TEST REPORT

EUT Description	**Convertible PC**
Brand Name	**HP**
Model Name	**TPN-Q293**
FCC ID	**PD9BE200NG**
ISED ID	**1000M-BE200NG**
Date of Test Start/End	**2023-10-27 / 2023-11-13**
Features	**IEEE 802.11a/b/g/n/ac/ax/be**

Applicant	**Intel Corporation SAS**
Address	**425 Rue de Goa – Le Cargo B6 – 06600 Antibes, FRANCE**
Contact Person	**Benjamin Lavenant**
Telephone/Fax/ Email	**Benjamin.lavenant@intel.com**

Test Report identification	**230824-02.TR01**
Revision Control	**Rev. 01** **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: 2023.11.13 10:41:25 +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	22.4ºC ± 1.5ºC
Humidity	57% ± 13%

4. Test Sample

Sample	ID #	Description	Model	Serial #	Note
#1	230824-02.S03	Convertible PC	TPN-Q293	5CD3247760	-

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 A(1)	Antenna B(2)	Antenna A(1)	Antenna B(2)	Antenna A(1)	Antenna B(2)	Antenna A(1)	Antenna B(2)
Lid Close	0°≤ - <35°	-	Standby	Standby	Standby	Standby	Standby	Standby	Standby	Standby
Notebook	35°≤ - <160°	0°	22.5	22.0	20.6	20.2	21.25	21.25	20.7	20.3
Tablet	160°≤ - <360°	90°; 270°	18.0	18.0	17.9	17.8	15.0	15.0	14.9	14.6
Book	70°≤ - ≤110°	90°; 270°	18.0	18.0	17.9	17.8	15.0	15.0	14.9	14.6

8. Document Revision History

Revision #	Modified by	Revision Details
Rev.00	Cheiel In	-
Rev.01	Cheiel In	Correction of table summary in section 7.1per OD Correction of angles in annex B

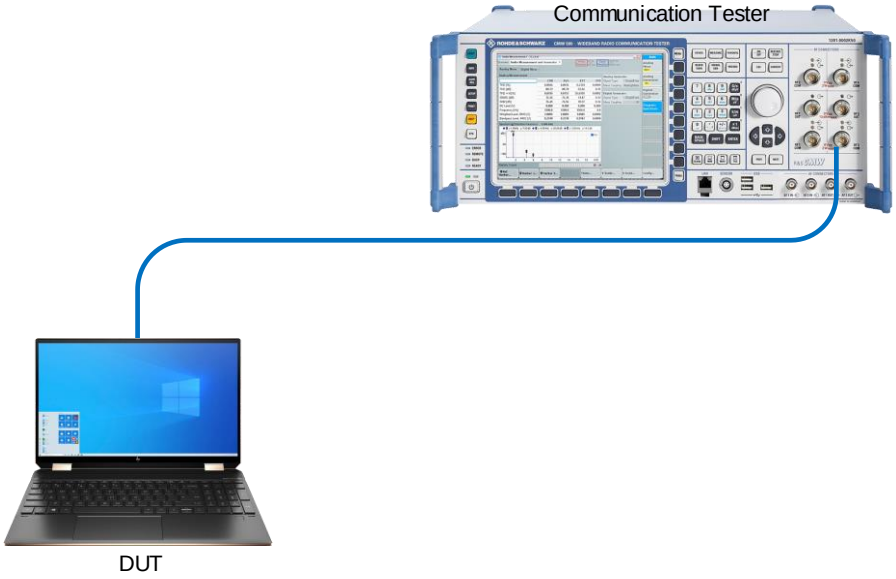
Annex A. Test & System description

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-Q293.* An *BE200NGW* 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)	
		A(1)	B(2)
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Notebook	40	20.6	20.2
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Notebook	40	20.6	20.2
	41	20.6	20.2
	42	20.6	20.2
	43	20.6	20.2
	44	20.6	20.2
	45	20.6	20.2
	50	20.6	20.2
	60	20.6	20.2
	70	20.6	20.2
	80	20.6	20.2
	90	20.6	20.2
	100	20.6	20.2
	110	20.6	20.2
	120	20.6	20.2
	130	20.6	20.2
	140	20.6	20.2
	150	20.6	20.2
	160	20.6	20.2
Tablet	170	17.9	17.8
	165	17.9	17.8
Notebook	160	20.6	20.2
	161	20.6	20.2
	162	20.6	20.2
	163	20.6	20.2
	164	20.6	20.2
Tablet	165	17.9	17.8
	166	17.9	17.8
	167	17.9	17.8
	168	17.9	17.8
	169	17.9	17.8
	170	17.9	17.8
	180	17.9	17.8
	190	17.9	17.8
	200	17.9	17.8

