CERTIFICATE #3478.01

EVALUATION REPORT

EUT Description	**WLAN and BT, 2x2 PCIe M.2 1216 adapter card**
Brand Name	**Intel® Wi-Fi 6 AX203**
Model Name	**AX203D2W**
FCC ID	**PD9AX203D2**
Date of Test Start/End	**2022-07-21 / 2022-07-21**
Features	**802.11ax, Dual Band, 2x2 Wi-Fi + Bluetooth® 5.1** **(**see section **3)**

Applicant	**Intel Mobile Communications**
Address	**100 Center Point Circle, Suite 200/Columbia, SC 29210/United States**
Contact Person	**Steven Hackett**
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Reference Standards	**FCC 47 CFR 1.1310** **FCC 47 CFR 2.1091** (see section 1)

Test Report identification	**220601-09.TR03**
Revision Control	**Rev. 00** **This test report revision replaces any previous test report revision** (see section 5)

The test results relate only to the samples tested.
Reference to accreditation shall be used only by full reproduction of test report

Issued by

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1. Standards, reference documents and applicable test methods

FCC	FCC 47 CFR Part §1.1310 Radiofrequency radiation exposure limits. Edition October 2019 FCC 47 CFR Part §2.1091 Radiofrequency radiation exposure evaluation: mobile devices. Edition October 2019

2. General conditions, competences and guarantees

- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2017 laboratory accredited by the American Association for Laboratory Accreditation (A2LA) with the certificate number 3478.01.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm recognized by the FCC, with Designation Number FR0011
- ✓ Intel WRF Lab declines any responsibility with respect to the identified information provided by the customer and that may affect the validity of results.
- ✓ 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. EUT Features

The herein information is provided by the customer

Brand Name	Intel® Wi-Fi 6 AX203
Model Name	AX203D2W
Supported Radios	802.11b/g/n/ax 2.4GHz (2400.0 – 2483.5 MHz) 802.11a/n/ac/ax 5.2GHz (5150.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5825.0 MHz) Bluetooth 5.1 2.4GHz (2400.0 – 2483.5 MHz)

Antenna Information

Transmitter	Main	Aux
Manufacturer	WIESON	WIESON
Antenna type	Dipole antenna	Dipole antenna
Part number	ARY121-0009-002-H0	ARY121-0009-002-H0

Frequency Band	Peak gain w/cable loss (dBi)
2.4 GHz (2400MHz-2500MHz)	3.10 dBi
5.2&5.3GHz (5150MHz-5350MHz)	4.11 dBi
5.5 GHz (5470MHz-5725MHz)	5.17 dBi
5.8 GHz (5725MHz-5850MHz)	5.17 dBi

Simultaneous Transmission Configurations	WLAN 2.4GHz Aux + BT Main WLAN 2.4GHz Main + WLAN 2.4GHz Aux WLAN 5GHz Aux + BT Main WLAN 5GHz Main + WLAN 5GHz Aux WLAN 5GHz Main + WLAN 5GHz Aux + BT Main

4. Evaluation Verdicts summary

Power Density Calculations

Mode	Frequency (MHz)	Highest Power Density @ 20cm (mW/m^2)	Limit (mW/m^2)	Verdict
DTS	2412	0.05	1	P
UNII	5180	0.08	1	P
BT	2400	0.004	1	P

Collocated Power Density Calculations

Mode	$\sum \frac{Power\ Density}{Limit}$	Ratio Max	Verdict
WLAN + BT	0.16	1	P

P: Pass
F: Fail
NM: Not Measured
NA: Not Applicable

5. Document Revision History

Revision #	Modified by	Revision Details
Rev. 00	A.Lounes	First Issue

Annex A. Evaluation Description

A.1 RF Exposure Limit

According to the FCC part 1.1310:

- For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in the table below.

Limits for Maximum Permissible Exposure (MPE) (TABLE 1 TO §1.1310(E)(1))

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(ii) Limits for General Population/Uncontrolled Exposure				
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
300-1,500	-	-	f/1500	<30
1,500-100,000	-	-	1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

For the purpose of this evaluation, a distance of 20cm was used to calculate the equivalent plan wave power density, to be compared with the limit described in the table above:

$$S_{eq} = \frac{P_{avg} \cdot G}{4 \cdot \pi \cdot R^2}$$

Where:

S_{eq} = Equivalent Plane Wave Power Density

P_{avg} = Average Power at antenna terminals in Watts

G = Gain of the Transmitting Antenna

R = Distance from the Transmitting Antenna in meters

A.2 Exposure from source with Multiple Frequencies

If the device is designed such that more than one antenna can functionally transmit at the same time, the RF exposure evaluation shall be conducted while all antennas are transmitting. The individual exposure level ratios shall be totalled and used for compliance purposes.:

$$\sum \frac{S_{eq_i}}{S_{Limit_i}} < 1$$

Annex B. RF Exposure Evaluation Results

B.1 Declared Maximum Output Power

According to the applicant, the maximum conducted transmit power (including the upper tolerance) for the EUT under evaluation are as follows:

Mode	Max Output Power (incl. Tolerance)
DTS	21.0 dBm
UNII 5GHz	21.0 dBm
BT	10.5 dBm

B.2 RF Exposure Evaluation Results

B.2.1 2.4GHz

Band	Avg Power [dBm]	Peak antenna Gain (dBi)	ERP/EIRP Avg [dBm]	ERP/EIRP Avg [mW]	Power density @ 20cm [mW/cm^2]	Limit [mW/cm^2]	Ratio (Power density/Limit)
DTS	21.0	3.10	24.1	257.0	0.05	1.0	0.05
BT	10.5		13.6	22.9	0.004	1.0	0.004

B.2.2 UNII 5GHz

Band	Avg Power [dBm]	Peak antenna Gain (dBi)	ERP/EIRP Avg [dBm]	ERP/EIRP Avg [mW]	Power density @ 20cm [mW/cm^2]	Limit [mW/cm^2]	Ratio (Power density/Limit)
UNII 5GHz	21.0	5.17	26.17	414.0	0.08	1.0	0.08

The maximum exposure for collocated transmitters is:

Band	Ratio (Power density/Limit)	$\sum$ Ratio$_i$	Limit
UNII 5GHz	0.08	0.16	1.0
UNII 5GHz	0.08		
Bluetooth	0.004		

End of the Report

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