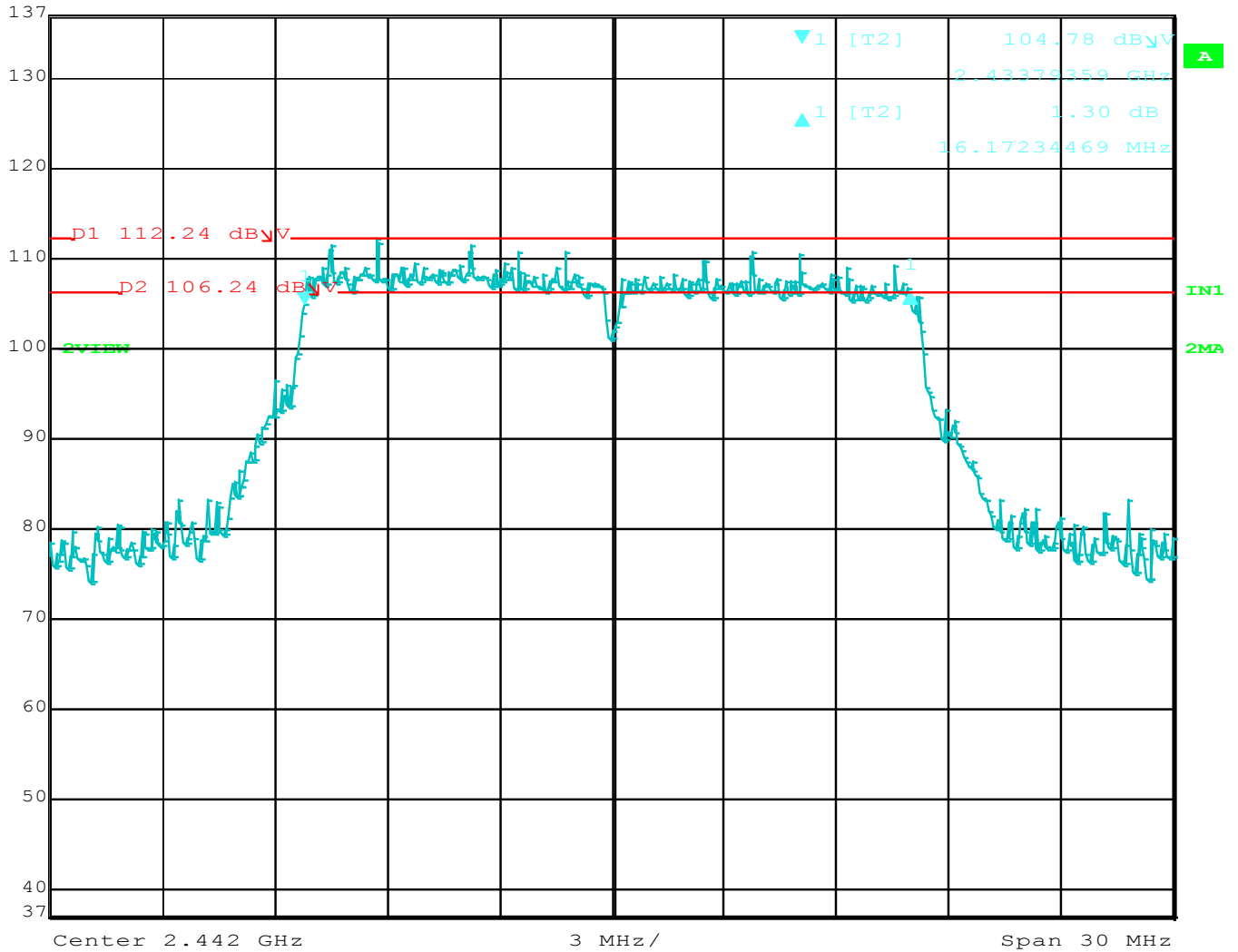


Title: ATWILC1000.
 Comment A: DTS BW, 802.11g, 2412MHz.
 Date: 10.JUL.2015 15:38:05





Delta 1 [T2] RBW 100 kHz RF Att 40 dB
 Ref Lvl 1.30 dB VBW 300 kHz
 137 dBμV 16.17234469 MHz SWT 7.5 ms Unit dBμV



Title: ATWILC1000.
 Comment A: DTS BW, 802.11g, 2442MHz.
 Date: 10.JUL.2015 15:39:25



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

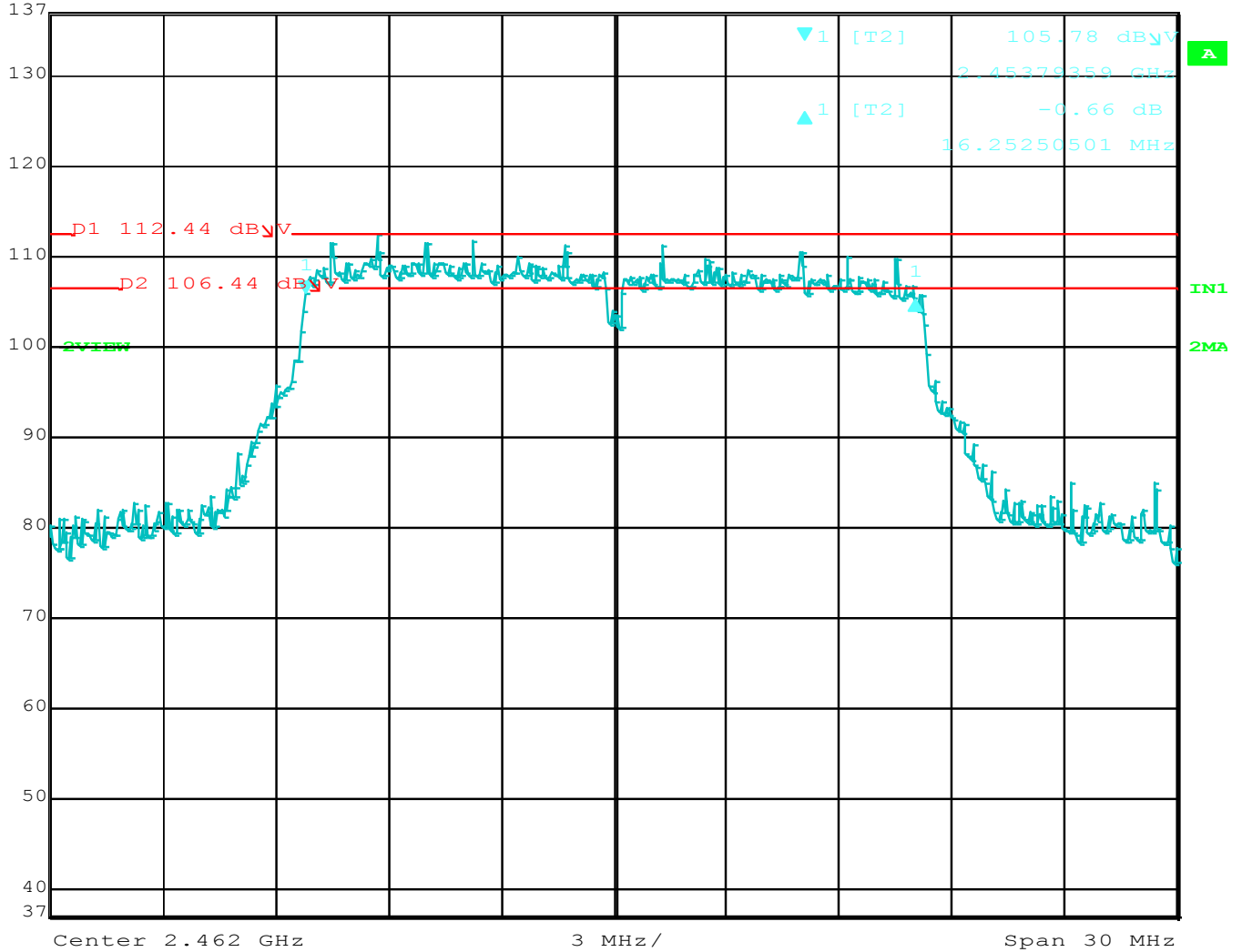
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

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



Delta 1 [T2] RBW 100 kHz RF Att 40 dB
 Ref Lvl -0.66 dB VBW 300 kHz
 137 dBμV 16.25250501 MHz SWT 7.5 ms Unit dBμV



Title: ATWILC1000.
 Comment A: DTS BW, 802.11g, 2462MHz.
 Date: 10.JUL.2015 15:40:41



Brea Division
 114 Olinda Drive
 Brea, CA 92823
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Agoura 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

802.11n MODE

FCC 15.247

Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11n

Date: 7/10/2015
Lab: R
Test ENG: M. Harrison

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

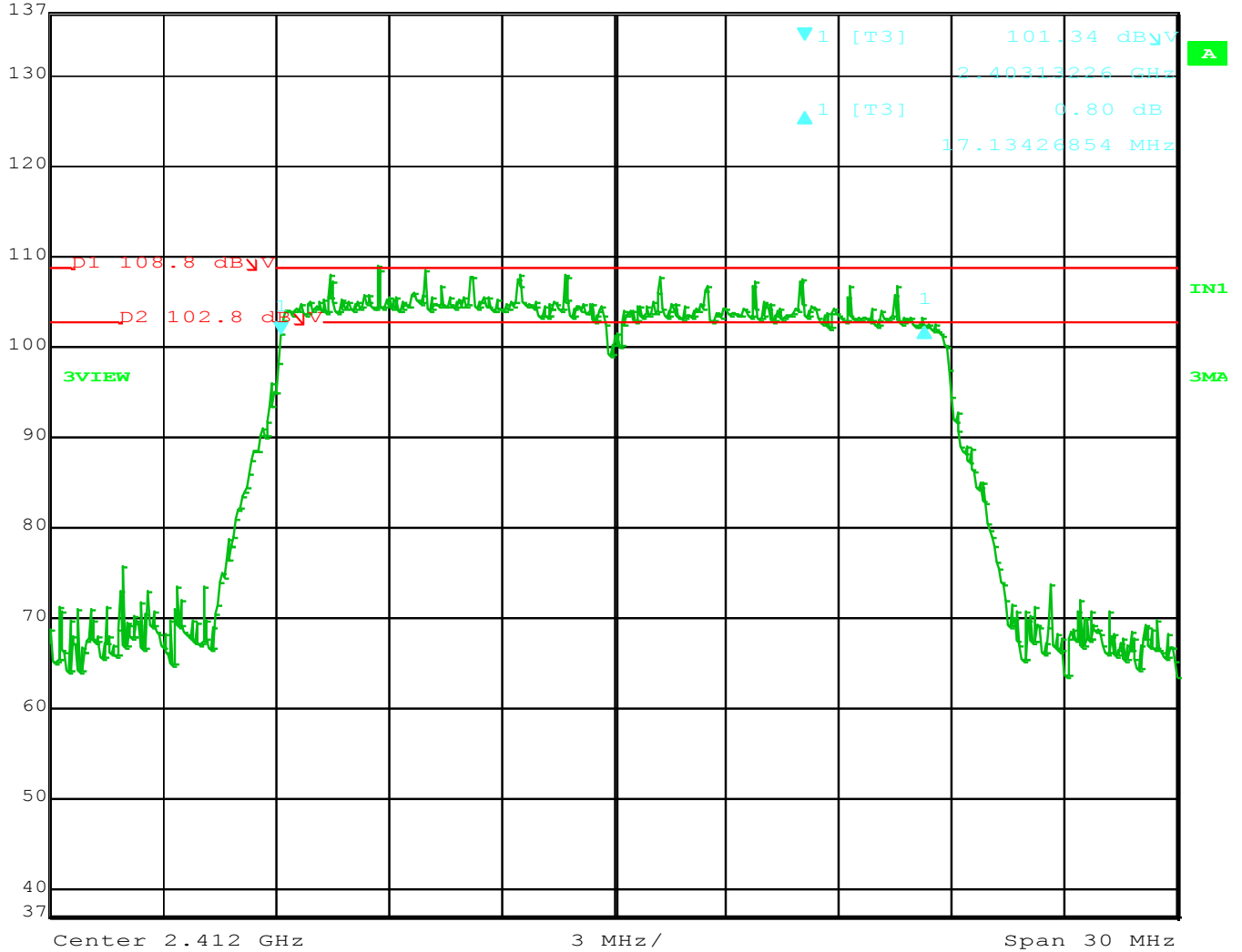
DTS Bandwidth

Freq. (MHz)	Measured BW (kHz)	Limit Min (kHz)	Margin (kHz)	Peak / QP / Avg	Comments
2412	17134.27	500.00	16634.27	Peak	
2442	17735.47	500.00	17235.47	Peak	
2462	17434.87	500.00	16934.87	Peak	





Delta 1 [T3] RBW 100 kHz RF Att 40 dB
 Ref Lvl 0.80 dB VBW 300 kHz
 137 dBμV 17.13426854 MHz SWT 7.5 ms Unit dBμV

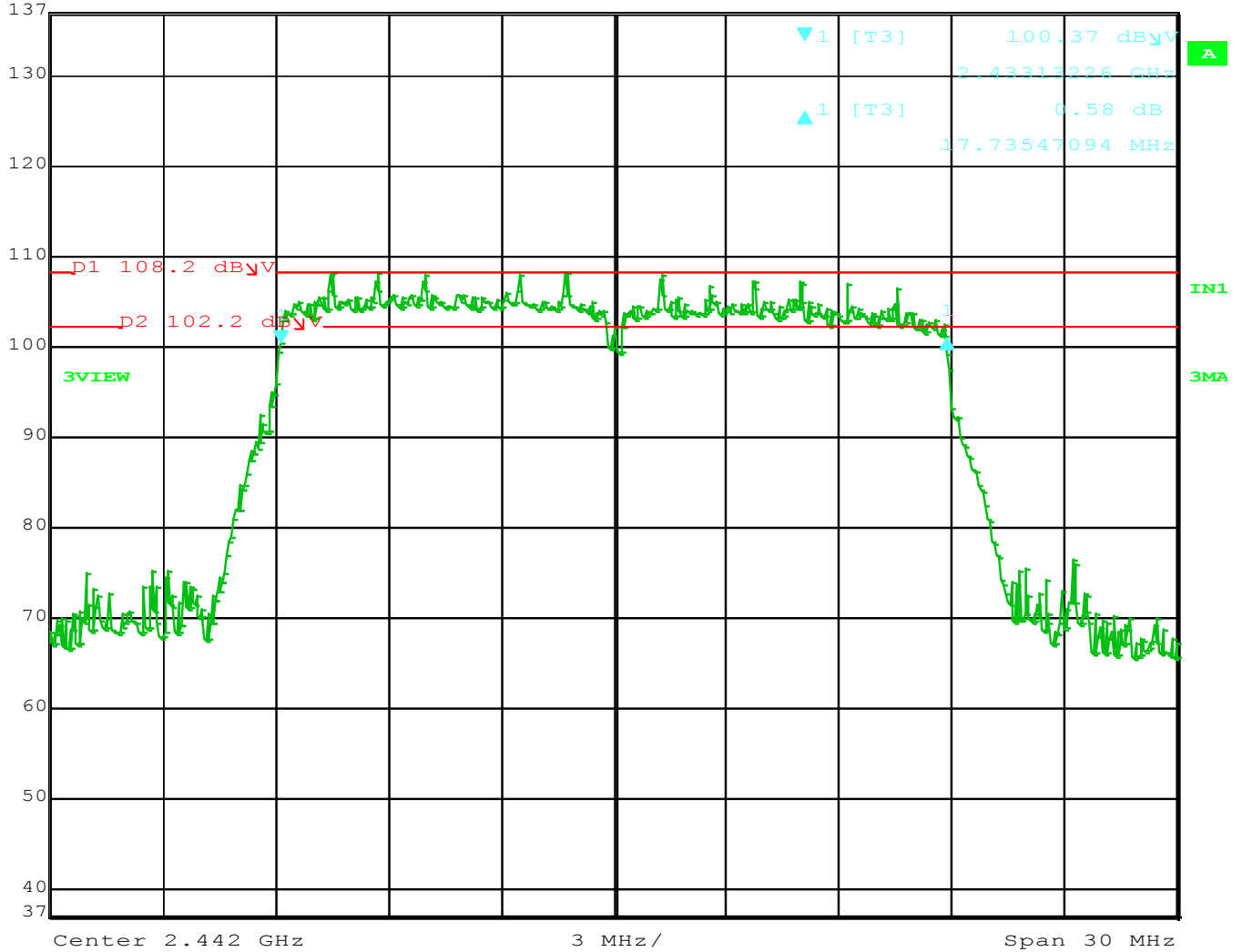


Title: ATWILC1000.
 Comment A: DTS BW, 802.11n, 2412MHz.
 Date: 10.JUL.2015 15:48:02





Delta 1 [T3] RBW 100 kHz RF Att 40 dB
 Ref Lvl 0.58 dB VBW 300 kHz
 137 dBμV 17.73547094 MHz SWT 7.5 ms Unit dBμV

