



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart E – Unlicensed National Information Infrastructure Devices

Section 15.407

General Technical Requirements.

Part 1 - 10 MHz Bandwidth Data

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION
(DFS not tested by DLS Electronic Systems Inc.)

Formal Name:	Air Fiber 5 - 5.4GHz Radio
Kind of Equipment:	Point-to-Point Digital Transmission Transceiver
Frequency Range:	5476 to 5719 MHz
Test Configuration:	Pole Mounted
Model Number(s):	AF5
Model(s) Tested:	AF5
Serial Number(s):	RF Conducted Unit: MAC address: 02:27:22:DA:5F:24 Radiated Unit: MAC address: 02:27:22:DA:5F:29
Date of Tests:	October 2013
Test Conducted For:	Ubiquiti Networks, Inc. 12F, No105, Song Ren Rd Taipei, Taiwan

NOTICE: “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

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166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Craig Brandt". The signature is written in a cursive style with a long horizontal stroke at the end.

Craig Brandt
Senior Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "William Stumpf". The signature is written in a cursive style with a long horizontal stroke at the end.

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is written in a cursive style with a long horizontal stroke at the end.

Brian Mattson
General Manager



166 South Carter, Genoa City, WI 53128

Company: Ubiquiti Networks, Inc.
Model Tested: AF5
Report Number: 19519 Part 1
DLS Project: 6154

Table of Contents

i. Cover Page	1
ii. Signature Page	2
iii. Table of Contents	3
iv. NVLAP Certificate of Accreditation	4
1.0 Summary of Test Report	5
2.0 Introduction	6
3.0 Test Facilities	6
4.0 Description of Test Sample	6
5.0 Test Equipment	8
6.0 Test Arrangements	9
7.0 Test Conditions	9
8.0 Modifications Made To EUT For Compliance	10
9.0 Additional Descriptions	10
10.0 Results	10
11.0 Conclusion	10
Appendix A – Test Photos	11
Appendix B – Measurement Data	18
B1.0 Duty Cycle of Test Unit	18
B2.0 Emission Bandwidth – 26 dB bandwidth – conducted	24
B3.0 99 Percent Occupied Bandwidth	55
B4.0 Maximum Conducted Output Power	86
B5.0 Unwanted Emission Levels – Radiated Restricted Band-Edge	88
B6.0 Peak Power Spectral Density – Conducted	109
B7.0 Peak Excursion – Conducted	126
B8.0 Unwanted Emission Levels – Radiated Operating Band-Edge	143
B9.0 Unwanted Emission Levels – Radiated with integral antenna	164
B10.0 AC Line Conducted Emissions	178



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
Wheeling, IL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*



2013-10-01 through 2014-09-30

Effective dates

John D. M. L.

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)



166 South Carter, Genoa City, WI 53128

Company: Ubiquiti Networks, Inc.
Model Tested: AF5
Report Number: 19519 Part 1
DLS Project: 6154

1.0 Summary of Test Report

It was determined that the Ubiquiti Networks Air Fiber 5 - 5.4GHz Radio, Model: AF5, complies with the requirements of CFR 47 Part 15 Subpart E Section 15.407.

Subpart E Section 15.407 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
Informative	Duty Cycle	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section B(2)(b)	1	NA
Informative	Emission Bandwidth – 26 dB bandwidth	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section C	1	NA
Informative	99 Percent Occupied Bandwidth	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section D	1	NA
15.407(a)(2)	Maximum Conducted Output Power	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section E(3)(a)	1	Yes
15.407(b)(7) & 15.205	Unwanted Emission Levels – Radiated Restricted Band-Edge (with antenna connected)	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H(1), H(2), H(3), H(5), H(6) & H(6)(c)	2	Yes
15.407(a)(2)	Peak Power Spectral Density - Conducted	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section E(2)(b) or (d)	1	Yes
15.407(a)(6)	Peak Excursion - Conducted	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section G	1	Yes
15.407(b)(3) & 15.407(b)(5)	Unwanted Emission Levels – Radiated Operating Band-Edge (with antenna connected)	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H, H(2), H(3), H(3)(d)(ii) & H(5)	2	Yes
15.407(b)(3) & 15.407(b)(6)	Unwanted Emission Levels – Radiated with integral antenna	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H(1), H(2), H(3), H(4), H(5), H(6) & H(6)(c)	2	Yes



166 South Carter, Genoa City, WI 53128

Company: Ubiquiti Networks, Inc.
Model Tested: AF5
Report Number: 19519 Part 1
DLS Project: 6154

Subpart E Section 15.407 Applicable Technical Requirements: continued

15.407(b)(6) & 15.207(a)	AC Line Conducted Emissions	ANSI C63.10:2009	3	Yes
15.407(h)(2)	Dynamic Frequency Selection (DFS)	Not tested by DLS		NA

Note 1: RF Conducted emission measurement.

Note 2: Radiated emission measurement.

Note 3: AC Line Conducted measurement.

2.0 Introduction

In October of 2013 the Air Fiber 5 - 5.4GHz Radio, Model: AF5, as provided from Ubiquiti Networks, was tested to the requirements of CFR 47 Part 15 Subpart E Section 15.407. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Wisconsin Test Facility:

D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

4.0 Description of Test Sample

Description:

The Ubiquiti Networks model AirFiber 5 is a 5.4Ghz and 5.8GHz Point-to-Point radio that uses OFDM with a 50MHz/40MHz/20MHz/10MHz bandwidth configuration. The EUT would be used outdoors and pole mounted. It is powered from a POE adapter. The integral antenna has a 23 dBi gain. This is an uncorrelated MIMO software defined radio.

Type of Equipment / Frequency Range:

Stand-Alone / 5476 to 5719 MHz (10 MHz bandwidth) (in this report)
5481 to 5714 MHz (20 MHz bandwidth)
5492 to 5703 MHz (40 MHz bandwidth)
5497 to 5698 MHz (50 MHz bandwidth)

(The 5.8 radio data is in a separate report.)



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Physical Dimensions of Equipment Under Test:

Length: 93.8 cm. Width: 46.8 cm. Height: 28.1 cm.

Power Source:

50 VDC (Power Over Ethernet to Radio)
120 Vac, 60 Hz using Ubiquiti Networks power supply model: GP-C500-120G or
Ubiquiti Networks power supply model: PSA60M-500(G)-R
(for AC Line Conducted testing)

Internal Frequencies:

150 kHz (Switching Power Supply Frequency)
5.719 GHz (Highest Operating Frequency for the 5.4GHz radio)

Transmit / Receive Frequencies Used For Test Purpose:

10 MHz Channel Bandwidth:	Low channel: 5476 MHz, Middle channel: 5575 MHz, High channel: 5719 MHz
20 MHz Channel Bandwidth:	Low channel: 5481 MHz, Middle channel: 5575 MHz, High channel: 5714 MHz
40 MHz Channel Bandwidth:	Low channel: 5492 MHz, Middle channel: 5575 MHz, High channel: 5703 MHz
50 MHz Channel Bandwidth:	Low channel: 5497 MHz, Middle channel: 5575 MHz, High channel: 5698 MHz

Type of Modulation(s):

OFDM: 1024QAM, 256QAM, 64QAM, 16QAM, QPSK

Description of Circuit Board(s) / Part Number:

Radio PC Board	11-02042-05 Rev 7
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166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

D.L.S. Wisconsin

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7-23-13	7-23-14
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-24-13	5-24-14
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1-7-13	1-7-14
Limiter	Electro-Metrics	EM-7600	706	9 kHz – 30 MHz	1-7-13	1-7-14
Preamp	Miteq	AMF-7D-01001800-22-10P	1809602	1GHz-18GHz	5-29-13	5-29-14
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	3-18-13	3-18-15
High Pass Filter	Planar	HP8G-7G8-CD-SFF	PF1226/0728	7.5-18 GHz	8-14-13	8-14-14
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	8-12-13	8-12-14
Horn Antenna	EMCO	3116	2549	18 – 40GHz	9-6-12	9-6-14
High Pass Filter	Planar	CL22500-9000-CD-SS	PF1229/0728	15-40 GHz	8-14-13	8-14-14
20 dB attenuator	Aeroflex/weinschel	75A-20-12	1071	DC – 40 GHz	8-14-13	8-14-14
20 dB attenuator	MCE/Weinschel	5955A-20	0256	DC – 40 GHz	8-12-13	8-12-14
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1-3-13	1-3-14
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	1-10-13	1-10-14
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	8-22-12	8-22-14
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	9-6-12	9-6-14
Power Meter	Anritsu	ML2487A	6K00002069	N/A	3-8-13	3-8-14
Thermal Power Sensor	Anritsu	MA24002A	1204359	10MHz-18GHz	3-3-13	3-3-14
Spectrum Analyzer	Agilent Technologies	N9030A	MY52350705	3Hz - 26.5GHz	2-13-13	2-13-14



166 South Carter, Genoa City, WI 53128

Company: Ubiquiti Networks, Inc.
Model Tested: AF5
Report Number: 19519 Part 1
DLS Project: 6154

6.0 Test Arrangements

RF Conducted Emissions Measurement Arrangement:

All RF conducted emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to FCC Publication KDB 789033 D01 General UNII test Procedures v01r03 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for photos of the test set up.

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for photos of the test set up.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

70° F at 46 % RH (or noted on the test data)

Supply Voltage:

50 VDC (Power Over Ethernet to Radio)

120 Vac, 60 Hz using Ubiquiti Networks power supply model: GP-C500-120G or

Ubiquiti Networks power supply model: PSA60M-500(G)-R

(for AC Line Conducted testing)



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

8.0 Modifications Made To EUT For Compliance

No modifications were made to the EUT at the time of test.

9.0 Additional Descriptions

Testing was performed at low, mid, and high channels over 4 modulation bandwidths (10MHz, 20MHz, 40MHz & 50MHz). All 5 OFDM modulation types have been tested (1024QAM, 256QAM, 64QAM, 16QAM, & QPSK). The antenna ports were tested (Channel 0 & 1). AC line conducted tested in transmit mode.

10.0 Results

Measurements were performed in accordance with FCC Publication KDB 789033 D01 General UNII test Procedures v01r03 and ANSI C63.10-2009. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

Dynamic Frequency Selection (DFS) testing was not performed by DLS Electronic Systems, Inc. Otherwise, the Air Fiber 5 - 5.4GHz Radio, Model: AF5, as provided from Ubiquiti Networks tested in October 2013 **meets** the requirements of CFR 47 Part 15 Subpart E Section 15.407.



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix A – Test Photos

Photo Information and Test Setup:

Item0: Air Fiber 5 - 5.4GHz Radio, Model: AF5
Item1: Shielded Power Over Ethernet Cable, 15 meters long

Radiated - Below 1 GHz - front





166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix A – Test Photos

Radiated - Below 1 GHz - Back



Appendix A – Test Photos

Radiated - above 1 GHz



Appendix A – Test Photos

RF Conducted / Output Power





166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix A – Test Photos

RF Conducted / In Band Emissions





166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix A – Test Photos

AC Line Conducted with Ubiquiti Power Supply GP-C500-120G





166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix A – Test Photos

AC Line Conducted with Ubiquiti Power Supply PSA60M-500(G)-R





166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B1.0 Duty Cycle of Test Unit

Rule Part: FCC Section 15.35(c)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*
Section B(2)(b) – Duty cycle (x)

Center frequency = center of emission

RBW $\geq$ OBW (otherwise, RBW = largest possible)

VBW $\geq$ RBW

Detector = Peak or Average

Span = Zero Span

Verify both RBW and VBW are > 50 /minimum transmission duration (T)

Verify the number of sweep points across T exceeds 100

Limits: Informative. Use correction factor if duty cycle is less than 100% ($x < 1$).

Results: 10 MHz BW mode: Requires a correction factor of 0.13 dB
20 MHz BW mode: Requires a correction factor of 0.13 dB
40 MHz BW mode: Requires a correction factor of 0.07 dB
50 MHz BW mode: Requires a correction factor of 0.07 dB

Sample Equations: Total Cycle time = 2.004008 ms
Total on Time = 1.943887 ms
Duty cycle factor x = $1.943887 / 2.004008 = 0.970$
Correction for duty cycle = $10 \log (1/x) = 0.13 \text{ dB}$

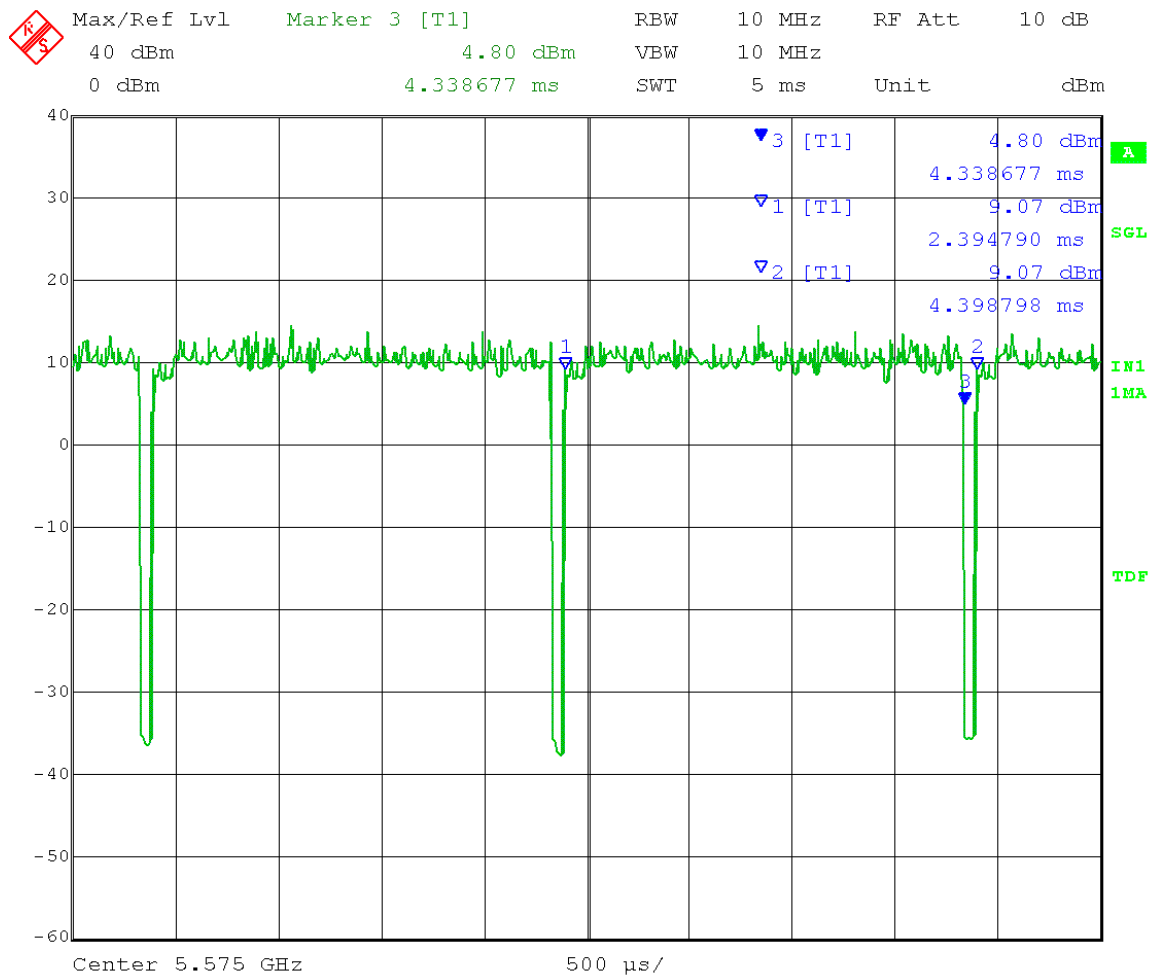
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

Output power was set to 30 dBm eirp using special test software.

Test Date: 10-17-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Duty Cycle during testing
 Operator: Lillian L
 Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz
 Span = 0 Hz
 Mid Channel: Transmit = 5.575GHz
 Total Cycle time = 4.398798-2.394790 = 2.004008
 Total on Time = 4.338677-2.394790 = 1.943887 ms

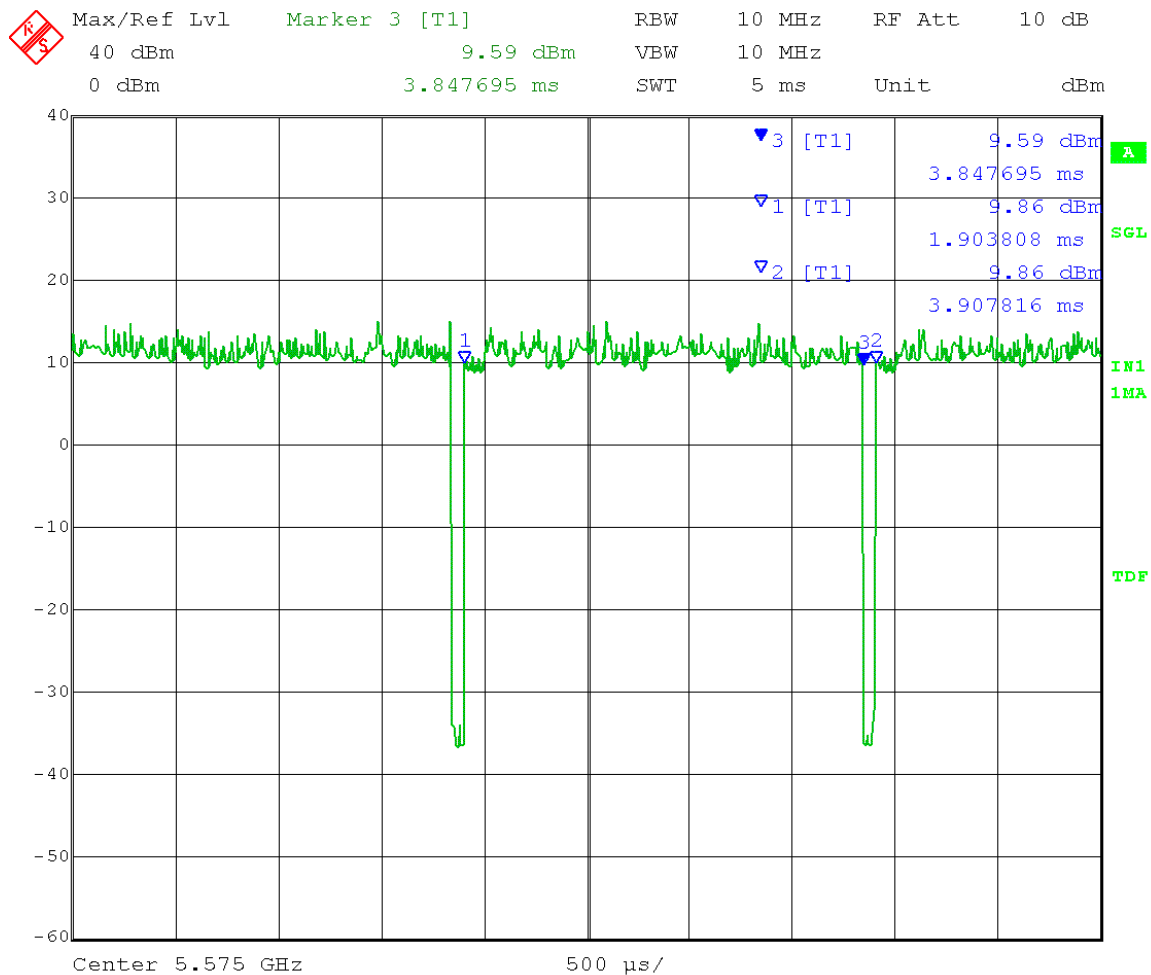
Duty cycle factor $x = 1.943887 / 2.004008 = 0.970$
 Adjustment for duty cycle $= 10 \log 1/x = 0.13$



Test Date: 10-17-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Duty Cycle during testing
 Operator: Lillian L
 Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz
 Span = 0 Hz
 Mid Channel: Transmit = 5.575GHz
 Total Cycle time = 3.907816-1.903808 = 2.004008
 Total on Time = 3.847695-1.903808 = 1.943887 ms

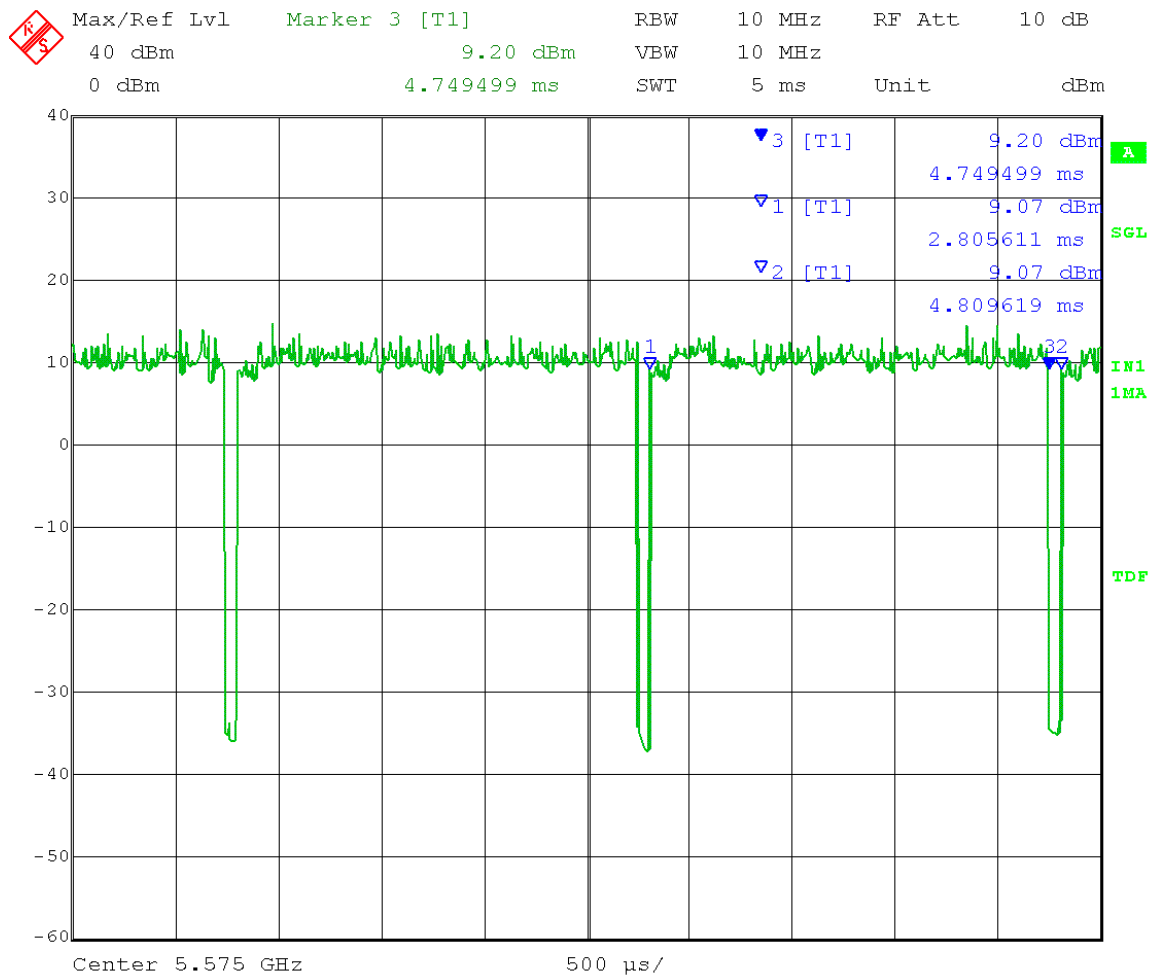
Duty cycle factor $x = 1.943887 / 2.004008 = 0.970$
 Adjustment for duty cycle $= 10 \log 1/x = 0.13$



Test Date: 10-17-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Duty Cycle during testing
 Operator: Lillian L
 Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz
 Span = 0 Hz
 Mid Channel: Transmit = 5.575GHz
 Total Cycle time = 4.809619-2.805611 = 2.004008
 Total on Time = 4.749499-2.805611 = 1.943888 ms

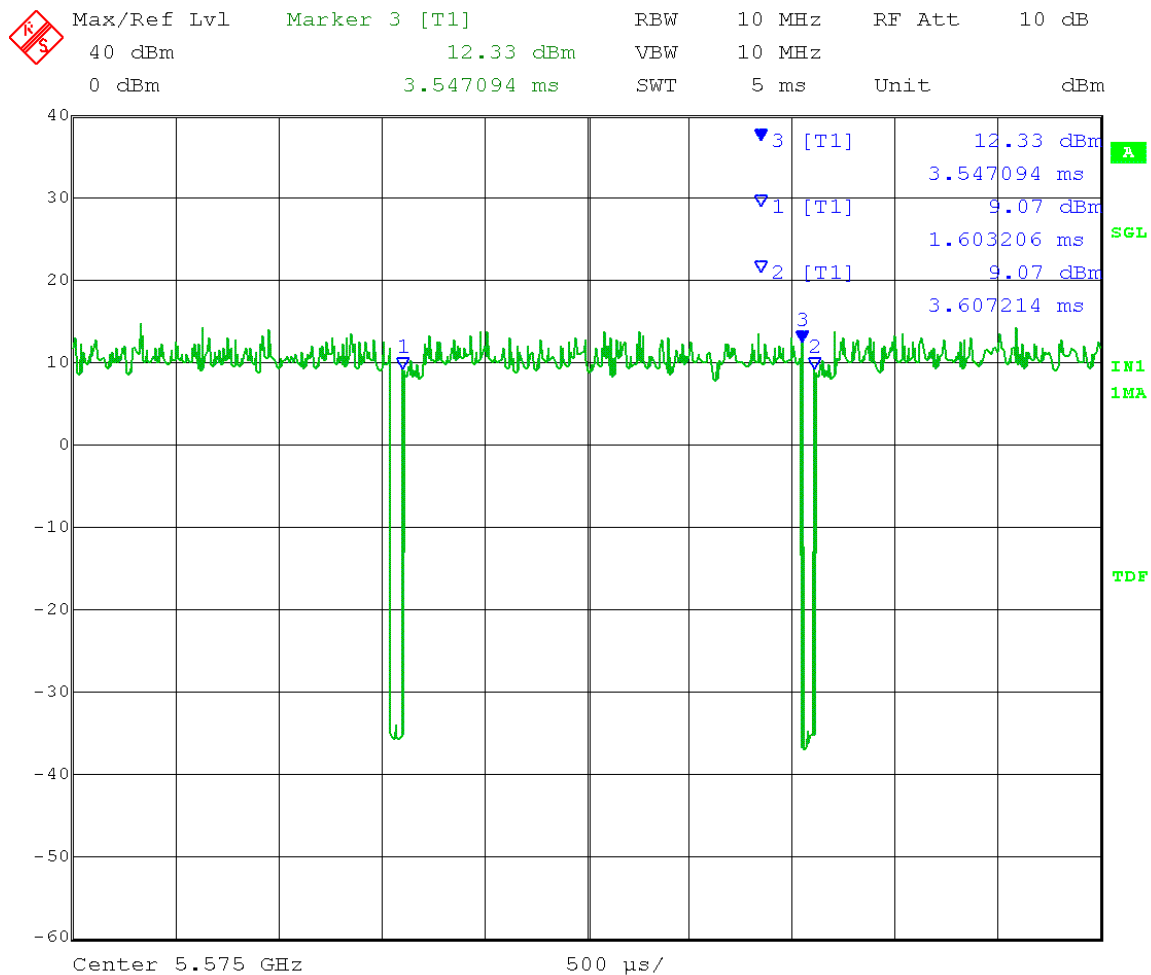
Duty cycle factor $x = 1.943888 / 2.004008 = 0.970$
 Adjustment for duty cycle $= 10 \log 1/x = 0.13$



Test Date: 10-17-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Duty Cycle during testing
 Operator: Lillian L
 Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz
 Span = 0 Hz
 Mid Channel: Transmit = 5.575GHz
 Total Cycle time = 3.607214-1.603206 = 2.004008
 Total on Time = 3.547094-1.603206 = 1.943888 ms

Duty cycle factor $x = 1.943888 / 2.004008 = 0.970$
 Adjustment for duty cycle $= 10 \log 1/x = 0.13$

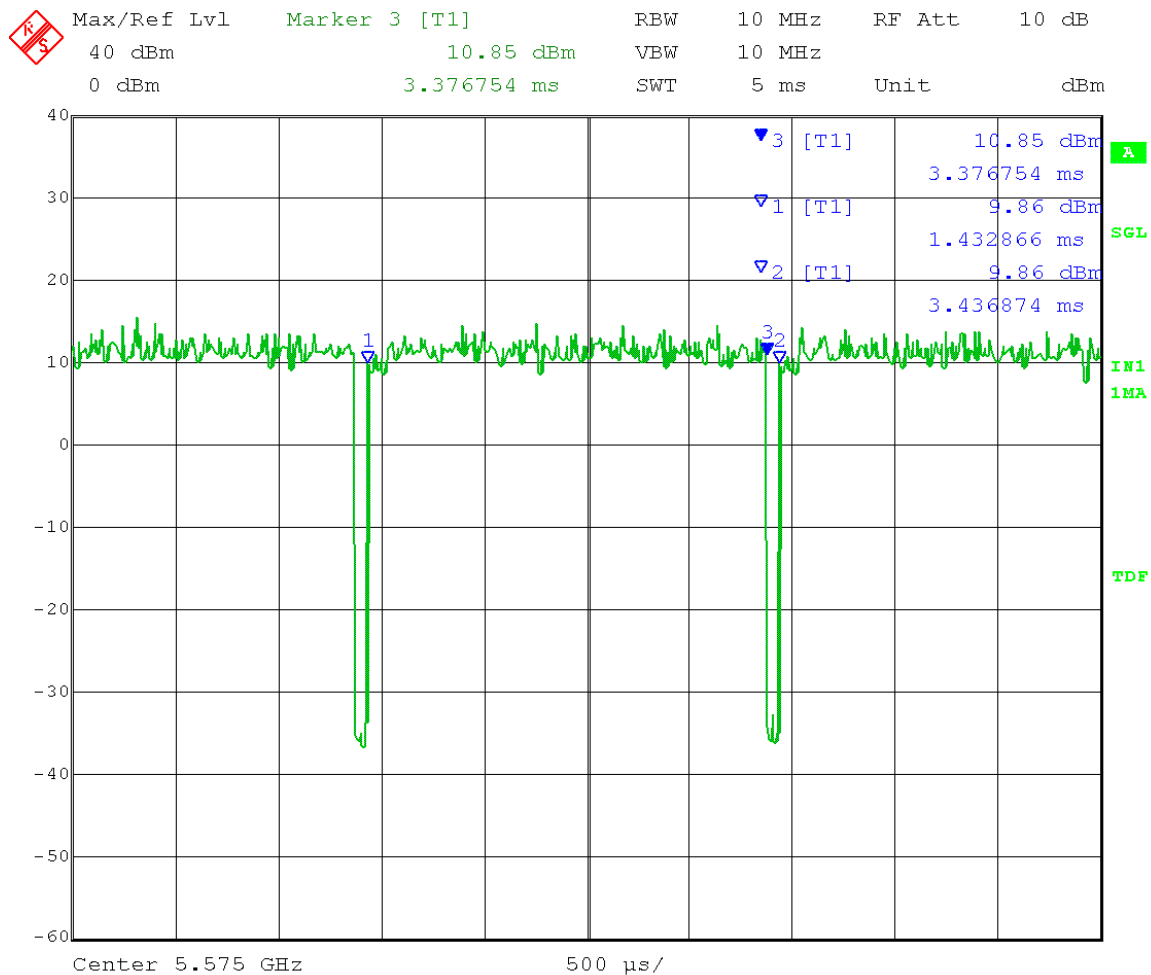


Date: 17.OCT.2013 13:59:53

Test Date: 10-17-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Duty Cycle during testing
 Operator: Lillian L
 Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz
 Span = 0 Hz
 Mid Channel: Transmit = 5.575GHz
 Total Cycle time = 3.436874-1.432866 = 2.004008
 Total on Time = 3.376754-1.432866 = 1.943887 ms

Duty cycle factor $x = 1.943887 / 2.004008 = 0.970$
 Adjustment for duty cycle $= 10 \log 1/x = 0.13$



Date: 17.OCT.2013 14:15:17



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix B – Measurement Data

B2.0 Emission Bandwidth – 26 dB bandwidth – conducted

Rule Section: Informative

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section C – Emission bandwidth

Description: RBW = approximately 1% of EBW
VBW > RBW
Detector = Peak
Trace mode = max hold

Measure the maximum width of the emission between the lower and upper frequencies that measure 26 dB below the maximum level of the in-band emission.

Limit: Informative

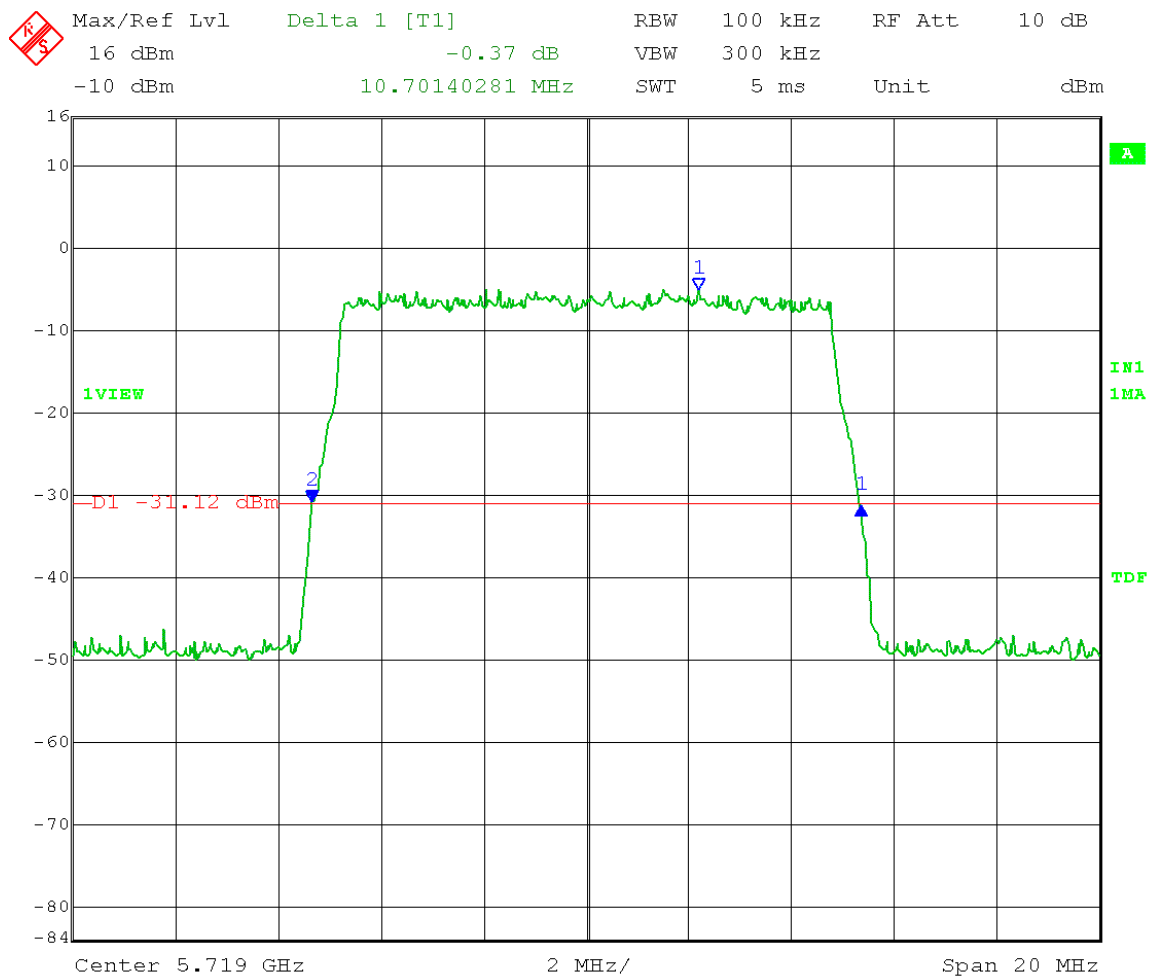
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

Output power was set to 30 dBm eirp using special test software.

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
High Channel: Transmit = 5.719 GHz 10MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

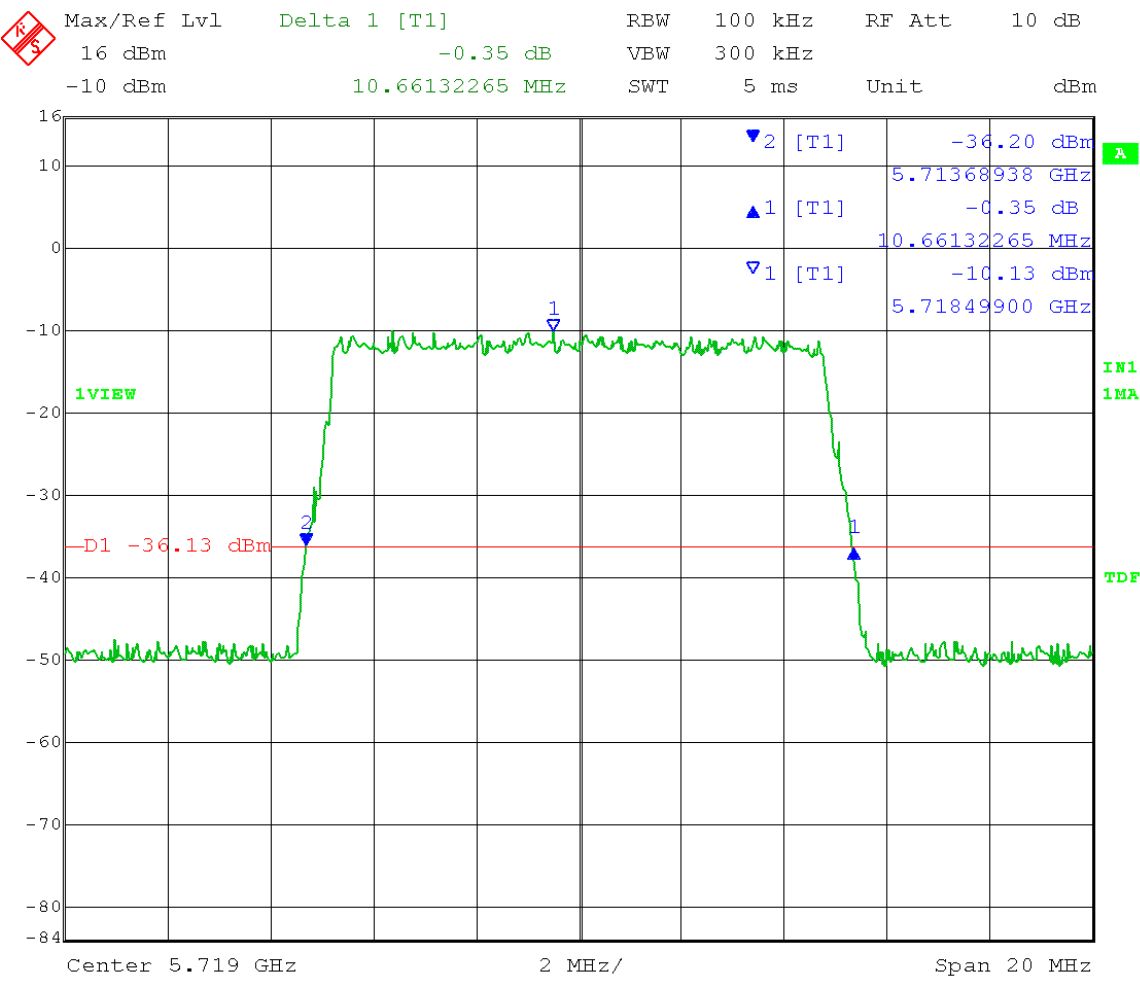
26 dB Emission Bandwidth = 10.70MHz



Date: 18.OCT.2013 10:59:18

TX 1:

26 dB Emission Bandwidth = 10.66MHz

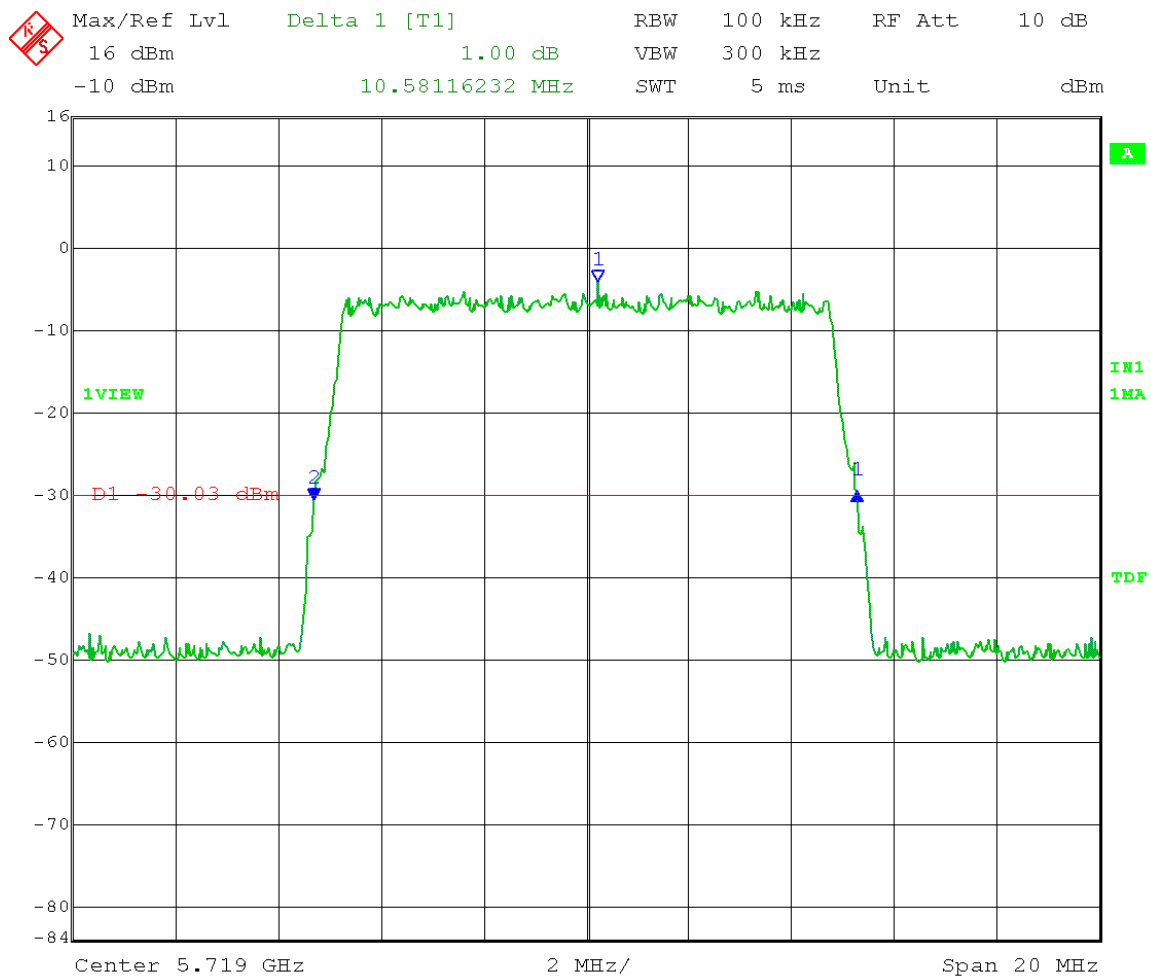


Date: 18.OCT.2013 14:04:29

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
High Channel: Transmit = 5.719 GHz 10MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

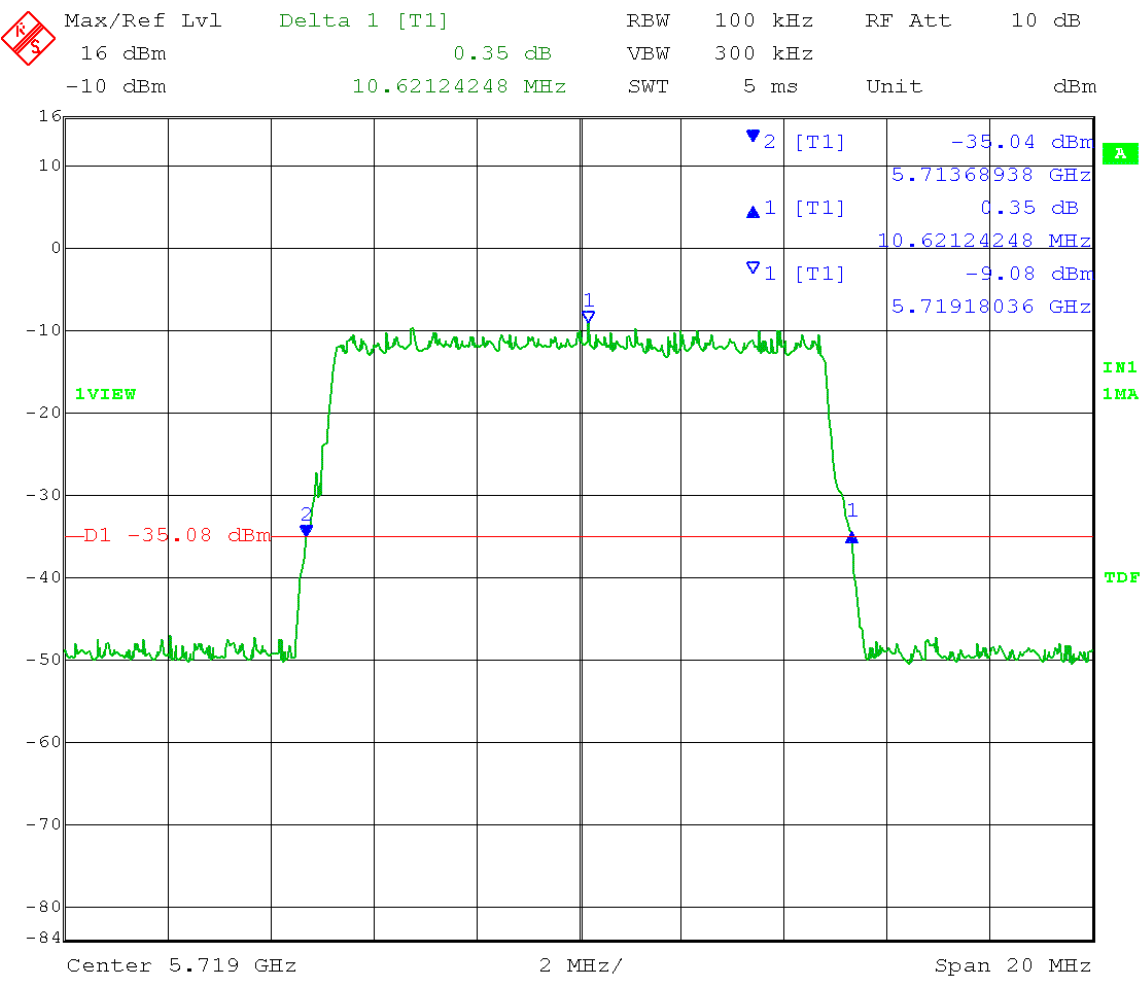
26 dB Emission Bandwidth = 10.58MHz



Date: 18.OCT.2013 11:00:53

TX 1:

26 dB Emission Bandwidth = 10.62MHz

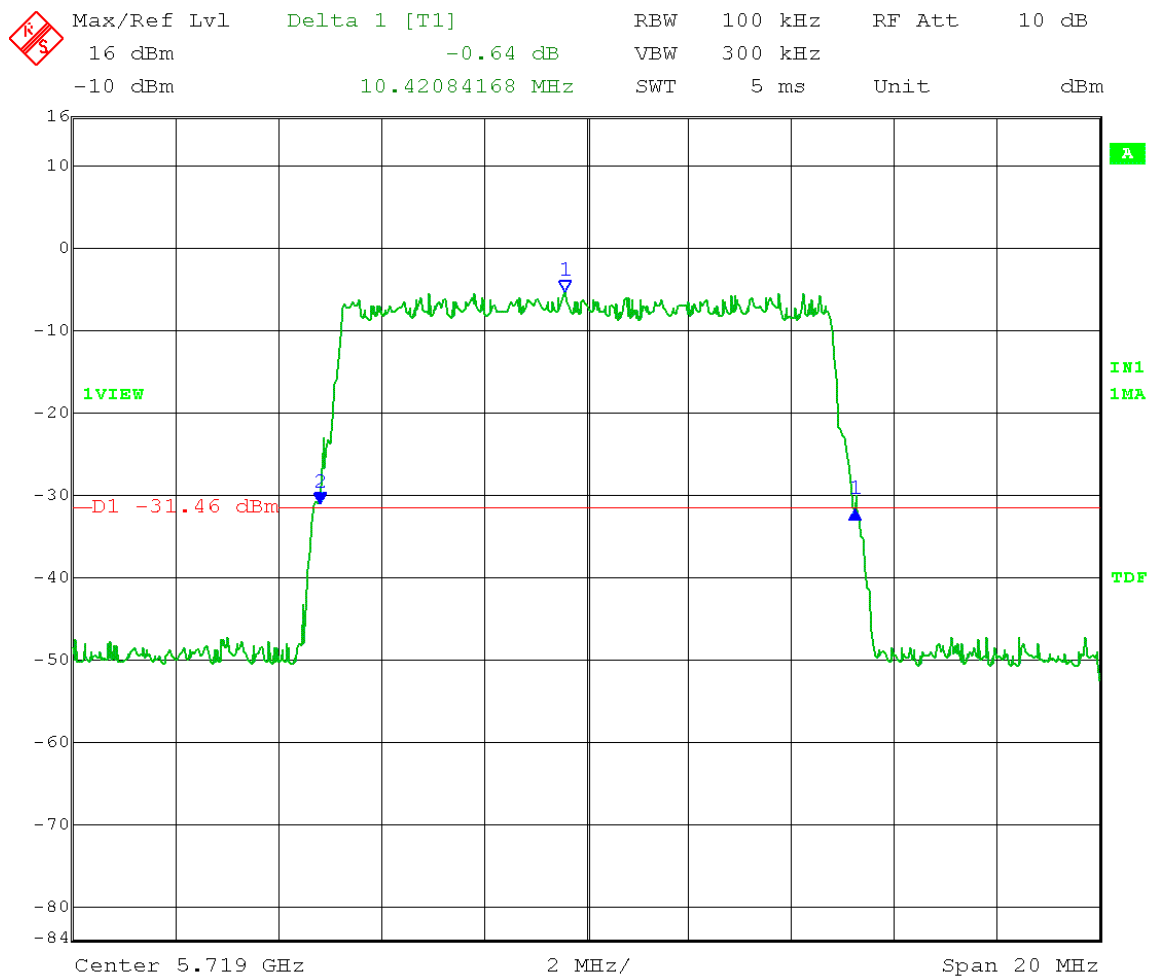


Date: 18.OCT.2013 14:03:21

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
High Channel: Transmit = 5.719 GHz 10MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

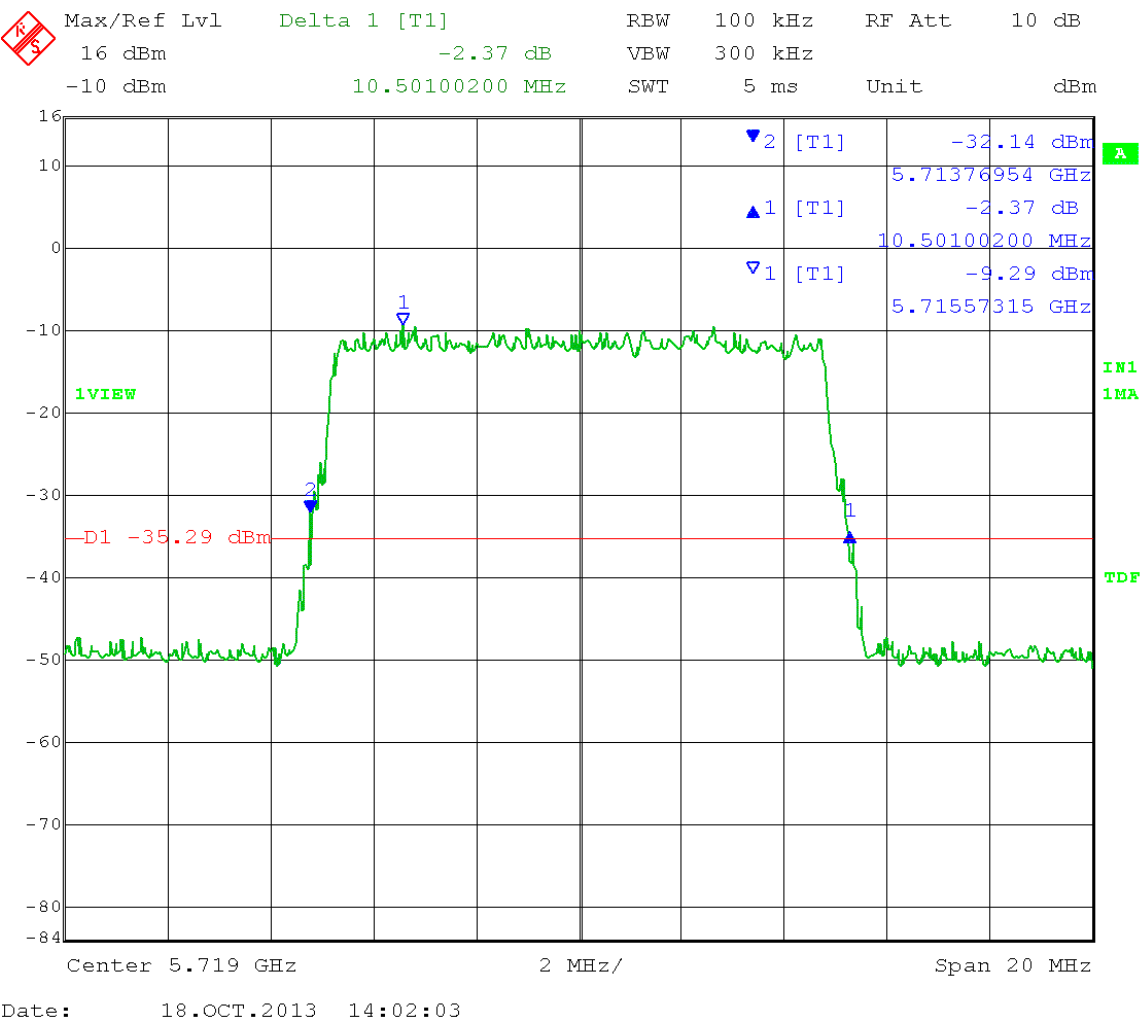
26 dB Emission Bandwidth = 10.42MHz



Date: 18.OCT.2013 11:02:17

TX 1:

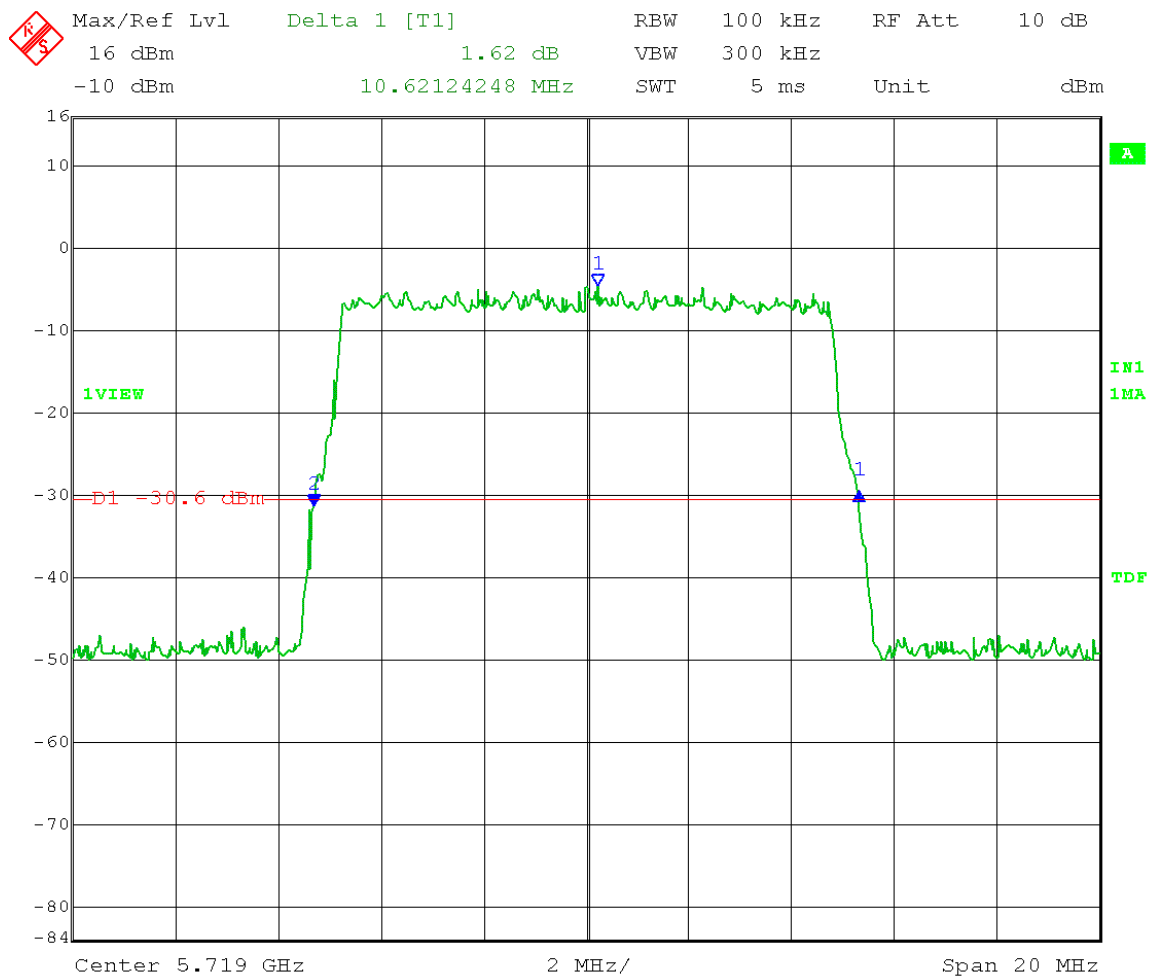
26 dB Emission Bandwidth = 10.50MHz



Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
High Channel: Transmit = 5.719 GHz 10MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

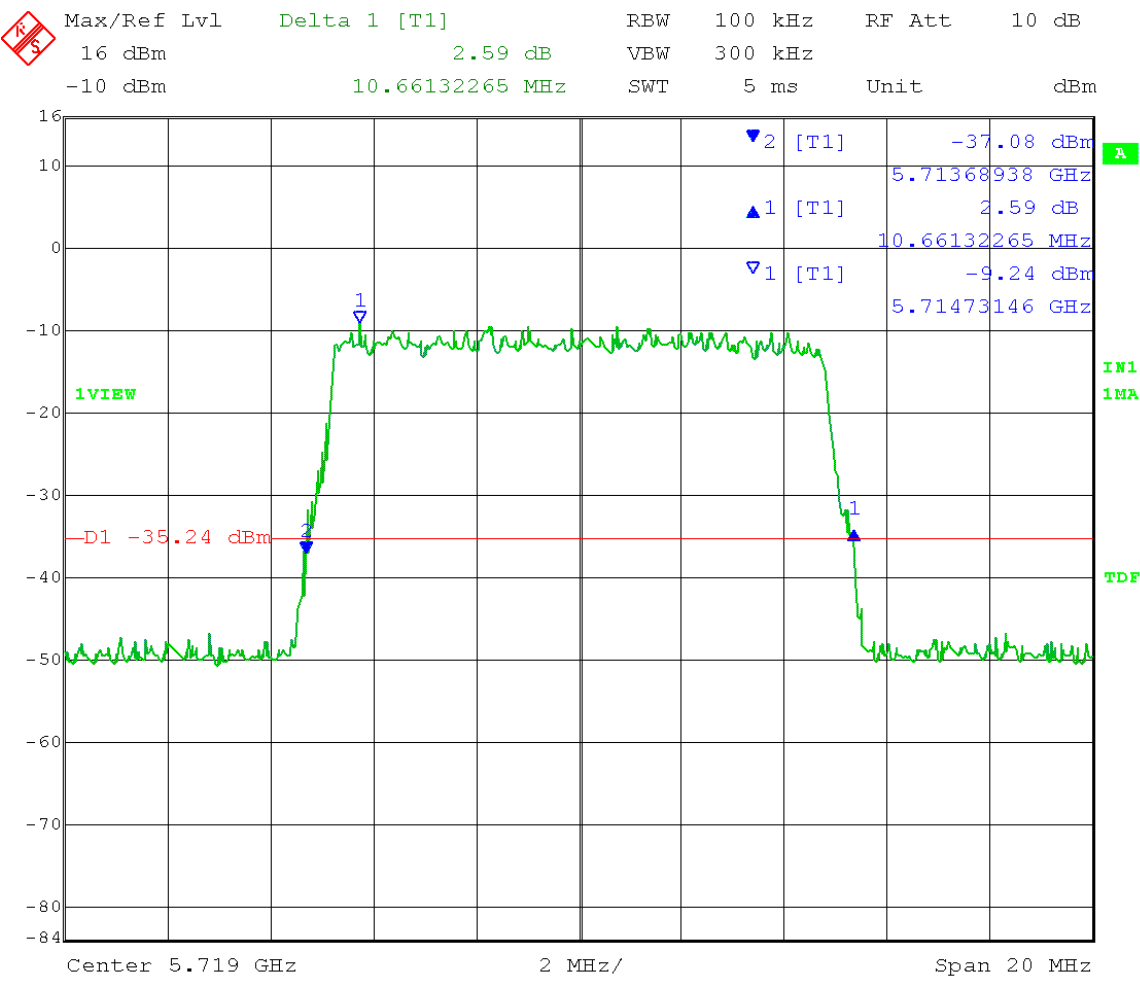
26 dB Emission Bandwidth = 10.62MHz



Date: 18.OCT.2013 11:03:54

TX 1:

26 dB Emission Bandwidth = 10.66MHz

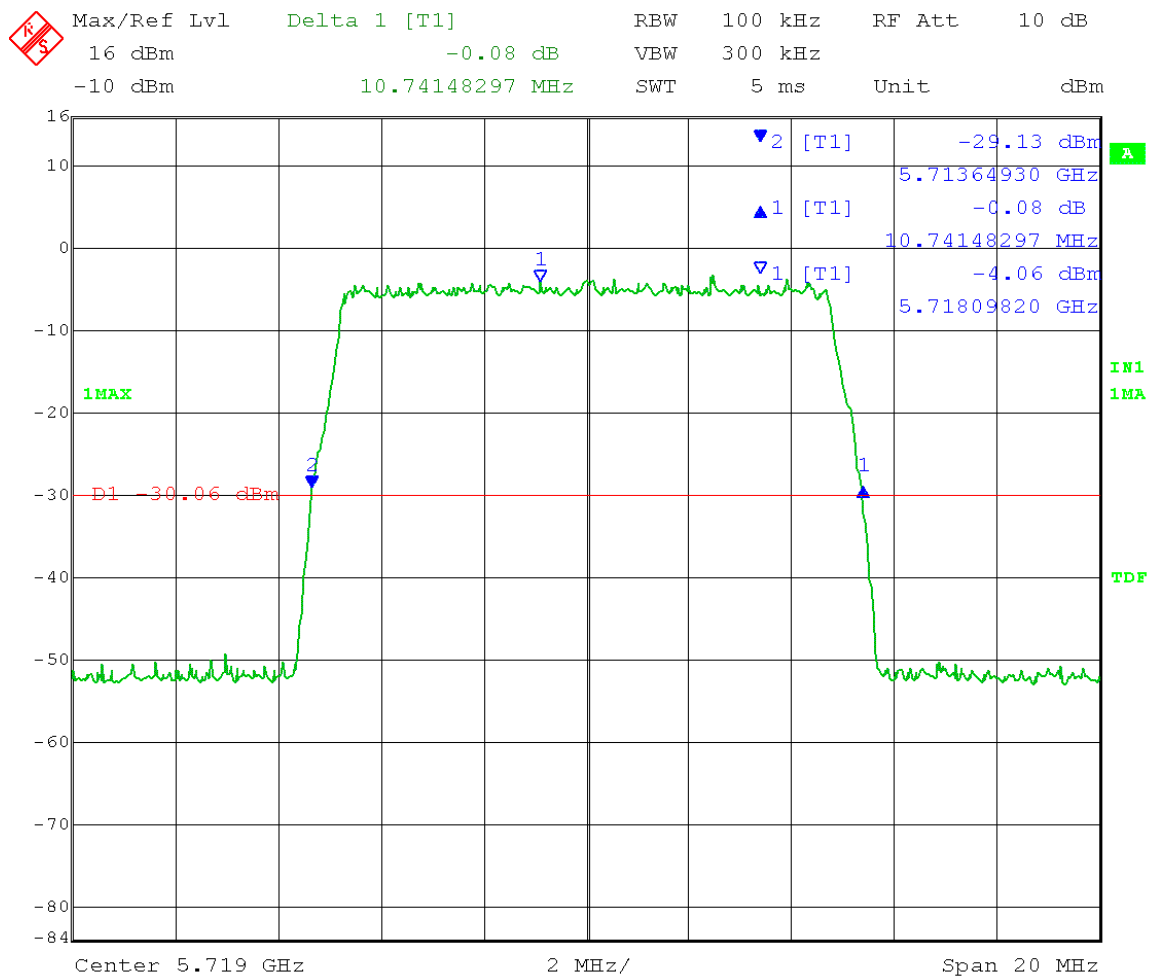


Date: 18.OCT.2013 14:00:34

Test Date: 10-4&7-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Emission Bandwidth (26 dB) - Conducted
 Operator: Lillian Li
 Test Procedure used: KDB 789033 D01 v01r03 - C)
 High Channel: Transmit = 5.719 GHz 10MHz BW QPSK
 Output power setting: 30 dBm eirp

TX 0:

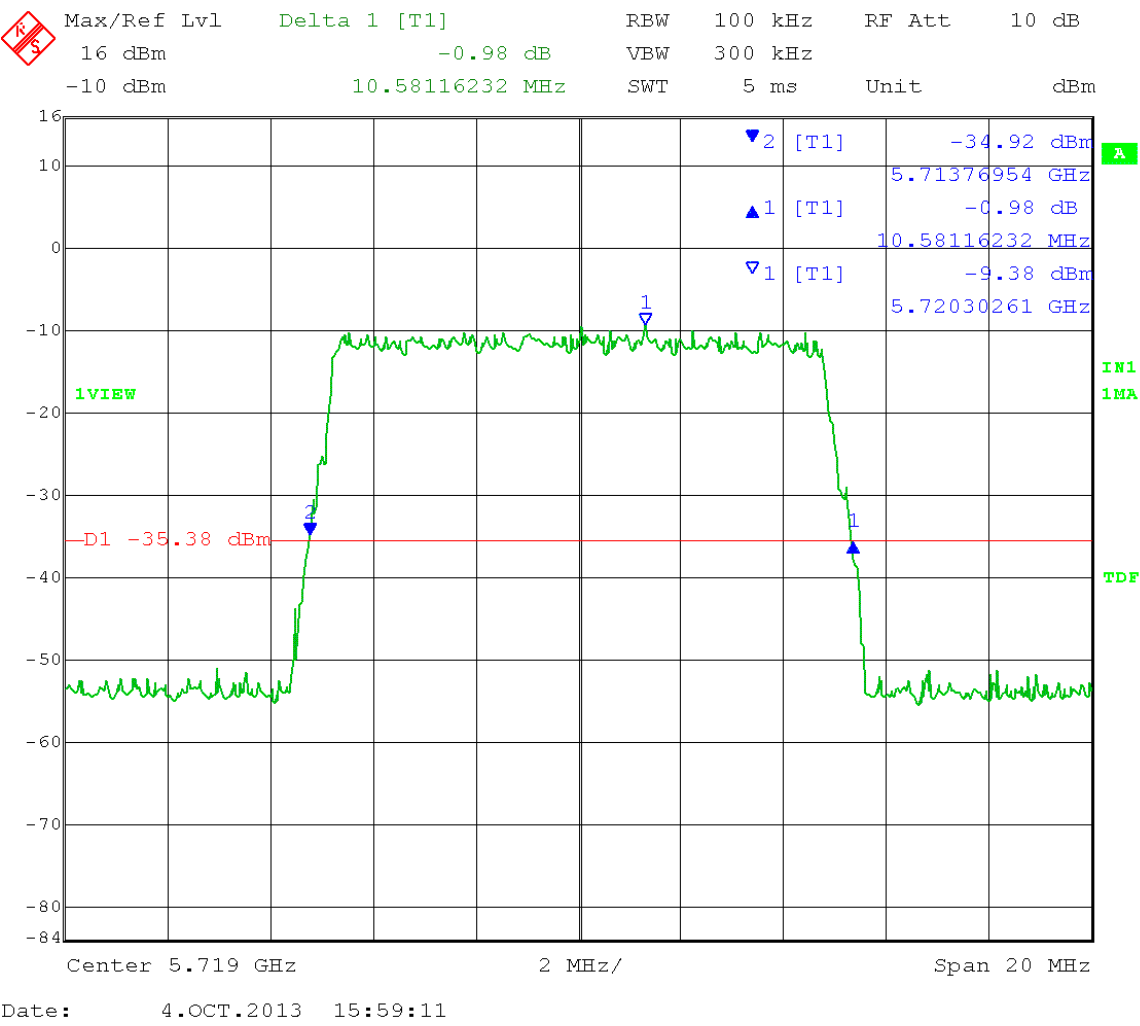
26 dB Emission Bandwidth = 10.74MHz



Date: 7.OCT.2013 10:14:15

TX 1:

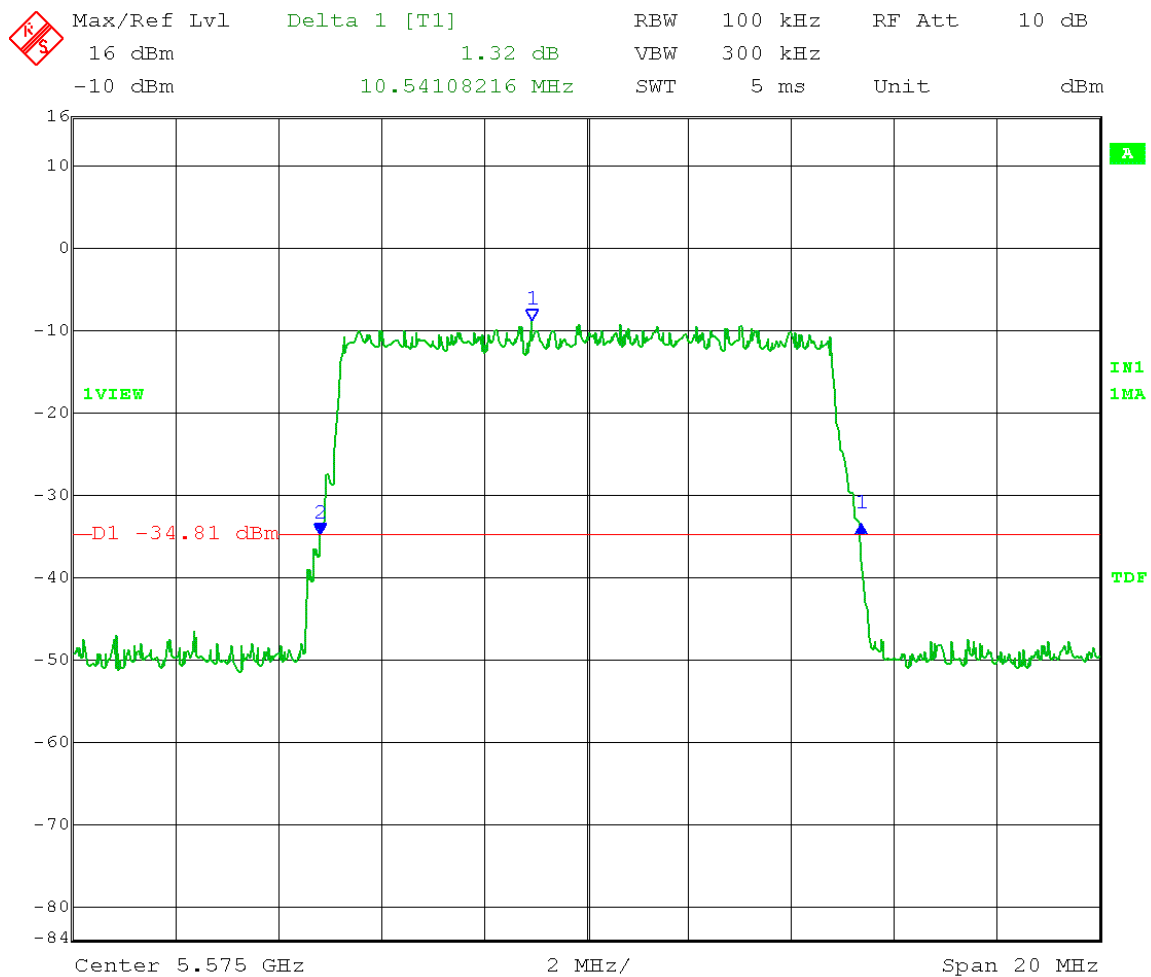
26 dB Emission Bandwidth = 10.58MHz



Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Mid Channel: Transmit = 5.575 GHz 10MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

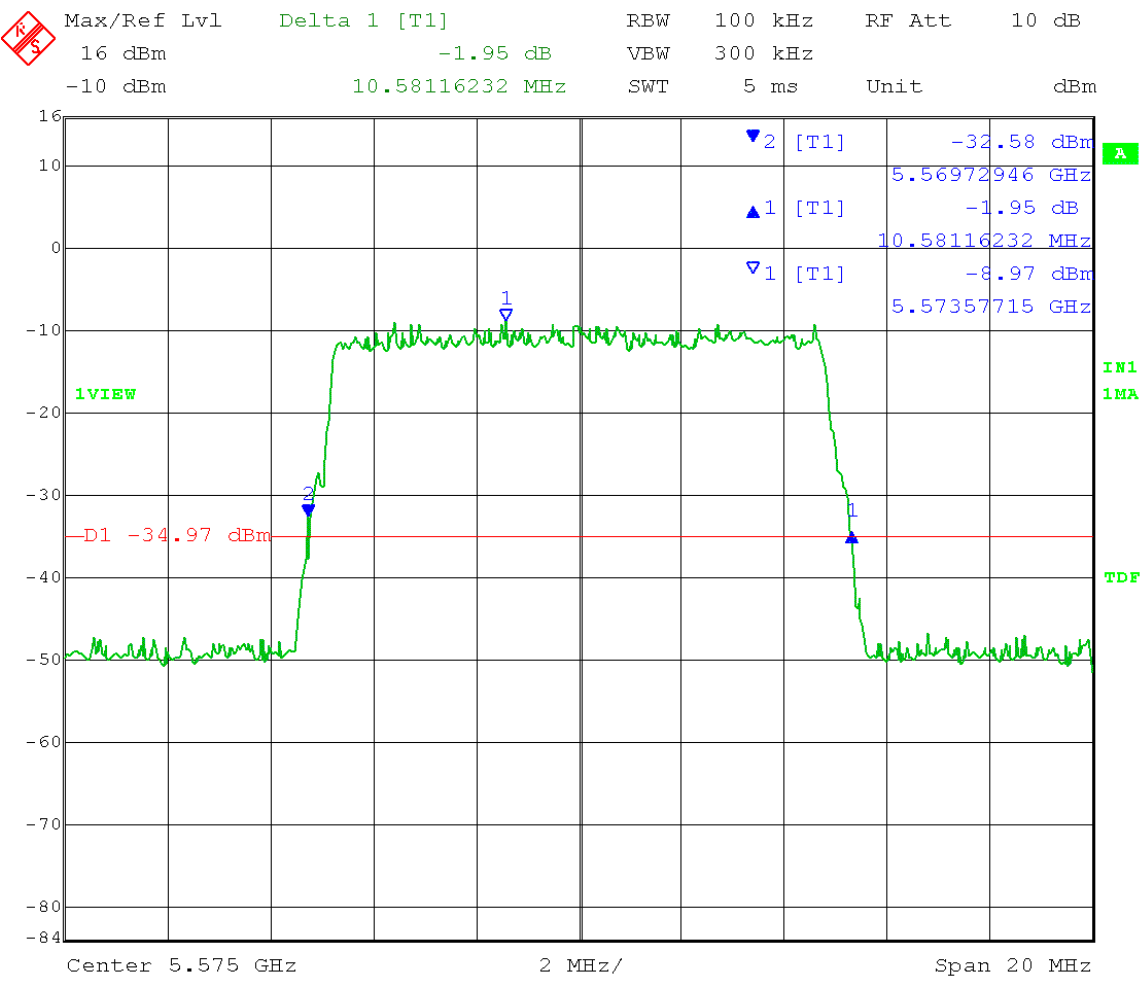
26 dB Emission Bandwidth = 10.54MHz



Date: 18.OCT.2013 10:56:07

TX 1:

