



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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 4 - 50 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 50 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.

© Copyright 1983 – 2013, D.L.S. Electronic Systems, Inc.

COPYRIGHT NOTICE

This report must not be reproduced (except in full), without the approval of D.L.S. Electronic Systems, Inc.



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 4
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 "W" and "S".

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is cursive and clear, with a distinct "B" and "M".

Brian Mattson
General Manager



166 South Carter, Genoa City, WI 53128

Company: Ubiquiti Networks, Inc.
Model Tested: AF5
Report Number: 19519 Part 4
DLS Project: 6154

Table of Contents

i. Cover Page	1
ii. Signature Page	2
iii. Table of Contents	3
iv. NVLAP Certificate of Accreditation	4
Appendix – Measurement Data	7
1.0 Duty Cycle of Test Unit	7
2.0 Emission Bandwidth – 26 dB bandwidth – conducted	13
3.0 99 Percent Occupied Bandwidth	44
4.0 Maximum Conducted Output Power	75
5.0 Unwanted Emission Levels – Radiated Restricted Band-Edge	77
6.0 Peak Power Spectral Density – Conducted	98
7.0 Peak Excursion – Conducted	115
8.0 Unwanted Emission Levels – Radiated Operating Band-Edge	132
9.0 Unwanted Emission Levels – Radiated with integral antenna	153



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 4
6154

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

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

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

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

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



2013-10-01 through 2014-09-30

Effective dates

John P. 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 4
 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.



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
DLS Project:	6154

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)
5492 to 5703 MHz (40 MHz bandwidth)
5497 to 5698 MHz (50 MHz bandwidth) (in this part of the report)

(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 50MHz 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.



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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.

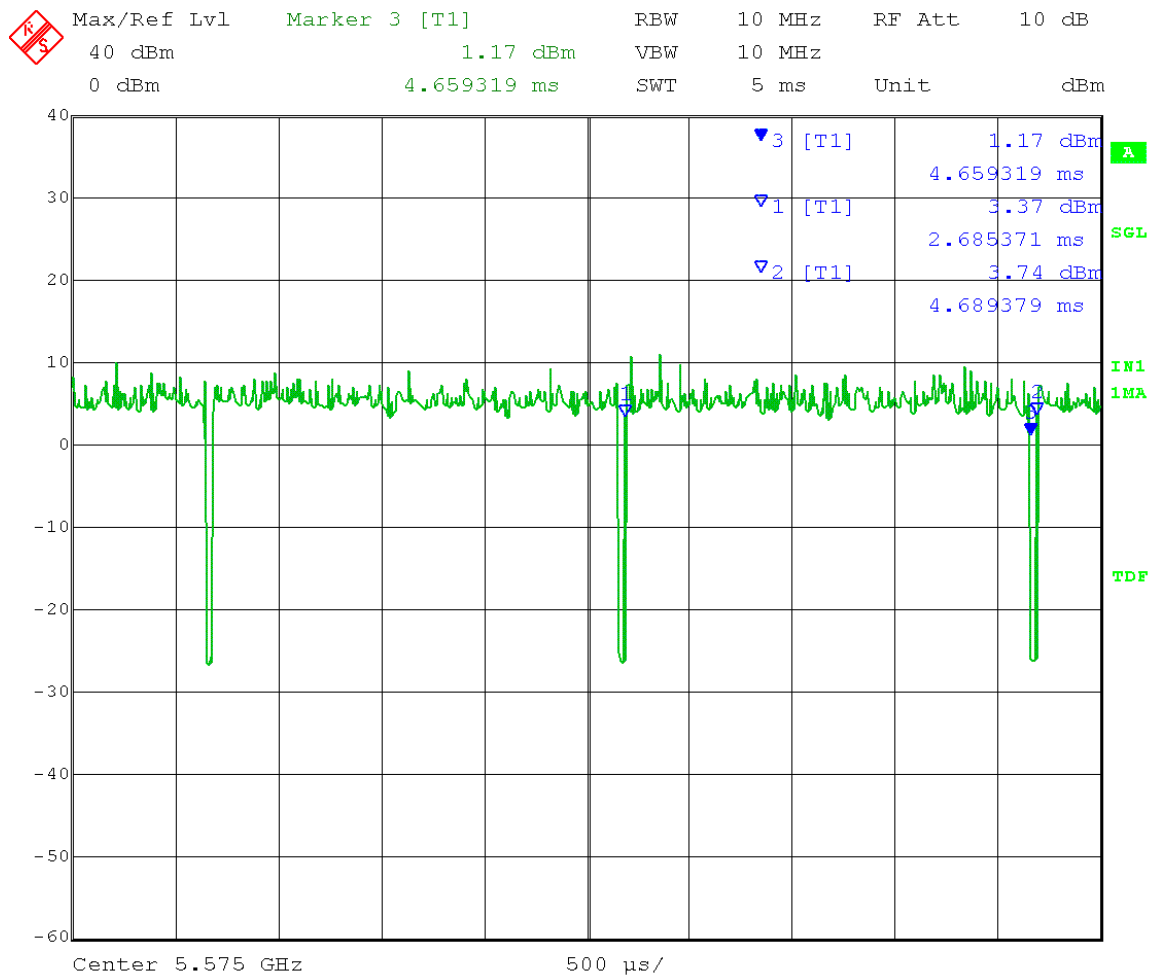
Output power was set to 30 dBm eirp using special test software.

Test Date: 10-16-2013
 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 = 4.689379-2.685371 = 2.004008
 Total on Time = 4.659319- 2.685371 = 1.973948 ms

VBW = 10 MHz
 SWT = 5 ms
 50MHz BW 16QAM

Duty cycle factor $x = 1.973948 / 2.004008 = 0.985$
 Adjustment for duty cycle $= 10\log 1/x = 0.07$

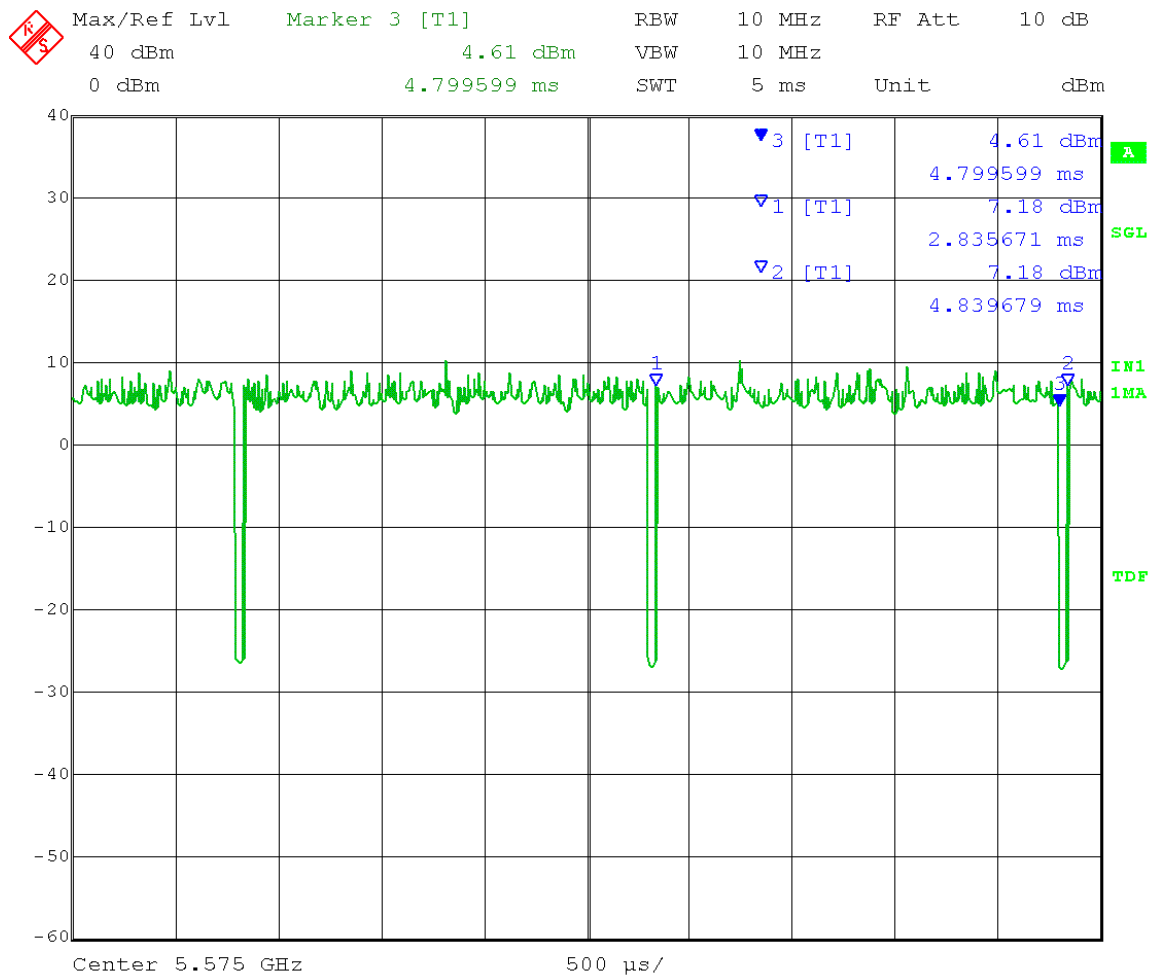


Date: 16.OCT.2013 11:23:32

Test Date: 10-16-2013
 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 = 4.839679-2.835671 = 2.004008
 Total on Time = 4.799599- 2.835671 = 1.963928 ms

Duty cycle factor $x = 1.963928 / 2.004008 = 0.980$
 Adjustment for duty cycle $= 10 \log 1/x = 0.07$



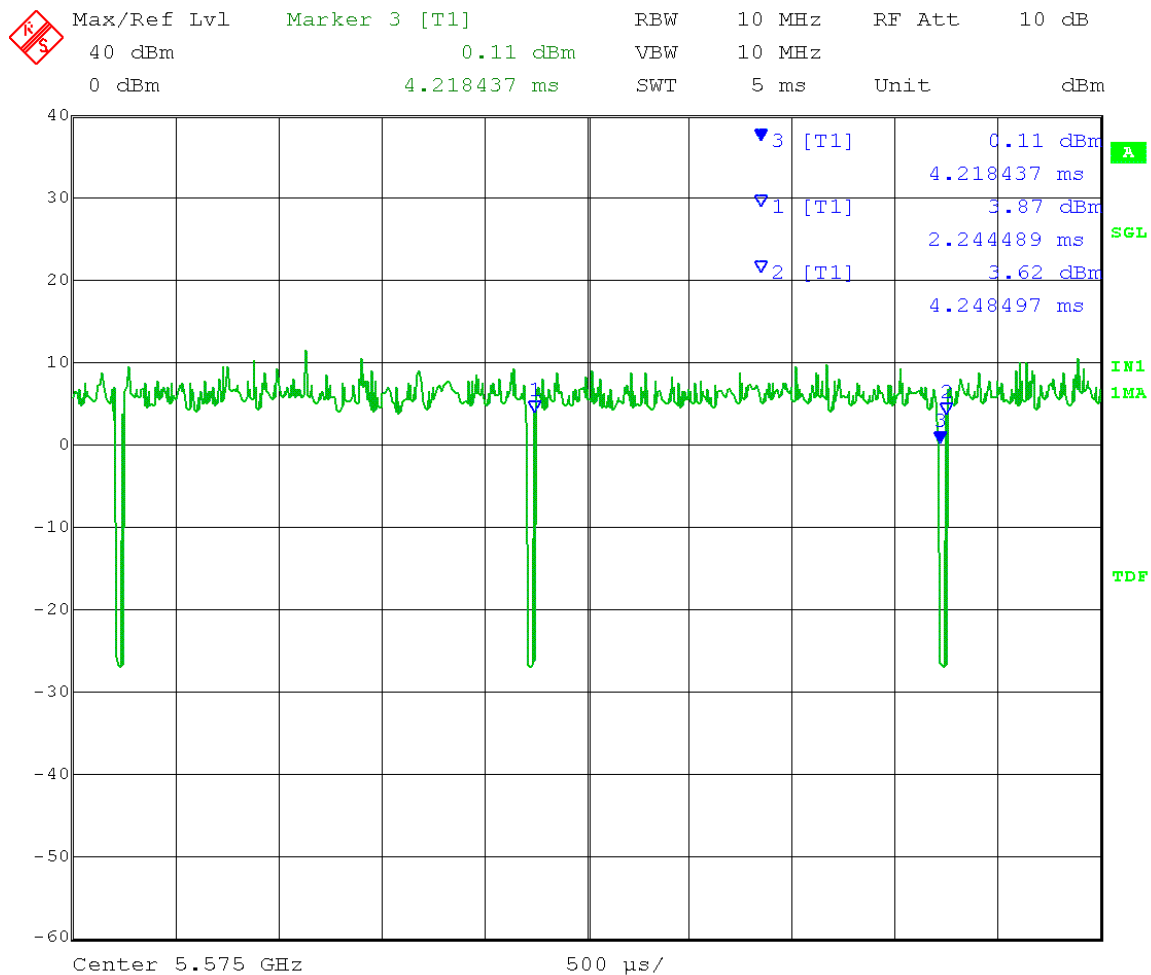
Date: 16.OCT.2013 11:35:01

Test Date: 10-16-2013
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 = 4.248497-2.244489 = 2.004008
Total on Time = 4.218437- 2.244489 = 1.993948 ms

VBW = 10 MHz
SWT = 5 ms
50MHz BW 256QAM

Duty cycle factor x = 1.963928 / 2.004008= 0.985
Adjustment for duty cycle =10log1/x = 0.07

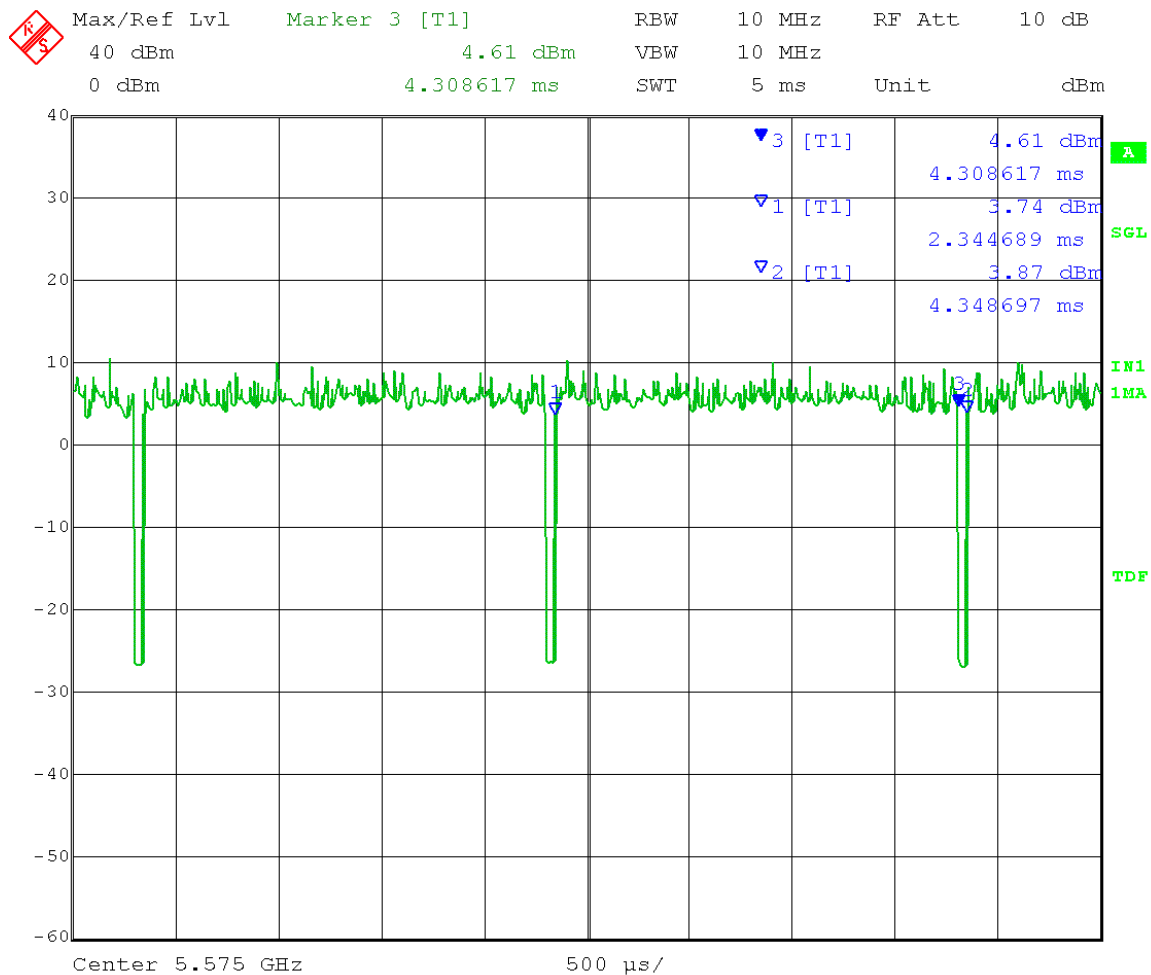


Date: 16.OCT.2013 11:41:02

Test Date: 10-16-2013
 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 VBW = 10 MHz
 Span = 0 Hz SWT = 5 ms
 Mid Channel: Transmit = 5.575GHz 50MHz BW 1024QAM
 Total Cycle time = 4.348697-2.344689 = 2.004008
 Total on Time = 4.308617- 2.344689 = 1.963928 ms

Duty cycle factor x = 1.963928 / 2.004008 = 0.980
 Adjustment for duty cycle = $10\log_{10} 1/x = 0.07$

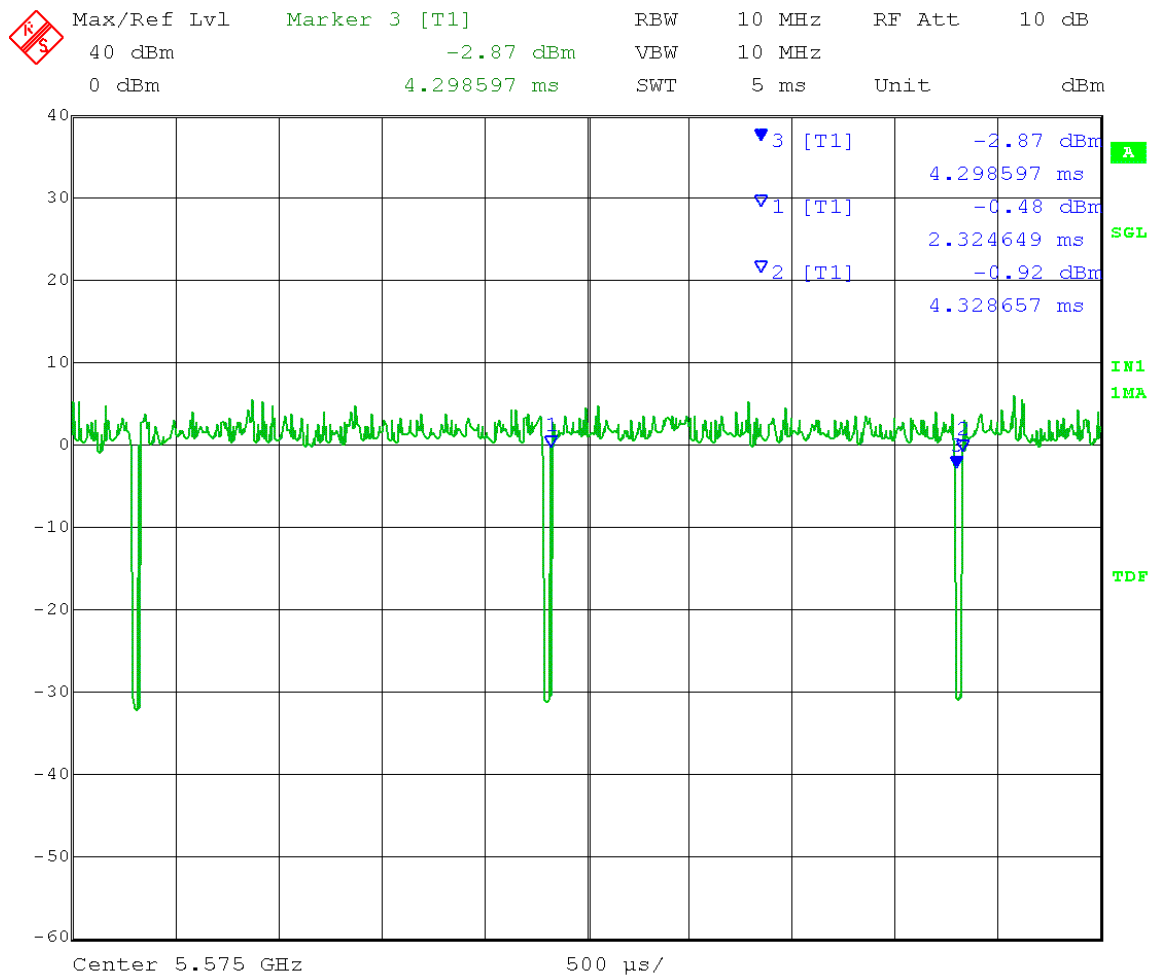


Date: 16.OCT.2013 11:45:41

Test Date: 10-15-2013
 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 = 4.328657-2.324649 = 2.004008
 Total on Time = 4.298597- 2.324649 = 1.973948 ms

Duty cycle factor $x = 1.973948 / 2.004008 = 0.985$
 Adjustment for duty cycle $= 10 \log 1/x = 0.07$



Date: 15.OCT.2013 13:05:54



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 4
6154

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

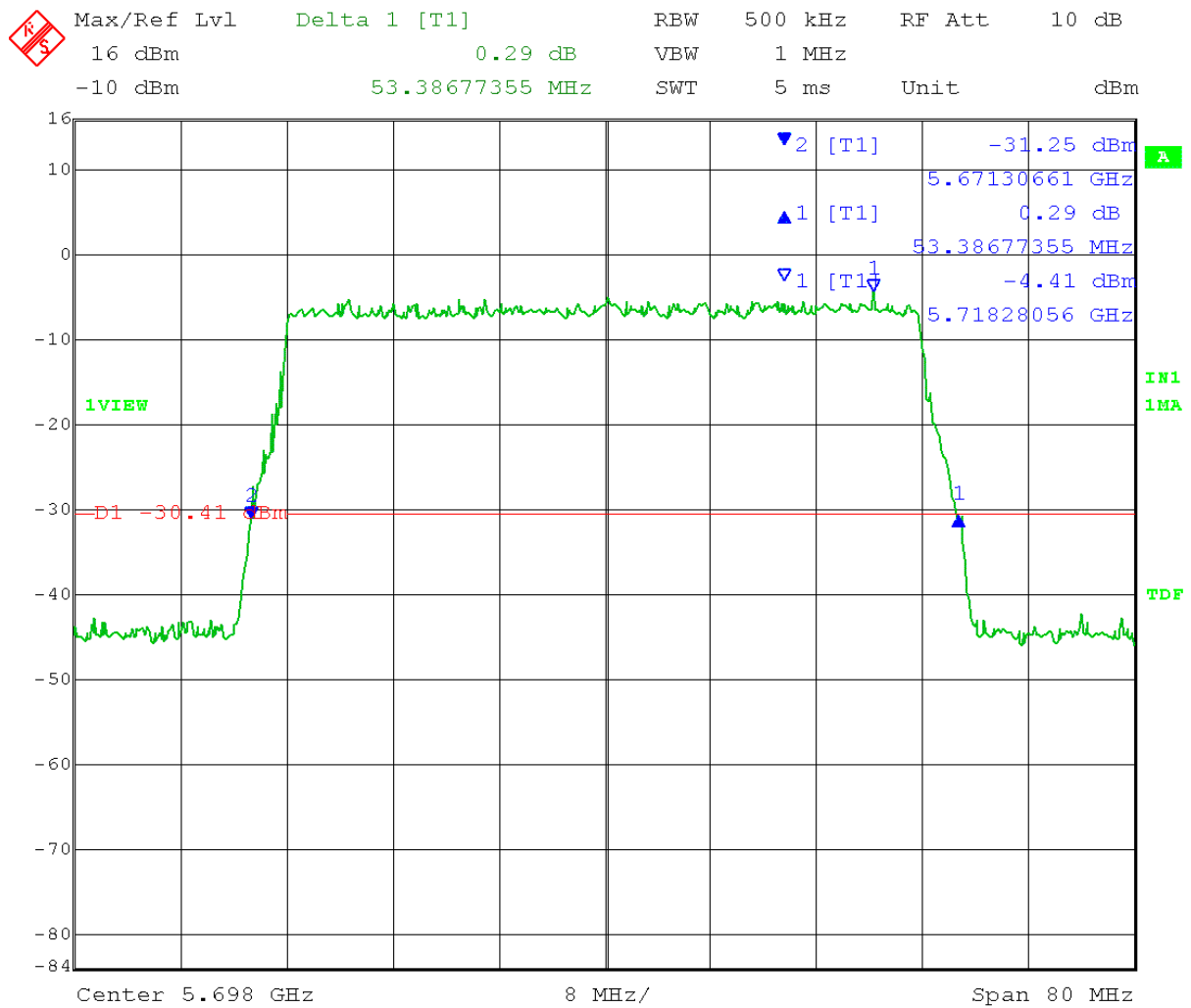
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

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

Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

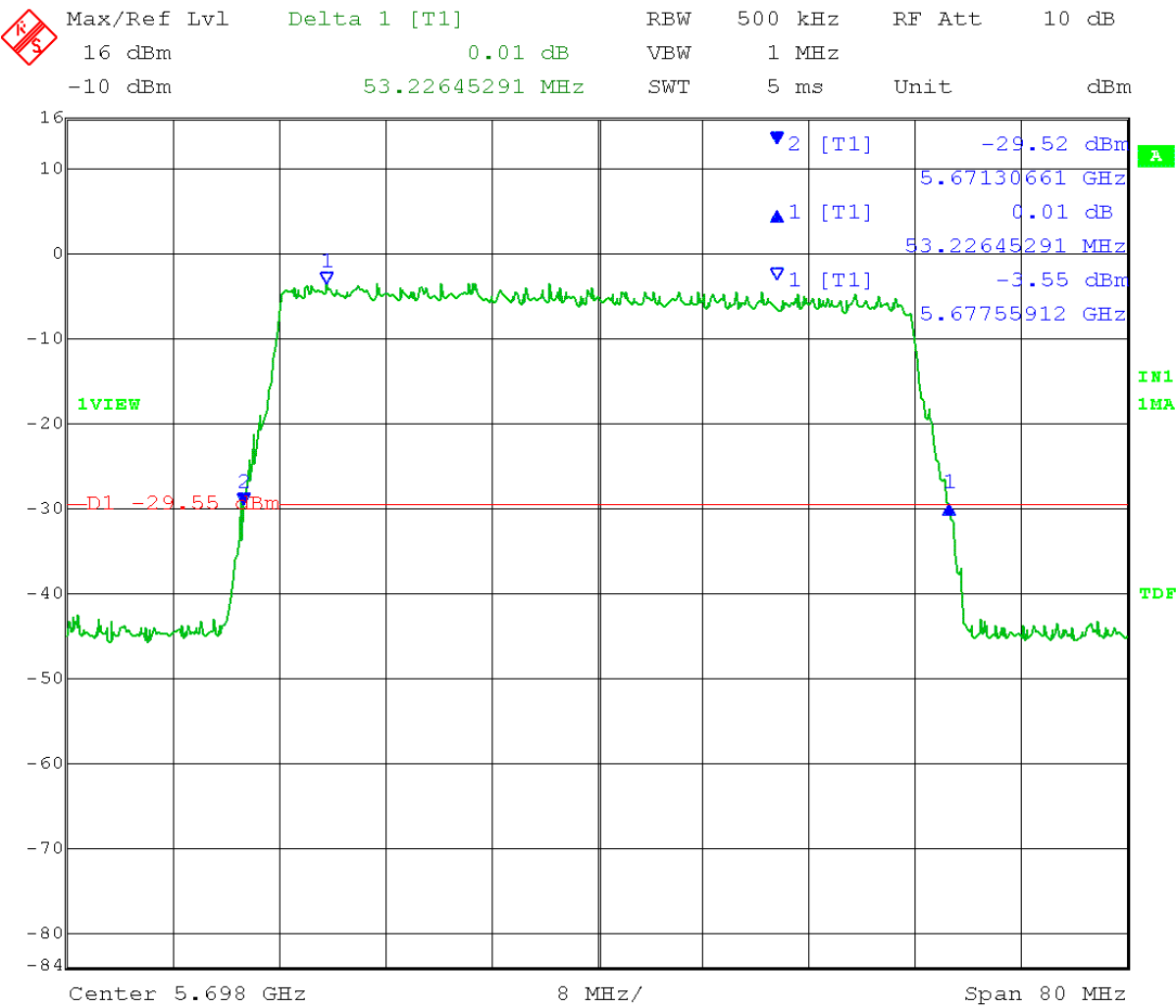
26 dB Emission Bandwidth = 53.39MHz



Date: 16.OCT.2013 15:01:30

TX 1:

26 dB Emission Bandwidth = 53.23MHz

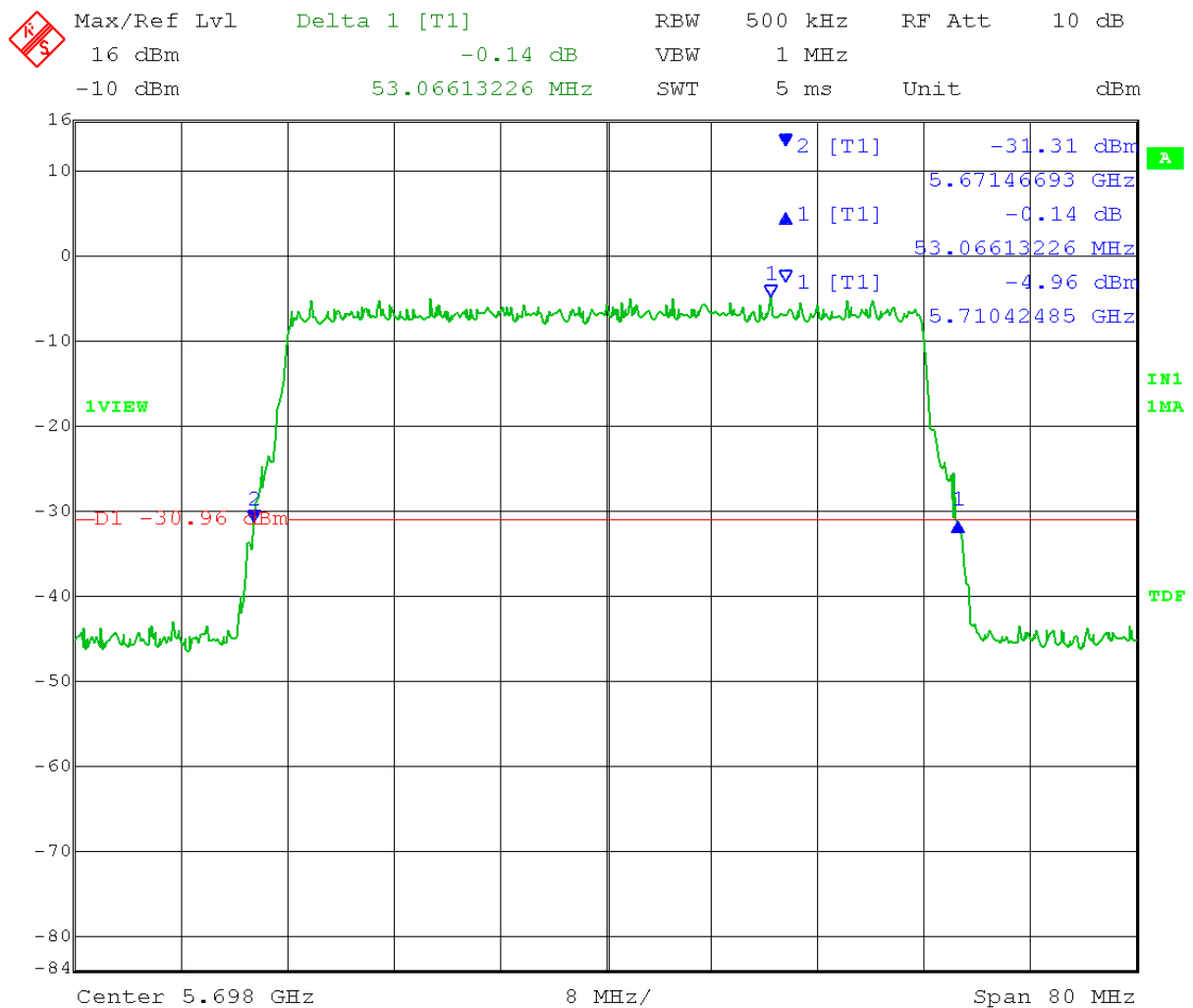


Date: 16.OCT.2013 14:05:59

Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

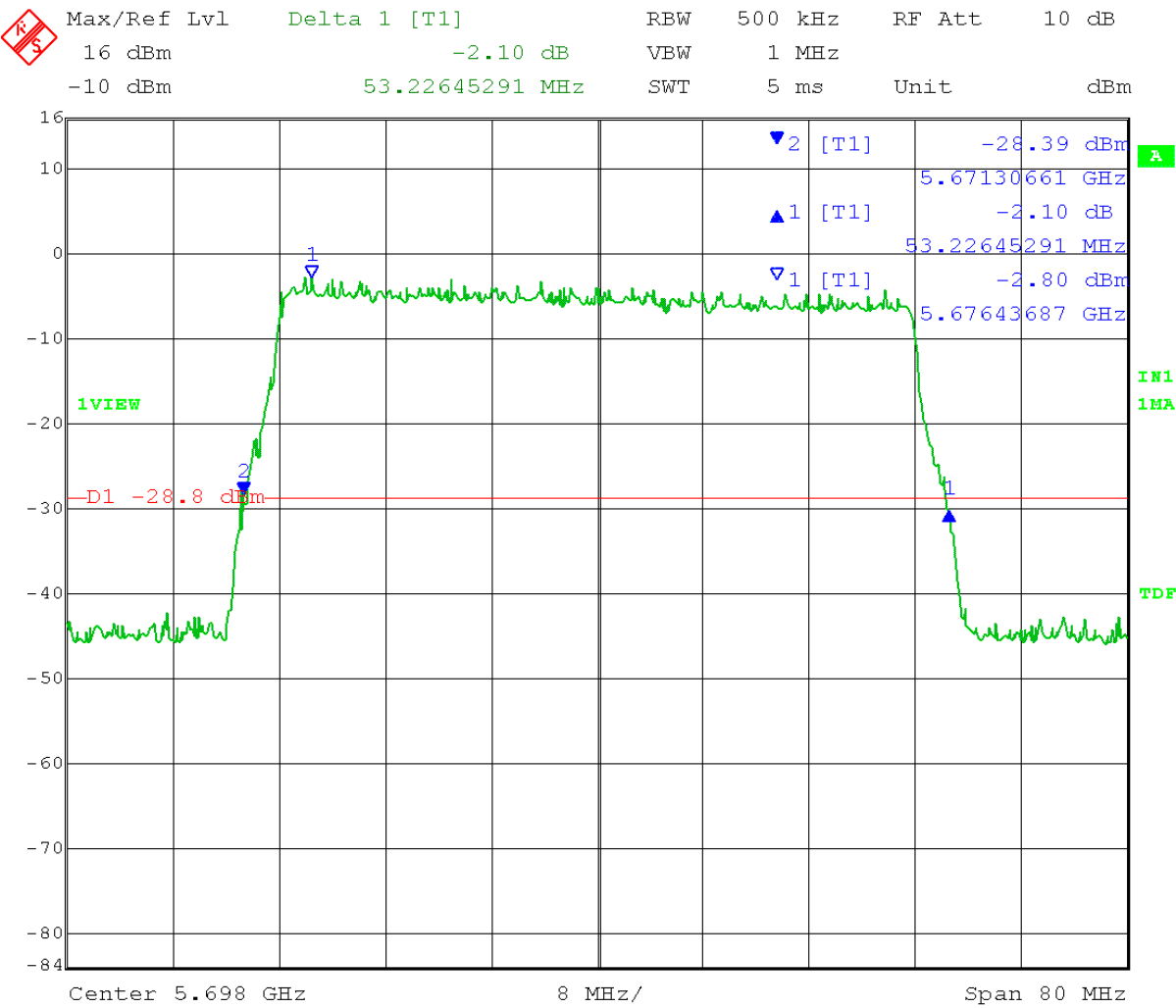
26 dB Emission Bandwidth = 53.07MHz



Date: 16.OCT.2013 14:59:47

TX 1:

26 dB Emission Bandwidth = 53.23MHz

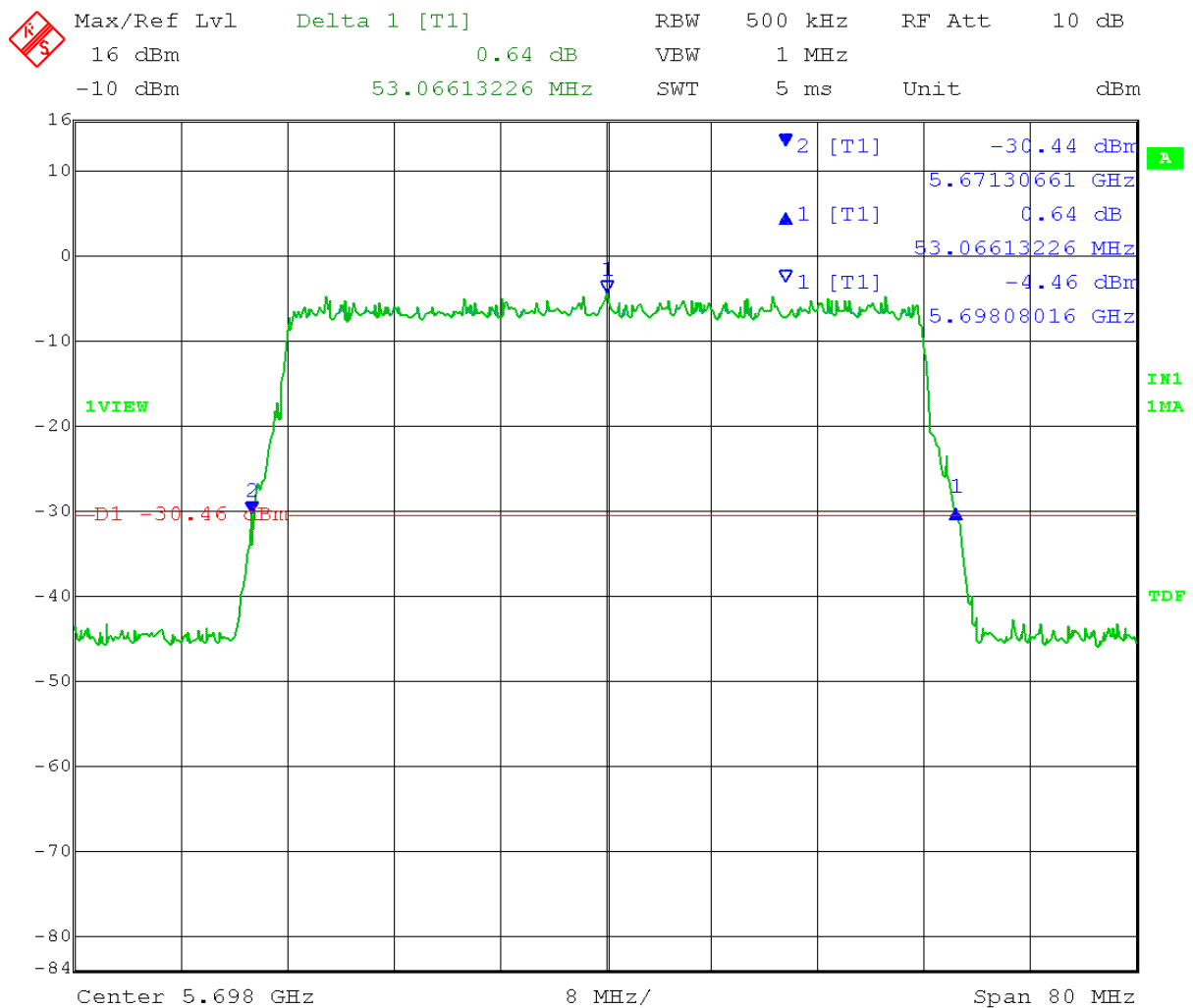


Date: 16.OCT.2013 14:07:53

Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

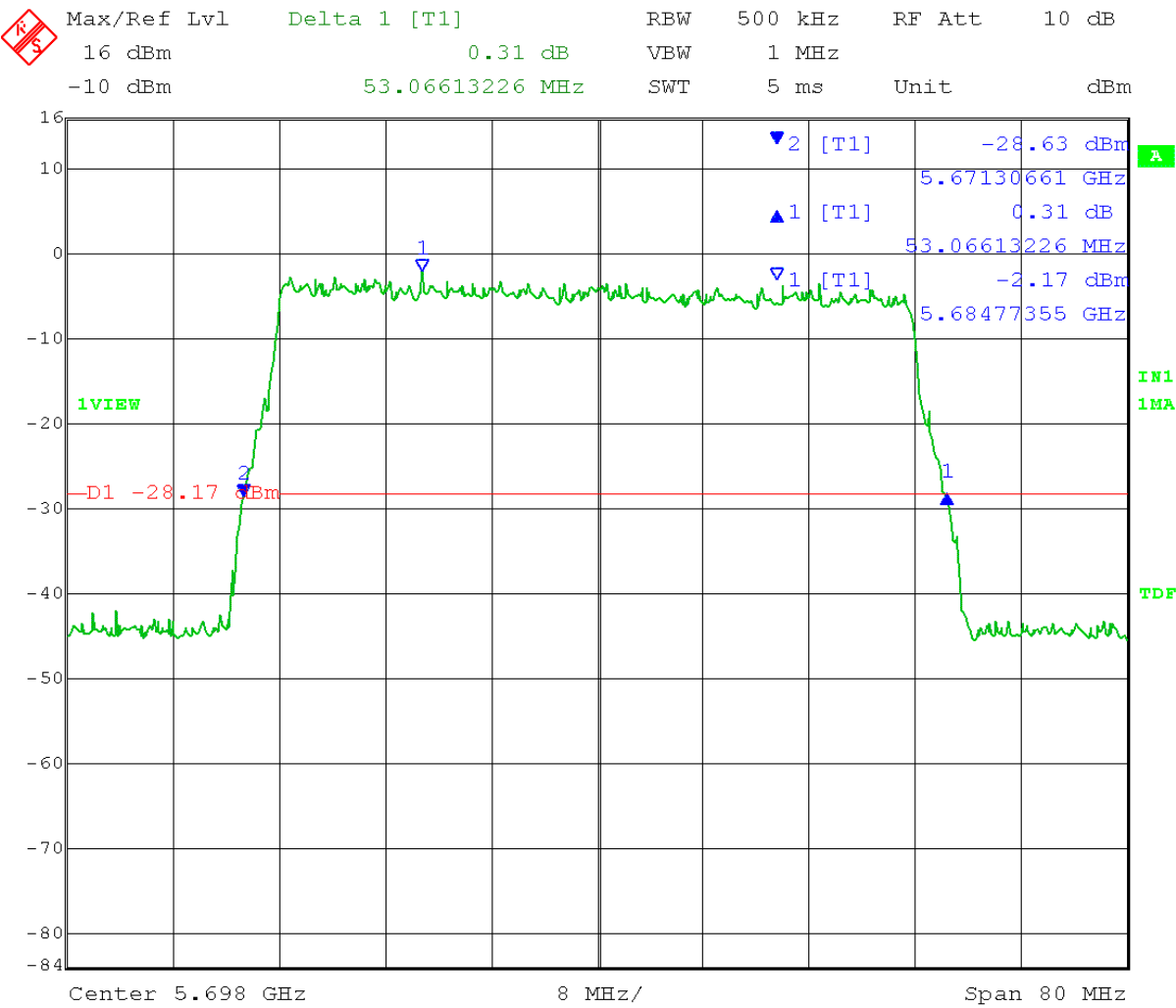
26 dB Emission Bandwidth = 53.07MHz



Date: 16.OCT.2013 14:58:16

TX 1:

26 dB Emission Bandwidth = 53.07MHz

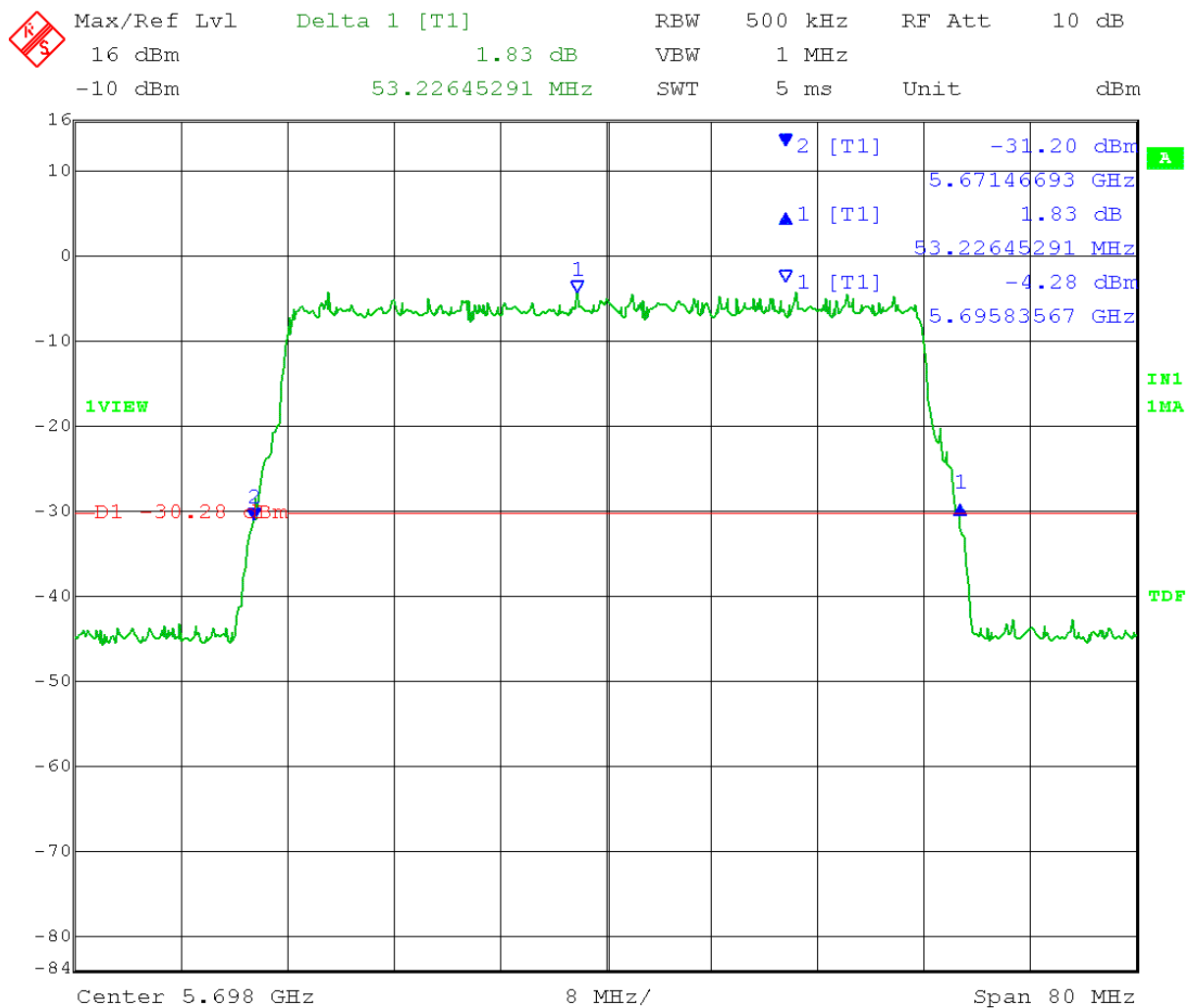


Date: 16.OCT.2013 14:10:45

Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

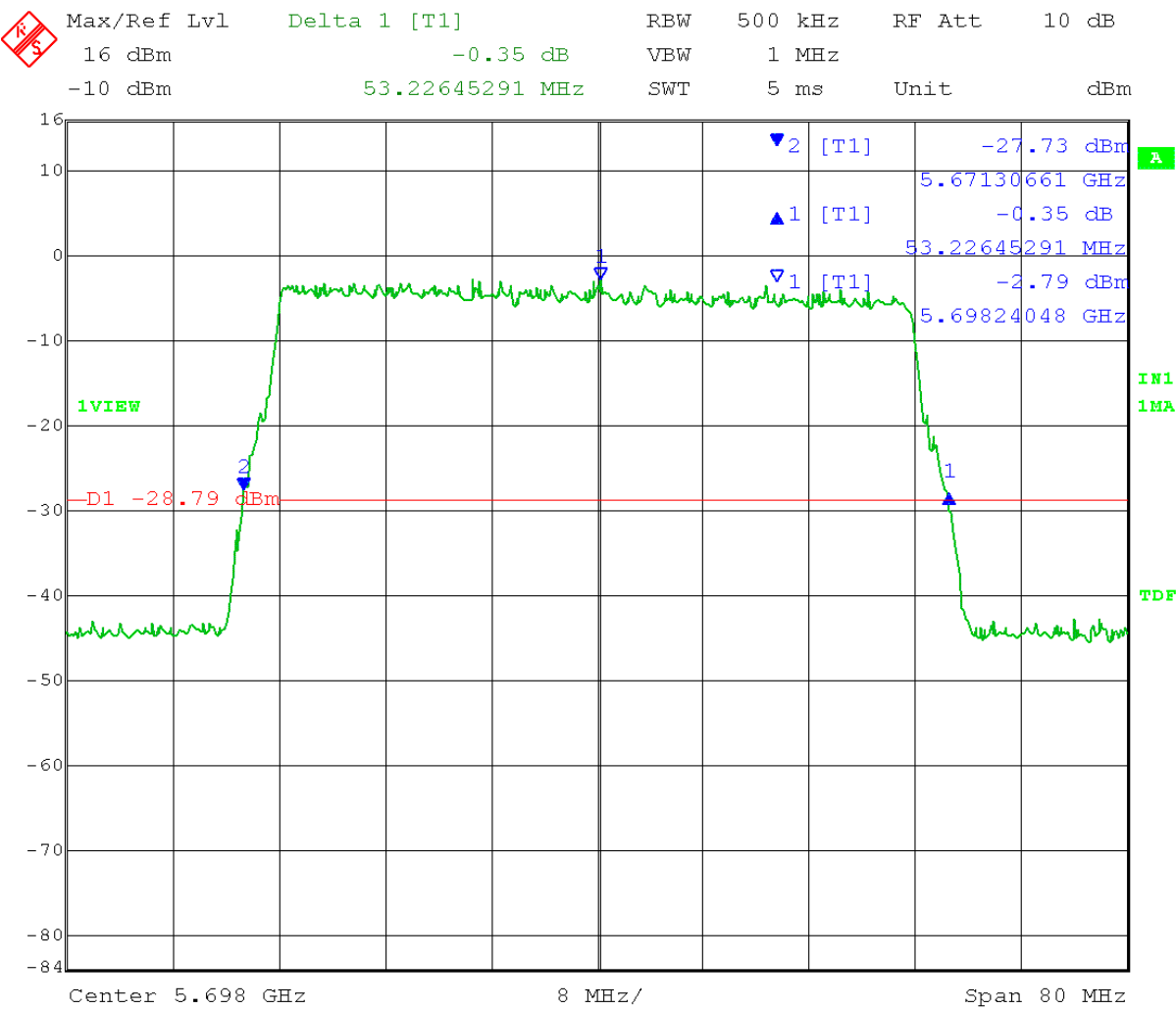
26 dB Emission Bandwidth = 53.23MHz



Date: 16.OCT.2013 14:56:14

TX 1:

26 dB Emission Bandwidth = 53.23MHz

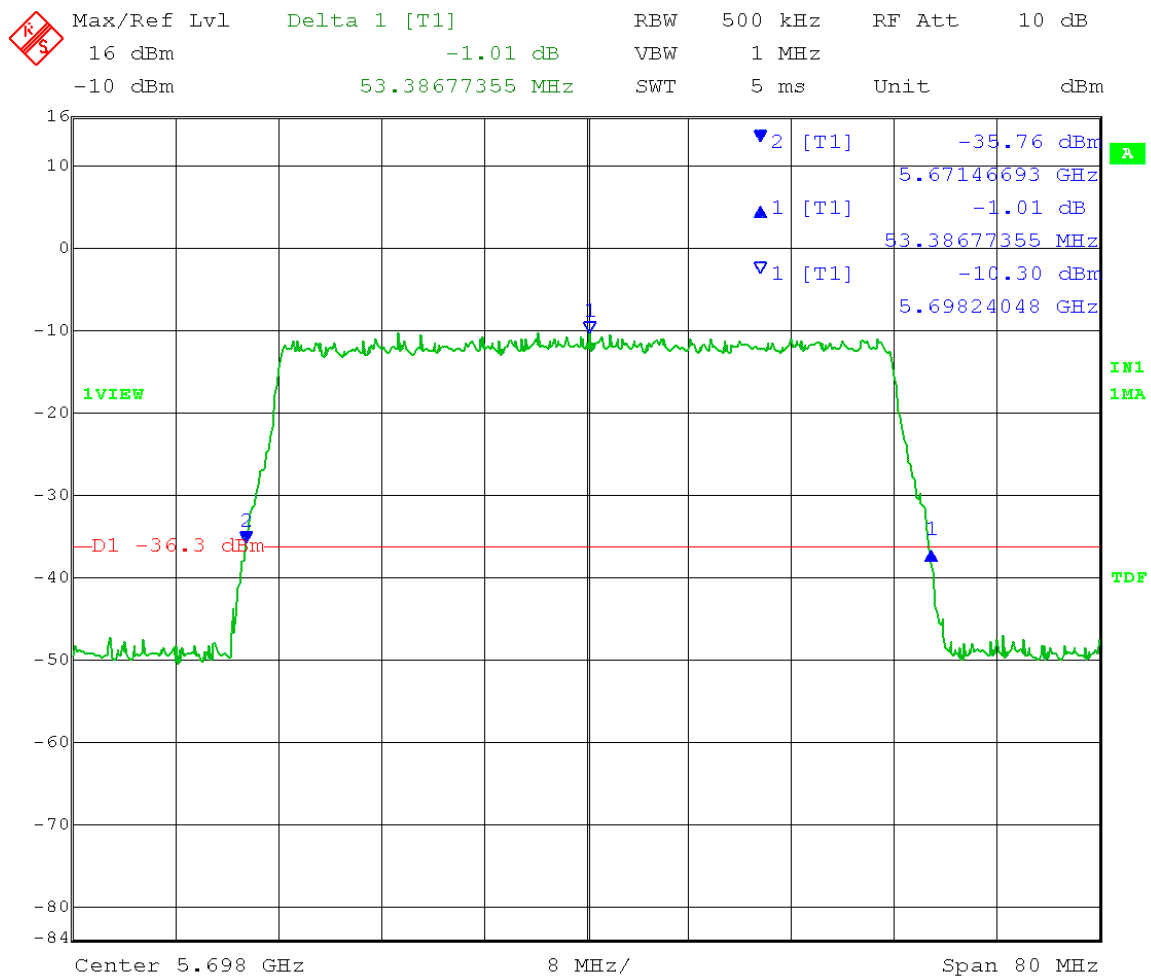


Date: 16.OCT.2013 14:12:54

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 = 5.698 GHz 50MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

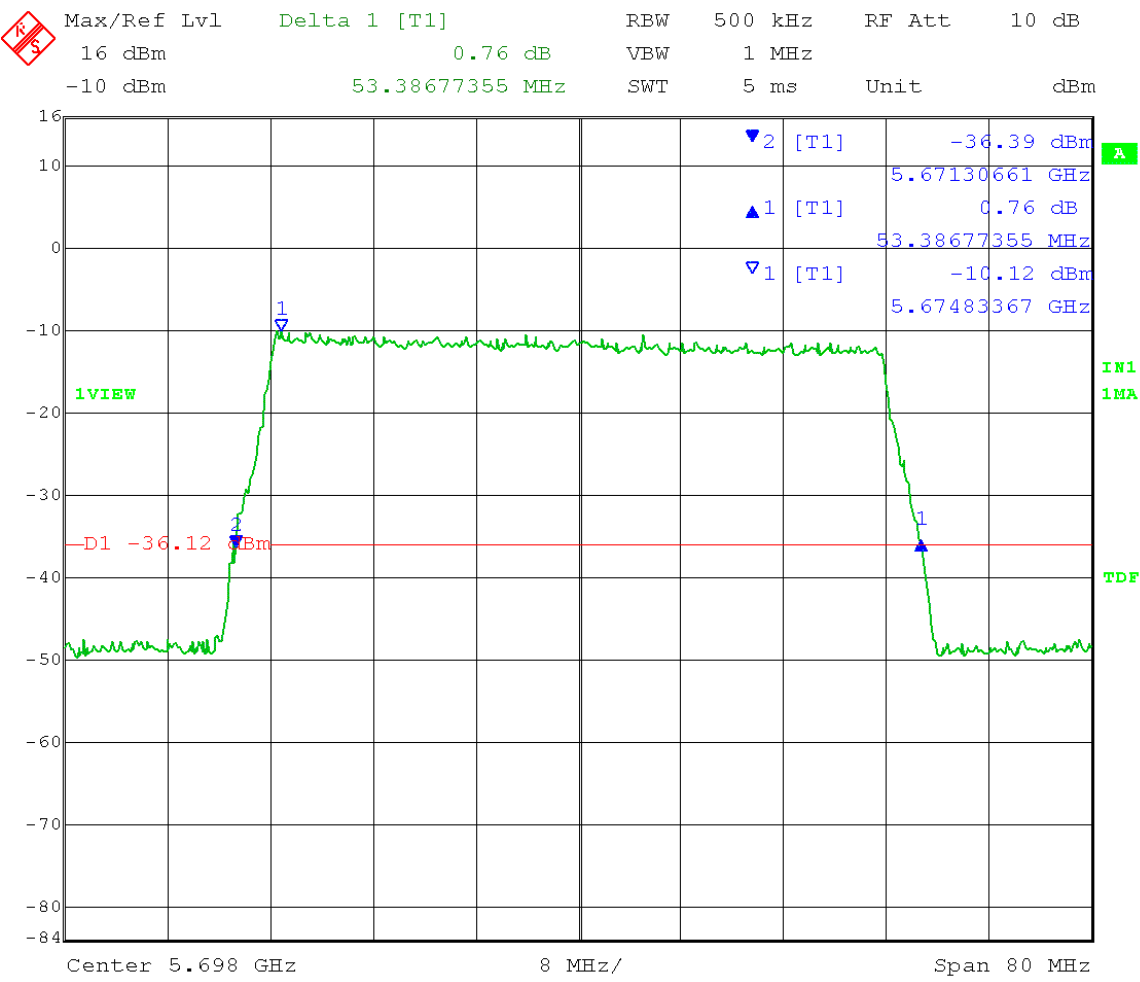
26 dB Emission Bandwidth = 53.39MHz



Date: 7.OCT.2013 10:49:05

TX 1:

26 dB Emission Bandwidth = 53.39MHz

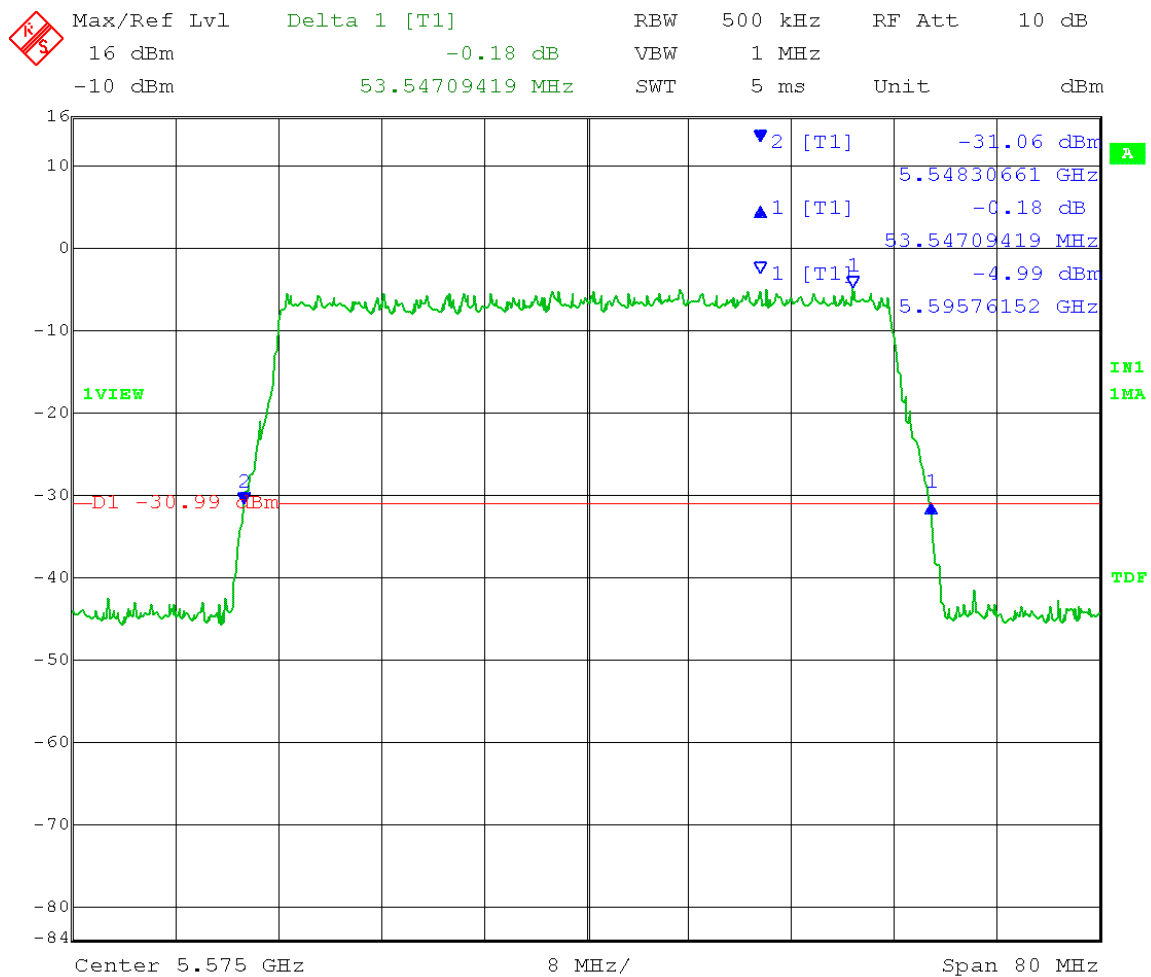


Date: 4.OCT.2013 15:21:16

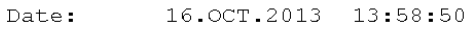
Test Date: 10-16-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - C)
Mid Channel: Transmit = 5.575 GHz 50MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 53.55MHz



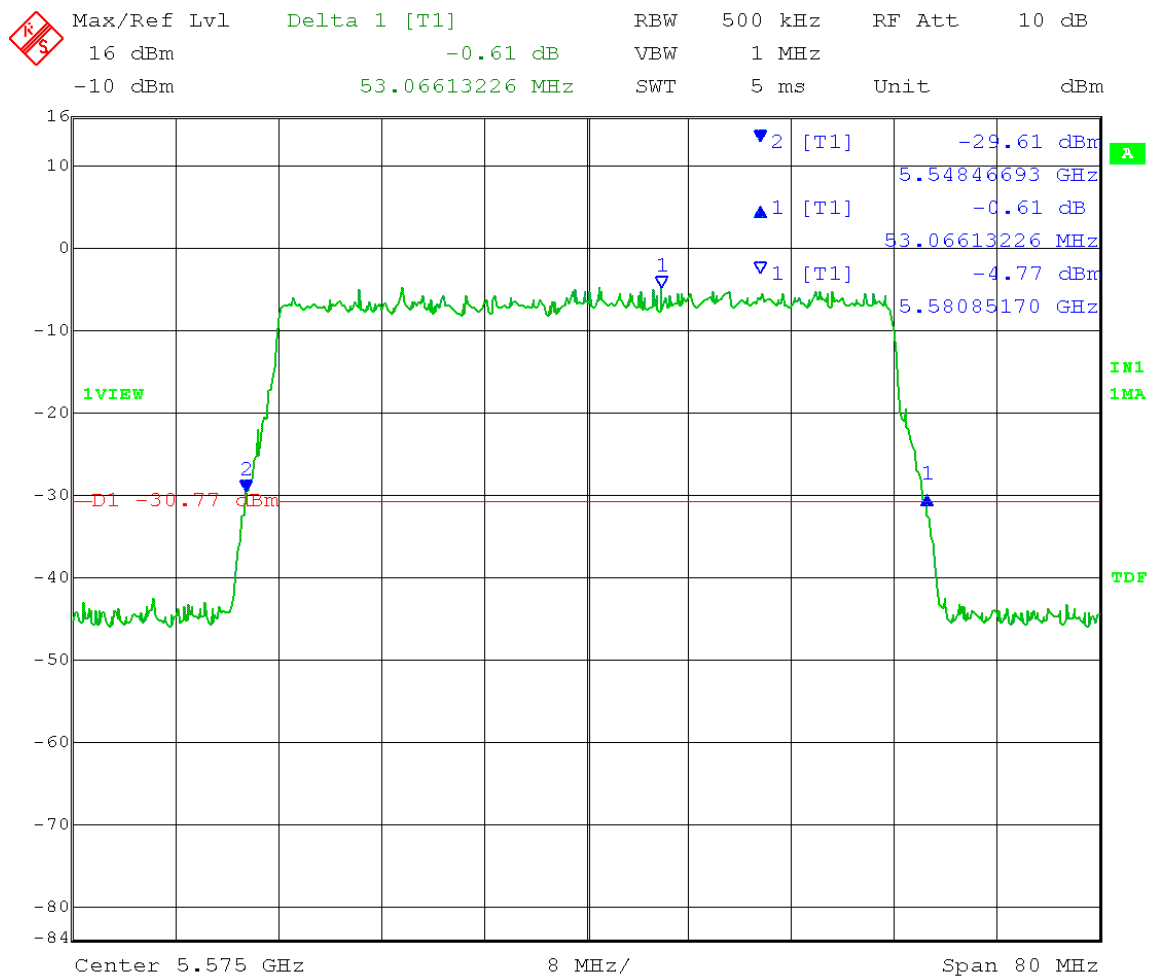
Date: 16.OCT.2013 15:07:48



Test Date: 10-16-2013
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 50MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

