DLS ELECTRONIC SYSTEMS, INC.

166 South Carter, Genoa City, WI 53128

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

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart E – Unlicensed National Information Infrastructure Devices
Section 15.407
General Technical Requirements.

Part 2 - 20 MHz Bandwidth Data

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

Formal Name: Air Fiber 5 - 5.4GHz Radio
Model Number(s): AF5

Kind of Equipment: Point-to-Point Digital Transmission Transceiver

Test Conducted For: Ubiquiti Networks, Inc.
12F, No105, Song Ren Rd
Taipei, Taiwan

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

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

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Company: Ubiquiti Networks, Inc.
Model Tested: AF5
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SIGNATURE PAGE

Tested By:

Craig Brandt
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Reviewed By:

William Stumpf
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General Manager

DLS ELECTRONIC SYSTEMS, INC.

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United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

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

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

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

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

For the National Institute of Standards and Technology

2013-10-01 through 2014-09-30
Effective dates

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

DLS
ELECTRONIC SYSTEMS, INC.

166 South Carter, Genoa City, WI 53128

Company: Ubiquiti Networks, Inc.
Model Tested: AF5
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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.

Description of the Test Sample:

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

Frequency Ranges of the Radio:

> **5476 to 5719 MHz (10 MHz bandwidth)**
> **5481 to 5714 MHz (20 MHz bandwidth)**   **(in this part of the report)**
> **5492 to 5703 MHz (40 MHz bandwidth)**
> **5497 to 5698 MHz (50 MHz bandwidth)**
>
> (The 5.8 radio data is in a separate report.)

Type of Modulations Tested:

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

Conclusion

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

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 ≥ OBW (otherwise, RBW = largest possible)
VBW ≥ 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 dB

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

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

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

RBW = 10 MHz   VBW = 10 MHz
Span = 0 Hz   SWT = 5 ms
Mid Channel: Transmit = 5.575GHz   20MHz BW   16QAM
Total Cycle time = 4.138277-2.124248 = 2.004008
Total on Time = 4.068136-2.124248 = 1.943888 ms

Duty cycle factor x = 1.943888 / 2.004008= 0.970
Adjustment for duty cycle =10log1/x = 0.13

Max/Ref Lvl	Marker 3 [T1]		RBW	10 MHz	RF Att	10 dB
40 dBm		9.99 dBm	VBW	10 MHz		
0 dBm		4.068136 ms	SWT	5 ms	Unit	dBm

Center 5.575 GHz   500 µs/

Date: 17.OCT.2013   14:23:30

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

RBW = 10 MHz   VBW = 10 MHz
Span = 0 Hz   SWT = 5 ms
Mid Channel: Transmit = 5.575GHz   20MHz BW   64QAM
Total Cycle time = 3.847695-1.843687 = 2.004008
Total on Time = 3.787575-1.843687 = 1.943888 ms

Duty cycle factor x = 1.943888 / 2.004008= 0.970
Adjustment for duty cycle =10log1/x = 0.13
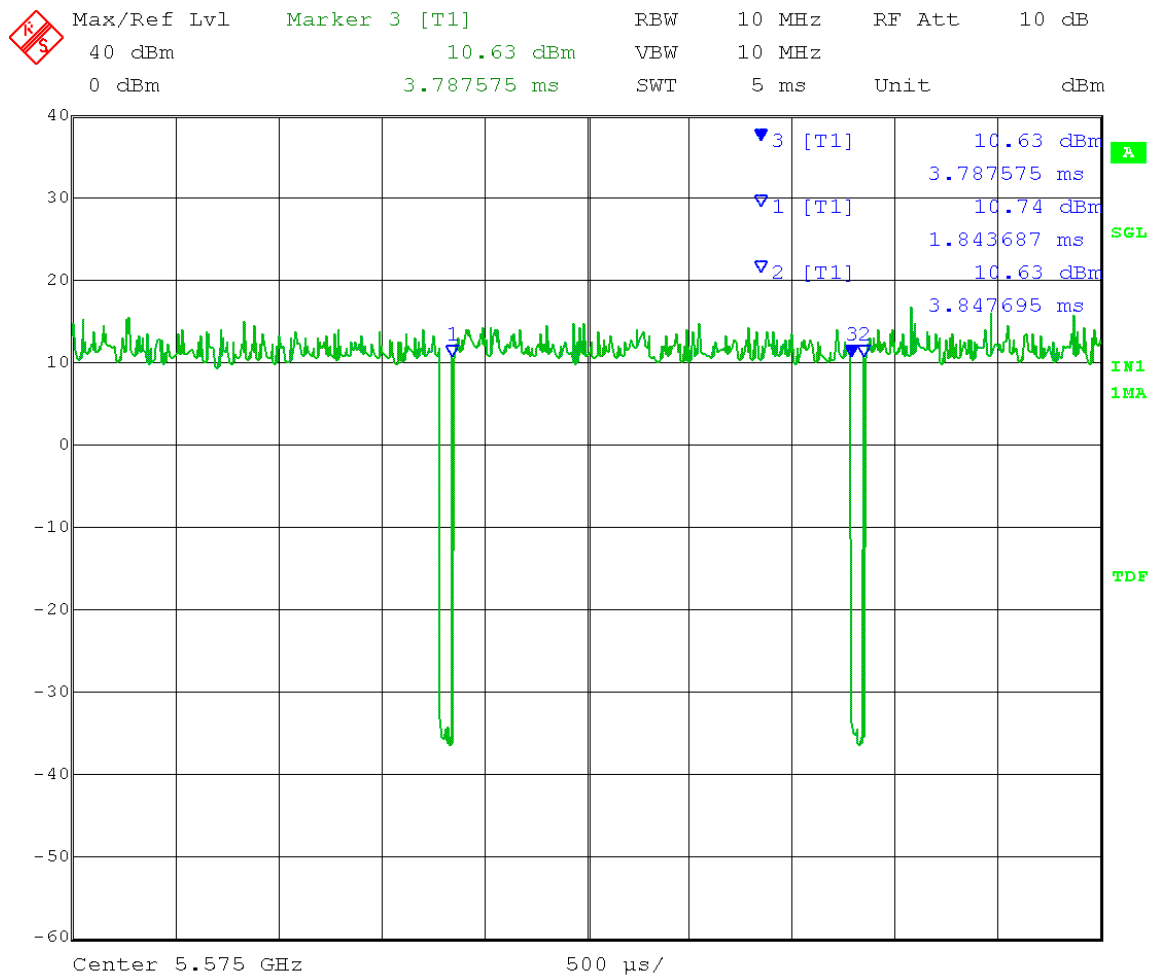
Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Duty Cycle during testing
Operator: Lillian L
Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz   VBW = 10 MHz
Span = 0 Hz   SWT = 5 ms
Mid Channel: Transmit = 5.575GHz   20MHz BW   256QAM
Total Cycle time = 4.759519-2.755511 = 2.004008
Total on Time = 4.699399-2.755511 = 1.943888 ms

Duty cycle factor x = 1.943888 / 2.004008= 0.970
Adjustment for duty cycle =10log1/x = 0.13
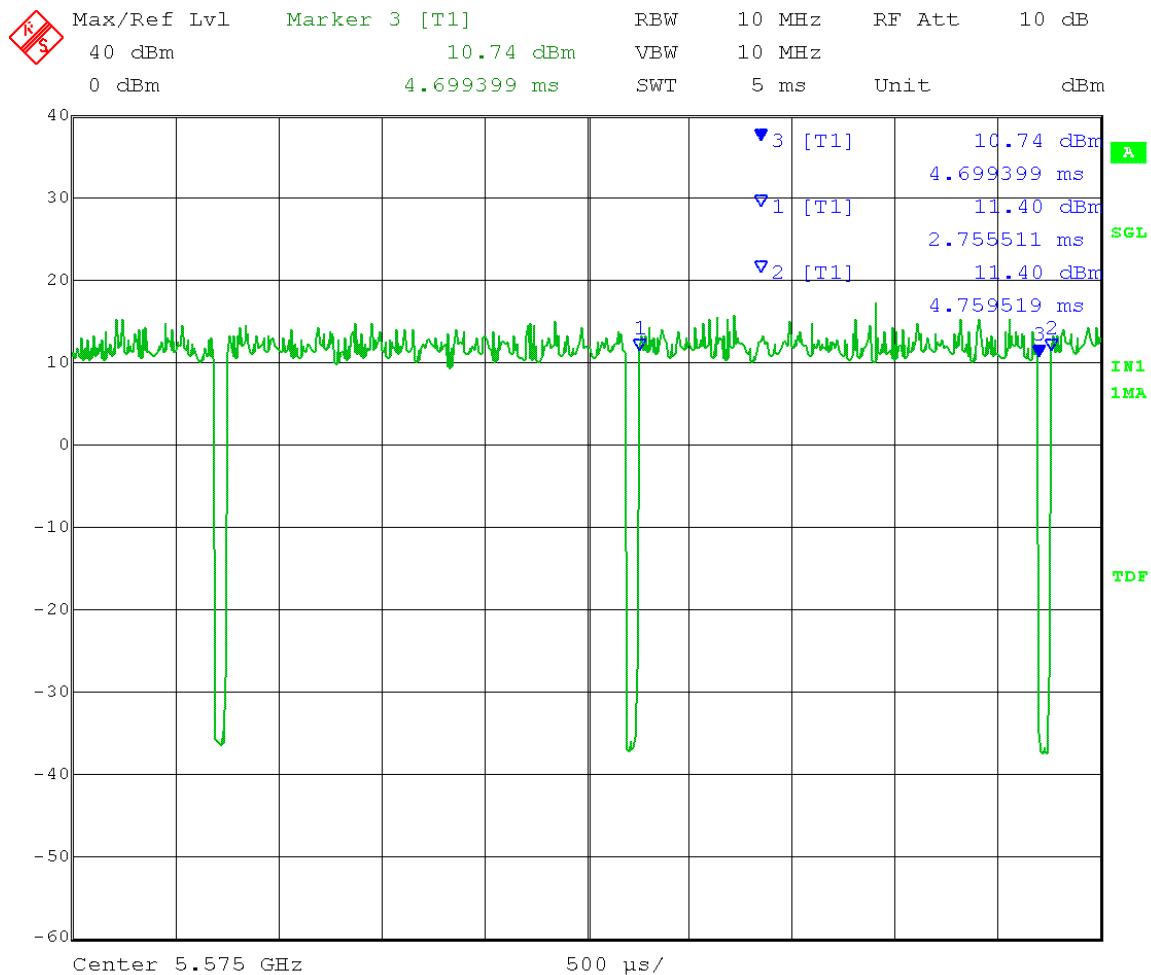
Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Duty Cycle during testing
Operator: Lillian L
Test Procedure used: KDB 789033 D01 v01r03 – B)2)b) zero-span method

RBW = 10 MHz   VBW = 10 MHz
Span = 0 Hz   SWT = 5 ms
Mid Channel: Transmit = 5.575GHz   20MHz BW   1024QAM
Total Cycle time = 3.867735-1.863727 = 2.004009
Total on Time = 3.807615-1.863727 = 1.943888 ms

Duty cycle factor x = 1.943888 / 2.004008= 0.970
Adjustment for duty cycle =10log1/x = 0.13

Max/Ref Lvl	Marker 3 [T1]		RBW	10 MHz	RF Att	10 dB
40 dBm		9.20 dBm	VBW	10 MHz		
0 dBm		3.807615 ms	SWT	5 ms	Unit	dBm

3 [T1]   9.20 dBm
            3.807615 ms
1 [T1]   8.94 dBm
            1.863727 ms
2 [T1]   8.81 dBm
            3.867735 ms

Center 5.575 GHz   500 µs/
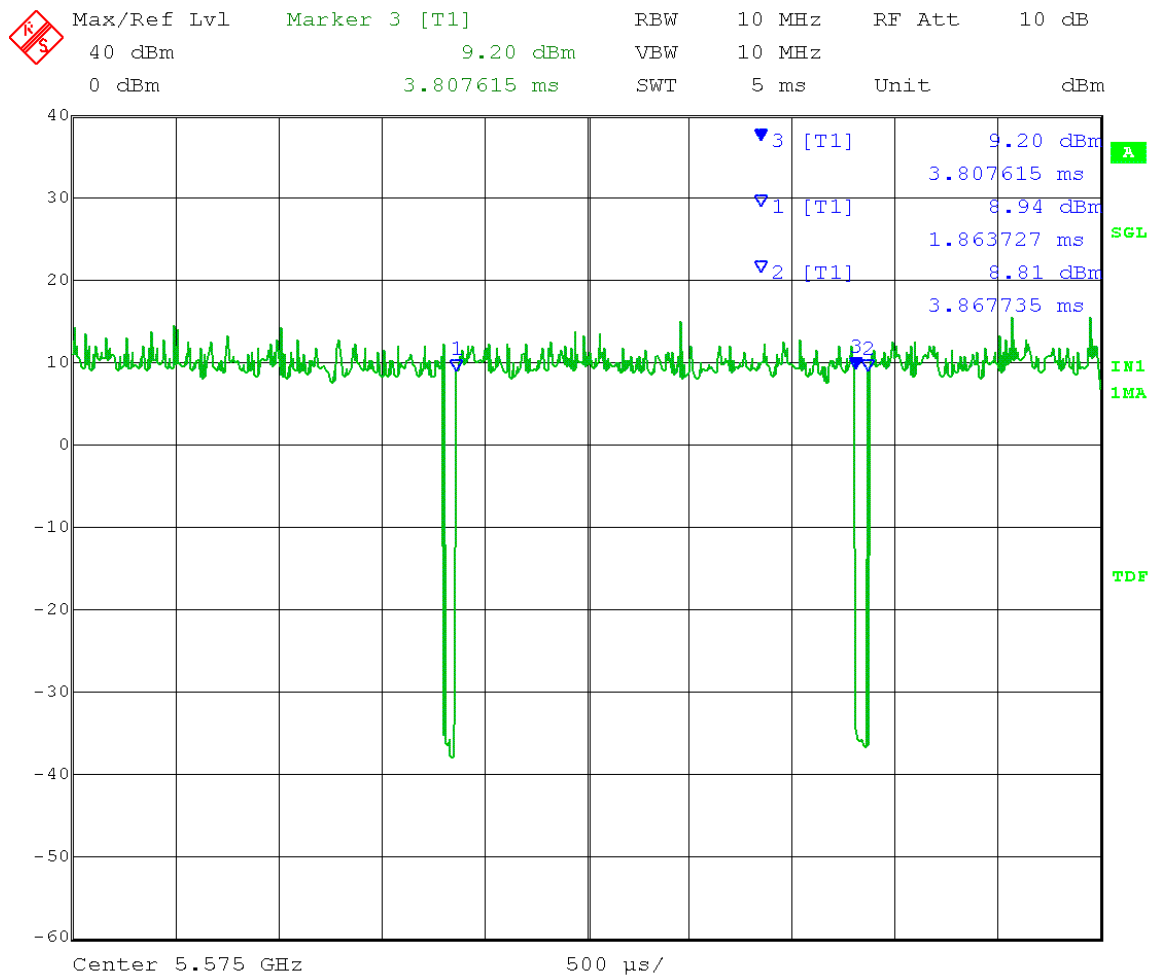
Date: 17.OCT.2013   13:54:46

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

RBW = 10 MHz   VBW = 10 MHz
Span = 0 Hz   SWT = 5 ms
Mid Channel: Transmit = 5.575GHz   20MHz BW   QPSK
Total Cycle time = 4.729459-2.725451 = 2.004008
Total on Time = 4.679359-2.725451 = 1.953908 ms

Duty cycle factor x = 1.953908 / 2.004008= 0.975
Adjustment for duty cycle =10log1/x = 0.11

Max/Ref Lvl	Marker 3 [T1]		RBW	10 MHz	RF Att	10 dB
40 dBm		8.15 dBm	VBW	10 MHz		
0 dBm		4.679359 ms	SWT	5 ms	Unit	dBm

Center 5.575 GHz   500 µs/

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

Appendix – Measurement Data

2.0   Emission Bandwidth – 26 dB bandwidth – conducted

Rule Section: Informative

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

Section C – Emission bandwidth

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

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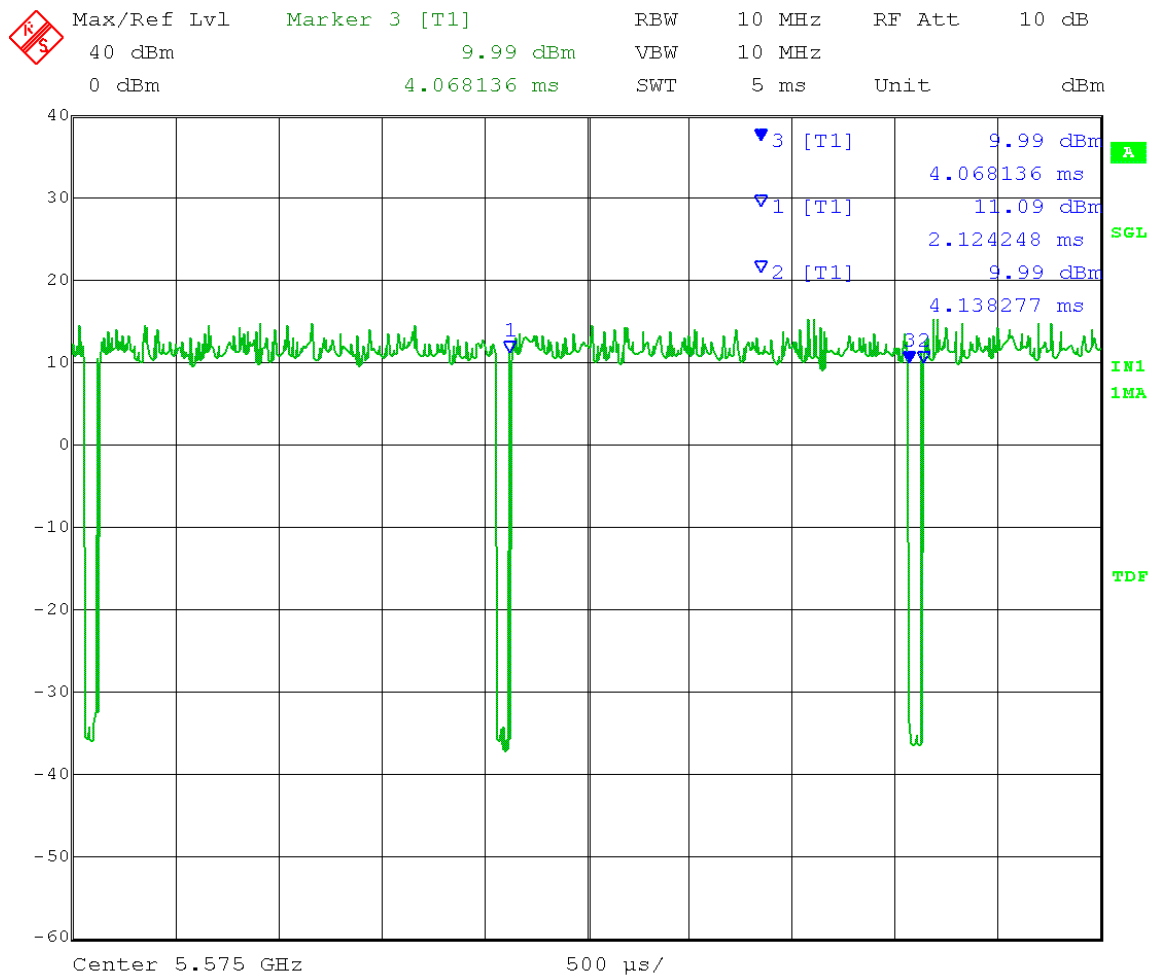
Limit: Informative

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

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

Test Date: 10-4&7-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
High Channel: Transmit = 5.714 GHz   20MHz BW   16QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.40MHz

Max/Ref Lvl	Delta 1 [T1]	RBW	200 kHz	RF Att	10 dB
16 dBm	-1.81 dB	VBW	500 kHz		
-10 dBm	21.40280561 MHz	SWT	5 ms	Unit	dBm

2 [T1]   -39.68 dBm
          5.70337876 GHz
1 [T1]   -1.81 dB
          21.40280561 MHz
1 [T1]   -13.53 dBm
          5.70738677 GHz

1VIEW

D1 -39.53 dBm

Center 5.714 GHz   4 MHz/   Span 40 MHz
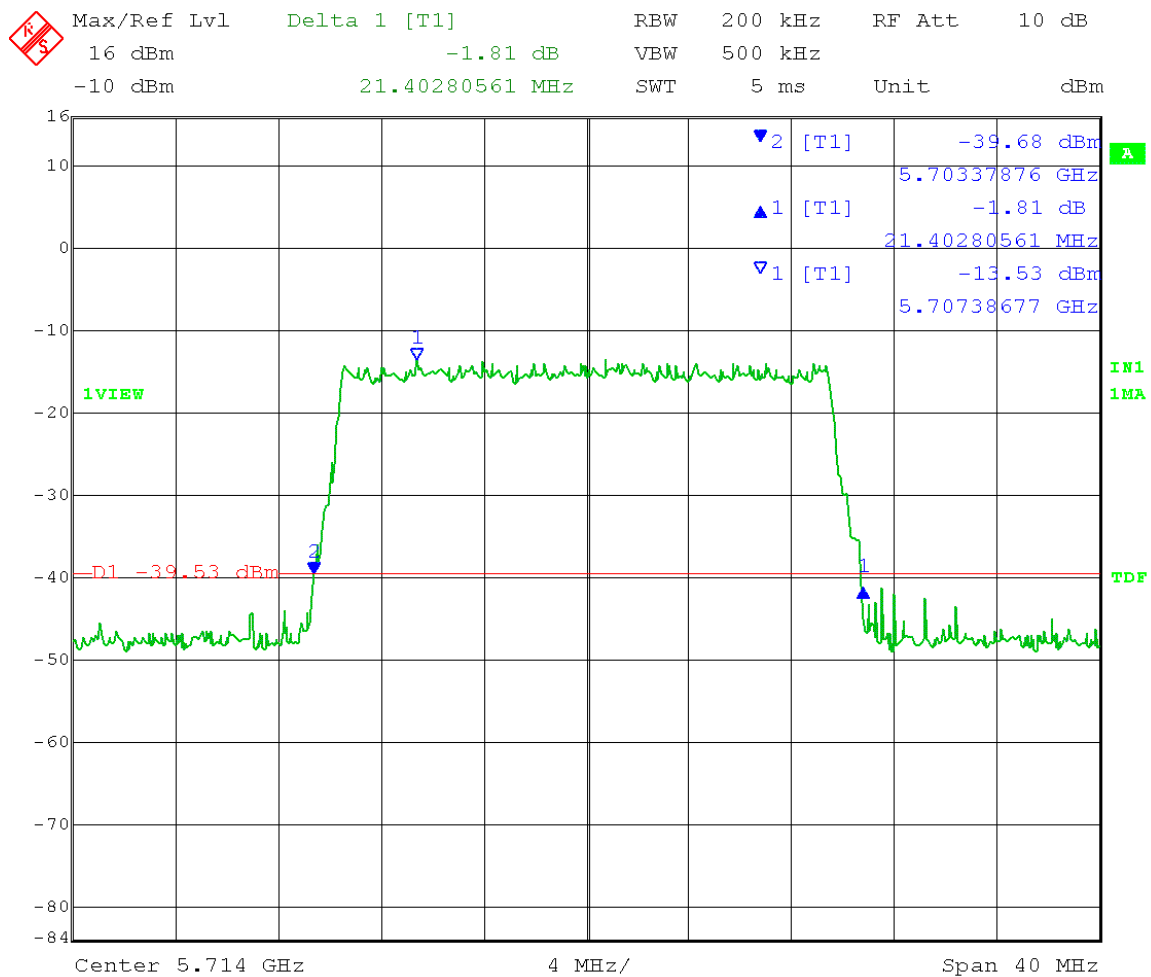
Date: 17.OCT.2013 15:27:13

TX 1:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl   Delta 1 [T1]   RBW   200 kHz   RF Att   10 dB
 16 dBm   0.47 dB   VBW   500 kHz
-10 dBm   21.24248497 MHz   SWT   5 ms   Unit   dBm

▼2 [T1]   -34.94 dBm
                 5.70337876 GHz
▲1 [T1]   0.47 dB
                 21.24248497 MHz
▽1 [T1]   -8.27 dBm
                 5.70578357 GHz

A

1VIEW

IN1
1MA

D1 -34.27 dBm

TDF

Center 5.714 GHz   4 MHz/   Span 40 MHz

Date: 18.OCT.2013   13:52:32

Test Date: 10-17&18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
High Channel: Transmit = 5.714 GHz   20MHz BW   64QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.24MHz

TX 1:

26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		1.05 dB	VBW	500 kHz		
-10 dBm		21.32264529 MHz	SWT	5 ms	Unit	dBm

▼2 [T1]   -34.26 dBm
5.70337876 GHz
▲1 [T1]   1.05 dB
21.32264529 MHz
▽1 [T1]   -8.60 dBm
5.70915030 GHz

A

IN1
1MA

1VIEW

D1 -34.6 dBm

TDF

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-17&18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
High Channel: Transmit = 5.714 GHz   20MHz BW   256QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		0.15 dB	VBW	500 kHz		
-10 dBm	21.24248497 MHz		SWT	5 ms	Unit	dBm

▼2 [T1]   -38.55 dBm
                  5.70329860 GHz
▲1 [T1]   0.15 dB
                  21.24248497 MHz
▽1 [T1]   -12.80 dBm
                  5.70666533 GHz

A

1VIEW

IN1
1MA

D1 -38.8 dBm

TDF

Center 5.714 GHz   4 MHz/   Span 40 MHz

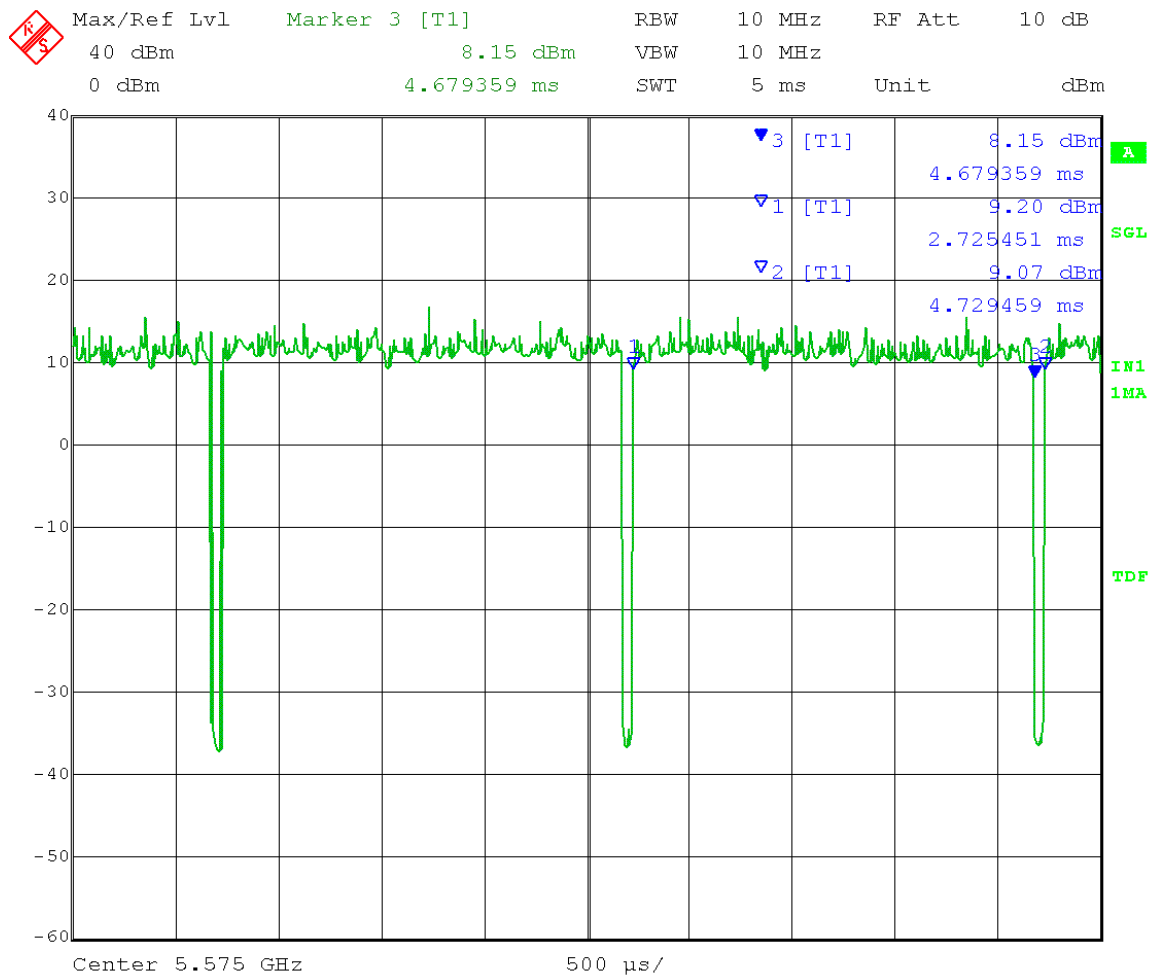Date: 17.OCT.2013 15:31:03

TX 1:

26 dB Emission Bandwidth = 21.16MHz

Date: 18.OCT.2013 13:56:26

Test Date: 10-17&18-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
High Channel: Transmit = 5.714 GHz   20MHz BW   1024QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		1.32 dB	VBW	500 kHz		
-10 dBm		21.24248497 MHz	SWT	5 ms	Unit	dBm

▼2 [T1]   -40.38 dBm
5.70329860 GHz
▲1 [T1]   1.32 dB
21.24248497 MHz
▽1 [T1]   -12.84 dBm
5.71195591 GHz

1VIEW

D1 -38.84 dBm

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

TX 1:

26 dB Emission Bandwidth = 21.16MHz

Max/Ref Lvl   Delta 1 [T1]   RBW   200 kHz   RF Att   10 dB
 16 dBm   -0.84 dB   VBW   500 kHz
-10 dBm   21.16232465 MHz   SWT   5 ms   Unit   dBm

▼2 [T1]   -33.75 dBm
               5.70345892 GHz
▲1 [T1]   -0.84 dB
               21.16232465 MHz
▽1 [T1]   -8.45 dBm
               5.70947094 GHz

1VIEW

D1 -34.45 dBm

Center 5.714 GHz   4 MHz/   Span 40 MHz
Date: 18.OCT.2013   13:57:56

Test Date: 10-4&7-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
High Channel: Transmit = 5.714 GHz   20MHz BW   QPSK
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		0.10 dB	VBW	500 kHz		
-10 dBm	21.24248497 MHz		SWT	5 ms	Unit	dBm

▼2 [T1]   -35.00 dBm
                     5.70337876 GHz
▲1 [T1]   0.10 dB
                     21.24248497 MHz
▽1 [T1]   -10.37 dBm
                     5.71764729 GHz

1VIEW

D1 -36.37 dBm

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

TX 1:

26 dB Emission Bandwidth = 21.40MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		-1.15 dB	VBW	500 kHz		
-10 dBm	21.40280561 MHz		SWT	5 ms	Unit	dBm

▼2 [T1]   -35.27 dBm
5.70329860 GHz

▲1 [T1]   -1.15 dB
21.40280561 MHz

▽1 [T1]   -10.16 dBm
5.70778758 GHz

A

1VIEW

IN1
1MA

D1 -36.16 dBm

TDF

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   16QAM
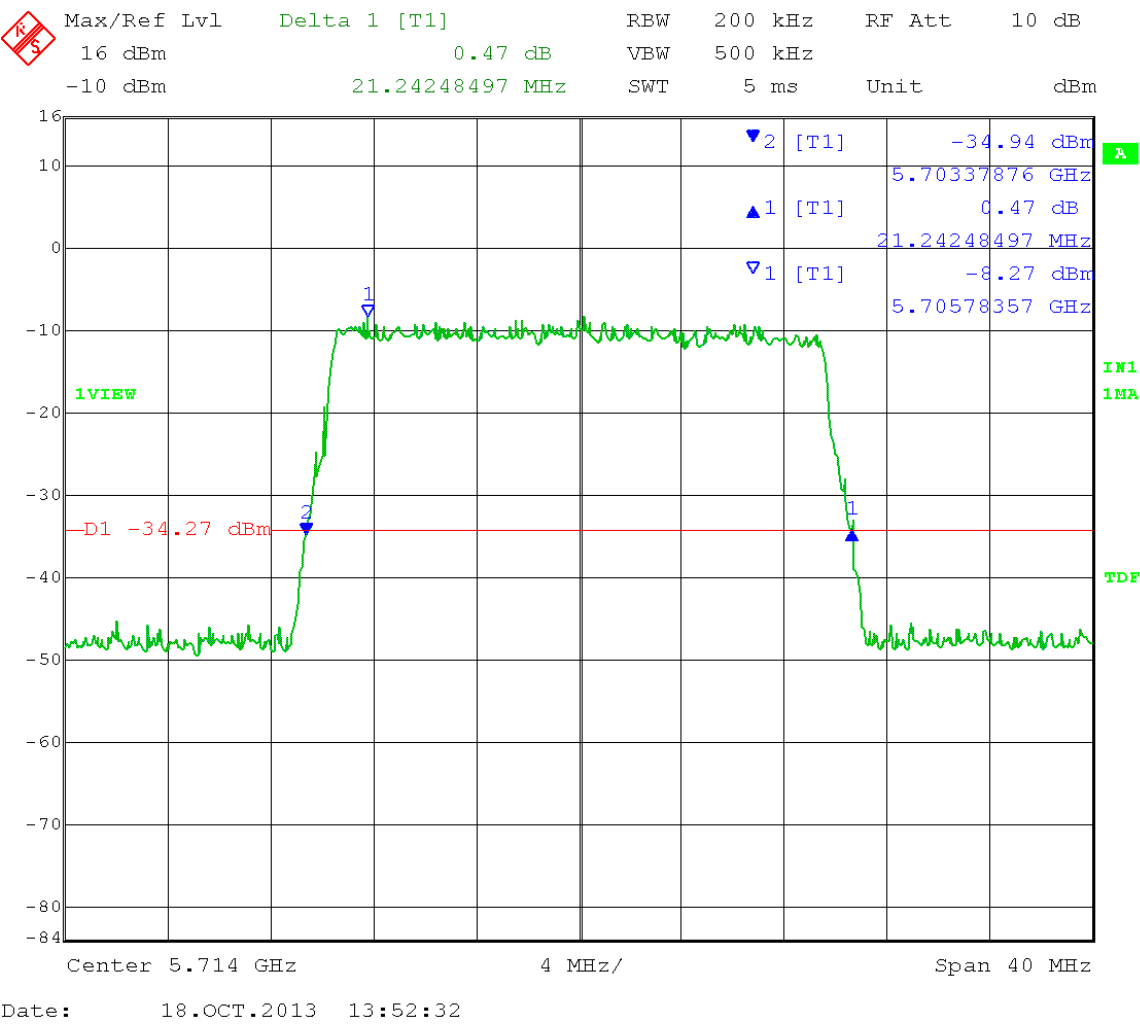Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.40MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		−0.64 dB	VBW	500 kHz		
−10 dBm		21.40280561 MHz	SWT	5 ms	Unit	dBm

▼2 [T1]   −40.83 dBm
                            5.56429860 GHz
▲1 [T1]   −0.64 dB
                            21.40280561 MHz
▽1 [T1]   −14.20 dBm
                            5.58385772 GHz

1VIEW

D1 −40.2 dBm

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

TX 1:

26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		2.07 dB	VBW	500 kHz		
-10 dBm		21.32264529 MHz	SWT	5 ms	Unit	dBm

▼2 [T1] -34.93 dBm
5.56437876 GHz

▲1 [T1] 2.07 dB
21.32264529 MHz

▽1 [T1] -8.10 dBm
5.57680361 GHz

A

IN1
1MA

TDF

1VIEW

D1 -34.1 dBm

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   64QAM
Output power setting: 30 dBm eirp
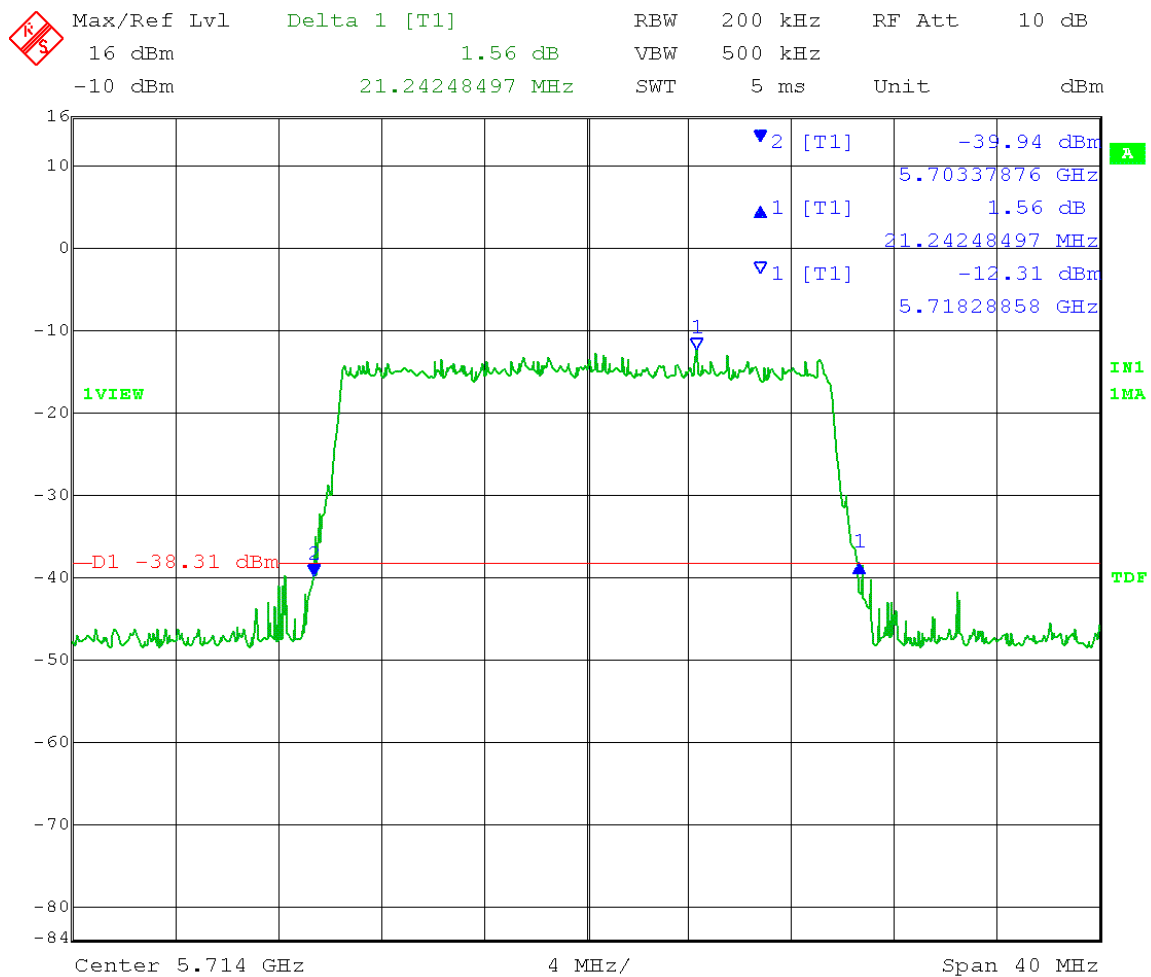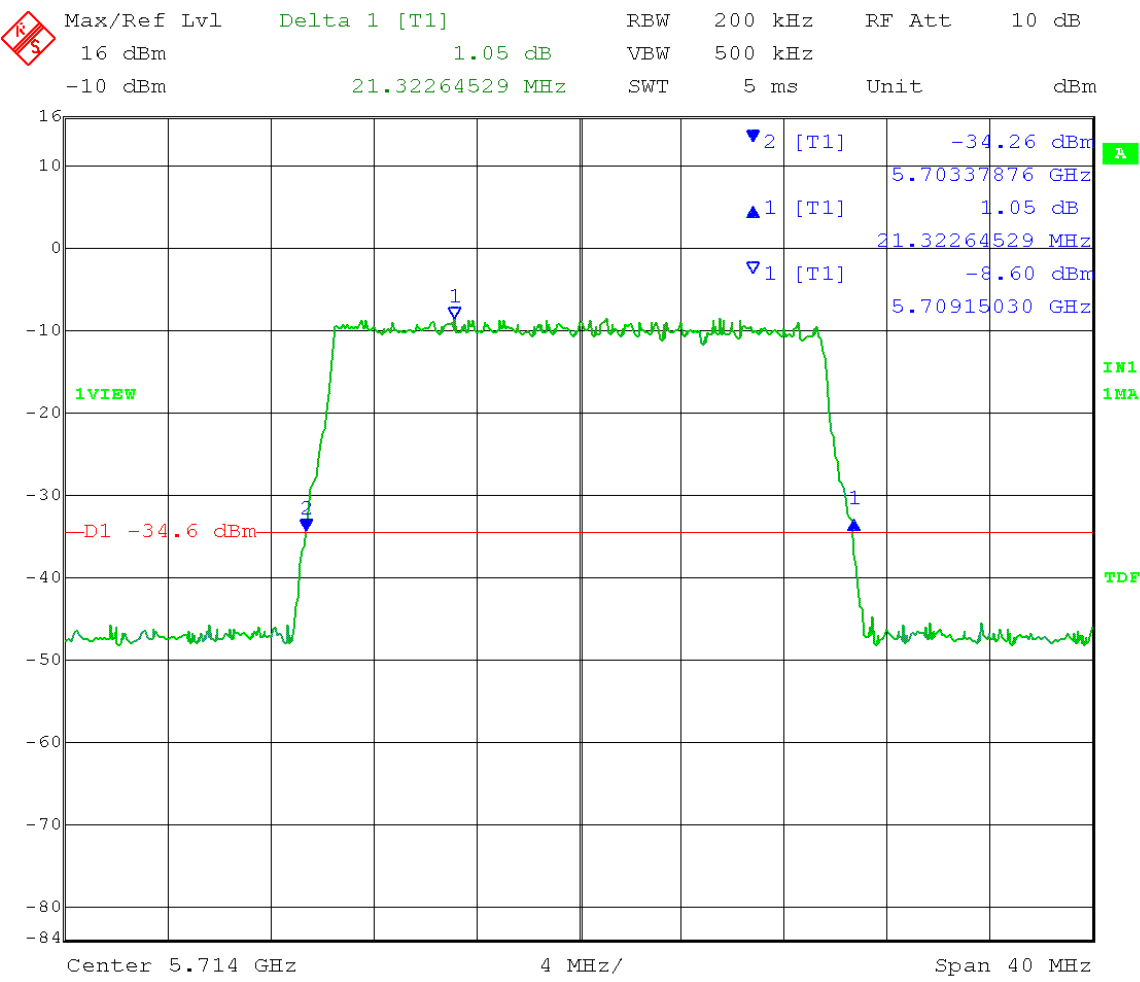
TX 0:

26 dB Emission Bandwidth = 21.32MHz

TX 1:

26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl   Delta 1 [T1]   RBW   200 kHz   RF Att   10 dB
16 dBm   1.20 dB   VBW   500 kHz
-10 dBm   21.32264529 MHz   SWT   5 ms   Unit   dBm

▼2 [T1]   -34.84 dBm
5.56437876 GHz

▲1 [T1]   1.20 dB
21.32264529 MHz

▽1 [T1]   -7.81 dBm
5.58369739 GHz

1VIEW

D1 -33.81 dBm

A

IN1
1MA

TDF

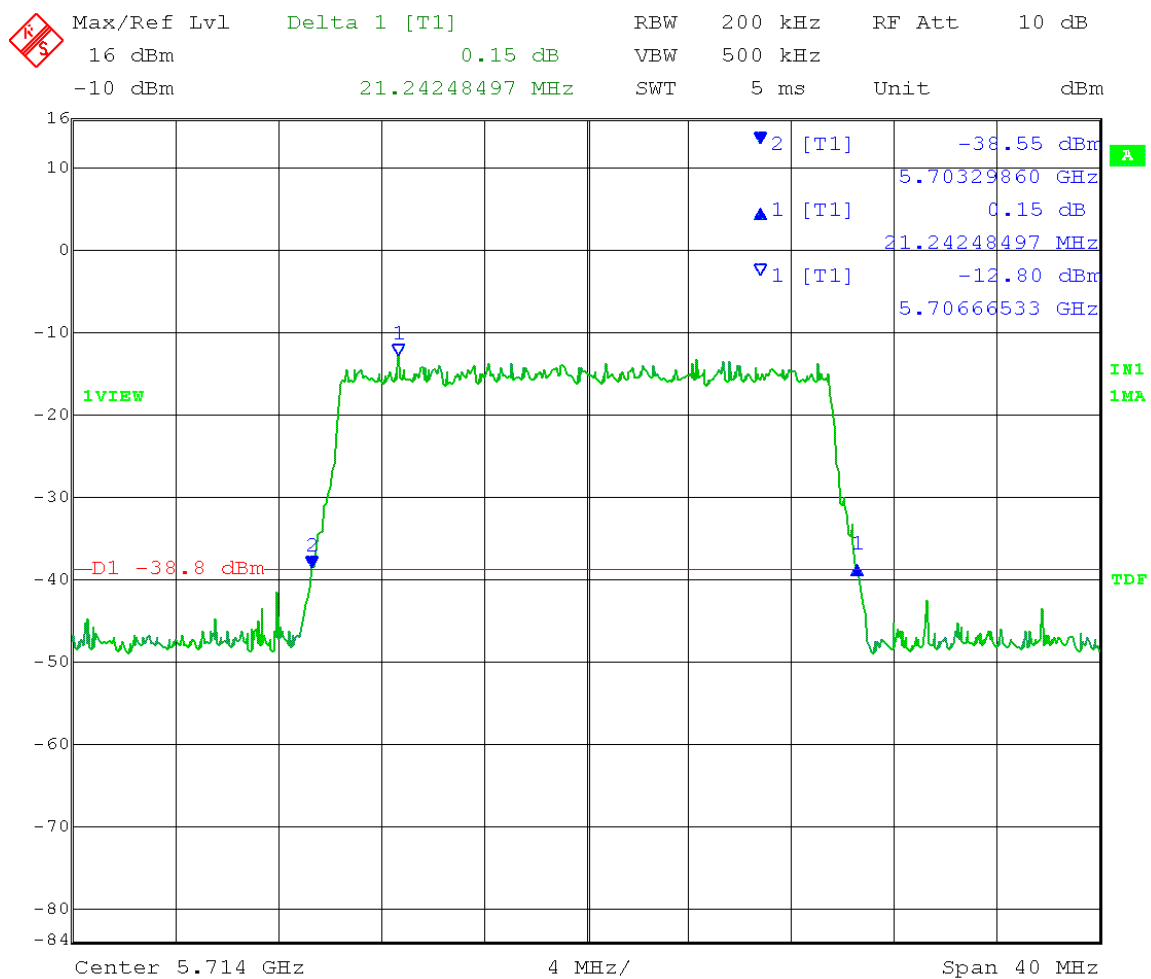Center 5.575 GHz   4 MHz/   Span 40 MHz
Date: 18.OCT.2013   13:42:04

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   256QAM
Output power setting: 30 dBm eirp
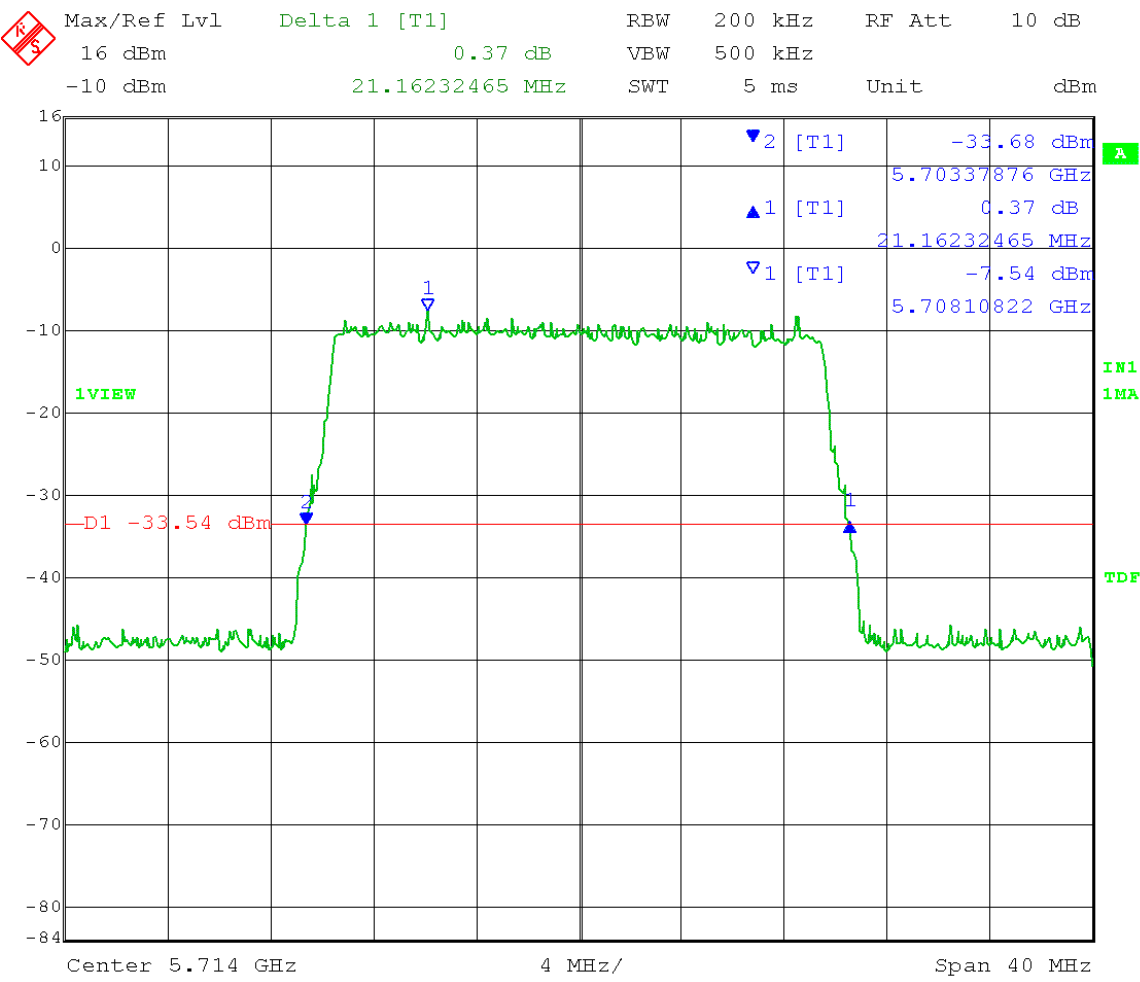
TX 0:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl	Delta 1 [T1]	RBW	200 kHz	RF Att	10 dB
16 dBm	−0.56 dB	VBW	500 kHz		
−10 dBm	21.24248497 MHz	SWT	5 ms	Unit	dBm

Marker readings:
▼2 [T1] −40.01 dBm 5.56437876 GHz
▲1 [T1] −0.56 dB 21.24248497 MHz
▽1 [T1] −13.91 dBm 5.57952906 GHz

D1 −39.91 dBm

1VIEW

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

TX 1:

26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl   Delta 1 [T1]   RBW   200 kHz   RF Att   10 dB
16 dBm   0.78 dB   VBW   500 kHz
-10 dBm   21.32264529 MHz   SWT   5 ms   Unit   dBm

▼2 [T1]   -35.20 dBm
               5.56437876 GHz
▲1 [T1]   0.78 dB
               21.32264529 MHz
▽1 [T1]   -7.74 dBm
               5.57512024 GHz

1VIEW

1MA

D1 -33.74 dBm

TDF

Center 5.575 GHz   4 MHz/   Span 40 MHz
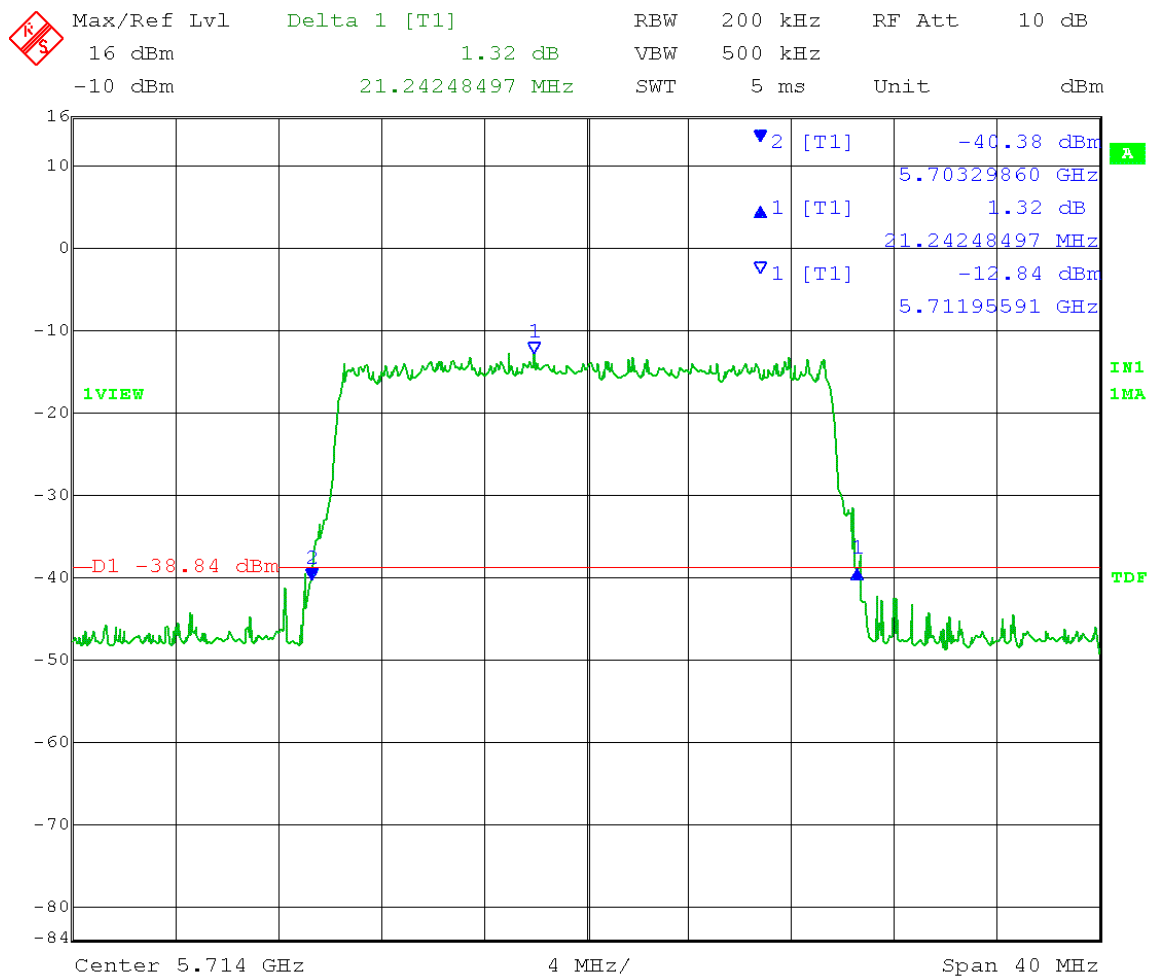
Date: 18.OCT.2013   13:40:44

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   1024QAM
Output power setting: 30 dBm eirp
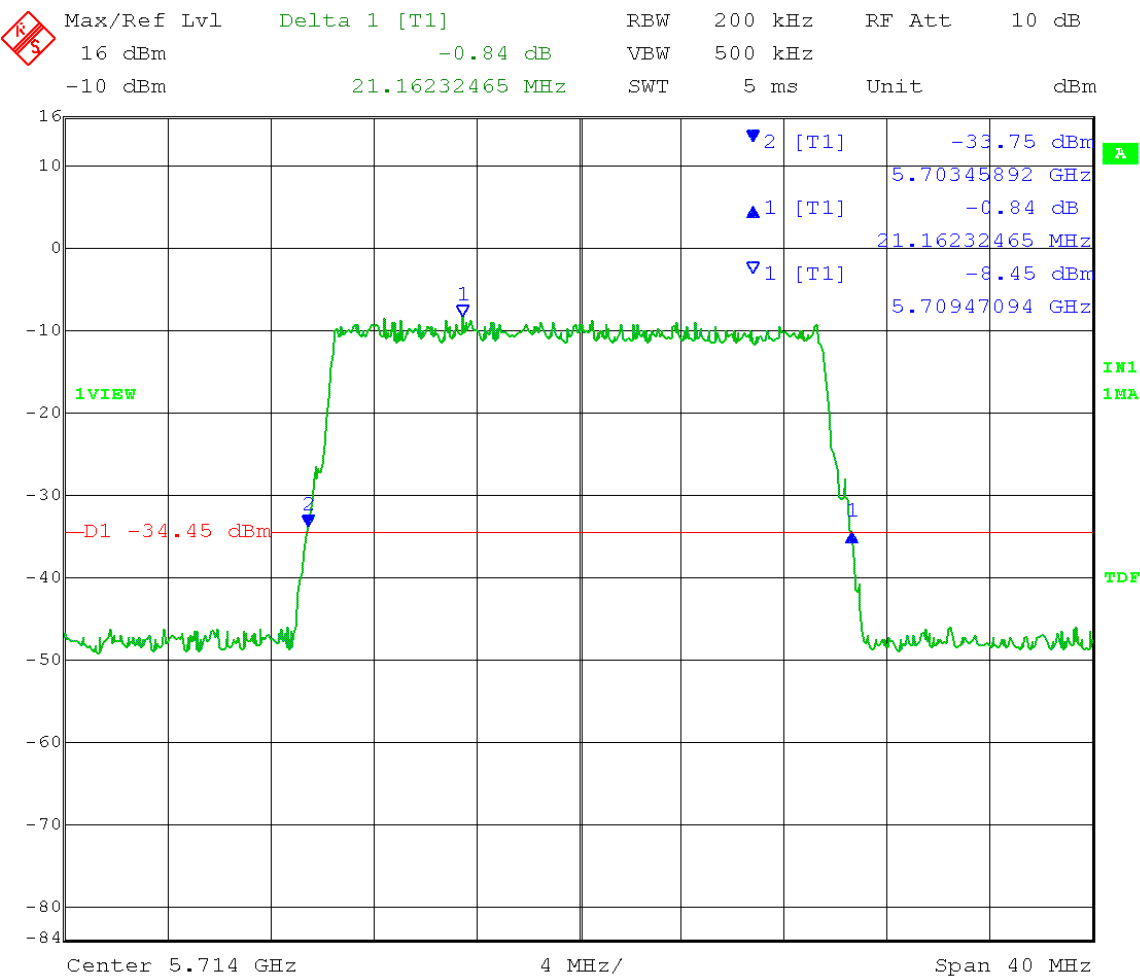
TX 0:

26 dB Emission Bandwidth = 21.16MHz

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

TX 1:

26 dB Emission Bandwidth = 21.40MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		0.28 dB	VBW	500 kHz		
-10 dBm		21.40280561 MHz	SWT	5 ms	Unit	dBm

▼2 [T1]   -35.17 dBm
                 5.56437876 GHz

▲1 [T1]   0.28 dB
                 21.40280561 MHz

▽1 [T1]   -7.87 dBm
                 5.57103206 GHz

A

IN1
1MA

1VIEW

D1 -33.87 dBm

TDF

Center 5.575 GHz   4 MHz/   Span 40 MHz
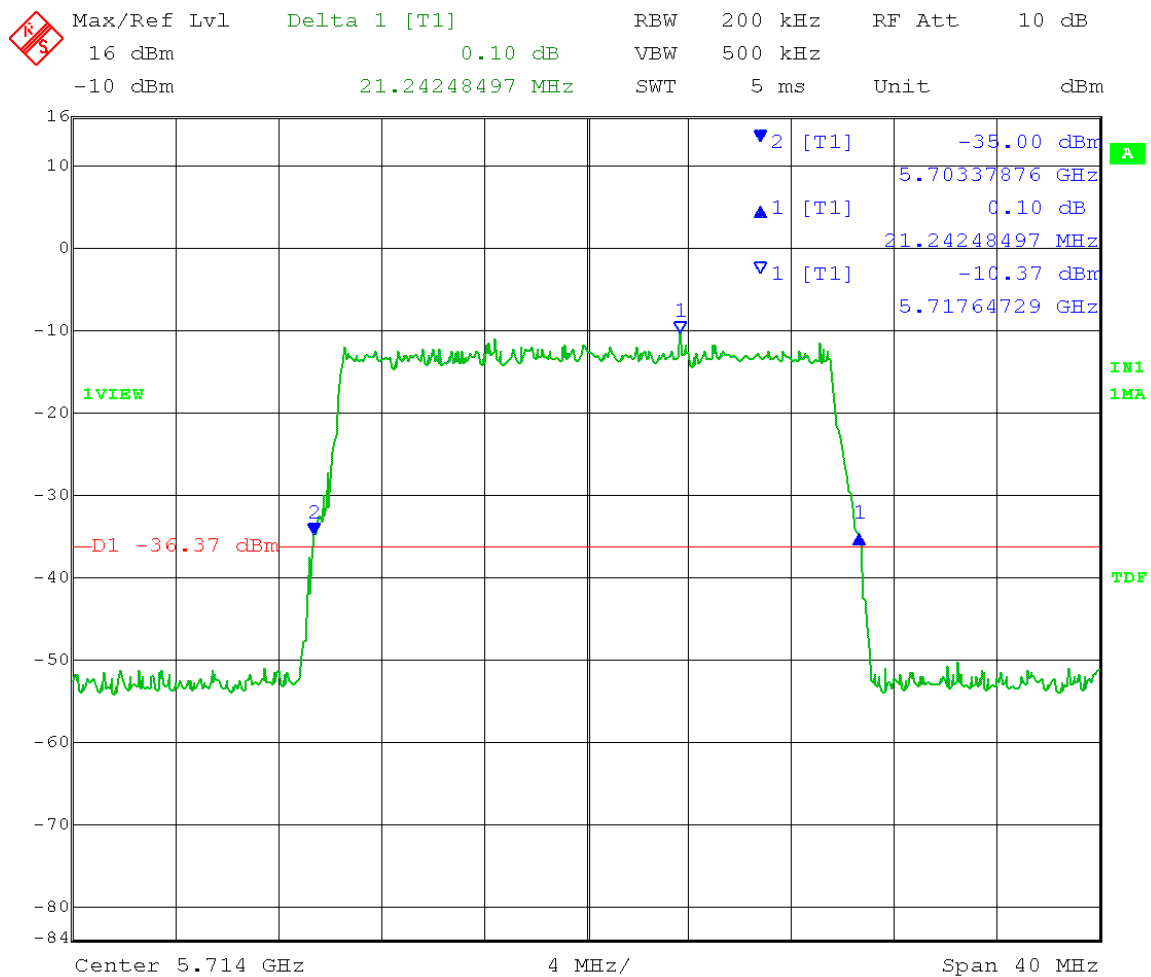
Date: 18.OCT.2013   13:39:19

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   QPSK
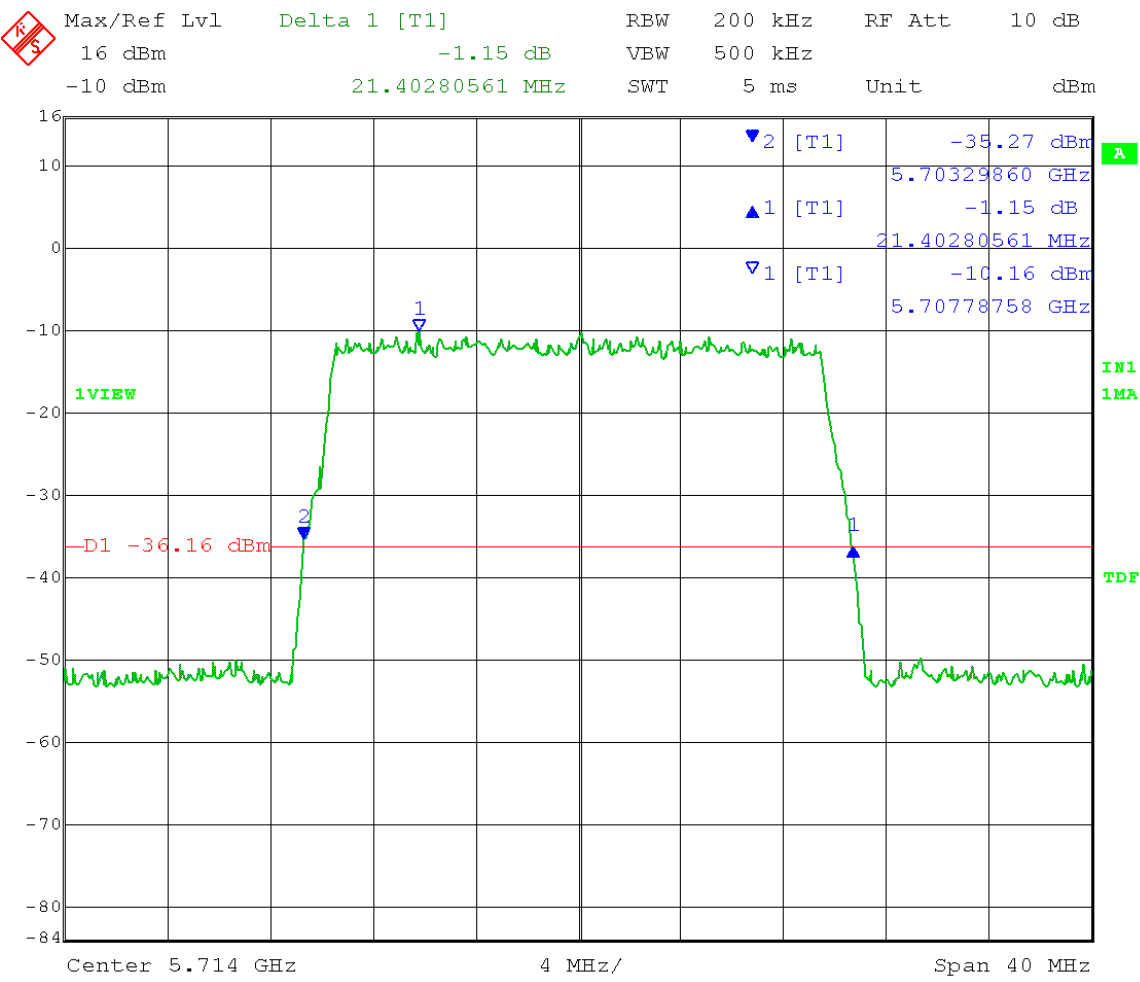Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.32MHz

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

TX 1:

26 dB Emission Bandwidth = 21.40MHz


```
Max/Ref Lvl      Delta 1 [T1]                RBW   200 kHz   RF Att    10 dB
  16 dBm                        1.51 dB      VBW   500 kHz
 -10 dBm             21.40280561 MHz         SWT    5 ms     Unit        dBm
```

```
 16 |                                        ▼2 [T1]          -35.37 dBm   │A│
 10 |                                           5.56437876 GHz
    |                                        ▲1 [T1]            1.51 dB
  0 |                                           21.40280561 MHz
    |                                        ▽1 [T1]          -10.05 dBm
    |                                           5.57856713 GHz
-10 |                                  1
    |                                  ▽                                    IN1
1VIEW                                                                       1MA
-20 |
    |
-30 |
    |              2                                  1
D1 -36.05 dBm      ▼                                  ▲
-40 |                                                                       TDF
    |
-50 |
    |
-60 |
    |
-70 |
    |
-80 |
-84 |
    Center 5.575 GHz              4 MHz/              Span 40 MHz
```
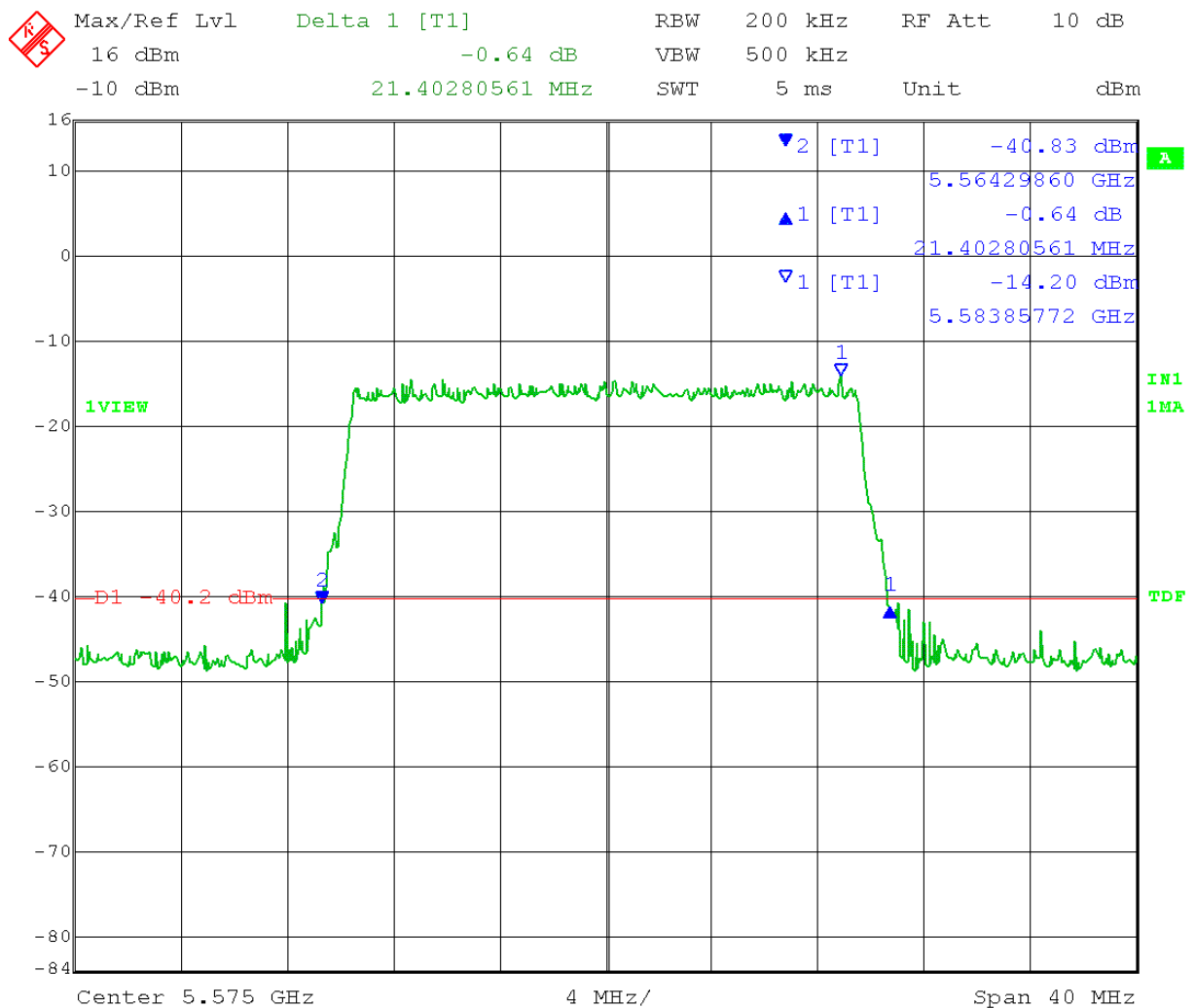
Date: 4.OCT.2013   15:45:50

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Low Channel: Transmit = 5.481 GHz   20MHz BW   16QAM
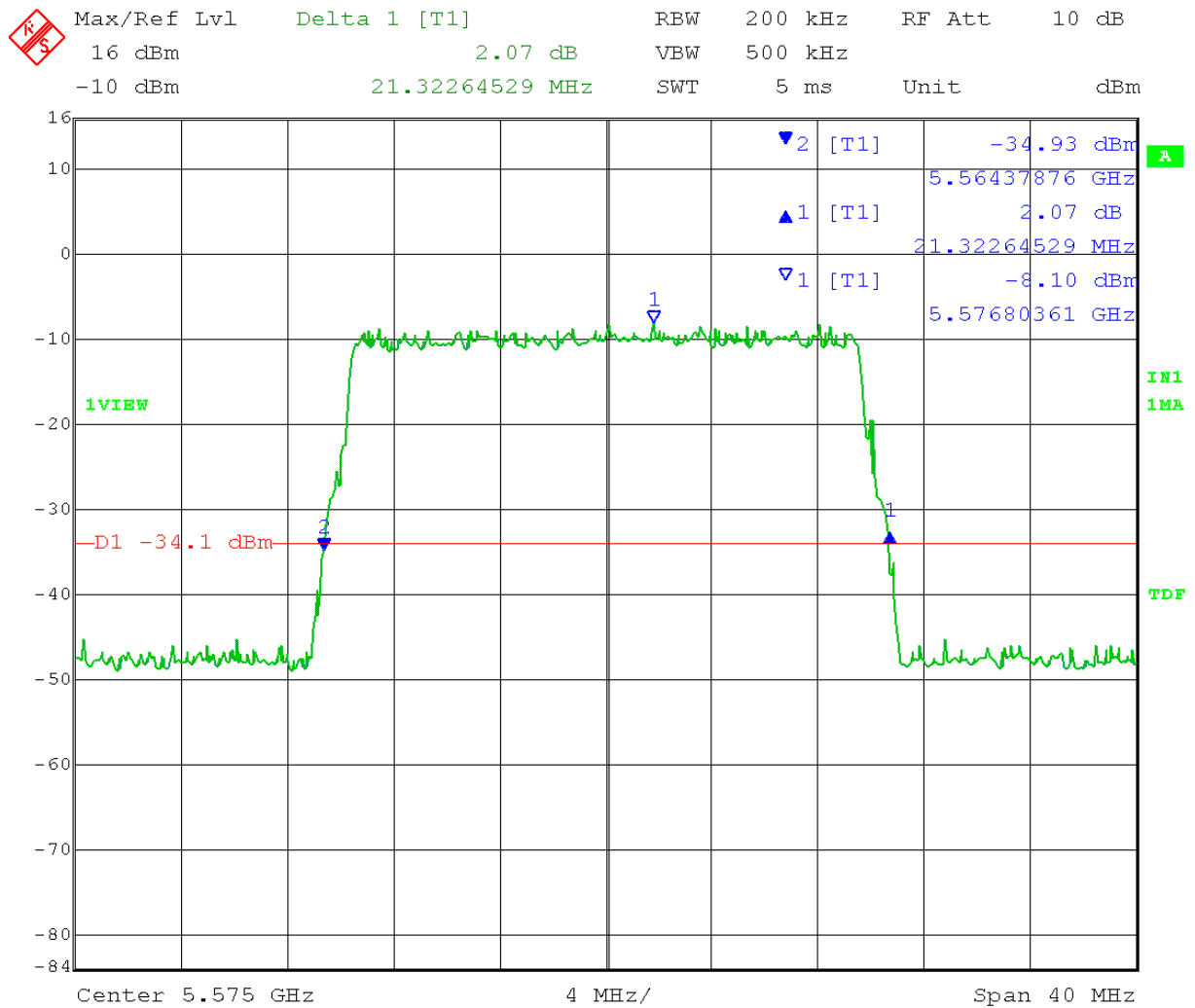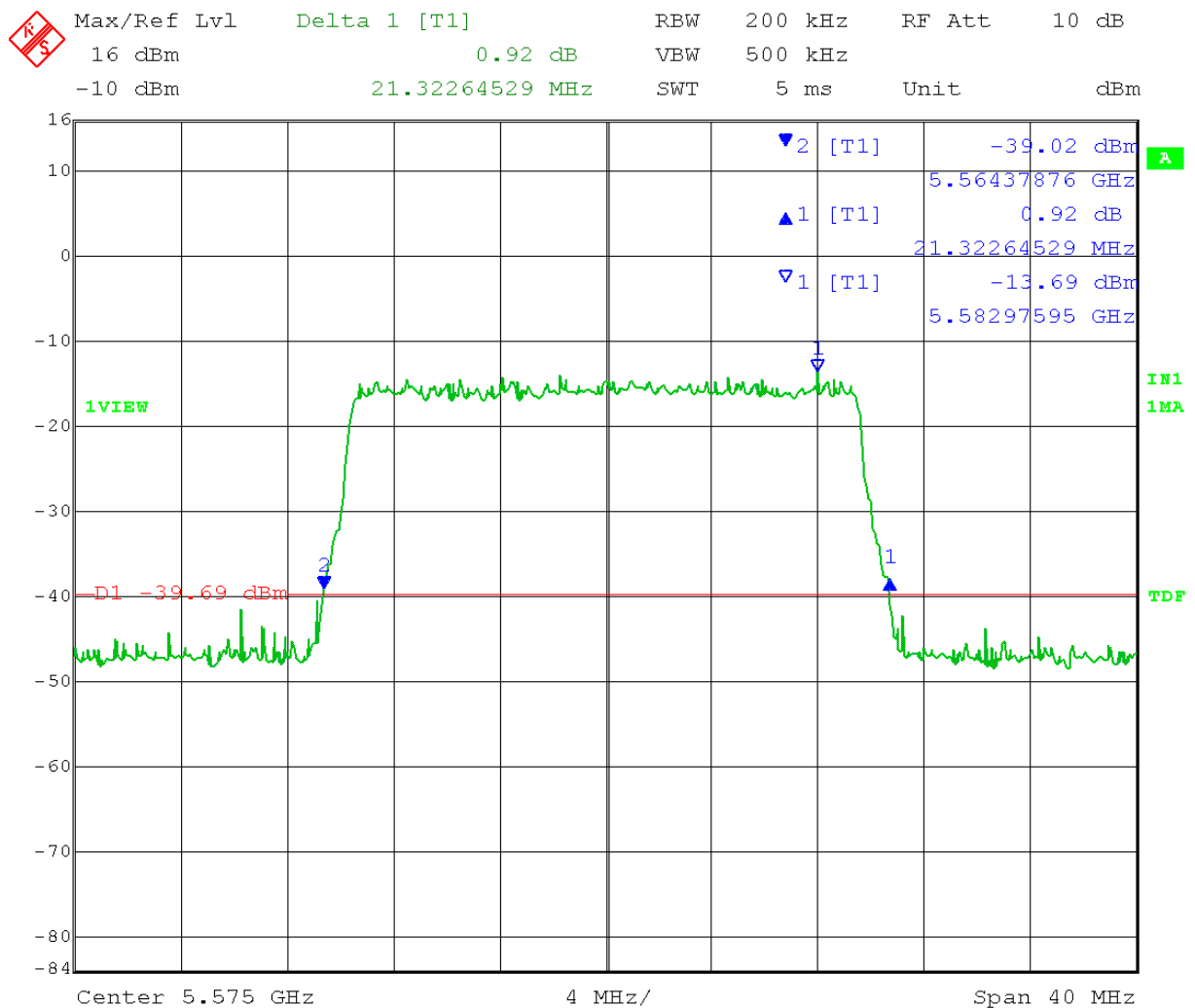Output power setting: 30 dBm eirp

TX 0:
26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm	0.81 dB		VBW	500 kHz		
-10 dBm	21.32264529 MHz		SWT	5 ms	Unit	dBm

Marker readings:
▼2 [T1] -38.15 dBm 5.47029860 GHz
▲1 [T1] 0.81 dB 21.32264529 MHz
▽1 [T1] -11.99 dBm 5.48392585 GHz

1VIEW
D1 -37.99 dBm

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

TX 1:

26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl	Delta 1 [T1]	RBW	200 kHz	RF Att	10 dB
16 dBm	−0.52 dB	VBW	500 kHz		
−10 dBm	21.32264529 MHz	SWT	5 ms	Unit	dBm

▼2 [T1]   −34.55 dBm
5.47037876 GHz

▲1 [T1]   −0.52 dB
21.32264529 MHz

▽1 [T1]   −9.07 dBm
5.48977756 GHz

A

1VIEW

IN1
1MA

D1 −35.07 dBm

TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz
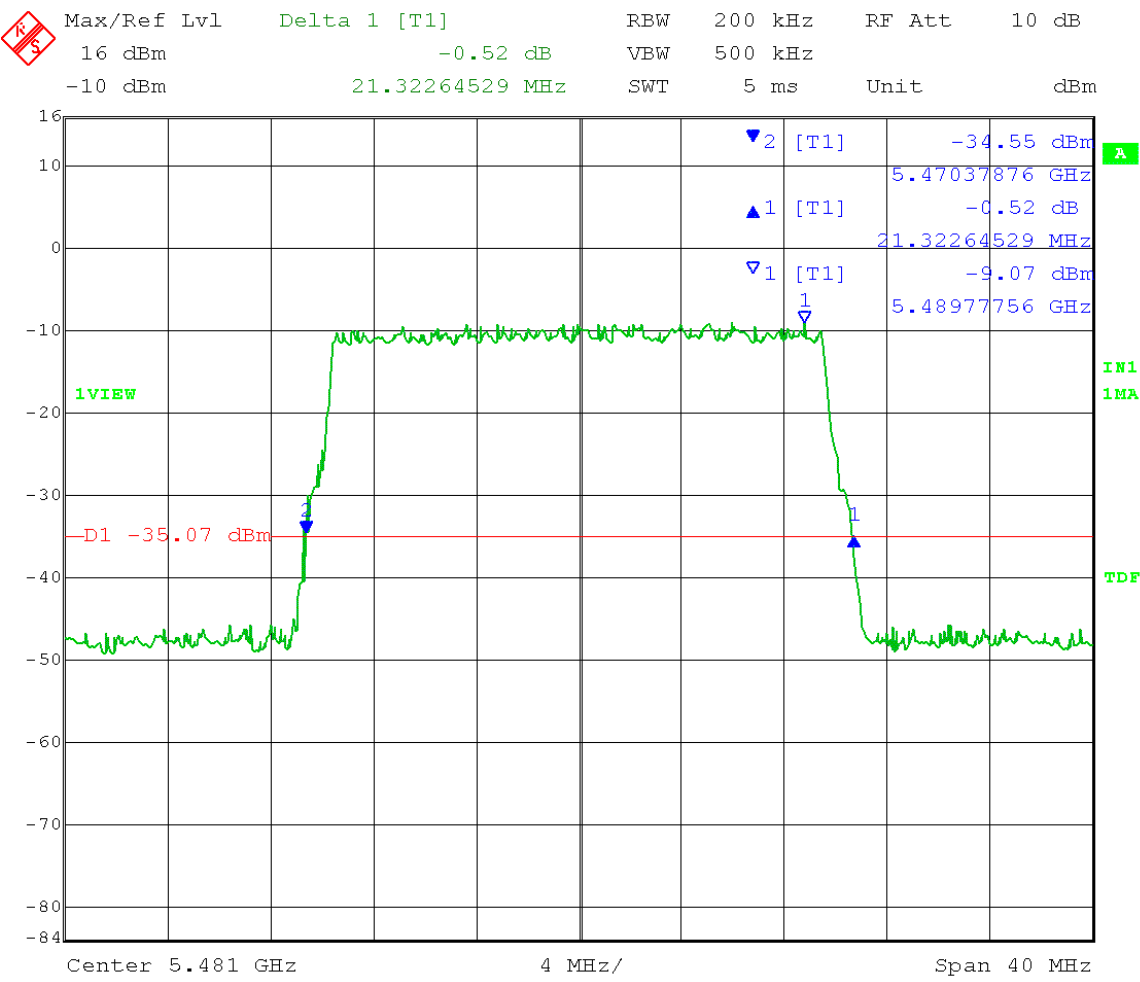
Date: 18.OCT.2013 13:32:50

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Low Channel: Transmit = 5.481 GHz   20MHz BW   64QAM
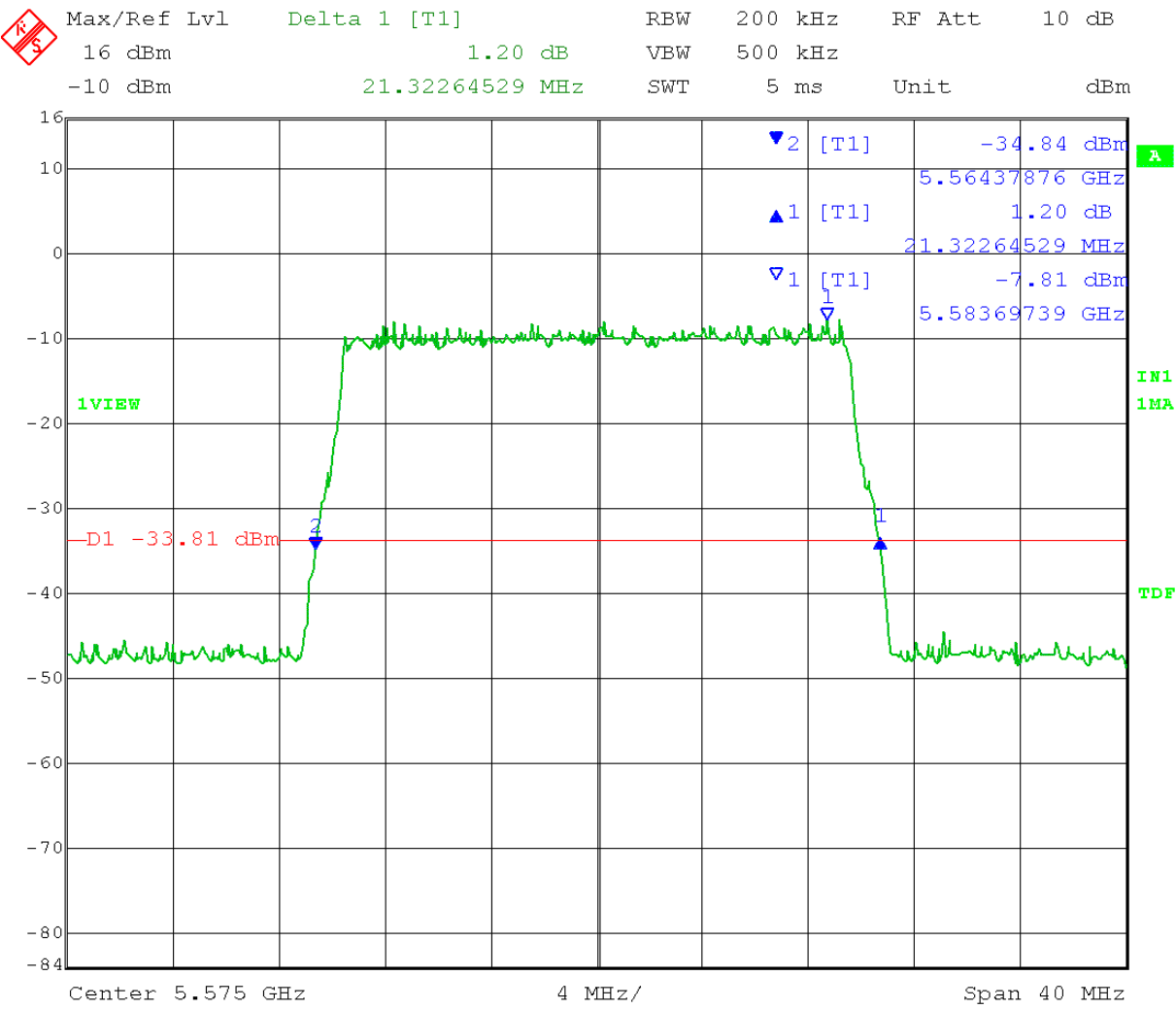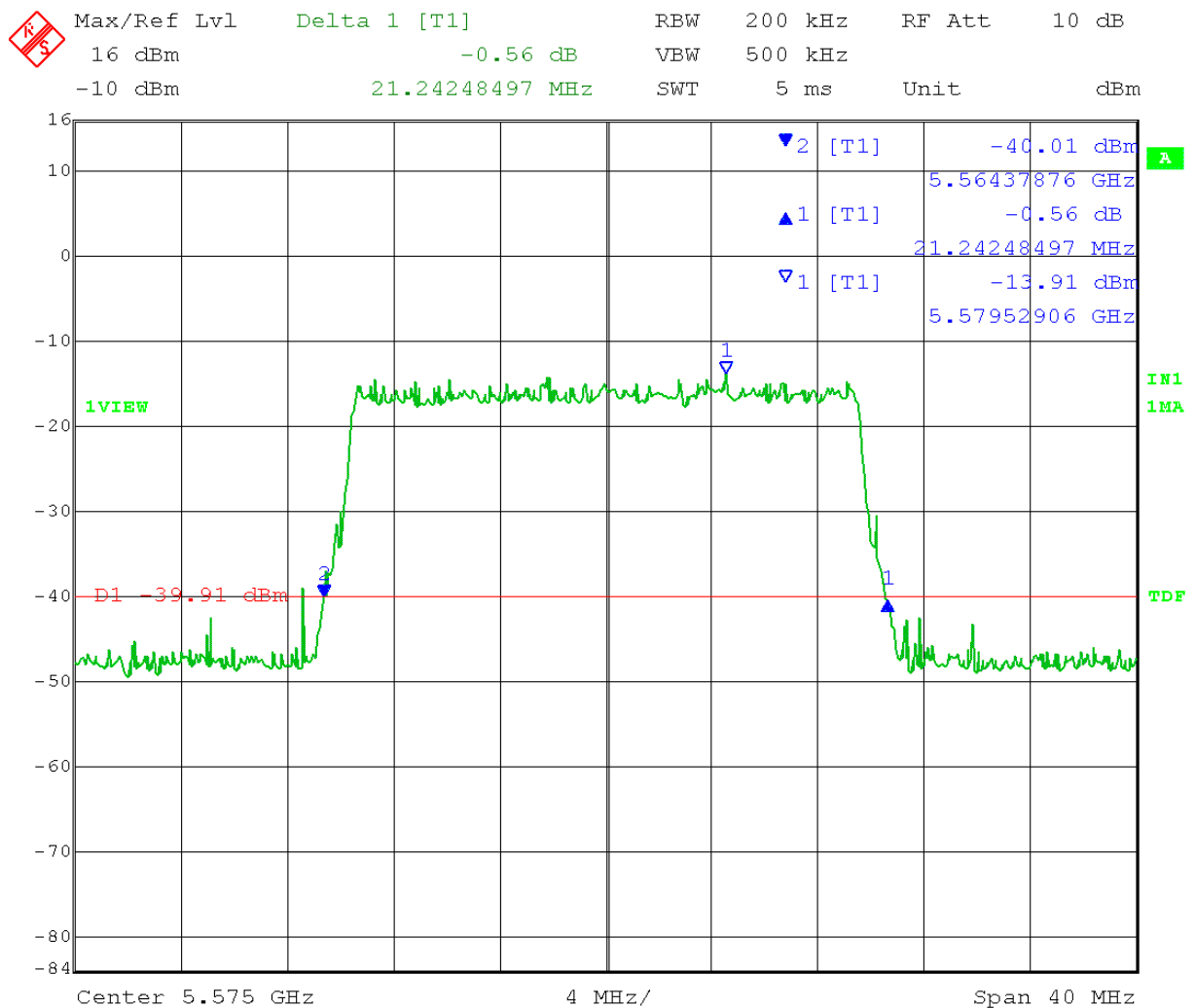Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.32MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		0.62 dB	VBW	500 kHz		
-10 dBm		21.32264529 MHz	SWT	5 ms	Unit	dBm

▽2 [T1]   -39.04 dBm
            5.47037876 GHz
▲1 [T1]   0.62 dB
            21.32264529 MHz
▽1 [T1]   -11.98 dBm
            5.48039880 GHz

1VIEW

D1 -37.98 dBm

Center 5.481 GHz   4 MHz/   Span 40 MHz
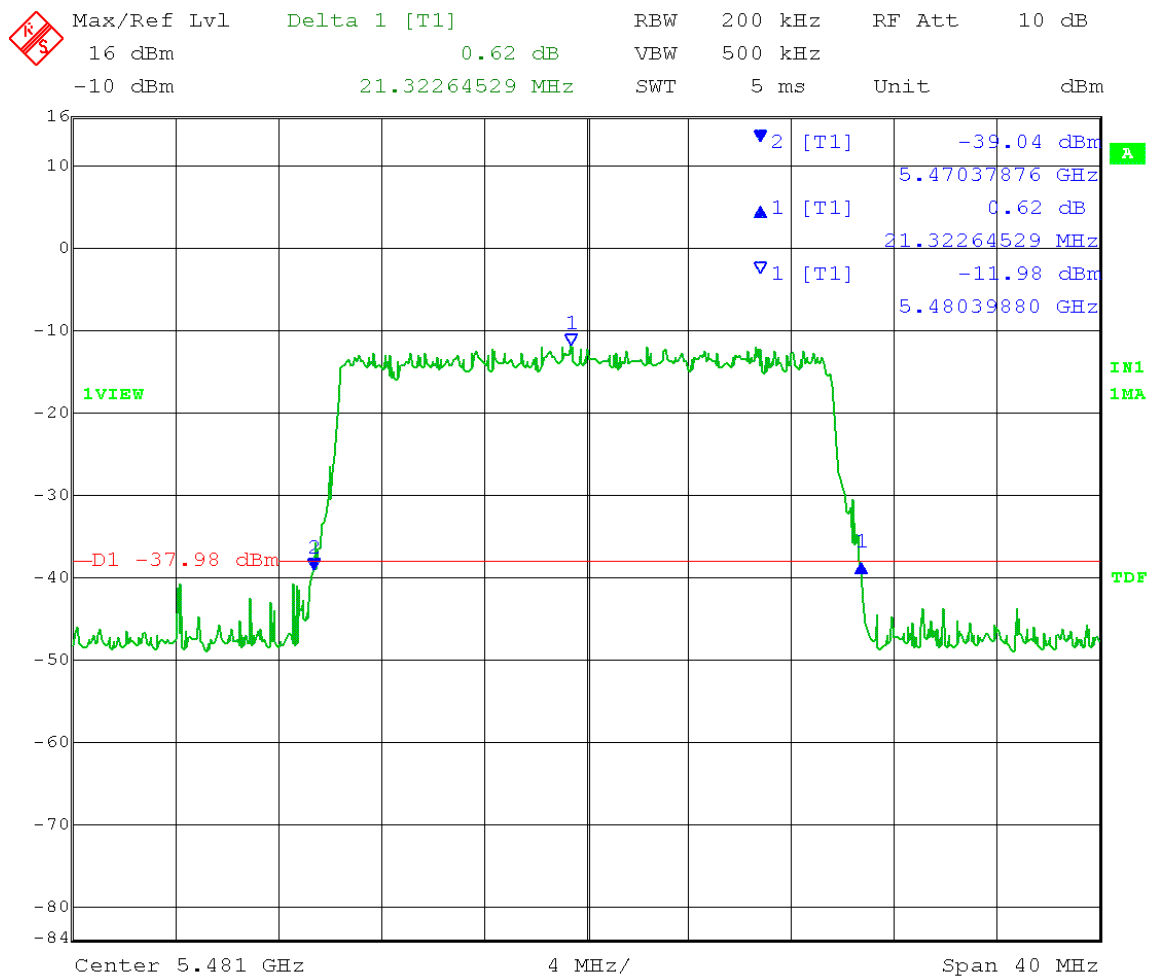
Date: 17.OCT.2013 15:21:14

TX 1:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl   Delta 1 [T1]   RBW   200 kHz   RF Att   10 dB
 16 dBm   0.61 dB   VBW   500 kHz
 -10 dBm   21.24248497 MHz   SWT   5 ms   Unit   dBm

▼2 [T1]   -33.73 dBm
                 5.47037876 GHz
▲1 [T1]   0.61 dB
                 21.24248497 MHz
▽1 [T1]   -8.06 dBm
                 5.47526854 GHz

1VIEW

D1 -34.06 dBm

A
IN1
1MA
TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Low Channel: Transmit = 5.481 GHz   20MHz BW   256QAM
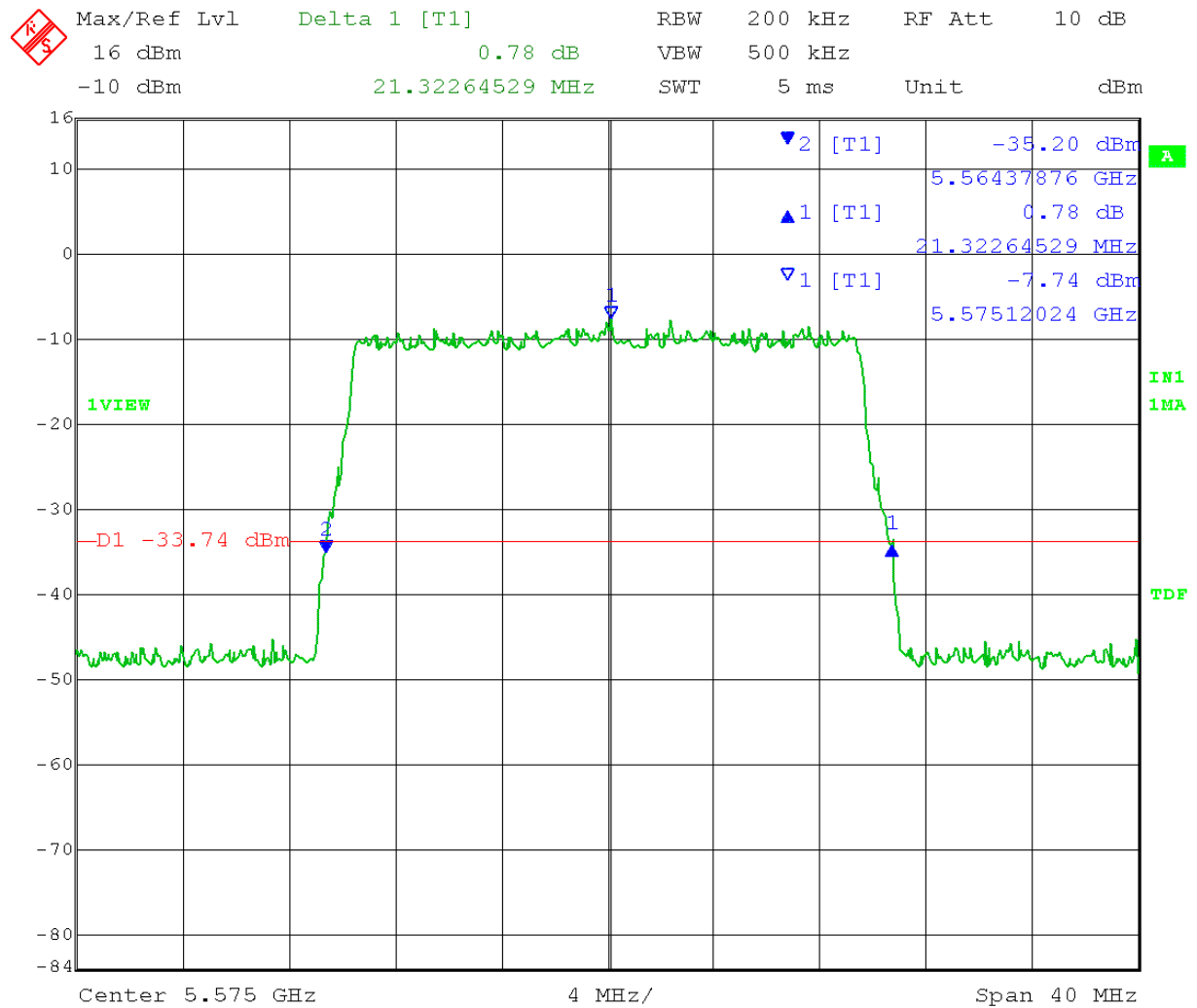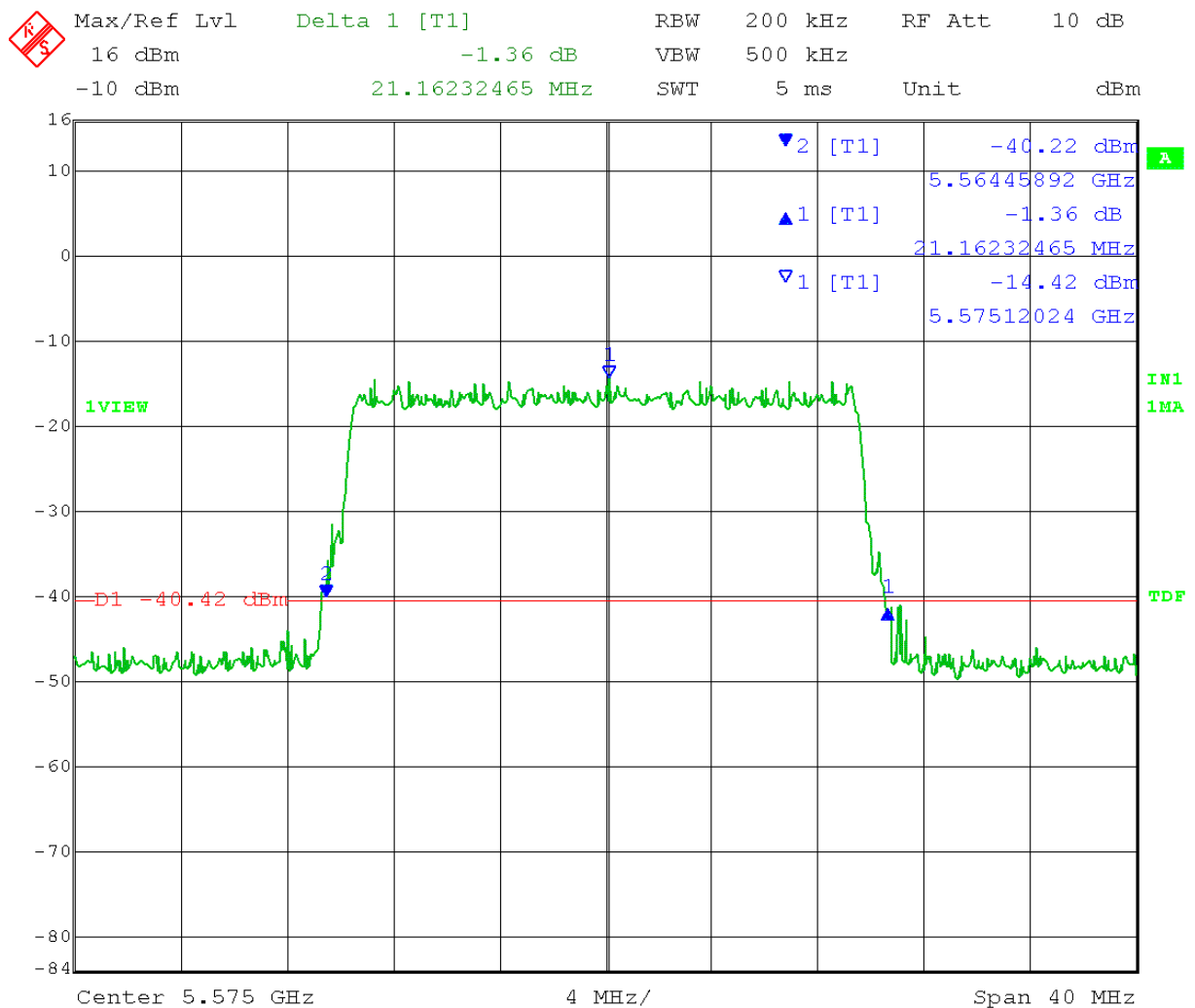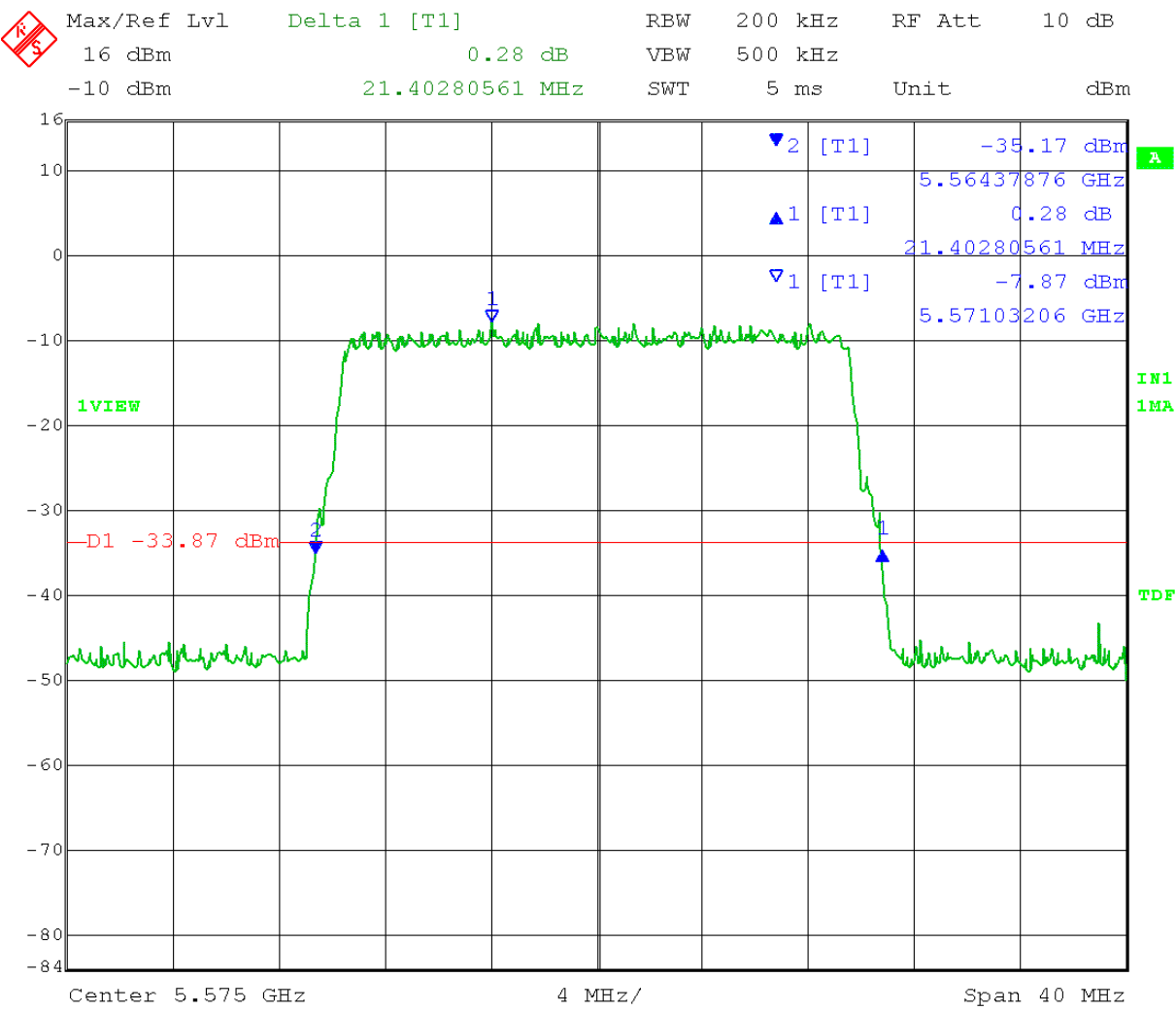Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.24MHz
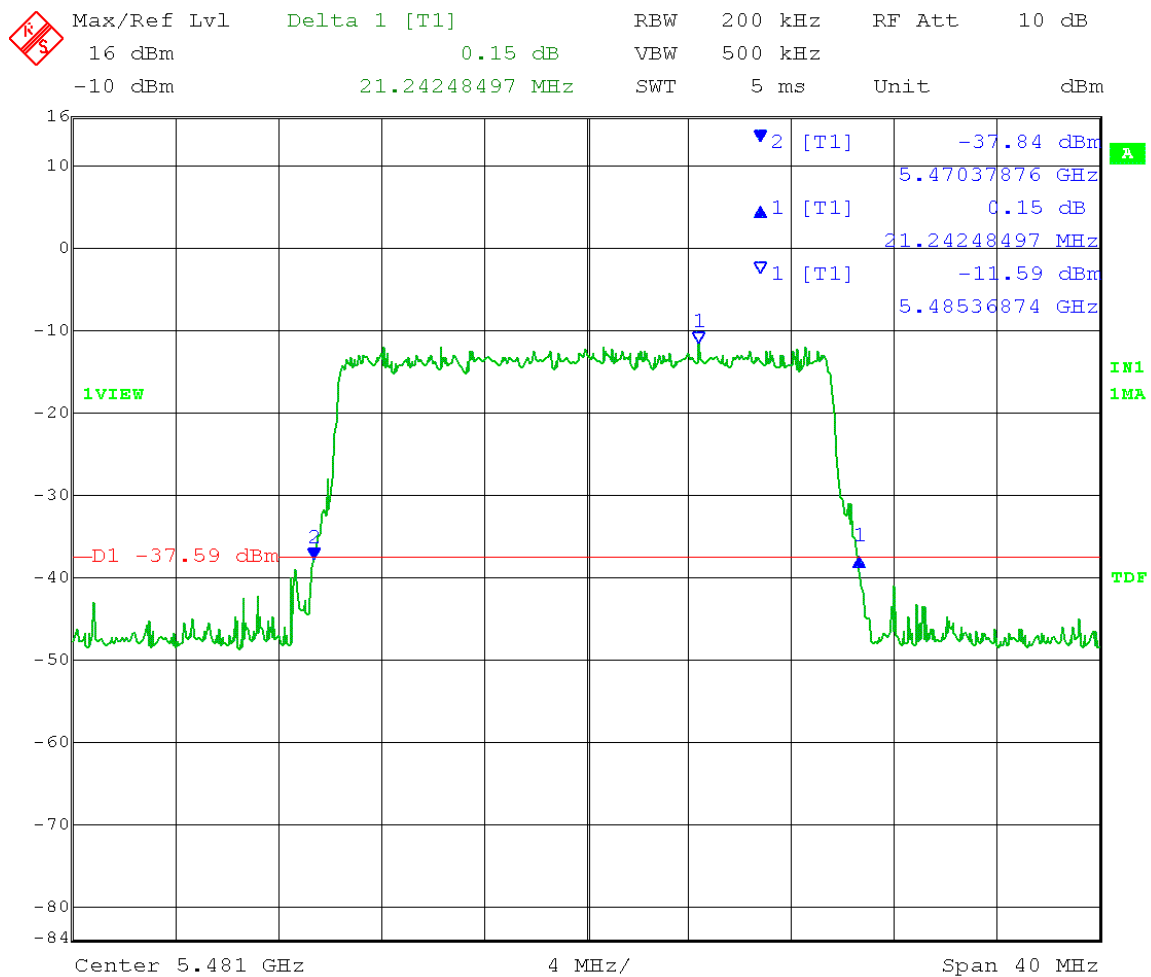
Date: 17.OCT.2013   15:19:37

TX 1:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl   Delta 1 [T1]   RBW   200 kHz   RF Att   10 dB
 16 dBm   0.50 dB   VBW   500 kHz
 -10 dBm   21.24248497 MHz   SWT   5 ms   Unit   dBm

▼2 [T1]   -33.21 dBm
               5.47037876 GHz
▲1 [T1]   0.50 dB
               21.24248497 MHz
▽1 [T1]   -7.79 dBm
               5.47967735 GHz

1VIEW

D1 -33.79 dBm

A
IN1
1MA
TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz
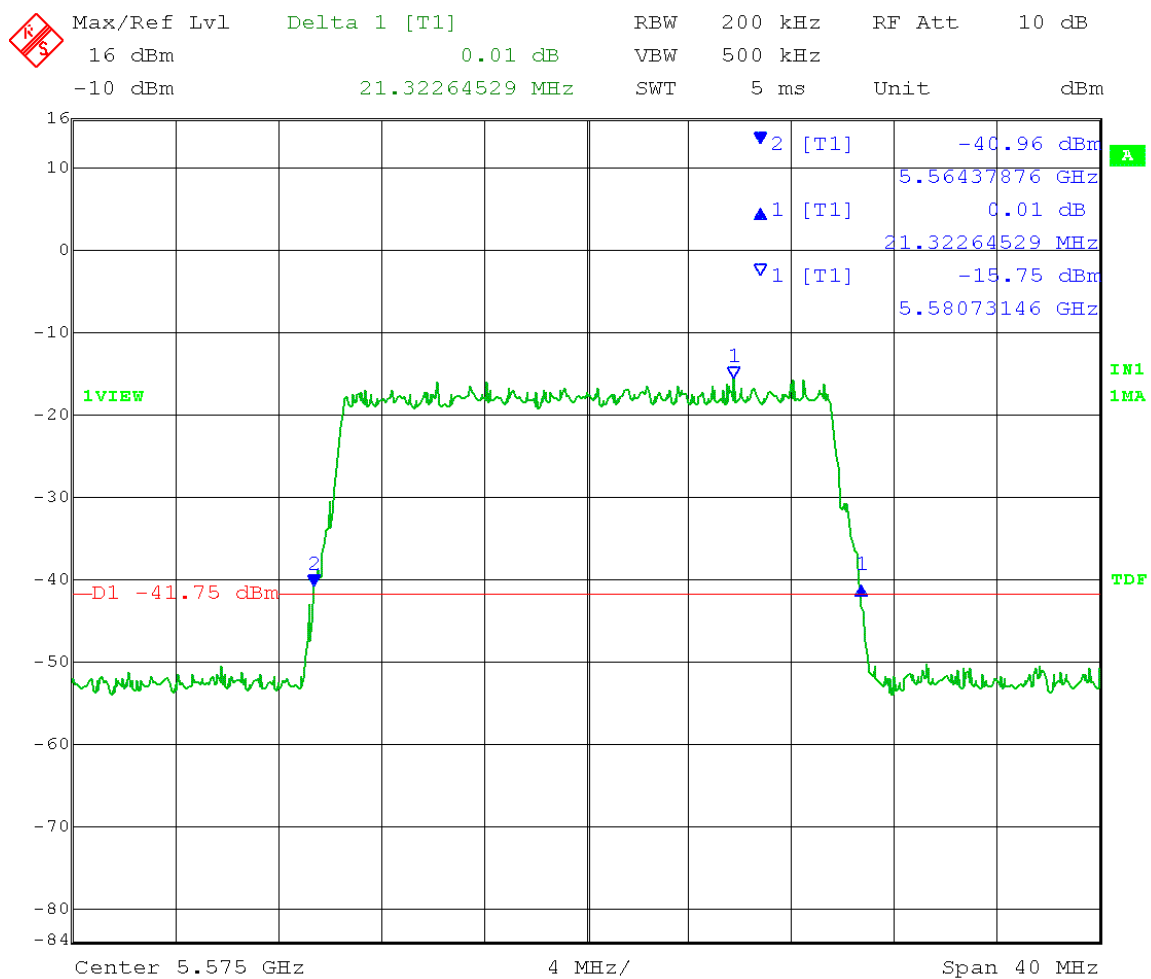Date: 18.OCT.2013   13:35:39

Test Date: 10-17-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Low Channel: Transmit = 5.481 GHz   20MHz BW   1024QAM
Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.40MHz

TX 1:

26 dB Emission Bandwidth = 21.24MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		−0.22 dB	VBW	500 kHz		
−10 dBm		21.24248497 MHz	SWT	5 ms	Unit	dBm

▼2 [T1] −34.18 dBm 5.47045892 GHz
▲1 [T1] −0.22 dB 21.24248497 MHz
▽1 [T1] −8.47 dBm 5.47799399 GHz

A

1VIEW

IN1
1MA

D1 −34.47 dBm

TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz
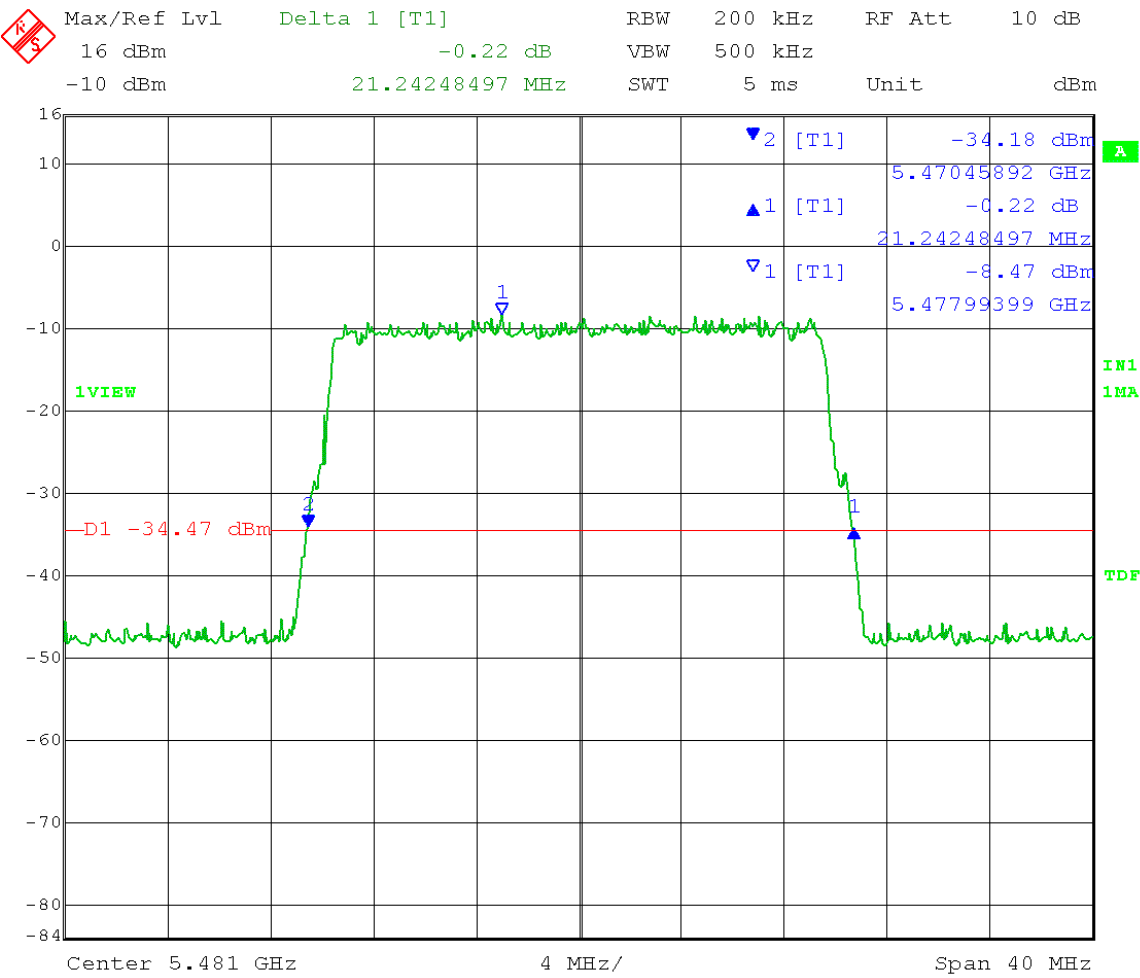
Date: 18.OCT.2013   13:37:07

Test Date: 10-4&7-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – C)
Low Channel: Transmit = 5.481 GHz   20MHz BW   QPSK
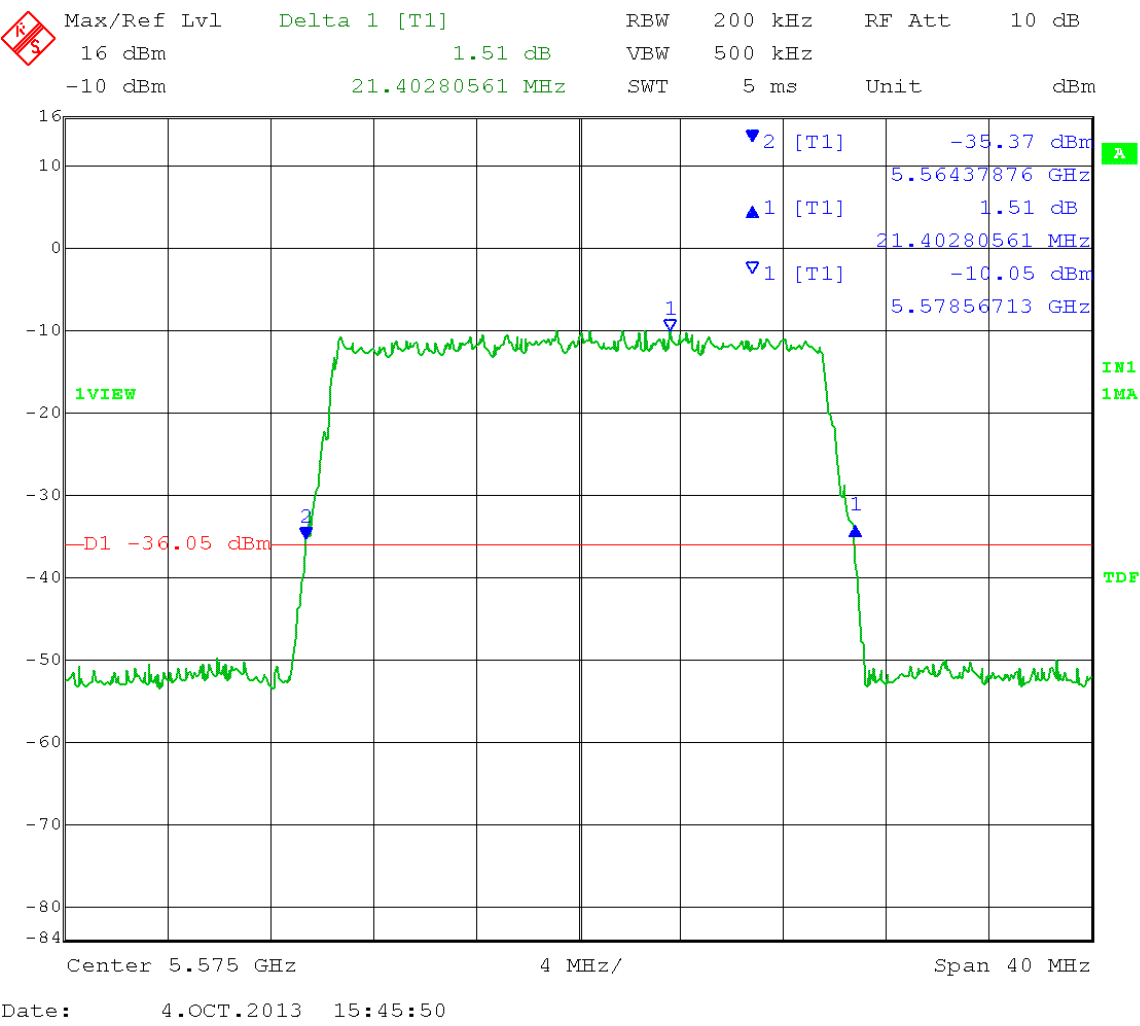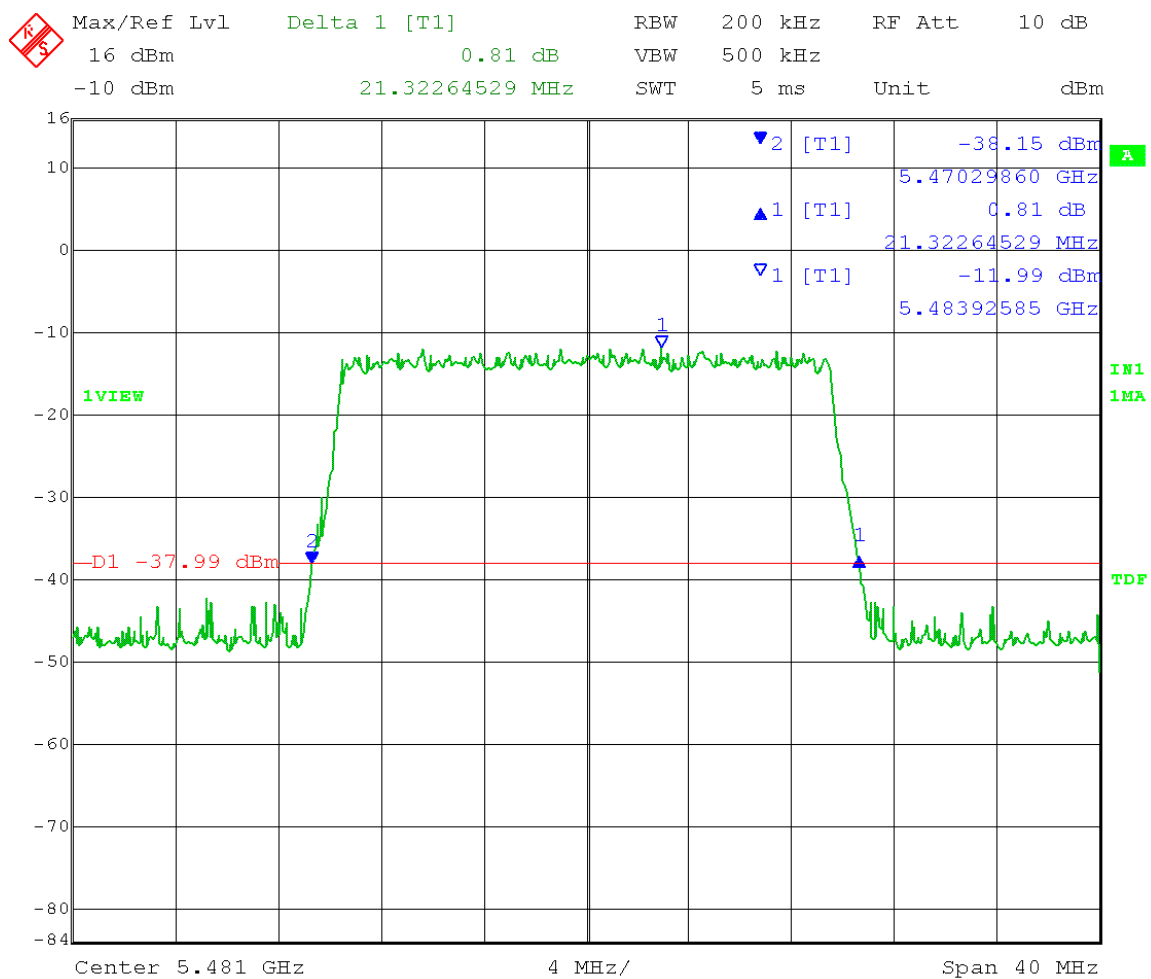Output power setting: 30 dBm eirp

TX 0:

26 dB Emission Bandwidth = 21.40MHz

Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		−0.52 dB	VBW	500 kHz		
−10 dBm		21.40280561 MHz	SWT	5 ms	Unit	dBm

▼2 [T1] −40.36 dBm
5.47037876 GHz
▲1 [T1] −0.52 dB
21.40280561 MHz
▽1 [T1] −15.55 dBm
5.48921643 GHz

1VIEW

D1 −41.55 dBm

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

TX 1:

26 dB Emission Bandwidth = 21.40MHz
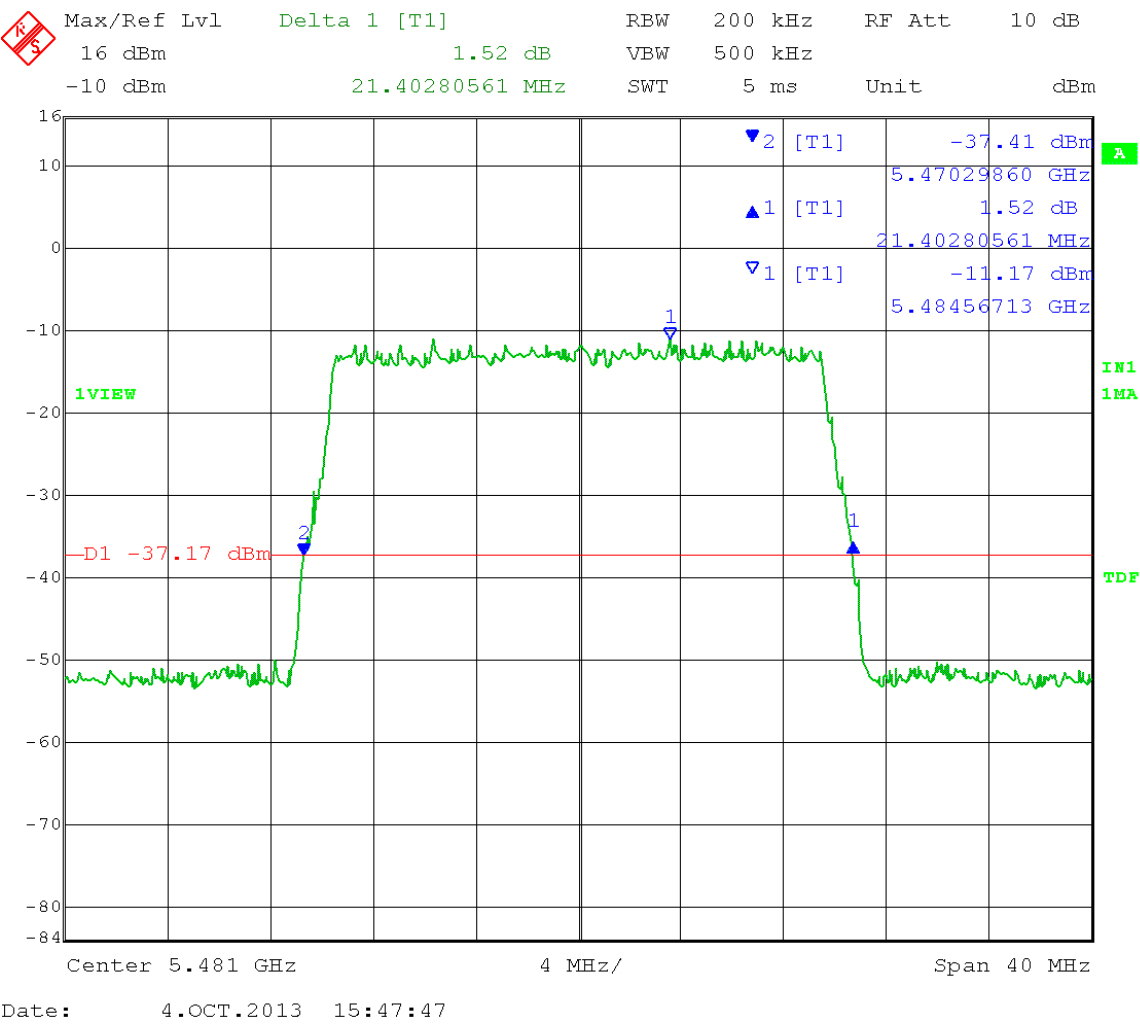
Max/Ref Lvl	Delta 1 [T1]		RBW	200 kHz	RF Att	10 dB
16 dBm		1.52 dB	VBW	500 kHz		
-10 dBm	21.40280561 MHz		SWT	5 ms	Unit	dBm

▼2 [T1]   -37.41 dBm
                 5.47029860 GHz

▲1 [T1]   1.52 dB
                 21.40280561 MHz

▽1 [T1]   -11.17 dBm
                 5.48456713 GHz

A

1VIEW

IN1
1MA

D1 -37.17 dBm

TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz

Date: 4.OCT.2013   15:47:47

Company:	Ubiquiti Networks, Inc.
Model Tested:	AF5
Report Number:	19519 Part 2
DLS Project:	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 ≥ RBW
Detector = Peak
Trace mode = max hold

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

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

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

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
High Channel: Transmit = 5.714 GHz   20MHz BW   16QAM
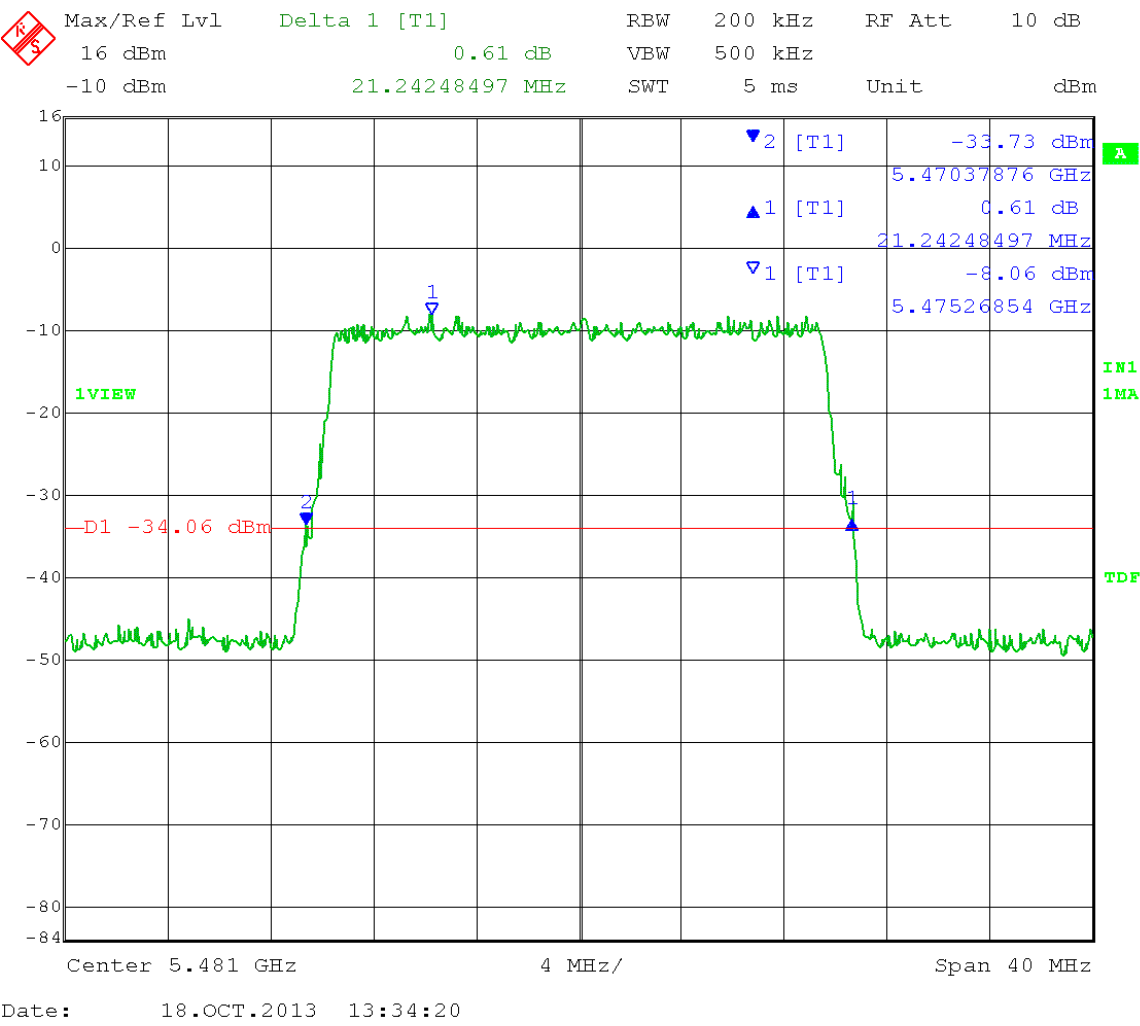Output power setting: 30 dBm eirp

