



427 West 12800 South
 Draper, UT 84020

Test Report Certification

FCC ID	SWX-AF60XRR
Canada ID	6545A-AF60XRR
Equipment Under Test	AF60-XRR
Test Report Serial Number	TR8444_04
Date of Test(s)	August 8 – 15, and August 23, 2023
Report Issue Date	November 15, 2023

Test Specification	Applicant
47 CFR FCC Part 15, Subpart E RSS-GEN	Ubiquiti Inc. 685 Third Avenue New York, NY 10019 U.S.A.



NVLAP LAB CODE 600241-0

Certification of Engineering Report

This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	airFiber
Model Number	AF60-XRR
FCC ID	SWX-AF60XRR
Canada ID	6545A-AF60XRR

On this 15th day of November 2023, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge and are made in good faith.

Although NVLAP has accredited the Unified Compliance Laboratory testing facilities, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. federal government.

Unified Compliance Laboratory



Written By: Clay Allred



Reviewed By: Richard L. Winter

Revision History		
Revision	Description	Date
01	Original Report Release	25 August 2023
02	Correct Power Output in Section 2.2.4	17 October 2023
03	Amended Table in Section 2.2.4	23 October 2023
04	Added Radiated Spurious Data	15 November 2023

Table of Contents

1	Client Information.....	5
1.1	Applicant.....	5
1.2	Manufacturer.....	5
2	Summary	6
2.1	Introduction.....	6
2.2	Description of EUT Differences	6

1 Client Information

1.1 Applicant

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Alex Macon
Title	Compliance Manager

1.2 Manufacturer

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Alex Macon
Title	Compliance Manager

2 Summary

2.1 Introduction

The purpose of this document is to provide definition of the differences between models and evidence of their similarities. It will also identify the test data that is to be used between the models and identifies the data that will be new to the AF60-XRR. This document is based on guidance provided in KDB 484596 DO1 Referencing test Data.

2.2 Description of EUT Differences

AF60-XR (FCC ID -SWX-AF60XR / IC ID 6545-AF60XR) is identical to the AF60-XRR (FCC ID -SWX-AF60XRR / IC ID 6545-AF60XRR) in hardware and software other than the RF output for the AF60-XRR UNII-1 and UNII-3 bands has an increased output power level.

2.2.1 AF60-XR (Original Equipment) Certification

The AF60-XR was originally granted on 2022-01-27 for the frequency bands of 58320-69120.0 MHz per CFR 47 Part 15C, 15.255; 5180-5240 MHz and 5745 – 5825 MHz per CFR 47 Part 15E, 15.407 and 2402 – 2480 MHz per CFR 47 Part 15C, 15.247 with a Class II Permissive change applied on 2023 – 03 – 24 to add the UNII-2A (5260-5320 MHz) and UNII-2C (5500 – 5720 MHz) bands per CFR 47 Part 15E, 15.407.

2.2.2 AF60-XRR (New Equipment Certification) Proposal

The AF60-XRR is requesting a grant for the frequency bands of 58320-69120.0 MHz per CFR 47 Part 15C, 15.255; 5180-5240 MHz; 5260-5320 MHz; 5500 – 5720 MHz; 5745 – 5825 MHz per CFR 47 Part 15E, 15.407 and 2402 – 2480 MHz per CFR 47 Part 15C, 15.247.

The 58320 – 69120 MHz; 5260-5320 MHz; 5500 – 5720 MHz and 2402 – 2480 MHz Bands have no changes from the original certification of the SWX-AF60XR The bands of 5180-5240 MHz (UNII-1) and 5745 – 5825 MHz (UNII-3) will have an increased output from the original filing (SWX-AF60XR) and is the reason for this application.

2.2.3 AF60-XRR Spot Check – Power / PSD

Per KDB 484596 DO1 a spot was conducted for the bands that have no changes applied (58320 – 69120 MHz; 5260-5320 MHz; 5500 – 5720 MHz and 2402 – 2480 MHz Bands) to ensure the levels are still less than the original power reported during the certification process. Below is the spot check comparison with test report references. The test report noted below will also be submitted to the TCB for reference.