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		A(1)	B(2)
Tablet	210	17.9	17.8
	220	17.9	17.8
	230	17.9	17.8
	240	17.9	17.8
	250	17.9	17.8
	260	17.9	17.8
	270	17.9	17.8
	280	17.9	17.8
	290	17.9	17.8
	300	17.9	17.8
	310	17.9	17.8
	320	17.9	17.8
	330	17.9	17.8
	340	17.9	17.8
	350	17.9	17.8
	360	17.9	17.8

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)	
		A(1)	B(2)
Tablet	360	17.9	17.8
	350	17.9	17.8
	340	17.9	17.8
	340	17.9	17.8
	330	17.9	17.8
	320	17.9	17.8
	310	17.9	17.8
	300	17.9	17.8
	290	17.9	17.8
	280	17.9	17.8
	270	17.9	17.8
	260	17.9	17.8
	250	17.9	17.8
	240	17.9	17.8
	230	17.9	17.8
	220	17.9	17.8
	210	17.9	17.8
	200	17.9	17.8
	190	17.9	17.8
	180	17.9	17.8
	170	17.9	17.8
	160	17.9	17.8
Notebook	150	20.6	20.2
	155	20.6	20.2
Tablet	160	17.9	17.8
	159	17.9	17.8
	158	17.9	17.8
	157	17.9	17.8
	156	17.9	17.8
	155	17.9	17.8

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		A(1)	B(2)
Notebook	154	20.6	20.2
	153	20.6	20.2
	152	20.6	20.2
	151	20.6	20.2
	150	20.6	20.2
	149	20.6	20.2
	140	20.6	20.2
	130	20.6	20.2
	120	20.6	20.2
	110	20.6	20.2
	100	20.6	20.2
	90	20.6	20.2
	80	20.6	20.2
	70	20.6	20.2
	60	20.6	20.2
	50	20.6	20.2
	40	20.6	20.2
Lid Close	30	Standby	Standby
Notebook	35	20.6	20.2
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)	
		A(1)	B(2)
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Book	40	17.9	17.8
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Book	40	17.9	17.8
	41	17.9	17.8
	42	17.9	17.8
	43	17.9	17.8
	44	17.9	17.8
	45	17.9	17.8
	50	17.9	17.8
	60	17.9	17.8
	70	17.9	17.8
	80	17.9	17.8
	90	17.9	17.8
	100	17.9	17.8
	110	17.9	17.8
	120	17.9	17.8
	130	17.9	17.8
	140	17.9	17.8
	150	17.9	17.8
	160	17.9	17.8
	170	17.9	17.8
	180	17.9	17.8

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)	
		A(1)	B(2)
Book	180	17.9	17.8
	170	17.9	17.8
	160	17.9	17.8
	150	17.9	17.8
	140	17.9	17.8
	130	17.9	17.8
	120	17.9	17.8
	110	17.9	17.8
	100	17.9	17.8
	90	17.9	17.8
	80	17.9	17.8
	70	17.9	17.8
	60	17.9	17.8
	50	17.9	17.8
	40	17.9	17.8
Lid Close	30	Standby	Standby
Book	35	17.9	17.8
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

