



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
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 2 - 20 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
Model Number(s):	AF5
Kind of Equipment:	Point-to-Point Digital Transmission Transceiver
Test Conducted For:	Ubiquiti Networks, Inc. 12F, No105, Song Ren Rd Taipei, Taiwan

This part of the report includes the 20 MHz Bandwidth Data Only

Further descriptions of the equipment under test
and the test setup photos will be found in Part 1 of test report # 19519.

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 2
6154

SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Craig Brandt". The signature is fluid and cursive, 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 cursive and somewhat stylized, with a prominent vertical stroke at the end.

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is cursive and includes a middle initial "J.", with a long horizontal stroke at the end.

Brian Mattson
General Manager



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Company: Ubiquiti Networks, Inc.
Model Tested: AF5
Report Number: 19519 Part 2
DLS Project: 6154

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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 2
 DLS Project: 6154

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
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 measurements - reported in Part 1 of Report #19519.



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Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
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Description of the Test Sample:

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.

Frequency Ranges of the Radio:

5476 to 5719 MHz (10 MHz bandwidth)
5481 to 5714 MHz (20 MHz bandwidth) (in this part of the report)
5492 to 5703 MHz (40 MHz bandwidth)
5497 to 5698 MHz (50 MHz bandwidth)

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

Type of Modulations Tested:

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

Conclusion

Dynamic Frequency Selection (DFS) testing was not performed by DLS Electronic Systems, Inc. Otherwise, the Air Fiber 5 - 5.4GHz Radio with the 20MHz Channel Bandwidth, Model: AF5, as provided from Ubiquiti Networks tested in October 2013 **meets** the requirements of CFR 47 Part 15 Subpart E Section 15.407.



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Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

1.0 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 = $10 \log (1/x) = 0.13 \text{ dB}$

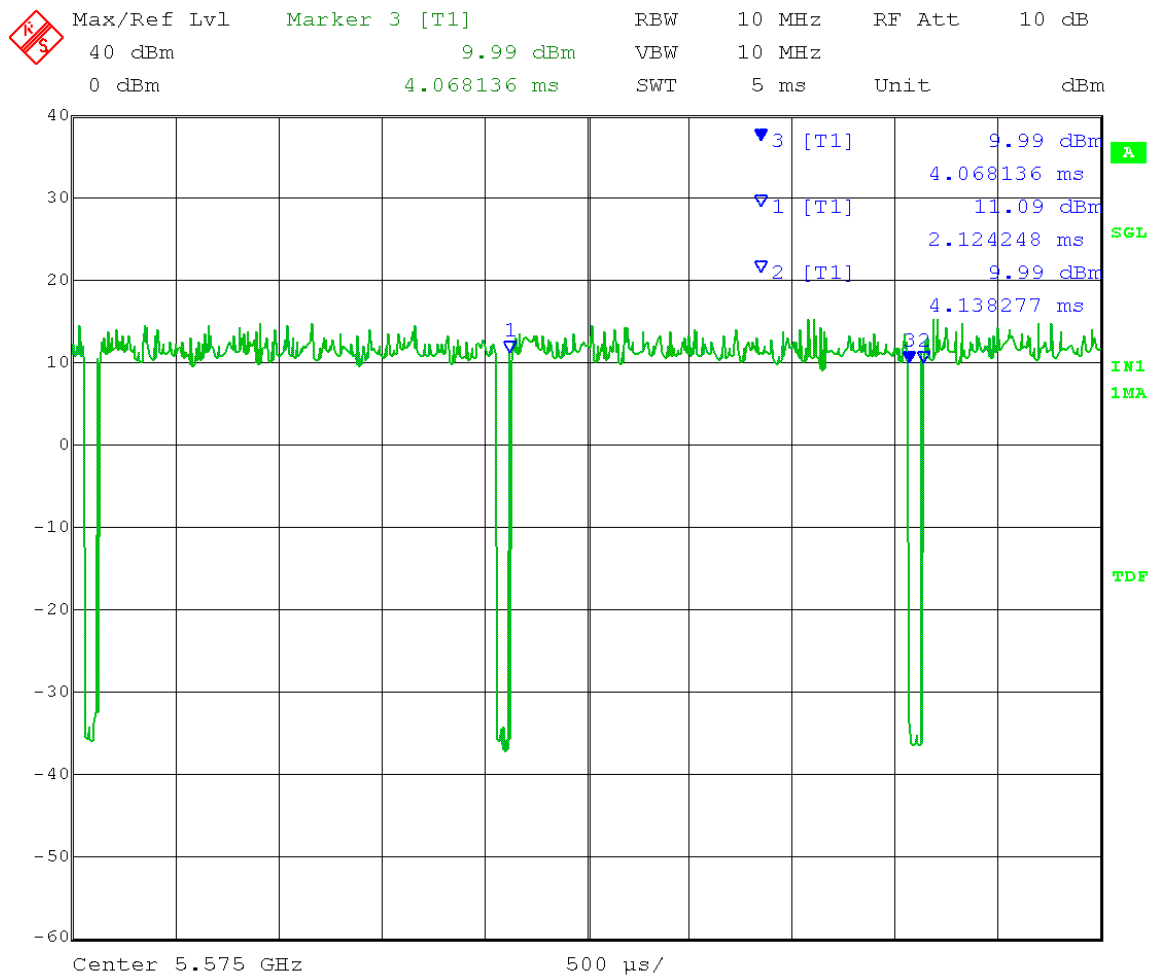
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

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 = 4.138277-2.124248 = 2.004008
 Total on Time = 4.068136-2.124248 = 1.943888 ms

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

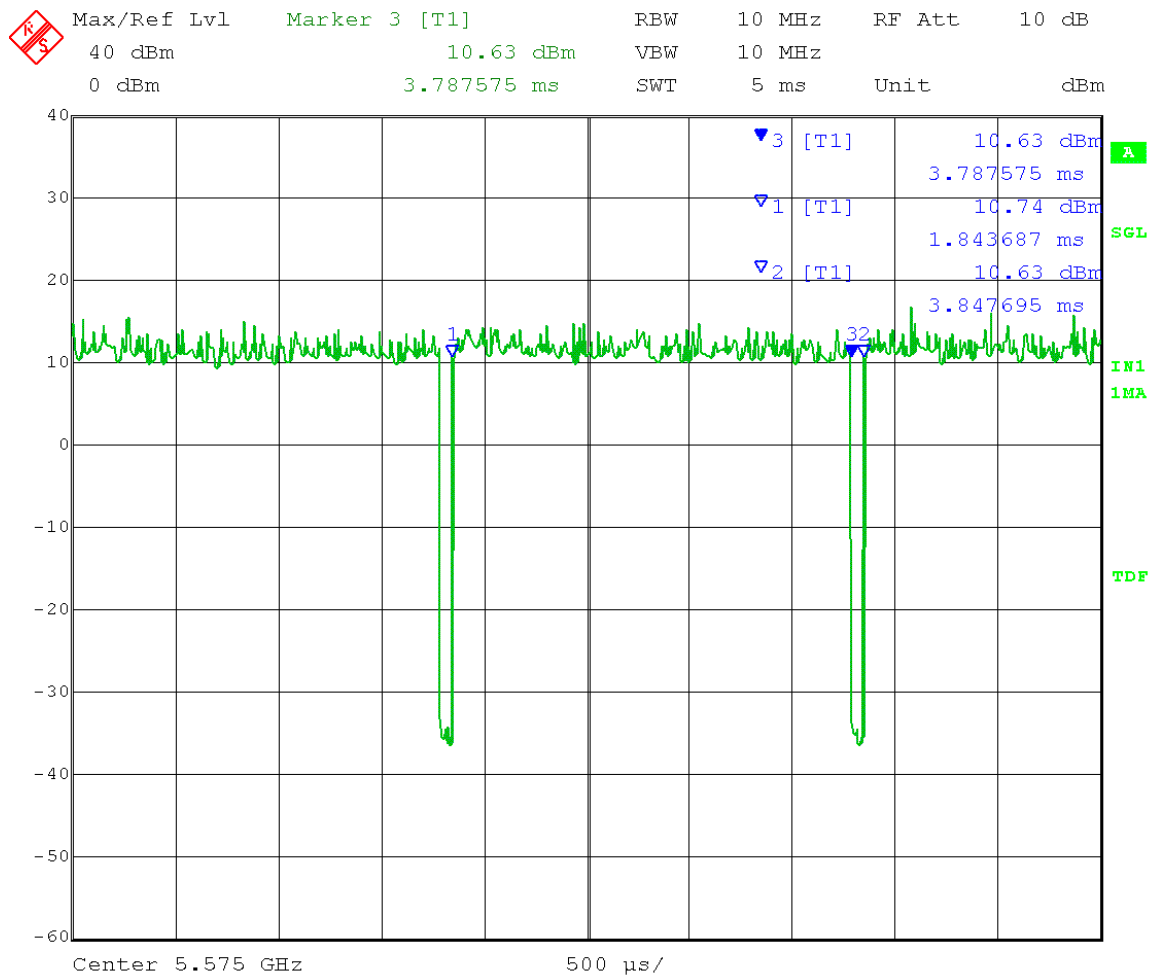


Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Duty Cycle during testing
Operator: Lillian L
Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz
Span = 0 Hz
Mid Channel: Transmit = 5.575GHz
Total Cycle time = 3.847695-1.843687 = 2.004008
Total on Time = 3.787575-1.843687 = 1.943888 ms

VBW = 10 MHz
SWT = 5 ms
20MHz BW 64QAM

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

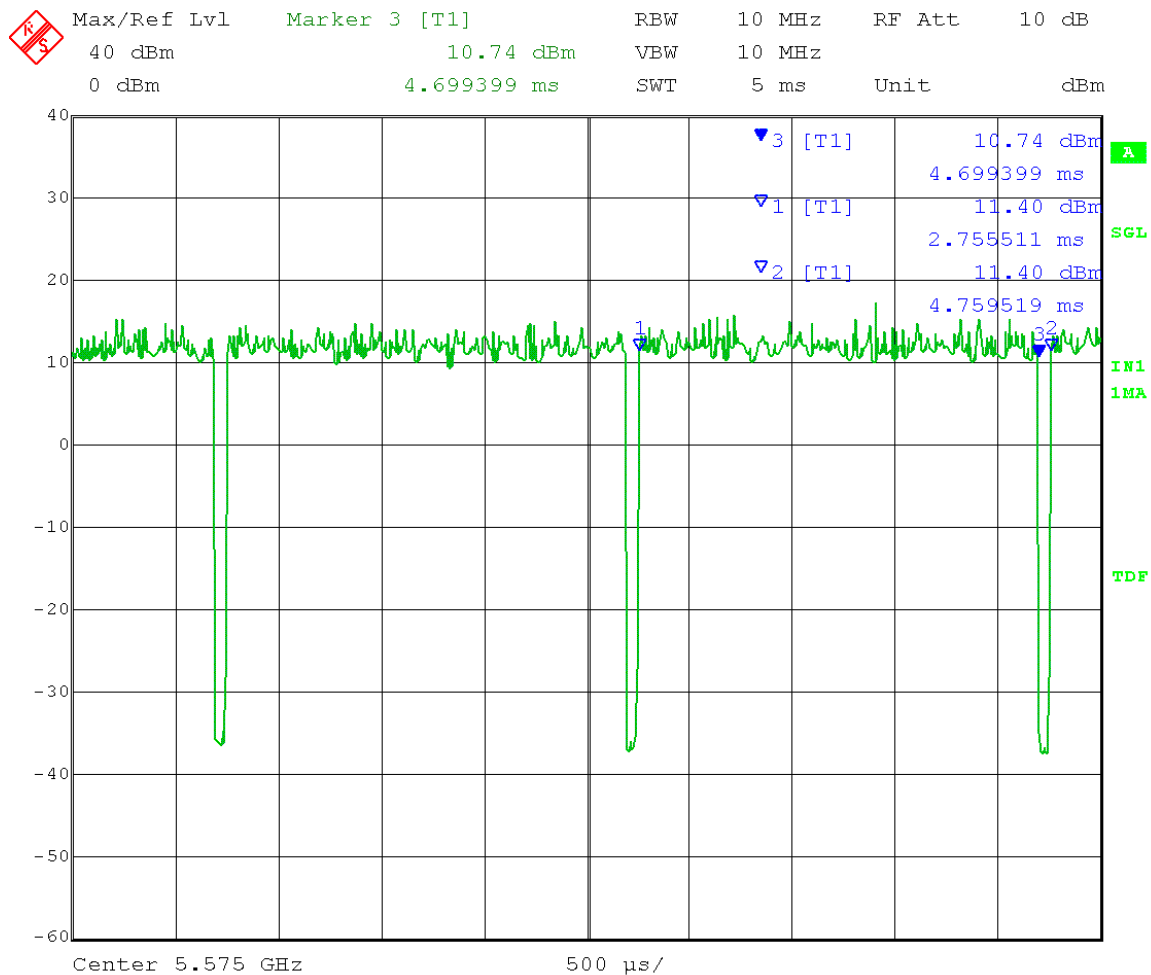


Date: 17.OCT.2013 14:34:01

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 = 4.759519-2.755511 = 2.004008
 Total on Time = 4.699399-2.755511 = 1.943888 ms

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

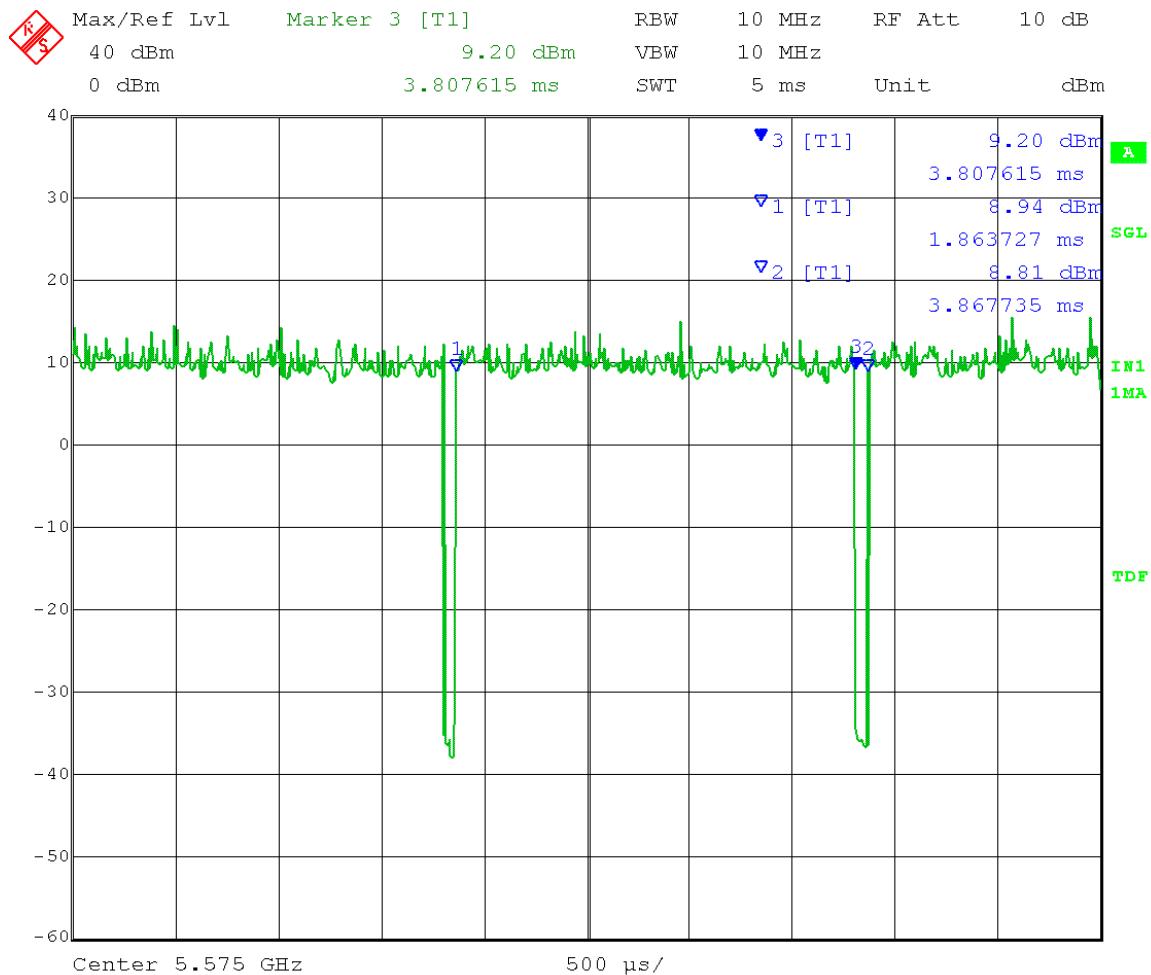


Date: 17.OCT.2013 14:29:18

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 = 3.867735-1.863727 = 2.004009
 Total on Time = 3.807615-1.863727 = 1.943888 ms

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

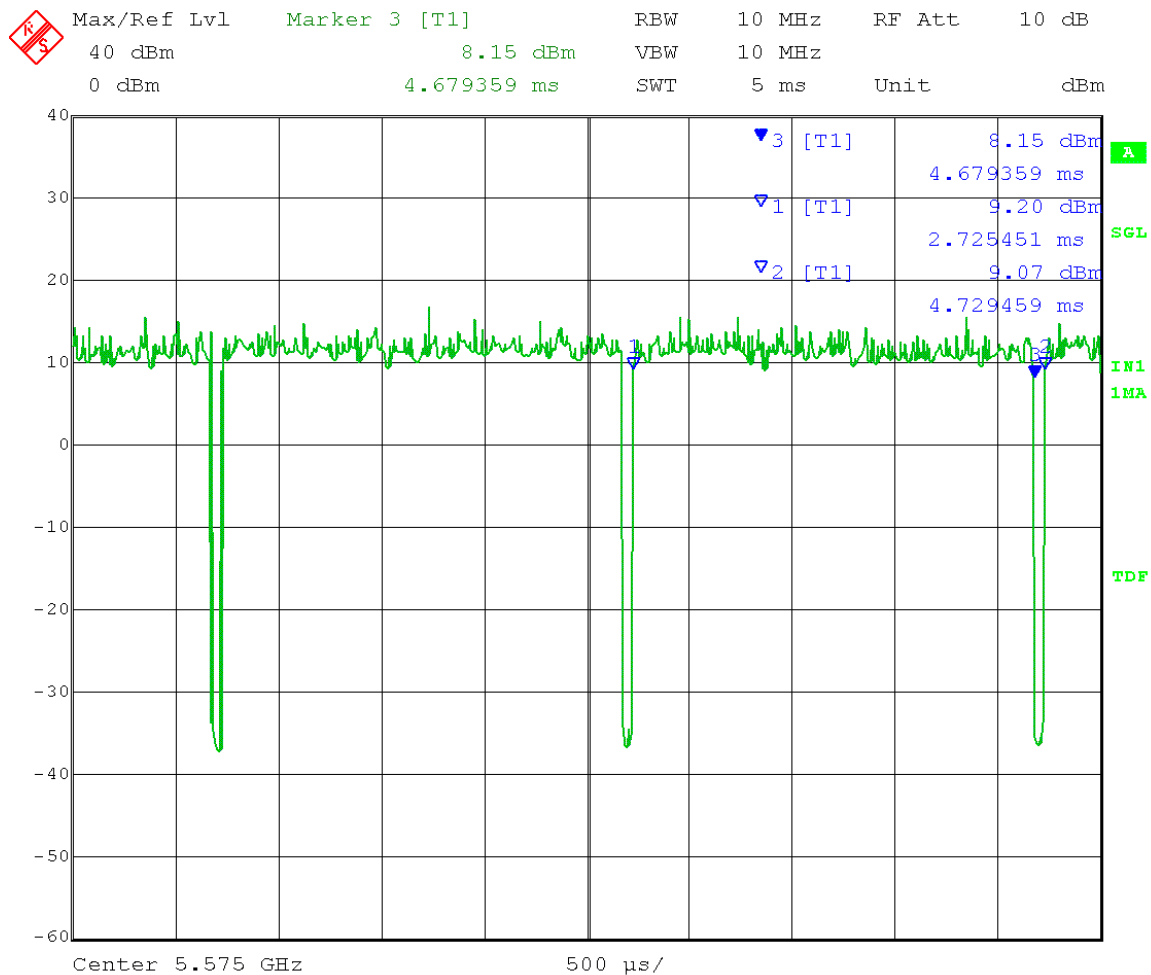


Date: 17.OCT.2013 13:54:46

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 = 4.729459-2.725451 = 2.004008
 Total on Time = 4.679359-2.725451 = 1.953908 ms

Duty cycle factor $x = 1.953908 / 2.004008 = 0.975$
 Adjustment for duty cycle $= 10 \log 1/x = 0.11$



Date: 17.OCT.2013 14:19:59



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Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
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Appendix – Measurement Data

2.0 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

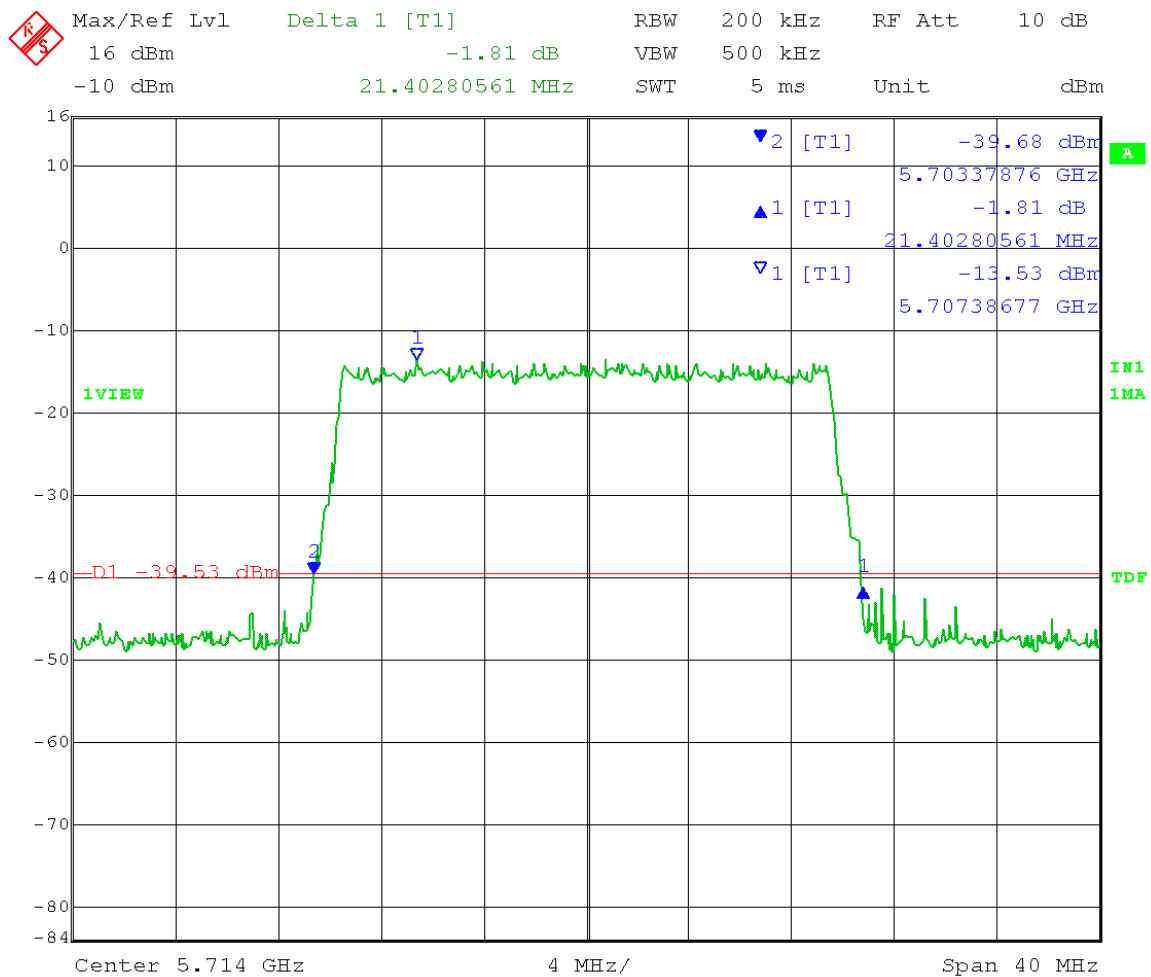
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

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

Test Date: 10-4&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 = 5.714 GHz 20MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

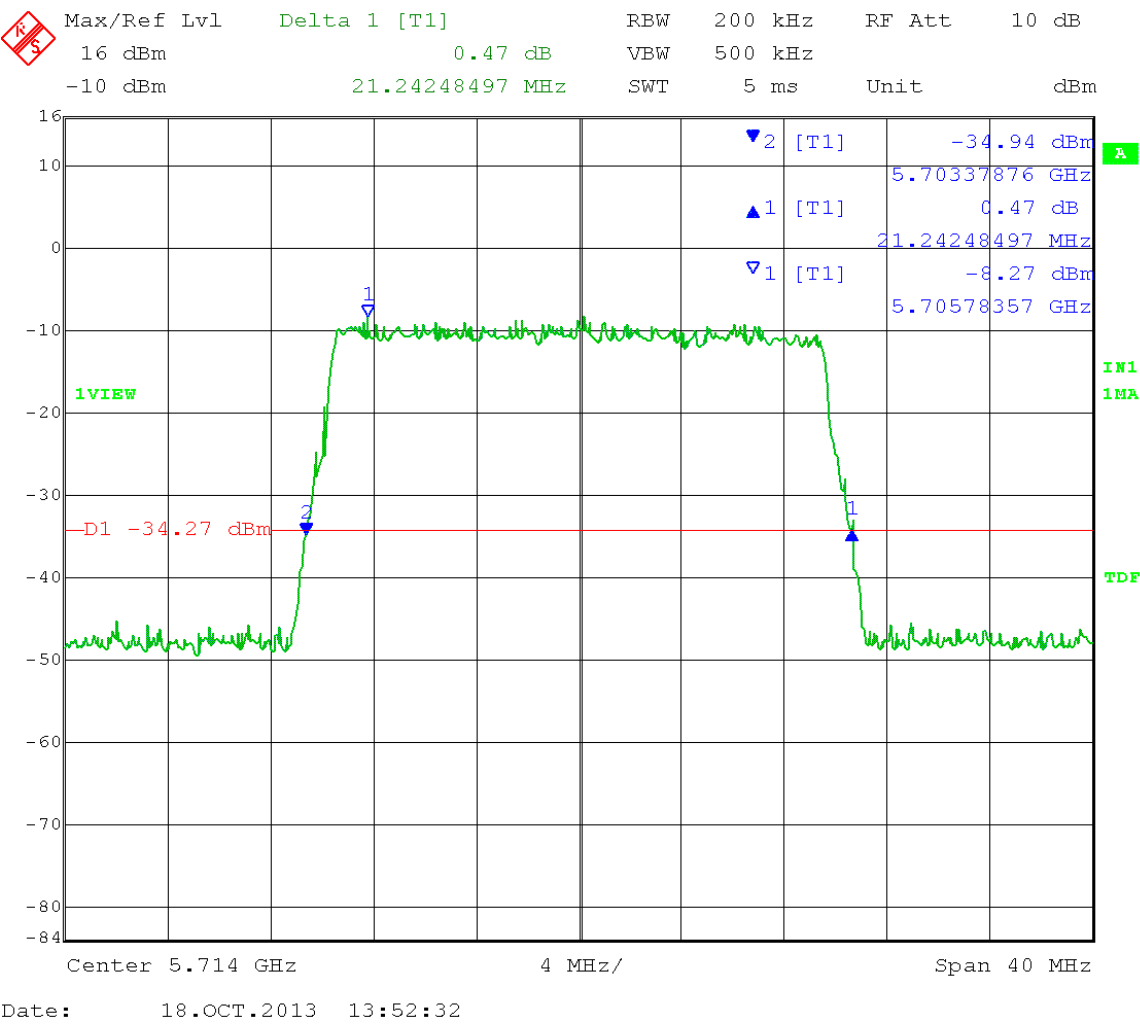
26 dB Emission Bandwidth = 21.40MHz



Date: 17.OCT.2013 15:27:13

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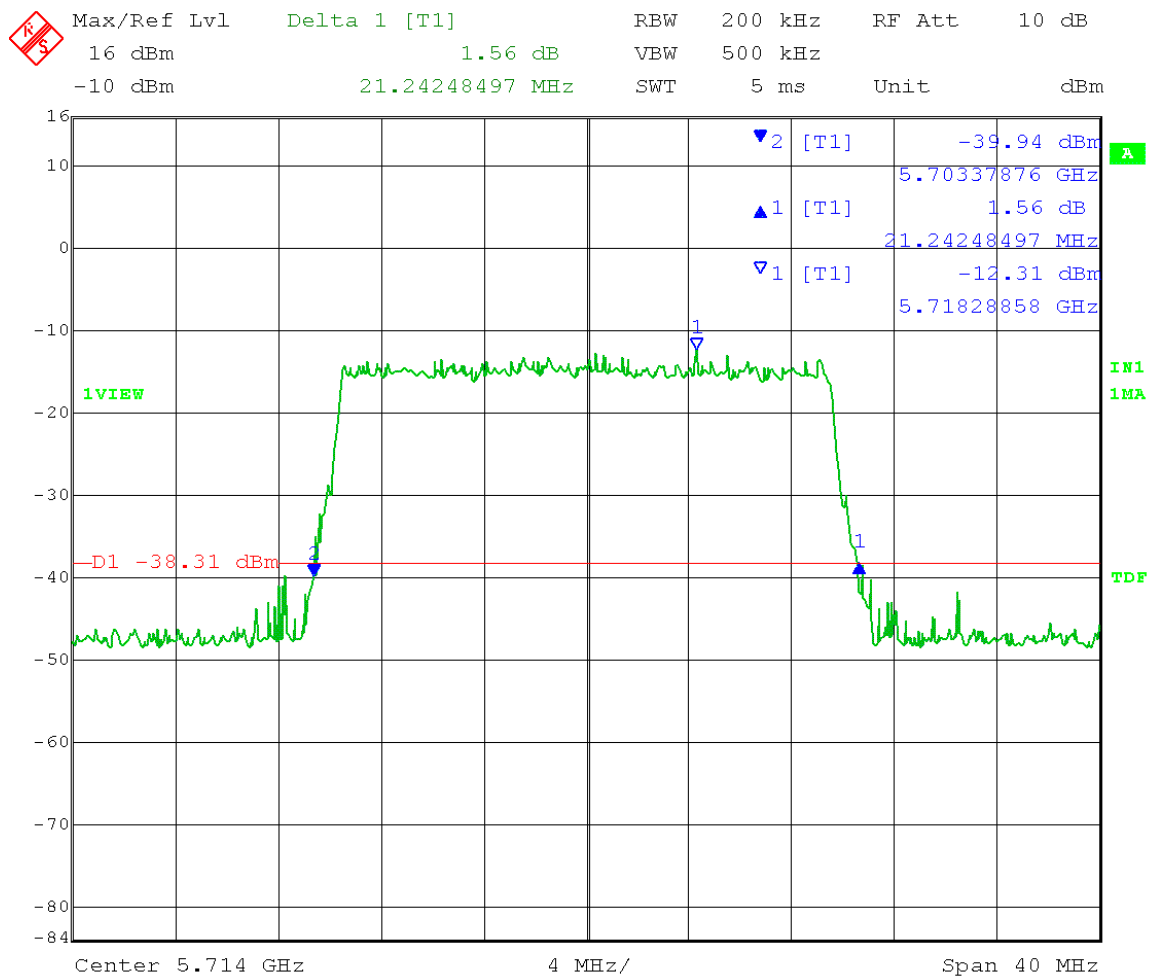
26 dB Emission Bandwidth = 21.24MHz



Test Date: 10-17&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 = 5.714 GHz 20MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

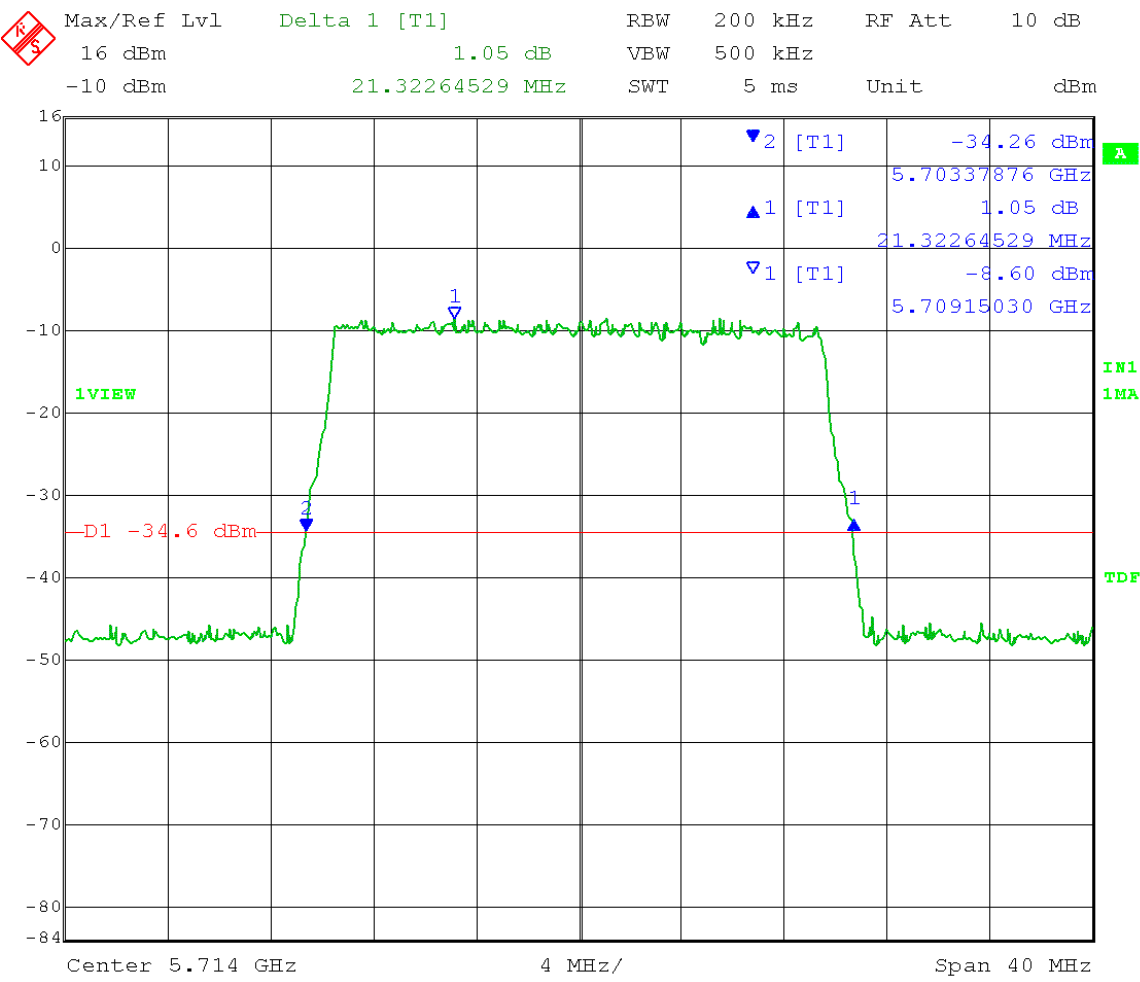
26 dB Emission Bandwidth = 21.24MHz



Date: 17.OCT.2013 15:29:38

TX 1:

26 dB Emission Bandwidth = 21.32MHz

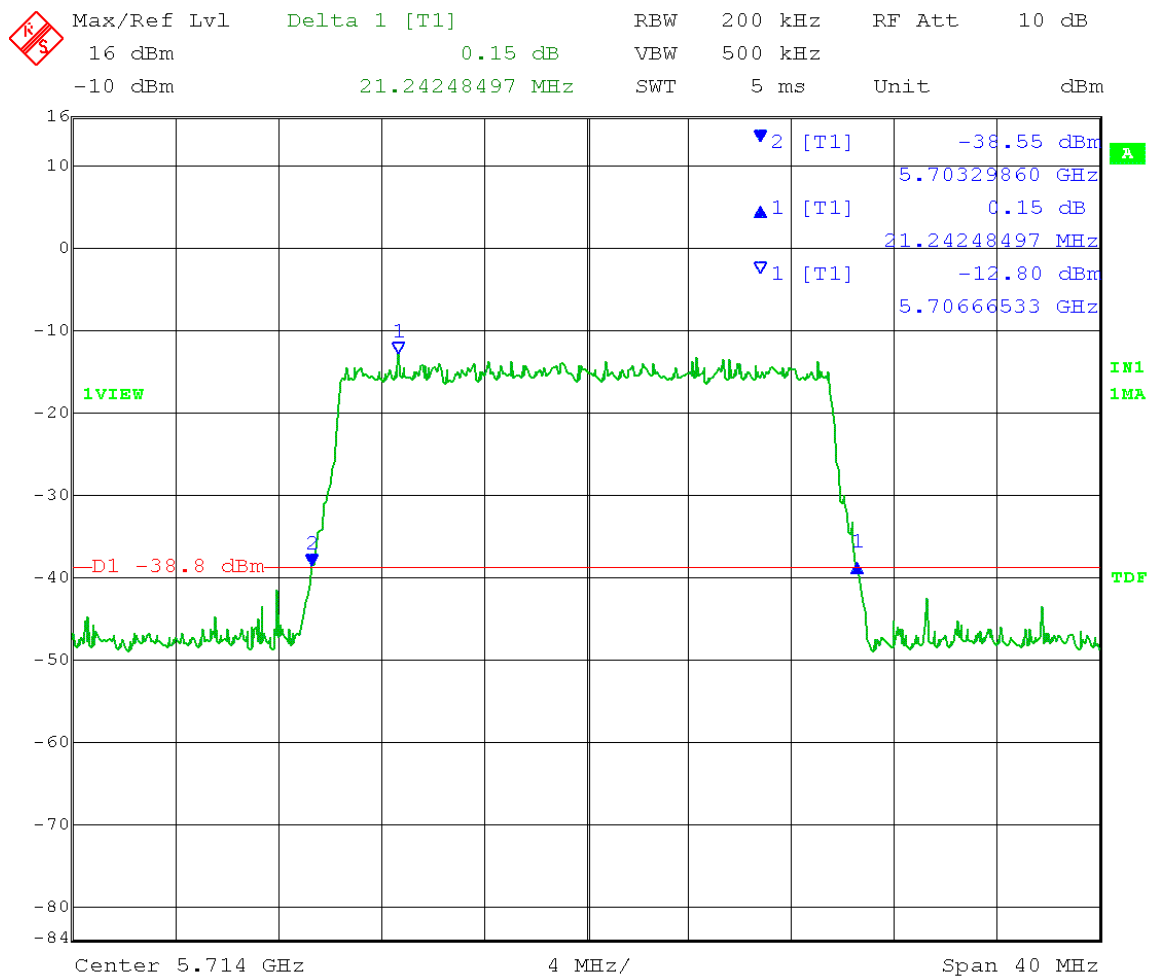


Date: 18.OCT.2013 13:54:55

Test Date: 10-17&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 = 5.714 GHz 20MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.24MHz



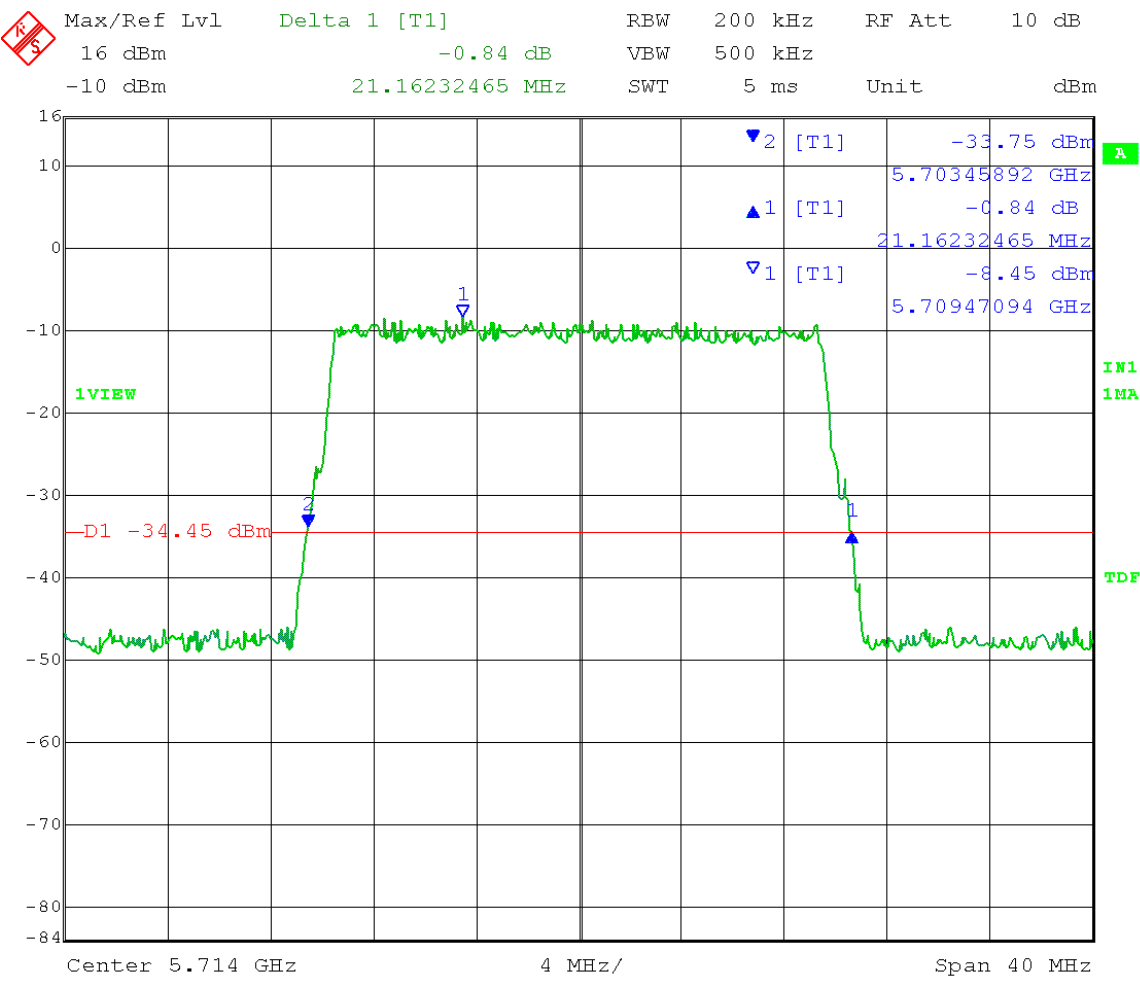
Date: 17.OCT.2013 15:31:03



Date: 17.OCT.2013 15:32:23

TX 1:

26 dB Emission Bandwidth = 21.16MHz

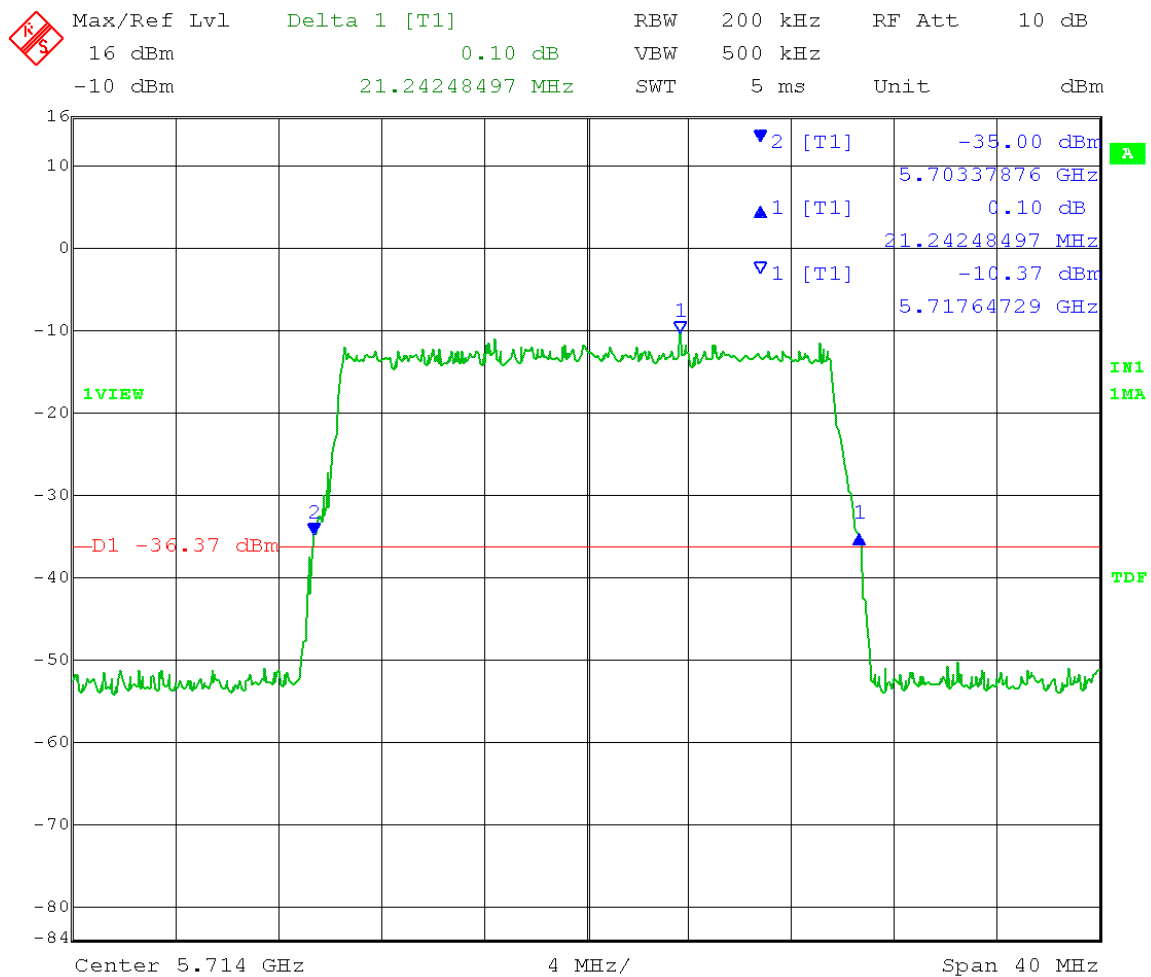


Date: 18.OCT.2013 13:57:56

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 = 5.714 GHz 20MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

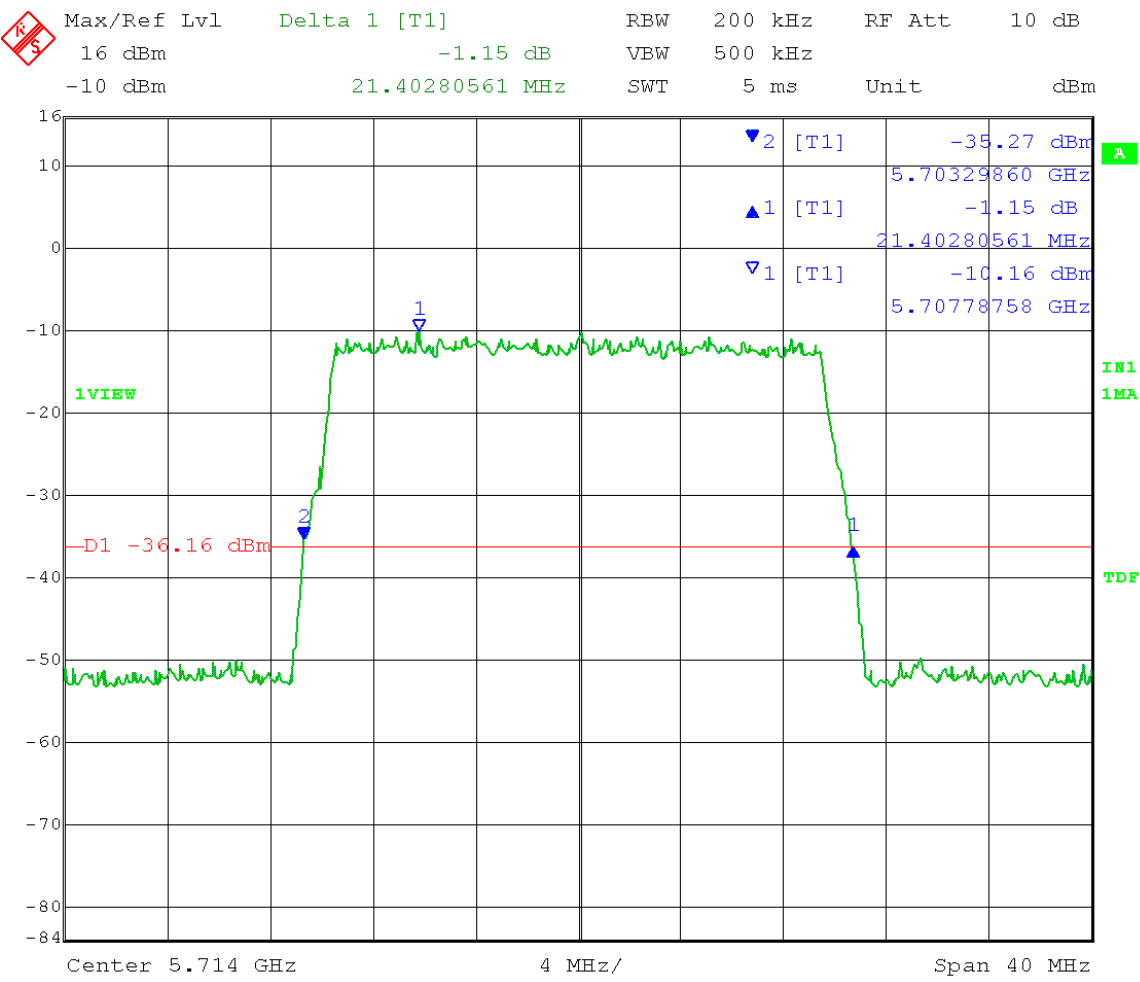
26 dB Emission Bandwidth = 21.24MHz



Date: 7.OCT.2013 10:32:21

TX 1:

26 dB Emission Bandwidth = 21.40MHz

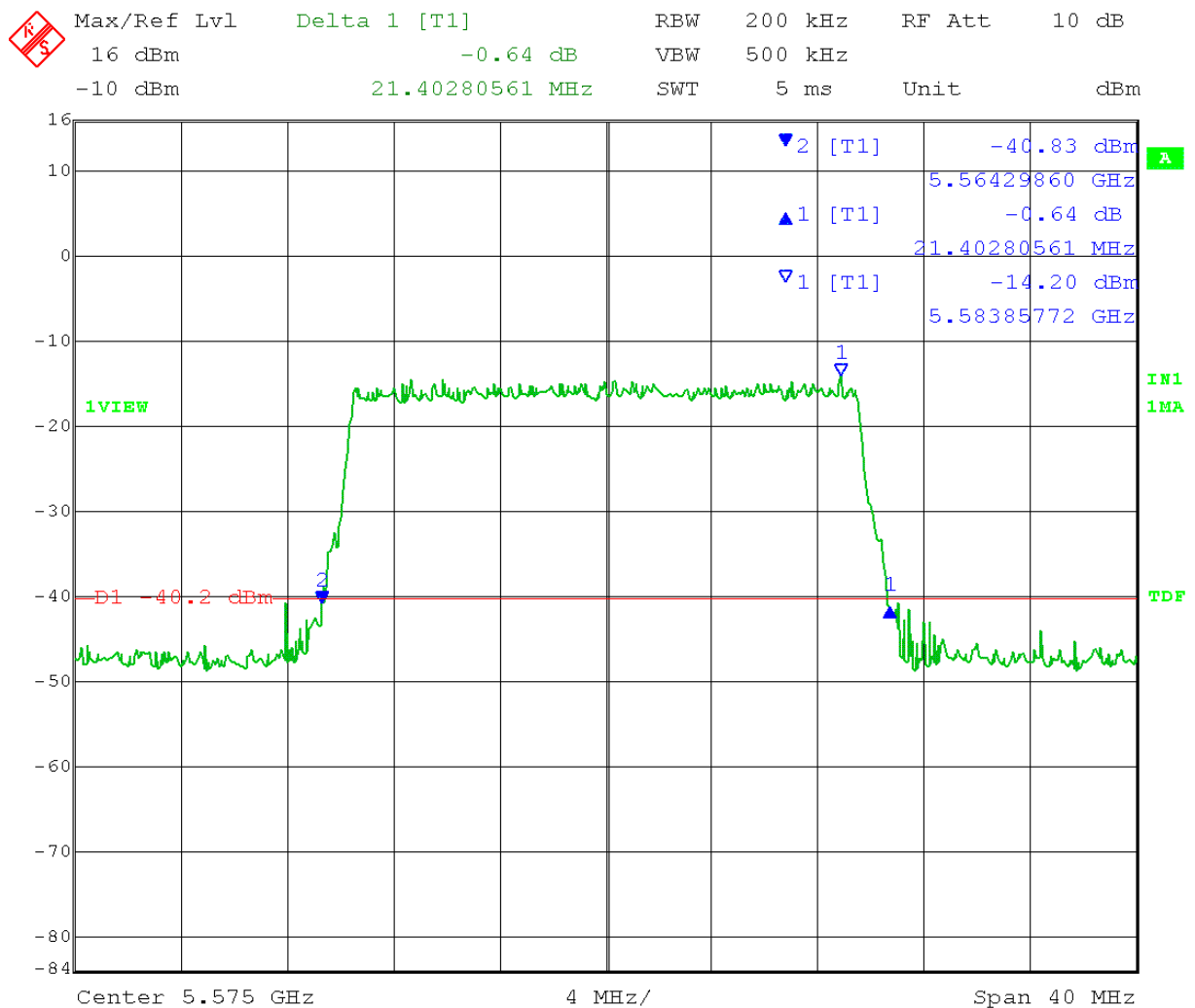


Date: 4.OCT.2013 15:43:52

Test Date: 10-17-2013
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 20MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

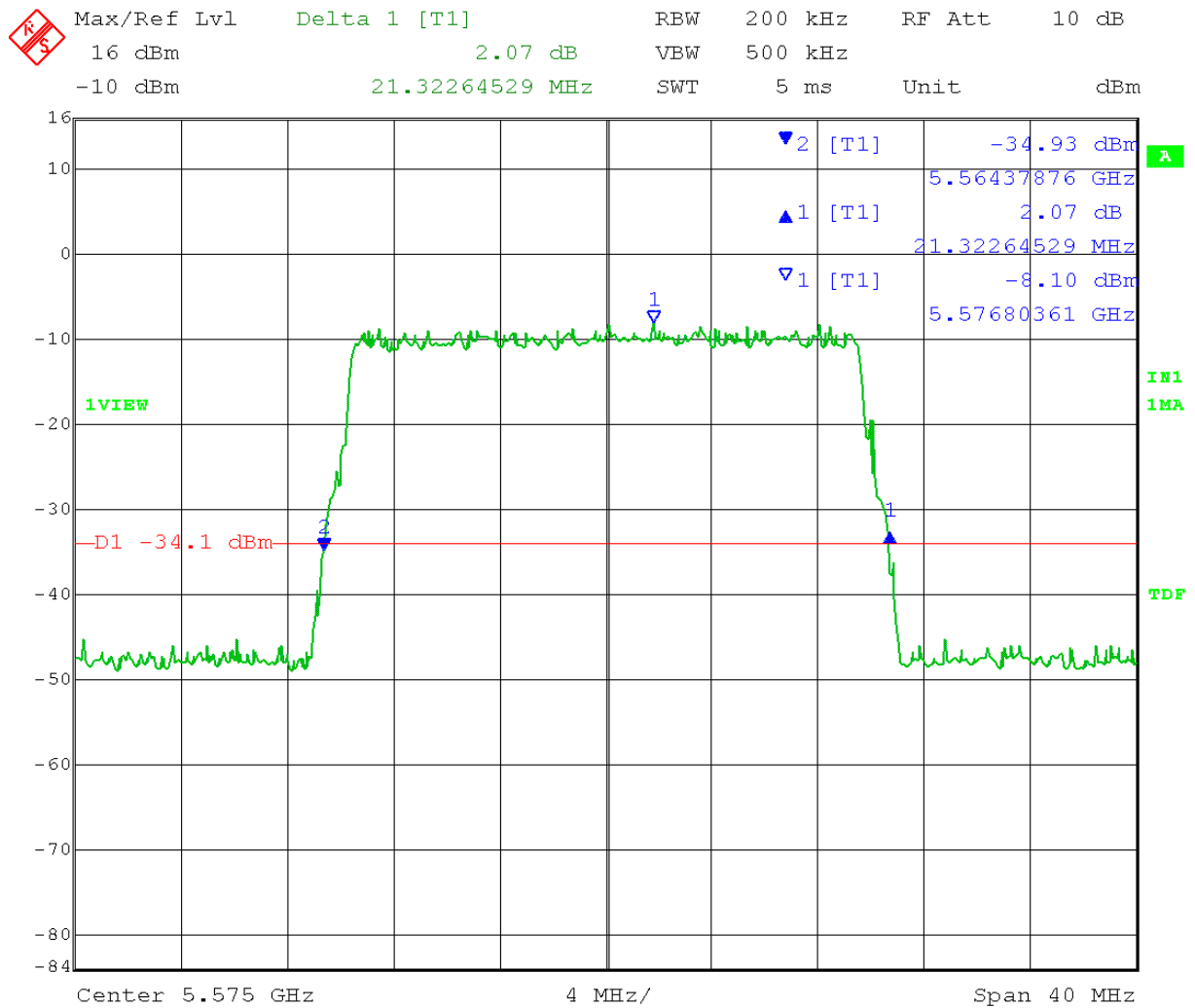
26 dB Emission Bandwidth = 21.40MHz



Date: 17.OCT.2013 15:09:42

TX 1:

26 dB Emission Bandwidth = 21.32MHz

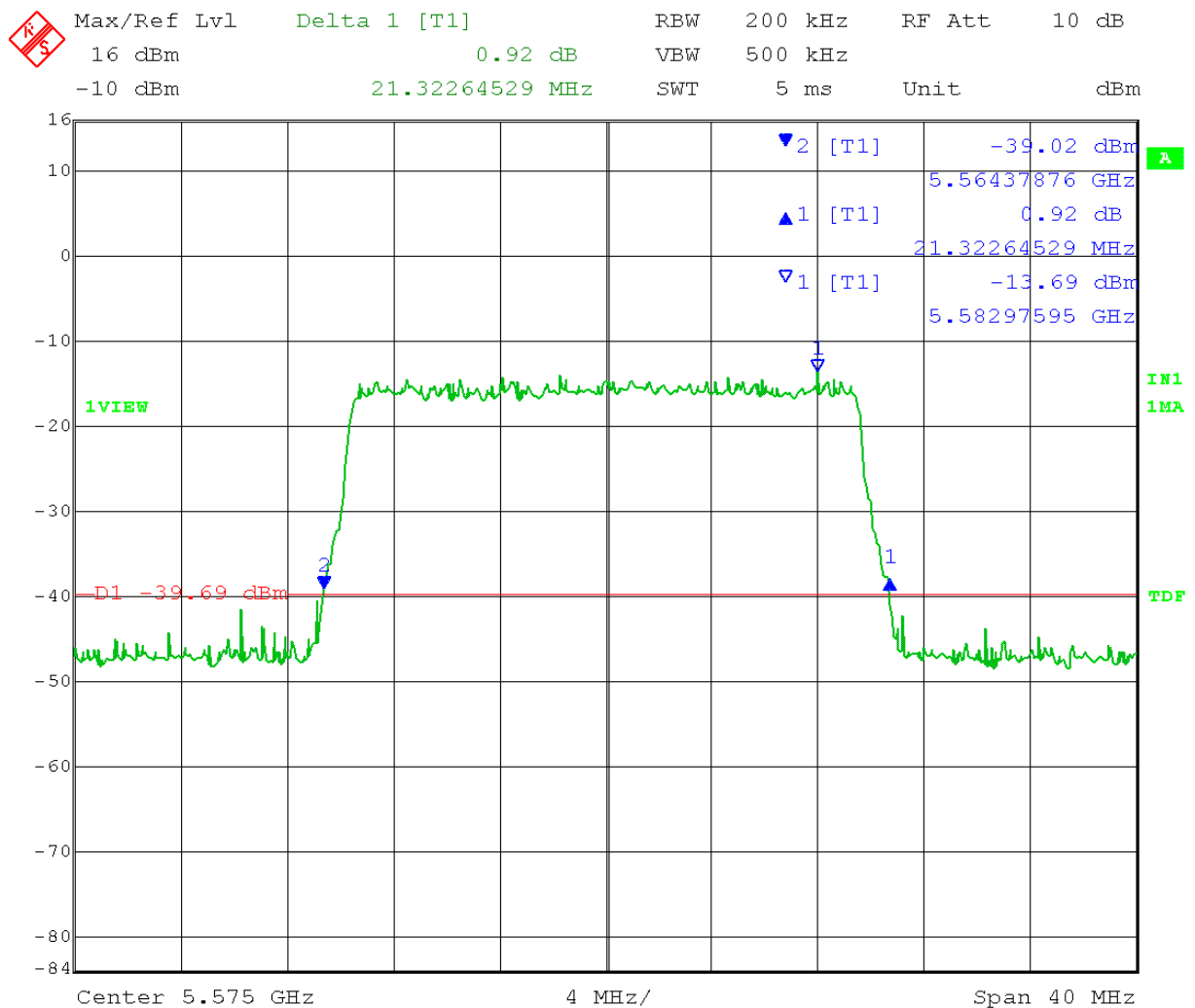


Date: 18.OCT.2013 13:43:18

Test Date: 10-17-2013
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 20MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

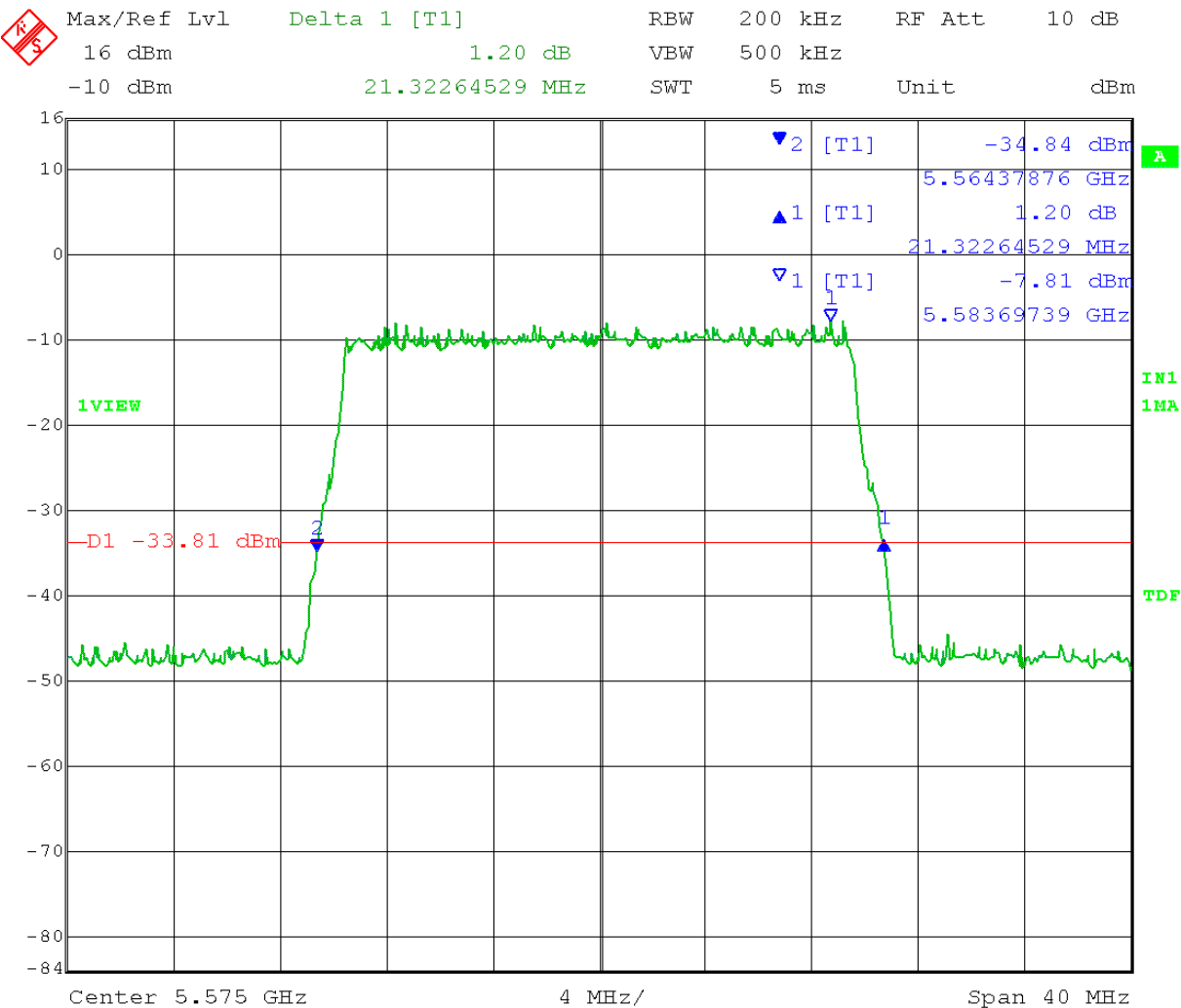
26 dB Emission Bandwidth = 21.32MHz



Date: 17.OCT.2013 15:07:58

TX 1:

26 dB Emission Bandwidth = 21.32MHz

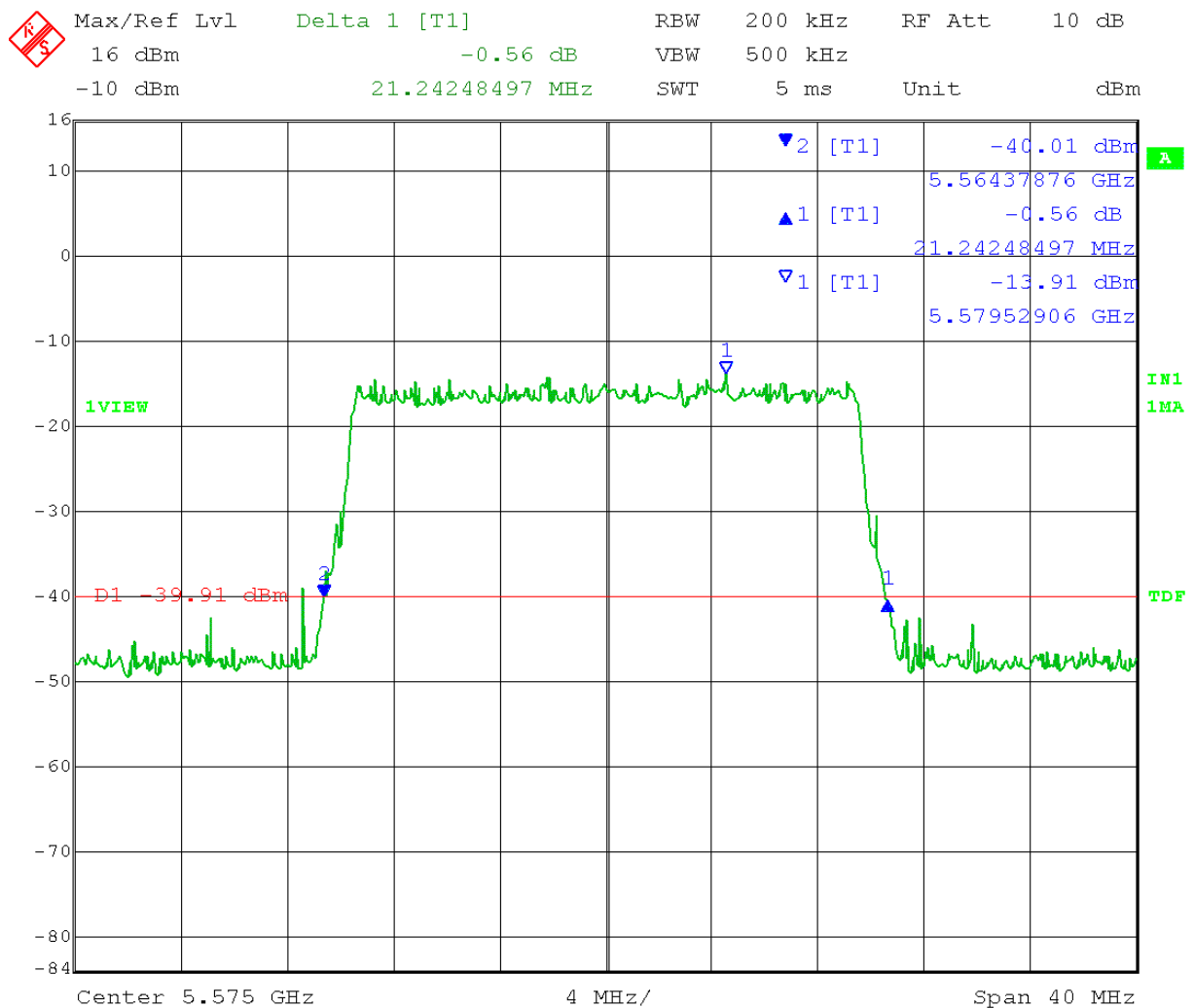


Date: 18.OCT.2013 13:42:04

Test Date: 10-17-2013
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 20MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

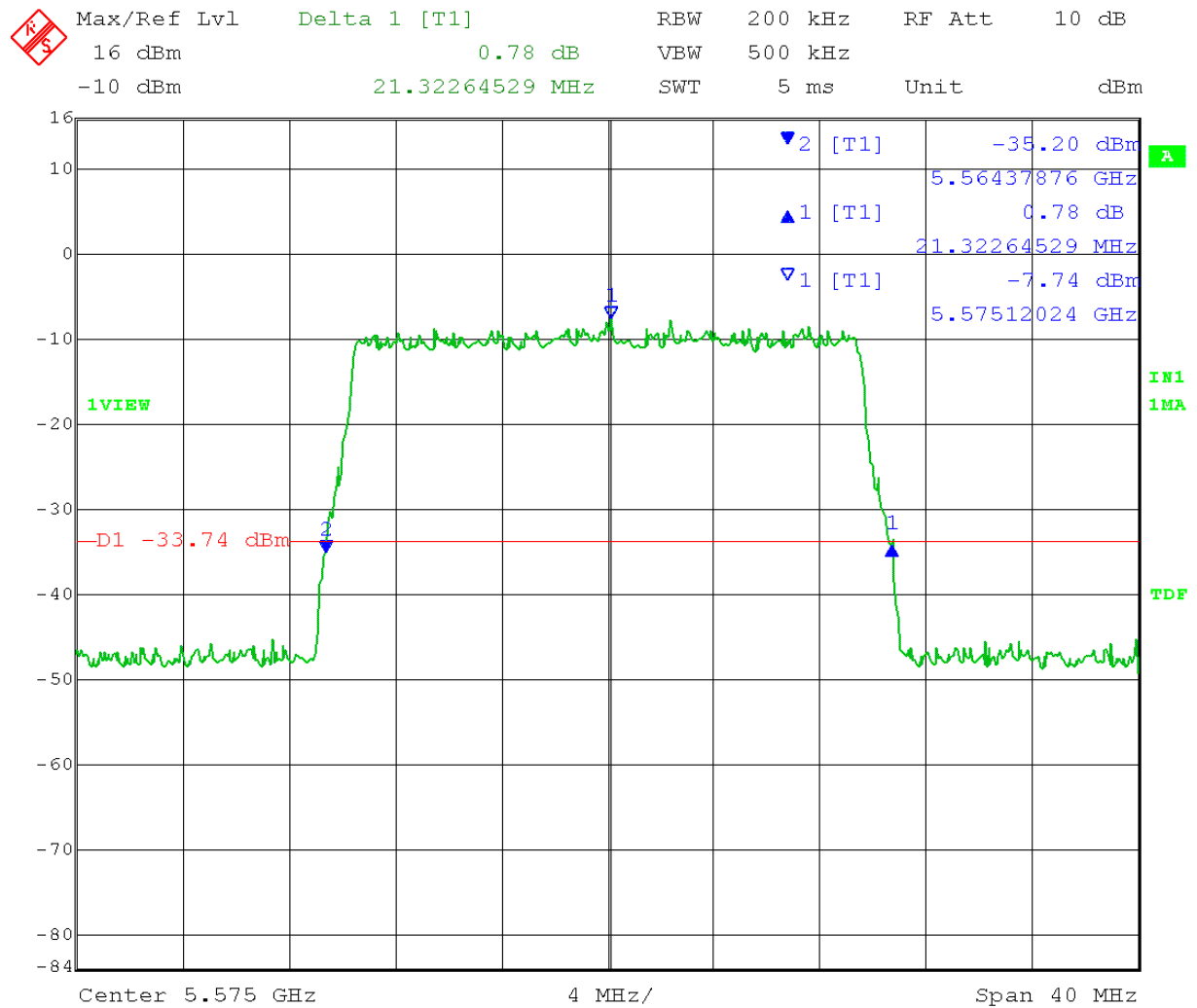
26 dB Emission Bandwidth = 21.24MHz



Date: 17.OCT.2013 15:11:09

TX 1:

26 dB Emission Bandwidth = 21.32MHz

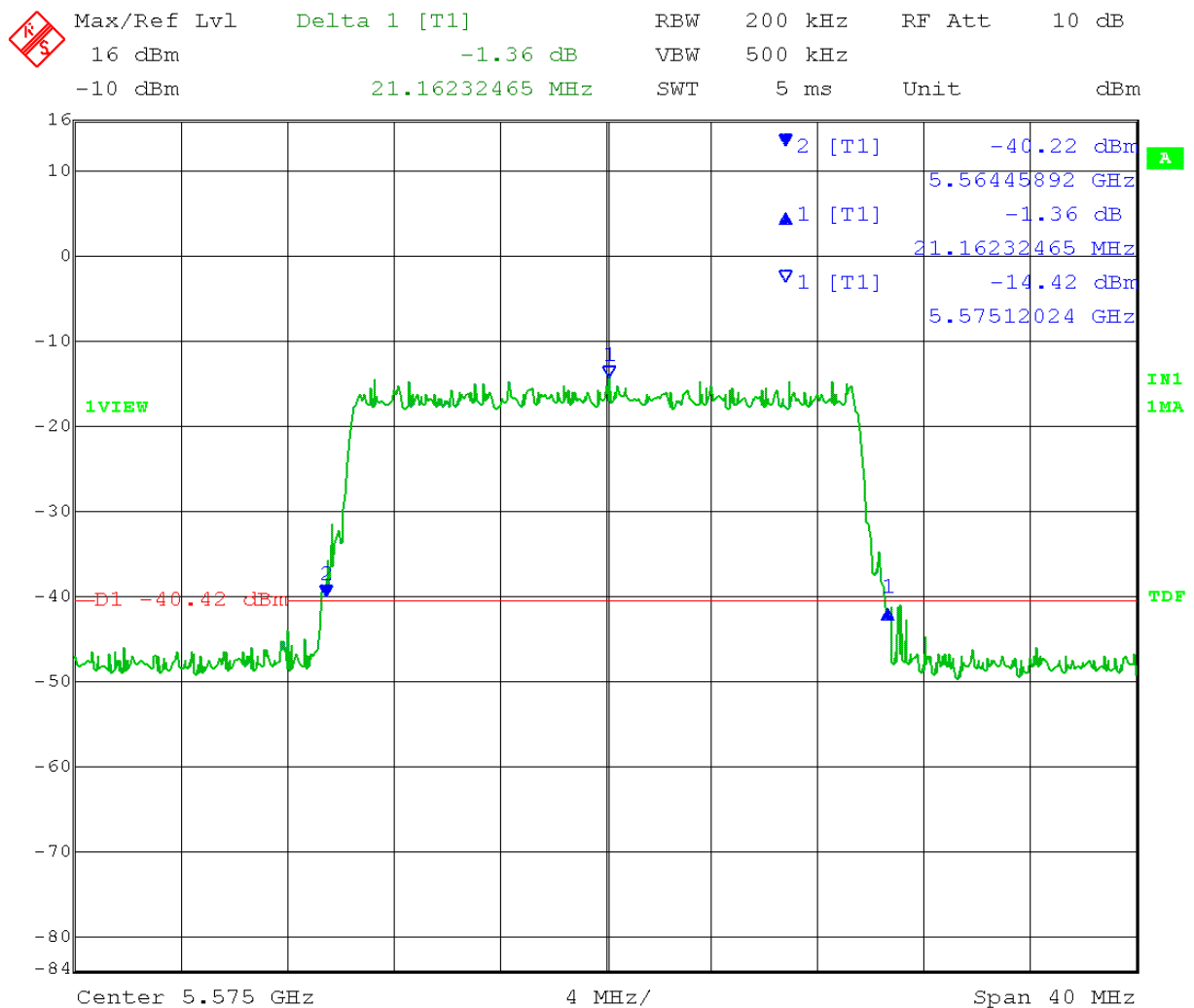


Date: 18.OCT.2013 13:40:44

Test Date: 10-17-2013
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 20MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

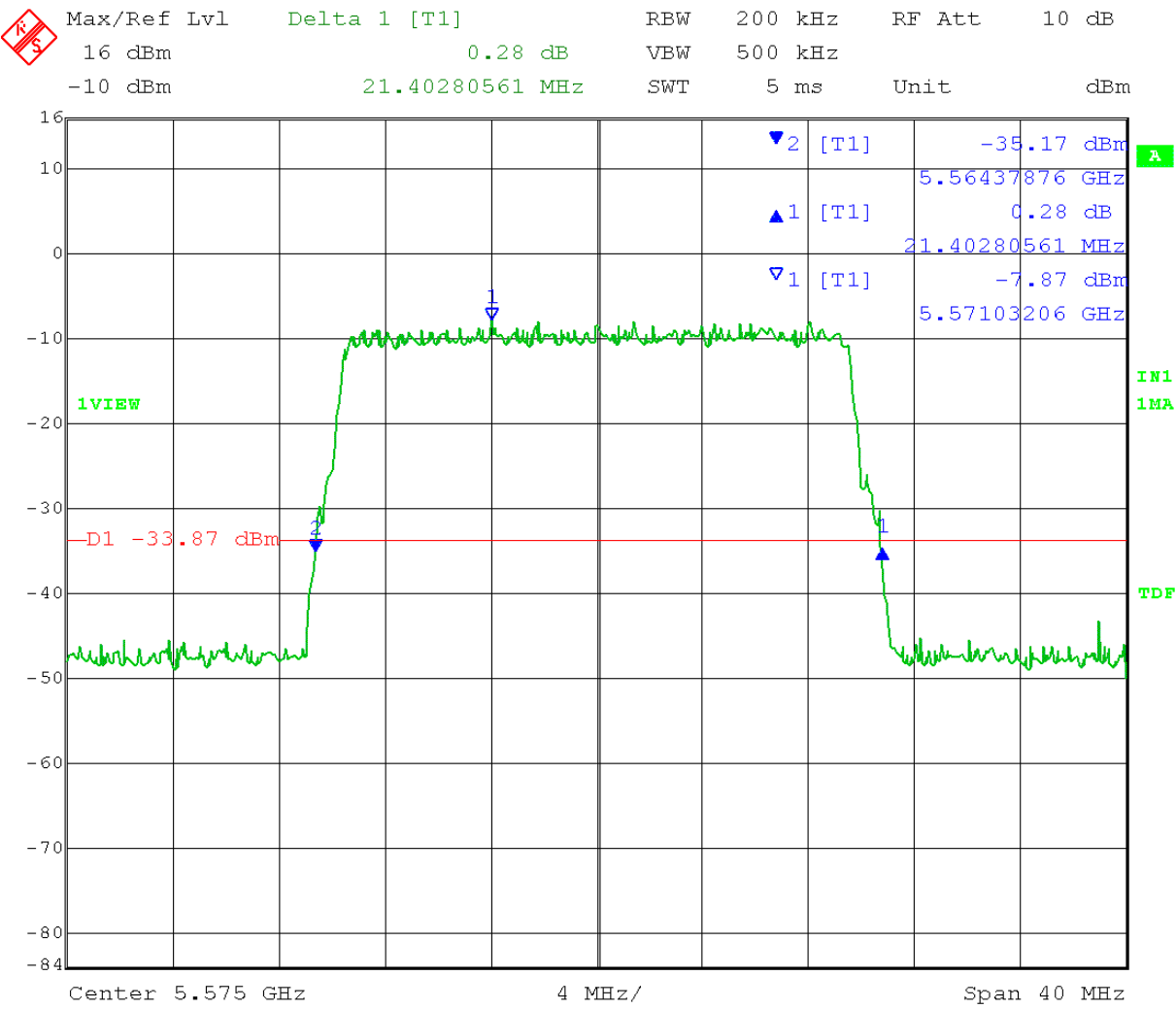
26 dB Emission Bandwidth = 21.16MHz



Date: 17.OCT.2013 15:12:33

TX 1:

26 dB Emission Bandwidth = 21.40MHz

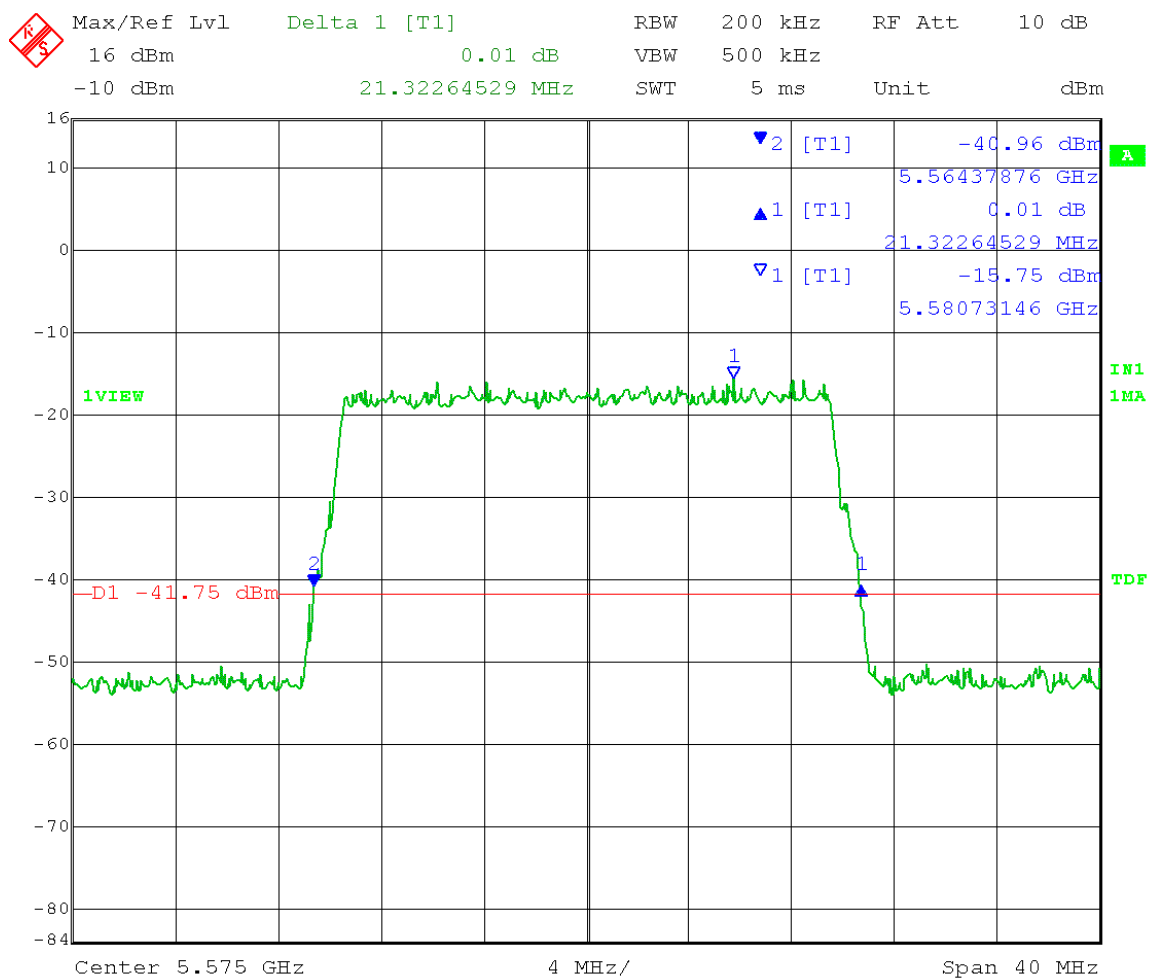


Date: 18.OCT.2013 13:39:19

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)
Mid Channel: Transmit = 5.575 GHz 20MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

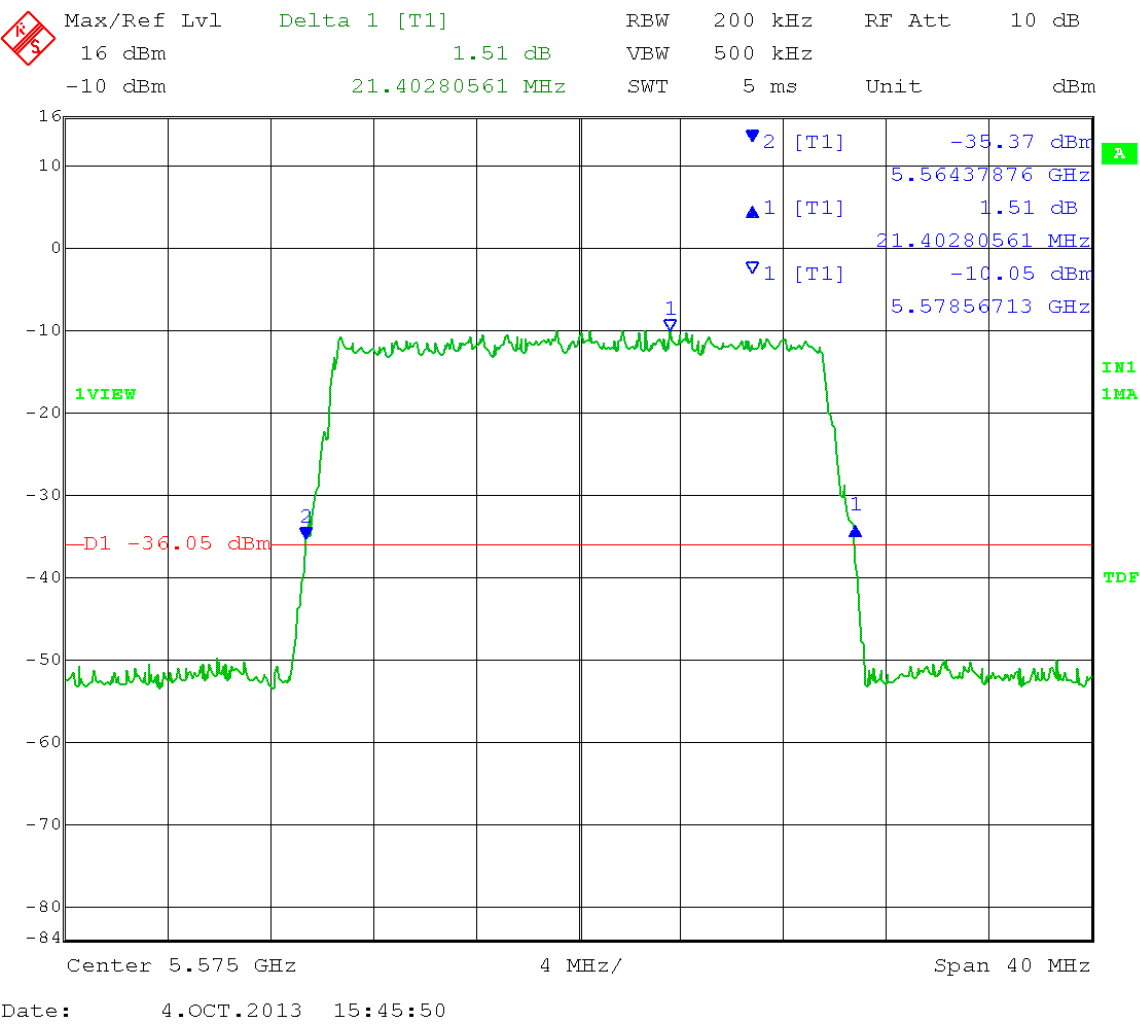
26 dB Emission Bandwidth = 21.32MHz



Date: 7.OCT.2013 10:29:48

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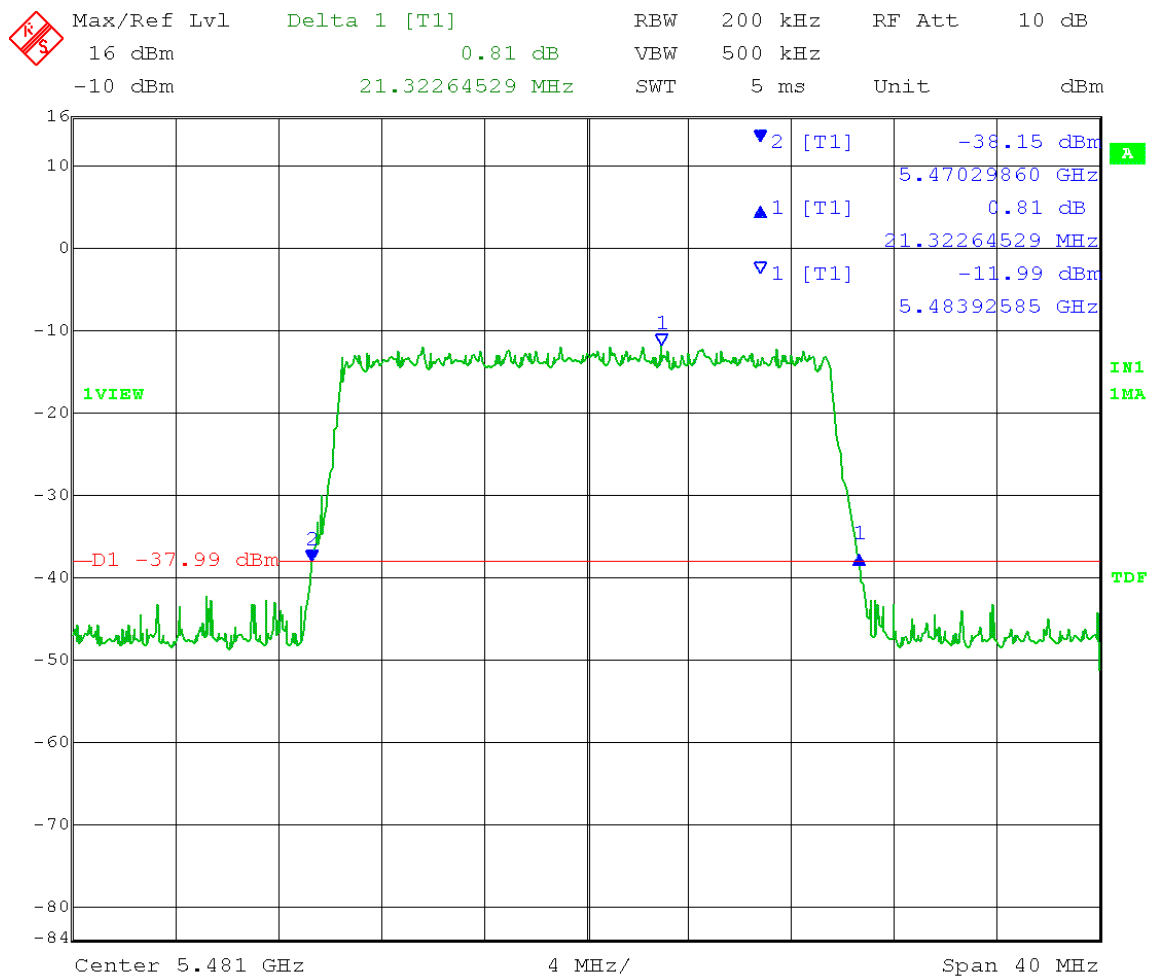
26 dB Emission Bandwidth = 21.40MHz



Test Date: 10-17-2013
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 = 5.481 GHz 20MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

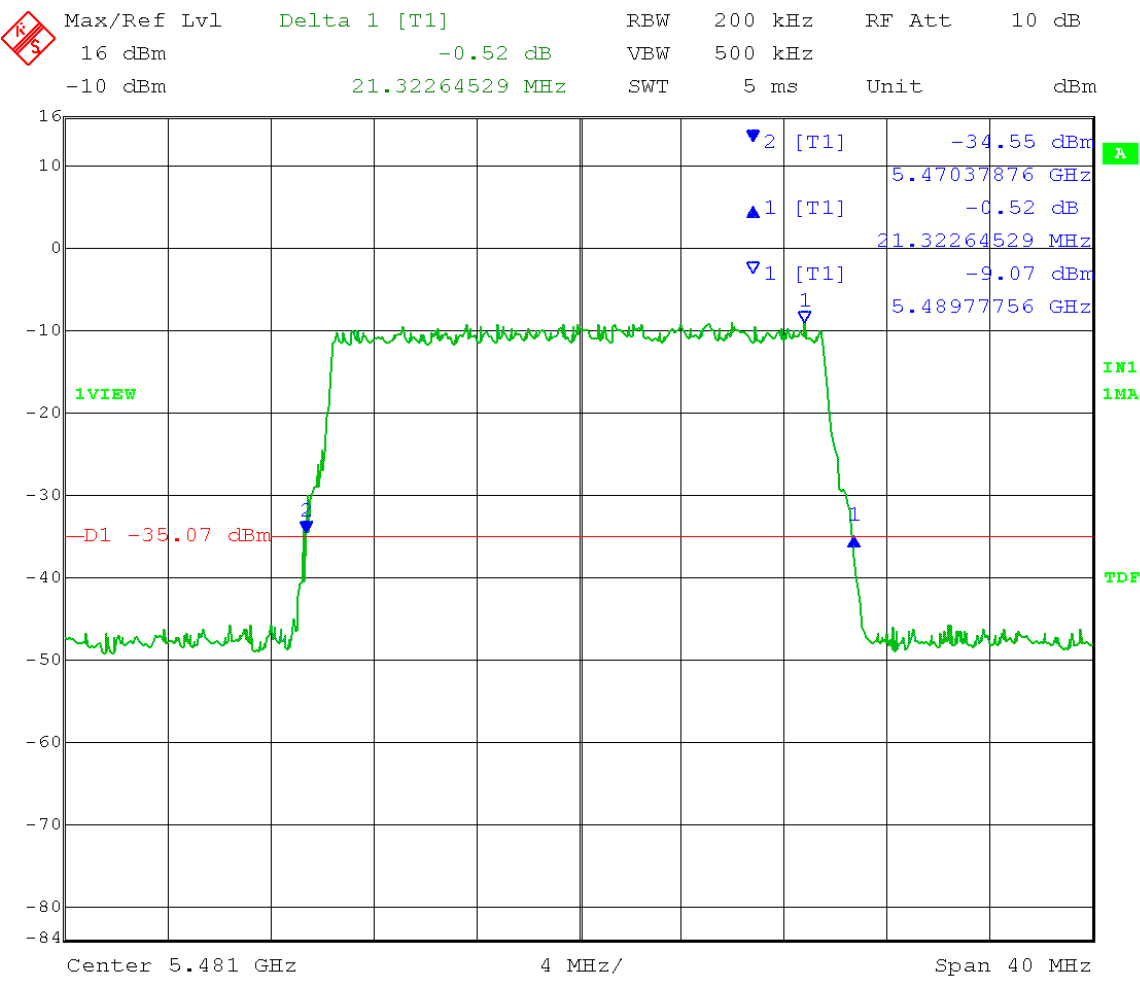
26 dB Emission Bandwidth = 21.32MHz



Date: 17.OCT.2013 15:24:01

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26 dB Emission Bandwidth = 21.32MHz

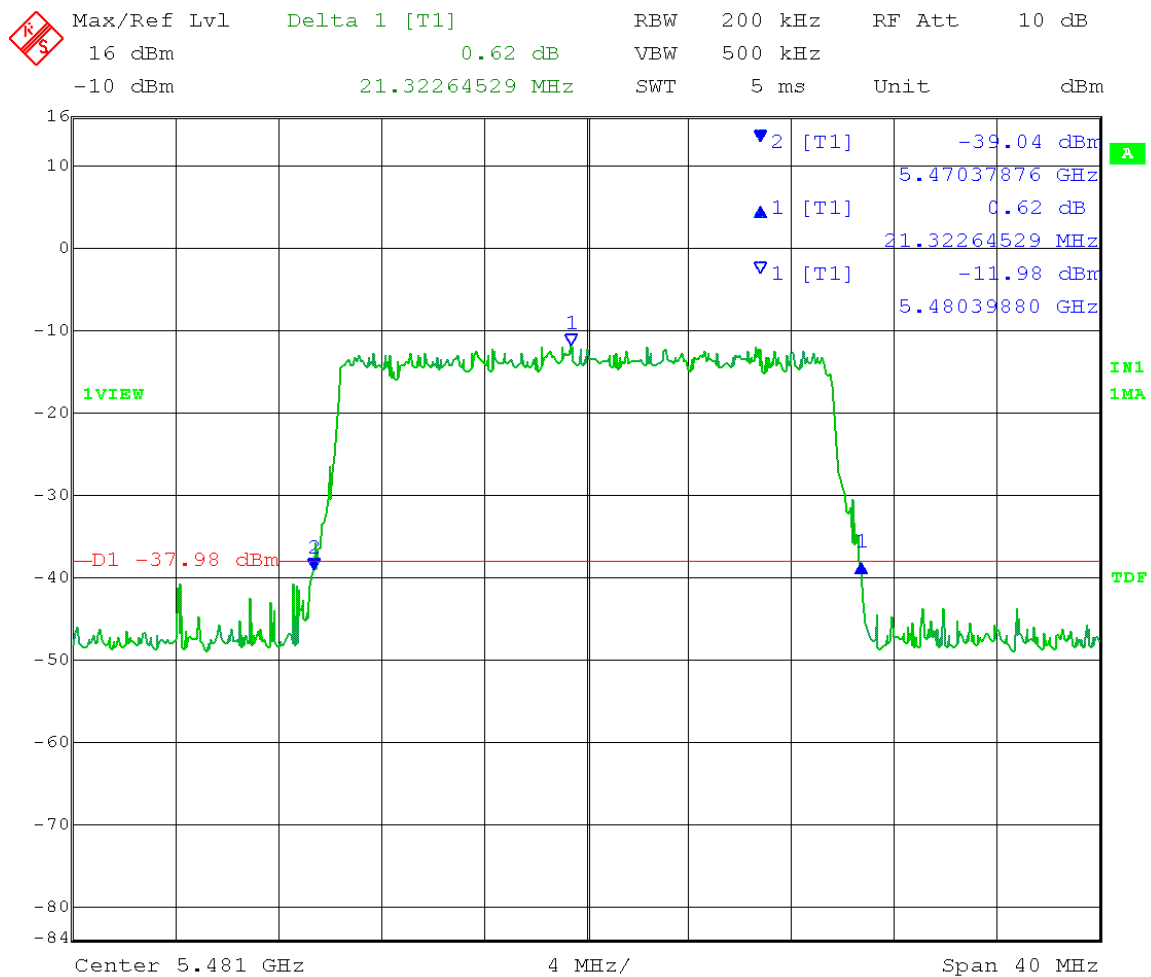


Date: 18.OCT.2013 13:32:50

Test Date: 10-17-2013
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 = 5.481 GHz 20MHz BW 64QAM
Output power setting: 30 dBm eirp

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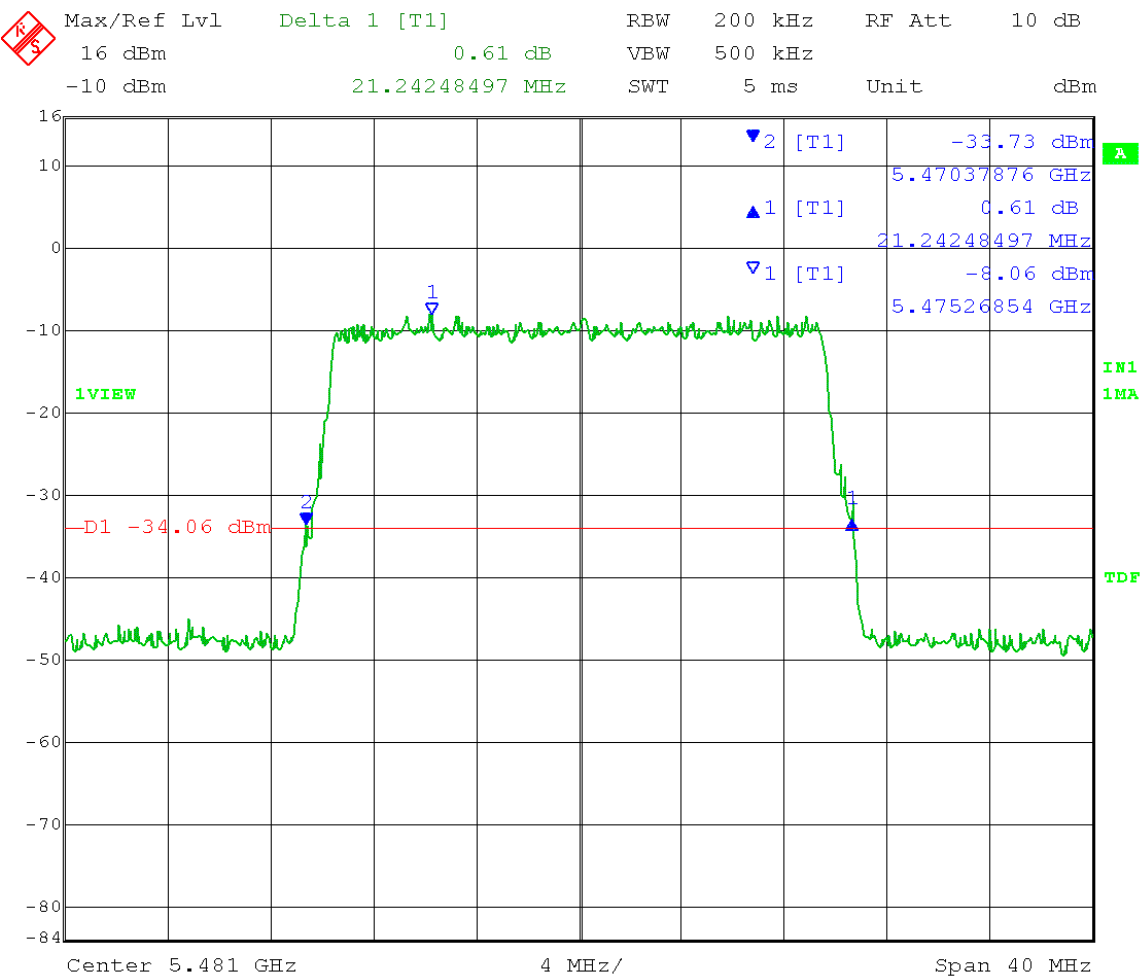
26 dB Emission Bandwidth = 21.32MHz



Date: 17.OCT.2013 15:21:14

TX 1:

26 dB Emission Bandwidth = 21.24MHz

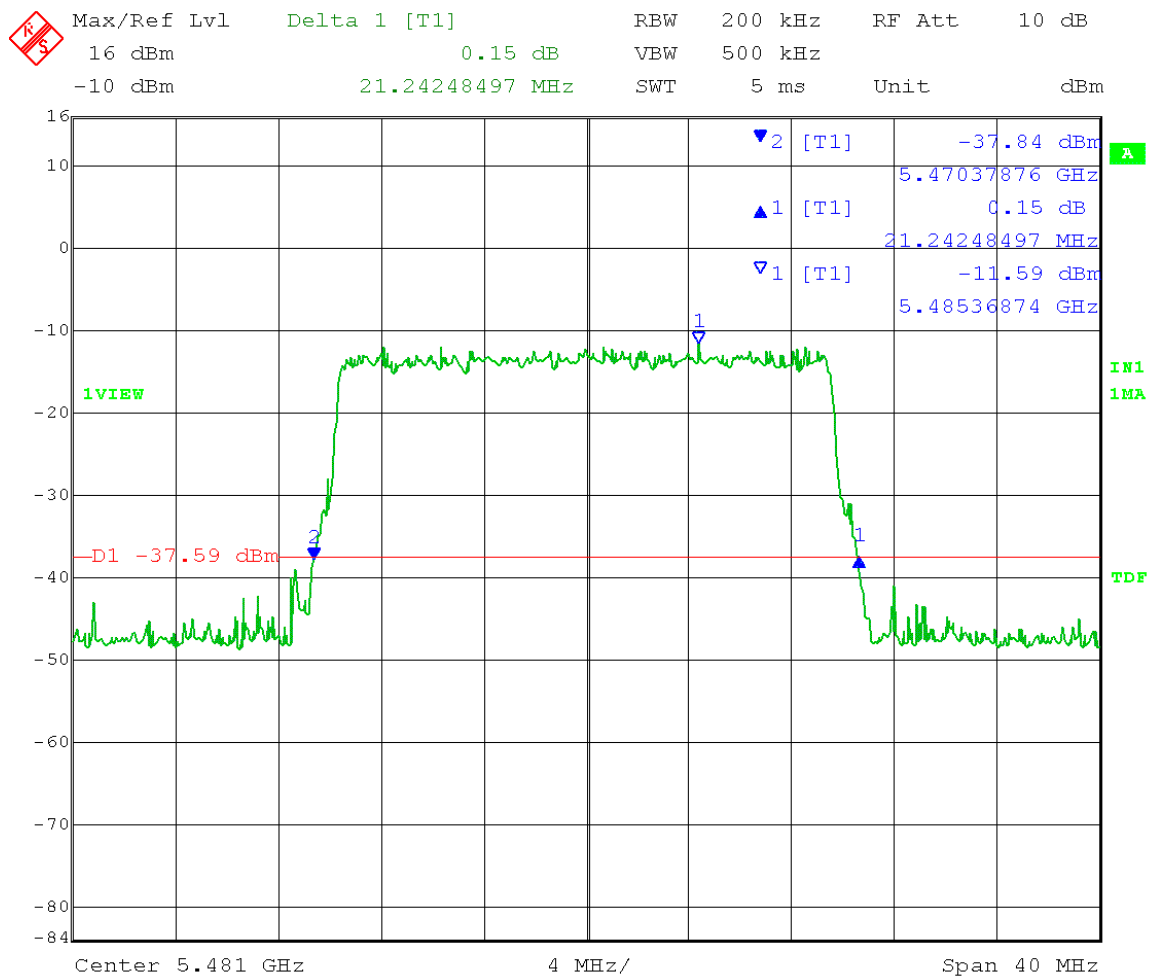


Date: 18.OCT.2013 13:34:20

Test Date: 10-17-2013
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 = 5.481 GHz 20MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

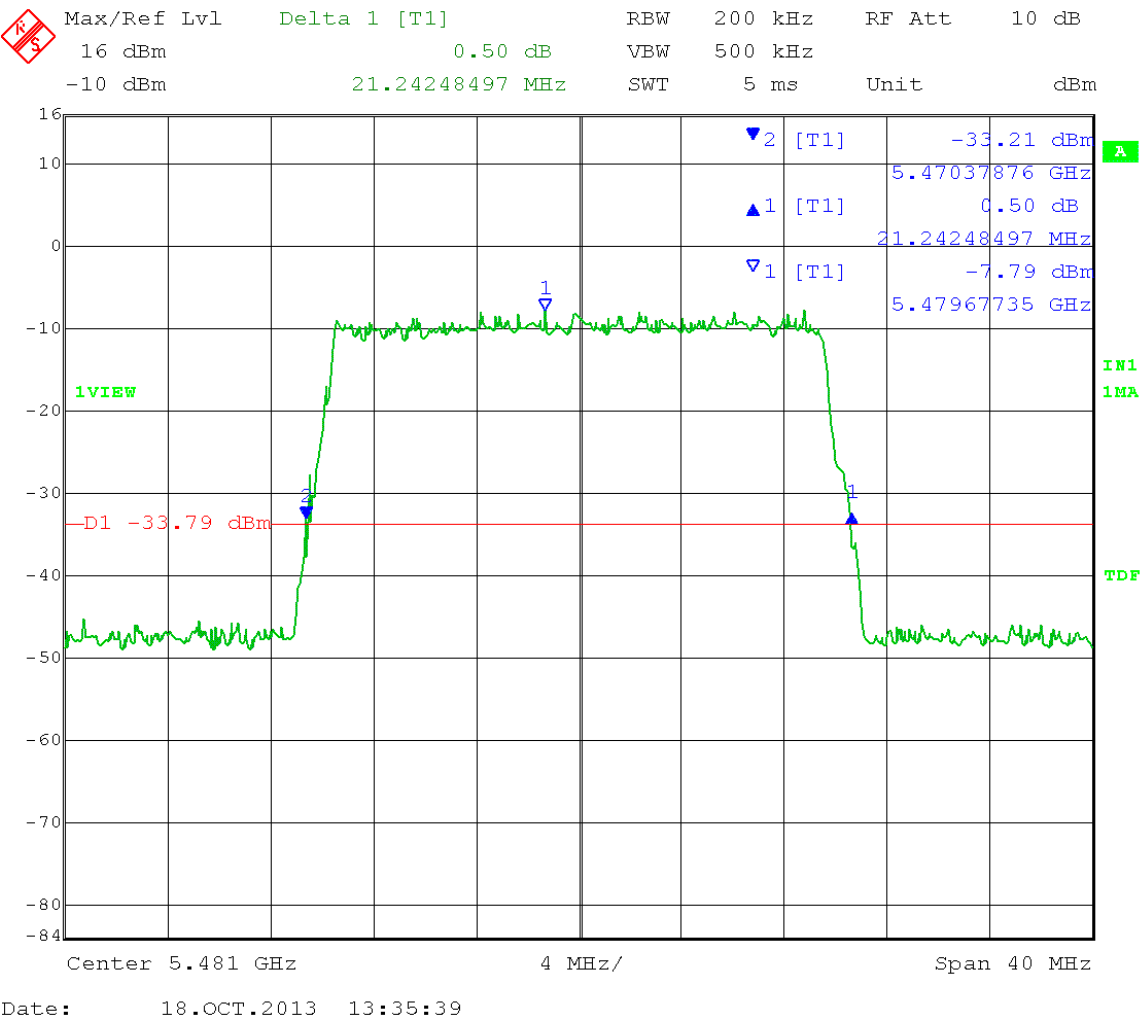
26 dB Emission Bandwidth = 21.24MHz



Date: 17.OCT.2013 15:19:37

TX 1:

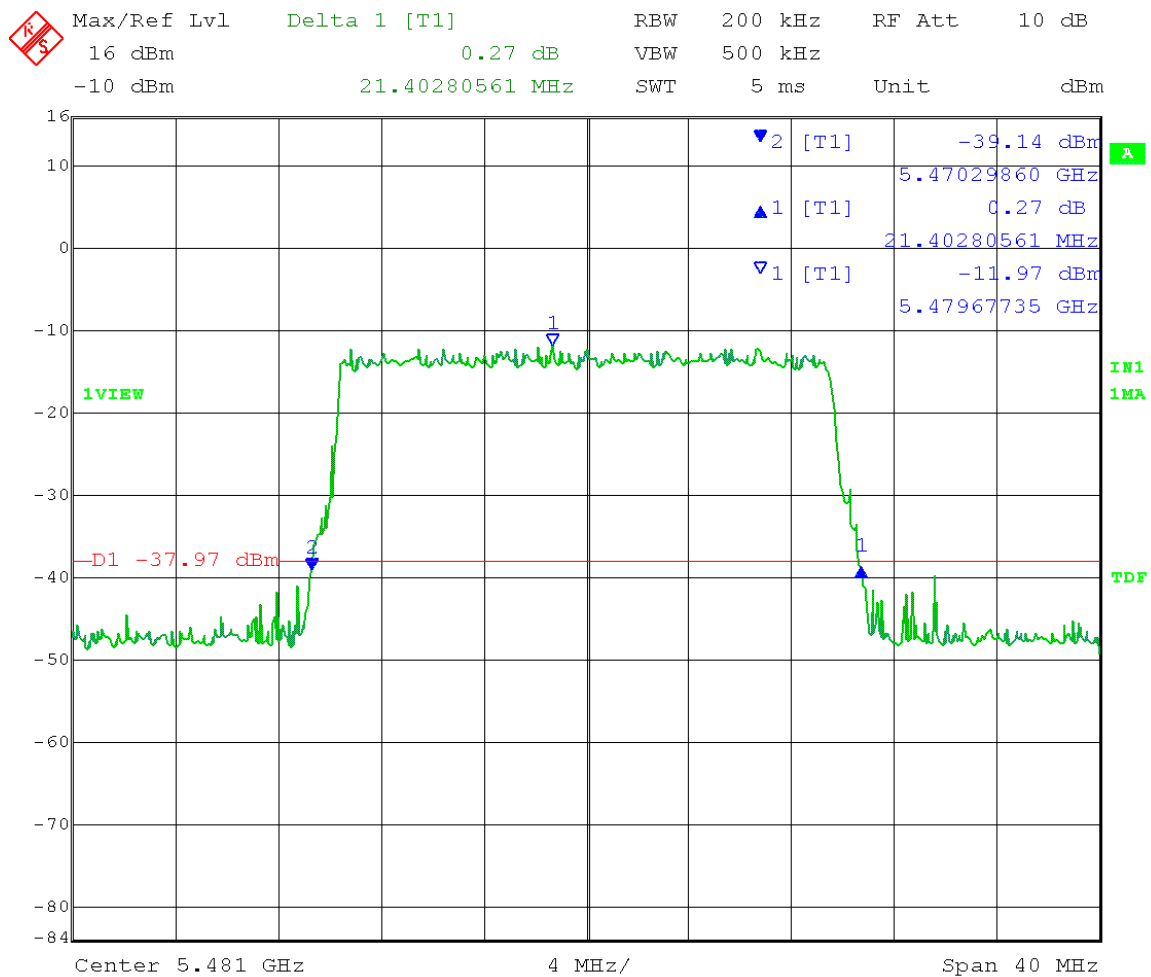
26 dB Emission Bandwidth = 21.24MHz



Test Date: 10-17-2013
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 = 5.481 GHz 20MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

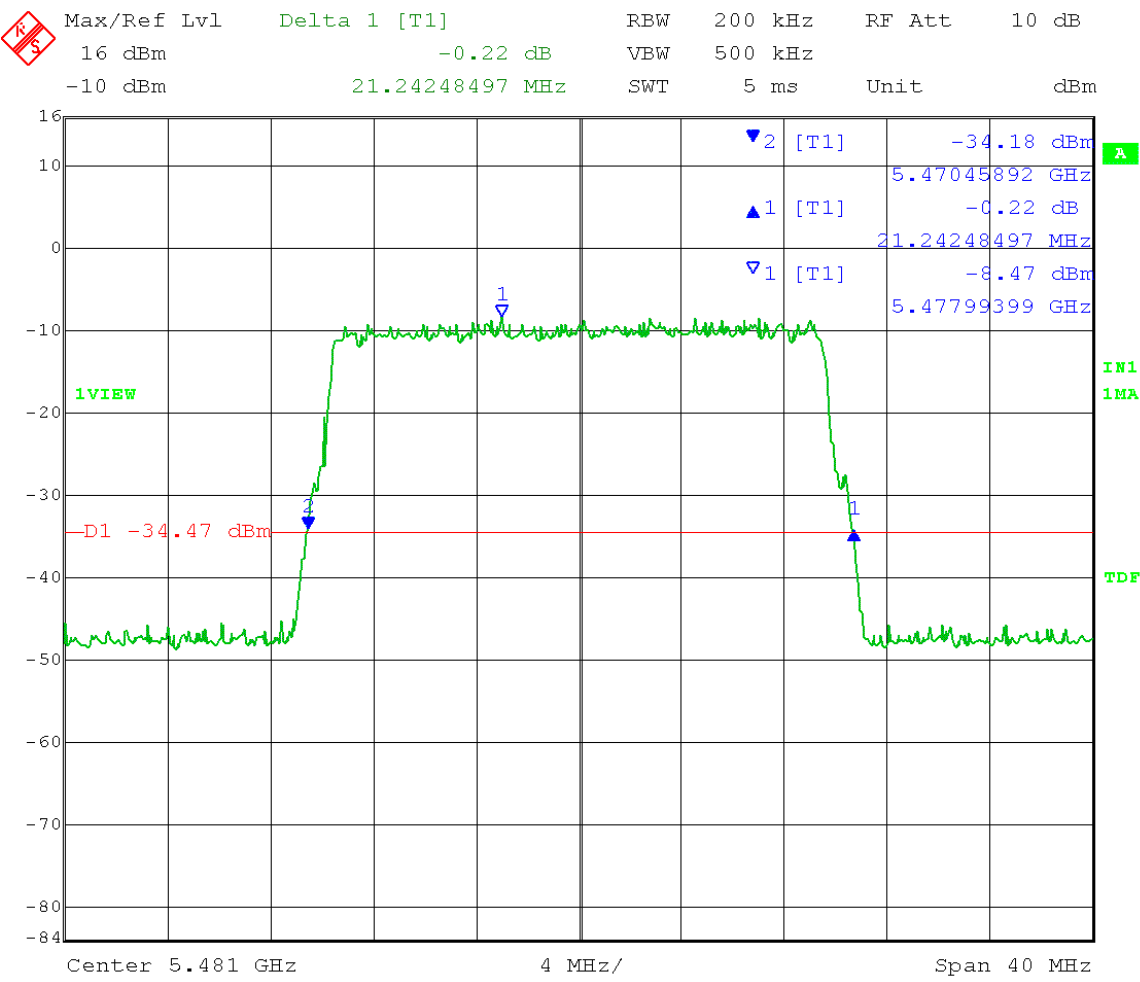
26 dB Emission Bandwidth = 21.40MHz



Date: 17.OCT.2013 15:15:52

TX 1:

26 dB Emission Bandwidth = 21.24MHz

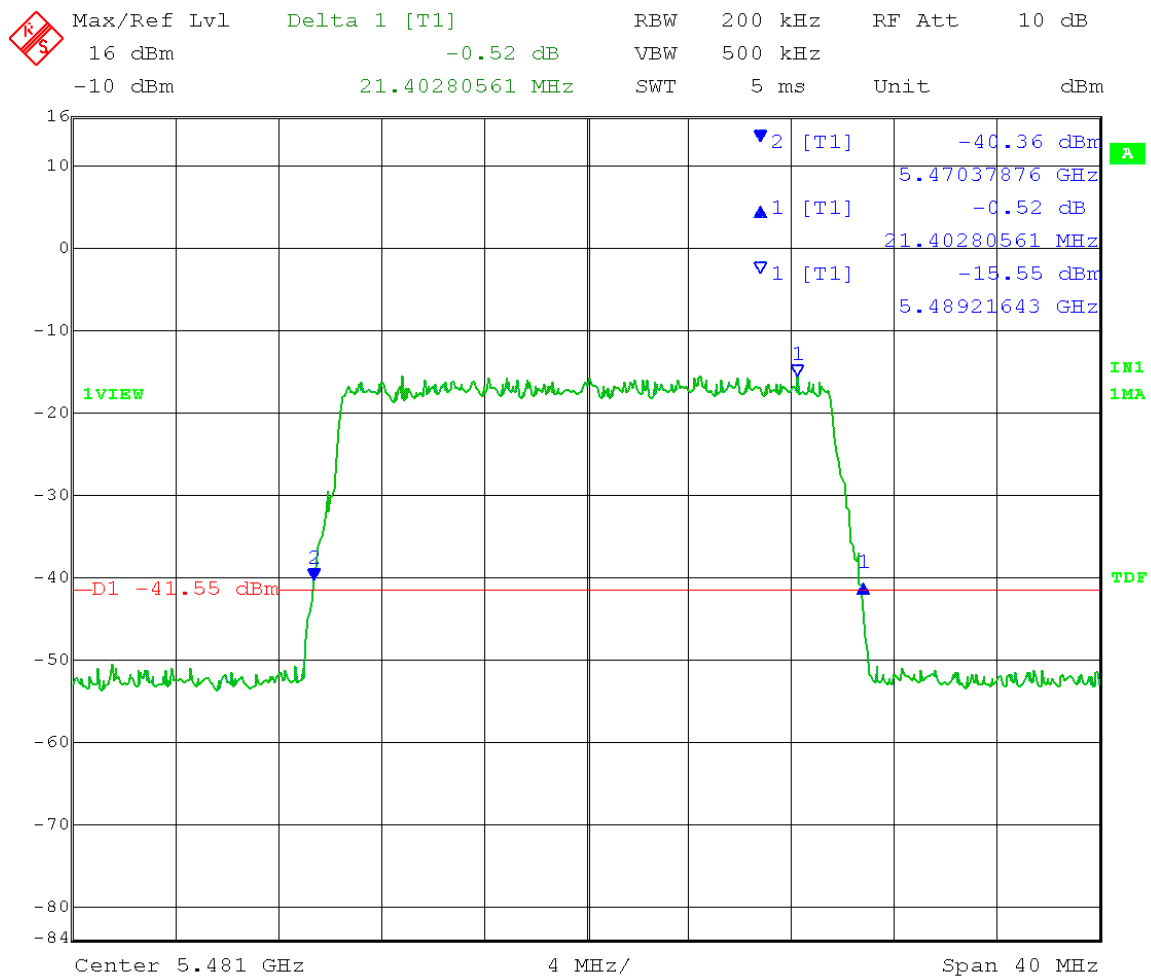


Date: 18.OCT.2013 13:37:07

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)
Low Channel: Transmit = 5.481 GHz 20MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

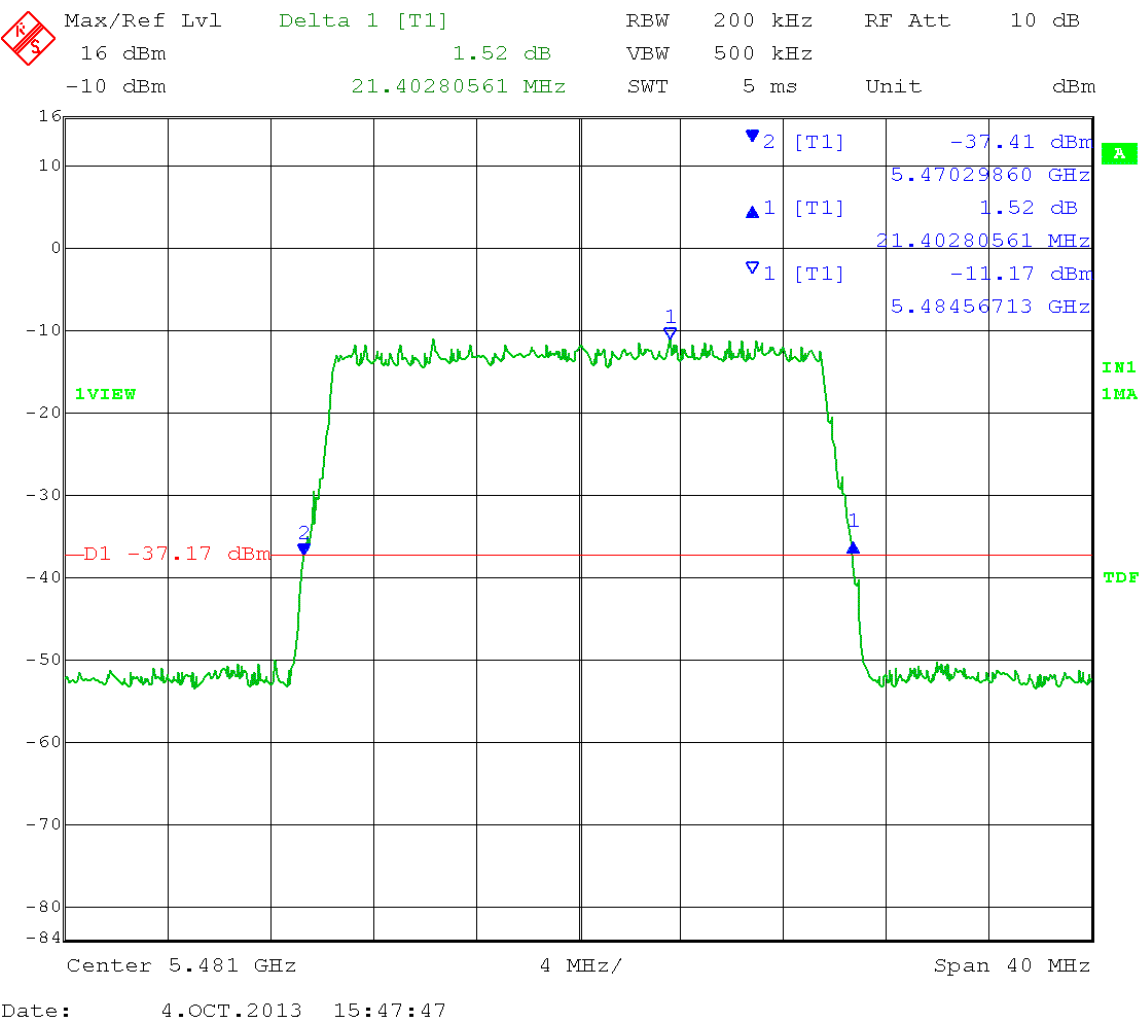
26 dB Emission Bandwidth = 21.40MHz



Date: 7.OCT.2013 10:27:26

TX 1:

26 dB Emission Bandwidth = 21.40MHz





166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 2
6154

Appendix – Measurement Data

3.0 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

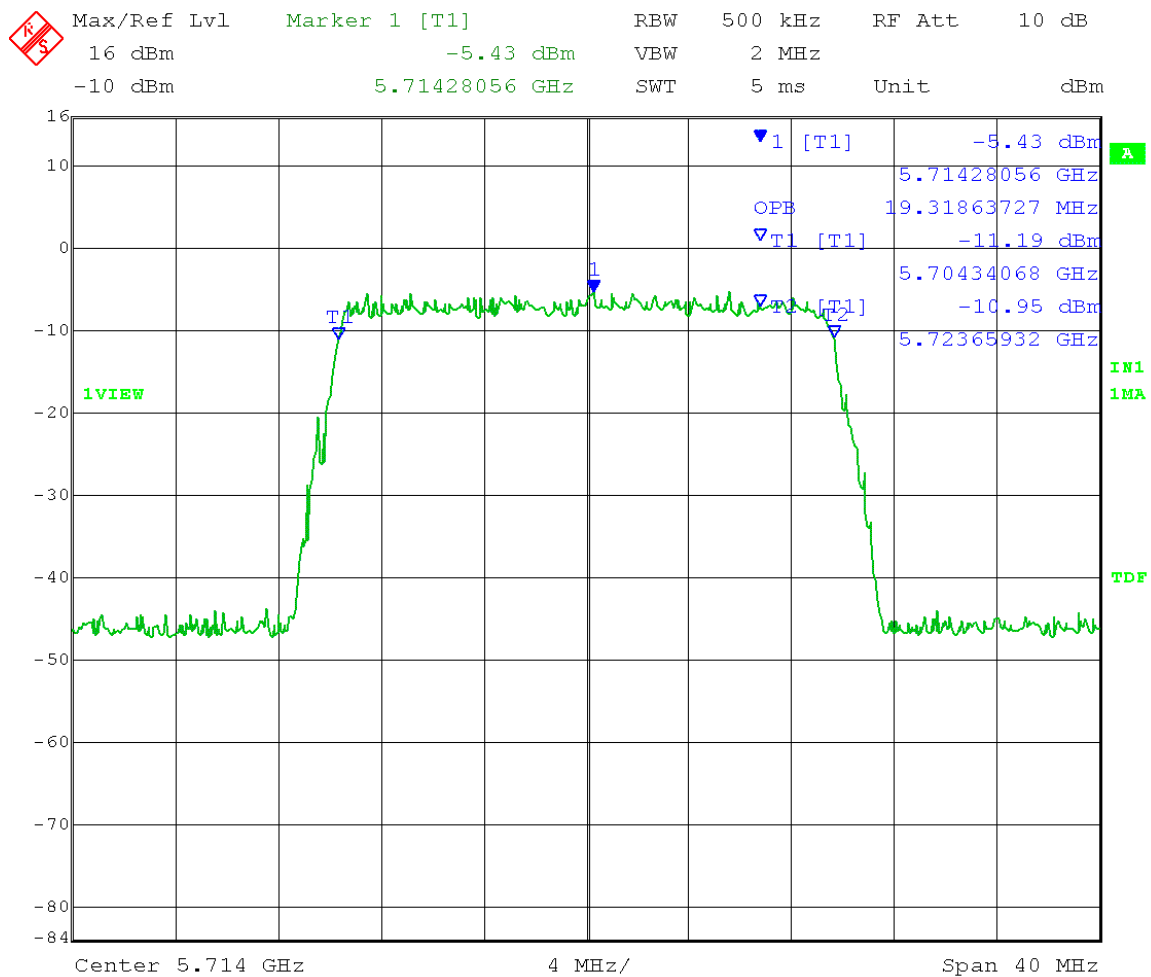
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

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

Test Date: 10-22-2013
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 = 5.714 GHz 20MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

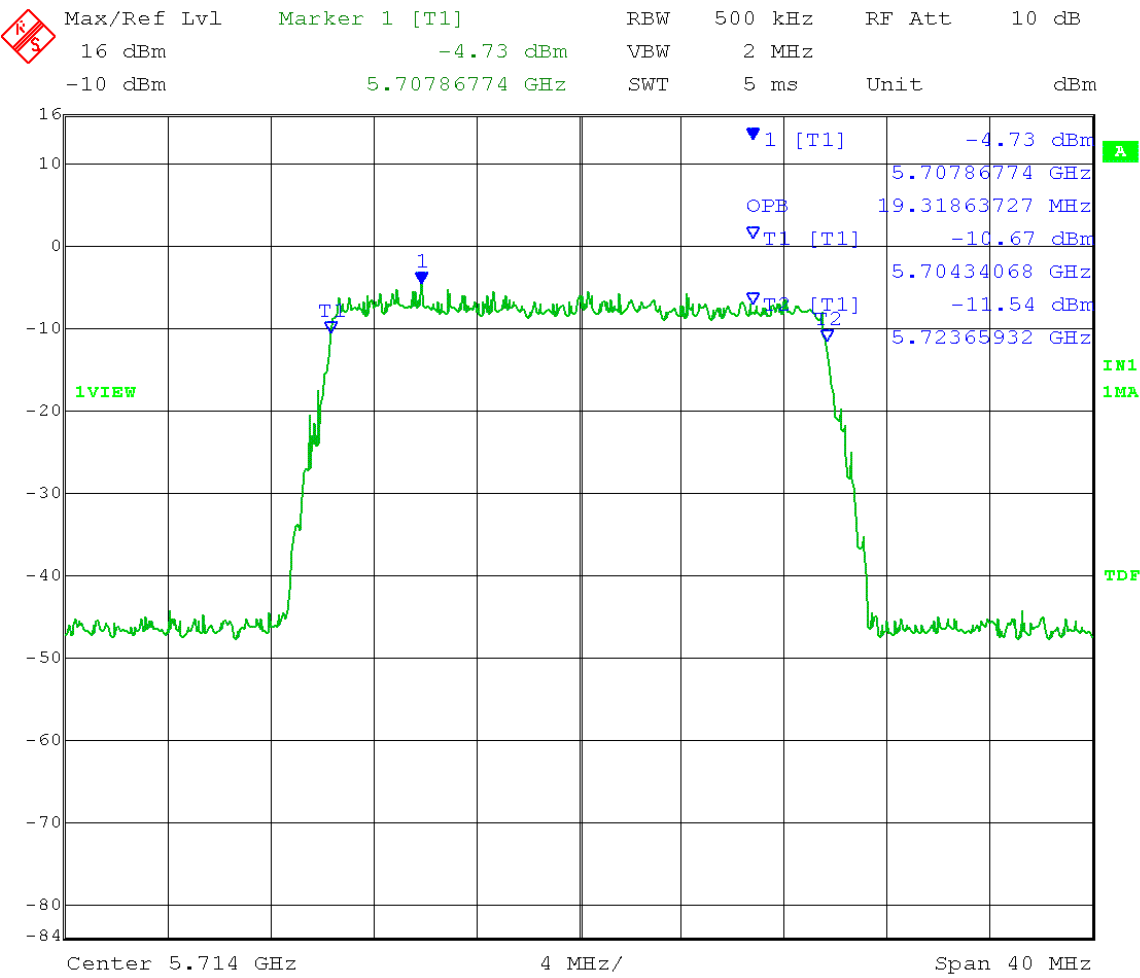
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:17:39

TX 1:

99% OBW = 19.32MHz

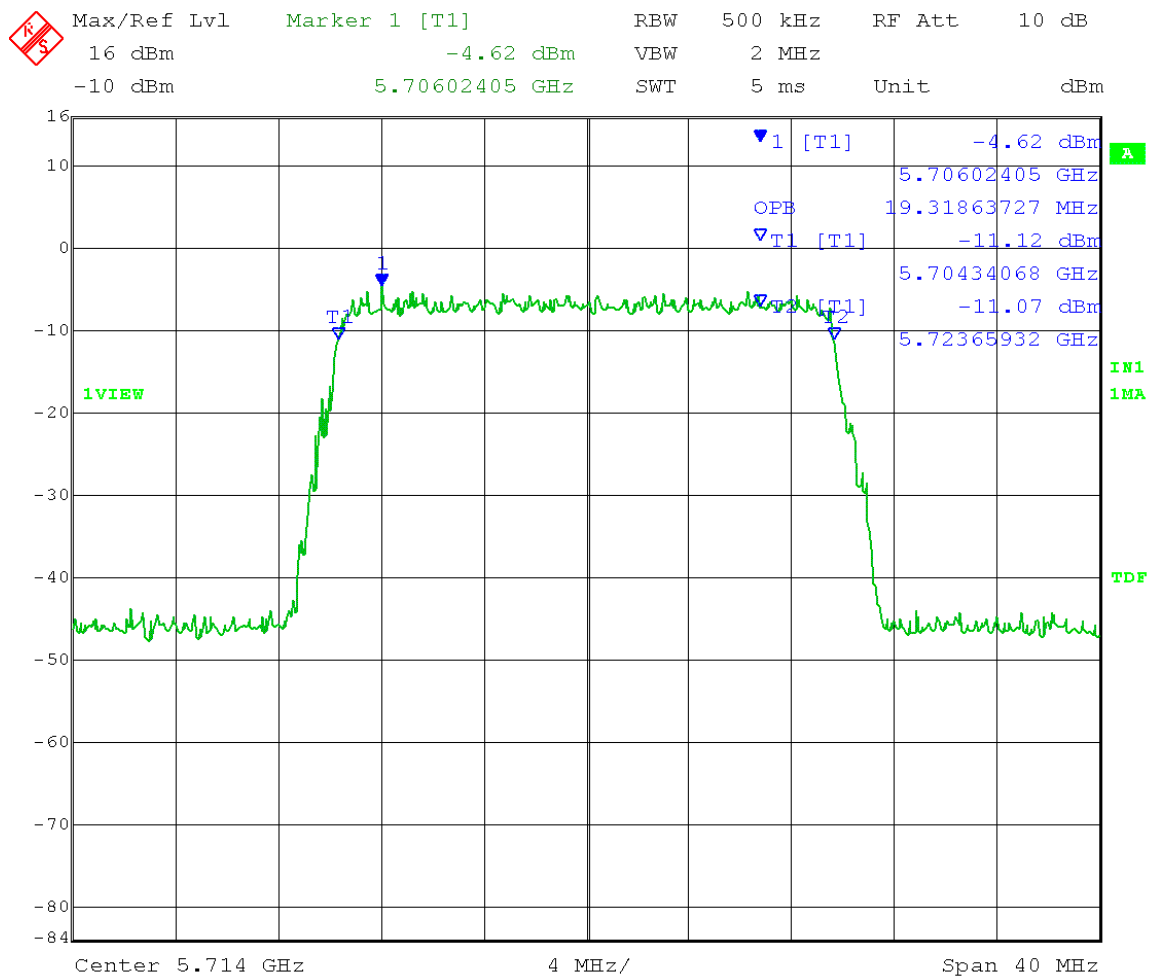


Date: 22.OCT.2013 11:06:01

Test Date: 10-22-2013
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 = 5.714 GHz 20MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

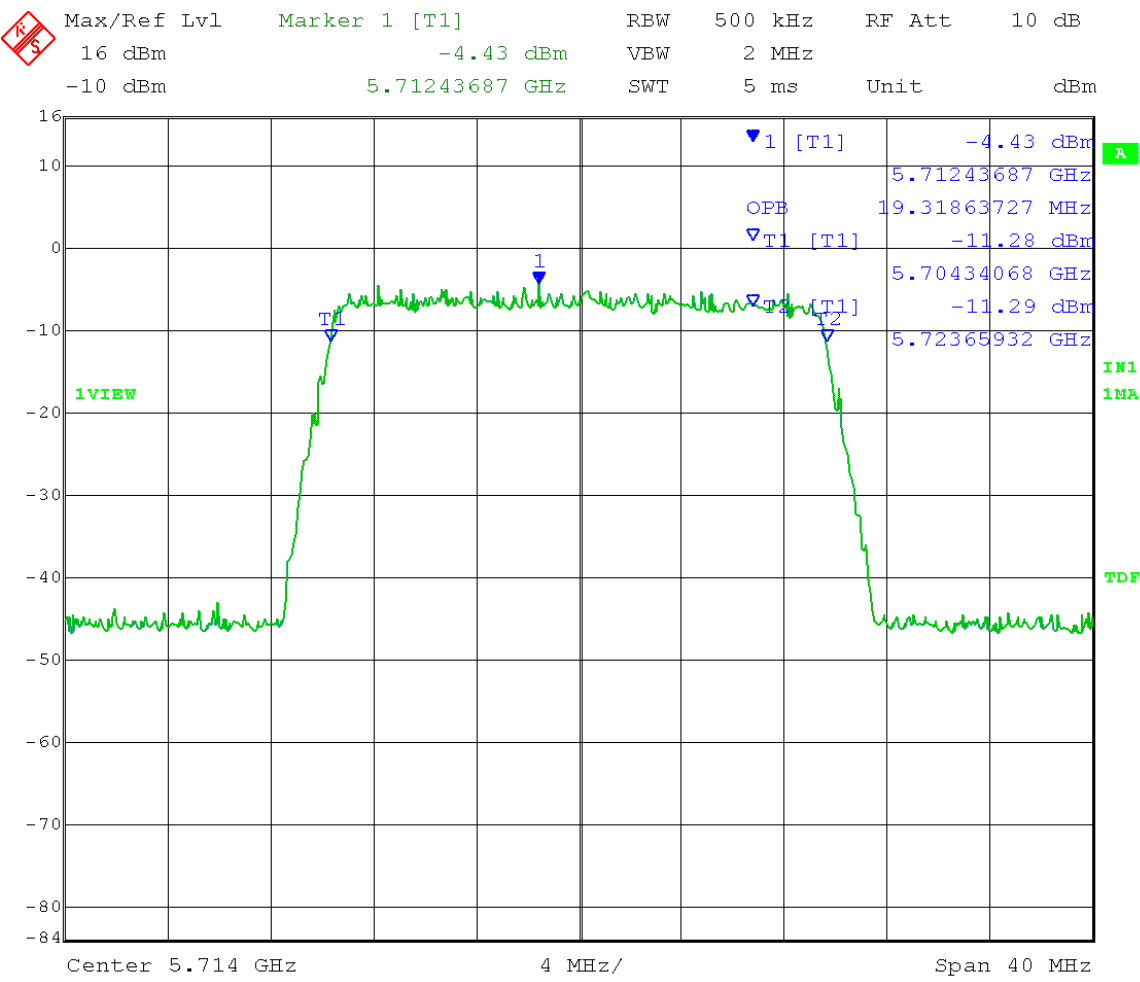
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:16:28

TX 1:

99% OBW = 19.32MHz

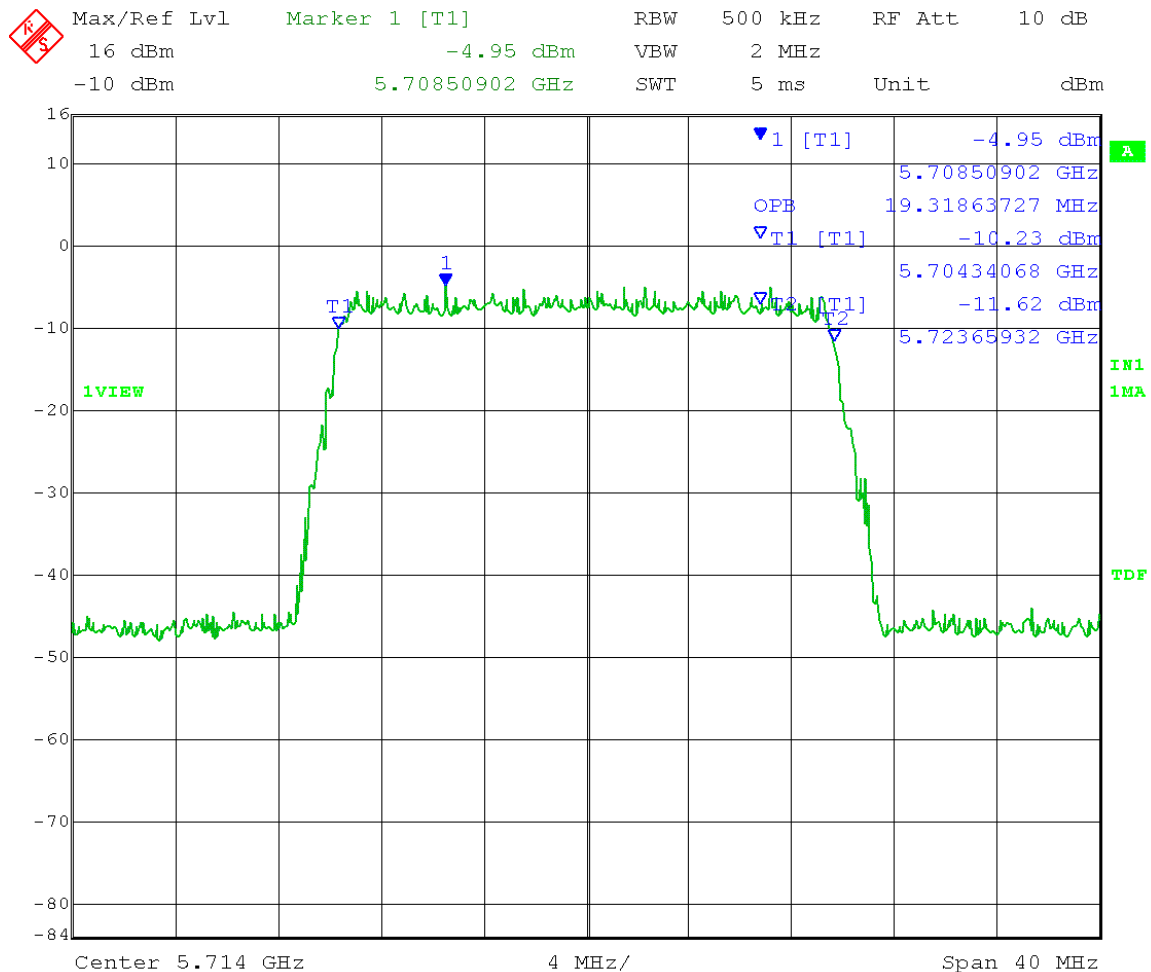


Date: 22.OCT.2013 11:07:05

Test Date: 10-22-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: 99% Occupied Bandwidth - Conducted
 Operator: Lillian Li
 Comment: FCC Test Guidelines for UNII Devices under 15.407 – OET 4/8/2013
 - D) 99% Occupied Bandwidth (Page 4)
 RBW = 500 kHz VBW = 1MHz
 High Channel: Transmit = 5.714 GHz 20MHz BW 256QAM
 Output power setting: 30 dBm eirp

Channel 0:

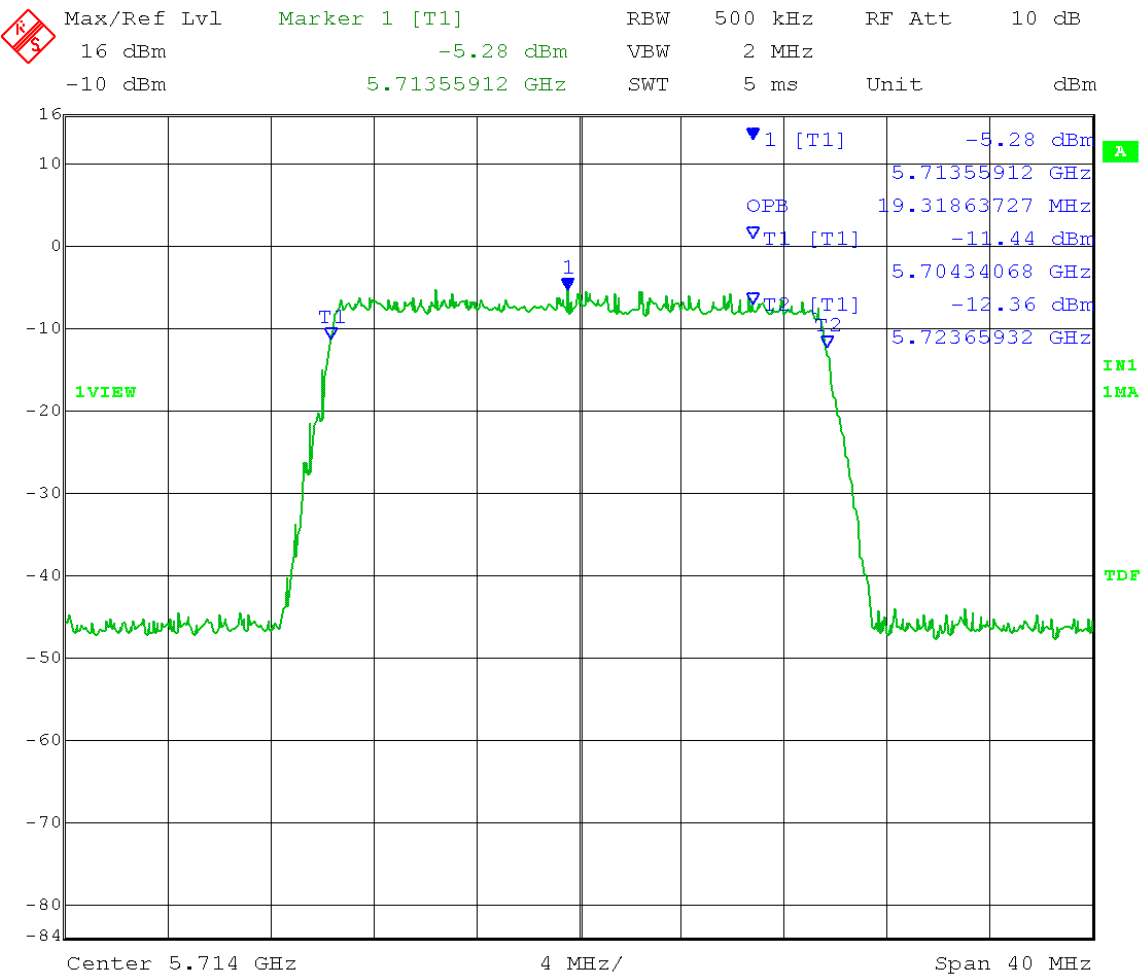
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:14:03

Channel 1:

99% OBW = 19.32MHz

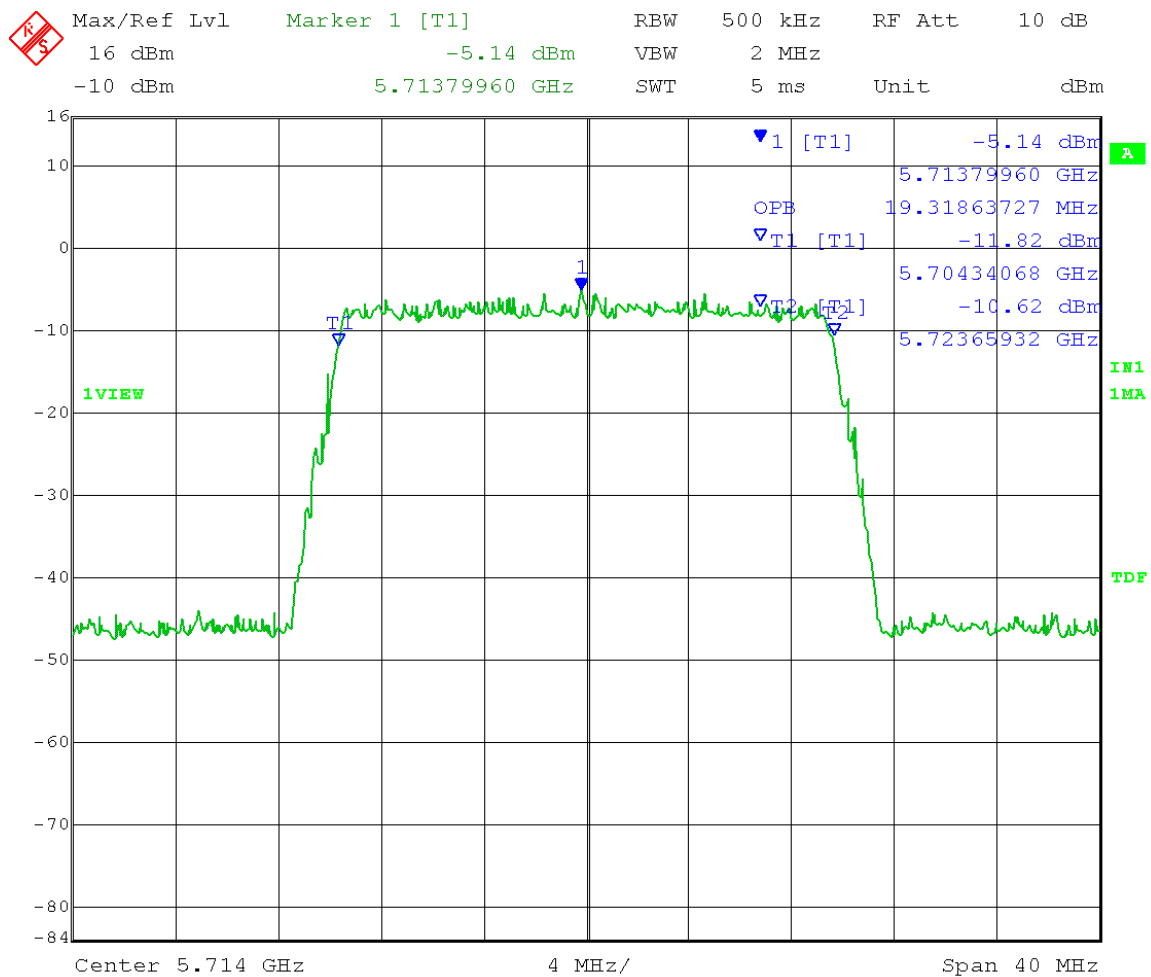


Date: 22.OCT.2013 11:07:55

Test Date: 10-22-2013
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 = 5.714 GHz 20MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

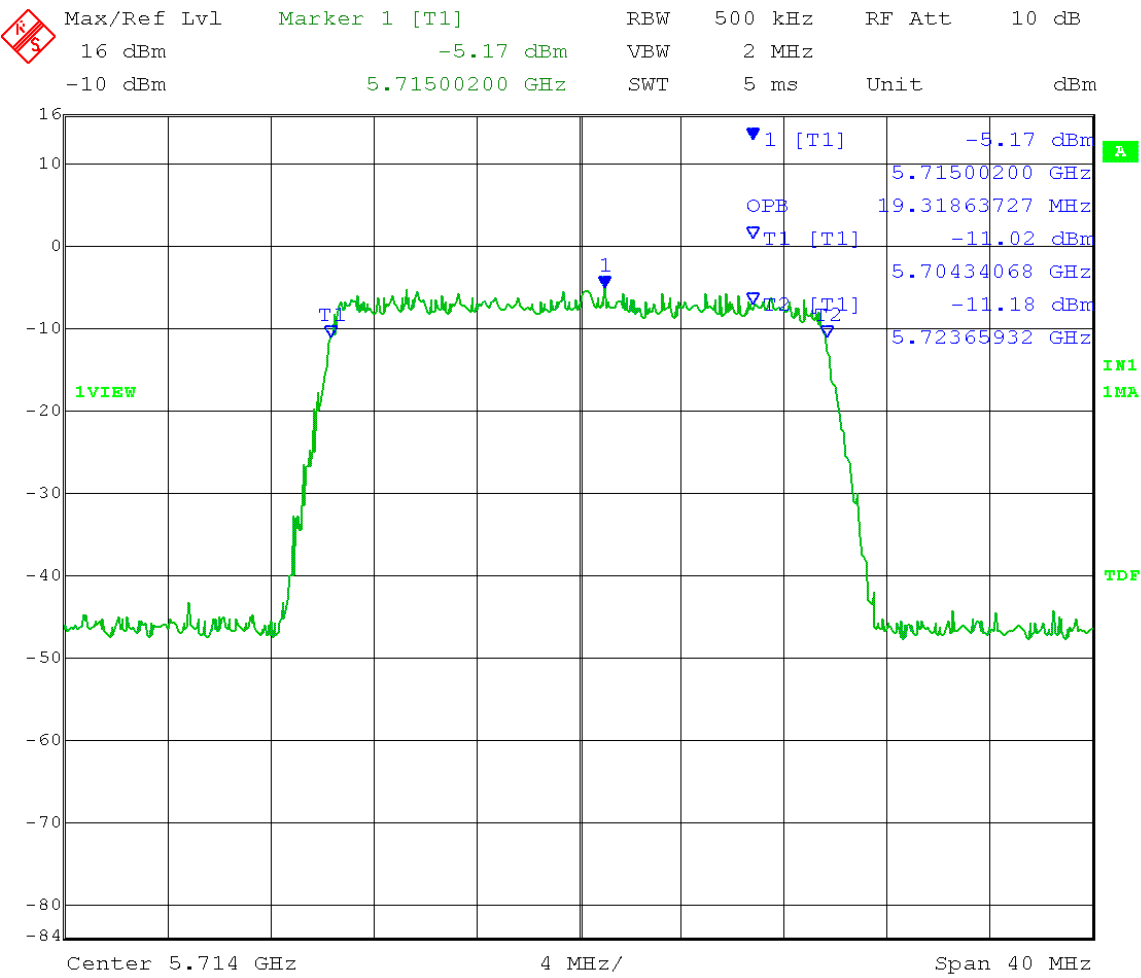
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:13:18

TX 1:

99% OBW = 19.32MHz

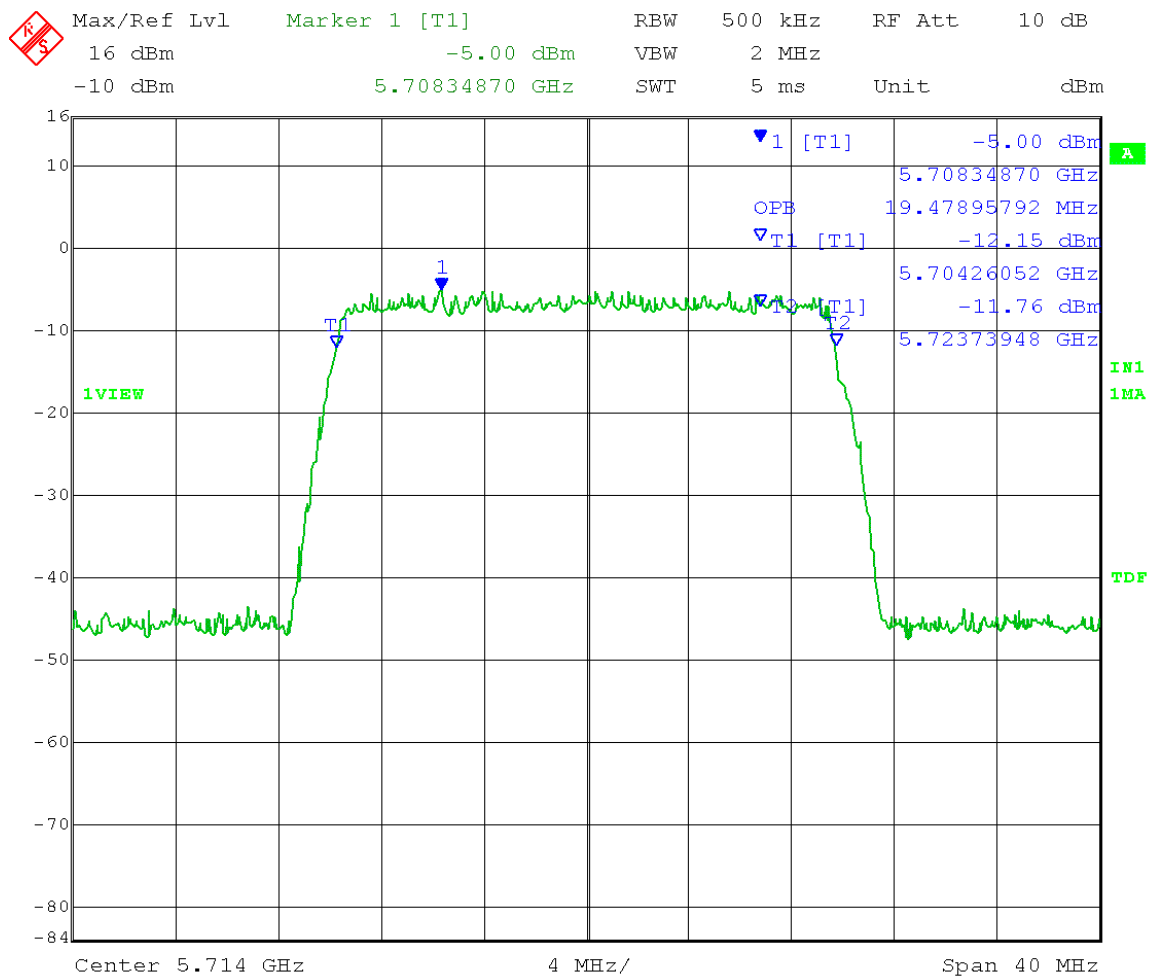


Date: 22.OCT.2013 11:09:13

Test Date: 10-22-2013
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 = 5.714 GHz 20MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

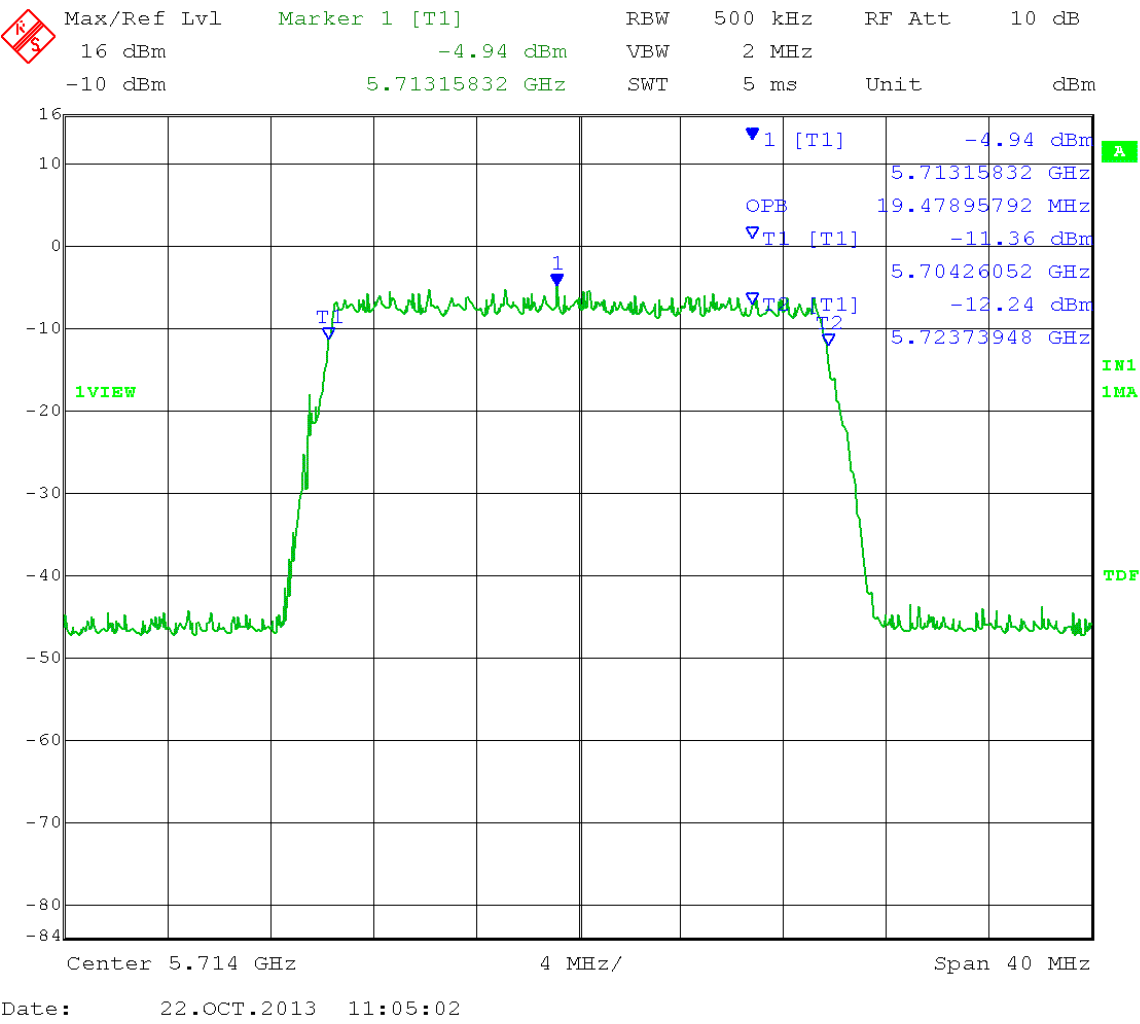
99% OBW = 19.48MHz



Date: 22.OCT.2013 11:18:29

TX 1:

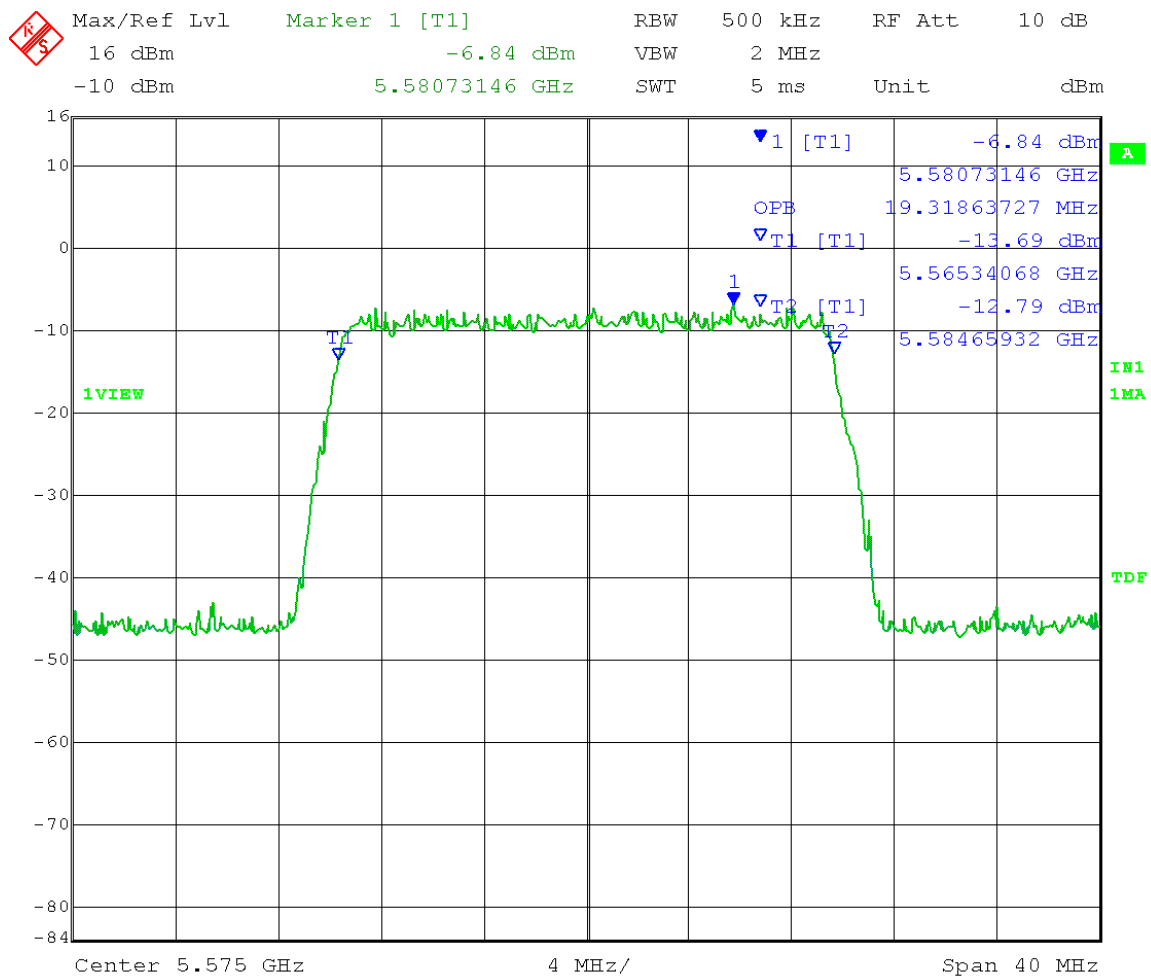
99% OBW = 19.48MHz



Test Date: 10-22-2013
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 20MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

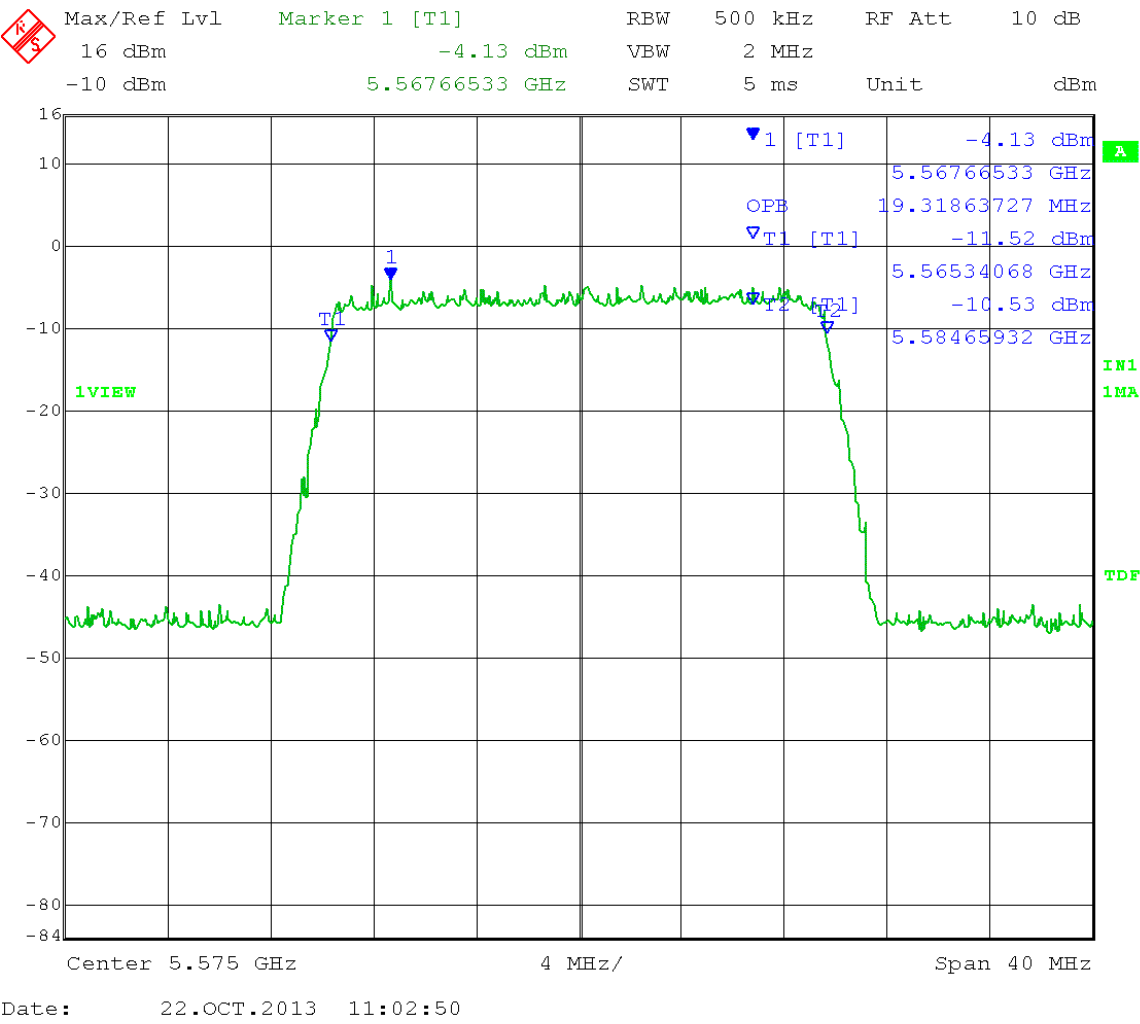
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:21:00

TX 1:

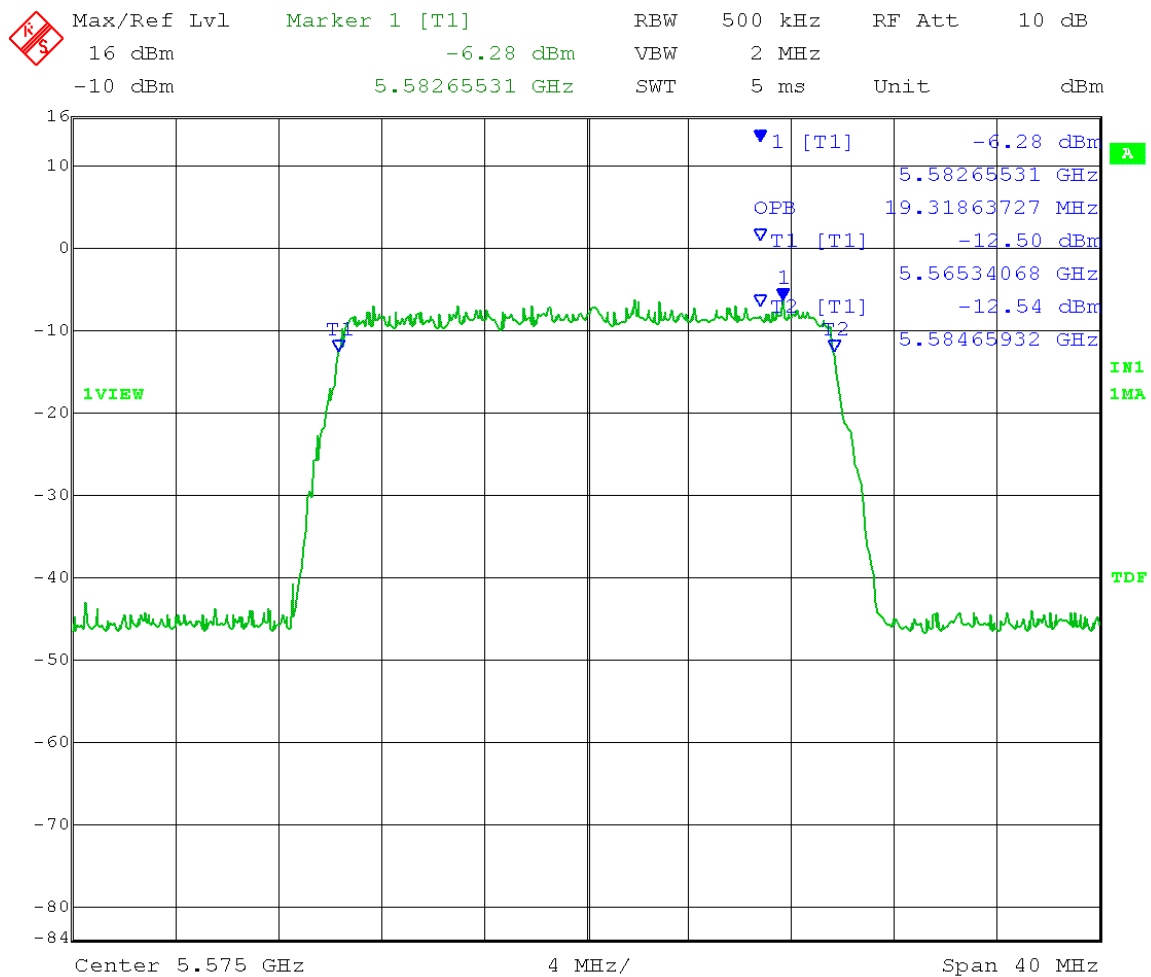
99% OBW = 19.32MHz



Test Date: 10-22-2013
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 20MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

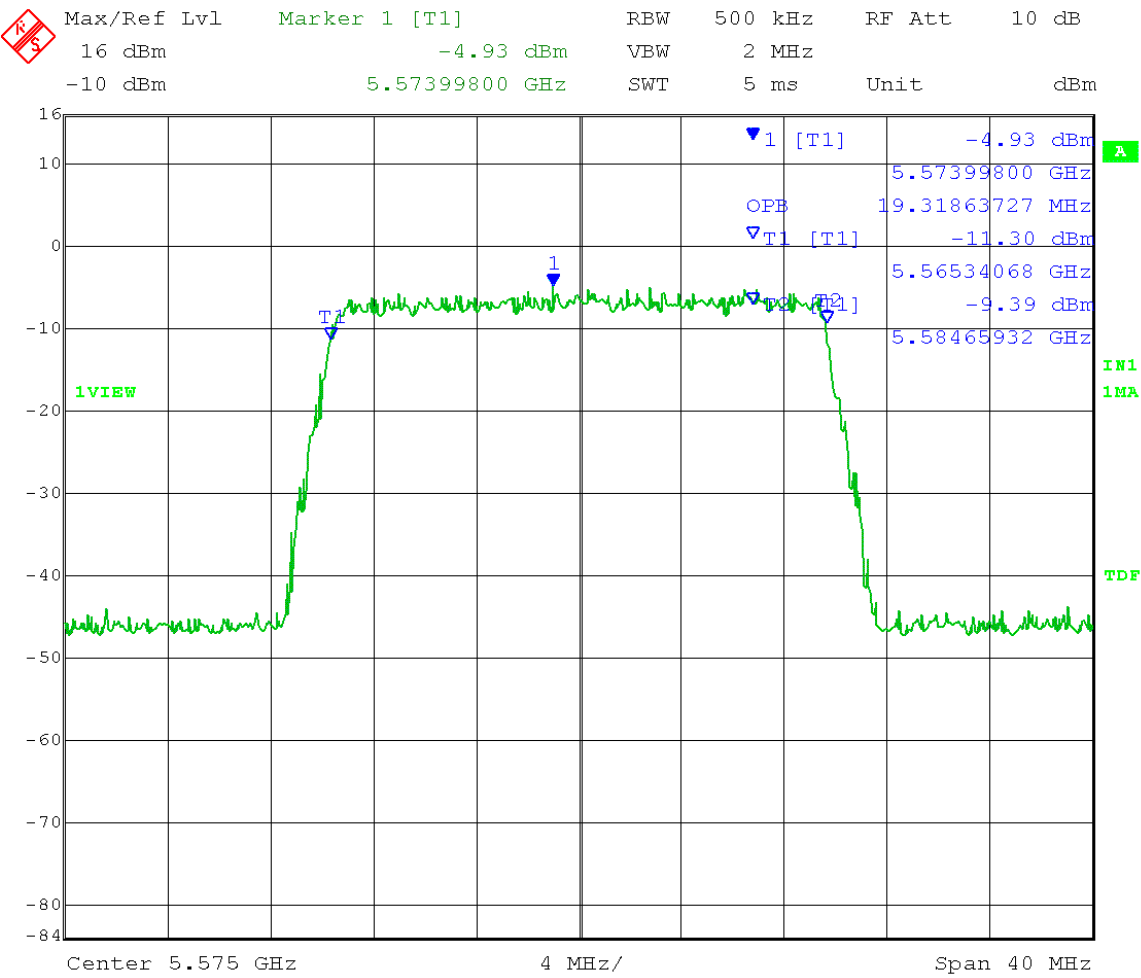
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:21:52

TX 1:

99% OBW = 19.32MHz

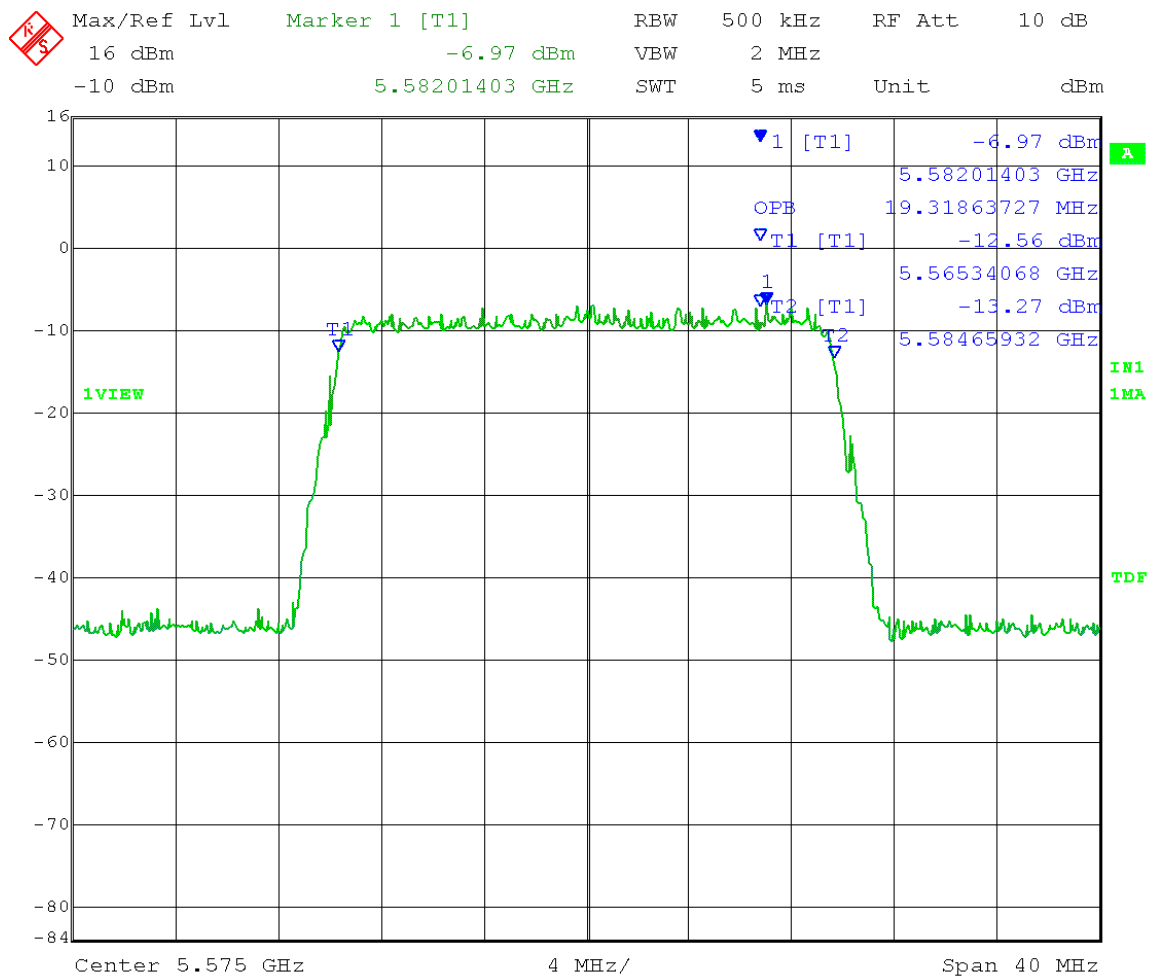


Date: 22.OCT.2013 11:01:58

Test Date: 10-22-2013
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 20MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

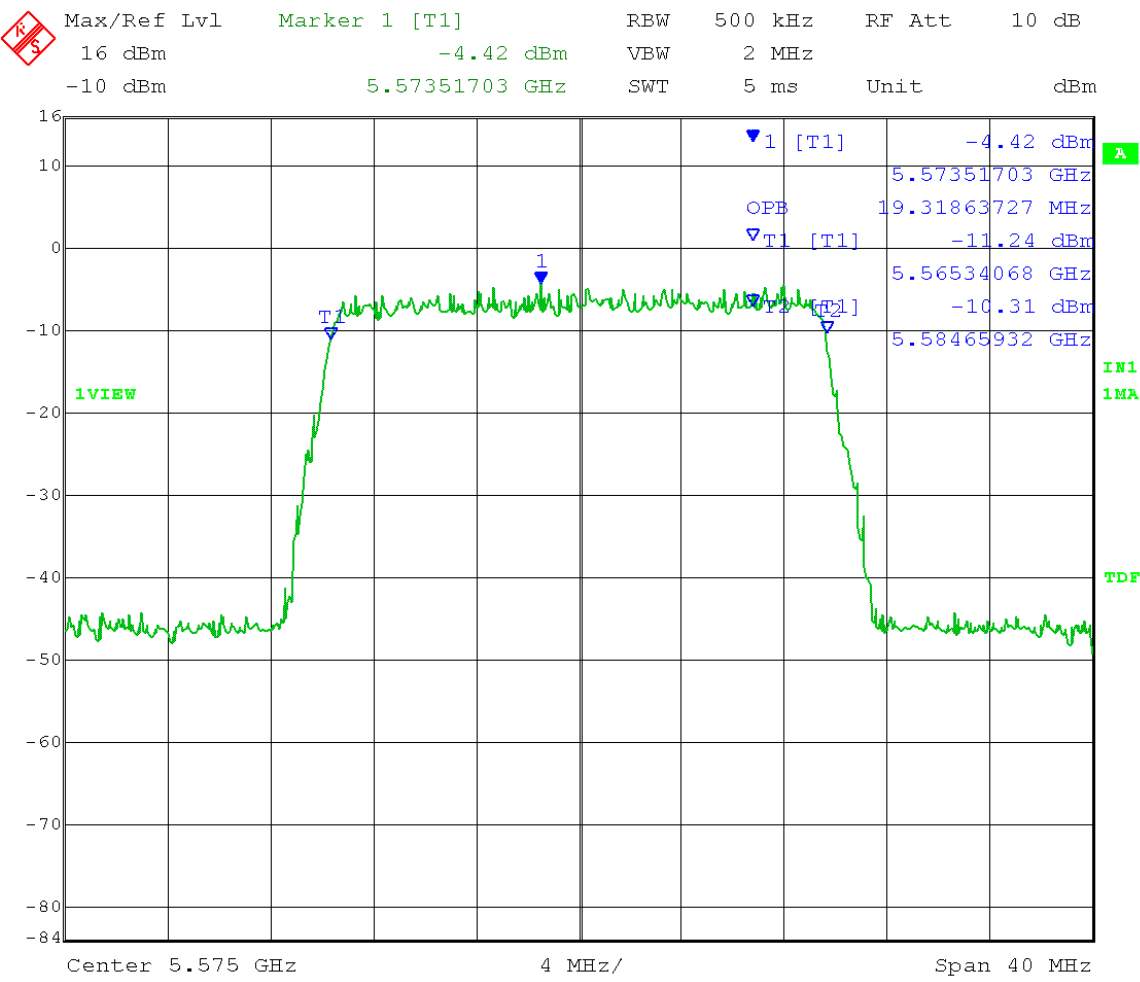
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:22:43

TX 1:

99% OBW = 19.32MHz

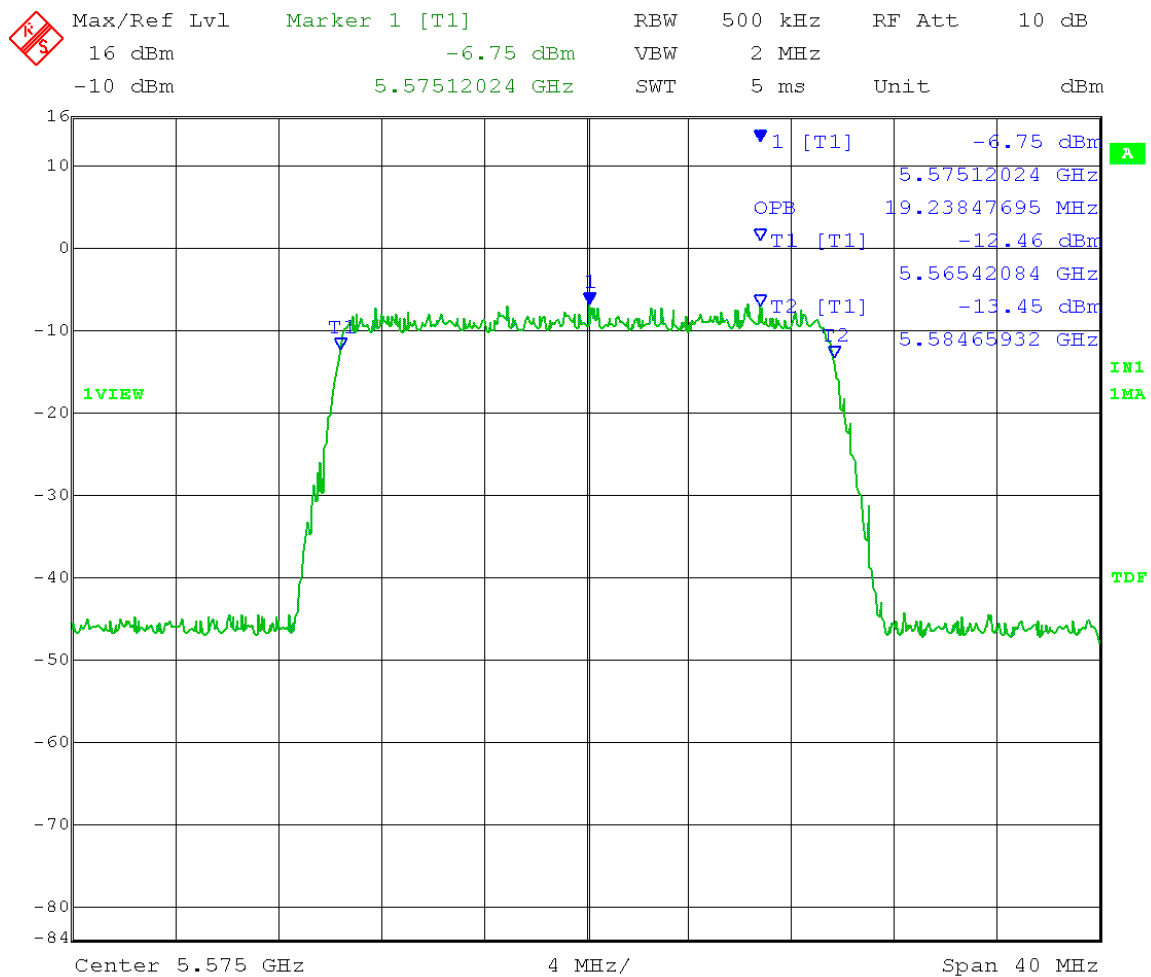


Date: 22.OCT.2013 11:01:20

Test Date: 10-22-2013
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 20MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

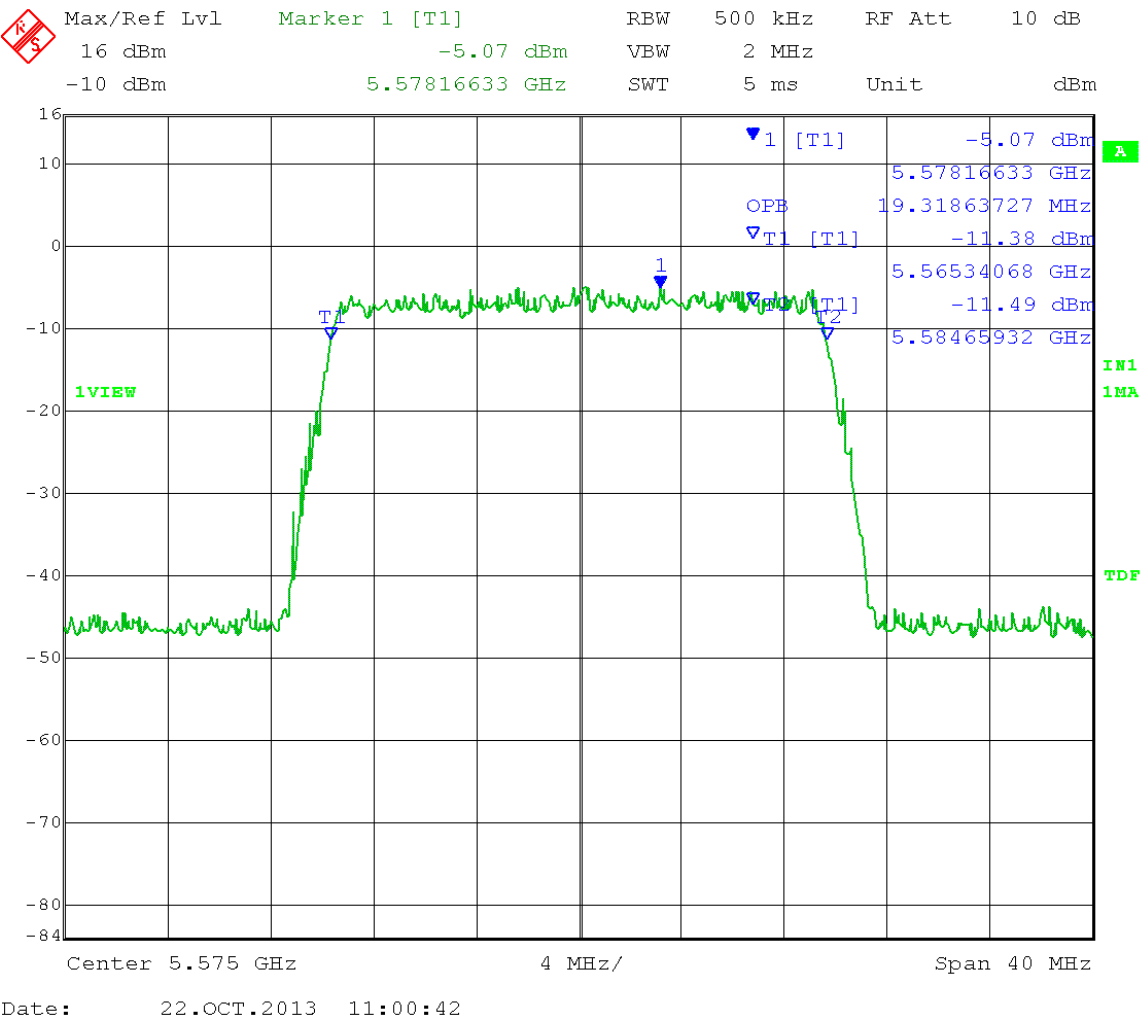
99% OBW = 19.24MHz



Date: 22.OCT.2013 11:23:33

TX 1:

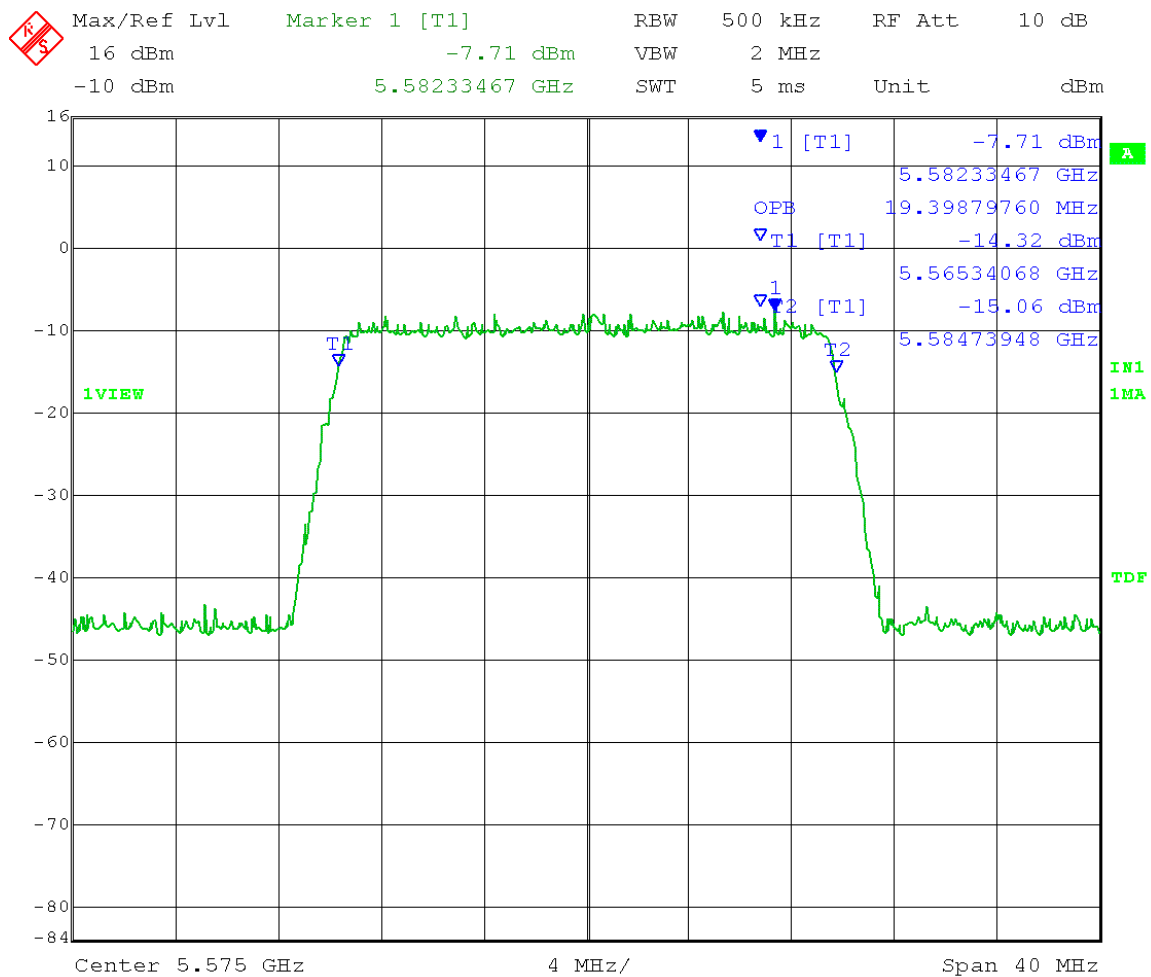
99% OBW = 19.32MHz



Test Date: 10-22-2013
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 20MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

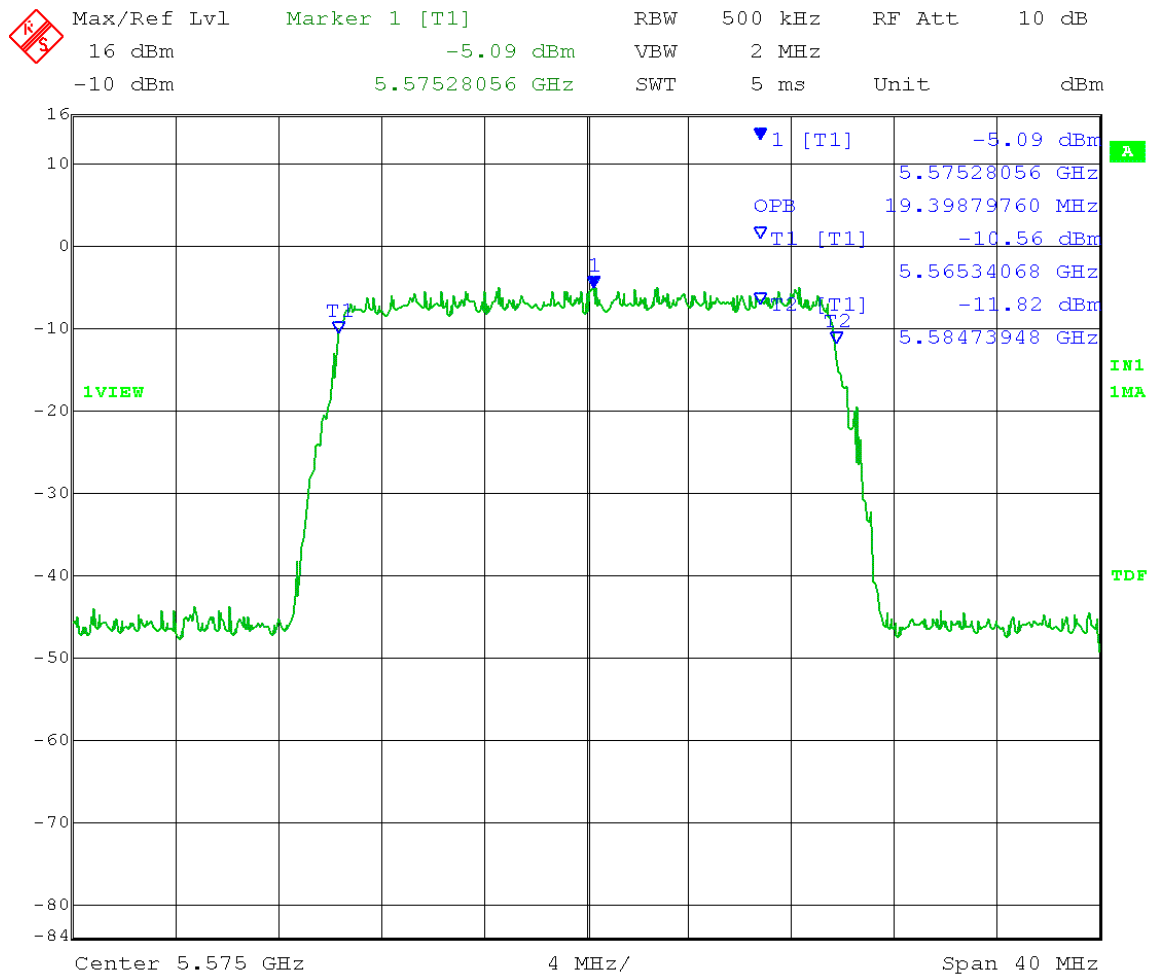
99% OBW = 19.40MHz



Date: 22.OCT.2013 11:20:13

TX 1:

99% OBW = 19.40MHz

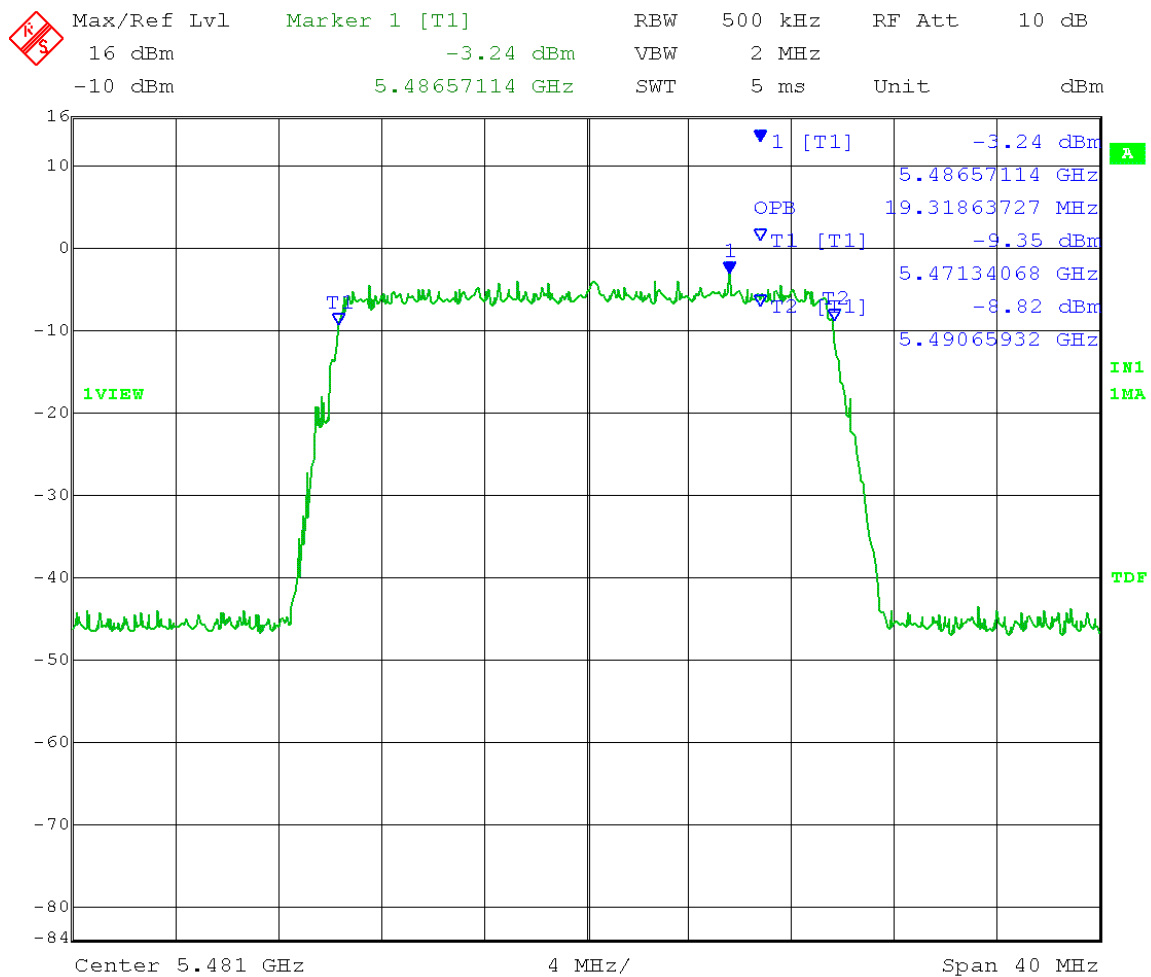


Date: 22.OCT.2013 11:03:54

Test Date: 10-22-2013
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 = 5.481 GHz 20MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

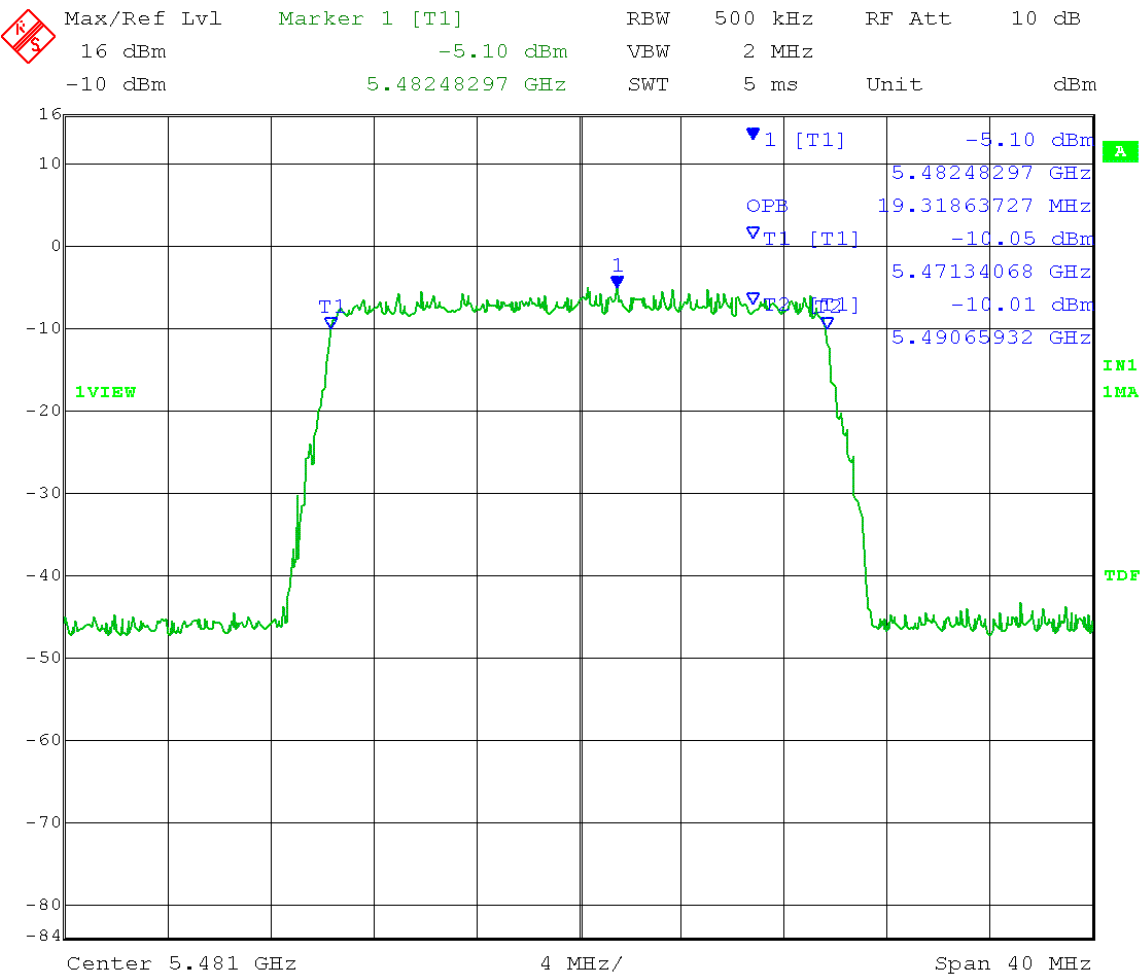
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:27:16

TX 1:

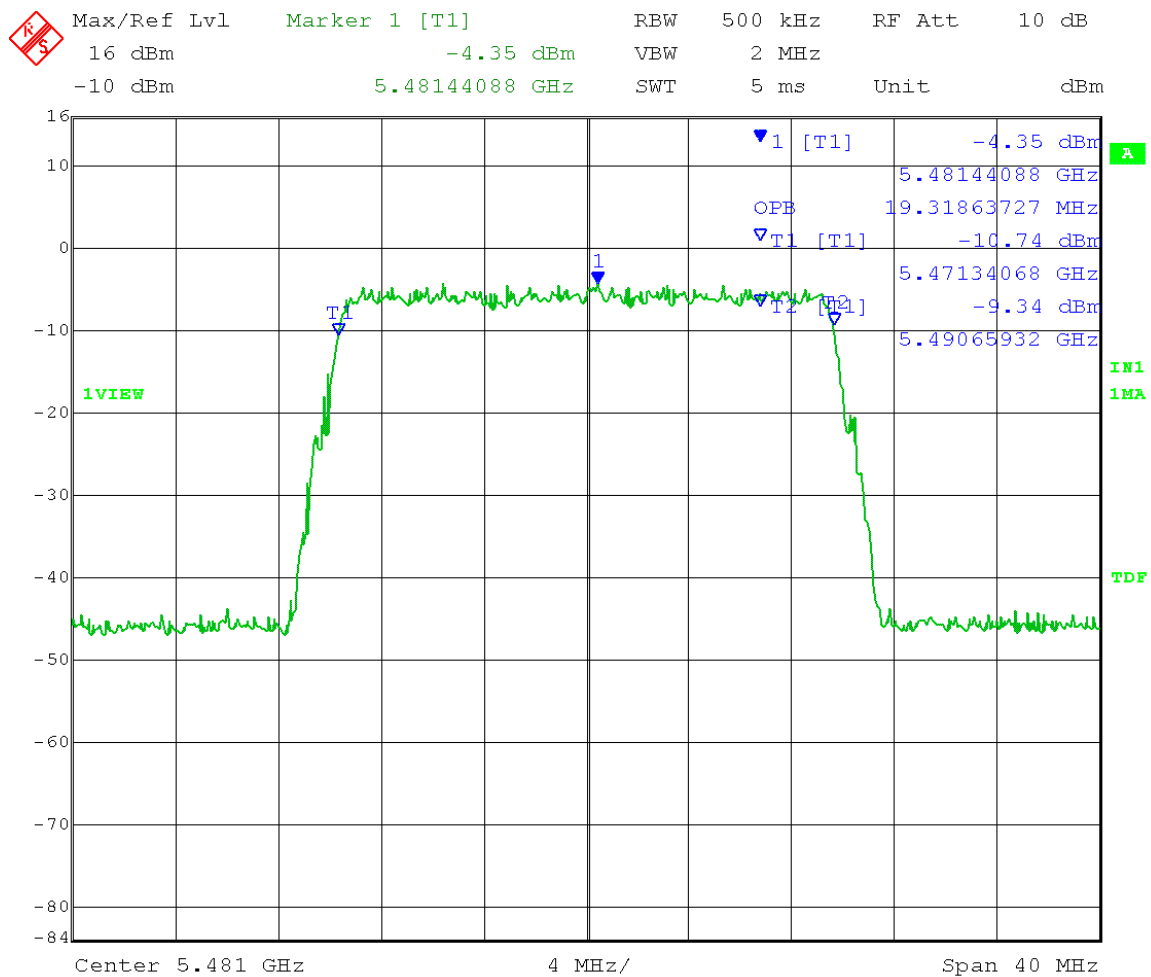
99% OBW = 19.32MHz



Test Date: 10-22-2013
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 = 5.481 GHz 20MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

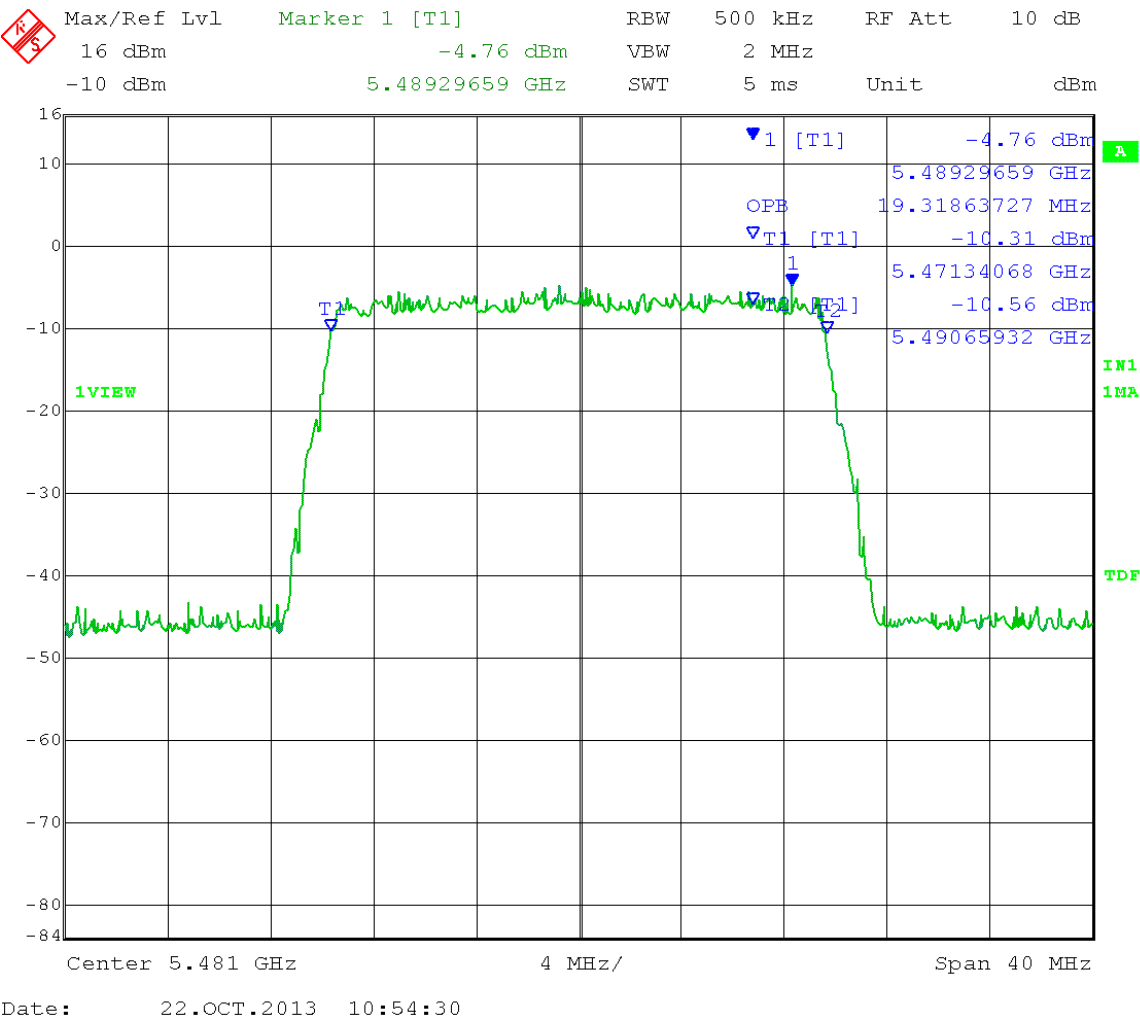
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:26:36

TX 1:

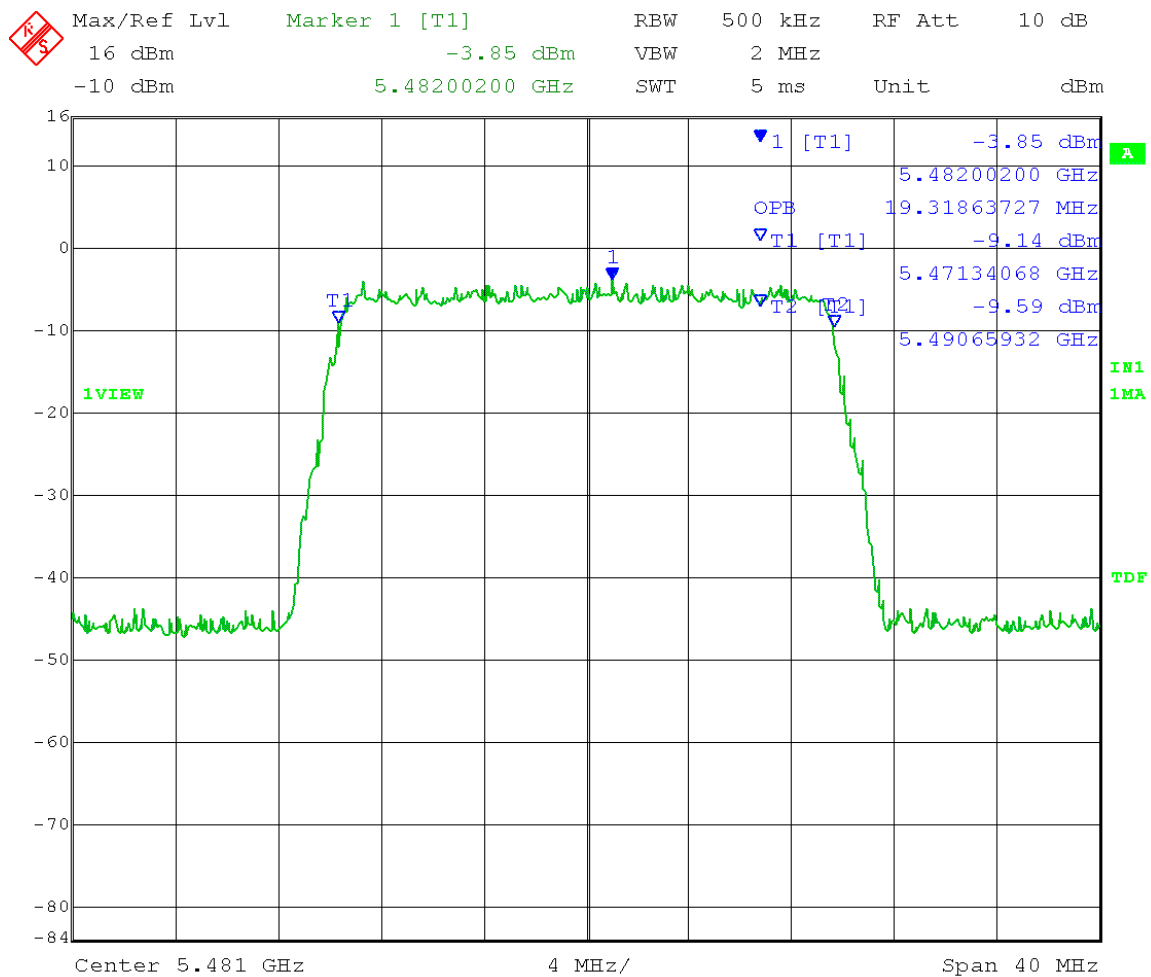
99% OBW = 19.32MHz



Test Date: 10-22-2013
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 = 5.481 GHz 20MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