TX 0:
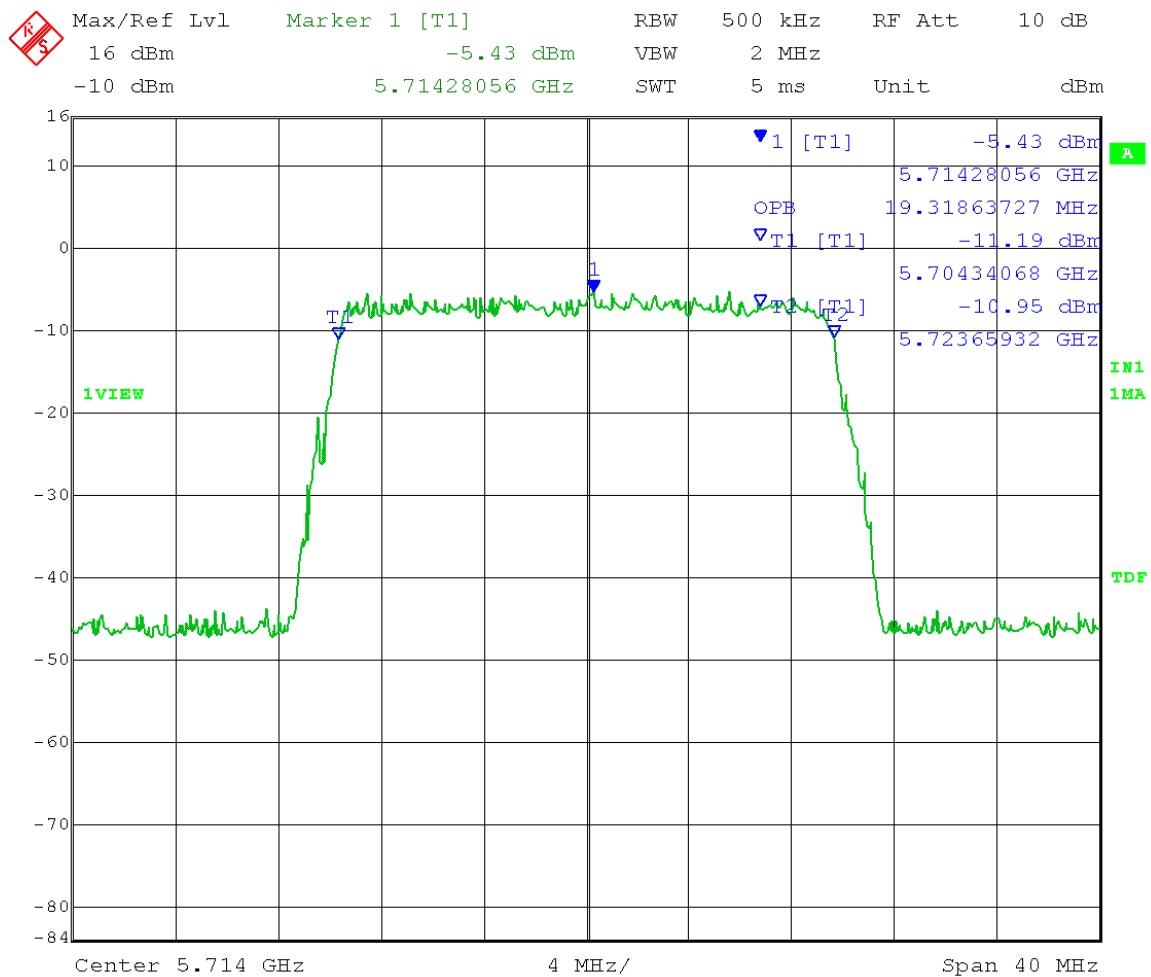
99% OBW = 19.32MHz

Date: 22.OCT.2013 11:17:39
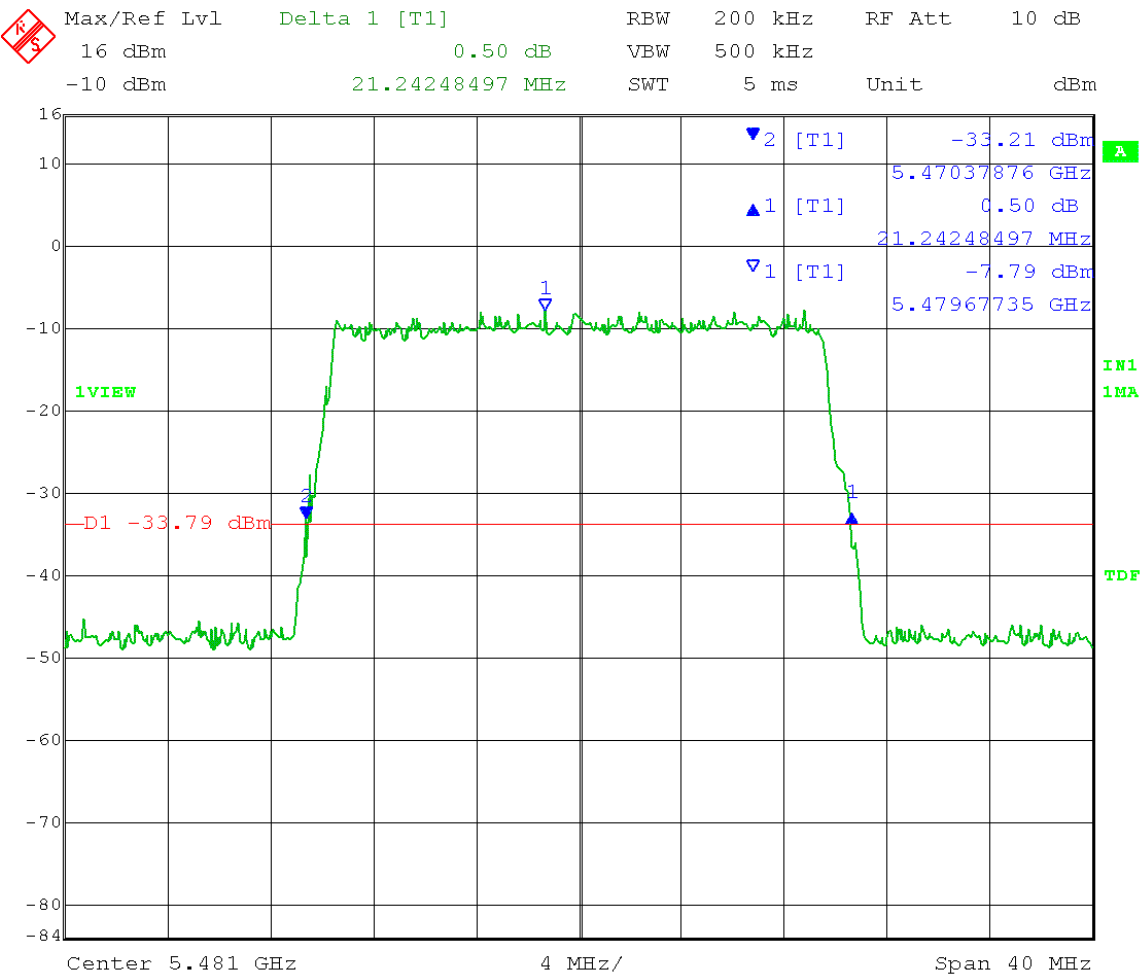
TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]	RBW	500 kHz	RF Att	10 dB
16 dBm	−4.73 dBm	VBW	2 MHz		
−10 dBm	5.70786774 GHz	SWT	5 ms	Unit	dBm

▼1 [T1] −4.73 dBm
5.70786774 GHz
OPB 19.31863727 MHz
▽T1 [T1] −10.67 dBm
5.70434068 GHz
▽T2 [T1] −11.54 dBm
5.72365932 GHz

A
IN1
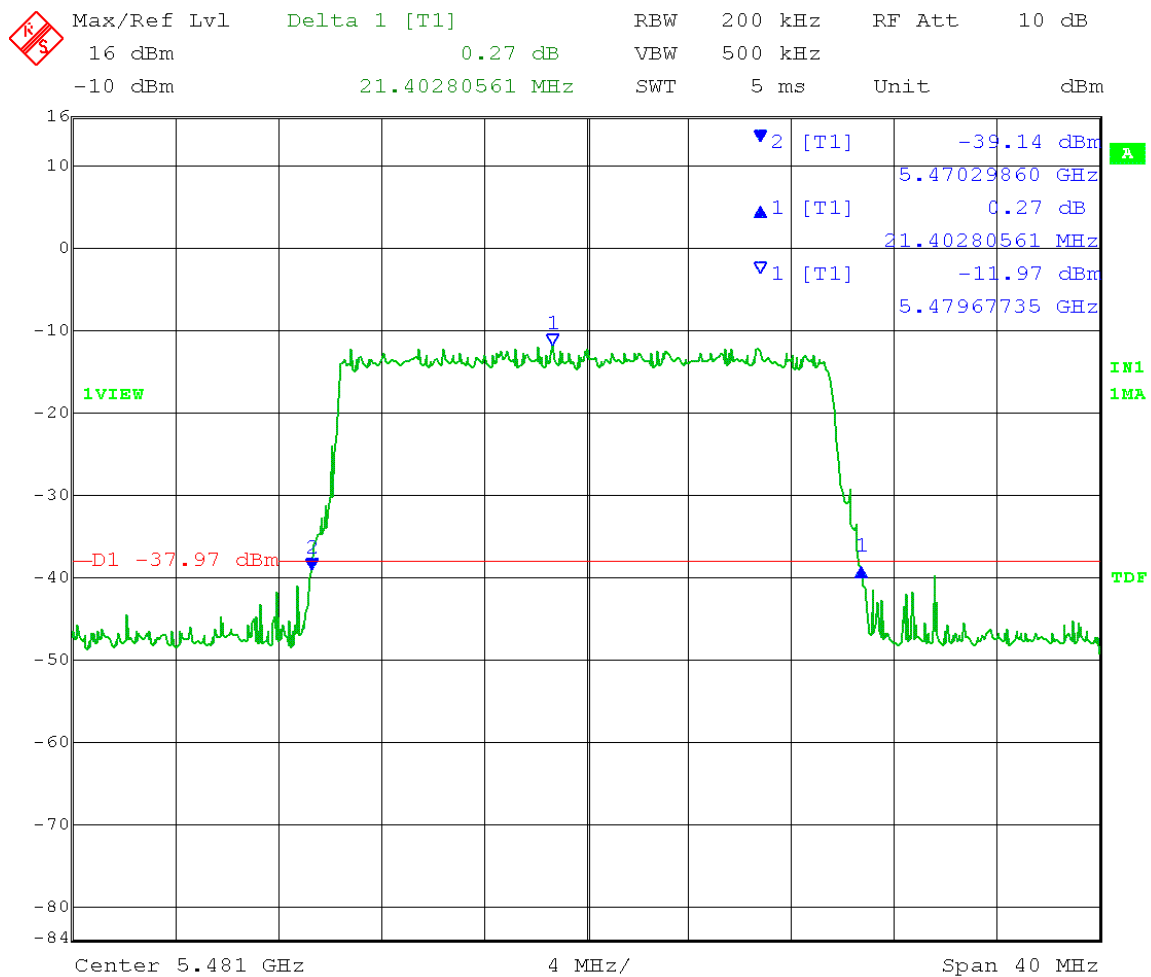1MA
TDF

1VIEW

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
High Channel: Transmit = 5.714 GHz   20MHz BW   64QAM
Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		-4.62 dBm	VBW	2 MHz		
-10 dBm		5.70602405 GHz	SWT	5 ms	Unit	dBm

Marker readings:
1 [T1]   -4.62 dBm   5.70602405 GHz
OPB   19.31863727 MHz
T1 [T1]   -11.12 dBm   5.70434068 GHz
T2 [T1]   -11.07 dBm   5.72365932 GHz

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
 16 dBm   -4.43 dBm   VBW   2 MHz
-10 dBm   5.71243687 GHz   SWT   5 ms   Unit   dBm

```
 16
                                              ▼1 [T1]           -4.43 dBm    [A]
 10
                                                          5.71243687 GHz
                                              OPB       19.31863727 MHz
  0                        1                   ▽T1 [T1]          -11.28 dBm
                          ▼                               5.70434068 GHz
        T1 ┬─ ╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢       ▽T╫ [T1]          -11.29 dBm
-10     ▽                                         ▽ ╫  T2        5.72365932 GHz
                                                                            IN1
-20                                                                         1MA
 1VIEW

-30

-40                                                                         TDF

-50  ╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢                                    ╢╢╢╢╢╢╢╢╢╢╢╢╢╢╢

-60

-70

-80
-84
```

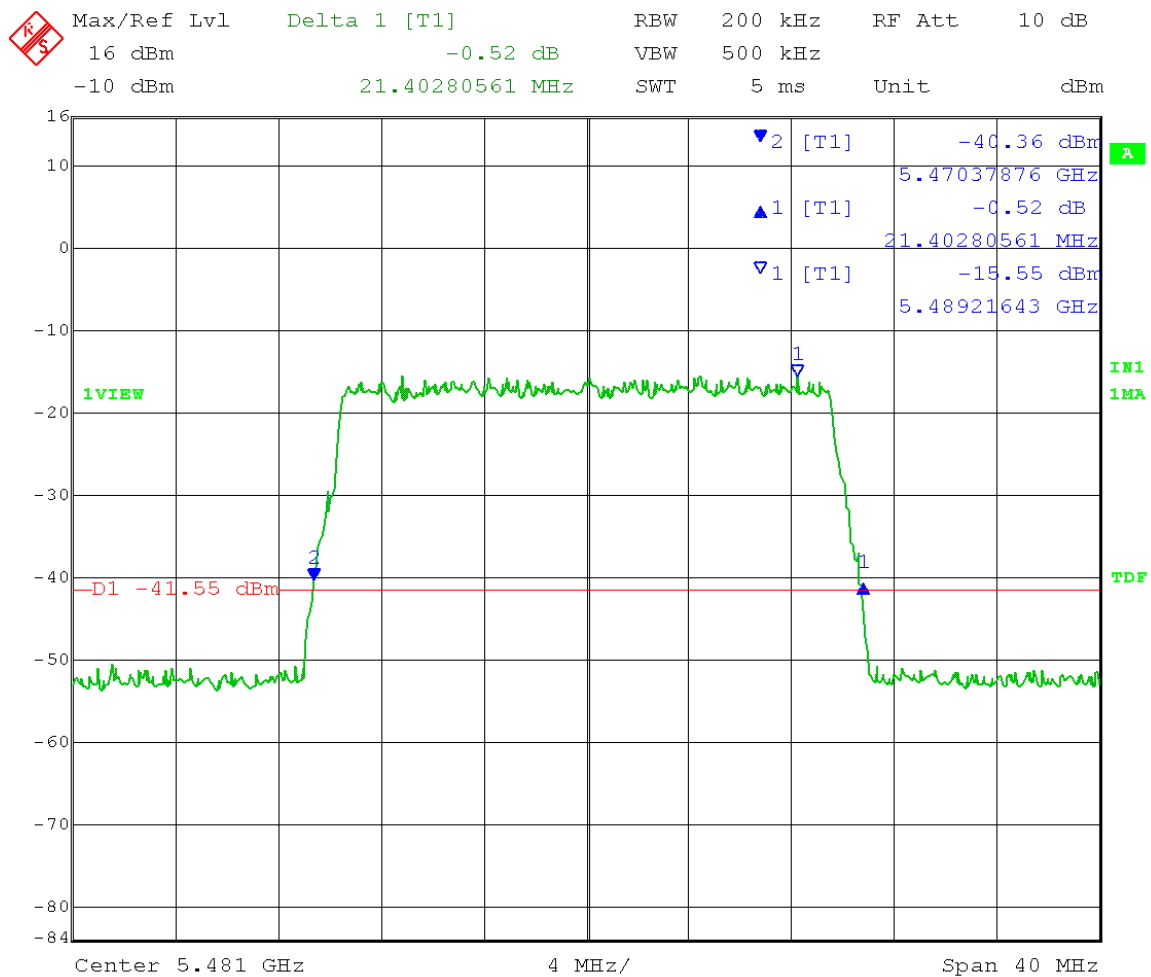Center 5.714 GHz   4 MHz/   Span 40 MHz

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

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

Channel 0:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		−4.95 dBm	VBW	2 MHz		
−10 dBm		5.70850902 GHz	SWT	5 ms	Unit	dBm

1 [T1]   −4.95 dBm
5.70850902 GHz
OPB   19.31863727 MHz
T1 [T1]   −10.23 dBm
5.70434068 GHz
T2 [T1]   −11.62 dBm
5.72365932 GHz

1VIEW

IN1
1MA

TDF

A

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

Channel 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
  16 dBm   -5.28 dBm   VBW   2 MHz
 -10 dBm   5.71355912 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]	-5.28 dBm
	5.71355912 GHz
OPB	19.31863727 MHz
▽T1 [T1]	-11.44 dBm
	5.70434068 GHz
▽T2 [T1]	-12.36 dBm
	5.72365932 GHz

A

IN1
1MA

TDF

1VIEW

Center 5.714 GHz   4 MHz/   Span 40 MHz
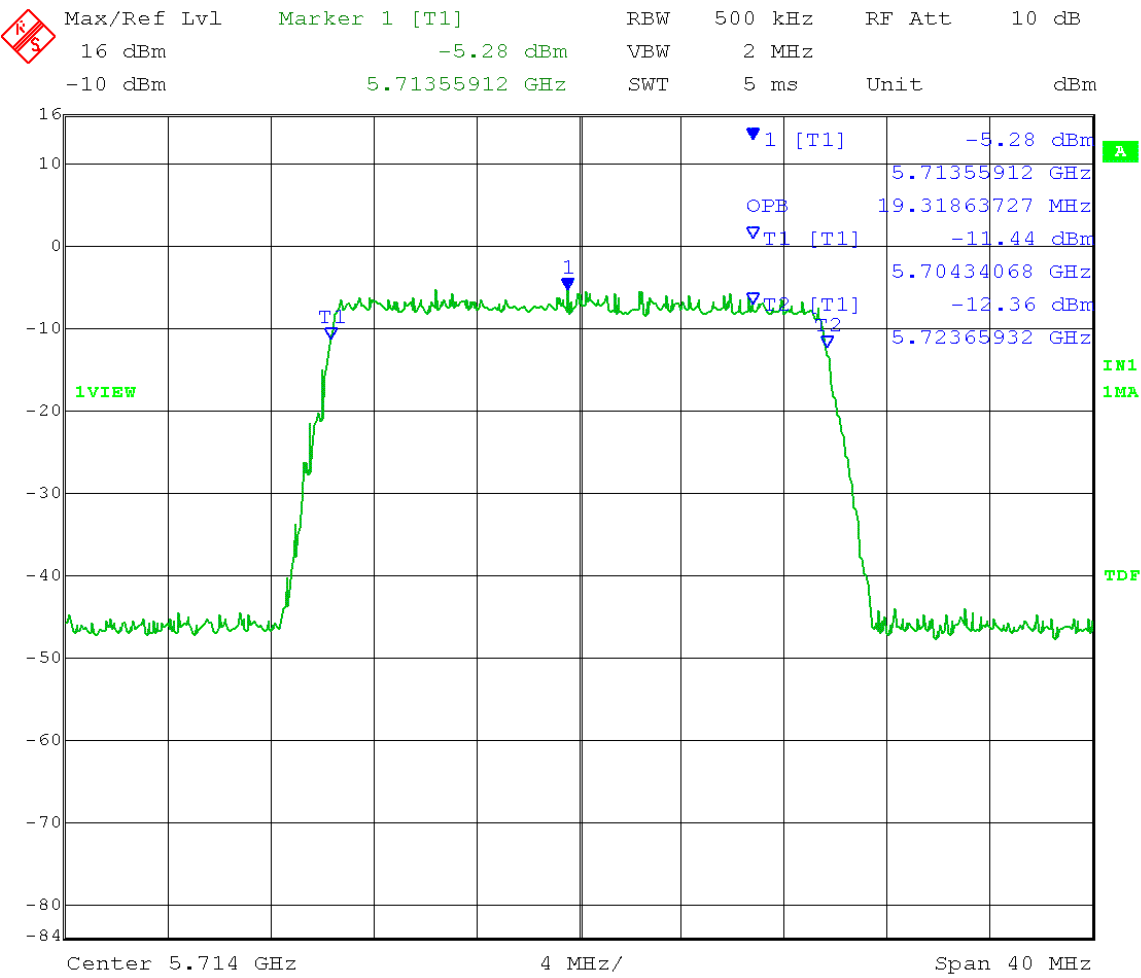
Date: 22.OCT.2013   11:07:55

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
High Channel: Transmit = 5.714 GHz   20MHz BW   1024QAM
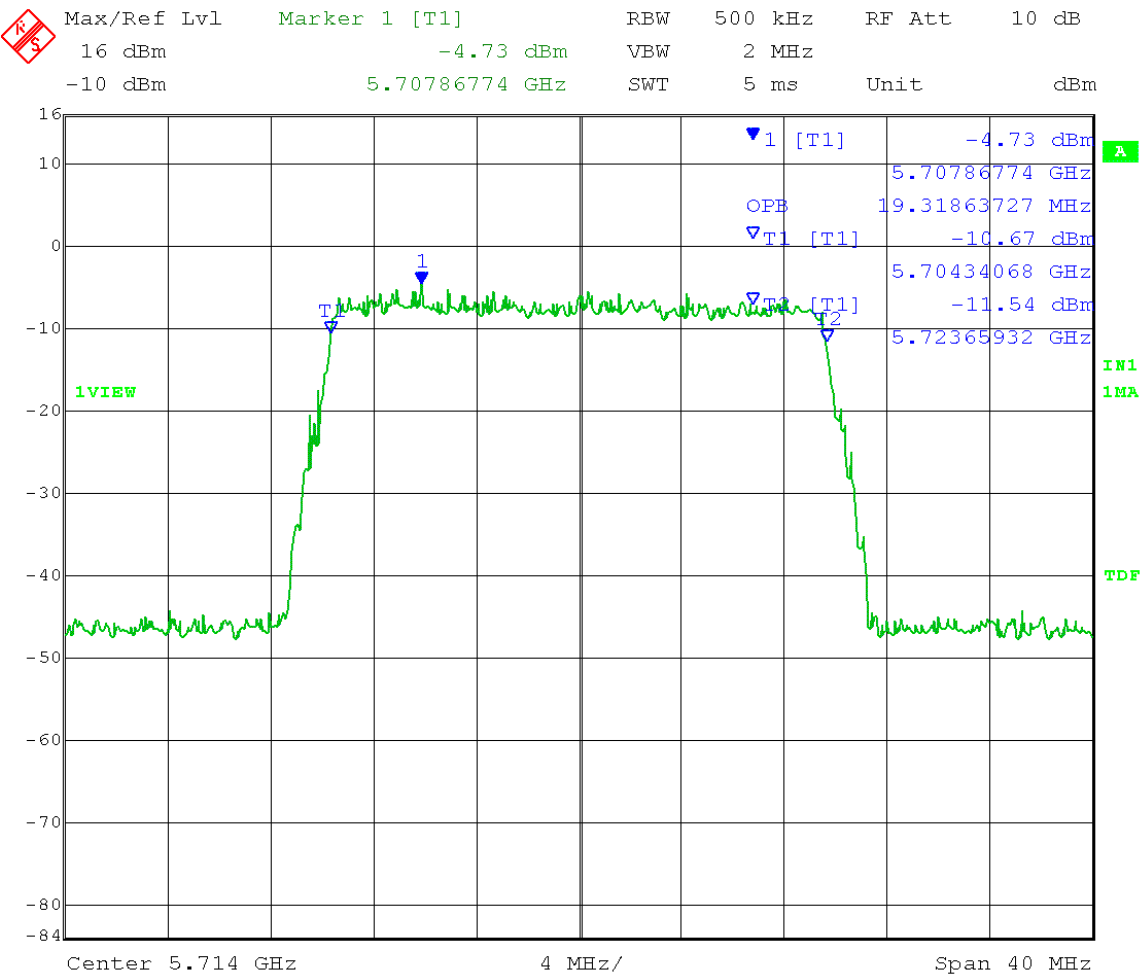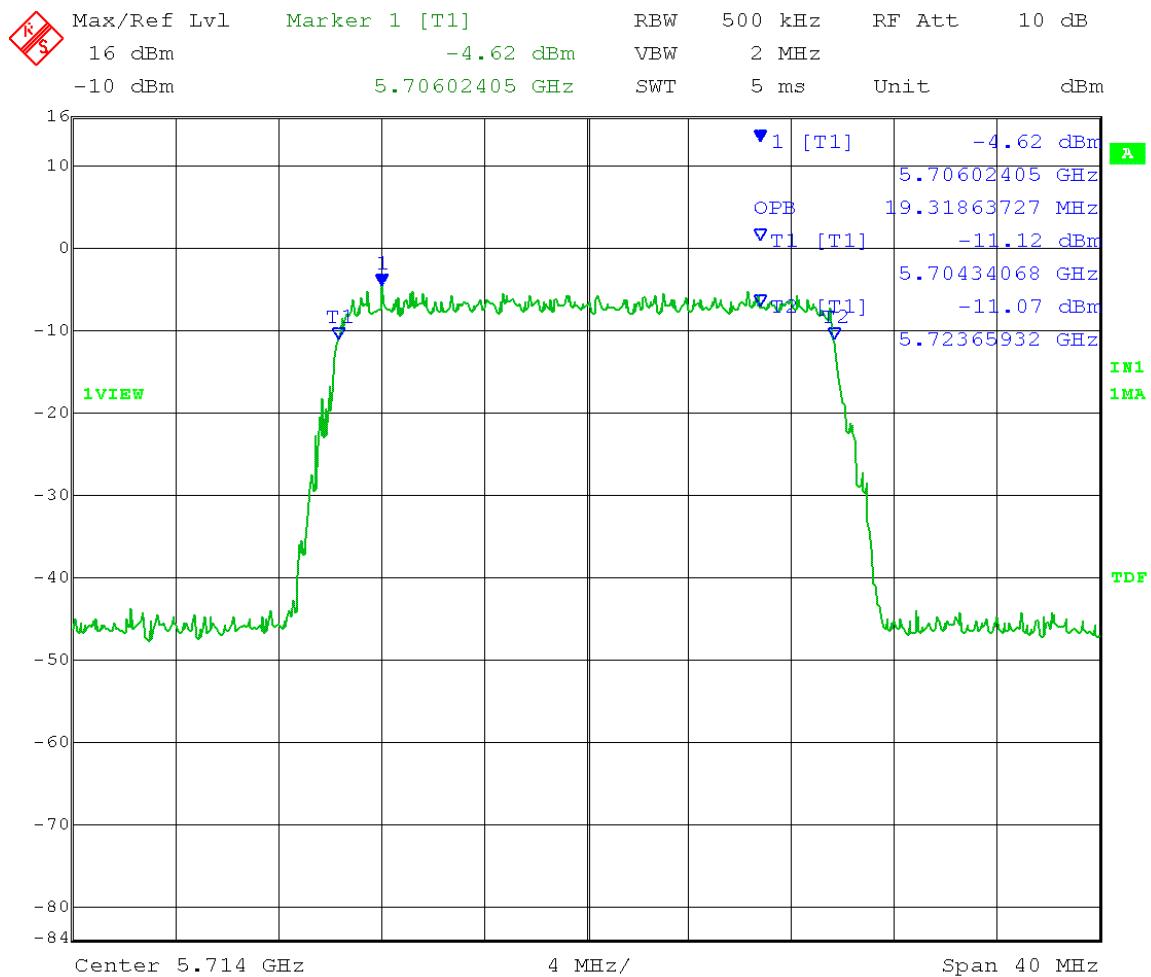Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		-5.14 dBm	VBW	2 MHz		
-10 dBm		5.71379960 GHz	SWT	5 ms	Unit	dBm


```
 16
                                                    ▼1 [T1]         -5.14 dBm   A
 10                                                  5.71379960 GHz
                                                    OPB      19.31863727 MHz
                                                    ▽T1 [T1]       -11.82 dBm
  0                                                  5.70434068 GHz
                          1                         ▽T2[T1]        -10.62 dBm
-10                                                  5.72365932 GHz
                                                                              IN1
1VIEW                                                                         1MA
-20

-30

-40                                                                          TDF

-50

-60

-70

-80
-84
     Center 5.714 GHz              4 MHz/                    Span 40 MHz
```

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

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
 16 dBm   −5.17 dBm   VBW   2 MHz
−10 dBm   5.71500200 GHz   SWT   5 ms   Unit   dBm

```
 16                                    ▼1 [T1]           −5.17 dBm   [A]
 10                                                   5.71500200 GHz
                                       OPB        19.31863727 MHz
  0                                    ▽T1 [T1]          −11.02 dBm
                                                     5.70434068 GHz  IN1
−10                                    ▽T2 [T1]          −11.18 dBm  1MA
                                                     5.72365932 GHz
−20   1VIEW

−30

−40                                                                  TDF

−50

−60

−70

−80
−84
```

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
High Channel: Transmit = 5.714 GHz   20MHz BW   QPSK
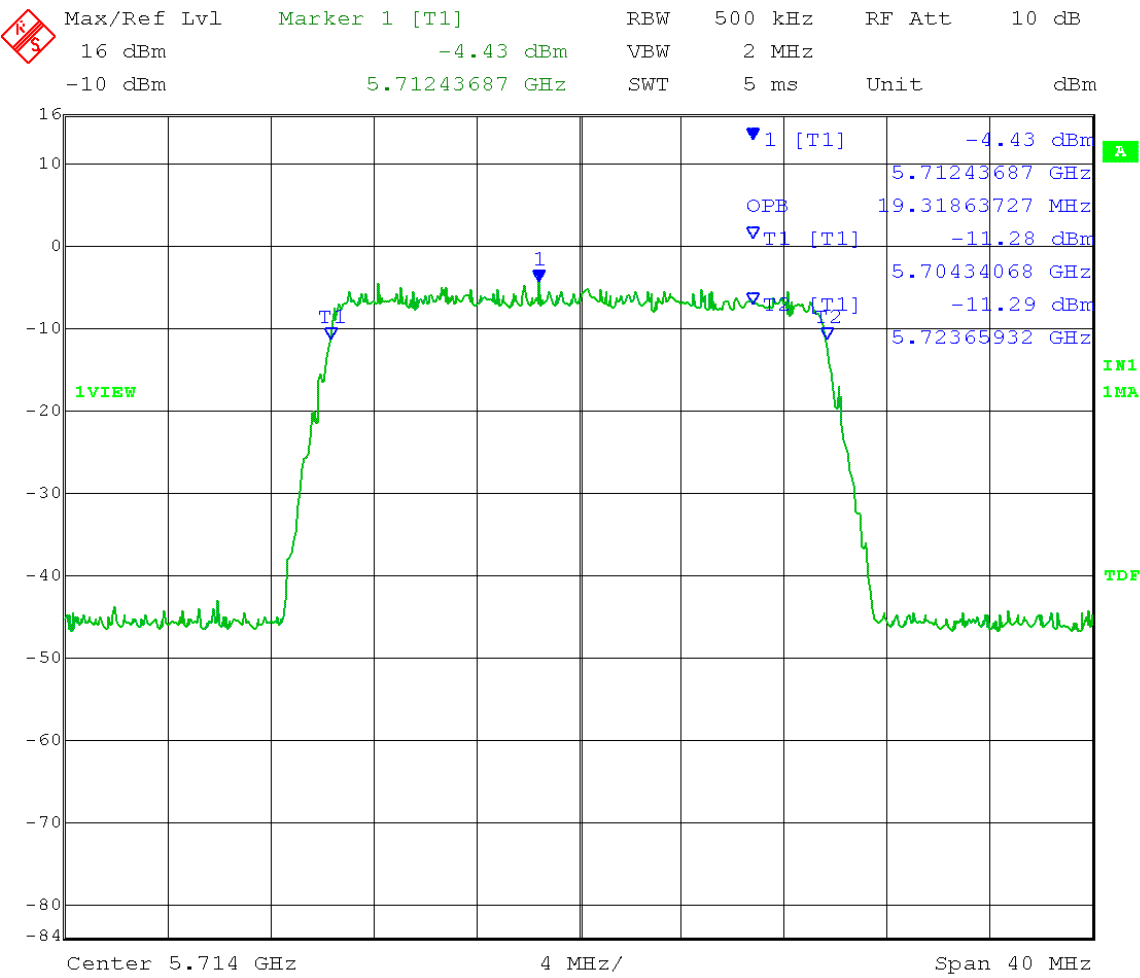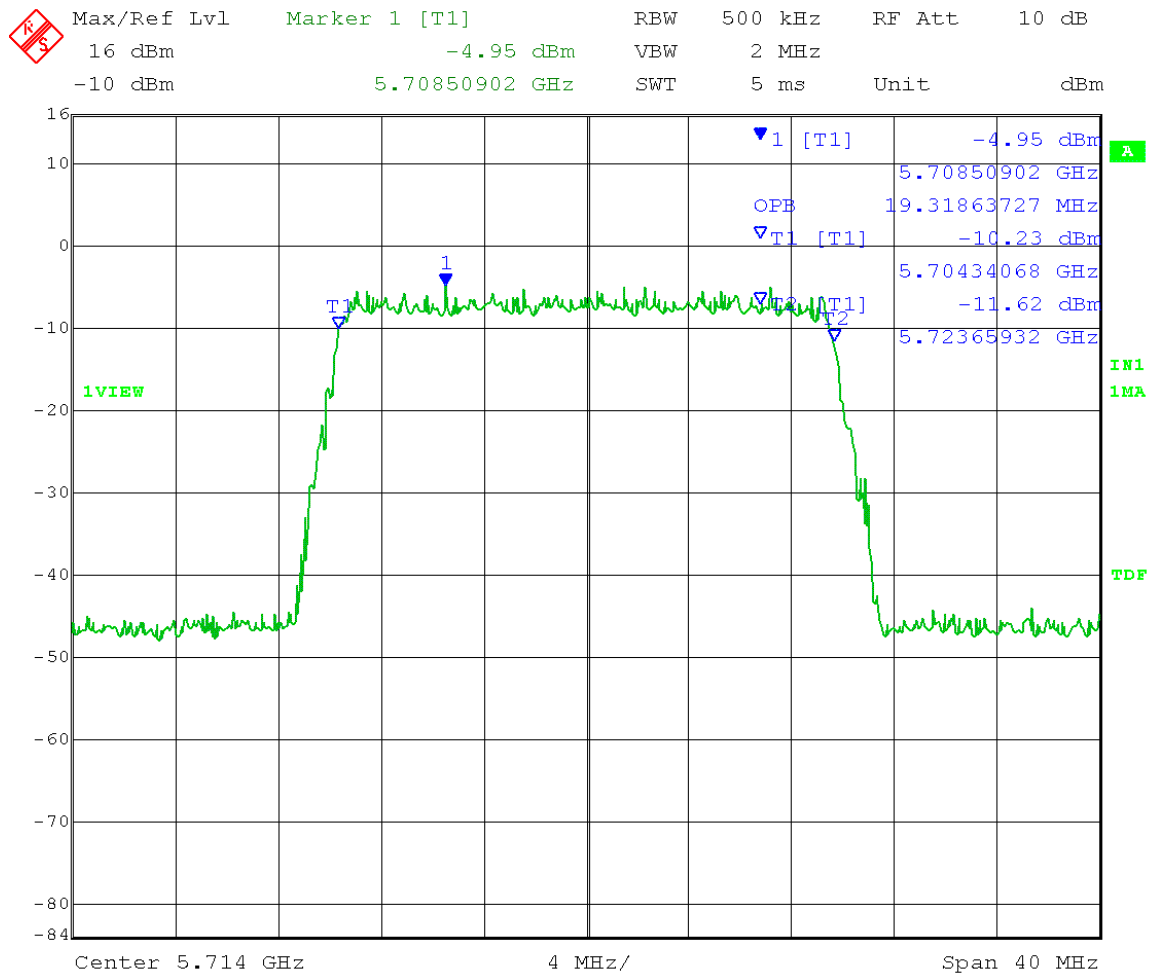Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.48MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		-5.00 dBm	VBW	2 MHz		
-10 dBm		5.70834870 GHz	SWT	5 ms	Unit	dBm

1 [T1]   -5.00 dBm
               5.70834870 GHz
OPB   19.47895792 MHz
T1 [T1]   -12.15 dBm
               5.70426052 GHz
T2 [T1]   -11.76 dBm
               5.72373948 GHz

1VIEW

Center 5.714 GHz   4 MHz/   Span 40 MHz

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

TX 1:

99% OBW = 19.48MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
 16 dBm   -4.94 dBm   VBW   2 MHz
-10 dBm   5.71315832 GHz   SWT   5 ms   Unit   dBm

```
 16                                        ▼1 [T1]           -4.94 dBm      A
 10                                                        5.71315832 GHz
                                          OPB        19.47895792 MHz
  0                                        ▽T1 [T1]         -11.36 dBm
                                                          5.70426052 GHz
                          1                ▽T2 [T1]         -12.24 dBm
-10    T1                              T2                  5.72373948 GHz   IN1
                                                                           1MA
-20

-30

-40                                                                        TDF

-50

-60

-70

-80
-84
   Center 5.714 GHz              4 MHz/              Span 40 MHz
```
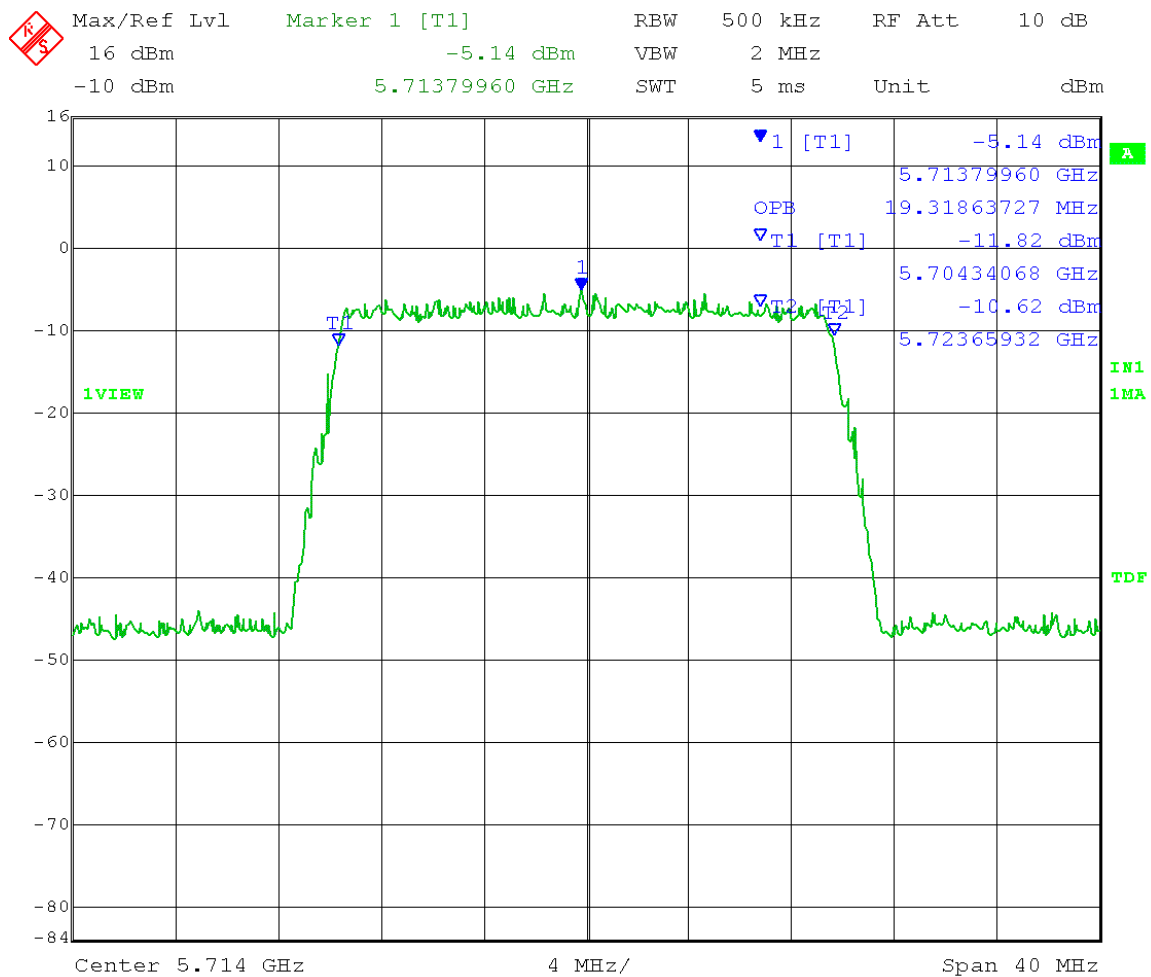
1VIEW

Date: 22.OCT.2013   11:05:02

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   16QAM
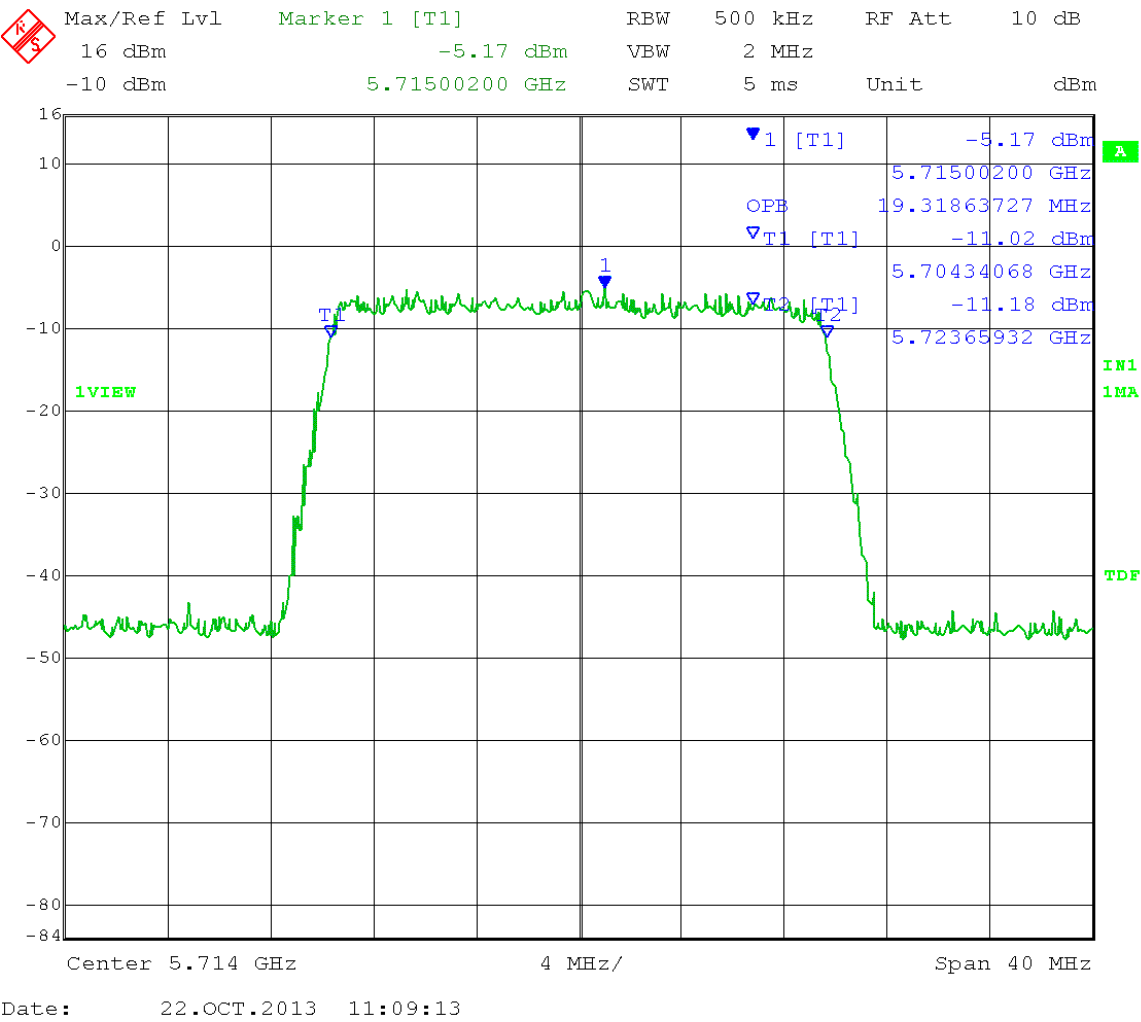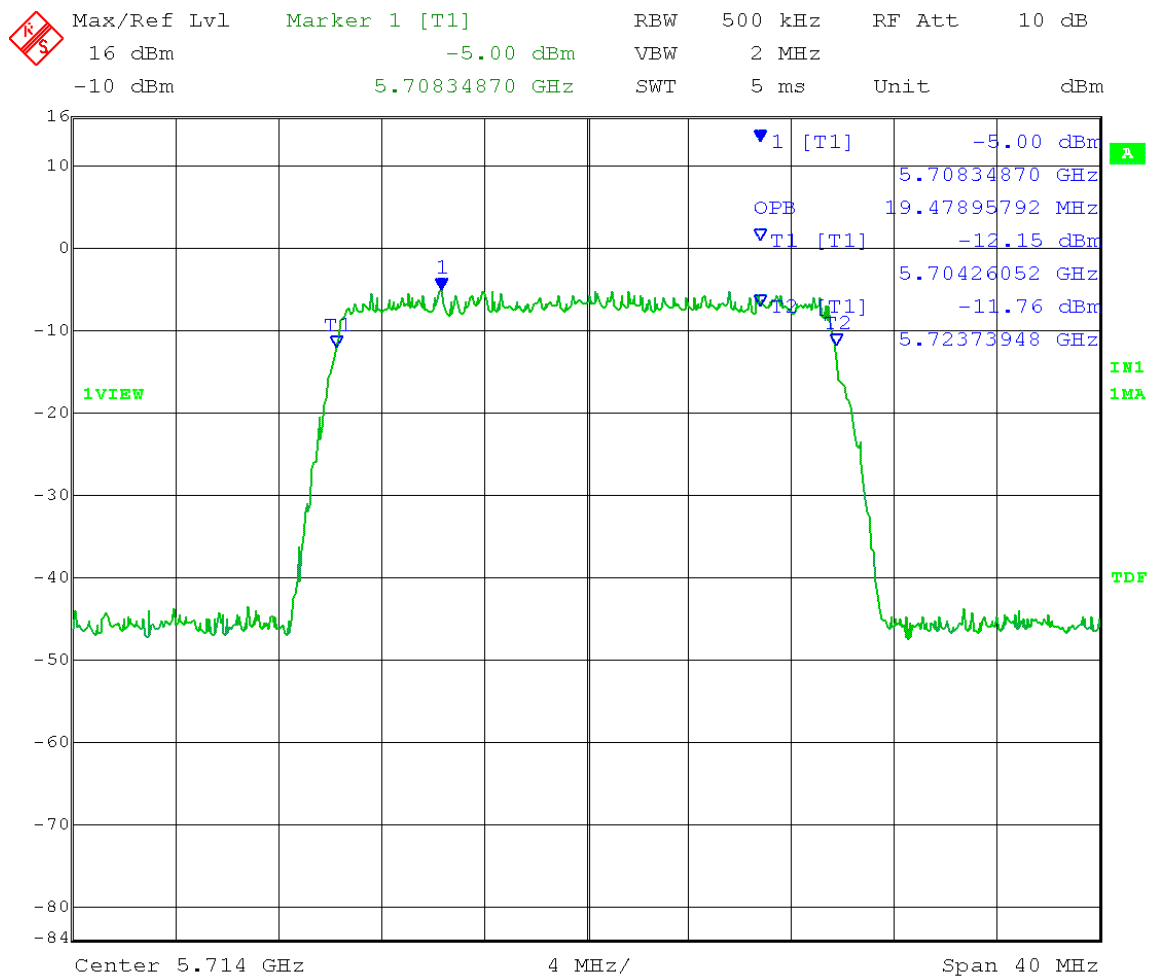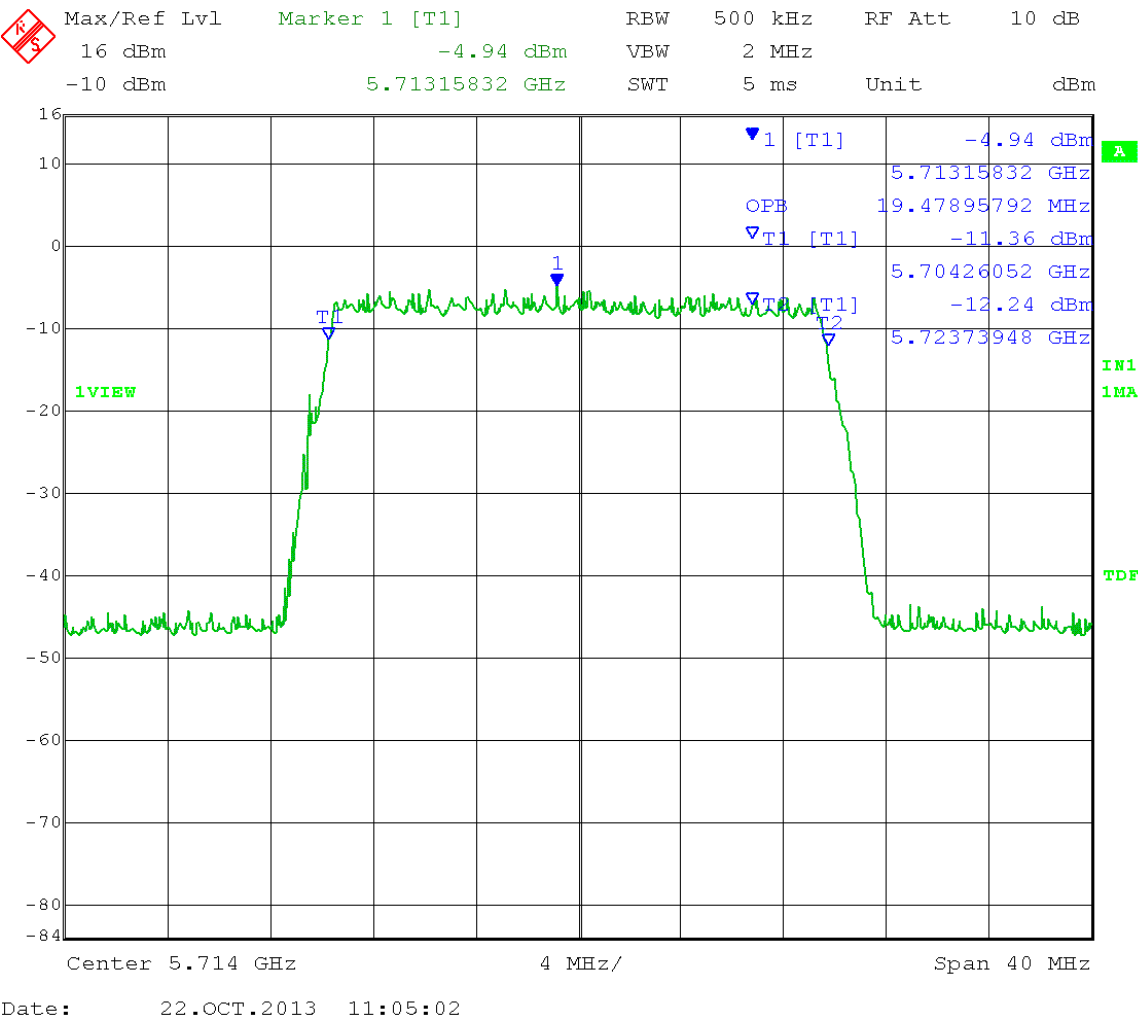Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
 16 dBm   -4.13 dBm   VBW   2 MHz
 -10 dBm   5.56766533 GHz   SWT   5 ms   Unit   dBm

```
  16
                                                    ▼1 [T1]              -4.13 dBm    ┌─┐
  10                                                                                  │A│
                                                                   5.56766533 GHz    └─┘
                                                    OPB       19.31863727 MHz
   0                                                ▽T1 [T1]             -11.52 dBm
                                                                   5.56534068 GHz
                       1                            ▽ T2    T1]         -10.53 dBm
 -10      T1                                                        5.58465932 GHz
                                                                                     IN1
                                                                                     1MA
 -20

 -30

 -40                                                                                 TDF

 -50

 -60

 -70

 -80
 -84
      Center 5.575 GHz           4 MHz/              Span 40 MHz
```
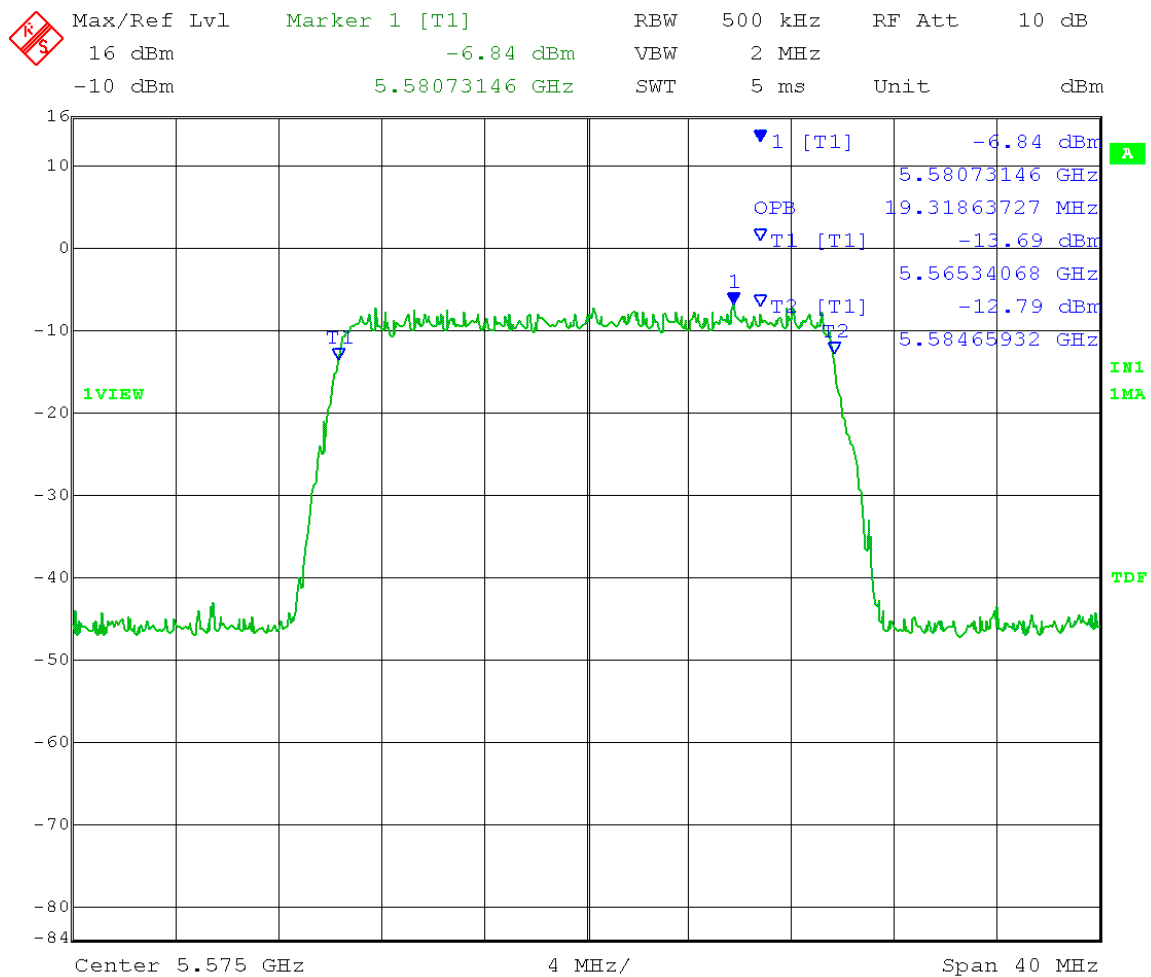1VIEW

Date: 22.OCT.2013 11:02:50

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   64QAM
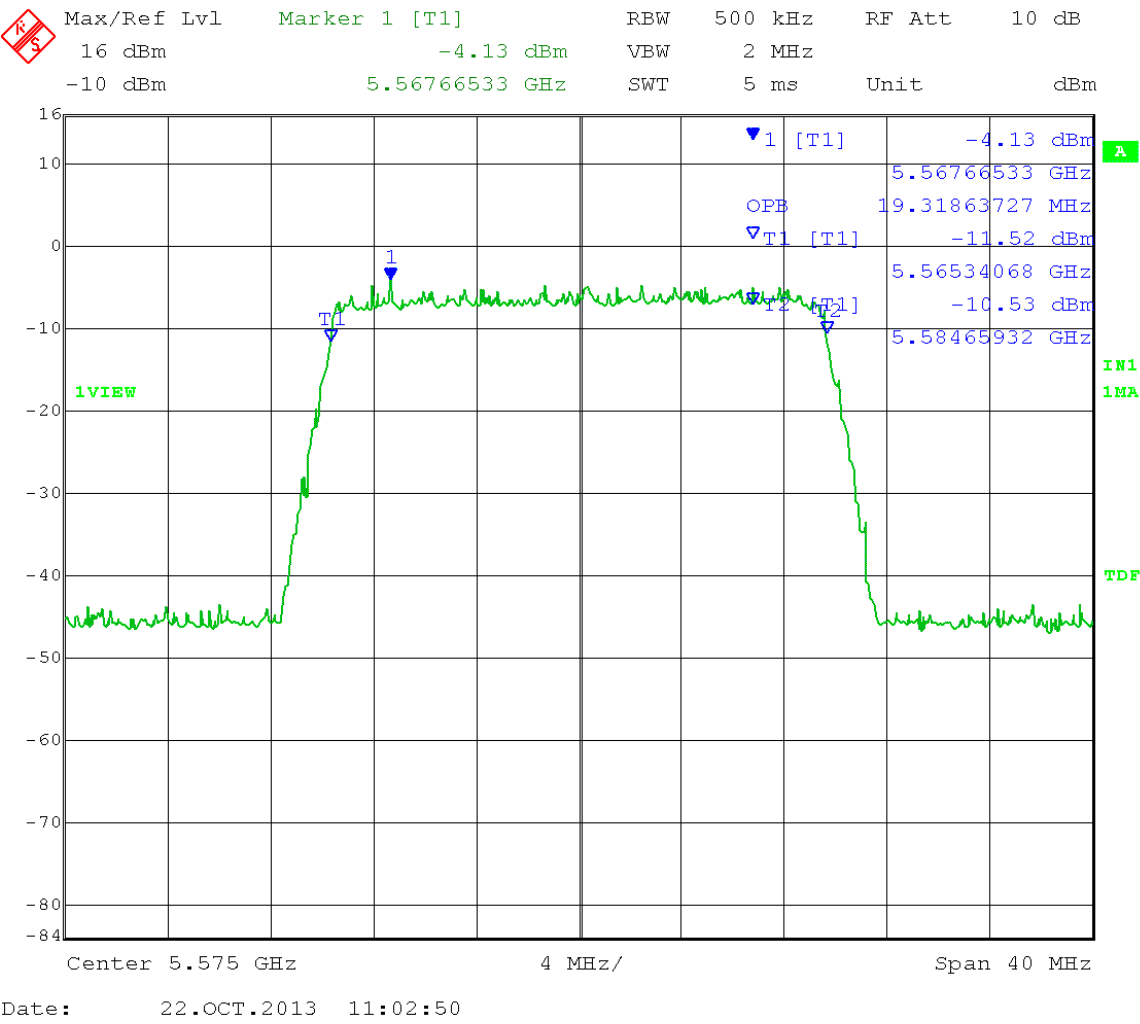Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz
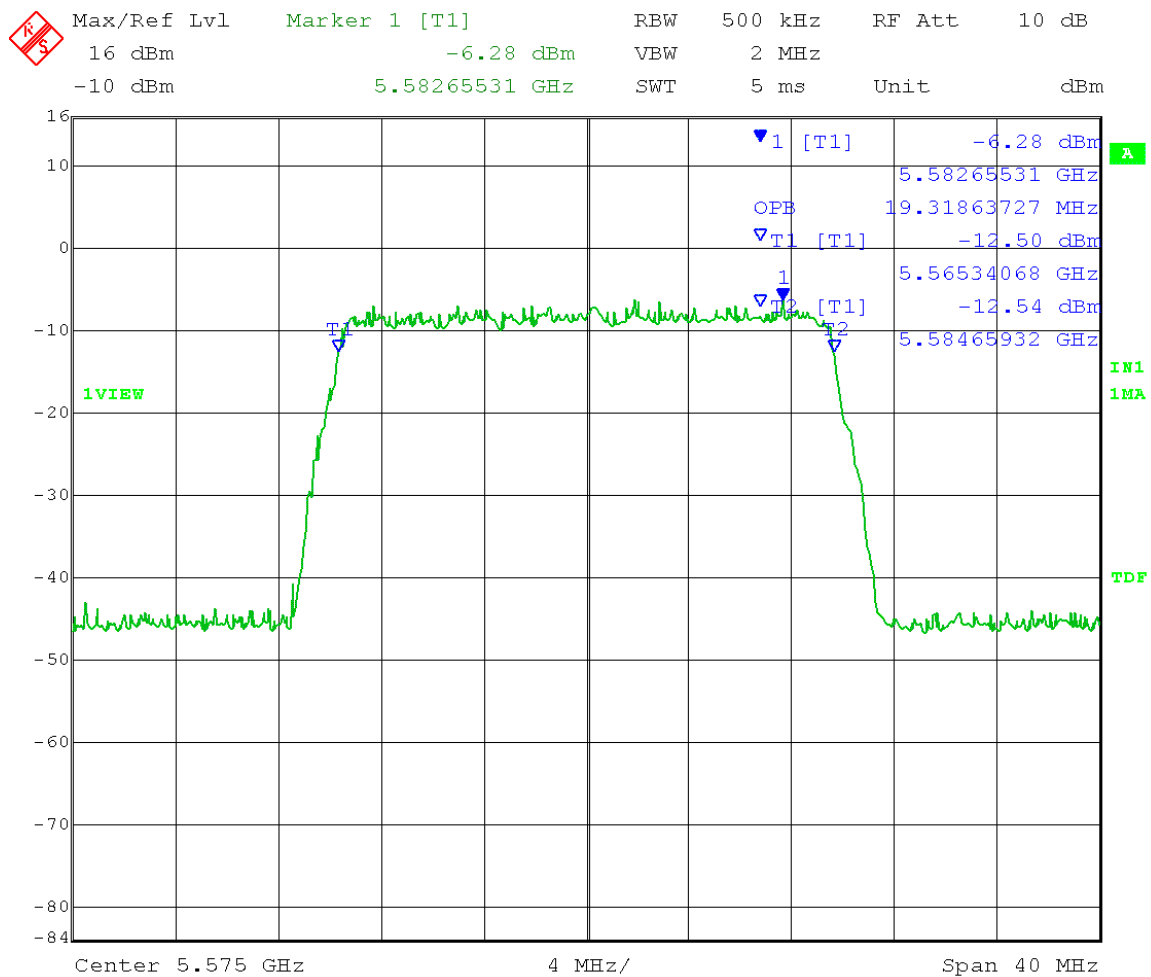

Date: 22.OCT.2013 11:21:52

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
  16 dBm   -4.93 dBm   VBW   2 MHz
  -10 dBm   5.57399800 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -4.93 dBm
                   5.57399800 GHz
OPB   19.31863727 MHz
▽T1 [T1]   -11.30 dBm
                   5.56534068 GHz
▽T2 [T1]   -9.39 dBm
                   5.58465932 GHz

