



DATE: 19 January 2012

I.T.L. (PRODUCT TESTING) LTD.
FCC Radio Test Report
for
GoNet Systems Ltd

Equipment under test:
WiFi Outdoor Access Point

MBW-3100F

Written by:

D. Shidowsky, Documentation

Approved by:

A. Sharabi, Test Engineer

Approved by:

I. Raz, EMC Laboratory Manager

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This report relates only to items tested.



Measurement/Technical Report for GoNet Systems Ltd

WiFi Outdoor Access Point

MBW-3100F

FCC ID: A7C-3100F-000

This report concerns: Original Grant: X

Class I Change:

Class II Change:

Equipment type: Digital Transmission System

Limits used:

47CFR15 Section 15.247

Measurement procedure used is ANSI C63.4-2003.

Application for Certification
prepared by:

Ishaishou Raz

ITL (Product Testing) Ltd.

Kfar Bin Nun

D.N. Shimshon 99780

Israel

e-mail Sraz@itl.co.il

Applicant for this device:
(different from "prepared by")

Sharon Ashkenazi

GoNet Systems Ltd.

34 HaBarzel St.

Tel-Aviv, 69710

Israel

Tel: +972-3-633-8634

Fax: +972-3-649-3866

e-mail: SharonA@GoNetworks.com



TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1 Administrative Information.....	5
1.2 List of Accreditations	6
1.3 Product Description	7
1.4 Test Methodology	7
1.5 Test Facility	8
1.6 Measurement Uncertainty	8
2. SYSTEM TEST CONFIGURATION	9
2.1 Justification.....	9
2.2 EUT Exercise Software	9
2.3 Special Accessories	9
2.4 Equipment Modifications	9
2.5 Configuration of Tested System.....	10
3. CONDUCTED AND RADIATED MEASUREMENT TEST SET-UP PHOTOS	11
4. CONDUCTED EMISSION DATA	13
4.1 Test Specification	13
4.2 Test Procedure	13
4.3 Measured Data	13
4.4 Test Instrumentation Used, Conducted Measurement	18
5. 6 DB MINIMUM BANDWIDTH	19
5.1 Test procedure	19
5.2 Results table.....	23
5.3 Test Equipment Used.....	24
6. 26 DB MINIMUM BANDWIDTH	25
6.1 Test procedure	25
6.2 Results table.....	29
6.3 Test Equipment Used.....	30
7. MAXIMUM TRANSMITTED PEAK POWER OUTPUT	31
7.1 Test procedure	31
7.2 Results table.....	35
7.3 Test Equipment Used.....	36
8. PEAK POWER OUTPUT OUT OF 5725-5850 MHZ BAND	37
8.1 Test procedure	37
8.2 Results table.....	62
8.3 Test Equipment Used.....	63
9. BAND EDGE SPECTRUM	64
9.1 Test procedure	64
9.2 Results table.....	67
9.3 Test Equipment Used.....	68
10. RADIATED EMISSION, 9 KHZ – 30 MHZ	69
10.1 Test Specification	69
10.2 Test Procedure	69
10.3 Measured Data.....	69
10.4 Test Instrumentation Used, Radiated Measurements.....	70
10.5 Field Strength Calculation	70
11. RADIATED EMISSION 30 – 40000 MHZ	71
11.1 Test Specification	71
11.2 Test Procedure	71
11.3 Test Data.....	72
11.4 Field Strength Calculation below 1 GHz	79
11.5 Test Instrumentation Used, Radiated Measurements 30 MHz -25 GHz.....	80



12. TRANSMITTED POWER DENSITY -----	81
12.1 Test procedure	81
12.2 Test Equipment Used.....	85
13. ANTENNA GAIN/INFORMATION-----	86
14. INTERMODULATION -----	87
14.1 Test procedure	87
15. R.F EXPOSURE/SAFETY-----	91
16. APPENDIX A - CORRECTION FACTORS -----	92
16.1 Correction factors for CABLE	92
16.2 Correction factors for CABLE	93
16.3 Correction factors for CABLE	94
12.6 Correction factors for LOG PERIODIC ANTENNA	95
16.4 Correction factors for LOG PERIODIC ANTENNA	96
16.5 Correction factors for BICONICAL ANTENNA	97
16.6 Correction factors for Double-Ridged Waveguide Horn.....	98
16.7 Correction factors for Horn Antenna	99
16.8 Correction factors for ACTIVE LOOP ANTENNA	100



1. General Information

1.1 Administrative Information

Manufacturer: GoNet Systems Ltd

Manufacturer's Address: 34 HaBarzel St., Tel-Aviv, 69710, Israel
Tel: +972-3-633-8634
Fax: +972-3-649-3866

Manufacturer's Representative: Sharon Ashkenazi

Equipment Under Test (E.U.T): WiFi Outdoor Access Point

Equipment Model No.: MBW-3100F

Equipment Serial No.: MLMU1000802

Date of Receipt of E.U.T: 13.11.2011

Start of Test: 13.11.2011

End of Test: 24.11.2011

Test Laboratory Location: I.T.L (Product Testing) Ltd.
Kfar Bin Nun,
ISRAEL 99780

Test Specifications: FCC Part 15 Section 15.247



1.2 List of Accreditations

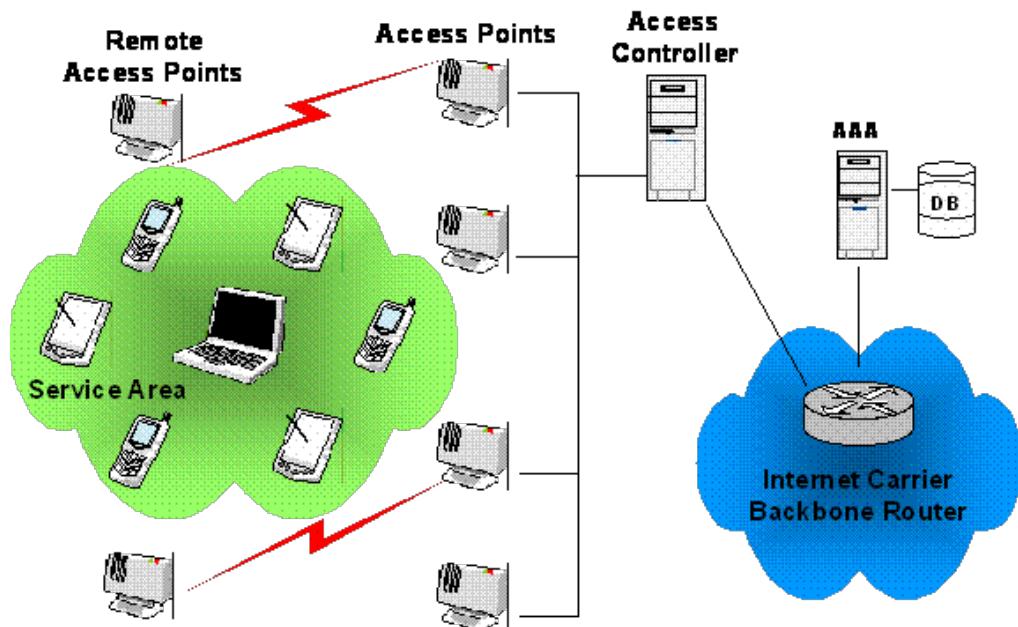
The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025B-1.
6. TUV Product Services, England, ASLLAS No. 97201.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

The MBW-3100 is designed to be an outdoor Wireless LAN Access Point (AP) to be installed in public wireless LAN hot spots / hot zones. A user in the vicinity of the AP, that has a laptop / PDA or cell phone with a wireless LAN NIC (Network Interface Card) can associate with the AP and be connected to the Internet.



In a public WLAN (wireless LAN) installation, the MBW-3100s will be installed by large service providers or cellular operators in areas where there will be a demand for this service, such as train stations, airports, convention centers and business areas. Another option is that the MBW-3100 will be installed in a campus (such as a university or hospital) by the "owner" of the campus.

The MBW-3100 will typically be installed either outdoors to provide outdoor coverage of Campuses or city neighborhoods, or in large indoor locations such as train stations, airports etc. In outdoor installations the MBW-3100 will typically be mounted either on a pole or on an outside wall of a building. In indoor installation, the MBW-3100 will typically be mounted on wall.

The 5GHz interface allows some of the MBW-3100's to be installed without cable connection to the Internet. The units that are installed in vicinity form link between each other and can transfer data to the nearest Internet connection.

1.4 Test Methodology

Conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.



1.5 **Test Facility**

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 03, 2009).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 **Measurement Uncertainty**

Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) 0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):
± 3.44 dB

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000 MHz:

Expanded Uncertainty (95% Confidence, K=2):
± 4.96 dB



2. System Test Configuration

2.1 ***Justification***

The unit was configured to transmit at maximum power and 100% of the time. During the tests the unit was checked in three different frequencies at the bottom of the range, at the upper limit of the range and in the middle of the range. At all the ranges the unit was tested on four different rates 6Mbit/sec and 54 Mbit/sec.

Radiated tests for the unit was in a typical installation position and with the external antenna connected.

2.2 ***EUT Exercise Software***

The original software was used in order to operate the system.

2.3 ***Special Accessories***

No special accessories were needed to achieve compliance.

2.4 ***Equipment Modifications***

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

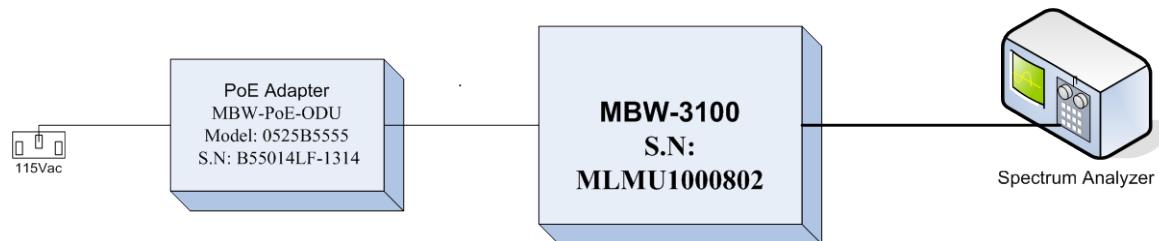


Figure 1. Configuration of Tested System – Conducted

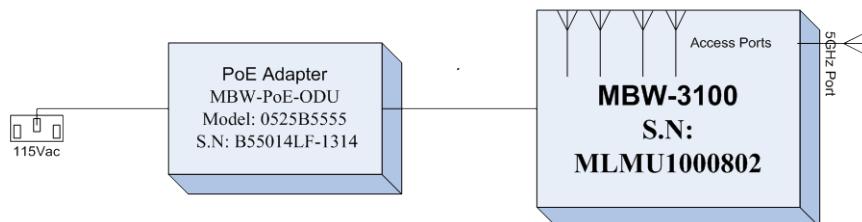


Figure 2. Configuration of Tested System – Radiated

3. Conducted and Radiated Measurement Test Set-up Photos

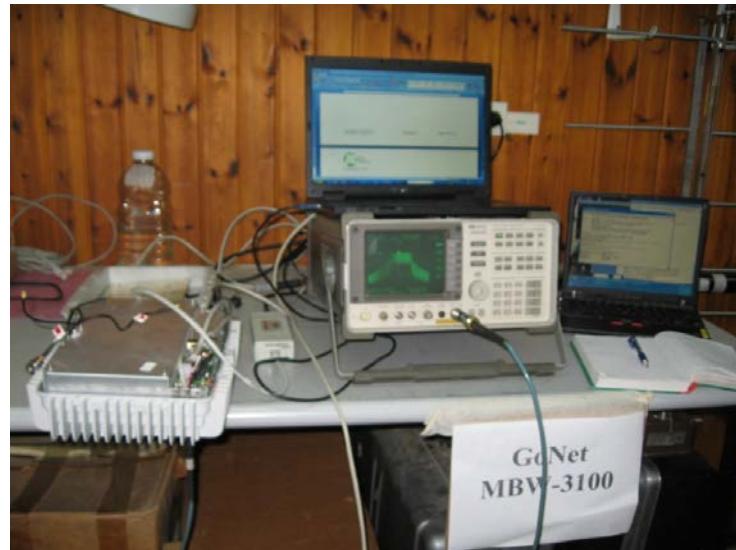


Figure 3. Conducted Emission From Antenna Port Test



Figure 4. Conducted Emission From AC Power line



Figure 5. Radiated Emission Test



4. Conducted Emission Data

4.1 Test Specification

F.C.C., Part 15, Subpart C

4.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3.1. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via a 50 Ohm / 50 μ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 Measured Data

JUDGEMENT: Passed by 7.2 dB

The margin between the emission levels and the specification limit was, in the worst case, 7.2 dB for the phase line at 20.86 MHz and 10.3 dB for the neutral line at 8.88 MHz.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 6* to *Figure 9*.

TEST PERSONNEL:

Tester Signature:

Date: 19.01.12

Typed/Printed Name: A. Sharabi



Conducted Emission

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC Part 15, Subpart C

Lead: Phase

Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Pk Delta I 1 (dB)	QP I 1 (dBuV)	QP Delta I 1 (dB)	Avg I 1 (dBuV)	Av Delta I 2 (dB)	Corr (dB)
1	0.182933	-13.7	49.4	-15.0	43.2	-11.2	0.0
2	0.371555	-17.6	39.6	-19.0	37.5	-11.1	0.0
3	5.148736	-18.5	38.3	-21.6	26.6	-23.4	0.0
4	8.869133	-11.0	44.5	-15.5	38.3	-11.7	0.0
5	18.066035	-16.0	39.6	-20.4	33.0	-17.0	0.0
6	20.867215	-7.3	48.8	-11.2	42.8	-7.2	0.0

Figure 6. Detectors: Peak, Quasi-peak, AVERAGE .

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.



