



# SAR TEST REPORT

Test Report No.: 12656075S-A-R1

Applicant : Nintendo Co., Ltd.  
Type of Equipment : Game Console  
Model No. : HDH-001  
FCC ID : BKEHDH001  
Test Standard : FCC 47CFR §2.1093  
Test Result : Complied (Refer to Section 3.3)

| Highest Reported SAR [W/kg] |                  |           |     |       | Remarks (DTS band) |            |                              |      | Remarks (UNII band) |                 |                              |      |
|-----------------------------|------------------|-----------|-----|-------|--------------------|------------|------------------------------|------|---------------------|-----------------|------------------------------|------|
| DTS band                    | U-NII band       | SAR type  |     | Limit | Frequency [MHz]    | Mode       | Output power (average) [dBm] |      | Frequency [MHz]     | Mode            | Output power (average) [dBm] |      |
|                             |                  |           |     |       |                    |            | Measured                     | Max. |                     |                 | Measured                     | Max. |
| 0.76 (Antenna 0)            | 1.42 (Antenna 0) | Body-worn | 1g  | 1.6   | 2412               | 11b(1Mbps) | 17.08                        | 19   | 5825                | ac20(MCS0,SISO) | 13.14                        | 14   |
| 0.76 (Antenna 0)            | 0.64 (Antenna 1) | Hand-held | 10g | 4     | 2412               | 11b(1Mbps) | 17.08                        | 19   | 5670                | n40(MCS0)       | 13.02                        | 15   |

- \*. Highest reported SAR values for body-touch and hand-held rf exposure conditions are "1.42 W/kg (1g)" and "0.76 W/kg (10g)" respectively.  
\*. Highest reported SAR values for simultaneous transmission (Bluetooth (Antenna 0) + Wi-Fi (Antenna 1)) is "0.67 W/kg (10g)".  
\*. Highest reported SAR (1g) values for Co-location (MIMO) is less than 0.04 SPLSR. (\*. Antenna separation distance is 79 mm)

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- The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
- The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
- The information provided from the customer for this report is identified in SECTION 1.
- This report (-R1) is a revised version of 12656075-A. 12656075-A report is replaced with this report.

Date of test: January 28 ~ February 6, 2019

Test engineer:   
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Approved by:   
Toyokazu Imamura  
Leader, Consumer Technology Division

- ☒ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.  
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**REVISION HISTORY**

| Revision | Test report No. | Date          | Page revised                  | Contents                                                                                                                                                                                                                                                                                                                                      |
|----------|-----------------|---------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Original | 12656075S-A     | June 24, 2019 | -                             | -                                                                                                                                                                                                                                                                                                                                             |
| -R1      | 12656075S-A-R1  | July 26, 2019 | p1, 2, 3, 4, 5, 8, 16, 24, 78 | (p1) Error correcting.; (p2, Contents) Error correcting.; (p3, 2.2) Error correcting of remarks.; (p4) Error correcting of power table.; (p5, 3.3) The number of figures was unified.; (p8, 4.2) Error correcting.; (p16, 7.1) Error correcting. (p24, Appendix 1-1) An overlap on drawing was corrected.; (p78, Plot 4-14) Error correcting. |
|          |                 |               |                               |                                                                                                                                                                                                                                                                                                                                               |

\*. By issue of new revision report, the report of an old revision becomes invalid.

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**SECTION 1: Customer information**

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| Company Name     | Nintendo Co., Ltd.                                            |
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The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No., FCC ID on the cover and other relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT)
- SECTION 4: Operation of EUT during testing
- Appendix 1: The part of Antenna location information, Description of EUT and Support Equipment
- \* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2, SECTION 4 and Appendix 1.

**SECTION 2: Equipment under test (EUT)****2.1 Identification of EUT**

|                                                           |                                                                                                                                                                                                                           |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of Equipment                                         | Game Console                                                                                                                                                                                                              |
| Model Number                                              | HDH-001                                                                                                                                                                                                                   |
| Serial Number                                             | XJW01000021163                                                                                                                                                                                                            |
| Condition of EUT                                          | Engineering prototype (*. Not for sale: These samples are equivalent to mass-produced items.)                                                                                                                             |
| Receipt Date of Sample<br>(*: Information from test lab.) | December 27, 2018 (*. EUT for power measurement. No modification by the Lab.)<br>January 26, 2019 (*. EUT for SAR test. No modification by the Lab.)<br>(*: After power measurement, the EUT was returned to a customer.) |
| Country of Mass-production                                | China                                                                                                                                                                                                                     |
| Category Identified                                       | Portable device<br>*. Since EUT may handle by hand and may contact and/or very close to a human body during Wi-Fi operation, the hand-held SAR (10g) and the partial-body SAR (1g) shall be measured.                     |
| Rating                                                    | DC3.8 V (Battery) *. This device was operated by the re-chargeable Li-ion battery during the SAR test.                                                                                                                    |
| Feature of EUT                                            | Model: HDH-001 (referred to as the EUT in this report) is a Game Console.                                                                                                                                                 |
| SAR Accessory                                             | none                                                                                                                                                                                                                      |

**2.2 Product Description (Wireless LAN module, antenna)**

|                                    |                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment type                     | Transceiver                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Frequency of operation             | Bluetooth                                                                                                                                                                                                      | 2.4GHz band: (2402~2480) MHz (BDR (Basic Data Rate), EDR (Enhanced Data Rate), LE (Low Energy mode))                                                                                                                                                                                                                                                                                                                                                              |
|                                    | Wi-Fi                                                                                                                                                                                                          | 2.4GHz band: (2412~2472) MHz (b, g, n20, n40, ac20, ac40);<br>U-NII-1: (5180~5240) MHz (a, n20, ac20) / (5190, 5230) MHz (n40, ac40) / 5210 MHz (ac80);<br>U-NII-2A: (5260~5320) MHz (a, n20, ac20) / (5270, 5310) MHz (n40, ac40) / 5290 MHz (ac80);<br>U-NII-2C: (5500~5580, 5660~5700) MHz (a, n20, ac20) / (5510, 5550, 5670) MHz (n40, ac40) / 5530 MHz (ac80);<br>U-NII-3: (5745~5825) MHz (a, n20, ac20) / (5755, 5795) MHz (n40, ac40) / 5775 MHz (ac80); |
| Channel spacing                    | Bluetooth                                                                                                                                                                                                      | 1MHz (BDR, EDR), 2MHz (LE)                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                    | Wi-Fi                                                                                                                                                                                                          | 5 MHz (2.4GHz band), 20 MHz (U-NII-1, U-NII-2A, U-NII-2C, U-NII-3)                                                                                                                                                                                                                                                                                                                                                                                                |
| Bandwidth                          | Bluetooth                                                                                                                                                                                                      | 79MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                    | Wi-Fi                                                                                                                                                                                                          | 20 MHz (b, g, a, n20, ac20), 40 MHz (n40, ac40), 80 MHz (ac80)                                                                                                                                                                                                                                                                                                                                                                                                    |
| Type of modulation                 | Bluetooth                                                                                                                                                                                                      | FHSS: GFSK (*. EDR: GFSK+ $\pi/4$ -DQPSK, GFSK+8DPSK)                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                    | Wi-Fi                                                                                                                                                                                                          | DSSS: DBPSK, QPSK, CCK (b);<br>OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM (g, a, n20, ac20, n40, ac40, ac80) (*. 256QAM is only for ac80)                                                                                                                                                                                                                                                                                                                             |
| Typical and maximum transmit power | *. The specification of typical and maximum transmit power (which may occur) refer to remarks in below.<br>*. The measured output power (conducted) as SAR reference power refers to section 6 in this report. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Antenna                                                      | Antenna 0 (Bottom edge)                                                                                                                                                                                                                                                   | Antenna 1 (Top edge)                                                         |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Antenna quantity                                             | 2 pcs. (*. Separation distance between the antenna #0 and the antenna #1: 79 mm )<br>Bluetooth: antenna #0, b/g/a: One selected Tx antenna operation,<br>n(20/40HT)/ac(20/40/80VHT): Either one selected Tx antenna operation or two Tx antenna operation simultaneously. |                                                                              |
| Antenna type / connector type                                | Sheet metal antenna / PCB side: MHF2, Antenna side: soldered                                                                                                                                                                                                              | Sheet metal antenna / PCB side: MHF2, Antenna side: soldered                 |
| Antenna gain (max.power)<br>(*: installed into the platform) | -0.904 dBi (2.4GHz band), 2.949 dBi (5GHz band)<br>(*: including cable loss)                                                                                                                                                                                              | -0.730 dBi (2.4GHz band), 1.994 dBi (5GHz band)<br>(*: including cable loss) |

\*. b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT), ac80: IEEE 802.11ac(80VHT).

\*. The EUT do not use the special transmitting technique such as "beam-forming" and "time-space code diversity."

\*. **Maximum tune-up tolerance limit** (Maximum power, refer to power table in next page.)

Maximum tune-up tolerance limit is conducted burst average power and is defined by a customer as Duty cycle 100% (continuous transmitting).

The SAR test reference power measurement and the SAR test were applied to the lowest data rate (as higher time-based average power) on each operation mode.

| [Power table]      |            |                 | SISO power (Conducted, Duty cycle 100%) |              |               |       |            |          | MIMO (Conducted, Duty cycle 100%) |              |               |       |         |            |      |
|--------------------|------------|-----------------|-----------------------------------------|--------------|---------------|-------|------------|----------|-----------------------------------|--------------|---------------|-------|---------|------------|------|
| Band               | Ch.        | Frequency [MHz] | Mode                                    | D/R or MCS#. | Typical [dBm] |       | Max. [dBm] |          | Mode                              | D/R or MCS#. | Typical [dBm] |       |         | Max. [dBm] |      |
|                    |            |                 |                                         |              | Ant.0         | Ant.1 | Ant.0      | Ant.1    |                                   |              | Ant.0         | Ant.1 | Ant.0+1 | Ant.0+1    |      |
| 2.4GHz Bluetooth   | 0~78       | 2402~2480       | BDR                                     | DH5          | -             | N/A   | 2.0        | N/A      | -                                 | -            | -             | -     | -       | -          |      |
|                    | 0~78       | 2402~2480       | EDR                                     | 2-DH5        | -             | N/A   | 2.0        | N/A      | -                                 | -            | -             | -     | -       | -          |      |
|                    | 0~78       | 2402~2480       | EDR                                     | 3-DH5        | -             | N/A   | 2.0        | N/A      | -                                 | -            | -             | -     | -       | -          |      |
|                    | 0~39       | 2402~2480       | LE                                      | -            | -             | N/A   | 2.0        | N/A      | -                                 | -            | -             | -     | -       | -          |      |
|                    | 1~11       | 2412~2462       | b                                       | 1~11 Mbps    | 17.5          | 17.5  | 19.0       | 19.0     | -                                 | -            | -             | -     | -       | -          |      |
| 12                 | 2467       | 8.5             |                                         |              | 8.5           | 10.0  | 10.0       | -        | -                                 | -            | -             | -     | -       |            |      |
| 13                 | 2472       | 3.5             |                                         |              | 3.5           | 5.0   | 5.0        | -        | -                                 | -            | -             | -     | -       |            |      |
| 2.4GHz Wi-Fi (DTS) | 1          | 2412            | g                                       | 6~18 Mbps    | 15.5          | 15.5  | 17.0       | 17.0     | -                                 | -            | -             | -     | -       | -          |      |
|                    |            | 24~54 Mbps      |                                         | 14.5         | 14.5          | 16.0  | 16.0       | -        | -                                 | -            | -             | -     | -       |            |      |
|                    | 2~11       | 2417~2462       |                                         | 6~18 Mbps    | 16.5          | 16.5  | 18.0       | 18.0     | -                                 | -            | -             | -     | -       | -          |      |
|                    |            | 24~54 Mbps      |                                         | 14.5         | 14.5          | 16.0  | 16.0       | -        | -                                 | -            | -             | -     | -       |            |      |
|                    | 12         | 2467            | n20                                     | 6~54 Mbps    | 8.5           | 8.5   | 10.0       | 10.0     | -                                 | -            | -             | -     | -       | -          |      |
|                    | 13         | 2472            |                                         |              | 3.5           | 3.5   | 5.0        | 5.0      | -                                 | -            | -             | -     | -       | -          |      |
|                    | 1          | 2412            |                                         |              | MCS0-6        | 15.5  | 15.5       | 17.0     | 17.0                              | n20          | MCS8-15       | 11.0  | 11.0    | 14.0       | 15.5 |
|                    |            |                 |                                         |              | MCS7          | 14.5  | 14.5       | 16.0     | 16.0                              |              |               |       |         |            |      |
|                    | 2~11       | 2417~2462       | MCS0-3                                  | 16.5         | 16.5          | 18.0  | 18.0       | 12.0     | 12.0                              |              |               | 15.0  | 16.5    |            |      |
|                    |            |                 | MCS4-6                                  | 15.5         | 15.5          | 17.0  | 17.0       |          |                                   |              |               |       |         |            |      |
|                    | 12         | 2467            | ac20                                    | MCS7         | 14.5          | 14.5  | 16.0       | 16.0     | ac20                              | MCS0-8       | 5.5           | 5.5   | 8.5     | 10.0       |      |
|                    | 13         | 2472            |                                         |              | MCS0-7        | 8.5   | 8.5        | 10.0     |                                   |              | 10.0          | 0.5   | 0.5     | 3.5        | 5.0  |
|                    |            |                 |                                         |              | MCS0-7        | 3.5   | 3.5        | 5.0      |                                   |              | 5.0           |       |         |            |      |
|                    | 1          | 2412            |                                         |              | MCS0-6        | 15.5  | 15.5       | 17.0     |                                   |              | 17.0          | 11.0  | 11.0    | 14.0       | 15.5 |
|                    |            |                 | ac20                                    | MCS7         | 14.5          | 14.5  | 16.0       | 16.0     | ac20                              | MCS0-8       | 12.0          | 12.0  | 15.0    | 16.5       |      |
|                    |            |                 |                                         |              | MCS8          | 13.0  | 13.0       | 14.5     |                                   |              | 14.5          |       |         |            |      |
|                    | 2~11       | 2417~2462       |                                         |              | MCS0-3        | 16.5  | 16.5       | 18.0     |                                   |              | 18.0          |       |         |            |      |
|                    |            |                 |                                         |              | MCS4-6        | 15.5  | 15.5       | 17.0     |                                   |              | 17.0          |       |         |            |      |
|                    | 12         | 2467            | n40                                     | MCS0-8       | 8.5           | 8.5   | 10.0       | 10.0     | n40                               | MCS8-15      | 5.5           | 5.5   | 8.5     | 10.0       |      |
|                    | 13         | 2472            |                                         |              | MCS0-8        | 3.5   | 3.5        | 5.0      |                                   |              | 5.0           | 0.5   | 0.5     | 3.5        | 5.0  |
|                    | 3~10       | 2422~2457       |                                         |              | MCS0-7        | 8.5   | 8.5        | 10.0     |                                   |              | 10.0          | 8.0   | 8.0     | 11.0       | 12.5 |
|                    | 11         | 2462            |                                         |              | MCS0-9        | 8.5   | 8.5        | 10.0     |                                   |              | 10.0          | 5.5   | 5.5     | 8.5        | 10.0 |
|                    | 3~10       | 2422~2457       | ac40                                    | MCS0-9       | 8.5           | 8.5   | 10.0       | 10.0     | ac40                              | MCS0-9       | 5.5           | 5.5   | 8.5     | 10.0       |      |
|                    | U-NII-1    | 36~48           | 5180~5240                               | a            | 6~54 Mbps     | 13.5  | 13.5       | 15.0     | 15.0                              | -            | -             | -     | -       | -          | -    |
|                    |            | 36~48           | 5180~5240                               | n20          | MCS0-7        | 13.5  | 13.5       | 15.0     | 15.0                              | n20          | MCS8-15       | 10.5  | 10.5    | 13.5       | 15.0 |
|                    |            | 36~48           | 5180~5240                               | ac20         | MCS0-7        | 13.5  | 13.5       | 15.0     | 15.0                              | ac20         | MCS0-8        | 10.5  | 10.5    | 13.5       | 15.0 |
|                    |            |                 |                                         | n40          | MCS8          | 13.0  | 13.0       | 14.5     | 14.5                              | n40          | MCS8-15       | 7.0   | 7.0     | 10.0       | 11.5 |
|                    |            | 38              | 5190                                    |              | MCS0-7        | 10.0  | 10.0       | 11.5     | 11.5                              |              |               | 10.5  | 10.5    | 13.5       | 15.0 |
|                    |            | 46              | 5230                                    |              | MCS0-7        | 13.5  | 13.5       | 15.0     | 15.0                              |              |               | 7.0   | 7.0     | 10.0       | 11.5 |
| 38                 |            | 5190            | MCS0-9                                  |              | 10.0          | 10.0  | 11.5       | 11.5     | 10.5                              |              |               | 10.5  | 13.5    | 15.0       |      |
| 46                 |            | 5230            | ac40                                    | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     | ac40                              | MCS0-9       | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    |            | ac80            | MCS8,9                                  | 13.0         | 13.0          | 14.5  | 14.5       | ac80     | MCS0-9                            | 6.0          | 6.0           | 9.0   | 10.5    |            |      |
| 42                 | 5210       |                 | MCS0-9                                  | 9.0          | 9.0           | 10.5  | 10.5       |          |                                   |              |               |       |         |            |      |
| U-NII-2A           | 52~64      | 5260~5320       | a                                       | 6~54 Mbps    | 13.5          | 13.5  | 15.0       | 15.0     | -                                 | -            | -             | -     | -       | -          |      |
|                    | 52~64      | 5260~5320       | n20                                     | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     | n20                               | MCS8-15      | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    | 52~64      | 5260~5320       | ac20                                    | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     | ac20                              | MCS0-8       | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    |            |                 | n40                                     | MCS8         | 13.0          | 13.0  | 14.5       | 14.5     | n40                               | MCS8-15      | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    | 54, 62     | 5270, 5310      |                                         | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     |                                   |              |               |       |         |            |      |
|                    | 54, 62     | 5270, 5310      | ac40                                    | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     | ac40                              | MCS0-9       | 10.5          | 10.5  | 13.5    | 15.0       |      |
| U-NII-2C           |            |                 | n40                                     | MCS8,9       | 13.0          | 13.0  | 14.5       | 14.5     | n40                               | MCS0-9       | 6.0           | 6.0   | 9.0     | 10.5       |      |
|                    | 58         | 5290            |                                         | MCS0-7       | 9.0           | 9.0   | 10.5       | 10.5     |                                   |              |               |       |         |            |      |
|                    | 100~116    | 5500~5580       |                                         | a            | 6~54 Mbps     | 13.5  | 13.5       | 15.0     |                                   |              | 15.0          | -     | -       | -          | -    |
|                    | 132~140    | 5660~5700       |                                         | n20          | MCS0-7        | 13.5  | 13.5       | 15.0     |                                   |              | 15.0          | n20   | MCS8-15 | 10.5       | 10.5 |
|                    | 100~116    | 5500~5580       | ac20                                    | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     | ac20                              | MCS0-8       | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    | 132~140    | 5660~5700       |                                         | MCS8         | 11.0          | 11.0  | 12.5       | 12.5     |                                   |              |               |       |         |            |      |
|                    |            |                 |                                         | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     |                                   |              |               |       |         |            |      |
|                    |            |                 |                                         | MCS8         | 11.0          | 11.0  | 12.5       | 12.5     |                                   |              |               |       |         |            |      |
|                    | 120~128    | 5600~5640       | a,n20,ac20                              | not use      | N/A           | N/A   | N/A        | N/A      | n20,ac20                          | not use      | N/A           | N/A   | N/A     | N/A        |      |
|                    | 144        | 5720            | a,n20,ac20                              | not use      | N/A           | N/A   | N/A        | N/A      | n20,ac20                          | not use      | N/A           | N/A   | N/A     | N/A        |      |
|                    | 102,110    | 5510,5550       | n40                                     | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     | n40                               | MCS8-15      | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    | 134        | 5670            |                                         | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     |                                   |              |               |       |         |            |      |
|                    | 102,110    | 5510,5550       |                                         | MCS8,9       | 12.0          | 12.0  | 13.5       | 13.5     |                                   |              | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    |            |                 |                                         | MCS0-7       | 13.5          | 13.5  | 15.0       | 15.0     |                                   |              |               |       |         |            |      |
|                    | 134        | 5670            | n40,ac40                                | MCS8,9       | 12.0          | 12.0  | 13.5       | 13.5     | n40,ac40                          | not use      | N/A           | N/A   | N/A     | N/A        |      |
|                    |            | not use         |                                         | N/A          | N/A           | N/A   | N/A        |          |                                   |              |               |       |         |            |      |
| 118,126            | 5590, 5630 | not use         |                                         | N/A          | N/A           | N/A   | N/A        |          |                                   |              |               |       |         |            |      |
| 142                | 5710       | not use         |                                         | N/A          | N/A           | N/A   | N/A        |          |                                   |              |               |       |         |            |      |
| 106                | 5530       | ac80            | MCS0-9                                  | 10.5         | 10.5          | 12.0  | 12.0       | ac80     | MCS0-9                            | 7.5          | 7.5           | 10.5  | 12.0    |            |      |
| 122                | 5610       | ac80            | not use                                 | N/A          | N/A           | N/A   | N/A        | n40,ac40 | not use                           | N/A          | N/A           | N/A   | N/A     |            |      |
| 138                | 5690       | ac80            | not use                                 | N/A          | N/A           | N/A   | N/A        | n40,ac40 | not use                           | N/A          | N/A           | N/A   | N/A     |            |      |
| U-NII-3            | 149~165    | 5745~5825       | a                                       | 6~54 Mbps    | 12.5          | 12.5  | 14.0       | 14.0     | -                                 | -            | -             | -     | -       | -          |      |
|                    | 149~165    | 5745~5825       | n20                                     | MCS0-7       | 12.5          | 12.5  | 14.0       | 14.0     | n20                               | MCS8-15      | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    | 149~165    | 5745~5825       | ac20                                    | MCS0-7       | 12.5          | 12.5  | 14.0       | 14.0     | ac20                              | MCS0-8       | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    |            |                 | n40                                     | MCS8         | 11.0          | 11.0  | 12.5       | 12.5     | n40                               | MCS8-15      | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    | 151, 159   | 5755, 5795      |                                         | MCS0-7       | 12.5          | 12.5  | 14.0       | 14.0     |                                   |              |               |       |         |            |      |
|                    |            |                 |                                         | MCS0-7       | 12.5          | 12.5  | 14.0       | 14.0     |                                   |              | 10.5          | 10.5  | 13.5    | 15.0       |      |
|                    |            |                 |                                         | MCS8,9       | 12.0          | 12.0  | 13.5       | 13.5     |                                   |              |               |       |         |            |      |
| 155                | 5775       | ac80            | MCS0-7                                  | 12.5         | 12.5          | 14.0  | 14.0       | ac80     | MCS0-9                            | 10.5         | 10.5          | 13.5  | 15.0    |            |      |

Ch.: channel, D/R: data rate, MCS#: MCS index number, Ant.: antenna, Max. Maximum tune-up limit power, N/A: Not applicable.