A

IN1
1MA

TDF

1VIEW

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   256QAM
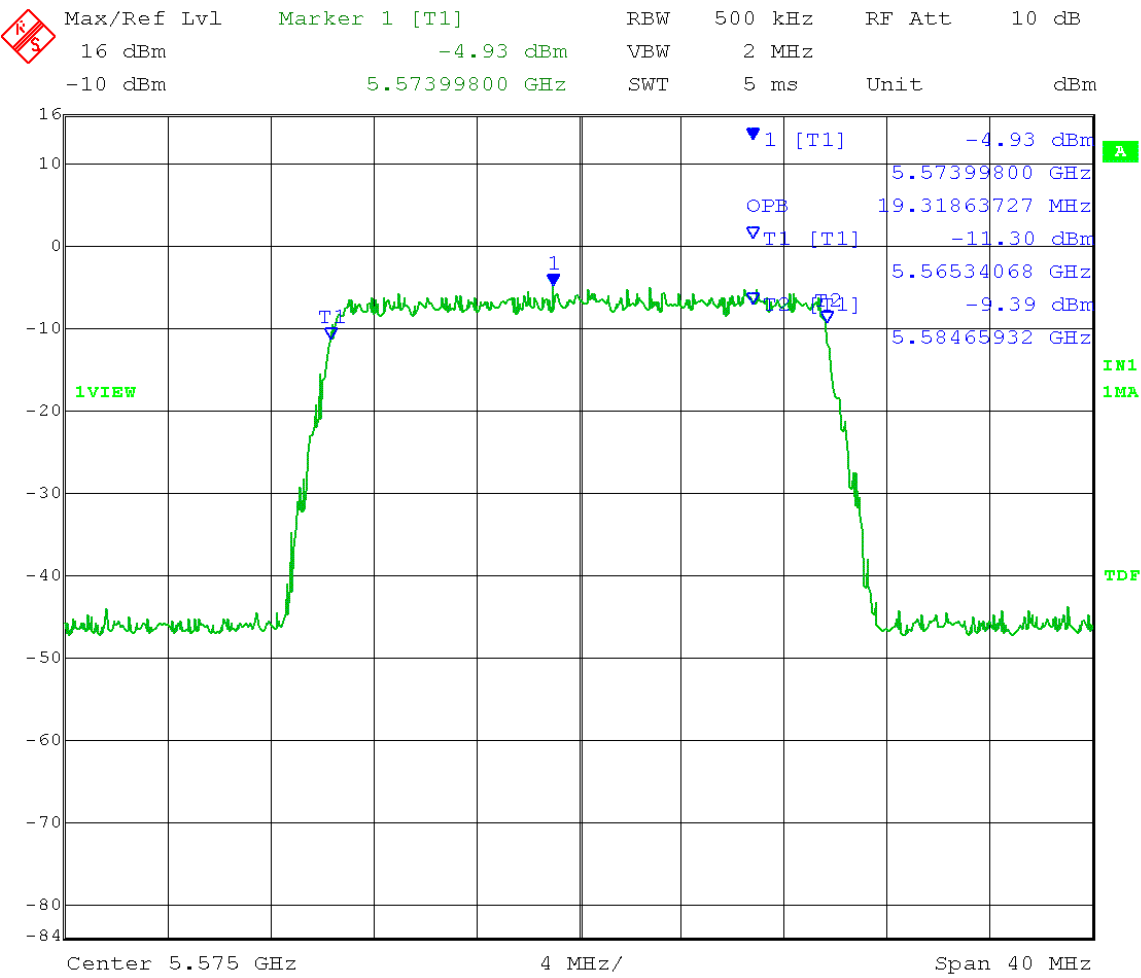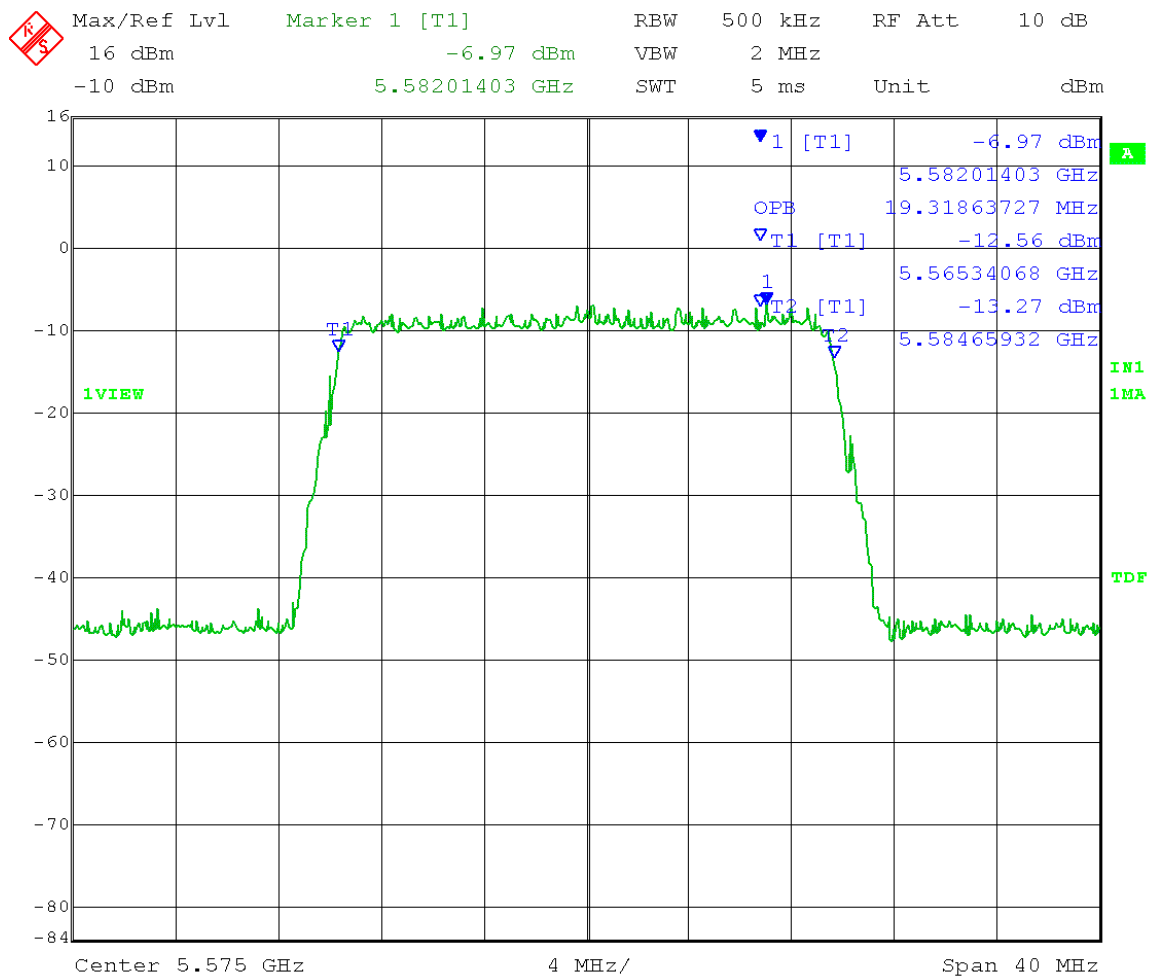Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		−6.97 dBm	VBW	2 MHz		
−10 dBm		5.58201403 GHz	SWT	5 ms	Unit	dBm

1 [T1]   −6.97 dBm
5.58201403 GHz
OPB   19.31863727 MHz
T1 [T1]   −12.56 dBm
5.56534068 GHz
T2 [T1]   −13.27 dBm
5.58465932 GHz

A
1VIEW
IN1
1MA
TDF

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]	RBW	500 kHz	RF Att	10 dB
16 dBm	−4.42 dBm	VBW	2 MHz		
−10 dBm	5.57351703 GHz	SWT	5 ms	Unit	dBm

```
16
                                                    ▼1 [T1]              −4.42 dBm      A
 10                                                                5.57351703 GHz
                                                     OPB       19.31863727 MHz
  0                                                 ▽T1 [T1]             −11.24 dBm    IN1
                          1                                        5.56534068 GHz
-10   T1                ▼                              ▽T2[T1]            −10.31 dBm    1MA
                                                        ▽            5.58465932 GHz
-20
 1VIEW
-30
-40                                                                                    TDF
-50
-60
-70
-80
-84
```

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   1024QAM
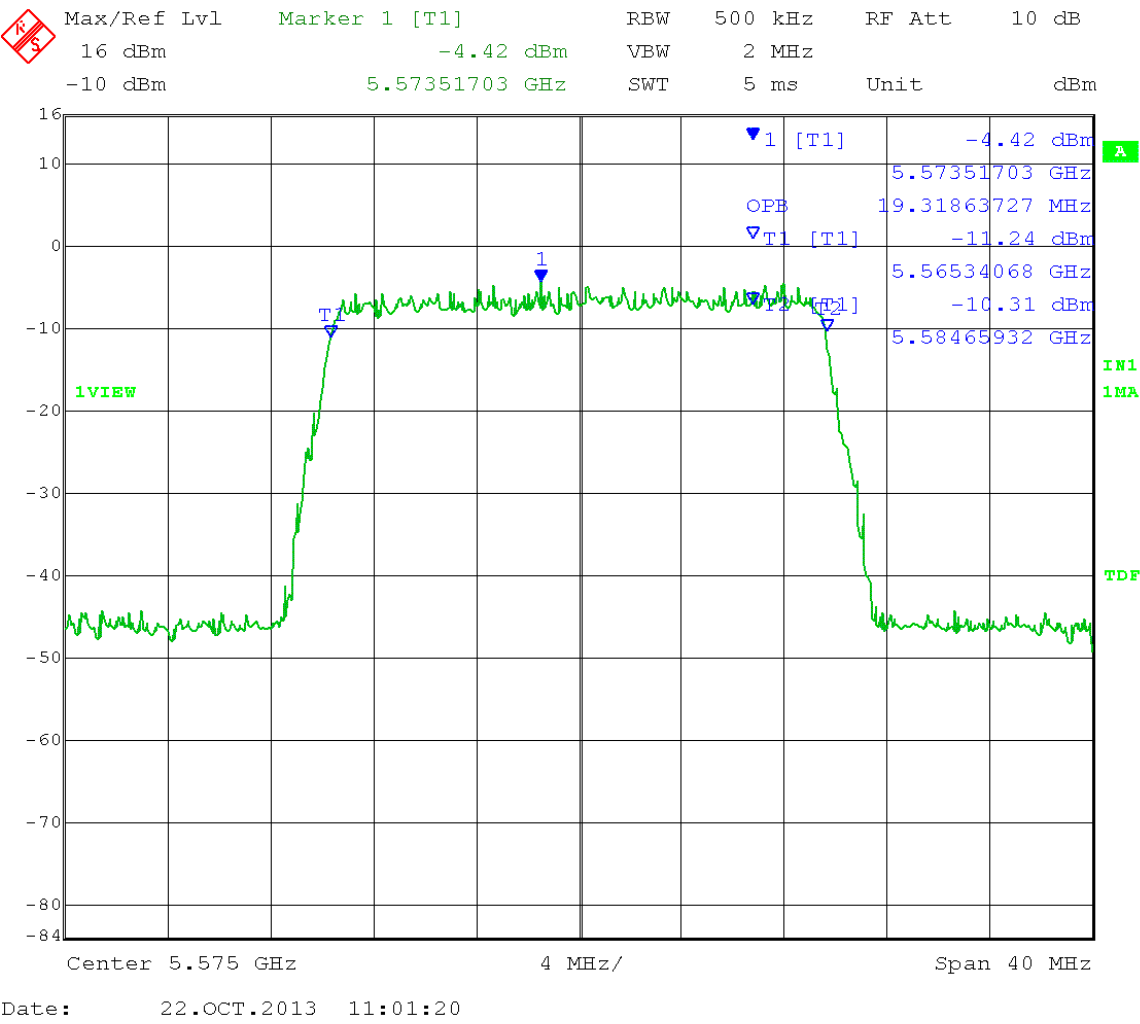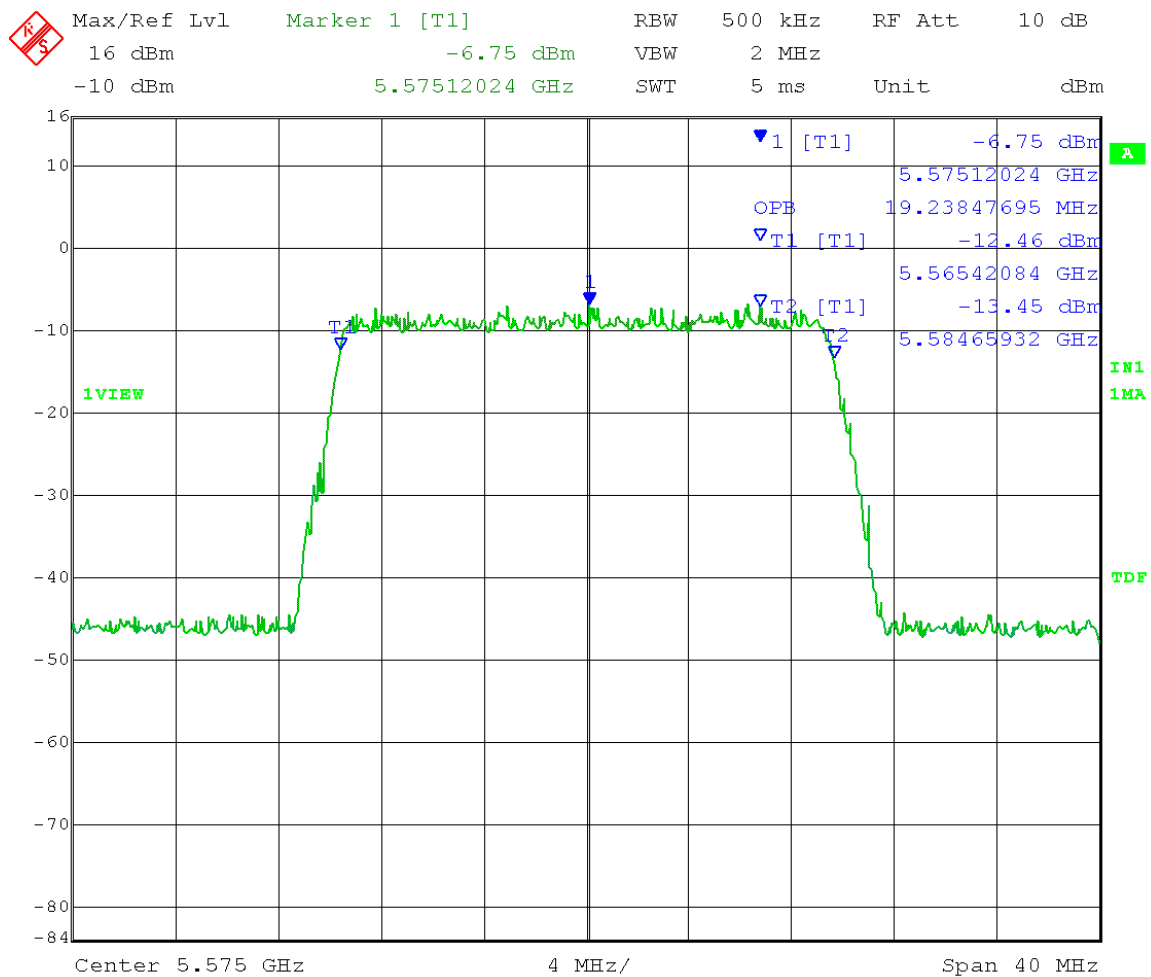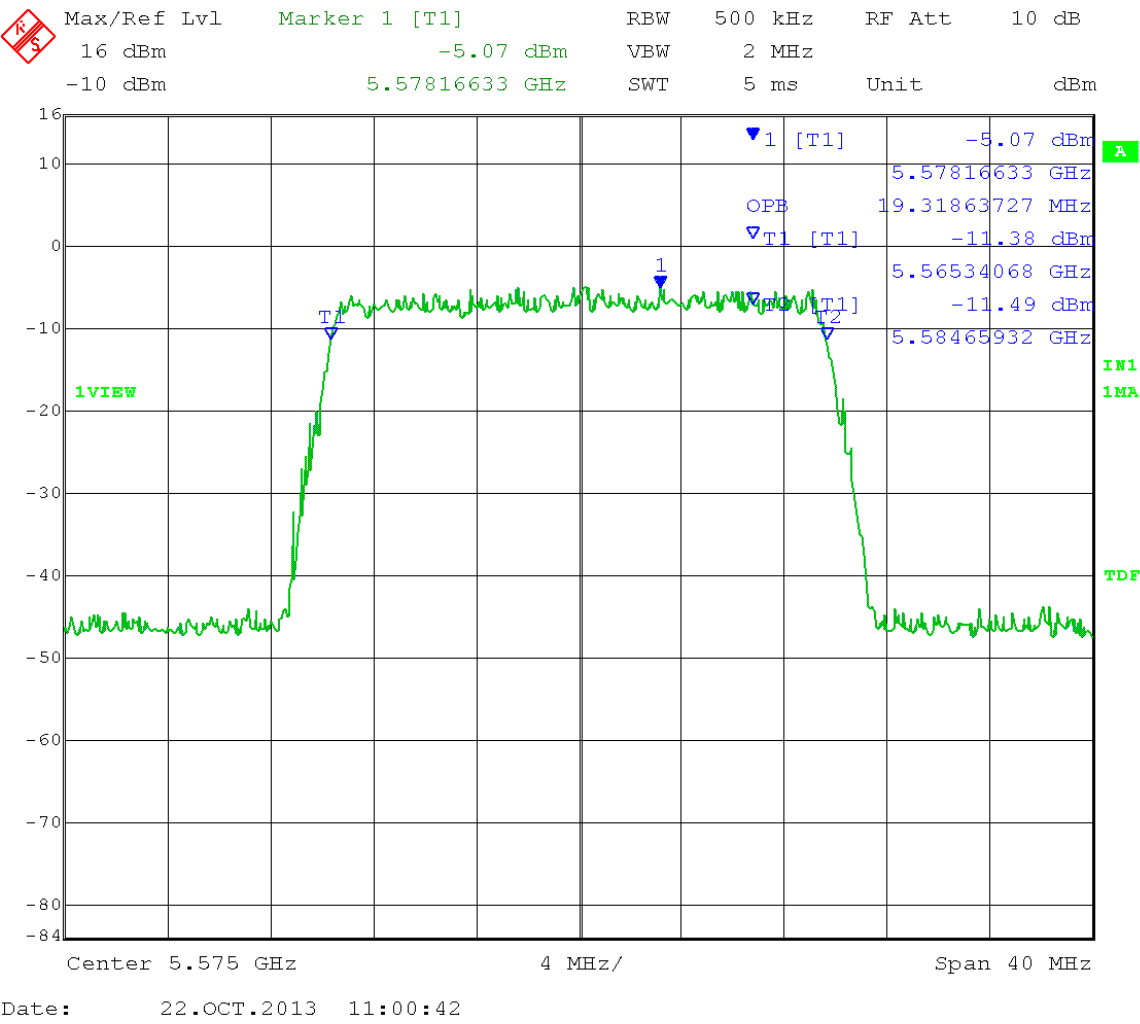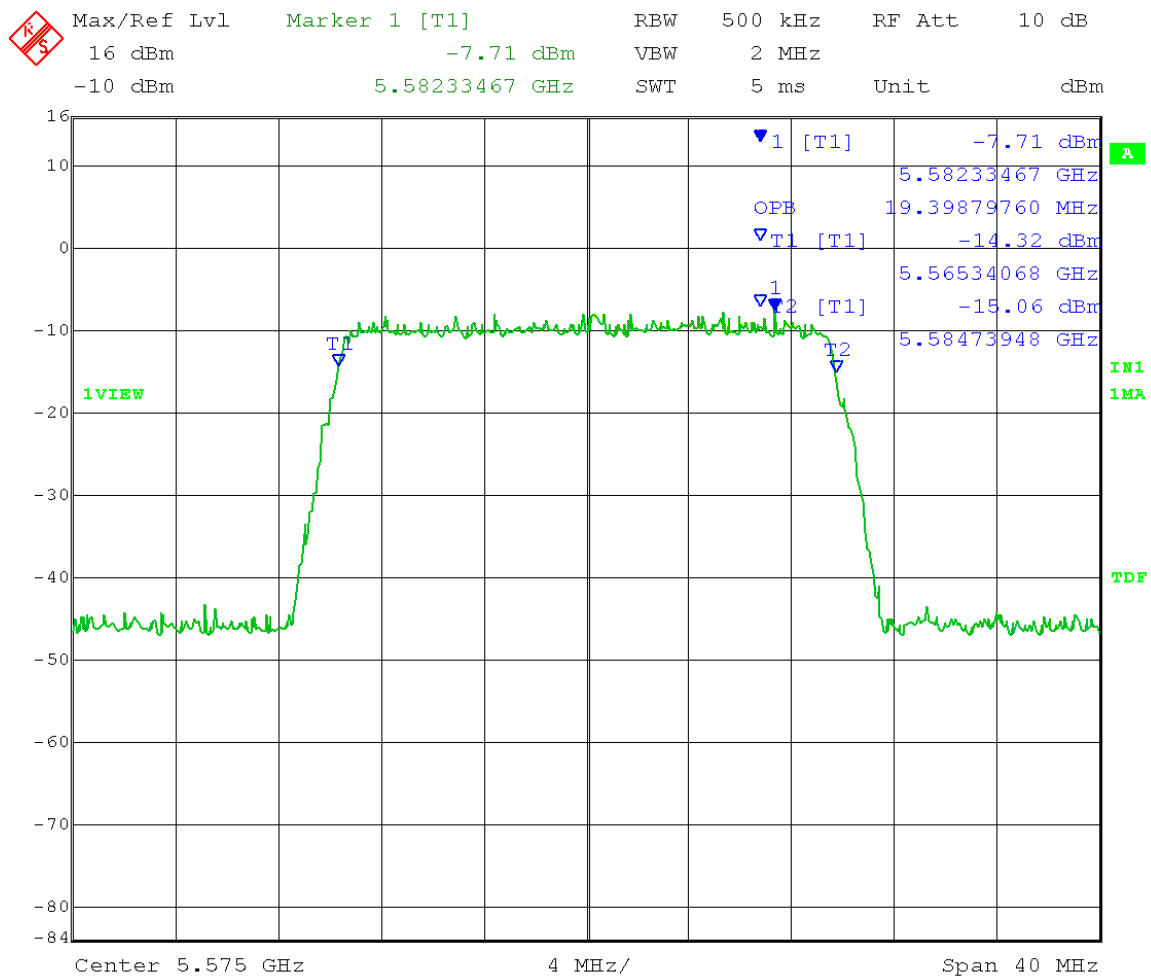Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.24MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		-6.75 dBm	VBW	2 MHz		
-10 dBm		5.57512024 GHz	SWT	5 ms	Unit	dBm

Marker readouts:
▼1 [T1]   -6.75 dBm
              5.57512024 GHz
OPB   19.23847695 MHz
▽T1 [T1]   -12.46 dBm
              5.56542084 GHz
▽T2 [T1]   -13.45 dBm
              5.58465932 GHz

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
16 dBm   −5.07 dBm   VBW   2 MHz
−10 dBm   5.57816633 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   −5.07 dBm
5.57816633 GHz
OPB   19.31863727 MHz
▽T1 [T1]   −11.38 dBm
5.56534068 GHz
−11.49 dBm
5.58465932 GHz

1VIEW

IN1
1MA

TDF

Center 5.575 GHz   4 MHz/   Span 40 MHz

Date: 22.OCT.2013 11:00:42

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Mid Channel: Transmit = 5.575 GHz   20MHz BW   QPSK
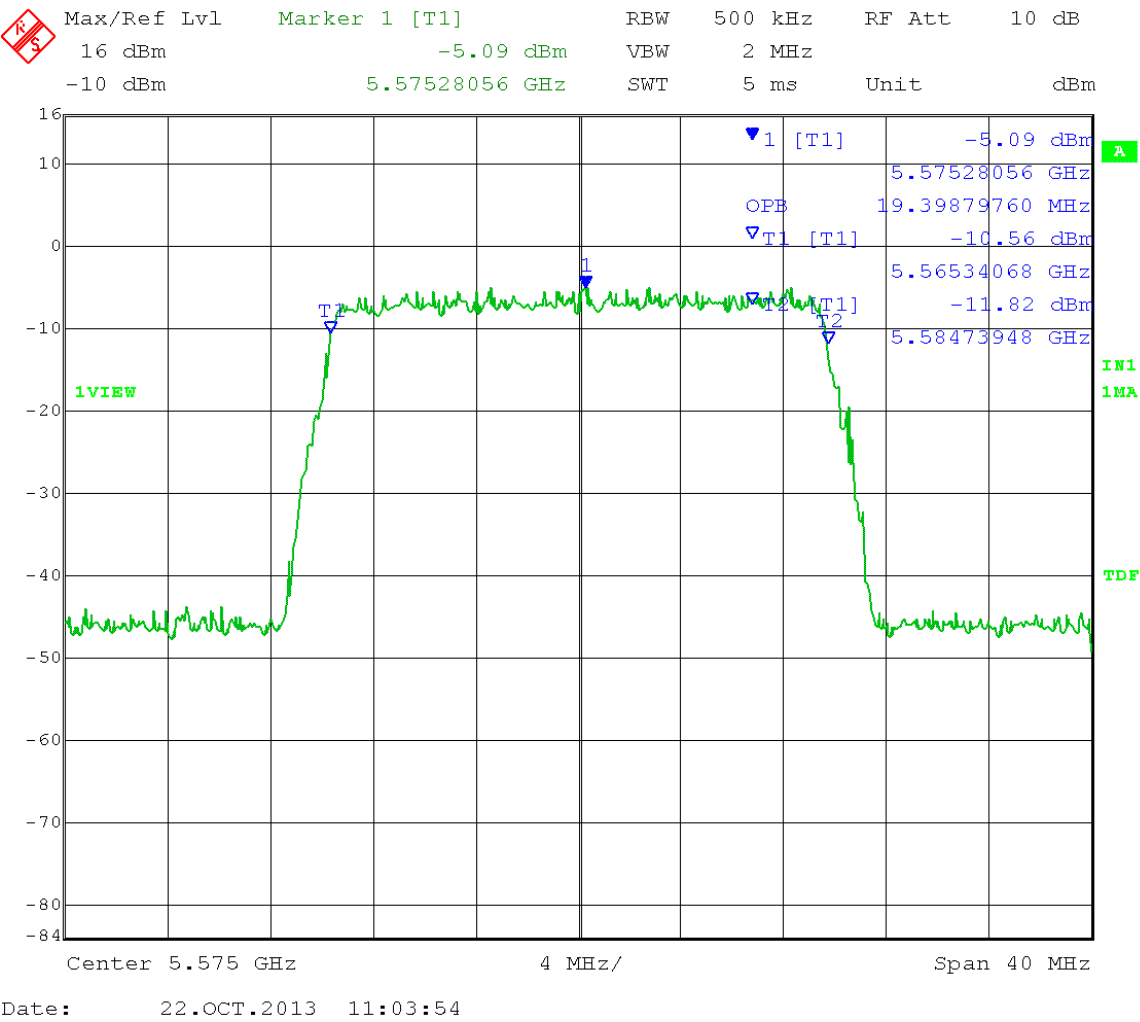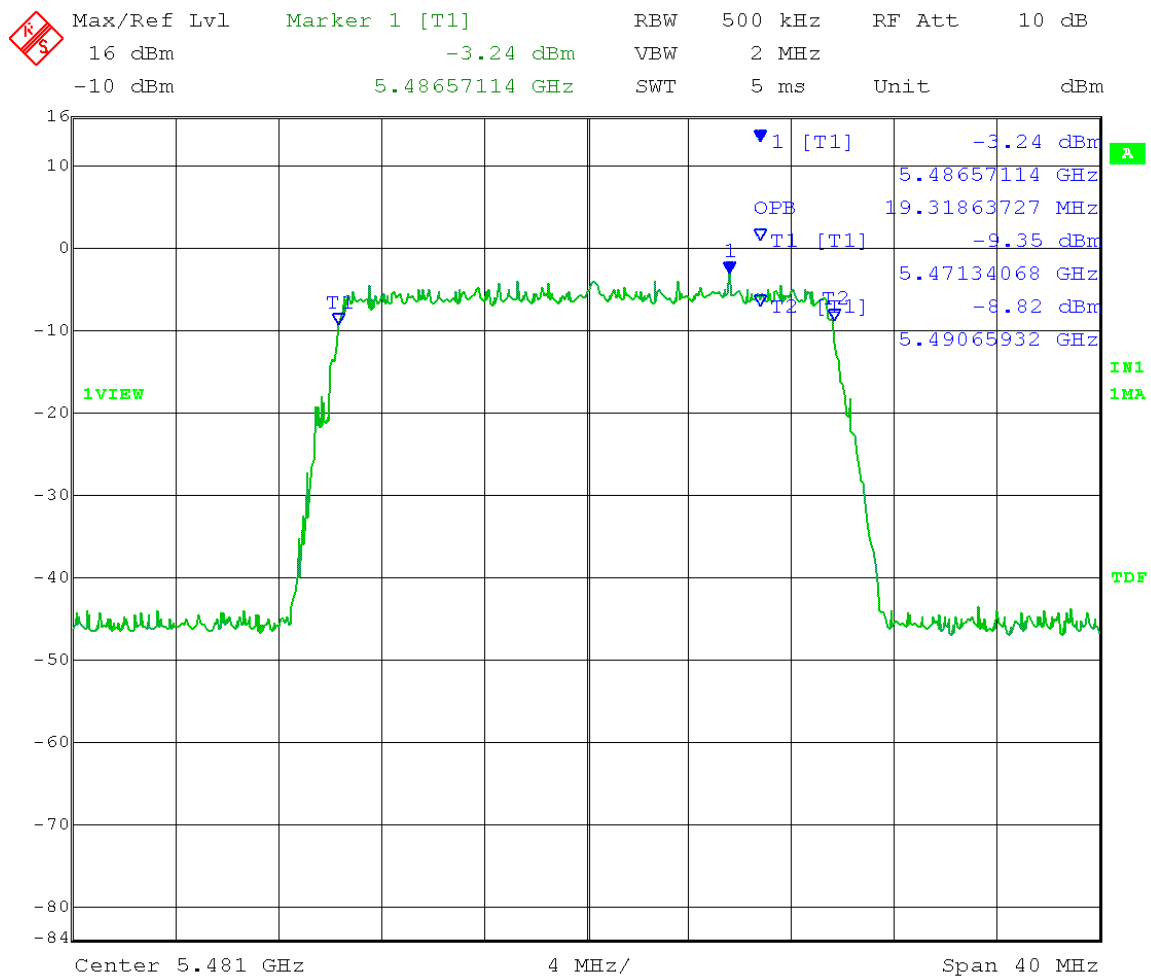Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.40MHz

Max/Ref Lvl	Marker 1 [T1]	RBW	500 kHz	RF Att	10 dB
16 dBm	-7.71 dBm	VBW	2 MHz		
-10 dBm	5.58233467 GHz	SWT	5 ms	Unit	dBm

1   [T1]   -7.71 dBm
                 5.58233467 GHz
OPB   19.39879760 MHz
T1   [T1]   -14.32 dBm
                 5.56534068 GHz
T2   [T1]   -15.06 dBm
                 5.58473948 GHz

1VIEW

A
IN1
1MA
TDF

Center 5.575 GHz   4 MHz/   Span 40 MHz

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

TX 1:

99% OBW = 19.40MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		−5.09 dBm	VBW	2 MHz		
−10 dBm		5.57528056 GHz	SWT	5 ms	Unit	dBm

```
 16
              ▼1 [T1]           −5.09 dBm    A
 10
                          5.57528056 GHz
                    OPB   19.39879760 MHz
                    ▽T1 [T1]    −10.56 dBm
  0
                          5.56534068 GHz    IN1
                    ▽T2  T1]    −11.82 dBm  1MA
-10       T1            T2      5.58473948 GHz
  1VIEW
-20
-30
-40                                          TDF

-50

-60

-70

-80
-84
    Center 5.575 GHz        4 MHz/        Span 40 MHz
```

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.481 GHz   20MHz BW   16QAM
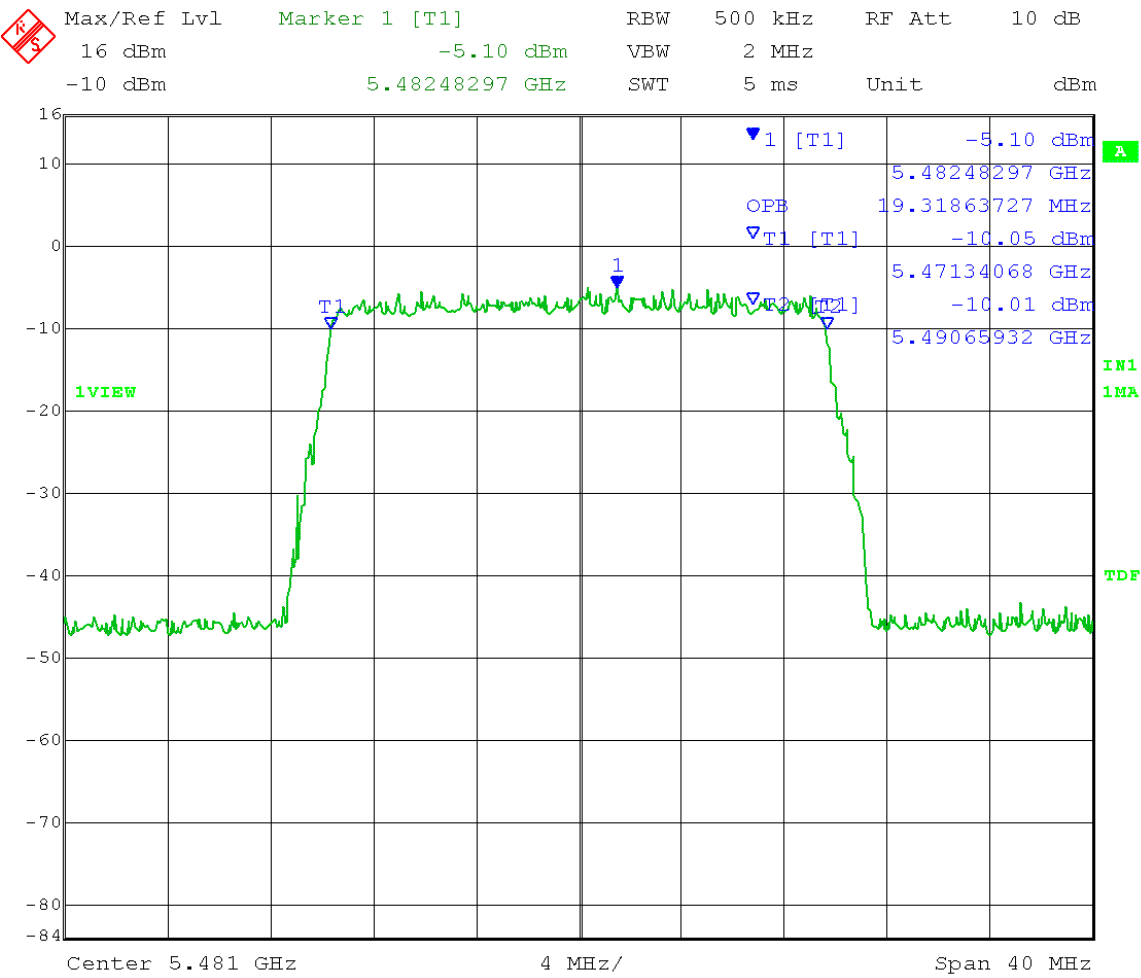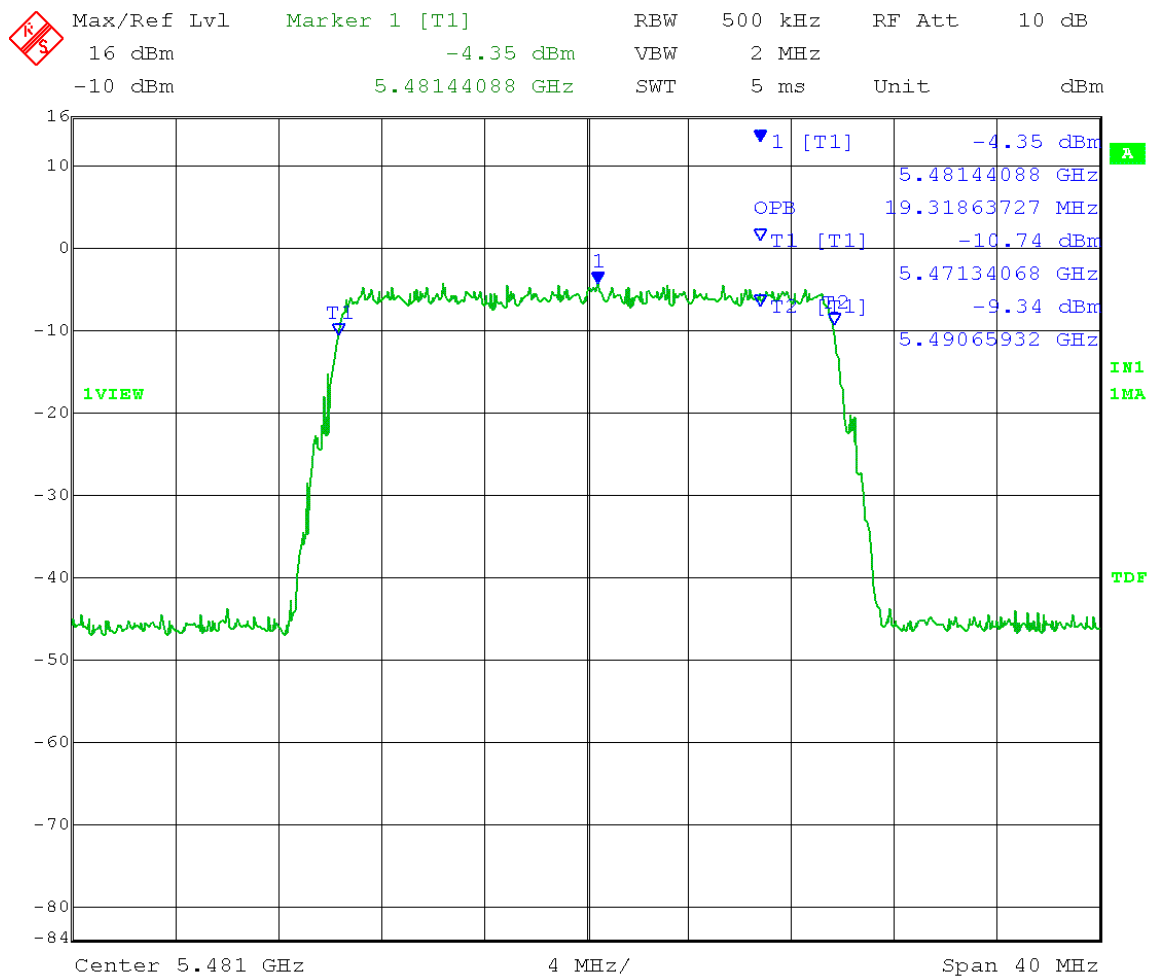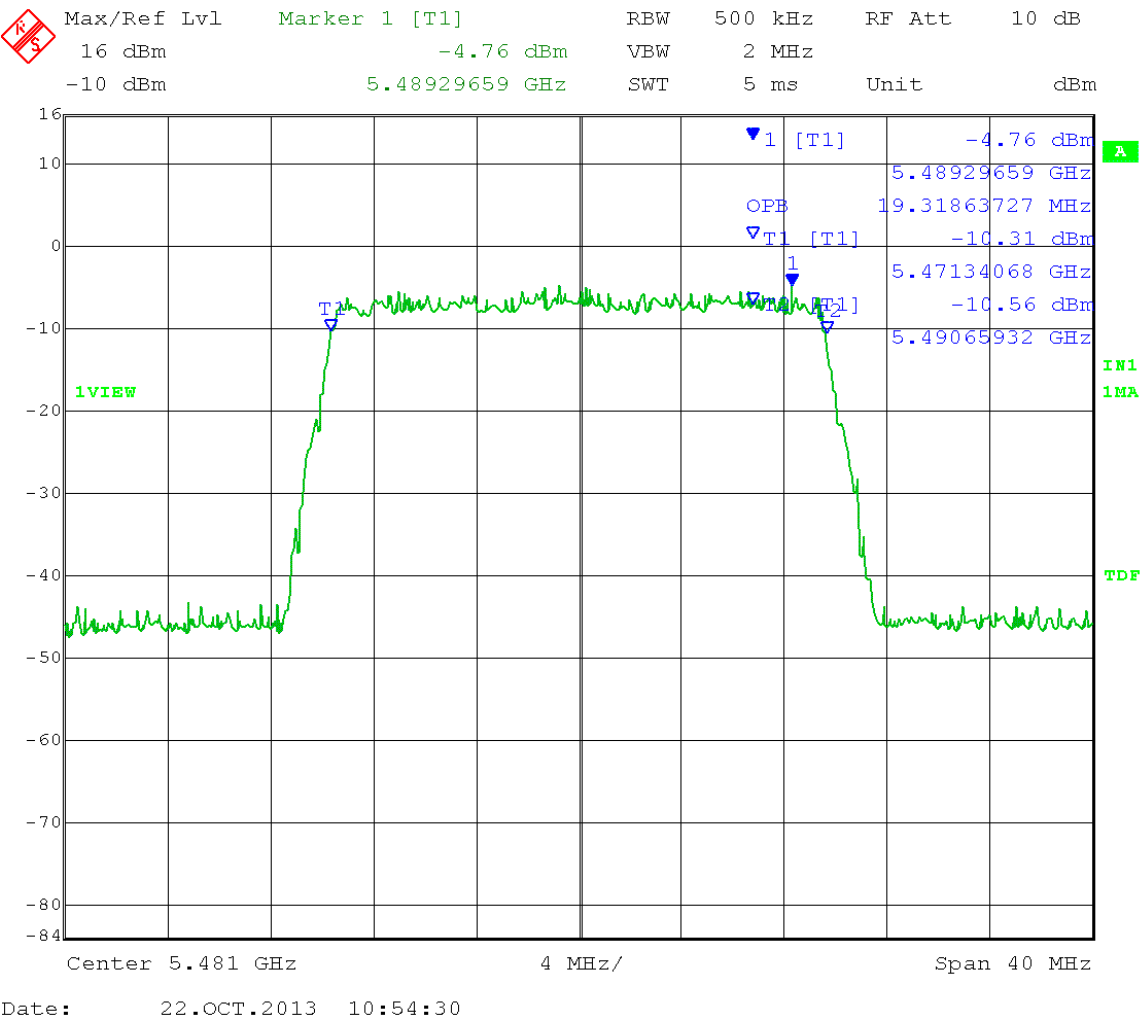Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		−5.10 dBm	VBW	2 MHz		
−10 dBm		5.48248297 GHz	SWT	5 ms	Unit	dBm

```
16                                                ▼1 [T1]              −5.10 dBm    A
10                                                                5.48248297 GHz
                                                  OPB         19.31863727 MHz
 0                                                ▽T1 [T1]            −10.05 dBm    IN1
                                       1                         5.47134068 GHz    1MA
      T1                              ▼              ▽T2 [T1]          −10.01 dBm
−10                                                             5.49065932 GHz
1VIEW                                                                              TDF
−20
−30
−40
−50
−60
−70
−80
−84
```

Center 5.481 GHz   4 MHz/   Span 40 MHz

Date: 22.OCT.2013   10:53:43

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.481 GHz   20MHz BW   64QAM
Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz
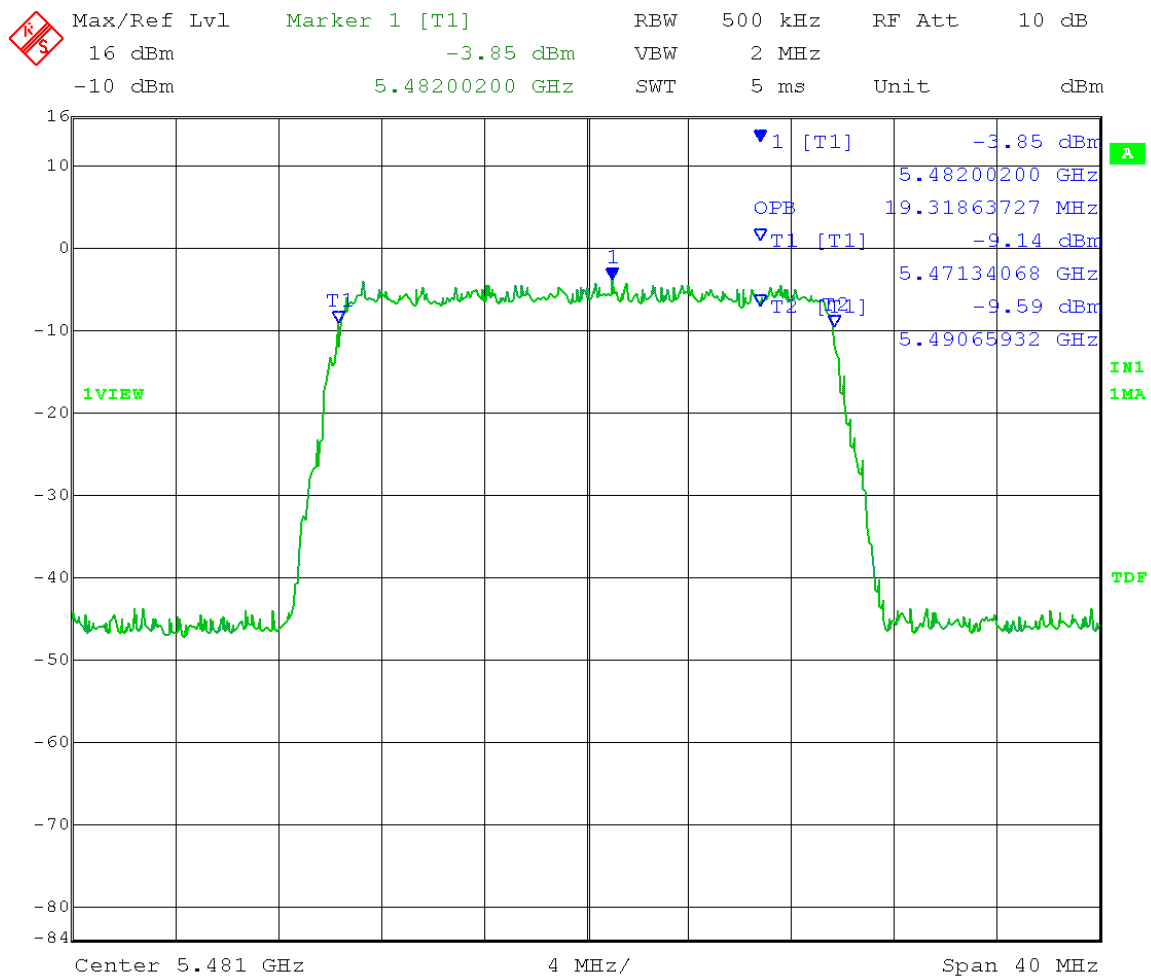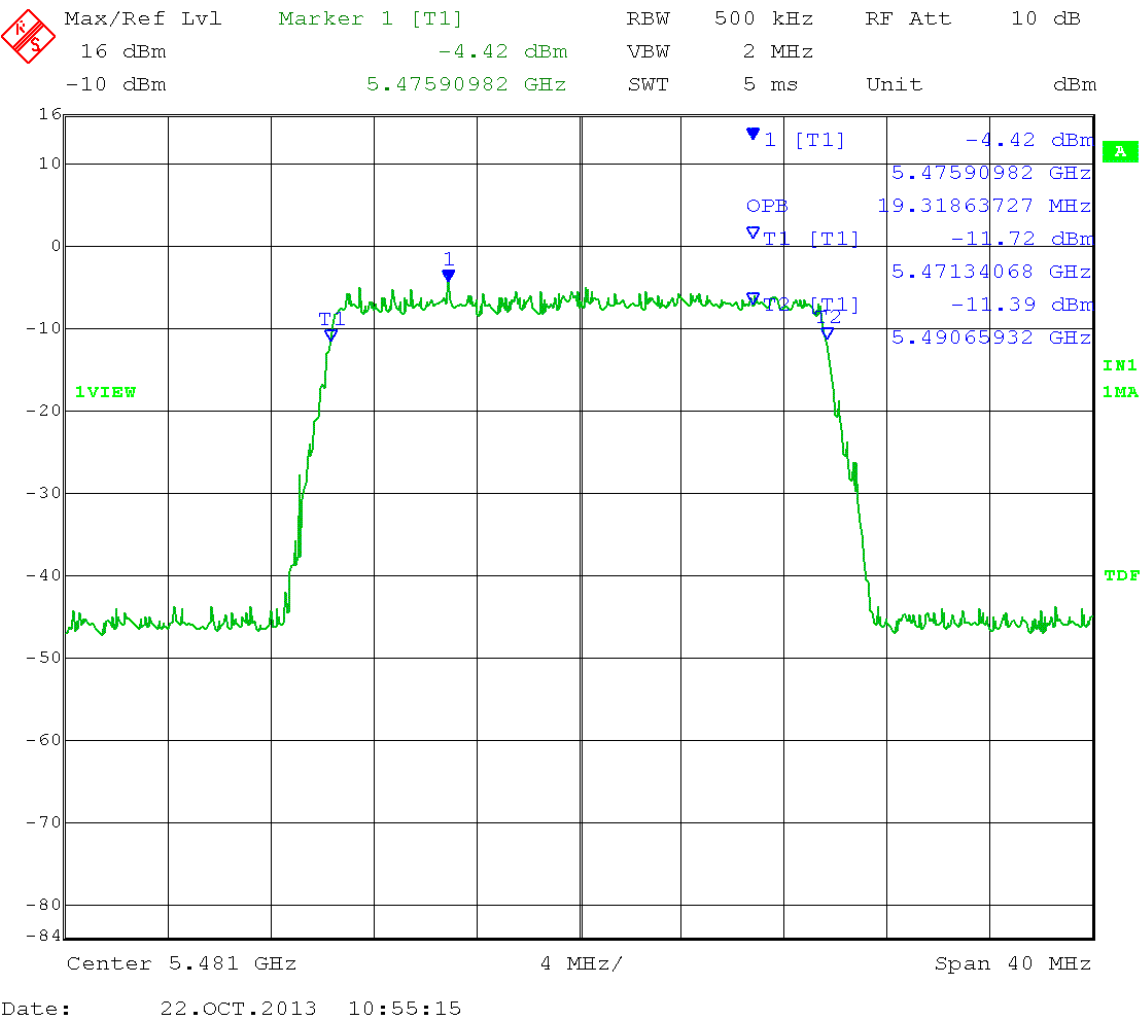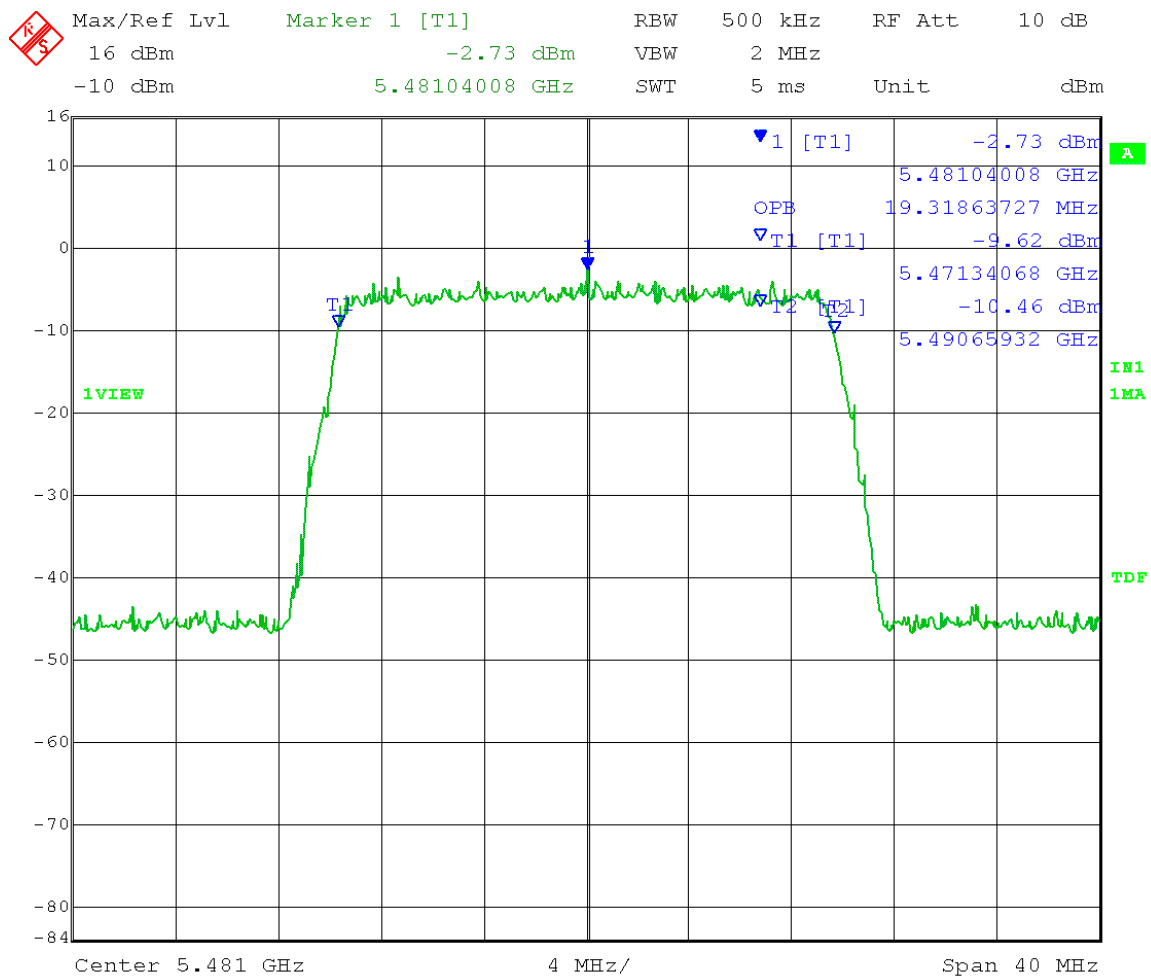

Date: 22.OCT.2013   11:26:36

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
16 dBm   -4.76 dBm   VBW   2 MHz
-10 dBm   5.48929659 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -4.76 dBm
                      5.48929659 GHz
OPB   19.31863727 MHz
▽T1 [T1]   -10.31 dBm
1   5.47134068 GHz
▽T2 [T1]   -10.56 dBm
                      5.49065932 GHz

1VIEW

Center 5.481 GHz   4 MHz/   Span 40 MHz

Date: 22.OCT.2013   10:54:30

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.481 GHz   20MHz BW   256QAM
Output power setting: 30 dBm eirp
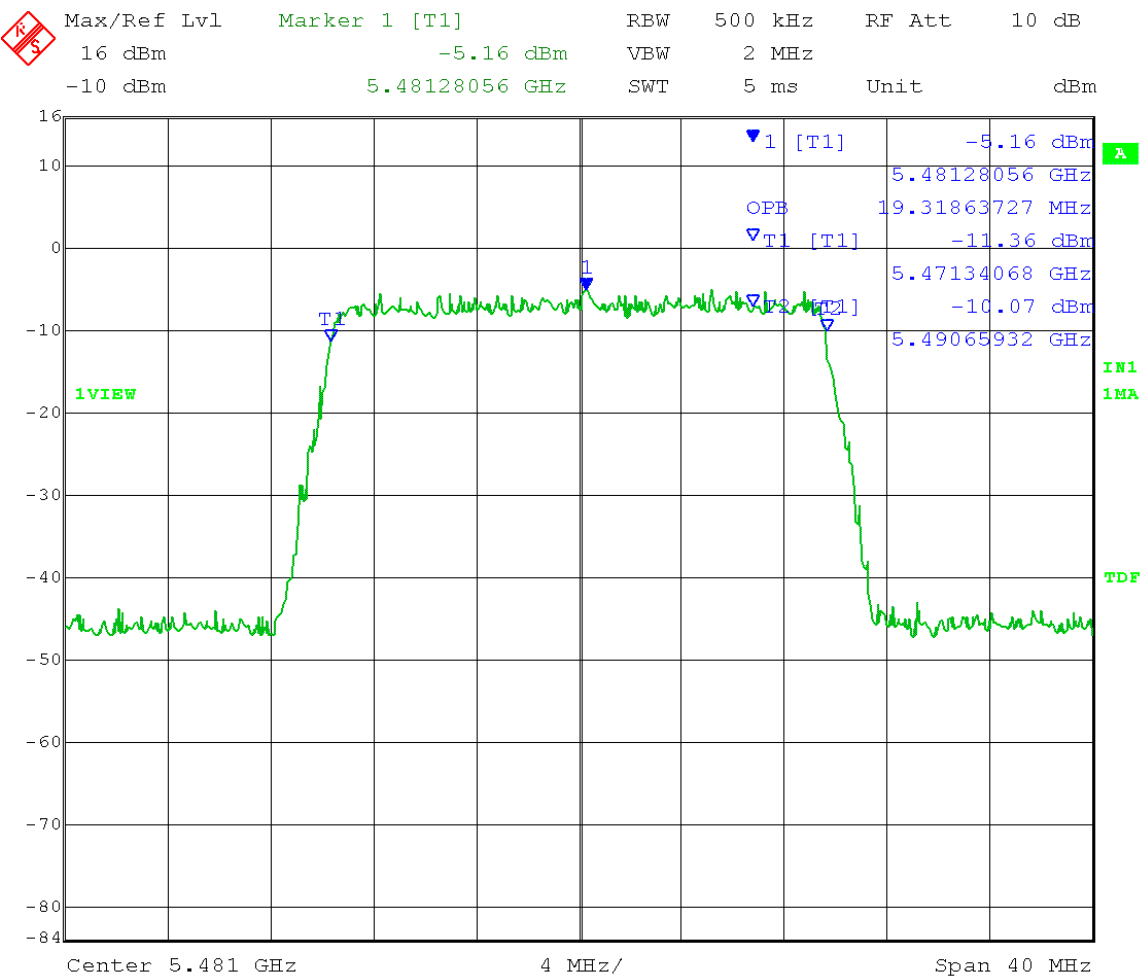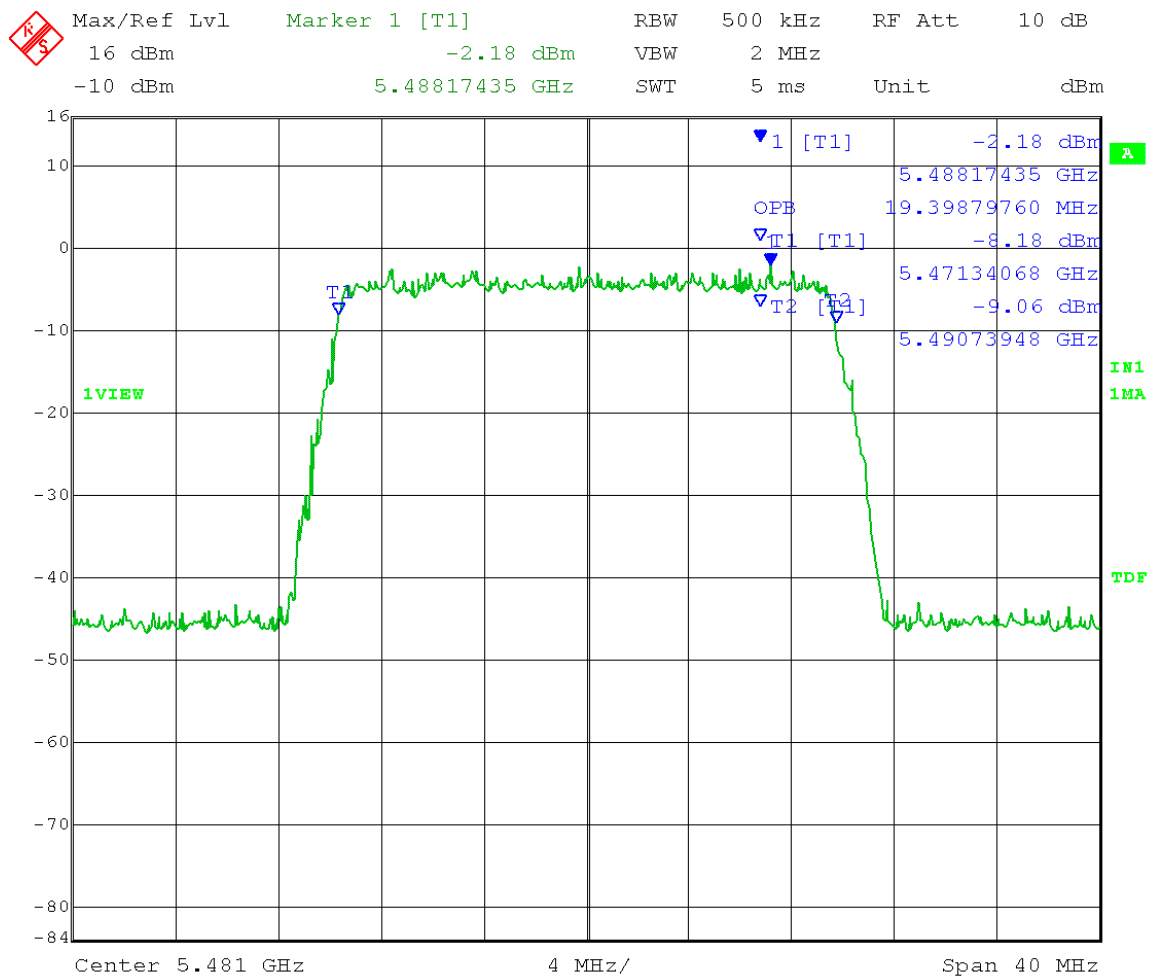
TX 0:

99% OBW = 19.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		-3.85 dBm	VBW	2 MHz		
-10 dBm		5.48200200 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   -3.85 dBm
5.48200200 GHz
OPB   19.31863727 MHz
▽T1 [T1]   -9.14 dBm
5.47134068 GHz
▽T2 [T1]   -9.59 dBm
5.49065932 GHz

1VIEW

IN1
1MA

TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
  16 dBm   -4.42 dBm   VBW   2 MHz
 -10 dBm   5.47590982 GHz   SWT   5 ms   Unit   dBm

```
16 │                                          ▼1 [T1]            -4.42 dBm    │ A
10 │                                             5.47590982 GHz              │
   │                                          OPB    19.31863727 MHz         │
 0 │                                          ▽T1 [T1]          -11.72 dBm    │
   │                                             5.47134068 GHz              │
   │                   1                      ▽T2 [T1]          -11.39 dBm    │ IN1
-10│             T1  ▽▼                           ▽T2▼   T2       5.49065932 GHz  │ 1MA
   │                                                                         │
-20│ 1VIEW                                                                   │
   │                                                                         │
-30│                                                                         │
   │                                                                         │
-40│                                                                         │ TDF
   │                                                                         │
-50│                                                                         │
   │                                                                         │
-60│                                                                         │
   │                                                                         │
-70│                                                                         │
   │                                                                         │
-80│                                                                         │
-84└─────────────────────────────────────────────────────────────────────┘
```

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.481 GHz   20MHz BW   1024QAM
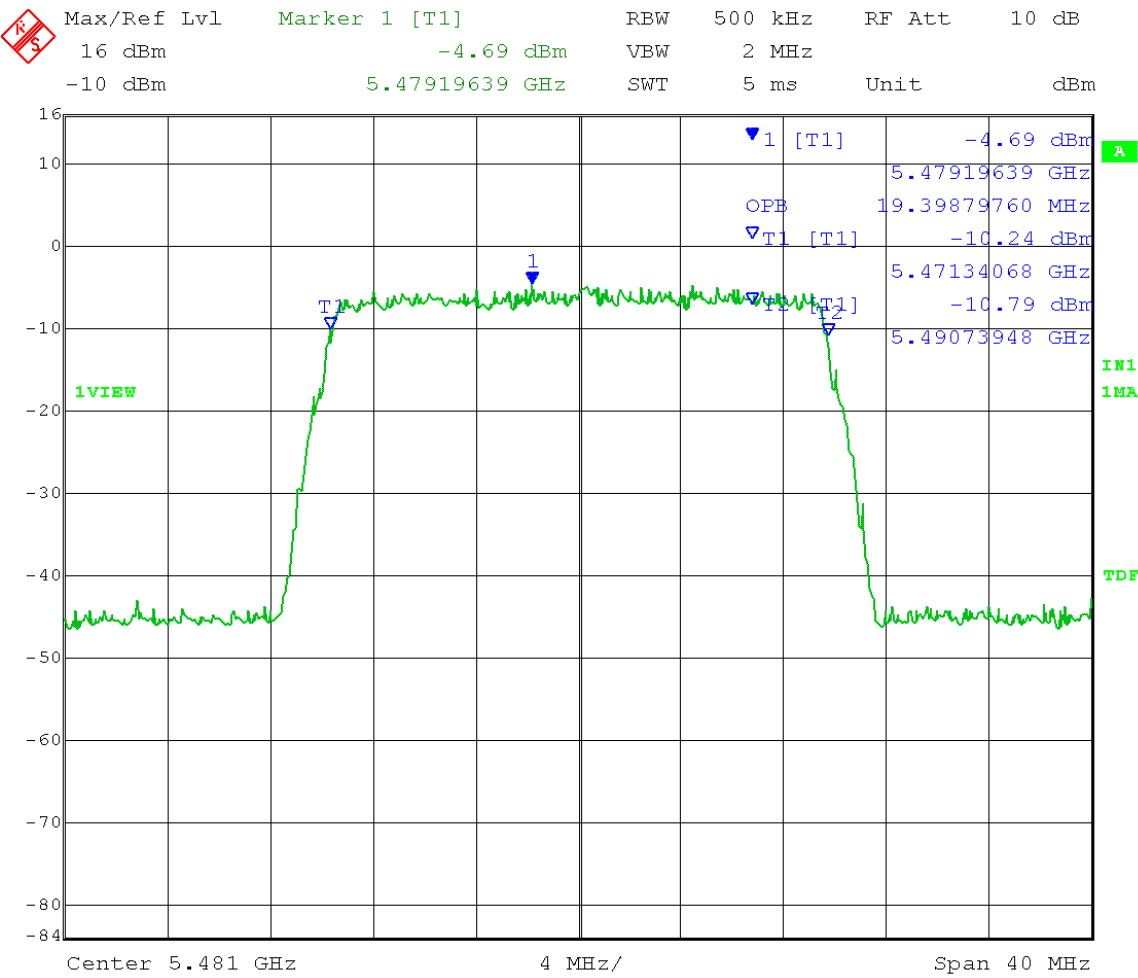Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.32MHz

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

TX 1:

99% OBW = 19.32MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
 16 dBm   -5.16 dBm   VBW   2 MHz
 -10 dBm   5.48128056 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -5.16 dBm
                       5.48128056 GHz
OPB   19.31863727 MHz
▽T1 [T1]   -11.36 dBm
                       5.47134068 GHz
▽T2 [T1]   -10.07 dBm
                       5.49065932 GHz

1VIEW

A

IN1
1MA

TDF

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

Test Date: 10-22-2013
Company: Ubiquiti Networks
EUT: Air Fiber 5 - 5.4GHz WiFi Radio
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Test Procedure used: KDB 789033 D01 v01r03 – D)
Low Channel: Transmit = 5.481 GHz   20MHz BW   QPSK
Output power setting: 30 dBm eirp

TX 0:

99% OBW = 19.40MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	500 kHz	RF Att	10 dB
16 dBm		-2.18 dBm	VBW	2 MHz		
-10 dBm		5.48817435 GHz	SWT	5 ms	Unit	dBm

```
16
10                                      ▼1 [T1]         -2.18 dBm
                                                    5.48817435 GHz
                                        OPB        19.39879760 MHz
0                                       ▽T1 [T1]        -8.18 dBm
                                                    5.47134068 GHz
-10                                     ▽T2 [T2]        -9.06 dBm
1VIEW                                               5.49073948 GHz
-20                                                             IN1
                                                               1MA
-30
-40                                                            TDF
-50
-60
-70
-80
-84
Center 5.481 GHz            4 MHz/              Span 40 MHz
```

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

TX 1:

99% OBW = 19.40MHz

Max/Ref Lvl   Marker 1 [T1]   RBW   500 kHz   RF Att   10 dB
  16 dBm   −4.69 dBm   VBW   2 MHz
 −10 dBm   5.47919639 GHz   SWT   5 ms   Unit   dBm

```
 16
                                                      ▼1  [T1]          −4.69 dBm   │ A │
 10
                                                            5.47919639 GHz
                                                      OPB    19.39879760 MHz
  0
                                                      ▽T1 [T1]          −10.24 dBm
                            1                               5.47134068 GHz
                           ▼                          ▽T2[T1]           −10.79 dBm
−10   T1▽                                      ▽  T2                    IN1
                                                            5.49073948 GHz
−20   1VIEW                                                             1MA

−30

−40                                                                    TDF

−50

−60

−70

−80
−84
```

Center 5.481 GHz   4 MHz/   Span 40 MHz

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

166 South Carter, Genoa City, WI 53128

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

Appendix – Measurement Data

4.0   Maximum Conducted Output Power

Rule Section:	Section 15.407(a)(2)

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

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

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

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

Results: Passed

Notes: Measurements were taken for QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulations at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously.
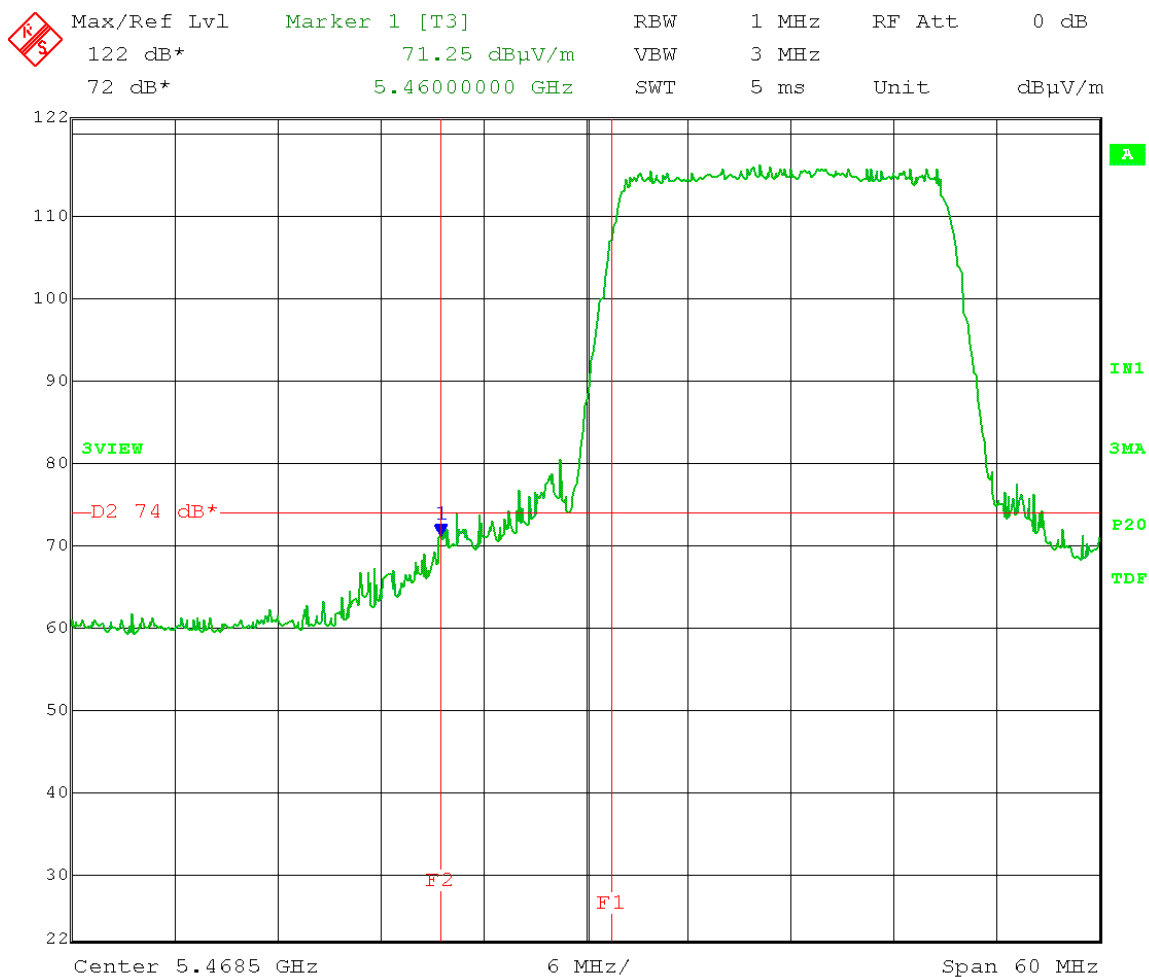
Output power was set to 30 dBm eirp using special test software.

