



Solutions

# TEST REPORT

**Test Report No.: UL-RPT-RP-14140770-1116-FCC**

**Applicant \*** : Maquet GmbH

**Model No. \*** : 1009.25B0

**FCC ID \*** : Contains FCC ID: 2A98NNINAW106

**Technology \*** : Bluetooth – Low Energy

**Test Standard(s)** : **FCC Parts 15.209(a) & 15.247**

For details of applied tests refer to test result summary

1. This test report shall not be reproduced in full or partial, without the written approval of UL International Germany GmbH.
2. The results in this report apply only to the sample tested.
3. The test results in this report are traceable to the national or international standards.
4. **Test Report Version 1.3 supersedes Version 1.2 with immediate effect**  
Test Report No. UL-RPT-RP-14140770-1116-FCC Version 1.3, Issue Date 06 JUNE 2024 replaces  
Test Report No. UL-RPT-RP-14140770-1116-FCC Version 1.2, Issue Date 04 JUNE 2024, which is no longer valid.
5. Result of the tested sample: **PASS**
6. All information marked with a (\*) were provided by customer / applicant or authorized representative

Prepared by: Muhammad Faiq Khan  
Title: Project Engineer  
Date: 06 June 2024

Approved by: Rachid, Acharkaoui  
Title: Operations Manager  
Date: 06 June 2024



Deutsche  
Akkreditierungsstelle  
D-PL-19381-02-00

This laboratory is accredited by DAkkS.  
The tests reported herein have been performed in  
accordance with its' terms of accreditation.

**UL INTERNATIONAL GERMANY GMBH**

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## **1. Customer Information \***

### **1.1. Applicant Information**

<b>Company Name:</b>	Maquet GmbH
<b>Company Address:</b>	Kehler Str. 31, 76437 Rastatt, GERMANY
<b>Company Phone No.:</b>	+49 7222 932 574
<b>Company E-Mail:</b>	cb-nrtl-reports.deras@getinge.com
<b>Contact Person:</b>	Knut von Kopp Ostrowski
<b>Contact E-Mail Address:</b>	knut.vonkoppostrowski@getinge.com
<b>Contact Phone No.:</b>	+49 7222 9321 281

### **1.2. Manufacturer Information**

<b>Company Name:</b>	Maquet GmbH
<b>Company Address:</b>	Kehler Str. 31, 76437 Rastatt, GERMANY
<b>Company Phone No.:</b>	+49 7222 932 574
<b>Company E-Mail:</b>	cb-nrtl-reports.deras@getinge.com
<b>Contact Person:</b>	Knut von Kopp Ostrowski
<b>Contact E-Mail Address:</b>	knut.vonkoppostrowski@getinge.com
<b>Contact Phone No.:</b>	+49 7222 9321 281

## **2. Summary of Testing**

### **2.1. General Information**

#### **Applied FCC Rule Part(s)**

<b>Specification Reference:</b>	47CFR15.247
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.247
<b>Specification Reference:</b>	47CFR15.209
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section15.209

#### **Location**

<b>Location of Testing:</b>	UL International Germany GmbH Hedelfinger Strasse. 61, 70327 Stuttgart, GERMANY
<b>Registration Number:</b>	399704

#### **Date Information**

<b>Order Date:</b>	15 December 2021
<b>EUT Arrived:</b>	18 September 2023
<b>Test Dates:</b>	25 September 2023 to 06 October 2023
<b>EUT Returned:</b>	-/-

## 2.2. Summary of Test Results

DIGITAL TRANSMISSION SYSTEMS (DTS): 2400-2483.5 MHz					
FCC Part 15 Clause	Compliance Test Description	Test Result			
		C	N.C.	N.P.	N.A.
15.207	Transmitter AC Power Line Conducted Emissions <sup>(1)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15.35(c)	Transmitter Duty Cycle <sup>(2)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth <sup>(3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.247(b)(3)	Transmitter Maximum Peak Output Power <sup>(3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.247(e)	Transmitter Power Spectral Density <sup>(3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.247(d) & 15.209(a)	Transmitter Conducted Emissions <sup>(4)</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.247(d) & 15.209(a)	Transmitter Radiated Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C: COMPLIED   N.C.: NOT COMPLIED   N.P.: NOT PERFORMED   N.A.: NOT APPLICABLE					

**Decision rule:**  
Where not otherwise specified or communicated in writing, statements of conformity (e.g. Pass/Fail) are established according to the following decision rule: considering the ILAC G8:2019 chapter 4.2.1 (simple acceptance rule). This leads to a maximum 50% of false accept or false reject when the measured value equals the tolerance limit. See ILAC-G8:09/2019 for further details.

### Note(s):

1. The EUT is a battery powered device therefore, no AC conducted emissions were performed.
2. The measurement was performed to assist the average measurements
3. According to applicant's declaration a Pre-certified Radio module was integrated (Model: NINA-W156, FCC ID: 2A98NNINAW106). Therefore, only partial testing has been performed.
4. The Spurious emission measurements were performed Radiated and therefore conducted emissions were not required.

## 2.3. Methods and Procedures

Reference:	ANSI C63.10-2013
Title:	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Reference:	FCC KDB 558074 D01 DTS Meas. Guidance v05r02 April 2, 2019
Title:	Guidance for compliance measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC rules
Title:	FCC KDB 996369 D04 Module Integration Guide v02 October 13, 2020
Reference:	Modular Transmitter Integration Guide Guidance for Host Product Manufacturers

## 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

### **3. Equipment Under Test (EUT)**

#### **3.1. Identification of Equipment Under Test (EUT) \***

<b>Brand Name:</b>	Universal Remote Control (URC) 1009.25B0
<b>Model Name or Number:</b>	Universal Remote Control (URC) 1009.25B0
<b>Test Sample Serial Number:</b>	00001 (Radiated Test Sample)
<b>Hardware Version Number:</b>	0980 0464 01
<b>Firmware Version Number:</b>	URC_EMVTEST_0_99_17
<b>FCC ID:</b>	2A98NNINAW106

#### **3.2. Description of EUT \***

The equipment under test was an Operating table Remote Control supporting Bluetooth Low Energy operations in 2400-2483.5 MHz ISM band.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

### **3.4. Additional Information Related to Testing \***

<b>Technology Tested:</b>	Bluetooth – Low Energy		
<b>FCC Equipment Classification:</b>	Digital Transmission System (DTS)		
<b>Type of Unit:</b>	Transceiver		
<b>Operating Frequency Range:</b>	2402 MHz to 2480 MHz		
<b>Channel Spacing:</b>	2 MHz		
<b>Tested Data Rate(s) &amp; Modulation(s):</b>	1 Mbps <small>(Note 1)</small>	GFSK	
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>RF Channel</b>	<b>Frequency(MHz)</b>
	Bottom	0	2402
	Middle	19	2440
	Top	39 <small>(Note 1)</small>	2480
<b>Power Supply Requirement(s):</b>	Internal Battery powered: 3.6V DC		
<b>Highest internally generated clock and/ or oscillator frequency:</b>	220 MHz		

(Note 1) According to applicant's declaration a Pre-certified Radio module was integrated (Model: NINA-W156, FCC ID: 2A98NNINAW106). Therefore, only partial testing has been performed only on the worst-case data rate and channel.

