# 1 Cover Page

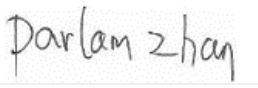
## *RF Exposure Evaluation Report*

| | |
|---|---|
| **Application No.:** | SHCR2212002802ME |
| **FCC ID:** | OU5VSM01 |
| **Applicant:** | GE Medical Systems Information Technologies, Inc. |
| **Address of Applicant:** | 9900 Innovation Drive, Wauwatosa, WI 53226 USA |
| **Manufacturer:** | GE Medical Systems Information Technologies, Inc. |
| **Address of Manufacturer:** | 9900 Innovation Drive, Wauwatosa, WI 53226 USA |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | VSM WLAN module |
| **Model No.:** | VSM-WLAN-01 |
| **Trade Mark:** | GE |
| **Standard(s) :** | 47 CFR Part 15, Subpart E 15.407<br>RSS-247 Issue 2, February 2017<br>KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02<br>KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02<br>KDB 905462 D04 Operational Modes for DFS Testing New Rules v01 |
| **Date of Receipt:** | 2022-12-22 |
| **Date of Test:** | 2023-03-06 to 2023-03-20 |
| **Date of Issue:** | 2023-03-21 |
| **Test Result:** | **Pass*** |

* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan
Laboratory Manager

| Revision Record | | | |
|---|---|---|---|
| **Version** | **Description** | **Date** | **Remark** |
| 00 | Original | 2023-03-21 | / |
| | | | |
| | | | |

| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| | |  | | |
| | | **Wade Zhang/Project Engineer** | | |
| | |  | | |
| | | **Parlam Zhan / Reviewer** | | |

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# 3 General Information

## 3.1 General Description of E.U.T.

| | |
|---|---|
| Power supply: | DC 3.3V |

## 3.2 Technical Specifications

BLE

| | |
|---|---|
| Operation Frequency: | 2402MHz to 2480MHz |
| Bluetooth Version: | V4.0 LE |
| Date Rate: | 1Mbps |
| Modulation Type: | GFSK |
| Number of Channels: | 40 |
| Channel Spacing: | 2MHz |
| Data Rate: | 1Mbps |
| Antenna Type: | PCB Antenna |
| Antenna Gain: | 2.83dBi @Ant 1 (Provided by manufacturer) |

BT

| | |
|---|---|
| Operation Frequency: | 2402MHz to 2480MHz |
| Bluetooth Version: | V4.0 BR+EDR |
| Date Rate: | 1Mbps,2Mbps, 3Mbps |
| Modulation Type: | GFSK, pi/4DQPSK, 8DPSK |
| Number of Channels: | 79 |
| Channel Spacing: | 1MHz |
| Spectrum Spread Technology: | Frequency Hopping Spread Spectrum(FHSS) |
| Antenna Type: | PCB Antenna |
| Antenna Gain: | 2.83dBi @Ant 1 (Provided by manufacturer) |

2.4GHz WiFi

| | |
|---|---|
| Operation Frequency: | 802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz |
| Modulation Type: | 802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Number of Channels: | 802.11b/g/n(HT20):11;802.11n(HT40):7 |
| Channel Spacing: | 5MHz |
| Antenna Type: | Antenna 1: PCB Antenna |

| | |
|---|---|
| | Antenna 2: PCB Antenna |
| Antenna Gain: | Antenna 1: 2.83dBi (Provided by manufacturer)<br>Antenna 2: 2.84dBi (Provided by manufacturer)<br>Directional gain: 5.85dBi |
| Date Rate: | 802.11b:1/2/5.5./11Mbps<br>802.11g:6/9/12/18/24/36/48/54Mbps<br>802.11n:MCS0-MCS7 |