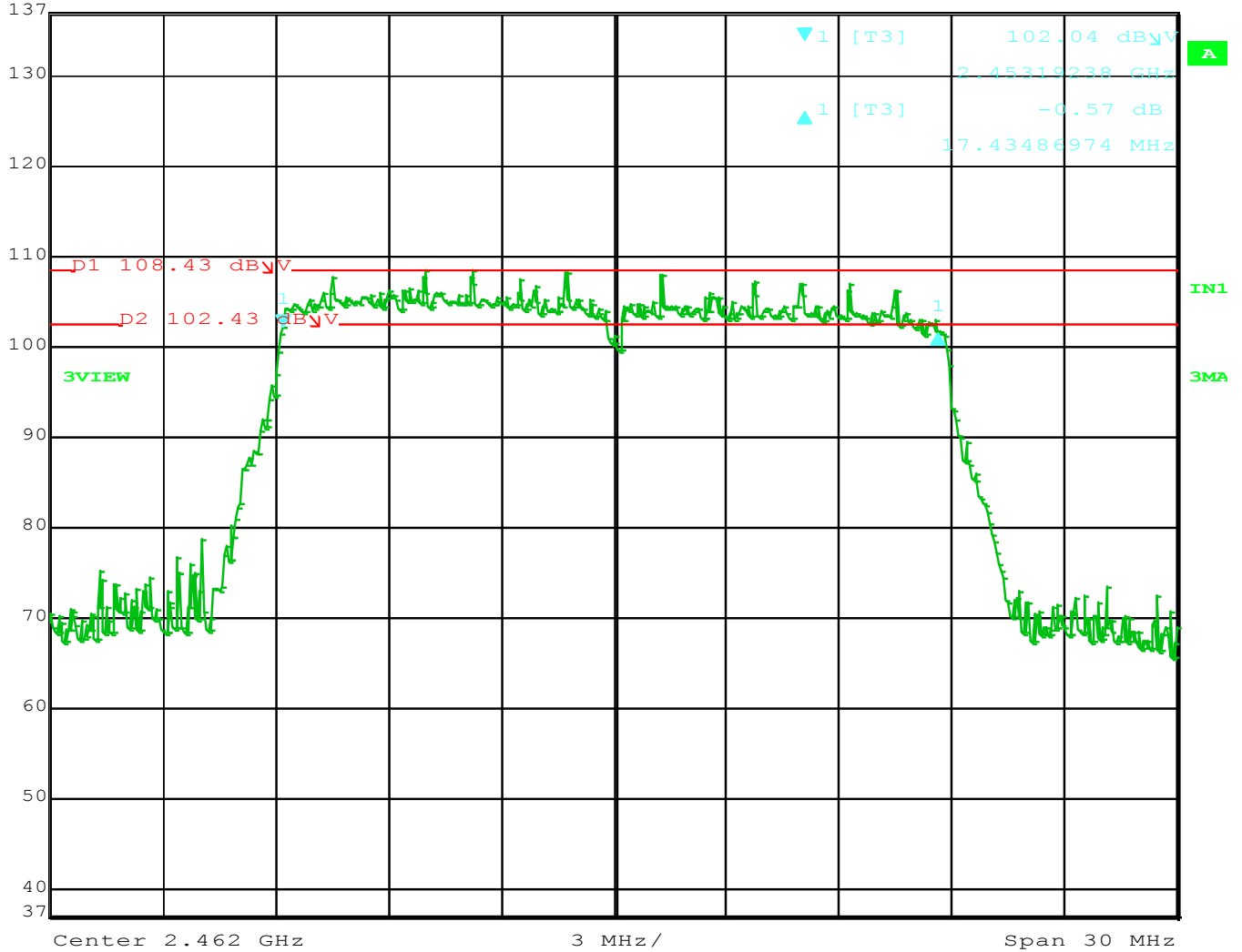


Title: ATWILC1000.
 Comment A: DTS BW, 802.11n, 2442MHz.
 Date: 10.JUL.2015 15:49:18





Delta 1 [T3] RBW 100 kHz RF Att 40 dB
 Ref Lvl -0.57 dB VBW 300 kHz
 137 dBμV 17.43486974 MHz SWT 7.5 ms Unit dBμV



Title: ATWILC1000.
 Comment A: DTS BW, 802.11n, 2462MHz.
 Date: 10.JUL.2015 15:50:45



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

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

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

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

MAXIMUM PEAK CONDUCTED OUTPUT POWER

DATA SHEETS



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

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

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

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

MAXIMUM PEAK CONDUCTED OUTPUT POWER**802.11b Mode****FCC 15.247**Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11bDate: 7/10/2015
Lab: R
Test ENG: M. Harrison**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	21.57	30.00	-8.43	Peak	DigGain= -10
2442	21.74	30.00	-8.26	Peak	DigGain= -7
2462	21.93	30.00	-8.07	Peak	DigGain= -7



MAXIMUM PEAK CONDUCTED OUTPUT POWER**802.11g Mode****FCC 15.247**Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11gDate: 7/10/2015
Lab: R
Test ENG: M. Harrison**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	21.73	30.00	-8.27	Peak	DigGain= -12
2442	23.29	30.00	-6.71	Peak	DigGain= -8
2462	22.23	30.00	-7.77	Peak	DigGain= -11



MAXIMUM PEAK CONDUCTED OUTPUT POWER**802.11n Mode****FCC 15.247**Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11nDate: 7/10/2015
Lab: R
Test ENG: M. Harrison**Compatible Electronics, Inc. FAC-3 (Lab R)**

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2412	20.44	30.00	-9.56	Peak	DigGain= -14
2442	23.32	30.00	-6.68	Peak	DigGain= -8
2462	22.30	30.00	-7.70	Peak	DigGain= -11



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

DATA SHEETS



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

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

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

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

PEAK POWER SPECTRAL DENSITY

802.11b Mode

FCC 15.247

Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11b

Date: 7/13/2015
Lab: R
Test ENG: M. Harrison

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

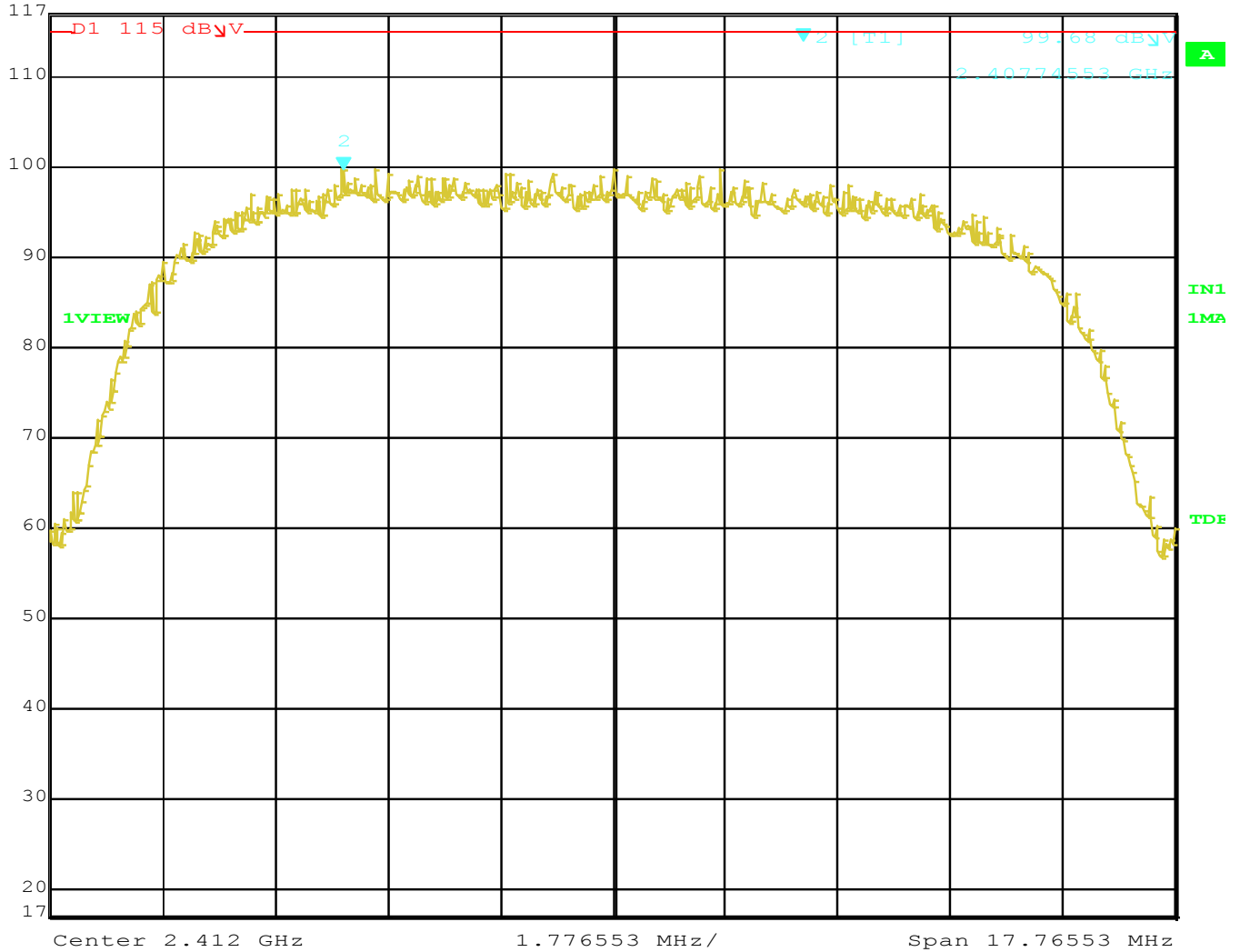
DTS Bandwidth

Freq. (MHz)	Peak (dBuV)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Comments
2412	99.68	115.00	-15.32	Peak	
2442	102.04	115.00	-12.96	Peak	
2462	102.41	115.00	-12.59	Peak	





Marker 2 [T1] RBW 3 kHz RF Att 30 dB
 Ref Lvl 99.68 dB μ V VBW 10 kHz
 117 dB μ V 2.40774553 GHz SWT 5 s Unit dB μ V



Title: ATWILC1000.
 Comment A: PSD, 802.11b, 2412MHz.
 Date: 13.JUL.2015 08:30:46



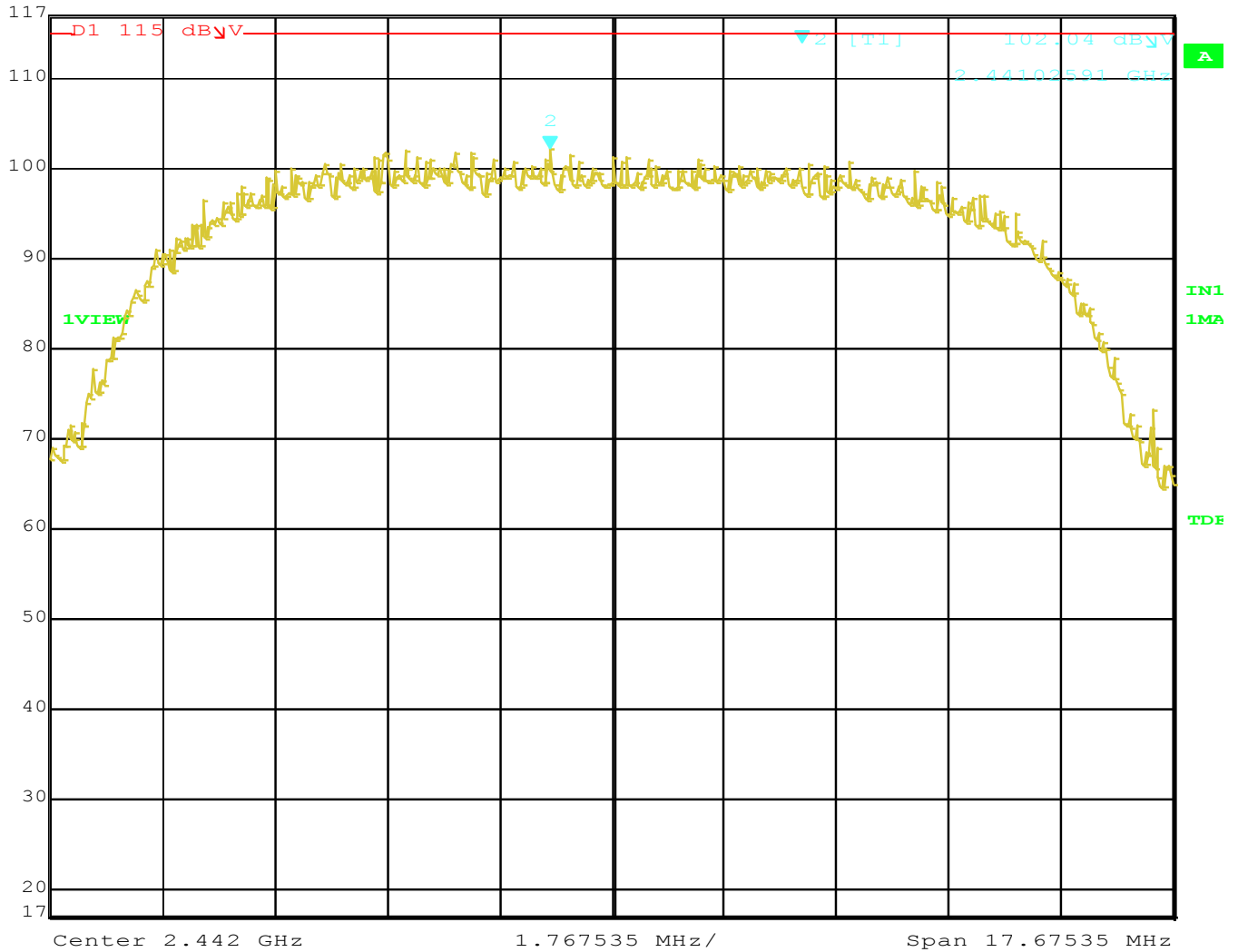
Brea Division
 114 Olinda Drive
 Brea, CA 92823
 (714) 579-0500

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

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

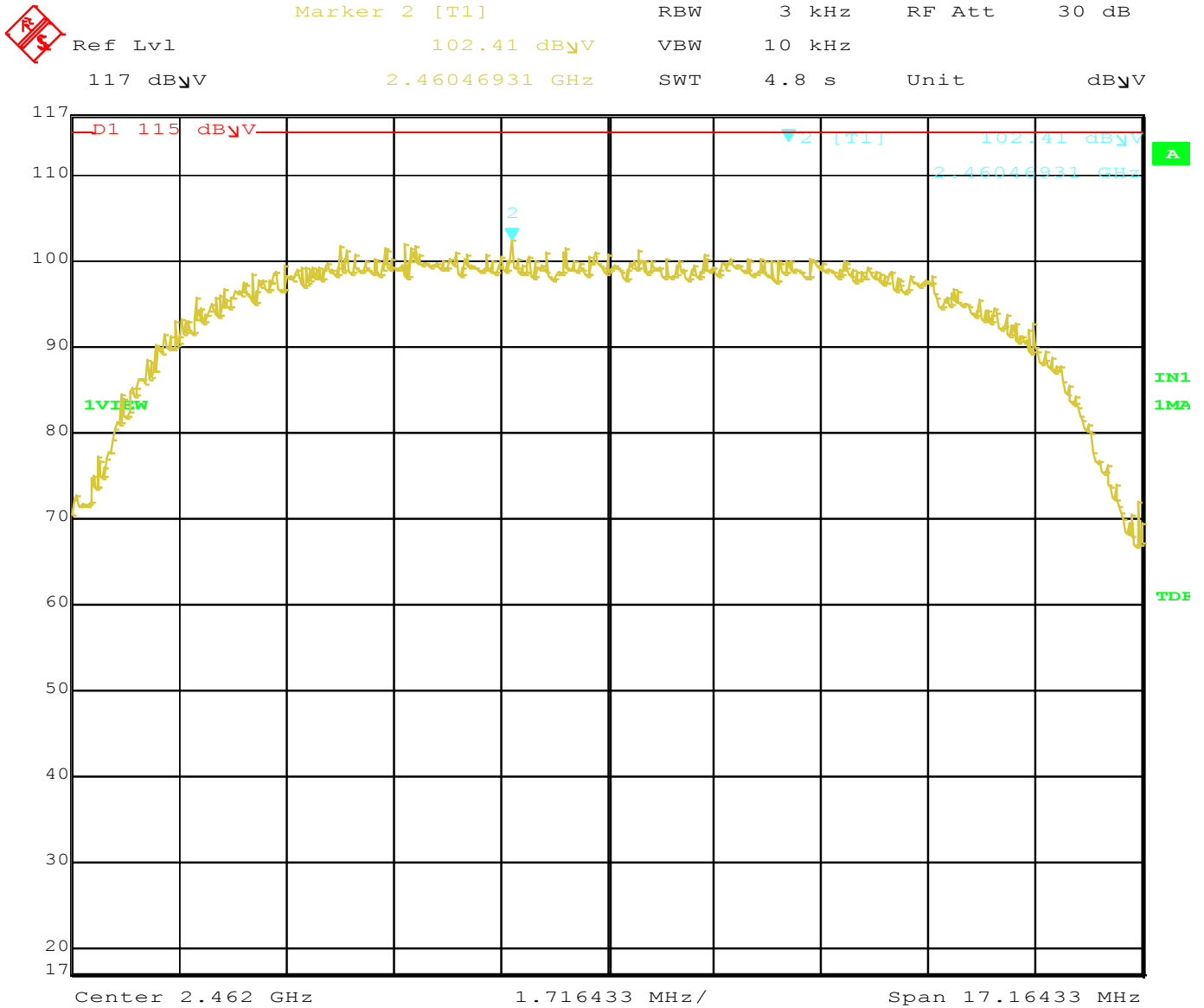
Lake Forest Division
 20621 Pascal Way
 Lake Forest, CA 92630
 (949) 587-0400

