Radio Exposure Evaluation Report

FCC ID	:	**HDC-17600023F1**
Equipment	:	**WiFi 6 Gigabit Router**
Brand Name	:	**ADTRAN**
Model Name	:	**834-v6YYYYYY(Y can be 0-9, a-z, A-Z, blank, "+" or "-" or "#") (With voice)** **834-6YYYYYY(Y can be 0-9, a-z, A-Z, blank, "+" or "-" or "#") (Without voice)**
Part Number	:	**17600023FYYYYYYY(Y can be 0-9, a-z, A-Z, blank, "+" or "-" or "#") for 834-v6YYYYYY** **17600022FYYYYYYY(Y can be 0-9, a-z, A-Z, blank, "+" or "-" or "#") for 834-6YYYYYY**
Applicant	:	**Adtran** **901 Explorer Blvd., Huntsville, AL 35806, USA**
Manufacturer	:	**XAVi Technologies Corporation** **22F., No.69, Sec. 2, Guangfu Rd., Sanchong Dist.,** **New Taipei City 241, Taiwan (R.O.C.)**
Standard	:	**47 CFR FCC Part 2 Subpart J, section 2.1091**

The product was received on Oct. 29, 2021, and testing was started from Nov. 09, 2021 and completed on Nov. 10, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR FCC Part 2 Subpart J, section 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA1O2025-01	01	Initial issue of report	Dec. 29, 2021
FA1O2025-01	02	Antenna brand name was modified. (This report is the latest version replacing for the report issued on Dec. 29, 2021)	Jan. 03, 2022
FA1O2025-01	03	Section 2.3 was modified. (This report is the latest version replacing for the report issued on Jan. 03, 2022)	Mar. 02, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
None

Reviewed by: Sam Tsai

Report Producer: Amber Chiu

1 General Description

1.1 Information

1.1.1 EUT General Information

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM), 1024QAM 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: DSSS (GFSK)

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support
1	Galtronics	60-2961-03	PCB	U.FL	2.4G
2	Galtronics	60-2961-03	PCB	U.FL	2.4G
3	Galtronics	60-2888-03	PCB	U.FL	5G
4	Galtronics	60-2888-03	PCB	U.FL	5G
5	Galtronics	60-2773-03	Chip	N/A	BT
6	Galtronics	02036142-07357-1	Chip	N/A	5G DFS RX

Non-Beamforming

Ant.	Gain (dBi)		
	2.4G	5G	BT
1	2.5	-	-
2	2.5	-	-
3	-	3.9	-
4	-	3.9	-
5	-	-	2.0
6	-	4.7	-

Note 1: The EUT has six antennas.

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax mode (2TX/2RX)

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

Ant. 5 can be used as transmitting/receiving antenna.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax mode (2TX/2RX)

Ant. 3 and Ant. 4 could transmit/receive simultaneously.

1.1.3 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Description
834-v6YYYYYY(Y can be 0-9, a-z, A-Z, blank, “+” or “-” or “#”) (With voice) 834-6YYYYYY(Y can be 0-9, a-z, A-Z, blank, “+” or “-” or “#”) (Without voice)	All the models are identical, the different model served as marketing strategy.

1.1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA1O2025AN

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Frequency bands U-NII-2A and U-NII-2C was added.	MPE was evaluated.