5GHz WiFi

| | |
|---|---|
| Operation Frequency/Number of channels (20MHz): | U-NII-1: 5180-5240MHz (4 Channels); U-NII-2A: 5260-5320MHz (4 Channels); U-NII-2C: 5500-5700MHz (11 Channels) ;U-NII-3: 5745-5825MHz (5 Channels) |
| Operation Frequency/Number of channels/(40MHz): | U-NII-1: 5190-5230MHz (2 Channels); U-NII-2A: 5270-5310MHz (2 Channels); U-NII-2C: 5510-5670MHz (5 Channels) ; U-NII-3: 5755-5795MHz (2 Channels) |
| Modulation Type: | 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| Channel Spacing: | 802.11a/n(HT20): 20MHz; 802.11n(HT40): 40MHz |
| DFS Function: | Slave without Radar detection |
| TPC Function: | Without TPC function |
| Antenna Type: | PCB Antenna |
| Antenna Gain: | Antenna 1: 2.38dBi (Provided by manufacturer)<br>Antenna 2: 1dBi (Provided by manufacturer) |
| Date Rate: | 802.11a:6/9/12/18/24/36/48/54Mbps<br>802.11n:MCS0-MCS7 |

## 3.3 Separation Distance

| | |
|---|---|
| Separation distance between the antenna to person (R): | ＞20cm |
| Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. | |

## 3.4 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China.
Tel: +86 21 6191 5666
Fax: +86 21 6191 5678
No tests were sub-contracted.
Note:
1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc ) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

## 3.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**• A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

**• FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

**• ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory Company Number: 8617A

**• VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

# 4 Test Standards and Limits

Test exemptions apply for devices used in general population/uncontrolled exposure environments, according to the SAR-based, or MPE-based exemption thresholds.

## 4.1 Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of §1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1-mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph §1.1307(b)(3)(ii)(A).

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

## 4.2 MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

**Table B.1—Thresholds For Single RF Sources Subject to Routine Environmental Evaluation**

| RF Source Frequency | | | Minimum Distance | | | Threshold ERP |
|---|---|---|---|---|---|---|
| $f_L$ MHz | | $f_H$ MHz | $\lambda_L / 2\pi$ | | $\lambda_H / 2\pi$ | W |
| 0.3 | – | 1.34 | 159 m | – | 35.6 m | 1,920 $R^2$ |
| 1.34 | – | 30 | 35.6 m | – | 1.6 m | 3,450 $R^2/f^2$ |
| 30 | – | 300 | 1.6 m | – | 159 mm | 3.83 $R^2$ |
| 300 | – | 1,500 | 159 mm | – | 31.8 mm | 0.0128 $R^2f$ |
| 1,500 | – | 100,000 | 31.8 mm | – | 0.5 mm | 19.2$R^2$ |
| Subscripts L and H are low and high; λ is wavelength.<br>From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns. | | | | | | |

The table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least λ/2π. The thresholds are

based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.

For mobile devices that are not exempt per Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than $ERP_{20cm}$ in Formula (B.1) [repeated from §2.1091(c)(1); also in §1.1307(b)(1)(i)(B)].

$$P_{th}\,(\mathrm{mW}) = ERP_{20\,cm}\,(\mathrm{mW}) = \begin{cases} 2040f & 0.3\ \mathrm{GHz} \le f < 1.5\ \mathrm{GHz} \\ 3060 & 1.5\ \mathrm{GHz} \le f \le 6\ \mathrm{GHz} \end{cases} \qquad (B.1)$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

| Limit calculation | | | |
|---|---|---|---|
| Frequency range | Frequency(MHz) | R(λ/2π)(m) | Threshold ERP(W) |
| 300~1500MHz | **915** | 0.0522 | 0.032 |
| 1500~100000MHz | **2462** | 0.0194 | 0.007 |
| 1500~100000MHz | **5825** | 0.0082 | 0.001 |

## 4.3 SAR-based Exemption

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of λ/4.

As for devices with antennas of length greater than λ/4 where the gain is not well defined, but always less than that of a half-wave dipole (length λ/2), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula of §1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold $P_{th}$ (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). $P_{th}$ is given by Formula (B.2).

$$P_{th}\,(\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\,\text{cm})^{x} & d \le 20\,\text{cm} \\ ERP_{20\,\text{cm}} & 20\,\text{cm} < d \le 40\,\text{cm} \end{cases} \qquad (B.2)$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

and $f$ is in GHz, d is the separation distance (cm), and $ERP_{20cm}$ is per Formula (B.1).

Example values shown in Table B.2 are for illustration only.