26 dB Emission Bandwidth = 10.58MHz



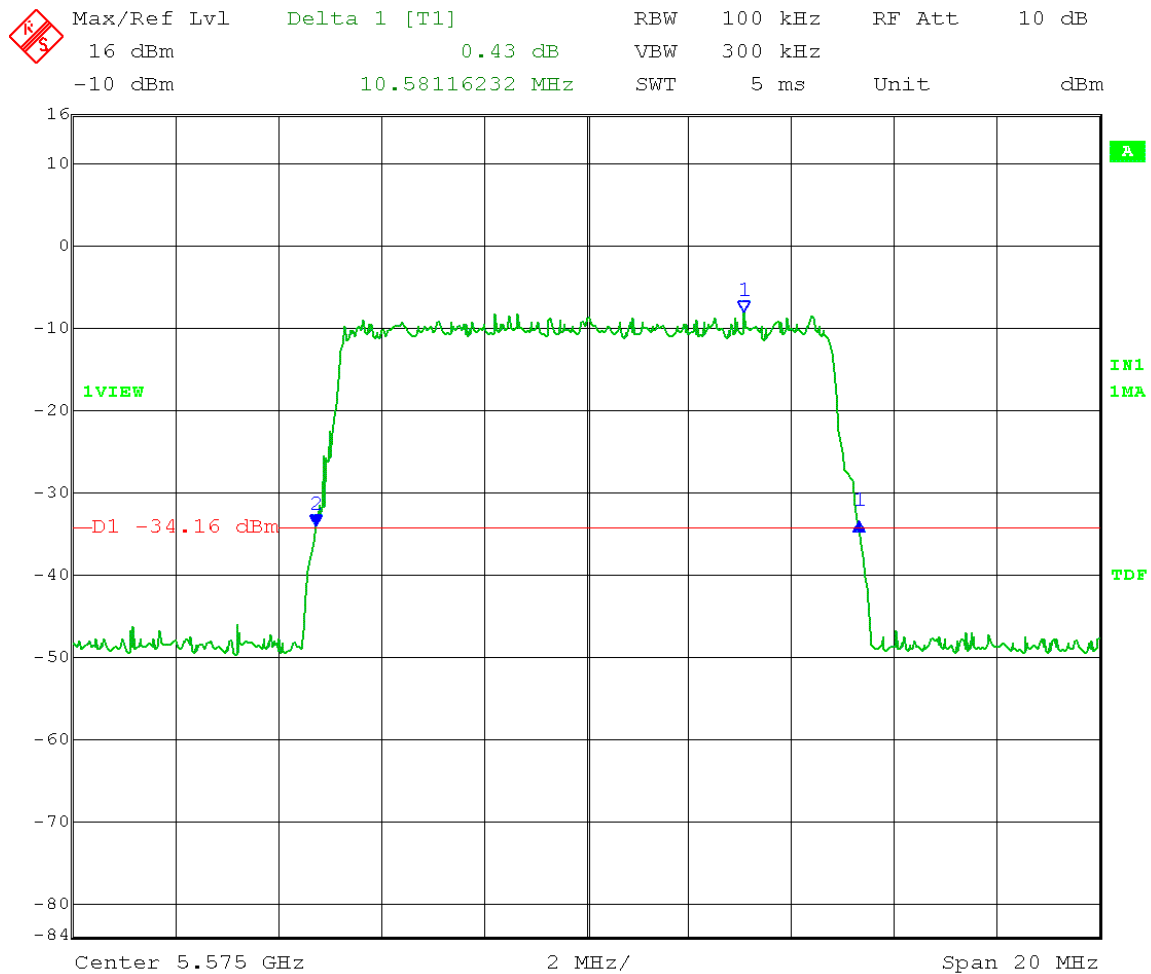
Date: 18.OCT.2013 14:06:19

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC Test Guidelines for UNII Devices under 15.407 – OET 4/8/2013
- C) Emission bandwidth(Page 3)
RBW = 200 kHz
Mid Channel: Transmit = 5.575 GHz
Output power setting: 30 dBm eirp

VBW = 500 kHz
10MHz BW 64QAM

Channel 0:

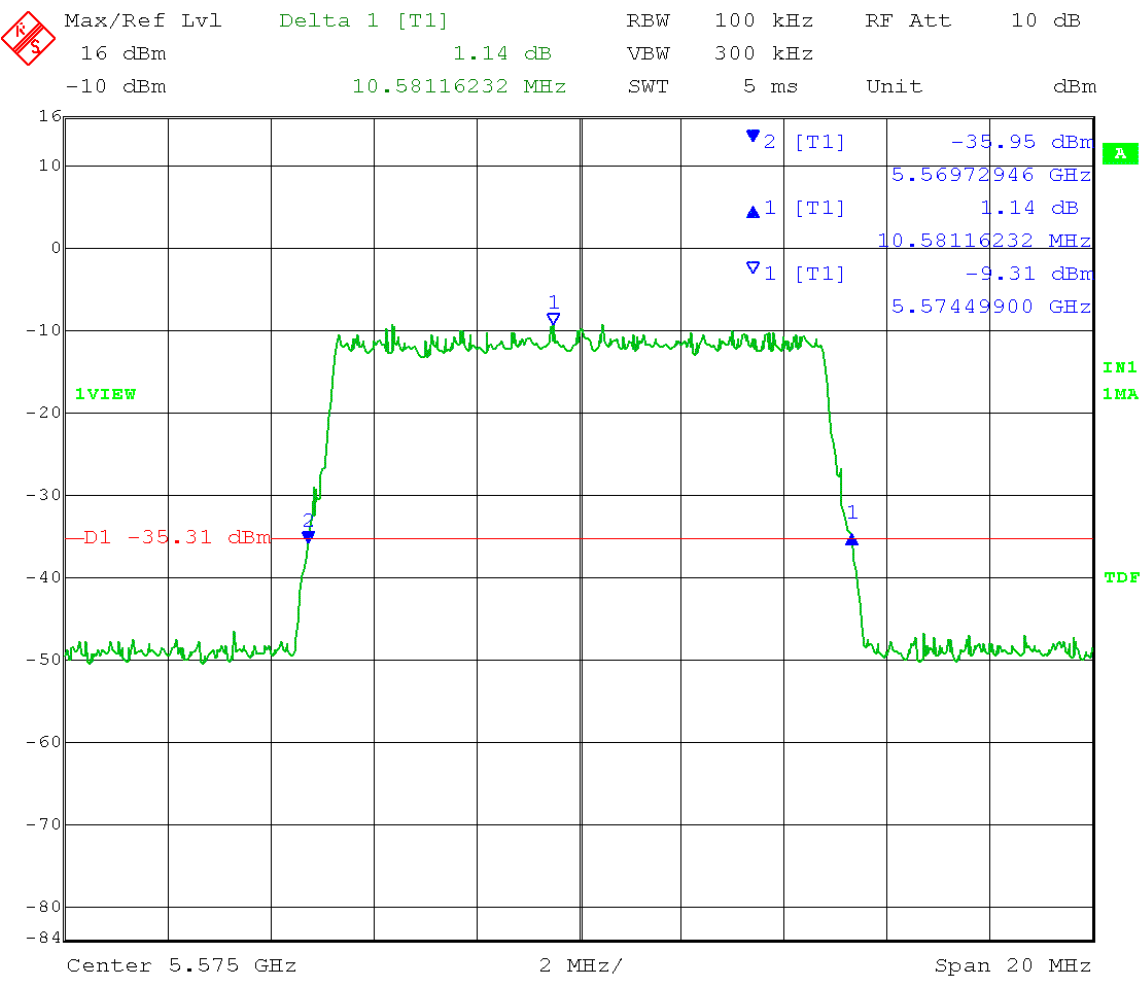
26 dB Emission Bandwidth = 10.58MHz



Date: 18.OCT.2013 10:54:45

Channel 1:

26 dB Emission Bandwidth = 10.58MHz

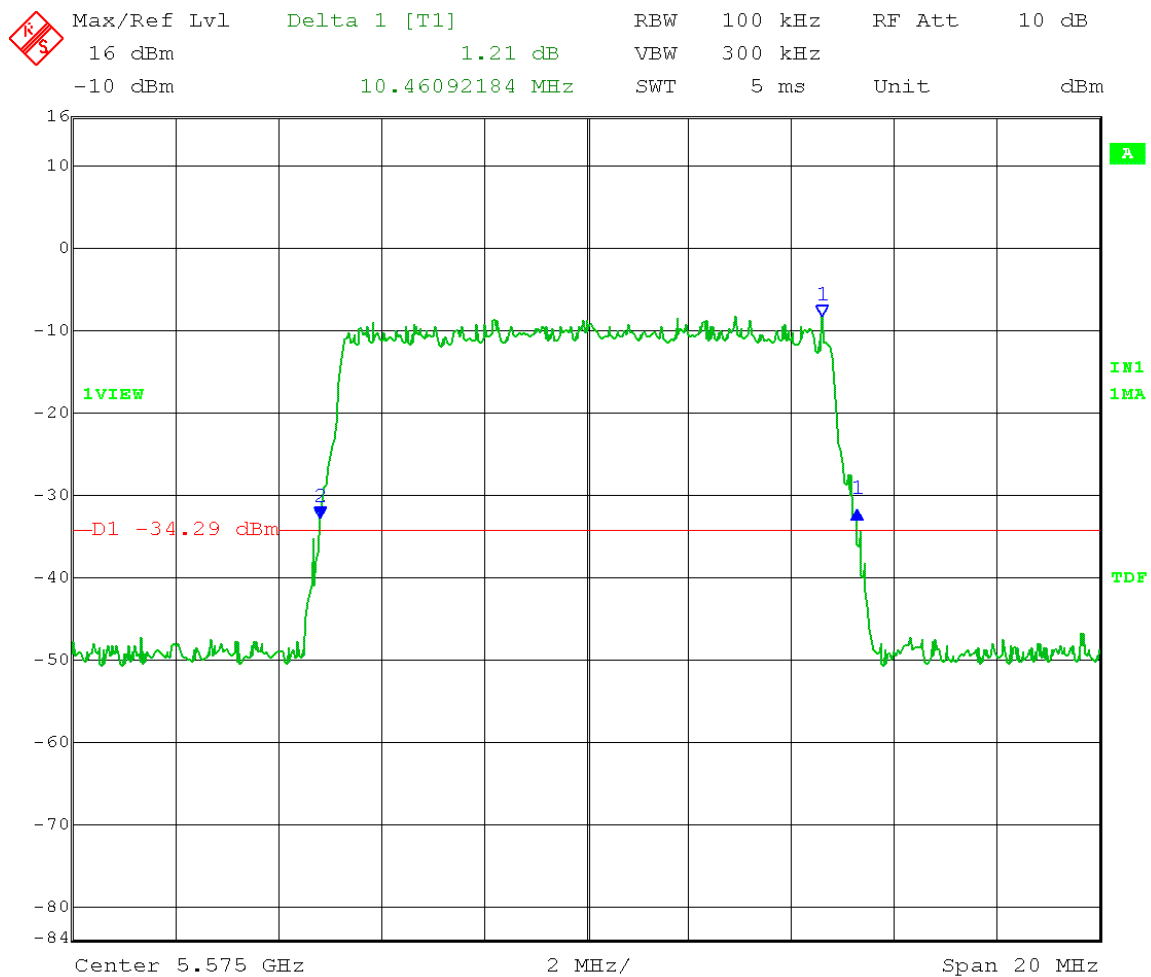


Date: 18.OCT.2013 14:07:35

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Mid Channel: Transmit = 5.575 GHz 10MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

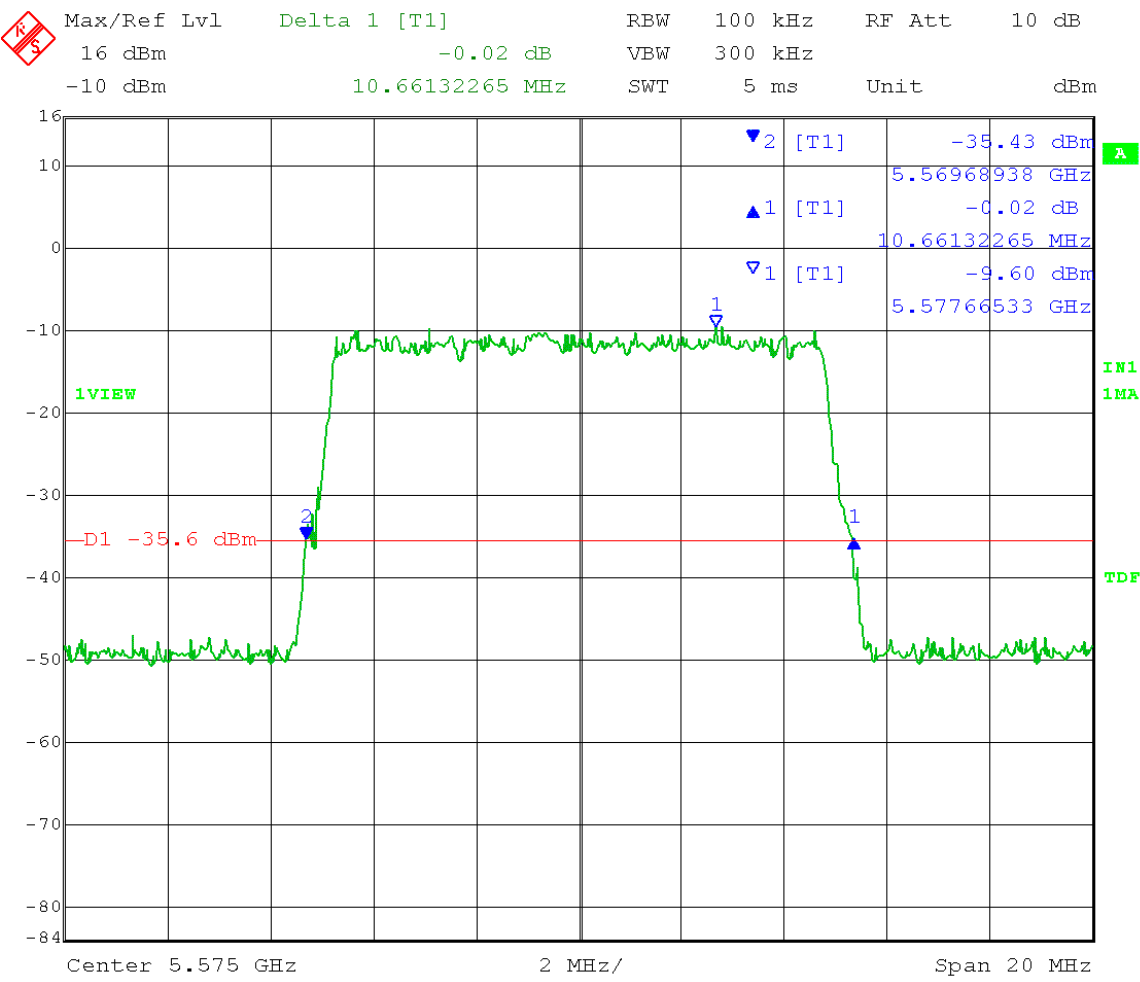
26 dB Emission Bandwidth = 10.46MHz



Date: 18.OCT.2013 10:53:00

TX 1:

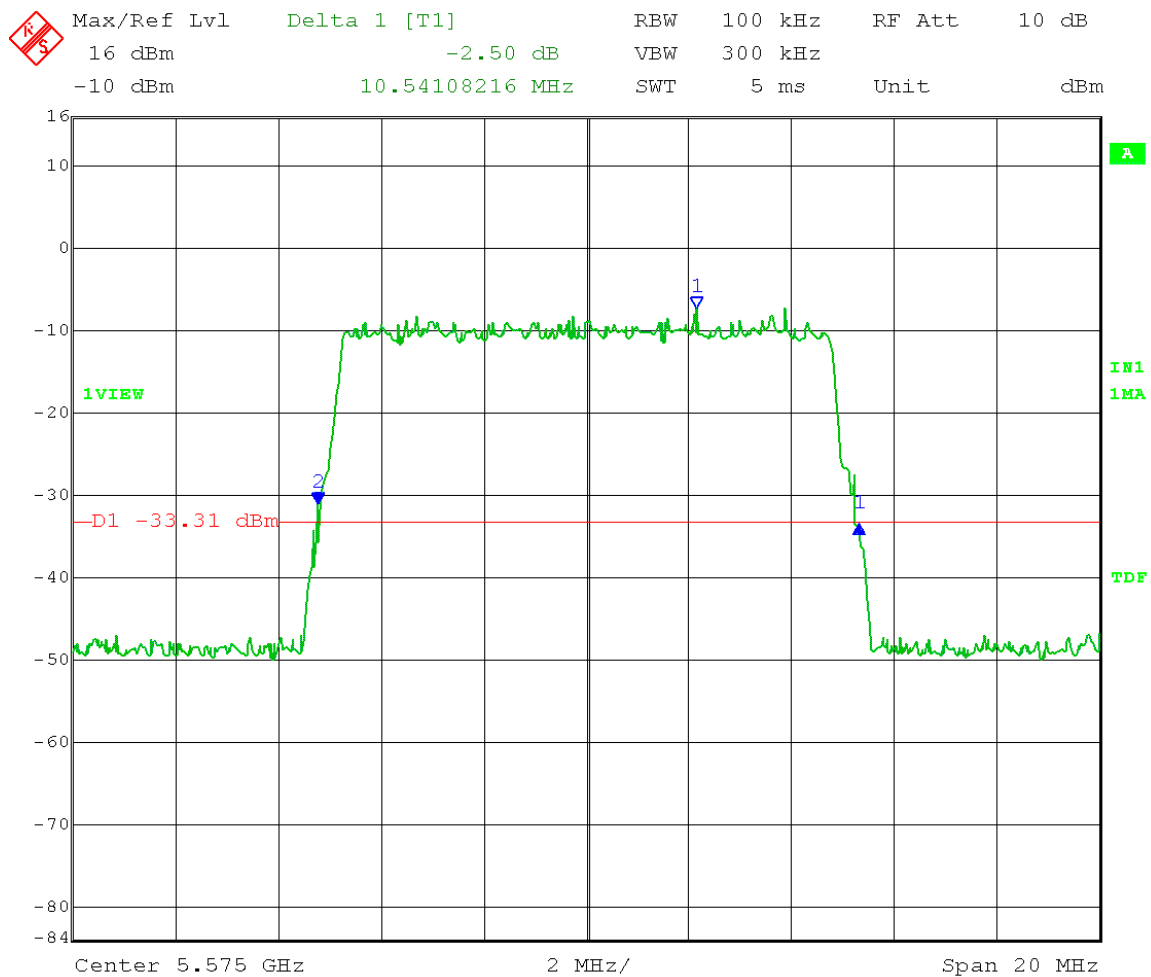
26 dB Emission Bandwidth = 10.66MHz



Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Mid Channel: Transmit = 5.575 GHz 10MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

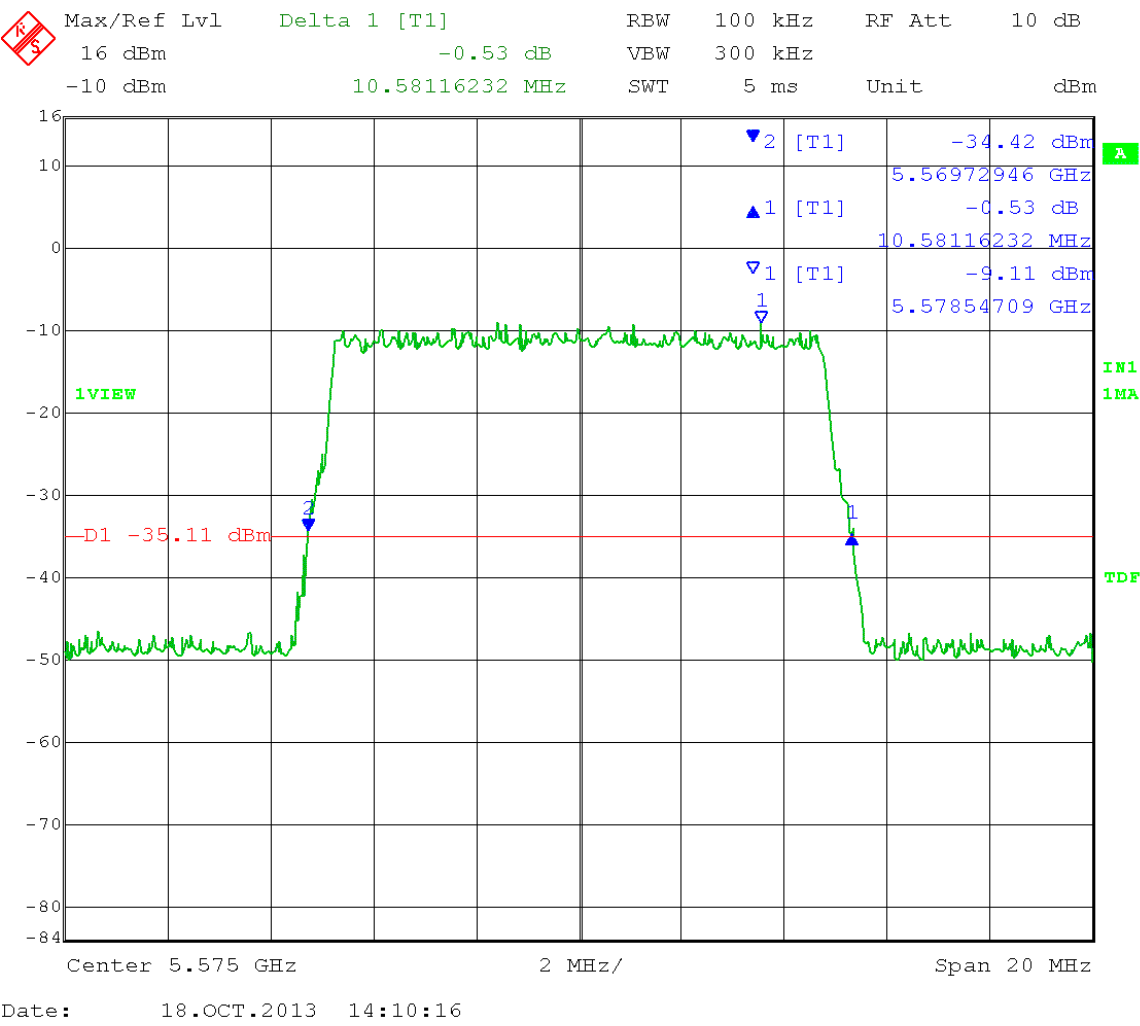
26 dB Emission Bandwidth = 10.54MHz



Date: 18.OCT.2013 10:51:01

TX 1:

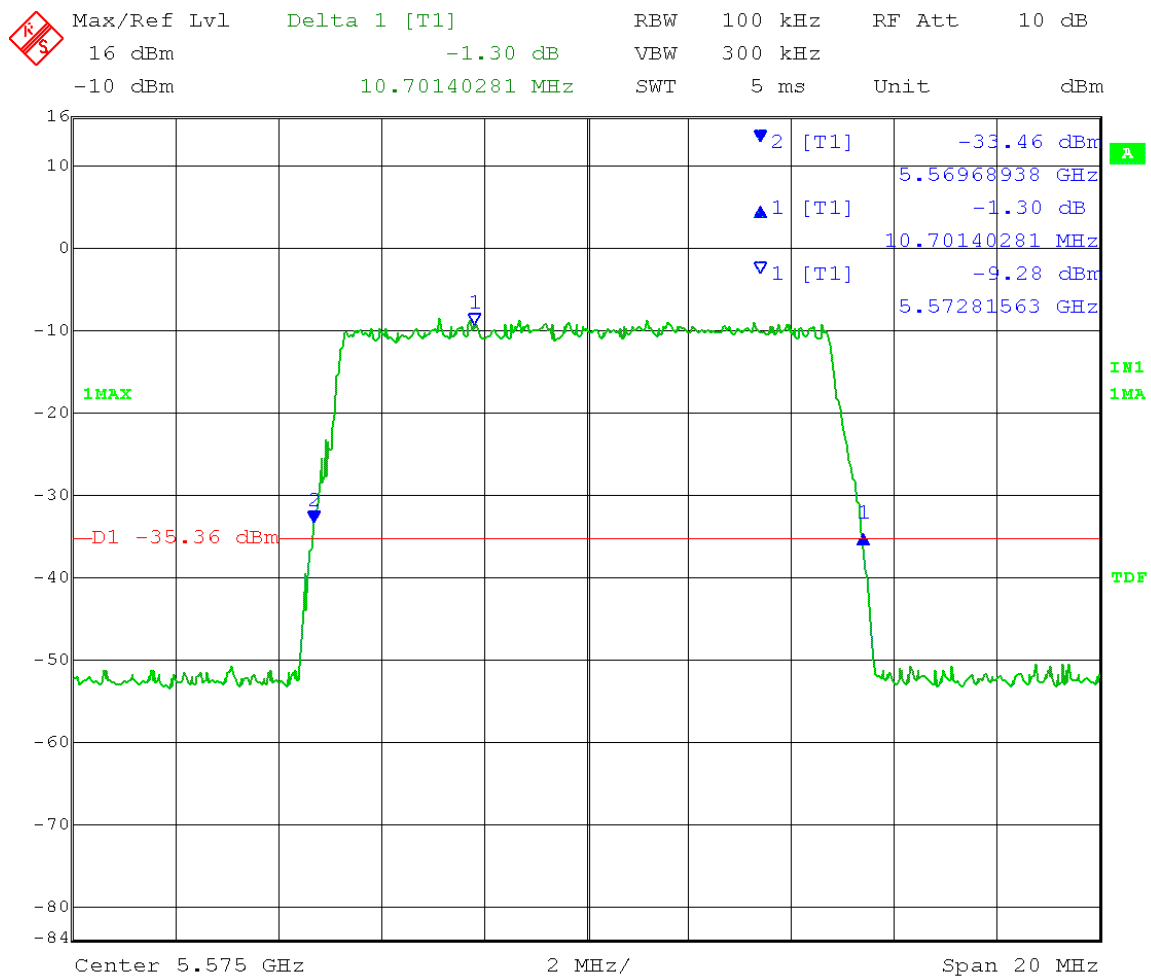
26 dB Emission Bandwidth = 10.58MHz



Test Date: 10-4&7-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Mid Channel: Transmit = 5.575 GHz 10MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

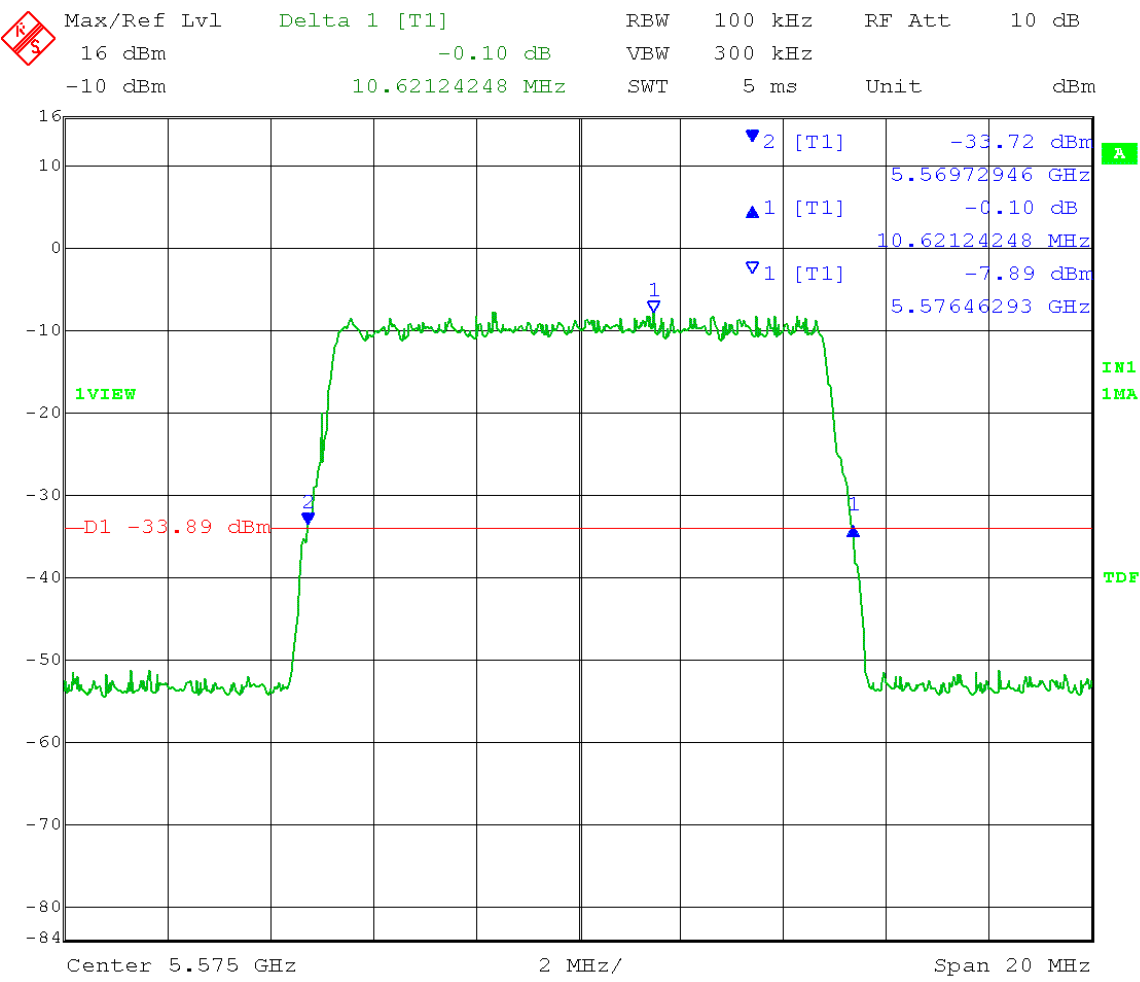
26 dB Emission Bandwidth = 10.70MHz



Date: 7.OCT.2013 10:18:25

TX 1:

26 dB Emission Bandwidth = 10.62MHz

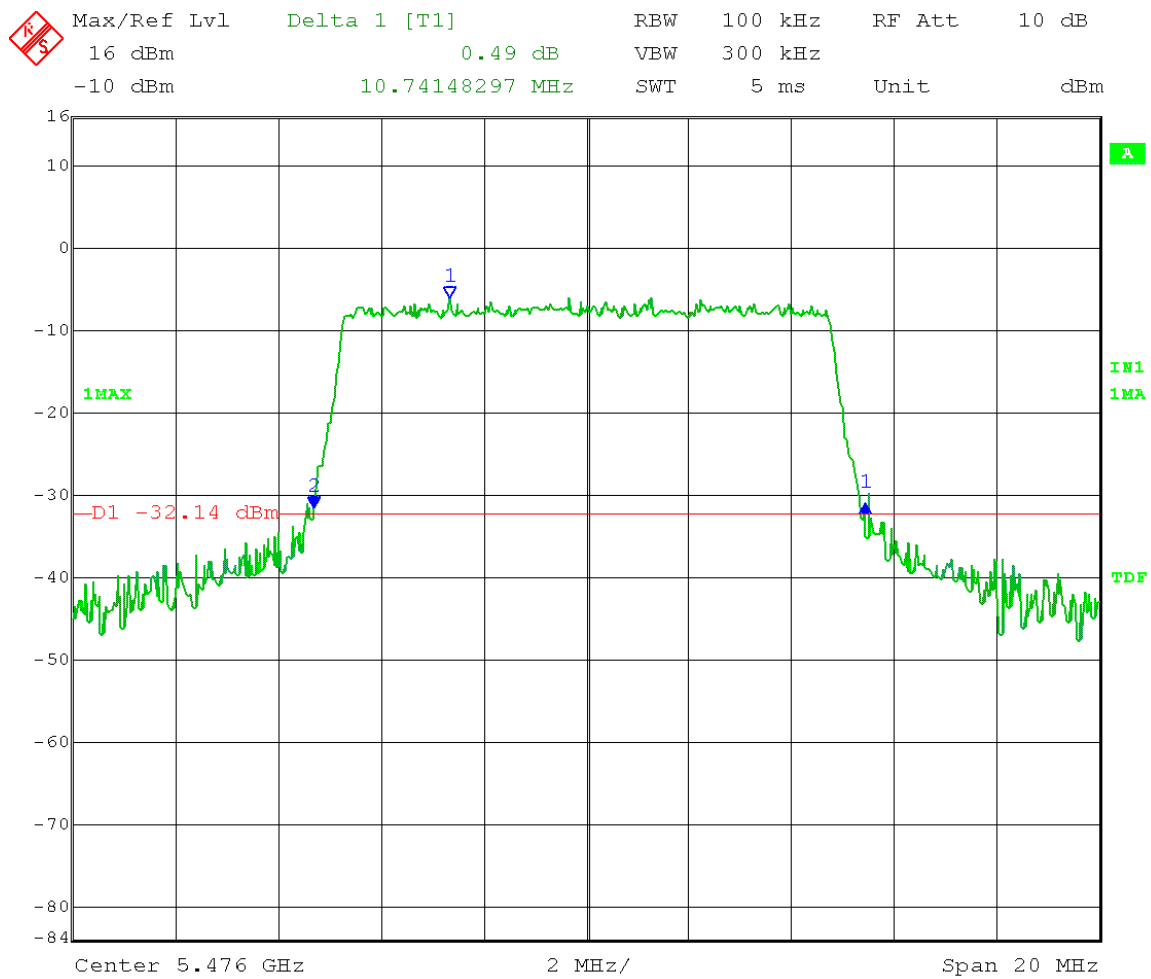


Date: 4.OCT.2013 15:56:17

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Low Channel: Transmit = 5.476 GHz 10MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

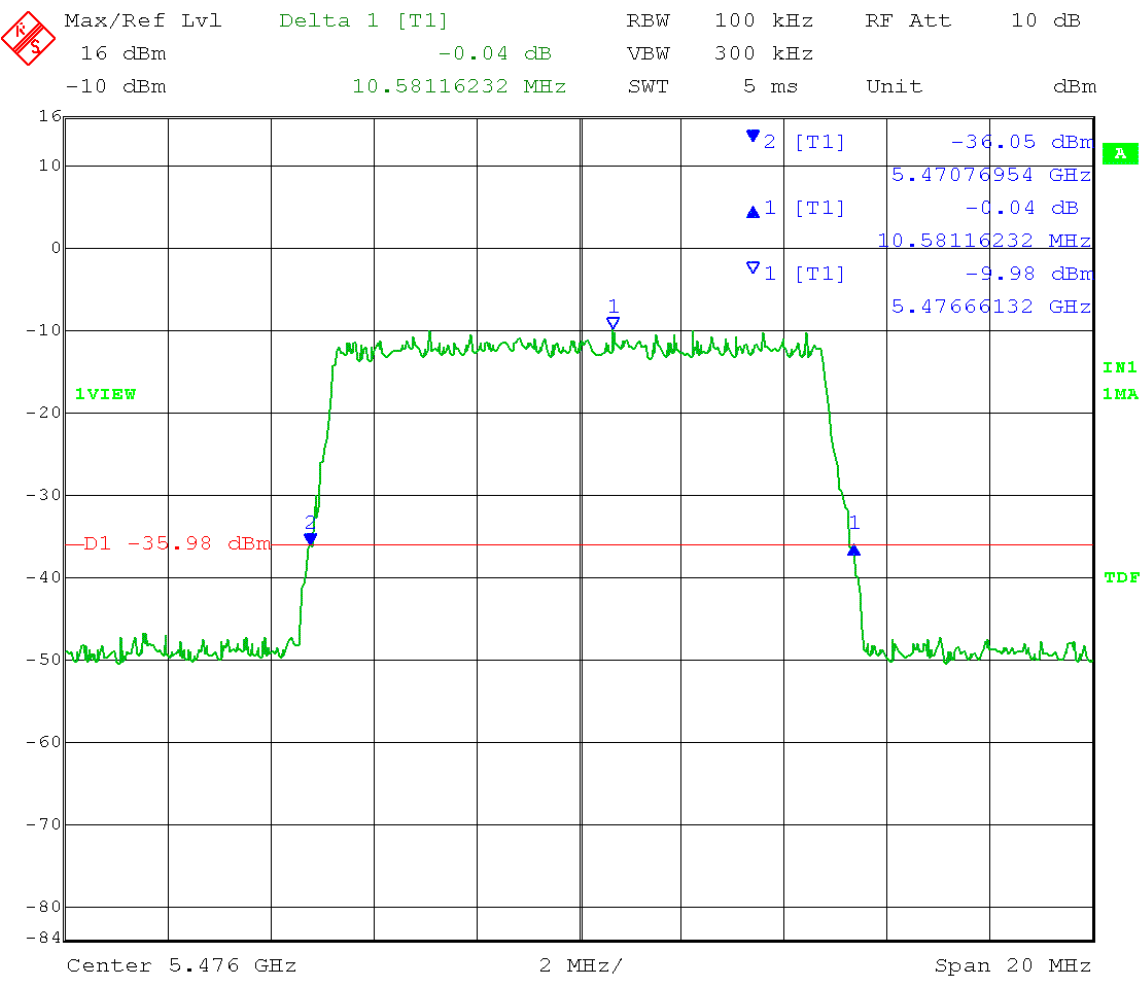
26 dB Emission Bandwidth = 10.74MHz



Date: 18.OCT.2013 10:42:52

TX 1:

26 dB Emission Bandwidth = 10.58MHz

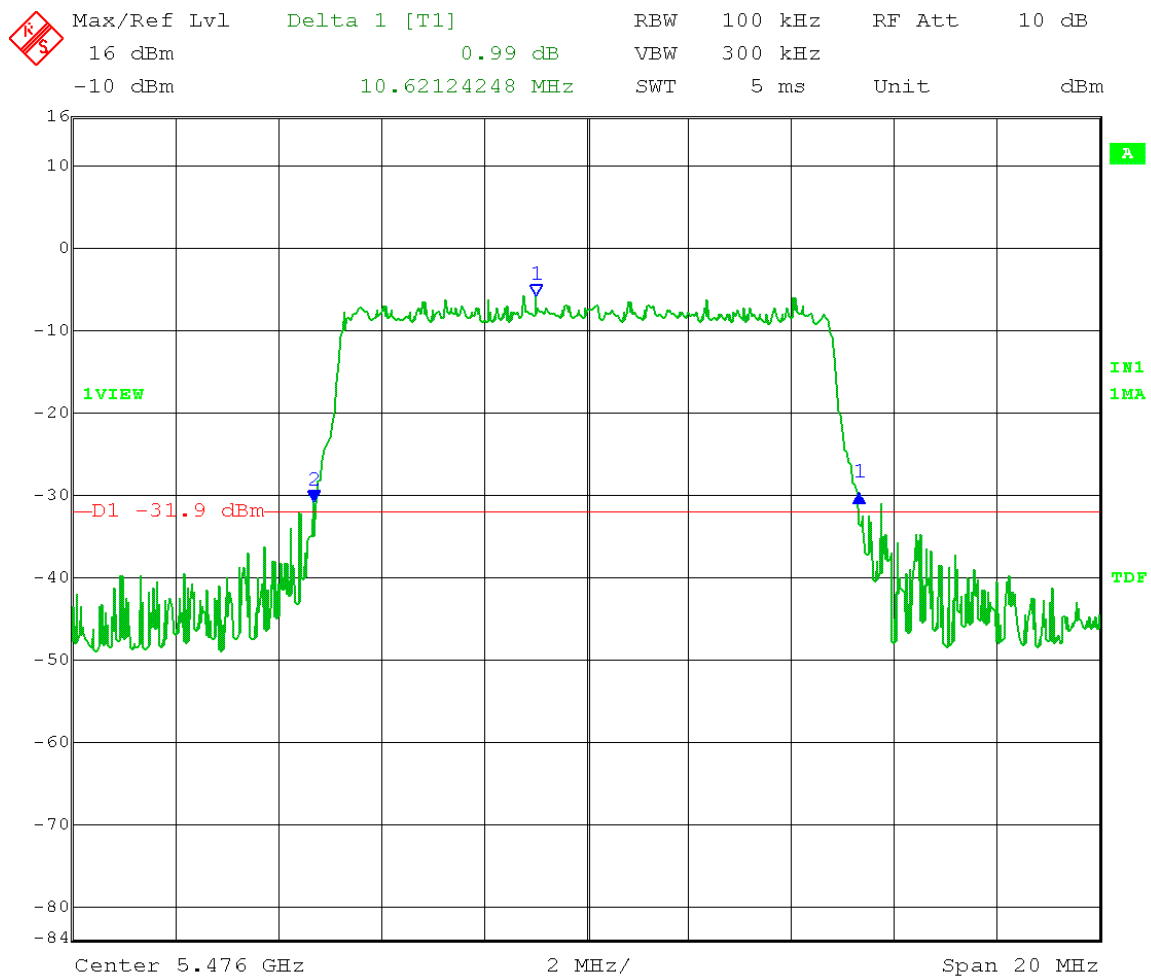


Date: 18.OCT.2013 14:19:31

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Low Channel: Transmit = 5.476 GHz 10MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

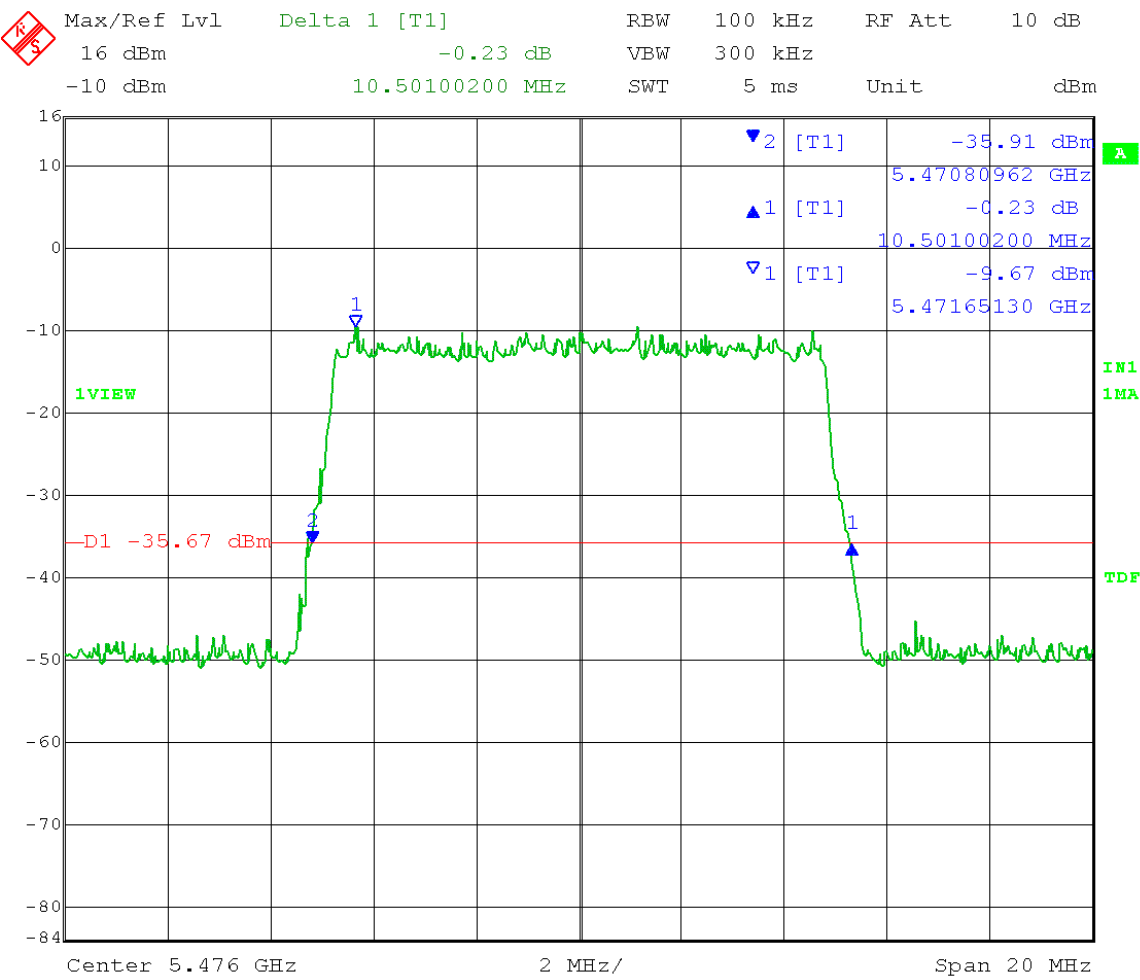
26 dB Emission Bandwidth = 10.62MHz



Date: 18.OCT.2013 10:45:03

TX 1:

26 dB Emission Bandwidth = 10.50MHz

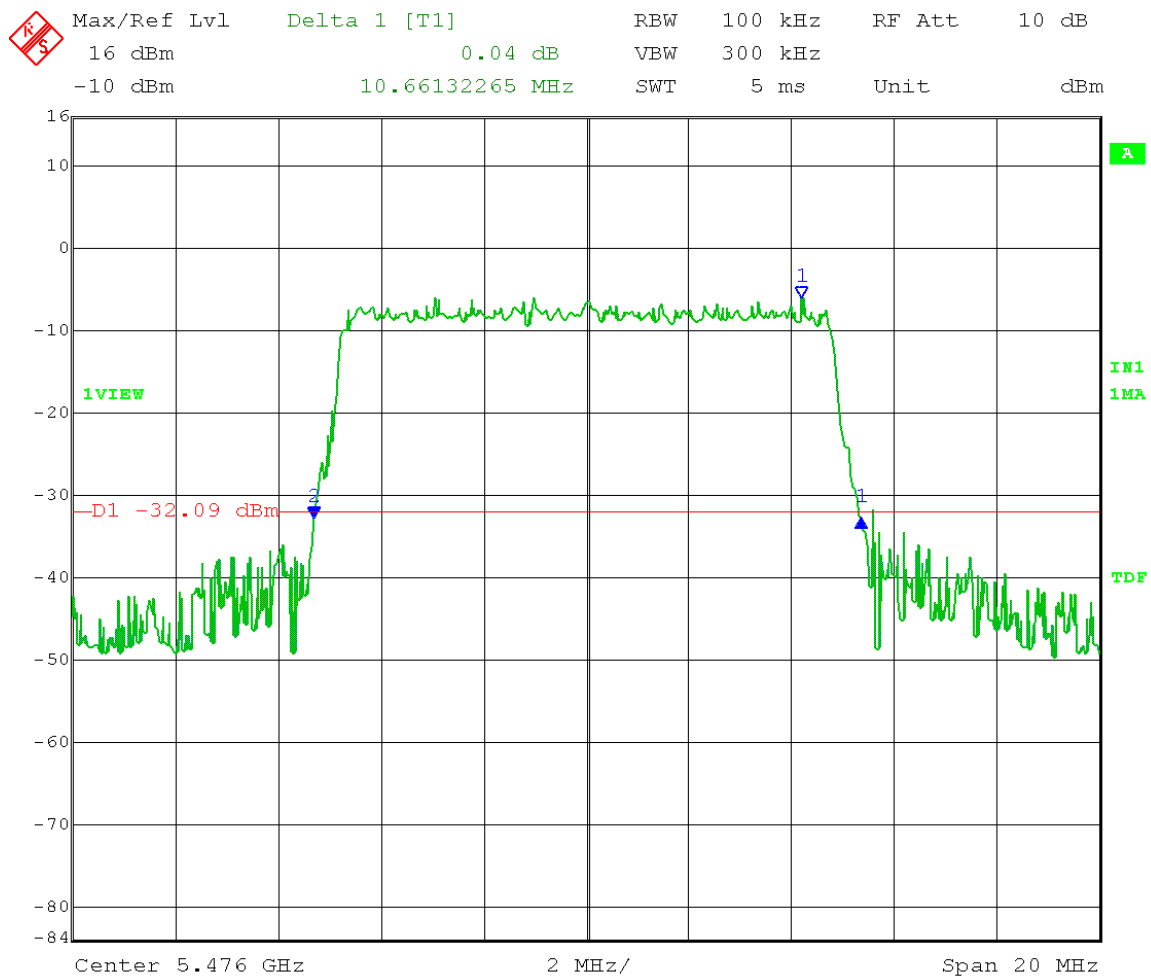


Date: 18.OCT.2013 14:17:46

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Low Channel: Transmit = 5.476 GHz 10MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

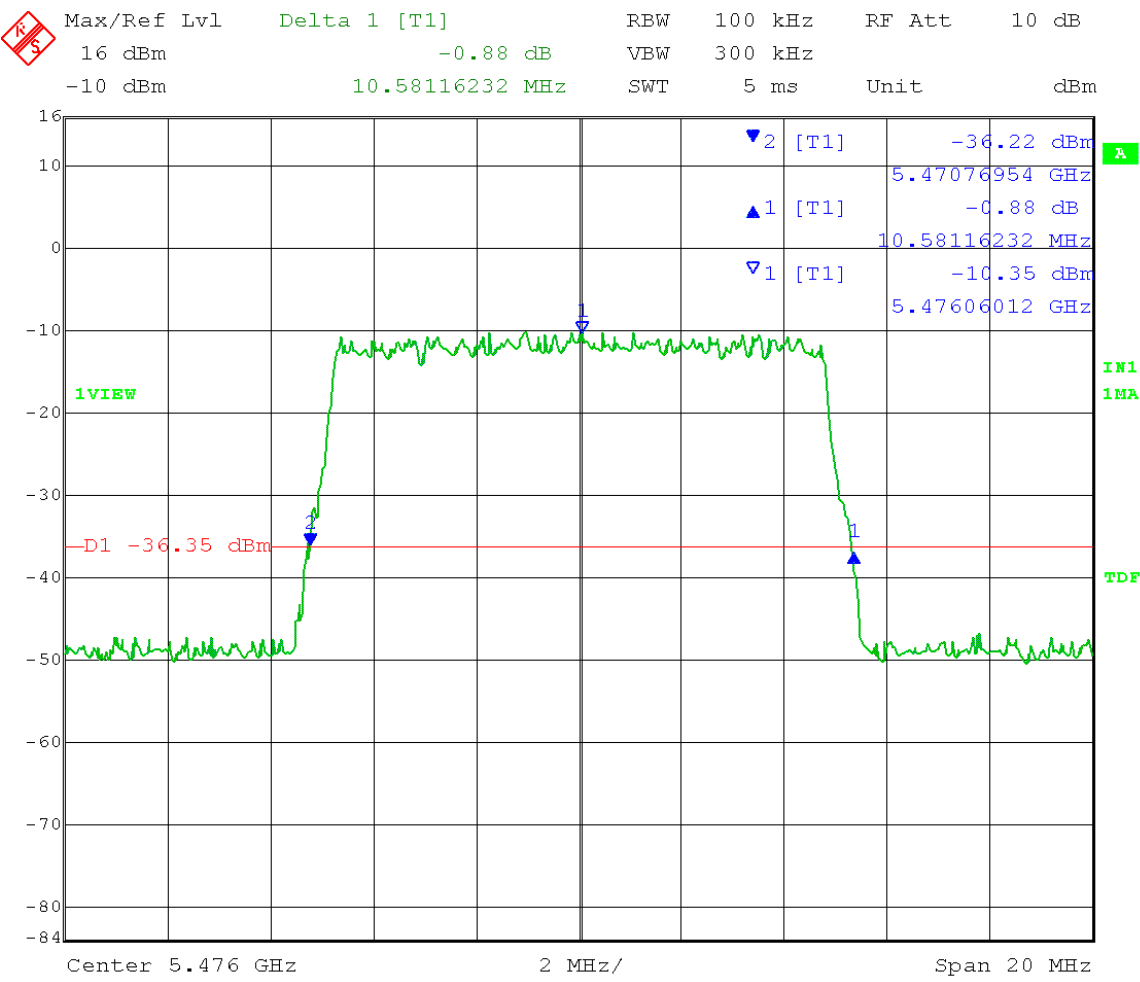
26 dB Emission Bandwidth = 10.66MHz



Date: 18.OCT.2013 10:46:46

TX 1:

26 dB Emission Bandwidth = 10.58MHz

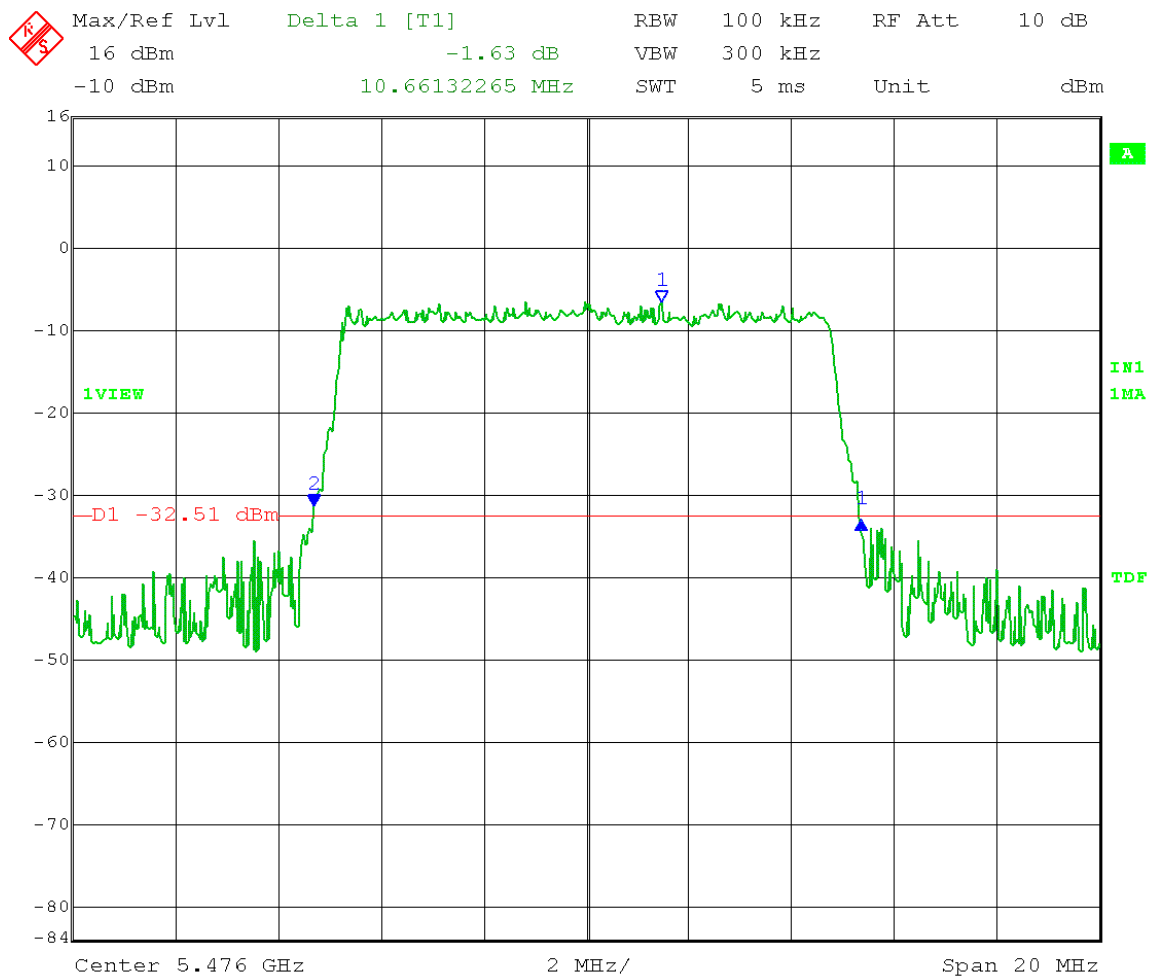


Date: 18.OCT.2013 14:16:23

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Low Channel: Transmit = 5.476 GHz 10MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

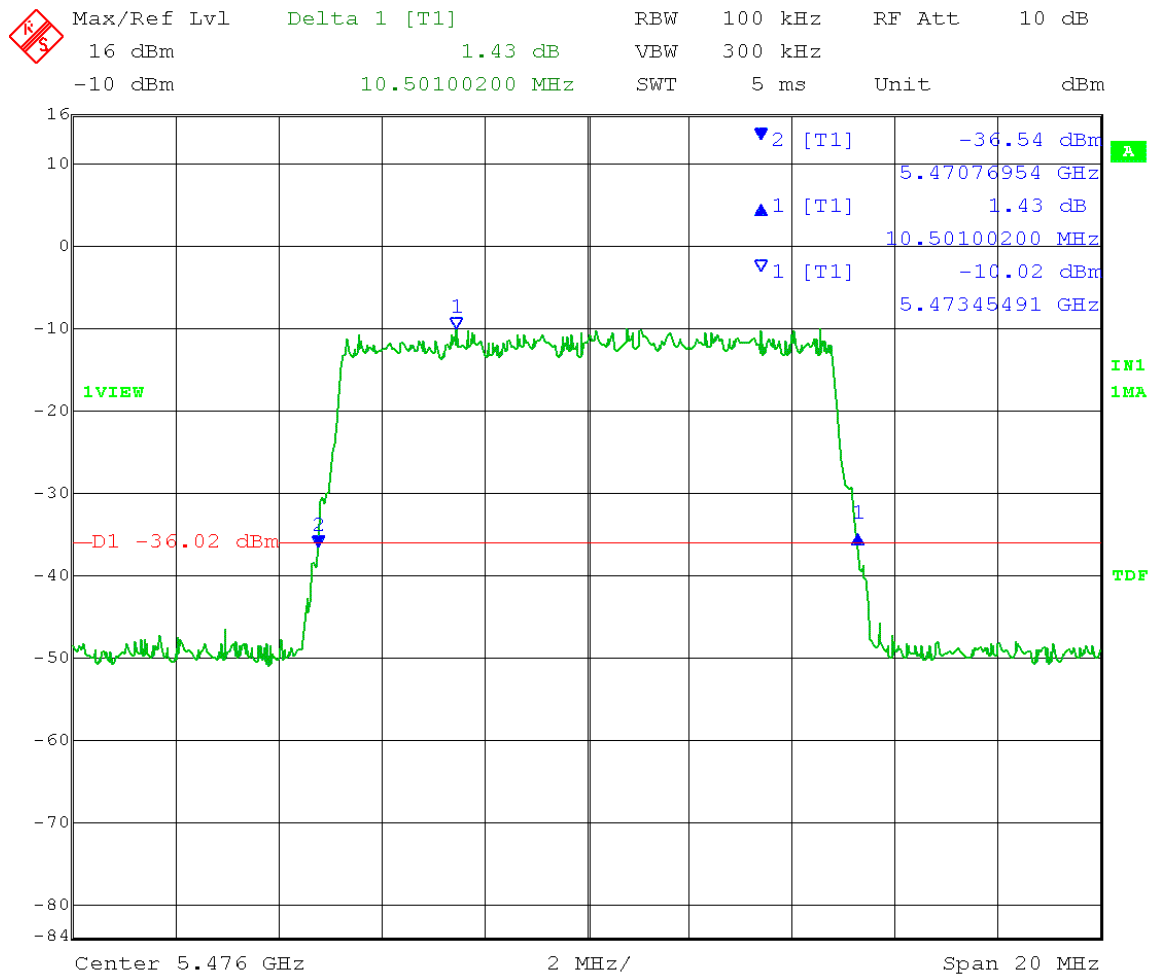
26 dB Emission Bandwidth = 10.66MHz



Date: 18.OCT.2013 10:48:32

TX 1:

26 dB Emission Bandwidth = 10.50MHz

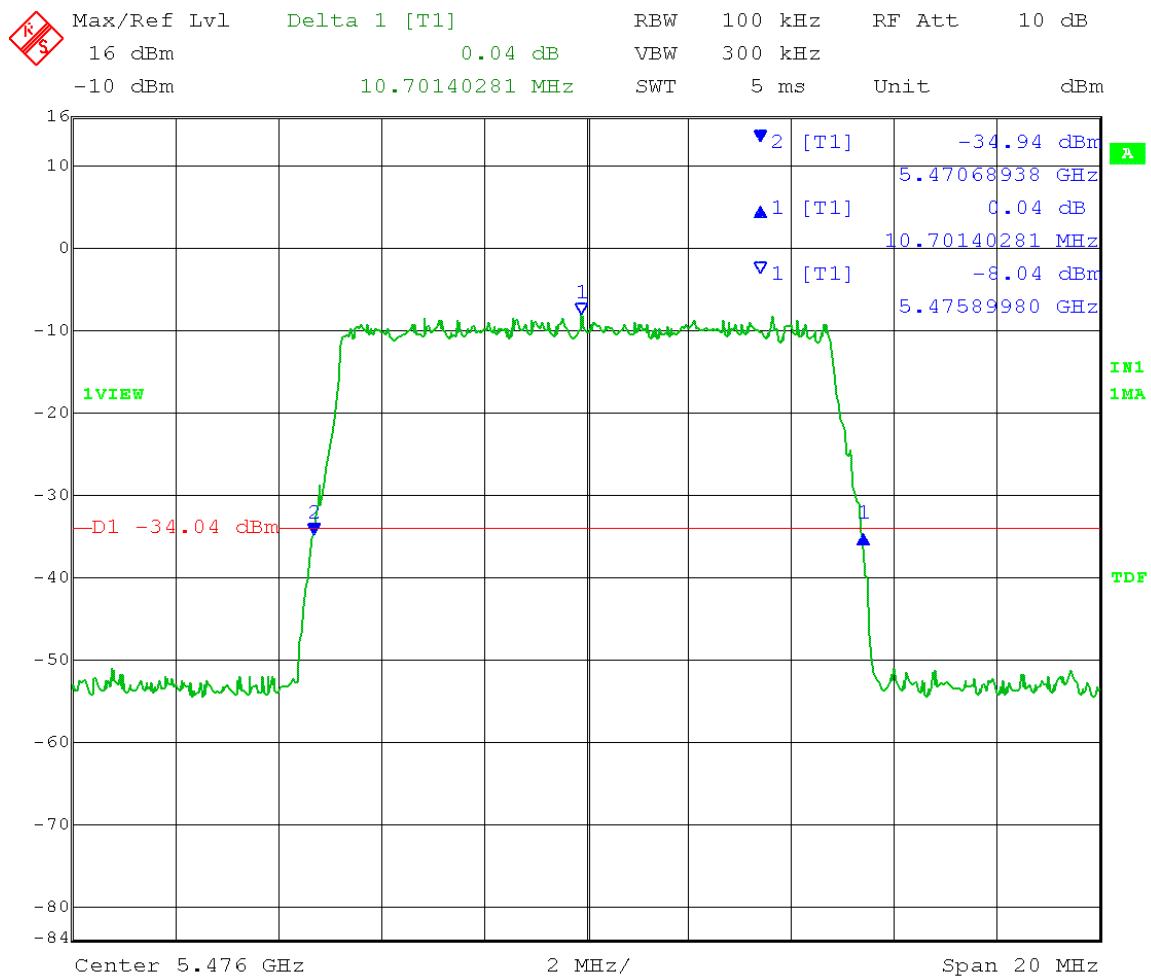


Date: 18.OCT.2013 14:12:11

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Low Channel: Transmit = 5.476 GHz 10MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

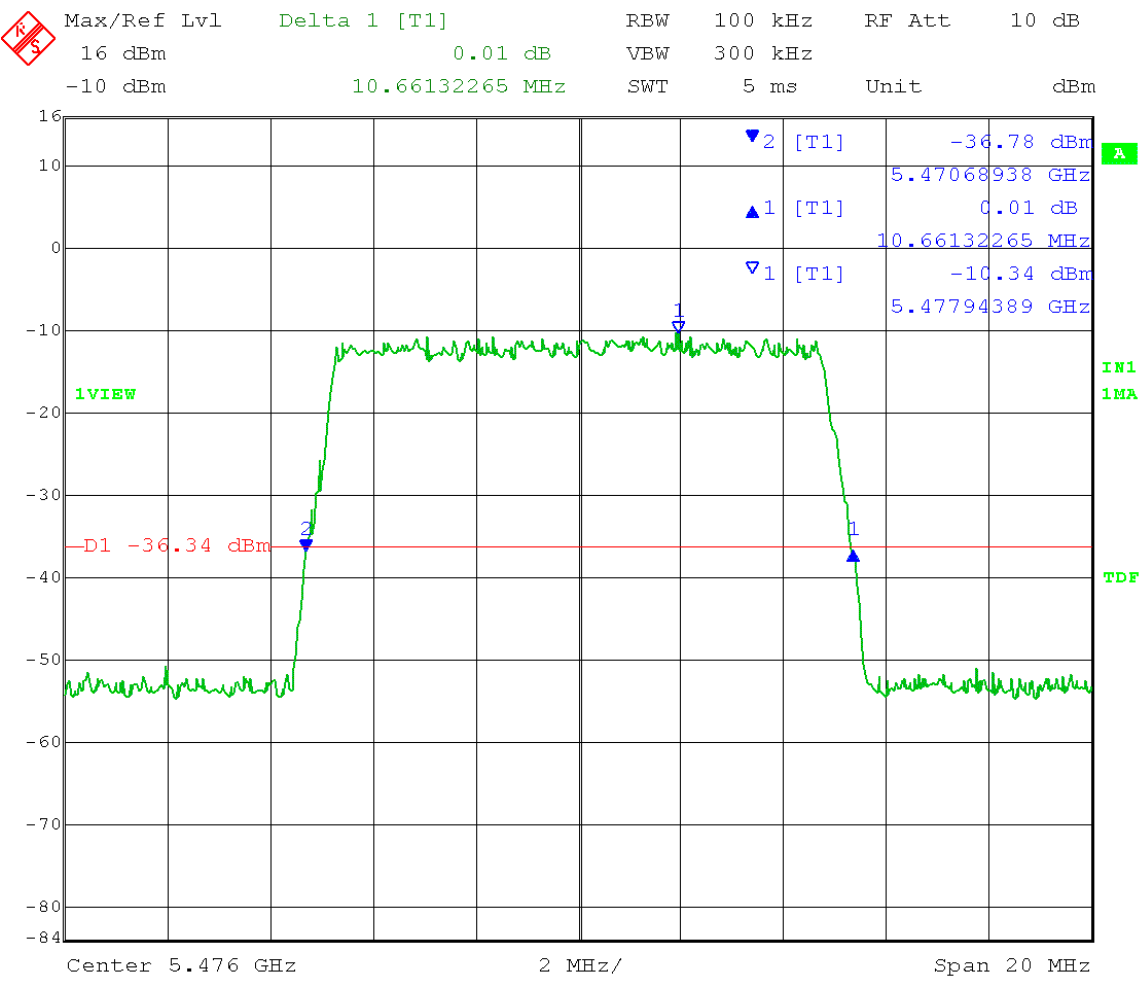
26 dB Emission Bandwidth = 10.70MHz



Date: 7.OCT.2013 10:23:07

TX 1:

26 dB Emission Bandwidth = 10.66MHz



Date: 4.OCT.2013 15:53:16



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix B – Measurement Data

B3.0 99 Percent Occupied Bandwidth

Rule Section: Informative

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section D – 99 Percent Occupied Bandwidth

Description: SPAN = 1.5 to 5 times the OBW
RBW = 1% to 5% of OBW
VBW $\geq$ RBW
Detector = Peak
Trace mode = max hold

Measure the width of the emission using the 99% power bandwidth function of the spectrum analyzer

Limit: Informative.
The emission designators are:
10 MHz BW: 10M0x1D
20 MHz BW: 20M0x1D
40 MHz BW: 40M0x1D
50 MHz BW: 50M0x1D

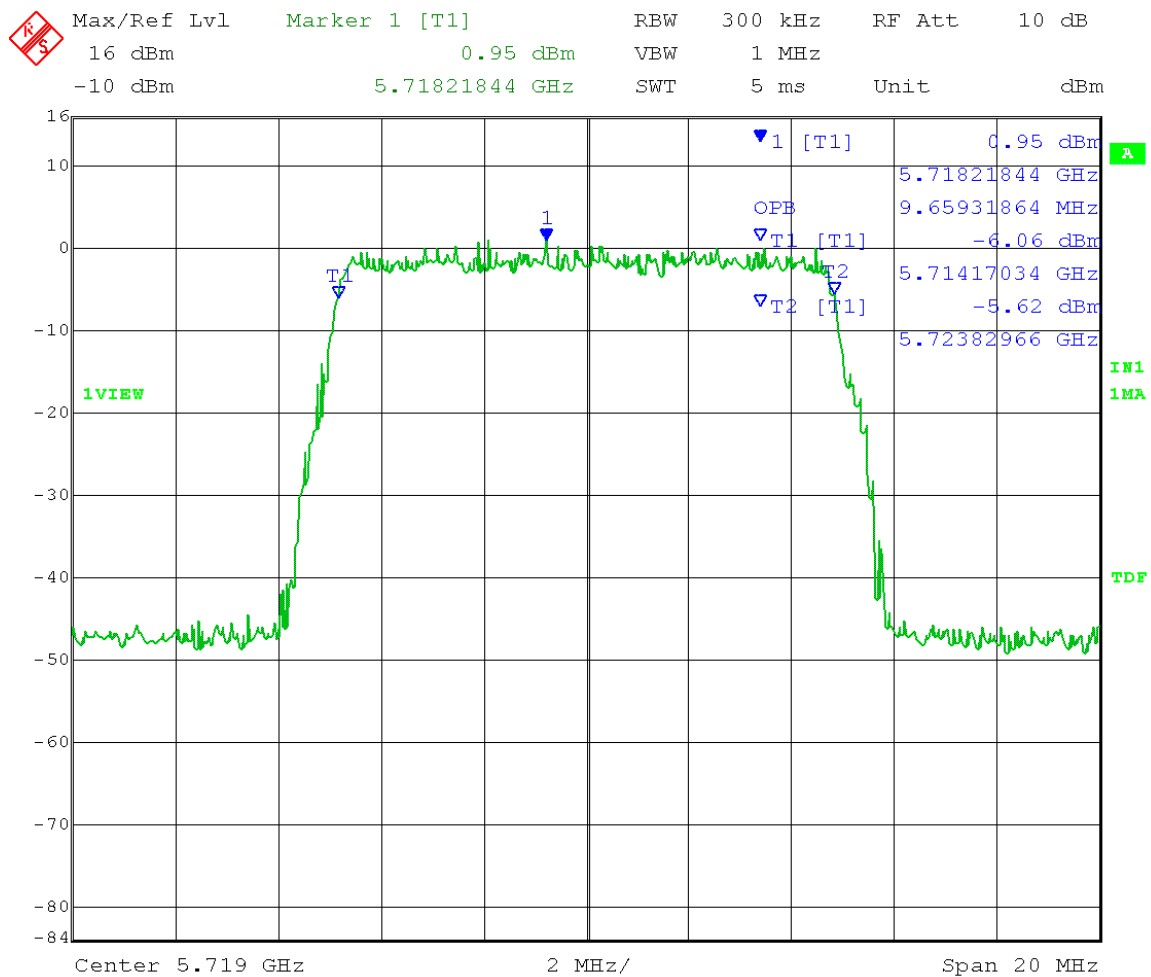
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

Output power was set to 30 dBm eirp using special test software.