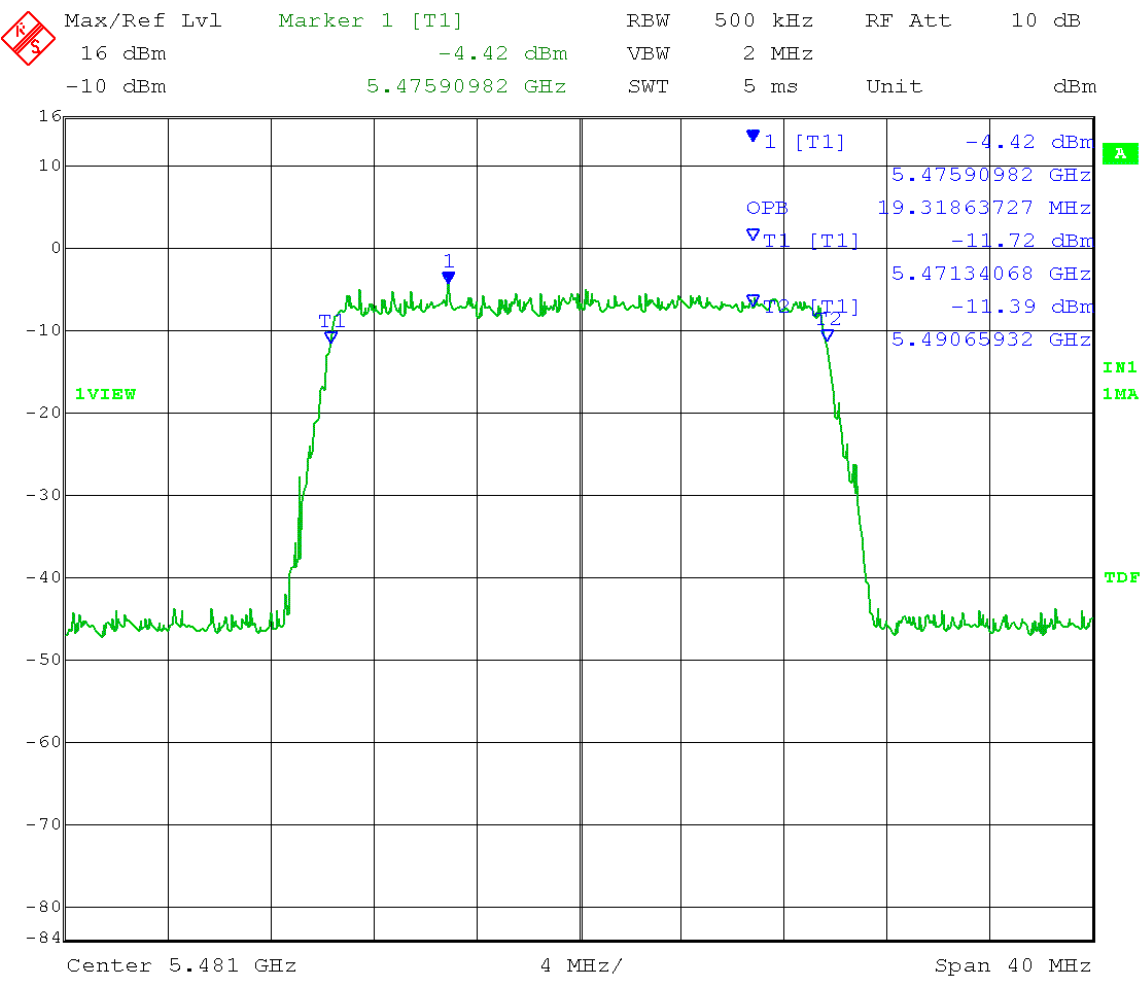
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:25:56

TX 1:

99% OBW = 19.32MHz

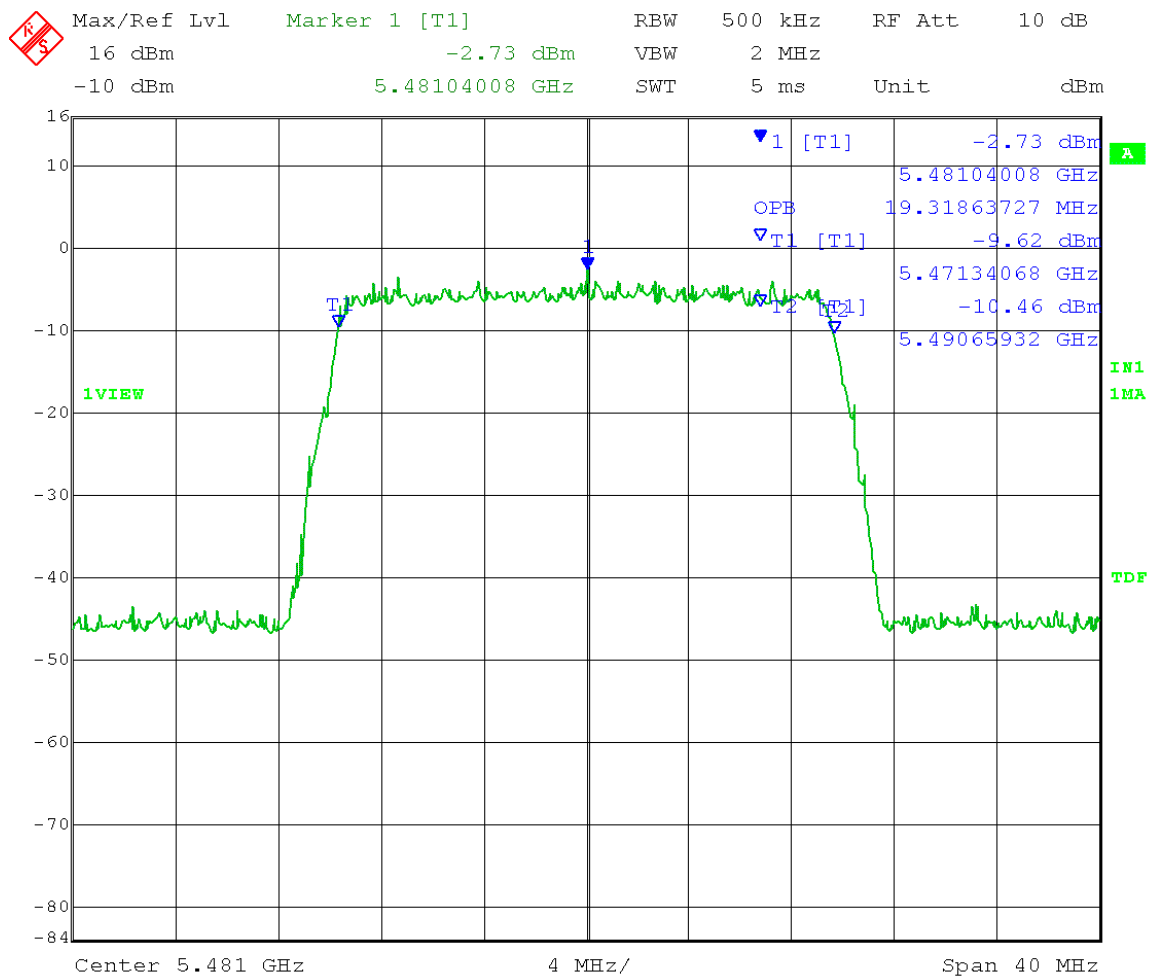


Date: 22.OCT.2013 10:55:15

Test Date: 10-22-2013
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 = 5.481 GHz 20MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

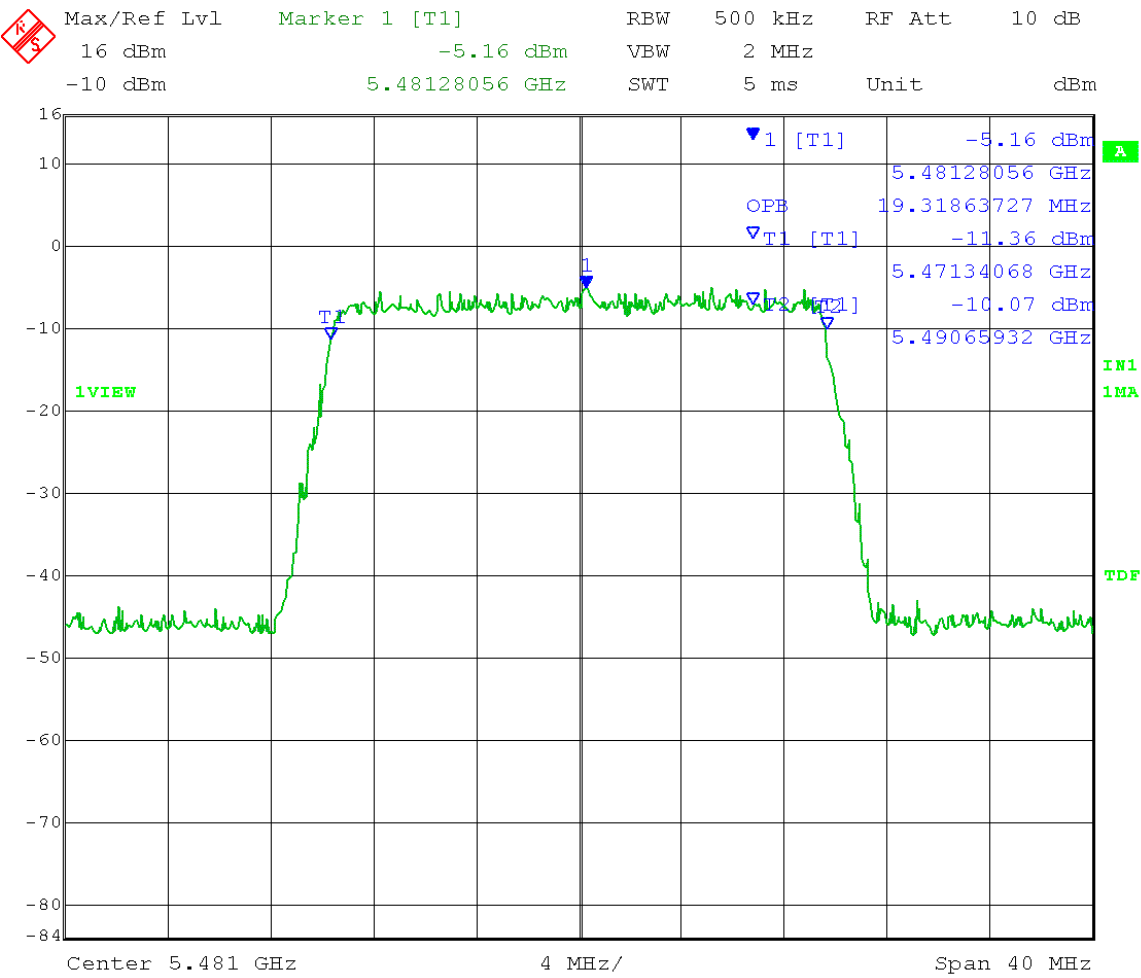
99% OBW = 19.32MHz



Date: 22.OCT.2013 11:24:46

TX 1:

99% OBW = 19.32MHz

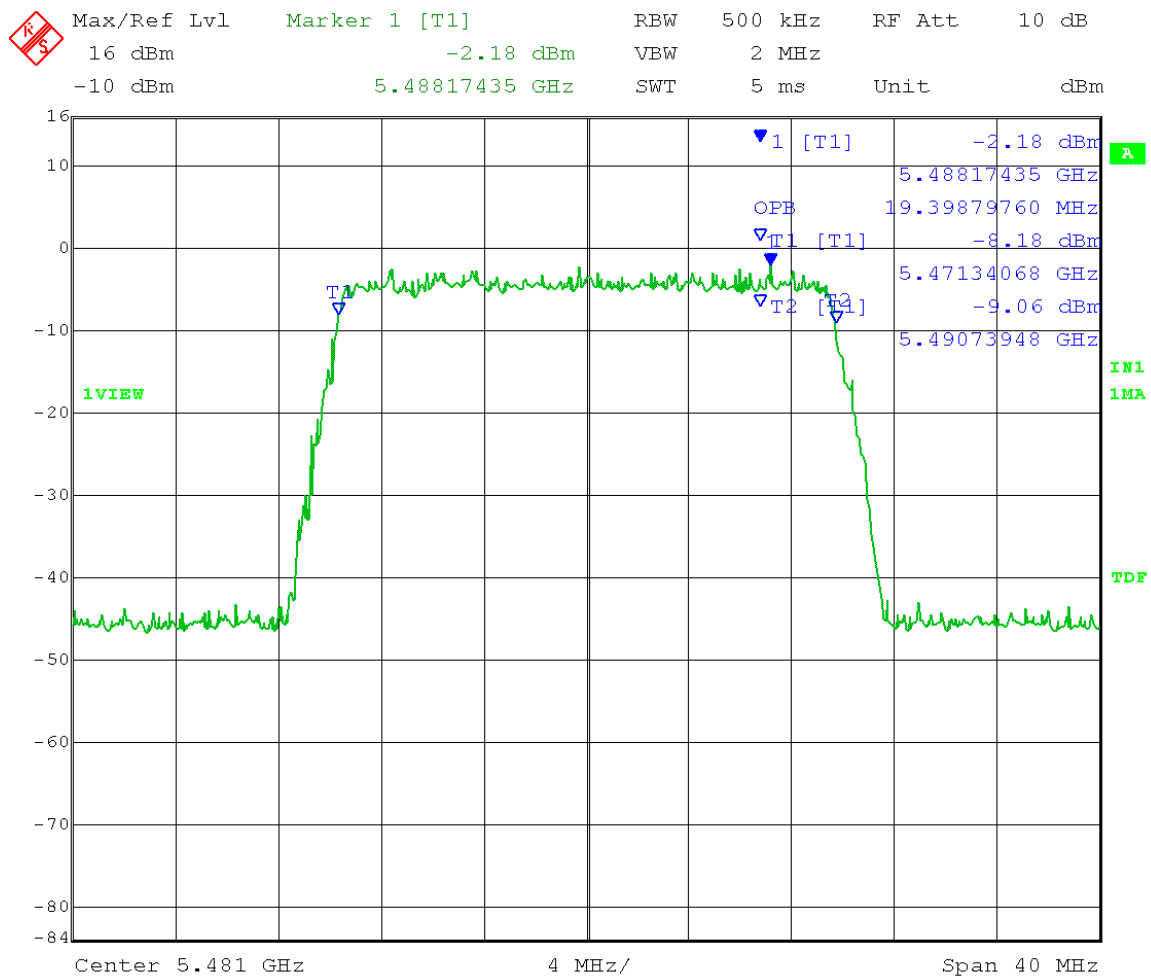


Date: 22.OCT.2013 10:57:02

Test Date: 10-22-2013
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 = 5.481 GHz 20MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

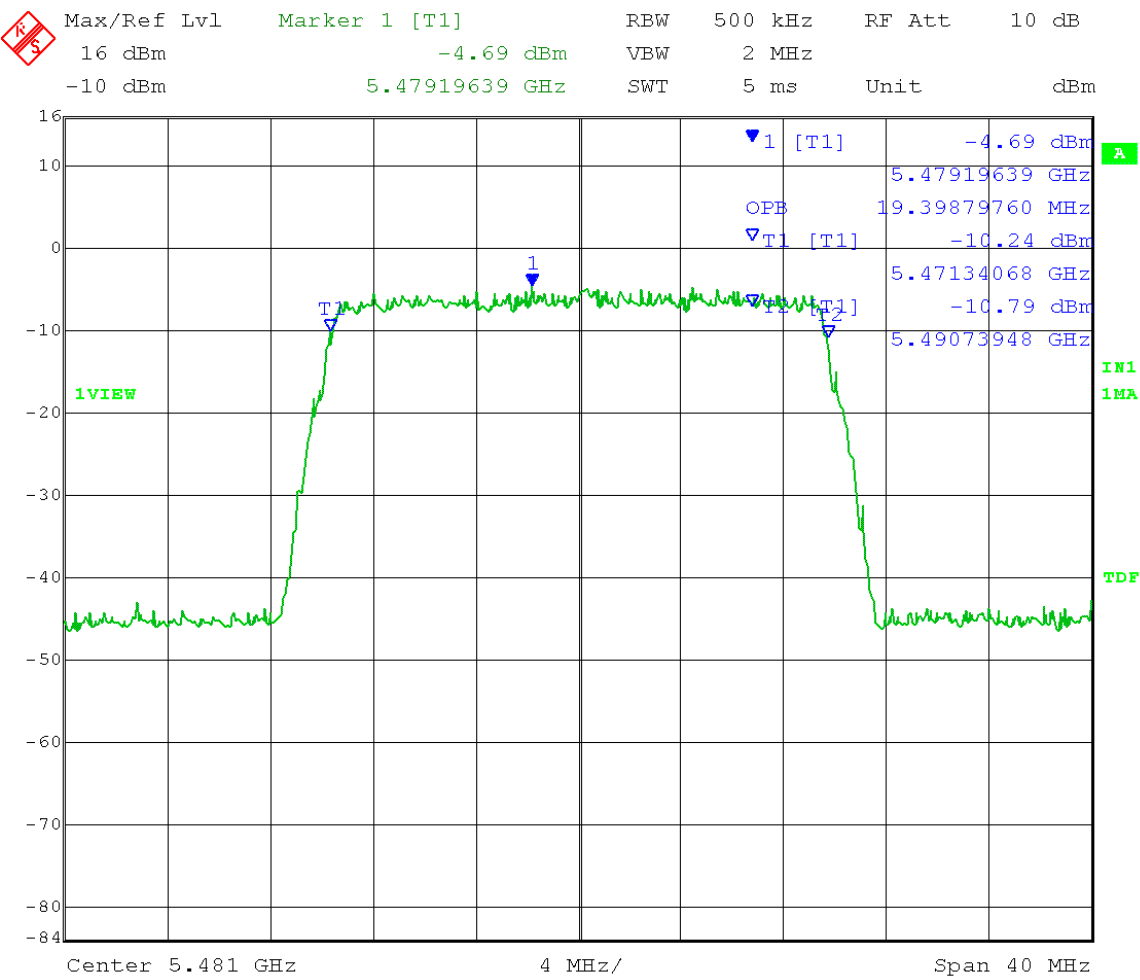
99% OBW = 19.40MHz



Date: 22.OCT.2013 11:28:03

TX 1:

99% OBW = 19.40MHz



Date: 22.OCT.2013 10:52:52



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

4.0 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)

20MHz Operating Bandwidth:

FCC Maximum Conducted Output Power		20MHz (Adjustment for duty cycle = $10\log 1/x = 0.13$ or 0.11)				
	dBm	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit $\leq$ 250mW	<i>EUT FCC limit:</i>	7	7	7	7	7
HCH = 5714 MHz	TX0 (mW)	2.39	2.41	2.38	2.36	2.36
	TX1 (mW)	2.37	2.35	2.35	2.34	2.35
	total(mW)	4.76	4.76	4.73	4.70	4.71
	Total(dBm)	6.89	6.91	6.88	6.85	6.86
	Margin	0.11	0.09	0.12	0.15	0.14
MCH = 5 575 MHz	TX0	2.3	2.29	2.3	2.31	2.33
	TX1	2.49	2.51	2.5	2.5	2.5
	total(mW)	4.79	4.80	4.80	4.81	4.83
	Total(dBm)	6.91	6.94	6.94	6.95	6.97
	Margin	0.09	0.06	0.06	0.05	0.03
LCH = 5481 MHz	TX0	2.35	2.34	2.33	2.33	2.33
	TX1	2.49	2.48	2.47	2.48	2.46
	total(mW)	4.84	4.82	4.80	4.81	4.79
	Total(dBm)	6.96	6.96	6.94	6.95	6.93
	Margin	0.04	0.04	0.06	0.05	0.07



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

5.0 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

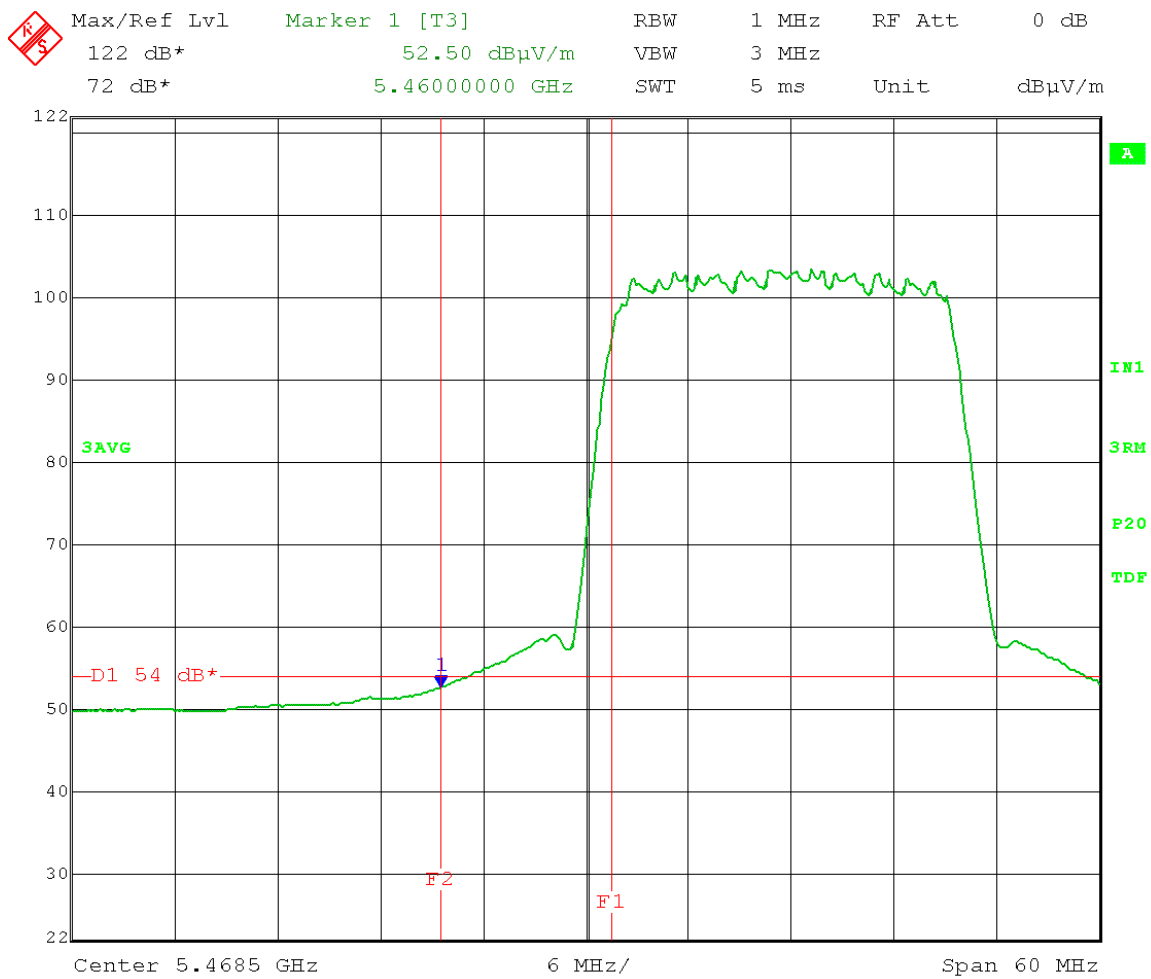
Results: Compliant

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.

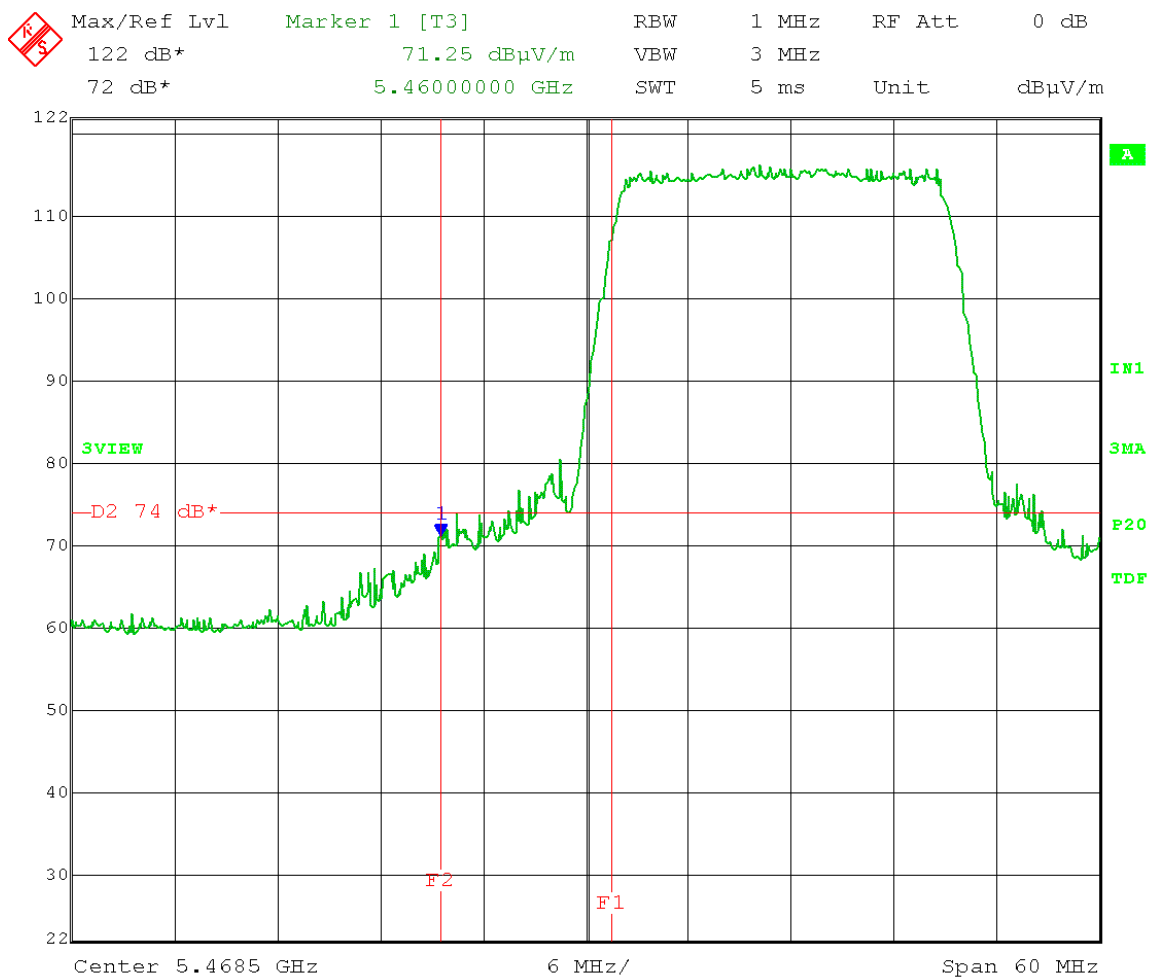
Both transmit chains active. Output power was set to 30 dBm eirp using special test software.

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



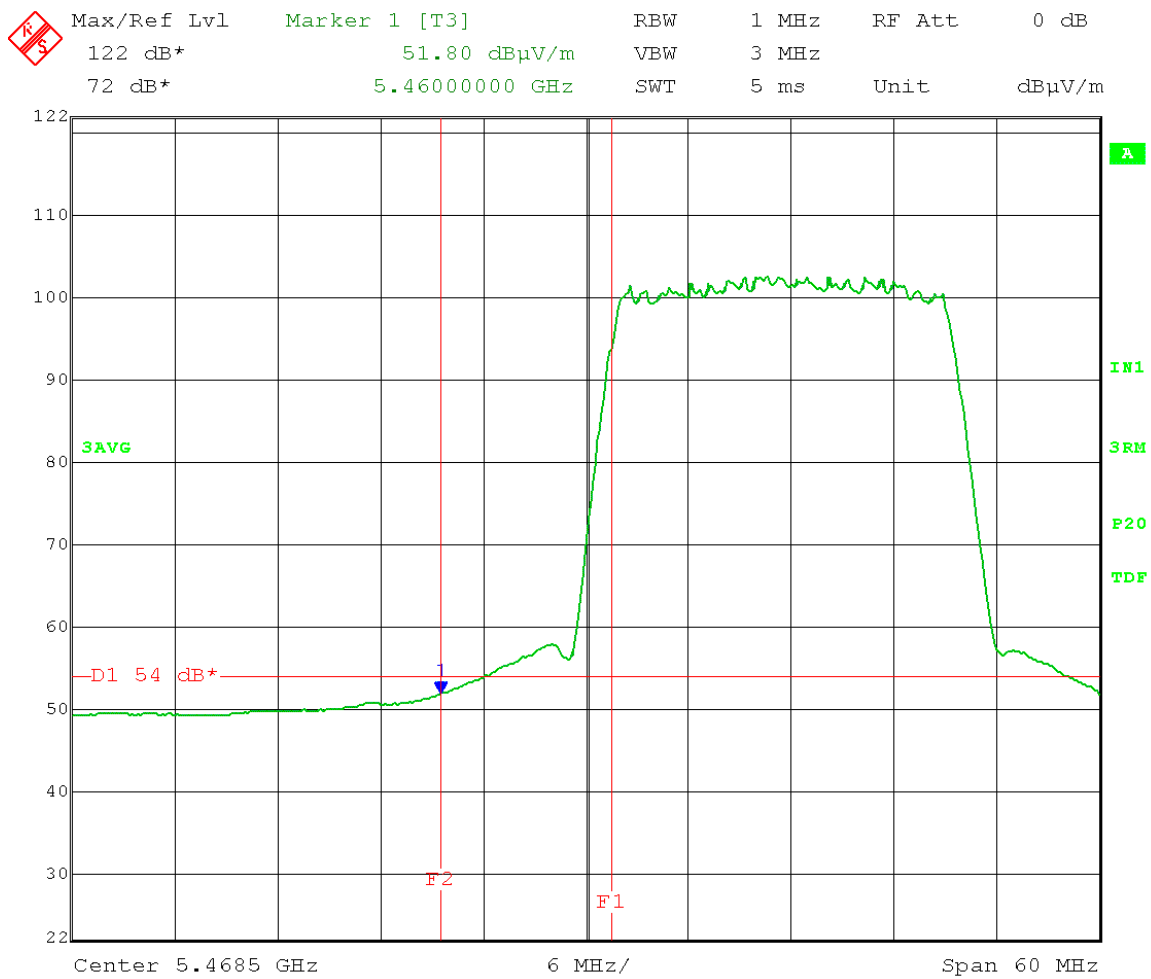
Date: 3.OCT.2013 15:06:33

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 256QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



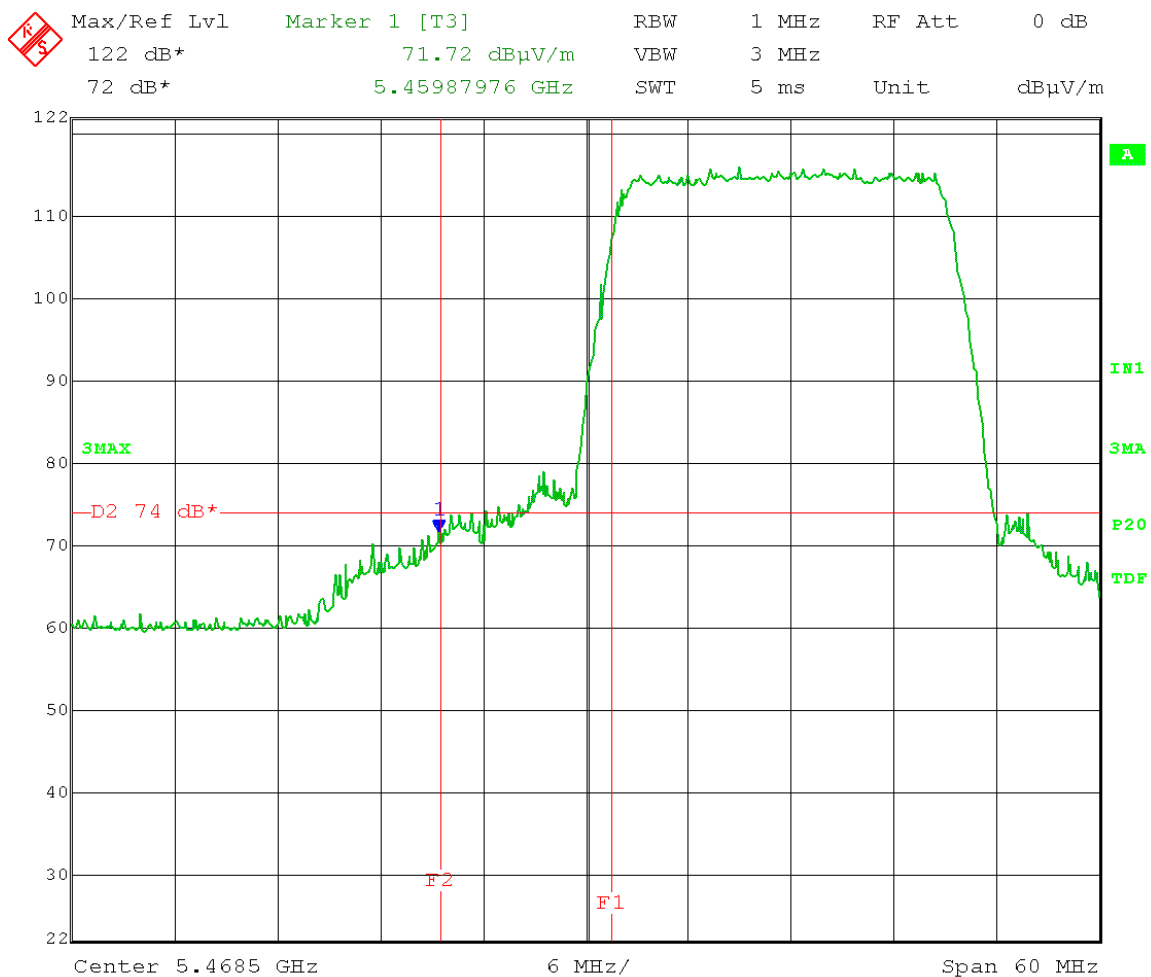
Date: 3.OCT.2013 15:05:52

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



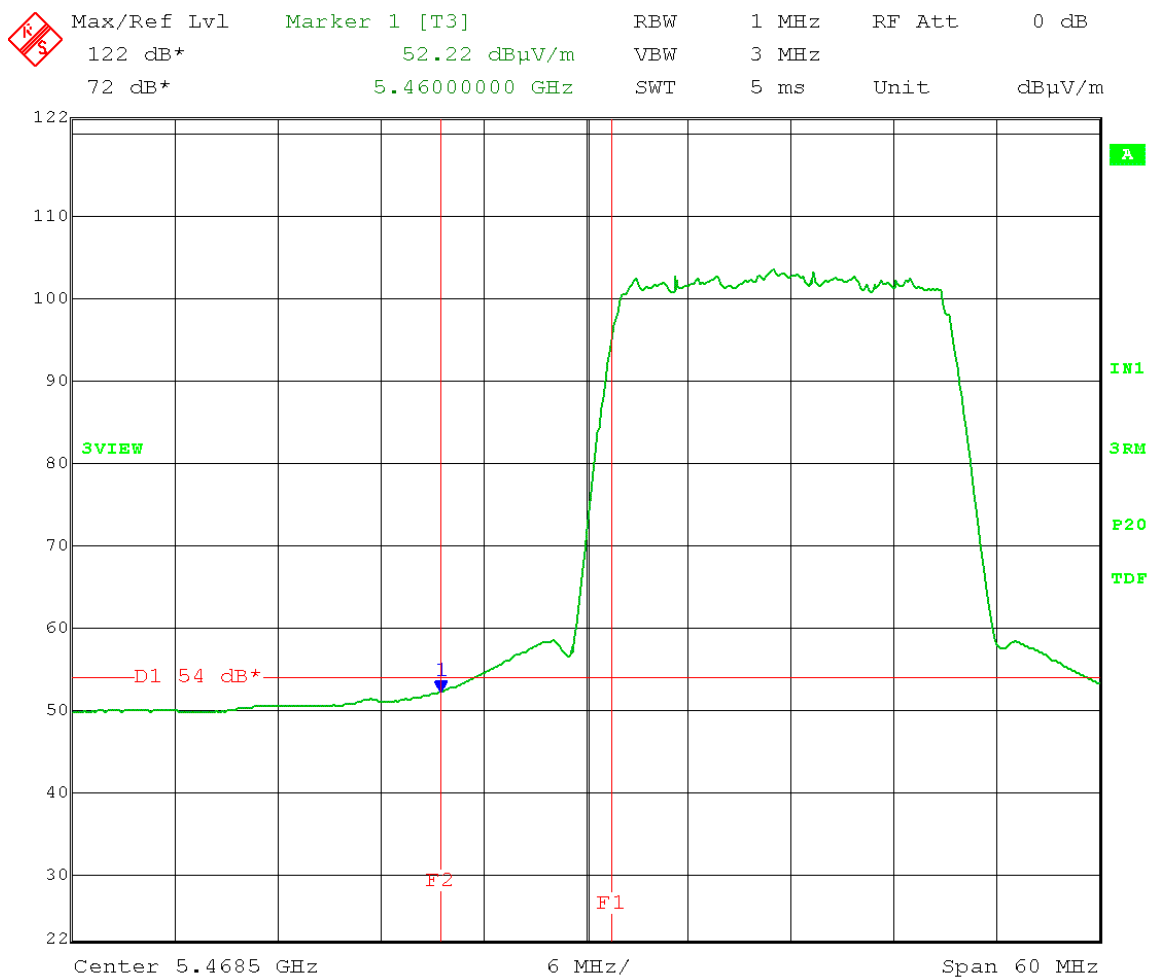
Date: 3.OCT.2013 15:40:21

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: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5480 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.



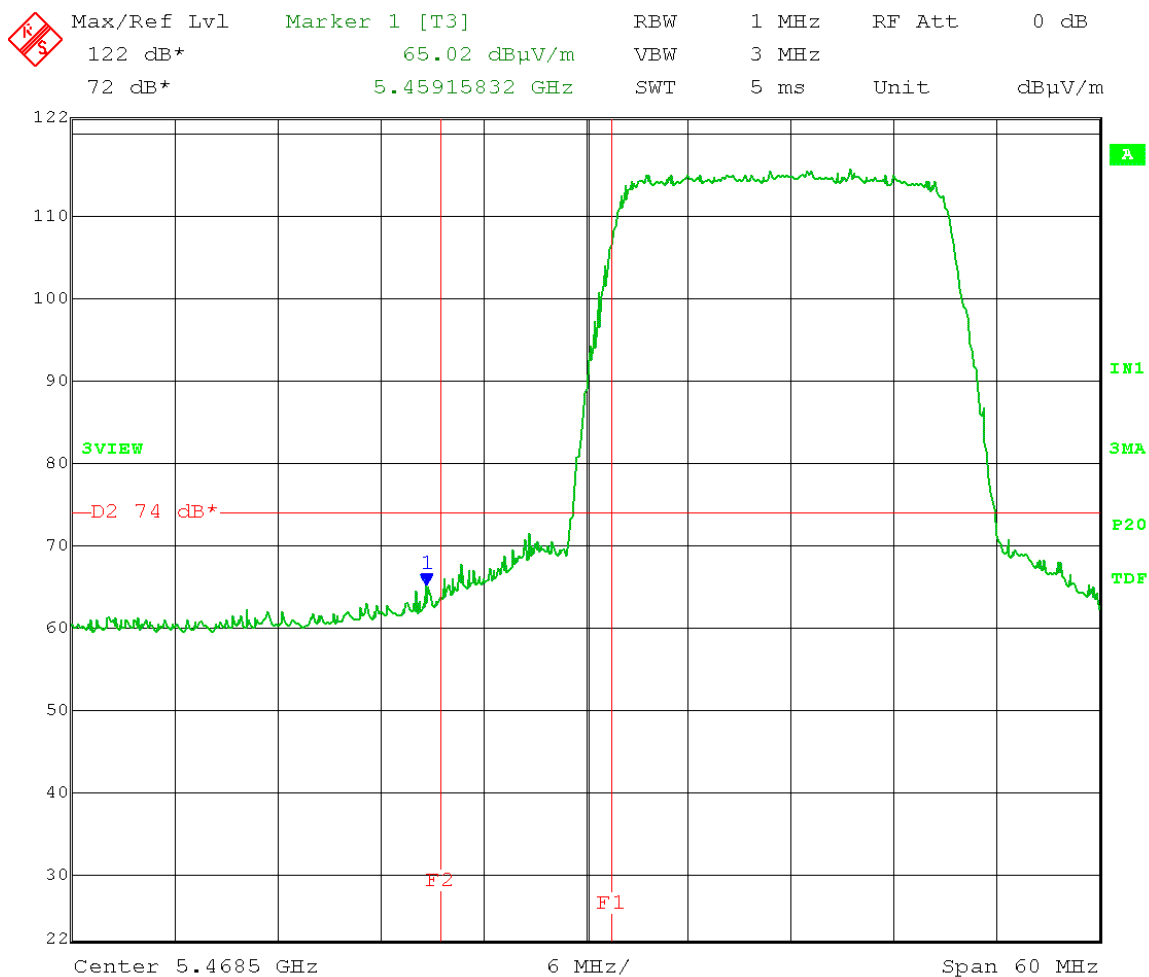
Date: 3.OCT.2013 15:39:42

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



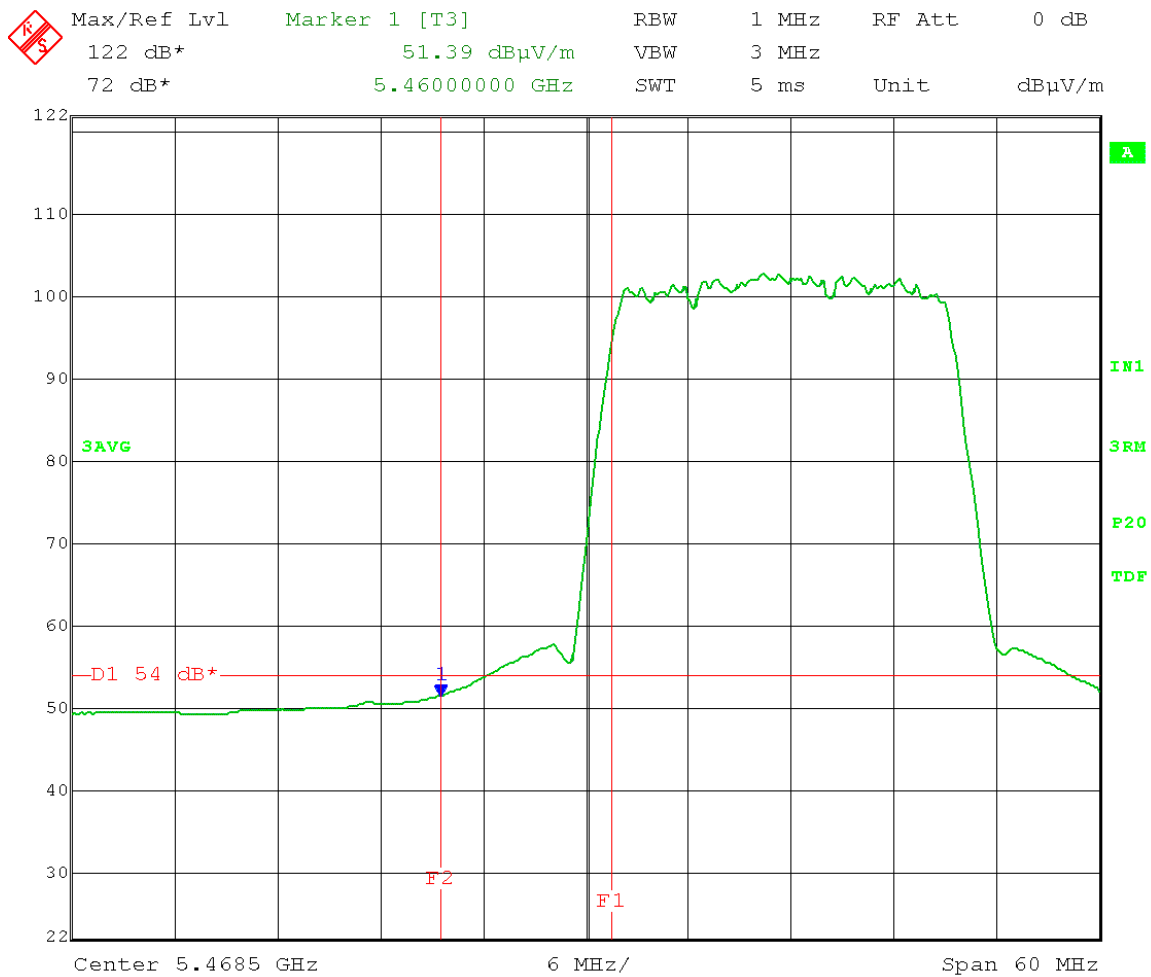
Date: 3.OCT.2013 15:00:23

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



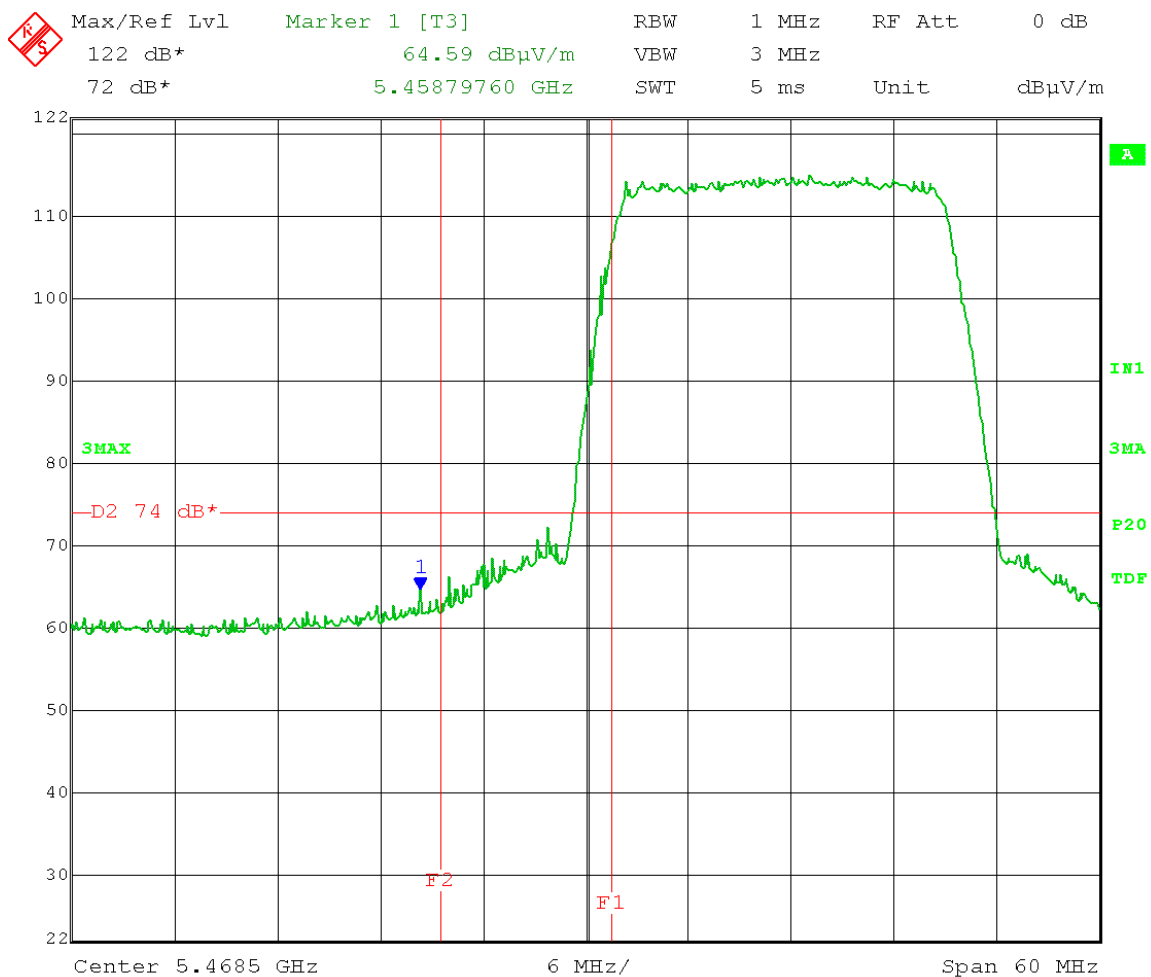
Date: 3.OCT.2013 15:01:09

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



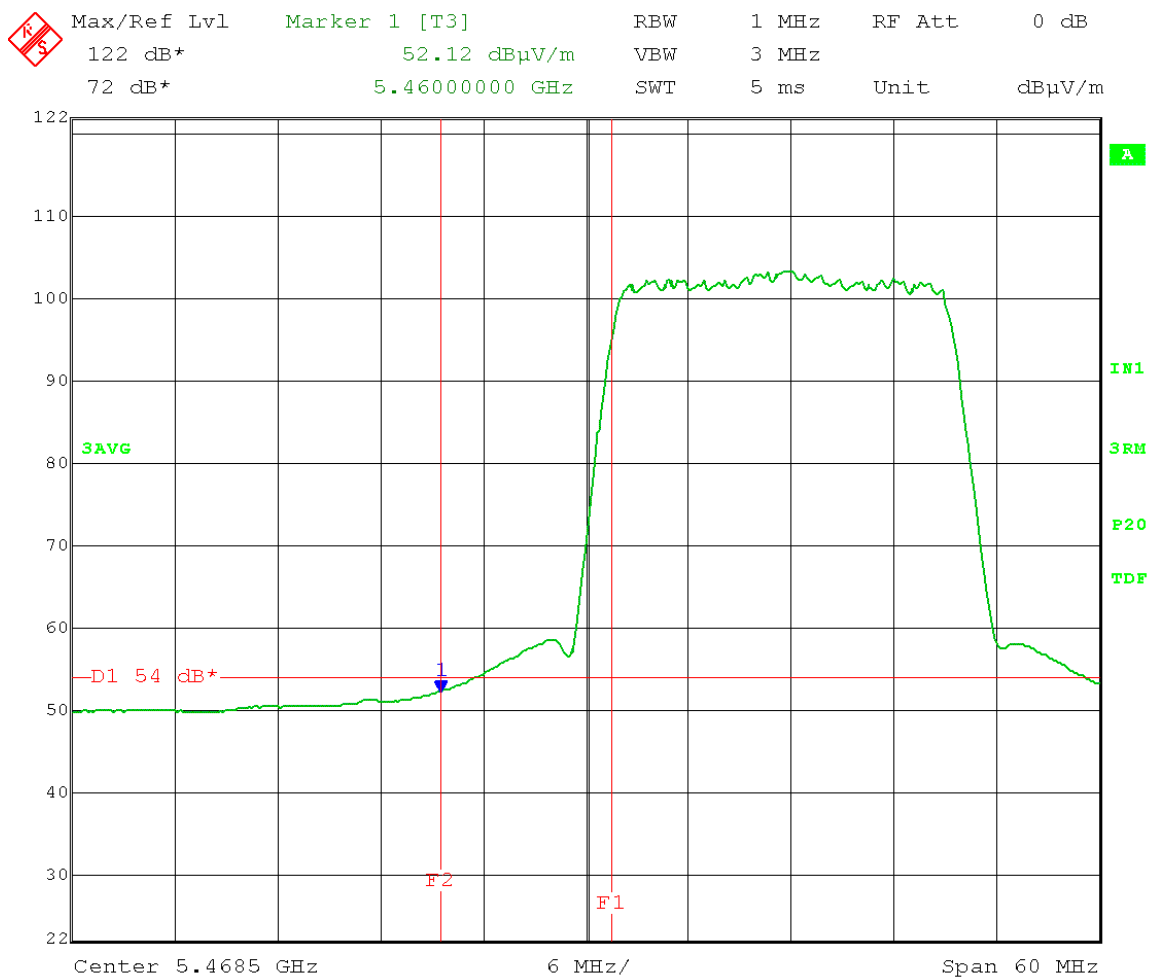
Date: 3.OCT.2013 15:34:29

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: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5480 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.



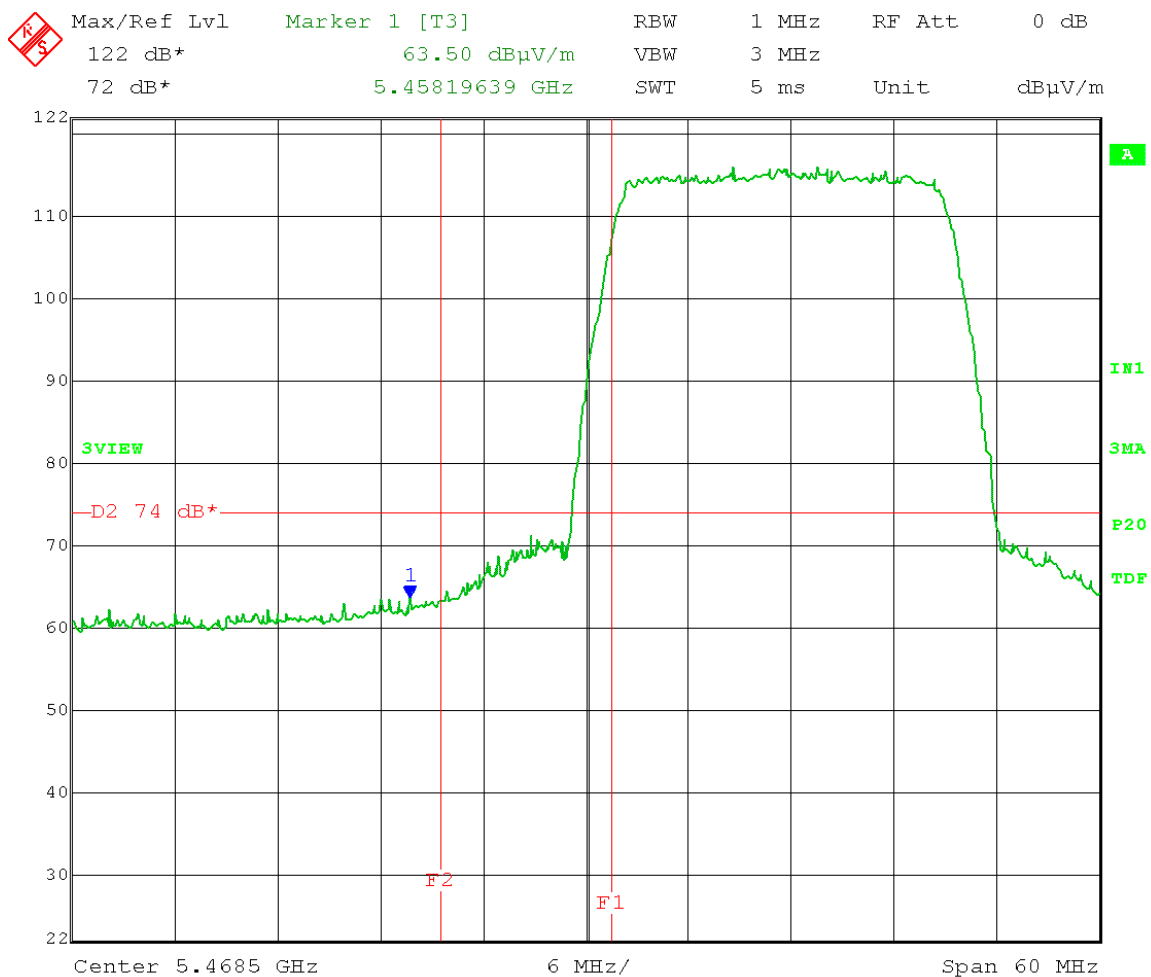
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Test Date: 10-03-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5480 MHz
 Modulation: 256QAM
 Horizontal
 Restricted Band-Edge Frequency: 5460 MHz (F2)
 Band-Edge Limit: 54 dB μ V/m AVERAGE at a test distance of 3 meters.



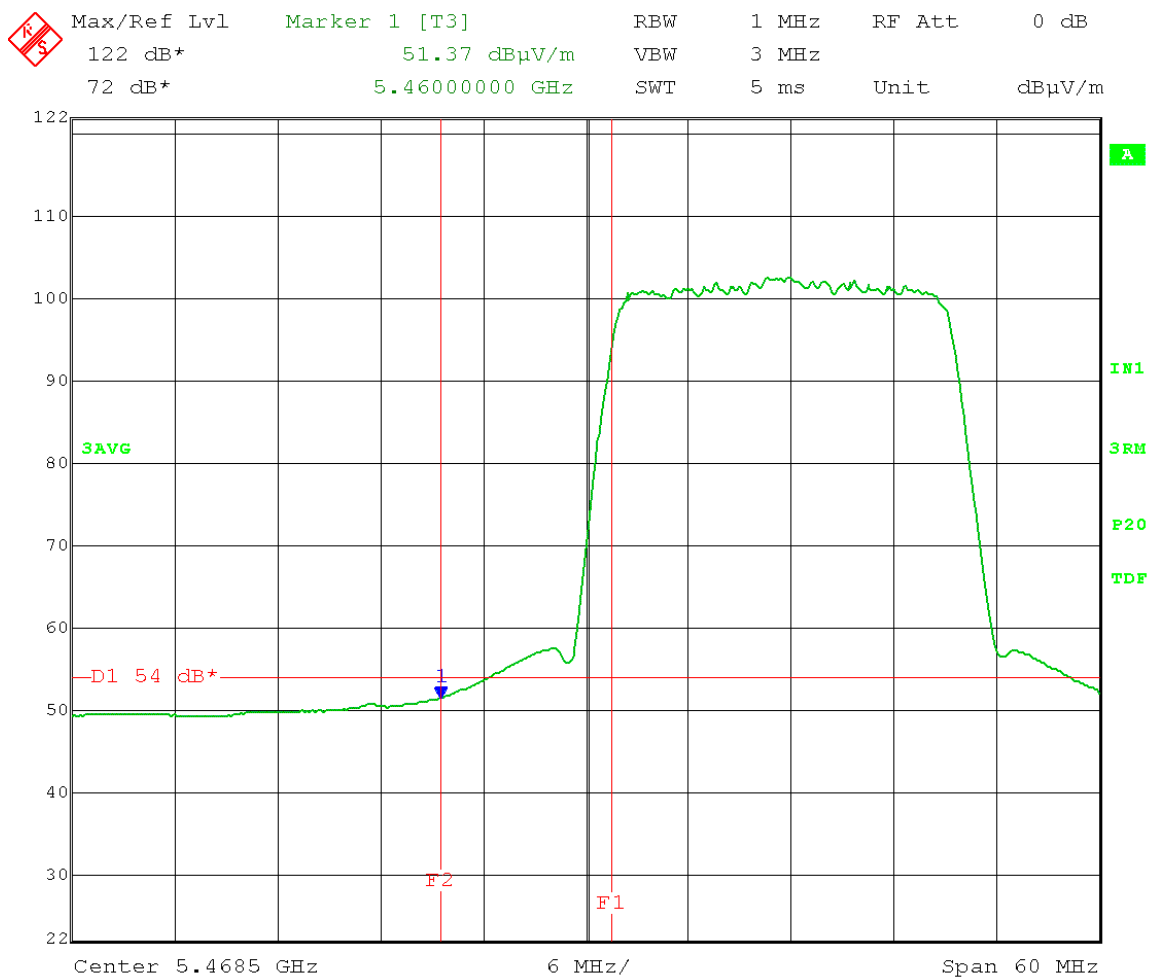
Date: 3.OCT.2013 15:03:58

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 256QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



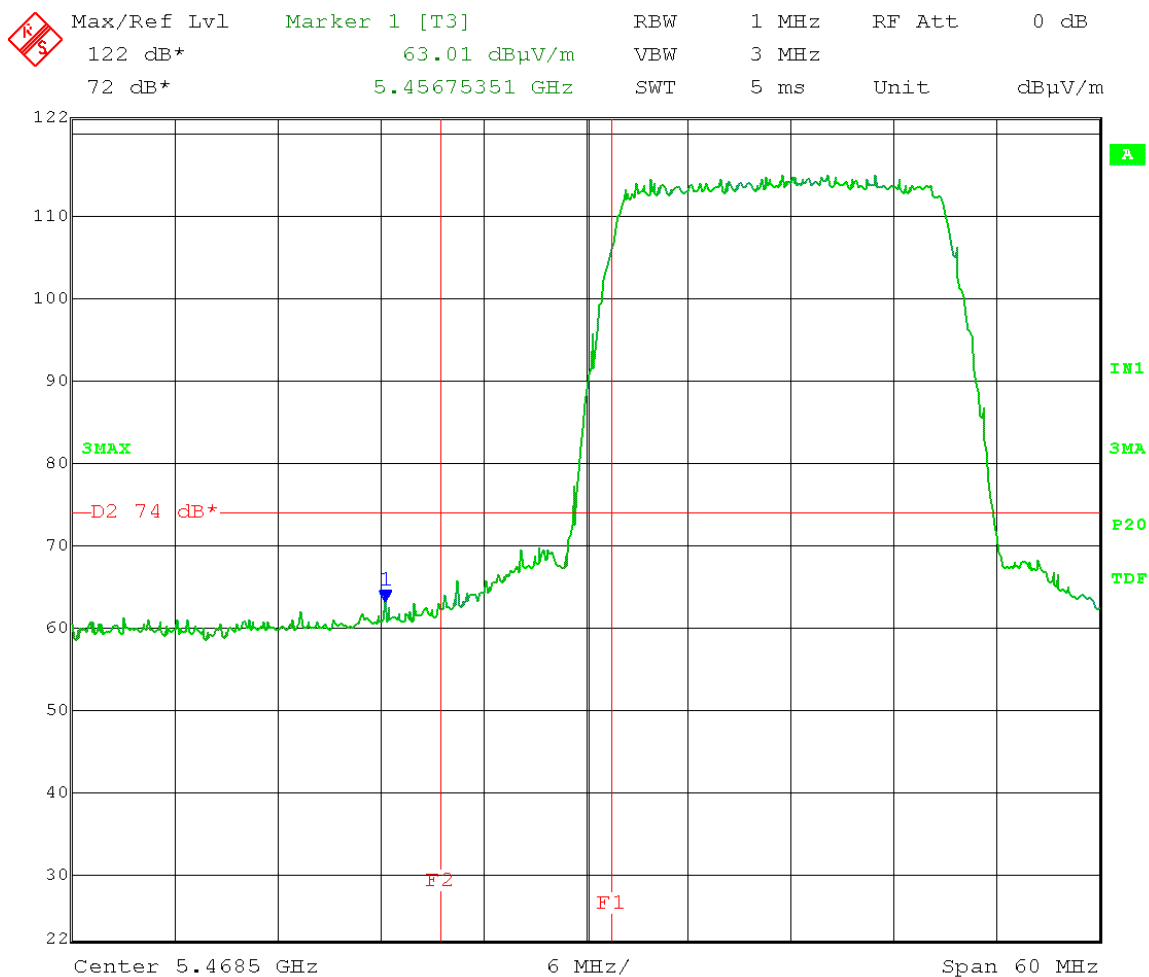
Date: 3.OCT.2013 15:04:49

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



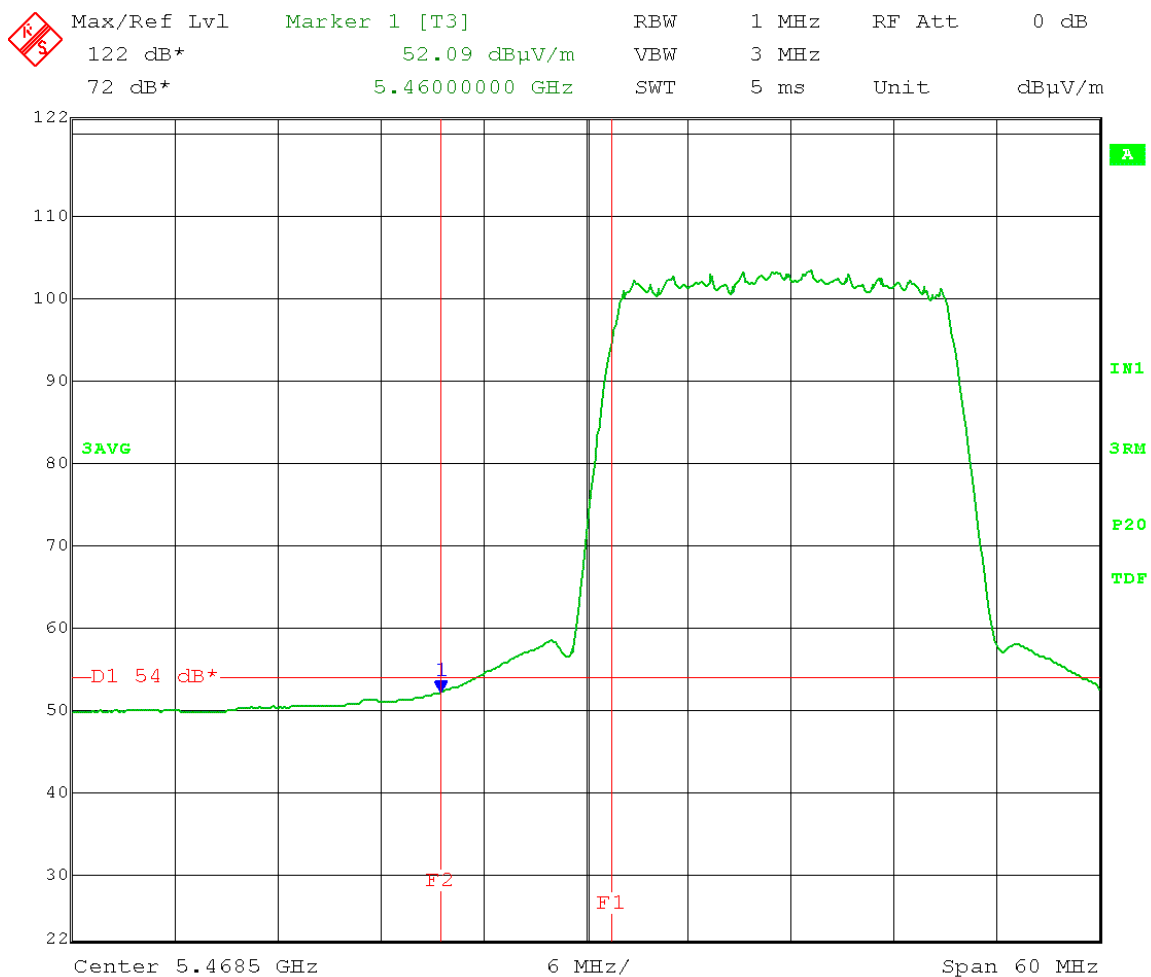
Date: 3.OCT.2013 15:38:01

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 256QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



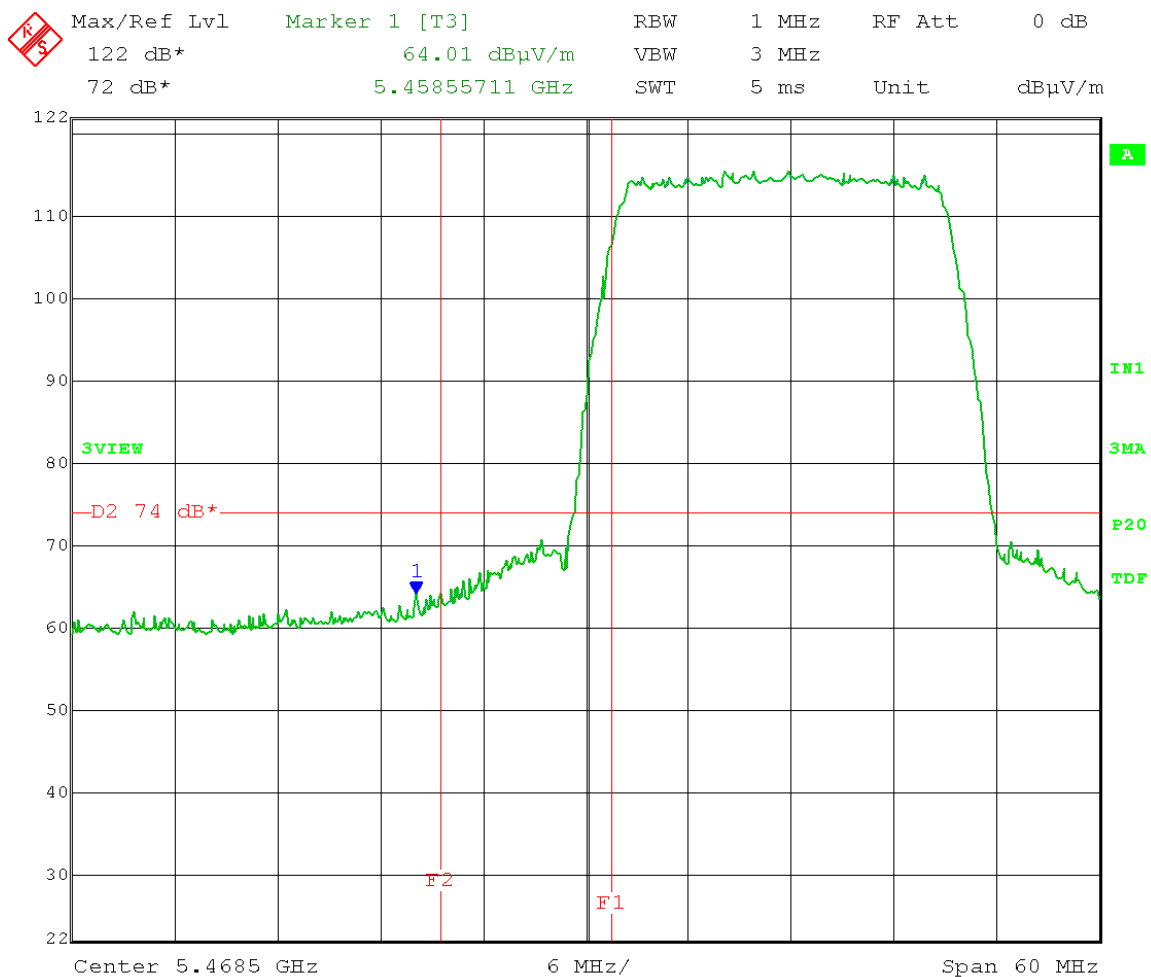
Date: 3.OCT.2013 15:38:37

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: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5480 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.



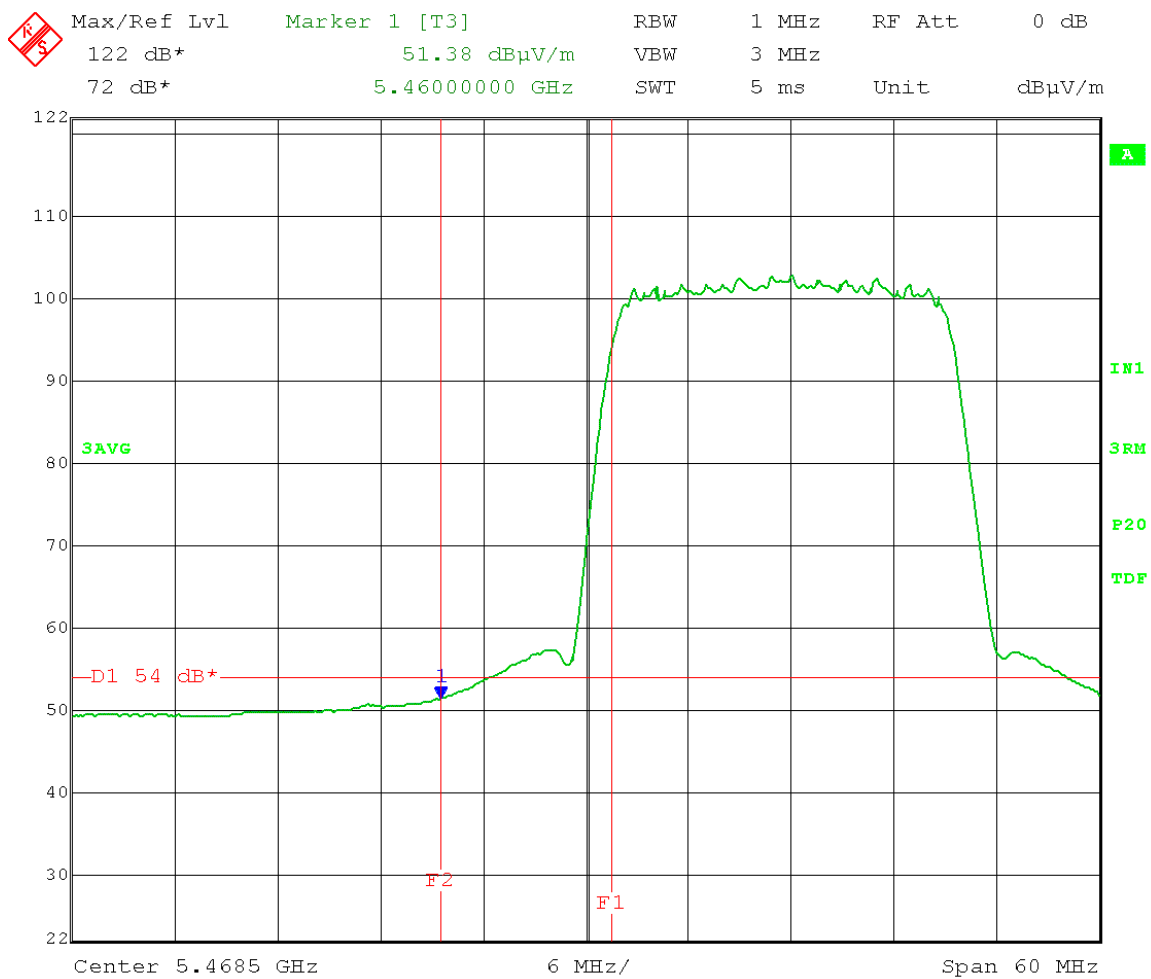
Date: 3.OCT.2013 15:03:01

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: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5480 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.