 Marker 2 [T1] RBW 3 kHz RF Att 30 dB
 Ref Lvl 102.04 dBµV VBW 10 kHz
 117 dBµV 2.44102591 GHz SWT 5 s Unit dBµV



Title: ATWILC1000.
 Comment A: PSD, 802.11b, 2442MHz.
 Date: 13.JUL.2015 08:33:30





Title: ATWILC1000.
 Comment A: PSD, 802.11b, 2462MHz.
 Date: 13.JUL.2015 08:34:25



PEAK POWER SPECTRAL DENSITY

802.11g Mode

FCC 15.247

Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11g

Date: 7/13/2015
Lab: R
Test ENG: M. Harrison

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

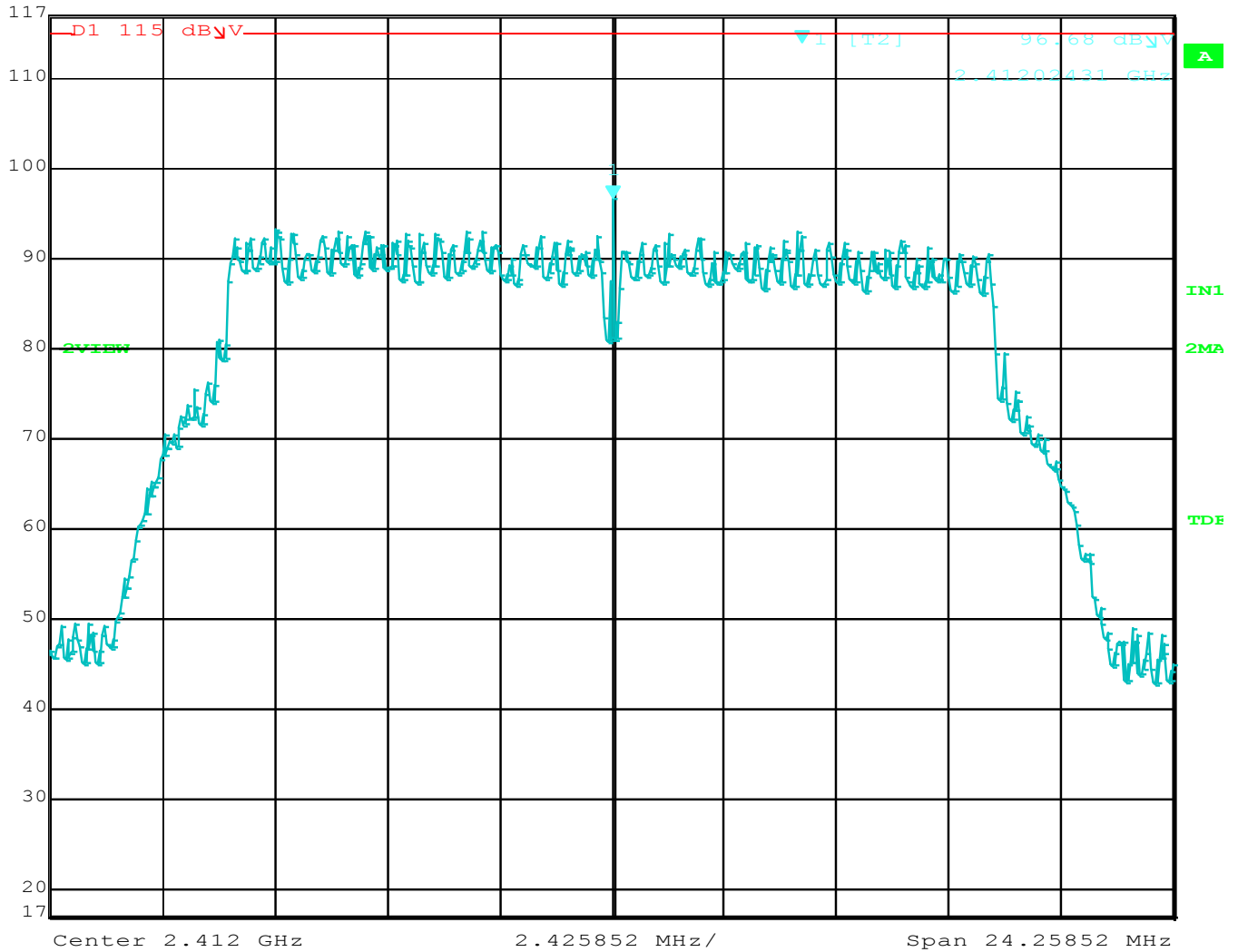
DTS Bandwidth

Freq. (MHz)	Peak (dBuV)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Comments
2412	96.68	115.00	-18.32	Peak	
2442	98.23	115.00	-16.77	Peak	
2462	97.28	115.00	-17.72	Peak	





Marker 1 [T2] RBW 3 kHz RF Att 30 dB
 Ref Lvl 96.68 dBμV VBW 10 kHz
 117 dBμV 2.41202431 GHz SWT 6.8 s Unit dBμV



Title: ATWILC1000.
 Comment A: PSD, 802.11g, 2412MHz.
 Date: 13.JUL.2015 08:36:29



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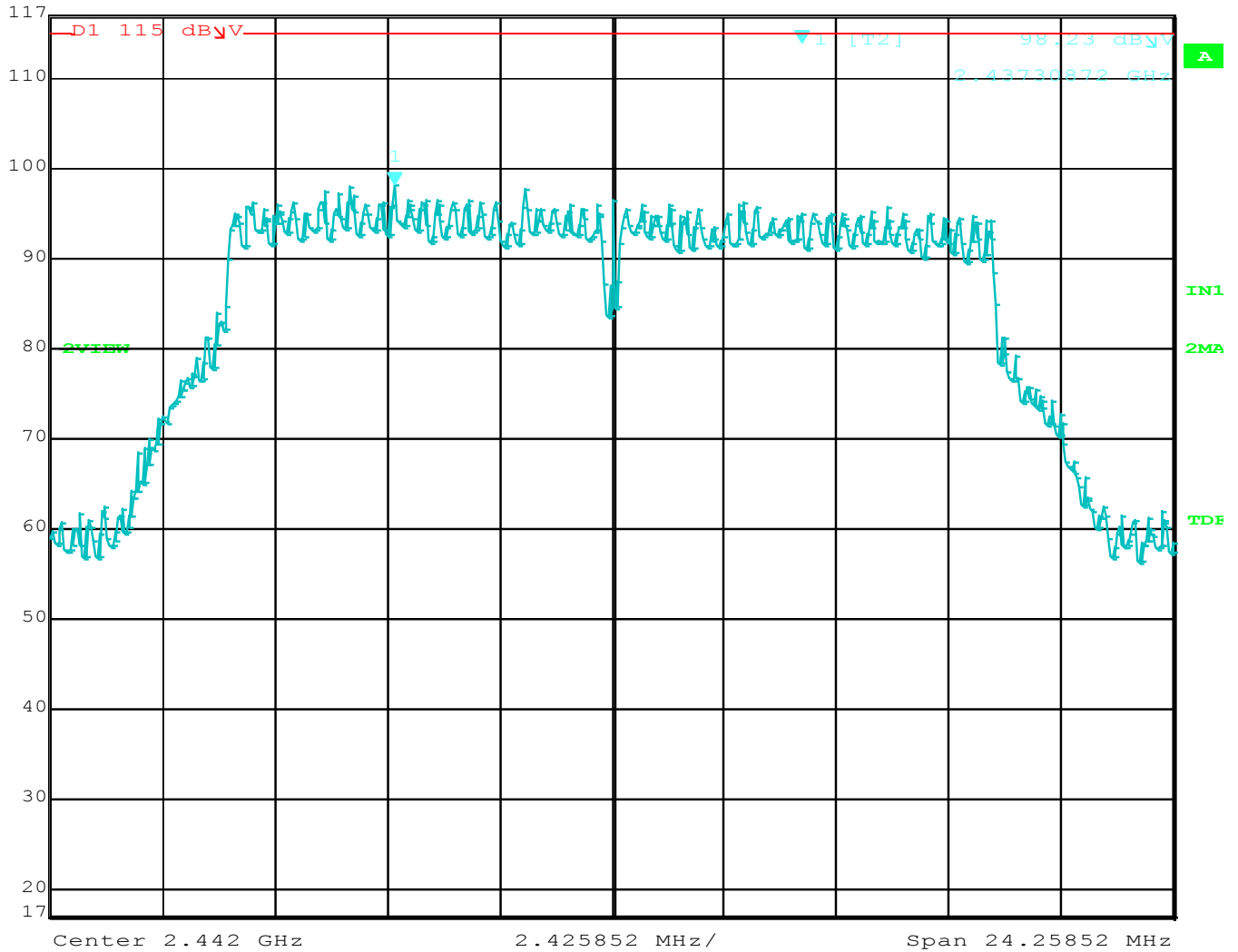
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

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

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



Marker 1 [T2] RBW 3 kHz RF Att 30 dB
 Ref Lvl 98.23 dBμV VBW 10 kHz
 117 dBμV 2.43730872 GHz SWT 6.8 s Unit dBμV



Title: ATWILC1000.
 Comment A: PSD, 802.11g, 2442MHz.
 Date: 13.JUL.2015 08:37:32



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

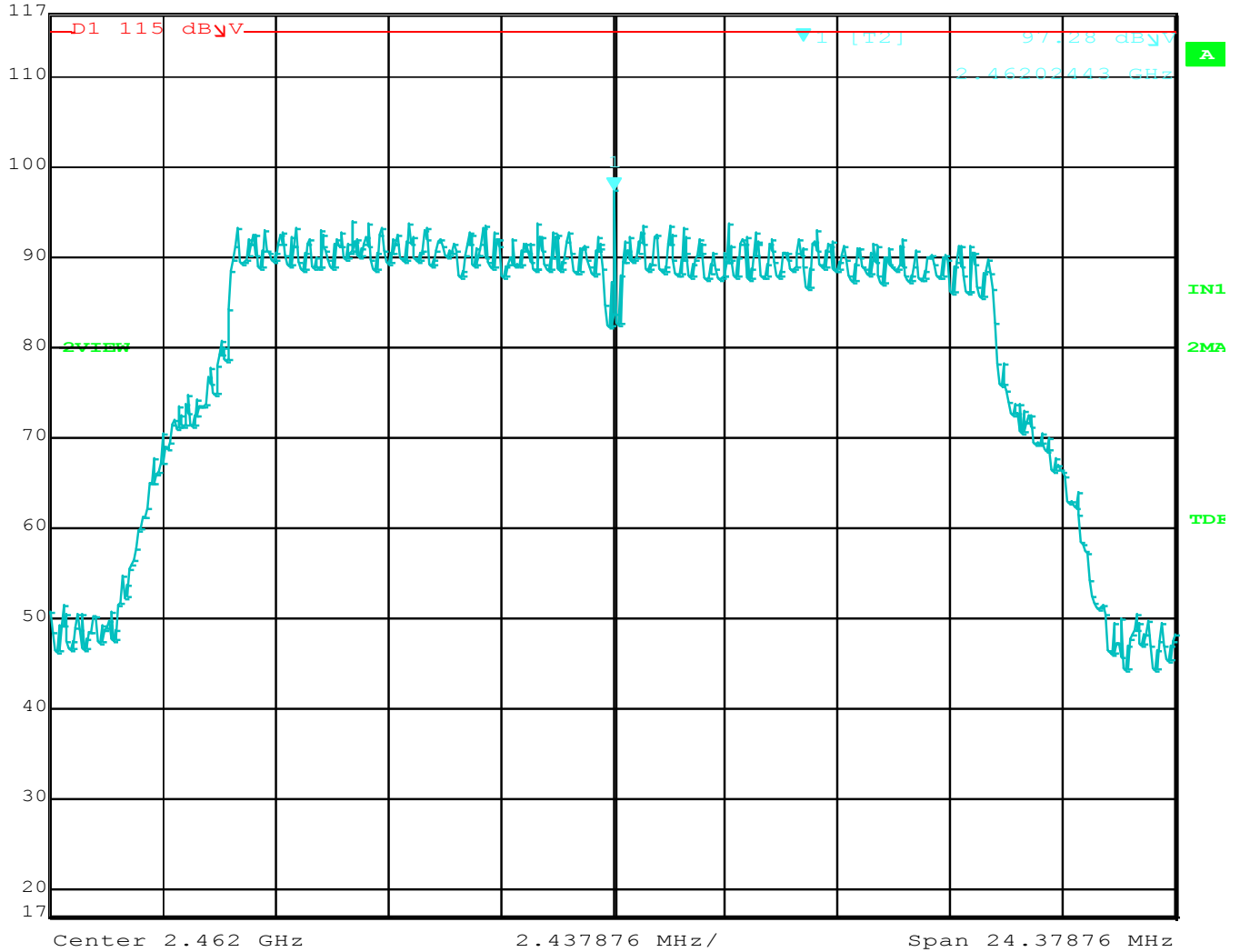
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

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



Marker 1 [T2] RBW 3 kHz RF Att 30 dB
 Ref Lvl 97.28 dBμV VBW 10 kHz
 117 dBμV 2.46202443 GHz SWT 6.8 s Unit dBμV



Title: ATWILC1000.
 Comment A: PSD, 802.11g, 2462MHz.
 Date: 13.JUL.2015 08:38:20



Brea Division
 114 Olinda Drive
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 19121 El Toro Road
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 (949) 589-0700

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

PEAK POWER SPECTRAL DENSITY

802.11n Mode

FCC 15.247

Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000B
Mode: 802.11n

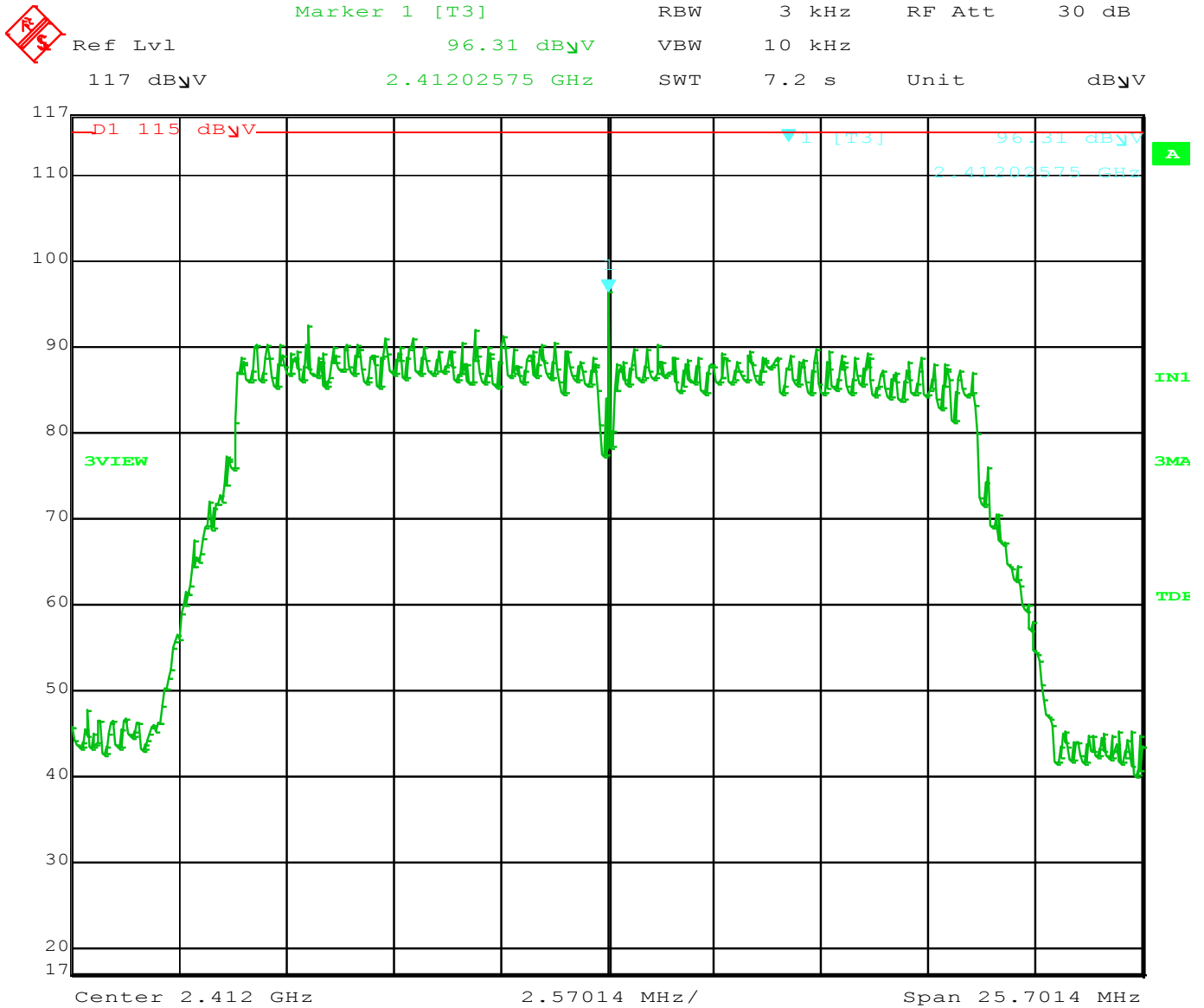
Date: 7/13/2015
Lab: R
Test ENG: M. Harrison