Conducted Emission

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC Part 15, Subpart C
Lead: Phase
Detectors: Peak, Quasi-peak, Average

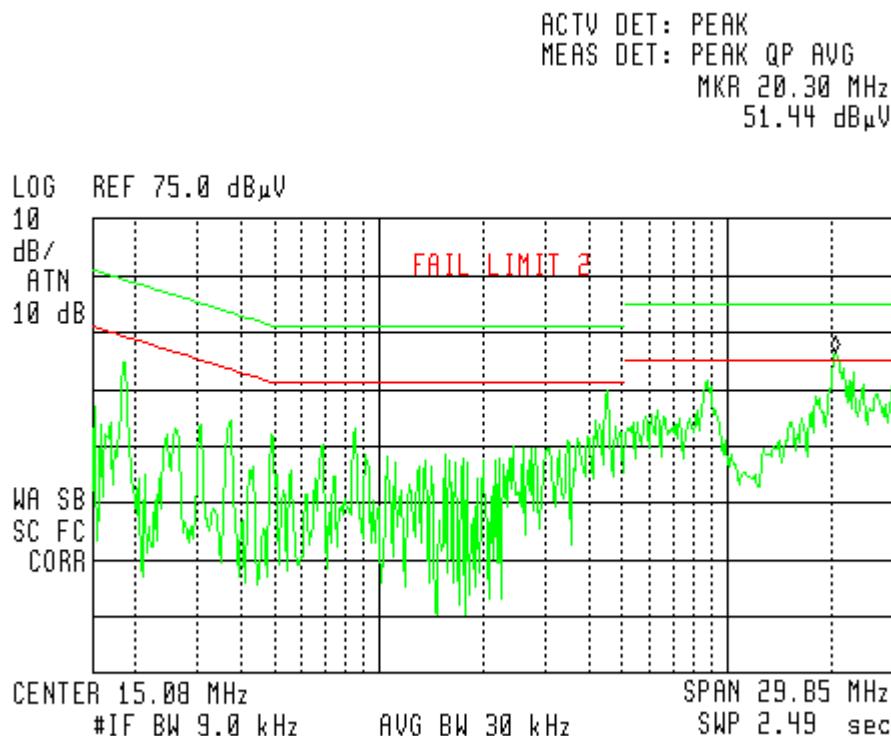


Figure 7. Detectors: Peak, Quasi-peak, Average

Note: Fail indication on the spectral plot results from peak detector level reading above the limit. This indication is for information only and it should not be interpreted as a test failure.



Conducted Emission

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC Part 15, Subpart C

Lead: Neutral

Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)	Corr (dB)
1	0.186721	49.7	48.8	-15.4	42.6	-11.6	0.0
2	0.376545	38.4	37.4	-21.0	35.7	-12.7	0.0
3	0.936136	34.3	33.3	-22.7	29.9	-16.1	0.0
4	4.653419	42.5	39.4	-16.6	28.7	-17.3	0.0
5	8.865163	49.4	45.6	-14.4	39.7	-10.3	0.0
6	20.443430	50.7	45.1	-14.9	38.8	-11.2	0.0

Figure 8. Detectors: Peak, Quasi-peak, AVERAGE

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.



Conducted Emission

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC Part 15, Subpart C
Lead: Neutral
Detectors: Peak, Quasi-peak, Average



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 20.61 MHz
49.82 dB μ V

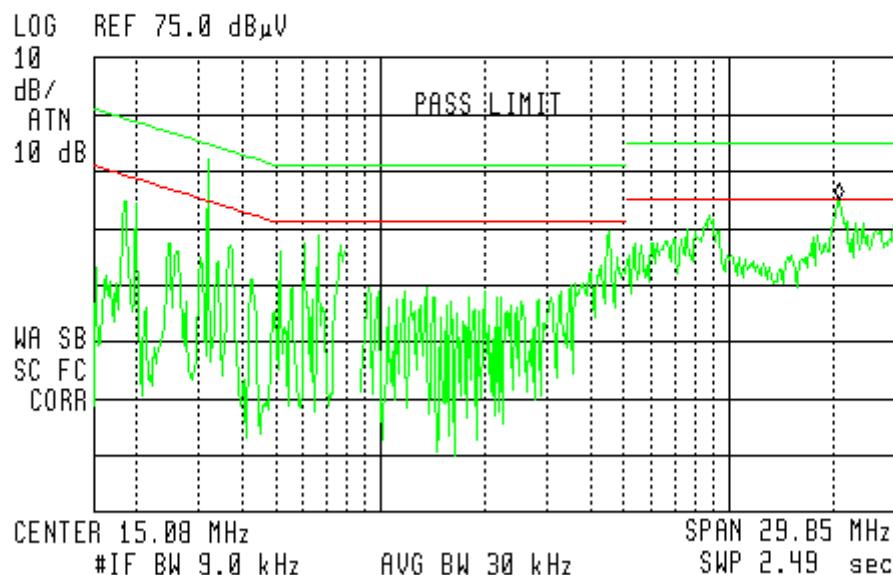


Figure 9 Conducted Emission: NEUTRAL
Detectors: Peak, Quasi-peak, Average



4.4 Test Instrumentation Used, Conducted Measurement

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
LISN	Fischer	FCC-LISN-2A	127	March 3, 2011	1 Year
EMI Receiver	HP	85422E	3906A00276	November 24, 2010	1 Year
RF Filter Section	HP	85420E	3705A00248	November 24, 2010	1 Year
Printer	HP	LaserJet 2200	JPKG C19982	N/A	N/A



5. 6 dB Minimum Bandwidth

5.1 *Test procedure*

The E.U.T. was set to the applicable test frequency. The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 100 kHz resolution BW. The spectrum bandwidth of the E.U.T. at the point of 6 dB below maximum peak power was measured and recorded.

The E.U.T. was tested at 5745, 5785 and 5825MHz with the following modulations: 6 and 54 Mbps.

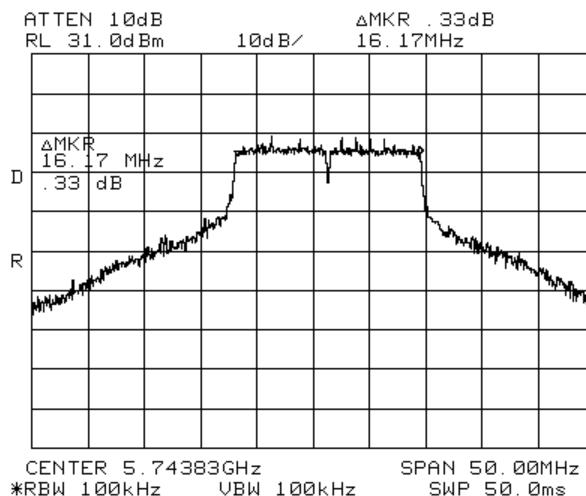


Figure 10 —5745 MHz 6Mbps

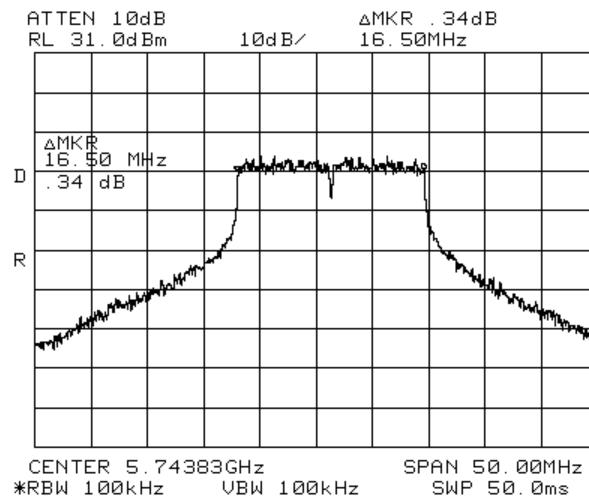


Figure 11 —5745MHZ 54Mbps

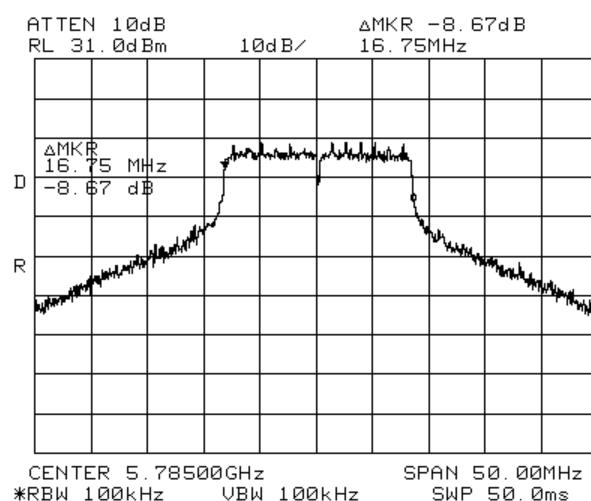


Figure 12 —5785 MHZ 6Mbps

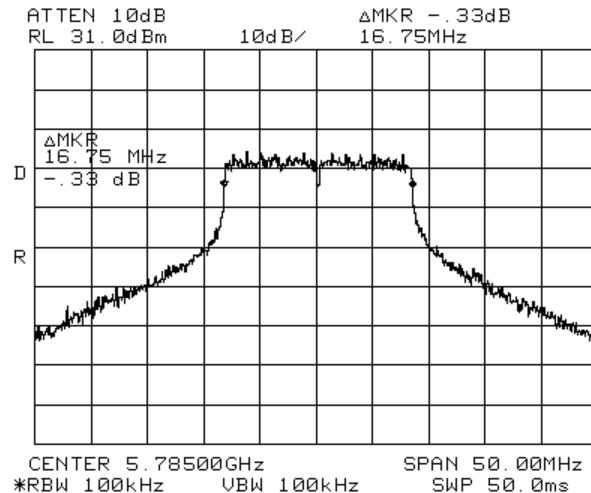


Figure 13 —5785 MHz 54Mbps

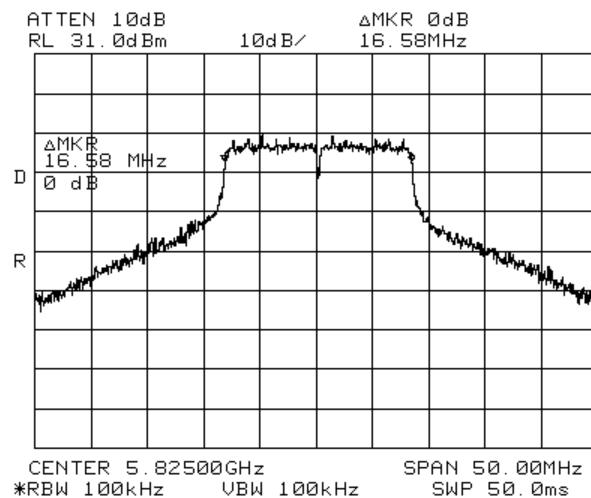


Figure 14 —5825 MHZ 6Mbps

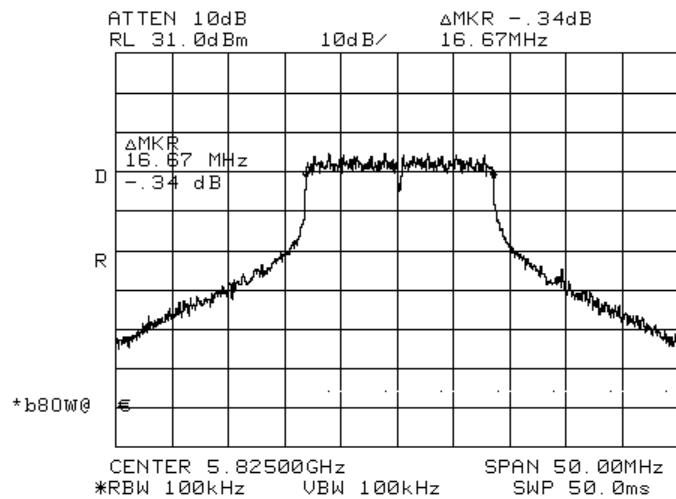


Figure 15 —5825 MHZ 54Mbps



5.2 **Results table**

E.U.T Description: WiFi Outdoor Access Point

Model No.: MBW-3100F

Serial Number: MLMU1000802

Specification: F.C.C. Part 15, Subpart C: (15.247-a2)

Operation Frequency (MHz)	Modulation (Mbps)	Reading (MHz)	Specification (MHz)
5745	6	16.17	0.5
	54	16.50	0.5
5785	6	16.75	0.5
	54	16.75	0.5
5825	6	16.58	0.5
	54	16.67	0.5

Figure 16 6 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



5.3 **Test Equipment Used.**

6 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3414U01226	January 23, 2011	1 year
Attenuator	-	30dB	-	November 10, 2011	1 year
Cable	TestLINE	18	11556	November 10, 2011	1 year

Figure 17 Test Equipment Used



6. 26 dB Minimum Bandwidth

6.1 *Test procedure*

The E.U.T. was set to the applicable test frequency. The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 100 kHz resolution BW. The spectrum bandwidth of the E.U.T. at the point of 26 dB below maximum peak power was measured and recorded.

The E.U.T. was tested at 5745, 5785 and 5825MHz MHz with the following modulations: 6 and 54 Mbps.