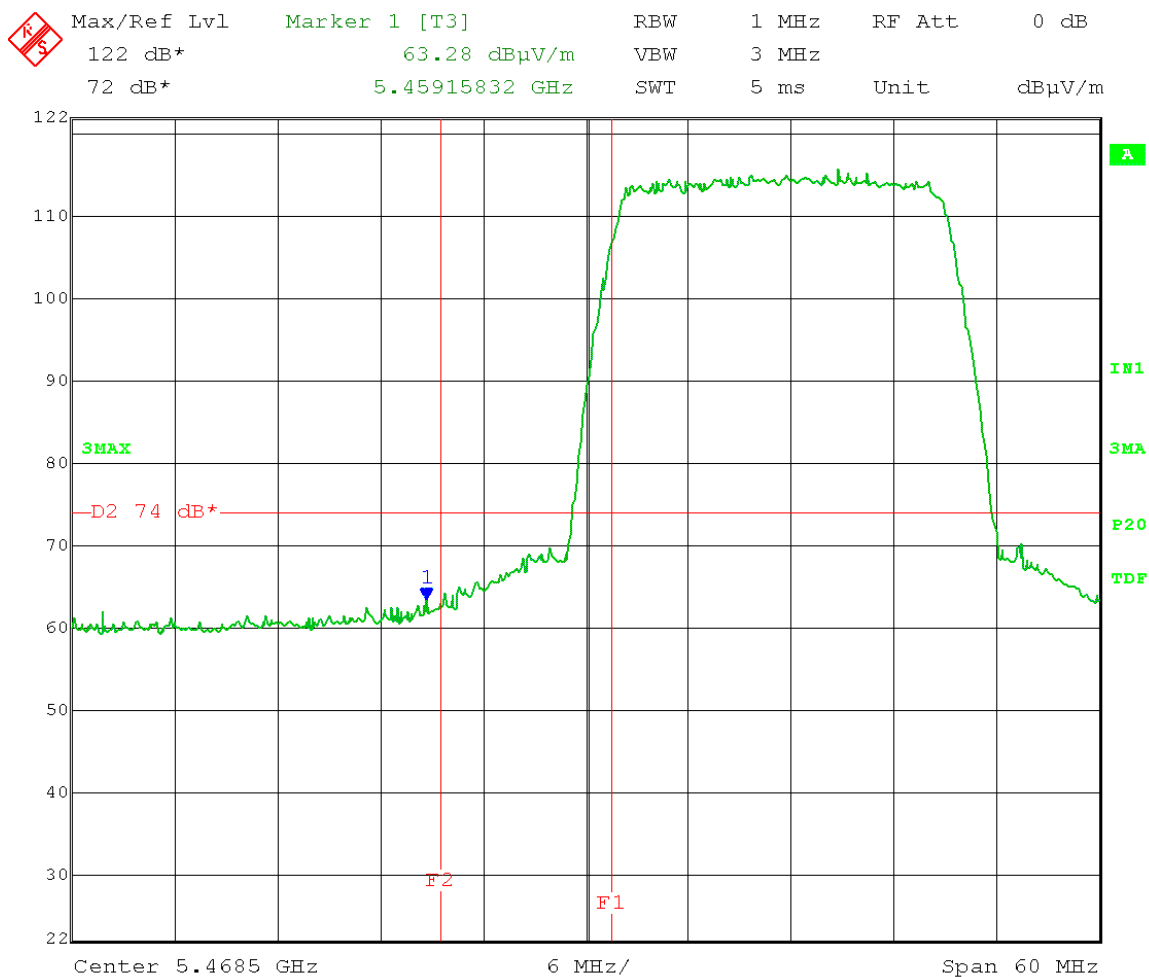
Date: 3.OCT.2013 15:01:59

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



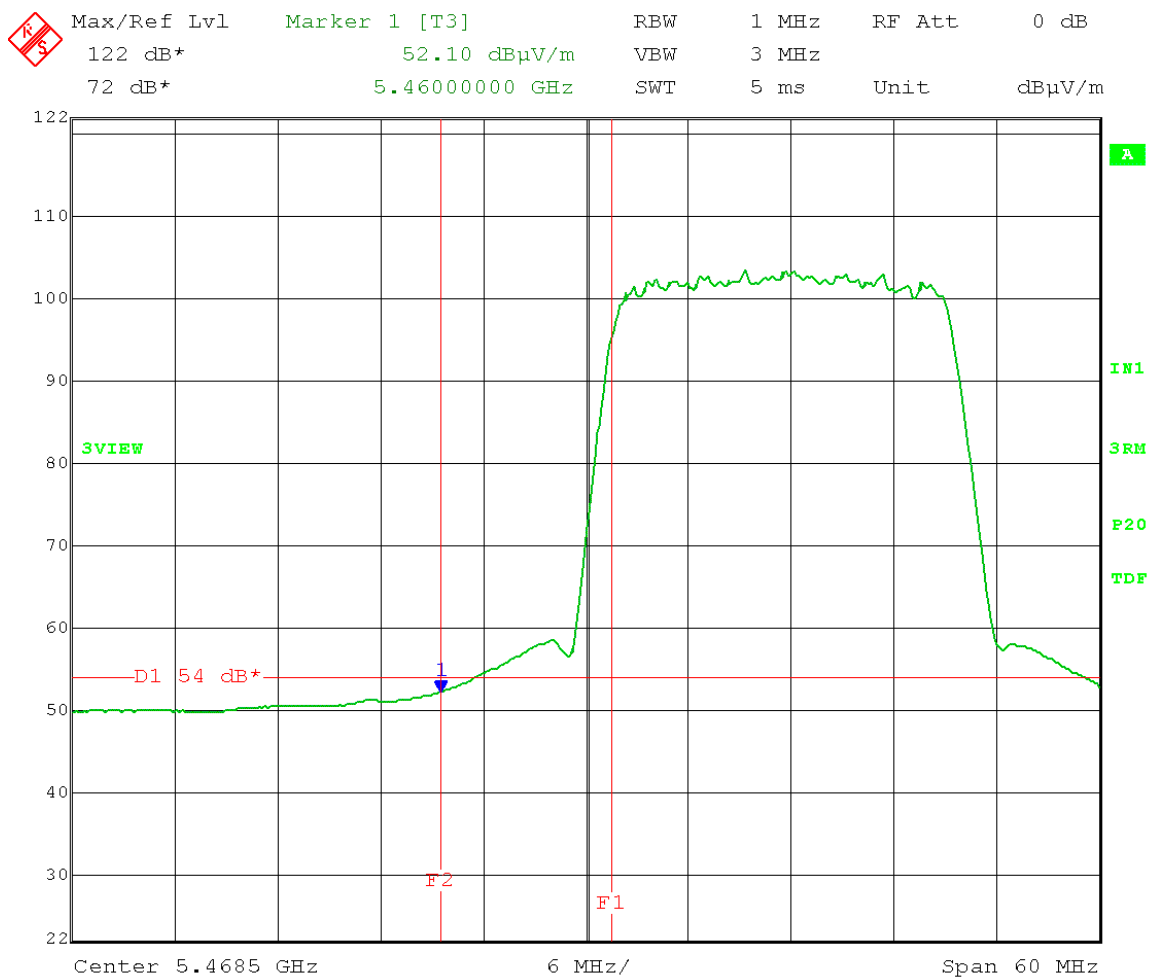
Date: 3.OCT.2013 15:36:49

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



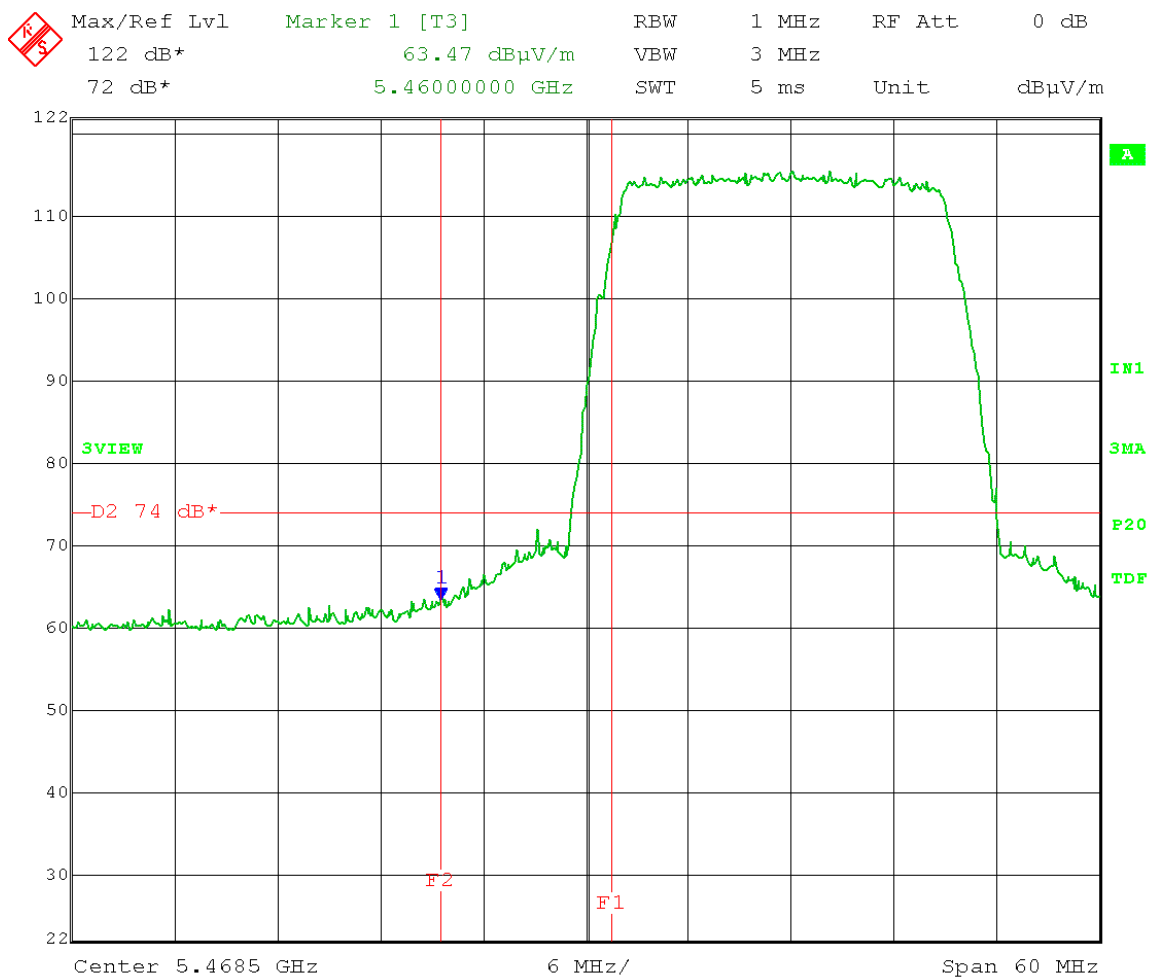
Date: 3.OCT.2013 15:36:14

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: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5480 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.



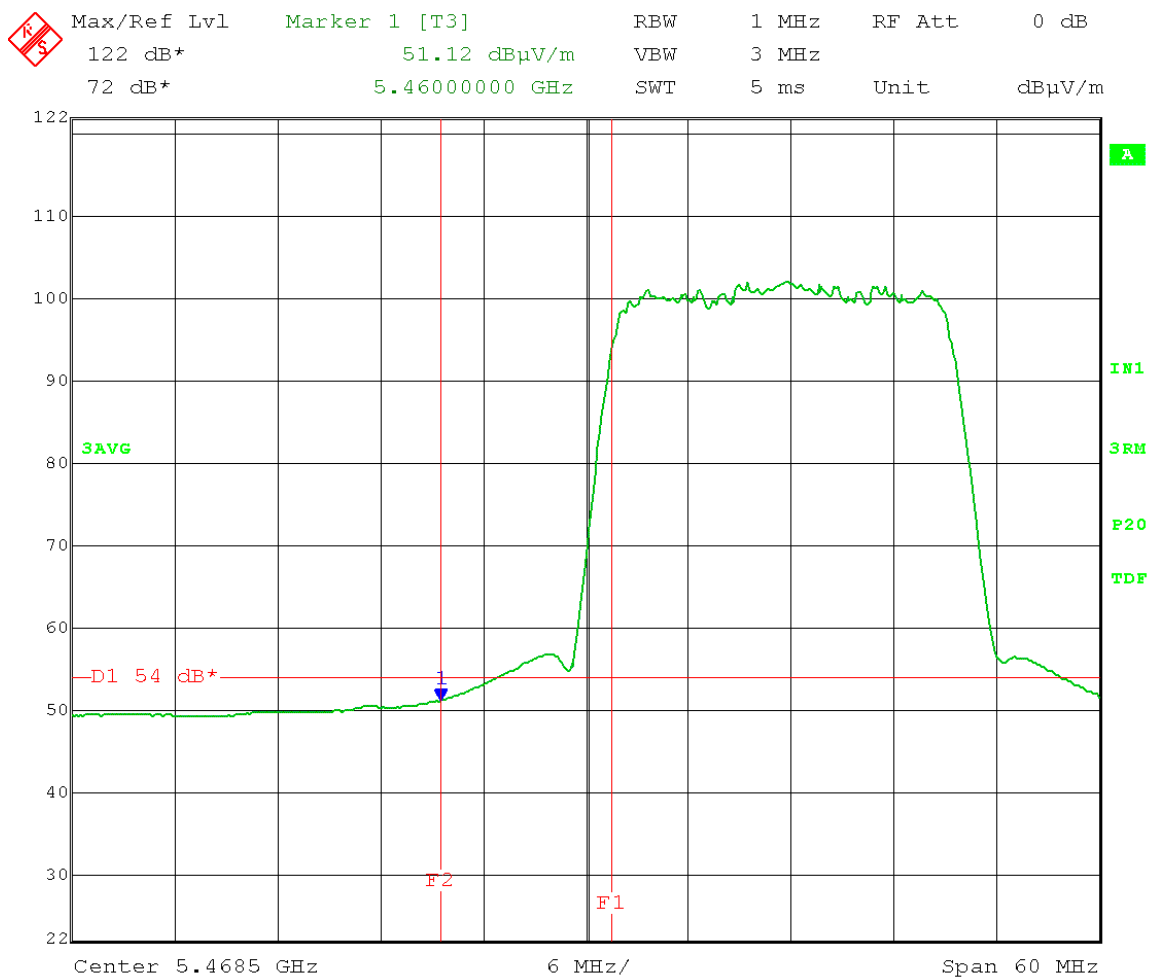
Date: 3.OCT.2013 14:58:59

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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.



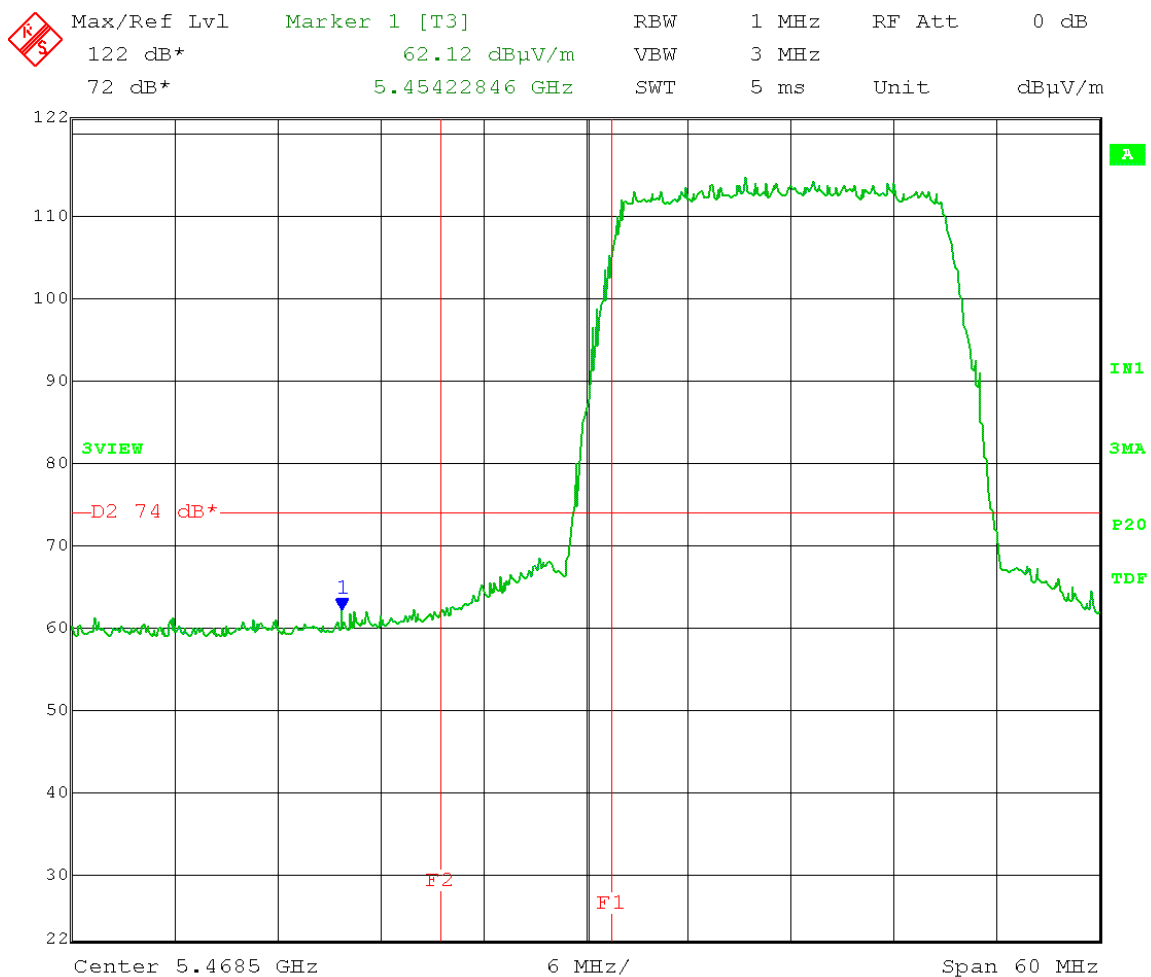
Date: 3.OCT.2013 14:57:51

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 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 15:33:25

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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: QPSK
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 15:32:49



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

6.0 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 $\geq 2 \times$ 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.

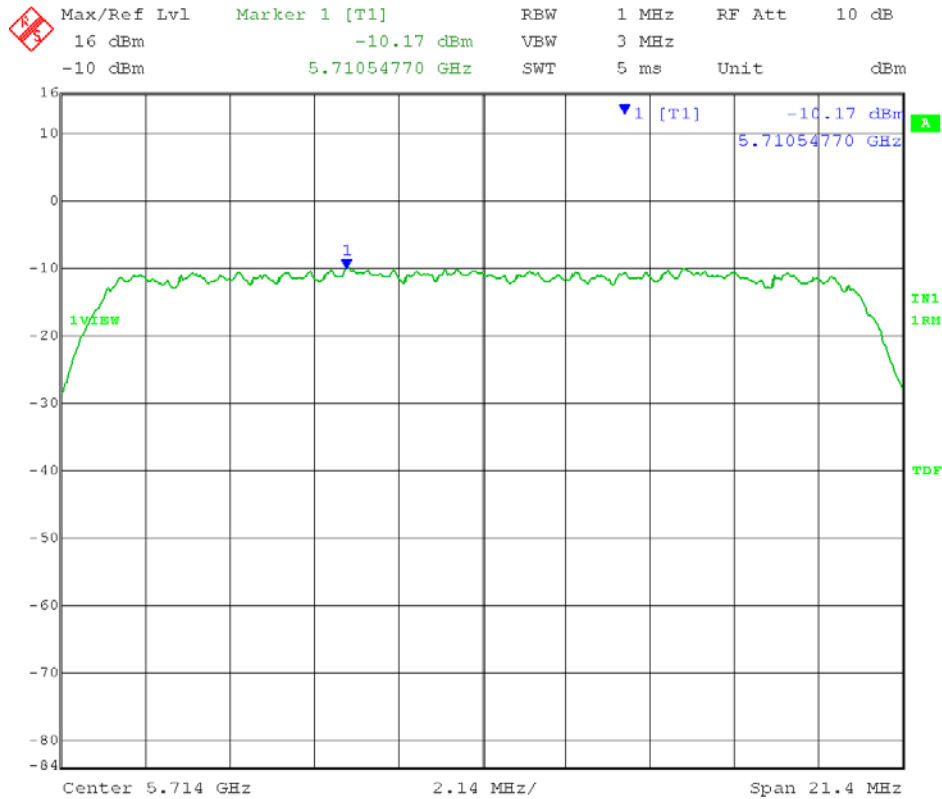
Test Date: 10-22-2013
 Company: Ubiquiti Networks
 EUT: Air Fiber 5 - 5.4GHz WiFi Radio
 Test: Peak Power Spectral Density - Conducted
 Operator: Lillian Li
 Test Procedure used: KDB 789033 D01 v01r03 – F)
 Limit: [15.407(a)(2)&(a)(5); RSS-210 A9.2(3)]: < 11dBm/MHz
 Operating Mode: Point-to-Point; Antenna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

20MHz Operating Bandwidth(Method SA-2):

Pesk Power Spectral Density (PPSD)		20M (Adjustment for duty cycle =10log1/x = 0.13 or 0.11)				
	dBm	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit=11dBm/MHz	EUT FCC Limit	-6	-6	-6	-6	-6
HCH = 5714 MHz	TX0	-10.09	-10.17	-10.11	-10.24	-10.04
	TX1	-11.77	-11.19	-12.16	-12.21	-12.38
	total(mW)	0.1687	0.1774	0.1631	0.1594	0.1617
	Total(dBm)	-7.73	-7.51	-7.87	-7.97	-7.91
	Margin	1.73	1.51	1.87	1.97	1.91
MCH = 5575 MHz	TX0	-10.93	-10.71	-10.75	-10.94	-10.93
	TX1	-10.71	-10.82	-10.58	-10.73	-11.63
	total(mW)	0.1699	0.1728	0.1769	0.1701	0.1540
	Total(dBm)	-7.70	-7.62	-7.52	-7.69	-8.13
	Margin	1.70	1.62	1.52	1.69	2.13
LCH = 5481 MHz	TX0	-10.62	-10.37	-10.31	-10.43	-10.54
	TX1	-11.28	-11.06	-10.98	-11	-10.87
	total(mW)	0.1653	0.1753	0.1782	0.1752	0.1753
	Total(dBm)	-7.82	-7.56	-7.49	-7.57	-7.56
	Margin	1.82	1.56	1.49	1.57	1.56

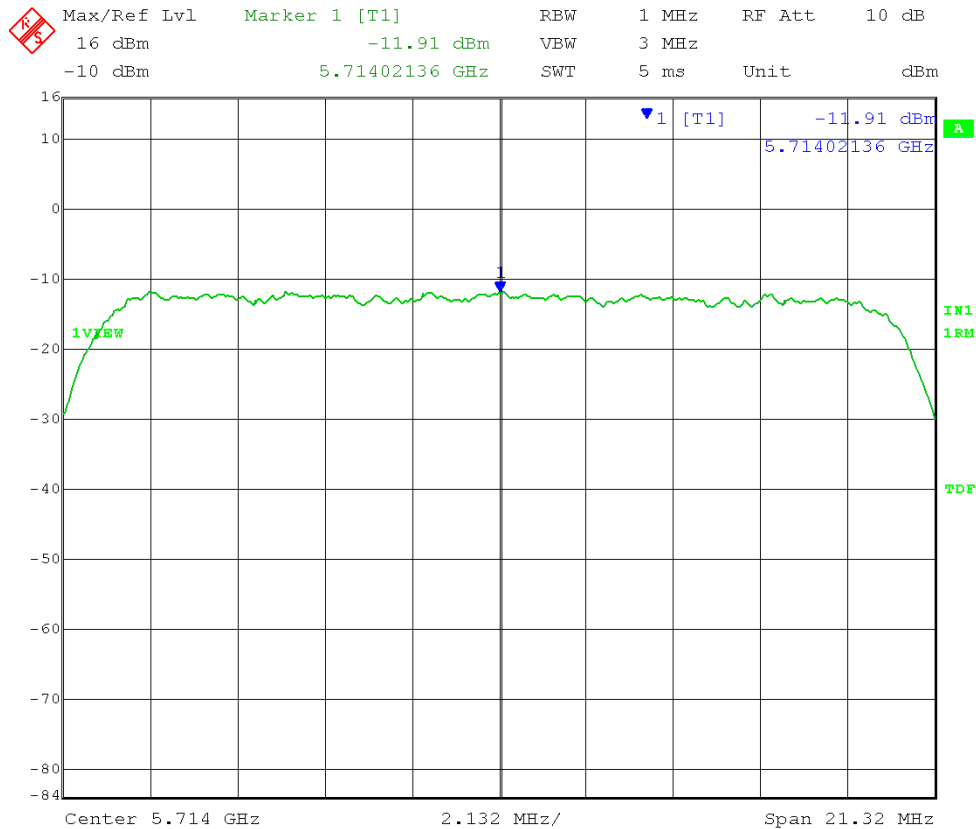
20MHz BW, HCH, 16QAM

TX 0: 26 dB EBW = 21.40MHz



Date: 22.OCT.2013 12:30:44

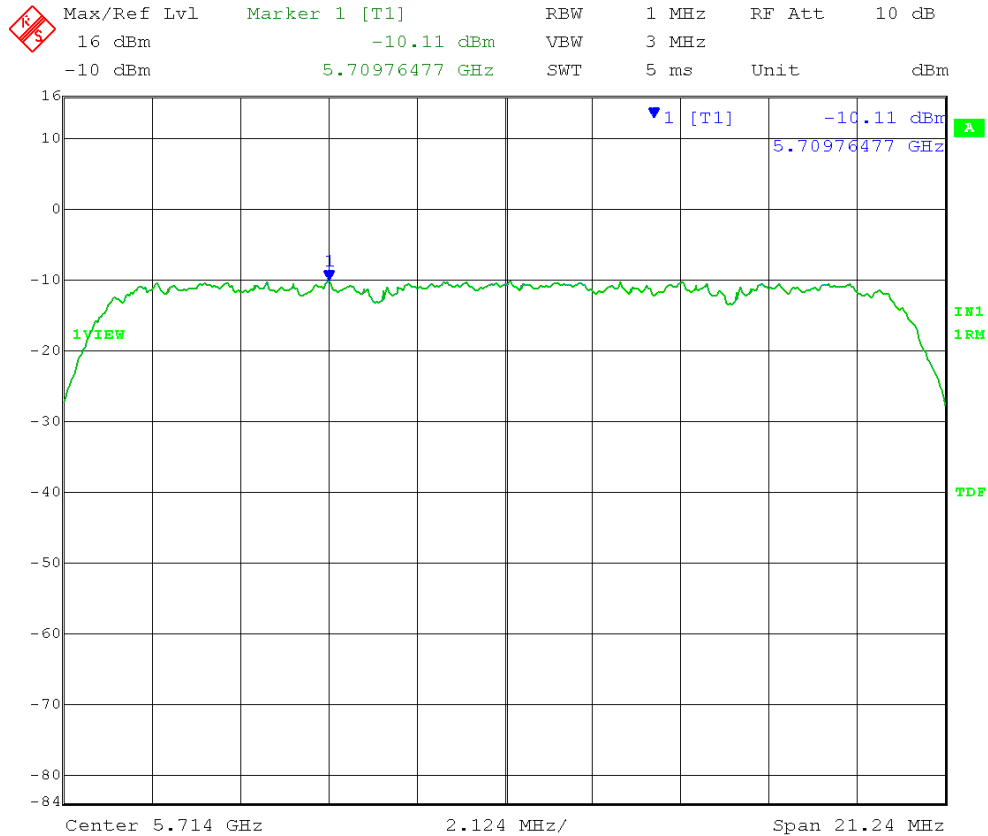
TX1: 26 dB EBW = 21.24MHz



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

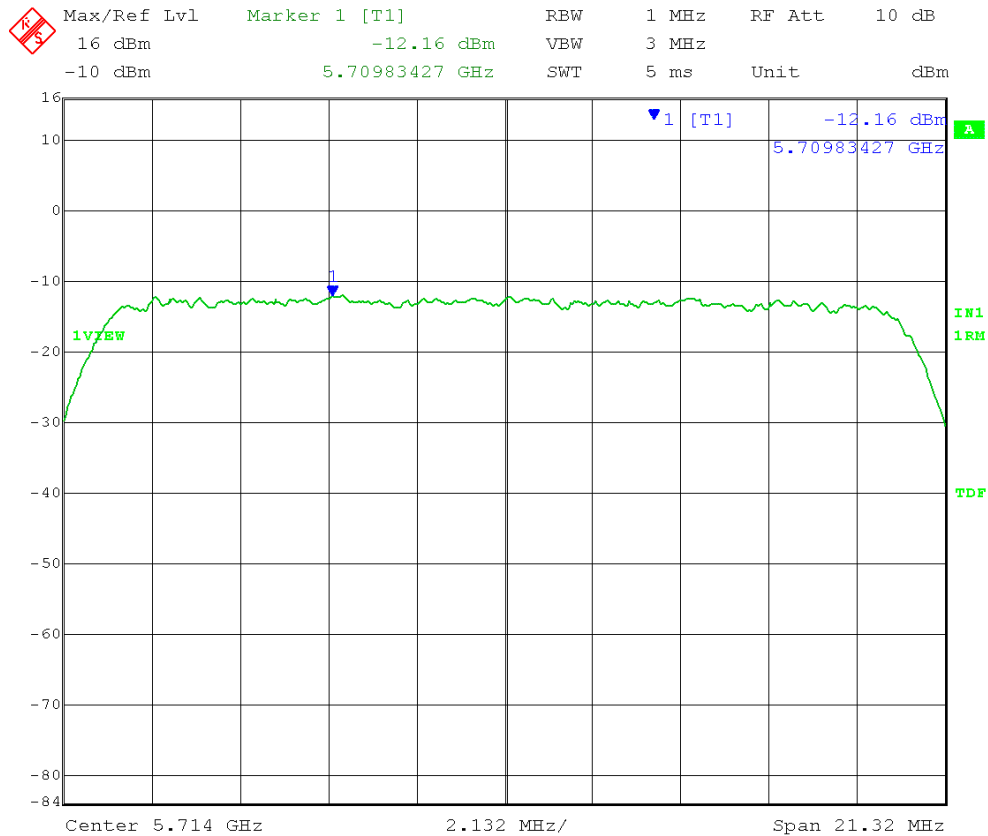
20MHz BW, HCH, 64QAM

TX 0: 26 dB EBW = 21.24MHz



Date: 22.OCT.2013 12:31:43

TX1: 26 dB EBW = 21.32MHz

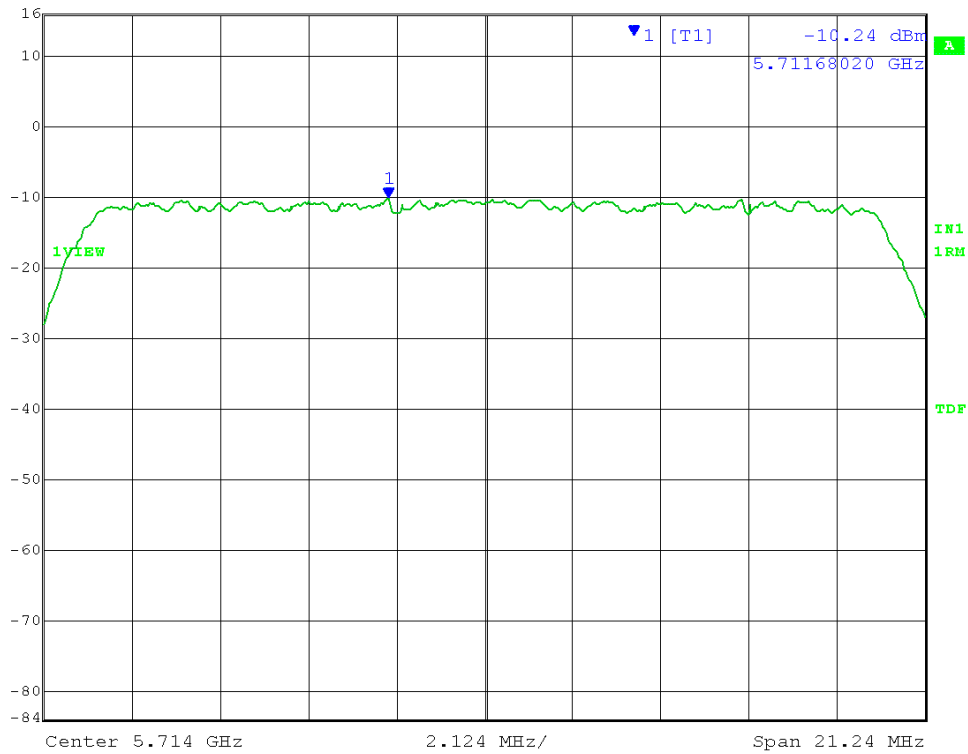


Date: 18.OCT.2013 15:37:11

20MHz BW, HCH, 256QAM

TX 0: 26 dB EBW = 21.24MHz

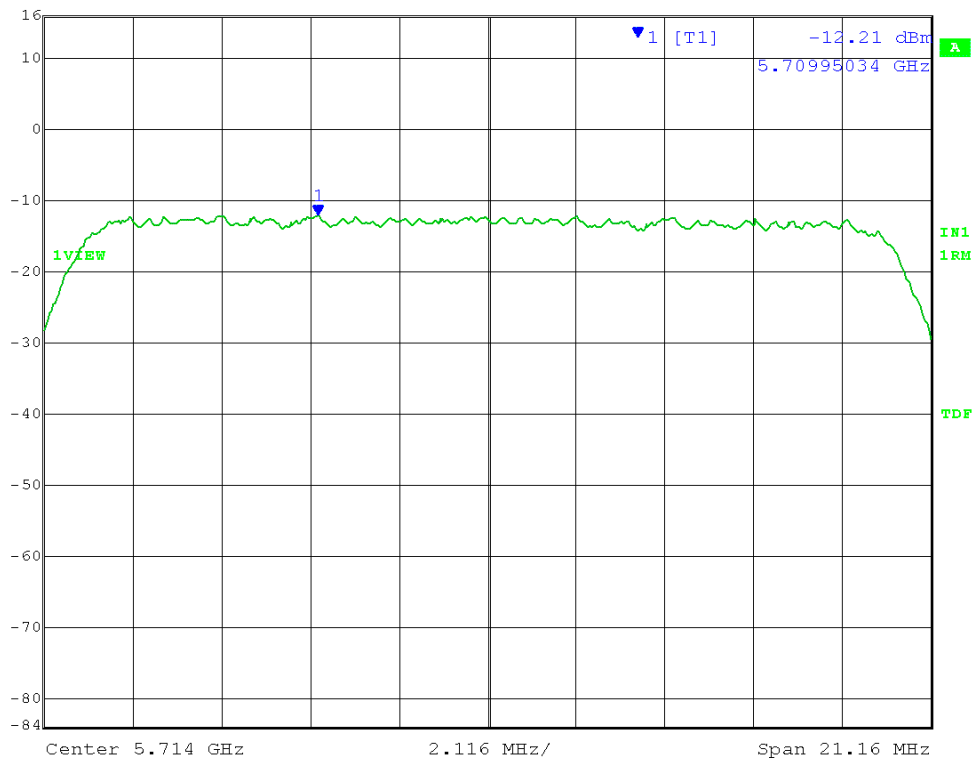
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.24 dBm VBW 3 MHz
-10 dBm 5.71168020 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:33:21

TX1: 26 dB EBW = 21.16MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -12.21 dBm VBW 3 MHz
-10 dBm 5.70995034 GHz SWT 5 ms Unit dBm

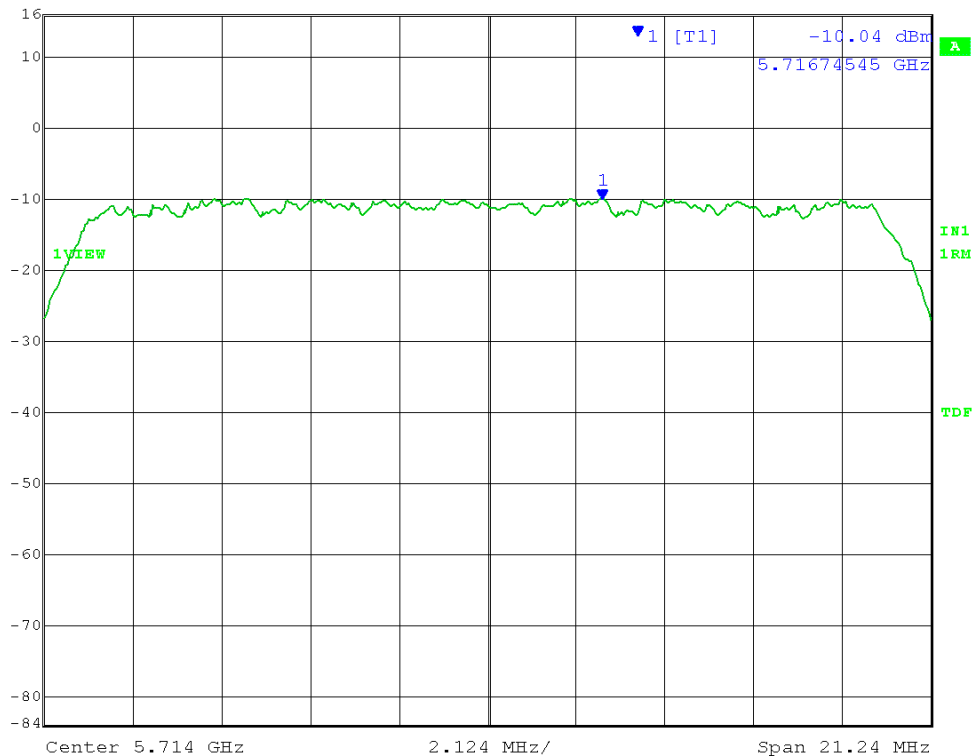


Date: 18.OCT.2013 15:36:05

20MHz BW, HCH, 1024QAM

TX 0: 26 dB EBW = 21.24MHz

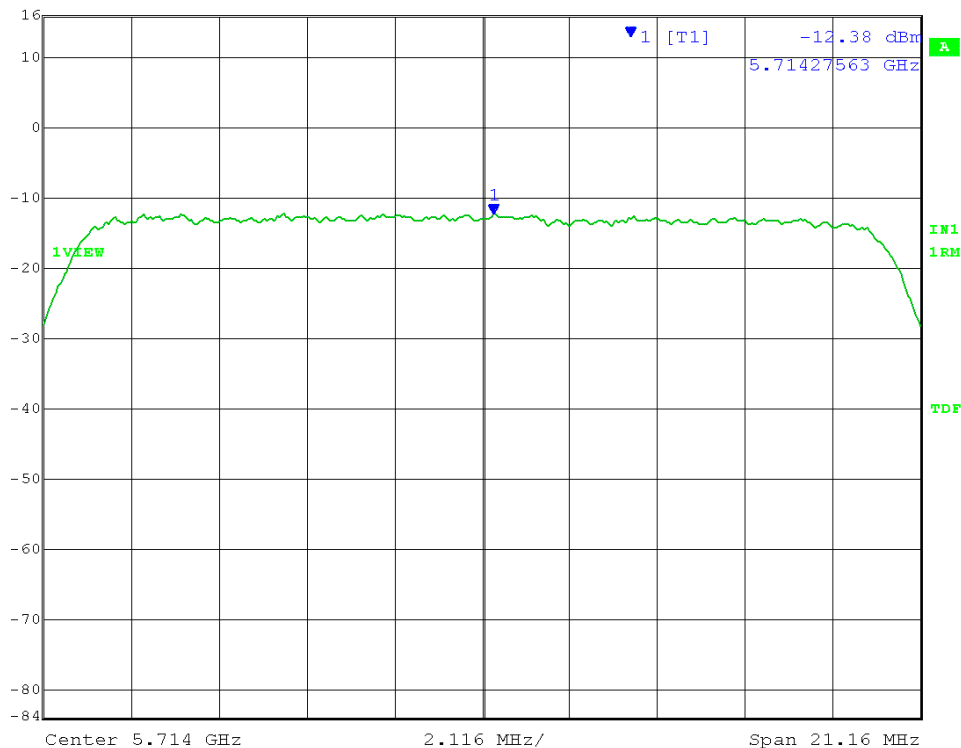
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.04 dBm VBW 3 MHz
-10 dBm 5.71674545 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:34:31

TX1: 26 dB EBW = 21.16MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -12.38 dBm VBW 3 MHz
-10 dBm 5.71427563 GHz SWT 5 ms Unit dBm

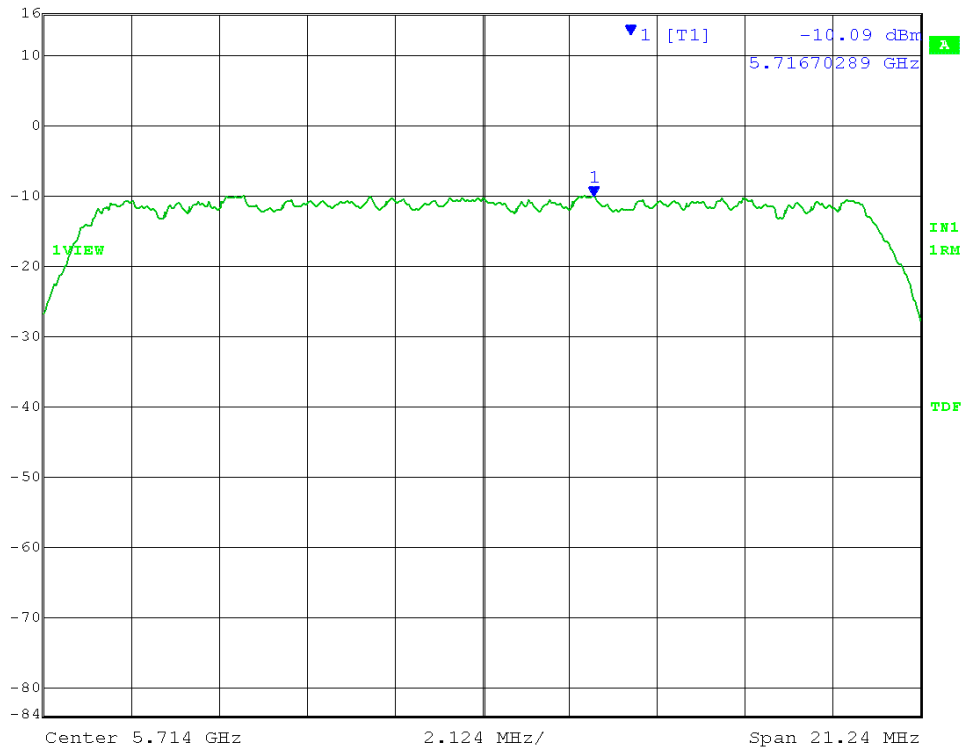


Date: 18.OCT.2013 15:34:28

20MHz BW, HCH, QPSK

TX 0: 26 dB EBW = 21.24MHz

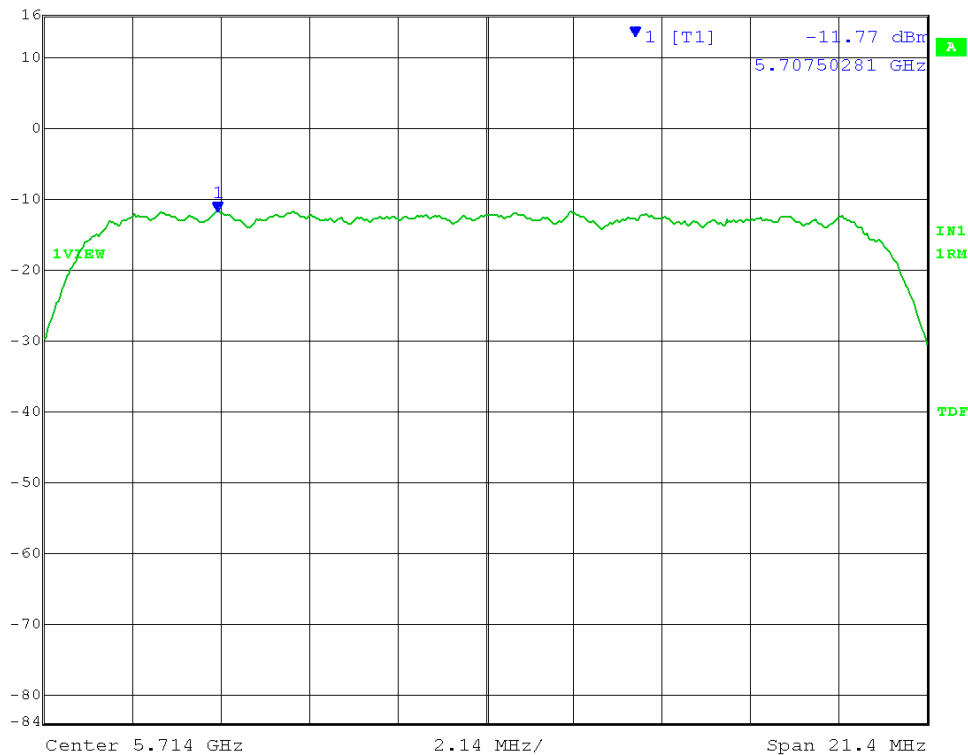
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.09 dBm VBW 3 MHz
-10 dBm 5.71670289 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:29:23

TX1: 26 dB EBW = 21.40MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -11.77 dBm VBW 3 MHz
-10 dBm 5.70750281 GHz SWT 5 ms Unit dBm

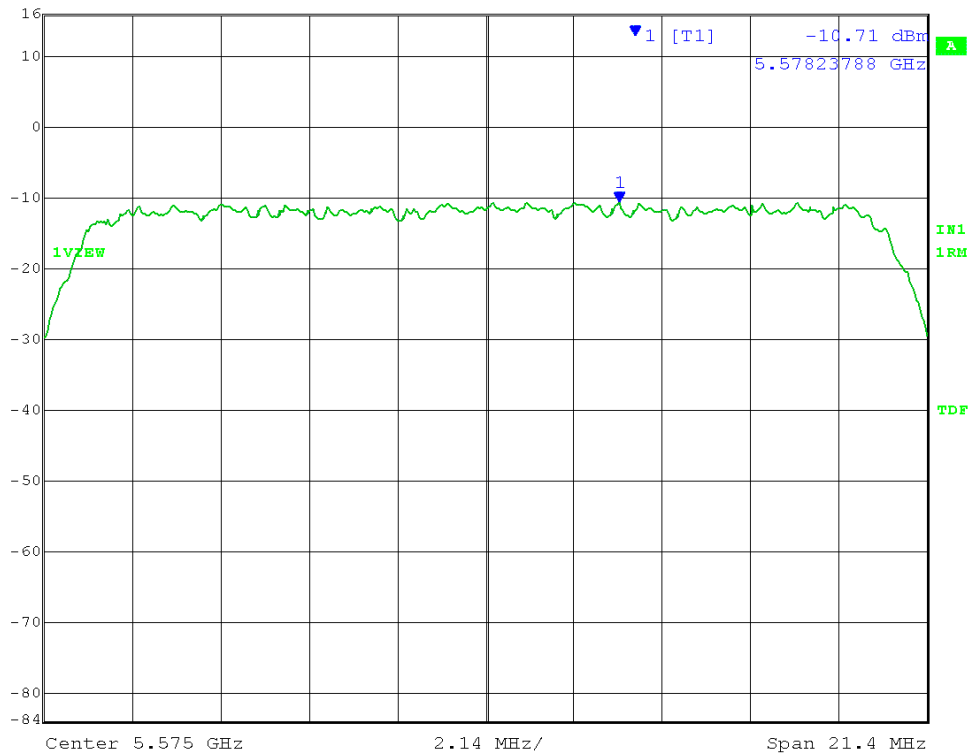


Date: 18.OCT.2013 15:40:04

20MHz BW, MCH, 16QAM

TX 0: 26 dB EBW = 21.40MHz

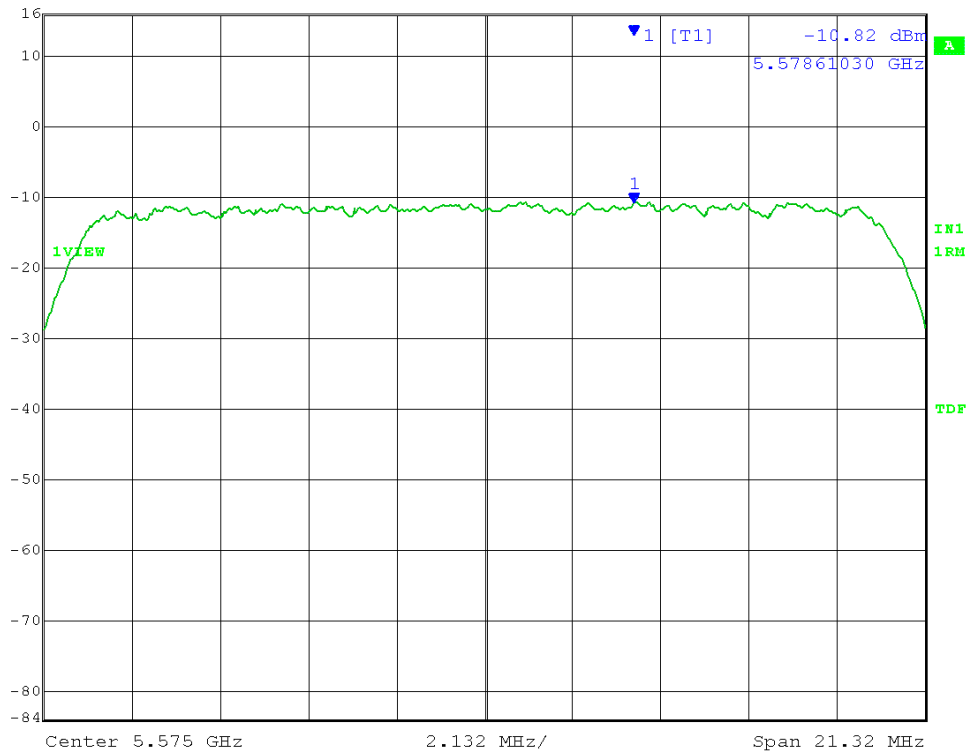
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.71 dBm VBW 3 MHz
-10 dBm 5.57823788 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:26:09

TX1: 26 dB EBW = 21.32MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.82 dBm VBW 3 MHz
-10 dBm 5.57861030 GHz SWT 5 ms Unit dBm

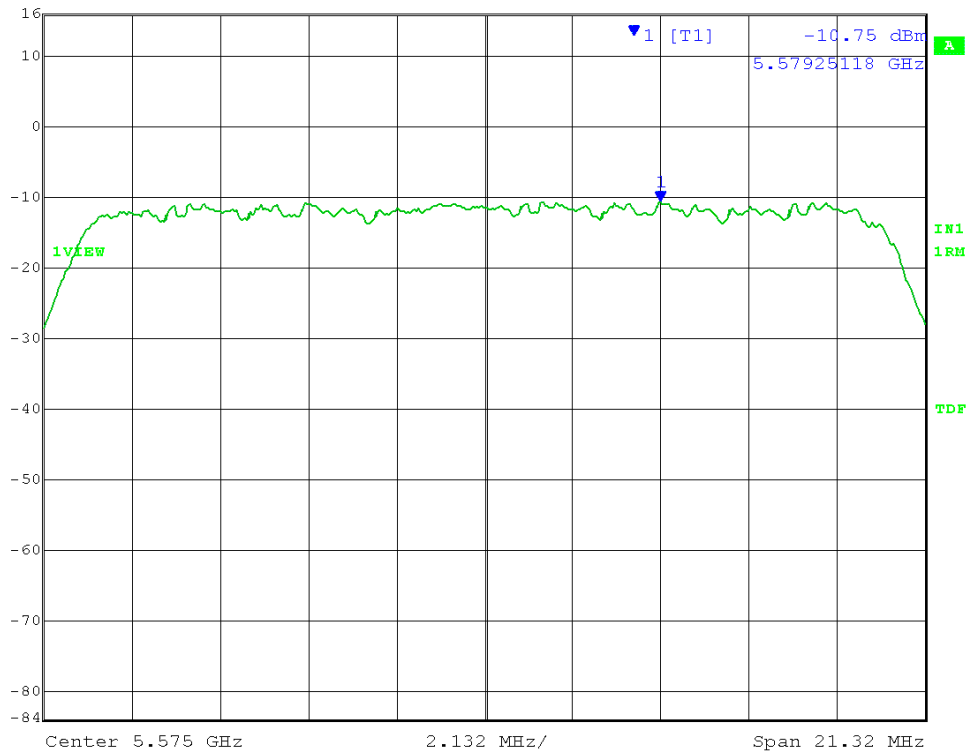


Date: 22.OCT.2013 12:50:13

20MHz BW, MCH, 64QAM

TX 0: 26 dB EBW = 21.32MHz

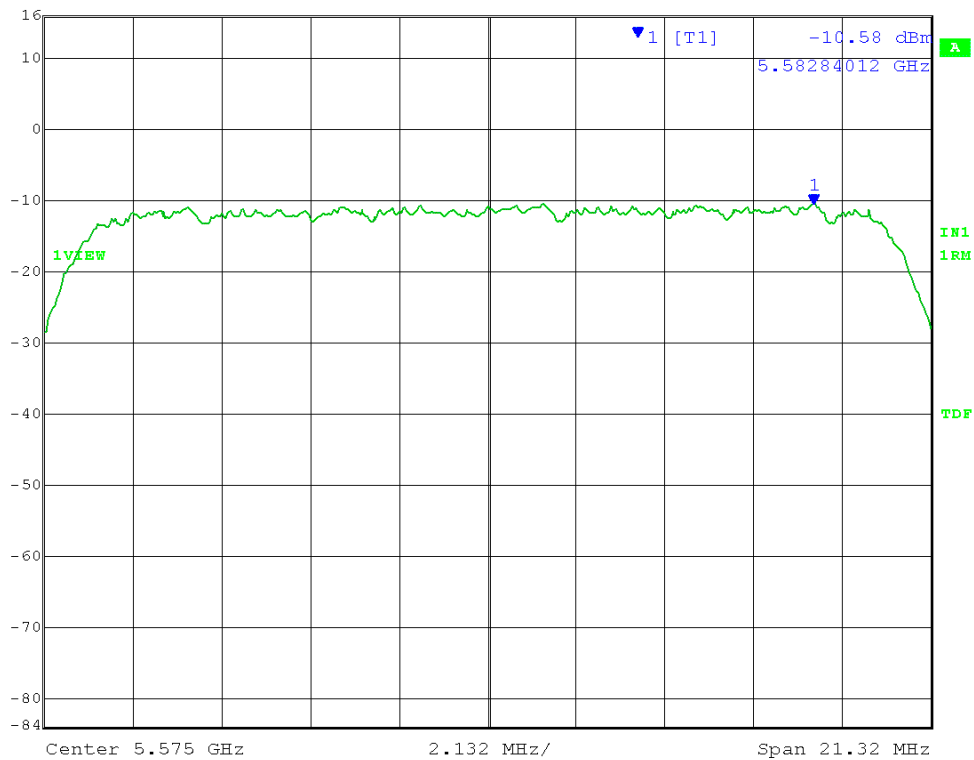
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.75 dBm VBW 3 MHz
-10 dBm 5.57925118 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:25:09

TX1: 26 dB EBW = 21.32MHz

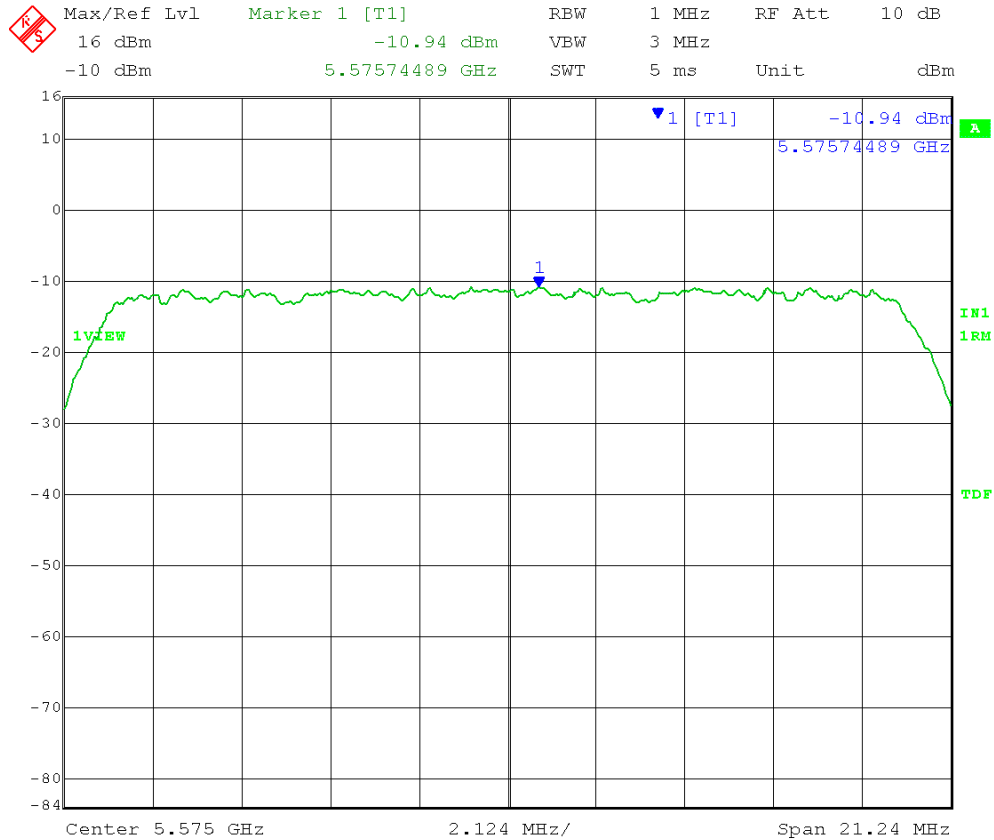
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.58 dBm VBW 3 MHz
-10 dBm 5.58284012 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:49:22

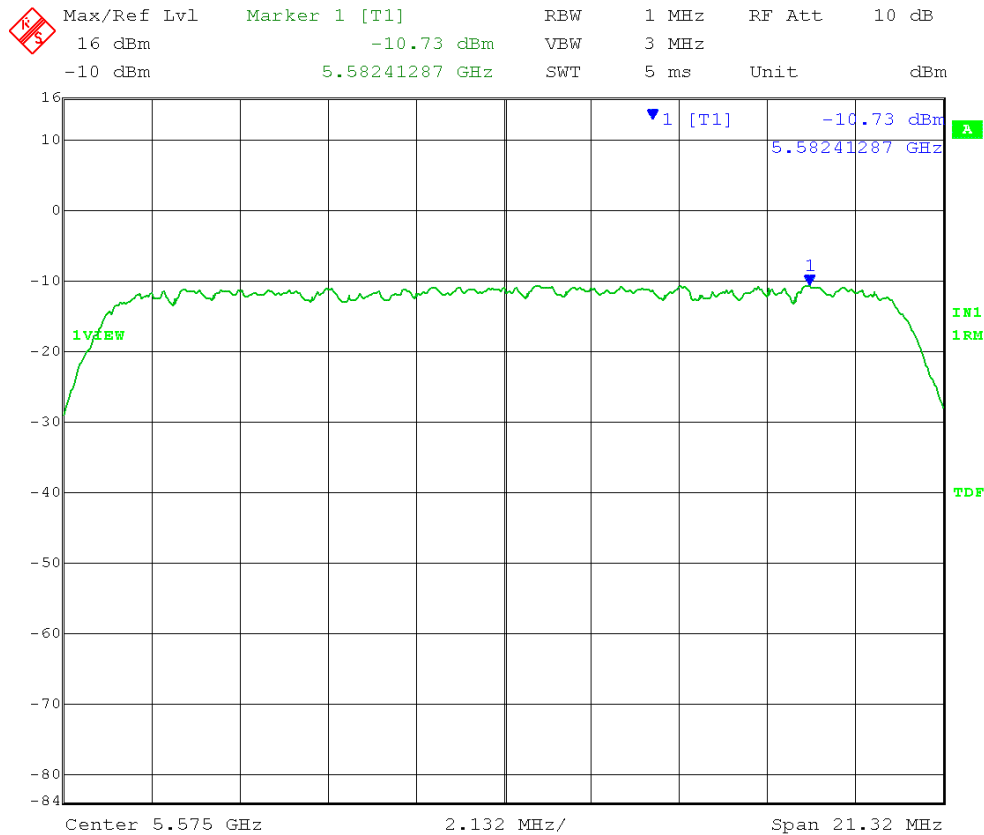
20MHz BW, MCH, 256QAM

TX 0: 26 dB EBW = 21.24MHz



Date: 22.OCT.2013 12:23:48

TX1: 26 dB EBW = 21.32MHz

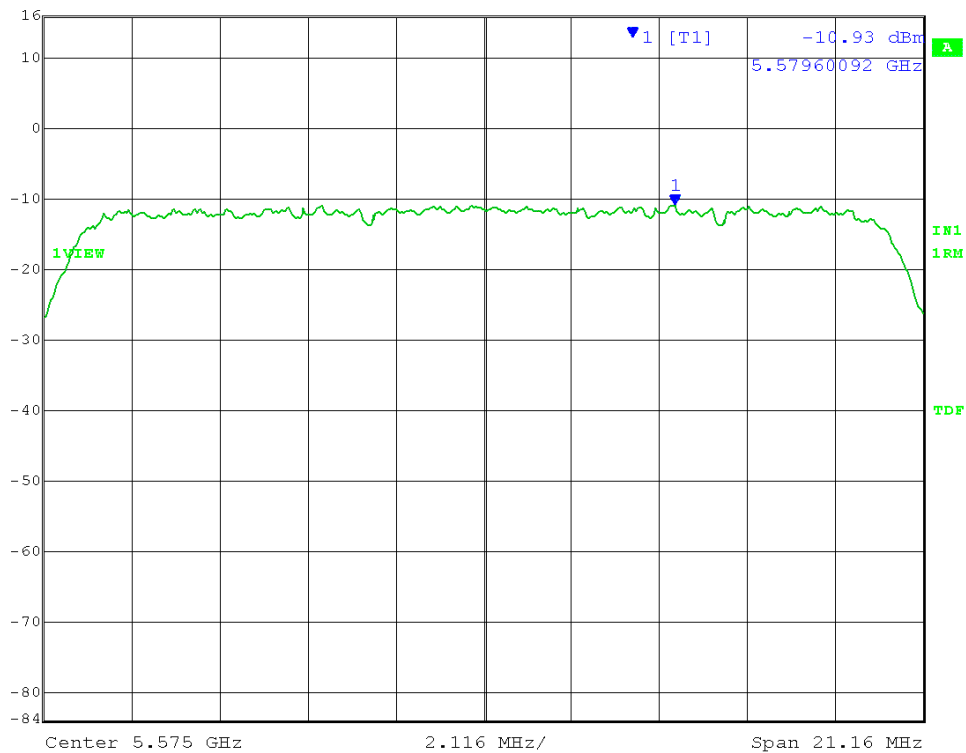


Date: 22.OCT.2013 12:48:25

20MHz BW, MCH, 1024QAM

TX 0: 26 dB EBW = 21.16MHz

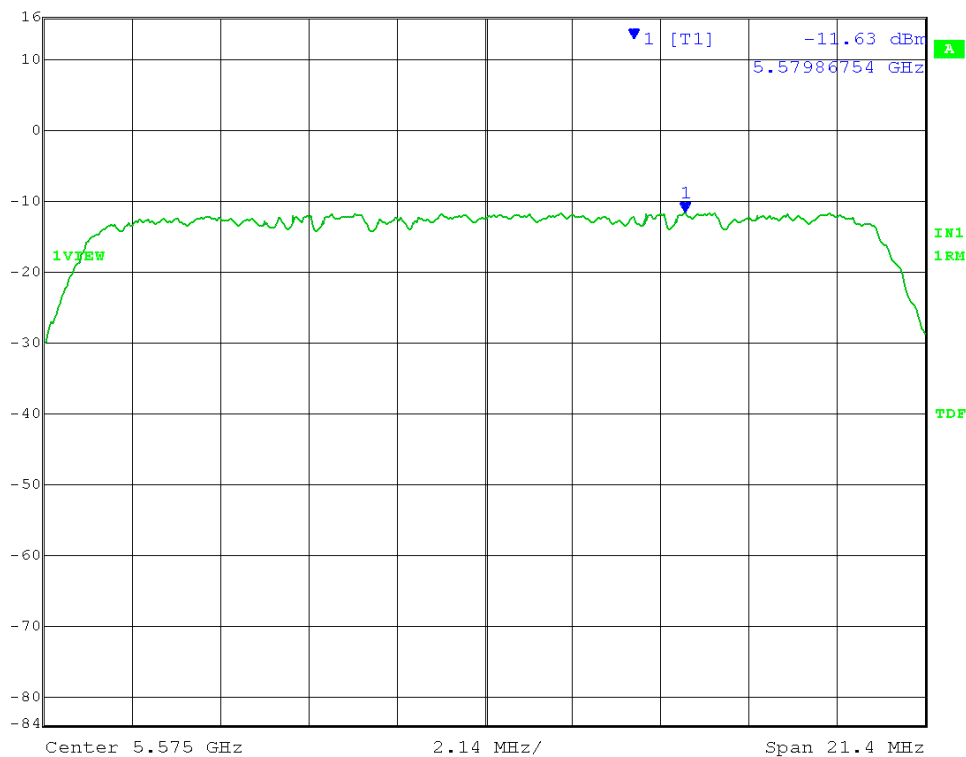
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.93 dBm VBW 3 MHz
-10 dBm 5.57960092 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:22:12

TX1: 26 dB EBW = 21.40MHz

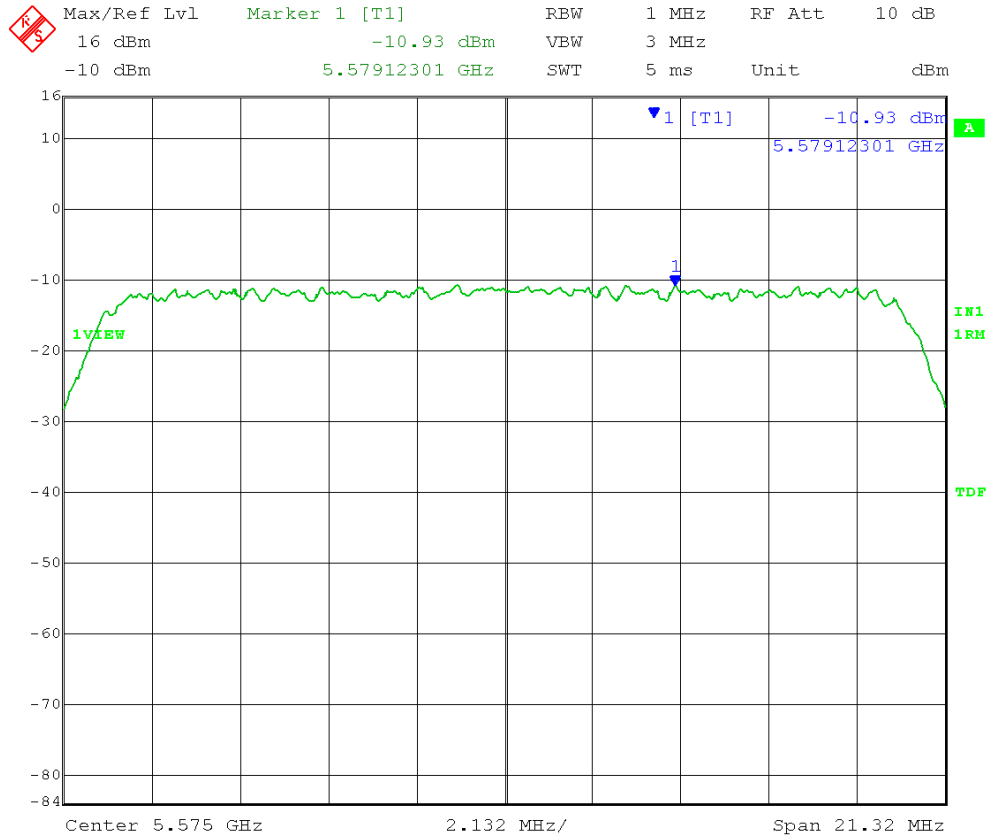
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -11.63 dBm VBW 3 MHz
-10 dBm 5.57986754 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 12:47:27