## SECTION 3: Test specification, procedures and results

### 3.1 Test specification

**FCC47CFR 2.1093:** Radiofrequency radiation exposure evaluation: portable devices.

The US Federal Communications Commission has released the report and order "Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. The device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling in accordance with the following measurement procedures.

|                                 |                                                                                                                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>KDB 447498 D01 (v06):</b>    | General RF exposure guidance                                                                                                                                                      |
| <b>KDB 248227 D01 (v02r02):</b> | SAR Guidance for IEEE 802.11 (Wi-Fi) transmitters                                                                                                                                 |
| <b>KDB 865664 D01 (v01r04):</b> | SAR measurement 100MHz to 6GHz                                                                                                                                                    |
| <b>IEEE Std. 1528-2013:</b>     | IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. |

### 3.2 Exposure limit

| Environments of exposure limit                                         | Whole-Body<br>(averaged over the entire body) | Partial-Body<br>(averaged over any 1g of tissue) | Hands, Wrists, Feet and Ankles<br>(averaged over any 10g of tissue) |
|------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------|
| <b>(A) Limits for Occupational /Controlled Exposure (W/kg)</b>         | 0.4                                           | 8.0                                              | 20.0                                                                |
| <b>(B) Limits for General population /Uncontrolled Exposure (W/kg)</b> | 0.08                                          | 1.6                                              | 4.0                                                                 |

\*. **Occupational/Controlled Environments:** are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

\*. **General Population/Uncontrolled Environments:** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

The limit applied in this test report is;

|                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------|
| <b>General population / uncontrolled exposure, Partial-Body (averaged over any 1g of tissue) limit: 1.6 W/kg (body touch)</b> |
| <b>General population / uncontrolled exposure, Extremity (averaged over any 10g of tissue) limit: 4.0 W/kg (hand-held)</b>    |

### 3.3 Procedures and Results

| Test Procedure                       |           | SAR measurement: KDB 447498 D01, KDB 248227 D01, KDB 865664 D01, KDB 914225 D07, IEC Std. 1528 |       |                                    |       |           |                                    |           |          |                                    |                                                                     |           |                                    |        |       |                                    |           |           |                                    |           |           |            |            |           |           |           |
|--------------------------------------|-----------|------------------------------------------------------------------------------------------------|-------|------------------------------------|-------|-----------|------------------------------------|-----------|----------|------------------------------------|---------------------------------------------------------------------|-----------|------------------------------------|--------|-------|------------------------------------|-----------|-----------|------------------------------------|-----------|-----------|------------|------------|-----------|-----------|-----------|
| Category                             |           | FCC 47CFR §2.1093 (Portable device)                                                            |       |                                    |       |           |                                    |           | SAR type |                                    | Hand-held, hand-operation. (The bottom surface may touch the body.) |           |                                    |        |       |                                    |           |           |                                    |           |           |            |            |           |           |           |
|                                      |           | Bluetooth                                                                                      |       | Wi-Fi (DTS)                        |       |           | Wi-Fi (U-NII-1)                    |           |          | Wi-Fi (U-NII-2A)                   |                                                                     |           | Wi-Fi (U-NII-2C)                   |        |       | Wi-Fi (U-NII-3)                    |           |           | Simultaneous transmission          |           |           |            |            |           |           |           |
| Frequency [MHz]                      |           | 2402-2480                                                                                      |       | 2412-2462                          |       |           | 5180-5240                          |           |          | 5260-5320                          |                                                                     |           | 5500-5700                          |        |       | 5745-5825                          |           |           |                                    |           |           |            |            |           |           |           |
| Results (SAR(1g))                    |           | Complied<br>(Refer to Section 4.1)                                                             |       | Complied<br>(Refer to Section 7.2) |       |           | Complied<br>(Refer to Section 7.3) |           |          | Complied<br>(Refer to Section 7.3) |                                                                     |           | Complied<br>(Refer to Section 7.4) |        |       | Complied<br>(Refer to Section 7.5) |           |           | Complied<br>(Refer to Section 7.8) |           |           |            |            |           |           |           |
| Antenna#                             |           | Ant.0                                                                                          |       | Ant.0                              |       | Ant.1     | Ant.0                              |           | Ant.1    | Ant.0                              |                                                                     | Ant.1     | Ant.0                              |        | Ant.1 | Ant.0                              |           | Ant.1     | Ant.0+Ant.1                        |           |           |            |            |           |           |           |
| SAR<br>[W/kg]                        | Ig or 10g | * Lower power, SAR test was exempt.                                                            | 1g    | 10g                                | 10g   | 1g        | 10g                                | 10g       | 1g       | 10g                                | 10g                                                                 | 1g        | 10g                                | 10g    | 1g    | 10g                                | 10g       | 10g       |                                    |           |           |            |            |           |           |           |
|                                      | Reported  |                                                                                                | 0.76  | 0.76                               | 0.48  | 1.08      | n/a (*2)                           |           | n/a (*2) |                                    | 1.27                                                                | 0.32      | 0.24                               | 1.15   | 0.36  | 0.64                               | 1.42      | 0.19      | 0.40                               | 0.67      |           |            |            |           |           |           |
|                                      | Measured  |                                                                                                | 0.482 | 0.480                              | 0.301 | 0.648     | n/a                                |           | n/a      |                                    | 0.882                                                               | 0.222     | 0.160                              | 0.726  | 0.218 | 0.355                              | 1.09      | 0.117     | 0.295                              |           |           |            |            |           |           |           |
| Operation mode (*1), Frequency [MHz] |           | BDR, EDR, BLE                                                                                  |       | b, 2412                            |       | b, 2412   |                                    | b, 2462   |          | a, 5240                            |                                                                     | n/a       |                                    | n/a    |       | ac40, 5310                         | n40, 5310 | n40, 5310 | ac20, 5500                         | n40, 5510 | n40, 5670 | ac20, 5825 | ac80, 5775 | a, 5745   |           |           |
| Output power [dBm]                   |           | Burst average                                                                                  |       | n/a                                |       | 17.08     |                                    | 17.08     |          | 17.00                              |                                                                     | 13.08     |                                    | n/a    |       | n/a                                |           | 14.00     | 13.98                              | 13.73     | 13.30     | 13.37      | 13.02      | 13.14     | 13.01     | 13.33     |
|                                      |           | Max. power (scaled factor)                                                                     |       | 2                                  |       | 19 (1.56) |                                    | 19 (1.56) |          | 19 (1.58)                          |                                                                     | 15 (1.56) |                                    | 15 (-) |       | 15 (-)                             |           | 15 (1.26) | 15 (1.26)                          | 15 (1.34) | 15 (1.48) | 15 (1.46)  | 15 (1.58)  | 14 (1.22) | 14 (1.26) | 14 (1.17) |
| Duty cycle [%]                       |           | n/a                                                                                            |       | 99.0                               |       | 99.0      |                                    | 99.0      |          | 93.7                               |                                                                     | n/a       |                                    | n/a    |       | 87.6                               | 87.4      | 87.4      | 93.3                               | 87.4      | 87.4      | 93.3       | 77.7       | 93.7      |           |           |
| Duty scaled factor                   |           | n/a                                                                                            |       | 1.01                               |       | 1.01      |                                    | 1.01      |          | 1.07                               |                                                                     | n/a       |                                    | n/a    |       | 1.14                               | 1.14      | 1.14      | 1.07                               | 1.14      | 1.14      | 1.07       | 1.29       | 1.07      |           |           |

Note: UL Japan's SAR Work Procedures No.13-EM-W0429 and 13-EM-W0430. No addition, deviation nor exclusion has been made from standards

\*1. The lowest data rate was selected by SAR test in each operation mode.

\*2. Since reported SAR 1g of U-NII-2A was enough lower than 1.2 W/kg(1g), 3 W/kg(10g), SAR test was only applied to a lower channel of U-NII-1 band.

\*. Since Bluetooth, Wi-Fi of 2.4GHz and Wi-Fi of 5GHz are used a same antenna, Bluetooth and Wi-Fi, DTS band and UNII band do not transmit simultaneously.

\*. (Calculating formula) Corrected SAR to max.power (W/kg) = (Measured SAR (W/kg)) × (Duty scaled) × (Tune-up factor)

where; Tune-up factor [-] = 1 / (10 ^ (\*Δmax (max.power - burst average power), dB" / 10)), Duty scaled factor [-] = 100(%) / (duty cycle, %)

\*. b: IEEE 802.11b, a: IEEE 802.11a, n40: IEEE 802.11n(40HTT), ac20: IEEE 802.11ac(20VHTT), ac40: IEEE 802.11n (40VHTT), ac80: IEEE 802.11ac(80VHTT), n/a: Not applicable.

\*. "yellow marker" in the table; The highest reported SAR(1g, 10g) of each band (DTS, U-NII) is shaded with yellow marker.

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### 3.4 Addition, deviation and exclusion to the test procedure

No addition, exclusion nor deviation has been made from the test procedure.

### 3.5 Test Location

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JAB Accreditation No.: RTL02610 / FCC Test Firm Registration Number: 839876

| Used?                               | Place                      | IC Registration No. | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance |
|-------------------------------------|----------------------------|---------------------|----------------------------|------------------------------------------------------------------|------------------------------|
| <input type="checkbox"/>            | No.1 Semi-anechoic chamber | 2973D-1             | 20.6 × 11.3 × 7.65         | 20.6 × 11.3                                                      | 10 m                         |
| <input type="checkbox"/>            | No.2 Semi-anechoic chamber | 2973D-2             | 20.6 × 11.3 × 7.65         | 20.6 × 11.3                                                      | 10 m                         |
| <input type="checkbox"/>            | No.3 Semi-anechoic chamber | 2973D-3             | 12.7 × 7.7 × 5.35          | 12.7 × 7.7                                                       | 5 m                          |
| <input type="checkbox"/>            | No.4 Semi-anechoic chamber | -                   | 8.1 × 5.1 × 3.55           | 8.1 × 5.1                                                        | -                            |
| <input type="checkbox"/>            | No.1 Shielded room         | -                   | 6.8 × 4.1 × 2.7            | 6.8 × 4.1                                                        | -                            |
| <input type="checkbox"/>            | No.2 Shielded room         | -                   | 6.8 × 4.1 × 2.7            | 6.8 × 4.1                                                        | -                            |
| <input type="checkbox"/>            | No.3 Shielded room         | -                   | 6.3 × 4.7 × 2.7            | 6.3 × 4.7                                                        | -                            |
| <input type="checkbox"/>            | No.4 Shielded room         | -                   | 4.4 × 4.7 × 2.7            | 4.4 × 4.7                                                        | -                            |
| <input type="checkbox"/>            | No.5 Shielded room         | -                   | 7.8 × 6.4 × 2.7            | 7.8 × 6.4                                                        | -                            |
| <input type="checkbox"/>            | No.6 Shielded room         | -                   | 7.8 × 6.4 × 2.7            | 7.8 × 6.4                                                        | -                            |
| <input checked="" type="checkbox"/> | No.7 Shielded room         | (2973D)             | 2.76 × 3.76 × 2.4          | 2.76 × 3.76                                                      | -                            |
| <input type="checkbox"/>            | No.8 Shielded room         | -                   | 3.45 × 5.5 × 2.4           | 3.45 × 5.5                                                       | -                            |
| <input type="checkbox"/>            | No.1 Measurement room      | -                   | 2.55 × 4.1 × 2.5           | 2.55 × 4.1                                                       | -                            |

### 3.6 Confirmation before SAR testing

Before SAR test, the RF wiring for the sample had been switched to the antenna conducted power measurement line from the antenna line and the average power was measured. The SAR test reference power measurement and the SAR test were applied to the lowest data rate (as higher time-based average power) on each operation mode. For the SAR test reference power, on each operation band, the average output power was measured on the low/middle/upper and specified channels with the lowest data rate of each operation mode. The result is shown in Section 6.

\*. The EUT transmission power was verified that it was within 2dB lower than the maximum tune-up tolerance limit when it was set the rated power. (Clause 4.1, KDB447498 D01 (v06))

### 3.7 Confirmation after SAR testing

It was checked that the power drift [W] is within ±5% in the evaluation procedure of SAR testing. The verification of power drift during the SAR test is that DASY5 system calculates the power drift by measuring the e-field at the same location at beginning and the end of the scan measurement for each test position.

The result is shown in APPENDIX 2.

\*. DASY5 system calculation Power drift value[dB] = 20log(Ea)/(Eb) (where, Before SAR testing: Eb[V/m] / After SAR testing: Ea[V/m])

Limit of power drift[W] = ±5%; Power drift limit (X) [dB] = 10log(P\_drift) = 10log(1.05/1) = 10log(1.05) - 10log(1) = 0.21dB

from E-field relations with power;  $S = E \times H = E^2 / \eta = P / (4 \times \pi \times r^2)$  ( $\eta$ : Space impedance)  $\rightarrow P = (E^2 \times 4 \times \pi \times r^2) / \eta$

Therefore, The correlation of power and the E-field

Power drift limit (X) dB = 10log(P\_drift) = 10log(E\_drift)^2 = 20log(E\_drift)

From the above mentioned, **the calculated power drift of DASY5 system must be the less than ±0.21dB.**

## SECTION 4: Operation of EUT during testing

### 4.1 Operating modes for SAR testing

This EUT has Bluetooth (BDR, EDR, BLE) and IEEE 802.11b, g, a, n(HT20), n(HT40), ac(VHT20), ac(VHT40), ac(VHT80) continuous transmitting modes. The frequency and the modulation used in the SAR testing are shown as a following.

| Operation mode                                                        | b                 |      | g    |      | n(HT20) |      |           | ac(VHT20) |      |           | n(HT40) |      |         | ac(VHT40) |      |           | BDR | EDR | BLE |     |
|-----------------------------------------------------------------------|-------------------|------|------|------|---------|------|-----------|-----------|------|-----------|---------|------|---------|-----------|------|-----------|-----|-----|-----|-----|
| band                                                                  | DTS (2.4GHz band) |      |      |      |         |      |           |           |      |           |         |      |         |           |      |           |     |     |     |     |
| Tx band [MHz]                                                         | 2402~2472         |      |      |      |         |      |           |           |      | 2422~2462 |         |      |         |           |      | 2402~2480 |     |     |     |     |
| Antenna#                                                              | 0                 | 1    | 0    | 1    | 0       | 1    | 0+1       | 0         | 1    | 0+1       | 0       | 1    | 0+1     | 0         | 1    | 0+1       | 0   | 0   | 0   | 0   |
| Tune-up limit [dBm]                                                   | 19                | 19   | 18   | 18   | 18      | 18   | 13.5+13.5 | 18        | 18   | 13.5+13.5 | 10      | 10   | 9.5+9.5 | 10        | 10   | 9.5+9.5   | 2   | 2   | 2   | 2   |
| (*1) SAR test considered?<br><small>(***) initial test setup)</small> | Back              | ○    | ○    | ○    | ×       | ×    | ×         | ×         | ×    | ×         | ×       | ○    | ○       | ×         | ×    | ×         | ×   | ×   | ×   | ×   |
|                                                                       | Front             | ○    | ○    | ×    | ×       | ×    | ×         | ×         | ×    | ×         | ×       | ○    | ○       | ×         | ×    | ×         | ×   | ×   | ×   | ×   |
|                                                                       | Top               | ×    | ○*   | ×    | ○       | ×    | ×         | ×         | ×    | ×         | ×       | ×    | ×       | ×         | ×    | ×         | ×   | ×   | ×   | ×   |
|                                                                       | Bottom            | ○*   | ×    | ○    | ×       | ×    | ×         | ×         | ×    | ×         | ×       | ×    | ×       | ×         | ×    | ×         | ×   | ×   | ×   | ×   |
|                                                                       | Right, Left       | ×    | ×    | ×    | ×       | ×    | ×         | ×         | ×    | ×         | ×       | ×    | ×       | ×         | ×    | ×         | ×   | ×   | ×   | ×   |
| Frequency tested                                                      | (*)2              | (*)2 | (*)2 | (*)2 | n/a     | n/a  | n/a       | n/a       | n/a  | n/a       | n/a     | n/a  | n/a     | n/a       | n/a  | n/a       | n/a | n/a | n/a | n/a |
| Data rate [Mbps]                                                      | 1                 | 1    | 6    | 6    | MCS0    | MCS0 | MCS0      | MCS0      | MCS0 | MCS8      | MCS0    | MCS0 | MCS0    | MCS0      | MCS0 | MCS0      | 1   | 2   | 3   | 1   |

| Operation mode                                         | a            |     | n(HT20) |      |       | ac(VHT20) |      |       | n(HT40) |           |       | ac(VHT40) |      |       | ac(VHT80) |      |         |
|--------------------------------------------------------|--------------|-----|---------|------|-------|-----------|------|-------|---------|-----------|-------|-----------|------|-------|-----------|------|---------|
| band                                                   | U-NII-1 (*3) |     |         |      |       |           |      |       |         |           |       |           |      |       |           |      |         |
| Tx band [MHz]                                          | 5180~5240    |     |         |      |       |           |      |       |         | 5190,5230 |       |           |      |       |           | 5210 |         |
| Antenna#                                               | 0            | 1   | 0       | 1    | 0+1   | 0         | 1    | 0+1   | 0       | 1         | 0+1   | 0         | 1    | 0+1   | 0         | 1    | 0+1     |
| Tune-up limit [dBm]                                    | 15           | 15  | 15      | 15   | 12+12 | 15        | 15   | 12+12 | 15      | 15        | 12+12 | 15        | 15   | 12+12 | 10.5      | 10.5 | 7.5+7.5 |
| (*1) SAR test considered?<br>(***) initial test setup) | Back         | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Front        | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Top          | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ○         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Bottom       | ○   | ×       | ○    | ×     | ×         | ○    | ×     | ○       | ×         | ×     | ○         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Right, Left  | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
| Frequency tested                                       | (*)2         | n/a | (*)2    | n/a  | n/a   | (*)2      | n/a  | n/a   | (*)2    | (*)2      | n/a   | (*)2      | n/a  | n/a   | n/a       | n/a  | n/a     |
| Data rate [Mbps]                                       | 6            | 6   | MCS0    | MCS0 | MCS8  | MCS0      | MCS0 | MCS0  | MCS0    | MCS0      | MCS8  | MCS0      | MCS0 | MCS0  | MCS0      | MCS0 | MCS0    |

| Operation mode                                         | a           |     | n(HT20) |      |       | ac(VHT20) |      |       | n(HT40) |           |       | ac(VHT40) |      |       | ac(VHT80) |      |         |
|--------------------------------------------------------|-------------|-----|---------|------|-------|-----------|------|-------|---------|-----------|-------|-----------|------|-------|-----------|------|---------|
| band                                                   | U-NII-2A    |     |         |      |       |           |      |       |         |           |       |           |      |       |           |      |         |
| Tx band [MHz]                                          | 5260~5320   |     |         |      |       |           |      |       |         | 5270,5310 |       |           |      |       |           | 5290 |         |
| Antenna#                                               | 0           | 1   | 0       | 1    | 0+1   | 0         | 1    | 0+1   | 0       | 1         | 0+1   | 0         | 1    | 0+1   | 0         | 1    | 0+1     |
| Tune-up limit [dBm]                                    | 15          | 15  | 15      | 15   | 12+12 | 15        | 15   | 12+12 | 15      | 15        | 12+12 | 15        | 15   | 12+12 | 10.5      | 10.5 | 7.5+7.5 |
| (*1) SAR test considered?<br>(***) initial test setup) | Back        | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Front       | ○   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ○         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Top         | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×         | ○*    | ×         | ×    | ×     | ×         | ×    | ×       |
|                                                        | Bottom      | ○   | ×       | ○    | ×     | ×         | ○    | ×     | ×       | ○*        | ×     | ×         | ○    | ×     | ×         | ×    | ×       |
|                                                        | Right, Left | ×   | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×         | ×     | ×         | ×    | ×     | ×         | ×    | ×       |
| Frequency tested                                       | (*)2        | n/a | (*)2    | n/a  | n/a   | (*)2      | n/a  | n/a   | (*)2    | (*)2      | n/a   | (*)2      | n/a  | n/a   | n/a       | n/a  | n/a     |
| Data rate [Mbps]                                       | 6           | 6   | MCS0    | MCS0 | MCS8  | MCS0      | MCS0 | MCS0  | MCS0    | MCS0      | MCS8  | MCS0      | MCS0 | MCS0  | MCS0      | MCS0 | MCS0    |

| Operation mode                                        | a                    |      | n(HT20) |      |       | ac(VHT20) |      |       | n(HT40) |                  |       | ac(VHT40) |      |       | ac(VHT80) |      |      |
|-------------------------------------------------------|----------------------|------|---------|------|-------|-----------|------|-------|---------|------------------|-------|-----------|------|-------|-----------|------|------|
| band                                                  | U-NII-2C             |      |         |      |       |           |      |       |         |                  |       |           |      |       |           |      |      |
| Tx band [MHz]                                         | 5500~5580, 5660~5700 |      |         |      |       |           |      |       |         | 5510, 5550, 5670 |       |           |      |       |           | 5530 |      |
| Antenna#                                              | 0                    | 1    | 0       | 1    | 0+1   | 0         | 1    | 0+1   | 0       | 1                | 0+1   | 0         | 1    | 0+1   | 0         | 1    | 0+1  |
| Tune-up limit [dBm]                                   | 15                   | 15   | 15      | 15   | 12+12 | 15        | 15   | 12+12 | 15      | 15               | 12+12 | 15        | 15   | 12+12 | 12        | 12   | 9+9  |
| (*1) SAR test considered?<br>(*2) initial test setup) | Back                 | x    | x       | x    | x     | x         | x    | x     | o       | o                | x     | x         | x    | x     | x         | x    | x    |
|                                                       | Front                | x    | x       | x    | x     | x         | x    | x     | o       | o                | x     | x         | x    | x     | x         | x    | x    |
|                                                       | Top                  | x    | o       | x    | x     | x         | x    | x     | x       | x                | o*    | x         | x    | x     | x         | x    | x    |
|                                                       | Bottom               | o    | x       | o    | x     | x         | o    | x     | o*      | x                | x     | o         | x    | x     | x         | x    | x    |
|                                                       | Right, Left          | x    | x       | x    | x     | x         | x    | x     | x       | x                | x     | x         | x    | x     | x         | x    | x    |
| Frequency tested                                      | (*2)                 | (*2) | (*2)    | n/a  | n/a   | (*2)      | n/a  | n/a   | (*2)    | (*2)             | n/a   | (*2)      | n/a  | n/a   | n/a       | n/a  | n/a  |
| Data rate [Mbps]                                      | 6                    | 6    | MCS0    | MCS0 | MCS8  | MCS0      | MCS0 | MCS0  | MCS0    | MCS0             | MCS8  | MCS0      | MCS0 | MCS0  | MCS0      | MCS0 | MCS0 |

| Operation mode                                         | a           |      | n(HT20) |      |       | ac(VHT20) |      |       | n(HT40) |            |       | ac(VHT40) |      |       | ac(VHT80) |      |       |
|--------------------------------------------------------|-------------|------|---------|------|-------|-----------|------|-------|---------|------------|-------|-----------|------|-------|-----------|------|-------|
| band                                                   | U-NII-3     |      |         |      |       |           |      |       |         |            |       |           |      |       |           |      |       |
| Tx band [MHz]                                          | 5745~5825   |      |         |      |       |           |      |       |         | 5755, 5795 |       |           |      |       |           | 5775 |       |
| Antenna#                                               | 0           | 1    | 0       | 1    | 0+1   | 0         | 1    | 0+1   | 0       | 1          | 0+1   | 0         | 1    | 0+1   | 0         | 1    | 0+1   |
| Tune-up limit [dBm]                                    | 14          | 14   | 14      | 14   | 12+12 | 14        | 14   | 12+12 | 14      | 14         | 12+12 | 14        | 14   | 12+12 | 14        | 14   | 12+12 |
| Initial test mode? (*1)                                | -           | -    | -       | -    | N/A   | -         | -    | N/A   | yes     | yes        | N/A   | -         | -    | N/A   | N/A       | N/A  | N/A   |
| (*1) SAR test considered?<br>(***) initial test setup) | Back        | ×    | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×          | ×     | ×         | ×    | ×     | ○         | ○    | ×     |
|                                                        | Front       | ×    | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×          | ×     | ×         | ×    | ×     | ○         | ○    | ×     |
|                                                        | Top         | ×    | ○       | ×    | ×     | ×         | ×    | ×     | ×       | ×          | ×     | ×         | ×    | ×     | ×         | ○*   | ×     |
|                                                        | Bottom      | ○    | ×       | ○    | ×     | ×         | ○    | ×     | ×       | ×          | ×     | ○         | ×    | ×     | ○*        | ×    | ×     |
|                                                        | Right, Left | ×    | ×       | ×    | ×     | ×         | ×    | ×     | ×       | ×          | ×     | ×         | ×    | ×     | ×         | ×    | ×     |
| Frequency tested                                       | (*)2        | (*)2 | (*)2    | n/a  | n/a   | (*)2      | n/a  | n/a   | (*)2    | n/a        | n/a   | (*)2      | n/a  | n/a   | (*)2      | (*)2 | N/A   |
| Data rate [Mbps]                                       | 6           | 6    | MCS0    | MCS0 | MCS8  | MCS0      | MCS0 | MCS0  | MCS0    | MCS0       | MCS8  | MCS0      | MCS0 | MCS0  | MCS0      | MCS0 | MCS0  |

Controlled software : HDH-001 WLAN&BT Radio test control (Ver.01)

\*1. "○": SAR test was applied. "×": SAR test can be reduced.

\*2. The tested frequencies refer to SAR test results in Section 7.

\*. b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11n(40VHT), ac80: IEEE 802.11ac(80VHT). n/a: not applied.

## 4.2 RF exposure conditions

Antenna separation distances in each test setup plan are shown as follows.

| Setup plan | SAR type  | Explanation of SAR test setup plan<br>(* Refer to Appendix 1 for the antenna location and the test setup photographs which had been tested.) | D: Separation distance [mm] |           |           |
|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------|-----------|
|            |           |                                                                                                                                              | Antenna 0                   |           | Antenna 1 |
|            |           |                                                                                                                                              | Wi-Fi                       | Bluetooth | Wi-Fi     |
| Bottom     | Body, 1g  | The bottom edge of EUT towards the bottom of the flat phantom.                                                                               | 2.223                       | 2.223     | ≈81       |
| Back       | Hand, 10g | The back surface of EUT towards the bottom of the flat phantom.<br>(* including the grip size for the Antenna 1)                             | 6.03                        | 6.03      | ≈ 10      |
| Front      | Hand, 10g | The front surface of EUT towards the bottom of the flat phantom.                                                                             | 2.61                        | 2.61      | 2.97      |
| Top        | Hand, 10g | The top edge of EUT towards the bottom of the flat phantom.                                                                                  | ≈82                         | ≈82       | 2.723     |
| Left       | Hand, 10g | The left-hand grip edge of EUT towards the bottom of the flat phantom.                                                                       | 58.873                      | 58.873    | 63.673    |
| Right      | Hand, 10g | The right-hand grip edge of EUT towards the bottom of the flat phantom.                                                                      | 119.673                     | 119.673   | 121.473   |

\*. D: Antenna separation distance. It is the distance from an antenna to the outer surface of the host device which an operator may touch.

\*. Size of EUT: 208.347 mm (width) × 83.72 mm (height) × 13.94 mm (depth) (\* The convex portions (joy stick, hand-grip, buttons, etc.) are not contained in size.)

## 4.3 SAR test exclusion considerations accordance to KDB 447498 D01

The following is based on KDB447498D01.

Step 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max.power of channel, including tune-up tolerance, mW}) / (\text{min.test separation distance, mm})] \times [\sqrt{f}(\text{GHz})] \leq 3.0 (\text{for SAR(1g)}), 7.5 (\text{for SAR(10g)}) \quad \text{formula (1)}$$

If power is calculated from the upper formula (1);

$$[\text{SAR(1g) test exclusion thresholds, mW}] = 3 \times [\text{test separation distance, mm}] / [\sqrt{f}(\text{GHz})] \quad \text{formula (2)}$$

- The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

When the calculated threshold value by a numerical formula above-mentioned in the following table is 3.0 or less, SAR test can be excluded.

Step 2) At 1500 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following.

$$[\text{test exclusion thresholds, mW}] = [(\text{Power allowed at numeric threshold for 50mm in formula (1)}) + [(\text{test separation distance, mm}) - (50\text{mm})] \times 10] \quad \text{formula (3)}$$

- The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.
- Power and distance are rounded to the nearest mW and mm before calculation

When output power is less than the calculated threshold value by a numerical formula above-mentioned in the following table, SAR test is excluded.