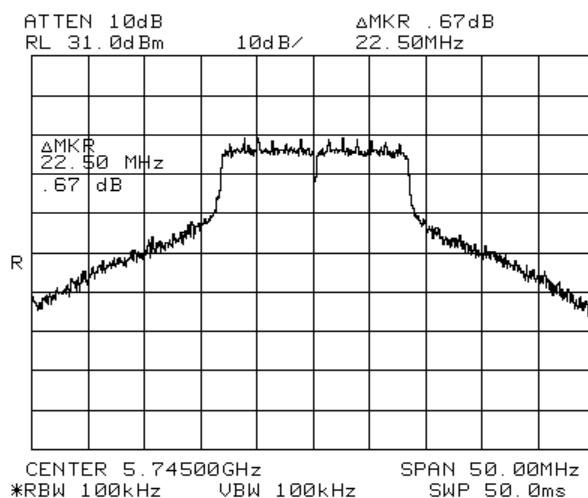


Figure 18 —5745 MHz 6Mbps

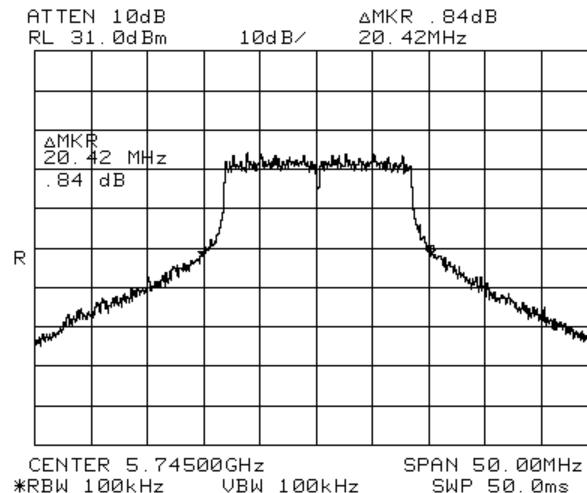


Figure 19 —5745MHz 54Mbps

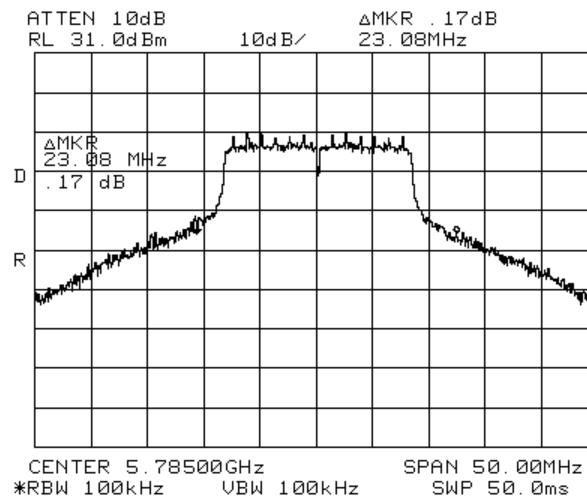


Figure 20 —5785 MHz 6Mbps

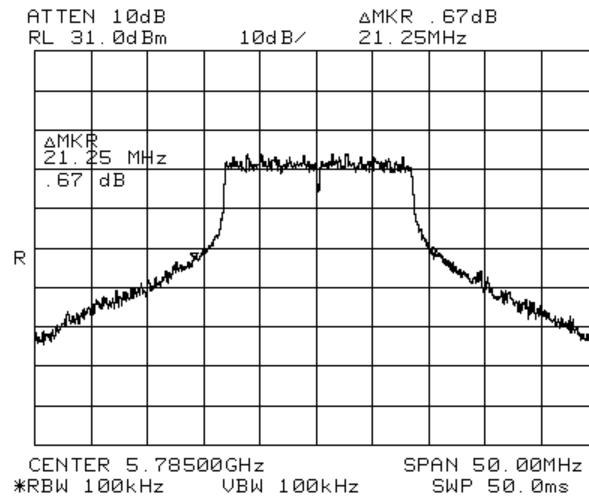


Figure 21 —5785 MHz 54Mbps

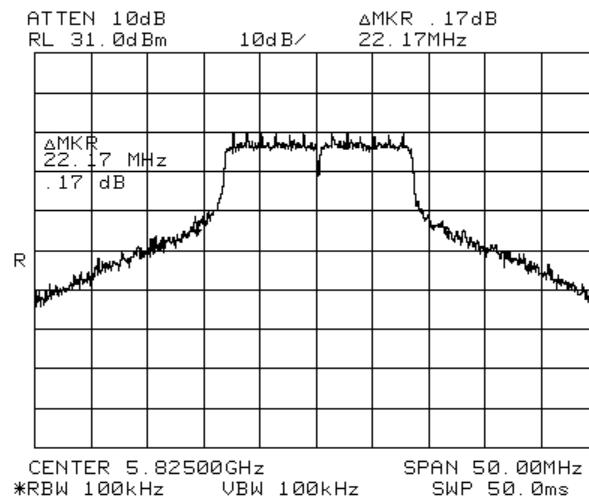


Figure 22 —5825 MHZ 6Mbps

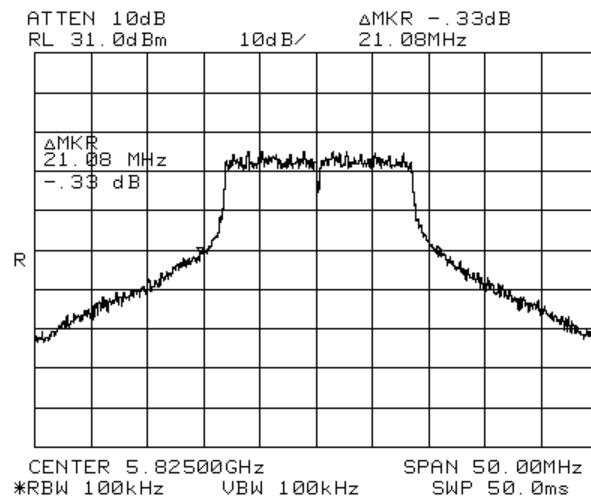


Figure 23 —5825 MHZ 54Mbps



6.2 **Results table**

E.U.T Description: WiFi Outdoor Access Point

Model No.: MBW-3100F

Serial Number: MLMU1000802

Specification: F.C.C. Part 15, Subpart C: (15.247-a2)

Operation Frequency (MHz)	Modulation (Mbps)	Reading (MHz)	Specification (MHz)
5745	6	22.50	0.5
	54	20.42	0.5
5785	6	23.08	0.5
	54	21.25	0.5
5825	6	22.17	0.5
	54	21.08	0.5

Figure 24 26 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



6.3 **Test Equipment Used.**

26 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3414U01226	January 23, 2011	1 year
Attenuator	-	30dB	-	November 10, 2011	1 year
Cable	TestLINE	18	11556	November 10, 2011	1 year

Figure 25 Test Equipment Used



7. Maximum Transmitted Peak Power Output

7.1 Test procedure

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (cable loss = 1 dB). The Spectrum Analyzer was set to 1.0 MHz resolution BW. Peak power level was measured at selected operation frequencies.

The E.U.T. was tested at 5745, 5785 and 5825MHz with the following modulations: 6 and 54 Mbps.

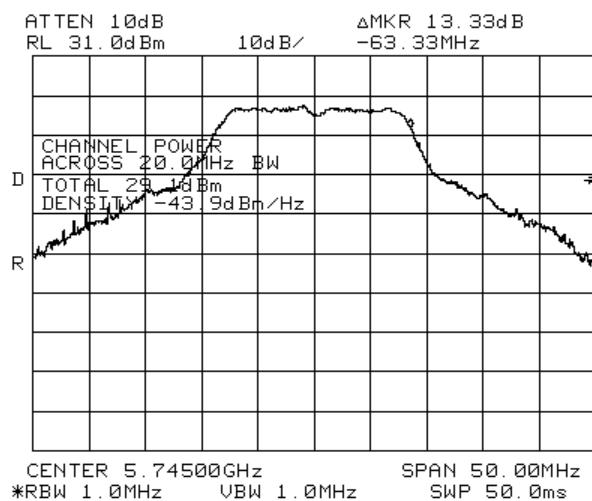


Figure 26 —5745 MHz 6Mbps

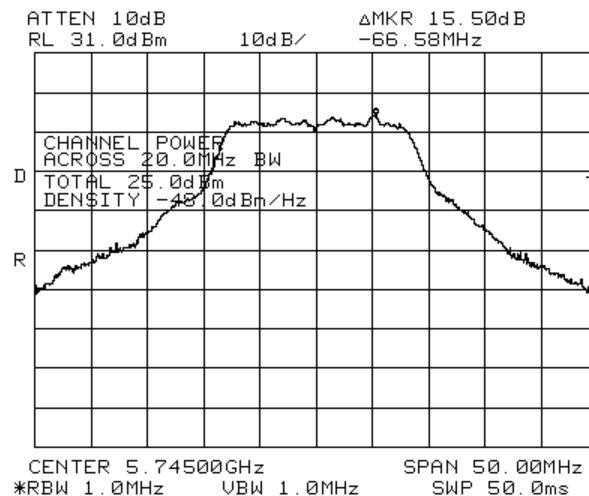


Figure 27 —5745MHz 54Mbps

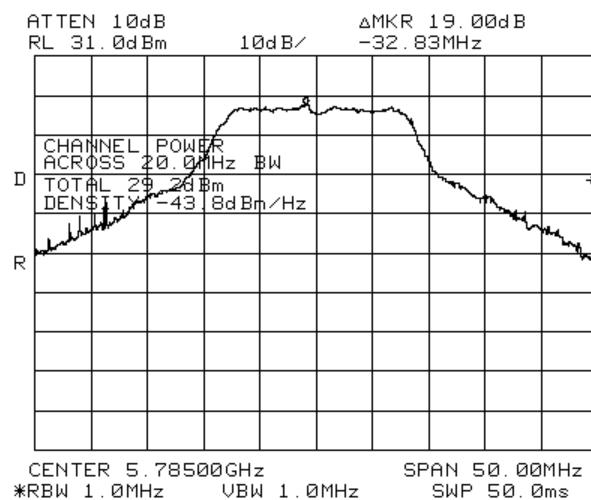


Figure 28 —5785 MHz 6Mbps

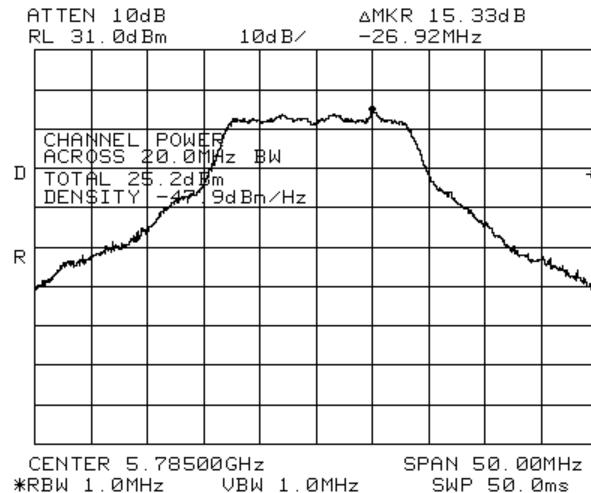


Figure 29 —5785 MHz 54Mbps

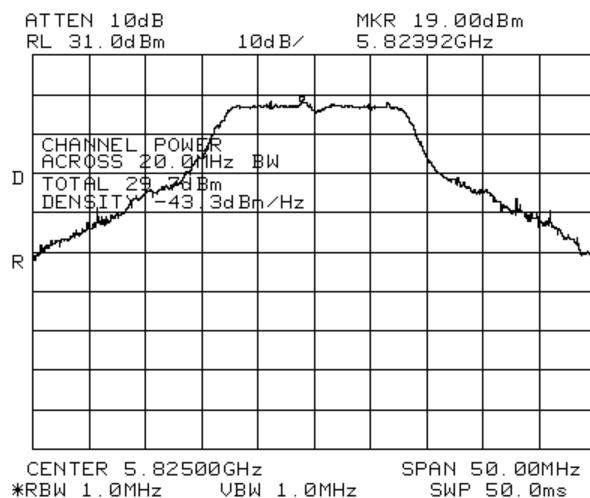


Figure 30 —5825 MHZ 6Mbps

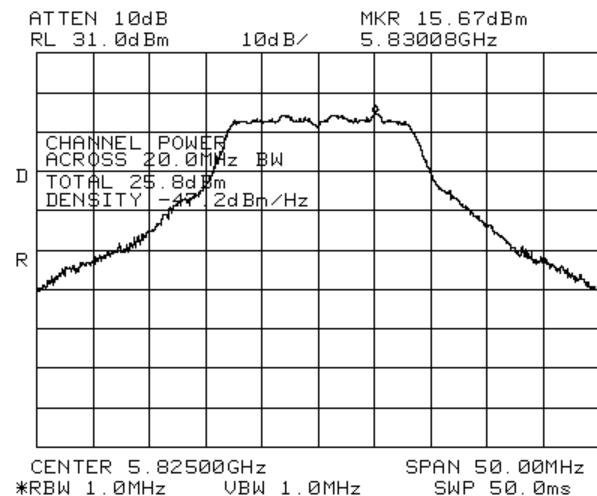


Figure 31 —5825 MHZ 54Mbps



7.2 **Results table**

E.U.T. Description: WiFi Outdoor Access Point

Model No.: MBW-3100F

Serial Number: MLMU1000802

Specification: F.C.C. Part 15, Subpart C Section 15.247(b.4.ii)

Operation Frequency (MHz)	Modulation (Mbps)	Reading (dBm)	Specification (dBm)	Margin (dB)
5745	6	29.1	30.0	-0.9
	54	25.0	30.0	-5.0
5785	6	29.2	30.0	-0.8
	54	25.2	30.0	-4.8
5825	6	29.7	30.0	-0.3
	54	25.8	30.0	-4.2

Figure 32 Maximum Peak Power Output

JUDGEMENT: Passed by 0.3 dB

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



7.3 **Test Equipment Used.**

Peak Power Output

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3414U01226	January 23, 2011	1 year
Attenuator	-	30dB	-	November 10, 2011	1 year
Cable	TestLINE	18	11556	November 10, 2011	1 year

Figure 33 Test Equipment Used

8. Peak Power Output Out of 5725-5850 MHz Band

8.1 ***Test procedure***

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (20 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 1 kHz resolution BW for the frequency range 9 kHz - 150 kHz, 10 kHz resolution BW for the frequency range 150 kHz - 1 MHz, 100 kHz resolution BW for the frequency range 1 MHz- 1 GHz, 100 kHz resolution BW for the frequency range 5.750 - 5850 GHz, and 1 MHz resolution BW for the frequency range 1 - 40 GHz. The frequency range from 9 kHz to 40 GHz was scanned. Level of spectrum components out of the 5725-5850 MHz was measured at the selected operation frequencies.

The E.U.T. was tested at 5745, 5785 and 5825MHz with the following modulations: 6 and 54 Mbps.