**Table B.2—Example Power Thresholds (mW)**

| Frequency (MHz) | Distance(mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 300 | 39 | 65 | 88 | 110 | 129 | 148 | 166 | 184 | 201 | 217 |
| 450 | 22 | 44 | 67 | 89 | 112 | 135 | 158 | 180 | 203 | 226 |
| 835 | 9 | 25 | 44 | 66 | 90 | 116 | 145 | 175 | 207 | 240 |
| 1900 | 3 | 12 | 26 | 44 | 66 | 92 | 122 | 157 | 195 | 236 |
| 2450 | 3 | 10 | 22 | 38 | 59 | 83 | 111 | 143 | 179 | 219 |
| 3600 | 2 | 8 | 18 | 32 | 49 | 71 | 96 | 125 | 158 | 195 |
| 5800 | 1 | 6 | 14 | 25 | 40 | 58 | 80 | 106 | 136 | 169 |

| **Limit calculation** | | | | |
|---|---|---|---|---|
| Frequency range(GHz) | Frequency(GHz) | X | Distance(cm) | Pth (mW) |
| 0.3~1.5 | **0.915** | 1.474 | **20** | **1866.600** |
| 1.5~6 | **2.462** | 1.903 | **20** | **3060.000** |
| 1.5~6 | **5.825** | 2.090 | **20** | **3060.000** |

## 4.4 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where $f$ is in MHz;

• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where $f$ is in MHz;

• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4GHz device, the limit of worse case is 2.68 W

For 5GHz device, the limit of worse case is 4.53 W

# 5 Measurement and Calculation

## 5.1 Maximum transmit power

**BT**

The Power Data is based on the RF Test Report SHCR221200280201

| TestMode | Antenna | Channel | Result [dBm] | Result [mW] |
|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 5.7 | 3.72 |
| | | 2441 | 6.39 | **4.36** |
| | | 2480 | 6.06 | 4.04 |
| 2DH5 | Ant1 | 2402 | 2.39 | 1.73 |
| | | 2441 | 3.15 | 2.07 |
| | | 2480 | 3.03 | 2.01 |
| 3DH5 | Ant1 | 2402 | 3.05 | 2.02 |
| | | 2441 | 3.81 | 2.40 |
| | | 2480 | 3.66 | 2.32 |

**BLE**

The Power Data is based on the RF Test Report SHCR221200280202

| TestMode | Antenna | Channel | Result [dBm] | Result [mW] |
|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 4.04 | 2.54 |
| | | 2440 | 4.72 | **2.96** |
| | | 2480 | 4.48 | 2.81 |

**2.4G WiFi**

The Power Data is based on the RF Test Report SHCR221200280203

| TestMode | Antenna | Channel | Result [dBm] | Result [mW] |
|---|---|---|---|---|
| 11B | Ant1 | 2412 | 13.92 | 24.66 |
| | | 2437 | 14.18 | **26.18** |
| | | 2462 | 14.09 | 25.64 |
| 11G | Ant1 | 2412 | 10.57 | 11.40 |
| | | 2437 | 11.05 | 12.74 |
| | | 2462 | 10.57 | 11.40 |
| 11N20MIMO | Ant1 | 2412 | 8.27 | 6.71 |
| | Ant2 | 2412 | 8.14 | 6.52 |
| | total | 2412 | 11.22 | 13.24 |
| | Ant1 | 2437 | 8.66 | 7.35 |
| | Ant2 | 2437 | 8.67 | **7.36** |
| | total | 2437 | 11.68 | **14.72** |
| | Ant1 | 2462 | 9.02 | 7.98 |
| | Ant2 | 2462 | 8.06 | 6.40 |
| | total | 2462 | 11.58 | 14.39 |
| 11N40SISO | Ant1 | 2422 | 7.24 | 5.30 |
| | | 2437 | 8.97 | 7.89 |
| | | 2452 | 7.16 | 5.20 |

