TEST REPORT

EUT Description	**Convertible PC**
Brand Name	**HP**
Model Name	**TPN-Q293**
FCC ID	**PD9AX211NG**
ISED ID	**1000M-AX211NG**
Date of Test Start/End	**2023-08-17 / 2023-08-17**
Features	**IEEE 802.11a/b/g/n/ac/ax**

Applicant	**Intel Corporation SAS**
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Test Report identification	**230726-01.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

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Date: 2023.08.25 12:35:44 +02'00'

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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	23.1ºC ± 1ºC
Humidity	65% ± 5%

4. Test Sample

Sample	ID #	Description	Model	Serial #	Note
#1	230726-01.S03	Convertible PC	TPN-Q293	A5CD3240004	-

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-Q293
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	LCD Direction	2.4GHz-CH6 802.11b				5GHz-CH120 802.11a			
			Target Power (dBm)		Measured Power (dBm)		Target Power (dBm)		Measured Power (dBm)	
			Antenna AUX	Antenna MAIN	Antenna AUX	Antenna MAIN	Antenna AUX	Antenna MAIN	Antenna AUX	Antenna MAIN
Lid Close	0°≤ - <35°	-	Standby	Standby	Standby	Standby	Standby	Standby	Standby	Standby
Notebook	35°≤ - <160°	0°	20.5	20.5	19.45	19.42	20.5	20.5	19.54	19.62
Tablet	340°≤ - <360°	90°; 270°	18.0	18.0	17.25	17.17	15.0	15.0	14.6	14.61
Book	70°≤ - ≤110°	90°; 270°	18.0	18.0	17.25	17.17	15.0	15.0	14.6	14.61

8. Document Revision History

Revision #	Modified by	Revision Details
Rev.00	Axel G	-

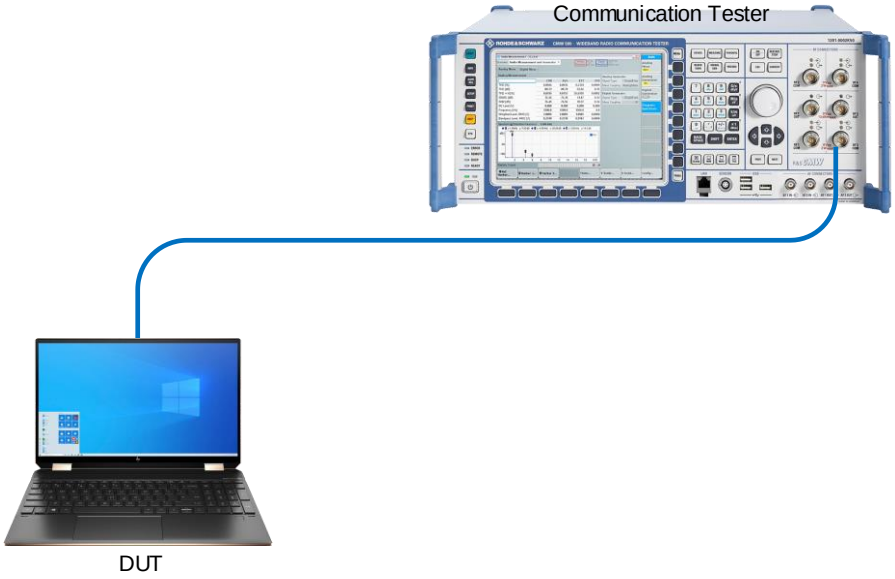
Annex A. Test & System description

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-Q292.* 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 tablet 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 tablet mode
5. Reverse the previous procedure to go from tablet 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	

Annex B. Test Results

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

B.1.1 LCD direction 0°

The lid is rotating from 0 to 360. The system base is horizontal, LCD direction is 0 degree for notebook mode