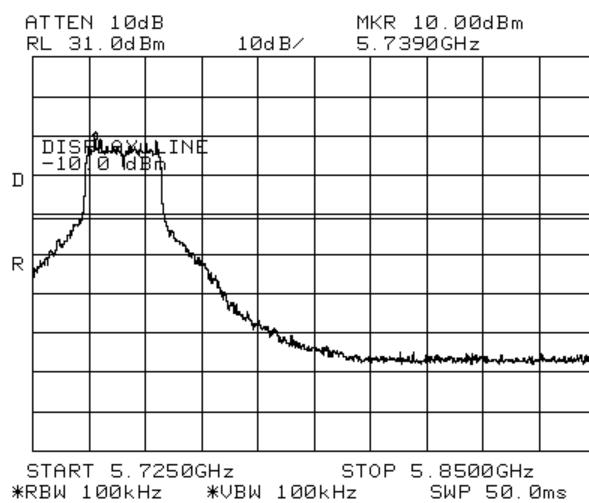


Figure 34 —5745 MHz 6Mbps

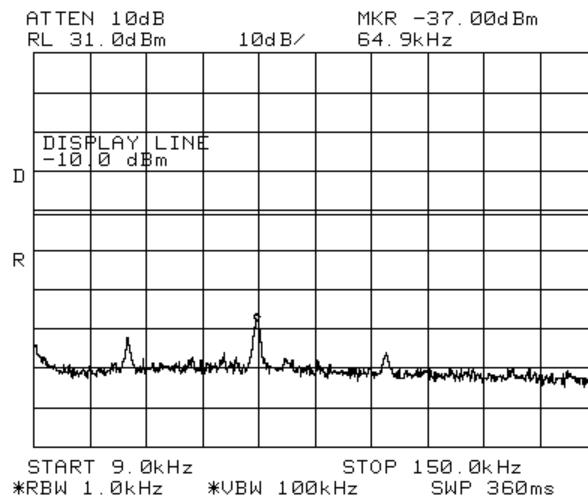


Figure 35 —5745 MHz 6Mbps

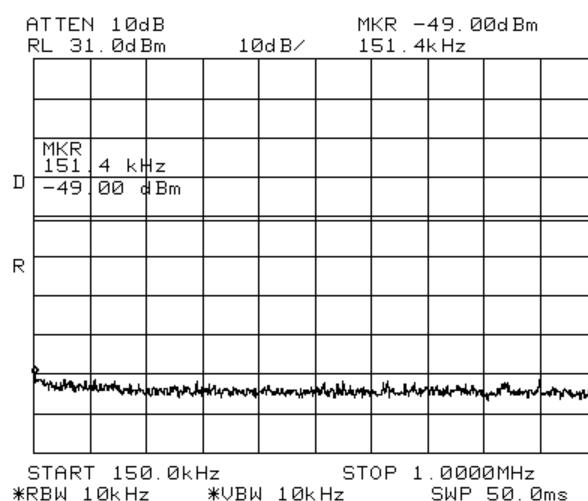


Figure 36 —5745 MHz 6Mbps

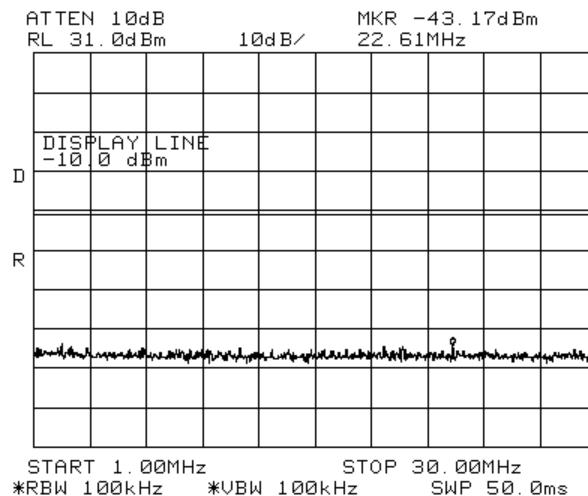


Figure 37 —5745 MHz 6Mbps

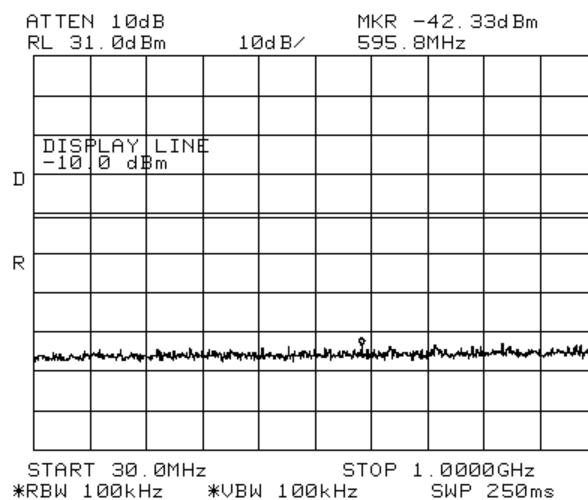


Figure 38 —5745 MHz 6Mbps

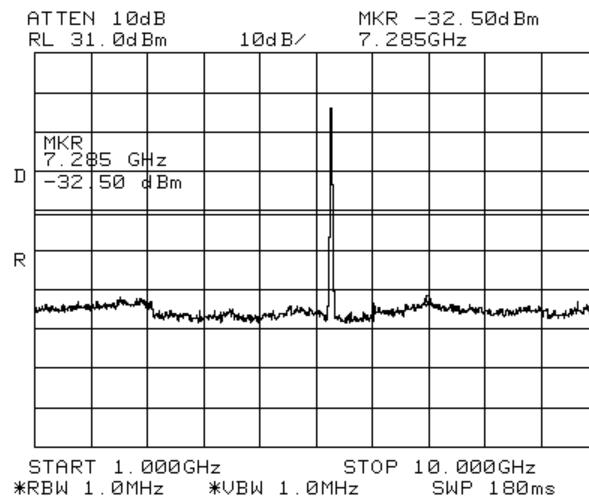


Figure 39 —5745 MHz 6Mbps

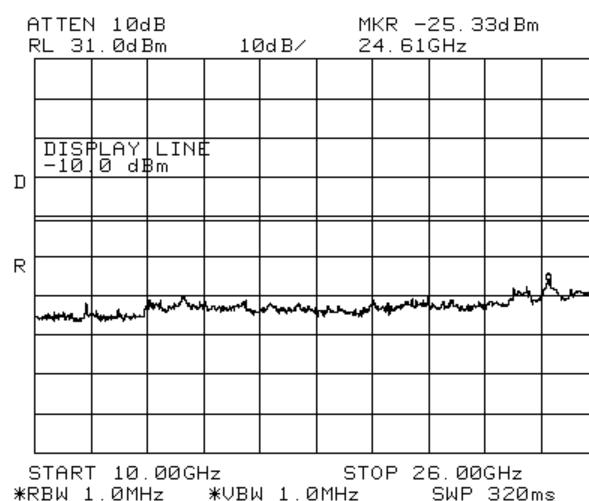


Figure 40 —5745 MHz 6Mbps

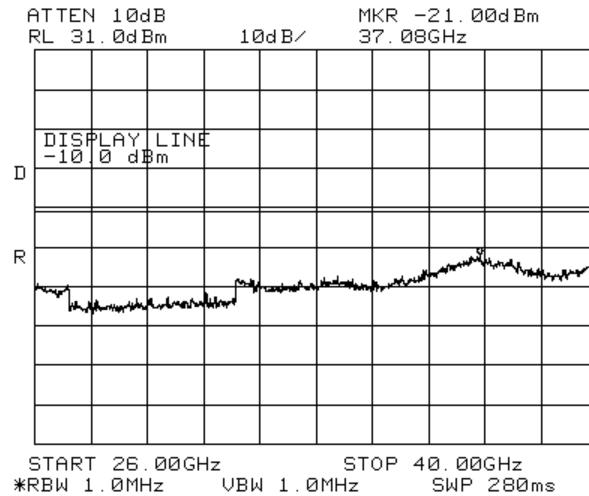


Figure 41 —5745 MHz 6Mbps

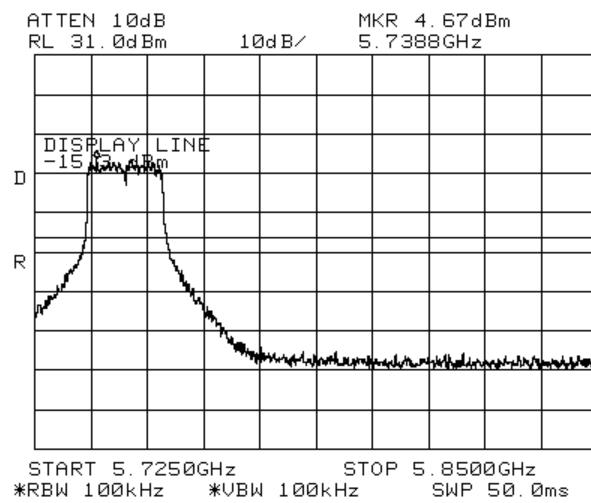


Figure 42 —5745 MHz 54Mbps

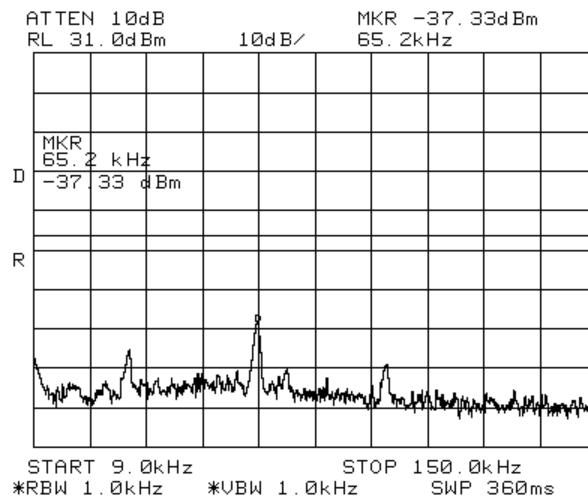


Figure 43 —5745 MHz 54Mbps

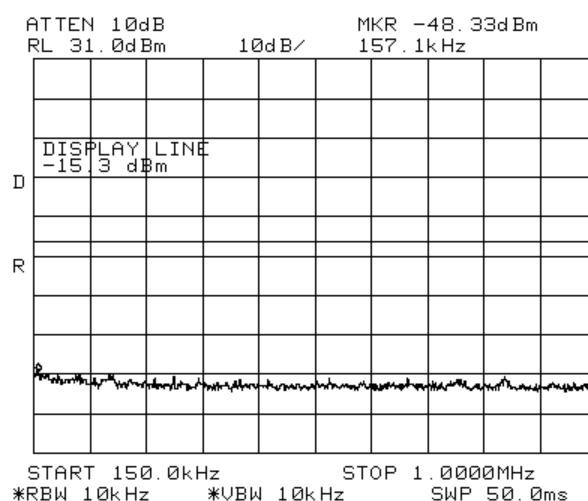


Figure 44 —5745 MHz 54Mbps

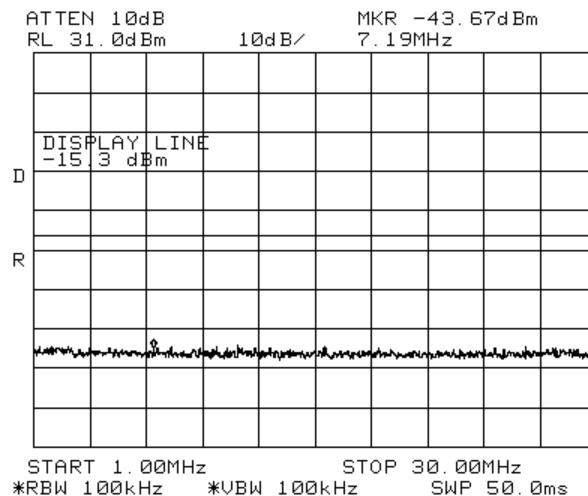


Figure 45 —5745 MHz 54Mbps

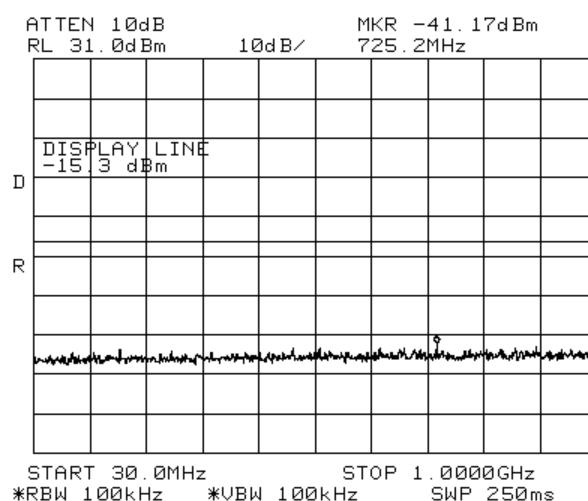


Figure 46 —5745 MHz 54Mbps

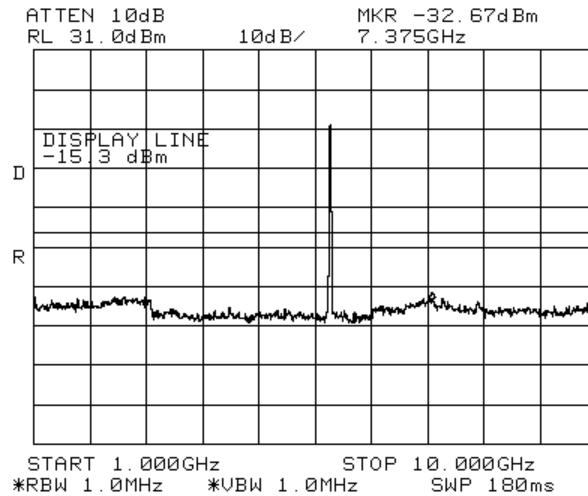


Figure 47 —5745 MHz 54Mbps

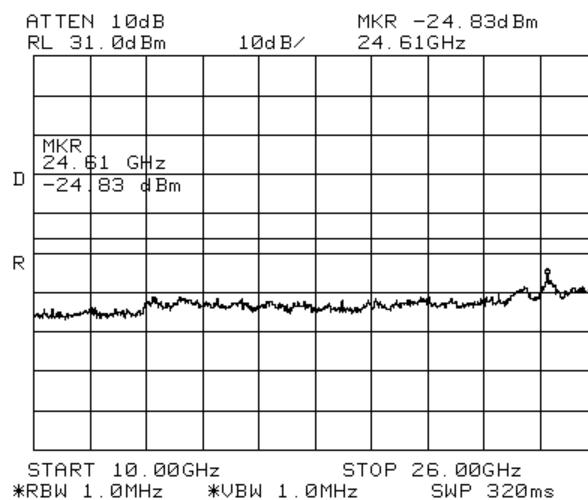


Figure 48 —5745 MHz 54Mbps

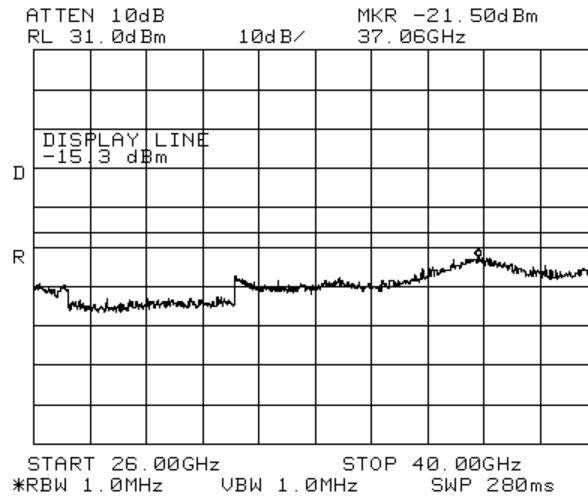


Figure 49 —5745 MHz 54Mbps

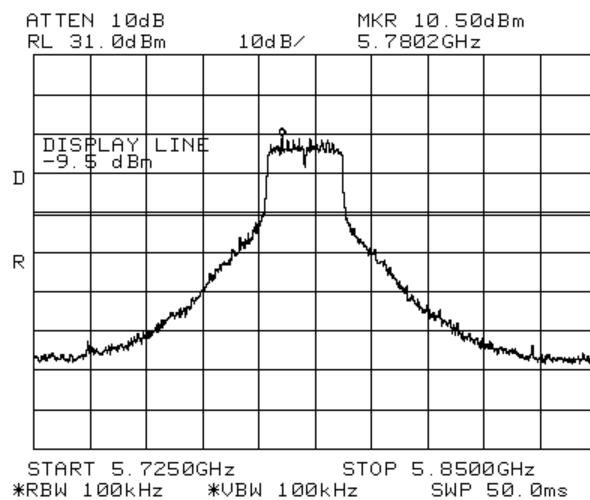


Figure 50 —5785 MHZ 6Mbps

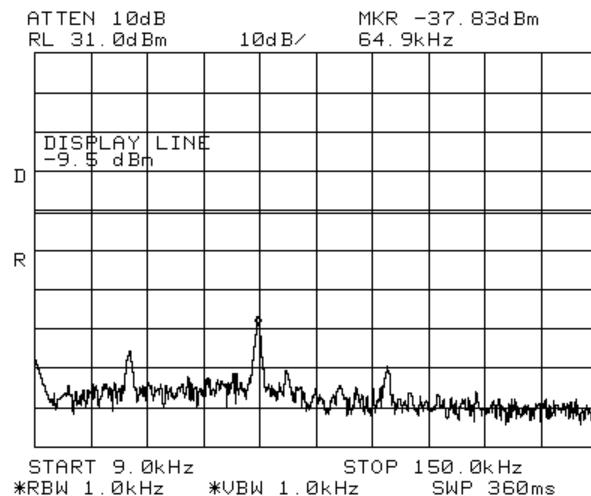


Figure 51 —5785 MHZ 6Mbps

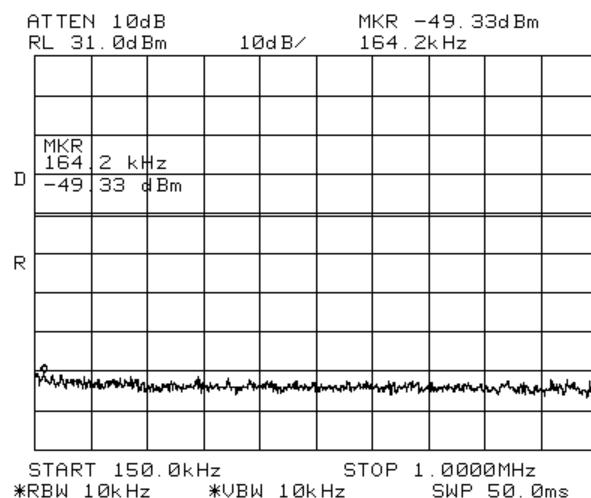


Figure 52 —5785 MHZ 6Mbps

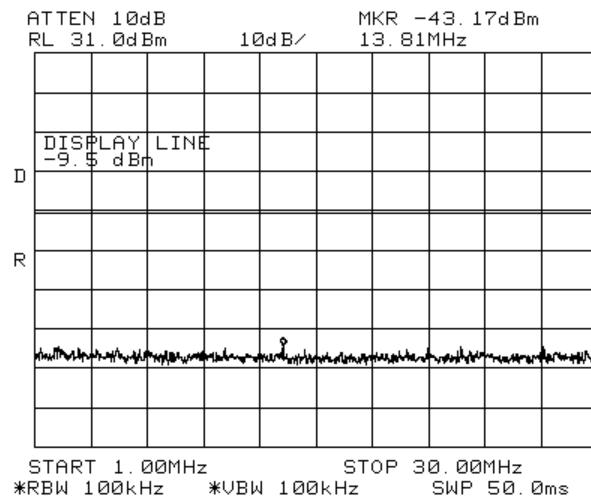


Figure 53 —5785 MHZ 6Mbps

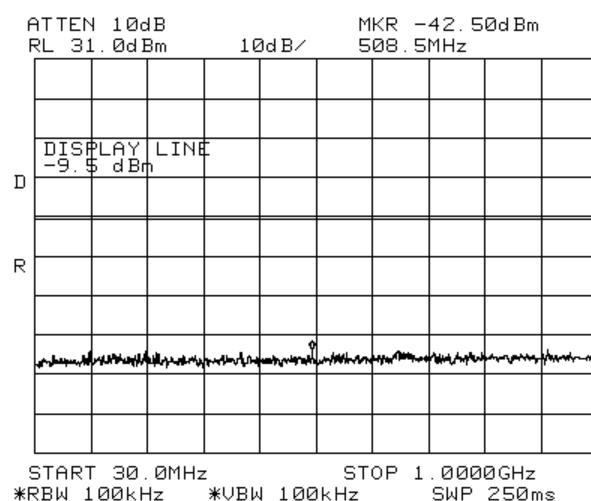


Figure 54 —5785 MHZ 6Mbps

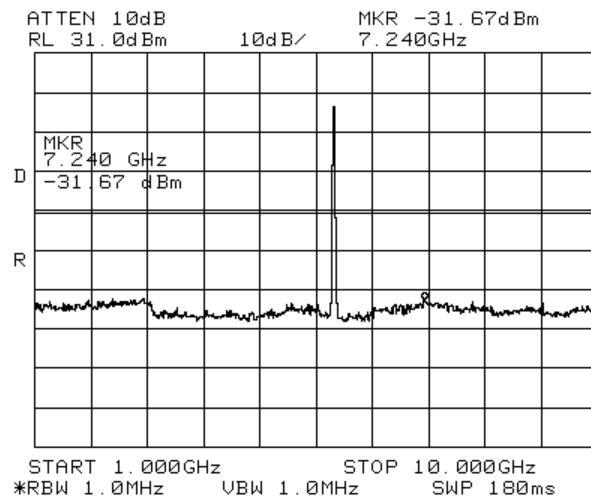