[SAR exclusion calculations for step 1) antenna ≤ 50mm from the user, and for step 2) antenna > 50mm from the user.]

|                                |                   |                           |      | Calculated threshold value                                                                                                                                                                           |             |             |             |             |             |                                                                                                                         |                |                |                |                |                |
|--------------------------------|-------------------|---------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Antenna #:                     |                   |                           |      | Antenna 0                                                                                                                                                                                            |             |             | Antenna 1   |             |             | Antenna 0                                                                                                               |                |                | Antenna 1      |                |                |
| Setup:                         |                   |                           |      | Bottom                                                                                                                                                                                               | Front       | Back        | Top         | Front       | Back        | Left                                                                                                                    | Right          | Top            | Left           | Right          | Bottom         |
| Antenna separation distance:   |                   |                           |      | ≤5                                                                                                                                                                                                   | ≤5          | 6           | ≤5          | ≤5          | ≈10         | 59                                                                                                                      | 120            | 82             | 64             | 121            | 81             |
| SAR type (1g: Body/10g: Hand): |                   |                           |      | 1g                                                                                                                                                                                                   | 10g         | 10g         | 10g         | 10g         | 10g         | 10g                                                                                                                     | 10g            | 10g            | 10g            | 10g            | 1g             |
| Mode (SISO)                    | Upper Freq. [MHz] | Tune-up limit (conducted) |      | Step 1) SAR exclusion calculations for antenna ≤50mm from the user.<br>Judge: “Exempt” when ≤ 3.0 (SAR (1g)), ≤ 7.5 (SAR (10g));<br>“Test” (SAR test required) when >3.0 (SAR(1g)), >7.5 (SAR(10g)). |             |             |             |             |             | Step 2) > 50mm from the user<br>Judge: “Exempt” when Tune-up limit power is less than calculated threshold power value. |                |                |                |                |                |
|                                |                   | [dBm]                     | [mW] |                                                                                                                                                                                                      |             |             |             |             |             |                                                                                                                         |                |                |                |                |                |
| Bluetooth                      | 2480              | 2.0                       | 2    | 0.6, Exempt                                                                                                                                                                                          | 0.6, Exempt | 0.5, Exempt | 0.6, Exempt | 0.6, Exempt | 0.3, Exempt | 185 mW, Exempt                                                                                                          | 795 mW, Exempt | 415 mW, Exempt | 235 mW, Exempt | 805 mW, Exempt | 405 mW, Exempt |
| b                              | 2462              | 19.0                      | 79   | 24.8, Test                                                                                                                                                                                           | 24.8, Test  | 20.7, Test  | 24.8, Test  | 24.8, Test  | 12.4, Test  | 186 mW, Exempt                                                                                                          | 796 mW, Exempt | 416 mW, Exempt | 236 mW, Exempt | 806 mW, Exempt | 406 mW, Exempt |
| g,n20,ac20                     | 2462              | 18.0                      | 63   | 19.8, Test                                                                                                                                                                                           | 19.8, Test  | 16.5, Test  | 19.8, Test  | 19.8, Test  | 9.9, Test   | 186 mW, Exempt                                                                                                          | 796 mW, Exempt | 416 mW, Exempt | 236 mW, Exempt | 806 mW, Exempt | 406 mW, Exempt |
| n40,ac40                       | 2462              | 10.0                      | 10   | 3.1, Test                                                                                                                                                                                            | 3.1, Exempt | 2.6, Exempt | 3.1, Exempt | 3.1, Exempt | 1.6, Exempt | 186 mW, Exempt                                                                                                          | 796 mW, Exempt | 416 mW, Exempt | 236 mW, Exempt | 806 mW, Exempt | 406 mW, Exempt |
| a,n20,ac20                     | 5240              | 15.0                      | 32   | 14.7, Test                                                                                                                                                                                           | 14.7, Test  | 12.2, Test  | 14.7, Test  | 14.7, Test  | 7.4, Exempt | 152 mW, Exempt                                                                                                          | 762 mW, Exempt | 382 mW, Exempt | 202 mW, Exempt | 772 mW, Exempt | 372 mW, Exempt |
| n40,ac40                       | 5230              | 15.0                      | 32   | 14.6, Test                                                                                                                                                                                           | 14.6, Test  | 12.2, Test  | 14.6, Test  | 14.6, Test  | 7.3, Exempt | 152 mW, Exempt                                                                                                          | 762 mW, Exempt | 382 mW, Exempt | 202 mW, Exempt | 772 mW, Exempt | 372 mW, Exempt |
| ac80                           | 5210              | 11.0                      | 13   | 5.9, Test                                                                                                                                                                                            | 5.9, Exempt | 4.9, Exempt | 5.9, Exempt | 5.9, Exempt | 5.9, Exempt | 152 mW, Exempt                                                                                                          | 762 mW, Exempt | 382 mW, Exempt | 202 mW, Exempt | 772 mW, Exempt | 372 mW, Exempt |
| a,n20,ac20                     | 5320              | 15.0                      | 32   | 14.8, Test                                                                                                                                                                                           | 14.8, Test  | 12.3, Test  | 14.8, Test  | 14.8, Test  | 7.4, Exempt | 155 mW, Exempt                                                                                                          | 765 mW, Exempt | 385 mW, Exempt | 205 mW, Exempt | 775 mW, Exempt | 375 mW, Exempt |
| n40,ac40                       | 5310              | 15.0                      | 32   | 14.7, Test                                                                                                                                                                                           | 14.7, Test  | 12.3, Test  | 14.7, Test  | 14.7, Test  | 7.4, Exempt | 155 mW, Exempt                                                                                                          | 765 mW, Exempt | 385 mW, Exempt | 205 mW, Exempt | 775 mW, Exempt | 375 mW, Exempt |
| ac80                           | 5290              | 11.0                      | 13   | 6.0, Test                                                                                                                                                                                            | 6.0, Exempt | 5.0, Exempt | 6.0, Exempt | 6.0, Exempt | 6.0, Exempt | 155 mW, Exempt                                                                                                          | 765 mW, Exempt | 385 mW, Exempt | 205 mW, Exempt | 775 mW, Exempt | 375 mW, Exempt |
| a,n20,ac20                     | 5700              | 15.0                      | 32   | 15.3, Test                                                                                                                                                                                           | 15.3, Test  | 12.7, Test  | 15.3, Test  | 15.3, Test  | 7.7, Test   | 153 mW, Exempt                                                                                                          | 763 mW, Exempt | 383 mW, Exempt | 203 mW, Exempt | 773 mW, Exempt | 373 mW, Exempt |
| n40,ac40                       | 5670              | 15.0                      | 32   | 15.2, Test                                                                                                                                                                                           | 15.2, Test  | 12.7, Test  | 15.2, Test  | 15.2, Test  | 7.6, Test   | 153 mW, Exempt                                                                                                          | 763 mW, Exempt | 383 mW, Exempt | 203 mW, Exempt | 773 mW, Exempt | 373 mW, Exempt |
| ac80                           | 5530              | 12.0                      | 16   | 7.5, Test                                                                                                                                                                                            | 7.5, Exempt | 6.3, Exempt | 7.5, Exempt | 7.5, Exempt | 7.5, Exempt | 153 mW, Exempt                                                                                                          | 763 mW, Exempt | 383 mW, Exempt | 203 mW, Exempt | 773 mW, Exempt | 373 mW, Exempt |
| a,n20,ac20                     | 5825              | 14.0                      | 25   | 12.1, Test                                                                                                                                                                                           | 12.1, Test  | 10.1, Test  | 12.1, Test  | 12.1, Test  | 6.0, Exempt | 152 mW, Exempt                                                                                                          | 762 mW, Exempt | 382 mW, Exempt | 202 mW, Exempt | 772 mW, Exempt | 372 mW, Exempt |
| n40,ac40                       | 5795              | 14.0                      | 25   | 12.1, Test                                                                                                                                                                                           | 12.1, Test  | 10.1, Test  | 12.1, Test  | 12.1, Test  | 6.0, Exempt | 152 mW, Exempt                                                                                                          | 762 mW, Exempt | 382 mW, Exempt | 202 mW, Exempt | 772 mW, Exempt | 372 mW, Exempt |
| ac80                           | 5775              | 14.0                      | 25   | 12.1, Test                                                                                                                                                                                           | 12.1, Test  | 10.1, Test  | 12.1, Test  | 12.1, Test  | 6.0, Exempt | 152 mW, Exempt                                                                                                          | 762 mW, Exempt | 382 mW, Exempt | 202 mW, Exempt | 772 mW, Exempt | 372 mW, Exempt |

\*. Freq.: Frequency, Mode; b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT), ac80: IEEE 802.11ac(80VHT).

Notes: 1. Power and distance are rounded to the nearest mW and mm before calculation.

#### 4.4 Estimated SAR for simultaneous transmission SAR analysis according to KDB447498 D01

The following is based on KDB447498D01.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

[(max. power of channel, including tune-up tolerance, mW) / (minimum test separation distance, mm)]<sup>1.5</sup> / [√ f(Hz)/x] W/kg

\*. for test separation distances ≤ 50 mm; where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR

\*. 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

\*. When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.

| SISO/<br>MIMO                    | Mode               | Upper Freq.[GHz] |       |       | Max.P [mW] |       |       | Estimated SAR 1g value [W/kg] |             |             | Estimated Σ SAR 1g value [W/kg] (≤ 1.6 W/kg) | Distance between antenna [mm] (*2) | Simulated SPLSR value |
|----------------------------------|--------------------|------------------|-------|-------|------------|-------|-------|-------------------------------|-------------|-------------|----------------------------------------------|------------------------------------|-----------------------|
|                                  |                    | Ant.0            |       | Ant.1 | Ant.0      |       | Ant.1 | Ant.0 BT                      | Ant.0 Wi-Fi | Ant.1 Wi-Fi |                                              |                                    |                       |
|                                  |                    | BT               | Wi-Fi | Wi-Fi | BT         | Wi-Fi | Wi-Fi | Bottom                        | Bottom      | Bottom      |                                              |                                    |                       |
| SISO                             | BT(ant.0)+b(ant.1) | 2.48             | -     | 2.462 | 2          | -     | 79    | 0.08                          | -           | 0.4         | 0.48                                         | 79                                 | n/a                   |
| MIMO                             | n20(ant.0)+ant.1   | -                | 2.462 | 2.462 | -          | 22    | 22    | -                             | 0.92        | 0.4         | 1.32                                         | 79                                 | n/a                   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.24  | 2          | -     | 32    | 0.08                          | -           | 0.4         | 0.48                                         | 79                                 | n/a                   |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.24  | 5.24  | -          | 16    | 16    | -                             | 0.98        | 0.4         | 1.38                                         | 79                                 | n/a                   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.32  | 2          | -     | 32    | 0.08                          | -           | 0.4         | 0.48                                         | 79                                 | n/a                   |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.32  | 5.32  | -          | 16    | 16    | -                             | 0.98        | 0.4         | 1.38                                         | 79                                 | n/a                   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.7   | 2          | -     | 32    | 0.08                          | -           | 0.4         | 0.48                                         | 79                                 | n/a                   |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.7   | 5.7   | -          | 16    | 16    | -                             | 1.02        | 0.4         | 1.42                                         | 79                                 | n/a                   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.825 | 2          | -     | 25    | 0.08                          | -           | 0.4         | 0.48                                         | 79                                 | n/a                   |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.825 | 5.825 | -          | 16    | 16    | -                             | 1.03        | 0.4         | 1.43                                         | 79                                 | n/a                   |
| Antenna separation distance [mm] |                    |                  |       |       |            |       |       |                               |             |             |                                              |                                    | -                     |
|                                  |                    |                  |       |       |            |       |       | ≤5                            | ≥50         | ≥50         | -                                            | -                                  | -                     |

| SISO/<br>MIMO                    | Mode               | Upper Freq.[GHz] |       |       | Max.P [mW] |       |       | Estimated SAR 1g value [W/kg] |      |       |      |       |             |     |       |      |       |
|----------------------------------|--------------------|------------------|-------|-------|------------|-------|-------|-------------------------------|------|-------|------|-------|-------------|-----|-------|------|-------|
|                                  |                    | Ant.0            |       | Ant.1 | Ant.0      |       | Ant.1 | BT-Ant.0 (*1)                 |      |       |      |       | Wi-Fi-Ant.0 |     |       |      |       |
|                                  |                    | BT               | Wi-Fi | Wi-Fi | BT         | Wi-Fi | Wi-Fi | Back                          | Top  | Front | Left | Right | Back        | Top | Front | Left | Right |
| SISO                             | BT(ant.0)+b(ant.1) | 2.48             | -     | 2.462 | 2          | -     | 79    | 0.03                          | 0.03 | 0.03  | 0.03 | 0.03  | -           | -   | -     | -    | -     |
| MIMO                             | n20(ant.0)+ant.1   | -                | 2.462 | 2.462 | -          | 22    | 22    | -                             | -    | -     | -    | -     | 0.31        | 1.0 | 0.37  | 1.0  | 1.0   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.24  | 2          | -     | 32    | 0.03                          | 0.03 | 0.03  | 0.03 | 0.03  | -           | -   | -     | -    | -     |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.24  | 5.24  | -          | 16    | 16    | -                             | -    | -     | -    | -     | 0.33        | 1.0 | 0.39  | 1.0  | 1.0   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.32  | 2          | -     | 32    | 0.03                          | 0.03 | 0.03  | 0.03 | 0.03  | -           | -   | -     | -    | -     |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.32  | 5.32  | -          | 16    | 16    | -                             | -    | -     | -    | -     | 0.33        | 1.0 | 0.39  | 1.0  | 1.0   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.7   | 2          | -     | 32    | 0.03                          | 0.03 | 0.03  | 0.03 | 0.03  | -           | -   | -     | -    | -     |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.7   | 5.7   | -          | 16    | 16    | -                             | -    | -     | -    | -     | 0.34        | 1.0 | 0.41  | 1.0  | 1.0   |
| SISO                             | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.825 | 2          | -     | 25    | 0.03                          | 0.03 | 0.03  | 0.03 | 0.03  | -           | -   | -     | -    | -     |
| MIMO                             | n20(ant.0)+ant.1   | -                | 5.825 | 5.825 | -          | 15    | 15    | -                             | -    | -     | -    | -     | 0.34        | 1.0 | 0.41  | 1.0  | 1.0   |
| Antenna separation distance [mm] |                    |                  |       |       |            |       |       | 6                             | ≥50  | ≤5    | ≥50  | ≥50   | 6           | ≥50 | ≤5    | ≥50  | ≥50   |

| SISO/<br>MIMO | Mode               | Upper Freq.[GHz] |       |       | Max.P [mW] |       |       | Estimated Σ SAR 1g value [W/kg] (≤ 4.0 W/kg) |      |       |      |       | The distance between antenna [mm] (*2) |     |       |      |       | Simulated SPLSR value |     |       |      |       |
|---------------|--------------------|------------------|-------|-------|------------|-------|-------|----------------------------------------------|------|-------|------|-------|----------------------------------------|-----|-------|------|-------|-----------------------|-----|-------|------|-------|
|               |                    | Ant.0            |       | Ant.1 | Ant.0      |       | Ant.1 |                                              |      |       |      |       |                                        |     |       |      |       |                       |     |       |      |       |
|               |                    | BT               | Wi-Fi | Wi-Fi | BT         | Wi-Fi | Wi-Fi | Back                                         | Top  | Front | Left | Right | Back                                   | Top | Front | Left | Right | Back                  | Top | Front | Left | Right |
| SISO          | BT(ant.0)+b(ant.1) | 2.48             | -     | 2.462 | 2          | -     | 79    | 1.35                                         | 1.35 | 1.35  | 1.03 | 1.03  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| MIMO          | n20(ant.0)+ant.1   | -                | 2.462 | 2.462 | -          | 22    | 22    | 0.68                                         | 1.37 | 0.74  | 2.00 | 2.00  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| SISO          | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.24  | 2          | -     | 32    | 0.81                                         | 0.81 | 0.81  | 1.03 | 1.03  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| MIMO          | n20(ant.0)+ant.1   | -                | 5.24  | 5.24  | -          | 16    | 16    | 0.72                                         | 1.39 | 0.78  | 2.00 | 2.00  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| SISO          | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.32  | 2          | -     | 32    | 0.82                                         | 0.82 | 0.82  | 1.03 | 1.03  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| MIMO          | n20(ant.0)+ant.1   | -                | 5.32  | 5.32  | -          | 16    | 16    | 0.72                                         | 1.39 | 0.79  | 2.00 | 2.00  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| SISO          | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.7   | 2          | -     | 32    | 0.85                                         | 0.85 | 0.85  | 1.03 | 1.03  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| MIMO          | n20(ant.0)+ant.1   | -                | 5.7   | 5.7   | -          | 16    | 16    | 0.75                                         | 1.41 | 0.81  | 2.00 | 2.00  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| SISO          | BT(ant.0)+a(ant.1) | 2.48             | -     | 5.825 | 2          | -     | 25    | 0.67                                         | 0.67 | 0.67  | 1.03 | 1.03  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |
| MIMO          | n20(ant.0)+ant.1   | -                | 5.825 | 5.825 | -          | 15    | 15    | 0.76                                         | 1.41 | 0.82  | 2.00 | 2.00  | 79                                     | 79  | 79    | 79   | 79    | n/a                   | n/a | n/a   | n/a  | n/a   |

\*. Ant.0: Antenna 0, Ant.1: Antenna 1, Freq.: Frequency, Max.P: Maximum power, BT: Bluetooth, b: IEEE 802.11b, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n/a: not applied.

\*. RF transmitter will choose either Wi-Fi 2.4GHz or Wi-Fi 5GHz according to the network signal condition, therefore, 2.4GHz Wi-Fi and 5GHz Wi-Fi will not operate simultaneously at any moment.

\*1. For Bluetooth operation, since the estimated SAR 1g value of 5mm separation distance was smaller than 0.4 W/kg (1.0 W/kg for SAR 10g), the estimated SAR 1g value of 5mm separation distance was used for the test separation distances is > 50 mm. Same approach was applied for SAR 10g consideration.

\*2. The distance between antenna 0 and antenna 1: back/front/left/right: 79 mm (\*minimum physical distance), top/bottom: 79 mm (\* Even if the antenna is piled at this direction, the physical distance separate is 79mm.).

Notes: 1. Power and distance are rounded to the nearest mW and mm before calculation.

2. The upper frequency of the frequency band had maximum output power and was used in order to calculate standalone SAR test exclusion considerations.

3. The estimated Σ SAR 1g value is calculated based on the same configuration and the same test position.

4. The estimated results (SAR value, SPLSR value) are rounded to two decimal place for comparison.

5. (Calculating formula) Per KDB447498 D01(v06), SPLSR = (SAR1 + SAR2)<sup>1.5</sup> / (minimum antenna separation distance, mm)

where; the minimum antenna separation distance is determined by the closest physical separation of the antennas, according to geometric center of the antennas.

**SECTION 5: Uncertainty Assessment (SAR measurement)**

Although this standard determines only the limit value of uncertainty, there is no applicable rule of uncertainty in this. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

| Uncertainty of SAR measurement (2.4-6GHz) (*.ε&σ: ≤± 5%, DAK3.5, Tx: ≈100% duty cycle) (v08) |                                                   |                   |                          |         |         |          | 1g SAR             | 10g SAR            |          |
|----------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------|--------------------------|---------|---------|----------|--------------------|--------------------|----------|
| Combined measurement uncertainty of the measurement system (k=1)                             |                                                   |                   |                          |         |         |          | ± 13.7%            | ± 13.6%            |          |
| Expanded uncertainty (k=2)                                                                   |                                                   |                   |                          |         |         |          | ± 27.4%            | ± 27.2%            |          |
|                                                                                              | Error Description (2.4-6GHz) (v08)                | Uncertainty Value | Probability distribution | Divisor | ci (1g) | ci (10g) | ui (1g)            | ui (10g)           | Vi, veff |
| A                                                                                            | Measurement System (DASY5)                        |                   |                          |         |         |          | (std. uncertainty) | (std. uncertainty) |          |
| 1                                                                                            | Probe Calibration Error                           | ±6.55 %           | Normal                   | 1       | 1       | 1        | ±6.55 %            | ±6.55 %            | ∞        |
| 2                                                                                            | Axial isotropy Error                              | ±4.7 %            | Rectangular              | √3      | √0.5    | √0.5     | ±1.9 %             | ±1.9 %             | ∞        |
| 3                                                                                            | Hemispherical isotropy Error                      | ±9.6 %            | Rectangular              | √3      | √0.5    | √0.5     | ±3.9 %             | ±3.9 %             | ∞        |
| 4                                                                                            | Linearity Error                                   | ±4.7 %            | Rectangular              | √3      | 1       | 1        | ±2.7 %             | ±2.7 %             | ∞        |
| 5                                                                                            | Probe modulation response                         | ±2.4 %            | Rectangular              | √3      | 1       | 1        | ±1.4 %             | ±1.4 %             | ∞        |
| 6                                                                                            | Sensitivity Error (detection limit)               | ±1.0 %            | Rectangular              | √3      | 1       | 1        | ±0.6 %             | ±0.6 %             | ∞        |
| 7                                                                                            | Boundary effects Error                            | ±4.3%             | Rectangular              | √3      | 1       | 1        | ±2.5 %             | ±2.5 %             | ∞        |
| 8                                                                                            | Readout Electronics Error(DAE)                    | ±0.3 %            | Rectangular              | √3      | 1       | 1        | ±0.3 %             | ±0.3 %             | ∞        |
| 9                                                                                            | Response Time Error                               | ±0.8 %            | Normal                   | 1       | 1       | 1        | ±0.8 %             | ±0.8 %             | ∞        |
| 10                                                                                           | Integration Time Error (≈100% duty cycle)         | ±0 %              | Rectangular              | √3      | 1       | 1        | 0 %                | 0 %                | ∞        |
| 11                                                                                           | RF ambient conditions-noise                       | ±3.0 %            | Rectangular              | √3      | 1       | 1        | ±1.7 %             | ±1.7 %             | ∞        |
| 12                                                                                           | RF ambient conditions-reflections                 | ±3.0 %            | Rectangular              | √3      | 1       | 1        | ±1.7 %             | ±1.7 %             | ∞        |
| 13                                                                                           | Probe positioner mechanical tolerance             | ±3.3 %            | Rectangular              | √3      | 1       | 1        | ±1.9 %             | ±1.9 %             | ∞        |
| 14                                                                                           | Probe Positioning with respect to phantom shell   | ±6.7 %            | Rectangular              | √3      | 1       | 1        | ±3.9 %             | ±3.9 %             | ∞        |
| 15                                                                                           | Max. SAR evaluation (Post-processing)             | ±4.0 %            | Rectangular              | √3      | 1       | 1        | ±2.3 %             | ±2.3 %             | ∞        |
| B                                                                                            | Test Sample Related                               |                   |                          |         |         |          |                    |                    |          |
| 16                                                                                           | Device Holder or Positioner Tolerance             | ±3.6 %            | Normal                   | 1       | 1       | 1        | ±3.6 %             | ±3.6 %             | 5        |
| 17                                                                                           | Test Sample Positioning Error                     | ±5.0 %            | Normal                   | 1       | 1       | 1        | ±5.0 %             | ±5.0 %             | 145      |
| 18                                                                                           | Power scaling                                     | ±0%               | Rectangular              | √3      | 1       | 1        | ±0 %               | ±0 %               | ∞        |
| 19                                                                                           | Drift of output power (measured, <0.2dB)          | ±2.3%             | Rectangular              | √3      | 1       | 1        | ±2.9 %             | ±2.9 %             | ∞        |
| C                                                                                            | Phantom and Setup                                 |                   |                          |         |         |          |                    |                    |          |
| 20                                                                                           | Phantom uncertainty (shape, thickness tolerances) | ±7.5 %            | Rectangular              | √3      | 1       | 1        | ±4.3 %             | ±4.3 %             | ∞        |
| 21                                                                                           | Algorithm for correcting SAR (ε,σ: ≤5%)           | ±1.2 %            | Normal                   | 1       | 1       | 0.84     | ±1.2 %             | ±0.97 %            | ∞        |
| 22                                                                                           | Measurement Liquid Conductivity Error (DAK3.5)    | ±3.0 %            | Normal                   | 1       | 0.78    | 0.71     | ±2.3 %             | ±2.1 %             | 7        |
| 23                                                                                           | Measurement Liquid Permittivity Error (DAK3.5)    | ±3.1 %            | Normal                   | 1       | 0.23    | 0.26     | ±0.7 %             | ±0.8 %             | 7        |
| 24                                                                                           | Liquid Conductivity-temp.uncertainty (≤2deg.C.)   | ±5.3 %            | Rectangular              | √3      | 0.78    | 0.71     | ±2.4 %             | ±2.2 %             | ∞        |
| 25                                                                                           | Liquid Permittivity-temp.uncertainty (≤2deg.C.)   | ±0.9 %            | Rectangular              | √3      | 0.23    | 0.26     | ±0.1 %             | ±0.1 %             | ∞        |
|                                                                                              | Combined Standard Uncertainty                     |                   |                          |         |         |          | ±13.7 %            | ±13.6 %            | 733      |
|                                                                                              | Expanded Uncertainty (k=2)                        |                   |                          |         |         |          | ±27.4 %            | ±27.2 %            |          |

\*. Table of uncertainties are listed for ISO/IEC 17025.

\*. This measurement uncertainty budget is suggested by IEEE Std.1528(2013) and determined by Schmid & Partner Engineering AG (DASY5 Uncertainty Budget). Per KDB 865664 D01 (v01r04) SAR Measurement 100 MHz to 6 GHz, Section 2.8.1., when the highest measured SAR(1g) within a frequency band is < 1.5W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std.1528 (2013) is not required in SAR reports submitted for equipment approval.