2402 – 2480 MHz Band

Frequency	UCL Results (Measurement date August 15, 2023)		Bureau Veritas (Test report #: RFBFPJ-WTW-P21030116)		Delta	
	RF Pwer	PSD	RF Pwer	PSD	RF Pwer	PSD
	mW	dbm	mW	dBm	mW	dBm
2402	2.3	-2.92	5.6	-7.06	-3.3	-4.14
2440	1.9	-3.98	6.1	-6.57	-4.2	-2.59
2480	1.3	-5.41	5.8	-7.26	-4.5	-1.85

5260-5320 MHz Band
UNII-2A Spot Check

Mode	Frequency	UCL Results (2/4/2022)		UCL Results (8/23/2023)		Delta	
		RF Pwer	PSD	RF Pwer	PSD	RF Pwer	PSD
		mW	dbm	mW	dBm	mW	dBm
VHT20	5260	2.31	-11.45	1.79	-10.6	-0.52	0.85
VHT20	5280	2.39	-11.31	1.66	-11.07	-0.73	0.24
VHT20	5320	2.39	-11.29	1.51	-11.61	-0.88	-0.32
VHT40	5270	2.31	-14.61	1.74	-13.94	-0.57	0.67
VHT40	5310	2.34	-14.71	1.55	-14.57	-0.79	0.14
VHT80	5290	2.48	-17.63	1.74	-17.4	-0.74	0.23

5500 – 5720 MHz Band
UNII-2C Spot Check

Mode	Frequency	UCL Results (2/4/2022)		UCL Results (8/23/2023)		Delta	
		RF Pwer	PSD	RF Pwer	PSD	RF Pwer	PSD
		mW	dbm	mW	dBm	mW	dBm
VHT20	5500	2.49	-10.63	1.53	-10.71	-0.96	-0.08
VHT20	5600	2.45	-10.28	1.54	-10.8	-0.91	-0.52
VHT20	5720	2.29	-11.33	1.69	-10.45	-0.6	0.88
VHT40	5510	2.29	-14.3	1.41	-14.87	-0.88	-0.57
VHT40	5590	2.28	-13.9	1.32	-14.43	-0.96	-0.53
VHT40	5710	2.42	-14.16	1.61	-13.66	-0.81	0.5
VHT80	5530	2.39	-17.84	1.22	-18.31	-1.17	-0.47
VHT80	5610	2.3	-17.68	1.3	-18.33	-1	-0.65
VHT80	5690	2.38	-17.83	1.51	-17.67	-0.87	0.16

58320 – 69120 MHz Band

Frequency (GHz)	BW (GHz)	UCL Results (Measurement Date August 11, 2023)		Frequency (GHz)	BW (GHz)	Bureau Veritas (Test Report #: RFBFPJ-WTW- P20120228)		Delta	
		Average EIRP dBm	Peak EIRP dBm			Average EIRP dBm	Peak EIRP dBm	Average EIRP dBm	Peak EIRP dBm
58.32	1.08	62.8	67.8	58.32	1.08	66.6	69.6	-3.8	-1.8
63.72	1.08	63.7	68.1	62.64	1.08	67.4	70.2	-3.7	-2.1
69.12	1.08	65.1	69.4	69.12	1.08	67.2	70	-2.1	-0.6
58.32	2.16	63	68.8	58.32	2.16	67	70.1	-4	-1.3
63.72	2.16	64.2	69.4	62.64	2.16	67.7	70.5	-3.5	-1.1
69.12	2.16	64.3	69.7	69.12	2.16	67.5	70.3	-3.2	-0.6

2.2.4 AF60-XRR Spot Check – Radiated TX Spurious Emissions

Per KDB 484596 DO1 a spot was conducted for the bands that have no changes applied (58320 – 69120 MHz; 5260-5320 MHz; 5500 – 5720 MHz and 2402 – 2480 MHz Bands) to ensure the levels of spurious / harmonic emissions comply with CFR 47 Part 15.209 and 15.255 respectively as reported during the certification process. Below is the spot check comparison with test report references. The test report noted below will also be submitted to the TCB for reference.