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
High Channel: Transmit = 5.719 GHz 10MHz BW 16QAM
Output power setting: 30 dBm eirp

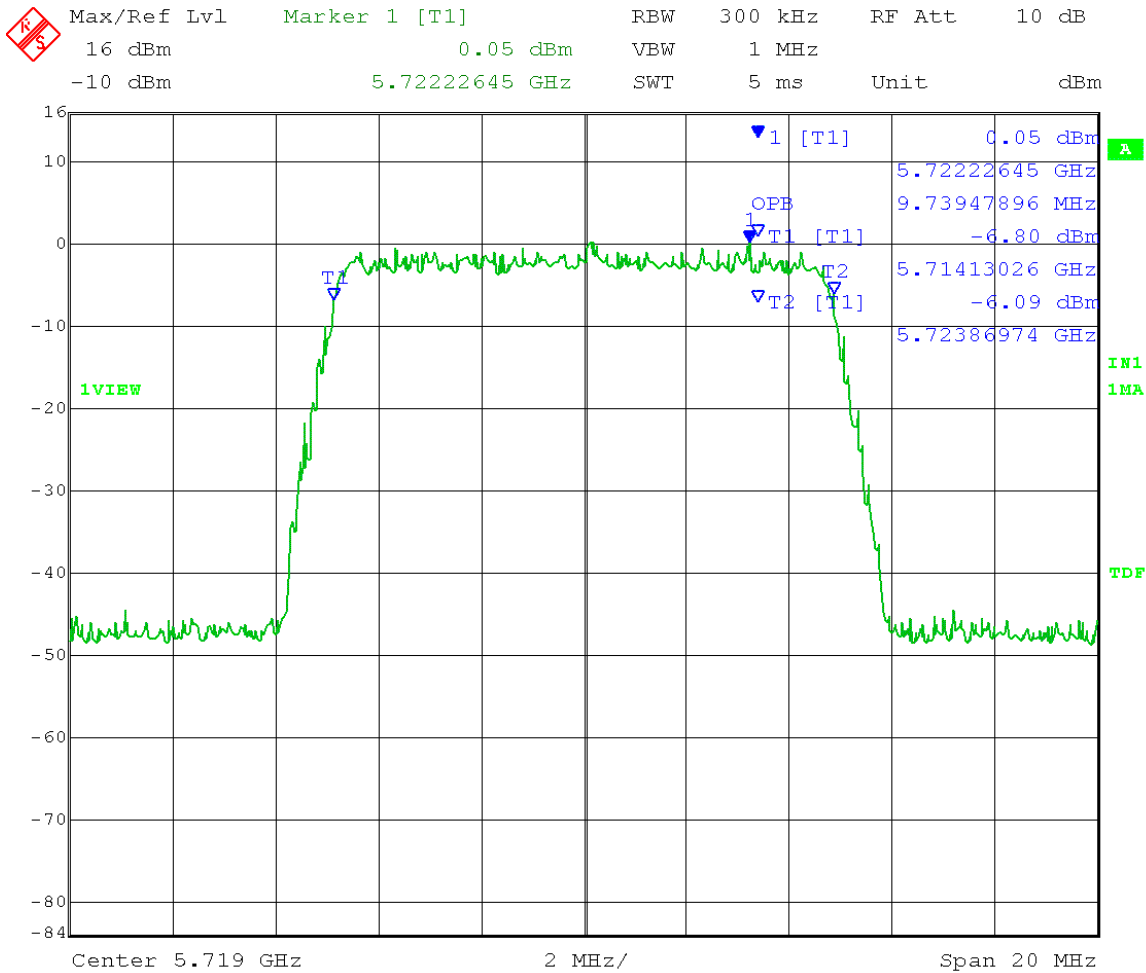
TX 0:

99% OBW = 9.66MHz



Date: 18.OCT.2013 12:32:20

99% OBW = 9.74MHz

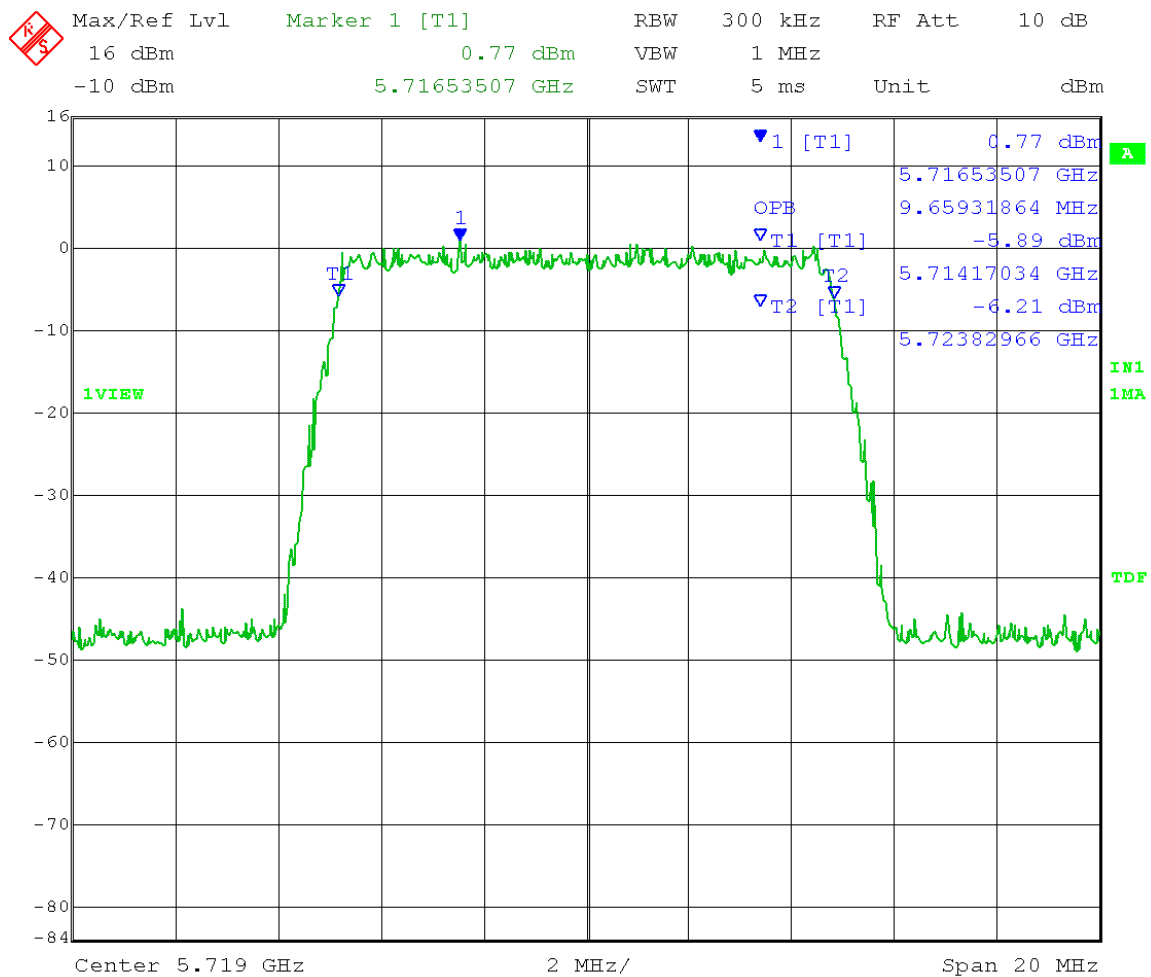


Date: 18.OCT.2013 12:38:30

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
High Channel: Transmit = 5.719 GHz 10MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

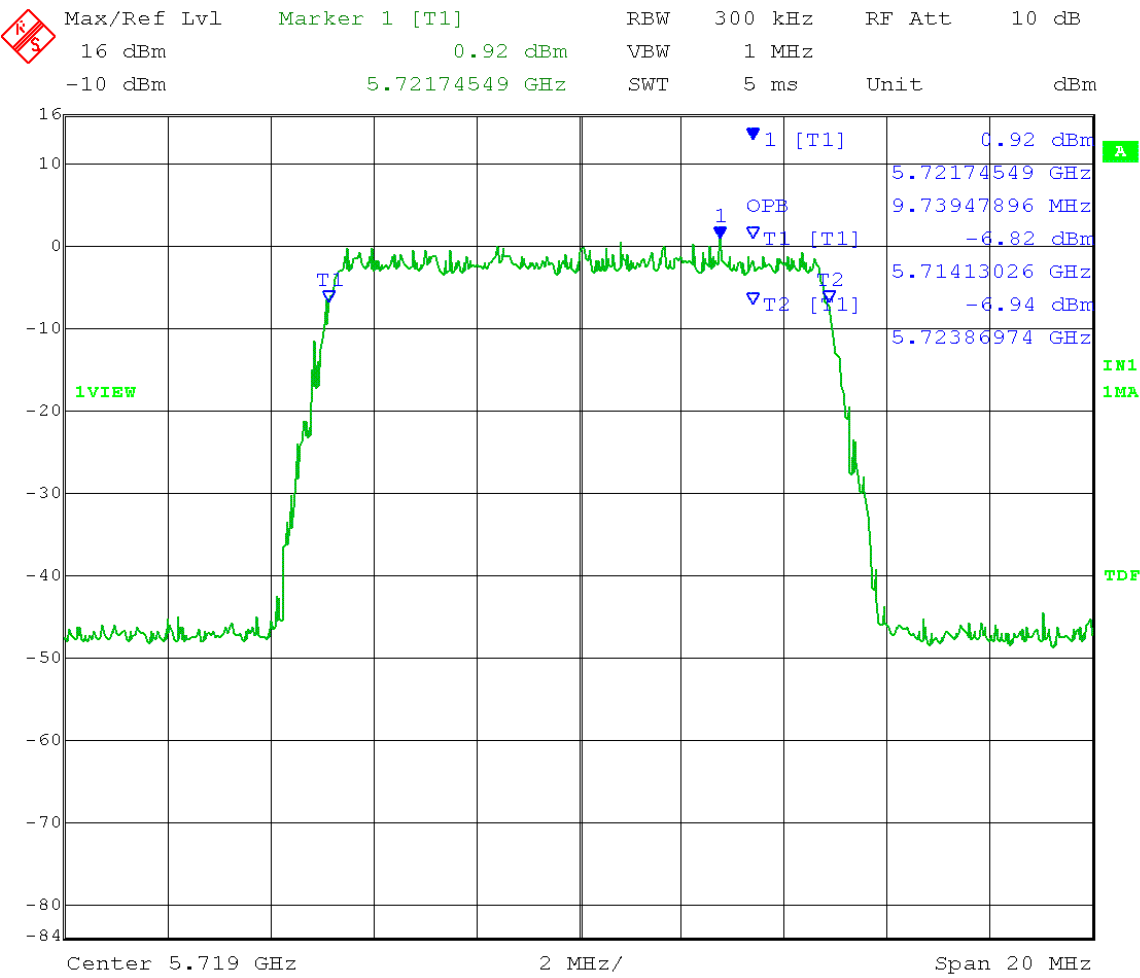
99% OBW = 9.66MHz



Date: 18.OCT.2013 12:31:39

TX 1:

99% OBW = 9.74MHz

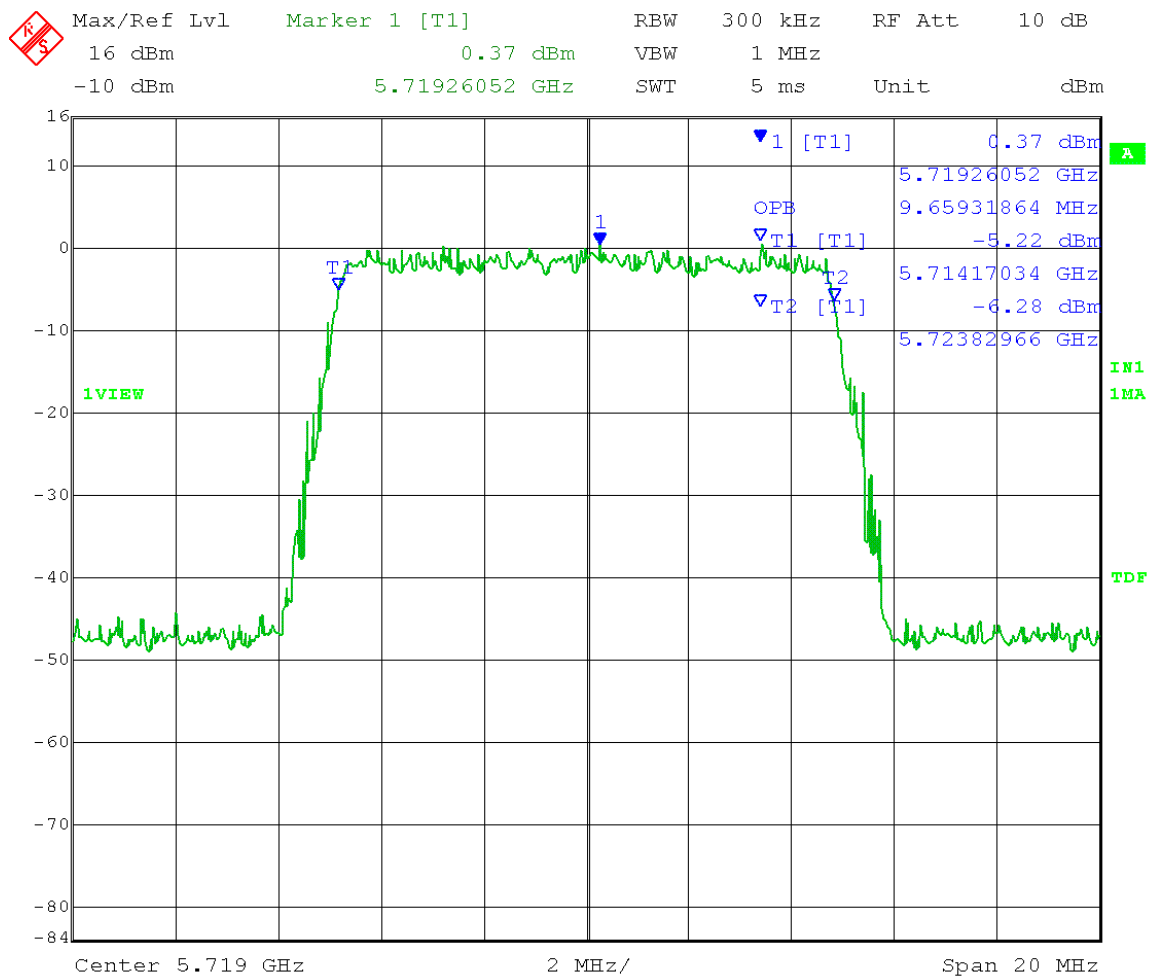


Date: 18.OCT.2013 12:39:23

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
High Channel: Transmit = 5.719 GHz 10MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

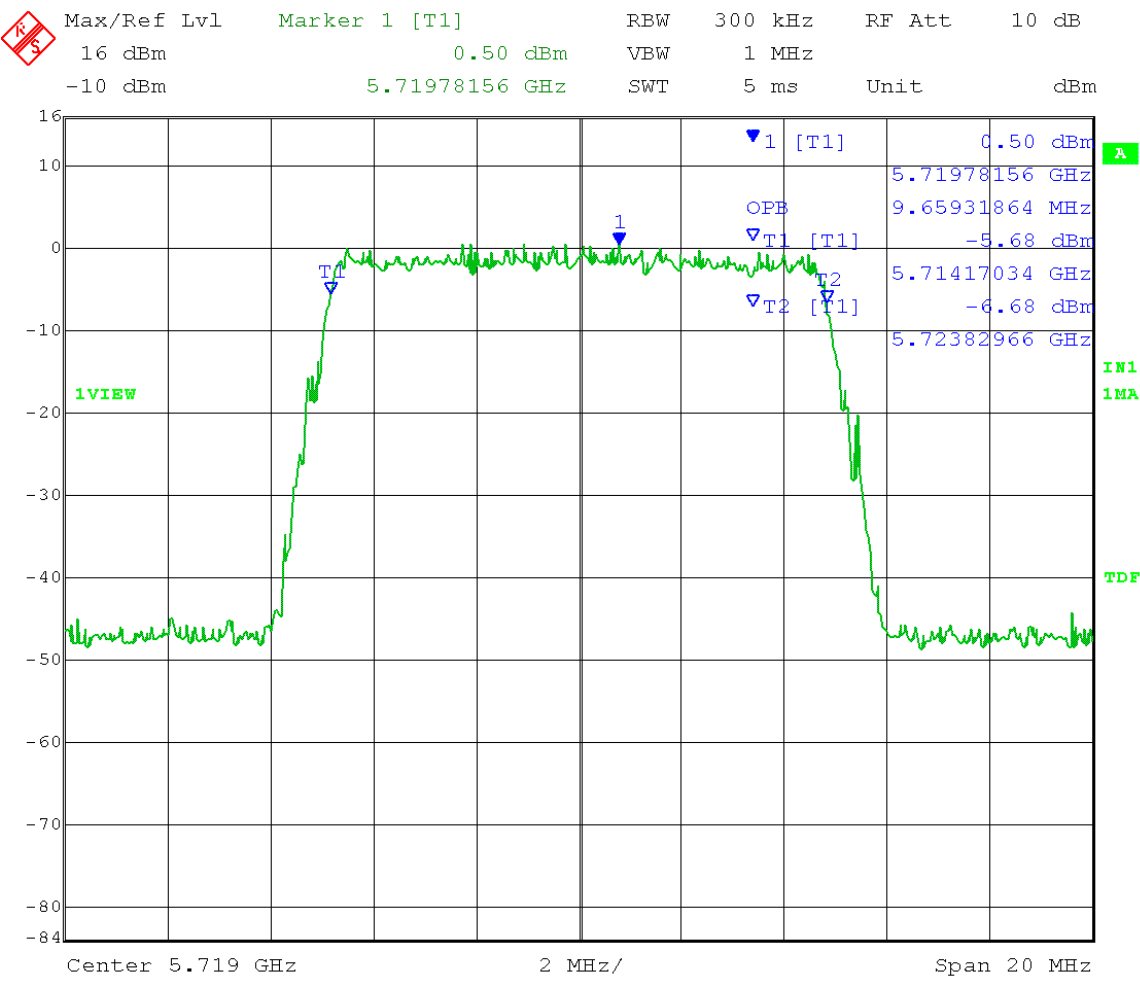
99% OBW = 9.66MHz



Date: 18.OCT.2013 12:30:29

TX 1:

99% OBW = 9.66MHz

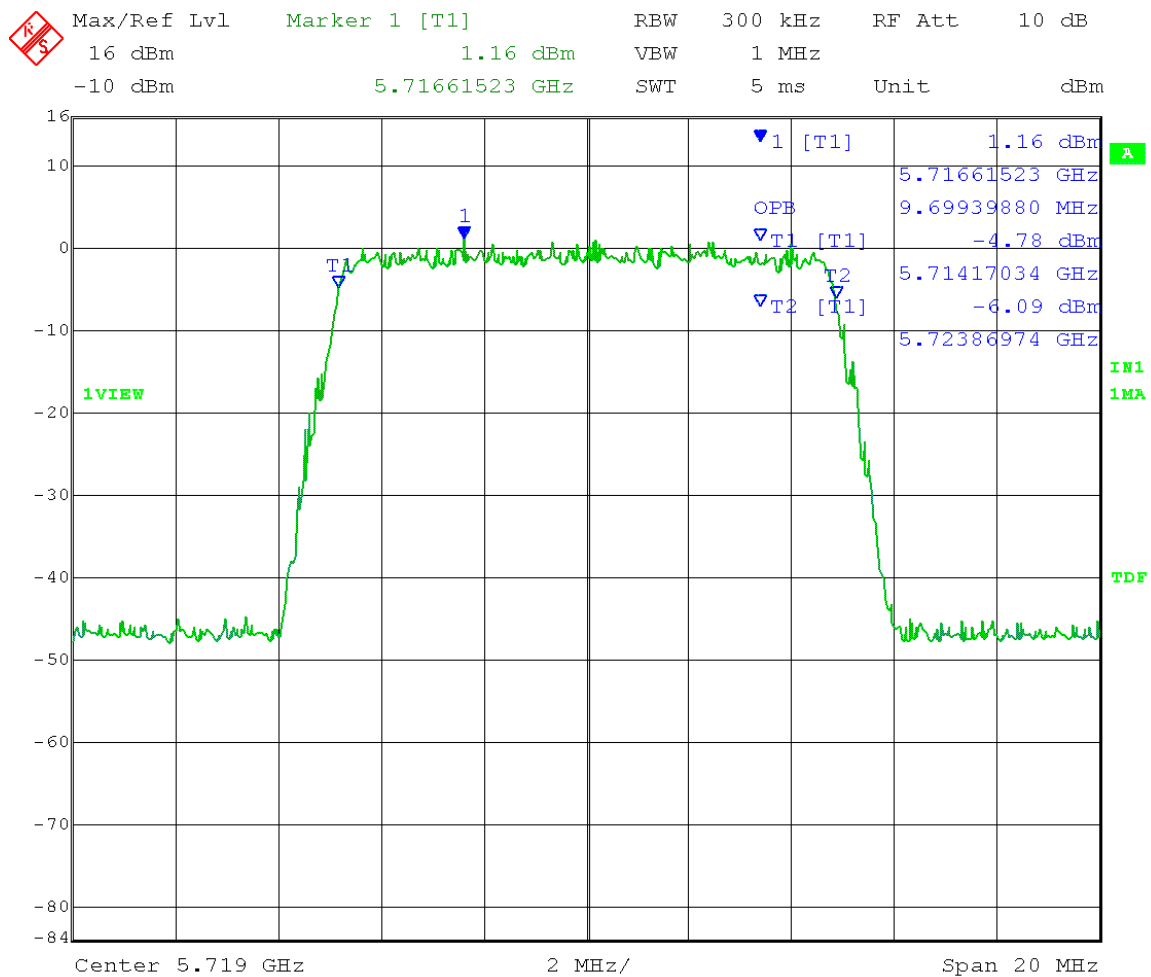


Date: 18.OCT.2013 12:40:09

Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
High Channel: Transmit = 5.719 GHz 10MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

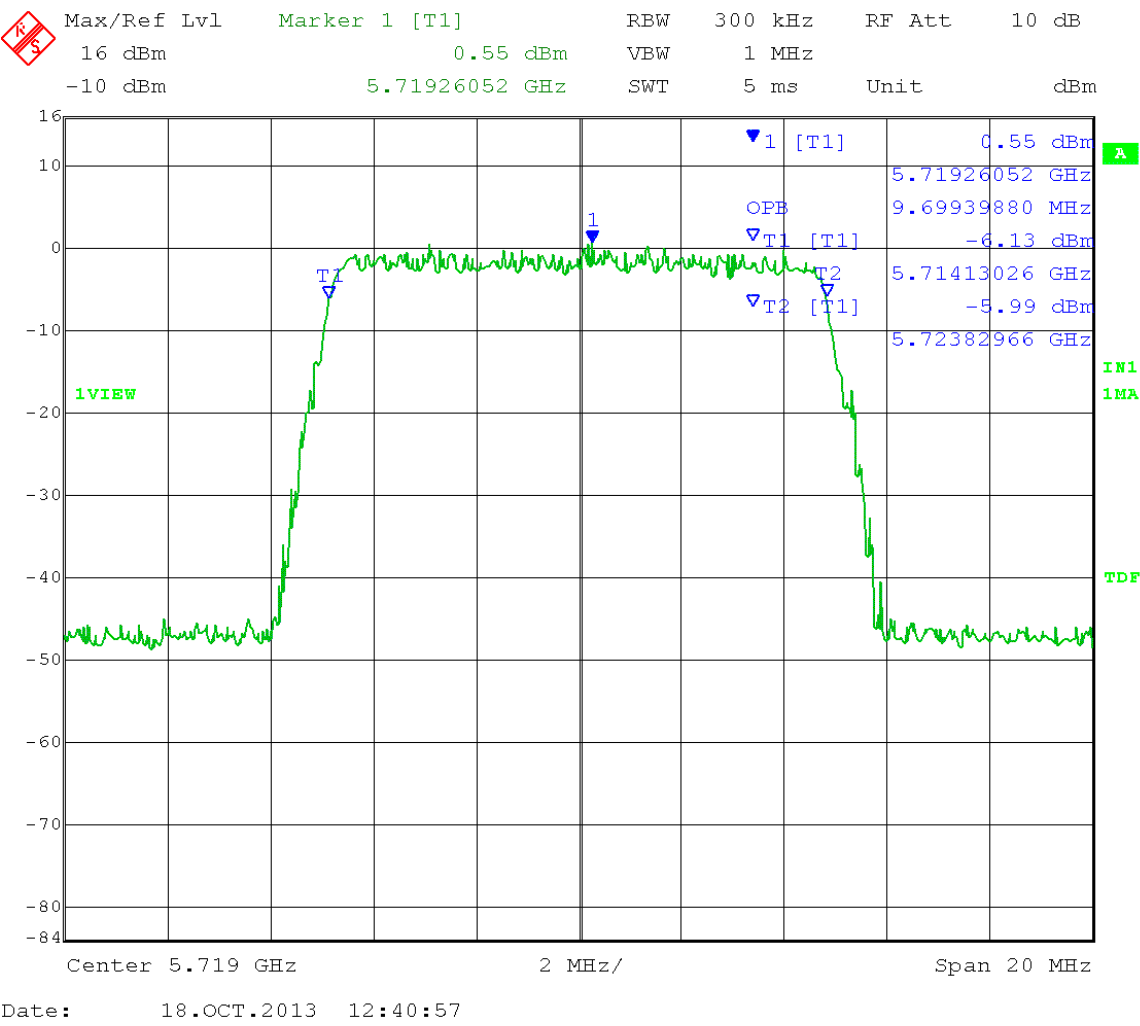
99% OBW = 9.70MHz



Date: 18.OCT.2013 12:28:57

TX 1:

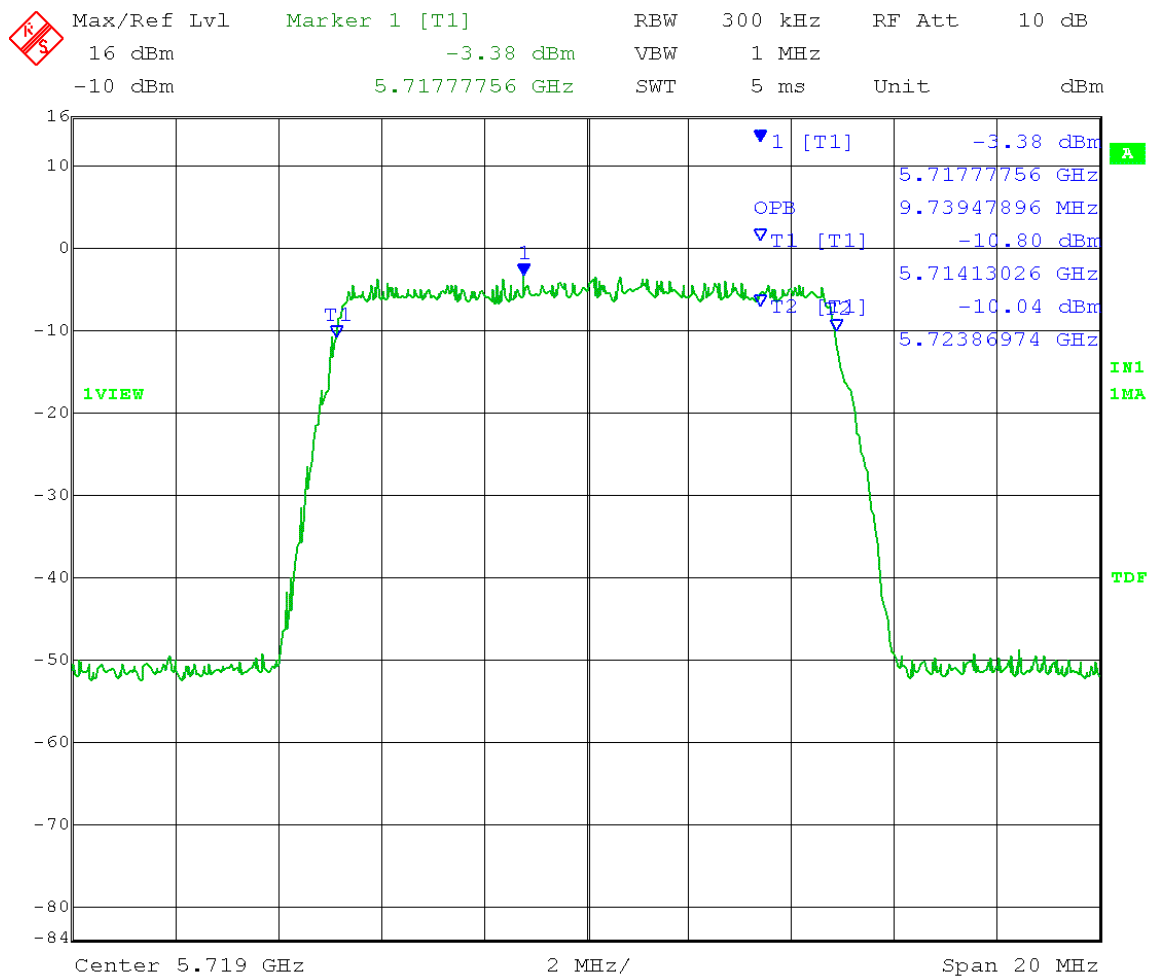
99% OBW = 9.70MHz



Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
High Channel: Transmit = 5.719 GHz 10MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

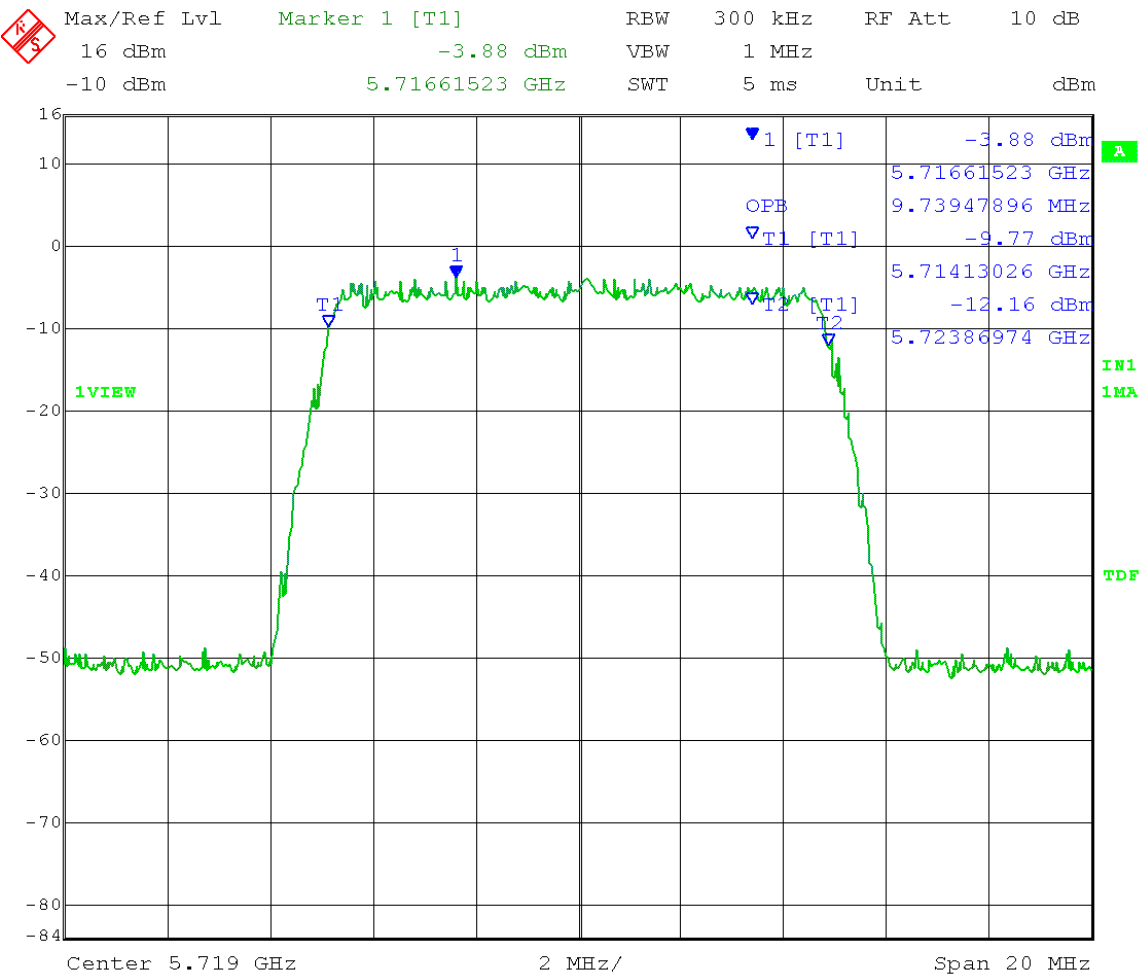
99% OBW = 9.74MHz



Date: 7.OCT.2013 11:22:25

TX 1:

99% OBW = 9.74MHz

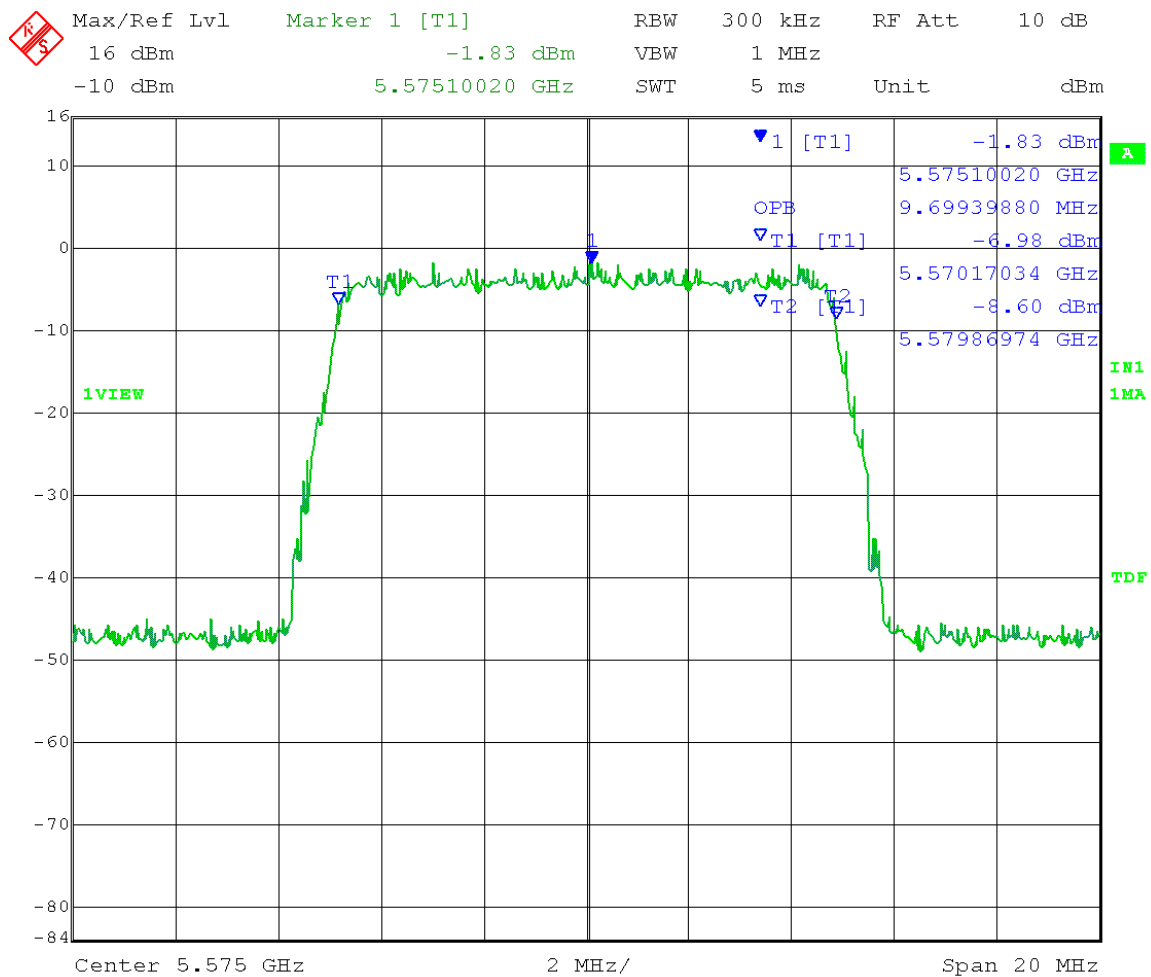


Date: 7.OCT.2013 11:33:07

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Mid Channel: Transmit = 5.575 GHz 10MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

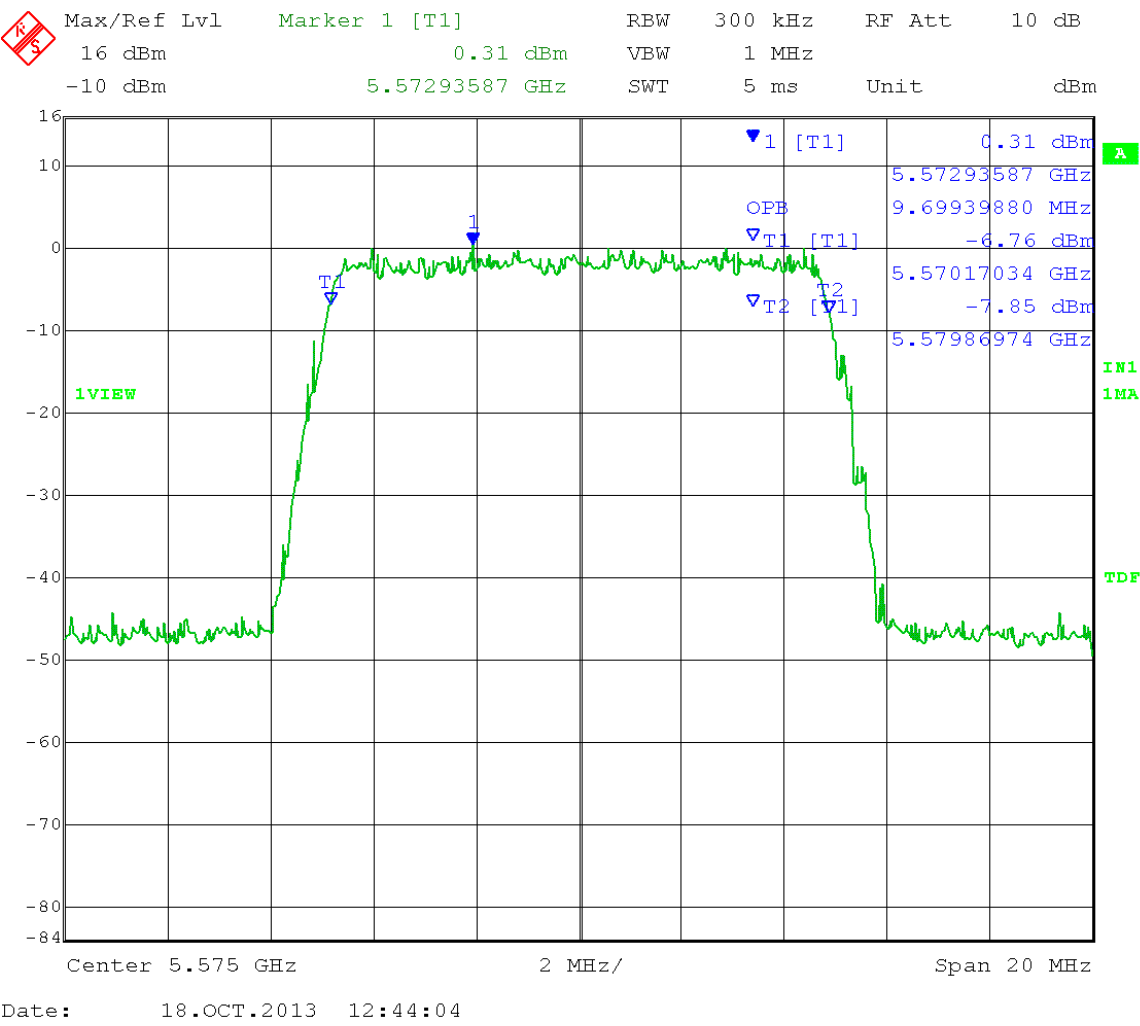
99% OBW = 9.70MHz



Date: 18.OCT.2013 12:24:03

TX 1:

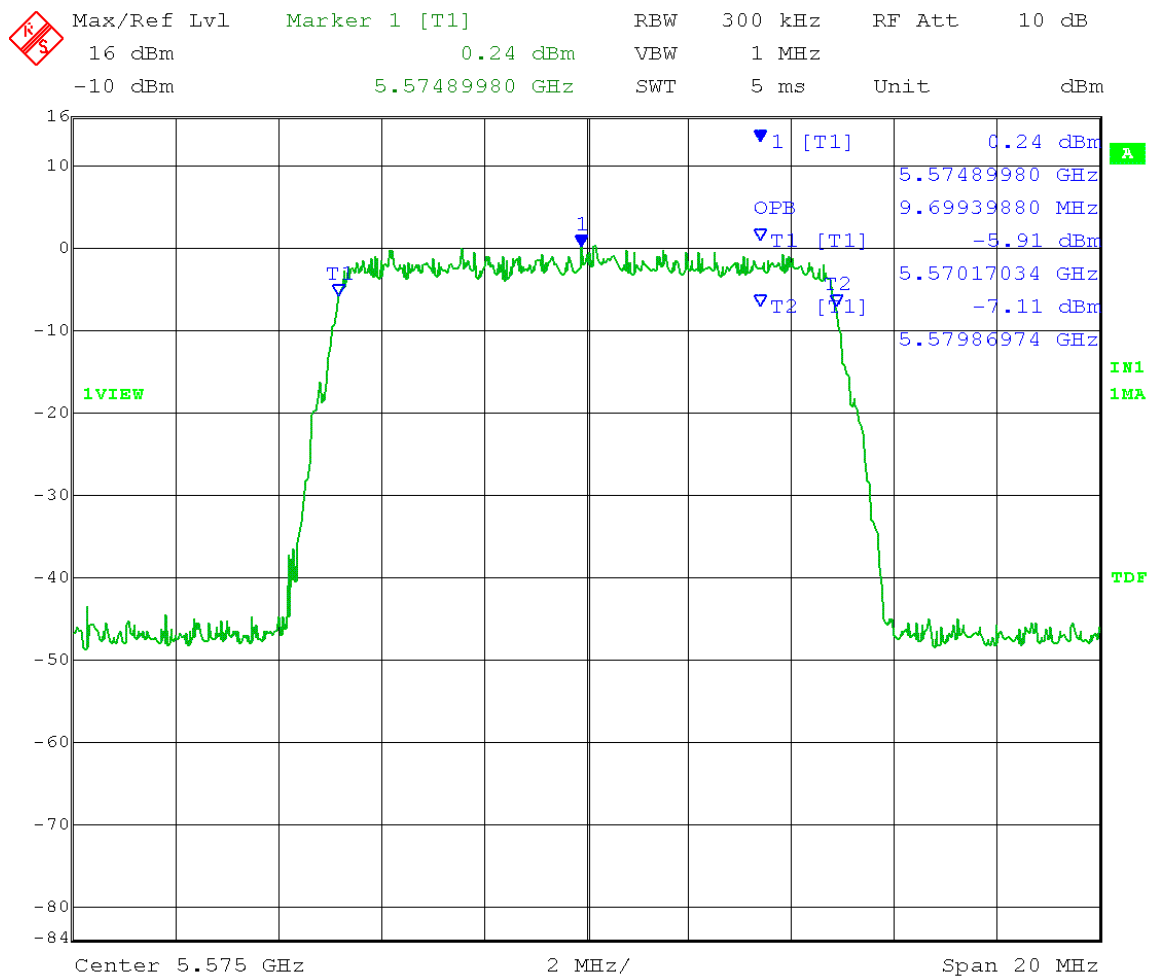
99% OBW = 9.70MHz



Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Mid Channel: Transmit = 5.575 GHz 10MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

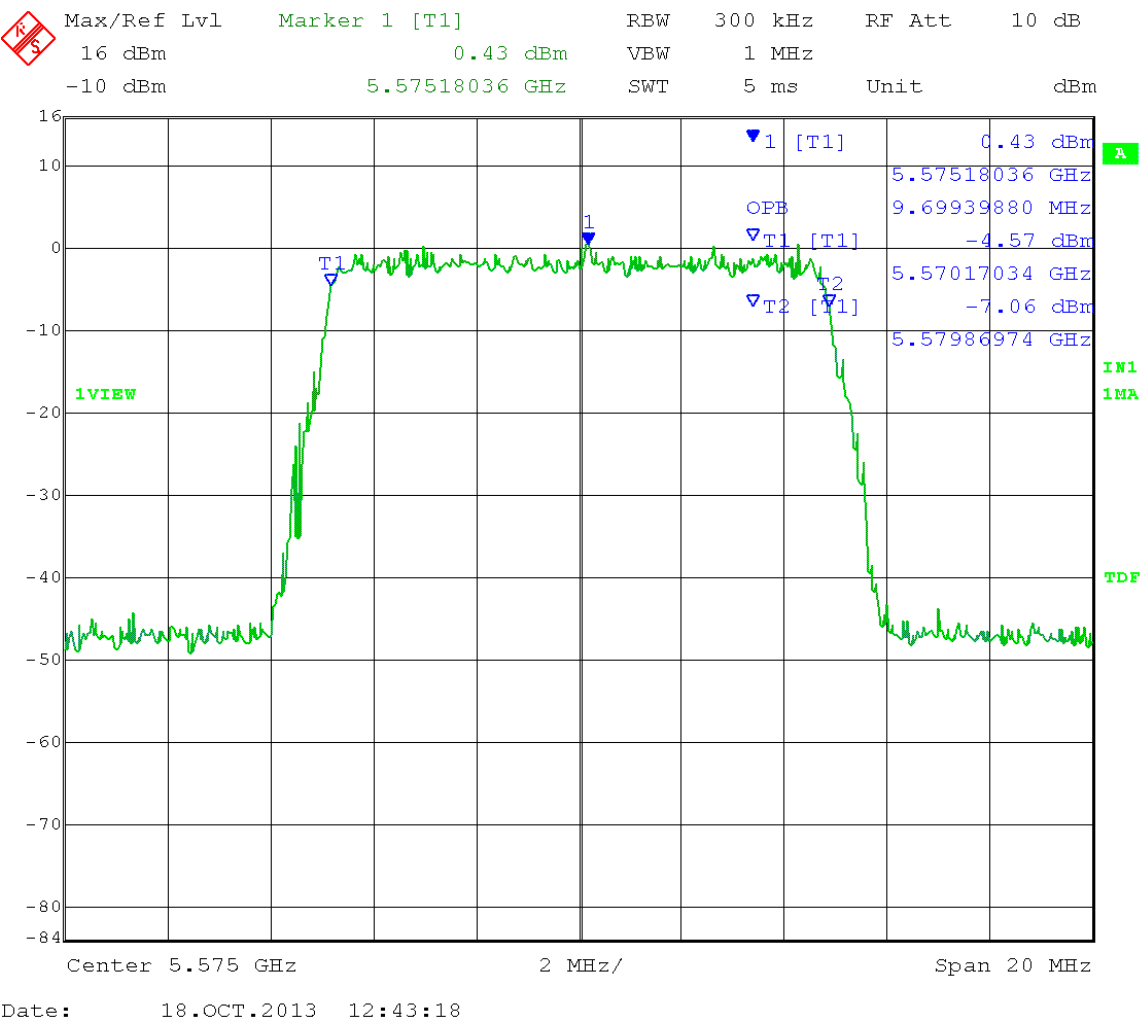
99% OBW = 9.70MHz



Date: 18.OCT.2013 12:25:51

TX 1:

99% OBW = 9.70MHz



TX 0:

Max/Ref Lvl 16 dBm Marker 1 [T1] 0.17 dBm RBW 300 kHz VBW 1 MHz RF Att 10 dB Unit dBm

-10 dBm 5.57514028 GHz SWT 5 ms

1 [T1] 0.17 dBm
5.57514028 GHz
9.65931864 MHz
T1 [T1] -6.00 dBm
5.57017034 GHz
T2 [T1] -6.51 dBm
5.57982966 GHz

1VIEW

IN1 1MA

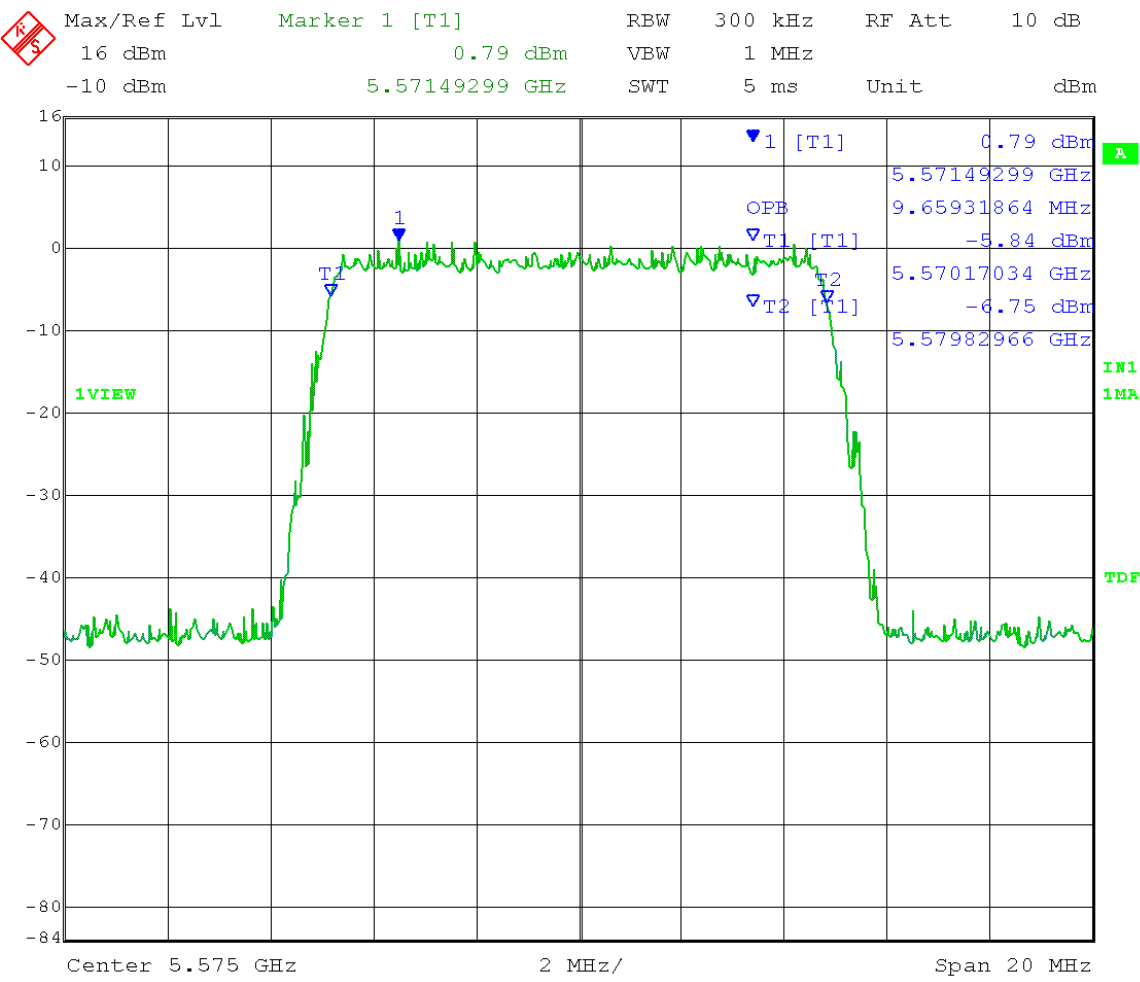
TDF

Center 5.575 GHz 2 MHz/ Span 20 MHz

Date: 18.OCT.2013 12:26:41

TX 1:

99% OBW = 9.66MHz

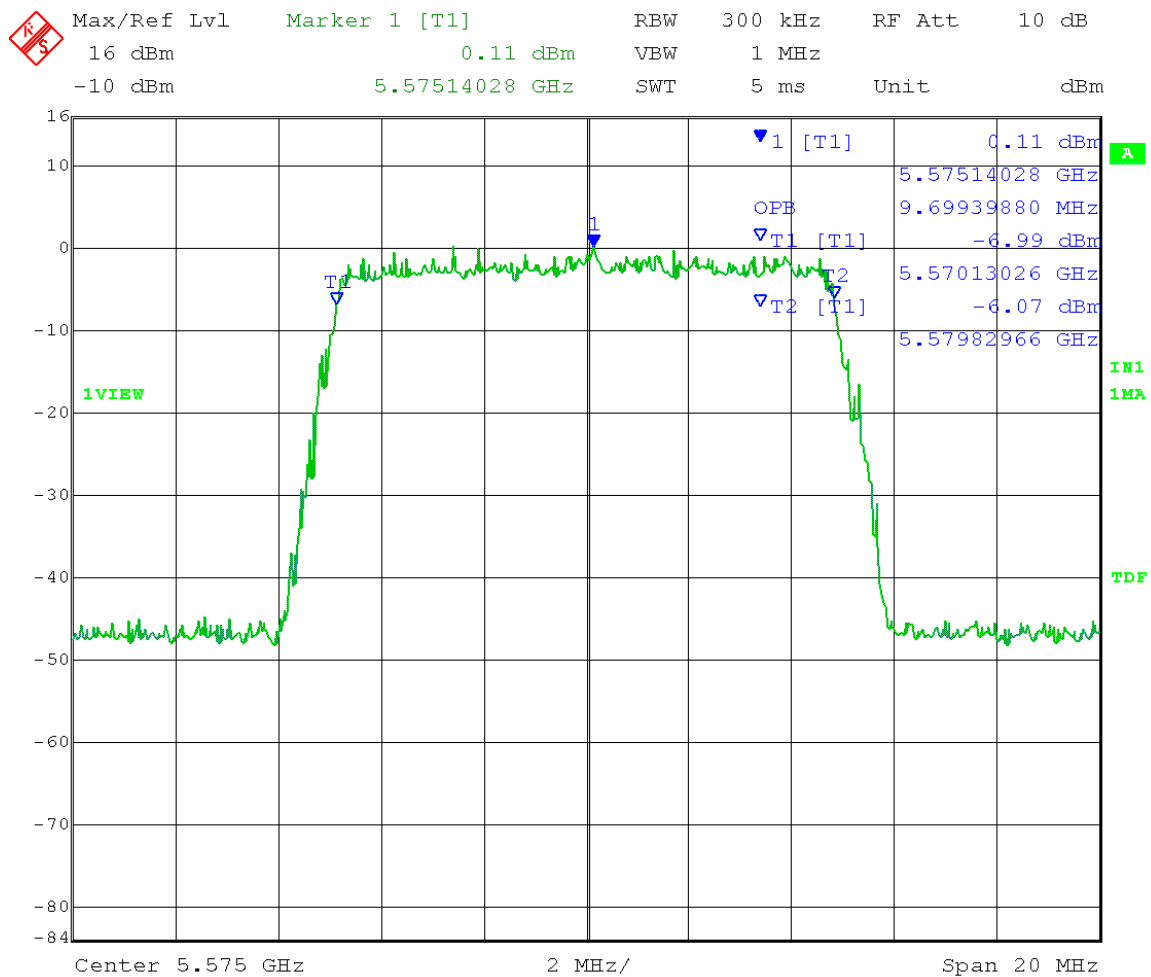


Date: 18.OCT.2013 12:42:37

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Mid Channel: Transmit = 5.575 GHz 10MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

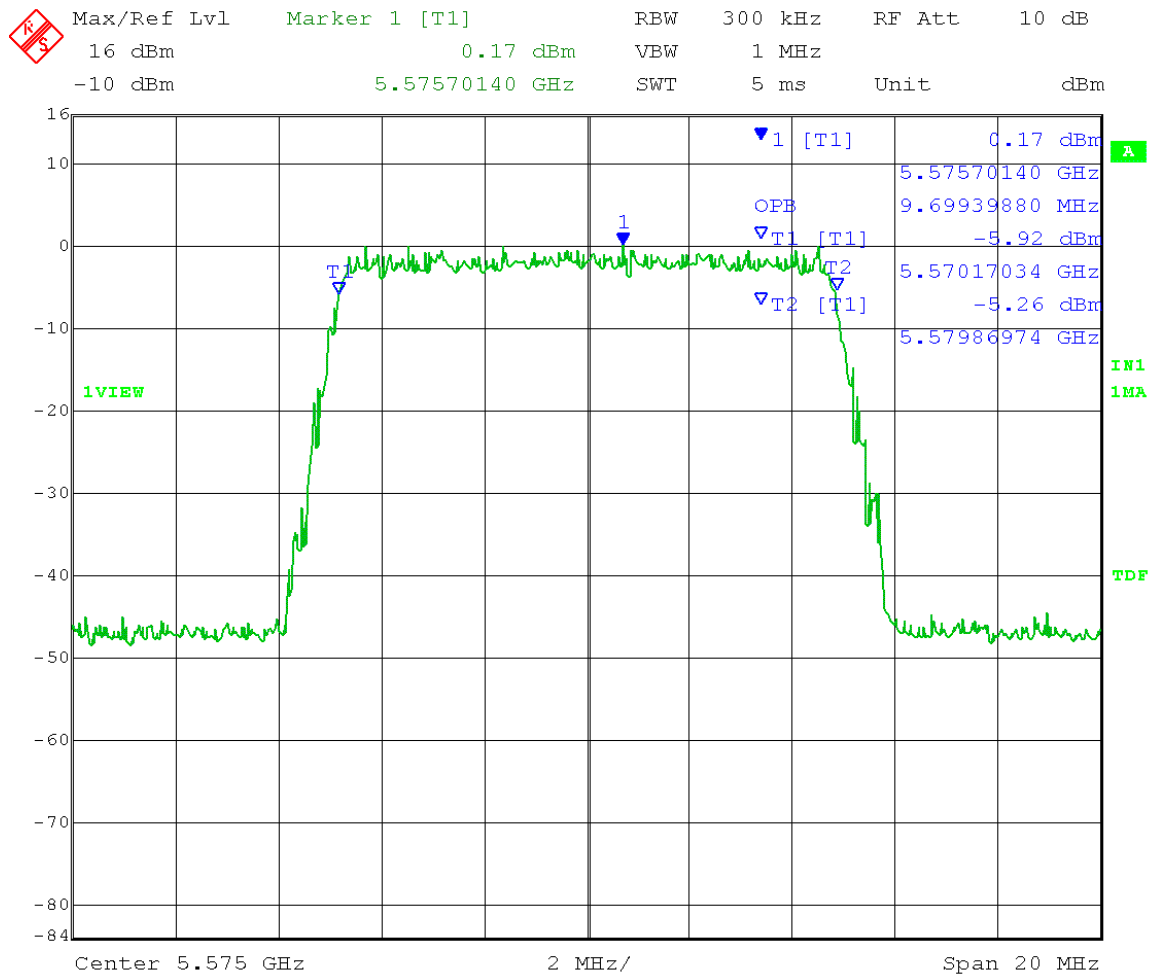
99% OBW = 9.70MHz



Date: 18.OCT.2013 12:27:27

TX 1:

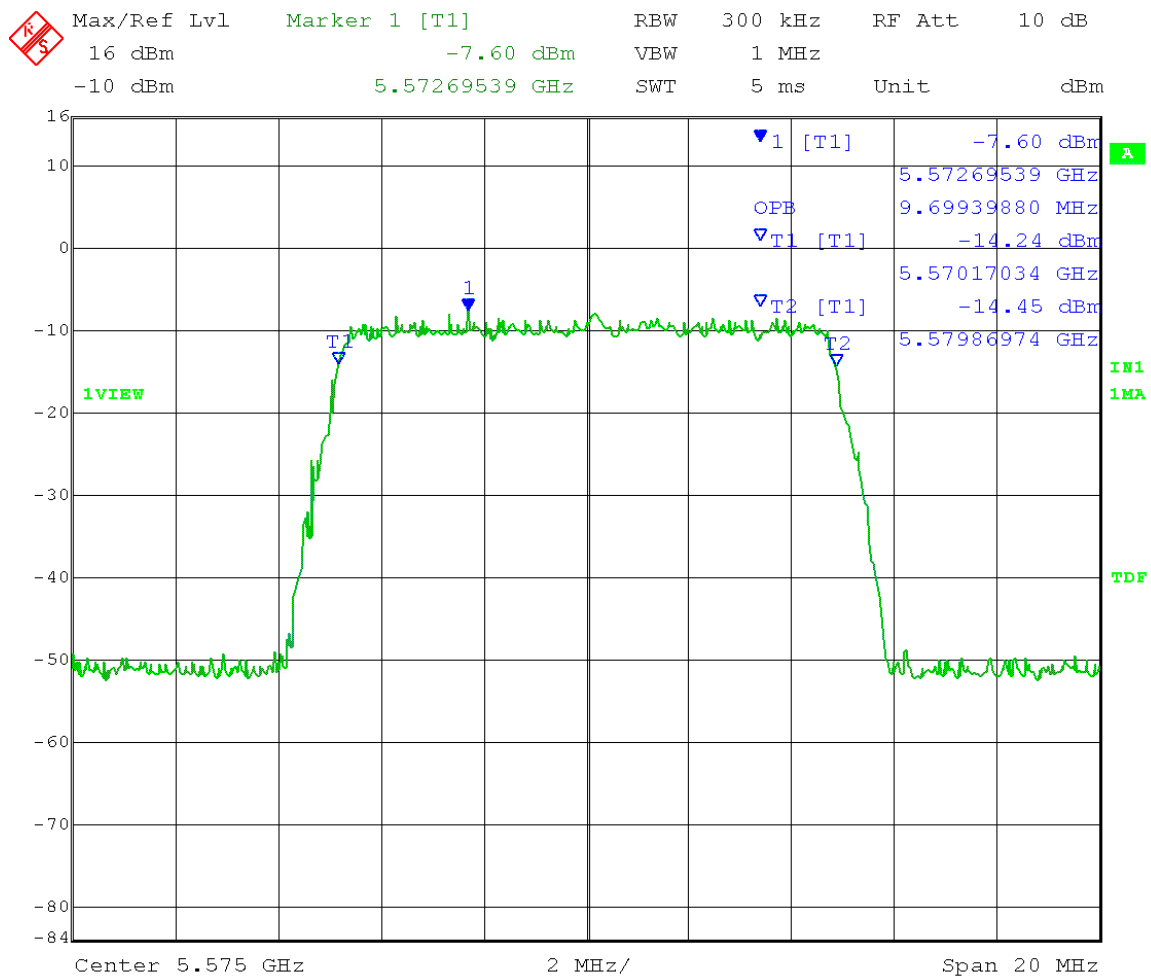
99% OBW = 9.70MHz



Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Mid Channel: Transmit = 5.575 GHz 10MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

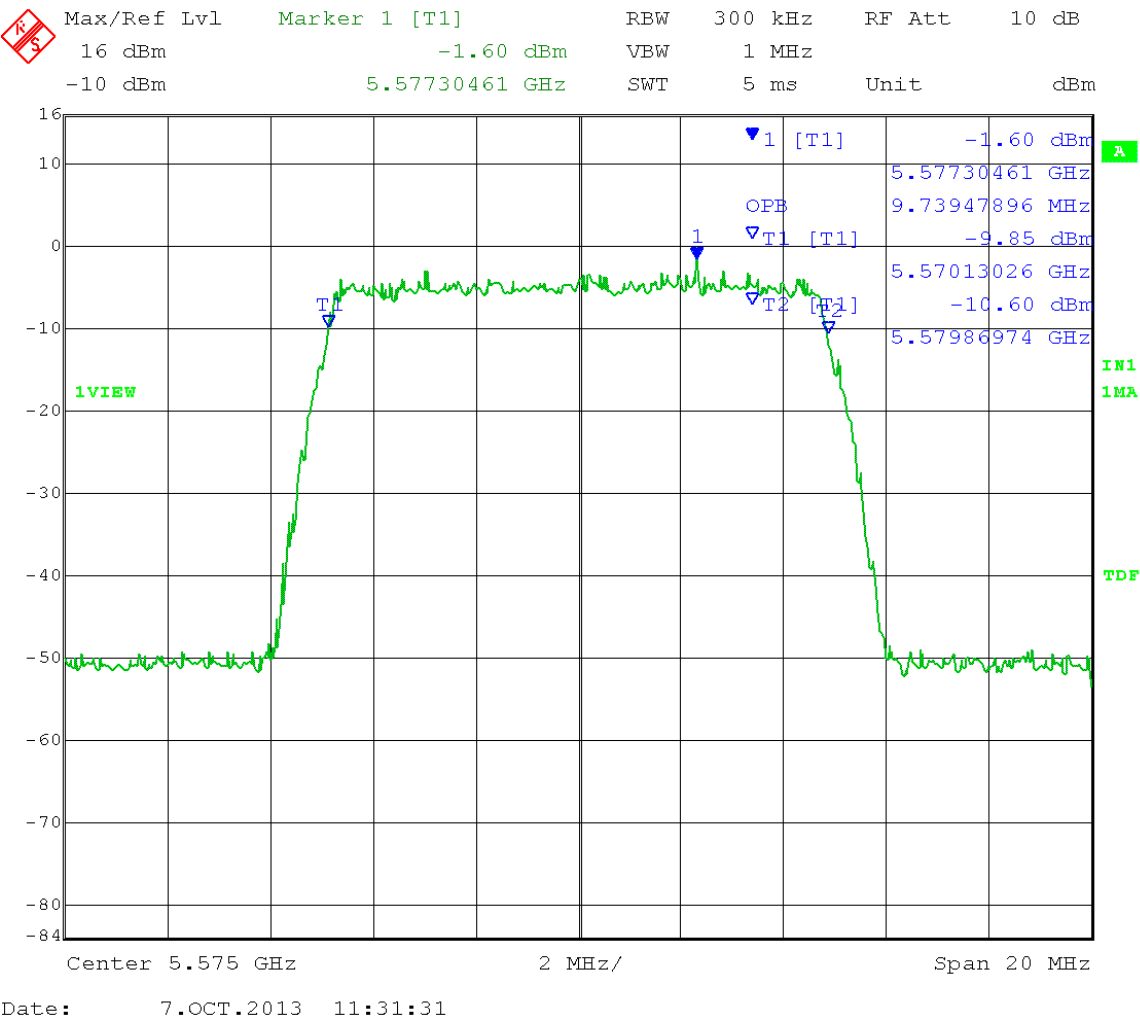
99% OBW = 9.70MHz



Date: 7.OCT.2013 11:24:00

TX 1:

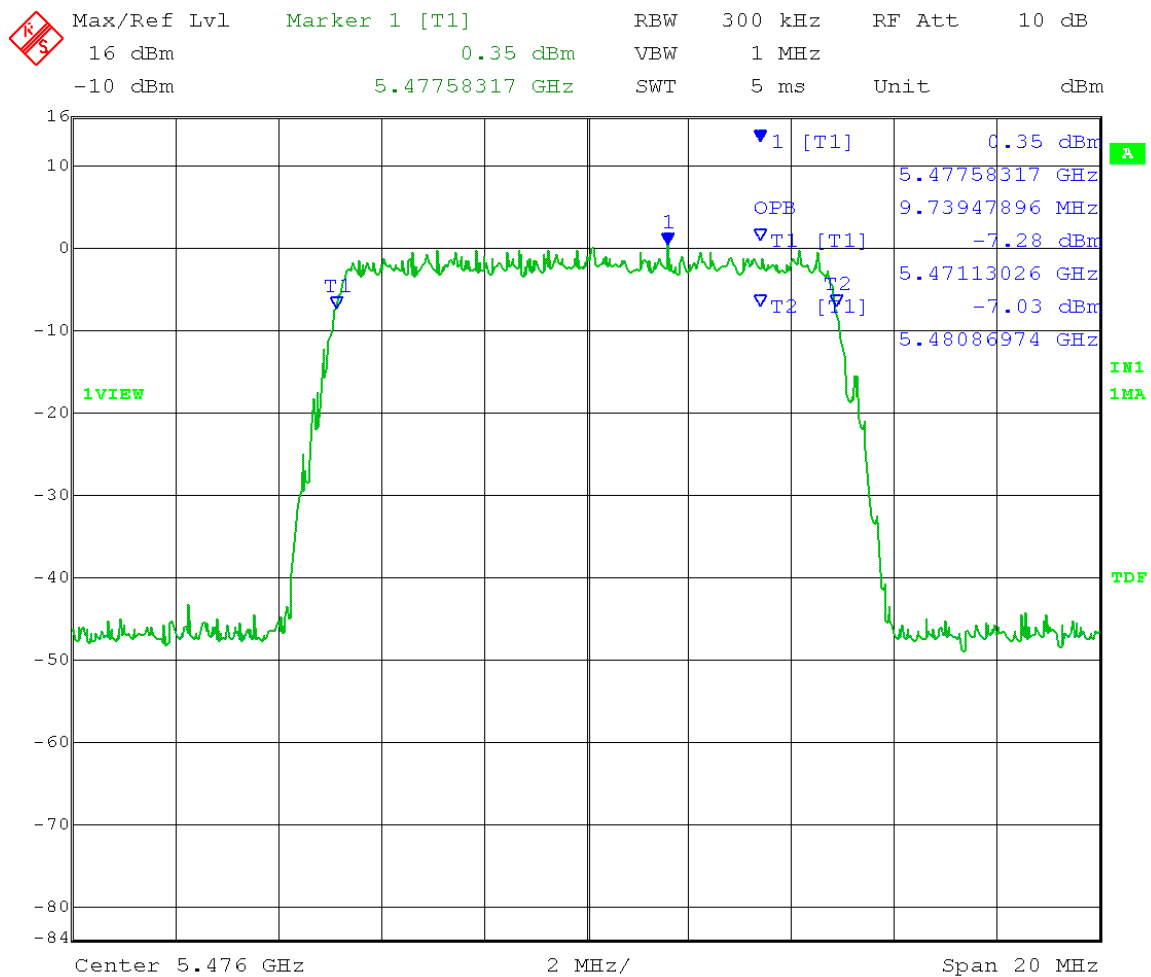
99% OBW = 9.74MHz



Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Low Channel: Transmit = 5.476 GHz 10MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

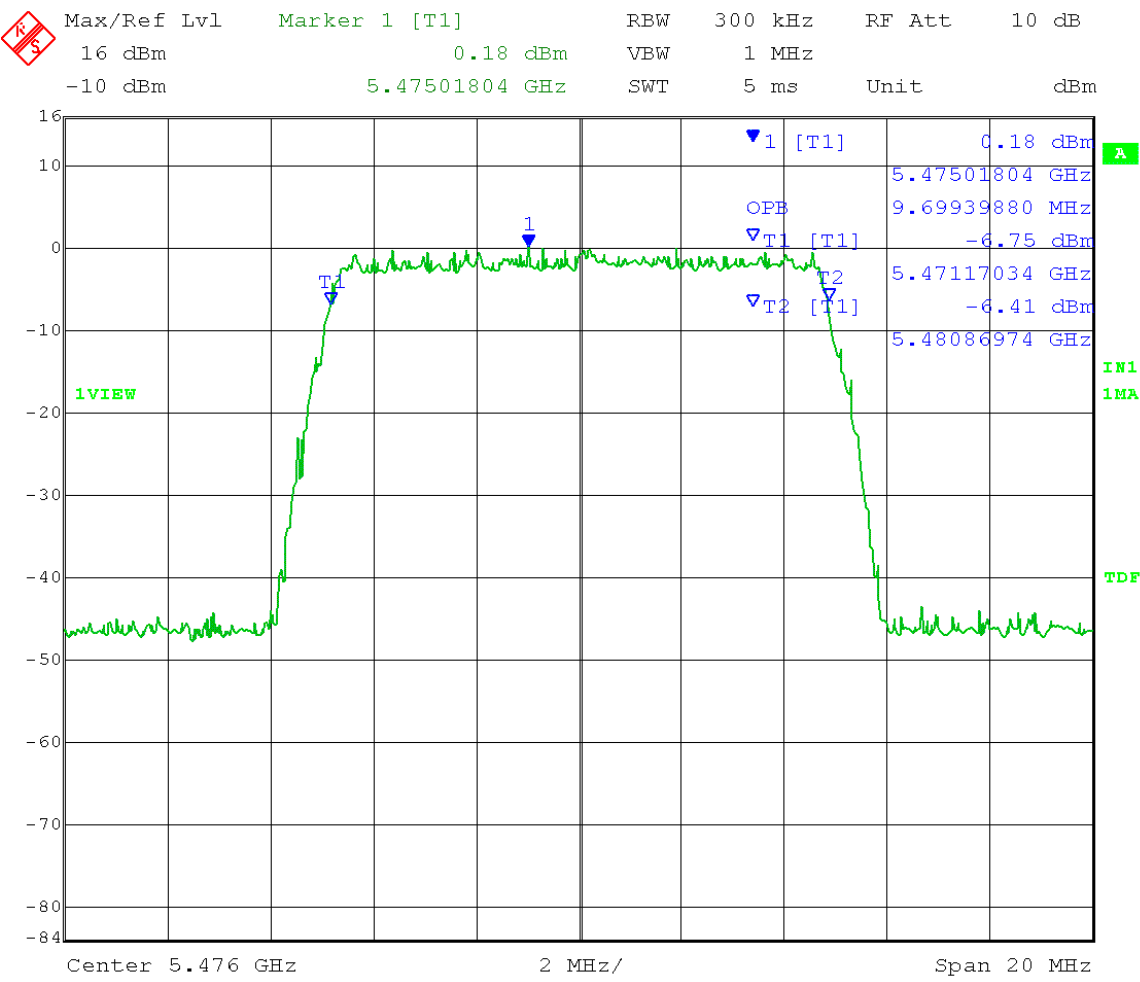
99% OBW = 9.74MHz



Date: 18.OCT.2013 11:40:19

TX 1:

99% OBW = 9.70MHz

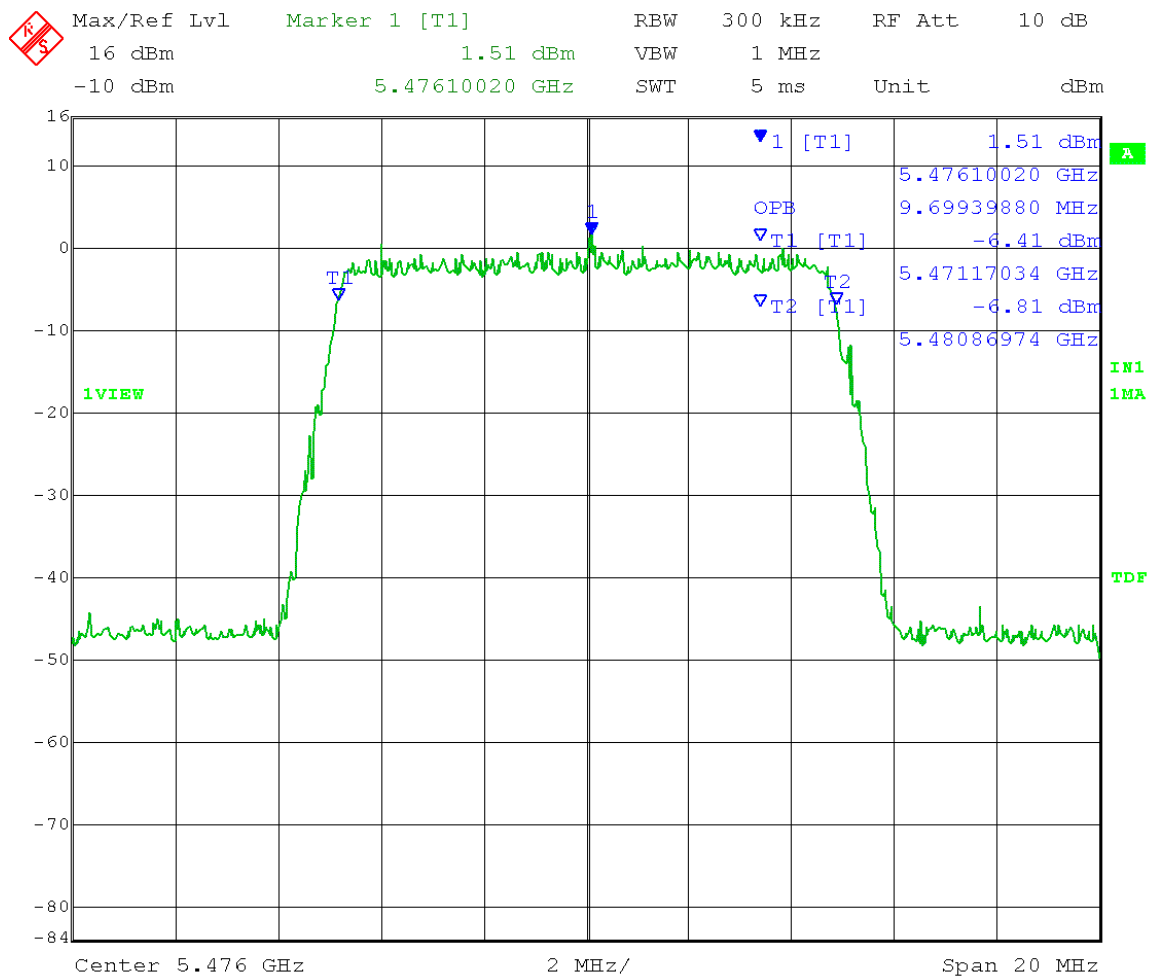


Date: 18.OCT.2013 12:45:38

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Low Channel: Transmit = 5.476 GHz 10MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

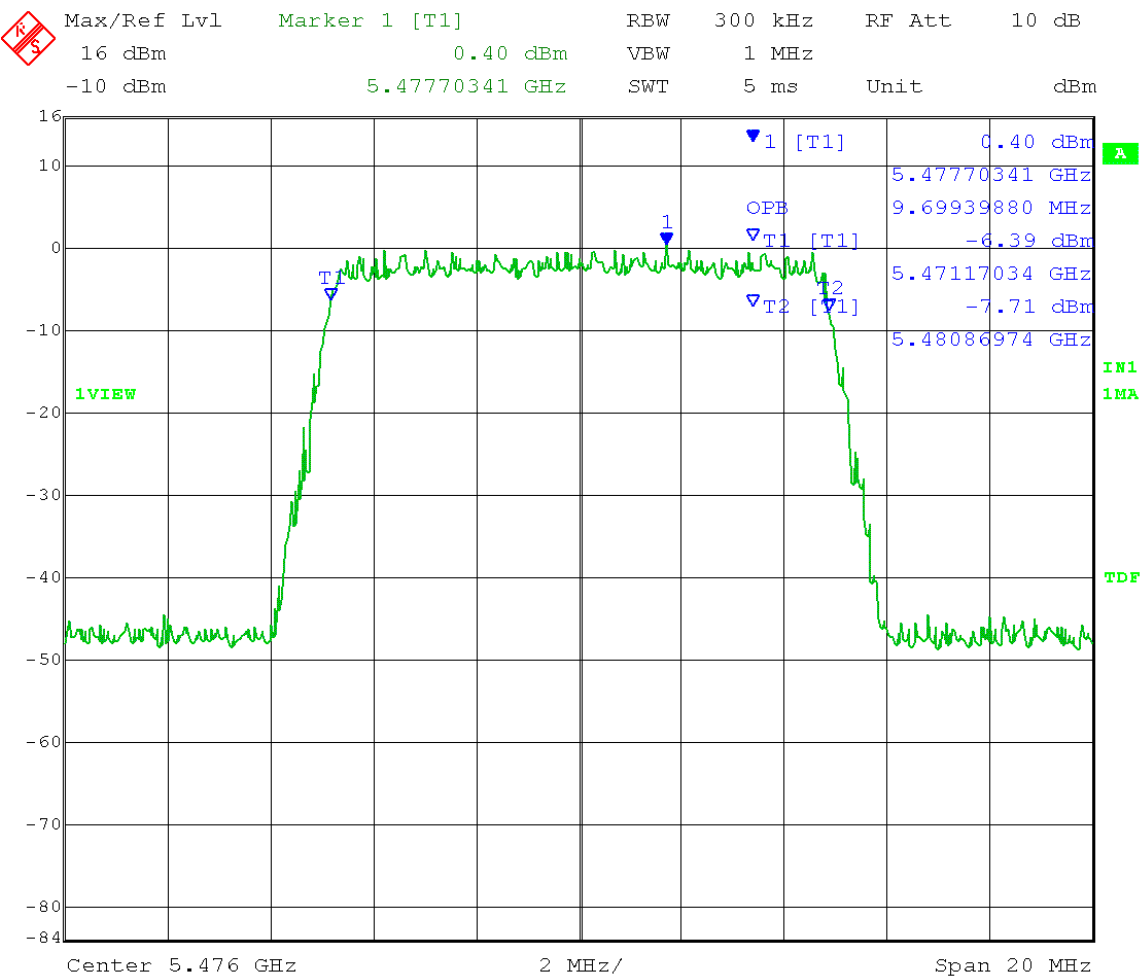
99% OBW = 9.70MHz



Date: 18.OCT.2013 11:39:08

TX 1:

99% OBW = 9.70MHz

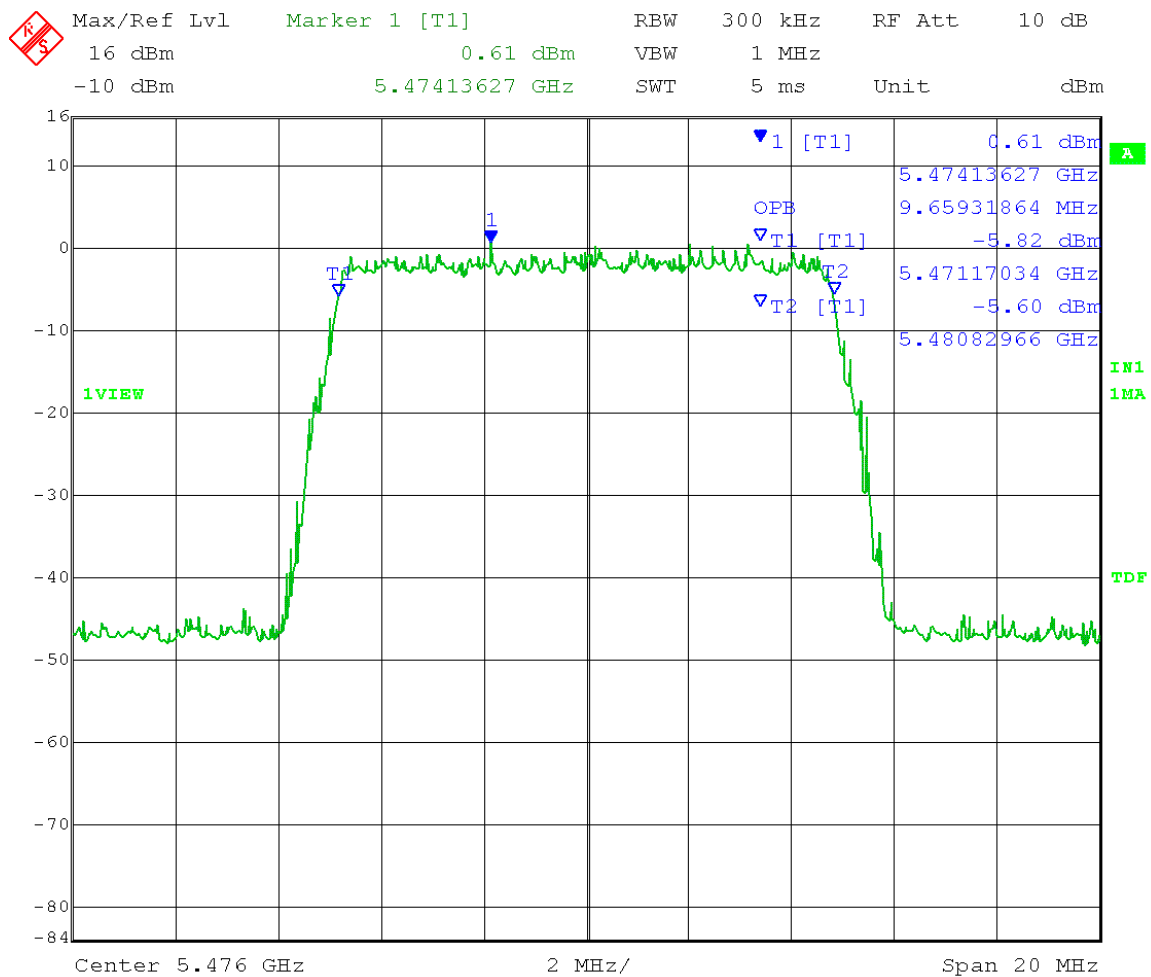


Date: 18.OCT.2013 12:46:26

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Low Channel: Transmit = 5.476 GHz 10MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

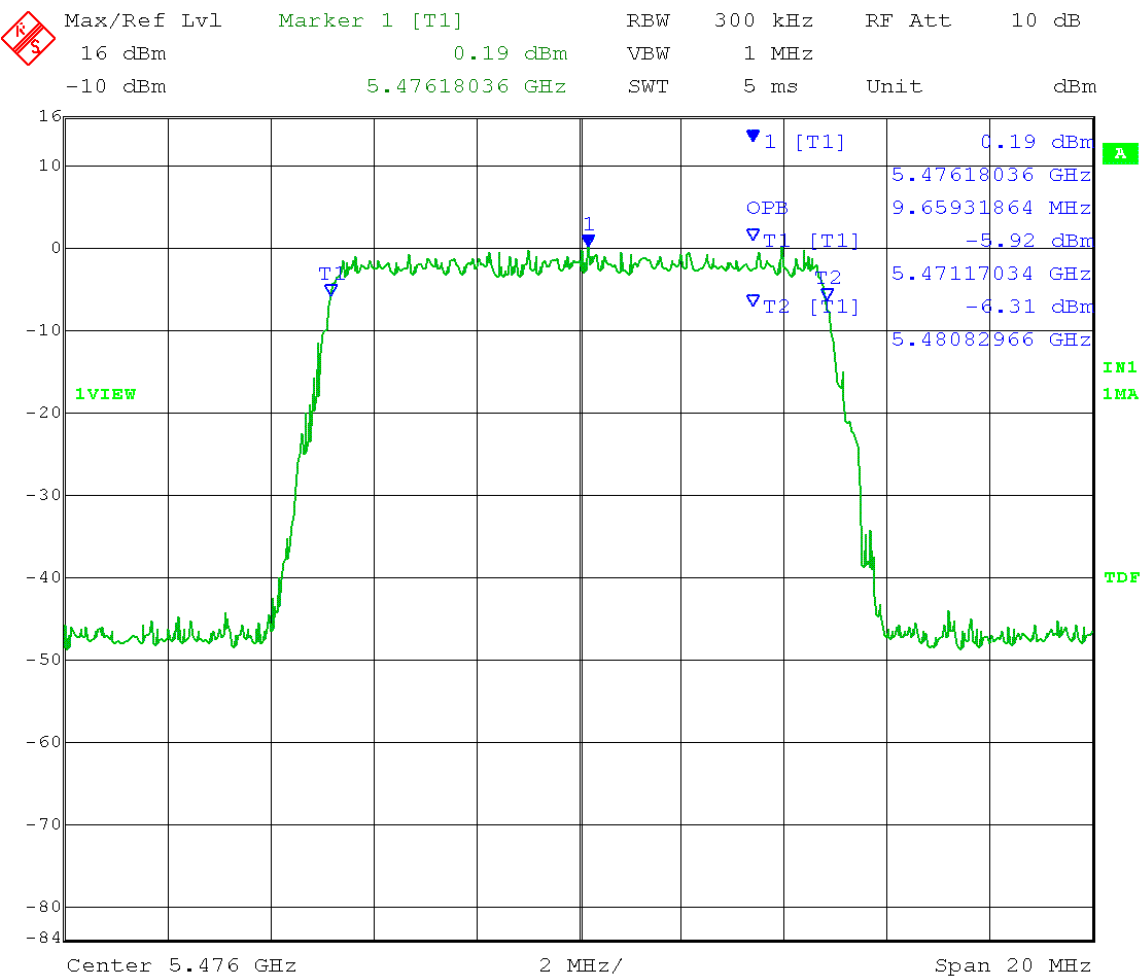
99% OBW = 9.66MHz



Date: 18.OCT.2013 11:38:15

TX 1:

99% OBW = 9.66MHz

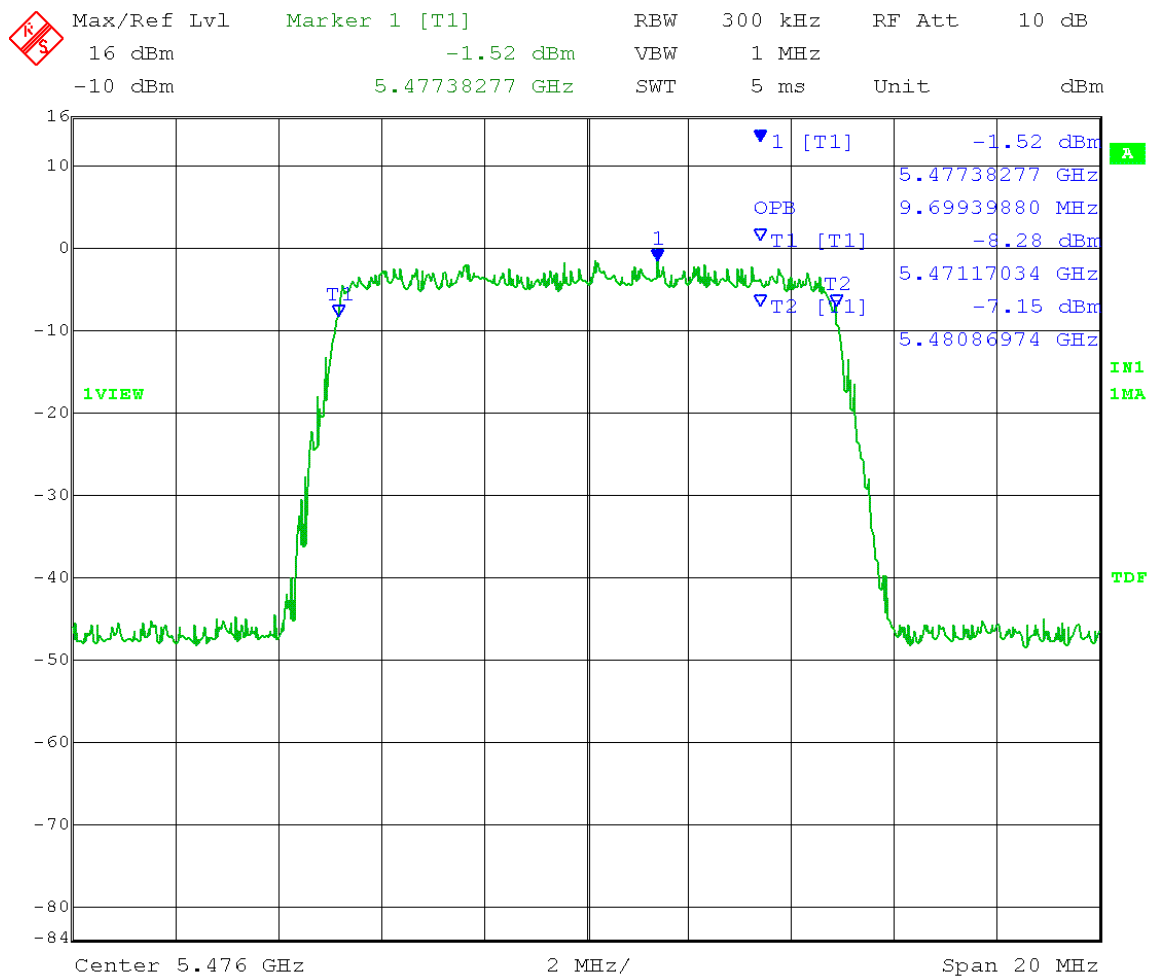


Date: 18.OCT.2013 12:47:09

Test Date: 10-18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.476 GHz 10MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

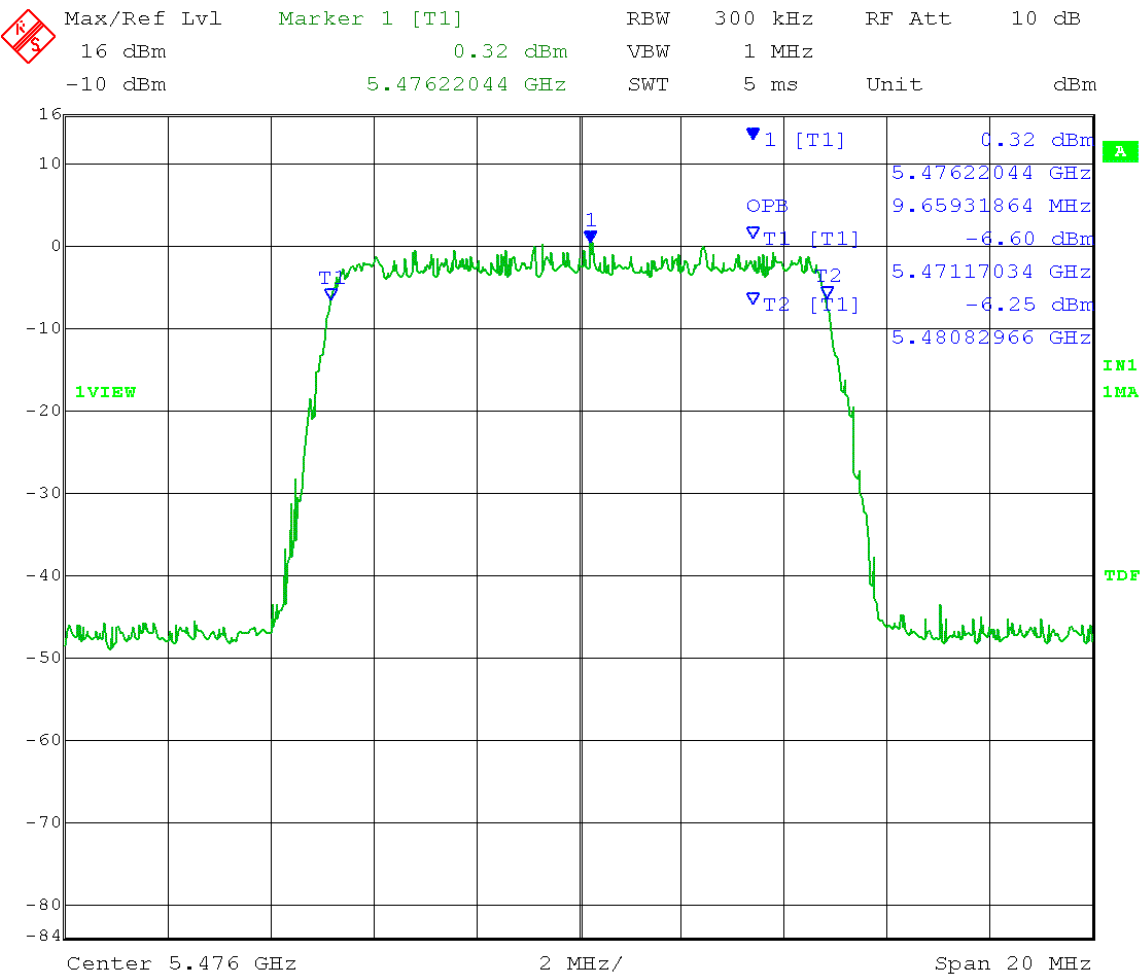
99% OBW = 9.70MHz



Date: 18.OCT.2013 11:36:41

TX 1:

99% OBW = 9.66MHz

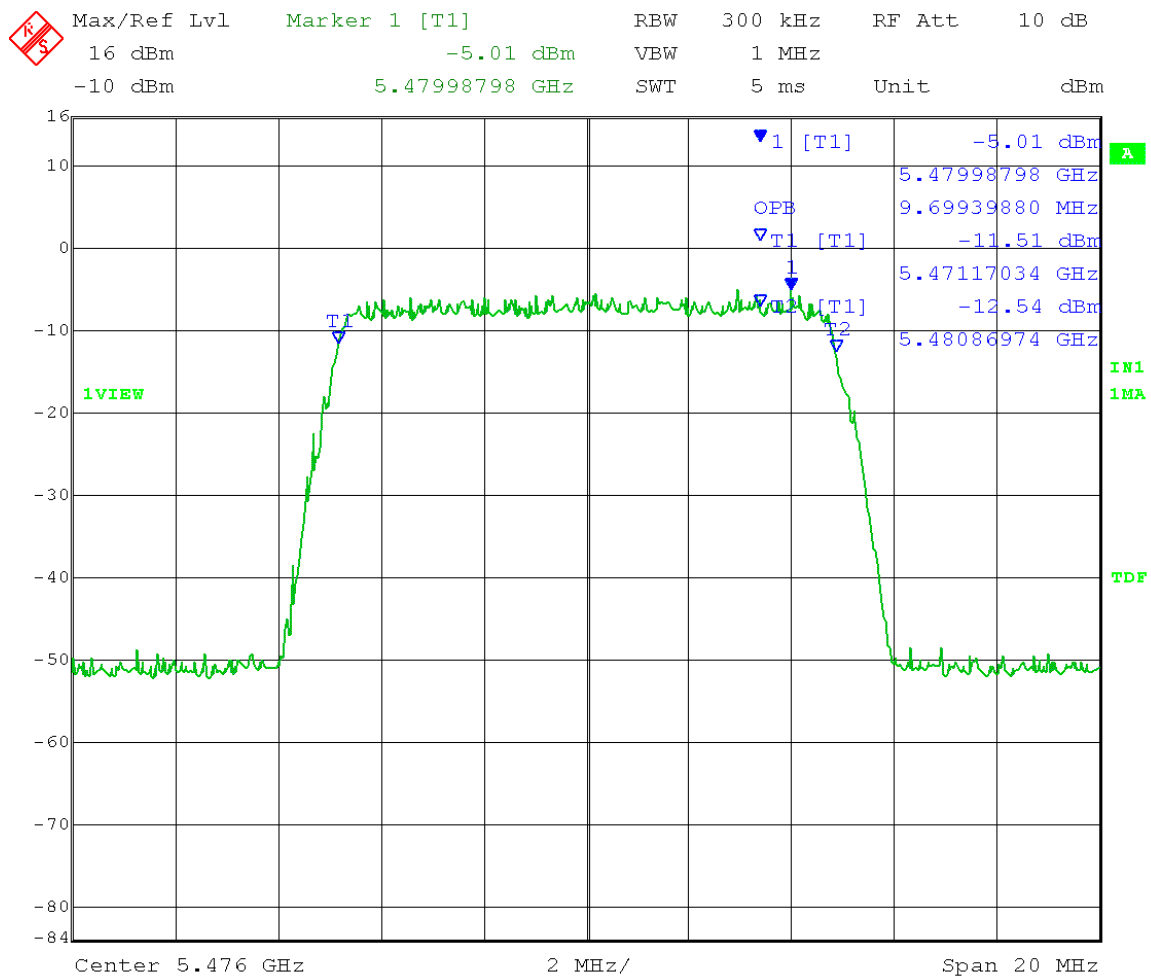


Date: 18.OCT.2013 12:47:55

Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Low Channel: Transmit = 5.476 GHz 10MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

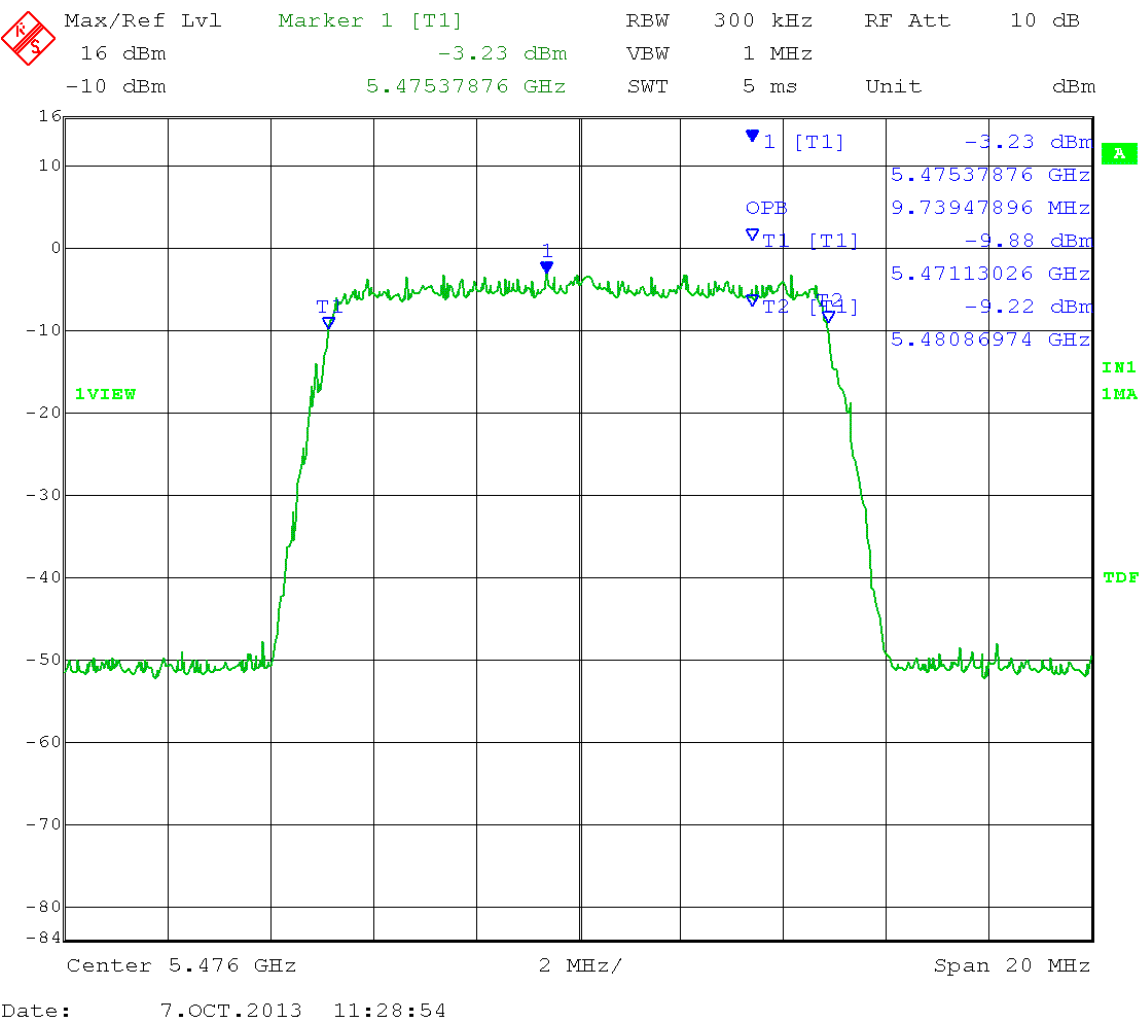
99% OBW = 9.70MHz



Date: 7.OCT.2013 11:25:40

TX 1:

99% OBW = 9.74MHz





166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B4.0 Maximum Conducted Output Power

Rule Section: Section 15.407(a)(2)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section E(3)(a) Method PM (Measurement using an RF average power meter):
Measurements performed using a wideband RF power meter with a thermocouple detector

Description: Measure the average power of each RF output port of the transmitter
Sum the powers of each port in linear power units
Convert linear power units to dBm
Add $10 \log (1/x)$, where x is the duty cycle, to the measured power

Limit: Lesser of: 250 mW (24 dBm) or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz.
Limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Results: Passed

Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

Output power was set to 30 dBm eirp using special test software.

Test Date: 10-22-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Maximum conducted output power – Conducted
 Operator: Lillian L
 Test Procedure used: KDB 789033 D01 v01r03 – E)3)a) Method PM
 Limit: [15.407(a)(2)]: lesser of 250mW or 11dBm+10log B (B=26dB EBW)
 Operating Mode: Point-to-Point; Antenna Gain = 23 dBi
 EUT Conducted Limit: = Limit - (23 dBi - 6 dB)

10MHz Operating Bandwidth:

FCC Maximum Conducted Output Power		10MHz (<i>Adjustment for duty cycle = 10log1/x = 0.13</i>)				
		QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit ≤ 250mW	dBm					
	<i>EUT FCC limit:</i>	<i>4.24</i>	<i>4.23</i>	<i>4.21</i>	<i>4.18</i>	<i>4.21</i>
HCH = 5719 MHz	TX0 (mW)	1.22	1.2	1.19	1.18	1.18
	TX1 (mW)	1.2	1.21	1.2	1.22	1.19
	total(mW)	2.42	2.41	2.39	2.40	2.37
	Total(dBm)	3.97	3.95	3.91	3.93	3.88
	Margin	0.28	0.28	0.30	0.25	0.33
MCH = 5575 MHz	TX0	1.22	1.22	1.18	1.26	1.22
	TX1	1.19	1.19	1.19	1.18	1.21
	total(mW)	2.41	2.41	2.37	2.44	2.43
	Total(dBm)	3.95	3.95	3.88	4.00	3.99
	Margin	0.29	0.28	0.33	0.17	0.23
LCH = 5476 MHz	TX0	1.22	1.12	1.19	1.2	1.2
	TX1	1.32	1.27	1.27	1.29	1.3
	total(mW)	2.54	2.39	2.46	2.49	2.50
	Total(dBm)	4.18	3.91	4.04	4.09	4.11
	Margin	0.07	0.31	0.17	0.09	0.10



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B5.0 Unwanted Emission Levels – Radiated Restricted Band-Edge Radiated with antenna connected

Rule Part: FCC Part 15.407(b)(7) and FCC Part 15.205

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section H(1) – Unwanted emissions in the restricted bands

Section H(3) – General Requirements for Unwanted Emissions Measurements

Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz

Section H(6) – Procedure for Average Unwanted Emissions Measurements Above 1 GHz

Section H(6)(c) – Average Detection method

Limit: FCC Part 15.209

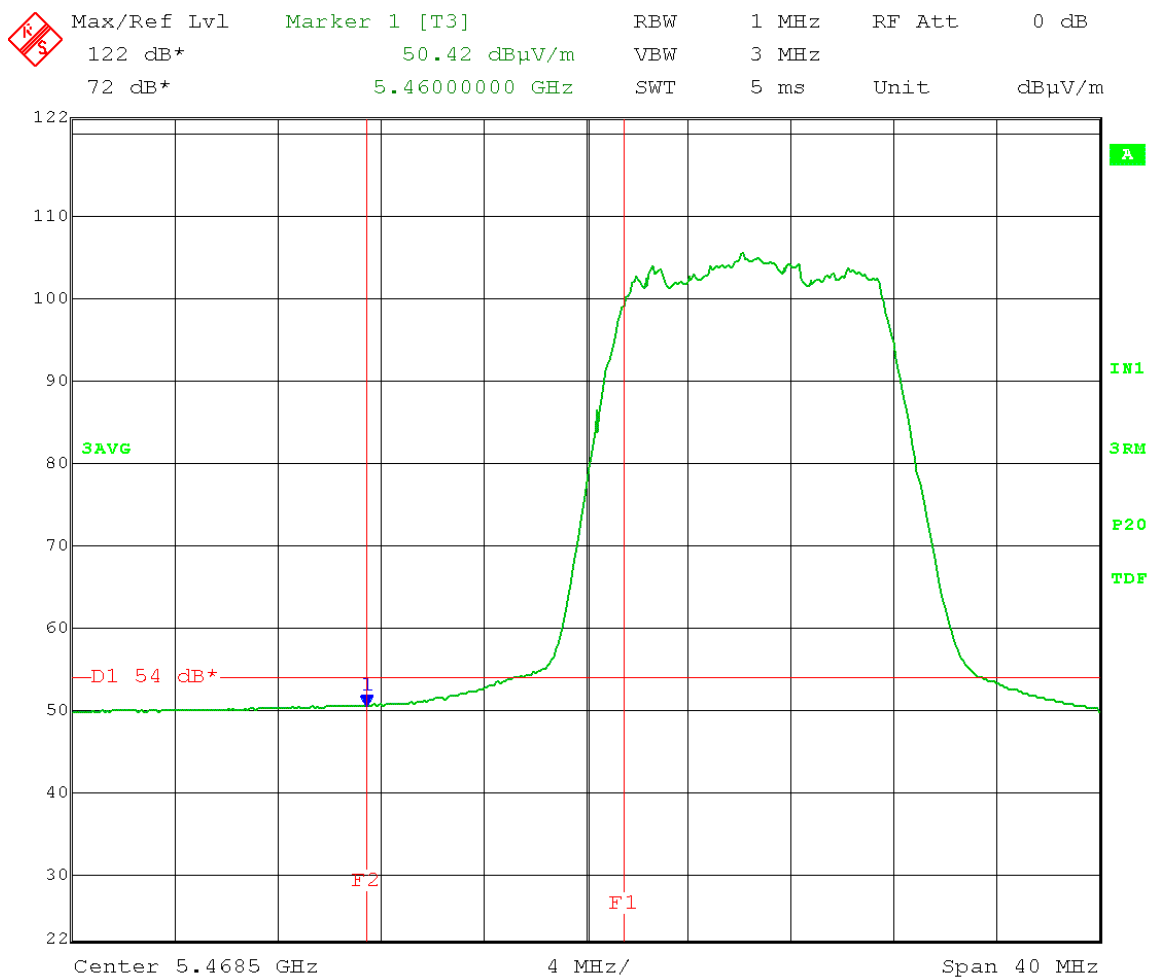
Results: Compliant

Notes: Because the lower operating band-edge is near a restricted band, compliance with this restricted band was determined by measuring the field strength of the lower channel emission at the restricted band edge.

Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024QAM modulations at the lowest channel of operation. The EUT was set to transmit continuously.

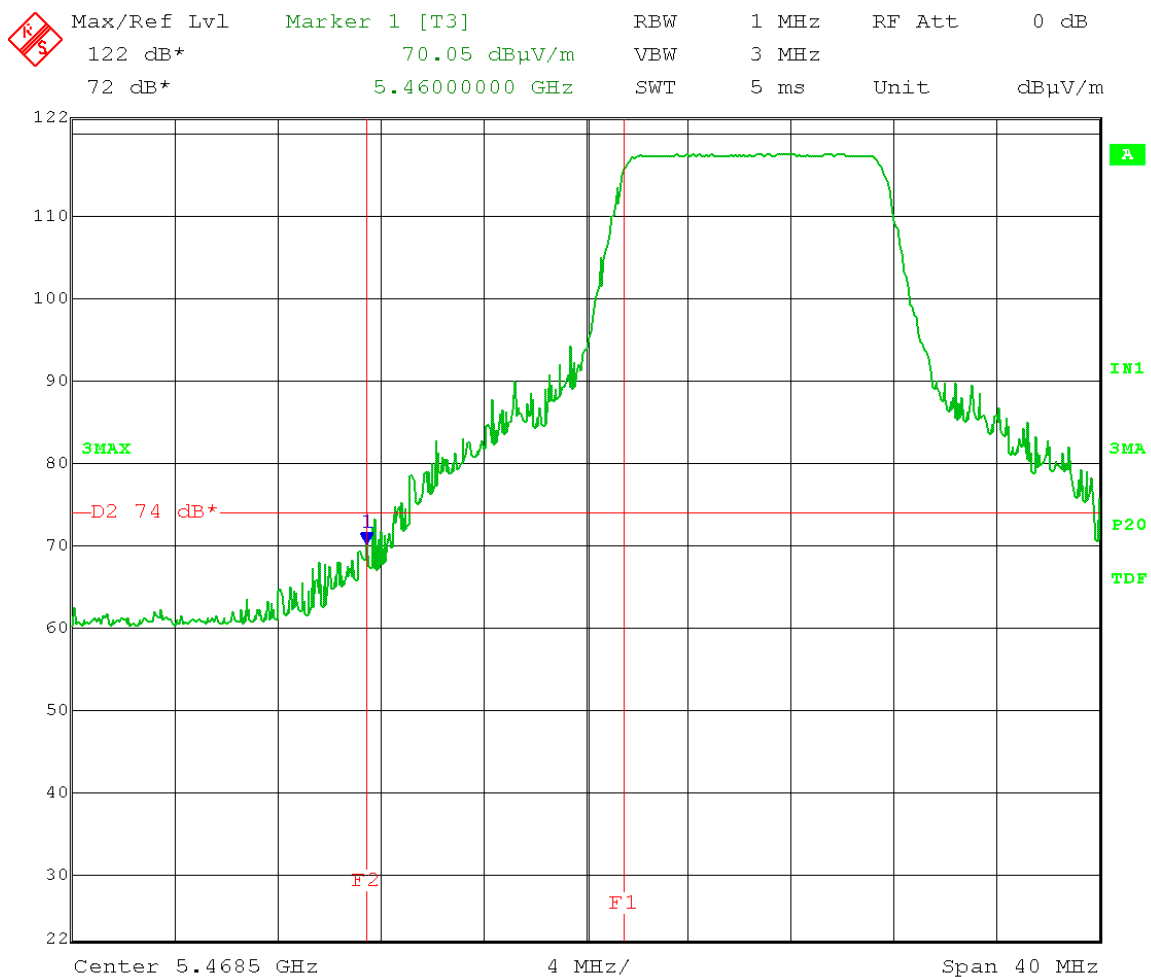
Both transmit chains active. Output power was set to 30 dBm eirp using special test software.

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 1024QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



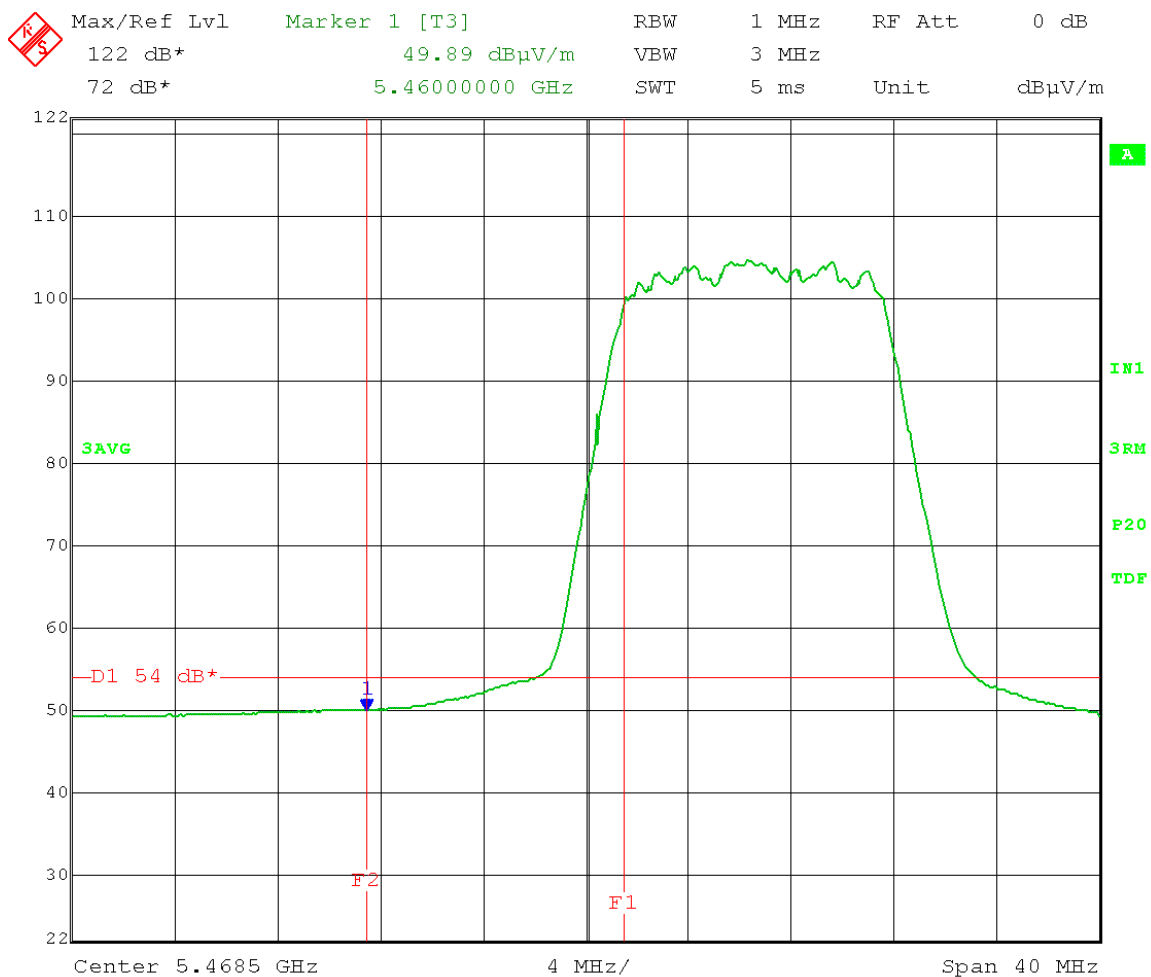
Date: 3.OCT.2013 15:18:45

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 1024QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



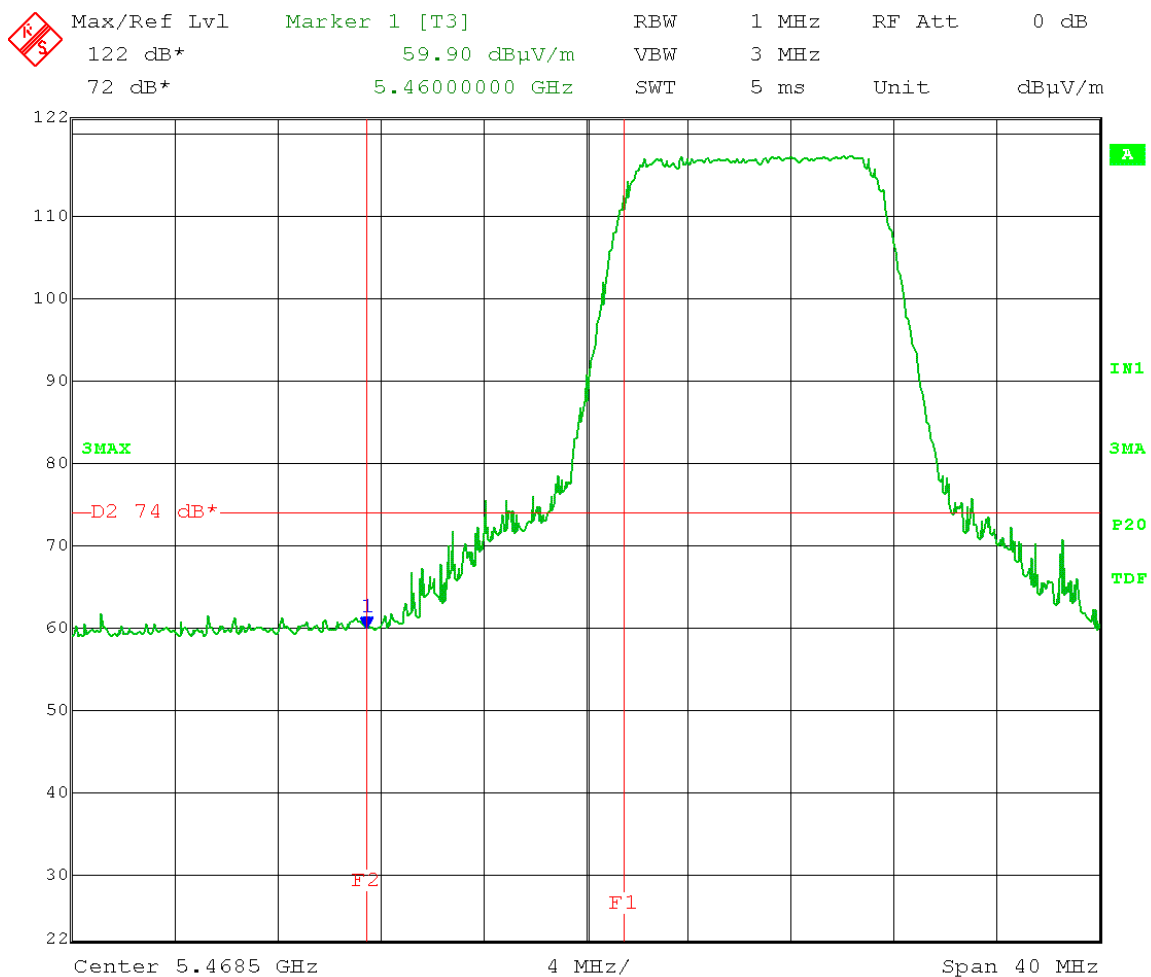
Date: 3.OCT.2013 15:18:06

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 1024QAM
 Vertical
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



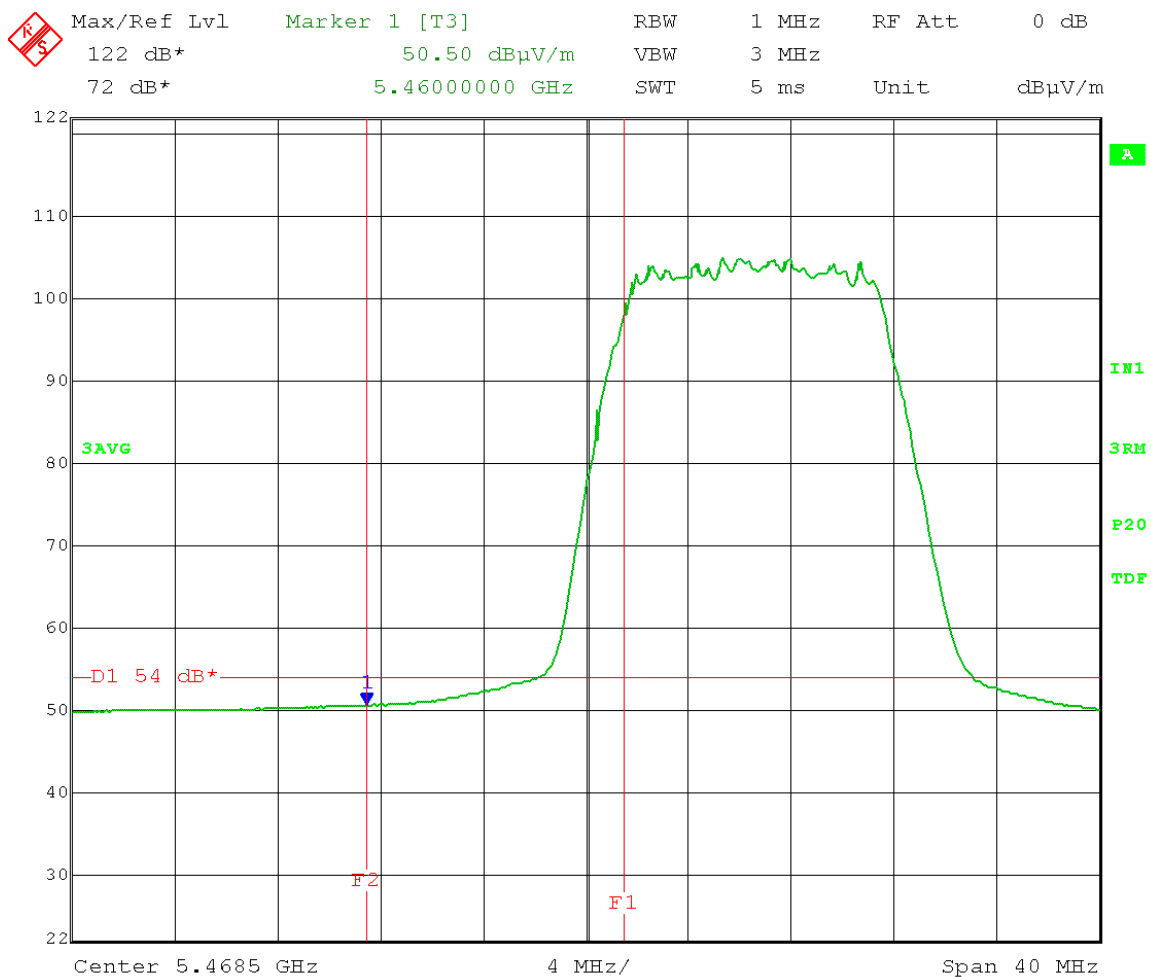
Date: 3.OCT.2013 15:22:46

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 1024QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



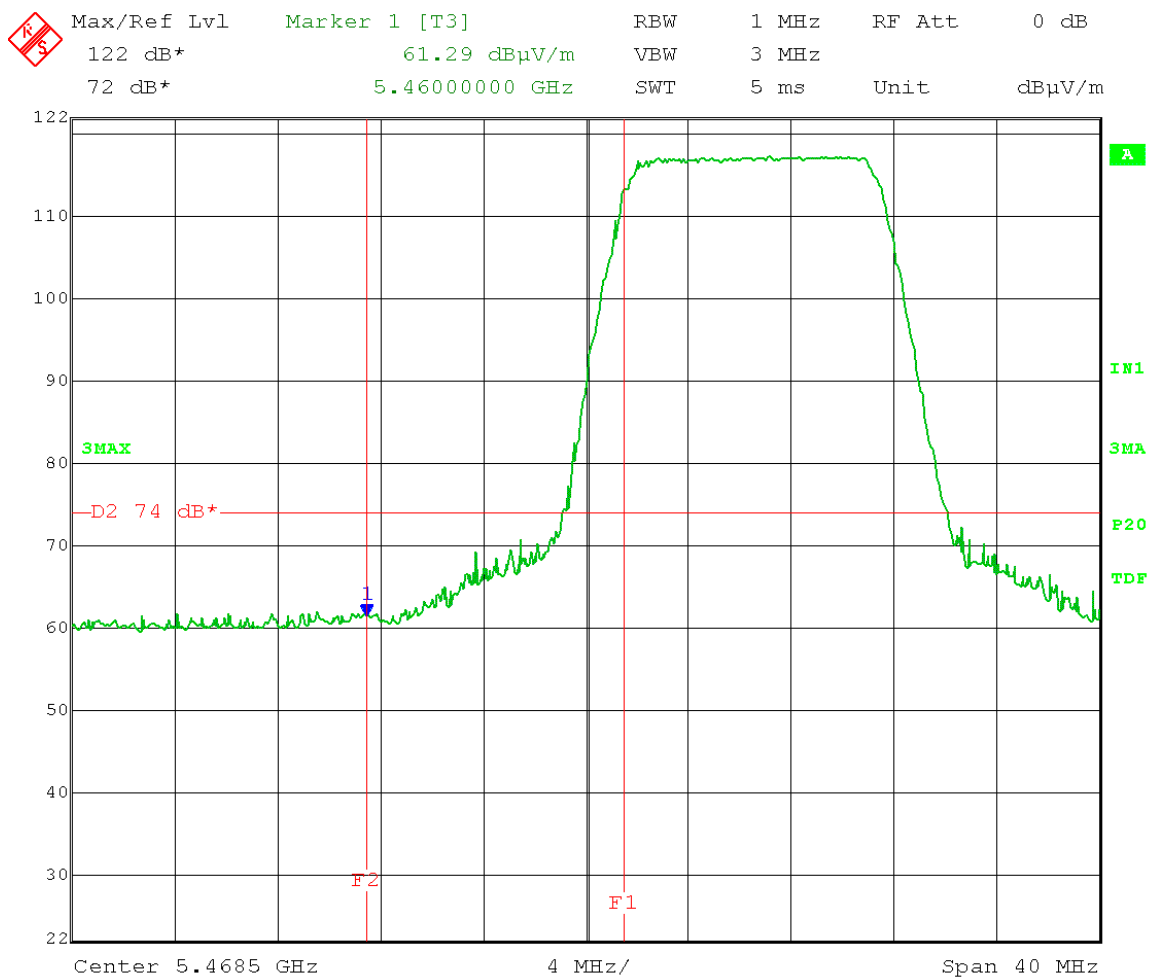
Date: 3.OCT.2013 15:23:16

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 16QAM
 Horizontal
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



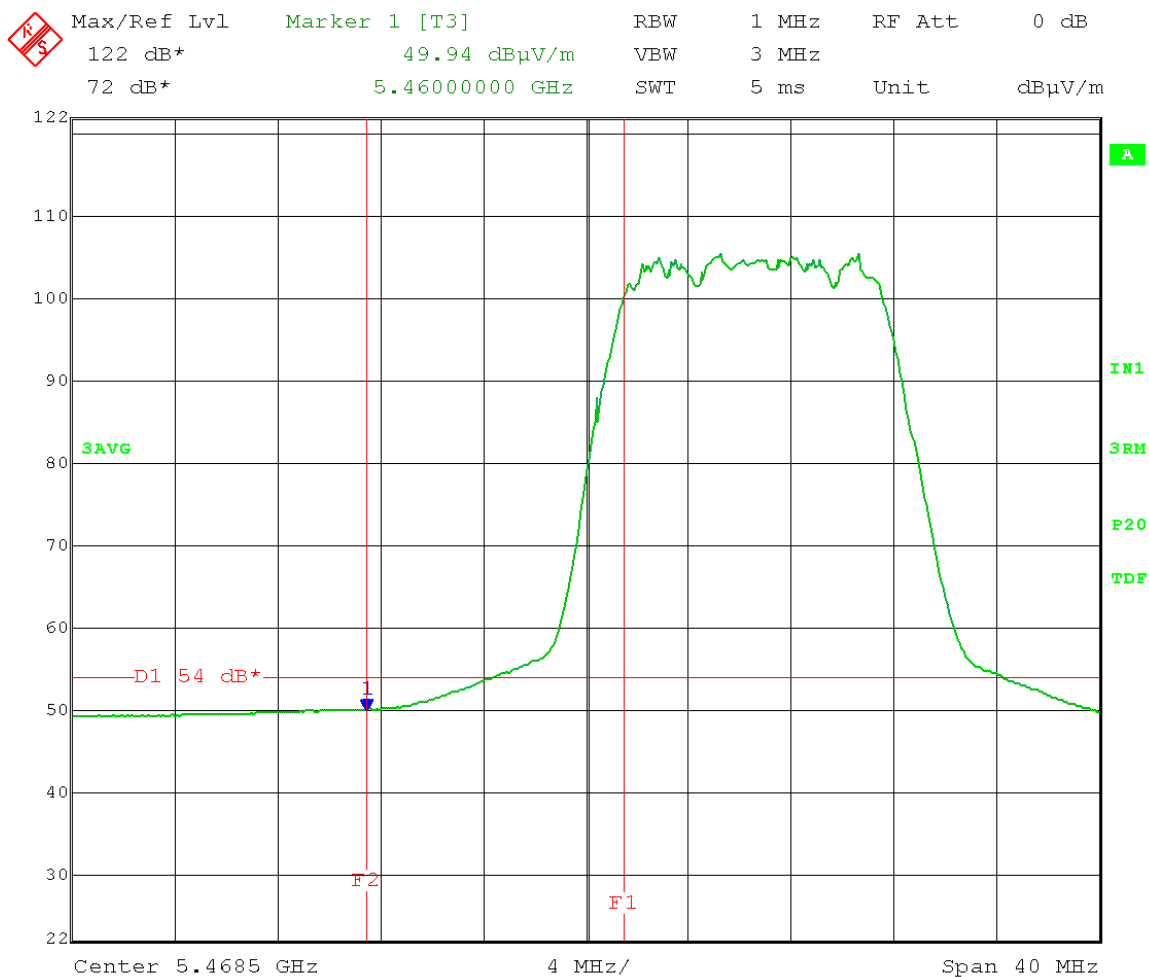
Date: 3.OCT.2013 15:12:39

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 16QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



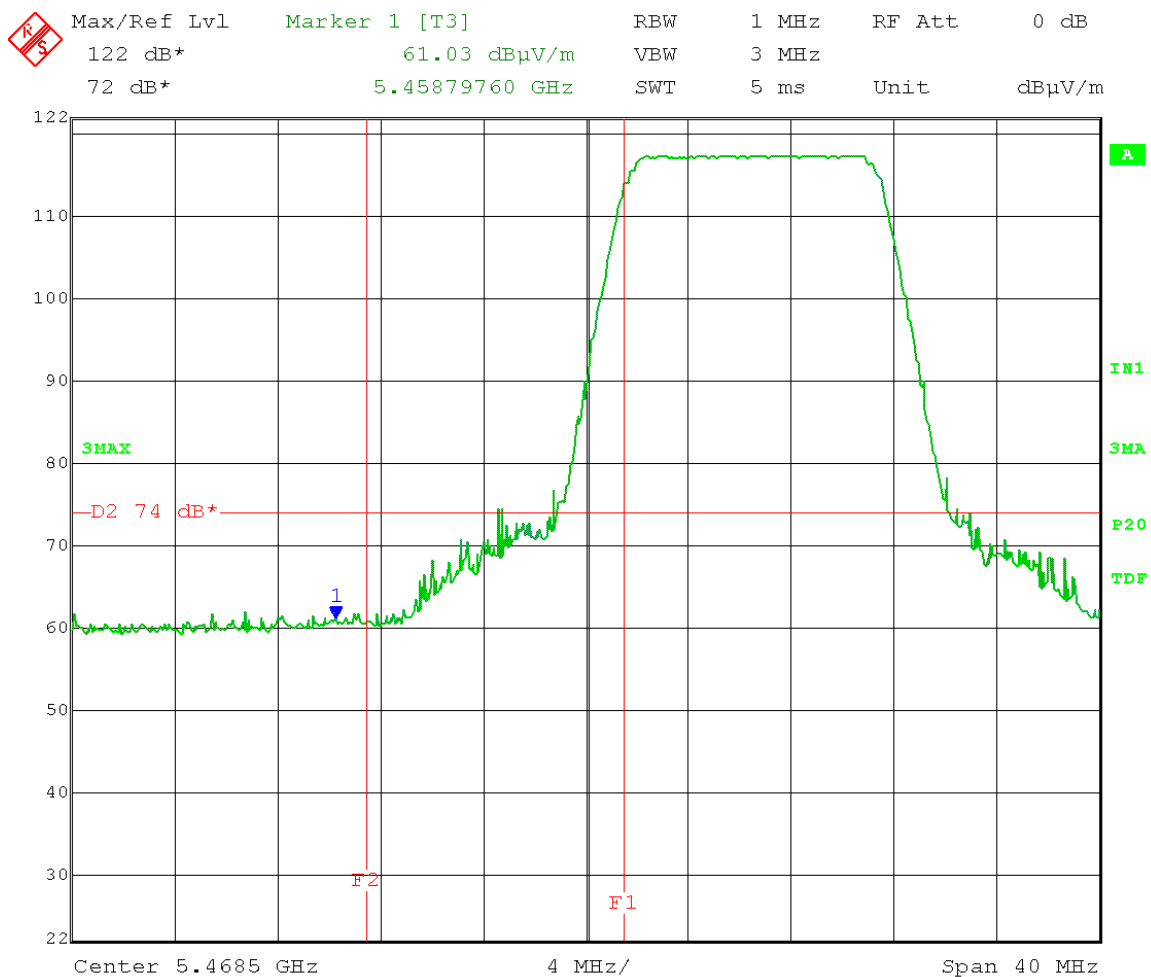
Date: 3.OCT.2013 15:13:14

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 16QAM
 Vertical
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



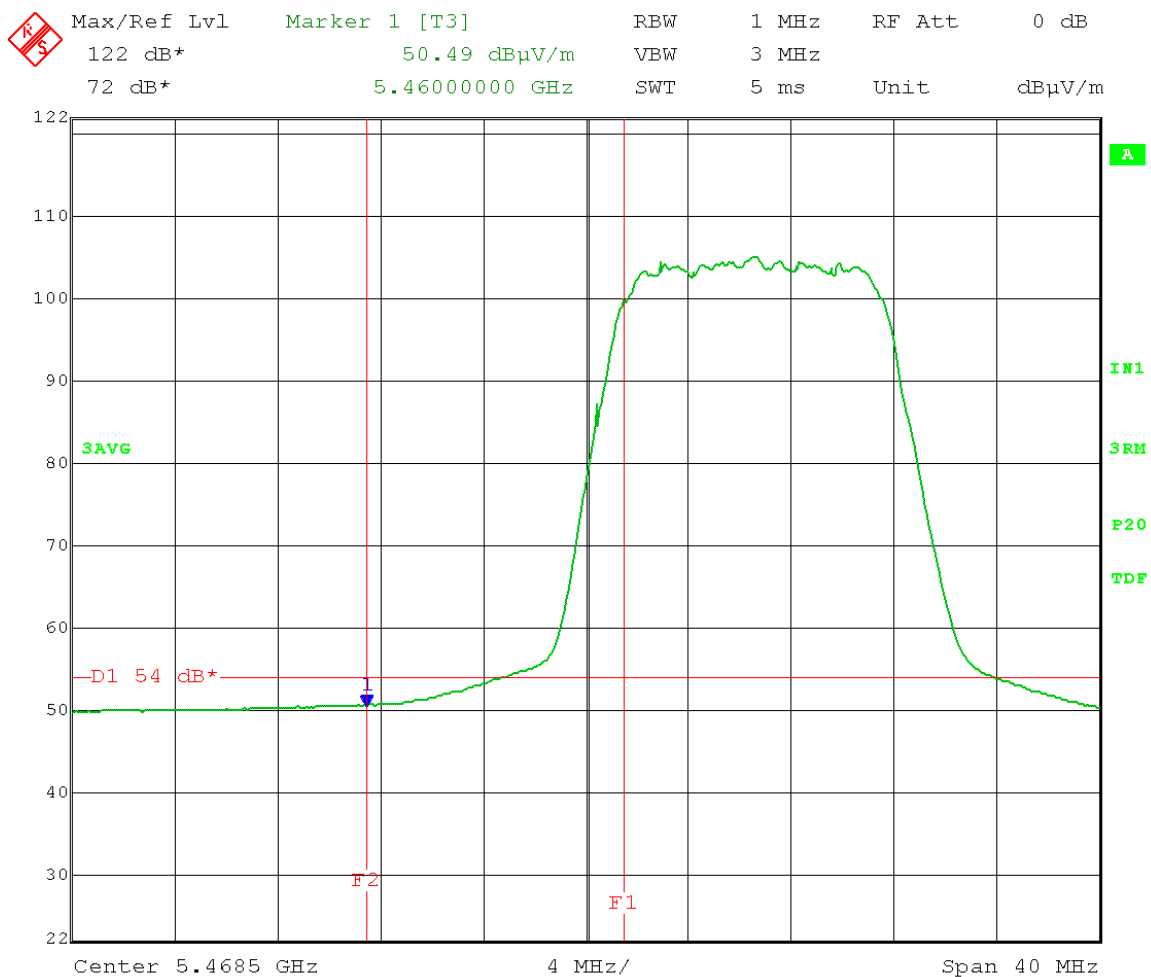
Date: 3.OCT.2013 15:28:19

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 16QAM
 Vertical
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



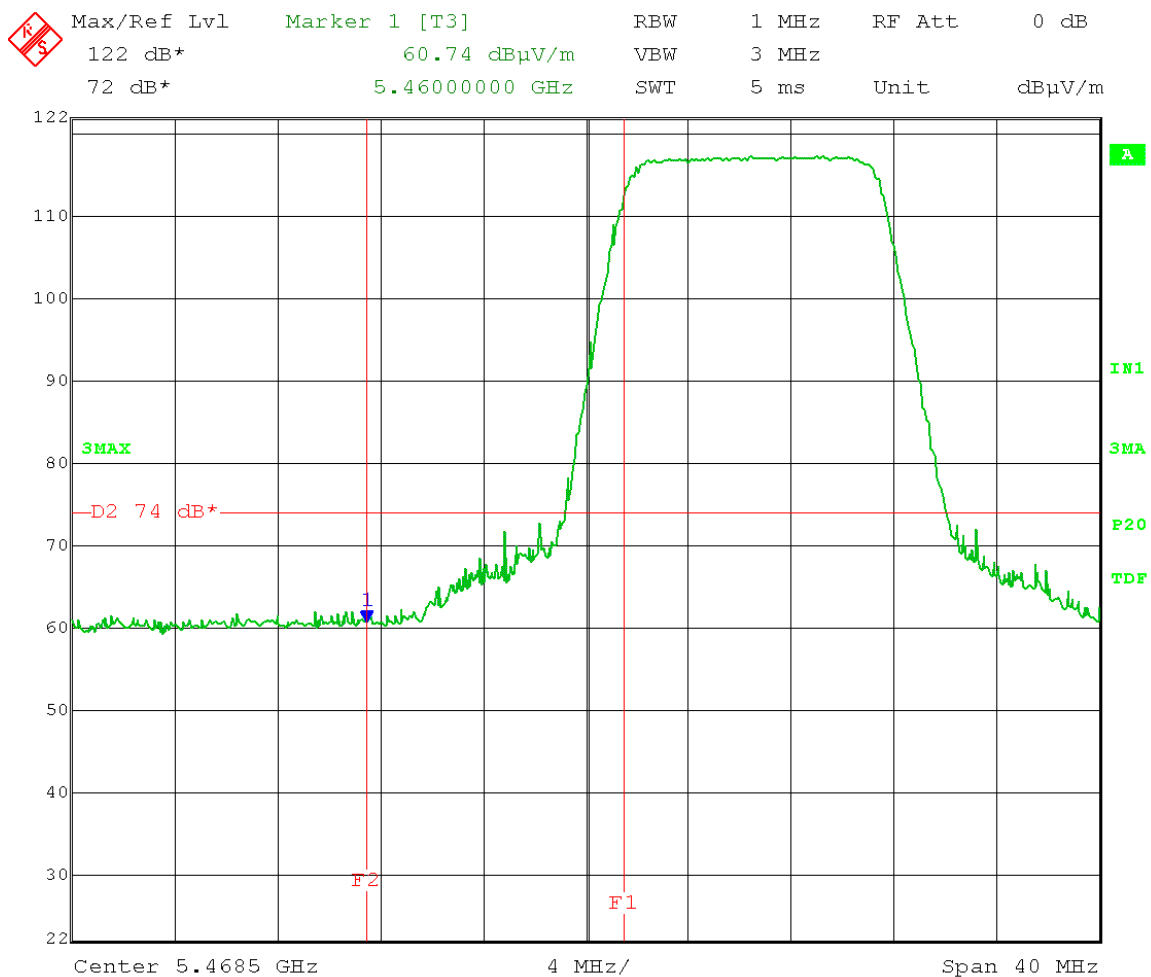
Date: 3.OCT.2013 15:27:36

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 256QAM
 Horizontal
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



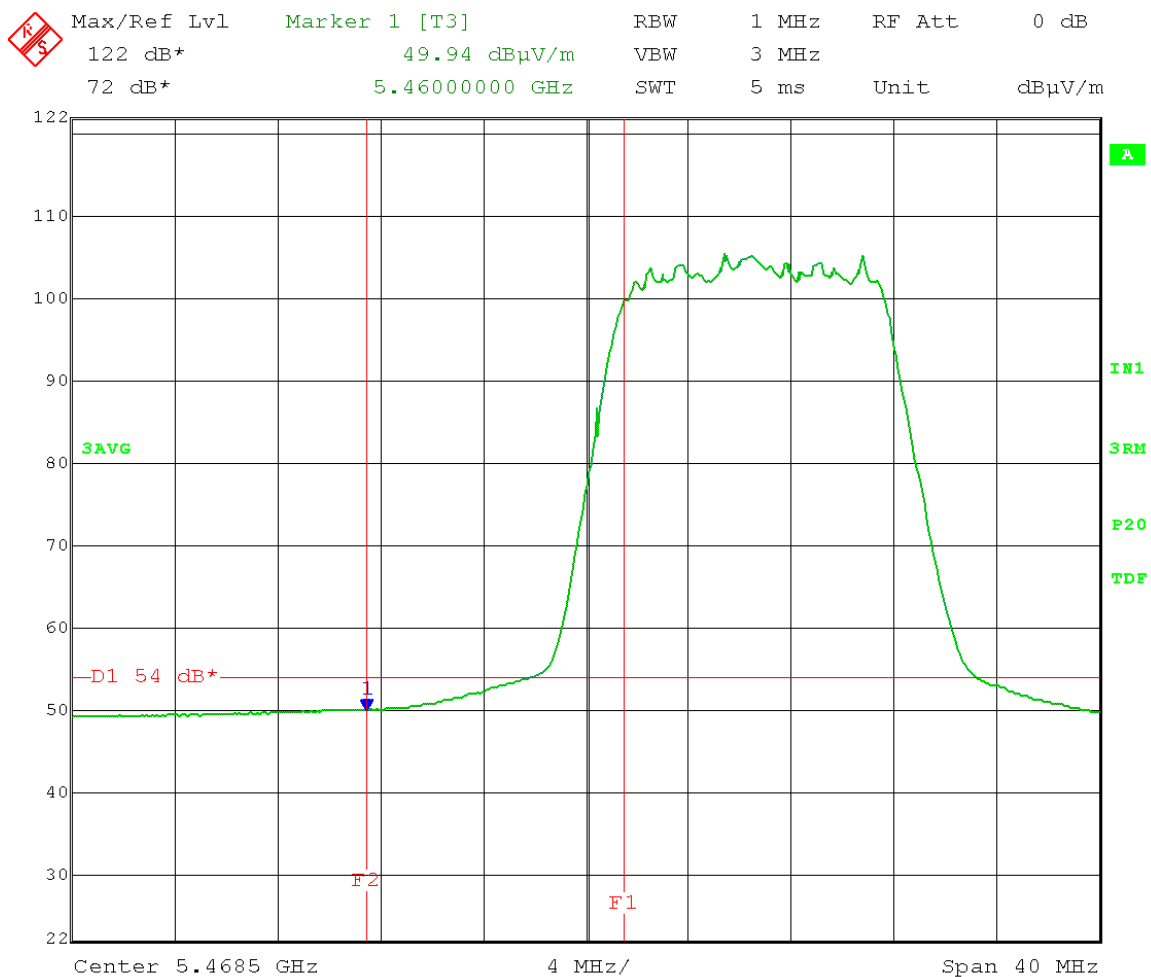
Date: 3.OCT.2013 15:15:38

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 256QAM
 Horizontal
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.



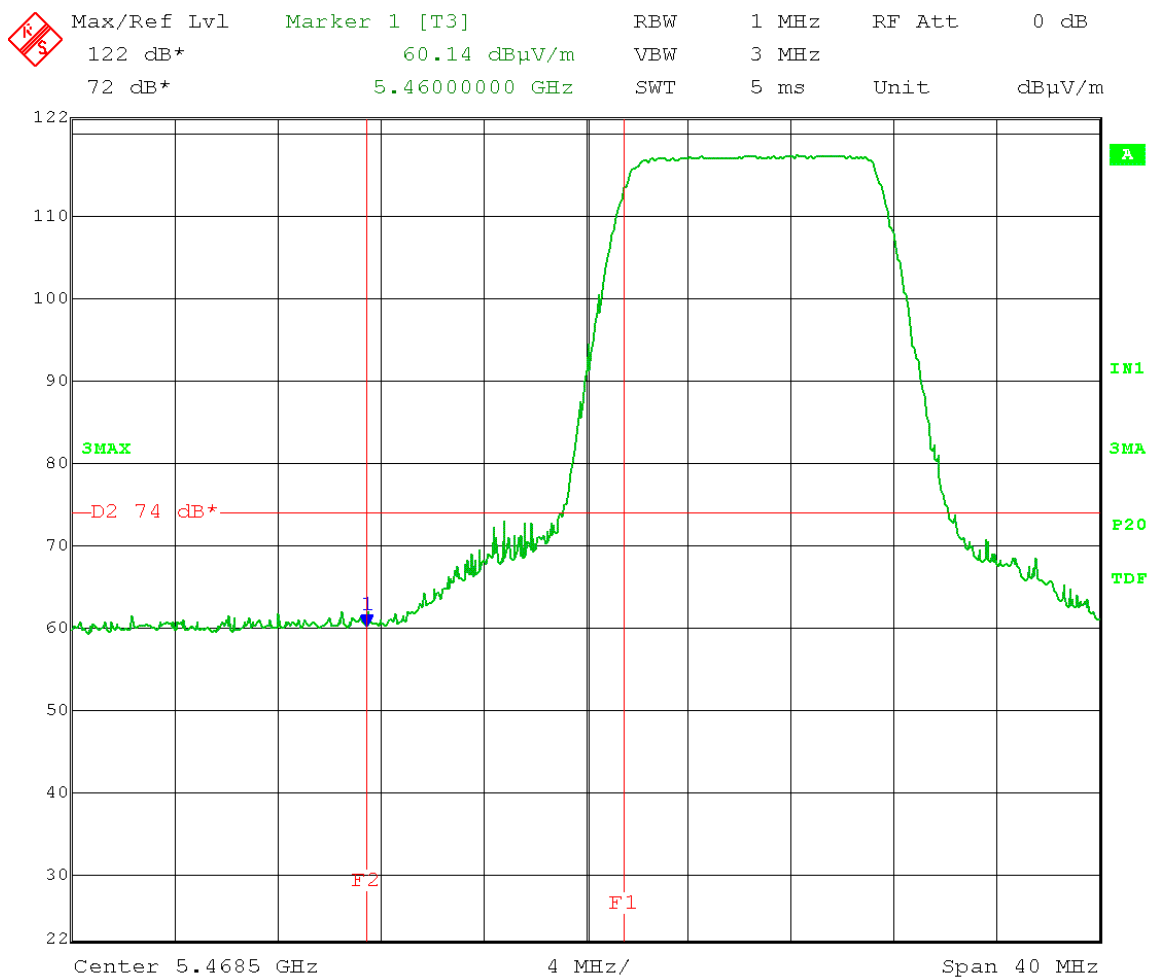
Date: 3.OCT.2013 15:16:24

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 256QAM
 Vertical
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



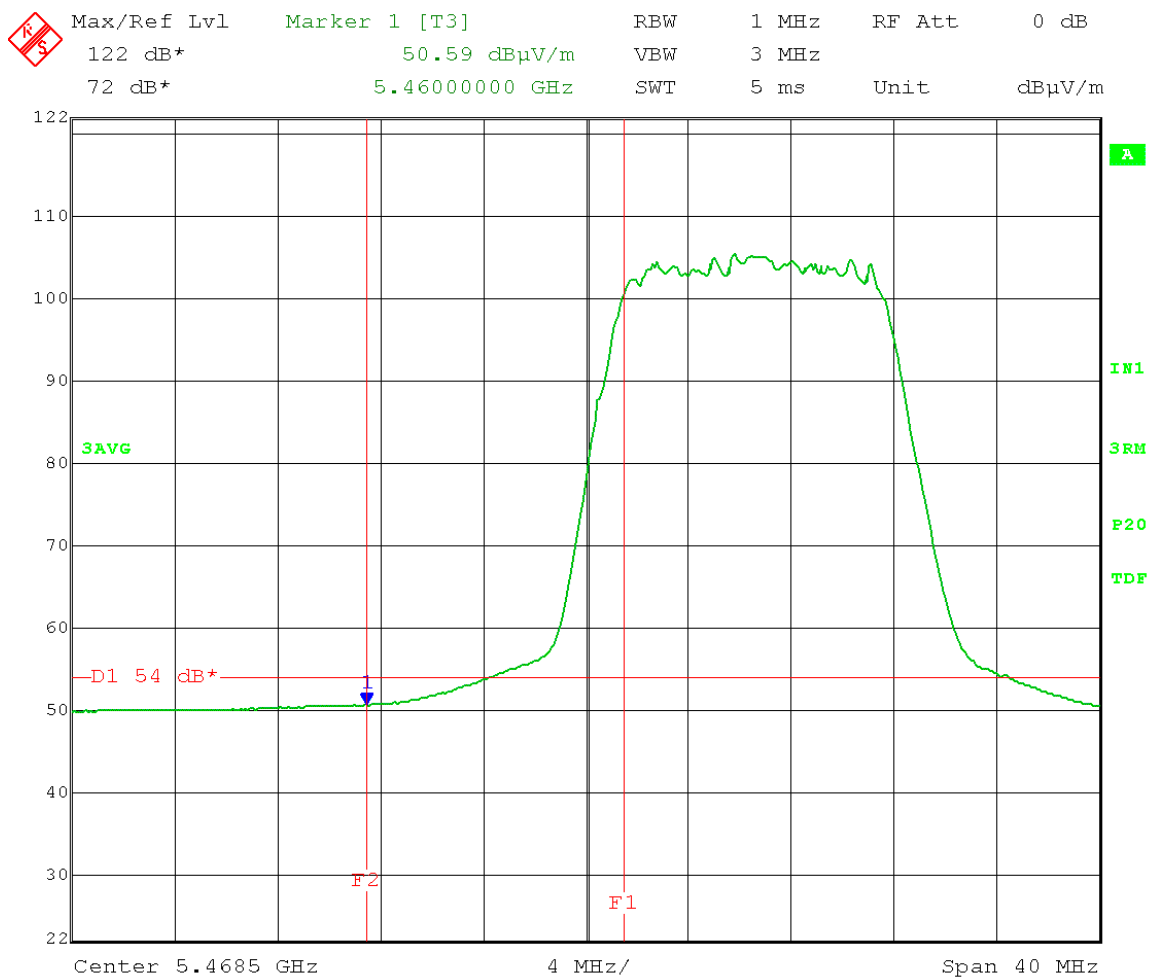
Date: 3.OCT.2013 15:24:53

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 256QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.