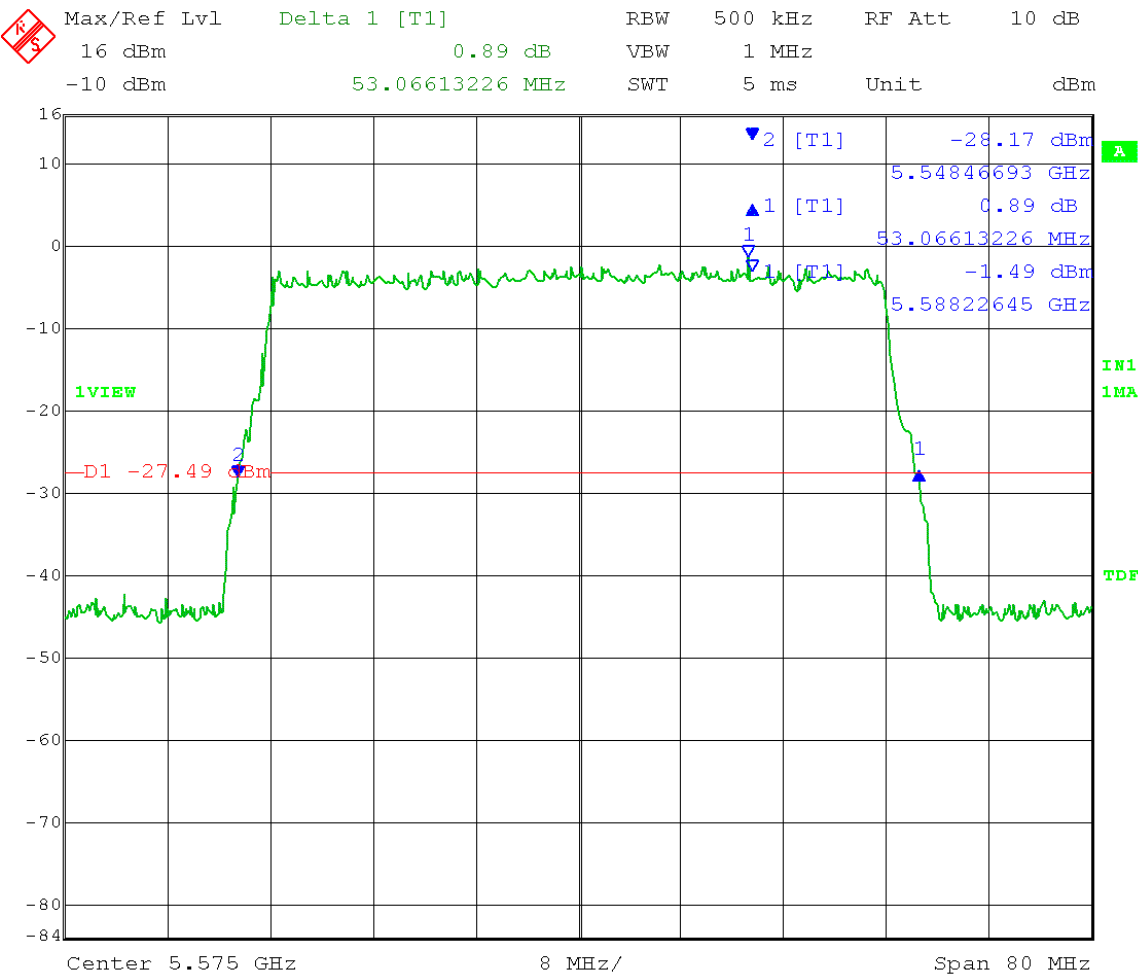
26 dB Emission Bandwidth = 53.07MHz



Date: 16.OCT.2013 15:09:18

TX 1:

26 dB Emission Bandwidth = 53.07MHz

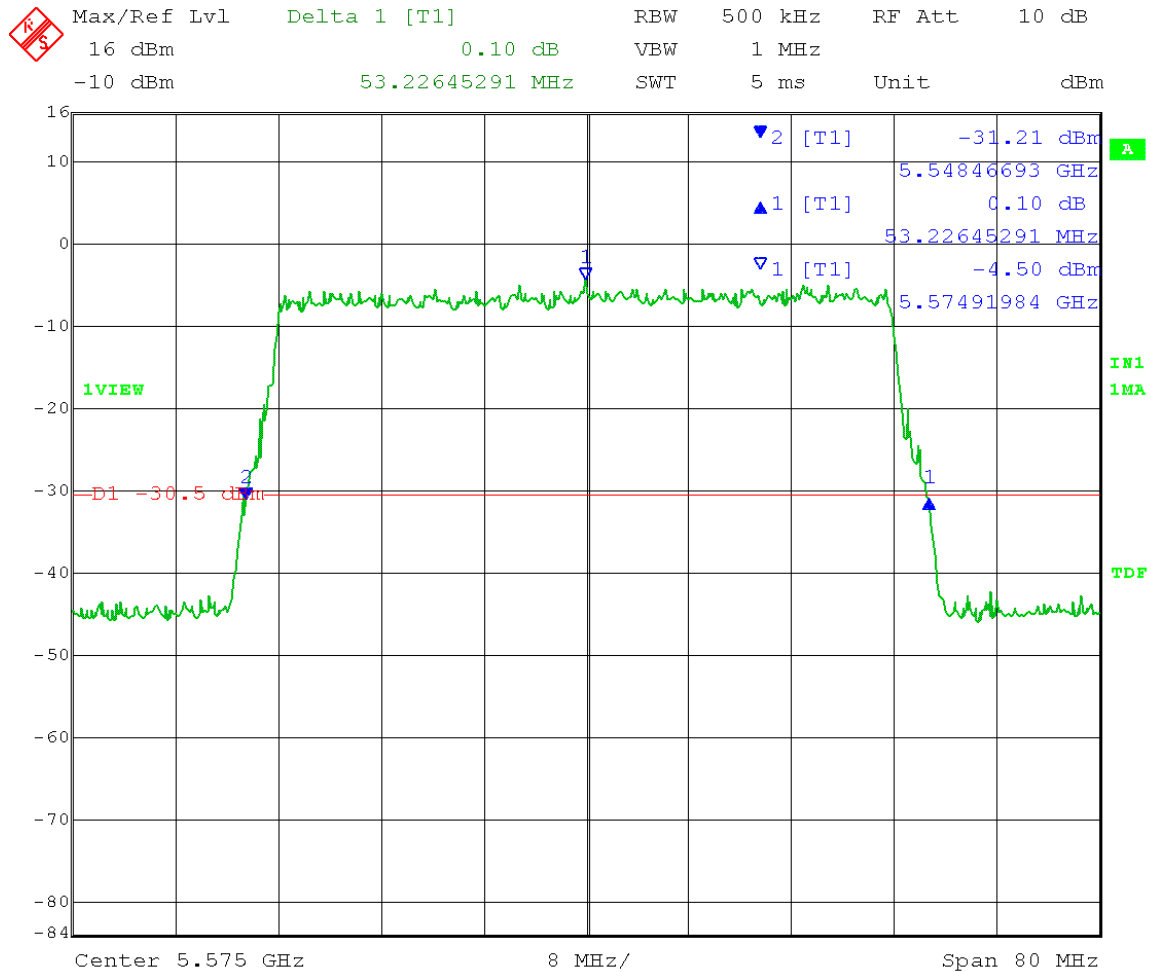


Date: 16.OCT.2013 14:00:27

Test Date: 10-16-2013
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 50MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

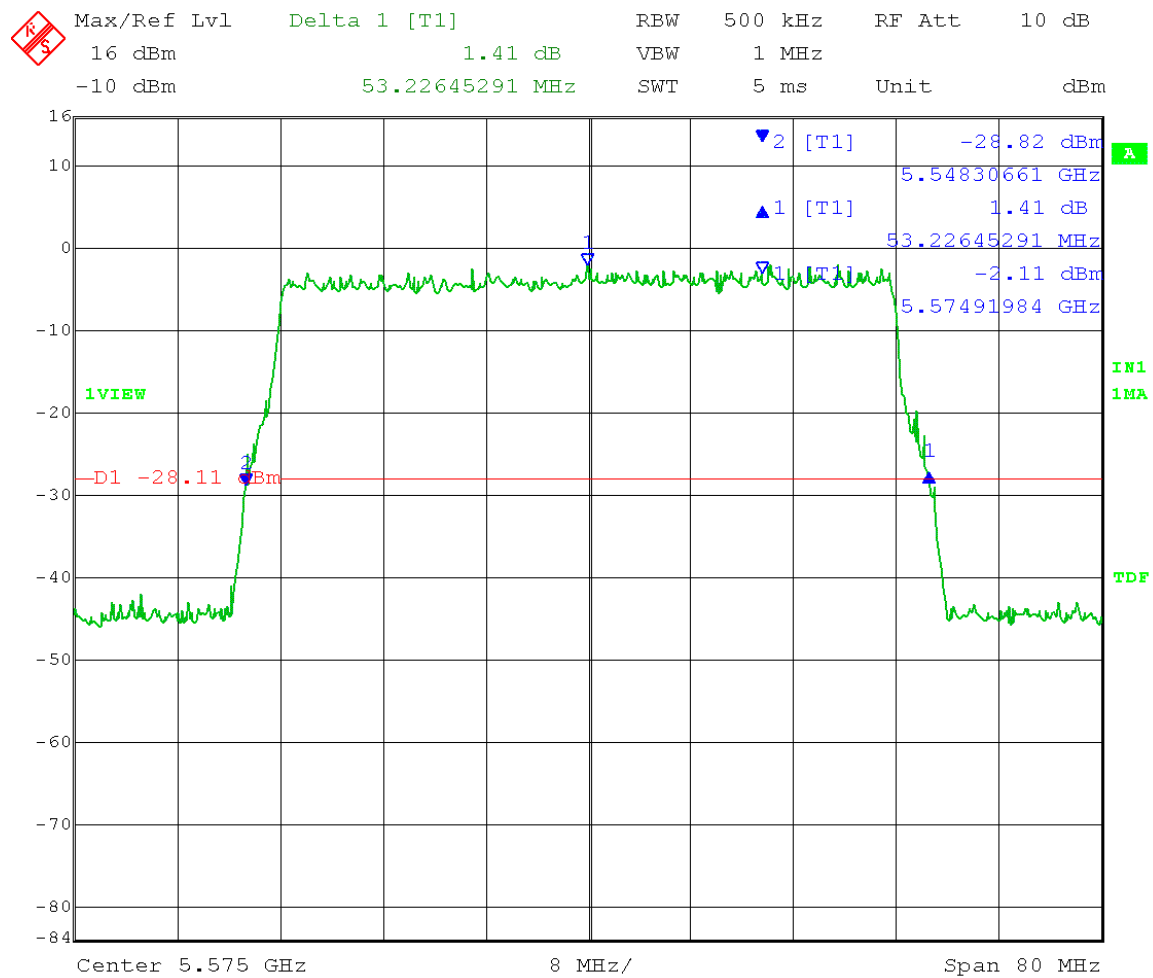
26 dB Emission Bandwidth = 53.23MHz



Date: 16.OCT.2013 15:10:53

TX 1:

26 dB Emission Bandwidth = 53.23MHz

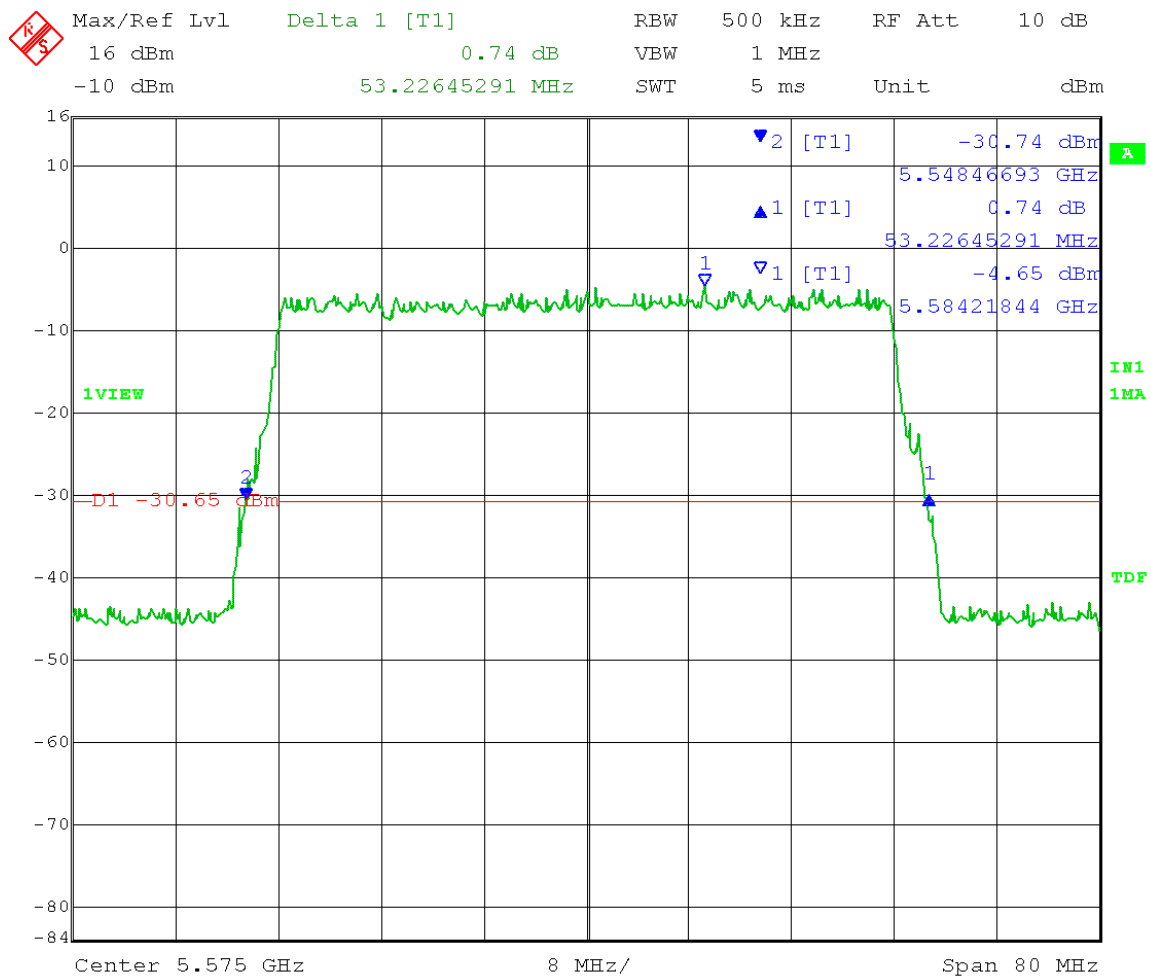


Date: 16.OCT.2013 14:01:46

Test Date: 10-16-2013
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 50MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

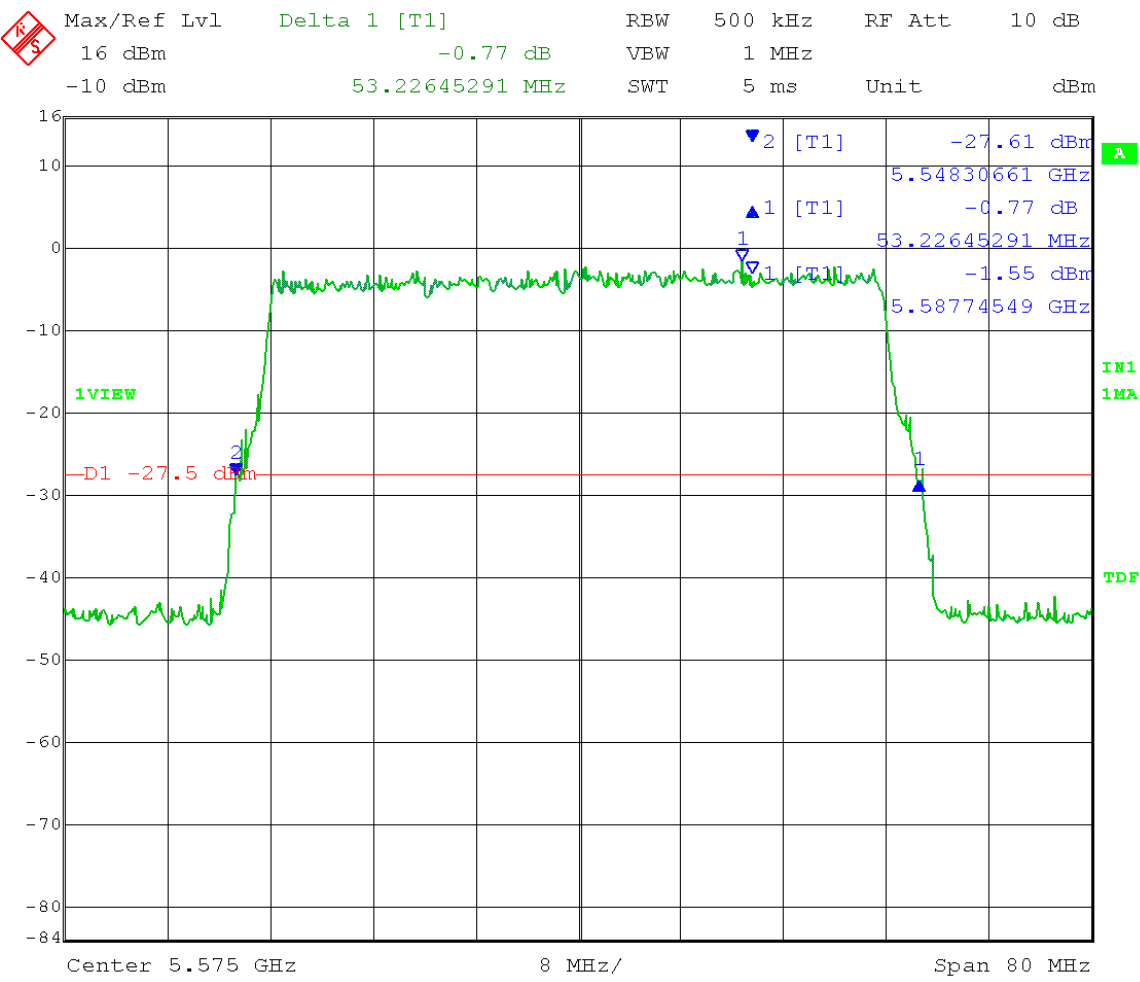
26 dB Emission Bandwidth = 53.23MHz



Date: 16.OCT.2013 15:12:21

TX 1:

26 dB Emission Bandwidth = 53.23MHz

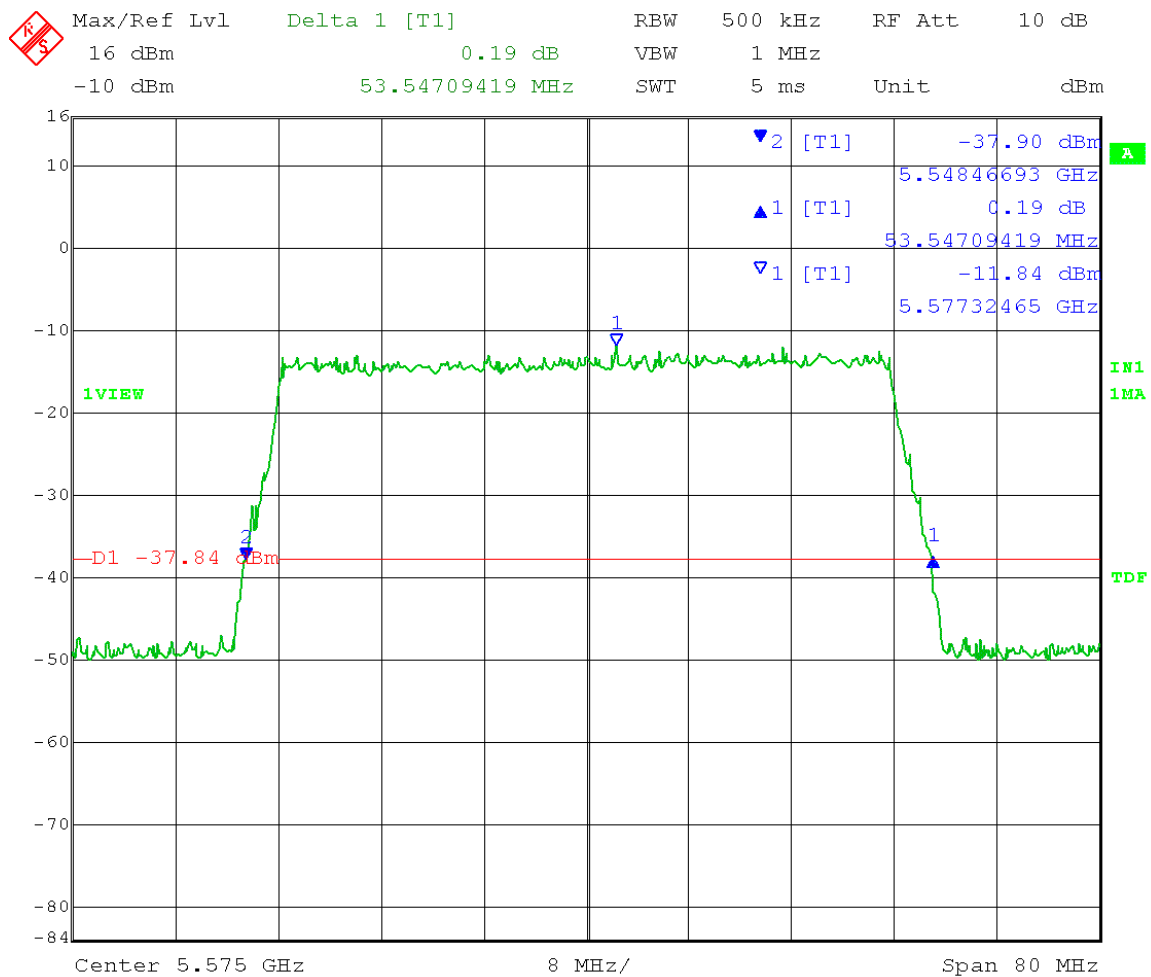


Date: 16.OCT.2013 14:02:56

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)
Mid Channel: Transmit = 5.575 GHz 50MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 53.55MHz



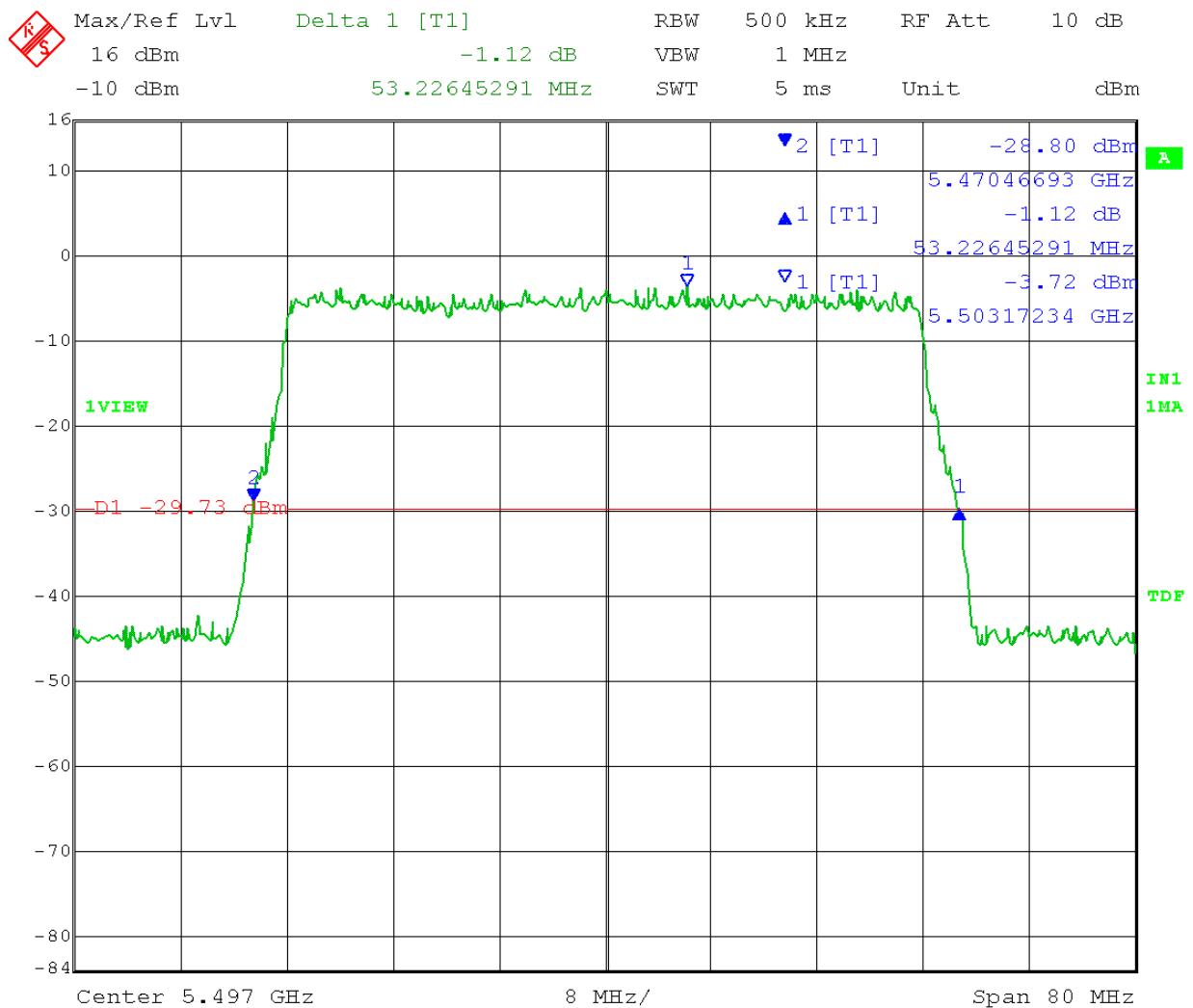
Date: 7.OCT.2013 10:47:14



Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

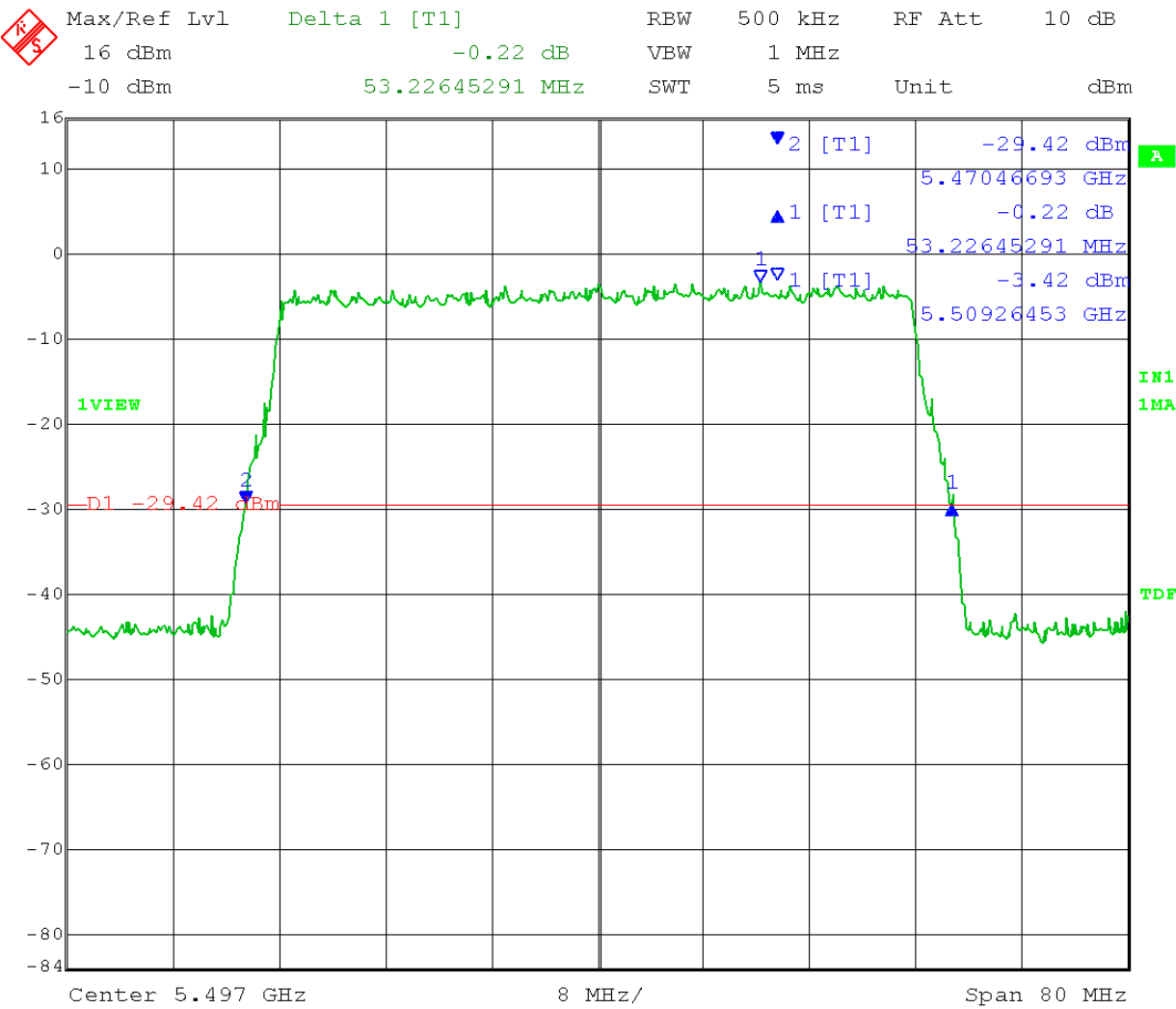
26 dB Emission Bandwidth = 53.23MHz



Date: 16.OCT.2013 15:14:15

TX 1:

26 dB Emission Bandwidth = 53.23MHz

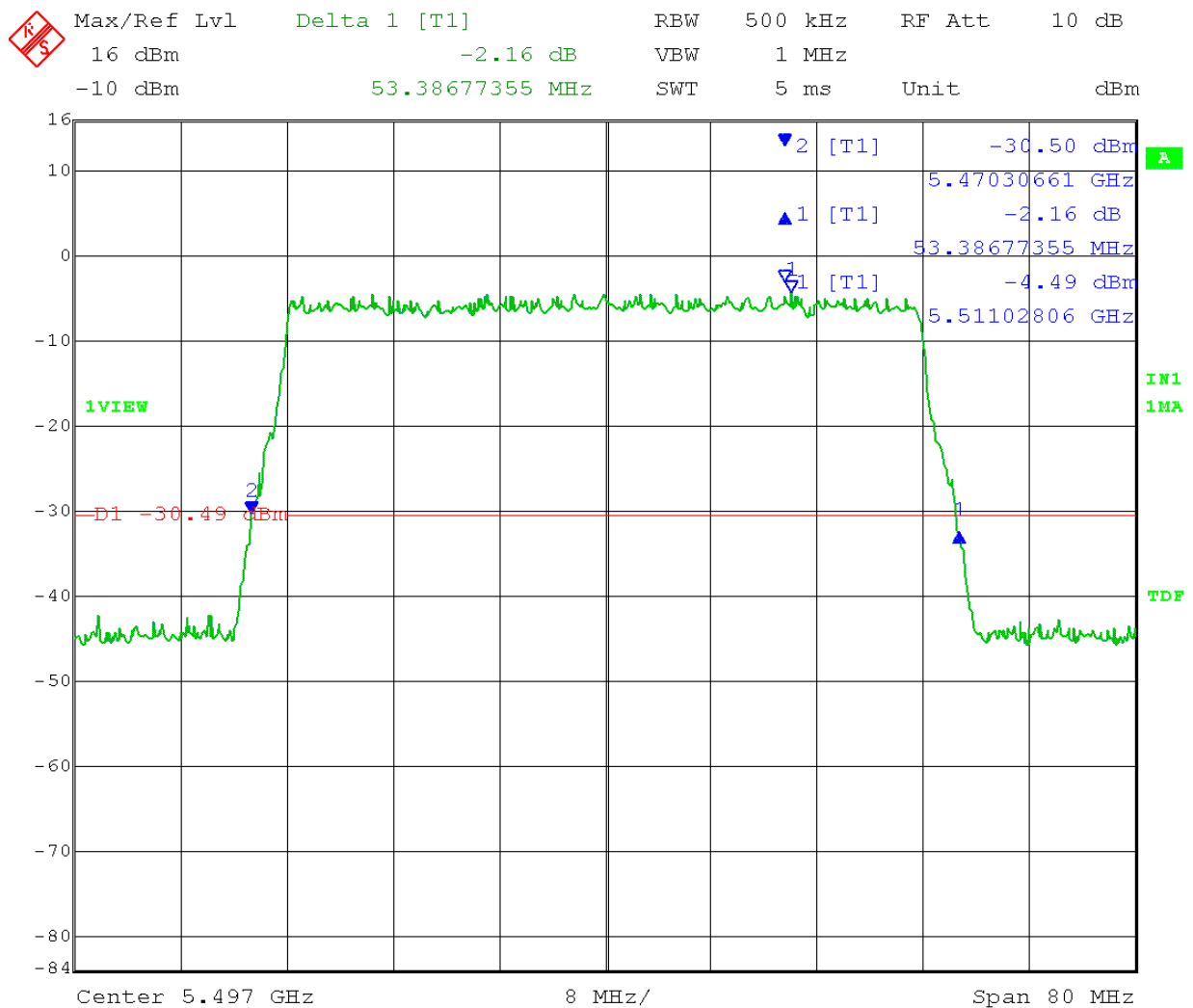


Date: 16.OCT.2013 13:51:04

Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

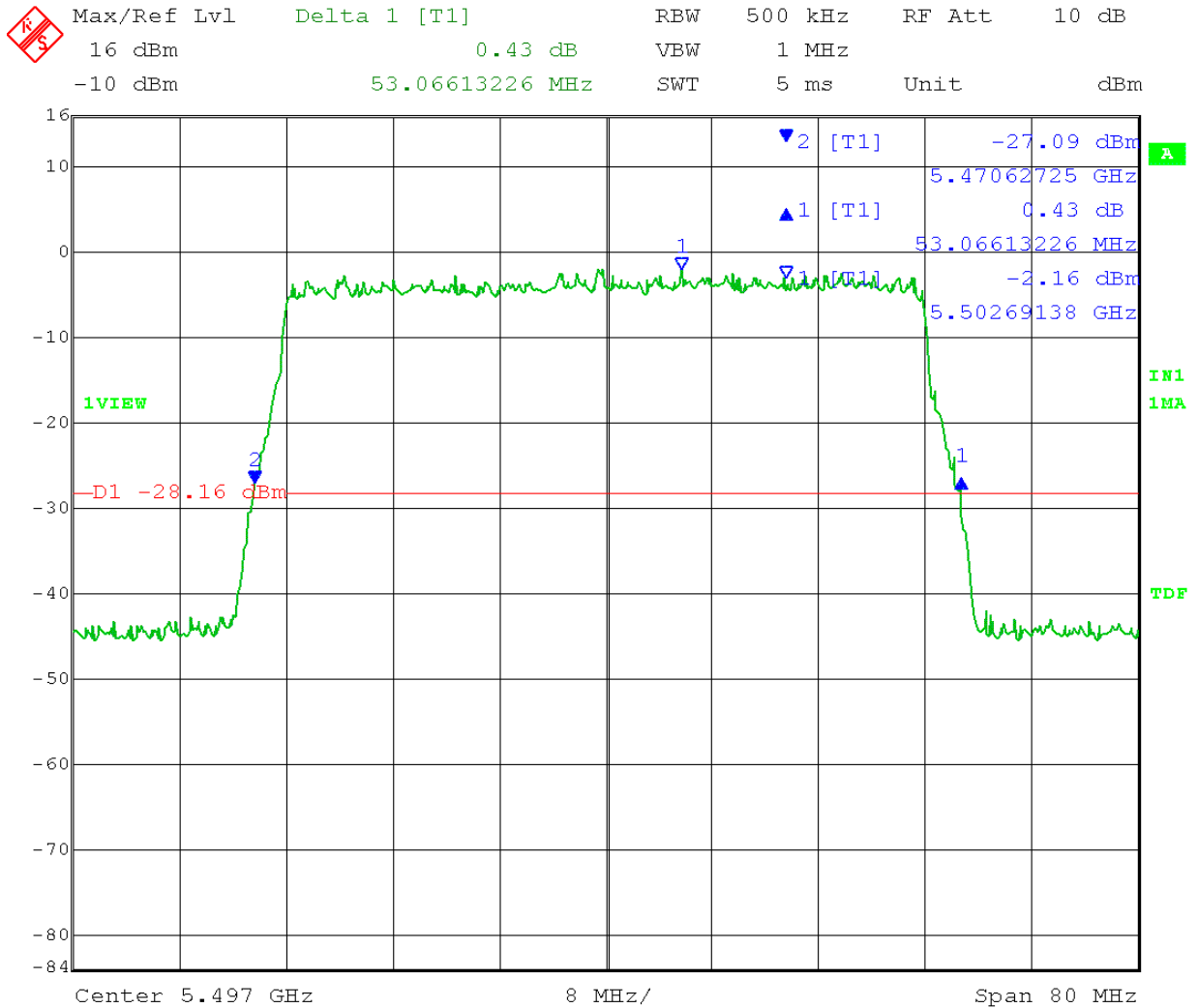
26 dB Emission Bandwidth = 53.39MHz



Date: 16.OCT.2013 15:15:42

TX 1:

26 dB Emission Bandwidth = 53.07MHz

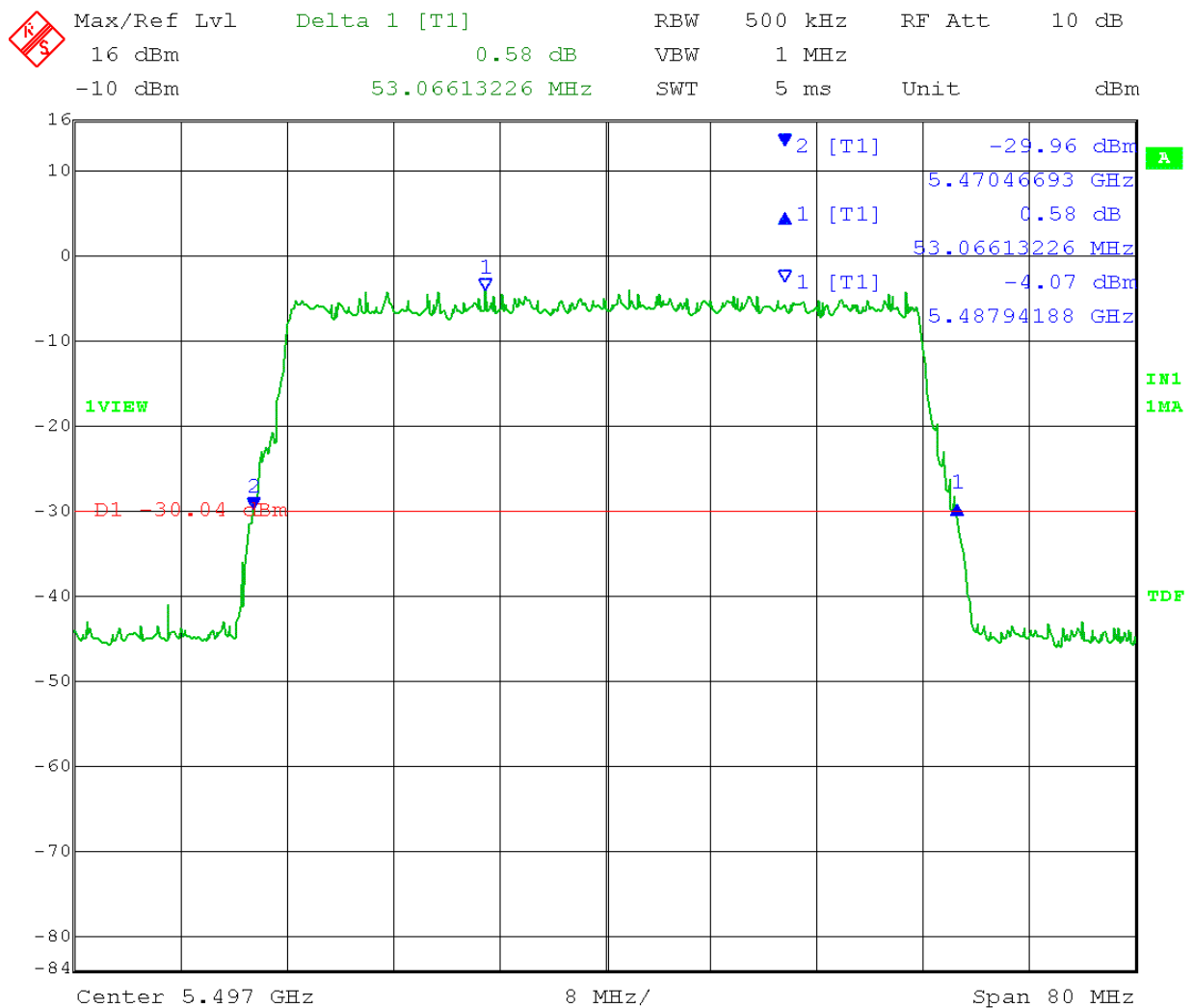


Date: 16.OCT.2013 13:52:34

Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

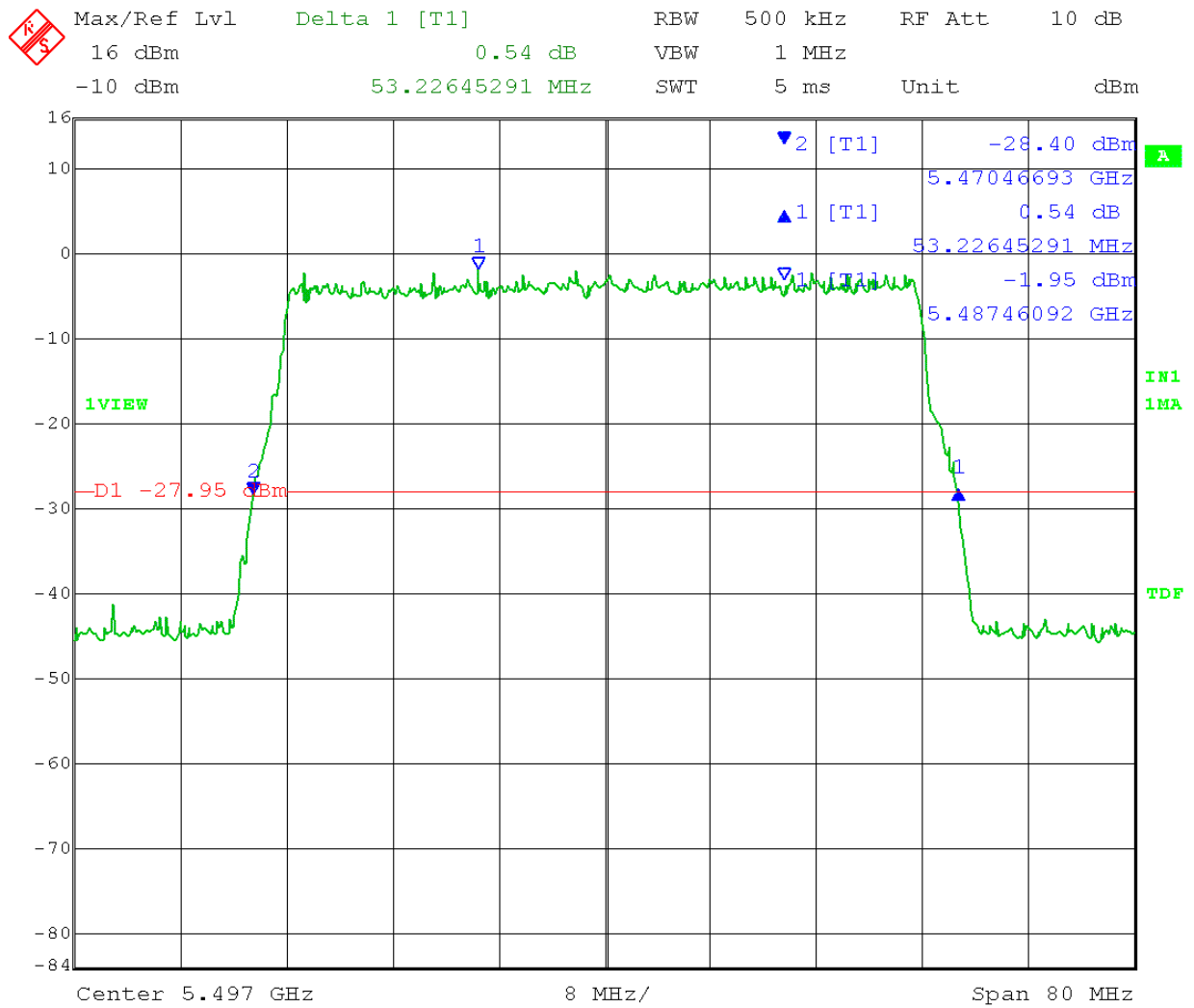
26 dB Emission Bandwidth = 53.07MHz



Date: 16.OCT.2013 15:17:01

TX 1:

26 dB Emission Bandwidth = 53.23MHz

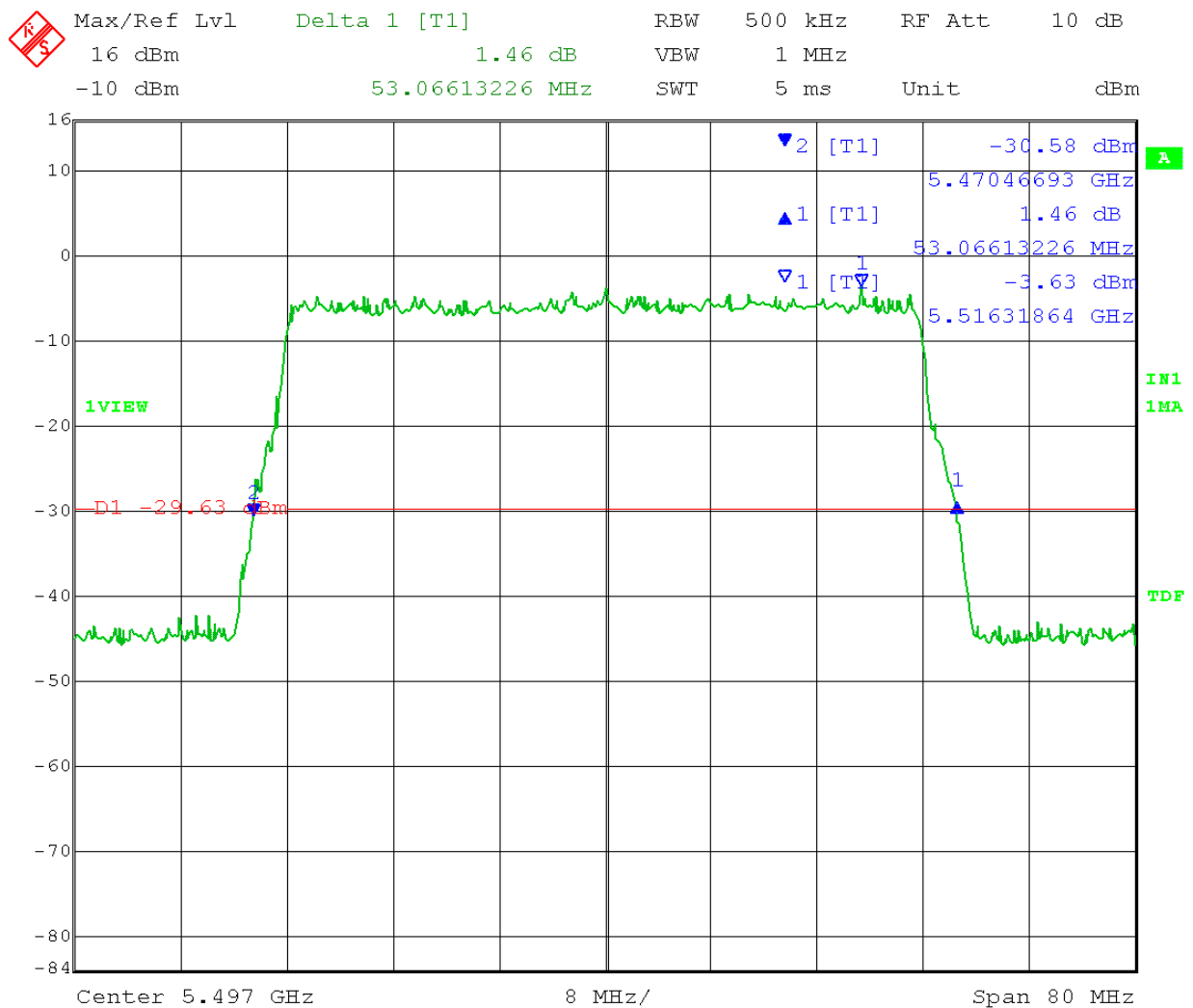


Date: 16.OCT.2013 13:54:16

Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

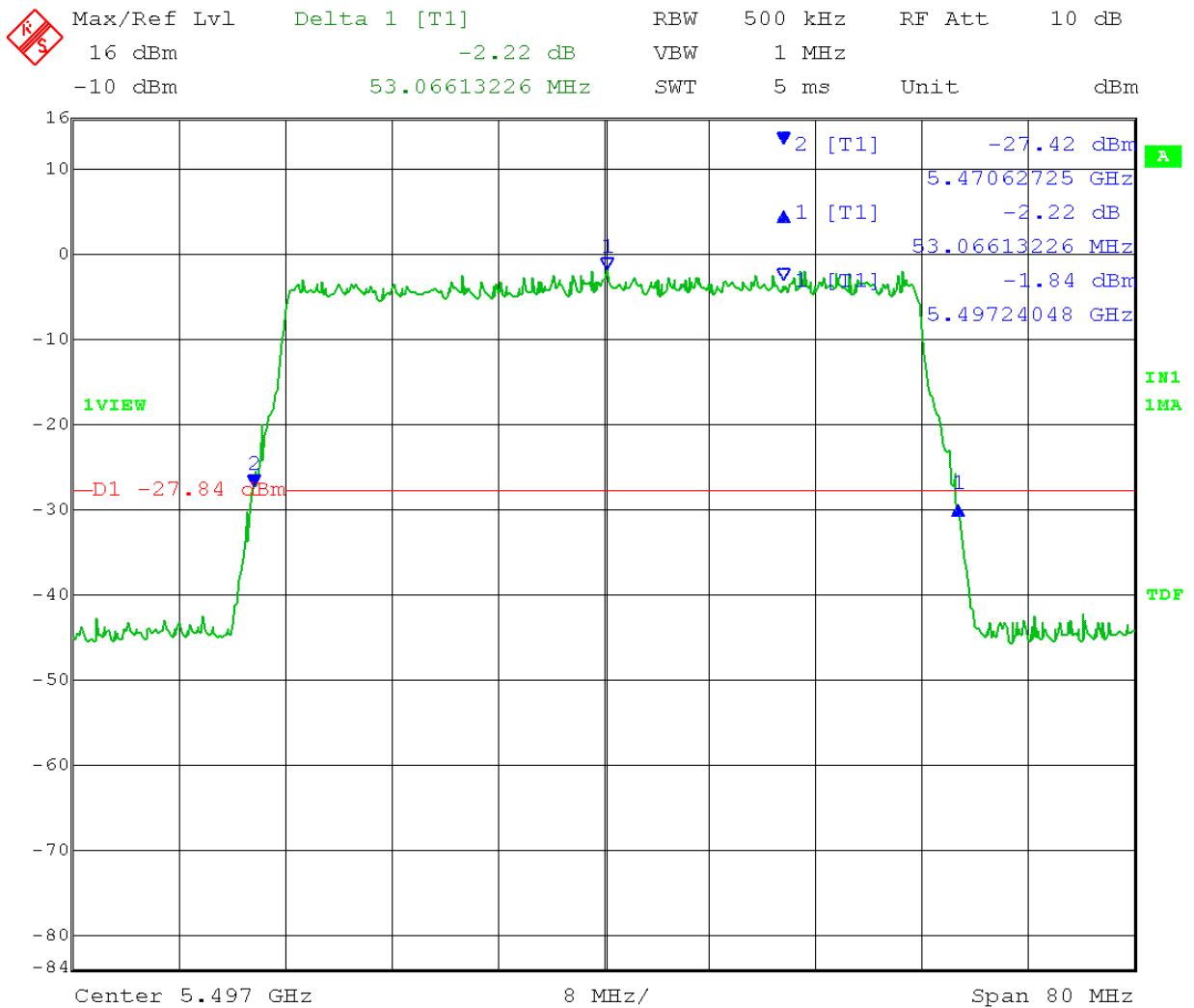
26 dB Emission Bandwidth = 53.07MHz



Date: 16.OCT.2013 15:18:38

TX 1:

26 dB Emission Bandwidth = 53.07MHz

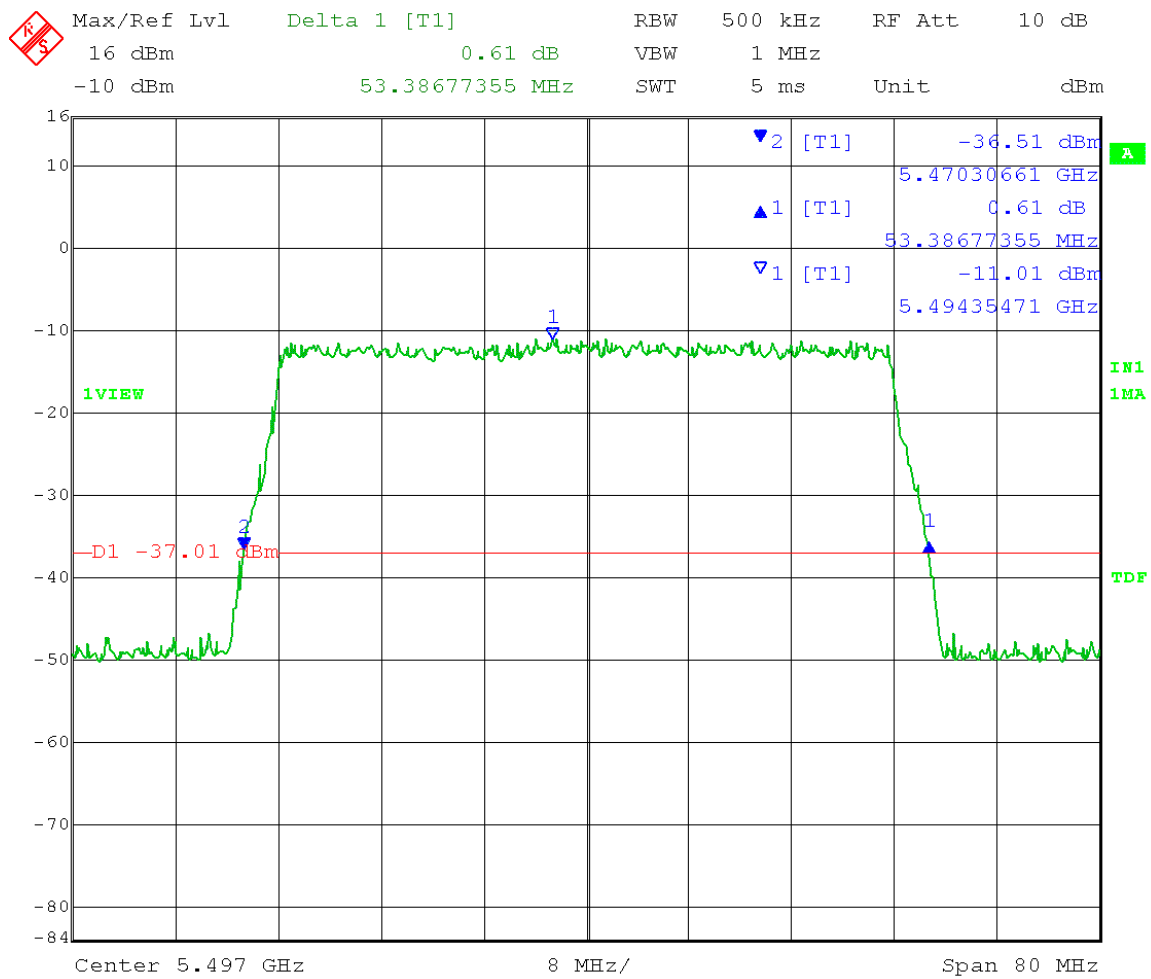


Date: 16.OCT.2013 13:55:40

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 = 5.497 GHz 50MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

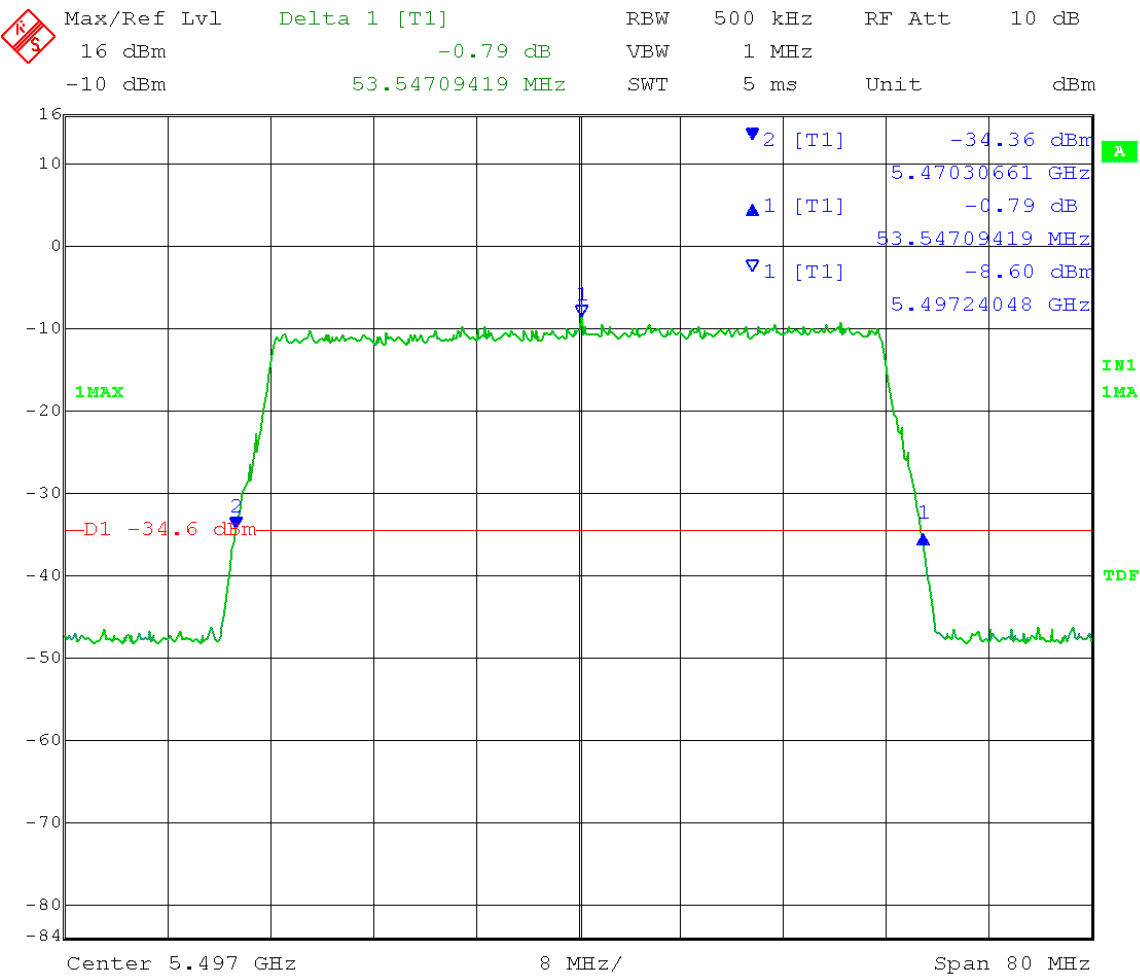
26 dB Emission Bandwidth = 53.39MHz



Date: 7.OCT.2013 10:45:01

TX 1:

26 dB Emission Bandwidth = 53.55MHz



Date: 4.OCT.2013 15:12:54



166 South Carter, Genoa City, WI 53128

Company:
Model Tested:
Report Number:
DLS Project:

Ubiquiti Networks, Inc.
AF5
19519 Part 4
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

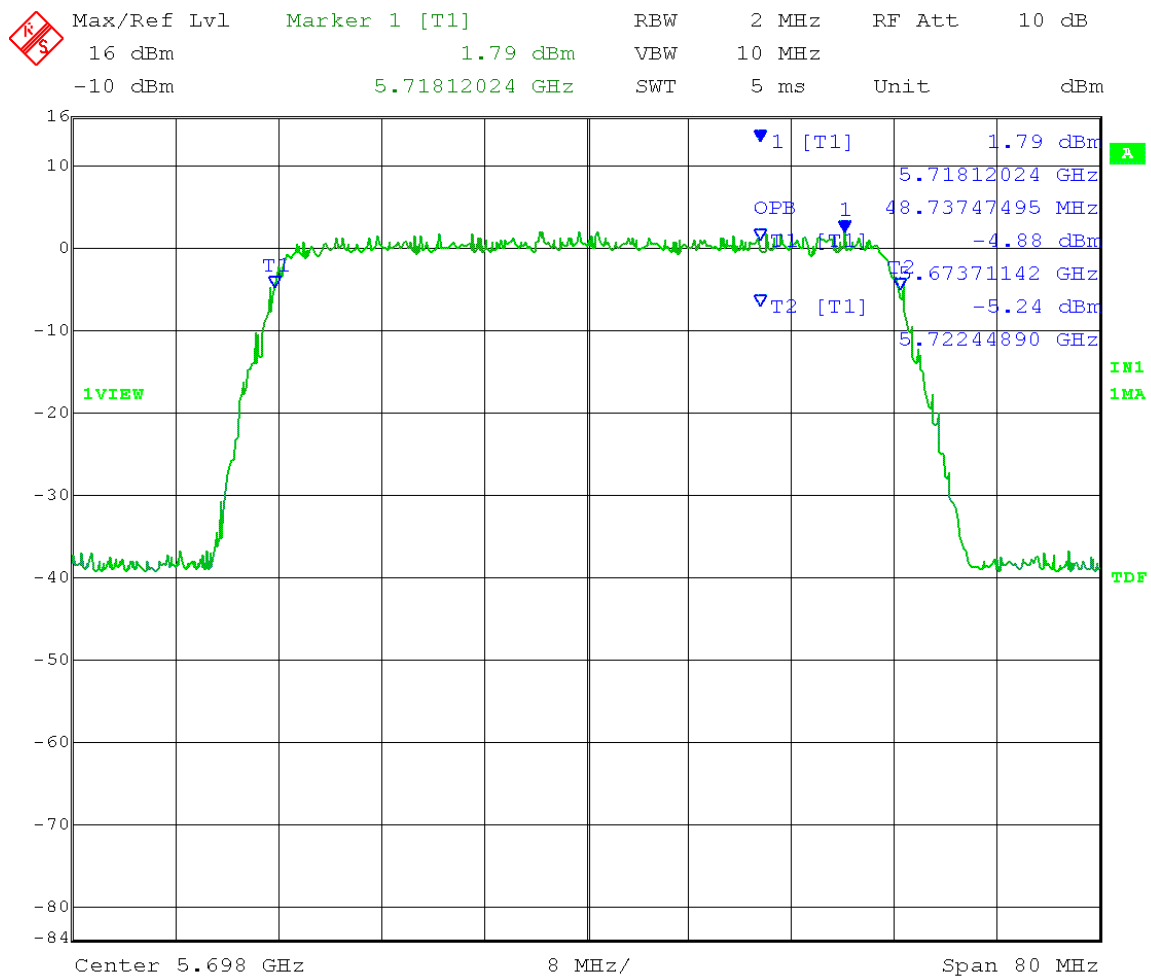
Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.