### **3.5. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

#### **A. Support Equipment (In-house)**

Item	Description	Brand Name	Model Name or Number	Serial Number
1	Test Laptop with Test software: Putty	HP	ProBook 650	5CG6143YWB

#### **B. Support Equipment (Manufacturer supplied)**

Item	Description	Brand Name	Model Name or Number	Serial Number
1	-/-	-/-	-/-	-/-

## 4. Operation and Monitoring of the EUT during Testing

### 4.1. Operating Modes

The EUT was tested in the following operating mode(s):

Transmitter Mode: Continuously transmitting modulated carrier with maximum power setting:

- BT-LE | 1 Mbps | PWR 6 | Channel Top |\*
- BT-LE | 1 Mbps | PWR 6 | Channel Bottom / Top |\*\*

\* According to applicant's declaration a Pre-certified Radio module was integrated (Model: NINA-W156, FCC ID: 2A98NNINAW106). Therefore, only partial testing has been performed only on the worst-case data rate and channel.

\*\* Used for band edge measurements.

### 4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

#### EUT Power Supply:

- The EUT was powered with Internal Battery (3.6V).

#### Test Mode Activation:

- The applicant or manufacturer supplied test setup instruction 'Setup Instructions Radio Test Remote.pdf' was used to configure the EUT into respective test modes.
- The EUT can be connected with the Test laptop via USB. The terminal software 'Putty' was used to give commands and configure the EUT in respective modes. The test laptop was then removed during the measurement.

#### Radiated Measurements:

- The radiated sample with integrated antenna was used for the radiated emissions measurement.
- The EUT with its integrated antenna was evaluated for its worst-case position and it was found that EUT in Standing position is the worst-case. Therefore, all the tests were performed in this position.
- Radiated measurements below 30 MHz were performed with the EUT positioned on the turn table and rotating 360 degrees while the loop antenna height was set at 100 cm.
- Radiated measurements above 30 MHz were performed with the EUT positioned on the turn table and rotating 360 degrees while the antenna height varies from 1 to 4 m over the measurement frequency range.
- R&S® EMC32 V11.30.00 Software was used for the Radiated spurious emission measurements.

#### Duty Cycle Correction Details:

- As the EUT continuous transmission of the EUT ( $D \geq 98\%$ ) cannot be achieved and EUT was transmitting continuously with 65.71% duty cycle (duty cycle variations are more than  $\pm 2\%$ ). Therefore, Duty Cycle Correction Factor of 1.82 dB was added to all average measurements.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to Section 6 *Measurement Uncertainty* for details.

In accordance with DAkkS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

## 5.2. Test Results

### 5.2.1. Transmitter Duty Cycle

#### Test Summary:

Test Engineer:	Muhammad Faiq Khan	Test Date:	06 October 2023
Test Samples Serial Numbers:	00001 (Radiated Test Sample)		
Test Site Identification	SR1/2		

FCC Reference:	Part 15.35(c)
Test Method Used:	FCC KDB 558074 Section 9.b) referencing ANSI C63.10 Section 7.5

#### Environmental Conditions:

Temperature (°C):	22.8
Relative Humidity (%):	47.2

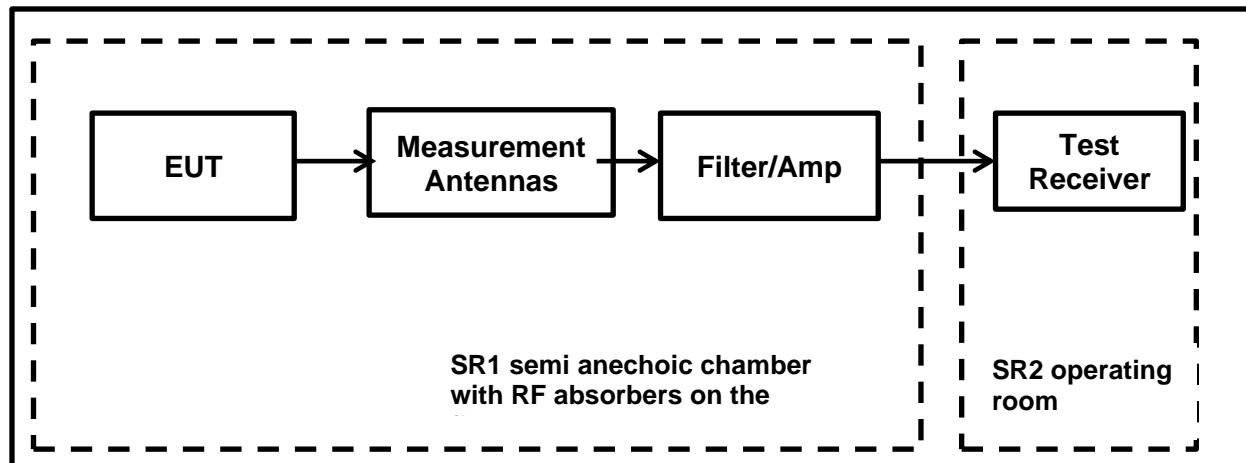
#### Note:

1. The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by using the following calculation:

*Duty Cycle (%) = 100 X [On Time (T<sub>ON</sub>)] / [Period(T<sub>ON</sub>+ T<sub>OFF</sub>) or 100ms whichever is the lesser]*