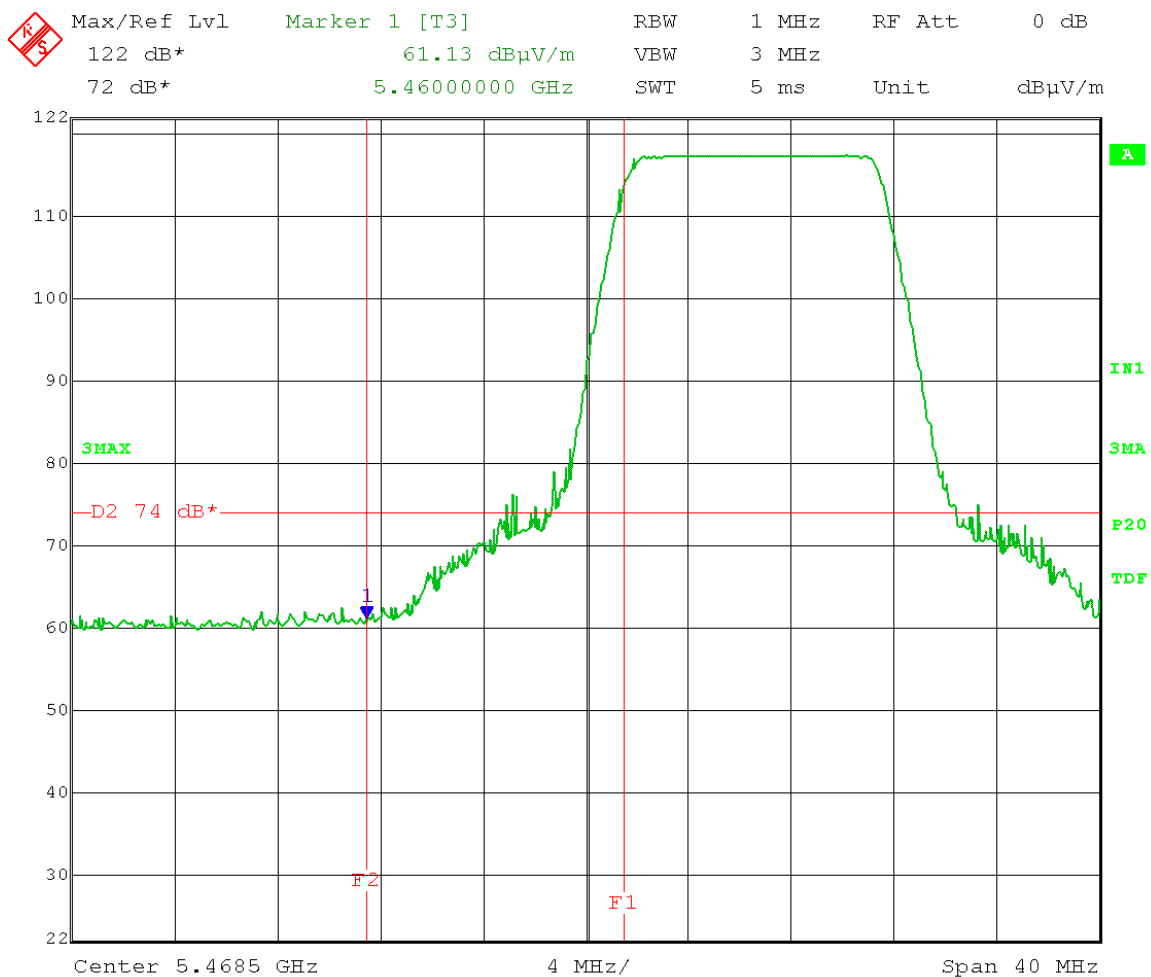
Date: 3.OCT.2013 15:24:15

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 64QAM
 Horizontal
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



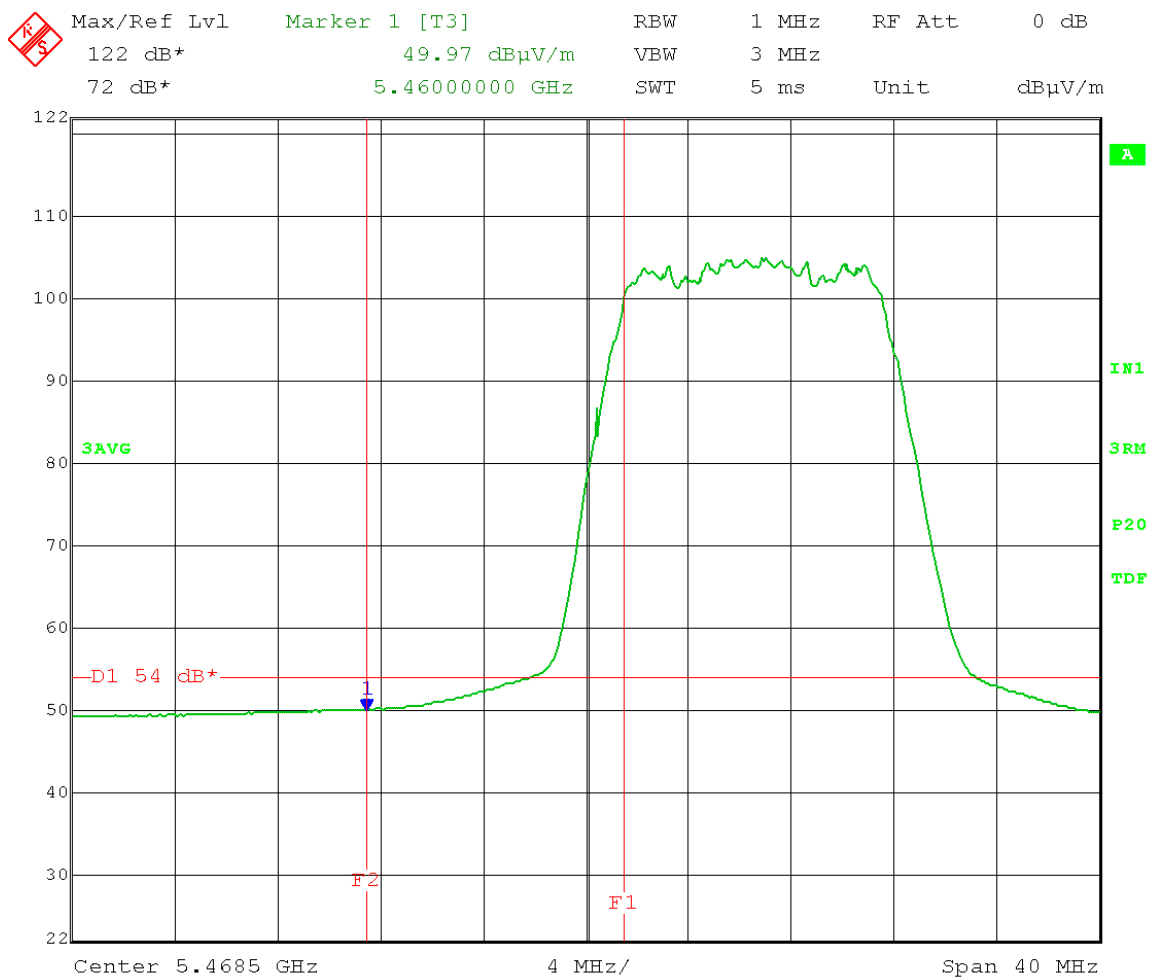
Date: 3.OCT.2013 15:14:38

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 64QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



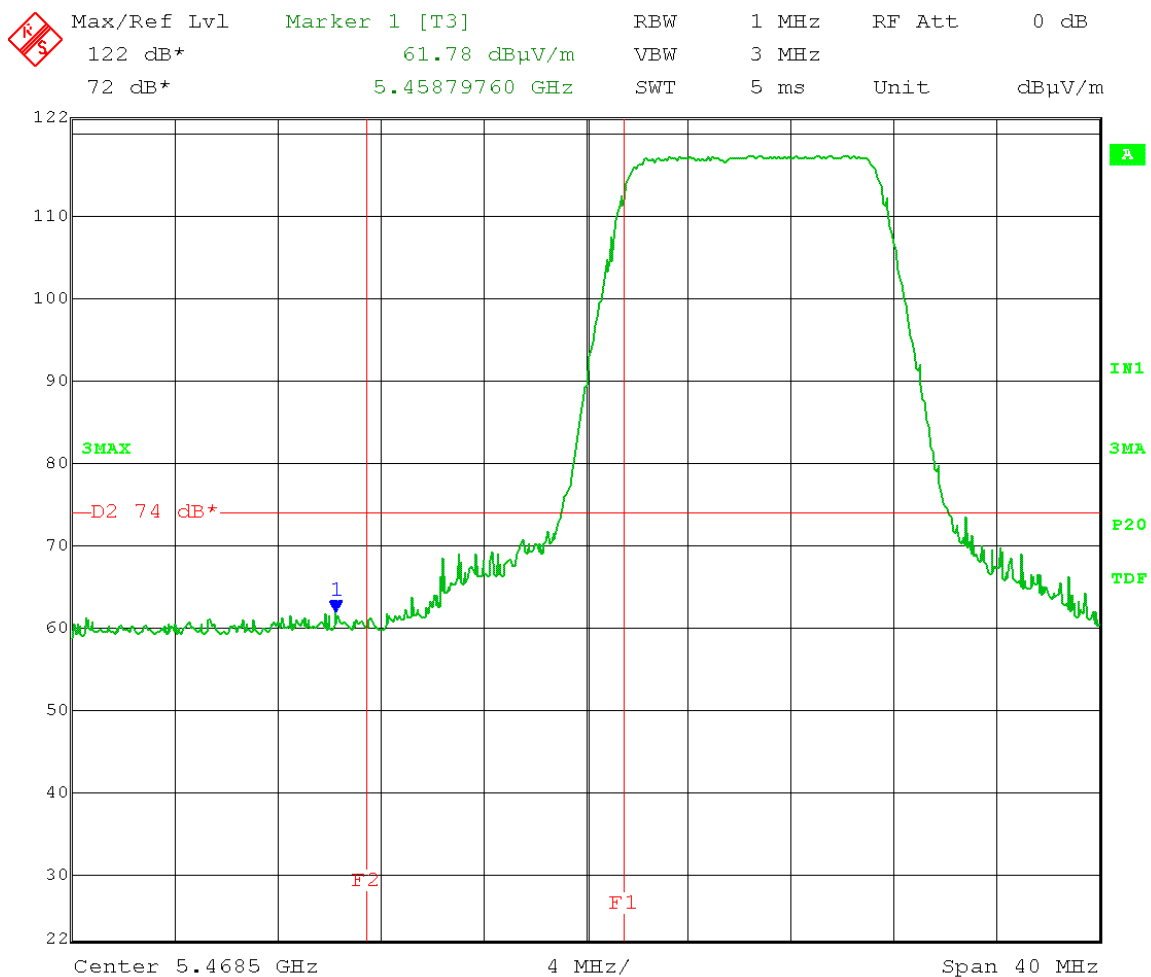
Date: 3.OCT.2013 15:14:00

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: 64QAM
 Vertical
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



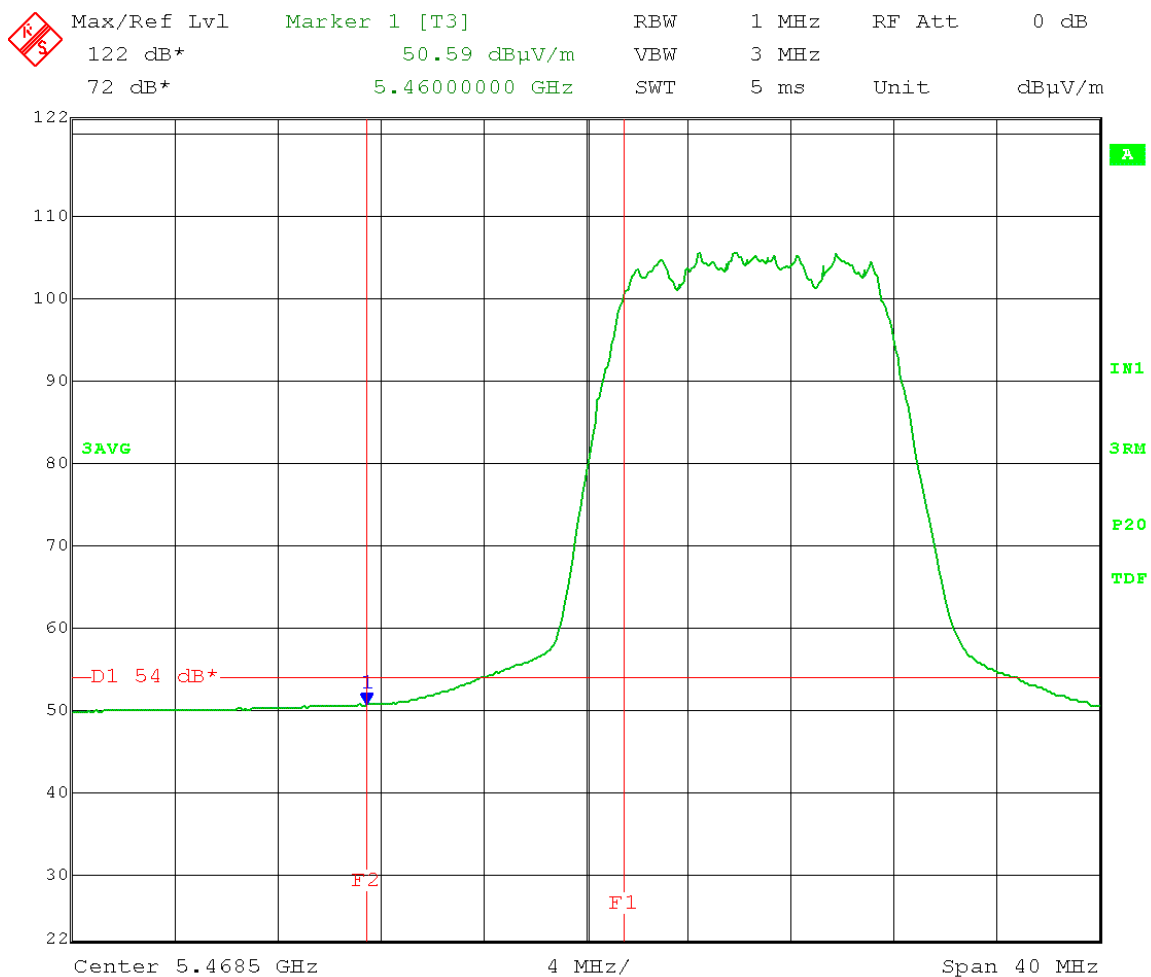
Date: 3.OCT.2013 15:26:03

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: 64QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



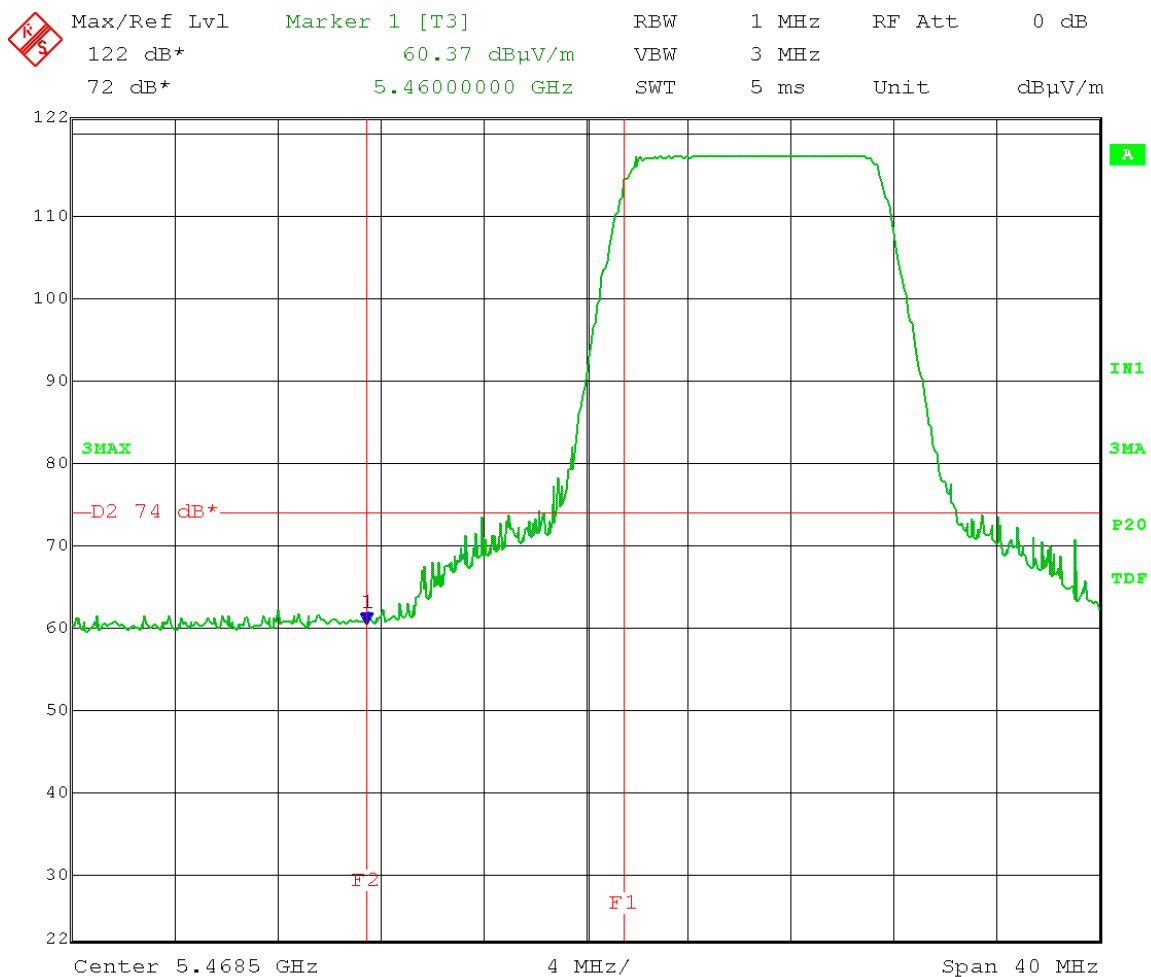
Date: 3.OCT.2013 15:26:37

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: QPSK
 Horizontal
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



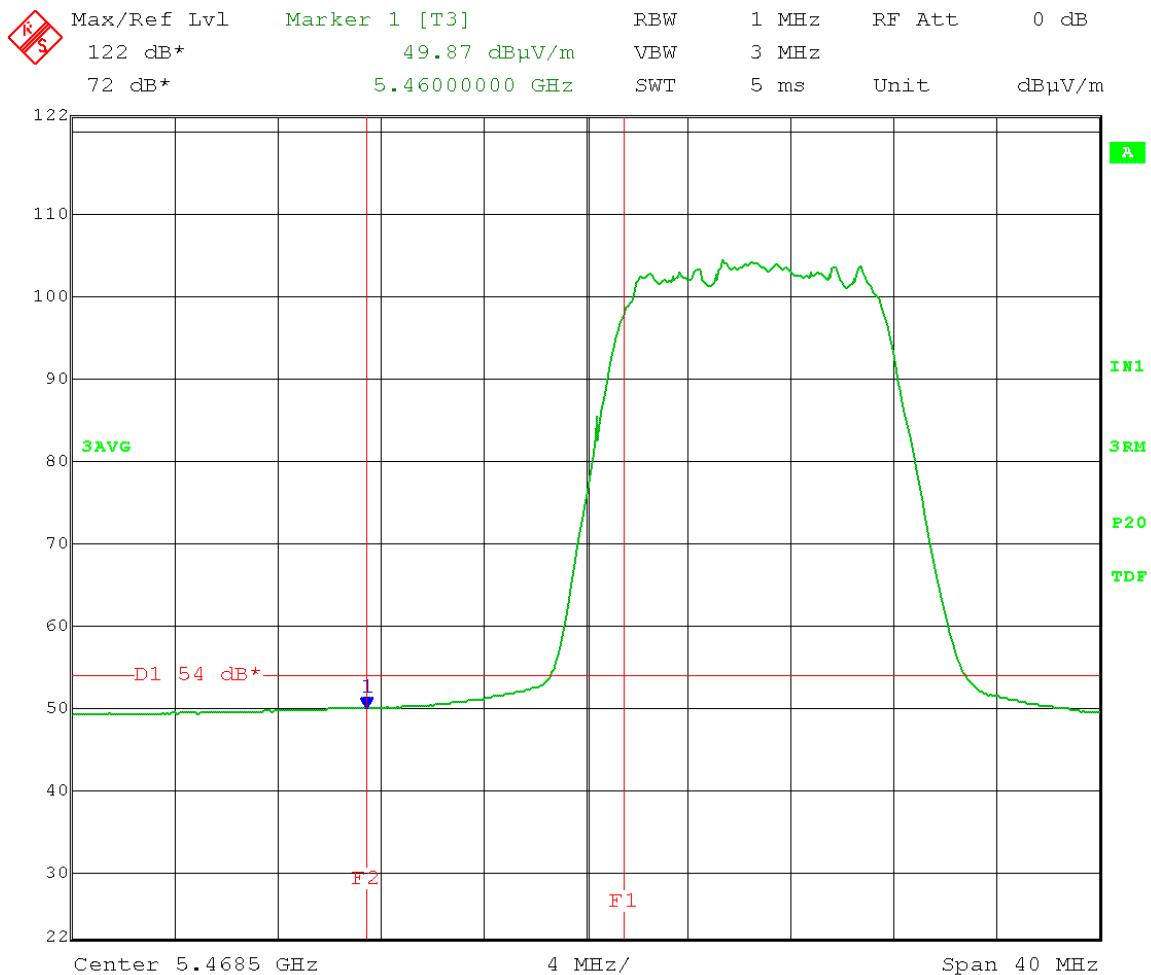
Date: 3.OCT.2013 15:09:54

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: QPSK
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



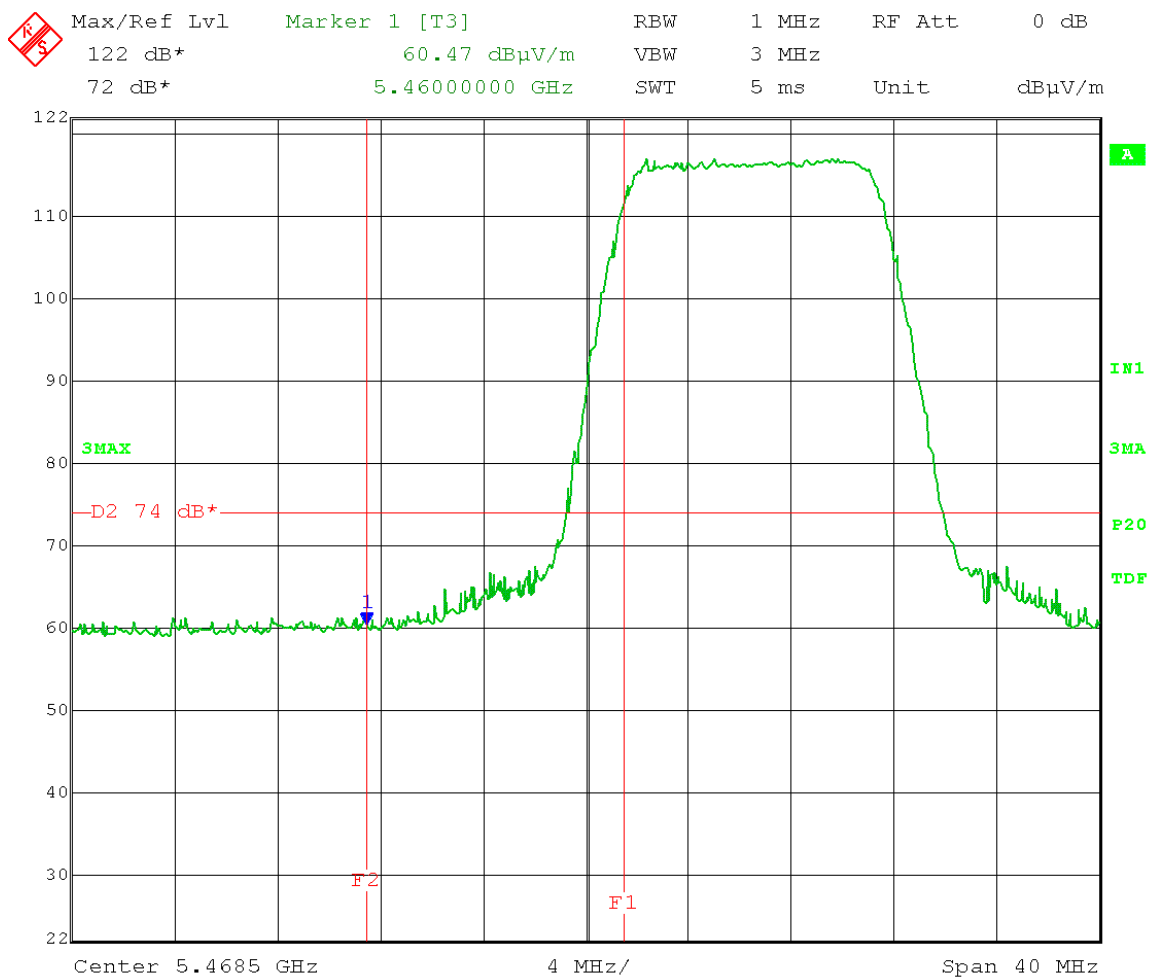
Date: 3.OCT.2013 15:10:29

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 10 MHz channel Bandwidth
Low Channel: Frequency – 5475 MHz
Modulation: QPSK
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



Date: 3.OCT.2013 15:29:21

Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5475 MHz
 Modulation: QPSK
 Vertical
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



Date: 3.OCT.2013 15:29:51



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B6.0 Peak Power Spectral Density – Conducted

Rule Section: Section 15.407(a)(2)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section F – Peak power spectral density (PPSD)
Using method E(2)(d) SA-2 for power spectrum (10 and 20 MHz BW's)
Using method E(2)(b) SA-1 for power spectrum (40 and 50 MHz BW's)

Description: SPAN: set to encompass entire emission bandwidth
RBW = 1 MHz
VBW $\geq$ 3 MHz
Number of points $\geq$ 2 x Span/RBW
Sweep time: auto
Detector = RMS
Sweep: trace average 200 sweeps in RMS mode
Use peak search to find the peak of the spectrum
Add $10 \log (1/x)$ where x is the duty cycle when duty cycle is $< 98\%$

Limit: 11 dBm in any 1 MHz band
Limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Results: Passed

Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

Output power was set to 30 dBm eirp using special test software.

Test Date: 10-22-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Peak Power Spectral Density - Conducted
 Operator: Lillian Li
 Test Procedure used: KDB 789033 D01 v01r03 – F)
 Limit: [15.407(a)(2)&(a)(5); RSS-210 A9.2(3)]: < 11dBm/MHz
 Operating Mode: Point-to-Point; Antenna Gain = 23 dBi
 EUT Limit: < 11-(23-6) = -6dBm/MHz

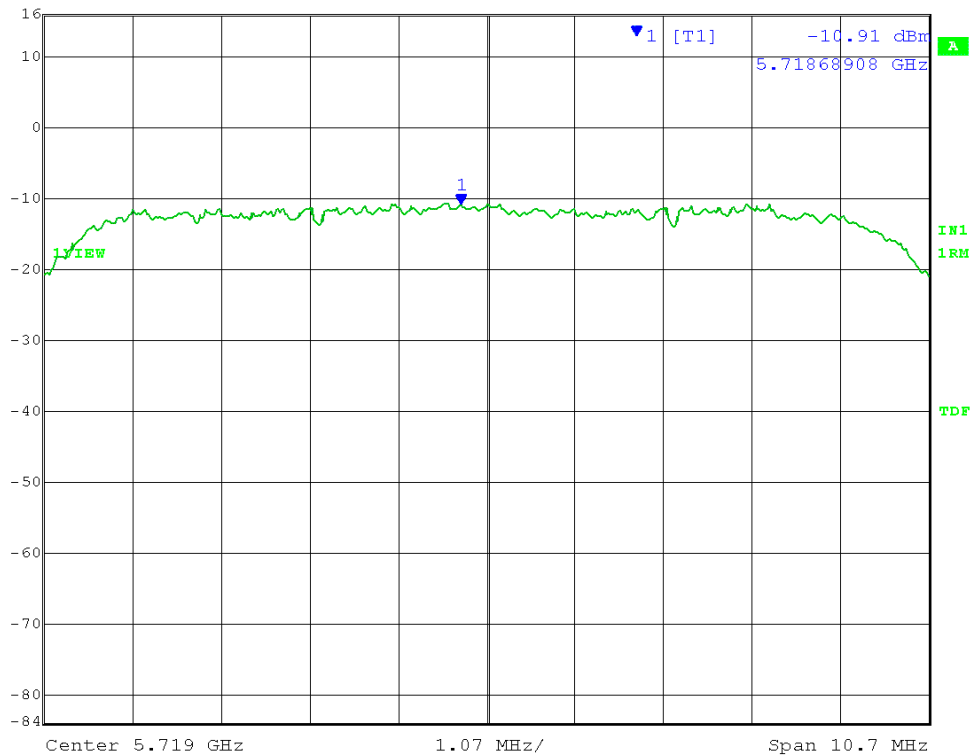
10MHz Operating Bandwidth(Method SA-2):

Pesk Power Spectral Density (PPSD)		10M (Adjustment for duty cycle =10log1/x = 0.13)				
FCC limit=11dBm/MHz	dBm	QPSK	16QAM	64QAM	256QAM	1024Q
	EUT FCC Limit	-6	-6	-6	-6	-6
HCH = 5719 MHz	TX0	-11.13	-10.91	-11.19	-11.2	-11.25
	TX1	-10.32	-10.24	-10.11	-10.17	-10.25
	total(mW)	0.1752	0.1811	0.1788	0.1772	0.1745
	Total(dBm)	-7.57	-7.42	-7.48	-7.51	-7.58
	Margin	1.57	1.42	1.48	1.51	1.58
MCH = 5575 MHz	TX0	-10.52	-10.69	-10.48	-10.6	-10.76
	TX1	-10.82	-10.54	-10.71	-10.99	-10.7
	total(mW)	0.1767	0.1789	0.1798	0.1718	0.1742
	Total(dBm)	-7.53	-7.47	-7.45	-7.65	-7.59
	Margin	1.53	1.47	1.45	1.65	1.59
LCH = 5476 MHz	TX0	-9.49	-9.3	-9.44	-9.39	-9.46
	TX1	-11.17	-10.6	-10.97	-10.63	-11.06
	total(mW)	0.1946	0.2108	0.1996	0.2077	0.1974
	Total(dBm)	-7.11	-6.76	-7.00	-6.83	-7.05
	Margin	1.11	0.76	1.00	0.83	1.05

10MHz BW, HCH, 16QAM

TX 0: 26 dB EBW = 10.70MHz

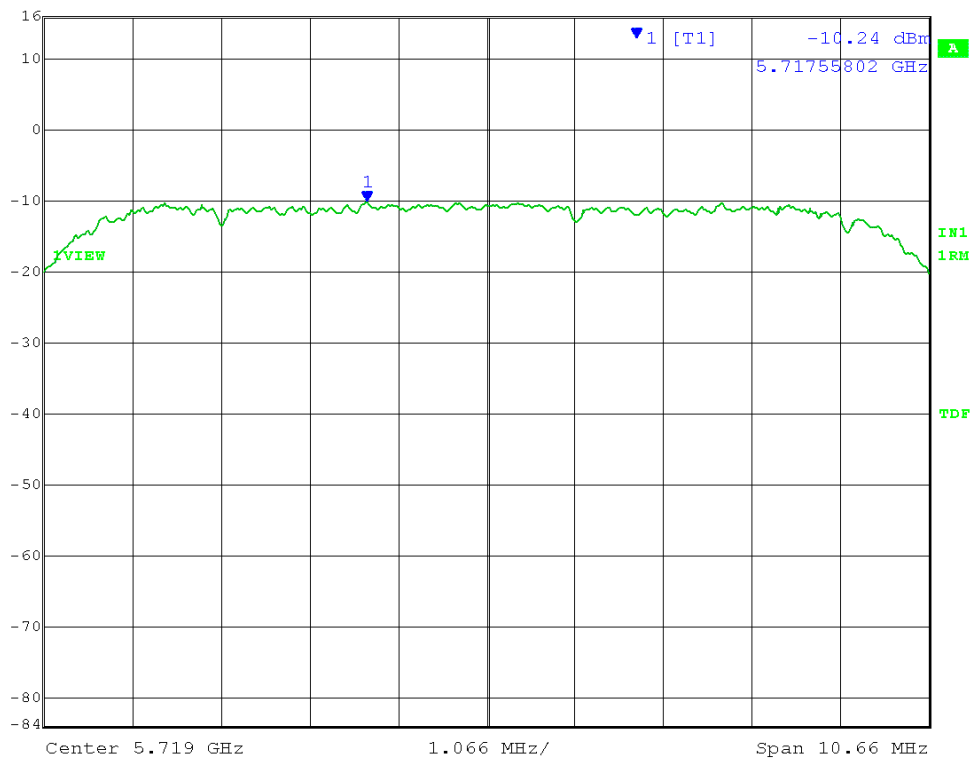
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.91 dBm VBW 3 MHz
-10 dBm 5.71868908 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 13:46:32

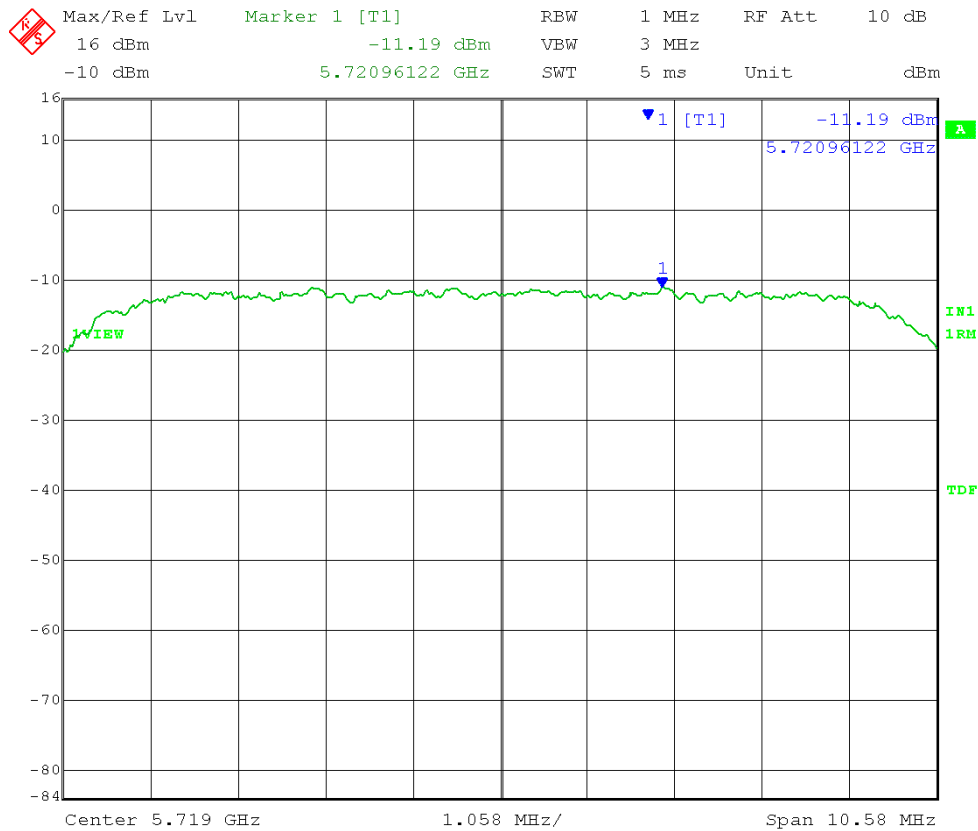
TX1: 26 dB EBW = 10.66MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.24 dBm VBW 3 MHz
-10 dBm 5.71755802 GHz SWT 5 ms Unit dBm



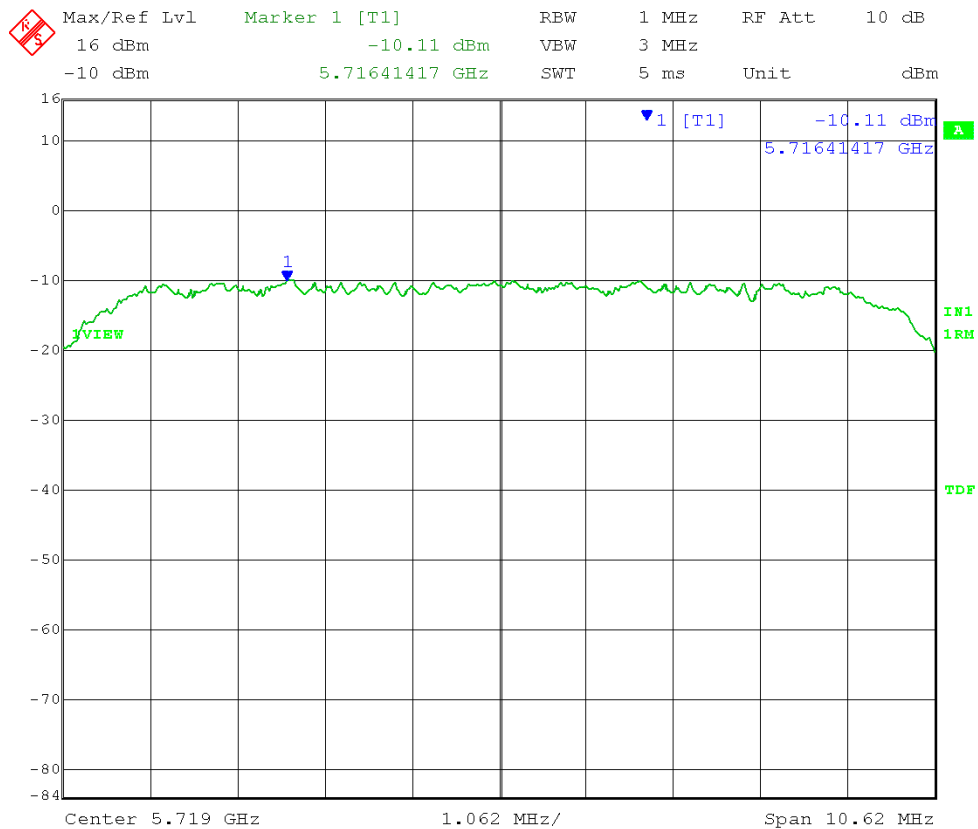
Date: 22.OCT.2013 13:41:26

10MHz BW, HCH, 64QAM,
TX0: 26 dB EBW = 10.58MHz



Date: 22.OCT.2013 13:47:48

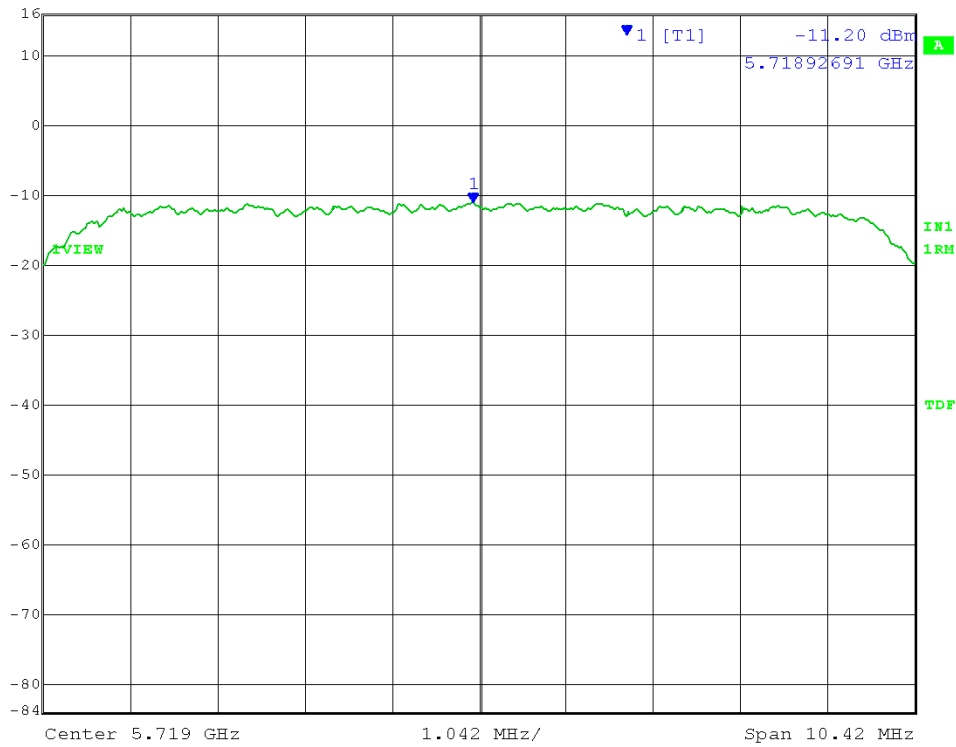
TX1: 26 dB Emission Bandwidth = 10.62MHz



Date: 22.OCT.2013 13:40:17

10MHz BW, HCH, 256QAM,
TX0: 26 dB EBW = 10.42MHz

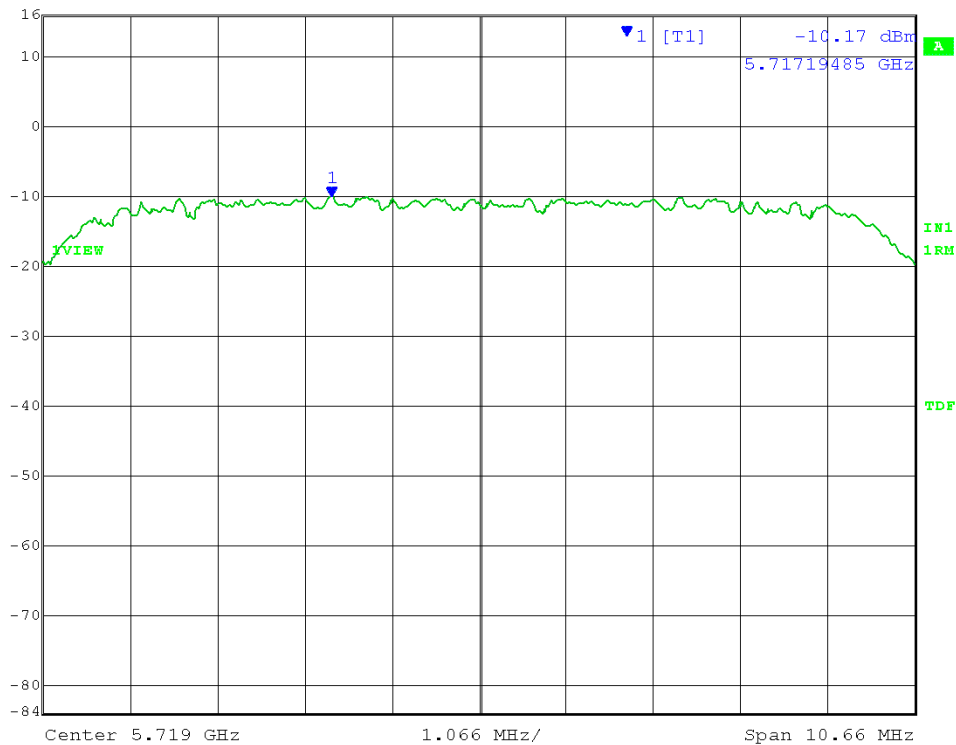
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -11.20 dBm VBW 3 MHz
-10 dBm 5.71892691 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 13:48:46

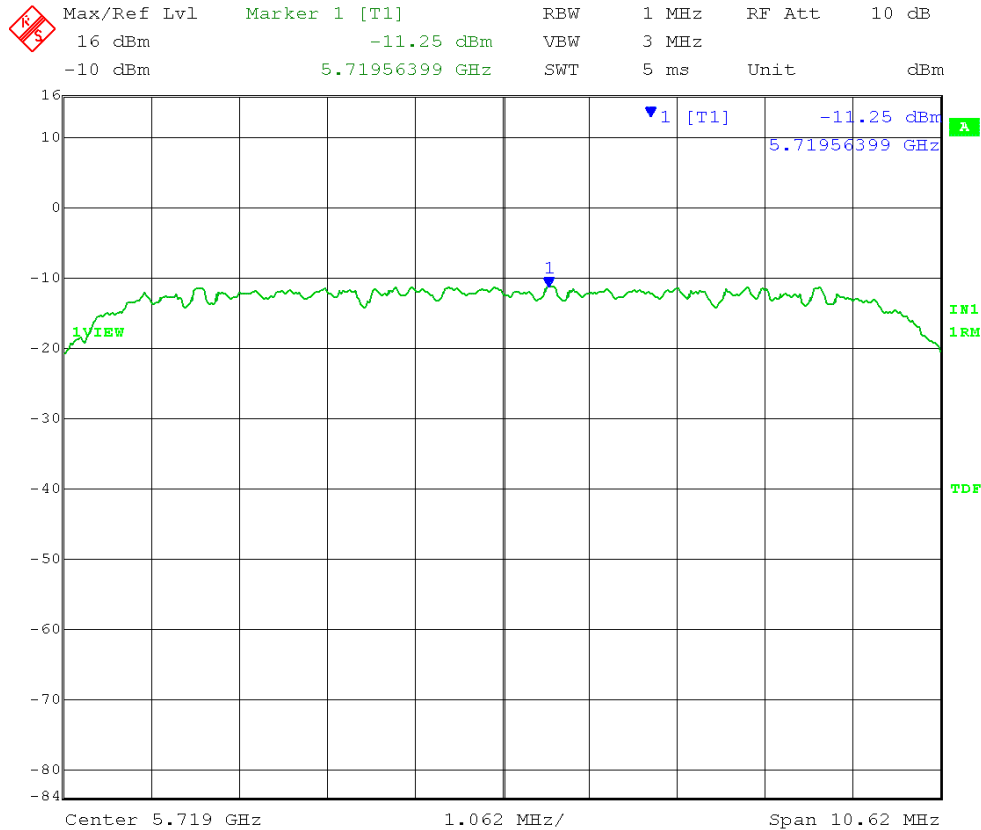
TX1: Emission Bandwidth = 10.50MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.17 dBm VBW 3 MHz
-10 dBm 5.71719485 GHz SWT 5 ms Unit dBm