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

20MHz Operating Bandwidth:

FCC Maximum Conducted Output Power		20MHz *(Adjustment for duty cycle =10log1/x = 0.13 or 0.11)*				
	dBm	QPSK	16QAM	64QAM	256QAM	1024Q
FCC limit ≤ 250mW	*EUT FCC limit:*	*7*	*7*	*7*	*7*	*7*
HCH = 5714 MHz	TX0 (mW)	2.39	2.41	2.38	2.36	2.36
	TX1 (mW)	2.37	2.35	2.35	2.34	2.35
	total(mW)	4.76	4.76	4.73	4.70	4.71
	Total(dBm)	**6.89**	**6.91**	**6.88**	**6.85**	**6.86**
	Margin	0.11	0.09	0.12	0.15	0.14
MCH = 5 575 MHz	TX0	2.3	2.29	2.3	2.31	2.33
	TX1	2.49	2.51	2.5	2.5	2.5
	total(mW)	4.79	4.80	4.80	4.81	4.83
	Total(dBm)	**6.91**	**6.94**	**6.94**	**6.95**	**6.97**
	Margin	0.09	0.06	0.06	0.05	0.03
LCH = 5481 MHz	TX0	2.35	2.34	2.33	2.33	2.33
	TX1	2.49	2.48	2.47	2.48	2.46
	total(mW)	4.84	4.82	4.80	4.81	4.79
	Total(dBm)	**6.96**	**6.96**	**6.94**	**6.95**	**6.93**
	Margin	0.04	0.04	0.06	0.05	0.07

Appendix – Measurement Data

5.0   Unwanted Emission Levels – Radiated Restricted Band-Edge
            Radiated with antenna connected

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

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

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

Limit: FCC Part 15.209

Results: Compliant

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

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

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 1024QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
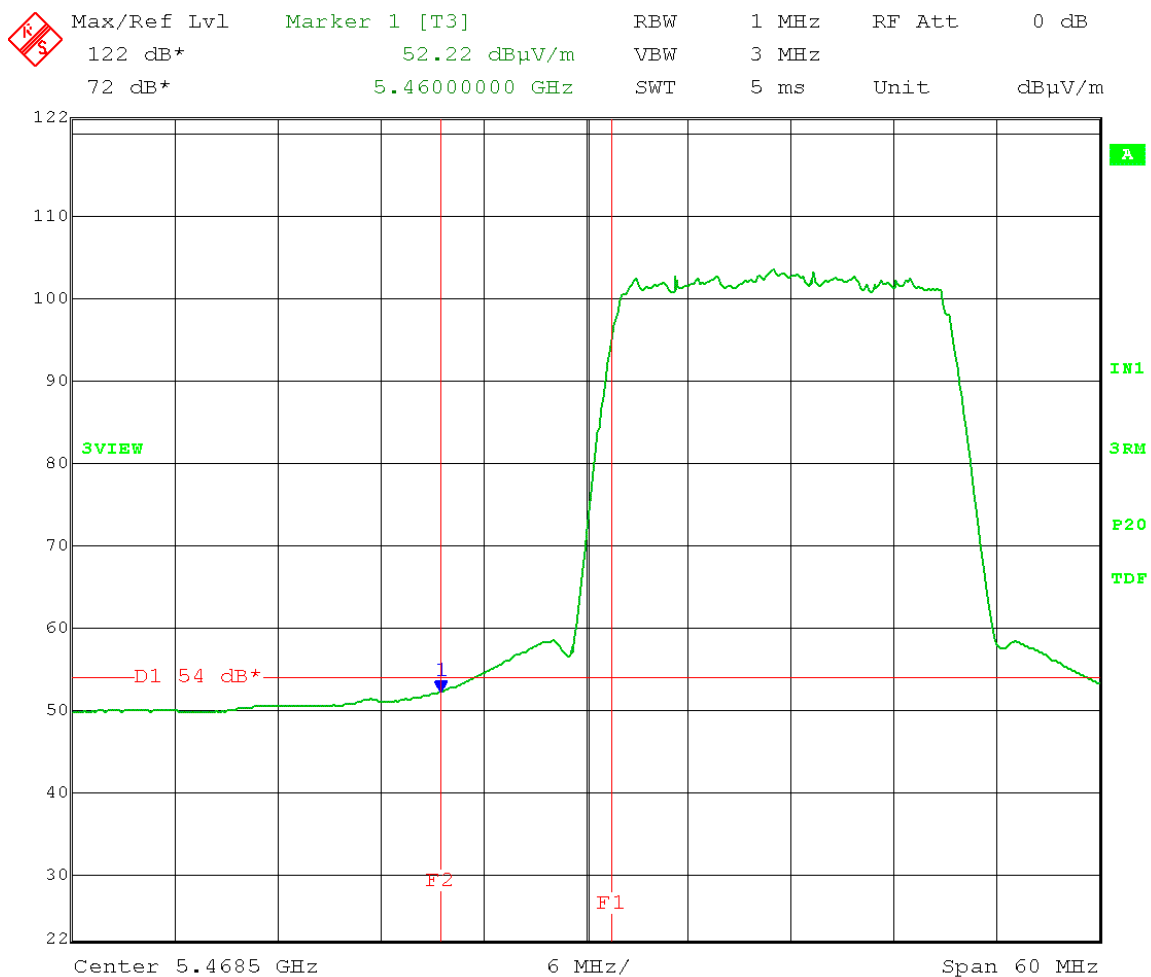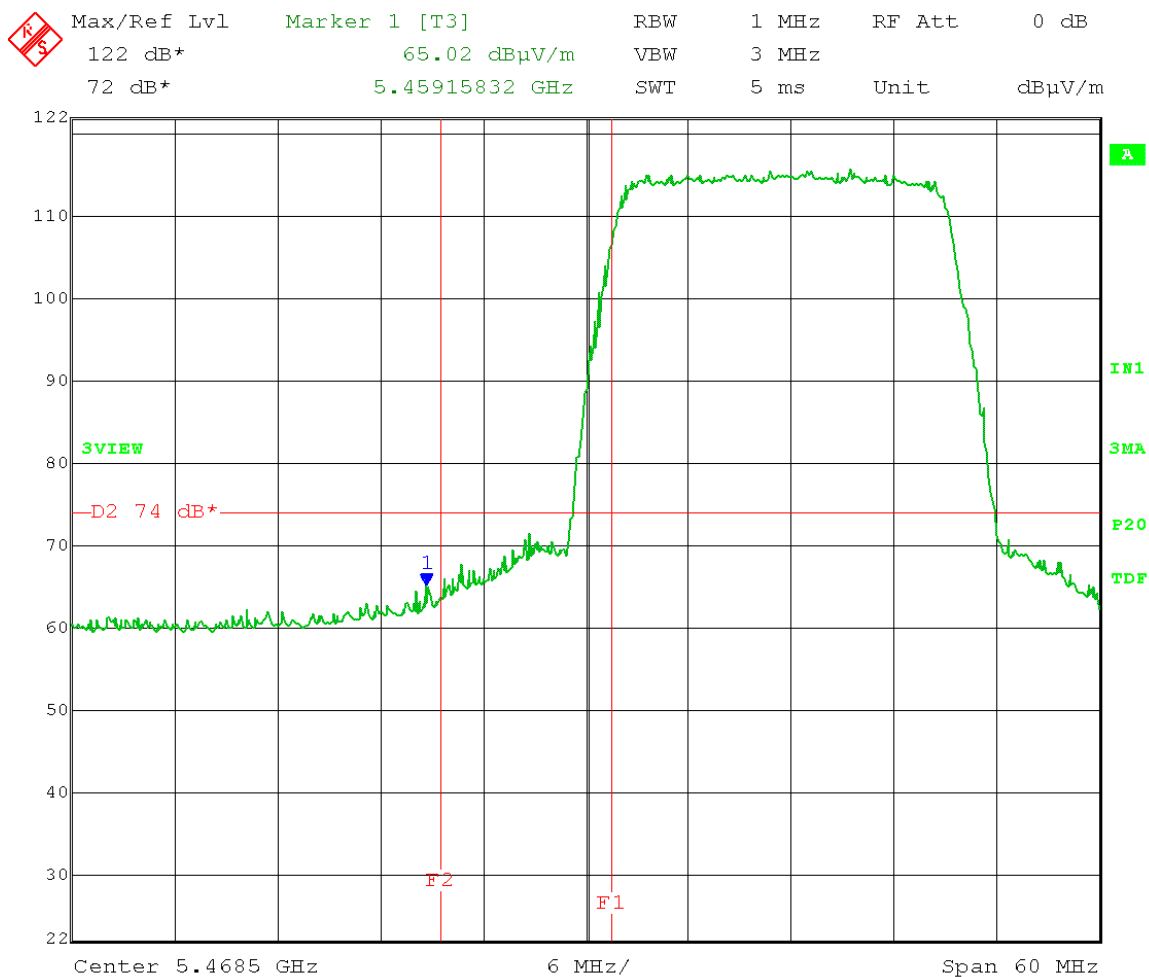Band-Edge Limit: 54 dBµV/m AVERAGE at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	52.50 dBµV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBµV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz
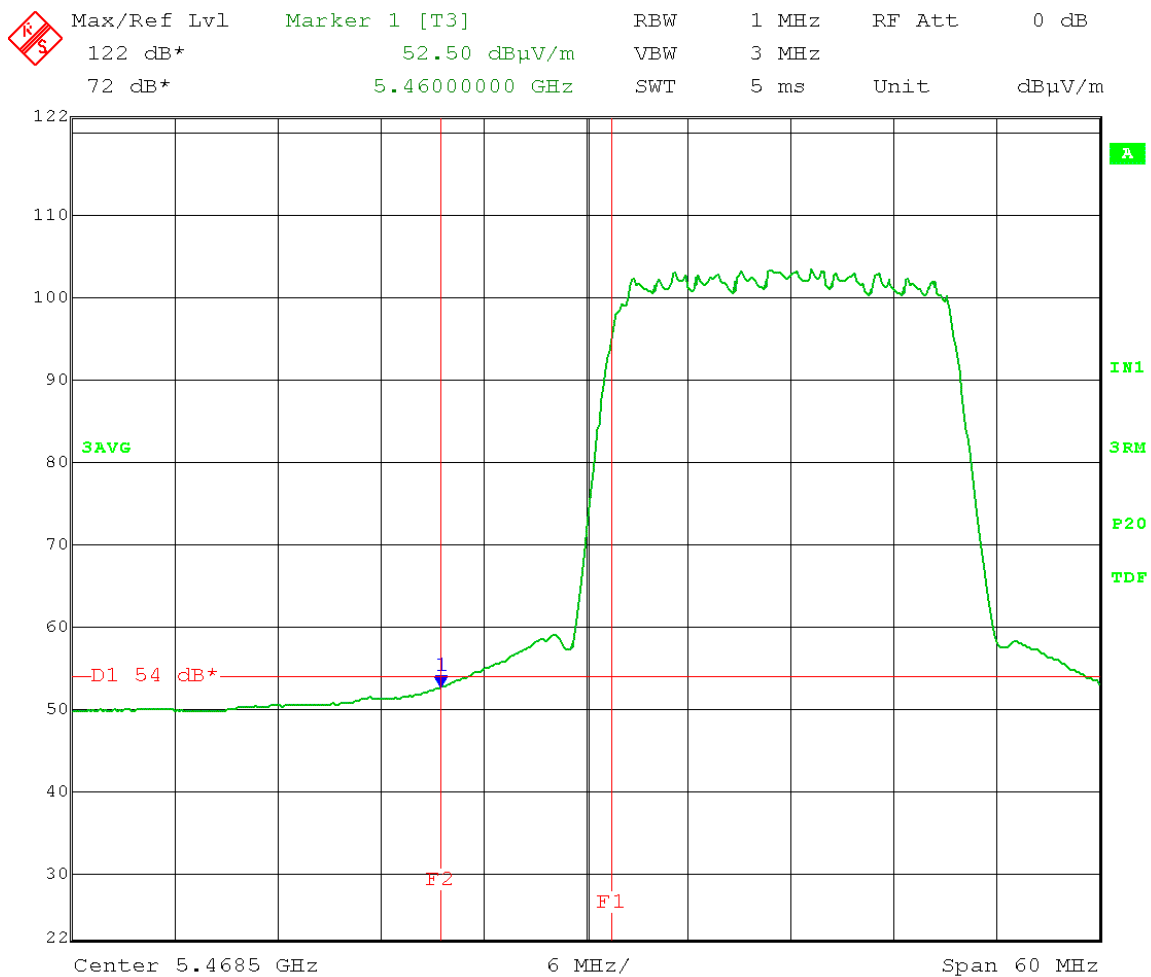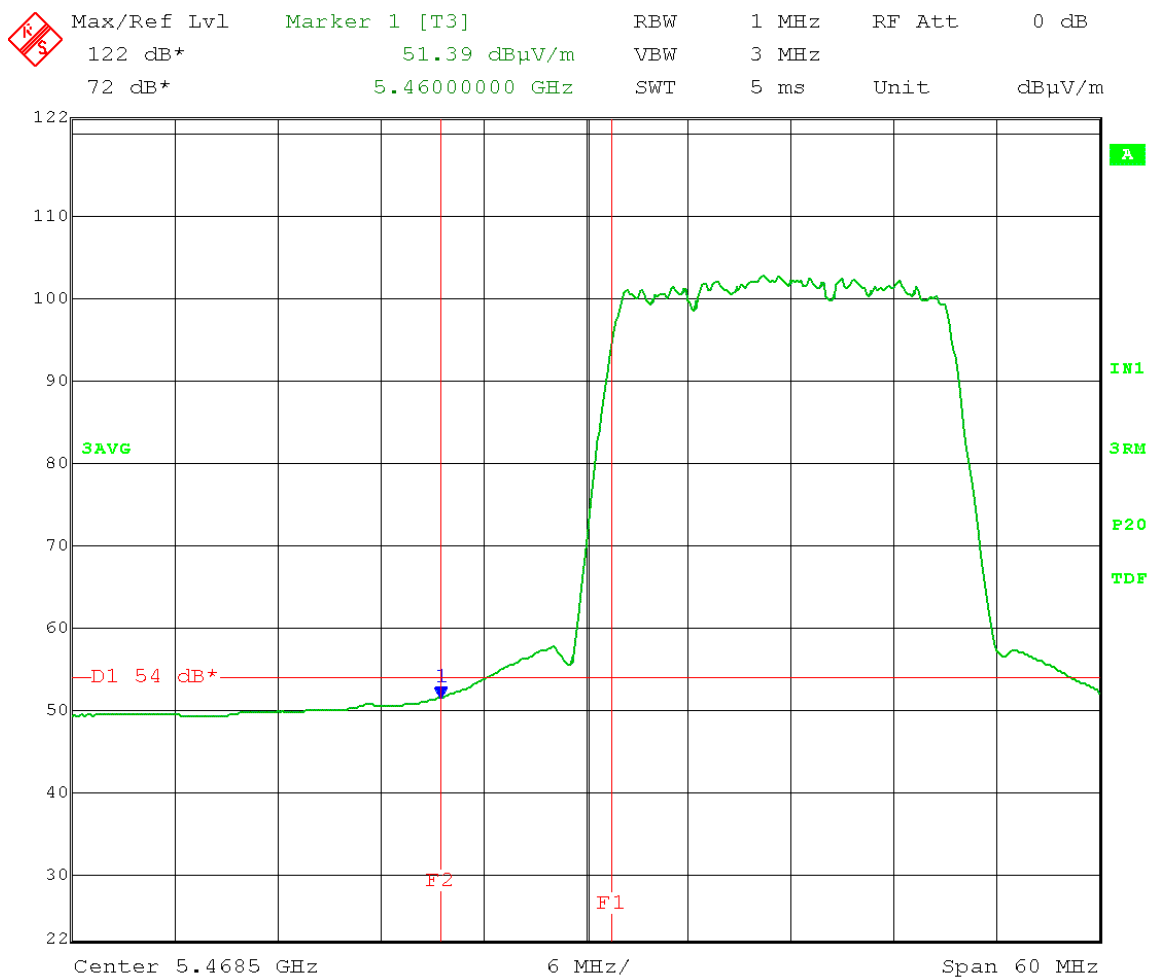
Date: 3.OCT.2013 15:06:33

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
              (FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
              Low Channel: Frequency – 5480 MHz
              Modulation: 256QAM
              Horizontal
              Restricted Band-Edge Frequency: 5460 MHz (F2)
              Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	71.25 dBµV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBµV/m

A

IN1

3MA

P20

TDF

3VIEW

D2 74 dB*

F2

F1

Center 5.4685 GHz   6 MHz/   Span 60 MHz
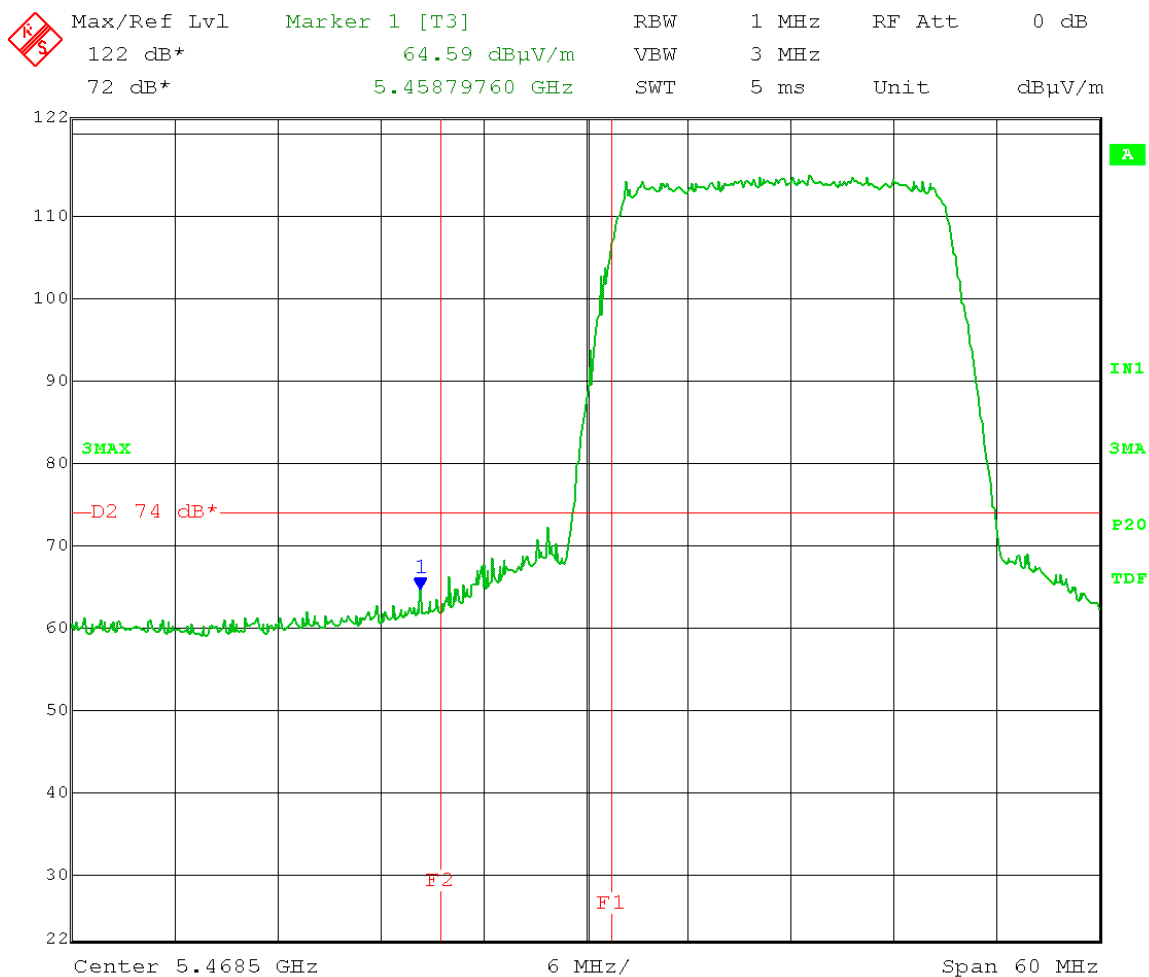
Date: 3.OCT.2013 15:05:52

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
               (FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
               Low Channel: Frequency – 5480 MHz
               Modulation: 1024QAM
               Vertical
               Restricted Band-Edge Frequency: 5460 MHz (F2)
               Band-Edge Limit: 54 dBµV/m AVERAGE at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	51.80 dBµV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBµV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz
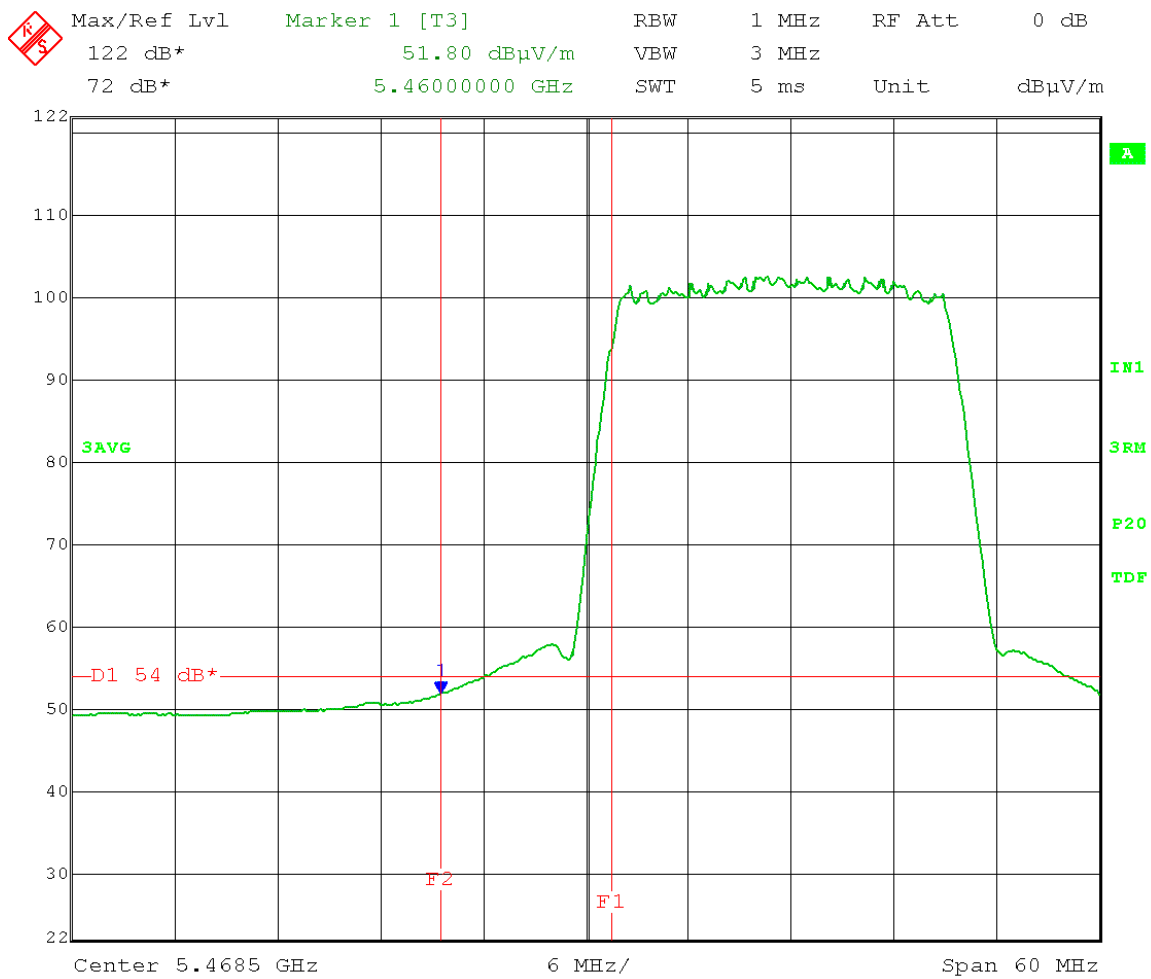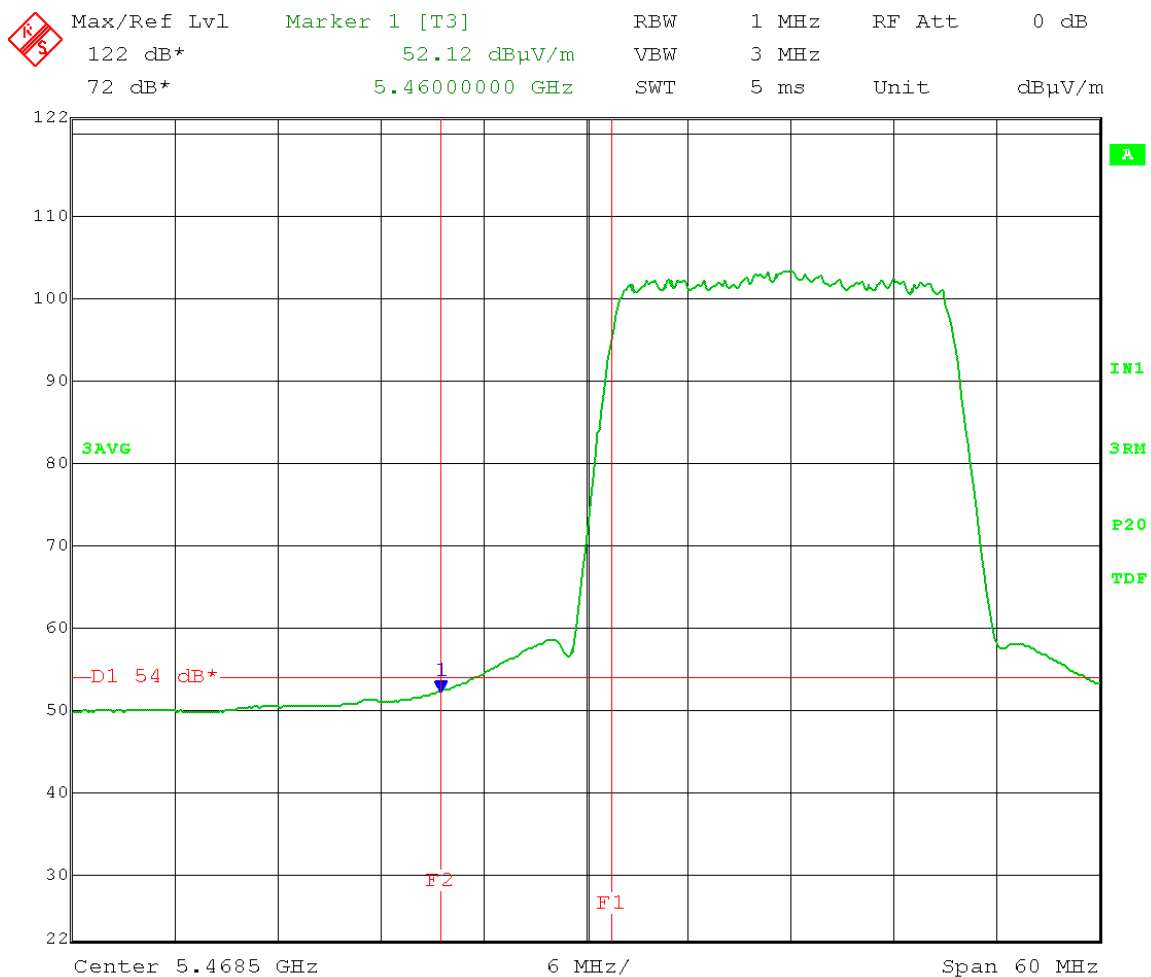
Date: 3.OCT.2013 15:40:21

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 256QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
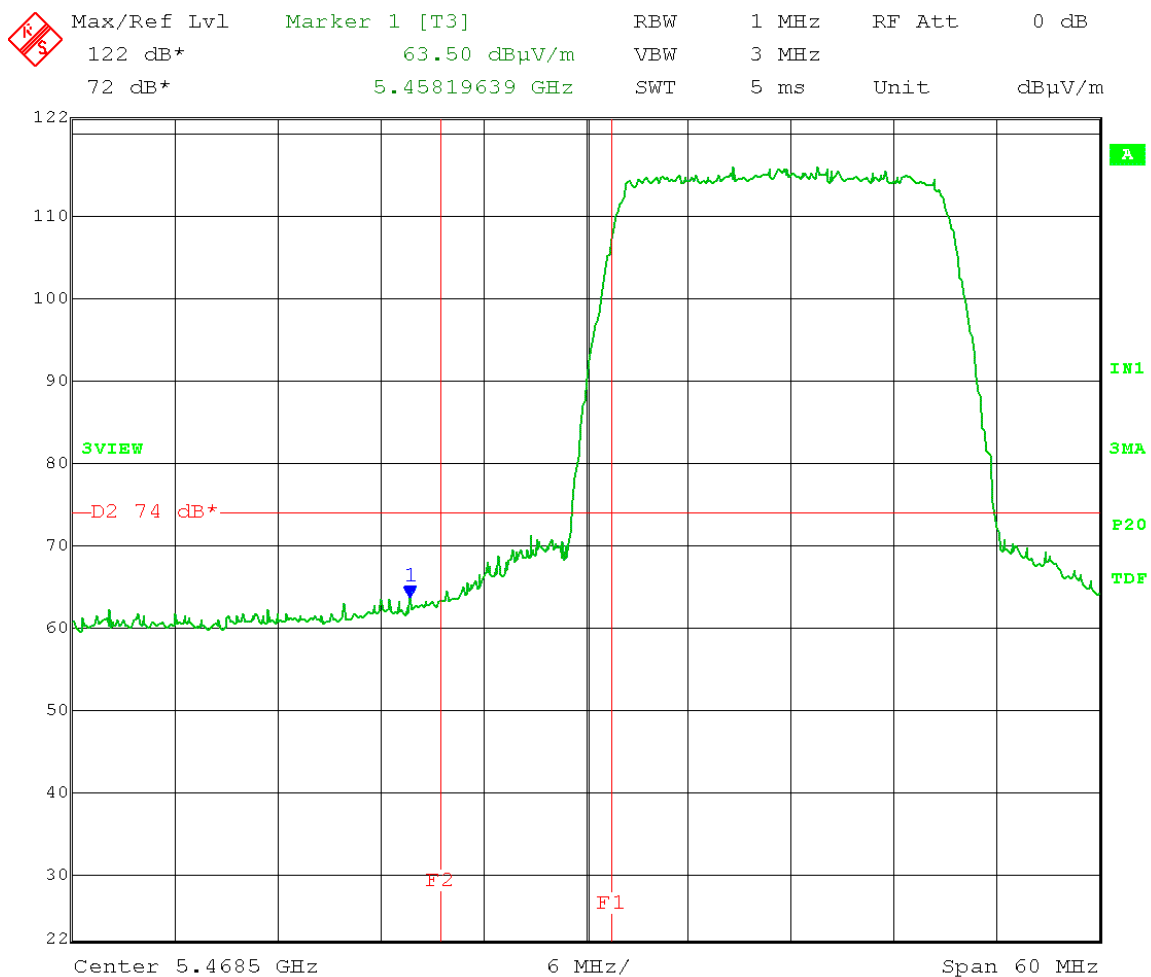Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	71.72 dBμV/m		VBW	3 MHz		
72 dB*	5.45987976 GHz		SWT	5 ms	Unit	dBμV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz
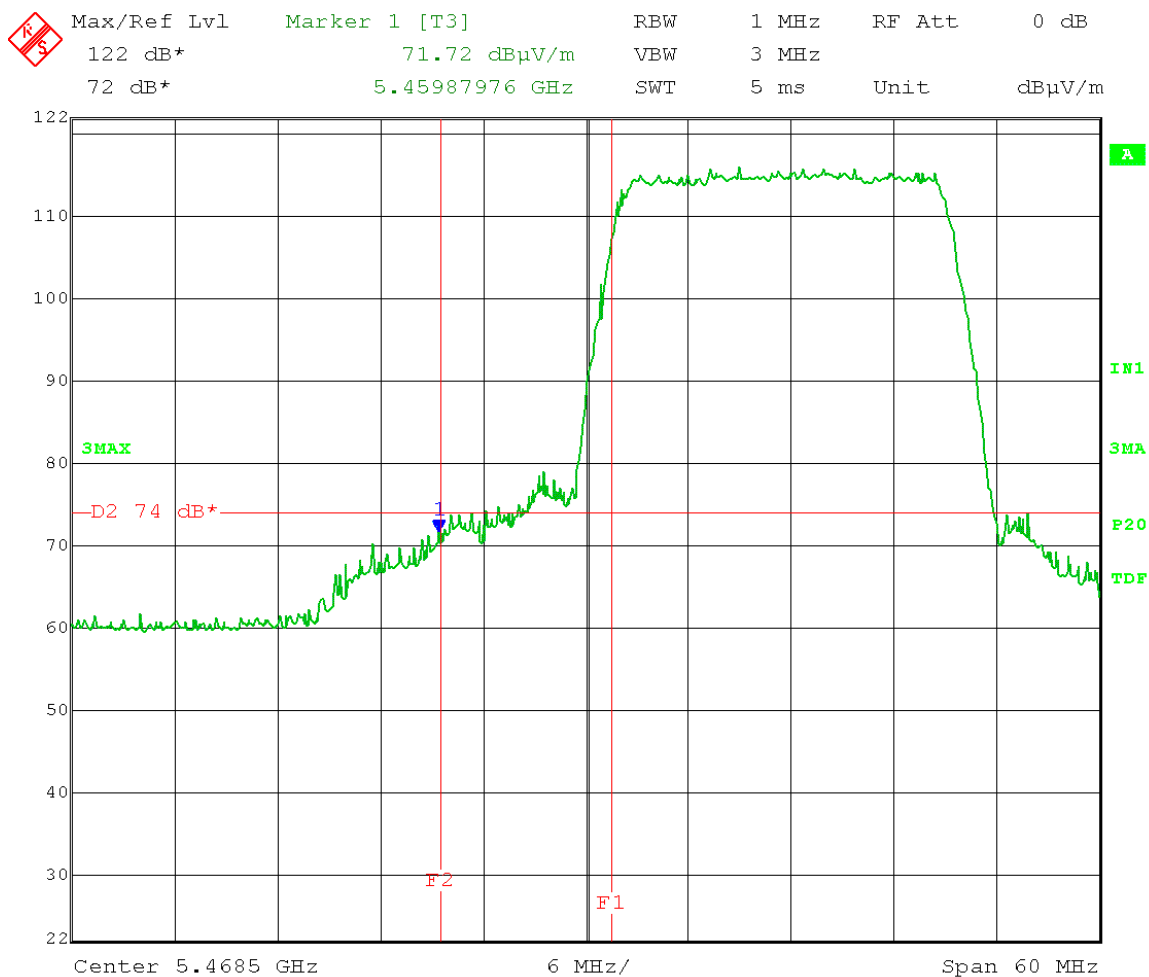
Date: 3.OCT.2013 15:39:42

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
             (FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
             Low Channel: Frequency – 5480 MHz
             Modulation: 16QAM
             Horizontal
             Restricted Band-Edge Frequency: 5460 MHz (F2)
             Band-Edge Limit: 54 dBμV/m AVERAGE at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	52.22 dBμV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBμV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz
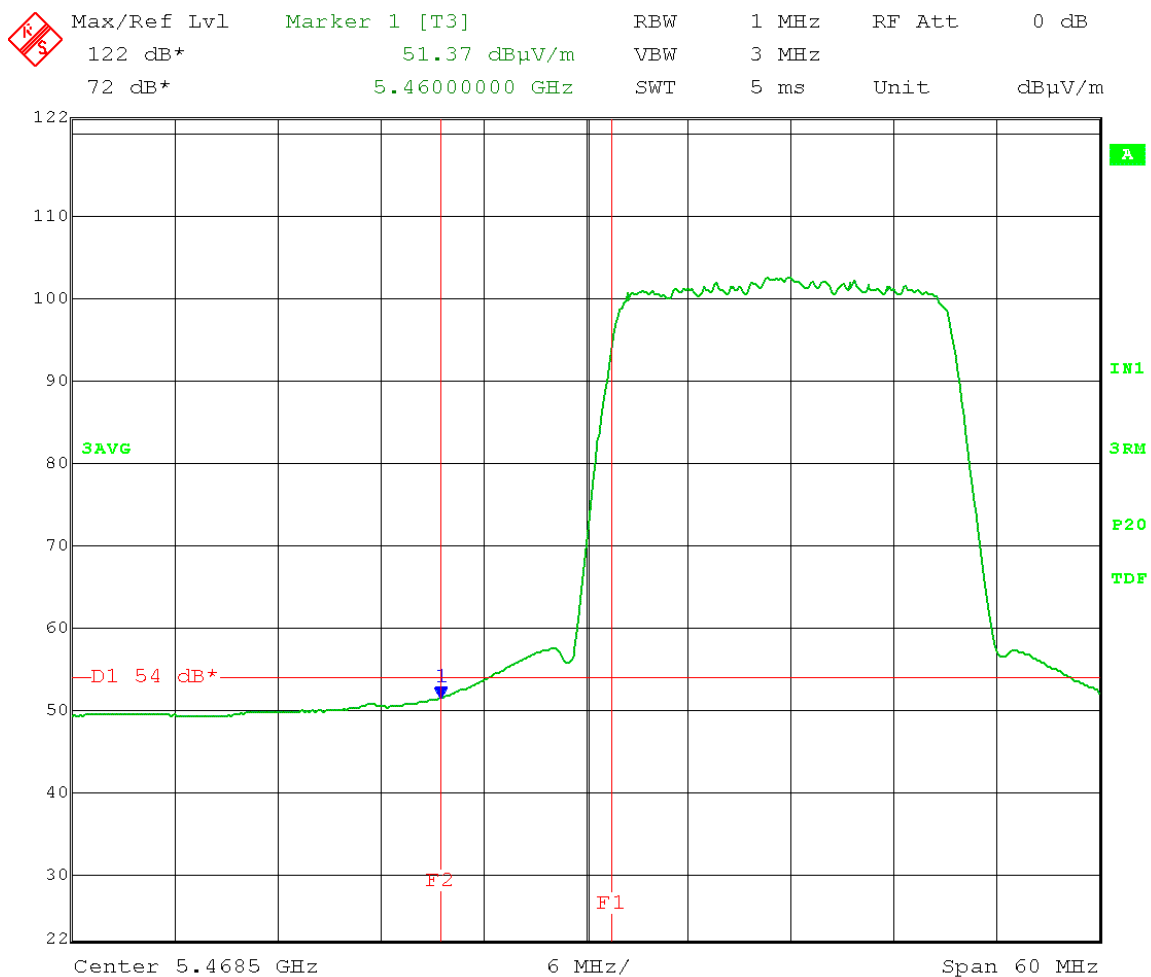
Date: 3.OCT.2013   15:00:23

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 16QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	65.02 dBμV/m		VBW	3 MHz		
72 dB*	5.45915832 GHz		SWT	5 ms	Unit	dBμV/m

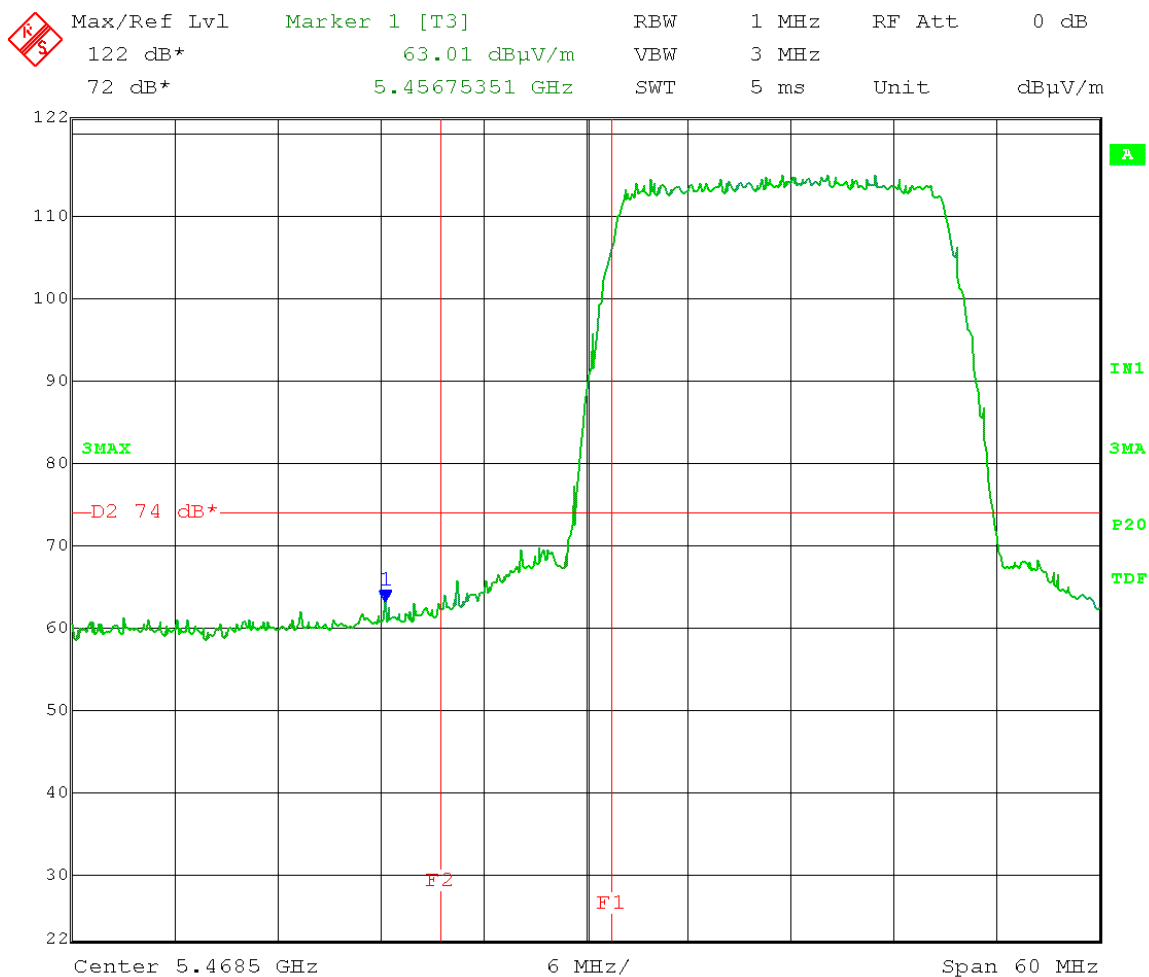Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 16QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 54 dBμV/m AVERAGE at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	51.39 dBμV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBμV/m

Center 5.4685 GHz

6 MHz/

Span 60 MHz

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 16QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
122 dB*	64.59 dBμV/m	VBW	3 MHz		
72 dB*	5.45879760 GHz	SWT	5 ms	Unit	dBμV/m

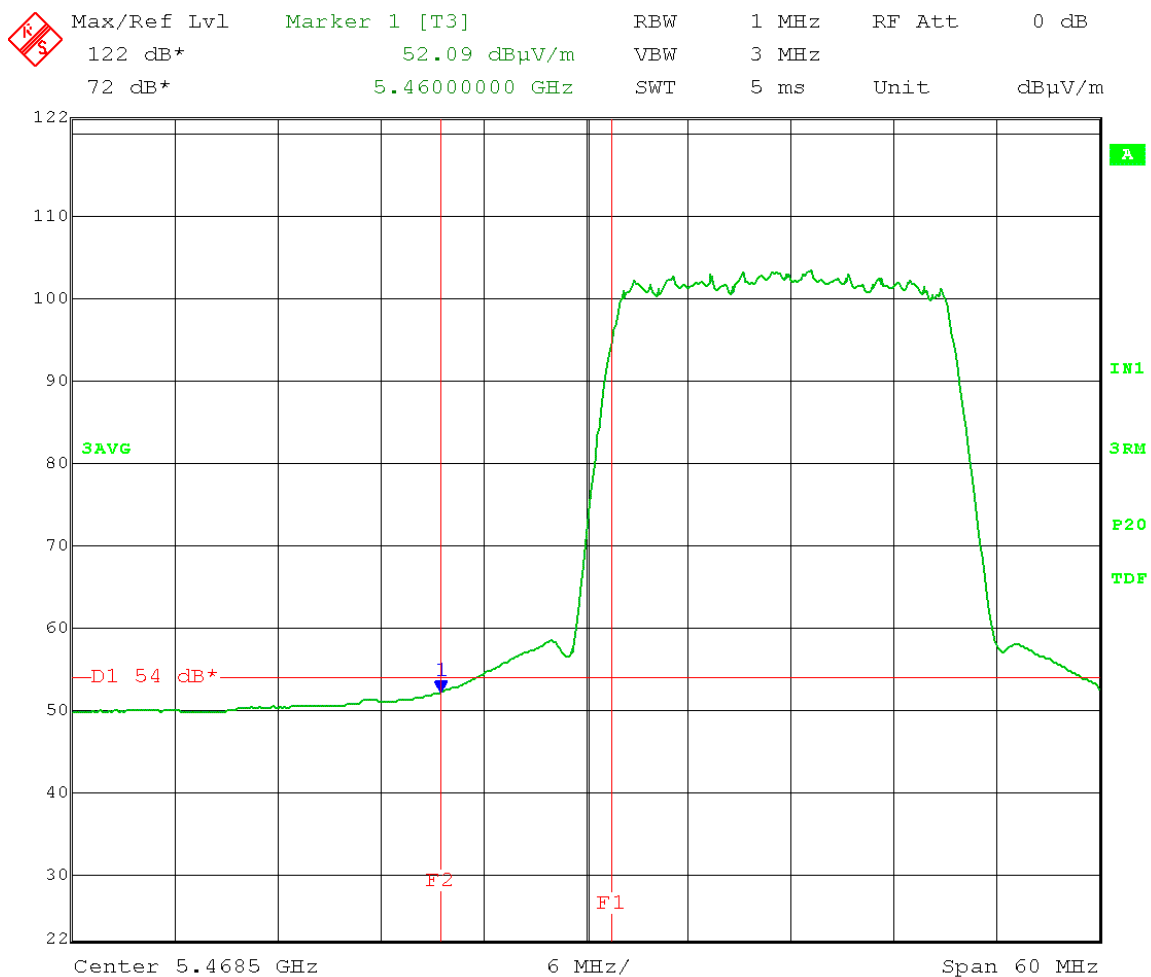Center 5.4685 GHz   6 MHz/   Span 60 MHz

Date: 3.OCT.2013 15:35:13

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

Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
122 dB*	52.12 dBµV/m	VBW	3 MHz		
72 dB*	5.46000000 GHz	SWT	5 ms	Unit	dBµV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 256QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
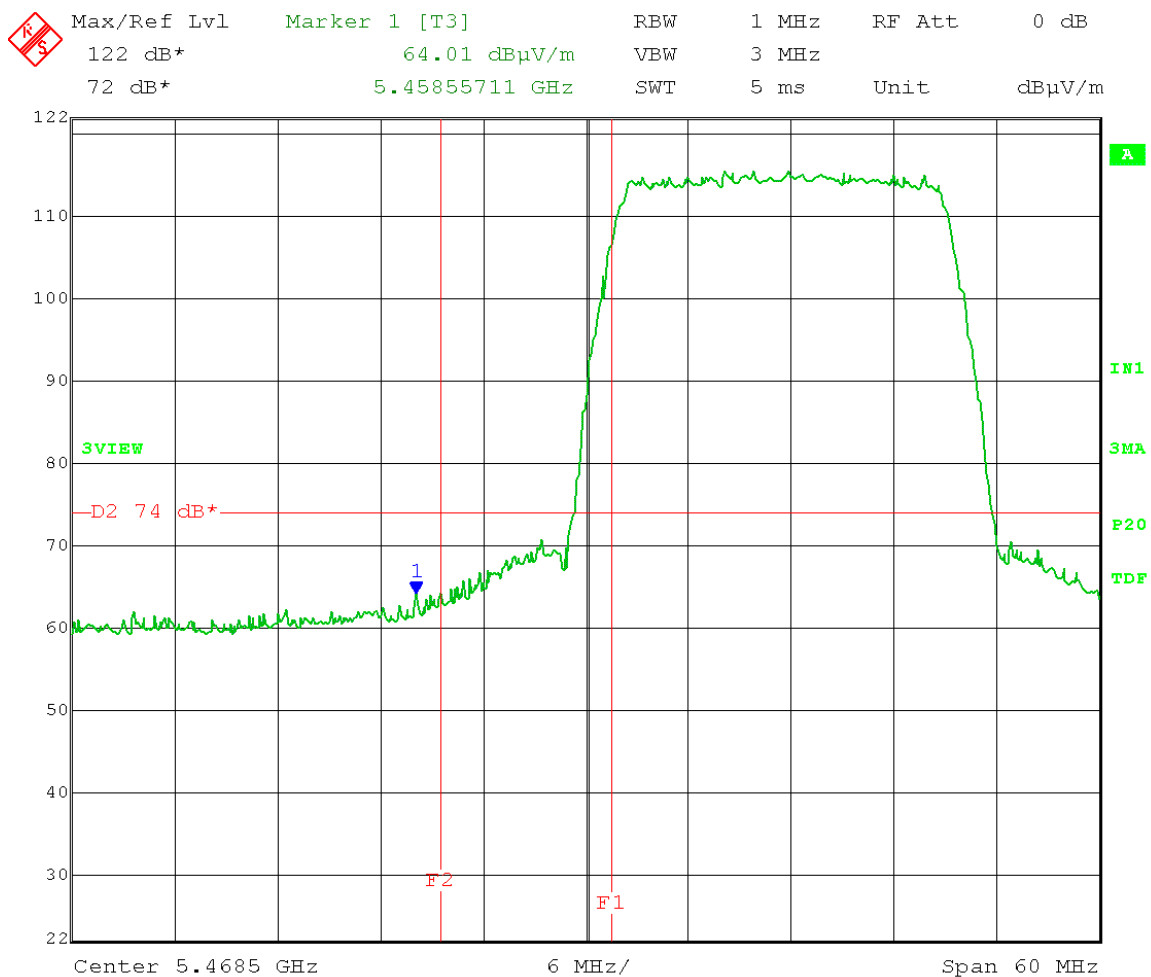Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*		63.50 dBμV/m	VBW	3 MHz		
72 dB*		5.45819639 GHz	SWT	5 ms	Unit	dBμV/m

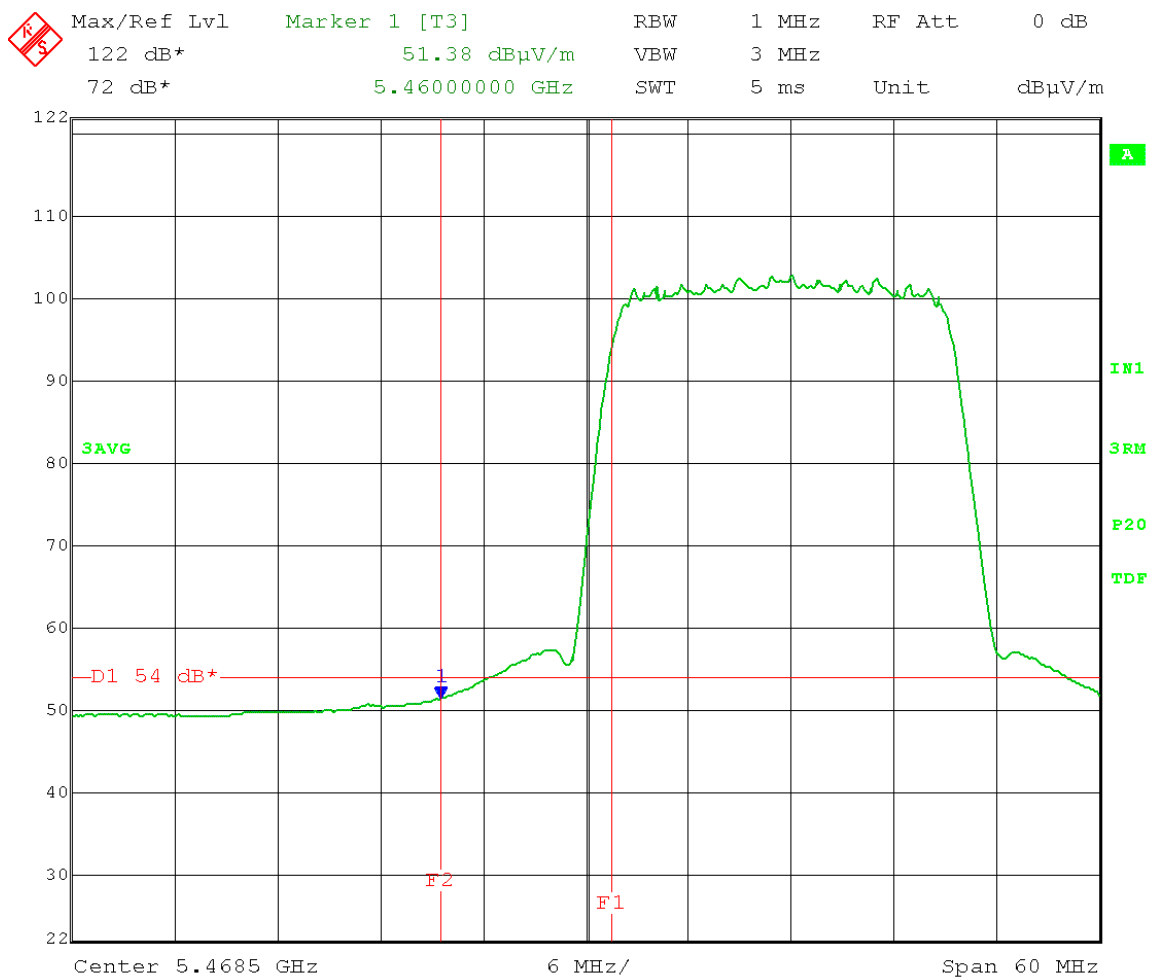Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

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

Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
122 dB*	51.37 dBµV/m	VBW	3 MHz		
72 dB*	5.46000000 GHz	SWT	5 ms	Unit	dBµV/m

A

IN1

3RM

P20

TDF

3AVG

D1 54 dB*

1

F2

F1

Center 5.4685 GHz   6 MHz/   Span 60 MHz
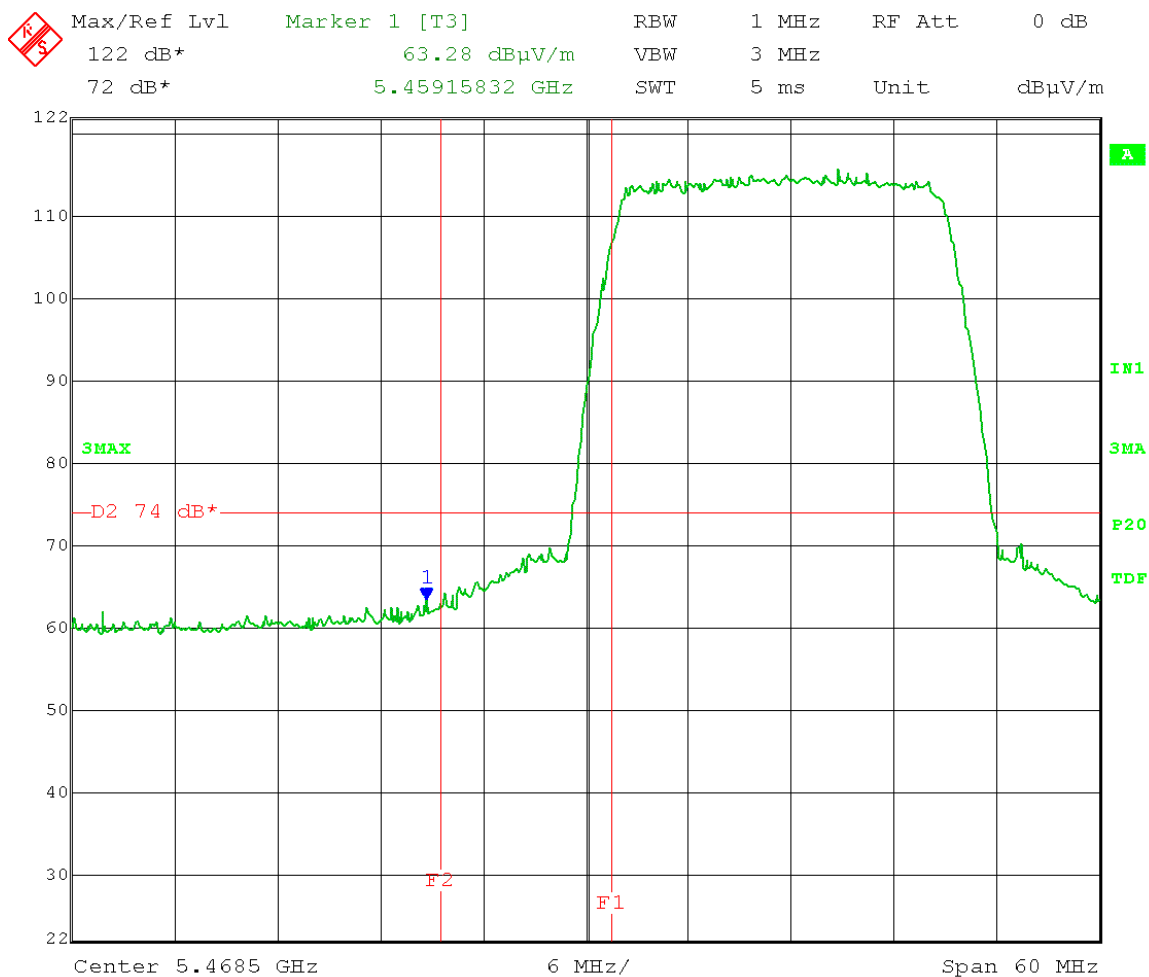
Date: 3.OCT.2013 15:38:01

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
               (FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
               Low Channel: Frequency – 5480 MHz
               Modulation: 256QAM
               Vertical
               Restricted Band-Edge Frequency: 5460 MHz (F2)
               Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	63.01 dBμV/m		VBW	3 MHz		
72 dB*	5.45675351 GHz		SWT	5 ms	Unit	dBμV/m

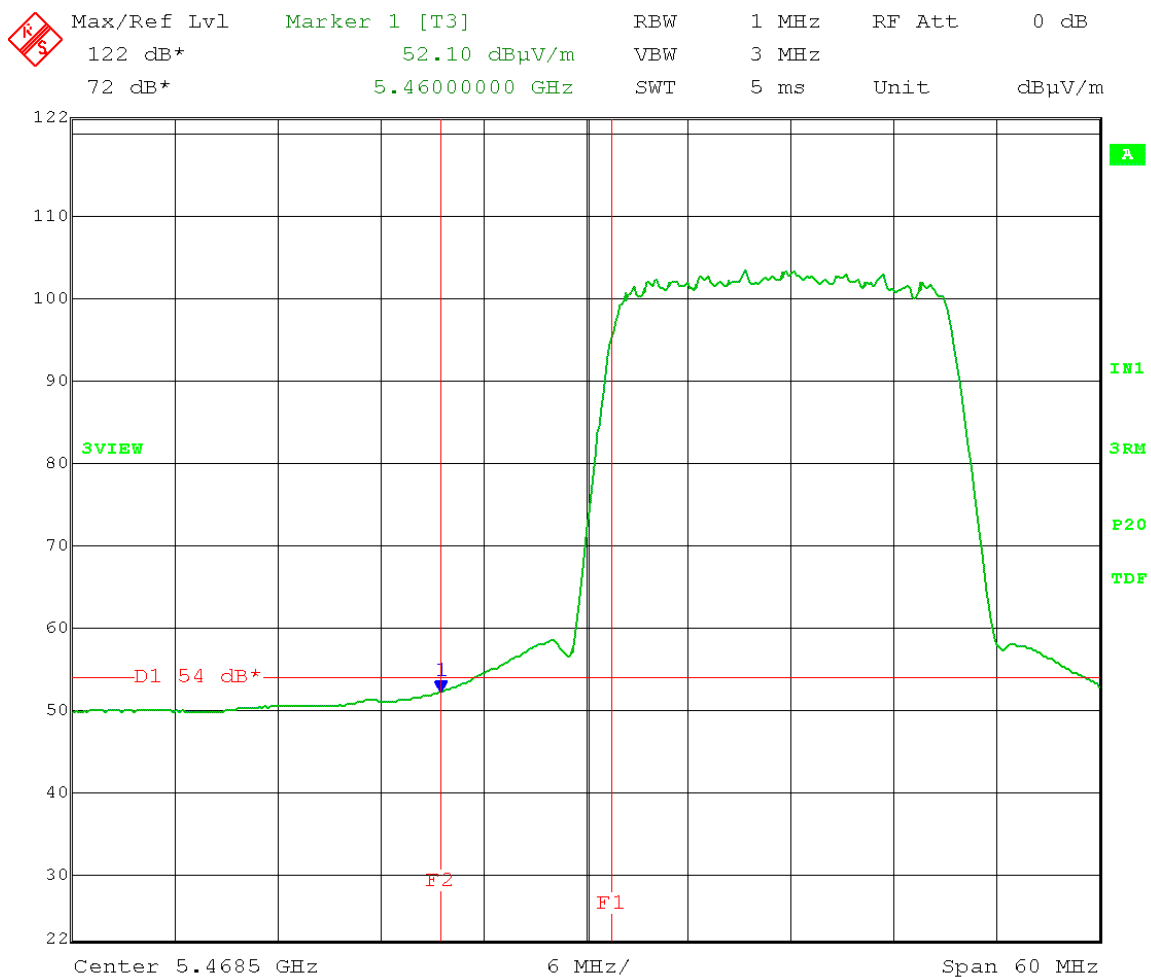Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 64QAM
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 54 dBμV/m AVERAGE at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
122 dB*	52.09 dBμV/m	VBW	3 MHz		
72 dB*	5.46000000 GHz	SWT	5 ms	Unit	dBμV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz
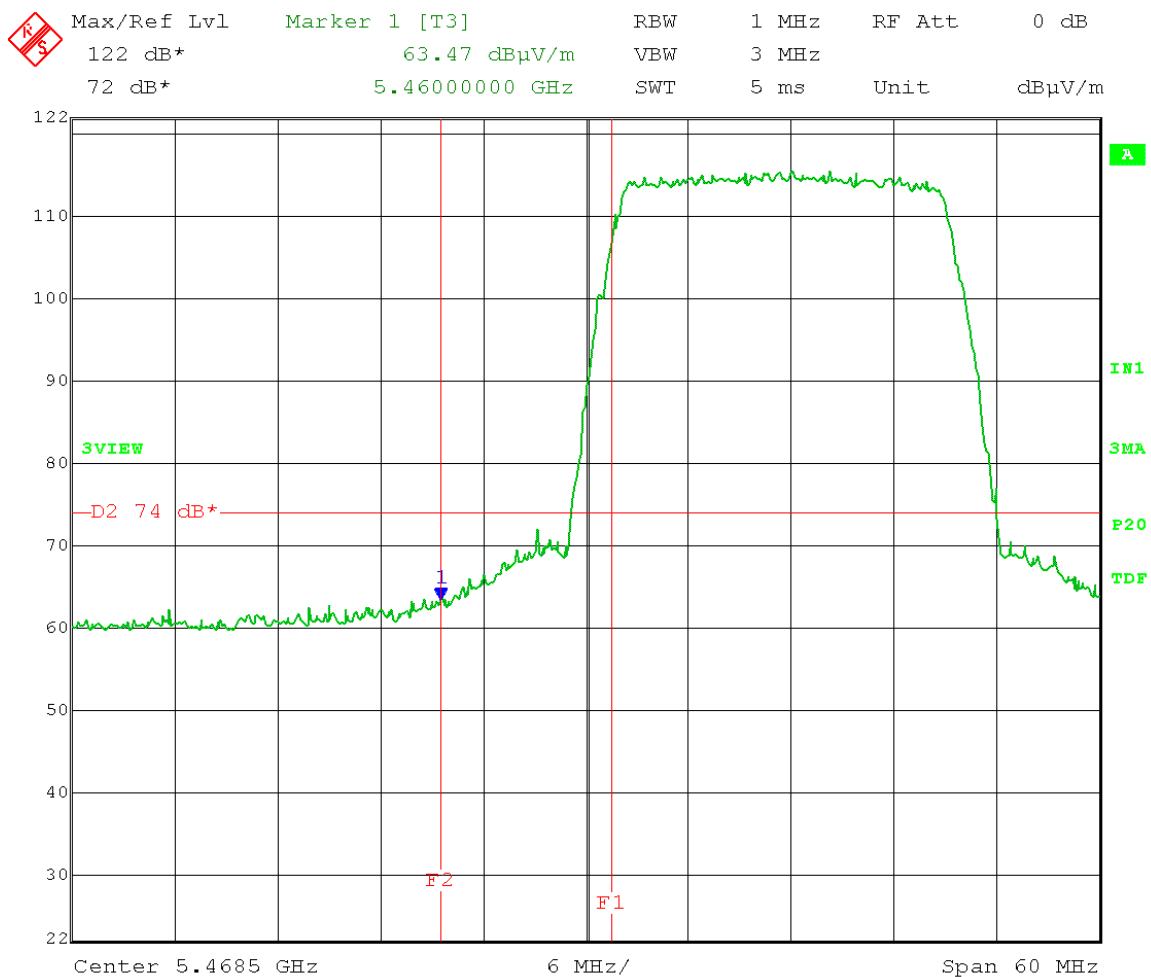
Date: 3.OCT.2013 15:03:01

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
               (FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
               Low Channel: Frequency – 5480 MHz
               Modulation: 64QAM
               Horizontal
               Restricted Band-Edge Frequency: 5460 MHz (F2)
               Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
122 dB*	64.01 dBµV/m	VBW	3 MHz		
72 dB*	5.45855711 GHz	SWT	5 ms	Unit	dBµV/m

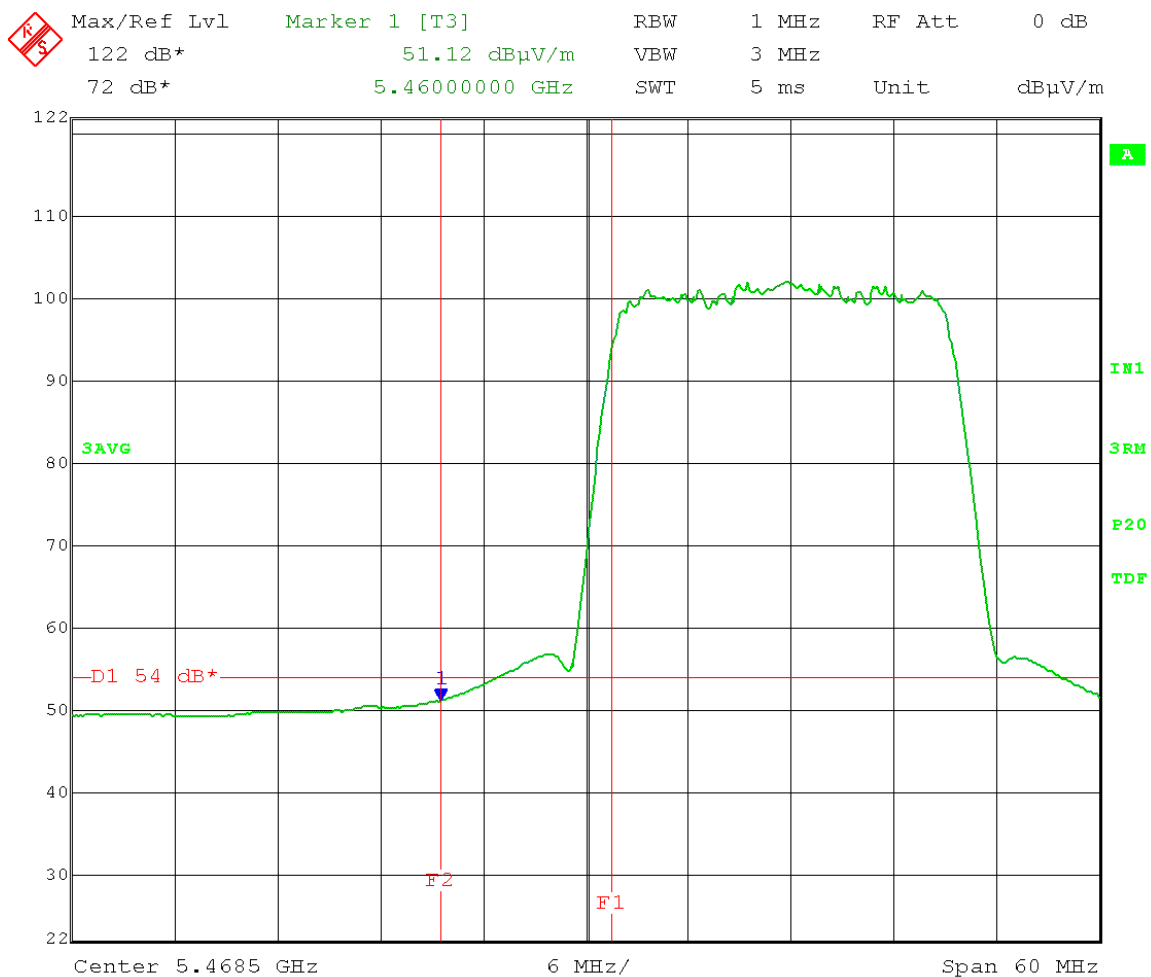Center 5.4685 GHz   6 MHz/   Span 60 MHz
Date: 3.OCT.2013 15:01:59

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: 64QAM
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 54 dBμV/m AVERAGE at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	51.38 dBμV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBμV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
               (FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
               Low Channel: Frequency – 5480 MHz
               Modulation: 64QAM
               Vertical
               Restricted Band-Edge Frequency: 5460 MHz (F2)
               Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	63.28 dBµV/m		VBW	3 MHz		
72 dB*	5.45915832 GHz		SWT	5 ms	Unit	dBµV/m

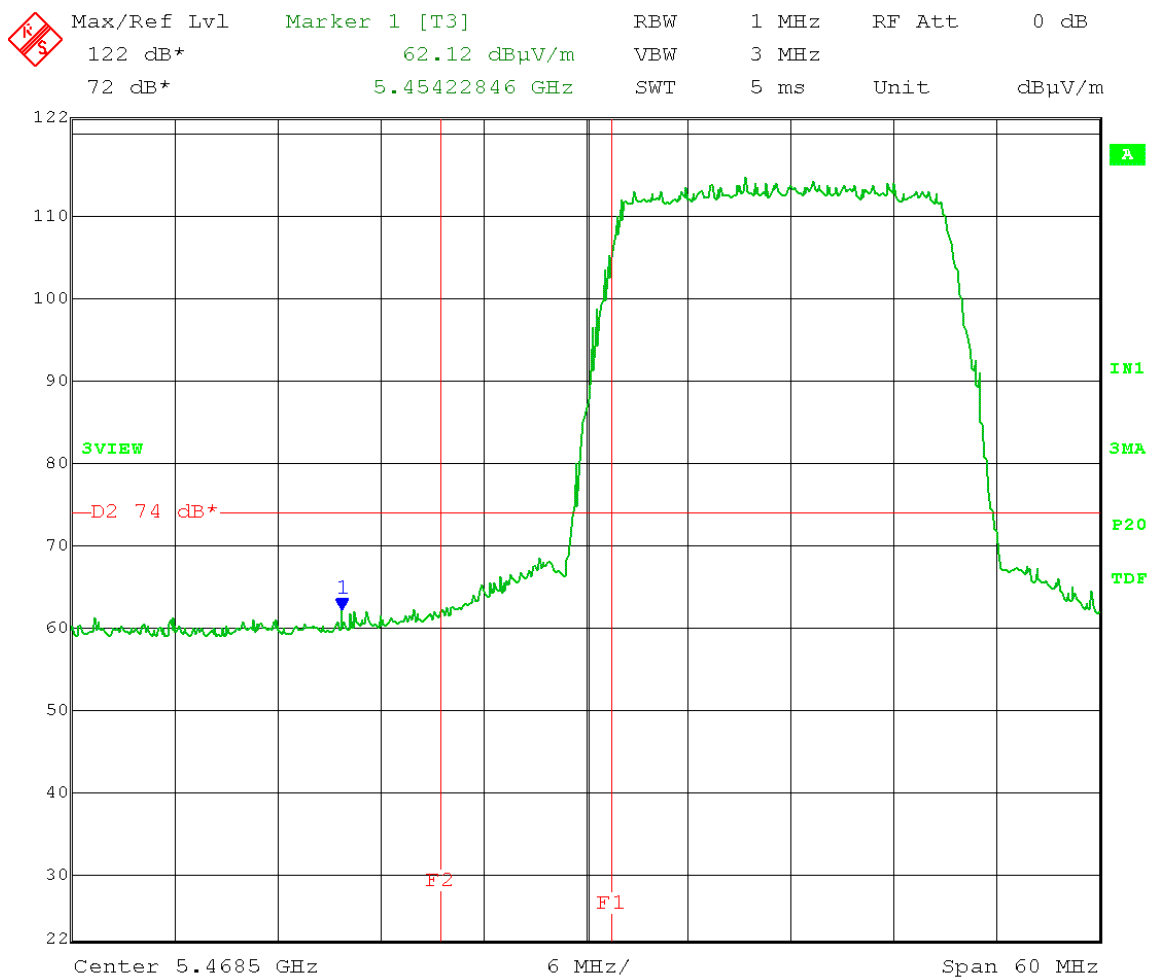Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

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

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	52.10 dBµV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBµV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz

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

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: QPSK
Horizontal
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dBμV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl	Marker 1 [T3]		RBW	1 MHz	RF Att	0 dB
122 dB*	63.47 dBμV/m		VBW	3 MHz		
72 dB*	5.46000000 GHz		SWT	5 ms	Unit	dBμV/m

```
122 ┤                                                          A
    │
110 ┤                        ╭──────────────╮
    │                        │              │                IN1
100 ┤                       ╱                ╲
    │                      │                  │
 90 ┤                     │                    │
    │                     │                    │              3MA
 80 ┤ 3VIEW              │                      │
    │                    │                       │
D2 74 dB*───────────────┼────────────────────────┼──────────  P20
 70 ┤        ╭╮╮        │                          ╲╮╮╮╮
    │    1 ▼╱  ╰        │                              ╰╰╮    TDF
 60 ┤───╯              │
    │
 50 ┤
    │
 40 ┤
    │
 30 ┤        F2         F1
 22 ┤
    └─────────────────────────────────────────────────────
    Center 5.4685 GHz          6 MHz/         Span 60 MHz
```

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

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

Max/Ref Lvl	Marker 1 [T3]	RBW	1 MHz	RF Att	0 dB
122 dB*	51.12 dBμV/m	VBW	3 MHz		
72 dB*	5.46000000 GHz	SWT	5 ms	Unit	dBμV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz

Date: 3.OCT.2013 15:33:25

Test Date: 10-03-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Restricted Band-Edge Compliance - Radiated – Peak
(FCC 15.407(b)(7))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5480 MHz
Modulation: QPSK
Vertical
Restricted Band-Edge Frequency: 5460 MHz (F2)
Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meters.