Figure 55 —5785 MHZ 6Mbps

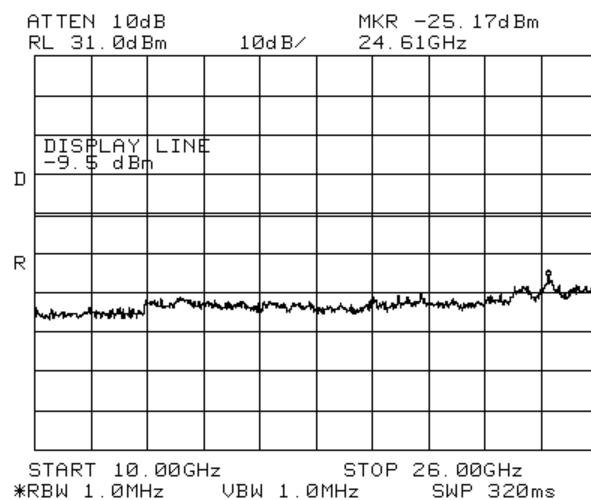


Figure 56 —5785 MHZ 6Mbps

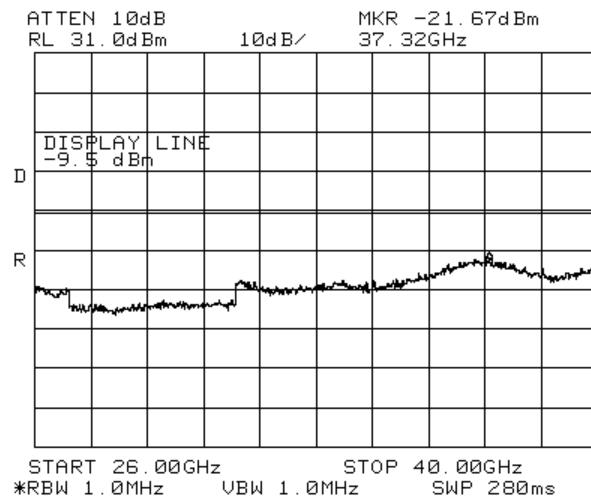


Figure 57 —5785 MHZ 6Mbps

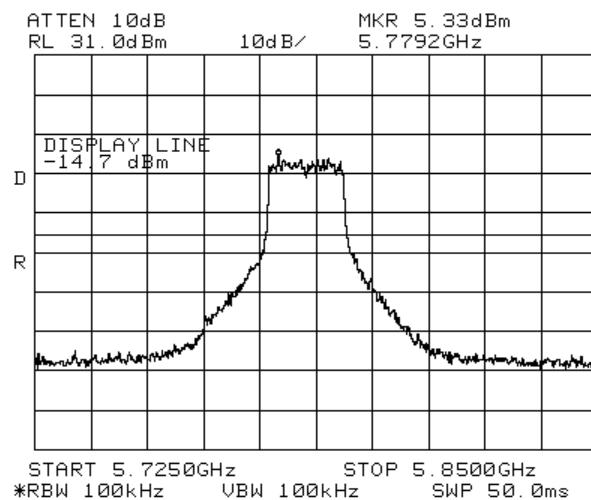


Figure 58 —5785 MHz 54Mbps

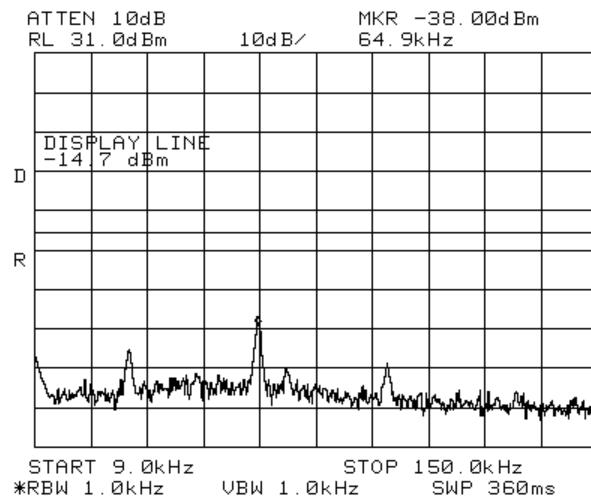


Figure 59 —5785 MHz 54Mbps

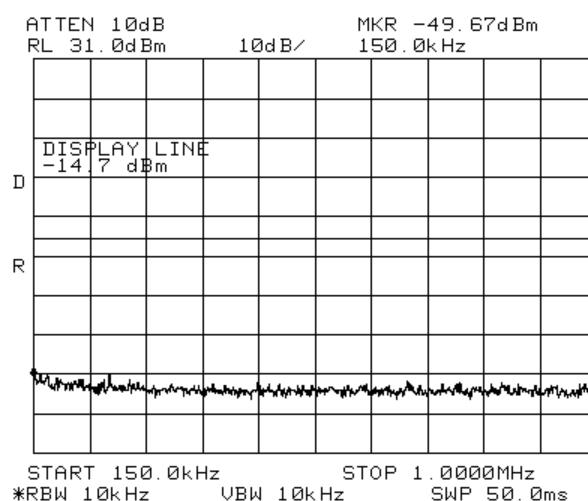


Figure 60 —5785 MHz 54Mbps

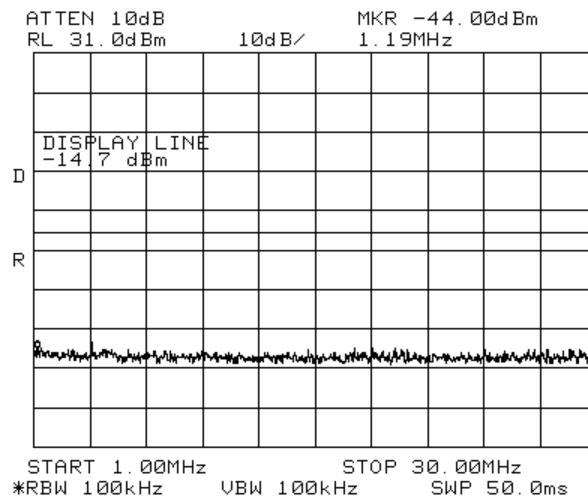


Figure 61 —5785 MHz 54Mbps

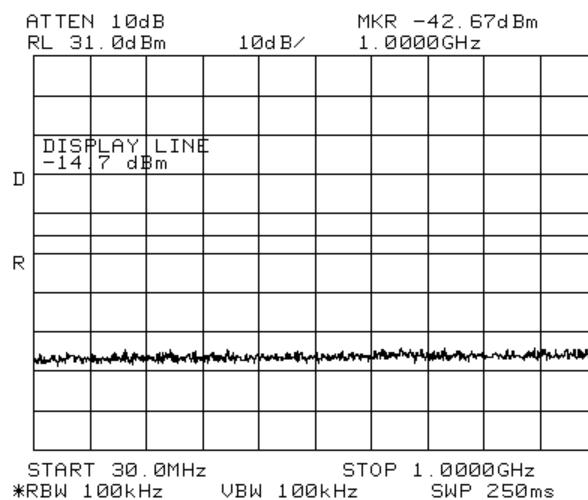


Figure 62 —5785 MHz 54Mbps

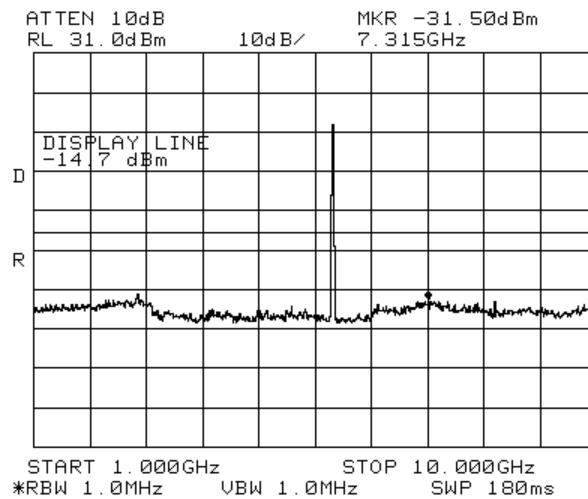


Figure 63 —5785 MHz 54Mbps

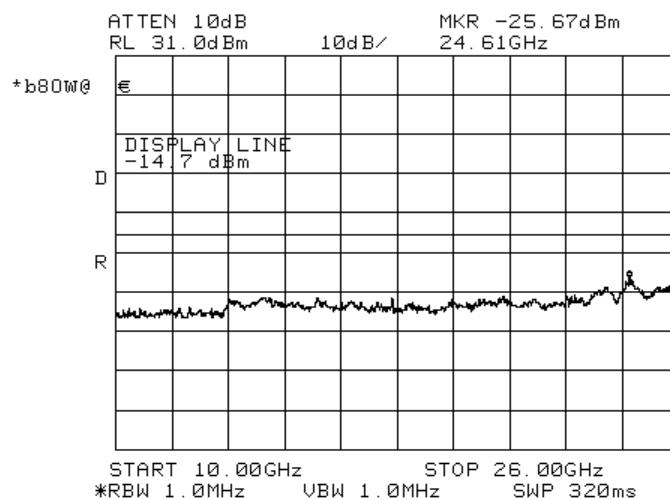


Figure 64 —5785 MHz 54Mbps

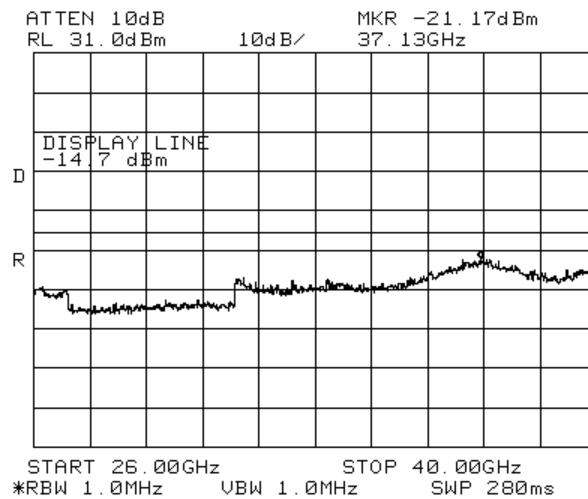


Figure 65 —5785 MHz 54Mbps

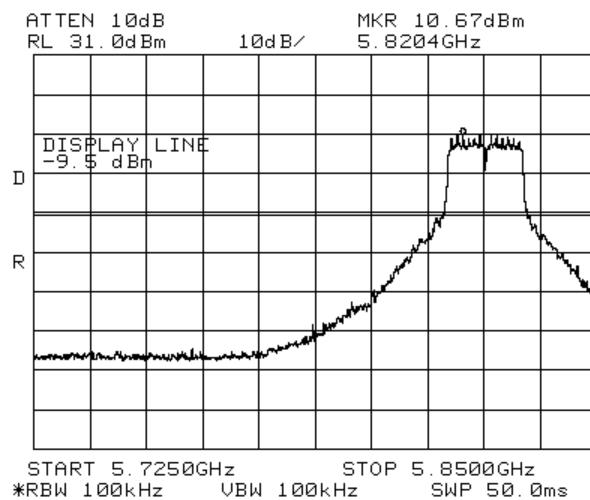


Figure 66 —5825 MHZ 6Mbps

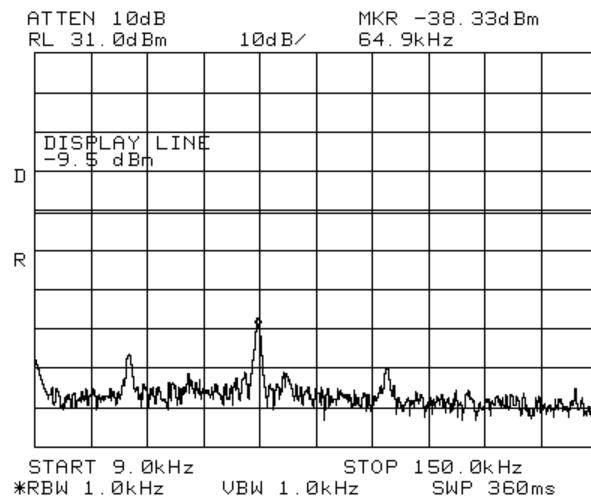


Figure 67 —5825 MHZ 6Mbps

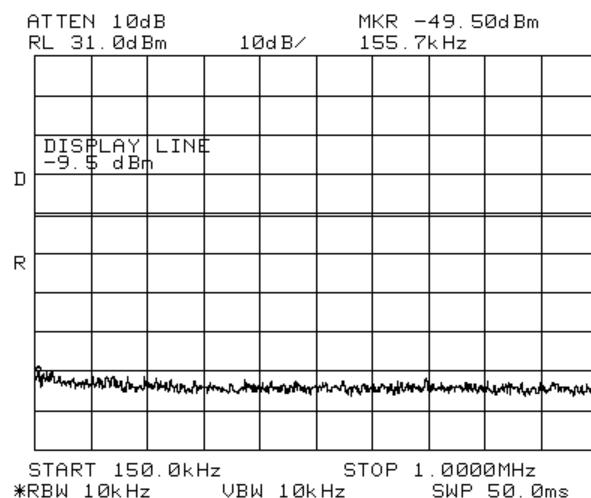


Figure 68 —5825 MHZ 6Mbps

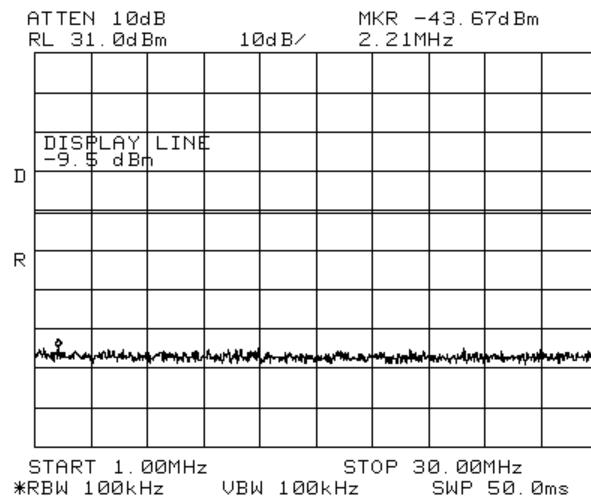


Figure 69 —5825 MHZ 6Mbps

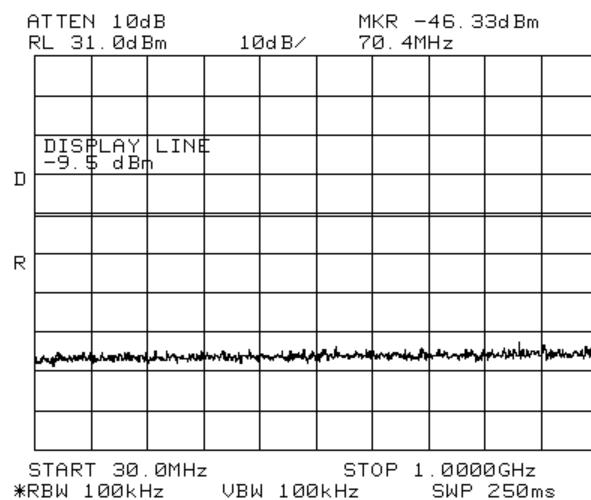


Figure 70 —5825 MHZ 6Mbps

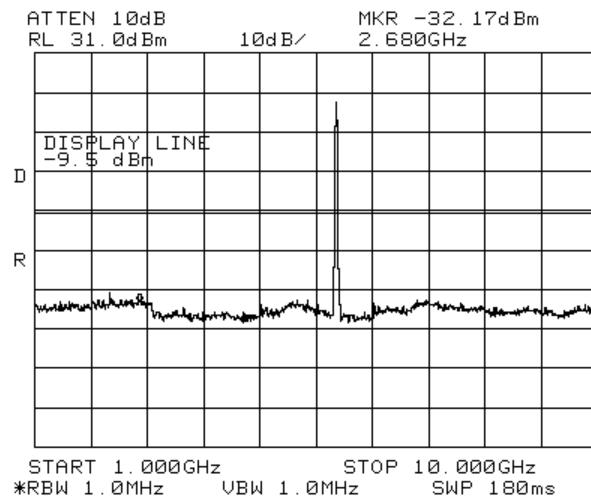


Figure 71 —5825 MHZ 6Mbps

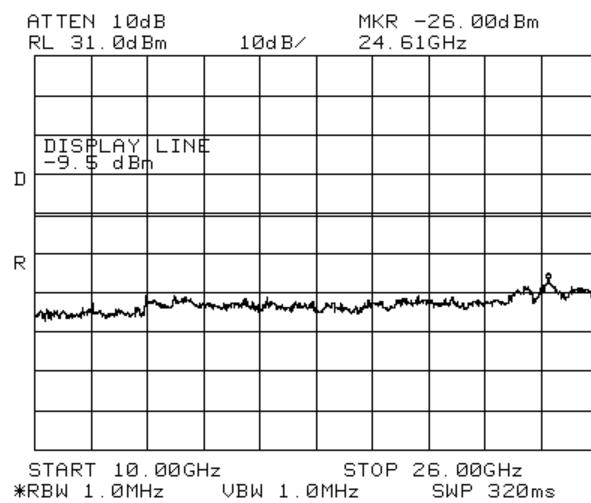


Figure 72 —5825 MHZ 6Mbps

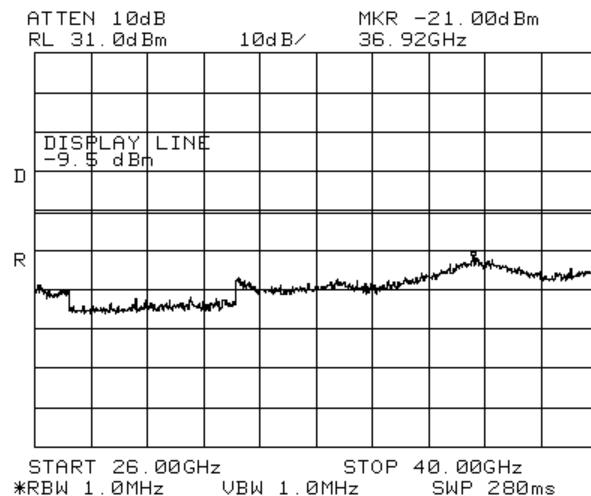


Figure 73 —5825 MHZ 6Mbps

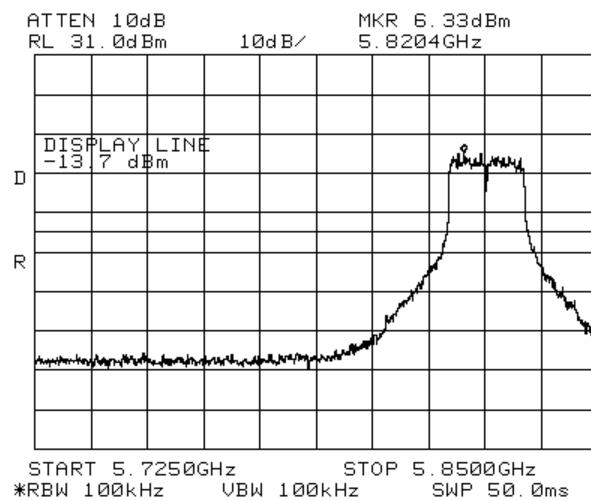


Figure 74 —5825 MHZ 54Mbps

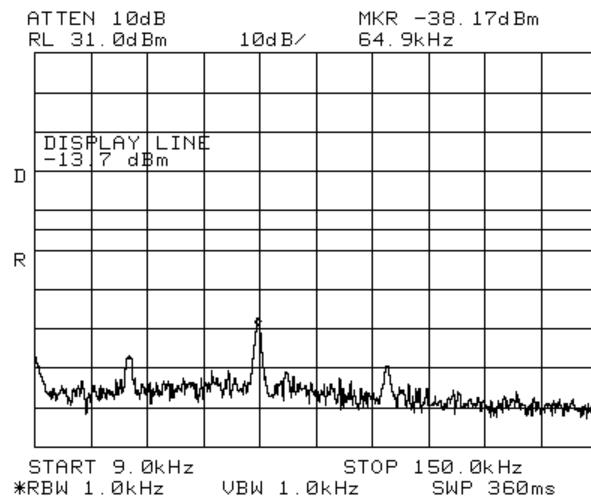


Figure 75 —5825 MHZ 54Mbps

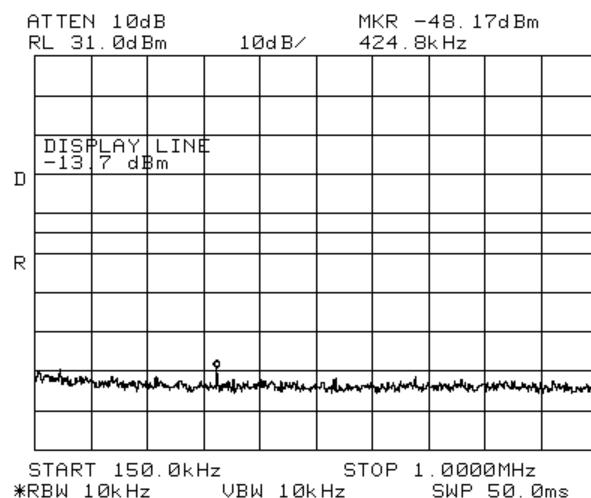


Figure 76 —5825 MHZ 54Mbps