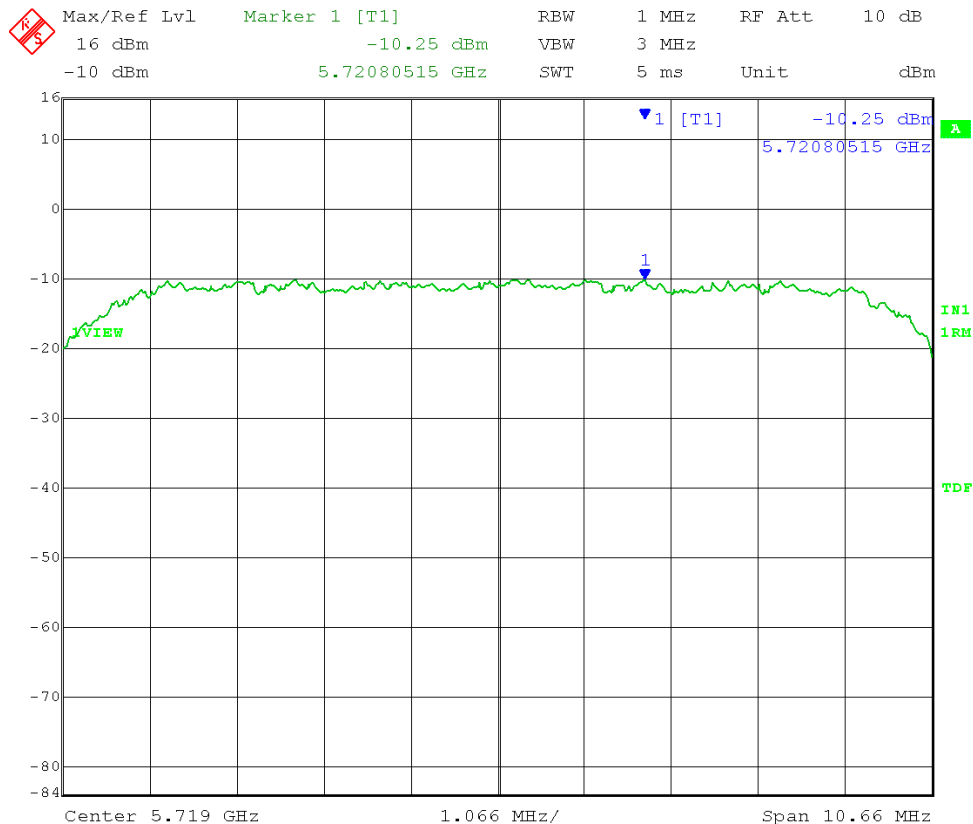
Date: 22.OCT.2013 13:38:55

10MHz BW, HCH, 1024QAM,
TX0:26 dB EBW = 10.62MHz



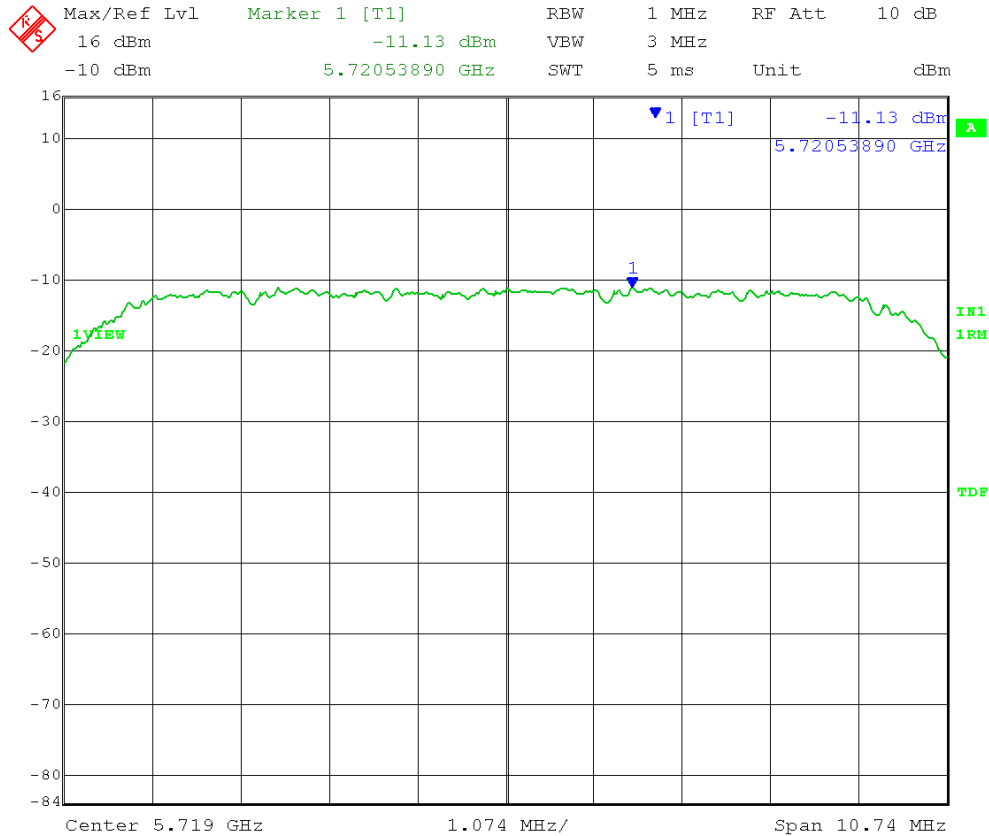
Date: 22.OCT.2013 13:50:01

TX1: 26 dB EBW = 10.66 MHz



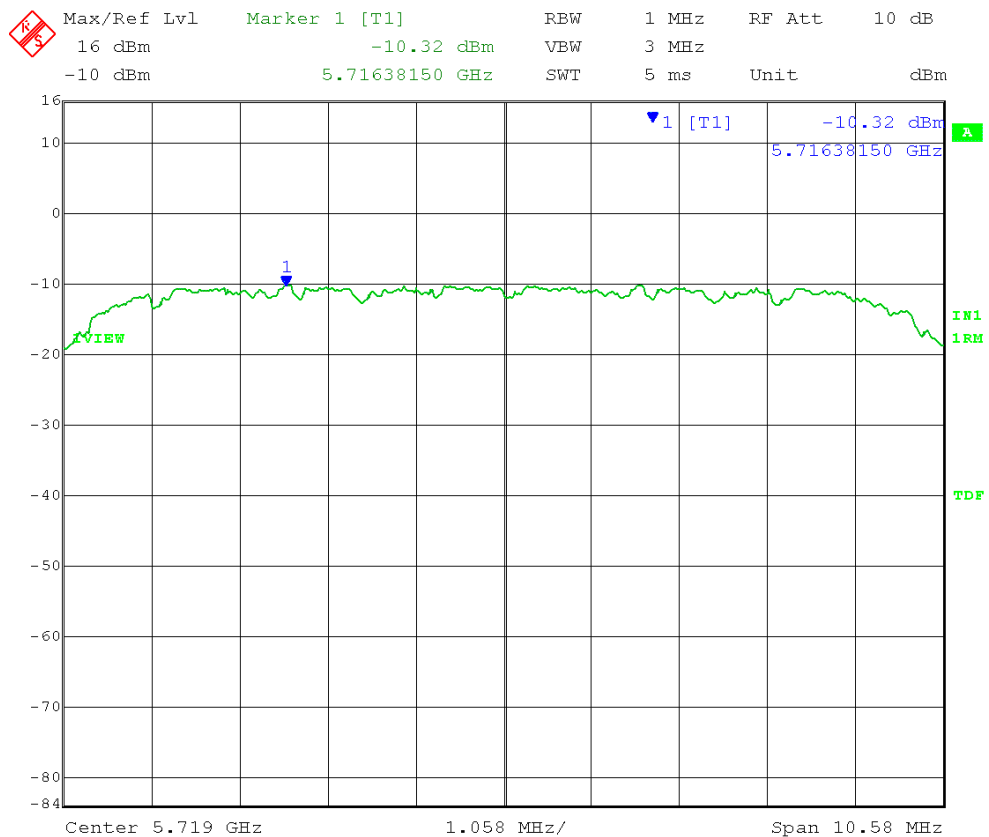
Date: 22.OCT.2013 13:37:41

10MHz BW, HCH, QPSK,
TX0: 26 dB EBW = 10.74MHz



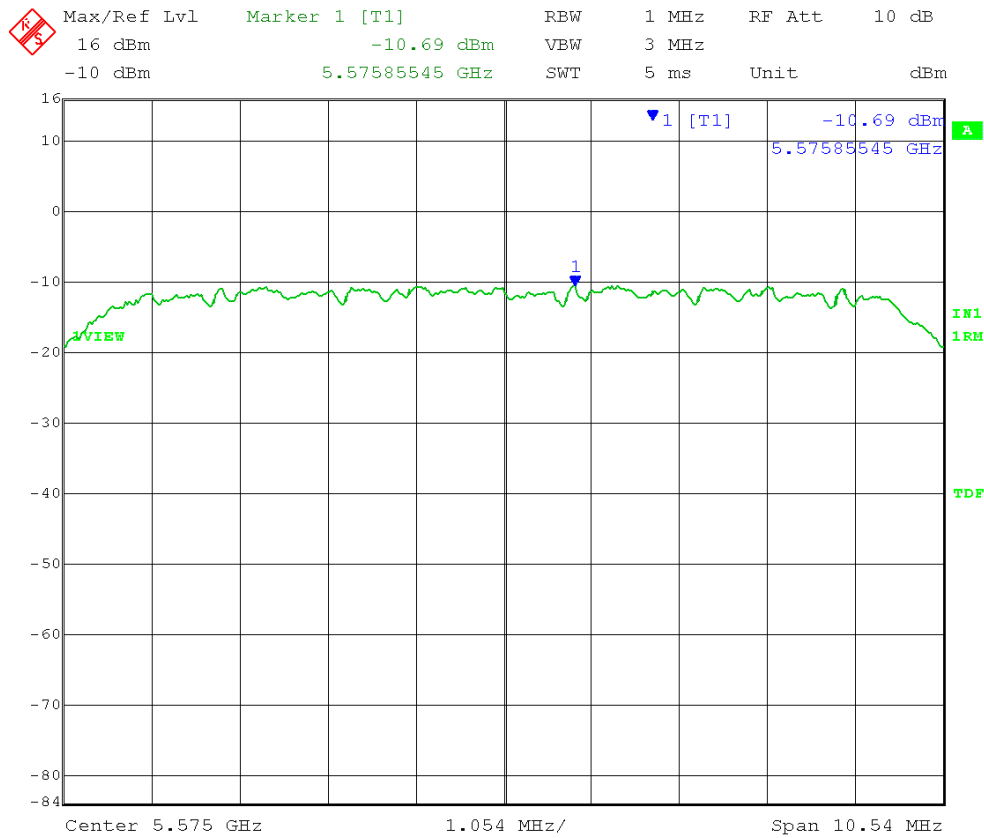
Date: 22.OCT.2013 13:45:39

TX1: 26 dB EBW = 10.58 MHz



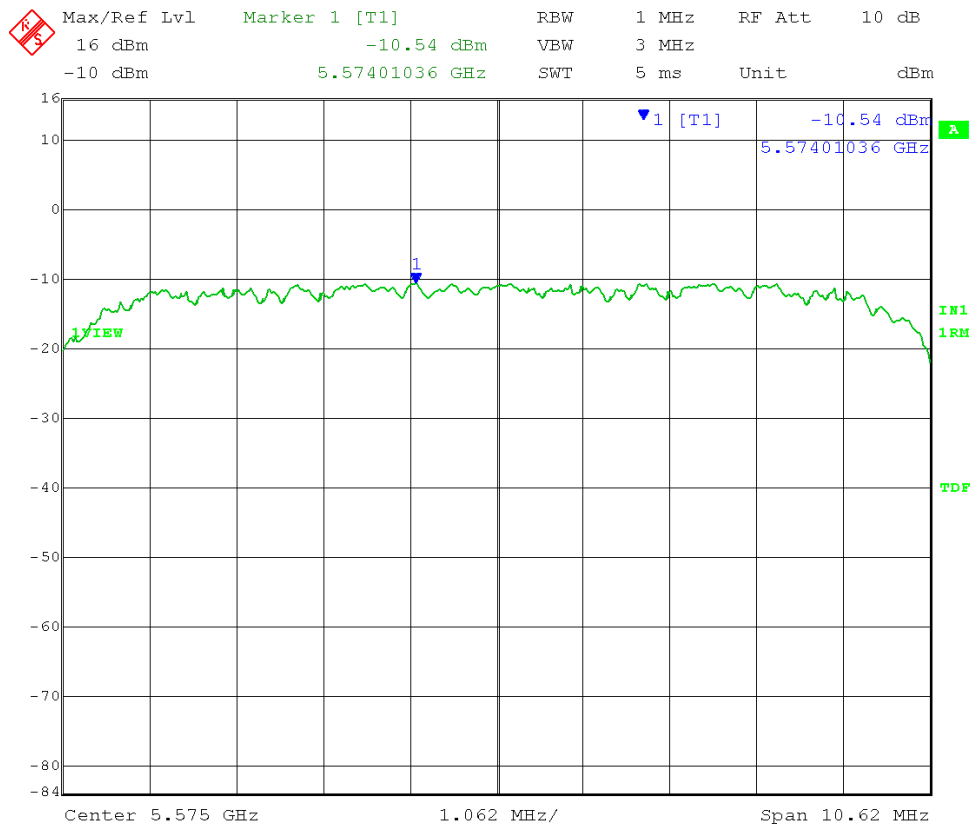
Date: 22.OCT.2013 13:42:35

10MHz BW, MCH, 16QAM,
TX0: 26 dB EBW = 10.54MHz



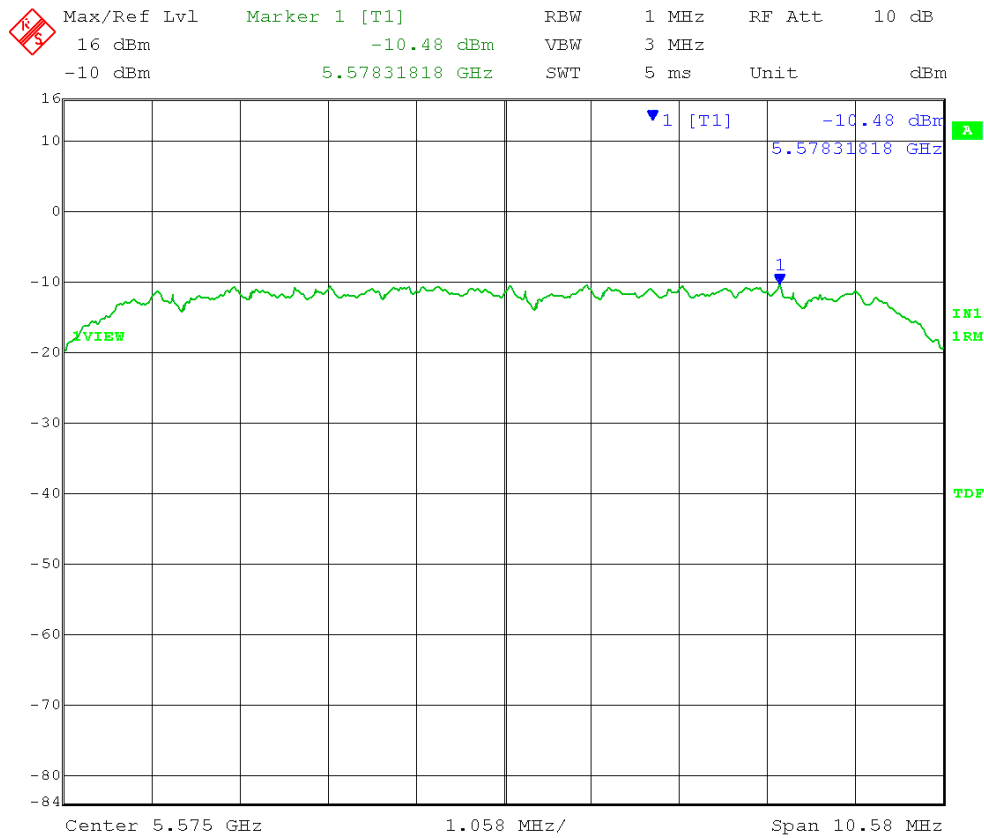
Date: 22.OCT.2013 13:55:25

TX1: 26 dB EBW = 10.58 MHz



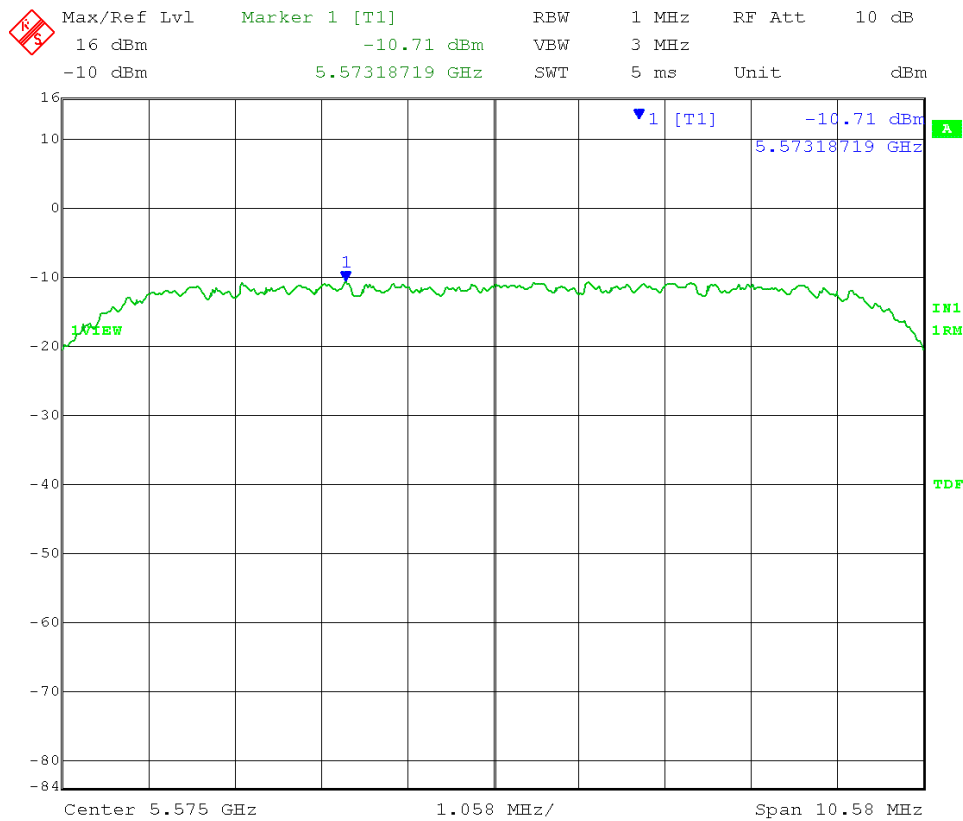
Date: 22.OCT.2013 13:22:13

10MHz BW, MCH, 64QAM,
TX0: 26 dB EBW = 10.58MHz



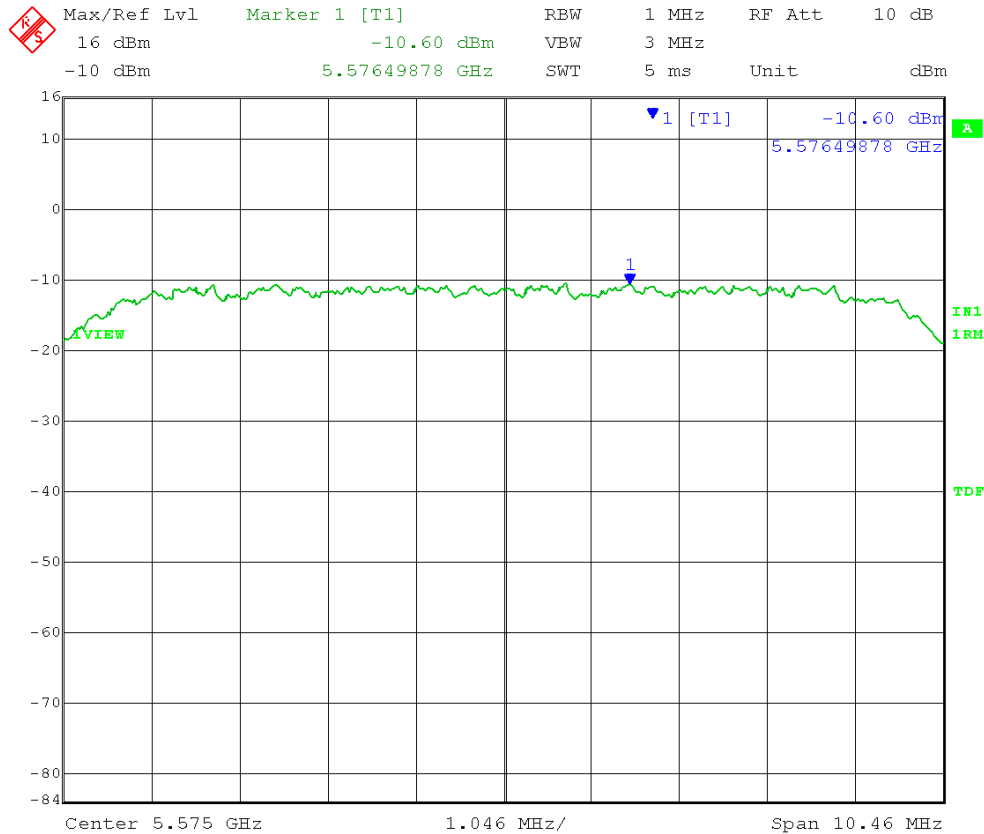
Date: 22.OCT.2013 13:54:24

TX1: 26 dB EBW = 10.58 MHz



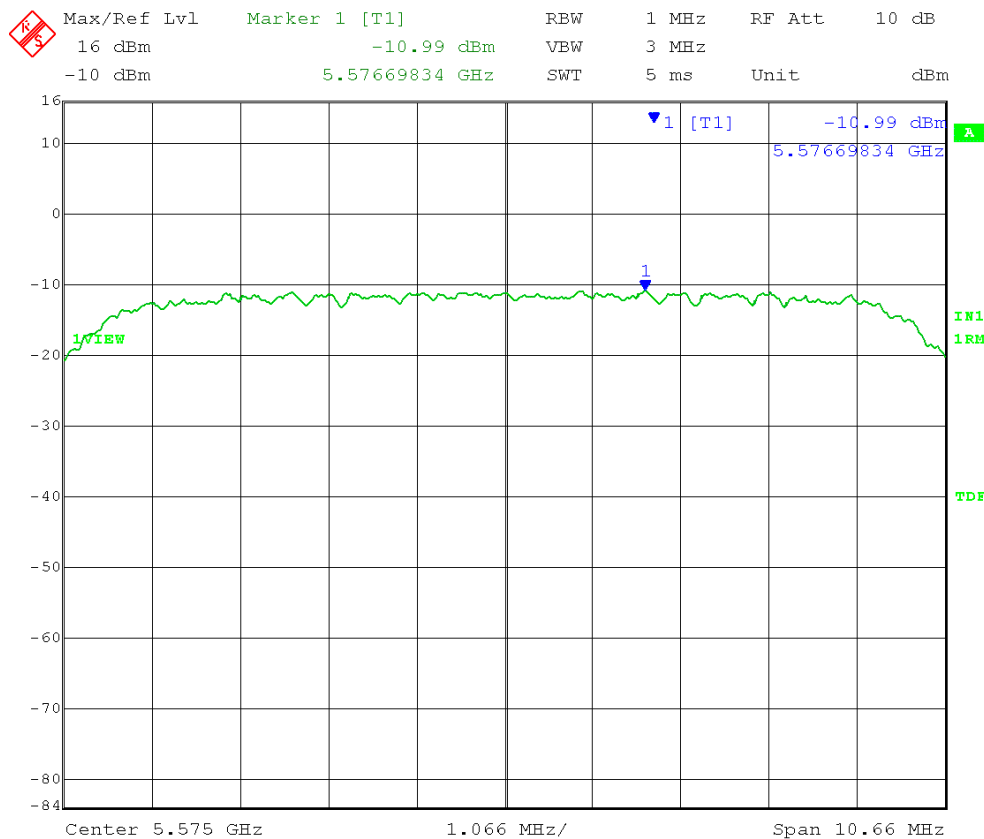
Date: 22.OCT.2013 13:23:53

10MHz BW, MCH, 256QAM,
TX0: 26 dB EBW = 10.46MHz



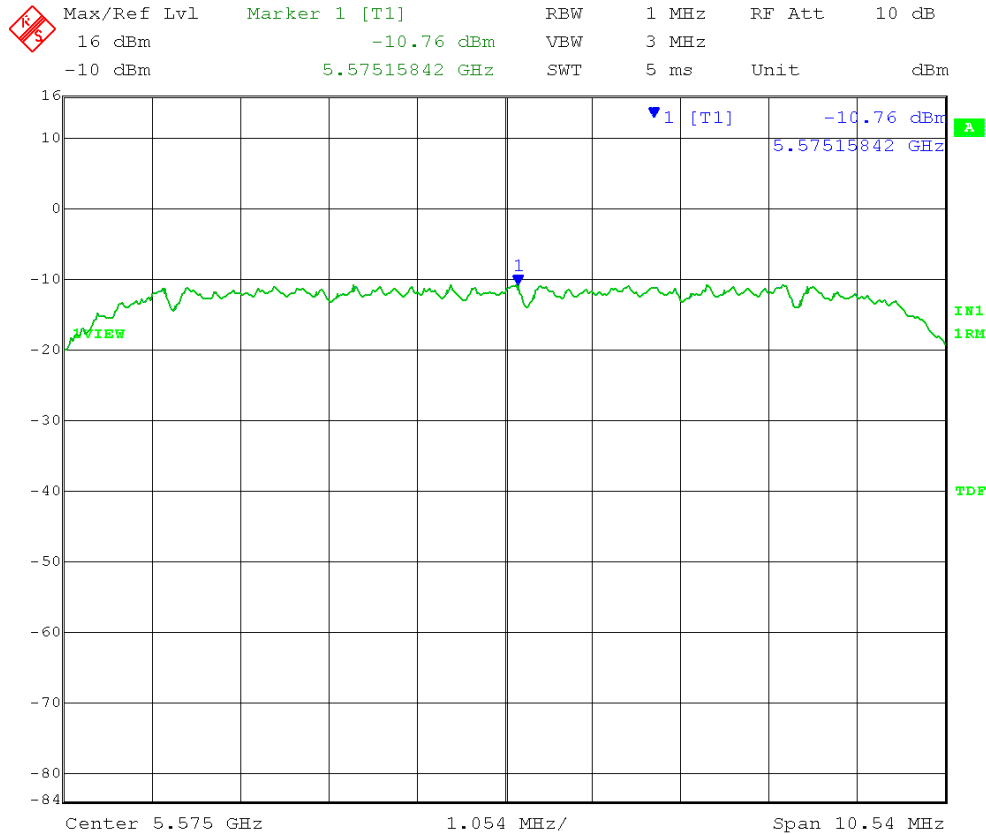
Date: 22.OCT.2013 13:53:19

TX1: 26 dB EBW = 10.66 MHz



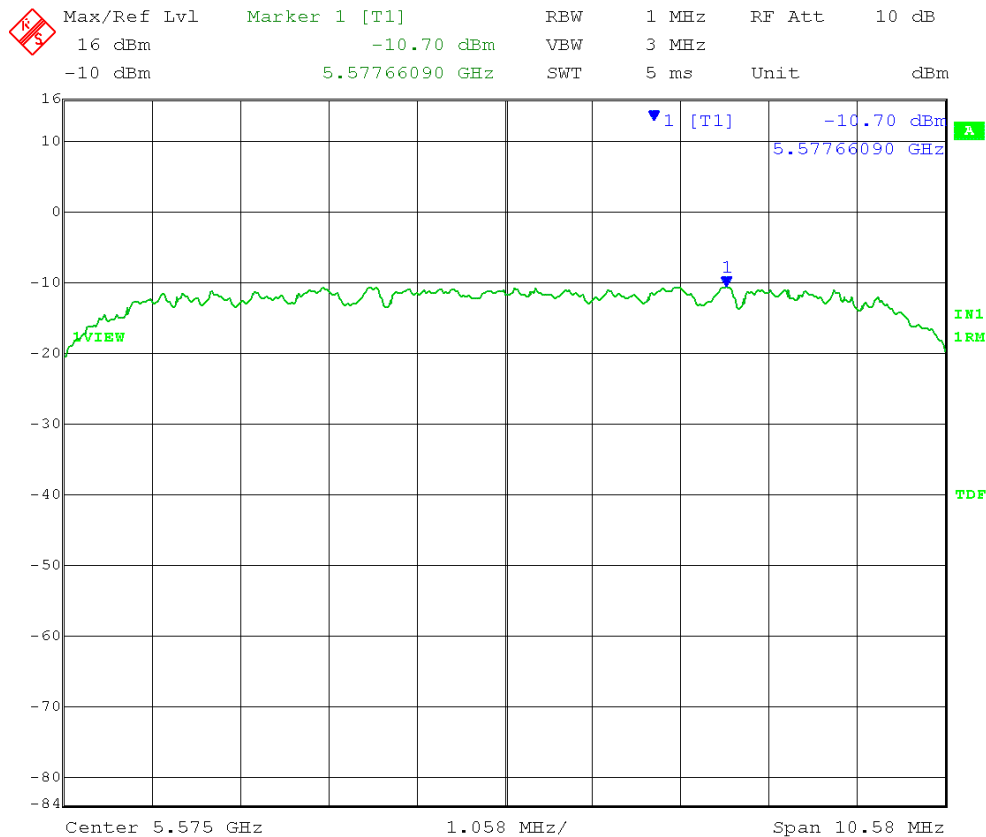
Date: 22.OCT.2013 13:25:16

10MHz BW, MCH, 1024QAM,
TX0: 26 dB EBW = 10.54MHz



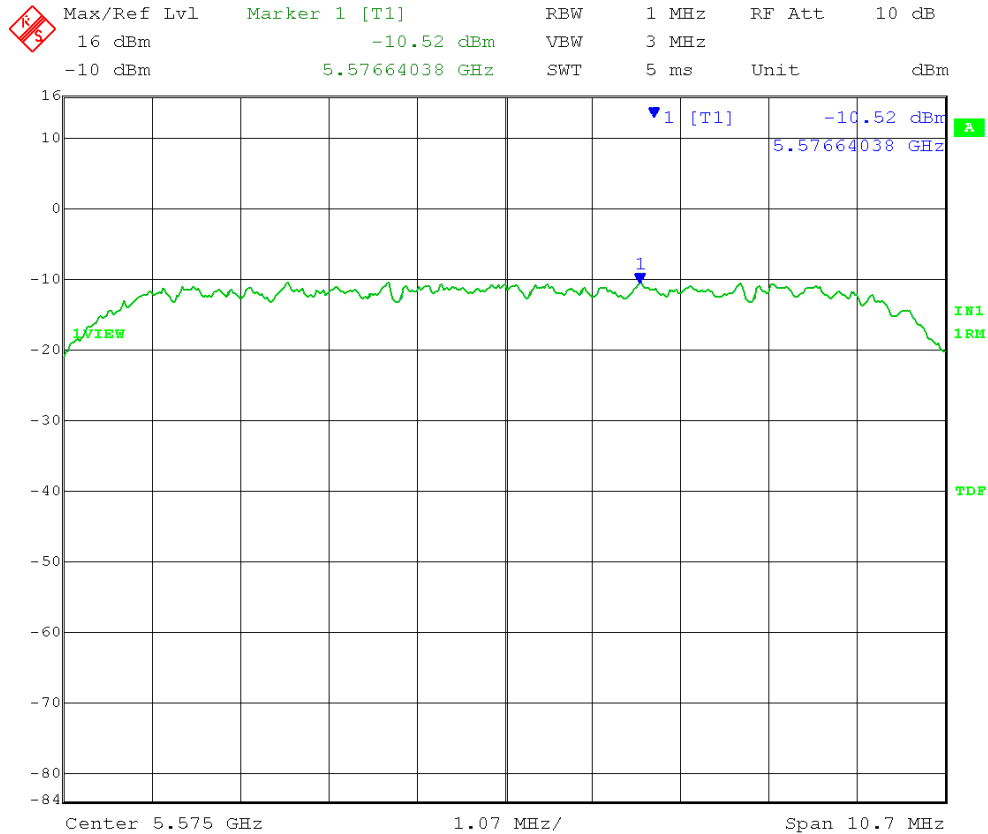
Date: 22.OCT.2013 13:52:08

TX1: 26 dB EBW = 10.58 MHz



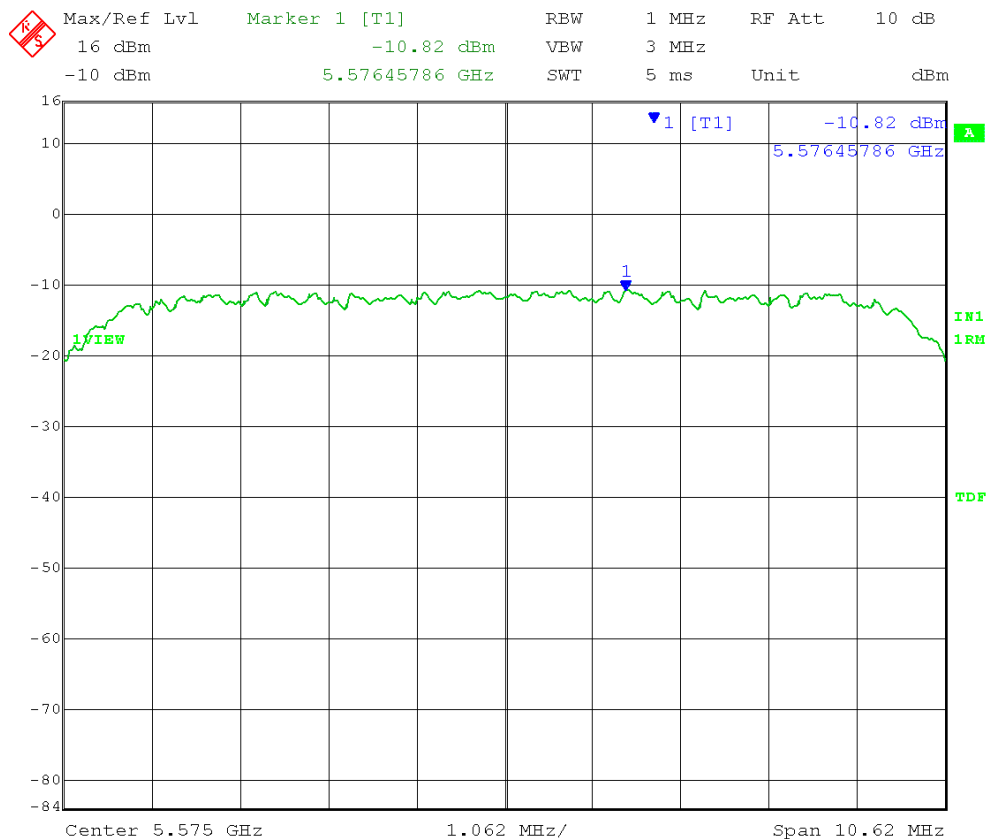
Date: 22.OCT.2013 13:26:20

10MHz BW, MCH, QPSK,
TX0: 26 dB EBW = 10.7MHz



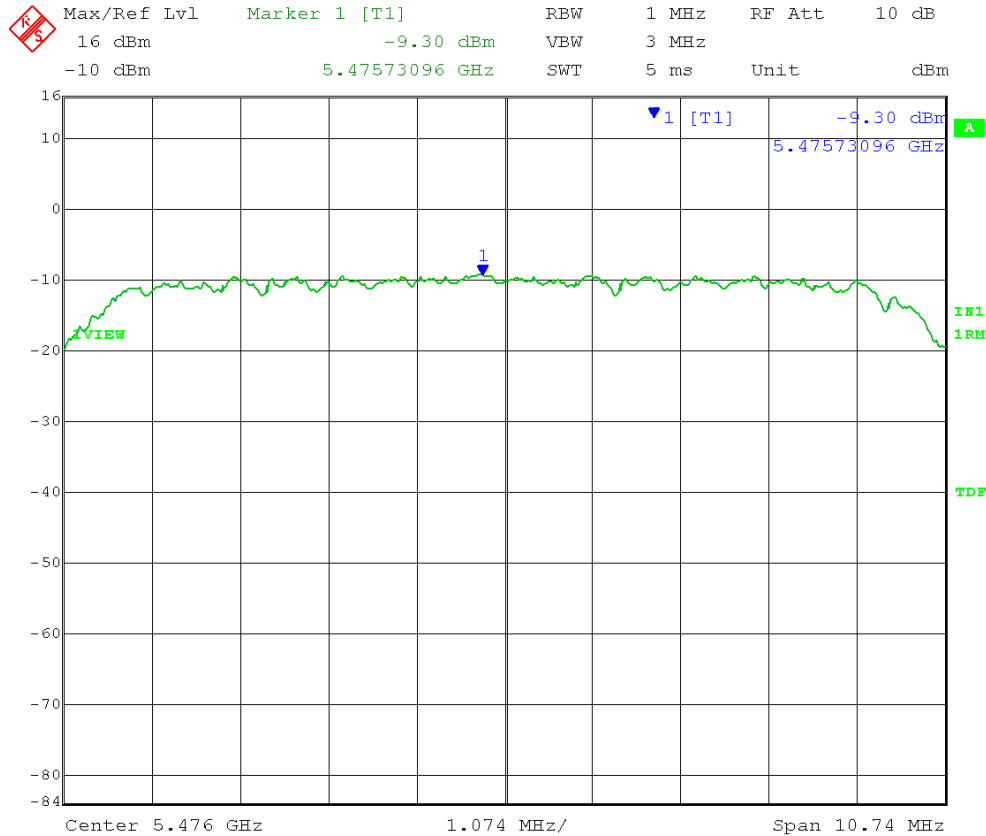
Date: 22.OCT.2013 13:56:15

TX1: 26 dB EBW = 10.62 MHz



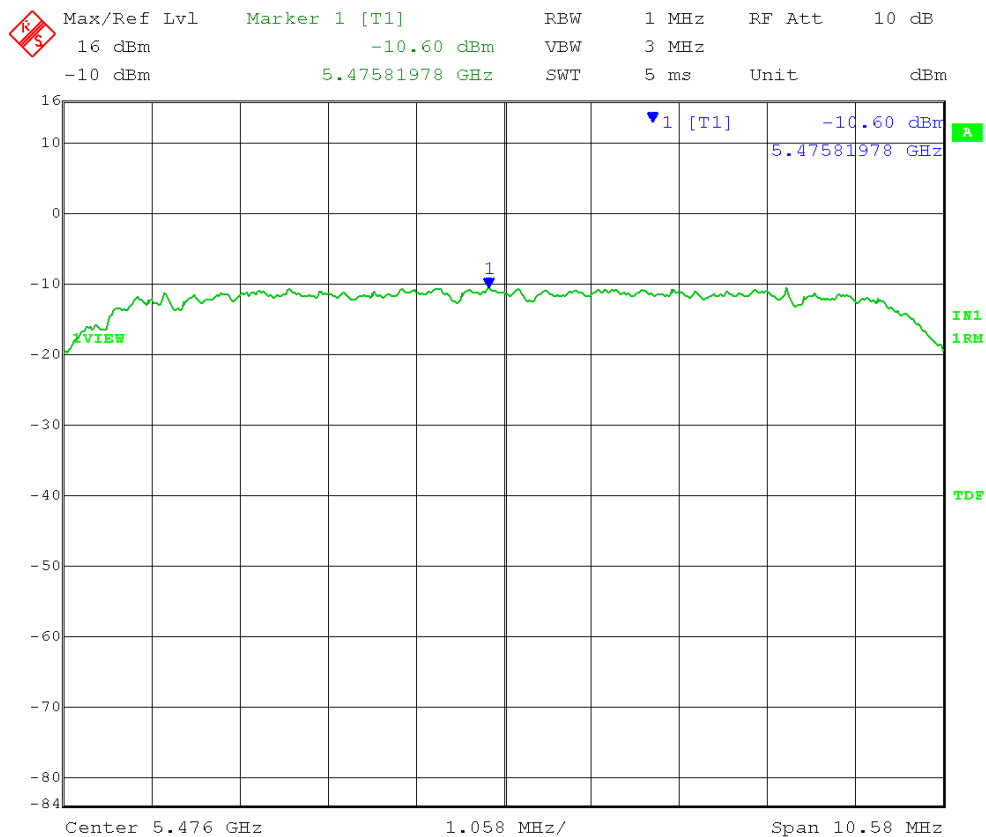
Date: 22.OCT.2013 13:27:38

10MHz BW, LCH, 16QAM,
TX0: 26 dB EBW = 10.74MHz



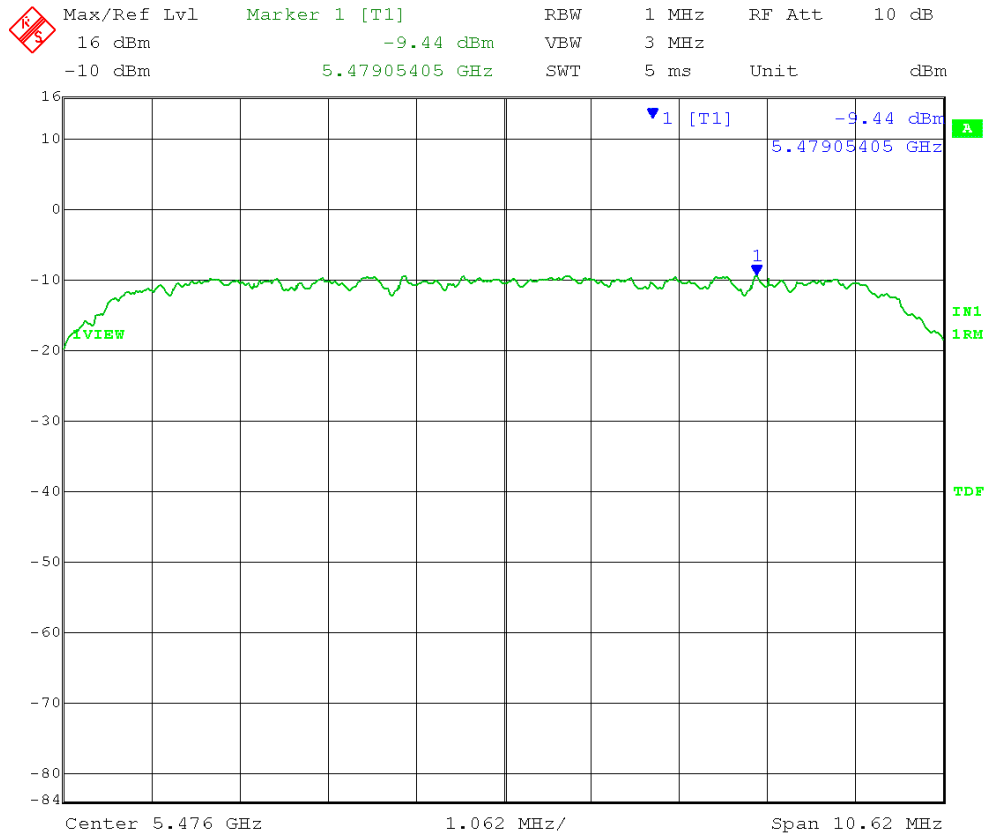
Date: 22.OCT.2013 13:58:50

TX1: 26 dB EBW = 10.58 MHz



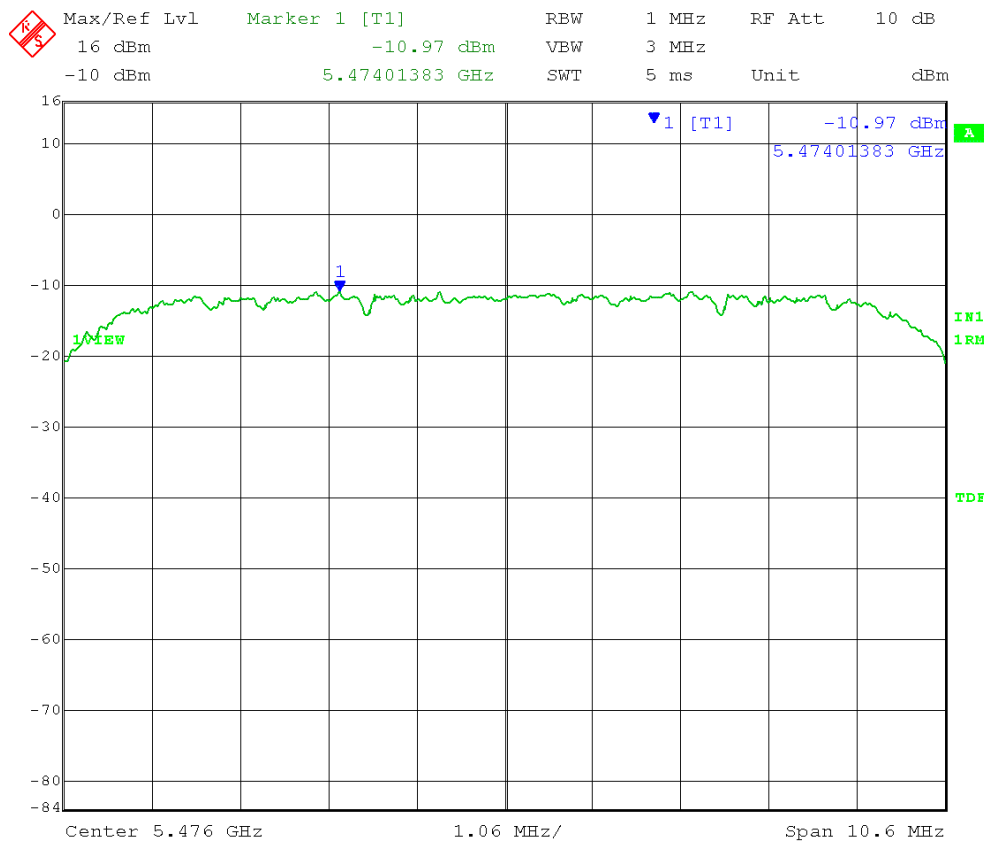
Date: 22.OCT.2013 13:31:48

10MHz BW, LCH, 64QAM,
TX0: 26 dB EBW = 10.62MHz



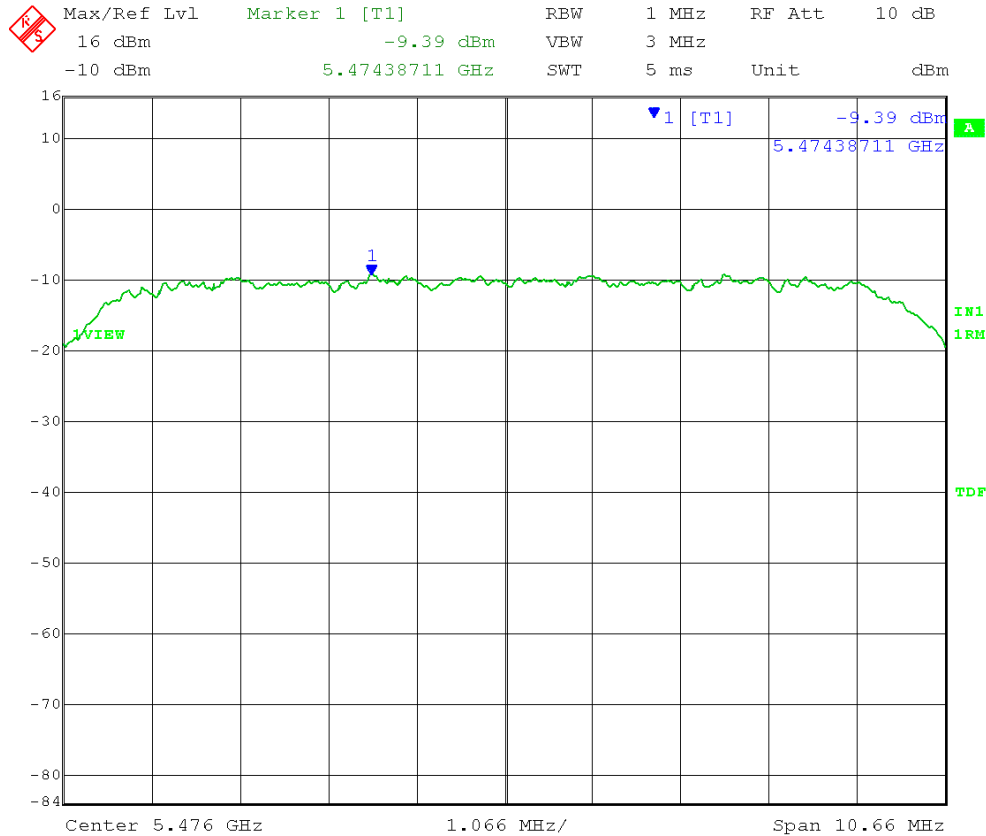
Date: 22.OCT.2013 14:06:11

TX1: 26 dB EBW = 10.60 MHz



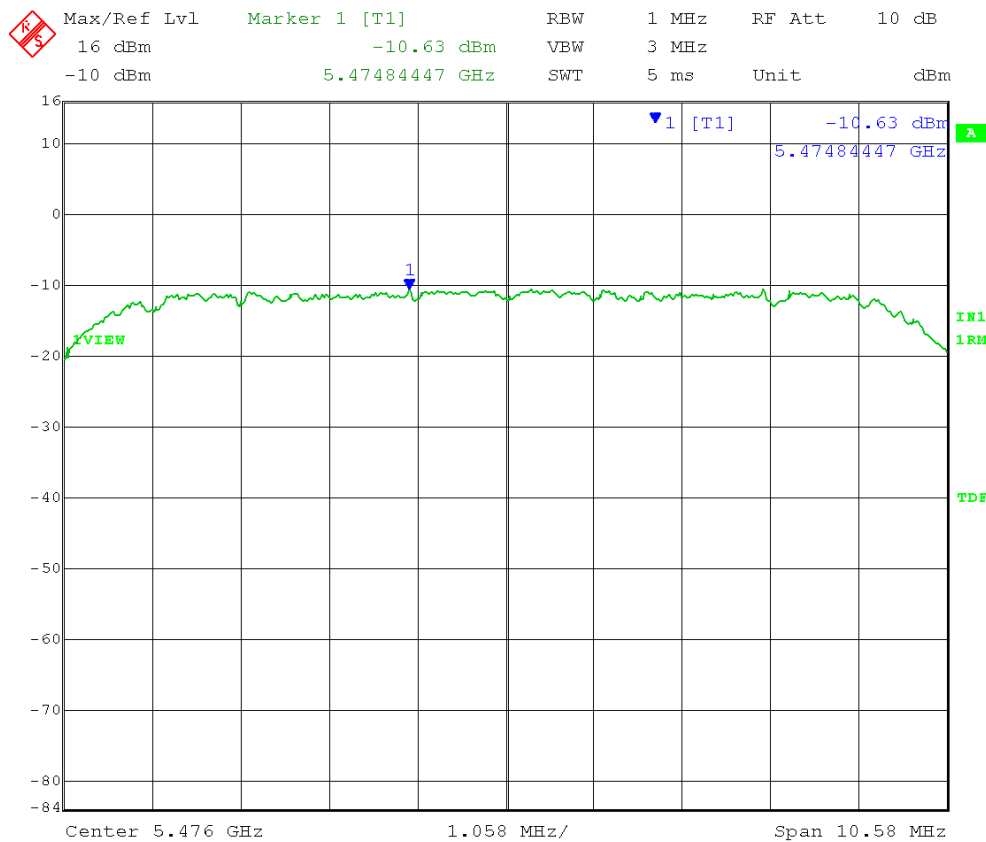
Date: 22.OCT.2013 13:32:59

10MHz BW, LCH, 256QAM,
TX0: 26 dB EBW = 10.66MHz



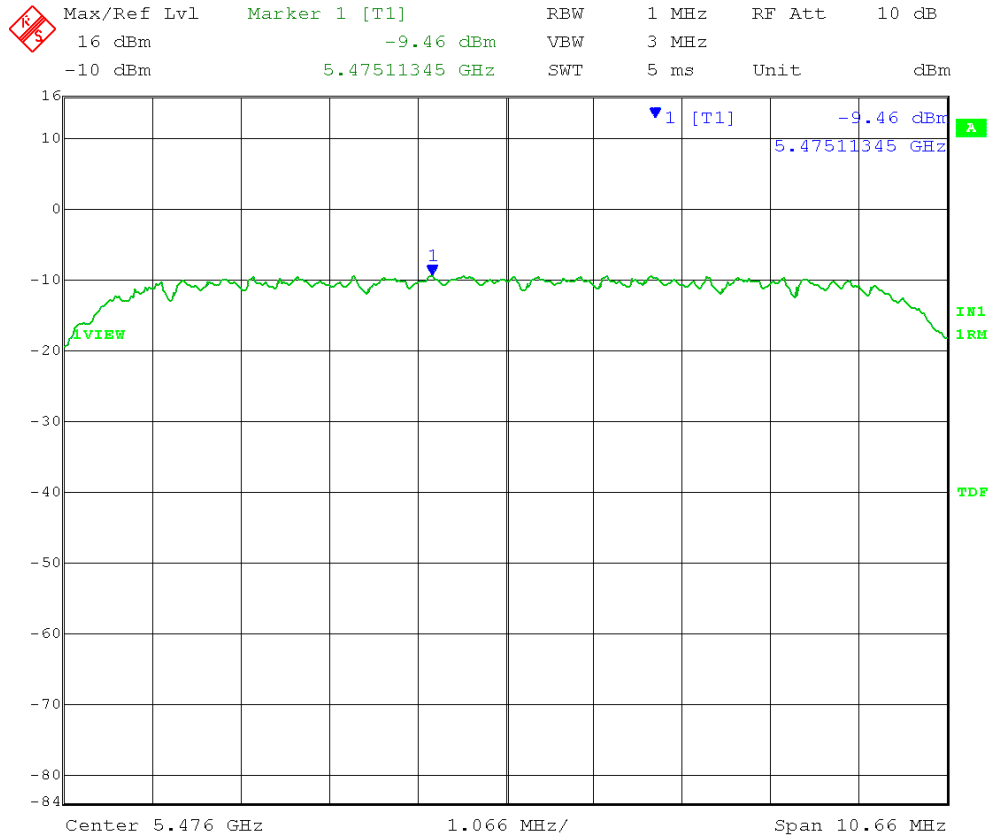
Date: 22.OCT.2013 14:07:16

TX1: 26 dB EBW = 10.58 MHz



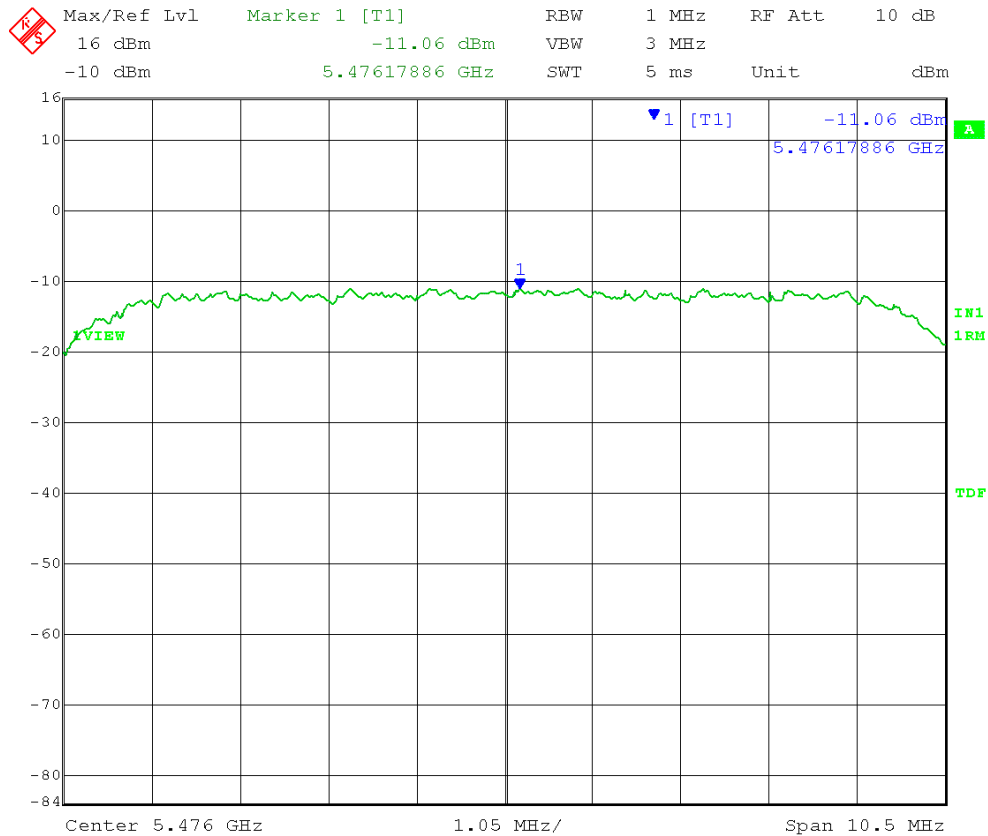
Date: 22.OCT.2013 13:34:26

10MHz BW, LCH, 1024QAM,
TX0: 26 dB EBW = 10.66MHz



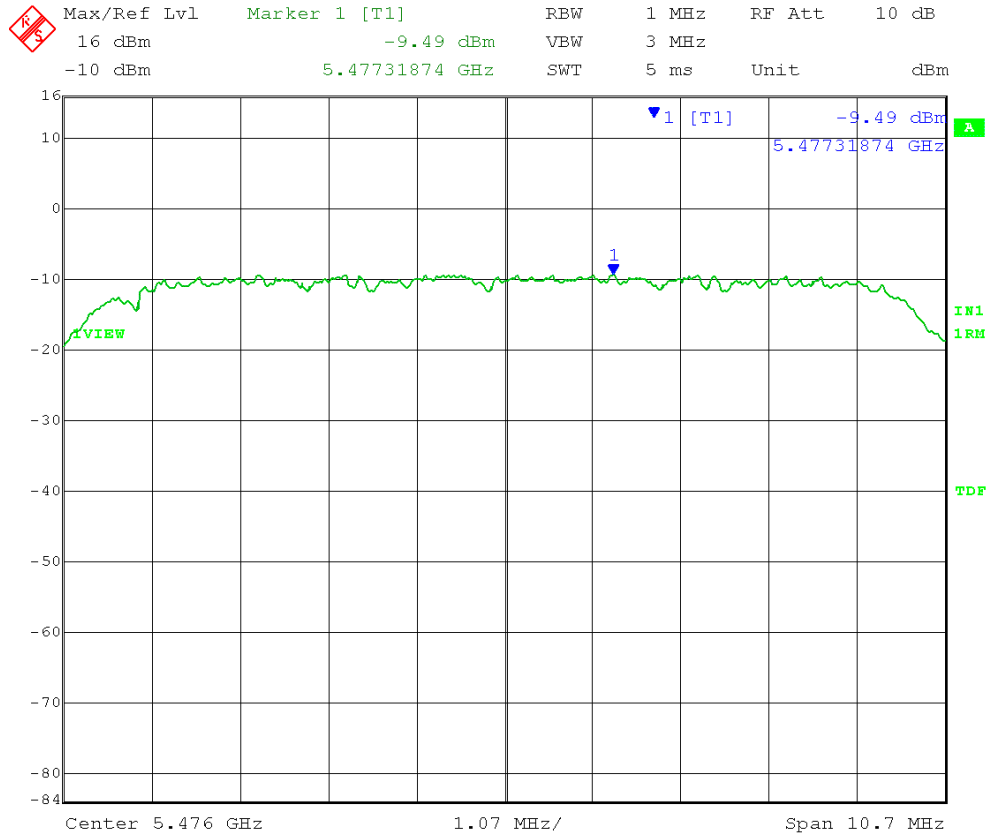
Date: 22.OCT.2013 14:08:18

TX1: 26 dB EBW = 10.50 MHz



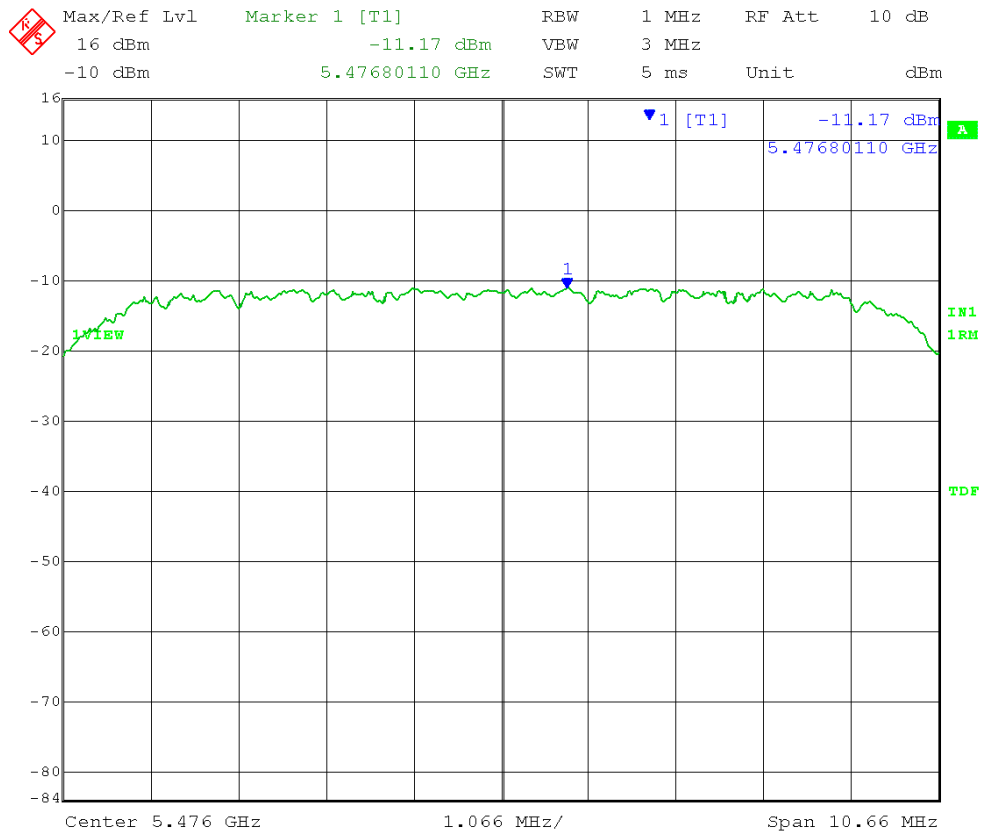
Date: 22.OCT.2013 13:35:22

10MHz BW, LCH, QPSK,
TX0: 26 dB EBW = 10.70MHz



Date: 22.OCT.2013 13:57:51

TX1: 26 dB EBW = 10.66 MHz



Date: 22.OCT.2013 13:30:28



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B7.0 Peak Excursion – Conducted

Rule Section: Section 15.407(a)(6)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section G – Peak excursion measurement

Description: SPAN: set to encompass entire emission bandwidth
RBW = 1 MHz
VBW $\geq$ 3 MHz
Detector = Peak
Trace mod = max hold
Use peak search to find the peak of the spectrum
Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD

Limit: 13 dB peak-to-average ratio across any 1 MHz bandwidth

Results: Passed

Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

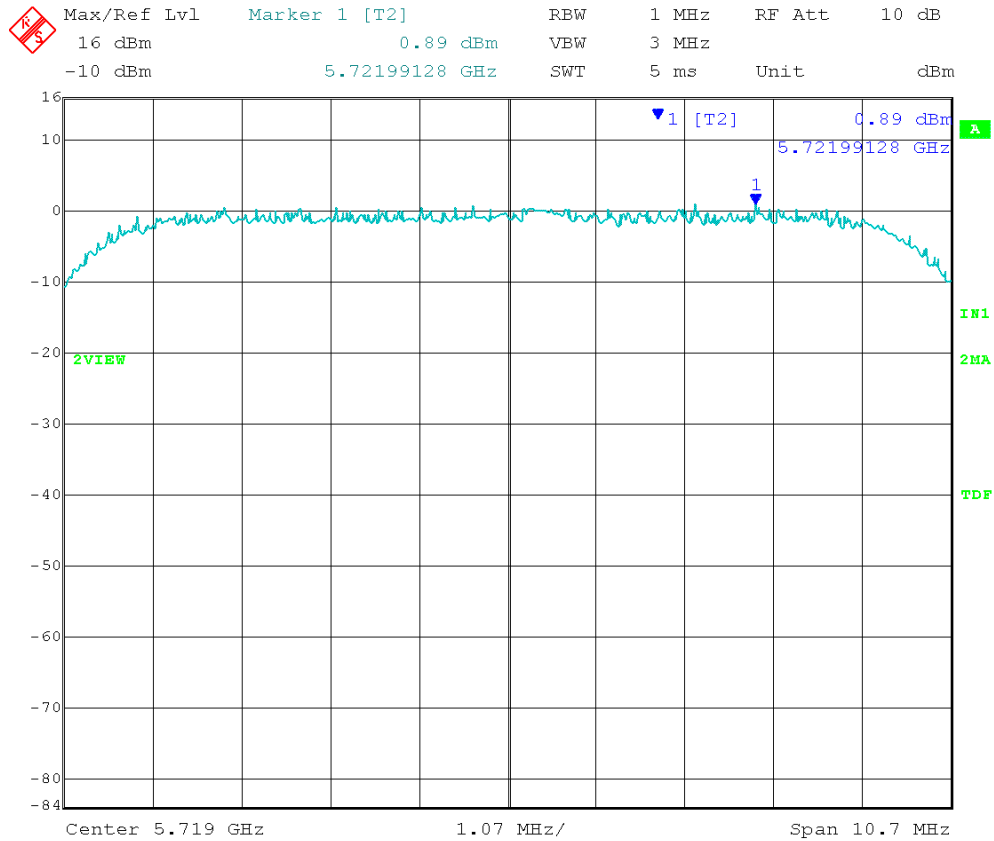
Output power was set to 30 dBm eirp using special test software.

Test Date: 10-22-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Peak Excursion Measurement - Conducted
 Operator: Lillian Li
 Test Procedure used: KDB 789033 D01 v01r03 – G)
 Limit: [15.407(a)(6)]: < 13dB/MHz

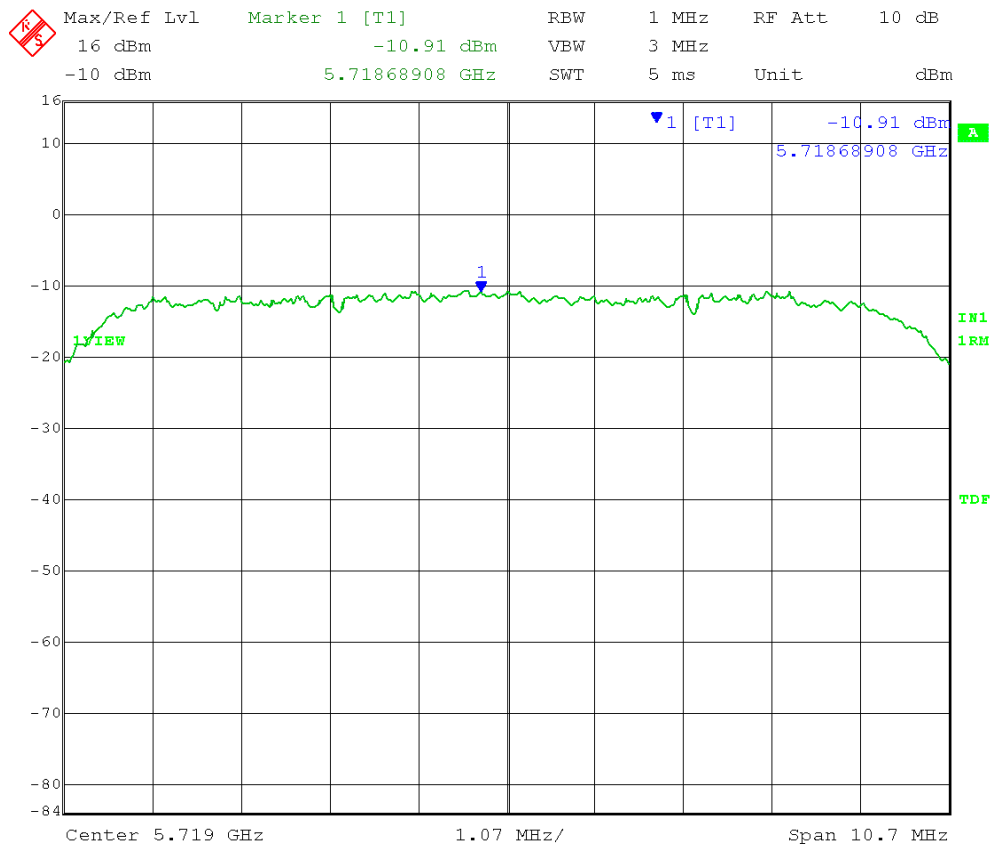
10MHz Operating Bandwidth:

Peak Excursion		10MHz				
	dB	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit = 13dB	<i>FCC limit:</i>	13	13	13	13	13
HCH = 5719 MHz	PK	0.77	0.89	1.51	0.78	1
	AVG	-11.13	-10.91	-11.19	-11.2	-11.25
	Excursion	11.9	11.8	12.7	11.98	12.25
	Margin	1.10	1.20	0.30	1.02	0.75
MCH = 5575 MHz	PK	-0.15	-0.19	0.2	-0.25	-0.27
	AVG	-10.52	-10.69	-10.48	-10.6	-10.76
	Excursion	10.37	10.5	10.68	10.35	10.49
	Margin	2.63	2.50	2.32	2.65	2.51
LCH = 5476 MHz	PK	2.32	2.41	1.46	2.4	2.44
	AVG	-9.49	-9.3	-9.44	-9.39	-9.46
	Excursion	11.81	11.71	10.9	11.79	11.9
	Margin	1.19	1.29	2.10	1.21	1.10

10MHz BW, HCH, 16QAM, 26 dB EBW = 10.70MHz

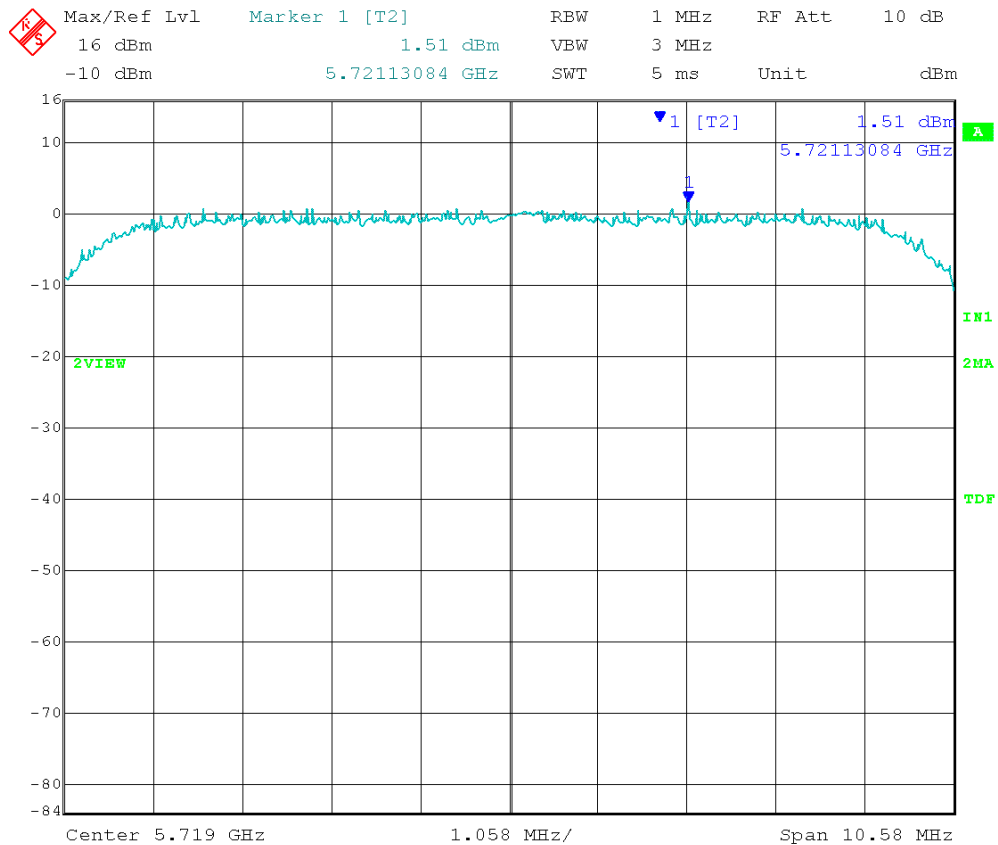


Date: 22.OCT.2013 15:14:35

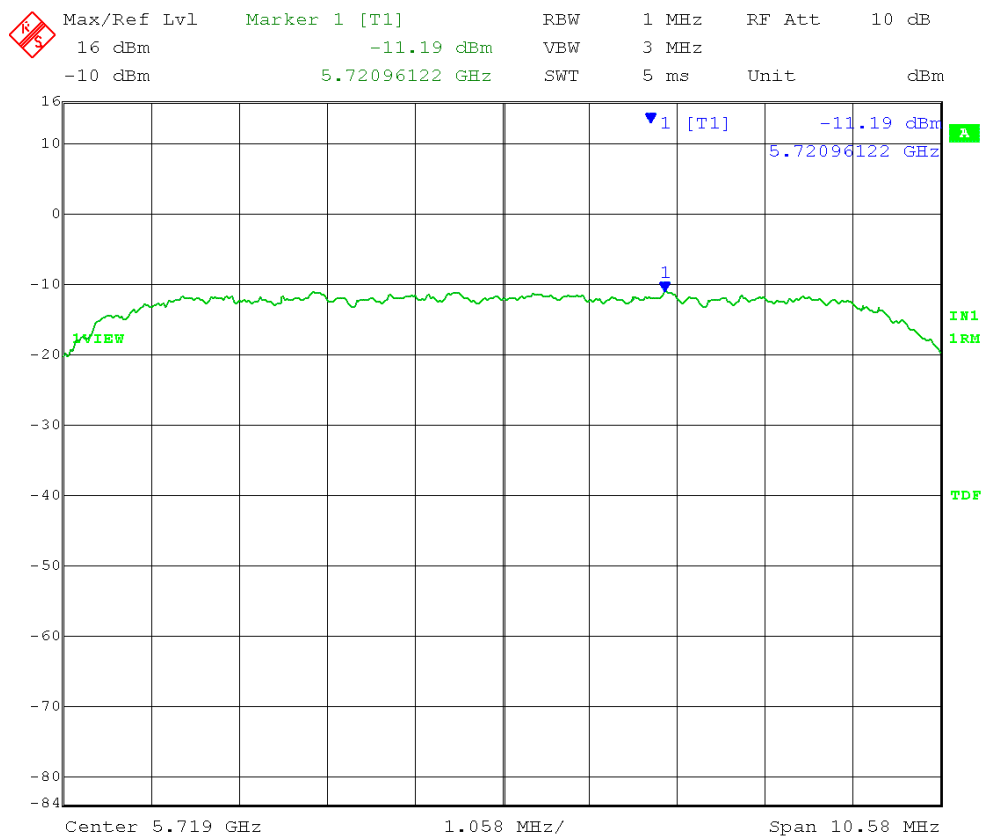


Date: 22.OCT.2013 13:46:32

10MHz BW, HCH, 64QAM, 26 dB EBW = 10.58MHz

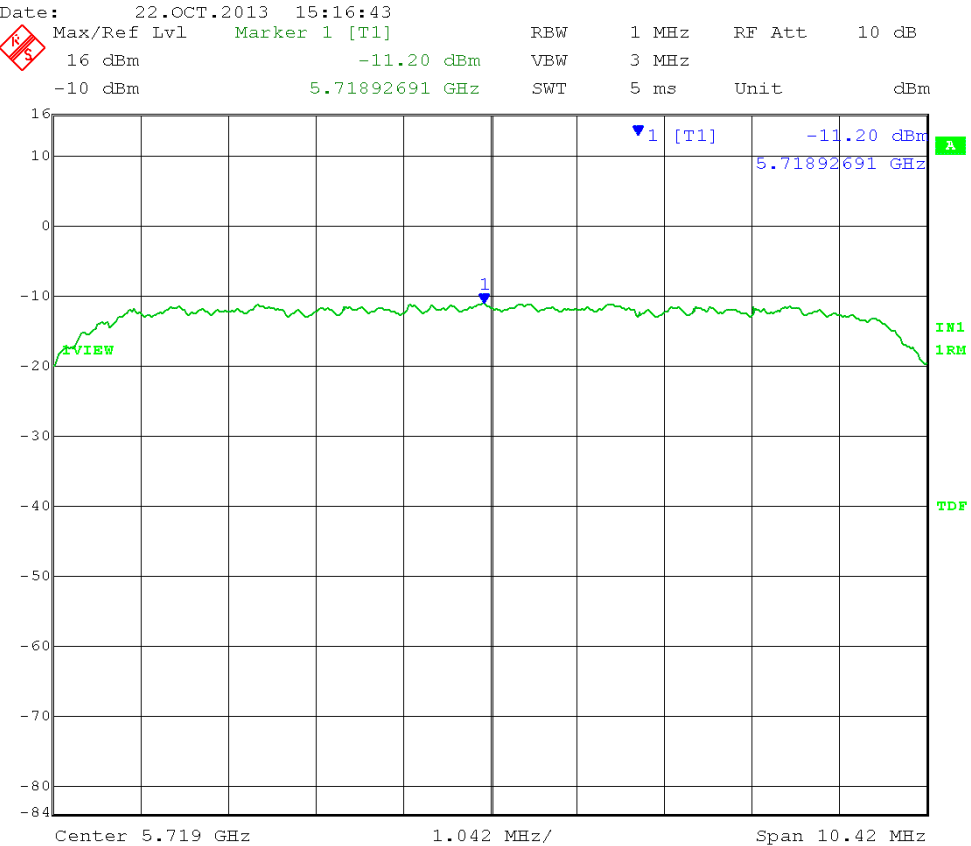
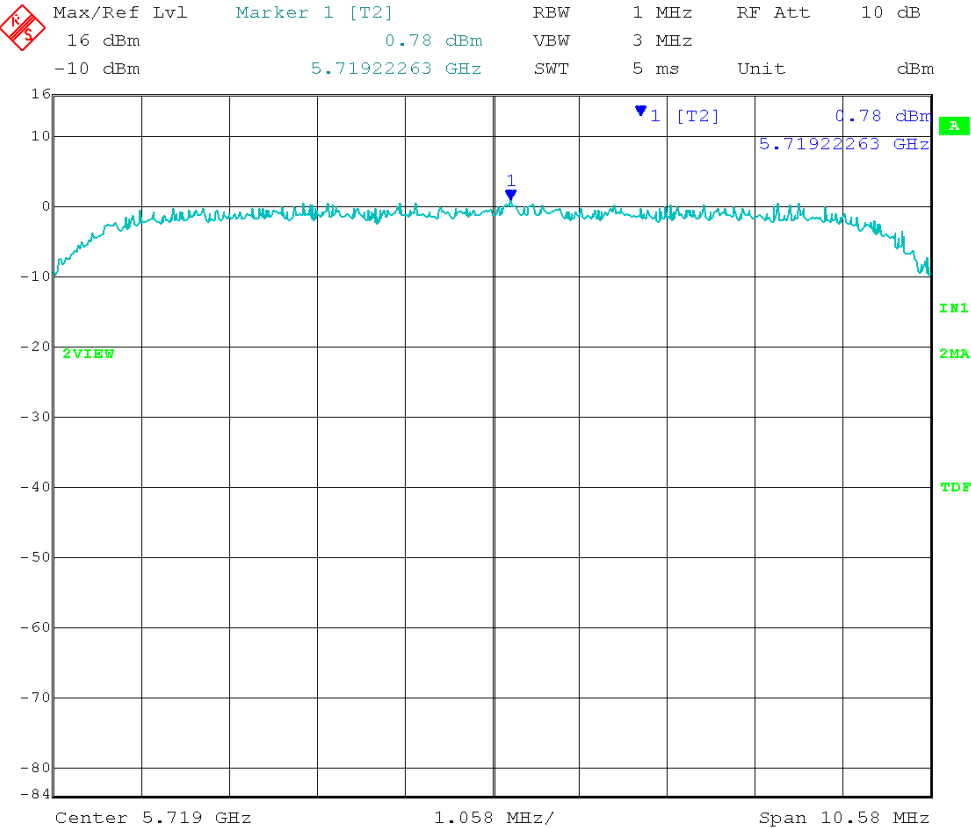


Date: 22.OCT.2013 15:15:53



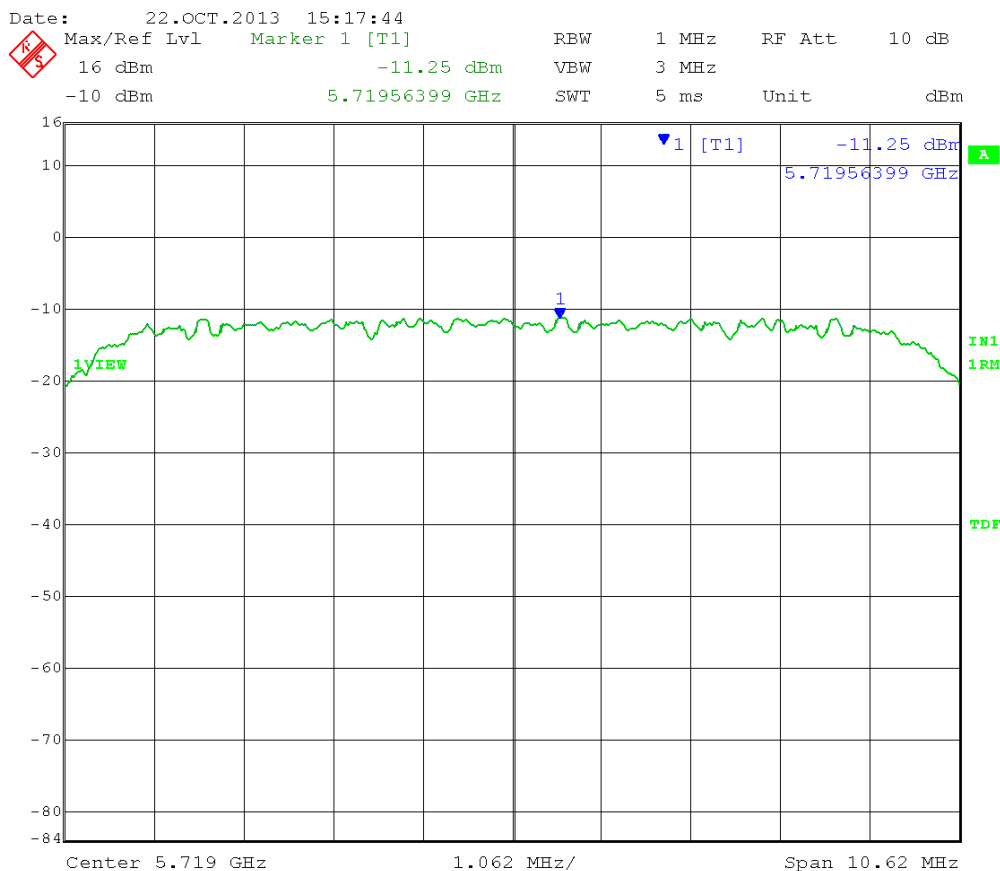
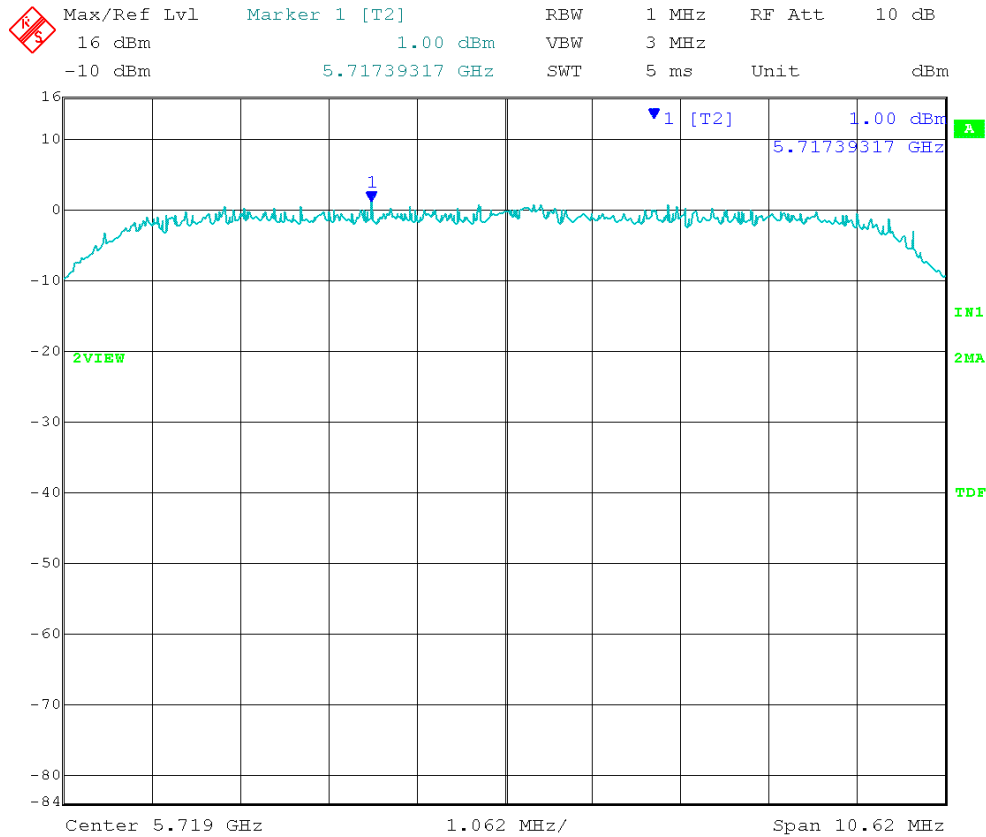
Date: 22.OCT.2013 13:47:48

10MHz BW, HCH, 256QAM, 26 dB EBW = 10.42MHz



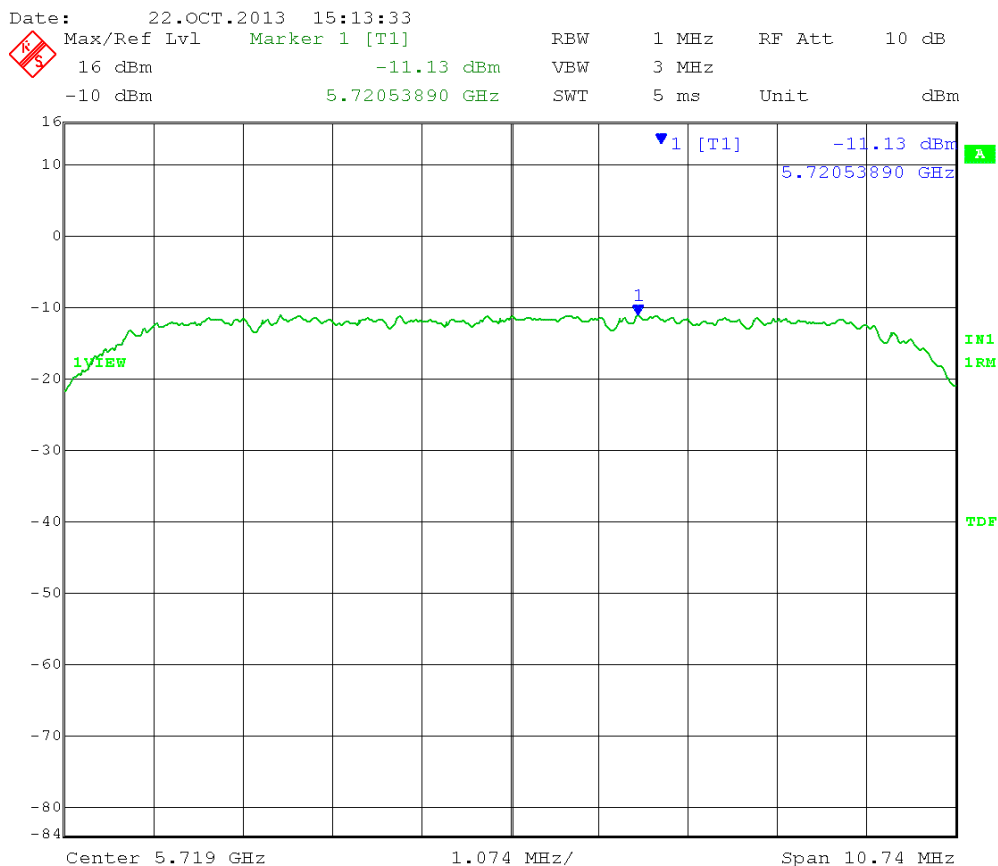
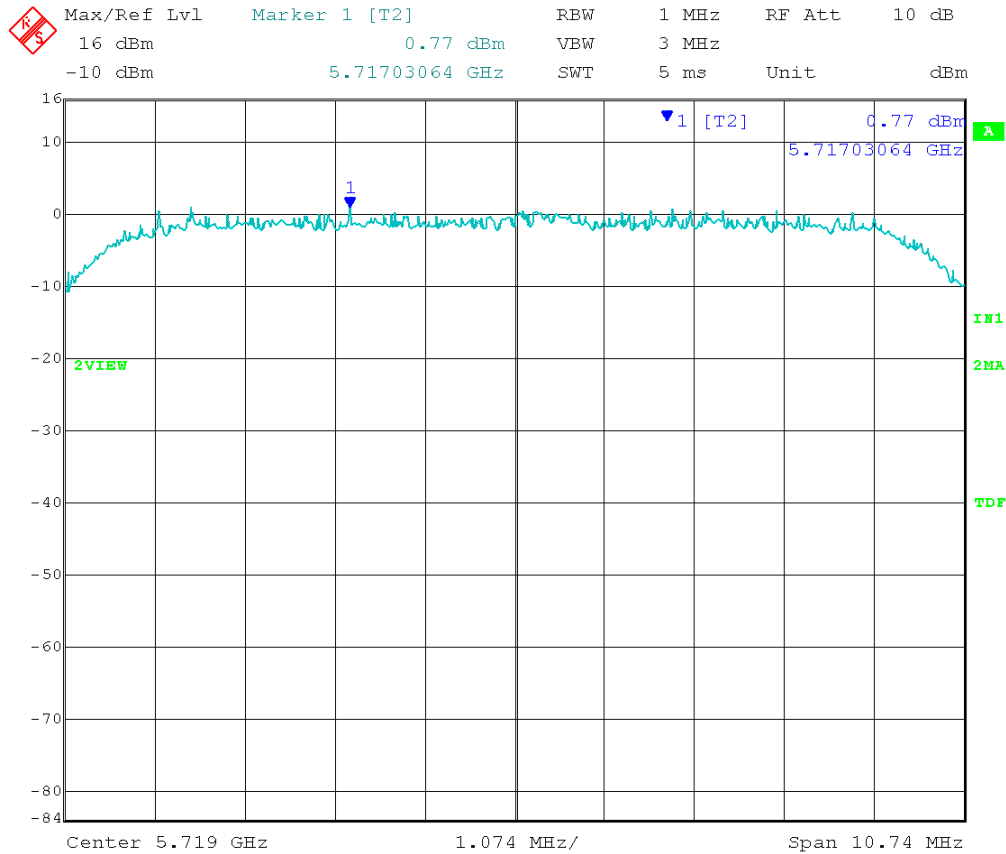
Date: 22.OCT.2013 13:48:46

10MHz BW, HCH, 1024QAM, 26 dB EBW = 10.62MHz



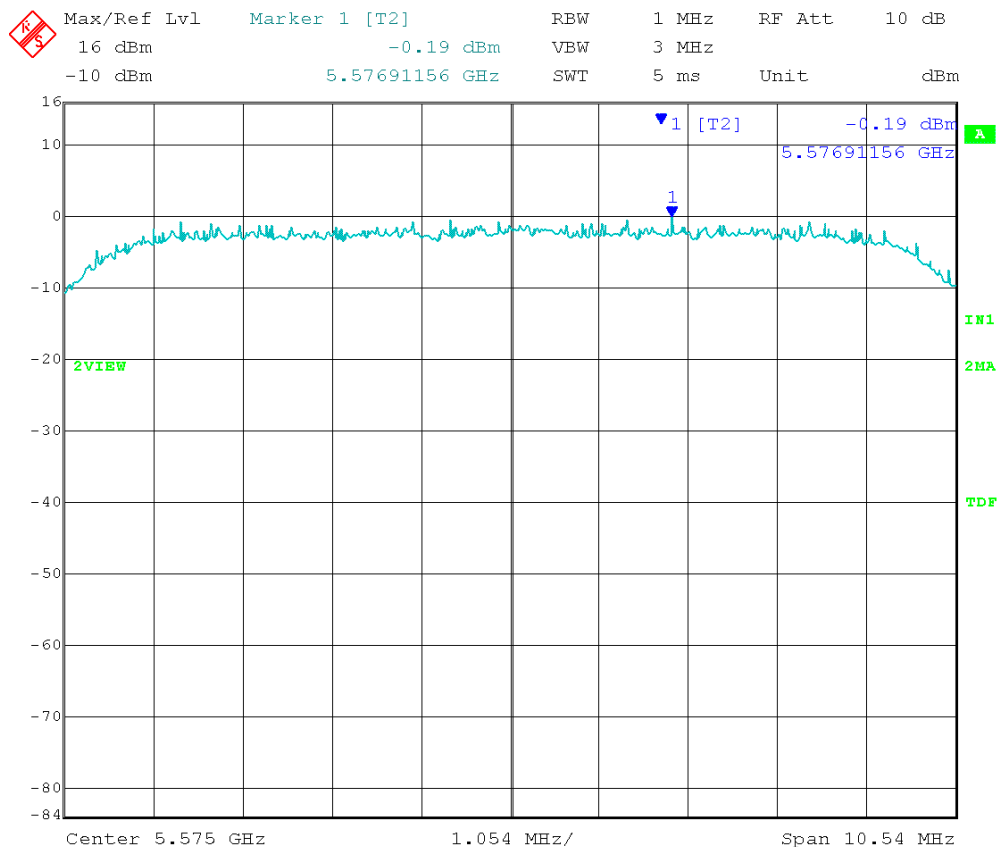
Date: 22.OCT.2013 13:50:01

10MHz BW, HCH, QPSK, 26 dB EBW = 10.74MHz

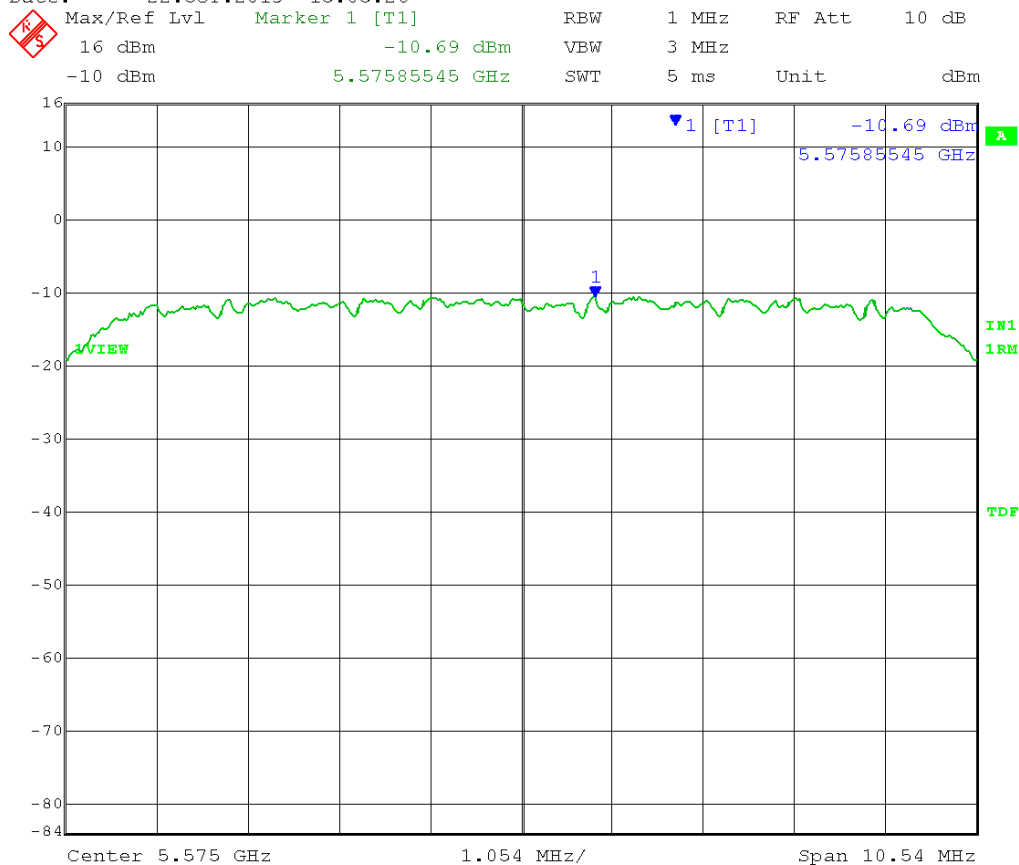


Date: 22.OCT.2013 13:45:39

10MHz BW, MCH, 16QAM, 26 dB EBW = 10.54MHz

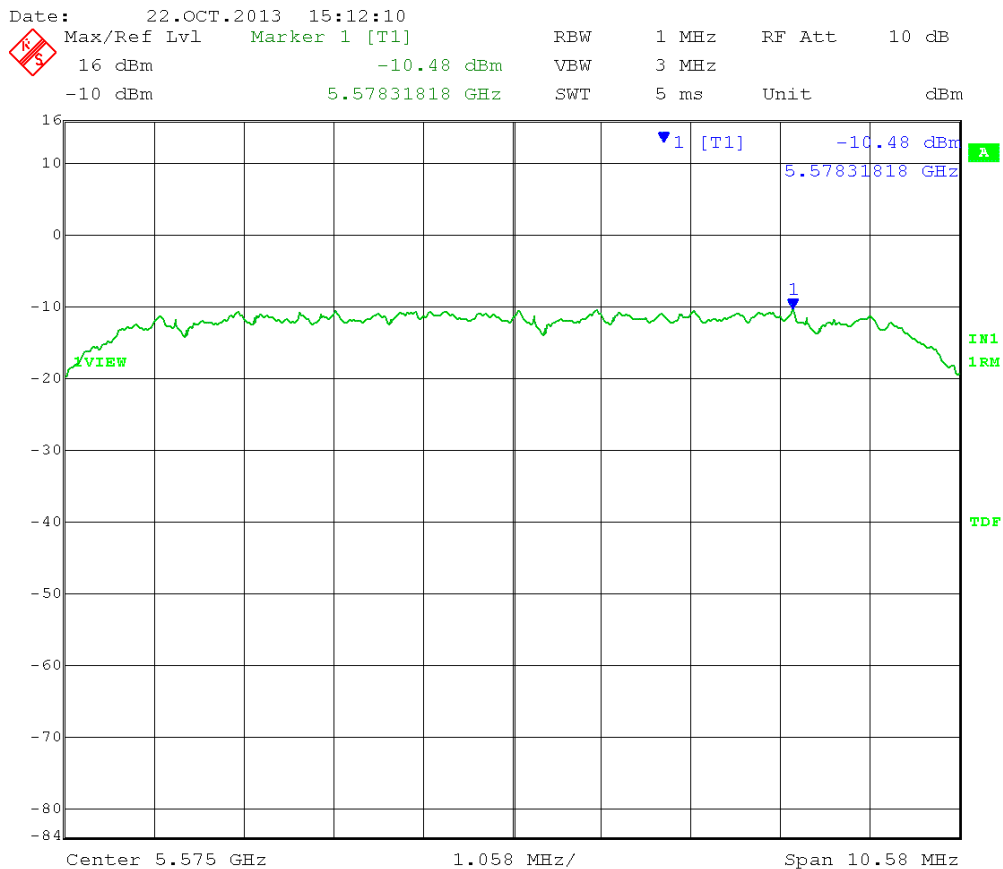
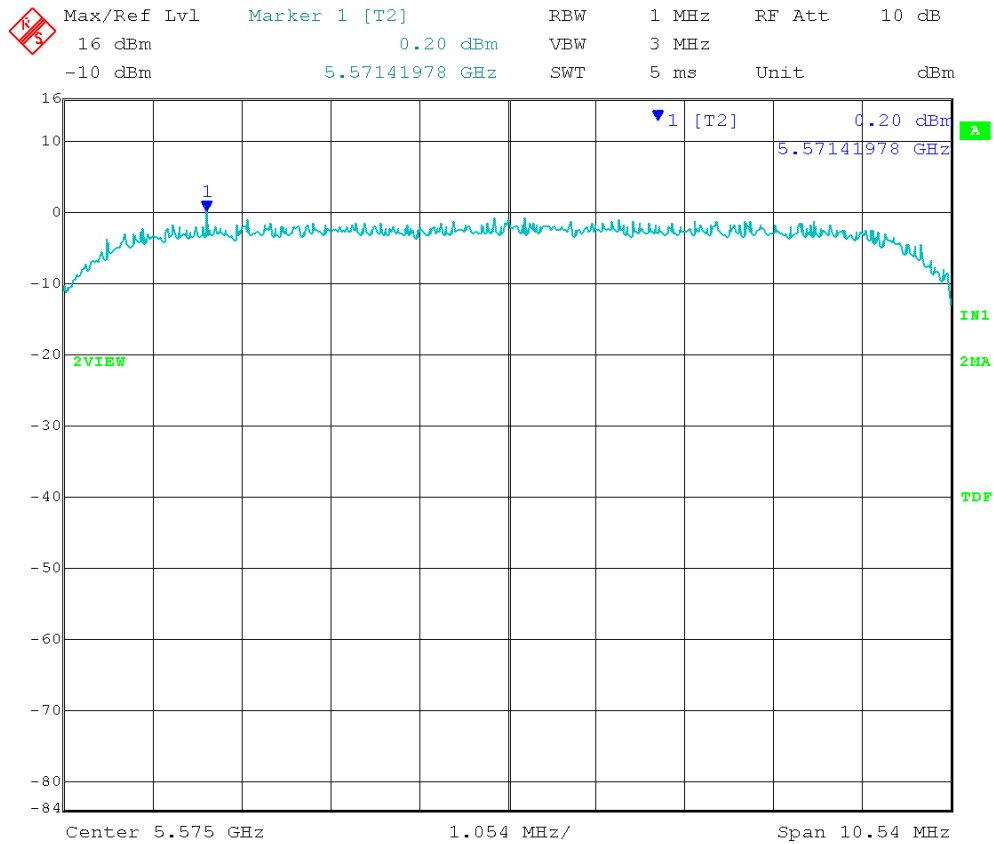


Date: 22.OCT.2013 15:05:26



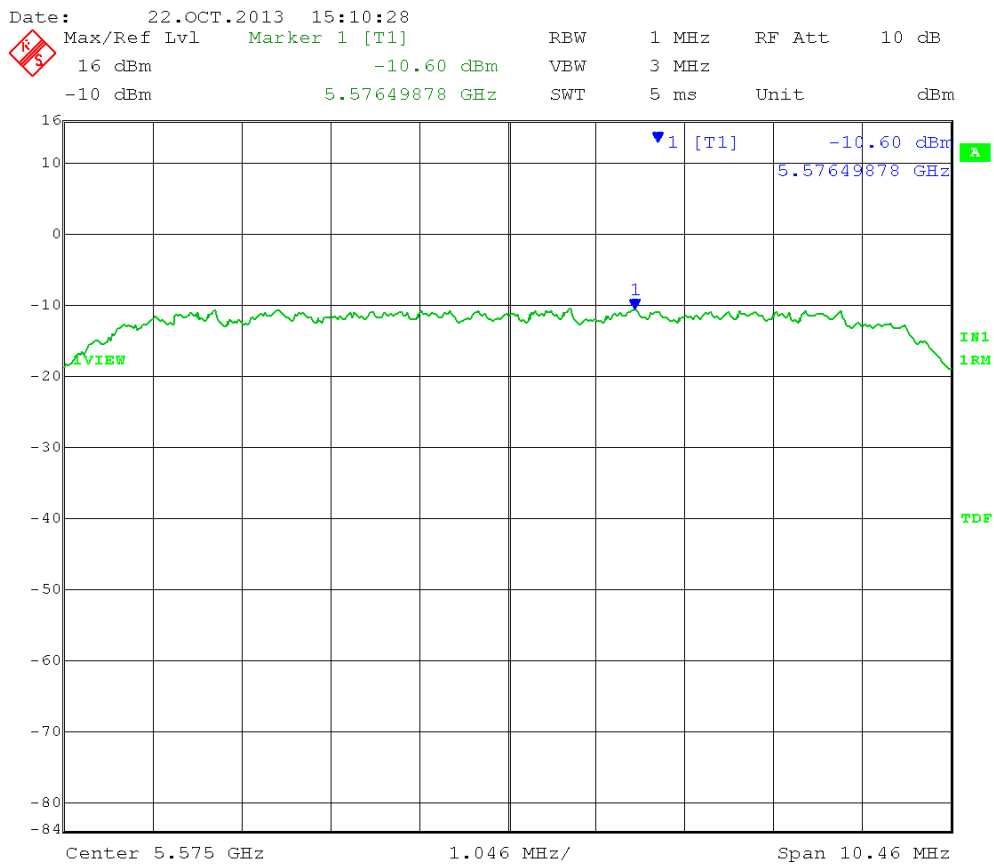
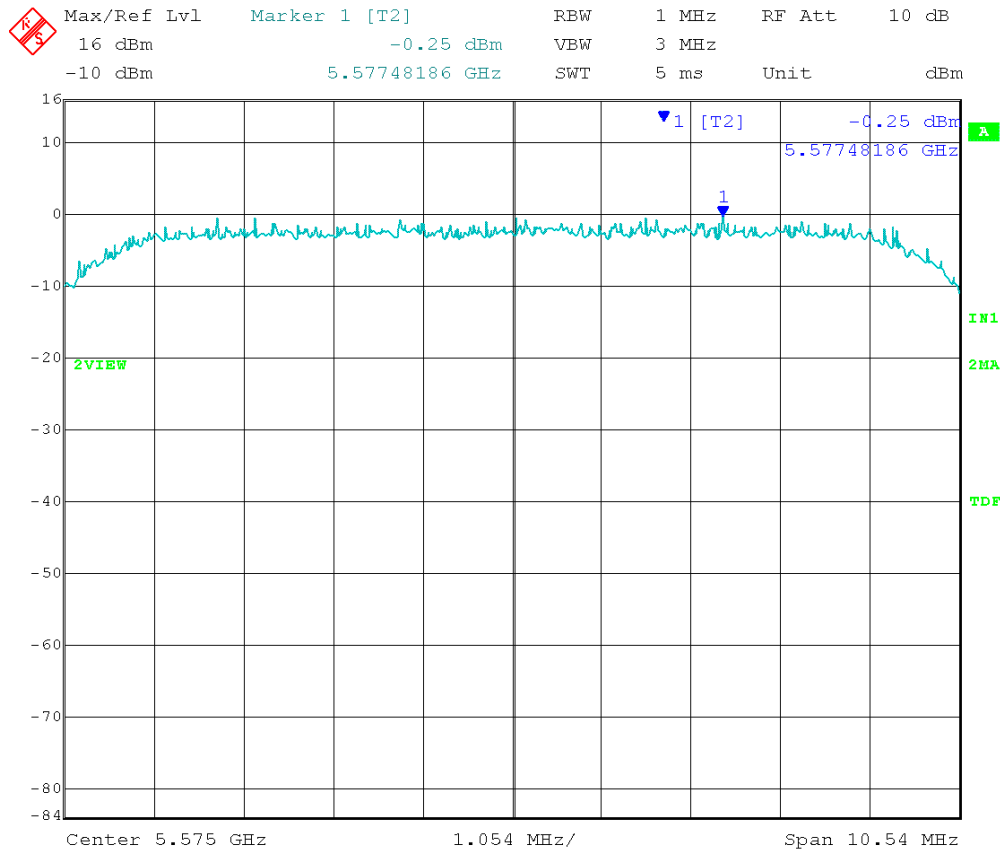
Date: 22.OCT.2013 13:55:25