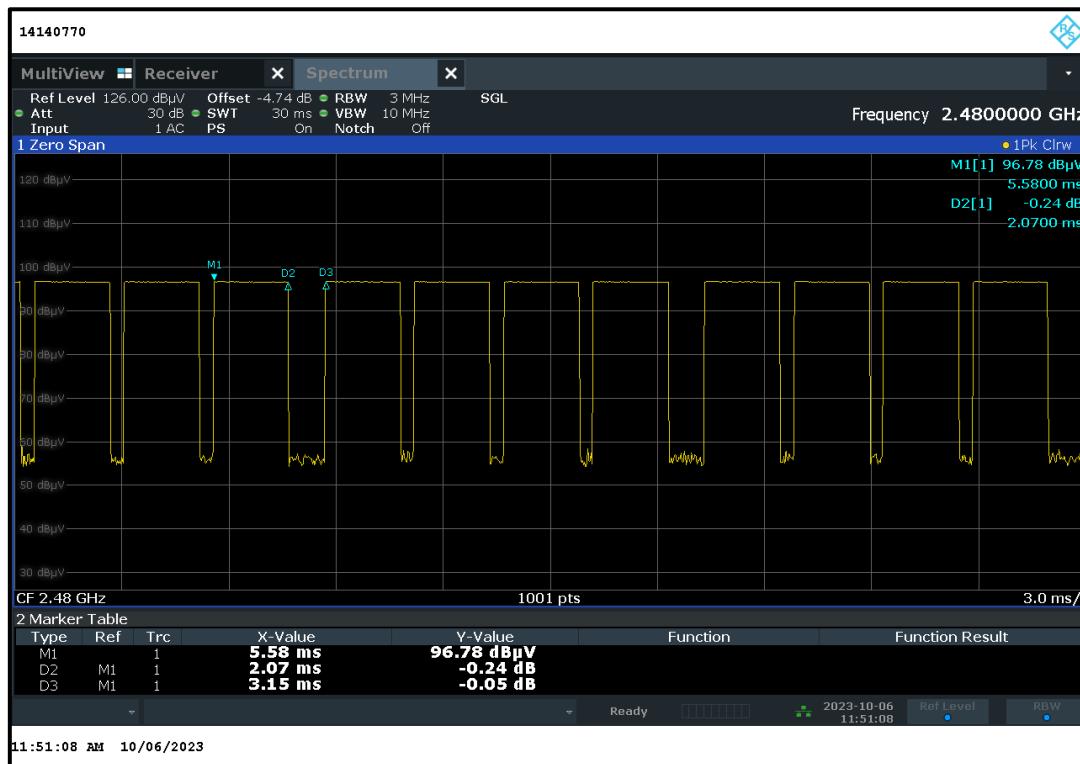
*Duty Cycle Correction Factor= 10 log 1 / [On Time (T<sub>ON</sub>)] / [Period(T<sub>ON</sub>+ T<sub>OFF</sub>) or 100ms whichever is the lesser]*

#### Test Setup:



**Transmitter Duty Cycle (continued)****Results: BT-LE / 1 Mbps / PRBS9 / PWR 6 / Top Channel**

Pulse On Time ( $T_{ON}$ ) (ms)	Pulse Period ( $T_{ON} + T_{OFF}$ ) (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
2.07	3.15	65.71	1.82



## 5.2.2. Transmitter Radiated Emissions

### Test Summary:

<b>Test Engineer:</b>	Muhammad Faiq Khan	<b>Test Date:</b>	29 September 2023
<b>Test Samples Serial Numbers:</b>	00001 (Radiated Test Sample)		
<b>Test Site Identification</b>	SR1/2		

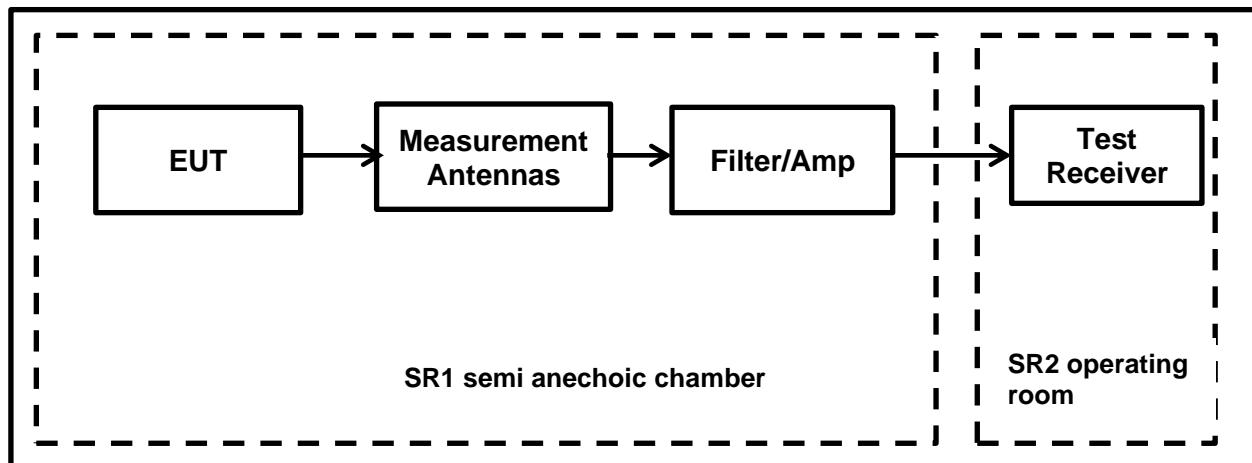
<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	FCC KDB 558074 Sections 8.5 & 8.6 referencing ANSI C63.10 Sections 11.11 and 11.12 ANSI C63.10:2013 Sections 6.3 and 6.4
<b>Frequency Range</b>	9 kHz to 30 MHz

### Environmental Conditions:

<b>Temperature (°C):</b>	24.1
<b>Relative Humidity (%):</b>	46.3

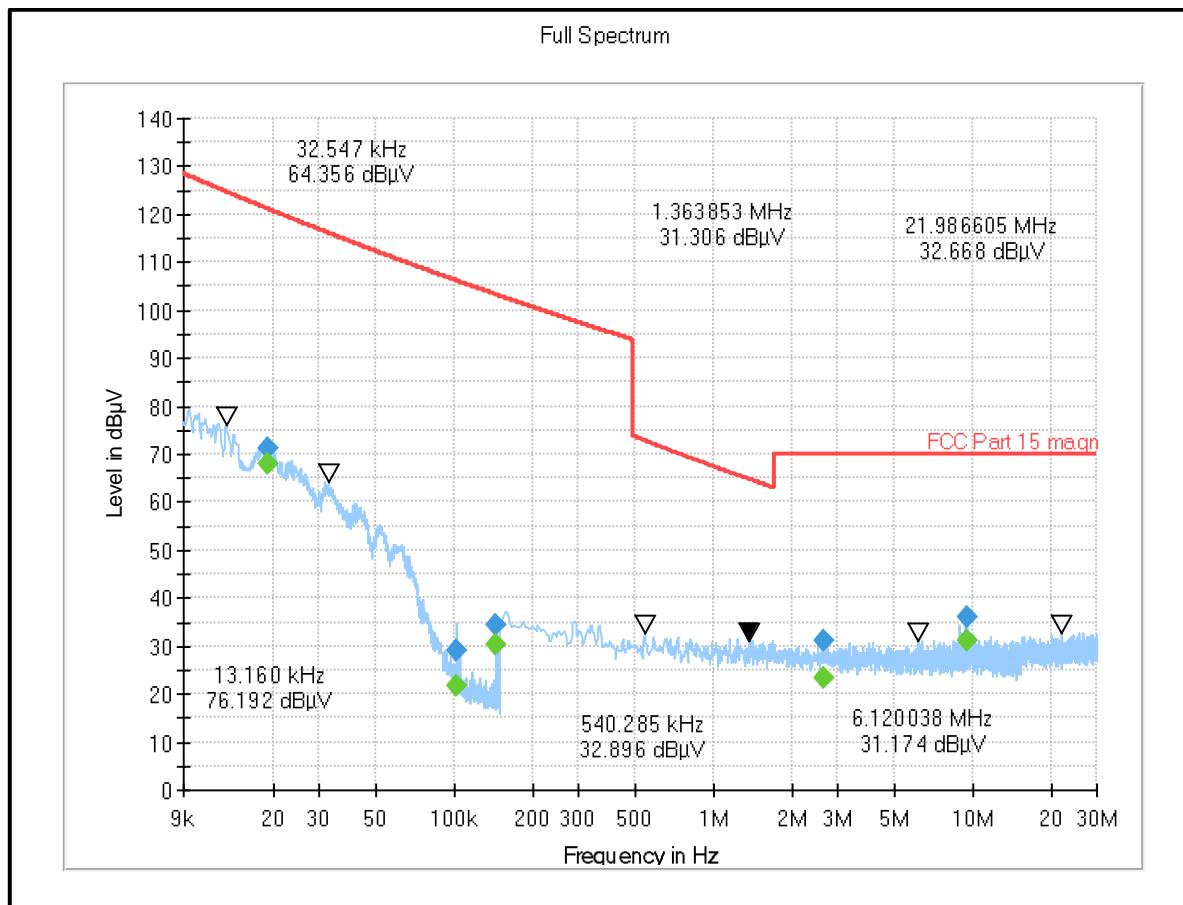
### Notes:

1. In accordance with FCC KDB 414788 D01 Radiated Test Site & ANSI C63.10 clause 5.2 an alternative test site that can demonstrate equivalence to an open area test site may be used. Therefore, the measurement was performed in a Semi Anechoic Chamber. (The OATS / SAC comparison data is available upon request).
2. The limits are specified at a test distance of 30 and 300 metres. However, as specified in FCC Section 15.31 (f)(2) & ANSI C63.10 clause 6.4.3, measurements may be performed at a closer distance and the measured level extrapolated to the specified measurement distance using the method described in clauses 6.4.4, specifically sub-clause 6.4.4.1 which specifies that the measured level shall be extrapolated to the specified distance by conservatively presuming that the field strength decays at 40 dB/decade. Therefore, measurements were performed at measurement distance of 3m.
3. The measured values at 3 m were extrapolated to the required measurement distances of 300 m and 30 m and compared the specified limits at those distances as follows:
  - 9 kHz- 490 kHz: measured value extrapolated from 3 m to 300 m by subtracting 80 dB at 40 dB /decade.
  - 490 kHz-30 MHz: measured value extrapolated from 3 m to 30 m by subtracting 40 dB at 40 dB /decade.
4. Measurements below 30 MHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) at a distance of 3 m. The EUT was placed at a height of 80cm from reference ground plane in the centre of the chamber turntable. The measurement loop antenna height was 100 cm.
5. The EUT was configured with the following modes:
  - BT-LE | 1 Mbps | PRBS9 | PWR 6 | Top Channel |
6. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
7. All other emissions shown on the pre-scan plots were investigated and found to be below system noise floor.
8. Pre-scans were performed, and markers placed on the highest measured levels. The test receiver was set to:
  - Frequency range: 9 kHz-150 kHz: RBW: 300 Hz /VBW: 1 kHz
  - Frequency range: 150 kHz – 30 MHz: RBW: 10 kHz /VBW: 30 kHz
  - Detector: Peak detector
  - Trace Mode: Max Hold

**Transmitter Radiated Emissions (continued)****Test Setup:**

**Transmitter Radiated Emissions (continued)****Results: BT-LE / 1 Mbps / PRBS9 / PWR 6 / Top Channel**

Frequency (MHz)	Loop Antenna Orientation	MaxPeak Level at 3 m(dB $\mu$ V/m) Note 2	MaxPeak Emission Level extrapolated (dBmV/m) Note 3	Limit (dB $\mu$ V/m)	Margin (dB)	Result
0.019011	90° to the EUT	71.21	-8.79	41.15	49.94	Complied
0.101426	90° to the EUT	29.03	-50.97	26.19	77.16	Complied
0.144995	0° to the EUT	34.39	-45.61	23.24	68.85	Complied
2.676.930	0° to the EUT	30.95	-9.05	30.00	39.05	Complied
9.462.980	90° to the EUT	35.82	-4.18	30.00	34.18	Complied

**Plot: 9 kHz – 30 MHz: BT-LE / 1 Mbps / PRBS9 / PWR 6 / Top Channel****Result: Pass**

**Transmitter Radiated Emissions (continued)****Test Summary:**

<b>Test Engineer:</b>	Muhammad Faiq Khan	<b>Test Date:</b>	29 September 2023
<b>Test Samples Serial Numbers:</b>	00001 (Radiated Test Sample)		
<b>Test Site Identification</b>	SR1/2		

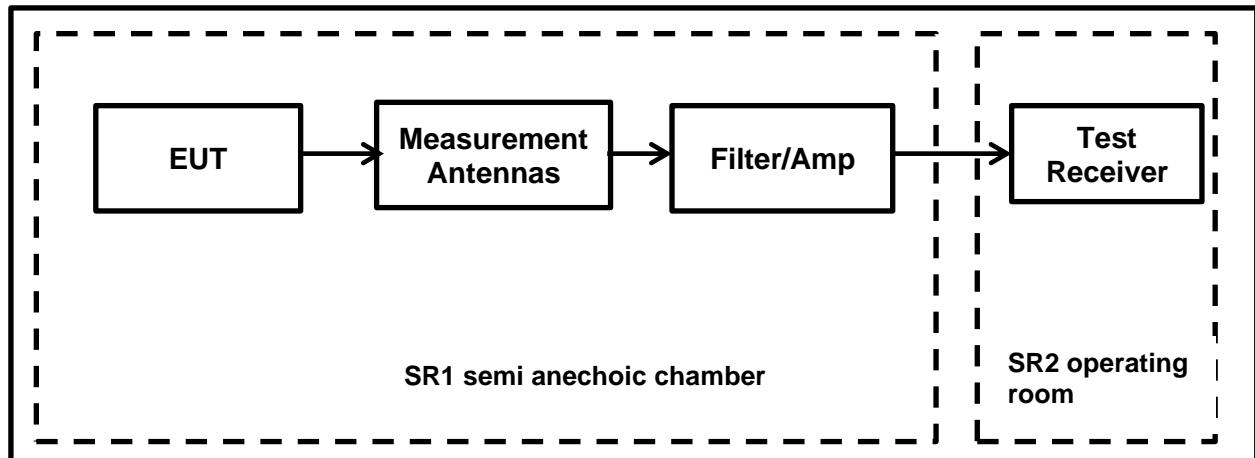
<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	FCC KDB 558074 Sections 8.5 & 8.6 referencing ANSI C63.10 Sections 11.11 and 11.12 ANSI C63.10:2013 Sections 6.3 and 6.5
<b>Frequency Range</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	24.1
<b>Relative Humidity (%):</b>	46.3

