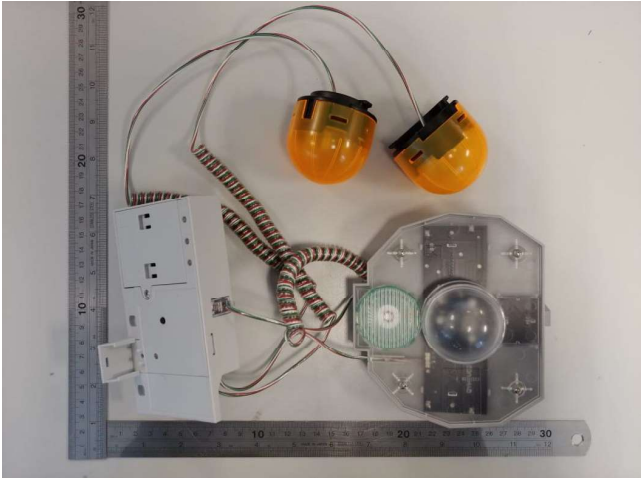


|                                                                                                                                                                                                                                |                                                                                                            |                                                                                           |                                                                     |                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------|
| <b>Prüfbericht-Nr.:</b><br><i>Test Report No.:</i>                                                                                                                                                                             | <b>CN21WANV 002</b>                                                                                        | <b>Auftrags-Nr.:</b><br><i>Order No.:</i>                                                 | <b>158226632</b>                                                    | <b>Seite 1 von 18</b><br><i>Page 1 of 18</i>     |
| <b>Kunden-Referenz-Nr.:</b><br><i>Client Reference No.:</i>                                                                                                                                                                    | <b>NA</b>                                                                                                  | <b>Auftragsdatum:</b><br><i>Order date:</i>                                               | <b>21.01.2021</b>                                                   |                                                  |
| <b>Auftraggeber:</b><br><i>Client:</i>                                                                                                                                                                                         | <b>geobra Brandstaetter Stiftung &amp; Co.KG</b><br><b>Brandstaetterstr. 2-10; 90513 Zirndorf, Germany</b> |                                                                                           |                                                                     |                                                  |
| <b>Prüfgegenstand:</b><br><i>Test item:</i>                                                                                                                                                                                    | <b>USSE Enterprise</b>                                                                                     |                                                                                           |                                                                     |                                                  |
| <b>Bezeichnung / Typ-Nr.:</b><br><i>Identification / Type No.:</i>                                                                                                                                                             | <b>#70548</b>                                                                                              |                                                                                           |                                                                     |                                                  |
| <b>Auftrags-Inhalt:</b><br><i>Order content:</i>                                                                                                                                                                               | <b>US FCC Certification; ISED Canada Certification</b>                                                     |                                                                                           |                                                                     |                                                  |
| <b>Prüfgrundlage:</b><br><i>Test specification:</i>                                                                                                                                                                            | <b>FCC Part 15 Subpart C</b><br><b>RSS-247 Issue 2</b><br><b>ANSI C63.10-2013</b>                          |                                                                                           |                                                                     |                                                  |
| <b>Wareneingangsdatum:</b><br><i>Date of receipt:</i>                                                                                                                                                                          | <b>22.01.2021</b><br><b>25.02.2021</b>                                                                     |        |                                                                     |                                                  |
| <b>Prüfmuster-Nr.:</b><br><i>Test sample No.:</i>                                                                                                                                                                              | <b>A002991780-005</b><br><b>A003006443-001</b>                                                             |                                                                                           |                                                                     |                                                  |
| <b>Prüfzeitraum:</b><br><i>Testing period:</i>                                                                                                                                                                                 | <b>22.01.2021 – 16.04.2021</b>                                                                             |                                                                                           |                                                                     |                                                  |
| <b>Ort der Prüfung:</b><br><i>Place of testing:</i>                                                                                                                                                                            | <b>Hong Kong</b>                                                                                           |                                                                                           |                                                                     |                                                  |
| <b>Prüflaboratorium:</b><br><i>Testing laboratory:</i>                                                                                                                                                                         | <b>TÜV Rheinland Hong Kong Ltd.</b>                                                                        |                                                                                           |                                                                     |                                                  |
| <b>Prüfergebnis*:</b><br><i>Test result*:</i>                                                                                                                                                                                  | <b>Pass</b>                                                                                                |                                                                                           |                                                                     |                                                  |