10MHz BW, MCH, 64QAM, 26 dB EBW = 10.58MHz



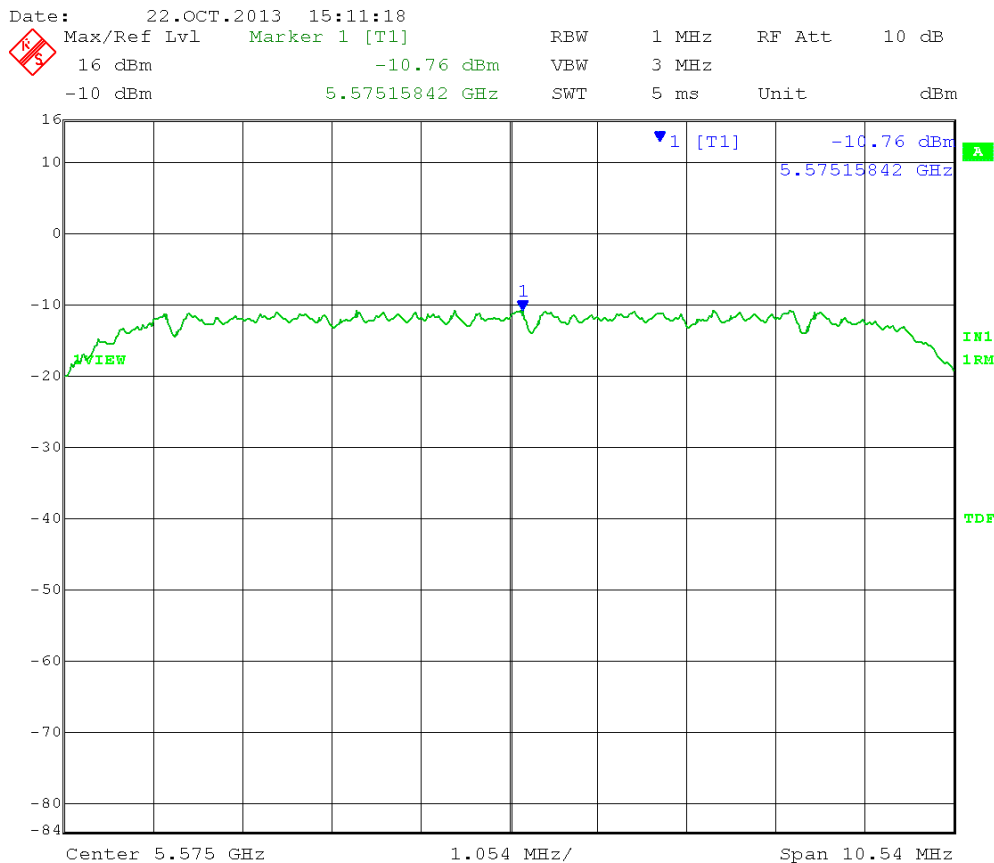
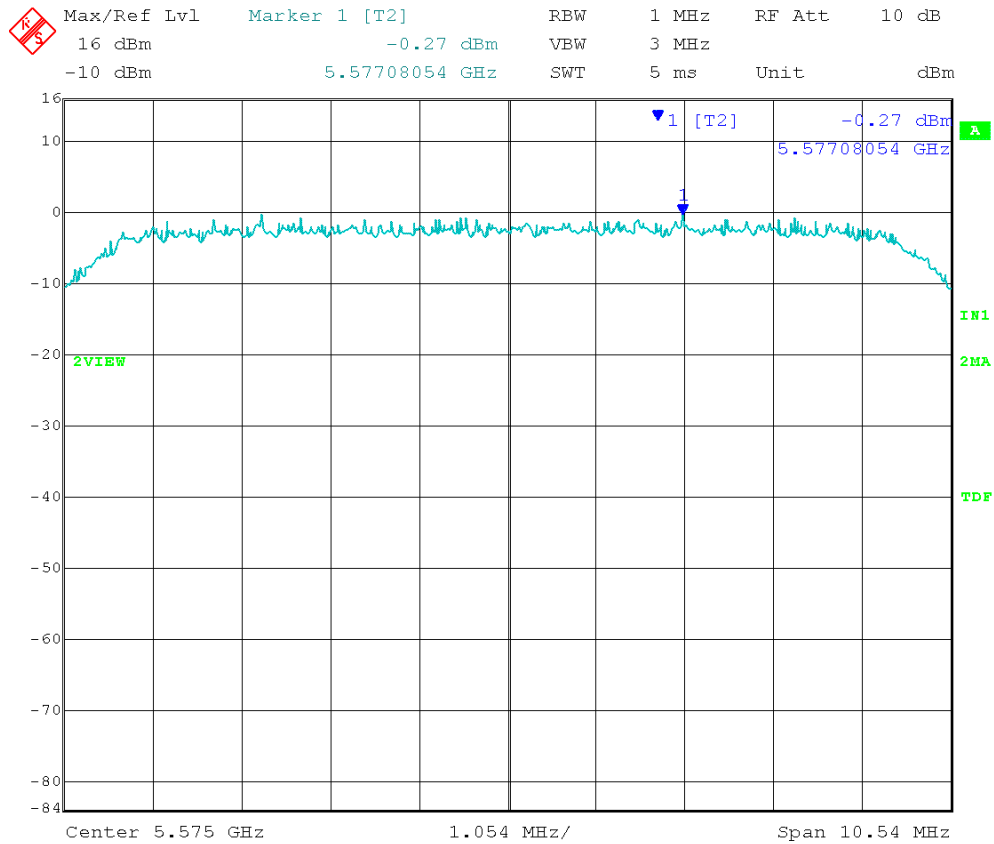
Date: 22.OCT.2013 13:54:24

10MHz BW, MCH, 256QAM, 26 dB EBW = 10.46MHz



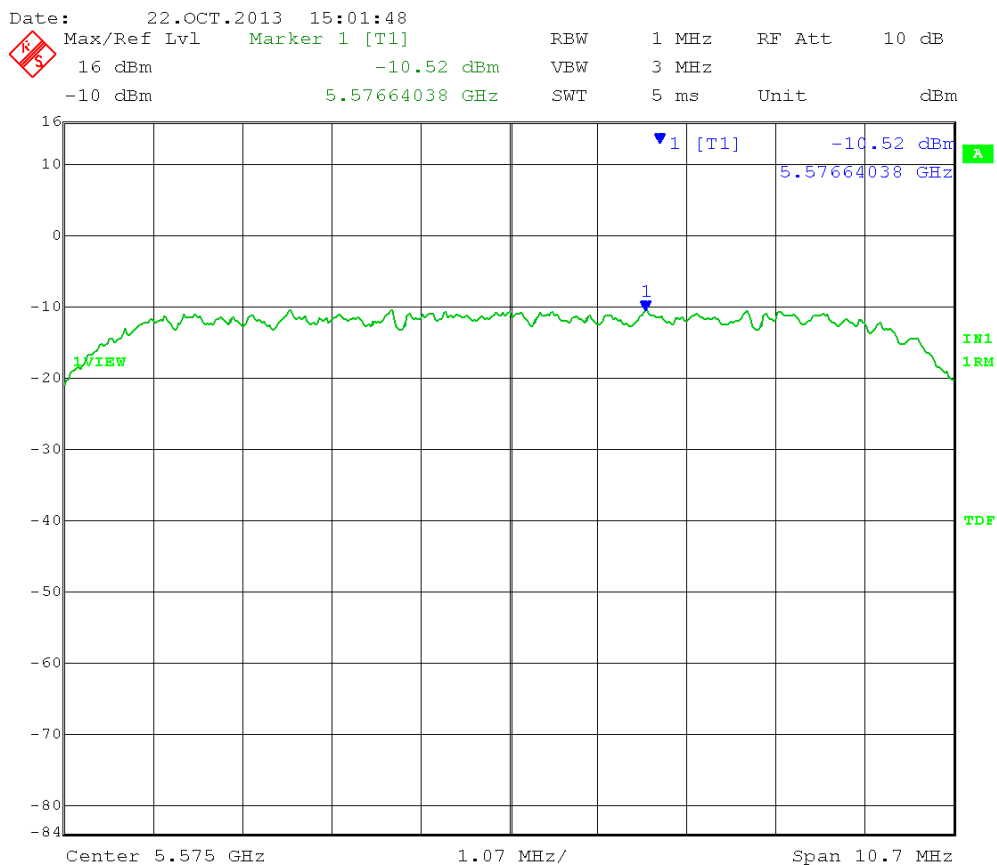
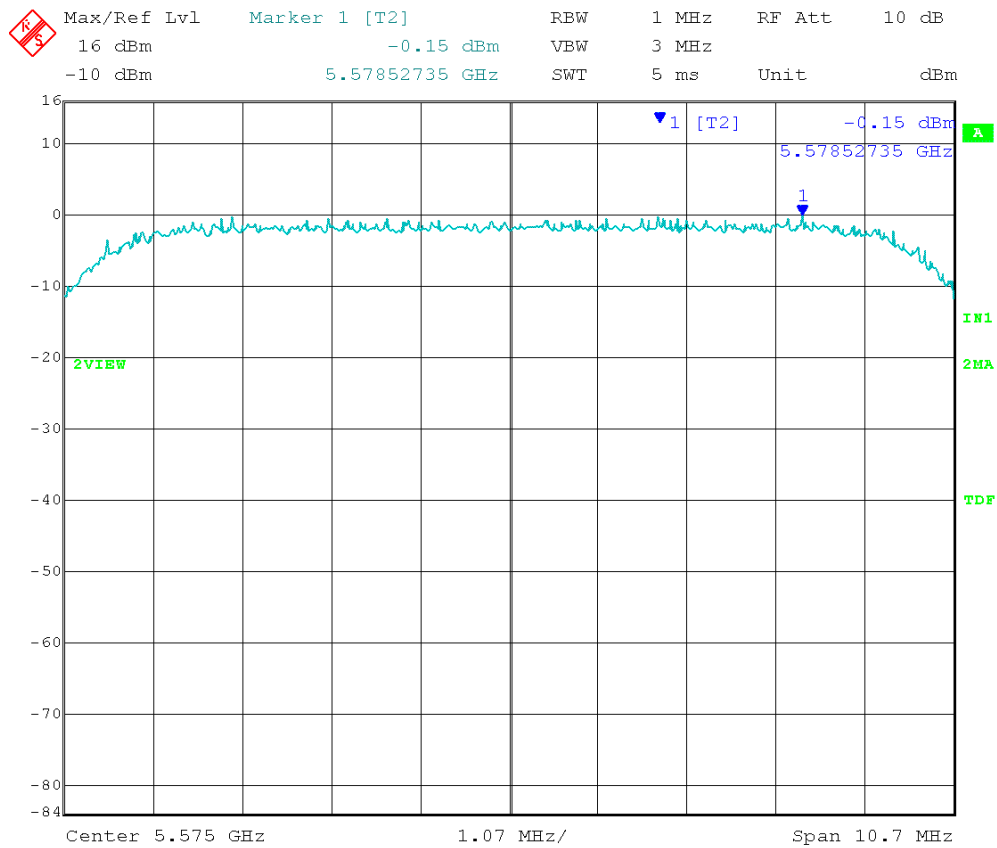
Date: 22.OCT.2013 13:53:19

10MHz BW, MCH, 1024QAM, 26 dB EBW = 10.54MHz



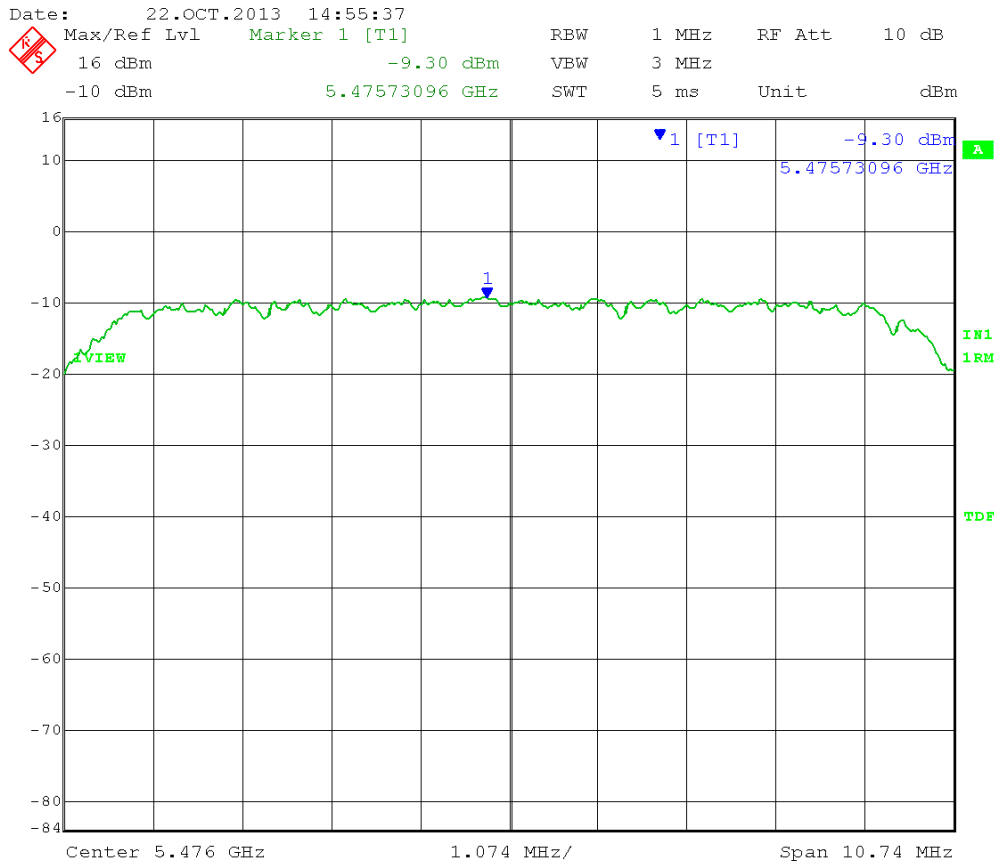
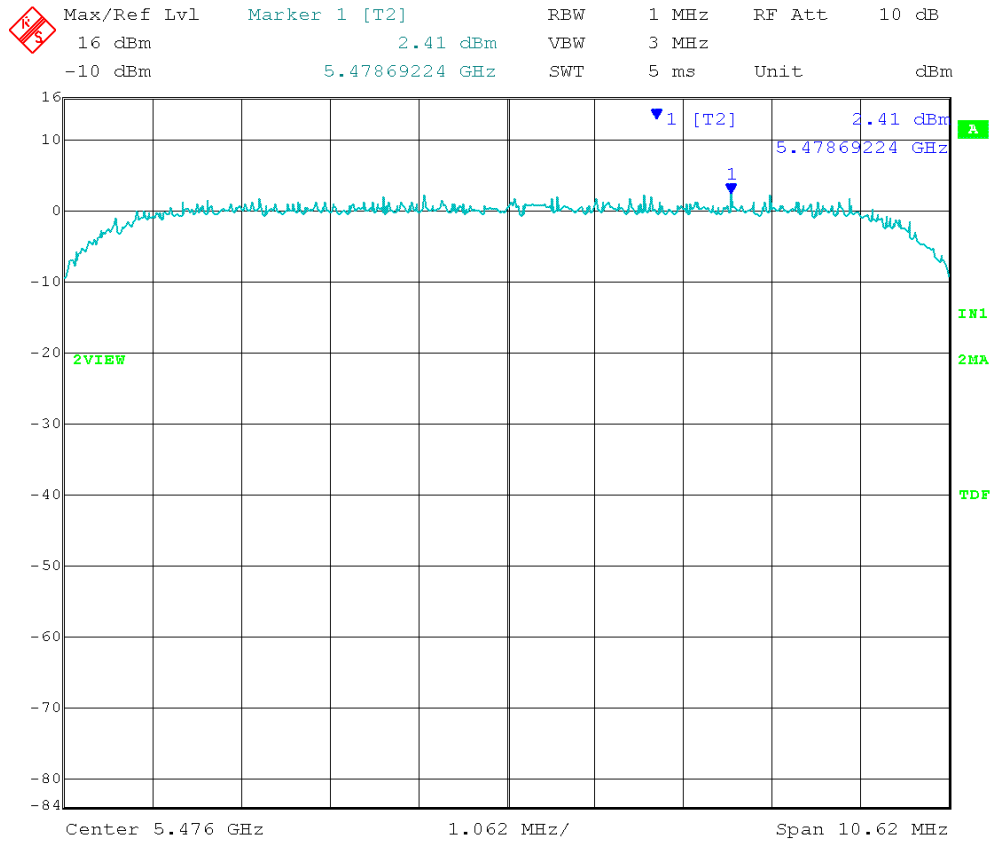
Date: 22.OCT.2013 13:52:08

10MHz BW, MCH, QPSK, 26 dB EBW = 10.70MHz



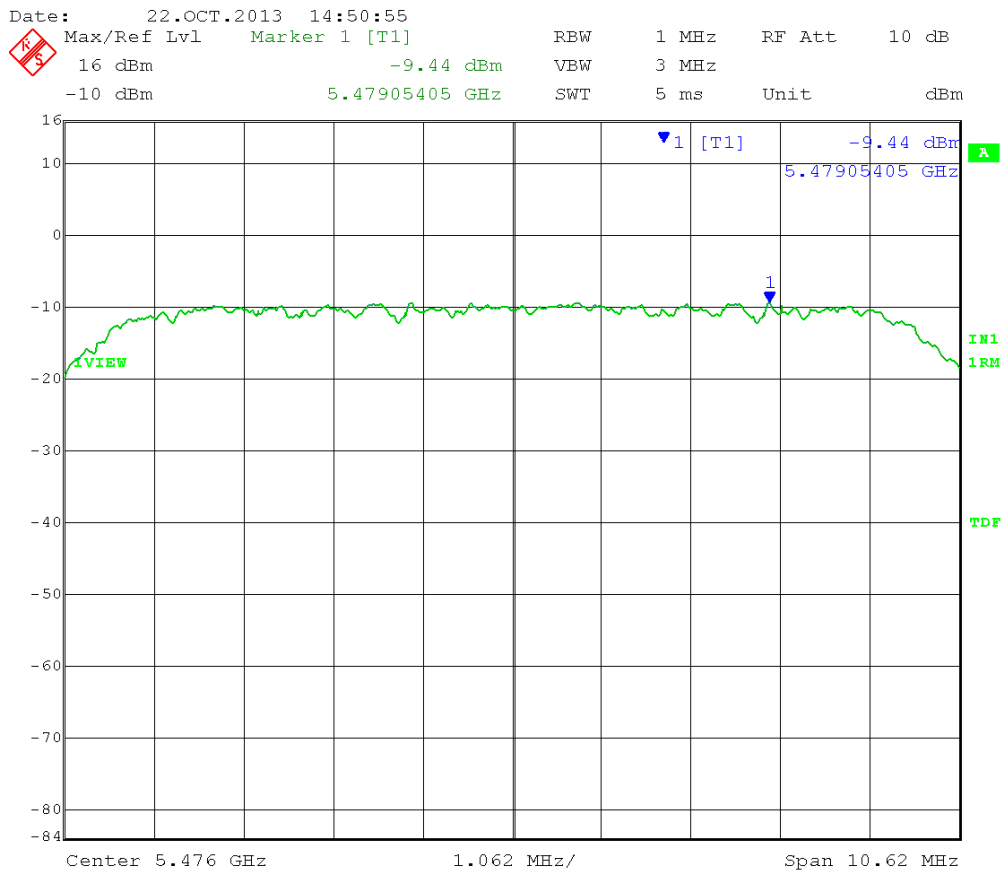
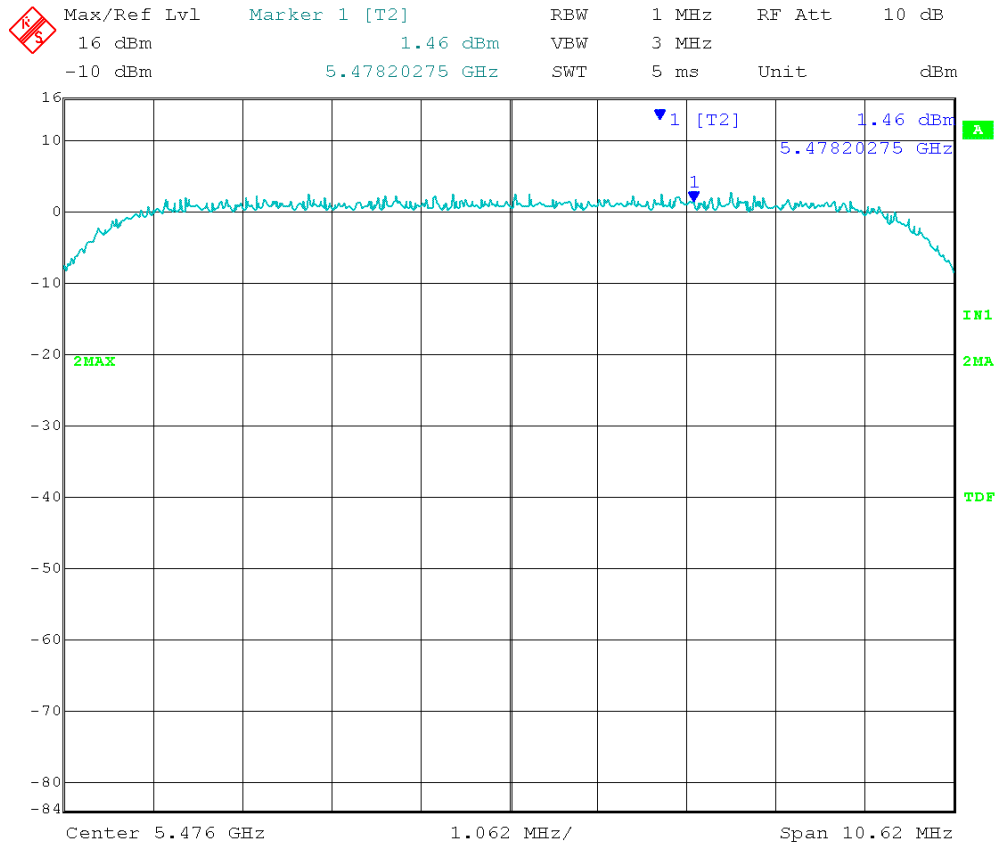
Date: 22.OCT.2013 13:56:15

10MHz BW, LCH, 16QAM, 26 dB EBW = 10.74MHz



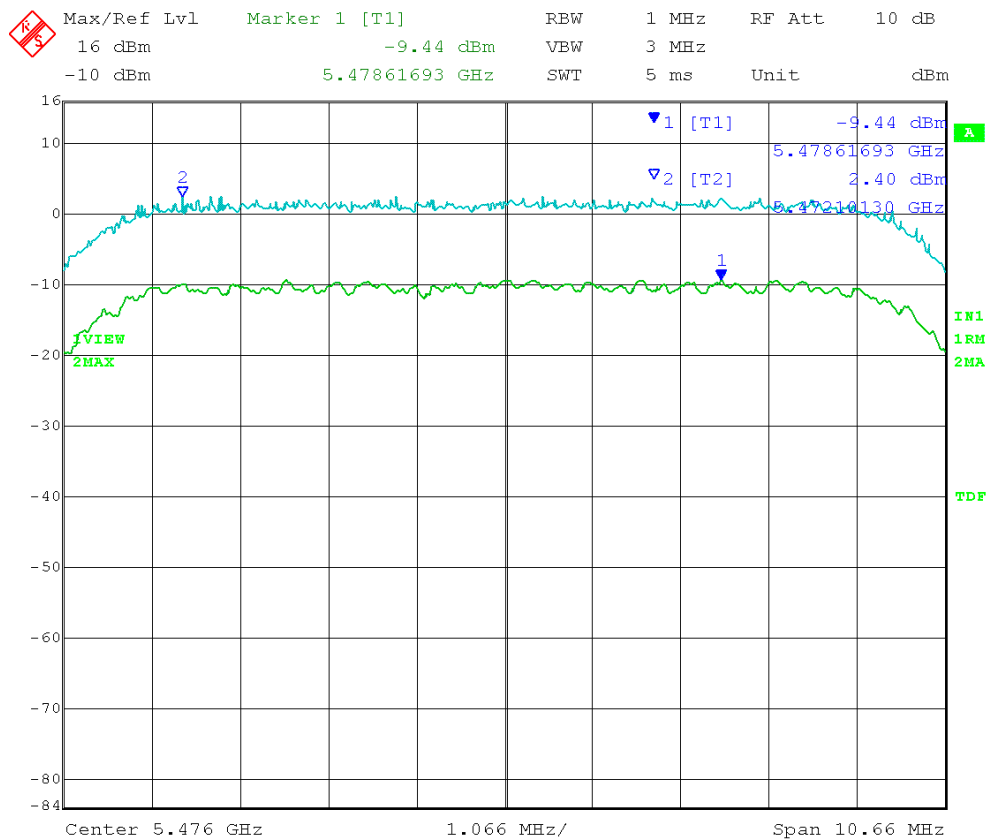
Date: 22.OCT.2013 13:58:50

10MHz BW, LCH, 64QAM, 26 dB EBW = 10.62MHz

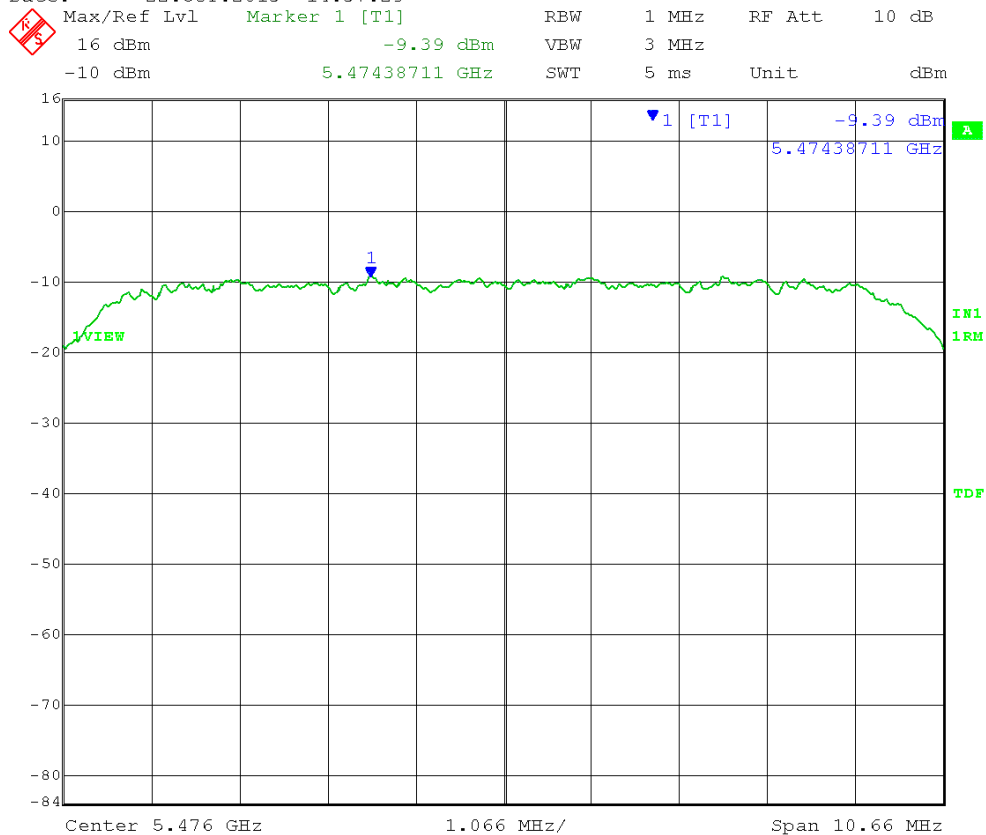


Date: 22.OCT.2013 14:06:11

10MHz BW, LCH, 256QAM, 26 dB EBW = 10.66MHz

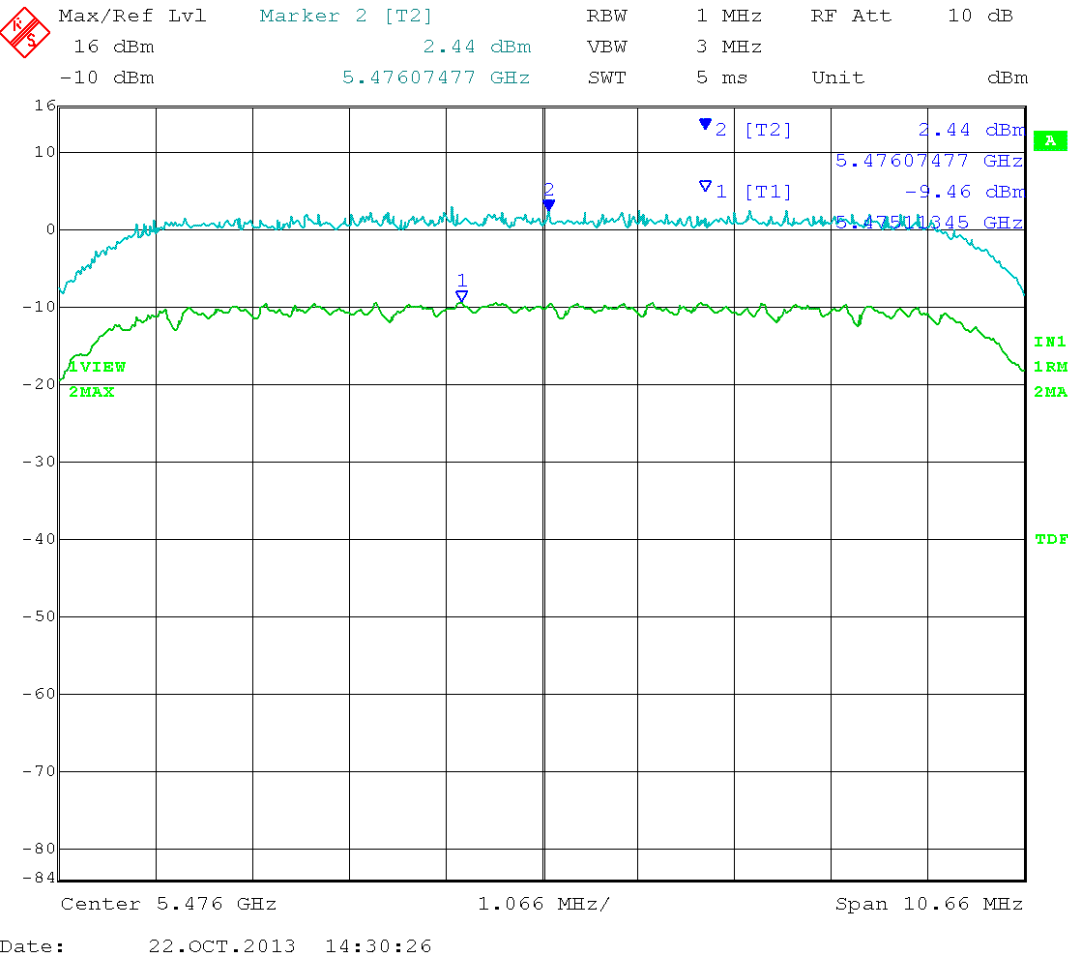


Date: 22.OCT.2013 14:37:29

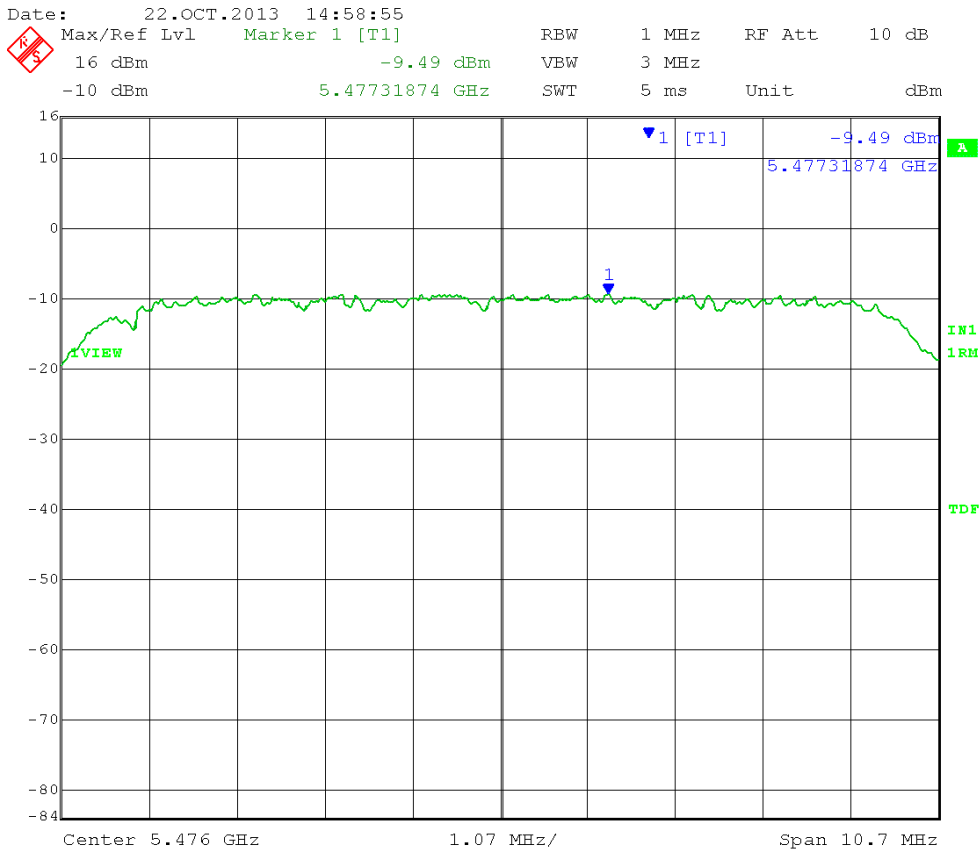
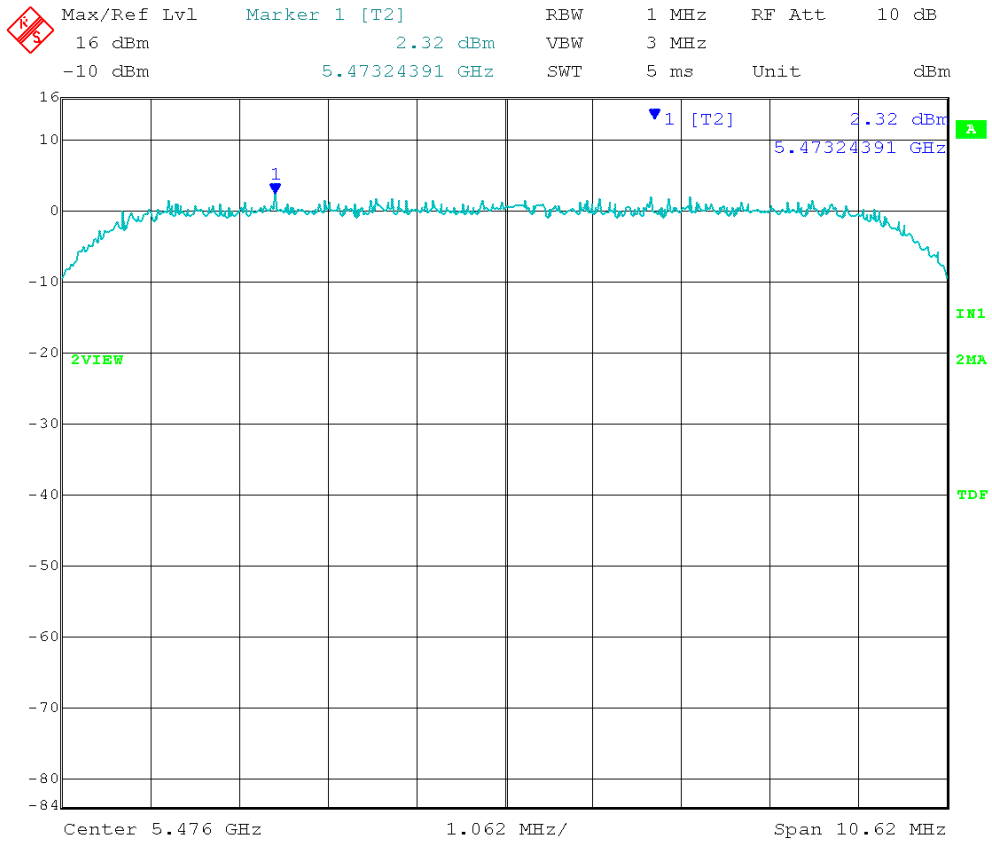


Date: 22.OCT.2013 14:07:16

10MHz BW, LCH, 1024QAM, 26 dB EBW = 10.66MHz



10MHz BW, LCH, QPSK, 26 dB EBW = 10.70MHz



Date: 22.OCT.2013 13:57:51



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B8.0 Unwanted Emission Levels – Radiated Operating Band-Edge

Radiated with antenna connected

Rule Section: Sections 15.407(b)(3) and 15.407(b)(5)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section H – Unwanted emission levels

Section H(2) – Unwanted emissions that fall outside of the restricted bands

Section H(3) – General Requirements for Unwanted Emissions Measurements

Section H(3)(d)(ii) – Band edge measurements, Integration method

Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz

Description: Measure the band-edge emission level using the following settings

Standard method: (only used for the 20MHz BW)

RBW = 1 MHz

VBW $\geq$ 3 MHz

Detector = peak

Sweep time = auto

Trace mode = max hold

Integration method (if band edge is within 2 MHz of the 99% occupied bandwidth edge:

RBW = 100 kHz

VBW $\geq$ 3 x RBW

Use the band power integration function of the spectrum analyzer to integrate the power across the 1 MHz bandwidth at the operating band edge

Limit: -27 dBm/MHz

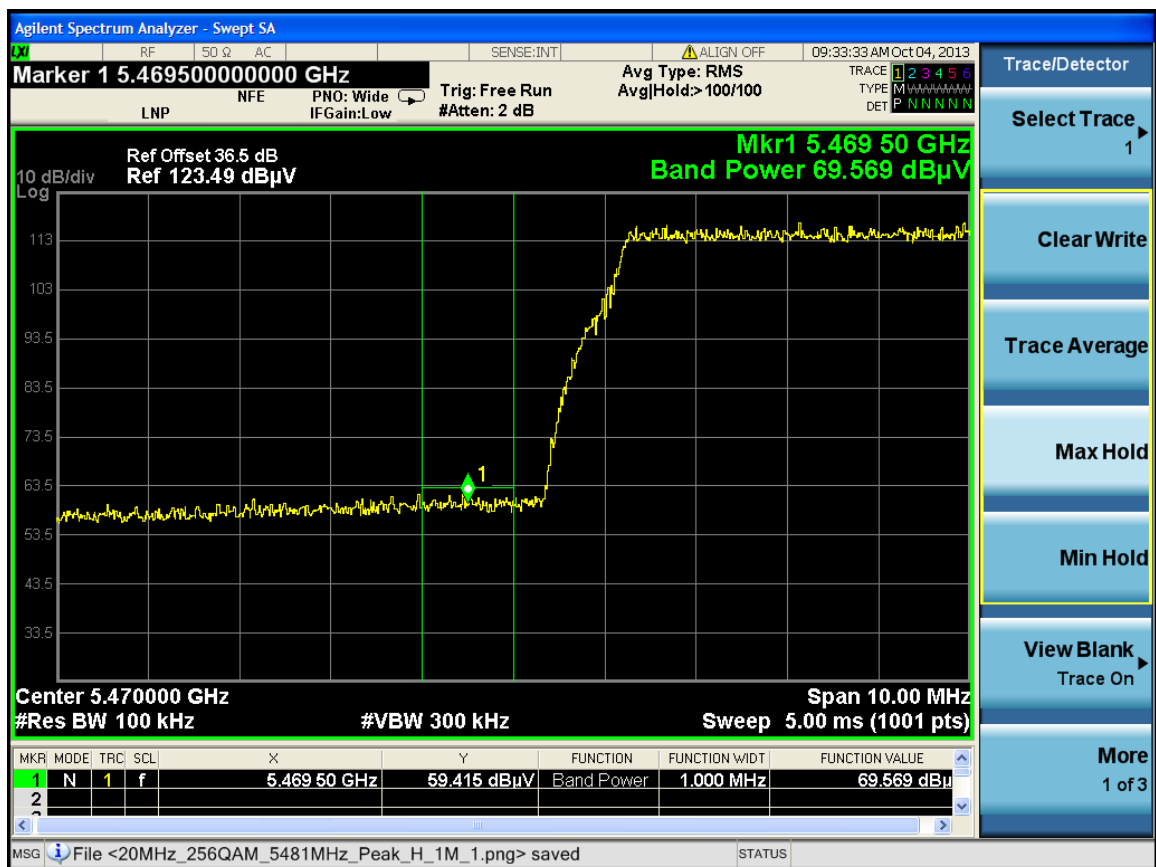
Results: Passed

Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

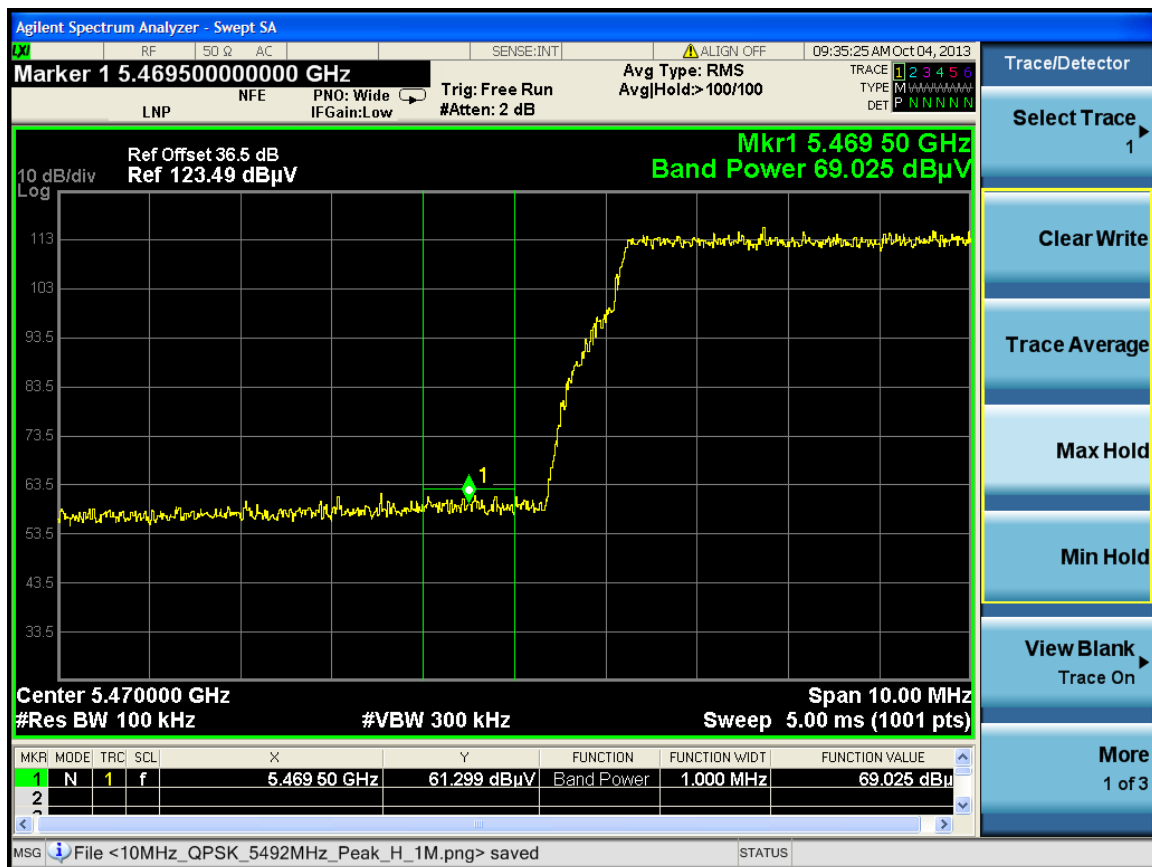
Both transmit chains active. Output power was set to 30 dBm eirp using special test software.

Test distance was 1 meter.

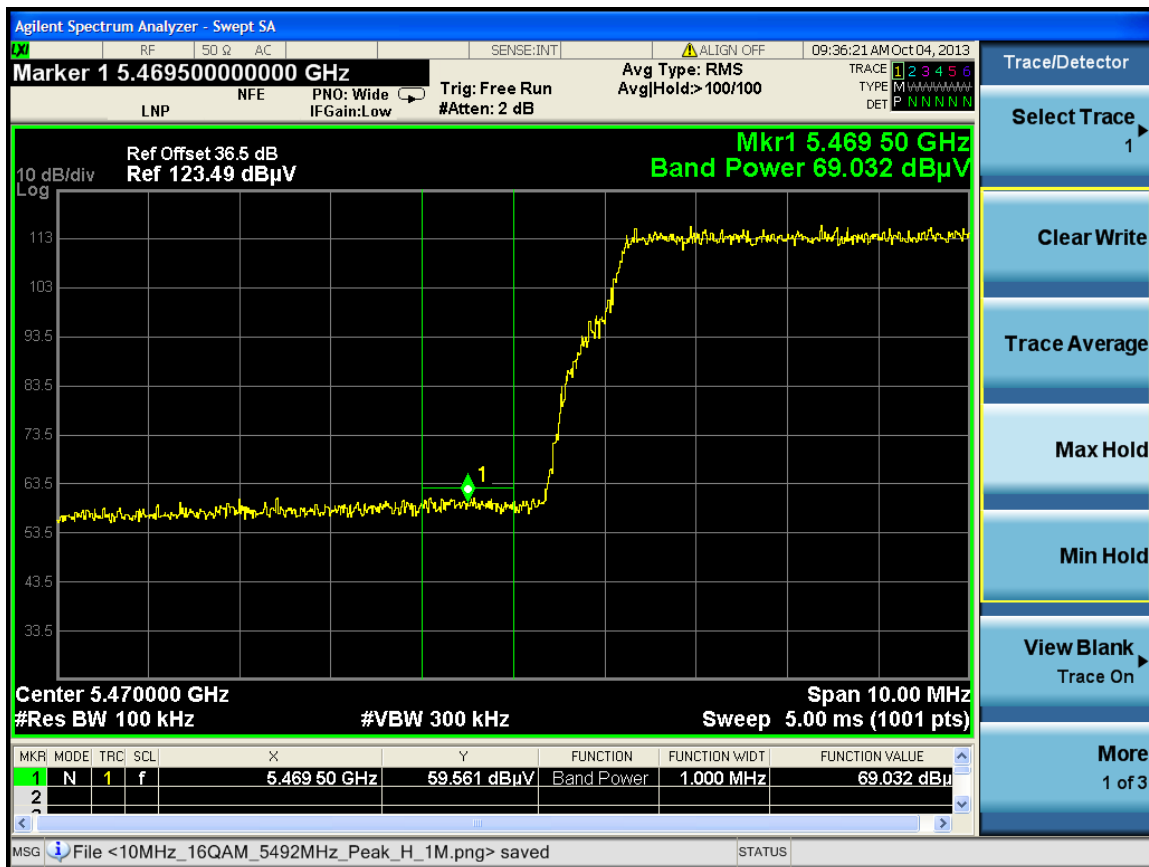
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: QPSK
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= E[\text{dB}\mu\text{V/m}] + 20 \log(d[\text{meters}]) - 104.77 \\ &= 69.569 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= -35.20 \text{ dBm/MHz} \end{aligned}$$



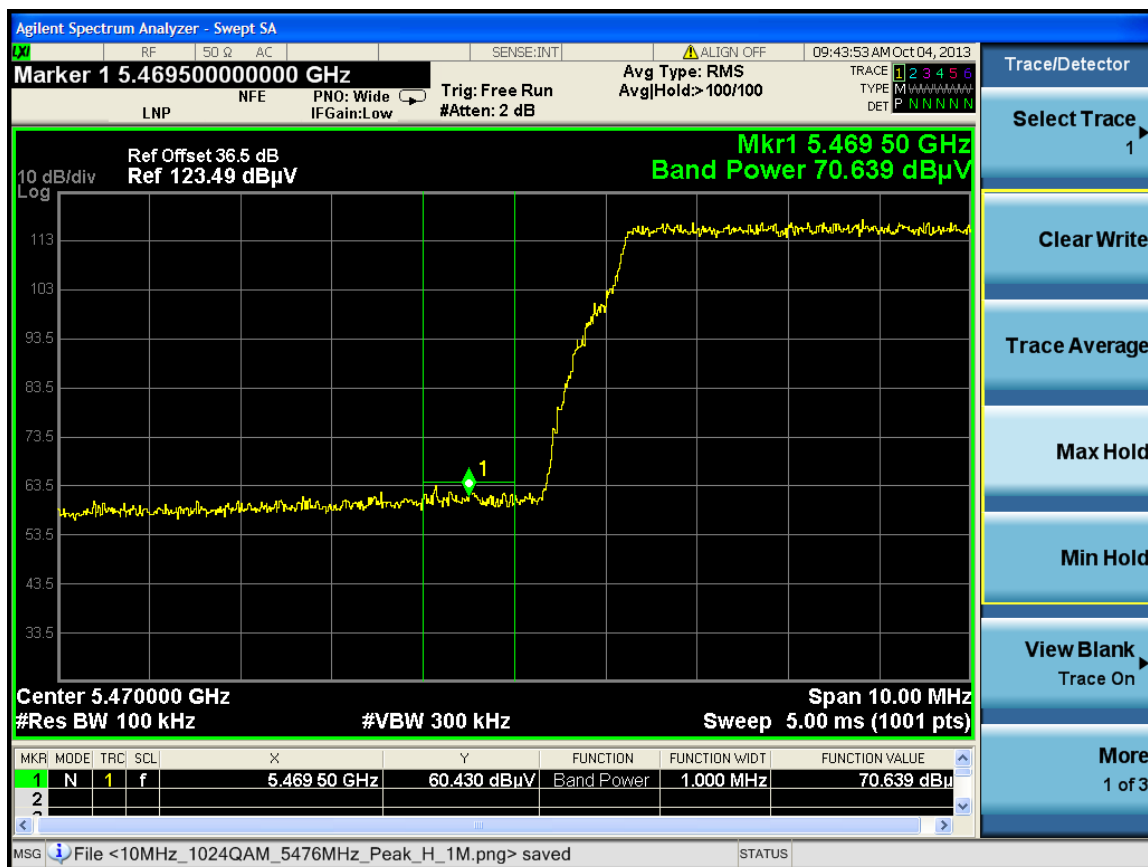
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 16QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 69.025 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-35.74 \text{ dBm/MHz}} \end{aligned}$$



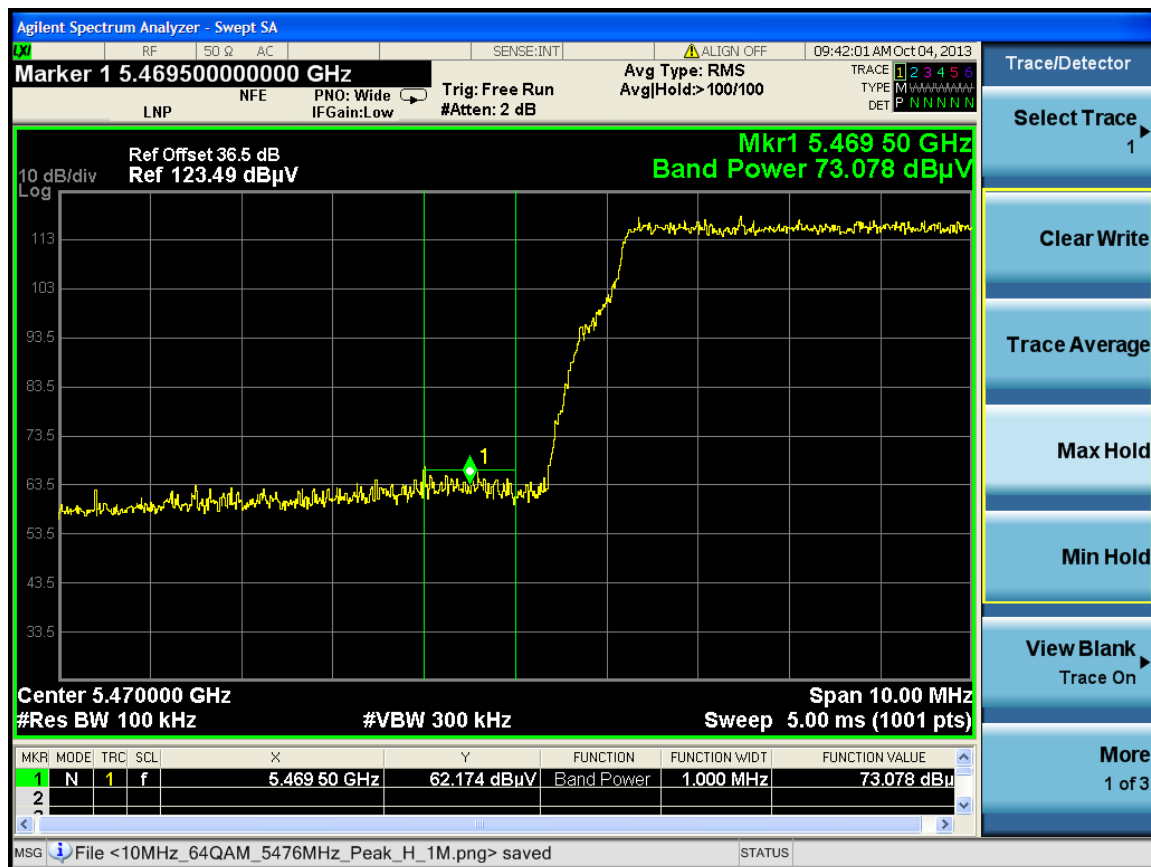
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 64QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
 $= 69.032 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -35.73 \text{ dBm/MHz}$



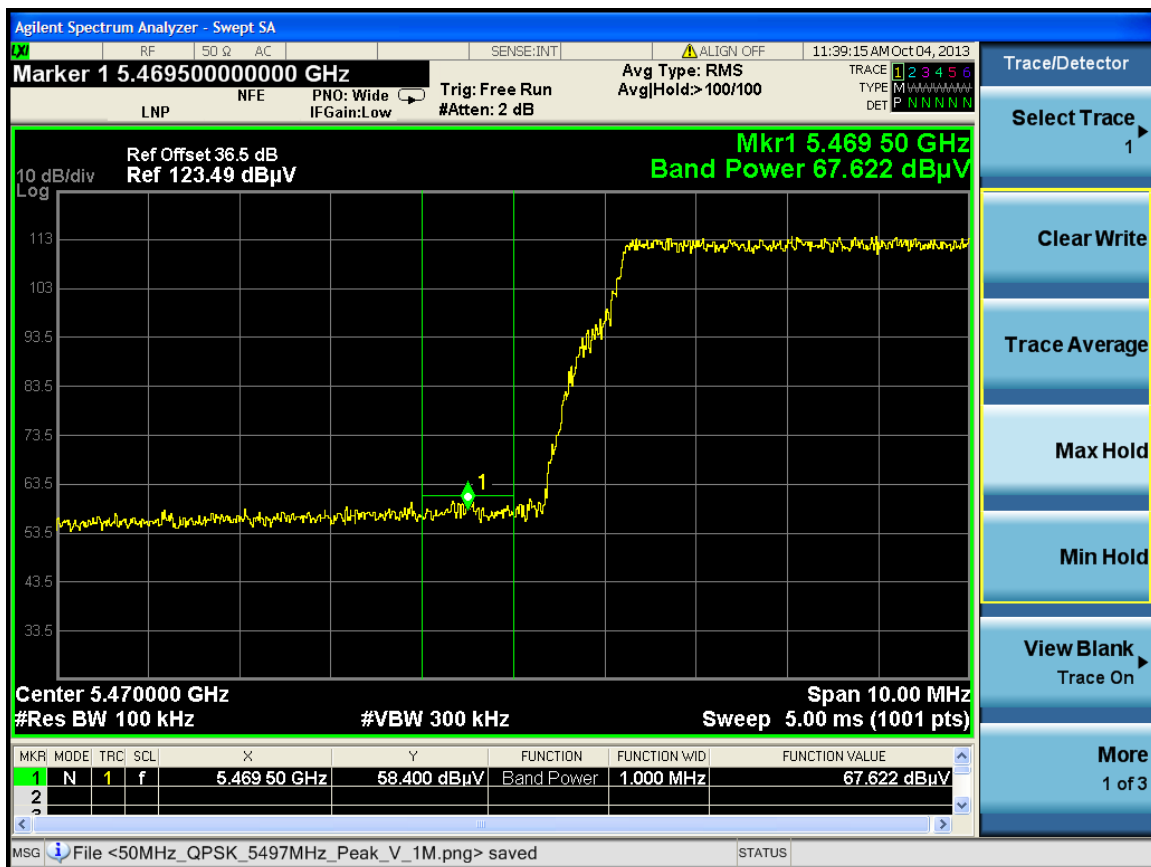
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 256QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 70.639 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-34.13 \text{ dBm/MHz}} \end{aligned}$$



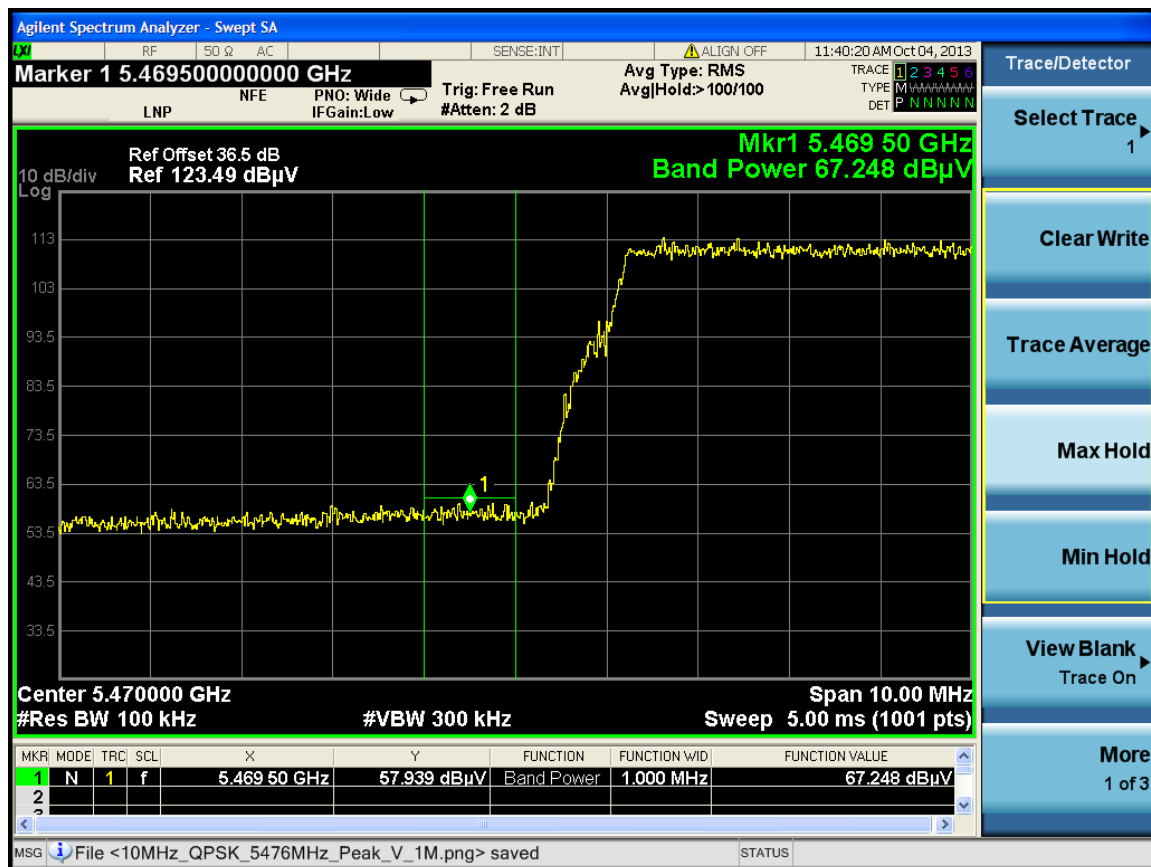
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 1024QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.078 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.69 \text{ dBm/MHz}$



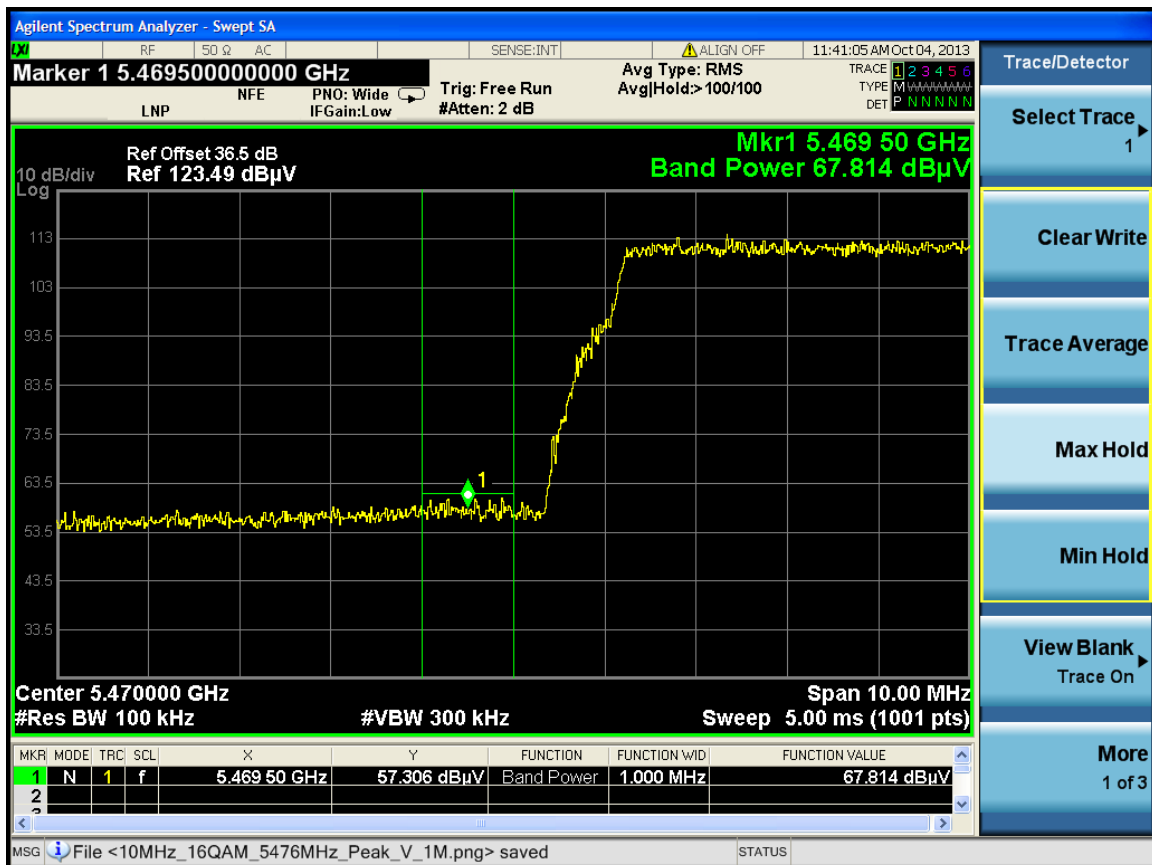
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: QPSK
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 67.622 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -37.14 \text{ dBm/MHz}$



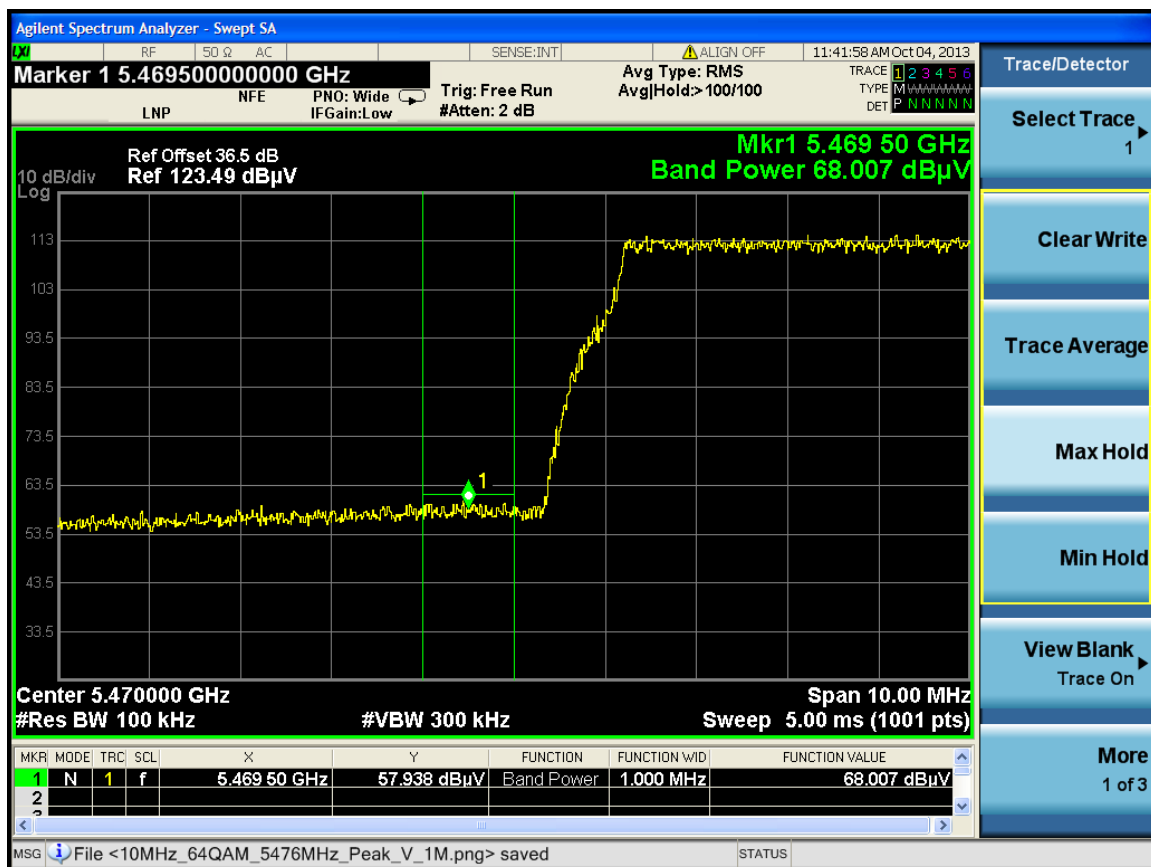
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 16QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 67.248 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -37.52 \text{ dBm/MHz}$



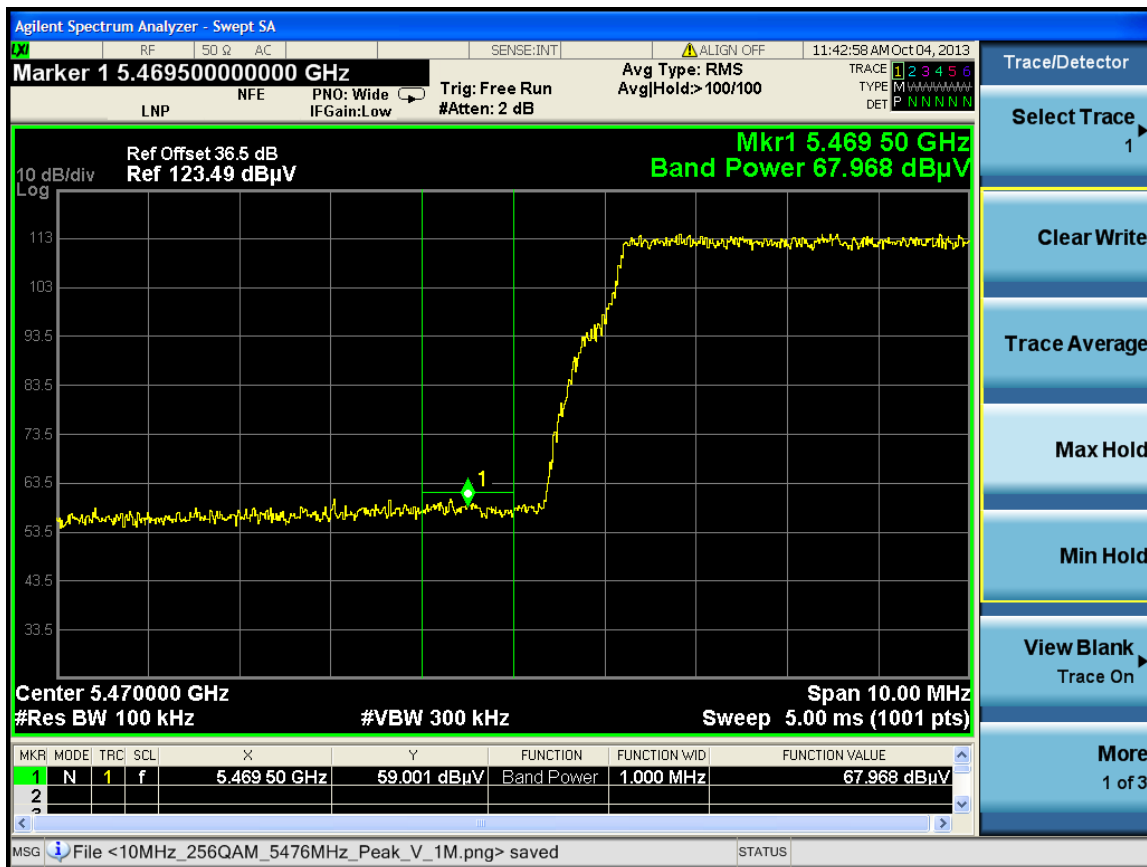
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 64QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 67.814 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.95 \text{ dBm/MHz}$



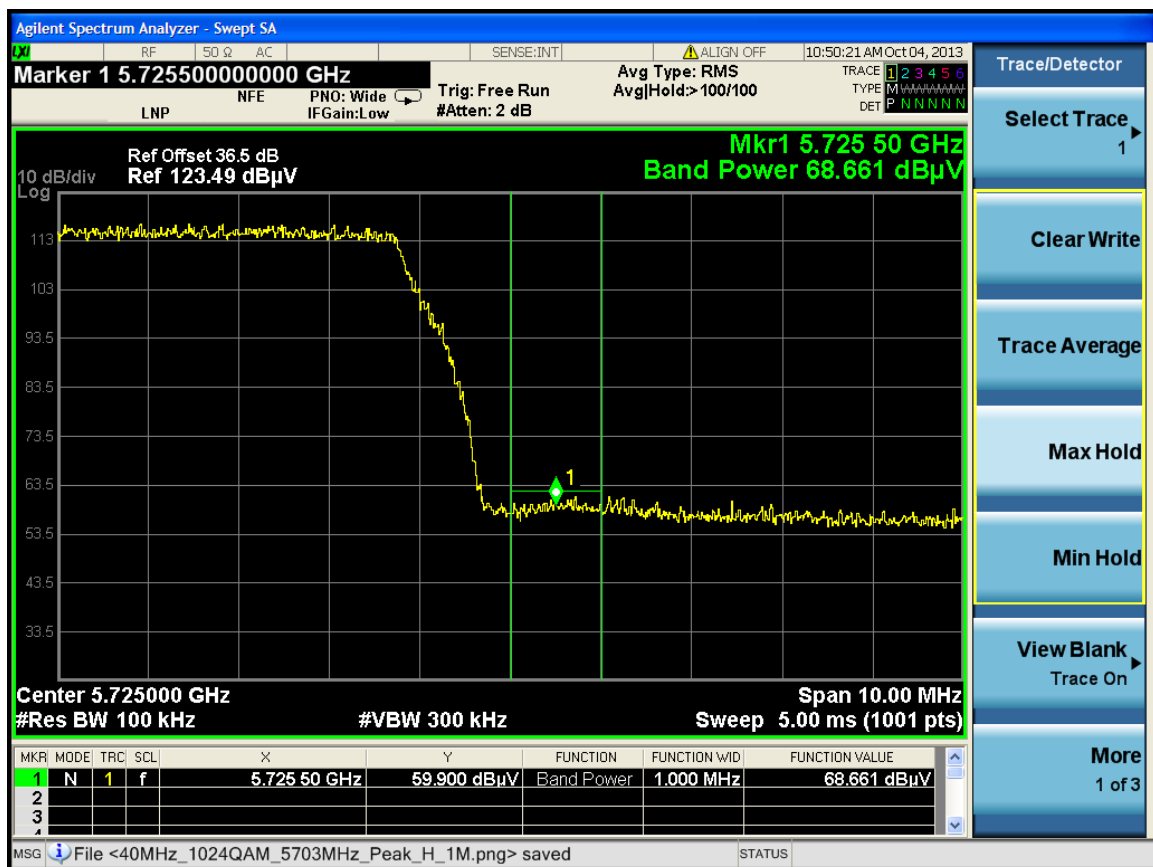
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 256QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 68.007 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.76 \text{ dBm/MHz}$



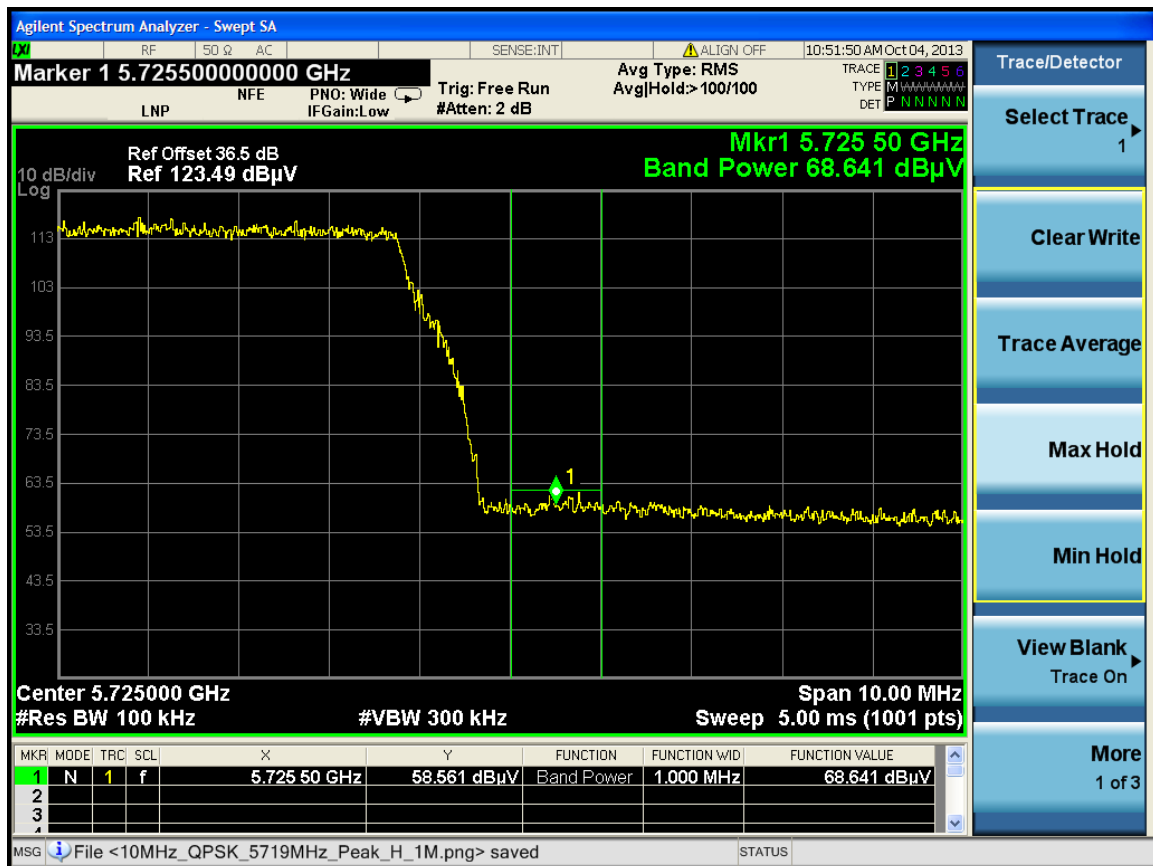
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 Low Channel: Frequency – 5476 MHz
 Modulation: 1024QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 67.968 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.80 \text{ dBm/MHz}$