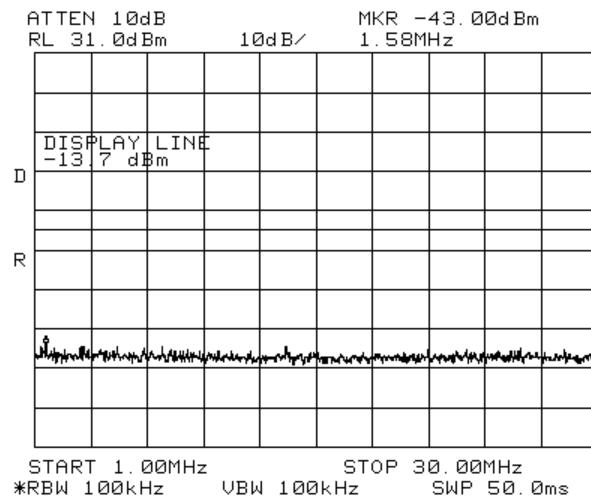


Figure 77 —5825 MHZ 54Mbps

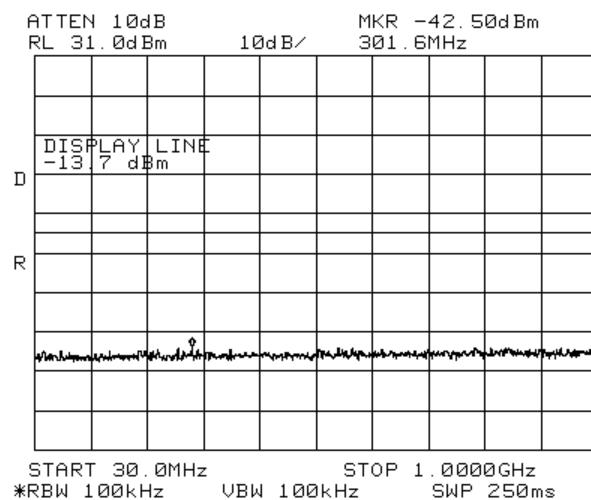


Figure 78 —5825 MHZ 54Mbps

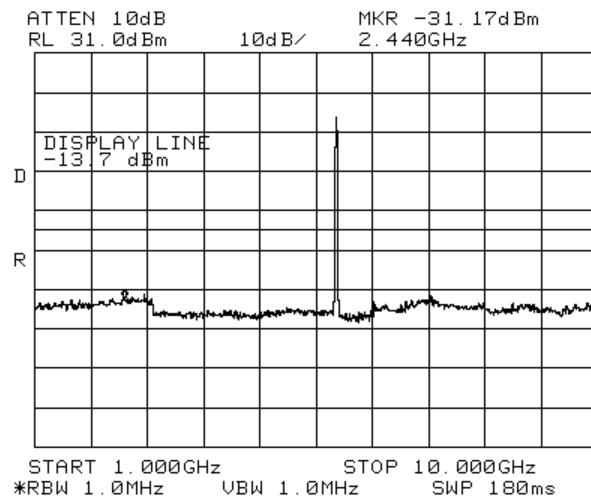


Figure 79 —5825 MHZ 54Mbps

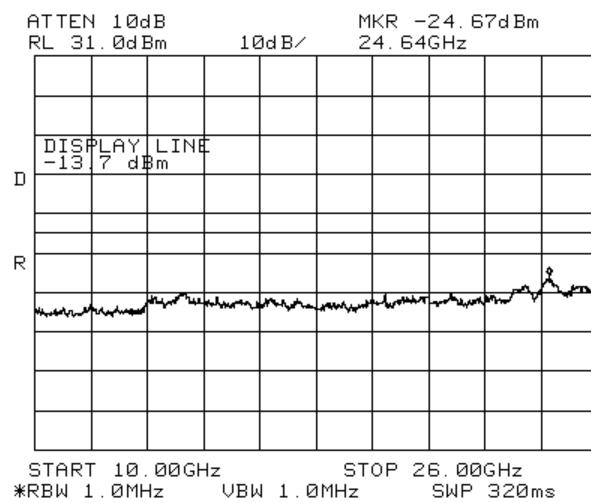


Figure 80 —5825 MHZ 54Mbps

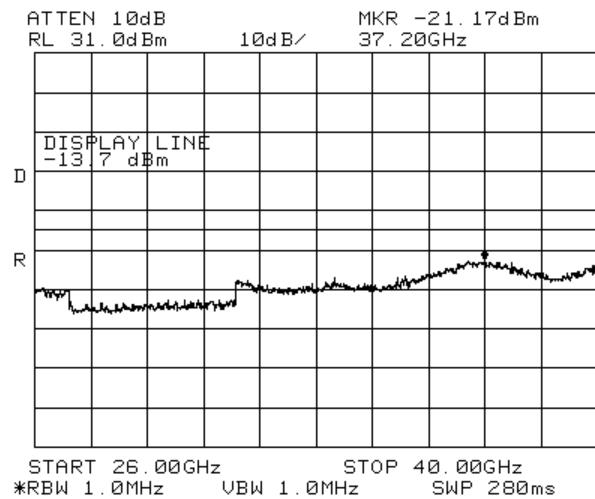


Figure 81 —5825 MHZ 54Mbps



8.2 Results table

E.U.T Description: WiFi Outdoor Access Point

Model No.: MBW-3100F

Serial Number: MLMU1000802

Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency (MHz)	Modulation (Mbps)	Reading (dBm)	Specification (dBm)	Margin (dB)
5745	6	-21.0	-10.0	-11
	54	-21.0	-15.3	-5.7
5785	6	-21.7	-9.5	-12.2
	54	-21.2	-14.7	-6.5
5825	6	-21.0	-9.5	-11.5
	54	-21.2	-13.7	-7.5

Figure 82 Peak Power Output of 5725-5850 MHz Band

JUDGEMENT: Passed by 5.7 dB

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



8.3 **Test Equipment Used.**

Peak Power Output of 2400-2438.5 MHz Band

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3414U01226	January 23, 2011	1 year
Attenuator	-	30dB	-	November 10, 2011	1 year
Cable	TestLINE	18	11556	November 10, 2011	1 year

Figure 83 Test Equipment Used

9. Band Edge Spectrum

[In Accordance with section 15.247(c)]

9.1 *Test procedure*

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 100 kHz resolution BW. Maximum power level below 5725 MHz and above 5850 MHz was measured relative to power level at 5725 MHz, and 5850 MHz correspondingly. The E.U.T. was tested at 5745 and 5825 MHz with the following modulations: 6 and 54 Mbps.