**SECTION 6: Confirmation before testing****6.1 SAR reference power measurement (antenna terminal conducted average power of EUT) - Worst data rate/channel determination**

(2.4GHz band)

| Mode           | Frequency |    | Data rate | Power spec. |       | Duty cycle |               | Antenna 0 power (Wi-Fi, Bluetooth) |            |        |                |           | Antenna 1 power (Wi-Fi) |            |        |                |           | MIMO Ant.0+1 power |           |                |        |               |
|----------------|-----------|----|-----------|-------------|-------|------------|---------------|------------------------------------|------------|--------|----------------|-----------|-------------------------|------------|--------|----------------|-----------|--------------------|-----------|----------------|--------|---------------|
|                |           |    |           | Typical     | Max.  | duty cycle | scaled factor | Set pwr.                           | Burst Ave. | Δ Max. | Tune-up factor | Time Ave. | Set pwr.                | Burst Ave. | Δ Max. | Tune-up factor | Time Ave. | MIMO target        | MIMO max. | SUM Burst Ave. | Δ Max. | SUM Time Ave. |
|                | [MHz]     | CH | [Mbps]    | [dBm]       | [dBm] | [%]        | [-]           | [-]                                | [dBm]      | [dB]   | [-]            | [dBm]     | [-]                     | [dBm]      | [dB]   | [-]            | [dBm]     | [dBm]              | [dBm]     | [dB]           | [dBm]  |               |
| BLE            | 2402      | 0  | 1         | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2440      | 19 | 1         | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2480      | 39 | 1         | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
| BDR            | 2401      | 0  | DH5       | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2441      | 39 | DH5       | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2480      | 78 | DH5       | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
| EDR            | 2401      | 0  | 2DH5      | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2441      | 39 | 2DH5      | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2480      | 78 | 2DH5      | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2401      | 0  | 3DH5      | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2441      | 39 | 3DH5      | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
|                | 2480      | 78 | 3DH5      | 0           | 2.0   | -          | -             | -                                  | n/a (*4)   | -      | -              | n/a (*4)  | -                       | -          | -      | -              | -         | -                  | -         | -              | -      |               |
| b              | 2412      | 1  | 1         | 17.5        | 19.0  | 99.0       | 1.01          | 70                                 | 17.08      | -1.92  | 1.56           | 17.04     | 70                      | 17.01      | -1.99  | 1.58           | 16.97     | -                  | -         | -              | -      |               |
|                | 2437      | 6  | 1         | 17.5        | 19.0  | 99.0       | 1.01          | 70                                 | 17.15      | -1.85  | 1.53           | 17.11     | 70                      | 17.06      | -1.94  | 1.56           | 17.02     | -                  | -         | -              | -      |               |
|                | 2462      | 11 | 1         | 17.5        | 19.0  | 99.0       | 1.01          | 70                                 | 17.00      | -2.00  | 1.58           | 16.96     | 70                      | 17.00      | -2.00  | 1.58           | 16.96     | -                  | -         | -              | -      |               |
|                | 2467      | 12 | 1         | 8.5         | 10.0  | 99.0       | 1.01          | 34                                 | 7.72       | -      | -              | 7.68      | 34                      | 8.44       | -      | -              | 8.40      | -                  | -         | -              | -      |               |
|                | 2472      | 13 | 1         | 3.5         | 5.0   | 99.0       | 1.01          | 14                                 | 2.76       | -      | -              | 2.72      | 14                      | 3.59       | -      | -              | 3.55      | -                  | -         | -              | -      |               |
| g (*2)         | 2412      | 1  | 6         | 15.5        | 17.0  | 93.7       | 1.07          | 68(*1)                             | 16.32      | -0.68  | 1.17           | 16.04     | 68(*1)                  | 16.15      | -0.85  | 1.22           | 15.87     | -                  | -         | -              | -      |               |
|                | 2437      | 6  | 6         | 16.5        | 18.0  | 93.7       | 1.07          | 68(*1)                             | 16.20      | -1.80  | 1.51           | 15.92     | 68(*1)                  | 16.16      | -1.84  | 1.53           | 15.88     | -                  | -         | -              | -      |               |
|                | 2462      | 11 | 6         | 16.5        | 18.0  | 93.7       | 1.07          | 68(*1)                             | 16.02      | -1.98  | 1.58           | 15.74     | 68(*1)                  | 16.04      | -1.96  | 1.57           | 15.76     | -                  | -         | -              | -      |               |
|                | 2467      | 12 | 6         | 8.5         | 10.0  | 93.7       | 1.07          | 36(*1)                             | 8.21       | -      | -              | 7.93      | 36(*1)                  | 8.65       | -      | -              | 8.37      | -                  | -         | -              | -      |               |
|                | 2472      | 13 | 6         | 3.5         | 5.0   | 93.7       | 1.07          | 16(*1)                             | 3.11       | -      | -              | 2.83      | 16(*1)                  | 3.93       | -      | -              | 3.65      | -                  | -         | -              | -      |               |
| n20 SISO (*2)  | 2412      | 1  | MCS0      | 15.5        | 17.0  | 93.2       | 1.07          | 68(*1)                             | 16.11      | -0.89  | 1.23           | 15.80     | 68(*1)                  | 16.36      | -0.64  | 1.16           | 16.05     | -                  | -         | -              | -      |               |
|                | 2437      | 6  | MCS0      | 16.5        | 18.0  | 93.2       | 1.07          | 68(*1)                             | 16.09      | -1.91  | 1.55           | 15.78     | 68(*1)                  | 16.10      | -1.90  | 1.55           | 15.79     | -                  | -         | -              | -      |               |
|                | 2462      | 11 | MCS0      | 16.5        | 18.0  | 93.2       | 1.07          | 68(*1)                             | 16.05      | -1.95  | 1.57           | 15.74     | 68(*1)                  | 16.00      | -2.00  | 1.58           | 15.69     | -                  | -         | -              | -      |               |
|                | 2467      | 12 | MCS0      | 8.5         | 10.0  | 93.2       | 1.07          | 36(*1)                             | 8.01       | -      | -              | 7.70      | 36(*1)                  | 8.66       | -      | -              | 8.35      | -                  | -         | -              | -      |               |
|                | 2472      | 13 | MCS0      | 3.5         | 5.0   | 93.2       | 1.07          | 16(*1)                             | 2.81       | -      | -              | 2.50      | 16(*1)                  | 3.70       | -      | -              | 3.39      | -                  | -         | -              | -      |               |
| ac20 SISO (*2) | 2412      | 1  | MCS0      | 15.5        | 17.0  | 93.3       | 1.07          | 68(*1)                             | 16.14      | -0.86  | 1.22           | 15.84     | 68(*1)                  | 16.09      | -0.91  | 1.23           | 15.79     | -                  | -         | -              | -      |               |
|                | 2437      | 6  | MCS0      | 16.5        | 18.0  | 93.3       | 1.07          | 68(*1)                             | 16.08      | -1.92  | 1.56           | 15.77     | 68(*1)                  | 16.14      | -1.86  | 1.53           | 15.73     | -                  | -         | -              | -      |               |
|                | 2462      | 11 | MCS0      | 16.5        | 18.0  | 93.3       | 1.07          | 68(*1)                             | 16.03      | -1.97  | 1.57           | 15.73     | 68(*1)                  | 16.00      | -2.00  | 1.58           | 15.70     | -                  | -         | -              | -      |               |
|                | 2467      | 12 | MCS0      | 8.5         | 10.0  | 93.3       | 1.07          | 36(*1)                             | 8.02       | -      | -              | 7.72      | 36(*1)                  | 8.58       | -      | -              | 8.28      | -                  | -         | -              | -      |               |
|                | 2472      | 13 | MCS0      | 3.5         | 5.0   | 93.3       | 1.07          | 16(*1)                             | 2.89       | -      | -              | 2.59      | 16(*1)                  | 3.90       | -      | -              | 3.60      | -                  | -         | -              | -      |               |
| n40 SISO (*2)  | 2422      | 2  | MCS0      | 8.5         | 10.0  | 87.3       | 1.15          | 34                                 | 8.56       | -1.44  | 1.39           | 7.97      | 34                      | 8.92       | -1.08  | 1.28           | 8.33      | -                  | -         | -              | -      |               |
|                | 2437      | 6  | MCS0      | 8.5         | 10.0  | 87.3       | 1.15          | 34                                 | 8.49       | -1.50  | 1.41           | 7.90      | 34                      | 8.73       | -1.27  | 1.34           | 8.13      | -                  | -         | -              | -      |               |
|                | 2462      | 11 | MCS0      | 8.5         | 10.0  | 87.3       | 1.15          | 34                                 | 8.31       | -1.69  | 1.48           | 7.72      | 34                      | 8.72       | -1.28  | 1.34           | 8.13      | -                  | -         | -              | -      |               |
| ac40 SISO (*2) | 2422      | 2  | MCS0      | 8.5         | 10.0  | 87.3       | 1.15          | 34                                 | 8.60       | -1.40  | 1.38           | 8.01      | 34                      | 8.87       | -1.13  | 1.30           | 8.28      | -                  | -         | -              | -      |               |
|                | 2437      | 6  | MCS0      | 8.5         | 10.0  | 87.3       | 1.15          | 34                                 | 8.36       | -1.63  | 1.46           | 7.77      | 34                      | 8.73       | -1.27  | 1.34           | 8.13      | -                  | -         | -              | -      |               |
|                | 2462      | 11 | MCS0      | 8.5         | 10.0  | 87.3       | 1.15          | 34                                 | 8.30       | -1.70  | 1.48           | 7.71      | 34                      | 8.73       | -1.27  | 1.34           | 8.14      | -                  | -         | -              | -      |               |
| n20 MIMO (*3)  | 2412      | 1  | MCS8      | 11.0        | 12.5  | 87.6       | 1.14          | 52(*1)                             | 12.48      | -      | -              | 11.91     | -                       | 12.49      | -      | -              | 11.92     | 14.0               | 15.5      | 15.49          | -      | 14.92         |
|                | 2437      | 6  | MCS8      | 12.0        | 13.5  | 87.6       | 1.14          | 52(*1)                             | 12.29      | -      | -              | 11.72     | -                       | 12.22      | -      | -              | 11.65     | 15.0               | 16.5      | 15.26          | -      | 14.70         |
|                | 2462      | 11 | MCS8      | 12.0        | 13.5  | 87.6       | 1.14          | 52(*1)                             | 12.19      | -      | -              | 11.62     | -                       | 12.20      | -      | -              | 11.63     | 15.0               | 16.5      | 15.21          | -      | 14.63         |
|                | 2467      | 12 | MCS8      | 5.5         | 7.0   | 87.6       | 1.14          | 26(*1)                             | 5.31       | -      | -              | 4.74      | -                       | 6.08       | -      | -              | 5.51      | 8.5                | 11.0      | 8.73           | -      | 8.16          |
|                | 2472      | 13 | MCS8      | 0.5         | 2.0   | 87.6       | 1.14          | 6(*1)                              | 0.31       | -      | -              | -0.26     | -                       | 1.42       | -      | -              | 0.85      | 3.5                | 5.0       | 3.91           | -      | 3.34          |
| ac20 MIMO (*3) | 2412      | 1  | MCS0      | 11.0        | 12.5  | 87.8       | 1.14          | 52(*1)                             | 12.50      | -      | -              | 11.93     | -                       | 12.47      | -      | -              | 11.90     | 14.0               | 15.5      | 15.49          | -      | 14.93         |
|                | 2437      | 6  | MCS0      | 12.0        | 13.5  | 87.8       | 1.14          | 52(*1)                             | 12.34      | -      | -              | 11.77     | -                       | 12.57      | -      | -              | 12.00     | 15.0               | 16.5      | 15.47          | -      | 14.90         |
|                | 2462      | 11 | MCS0      | 12.0        | 13.5  | 87.8       | 1.14          | 52(*1)                             | 12.31      | -      | -              | 11.74     | -                       | 12.20      | -      | -              | 11.63     | 15.0               | 16.5      | 15.27          | -      | 14.70         |
|                | 2467      | 12 | MCS0      | 5.5         | 7.0   | 87.8       | 1.14          | 26(*1)                             | 5.38       | -      | -              | 4.81      | -                       | 6.16       | -      | -              | 5.59      | 8.5                | 11.0      | 8.80           | -      | 8.23          |
|                | 2472      | 13 | MCS0      | 0.5         | 2.0   | 87.8       | 1.14          | 6(*1)                              | 0.29       | -      | -              | -0.28     | -                       | 1.35       | -      | -              | 0.78      | 3.5                | 5.0       | 3.86           | -      | 3.30          |
| n40 MIMO (*3)  | 2422      | 2  | MCS8      | 8.0         | 9.5   | 78.4       | 1.28          | 32                                 | 7.67       | -      | -              | 6.61      | -                       | 8.40       | -      | -              | 7.34      | 11.0               | 12.5      | 11.06          | -      | 10.00         |
|                | 2437      | 6  | MCS8      | 8.0         | 9.5   | 78.4       | 1.28          | 32                                 | 7.79       | -      | -              | 6.72      | -                       | 8.21       | -      | -              | 7.16      | 11.0               | 12.5      | 11.01          | -      | 9.96          |
|                | 2457      | 10 | MCS8      | 8.0         | 9.5   | 78.4       | 1.28          | 32                                 | 7.65       | -      | -              | 6.59      | -                       | 8.25       | -      | -              | 7.19      | 11.0               | 12.5      | 10.97          | -      | 9.91          |
|                | 2462      | 11 | MCS8      | 5.5         | 7.0   | 78.4       | 1.28          | 22                                 | 4.99       | -      | -              | 3.93      | -                       | 5.59       | -      | -              | 4.53      | 8.5                | 10.0      | 8.31           | -      | 7.25          |
| ac40 MIMO (*3) | 2422      | 2  | MCS0      | 8.0         | 9.5   | 78.6       | 1.27          | 32                                 | 7.89       | -      | -              | 6.84      | -                       | 8.44       | -      | -              | 7.39      | 11.0               | 12.5      | 11.18          | -      | 10.13         |
|                | 2437      | 6  | MCS0      | 8.0         | 9.5   | 78.6       | 1.27          | 32                                 | 7.82       | -      | -              | 6.78      | -                       | 8.23       | -      | -              | 7.19      | 11.0               | 12.5      | 11.04          | -      | 9.99          |
|                | 2457      | 10 | MCS0      | 8.0         | 9.5   | 78.6       | 1.27          | 32                                 | 7.56       | -      | -              | 6.51      | -                       | 8.36       | -      | -              | 7.31      | 11.0               | 12.5      | 10.99          | -      | 9.94          |
|                | 2462      | 11 | MCS0      | 5.5         | 7.0   | 78.6       | 1.27          | 22                                 | 4.96       | -      | -              | 3.91      | -                       | 5.61       | -      | -              | 4.56      | 8.5                | 10.0      | 8.31           | -      | 7.26          |

\* Initial SAR test channel was chosen. (shaded yellow marker) This mode has the highest tune-up power, highest duty cycle and lowest modulation.

\* CH: Channel; Power spec.: Power specification; Max.: Maximum; Set pwr.: Setting power; Burst Ave.: Measured burst average power; SUM Ave.: Sum of antenna 0 power and antenna 1 power; n/a: Not applied, Not applicable; Mode; b: IEEE 802.11b, g: IEEE 802.11g, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT).

\*1. The power setting was adjusted so that measured average power was not more than 2 dB lower than the maximum tune-up tolerance limit.

\*2. According to KDB248227 D01, SAR is required for g, n20, ac20, n40 and ac40 channels when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is &gt;1.2 W/kg.

\*3. The standalone (SISO) SAR results were considered acceptable for the MIMO simultaneous transmission analysis as the MIMO power does not exceed the SISO power. The antenna separation distance will not be less than 50mm.

\*4. Since the Bluetooth power was enough lower to exempt the SAR test, the power measurement was also reduced for the Bluetooth operation.

(5GHz band)

| Mode           | Frequency     |      | Data rate | Power spec. |       | Duty cycle |               | Antenna 0 power (Wi-Fi, Bluetooth) |            |        |                |           | Antenna 1 power (Wi-Fi) |            |        |                |           | MIMO Ant.0+1 power |           |                |        |               |  |
|----------------|---------------|------|-----------|-------------|-------|------------|---------------|------------------------------------|------------|--------|----------------|-----------|-------------------------|------------|--------|----------------|-----------|--------------------|-----------|----------------|--------|---------------|--|
|                |               |      |           | Typical     | Max.  | duty cycle | scaled factor | Set pwr.                           | Burst Ave. | Δ Max. | Tune-up factor | Time Ave. | Set pwr.                | Burst Ave. | Δ Max. | Tune-up factor | Time Ave. | MIMO target        | MIMO max. | SUM Burst Ave. | Δ Max. | SUM Time Ave. |  |
|                | [MHz]         | CH   | [Mbps]    | [dBm]       | [dBm] | [%]        | [-]           | [-]                                | [dBm]      | [dB]   | [-]            | [dBm]     | [-]                     | [dBm]      | [dB]   | [-]            | [dBm]     | [dBm]              | [dBm]     | [dB]           | [dBm]  |               |  |
| a (*4)         | 5180          | 36   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.06      | -1.94  | 1.56           | 12.78     | 54                      | 13.30      | -1.70  | 1.48           | 13.02     |                    |           |                |        |               |  |
|                | 5200          | 40   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.06      | -1.94  | 1.56           | 12.78     | 54                      | 13.18      | -1.82  | 1.52           | 12.90     |                    |           |                |        |               |  |
|                | 5220          | 44   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.00      | -2.00  | 1.58           | 12.72     | 54                      | 13.02      | -1.98  | 1.58           | 12.74     |                    |           |                |        |               |  |
|                | 5240          | 48   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.08      | -1.92  | 1.56           | 12.80     | 54                      | 13.11      | -1.89  | 1.55           | 12.83     |                    |           |                |        |               |  |
|                | 5260          | 52   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.12      | -1.88  | 1.54           | 12.84     | 54                      | 13.05      | -1.95  | 1.57           | 12.77     |                    |           |                |        |               |  |
|                | 5280          | 56   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.17      | -1.83  | 1.52           | 12.89     | 54                      | 13.18      | -1.82  | 1.52           | 12.90     |                    |           |                |        |               |  |
|                | 5300          | 60   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.49      | -1.51  | 1.42           | 13.21     | 54                      | 13.11      | -1.89  | 1.55           | 12.83     |                    |           |                |        |               |  |
|                | 5320          | 64   | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.56      | -1.44  | 1.39           | 13.28     | 54                      | 13.37      | -1.63  | 1.46           | 13.09     |                    |           |                |        |               |  |
|                | 5500          | 100  | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.45      | -1.55  | 1.43           | 13.17     | 54                      | 13.78      | -1.22  | 1.32           | 13.50     |                    |           |                |        |               |  |
|                | 5580          | 116  | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.22      | -1.78  | 1.51           | 12.94     | 54                      | 13.49      | -1.51  | 1.42           | 13.21     |                    |           |                |        |               |  |
|                | 5700          | 140  | 6         | 13.5        | 15.0  | 93.7       | 1.07          | 54                                 | 13.34      | -1.66  | 1.47           | 13.06     | 54                      | 13.19      | -1.81  | 1.52           | 12.91     |                    |           |                |        |               |  |
|                | 5745          | 149  | 6         | 12.5        | 14.0  | 93.7       | 1.07          | 54                                 | 13.36      | -0.64  | 1.16           | 13.08     | 54                      | 13.33      | -0.67  | 1.17           | 13.05     |                    |           |                |        |               |  |
|                | 5785          | 157  | 6         | 12.5        | 14.0  | 93.7       | 1.07          | 54                                 | 13.20      | -0.80  | 1.20           | 12.92     | 54                      | 13.59      | -0.41  | 1.10           | 13.31     |                    |           |                |        |               |  |
|                | 5825          | 165  | 6         | 12.5        | 14.0  | 93.7       | 1.07          | 54                                 | 13.21      | -0.79  | 1.20           | 12.93     | 54                      | 13.55      | -0.45  | 1.11           | 13.27     |                    |           |                |        |               |  |
|                | n20 SISO (*4) | 5180 | 36        | MCS0        | 13.5  | 15.0       | 93.2          | 1.07                               | 54         | 13.00  | -2.00          | 1.58      | 12.69                   | 54         | 13.24  | -1.76          | 1.50      | 12.93              |           |                |        |               |  |
|                |               | 5200 | 40        | MCS0        | 13.5  | 15.0       | 93.2          | 1.07                               | 54         | 12.95  | -2.05          | 1.60      | 12.64                   | 54         | 13.32  | -1.68          | 1.47      | 13.01              |           |                |        |               |  |
| 5220           |               | 44   | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.12      | -1.88  | 1.54           | 12.81     | 54                      | 13.04      | -1.96  | 1.57           | 12.73     |                    |           |                |        |               |  |
| 5240           |               | 48   | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.00      | -2.00  | 1.58           | 12.69     | 54                      | 13.03      | -1.97  | 1.57           | 12.72     |                    |           |                |        |               |  |
| 5260           |               | 52   | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.24      | -1.76  | 1.50           | 12.93     | 54                      | 13.03      | -1.97  | 1.57           | 12.72     |                    |           |                |        |               |  |
| 5280           |               | 56   | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.30      | -1.70  | 1.48           | 12.99     | 54                      | 13.20      | -1.80  | 1.51           | 12.89     |                    |           |                |        |               |  |
| 5300           |               | 60   | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.25      | -1.75  | 1.50           | 12.94     | 54                      | 13.02      | -1.98  | 1.58           | 12.71     |                    |           |                |        |               |  |
| 5320           |               | 64   | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.30      | -1.70  | 1.48           | 12.99     | 54                      | 13.26      | -1.74  | 1.49           | 12.95     |                    |           |                |        |               |  |
| 5500           |               | 100  | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.24      | -1.76  | 1.50           | 12.93     | 54                      | 13.81      | -1.19  | 1.32           | 13.50     |                    |           |                |        |               |  |
| 5580           |               | 116  | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.05      | -1.95  | 1.57           | 12.74     | 54                      | 13.44      | -1.56  | 1.43           | 13.13     |                    |           |                |        |               |  |
| 5700           |               | 140  | MCS0      | 13.5        | 15.0  | 93.2       | 1.07          | 54                                 | 13.22      | -1.78  | 1.51           | 12.91     | 54                      | 13.05      | -1.95  | 1.57           | 12.74     |                    |           |                |        |               |  |
| 5745           |               | 149  | MCS0      | 12.5        | 14.0  | 93.2       | 1.07          | 54                                 | 13.29      | -0.71  | 1.18           | 12.98     | 54                      | 13.23      | -0.77  | 1.19           | 12.92     |                    |           |                |        |               |  |
| 5785           |               | 157  | MCS0      | 12.5        | 14.0  | 93.2       | 1.07          | 54                                 | 13.25      | -0.75  | 1.19           | 12.94     | 54                      | 13.45      | -0.55  | 1.14           | 13.14     |                    |           |                |        |               |  |
| 5825           |               | 165  | MCS0      | 12.5        | 14.0  | 93.2       | 1.07          | 54                                 | 13.11      | -0.89  | 1.23           | 12.80     | 54                      | 13.62      | -0.38  | 1.09           | 13.31     |                    |           |                |        |               |  |
| ac20 SISO (*4) |               | 5180 | 36        | MCS0        | 13.5  | 15.0       | 93.3          | 1.07                               | 54         | 13.01  | -1.99          | 1.58      | 12.71                   | 54         | 13.20  | -1.80          | 1.51      | 12.90              |           |                |        |               |  |
|                |               | 5200 | 40        | MCS0        | 13.5  | 15.0       | 93.3          | 1.07                               | 54         | 12.91  | -2.09          | 1.62      | 12.61                   | 54         | 13.03  | -1.97          | 1.57      | 12.73              |           |                |        |               |  |
|                | 5220          | 44   | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.09      | -1.91  | 1.55           | 12.79     | 54                      | 13.04      | -1.96  | 1.57           | 12.74     |                    |           |                |        |               |  |
|                | 5240          | 48   | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.10      | -1.90  | 1.55           | 12.80     | 54                      | 13.04      | -1.96  | 1.57           | 12.74     |                    |           |                |        |               |  |
|                | 5260          | 52   | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.08      | -1.92  | 1.56           | 12.78     | 54                      | 13.09      | -1.91  | 1.55           | 12.79     |                    |           |                |        |               |  |
|                | 5280          | 56   | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.25      | -1.75  | 1.50           | 12.95     | 54                      | 13.03      | -1.97  | 1.57           | 12.73     |                    |           |                |        |               |  |
|                | 5300          | 60   | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.18      | -1.82  | 1.52           | 12.88     | 54                      | 13.26      | -1.74  | 1.49           | 12.96     |                    |           |                |        |               |  |
|                | 5320          | 64   | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.40      | -1.60  | 1.45           | 13.10     | 54                      | 13.25      | -1.75  | 1.50           | 12.95     |                    |           |                |        |               |  |
|                | 5500          | 100  | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.30      | -1.70  | 1.48           | 13.00     | 54                      | 13.83      | -1.17  | 1.31           | 13.53     |                    |           |                |        |               |  |
|                | 5580          | 116  | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.30      | -1.70  | 1.48           | 13.00     | 54                      | 13.49      | -1.51  | 1.42           | 13.19     |                    |           |                |        |               |  |
|                | 5700          | 140  | MCS0      | 13.5        | 15.0  | 93.3       | 1.07          | 54                                 | 13.12      | -1.88  | 1.54           | 12.82     | 54                      | 13.02      | -1.98  | 1.58           | 12.72     |                    |           |                |        |               |  |
|                | 5745          | 149  | MCS0      | 12.5        | 14.0  | 93.3       | 1.07          | 54                                 | 13.32      | -0.68  | 1.17           | 13.02     | 54                      | 13.26      | -0.74  | 1.19           | 12.96     |                    |           |                |        |               |  |
|                | 5785          | 157  | MCS0      | 12.5        | 14.0  | 93.3       | 1.07          | 54                                 | 13.21      | -0.79  | 1.20           | 12.91     | 54                      | 13.52      | -0.48  | 1.12           | 13.22     |                    |           |                |        |               |  |
|                | 5825          | 165  | MCS0      | 12.5        | 14.0  | 93.3       | 1.07          | 54                                 | 13.14      | -0.86  | 1.22           | 12.84     | 54                      | 13.46      | -0.54  | 1.13           | 13.16     |                    |           |                |        |               |  |
|                | n40 SISO (*4) | 5190 | 38        | MCS0        | 10.0  | 11.5       | 87.4          | 1.14                               | 44(*1)     | 9.93   | (*)2           | -         | 9.35                    | 44(*1)     | 10.08  | (*)2           | -         | 9.50               |           |                |        |               |  |
|                |               | 5230 | 46        | MCS0        | 13.5  | 15.0       | 87.4          | 1.14                               | 58(*1)     | 13.73  | -1.27          | 1.34      | 13.15                   | 58(*1)     | 13.34  | -1.66          | 1.47      | 12.76              |           |                |        |               |  |
| 5270           |               | 54   | MCS0      | 13.5        | 15.0  | 87.4       | 1.14          | 58(*1)                             | 13.68      | -1.32  | 1.36           | 13.10     | 58(*1)                  | 13.65      | -1.35  | 1.36           | 13.07     |                    |           |                |        |               |  |
| 5310           |               | 62   | MCS0      | 13.5        | 15.0  | 87.4       | 1.14          | 58(*1)                             | 13.98      | -1.02  | 1.26           | 13.40     | 58(*1)                  | 13.73      | -1.27  | 1.34           | 13.15     |                    |           |                |        |               |  |
| 5510           |               | 102  | MCS0      | 13.5        | 15.0  | 87.4       | 1.14          | 54                                 | 13.37      | -1.63  | 1.46           | 12.79     | 54                      | 13.53      | -1.47  | 1.40           | 12.95     |                    |           |                |        |               |  |
| 5550           |               | 110  | MCS0      | 13.5        | 15.0  | 87.4       | 1.14          | 54                                 | 13.18      | -1.82  | 1.52           | 12.60     | 54                      | 13.25      | -1.75  | 1.50           | 12.67     |                    |           |                |        |               |  |
| 5670           |               | 134  | MCS0      | 13.5        | 15.0  | 87.4       | 1.14          | 54                                 | 13.06      | -1.94  | 1.56           | 12.48     | 54                      | 13.02      | -1.98  | 1.58           | 12.44     |                    |           |                |        |               |  |
| 5755           |               | 151  | MCS0      | 12.5        | 14.0  | 87.4       | 1.14          | 54                                 | 13.17      | -0.83  | 1.21           | 12.59     | 54                      | 13.26      | -0.74  | 1.19           | 12.68     |                    |           |                |        |               |  |
| 5795           |               | 159  | MCS0      | 12.5        | 14.0  | 87.4       | 1.14          | 54                                 | 13.16      | -0.84  | 1.21           | 12.58     | 54                      | 13.25      | -0.75  | 1.19           | 12.67     |                    |           |                |        |               |  |
| ac40 SISO (*4) |               | 5190 | 38        | MCS0        | 10.0  | 11.5       | 87.6          | 1.14                               | 44(*1)     | 9.88   | (*)2           | -         | 9.31                    | 44(*1)     | 10.36  | (*)2           | -         | 9.79               |           |                |        |               |  |
|                | 5230          | 46   | MCS0      | 13.5        | 15.0  | 87.6       | 1.14          | 58(*1)                             | 13.42      | -1.58  | 1.44           | 12.85     | 58(*1)                  | 13.62      | -1.38  | 1.37           | 13.05     |                    |           |                |        |               |  |
|                | 5270          | 54   | MCS0      | 13.5        | 15.0  | 87.6       | 1.14          | 58(*1)                             | 13.60      | -1.40  | 1.38           | 13.03     | 58(*1)                  | 13.60      | -1.40  | 1.38           | 13.03     |                    |           |                |        |               |  |
|                | 5310          | 62   | MCS0      | 13.5        | 15.0  | 87.6       | 1.14          | 58(*1)                             | 14.00      | -1.00  | 1.26           | 13.43     | 58(*1)                  | 13.68      | -1.32  | 1.36           | 13.11     |                    |           |                |        |               |  |
|                | 5510          | 102  | MCS0      | 13.5        | 15.0  | 87.6       | 1.14          | 54                                 | 13.39      | -1.61  | 1.45           | 12.82     | 54                      | 13.64      | -1.36  | 1.37           | 13.07     |                    |           |                |        |               |  |
|                | 5550          | 110  | MCS0      | 13.5        | 15.0  | 87.6       | 1.14          | 54                                 | 13.23      | -1.77  | 1.50           | 12.66     | 54                      | 13.27      | -1.73  | 1.49           | 12.70     |                    |           |                |        |               |  |
|                | 5670          | 134  | MCS0      | 13.5        | 15.0  | 87.6       | 1.14          | 54                                 | 13.15      | -1.85  | 1.53           | 12.58     | 54                      | 13.02      | -1.98  | 1.58           | 12.45     |                    |           |                |        |               |  |
|                | 5755          | 151  | MCS0      | 12.5        | 14.0  | 87.6       | 1.14          | 54                                 | 13.21      | -0.79  | 1.20           | 12.64     | 54                      | 13.20      | -0.80  | 1.20           | 12.63     |                    |           |                |        |               |  |
| ac80 SISO (*4) | 5795          | 159  | MCS0      | 12.5        | 14.0  | 87.6       | 1.14          | 54                                 | 13.18      | -0.82  | 1.21           | 12.61     | 54                      | 13.23      | -0.77  | 1.19           | 12.66     |                    |           |                |        |               |  |
|                | 5210          | 42   | MCS0      | 9.0         | 10.5  | 77.7       | 1.29          | 40(*1)                             | 8.64       | -      | -              | 7.54      | 40(*1)                  | 9.03       | -      | -              | 7.93      |                    |           |                |        |               |  |
|                | 5290          | 58   | MCS0      | 9.0         | 10.5  | 77.7       | 1.29          |                                    |            |        |                |           |                         |            |        |                |           |                    |           |                |        |               |  |