B.2.1 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 5GHz-Ch120(dBm)	
		A(1)	B(2)
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Notebook	40	20.7	20.3
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Notebook	40	20.7	20.3
	41	20.7	20.3
	42	20.7	20.3
	43	20.7	20.3
	44	20.7	20.3
	45	20.7	20.3
	50	20.7	20.3
	60	20.7	20.3
	70	20.7	20.3
	80	20.7	20.3
	90	20.7	20.3
	100	20.7	20.3
	110	20.7	20.3
	120	20.7	20.3
	130	20.7	20.3
	140	20.7	20.3
	150	20.7	20.3
	160	20.7	20.3
Tablet	170	14.9	14.6
	165	14.9	14.6
Notebook	160	20.7	20.3
	161	20.7	20.3
	162	20.7	20.3
	163	20.7	20.3
	164	20.7	20.3
Tablet	165	14.9	14.6
	166	14.9	14.6
	167	14.9	14.6
	168	14.9	14.6
	169	14.9	14.6
	170	14.9	14.6
	180	14.9	14.6
	190	14.9	14.6
	200	14.9	14.6

Mode	Angle (degree)	Measured power 5GHz-Ch120(dBm)	
		A(1)	B(2)
Tablet	210	14.9	14.6
	220	14.9	14.6
	230	14.9	14.6
	240	14.9	14.6
	250	14.9	14.6
	260	14.9	14.6
	270	14.9	14.6
	280	14.9	14.6
	290	14.9	14.6
	300	14.9	14.6
	310	14.9	14.6
	320	14.9	14.6
	330	14.9	14.6
	340	14.9	14.6
	350	14.9	14.6
	360	14.9	14.6

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)	
		A(1)	B(2)
Tablet	360	14.9	14.6
	350	14.9	14.6
	340	14.9	14.6
	340	14.9	14.6
	330	14.9	14.6
	320	14.9	14.6
	310	14.9	14.6
	300	14.9	14.6
	290	14.9	14.6
	280	14.9	14.6
	270	14.9	14.6
	260	14.9	14.6
	250	14.9	14.6
	240	14.9	14.6
	230	14.9	14.6
	220	14.9	14.6
	210	14.9	14.6
	200	14.9	14.6
	190	14.9	14.6
	180	14.9	14.6
	170	14.9	14.6
	160	14.9	14.6
Notebook	150	20.7	20.3
	155	20.7	20.3
Tablet	160	14.9	14.6
	159	14.9	14.6
	158	14.9	14.6
	157	14.9	14.6
	156	14.9	14.6
	155	14.9	14.6

Mode	Angle (degree)	Measured power 2.4GHz-Ch6(dBm)	
		A(1)	B(2)
Notebook	154	20.7	20.3
	153	20.7	20.3
	152	20.7	20.3
	151	20.7	20.3
	150	20.7	20.3
	149	20.7	20.3
	140	20.7	20.3
	130	20.7	20.3
	120	20.7	20.3
	110	20.7	20.3
	100	20.7	20.3
	90	20.7	20.3
	80	20.7	20.3
	70	20.7	20.3
	60	20.7	20.3
	50	20.7	20.3
	40	20.7	20.3
Lid Close	30	Standby	Standby
Notebook	35	20.7	20.3
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.2.2 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 5GHz-Ch120(dBm)	
		A(1)	B(2)
Lid close	0	Standby	Standby
	10	Standby	Standby
	20	Standby	Standby
	30	Standby	Standby
Book	40	14.9	14.6
Lid close	35	Standby	Standby
	36	Standby	Standby
	37	Standby	Standby
	38	Standby	Standby
	39	Standby	Standby
Book	40	14.9	14.6
	41	14.9	14.6
	42	14.9	14.6
	43	14.9	14.6
	44	14.9	14.6
	45	14.9	14.6
	50	14.9	14.6
	60	14.9	14.6
	70	14.9	14.6
	80	14.9	14.6
	90	14.9	14.6
	100	14.9	14.6
	110	14.9	14.6
	120	14.9	14.6
	130	14.9	14.6
	140	14.9	14.6
	150	14.9	14.6
	160	14.9	14.6
	170	14.9	14.6
	180	14.9	14.6

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)	
		A(1)	B(2)
Book	180	14.9	14.6
	170	14.9	14.6
	160	14.9	14.6
	150	14.9	14.6
	140	14.9	14.6
	130	14.9	14.6
	120	14.9	14.6
	110	14.9	14.6
	100	14.9	14.6
	90	14.9	14.6
	80	14.9	14.6
	70	14.9	14.6
	60	14.9	14.6
	50	14.9	14.6
	40	14.9	14.6
Lid Close	30	Standby	Standby
Book	35	14.9	14.6
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