

Approved Body Type Examination Certificate

Manufacturer company name: Intel Corporation SAS
Manufacturer address: 425 Rue de Goa – Le Cargo B6-B7
06600 Antibes
France
Description of the radio equipment: Intel® BE201D2W
Trade /brand name or registered trademark: Intel®
Model/type indication: BE201D2W
Software version: Intel® PROSet/Wireless WiFi version 23.x and subsequent versions
Hardware version: RM17
Frequency bands of operation: 2400 MHz to 2483.5 MHz
5150 MHz to 5350 MHz
5470 MHz to 5725 MHz
5725 MHz to 5875 MHz
5945 MHz to 6425 MHz

Technical documentation (TD) reference: RED_TD_BE201D2W
ACB project number: ATCB031419
Certificate number: ATCB031419, issue 1

ACB, Inc. is designated as an Approved Body under the
U.S.-UK Mutual Recognition Agreement (Telecommunications Equipment & EMC Annexes)

ACB, Inc.
Approved Body Number 1588
313 Park Avenue Suite 300
Falls Church, VA 22046, USA

In the opinion of ACB, Inc., the examination of the technical documentation as drawn up by the manufacturer demonstrates that the essential requirements of Regulation 6 (1)(a), Regulation 6 (1)(b) and Regulation 6 (2) of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206) have been met. The conformity assessment on the radio equipment listed above and as described in Annex 1 to this type examination certificate has been carried out in accordance with Schedule 3, Module B, of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206). This type examination certificate relates only to the documents as provided to ACB, Inc. A list of documentation forming the basis for the type examination is provided in Annex 2 to this type examination certificate.



Approved Body: *P.A.J.M. Robben*

29 February 2024
Date



Annex 1 to type examination certificate for the Radio Equipment Regulations 2017 (S.I. No. 2017/1206)

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The radio equipment as described and documented in the technical documentation as drawn up by the manufacturer is a WLAN and BT 2x2 PCIe M.2 1216 adapter card and which supports the IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11a, IEEE 802.11ac, IEEE 802.11ax and IEEE 802.11be standards. This WLAN and BT 2x2 PCIe M.2 1216 adapter card also supports Bluetooth® radio technologies.

The radio equipment has been assessed for use in an ambient temperature range of -10 °C to +70 °C and for use with a nominal input voltage of 3.3 VDC. The radio equipment has been assessed for localized SAR (head and trunk) and where the highest resulting SAR value is 1.19 W/kg (10g) in the 2.4 GHz and 5 GHz frequency bands for a separation distance of 0 mm. The radio equipment has been assessed for localized SAR (head and trunk) and where the highest resulting SAR value is 0.83 W/kg (10g) in the 6 GHz frequency band for a separation distance of 0 mm. The radio equipment has been assessed assuming that each antenna port is connected to an external antenna having a peak gain of:

2400 MHz to 2483.5 MHz:

Description	Transmitter chain A
Manufacturer	Intel WRF Lab
Antenna type	PIFA antenna
Model	WRF-Tri Band-Antenna
Antenna peak gain	+3 dBi max. including coaxial cable losses

Description	Transmitter chain B
Manufacturer	Intel WRF Lab
Antenna type	PIFA antenna
Model	WRF-Tri Band-Antenna
Antenna peak gain	+3 dBi max. including coaxial cable losses

Description	Transmitter chain A
Manufacturer	Wieson
Antenna type	Dipole antenna
Model	ARY121-0009-002-H0 (with cable assembly AR9851-0009-005-H0)
Antenna peak gain	+3 dBi max. including coaxial cable losses

Description	Transmitter chain A
Manufacturer	Changshu HongBo Telecommunication Technology Co., Ltd.
Antenna type	Monopole antenna
Model	260-25095 (with cable assembly SY113L/50)
Antenna peak gain	+3 dBi max. including coaxial cable losses

Description	Transmitter chain B
Manufacturer	Changshu HongBo Telecommunication Technology Co., Ltd.
Antenna type	Monopole antenna
Model	260-25095 (with cable assembly SY113L/50)
Antenna peak gain	+3 dBi max. including coaxial cable losses

5150 MHz to 5350 MHz, 5470 MHz to 5725 MHz and 5725 MHz to 5875 MHz:

Description	Transmitter chain A
Manufacturer	Intel WRF Lab
Antenna type	PIFA antenna
Model	WRF-Tri Band-Antenna
Antenna peak gain	+5 dBi max. including coaxial cable losses



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Description
Manufacturer Intel WRF Lab
Antenna type PIFA antenna
Model WRF-Tri Band-Antenna
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain B

Description
Manufacturer Wieson
Antenna type Dipole antenna
Model ARY121-0009-002-H0 (with cable assembly AR9851-0009-005-H0)
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain A