**5G WiFi:**

The Power Data is based on the RF Test Report SHCR221200280204

| Test Mode | Antenna | Channel | Result [dBm] | Result [mW] |
|---|---|---|---|---|
| 11A | Ant1 | 5180 | 3.55 | 2.26 |
| | Ant2 | 5180 | 4.28 | 2.68 |
| | Ant1 | 5220 | 2.62 | 1.83 |
| | Ant2 | 5220 | 4.07 | 2.55 |
| | Ant1 | 5240 | 2.81 | 1.91 |
| | Ant2 | 5240 | 4.05 | 2.54 |
| | Ant1 | 5260 | 2.56 | 1.80 |
| | Ant2 | 5260 | 4.25 | 2.66 |
| | Ant1 | 5300 | 3.20 | 2.09 |
| | Ant2 | 5300 | 2.52 | 1.79 |
| | Ant1 | 5320 | 2.32 | 1.71 |
| | Ant2 | 5320 | 2.25 | 1.68 |
| | Ant1 | 5500 | 1.43 | 1.39 |
| | Ant2 | 5500 | 2.23 | 1.67 |
| | Ant1 | 5580 | 2.38 | 1.73 |
| | Ant2 | 5580 | 2.36 | 1.72 |
| | Ant1 | 5700 | 2.17 | 1.65 |
| | Ant2 | 5700 | 0.85 | 1.22 |
| | Ant1 | 5745 | 2.61 | 1.82 |
| | Ant2 | 5745 | 1.68 | 1.47 |
| | Ant1 | 5785 | 2.23 | 1.67 |
| | Ant2 | 5785 | 1.29 | 1.35 |
| | Ant1 | 5825 | 2.39 | 1.73 |
| | Ant2 | 5825 | 0.80 | 1.20 |
| 11N20SISO | Ant1 | 5180 | 3.64 | **2.31** |
| | Ant2 | 5180 | 4.43 | **2.77** |
| | Ant1 | 5220 | 2.46 | 1.76 |
| | Ant2 | 5220 | 4.29 | 2.69 |
| | Ant1 | 5240 | 2.93 | 1.96 |
| | Ant2 | 5240 | 4.25 | 2.66 |
| | Ant1 | 5260 | 2.69 | 1.86 |
| | Ant2 | 5260 | 3.87 | 2.44 |
| | Ant1 | 5300 | 3.28 | 2.13 |
| | Ant2 | 5300 | 2.81 | 1.91 |
| | Ant1 | 5320 | 2.85 | 1.93 |
| | Ant2 | 5320 | 2.61 | 1.82 |
| | Ant1 | 5500 | 1.99 | 1.58 |
| | Ant2 | 5500 | 2.43 | 1.75 |
| | Ant1 | 5580 | 2.41 | 1.74 |
| | Ant2 | 5580 | 2.22 | 1.67 |
| | Ant1 | 5700 | 2.29 | 1.69 |
| | Ant2 | 5700 | 1.66 | 1.47 |
| | Ant1 | 5745 | 3.03 | 2.01 |
| | Ant2 | 5745 | 1.70 | 1.48 |
| | Ant1 | 5785 | 2.85 | 1.93 |
| | Ant2 | 5785 | 1.43 | 1.39 |
| | Ant1 | 5825 | 2.92 | 1.96 |

| | | | | |
|---|---|---|---|---|
| | Ant2 | 5825 | 1.00 | 1.26 |
| 11N40SISO | Ant1 | 5190 | 2.84 | 1.92 |
| | Ant2 | 5190 | 2.82 | 1.91 |
| | Ant1 | 5230 | 2.95 | 1.97 |
| | Ant2 | 5230 | 2.69 | 1.86 |
| | Ant1 | 5270 | 2.73 | 1.87 |
| | Ant2 | 5270 | 0.88 | 1.22 |
| | Ant1 | 5310 | 1.13 | 1.30 |
| | Ant2 | 5310 | 0.64 | 1.16 |
| | Ant1 | 5510 | 2.32 | 1.71 |
| | Ant2 | 5510 | 1.57 | 1.44 |
| | Ant1 | 5550 | 1.89 | 1.55 |
| | Ant2 | 5550 | 3.52 | 2.25 |
| | Ant1 | 5670 | 1.66 | 1.47 |
| | Ant2 | 5670 | 1.08 | 1.28 |
| | Ant1 | 5755 | 2.74 | 1.88 |
| | Ant2 | 5755 | 2.33 | 1.71 |
| | Ant1 | 5795 | 3.17 | 2.07 |
| | Ant2 | 5795 | 2.08 | 1.61 |


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## 5.2 RF Exposure Calculation

**BT**

The Max Conducted Peak Output Power is 4.36mW. The best case gain of the antenna is 2.83dBi.