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX	MAIN
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Notebook	40	19.45	19.42
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Notebook	40	19.45	19.42
	41	19.45	19.42
	42	19.45	19.42
	43	19.45	19.42
	44	19.45	19.42
	45	19.45	19.42
	50	19.45	19.42
	60	19.45	19.42
	70	19.45	19.42
	80	19.45	19.42
	90	19.45	19.42
	100	19.45	19.42
	110	19.45	19.42
	120	19.45	19.42
	130	19.45	19.42
	140	19.45	19.42
	150	19.45	19.42
	160	19.45	19.42
Tablet	170	17.25	17.17
	165	17.25	17.17
Notebook	160	19.45	19.42
	161	19.45	19.42
	162	19.45	19.42
	163	19.45	19.42
	164	19.45	19.42
Tablet	165	17.25	17.17
	166	17.25	17.17
	167	17.25	17.17
	168	17.25	17.17
	169	17.25	17.17
	170	17.25	17.17
	180	17.25	17.17
	190	17.25	17.17
	200	17.25	17.17

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX	MAIN
Notebook	210	19.45	19.42
	205	19.45	19.42
Tablet	200	17.25	17.17
	201	17.25	17.17
	202	17.25	17.17
	203	17.25	17.17
	204	17.25	17.17
Notebook	205	19.45	19.42
	210	19.45	19.42
	220	19.45	19.42
	230	19.45	19.42
	240	19.45	19.42
	250	19.45	19.42
	260	19.45	19.42
	270	19.45	19.42
	280	19.45	19.42
	290	19.45	19.42
	300	19.45	19.42
	310	19.45	19.42
	320	19.45	19.42
	330	19.45	19.42
	340	19.45	19.42
Tablet	350	17.25	17.17
	345	17.25	17.17
Notebook	340	19.45	19.42
	341	19.45	19.42
	342	19.45	19.42
	343	19.45	19.42
	344	19.45	19.42
Tablet	345	17.25	17.17
	346	17.25	17.17
	347	17.25	17.17
	348	17.25	17.17
	349	17.25	17.17
	350	17.25	17.17
	360	17.25	17.17

The lid is rotating from 360 to 0. The system base is horizontal, LCD direction is 0 degree for notebook mode.

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX	MAIN
Tablet	360	17.25	17.17
	350	17.25	17.17
	340	17.25	17.17
Notebook	330	19.45	19.42
	335	19.45	19.42
	340	19.45	19.42
Tablet	345	17.25	17.17
	344	17.25	17.17
	343	17.25	17.17
	342	17.25	17.17
	341	17.25	17.17
Notebook	340	19.45	19.42
	339	19.45	19.42
	338	19.45	19.42
	337	19.45	19.42
	336	19.45	19.42
	335	19.45	19.42
	330	19.45	19.42
	320	19.45	19.42
	310	19.45	19.42
	300	19.45	19.42
	290	19.45	19.42
	280	19.45	19.42
	270	19.45	19.42
	260	19.45	19.42
	250	19.45	19.42
	240	19.45	19.42
	230	19.45	19.42
	220	19.45	19.42
	210	19.45	19.42
Tablet	200	17.25	17.17
Notebook	205	19.45	19.42
	204	19.45	19.42
	203	19.45	19.42
	202	19.45	19.42
	201	19.45	19.42
Tablet	200	17.25	17.17
	201	17.25	17.17
	202	17.25	17.17
	203	17.25	17.17
	204	17.25	17.17
	190	17.25	17.17
	180	17.25	17.17
	170	17.25	17.17
	160	17.25	17.17
Notebook	150	19.45	19.42
	155	19.45	19.42
	160	19.45	19.42

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX	MAIN
Tablet	165	17.25	17.17
	164	17.25	17.17
	163	17.25	17.17
	162	17.25	17.17
	161	17.25	17.17
	160	17.25	17.17
Notebook	159	19.45	19.42
	158	19.45	19.42
	157	19.45	19.42
	156	19.45	19.42
	155	19.45	19.42
	150	19.45	19.42
	140	19.45	19.42
	130	19.45	19.42
	120	19.45	19.42
	110	19.45	19.42
	100	19.45	19.42
	90	19.45	19.42
	80	19.45	19.42
	70	19.45	19.42
	60	19.45	19.42
	50	19.45	19.42
	40	19.45	19.42
Lid Close	30	Standby	Standby
Notebook	35	19.45	19.42
Lid Close	34	Standby	Standby
	33	Standby	Standby
	32	Standby	Standby
	31	Standby	Standby
	30	Standby	Standby
	20	Standby	Standby
	10	Standby	Standby
	0	Standby	Standby

B.1.2 LCD direction 90/270°

The lid is rotating from 0 to 180 degrees. LCD orientation 90 or 270 degrees and system base is not horizontal.