Description
Manufacturer Changshu HongBo Telecommunication Technology Co., Ltd.
Antenna type Monopole antenna
Model 260-25095 (with cable assembly SY113L/50)
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain A

Description
Manufacturer Changshu HongBo Telecommunication Technology Co., Ltd.
Antenna type Monopole antenna
Model 260-25095 (with cable assembly SY113L/50)
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain B

5945 MHz to 6425 MHz:

Description
Manufacturer Intel WRF Lab
Antenna type PIFA antenna
Model WRF-Tri Band-Antenna
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain A

Description
Manufacturer Intel WRF Lab
Antenna type PIFA antenna
Model WRF-Tri Band-Antenna
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain B

Description
Manufacturer Wieson
Antenna type Dipole antenna
Model ARY121-0009-002-H0 (with cable assembly AR9851-0009-005-H0)
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain A

Description
Manufacturer Changshu HongBo Telecommunication Technology Co., Ltd.
Antenna type Monopole antenna
Model 260-25095 (with cable assembly SY113L/50)
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain A

Description
Manufacturer Changshu HongBo Telecommunication Technology Co., Ltd.
Antenna type Monopole antenna
Model 260-25095 (with cable assembly SY113L/50)
Antenna peak gain +5 dBi max. including coaxial cable losses

Transmitter chain B



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The radio equipment has been tested in order to ensure that the radio equipment remains compliant with the essential requirements of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206) when an antenna, or antennas, with lower peak gain as listed above is/are used in combination with the radio equipment. The absolute maximum allowable increase in conducted RF output power, based on an equivalent or larger decrease in peak antenna gain, is specified as being:

2400 MHz to 2483.5 MHz (IEEE 802.11b/g/n/ax/be, 20 MHz, chain A/chain B): +4.00 dB
2400 MHz to 2483.5 MHz (IEEE 802.11b/g/n/ax/be, 20 MHz, chain A + chain B): +4.75 dB
2400 MHz to 2483.5 MHz (IEEE 802.11n/ax/be, 40 MHz, chain A/chain B): +4.25 dB
2400 MHz to 2483.5 MHz (IEEE 802.11n/ax/be, 40 MHz, chain A + chain B): +4.75 dB

5150 MHz to 5350 MHz (20 MHz, chain A/chain B): +5.25 dB
5150 MHz to 5350 MHz (20 MHz, chain A + chain B): +5.50 dB
5150 MHz to 5350 MHz (40 MHz, chain A/chain B): +4.50 dB
5150 MHz to 5350 MHz (40 MHz, chain A + chain B): +5.00 dB
5150 MHz to 5350 MHz (80 MHz, chain A/chain B): +4.50 dB
5150 MHz to 5350 MHz (80 MHz, chain A + chain B): +5.50 dB
5150 MHz to 5350 MHz (160 MHz, chain A/chain B): +4.50 dB
5150 MHz to 5350 MHz (160 MHz, chain A + chain B): +4.75 dB

5470 MHz to 5725 MHz (20 MHz, chain A/chain B): +4.50 dB
5470 MHz to 5725 MHz (20 MHz, chain A + chain B): +5.50 dB
5470 MHz to 5725 MHz (40 MHz, chain A/chain B): +3.75 dB
5470 MHz to 5725 MHz (40 MHz, chain A + chain B): +5.50 dB
5470 MHz to 5725 MHz (80 MHz, chain A/chain B): +3.50 dB
5470 MHz to 5725 MHz (80 MHz, chain A + chain B): +5.50 dB
5470 MHz to 5725 MHz (160 MHz, chain A/chain B): +3.25 dB
5470 MHz to 5725 MHz (160 MHz, chain A + chain B): +4.75 dB

5725 MHz to 5875 MHz: +7 dB

5945 MHz to 6425 MHz (20 MHz, chain A/chain B): +4.75 dB
5945 MHz to 6425 MHz (20 MHz, chain A + chain B): +4.75 dB
5945 MHz to 6425 MHz (40 MHz, chain A/chain B): +4.50 dB
5945 MHz to 6425 MHz (40 MHz, chain A + chain B): +4.75 dB
5945 MHz to 6425 MHz (80 MHz, chain A/chain B): +4.25 dB
5945 MHz to 6425 MHz (80 MHz, chain A + chain B): +5.25 dB
5945 MHz to 6425 MHz (160 MHz, chain A/chain B): +3.50 dB
5945 MHz to 6425 MHz (160 MHz, chain A + chain B): +3.50 dB
5945 MHz to 6425 MHz (320 MHz, chain A/chain B): +1.75 dB
5945 MHz to 6425 MHz (320 MHz, chain A + chain B): +1.75 dB

When installing this radio equipment into a host product to create a new radio equipment device: the manufacturer responsible for placing the new radio equipment device on the market in GB must assess if the combination of this radio equipment and the host product complies with the essential requirements of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206).