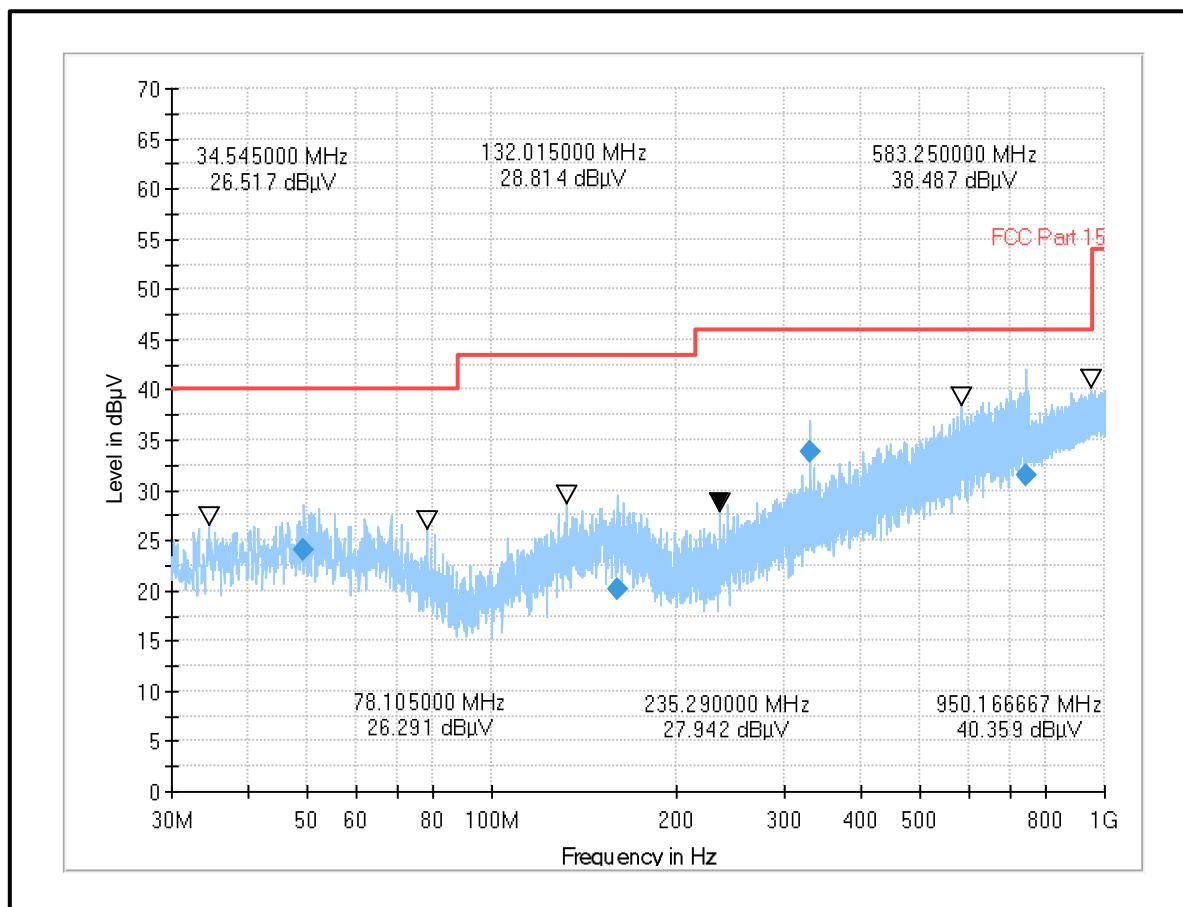
**Note(s):**

1. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
2. Pre-scans were performed, and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
3. The EUT was configured with the following modes:
  - BT-LE | 1 Mbps | PWR 6 | Top Channel |
4. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
5. All other emissions shown on the pre-scan plots were investigated and found to be below system noise floor.

**Test Setup:**

**Transmitter Radiated Emissions (continued)****Results: BT-LE / 1 Mbps / PWR 6 / Top Channel**

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
49.305000	Vertical	24.11	40.00	15.89	Complied
160.725000	Vertical	20.19	43.50	23.31	Complied
329.933333	Horizontal	33.83	46.00	12.17	Complied
744.875000	Horizontal	31.56	46.00	14.44	Complied

**Plot: 30 MHz – 1 GHz: BT-LE / 1 Mbps / PWR 6 / Top Channel****Result: Pass**

**Transmitter Radiated Emissions (continued)****Test Summary:**

<b>Test Engineer:</b>	Muhammad Faiq Khan	<b>Test Date:</b>	25 September 2023
<b>Test Samples Serial Numbers:</b>	00001 (Radiated Test Sample)		
<b>Test Site Identification</b>	SR1/2		

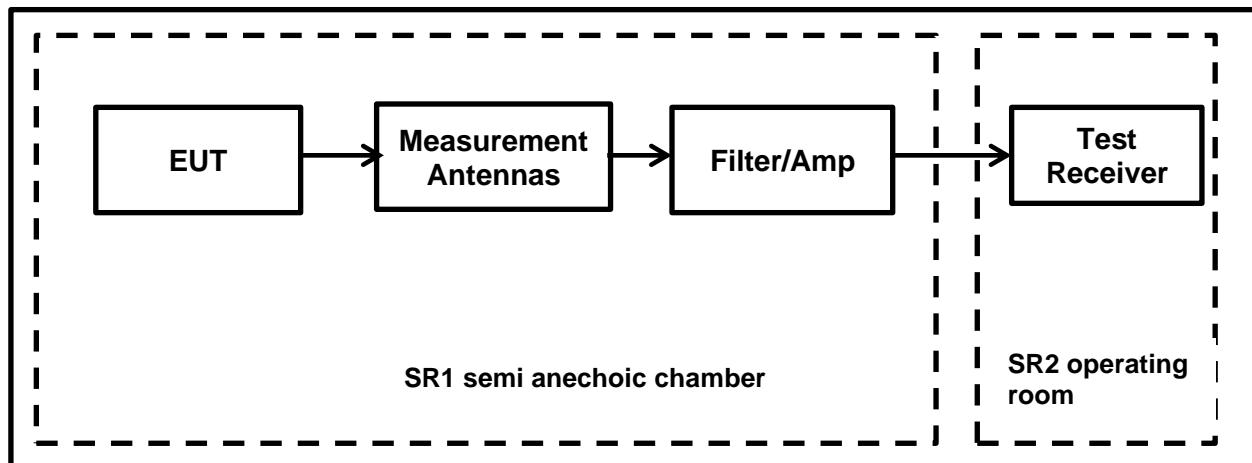
<b>FCC Reference:</b>	Parts 15.247(d), 15.209(a) & 15.205(a)
<b>Test Method Used:</b>	FCC KDB 558074 Sections 8.5 & 8.6 referencing ANSI C63.10 Sections 11.11 and 11.12 ANSI C63.10:2013 Sections 6.3 and 6
<b>Frequency Range</b>	1 GHz to 26.5 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	23.3
<b>Relative Humidity (%):</b>	44.5