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX	MAIN
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Book	40	17.25	17.17
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Book	40	17.25	17.17
	41	17.25	17.17
	42	17.25	17.17
	43	17.25	17.17
	44	17.25	17.17
	45	17.25	17.17
	50	17.25	17.17
	60	17.25	17.17
	70	17.25	17.17
	80	17.25	17.17
	90	17.25	17.17
	100	17.25	17.17
	110	17.25	17.17
	120	17.25	17.17
	130	17.25	17.17
	140	17.25	17.17
	150	17.25	17.17
	160	17.25	17.17
	170	17.25	17.17
	180	17.25	17.17

The lid is rotating from 180 to 0 degrees. LCD orientation 90 or 270 degrees and system base is not horizontal.

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		AUX	MAIN
Book	180	17.25	17.17
	170	17.25	17.17
	160	17.25	17.17
	150	17.25	17.17
	140	17.25	17.17
	130	17.25	17.17
	120	17.25	17.17
	110	17.25	17.17
	100	17.25	17.17
	90	17.25	17.17
	80	17.25	17.17
	70	17.25	17.17
	60	17.25	17.17
	50	17.25	17.17
	40	17.25	17.17
Lid Close	30	Standby	Standby
Book	35	17.25	17.17
Lid Close	34	Standby	Standby
	33	Standby	Standby
	32	Standby	Standby
	31	Standby	Standby
	30	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, LCD direction is 0 degree for notebook mode

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX	MAIN
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Notebook	40	19.54	19.62
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Notebook	40	19.54	19.62
	41	19.54	19.62
	42	19.54	19.62
	43	19.54	19.62
	44	19.54	19.62
	45	19.54	19.62
	50	19.54	19.62
	60	19.54	19.62
	70	19.54	19.62
	80	19.54	19.62
	90	19.54	19.62
	100	19.54	19.62
	110	19.54	19.62
	120	19.54	19.62
	130	19.54	19.62
	140	19.54	19.62
	150	19.54	19.62
	160	19.54	19.62
Tablet	170	14.6	14.61
	165	14.6	14.61
Notebook	160	19.54	19.62
	161	19.54	19.62
	162	19.54	19.62
	163	19.54	19.62
	164	19.54	19.62
Tablet	165	14.6	14.61
	166	14.6	14.61
	167	14.6	14.61
	168	14.6	14.61
	169	14.6	14.61
	170	14.6	14.61
	180	14.6	14.61
	190	14.6	14.61
	200	14.6	14.61

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX	MAIN
Notebook	210	19.54	19.62
	205	19.54	19.62
Tablet	200	14.6	14.61
	201	14.6	14.61
	202	14.6	14.61
	203	14.6	14.61
	204	14.6	14.61
Notebook	205	19.54	19.62
	210	19.54	19.62
	220	19.54	19.62
	230	19.54	19.62
	240	19.54	19.62
	250	19.54	19.62
	260	19.54	19.62
	270	19.54	19.62
	280	19.54	19.62
	290	19.54	19.62
	300	19.54	19.62
	310	19.54	19.62
	320	19.54	19.62
	330	19.54	19.62
	340	19.54	19.62
Tablet	350	14.6	14.61
	345	14.6	14.61
Notebook	340	19.54	19.62
	341	19.54	19.62
	342	19.54	19.62
	343	19.54	19.62
	344	19.54	19.62
Tablet	345	14.6	14.61
	346	14.6	14.61
	347	14.6	14.61
	348	14.6	14.61
	349	14.6	14.61
	350	14.6	14.61
	360	14.6	14.61

The lid is rotating from 360 to 0. The system base is horizontal, LCD direction is 0 degree for notebook mode.