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

DTS Bandwidth

Freq. (MHz)	Peak (dBuV)	Limit (dBuV)	Margin (dB)	Peak / QP / Avg	Comments
2412	96.31	115.00	-18.69	Peak	
2442	97.12	115.00	-17.88	Peak	
2462	96.10	115.00	-18.90	Peak	





Title: ATWILC1000.
 Comment A: PSD, 802.11n, 2412MHz.
 Date: 13.JUL.2015 08:41:16



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

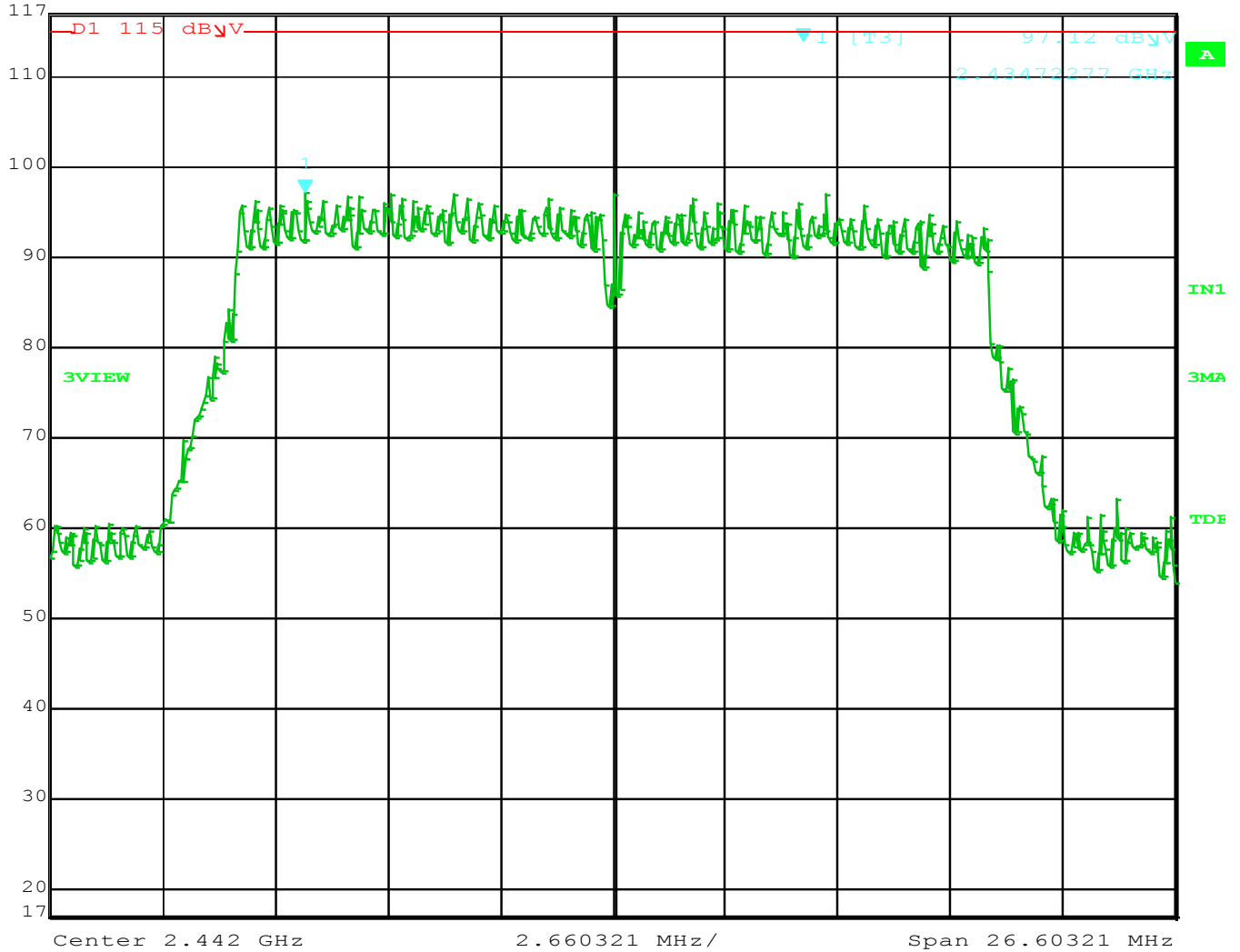
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

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



Marker 1 [T3] RBW 3 kHz RF Att 30 dB
 Ref Lvl 97.12 dBμV VBW 10 kHz
 117 dBμV 2.43472277 GHz SWT 7.4 s Unit dBμV



Title: ATWILC1000.
 Comment A: PSD, 802.11n, 2442MHz.
 Date: 13.JUL.2015 08:42:21



Brea Division
 114 Olinda Drive
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 (714) 579-0500

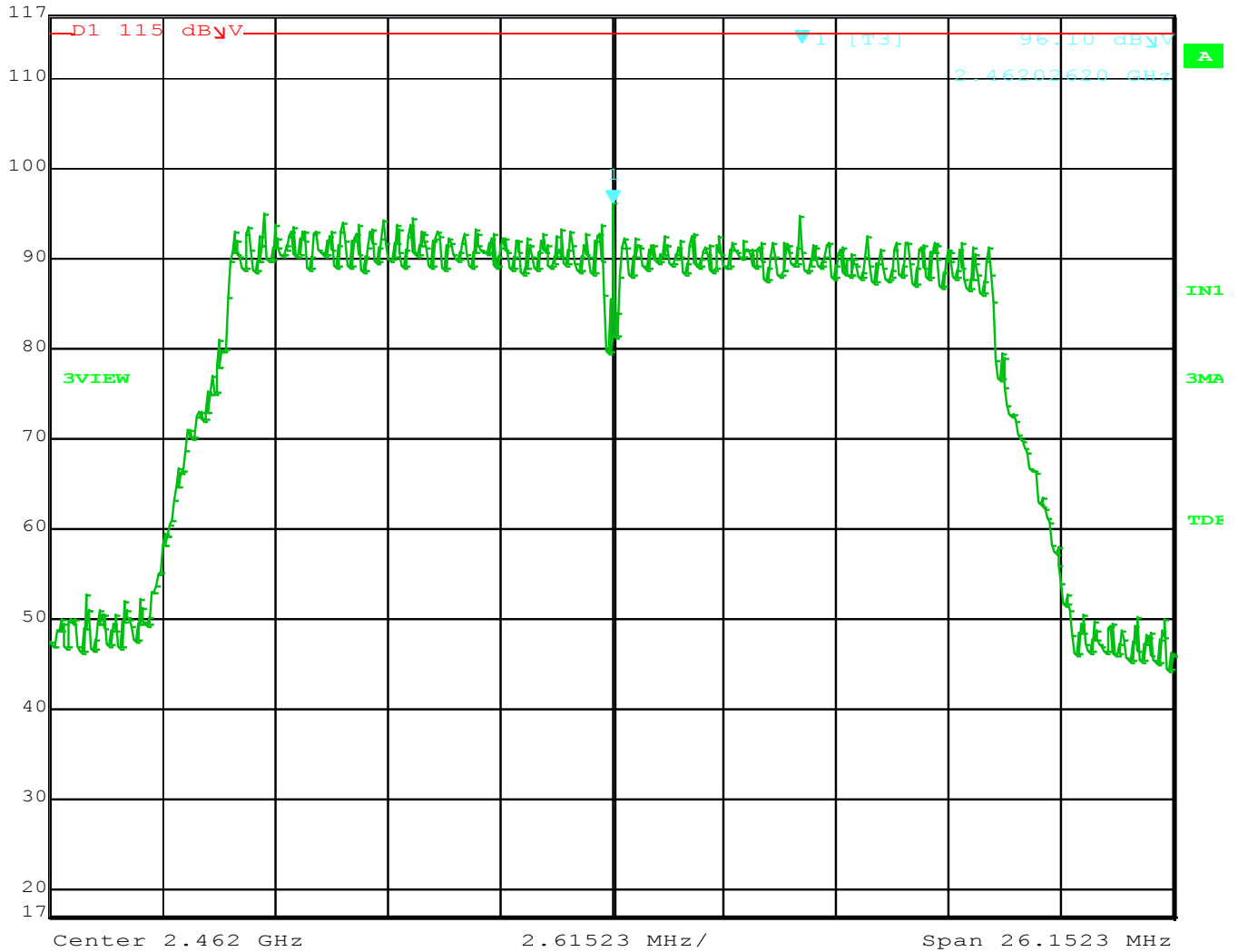
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

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



Marker 1 [T3] RBW 3 kHz RF Att 30 dB
 Ref Lvl 96.10 dBμV VBW 10 kHz
 117 dBμV 2.46202620 GHz SWT 7.4 s Unit dBμV



Title: ATWILC1000.
 Comment A: PSD, 802.11n, 2462MHz.
 Date: 13.JUL.2015 08:43:24



Brea Division
 114 Olinda Drive
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 (714) 579-0500

Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
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Silverado Division
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 Silverado, CA 92676
 (949) 589-0700

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

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

DATA SHEETS



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

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

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

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

HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

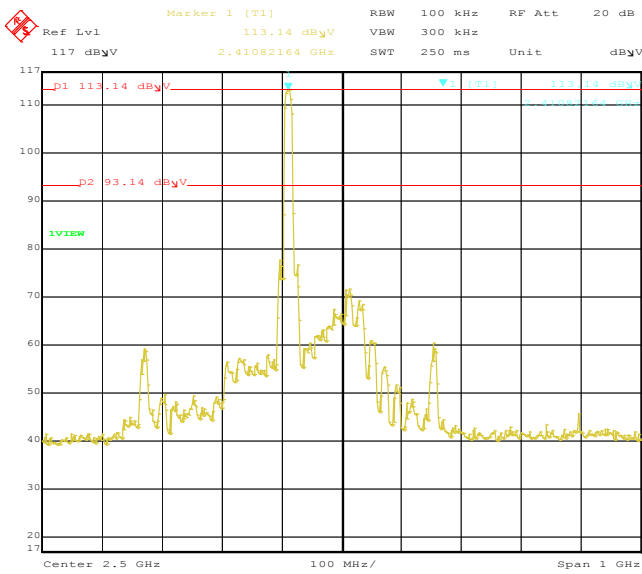
802.11b Mode

FCC 15.247Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000BMDate: 7/9/2015
Lab: R
Test ENG: M. Harrison

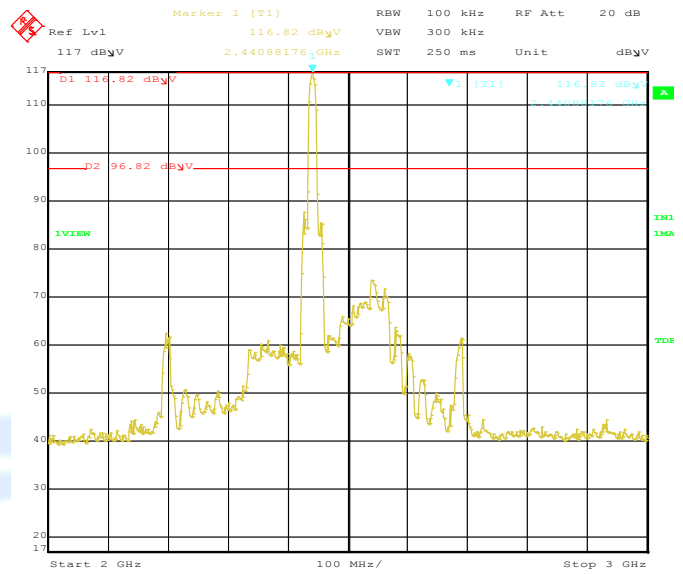
Freq. (MHz)	Level (dBuV)	Limit	Margin	Peak / QP / Avg	Comments
9648.00	74.54	93.14	-18.60	Peak	Channel 1
9768.00	78.53	96.82	-18.29	Peak	Channel 7
9848.00	78.90	95.95	-17.05	Peak	Channel 11

Worst case for all b mode measurements

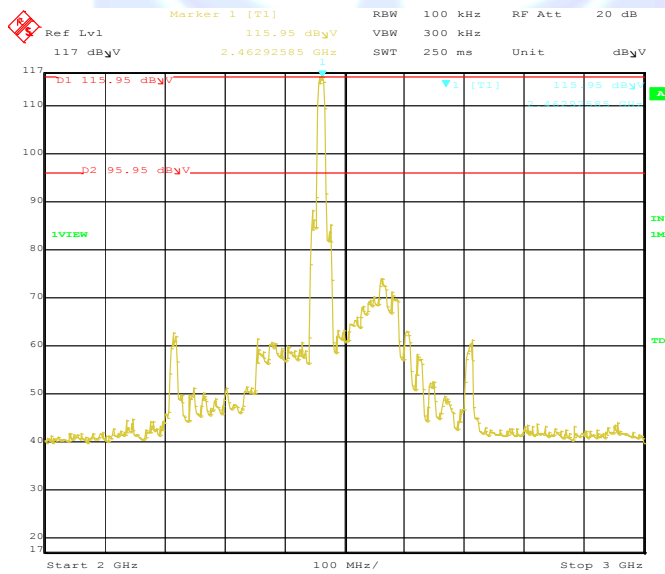
802.11b Mode Reference Level Measurements



Title: ATWILC1000.
 Comment A: Emissions in Non Restricted Bands, 802.11b, 2412MHz.
 Date: 13.JUL.2015 08:49:32



Title: ATWILC1000.
 Comment A: Emissions in Non Restricted Bands, 802.11b, 2442MHz.
 Date: 13.JUL.2015 08:53:15



Title: ATWILC1000.
 Comment A: Emissions in Non Restricted Bands, 802.11b, 2462MHz.
 Date: 13.JUL.2015 08:56:44



HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

802.11g Mode

FCC 15.247Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000BMDate: 7/9/2015
Lab: R
Test ENG: M. Harrison

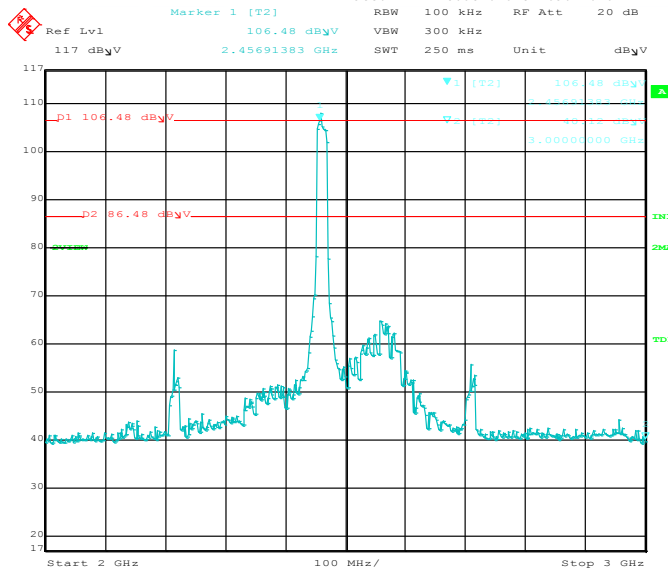
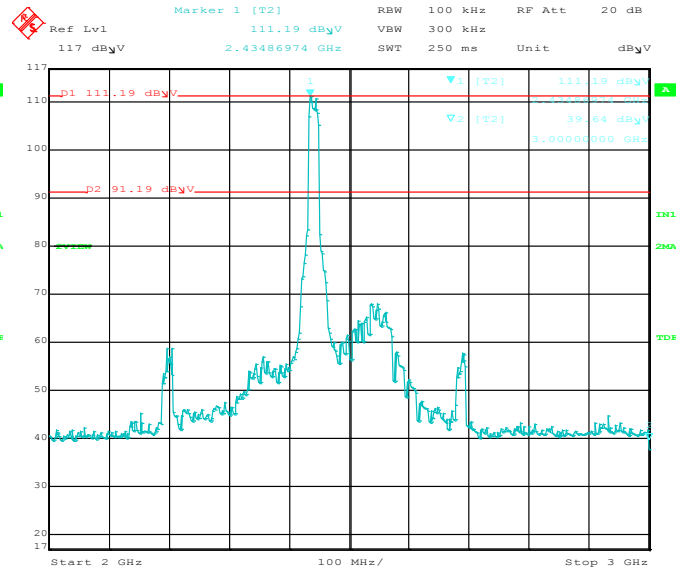
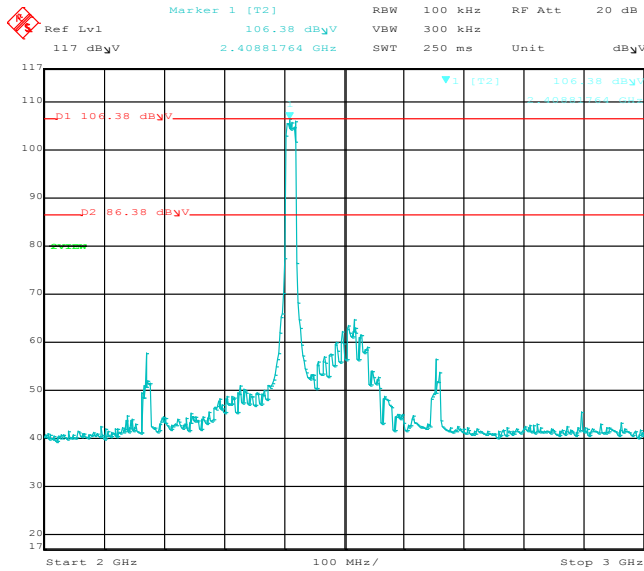
Freq. (MHz)	Level (dBuV)	Limit	Margin	Peak / QP / Avg	Comments
9648.00	75.05	86.38	-11.33	Peak	Channel 1
9768.00	76.41	91.19	-14.78	Peak	Channel 7
9848.00	76.03	86.48	-10.45	Peak	Channel 11