| <b>geprüft von / tested by:</b>                                                                                                                                                                                                |                                                                                                            | <b>kontrolliert von / reviewed by:</b>                                                    |                                                                     |                                                  |
|                                                                                                                                             |                                                                                                            |      |                                                                     |                                                  |
| <b>16.06.2021</b>                                                                                                                                                                                                              | <b>Felicia Chan / Assistant Engineer</b>                                                                   | <b>16.06.2021</b>                                                                         | <b>Sharon Li / Unit Senior Manager</b>                              |                                                  |
| <b>Datum</b><br><i>Date</i>                                                                                                                                                                                                    | <b>Name / Stellung</b><br><i>Name / Position</i>                                                           | <b>Unterschrift</b><br><i>Signature</i>                                                   | <b>Datum</b><br><i>Date</i>                                         | <b>Name / Stellung</b><br><i>Name / Position</i> |
|                                                                                                                                                                                                                                |                                                                                                            |                                                                                           |                                                                     |                                                  |
| <b>Sonstiges / Other:</b>                                                                                                                                                                                                      |                                                                                                            | <b>FCC ID: N2T30659894</b><br><b>IC ID: 9285A-30659894</b>                                |                                                                     |                                                  |
| <b>This report is prepared for the purpose of IC ID updated and typo mistake regarding the 4.5 VDC test voltage. All the test result were referred from CN21WANV 001 report.</b>                                               |                                                                                                            |                                                                                           |                                                                     |                                                  |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br><i>Condition of the test item at delivery:</i>                                                                                                                         |                                                                                                            | <b>Prüfmuster vollständig und unbeschädigt</b><br><i>Test item complete and undamaged</i> |                                                                     |                                                  |
| <b>* Legende:</b>                                                                                                                                                                                                              | 1 = sehr gut<br>P(ass) = entspricht o.g. Prüfgrundlage(n)                                                  | 2 = gut<br>F(ail) = entspricht nicht o.g. Prüfgrundlage(n)                                | 3 = befriedigend<br>F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | 4 = ausreichend<br>N/A = nicht anwendbar         |
| <b>Legend:</b>                                                                                                                                                                                                                 | 1 = very good<br>P(ass) = passed a.m test specification(s)                                                 | 2 = good<br>F(ail) = failed a.m test specification(s)                                     | 3 = satisfactory<br>F(ail) = failed a.m test specification(s)       | 4 = sufficient<br>N/A = not applicable           |
| 5 = mangelhaft<br>N/T = nicht getestet                                                                                                                                                                                         |                                                                                                            |                                                                                           |                                                                     |                                                  |
| 5 = poor<br>N/T = not tested                                                                                                                                                                                                   |                                                                                                            |                                                                                           |                                                                     |                                                  |
| <b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b>       |                                                                                                            |                                                                                           |                                                                     |                                                  |
| <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i> |                                                                                                            |                                                                                           |                                                                     |                                                  |