Max/Ref Lvl   Marker 1 [T3]   RBW   1 MHz   RF Att   0 dB
122 dB*   62.12 dBµV/m   VBW   3 MHz
72 dB*   5.45422846 GHz   SWT   5 ms   Unit   dBµV/m

Center 5.4685 GHz   6 MHz/   Span 60 MHz
Date: 3.OCT.2013   15:32:49

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 ≥ 3 MHz
Number of points ≥ 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

20MHz Operating Bandwidth(Method SA-2):

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

20MHz BW, HCH, 16QAM
TX 0: 26 dB EBW = 21.40MHz

Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
16 dBm	-10.17 dBm	VBW	3 MHz		
-10 dBm	5.71054770 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   -10.17 dBm
5.71054770 GHz

Center 5.714 GHz   2.14 MHz/   Span 21.4 MHz
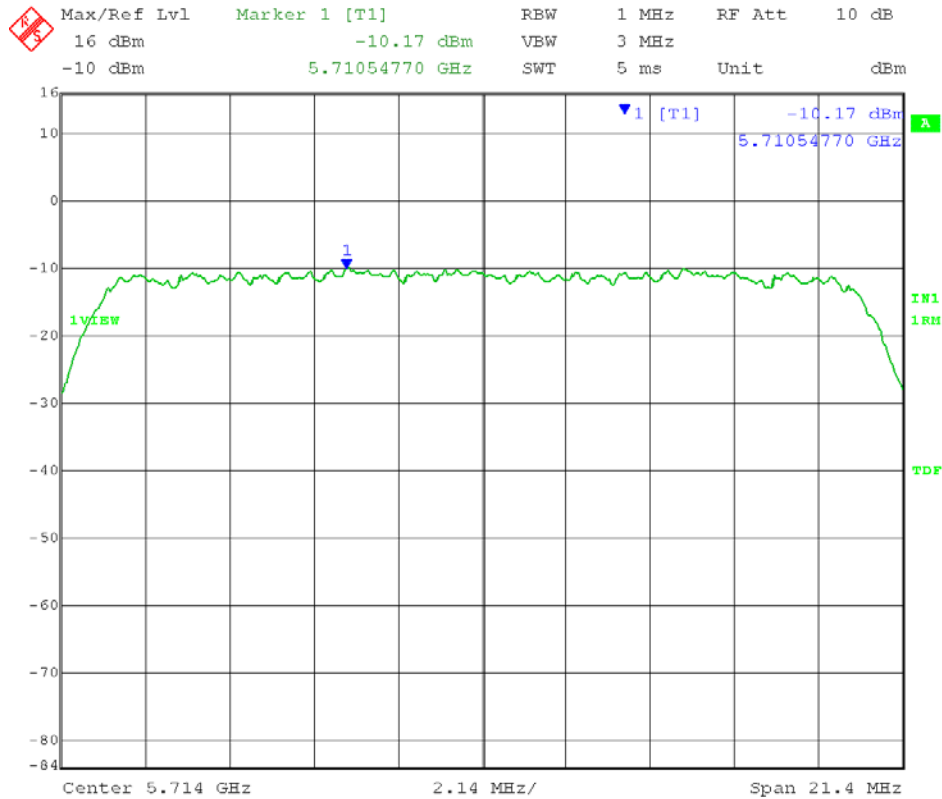
Date: 22.OCT.2013 12:30:44

TX1: 26 dB EBW = 21.24MHz

Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
16 dBm	-11.91 dBm	VBW	3 MHz		
-10 dBm	5.71402136 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   -11.91 dBm
5.71402136 GHz

Center 5.714 GHz   2.132 MHz/   Span 21.32 MHz
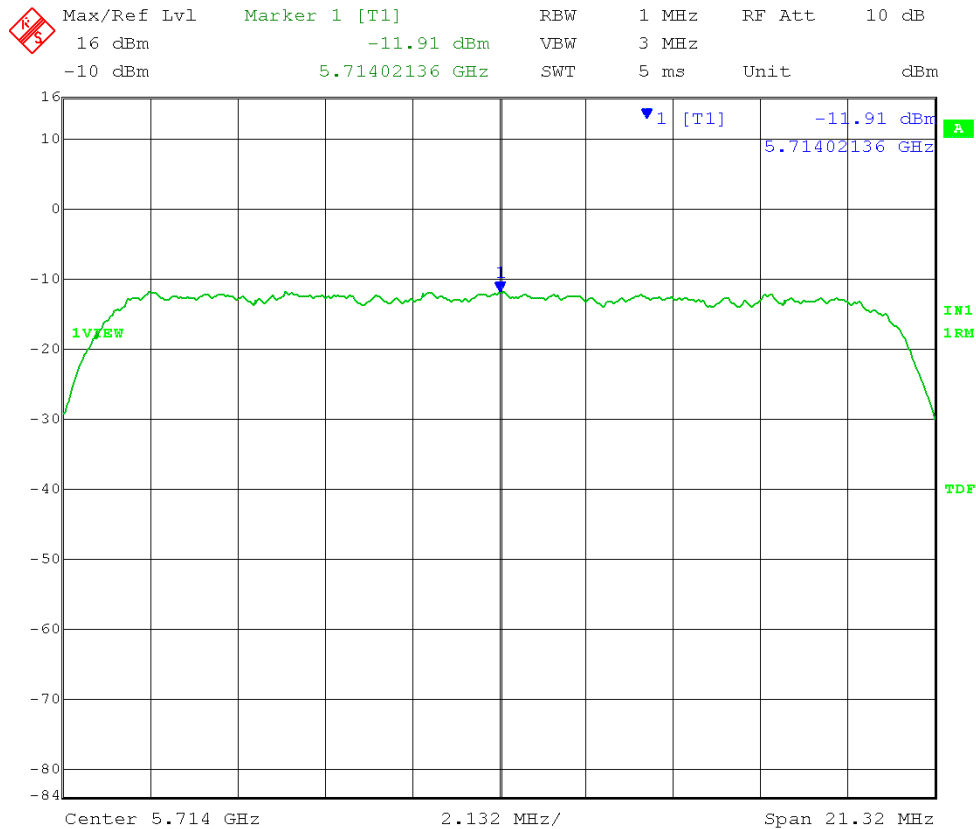
Date: 18.OCT.2013 15:38:15

20MHz BW, HCH, 64QAM
TX 0: 26 dB EBW = 21.24MHz
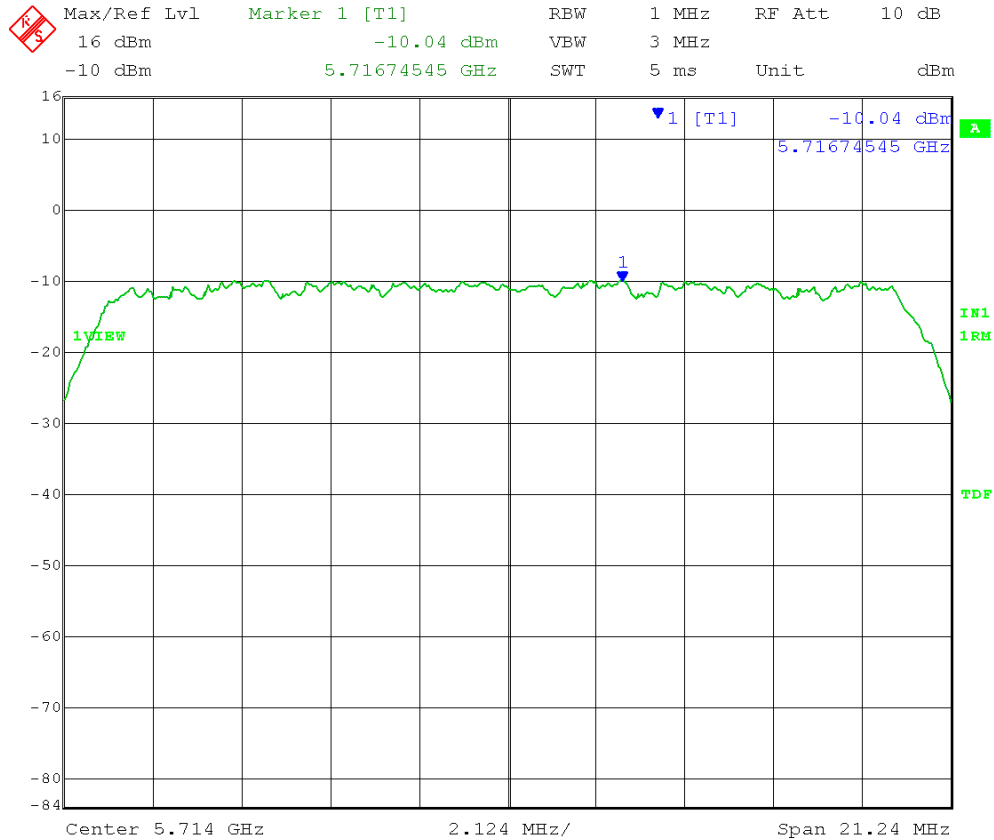
Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
  16 dBm   -10.11 dBm   VBW   3 MHz
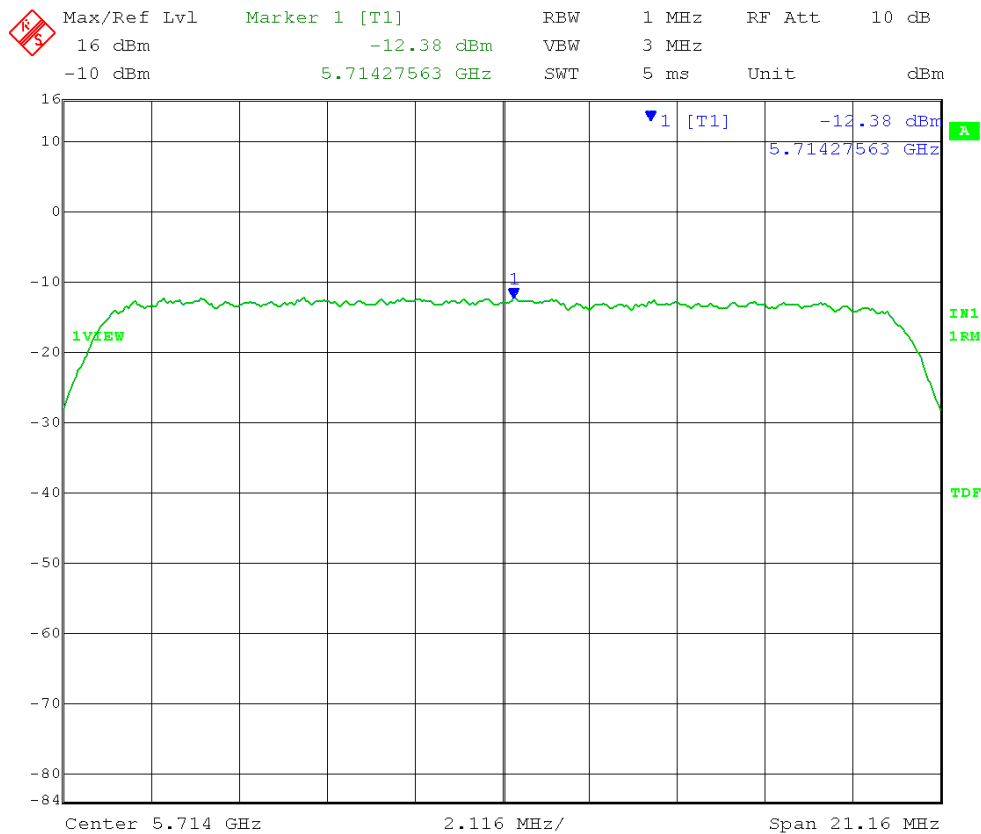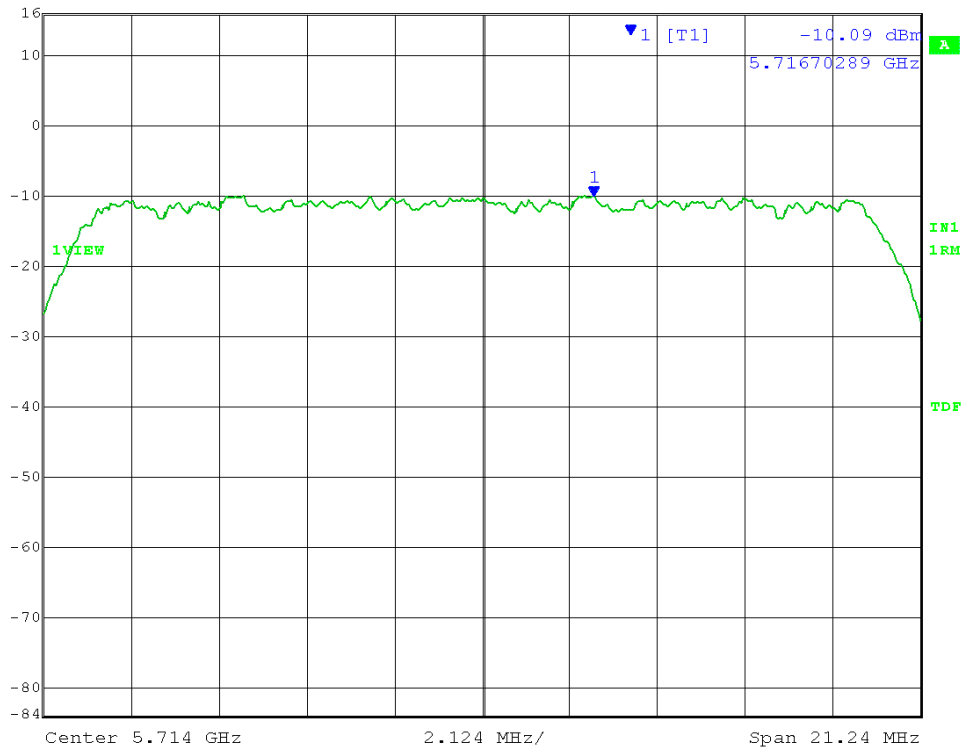 -10 dBm   5.70976477 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.11 dBm
5.70976477 GHz

A

1VIEW   IN1
                                                                         1RM

                                                                         TDF

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz
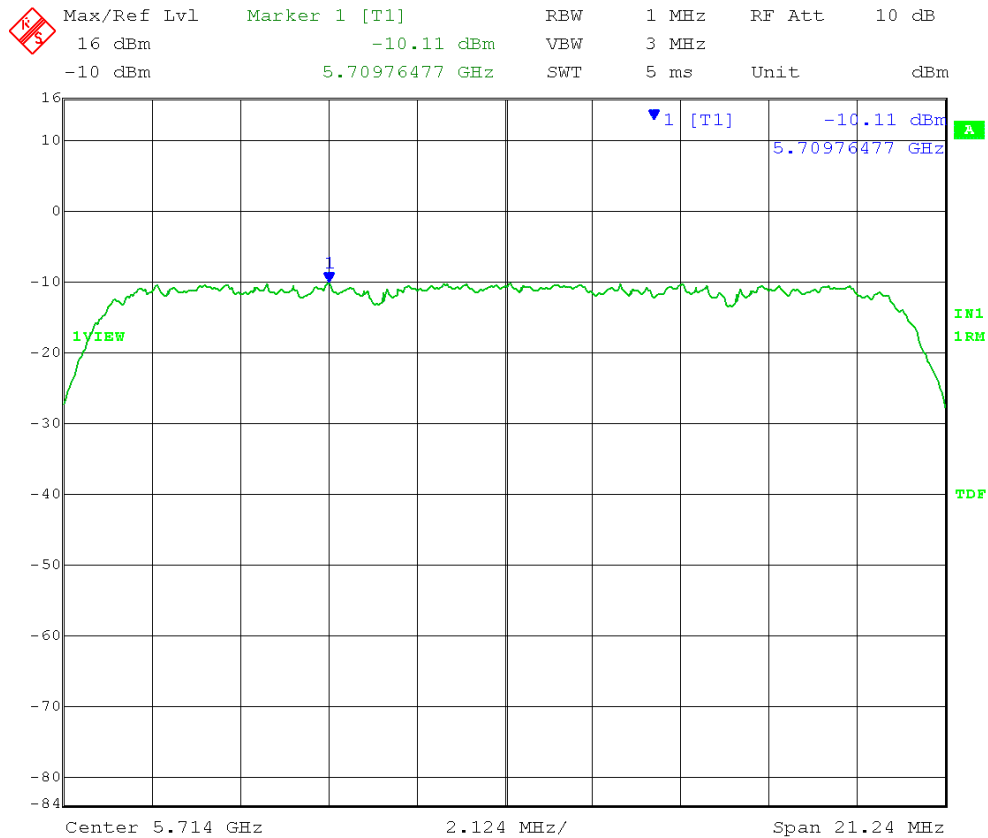
Date: 22.OCT.2013 12:31:43

TX1: 26 dB EBW = 21.32MHz

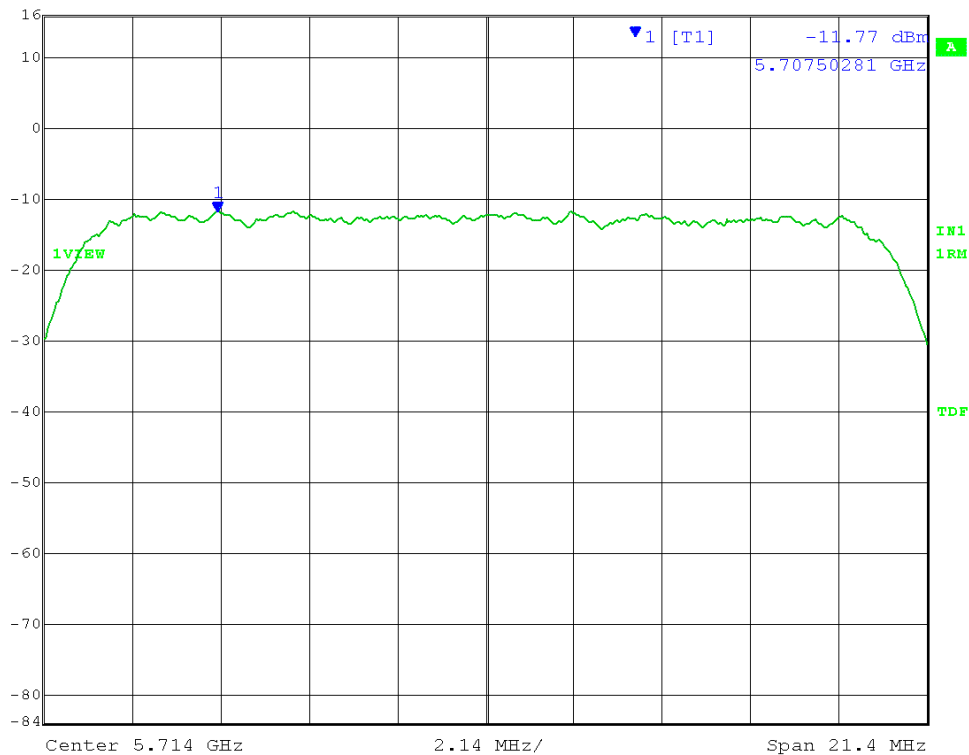Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
  16 dBm   -12.16 dBm   VBW   3 MHz
 -10 dBm   5.70983427 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -12.16 dBm
5.70983427 GHz

A

1VIEW   IN1
                                                                         1RM

                                                                         TDF

Center 5.714 GHz   2.132 MHz/   Span 21.32 MHz
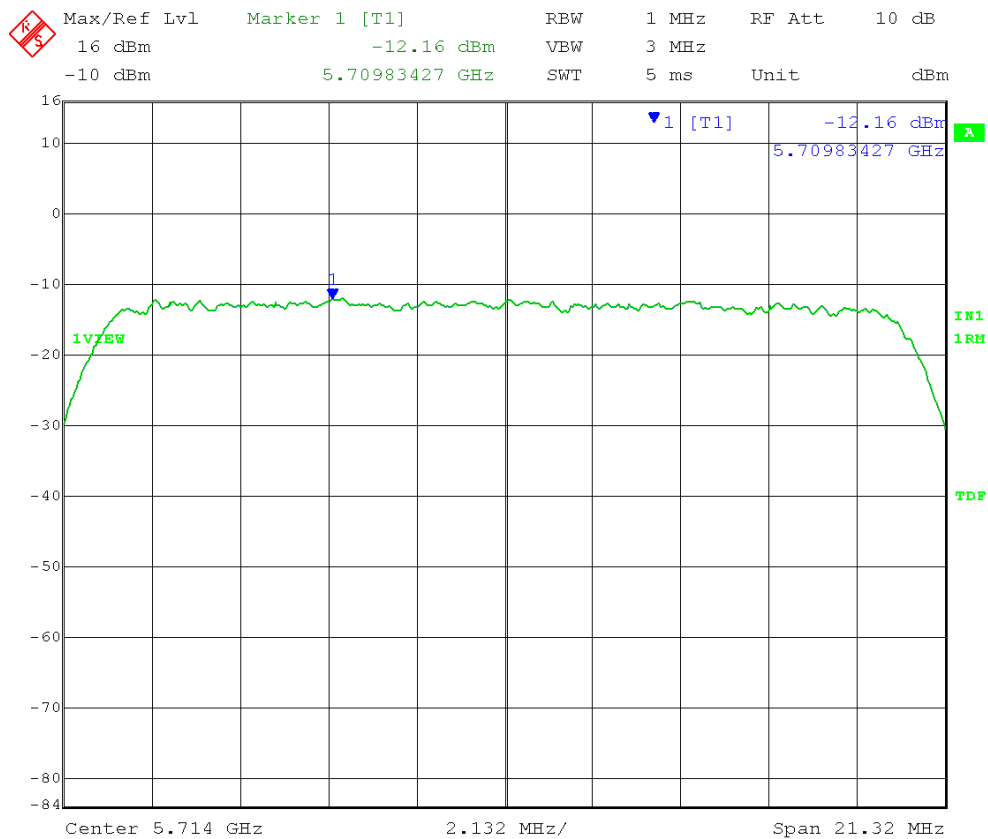
Date: 18.OCT.2013 15:37:11

20MHz BW, HCH, 256QAM
TX 0: 26 dB EBW = 21.24MHz

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

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz
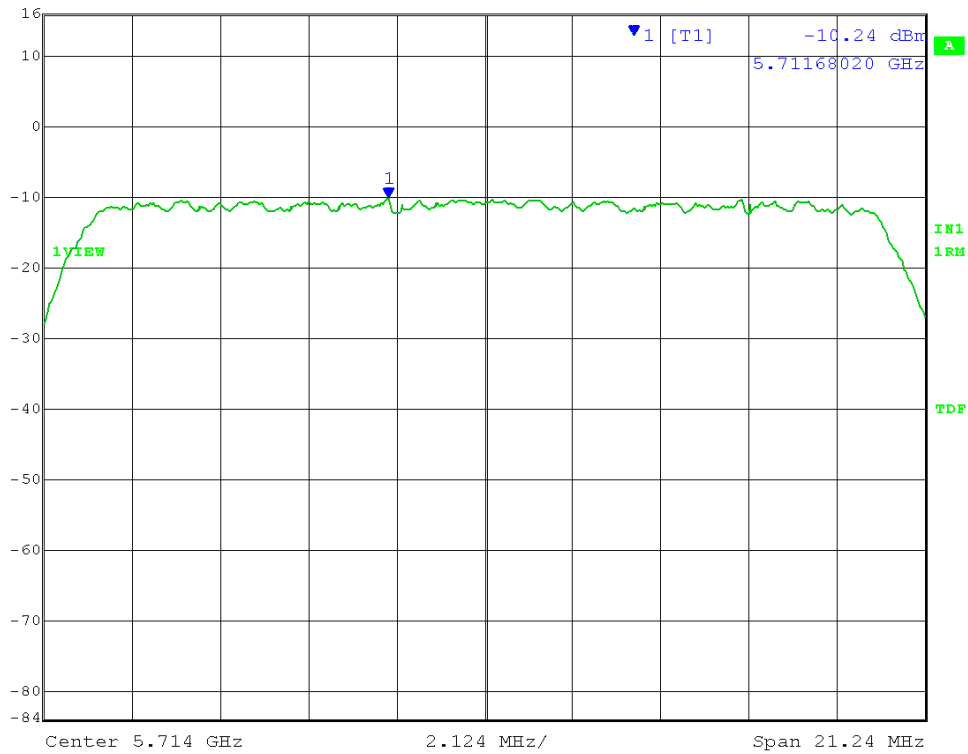
Date: 22.OCT.2013   12:33:21

TX1: 26 dB EBW = 21.16MHz

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

Center 5.714 GHz   2.116 MHz/   Span 21.16 MHz
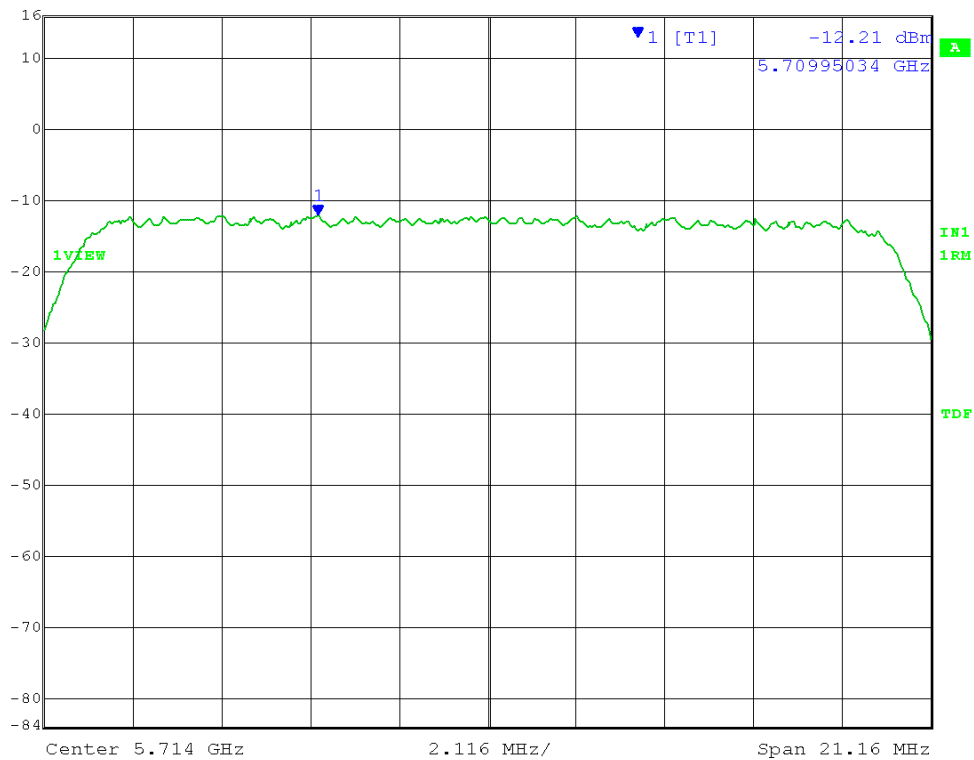
Date: 18.OCT.2013   15:36:05

20MHz BW, HCH, 1024QAM
TX 0: 26 dB EBW = 21.24MHz

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

▼1 [T1] -10.04 dBm
5.71674545 GHz
A

16
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-84

1VIEW

IN1
1RM

TDF

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

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

TX1: 26 dB EBW = 21.16MHz

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

▼1 [T1] -12.38 dBm
5.71427563 GHz
A

16
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-84

1VIEW

IN1
1RM

TDF

Center 5.714 GHz   2.116 MHz/   Span 21.16 MHz

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

20MHz BW, HCH, QPSK
TX 0: 26 dB EBW = 21.24MHz

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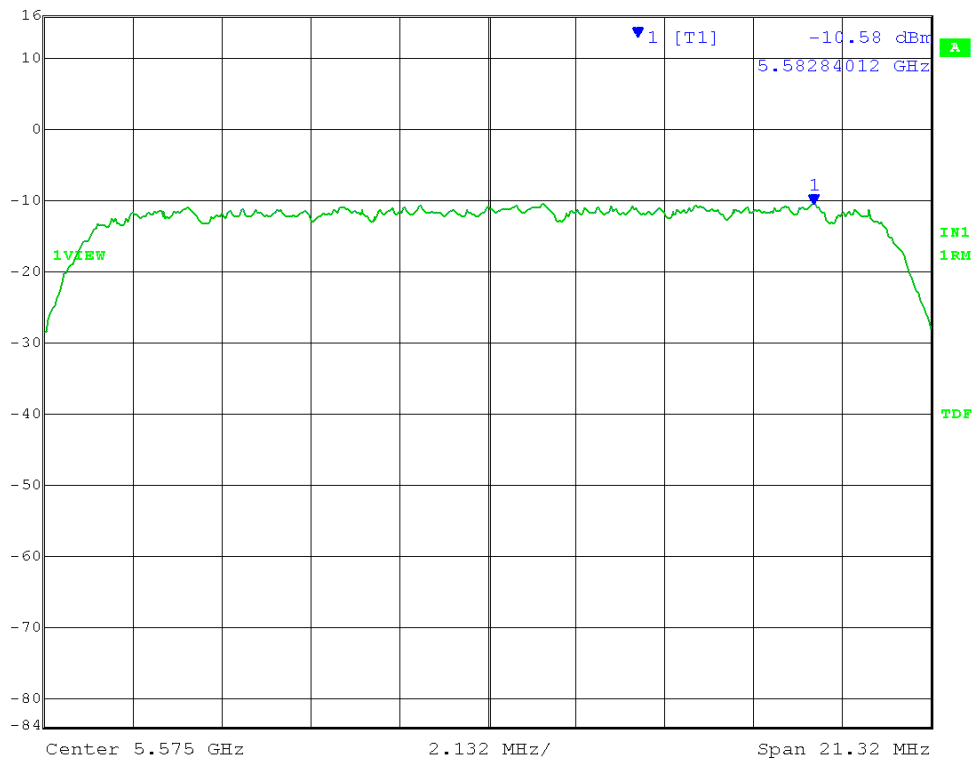 -10 dBm   5.71670289 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.09 dBm
5.71670289 GHz

1VIEW
1RM
IN1
TDF
A

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

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

TX1: 26 dB EBW = 21.40MHz

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

▼1 [T1]   -11.77 dBm
5.70750281 GHz

1VIEW
1RM
IN1
TDF
A

Center 5.714 GHz   2.14 MHz/   Span 21.4 MHz

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

20MHz BW, MCH, 16QAM
TX 0:   26 dB EBW = 21.40MHz

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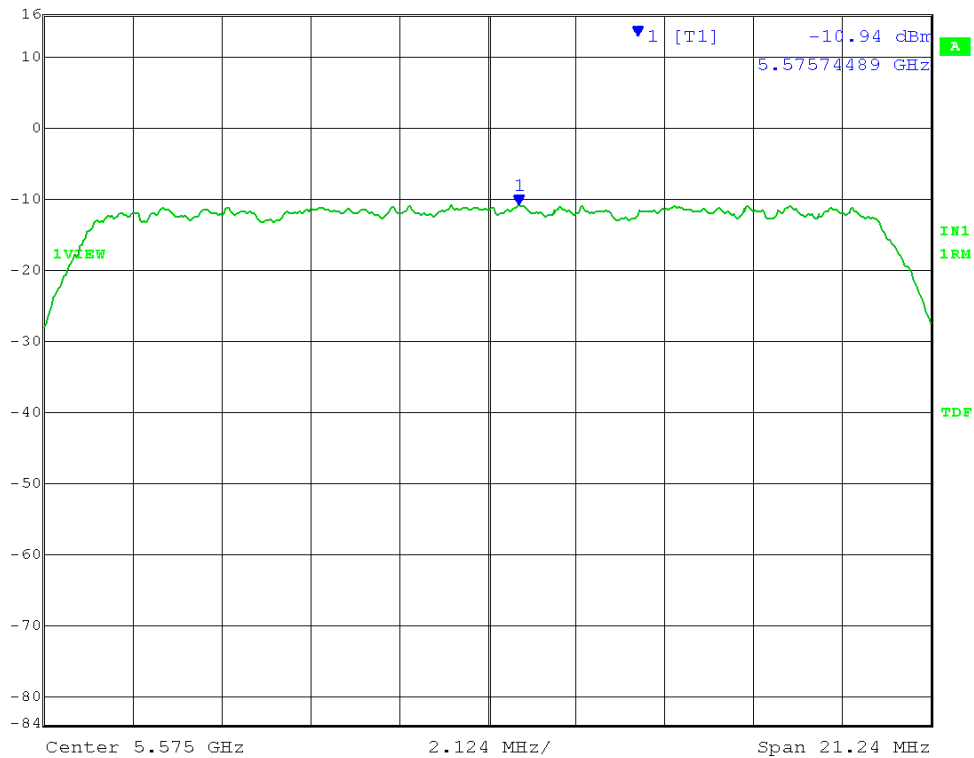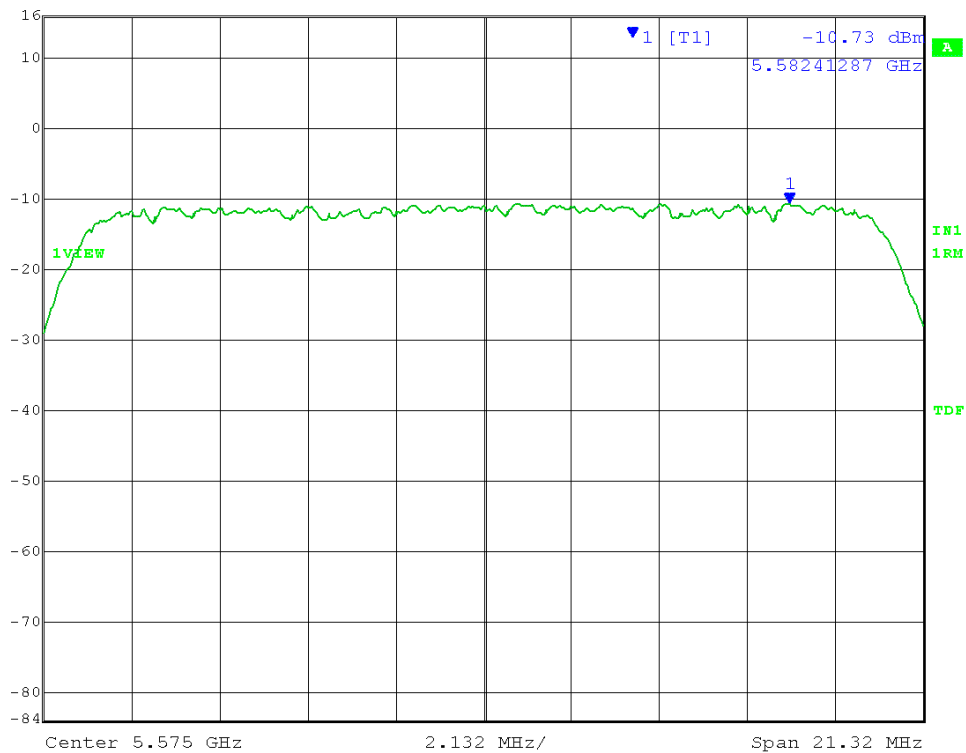 -10 dBm   5.57823788 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.71 dBm
5.57823788 GHz

A

IN1
1RM

1VZEW

TDF

Center 5.575 GHz   2.14 MHz/   Span 21.4 MHz
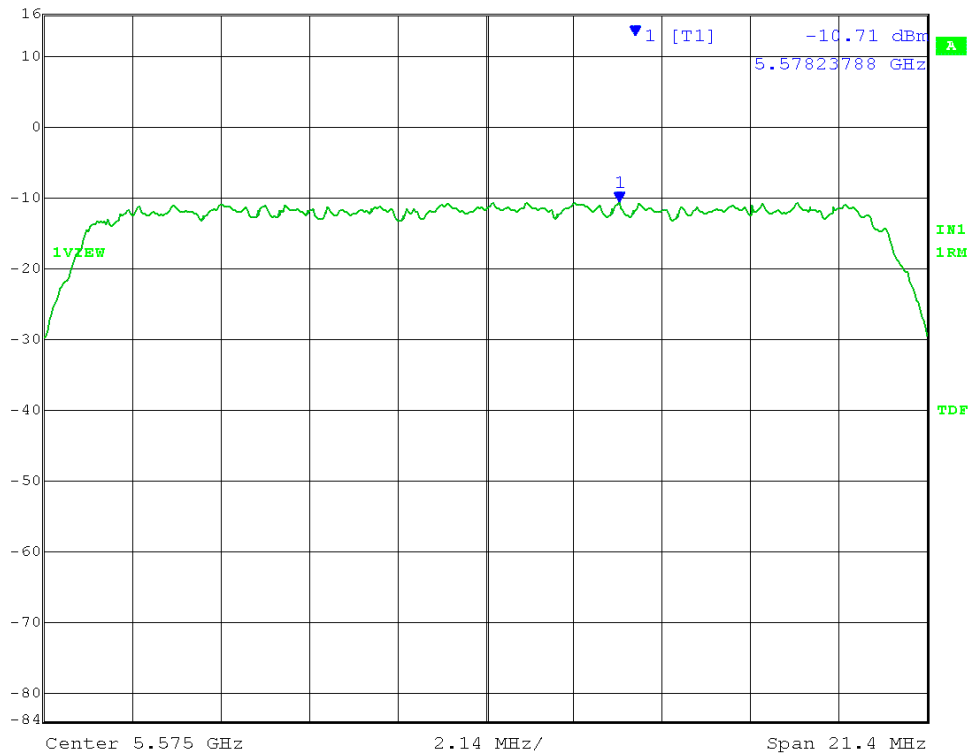
Date: 22.OCT.2013 12:26:09

TX1: 26 dB EBW = 21.32MHz

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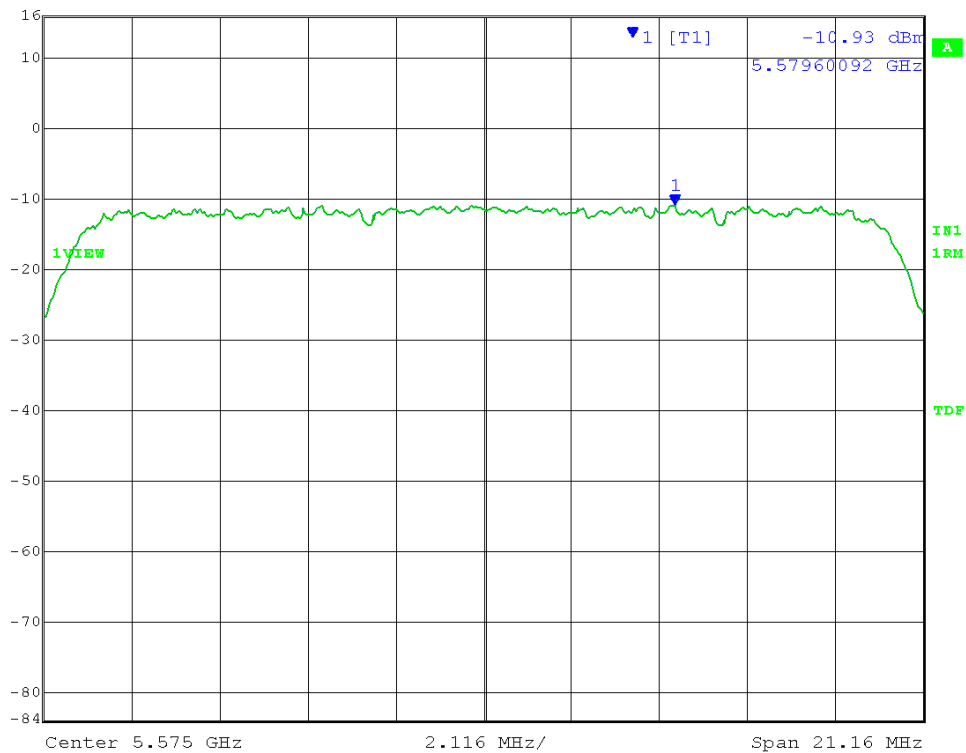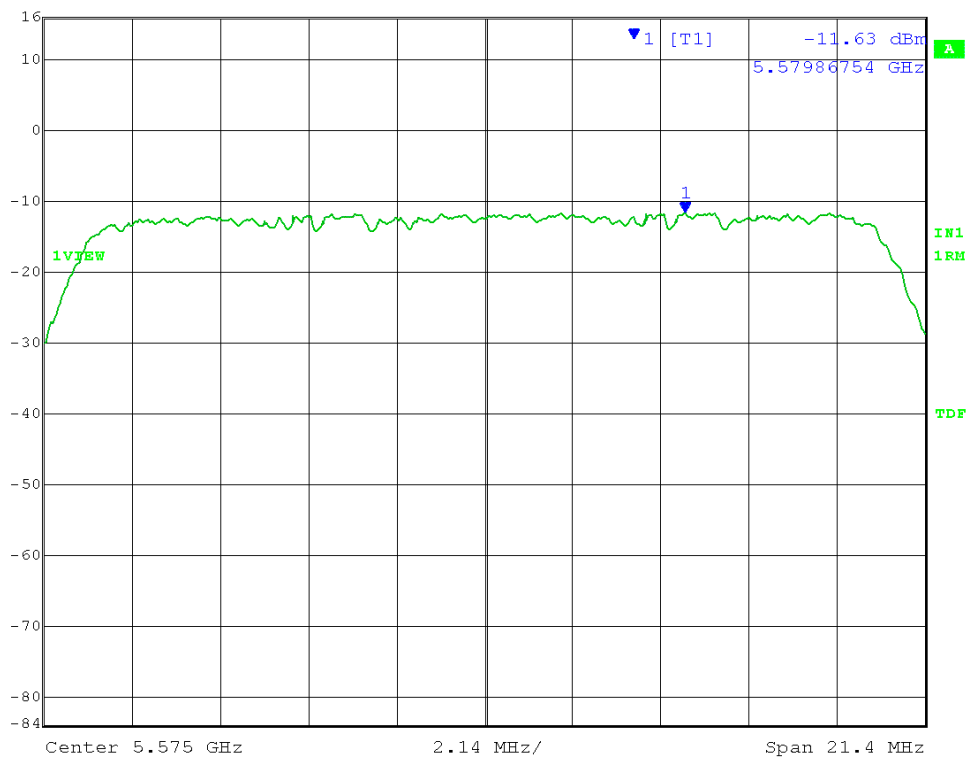 -10 dBm   5.57861030 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.82 dBm
5.57861030 GHz

A

IN1
1RM

1VIEW

TDF

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz
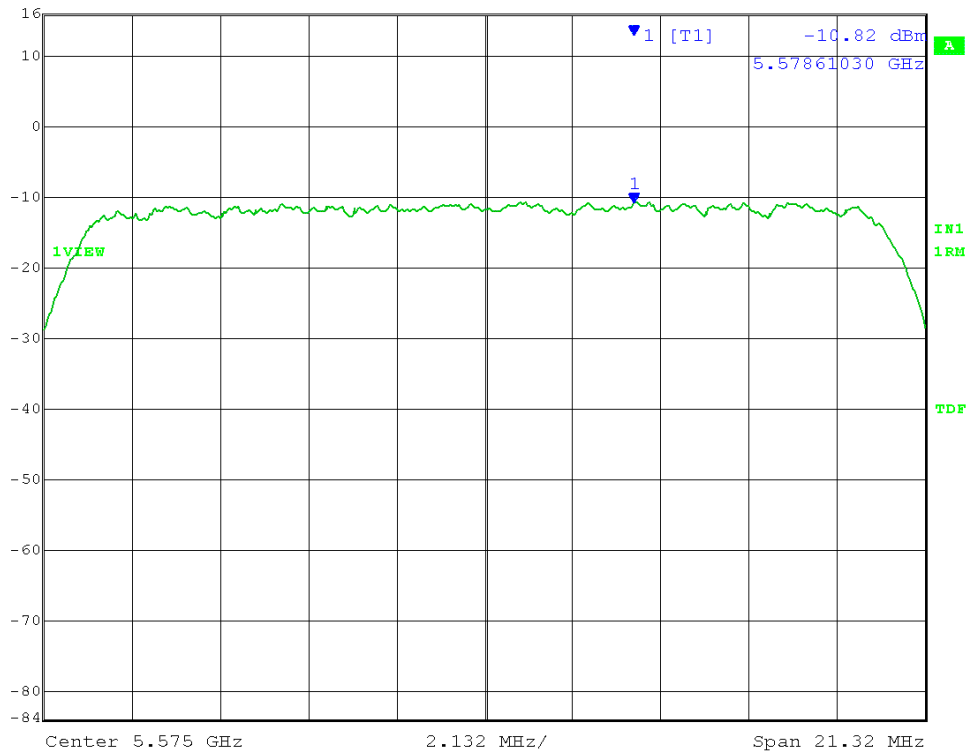
Date: 22.OCT.2013 12:50:13

20MHz BW, MCH, 64QAM
TX 0: 26 dB EBW = 21.32MHz

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

▼1 [T1] −10.75 dBm
5.57925118 GHz

A

IN1
1RM

1VIEW

TDF

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz
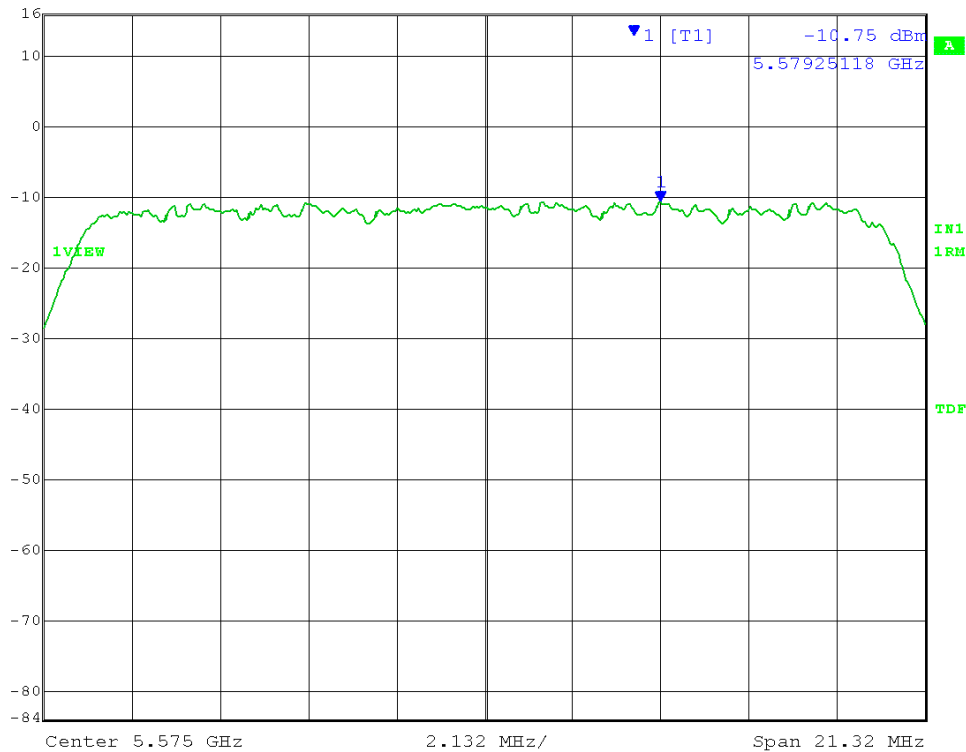
Date: 22.OCT.2013   12:25:09

TX1: 26 dB EBW = 21.32MHz

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

▼1 [T1] −10.58 dBm
5.58284012 GHz

A

IN1
1RM

1VIEW

TDF

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz

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

20MHz BW, MCH, 256QAM
TX 0: 26 dB EBW = 21.24MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	1 MHz	RF Att	10 dB
16 dBm		-10.94 dBm	VBW	3 MHz		
-10 dBm		5.57574489 GHz	SWT	5 ms	Unit	dBm

```
16
10                                          ▼1 [T1]          -10.94 dBm      A
                                                      5.57574489 GHz
 0
-10                          1                                              IN1
                                                                           1RM
1VIEW
-20
-30
-40                                                                        TDF
-50
-60
-70
-80
-84
```

Center 5.575 GHz   2.124 MHz/   Span 21.24 MHz

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

TX1: 26 dB EBW = 21.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	1 MHz	RF Att	10 dB
16 dBm		-10.73 dBm	VBW	3 MHz		
-10 dBm		5.58241287 GHz	SWT	5 ms	Unit	dBm

```
16
10                              ▼1 [T1]              -10.73 dBm      A
                                          5.58241287 GHz
 0
-10                                          1                              IN1
                                                                           1RM
1VIEW
-20
-30
-40                                                                        TDF
-50
-60
-70
-80
-84
```

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz

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

20MHz BW, MCH, 1024QAM
TX 0: 26 dB EBW = 21.16MHz

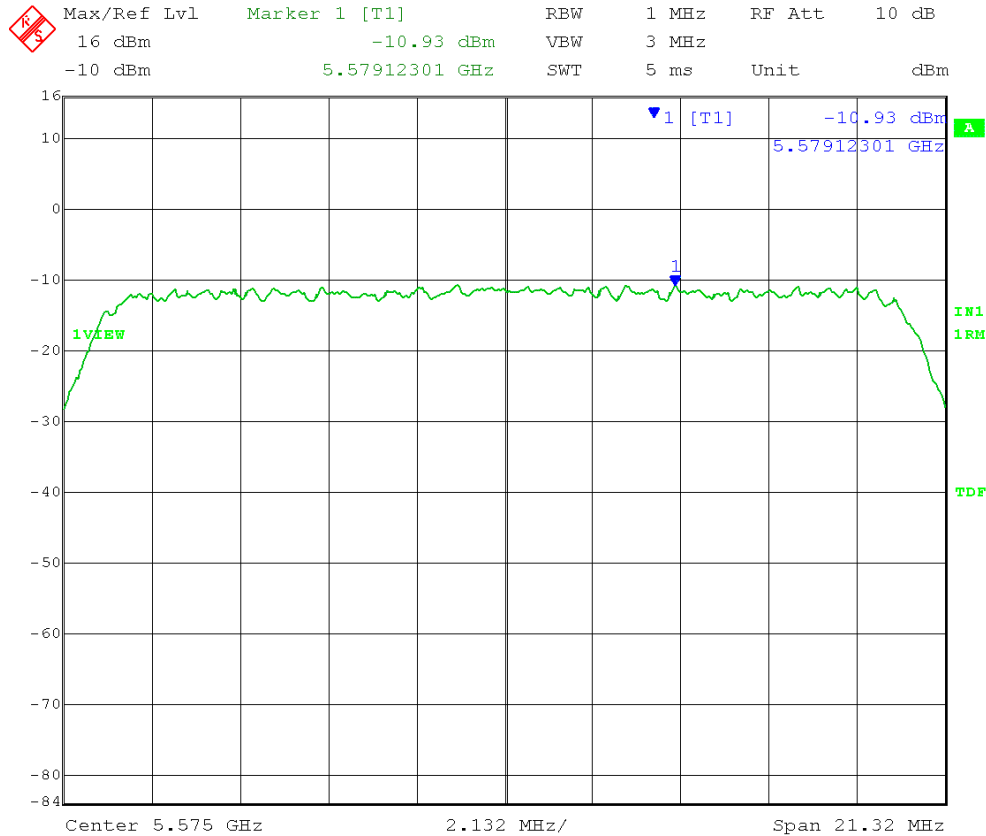Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
16 dBm   -10.93 dBm   VBW   3 MHz
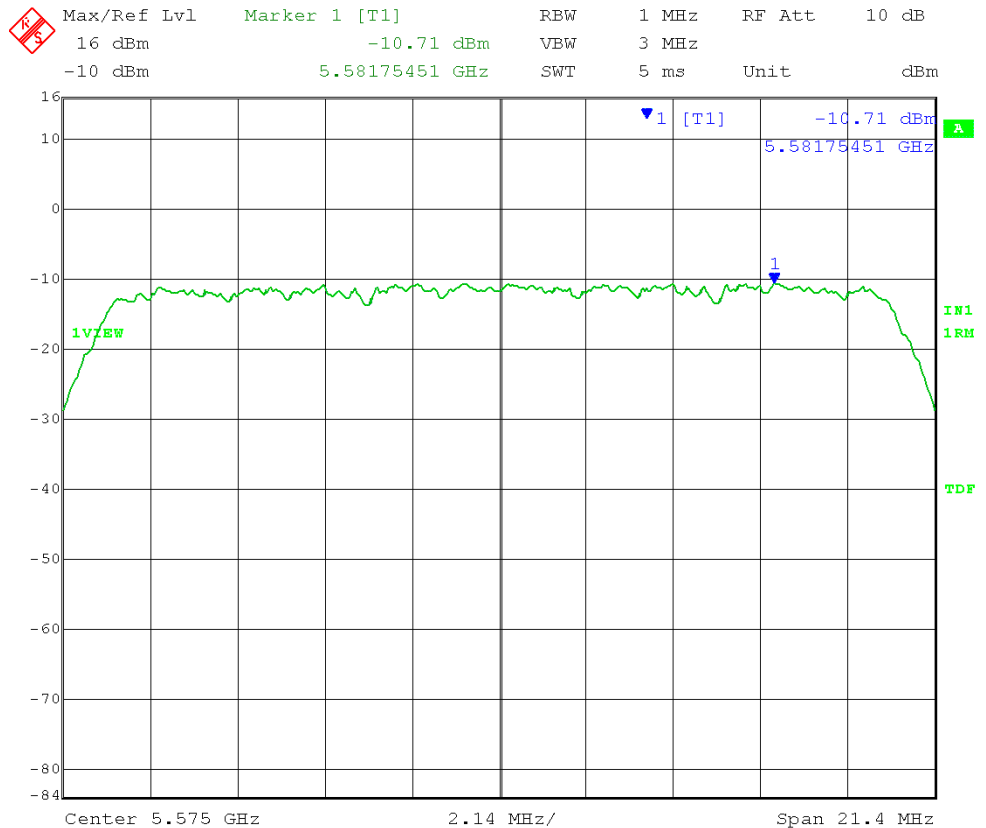-10 dBm   5.57960092 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.93 dBm
5.57960092 GHz

1VIEW   IN1 1RM   TDF

Center 5.575 GHz   2.116 MHz/   Span 21.16 MHz

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

TX1: 26 dB EBW = 21.40MHz

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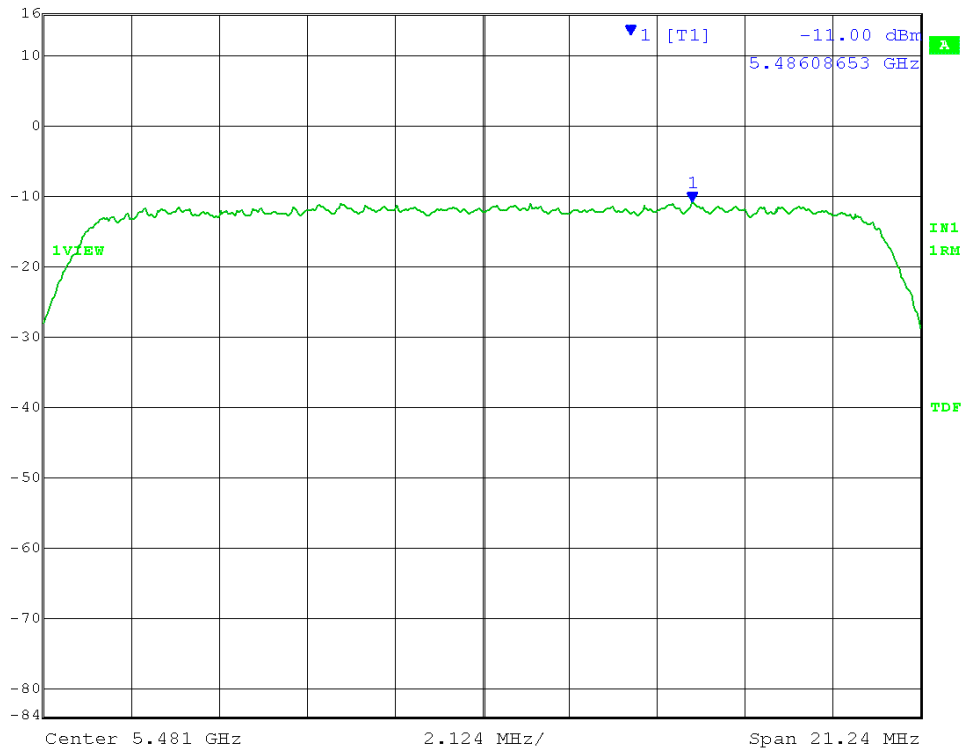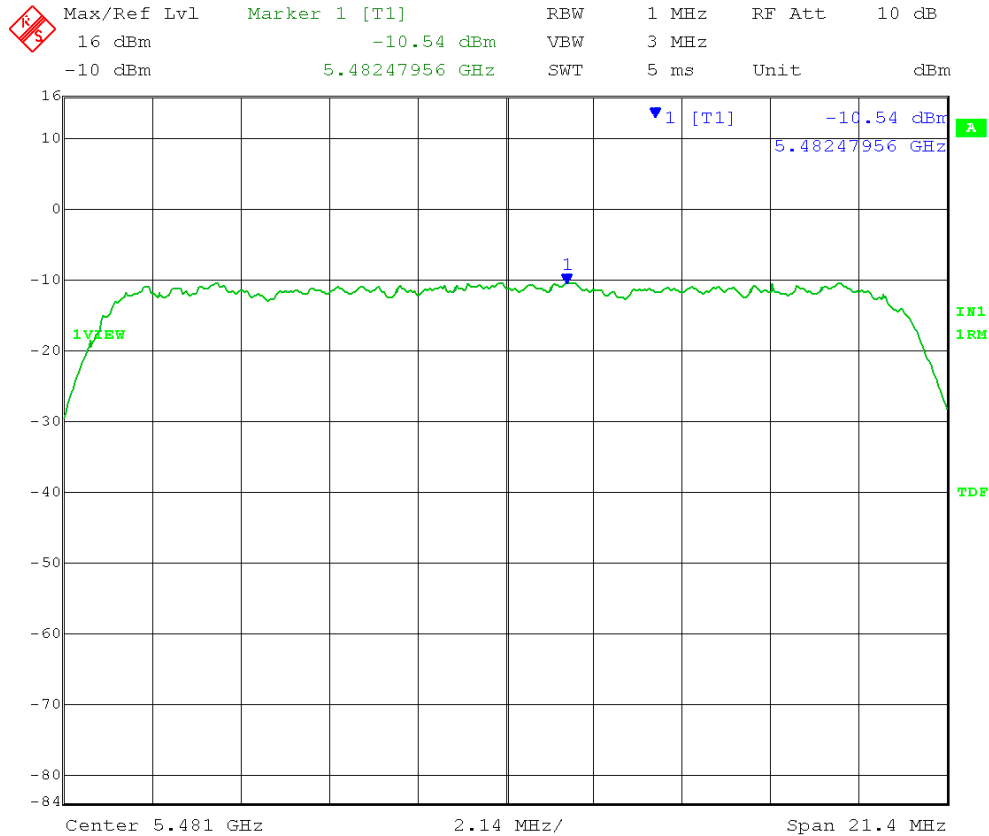-10 dBm   5.57986754 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -11.63 dBm
5.57986754 GHz