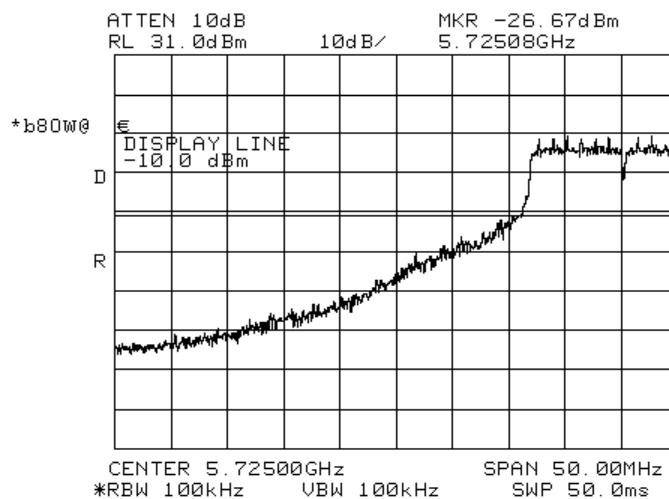


Figure 84 —5745 MHz 6Mbps

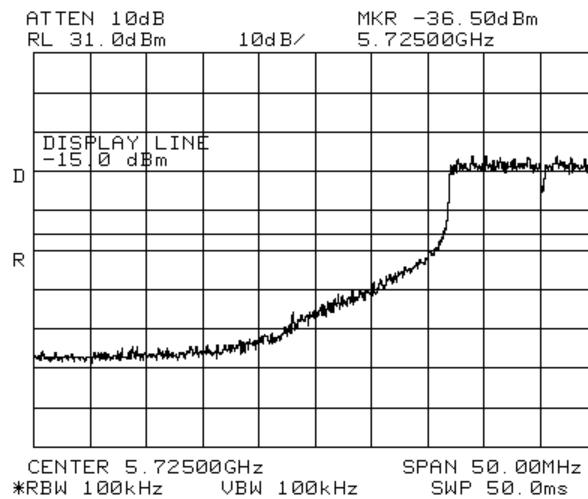


Figure 85 —5745MHz 54Mbps

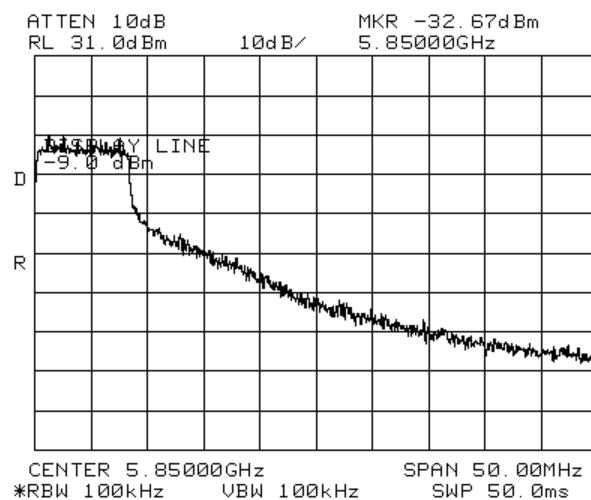


Figure 86 —5825 MHz 6Mbps

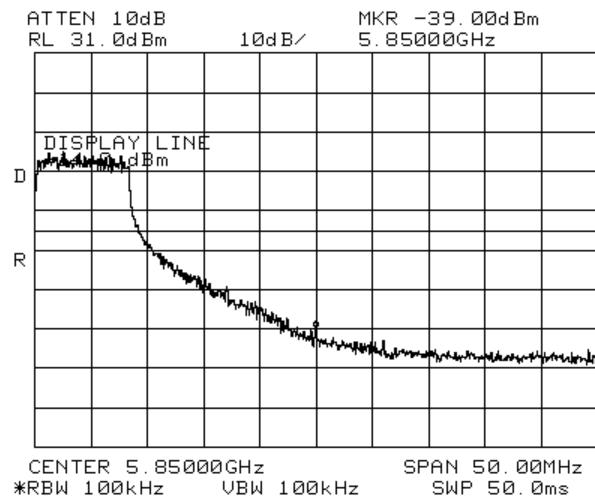


Figure 87 —5825 MHZ 54Mbps



9.2 Results table

E.U.T. Description: WiFi Outdoor Access Point

Model No.: MBW-3100F

Serial Number: MLMU1000802

Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency (MHz)	Modulation (Mbps)	Band Edge Frequency (MHz)	Peak Reading (dBm)	Band Edge Limit (dBm)	Band Edge Reading (dBm)
5725	6	5725	-26.7	-10.0	-16.7
	54	5725	-36.5	-15.0	-21.5
5825	6	5850	-32.7	-9.0	-23.7
	54	5850	-39.0	-14.9	-24.1

Figure 88 Band Edge Spectrum

JUDGEMENT: Passed by 16.7 dB

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



9.3 **Test Equipment Used.**

Band edge Spectrum

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3414U01226	January 23, 2011	1 year
Attenuator	-	30dB	-	November 10, 2011	1 year
Cable	TestLINE	18	11556	November 10, 2011	1 year

Figure 89 Test Equipment Used



10. Radiated Emission, 9 kHz – 30 MHz

10.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

10.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was tested at 5745, 5785 and 5825MHz with the following modulations: 6 and 54 Mbps.

Measurement was performed using a peak detector.

10.3 Measured Data

JUDGEMENT: Passed by more than 20dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

The results for all 3 operation frequencies and modulations were the same.

No signals were detected in the frequency range of 9 kHz – 30 MHz.

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



10.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 24, 2010	1 year
RF Section	HP	85420E	3705A00248	November 24, 2010	1 year
Active Loop Antenna	Emco	6502	2950	October 19, 2011	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

10.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS: Field Strength [dB μ V/m]

RA: Receiver Amplitude [dB μ V]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable Attenuation Factor [dB]

Example: $FS = 30.7 \text{ dB}\mu\text{V (RA)} + 14.0 \text{ dB (AF)} + 0.9 \text{ dB (CF)} = 45.6 \text{ dB}\mu\text{V}$

No external pre-amplifiers are used.



11. Radiated Emission 30 – 40000 MHz

11.1 Test Specification

30 MHz-40000 MHz, F.C.C., Part 15, Subpart C

11.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The frequency range 30 MHz-25000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

In the frequency range of 30 MHz – 2.9 GHz, the emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 2.9-40.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements, the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements, the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.

The test distance was 3 meters.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The E.U.T. was tested at 5745, 5785 and 5825MHz with the following modulations: 6 and 54 Mbps.



11.3 **Test Data**

JUDGEMENT: Passed by 6.2 dB

For the operation frequency of 5745 MHz, the margin between the emission level and the specification limit is 6.2 dB in the worst case at the frequency of 11490.00 MHz, vertical polarization.

For the operation frequency of 5785 MHz, the margin between the emission level and the specification limit is 7.0 dB in the worst case at the frequency of 11570.00 MHz, vertical polarization.

For the operation frequency of 5825 MHz, the margin between the emission level and the specification limit is 7.0 dB in the worst case at the frequency of 11650.5 MHz, vertical polarization.

The results for all modulations were the same.

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

The details of the highest emissions are given in *Figure 90* to *Figure 95*.

TEST PERSONNEL:

Tester Signature: 

Date: 19.01.12

Typed/Printed Name: A. Sharabi



Radiated Emission 30 MHz – 40 GHz

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30MHz to 40.0 GHz
Test Distance: 3 meters Detector: Peak
Operation Frequency: 5745 MHz

Frequency (MHz)	Polarity (H/V)	Peak Reading (dB μ V/m)	Peak. Specification (dB μ V/m)	Peak. Margin (dB)
11490	H	58.0	74.0	-16.0
11490	V	54.0	74.0	-20.0

**Figure 90. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Reading” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss



Radiated Emission 30 MHz – 40 GHz

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30MHz to 40.0 GHz
Test Distance: 3 meters Detector: Average
Operation Frequency: 5745 MHz

Frequency (MHz)	Polarity (H/V)	Average Reading (dB μ V/m)	Average Specification (dB μ V/m)	Peak. Margin (dB)
11490	H	47.8	54.0	-6.2
11490	V	47.0	54.0	-7.0

**Figure 91. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Reading” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss



Radiated Emission 30 MHz – 40 GHz

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30MHz to 40.0 GHz
Test Distance: 3 meters Detector: Peak
Operation Frequency: 5785 MHz

Frequency (MHz)	Polarity (H/V)	Peak Reading (dB μ V/m)	Peak. Specification (dB μ V/m)	Peak. Margin (dB)
11570	H	57.0	74.0	-17.0
11570	V	59.1	74.0	-14.9

**Figure 92. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Reading” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



Radiated Emission 30 MHz – 40 GHz

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30MHz to 40.0 GHz
Test Distance: 3 meters Detector: Average
Operation Frequency: 5785 MHz

Frequency (MHz)	Polarity (H/V)	Average Reading (dB μ V/m)	Average Specification (dB μ V/m)	Peak. Margin (dB)
11570	H	45.0	54.0	-9.0
11570	V	47.0	54.0	-7.0

**Figure 93. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Reading” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



Radiated Emission 30 MHz – 40 GHz

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30MHz to 40.0 GHz
Test Distance: 3 meters Detector: Peak
Operation Frequency: 5825 MHz

Frequency (MHz)	Polarity (H/V)	Peak Reading (dB μ V/m)	Peak. Specification (dB μ V/m)	Peak. Margin (dB)
11650	H	57.0	74.0	-17.0
11650	V	58.5	74.0	-15.5

**Figure 94. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Reading” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

**“Correction Factor” = Antenna Factor + Cable Loss



Radiated Emission 30 MHz – 40 GHz

E.U.T Description WiFi Outdoor Access Point
Type MBW-3100F
Serial Number: MLMU1000802

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 30MHz to 40.0 GHz
Test Distance: 3 meters Detector: Average
Operation Frequency: 5825 MHz

Frequency (MHz)	Polarity (H/V)	Average Reading (dB μ V/m)	Average Specification (dB μ V/m)	Peak. Margin (dB)
11650	H	46.5	54.0	-7.5
11650	V	47.0	54.0	-7.0

**Figure 95. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.
Detector: Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Reading” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

**“Correction Factor” = Antenna Factor + Cable Loss



11.4 **Field Strength Calculation below 1 GHz**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v}/\text{m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

FS: Field Strength [dB μ v/m]

RA: Receiver Amplitude [dB μ v]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dB μ V (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dB μ V

No external pre-amplifiers are used.



**11.5 Test Instrumentation Used, Radiated Measurements
30 MHz -25 GHz**

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 24, 2010	1 year
RF Section	HP	85420E	3705A00248	November 24, 2010	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	November 13, 2011	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 23, 2011	1 year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	January 27, 2011	2 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A
Spectrum Analyzer	HP	8592L	3826A01204	February 21, 2011	1 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	November 5, 2011	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	January 4, 2011	1 Year



12. Transmitted Power Density

[In accordance with section 15.247(d)]

12.1 Test procedure

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (30dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 3 kHz resolution BW. and sweep time of 1 second for each 3 kHz "window". The spectrum peaks were located at each of the 3 operating frequencies.