## Table of Content

|                                                                          | Page                 |
|--------------------------------------------------------------------------|----------------------|
| <b>Cover Page .....</b>                                                  | <b>1</b>             |
| <b>Table of Content .....</b>                                            | <b>2</b>             |
| <b>Product information.....</b>                                          | <b>4</b>             |
| <b>Manufacturers declarations.....</b>                                   | <b>4</b>             |
| <b>Product function and intended use .....</b>                           | <b>4</b>             |
| <b>Submitted documents .....</b>                                         | <b>4</b>             |
| <b>Independent Operation Modes.....</b>                                  | <b>4</b>             |
| <b>Related Submittal(s) Grants.....</b>                                  | <b>4</b>             |
| <b>Remark.....</b>                                                       | <b>5</b>             |
| <b>Test Set-up and Operation Mode.....</b>                               | <b>6</b>             |
| <b>Principle of Configuration Selection .....</b>                        | <b>6</b>             |
| <b>Test Operation and Test Software .....</b>                            | <b>6</b>             |
| <b>Special Accessories and Auxiliary Equipment .....</b>                 | <b>6</b>             |
| <b>Countermeasures to achieve EMC Compliance.....</b>                    | <b>6</b>             |
| <b>Test Methodology.....</b>                                             | <b>7</b>             |
| <b>Radiated Emission.....</b>                                            | <b>7</b>             |
| <b>Field Strength Calculation .....</b>                                  | <b>7</b>             |
| <b>Test Setup Diagram.....</b>                                           | <b>8</b>             |
| <b>Test Facility.....</b>                                                | <b>10</b>            |
| <b>Test Laboratory Information.....</b>                                  | <b>10</b>            |
| <b>List of Test and Measurement Instruments .....</b>                    | <b>11</b>            |
| <b>Measurement Uncertainty .....</b>                                     | <b>12</b>            |
| <b>Results FCC Part 15 – Subpart C / RSS-247 Issue 2.....</b>            | <b>13</b>            |
| <b>FCC 15.203 – Antenna Requirement 1 .....</b>                          | <b>Pass .....</b> 13 |
| <b>FCC 15.204 – Antenna Requirement 2 .....</b>                          | <b>N/A .....</b> 13  |
| <b>RSS-Gen 6.3 – External Control.....</b>                               | <b>Pass .....</b> 13 |
| <b>RSS-Gen 8.3 – Antenna Requirement.....</b>                            | <b>Pass .....</b> 13 |
| <b>FCC 15.207/ RSS-Gen 8.8 – Conducted Emission on AC Mains .....</b>    | <b>N/A .....</b> 14  |
| <b>FCC 15.247 (a)(2) / RSS-247 5.2 – 6dB Bandwidth Measurement .....</b> | <b>Pass .....</b> 14 |

|                                                                                   |                   |                 |
|-----------------------------------------------------------------------------------|-------------------|-----------------|
| <b>RSS-Gen 6.6 – Occupied Bandwidth .....</b>                                     | <b>Pass .....</b> | <b>14</b>       |
| <b>FCC 15.247(b)(3) / RSS-247 5.4 – Maximum Peak Conducted Output Power .....</b> | <b>Pass .....</b> | <b>15</b>       |
| <b>FCC 15.247(e) / RSS-247 5.2 – Power Spectral Density .....</b>                 | <b>Pass .....</b> | <b>15</b>       |
| <b>FCC 15.247(d) / RSS-247 5.5 – Spurious Conducted Emissions.....</b>            | <b>Pass .....</b> | <b>16</b>       |
| <b>FCC 15.205/ RSS-Gen 8.9 – Radiated Emissions in Restricted Frequency Bands</b> | <b>Pass.....</b>  | <b>17</b>       |
| <b>Appendix 1 – Test protocols .....</b>                                          |                   | <b>39 pages</b> |
| <b>Appendix 2 – Test setup .....</b>                                              |                   | <b>3 pages</b>  |
| <b>Appendix 3 – EUT External Photos .....</b>                                     |                   | <b>5 pages</b>  |
| <b>Appendix 4 – EUT Internal Photos .....</b>                                     |                   | <b>5 pages</b>  |
| <b>Appendix 5 – RF exposure information.....</b>                                  |                   | <b>2 pages</b>  |

## Product information

### Manufacturers declarations

|                                         | <b>Transceiver</b>       |
|-----------------------------------------|--------------------------|
| Operating frequency range               | 2402 - 2480 MHz          |
| Type of modulation                      | GFSK                     |
| Number of channels                      | 40                       |
| Channel separation                      | 2 MHz                    |
| Type of antenna                         | Integral PCB antenna     |
| Antenna gain (dBi)                      | 0 dBi                    |
| Power level                             | fix                      |
| Type of equipment                       | stand alone radio device |
| Connection to public utility power line | No                       |
| Nominal voltage                         | 4.5 VDC                  |
| Independent Operation Modes             | Transmitting             |

### Product function and intended use

The equipment under test (EUT) is a Bluetooth low energy lighting device.

FCC ID: N2T30659894/ IC ID: 9285A-30659894

| <b>Models</b> | <b>Product description</b> |
|---------------|----------------------------|
| #70548        | USSE Enterprise            |

### Submitted documents

Circuit Diagram  
Block Diagram  
Technical Description  
User manual  
Label

### Independent Operation Modes

The basic operation modes are:

- Transmitting mode.

For further information refer to User Manual

### Related Submittal(s) Grants

This is a single application for certification of the transmitter.

## Remark

The test results in this test report are only relevant to the tested sample and does not involve any assessment in the production.