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Details of operation:

Description of service: Bluetooth Basic Rate + EDR + LE FHSS
Transmit frequency: 2402 MHz to 2480 MHz
Receive frequency: 2402 MHz to 2480 MHz
Modulation: GFSK, $\pi/4$ DQPSK, 8DPSK
Transmit power: 18.1 dBm, e.i.r.p.

Description of service: Bluetooth Low Energy (BLE)
Transmit frequency: 2402 MHz to 2480 MHz
Receive frequency: 2402 MHz to 2480 MHz
Modulation: GFSK
Transmit power: 9.9 dBm, e.i.r.p.

Description of service: IEEE 802.11b/g/n/ax/be WLAN
Transmit frequency: 2412 MHz to 2472 MHz (20 MHz)
2422 MHz to 2462 MHz (40 MHz)
Receive frequency: 2412 MHz to 2472 MHz (20 MHz)
2422 MHz to 2462 MHz (40 MHz)
Modulation: DSSS (DBPSK, DQPSK, CCK), OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 1024QAM, 4096QAM)
Transmit power: 19.9 dBm, e.i.r.p.

Description of service: IEEE 802.11a/n/ac/ax/be WLAN
Transmit frequency: 5180 MHz to 5320 MHz (20 MHz)
5190 MHz to 5310 MHz (40 MHz)
5210 MHz, 5290 MHz (80 MHz)
5250 MHz (160 MHz)
Receive frequency: 5180 MHz to 5320 MHz (20 MHz)
5190 MHz to 5310 MHz (40 MHz)
5210 MHz, 5290 MHz (80 MHz)
5250 MHz (160 MHz)
Modulation: OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Transmit power: 22.9 dBm, e.i.r.p.

Description of service: IEEE 802.11a/n/ac/ax/be WLAN
Transmit frequency: 5500 MHz to 5700 MHz (20 MHz)
5510 MHz to 5670 MHz (40 MHz)
5530 MHz, 5610 MHz (80 MHz)
5570 MHz (160 MHz)
Receive frequency: 5500 MHz to 5700 MHz (20 MHz)
5510 MHz to 5670 MHz (40 MHz)
5530 MHz, 5610 MHz (80 MHz)
5570 MHz (160 MHz)
Modulation: OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Transmit power: 22.9 dBm, e.i.r.p.



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Description of service: IEEE 802.11a/n/ac/ax/be WLAN
Transmit frequency: 5745 MHz to 5865 MHz (20 MHz)
5755 MHz to 5835 MHz (40 MHz)
5775 MHz (80 MHz)
Receive frequency: 5745 MHz to 5865 MHz (20 MHz)
5755 MHz to 5835 MHz (40 MHz)
5775 MHz (80 MHz)
Modulation: OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Transmit power: 13.97 dBm, e.i.r.p.

Description of service: IEEE 802.11ax/be WLAN
Transmit frequency: 5955 MHz to 6415 MHz (20 MHz)
5965 MHz to 6405 MHz (40 MHz)
5985 MHz to 6385 MHz (80 MHz)
6025 MHz to 6345 MHz (160 MHz)
6105 MHz to 6265 MHz (320 MHz)
Receive frequency: 5955 MHz to 6415 MHz (20 MHz)
5965 MHz to 6405 MHz (40 MHz)
5985 MHz to 6385 MHz (80 MHz)
6025 MHz to 6345 MHz (160 MHz)
6105 MHz to 6265 MHz (320 MHz)
Modulation: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Transmit power: 22.9 dBm, e.i.r.p. (LPI) ; 13.9 dBm, e.i.r.p. (VLP)



Annex 2 to type examination certificate for the Radio Equipment Regulations 2017 (S.I. No. 2017/1206)

Date of issue: 29 February 2024
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1	Test report:	Report number:	Dated:
	EMC	23C0647R-0E3012100146-A	19 December 2023
	Radio	231120-05.TR01	23 February 2024
	Radio	231120-05.TR02	23 February 2024
	Radio	231120-05.TR03	22 February 2024
	Radio	231120-05.TR04	22 February 2024
	Radio	231120-05.TR05	22 February 2024
	Radio	231120-05.TR06	23 February 2024
	Radio	231120-05.TR07	23 February 2024
	RF safety	231120-05.TR08	20 February 2024
	RF safety	231120-05.TR09	20 February 2024
	Product safety	REP013900	27 July 2023
	Product safety	REP029139	23 February 2024