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

Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 16QPSK
Output power setting: 30 dBm eirp

TX 0:

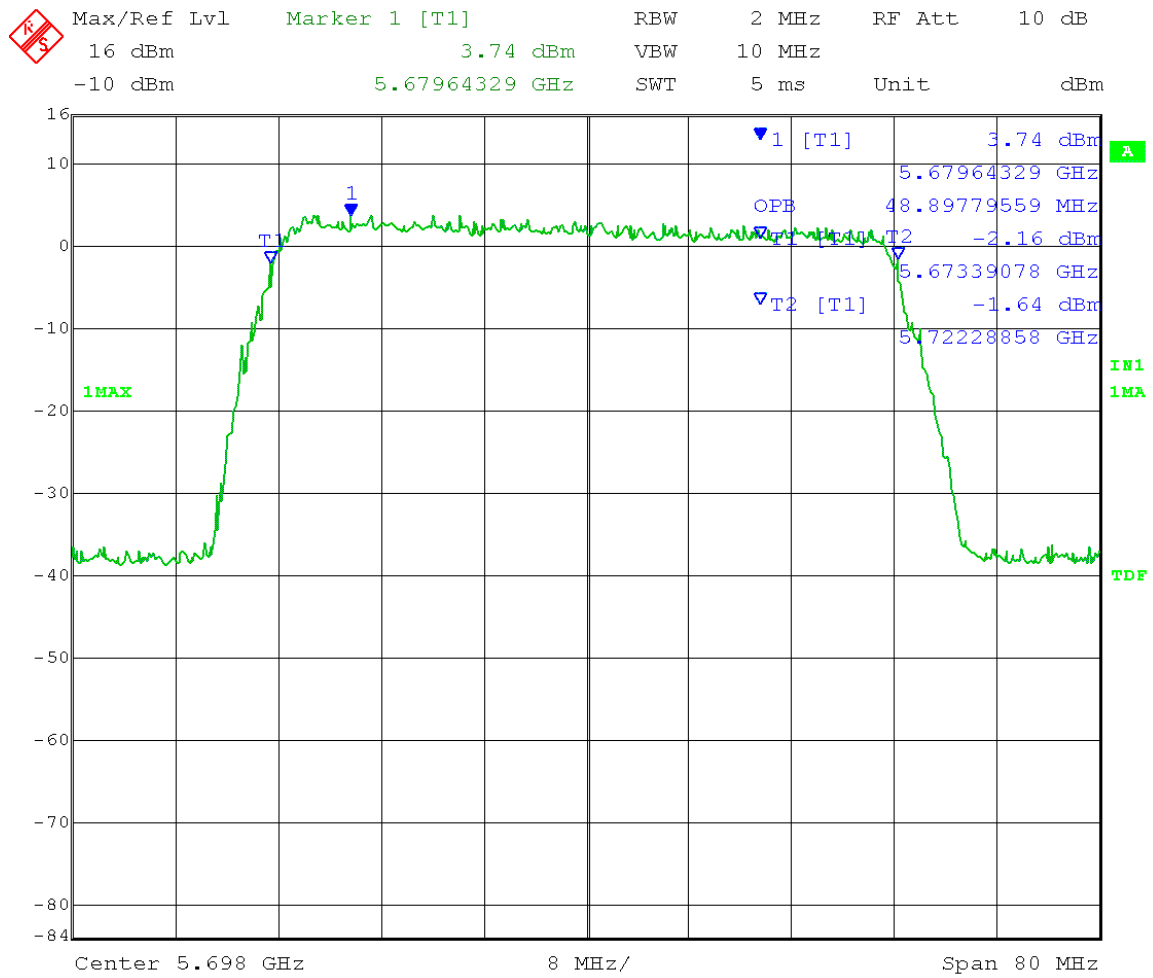
99% OBW = 48.74MHz



Date: 16.OCT.2013 14:49:27

TX 1:

99% OBW = 48.90MHz

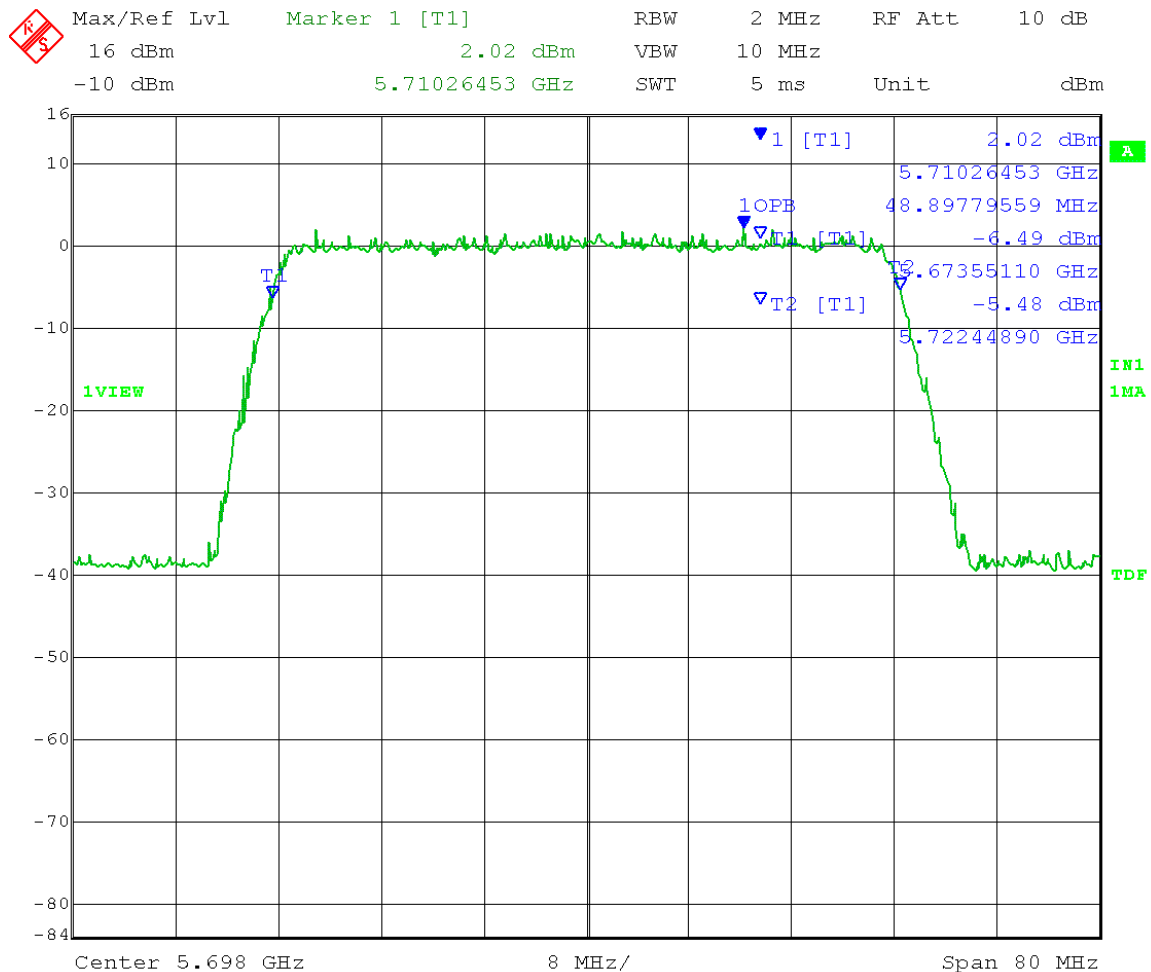


Date: 16.OCT.2013 14:21:54

Test Date: 10-16-2013
 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 = 2MHz VBW = 10MHz
 High Channel: Transmit = 5.698 GHz 50MHz BW 64QPSK
 Output power setting: 30 dBm eirp

Channel 0:

99% OBW = 48.90MHz



Date: 16.OCT.2013 14:50:42



Marker 1 [T1]

16 dBm

-10 dBm

4.25 dBm

5.69086573 GHz

RBW

2 MHz

RF Att

10 dB

VBW

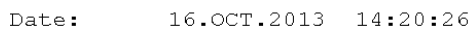
10 MHz

SWT

5 ms

Unit

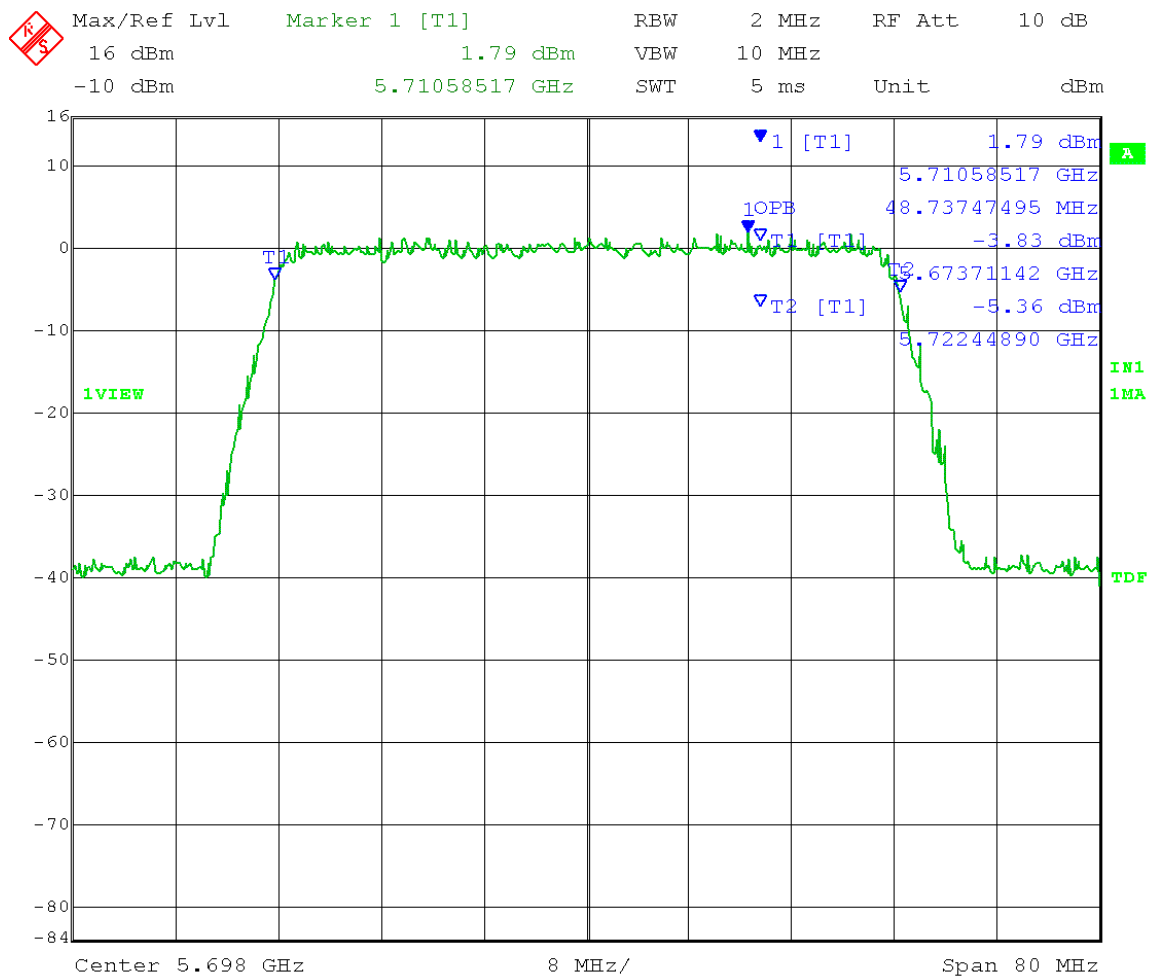
dBm



Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 256QPSK
Output power setting: 30 dBm eirp

TX 0:

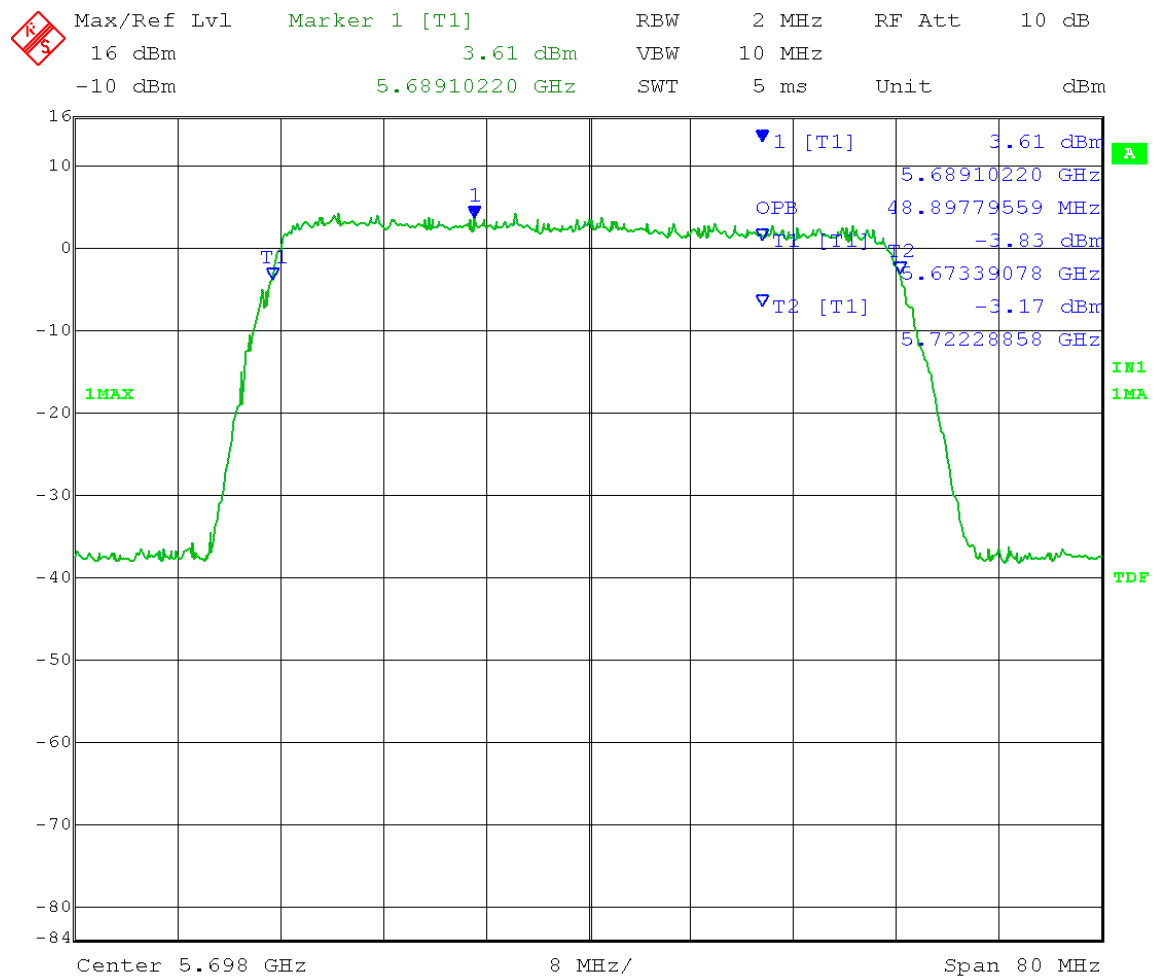
99% OBW = 48.74MHz



Date: 16.OCT.2013 14:51:31

TX 1:

99% OBW = 48.90MHz

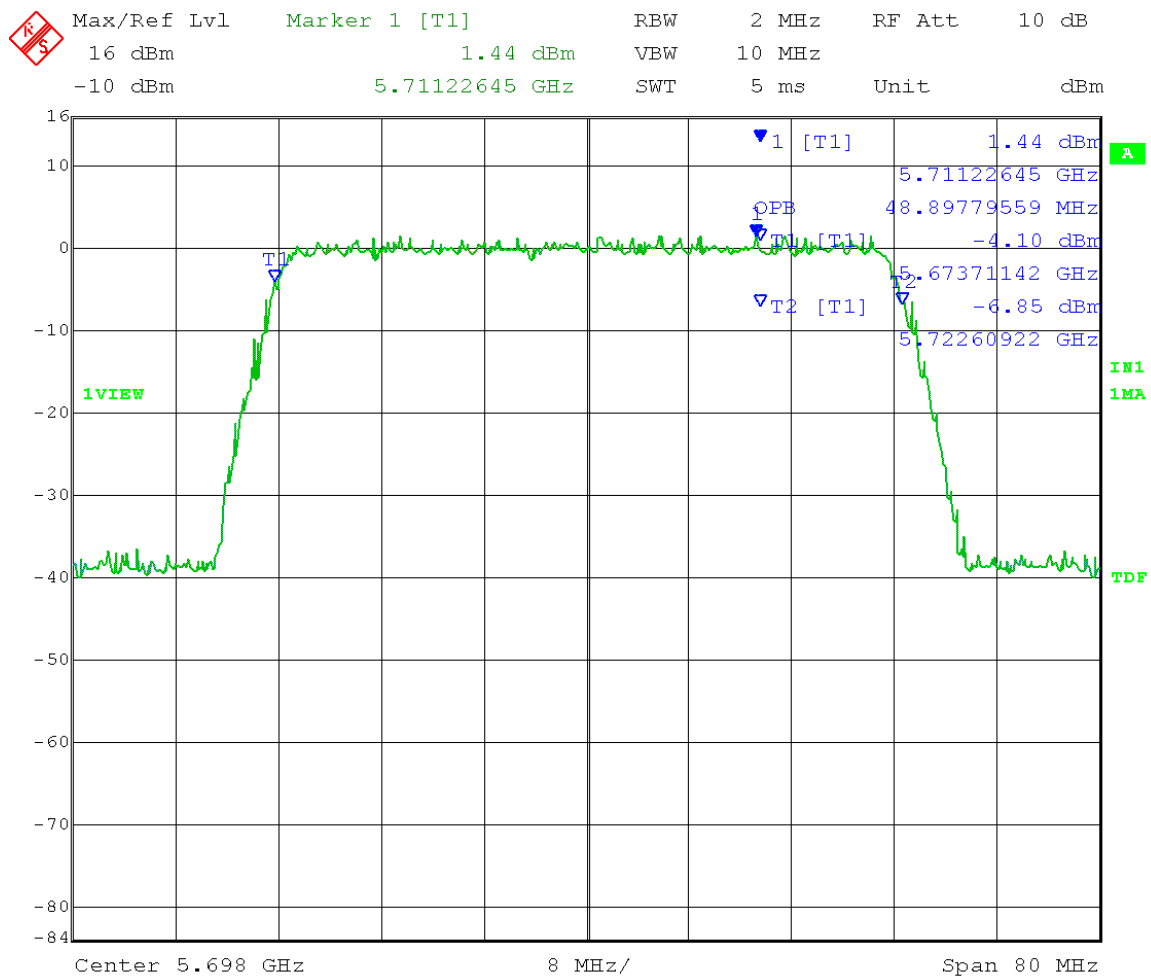


Date: 16.OCT.2013 14:18:44

Test Date: 10-16-2013
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 = 5.698 GHz 50MHz BW 1024QPSK
Output power setting: 30 dBm eirp

TX 0:

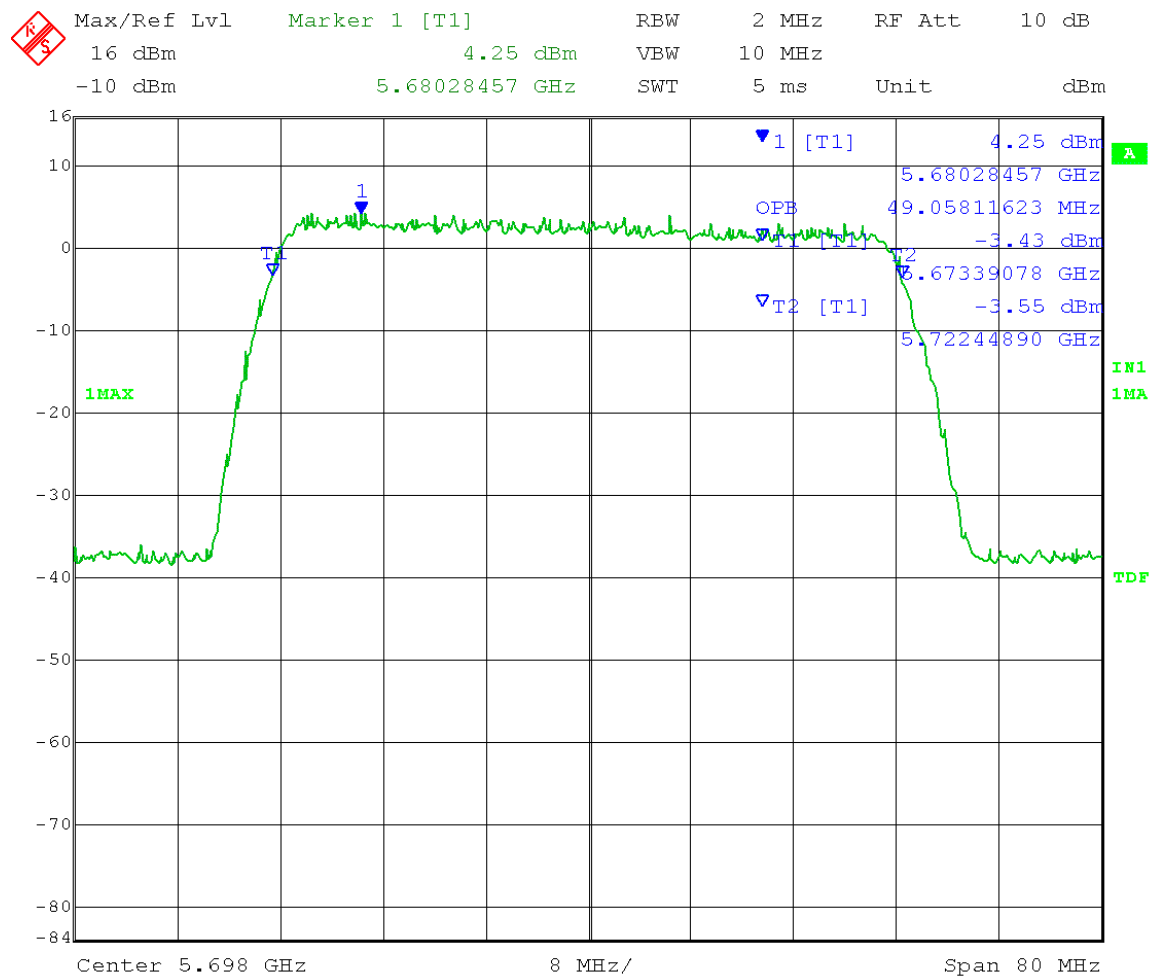
99% OBW = 48.90MHz



Date: 16.OCT.2013 14:52:27

TX 1:

99% OBW = 49.06MHz

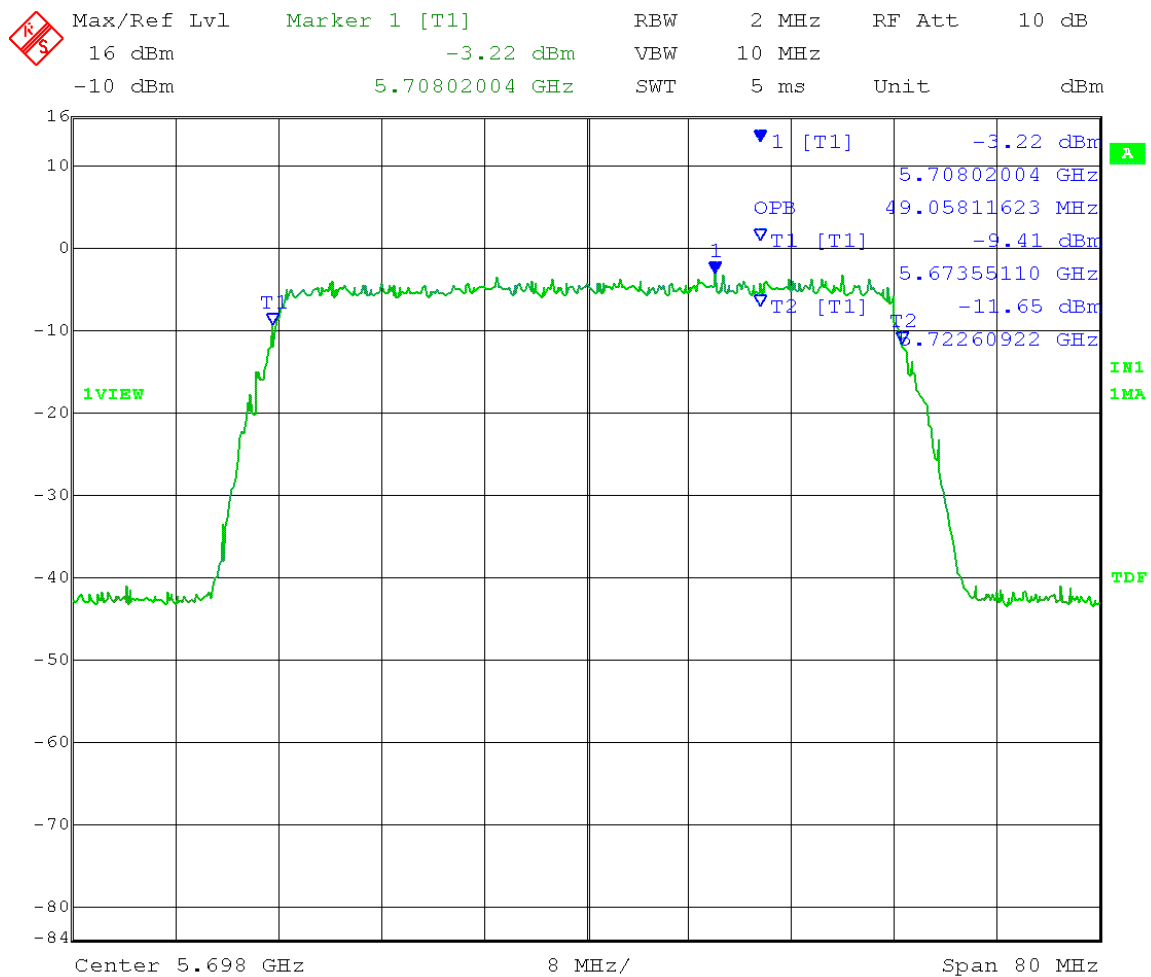


Date: 16.OCT.2013 14:16:49

Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
High Channel: Transmit = 5.698 GHz 50MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

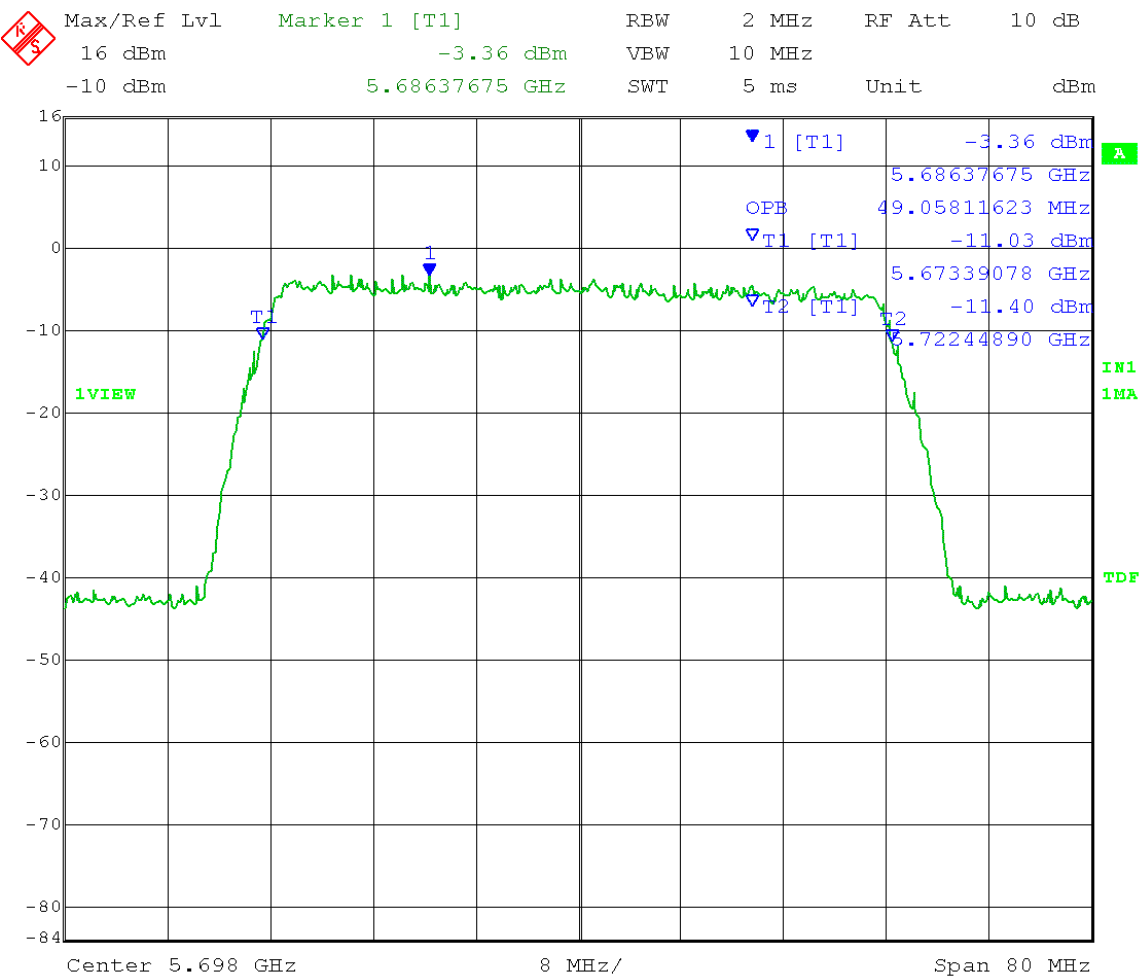
99% OBW = 49.06MHz



Date: 7.OCT.2013 11:01:32

TX 1:

99% OBW = 49.06MHz

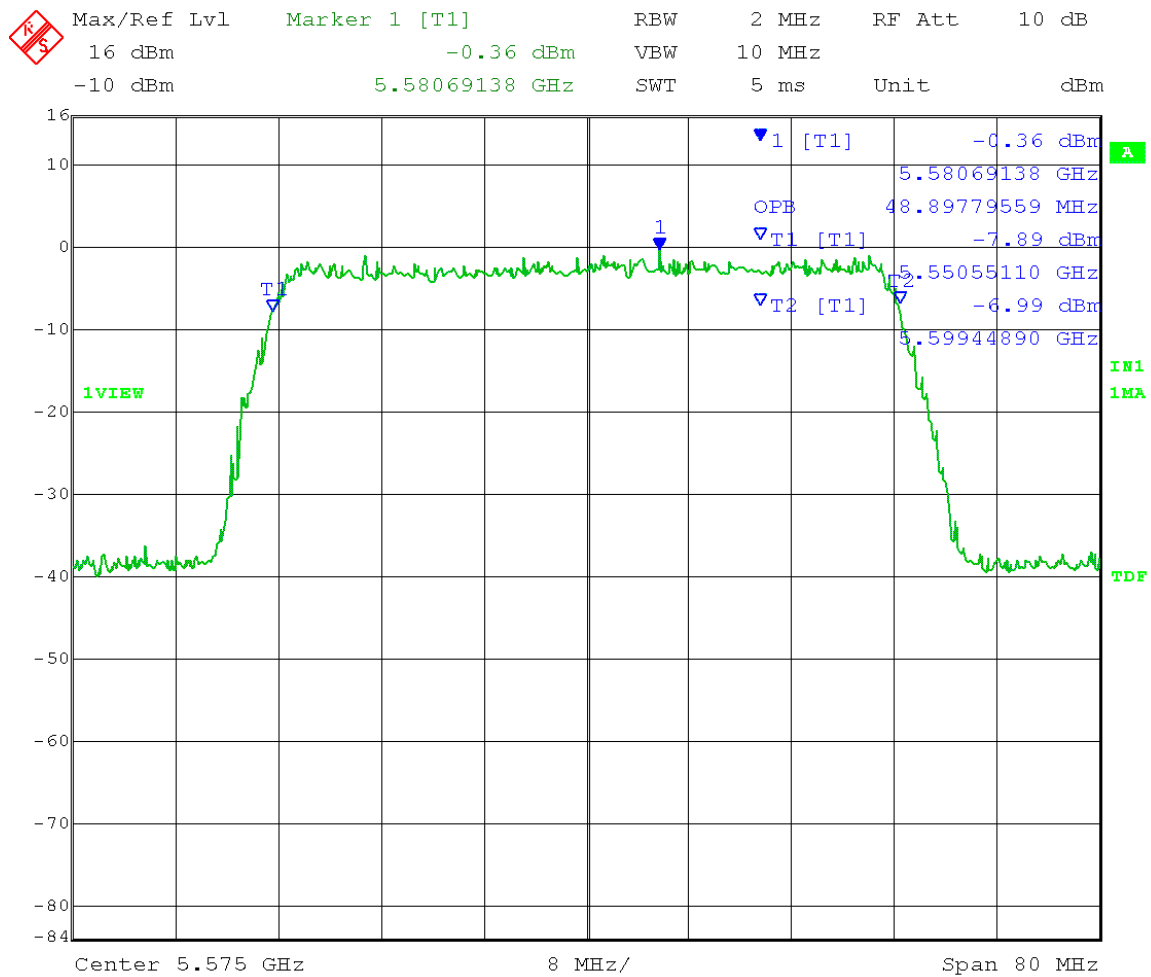


Date: 7.OCT.2013 11:45:05

Test Date: 10-16-2013
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 50MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

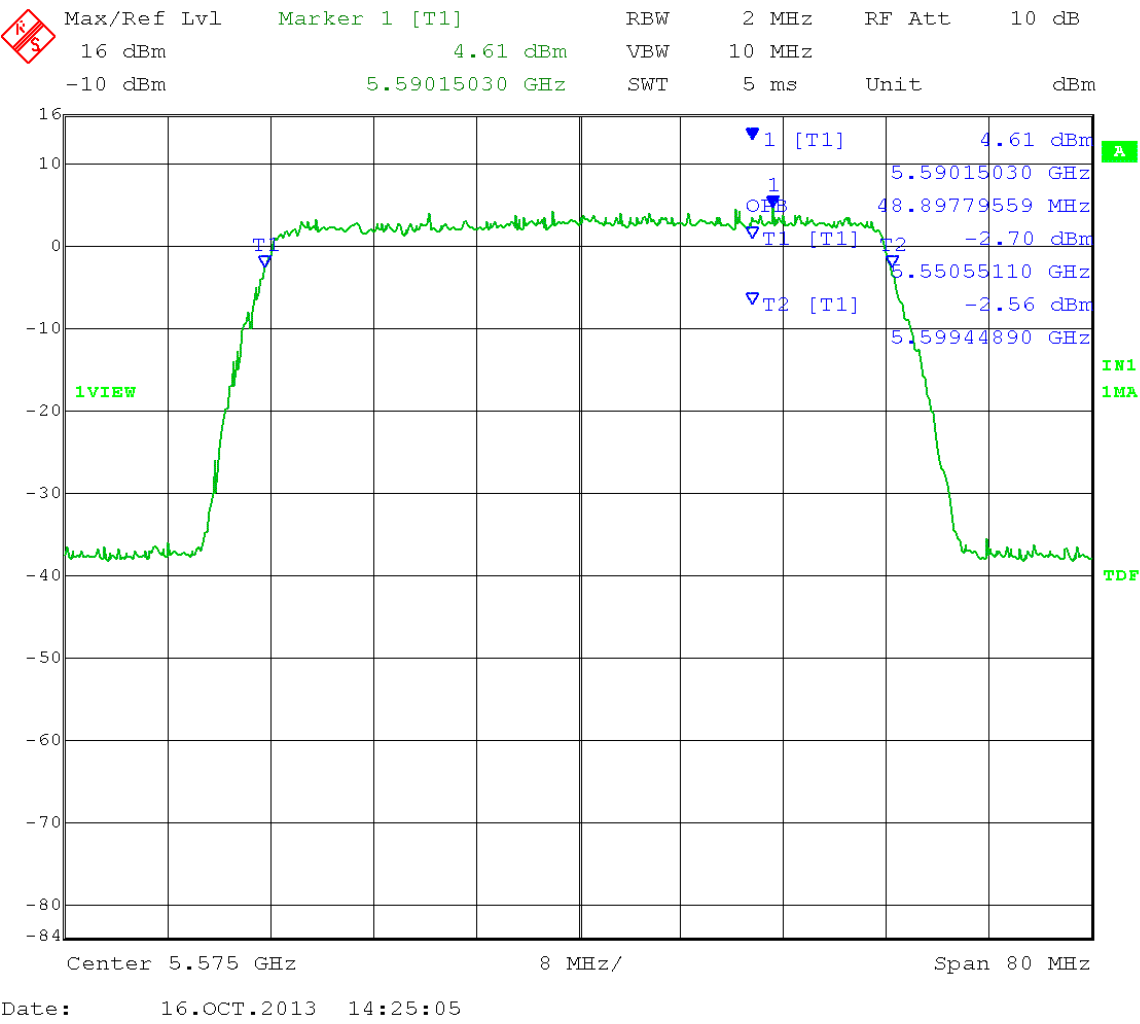
99% OBW = 48.90MHz



Date: 16.OCT.2013 14:45:35

TX 1:

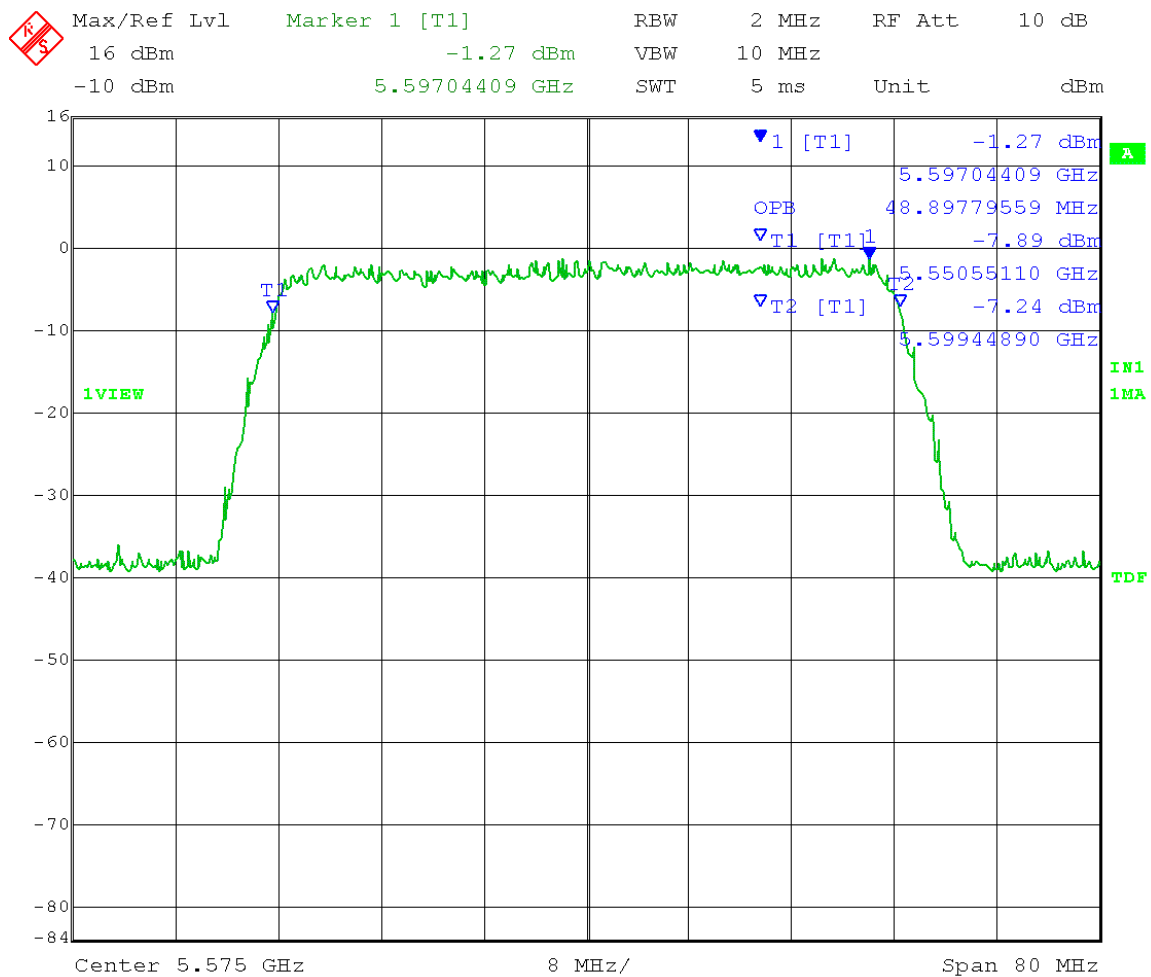
99% OBW = 48.90MHz



Test Date: 10-16-2013
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 50MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

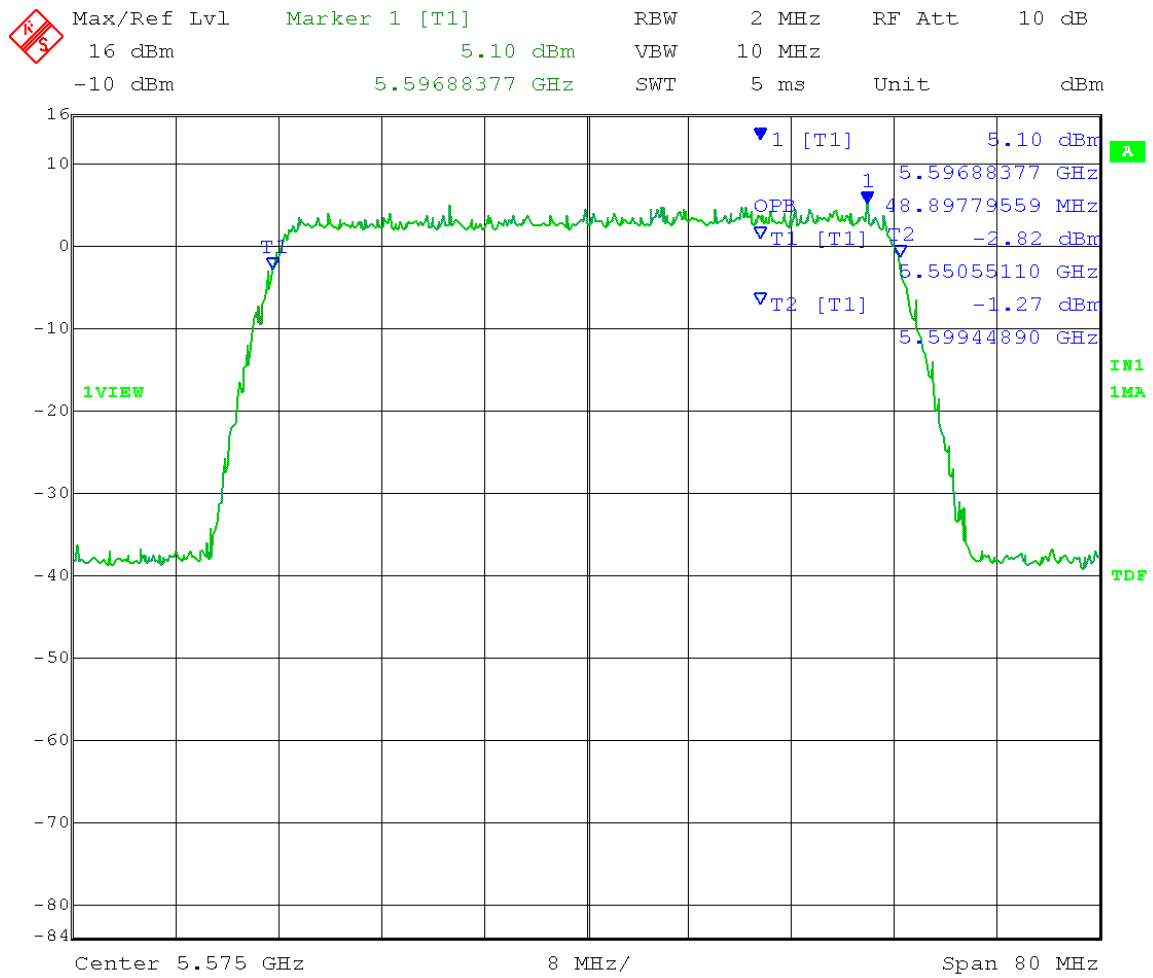
99% OBW = 48.90MHz



Date: 16.OCT.2013 14:46:32

TX 1:

99% OBW = 48.90MHz

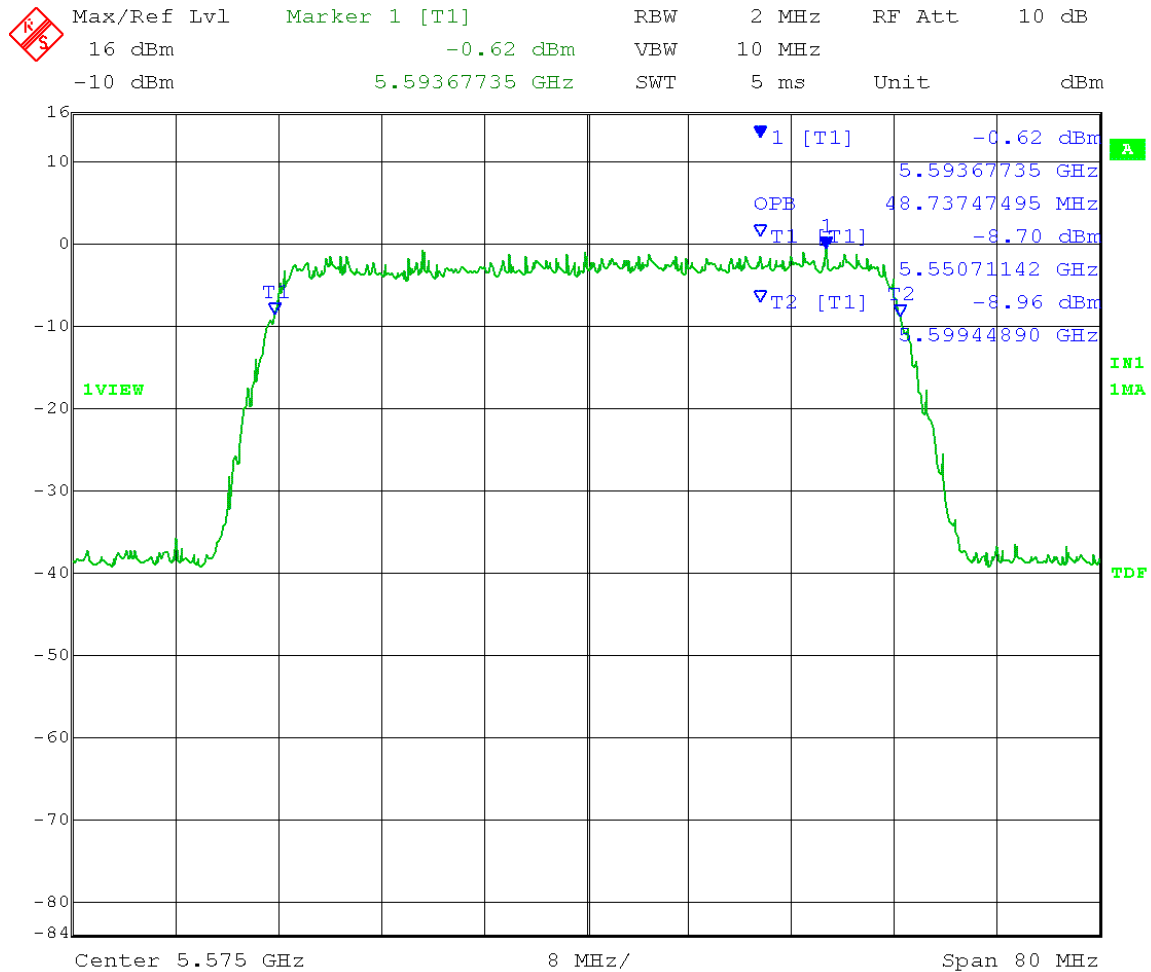


Date: 16.OCT.2013 14:27:23

Test Date: 10-16-2013
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 50MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

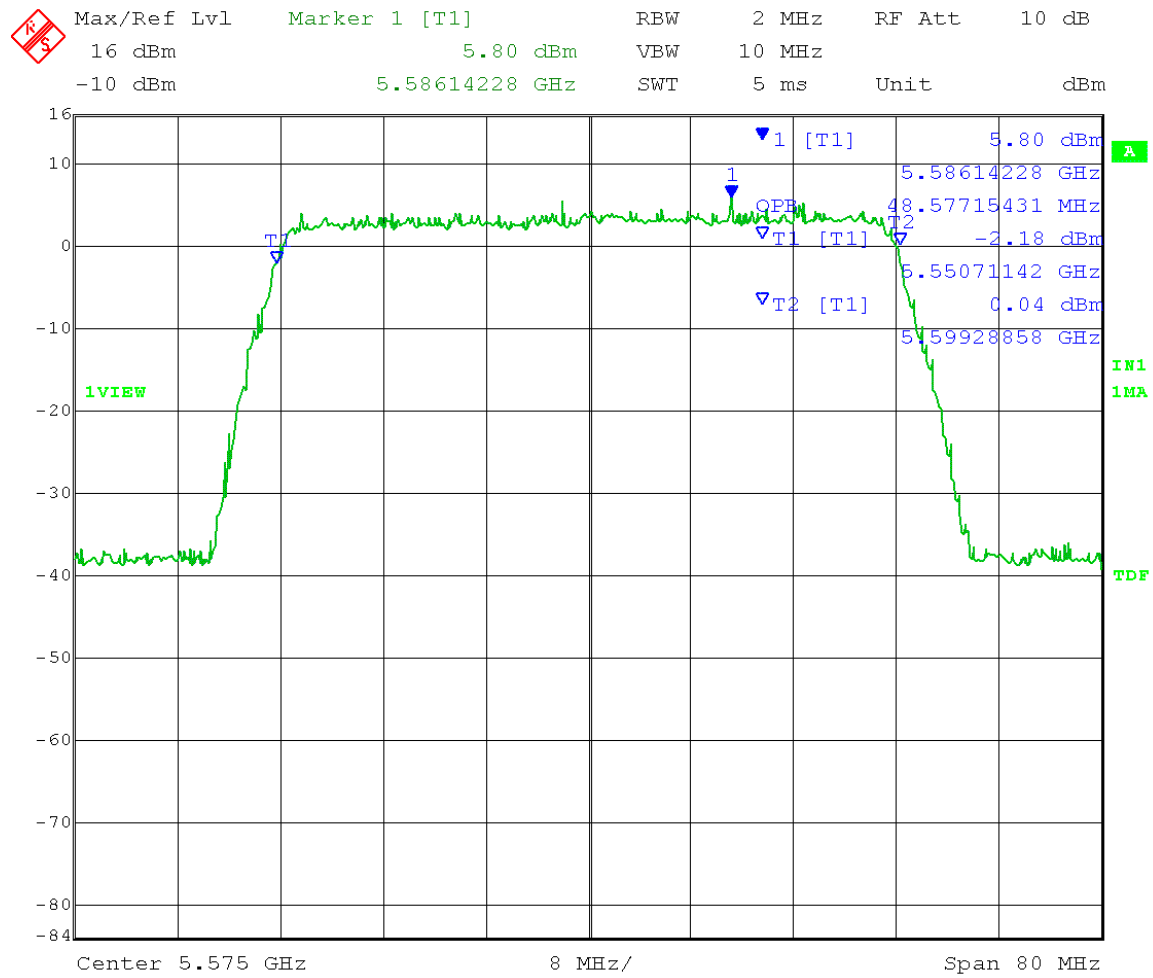
99% OBW = 48.74MHz



Date: 16.OCT.2013 14:47:22

TX 1:

99% OBW = 48.58MHz

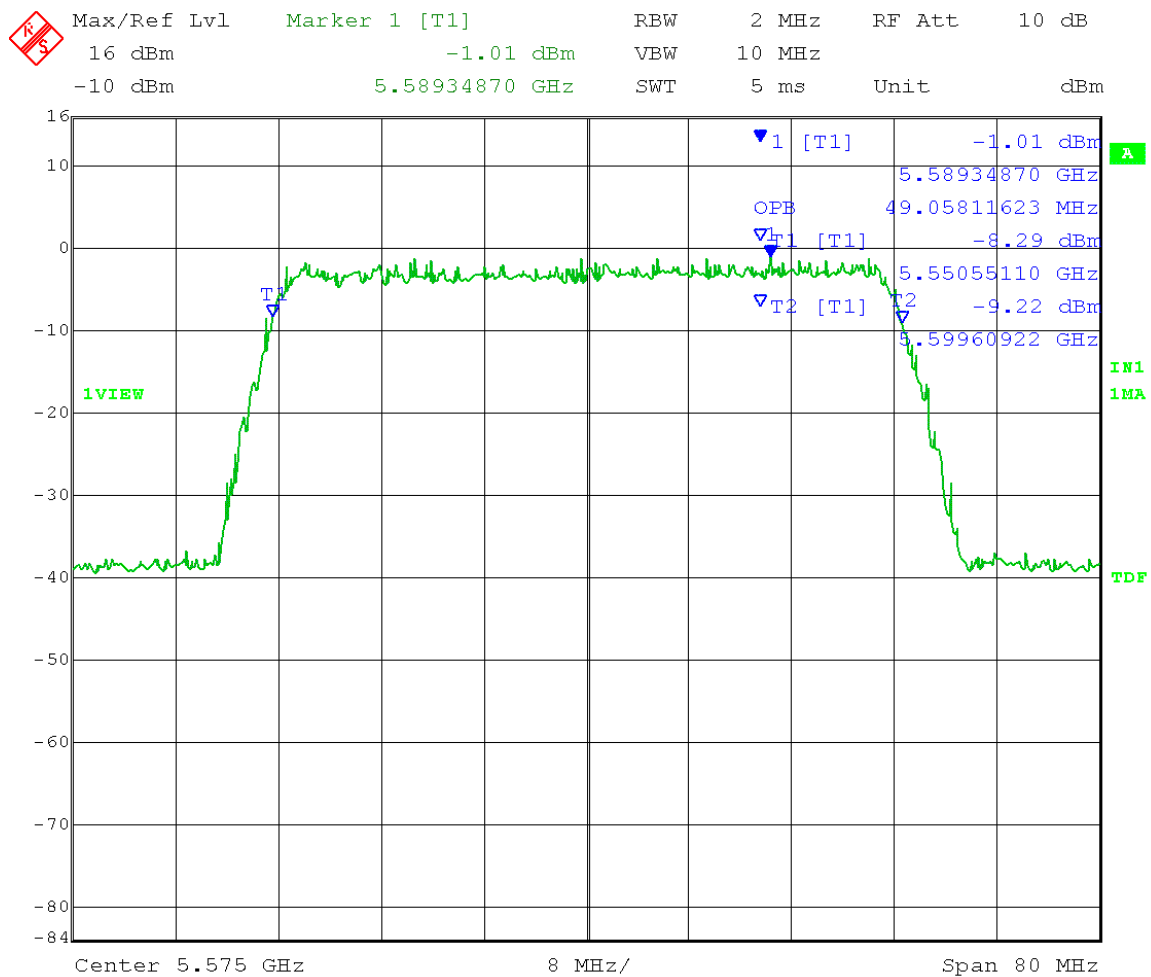


Date: 16.OCT.2013 14:28:41

Test Date: 10-16-2013
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 50MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

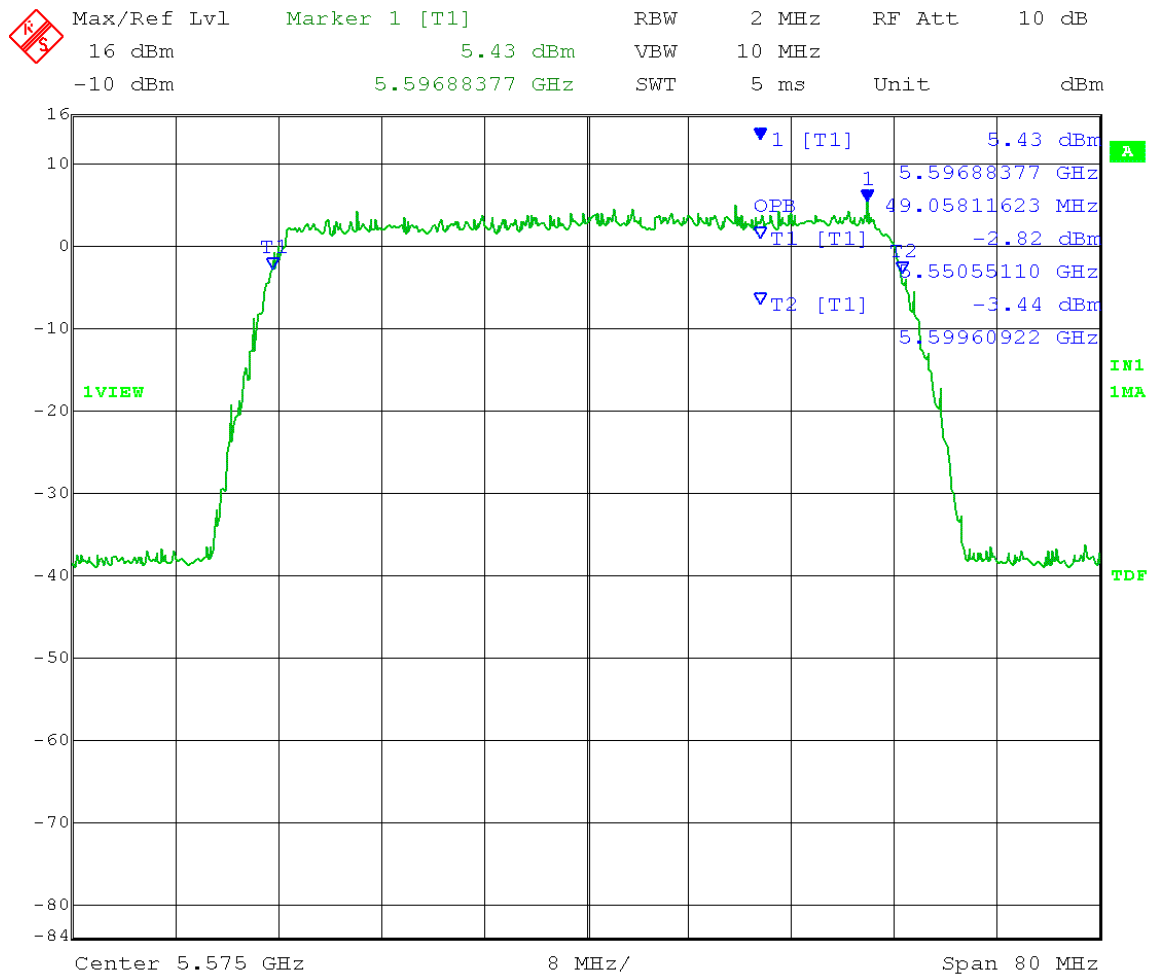
99% OBW = 49.06MHz



Date: 16.OCT.2013 14:48:20

TX 1:

99% OBW = 49.06MHz

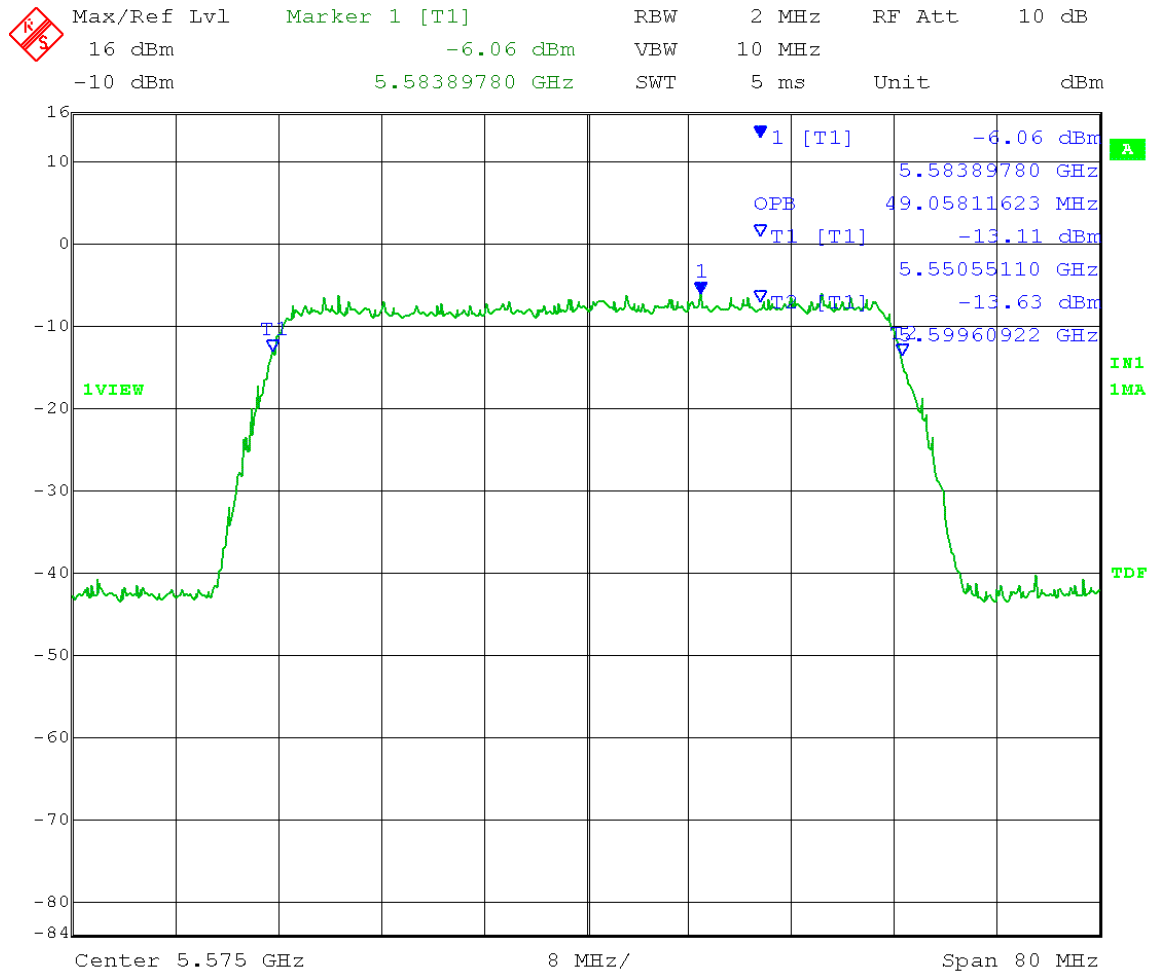


Date: 16.OCT.2013 14:29:38

Test Date: 10-07-2013
 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 = 2MHz VBW = 10MHz
 Mid Channel: Transmit = 5.575 GHz 50MHz BW QPSK
 Output power setting: 30 dBm eirp

Channel 0:

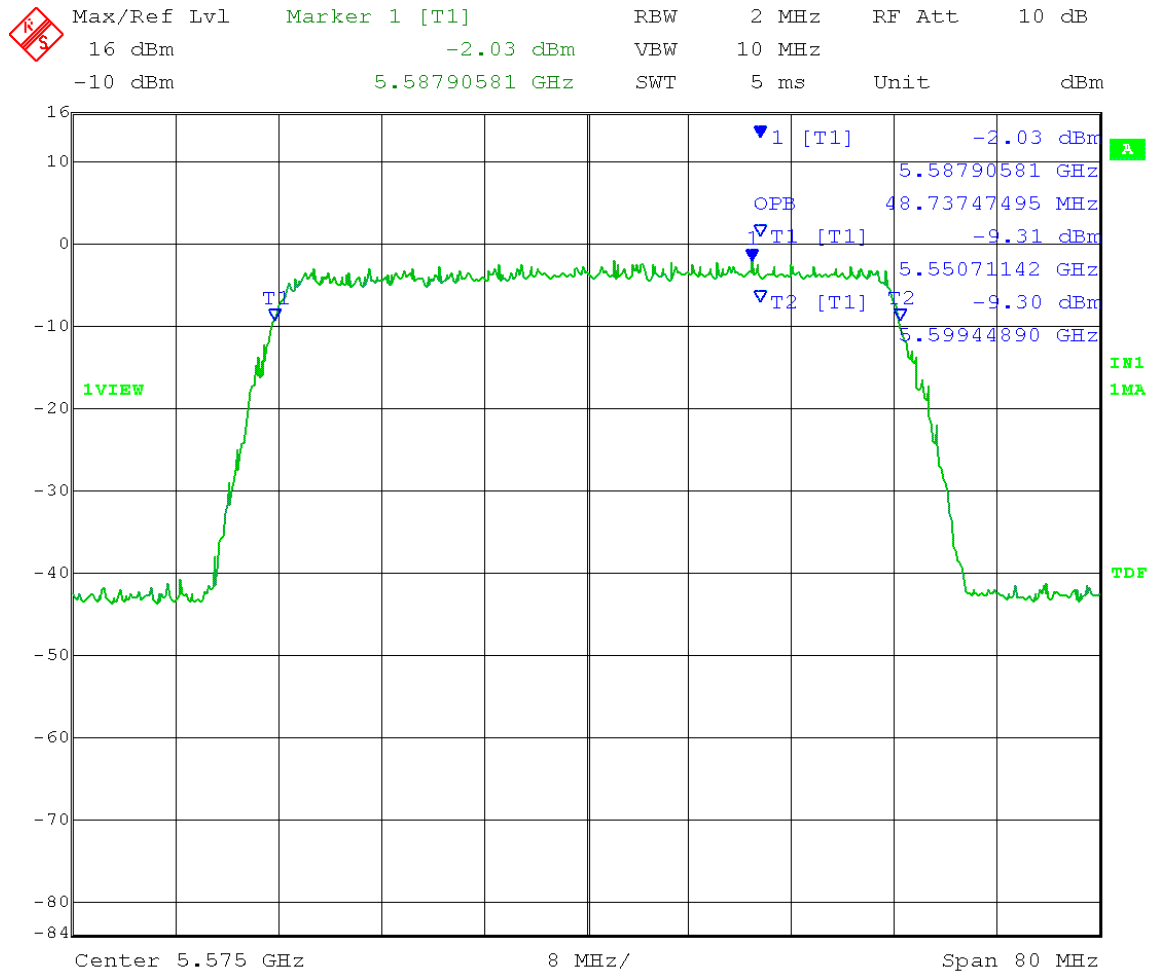
99% OBW = 49.06MHz



Test Date: 10-07-2013
 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 = 2MHz VBW = 10MHz
 Mid Channel: Transmit = 5.575 GHz 50MHz BW QPSK
 Output power setting: 30 dBm eirp

Channel 1:

99% OBW = 48.74MHz

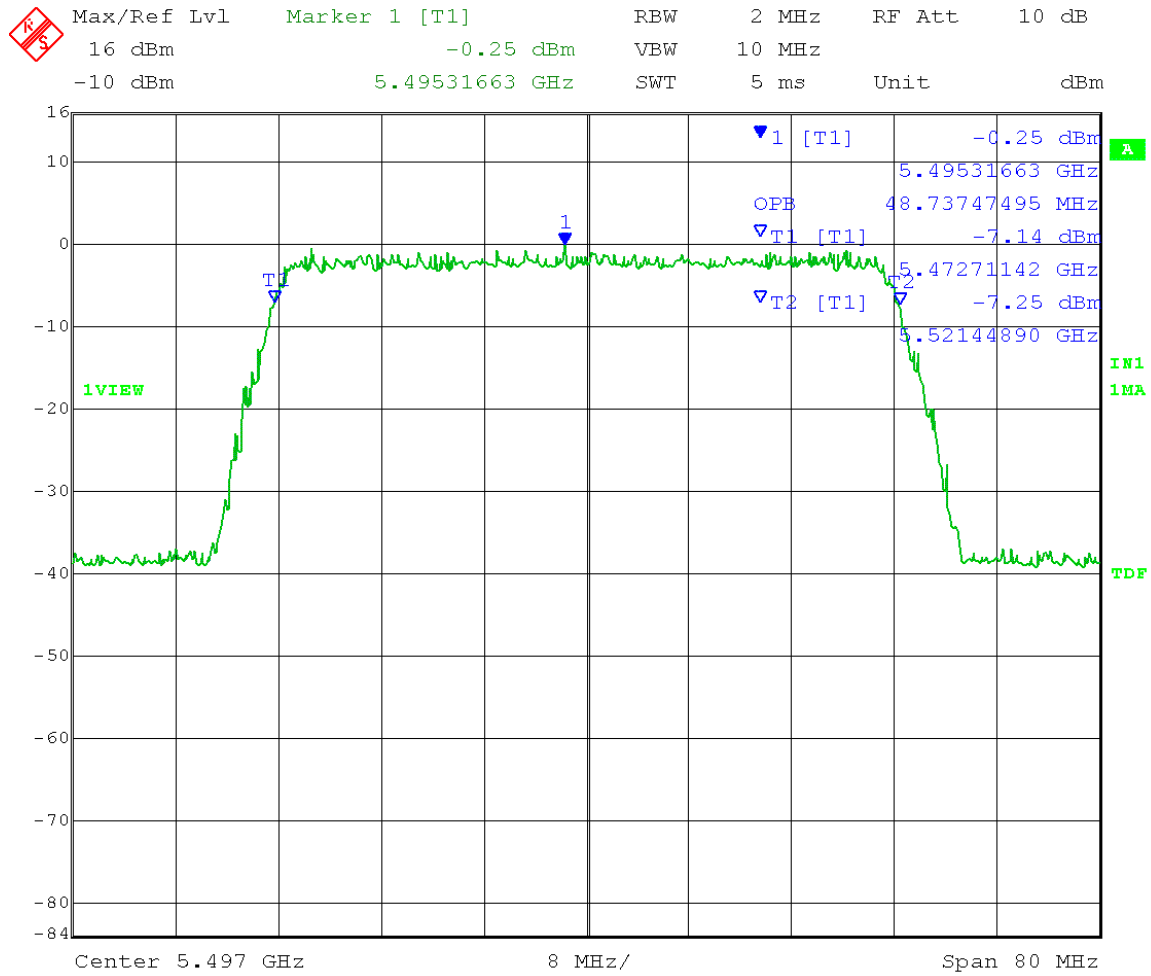


Date: 7.OCT.2013 11:46:35

Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.497 GHz 50MHz BW 16QAM
Output power setting: 30 dBm eirp

TX 0:

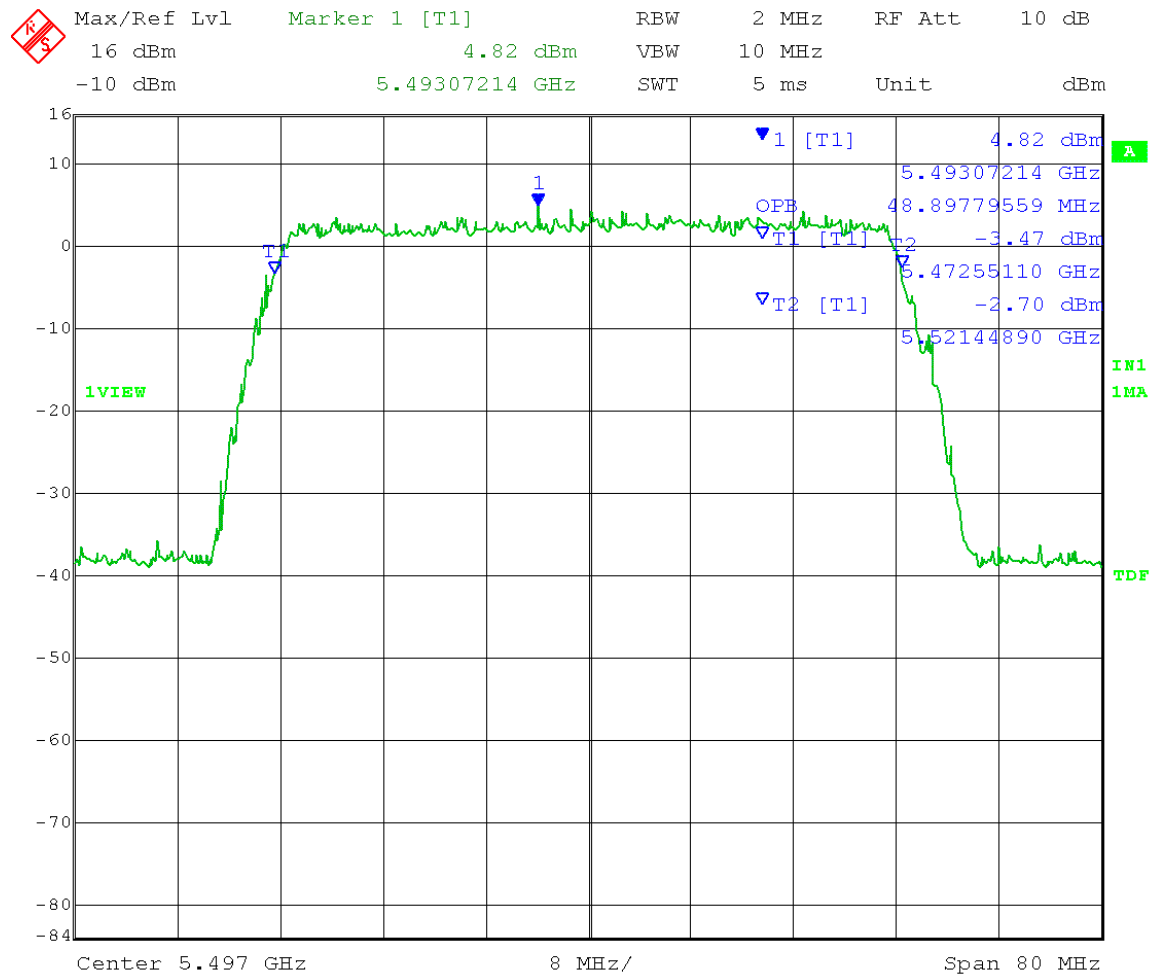
99% OBW = 48.74MHz



Date: 16.OCT.2013 14:44:27

TX 1:

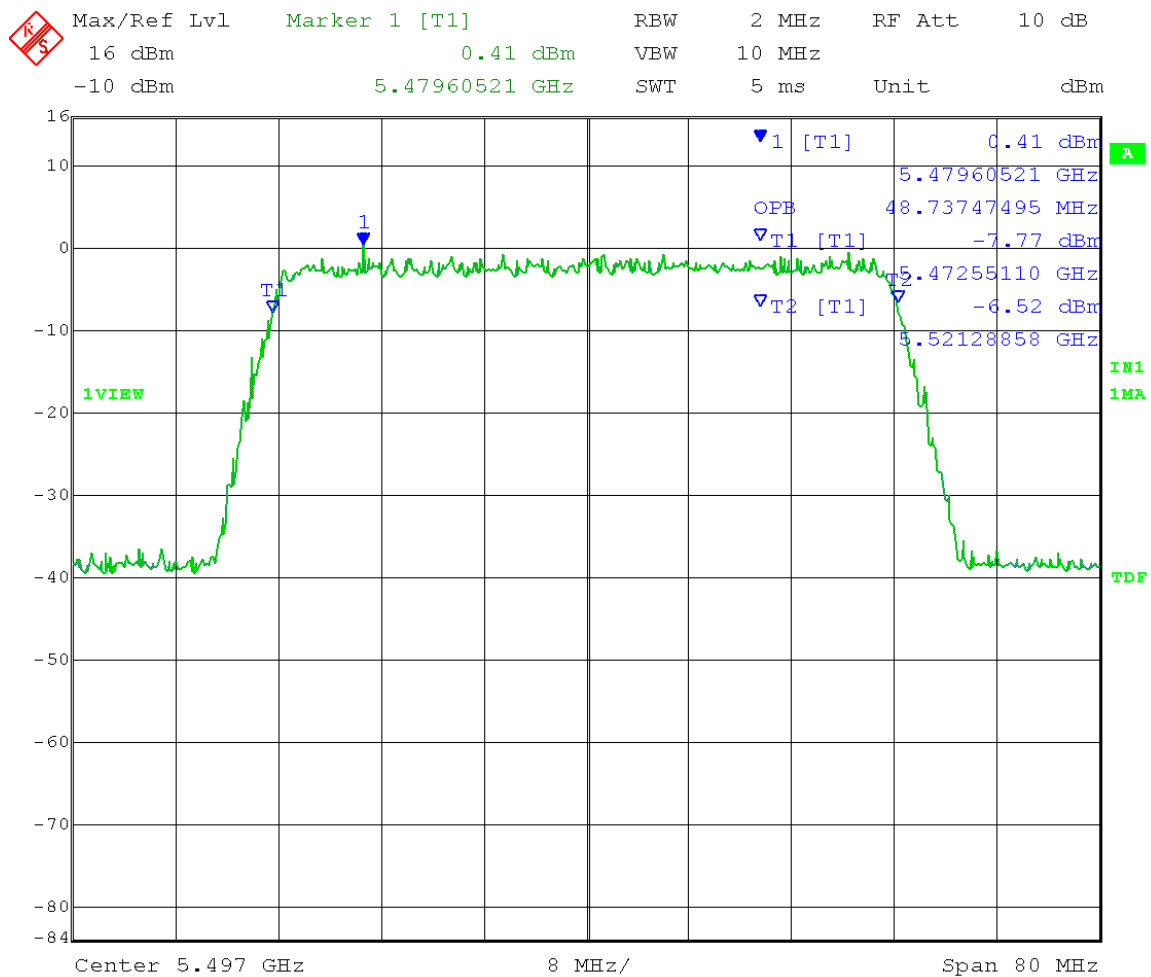
99% OBW = 48.90MHz



Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 64QAM
Output power setting: 30 dBm eirp

TX 0:

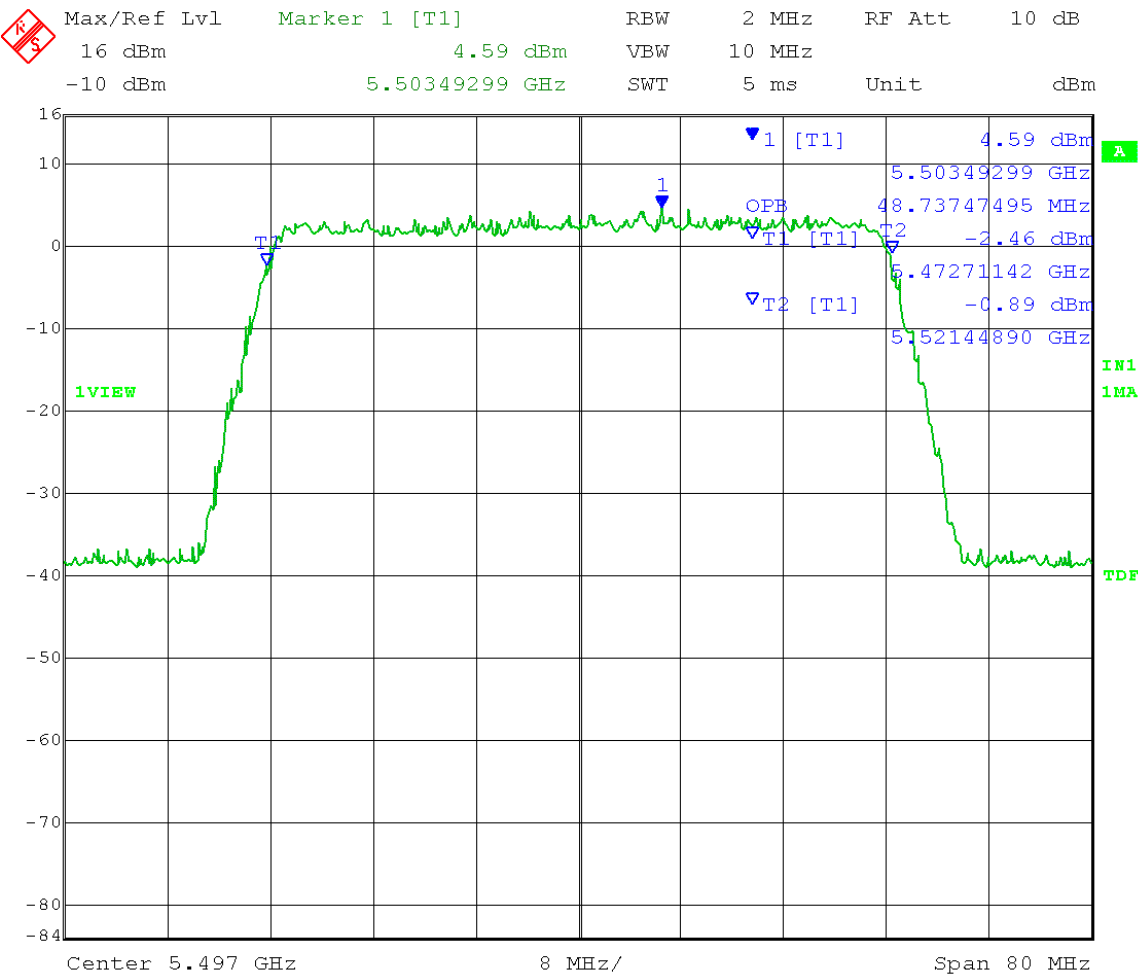
99% OBW = 48.74MHz



Date: 16.OCT.2013 14:43:36

TX 1:

99% OBW = 48.74MHz

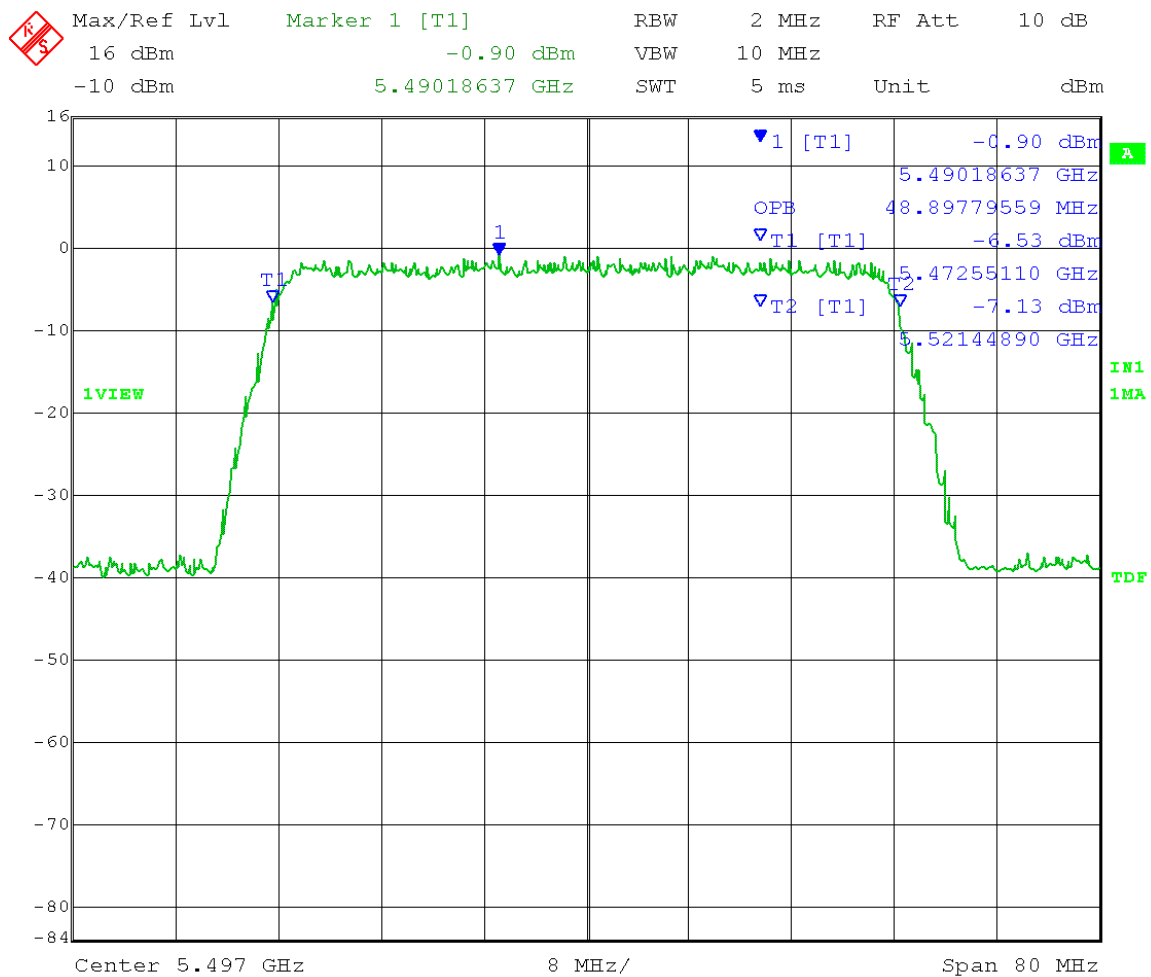


Date: 16.OCT.2013 14:32:17

Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 256QAM
Output power setting: 30 dBm eirp

TX 0:

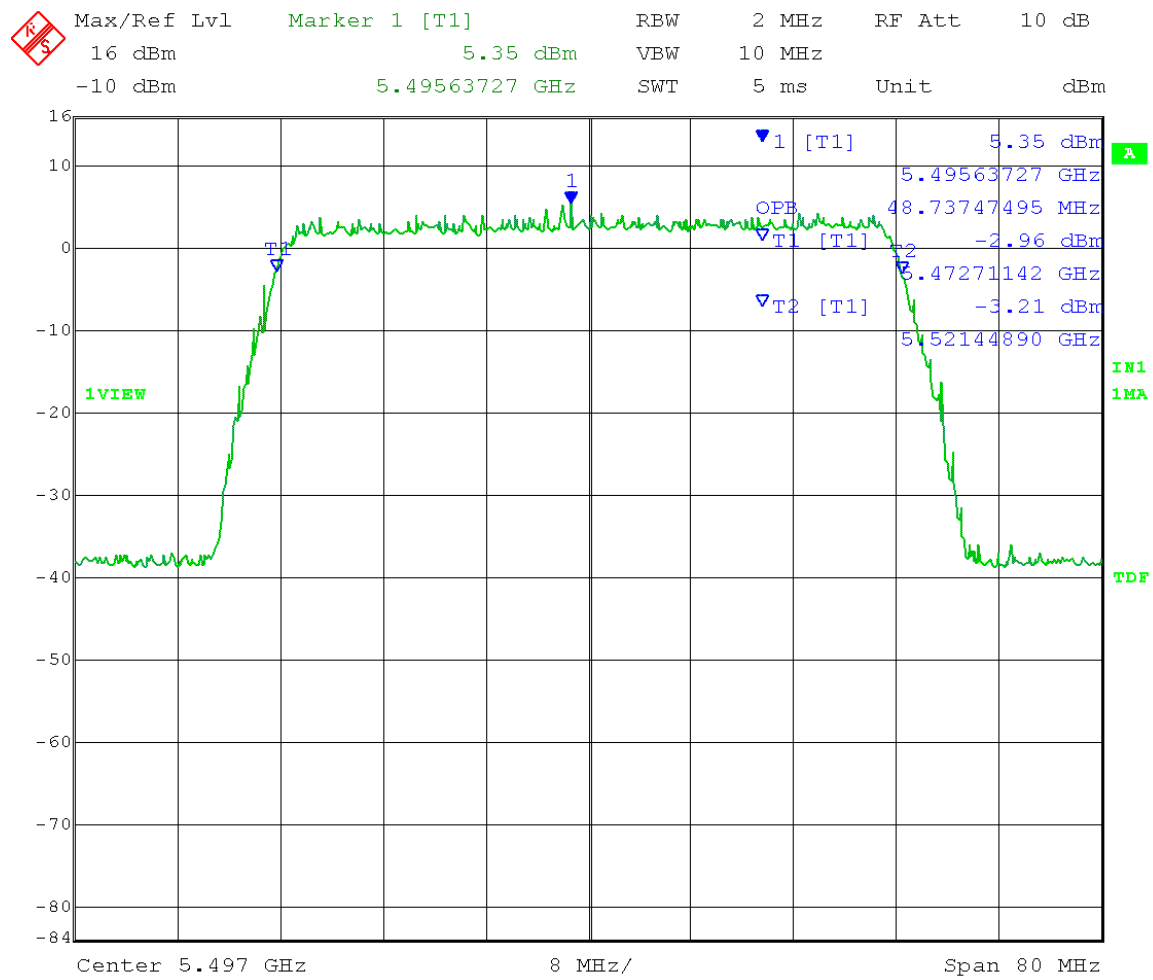
99% OBW = 48.90MHz



Date: 16.OCT.2013 14:42:16

TX 1:

99% OBW = 48.74MHz

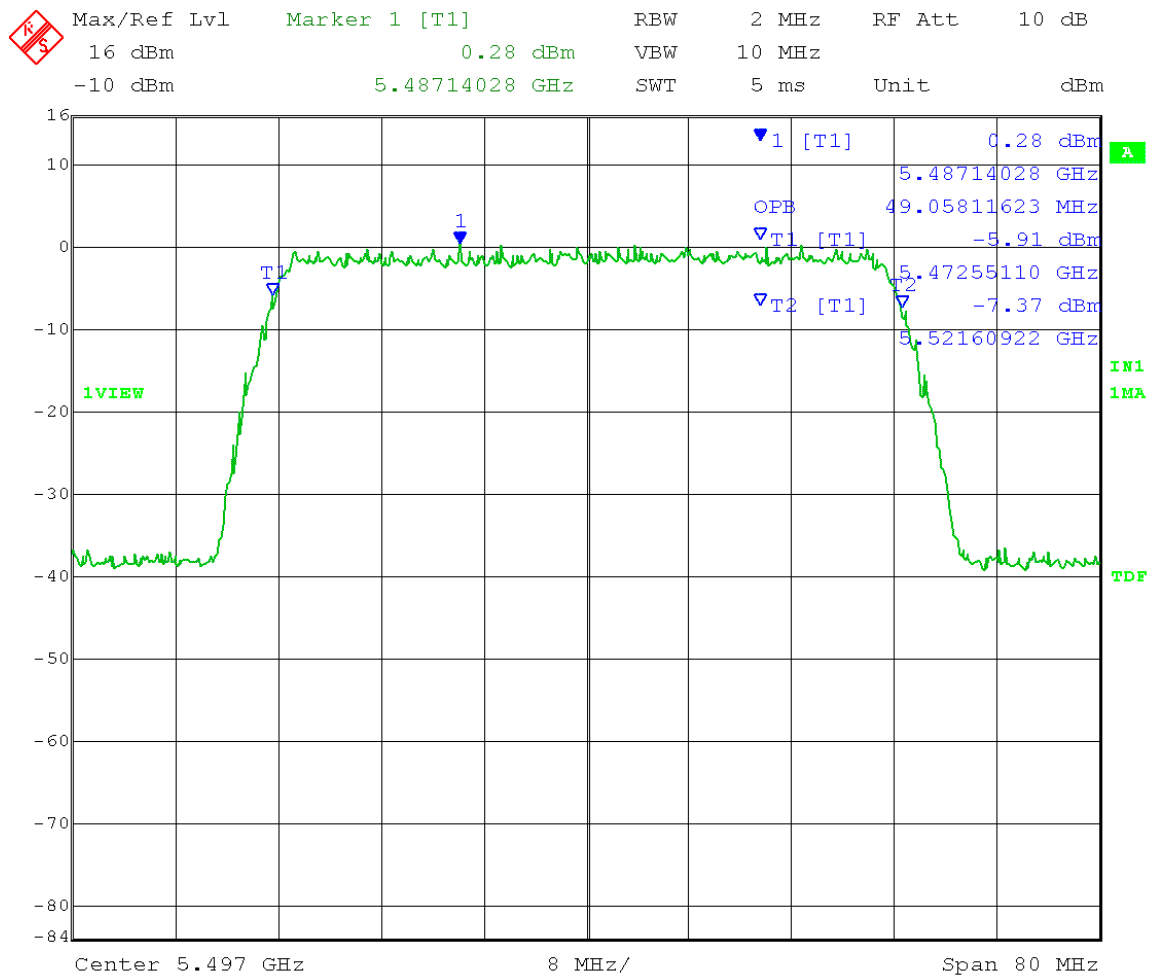


Date: 16.OCT.2013 14:33:20

Test Date: 10-16-2013
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 = 5.497 GHz 50MHz BW 1024QAM
Output power setting: 30 dBm eirp

TX 0:

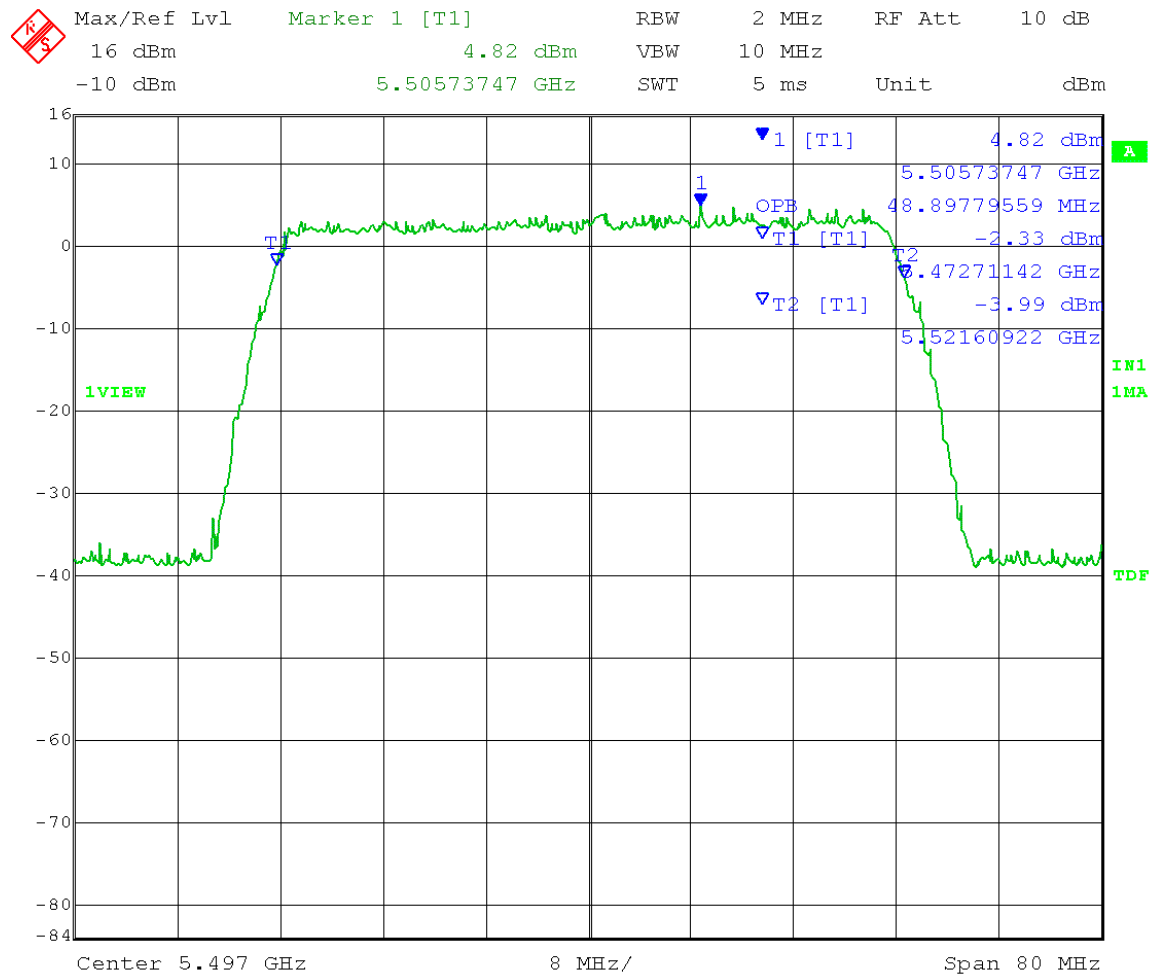
99% OBW = 49.06MHz



Date: 16.OCT.2013 14:41:11

TX 1:

99% OBW = 48.90MHz

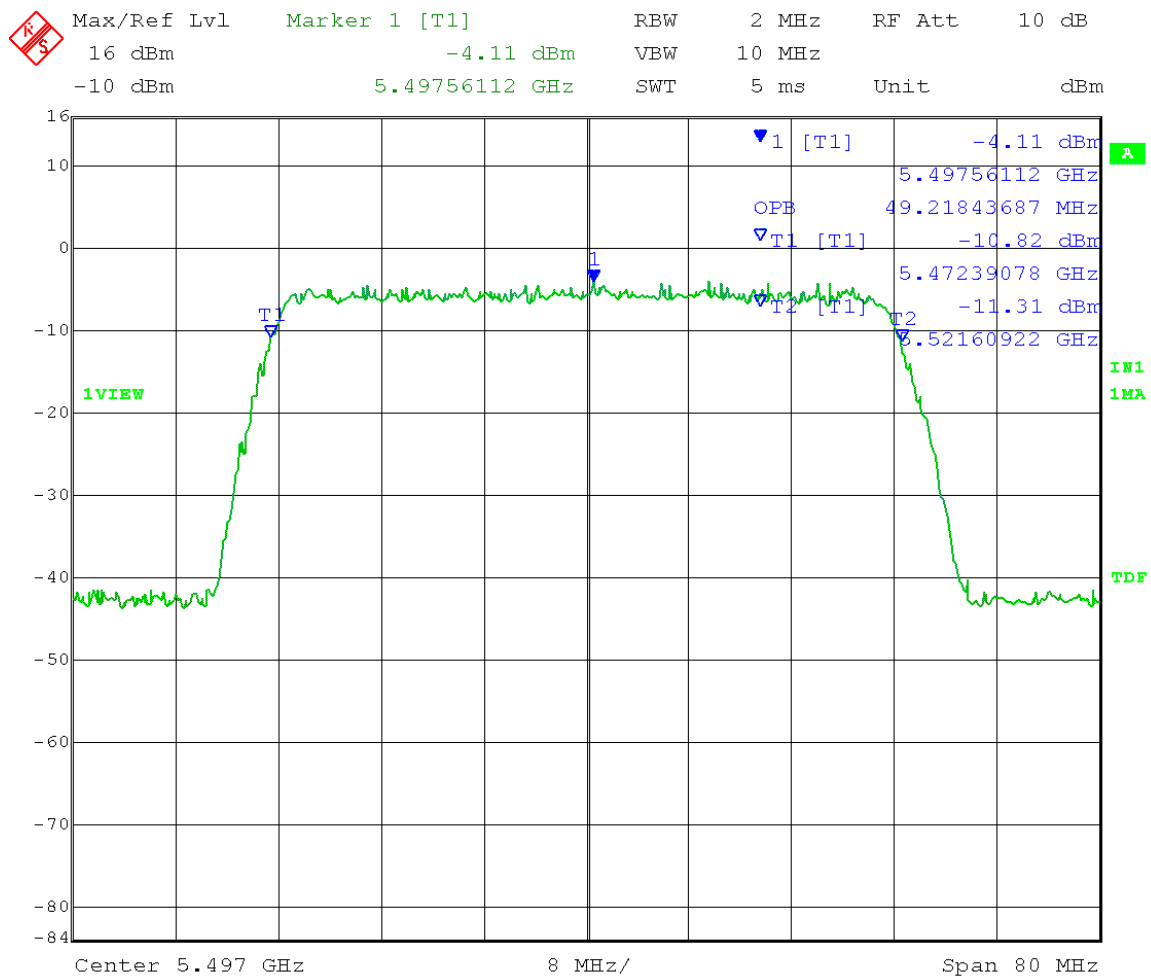


Date: 16.OCT.2013 14:34:08

Test Date: 10-07-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 - D)
Low Channel: Transmit = 5.497 GHz 50MHz BW QPSK
Output power setting: 30 dBm eirp

TX 0:

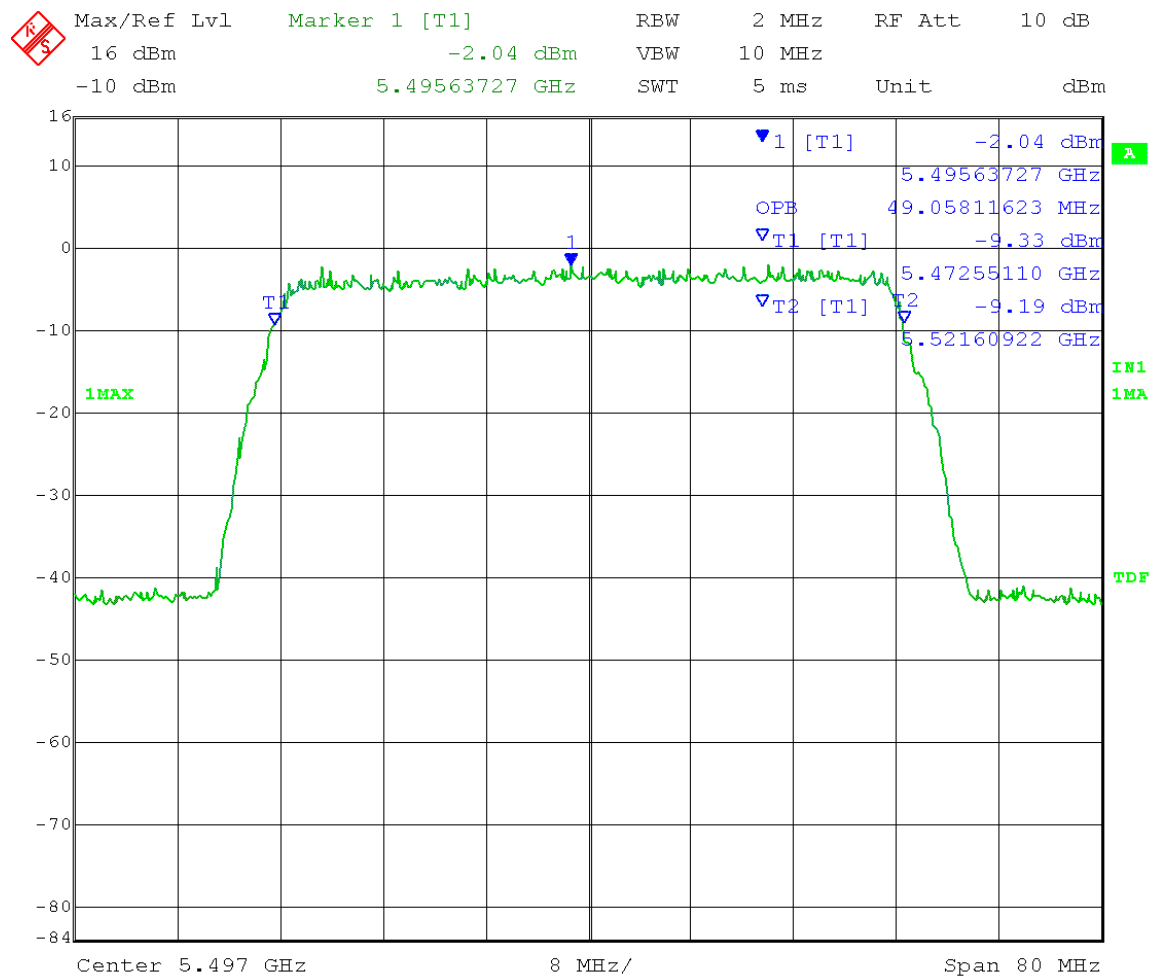
99% OBW = 49.22MHz



Date: 7.OCT.2013 10:59:47

TX 1:

99% OBW = 49.06MHz



Date: 7.OCT.2013 11:47:37



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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)

50MHz Operating Bandwidth:

FCC Maximum Conducted Output Power		50MHz				
	dBm	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit $\leq$ 250mW	<i>EUT FCC limit:</i>	7	7	7	7	7
HCH = 5698 MHz	TX0 (mW)	2.25	2.24	2.23	2.22	2.22
	TX1 (mW)	2.72	2.68	2.56	2.58	2.76
	total(mW)	4.97	4.92	4.79	4.80	4.98
	Total(dBm)	6.96	6.92	6.80	6.81	6.97
	Margin	0.04	0.08	0.20	0.19	0.03
MCH = 5575 MHz	TX0	2.33	2.32	2.33	2.36	2.45
	TX1	2.58	2.51	2.49	2.63	2.5
	total(mW)	4.91	4.83	4.82	4.99	4.95
	Total(dBm)	6.91	6.84	6.83	6.98	6.95
	Margin	0.09	0.16	0.17	0.02	0.05
LCH = 5497 MHz	TX0	2.36	2.36	2.37	2.36	2.36
	TX1	2.53	2.58	2.56	2.52	2.5
	total(mW)	4.89	4.94	4.93	4.88	4.86
	Total(dBm)	6.89	6.94	6.93	6.88	6.87
	Margin	0.11	0.06	0.07	0.12	0.13



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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

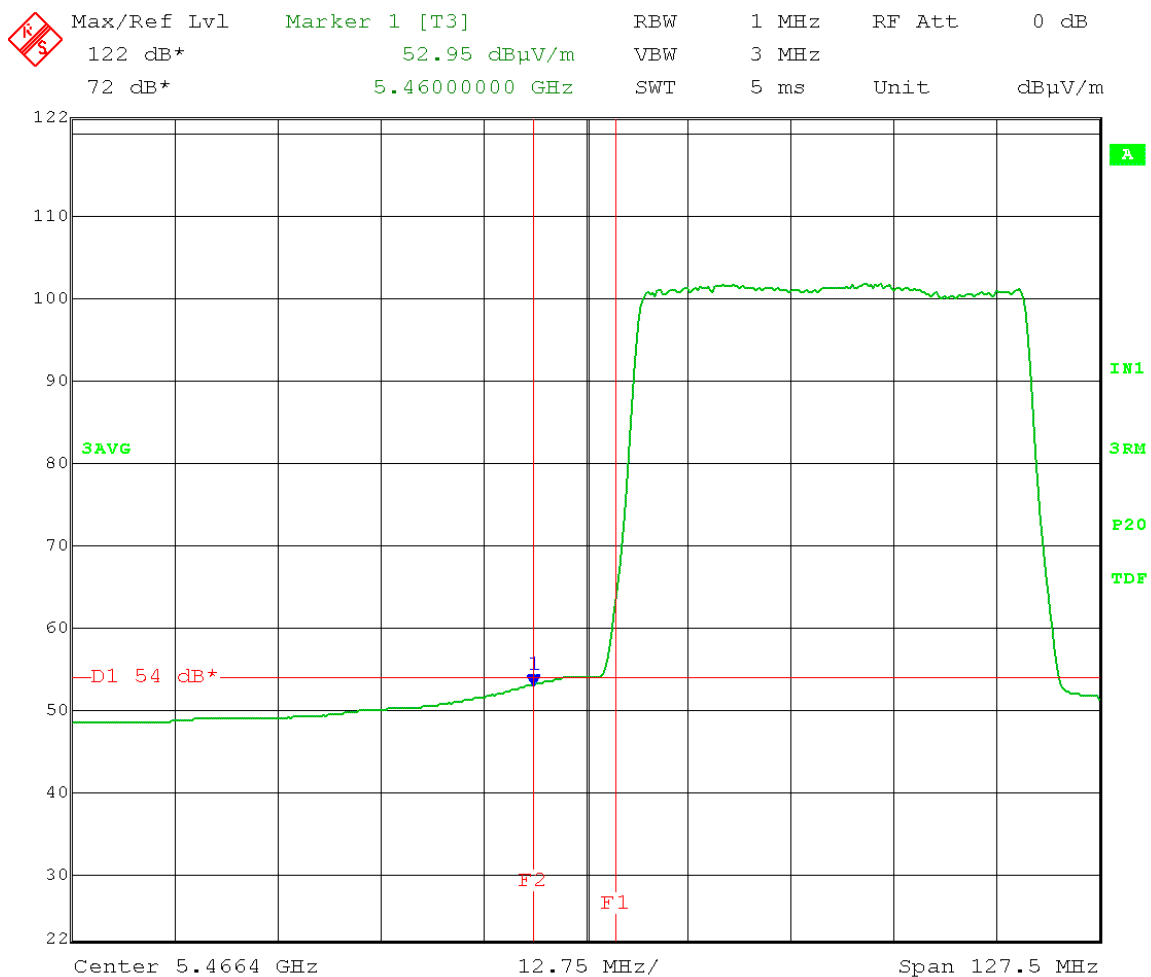
Results: Compliant

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.

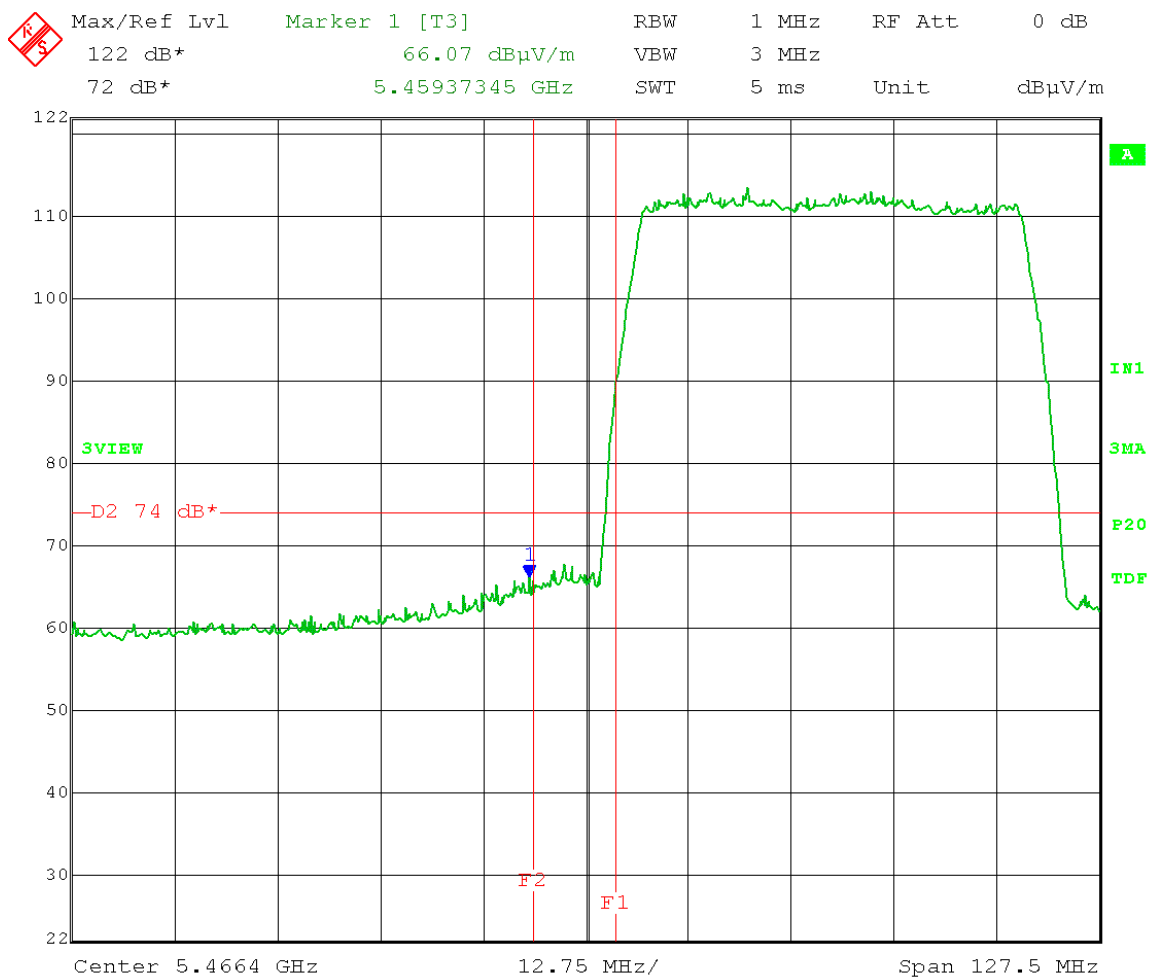
Both transmit chains active. Output power was set to 30 dBm eirp using special test software.

Test Date: 10-17-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
 (FCC 15.407(b)(7))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 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.



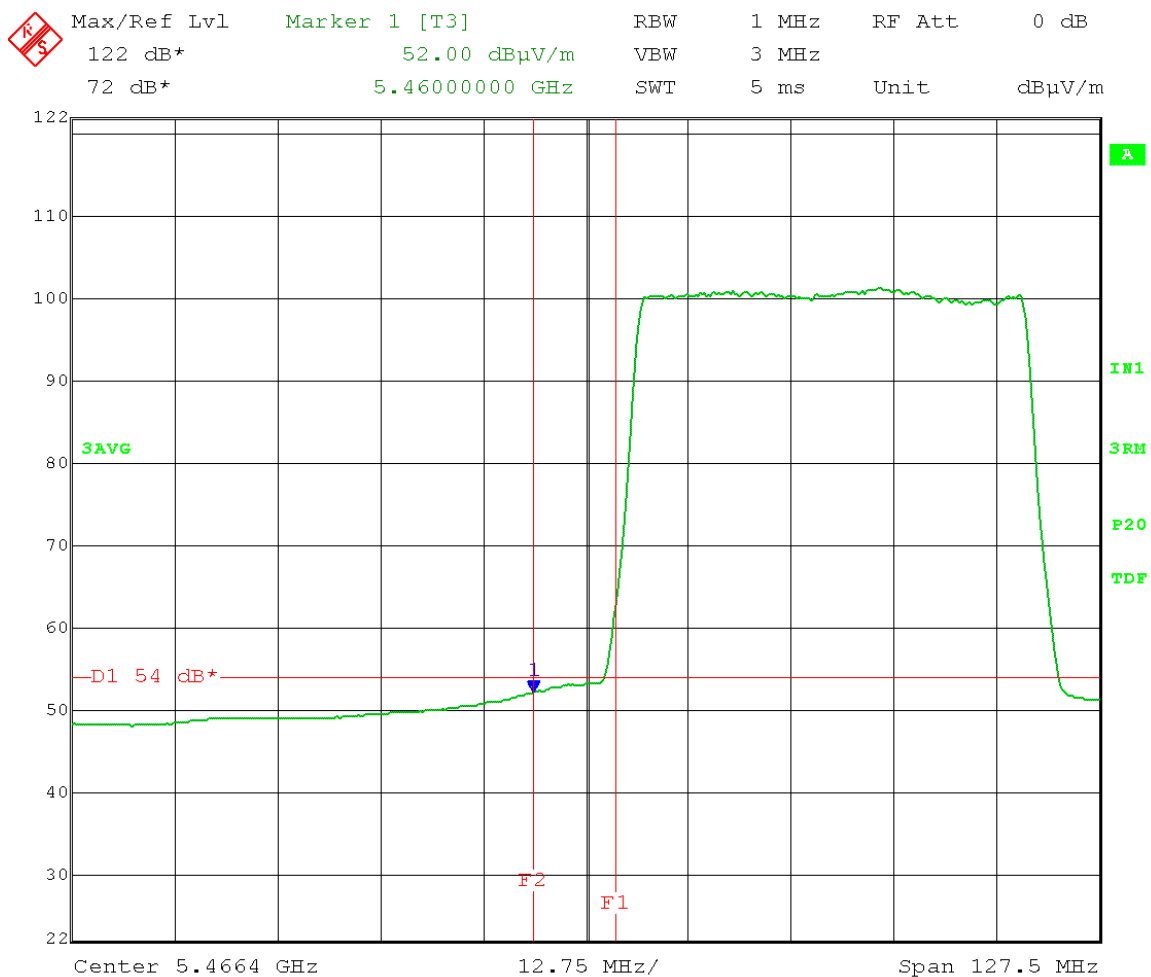
Date: 17.OCT.2013 13:18:47

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 50 MHz channel Bandwidth
Low Channel: Frequency – 5497 MHz
Modulation: 1024QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



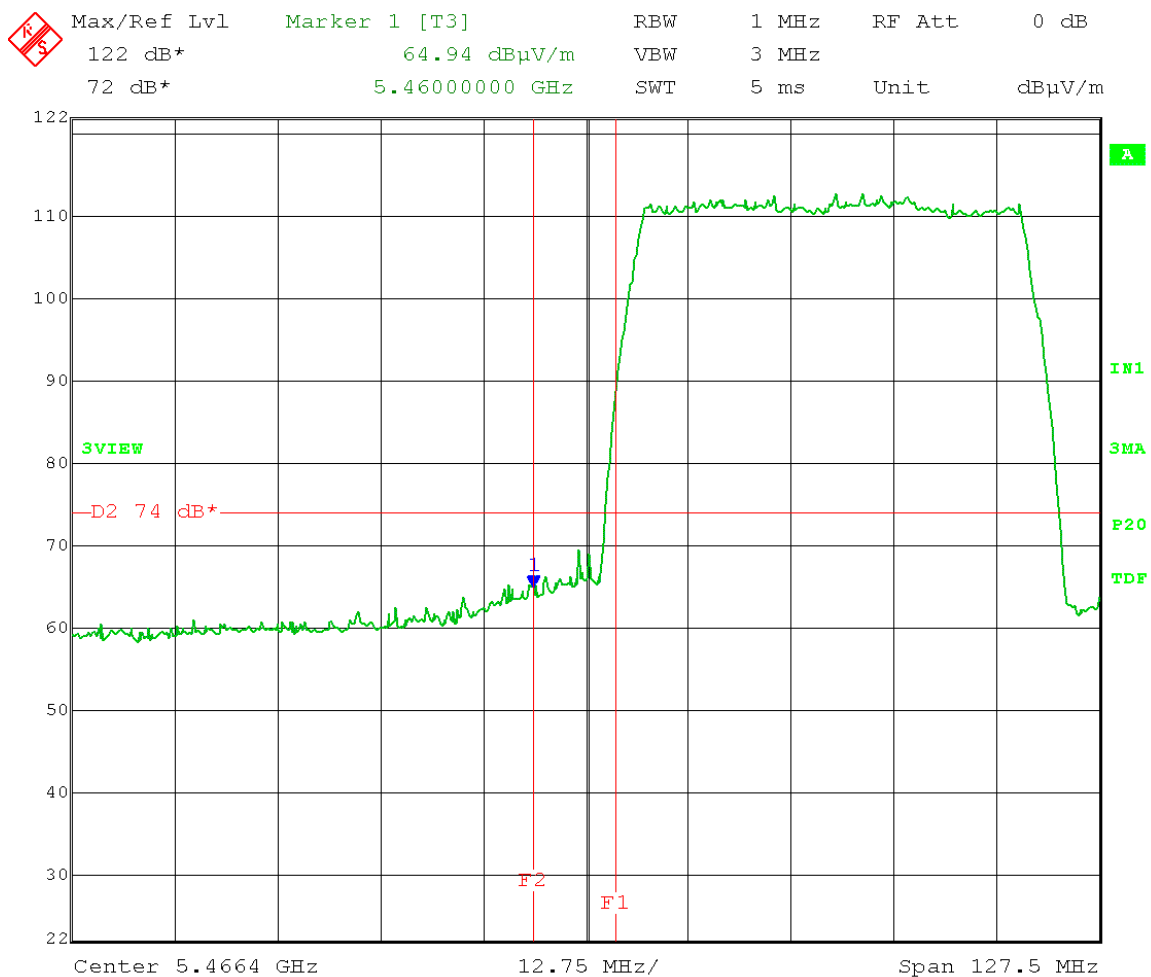
Date: 17.OCT.2013 13:17:48

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 50 MHz channel Bandwidth
Low Channel: Frequency – 5497 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.



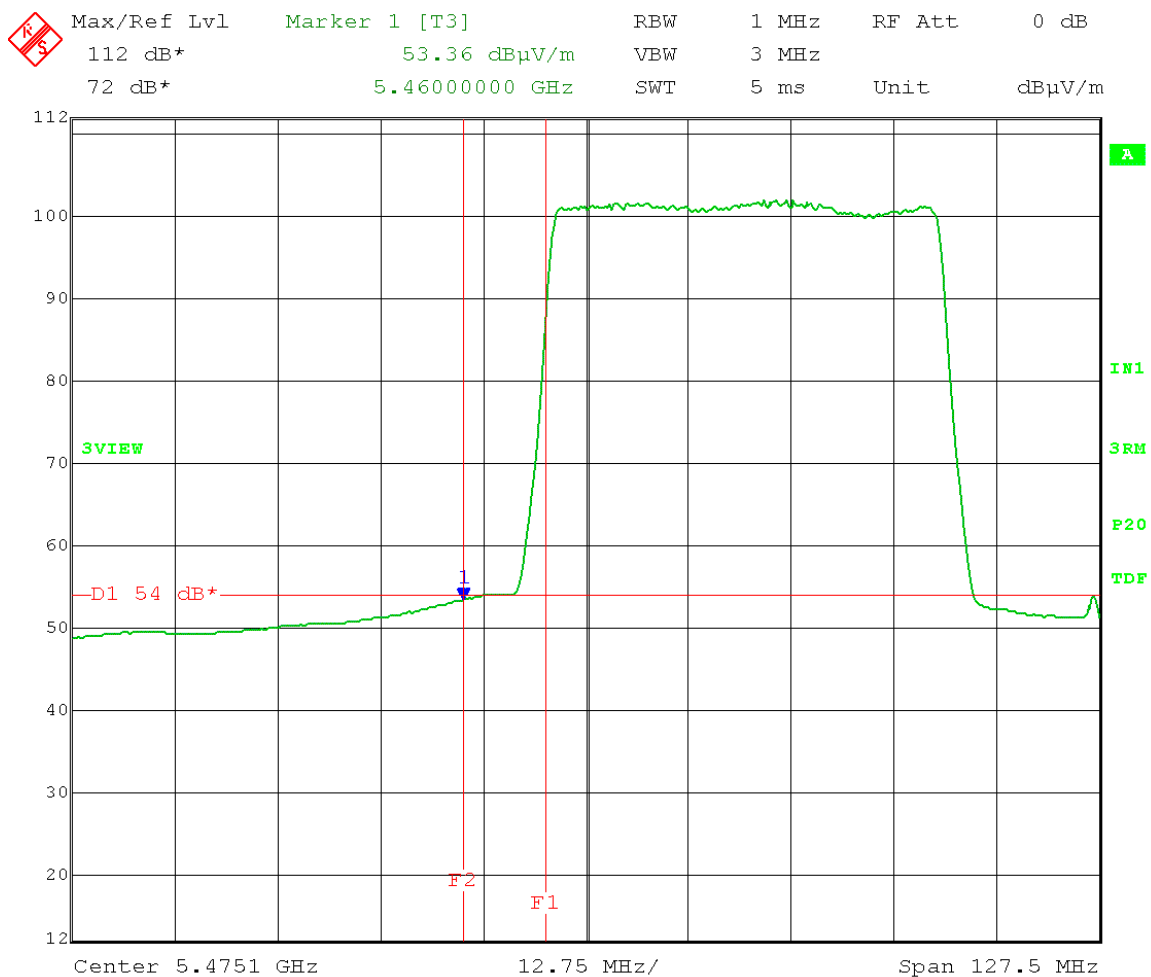
Date: 17.OCT.2013 13:12:01

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 50 MHz channel Bandwidth
Low Channel: Frequency – 5497 MHz
Modulation: 1024QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



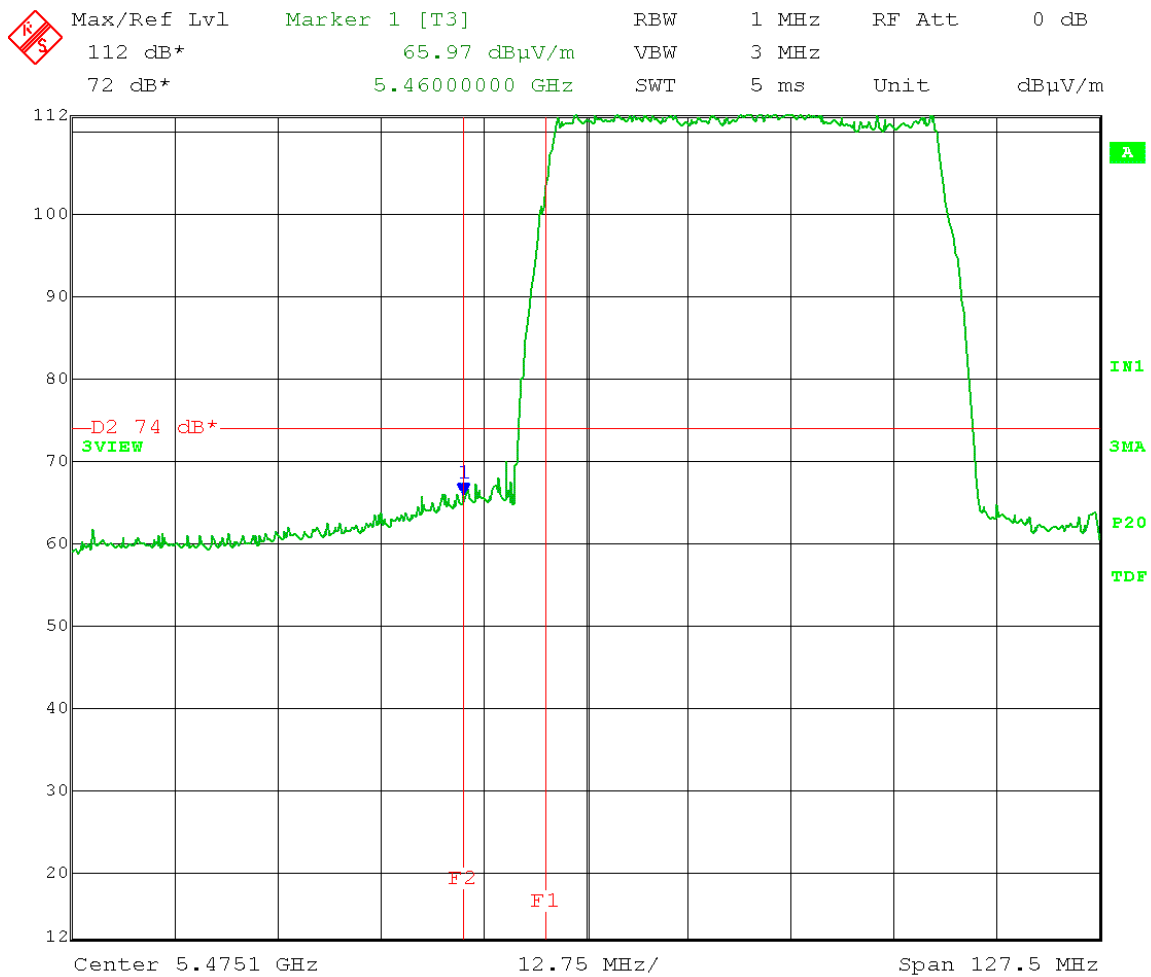
Date: 17.OCT.2013 13:13:34

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: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5495 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.



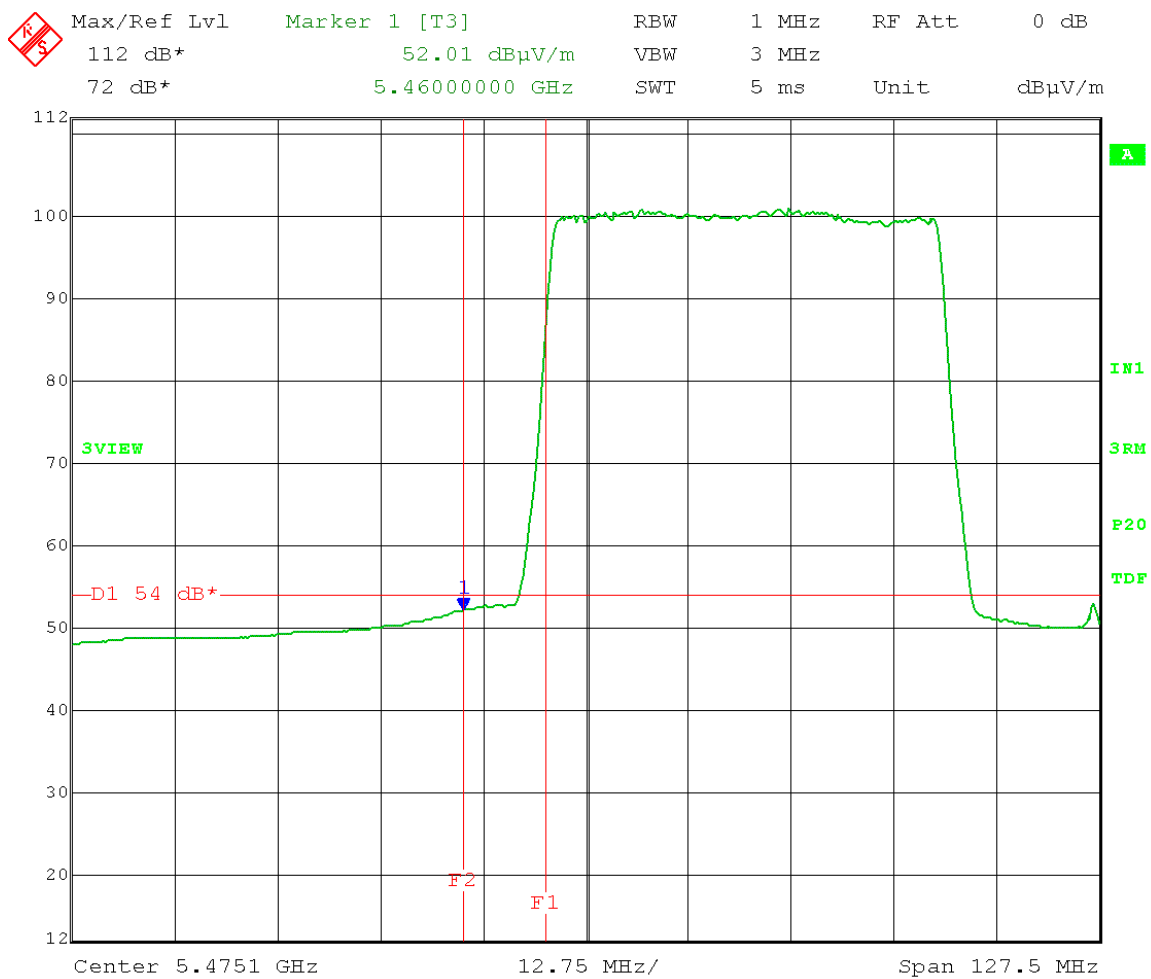
Date: 3.OCT.2013 14:28:44

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



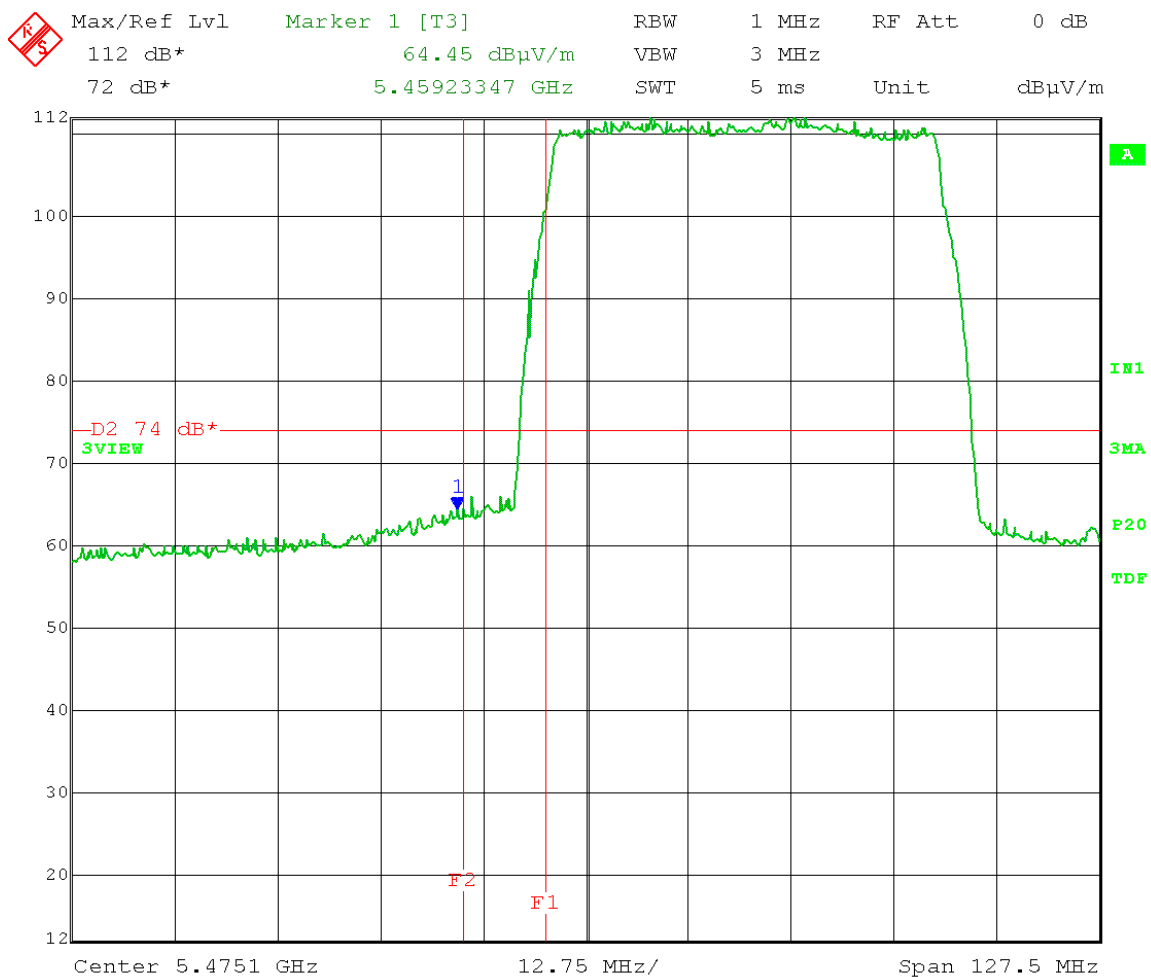
Date: 3.OCT.2013 14:29:46

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



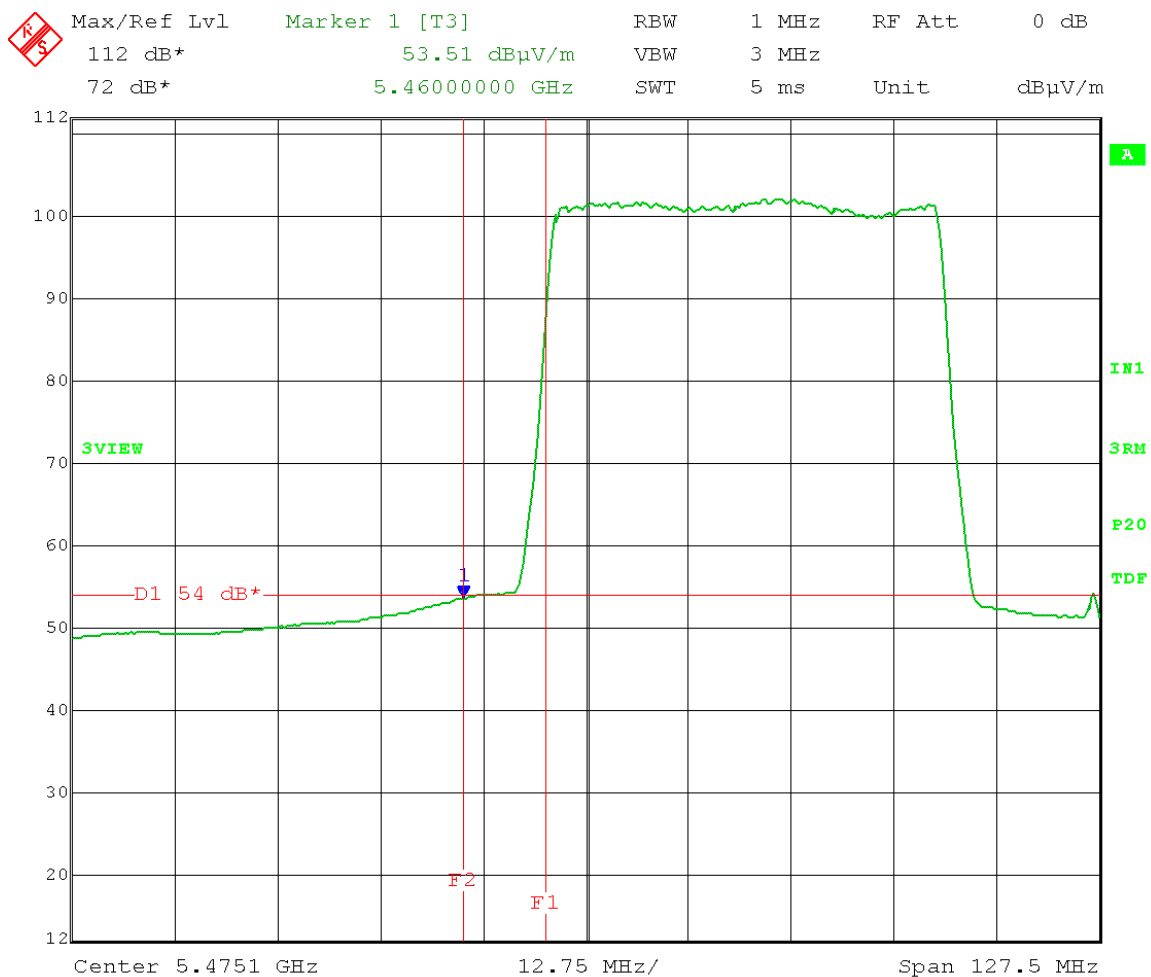
Date: 3.OCT.2013 14:24:11

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 MHz
Modulation: 16QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



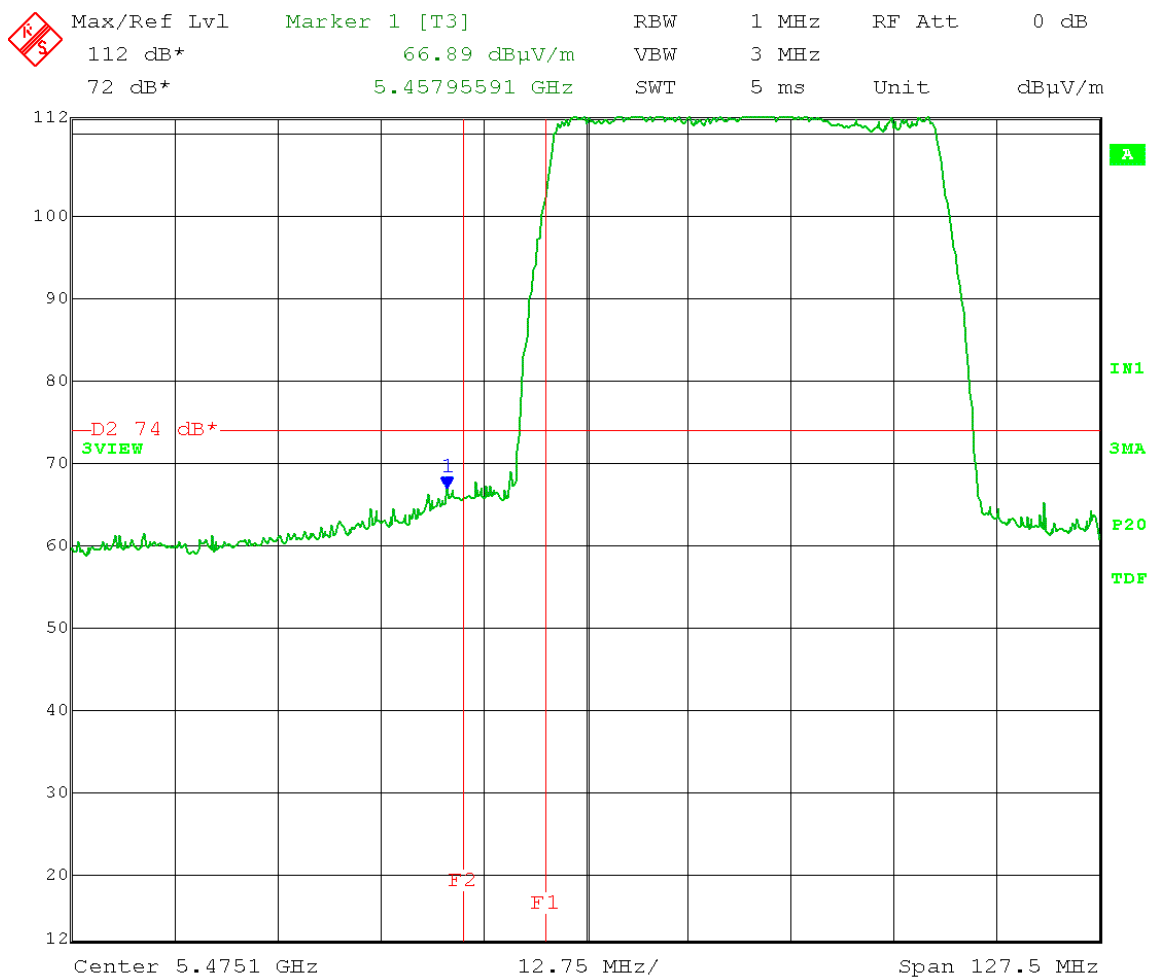
Date: 3.OCT.2013 14:23:02

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: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5495 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.