This report is prepared for the purpose of IC ID updated and typo mistake regarding the 4.5 VDC test voltage. All the test result were referred from CN21WANV 001 report.

## Test Set-up and Operation Mode

### Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### Test Operation and Test Software

Test operation should refer to test methodology.

- A test mode sample is provided by the applicant to control the operating channel. The RF output power is fixed in the test mode sample. The setting of the RF output power used in the testing shall be fixed on the firmware of the final end product.

### Special Accessories and Auxiliary Equipment

- None

### Countermeasures to achieve EMC Compliance

- None

## Test Methodology

### Radiated Emission

The radiated emission measurements of the transmitter part were performed according to the procedures in ANSI C63.10-2013.

For measurement below 1GHz - the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For measurement above 1GHz - the EUT was placed at the middle of the 1.5 m height turntable and RF absorbing material was placed on ground plane between turntable and measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360 °, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

### Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

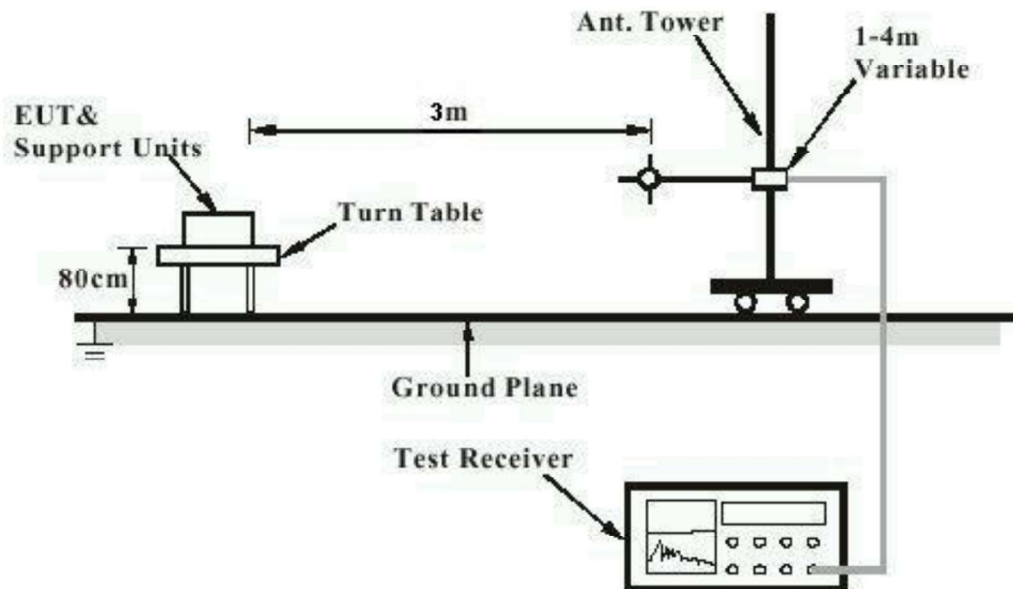
FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