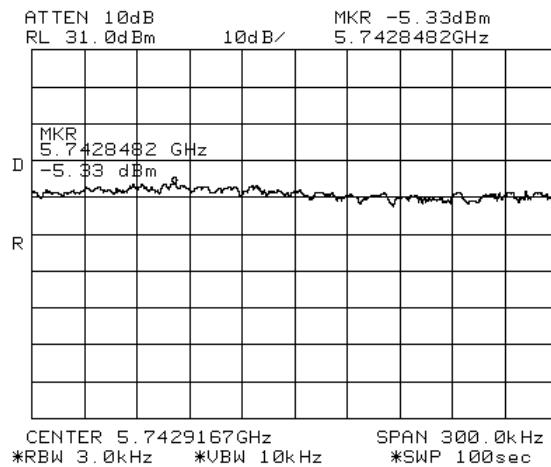


Figure 96 —5745 MHz 6Mbps

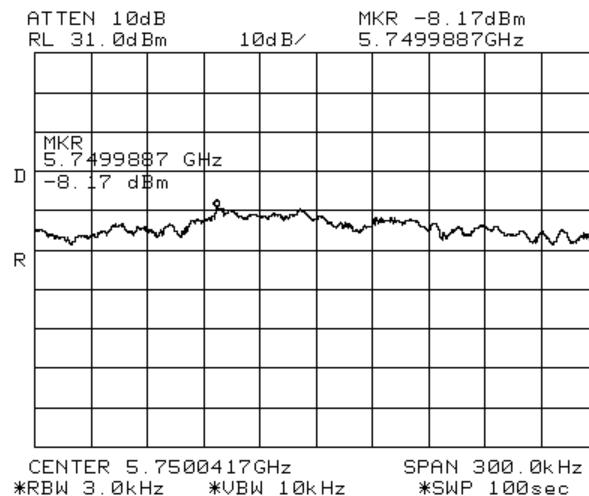


Figure 97 —5745MHZ 54Mbps

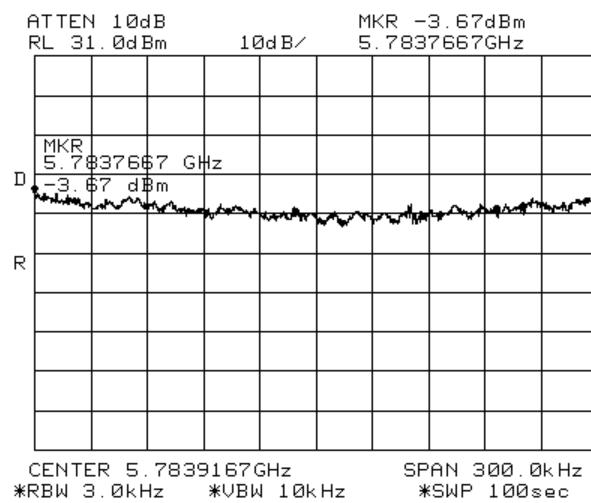


Figure 98 —5785 MHZ 6Mbps

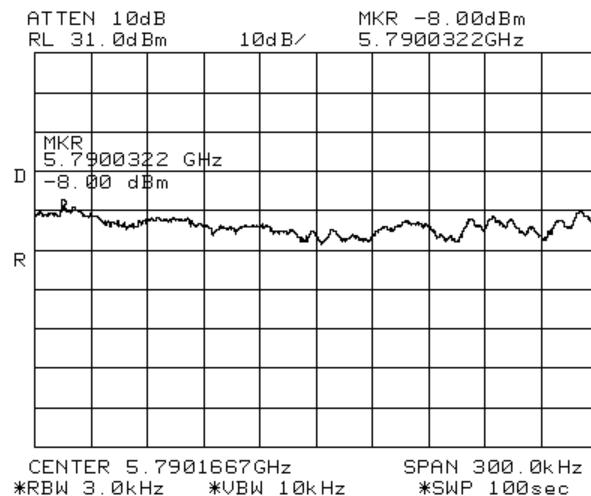


Figure 99 —5785 MHz 54Mbps

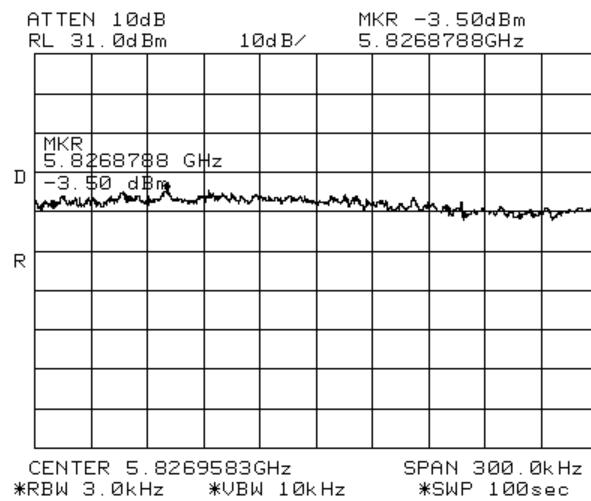


Figure 100 —5825 MHz 6Mbps

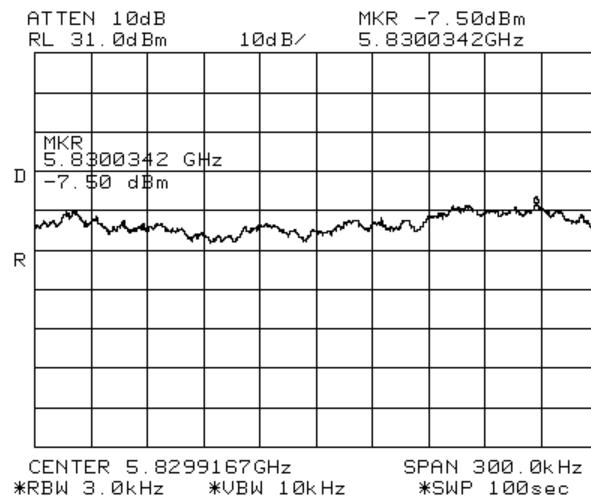


Figure 101 —5825 MHZ 54Mbps

E.U.T. Description: WiFi Outdoor Access Point

Model No.: MBW-3100F

Serial Number: MLMU1000802

Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency (MHz)	Modulation (Mbps)	Reading (dBm)	Specification (dBm)	Margin (dB)
5745	6	-5.33	8.0	-13.4
	54	-8.17	8.0	-16.2
5785	6	-3.67	8.0	-11.7
	54	-8.0	8.0	-16.0
5825	6	-3.5	8.0	-11.5
	54	-7.5	8.0	-15.5

Figure 102 Test Results

JUDGEMENT:

Passed by 11.5 dB

TEST PERSONNEL:

Tester Signature:

Date: 19.01.12

Typed/Printed Name: A. Sharabi



12.2 **Test Equipment Used.**

Transmitted Power Density

Instrument	Manufacturer	Model	Serial/Part Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3414U01226	January 23, 2011	1 year
Attenuator	-	30dB	-	November 10, 2011	1 year
Cable	TestLINE	18	11556	November 10, 2011	1 year

Figure 103 Test Equipment Used



13. Antenna Gain/Information

The antenna gain is 10.5dBi.

14. Intermodulation

14.1 Test procedure

The E.U.T. antenna terminal of the Backhaul was connected to the spectrum analyzer through an external attenuator (30 dB) and an appropriate coaxial cable (cable loss = 1 dB). The spectrum analyzer was set to 1MHz resolution BW except for the frequency range.

Both transmitters were operating at 2.427GHz and 5.745GHz (from different RF ports) the spectrum was scanned for intermodulation products in the range of 9KHz to 40GHz.

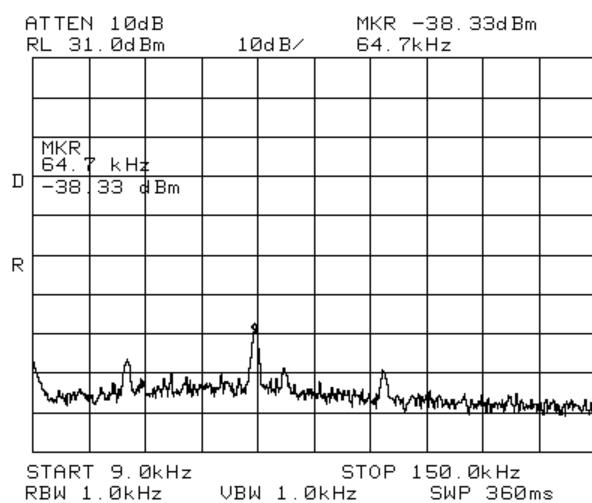


Figure 104 Intermodulation

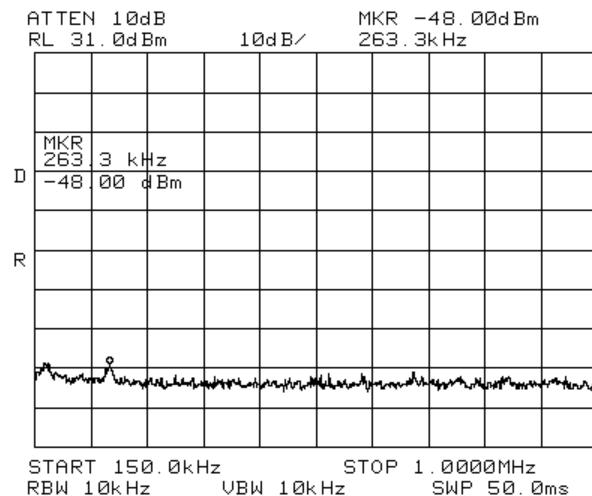


Figure 105 Intermodulation

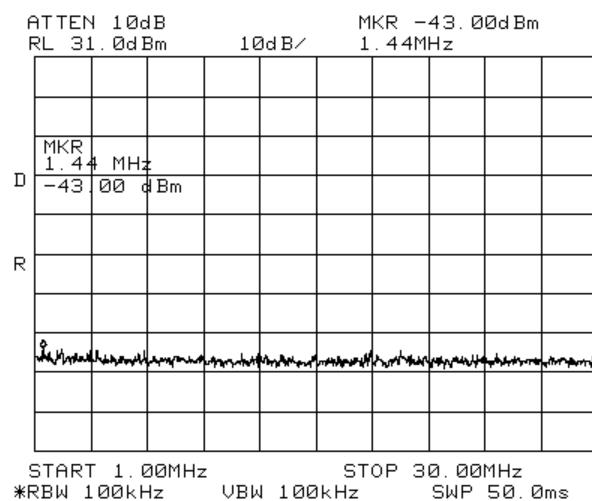


Figure 106 Intermodulation

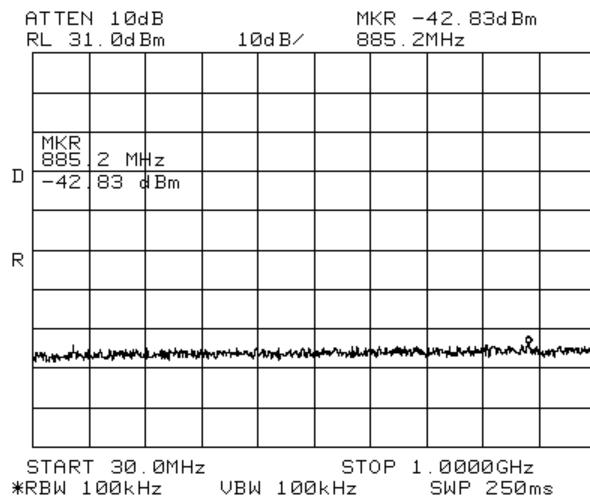


Figure 107 Intermodulation

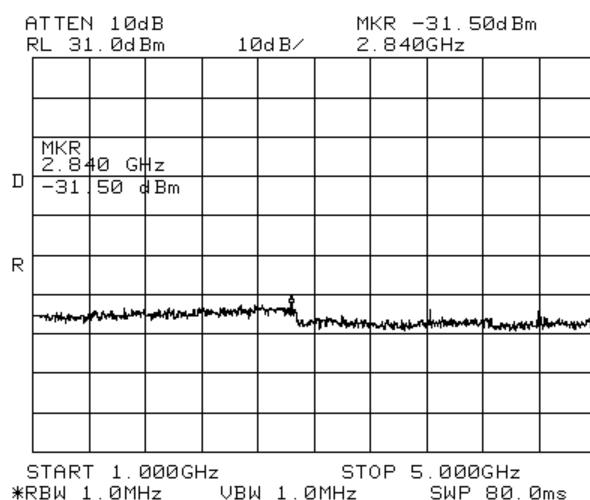


Figure 108 Intermodulation

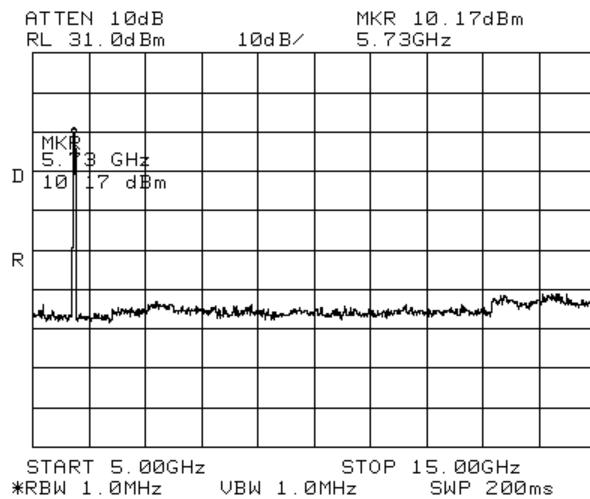


Figure 109 Intermodulation

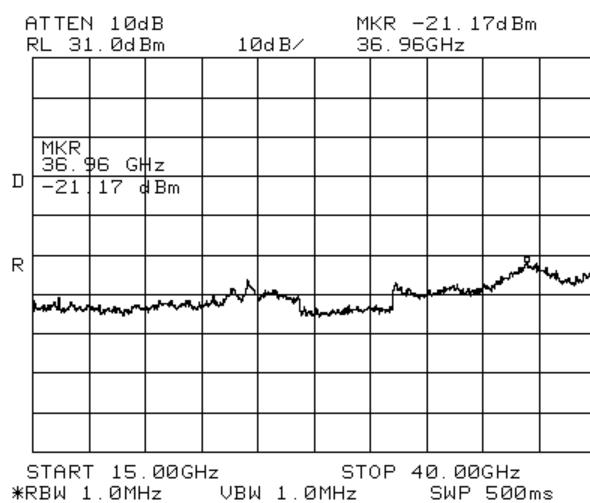


Figure 110 Intermodulation



15. R.F Exposure/Safety

The typical distance between the E.U.T. and the user in the worst case application, is >40 cm .

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1307(b)(1) Requirements

(a) FCC limit is:

$$1 \frac{mW}{cm^2}$$

Using table 1 of Section 1.1310 $1 \frac{mW}{cm^2}$ for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

P_t - Transmitted Peak Power 29.7 dBm = 933.25 mw

$$S = \frac{P_t G_t}{4\pi R^2}$$

G_t -Antenna Gain, 10.5 dBi = 11.22

R- Distance from Transmitter using 40 cm worst case

(c) The peak power density is :

$$S_p = \frac{933.25 \times 11.22}{4\pi(40)^2} = 0.521 \frac{mW}{cm^2}$$

(d) This is below the FCC limit.



16. APPENDIX A - CORRECTION FACTORS

16.1 Correction factors for

CABLE

**from EMI receiver
to test antenna
at 3 meter range.**

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".



16.2 Correction factors for

CABLE from EMI receiver to test antenna at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

1. The cable type is RG-8.
2. The overall length of the cable is 10 meters.



16.3 Correction factors for

CABLE from spectrum analyzer to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.
2. The cable is used for measurements above 2.9 GHz.
3. The overall length of the cable is 10 meters.



12.6 Correction factors for LOG PERIODIC ANTENNA

Type LPD 2010/A
at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".



16.4 Correction factors for

LOG PERIODIC ANTENNA

Type SAS-200/511
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".



16.5 Correction factors for

BICONICAL ANTENNA

**Type BCD-235/B,
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".



16.6 Correction factors for Double-Ridged Waveguide Horn

**Model: 3115, S/N 29845
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENN A Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			



16.7 Correction factors for

**Horn Antenna
Model: SWH-28
at 1 meter range.**

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4



16.8 Correction factors for ACTIVE LOOP ANTENNA

**Model 6502
S/N 9506-2950**

FREQUENCY (MHz)	Magnetic Antenna Factor (dB)	Electric Antenna Factor (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2