

TEST REPORT

COMPLIANCE TEST REPORT

EUT Description	Convertible PC
Brand Name	HP
Model Name	TPN-W155
FCC ID	PD9AX211NG
ISED ID	1000M-AX211NG
Date of Test Start/End	2022-04-15 / 2022-04-28
Features	IEEE802.11a/b/g/n/ac/ax

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Test Report identification	220211-01.TR02
Revision Control	Rev. 04 This test report replaces any previous versions of this test report (see Section 2)

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2. Document Revision History

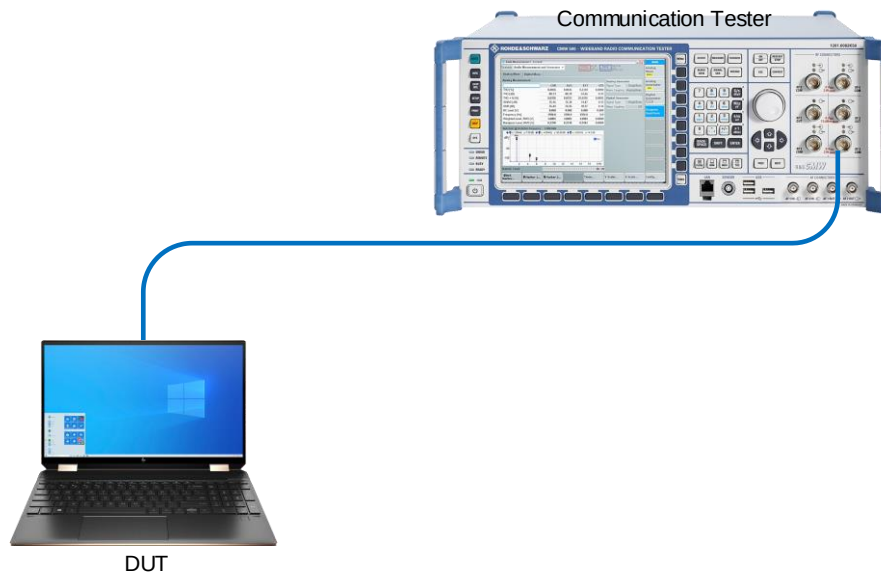
Revision #	Date	Modified by	Revision Details
Rev.00	2022-04-29	Estelle GILLES	First Issue
Rev.01	2022-05-24	Estelle GILLES	Section 6.1 updated, and step 6 added in section 6.2
Rev.02	2022-05-30	Estelle GILLES	Feature and test sample model updated
Rev.03	2022-07-29	Cheiel In	Addition of not-on-table/on-table states power verification
Rev.04	2022-08-02	Cheiel In	Addition of ISED ID

3. Test Setup

The conducted power measurement test setup is described in the following and illustrated in Figure A.1.

- The DUT which AX211 WiFi module is installed inside convertible PC from HP model TPN-W155.
- A control PC is used to configure the Call Box as an access point to manage the uplink and downlink data traffic.
- Uplink signal power is measured with the Call Box.
- Path loss in the power measurement setup from the AX211 Antenna port to the Call Box.

Figure.1 – Validation using conducted power measurement test setup.



4. Test Sample

Sample	ID #	Description	Model	Serial #	Note
#1	220211-01.S01	Convertible	TPN-W155	4PD0RA010001	-

5. Test Equipment List

Equipment and accessories used for the conducted power measurement test setup are listed below. The Test Platform (DUT), test setup and associated equipment are shown in A.1.3.

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
144-000	Communication Tester	CMW500	169123	Rohde & Schwartz	2021-05-18	2023-05-18

6. Test Results

6.1. Tx Power Table Assignment

Device Status	Device Mode	Lid Angle	LCD Direction	Band	Bios Tx Power Table (dBm)		Measured Tx Power Table (dBm)	
					Chain A	Chain B	Chain A	Chain B
On Table	Lid Closed	0 - 20°	-	2.4 GHz	Standby	Standby	Standby	Standby
				5.0 GHz	Standby	Standby	Standby	Standby
	Clamshell	20 - 180°	-	2.4 GHz	20.5	20.5	20.5	20.5
				5.0 GHz	19.5	19.5	19.3	19.3
	Tent	180 - 350°	180°	2.4 GHz	20.5	20.5	20.5	20.5
				5.0 GHz	19.5	19.5	19.3	19.3
	Stand	180 - 350°	0°	2.4 GHz	20.5	20.5	20.5	20.5
				5.0 GHz	19.5	19.5	19.3	19.3
	Tablet	350 - 360°	-	2.4 GHz	20.5	20.5	20.5	20.5
				5.0 GHz	19.5	19.5	19.3	19.3
Not On Table	Lid Closed	0 - 20°	-	2.4 GHz	Standby	Standby	Standby	Standby
				5.0 GHz	Standby	Standby	Standby	Standby
	Clamshell	20 - 180°	-	2.4 GHz	20.5	20.5	20.5	20.5
				5.0 GHz	19.5	19.5	19.2	19.2
	Tent	180 - 350°	180°	2.4 GHz	18.5	18.5	18.8	18.8
				5.0 GHz	17.0	17.0	16.8	16.8
	Stand	180 - 350°	0°	2.4 GHz	20.5	20.5	20.5	20.5
				5.0 GHz	19.5	19.5	19.2	19.2
	Tablet	350 - 360°	-	2.4 GHz	18.5	18.5	18.8	18.8
				5.0 GHz	17.0	17.0	16.8	16.8
	Book	35° - 200°	90°	2.4 GHz	18.5	18.5	18.8	18.8
				5.0 GHz	17.0	17.0	16.8	16.8