Worst case for all g mode measurements



802.11g Mode

Reference Level Measurements



HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

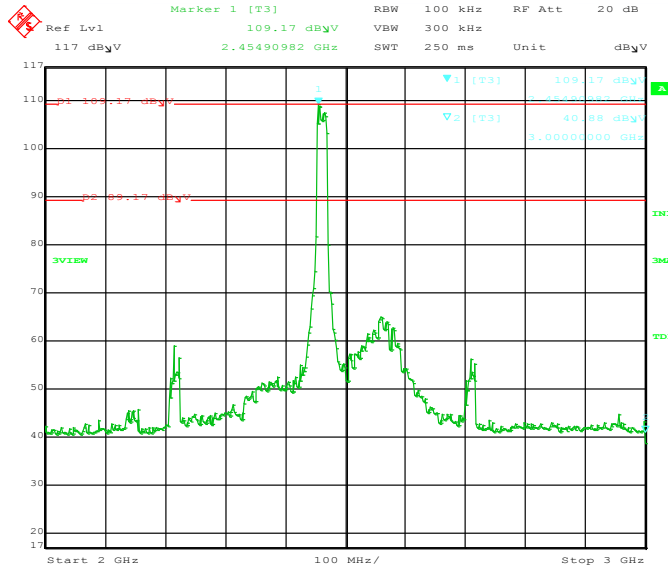
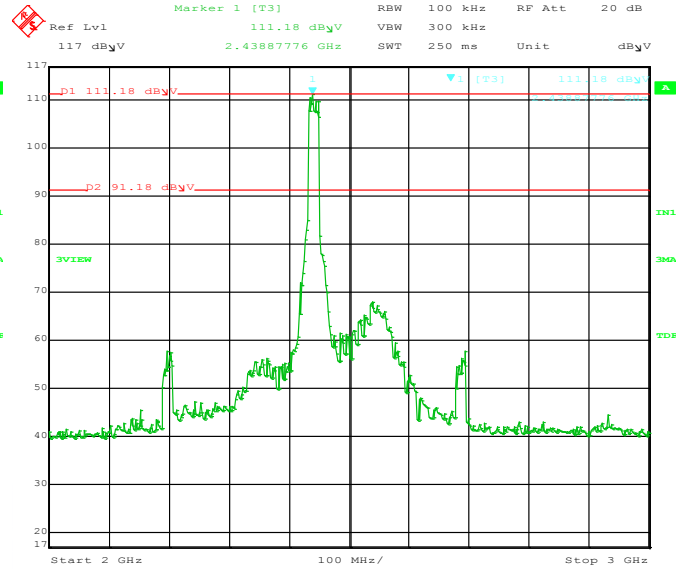
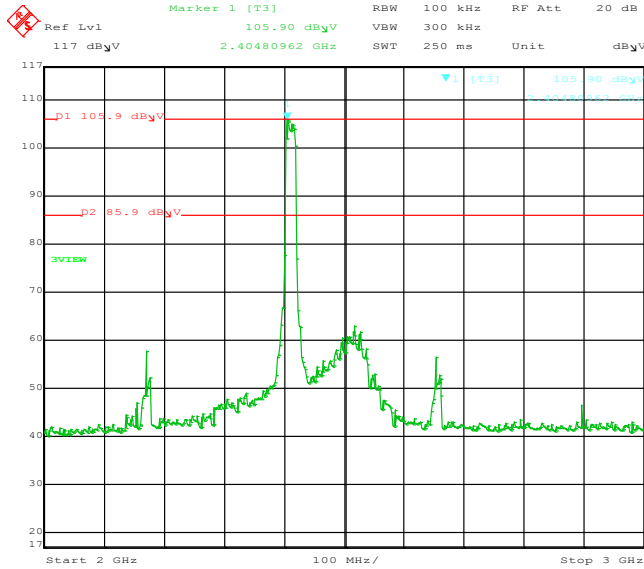
802.11n Mode

FCC 15.247Company: Atmel Corporation
EUT: Modular Transmitter
Model: ATWILC1000BMDate: 7/9/2015
Lab: R
Test ENG: M. Harrison

Freq. (MHz)	Level (dBuV)	Limit	Margin	Peak / QP / Avg	Comments
9648.00	74.96	85.90	-10.94	Peak	Channel 1
9768.00	76.72	91.18	-14.46	Peak	Channel 7
9848.00	76.40	89.17	-12.77	Peak	Channel 11



802.11n Mode Reference Level Measurements



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



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

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

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

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

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

802.11b Mode, Low Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

Date: 7/9/2015
 Lab: R

Model: ATWILC1000B
 Mode: 802.11b

Test
 ENG: M. Harrison

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4824.00	64.74	H	73.98	-9.24	Peak	1.00	358	In Restricted Band
4824.00	50.46	H	53.98	-3.52	Avg	1.00	358	
12060.00	61.95	H	73.98	-12.03	Peak	1.00	169	In Restricted Band
12060.00	49.99	H	53.98	-3.99	Avg	1.00	169	
14472.00	62.46	H	73.98	-11.52	Peak	1.04	144	In Restricted Band
14472.00	49.24	H	53.98	-4.74	Avg	1.04	144	
19296.00	--	H	73.98	--	Peak	--	--	In Restricted Band
19296.00	--	H	53.98	--	Avg	--	--	No Emissions Found
4824.00	66.81	V	73.98	-7.17	Peak	1.71	291	In Restricted Band
4824.00	52.75	V	53.98	-1.23	Avg	1.71	291	
12060.00	64.09	V	73.98	-9.89	Peak	1.28	241	In Restricted Band
12060.00	51.95	V	53.98	-2.03	Avg	1.28	241	
14472.00	61.64	V	73.98	-12.34	Peak	1.49	126	In Restricted Band
14472.00	48.12	V	53.98	-5.86	Avg	1.49	126	
19296.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19296.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
 3 meter



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS 802.11b Mode, Mid Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

 Model: ATWILC1000B
 Mode: 802.11b

Date: 7/8/2015
 Lab: R
 Test
 ENG: M. Harrison

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

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4884.00	59.63	H	73.98	-14.35	Peak	1.16	147	
4884.00	47.33	H	53.98	-6.65	Avg	1.16	147	In Restricted Band
7326.00	54.02	H	73.98	-19.96	Peak	2.10	70	
7326.00	41.32	H	53.98	-12.66	Avg	2.10	70	In Restricted Band
12210.00	63.46	H	73.98	-10.52	Peak	1.22	171	
12210.00	50.74	H	53.98	-3.24	Avg	1.22	171	In Restricted Band
19536.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	H	53.98	--	Avg	--	--	In Restricted Band
4884.00	66.77	V	73.98	-7.21	Peak	1.13	294	
4884.00	52.91	V	53.98	-1.07	Avg	1.13	294	In Restricted Band
7326.00	59.53	V	73.98	-14.45	Peak	1.49	234	
7326.00	46.56	V	53.98	-7.42	Avg	1.49	234	In Restricted Band
12210.00	65.98	V	73.98	-8.00	Peak	1.5	244	
12210.00	53.15	V	53.98	-0.83	Avg	1.5	244	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



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

802.11b Mode, High Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

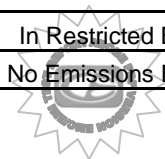
Date: 7/8/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11b

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	59.26	H	73.98	-14.72	Peak	1.44	152	In Restricted Band
4924.00	47.31	H	53.98	-6.67	Avg	1.44	152	
7386.00	55.30	H	73.98	-18.68	Peak	1.32	60	In Restricted Band
7386.00	42.21	H	53.98	-11.77	Avg	1.32	60	
12310.00	62.46	H	73.98	-11.52	Peak	1.01	168	In Restricted Band
12310.00	51.03	H	53.98	-2.95	Avg	1.01	168	
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	65.54	V	73.98	-8.44	Peak	2.22	250	In Restricted Band
4924.00	53.54	V	53.98	-0.44	Avg	2.22	250	
7386.00	55.29	V	73.98	-18.69	Peak	3.32	360.00	In Restricted Band
7386.00	42.26	V	53.98	-11.72	Avg	3.32	360.00	
12310.00	65.11	V	73.98	-8.87	Peak	1.05	152	In Restricted Band
12310.00	52.69	V	53.98	-1.29	Avg	1.05	152	
19696.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19696.00	--	V	53.98	--	Avg	--	--	No Emissions Found
22158.00	--	V	73.98	--	Peak	--	--	In Restricted Band
22158.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
 3 meter



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

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

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

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

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

802.11g Mode, Low Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

Date: 7/9/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11g

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	55.58	H	73.98	-18.40	Peak	1.02	0	In Restricted Band
4824.00	41.04	H	53.98	-12.94	Avg	1.02	0	
12060.00	60.01	H	73.98	-13.97	Peak	1.18	225	In Restricted Band
12060.00	45.87	H	53.98	-8.11	Avg	1.18	225	
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	59.54	V	73.98	-14.44	Peak	1.47	252	In Restricted Band
4824.00	45.02	V	53.98	-8.96	Avg	1.47	252	
12060.00	61.19	V	73.98	-12.79	Peak	1.15	236	In Restricted Band
12060.00	47.11	V	53.98	-6.87	Avg	1.15	236	
14472.00		V	73.98	--	Peak			In Restricted Band
14472.00		V	53.98	--	Avg			No Emissions Found
19296.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19296.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
 3 meter



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

802.11g Mode, Mid Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

Date: 7/9/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11g

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	59.86	H	73.98	-14.12	Peak	1.17	148	
4884.00	45.22	H	53.98	-8.76	Avg	1.17	148	In Restricted Band
7326.00	55.22	H	73.98	-18.76	Peak	1.00	236	
7326.00	42.38	H	53.98	-11.60	Avg	1.00	236	In Restricted Band
12210.00	67.95	H	73.98	-6.03	Peak	1.41	235	
12210.00	52.24	H	53.98	-1.74	Avg	1.41	235	In Restricted Band
19536.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	H	53.98	--	Avg	--	--	In Restricted Band
4884.00	66.94	V	73.98	-7.04	Peak	1.42	254	
4884.00	52.63	V	53.98	-1.35	Avg	1.42	254	In Restricted Band
7326.00	58.90	V	73.98	-15.08	Peak	1.47	136	
7326.00	44.31	V	53.98	-9.67	Avg	1.47	136	In Restricted Band
12210.00	68.07	V	73.98	-5.91	Peak	1.05	152	
12210.00	52.37	V	53.98	-1.61	Avg	1.05	152	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



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

802.11g Mode, High Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

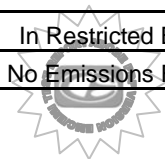
Date: 7/9/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11g

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	54.88	H	73.98	-19.10	Peak	1.47	151	In Restricted Band
4924.00	39.53	H	53.98	-14.45	Avg	1.47	151	
7386.00	--	H	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	H	53.98	--	Avg	--	--	No Emissions Found
12310.00	61.33	H	73.98	-12.65	Peak	1.06	167	In Restricted Band
12310.00	48.76	H	53.98	-5.22	Avg	1.06	167	
19696.00	--	H	73.98	--	Peak	--	--	In Restricted Band
19696.00	--	H	53.98	--	Avg	--	--	No Emissions Found
22158.00	--	H	73.98	--	Peak	--	--	In Restricted Band
22158.00	--	H	53.98	--	Avg	--	--	No Emissions Found
4924.00	59.13	V	73.98	-14.85	Peak	1.14	111	In Restricted Band
4924.00	44.90	V	53.98	-9.08	Avg	1.14	111	
7386.00	--	V	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	V	53.98	--	Avg	--	--	No Emissions Found
12310.00	62.46	V	73.98	-11.52	Peak	1.19	152	In Restricted Band
12310.00	49.35	V	53.98	-4.63	Avg	1.19	152	
19696.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19696.00	--	V	53.98	--	Avg	--	--	No Emissions Found
22158.00	--	V	73.98	--	Peak	--	--	In Restricted Band
22158.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
 3 meter



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

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

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

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

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS

802.11n Mode, Low Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

Date: 7/9/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11n

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	48.18	H	73.98	-25.80	Peak	1.00	147	In Restricted Band
4824.00	34.25	H	53.98	-19.73	Avg	1.00	147	
12060.00	60.01	H	73.98	-13.97	Peak	1.45	203	In Restricted Band
12060.00	51.39	H	53.98	-2.59	Avg	1.45	203	
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	51.40	V	73.98	-22.58	Peak	1.31	262	In Restricted Band
4824.00	34.97	V	53.98	-19.01	Avg	1.31	262	
12060.00	61.19	V	73.98	-12.79	Peak	1.24	249	In Restricted Band
12060.00	52.05	V	53.98	-1.93	Avg	1.24	249	
14472.00	--	V	73.98	--	Peak	--	--	In Restricted Band
14472.00	--	V	53.98	--	Avg	--	--	No Emissions Found
19296.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19296.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
 3 meter



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS 802.11n Mode, Mid Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

Date: 7/9/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11n

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	52.48	H	73.98	-21.50	Peak	1.44	132	
4884.00	38.11	H	53.98	-15.87	Avg	1.44	132	In Restricted Band
7326.00	--	H	73.98	--	Peak	--	--	No Emissions Found
7326.00	--	H	53.98	--	Avg	--	--	In Restricted Band
12210.00	65.48	H	73.98	-8.50	Peak	1	166	
12210.00	50.20	H	53.98	-3.78	Avg	1	166	In Restricted Band
19536.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19536.00	--	H	53.98	--	Avg	--	--	In Restricted Band
4884.00	56.32	V	73.98	-17.66	Peak	1.21	337	
4884.00	42.02	V	53.98	-11.96	Avg	1.21	337	In Restricted Band
7326.00	--	V	73.98	--	Peak	--	--	No Emissions Found
7326.00	--	V	53.98	--	Avg	--	--	In Restricted Band
12210.00	66.37	V	73.98	-7.61	Peak	1.06	151	
12210.00	51.17	V	53.98	-2.81	Avg	1.06	151	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



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS 802.11n Mode, High Channel, Horizontal & Vertical

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter

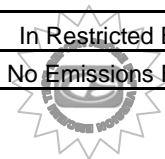
Date: 7/9/2015
 Lab: R
 Test
 ENG: M. Harrison

Model: ATWILC1000B
 Mode: 802.11n

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	52.31	H	73.98	-21.67	Peak	1.01	148	In Restricted Band
4924.00	36.64	H	53.98	-17.34	Avg	1.01	148	
7386.00	--	H	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	H	53.98	--	Avg	--	--	No Emissions Found
12310.00	63.46	H	73.98	-10.52	Peak	1.26	348	In Restricted Band
12310.00	52.19	H	53.98	-1.79	Avg	1.26	348	
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	53.11	V	73.98	-20.87	Peak	1.01	331	In Restricted Band
4924.00	39.16	V	53.98	-14.82	Avg	1.01	331	
7386.00	--	V	73.98	--	Peak	--	--	In Restricted Band
7386.00	--	V	53.98	--	Avg	--	--	No Emissions Found
12310.00	63.46	V	73.98	-10.52	Peak	1.01	152	In Restricted Band
12310.00	49.55	V	53.98	-4.43	Avg	1.01	152	
19696.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19696.00	--	V	53.98	--	Avg	--	--	No Emissions Found
22158.00	--	V	73.98	--	Peak	--	--	In Restricted Band
22158.00	--	V	53.98	--	Avg	--	--	No Emissions Found

Test distance
 3 meter



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

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

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

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

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

DATA SHEETS



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

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

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

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

802.11b Mode

BAND EDGES- VERTICAL

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter
 Model: ATWILC1000B
 Mode: 802.11b

Date: 7/8/2015
 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	109.94	V	--	--	Peak	1	0	Fundamental of High Channel
2396.17	87.11	V	89.94	-2.83	Delta	1	0	From Peak
2384.64	69.79	V	73.98	-4.19	Peak	1	0	
2384.64	51.40	V	53.98	-2.58	Avg	1	0	
2462.00	111.07	V	--	--	Peak	1	0	Fundamental of High Channel
2488.97	67.70	V	73.98	-6.28	Peak	1	0	
2488.97	47.38	V	53.98	-6.60	Avg	1	0	

Test distance
 3 meter



BAND EDGES- HORIZONTAL

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter
 Model: ATWILC1000B
 Mode: 802.11b