(cont'd)(5GHz band)

| Mode           | Frequency |     | Data rate | Power spec. |       | Duty cycle |               | Antenna 0 power (Wi-Fi, Bluetooth) |            |        |                |           | Antenna 1 power (Wi-Fi) |            |        |                |           | MIMO Ant0+1 power |           |                |        |               |
|----------------|-----------|-----|-----------|-------------|-------|------------|---------------|------------------------------------|------------|--------|----------------|-----------|-------------------------|------------|--------|----------------|-----------|-------------------|-----------|----------------|--------|---------------|
|                |           |     |           | Typical     | Max.  | duty cycle | scaled factor | Set pwr.                           | Burst Ave. | Δ Max. | Tune-up factor | Time Ave. | Set pwr.                | Burst Ave. | Δ Max. | Tune-up factor | Time Ave. | MIMO target       | MIMO max. | SUM Burst Ave. | Δ Max. | SUM Time Ave. |
|                | [MHz]     | CH  | [Mbps]    | [dBm]       | [dBm] | [%]        | [-]           | [-]                                | [dBm]      | [dB]   | [-]            | [dBm]     | [-]                     | [dBm]      | [dB]   | [-]            | [dBm]     | [dBm]             | [dBm]     | [dB]           | [dBm]  |               |
| n20 MIMO (*5)  | 5180      | 36  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.73       | -      | -              | 9.16      | -                       | 10.43      | -      | -              | 9.86      | 13.5              | 15.0      | 13.10          | -      | 12.53         |
|                | 5200      | 40  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.84       | -      | -              | 9.27      | -                       | 10.30      | -      | -              | 9.73      | 13.5              | 15.0      | 13.09          | -      | 12.52         |
|                | 5220      | 44  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.83       | -      | -              | 9.26      | -                       | 10.26      | -      | -              | 9.69      | 13.5              | 15.0      | 13.06          | -      | 12.49         |
|                | 5240      | 48  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.93       | -      | -              | 9.36      | -                       | 10.28      | -      | -              | 9.71      | 13.5              | 15.0      | 13.12          | -      | 12.55         |
|                | 5260      | 52  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.75       | -      | -              | 9.18      | -                       | 10.50      | -      | -              | 9.93      | 13.5              | 15.0      | 13.15          | -      | 12.58         |
|                | 5280      | 56  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.83       | -      | -              | 9.26      | -                       | 10.44      | -      | -              | 9.87      | 13.5              | 15.0      | 13.16          | -      | 12.59         |
|                | 5300      | 60  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 9.98       | -      | -              | 9.41      | -                       | 10.52      | -      | -              | 9.95      | 13.5              | 15.0      | 13.27          | -      | 12.70         |
|                | 5320      | 64  | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.11      | -      | -              | 9.54      | -                       | 10.51      | -      | -              | 9.94      | 13.5              | 15.0      | 13.33          | -      | 12.75         |
|                | 5500      | 100 | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.23      | -      | -              | 9.66      | -                       | 10.93      | -      | -              | 10.36     | 13.5              | 15.0      | 13.60          | -      | 13.03         |
|                | 5580      | 116 | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.08      | -      | -              | 9.51      | -                       | 10.48      | -      | -              | 9.91      | 13.5              | 15.0      | 13.30          | -      | 12.72         |
|                | 5700      | 140 | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.27      | -      | -              | 9.70      | -                       | 10.37      | -      | -              | 9.80      | 13.5              | 15.0      | 13.33          | -      | 12.76         |
|                | 5745      | 149 | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.51      | -      | -              | 9.94      | -                       | 10.41      | -      | -              | 9.84      | 13.5              | 15.0      | 13.47          | -      | 12.90         |
|                | 5785      | 157 | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.40      | -      | -              | 9.83      | -                       | 10.57      | -      | -              | 10.00     | 13.5              | 15.0      | 13.49          | -      | 12.93         |
|                | 5825      | 165 | MCS8      | 10.5        | 12.0  | 87.7       | 1.14          | 42                                 | 10.31      | -      | -              | 9.74      | -                       | 10.57      | -      | -              | 10.00     | 13.5              | 15.0      | 13.45          | -      | 12.88         |
| ac20 MIMO (*5) | 5180      | 36  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.79       | -      | -              | 9.22      | -                       | 10.35      | -      | -              | 9.78      | 13.5              | 15.0      | 13.09          | -      | 12.52         |
|                | 5200      | 40  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.87       | -      | -              | 9.30      | -                       | 10.43      | -      | -              | 9.86      | 13.5              | 15.0      | 13.17          | -      | 12.60         |
|                | 5220      | 44  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.88       | -      | -              | 9.31      | -                       | 10.22      | -      | -              | 9.65      | 13.5              | 15.0      | 13.06          | -      | 12.49         |
|                | 5240      | 48  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.91       | -      | -              | 9.34      | -                       | 10.20      | -      | -              | 9.63      | 13.5              | 15.0      | 13.07          | -      | 12.50         |
|                | 5260      | 52  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.80       | -      | -              | 9.23      | -                       | 10.38      | -      | -              | 9.81      | 13.5              | 15.0      | 13.11          | -      | 12.54         |
|                | 5280      | 56  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.82       | -      | -              | 9.25      | -                       | 10.41      | -      | -              | 9.84      | 13.5              | 15.0      | 13.13          | -      | 12.56         |
|                | 5300      | 60  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 9.94       | -      | -              | 9.37      | -                       | 10.41      | -      | -              | 9.84      | 13.5              | 15.0      | 13.19          | -      | 12.62         |
|                | 5320      | 64  | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.11      | -      | -              | 9.54      | -                       | 10.54      | -      | -              | 9.97      | 13.5              | 15.0      | 13.34          | -      | 12.77         |
|                | 5500      | 100 | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.31      | -      | -              | 9.74      | -                       | 10.89      | -      | -              | 10.32     | 13.5              | 15.0      | 13.62          | -      | 13.05         |
|                | 5580      | 116 | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.10      | -      | -              | 9.53      | -                       | 10.43      | -      | -              | 9.86      | 13.5              | 15.0      | 13.28          | -      | 12.71         |
|                | 5700      | 140 | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.29      | -      | -              | 9.72      | -                       | 10.43      | -      | -              | 9.86      | 13.5              | 15.0      | 13.37          | -      | 12.80         |
|                | 5745      | 149 | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.45      | -      | -              | 9.88      | -                       | 10.37      | -      | -              | 9.80      | 13.5              | 15.0      | 13.42          | -      | 12.85         |
|                | 5785      | 157 | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.38      | -      | -              | 9.81      | -                       | 10.57      | -      | -              | 10.00     | 13.5              | 15.0      | 13.48          | -      | 12.92         |
|                | 5825      | 165 | MCS0      | 10.5        | 12.0  | 87.8       | 1.14          | 42                                 | 10.27      | -      | -              | 9.70      | -                       | 10.67      | -      | -              | 10.10     | 13.5              | 15.0      | 13.48          | -      | 12.91         |
| n40 MIMO (*5)  | 5190      | 38  | MCS8      | 7.0         | 8.5   | 79.0       | 1.27          | 32(*1)                             | 6.57       | -      | -              | 5.55      | -                       | 7.44       | -      | -              | 6.42      | 10.0              | 11.5      | 10.04          | -      | 9.02          |
|                | 5230      | 46  | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 9.77       | -      | -              | 8.75      | -                       | 10.23      | -      | -              | 9.21      | 13.5              | 15.0      | 13.01          | -      | 12.00         |
|                | 5270      | 54  | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 9.80       | -      | -              | 8.78      | -                       | 10.41      | -      | -              | 9.39      | 13.5              | 15.0      | 13.13          | -      | 12.11         |
|                | 5310      | 62  | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 10.04      | -      | -              | 9.02      | -                       | 10.49      | -      | -              | 9.47      | 13.5              | 15.0      | 13.28          | -      | 12.26         |
|                | 5510      | 102 | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 10.32      | -      | -              | 9.30      | -                       | 11.00      | -      | -              | 9.98      | 13.5              | 15.0      | 13.68          | -      | 12.66         |
|                | 5550      | 110 | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 10.25      | -      | -              | 9.23      | -                       | 11.04      | -      | -              | 10.02     | 13.5              | 15.0      | 13.67          | -      | 12.66         |
|                | 5670      | 134 | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 10.13      | -      | -              | 9.11      | -                       | 10.65      | -      | -              | 9.63      | 13.5              | 15.0      | 13.41          | -      | 12.39         |
|                | 5755      | 151 | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 10.59      | -      | -              | 9.57      | -                       | 10.62      | -      | -              | 9.60      | 13.5              | 15.0      | 13.62          | -      | 12.60         |
|                | 5795      | 159 | MCS8      | 10.5        | 12.0  | 79.0       | 1.27          | 42                                 | 10.44      | -      | -              | 9.42      | -                       | 10.66      | -      | -              | 9.64      | 13.5              | 15.0      | 13.56          | -      | 12.54         |
| ac40 MIMO (*5) | 5190      | 38  | MCS0      | 7.0         | 8.5   | 79.1       | 1.26          | 32(*1)                             | 6.55       | -      | -              | 5.53      | -                       | 7.42       | -      | -              | 6.40      | 10.0              | 11.5      | 10.02          | -      | 9.00          |
|                | 5230      | 46  | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 9.72       | -      | -              | 8.70      | -                       | 10.26      | -      | -              | 9.24      | 13.5              | 15.0      | 13.01          | -      | 11.99         |
|                | 5270      | 54  | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 9.81       | -      | -              | 8.79      | -                       | 10.42      | -      | -              | 9.40      | 13.5              | 15.0      | 13.14          | -      | 12.12         |
|                | 5310      | 62  | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 9.88       | -      | -              | 8.86      | -                       | 10.47      | -      | -              | 9.45      | 13.5              | 15.0      | 13.20          | -      | 12.17         |
|                | 5510      | 102 | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 10.34      | -      | -              | 9.32      | -                       | 11.07      | -      | -              | 10.05     | 13.5              | 15.0      | 13.73          | -      | 12.71         |
|                | 5550      | 110 | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 10.27      | -      | -              | 9.25      | -                       | 10.98      | -      | -              | 9.96      | 13.5              | 15.0      | 13.65          | -      | 12.63         |
|                | 5670      | 134 | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 10.27      | -      | -              | 9.25      | -                       | 10.67      | -      | -              | 9.65      | 13.5              | 15.0      | 13.48          | -      | 12.46         |
|                | 5755      | 151 | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 10.65      | -      | -              | 9.63      | -                       | 10.60      | -      | -              | 9.58      | 13.5              | 15.0      | 13.63          | -      | 12.62         |
|                | 5795      | 159 | MCS0      | 10.5        | 12.0  | 79.1       | 1.26          | 42                                 | 10.57      | -      | -              | 9.55      | -                       | 10.64      | -      | -              | 9.62      | 13.5              | 15.0      | 13.62          | -      | 12.60         |
| ac80 MIMO (*5) | 5210      | 42  | MCS0      | 6.0         | 7.5   | 67.1       | 1.49          | 28(*1)                             | 5.48       | -      | -              | 3.75      | -                       | 5.79       | -      | -              | 4.06      | 9.0               | 10.5      | 8.65           | -      | 6.92          |
|                | 5290      | 58  | MCS0      | 6.0         | 7.5   | 67.1       | 1.49          | 28(*1)                             | 5.59       | -      | -              | 3.86      | -                       | 5.82       | -      | -              | 4.09      | 9.0               | 10.5      | 8.72           | -      | 6.98          |
|                | 5530      | 106 | MCS0      | 7.5         | 9.0   | 67.1       | 1.49          | -                                  | -(*3)      | -      | -              | -         | -                       | -(*3)      | -      | -              | -         | 10.5              | 12.0      | -(*3)          | -      | -             |
|                | 5775      | 155 | MCS0      | 10.5        | 12.0  | 67.1       | 1.49          | 42                                 | 10.47      | -      | -              | 8.74      | -                       | 10.41      | -      | -              | 8.68      | 13.5              | 15.0      | 13.45          | -      | 11.72         |

\*. CH: Channel; Power spec.: Power specification; Max.: Maximum; Set pwr.: Setting power; Burst Ave.: Measured burst average power; SUM Ave.: Sum of antenna 0 power and antenna 1 power; Mode: n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11n(40VHT), ac80: IEEE 802.11ac(80VHT).

\*1. The power setting was adjusted so that measured average power was not more than 2 dB lower than the maximum tune-up tolerance limit.

\*2. Since the lower channel of this mode had lower power than other channels, the lower channel of other mode was tested to verify the SAR at lower channel.

\*3. Since the power of 5530MHz in ac80 mode was changed smaller than the lower bandwidth mode after initial power measurement, the power of this channel was not measured again and not applied the SAR test.

\*4. When the same transmission mode configurations have the same maximum output power on the same channel for the a/n/ac modes, the channel with the largest bandwidth and lowest data rate is selected.

\*5. The standalone (SISO) SAR results were considered acceptable for the MIMO simultaneous transmission analysis as the MIMO power does not exceed the SISO power. The antenna separation distance will not be less than 50mm.

\*6. When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is;  $\leq 1.2$  W/kg, SAR is not required for UNII band I /  $> 1.2$  W/kg, both bands should be tested independently for SAR.

\*. Calculating formula: Burst power (dBm) = (P/M Reading, dBm) + (Cable loss, dB) + (Attenuator, dB) + (duty factor, dB)  
Duty cycle: (duty cycle, %) = (Tx on time, ms) / (1 cycle time, ms)  $\times 100$ , where Duty factor (dBm) =  $10 \times \log(100/\text{duty cycle, \%})$   
Duty cycle scaled factor: Duty cycle correction factor for obtained SAR value, Duty scaled factor [-] =  $100(\%) / (\text{duty cycle, \%})$   
ΔMax. (Deviation from maximum power, dB) = (Burst power measured (average, dBm)) - (Max.tune-up limit power (average, dBm))  
Tune-up factor: Power tune-up factor for obtained SAR value, Tune-up factor [-] =  $1 / (10^{(\text{"Deviation from max., dB"} / 10)})$

\*. Date measured: January 8~11, 2019 / Measured by: H. Naka / Place: No. 1 measurement room. (25 ± 1 deg.C/50 ± 10 %RH)

\*. Uncertainty of antenna port conducted test; (±) 0.81 dB (Average power), (±) 0.95 dB (Average power, BW80MHz), (±) 0.012 % (duty cycle).

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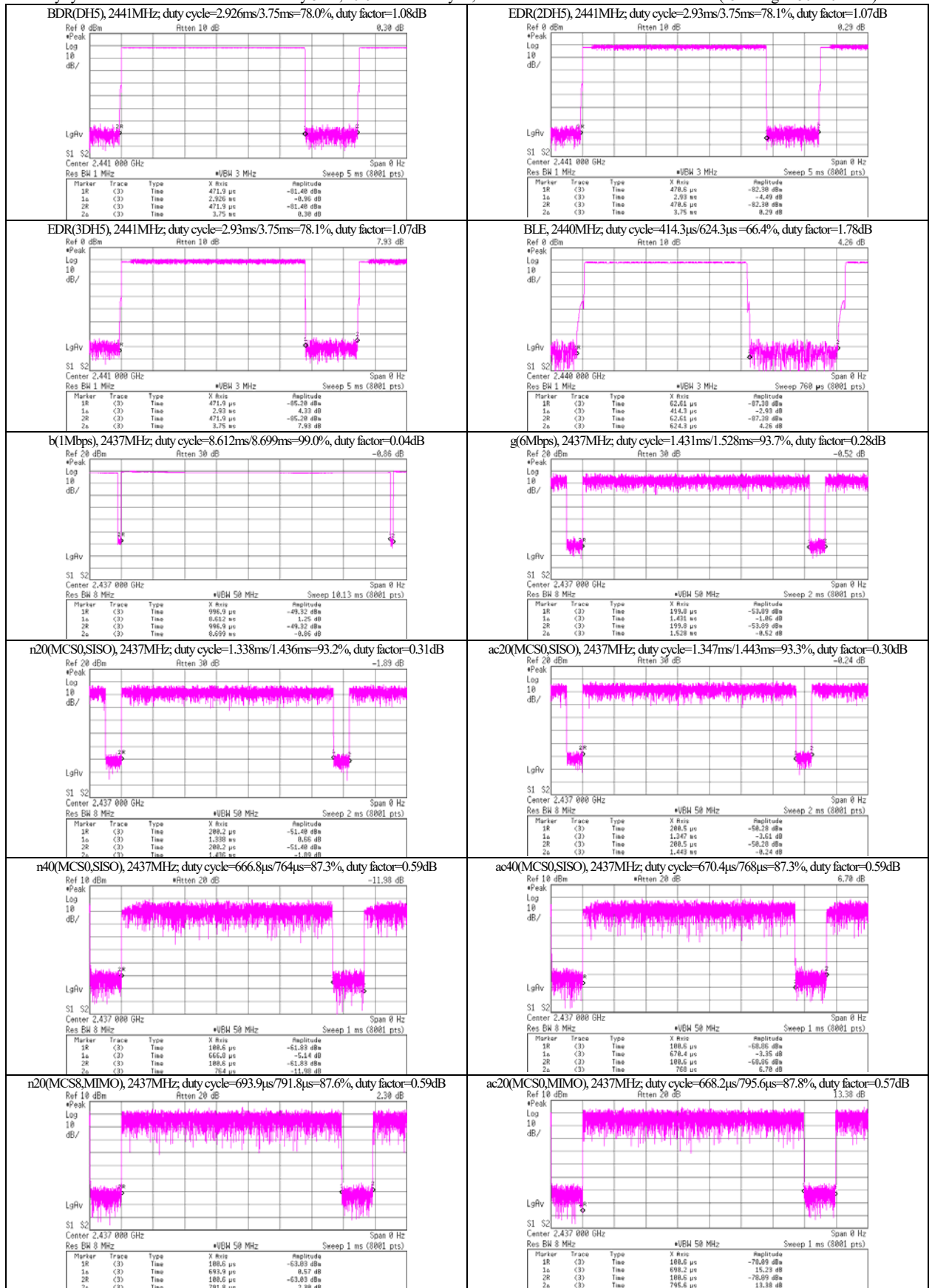
Shonan EMC Lab.

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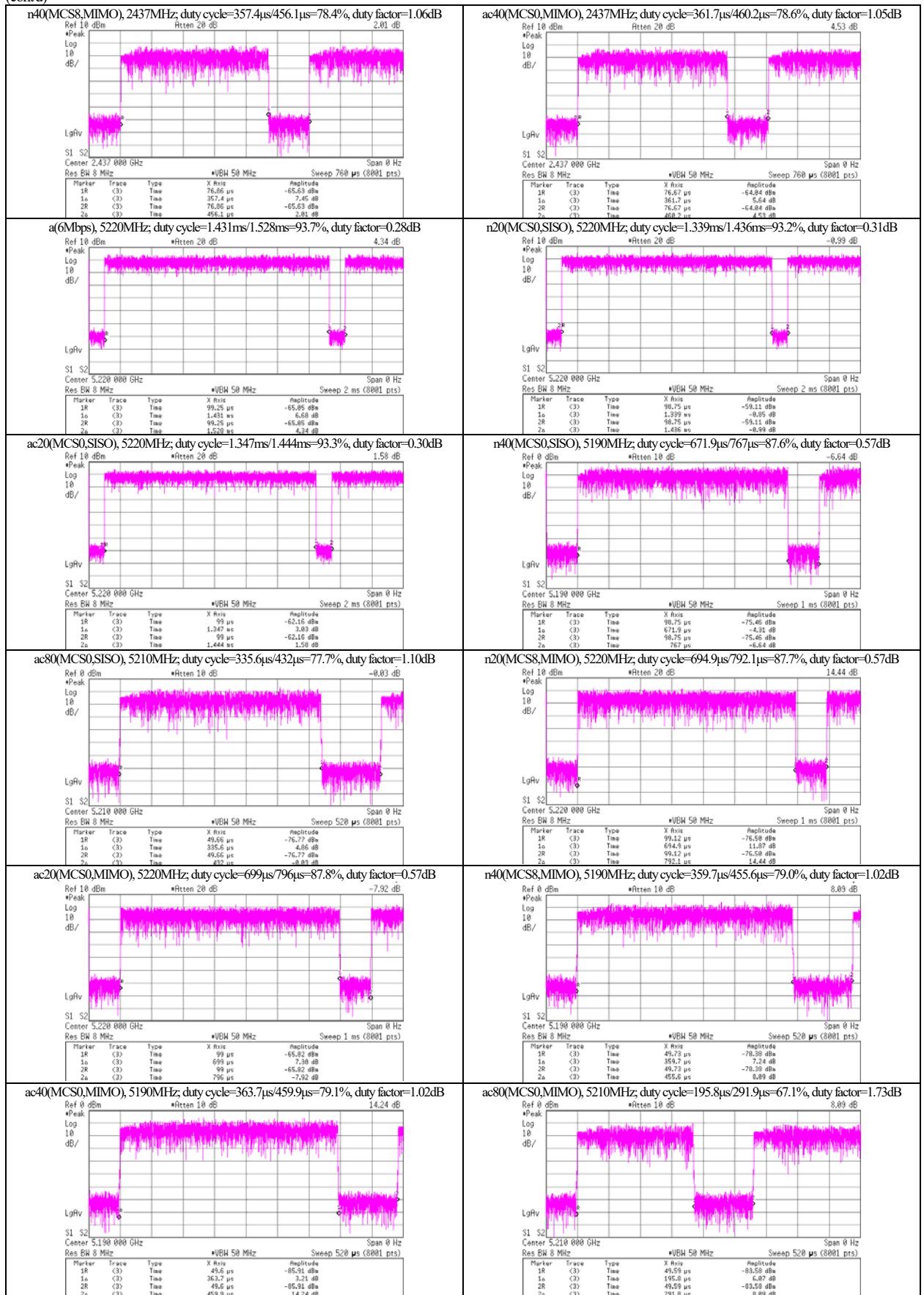
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\*. Duty cycle conformation. Date measured: January 8~11, 2019 / Measured by: Y. Ishikawa / Place: No. 1 measurement room. (25 ± 1 deg.C/50 ± 10 %RH)



(cont'd)



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**SECTION 7: SAR Measurement results****7.1 Liquid parameters**