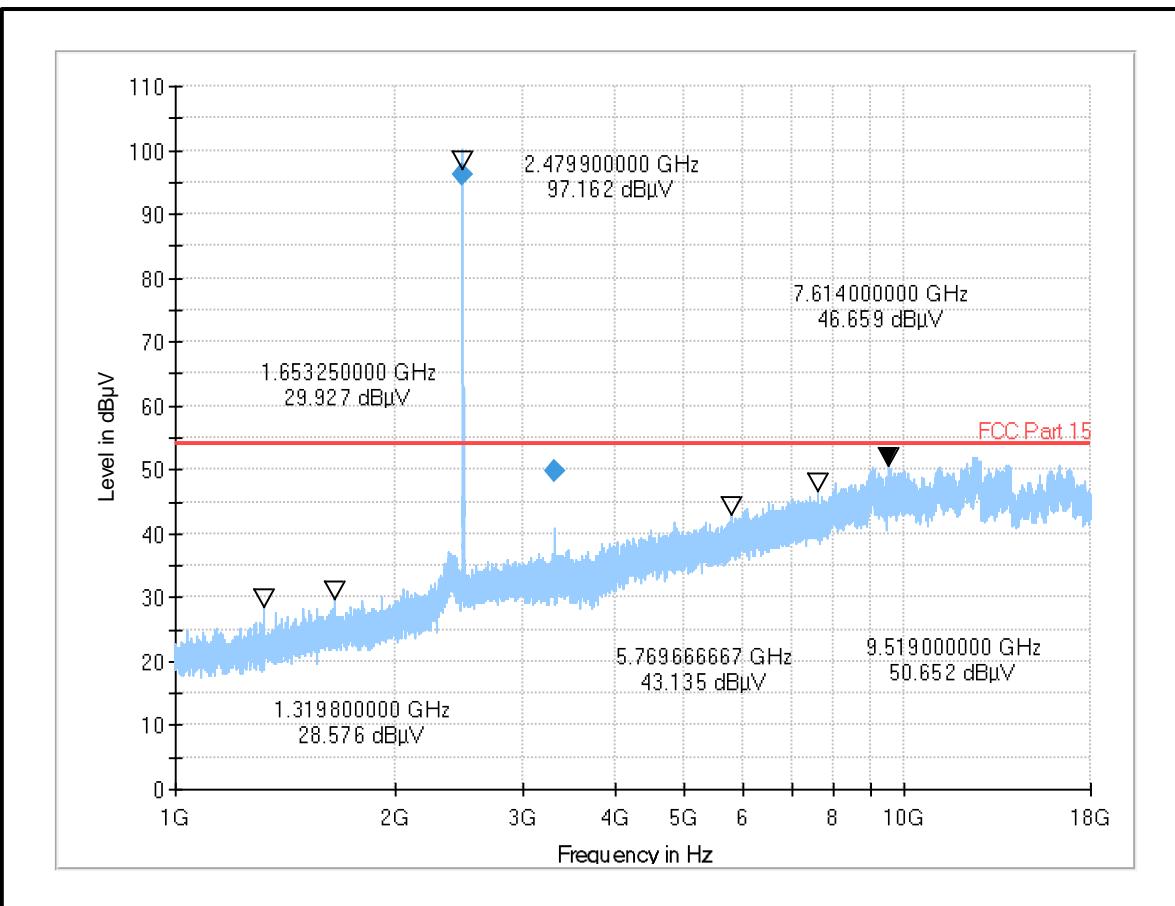
**Note(s):**

1. Pre-scans above 1 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with RF absorbers on the floor at a distance of 3 m. The EUT was placed at a height of 1.5m from ground reference plane in the centre of the chamber turntable.
2. Final measurements above 1 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with absorber on the floor at a distance of 3 m. Maximum emission levels were determined by height searching the measurement antenna over the range 1 m to 4 m.
3. The emissions shown at frequencies approximately 2.4 GHz to 2.4835 GHz on the 1 GHz to 18 GHz plots are the EUT fundamental for the tested channel.
4. The EUT was configured with the following modes:
  - BT-LE | 1 Mbps | PWR 6 | Top Channel |
5. Pre-scans were performed, and marker placed on the highest measured level of the plot. The test receiver RBW was set to 1 MHz and VBW 3 MHz. The sweep time was set to auto.
6. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
7. All other emissions shown on the pre-scan plots were investigated and found to be below system noise floor.
8. In accordance with ANSI C63.10 Section 6.6.4.3 (Note 1), if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
9. In accordance with ANSI C63.10-2013 Section 5.3.3 measurements above 18 GHz were performed at closer distance (1 m); because at specified measurement distance (3m) for compliance the instrumentation noise floor was typically close to the radiated emission limit.
10. For frequency range between 18 GHz and 26.5 GHz, on the pre-scan plots were investigated and found to be below system noise floor.

**Transmitter Radiated Emissions (continued)****Test Setup:**

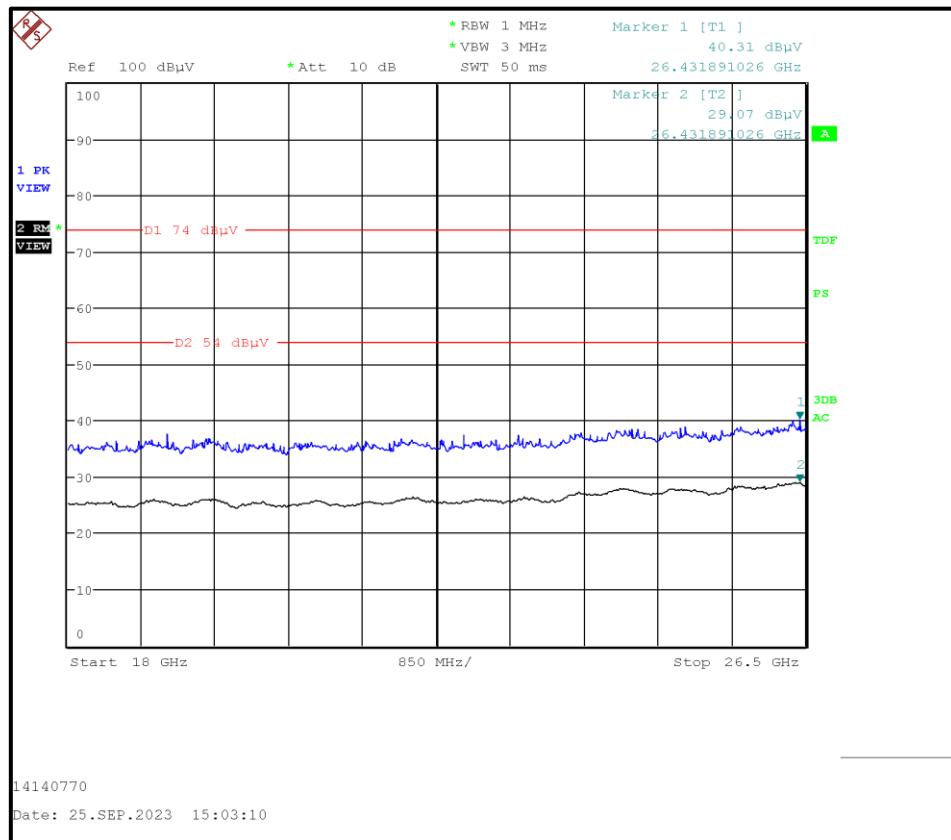
**Transmitter Radiated Emissions (continued)****Results : BT-LE / 1 Mbps / PWR 6 / Top Channel**