1VIEW   IN1 1RM   TDF

Center 5.575 GHz   2.14 MHz/   Span 21.4 MHz

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

20MHz BW, MCH, QPSK
TX 0: 26 dB EBW = 21.32MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	1 MHz	RF Att	10 dB
16 dBm		−10.93 dBm	VBW	3 MHz		
−10 dBm		5.57912301 GHz	SWT	5 ms	Unit	dBm

```
 16
                                                          ▼1 [T1]          −10.93 dBm    A
 10
                                                                     5.57912301 GHz

  0

−10                                                        1                          IN1
                                                                                      1RM
1VIEW
−20

−30

−40                                                                                   TDF

−50

−60

−70

−80
−84
   Center 5.575 GHz              2.132 MHz/              Span 21.32 MHz
```

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

TX1: 26 dB EBW = 21.40MHz

Max/Ref Lvl	Marker 1 [T1]		RBW	1 MHz	RF Att	10 dB
16 dBm		−10.71 dBm	VBW	3 MHz		
−10 dBm		5.58175451 GHz	SWT	5 ms	Unit	dBm

```
 16
                                                          ▼1 [T1]          −10.71 dBm    A
 10
                                                                     5.58175451 GHz

  0

−10                                                           1                       IN1
                                                                                      1RM
1VIEW
−20

−30

−40                                                                                   TDF

−50

−60

−70

−80
−84
   Center 5.575 GHz              2.14 MHz/               Span 21.4 MHz
```

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

20MHz BW, LCH, 16QAM
TX 0: 26 dB EBW = 21.32MHz

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

▼1 [T1]   -10.37 dBm
5.48003868 GHz

A

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.132 MHz/   Span 21.32 MHz
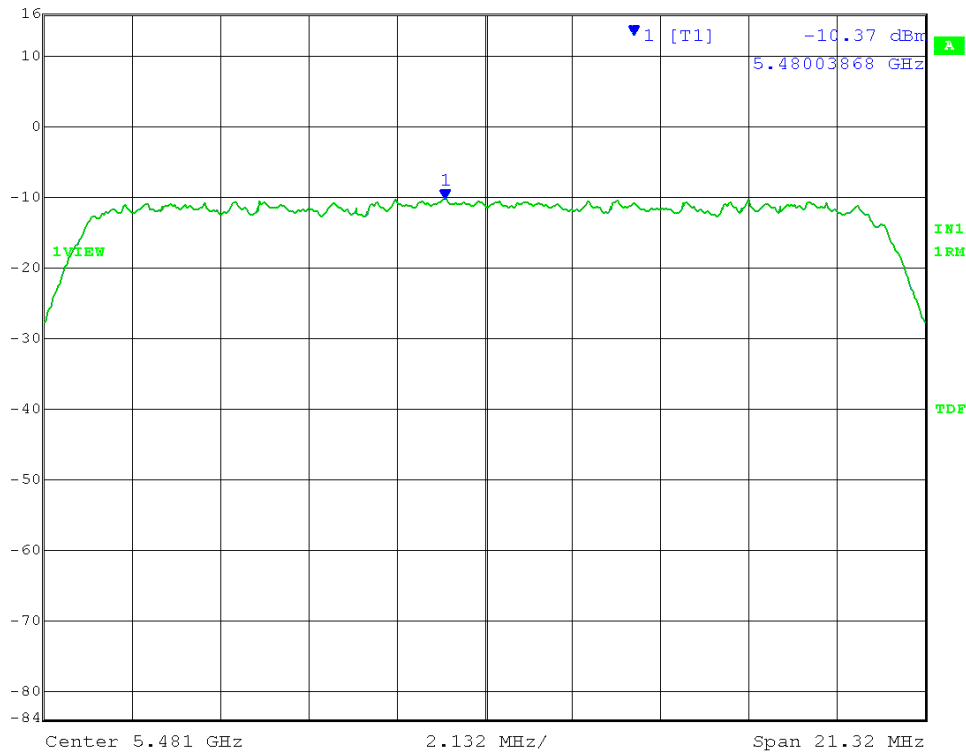
Date: 22.OCT.2013 11:37:45

TX1: 26 dB EBW = 21.32MHz

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

▼1 [T1]   -11.06 dBm
5.48439667 GHz

A

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.132 MHz/   Span 21.32 MHz
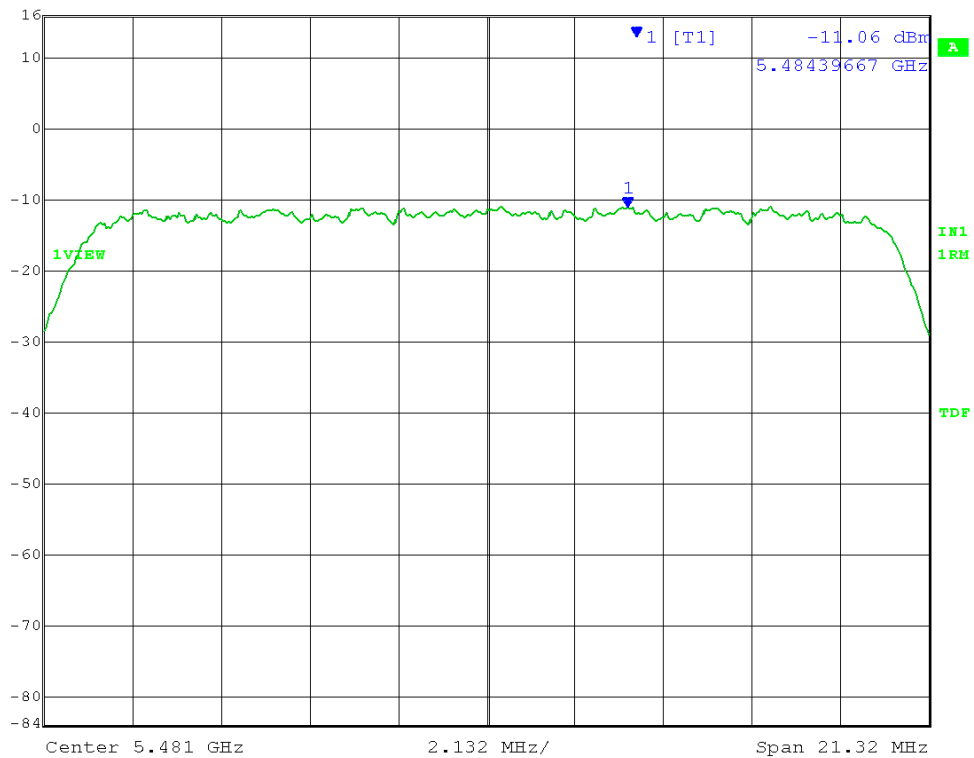
Date: 22.OCT.2013 12:42:52

20MHz BW, LCH, 64QAM
TX 0: 26 dB EBW = 21.32MHz

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

▼1 [T1] −10.31 dBm
5.48546481 GHz

A

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.132 MHz/   Span 21.32 MHz
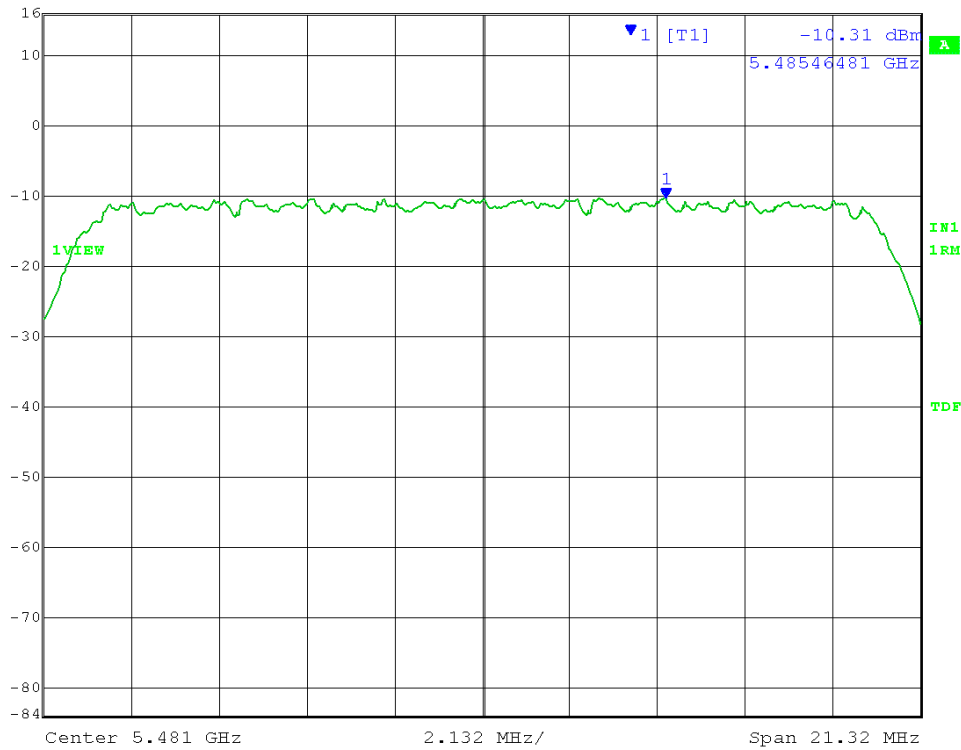
Date: 22.OCT.2013 11:38:57

TX1: 26 dB EBW = 21.64MHz

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

▼1 [T1] −10.98 dBm
5.48024108 GHz

A

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.164 MHz/   Span 21.64 MHz
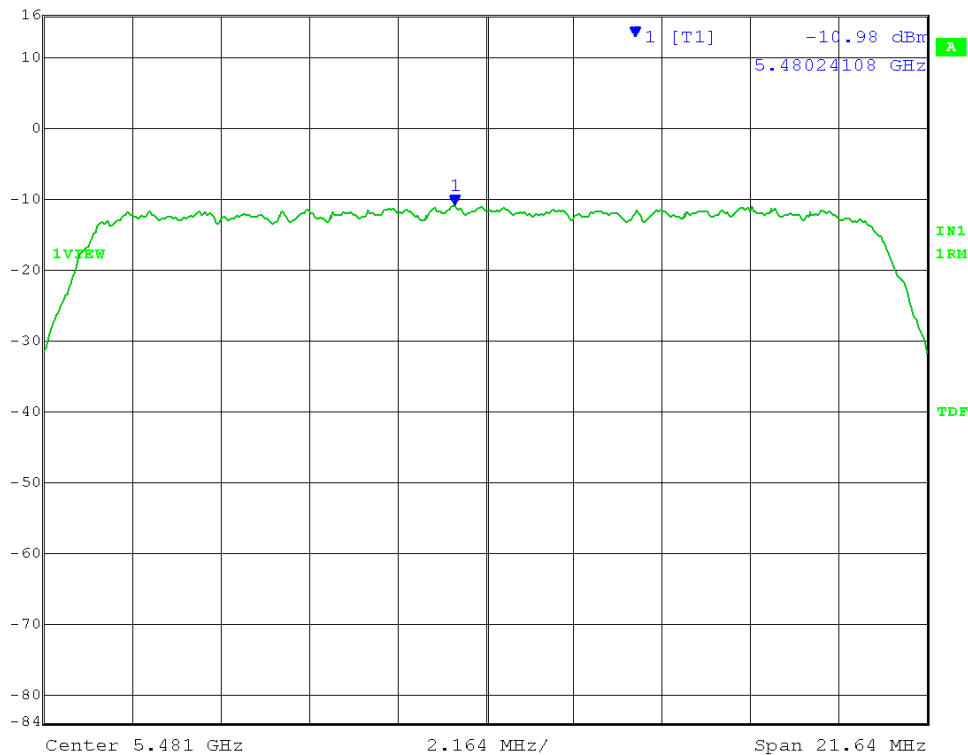
Date: 22.OCT.2013 12:44:13

20MHz BW, LCH, 256QAM
TX 0: 26 dB EBW = 21.24MHz

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

▼1 [T1]   −10.43 dBm
5.48306441 GHz

A

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.124 MHz/   Span 21.24 MHz
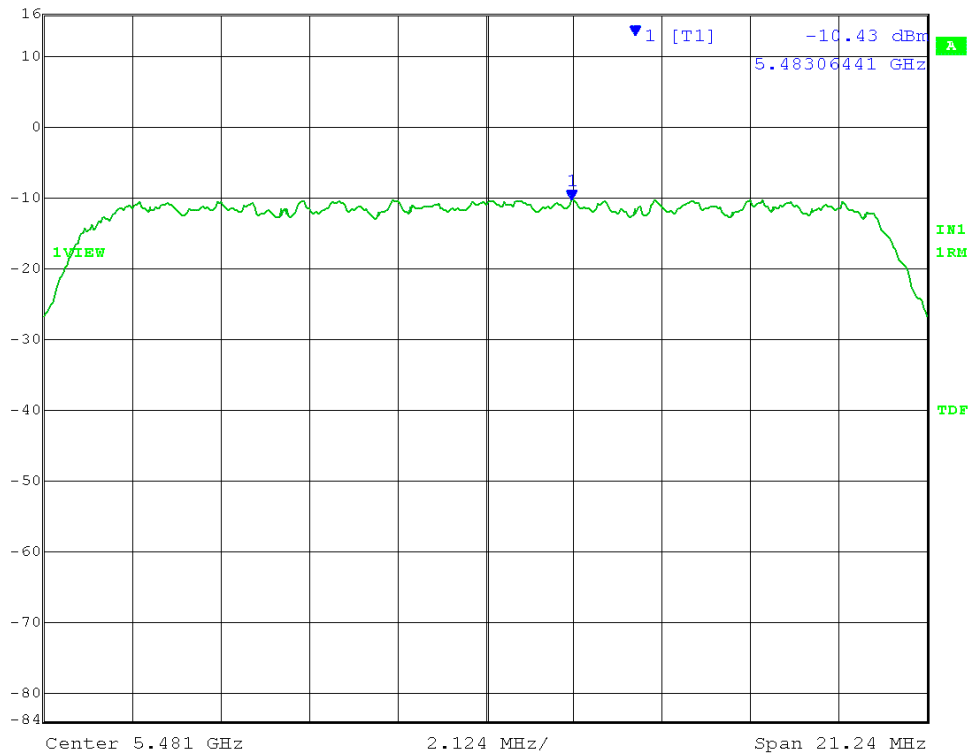
Date: 22.OCT.2013 11:42:10

TX1: 26 dB EBW = 21.24MHz

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

▼1 [T1]   −11.00 dBm
5.48608653 GHz

A

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.124 MHz/   Span 21.24 MHz

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

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

Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
16 dBm	−10.54 dBm	VBW	3 MHz		
−10 dBm	5.48247956 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   −10.54 dBm
5.48247956 GHz

1VIEW

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz

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

TX1: 26 dB EBW = 21.24MHz

Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
16 dBm	−10.87 dBm	VBW	3 MHz		
−10 dBm	5.48297928 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   −10.87 dBm
5.48297928 GHz

1VIEW

Center 5.481 GHz   2.124 MHz/   Span 21.24 MHz
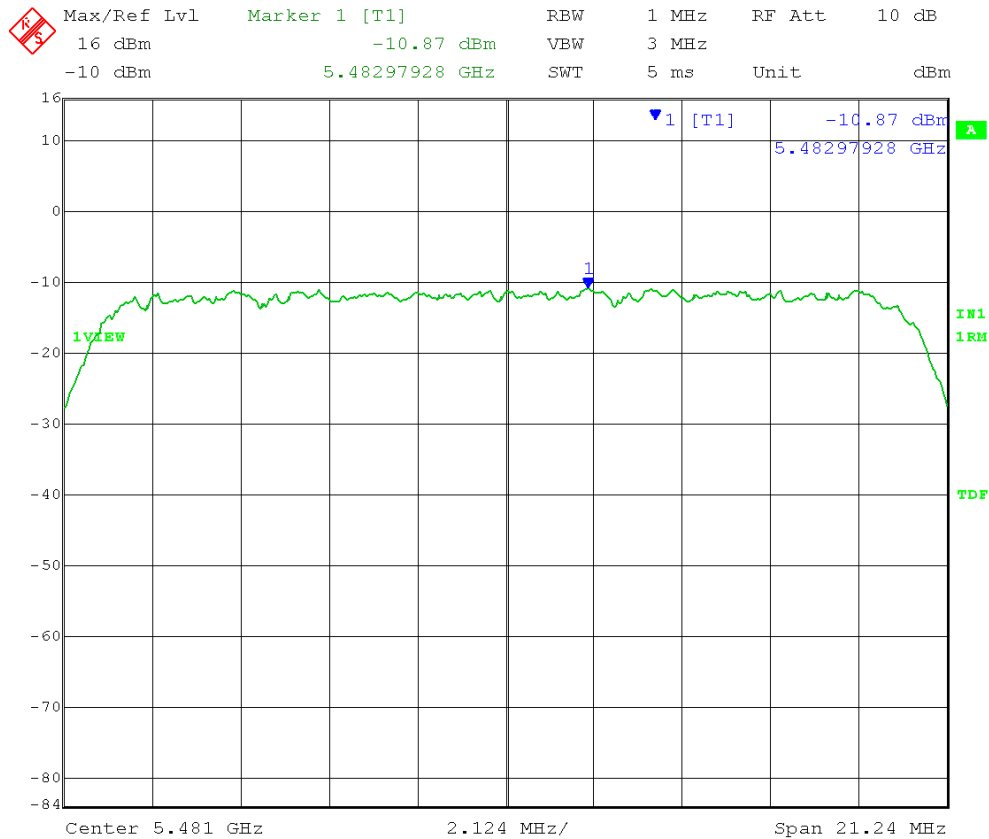
Date: 22.OCT.2013 12:46:11

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

Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
16 dBm	-10.62 dBm	VBW	3 MHz		
-10 dBm	5.48338016 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   -10.62 dBm
5.48338016 GHz

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz
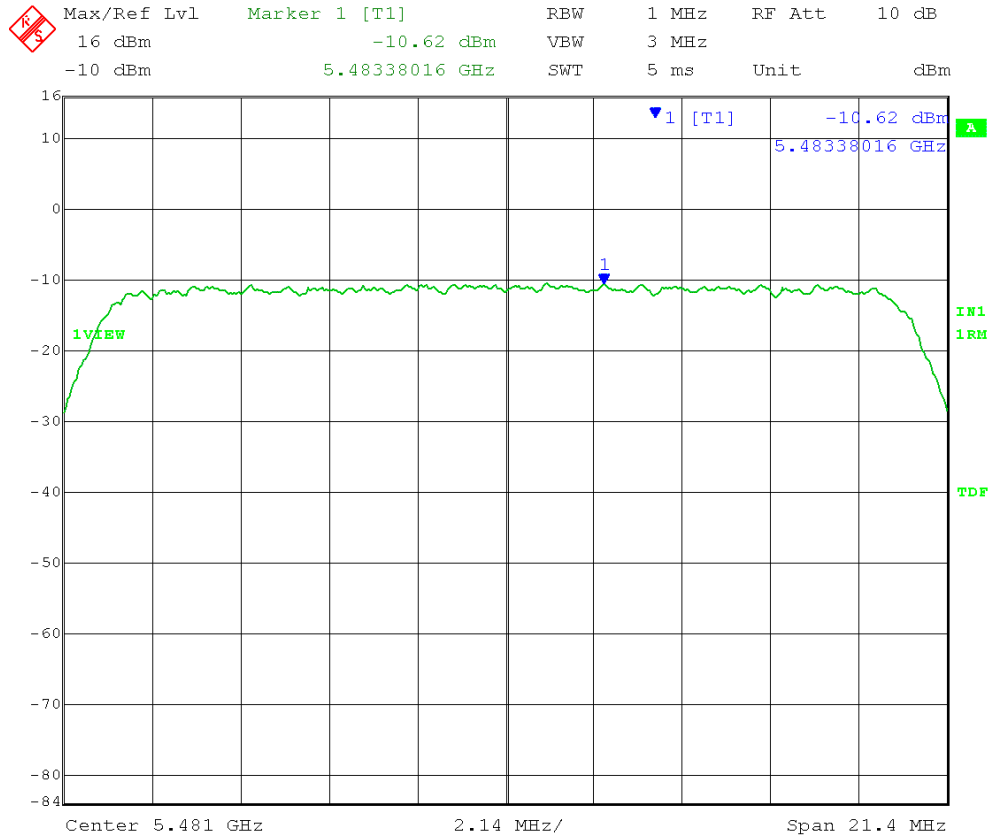
Date: 22.OCT.2013   11:34:39

TX1: 26 dB EBW = 21.40MHz
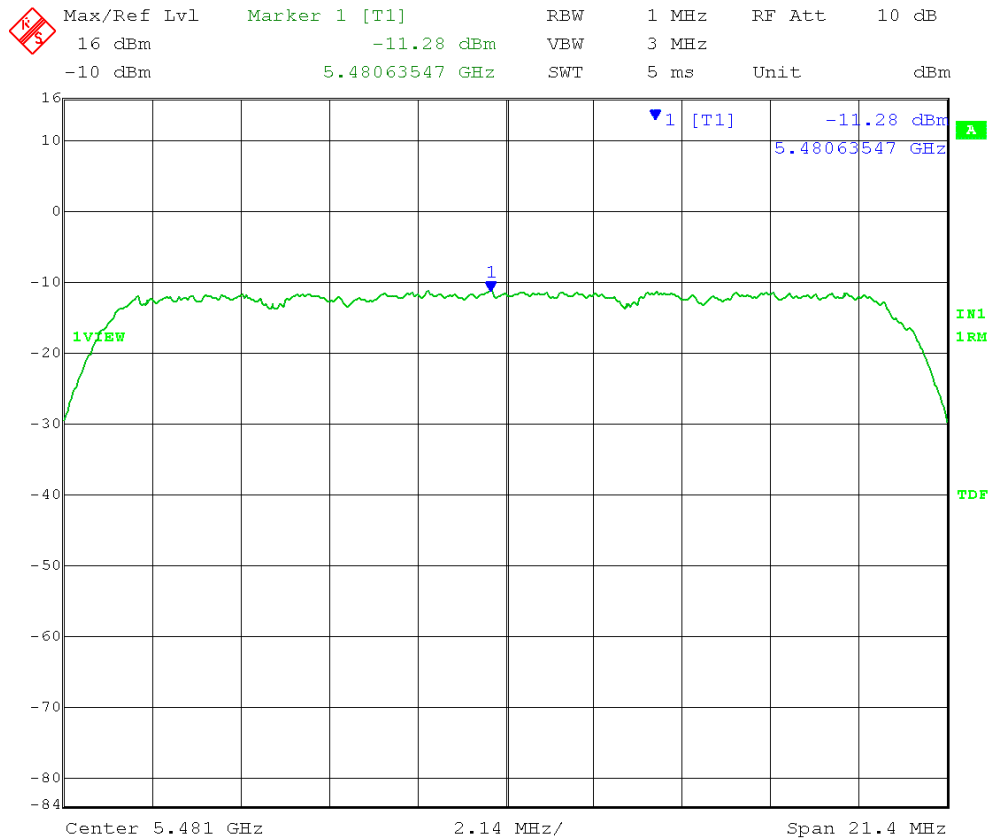
Max/Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
16 dBm	-11.28 dBm	VBW	3 MHz		
-10 dBm	5.48063547 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]   -11.28 dBm
5.48063547 GHz

1VIEW

IN1
1RM

TDF

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz

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

DLS
ELECTRONIC SYSTEMS, INC.
166 South Carter, Genoa City, WI 53128

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

Appendix – Measurement Data

7.0   Peak Excursion – Conducted

Rule Section: Section 15.407(a)(6)

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

Section G – Peak excursion measurement

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

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

Results: Passed

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

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

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

20MHz Operating Bandwidth:

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

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

Max/Ref Lvl	Marker 1 [T2]		RBW	1 MHz	RF Att	10 dB
16 dBm		0.14 dBm	VBW	3 MHz		
-10 dBm		5.71282064 GHz	SWT	5 ms	Unit	dBm

▼1 [T2]　　　　0.14 dBm
5.71282064 GHz

2VIEW

Center 5.714 GHz　　　　2.14 MHz/　　　　Span 21.4 MHz

Date:　　22.OCT.2013　15:30:51

Max/Ref Lvl	Marker 1 [T1]		RBW	1 MHz	RF Att	10 dB
16 dBm		-10.17 dBm	VBW	3 MHz		
-10 dBm		5.71054770 GHz	SWT	5 ms	Unit	dBm

▼1 [T1]　　　　-10.17 dBm
5.71054770 GHz

1VIEW

Center 5.714 GHz　　　　2.14 MHz/　　　　Span 21.4 MHz
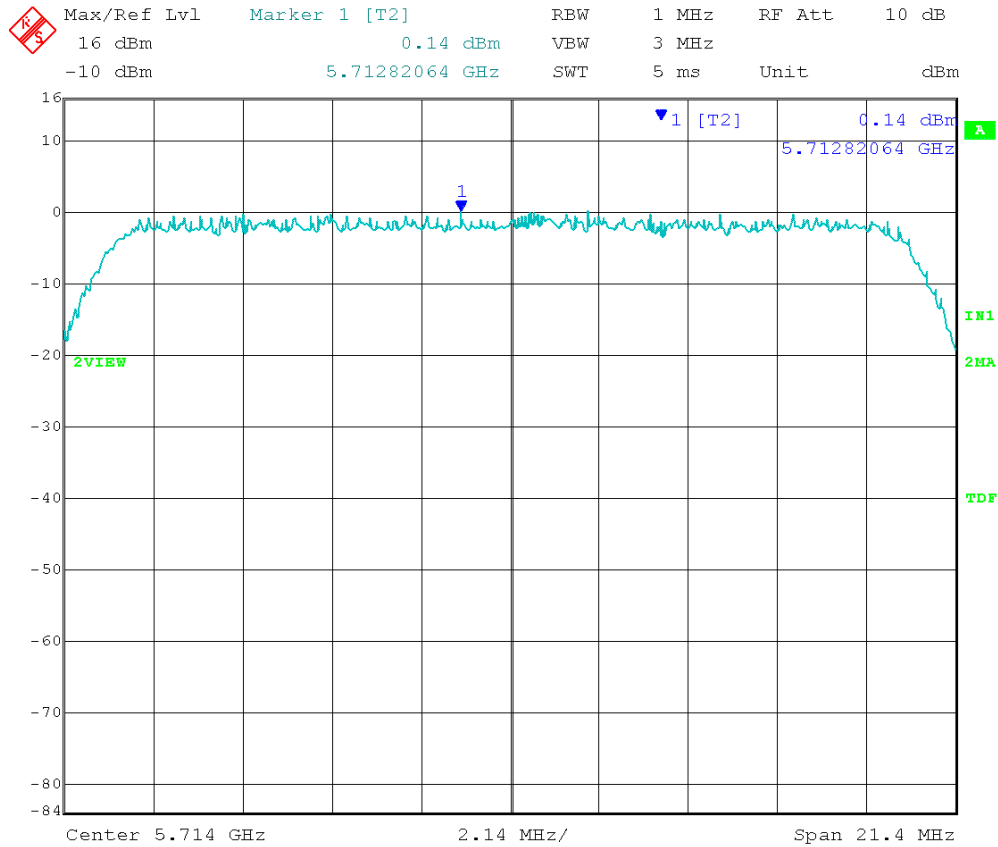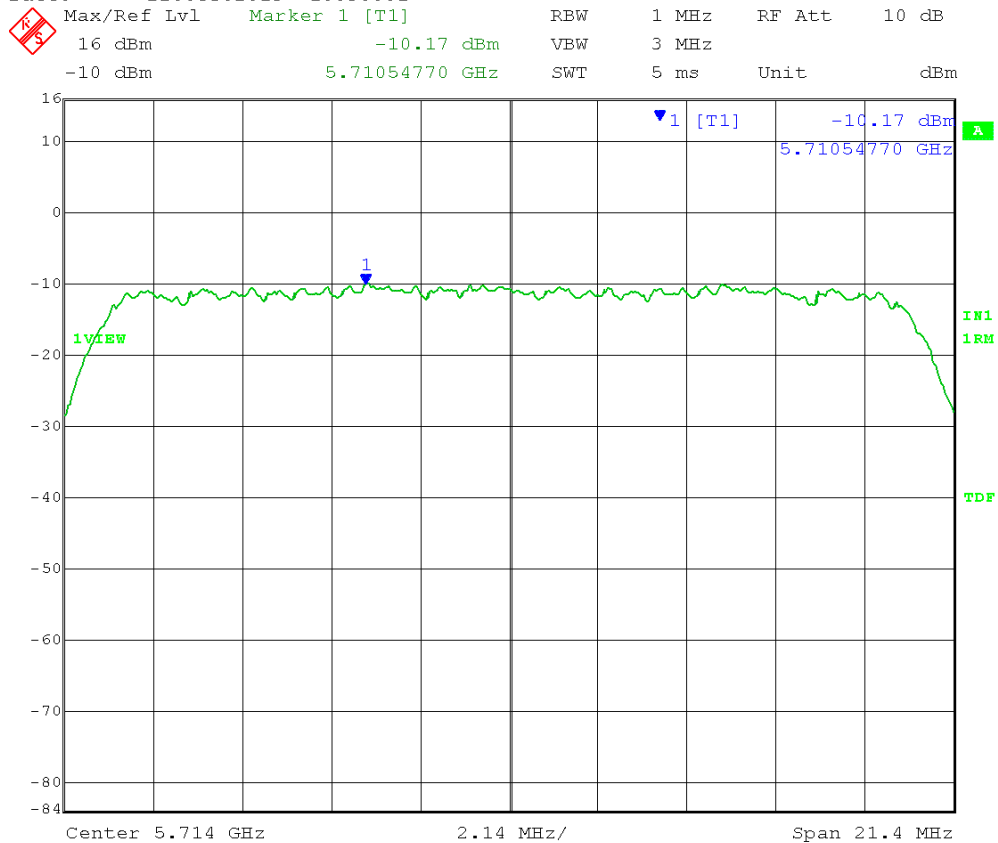
Date:　　22.OCT.2013　12:30:44

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
16 dBm   -0.88 dBm   VBW   3 MHz
-10 dBm   5.71082890 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   -0.88 dBm
5.71082890 GHz

A

IN1

2MA

TDF

2VIEW

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

Date: 22.OCT.2013 15:32:01

Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
16 dBm   -10.11 dBm   VBW   3 MHz
-10 dBm   5.70976477 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.11 dBm
5.70976477 GHz

A

IN1

1RM

TDF

1VIEW

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

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

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

Max/Ref Lvl	Marker 1 [T2]		RBW	1 MHz	RF Att	10 dB
16 dBm		-1.18 dBm	VBW	3 MHz		
-10 dBm		5.71759675 GHz	SWT	5 ms	Unit	dBm

▼1 [T2]   -1.18 dBm
5.71759675 GHz

A

IN1

2MA

TDF

2VIEW

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

Date: 22.OCT.2013   15:33:29

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

▼1 [T1]   -10.24 dBm
5.71168020 GHz

A

IN1

1RM

TDF

1VIEW

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
  16 dBm   -1.30 dBm   VBW   3 MHz
 -10 dBm   5.71385102 GHz   SWT   5 ms   Unit   dBm

```
16
                                                    ▼1 [T2]              -1.30 dBm    ▐A▌
10                                                           5.71385102 GHz
             1
 0  ╥──┬──┬─────────────────────────▼─────────────────────────────────┬──
-10
                                                                                     IN1
-20  2VIEW                                                                            2MA
-30
-40                                                                                  TDF
-50
-60
-70
-80
-84
     Center 5.714 GHz            2.124 MHz/              Span 21.24 MHz
```

Date: 22.OCT.2013 15:34:13

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

```
16
                                                    ▼1 [T1]             -10.04 dBm    ▐A▌
10                                                           5.71674545 GHz
 0
                                          1
-10                                       ▼
                                                                                     IN1
-20  1VIEW                                                                            1RM
-30
-40                                                                                  TDF
-50
-60
-70
-80
-84
     Center 5.714 GHz            2.124 MHz/              Span 21.24 MHz
```

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -0.76 dBm   VBW   3 MHz
-10 dBm   5.71163764 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   -0.76 dBm
5.71163764 GHz

2VIEW

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz

Date: 22.OCT.2013 15:30:07

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

▼1 [T1]   -10.09 dBm
5.71670289 GHz

1VIEW

Center 5.714 GHz   2.124 MHz/   Span 21.24 MHz
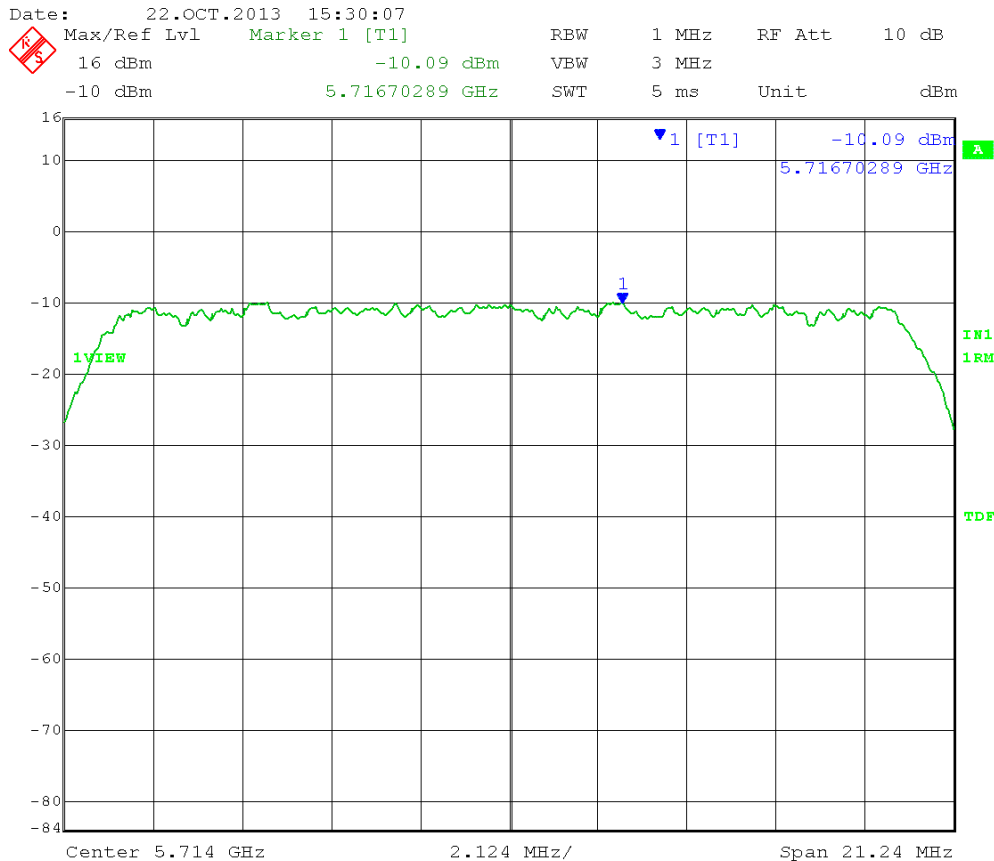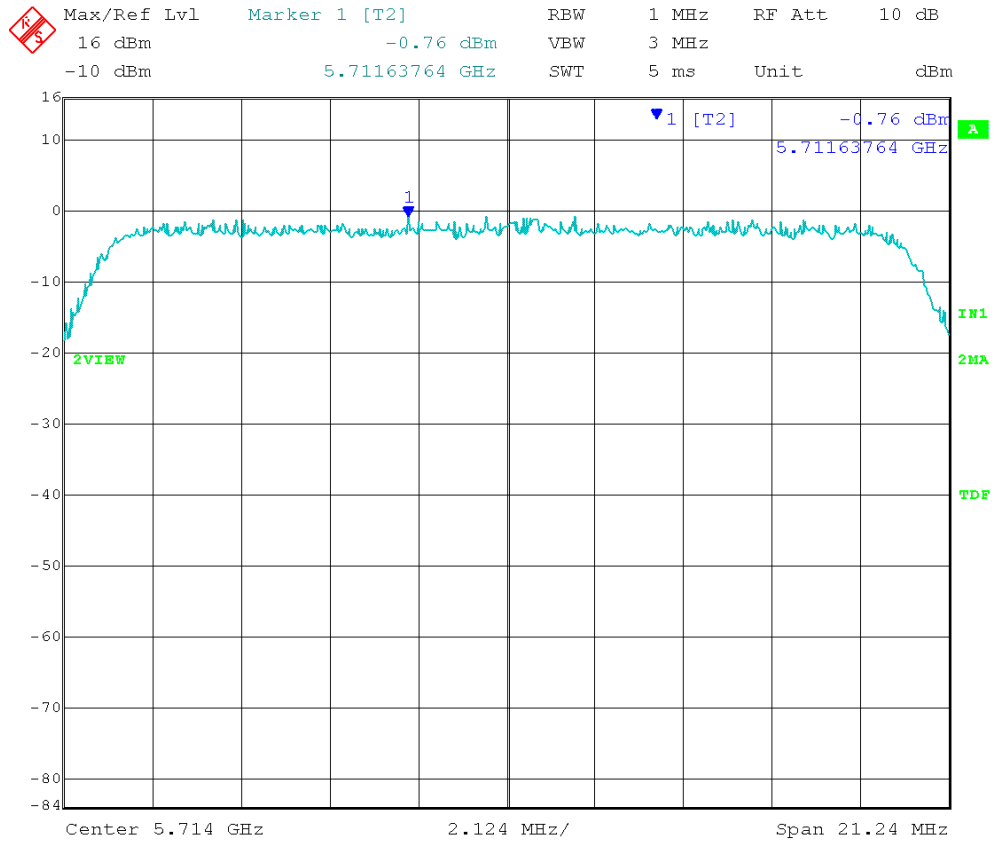
Date: 22.OCT.2013 12:29:23

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -1.80 dBm   VBW   3 MHz
-10 dBm   5.57729439 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   -1.80 dBm A
5.57729439 GHz

16
10
0
-10
-20   2VIEW
-30
-40
-50
-60
-70
-80
-84

IN1
2MA

TDF

Center 5.575 GHz   2.14 MHz/   Span 21.4 MHz

Date: 22.OCT.2013 15:27:18

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

▼1 [T1]   -10.71 dBm A
5.57823788 GHz

16
10
0
-10
-20   1VIEW
-30
-40
-50
-60
-70
-80
-84

IN1
1RM

TDF

Center 5.575 GHz   2.14 MHz/   Span 21.4 MHz

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -1.81 dBm   VBW   3 MHz
-10 dBm   5.57361142 GHz   SWT   5 ms   Unit   dBm

```
16                                              ▼1 [T2]        -1.81 dBm   A
10                                                      5.57361142 GHz
 0                          1▼
-10
-20  2VIEW                                                              IN1
                                                                       2MA
-30
-40                                                                    TDF
-50
-60
-70
-80
-84
```

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz

Date: 22.OCT.2013 15:26:40

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

```
16                                              ▼1 [T1]       -10.75 dBm   A
10                                                      5.57925118 GHz
 0
-10                                           1▼
-20  1VIEW                                                              IN1
                                                                       1RM
-30
-40                                                                    TDF
-50
-60
-70
-80
-84
```

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -1.63 dBm   VBW   3 MHz
-10 dBm   5.57800084 GHz   SWT   5 ms   Unit   dBm

```
16 ┌─────────────────────────────────────────────────────────┐ A
   │                                      ▼1 [T2]      -1.63 dBm│
10 ┤                                         5.57800084 GHz    │
   │                                                           │
 0 ┤        ╷         1                                        │
   │                                                           │ IN1
-10┤                                                           │
   │                                                           │ 2MA
-20┤2VIEW                                                      │
   │                                                           │
-30┤                                                           │
   │                                                           │
-40┤                                                           │ TDF
   │                                                           │
-50┤                                                           │
   │                                                           │
-60┤                                                           │
   │                                                           │
-70┤                                                           │
   │                                                           │
-80┤                                                           │
-84└─────────────────────────────────────────────────────────┘
```
  Center 5.575 GHz   2.124 MHz/   Span 21.24 MHz

Date: 22.OCT.2013 15:25:42

Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -10.94 dBm   VBW   3 MHz
-10 dBm   5.57574489 GHz   SWT   5 ms   Unit   dBm

```
16 ┌─────────────────────────────────────────────────────────┐ A
   │                                    ▼1 [T1]     -10.94 dBm │
10 ┤                                       5.57574489 GHz      │
   │                                                           │
 0 ┤                                                           │
   │                                  1                        │ IN1
-10┤                                  ▼                        │
   │                                                           │ 1RM
-20┤1VIEW                                                      │
   │                                                           │
-30┤                                                           │
   │                                                           │
-40┤                                                           │ TDF
   │                                                           │
-50┤                                                           │
   │                                                           │
-60┤                                                           │
   │                                                           │
-70┤                                                           │
   │                                                           │
-80┤                                                           │
-84└─────────────────────────────────────────────────────────┘
```
  Center 5.575 GHz   2.124 MHz/   Span 21.24 MHz

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -1.07 dBm   VBW   3 MHz
-10 dBm   5.57485158 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   -1.07 dBm
5.57485158 GHz

2VIEW

Center 5.575 GHz   2.116 MHz/   Span 21.16 MHz

Date: 22.OCT.2013 15:24:53

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

▼1 [T1]   -10.93 dBm
5.57960092 GHz

1VIEW

Center 5.575 GHz   2.116 MHz/   Span 21.16 MHz
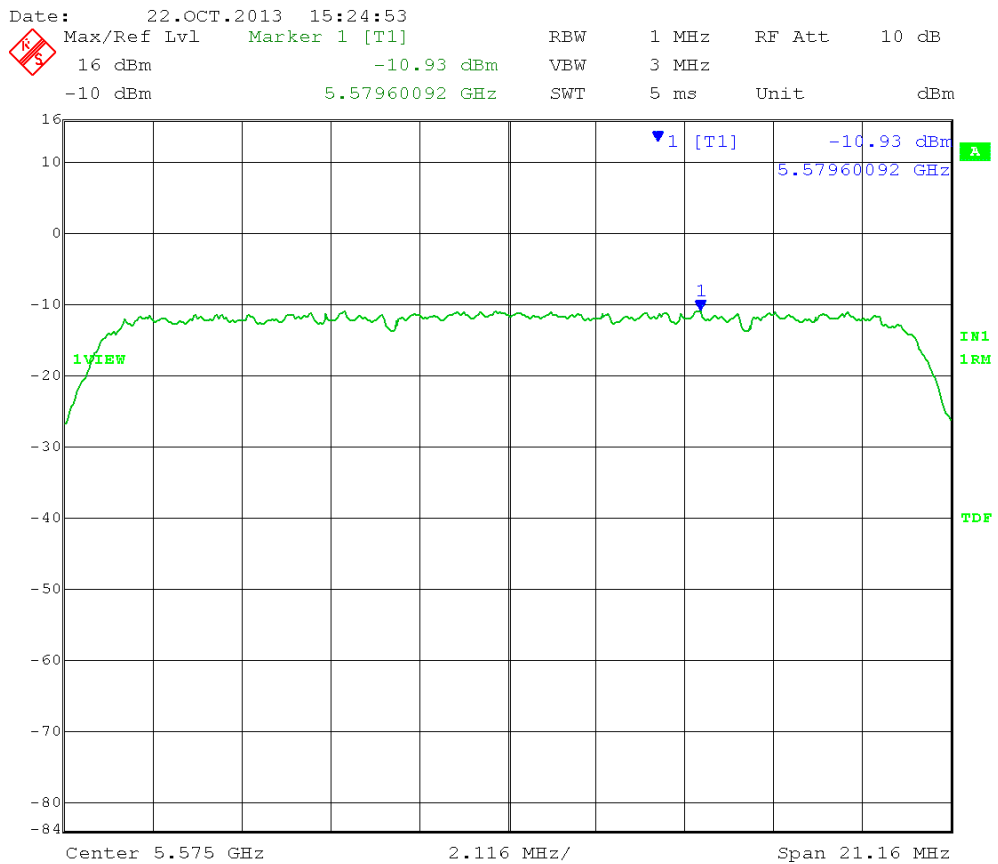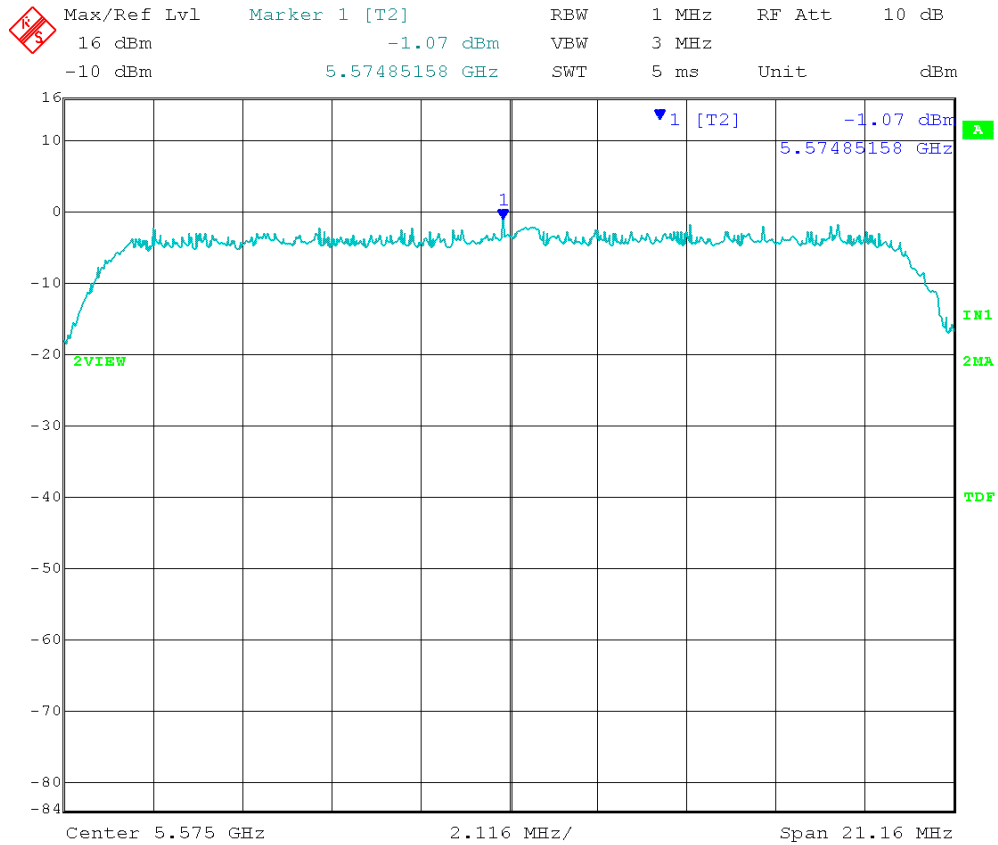
Date: 22.OCT.2013 12:22:12

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -2.09 dBm   VBW   3 MHz
-10 dBm   5.57626040 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   -2.09 dBm
                           5.57626040 GHz

A

IN1
2MA
2VIEW
TDF

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz

Date: 22.OCT.2013   15:29:00

Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -10.93 dBm   VBW   3 MHz
-10 dBm   5.57912301 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.93 dBm
                          5.57912301 GHz

A

IN1
1RM
1VIEW
TDF

Center 5.575 GHz   2.132 MHz/   Span 21.32 MHz

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

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

Max/Ref Lvl	Marker 1 [T2]		RBW	1 MHz	RF Att	10 dB
16 dBm		0.61 dBm	VBW	3 MHz		
-10 dBm		5.47807331 GHz	SWT	5 ms	Unit	dBm

```
16 |                                              ▼1 [T2]        0.61 dBm  A
10 |                                                       5.47807331 GHz
   |                    1
 0 |---------ʌ̯ʍ̩ʌʍ̩ʍ̩ʌ̯ʍ̩----▼----ʍ̩ʌ̯ʍ̩-----ʍ̩ʌ̯ʍ̩ʌʍ̩ʌ̯----------
   |                                                              IN1
-10|
   |                                                              2MA
-20| 2VIEW
-30|
-40|                                                              TDF
-50|
-60|
-70|
-80|
-84|
   Center 5.481 GHz          2.132 MHz/          Span 21.32 MHz
```

Date: 22.OCT.2013 15:21:51

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

```
16 |                                              ▼1 [T1]      -10.37 dBm  A
10 |                                                       5.48003868 GHz
   |
 0 |
   |                    1
-10|--------ʍ̩ʌ̯ʍ̩ʍ̩ʌ̯ʍ̩----▼----ʍ̩ʌ̯ʍ̩ʌ̯ʍ̩ʌ̯ʍ̩----------        IN1
   |                                                              1RM
-20| 1VIEW
-30|
-40|                                                              TDF
-50|
-60|
-70|
-80|
-84|
   Center 5.481 GHz          2.132 MHz/          Span 21.32 MHz
```

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   −0.13 dBm   VBW   3 MHz
−10 dBm   5.47572341 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   −0.13 dBm
                     5.47572341 GHz   A

2VIEW   IN1
                                                                     2MA

                                                                     TDF

Center 5.481 GHz   2.132 MHz/   Span 21.32 MHz

Date: 22.OCT.2013   15:22:31

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

▼1 [T1]   −10.31 dBm
                     5.48546481 GHz   A

1VIEW   IN1
                                                                     1RM

                                                                     TDF

Center 5.481 GHz   2.132 MHz/   Span 21.32 MHz

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
  16 dBm   0.12 dBm   VBW   3 MHz
 -10 dBm   5.48089359 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   0.12 dBm
5.48089359 GHz

Center 5.481 GHz   2.124 MHz/   Span 21.24 MHz

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

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

▼1 [T1]   -10.43 dBm
5.48306441 GHz

Center 5.481 GHz   2.124 MHz/   Span 21.24 MHz
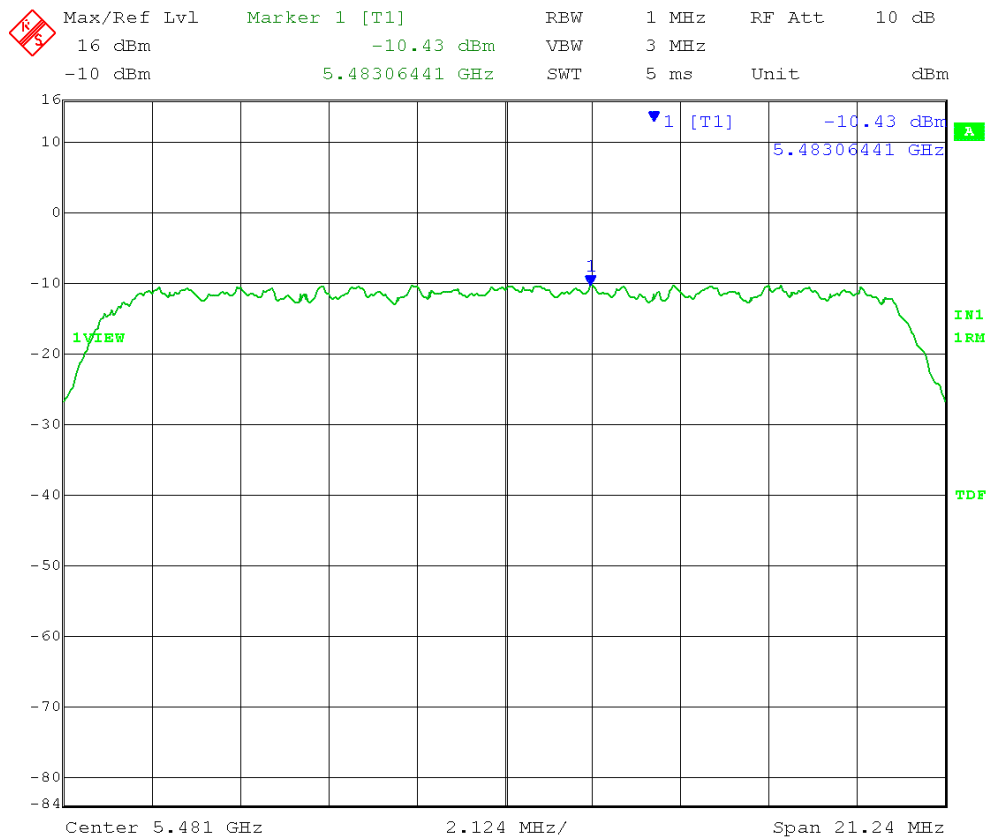
Date: 22.OCT.2013   11:42:10

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -0.05 dBm   VBW   3 MHz
-10 dBm   5.48093567 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   -0.05 dBm
5.48093567 GHz

A

IN1

2VIEW   2MA

TDF

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz

Date: 22.OCT.2013   15:23:58

Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -10.54 dBm   VBW   3 MHz
-10 dBm   5.48247956 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.54 dBm
5.48247956 GHz

A

IN1

1VIEW   1RM

TDF

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz

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

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

Max/Ref Lvl   Marker 1 [T2]   RBW   1 MHz   RF Att   10 dB
 16 dBm   0.15 dBm   VBW   3 MHz
-10 dBm   5.48518136 GHz   SWT   5 ms   Unit   dBm

▼1 [T2]   0.15 dBm
                           5.48518136 GHz

2VIEW

IN1
2MA
TDF

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz

Date: 22.OCT.2013   15:21:14
Max/Ref Lvl   Marker 1 [T1]   RBW   1 MHz   RF Att   10 dB
 16 dBm   -10.62 dBm   VBW   3 MHz
-10 dBm   5.48338016 GHz   SWT   5 ms   Unit   dBm

▼1 [T1]   -10.62 dBm
                         5.48338016 GHz

1VIEW

IN1
1RM
TDF

Center 5.481 GHz   2.14 MHz/   Span 21.4 MHz

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

166 South Carter, Genoa City, WI 53128

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

Appendix – Measurement Data

8.0   Unwanted Emission Levels – Radiated Operating Band-Edge
Radiated with antenna connected

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

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

Section H – Unwanted emission levels
Section H(2) – Unwanted emissions that fall outside of the restricted bands
Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(3)(d)(ii) – Band edge measurements, Integration method
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1
        GHz

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

Standard method: (needed for the 20MHz BW)
        RBW = 1 MHz
        VBW ≥ 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 ≥ 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.
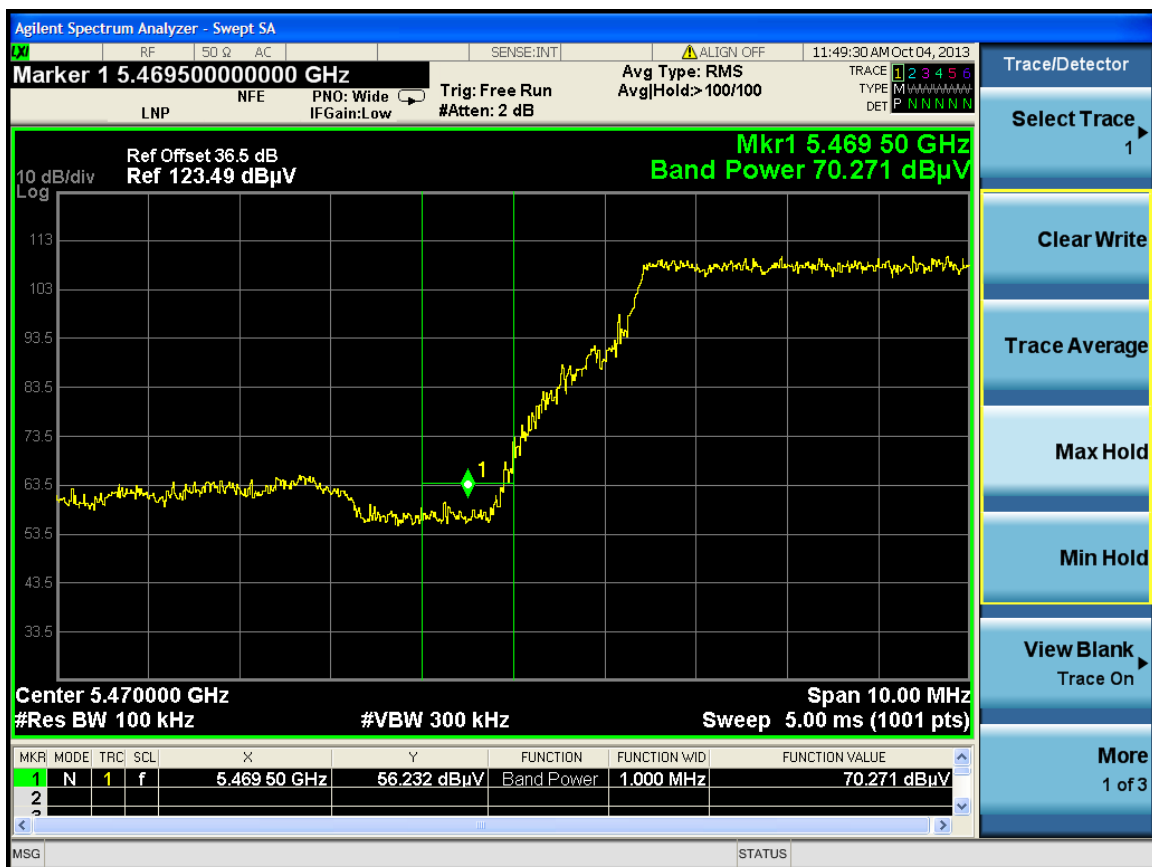Test distance was 1 meter.