Measurement date: June 28 ~ February 6, 2019

Measurement by: Hiroshi Naka

**[Liquid measurement]**

| Target Frequency [MHz] | Liquid type | Liquid parameters (*a) |          |       |                        |                    |                        |       |                       | ASAR Coefficients(*c) |               |          |       | Date measured         |                                           |
|------------------------|-------------|------------------------|----------|-------|------------------------|--------------------|------------------------|-------|-----------------------|-----------------------|---------------|----------|-------|-----------------------|-------------------------------------------|
|                        |             | Permittivity (εr) [-]  |          |       |                        | Conductivity [S/m] |                        |       |                       | Temp. [deg.C.]        | Depth [mm]    | ASAR [%] |       |                       | Correction required?                      |
|                        |             | Target                 | Measured |       | Limit (*b)             | Target             | Measured               |       | Limit (*b)            |                       |               | (1g)     | (10g) |                       |                                           |
| 2412                   | Body        | 52.75                  | 50.94    | -3.4  | -5% ≤                  | 1.914              | 1.969                  | +2.9  | 0% ≤                  | 21.9                  | 151           | +2.19    | +1.32 | not required.         | January 28~29, 2019, before SAR test (*1) |
| 2437                   |             | 52.72                  | 50.85    | -3.6  | εr-meas. ≤ 0%          | 1.938              | 2.003                  | +3.4  | σ-meas. ≤ +5%         |                       |               | +2.43    | +1.45 | not required.         |                                           |
| 2462                   |             | 52.68                  | 50.74    | -3.7  |                        | 1.967              | 2.038                  | +3.6  |                       |                       |               | +2.56    | +1.52 | not required.         |                                           |
| 5180                   | Body        | 49.04                  | 48.51    | -1.1  | -5% ≤<br>εr-meas. ≤ 0% | 5.276              | 5.334                  | +1.1  | 0% ≤<br>σ-meas. ≤ +5% | 23.0                  | 151           | +0.19    | +0.22 | not required.         | January 30, 2019, before SAR test         |
| 5190                   |             | 49.03                  | 48.45    | -1.2  |                        | 5.288              | 5.343                  | +1.0  |                       |                       |               | +0.21    | +0.24 | not required.         |                                           |
| 5220                   |             | 48.99                  | 48.40    | -1.2  |                        | 5.323              | 5.391                  | +1.3  |                       |                       |               | +0.21    | +0.24 | not required.         |                                           |
| 5230                   |             | 48.97                  | 48.42    | -1.1  |                        | 5.334              | 5.405                  | +1.3  |                       |                       |               | +0.19    | +0.22 | not required.         |                                           |
| 5240                   |             | 48.96                  | 48.40    | -1.1  |                        | 5.346              | 5.422                  | +1.4  |                       |                       |               | +0.19    | +0.22 | not required.         |                                           |
| 5260                   |             | 48.93                  | 48.36    | -1.2  |                        | 5.369              | 5.438                  | +1.3  |                       |                       |               | +0.20    | +0.23 | not required.         |                                           |
| 5270                   |             | 48.92                  | 48.35    | -1.2  |                        | 5.381              | 5.459                  | +1.4  |                       |                       |               | +0.19    | +0.22 | not required.         |                                           |
| 5300                   |             | 48.88                  | 48.30    | -1.2  |                        | 5.416              | 5.494                  | +1.4  |                       |                       |               | +0.19    | +0.23 | not required.         |                                           |
| 5310                   |             | 48.87                  | 48.28    | -1.2  |                        | 5.428              | 5.501                  | +1.4  |                       |                       |               | +0.20    | +0.24 | not required.         |                                           |
| 5320                   |             | 48.85                  | 48.25    | -1.2  |                        | 5.439              | 5.512                  | +1.3  |                       |                       |               | +0.20    | +0.24 | not required.         |                                           |
| 5500                   |             | Body                   | 48.61    | 47.97 |                        | -1.3               | -5% ≤<br>εr-meas. ≤ 0% | 5.650 |                       |                       |               | 5.768    | +2.1  | 0% ≤<br>σ-meas. ≤ +5% |                                           |
| 5510                   | 48.59       |                        | 47.97    | -1.3  | 5.661                  | 5.775              |                        | +2.0  | +0.17                 | +0.24                 | not required. |          |       |                       |                                           |
| 5550                   | 48.54       |                        | 47.90    | -1.3  | 5.708                  | 5.827              |                        | +2.1  | +0.17                 | +0.24                 | not required. |          |       |                       |                                           |
| 5580                   | 48.50       |                        | 47.87    | -1.3  | 5.743                  | 5.874              |                        | +2.3  | +0.16                 | +0.23                 | not required. |          |       |                       |                                           |
| 5670                   | 48.49       |                        | 47.85    | -1.3  | 5.755                  | 5.883              |                        | +2.2  | +0.16                 | +0.24                 | not required. |          |       |                       |                                           |
| 5700                   | Body        | 48.38                  | 47.70    | -1.4  | -5% ≤<br>εr-meas. ≤ 0% | 5.848              | 6.006                  | +2.7  | 0% ≤<br>σ-meas. ≤ +5% | 23.0                  | 151           | +0.15    | +0.25 | not required.         | February 1, 2019, before SAR test         |
| 5745                   |             | 48.27                  | 47.60    | -1.4  |                        | 5.936              | 6.108                  | +2.9  |                       |                       |               | +0.15    | +0.25 | not required.         |                                           |
| 5755                   |             | 48.26                  | 47.58    | -1.4  |                        | 5.947              | 6.134                  | +3.1  |                       |                       |               | +0.14    | +0.25 | not required.         |                                           |
| 5775                   |             | 48.23                  | 47.56    | -1.4  |                        | 5.971              | 6.155                  | +3.1  |                       |                       |               | +0.14    | +0.25 | not required.         |                                           |
| 5785                   |             | 48.22                  | 47.51    | -1.5  |                        | 5.982              | 6.172                  | +3.2  |                       |                       |               | +0.15    | +0.27 | not required.         |                                           |
| 5795                   |             | 48.21                  | 47.52    | -1.4  |                        | 5.994              | 6.182                  | 3.1   |                       |                       |               | +0.14    | +0.27 | not required.         |                                           |
| 5825                   | Body        | 48.17                  | 47.49    | -1.4  | -5% ≤<br>εr-meas. ≤ 0% | 6.029              | 6.220                  | +3.2  | 0% ≤<br>σ-meas. ≤ +5% | 23.0                  | 151           | +0.14    | +0.26 | not required.         | February 4, 2019, before SAR test         |
| 5180                   |             | 49.04                  | 48.42    | -1.3  |                        | 5.276              | 5.364                  | +1.7  |                       |                       |               | +0.22    | +0.24 | not required.         |                                           |
| 5190                   |             | 49.03                  | 48.43    | -1.2  |                        | 5.288              | 5.370                  | +1.6  |                       |                       |               | +0.21    | +0.23 | not required.         |                                           |
| 5220                   |             | 48.99                  | 48.37    | -1.3  |                        | 5.323              | 5.417                  | +1.8  |                       |                       |               | +0.21    | +0.23 | not required.         |                                           |
| 5230                   |             | 48.97                  | 48.34    | -1.3  |                        | 5.334              | 5.434                  | +1.9  |                       |                       |               | +0.21    | +0.24 | not required.         |                                           |
| 5240                   |             | 48.96                  | 48.32    | -1.3  |                        | 5.346              | 5.446                  | +1.9  |                       |                       |               | +0.21    | +0.23 | not required.         |                                           |
| 5260                   |             | 48.93                  | 48.27    | -1.4  |                        | 5.369              | 5.480                  | +2.1  |                       |                       |               | +0.21    | +0.24 | not required.         |                                           |
| 5270                   |             | 48.92                  | 48.25    | -1.4  |                        | 5.381              | 5.484                  | +1.9  |                       |                       |               | +0.22    | +0.25 | not required.         |                                           |
| 5300                   |             | 48.88                  | 48.23    | -1.3  |                        | 5.416              | 5.531                  | +2.1  |                       |                       |               | +0.20    | +0.23 | not required.         |                                           |
| 5310                   | Body        | 48.87                  | 48.20    | -1.4  | -5% ≤<br>εr-meas. ≤ 0% | 5.428              | 5.533                  | +1.9  | 0% ≤<br>σ-meas. ≤ +5% | 23.0                  | 151           | +0.21    | +0.25 | not required.         | February 5, 2019, before SAR test         |
| 5320                   |             | 48.85                  | 48.21    | -1.3  |                        | 5.439              | 5.540                  | +1.9  |                       |                       |               | +0.20    | +0.24 | not required.         |                                           |
| 5500                   |             | 48.61                  | 47.93    | -1.4  |                        | 5.650              | 5.793                  | +2.5  |                       |                       |               | +0.17    | +0.24 | not required.         |                                           |
| 5510                   |             | 48.59                  | 47.90    | -1.4  |                        | 5.661              | 5.793                  | +2.3  |                       |                       |               | +0.19    | +0.26 | not required.         |                                           |
| 5550                   |             | 48.54                  | 47.82    | -1.5  |                        | 5.708              | 5.866                  | +2.8  |                       |                       |               | +0.18    | +0.25 | not required.         |                                           |
| 5580                   |             | 48.50                  | 47.79    | -1.5  |                        | 5.743              | 5.898                  | +2.7  |                       |                       |               | +0.17    | +0.25 | not required.         |                                           |
| 5670                   | Body        | 48.49                  | 47.75    | -1.5  | -5% ≤<br>εr-meas. ≤ 0% | 5.755              | 5.917                  | +2.8  | 0% ≤<br>σ-meas. ≤ +5% | 23.0                  | 151           | +0.18    | +0.27 | not required.         | February 6, 2019, before SAR test         |
| 5700                   |             | 48.38                  | 47.62    | -1.6  |                        | 5.848              | 6.026                  | +3.1  |                       |                       |               | +0.17    | +0.28 | not required.         |                                           |
| 5745                   |             | 48.27                  | 47.50    | -1.6  |                        | 5.936              | 6.130                  | +3.3  |                       |                       |               | +0.17    | +0.30 | not required.         |                                           |
| 5755                   |             | 48.26                  | 47.48    | -1.6  |                        | 5.947              | 6.148                  | +3.4  |                       |                       |               | +0.17    | +0.30 | not required.         |                                           |
| 5775                   |             | 48.23                  | 47.45    | -1.6  |                        | 5.971              | 6.181                  | +3.5  |                       |                       |               | +0.16    | +0.30 | not required.         |                                           |
| 5785                   |             | 48.22                  | 47.46    | -1.6  |                        | 5.982              | 6.183                  | +3.4  |                       |                       |               | +0.16    | +0.29 | not required.         |                                           |
| 5795                   |             | 48.21                  | 47.43    | -1.6  |                        | 5.994              | 6.196                  | +3.4  |                       |                       |               | +0.17    | +0.30 | not required.         |                                           |
| 5825                   |             | 48.17                  | 47.38    | -1.6  |                        | 6.029              | 6.250                  | +3.7  |                       |                       |               | +0.16    | +0.31 | not required.         |                                           |

\*1. On January 29, it was within 24 hours from measurement on January 28 and same liquid temperature, so parameters of January 28 were used continuously.

\*a. The target values of (2000, 2450, 3000 and 5800) MHz are parameters defined in Appendix A of KDB 865664 D01. For other frequencies, the target nominal dielectric values shall be obtained by linear interpolation between the higher and lower tabulated figures. Above 5800MHz were obtained using linear extrapolation.

\*b. Calculating formula:  $\Delta\text{SAR}(1g) = C\sigma \times \Delta\epsilon_r + C\sigma \times \Delta\sigma$ ,  $C\sigma = 7.854E-4 \times f^3 + 9.402E-3 \times f^2 - 2.742E-2 \times f + 0.206$  /  $C\sigma = 9.804E-3 \times f^3 - 8.661E-2 \times f^2 + 2.981E-2 \times f + 0.7829$ 

\*c. Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction.

Calculating formula:  $\Delta\text{SAR corrected SAR (W/kg)} = (\text{Meas. SAR (W/kg)}) \times (100 - (\Delta\text{SAR}(\%))) / 100$

## 7.2 SAR results: 2.4 GHz band

| Test setup                                     |          |              | Mode | Data rate [Mbps] or [MCS] | Frequency |    | Duty cycle |                    | Power correction    |             |                | SAR results [W/kg]<br>(Max.value of multi-peak) |          |                |               | SAR plot # in Appendix 2-2 | SAR type | SAR Limit [W/kg] | Remarks         |
|------------------------------------------------|----------|--------------|------|---------------------------|-----------|----|------------|--------------------|---------------------|-------------|----------------|-------------------------------------------------|----------|----------------|---------------|----------------------------|----------|------------------|-----------------|
| Test position<br>*** is Initial test position. | Gap [mm] | Source power |      |                           | [MHz]     | CH | Duty [%]   | Duty scaled factor | Tune-up limit [dBm] | Meas. [dBm] | Tune-up factor | Meas.                                           | ASAR [%] | ASAR corrected | Reported (*b) |                            |          |                  |                 |
| [Tx: Antenna 0]                                |          |              |      |                           |           |    |            |                    |                     |             |                |                                                 |          |                |               |                            |          |                  |                 |
| Bottom*                                        | 0        | Battery      | b    | 1                         | 2412      | 1  | 99.0       | 1.01               | 19.0                | 17.08       | 1.56           | 0.482                                           | +2.19    | n/a (*a)       | 0.759         | 1-1                        | 1g       | 1.6              | *Higher, SAR1g  |
|                                                |          | Battery      |      |                           | 2437      | 6  | 99.0       | 1.01               | 19.0                | 17.15       | 1.53           | 0.442                                           | +2.43    | n/a (*a)       | 0.683         | 1-3                        | 1g       | 1.6              | -               |
|                                                |          | Battery      |      |                           | 2462      | 11 | 99.0       | 1.01               | 19.0                | 17.00       | 1.58           | 0.408                                           | +2.56    | n/a (*a)       | 0.651         | 1-4                        | 1g       | 1.6              | -               |
| Front                                          | 0        | USB          | b    | 1                         | 2412      | 1  | 99.0       | 1.01               | 19.0                | 17.08       | 1.56           | 0.307                                           | +1.32    | n/a (*a)       | 0.484         | 1-5                        | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2437      | 6  | 99.0       | 1.01               | 19.0                | 17.15       | 1.53           | 0.285                                           | +1.45    | n/a (*a)       | 0.440         | 1-6                        | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2462      | 11 | 99.0       | 1.01               | 19.0                | 17.00       | 1.58           | 0.280                                           | +1.52    | n/a (*a)       | 0.447         | 1-7                        | 10g      | 4.0              | -               |
| Back                                           | 0        | USB          | b    | 1                         | 2412      | 1  | 99.0       | 1.01               | 19.0                | 17.08       | 1.56           | 0.480                                           | +1.32    | n/a (*a)       | 0.756         | 1-2                        | 10g      | 4.0              | *Higher, SAR10g |
|                                                |          | USB          |      |                           | 2437      | 6  | 99.0       | 1.01               | 19.0                | 17.15       | 1.53           | 0.446                                           | +1.45    | n/a (*a)       | 0.689         | 1-8                        | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2462      | 11 | 99.0       | 1.01               | 19.0                | 17.00       | 1.58           | 0.392                                           | +1.52    | n/a (*a)       | 0.626         | 1-9                        | 10g      | 4.0              | -               |
| [Tx: Antenna 1]                                |          |              |      |                           |           |    |            |                    |                     |             |                |                                                 |          |                |               |                            |          |                  |                 |
| Top*                                           | 0        | USB          | b    | 1                         | 2412      | 1  | 99.0       | 1.01               | 19.0                | 17.01       | 1.58           | 0.242                                           | +1.32    | n/a (*a)       | 0.386         | 1-10                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2437      | 6  | 99.0       | 1.01               | 19.0                | 17.06       | 1.56           | 0.275                                           | +1.45    | n/a (*a)       | 0.433         | 1-11                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2462      | 11 | 99.0       | 1.01               | 19.0                | 17.00       | 1.58           | 0.301                                           | +1.52    | n/a (*a)       | 0.480         | 1-12                       | 10g      | 4.0              | -               |
| Front                                          | 0        | USB          | b    | 1                         | 2412      | 1  | 99.0       | 1.01               | 19.0                | 17.01       | 1.58           | 0.229                                           | +1.32    | n/a (*a)       | 0.365         | 1-13                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2437      | 6  | 99.0       | 1.01               | 19.0                | 17.06       | 1.56           | 0.246                                           | +1.45    | n/a (*a)       | 0.388         | 1-14                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2462      | 11 | 99.0       | 1.01               | 19.0                | 17.00       | 1.58           | 0.261                                           | +1.52    | n/a (*a)       | 0.417         | 1-15                       | 10g      | 4.0              | -               |
| Back                                           | 0        | USB          | b    | 1                         | 2412      | 1  | 99.0       | 1.01               | 19.0                | 17.01       | 1.58           | n/a                                             | +1.32    | n/a (*a)       | n/a           | -                          | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2437      | 6  | 99.0       | 1.01               | 19.0                | 17.06       | 1.56           | 0.062                                           | +1.45    | n/a (*a)       | 0.098         | 1-16                       | 10g      | 4.0              | <2              |
|                                                |          | USB          |      |                           | 2462      | 11 | 99.0       | 1.01               | 19.0                | 17.00       | 1.58           | n/a                                             | +1.52    | n/a (*a)       | n/a           | -                          | 10g      | 4.0              | -               |
| [Tx: Antenna 0] (OFDM mode)                    |          |              |      |                           |           |    |            |                    |                     |             |                |                                                 |          |                |               |                            |          |                  |                 |
| Bottom                                         | 0        | Battery      | g    | 6                         | 2412      | 1  | 93.7       | 1.07               | 17.0                | 16.32       | 1.17           | 0.405                                           | +2.19    | n/a (*a)       | 0.507         | 1-17                       | 1g       | 1.6              | -               |
|                                                |          | Battery      |      |                           | 2437      | 6  | 93.7       | 1.07               | 18.0                | 16.20       | 1.51           | 0.349                                           | +2.43    | n/a (*a)       | 0.564         | 1-18                       | 1g       | 1.6              | -               |
|                                                |          | Battery      |      |                           | 2462      | 11 | 93.7       | 1.07               | 18.0                | 16.02       | 1.58           | 0.339                                           | +2.56    | n/a (*a)       | 0.573         | 1-19                       | 1g       | 1.6              | -               |
| Back                                           | 0        | USB          | g    | 6                         | 2412      | 1  | 93.7       | 1.07               | 17.0                | 16.32       | 1.17           | 0.401                                           | +1.32    | n/a (*a)       | 0.502         | 1-20                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2437      | 6  | 93.7       | 1.07               | 18.0                | 16.20       | 1.51           | 0.359                                           | +1.45    | n/a (*a)       | 0.580         | 1-21                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2462      | 11 | 93.7       | 1.07               | 18.0                | 16.02       | 1.58           | 0.310                                           | +1.52    | n/a (*a)       | 0.524         | 1-22                       | 10g      | 4.0              | -               |
| [Tx: Antenna 1] (OFDM mode)                    |          |              |      |                           |           |    |            |                    |                     |             |                |                                                 |          |                |               |                            |          |                  |                 |
| Top                                            | 0        | USB          | g    | 6                         | 2412      | 1  | 93.7       | 1.07               | 17.0                | 16.15       | 1.22           | 0.196                                           | +1.32    | n/a (*a)       | 0.256         | 1-23                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2437      | 6  | 93.7       | 1.07               | 18.0                | 16.16       | 1.53           | 0.225                                           | +1.45    | n/a (*a)       | 0.368         | 1-24                       | 10g      | 4.0              | -               |
|                                                |          | USB          |      |                           | 2462      | 11 | 93.7       | 1.07               | 18.0                | 16.04       | 1.57           | 0.238                                           | +1.52    | n/a (*a)       | 0.400         | 1-25                       | 10g      | 4.0              | -               |

\*a. Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction.

Calculating formula: ΔSAR corrected SAR (W/kg) = (Meas. SAR (W/kg)) × (100 - (ΔSAR(%)) / 100

\*b. Calculating formula: Reported SAR (W/kg) = (Measured SAR (W/kg)) × (Duty scaled) × (Tune-up factor)

Duty scaled = Duty cycle correction factor for obtained SAR value, Duty scaled factor [-] = 100(%) / (duty cycle, %)

Tune-up factor: Power tune-up factor for obtained SAR value, Tune-up factor [-] = 1 / (10 ^ ("Deviation from max., dB" / 10))

## Notes:

\*. Highest measured output power channel was tested initially according to KDB 248227 D01.

\*. Since the power of 2467 MHz (CH12) and 2472 MHz (CH13) are more than 9 dB lower than other SAR tested frequencies, the SAR test was omitted.

\*. 2.4GHz SAR test reduction procedures, in KDB248227 D01 (v02r02)

(DSSS mode) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg (for SAR (1g)) or ≤ 2.0 W/kg (for SAR (10g)), no further SAR testing is required for 802.11b DSSS in that exposure configuration.

(OFDM mode) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg (for SAR (1g)) or ≤ 3 W/kg (for SAR (10g)). Refer to the following table for the estimated SAR of OFDM mode.

| OFDM mode        | ANT.<br># | Maximum tune-up tolerance limit |         |       |         | OFDM scaled<br>factor [-]<br>(b)/(a)×100 | DSSS reported SAR value |        |        | Estimated SAR<br>value: OFDM<br>[W/kg] | Exclusion<br>limit<br>[W/kg] | Standalone<br>SAR test<br>require? |
|------------------|-----------|---------------------------------|---------|-------|---------|------------------------------------------|-------------------------|--------|--------|----------------------------------------|------------------------------|------------------------------------|
|                  |           | DSSS                            |         | OFDM  |         |                                          | type                    | Setup  | [W/kg] |                                        |                              |                                    |
|                  |           | [dBm]                           | [mW](a) | [dBm] | [mW](b) |                                          |                         |        |        |                                        |                              |                                    |
| 11g, n20, ac20   | 0         | 19.0                            | 79      | 18.0  | 63      | 0.797                                    | 1g                      | Bottom | 0.759  | <b>0.605</b>                           | ≤1.2                         | No                                 |
| n40, ac40        | 0         | 19.0                            | 79      | 10.0  | 10      | 0.127                                    | 1g                      | Bottom | 0.759  | <b>0.096</b>                           | ≤1.2                         | No                                 |
| (MIMO) n20, ac20 | 0         | 19.0                            | 79      | 13.5  | 22      | 0.278                                    | 1g                      | Bottom | 0.759  | <b>0.211</b>                           | ≤1.2                         | No                                 |
| (MIMO) n40, ac40 | 0         | 19.0                            | 79      | 9.5   | 9       | 0.114                                    | 1g                      | Bottom | 0.759  | <b>0.087</b>                           | ≤1.2                         | No                                 |
| 11g, n20, ac20   | 0         | 19.0                            | 79      | 18.0  | 63      | 0.797                                    | 10g                     | Back   | 0.756  | <b>0.603</b>                           | ≤3                           | No                                 |
| n40, ac40        | 0         | 19.0                            | 79      | 10.0  | 10      | 0.127                                    | 10g                     | Back   | 0.756  | <b>0.096</b>                           | ≤3                           | No                                 |
| (MIMO) n20, ac20 | 0         | 19.0                            | 79      | 13.5  | 22      | 0.278                                    | 10g                     | Back   | 0.756  | <b>0.210</b>                           | ≤3                           | No                                 |
| (MIMO) n40, ac40 | 0         | 19.0                            | 79      | 9.5   | 9       | 0.114                                    | 10g                     | Back   | 0.756  | <b>0.086</b>                           | ≤3                           | No                                 |
| 11g, n20, ac20   | 1         | 19.0                            | 79      | 18.0  | 63      | 0.797                                    | 10g                     | Back   | 0.480  | <b>0.383</b>                           | ≤3                           | No                                 |
| n40, ac40        | 1         | 19.0                            | 79      | 10.0  | 10      | 0.127                                    | 10g                     | Back   | 0.480  | <b>0.061</b>                           | ≤3                           | No                                 |
| (MIMO) n20, ac20 | 1         | 19.0                            | 79      | 13.5  | 22      | 0.278                                    | 10g                     | Back   | 0.480  | <b>0.133</b>                           | ≤3                           | No                                 |
| (MIMO) n40, ac40 | 1         | 19.0                            | 79      | 9.5   | 9       | 0.114                                    | 10g                     | Back   | 0.480  | <b>0.055</b>                           | ≤3                           | No                                 |

\*. Gap: It is the separation distance between the outer surface of product and the bottom outer surface of phantom; CH: Channel; Meas.: Measured value; n/a: not applied; Max.: Maximum; ANT.#: Antenna ID number 0 or 1; Mode: b: IEEE 802.11b, g: IEEE 802.11g, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT).

\*. During test, the EUT was operated by build-in rechargeable Li-ion battery with connecting USB cable (charging and setting Tx parameters).