UNII-2A Spurious Mid Channel

Previous Data as recorded in Report #: TR6834_AF60-XR_FCC_15.407_UNII-2_03

Frequency	SR #	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.56 GHz	Peak	58.974	74	-15.026	92	1.647	Vertical	4.732
15.83 GHz	Peak	58.28	74	-15.72	89	2.15	Vertical	5.189
10.554 GHz	Peak	57.369	74	-16.631	98	1.647	Horizontal	4.859
15.836 GHz	Peak	61.403	74	-12.597	89	1.643	Horizontal	4.956
10.56 GHz	AVG	45.305	54	-8.695	92	1.647	Vertical	4.732
15.83 GHz	AVG	41.647	54	-12.353	89	2.15	Vertical	5.189
10.554 GHz	AVG	42.758	54	-11.242	98	1.647	Horizontal	4.859
15.836 GHz	AVG	45.889	54	-8.111	89	1.643	Horizontal	4.956

UNII-2A Spurious Mid Channel

Data taken 11-14-23

Frequency	SR #	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.56 GHz	Peak	60.332	74	-13.668	16	1.638	Vertical	7.141
15.84 GHz	Peak	64.912	74	-9.088	16	1.643	Vertical	9.659
10.56 GHz	Ave	51.431	54	-2.569	16	1.638	Vertical	7.141
15.84 GHz	Ave	43.655	54	-10.345	16	1.643	Vertical	9.659
10.56 GHz	Peak	53.534	74	-20.466	15	2.146	Horizontal	7.141
10.56 GHz	Ave	41.253	54	-12.747	15	2.146	Horizontal	7.141

UNII-2C Spurious Low Channel
Previous Data as recorded in Report #: TR6834_AF60-XR_FCC_15.407_UNII-2_03

Frequency	SR #	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
11.006 GHz	Peak	51.846	74	-22.154	307	2.321	Vertical	5.065
16.493 GHz	Peak	56.321	74	-17.679	95	2.15	Vertical	8.783
11.006 GHz	Ave	38.74	54	-15.26	307	2.321	Vertical	5.065
16.493 GHz	Ave	42.388	54	-11.612	95	2.15	Vertical	8.783
10.997 GHz	Peak	51.36	74	-22.64	38	2.812	Horizontal	4.932
16.495 GHz	Peak	60.93	74	-13.07	96	1.825	Horizontal	8.75
10.997 GHz	Ave	38.526	54	-15.474	38	2.812	Horizontal	4.932
16.495 GHz	Ave	45.754	54	-8.246	96	1.825	Horizontal	8.75

UNII-2C Spurious Low Channel
Data Taken 11-14-23

Frequency	SR #	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
11.049 GHz	Peak	52.503	74	-21.497	126	1.638	Vertical	7.6
11.049 GHz	Ave	39.688	54	-14.312	126	1.638	Vertical	7.6
11.027 GHz	Peak	53.78	74	-20.22	89	3.652	Horizontal	7.6
11.027 GHz	Ave	39.413	54	-14.587	89	3.652	Horizontal	7.6

BLE Spurious High Channel
Previous Data as recoded in report #: RFBFPJ-WTW-P21030116

Frequency	SR #	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
4960	Ave	68.54	54	-1.16	352	234	Horizontal	-15.7
4960	Peak	73.58	74	-16.12	352	234	Horizontal	-15.7
4960	Ave	61.86	54	-7.84	0	188	Vertical	-15.7
4960	Peak	67.18	74	-22.52	0	188	Vertical	-15.7

BLE Spurious High Channel
Data taken 11-13-23

Frequency	SR #	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
4.9599 GHz	Peak	49.501	74	-24.499	30	2.65	Vertical	-5.798
4.9599 GHz	Ave	44.919	54	-9.081	30	2.65	Vertical	-5.798
4.9605 GHz	Peak	44.626	74	-29.374	219	1.638	Horizontal	-5.795
4.9605 GHz	Ave	31.465	54	-22.535	219	1.638	Horizontal	-5.795