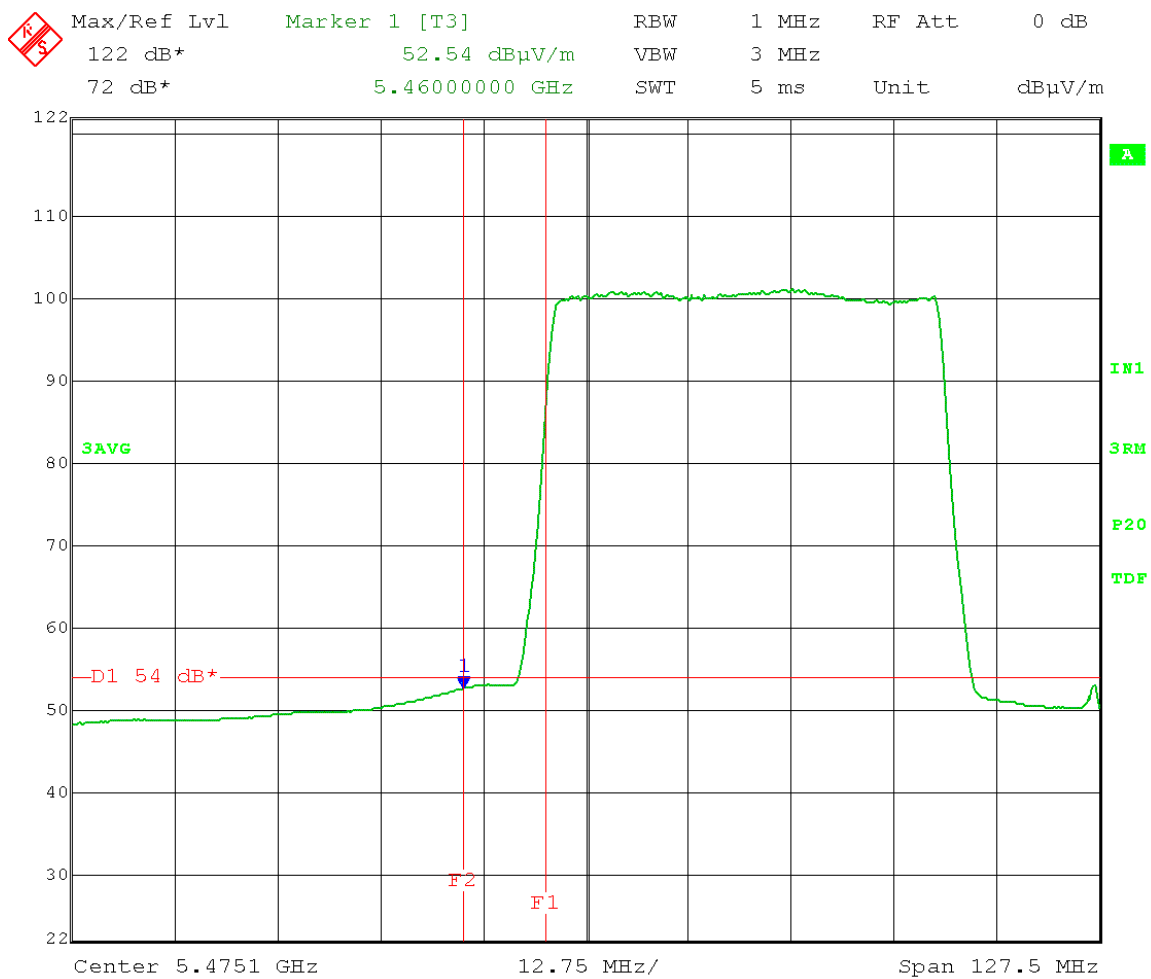
Date: 3.OCT.2013 14:33:54

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



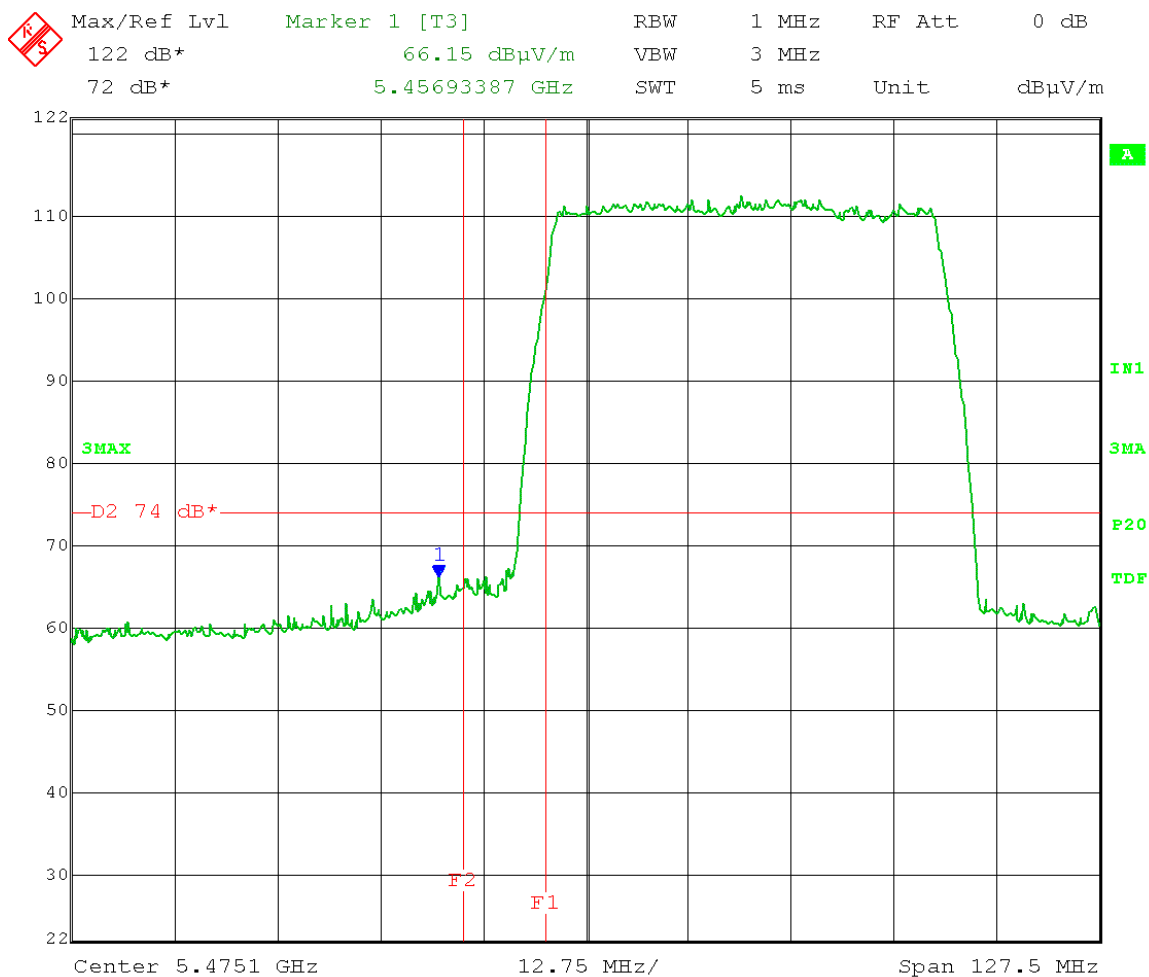
Date: 3.OCT.2013 14:34:55

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



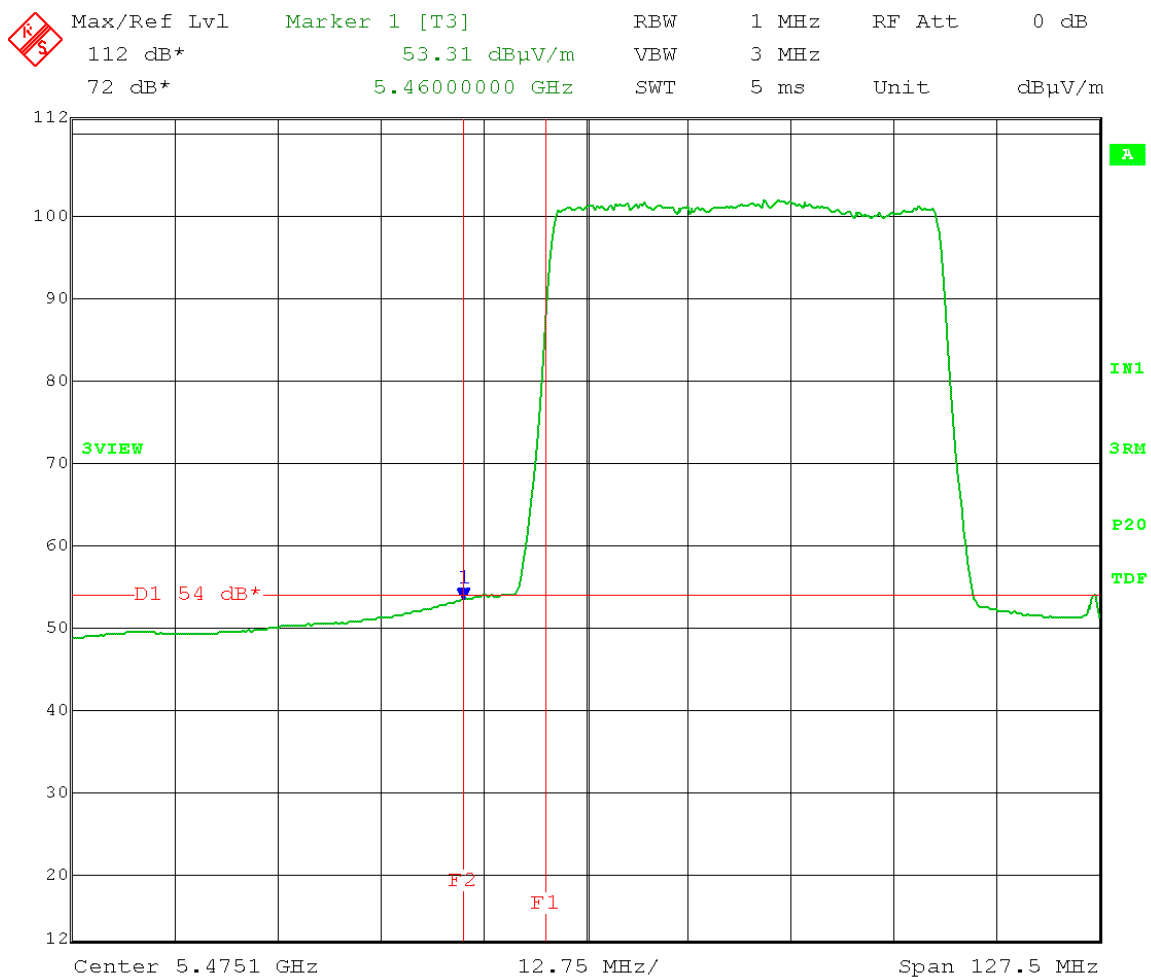
Date: 3.OCT.2013 15:54:38

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



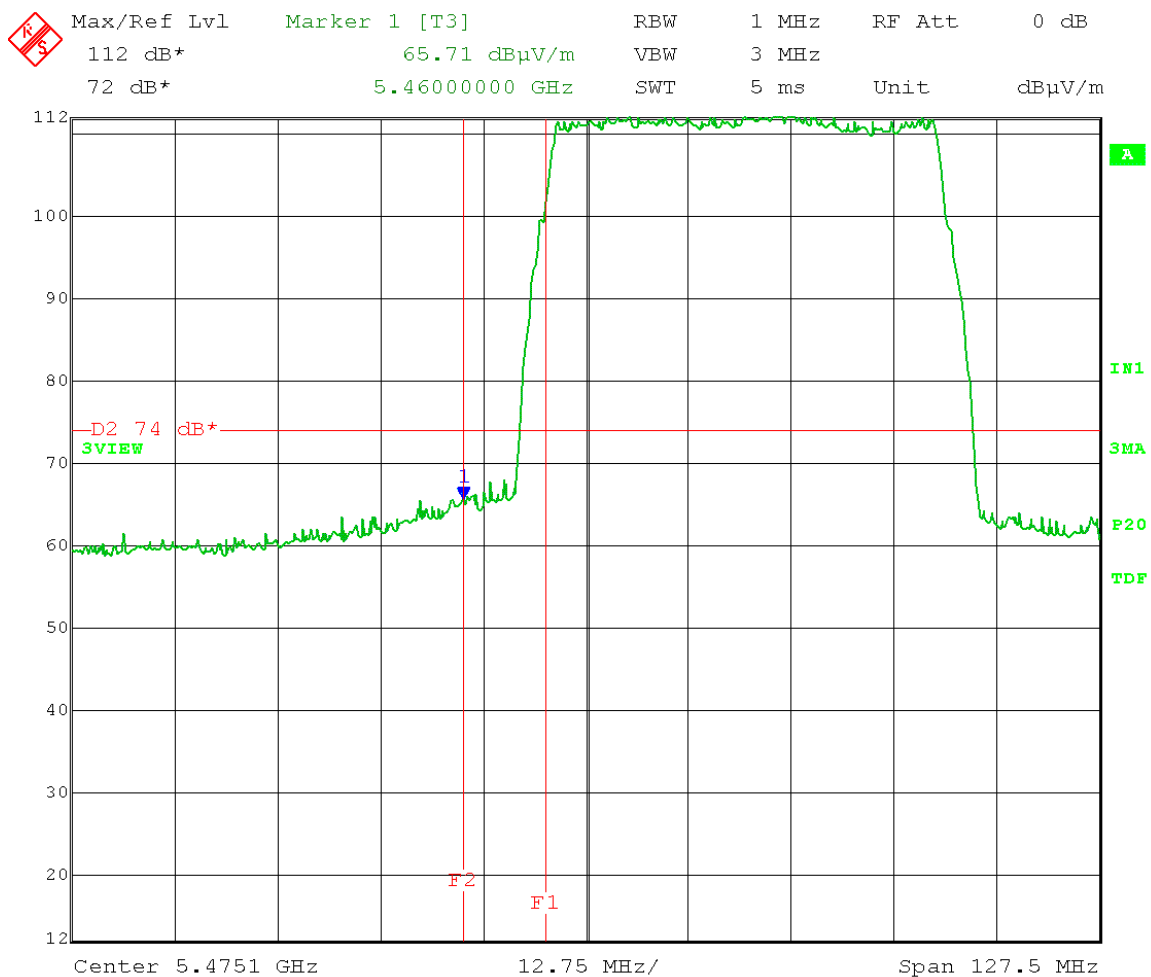
Date: 3.OCT.2013 15:55:24

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



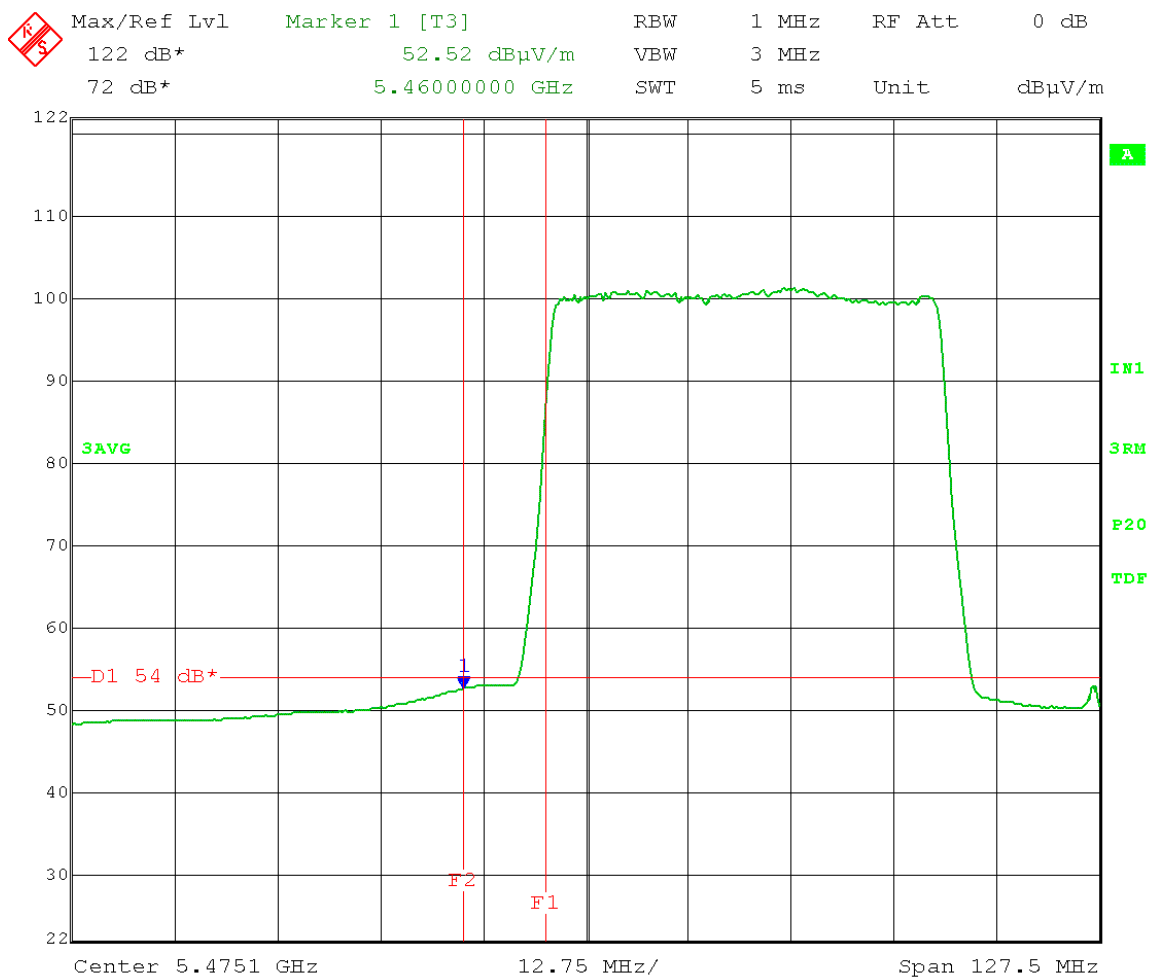
Date: 3.OCT.2013 14:32:24

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: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5495 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.



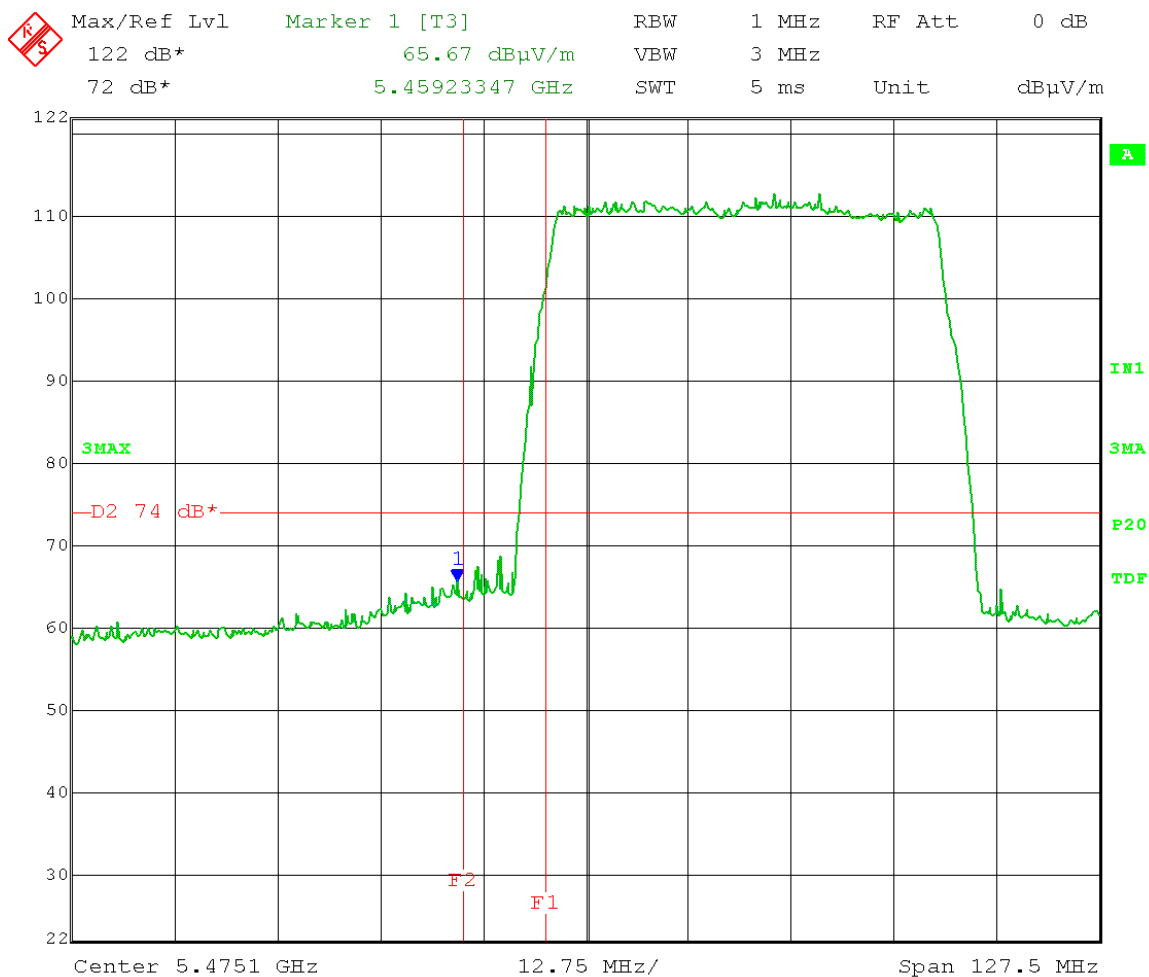
Date: 3.OCT.2013 14:31:25

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: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5495 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.



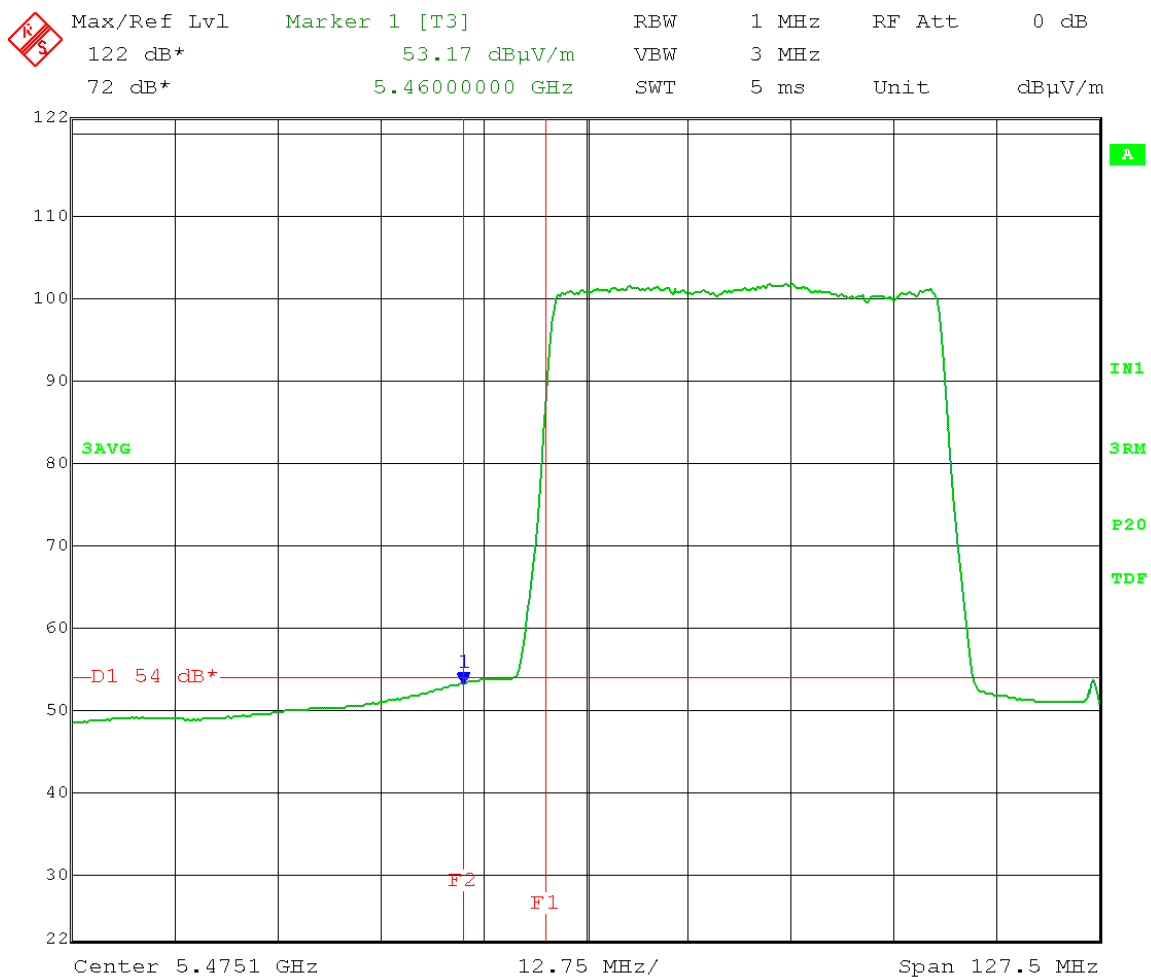
Date: 3.OCT.2013 15:53:25

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



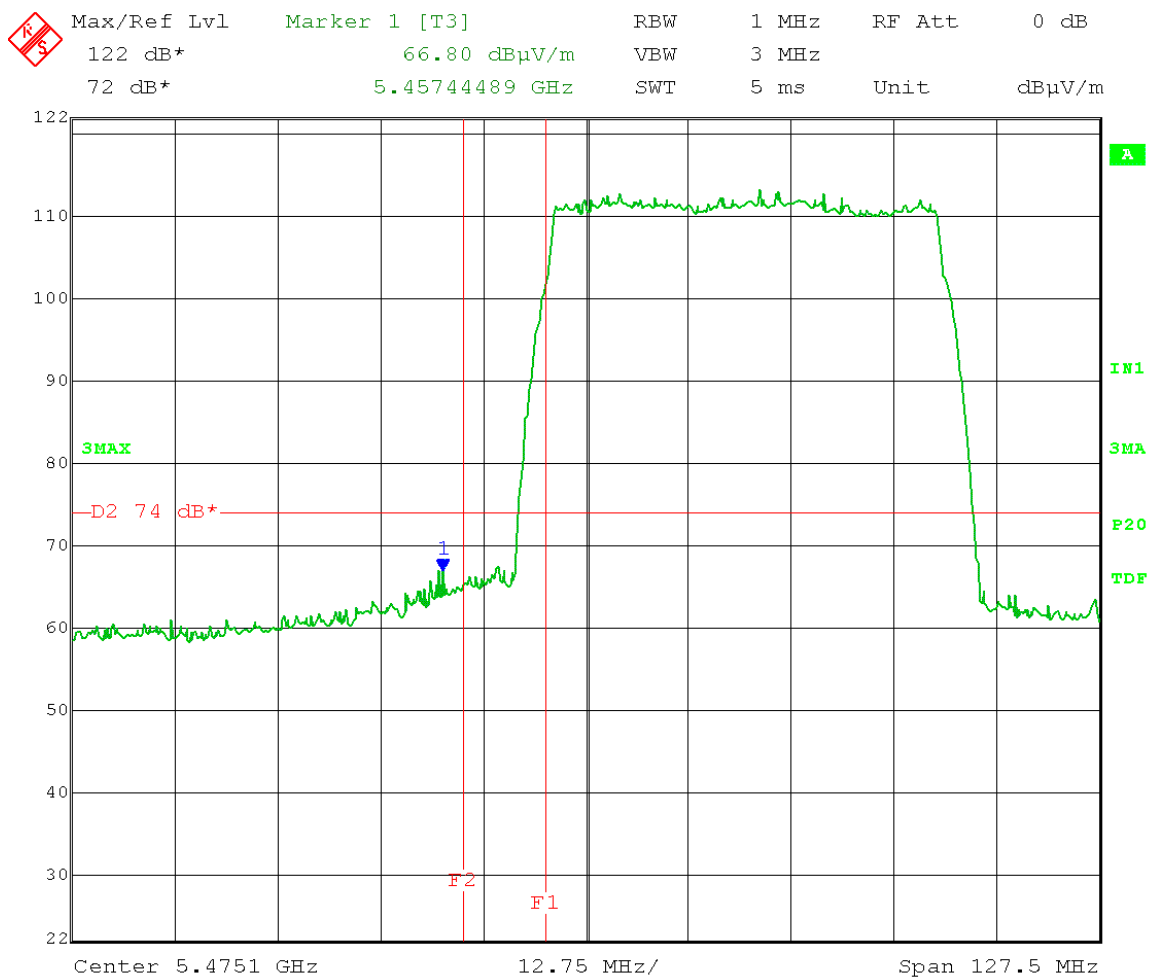
Date: 3.OCT.2013 15:52:51

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



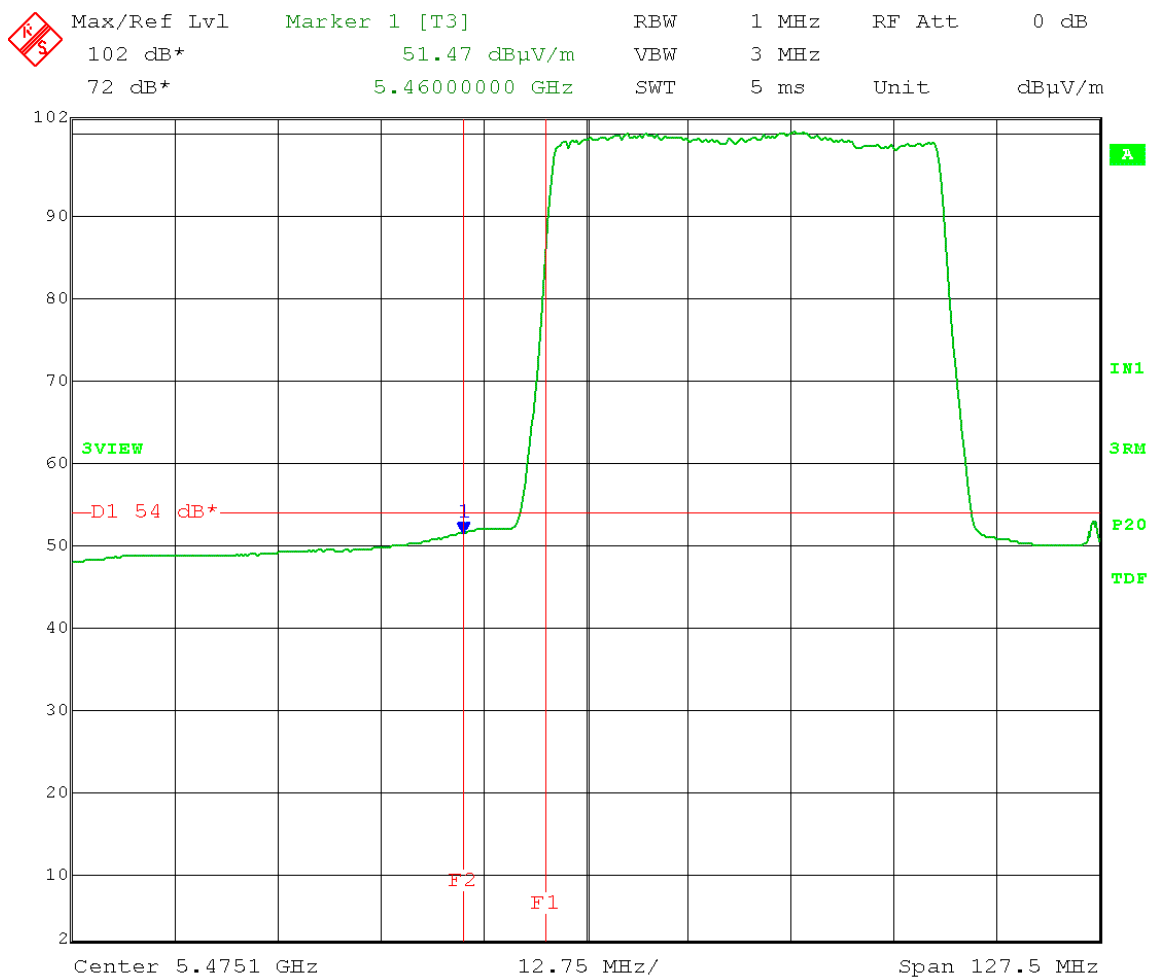
Date: 3.OCT.2013 16:00:28

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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.



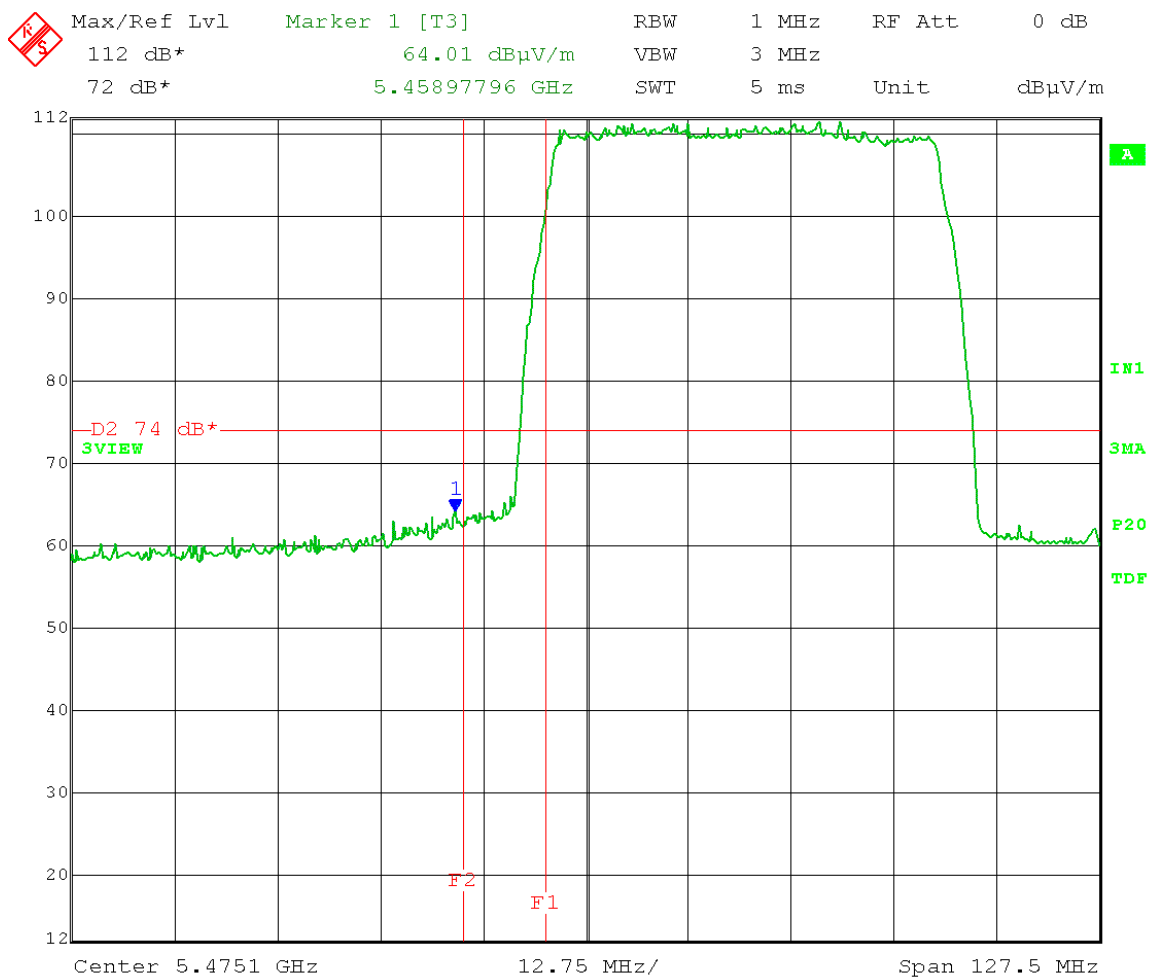
Date: 3.OCT.2013 16:01:02

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 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 14:17:36

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: 50 MHz channel Bandwidth
Low Channel: Frequency – 5495 MHz
Modulation: QPSK
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dB μ V/m PEAK at a test distance of 3 meters.



Date: 3.OCT.2013 14:19:19



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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 x Span/RBW
Sweep time: auto
Detector = RMS
Sweep: trace average 200 sweeps in RMS mode
Use peak search to find the peak of the spectrum
Add 10 log (1/x) where x is the duty cycle when duty cycle is < 98%

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

Results: Passed

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

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

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

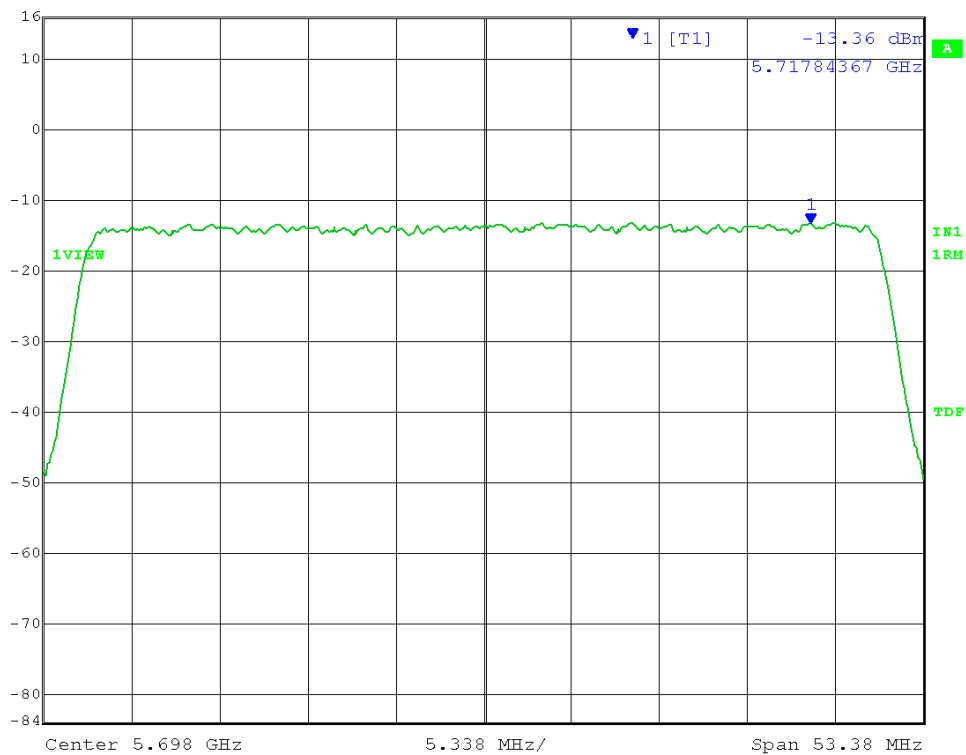
50MHz Operating Bandwidth(Method SA-1):

Peak Power Spectral Density (PPSD)		50MHz				
		QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit=11dBm/MHz	dBm					
	EUT FCC Limit	-6	-6	-6	-6	-6
HCH = 5698 MHz	TX0	-13.5	-13.36	-13.38	-13.4	-13.33
	TX1	-12.6	-14.14	-14.45	-14.32	-13.97
	total(mW)	0.0996	0.0847	0.0818	0.0827	0.0865
	Total(dBm)	-10.02	-10.72	-10.87	-10.83	-10.63
	Margin	4.02	4.72	4.87	4.83	4.63
MCH = 5575 MHz	TX0	-15.52	-15.93	-15.9	-15.52	-15.54
	TX1	-11.61	-13.27	-13.33	-13.28	-13.01
	total(mW)	0.0971	0.0726	0.0722	0.0750	0.0779
	Total(dBm)	-10.13	-11.39	-11.42	-11.25	-11.08
	Margin	4.13	5.39	5.42	5.25	5.08
LCH = 5497 MHz	TX0	-14.06	-15.12	-13.99	-13.97	-13.96
	TX1	-12.51	-13.79	-13.56	-13.7	-13.52
	total(mW)	0.0954	0.0725	0.0840	0.0827	0.0846
	Total(dBm)	-10.21	-11.39	-10.76	-10.82	-10.72
	Margin	4.21	5.39	4.76	4.82	4.72

50MHz BW, HCH, 16QAM

TX 0: 26 dB EBW = 53.38MHz

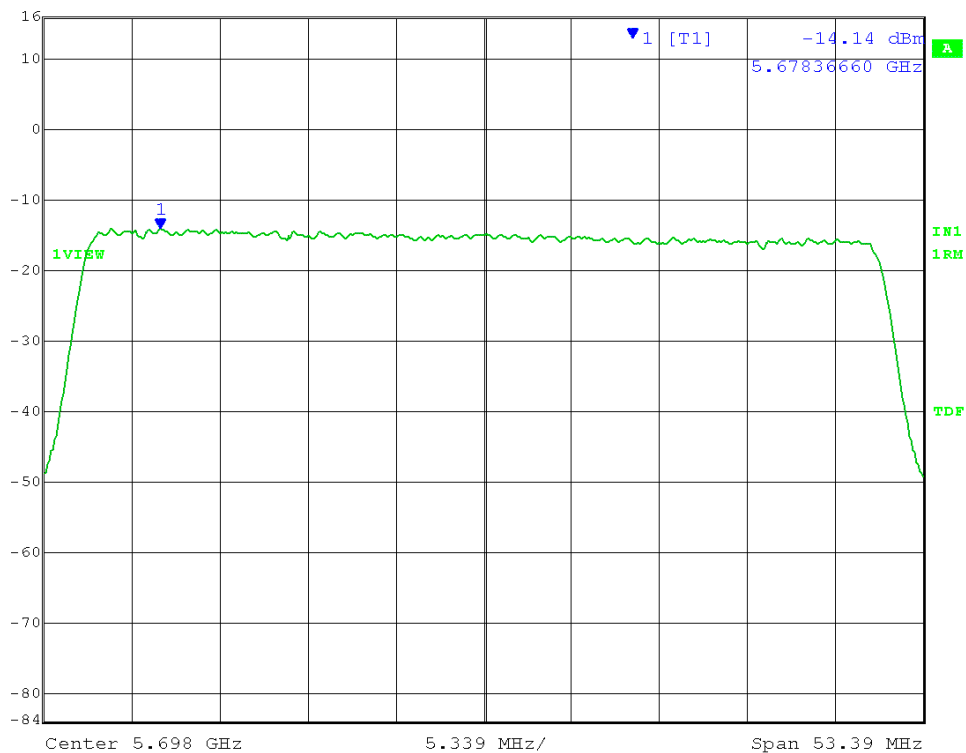
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.36 dBm VBW 3 MHz
-20 dBm 5.71784367 GHz SWT 5 ms Unit dBm



Date: 7.OCT.2013 15:43:02

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -14.14 dBm VBW 3 MHz
-20 dBm 5.67836660 GHz SWT 5 ms Unit dBm

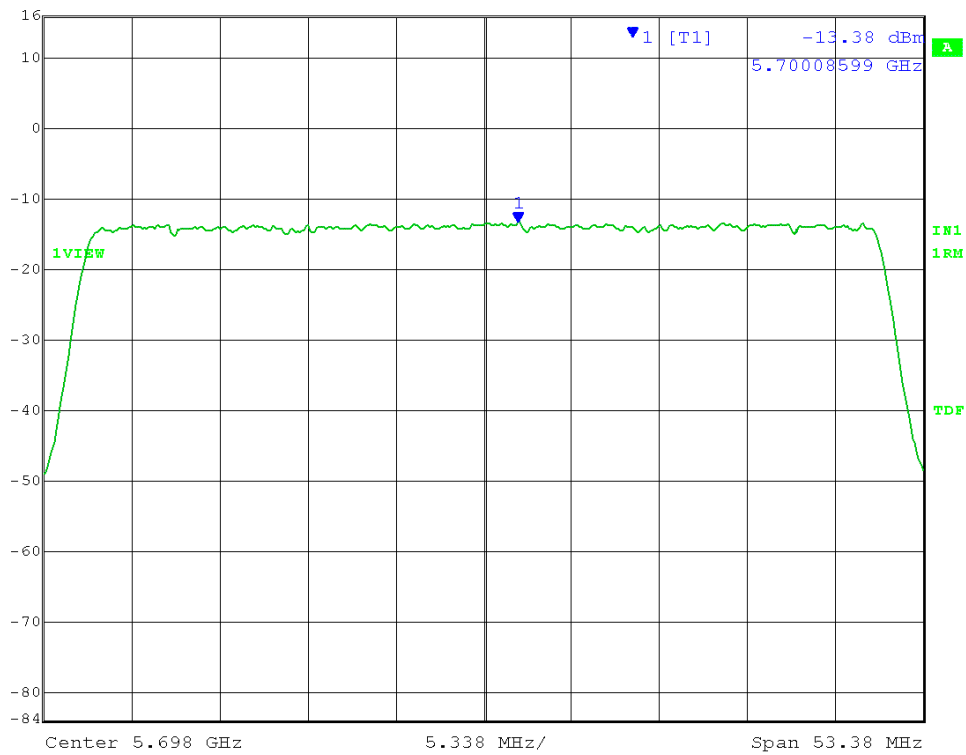


Date: 16.OCT.2013 15:52:46

50MHz BW, HCH, 64QAM

TX 0: 26 dB EBW = 53.38MHz

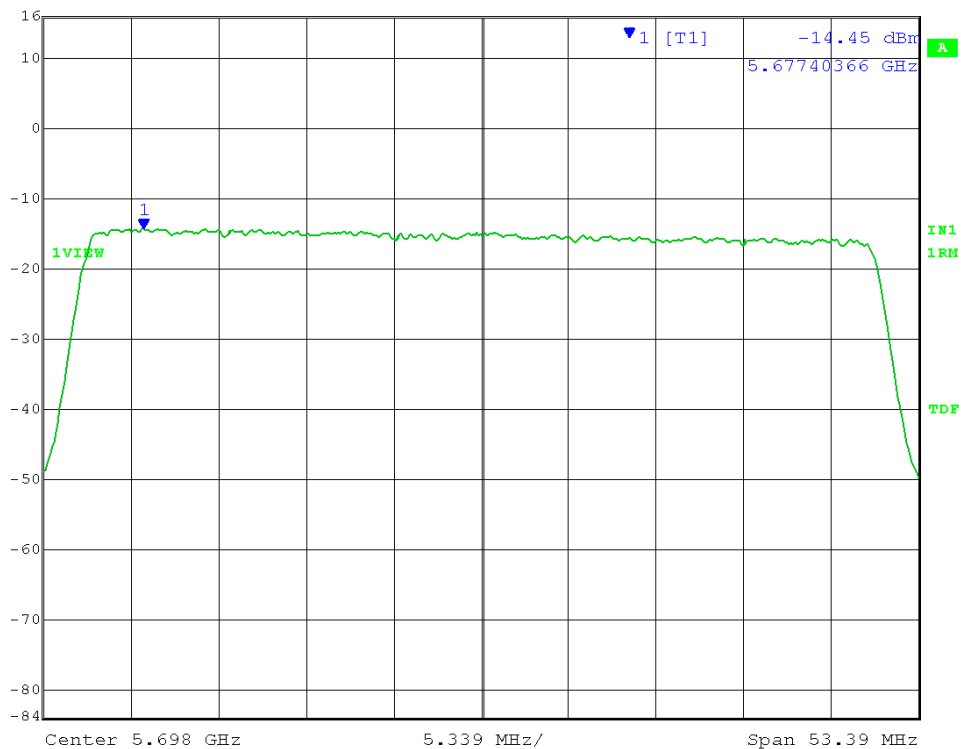
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.38 dBm VBW 3 MHz
-20 dBm 5.70008599 GHz SWT 5 ms Unit dBm



Date: 7.OCT.2013 15:44:26

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -14.45 dBm VBW 3 MHz
-20 dBm 5.67740366 GHz SWT 5 ms Unit dBm

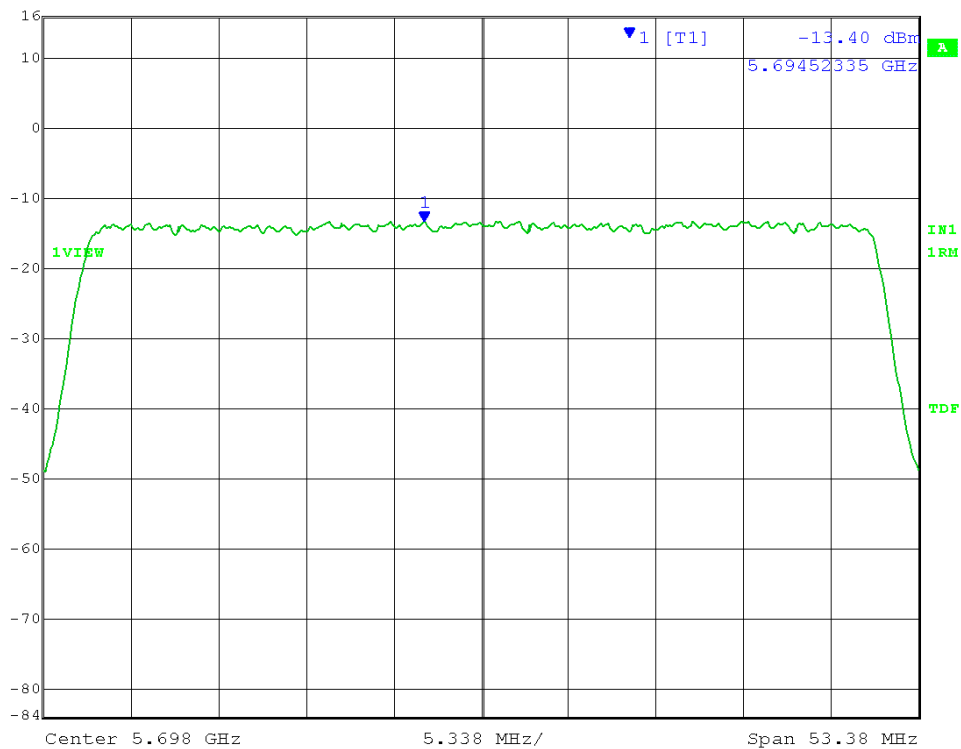


Date: 16.OCT.2013 15:47:46

50MHz BW, HCH, 256QAM

TX 0: 26 dB EBW = 53.38MHz

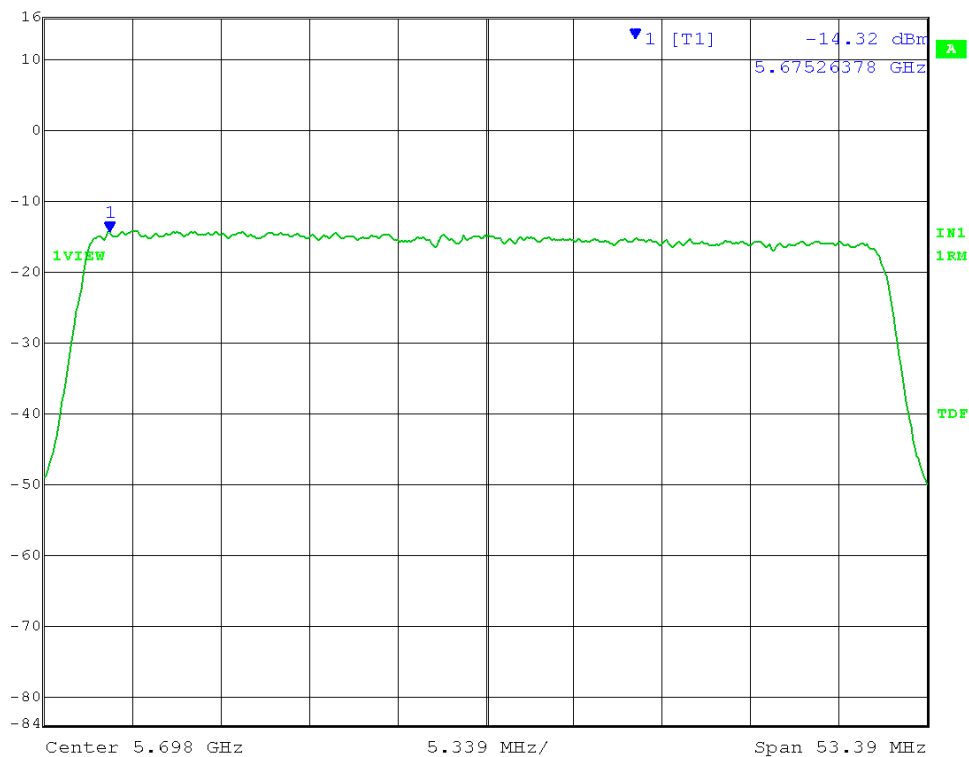
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.40 dBm VBW 3 MHz
-20 dBm 5.69452335 GHz SWT 5 ms Unit dBm



Date: 7.OCT.2013 15:45:35

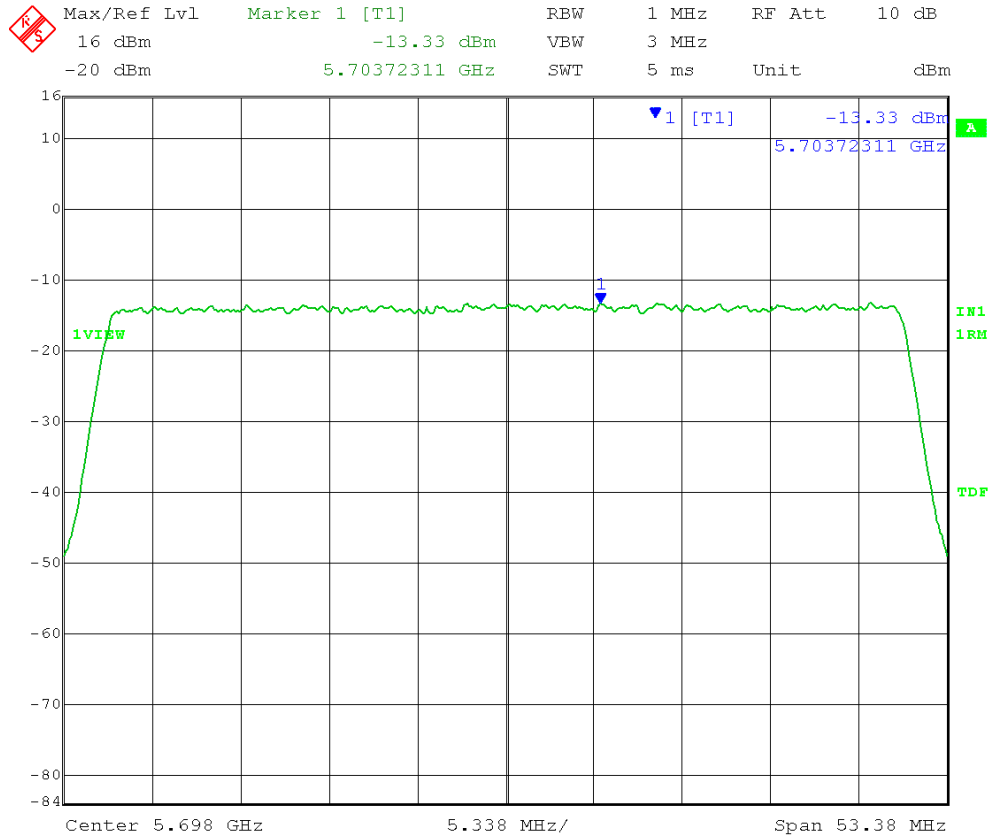
TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -14.32 dBm VBW 3 MHz
-20 dBm 5.67526378 GHz SWT 5 ms Unit dBm



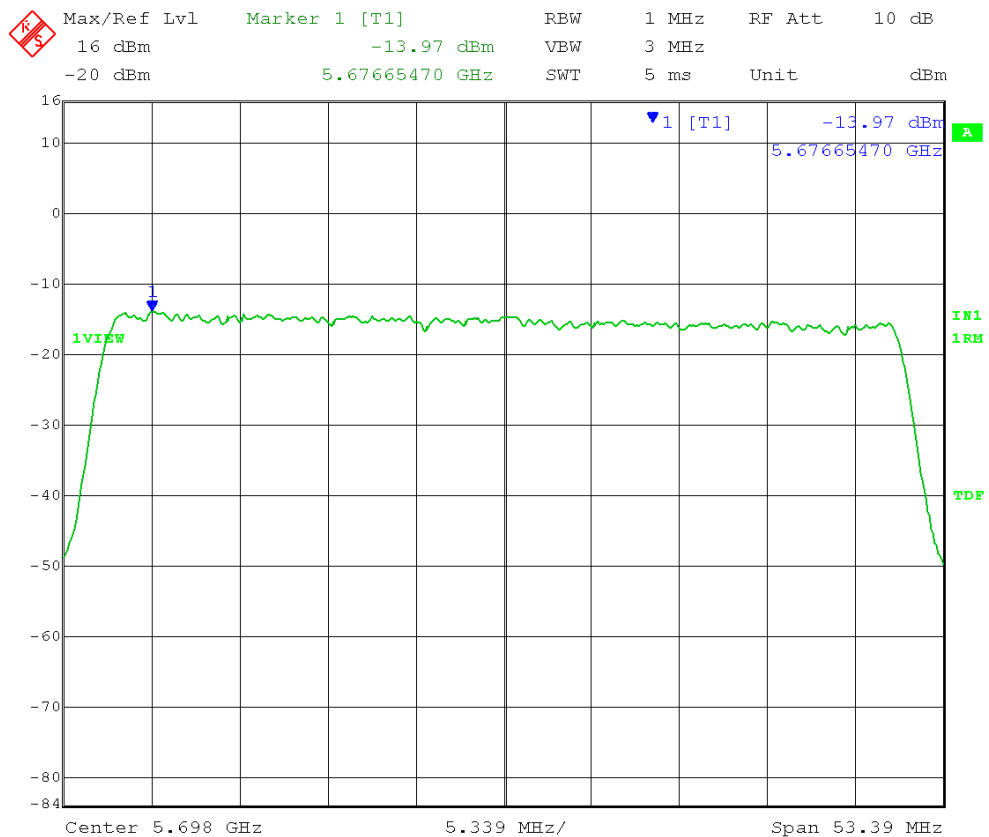
Date: 16.OCT.2013 15:51:00

50MHz BW, HCH, 1024QAM
TX 0: 26 dB EBW = 53.38MHz



Date: 7.OCT.2013 15:46:41

TX1: 26 dB EBW = 53.39MHz

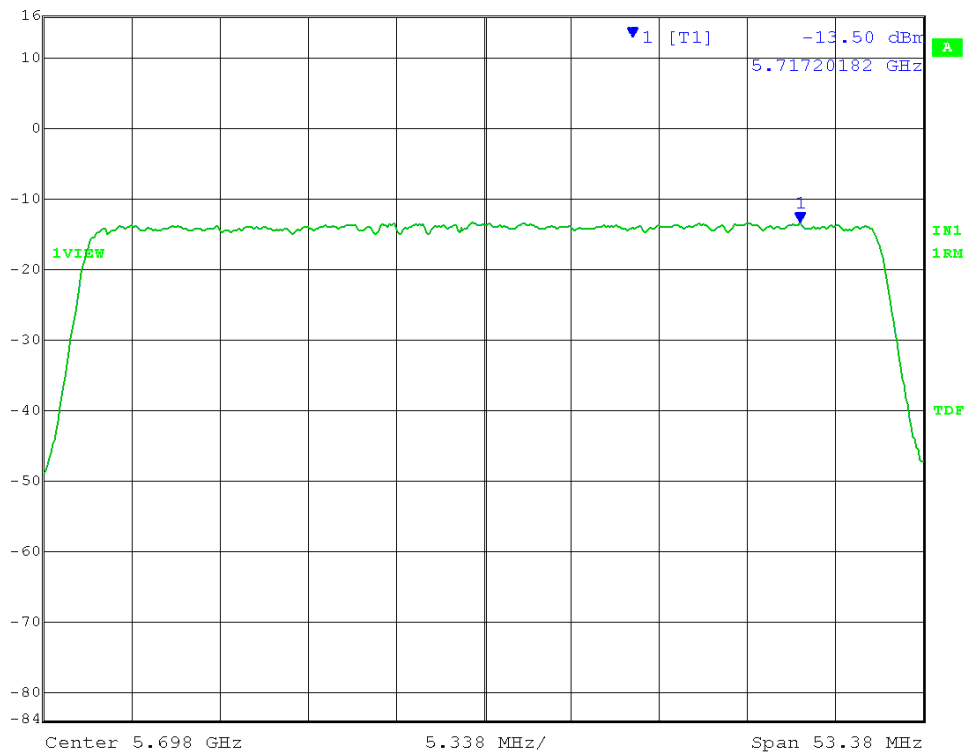


Date: 16.OCT.2013 15:51:50

50MHz BW, HCH, QPSK

TX 0: 26 dB EBW = 53.38MHz

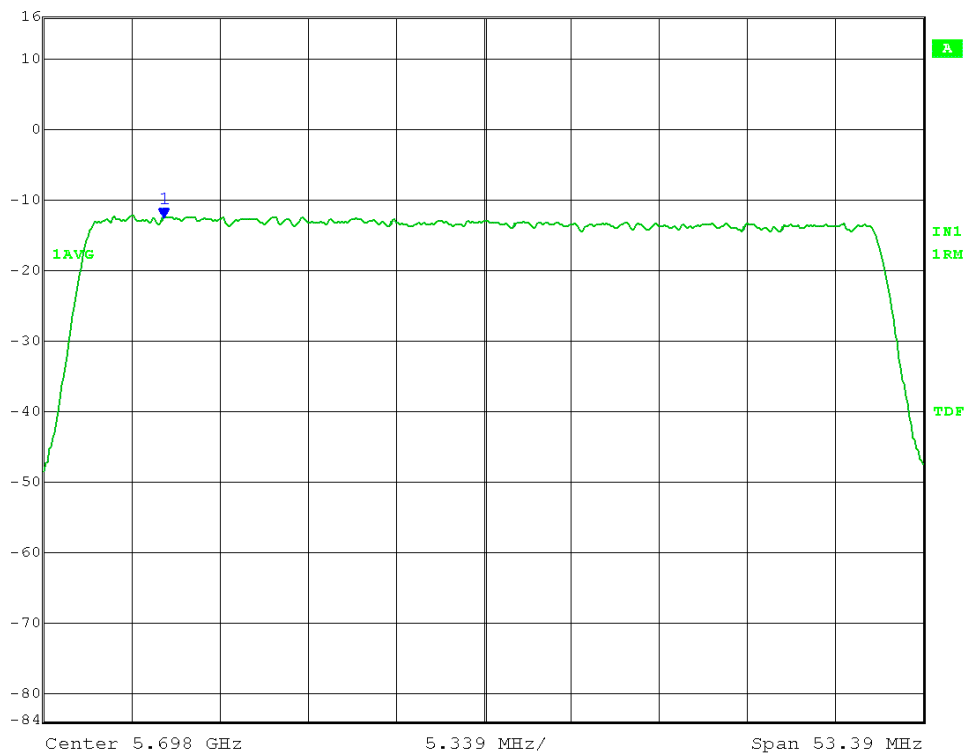
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.50 dBm VBW 3 MHz
-20 dBm 5.71720182 GHz SWT 5 ms Unit dBm



Date: 7.OCT.2013 15:41:35

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -12.60 dBm VBW 3 MHz
-20 dBm 5.67858059 GHz SWT 5 ms Unit dBm

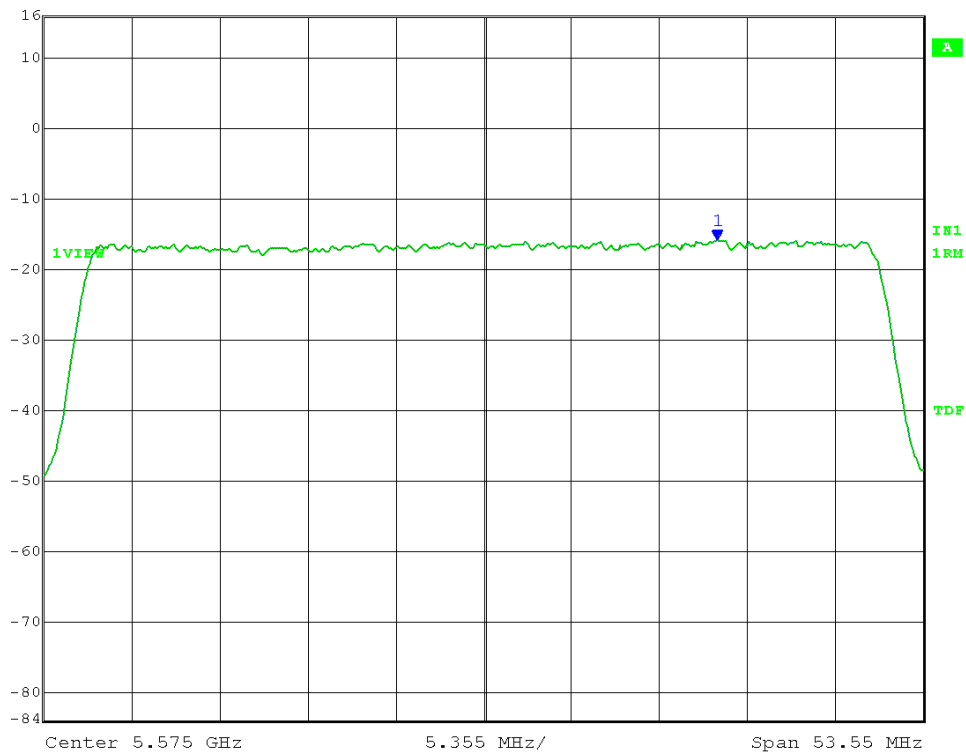


Date: 7.OCT.2013 13:24:36

50MHz BW, MCH, 16QAM

TX 0: 26 dB EBW = 53.55MHz

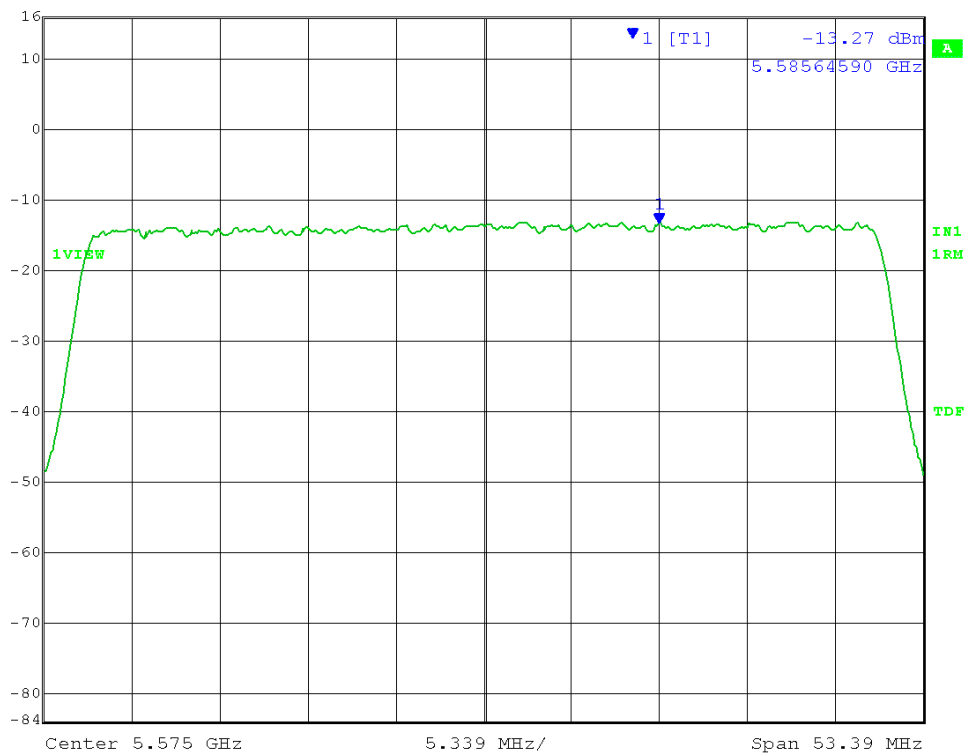
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -15.93 dBm VBW 3 MHz
-10 dBm 5.58921919 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:38:32

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.27 dBm VBW 3 MHz
-20 dBm 5.58564590 GHz SWT 5 ms Unit dBm