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX	MAIN
Tablet	360	14.6	14.61
	350	14.6	14.61
	340	14.6	14.61
Notebook	330	19.54	19.62
	335	19.54	19.62
	340	19.54	19.62
Tablet	345	14.6	14.61
	344	14.6	14.61
	343	14.6	14.61
	342	14.6	14.61
	341	14.6	14.61
Notebook	340	19.54	19.62
	339	19.54	19.62
	338	19.54	19.62
	337	19.54	19.62
	336	19.54	19.62
	335	19.54	19.62
	330	19.54	19.62
	320	19.54	19.62
	310	19.54	19.62
	300	19.54	19.62
	290	19.54	19.62
	280	19.54	19.62
	270	19.54	19.62
	260	19.54	19.62
	250	19.54	19.62
	240	19.54	19.62
	230	19.54	19.62
	220	19.54	19.62
	210	19.54	19.62
Tablet	200	14.6	14.61
Notebook	205	19.54	19.62
	204	19.54	19.62
	203	19.54	19.62
	202	19.54	19.62
	201	19.54	19.62
Tablet	200	14.6	14.61
	201	14.6	14.61
	202	14.6	14.61
	203	14.6	14.61
	204	14.6	14.61
	190	14.6	14.61
	180	14.6	14.61
	170	14.6	14.61
	160	14.6	14.61
Notebook	150	19.54	19.62
	155	19.54	19.62
	160	19.54	19.62

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX	MAIN
Tablet	165	14.6	14.61
	164	14.6	14.61
	163	14.6	14.61
	162	14.6	14.61
	161	14.6	14.61
	160	14.6	14.61
Notebook	159	19.54	19.62
	158	19.54	19.62
	157	19.54	19.62
	156	19.54	19.62
	155	19.54	19.62
	150	19.54	19.62
	140	19.54	19.62
	130	19.54	19.62
	120	19.54	19.62
	110	19.54	19.62
	100	19.54	19.62
	90	19.54	19.62
	80	19.54	19.62
	70	19.54	19.62
	60	19.54	19.62
	50	19.54	19.62
	40	19.54	19.62
Lid Close	30	Standby	Standby
Notebook	35	19.54	19.62
Lid Close	34	Standby	Standby
	33	Standby	Standby
	32	Standby	Standby
	31	Standby	Standby
	30	Standby	Standby
	20	Standby	Standby
	10	Standby	Standby
	0	Standby	Standby

B.2.1 LCD direction 90/270°

The lid is rotating from 0 to 180 degrees. LCD orientation 90 or 270 degrees and system base is not horizontal.

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX	MAIN
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Book	40	14.6	14.61
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Book	40	14.6	14.61
	41	14.6	14.61
	42	14.6	14.61
	43	14.6	14.61
	44	14.6	14.61
	45	14.6	14.61
	50	14.6	14.61
	60	14.6	14.61
	70	14.6	14.61
	80	14.6	14.61
	90	14.6	14.61
	100	14.6	14.61
	110	14.6	14.61
	120	14.6	14.61
	130	14.6	14.61
	140	14.6	14.61
	150	14.6	14.61
	160	14.6	14.61
	170	14.6	14.61
	180	14.6	14.61

The lid is rotating from 180 to 0 degrees. LCD orientation 90 or 270 degrees and system base is not horizontal.

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		AUX	MAIN
Book	180	14.6	14.61
	170	14.6	14.61
	160	14.6	14.61
	150	14.6	14.61
	140	14.6	14.61
	130	14.6	14.61
	120	14.6	14.61
	110	14.6	14.61
	100	14.6	14.61
	90	14.6	14.61
	80	14.6	14.61
	70	14.6	14.61
	60	14.6	14.61
	50	14.6	14.61
	40	14.6	14.61
Lid Close	30	Standby	Standby
Book	35	14.6	14.61
Lid Close	34	Standby	Standby
	33	Standby	Standby
	32	Standby	Standby
	31	Standby	Standby
	30	Standby	Standby
	20	Standby	Standby
	10	Standby	Standby
	0	Standby	Standby