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
3306.666667	Vertical	49.65	54.00	4.35	Complied

**Plot: 1 GHz – 18 GHz: BT-LE / 1 Mbps / PWR 6 / Top Channel****Result: Pass**

**Transmitter Radiated Emissions (continued)****Results: BT-LE / 1 Mbps / PWR 6 / Top Channel**

Frequency (MHz)	Antenna Polarization	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
No critical spurious emissions were detected					

**Plot: 18 GHz – 26.5 GHz: BT-LE / 1 Mbps / PWR 6 / Top Channel****Result: Pass**

### **5.2.3. Transmitter Band Edge Radiated Emissions**

#### **Test Summary:**

<b>Test Engineer:</b>	Muhammad Faiq Khan	<b>Test Date:</b>	04 & 05 October 2023
<b>Test Samples Serial Numbers:</b>	00001 (Radiated Test Sample)		
<b>Test Site Identification</b>	SR1/2		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	DTS emissions in non-restricted frequency bands: FCC KDB 558074 Section 8.5 referencing ANSI C63.10:2013 Sections 11.11
	DTS emissions in restricted frequency bands: FCC KDB 558074 Section 8.6 referencing ANSI C63.10:2013 Sections 11.12
	FCC KDB 558074 Section 8.7 referencing ANSI C63.10:2013 Sections 6.10.4, 6.10.5, 11.13

#### **Environmental Conditions:**

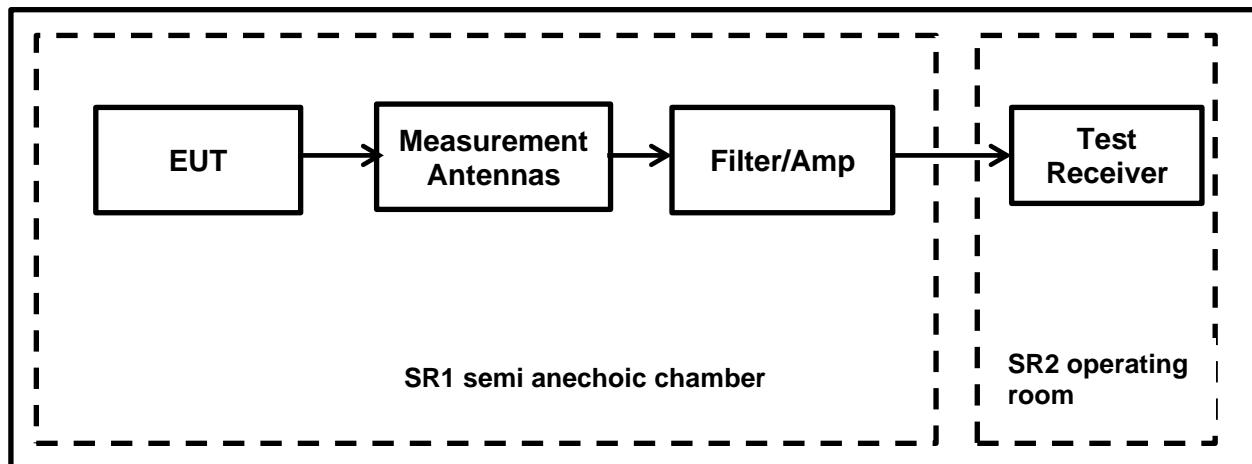
<b>Temperature (°C):</b>	22.0 to 23.1
<b>Relative Humidity (%):</b>	47.8 to 50.7

#### **Note(s):**

1. The measurements were in a semi-anechoic chamber SR1/2 (Asset Number 1603665) with RF absorbers on the floor at a distance of 3 m. The EUT was placed at a height of 1.5m from reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 m to 4 m.
2. As the lower band edge falls within a non-restricted band, measurements were performed in accordance with FCC KDB 558074 Section 8.5 referencing ANSI C63.10 Section 11.11. As the maximum peak conducted output power was previously measured, in accordance with ANSI C63.10 Section 11.11.1(a) lower band edge measurement was performed with a peak detector and the -20 dBc limit applied.
3. As the lower band edge falls within a non-restricted band, only peak measurements are required. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker and corresponding reference level line were placed on the peak of the carrier. Marker frequencies and levels were recorded.
4. The restricted band peak measurements were performed in accordance with ANSI C63.10 Section 11.12.2.4.
5. As the upper band edge falls within a restricted band both peak and average measurements were recorded by placing a marker at the edge of the band. For peak measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz A peak detector was used, sweep time was set to auto and trace mode was Max Hold. For average measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz and RMS detector in linear power averaging mode was used. The test receiver was left to sweep for 300 sweeps in order to maximise the carrier level and out-of-band emissions. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent restricted band of operation (where a higher-level emission was present). Marker frequencies and levels were recorded.
6. There is a restricted band 10 MHz below the lower band edge. The test receiver was set up as follows: the RBW set to 1 MHz, the VBW set to 3 MHz, with the sweep time set to auto couple. Peak and average measurements were performed with their respective detectors. Markers were placed on the highest point on each trace.

**Transmitter Band Edge Radiated Emissions (continued)****Note(s):**

7. The EUT was configured with the following modes:
  - BT-LE | 1 Mbps | PWR 6
8. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
9. \*\*As the EUT continuous transmission of the EUT ( $D \geq 98\%$ ) cannot be achieved and EUT was transmitting continuously with 65.71% duty cycle (duty cycle variations are more than  $\pm 2\%$ ). Therefore, Duty Cycle Correction Factor of 1.82 dB was added to all average measurements.