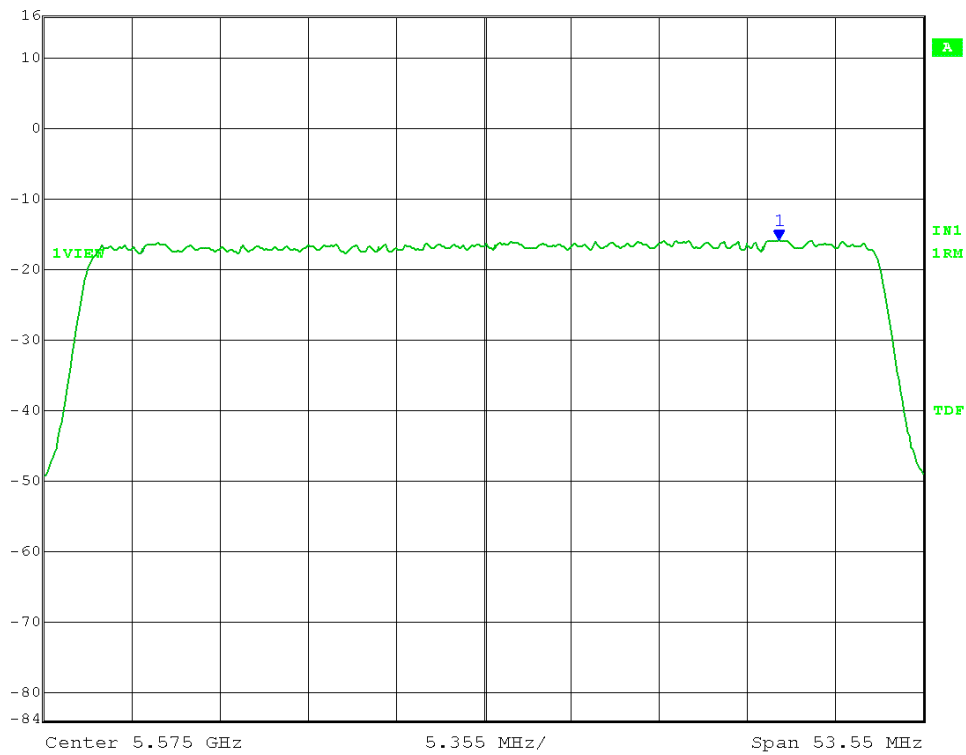


Date: 16.OCT.2013 15:45:53

50MHz BW, MCH, 64QAM

TX 0: 26 dB EBW = 53.55MHz

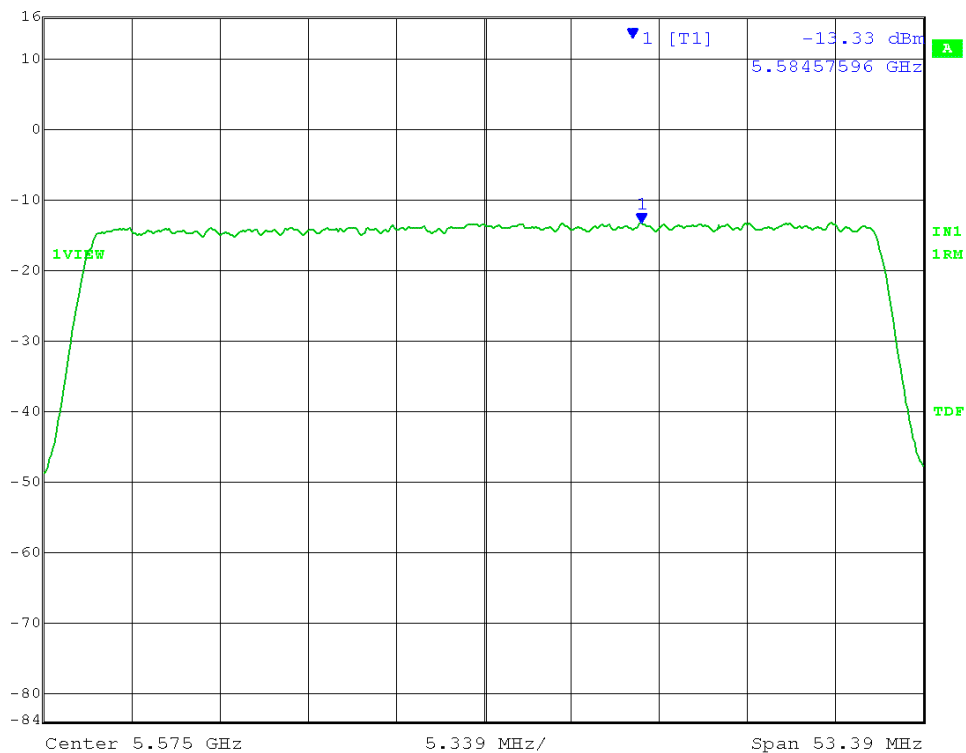
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -15.90 dBm VBW 3 MHz
-10 dBm 5.59297520 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:36:19

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.33 dBm VBW 3 MHz
-20 dBm 5.58457596 GHz SWT 5 ms Unit dBm

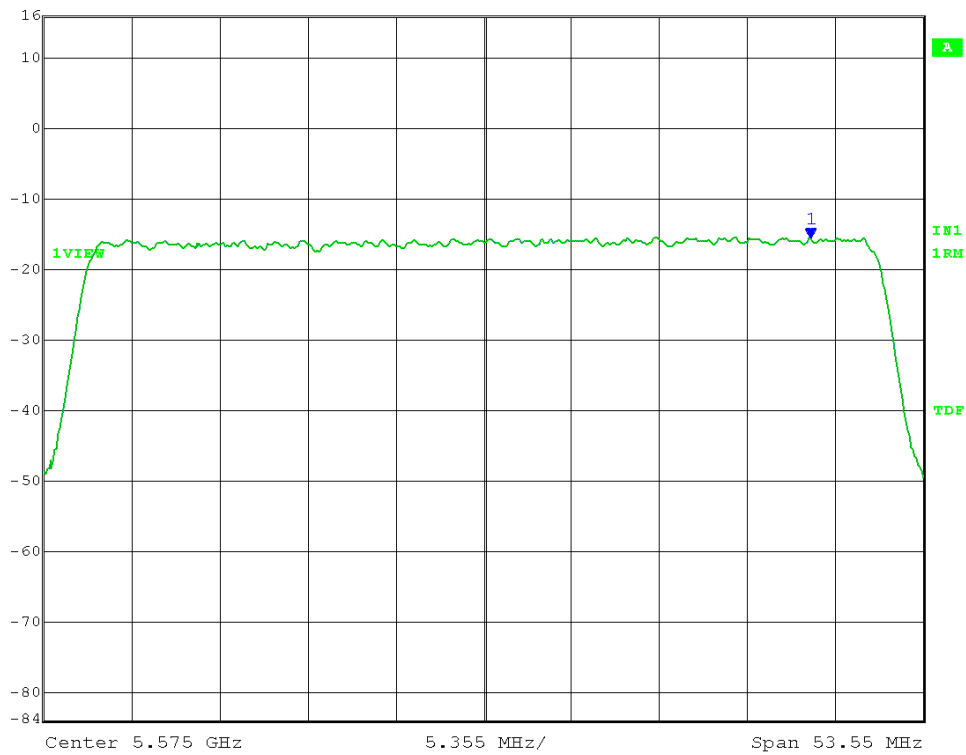


Date: 16.OCT.2013 15:42:49

50MHz BW, MCH, 256QAM

TX 0: 26 dB EBW = 53.55MHz

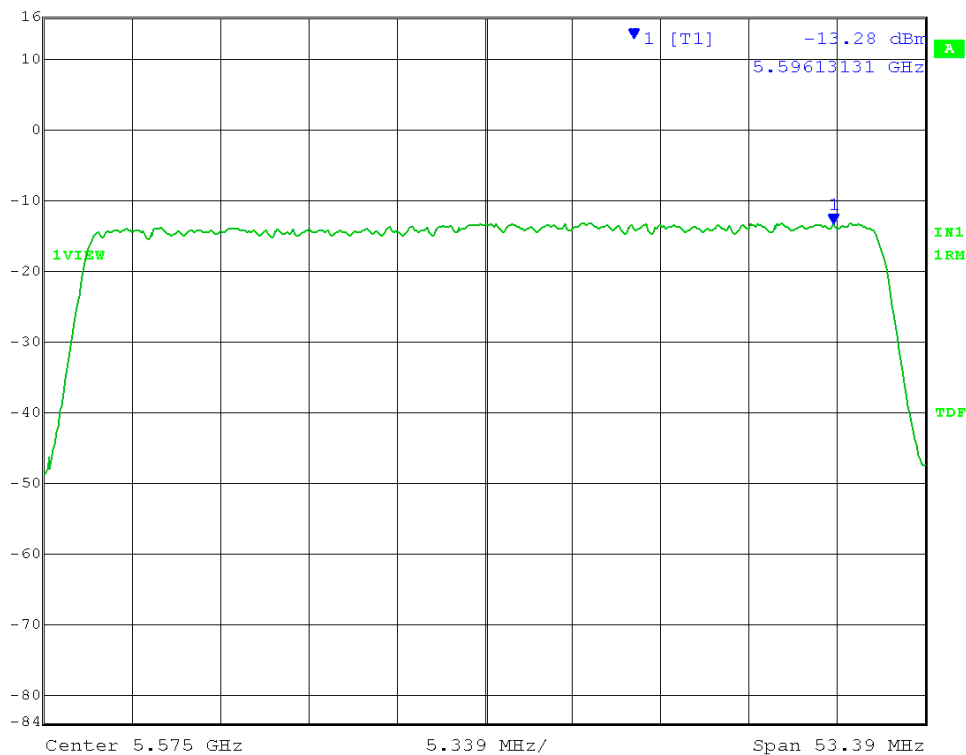
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -15.52 dBm VBW 3 MHz
-10 dBm 5.59490686 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:35:17

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.28 dBm VBW 3 MHz
-20 dBm 5.59613131 GHz SWT 5 ms Unit dBm

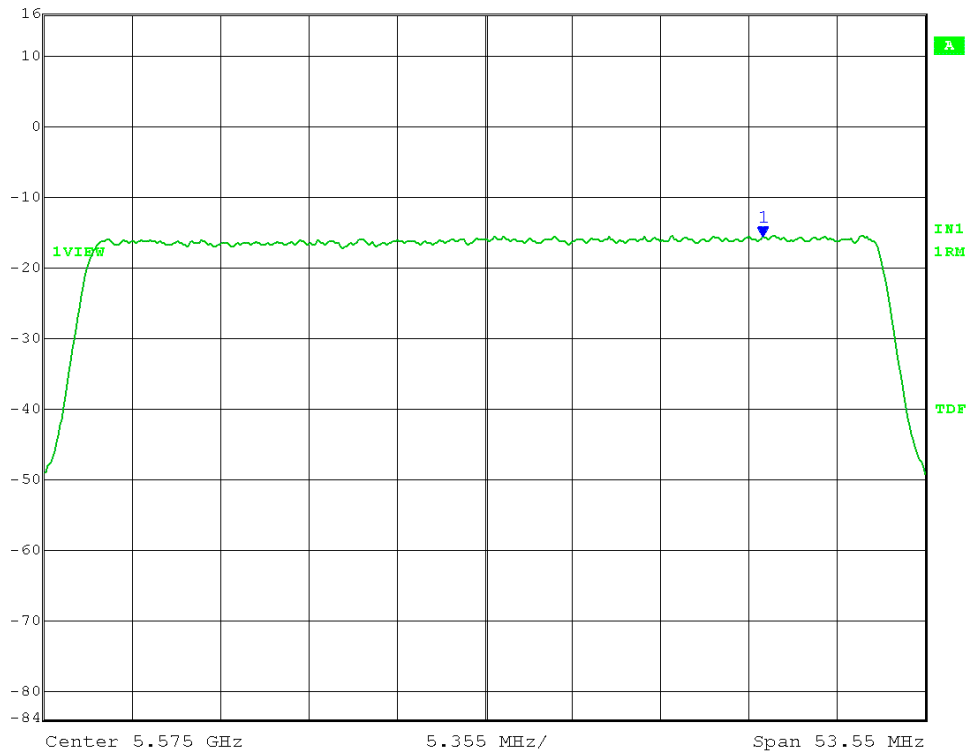


Date: 16.OCT.2013 15:43:51

50MHz BW, MCH, 1024QAM

TX 0: 26 dB EBW = 53.55MHz

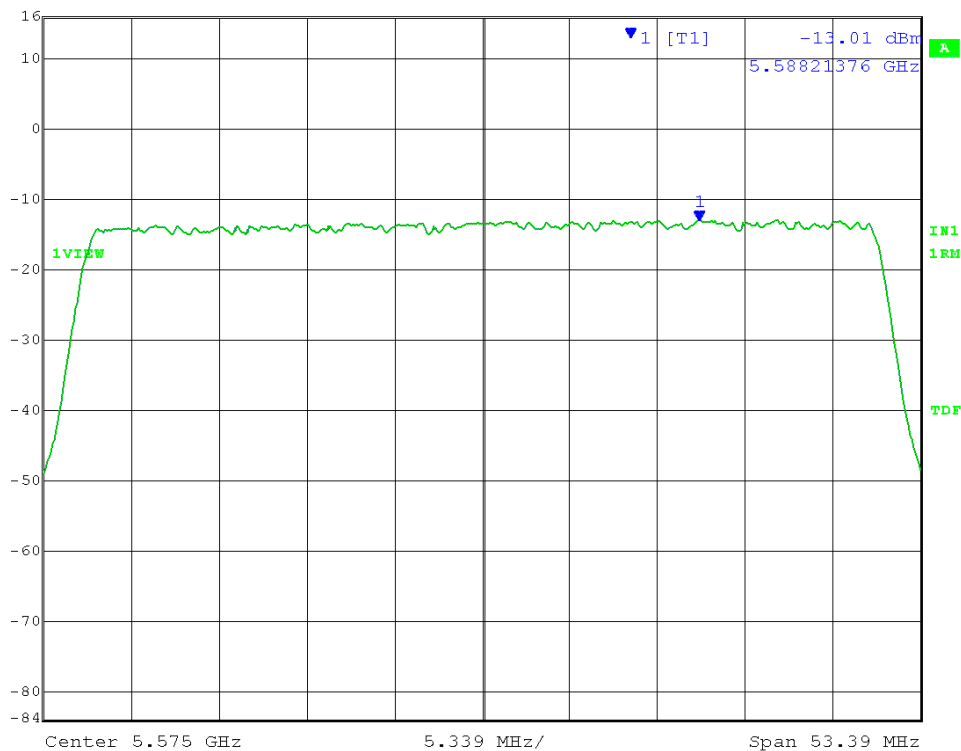
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -15.54 dBm VBW 3 MHz
-10 dBm 5.59190205 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:32:34

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.01 dBm VBW 3 MHz
-20 dBm 5.58821376 GHz SWT 5 ms Unit dBm

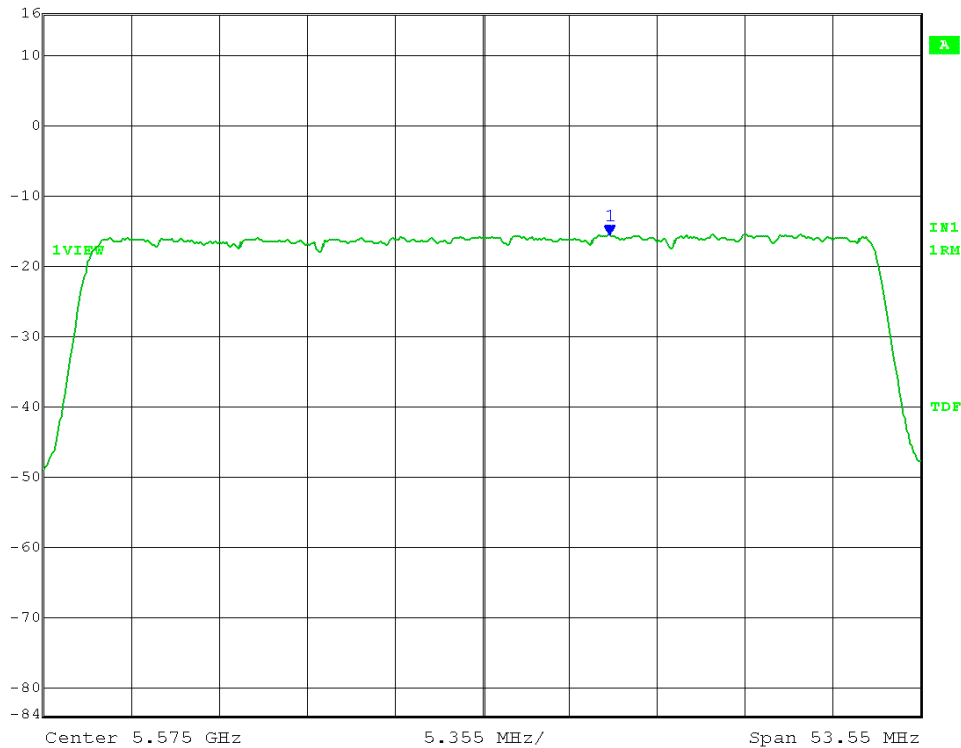


Date: 16.OCT.2013 15:44:53

50MHz BW, MCH, QPSK

TX 0: 26 dB EBW = 53.55MHz

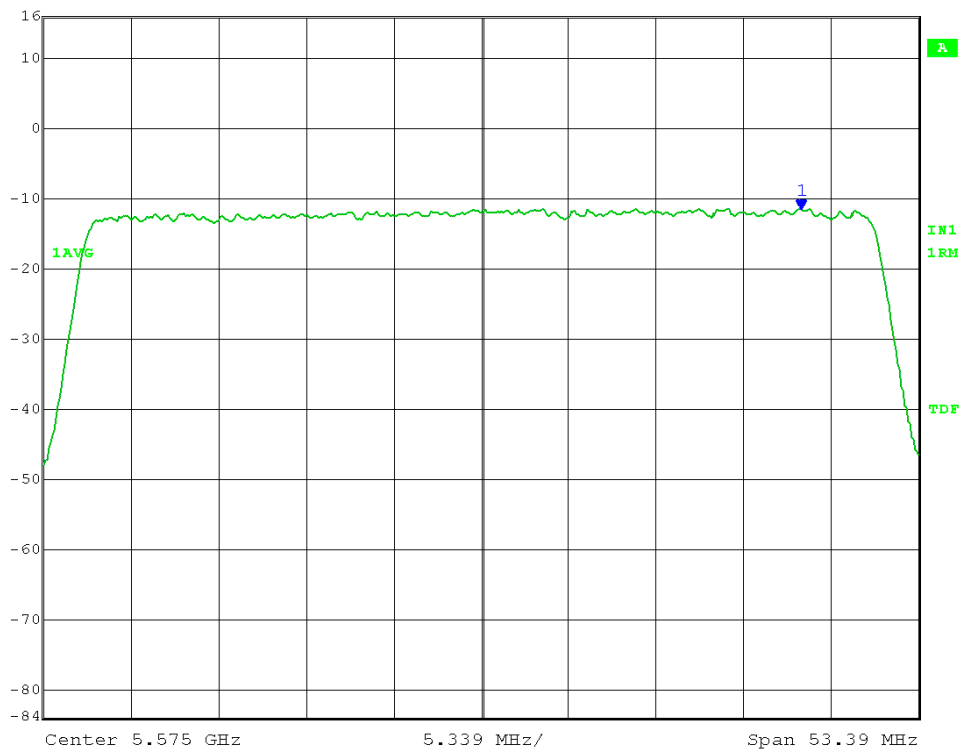
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -15.52 dBm VBW 3 MHz
-10 dBm 5.58278031 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:39:36

TX1: 26 dB EBW = 53.39MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -11.61 dBm VBW 3 MHz
-20 dBm 5.59452640 GHz SWT 5 ms Unit dBm

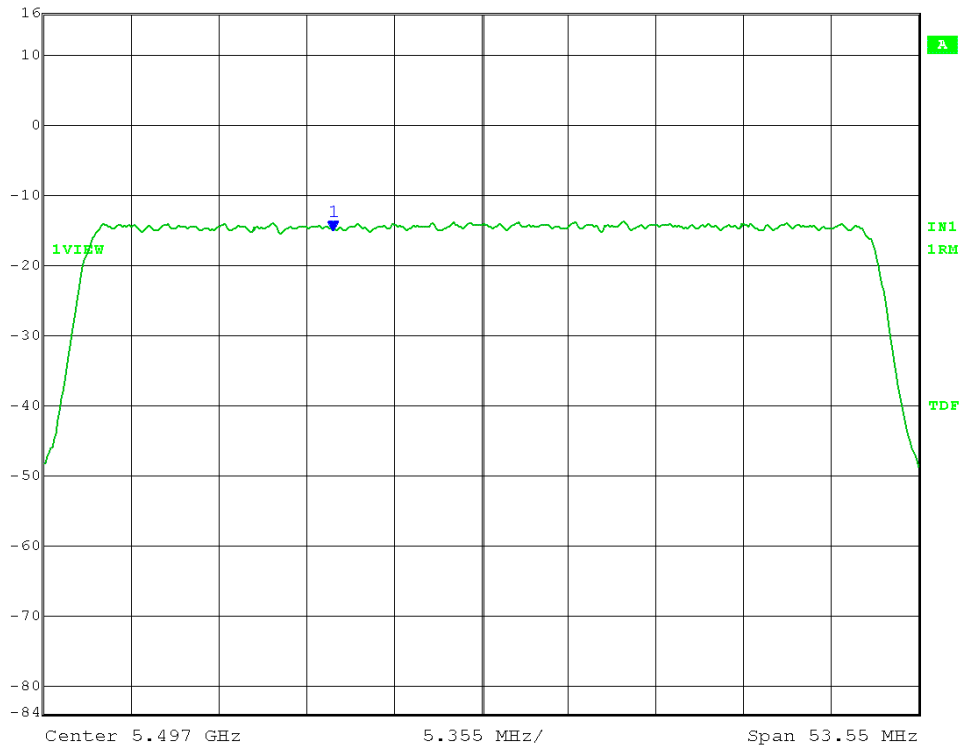


Date: 7.OCT.2013 13:22:15

50MHz BW, LCH, 16QAM

TX 0: 26 dB EBW = 53.39MHz

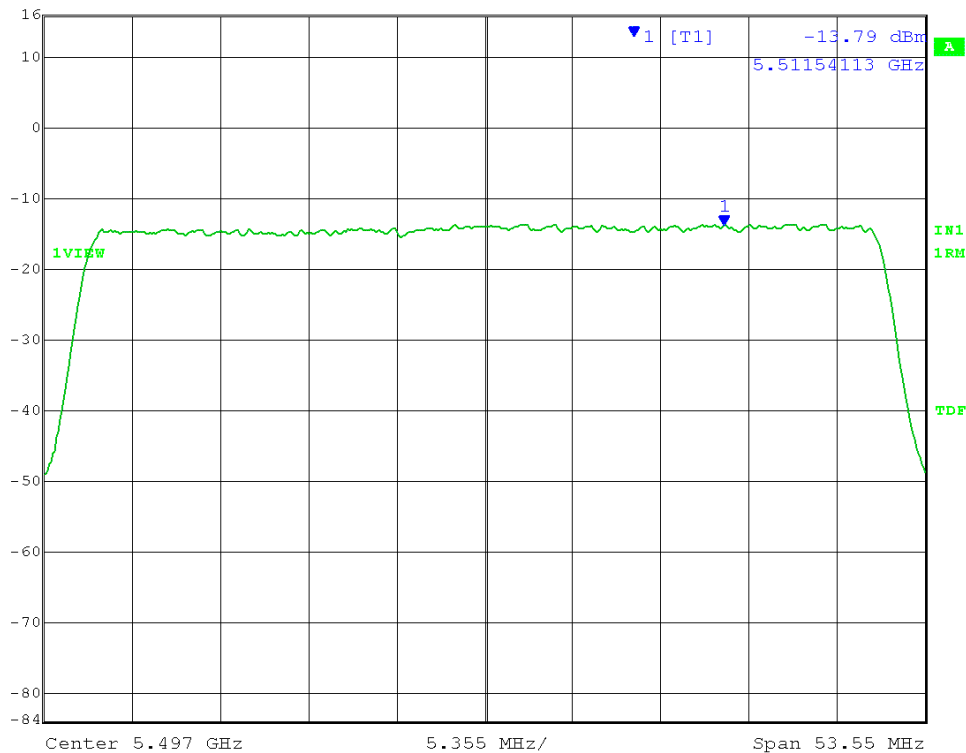
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -15.12 dBm VBW 3 MHz
-10 dBm 5.48793191 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:21:12

TX1: 26 dB EBW = 53.33MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.79 dBm VBW 3 MHz
-20 dBm 5.51154113 GHz SWT 5 ms Unit dBm

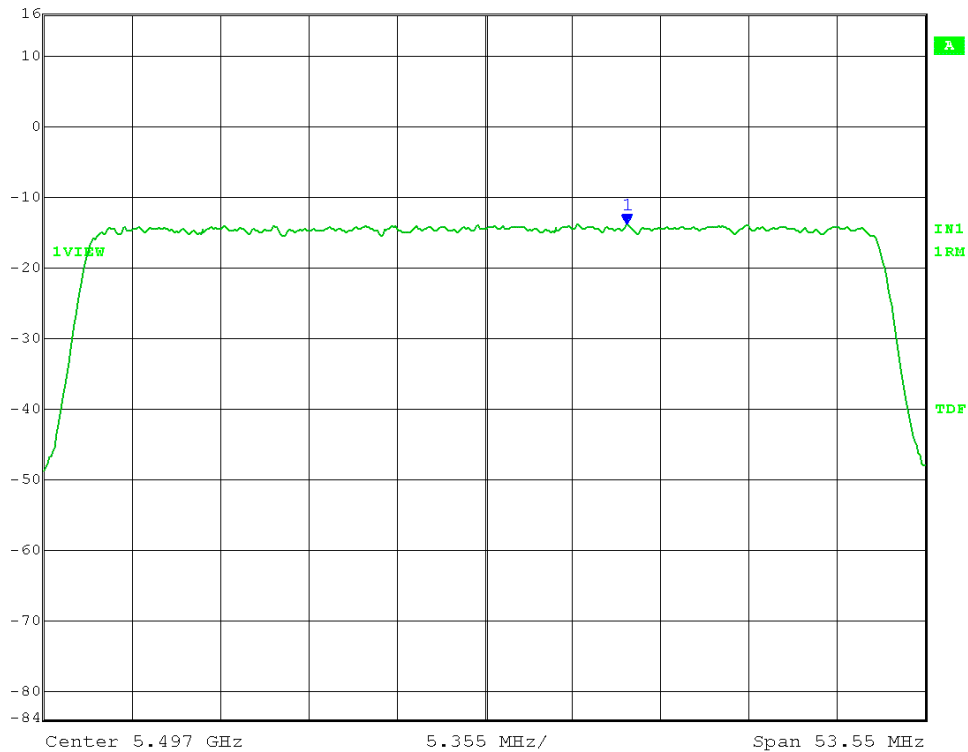


Date: 16.OCT.2013 15:33:11

50MHz BW, LCH, 64QAM

TX 0: 26 dB EBW = 53.39MHz

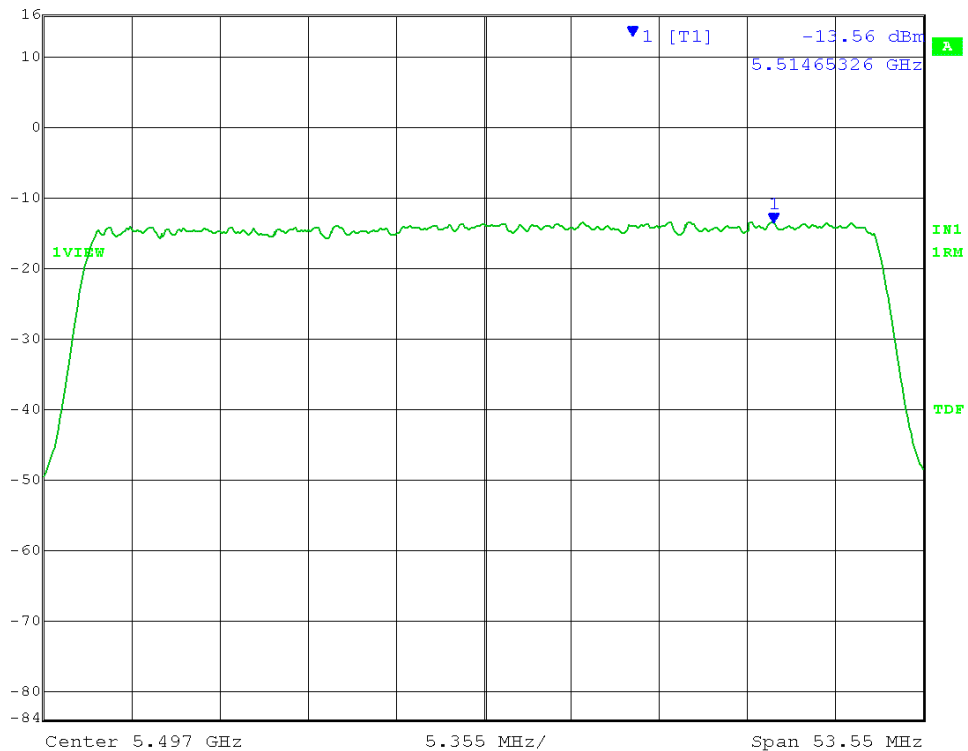
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.99 dBm VBW 3 MHz
-10 dBm 5.50563883 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:24:09

TX1: 26 dB EBW = 53.55MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.56 dBm VBW 3 MHz
-20 dBm 5.51465326 GHz SWT 5 ms Unit dBm

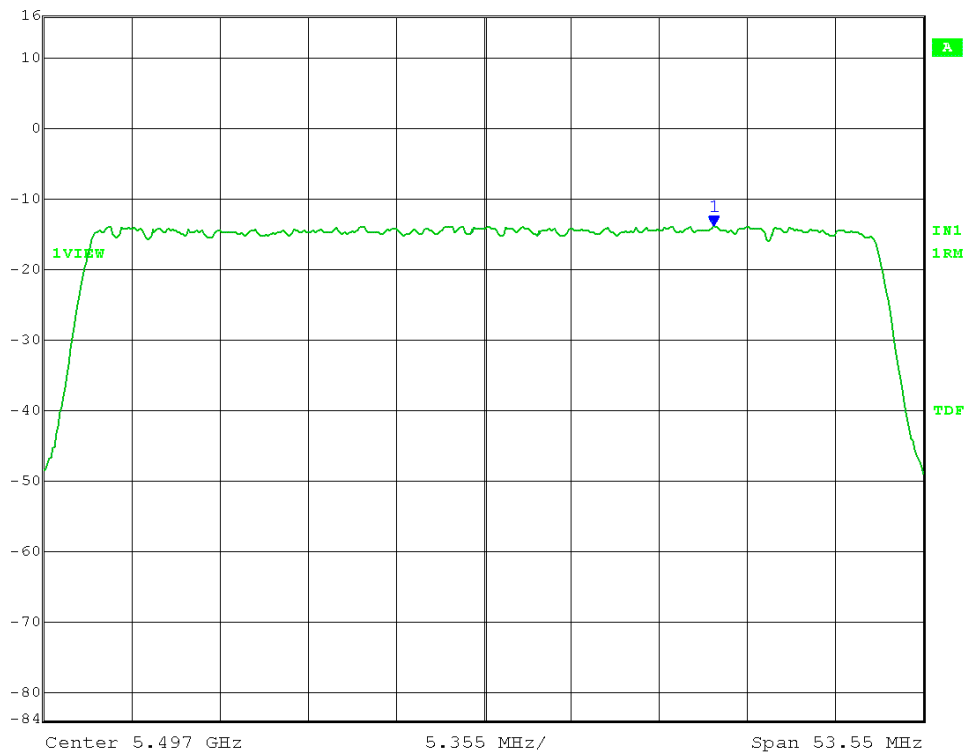


Date: 16.OCT.2013 15:36:09

50MHz BW, LCH, 256QAM

TX 0: 26 dB EBW = 53.39MHz

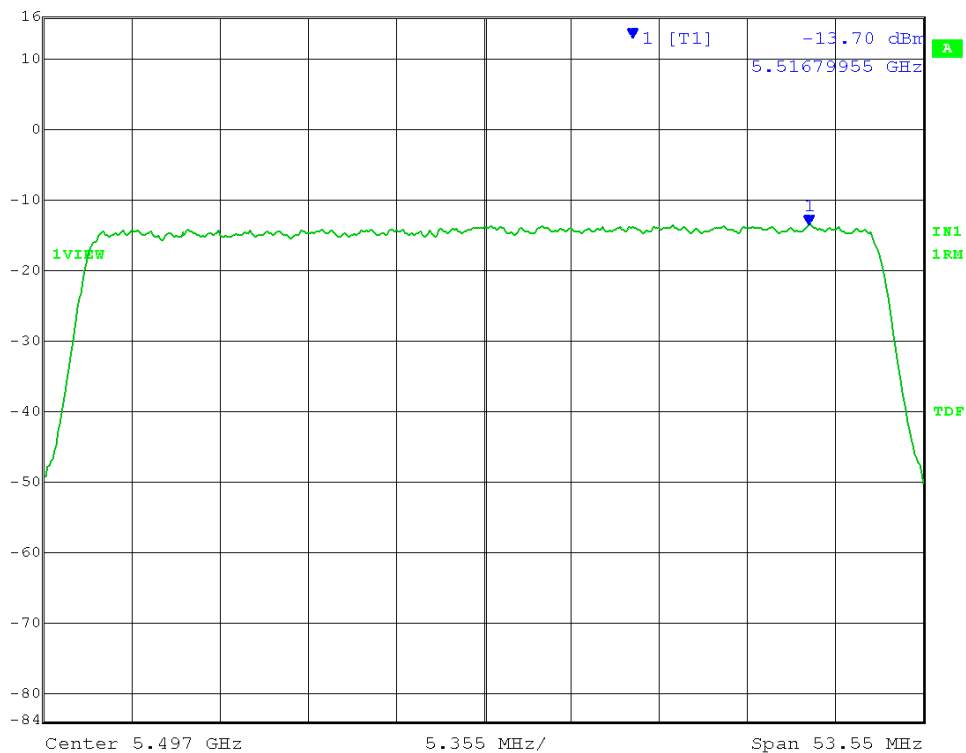
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.97 dBm VBW 3 MHz
-10 dBm 5.51100456 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:25:26

TX1: 26 dB EBW = 53.55MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.70 dBm VBW 3 MHz
-20 dBm 5.51679955 GHz SWT 5 ms Unit dBm

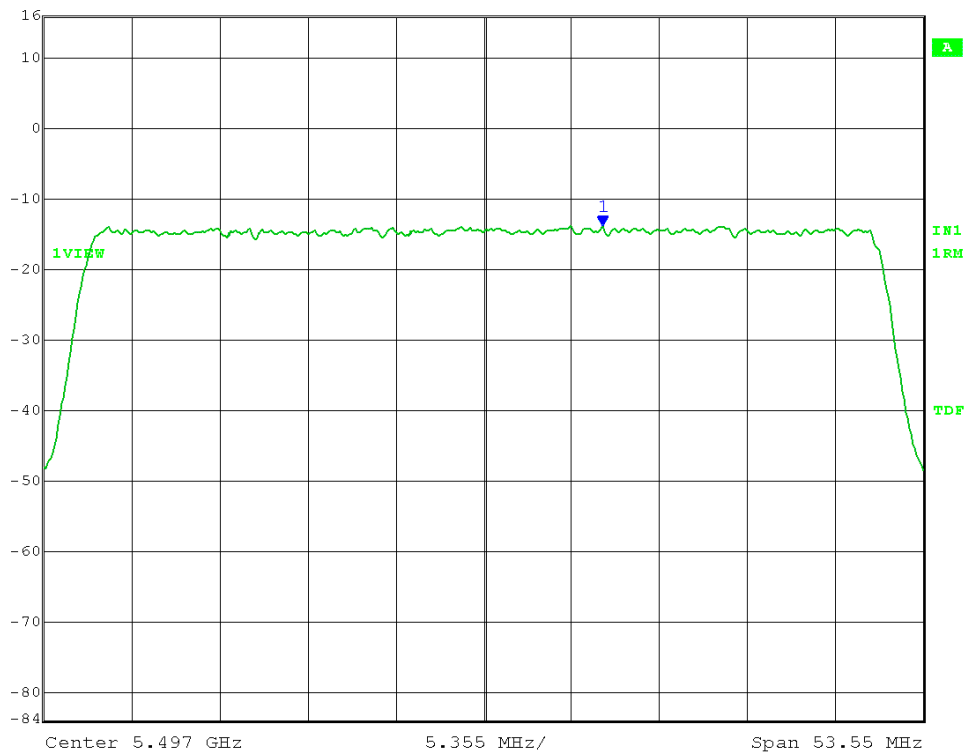


Date: 16.OCT.2013 15:37:45

50MHz BW, LCH, 1024QAM

TX 0: 26 dB EBW = 53.39MHz

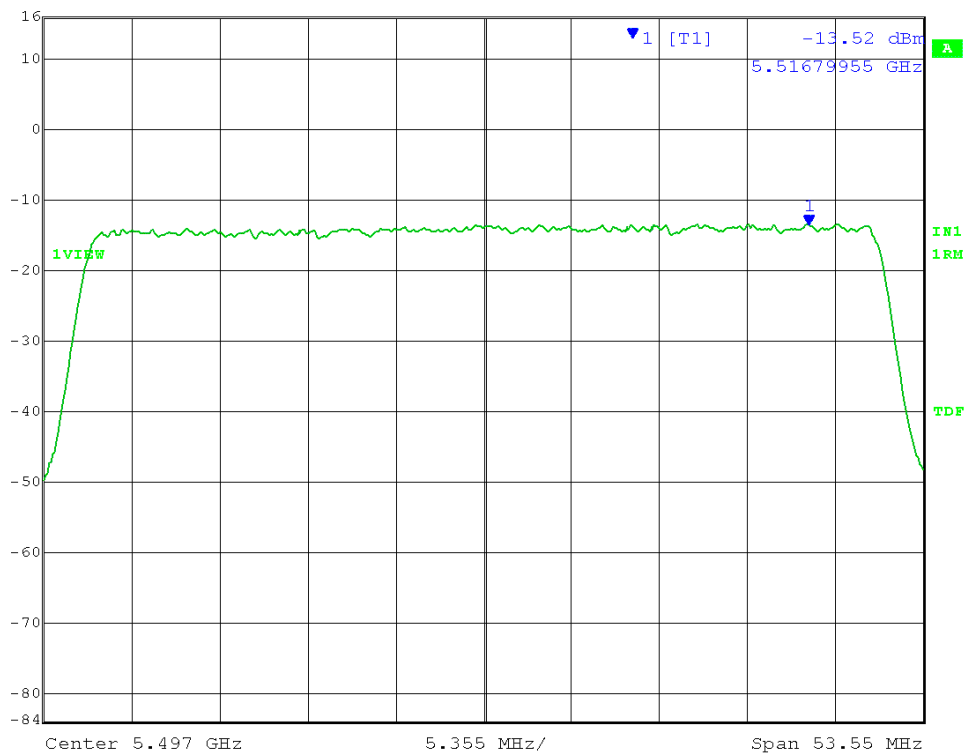
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.96 dBm VBW 3 MHz
-10 dBm 5.50424374 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:28:58

TX1: 26 dB EBW = 53.55MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -13.52 dBm VBW 3 MHz
-20 dBm 5.51679955 GHz SWT 5 ms Unit dBm

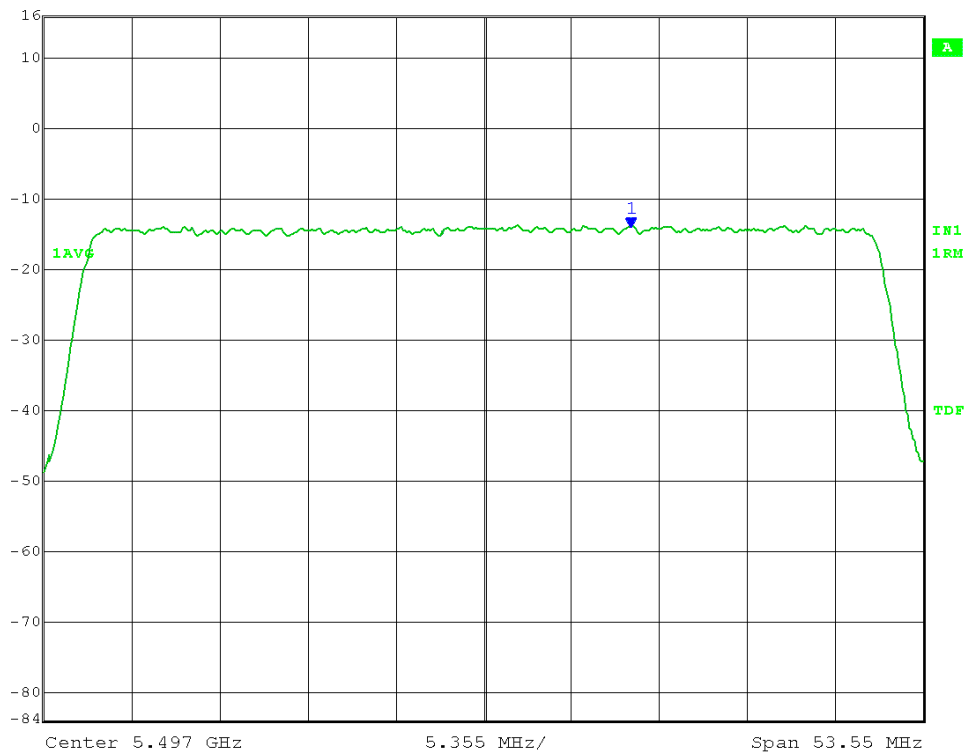


Date: 16.OCT.2013 15:39:55

50MHz BW, LCH, QPSK

TX 0: 26 dB EBW = 53.39MHz

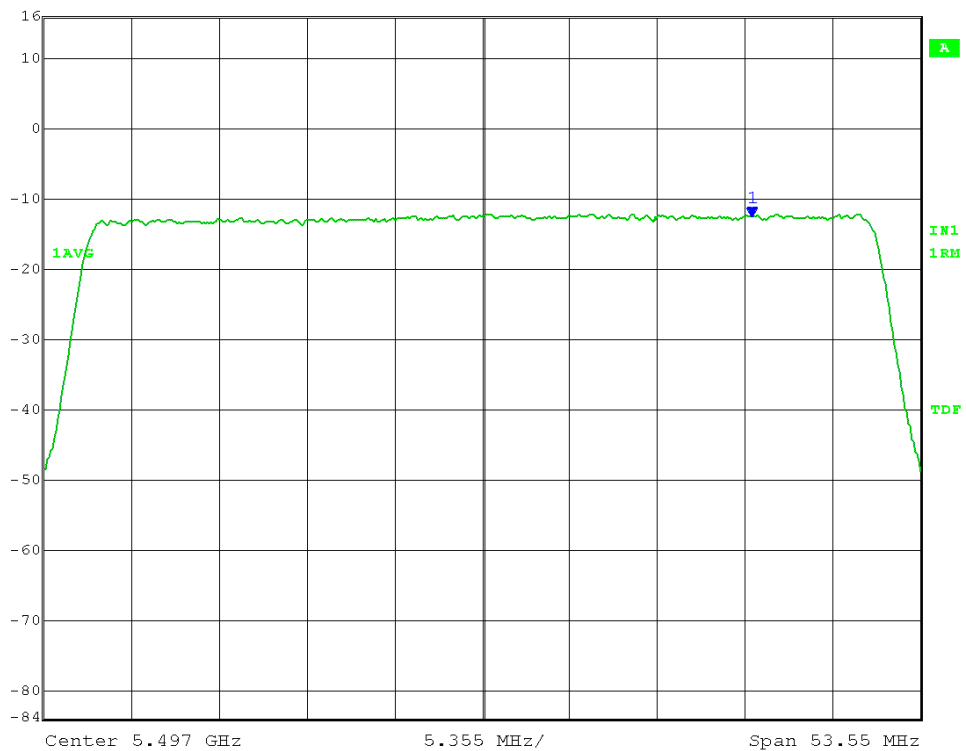
Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -14.06 dBm VBW 3 MHz
-10 dBm 5.50596077 GHz SWT 5 ms Unit dBm



Date: 15.OCT.2013 11:15:19

TX1: 26 dB EBW = 53.55MHz

Max/Ref Lvl Marker 1 [T1] RBW 1 MHz RF Att 10 dB
16 dBm -12.51 dBm VBW 3 MHz
-20 dBm 5.51347280 GHz SWT 5 ms Unit dBm



Date: 7.OCT.2013 13:17:54



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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.

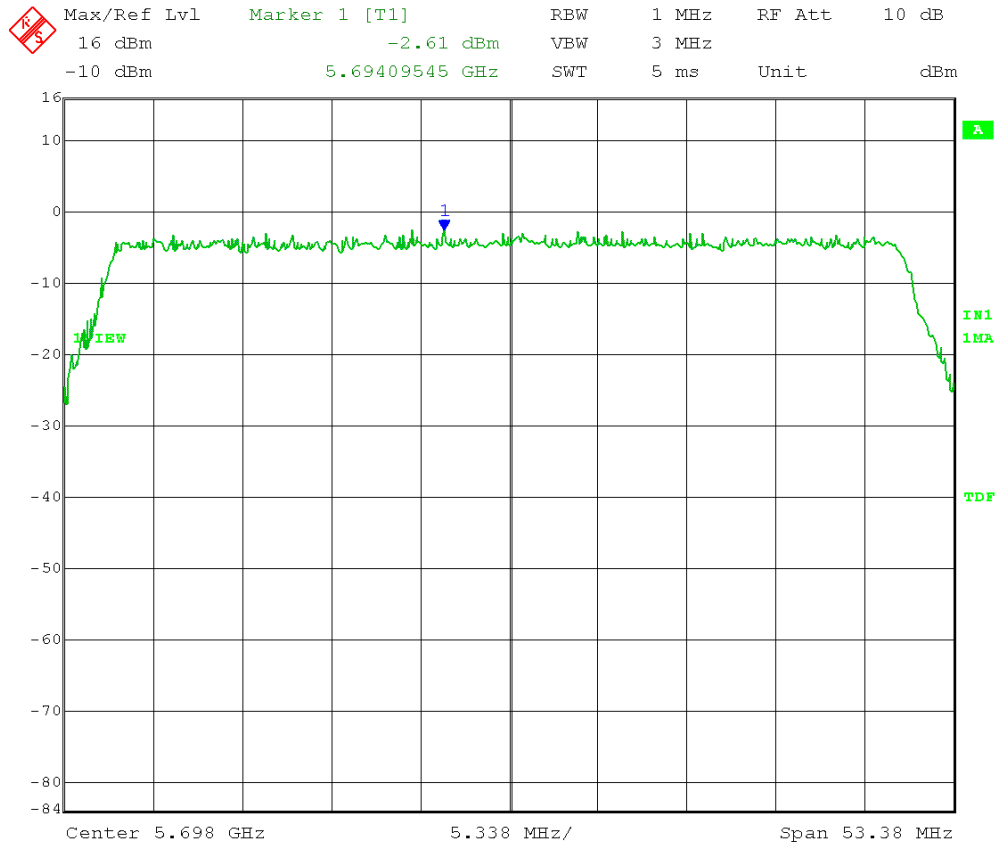
Output power was set to 30 dBm eirp using special test software.

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

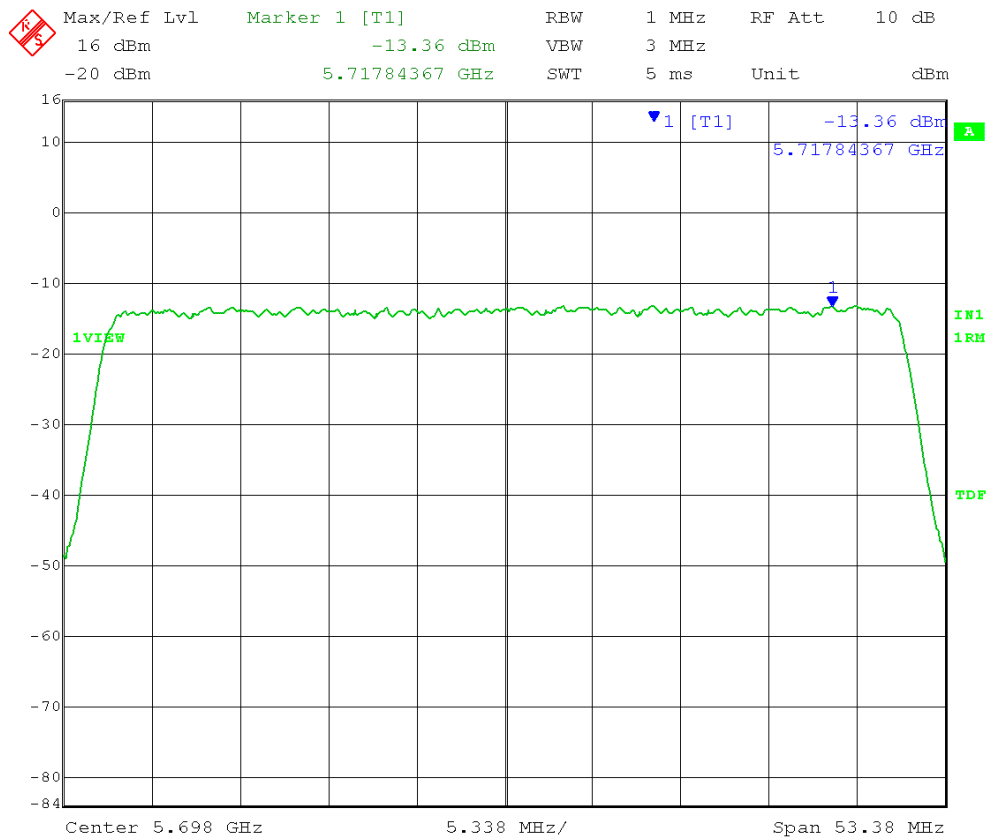
50MHz Operating Bandwidth:

Peak Excursion		50MHz				
	dB	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit = 13dB	<i>FCC limit:</i>	13	13	13	13	13
HCH = 5698 MHz	PK	-2.22	-2.61	-2.42	-2.08	-2.2
	AVG	-13.5	-13.36	-13.38	-13.4	-13.33
	Excursion	11.28	10.75	10.96	11.32	11.13
	Margin	1.72	2.25	2.04	1.68	1.87
MCH = 5575 MHz	PK	-4.93	-5.12	-4.29	-4.5	-4.76
	AVG	-15.52	-15.93	-15.9	-15.52	-15.54
	Excursion	10.59	10.81	11.61	11.02	10.78
	Margin	2.41	2.19	1.39	1.98	2.22
LCH = 5497 MHz	PK	-2.75	-2.33	-2.36	-2.22	-2.65
	AVG	-14.06	-15.12	-13.99	-13.97	-13.96
	Excursion	11.31	12.79	11.63	11.75	11.31
	Margin	1.69	0.21	1.37	1.25	1.69

50MHz BW, HCH, 16QAM, 26 dB EBW = 53.38MHz

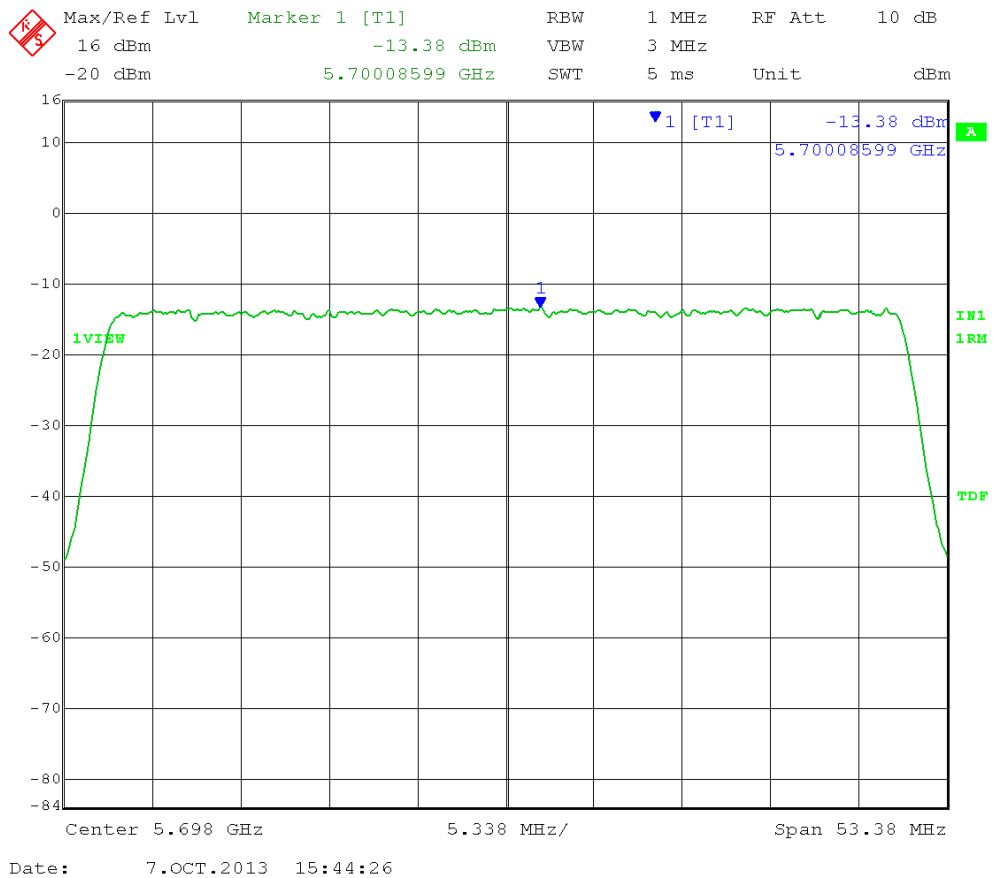
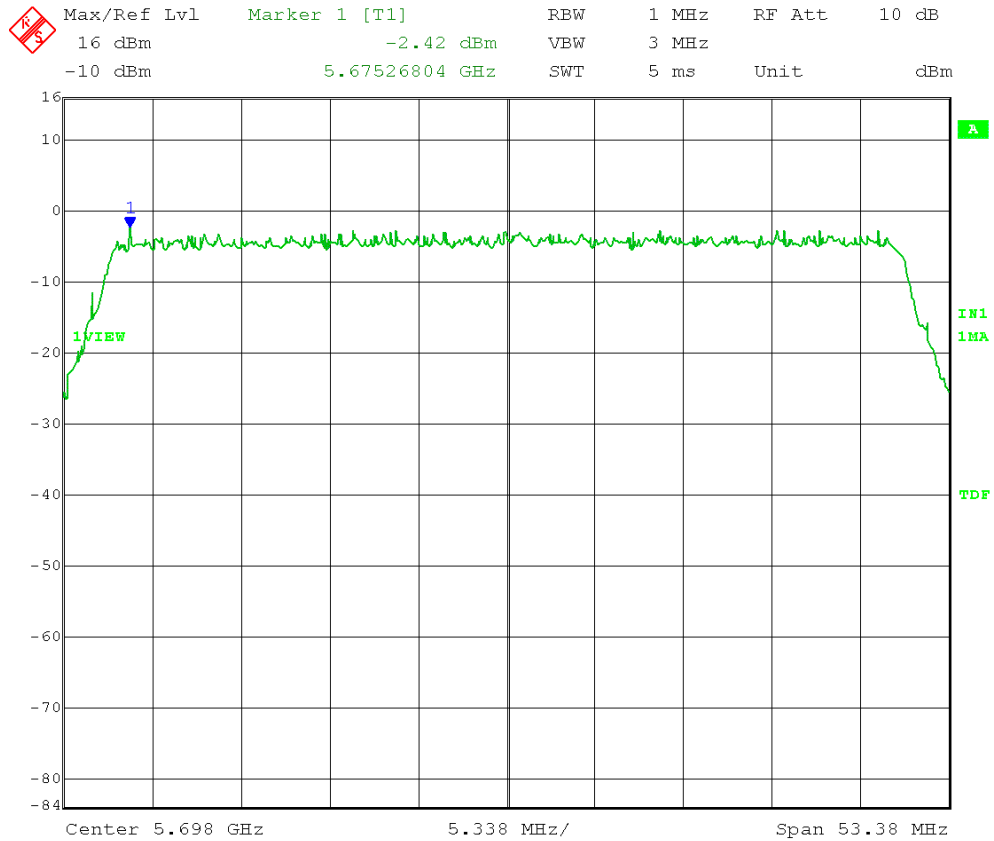


Date: 15.OCT.2013 11:42:53

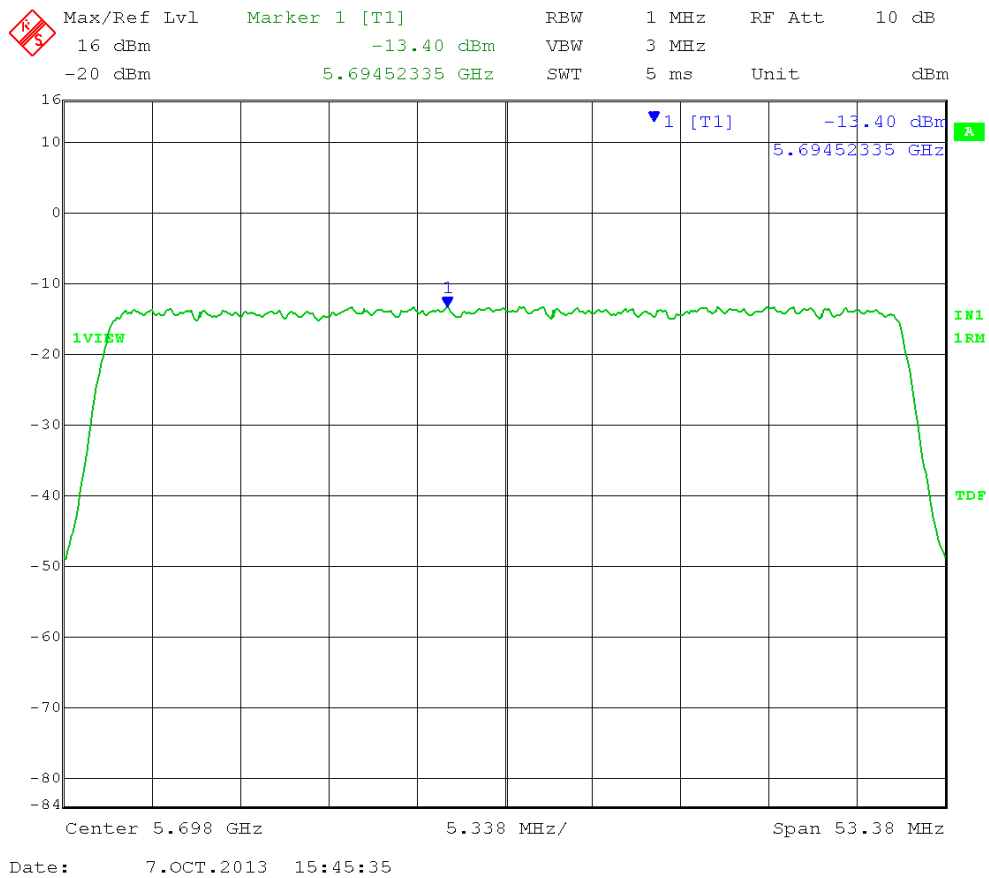
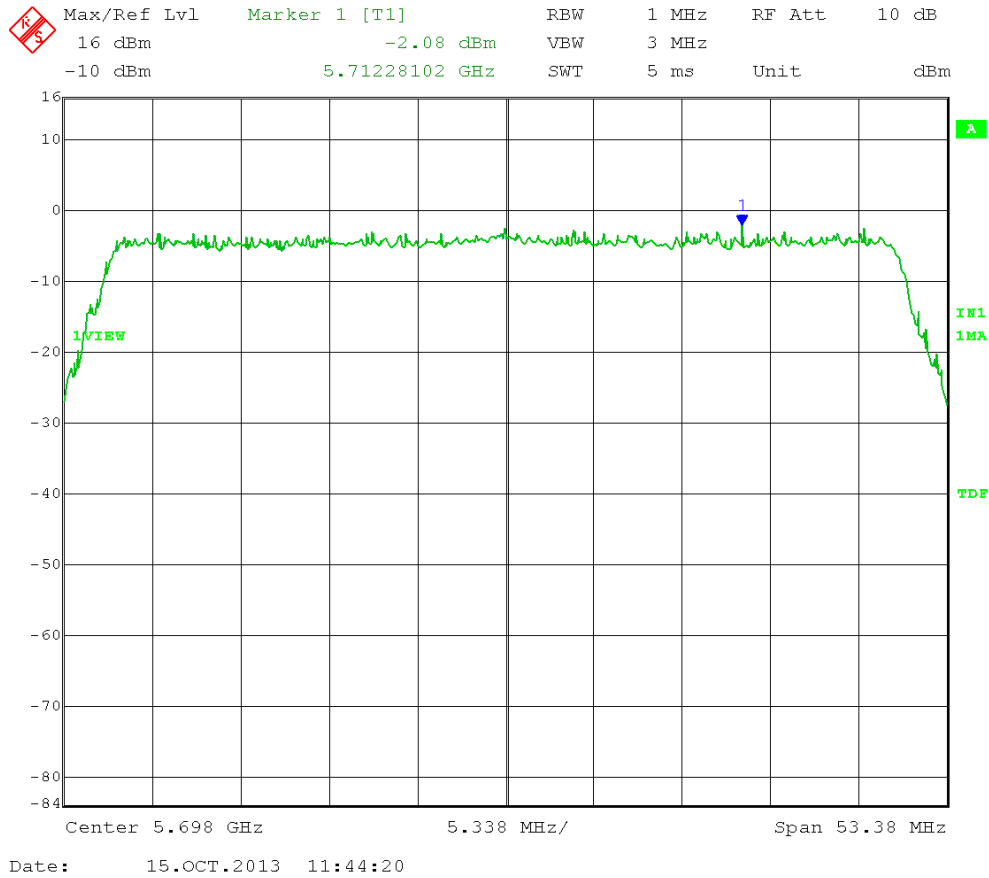


Date: 7.OCT.2013 15:43:02

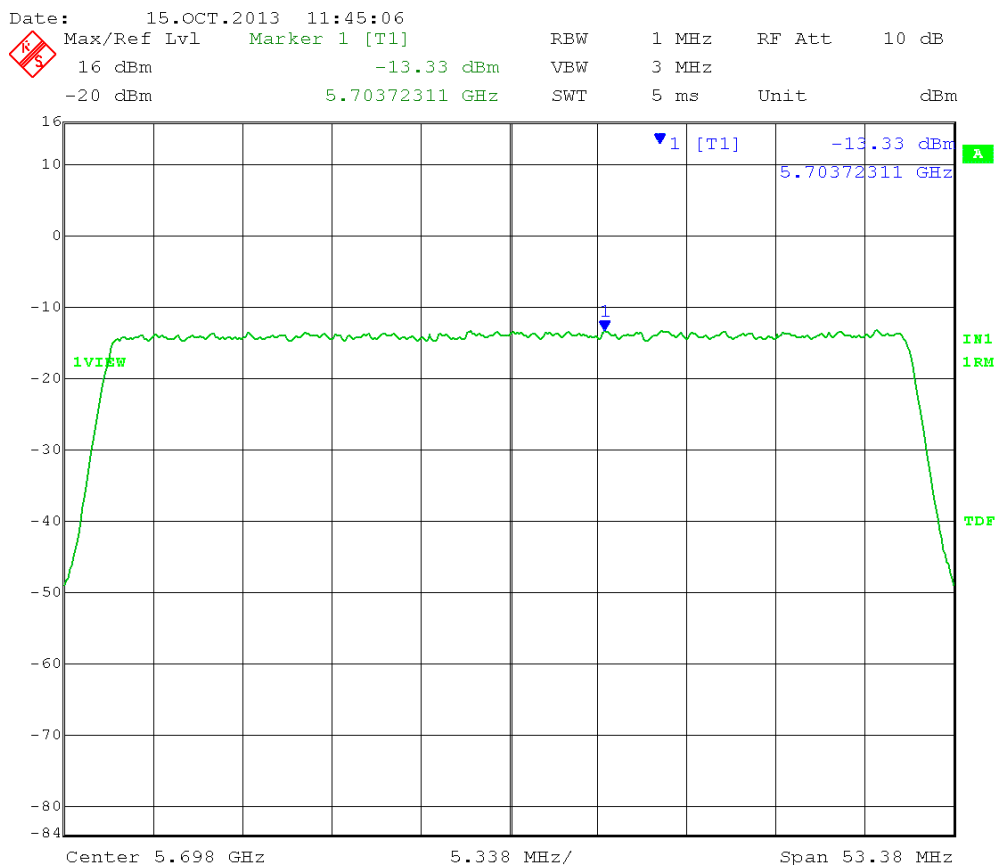
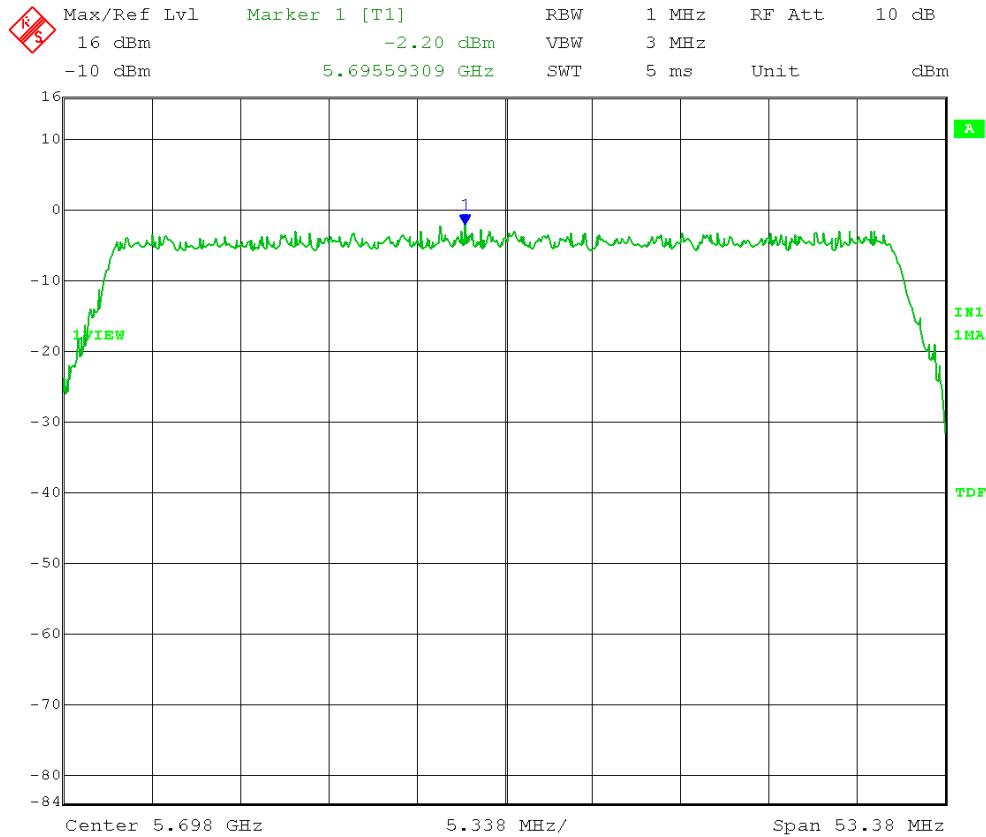
50MHz BW, HCH, 64QAM, 26 dB EBW = 53.38MHz