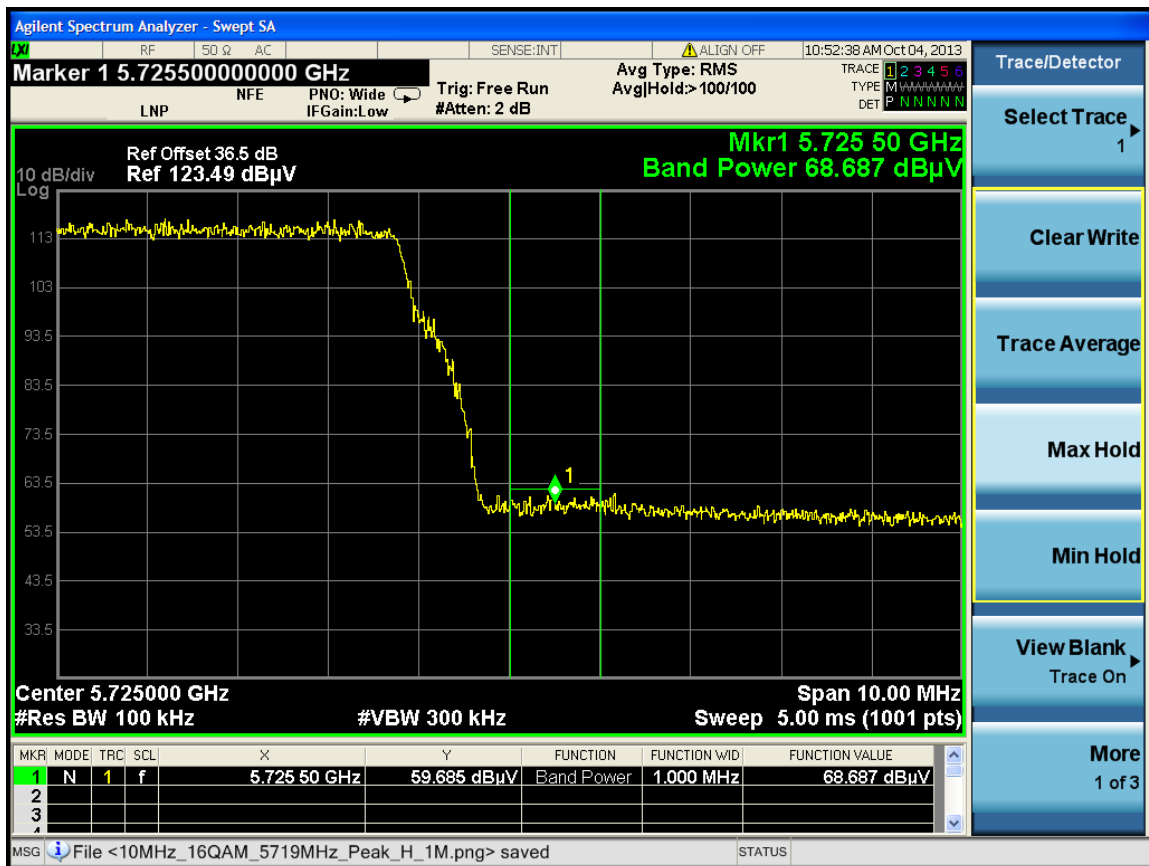
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: QPSK
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 68.661 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.10 \text{ dBm/MHz}$



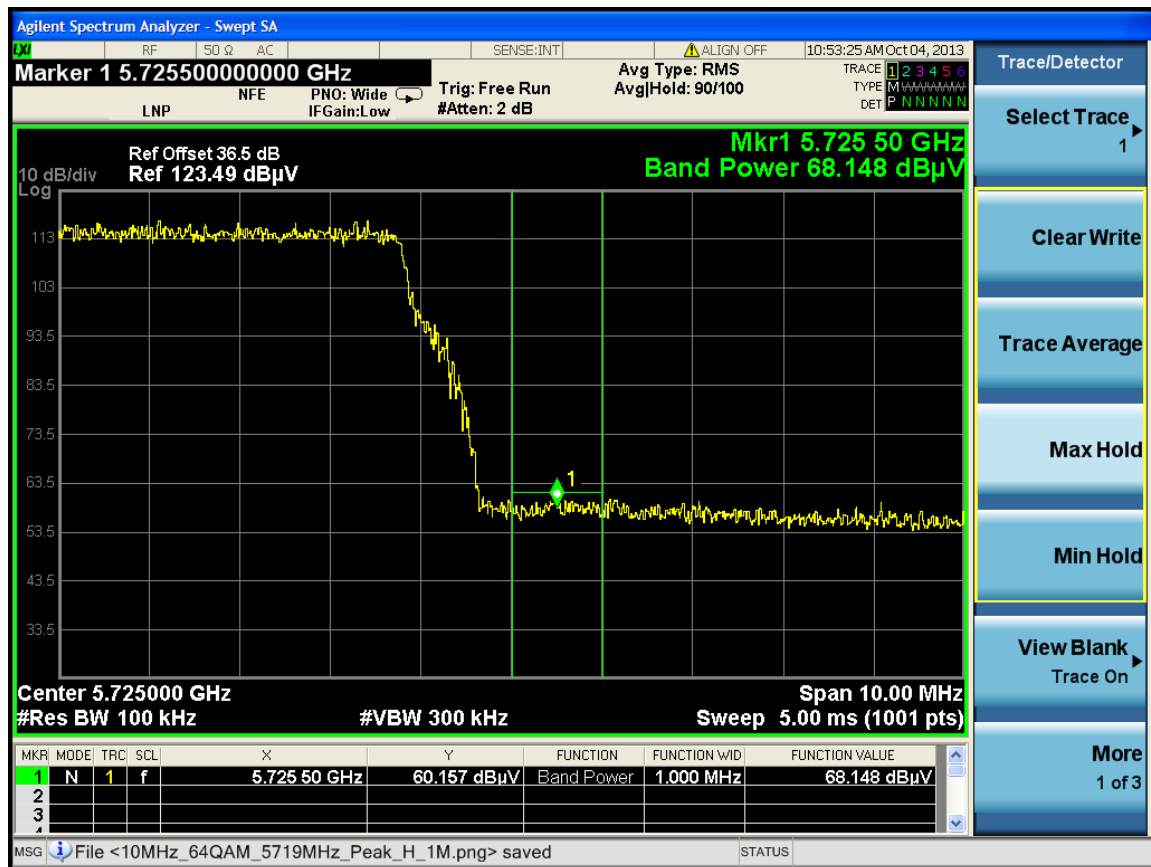
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 16QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 68.641 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.12 \text{ dBm/MHz}$



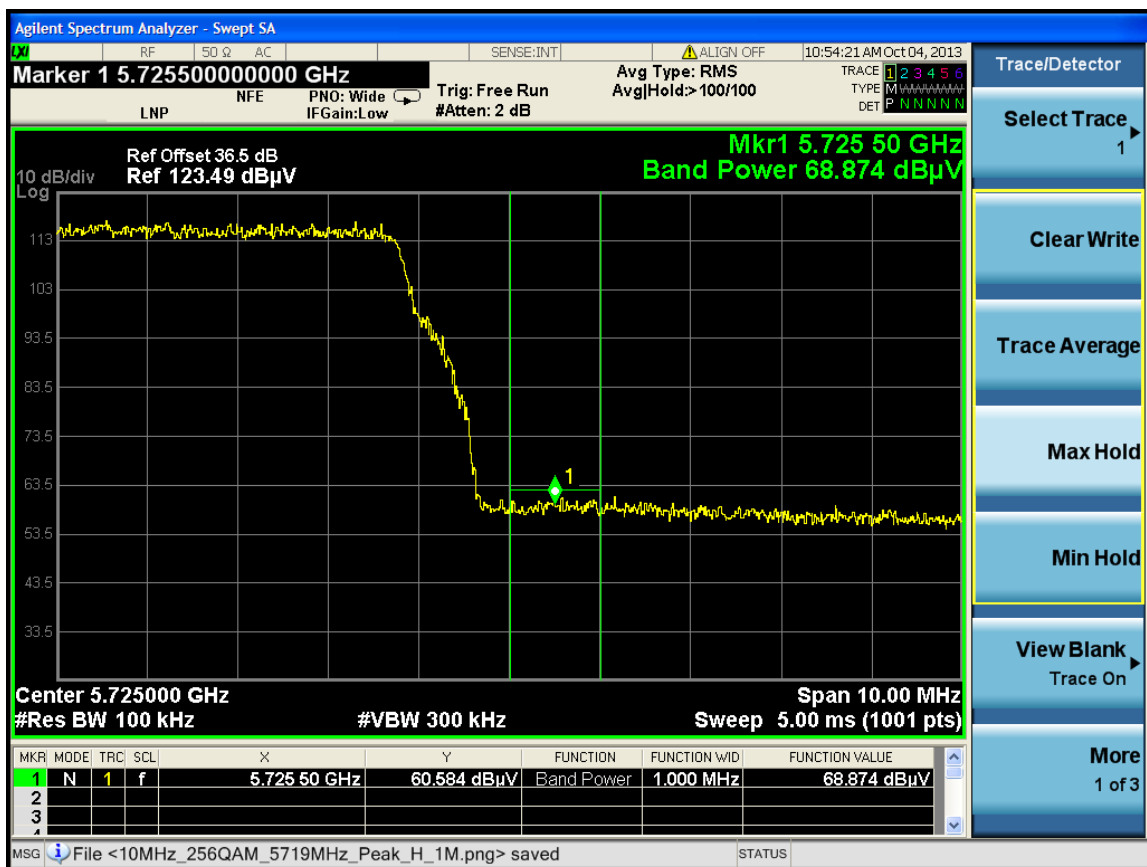
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 64QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 68.687 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.08 \text{ dBm/MHz}$



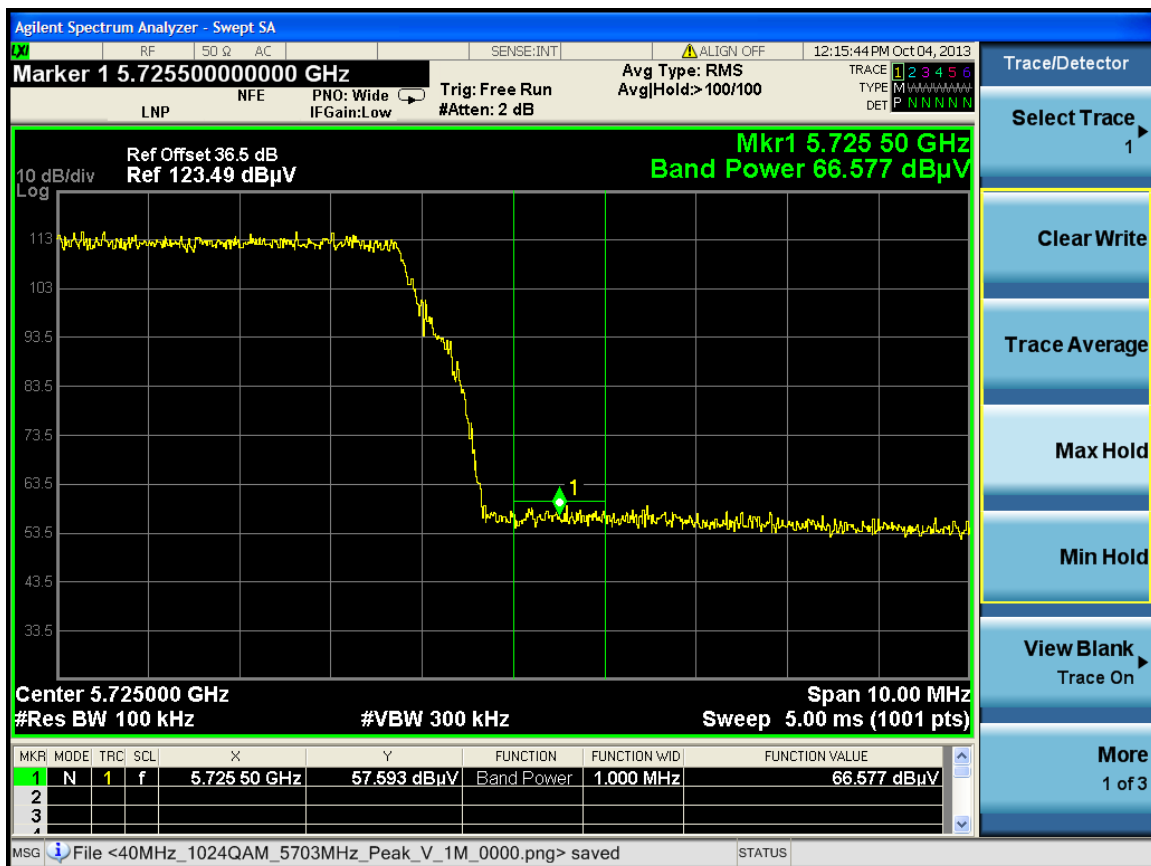
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 256QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 68.148 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -36.62 \text{ dBm/MHz}$



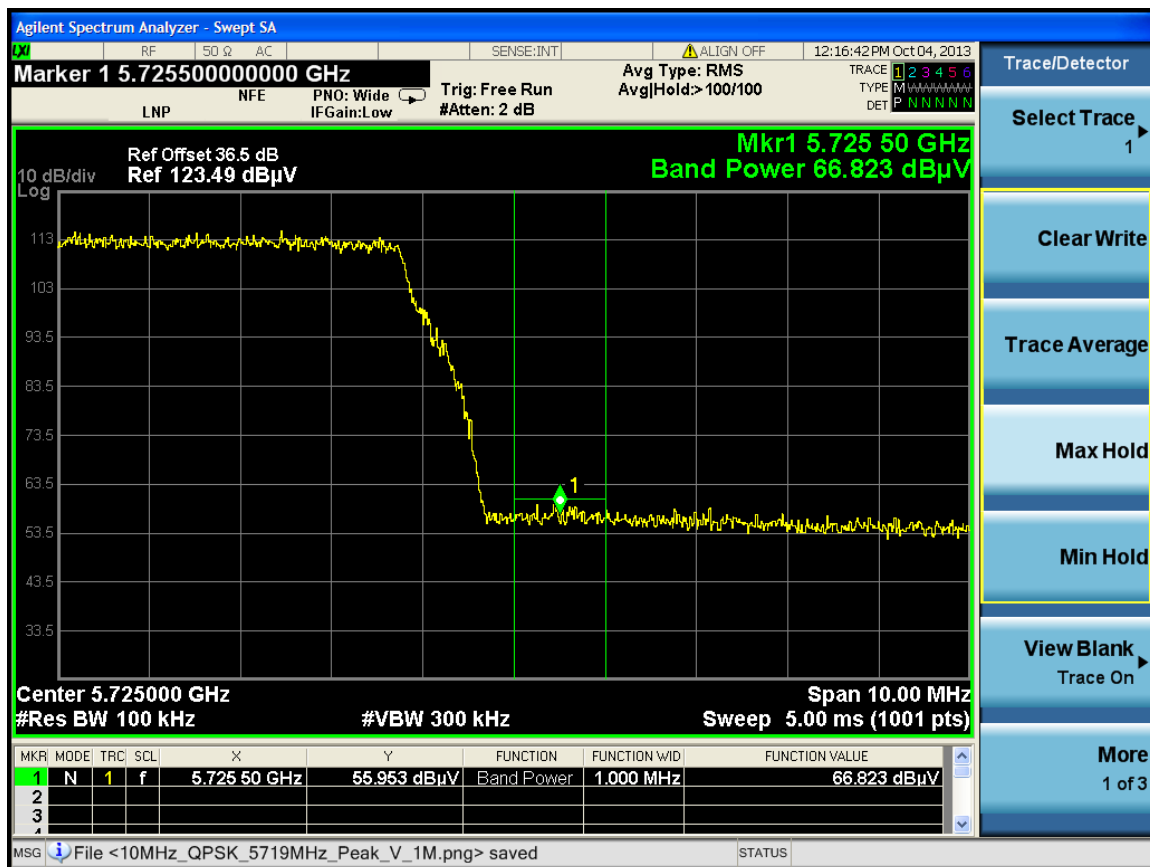
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 1024QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 68.874 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -35.89 \text{ dBm/MHz}$



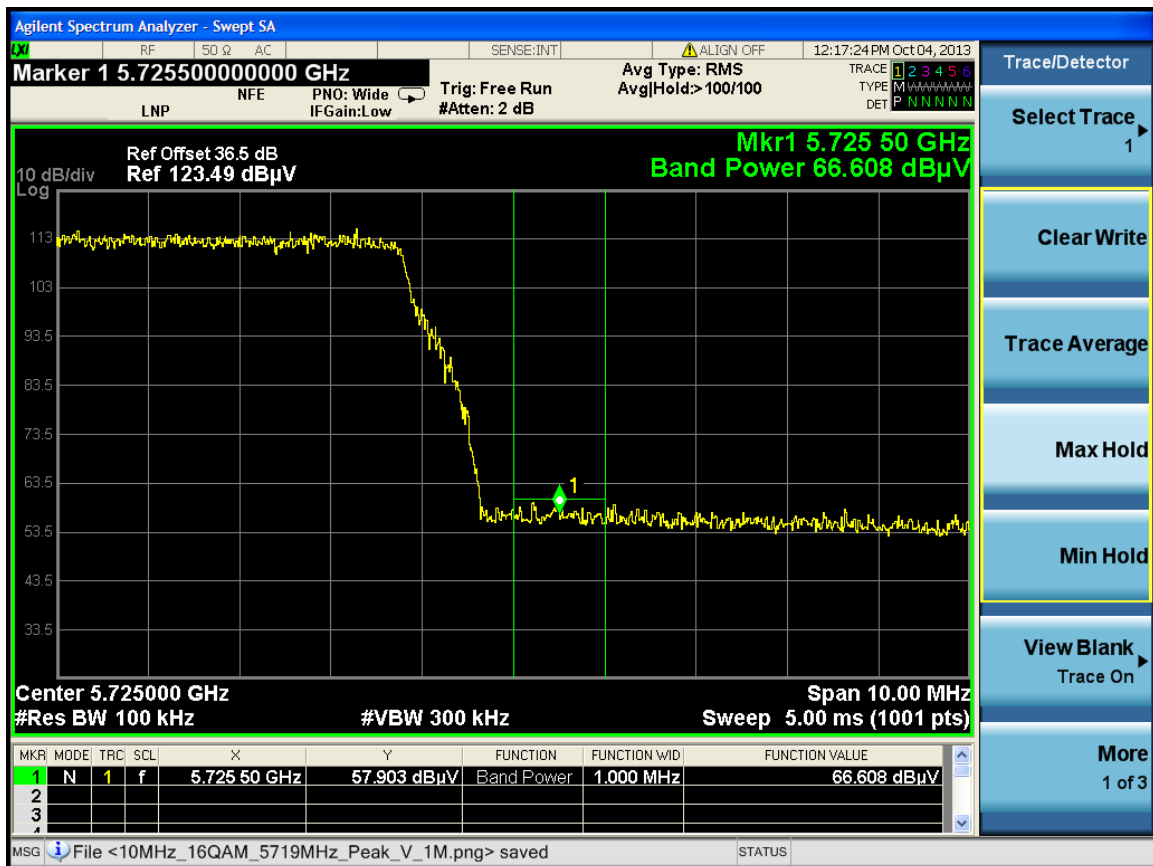
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: QPSK
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP}[\text{dBm}] = \text{E}[\text{dB}\mu\text{V}/\text{m}] + 20 \log(\text{d}[\text{meters}]) - 104.77$
 $= 66.577 \text{ dB}\mu\text{V}/\text{m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -38.19 \text{ dBm/MHz}$



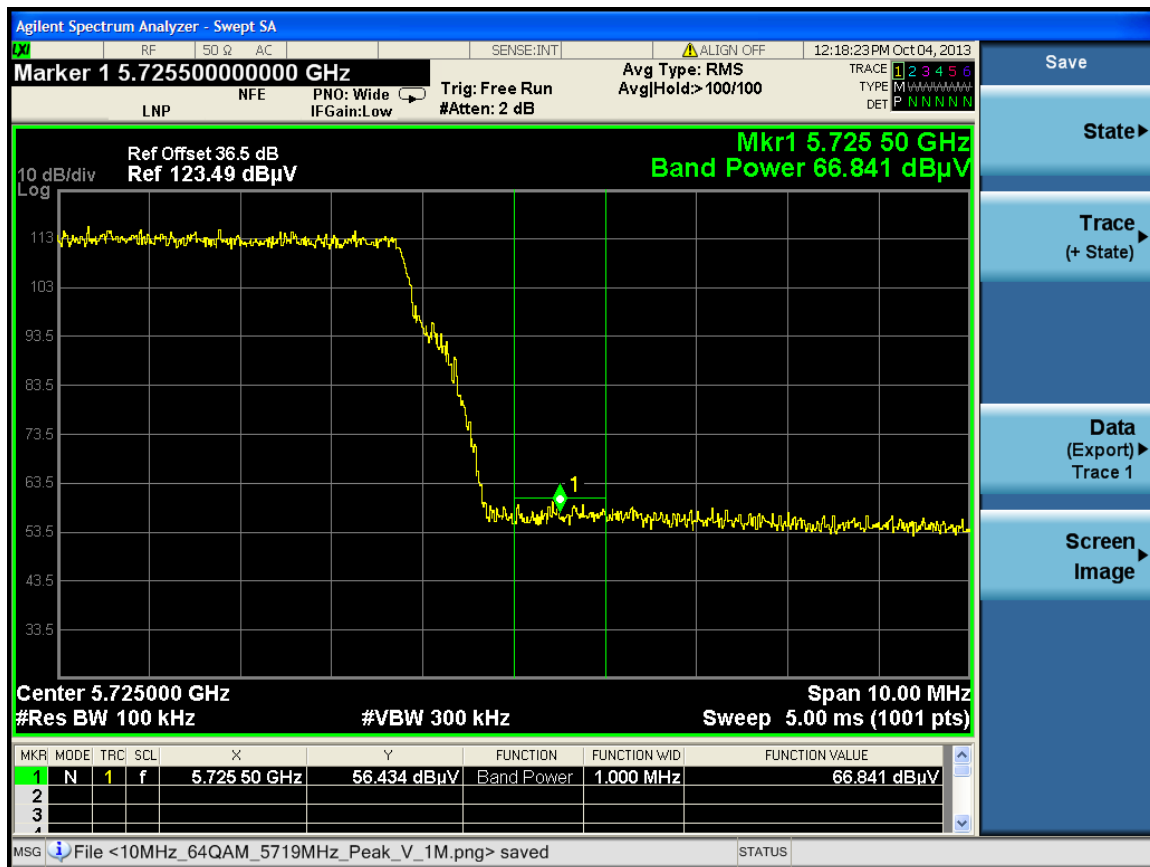
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 16QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 66.823 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -37.94 \text{ dBm/MHz}$



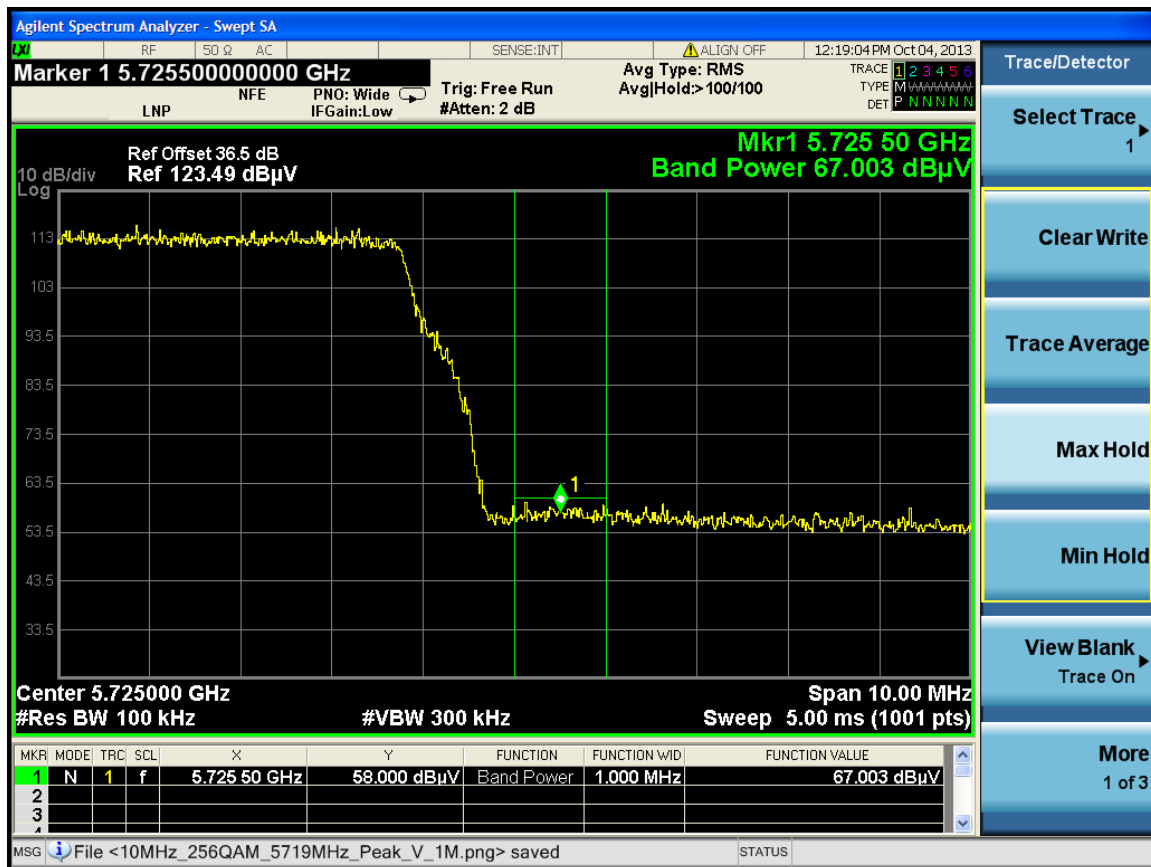
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 64QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 66.608 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -38.16 \text{ dBm/MHz}$



Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 256QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 66.841 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -37.92 \text{ dBm/MHz}$



Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 10 MHz channel Bandwidth
 High Channel: Frequency – 5719 MHz
 Modulation: 1024QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 67.003 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -37.76 \text{ dBm/MHz}$





166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 1
DLS Project:	6154

Appendix B – Measurement Data

B9.0 Unwanted Emission Levels – Radiated with integral antenna

Rule Section: Sections 15.407(b)(3) and 15.407(b)(6)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section H(1) – Unwanted emissions in the restricted bands
Section H(2) – Unwanted emissions that fall outside of the restricted bands
Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(4) – Procedure for Unwanted Emissions Measurements Below 1 GHz
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz
Section H(6) – Procedure for Average Unwanted Emissions Measurements Above 1 GHz
Section H(6)(c) – Average Detection method

Below 1000 MHz

Detector = quasi-peak

Alternately, peak detector is permitted

Peak measurements above 1000 MHz

RBW = 1 MHz

VBW $\geq$ 3 MHz

Detector = peak

Sweep time = auto; increased by a factor of (1 / duty cycle)

Trace mode = max hold

Average measurements above 1000 MHz (required for peak emissions that are above the average limits)

– Method AD (Average Detection)

RBW = 1 MHz

VBW $\geq$ 3 MHz

Detector = RMS (span/(# of points in sweep) $\leq$ RBW/2)

Averaging type = power

Sweep time = auto; increased by a factor of (1 / duty cycle)

Trace mode = trace average 100 sweeps; increased by a factor of (1 / duty cycle)

For a duty cycle less than 98%, add 10 log (1/duty cycle)

Limits: Outside restricted bands: Peak EIRP shall not exceed -27 dBm/MHz

Inside restricted bands: Peak and Average limits of FCC Part 15.209

Per Section H(2)(c)(i): “an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.”

Results: Passed

Notes: Both transmit chains active. Output power was set to 30 dBm eirp using special test software. Measurements were taken for QPSK modulation (worst case) at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

FCC Part 15.209

Electric Field Strength

EUT: Model: AF5
Manufacturer: Ubiquiti Networks
Operating Condition: 70 deg. F; 46% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: All channel BW; L, M, and H channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 10-02-2013; 10-17-2013

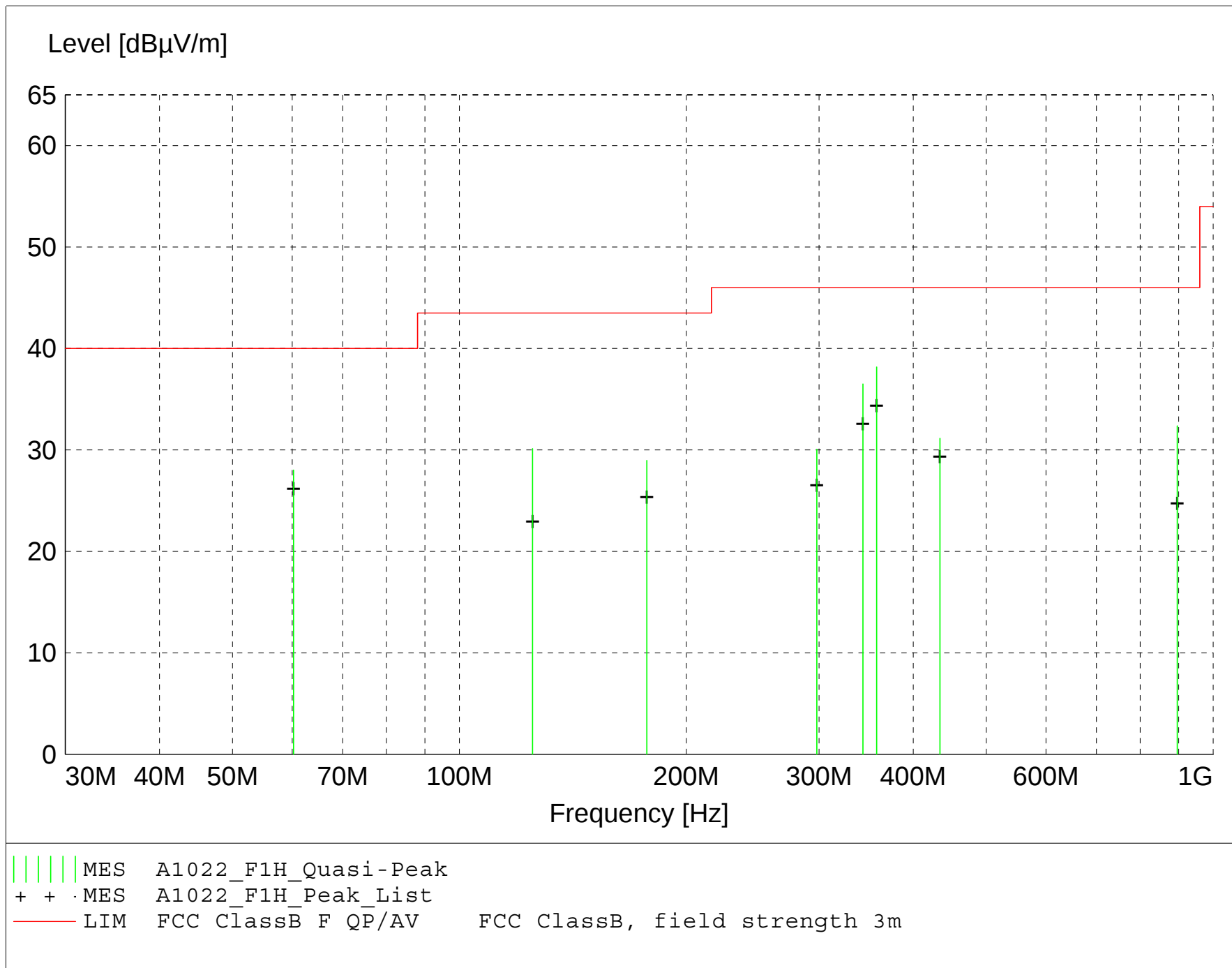
TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations:
$$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$$
$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "A1022_F1H_Final"

10/17/2013 11:53AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
357.640000	44.19	14.90	-20.9	38.2	46.0	7.8	2.00	290	QUASI-PEAK	broadband
342.990000	42.57	14.90	-21.0	36.5	46.0	9.5	2.00	270	QUASI-PEAK	broadband
60.245000	41.69	10.15	-23.8	28.0	40.0	12.0	1.90	270	QUASI-PEAK	broadband
125.000000	39.72	13.10	-22.7	30.1	43.5	13.4	1.60	260	QUASI-PEAK	None
896.000000	26.63	23.44	-17.7	32.4	46.0	13.6	1.20	135	QUASI-PEAK	None
177.260000	35.09	15.95	-22.1	29.0	43.5	14.5	1.00	340	QUASI-PEAK	broadband
433.960000	34.96	16.70	-20.5	31.2	46.0	14.9	2.00	290	QUASI-PEAK	None
297.900000	36.98	14.27	-21.2	30.1	46.0	15.9	2.20	260	QUASI-PEAK	broadband

FCC Part 15.209

Electric Field Strength

EUT: Model: AF5
Manufacturer: Ubiquiti Networks
Operating Condition: 70 deg. F; 46% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: All channel BW; L, M, and H channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 10-02-2013; 10-17-2013

TEXT: "Vert 3 meters"

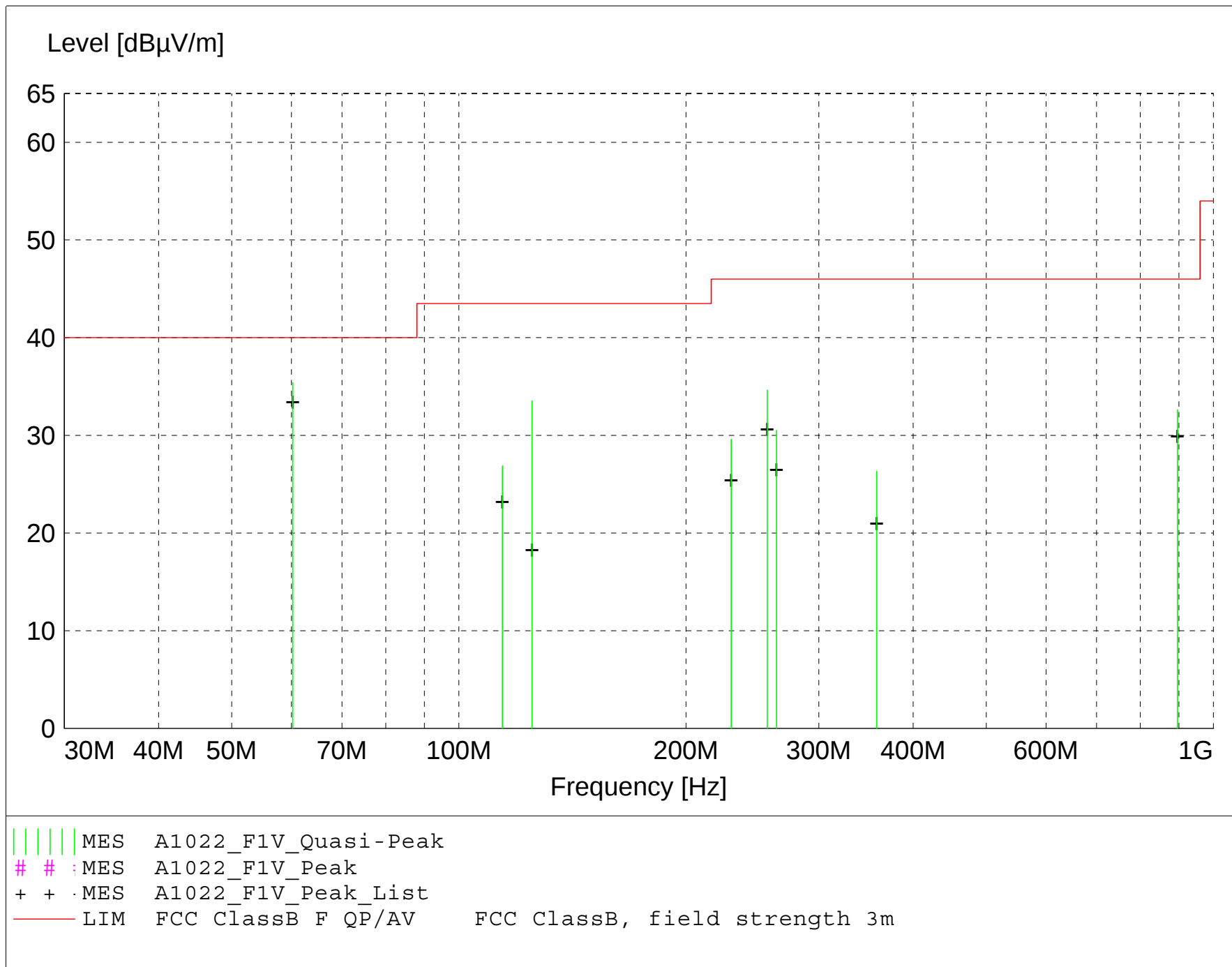
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations:
$$\begin{array}{rclclcl} \text{Total Level (dB}\mu\text{V/m)} & = & \text{Level (dB}\mu\text{V)} & + & \text{System Loss (dB)} & + & \text{Antenna Factor (dB}\mu\text{V/m)} \\ 24.6 & & = 35.51 & & + (-22.1) & & + 11.20 \end{array}$$

$$\begin{array}{rclcl} \text{Margin (dB)} & = & \text{Limit (dB}\mu\text{V/m)} & - & \text{Total Level (dB}\mu\text{V/m)} \\ 15.4 & = & 40 & - & 24.6 \end{array}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
 | Final maximized level using Quasi-Peak detector
 X Final maximized level using Average dector
 # Final maximized level using Peak detector



MEASUREMENT RESULT: "A1022_F1V_Final"

10/17/2013 11:50AM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
60.260000	49.07	10.15	-23.8	35.4	40.0	4.6	1.00	200	QUASI-PEAK	broadband
125.000000	43.12	13.10	-22.7	33.5	43.5	10.0	1.00	180	QUASI-PEAK	None
256.300000	43.39	12.78	-21.5	34.6	46.0	11.4	1.80	180	QUASI-PEAK	broadband
896.000000	26.87	23.44	-17.7	32.6	46.0	13.4	1.10	110	QUASI-PEAK	None
263.630000	38.83	13.15	-21.5	30.5	46.0	15.5	2.00	180	QUASI-PEAK	broadband
229.630000	39.75	11.49	-21.6	29.6	46.0	16.4	1.70	130	QUASI-PEAK	broadband
114.215000	36.99	12.68	-22.8	26.9	43.5	16.6	1.00	180	QUASI-PEAK	broadband
357.860000	32.32	14.90	-20.9	26.3	46.0	19.7	2.00	260	QUASI-PEAK	broadband

FCC Part 15.209

Electric Field Strength

EUT: Model: AF5
Manufacturer: Ubiquiti Networks
Operating Condition: 70 deg. F; 53% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 10 MHz channel BW; 5485, 5585, 5710 MHz channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 10-01-2013

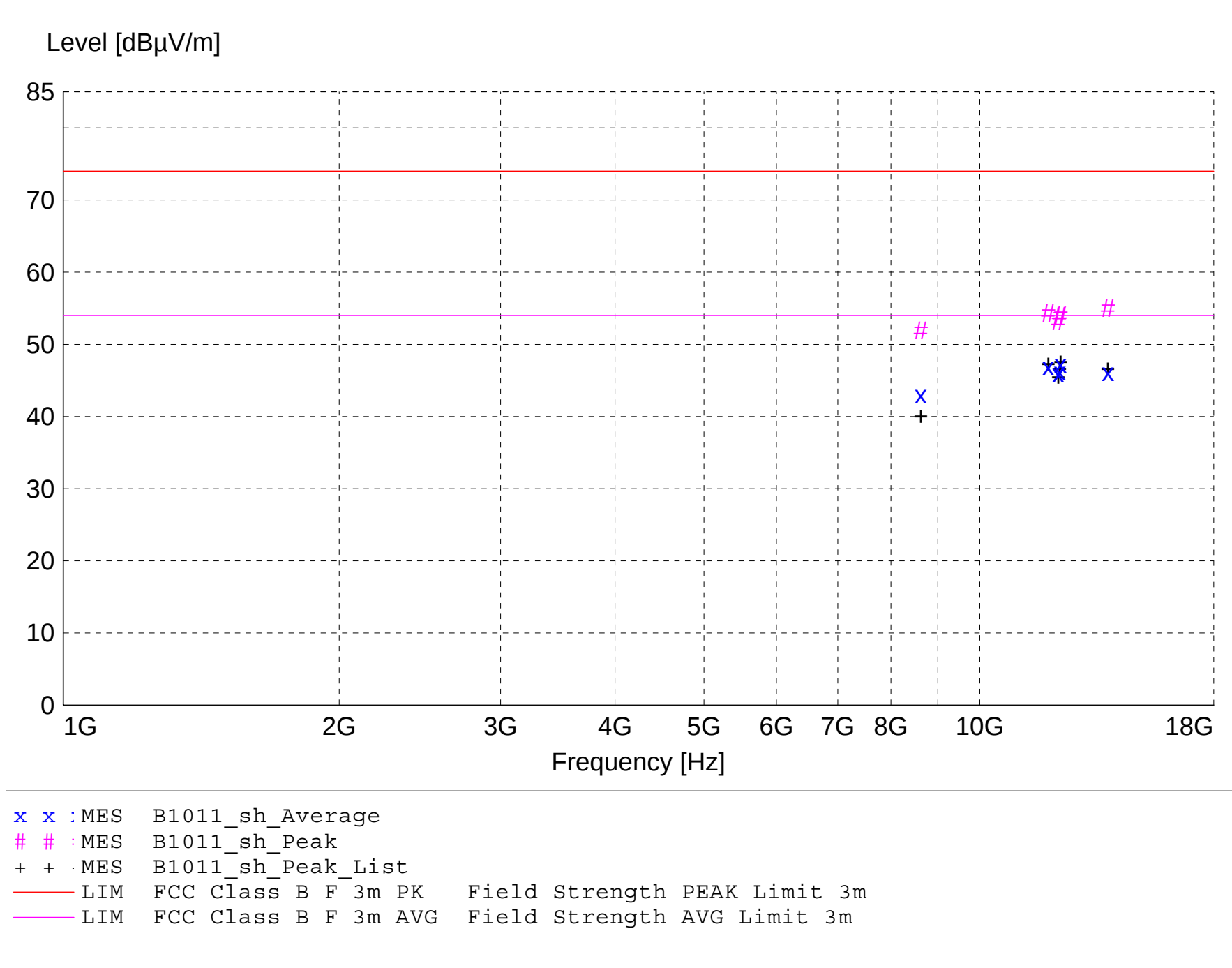
TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations:
$$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$$
$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



MEASUREMENT RESULT: "B1011_sh_Final"

10/1/2013 1:22PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m		m	deg		
12255.000000	60.39	38.94	-52.1	47.3	54.0	6.7	1.10	0	AVERAGE	High ch; QPSK
11880.000000	60.31	39.07	-52.5	46.9	54.0	7.1	1.00	225	AVERAGE	Low ch; QPSK
12225.000000	59.31	38.95	-52.0	46.2	54.0	7.8	1.00	170	AVERAGE	Low ch; QPSK
13800.000000	56.95	40.75	-51.6	46.1	54.0	7.9	1.00	150	AVERAGE	High ch; QPSK
12180.000000	58.98	38.97	-52.1	45.9	54.0	8.1	1.10	0	AVERAGE	Mid ch; QPSK
8625.000000	57.73	37.73	-52.5	43.0	54.0	11.0	1.20	225	AVERAGE	Low ch; QPSK
13800.000000	65.88	40.75	-51.6	55.1	74.0	18.9	1.00	150	MAX PEAK	High ch; QPSK
11880.000000	67.74	39.07	-52.5	54.3	74.0	19.7	1.00	225	MAX PEAK	Low ch; QPSK
12255.000000	67.13	38.94	-52.1	54.0	74.0	20.0	1.10	0	MAX PEAK	High ch; QPSK
12225.000000	67.01	38.95	-52.0	53.9	74.0	20.1	1.00	170	MAX PEAK	Low ch; QPSK
12180.000000	66.26	38.97	-52.1	53.2	74.0	20.8	1.10	0	MAX PEAK	Mid ch; QPSK
8625.000000	66.63	37.73	-52.5	51.9	74.0	22.1	1.20	225	MAX PEAK	Low ch; QPSK

FCC Part 15.209

Electric Field Strength

EUT: Model: AF5
Manufacturer: Ubiquiti Networks
Operating Condition: 70 deg. F; 53% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 10 MHz channel BW; 5485, 5585, 5710 MHz channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 10-01-2013

TEXT: "Vert 3 meters"

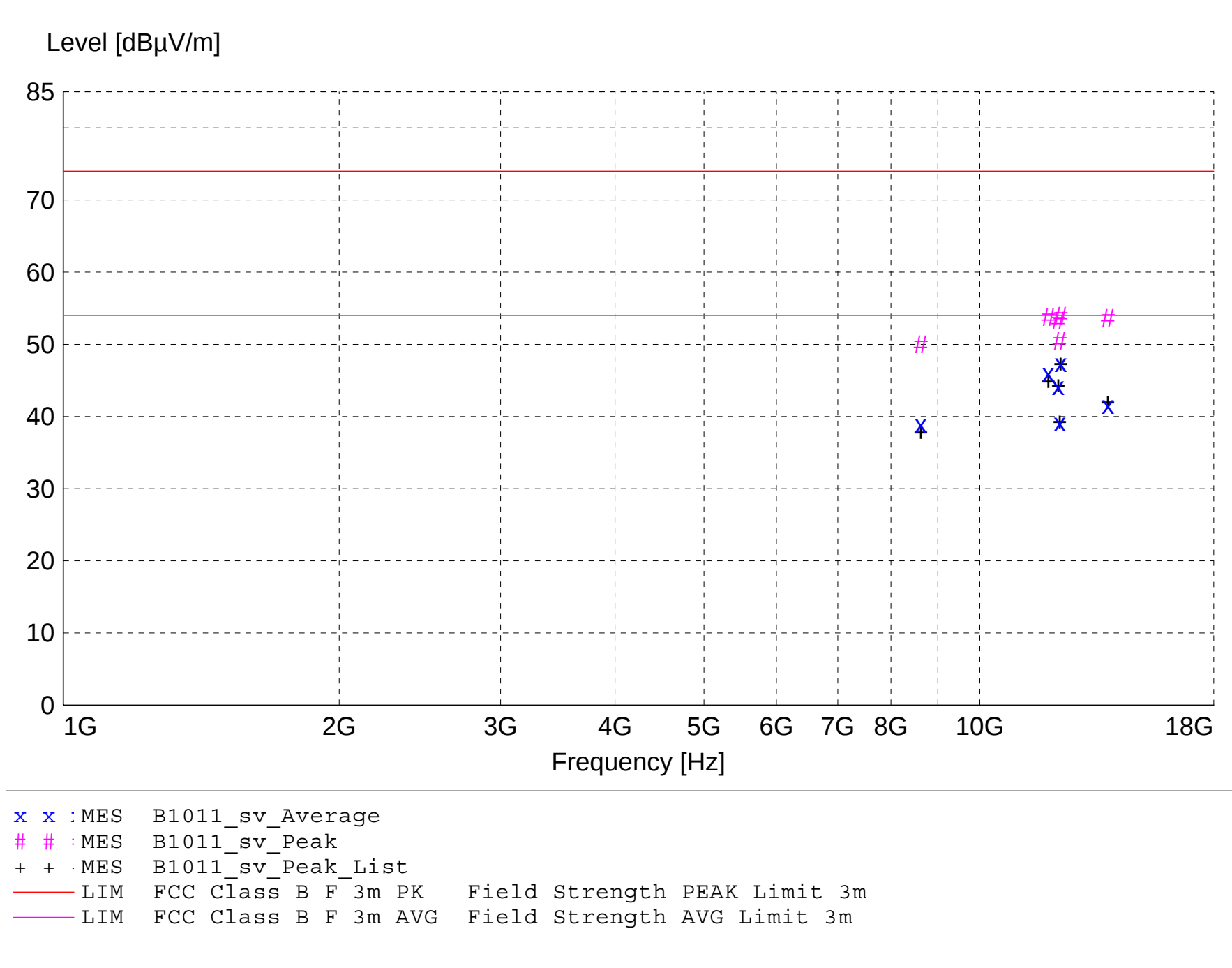
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations:
$$\begin{array}{rclclcl} \text{Total Level (dB}\mu\text{V/m)} & = & \text{Level (dB}\mu\text{V)} & + & \text{System Loss (dB)} & + & \text{Antenna Factor (dB}\mu\text{V/m)} \\ 24.6 & & = 35.51 & + & (-22.1) & + & 11.20 \end{array}$$

$$\begin{array}{rclcl} \text{Margin (dB)} & = & \text{Limit (dB}\mu\text{V/m)} & - & \text{Total Level (dB}\mu\text{V/m)} \\ 15.4 & = & 40 & - & 24.6 \end{array}$$

Graph Markers: + Frequency marker (Level of marker not related to final level)
 | Final maximized level using Quasi-Peak detector
 X Final maximized level using Average dector
 # Final maximized level using Peak detector



MEASUREMENT RESULT: "B1011_sv_Final"

10/1/2013 1:21PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m		m	deg		
12255.000000	60.46	38.94	-52.1	47.3	54.0	6.7	1.30	0	AVERAGE	High ch; QPSK
11880.000000	59.40	39.07	-52.5	46.0	54.0	8.0	1.10	0	AVERAGE	Low ch; QPSK
12180.000000	57.27	38.97	-52.1	44.2	54.0	9.8	1.30	0	AVERAGE	Mid ch; QPSK
13800.000000	52.42	40.75	-51.6	41.6	54.0	12.4	1.50	135	AVERAGE	High ch; QPSK
12225.000000	52.22	38.95	-52.0	39.1	54.0	14.9	1.20	170	AVERAGE	Low ch; QPSK
8625.000000	53.67	37.73	-52.5	38.9	54.0	15.1	1.20	150	AVERAGE	Low ch; QPSK
12255.000000	67.13	38.94	-52.1	54.0	74.0	20.0	1.30	0	MAX PEAK	High ch; QPSK
11880.000000	67.13	39.07	-52.5	53.7	74.0	20.3	1.10	0	MAX PEAK	Low ch; QPSK
13800.000000	64.46	40.75	-51.6	53.6	74.0	20.4	1.50	135	MAX PEAK	High ch; QPSK
12180.000000	66.38	38.97	-52.1	53.3	74.0	20.7	1.30	0	MAX PEAK	Mid ch; QPSK
12225.000000	63.53	38.95	-52.0	50.4	74.0	23.6	1.20	170	MAX PEAK	Low ch; QPSK
8625.000000	64.72	37.73	-52.5	50.0	74.0	24.0	1.20	150	MAX PEAK	Low ch; QPSK

**No measurable emissions were detected
from the EUT from
18 to 40 GHz.**



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

Appendix B – Measurement Data

B10.0 AC Line Conducted Emissions

Rule Part: FCC Part 15.207

Test Procedure: ANSI C63.10-2009
Section 6.2

Limit: FCC Part 15.207(a)

Results: Compliant

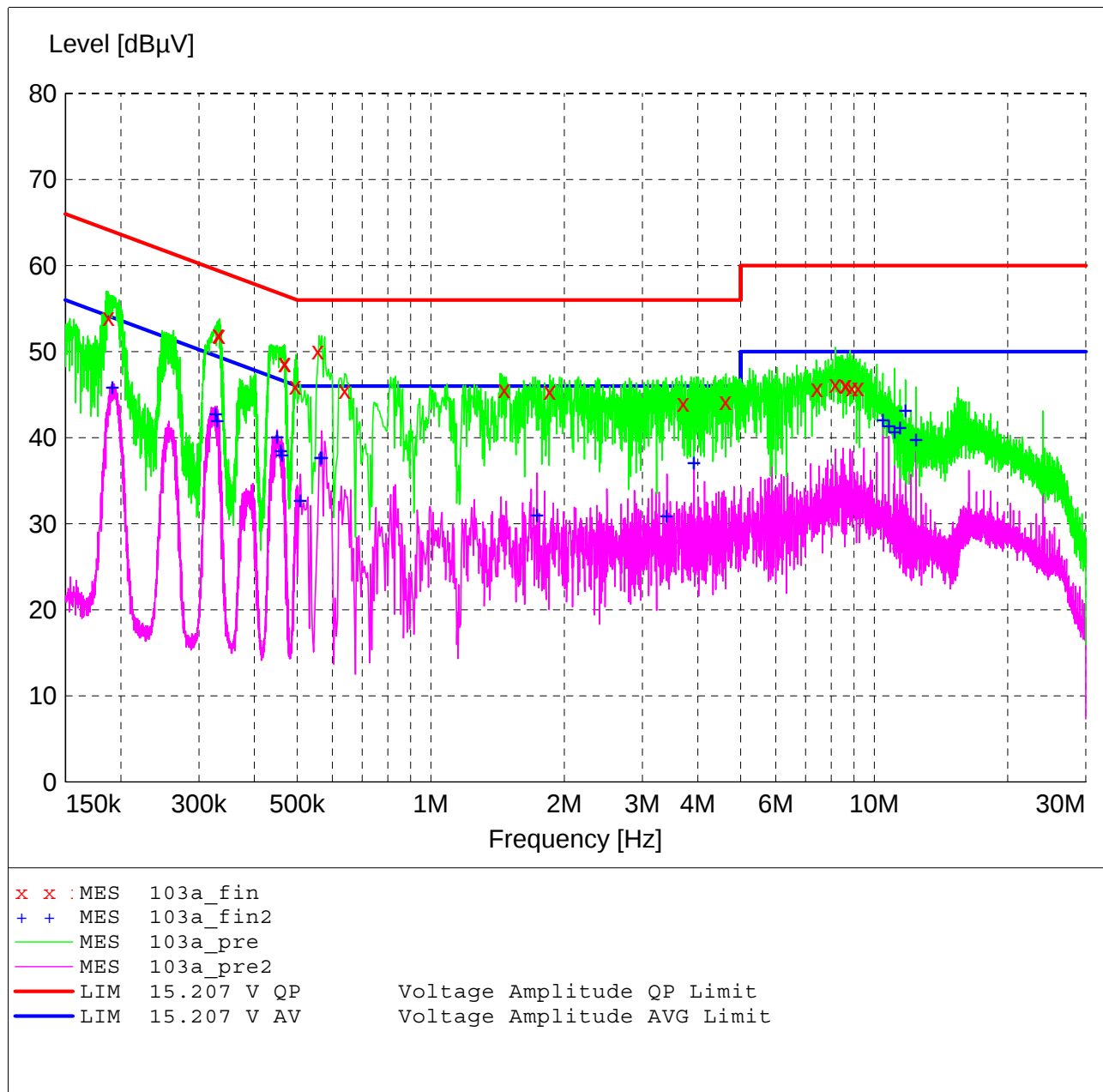
Notes: This was an AC Conducted emissions measurement.
The EUT was powered from a representative AC Adapter with an input of
120 VAC 60 Hz.

Voltage Mains Test

EUT: Airfiber 5 - 5.4 GHz radio
 Manufacturer: Ubiquiti Networks, Inc.
 Operating Condition: 70 deg. F, 45% R.H.
 Test Site: DLS O.F. Screen Room
 Operator: Craig B
 Test Specification: 120 V 60 Hz; Adpt1 Model: GP-C500-120G
 Comment: continuous TX Line 1
 10-03-2013

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions					Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
Frequency 150.0 kHz	Frequency 30.0 MHz	Width 4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128	
CISPR AV							



MEASUREMENT RESULT: "103a_fin"

10/3/2013 8:46AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.187600	54.00	12.9	64	10.1	QP
0.332000	52.00	11.7	59	7.4	QP
0.333200	51.90	11.7	59	7.5	QP
0.468000	48.70	11.3	57	7.8	QP
0.468200	48.60	11.3	57	7.9	QP
0.494800	46.00	11.2	56	10.1	QP
0.556000	50.10	11.1	56	5.9	QP
0.640000	45.50	10.9	56	10.5	QP
1.464000	45.60	10.6	56	10.4	QP
1.856000	45.40	10.6	56	10.6	QP
3.712000	44.00	10.7	56	12.0	QP
4.620000	44.20	10.6	56	11.8	QP
7.430000	45.70	10.8	60	14.3	QP
8.168000	46.20	10.9	60	13.8	QP
8.609000	46.10	10.9	60	13.9	QP
8.627000	46.10	10.9	60	13.9	QP
8.906000	45.80	10.9	60	14.2	QP
9.203000	45.80	10.9	60	14.2	QP

MEASUREMENT RESULT: "103a_fin2"

10/3/2013 8:46AM

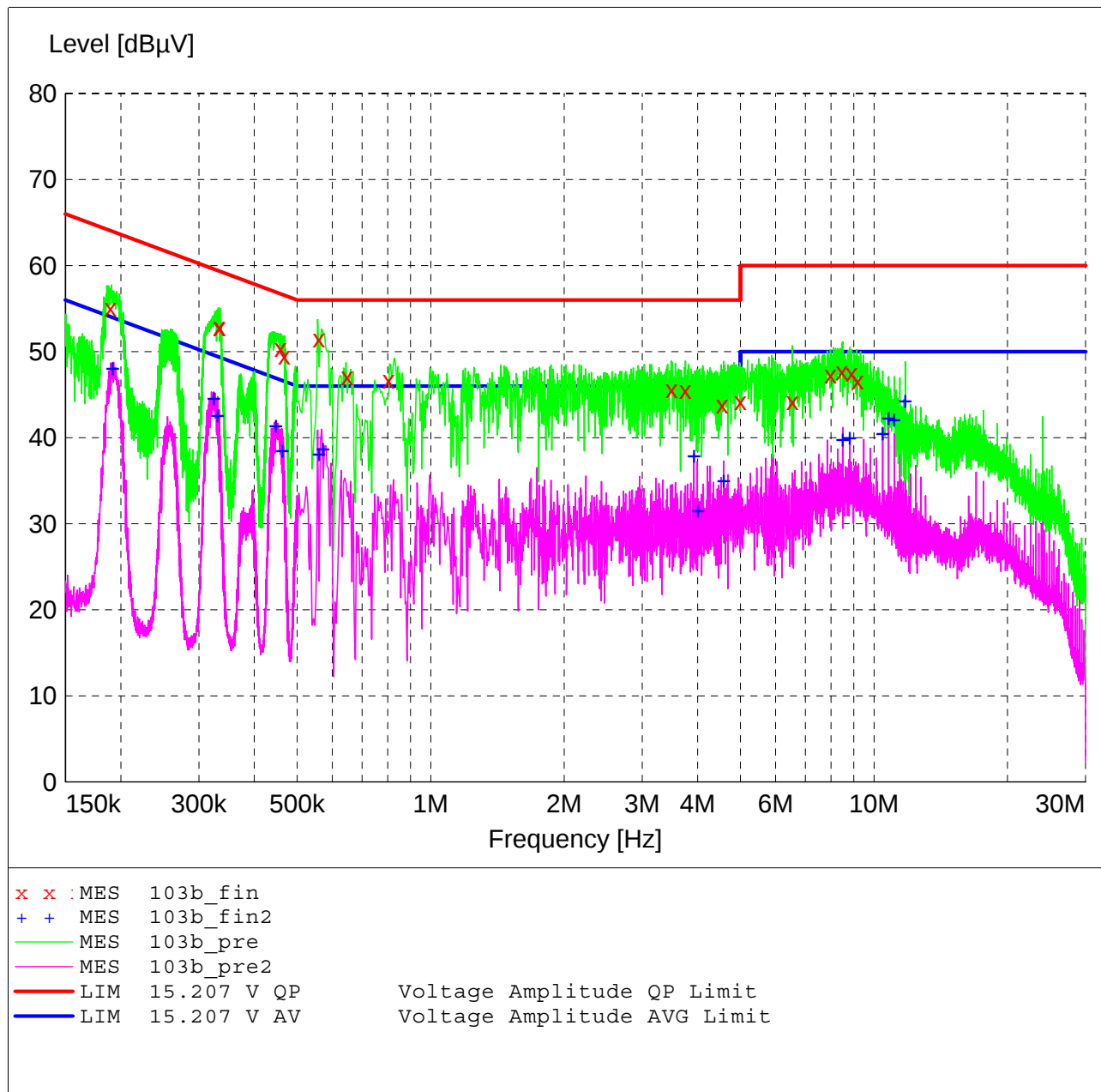
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.191600	45.80	12.8	54	8.2	CAV
0.327400	42.70	11.7	50	6.8	CAV
0.330200	41.90	11.7	49	7.5	CAV
0.450400	40.00	11.3	47	6.9	CAV
0.459200	38.50	11.3	47	8.2	CAV
0.461400	38.00	11.3	47	8.7	CAV
0.508000	32.70	11.2	46	13.3	CAV
0.564000	37.70	11.0	46	8.3	CAV
0.568000	37.70	11.0	46	8.3	CAV
1.736000	31.00	10.6	46	15.0	CAV
3.404000	30.90	10.7	46	15.1	CAV
3.924000	37.10	10.7	46	8.9	CAV
10.463000	42.00	10.9	50	8.0	CAV
10.787000	41.30	10.9	50	8.7	CAV
11.120000	40.60	11.0	50	9.4	CAV
11.444000	41.10	11.0	50	8.9	CAV
11.768000	43.10	11.0	50	6.9	CAV
12.425000	39.80	11.0	50	10.2	CAV

Voltage Mains Test

EUT: Airfiber 5 - 5.4 GHz radio
 Manufacturer: Ubiquiti Networks, Inc.
 Operating Condition: 70 deg. F, 45% R.H.
 Test Site: DLS O.F. Screen Room
 Operator: Craig B
 Test Specification: 120 V 60 Hz; Adpt1 Model: GP-C500-120G
 Comment: continuous TX Line 2
 10-03-2013

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions					Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
Frequency 150.0 kHz	Frequency 30.0 MHz	Width 4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128	
CISPR AV							



MEASUREMENT RESULT: "103b_fin"

10/3/2013 8:54AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.189600	55.10	12.9	64	9.0	QP
0.334000	52.90	11.7	59	6.5	QP
0.334200	52.80	11.7	59	6.5	QP
0.459000	50.40	11.3	57	6.3	QP
0.468000	49.50	11.3	57	7.0	QP
0.560000	51.50	11.1	56	4.5	QP
0.648000	47.10	10.9	56	8.9	QP
0.804000	46.70	10.7	56	9.3	QP
3.500000	45.60	10.7	56	10.4	QP
3.756000	45.50	10.7	56	10.5	QP
4.548000	43.80	10.6	56	12.2	QP
5.000000	44.20	10.6	56	11.8	QP
6.548000	44.20	10.7	60	15.8	QP
7.979000	47.30	10.8	60	12.7	QP
8.474000	47.70	10.9	60	12.3	QP
8.906000	47.50	10.9	60	12.5	QP
9.194000	46.60	10.9	60	13.4	QP

MEASUREMENT RESULT: "103b_fin2"

10/3/2013 8:54AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.191800	48.00	12.8	54	6.0	CAV
0.324000	44.50	11.7	50	5.1	CAV
0.330600	42.50	11.7	49	6.9	CAV
0.448000	41.30	11.3	47	5.6	CAV
0.462600	38.50	11.3	47	8.1	CAV
0.560000	38.10	11.1	46	7.9	CAV
0.572000	38.70	11.0	46	7.3	CAV
3.924000	37.90	10.7	46	8.1	CAV
4.012000	31.50	10.7	46	14.5	CAV
4.580000	35.00	10.6	46	11.0	CAV
8.501000	39.80	10.9	50	10.2	CAV
8.825000	39.90	10.9	50	10.1	CAV
10.463000	40.50	10.9	50	9.5	CAV
10.787000	42.20	10.9	50	7.8	CAV
11.111000	42.00	11.0	50	8.0	CAV
11.768000	44.20	11.0	50	5.8	CAV

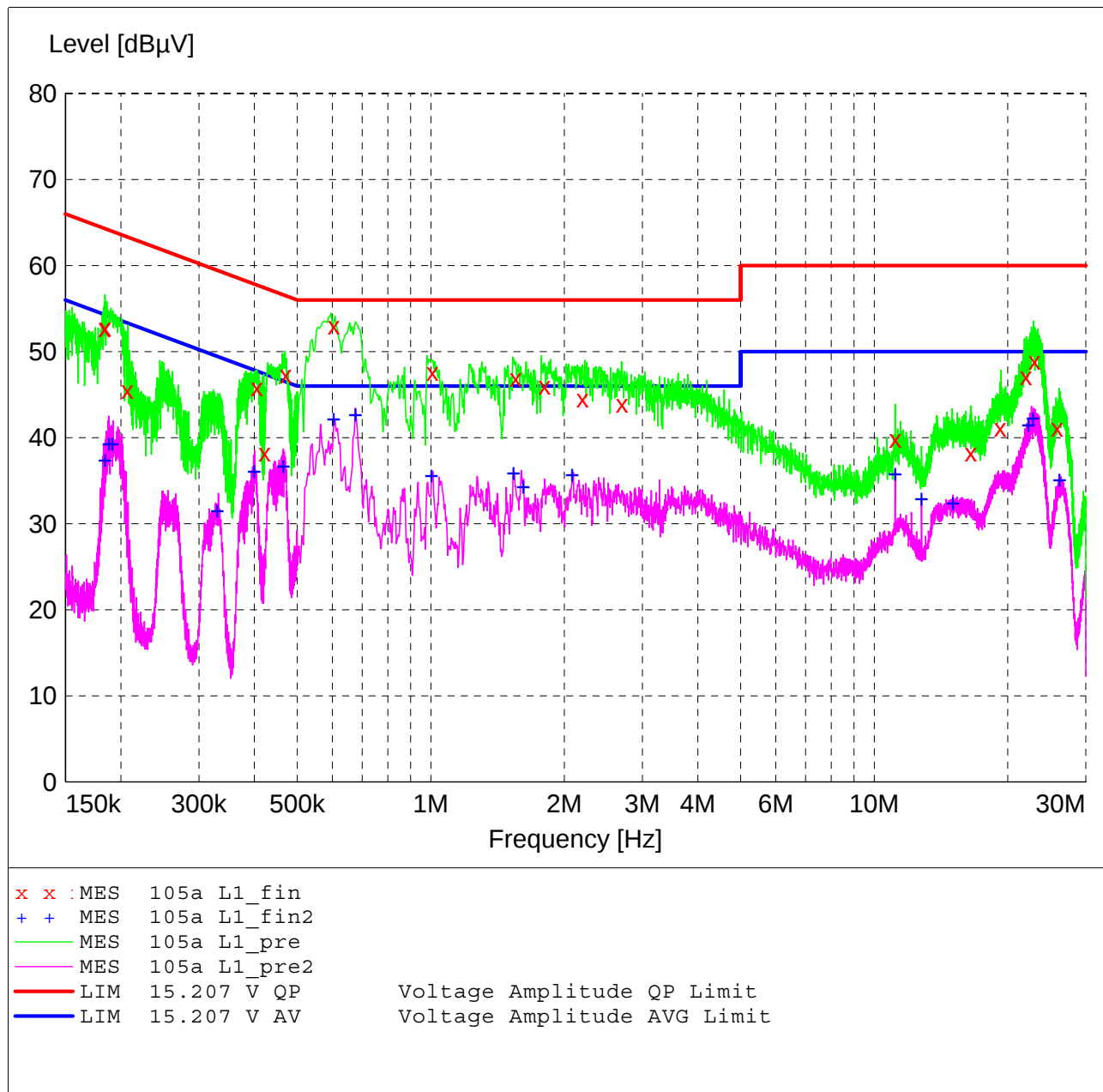
FCC Part 15.207

Voltage Mains Test

EUT: Airfiber 5 - 5.4 GHz radio
Manufacturer: Ubiquiti Networks, Inc.
Operating Condition: 70 deg. F, 45% R.H.
Test Site: DLS O.F. Screen Room
Operator: Craig B
Test Specification: 120 V 60 Hz; Line 1
Comment: TX ON; Adpt2 Model: PSA60M-500 (G) -R
10-15-2013

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128
			CISPR AV			



MEASUREMENT RESULT: "105a L1_fin"

10/15/2013 3:13PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.183800	52.70	13.0	64	11.6	QP
0.184200	52.80	12.9	64	11.5	QP
0.206800	45.50	12.7	63	17.8	QP
0.405200	45.80	11.4	58	11.9	QP
0.421600	38.20	11.4	57	19.2	QP
0.470600	47.30	11.3	57	9.2	QP
0.604000	53.00	10.9	56	3.0	QP
1.008000	47.60	10.7	56	8.4	QP
1.552000	46.90	10.6	56	9.1	QP
1.804000	46.00	10.6	56	10.0	QP
2.200000	44.50	10.7	56	11.5	QP
2.696000	43.90	10.6	56	12.1	QP
11.147000	39.80	11.0	60	20.2	QP
16.520000	38.20	11.2	60	21.8	QP
19.238000	41.10	11.3	60	18.9	QP
21.983000	47.10	11.3	60	12.9	QP
23.018000	48.90	11.4	60	11.1	QP
25.844000	41.10	11.5	60	18.9	QP

MEASUREMENT RESULT: "105a L1_fin2"

10/15/2013 3:13PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.184200	37.40	12.9	54	16.9	CAV
0.188200	39.30	12.9	54	14.8	CAV
0.191600	39.20	12.8	54	14.8	CAV
0.330200	31.50	11.7	49	17.9	CAV
0.400000	36.10	11.4	48	11.8	CAV
0.465000	36.70	11.3	47	9.9	CAV
0.604000	42.10	10.9	46	3.9	CAV
0.676000	42.60	10.8	46	3.4	CAV
1.004000	35.60	10.7	46	10.4	CAV
1.536000	35.90	10.6	46	10.1	CAV
1.616000	34.30	10.6	46	11.7	CAV
2.084000	35.70	10.6	46	10.3	CAV
11.147000	35.80	11.0	50	14.2	CAV
12.785000	32.90	11.0	50	17.1	CAV
15.053000	32.40	11.1	50	17.6	CAV
22.280000	41.40	11.3	50	8.6	CAV
22.793000	42.20	11.4	50	7.8	CAV
26.213000	35.10	11.5	50	14.9	CAV

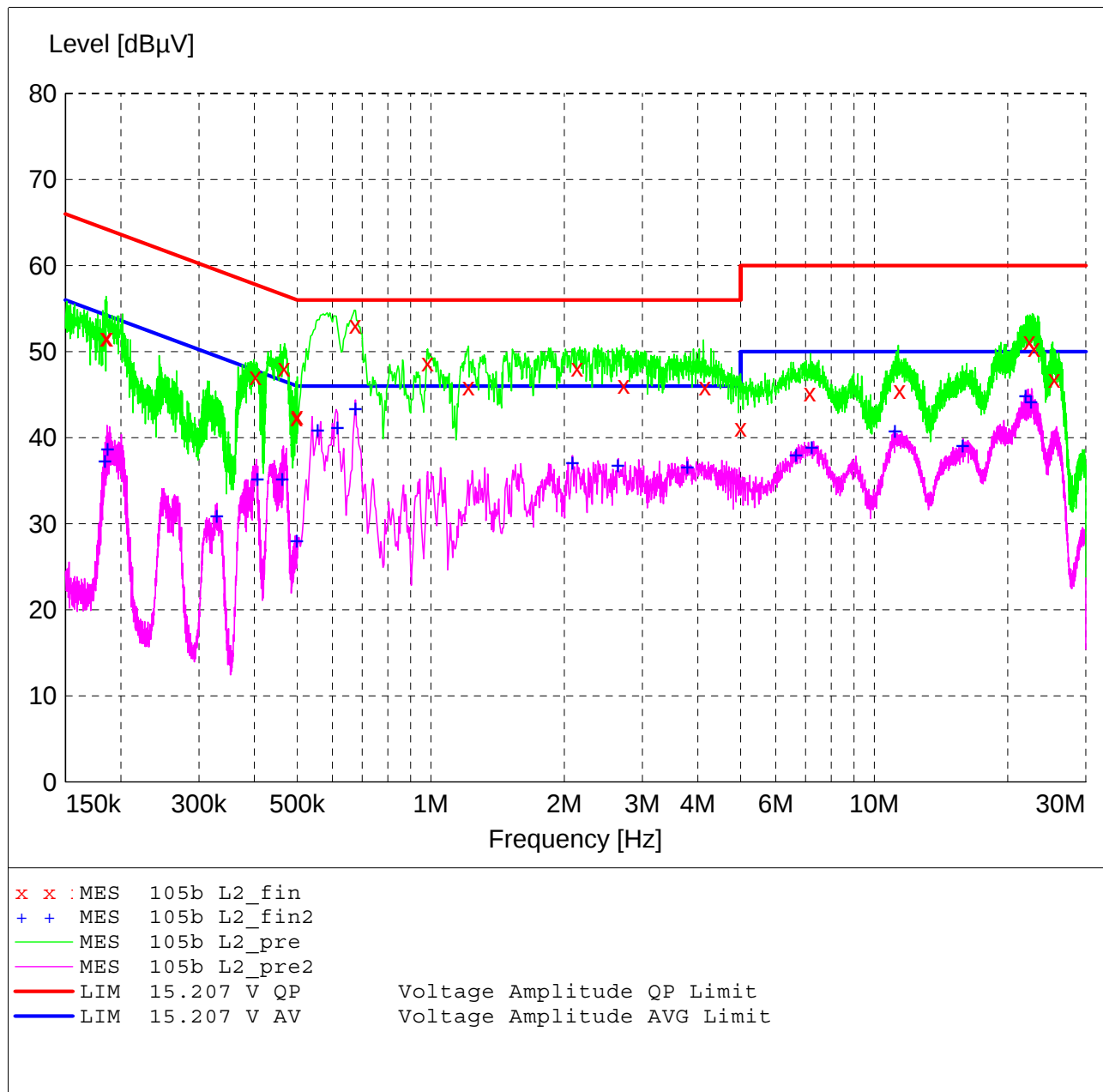
FCC Part 15.207

Voltage Mains Test

EUT: Airfiber 5 - 5.4 GHz radio
Manufacturer: Ubiquiti Networks, Inc.
Operating Condition: 70 deg. F, 45% R.H.
Test Site: DLS O.F. Screen Room
Operator: Craig B
Test Specification: 120 V 60 Hz; Line 2
Comment: TX ON; Adpt2 Model: PSA60M-500 (G) -R
10-15-2013

SCAN TABLE: "Line Cond SR Final"

Short Description:		Line Conducted Emissions				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128
CISPR AV						



MEASUREMENT RESULT: "105b L2_fin"

10/15/2013 3:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.185200	51.60	12.9	64	12.6	QP
0.186200	51.60	12.9	64	12.6	QP
0.402600	47.10	11.4	58	10.7	QP
0.466600	48.10	11.3	57	8.5	QP
0.498400	42.30	11.2	56	13.7	QP
0.500000	42.50	11.2	56	13.5	QP
0.676000	53.10	10.8	56	2.9	QP
0.984000	48.70	10.7	56	7.3	QP
1.216000	45.90	10.6	56	10.1	QP
2.140000	48.10	10.6	56	7.9	QP
2.724000	46.10	10.6	56	9.9	QP
4.156000	45.90	10.7	56	10.1	QP
5.000000	41.10	10.6	56	14.9	QP
7.160000	45.20	10.8	60	14.8	QP
11.408000	45.50	11.0	60	14.5	QP
22.397000	51.20	11.3	60	8.8	QP
22.937000	50.40	11.4	60	9.6	QP
25.466000	46.80	11.5	60	13.2	QP

MEASUREMENT RESULT: "105b L2_fin2"

10/15/2013 3:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector
0.184200	37.20	12.9	54	17.1	CAV
0.186600	38.70	12.9	54	15.5	CAV
0.329000	30.90	11.7	50	18.6	CAV
0.406200	35.20	11.4	48	12.5	CAV
0.462400	35.20	11.3	47	11.4	CAV
0.498800	28.00	11.2	46	18.0	CAV
0.556000	40.80	11.1	46	5.2	CAV
0.616000	41.10	10.9	46	4.9	CAV
0.676000	43.30	10.8	46	2.7	CAV
2.088000	37.10	10.6	46	8.9	CAV
2.640000	36.80	10.6	46	9.2	CAV
3.788000	36.60	10.7	46	9.4	CAV
6.665000	38.00	10.7	50	12.0	CAV
7.232000	38.80	10.8	50	11.2	CAV
11.138000	40.70	11.0	50	9.3	CAV
15.836000	39.00	11.1	50	11.0	CAV
21.947000	44.80	11.3	50	5.2	CAV
22.595000	44.10	11.4	50	5.9	CAV



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 1
6154

END OF REPORT

Revision #	Date	Comments	By
1.0	11-5-2013	Preliminary Release	JS
1.1	11-7-2013	Removed data for extra bandwidths	JS
1.2	11-11-2013	Additional Description	JS