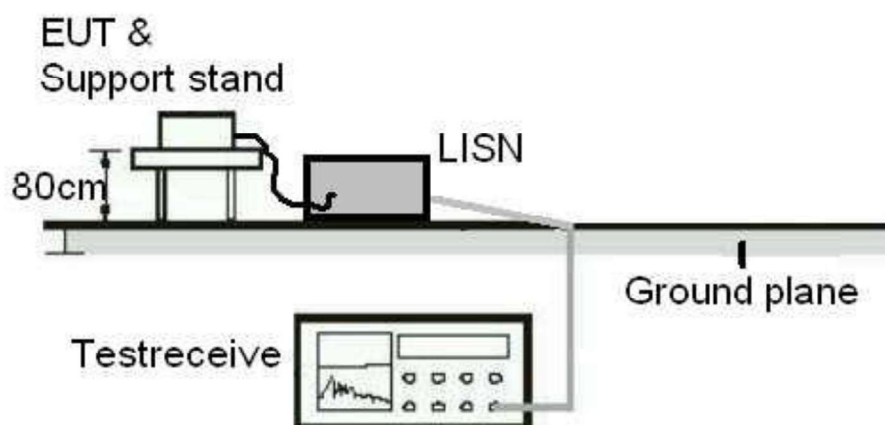
## Test Setup Diagram

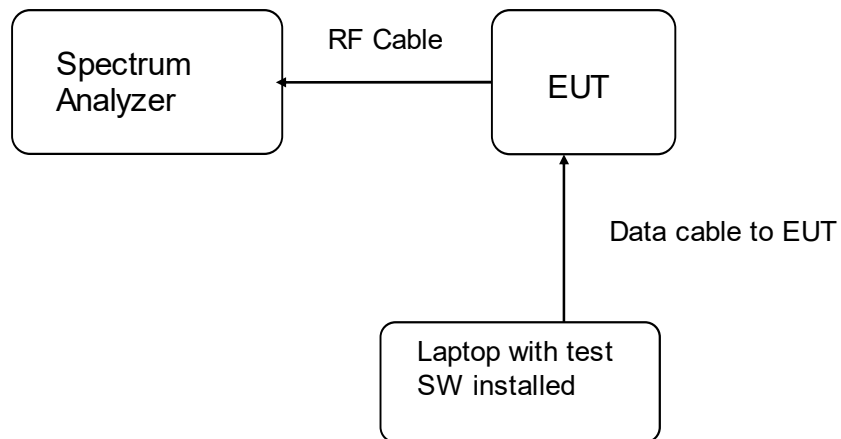
Diagram of Measurement Configuration for Radiation Test



**Note:** Measurements above 1 GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



**Diagram of Equipment Configuration for Antenna-port Conducted Measurement (if applicable)**

## Test Facility

### Test Laboratory Information

TÜV Rheinland Hong Kong Ltd.

Address: 3-4/F, Fou Wah Industrial Building, 10-16 Pun Shan Street, Tsuen Wan, N.T., Hong Kong

Tel.: +852 2192 1000

Fax: +852 2192 1001

Email [service-gc@tuv.com](mailto:service-gc@tuv.com)

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

#### **FCC**

Test Firm Registration Number : 371735

#### **ISED/IC**

Test Site Registration Number : 26152

## List of Test and Measurement Instruments

### Radiated Emission

| Equipment                                       | Manufacturer          | Type                   | Cal. Date | Due Date  |
|-------------------------------------------------|-----------------------|------------------------|-----------|-----------|
| Semi-anechoic Chamber                           | Frankonia             | Nil                    | 5-Mar-21  | 5-Mar-22  |
| Multi-functional Anechoic Chamber               | Albatross             | Nil                    | 4-Jan-21  | 4-Jan-22  |
| Test Receiver                                   | R & S                 | ESU40                  | 7-Oct-20  | 7-Oct-21  |
| Active Loop Antenna                             | EMCO                  | 6502                   | 3-Nov-20  | 3-Nov-22  |
| Bi-conical Antenna                              | R & S                 | HK116                  | 15-Sep-20 | 15-Sep-22 |
| Log Periodic Antenna                            | R & S                 | HL223                  | 15-Sep-20 | 15-Sep-22 |
| Standard Gain Horn                              | ETS-Lindgren          | 3160-07                | 24-Nov-20 | 24-Nov-22 |
| Standard Gain Horn                              | ETS-Lindgren          | 3160-08                | 24-Nov-20 | 24-Nov-22 |
| Standard Gain Horn                              | ETS-Lindgren          | 3160-10                | 30-Oct-20 | 30-Oct-22 |
| Double-Ridged Waveguide Horn                    | EMCO                  | 3116                   | 30-Oct-20 | 30-Oct-22 |
| Double-Ridged Waveguide Horn                    | EMCO                  | 3117                   | 11-Nov-20 | 11-Nov-22 |
| Coaxial cable                                   | Harbour               | SF118/11n/11n/1 2000.0 | 3-Aug-20  | 3-Aug-22  |
| High Frequency Cable                            | Pasternack            | PE3VNA4001-3M          | 29-Jan-21 | 29-Jan-23 |
| Microwave amplifier 0.5-26.5GHz, 25dB gain      | COM-POWER Corporation | PAM-118A               | 5-Mar-21  | 5-Mar-22  |
| Preamplifier 18GHz to 40GHz with cable (EMC656) | A.H. Systems, Inc.    | PAM-1840VH             | 29-Jan-21 | 29-Jan-22 |
| High Pass Filter (cutoff freq. =1000MHz)        | Trilithic             | 23042                  | 30-Oct-19 | 30-Oct-21 |
| Bore-Sight Antenna Mast                         | Maturo                | BAM 4.0-P-10kg         | N.A.      | N.A.      |

### Radio Test

| Equipment         | Manufacturer | Type  | Cal. Date | Due Date |
|-------------------|--------------|-------|-----------|----------|
| Spectrum Analyzer | R & S        | FSV40 | 3-Nov-20  | 3-Nov-21 |

## Measurement Uncertainty

The estimated combined standard uncertainty for power-line conducted emissions measurements is 2.28dB.