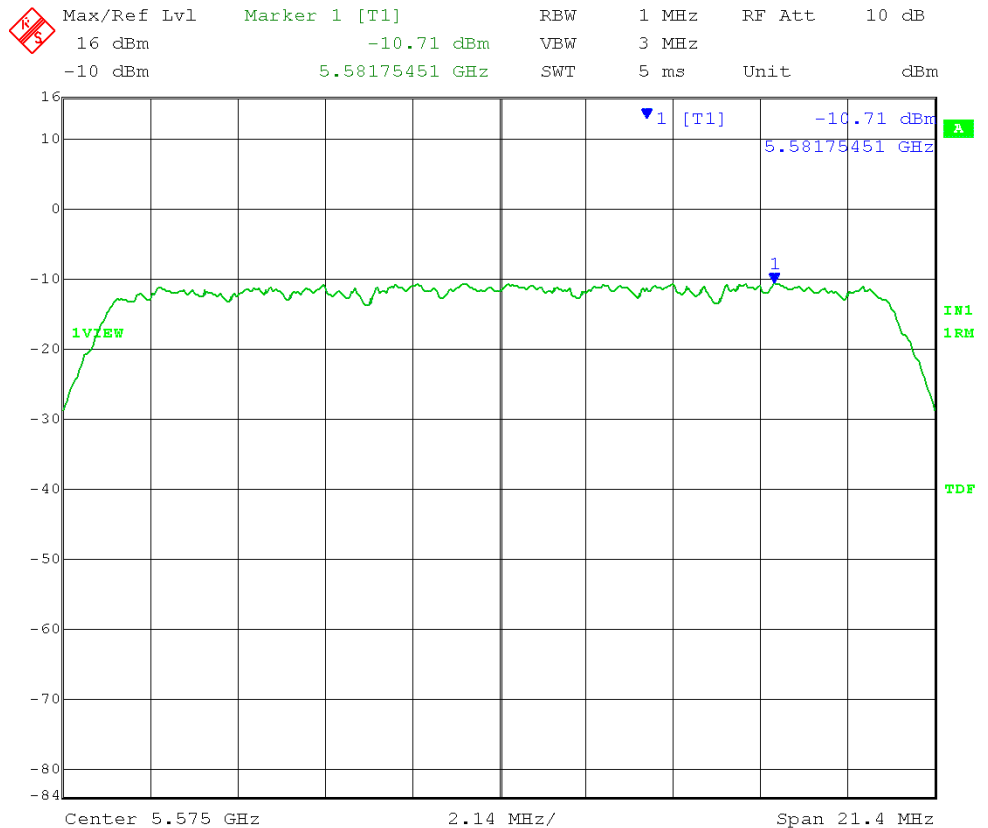
20MHz BW, MCH, QPSK

TX 0: 26 dB EBW = 21.32MHz



Date: 22.OCT.2013 12:27:43

TX1: 26 dB EBW = 21.40MHz

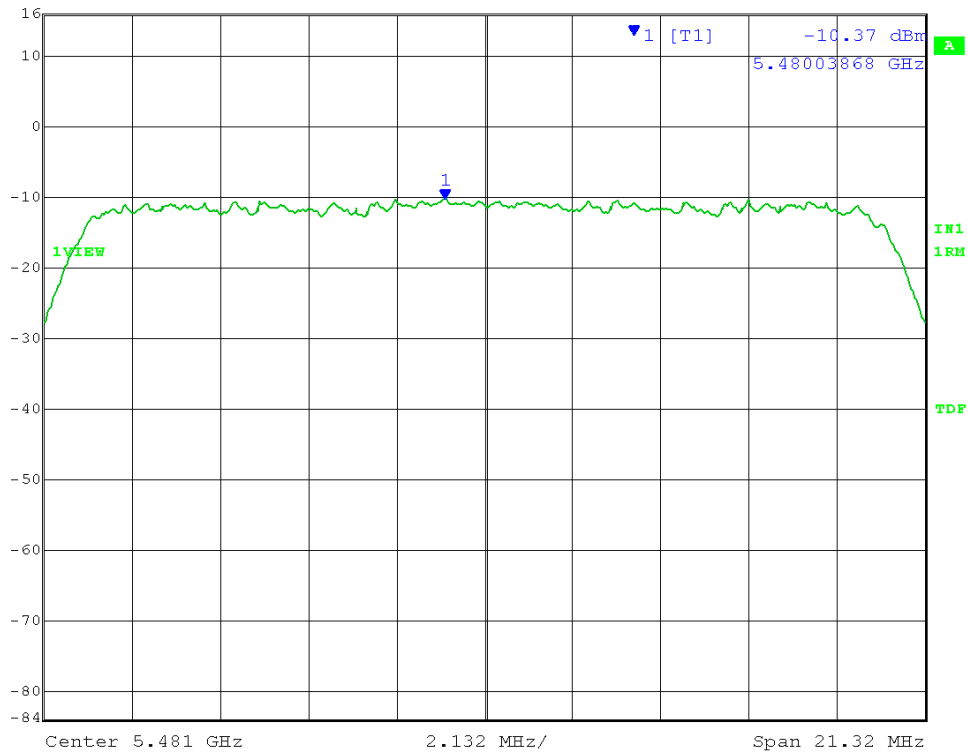


Date: 22.OCT.2013 12:51:15

20MHz BW, LCH, 16QAM

TX 0: 26 dB EBW = 21.32MHz

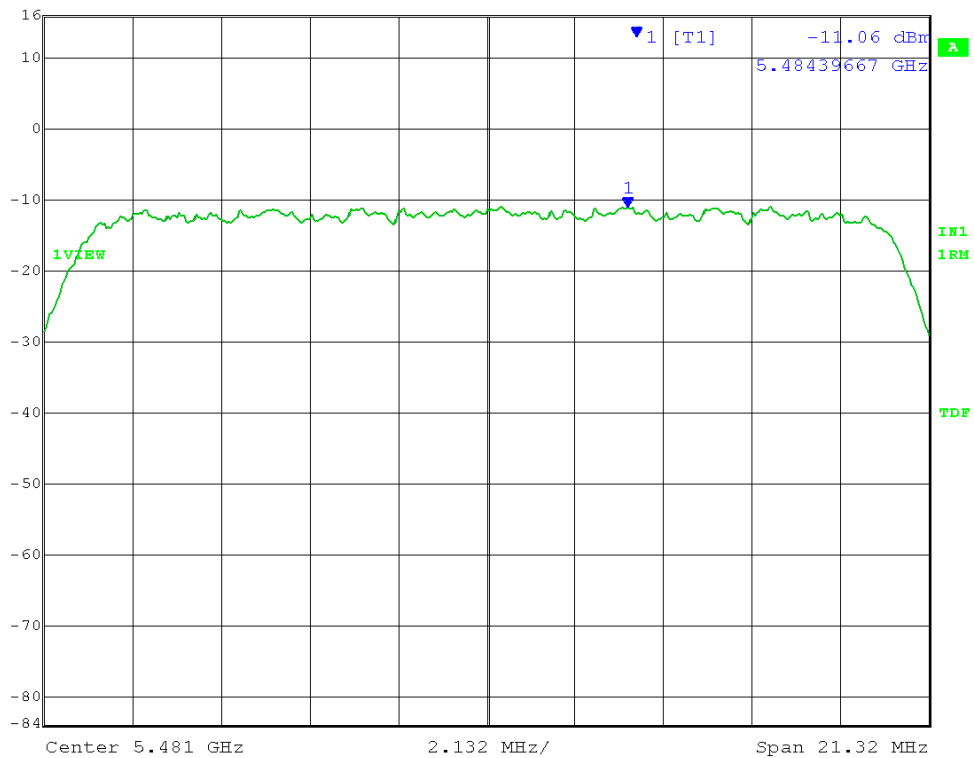
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.37 dBm VBW 3 MHz
-10 dBm 5.48003868 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 11:37:45

TX1: 26 dB EBW = 21.32MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -11.06 dBm VBW 3 MHz
-10 dBm 5.48439667 GHz SWT 5 ms Unit dBm

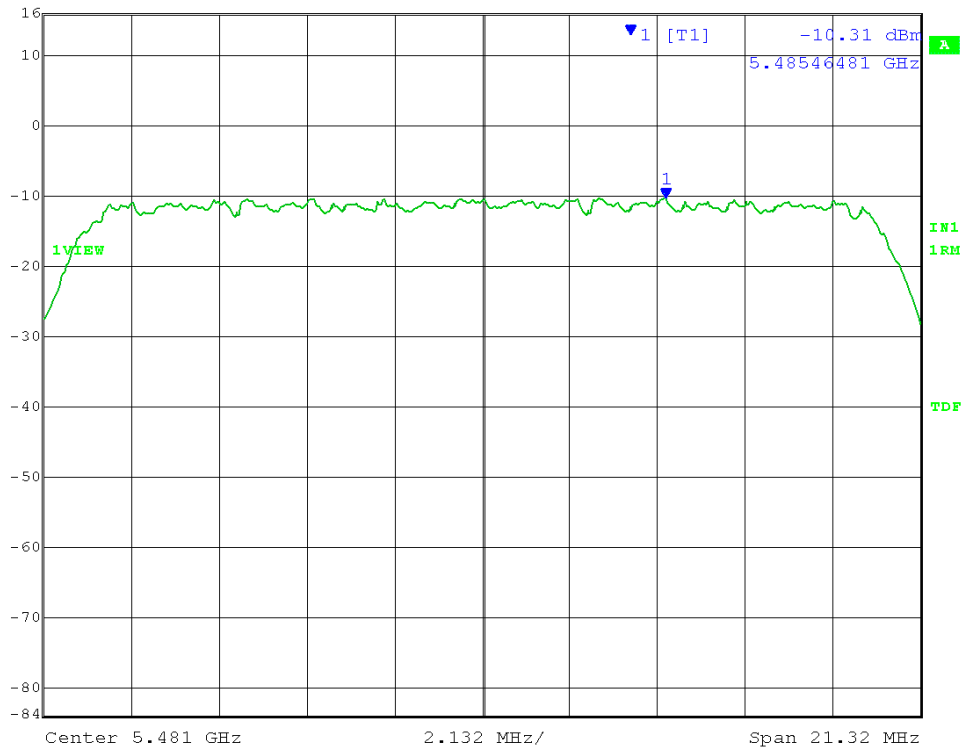


Date: 22.OCT.2013 12:42:52

20MHz BW, LCH, 64QAM

TX 0: 26 dB EBW = 21.32MHz

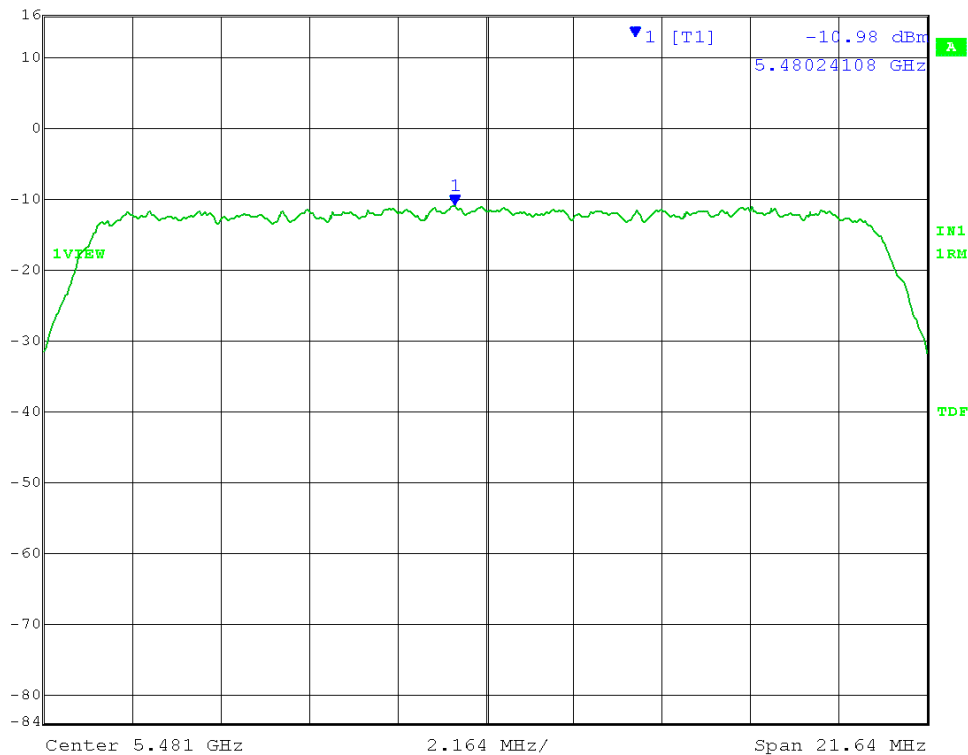
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.31 dBm VBW 3 MHz
-10 dBm 5.48546481 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 11:38:57

TX1: 26 dB EBW = 21.64MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.98 dBm VBW 3 MHz
-10 dBm 5.48024108 GHz SWT 5 ms Unit dBm

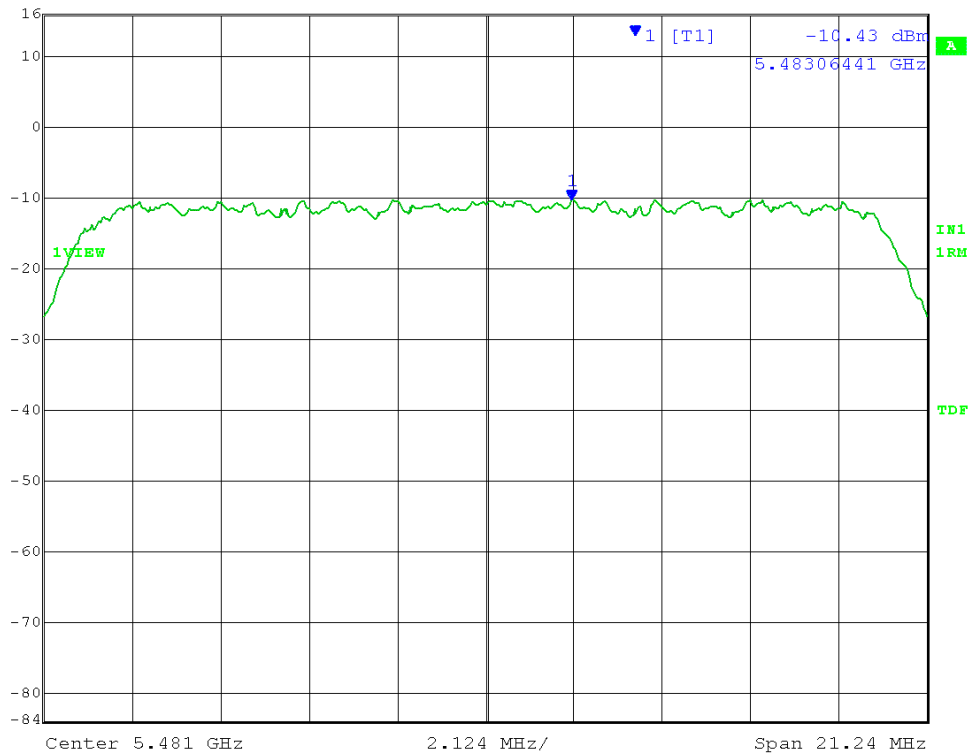


Date: 22.OCT.2013 12:44:13

20MHz BW, LCH, 256QAM

TX 0: 26 dB EBW = 21.24MHz

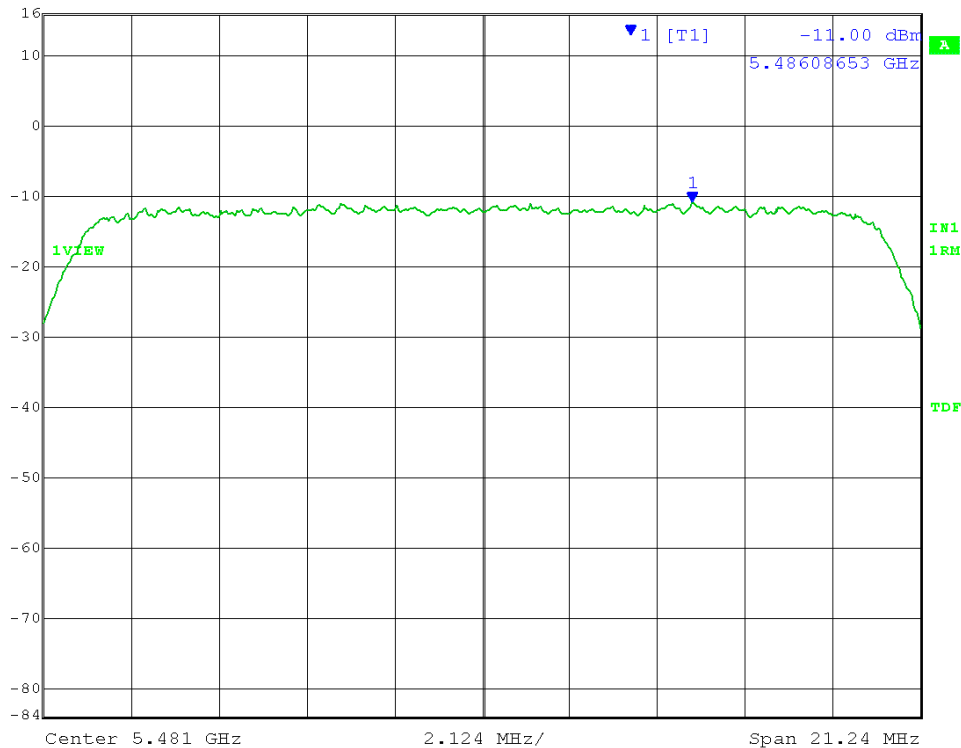
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -10.43 dBm VBW 3 MHz
-10 dBm 5.48306441 GHz SWT 5 ms Unit dBm



Date: 22.OCT.2013 11:42:10

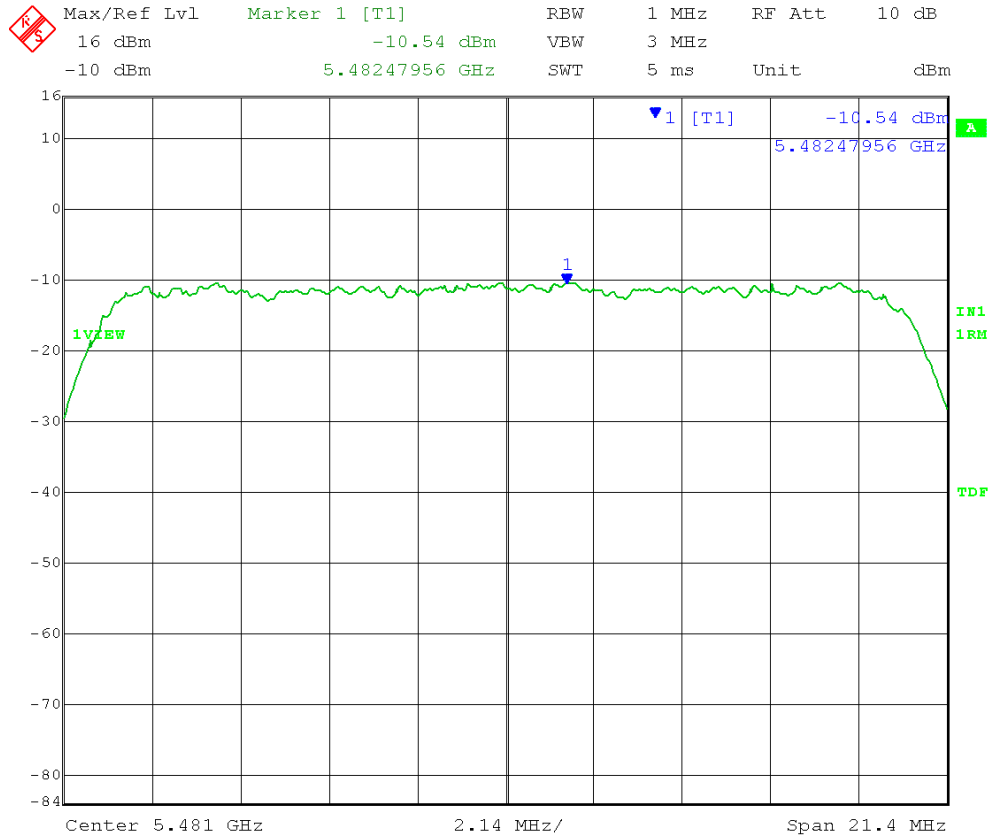
TX1: 26 dB EBW = 21.24MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -11.00 dBm VBW 3 MHz
-10 dBm 5.48608653 GHz SWT 5 ms Unit dBm



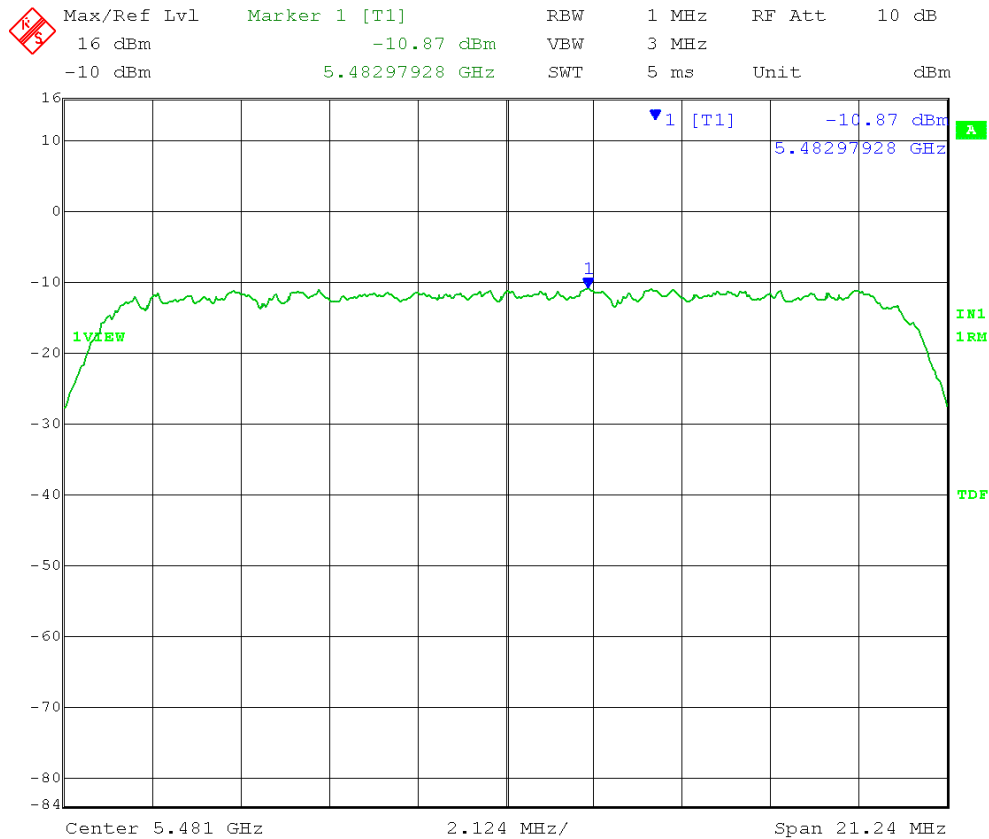
Date: 22.OCT.2013 12:45:12

20MHz BW, LCH, 1024QAM
TX 0: 26 dB EBW = 21.40MHz



Date: 22.OCT.2013 11:44:42

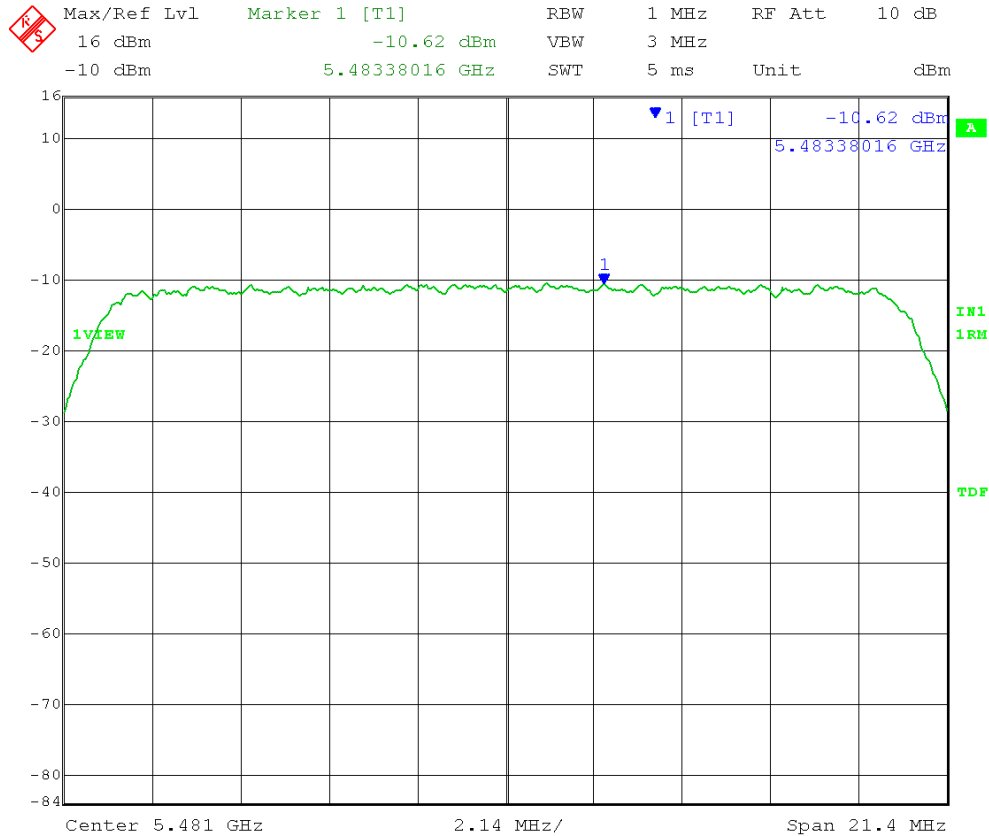
TX1: 26 dB EBW = 21.24MHz



Date: 22.OCT.2013 12:46:11

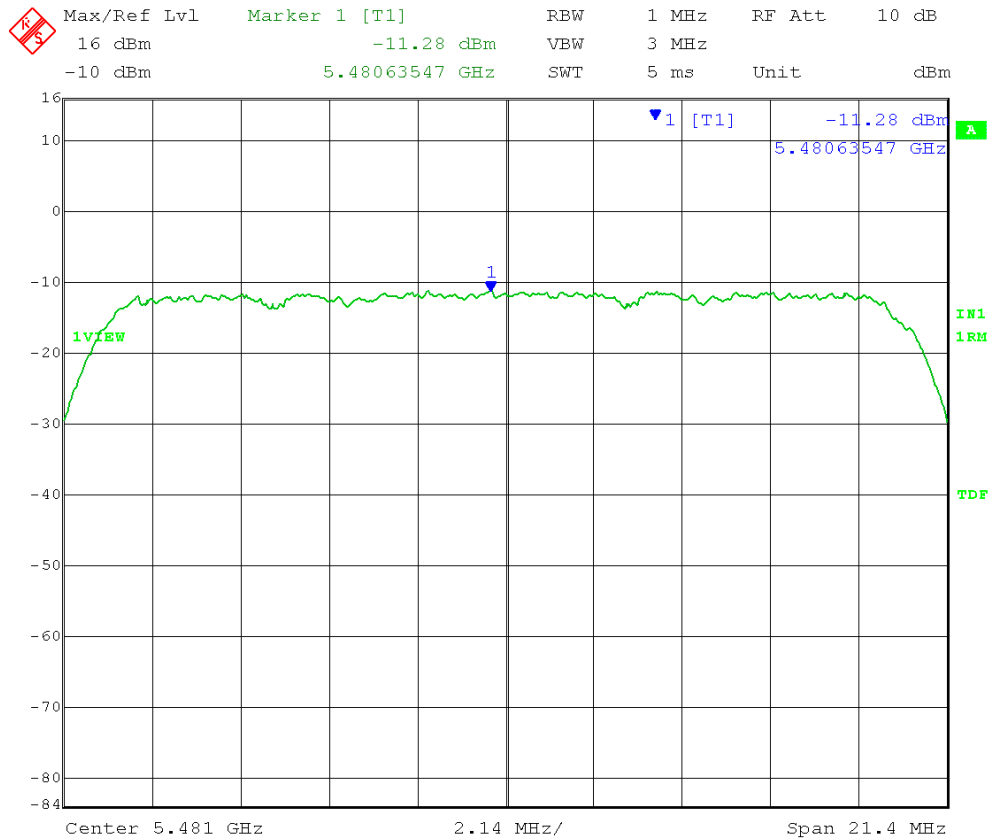
20MHz BW, LCH, QPSK

TX 0: 26 dB EBW = 21.40MHz



Date: 22.OCT.2013 11:34:39

TX1: 26 dB EBW = 21.40MHz



Date: 22.OCT.2013 12:41:46



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

7.0 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.

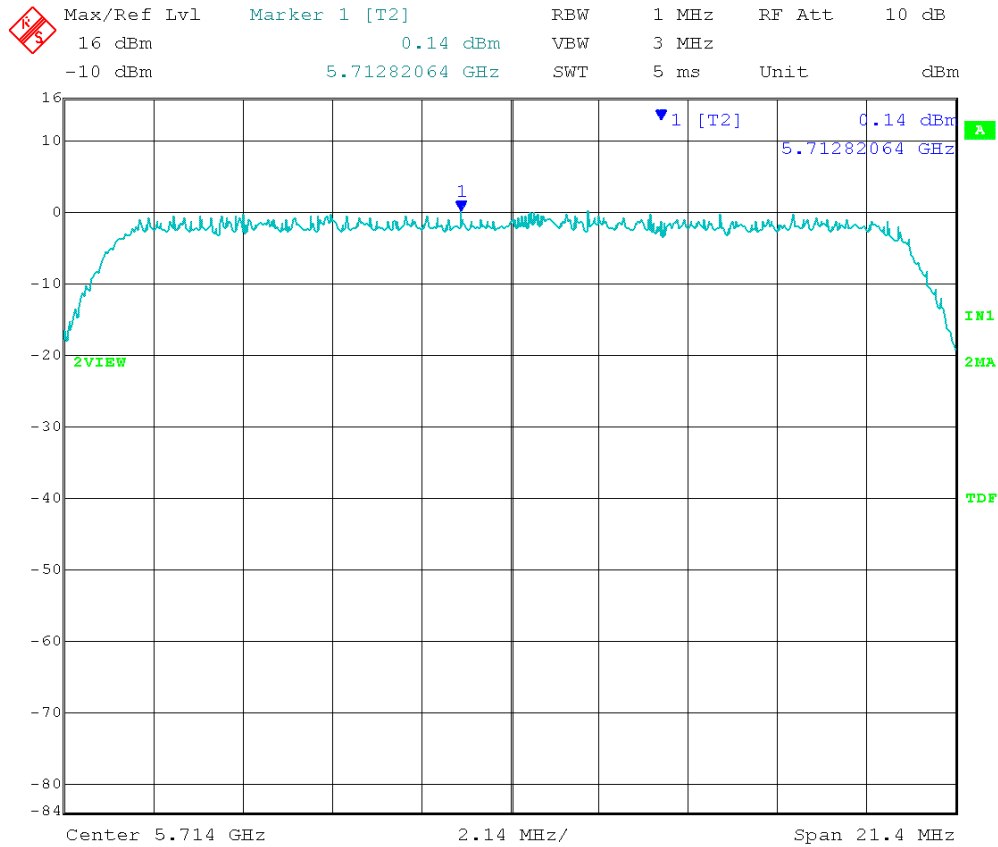
Output power was set to 30 dBm eirp using special test software.

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

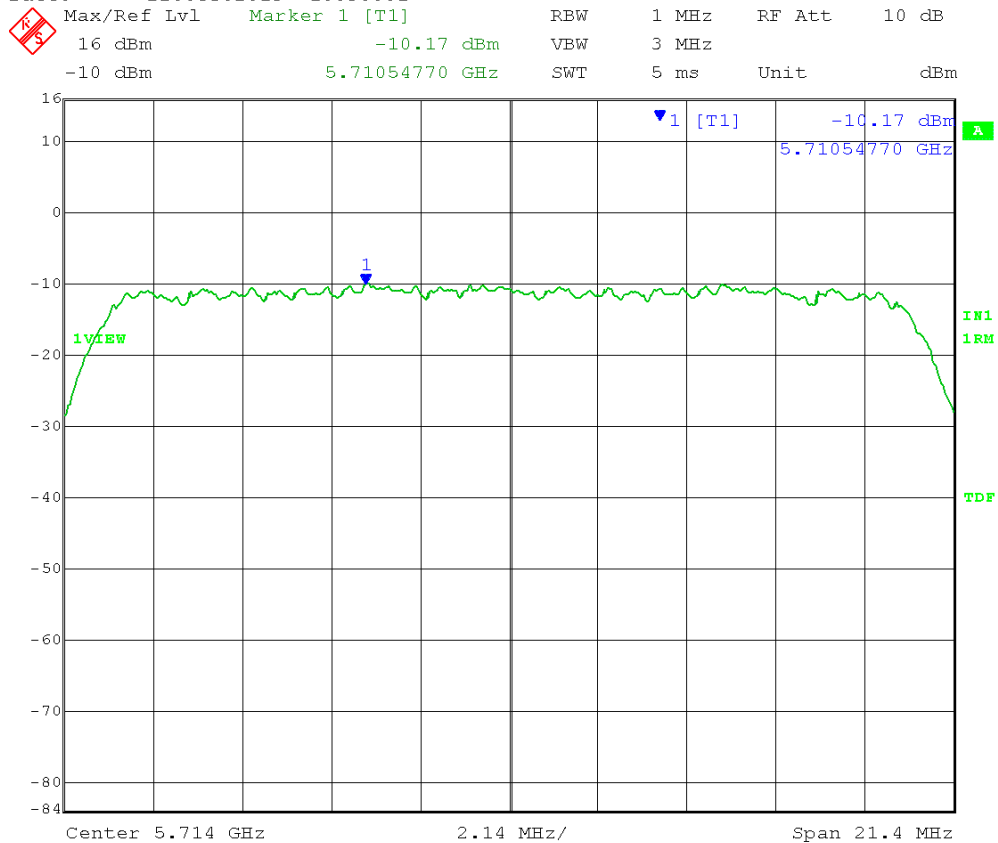
20MHz Operating Bandwidth:

Peak Excursion		20M				
	dB	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit = 13dB	<i>FCC limit:</i>	13	13	13	13	13
HCH = 5714 MHz	PK	-0.76	0.14	-0.88	-1.18	-1.3
	AVG	-10.09	-10.17	-10.11	-10.24	-10.04
	Excursion	9.33	10.31	9.23	9.06	8.74
	Margin	3.67	2.69	3.77	3.94	4.26
MCH = 5575 MHz	PK	-2.09	-1.8	-1.81	-1.63	-1.07
	AVG	-10.93	-10.71	-10.75	-10.94	-10.93
	Excursion	8.84	8.91	8.94	9.31	9.86
	Margin	4.16	4.09	4.06	3.69	3.14
LCH = 5481 MHz	PK	0.15	0.61	-0.13	0.12	-0.05
	AVG	-10.62	-10.37	-10.31	-10.43	-10.54
	Excursion	10.77	10.98	10.18	10.55	10.49
	Margin	2.23	2.02	2.82	2.45	2.51

20MHz BW, HCH, 16QAM, 26 dB EBW = 21.40MHz

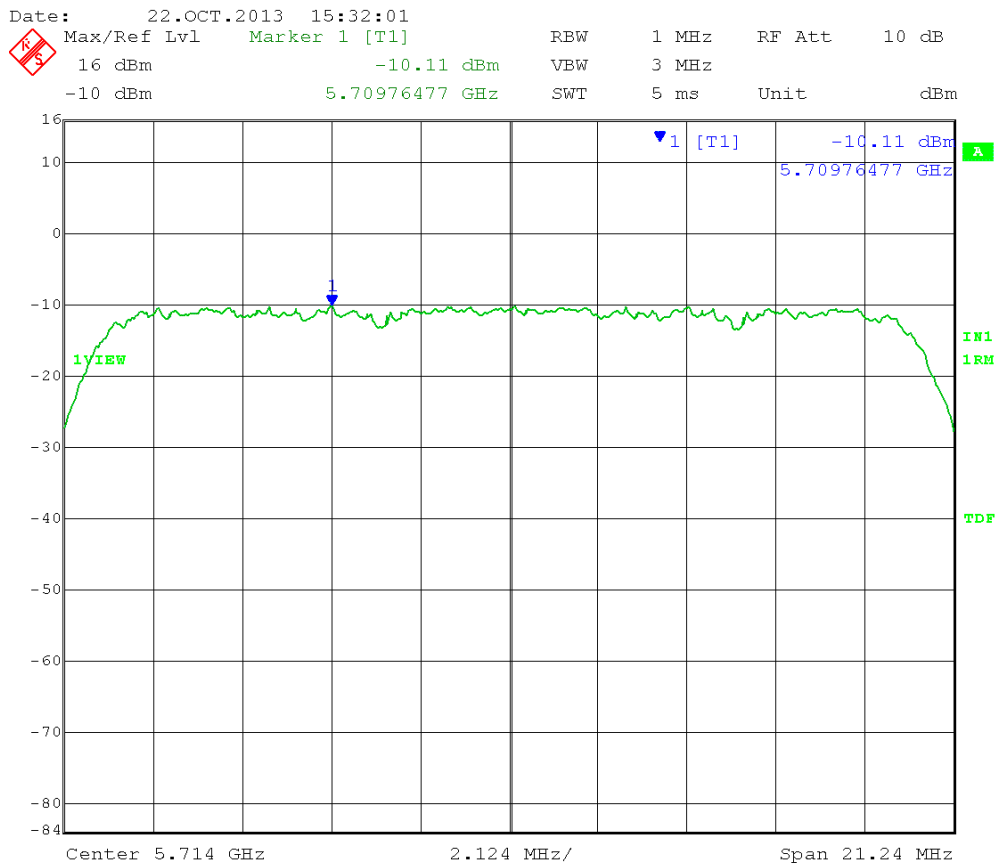
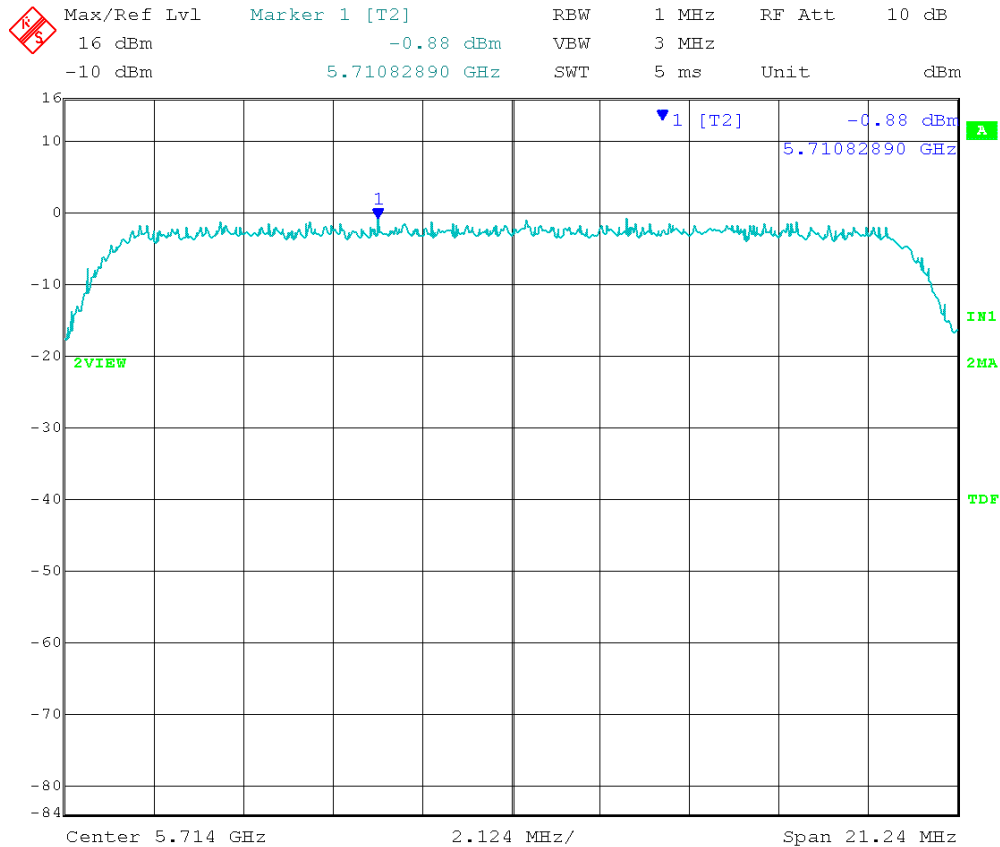


Date: 22.OCT.2013 15:30:51



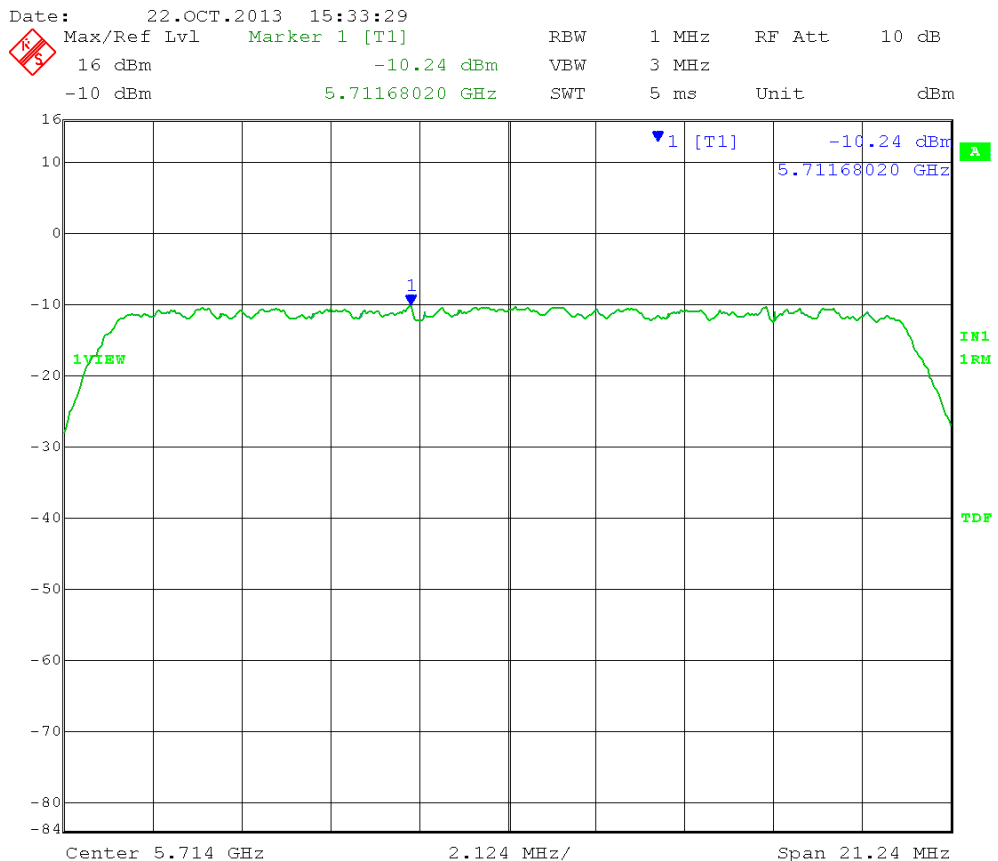
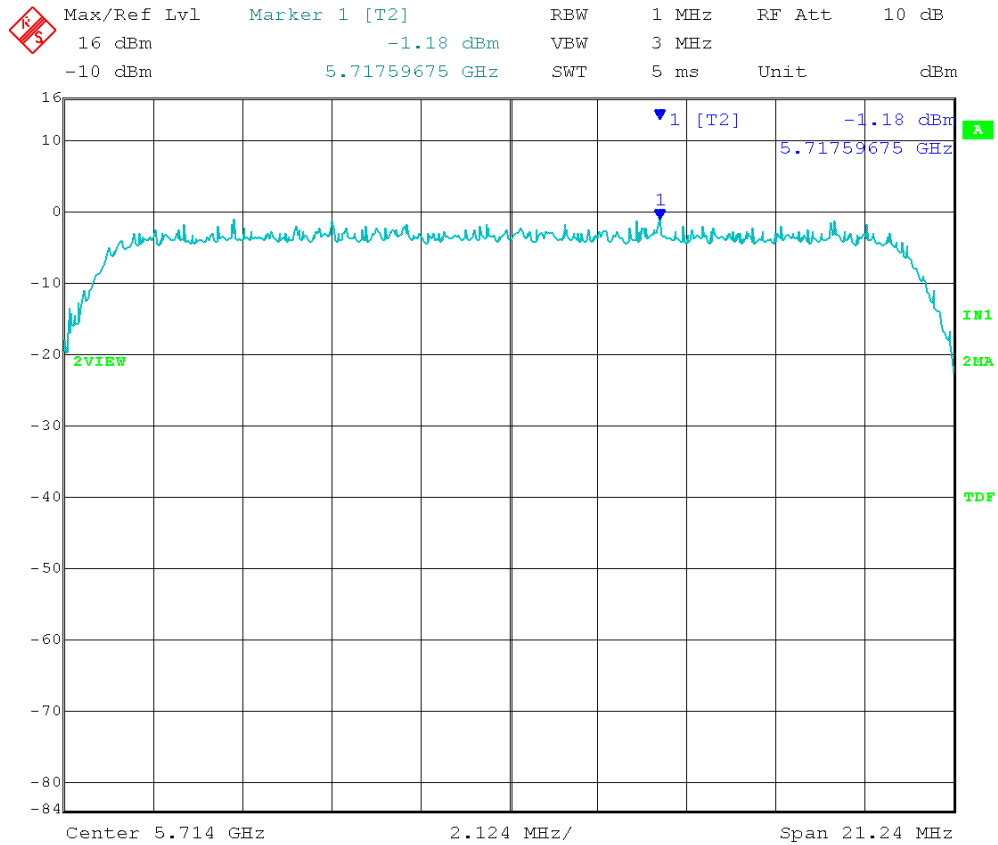
Date: 22.OCT.2013 12:30:44

20MHz BW, HCH, 64QAM, 26 dB EBW = 21.24MHz



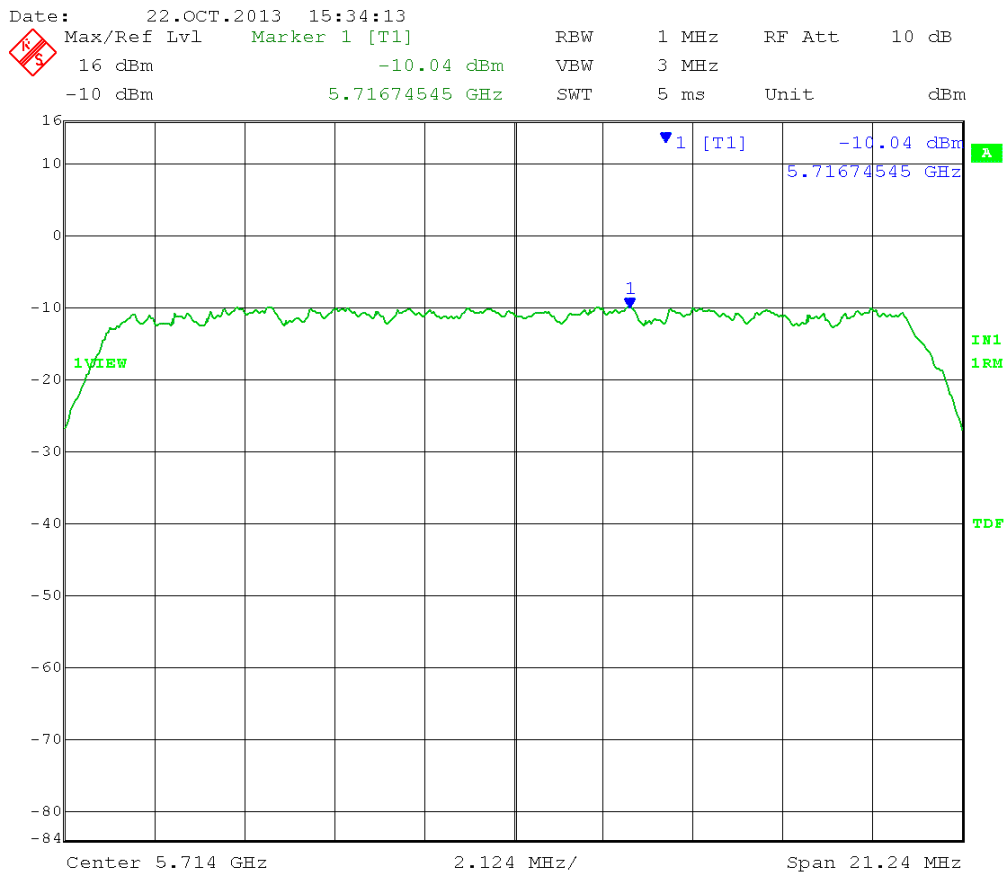
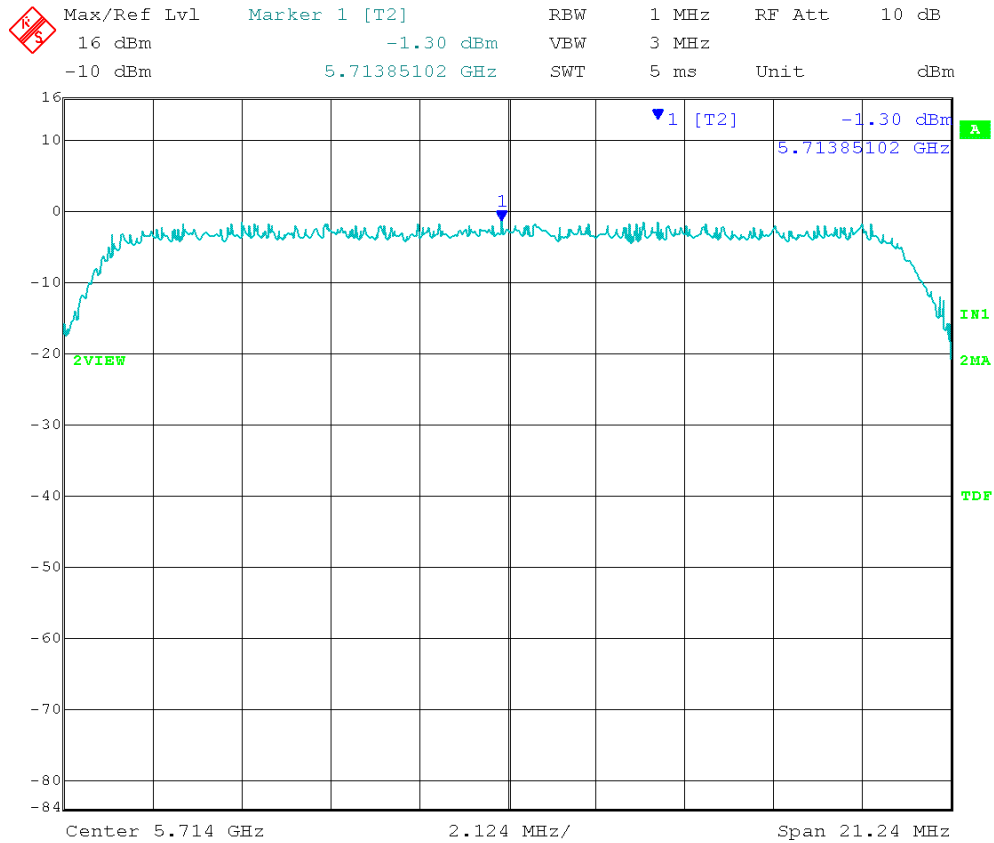
Date: 22.OCT.2013 12:31:43

20MHz BW, HCH, 256QAM, 26 dB EBW = 21.24MHz



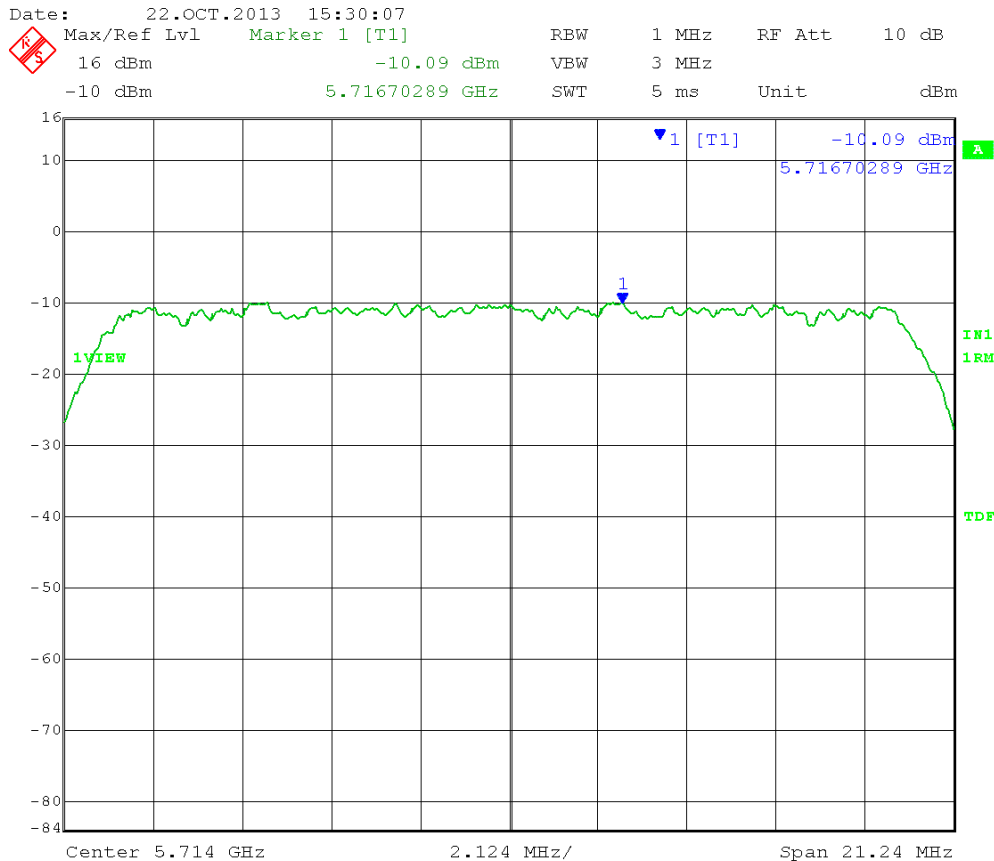
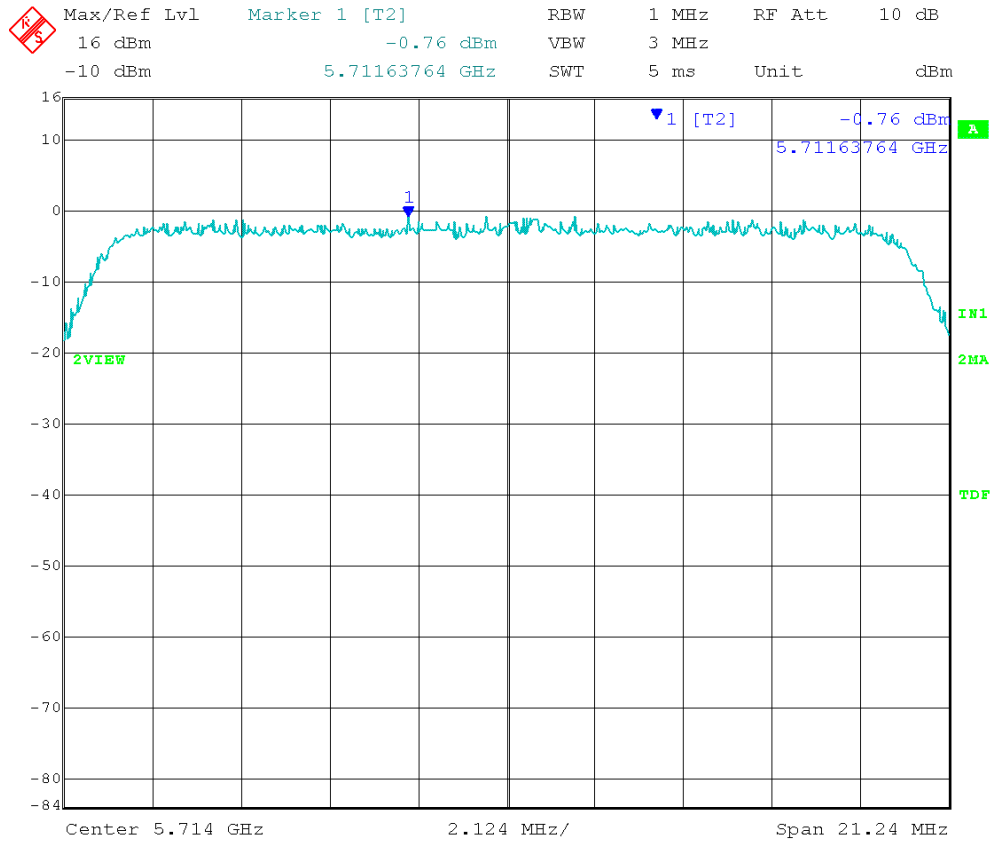
Date: 22.OCT.2013 12:33:21

20MHz BW, HCH, 1024QAM, 26 dB EBW = 21.24MHz



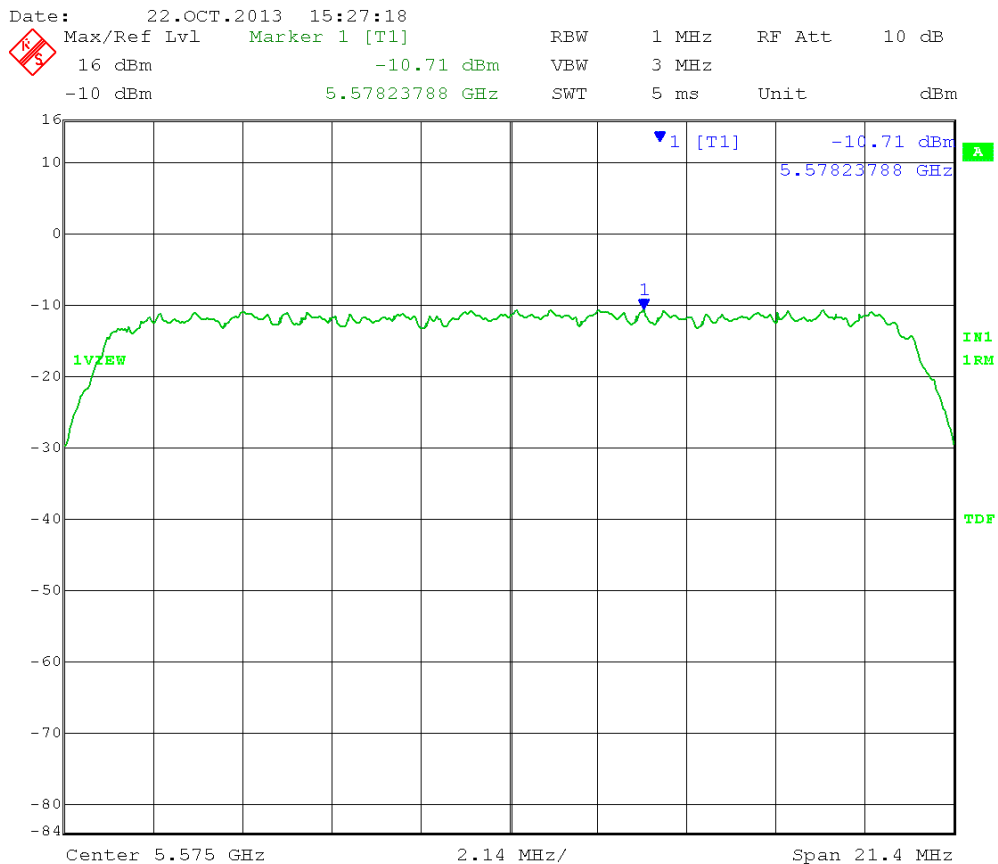
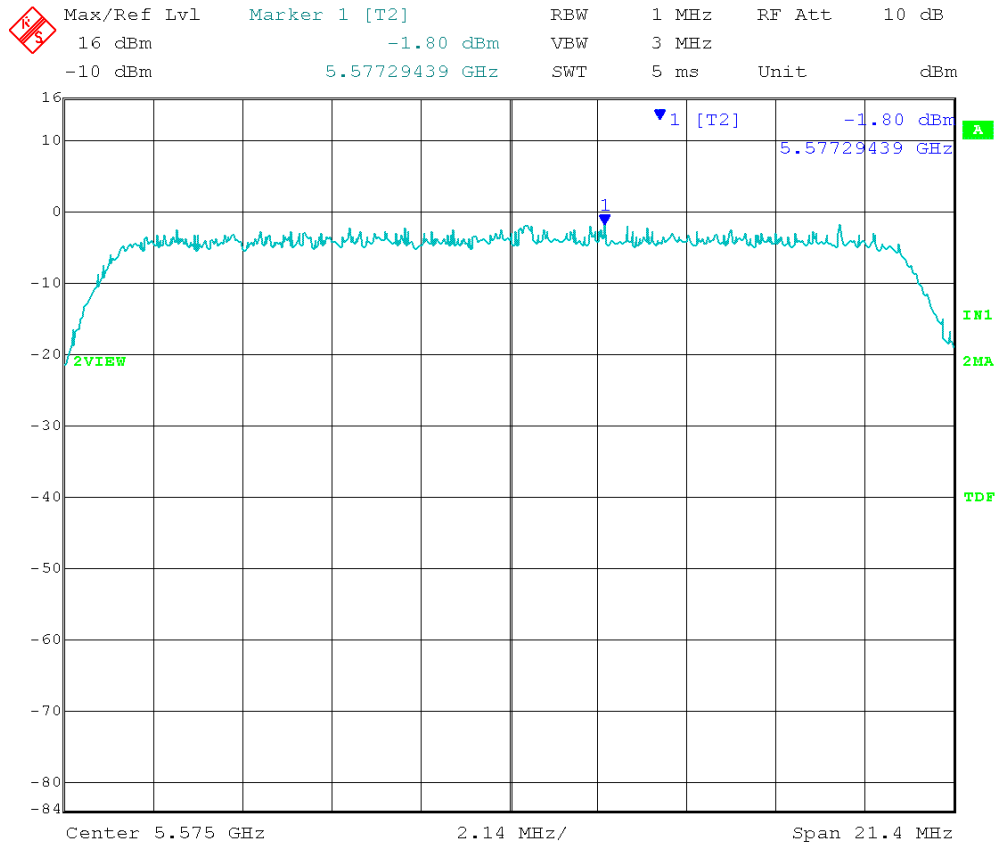
Date: 22.OCT.2013 12:34:31

20MHz BW, HCH, QPSK, 26 dB EBW = 21.24MHz



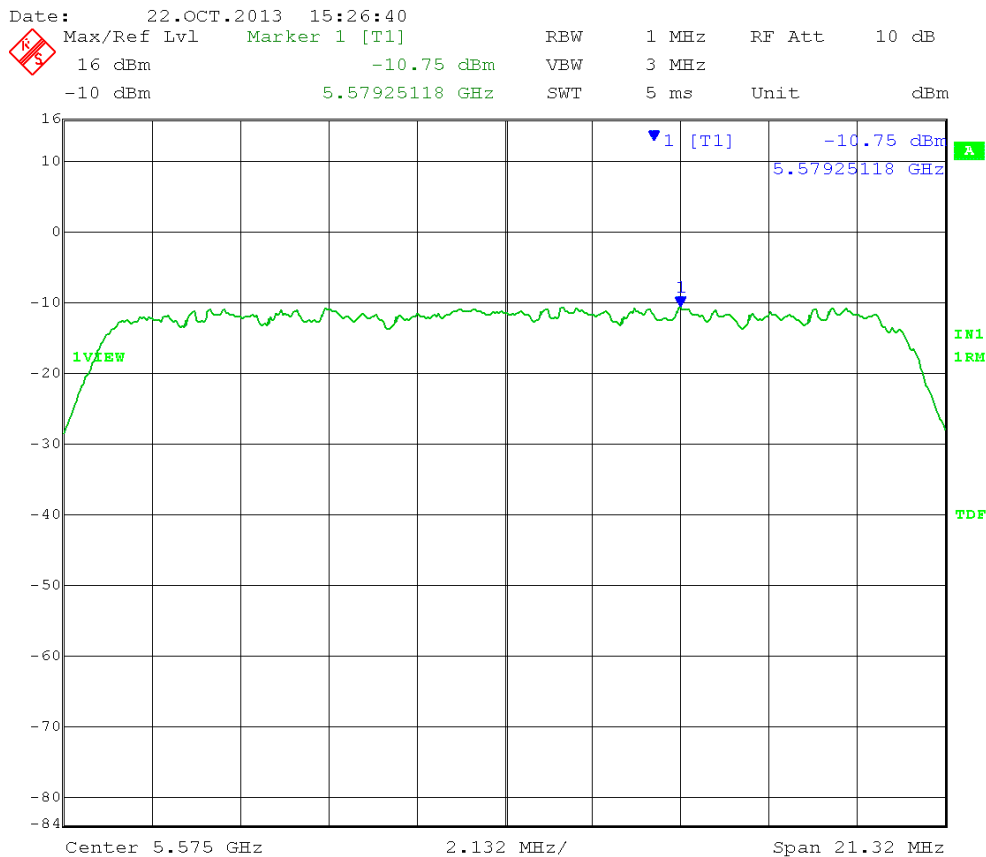
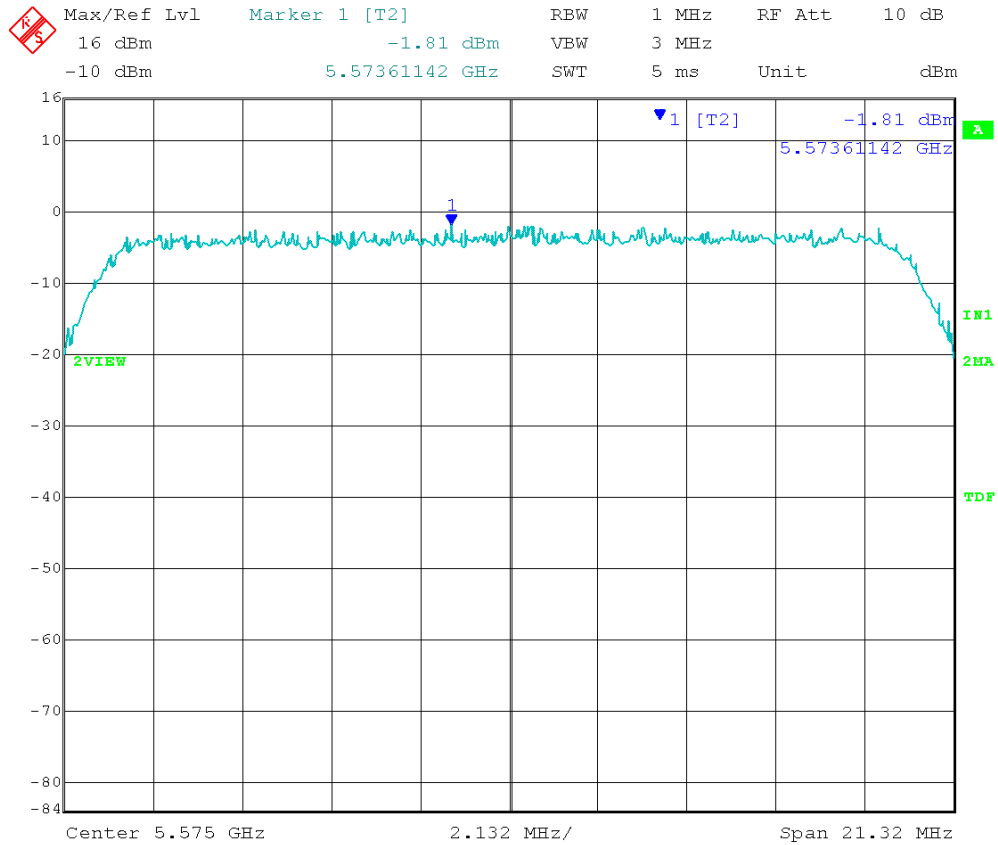
Date: 22.OCT.2013 12:29:23

20MHz BW, MCH, 16QAM, 26 dB EBW = 21.40MHz



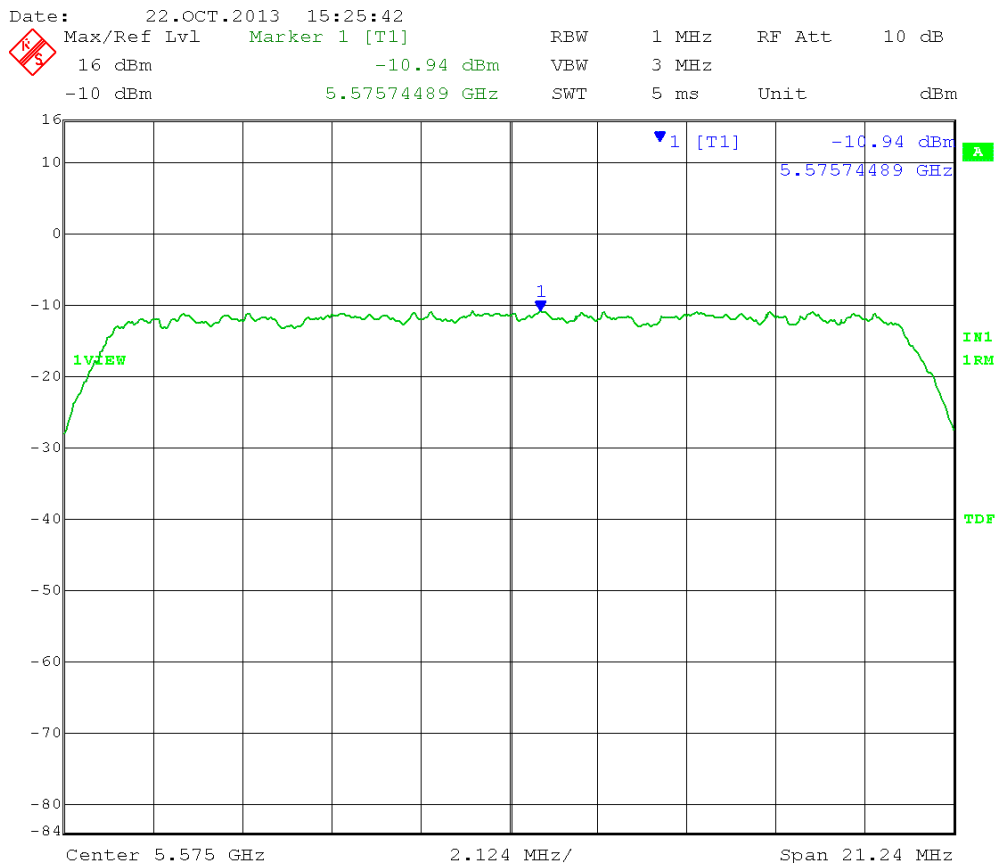
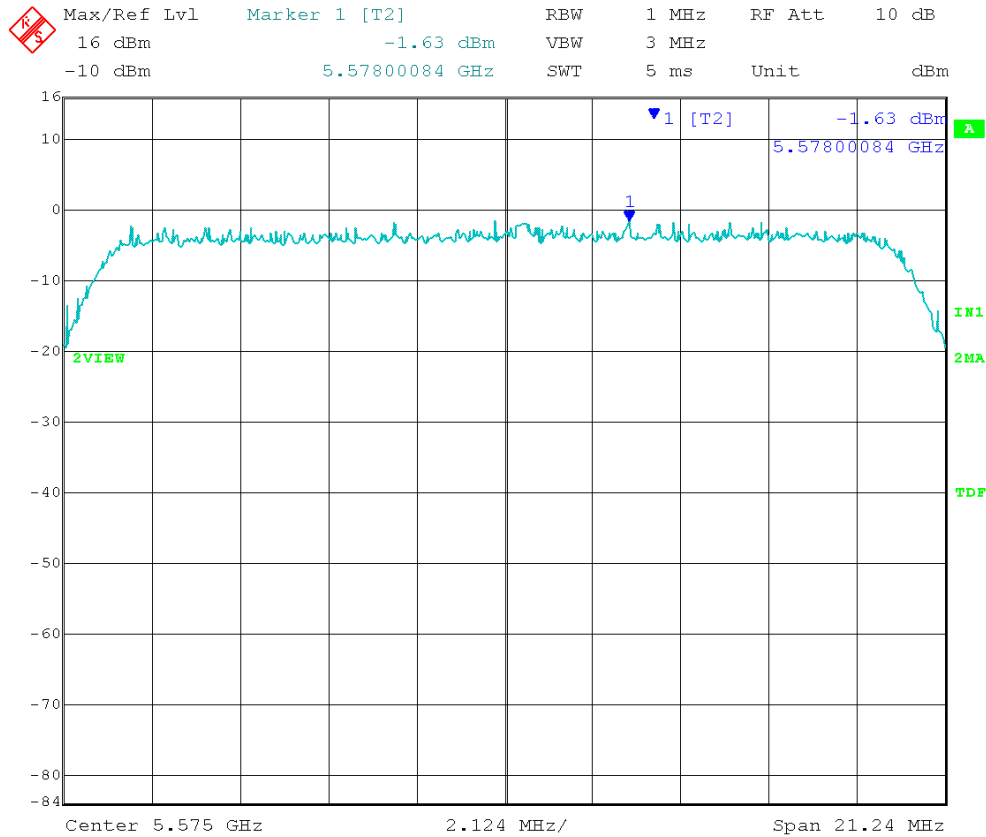
Date: 22.OCT.2013 12:26:09