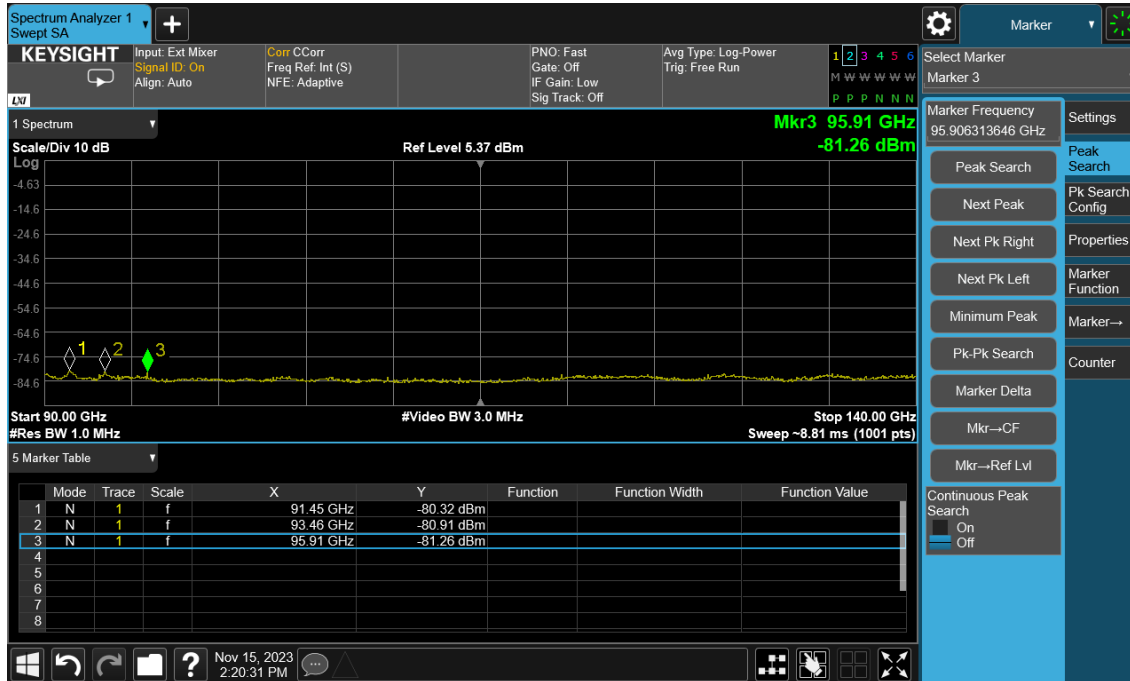
60GHz Spurious High Channel as recorded in Report #: RFBFPJ-WTW-P20120228
Previous Data

Channel	CH 11 : 69.12 GHz		
Frequency Range	40GHz ~ 220GHz	Detector Function	Average (AV)