The estimated combined standard uncertainty for radiated emissions measurements is 3.23dB (9kHz to 30MHz) and 5.18dB (30MHz to 200MHz) and 6.09dB (200MHz to 1000MHz) and is 4.91dB (1GHz to 8.2GHz) and 4.78dB (8.2GHz to 12.4GHz) and 4.91dB (12.4GHz to 18GHz)

The estimated combined standard uncertainty for antenna conducted emission is 2.68dB

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of  $k=2$ , which for the level of confidence is approximately 95%.

## Results FCC Part 15 – Subpart C / RSS-247 Issue 2

|                                                                                                                     |                                                                                                   |             |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------|
| <b>FCC 15.203 – Antenna Requirement 1</b>                                                                           |                                                                                                   | <b>Pass</b> |
| <b>FCC Requirement:</b> No antenna other than that furnished by the responsible party shall be used with the device |                                                                                                   |             |
| <b>Results:</b>                                                                                                     | a) Antenna type: Integral PCB antenna<br>b) Manufacturer and model no: N/A<br>c) Peak Gain: 0 dBi |             |
| <b>Verdict:</b>                                                                                                     | Pass                                                                                              |             |

|                                                                                                                                                                                                                                                      |                                        |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------|
| <b>FCC 15.204 – Antenna Requirement 2</b>                                                                                                                                                                                                            |                                        | <b>N/A</b> |
| <b>FCC Requirement:</b> An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator. |                                        |            |
| <b>Results:</b>                                                                                                                                                                                                                                      | Only one integral antenna can be used. |            |
| <b>Verdict:</b>                                                                                                                                                                                                                                      | N/A                                    |            |

|                                                                                                                                                                                                                             |                                                                                                                                                                  |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>RSS-Gen 6.3 – External Control</b>                                                                                                                                                                                       |                                                                                                                                                                  | <b>Pass</b> |
| <b>IC Requirement:</b> The device shall not have any external controls accessible to the user that enable it to be adjusted, selected or programmed to operate in violation of the limits prescribed in the applicable RSS. |                                                                                                                                                                  |             |
| <b>Results:</b>                                                                                                                                                                                                             | The device does not have any transmitter external controls accessible to the user that can be adjusted and operated in violation of the limits of this standard. |             |
| <b>Verdict:</b>                                                                                                                                                                                                             | Pass                                                                                                                                                             |             |

|                                                                                                                                                                                                                                     |                                                                                                                                             |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>RSS-Gen 8.3 – Antenna Requirement</b>                                                                                                                                                                                            |                                                                                                                                             | <b>Pass</b> |
| <b>IC Requirement:</b> When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. |                                                                                                                                             |             |
| <b>Results:</b>                                                                                                                                                                                                                     | a) Antenna type: Integral PCB antenna<br>b) Manufacturer: N/A<br>c) model no: N/A<br>d) Gain with reference to an isotropic radiator: 0 dBi |             |
| <b>Verdict:</b>                                                                                                                                                                                                                     | Pass                                                                                                                                        |             |

**FCC 15.207/ RSS-Gen 8.8 – Conducted Emission on AC Mains****N/A**

There is no AC power input or output ports on the EUT.

**FCC 15.247 (a)(2) / RSS-247 5.2 – 6dB Bandwidth Measurement****Pass**

**FCC/ IC Requirement:** Systems using digital modulation techniques may operate in the 902 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500kHz.