2 Technical documentation provided:

Antenna details	Assembly drawing(s)	Block diagram
Circuit diagram/schematics	External photographs	Internal photographs
Label drawing/location	Operational description	Parts list/bill of materials
PCB layout	Production quality assurance	Regulation 14 information
Risk assessment document	Software version declaration	Test reports
Test setup photographs	User manual	UK Declaration of conformity

3 Standards used to demonstrate conformity with the essential requirements of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206):

Radio spectrum (Regulation 6 (2)):	EN 300 328 V2.2.2 EN 300 440 V2.2.1	EN 301 893 V2.1.1 EN 303 687 V1.1.1
EMC (Regulation 6 (1)(b)):	EN 301 489-1 V2.2.3 EN 301 489-17 V3.2.4	EN 301 489-3 V2.3.2
RF safety (Regulation 6 (1)(a)):	EN 50566:2017	
Product safety (Regulation 6 (1)(a)):	EN IEC 62368-1:2020 + EN IEC 62368-1:2020/A11:2020	

Note: Essential requirements of Regulation 6 (3) of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206) not listed above have been deemed as not being applicable to the radio equipment as described in this type examination certificate.



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4 Additional information:

The conditions for use of the radio spectrum for license exempt short range devices shall be based on the relevant interface definitions in IR 2030 - UK Interface Requirements 2030 of 23 March 2023.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 11: Manufacturers shall keep the technical documentation and the declaration of conformity for 10 years after the radio equipment has been placed on the market.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 12 (1): Manufacturers shall ensure that radio equipment which they have placed on the market bears a type, batch or serial number or other element allowing its identification, or, where the size or nature of the radio equipment does not allow it, that the required information is provided on the packaging, or in a document accompanying the radio equipment.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 12 (2)-(5): Manufacturers shall indicate on the radio equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted or, where the size or nature of radio equipment does not allow it, on its packaging, or in a document accompanying the radio equipment. The address shall indicate a single point at which the manufacturer can be contacted. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 13 (1): Manufacturers shall ensure that the radio equipment is accompanied by instructions and safety information in a language which can be easily understood by consumers and other end-users, as determined by the UK. Instructions shall include the information required to use radio equipment in accordance with its intended use. Such information shall include, where applicable, a description of accessories and components, including software, which allow the radio equipment to operate as intended. Such instructions and safety information, as well as any labelling, shall be clear, understandable and intelligible.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 13 (2): The following information shall also be included in the case of radio equipment intentionally emitting radio waves:

- (a) frequency band(s) in which the radio equipment operates;
- (b) maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 13 (3): Manufacturers shall ensure that each item of radio equipment is accompanied by a copy of the declaration of conformity or by a simplified declaration of conformity drawn up in accordance with regulation 43 (simplified declaration of conformity). Where a simplified declaration of conformity is provided, it shall contain the exact internet address where the full text of the declaration of conformity can be obtained.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 14: In cases of restrictions on putting into service or of requirements for authorization of use, information available on the packaging shall allow the identification of the geographical area within the UK where restrictions on putting into service or requirements for authorization of use exist. Such information shall be completed in the instructions accompanying the radio equipment.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 44 (1)-(2): The UK marking shall be affixed visibly, legibly and indelibly to the radio equipment or to its data plate, unless that is not possible or not warranted on account of the nature of radio equipment. The UK marking shall also be affixed visibly and legibly to the packaging.



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Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Regulation 44 (3): On account of the nature of radio equipment, the height of the UK marking affixed to radio equipment may be lower than 5 mm, provided that it remains visible and legible.

Radio Equipment Regulations 2017 (S.I. No. 2017/1206), Schedule 7 (2): The manufacturer shall inform the approved body that holds the technical documentation relating to the type examination certificate of all modifications to the approved type that may affect the conformity of the radio equipment with the essential requirements of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206) or the conditions for validity of that certificate. Such modifications shall require additional approval in the form of an addition to the original type examination certificate.

This Approved Body type examination certificate has a validity of 10 years from the date of issue.

This type examination certificate automatically expires in the following cases:

- Changes in the product identification and/or the manufacturer's identification at stated on this type examination certificate (without any technical change);
- Technical modifications in the product(s) covered by this type examination certificate that affect the compliance of the product(s) with the essential requirements of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206);
- Revisions and/or updates in the (designated) standards applied in full or in part or other solutions adopted as listed in this type examination certificate which affect the demonstration of compliance of the product(s) with the essential requirements of the Radio Equipment Regulations 2017 (S.I. No. 2017/1206).

To avoid the automatic expiration of the type examination certificate, any of the three cases above would require a re-assessment of (parts of) the updated technical documentation of the product(s) and an update/re-issue of the type examination certificate by the Approved Body.

5 Contact information:

For contact with ACB or questions regarding this type examination certificate:

Web: www.acbcert.com

<http://acbcert.com/contact>

Tel.: (+1) 703 847 4700