2.83dBi logarithmic terms convert to numeric result is nearly 1.92

According to the formula. calculate the EIRP test result:

EIRP= P x G = 4.36 mW x 1.92 = 8.37 mW

**BLE**

The Max Conducted Peak Output Power is 2.96mW. The best case gain of the antenna is 2.83dBi.

2.83dBi logarithmic terms convert to numeric result is nearly 1.92

According to the formula. calculate the EIRP test result:

EIRP= P x G = 2.96 mW x 1.92 = 5.68 mW

**2.4G WiFi**

The Max Conducted Average Output Power is 26.18 mW for antenna1, 7.36 mW for antenna2, 14.72 mW for MIMO.

The best case gain of the antenna is 2.83dBi for antenna1 and 2.84dBi for antenna2.

Directional gain: 5.85dBi.

2.83dBi logarithmic terms convert to numeric result is nearly 1.92.

2.84dBi logarithmic terms convert to numeric result is nearly 1.92.

5.85dBi logarithmic terms convert to numeric result is nearly 3.85.

According to the formula. calculate the EIRP test result:

Antenna1: E.I.R.P.= P x G = 26.18 mW x 1.92= 50.27mW

Antenna2: E.I.R.P.= P x G = 7.36 mW x 1.92 = 14.13mW

In MIMO mode: EIRP= P x G = 14.72 mW x 3.85= 56.67mW

**5G WiFi**

The Max Conducted Average Output Power is 2.31 mW for antenna1, 2.77 mW for antenna2.

The best case gain of the antenna is 2.38dBi for antenna1 and 1dBi for antenna2.

2.38dBi logarithmic terms convert to numeric result is nearly 1.73.

1dBi logarithmic terms convert to numeric result is nearly 1.26.

According to the formula. calculate the EIRP test result:

Antenna1: E.I.R.P.= P x G = 2.31 mW x 1.73= 4.00mW

Antenna2: E.I.R.P.= P x G = 2.77 mW x 1.26 = 3.49mW

The BT, 2.4GHz WiFi,5GHz WiFi modules can transmit simultaneously, but the maximum rate of MPE is 8.37/3060+56.67/3060+4.00/3060=0.02≤1

**Remark**: we used the maximum power between the conducted power and ERP/EIRP to perform RF exposure exemption evaluation.

| | Evaluation method | Exempt Limit(mW) | Verdict |
|---|---|---|---|
| ☐ | Blanket 1 mW Blanket Exemption | 1mW | N/A |
| ☐ | MPE-based Exemption(ERP) | 7mW(ERP) (2.4GHz Band) | N/A |
| ☒ | SAR-based Exemption($P_{th}$) | 3060mW(ERP) (1.5GHz~6GHz) | Yes |

So, the device is to qualify for SAR test exemption, the exemption report is in lieu of the SAR report.

**For IC:**

**BT**

EIRP= P x G = 4.36 mW x 1.92 = 8.37 mW = 0.00837W<2.68W

**BLE**

EIRP= P x G = 2.96 mW x 1.92 = 5.68 Mw = 0.00568W<2.68W

**2.4GHz WiFi:**

Antenna1: E.I.R.P.= P x G = 26.18 mW x 1.92= 50.27mW = 0.05027W<2.68W

Antenna2: E.I.R.P.= P x G = 7.36 mW x 1.92 = 14.13mW = 0.01413W <2.68W

In MIMO mode: EIRP= P x G = 14.72 mW x 3.85= 56.67mW = 0.05667W<2.68W

**5GHz WiFi:**

Antenna1: E.I.R.P.= P x G = 2.31 mW x 1.73= 4.00mW =0.004W <4.53W

Antenna2: E.I.R.P.= P x G = 2.77 mW x 1.26 = 3.49mW =0.00349W <4.53W

The BT, 2.4GHz WiFi,5GHz WiFi modules can transmit simultaneously, so the maximum rate of MPE is 0.00837/2.68+0.05667/2.68+0.004/4.53=0.025≤1. So the device is exclusion from SAR test

**--End of the Report--**