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: 20 MHz channel Bandwidth
      Low Channel: Frequency – 5481 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[dBμV/m] + 20 log(d[meters]) - 104.77
      = 71.086 dBμV/m + 20 log(1 meter) - 104.77
      = **-33.68 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)

Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                         = 74.778 dBµV/m + 20 log(1 meter) - 104.77
                         = **-29.99 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
                (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                Low Channel: Frequency – 5481 MHz
                Modulation: 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: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                    = 71.039 dBµV/m + 20 log(1 meter) - 104.77
                    = **-33.73 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
                                = 74.915 dBμV/m + 20 log(1 meter) - 104.77
                                = **-29.85 dBm/MHz**
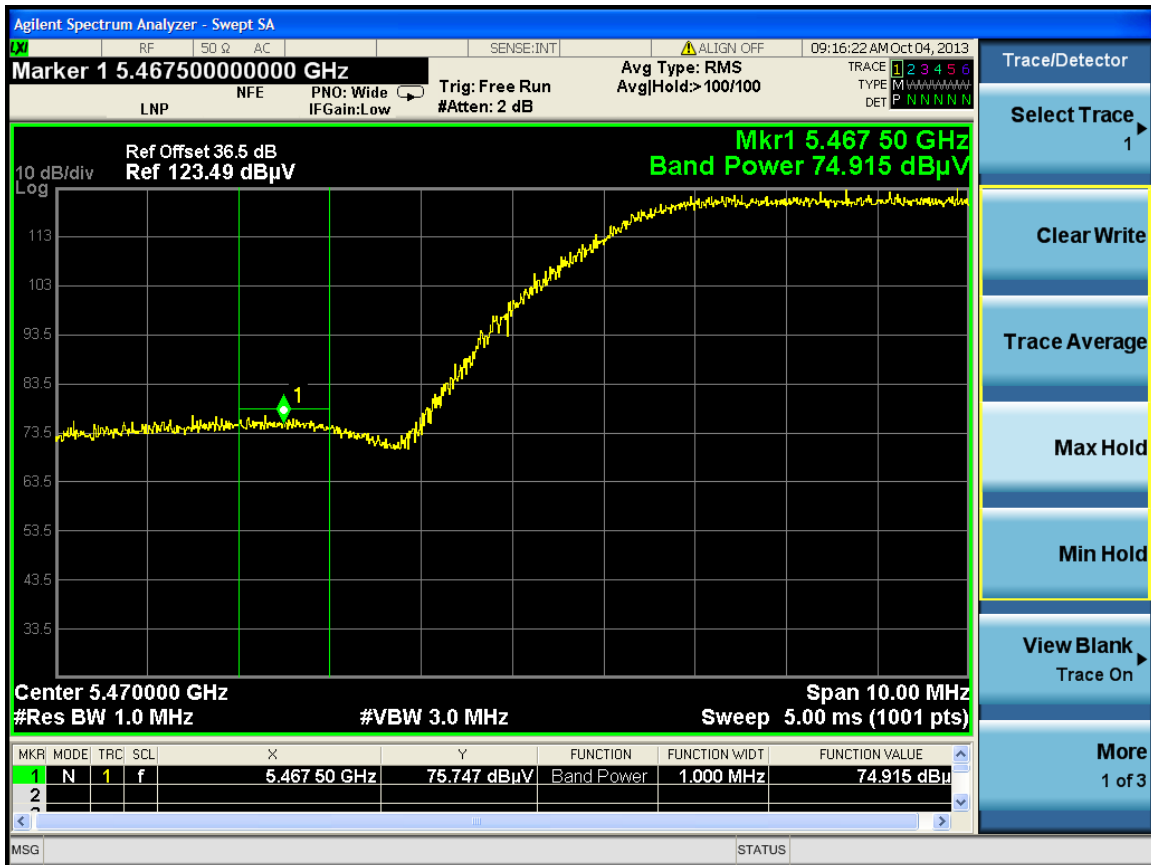
Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
              (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
              Low Channel: Frequency – 5481 MHz
              Modulation: 64QAM
              Horizontal
              Operating Band-Edge Frequency: 5470 MHz
              Band-Edge Limit: -27 dBm/MHz
              Test method: Integration
              Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
                      = 70.196 dBμV/m + 20 log(1 meter) - 104.77
                      = -34.57 dBm/MHz
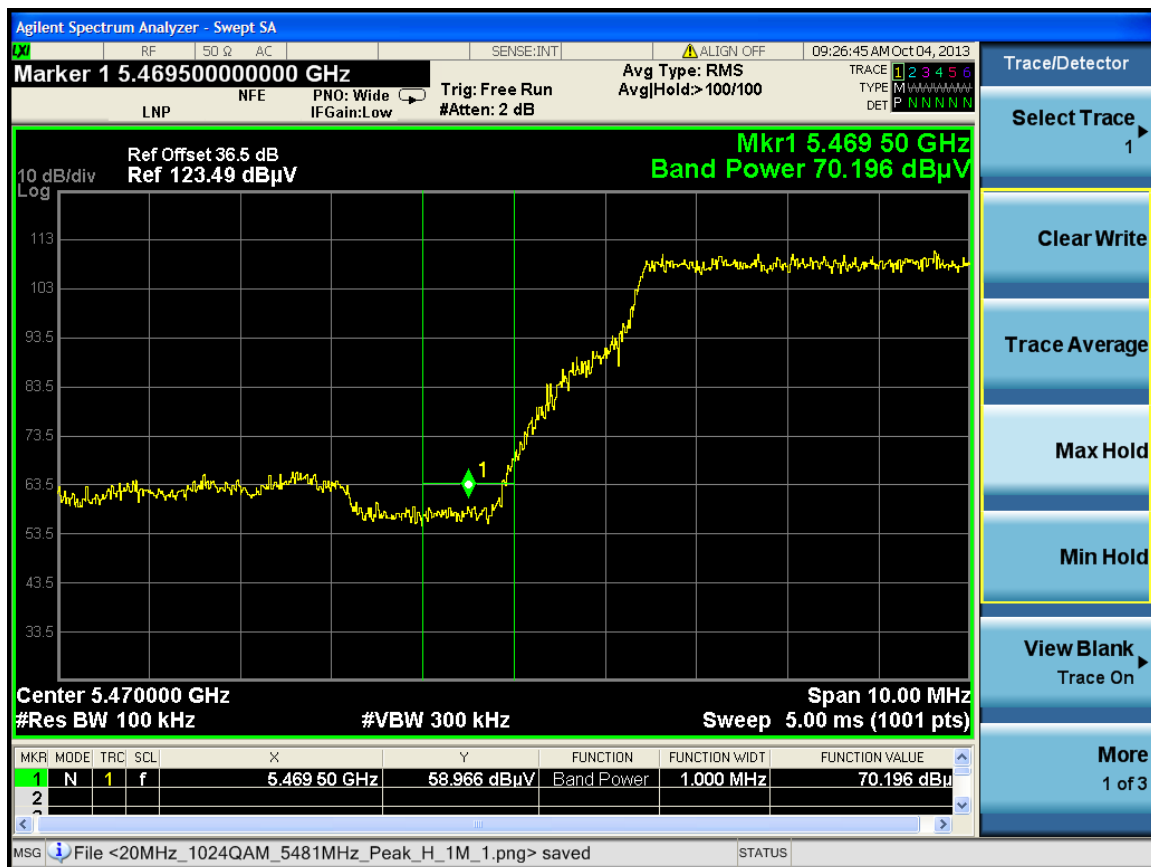
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
= 75.033 dBµV/m + 20 log(1 meter) - 104.77
= **-29.73 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
                (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                Low Channel: Frequency – 5481 MHz
                Modulation: 256QAM
                Horizontal
                Operating Band-Edge Frequency: 5470 MHz
                Band-Edge Limit: -27 dBm/MHz
                Test method: Integration
                Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                    = 70.466 dBµV/m + 20 log(1 meter) - 104.77
                    = -34.30 dBm/MHz
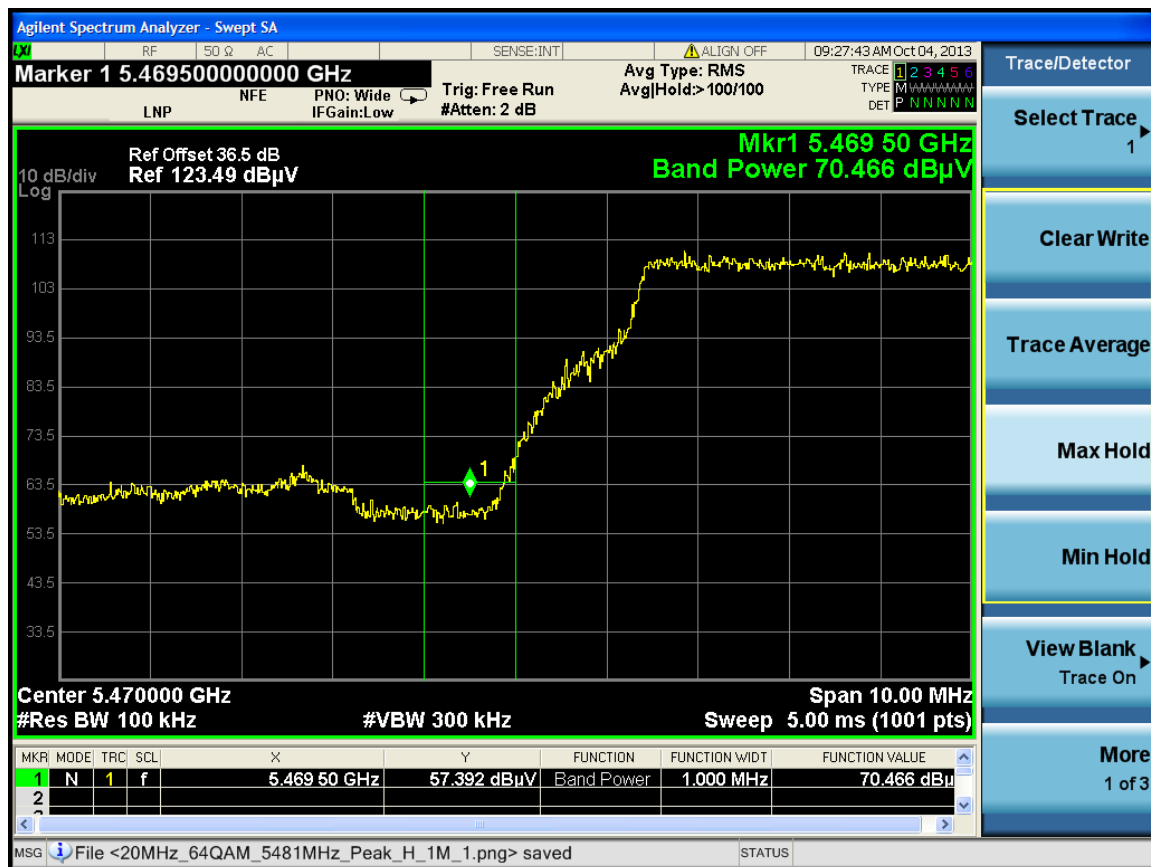
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                   = 75.024 dBµV/m + 20 log(1 meter) - 104.77
                   = **-29.74 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5481 MHz
Modulation: 1024QAM
Horizontal
Operating Band-Edge Frequency: 5470 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
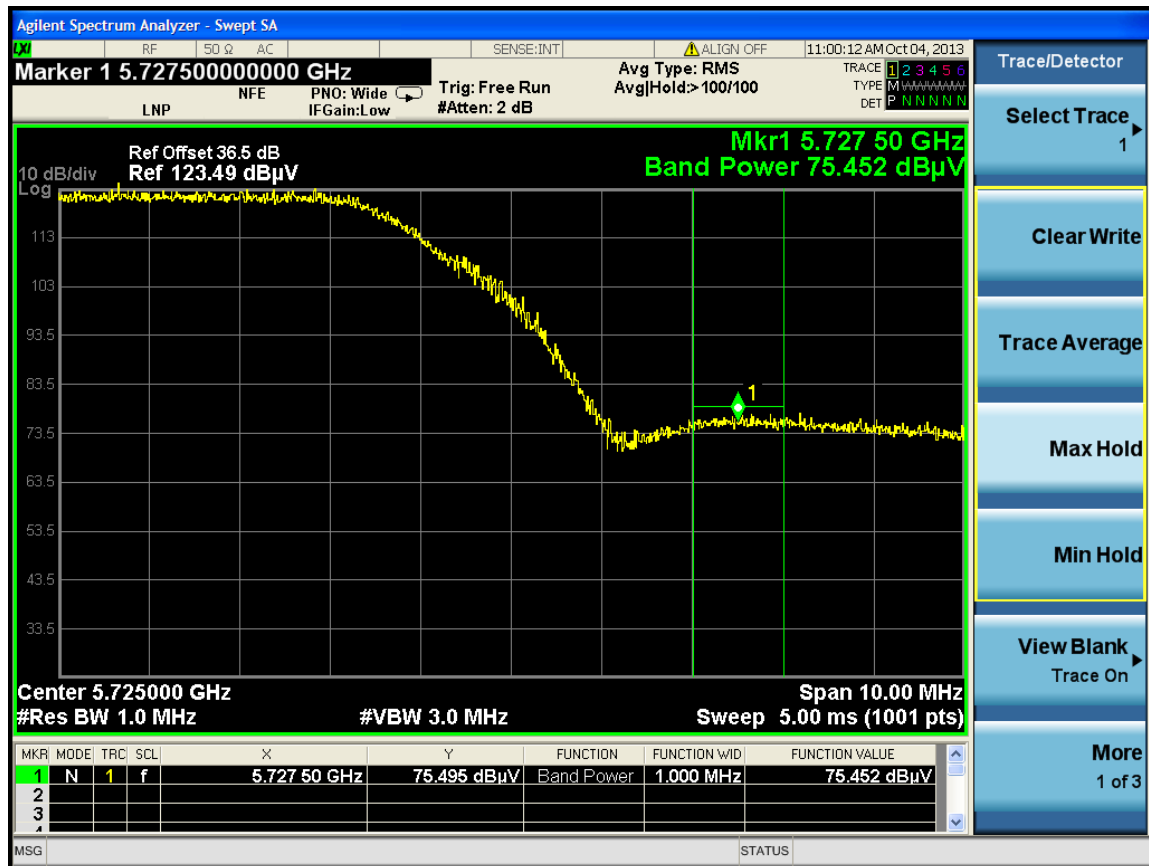Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$
$= 70.496 \ dB\mu V/m + 20 \log(1 \ meter) - 104.77$
$= -34.27 \ dBm/MHz$
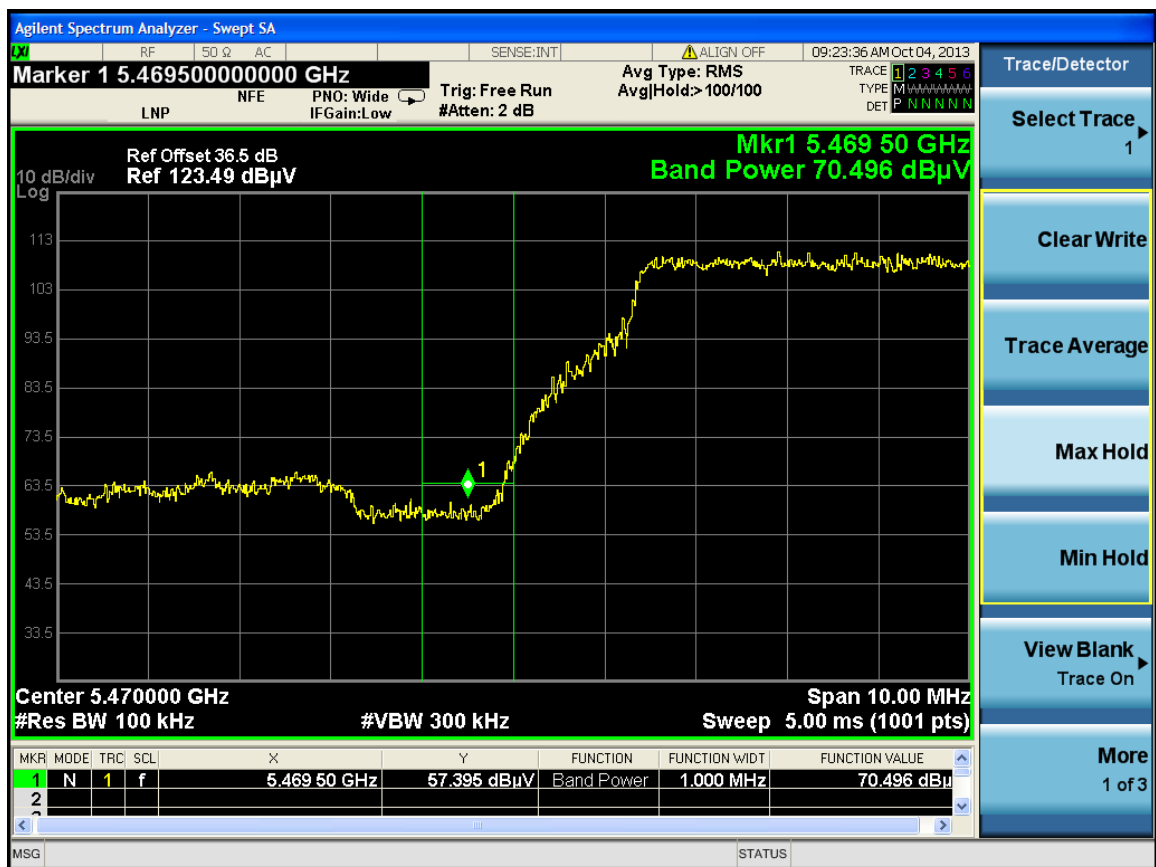
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                   = 74.767 dBµV/m + 20 log(1 meter) - 104.77
                   = **-30.00 dBm/MHz**
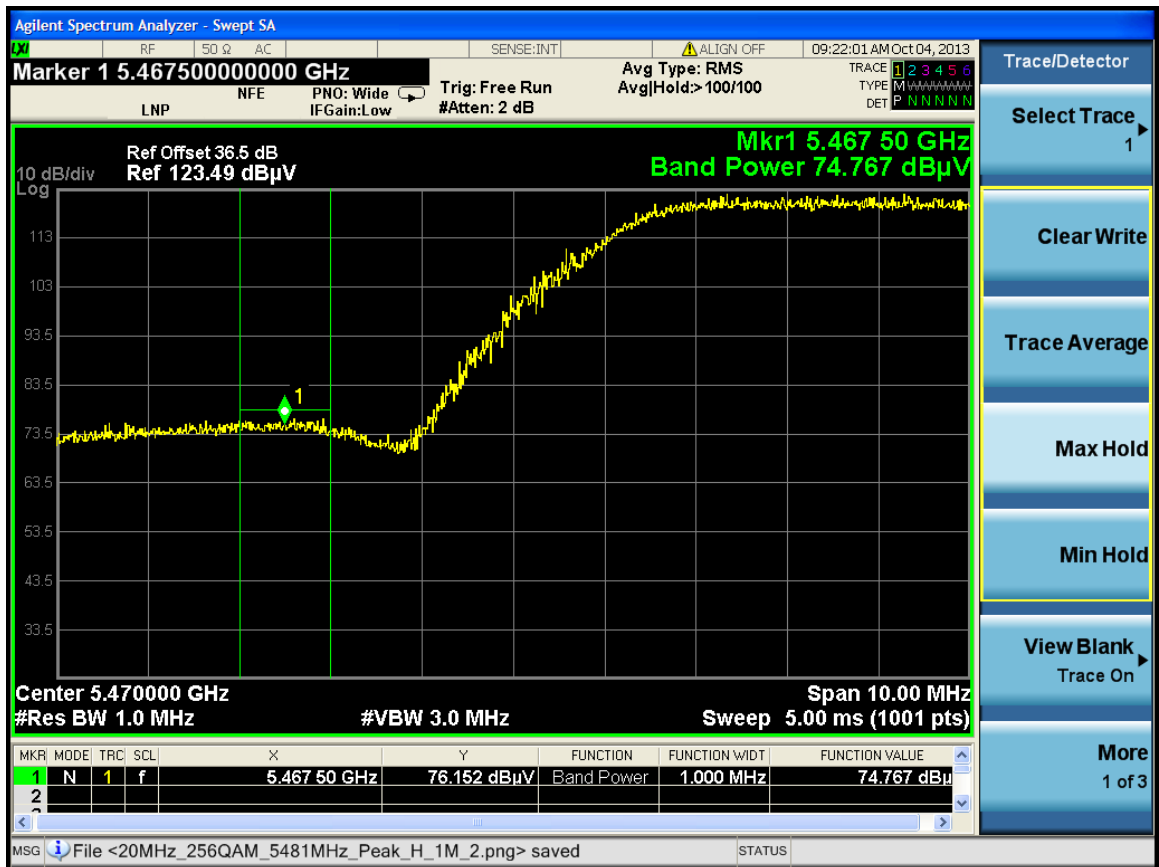
Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
    (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
    Low Channel: Frequency – 5481 MHz
    Modulation: QPSK
    Vertical
    Operating Band-Edge Frequency: 5470 MHz
    Band-Edge Limit: -27 dBm/MHz
    Test method: Integration
    Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
    = 69.903 dBµV/m + 20 log(1 meter) - 104.77
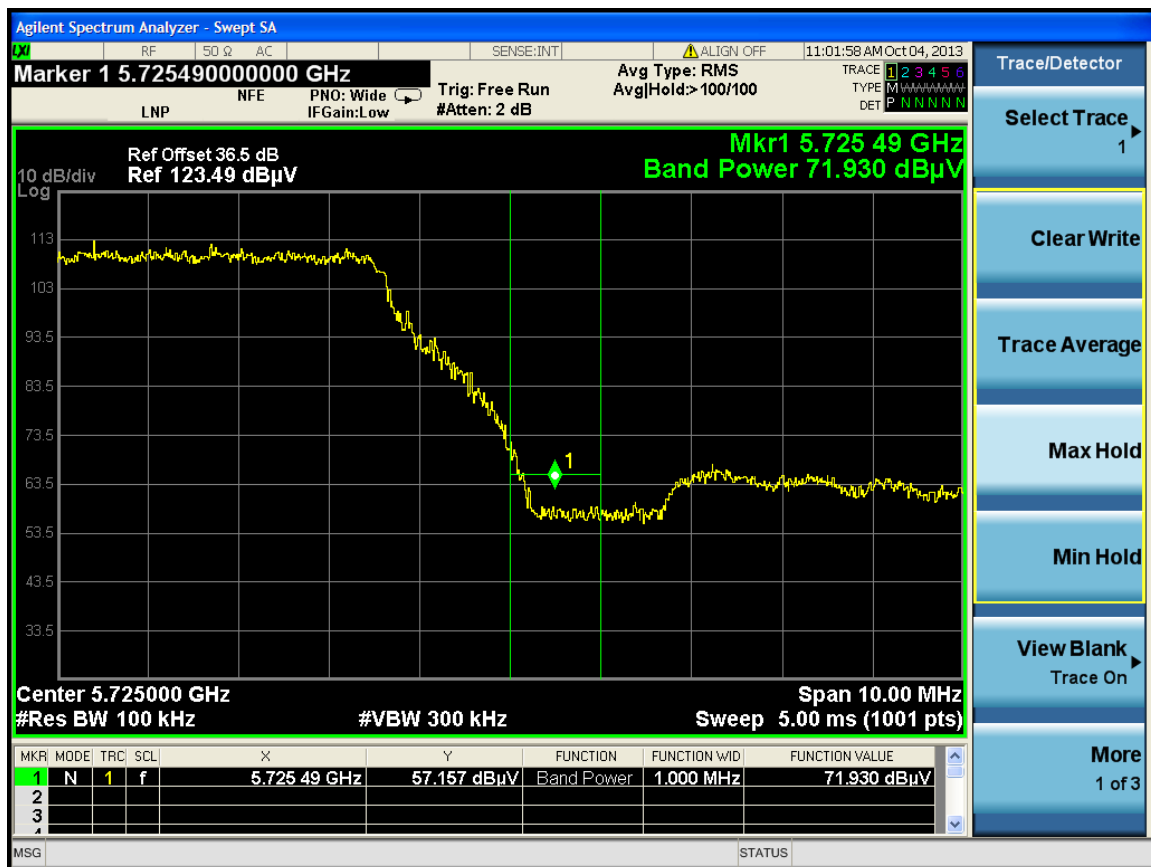   **= -34.86 dBm/MHz**
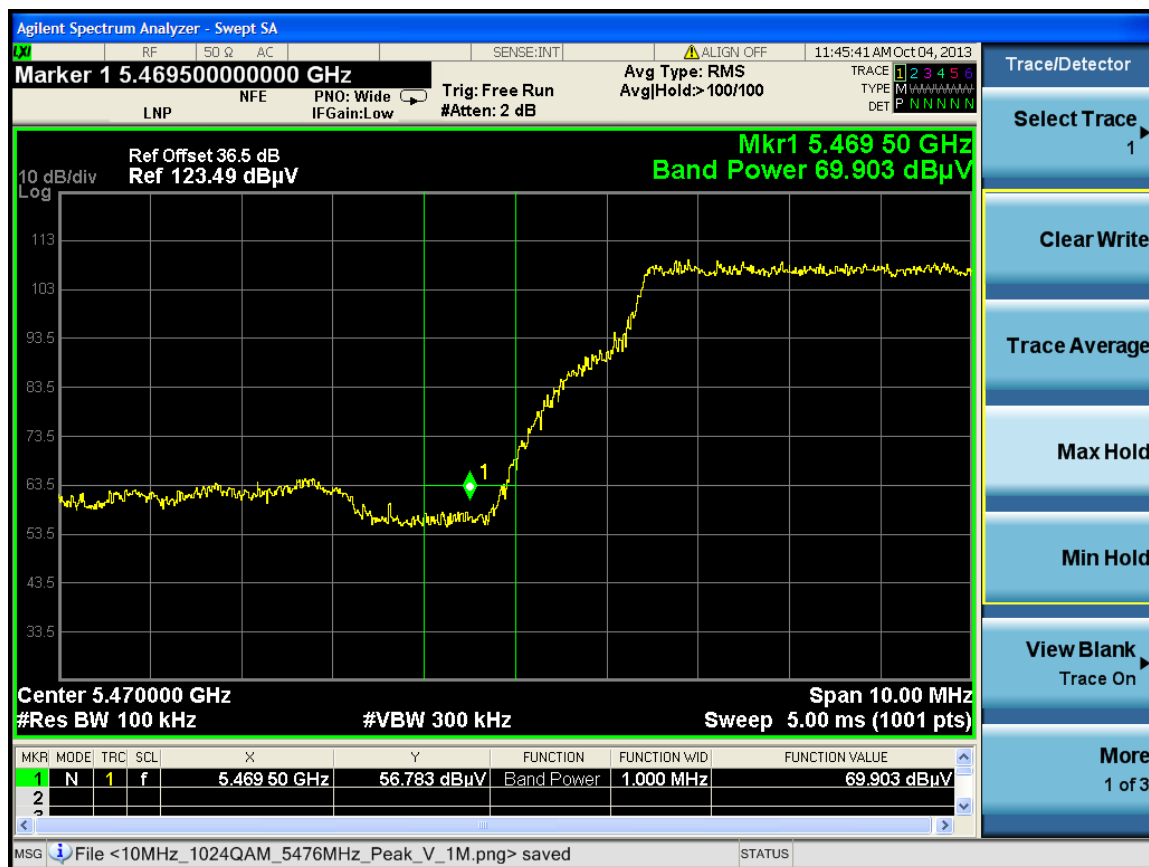
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                              = 74.278 dBµV/m + 20 log(1 meter) - 104.77
                              = **-30.49 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
Low Channel: Frequency – 5481 MHz
Modulation: 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: $\text{EIRP[dBm]} = \text{E[dBμV/m]} + 20 \log(d\text{[meters]}) - 104.77$
$= 70.482 \text{ dBμV/m} + 20 \log(1 \text{ meter}) - 104.77$
= -34.28 dBm/MHz
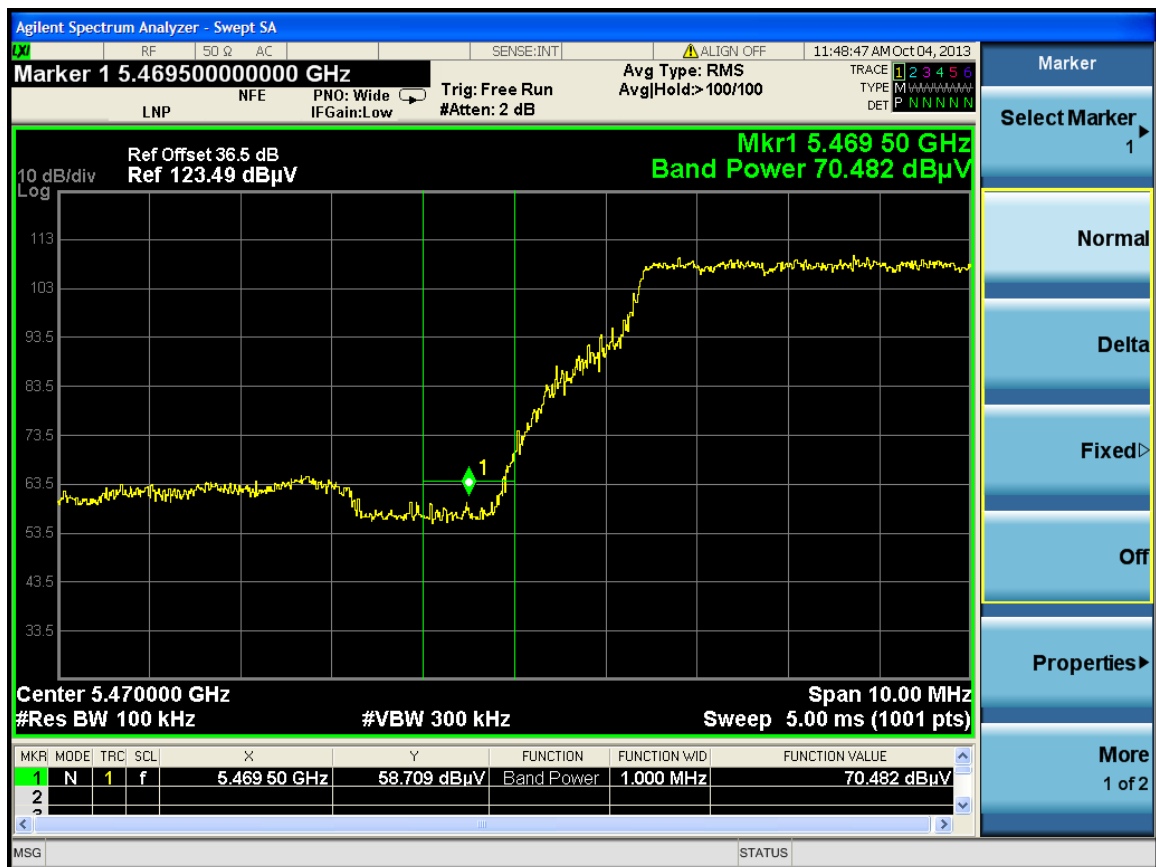
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(\text{d[meters]}) - 104.77$
                 $= 74.075 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$
                 $= \textbf{-30.69 dBm/MHz}$

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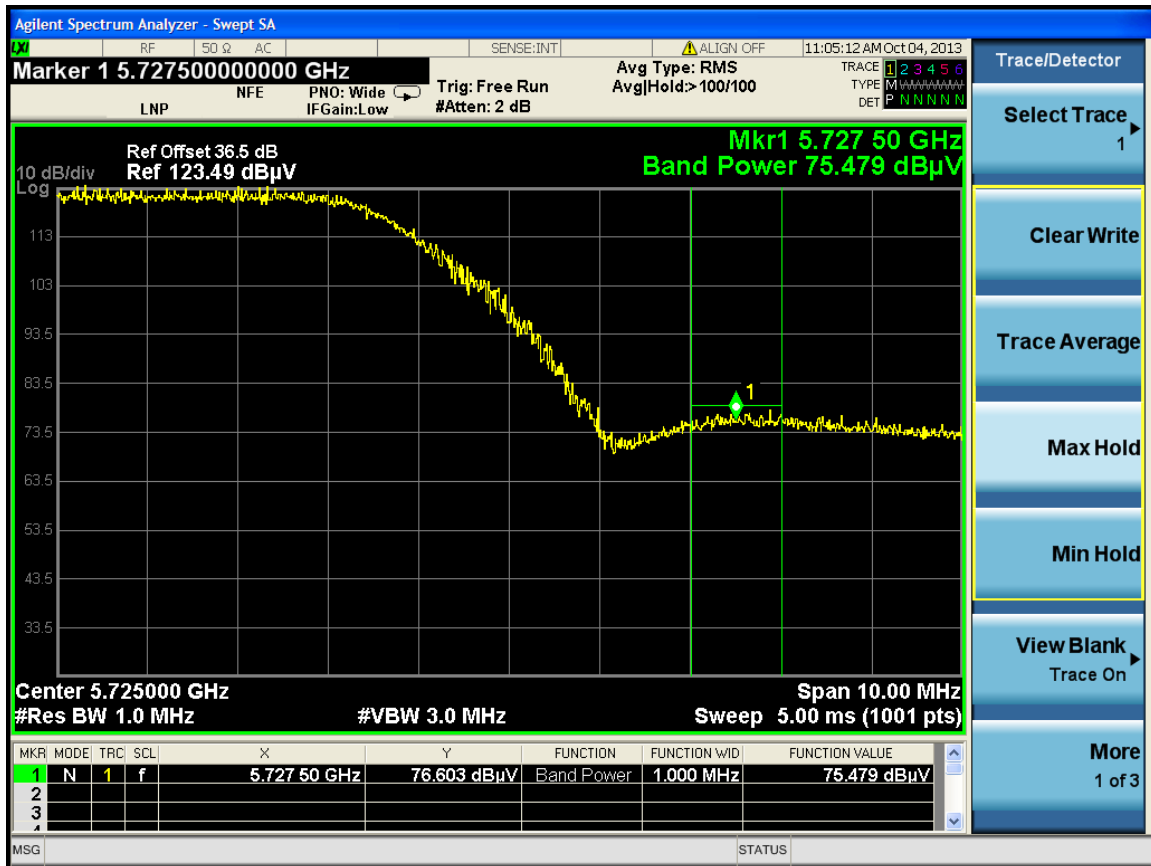   **= -34.49 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: $\quad$ EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
$\quad\quad\quad\quad\quad\quad\quad$ = 74.327 dBμV/m + 20 log(1 meter) - 104.77
$\quad\quad\quad\quad\quad\quad\quad$ = **-30.44 dBm/MHz**
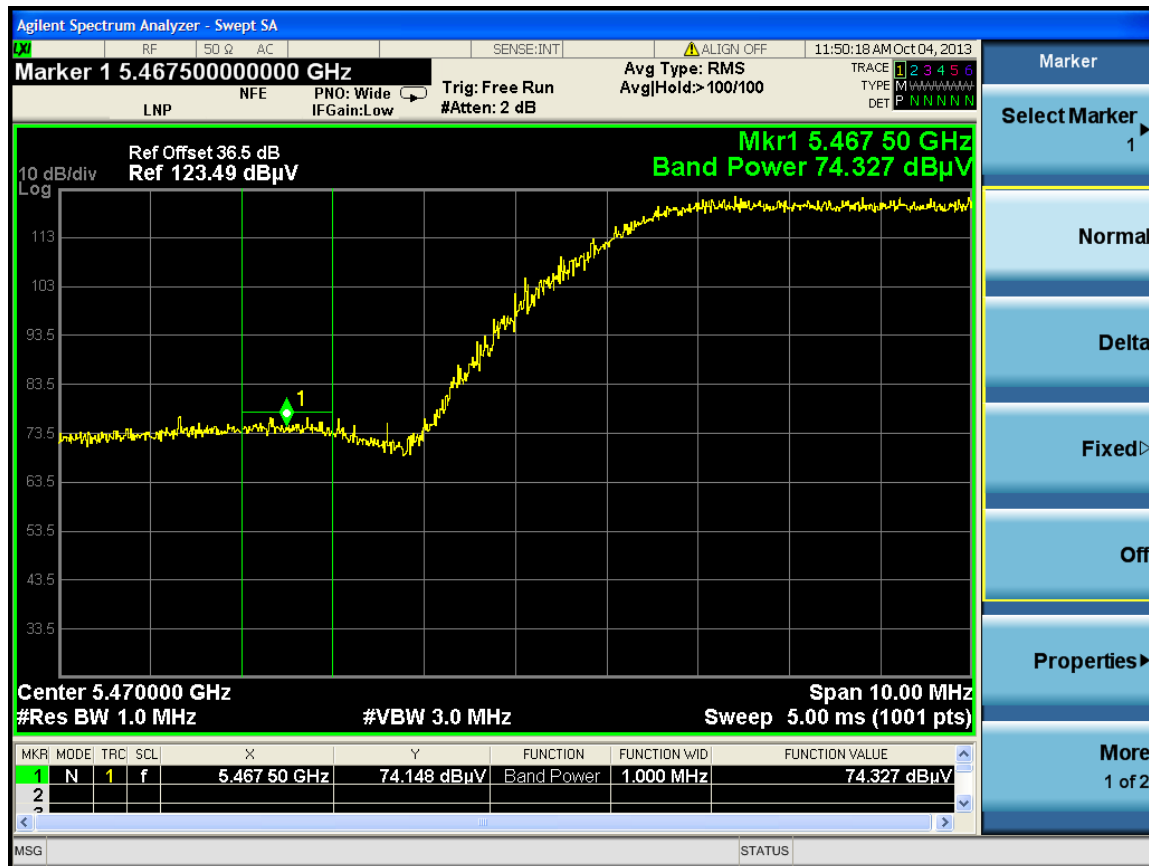
Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
                (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                Low Channel: Frequency – 5481 MHz
                Modulation: 256QAM
                Vertical
                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[dBµV/m] + 20 log(d[meters]) - 104.77
                        = 70.356 dBµV/m + 20 log(1 meter) - 104.77
                        = -34.41 dBm/MHz
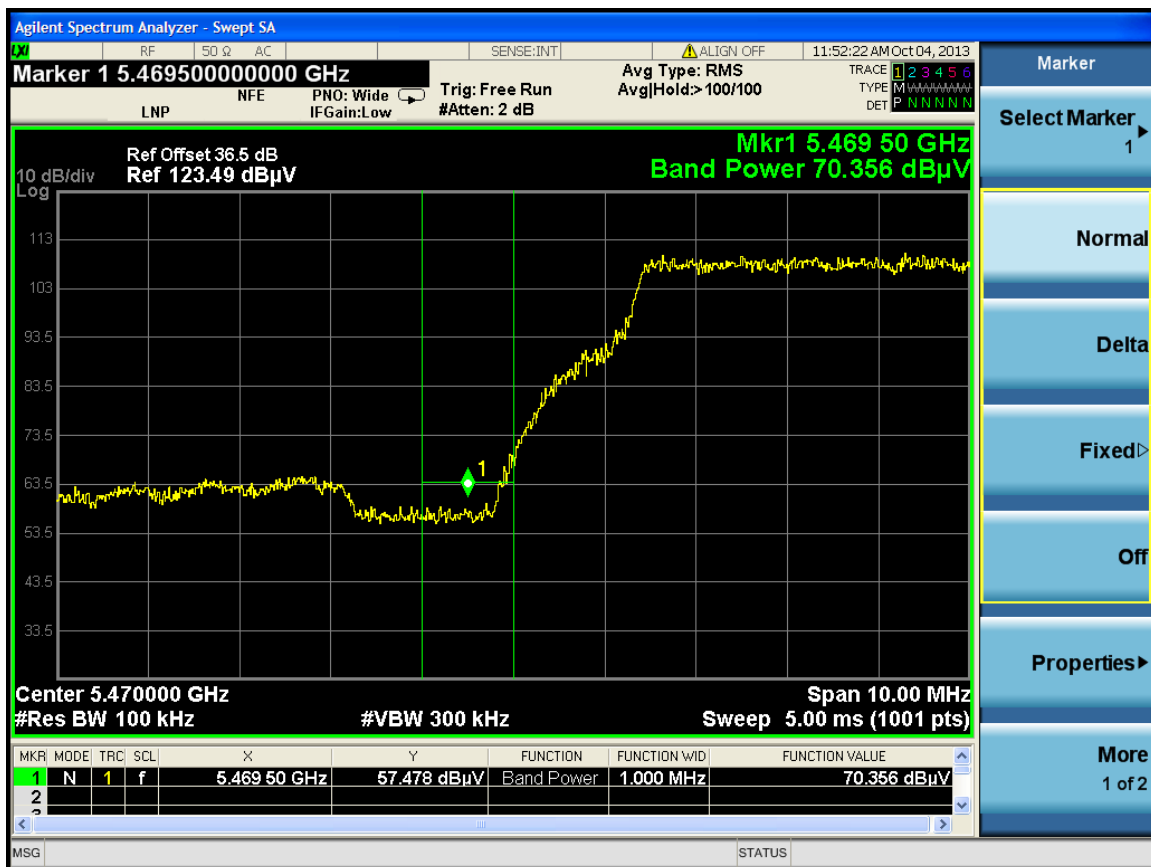
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)

Measurement: $\quad$ EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77

$\qquad = 74.092 \text{ dBμV/m} + 20 \log(1 \text{ meter}) - 104.77$

$\qquad$ **= -30.67 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Lower Operating Band-Edge Compliance - Radiated
               (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
               Low Channel: Frequency – 5481 MHz
               Modulation: 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[dBµV/m] + 20 log(d[meters]) - 104.77
                      = 70.174 dBµV/m + 20 log(1 meter) - 104.77
                      = -34.59 dBm/MHz

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)

Measurement: $\quad$ EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77

$= 74.369 \text{ dBµV/m} + 20 \log(1 \text{ meter}) - 104.77$

$= \textbf{-30.40 dBm/MHz}$

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
High Channel: Frequency – 5714 MHz
Modulation: QPSK
Horizontal
Operating Band-Edge Frequency: 5725 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
= 71.448 dBμV/m + 20 log(1 meter) - 104.77
= **-33.32 dBm/MHz**
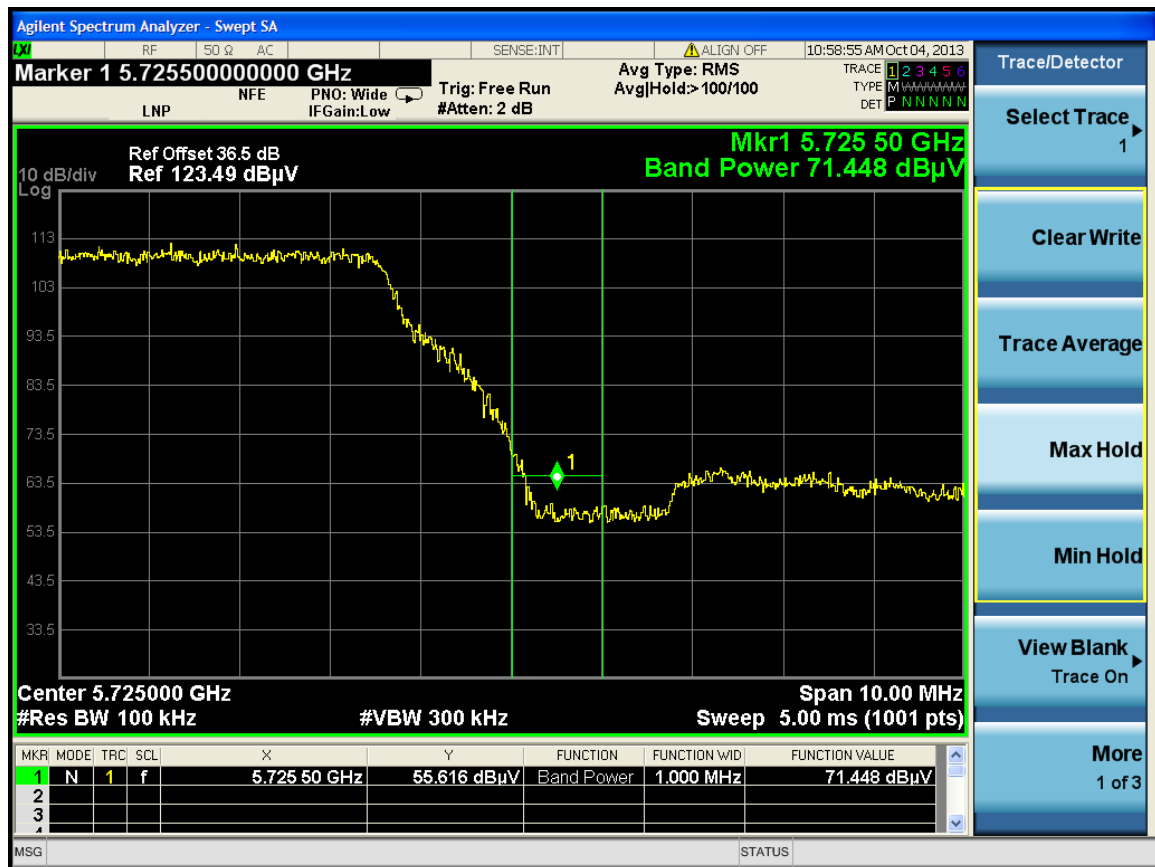
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                  = 75.452 dBµV/m + 20 log(1 meter) - 104.77
                  = **-29.31 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
                (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                High Channel: Frequency – 5714 MHz
                Modulation: 16QAM
                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[dBµV/m] + 20 log(d[meters]) - 104.77
                          = 71.930 dBµV/m + 20 log(1 meter) - 104.77
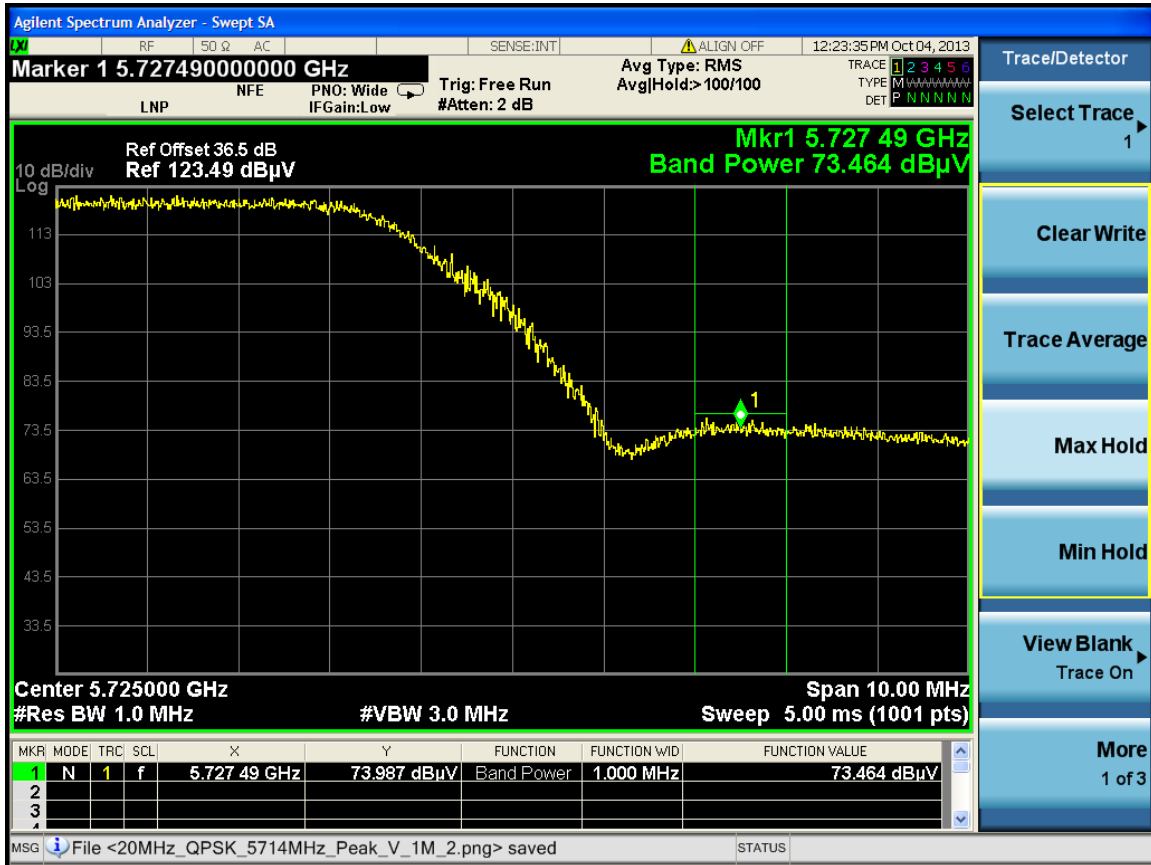   = **-32.84 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                            = 75.227 dBµV/m + 20 log(1 meter) - 104.77
                            = **-29.54 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
High Channel: Frequency – 5714 MHz
Modulation: 64QAM
Horizontal
Operating Band-Edge Frequency: 5725 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
= 70.777 dBµV/m + 20 log(1 meter) - 104.77
= **-33.99 dBm/MHz**
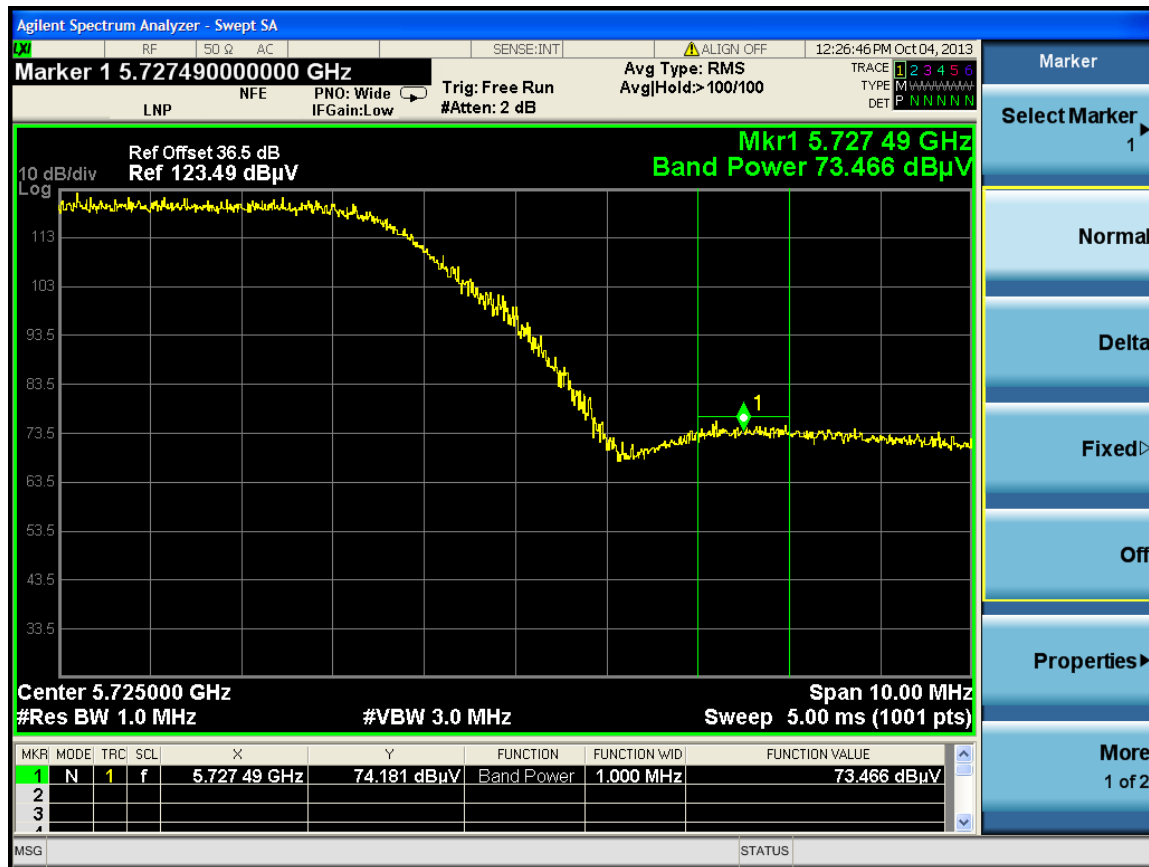
Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                 = 75.479 dBµV/m + 20 log(1 meter) - 104.77
                 = **-29.29 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
                      (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                      High Channel: Frequency – 5714 MHz
                      Modulation: 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[dBµV/m] + 20 log(d[meters]) - 104.77
                              = 70.866 dBµV/m + 20 log(1 meter) - 104.77
                              = -33.90 dBm/MHz

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)

Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77

                 = 75.545 dBµV/m + 20 log(1 meter) - 104.77

                 = **-29.22 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
                (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                High Channel: Frequency – 5714 MHz
                Modulation: 1024QAM
                Horizontal
                Operating Band-Edge Frequency: 5725 MHz
                Band-Edge Limit: -27 dBm/MHz
                Test method: Integration
                Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                            = 70.621 dBµV/m + 20 log(1 meter) - 104.77
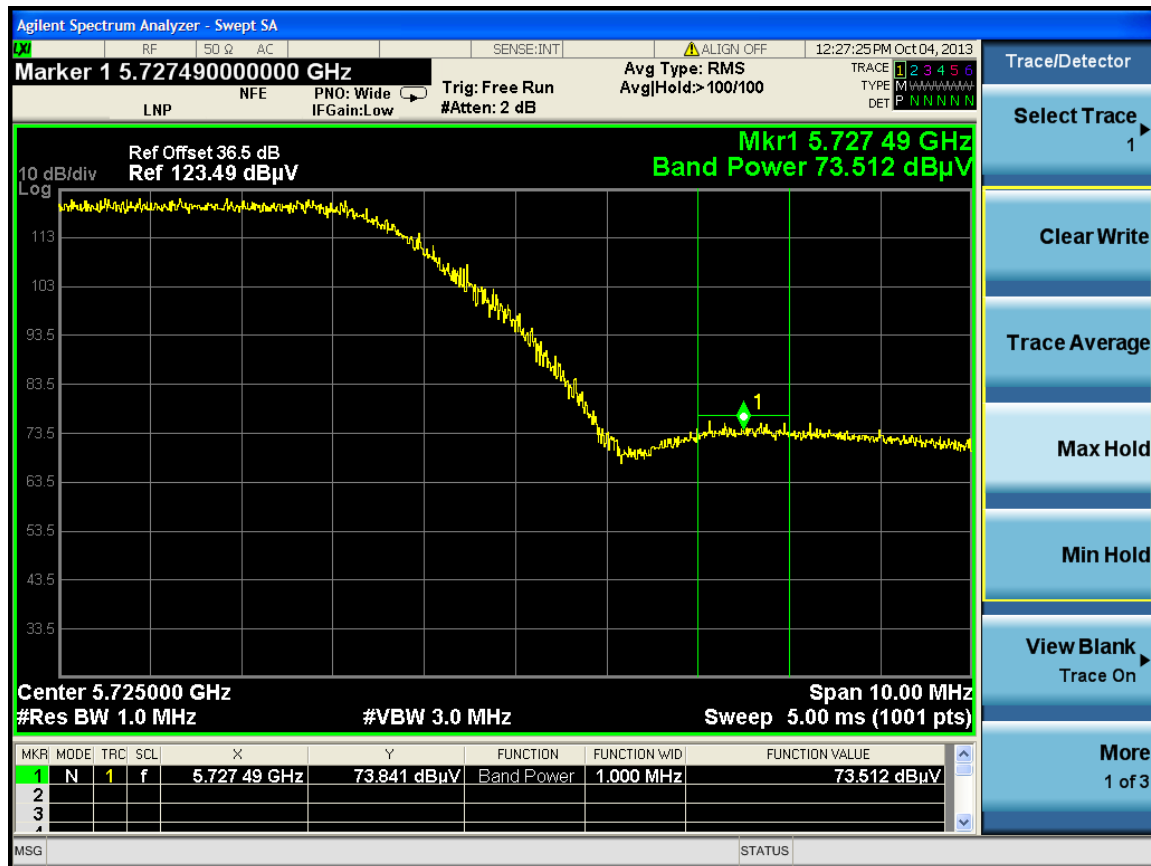   = **-34.14 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
  = 75.505 dBμV/m + 20 log(1 meter) - 104.77
  = **-29.26 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
High Channel: Frequency – 5714 MHz
Modulation: QPSK
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[dBµV/m] + 20 log(d[meters]) - 104.77
= 69.091 dBµV/m + 20 log(1 meter) - 104.77
= **-35.67 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)

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

$= 73.352 \text{ dB}\mu\text{V/m} + 20 \log(1 \text{ meter}) - 104.77$

$= \textbf{-31.41 dBm/MHz}$

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
                (FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
                High Channel: Frequency – 5714 MHz
                Modulation: 16QAM
                Vertical
                Operating Band-Edge Frequency: 5725 MHz
                Band-Edge Limit: -27 dBm/MHz
                Test method: Integration
                Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                        = 70.241 dBµV/m + 20 log(1 meter) - 104.77
                        = **-34.52 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
= 73.464 dBµV/m + 20 log(1 meter) - 104.77
= **-31.30 dBm/MHz**

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
High Channel: Frequency – 5714 MHz
Modulation: 64QAM
Vertical
Operating Band-Edge Frequency: 5725 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement:

$$EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$$
$$= 69.060 \ dB\mu V/m + 20 \log(1 \ meter) - 104.77$$
$$= \textbf{-35.71 dBm/MHz}$$

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                   = 73.466 dBµV/m + 20 log(1 meter) - 104.77
                   = -31.30 dBm/MHz

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
High Channel: Frequency – 5714 MHz
Modulation: 256QAM
Vertical
Operating Band-Edge Frequency: 5725 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
= 68.795 dBµV/m + 20 log(1 meter) - 104.77
= **-35.97 dBm/MHz**

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement:　　　　EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
　　　　　　　　　　= 73.512 dBμV/m + 20 log(1 meter) - 104.77
　　　　　　　　　　= -31.25 dBm/MHz

Test Date: 10-04-2013
Company: Ubiquiti Networks
EUT: AF5
Test: Upper Operating Band-Edge Compliance - Radiated
(FCC 15.407(b)(3))
Operator: Craig B
Comment: 20 MHz channel Bandwidth
High Channel: Frequency – 5714 MHz
Modulation: 1024QAM
Vertical
Operating Band-Edge Frequency: 5725 MHz
Band-Edge Limit: -27 dBm/MHz
Test method: Integration
Offset on analyzer includes horn antenna and cable loss correction factors
Limit: -27 dBm/MHz
Measurement: $\text{EIRP[dBm]} = \text{E[dBμV/m]} + 20 \log(d\text{[meters]}) - 104.77$

$= 69.465 \text{ dBμV/m} + 20 \log(1 \text{ meter}) - 104.77$

= -35.30 dBm/MHz

Standard Method > 2 MHz from band edge (1 MHz RBW, 3 MHz VBW)
Measurement: EIRP[dBm] = E[dBµV/m] + 20 log(d[meters]) - 104.77
                                = 73.880 dBµV/m + 20 log(1 meter) - 104.77
                                = **-30.89 dBm/MHz**
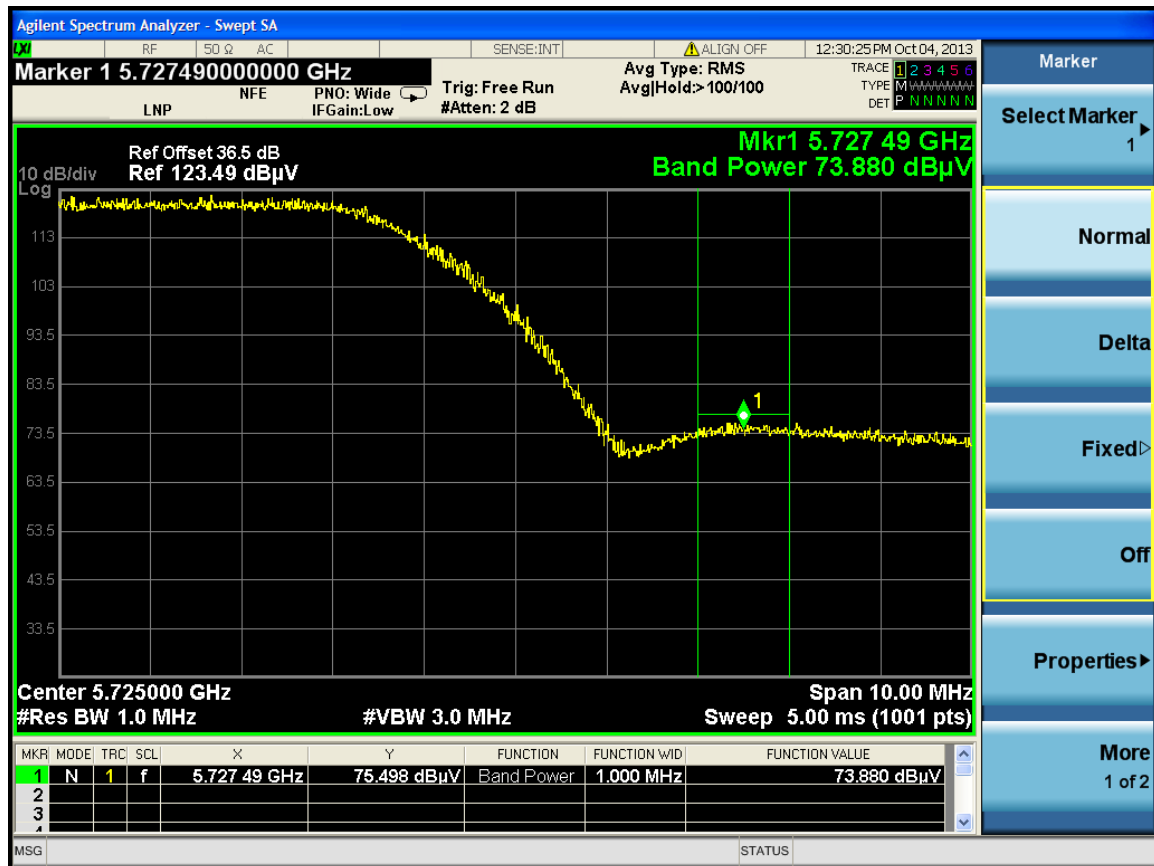
Appendix – Measurement Data

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 ≥ 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 ≥ 3 MHz
    Detector = RMS (span/(# of points in sweep) ≤ 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
```
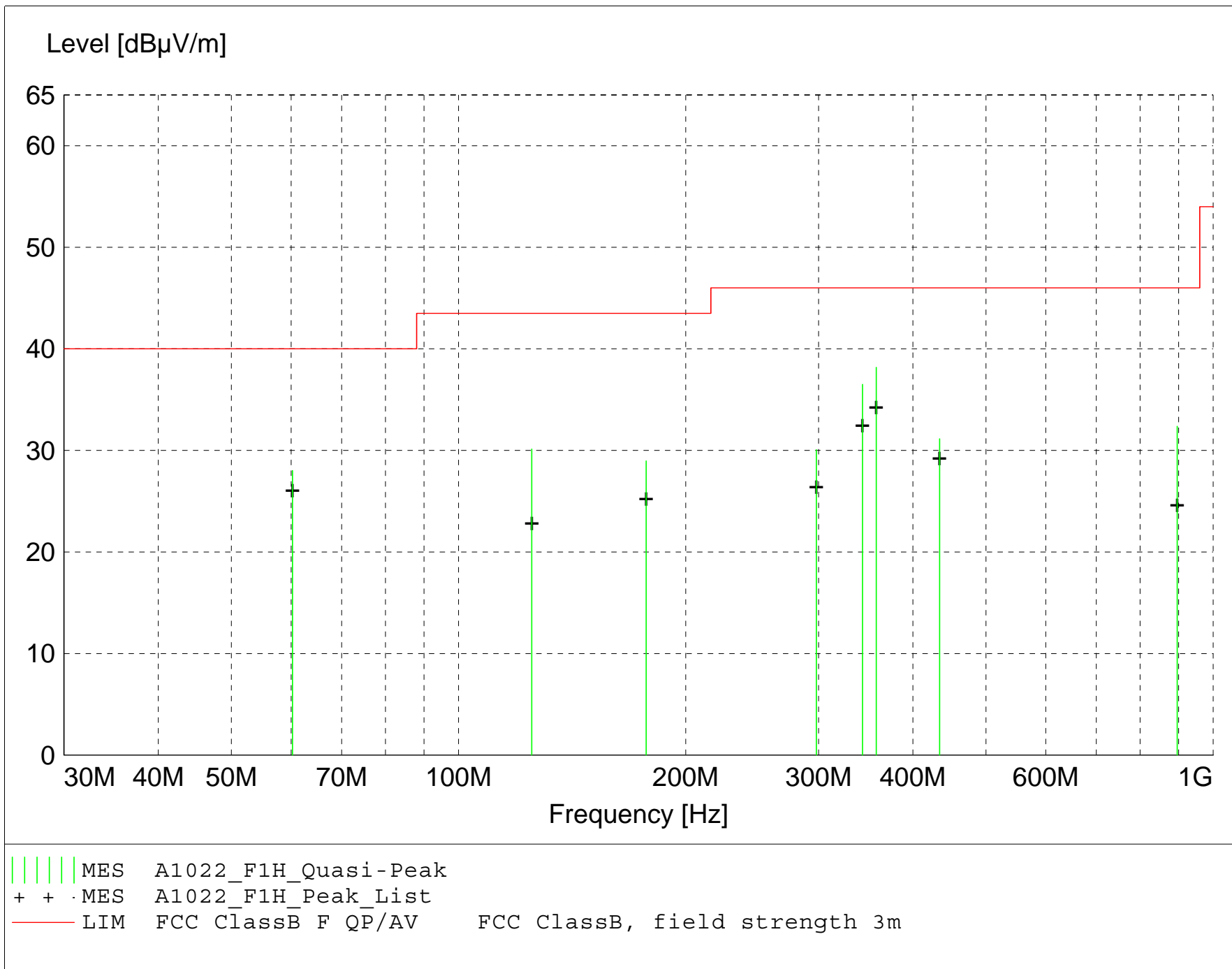
TEXT: "Horz 3 meters"

```
  Short Description:            Test Set-up


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


Equations:      Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

                Margin(dB)  = Limit(dBµV/m) - Total Level(dBµV/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 dector

                #       Final maximized level using Peak detector
```

Level [dBµV/m]

Frequency [Hz]

MES	A1022_F1H_Quasi-Peak	
MES	A1022_F1H_Peak_List	
LIM	FCC ClassB F QP/AV	FCC ClassB, field strength 3m

MEASUREMENT RESULT: "A1022_F1H_Final"

10/17/2013 11:53AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	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: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
                    24.6   = 35.51   + (-22.1)   + 11.20

                    Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
                    15.4   = 40   - 24.6

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

Level [dBμV/m]

MES	A1022_F1V_Quasi-Peak
MES	A1022_F1V_Peak
MES	A1022_F1V_Peak_List
LIM	FCC ClassB F QP/AV FCC ClassB, field strength 3m

MEASUREMENT RESULT: "A1022_F1V_Final"

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

FCC Part 15.209

Electric Field Strength

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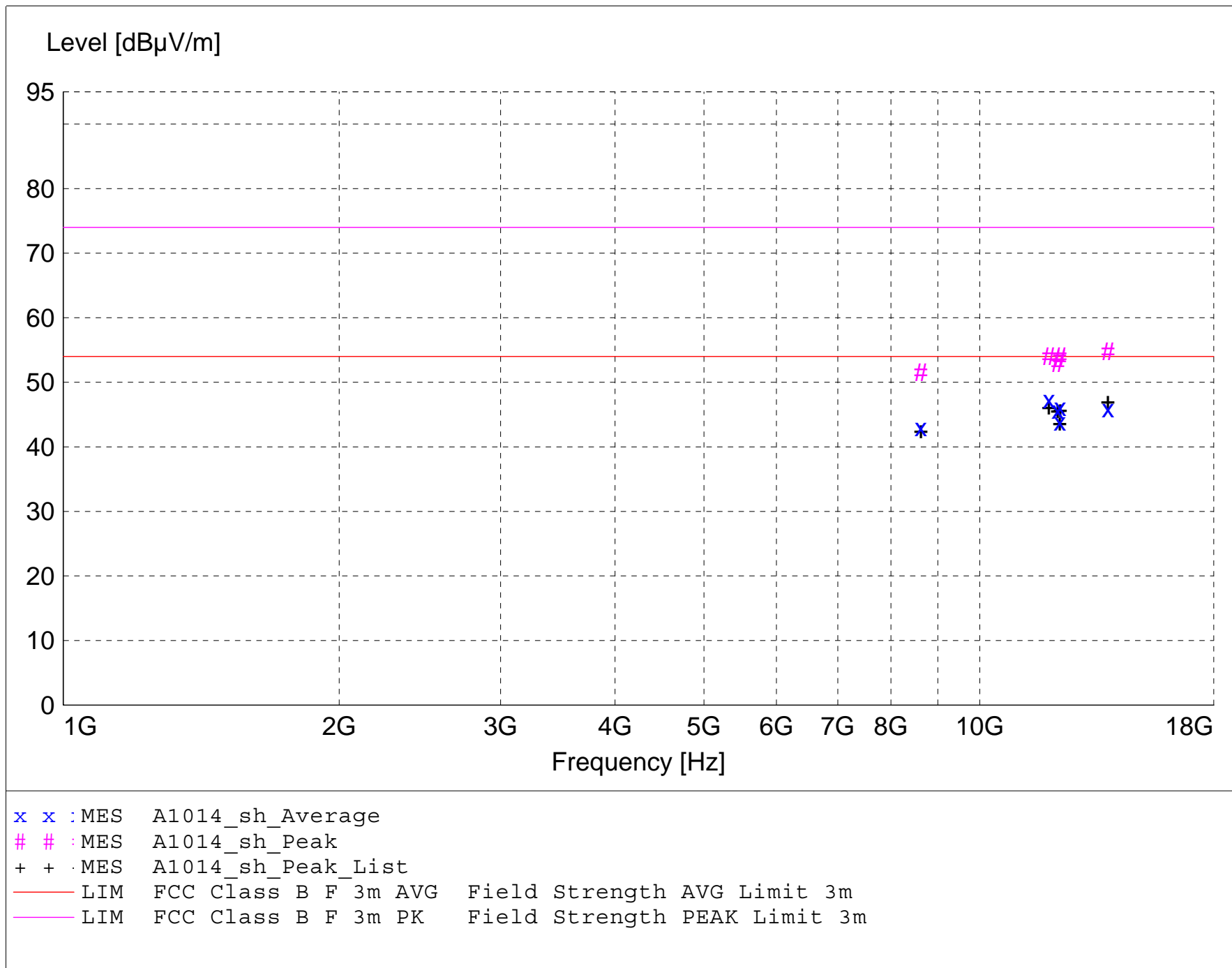
TEXT: "Horz 3 meters"

```
  Short Description:             Test Set-up


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


Equations:      Total Level(dBμV/m) = Level(dBμV) + System Loss(dB) + Antenna Factor(dBμV/m)

                Margin(dB)  = Limit(dBμV/m) - Total Level(dBμV/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 dector

                #       Final maximized level using Peak detector
```

x x :MES   A1014_sh_Average
:MES   A1014_sh_Peak
+ + :MES   A1014_sh_Peak_List
——— LIM   FCC Class B F 3m AVG   Field Strength AVG Limit 3m
——— LIM   FCC Class B F 3m PK   Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A1014_sh_Final"

Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
11895.000000	60.70	39.09	-52.5	47.3	54.0	6.7	1.20	225	AVERAGE	Low ch; QPSK
12240.000000	59.27	38.95	-52.0	46.2	54.0	7.8	1.00	0	AVERAGE	High ch; QPSK
13800.000000	56.72	40.75	-51.6	45.9	54.0	8.1	1.00	135	AVERAGE	Low ch; QPSK
12165.000000	58.79	38.98	-52.1	45.7	54.0	8.3	1.00	0	AVERAGE	Mid ch; QPSK
12225.000000	56.96	38.95	-52.0	43.9	54.0	10.1	1.00	170	AVERAGE	Low ch; QPSK
8625.000000	57.72	37.73	-52.5	43.0	54.0	11.0	1.00	225	AVERAGE	Low ch; QPSK
13800.000000	65.62	40.75	-51.6	54.8	74.0	19.2	1.00	135	MAX PEAK	Low ch; QPSK
11895.000000	67.50	39.09	-52.5	54.1	74.0	19.9	1.20	225	MAX PEAK	Low ch; QPSK
12240.000000	67.13	38.95	-52.0	54.0	74.0	20.0	1.00	0	MAX PEAK	High ch; QPSK
12225.000000	66.76	38.95	-52.0	53.7	74.0	20.3	1.00	170	MAX PEAK	Low ch; QPSK
12165.000000	66.13	38.98	-52.1	53.0	74.0	21.0	1.00	0	MAX PEAK	Mid ch; QPSK
8625.000000	66.26	37.73	-52.5	51.5	74.0	22.5	1.00	225	MAX PEAK	Low ch; QPSK

FCC Part 15.209

Electric Field Strength

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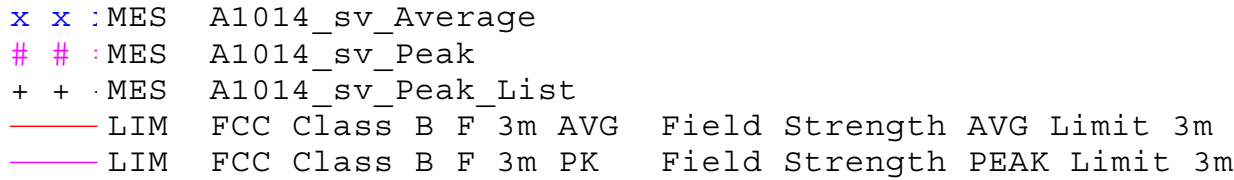   Date: 10-01-2013

TEXT: "Vert 3 meters"

   Short Description: Test Set-up

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

Sample Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
                    24.6   = 35.51   + (-22.1)   + 11.20

                    Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
                    15.4   = 40   - 24.6

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

Level [dBμV/m]

x x : MES   A1014_sv_Average
: MES   A1014_sv_Peak
+ + : MES   A1014_sv_Peak_List
———— LIM   FCC Class B F 3m AVG   Field Strength AVG Limit 3m
———— LIM   FCC Class B F 3m PK   Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A1014_sv_Final"

10/1/2013 3:33PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
12240.000000	60.83	38.95	-52.0	47.7	54.0	6.3	1.30	0	AVERAGE	High ch; QPSK
11895.000000	60.46	39.09	-52.5	47.0	54.0	7.0	1.10	0	AVERAGE	Low ch; QPSK
13800.000000	53.08	40.75	-51.6	42.3	54.0	11.7	1.80	150	AVERAGE	low ch; QPSK
12165.000000	54.13	38.98	-52.1	41.0	54.0	13.0	1.20	225	AVERAGE	Mid ch; QPSK
12225.000000	53.66	38.95	-52.0	40.6	54.0	13.4	1.20	160	AVERAGE	Low ch; QPSK
8625.000000	54.82	37.73	-52.5	40.1	54.0	13.9	1.00	120	AVERAGE	Low ch; QPSK
11895.000000	67.74	39.09	-52.5	54.3	74.0	19.7	1.10	0	MAX PEAK	Low ch; QPSK
12240.000000	67.25	38.95	-52.0	54.2	74.0	19.8	1.30	0	MAX PEAK	High ch; QPSK
13800.000000	64.33	40.75	-51.6	53.5	74.0	20.5	1.80	150	MAX PEAK	low ch; QPSK
12165.000000	65.12	38.98	-52.1	52.0	74.0	22.0	1.20	225	MAX PEAK	Mid ch; QPSK
12225.000000	64.46	38.95	-52.0	51.4	74.0	22.6	1.20	160	MAX PEAK	Low ch; QPSK
8625.000000	65.75	37.73	-52.5	51.0	74.0	23.0	1.00	120	MAX PEAK	Low ch; QPSK

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

DLS
ELECTRONIC SYSTEMS, INC.
166 South Carter, Genoa City, WI 53128

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