6.2. Not-on-table/on-table states power verification

Device mode	Cycle	Device Status	Power Mode	Cumulative Time (s)	Target power (dBm)	Measured power (dBm)	Target power (dBm)	Measured power (dBm)
					2.4GHz (ch6)		5.0GHz (ch44)	
Tablet mode	Cycle 1	On Table (motion)	Reduced	20	18.5	18.83	17.0	16.86
		On Table (static)	Full	50	20.5	20.45	19.5	19.16
		Not On Table (motion)	Reduced	80	18.5	18.82	17.0	16.81
	Cycle 2	On Table (motion)	Reduced	100	18.5	18.83	17.0	16.86
		On Table (static)	Full	130	20.5	20.45	19.5	19.16
		Not On Table (motion)	Reduced	160	18.5	18.82	17.0	16.81

6.3. Lid Angle Detection

Step 1 – Open Screen with 10 degrees step

Starting Point Mode Laptop						Starting Point Mode Tablet					
Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode	Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode
0	Standby	Lid Closed	0	Standby	Lid Closed	360	18.8	Tablet	360	16.8	Tablet
10	Standby	Lid Closed	10	Standby	Lid Closed	350	18.8	Tablet	350	16.8	Tablet
20	Standby	Lid Closed	20	Standby	Lid Closed	340	18.8	Tablet	340	16.8	Tablet
30	Standby	Lid Closed	30	19.2	Clamshell	330	20.5	Stand	330	19.2	Stand
40	20.5	Clamshell	-	-	-	-	-	-	-	-	-

Step 2 – Close Screen with 5 degrees step

Starting Point Mode Laptop						Starting Point Mode Tablet					
Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode	Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode
35	20.5	Clamshell	25	19.2	Clamshell	335	20.5	Stand	335	19.2	Stand
30	20.5	Clamshell	20	Standby	Lid Closed	340	20.5	Stand	340	19.2	Stand
25	Standby	Lid Closed	-	-	-	345	20.5	Stand	345	19.2	Stand
-	-	-	-	-	-	350	18.8	Tablet	350	16.8	Tablet

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Step 3 – Open Screen with 1 degree step

Starting Point Mode Laptop						Starting Point Mode Tablet					
Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode	Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode
26	Standby	Lid Closed	26	Standby	Lid Closed	349	18.8	Tablet	349	16.8	Tablet
27	Standby	Lid Closed	27	Standby	Lid Closed	348	18.8	Tablet	348	16.8	Tablet
28	Standby	Lid Closed	28	Standby	Lid Closed	347	18.8	Tablet	347	16.8	Tablet
29	Standby	Lid Closed	29	Standby	Lid Closed	346	18.8	Tablet	346	16.8	Tablet
30	Standby	Lid Closed	30	Standby	Lid Closed	345	18.8	Tablet	345	16.8	Tablet
31	Standby	Lid Closed	31	Standby	Lid Closed	344	18.8	Tablet	344	16.8	Tablet
32	Standby	Lid Closed	32	Standby	Lid Closed	343	18.8	Tablet	343	16.8	Tablet
33	Standby	Lid Closed	33	Standby	Lid Closed	342	18.8	Tablet	342	16.8	Tablet
34	Standby	Lid Closed	34	Standby	Lid Closed	341	18.8	Tablet	341	16.8	Tablet
35	20.5	Clamshell	35	19.2	Clamshell	340	18.8	Tablet	340	16.8	Tablet
-	-	-	-	-	-	339	18.8	Tablet	339	16.8	Tablet
-	-	-	-	-	-	338	18.8	Tablet	338	16.8	Tablet
-	-	-	-	-	-	337	18.8	Tablet	337	16.8	Tablet
-	-	-	-	-	-	336	18.8	Tablet	336	16.8	Tablet
-	-	-	-	-	-	335	20.5	Stand	335	19.2	Stand

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Step 4 – Close Screen with 1 degree step