20MHz BW, MCH, 64QAM, 26 dB EBW = 21.32MHz



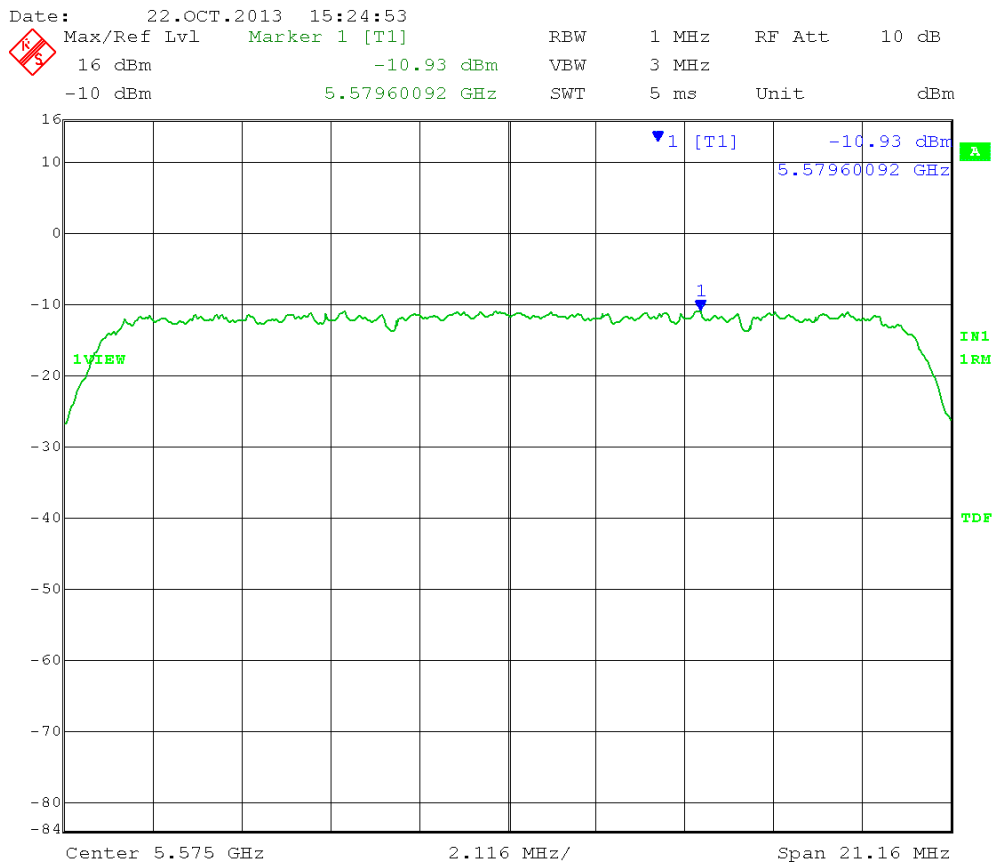
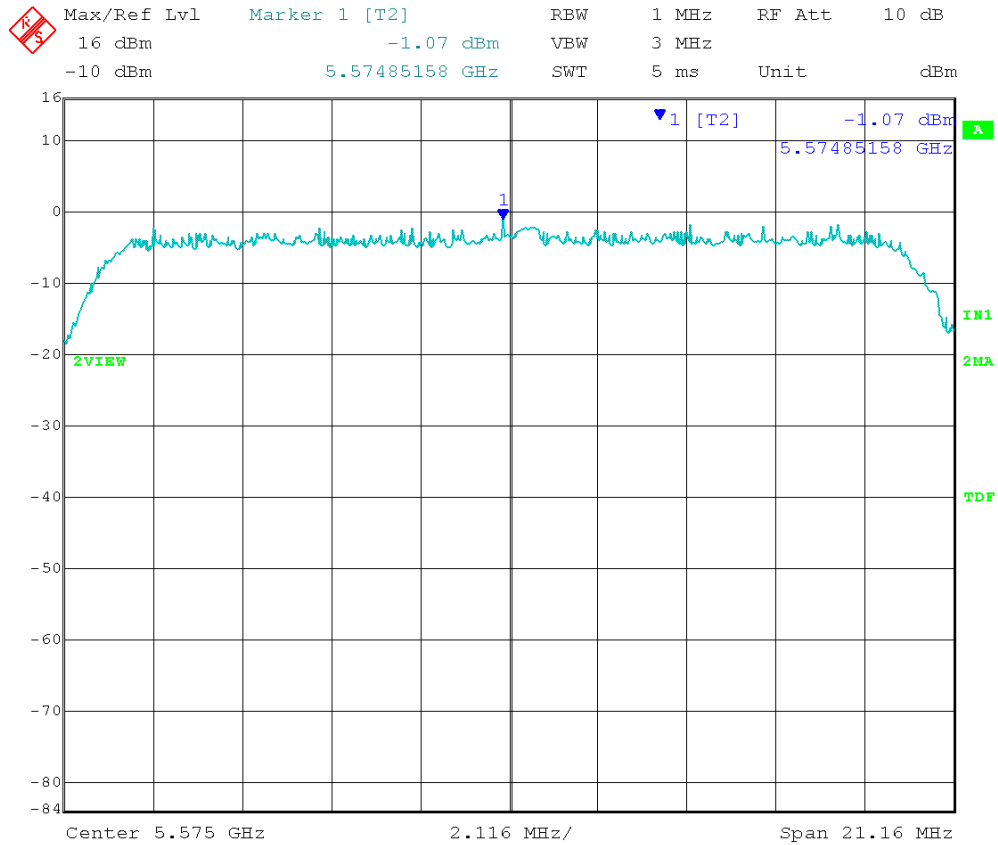
Date: 22.OCT.2013 12:25:09

20MHz BW, MCH, 256QAM, 26 dB EBW = 21.24MHz



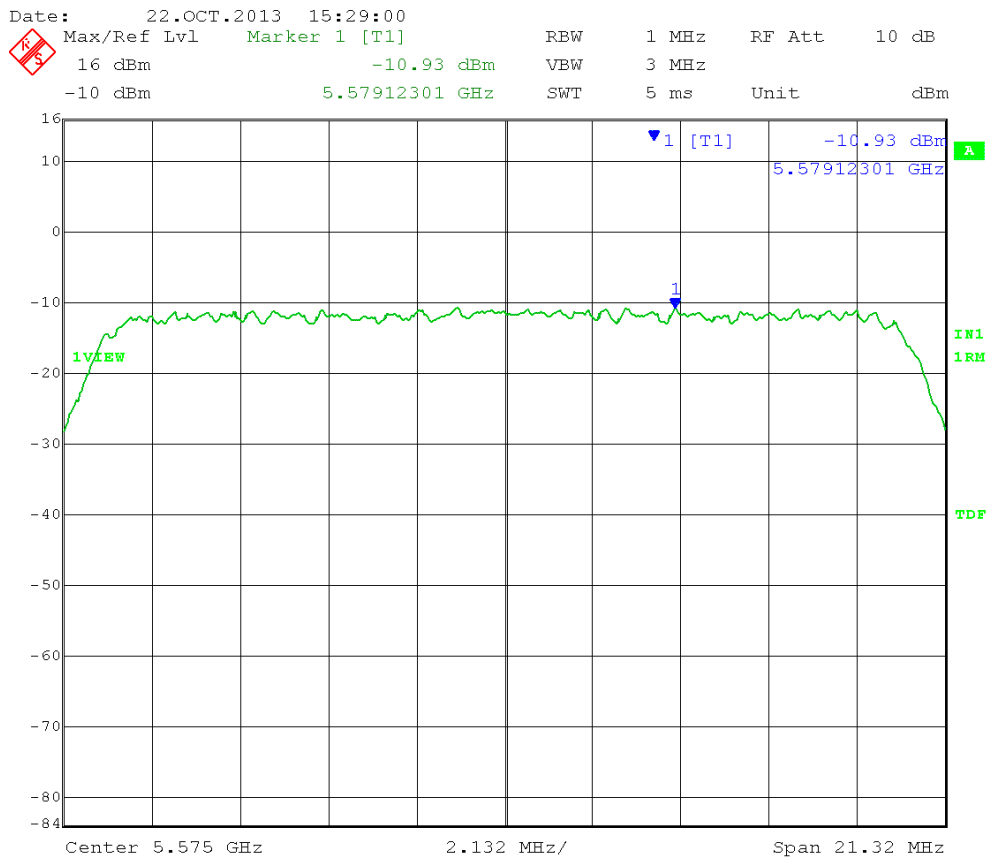
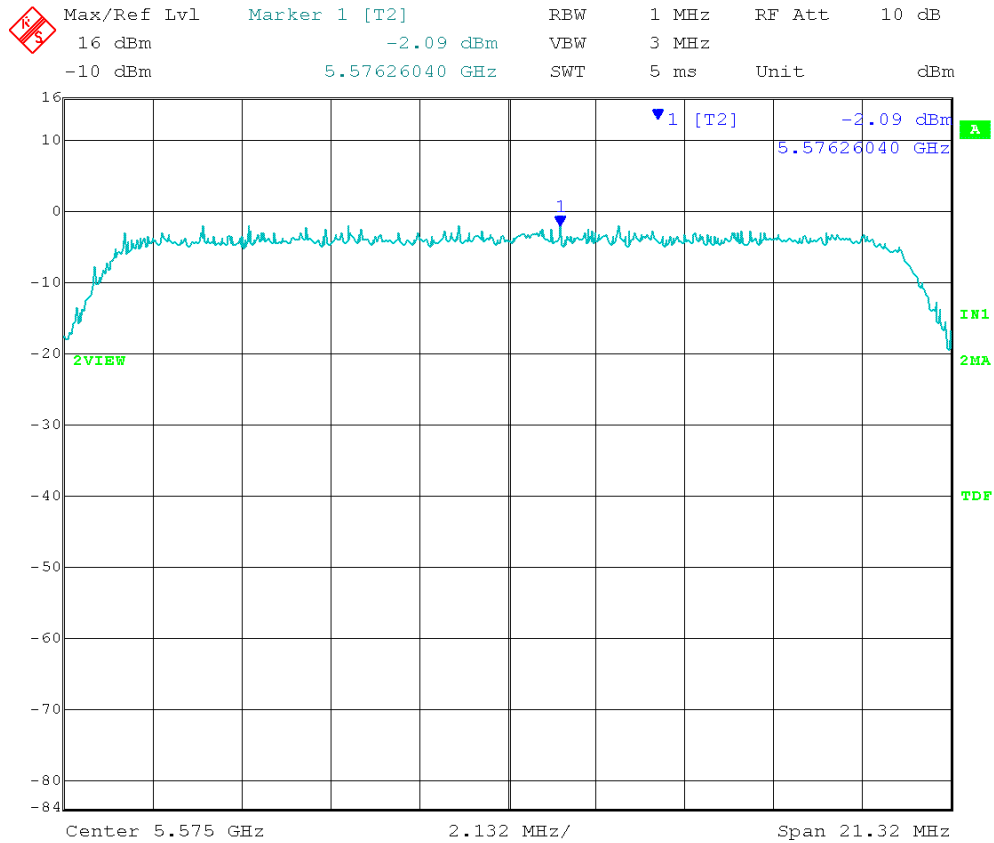
Date: 22.OCT.2013 12:23:48

20MHz BW, MCH, 1024QAM, 26 dB EBW = 21.16MHz



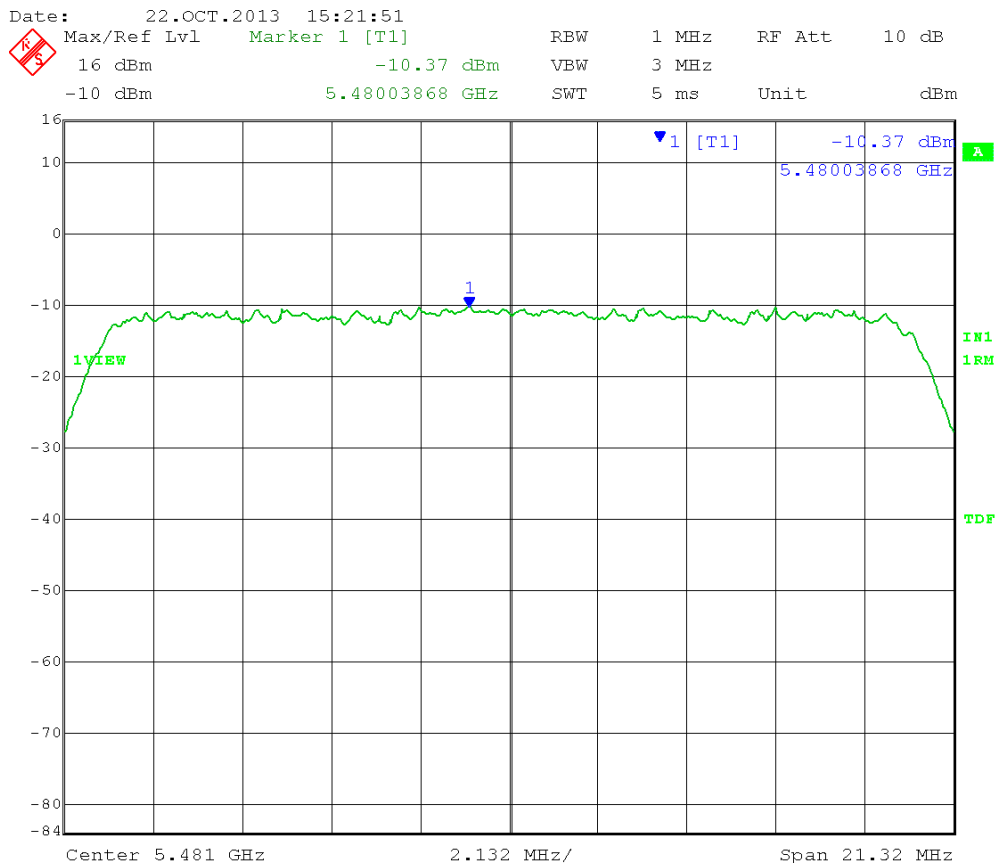
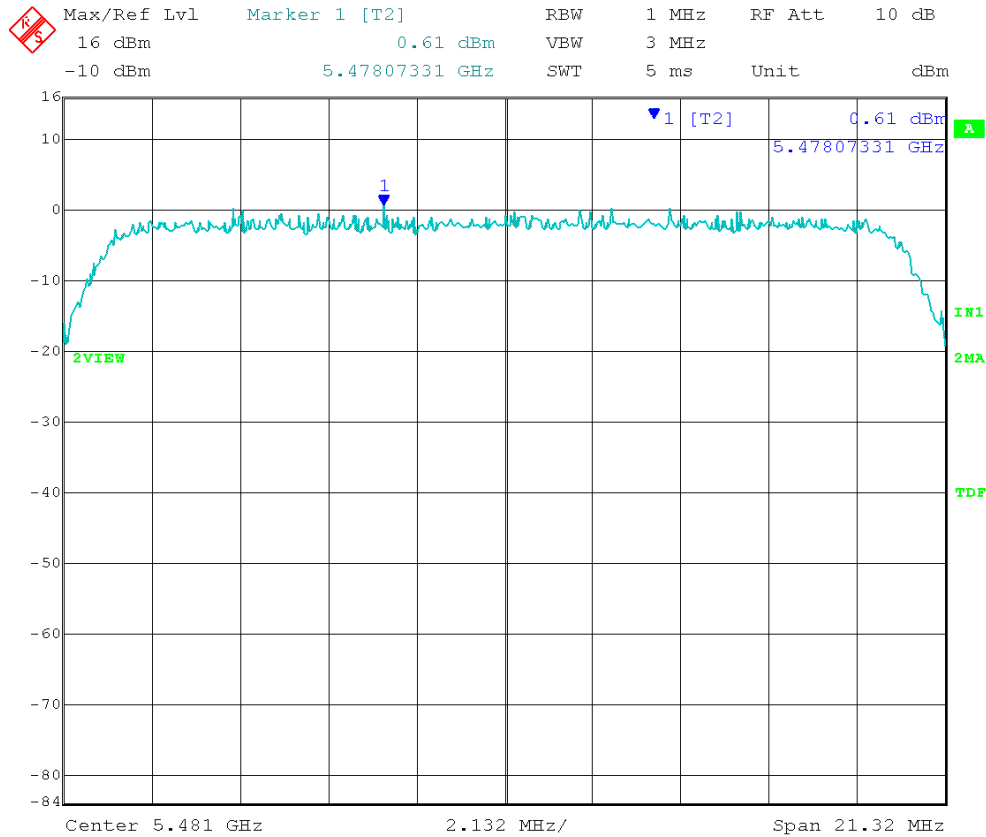
Date: 22.OCT.2013 12:22:12

20MHz BW, MCH, QPSK, 26 dB EBW = 21.32MHz



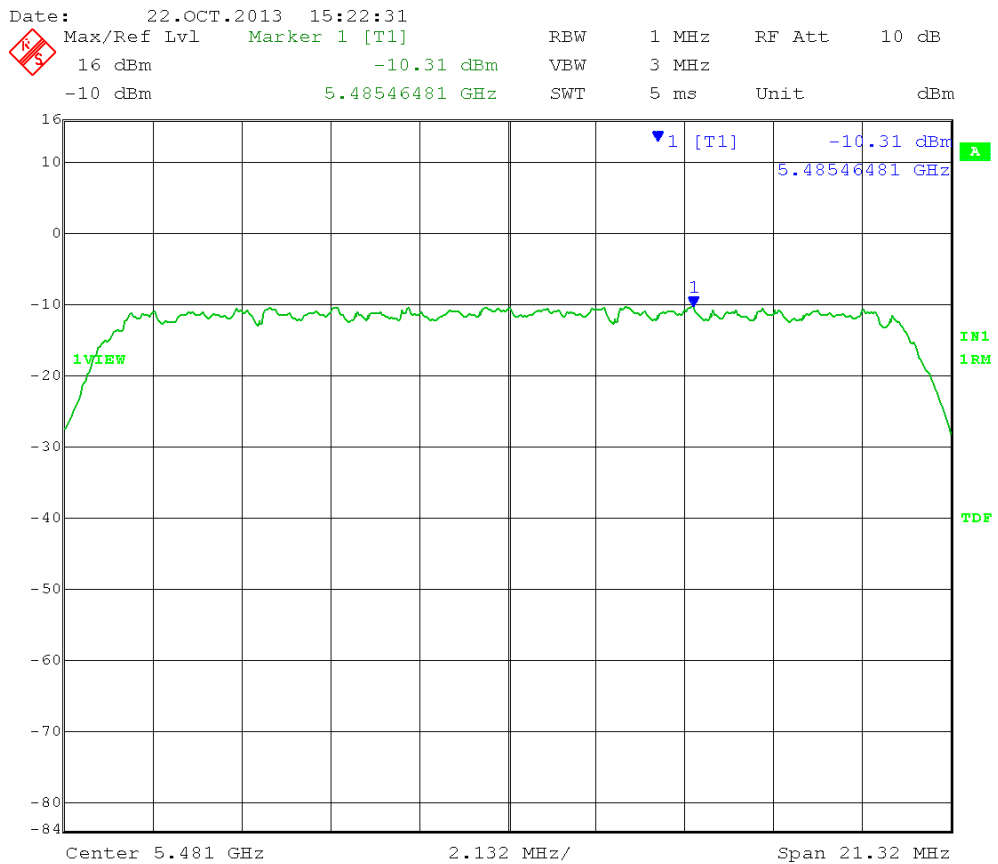
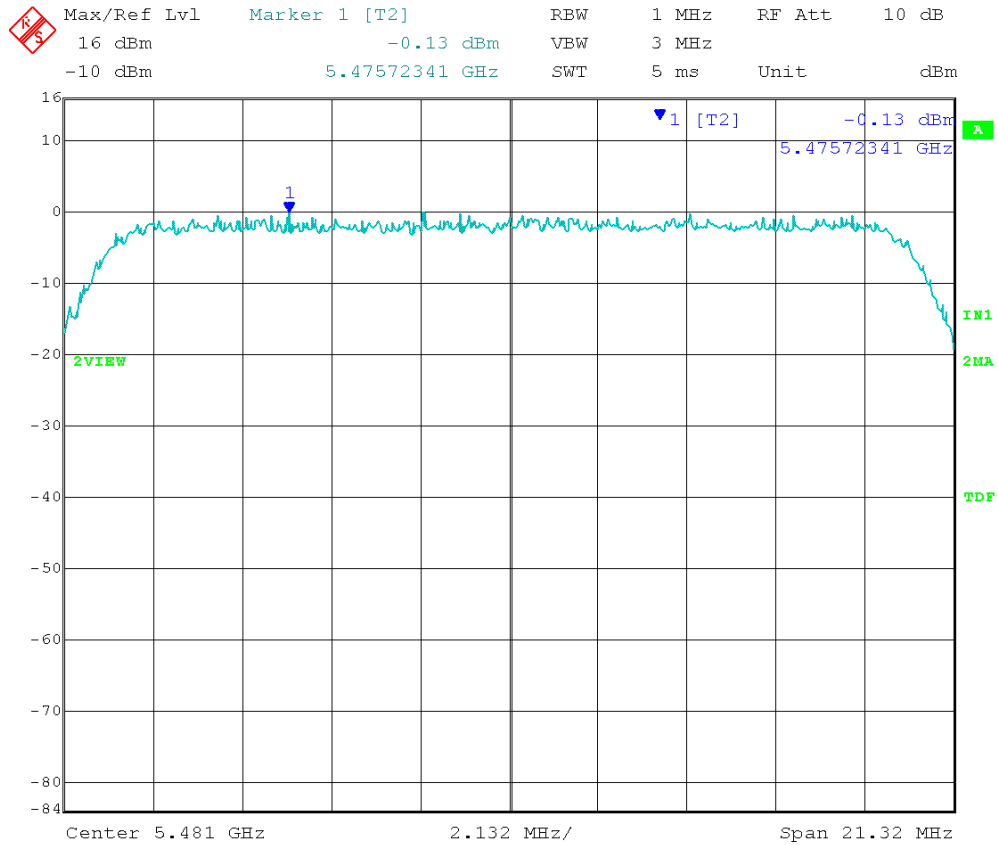
Date: 22.OCT.2013 12:27:43

20MHz BW, LCH, 16QAM, 26 dB EBW = 21.32MHz



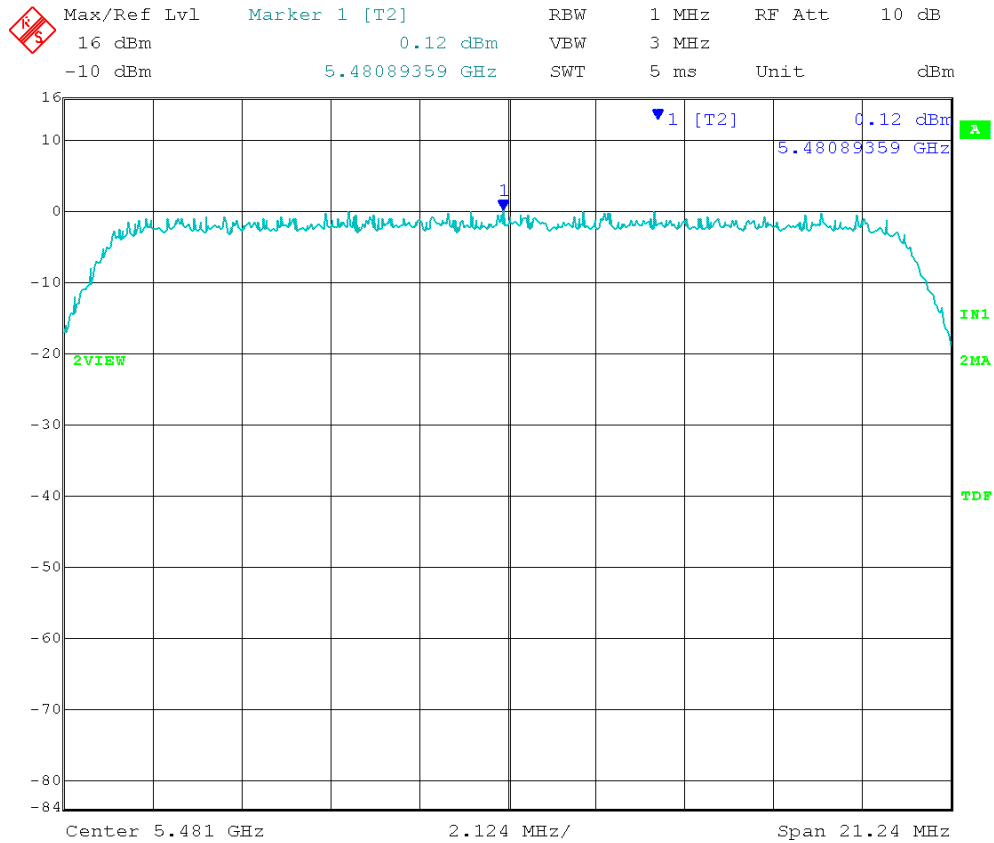
Date: 22.OCT.2013 11:37:45

20MHz BW, LCH, 64QAM, 26 dB EBW = 21.32MHz

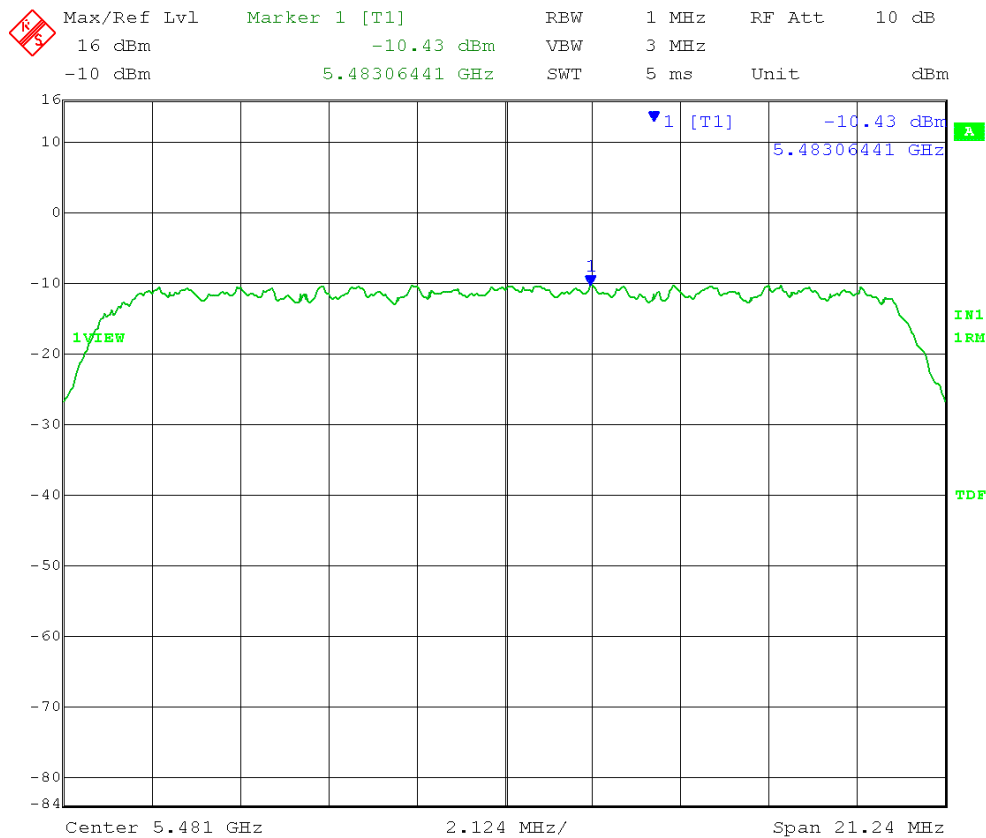


Date: 22.OCT.2013 11:38:57

20MHz BW, LCH, 256QAM, 26 dB EBW = 21.24MHz

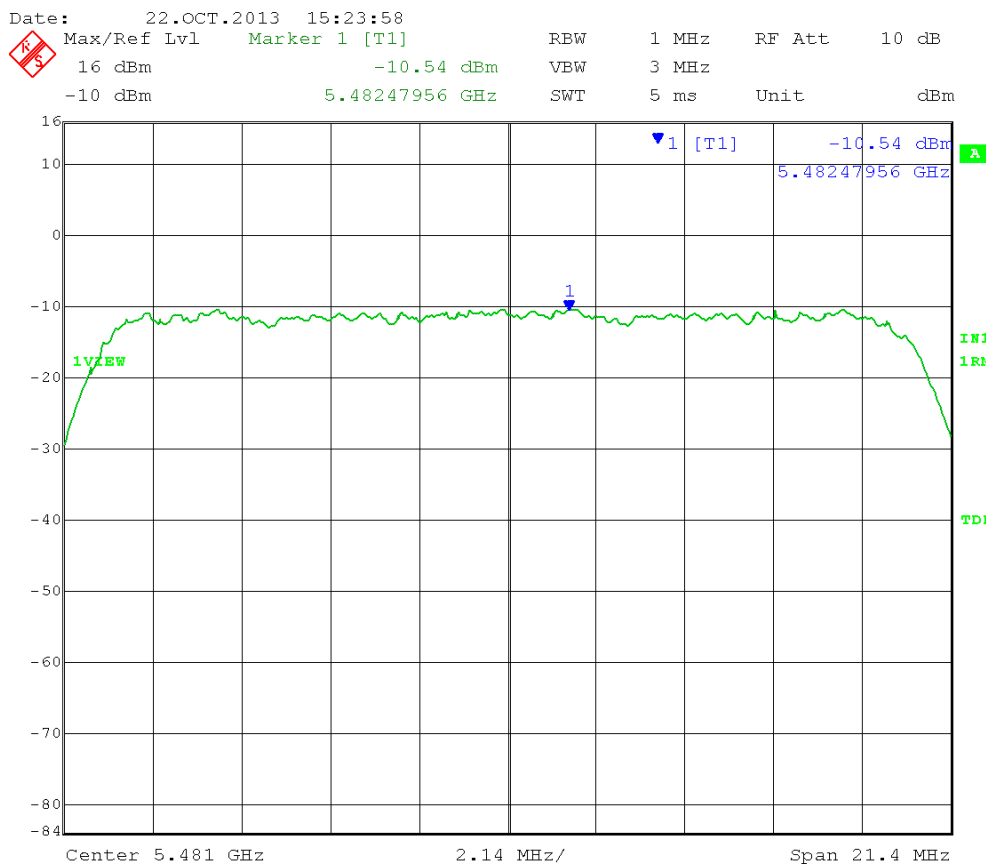
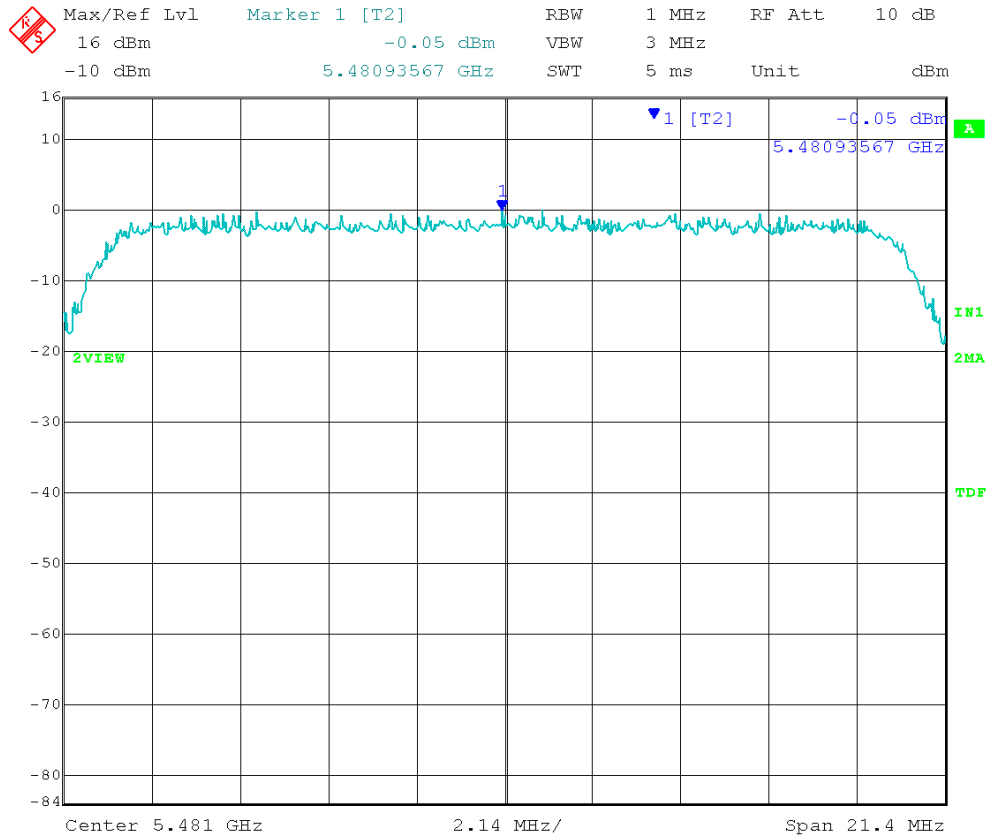


Date: 22.OCT.2013 15:23:12



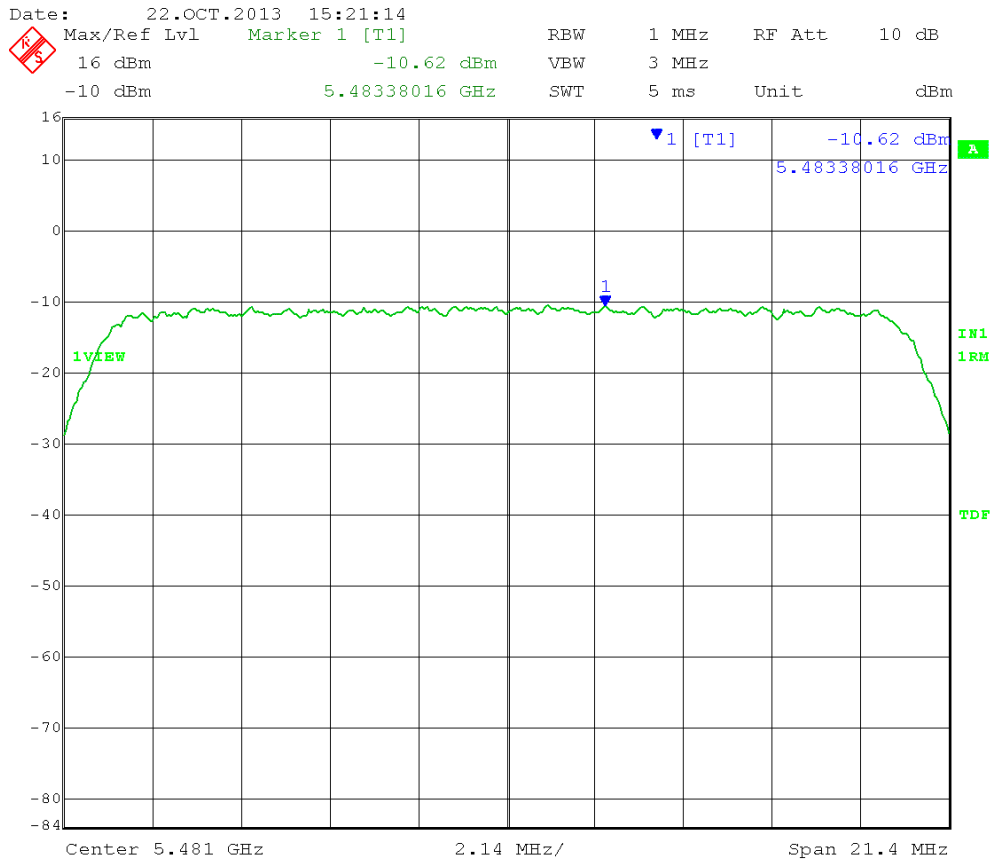
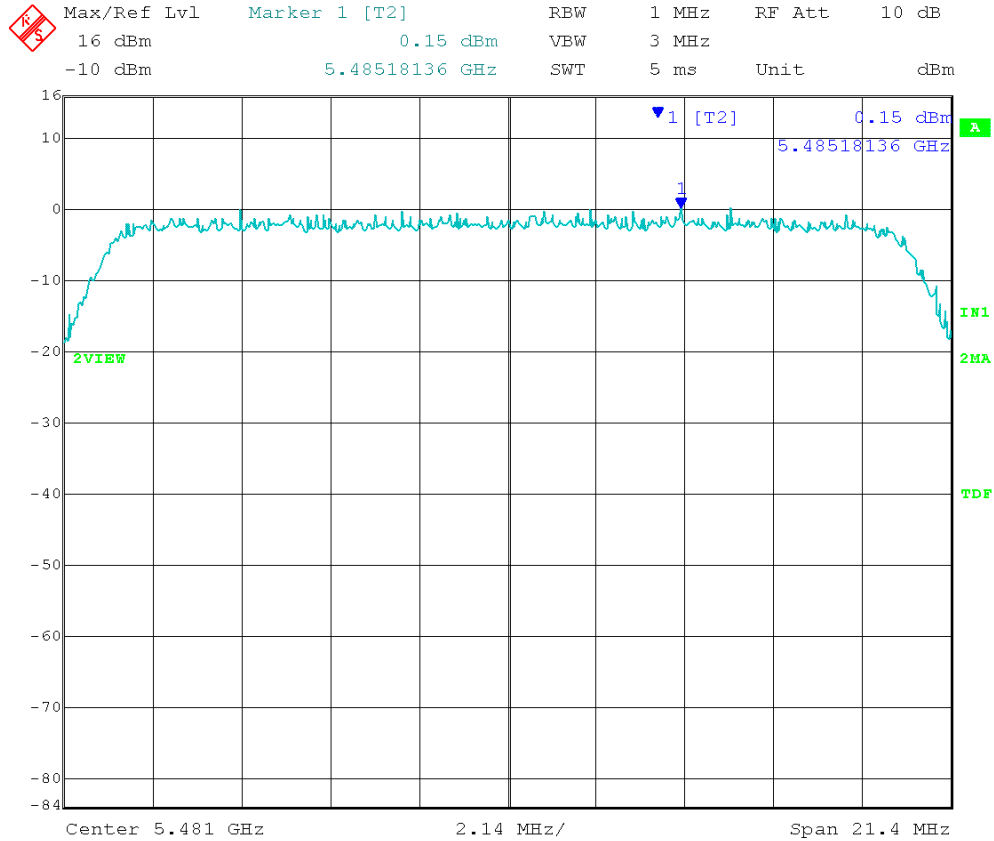
Date: 22.OCT.2013 11:42:10

20MHz BW, LCH, 1024QAM, 26 dB EBW = 21.40MHz



Date: 22.OCT.2013 11:44:42

20MHz BW, LCH, QPSK, 26 dB EBW = 21.40MHz



Date: 22.OCT.2013 11:34:39



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

8.0 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: (needed 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

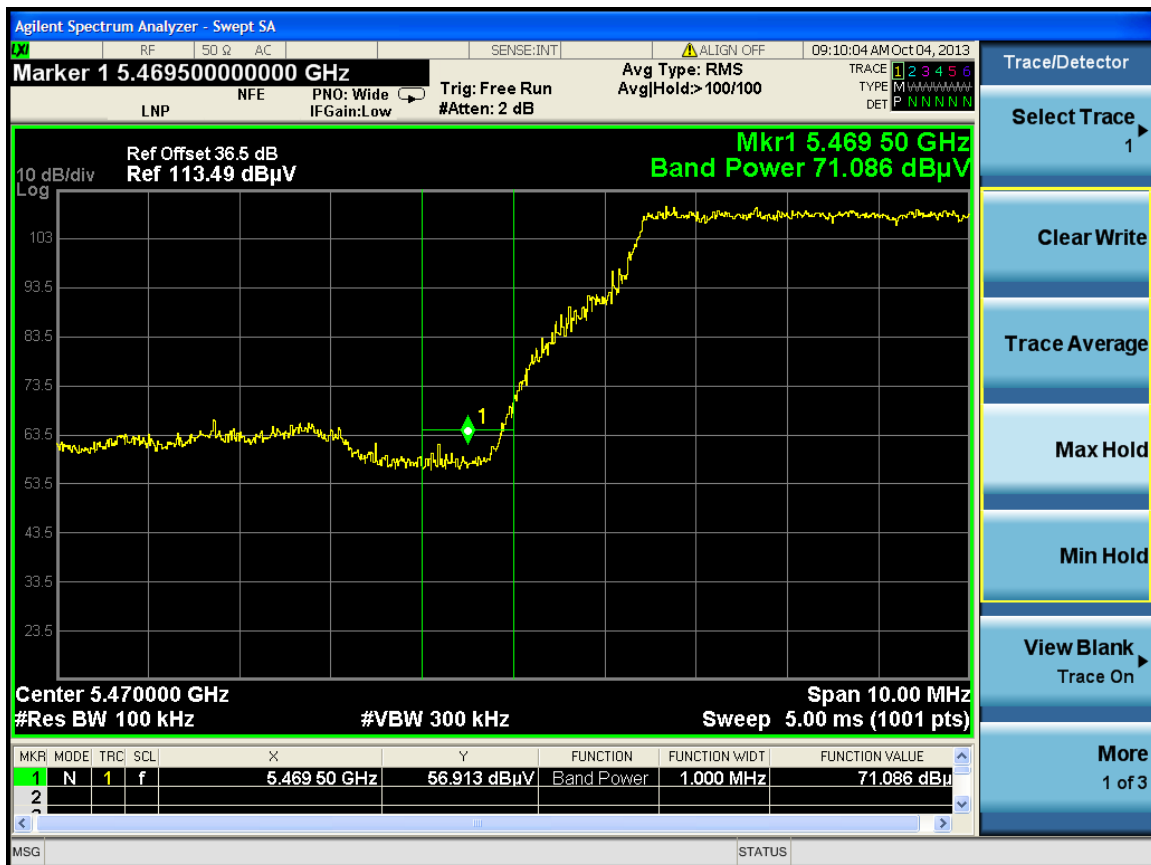
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

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

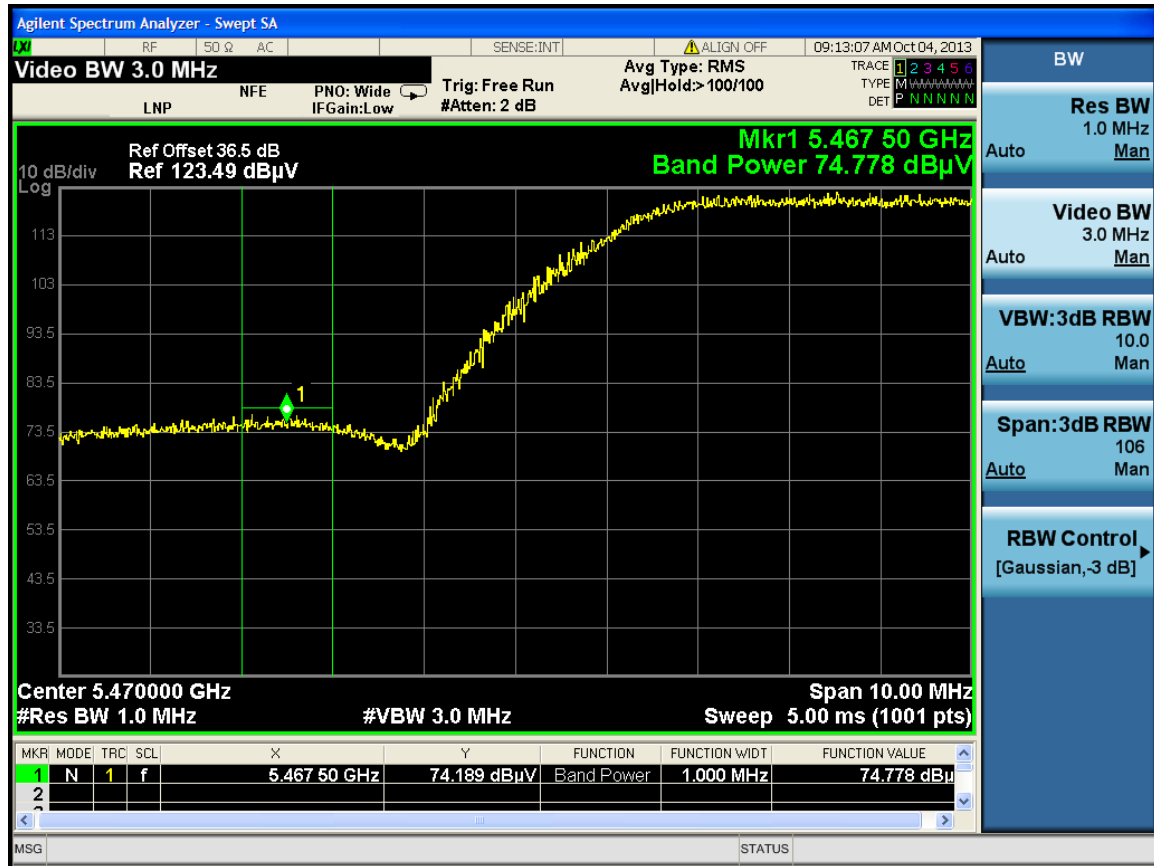
Test distance was 1 meter.

Limit:

Measurement:

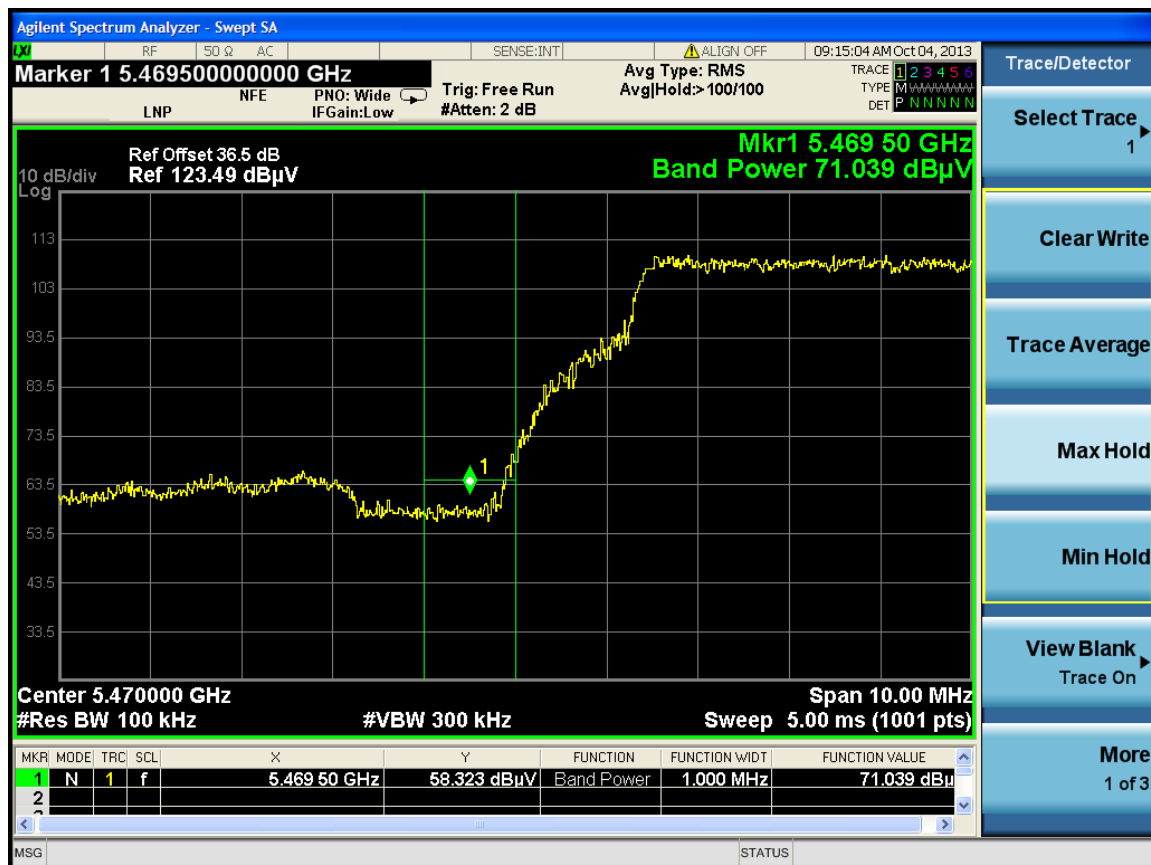


Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.778 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.99 \text{ dBm/MHz}$

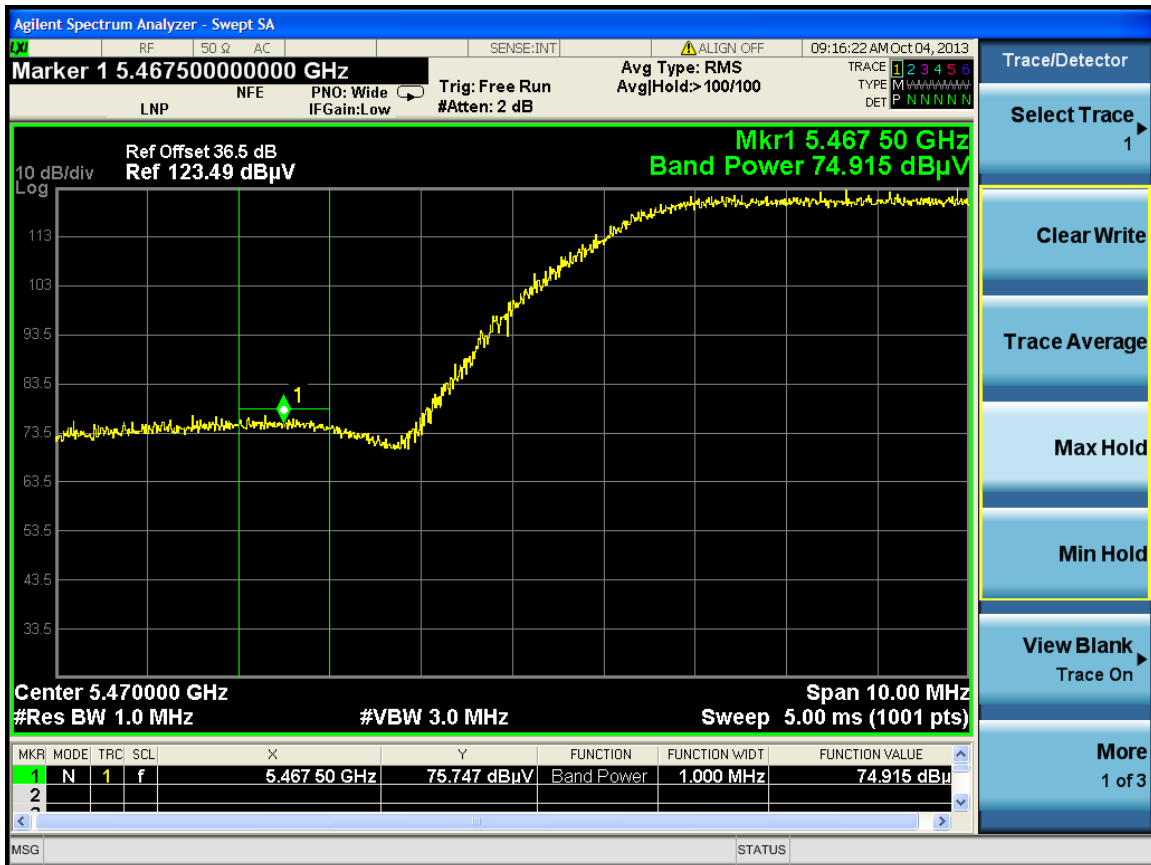


Limit:

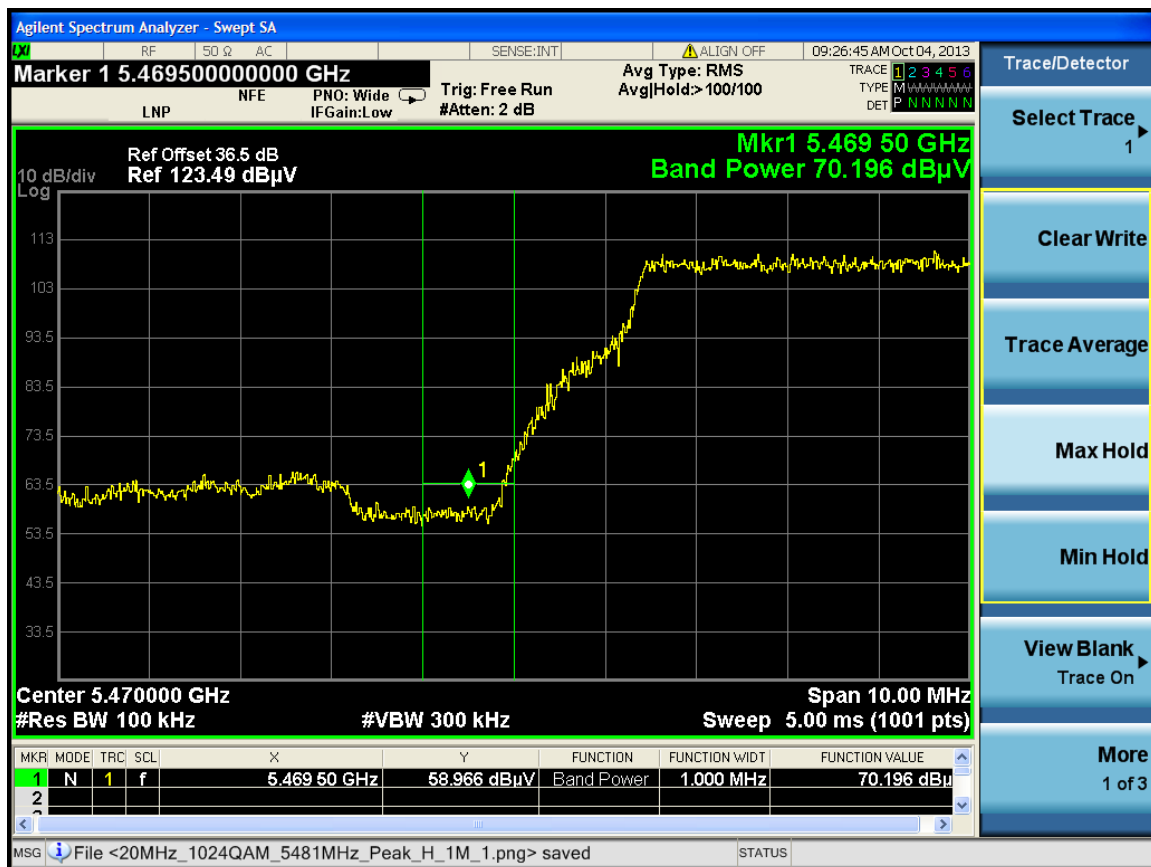
Measurement:



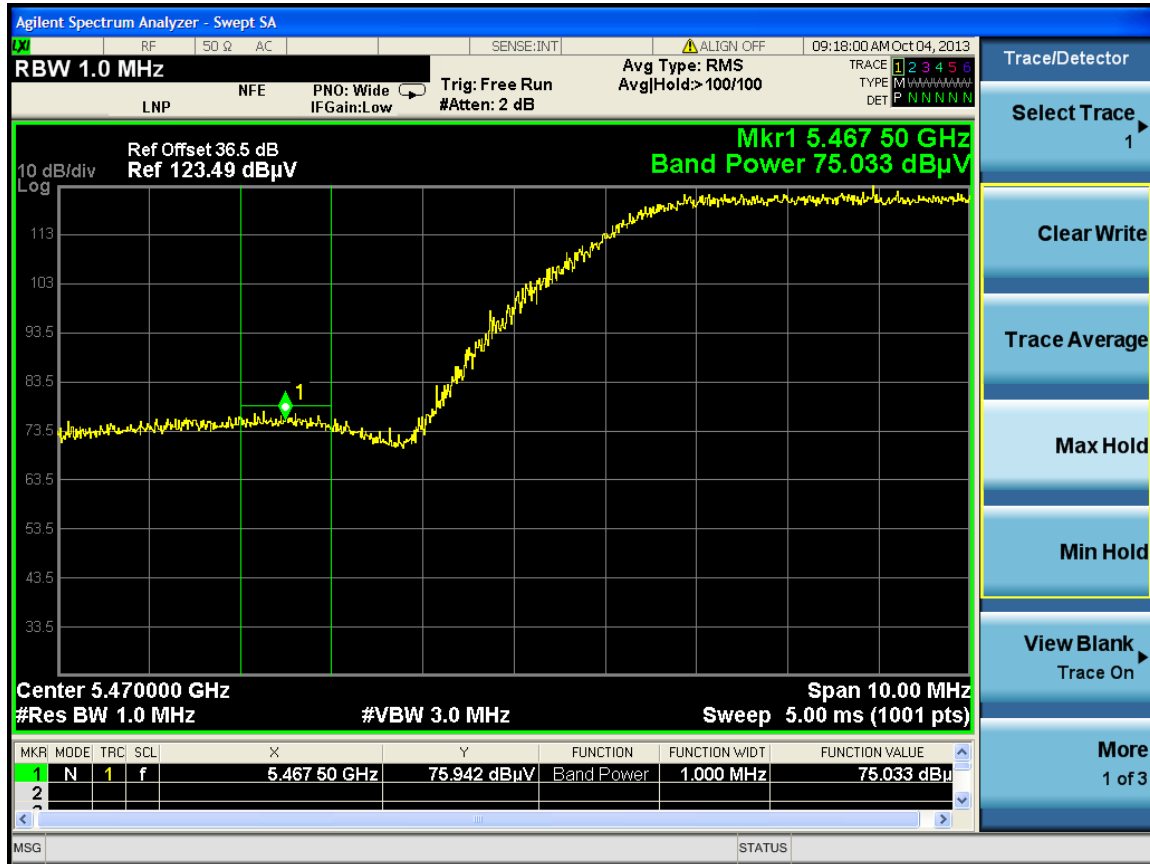
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.915 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.85 \text{ dBm/MHz}$



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: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5481 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: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 70.196 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -34.57 \text{ dBm/MHz}$

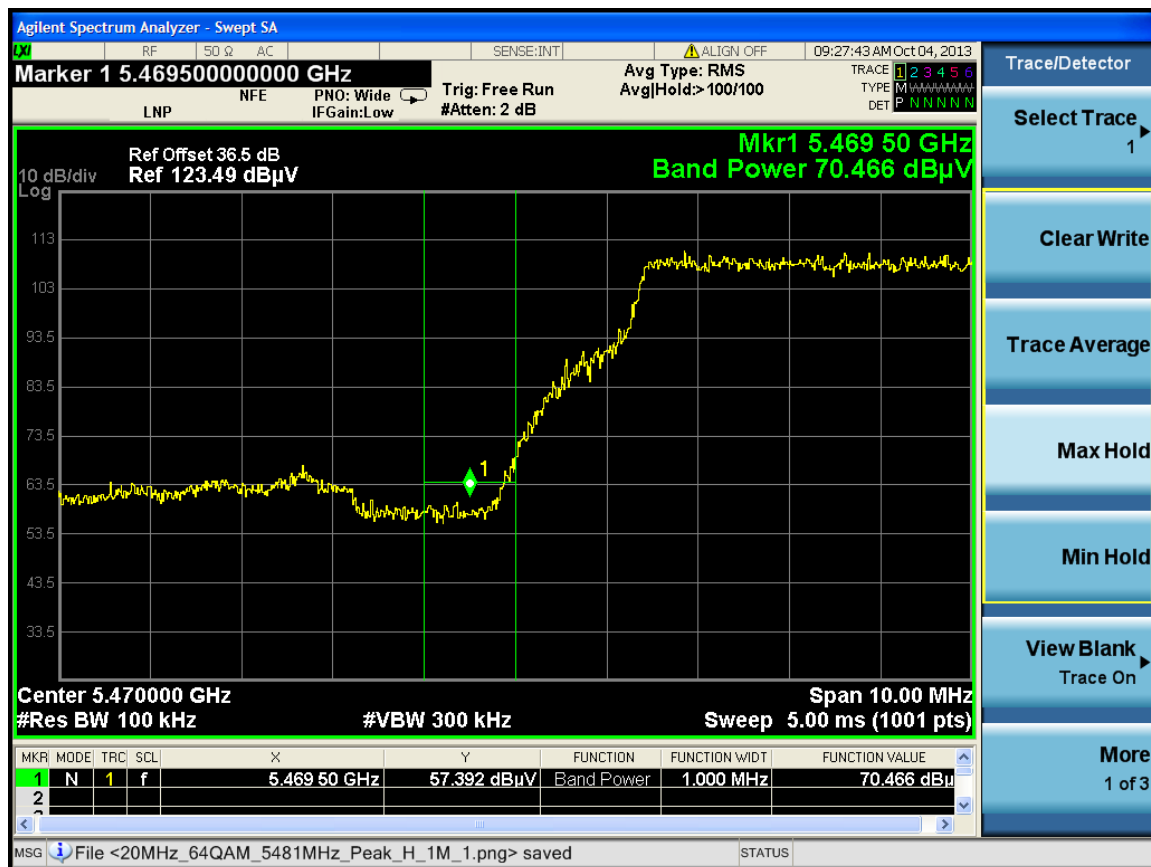


Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.033 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.73 \text{ dBm/MHz}$

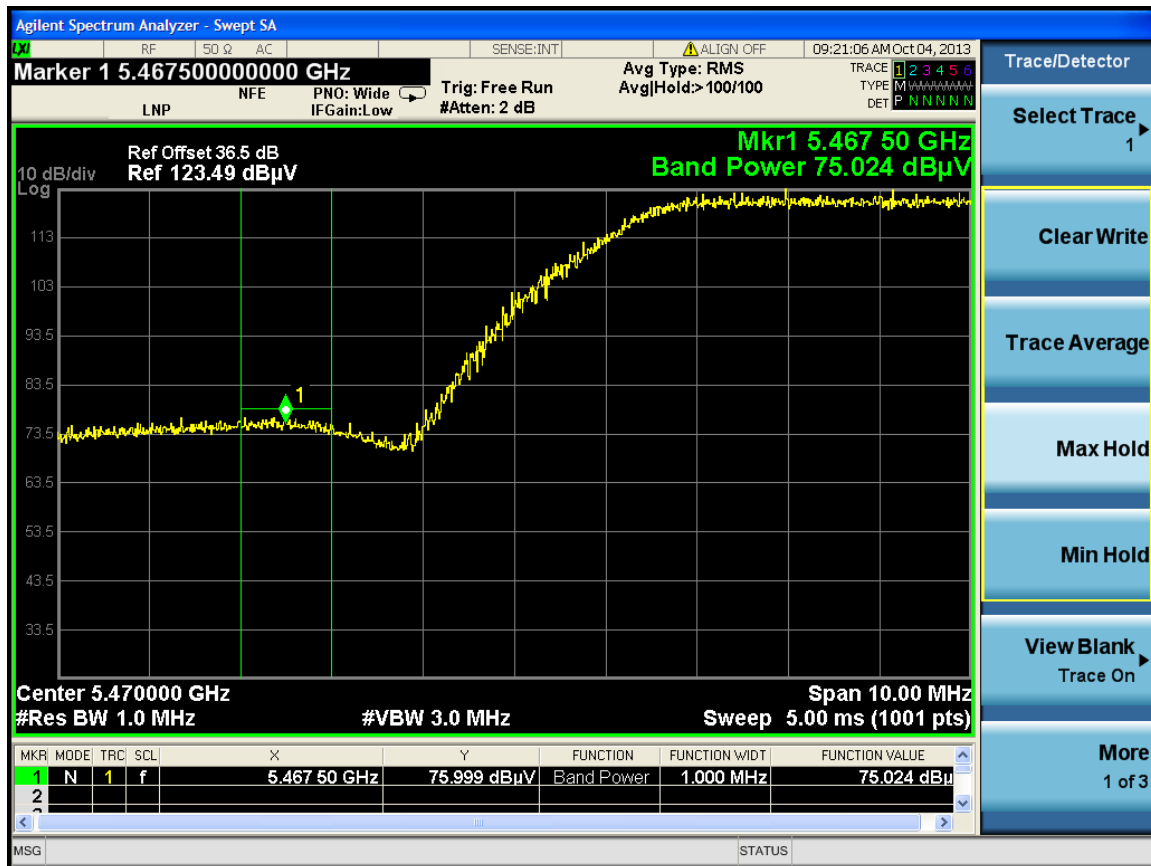


Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5481 MHz
Modulation: 256QAM
Horizontal
Operating Band-Edge Frequency: 5470 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz

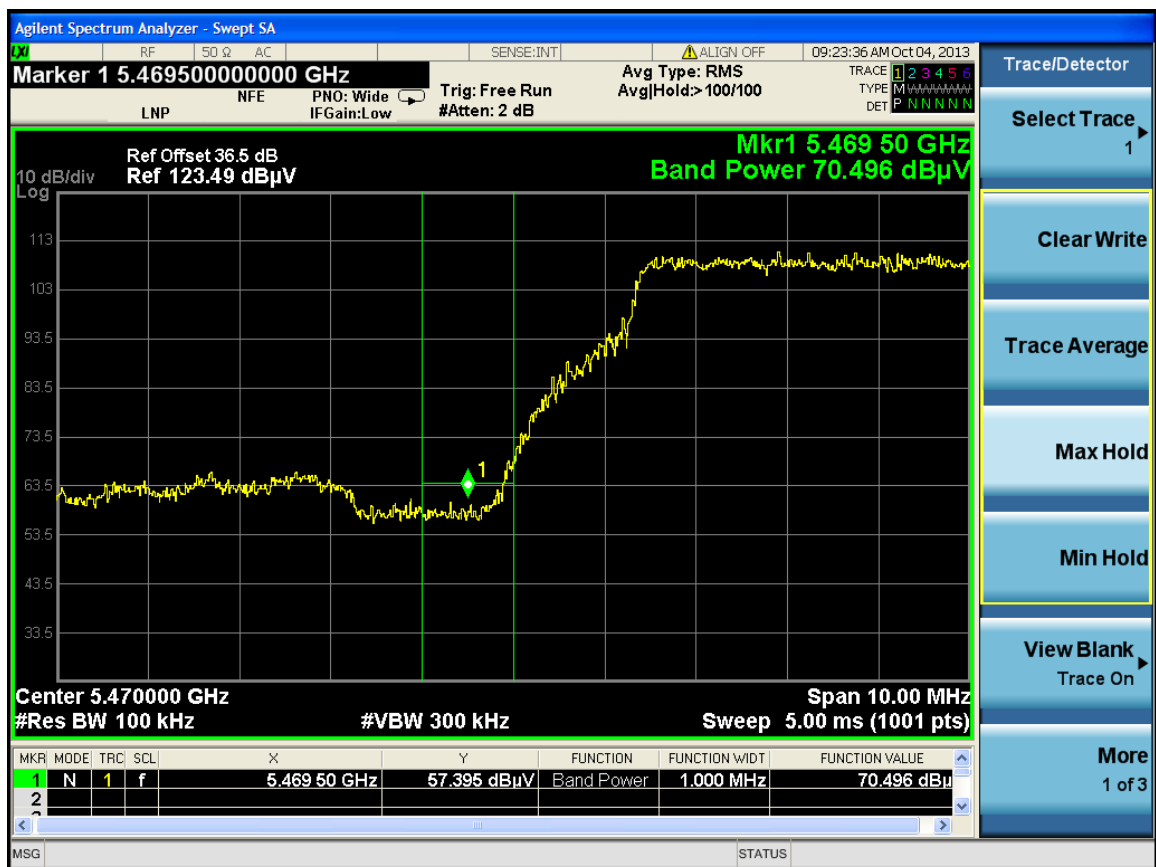
Measurement:
$$\begin{aligned}\text{EIRP}[\text{dBm}] &= E[\text{dB}\mu\text{V}/\text{m}] + 20 \log(d[\text{meters}]) - 104.77 \\ &= 70.466 \text{ dB}\mu\text{V}/\text{m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-34.30 \text{ dBm/MHz}}\end{aligned}$$



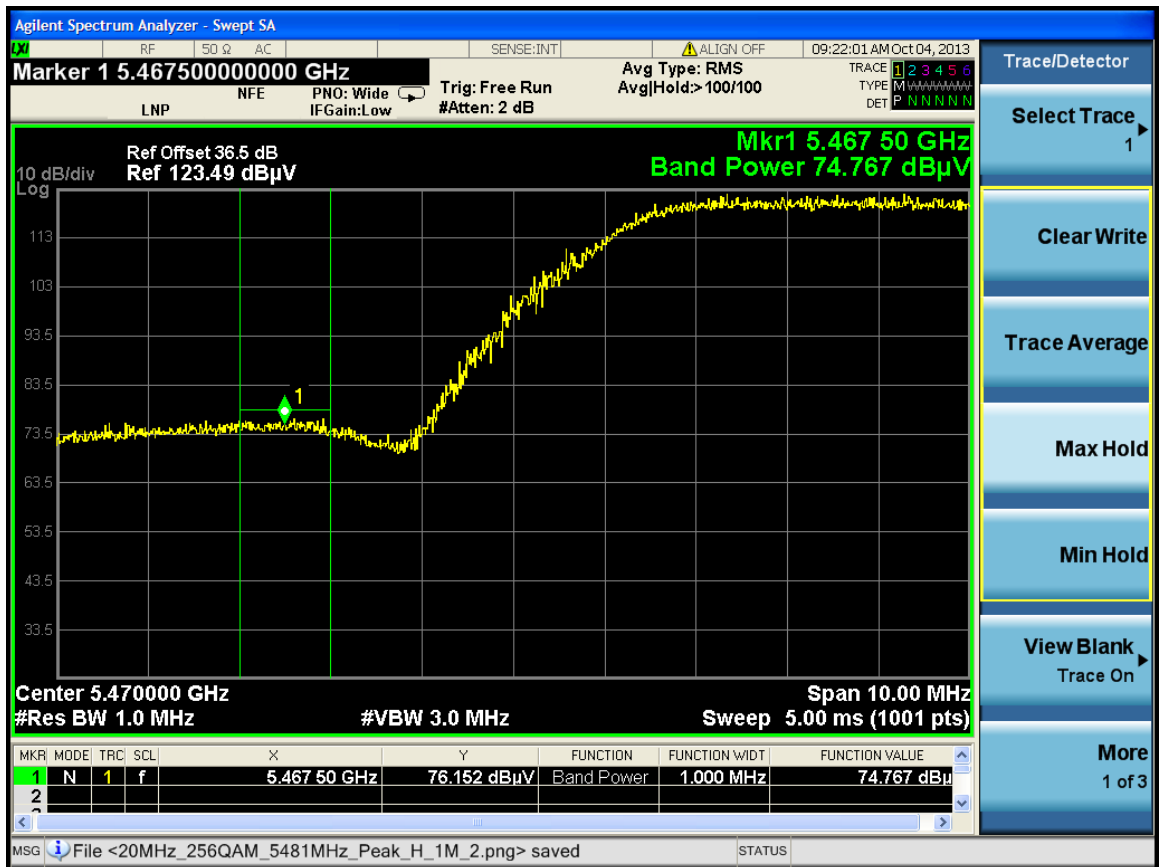
Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 75.024 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-29.74 \text{ dBm/MHz}} \end{aligned}$$



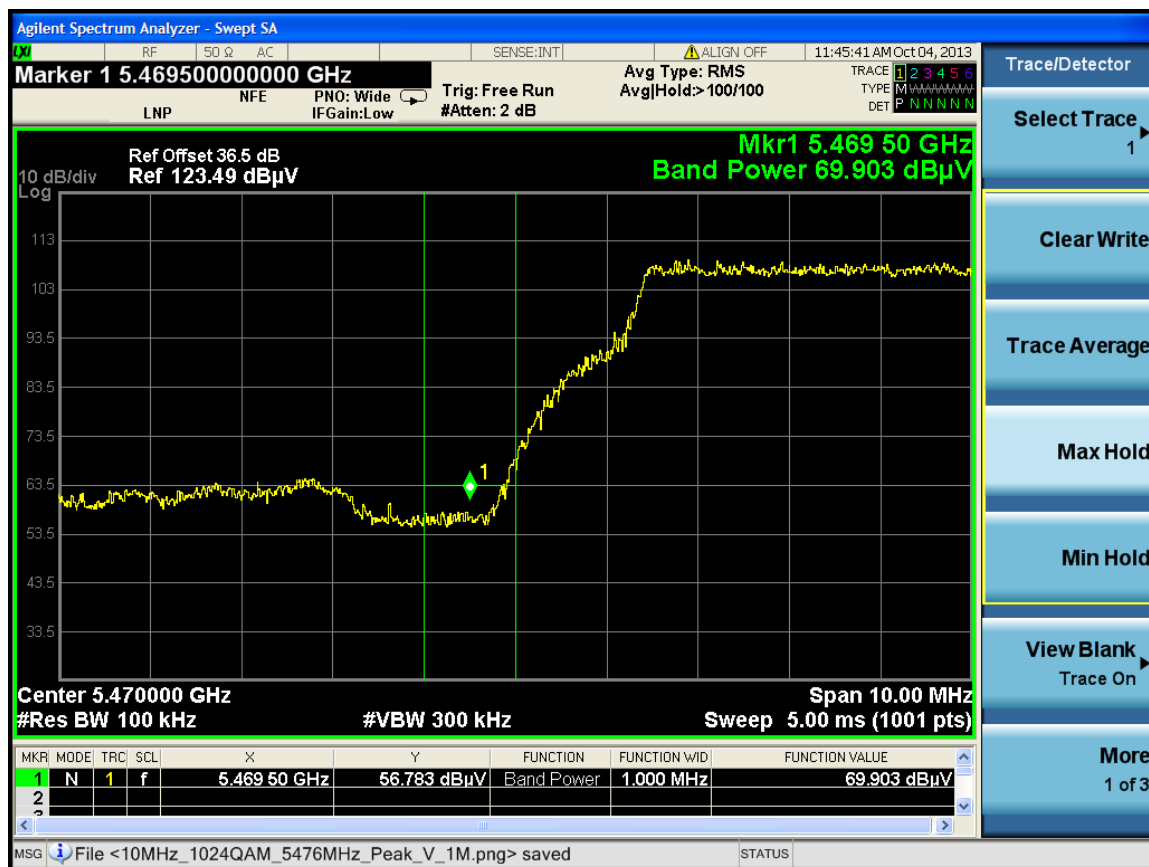
Limit: -27 dBm/MHz
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 70.496 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= \mathbf{-34.27 \text{ dBm/MHz}}$