50MHz BW, HCH, 256QAM, 26 dB EBW = 53.38MHz

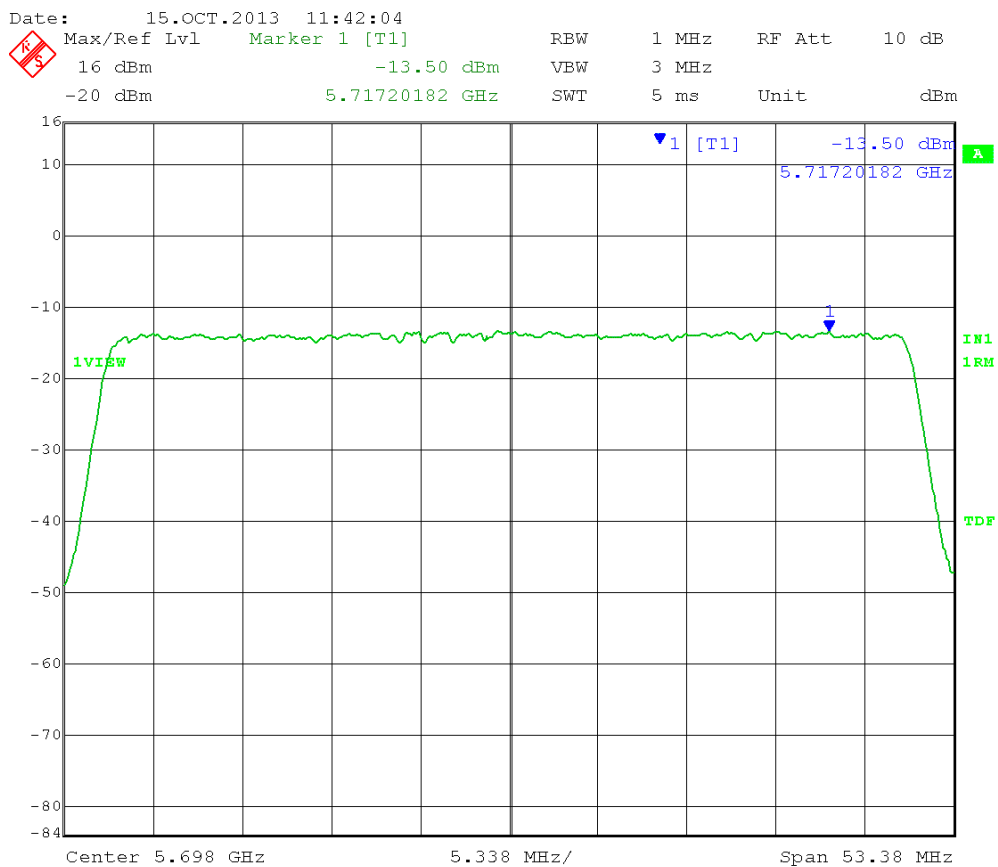
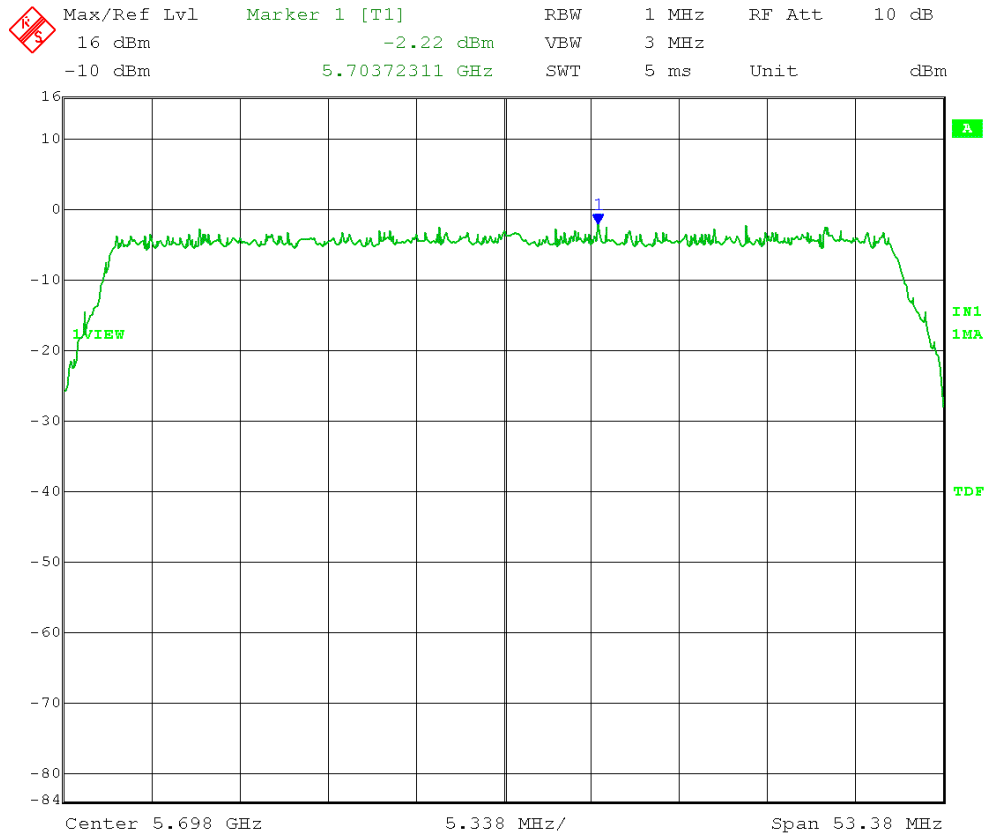


50MHz BW, HCH, 1024QAM, 26 dB EBW = 53.38MHz



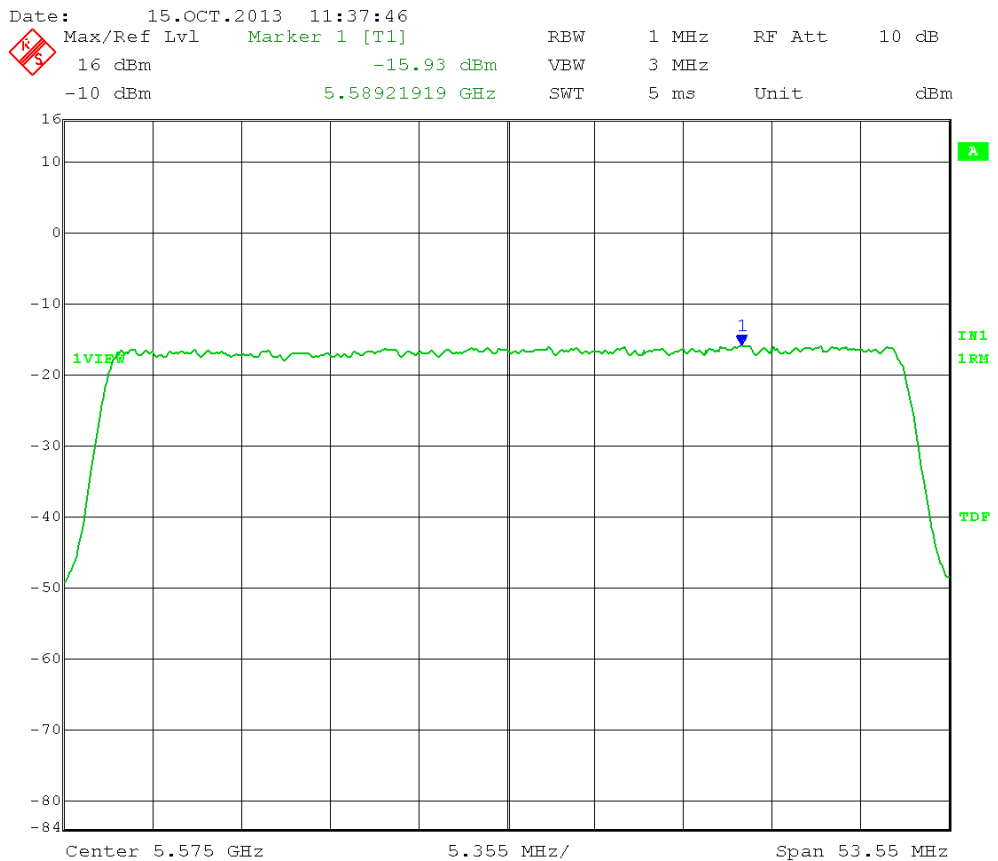
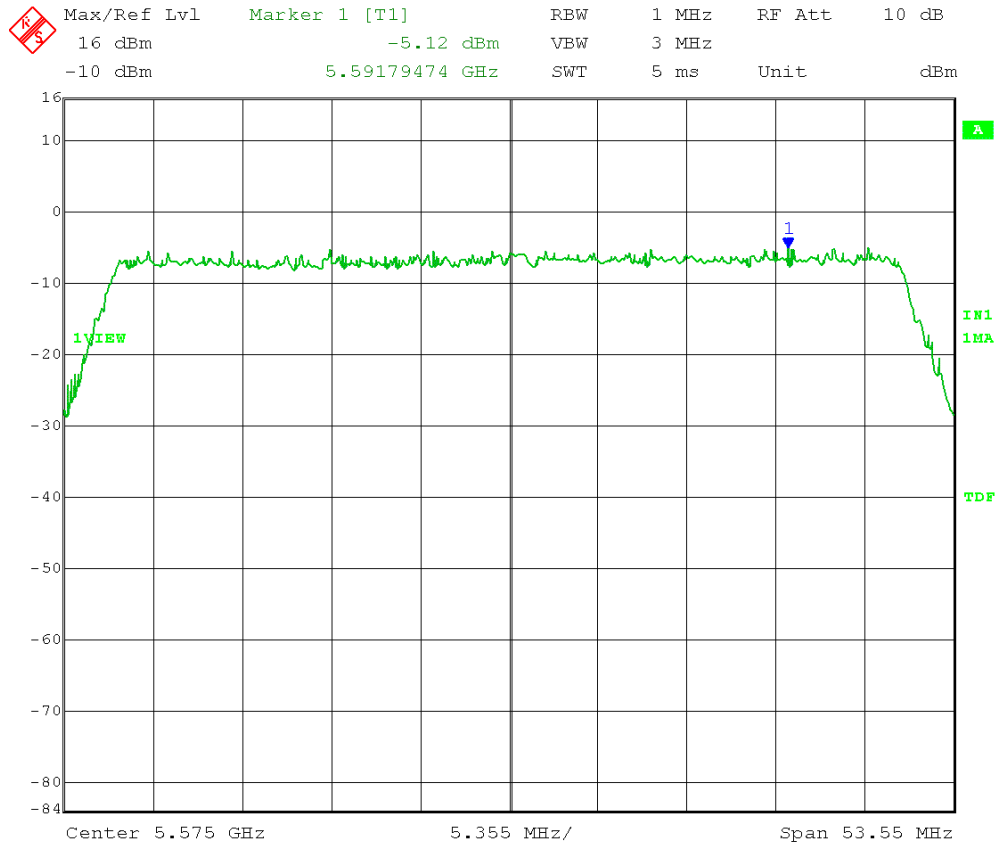
Date: 7.OCT.2013 15:46:41

50MHz BW, HCH, QPSK, 26 dB EBW = 53.38MHz



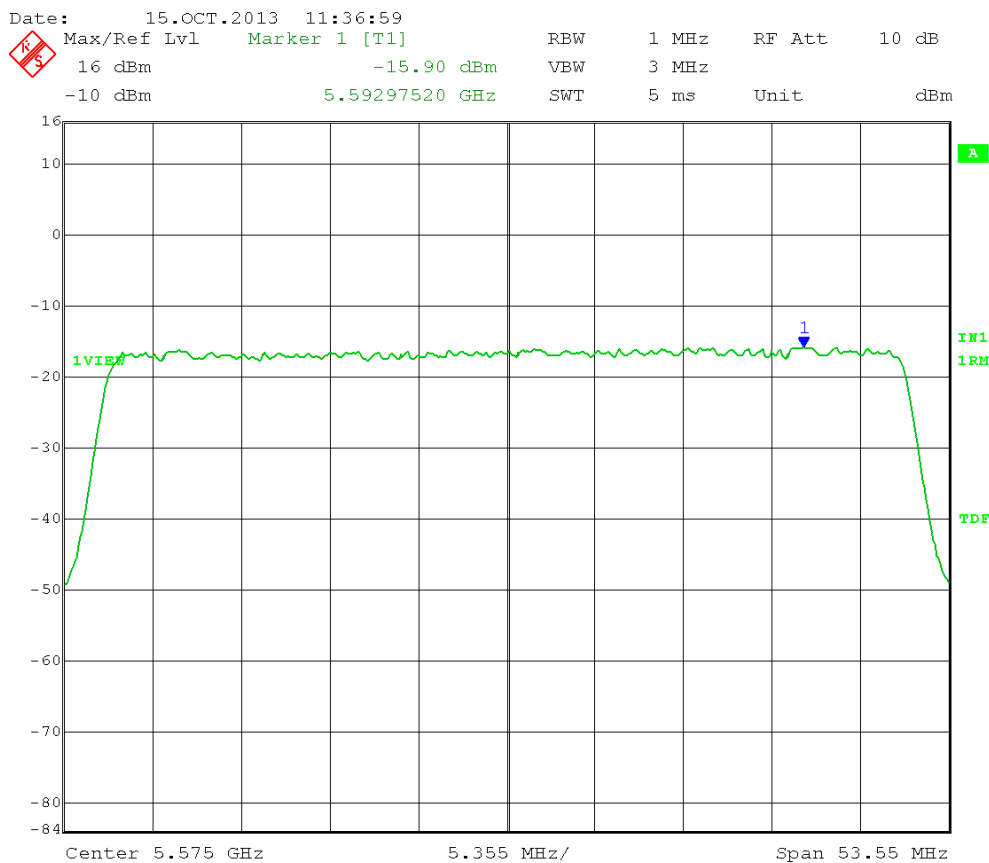
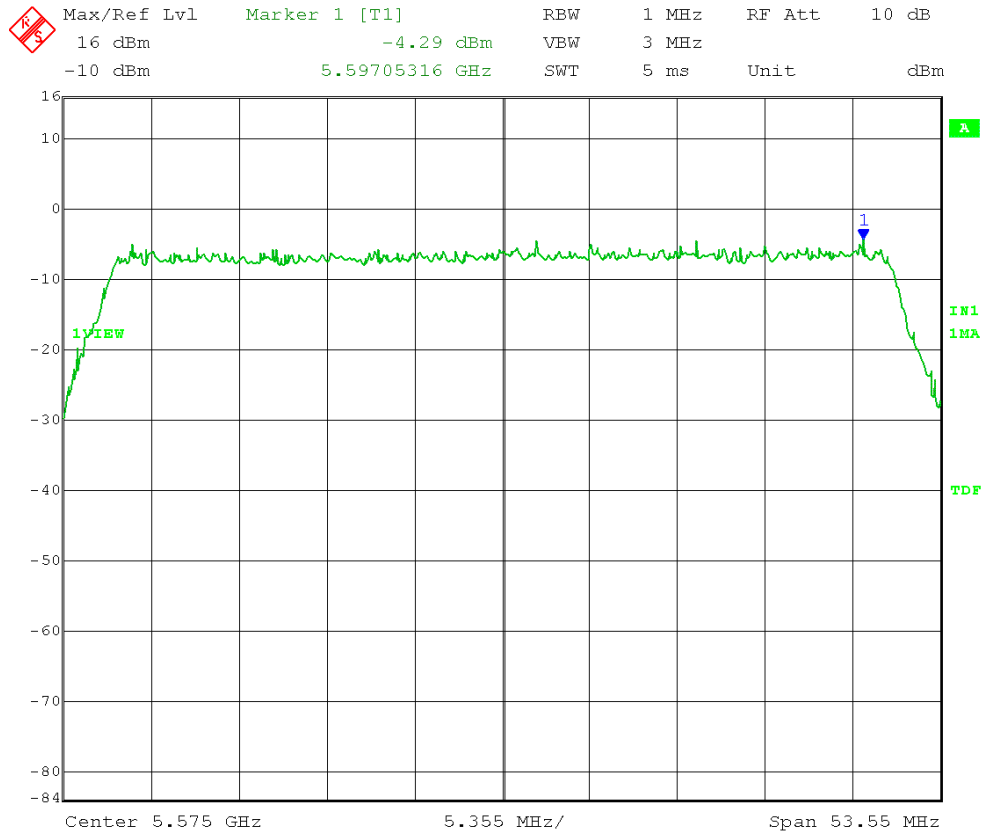
Date: 7.OCT.2013 15:41:35

50MHz BW, MCH, 16QAM, 26 dB EBW = 53.55MHz



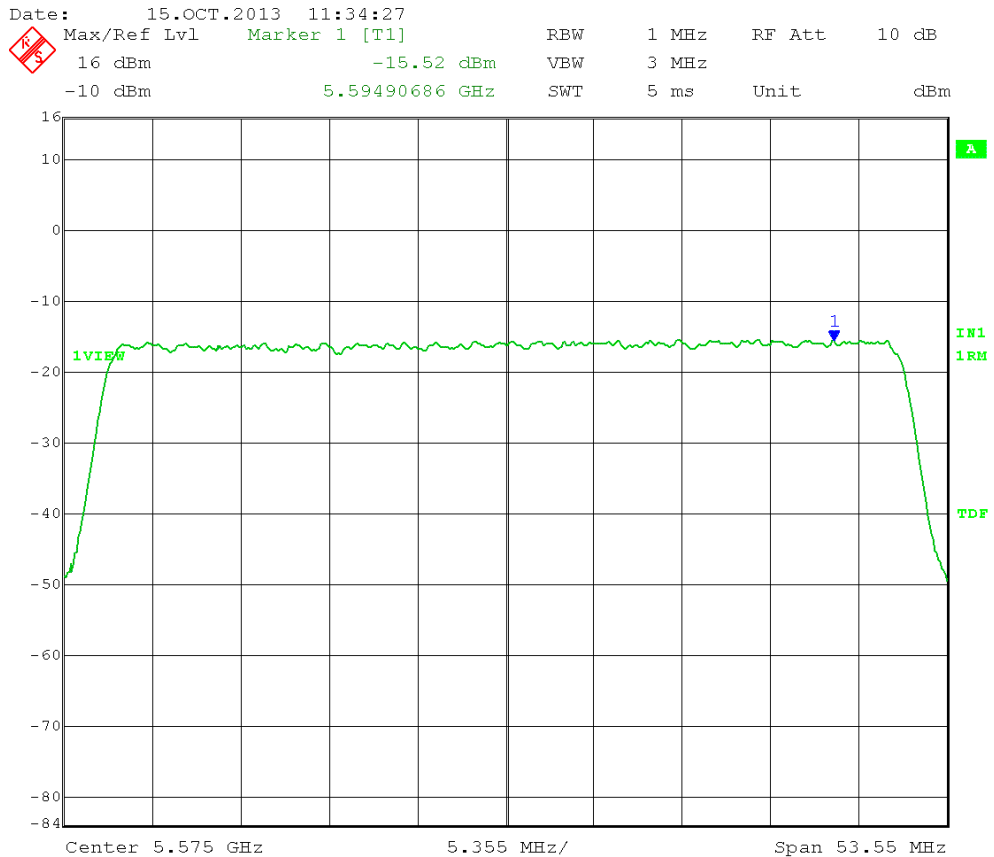
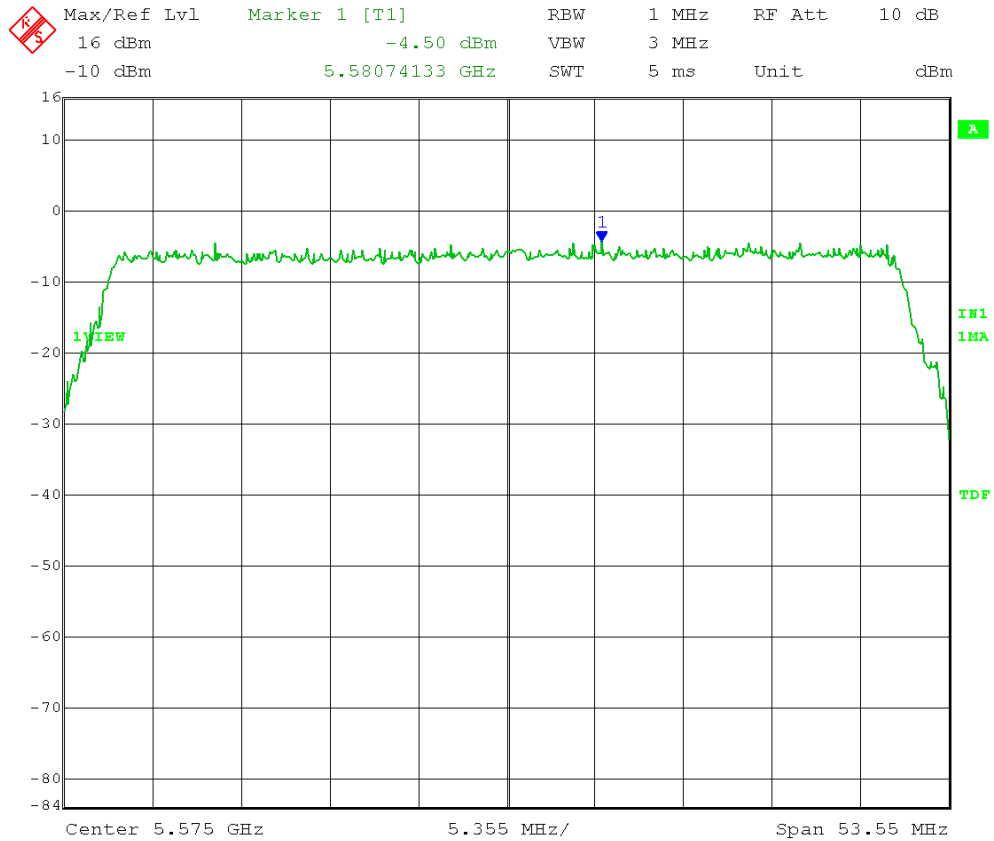
Date: 15.OCT.2013 11:38:32

50MHz BW, MCH, 64QAM, 26 dB EBW = 53.55MHz



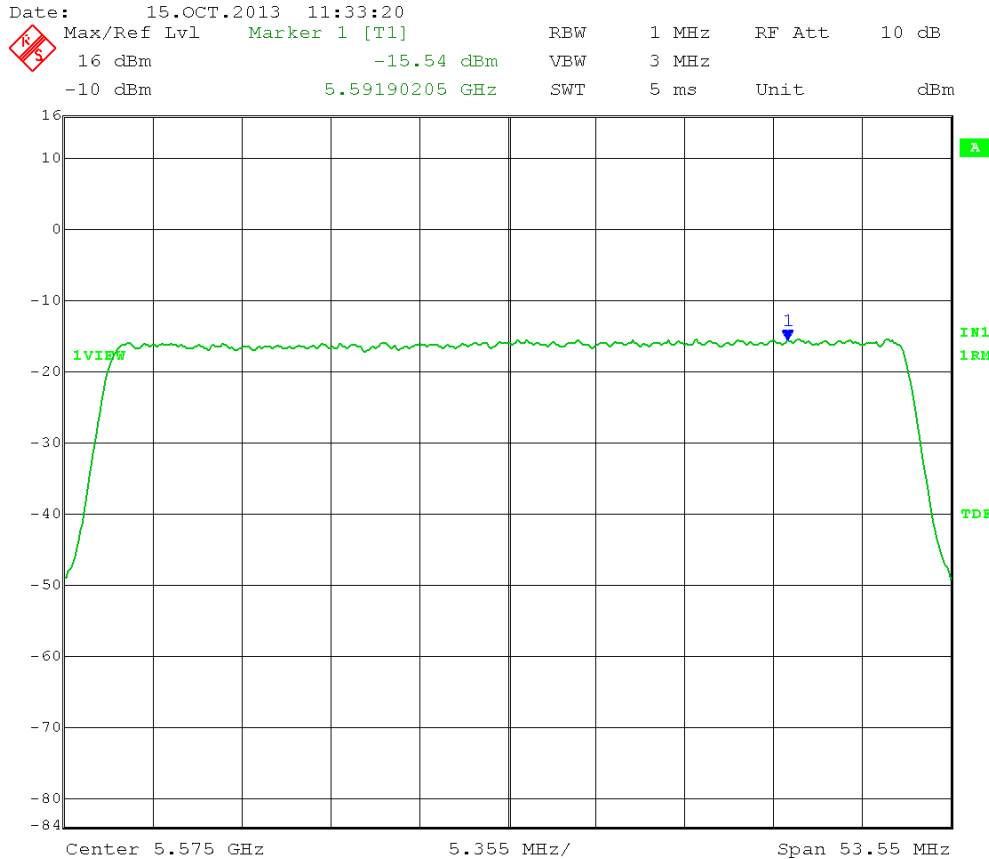
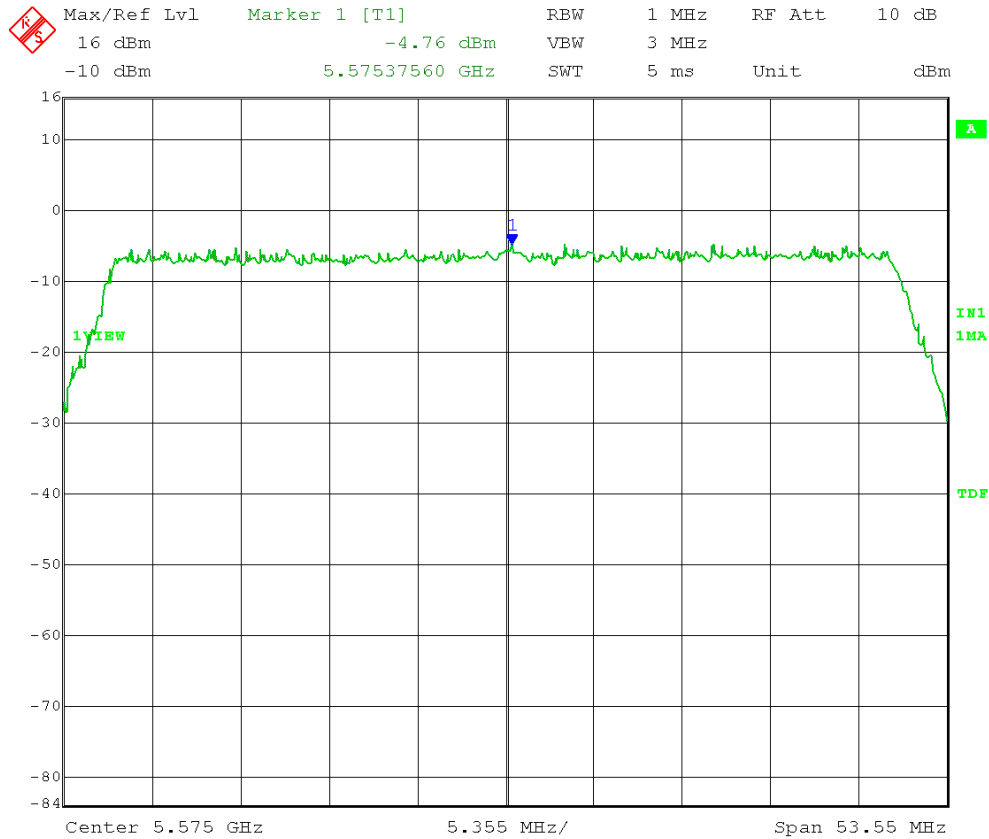
Date: 15.OCT.2013 11:36:19

50MHz BW, MCH, 256QAM, 26 dB EBW = 53.55MHz



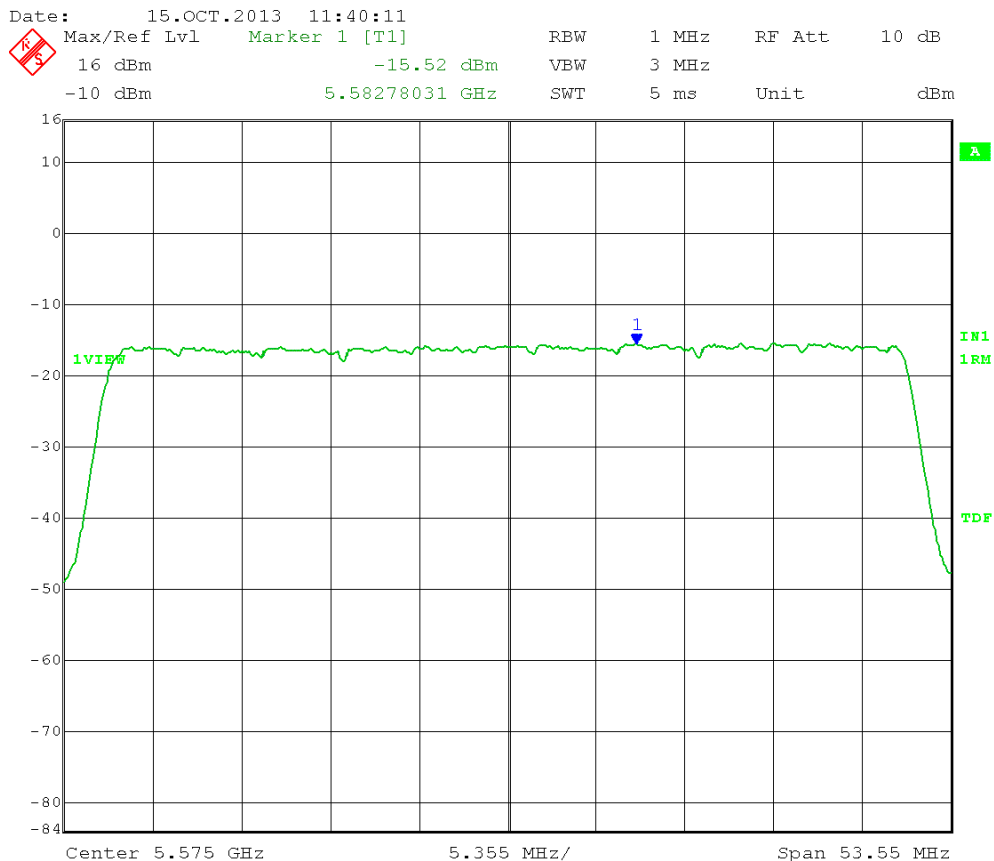
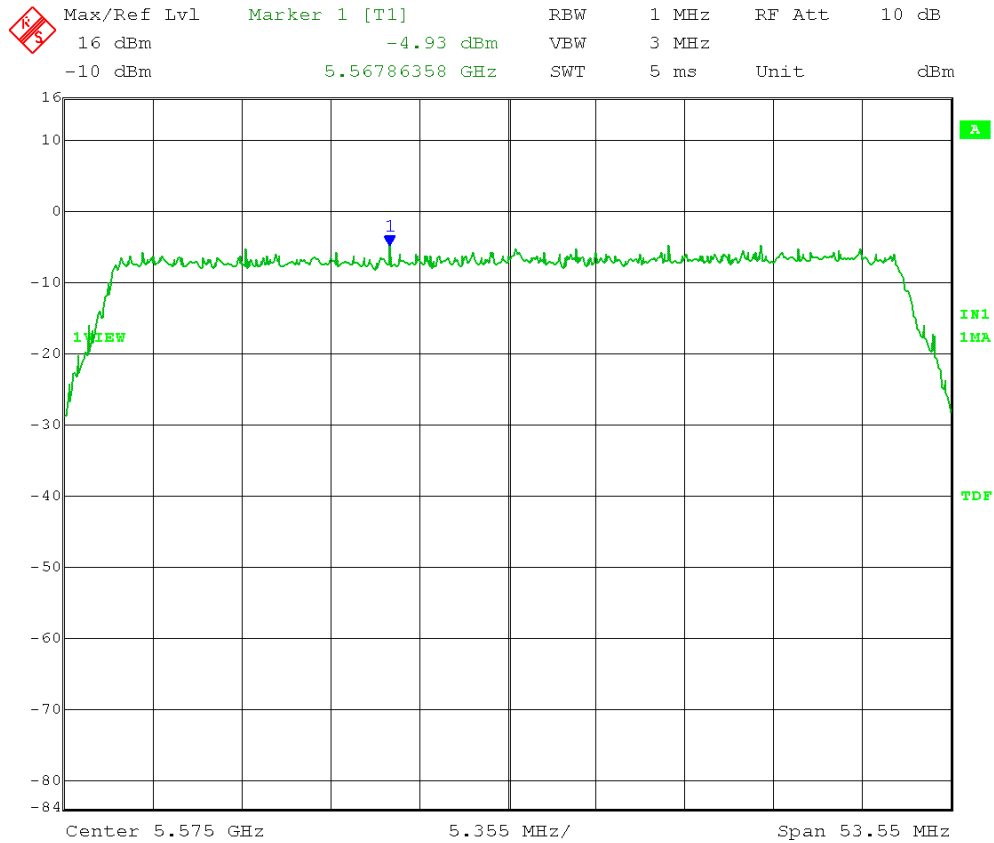
Date: 15.OCT.2013 11:35:17

50MHz BW, MCH, 1024QAM, 26 dB EBW = 53.55MHz



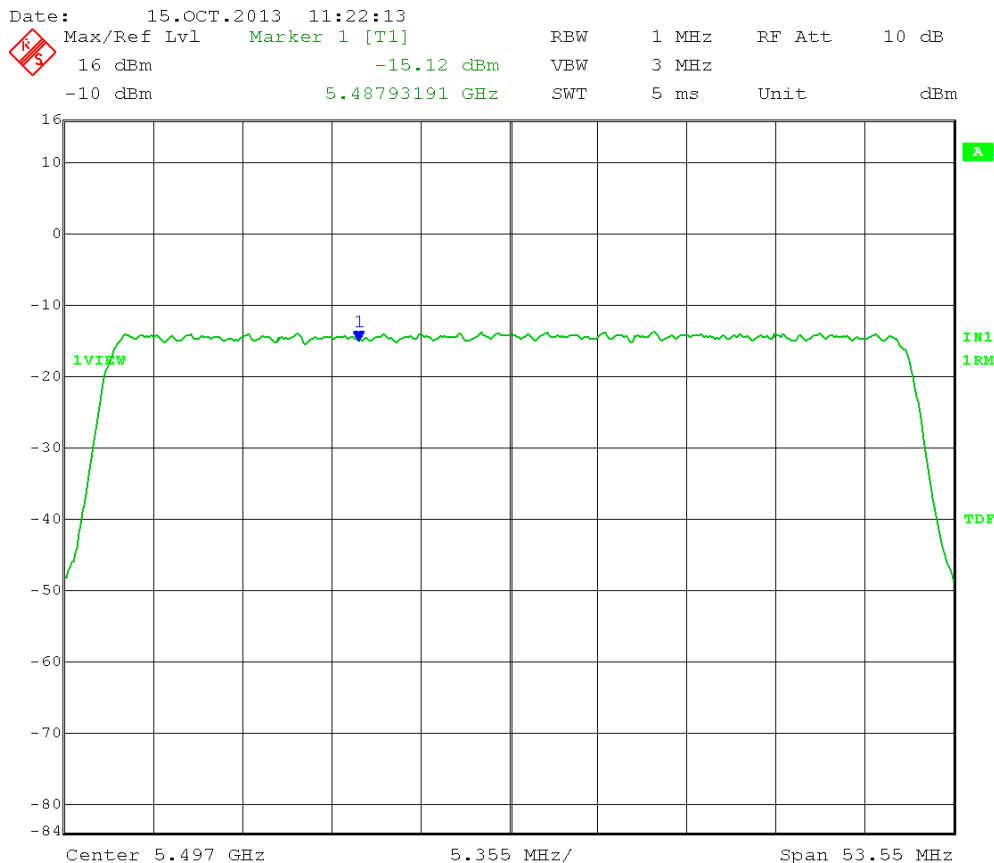
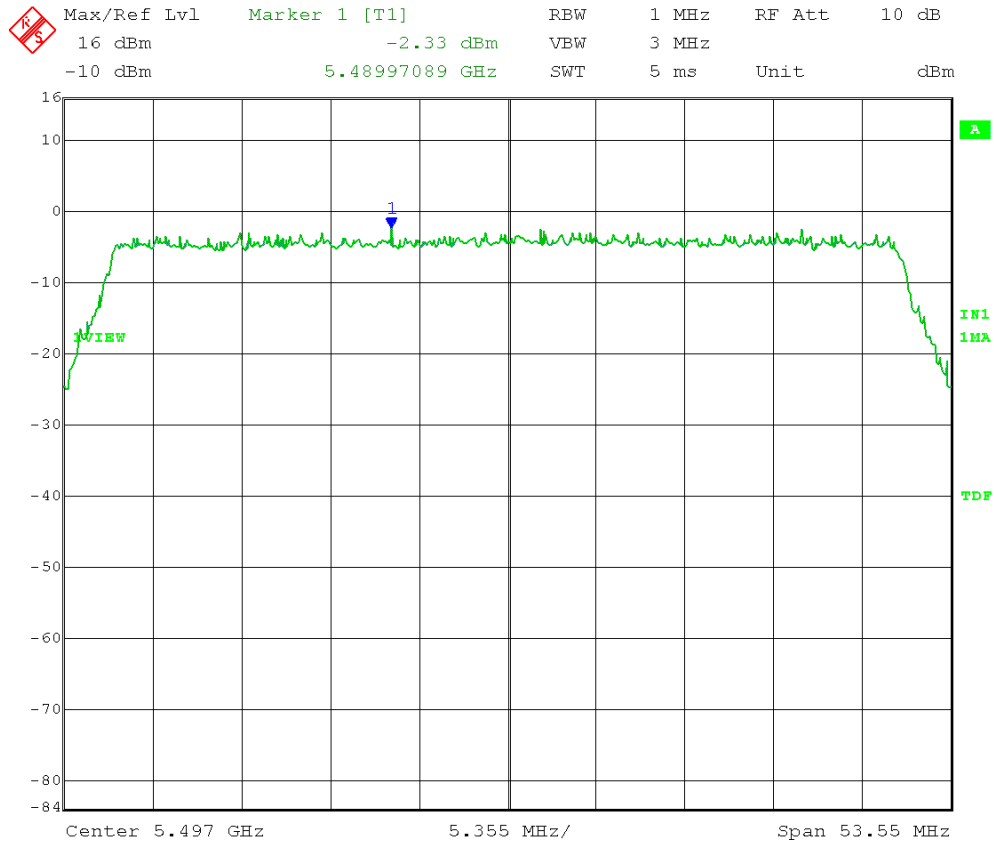
Date: 15.OCT.2013 11:32:34

50MHz BW, MCH, QPSK, 26 dB EBW = 53.55MHz



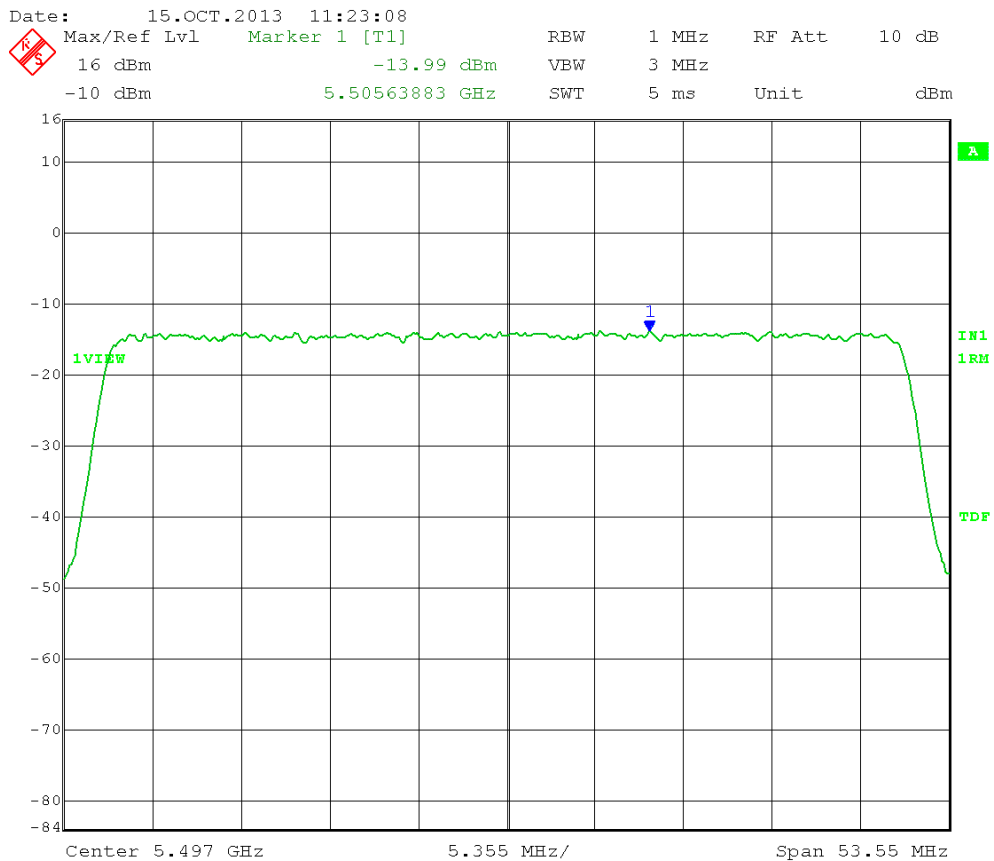
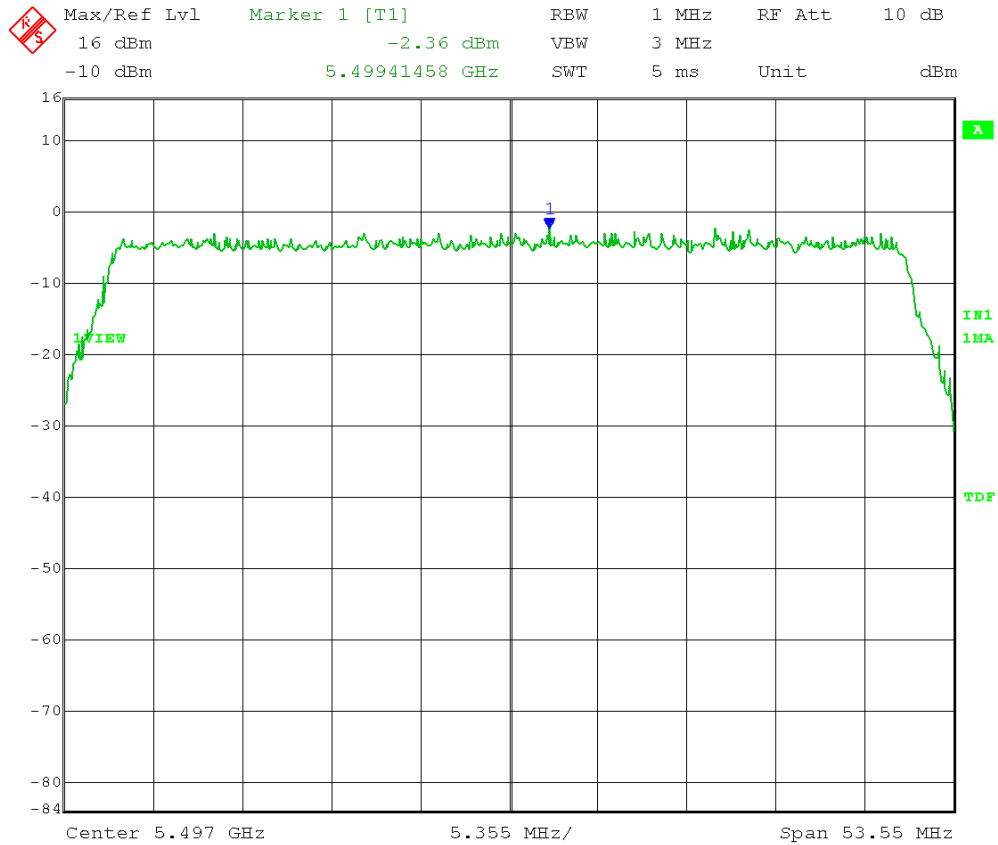
Date: 15.OCT.2013 11:39:36

50MHz BW, LCH, 16QAM, 26 dB EBW = 53.39MHz



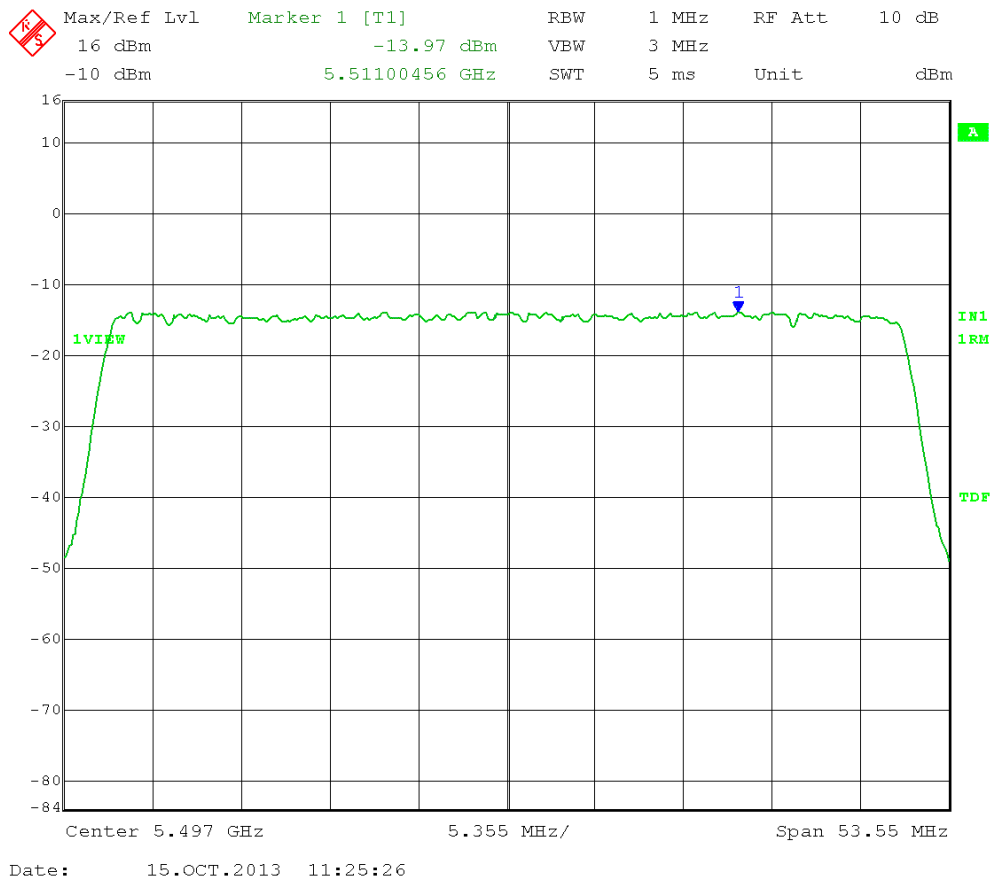
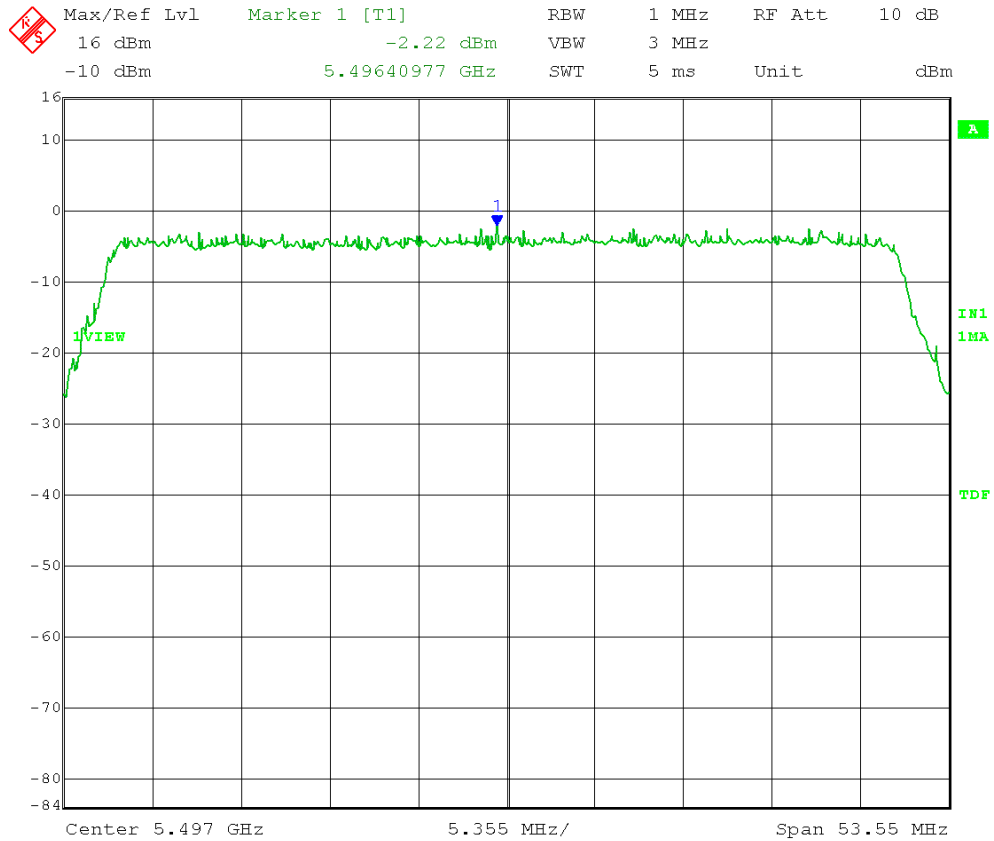
Date: 15.OCT.2013 11:21:12

50MHz BW, LCH, 64QAM, 26 dB EBW = 53.39MHz

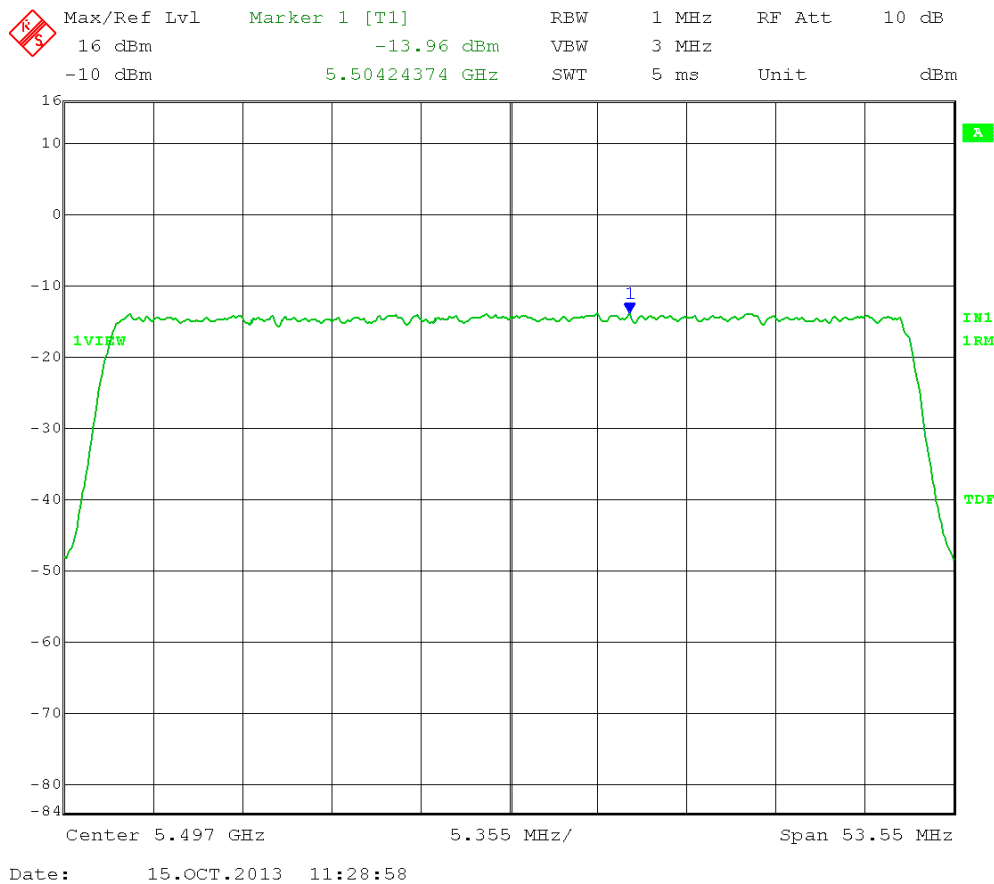
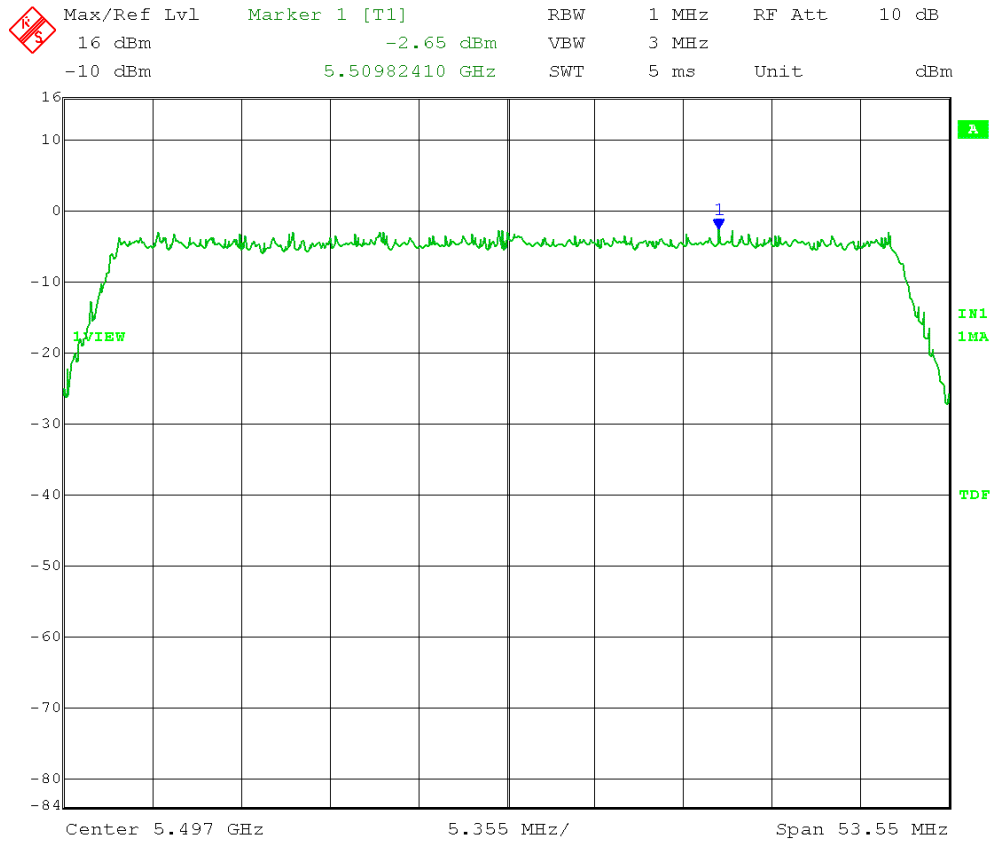


Date: 15.OCT.2013 11:24:09

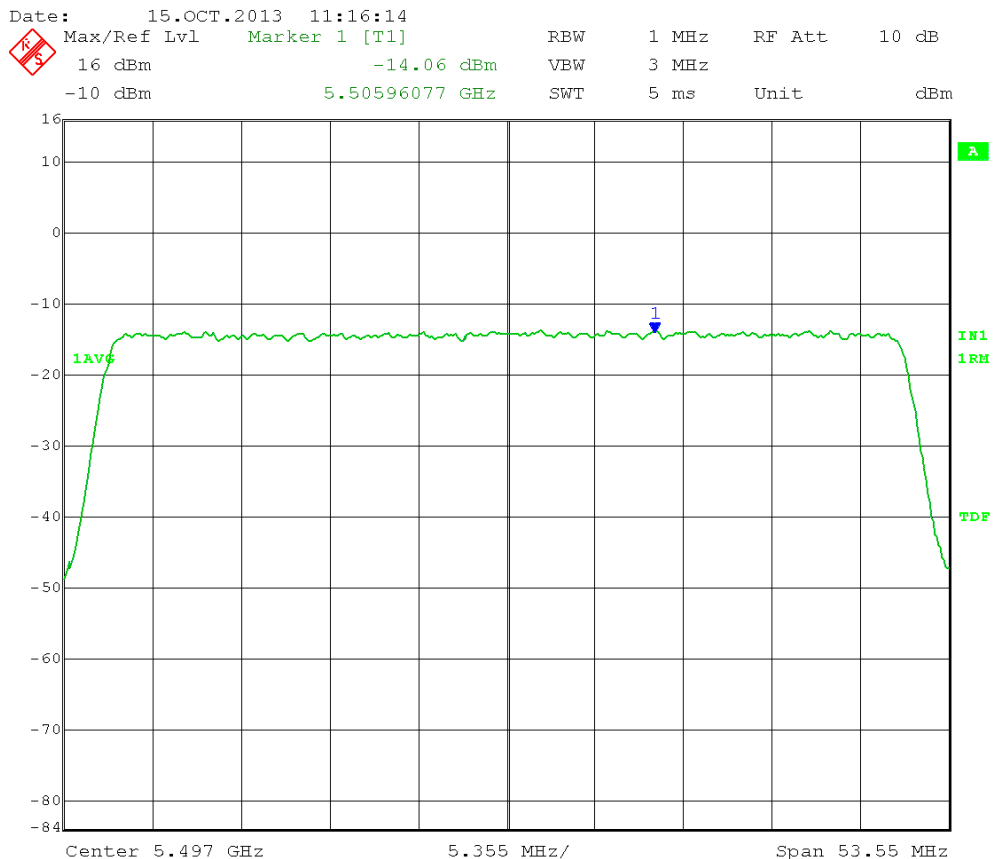
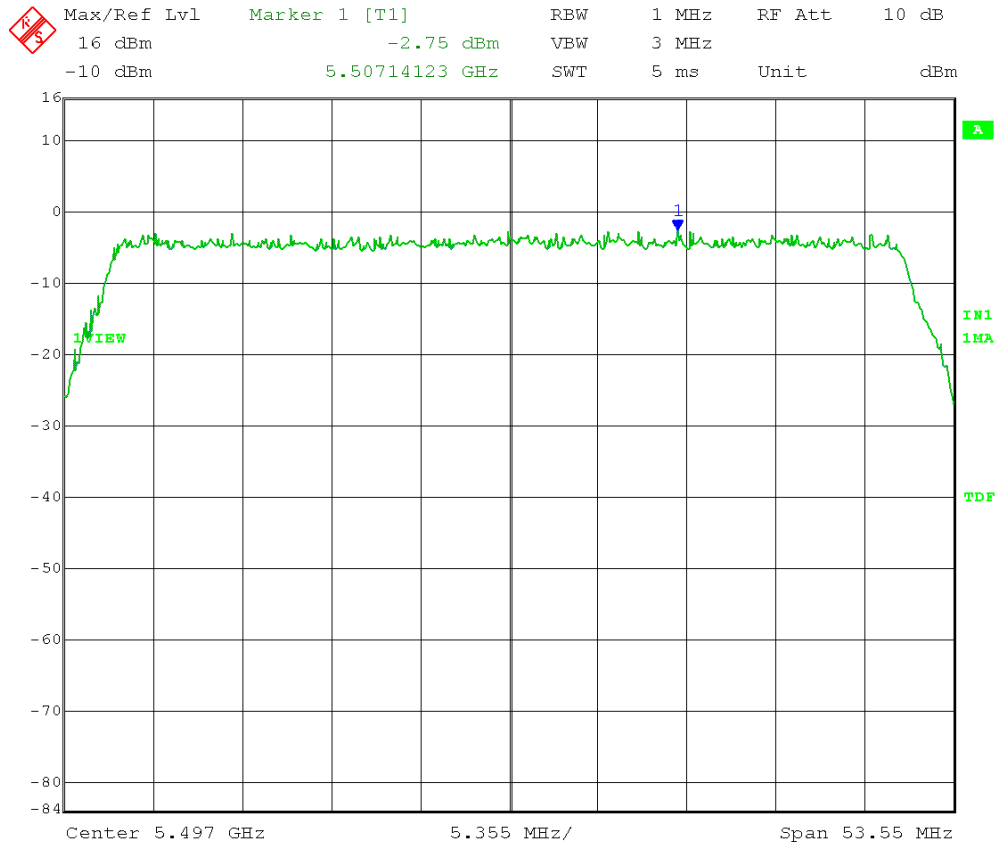
50MHz BW, LCH, 256QAM, 26 dB EBW = 53.39MHz



50MHz BW, LCH, 1024QAM, 26 dB EBW = 53.39MHz



50MHz BW, LCH, QPSK, 26 dB EBW = 53.39MHz



Date: 15.OCT.2013 11:15:19



166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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

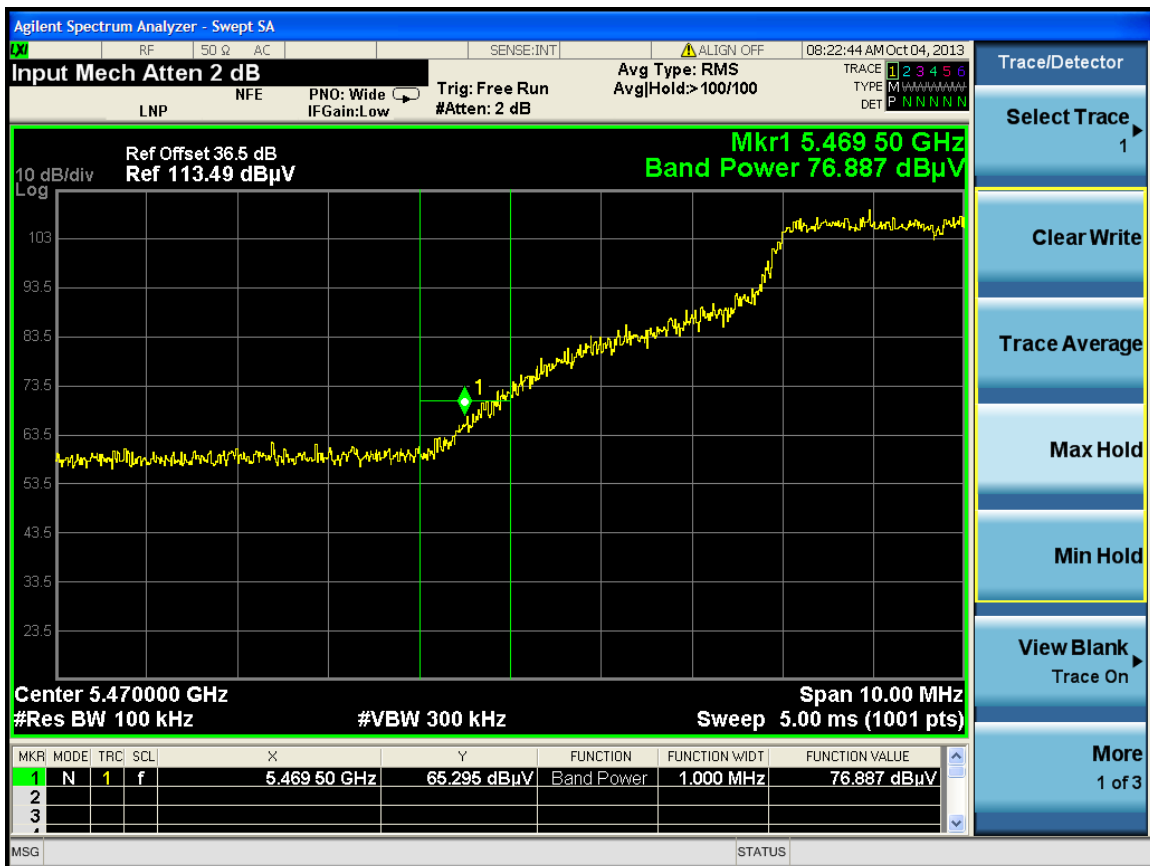
Results: Passed

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.

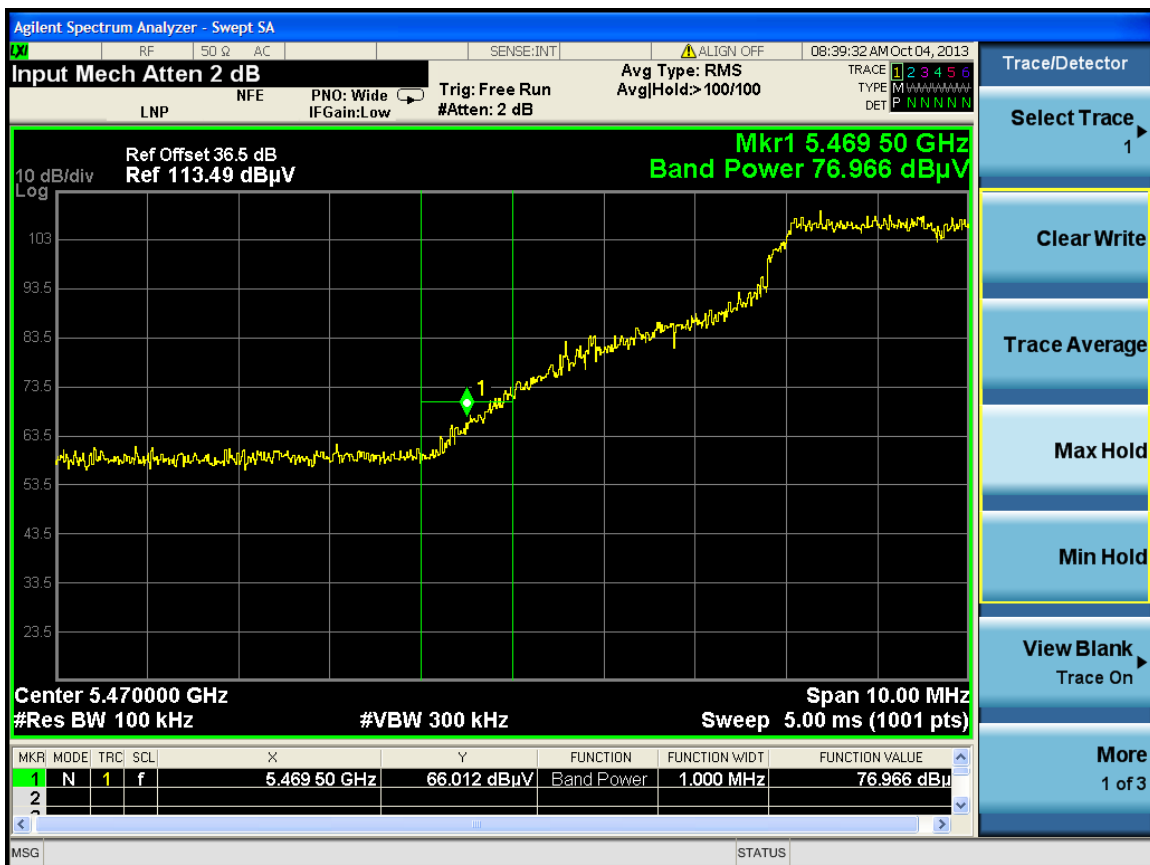
Both transmit chains active. Output power was set to 30 dBm eirp using special test software.

Test distance was 1 meter.