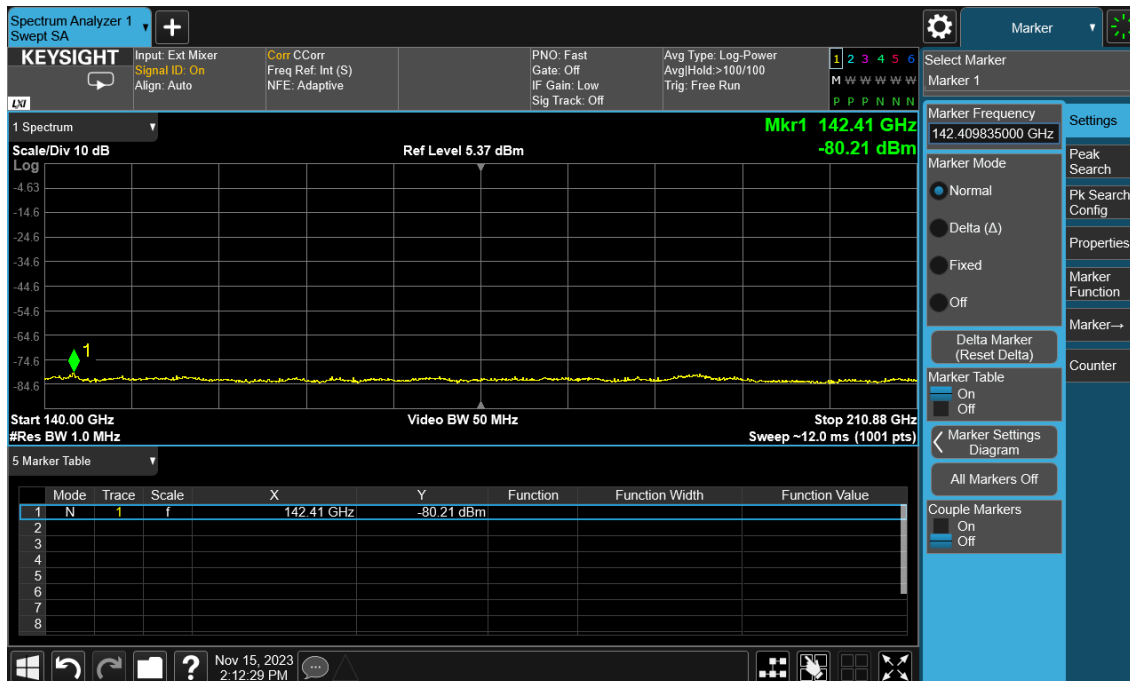
Antenna Polarity : Horizontal							
No.	Frequency (GHz)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	PASS/FAIL
1	42.37	78.72	-16.44	20.09	90.00	-69.91	PASS
2	53.99	83.46	-11.69	59.86	90.00	-30.14	PASS
3	73.69	71.86	-23.29	4.14	90.00	-85.86	PASS
4	102.03	74.26	-20.89	7.20	90.00	-82.80	PASS
5	116.78	84.02	-11.13	68.09	90.00	-21.91	PASS
6	193.92	78.37	-16.79	18.52	90.00	-71.48	PASS
Antenna Polarity : Vertical							
No.	Frequency (GHz)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	PASS/FAIL
1	41.31	78.85	-16.31	20.67	90.00	-69.33	PASS
2	53.90	85.17	-9.99	88.68	90.00	-1.32	PASS
3	74.02	72.35	-22.81	4.63	90.00	-85.37	PASS
4	101.39	74.85	-20.31	8.24	90.00	-81.76	PASS
5	116.31	84.40	-10.76	74.30	90.00	-15.71	PASS
6	191.83	78.60	-16.55	19.55	90.00	-70.45	PASS

Remarks:

60GHz Spurious High Channel Data Taken 11-15-23



90-140GHz (No emissions of significance)



140-210GHz (No emissions of significance)

2.2.5 Cross Reference Table

Below is a table which identifies the report cross references for the AF60-XRR vs the AF60-XR.

FCC ID	FCC Rules Part	Frequency Range (MHz)	Output Watts	Test Report	Test report issuant	Comment
SWX-AF60XR	15C	2402-2480	0.006	RFBFPJ-WTW-P21030116	Bureau Veritas	Original report. No changes. Reference for AF60-XRR
SWX-AF60XRR	15E	5180-5240	0.048	TR8567_AF60-XRR_FCC_15.407_UNII-1_01	UCL	Updated report for AF60-XRR
SWX-AF60XR	15E	5500-5720	0.003	TR6834_AF60-XR_FCC_15.407_UNII-2_03	UCL	Original report. No changes. Reference for AF60-XRR
SWX-AF60XR	15E	5260 - 5320	0.003	TR6834_AF60-XR_FCC_15.407_UNII-2_03	UCL	Original report. No changes. Reference for AF60-XRR
SWX-AF60XRR	15E	5745 - 5825	0.109	TR8572_AF60-XRR_FCC_15.407_UNII-3_01	UCL	Updated report for AF60-XRR
SWX-AF60XR	15C	58320-69120	0.222	RFBFPJ-WTW-P20120228	Bureau Veritas	Original report. No changes. Reference for AF60-XRR

-- End of Test Report --