Date: 7/8/2015
 Lab: R
 Test
 ENG: Matt Harrison

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

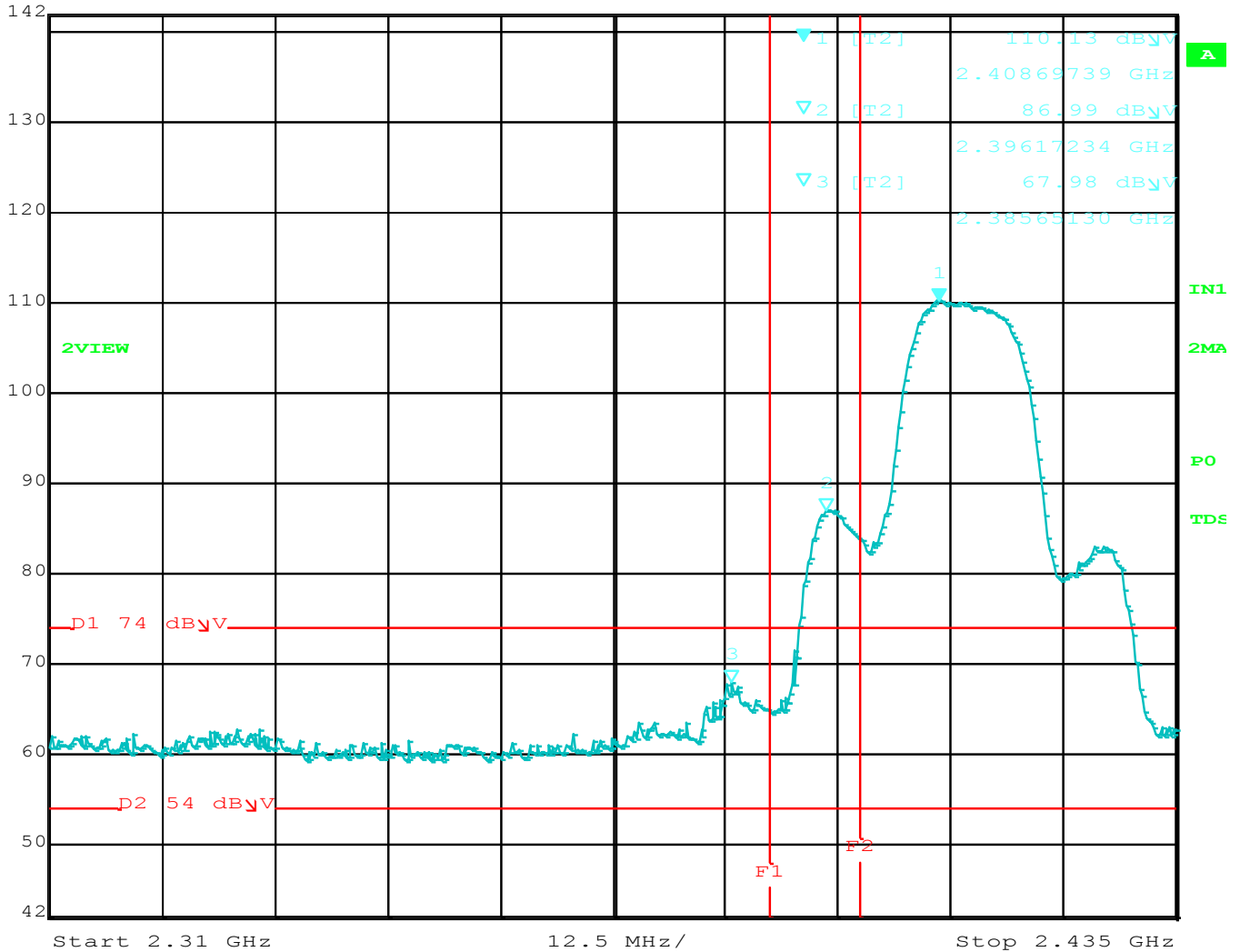
Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	110.13	H	--	--	Peak	1	225	Fundamental of High Channel
2396.17	86.99	H	90.13	-3.14	Delta	1	225	From Peak
2385.65	67.98	H	73.98	-6.00	Peak	1	225	
2385.65	52.07	H	53.98	-1.91	Avg	1	225	
2462.00	108.95	H	--	--	Peak	1	220	Fundamental of High Channel
2488.47	65.07	H	73.98	-8.91	Peak	1	220	
2488.47	45.70	H	53.98	-8.28	Avg	1	220	

Test distance
 3 meter



LOWER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	110.13 dB μ V	VBW	3 MHz		
	72 dB μ V	2.40869739 GHz	SWT	5 ms	Unit	dB μ V

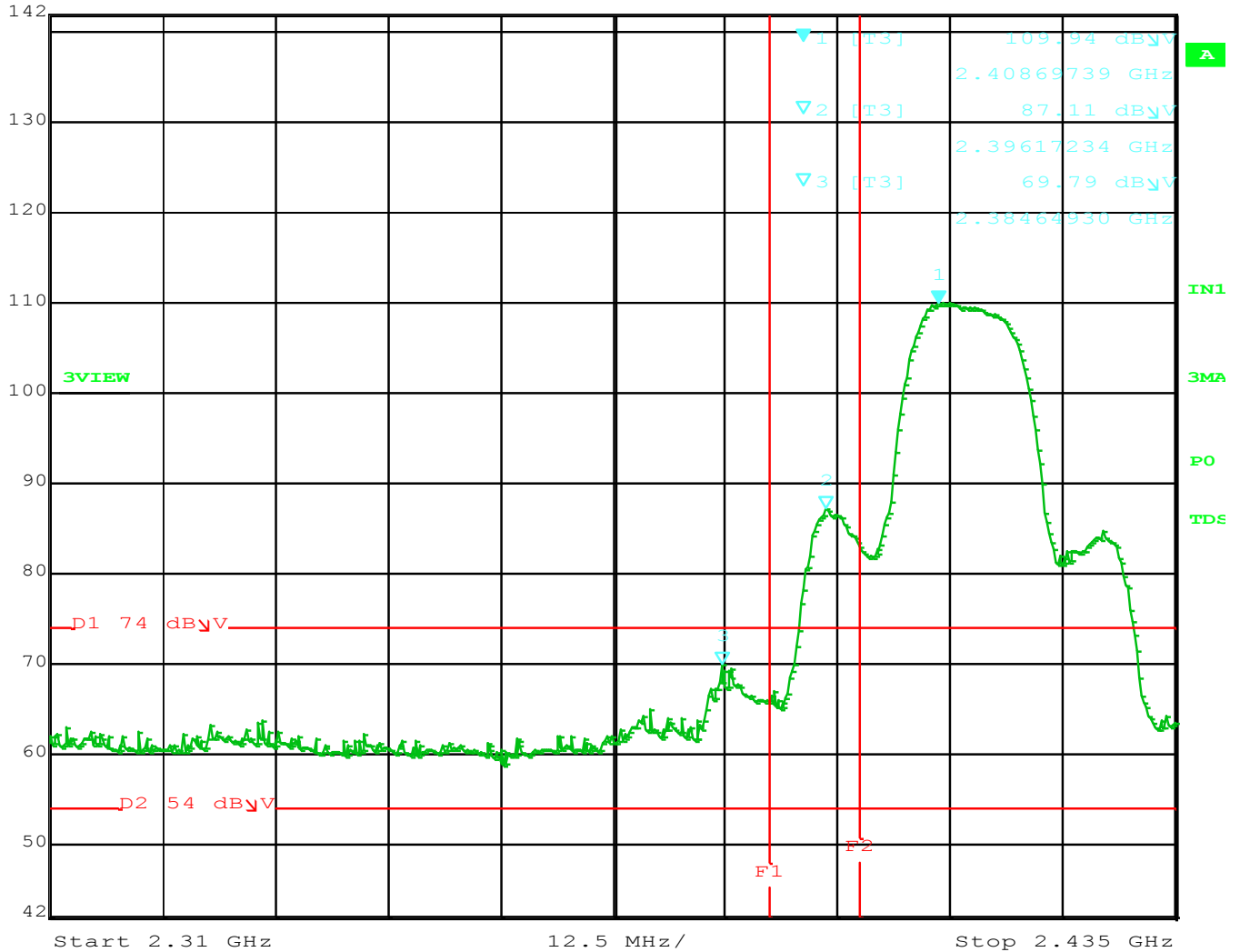


Title: ATWILC1000.
 Comment A: LBE, 802.11b, Horizontal.
 Date: 8.JUL.2015 14:43:41



LOWER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	109.94 dB μ V	VBW	3 MHz		
	72 dB μ V	2.40869739 GHz	SWT	5 ms	Unit	dB μ V

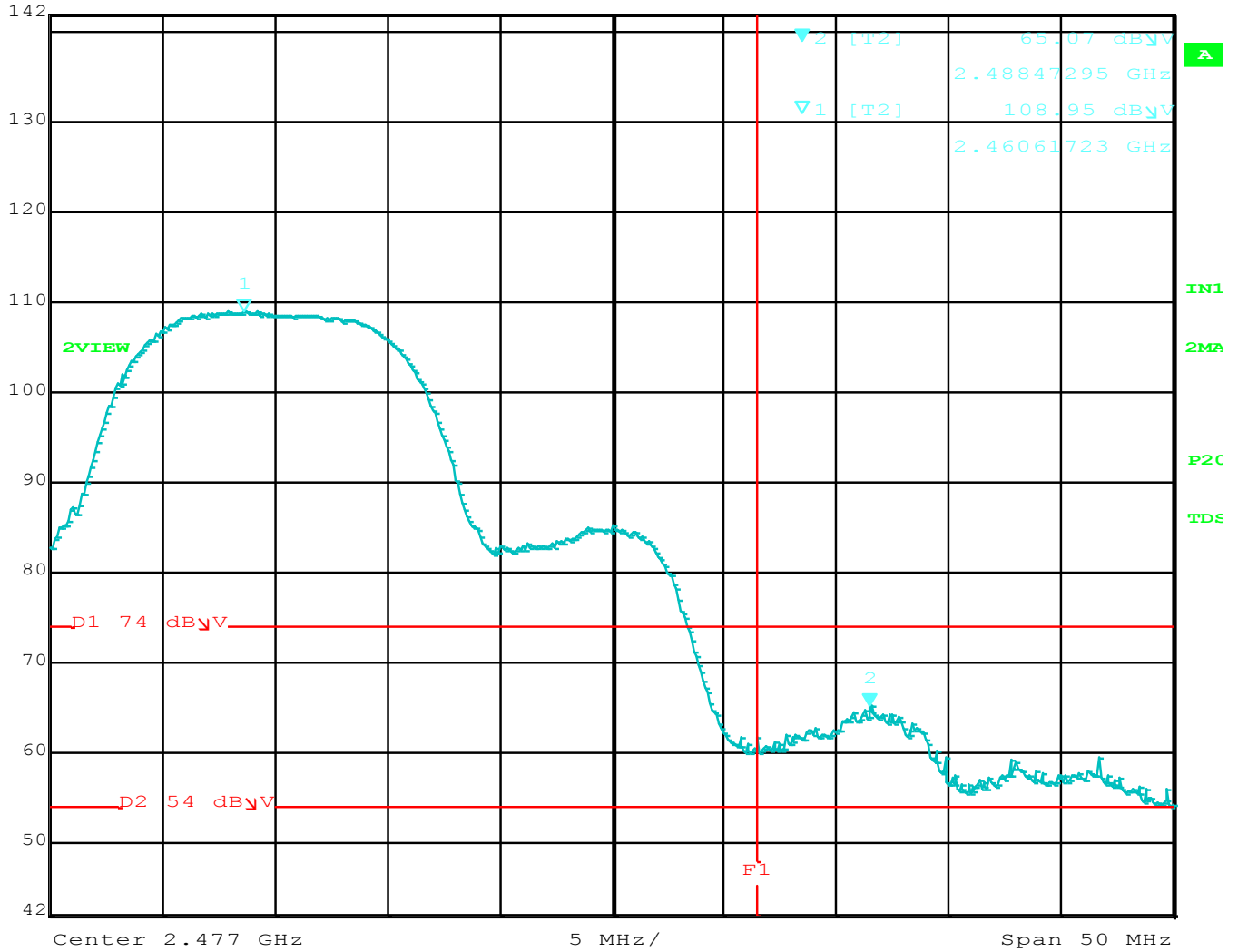


Title: ATWILC1000.
 Comment A: LBE, 802.11b, Vertical.
 Date: 8.JUL.2015 14:36:56



UPPER BAND EDGE
(Horizontal)

Max/Ref Lvl Marker 2 [T2] RBW 1 MHz RF Att 0 dB
 142 dBμV 65.07 dBμV VBW 3 MHz
 72 dBμV 2.48847295 GHz SWT 5 ms Unit dBμV

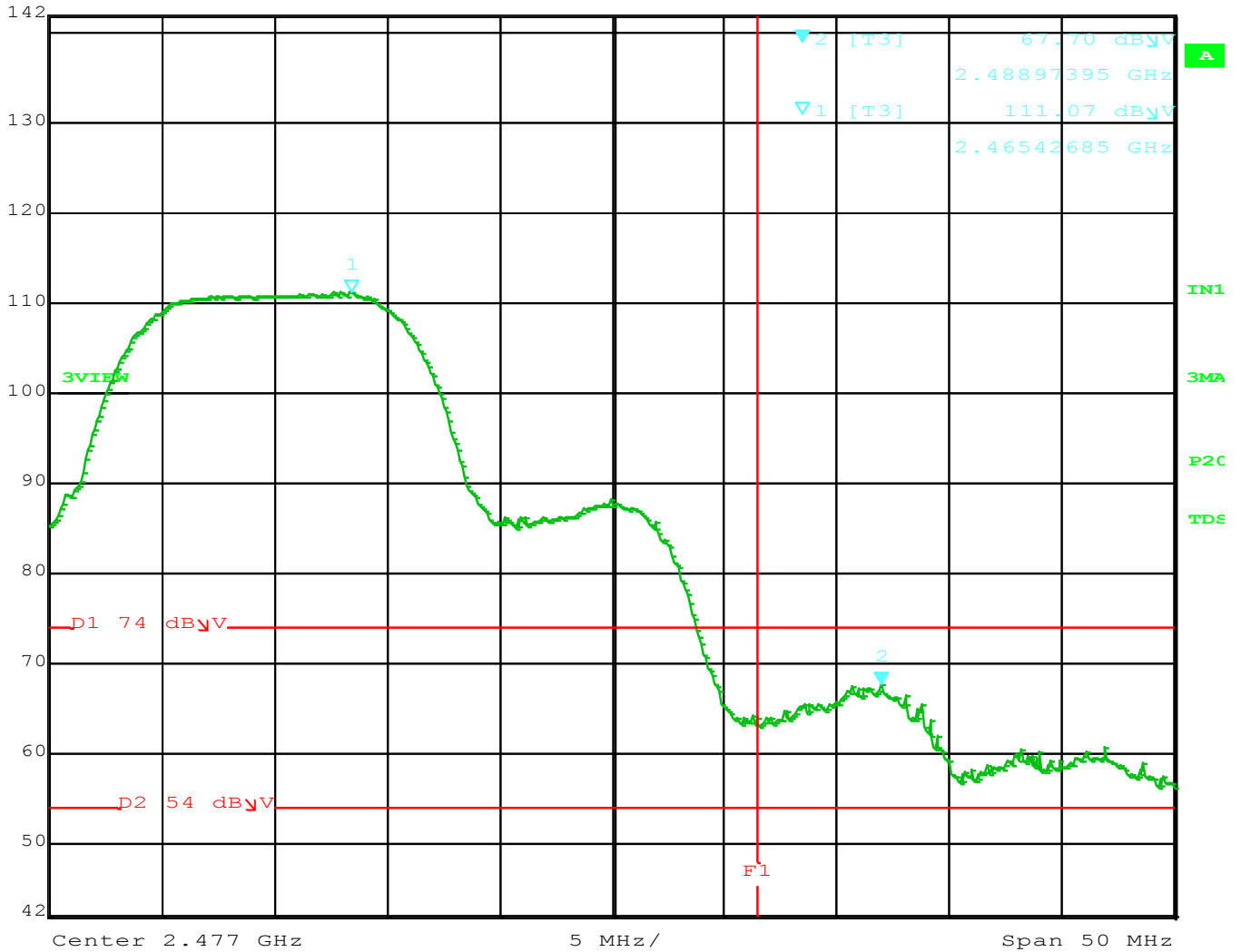


Title: ATWILC1000.
 Comment A: UBE, 802.11b, Horizontal.
 Date: 8.JUL.2015 15:36:53



UPPER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 2 [T3]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	67.70 dB μ V	VBW	3 MHz		
	72 dB μ V	2.48897395 GHz	SWT	5 ms	Unit	dB μ V



Title: ATWILC1000.
 Comment A: UBE, 802.11b, Vertical.
 Date: 8.JUL.2015 15:23:54



802.11g Mode

BAND EDGES- VERTICAL

FCC 15.247Company: Atmel Corporation
EUT: Modular Transmitter

Date: 7/8/2015

Lab: R

Test

Model: ATWILC1000B

ENG: Matt Harrison

Mode: 802.11g

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	106.39	V	--	--	Peak	1	0	Fundamental of High Channel
2397.17	82.67	V	86.39	-3.72	Delta	1	0	From Peak
2388.99	71.86	V	73.98	-2.12	Peak	1	0	
2388.99	52.40	V	53.98	-1.58	Avg	1	0	
2462.00	105.66	V	--	--	Peak	1	0	Fundamental of High Channel
2483.70	71.66	V	73.98	-2.32	Peak	1	0	
2483.70	48.51	V	53.98	-5.47	Avg	1	0	

Test distance
3 meter

BAND EDGES- HORIZONTAL

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter
 Model: ATWILC1000B
 Mode: 802.11g