1.1.5 Accessories

Accessories				
AC Adapter (US Plug)	**Brand Name**	MASS POWER	**Model Name**	S030-1A120250VU
	Power Rating	I/P: 100 – 240 Vac, 0.8A, O/P: 12.0 Vdc, 2.5 A		
	Power Cord	1.45 meter, non-shielded cable, w/o ferrite core		
AC Adapter (EU Plug)	**Brand Name**	MASS POWER	**Model Name**	S030-1A120250VE
	Power Rating	I/P: 100 – 240 Vac, 0.8A, O/P: 12.0 Vdc, 2.5 A		
	Power Cord	1.45 meter, non-shielded cable, w/o ferrite core		
AC Adapter (UK Plug)	**Brand Name**	MASS POWER	**Model Name**	S030-1A120250VK
	Power Rating	I/P: 100 – 240 Vac, 0.8A, O/P: 12.0 Vdc, 2.5 A		
	Power Cord	1.45 meter, non-shielded cable, w/o ferrite core		
AC Adapter (AUS/NZ Plug)	**Brand Name**	MASS POWER	**Model Name**	S030-1A120250VA
	Power Rating	I/P: 100 – 240 Vac, 0.8A, O/P: 12.0 Vdc, 2.5 A		
	Power Cord	1.45 meter, non-shielded cable, w/o ferrite core		

Reminder: Regarding to more detail and other information, please refer to user manual.

1.2 Testing Location

Test Lab.：Sporton International Inc. Hsinhua Laboratory			
☒	Hsinhua **(TAF:** 3785**)**	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)	
		TEL: 886-3-327-3456	**FAX:** 886-3-327-0973
		Test site Designation No. TW3785 with FCC.	
☐	Wen 33rd.St. **(TAF:** 3785**)**	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)	
		TEL: 886-3-318-0787	**FAX:** 886-3-318-0287
		Test site Designation No. TW0008 with FCC.	

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	F/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	F/1500	30
1500-100,000	-	-	1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

Multiple Transmitters Condition
Co-location as simultaneously transmitting (co-transmitting) and the evaluation shall be consider that simultaneous transmissions from co-located devices the individual transmitters are evaluated separately. After sum of the individual value (basic restriction / reference level) are measured/calculated also have to under basic restriction / reference level.
Co-transmitting mode: WLAN 2.4GHz+WLAN 5GHz + Bluetooth

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.
The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

WLAN 2.4GHz <Non-Beamforming>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
2.4G;G1D	2.50	18.54	21.04	0.50	21.54	0.14256	20	0.02836	1.00000
2.4G;D1D	2.50	20.76	23.26	0.50	23.76	0.23768	20	0.04728	1.00000

WLAN 2.4GHz <Beamforming>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
2.4G;D1D	5.51	22.87	28.38	0.50	28.88	0.77268	20	0.15372	1.00000

WLAN 5GHz <Non-Beamforming>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
5.2G;D1D	3.90	26.63	30.53	0.50	31.03	1.26765	20	0.25219	1.00000
5.3G;D1D	3.90	22.67	26.57	0.50	27.07	0.50933	20	0.10133	1.00000
5.6G;D1D	3.90	21.59	25.49	0.50	25.99	0.39719	20	0.07902	1.00000
5.8G;D1D	3.90	21.58	25.48	0.50	25.98	0.39628	20	0.07884	1.00000

WLAN 5GHz <Beamforming>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
5.2G;D1D	6.91	24.91	31.82	0.50	32.32	1.70608	20	0.33941	1.00000
5.3G;D1D	6.91	22.54	29.45	0.50	29.95	0.98855	20	0.19667	1.00000
5.6G;D1D	6.91	22.43	29.34	0.50	29.84	0.96383	20	0.19175	1.00000
5.8G;D1D	6.91	22.30	29.21	0.50	29.71	0.93541	20	0.18609	1.00000

Bluetooth

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
2.4G;BT-LE	2.00	7.21	9.21	0.50	9.71	0.00935	20	0.00186	1.00000

WLAN 2.4GHz+WLAN 5GHz + Bluetooth

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm2)	Lim (mW/cm2)	Ratio (S/Limit)
2.4G;D1D	5.51	22.87	28.38	0.50	28.88	0.77268	20	0.15372	1.00000	0.15372
5.2G;D1D	6.91	24.91	31.82	0.50	32.32	1.70608	20	0.33941	1.00000	0.33941
2.4G;BT-LE	2	7.21	9.21	0.50	9.71	0.00935	20	0.00186	1.00000	0.00186
									Sum Ratio	0.49499
									Ratio Limit	1

———THE END———