Test Specification : ANSI C63.10 – 2013  
 Test date : 18.03.2021  
 Mode of operation : Tx mode  
 Port of testing : Temporary antenna port  
 Supply voltage : 4.5VDC  
 Temperature : 23°C  
 Humidity : 50%

**Results:** For test protocols please refer to Appendix 1

| Channel frequency (MHz) | 6 dB left (MHz) | 6 dB right (MHz) | 6dB bandwidth (kHz) |
|-------------------------|-----------------|------------------|---------------------|
| 2402                    | 2401.663        | 2402.198         | 534                 |
| 2440                    | 2439.643        | 2440.198         | 554                 |
| 2480                    | 2479.663        | 2480.198         | 534                 |

**RSS-Gen 6.6 – Occupied Bandwidth****Pass****FCC/ IC Requirement:** N/A

Test Specification : RSS-Gen  
 Test date : 18.03.2021  
 Mode of operation : Tx mode  
 Port of testing : Temporary antenna port  
 Supply voltage : 4.5VDC  
 Temperature : 23°C  
 Humidity : 50%

**Results:** Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

For test protocols refer to Appendix 1.

| Frequency (MHz) | Left (MHz) | Right (MHz) | 99% bandwidth (MHz) |
|-----------------|------------|-------------|---------------------|
| 2402            | 2401.471   | 2402.578    | 1.107               |
| 2440            | 2439.460   | 2440.593    | 1.129               |
| 2480            | 2479.406   | 2480.542    | 1.129               |

| FCC 15.247(b)(3) / RSS-247 5.4 – Maximum Peak Conducted Output Power                                                                                                                                            |                             |             | Pass    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|---------|
| <b>FCC/ IC Requirement:</b> For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt (30dBm)                                                                    |                             |             |         |
| Test Specification : ANSI C63.10 – 2013<br>Test date : 18.03.2021<br>Mode of operation : Tx mode<br>Port of testing : Temporary antenna port<br>Supply voltage : 4.5VDC<br>Temperature : 23°C<br>Humidity : 50% |                             |             |         |
| <b>Results:</b> For test protocols please refer to Appendix 1                                                                                                                                                   |                             |             |         |
| Frequency (MHz)                                                                                                                                                                                                 | Measured Output Power (dBm) | Limit (dBm) | Verdict |
| 2402                                                                                                                                                                                                            | -5.8                        | 30.0        | Pass    |
| 2440                                                                                                                                                                                                            | -5.6                        | 30.0        | Pass    |
| 2480                                                                                                                                                                                                            | -6.0                        | 30.0        | Pass    |

| FCC 15.247(e) / RSS-247 5.2 – Power Spectral Density                                                                                                                                                                                                  |                     |             | Pass    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|---------|
| <b>FCC/ IC Requirement:</b> For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. |                     |             |         |
| Test Specification : ANSI C63.10 – 2013<br>Test date : 18.03.2021<br>Mode of operation : Tx mode<br>Port of testing : Temporary antenna port<br>Supply voltage : 4.5VDC<br>Temperature : 23°C<br>Humidity : 50%                                       |                     |             |         |
| <b>Results:</b> For test protocols please refer to Appendix 1.                                                                                                                                                                                        |                     |             |         |
| Operating frequency (MHz)                                                                                                                                                                                                                             | Power density (dBm) | Limit (dBm) | Verdict |
| 2402                                                                                                                                                                                                                                                  | -5.37               | 8.0         | Pass    |
| 2440                                                                                                                                                                                                                                                  | -5.49               | 8.0         | Pass    |
| 2480                                                                                                                                                                                                                                                  | -5.36               | 8.0         | Pass    |

| FCC 15.247(d) / RSS-247 5.5 – Spurious Conducted Emissions                                                                                                                                                                                                                                                                                                                                                                                 |                          |                      |                       |            | Pass    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------|-----------------------|------------|---------|
| Test Specification : ANSI C63.10 – 2013<br>Test date : 21.03.2021<br>Mode of operation : Tx mode<br>Port of testing : Temporary antenna port<br>Supply voltage : 4.5VDC<br>Temperature : 23°C<br>Humidity : 50%                                                                                                                                                                                                                            |                          |                      |                       |            |         |
| <b>FCC/ IC Requirement:</b> In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |                          |                      |                       |            |         |
| <b>Results:</b> Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate.<br><br>Only the worst cases is shown below. For test protocols refer to Appendix 1                                                                                                                                                                                                |                          |                      |                       |            |         |
| Operating frequency (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                  | Spurious frequency (MHz) | Spurious Level (dBm) | Reference value (dBm) | Delta (dB) | Verdict |
| 2402                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2396.775                 | -45.30               | -5.37                 | 39.93      | Pass    |
| 2440                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4879.525                 | -52.60               | -5.49                 | 47.11      | Pass    |
| 2480                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2485.025                 | -47.70               | -5.36                 | 42.34      | Pass    |