Date: 7/8/2015
 Lab: R
 Test
 ENG: Matt Harrison

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

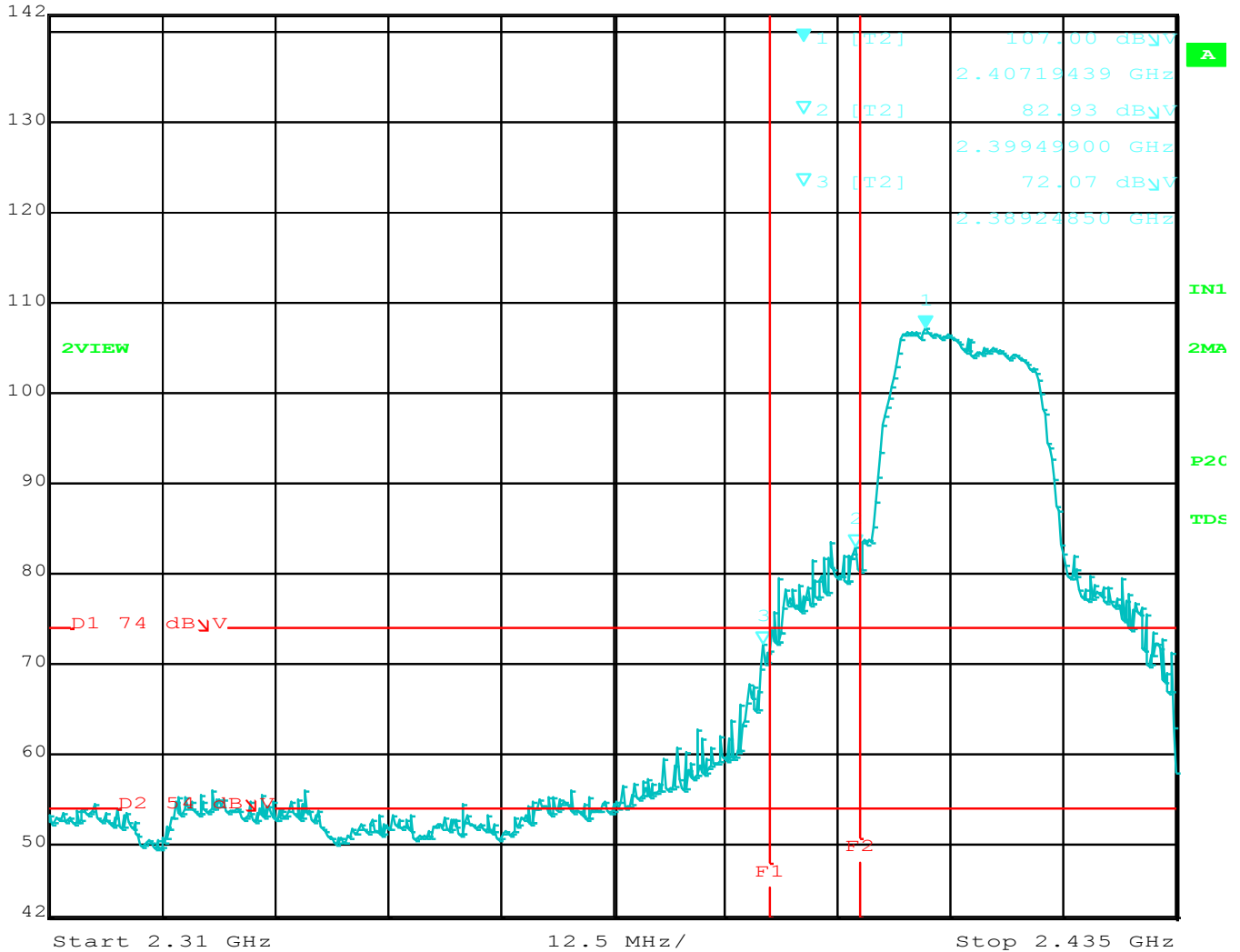
Freq. (MHz)	Level (dBµV)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	107.00	H	--	--	Peak	1	225	Fundamental of High Channel
2399.49	82.93	H	87.00	-4.07	Delta	1	225	From Peak
2389.24	72.07	H	73.98	-1.91	Peak	1	225	
2389.24	50.54	H	53.98	-3.44	Avg	1	225	
2462.00	104.14	H	--	--	Peak	1	230	Fundamental of High Channel
2483.50	69.32	H	73.98	-4.66	Peak	1	230	
2483.50	45.48	H	53.98	-8.50	Avg	1	230	

Test distance
 3 meter



LOWER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	107.00 dB μ V	VBW	3 MHz		
	72 dB μ V	2.40719439 GHz	SWT	5 ms	Unit	dB μ V

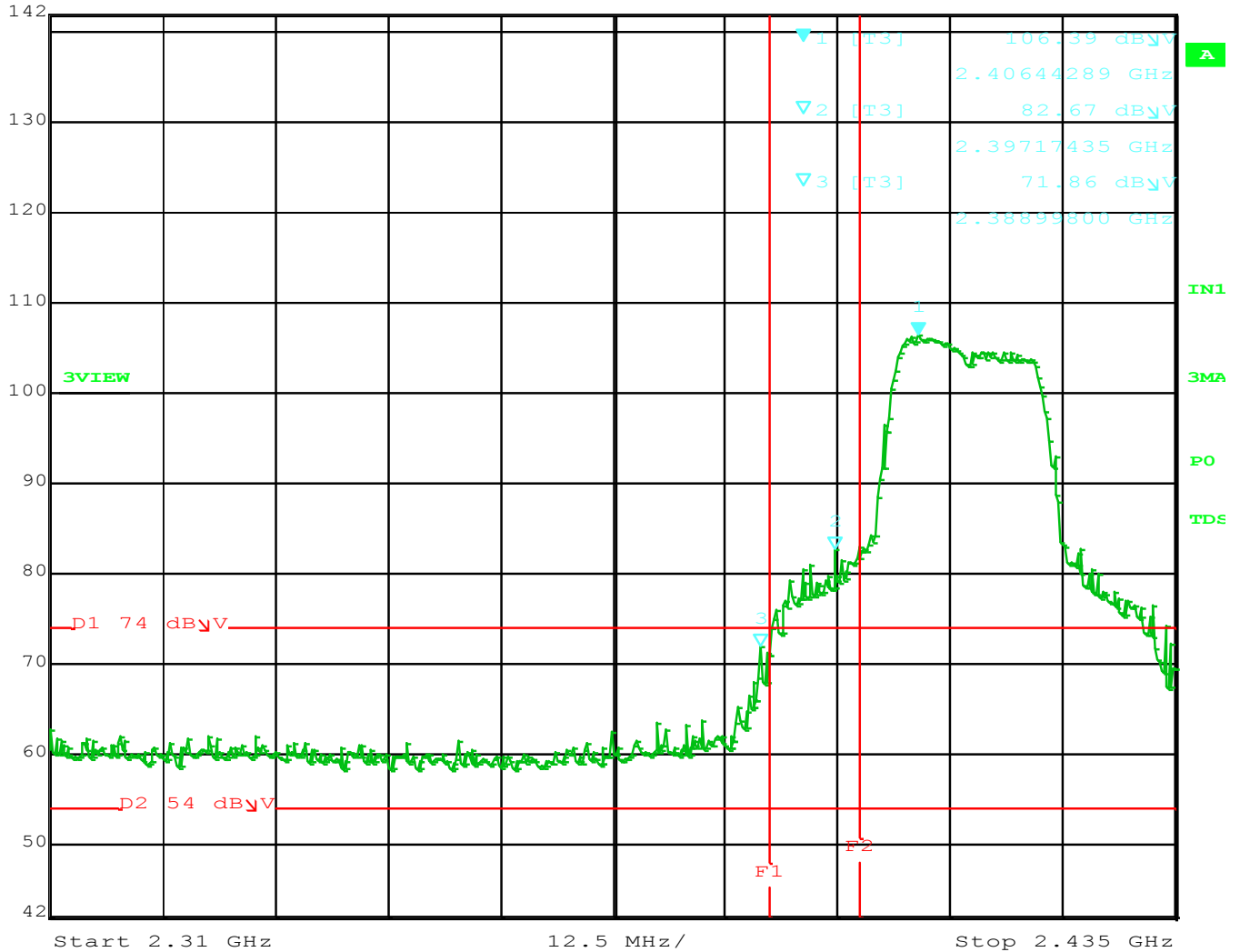


Title: ATWILC1000.
 Comment A: LBE, 802.11g, Horizontal.
 Date: 8.JUL.2015 14:57:51



LOWER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	106.39 dB μ V	VBW	3 MHz		
	72 dB μ V	2.40644289 GHz	SWT	5 ms	Unit	dB μ V

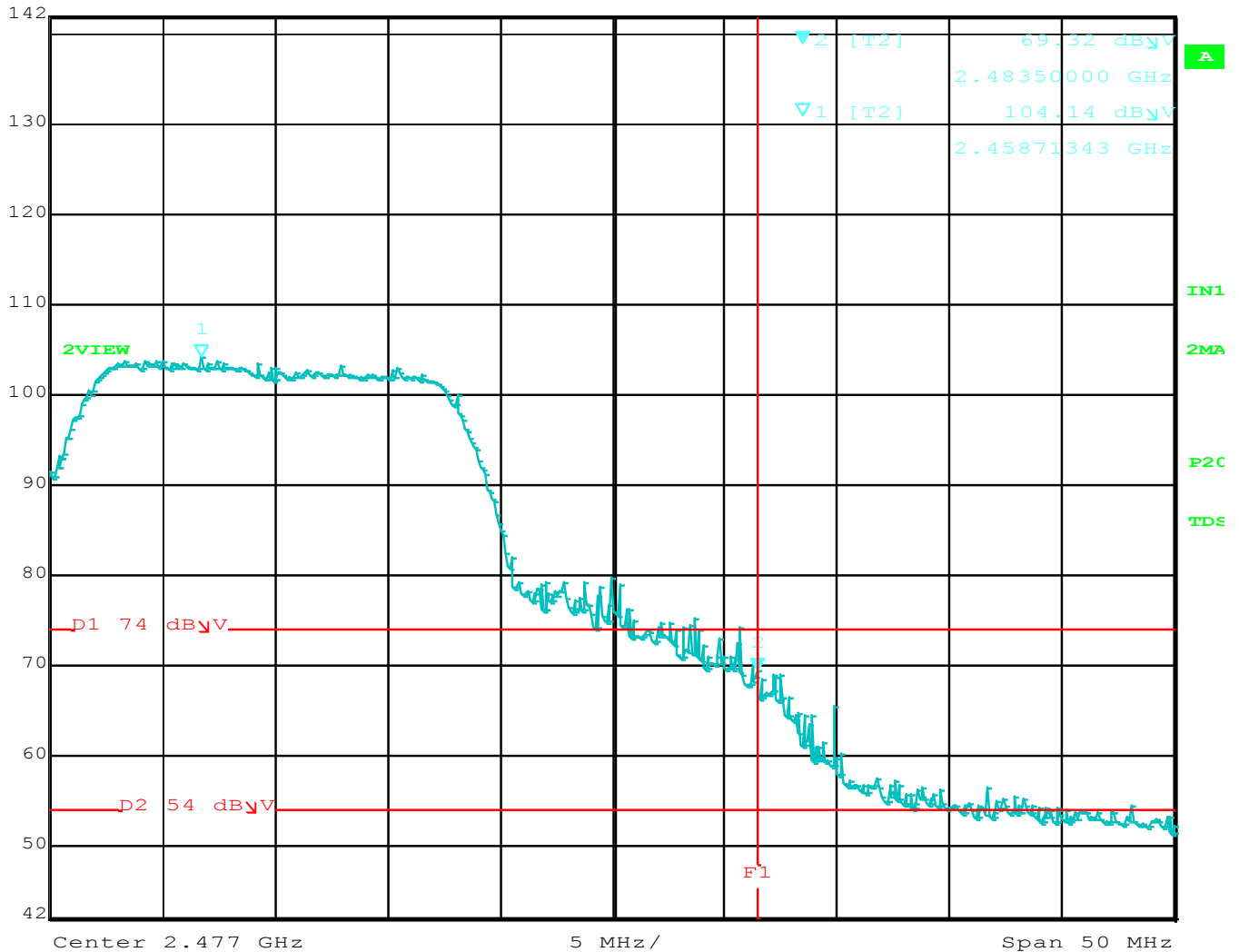


Title: ATWILC1000.
 Comment A: LBE, 802.11g, Vertical.
 Date: 8.JUL.2015 14:53:39



UPPER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 2 [T2]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	69.32 dB μ V	VBW	3 MHz		
	72 dB μ V	2.48350000 GHz	SWT	5 ms	Unit	dB μ V

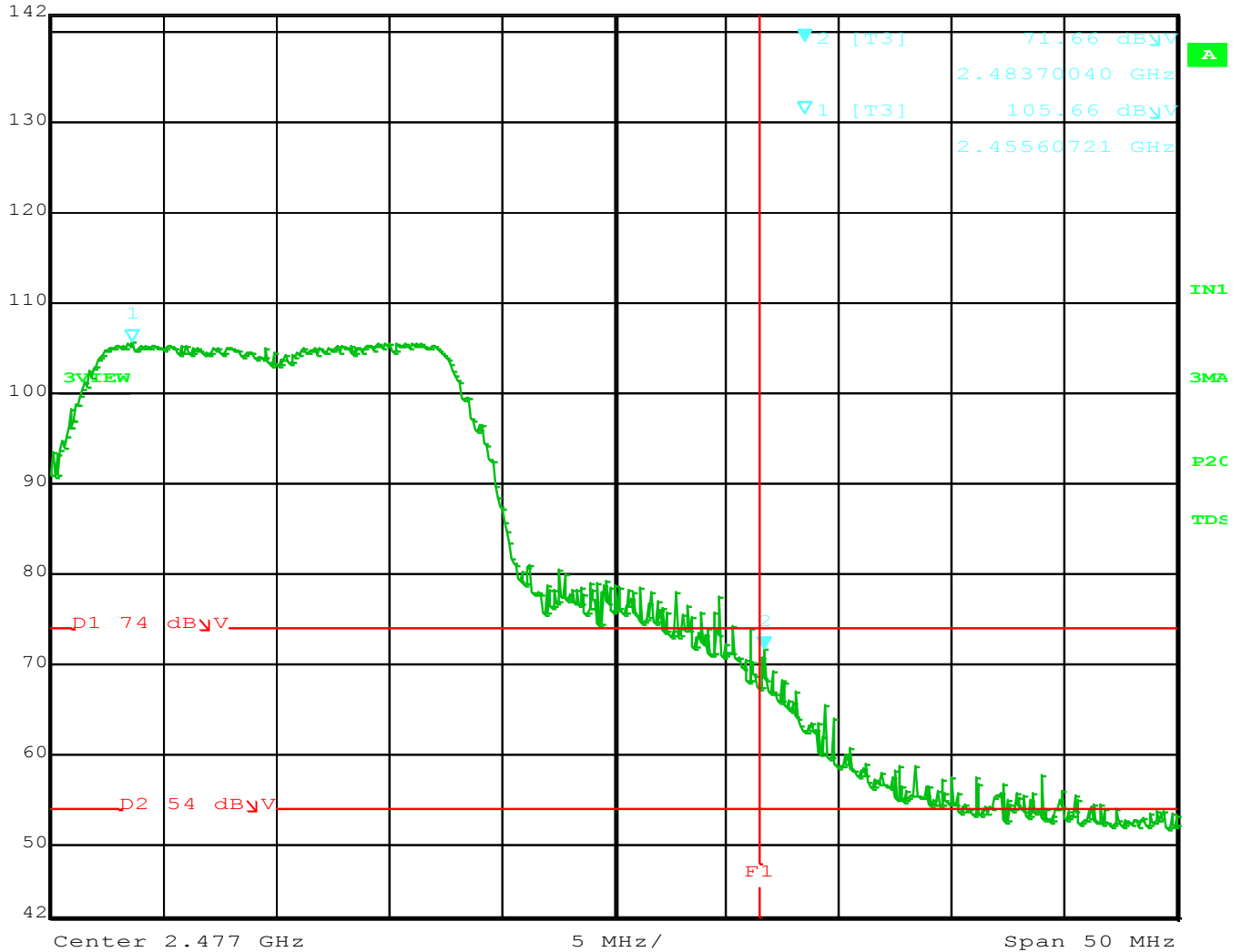


Title: ATWILC1000.
 Comment A: UBE, 802.11g, Horizontal.
 Date: 8.JUL.2015 15:09:17



UPPER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 2 [T3]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	71.66 dB μ V	VBW	3 MHz		
	72 dB μ V	2.48370040 GHz	SWT	5 ms	Unit	dB μ V



Title: ATWILC1000.
 Comment A: UBE, 802.11g, Vertical.
 Date: 8.JUL.2015 15:06:49



802.11n Mode

BAND EDGES- VERTICAL

FCC 15.247

 Company: Atmel Corporation
 EUT: Modular Transmitter

Date: 7/8/2015

Lab: R

Test

ENG: Matt Harrison

Model: ATWILC1000B

Mode: 802.11n

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	104.50	V	--	--	Peak	1	0	Fundamental of High Channel
2399.04	81.39	V	84.50	-3.11	Delta	1	0	From Peak
2389.32	72.48	V	73.98	-1.50	Peak	1	0	
2389.32	49.08	V	53.98	-4.90	Avg	1	0	
2462.00	105.92	V	--	--	Peak	1	0	Fundamental of High Channel
2484.26	72.34	V	73.98	-1.64	Peak	1	0	
2484.26	49.56	V	53.98	-4.42	Avg	1	0	