**Test Setup:**

**Transmitter Band Edge Radiated Emissions (continued)****Results : BT-LE / 1 Mbps / PWR 6****Results: Lower Band Edge / Peak**

Frequency (MHz)	Peak Level (dB $\mu$ V/m)	-20 dBc Limit (dB $\mu$ V/m)	Margin (dB)	Result
2399.95	48.89	78.80	29.91	Complied
2400.00	47.11	78.80	31.69	Complied

**Results: 2310 to 2390 MHz Restricted Band / Peak**

Frequency (MHz)	Peak Level (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Margin (dB)	Result
2372.61	50.03	74.00	23.97	Complied

**Results: 2310 to 2390 MHz Restricted Band / Average**

Frequency (MHz)	Average Level (dB $\mu$ V/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
2384.36	38.27	1.82	40.09**	54.00	13.91	Complied

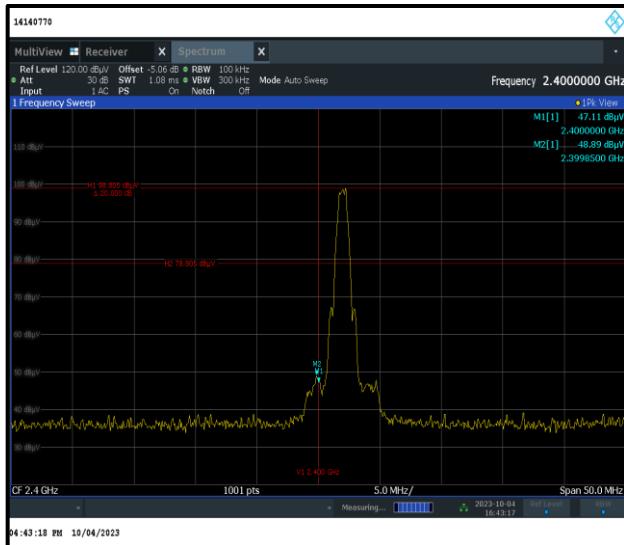
**Results: Upper Band Edge / Peak**

Frequency (MHz)	Peak Level (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.50	45.94	74.00	28.06	Complied
2483.82	46.59	74.00	27.41	Complied

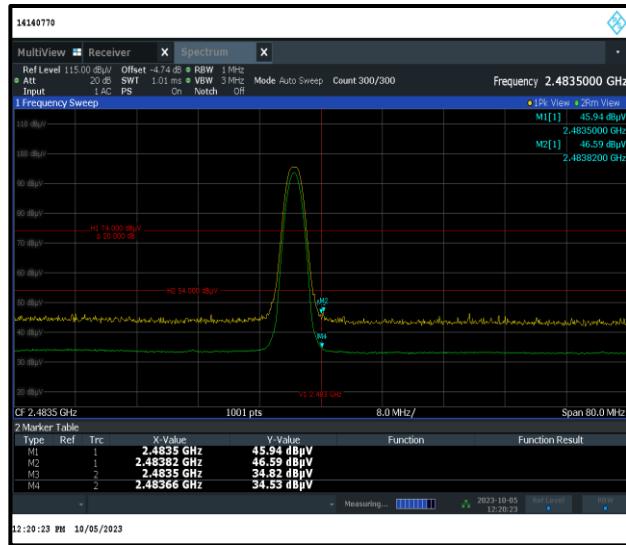
**Results: Upper Band Edge / Average**

Frequency (MHz)	Average Level (dB $\mu$ V/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.50	34.82	1.82	36.64**	54.0	17.36	Complied
2483.66	34.53	1.82	36.35**	54.0	17.65	Complied

**Result: Pass**

**Transmitter Band Edge Radiated Emissions (continued)****Results : BT-LE / 1 Mbps / PWR 6**

Lower Band Edge Peak Measurement



Upper Band Edge Peak &amp; Average Measurement



2310 MHz to 2390 MHz Restricted Band

**Result: Pass**

## **6. Measurement Uncertainty**

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Confidence Level (%)	Calculated Uncertainty
Transmitter Duty Cycle	95%	±3.4%
Radiated Spurious Emissions	95%	±3.10 dB
Band Edge Radiated Emissions	95%	±3.10 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

## 7. Used equipment

### Test site: SR 1/2

ID	Manufacturer	Type	Model	Serial	Calibration Date	Cal. Cycle (months)
1	Rohde & Schwarz	Antenna, Loop	HFH2-Z2	831247/012	18/07/2023	36
377	BONN Elektronik	Amplifier, Low Noise Pre	BLMA 0118-1A	025294B	18/07/2023	12
423	Bonn Elektronik	Amplifier, Low Noise Pre	BLMA 1840-1A	55929	18/07/2023	12
460	Deisel	Turntable	DT 4250 S	n/a	n/a	n/a
465	Schwarzbeck	Antenna, Trilog Broadband	VULB 9168	9168-240	02/09/2020	42
496	Rohde & Schwarz	Antenna, log. - periodical	HL050	100297	22/08/2022	24
588	Maturo	Controller	NCD	029/7180311	n/a	n/a
591	Rohde & Schwarz	Receiver	ESU 40	100244/040	13/07/2023	12
669	Rohde & Schwarz	EMI Test Receiver	ESW 44	103087	13/07/2023	18
607	Schwarzbeck	Antenna broadband horn antenna	BBHA 9170	9170-561	15/10/2019	48
608	Rohde & Schwarz	Switch Matrix	OSP 120	101227	lab verification	n/a
628	Maturo	Antenna mast	CAM 4.0-P	224/19590716	n/a	n/a
629	Maturo	Kippeinrichtung	KE 2.5-R-M	MAT002	n/a	n/a
-/-	Testo	Thermo-Hygrometer	608-H1	01	lab verification	n/a
328	SPS	AC/DC power distribution system	PAS 5000	A2464 00/2 0200	lab verification	n/a
1603665	Siemens Matsushita Components	semi-anechoic chamber SR1/ 2	-/-	B83117-A1421-T161	n/a	n/a
681	Maturo	Antenna mast, tilting	BAM4.5-P	402/0718.1	n/a	n/a

## 8. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	28	-	Initial Version
1.1	Page No(s)	Clause	Details
	1	Front	FCC ID info updated
	4	1	Table info updated
	6	2.2	Notes updated
	8	3.4	Additional info table and notes updated
	9	4.1	Notes updated
	9	4.2	Notes updated
	12	5.2.1	Measurement table updated
	13,16 &18	5.2.2	Notes updated
	22 - 23	5.2.3	Notes updated
1.2	Page No(s)	Clause	Details
	9	4.1	Notes updated
	13	5.2.2	Notes updated
	15	5.2.2	Result table updated
	18	5.2.2	Notes updated
<b>Test Report Version 1.3 supersedes Version 1.2 with immediate effect</b> Test Report No. UL-RPT-RP-14140770-1116-FCC Version 1.3, Issue Date 06 JUNE 2024 replaces Test Report No. UL-RPT-RP-14140770-1116-FCC Version 1.2, Issue Date 04 JUNE 2024, which is no longer valid.			
1.3	Page No(s)	Clause	Details
	15	5.2.2	Result table updated

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