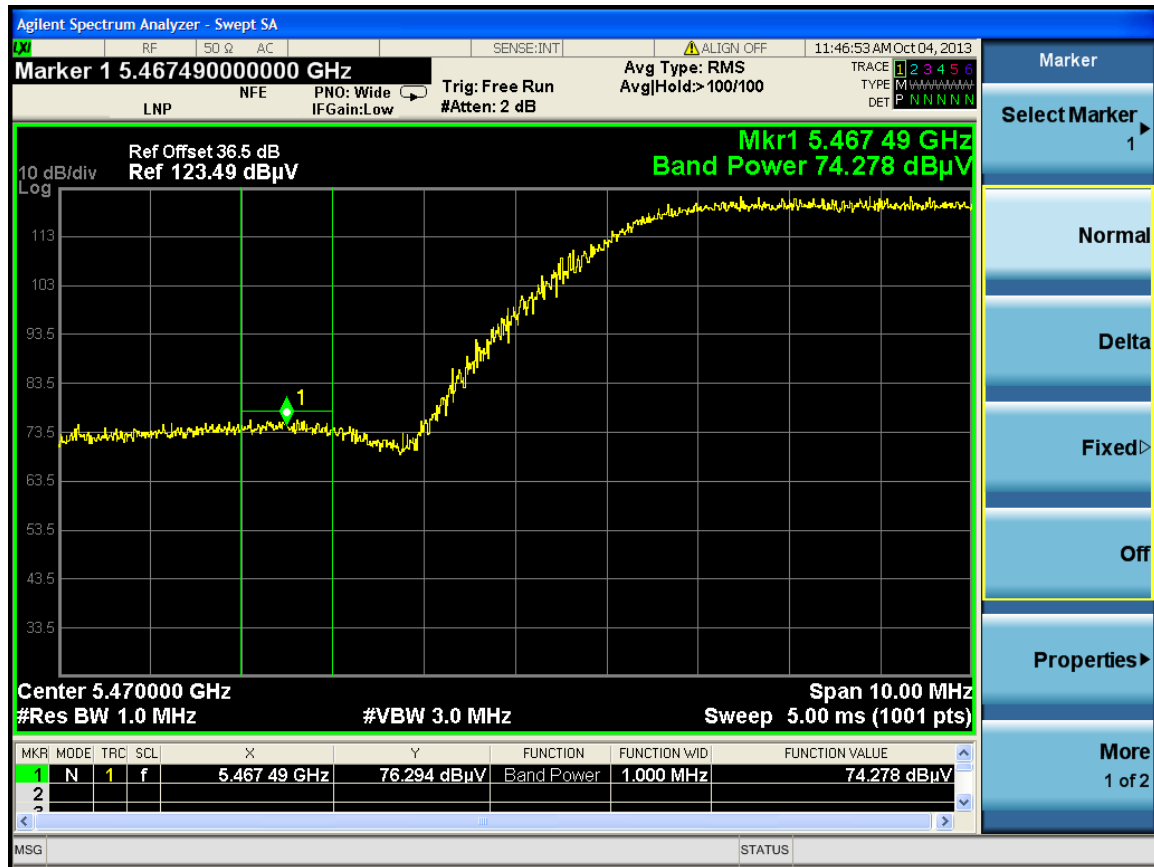
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.767 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -30.00 \text{ dBm/MHz}$



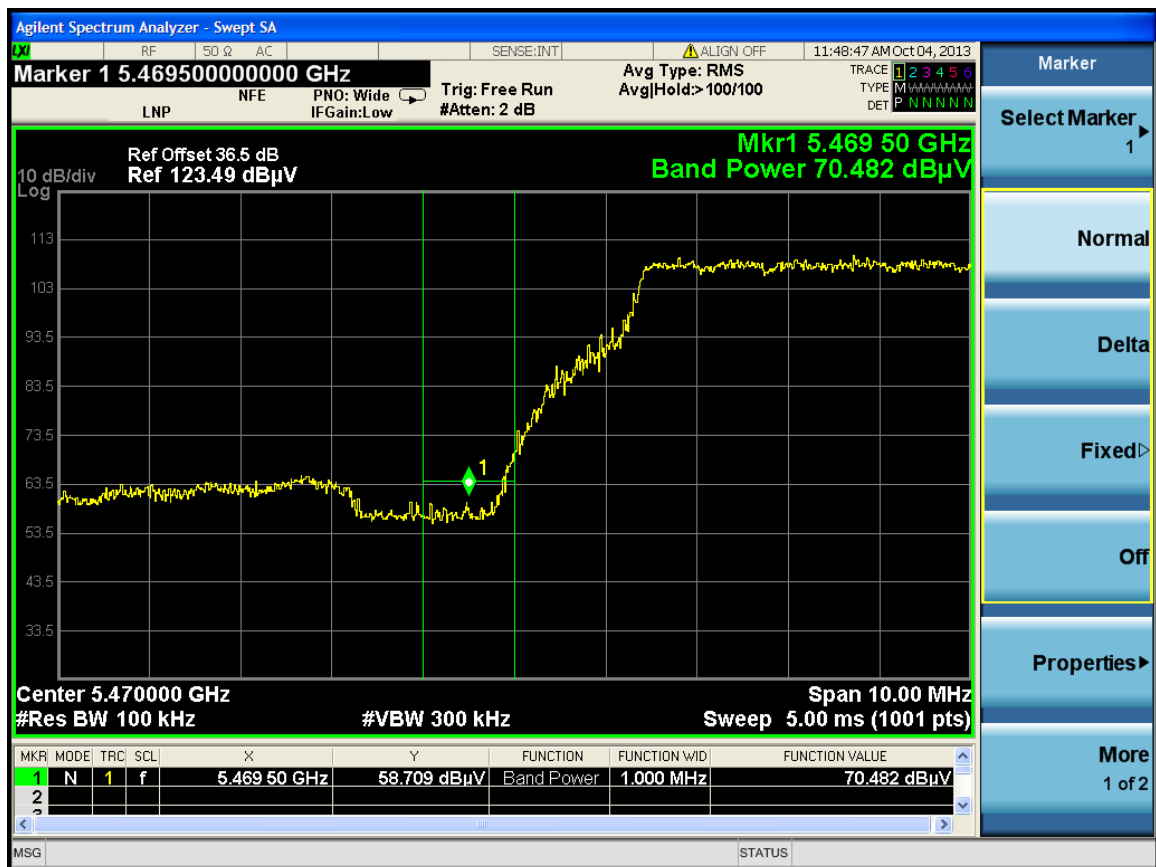
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 20 MHz channel Bandwidth
 Low Channel: Frequency – 5481 MHz
 Modulation: QPSK
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 69.903 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -34.86 \text{ dBm/MHz}$



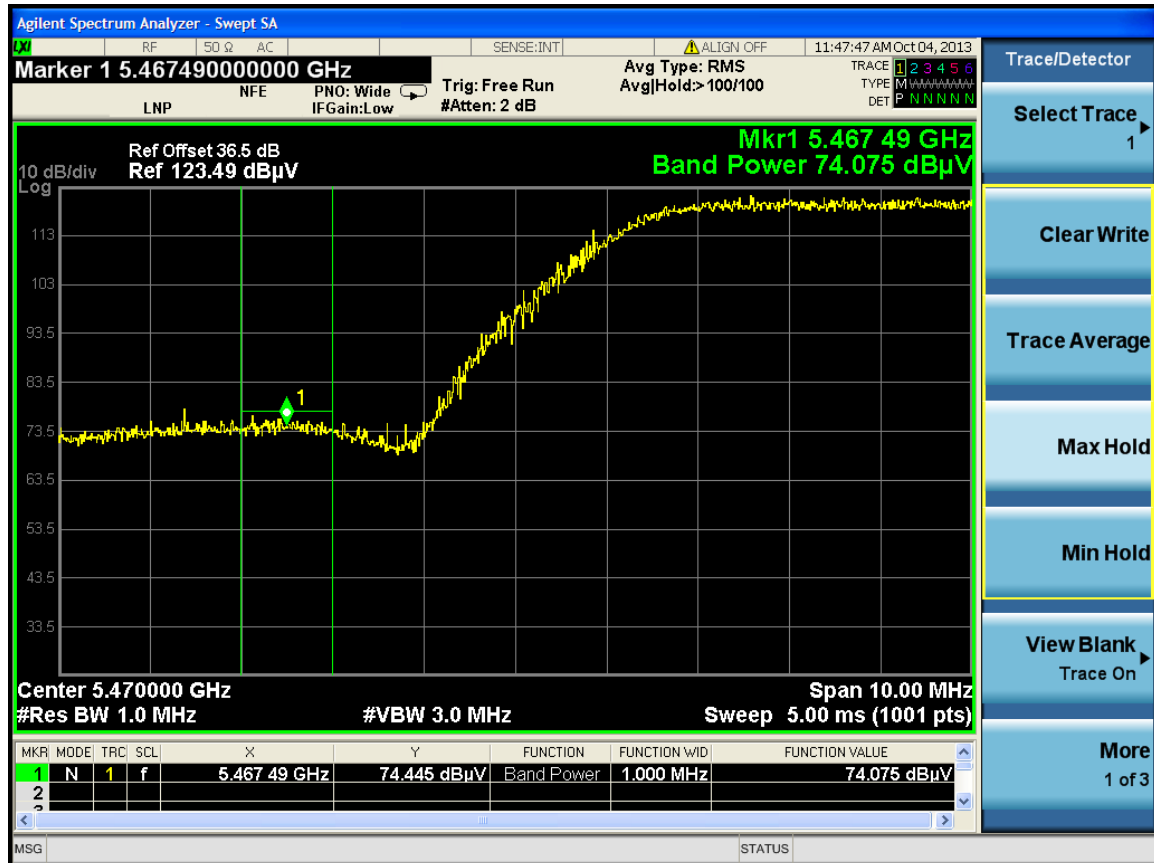
Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 74.278 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-30.49 \text{ dBm/MHz}} \end{aligned}$$



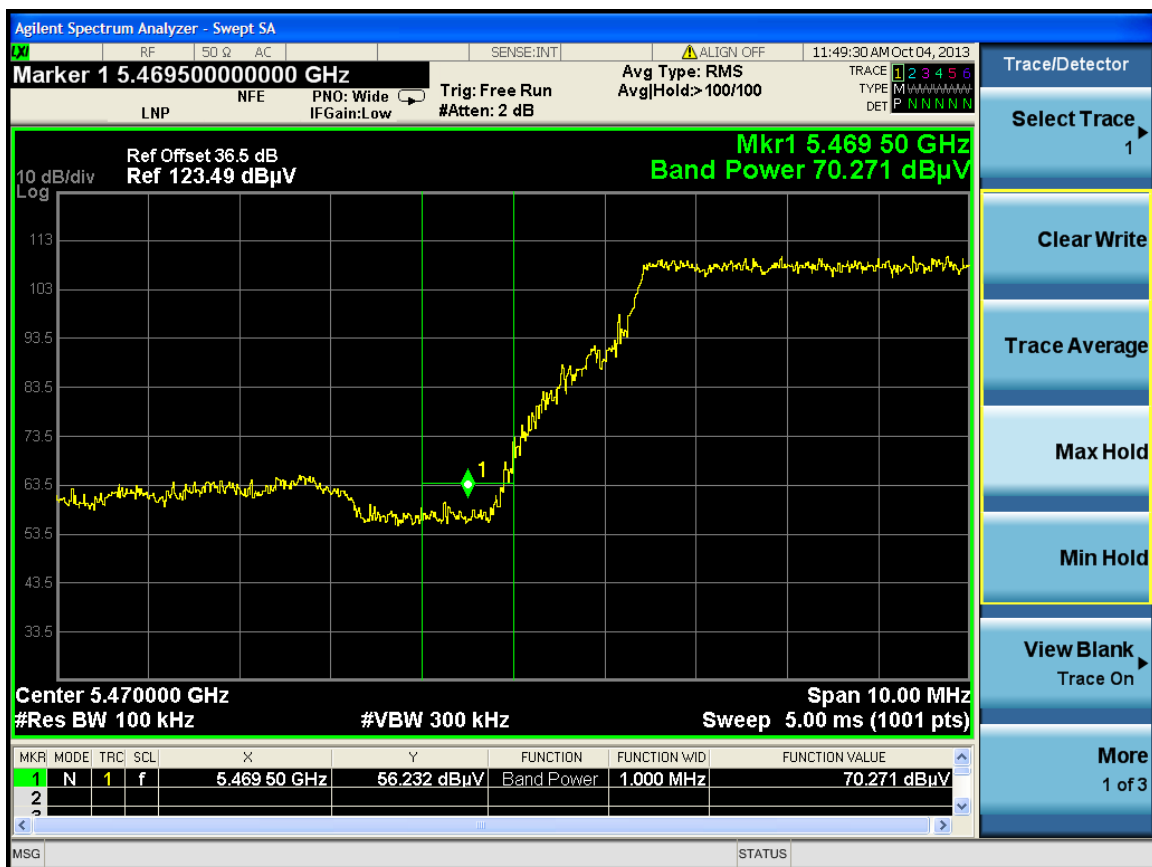
Test Date:	10-04-2013
Company:	Ubiquiti Networks
EUT:	AF5
Test:	Lower Operating Band-Edge Compliance - Radiated (FCC 15.407(b)(3))
Operator:	Craig B
Comment:	20 MHz channel Bandwidth Low Channel: Frequency – 5481 MHz Modulation: 16QAM Vertical Operating Band-Edge Frequency: 5470 MHz Band-Edge Limit: -27 dBm/MHz Test method: Integration Offset on analyzer includes horn antenna and cable loss correction factors
Limit:	-27 dBm/MHz
Measurement:	$\begin{aligned}\text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 70.482 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-34.28 \text{ dBm/MHz}}\end{aligned}$



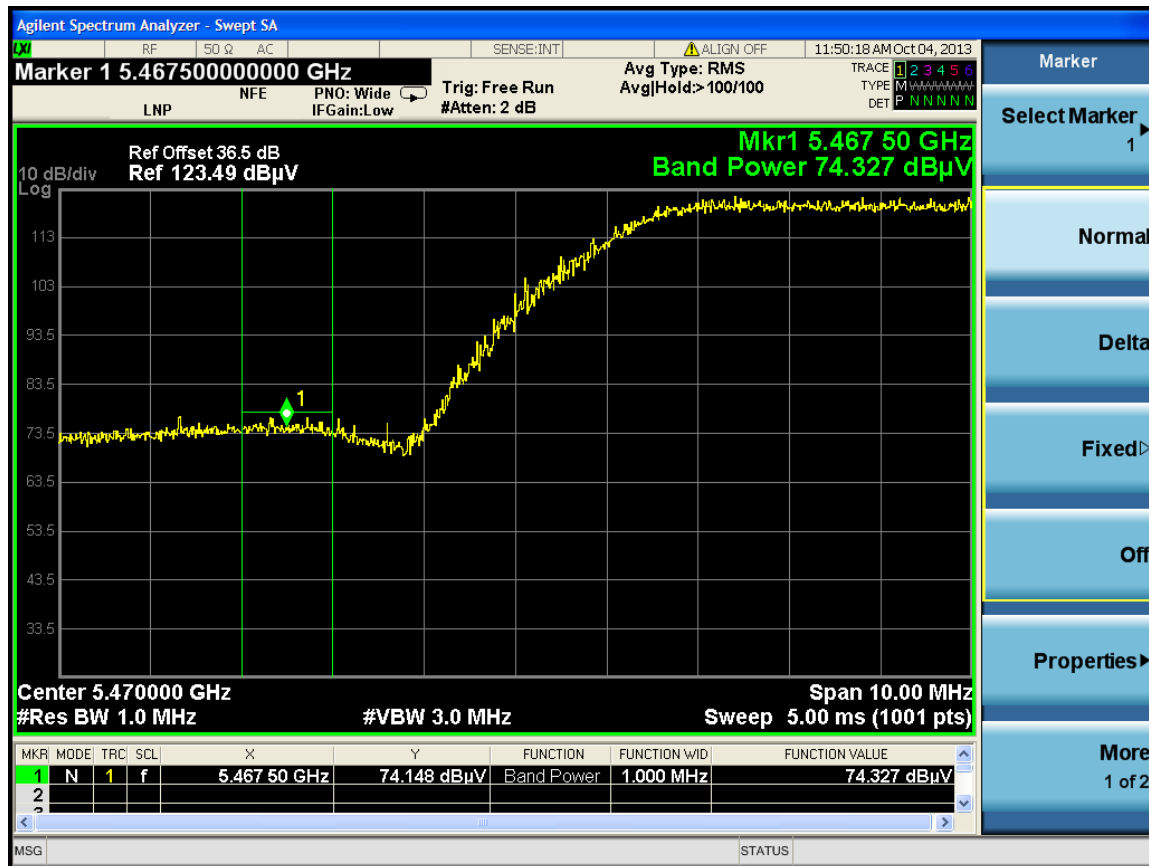
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.075 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -30.69 \text{ dBm/MHz}$



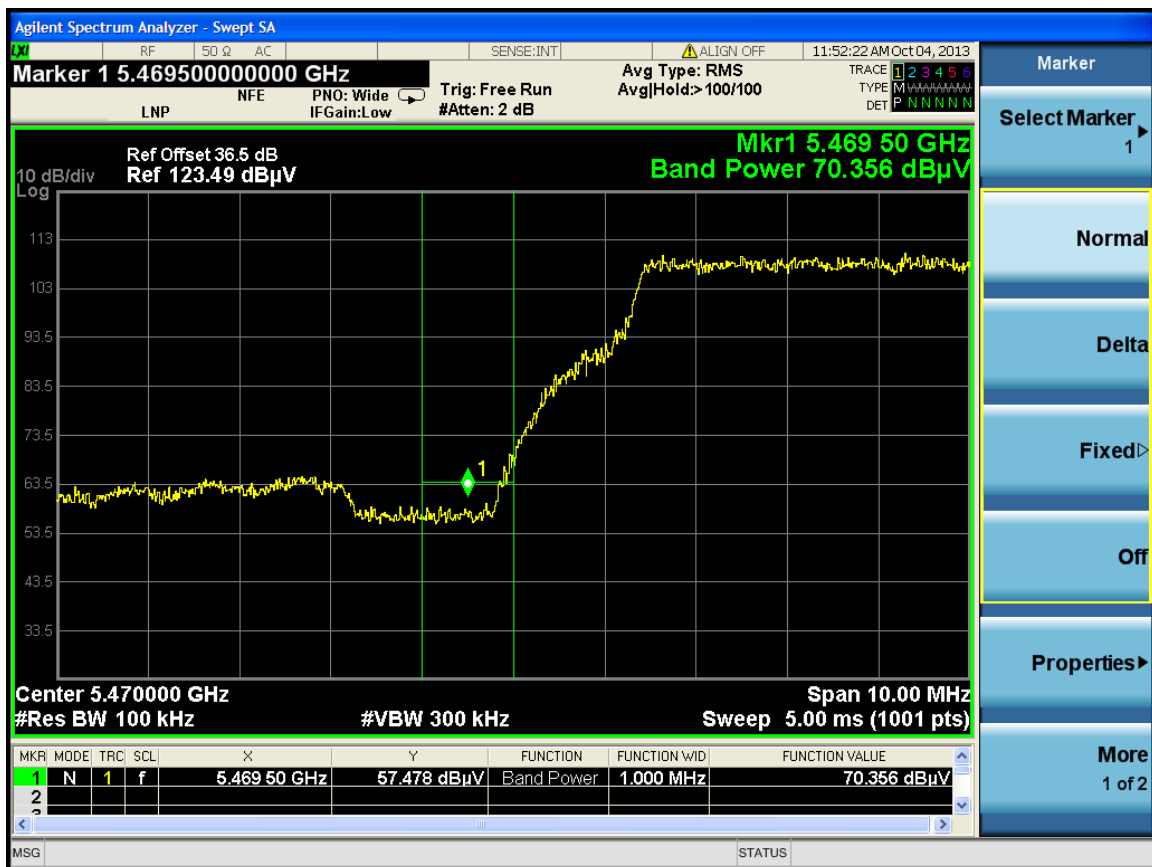
Test Date:	10-04-2013
Company:	Ubiquiti Networks
EUT:	AF5
Test:	Lower Operating Band-Edge Compliance - Radiated (FCC 15.407(b)(3))
Operator:	Craig B
Comment:	20 MHz channel Bandwidth Low Channel: Frequency – 5481 MHz Modulation: 64QAM Vertical Operating Band-Edge Frequency: 5470 MHz Band-Edge Limit: -27 dBm/MHz Test method: Integration Offset on analyzer includes horn antenna and cable loss correction factors
Limit:	-27 dBm/MHz
Measurement:	$\begin{aligned}\text{EIRP}[\text{dBm}] &= \text{E}[\text{dB}\mu\text{V/m}] + 20 \log(\text{d}[\text{meters}]) - 104.77 \\ &= 70.271 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-34.49 \text{ dBm/MHz}}\end{aligned}$



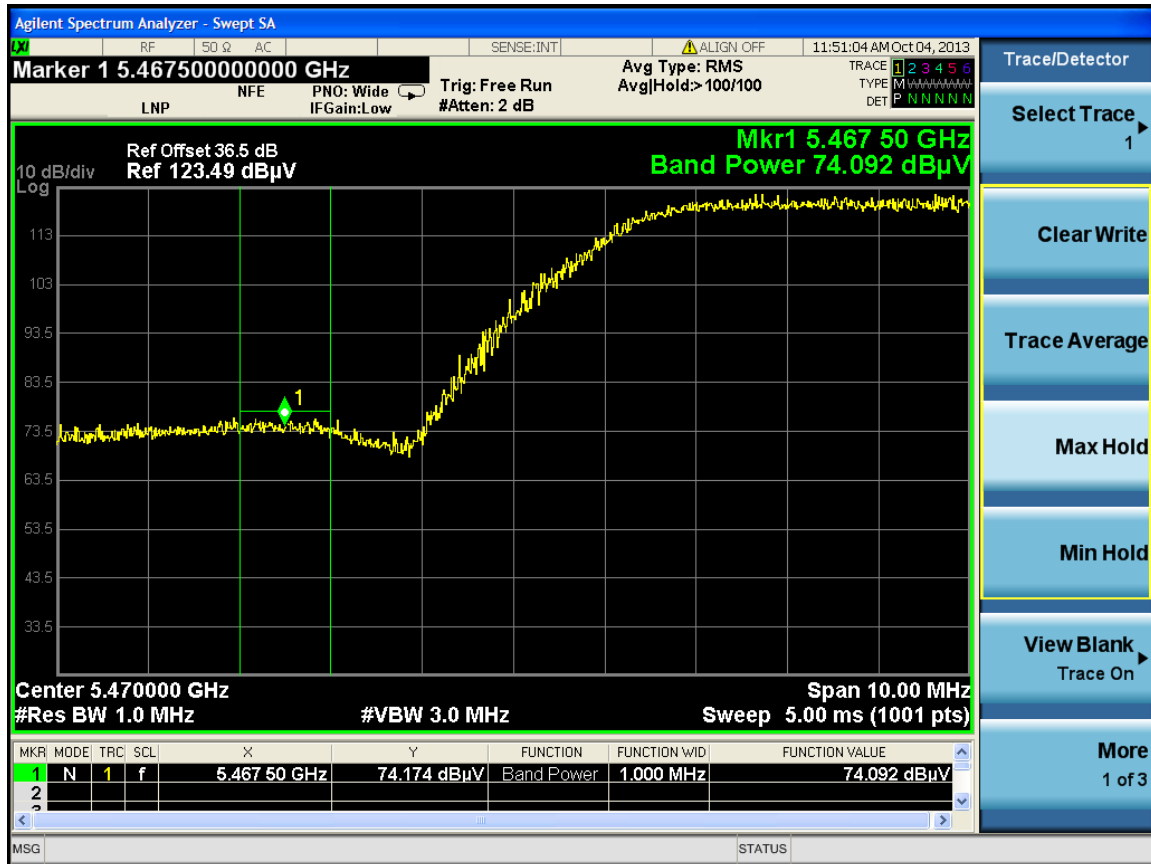
Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 74.327 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-30.44 \text{ dBm/MHz}} \end{aligned}$$



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: 20 MHz channel Bandwidth
Low Channel: Frequency – 5481 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:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 70.356 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-34.41 \text{ dBm/MHz}} \end{aligned}$$



Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.092 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= \mathbf{-30.67 \text{ dBm/MHz}}$



Agilent Spectrum Analyzer - Swept SA

RF 50 Ω AC SENSE:INT ALIGN OFF 11:53:13 AM Oct 04, 2013

Marker 1 5.469500000000 GHz Avg Type: RMS Trg: Free Run PNO: Wide IF Gain: Low #Atten: 2 dB

LNP NFE TYPE M DET P

Ref Offset 36.5 dB Ref 123.49 dB μ V

Mkr1 5.469 50 GHz Band Power 70.174 dB μ V

10 dB/div Log

Center 5.470000 GHz Span 10.00 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 5.00 ms (1001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WID	FUNCTION VALUE
1	N	1	f	5.469 50 GHz	56.656 dB μ V	Band Power	1.000 MHz	70.174 dB μ V
2								
3								

MSG STATUS

Trace/Detector

Select Trace 1

Clear Write

Trace Average

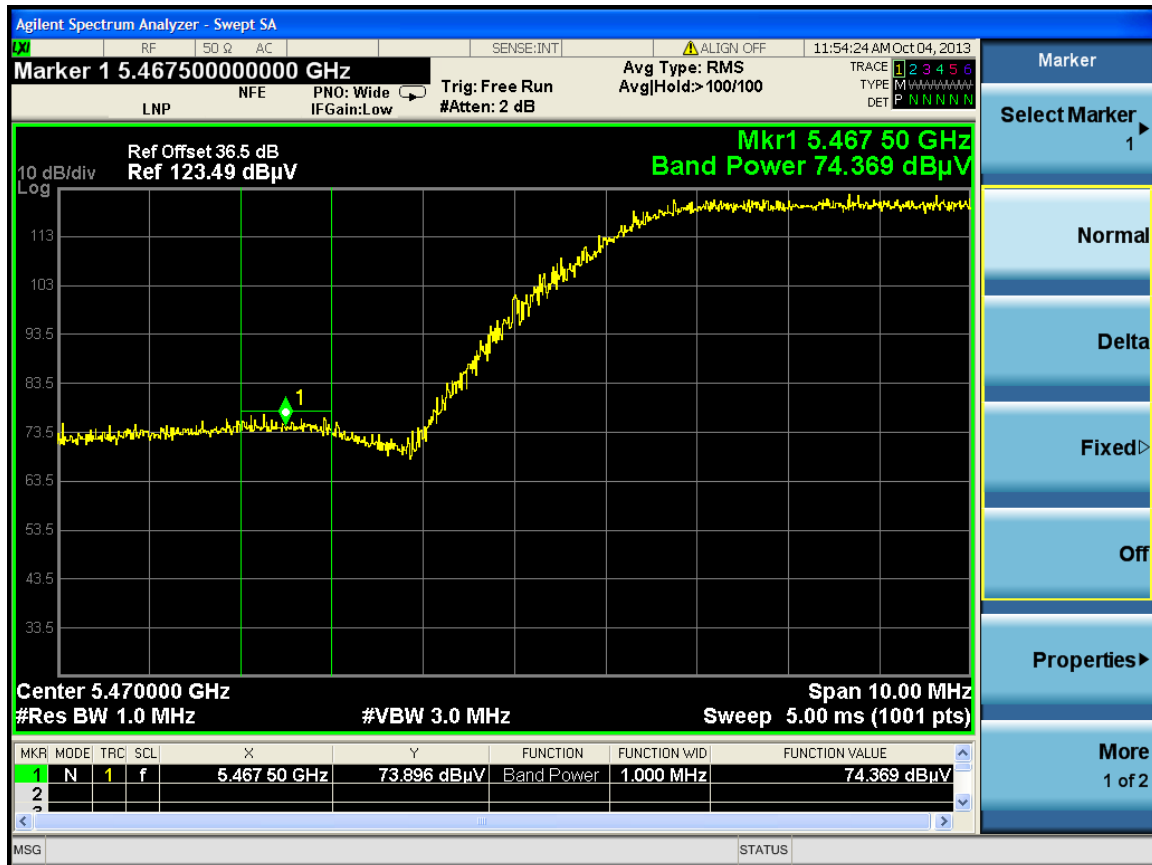
Max Hold

Min Hold

View Blank Trace On

More 1 of 3

Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.369 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= \mathbf{-30.40 \text{ dBm/MHz}}$



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:	20 MHz channel Bandwidth High Channel: Frequency – 5714 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:	$\begin{aligned}\text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 71.448 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-33.32 \text{ dBm/MHz}}\end{aligned}$

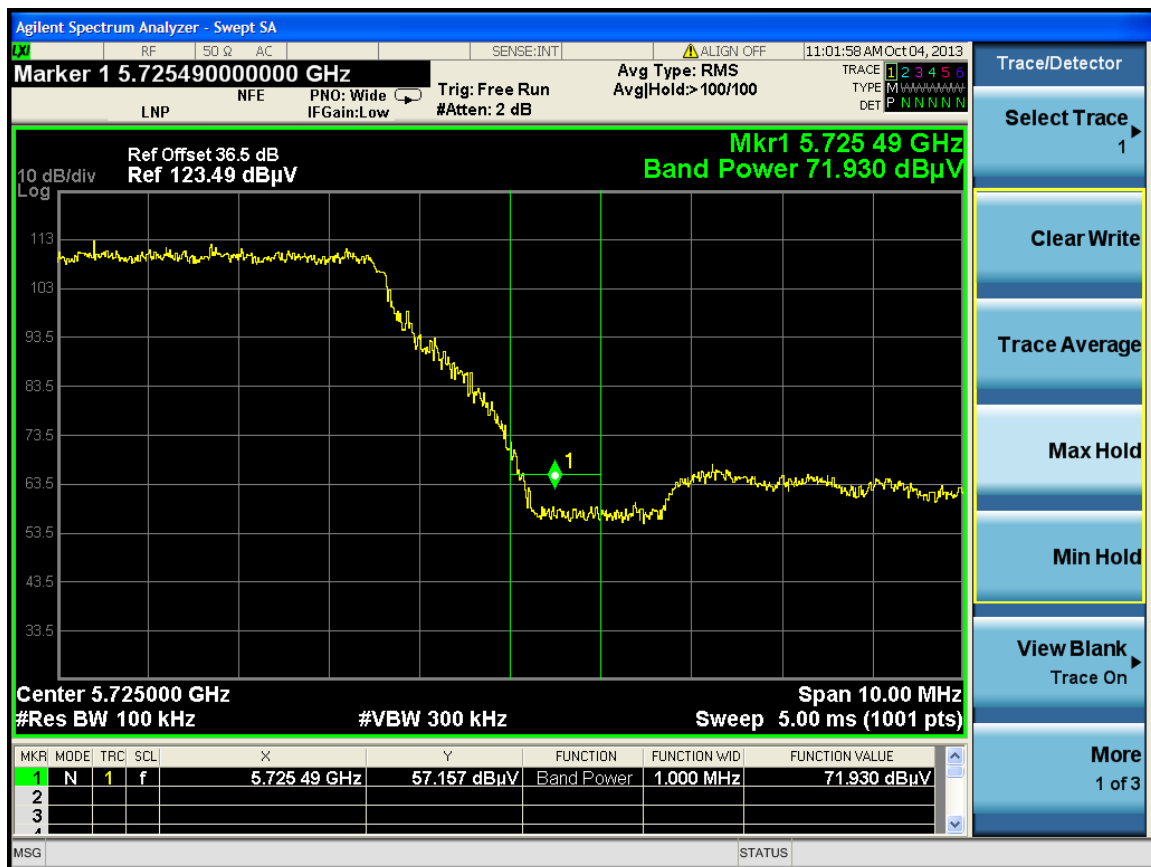


Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.452 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
= -29.31 dBm/MHz



Limit:

Measurement:



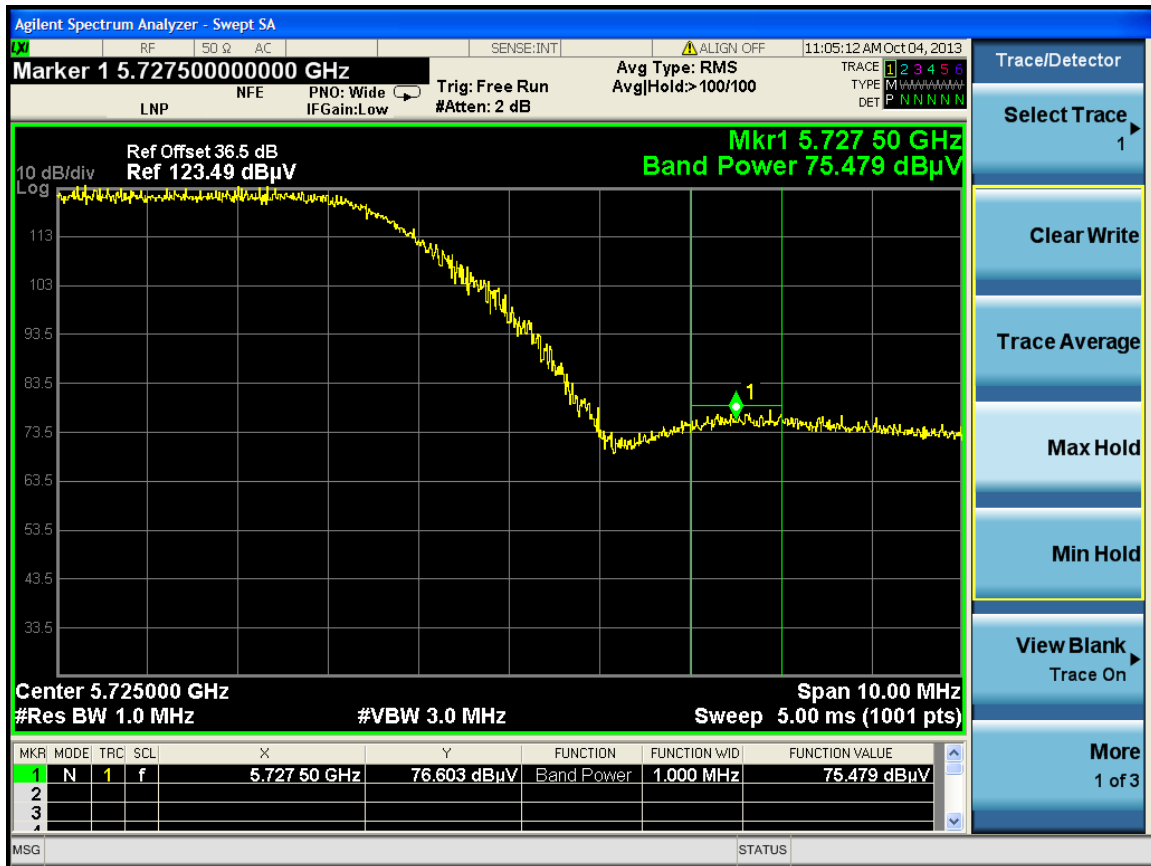
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.227 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.54 \text{ dBm/MHz}$



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: 20 MHz channel Bandwidth
 High Channel: Frequency – 5714 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: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
 $= 70.777 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -33.99 \text{ dBm/MHz}$



Measurement:
$$\begin{aligned} \text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 75.479 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-29.29 \text{ dBm/MHz}} \end{aligned}$$



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:	20 MHz channel Bandwidth High Channel: Frequency – 5714 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:	$\begin{aligned}\text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 70.866 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-33.90 \text{ dBm/MHz}}\end{aligned}$



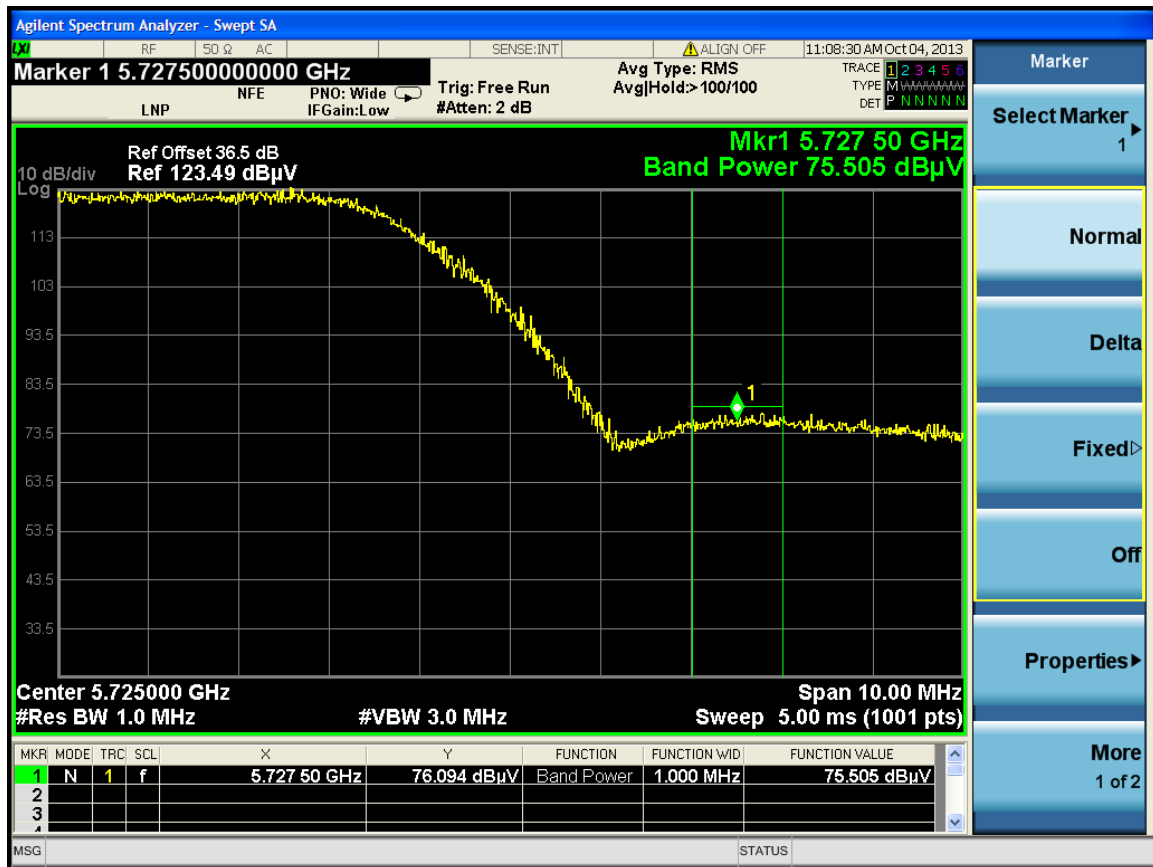
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.545 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.22 \text{ dBm/MHz}$



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: 20 MHz channel Bandwidth
 High Channel: Frequency – 5714 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: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 70.621 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -34.14 \text{ dBm/MHz}$



Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.505 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= \mathbf{-29.26 \text{ dBm/MHz}}$



Limit:

Measurement:



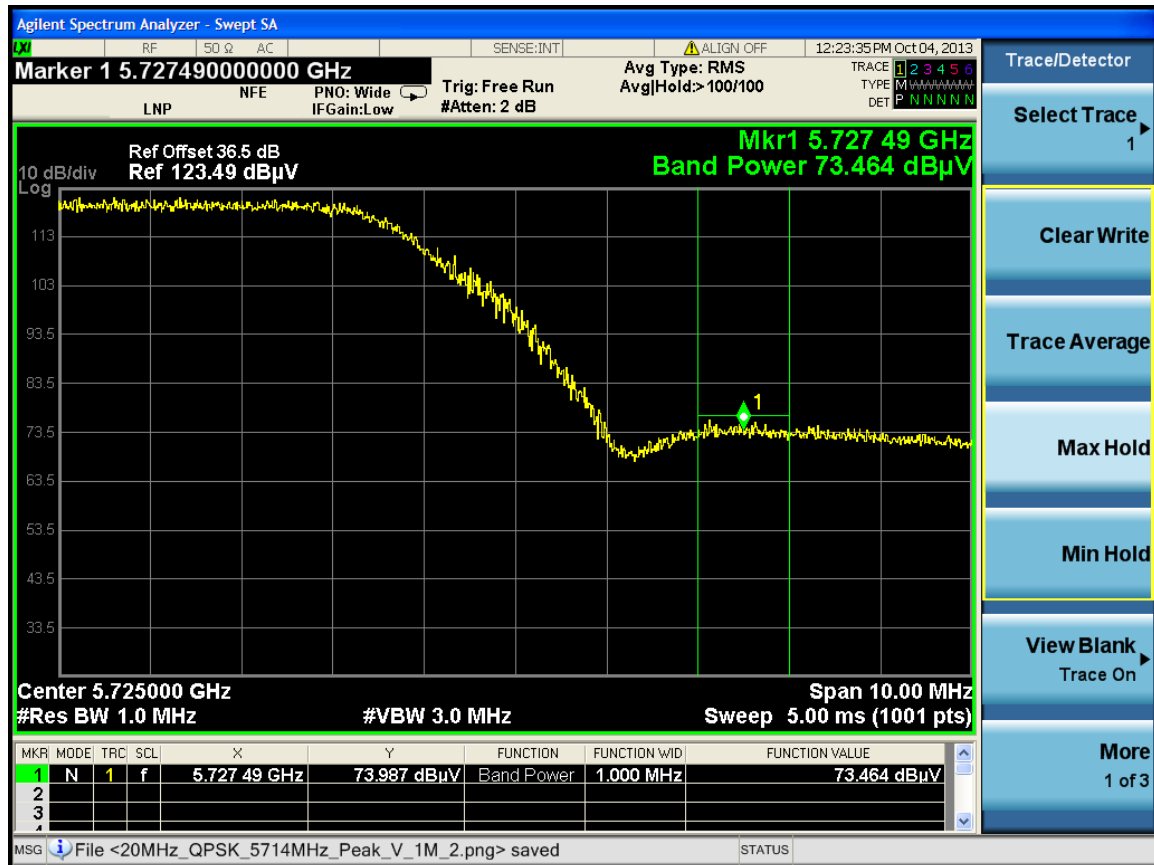
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.352 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= \mathbf{-31.41 \text{ dBm/MHz}}$



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: 20 MHz channel Bandwidth
 High Channel: Frequency – 5714 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: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 70.241 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -34.52 \text{ dBm/MHz}$



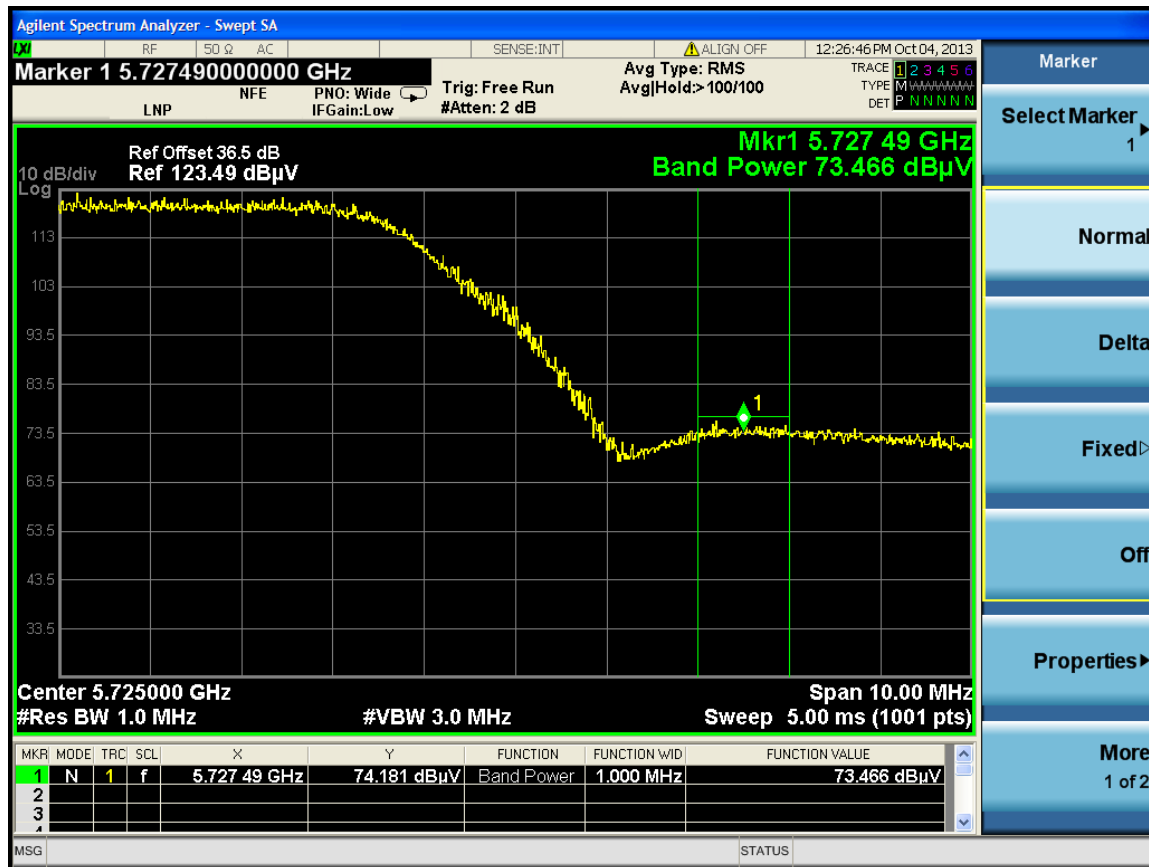
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.464 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.30 \text{ dBm/MHz}$



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:	20 MHz channel Bandwidth High Channel: Frequency – 5714 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:	$\begin{aligned}\text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 69.060 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-35.71 \text{ dBm/MHz}}\end{aligned}$



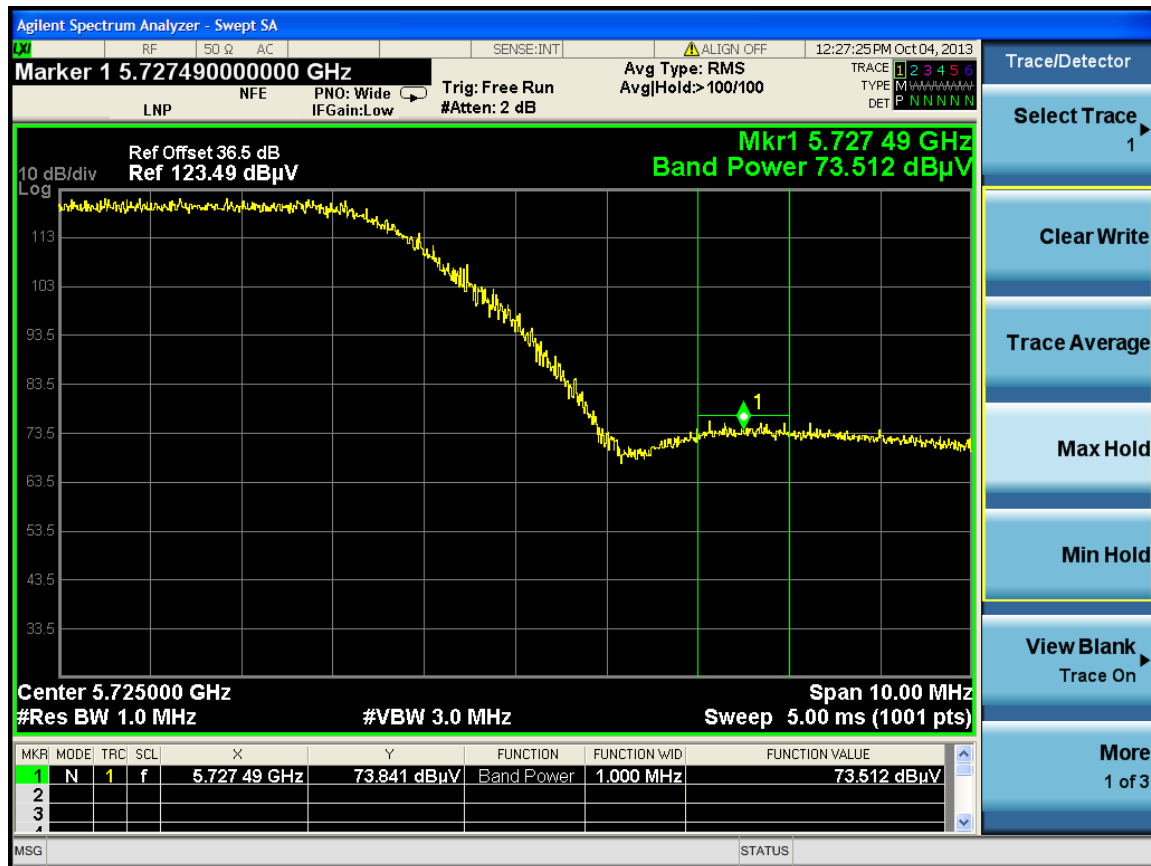
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.466 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.30 \text{ dBm/MHz}$



Limit:



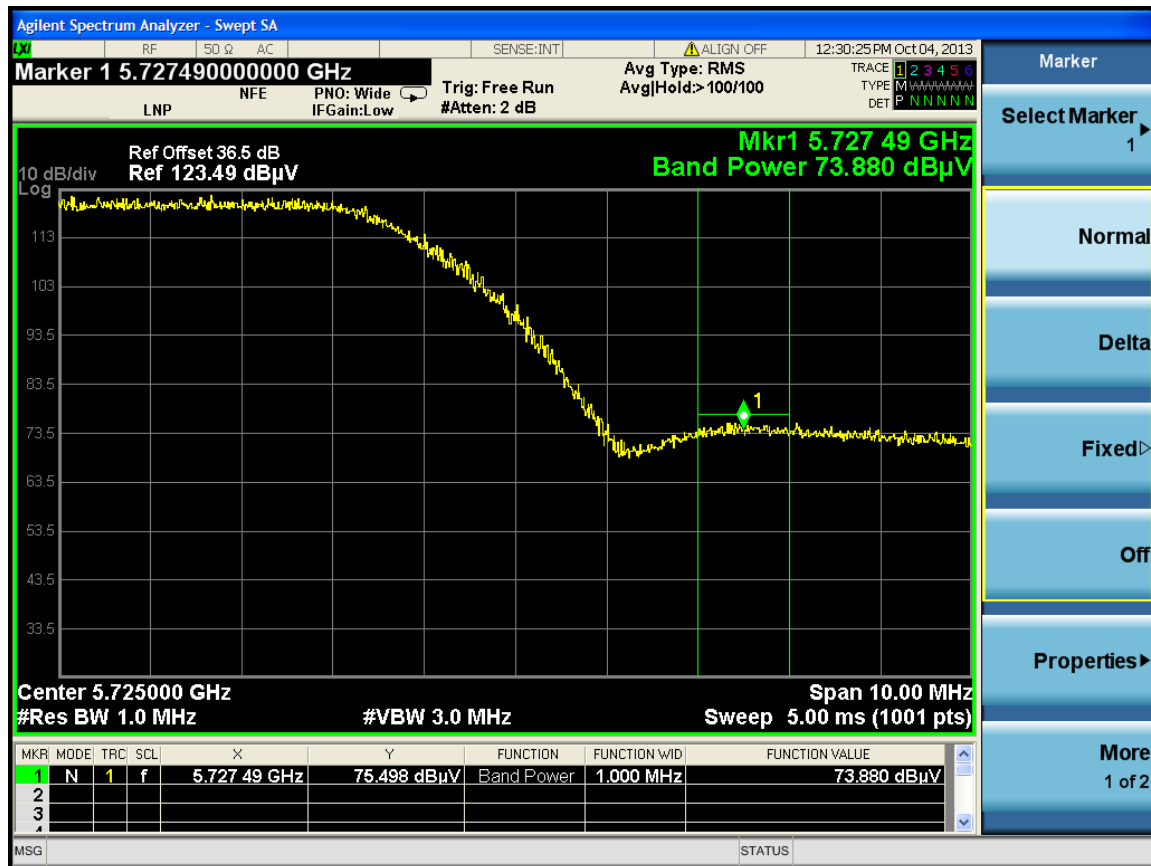
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.512 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.25 \text{ dBm/MHz}$



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:	20 MHz channel Bandwidth High Channel: Frequency – 5714 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:	$\begin{aligned}\text{EIRP[dBm]} &= \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77 \\ &= 69.465 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77 \\ &= \mathbf{-35.30 \text{ dBm/MHz}}\end{aligned}$



Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.880 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= \mathbf{-30.89 \text{ dBm/MHz}}$





166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	6154

Appendix – Measurement Data

9.0 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

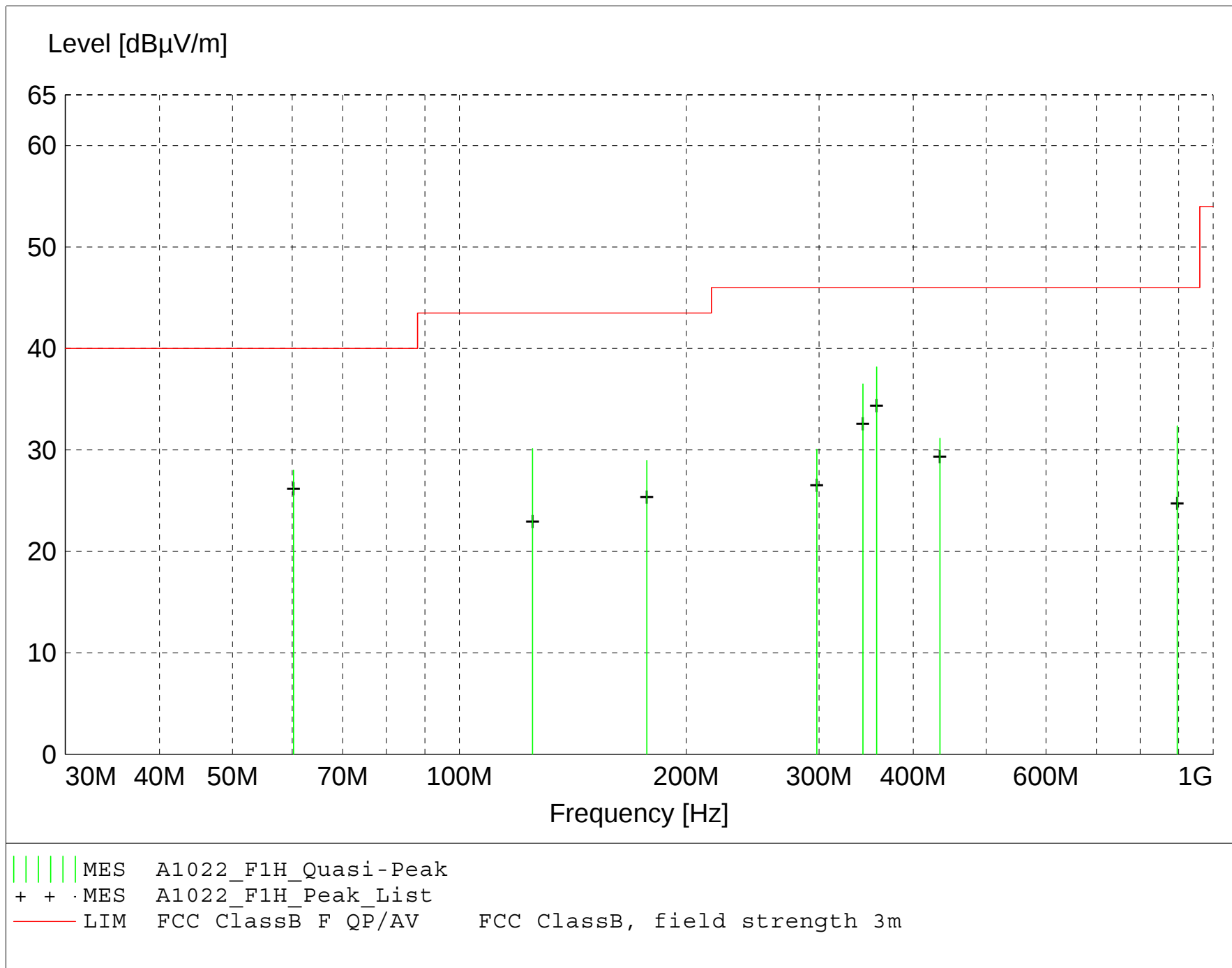
TEXT: "Horz 3 meters"

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"

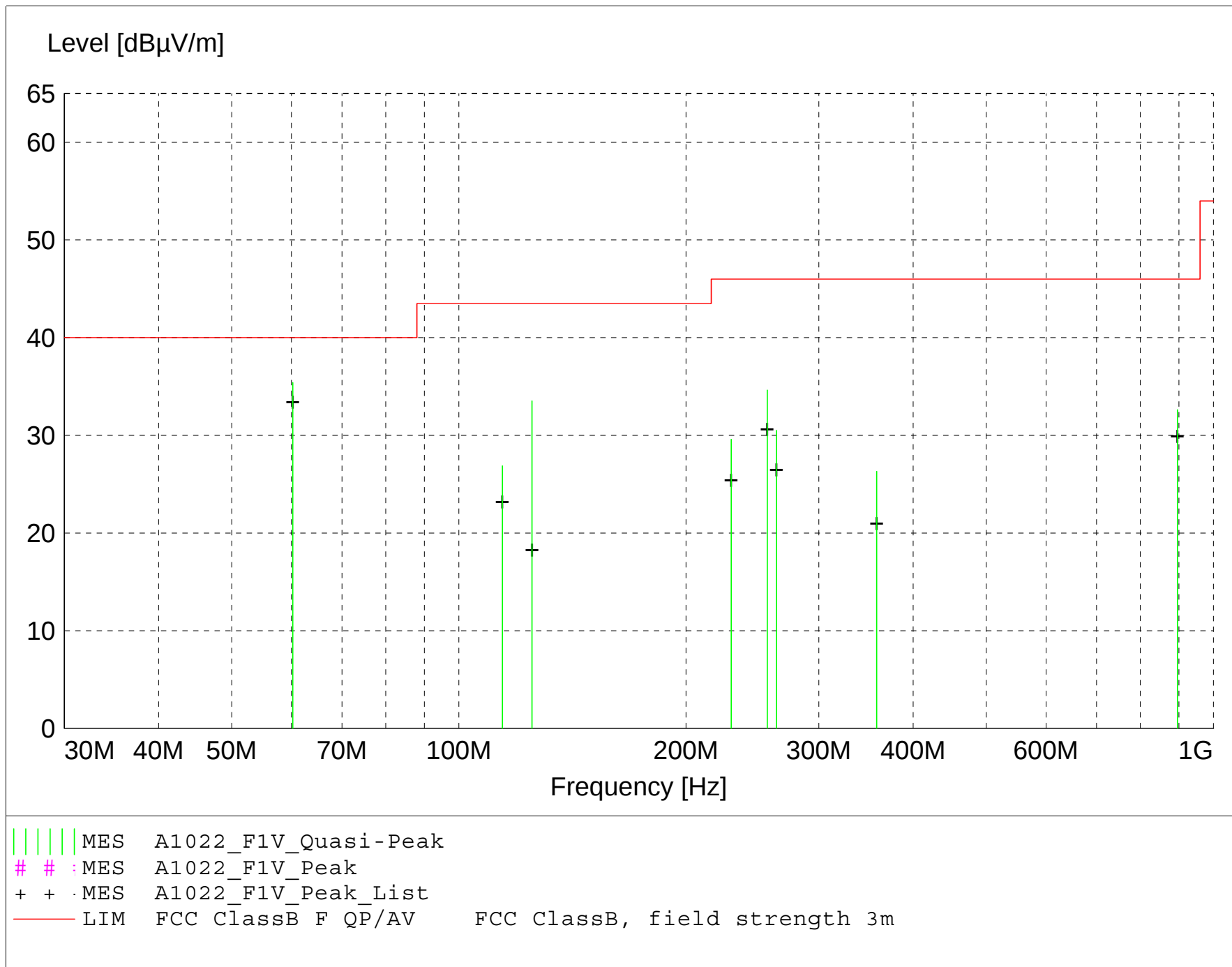
Short Description: Test Set-up

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: 72 deg. F; 54% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 20 MHz channel BW; 5490, 5580, 5705 MHz channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 10-01-2013

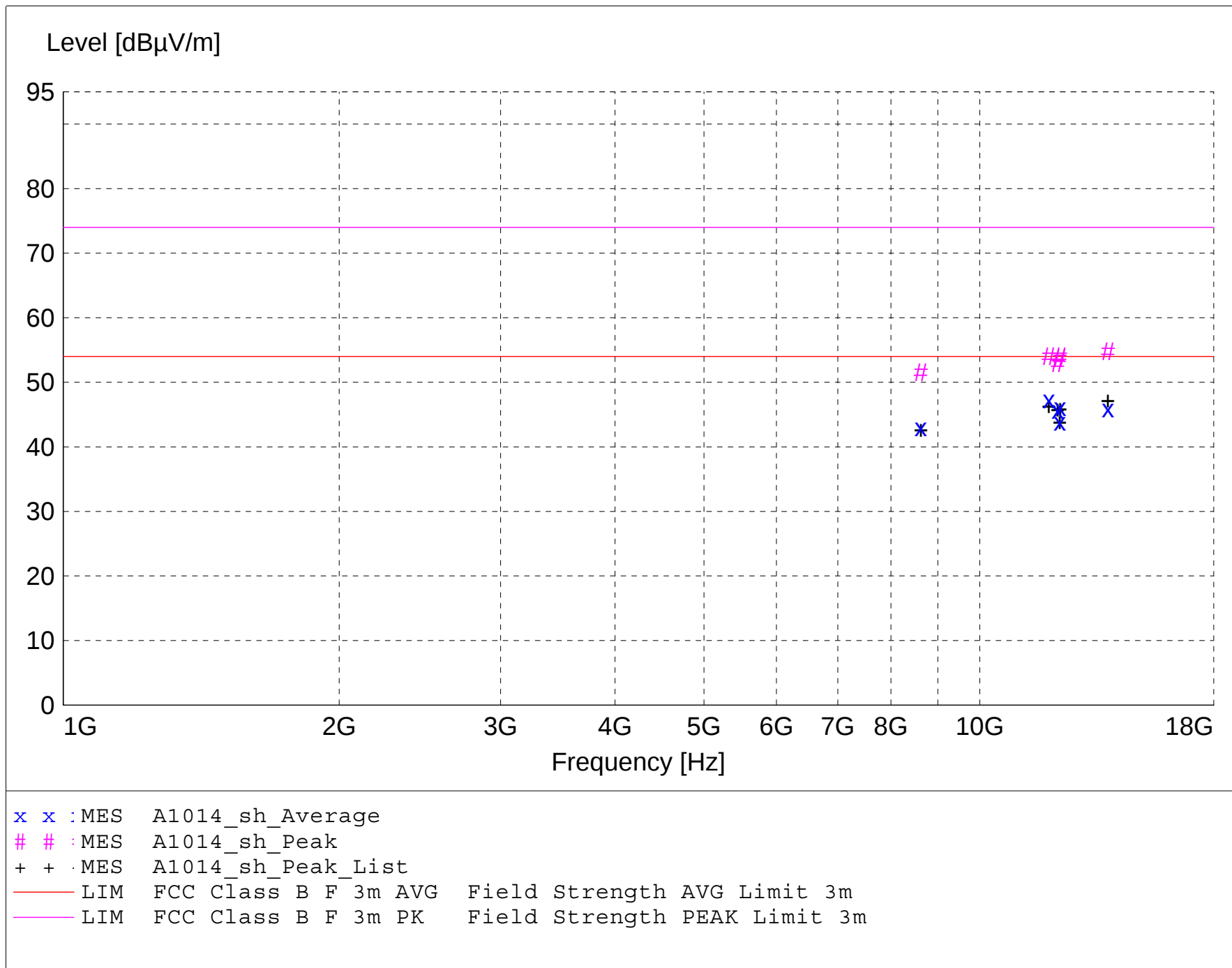
TEXT: "Horz 3 meters"

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: "A1014_sh_Final"

10/1/2013 3:45PM

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		
11895.000000	60.70	39.09	-52.5	47.3	54.0	6.7	1.20	225	AVERAGE	Low ch; QPSK
12240.000000	59.27	38.95	-52.0	46.2	54.0	7.8	1.00	0	AVERAGE	High ch; QPSK
13800.000000	56.72	40.75	-51.6	45.9	54.0	8.1	1.00	135	AVERAGE	Low ch; QPSK
12165.000000	58.79	38.98	-52.1	45.7	54.0	8.3	1.00	0	AVERAGE	Mid ch; QPSK
12225.000000	56.96	38.95	-52.0	43.9	54.0	10.1	1.00	170	AVERAGE	Low ch; QPSK
8625.000000	57.72	37.73	-52.5	43.0	54.0	11.0	1.00	225	AVERAGE	Low ch; QPSK
13800.000000	65.62	40.75	-51.6	54.8	74.0	19.2	1.00	135	MAX PEAK	Low ch; QPSK
11895.000000	67.50	39.09	-52.5	54.1	74.0	19.9	1.20	225	MAX PEAK	Low ch; QPSK
12240.000000	67.13	38.95	-52.0	54.0	74.0	20.0	1.00	0	MAX PEAK	High ch; QPSK
12225.000000	66.76	38.95	-52.0	53.7	74.0	20.3	1.00	170	MAX PEAK	Low ch; QPSK
12165.000000	66.13	38.98	-52.1	53.0	74.0	21.0	1.00	0	MAX PEAK	Mid ch; QPSK
8625.000000	66.26	37.73	-52.5	51.5	74.0	22.5	1.00	225	MAX PEAK	Low ch; QPSK

FCC Part 15.209

Electric Field Strength

EUT: Model: AF5
Manufacturer: Ubiquiti Networks
Operating Condition: 72 deg. F; 54% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 20 MHz channel BW; 5490, 5580, 5705 MHz channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 10-01-2013

TEXT: "Vert 3 meters"

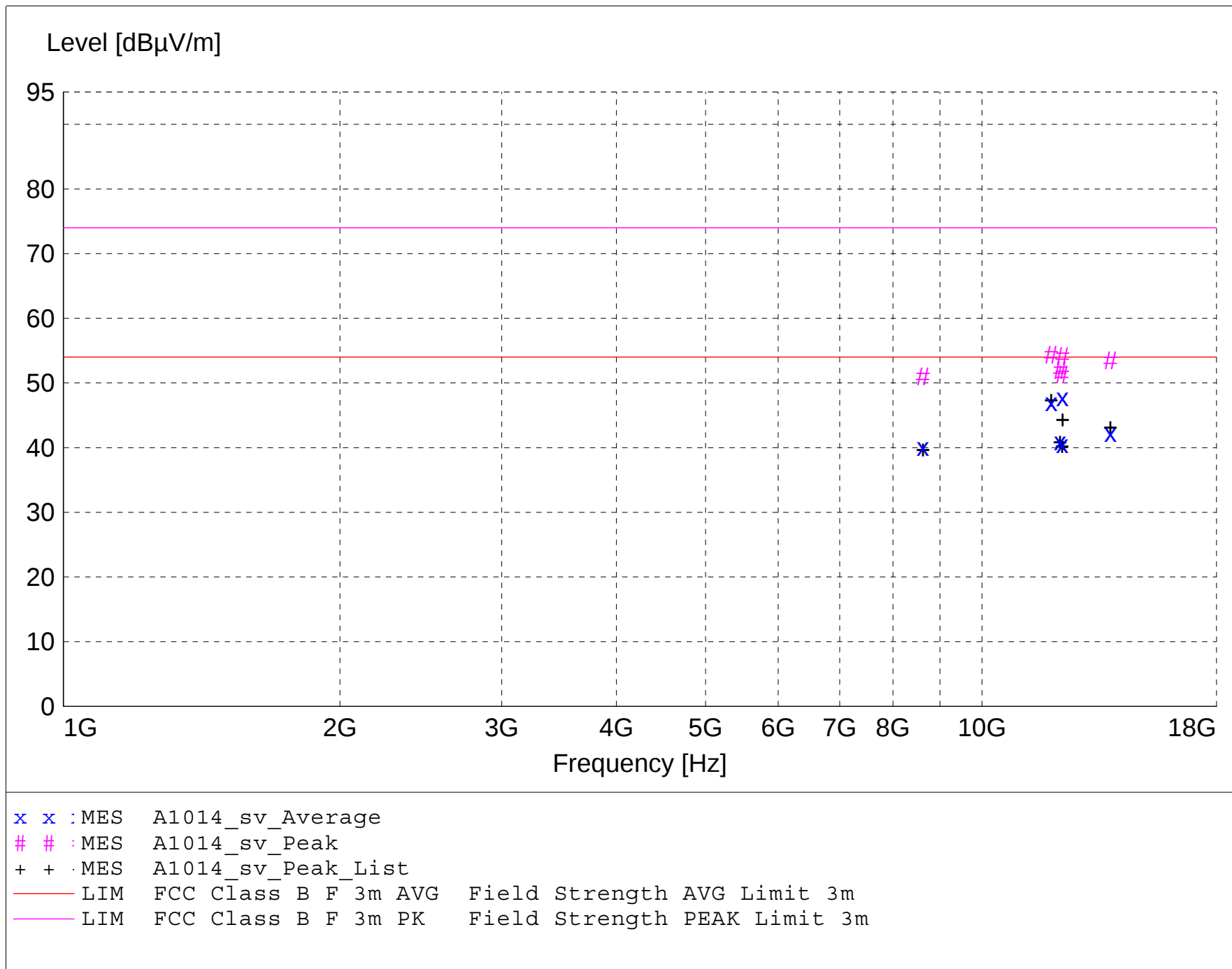
Short Description: Test Set-up

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: "A1014_sv_Final"

10/1/2013 3:33PM

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		
12240.000000	60.83	38.95	-52.0	47.7	54.0	6.3	1.30	0	AVERAGE	High ch; QPSK
11895.000000	60.46	39.09	-52.5	47.0	54.0	7.0	1.10	0	AVERAGE	Low ch; QPSK
13800.000000	53.08	40.75	-51.6	42.3	54.0	11.7	1.80	150	AVERAGE	low ch; QPSK
12165.000000	54.13	38.98	-52.1	41.0	54.0	13.0	1.20	225	AVERAGE	Mid ch; QPSK
12225.000000	53.66	38.95	-52.0	40.6	54.0	13.4	1.20	160	AVERAGE	Low ch; QPSK
8625.000000	54.82	37.73	-52.5	40.1	54.0	13.9	1.00	120	AVERAGE	Low ch; QPSK
11895.000000	67.74	39.09	-52.5	54.3	74.0	19.7	1.10	0	MAX PEAK	Low ch; QPSK
12240.000000	67.25	38.95	-52.0	54.2	74.0	19.8	1.30	0	MAX PEAK	High ch; QPSK
13800.000000	64.33	40.75	-51.6	53.5	74.0	20.5	1.80	150	MAX PEAK	low ch; QPSK
12165.000000	65.12	38.98	-52.1	52.0	74.0	22.0	1.20	225	MAX PEAK	Mid ch; QPSK
12225.000000	64.46	38.95	-52.0	51.4	74.0	22.6	1.20	160	MAX PEAK	Low ch; QPSK
8625.000000	65.75	37.73	-52.5	51.0	74.0	23.0	1.00	120	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 2
6154

END OF REPORT

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