TEST REPORT

EUT Description	**Convertible PC**
Brand Name	**HP**
Model Name	**TPN-W157**
FCC ID	**PD9AX211NG**
ISED ID	**1000M-AX211NG**
Date of Test Start/End	**2023-12-11 / 2023-12-11**
Features	**IEEE 802.11a/b/g/n/ac/ax**

Applicant	**Intel Corporation SAS**
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Test Report identification	**231211-01.TR01**
Revision Control	**Rev. 00** **This test report replaces any previous versions of this test report** (see Section 7)

The test results relate only to the samples tested.

Reviewed by

Digitally signed by Chei el IN
Date: 2023.12.12 09:22:03 +01'00'

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1. Standards, reference documents and applicable test methods

a. KDB 388624 D02 Pre-Approval Guidance List v18, PRE-APPROVAL GUIDANCE LIST

b. FCC Presentations TCB Workshop November 2019, RF exposure procedures.

2. General conditions, competences and guarantees

- ✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.

3. Environmental Conditions

✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	21.5ºC ± 0.2ºC
Humidity	42.4% ± 3.9%

4. Test Sample

Sample	ID #	Description	Model	Serial #	Note
#1	231024-01.S06	Convertible PC	TPN-W157	ABC33400QX	-

5. EUT Features

The herein information is provided by the customer.
Intel WRF Lab declines any responsibility for the accuracy of the stated customer provided information, especially if it has any impact on the correctness of test results presented in this report.

Brand Name	HP
Model Name	TPN-W157
Prototype / Production	Pre - Production
Host Identification	Convertible PC

6. Remarks and comments

1. The test report is validation of the G sensor functionality.

7. Test Results summary

7.1. WLAN Tx Power Table Summary

Device Mode	Lid Angle range	2.4GHz-CH6 802.11b				5GHz-CH120 802.11a			
		Target Power (dBm)		Measured Power (dBm)		Target Power (dBm)		Measured Power (dBm)	
		Antenna AUX (1)	Antenna MAIN (2)	Antenna AUX (1)	Antenna MAIN (2)	Antenna AUX (1)	Antenna MAIN (2)	Antenna AUX (1)	Antenna MAIN (2)
Lid Close	0°≤ - <30°	Standby	Standby	Standby	Standby	Standby	Standby	Standby	Standby
Laptop	30°< - ≤200°	20.5	20.5	20.2	19.9	20.5	20.5	20.1	19.9
Tablet	200°< - ≤360°	18.0	18.0	17.2	17.3	15.5	15.5	15.1	15.2

8. Document Revision History

Revision #	Modified by	Revision Details
Rev.00	Cheiel In	Initial release

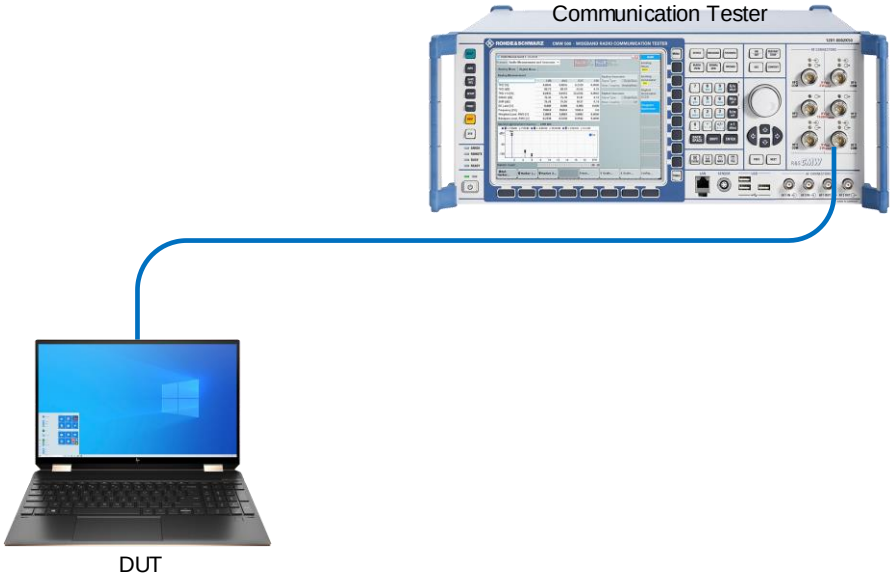
Annex A. Test & System description

A.1 Test setup

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

- The DUT is Convertible PC from *HP* model *TPN-W157.* An *AX211NGW* connectivity module is installed inside
- 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 wireless module antenna port to the Call Box.