\*. Calibration frequency of the SAR measurement probe (and used conversion factors)

| Liquid | SAR test frequency   | Probe calibration frequency | Validity                               | Conversion factor | Uncertainty |
|--------|----------------------|-----------------------------|----------------------------------------|-------------------|-------------|
| Body   | 2412, 2437, 2462 MHz | 2450 MHz                    | within ±50MHz of calibration frequency | 7.32              | ±12.0%      |

\*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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## 7.3 SAR results: U-NII-1 and U-NII-2A band

| Test setup                                                                                                                                   |             |                 | Mode | Data rate<br>[Mbps]<br>or [MCS] | Frequency |      | Duty cycle  |                          | Power correction          |                |                   | SAR results [W/kg]<br>(Max.value of multi-peak) |             |                   |                  | SAR<br>plot # in<br>Appendix<br>2-2 | SAR<br>type | SAR<br>Limit<br>[W/kg] | Remarks                                                |     |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|------|---------------------------------|-----------|------|-------------|--------------------------|---------------------------|----------------|-------------------|-------------------------------------------------|-------------|-------------------|------------------|-------------------------------------|-------------|------------------------|--------------------------------------------------------|-----|-----------------|
| Test position<br>** is Initial<br>test position.                                                                                             | Gap<br>[mm] | Source<br>power |      |                                 | [MHz]     | CH   | Duty<br>[%] | Duty<br>scaled<br>factor | Tune-up<br>limit<br>[dBm] | Meas.<br>[dBm] | Tune-up<br>factor | Meas.                                           | ASAR<br>[%] | ASAR<br>corrected | Reported<br>*(b) |                                     |             |                        |                                                        |     |                 |
| [Tx: Antenna 0] *. n40 is the initial test mode which has the higher bandwidth with the highest tune-up power and has the lowest modulation. |             |                 |      |                                 |           |      |             |                          |                           |                |                   |                                                 |             |                   |                  |                                     |             |                        |                                                        |     |                 |
| Bottom*                                                                                                                                      | 0           | Battery         | n40  | MCS0                            | 5270      | 54   | 87.4        | 1.14                     | 15.0                      | 13.68          | 1.36              | 0.790                                           | +0.22       | n/a (*a)          | 1.225            | 2-3                                 | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5310      | 62   | 87.4        | 1.14                     | 15.0                      | 13.98          | 1.26              | 0.839                                           | +0.20       | n/a (*a)          | 1.205            | 2-4                                 | 1g          | 1.6                    | >0.8, next ch.<br>>1.2, add U-NII-1.                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5190      | 38   | 87.4        | 1.14                     | 11.5                      | 9.93           | -                 | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 1g          | 1.6                    | *lower power.                                          |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5230      | 46   | 87.4        | 1.14                     | 15.0                      | 13.73          | 1.34              | 0.655                                           | +0.21       | n/a (*a)          | 1.001            | 2-5                                 | 1g          | 1.6                    | <1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         | ac40 | MCS0                            | 5270      | 54   | 87.6        | 1.14                     | 15.0                      | 13.60          | 1.38              | 0.730                                           | +0.22       | n/a (*a)          | 1.148            | 2-6                                 | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5310      | 62   | 87.6        | 1.14                     | 15.0                      | 14.00          | 1.26              | 0.882                                           | +0.21       | n/a (*a)          | 1.267            | 2-1                                 | 1g          | 1.6                    | >0.8, next ch.<br>>1.2, add U-NII-1.<br>*Higher, SAR1g |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5190      | 38   | 87.6        | 1.14                     | 11.5                      | 9.88           | -                 | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 1g          | 1.6                    | *lower power.                                          |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5230      | 46   | 87.6        | 1.14                     | 15.0                      | 13.42          | 1.44              | 0.626                                           | +0.21       | n/a (*a)          | 1.028            | 2-7                                 | 1g          | 1.6                    | <1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         | a    | 6                               | 5260      | 52   | 93.7        | 1.07                     | 15.0                      | 13.12          | 1.54              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5300      | 60   | 93.7        | 1.07                     | 15.0                      | 13.49          | 1.42              | 0.782                                           | +0.20       | n/a (*a)          | 1.188            | 2-8                                 | 1g          | 1.6                    | <1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5320      | 64   | 93.7        | 1.07                     | 15.0                      | 13.56          | 1.39              | 0.838                                           | +0.20       | n/a (*a)          | 1.246            | 2-9                                 | 1g          | 1.6                    | >0.8, next ch.<br>>1.2, add U-NII-1.                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5180      | 36   | 93.7        | 1.07                     | 15.0                      | 13.06          | 1.56              | 0.538                                           | +0.19       | n/a (*a)          | 0.898            | 2-10                                | 1g          | 1.6                    | <1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5220      | 44   | 93.7        | 1.07                     | 15.0                      | 13.00          | 1.58              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5240      | 48   | 93.7        | 1.07                     | 15.0                      | 13.08          | 1.56              | 0.648                                           | +0.21       | n/a (*a)          | 1.082            | 2-11                                | 1g          | 1.6                    | >0.8, next ch.                                         |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5260      | 52   | 93.2        | 1.07                     | 15.0                      | 13.24          | 1.50              | 0.662                                           | +0.21       | n/a (*a)          | 1.063            | 2-12                                | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5300      | 60   | 93.2        | 1.07                     | 15.0                      | 13.25          | 1.50              | 0.755                                           | +0.20       | n/a (*a)          | 1.212            | 2-13                                | 1g          | 1.6                    | >1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         | n20  | MCS0                            | 5320      | 64   | 93.2        | 1.07                     | 15.0                      | 13.30          | 1.48              | 0.780                                           | +0.20       | n/a (*a)          | 1.235            | 2-14                                | 1g          | 1.6                    | >0.8, next ch.<br>>1.2, add U-NII-1.                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5180      | 36   | 93.2        | 1.07                     | 15.0                      | 13.00          | 1.58              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5220      | 44   | 93.2        | 1.07                     | 15.0                      | 13.12          | 1.54              | 0.565                                           | +0.21       | n/a (*a)          | 0.931            | 2-15                                | 1g          | 1.6                    | >0.8, next ch.                                         |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5240      | 48   | 93.2        | 1.07                     | 15.0                      | 13.00          | 1.58              | 0.610                                           | +0.21       | n/a (*a)          | 1.031            | 2-16                                | 1g          | 1.6                    | <1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         | ac20 | MCS0                            | 5260      | 52   | 93.3        | 1.07                     | 15.0                      | 13.08          | 1.56              | 0.659                                           | +0.21       | n/a (*a)          | 1.100            | 2-17                                | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5300      | 60   | 93.3        | 1.07                     | 15.0                      | 13.18          | 1.52              | 0.744                                           | +0.20       | n/a (*a)          | 1.210            | 2-18                                | 1g          | 1.6                    | >1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5320      | 64   | 93.3        | 1.07                     | 15.0                      | 13.40          | 1.45              | 0.811                                           | +0.20       | n/a (*a)          | 1.258            | 2-19                                | 1g          | 1.6                    | >0.8, next ch.<br>>1.2, add U-NII-1.                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5180      | 36   | 93.3        | 1.07                     | 15.0                      | 13.01          | 1.58              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 1g          | 1.6                    | -                                                      |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5220      | 44   | 93.3        | 1.07                     | 15.0                      | 13.09          | 1.55              | 0.558                                           | +0.21       | n/a (*a)          | 0.925            | 2-20                                | 1g          | 1.6                    | <1.2                                                   |     |                 |
|                                                                                                                                              |             | Battery         |      |                                 | 5240      | 48   | 93.3        | 1.07                     | 15.0                      | 13.10          | 1.55              | 0.595                                           | +0.21       | n/a (*a)          | 0.987            | 2-21                                | 1g          | 1.6                    | >0.8, next ch.                                         |     |                 |
|                                                                                                                                              |             | Front           | 0    | USB                             | n40       | MCS0 | 5270        | 54                       | 87.4                      | 1.14           | 15.0              | 13.68                                           | 1.36        | 0.203             | +0.25            | n/a (*a)                            | 0.315       | 2-22                   | 10g                                                    | 4.0 | <1              |
|                                                                                                                                              |             |                 |      | USB                             |           |      | 5310        | 62                       | 87.4                      | 1.14           | 15.0              | 13.98                                           | 1.26        | 0.222             | +0.23            | n/a (*a)                            | 0.319       | 2-2                    | 10g                                                    | 4.0 | *Higher, SAR10g |
|                                                                                                                                              |             |                 |      | USB                             | a         | 6    | 5180        | 36                       | 93.7                      | 1.07           | 15.0              | 13.06                                           | 1.56        | 0.129             | +0.24            | n/a (*a)                            | 0.215       | 2-23                   | 10g                                                    | 4.0 | -               |
|                                                                                                                                              |             |                 |      | USB                             |           |      | 5260        | 52                       | 93.7                      | 1.07           | 15.0              | 13.12                                           | 1.54        | 0.188             | +0.24            | n/a (*a)                            | 0.310       | 2-24                   | 10g                                                    | 4.0 | -               |
| USB                                                                                                                                          | 5320        |                 |      | 64                              |           |      | 93.7        | 1.07                     | 15.0                      | 13.56          | 1.39              | 0.207                                           | +0.24       | n/a (*a)          | 0.308            | 2-25                                | 10g         | 4.0                    | -                                                      |     |                 |
| Back                                                                                                                                         | 0           | USB             | n40  | MCS0                            | 5270      | 54   | 87.4        | 1.14                     | 15.0                      | 13.68          | 1.36              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 10g         | 4.0                    | -                                                      |     |                 |
|                                                                                                                                              |             | USB             |      |                                 | 5310      | 62   | 87.4        | 1.14                     | 15.0                      | 13.98          | 1.26              | 0.111                                           | +0.24       | n/a (*a)          | 0.159            | 2-26                                | 10g         | 4.0                    | <1                                                     |     |                 |
| [Tx: Antenna 1] *. n40 is the initial test mode which has the higher bandwidth with the highest tune-up power and has the lowest modulation. |             |                 |      |                                 |           |      |             |                          |                           |                |                   |                                                 |             |                   |                  |                                     |             |                        |                                                        |     |                 |
| Top*                                                                                                                                         | 0           | USB             | n40  | MCS0                            | 5270      | 54   | 87.4        | 1.14                     | 15.0                      | 13.65          | 1.36              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 10g         | 4.0                    | -                                                      |     |                 |
|                                                                                                                                              |             | USB             |      |                                 | 5310      | 62   | 87.4        | 1.14                     | 15.0                      | 13.73          | 1.34              | 0.160                                           | +0.24       | n/a (*a)          | 0.244            | 2-27                                | 10g         | 4.0                    | <1                                                     |     |                 |
| Front                                                                                                                                        | 0           | USB             | n40  | MCS0                            | 5270      | 54   | 87.4        | 1.14                     | 15.0                      | 13.65          | 1.36              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 10g         | 4.0                    | -                                                      |     |                 |
|                                                                                                                                              |             | USB             |      |                                 | 5310      | 62   | 87.4        | 1.14                     | 15.0                      | 13.73          | 1.34              | 0.130                                           | +0.24       | n/a (*a)          | 0.199            | 2-28                                | 10g         | 4.0                    | <1                                                     |     |                 |
| Back                                                                                                                                         | 0           | USB             | n40  | MCS0                            | 5270      | 54   | 87.4        | 1.14                     | 15.0                      | 13.65          | 1.36              | n/a                                             | -           | n/a (*a)          | n/a              | -                                   | 10g         | 4.0                    | -                                                      |     |                 |
|                                                                                                                                              |             | USB             |      |                                 | 5310      | 62   | 87.4        | 1.14                     | 15.0                      | 13.73          | 1.34              | 0.027                                           | +0.24       | n/a (*a)          | 0.041            | 2-29                                | 10g         | 4.0                    | <1                                                     |     |                 |

\*a. Since the calculated  $\Delta$ SAR values of the tested liquid had shown positive correction, the measured SAR was not converted by  $\Delta$ SAR correction.

Calculating formula:  $\Delta$ SAR corrected SAR (W/kg) = (Meas. SAR (W/kg))  $\times$  (100 - ( $\Delta$ SAR(%)) / 100

\*b. Calculating formula: Reported SAR (W/kg) = (Measured SAR (W/kg))  $\times$  (Duty scaled)  $\times$  (Tune-up factor)

Duty scaled = Duty scaled factor: Duty cycle correction factor for obtained SAR value, Duty scaled factor [-] = 100(%) / (duty cycle, %)

Tune-up factor: Power tune-up factor for obtained SAR value, Tune-up factor [-] = 1 / (10<sup>^</sup> ("Deviation from max., dB" / 10))

## Notes:

\*. Highest measured output power channel was tested initially according to KDB 248227 D01.

\*. Since the power of 5190 MHz (CH38) of BW40MHz mode is more than 3 dB lower than other SAR tested frequency, the SAR test was omitted.

\*. According to KDB248227D01

1) Highest reported SAR is  $\leq 0.4$  W/kg (SAR(1g)),  $\leq 1$  W/kg (SAR(10g)). Therefore, further SAR measurements within this exposure condition are not required.

2) Highest reported SAR is  $> 0.4$  W/kg (SAR(1g)),  $> 1$  W/kg (SAR(10g)). Due to the highest reported SAR for this test position, other test positions in standalone exposure condition were evaluated until a SAR  $\leq 0.8$  W/kg (SAR(1g)),  $\leq 2$  W/kg (SAR(10g)) was reported.

3) For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is  $> 0.8$  W/kg (SAR(1g)),  $> 2$  W/kg (SAR(10g)), measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg (SAR(1g)),  $\leq 3$  W/kg (SAR(10g)) or all required test channels are considered.

\*. Subsequent test configuration was excluded from the following table according to KDB 248227 D01. SAR is not required for the following exclusion conditions according to KDB 248227 D01.

- 1) When KDB 447498 D01 SAR test exclusion applies to the initial test configuration.
- 2) When the highest reported SAR for initial test configuration is adjusted by the ratio of Subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

| Subsequent test mode   | ANT.<br># | Maximum tune-up tolerance limit |          |                                  |          | Scaled<br>factor [-]<br>(b)/(a)×100 | Reported SAR value<br>*. Initial test configuration |        |        | Estimated SAR value:<br>Subsequent test<br>configuration [W/kg] | Exclusion<br>limit<br>[W/kg] | Standalone<br>SAR test<br>require?* |
|------------------------|-----------|---------------------------------|----------|----------------------------------|----------|-------------------------------------|-----------------------------------------------------|--------|--------|-----------------------------------------------------------------|------------------------------|-------------------------------------|
|                        |           | Initial test<br>configuration   |          | Subsequent test<br>configuration |          |                                     | type                                                | Setup  | [W/kg] |                                                                 |                              |                                     |
|                        |           | [dBm]                           | [mW] (a) | [dBm]                            | [mW] (b) |                                     |                                                     |        |        |                                                                 |                              |                                     |
| ac80                   | 0         | 15.0                            | 32       | 10.5                             | 11       | 0.344                               | 1g                                                  | Bottom | 1.267  | <b>0.436</b>                                                    | ≤1.2                         | No                                  |
| (MIMO) n20/40, ac20/40 | 0         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 1g                                                  | Bottom | 1.267  | <b>0.634</b>                                                    | ≤1.2                         | No                                  |
| (MIMO) ac80            | 0         | 15.0                            | 32       | 7.5                              | 6        | 0.188                               | 1g                                                  | Bottom | 1.267  | <b>0.238</b>                                                    | ≤1.2                         | No                                  |
| ac80                   | 0         | 15.0                            | 32       | 10.5                             | 11       | 0.344                               | 10g                                                 | Front  | 0.319  | <b>0.110</b>                                                    | ≤3                           | No                                  |
| (MIMO) n20/40, ac20/40 | 0         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 10g                                                 | Front  | 0.319  | <b>0.160</b>                                                    | ≤3                           | No                                  |
| (MIMO) ac80            | 0         | 15.0                            | 32       | 7.5                              | 6        | 0.188                               | 10g                                                 | Front  | 0.319  | <b>0.060</b>                                                    | ≤3                           | No                                  |
| ac80                   | 1         | 15.0                            | 32       | 10.5                             | 11       | 0.344                               | 10g                                                 | Top    | 0.244  | <b>0.084</b>                                                    | ≤3                           | No                                  |
| (MIMO) n20/40, ac20/40 | 1         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 10g                                                 | Top    | 0.244  | <b>0.122</b>                                                    | ≤3                           | No                                  |
| (MIMO) ac80            | 1         | 15.0                            | 32       | 7.5                              | 6        | 0.188                               | 10g                                                 | Top    | 0.244  | <b>0.046</b>                                                    | ≤3                           | No                                  |

\*. Gap: It is the separation distance between the outer surface of product and the bottom outer surface of phantom; CH: Channel; Meas.: Measured value; n/a: not applied; Max.: Maximum; ANT.#: Antenna ID number 0 or 1; Mode: a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT), ac80: IEEE 802.11ac(80VHT).

\*. During test, the EUT was operated by build-in rechargeable Li-ion battery with connecting USB cable (charging and setting Tx parameters).

\*. Calibration frequency of the SAR measurement probe (and used conversion factors)

| Liquid | SAR test frequency                                       | Probe calibration frequency | Validity                                      | Conversion factor | Uncertainty  |
|--------|----------------------------------------------------------|-----------------------------|-----------------------------------------------|-------------------|--------------|
| Body   | 5180, 5220, 5230, 5240, 5260, 5270, 5300, 5310, 5320 MHz | 5250 MHz                    | within $\pm 110$ MHz of calibration frequency | 4.49              | $\pm 13.1\%$ |

\*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

## 7.4 SAR results: U-NII-2C band

| Test setup                                                                                                                                   |             |                 | Mode | Data rate<br>[Mbps]<br>or [MCS] | Frequency |     | Duty cycle  |                          | Power correction          |                |                   | SAR results [W/kg]<br>(Max.value of multi-peak) |             |                   |                  | SAR<br>plot # in<br>Appendix<br>2-2 | SAR<br>type | SAR<br>Limit<br>[W/kg] | Remarks                          |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|------|---------------------------------|-----------|-----|-------------|--------------------------|---------------------------|----------------|-------------------|-------------------------------------------------|-------------|-------------------|------------------|-------------------------------------|-------------|------------------------|----------------------------------|
| Test position<br>** is Initial<br>test position.                                                                                             | Gap<br>[mm] | Source<br>power |      |                                 | [MHz]     | CH  | Duty<br>[%] | Duty<br>scaled<br>factor | Tune-up<br>limit<br>[dBm] | Meas.<br>[dBm] | Tune-up<br>factor | Meas.                                           | ΔSAR<br>[%] | ΔSAR<br>corrected | Reported<br>(*)b |                                     |             |                        |                                  |
| [Tx: Antenna 0] *, n40 is the initial test mode which has the higher bandwidth with the highest tune-up power and has the lowest modulation. |             |                 |      |                                 |           |     |             |                          |                           |                |                   |                                                 |             |                   |                  |                                     |             |                        |                                  |
| Bottom*                                                                                                                                      | 0           | Battery         | n40  | MCS0                            | 5510      | 102 | 87.4        | 1.14                     | 15.0                      | 13.37          | 1.46              | 0.690                                           | +0.17       | n/a (*)a          | 1.148            | 3-3                                 | 1g          | 1.6                    | >0.8, next ch.                   |
|                                                                                                                                              |             | Battery         |      |                                 | 5550      | 110 | 87.4        | 1.14                     | 15.0                      | 13.18          | 1.52              | 0.590                                           | +0.18       | n/a (*)a          | 1.022            | 3-4                                 | 1g          | 1.6                    | <1.2                             |
|                                                                                                                                              |             | Battery         |      |                                 | 5670      | 134 | 87.4        | 1.14                     | 15.0                      | 13.06          | 1.56              | 0.503                                           | +0.18       | n/a (*)a          | 0.895            | 3-5                                 | 1g          | 1.6                    | High CH.                         |
|                                                                                                                                              |             | Battery         | ac40 | MCS0                            | 5510      | 102 | 87.6        | 1.14                     | 15.0                      | 13.39          | 1.45              | 0.663                                           | +0.19       | n/a (*)a          | 1.096            | 3-6                                 | 1g          | 1.6                    | >0.8, next ch.                   |
|                                                                                                                                              |             | Battery         |      |                                 | 5550      | 110 | 87.6        | 1.14                     | 15.0                      | 13.23          | 1.50              | 0.592                                           | +0.18       | n/a (*)a          | 1.012            | 3-7                                 | 1g          | 1.6                    | <1.2                             |
|                                                                                                                                              |             | Battery         |      |                                 | 5670      | 134 | 87.6        | 1.14                     | 15.0                      | 13.15          | 1.53              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 1g          | 1.6                    | -                                |
|                                                                                                                                              |             | Battery         | a    | 6                               | 5500      | 100 | 93.7        | 1.07                     | 15.0                      | 13.45          | 1.43              | 0.731                                           | +0.17       | n/a (*)a          | 1.119            | 3-8                                 | 1g          | 1.6                    | >0.8, next ch.                   |
|                                                                                                                                              |             | Battery         |      |                                 | 5580      | 100 | 93.7        | 1.07                     | 15.0                      | 13.22          | 1.51              | 0.623                                           | +0.16       | n/a (*)a          | 1.007            | 3-9                                 | 1g          | 1.6                    | <1.2                             |
|                                                                                                                                              |             | Battery         |      |                                 | 5700      | 100 | 93.7        | 1.07                     | 15.0                      | 13.34          | 1.47              | 0.542                                           | +0.15       | n/a (*)a          | 0.853            | 3-10                                | 1g          | 1.6                    | High CH.                         |
|                                                                                                                                              |             | Battery         | n20  | MCS0                            | 5500      | 100 | 93.2        | 1.07                     | 15.0                      | 13.24          | 1.50              | 0.710                                           | +0.17       | n/a (*)a          | 1.140            | 3-11                                | 1g          | 1.6                    | >0.8, next ch.                   |
|                                                                                                                                              |             | Battery         |      |                                 | 5580      | 100 | 93.2        | 1.07                     | 15.0                      | 13.05          | 1.57              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 1g          | 1.6                    | -                                |
|                                                                                                                                              |             | Battery         |      |                                 | 5700      | 100 | 93.2        | 1.07                     | 15.0                      | 13.22          | 1.51              | 0.547                                           | +0.17       | n/a (*)a          | 0.884            | 3-12                                | 1g          | 1.6                    | <1.2                             |
|                                                                                                                                              |             | Battery         | ac20 | MCS0                            | 5500      | 100 | 93.3        | 1.07                     | 15.0                      | 13.30          | 1.48              | 0.726                                           | +0.17       | n/a (*)a          | 1.150            | 3-1                                 | 1g          | 1.6                    | >0.8, next ch.<br>*Higher, SAR1g |
|                                                                                                                                              |             | Battery         |      |                                 | 5580      | 100 | 93.3        | 1.07                     | 15.0                      | 13.30          | 1.48              | 0.595                                           | +0.17       | n/a (*)a          | 0.942            | 3-13                                | 1g          | 1.6                    | <1.2                             |
|                                                                                                                                              |             | Battery         |      |                                 | 5700      | 100 | 93.3        | 1.07                     | 15.0                      | 13.12          | 1.54              | 0.553                                           | +0.18       | n/a (*)a          | 0.911            | 3-14                                | 1g          | 1.6                    | -                                |
| Front                                                                                                                                        | 0           | USB             | n40  | MCS0                            | 5510      | 102 | 87.4        | 1.14                     | 15.0                      | 13.37          | 1.46              | 0.218                                           | +0.24       | n/a (*)a          | 0.363            | 3-15                                | 10g         | 4.0                    | <1                               |
|                                                                                                                                              |             | USB             |      |                                 | 5550      | 110 | 87.4        | 1.14                     | 15.0                      | 13.18          | 1.52              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5670      | 134 | 87.4        | 1.14                     | 15.0                      | 13.06          | 1.56              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | -                                |
| Back                                                                                                                                         | 0           | USB             | n40  | MCS0                            | 5510      | 102 | 87.4        | 1.14                     | 15.0                      | 13.37          | 1.46              | 0.097                                           | +0.24       | n/a (*)a          | 0.161            | 3-16                                | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5550      | 110 | 87.4        | 1.14                     | 15.0                      | 13.18          | 1.52              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5670      | 134 | 87.4        | 1.14                     | 15.0                      | 13.06          | 1.56              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | <1                               |
| [Tx: Antenna 1] *, n40 is the initial test mode which has the higher bandwidth with the highest tune-up power and has the lowest modulation. |             |                 |      |                                 |           |     |             |                          |                           |                |                   |                                                 |             |                   |                  |                                     |             |                        |                                  |
| Top*                                                                                                                                         | 0           | USB             | n40  | MCS0                            | 5510      | 102 | 87.4        | 1.14                     | 15.0                      | 13.53          | 1.40              | 0.303                                           | +0.26       | n/a (*)a          | 0.484            | 3-17                                | 10g         | 4.0                    | <1                               |
|                                                                                                                                              |             | USB             |      |                                 | 5550      | 110 | 87.4        | 1.14                     | 15.0                      | 13.25          | 1.50              | 0.338                                           | +0.25       | n/a (*)a          | 0.578            | 3-18                                | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5670      | 134 | 87.4        | 1.14                     | 15.0                      | 13.02          | 1.58              | 0.355                                           | +0.27       | n/a (*)a          | 0.639            | 3-2                                 | 10g         | 4.0                    | *Higher, SAR10g                  |
|                                                                                                                                              |             | USB             | a    | 6                               | 5500      | 100 | 93.7        | 1.07                     | 15.0                      | 13.78          | 1.32              | 0.323                                           | +0.24       | n/a (*)a          | 0.456            | 3-19                                | 10g         | 4.0                    | <1, Low ch.                      |
|                                                                                                                                              |             | USB             |      |                                 | 5580      | 100 | 93.7        | 1.07                     | 15.0                      | 13.49          | 1.42              | 0.400                                           | +0.25       | n/a (*)a          | 0.608            | 3-20                                | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5700      | 100 | 93.7        | 1.07                     | 15.0                      | 13.19          | 1.52              | 0.338                                           | +0.28       | n/a (*)a          | 0.550            | 3-21                                | 10g         | 4.0                    | High ch.                         |
| Front                                                                                                                                        | 0           | USB             | n40  | MCS0                            | 5510      | 102 | 87.4        | 1.14                     | 15.0                      | 13.53          | 1.40              | 0.207                                           | +0.24       | n/a (*)a          | 0.330            | 3-22                                | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5550      | 110 | 87.4        | 1.14                     | 15.0                      | 13.25          | 1.50              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5670      | 134 | 87.4        | 1.14                     | 15.0                      | 13.02          | 1.58              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | <1                               |
| Back                                                                                                                                         | 0           | USB             | n40  | MCS0                            | 5510      | 102 | 87.4        | 1.14                     | 15.0                      | 13.53          | 1.40              | 0.051                                           | +0.24       | n/a (*)a          | 0.081            | 3-23                                | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5550      | 110 | 87.4        | 1.14                     | 15.0                      | 13.25          | 1.50              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | -                                |
|                                                                                                                                              |             | USB             |      |                                 | 5670      | 134 | 87.4        | 1.14                     | 15.0                      | 13.02          | 1.58              | n/a                                             | -           | n/a (*)a          | n/a              | -                                   | 10g         | 4.0                    | <1                               |

\*a. Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction.

Calculating formula:  $\Delta\text{SAR corrected SAR (W/kg)} = (\text{Meas. SAR (W/kg)}) \times (100 - (\Delta\text{SAR}(\%))) / 100$

\*b. Calculating formula:  $\text{Reported SAR (W/kg)} = (\text{Measured SAR (W/kg)}) \times (\text{Duty scaled}) \times (\text{Tune-up factor})$

Duty scaled = Duty scaled factor: Duty cycle correction factor for obtained SAR value, Duty scaled factor [-] =  $100(\%) / (\text{duty cycle, } \%)$

Tune-up factor: Power tune-up factor for obtained SAR value, Tune-up factor [-] =  $1 / (10^{(T - T_{\text{max}}) / 10})$

## Notes:

\*. Highest measured output power channel was tested initially according to KDB 248227 D01.

\*. Since the power of 5190 MHz (CH38) of BW40MHz mode is more than 3 dB lower than other SAR tested frequency, the SAR test was omitted.

\*. According to KDB248227D01

1) Highest reported SAR is  $\leq 0.4 \text{ W/kg (SAR(1g))}$ ,  $\leq 1 \text{ W/kg (SAR(10g))}$ . Therefore, further SAR measurements within this exposure condition are not required.

2) Highest reported SAR is  $> 0.4 \text{ W/kg (SAR(1g))}$ ,  $> 1 \text{ W/kg (SAR(10g))}$ . Due to the highest reported SAR for this test position, other test positions in standalone exposure condition were evaluated until a SAR  $\leq 0.8 \text{ W/kg (SAR(1g))}$ ,  $\leq 2 \text{ W/kg (SAR(10g))}$  was reported.

3) For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is  $> 0.8 \text{ W/kg (SAR(1g))}$ ,  $> 2 \text{ W/kg (SAR(10g))}$ , measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2 \text{ W/kg (SAR(1g))}$ ,  $\leq 3 \text{ W/kg (SAR(10g))}$  or all required test channels are considered.

\*. Subsequent test configuration was excluded from the following table according to KDB 248227 D01. SAR is not required for the following exclusion conditions according to KDB 248227 D01.