 Test distance
 3 meter


BAND EDGES- HORIZONTAL

FCC 15.247

Company: Atmel Corporation
 EUT: Modular Transmitter
 Model: ATWILC1000B
 Mode: 802.11n

Date: 7/8/2015
 Lab: R
 Test
 ENG: Matt Harrison

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

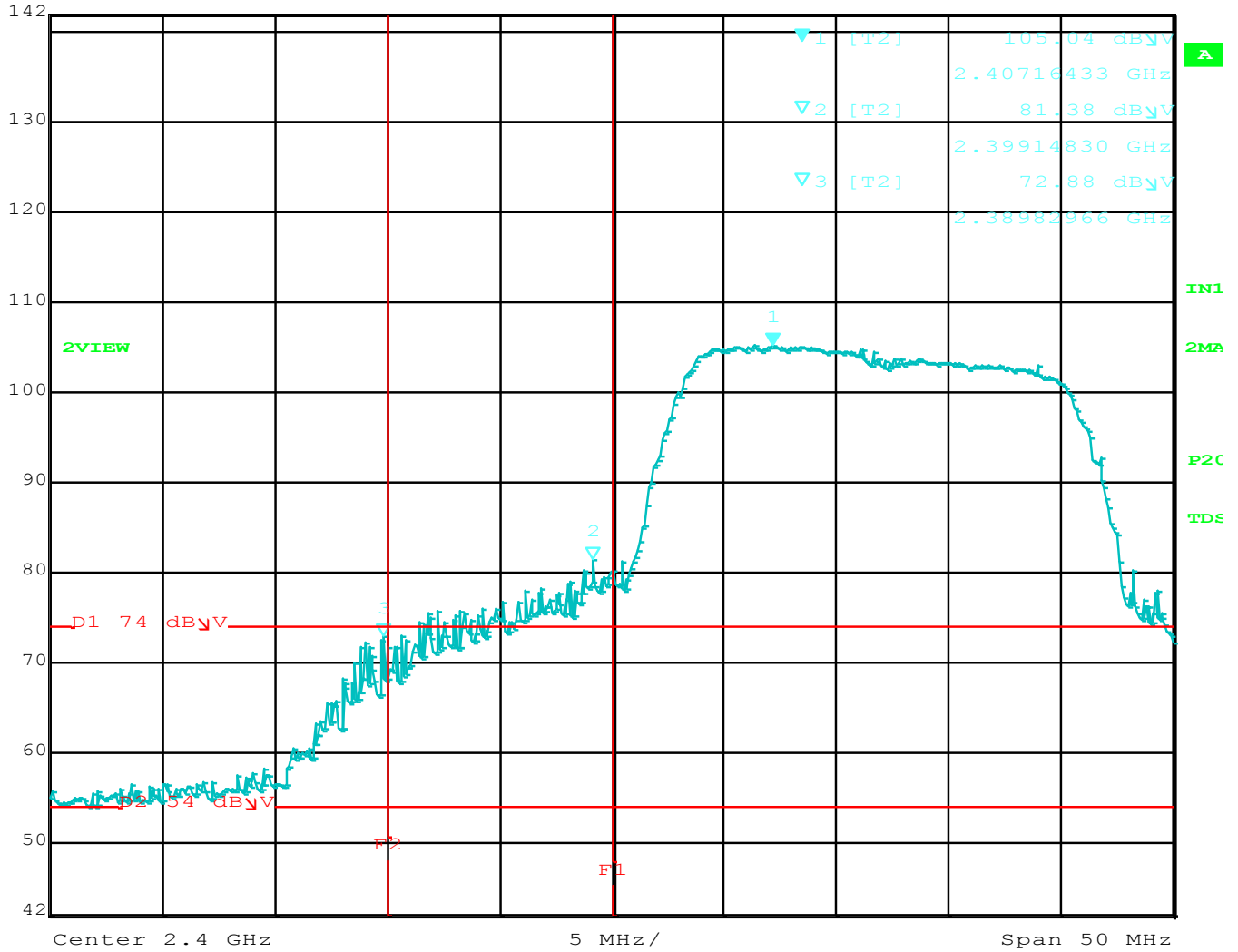
Freq. (MHz)	Level (dBμV)	Pol	Limit (dBμV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2412.00	105.04	H	--	--	Peak	1	230	Fundamental of High Channel
2399.14	81.38	H	85.04	-3.66	Delta	1	230	From Peak
2389.82	72.88	H	73.98	-1.10	Peak	1	230	
2389.82	49.37	H	53.98	-4.61	Avg	1	230	
2462.00	103.99	H	--	--	Peak	1	225	Fundamental of High Channel
2484.46	71.74	H	73.98	-2.24	Peak	1	225	
2484.46	46.94	H	53.98	-7.04	Avg	1	225	

Test distance
 3 meter



LOWER BAND EDGE (Horizontal)

	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	105.04 dB μ V	VBW	3 MHz		
	72 dB μ V	2.40716433 GHz	SWT	5 ms	Unit	dB μ V

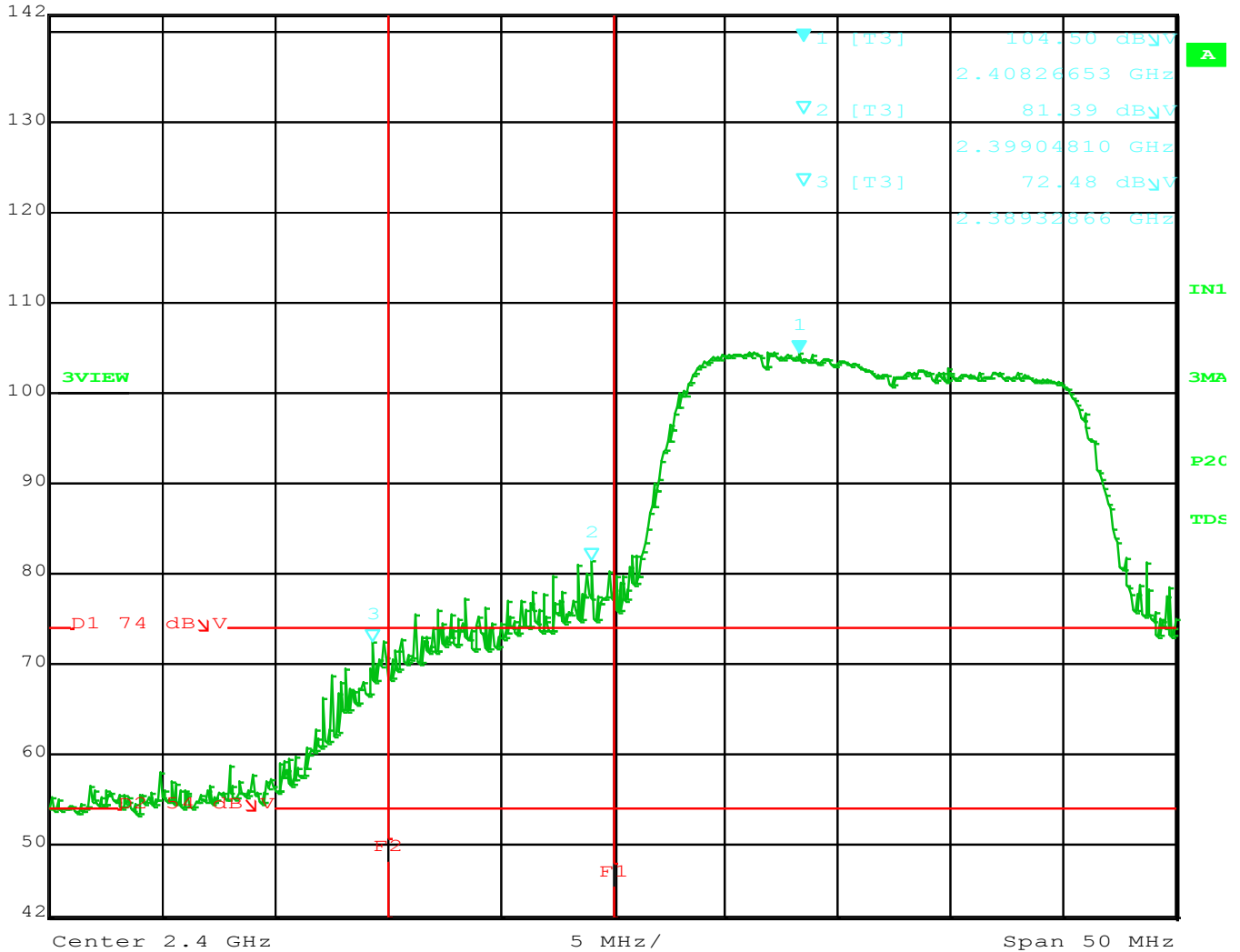


Title: ATWILC1000.
 Comment A: LBE, 802.11n, Horizontal.
 Date: 8.JUL.2015 16:11:16



LOWER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	142 dBμV	104.50 dBμV	VBW	3 MHz		
	72 dBμV	2.40826653 GHz	SWT	5 ms	Unit	dBμV

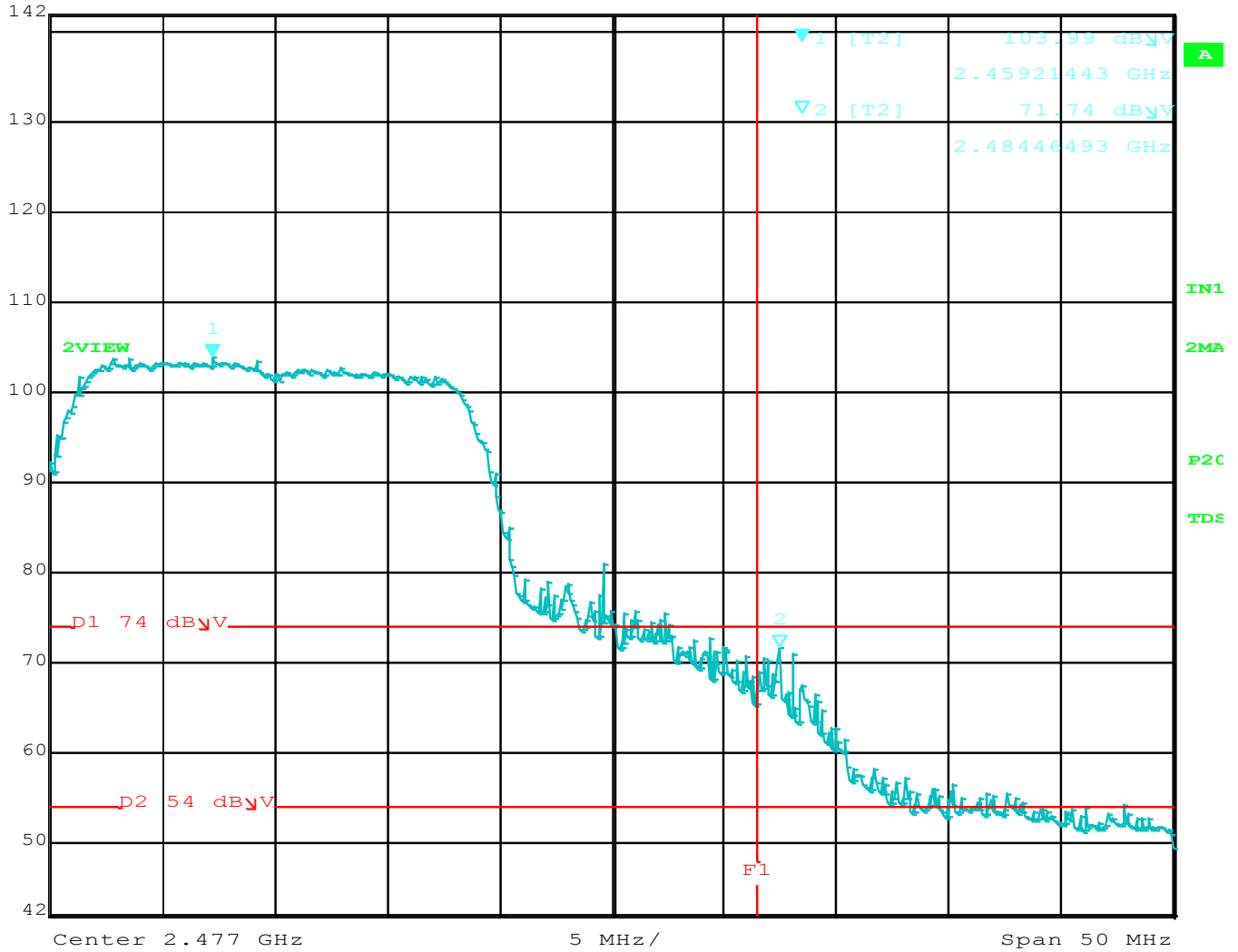


Title: ATWILC1000.
 Comment A: LBE, 802.11n, Vertical.
 Date: 8.JUL.2015 16:09:23



UPPER BAND EDGE (Horizontal)


	Max/Ref Lvl	Marker 1 [T2]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	103.99 dB μ V	VBW	3 MHz		
	72 dB μ V	2.45921443 GHz	SWT	5 ms	Unit	dB μ V

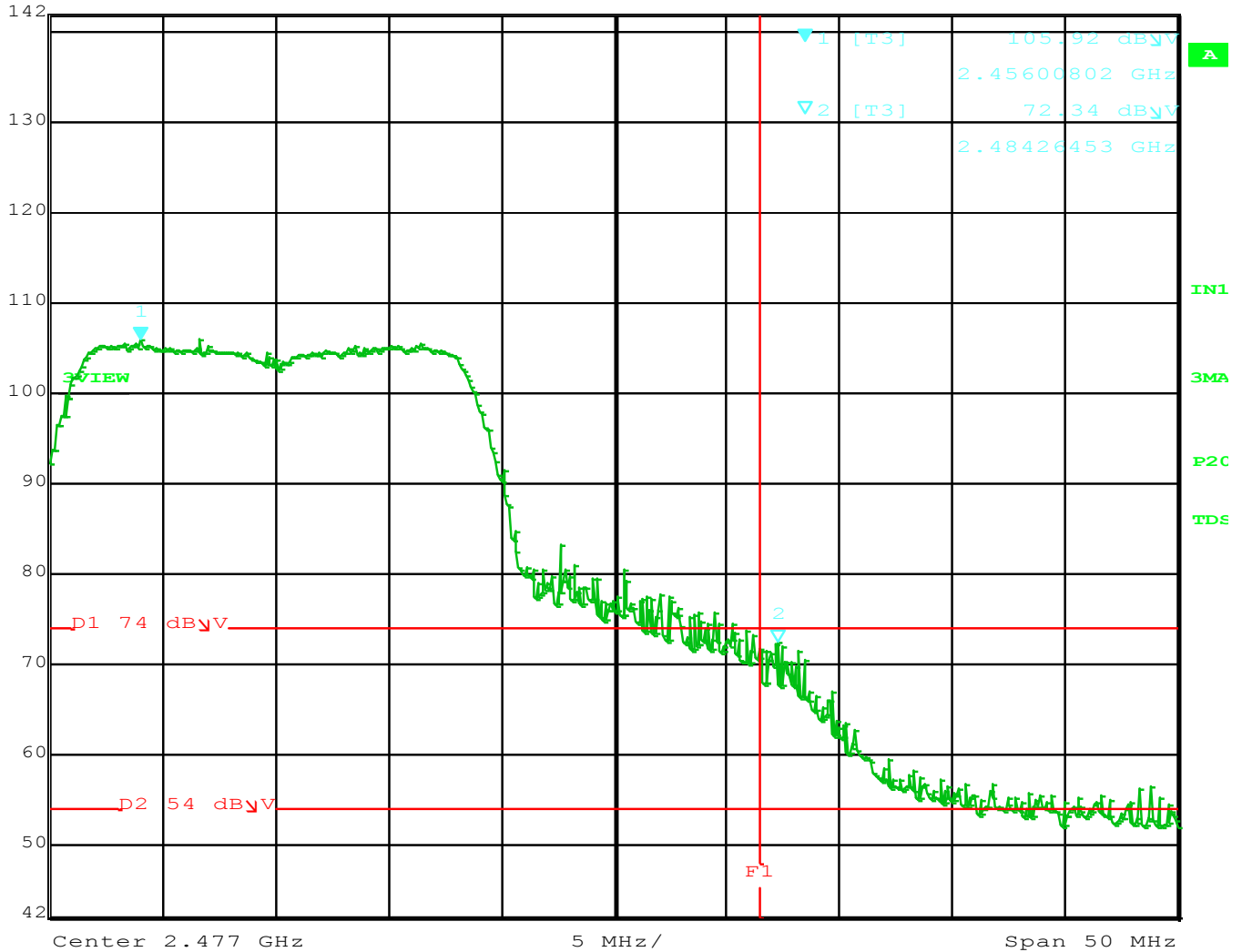


Title: ATWILC1000.
 Comment A: UBE, 802.11n, Horizontal.
 Date: 8.JUL.2015 15:55:37



UPPER BAND EDGE (Vertical)

	Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
	142 dB μ V	105.92 dB μ V	VBW	3 MHz		
	72 dB μ V	2.45600802 GHz	SWT	5 ms	Unit	dB μ V



Title: ATWILC1000.
 Comment A: UBE, 802.11n, Vertical.
 Date: 8.JUL.2015 15:47:25