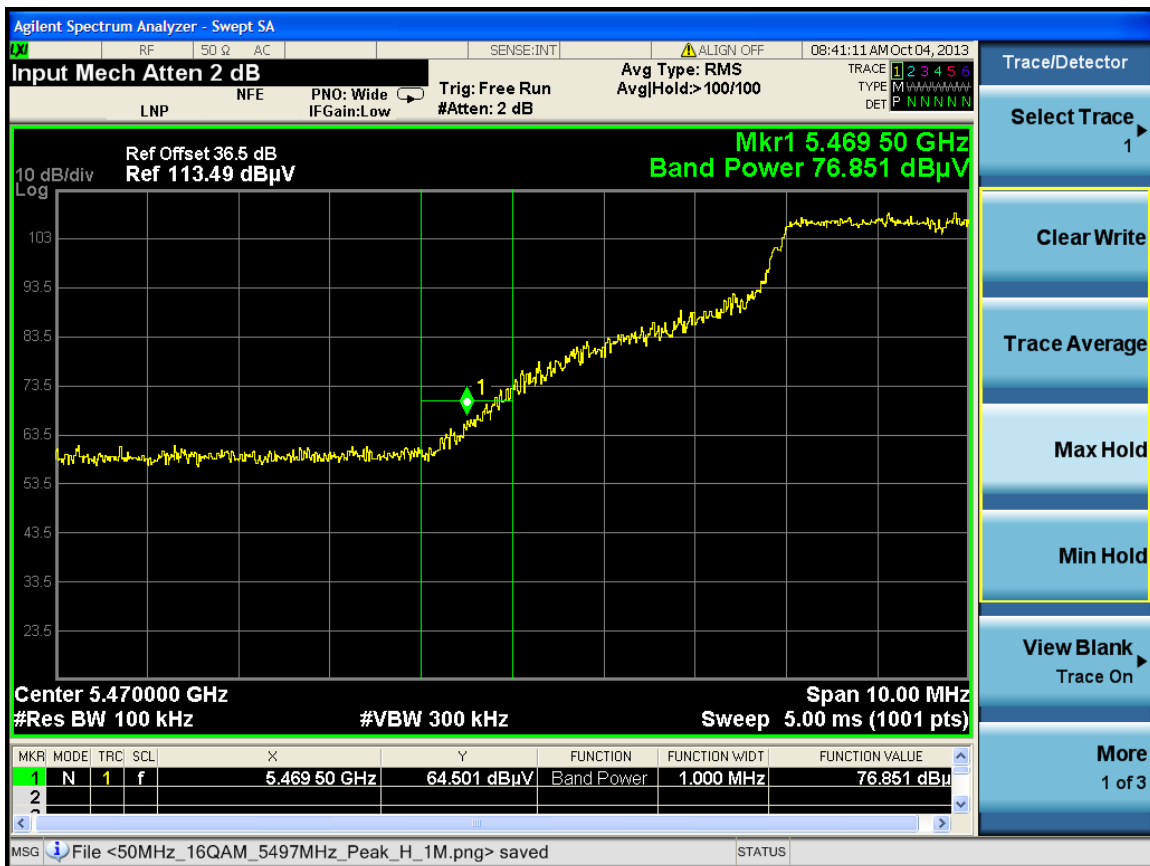
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: QPSK
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 76.887 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -27.88 \text{ dBm/MHz}$



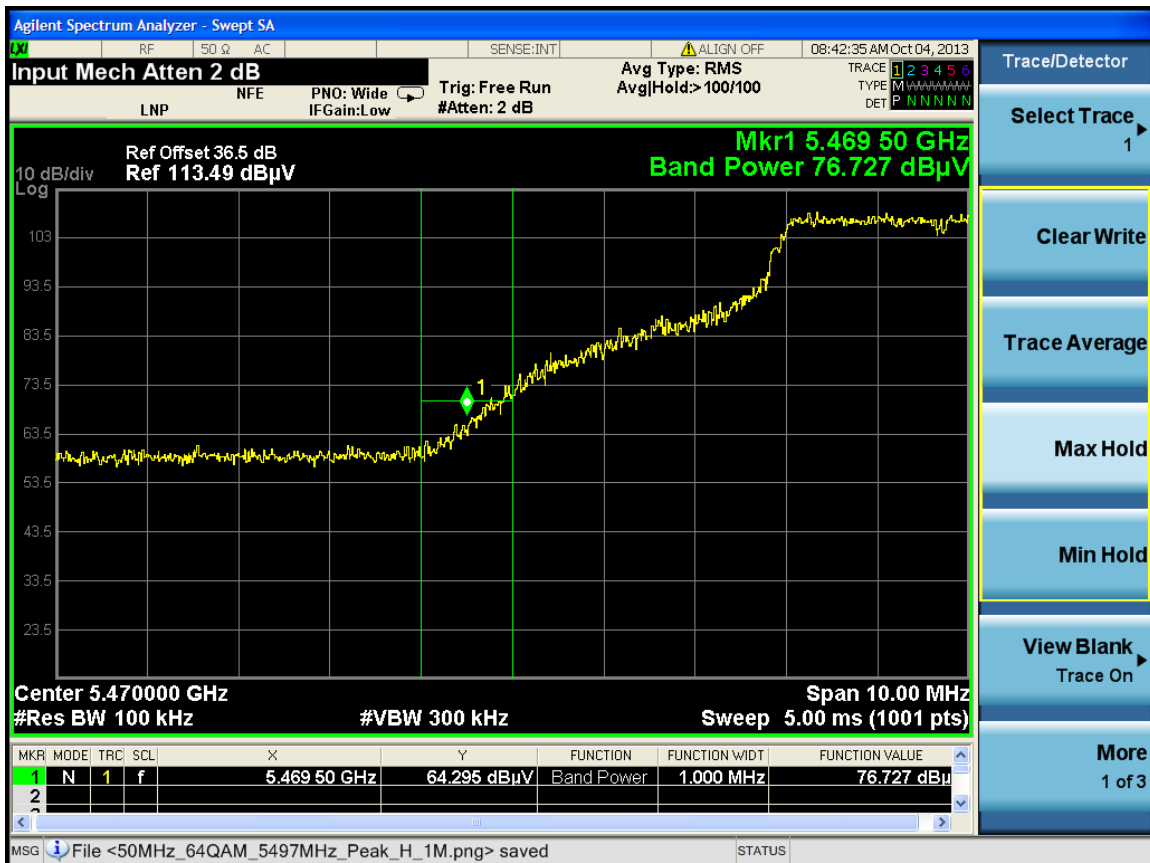
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 16QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
 $= 76.966 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -27.80 \text{ dBm/MHz}$



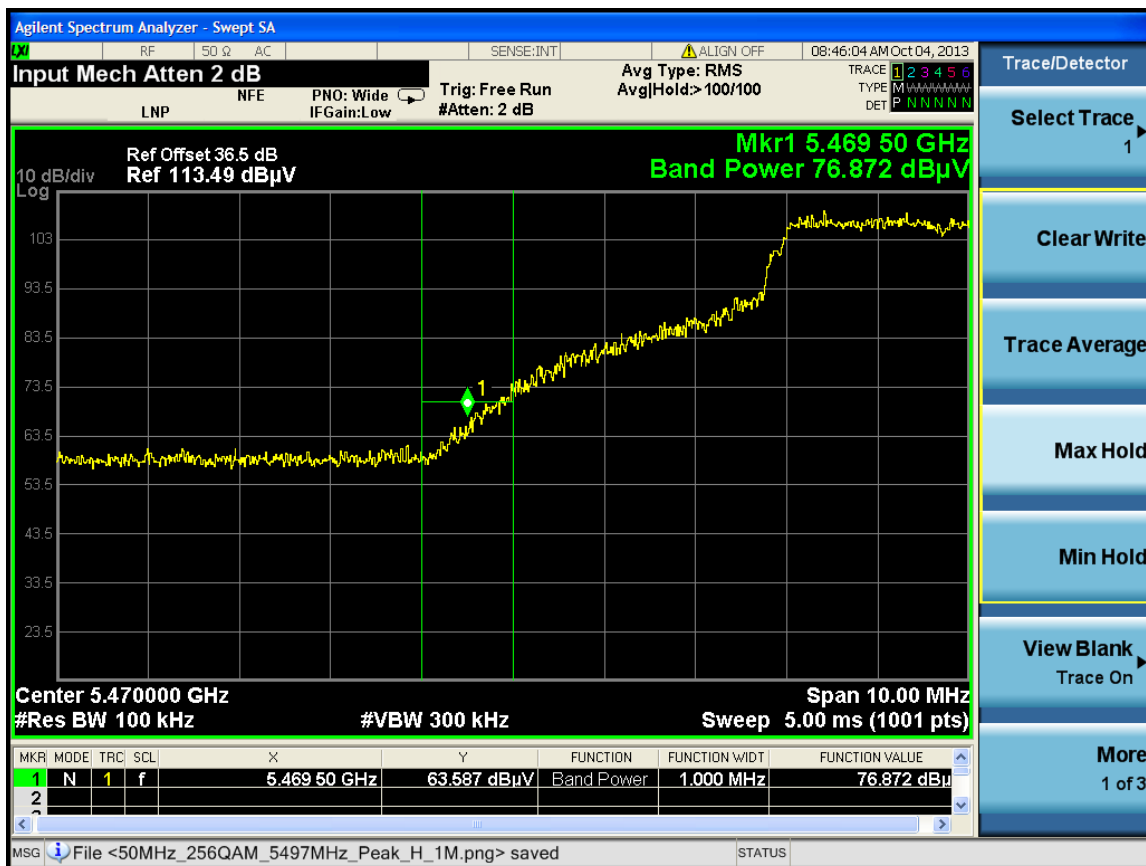
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 64QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 76.851 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -27.92 \text{ dBm/MHz}$



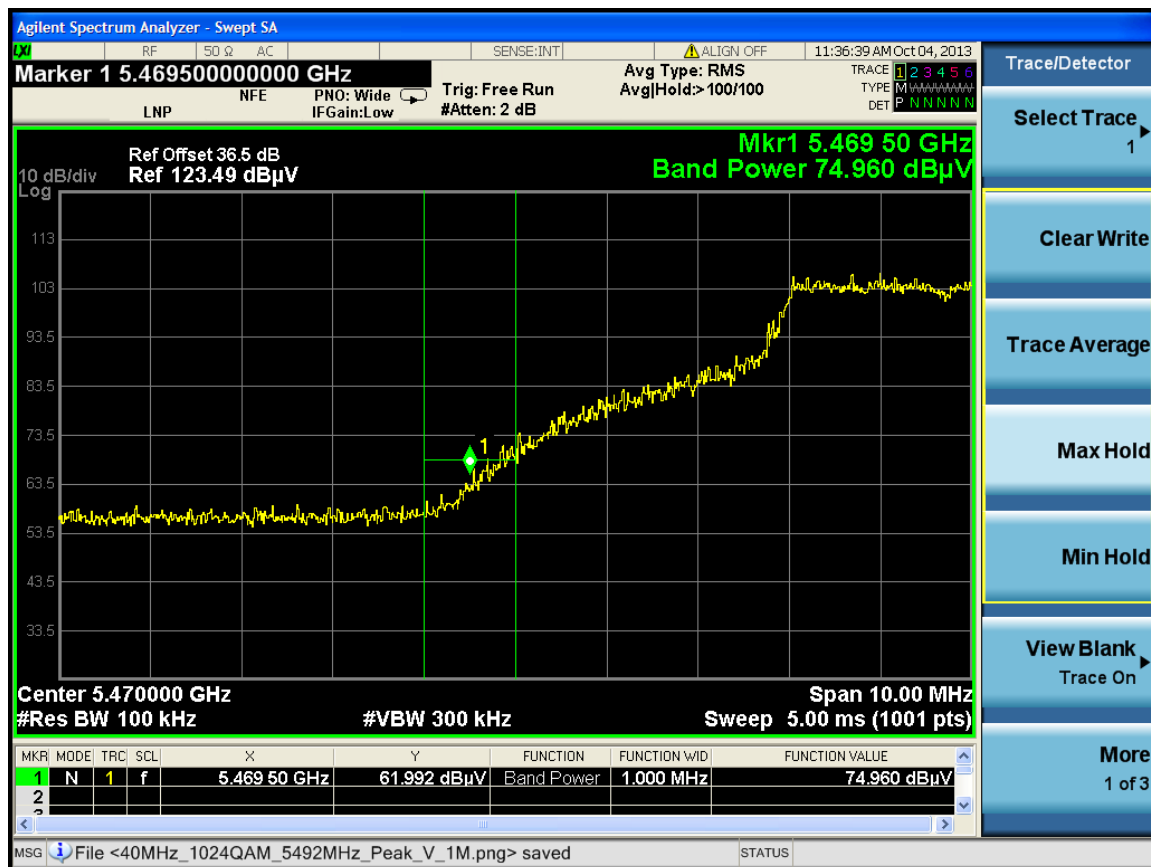
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 256QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 76.727 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -28.04 \text{ dBm/MHz}$



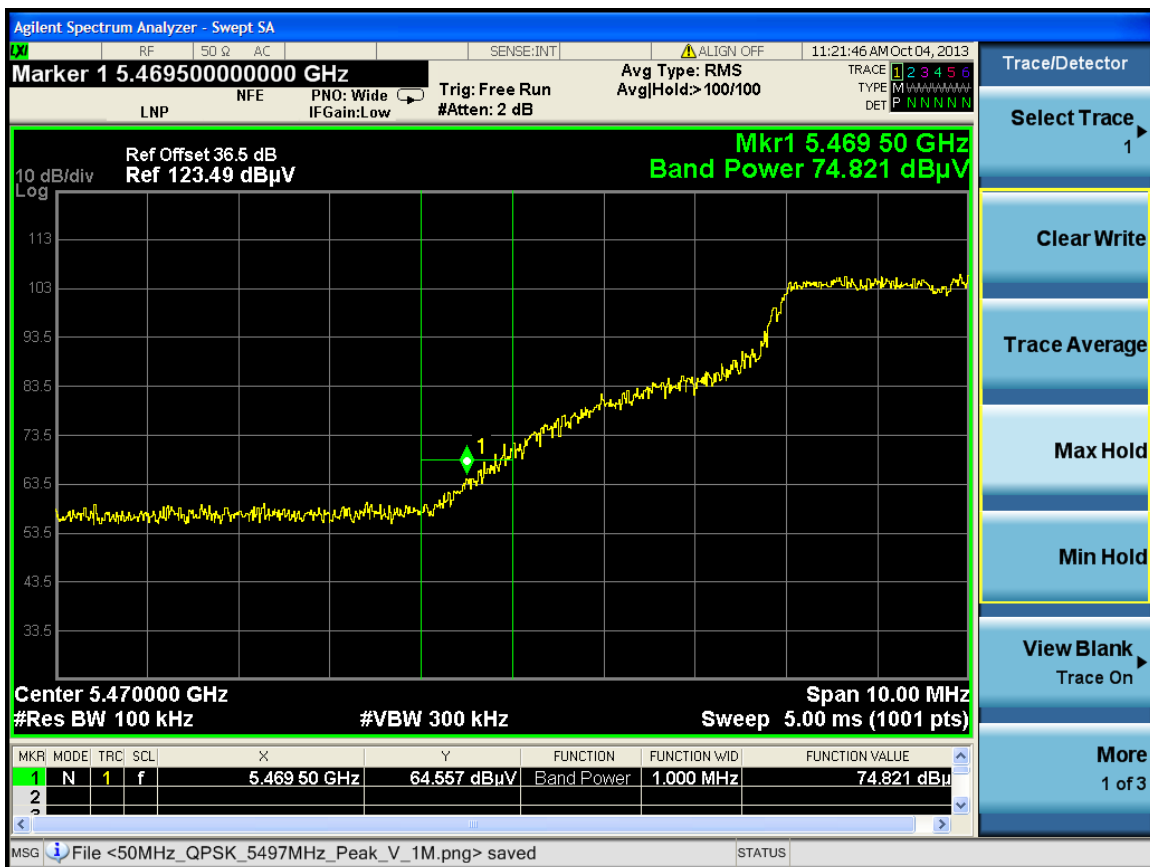
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 1024QAM
 Horizontal
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 76.872 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -27.90 \text{ dBm/MHz}$



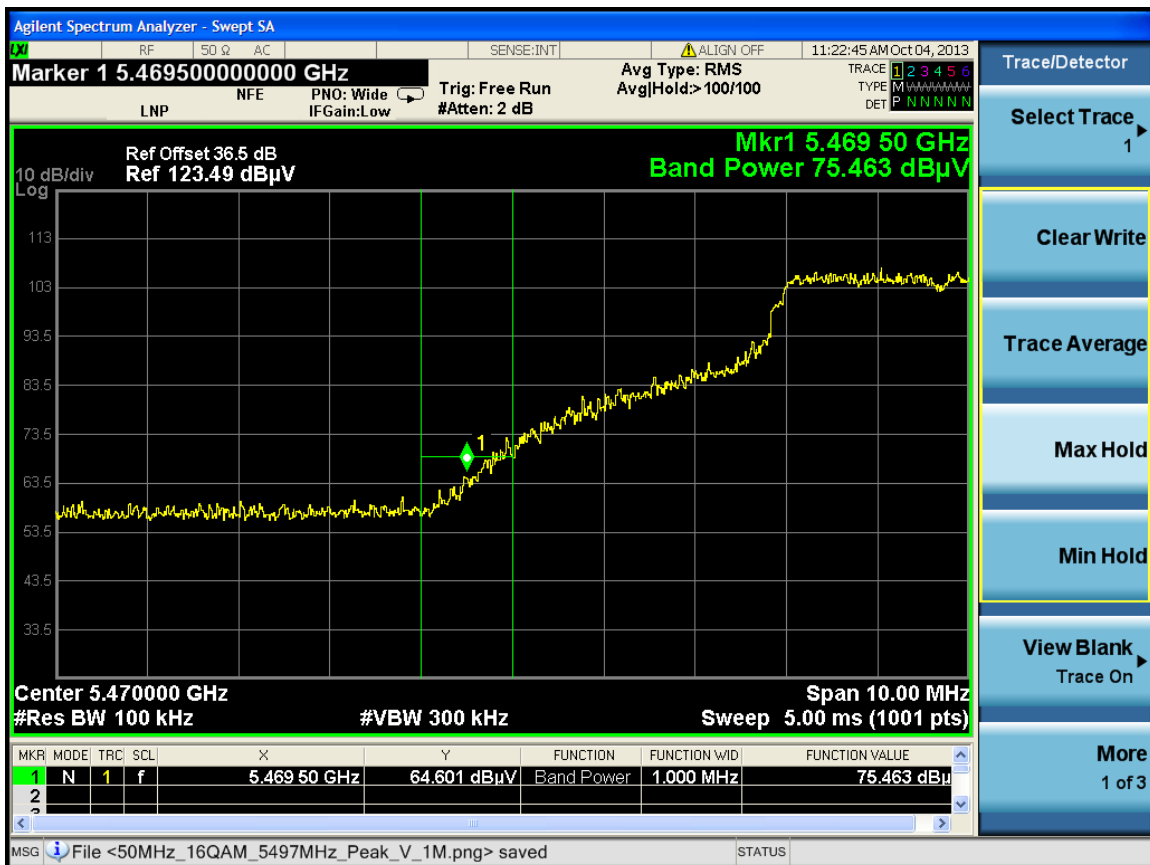
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: QPSK
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.960 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.81 \text{ dBm/MHz}$



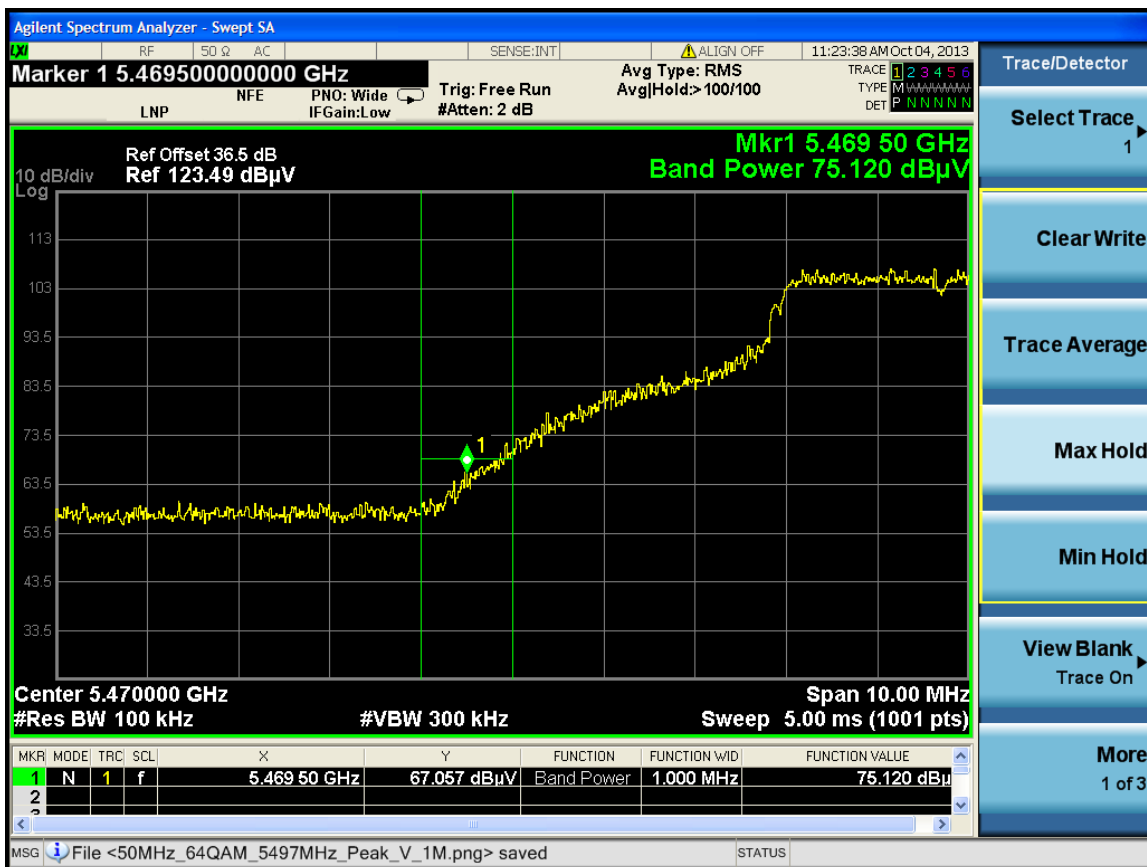
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 16QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.821 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.95 \text{ dBm/MHz}$



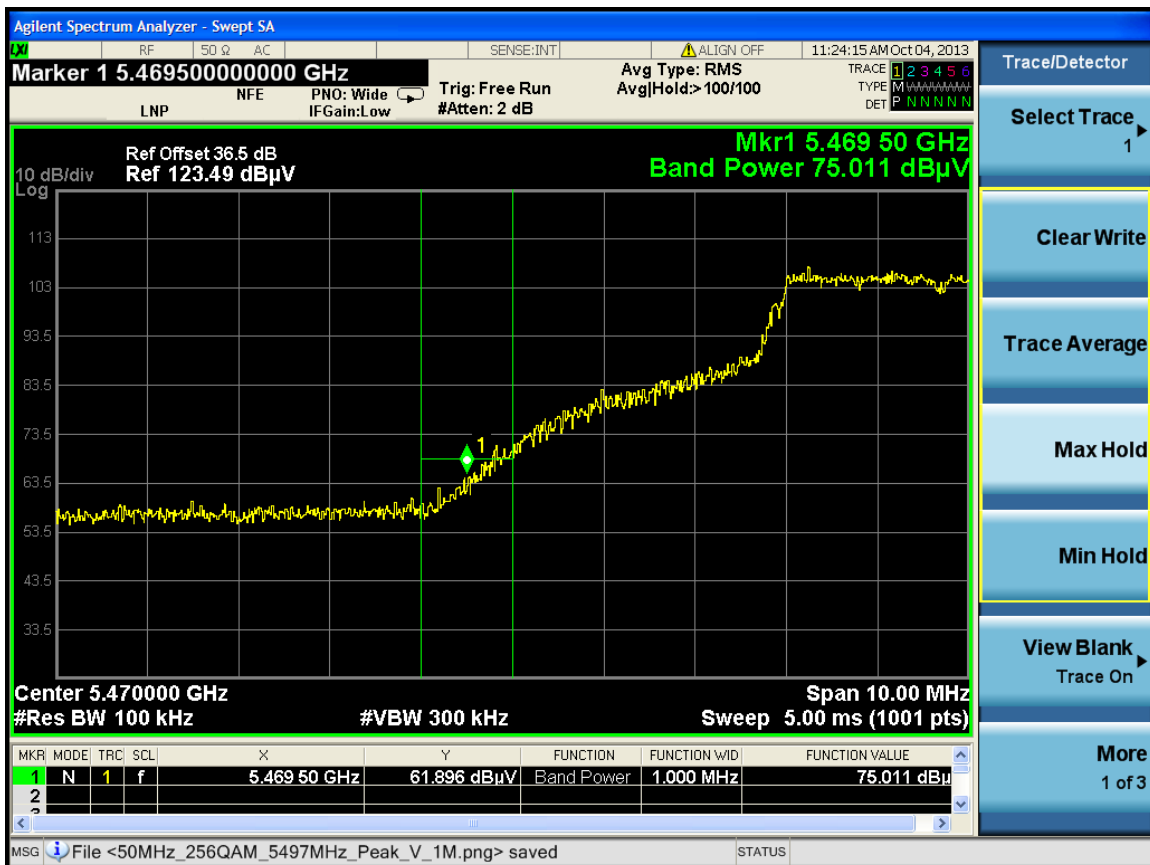
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 64QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.463 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.31 \text{ dBm/MHz}$



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: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 256QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.120 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.65 \text{ dBm/MHz}$

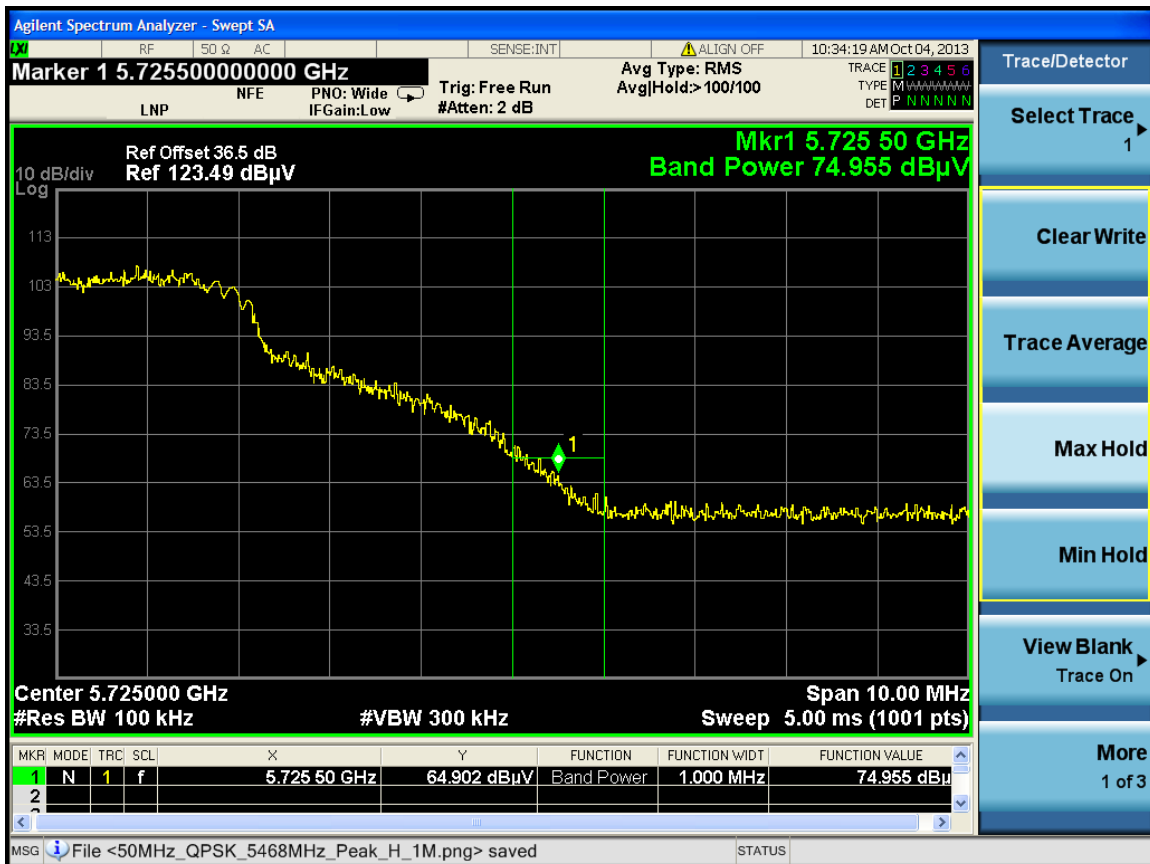


Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Lower Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 Low Channel: Frequency – 5497 MHz
 Modulation: 1024QAM
 Vertical
 Operating Band-Edge Frequency: 5470 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.011 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.76 \text{ dBm/MHz}$

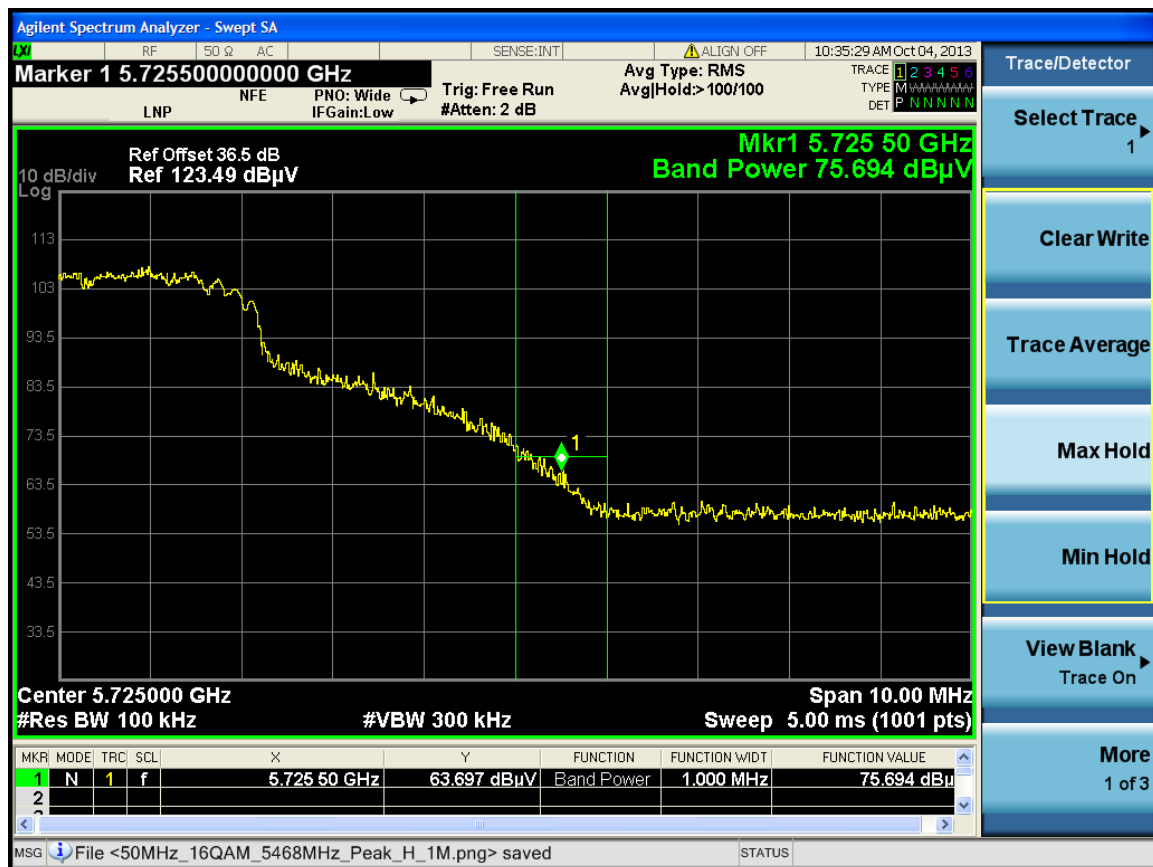


[illegible]

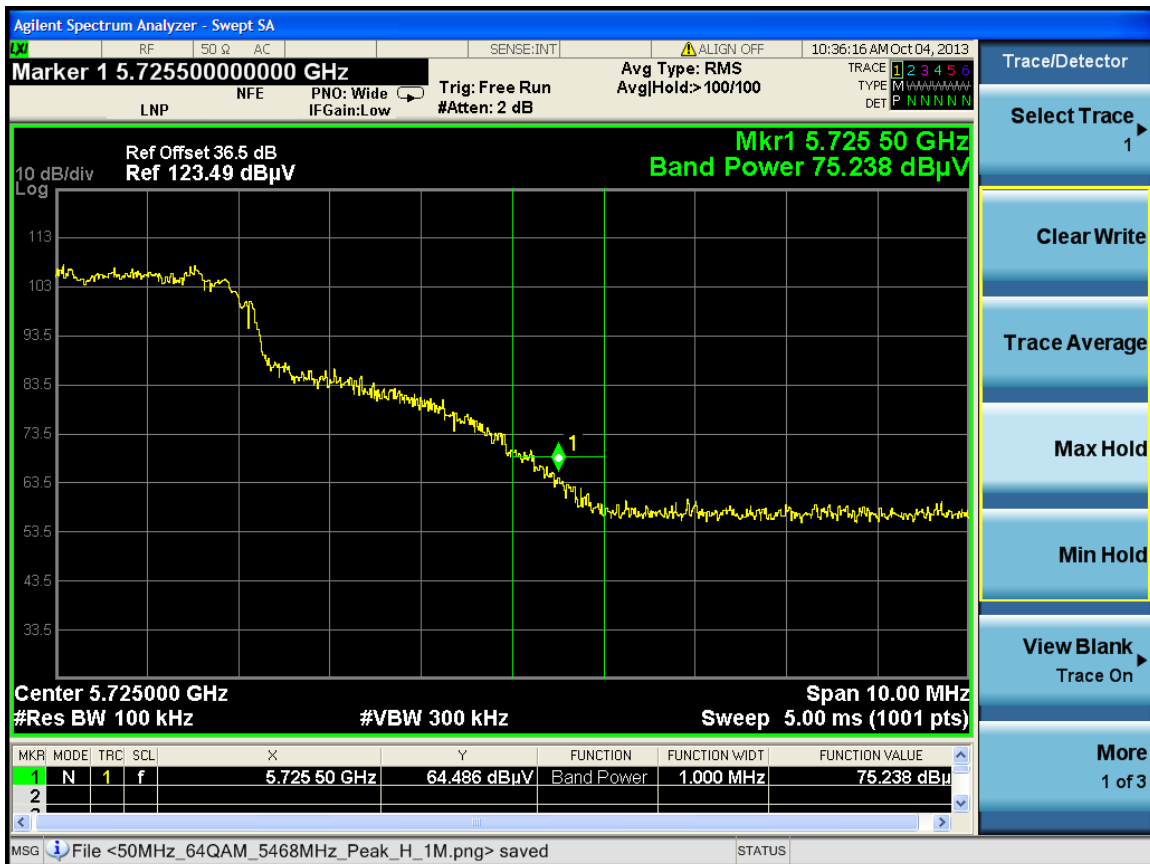
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 16QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 74.955 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.81 \text{ dBm/MHz}$



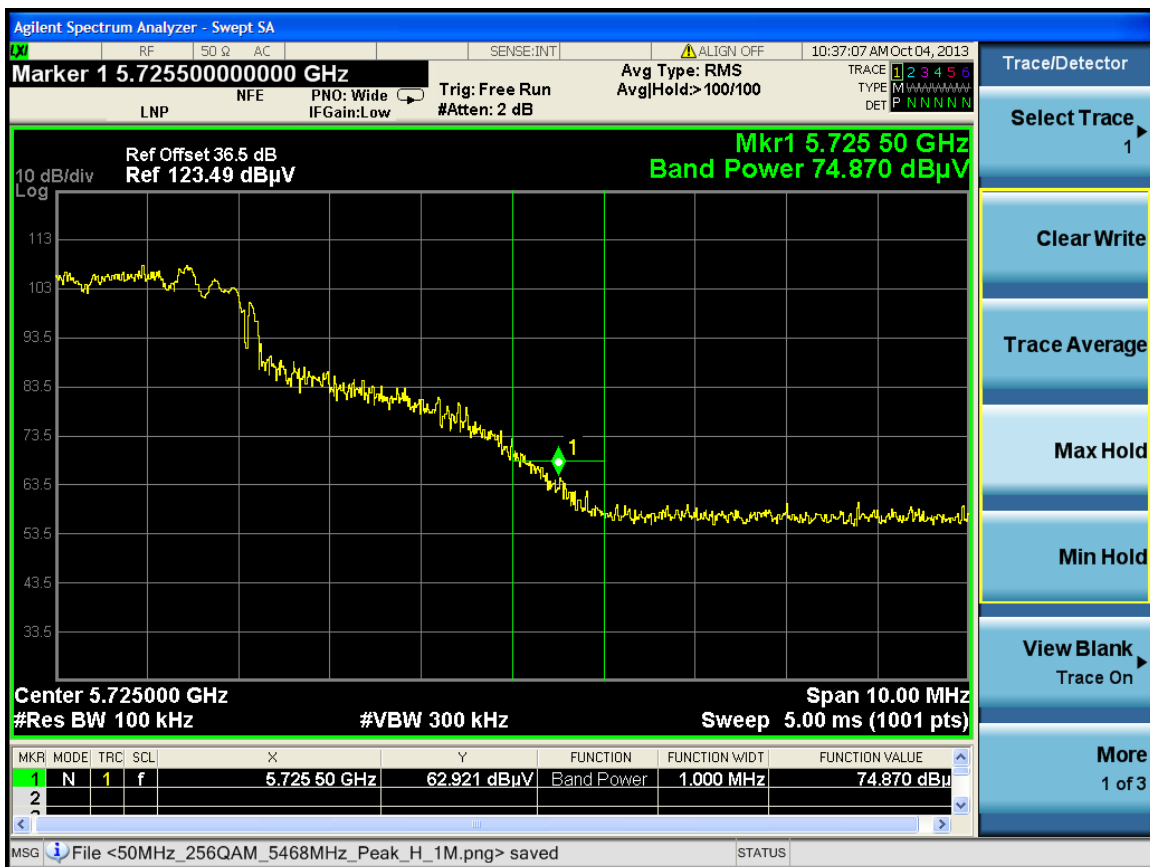
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 64QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
 $= 75.694 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.07 \text{ dBm/MHz}$



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: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 256QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 75.238 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.35 \text{ dBm/MHz}$

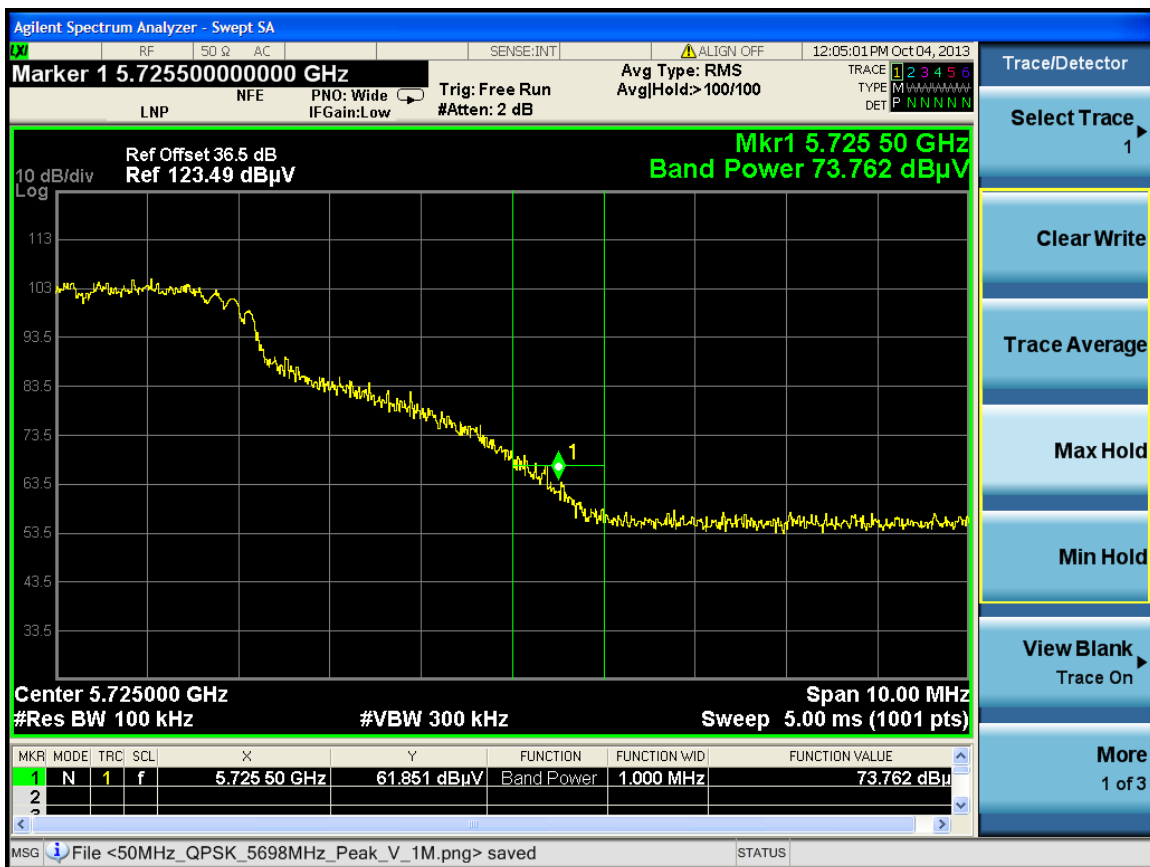


Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 1024QAM
 Horizontal
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
 $= 74.870 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -29.90 \text{ dBm/MHz}$

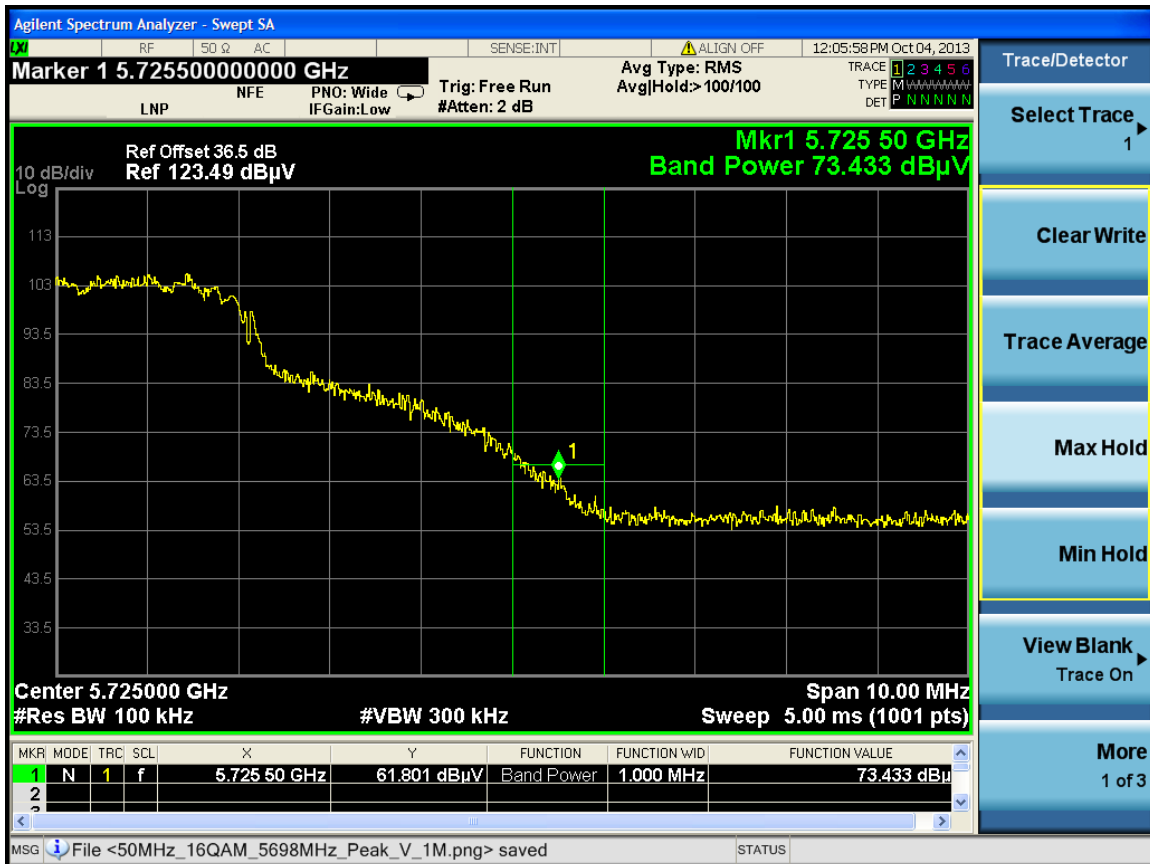


[illegible]

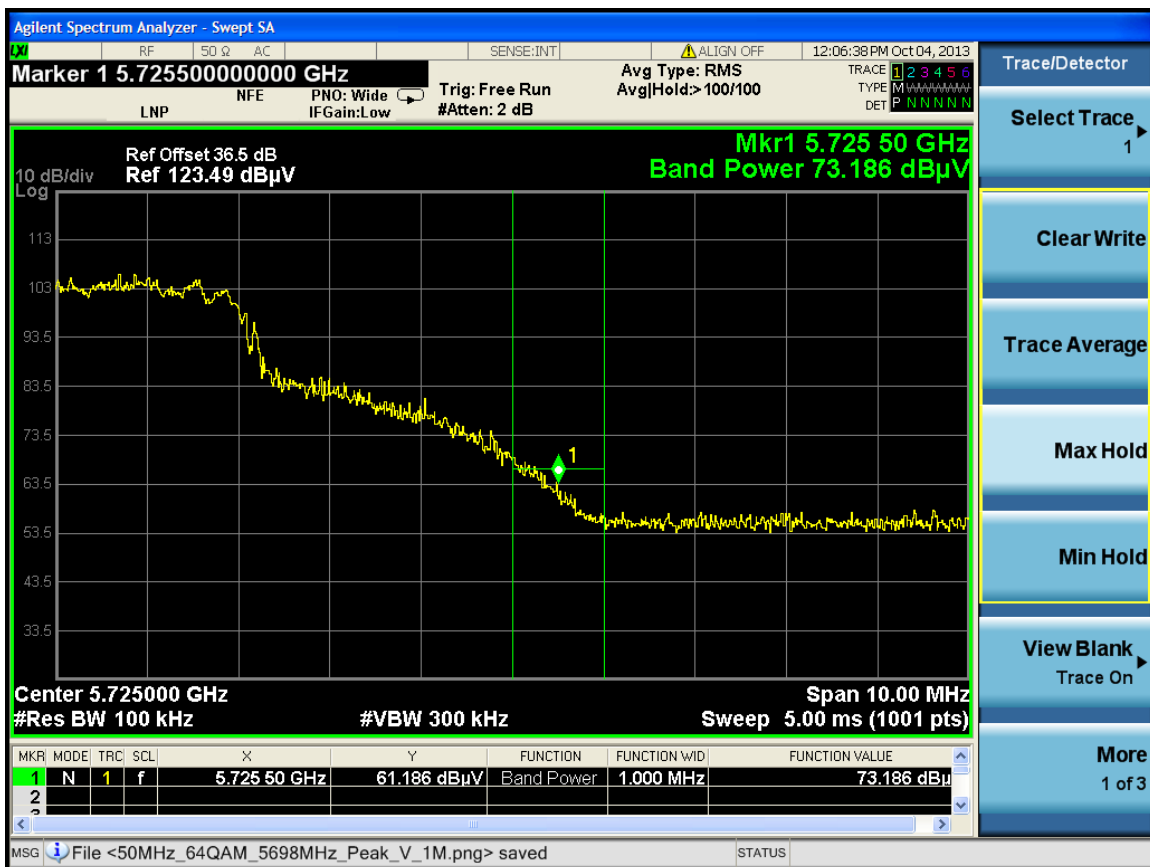
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 16QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP}[\text{dBm}] = \text{E}[\text{dB}\mu\text{V}/\text{m}] + 20 \log(\text{d}[\text{meters}]) - 104.77$
 $= 73.762 \text{ dB}\mu\text{V}/\text{m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.01 \text{ dBm/MHz}$



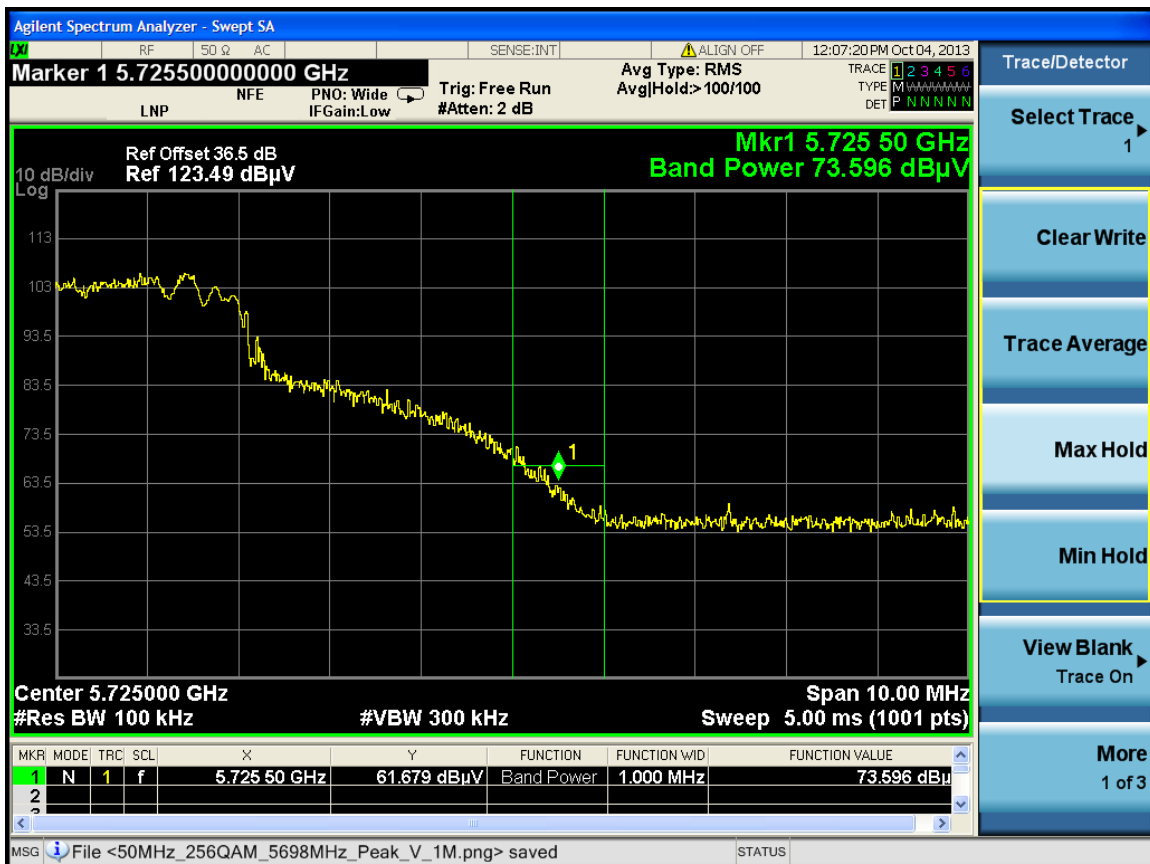
Test Date: 10-04-2013
 Company: Ubiquiti Networks
 EUT: AF5
 Test: Upper Operating Band-Edge Compliance - Radiated
 (FCC 15.407(b)(3))
 Operator: Craig B
 Comment: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 64QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
 $= 73.433 \text{ dB}\mu V/m + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.34 \text{ dBm/MHz}$



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: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 MHz
 Modulation: 256QAM
 Vertical
 Operating Band-Edge Frequency: 5725 MHz
 Band-Edge Limit: -27 dBm/MHz
 Test method: Integration
 Offset on analyzer includes horn antenna and cable loss correction factors
 Limit: -27 dBm/MHz
 Measurement: $\text{EIRP}[\text{dBm}] = \text{E}[\text{dB}\mu\text{V}/\text{m}] + 20 \log(\text{d}[\text{meters}]) - 104.77$
 $= 73.186 \text{ dB}\mu\text{V}/\text{m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.58 \text{ dBm}/\text{MHz}$



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: 50 MHz channel Bandwidth
 High Channel: Frequency – 5698 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: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
 $= 73.596 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
 $= -31.17 \text{ dBm/MHz}$





166 South Carter, Genoa City, WI 53128

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 4
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

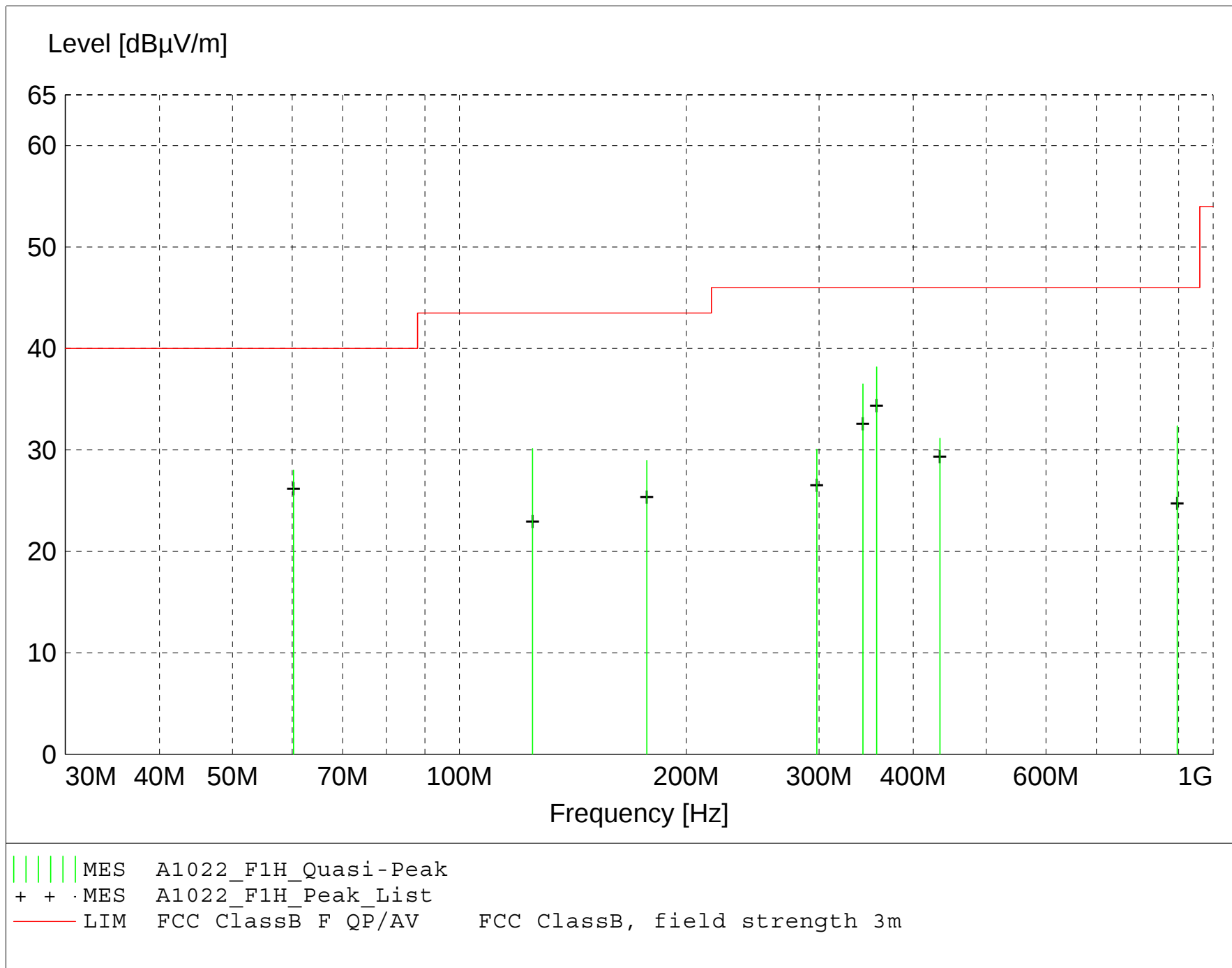
TEXT: "Horz 3 meters"

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"

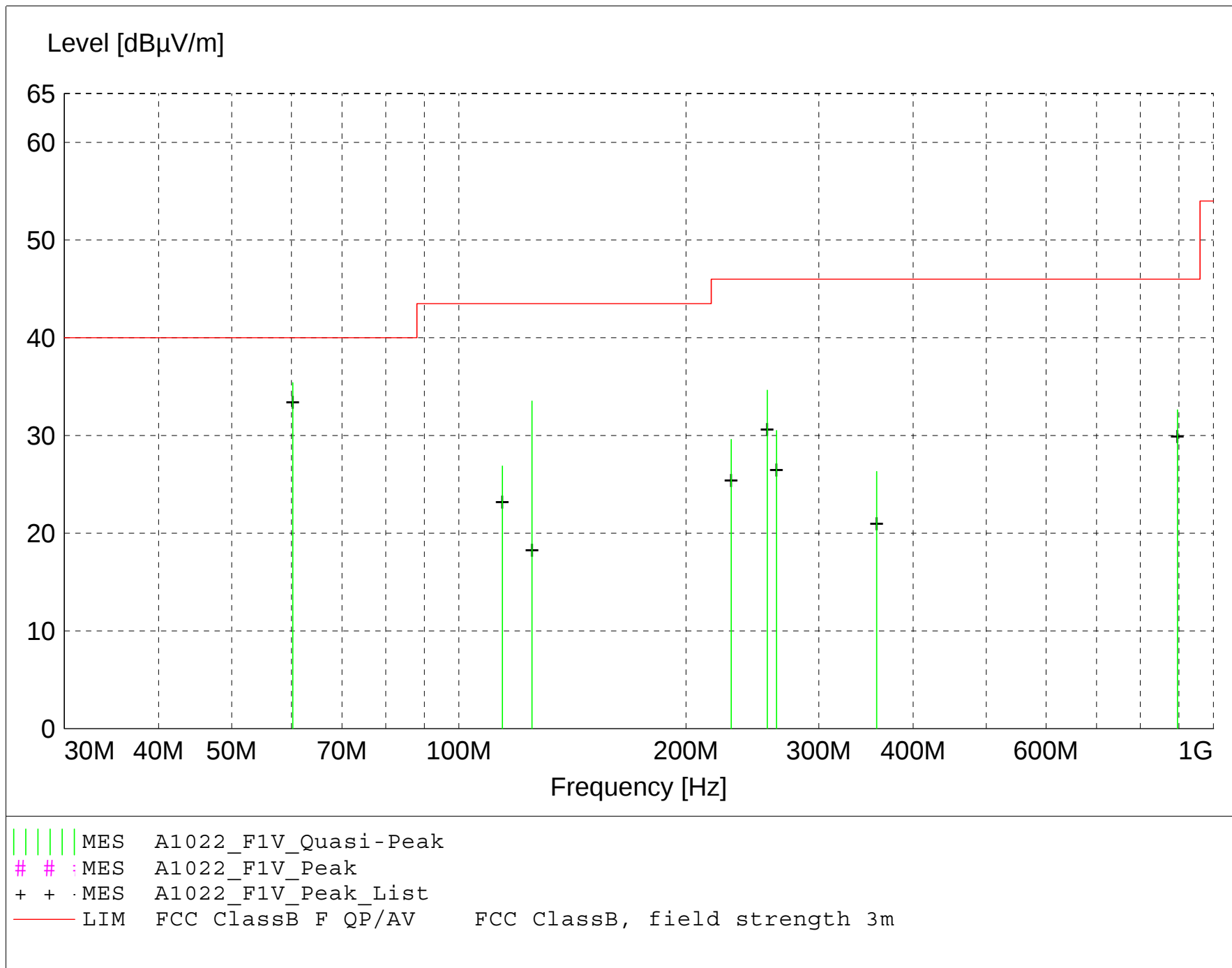
Short Description: Test Set-up

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: 70 deg. F; 44% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 50 MHz channel BW; 5510, ,5575, 5685 MHz channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 09-30-2013

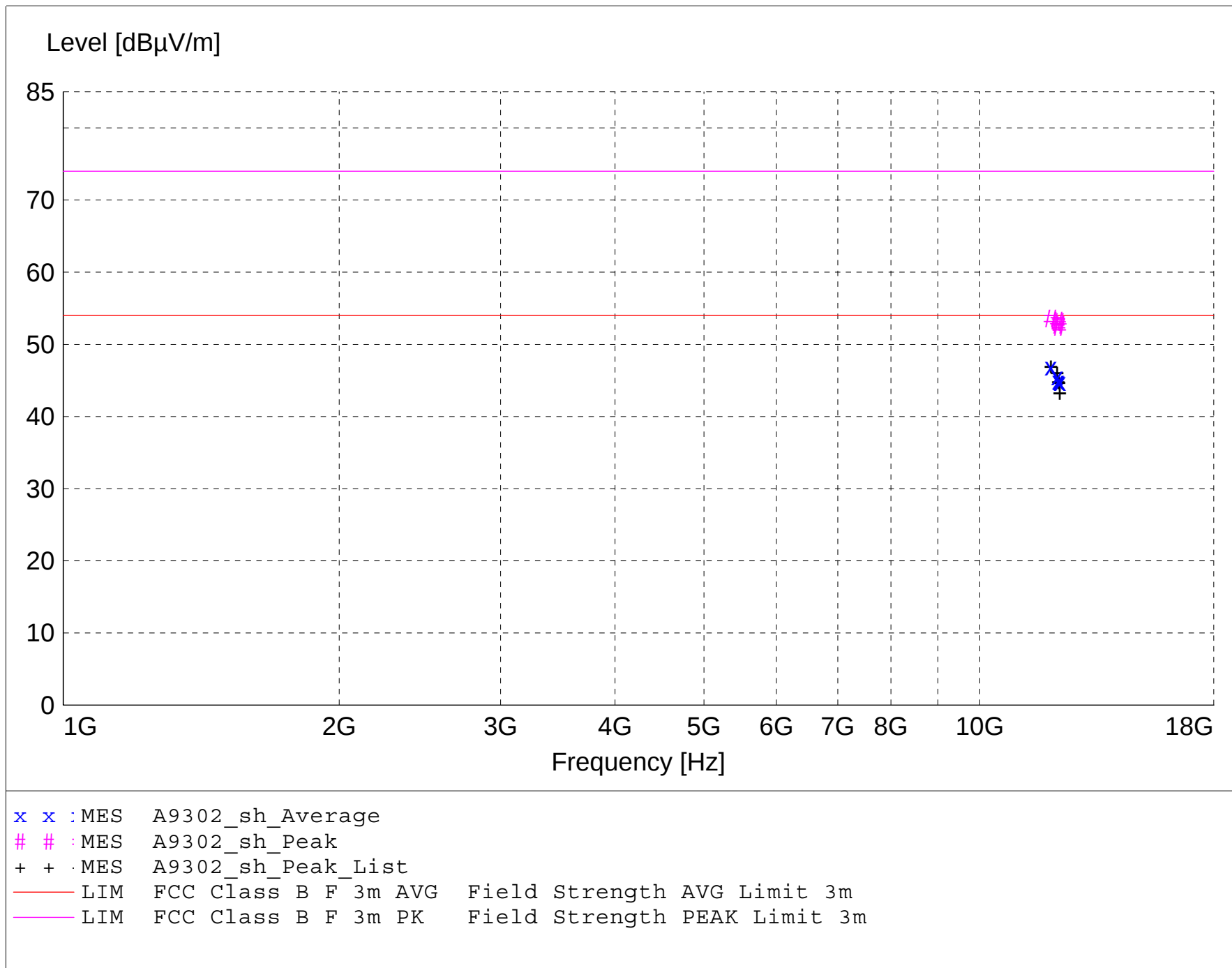
TEXT: "Horz 3 meters"

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: "A9302_sh_Final"

9/30/2013 2:24PM

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		
11955.020000	60.19	39.09	-52.4	46.9	54.0	7.1	1.20	225	AVERAGE	Low ch; QPSK
12150.000000	58.71	38.99	-52.1	45.6	54.0	8.4	1.00	100	AVERAGE	Mid ch; QPSK
12180.000000	58.05	38.97	-52.1	45.0	54.0	9.0	1.00	110	AVERAGE	High ch; QPSK
12200.000000	57.96	38.96	-52.0	44.9	54.0	9.1	1.10	0	AVERAGE	Low ch; QPSK
12225.000000	57.89	38.95	-52.0	44.8	54.0	9.2	1.00	170	AVERAGE	Low ch; QPSK
11955.020000	66.82	39.09	-52.4	53.5	74.0	20.5	1.20	225	MAX PEAK	Low ch; QPSK
12150.000000	66.43	38.99	-52.1	53.3	74.0	20.7	1.00	100	MAX PEAK	Mid ch; QPSK
12180.000000	66.18	38.97	-52.1	53.1	74.0	20.9	1.00	110	MAX PEAK	High ch; QPSK
12200.000000	65.80	38.96	-52.0	52.7	74.0	21.3	1.10	0	MAX PEAK	Low ch; QPSK
12225.000000	65.55	38.95	-52.0	52.5	74.0	21.5	1.00	170	MAX PEAK	Low ch; QPSK

FCC Part 15.209

Electric Field Strength

EUT: Model: AF5
Manufacturer: Ubiquiti Networks
Operating Condition: 70 deg. F; 44% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 50 MHz channel BW; 5510, ,5575, 5685 MHz channels
Comment: Power set to 30 dBm eirp; QPSK
Date: 09-30-2013

TEXT: "Vert 3 meters"

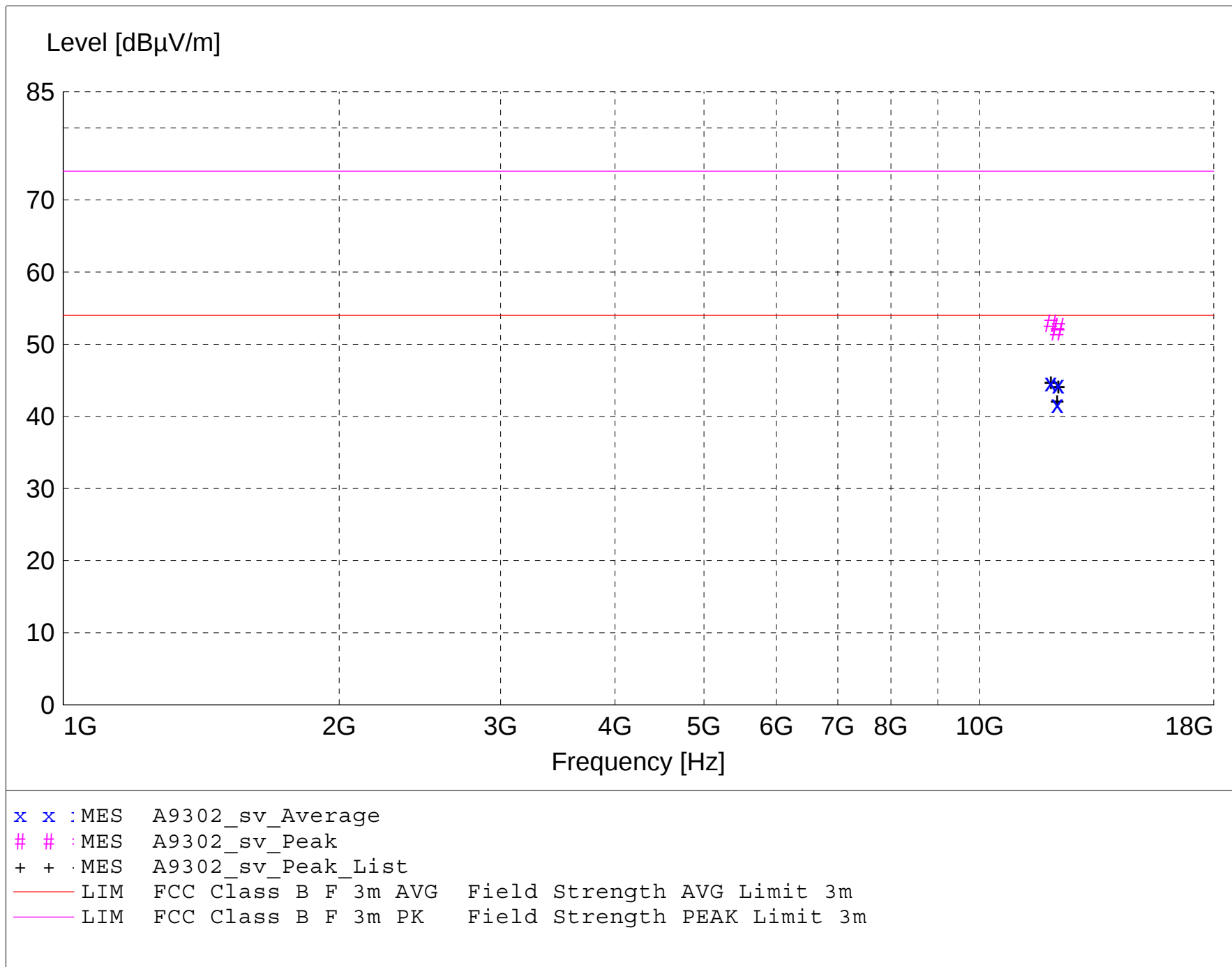
Short Description: Test Set-up

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: "A9302_sv_Final"

9/30/2013 2:12PM

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		
11955.020000	57.92	39.09	-52.4	44.6	54.0	9.4	1.30	0	AVERAGE	L ch; QPSK
12180.000000	57.52	38.97	-52.1	44.4	54.0	9.6	1.30	0	AVERAGE	High ch; QPSK
12150.005000	54.79	38.99	-52.1	41.6	54.0	12.4	1.40	190	AVERAGE	Mid ch; QPSK
11955.020000	66.18	39.09	-52.4	52.9	74.0	21.1	1.30	0	MAX PEAK	L ch; QPSK
12180.000000	65.55	38.97	-52.1	52.5	74.0	21.5	1.30	0	MAX PEAK	High ch; QPSK
12150.005000	64.91	38.99	-52.1	51.8	74.0	22.2	1.40	190	MAX PEAK	Mid 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 4
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