Starting Point Mode Laptop						Starting Point Mode Tablet					
Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode	Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode
34	20.5	Clamshell	34	19.2	Clamshell	336	20.5	Stand	336	19.2	Stand
33	20.5	Clamshell	33	19.2	Clamshell	337	20.5	Stand	337	19.2	Stand
32	20.5	Clamshell	32	19.2	Clamshell	338	20.5	Stand	338	19.2	Stand
31	20.5	Clamshell	31	19.2	Clamshell	339	20.5	Stand	339	19.2	Stand
30	20.5	Clamshell	30	19.2	Clamshell	340	20.5	Stand	340	19.2	Stand
29	Standby	Lid Closed	29	Standby	Lid Closed	341	20.5	Stand	341	19.2	Stand
-	-	-	-	-	-	342	20.5	Stand	342	19.2	Stand
-	-	-	-	-	-	343	20.5	Stand	343	19.2	Stand
-	-	-	-	-	-	344	20.5	Stand	344	19.2	Stand
-	-	-	-	-	-	345	20.5	Stand	345	19.2	Stand
-	-	-	-	-	-	346	18.8	Tablet	346	16.8	Tablet

Step 5 – Open Screen with 10 degrees step

Starting Point Mode Laptop						Starting Point Mode Tablet					
Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode	Angle	2.4 GHz (dBm)	Device Mode	Angle	5 GHz (dBm)	Device Mode
39	20.5	Clamshell	39	19.2	Clamshell	336	20.5	Stand	336	19.2	Stand
49	20.5	Clamshell	49	19.2	Clamshell	326	20.5	Stand	326	19.2	Stand
59	20.5	Clamshell	59	19.2	Clamshell	316	20.5	Stand	316	19.2	Stand
69	20.5	Clamshell	69	19.2	Clamshell	306	20.5	Stand	306	19.2	Stand
79	20.5	Clamshell	79	19.2	Clamshell	296	20.5	Stand	296	19.2	Stand
89	20.5	Clamshell	89	19.2	Clamshell	286	20.5	Stand	286	19.2	Stand
99	20.5	Clamshell	99	19.2	Clamshell	276	20.5	Stand	276	19.2	Stand
109	20.5	Clamshell	109	19.2	Clamshell	266	20.5	Stand	266	19.2	Stand
119	20.5	Clamshell	119	19.2	Clamshell	256	20.5	Stand	256	19.2	Stand
129	20.5	Clamshell	129	19.2	Clamshell	246	20.5	Stand	246	19.2	Stand
139	18.8	Tablet	139	16.8	Tablet	236	20.5	Stand	236	19.2	Stand
149	18.8	Tablet	149	16.8	Tablet	226	20.5	Stand	226	19.2	Stand
159	18.8	Tablet	159	16.8	Tablet	216	20.5	Stand	216	19.2	Stand
169	18.8	Tablet	169	16.8	Tablet	206	20.5	Stand	206	19.2	Stand
179	18.8	Tablet	179	16.8	Tablet	196	18.8	Tablet	196	16.8	Tablet
189	18.8	Tablet	189	16.8	Tablet	186	18.8	Tablet	186	16.8	Tablet
199	18.8	Tablet	199	16.8	Tablet	176	18.8	Tablet	176	16.8	Tablet
209	20.5	Stand	209	19.2	Stand	166	18.8	Tablet	166	16.8	Tablet
219	20.5	Stand	219	19.2	Stand	156	18.8	Tablet	156	16.8	Tablet
229	20.5	Stand	229	19.2	Stand	146	18.8	Tablet	146	16.8	Tablet
239	20.5	Stand	239	19.2	Stand	136	18.8	Tablet	136	16.8	Tablet
249	20.5	Stand	249	19.2	Stand	126	20.5	Clamshell	126	19.2	Clamshell
259	20.5	Stand	259	19.2	Stand	116	20.5	Clamshell	116	19.2	Clamshell
269	20.5	Stand	269	19.2	Stand	106	20.5	Clamshell	106	19.2	Clamshell

279	20.5	Stand	279	19.2	Stand	96	20.5	Clamshell	96	19.2	Clamshell
289	20.5	Stand	289	19.2	Stand	86	20.5	Clamshell	86	19.2	Clamshell
299	20.5	Stand	299	19.2	Stand	76	20.5	Clamshell	76	19.2	Clamshell
309	20.5	Stand	309	19.2	Stand	66	20.5	Clamshell	66	19.2	Clamshell
319	20.5	Stand	319	19.2	Stand	56	20.5	Clamshell	56	19.2	Clamshell
329	20.5	Stand	329	19.2	Stand	46	20.5	Clamshell	46	19.2	Clamshell
339	20.5	Stand	339	19.2	Stand	36	20.5	Clamshell	36	19.2	Clamshell
349	18.8	Tablet	349	16.8	Tablet	26	Standby	Lid closed	26	Standby	Lid closed
360	18.8	Tablet	360	16.8	Tablet	16	Standby	Lid closed	16	Standby	Lid closed
-	-	-	-	-	-	0	Standby	Lid closed	0	Standby	Lid closed

7. Conclusion

The Enhanced Device Mode functionality of AX211 WiFi Module Integrated inside HP TPN-W155 is tested. All user cases are compliant.