Figure.1 – Power measurement test setup.



A.2 Procedure

The following additional guidance applies only to convertible laptops whose screen rotates around one axis, from 0 degrees to 180 degrees, in a clamshell style, i.e., from closed mode to open mode, to “tent” mode, and finally, to Non-Laptop mode. This process must be followed to determine the lid angle where a power reduction occurs, by taking power measurements at each step, as indicated in the step listed here below:

1. From the lid in closed mode (0 degrees), open the screen in 10-degree steps until laptop mode is obtained
2. Lower the screen by 5 degrees increments to verify that the “closed mode” is triggered
3. From the position of the previous step, open the screen in 1-degree increments until laptop mode is triggered again
4. Continue opening the screen in 1-degree increments until at least 5 degrees past where “laptop mode” was obtained, then continue opening the screen in 10-degree steps until the device switches to Non-Laptop mode
5. Reverse the previous procedure to go from Non-Laptop mode back down to closed mode

A.3 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.

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
125-000	Communication Tester	CMW500	129337	Rohde & Schwartz	2023-04-20	2025-04-20
022-003 022-004	RF path (RF cable + Adapters)	-	-	-	RF path loss was verified before usage	

A.4 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the table below with a coverage factor of k = 2 to indicate a 95% level of confidence:

Measurement type	Uncertainty	Unit
Power level	±1	dB

Annex B. Test Results

B.1 Trigger lid angle detection and power verification 2.4GHz

The lid is rotating from 0 to 360. The system base is horizontal

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX(1)	MAIN(2)
Lid close	0	Standby	Standby
	10	Standby	Standby
	30	Standby	Standby
Laptop	40	20.2	19.9
	35	Standby	Standby
Lid close	30	Standby	Standby
Laptop	31	20.2	19.9
	32	20.2	19.9
	33	20.2	19.9
	34	20.2	19.9
	35	20.2	19.9
	40	20.2	19.9
	50	20.2	19.9
	60	20.2	19.9
	70	20.2	19.9
	80	20.2	19.9
	90	20.2	19.9
	100	20.2	19.9
	110	20.2	19.9
	120	20.2	19.9
	130	20.2	19.9
	140	20.2	19.9
	150	20.2	19.9
	160	20.2	19.9
	170	20.2	19.9
	180	20.2	19.9
	190	20.2	19.9
	200	20.2	19.9
Tablet	210	17.2	17.3
	205	17.2	17.3
Laptop	200	20.2	19.9
	201	20.2	19.9
	202	20.2	19.9
	203	20.2	19.9
	204	20.2	19.9
Tablet	205	17.2	17.3
	206	17.2	17.3

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX(1)	MAIN(2)
Tablet	207	17.2	17.3
	208	17.2	17.3
	209	17.2	17.3
	210	17.2	17.3
	220	17.2	17.3
	230	17.2	17.3
	240	17.2	17.3
	250	17.2	17.3
	260	17.2	17.3
	270	17.2	17.3
	280	17.2	17.3
	290	17.2	17.3
	300	17.2	17.3
	310	17.2	17.3
	320	17.2	17.3
	330	17.2	17.3
	340	17.2	17.3
	350	17.2	17.3
	360	17.2	17.3

The lid is rotating from 360 to 0. The system base is horizontal.

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX(1)	MAIN(2)
Tablet	360	17.2	17.3
	350	17.2	17.3
	340	17.2	17.3
	330	17.2	17.3
	320	17.2	17.3
	310	17.2	17.3
	300	17.2	17.3
	290	17.2	17.3
	280	17.2	17.3
	270	17.2	17.3
	260	17.2	17.3
	250	17.2	17.3
	240	17.2	17.3
	230	17.2	17.3
	220	17.2	17.3
	210	17.2	17.3
	200	17.2	17.3
Laptop	190	20.2	19.9
Tablet	195	17.2	17.3
	200	17.2	17.3
	199	17.2	17.3
	198	17.2	17.3
	197	17.2	17.3
	196	17.2	17.3
	195	17.2	17.3
Laptop	194	20.2	19.9
	193	20.2	19.9
	192	20.2	19.9
	191	20.2	19.9
	190	20.2	19.9