**FCC 15.205/ RSS-Gen 8.9 – Radiated Emissions in Restricted Frequency Bands Pass**

Test Specification : ANSI C63.10 – 2013

Test Date : 21.03.2021

Mode of operation : Tx mode

Port of testing : Enclosure

Frequency range : 9kHz – 25GHz

Supply voltage : 4.5VDC

Temperature : 23°C

Humidity : 50%

**FCC/ IC Requirement:** In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission general limits.

**Results:** Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate.

All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.

Mode: 2402MHz TX

Vertical Polarization

| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
|----------|--------------|------------------------|
| 2390.000 | 44.1         | 74.0 / PK              |
| 2390.000 | 26.0         | 54.0 / AV              |
| 4803.967 | 51.8         | 74.0 / PK              |
| 4803.967 | 35.6         | 54.0 / AV              |
| 5760.000 | 51.0         | 74.0 / PK              |
| 5760.000 | 47.9         | 54.0 / AV              |
| 7205.951 | 44.3         | 74.0 / PK              |
| 7205.951 | 29.9         | 54.0 / AV              |

Mode: 2402 MHz TX

Horizontal Polarization

| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
|----------|--------------|------------------------|
| 408.004  | 35.3         | 46.0 / QP              |
| 672.001  | 37.3         | 46.0 / QP              |
| 936.001  | 36.6         | 46.0 / QP              |
| 2390.000 | 39.6         | 74.0 / PK              |
| 2390.000 | 28.9         | 54.0 / AV              |
| 4803.487 | 57.2         | 74.0 / PK              |
| 4803.487 | 38.7         | 54.0 / AV              |
| 7205.471 | 44.0         | 74.0 / PK              |
| 7205.471 | 29.9         | 54.0 / AV              |

| Mode: 2440 MHz TX Vertical Polarization   |              |                        |
|-------------------------------------------|--------------|------------------------|
| Freq MHz                                  | Level dBuV/m | Limit/ Detector dBuV/m |
| 4879.490                                  | 51.1         | 74.0 / PK              |
| 4879.490                                  | 37.4         | 54.0 / AV              |
| 5760.064                                  | 43.2         | 74.0 / PK              |
| 5760.064                                  | 29.6         | 54.0 / AV              |
| 7319.483                                  | 43.2         | 74.0 / PK              |
| 7319.483                                  | 29.6         | 54.0 / AV              |
| Mode: 2440 MHz TX Horizontal Polarization |              |                        |
| Freq MHz                                  | Level dBuV/m | Limit/ Detector dBuV/m |
| 4879.490                                  | 53.8         | 74.0 / PK              |
| 4879.490                                  | 40.1         | 54.0 / AV              |
| 7319.740                                  | 43.7         | 74.0 / PK              |
| 7319.740                                  | 29.7         | 54.0 / AV              |
| Mode: 2480MHz TX Vertical Polarization    |              |                        |
| Freq MHz                                  | Level dBuV/m | Limit/ Detector dBuV/m |
| 2483.500                                  | 45.9         | 74.0 / PK              |
| 2483.500                                  | 30.3         | 54.0 / AV              |
| 4959.483                                  | 53.7         | 74.0 / PK              |
| 4959.483                                  | 39.9         | 54.0 / AV              |
| 7439.474                                  | 43.4         | 74.0 / PK              |
| 7439.474                                  | 29.8         | 54.0 / AV              |
| Mode: 2480 MHz TX Horizontal Polarization |              |                        |
| Freq MHz                                  | Level dBuV/m | Limit/ Detector dBuV/m |
| 2483.500                                  | 45.5         | 74.0 / PK              |
| 2483.500                                  | 30.8         | 54.0 / AV              |
| 4959.483                                  | 53.7         | 74.0 / PK              |
| 4959.483                                  | 39.7         | 54.0 / AV              |
| 7439.467                                  | 43.3         | 74.0 / PK              |
| 7439.467                                  | 29.8         | 54.0 / AV              |