- 1) When KDB 447498 D01 SAR test exclusion applies to the initial test configuration.
- 2) When the highest reported SAR for initial test configuration is adjusted by the ratio of Subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.

| Subsequent test mode   | ANT.<br># | Maximum tune-up tolerance limit |          |                                  |          | Scaled<br>factor [-]<br>(b)/(a)×100 | Reported SAR value<br>*. Initial test configuration |        |        | Estimated SAR value:<br>Subsequent test<br>configuration [W/kg] | Exclusion<br>limit<br>[W/kg] | Standalone<br>SAR test<br>require?* |
|------------------------|-----------|---------------------------------|----------|----------------------------------|----------|-------------------------------------|-----------------------------------------------------|--------|--------|-----------------------------------------------------------------|------------------------------|-------------------------------------|
|                        |           | Initial test<br>configuration   |          | Subsequent test<br>configuration |          |                                     | type                                                | Setup  | [W/kg] |                                                                 |                              |                                     |
|                        |           | [dBm]                           | [mW] (a) | [dBm]                            | [mW] (b) |                                     |                                                     |        |        |                                                                 |                              |                                     |
| ac80                   | 0         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 1g                                                  | Bottom | 1.150  | <b>0.575</b>                                                    | ≤1.2                         | No                                  |
| (MIMO) n20/40, ac20/40 | 0         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 1g                                                  | Bottom | 1.150  | <b>0.575</b>                                                    | ≤1.2                         | No                                  |
| (MIMO) ac80            | 0         | 15.0                            | 32       | 9.0                              | 8        | 0.25                                | 1g                                                  | Bottom | 1.150  | <b>0.288</b>                                                    | ≤1.2                         | No                                  |
| ac80                   | 0         | 15.0                            | 32       | 10.5                             | 11       | 0.5                                 | 10g                                                 | Front  | 0.363  | <b>0.182</b>                                                    | ≤3                           | No                                  |
| (MIMO) n20/40, ac20/40 | 0         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 10g                                                 | Front  | 0.363  | <b>0.182</b>                                                    | ≤3                           | No                                  |
| (MIMO) ac80            | 0         | 15.0                            | 32       | 7.5                              | 6        | 0.25                                | 10g                                                 | Front  | 0.363  | <b>0.091</b>                                                    | ≤3                           | No                                  |
| ac80                   | 1         | 15.0                            | 32       | 10.5                             | 11       | 0.5                                 | 10g                                                 | Top    | 0.639  | <b>0.320</b>                                                    | ≤3                           | No                                  |
| (MIMO) n20/40, ac20/40 | 1         | 15.0                            | 32       | 12.0                             | 16       | 0.5                                 | 10g                                                 | Top    | 0.639  | <b>0.320</b>                                                    | ≤3                           | No                                  |
| (MIMO) ac80            | 1         | 15.0                            | 32       | 7.5                              | 6        | 0.25                                | 10g                                                 | Top    | 0.639  | <b>0.160</b>                                                    | ≤3                           | No                                  |

\*. Gap: It is the separation distance between the outer surface of product and the bottom outer surface of phantom; CH: Channel; Meas.: Measured value; n/a: not applied; Max.: Maximum; ANT.#: Antenna ID number 0 or 1; Mode: a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT), ac80: IEEE 802.11ac(80VHT).

\*. During test, the EUT was operated by build-in rechargeable Li-ion battery with connecting USB cable (charging and setting Tx parameters).

\*. Calibration frequency of the SAR measurement probe (and used conversion factors)

| Liquid | SAR test frequency               | Probe calibration frequency | Validity                                     | Conversion factor | Uncertainty  |
|--------|----------------------------------|-----------------------------|----------------------------------------------|-------------------|--------------|
| Body   | 5500, 5510, 5550, 5580, 5670 MHz | 5600 MHz                    | within $\pm 10$ MHz of calibration frequency | 3.92              | $\pm 13.1\%$ |
| Body   | 5700 MHz                         | 5750 MHz                    | within $\pm 10$ MHz of calibration frequency | 4                 | $\pm 13.1\%$ |

\*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

## 7.5 SAR results: U-NII-3 band

| Test setup                                                                                                                                    |             |                 | Mode | Data rate<br>[Mbps]<br>or [MCS] | Frequency |     | Duty cycle  |                          | Power correction          |                |                   | SAR results [W/kg]<br>(Max.value of multi-peak) |             |                   |                  | SAR<br>plot # in<br>Appendix<br>2-2 | SAR<br>type | SAR<br>Limit<br>[W/kg] | Remarks          |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|------|---------------------------------|-----------|-----|-------------|--------------------------|---------------------------|----------------|-------------------|-------------------------------------------------|-------------|-------------------|------------------|-------------------------------------|-------------|------------------------|------------------|
| Test position<br>** is Initial<br>test position.                                                                                              | Gap<br>[mm] | Source<br>power |      |                                 | [MHz]     | CH  | Duty<br>[%] | Duty<br>scaled<br>factor | Tune-up<br>limit<br>[dBm] | Meas.<br>[dBm] | Tune-up<br>factor | Meas.                                           | ΔSAR<br>[%] | ΔSAR<br>corrected | Reported<br>*(b) |                                     |             |                        |                  |
| [Tx: Antenna 0] *: ac80 is the initial test mode which has the higher bandwidth with the highest tune-up power and has the lowest modulation. |             |                 |      |                                 |           |     |             |                          |                           |                |                   |                                                 |             |                   |                  |                                     |             |                        |                  |
| Bottom*                                                                                                                                       | 0           | Battery         | ac80 | MCS0                            | 5775      | 155 | 77.7        | 1.29                     | 14.0                      | 13.01          | 1.26              | 0.666                                           | +0.16       | n/a (*a)          | 1.083            | 4-3                                 | 1g          | 1.6                    | >0.8             |
|                                                                                                                                               |             | Battery         | n40  | MCS0                            | 5755      | 151 | 87.4        | 1.14                     | 14.0                      | 13.17          | 1.21              | 0.670                                           | +0.14       | n/a (*a)          | 0.924            | 4-4                                 | 1g          | 1.6                    | >0.8, next ch.   |
|                                                                                                                                               |             | Battery         |      |                                 | 5795      | 159 | 87.4        | 1.14                     | 14.0                      | 13.16          | 1.21              | 0.866                                           | +0.14       | n/a (*a)          | 1.195            | 4-5                                 | 1g          | 1.6                    | -                |
|                                                                                                                                               |             | Battery         | ac40 | MCS0                            | 5755      | 151 | 87.6        | 1.14                     | 14.0                      | 13.21          | 1.20              | 0.703                                           | +0.17       | n/a (*a)          | 0.962            | 4-6                                 | 1g          | 1.6                    | >0.8, next ch.   |
|                                                                                                                                               |             | Battery         |      |                                 | 5795      | 159 | 87.6        | 1.14                     | 14.0                      | 13.18          | 1.21              | 0.860                                           | +0.14       | n/a (*a)          | 1.186            | 4-7                                 | 1g          | 1.6                    | -                |
|                                                                                                                                               |             | Battery         | a    | 6                               | 5745      | 149 | 93.7        | 1.07                     | 14.0                      | 13.36          | 1.16              | 0.734                                           | +0.15       | n/a (*a)          | 0.911            | 4-8                                 | 1g          | 1.6                    | >0.8, next ch.   |
|                                                                                                                                               |             | Battery         |      |                                 | 5785      | 157 | 93.7        | 1.07                     | 14.0                      | 13.20          | 1.20              | 0.958                                           | +0.15       | n/a (*a)          | 1.230            | 4-9                                 | 1g          | 1.6                    | >1.2             |
|                                                                                                                                               |             | Battery         |      |                                 | 5825      | 165 | 93.7        | 1.07                     | 14.0                      | 13.21          | 1.20              | 1.05                                            | +0.14       | n/a (*a)          | 1.348            | 4-10                                | 1g          | 1.6                    | -                |
|                                                                                                                                               |             | Battery         |      |                                 | 5745      | 149 | 93.2        | 1.07                     | 14.0                      | 13.29          | 1.18              | 0.700                                           | +0.17       | n/a (*a)          | 0.884            | 4-11                                | 1g          | 1.6                    | >0.8, next ch.   |
|                                                                                                                                               |             | Battery         | n20  | MCS0                            | 5785      | 157 | 93.2        | 1.07                     | 14.0                      | 13.25          | 1.19              | 0.912                                           | +0.16       | n/a (*a)          | 1.161            | 4-12                                | 1g          | 1.6                    | <1.2             |
|                                                                                                                                               |             | Battery         |      |                                 | 5825      | 165 | 93.2        | 1.07                     | 14.0                      | 13.11          | 1.23              | 1.07                                            | +0.14       | n/a (*a)          | 1.408            | 4-13                                | 1g          | 1.6                    | *.Worst CH.      |
|                                                                                                                                               |             | Battery         | ac20 | MCS0                            | 5745      | 149 | 93.3        | 1.07                     | 14.0                      | 13.32          | 1.17              | 0.693                                           | +0.17       | n/a (*a)          | 0.868            | 4-14                                | 1g          | 1.6                    | >0.8, next ch.   |
|                                                                                                                                               |             | Battery         |      |                                 | 5785      | 157 | 93.3        | 1.07                     | 14.0                      | 13.21          | 1.20              | 0.887                                           | +0.16       | n/a (*a)          | 1.139            | 4-15                                | 1g          | 1.6                    | <1.2             |
|                                                                                                                                               |             | Battery         |      |                                 | 5825      | 165 | 93.3        | 1.07                     | 14.0                      | 13.14          | 1.22              | 1.09                                            | +0.14       | n/a (*a)          | 1.423            | 4-1                                 | 1g          | 1.6                    | *.Higher, SAR1g  |
| Front                                                                                                                                         | 0           | USB             | ac80 | MCS0                            | 5775      | 155 | 77.7        | 1.29                     | 14.0                      | 13.01          | 1.26              | 0.117                                           | +0.25       | n/a (*a)          | 0.190            | 4-16                                | 10g         | 4.0                    | <1               |
| Back                                                                                                                                          | 0           | USB             | ac80 | MCS0                            | 5775      | 155 | 77.7        | 1.29                     | 14.0                      | 13.01          | 1.26              | 0.066                                           | +0.25       | n/a (*a)          | 0.107            | 4-17                                | 10g         | 4.0                    | <1               |
| [Tx: Antenna 1] *: ac80 is the initial test mode which has the higher bandwidth with the highest tune-up power and has the lowest modulation. |             |                 |      |                                 |           |     |             |                          |                           |                |                   |                                                 |             |                   |                  |                                     |             |                        |                  |
| Top*                                                                                                                                          | 0           | USB             | ac80 | MCS0                            | 5775      | 155 | 77.7        | 1.29                     | 14.0                      | 13.06          | 1.24              | 0.217                                           | +0.25       | n/a (*a)          | 0.347            | 4-18                                | 10g         | 4.0                    | <1               |
|                                                                                                                                               |             | USB             | n40  | MCS0                            | 5755      | 151 | 87.6        | 1.14                     | 14.0                      | 13.26          | 1.19              | 0.258                                           | +0.30       | n/a (*a)          | 0.350            | 4-19                                | 10g         | 4.0                    | -                |
|                                                                                                                                               |             | USB             |      |                                 | 5795      | 159 | 87.6        | 1.14                     | 14.0                      | 13.25          | 1.19              | 0.231                                           | +0.30       | n/a (*a)          | 0.313            | 4-20                                | 10g         | 4.0                    | -                |
|                                                                                                                                               |             | USB             | a    | 6                               | 5745      | 149 | 93.7        | 1.07                     | 14.0                      | 13.33          | 1.17              | 0.295                                           | +0.30       | n/a (*a)          | 0.399            | 4-2                                 | 10g         | 4.0                    | *.Higher, SAR10g |
|                                                                                                                                               |             | USB             |      |                                 | 5785      | 157 | 93.7        | 1.07                     | 14.0                      | 13.59          | 1.10              | 0.259                                           | +0.29       | n/a (*a)          | 0.305            | 4-21                                | 10g         | 4.0                    | -                |
|                                                                                                                                               |             | USB             |      |                                 | 5825      | 165 | 93.7        | 1.07                     | 14.0                      | 13.55          | 1.11              | 0.239                                           | +0.31       | n/a (*a)          | 0.284            | 4-22                                | 10g         | 4.0                    | -                |
| Front                                                                                                                                         | 0           | USB             | ac80 | MCS0                            | 5775      | 155 | 77.7        | 1.29                     | 14.0                      | 13.06          | 1.24              | 0.123                                           | +0.25       | n/a (*a)          | 0.197            | 4-23                                | 10g         | 4.0                    | <1               |
| Back                                                                                                                                          | 0           | USB             | ac80 | MCS0                            | 5775      | 155 | 77.7        | 1.29                     | 14.0                      | 13.06          | 1.24              | 0.023                                           | +0.25       | n/a (*a)          | 0.037            | 4-24                                | 10g         | 4.0                    | <1               |

\*a. Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction.

Calculating formula: ΔSAR corrected SAR (W/kg) = (Meas. SAR (W/kg)) × (100 - (ΔSAR(%)) / 100

\*b. Calculating formula: Reported SAR (W/kg) = (Measured SAR (W/kg)) × (Duty scaled) × (Tune-up factor)

Duty scaled = Duty scaled factor: Duty cycle correction factor for obtained SAR value, Duty scaled factor [-] = 100(%) / (duty cycle, %)

Tune-up factor: Power tune-up factor for obtained SAR value, Tune-up factor [-] = 1 / (10 ^ ("Deviation from max., dB" / 10))

## Notes:

\*. Highest measured output power channel was tested initially according to KDB 248227 D01.

\*. Since the power of 5190 MHz (CH38) of BW40MHz mode is more than 3 dB lower than other SAR tested frequency, the SAR test was omitted.

\*. According to KDB248227D01

1) Highest reported SAR is ≤ 0.4 W/kg (SAR(1g)), ≤ 1 W/kg (SAR(10g)). Therefore, further SAR measurements within this exposure condition are not required.

2) Highest reported SAR is > 0.4 W/kg (SAR(1g)), > 1 W/kg (SAR(10g)). Due to the highest reported SAR for this test position, other test positions in standalone exposure condition were evaluated until a SAR ≤ 0.8 W/kg (SAR(1g)), ≤ 2 W/kg (SAR(10g)) was reported.

3) For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg (SAR(1g)), > 2 W/kg (SAR(10g)), measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg (SAR(1g)), ≤ 3 W/kg (SAR(10g)) or all required test channels are considered.

\*. Subsequent test configuration was excluded from the following table according to KDB 248227 D01. SAR is not required for the following exclusion conditions according to KDB 248227 D01.

1) When KDB 447498 D01 SAR test exclusion applies to the initial test configuration.

2) When the highest reported SAR for initial test configuration is adjusted by the ratio of Subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

| Subsequent test mode      | ANT.<br># | Maximum tune-up tolerance limit |          |                                  |          | Scaled<br>factor [-]<br>(b)/(a)×100 | Reported SAR value<br>*. Initial test configuration |        |        | Estimated SAR value:<br>Subsequent test<br>configuration [W/kg] | Exclusion<br>limit<br>[W/kg] | Standalone<br>SAR test<br>require? |
|---------------------------|-----------|---------------------------------|----------|----------------------------------|----------|-------------------------------------|-----------------------------------------------------|--------|--------|-----------------------------------------------------------------|------------------------------|------------------------------------|
|                           |           | Initial test<br>configuration   |          | Subsequent test<br>configuration |          |                                     | type                                                | Setup  | [W/kg] |                                                                 |                              |                                    |
|                           |           | [dBm]                           | [mW] (a) | [dBm]                            | [mW] (b) |                                     |                                                     |        |        |                                                                 |                              |                                    |
| (MIMO) n20/40, ac20/40/80 | 0         | 14.0                            | 25       | 12.0                             | 16       | 0.64                                | 1g                                                  | Bottom | 1.423  | <b>0.911</b>                                                    | <b>≤1.2</b>                  | <b>No</b>                          |
| (MIMO) n20/40, ac20/40/80 | 0         | 14.0                            | 25       | 12.0                             | 16       | 0.64                                | 10g                                                 | Front  | 0.190  | <b>0.122</b>                                                    | <b>≤3</b>                    | <b>No</b>                          |
| (MIMO) n20/40, ac20/40/80 | 1         | 14.0                            | 25       | 12.0                             | 16       | 0.64                                | 10g                                                 | Top    | 0.399  | <b>0.255</b>                                                    | <b>≤3</b>                    | <b>No</b>                          |

\*. Gap: It is the separation distance between the outer surface of product and the bottom outer surface of phantom; CH: Channel; Meas.: Measured value; n/a: not applied; Max.: Maximum; ANT.#: Antenna ID number 0 or 1; Mode: a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11ac(40VHT), ac80: IEEE 802.11ac(80VHT).

\*. During test, the EUT was operated by build-in rechargeable Li-ion battery with connecting USB cable (charging and setting Tx parameters).

\*. Calibration frequency of the SAR measurement probe (and used conversion factors)

| Liquid | SAR test frequency                     | Probe calibration frequency | Validity                                | Conversion factor | Uncertainty |
|--------|----------------------------------------|-----------------------------|-----------------------------------------|-------------------|-------------|
| Body   | 5745, 5755, 5775, 5785, 5795, 5825 MHz | 5750 MHz                    | within ±110MHz of calibration frequency | 4                 | ±13.1%      |

\*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

## 7.6 SAR Measurement Variability (Repeated measurement requirement)

In accordance with published RF Exposure KDB procedure 865664 D01 (v01r04) SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg (< 2 W/kg for SAR(10g)); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg (≥ 2 W/kg for SAR(10g)), repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

| EUT setup        |          |          | Mode        | Frequency [MHz] (Channel) | Measured SAR [W/kg] |          |          | Largest to Smallest SAR Ratio | SAR plot # in Appendix 2-2 |          |
|------------------|----------|----------|-------------|---------------------------|---------------------|----------|----------|-------------------------------|----------------------------|----------|
| Transmit antenna | Position | Gap [mm] |             |                           | Type                | Original | Repeated |                               | Original                   | Repeated |
| Antenna 0        | Bottom   | 0        | ac20 (MCS0) | 5825 (165)                | 1g                  | 1.09     | 1.09     | 1.00                          | Plot 4-1                   | Plot 5-1 |

\*. Calculating formula: Largest to Smallest SAR Ratio (%) = (Largest SAR (W/kg)) / Smallest SAR (W/kg); \*. Mode; ac20: IEEE 802.11ac(20VHT)

## 7.7 Device holder perturbation verification

When the highest reported SAR of an antenna is > 1.2 W/kg (> 3 W/kg for SAR(10g)), holder perturbation verification (by Urethane form alone) is required by using the highest SAR configuration among all applicable frequency bands.

| EUT setup        |          |          | Mode        | Frequency [MHz] (Channel) | Measured SAR [W/kg]        |                        |          | Device holder perturbation SAR Ratio | Remarks                                                                                                             |
|------------------|----------|----------|-------------|---------------------------|----------------------------|------------------------|----------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Transmit antenna | Position | Gap [mm] |             |                           | Type                       | Device holder          |          |                                      |                                                                                                                     |
|                  |          |          |             |                           |                            | Exist                  | None     |                                      |                                                                                                                     |
| Antenna 0        | Bottom   | 0        | ac20 (MCS0) | 5825 (165)                | 1g                         | 1.09 (Reported: 1.423) | 1.1      | +0.9 %                               | *. It was smaller than 5% of uncertainty of the setup, so influence of a device holder was judged to be no problem. |
|                  |          |          |             |                           | SAR plot # in Appendix 2-2 | Plot 4-1               | Plot 5-2 |                                      |                                                                                                                     |

\*. Calculating formula: Device holder perturbation SAR Ratio (%) = {((Measured SAR-none (W/kg)) / Measured SAR-exist (W/kg)) - 1} \* 100

\*. Mode; ac20: IEEE 802.11ac(20VHT)

## 7.8 Simultaneous transmission and Co-location (MIMO) evaluation

| Simultaneous transmission scenario |          |               |             |                                               |                        |                       |                        |           | Σ SAR<br>[W/kg]<br>(1g: ≤1.6<br>10g: ≤4) | SPLSR<br>Check?<br>(Yes<br>/No) | Antenna<br>separation<br>distance-<br>design base<br>[mm] | SPLSR<br>(≤ 0.04) | Volume<br>Scan?<br>(Yes/No) |
|------------------------------------|----------|---------------|-------------|-----------------------------------------------|------------------------|-----------------------|------------------------|-----------|------------------------------------------|---------------------------------|-----------------------------------------------------------|-------------------|-----------------------------|
| Test<br>position                   | Mode     | U-NII<br>band | SAR<br>type | Highest Reported SAR (Standalone base) [W/kg] |                        |                       |                        |           |                                          |                                 |                                                           |                   |                             |
|                                    |          |               |             | Antenna 1                                     |                        | Antenna 0             |                        |           |                                          |                                 |                                                           |                   |                             |
|                                    |          |               |             | Wi-Fi (*)<br>DTS Band                         | Wi-Fi (*)<br>UNII band | Wi-Fi (*)<br>DTS Band | Wi-Fi (*)<br>UNII band | Bluetooth |                                          |                                 |                                                           |                   |                             |
| Front                              | SISO     | -             | 10g         | 0.385 (b)                                     |                        |                       |                        | 0.03 (*)  | 0.415                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | SISO     | U-NII-1&2A    | 10g         |                                               | 0.199 (n40)            |                       |                        | 0.03 (*)  | 0.229                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    |          | U-NII-2C      | 10g         |                                               | 0.330 (n40)            |                       |                        | 0.03 (*)  | 0.360                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    |          | U-NII-3       | 10g         |                                               | 0.197 (ac80)           |                       |                        | 0.03 (*)  | 0.227                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | -             | 10g         | 0.385 (b)                                     |                        | 0.446 (b)             |                        |           | 0.831                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | U-NII-1&2A    | 10g         |                                               | 0.199 (n40)            |                       | 0.319 (n40)            |           | 0.518                                    | <4, No                          | -                                                         | -                 | -                           |
| U-NII-2C                           |          | 10g           |             | 0.330 (n40)                                   |                        | 0.363 (n40)           |                        | 0.693     | <4, No                                   | -                               | -                                                         | -                 |                             |
| U-NII-3                            |          | 10g           |             | 0.197 (ac80)                                  |                        | 0.272 (a)             |                        | 0.469     | <4, No                                   | -                               | -                                                         | -                 |                             |
| Back                               | SISO     | -             | 10g         | 0.097 (b)                                     |                        |                       |                        | 0.03 (*)  | 0.127                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | SISO     | U-NII-1&2A    | 10g         |                                               | 0.040 (n40)            |                       |                        | 0.03 (*)  | 0.070                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    |          | U-NII-2C      | 10g         |                                               | 0.073 (n40)            |                       |                        | 0.03 (*)  | 0.103                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    |          | U-NII-3       | 10g         |                                               | 0.036 (ac80)           |                       |                        | 0.03 (*)  | 0.063                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | -             | 10g         | 0.097 (b)                                     |                        | 0.756 (b)             |                        |           | 0.853                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | U-NII-1&2A    | 10g         |                                               | 0.040 (n40)            |                       | 0.159 (n40)            |           | 0.199                                    | <4, No                          | -                                                         | -                 | -                           |
| U-NII-2C                           |          | 10g           |             | 0.073 (n40)                                   |                        | 0.161 (n40)           |                        | 0.234     | <4, No                                   | -                               | -                                                         | -                 |                             |
| U-NII-3                            |          | 10g           |             | 0.036 (ac80)                                  |                        | 0.107 (ac80)          |                        | 0.143     | <4, No                                   | -                               | -                                                         | -                 |                             |
| Top                                | SISO     | -             | 10g         | 0.480 (b)                                     |                        |                       |                        | 0.03 (*)  | 0.510                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | SISO     | U-NII-1&2A    | 10g         |                                               | 0.244 (n40)            |                       |                        | 0.03 (*)  | 0.274                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    |          | U-NII-2C      | 10g         |                                               | 0.639 (n40)            |                       |                        | 0.03 (*)  | 0.669                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    |          | U-NII-3       | 10g         |                                               | 0.369 (a)              |                       |                        | 0.03 (*)  | 0.399                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | -             | 10g         | 0.480 (b)                                     |                        | 1.0 (*)               |                        |           | 1.480                                    | <4, No                          | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | U-NII-1&2A    | 10g         |                                               | 0.244 (n40)            |                       | 1.0 (*)                |           | 1.244                                    | <4, No                          | -                                                         | -                 | -                           |
| U-NII-2C                           |          | 10g           |             | 0.639 (n40)                                   |                        | 1.0 (*)               |                        | 1.639     | <4, No                                   | -                               | -                                                         | -                 |                             |
| U-NII-3                            |          | 10g           |             | 0.369 (a)                                     |                        | 1.0 (*)               |                        | 1.369     | <4, No                                   | -                               | -                                                         | -                 |                             |
| Bottom                             | SISO     | -             | 1g          | 0.4 (*)                                       |                        |                       |                        | 0.08 (*)  | 0.48                                     | <1.6, No                        | -                                                         | -                 | -                           |
|                                    | SISO     | U-NII-1&2A    | 1g          |                                               | 0.4 (*)                |                       |                        | 0.08 (*)  | 0.48                                     | <1.6, No                        | -                                                         | -                 | -                           |
|                                    |          | U-NII-2C      | 1g          |                                               | 0.4 (*)                |                       |                        | 0.08 (*)  | 0.48                                     | <1.6, No                        | -                                                         | -                 | -                           |
|                                    |          | U-NII-3       | 1g          |                                               | 0.4 (*)                |                       |                        | 0.08 (*)  | 0.48                                     | <1.6, No                        | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | -             | 1g          | 0.4 (*)                                       |                        | 0.759 (b)             |                        | -         | 1.159                                    | <1.6, No                        | -                                                         | -                 | -                           |
|                                    | MIMO(*)2 | U-NII-1&2A    | 1g          |                                               | 0.4 (*)                |                       | 1.267 (ac40)           |           | 1.667                                    | >1.6, Yes                       | 78.774                                                    | 0.027             | No                          |
| U-NII-2C                           |          | 1g            |             | 0.4 (*)                                       |                        | 1.150 (ac20)          |                        | 1.550     | <1.6, No                                 | -                               | -                                                         | -                 |                             |
| U-NII-3                            |          | 1g            |             | 0.4 (*)                                       |                        | 1.423 (ac20)          |                        | -         | 1.823                                    | >1.6, Yes                       | 78.774                                                    | 0.031             | No                          |

Note: \*1. These values are estimated SAR. Refer to section 4.2.

\*2. These SAR values were obtained by the SISO mode which has the higher power than MIMO mode on each antenna.

\*3. ( ) shows the operation mode. b: IEEE 802.11b; a: IEEE 802.11a; n40: IEEE 802.11n(40HT); ac20: IEEE 802.11ac(20VHT); ac80: IEEE 802.11ac(80VHT).

\*. This Wireless module supports both Wi-Fi and Bluetooth on an antenna 0. An antenna 1 is only supported Wi-Fi.

\*. Wi-Fi and Bluetooth cannot transmit simultaneously on an antenna 0.

\*. Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the SAR(1g) is < 1.6 W/kg (SAR(10g) is < 4 W/kg) or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.