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX(1)	MAIN(2)
Laptop	180	20.2	19.9
	170	20.2	19.9
	160	20.2	19.9
	150	20.2	19.9
	140	20.2	19.9
	130	20.2	19.9
	120	20.2	19.9
	110	20.2	19.9
	100	20.2	19.9
	90	20.2	19.9
	80	20.2	19.9
	70	20.2	19.9
	60	20.2	19.9
	50	20.2	19.9
	40	20.2	19.9
Lid Close	30	Standby	Standby
Laptop	35	20.2	19.9
	34	20.2	19.9
	33	20.2	19.9
	32	20.2	19.9
	31	20.2	19.9
Lid Close	30	Standby	Standby
	29	Standby	Standby
	28	Standby	Standby
	27	Standby	Standby
	26	Standby	Standby
	25	Standby	Standby
	20	Standby	Standby
	10	Standby	Standby
	0	Standby	Standby

B.2 Trigger lid angle detection and power verification 5GHz

The lid is rotating from 0 to 360. The system base is horizontal

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX(1)	MAIN(2)
Lid close	0	Standby	Standby
	10	Standby	Standby
	30	Standby	Standby
Laptop	40	20.1	19.9
	35	Standby	Standby
Lid close	30	Standby	Standby
Laptop	31	20.1	19.9
	32	20.1	19.9
	33	20.1	19.9
	34	20.1	19.9
	35	20.1	19.9
	40	20.1	19.9
	50	20.1	19.9
	60	20.1	19.9
	70	20.1	19.9
	80	20.1	19.9
	90	20.1	19.9
	100	20.1	19.9
	110	20.1	19.9
	120	20.1	19.9
	130	20.1	19.9
	140	20.1	19.9
	150	20.1	19.9
	160	20.1	19.9
	170	20.1	19.9
	180	20.1	19.9
	190	20.1	19.9
	200	20.1	19.9

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX(1)	MAIN(2)
Tablet	210	15.1	15.2
	205	15.1	15.2
Laptop	200	20.1	19.9
	201	20.1	19.9
	202	20.1	19.9
	203	20.1	19.9
	204	20.1	19.9
Tablet	205	15.1	15.2
	206	15.1	15.2
	207	15.1	15.2
	208	15.1	15.2
	209	15.1	15.2
	210	15.1	15.2
	220	15.1	15.2
	230	15.1	15.2
	240	15.1	15.2
	250	15.1	15.2
	260	15.1	15.2
	270	15.1	15.2
	280	15.1	15.2
	290	15.1	15.2
	300	15.1	15.2
	310	15.1	15.2
	320	15.1	15.2
	330	15.1	15.2
	340	15.1	15.2
	350	15.1	15.2
	360	15.1	15.2

The lid is rotating from 360 to 0. The system base is horizontal

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX(1)	MAIN(2)
Tablet	360	15.1	15.2
	350	15.1	15.2
	340	15.1	15.2
	330	15.1	15.2
	320	15.1	15.2
	310	15.1	15.2
	300	15.1	15.2
	290	15.1	15.2
	280	15.1	15.2
	270	15.1	15.2
	260	15.1	15.2
	250	15.1	15.2
	240	15.1	15.2
	230	15.1	15.2
	220	15.1	15.2
	210	15.1	15.2
	200	15.1	15.2
Laptop	190	20.1	19.9
Tablet	195	15.1	15.2
	200	15.1	15.2
	199	15.1	15.2
	198	15.1	15.2
	197	15.1	15.2
	196	15.1	15.2
	195	15.1	15.2
Laptop	194	20.1	19.9
	193	20.1	19.9
	192	20.1	19.9
	191	20.1	19.9
	190	20.1	19.9

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX(1)	MAIN(2)
Laptop	180	20.1	19.9
	170	20.1	19.9
	160	20.1	19.9
	150	20.1	19.9
	140	20.1	19.9
	130	20.1	19.9
	120	20.1	19.9
	110	20.1	19.9
	100	20.1	19.9
	90	20.1	19.9
	80	20.1	19.9
	70	20.1	19.9
	60	20.1	19.9
	50	20.1	19.9
	40	20.1	19.9
Lid Close	30	Standby	Standby
Laptop	35	20.1	19.9
	34	20.1	19.9
	33	20.1	19.9
	32	20.1	19.9
	31	20.1	19.9
Lid Close	30	Standby	Standby
	29	Standby	Standby
	28	Standby	Standby
	27	Standby	Standby
	26	Standby	Standby
	25	Standby	Standby
	20	Standby	Standby
	10	Standby	Standby
	0	Standby	Standby