



Solutions

TEST REPORT

Test Report No. : UL-RPT-RP-13304752-916-FCC

Applicant * : Weidmüller Interface GmbH & Co KG
Model No. * : US67-V1T-BLE / 2751260000
FCC ID * : 2BAKG-US67-V1T-BLE
Technology * : Bluetooth 4.0 – Low Energy
Test Standard(s) : **FCC Parts 15.207, 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 1.2 supersede Version 1.1 with immediate effect**
Test Report No. UL-RPT-RP-13304752-916-FCC Version 1.2, Issue Date 15 SEPTEMBER 2023 replaces
Test Report No. UL-RPT-RP-13304752-916-FCC Version 1.1, Issue Date 11 SEPTEMBER 2022, which is no longer valid.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

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Title: Project Engineer
Date: 15 September 2023

Approved by: Rachid Acharkaoui
Title: Operations Manager
Date: 15 September 2023



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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

Company Name:	Weidmüller Interface GmbH & Co KG
Company Address:	Klingenbergstr. 26, 32758 Detmold, Germany
Company Phone No.:	+49 5231 14-0
Company E-Mail:	weidmueller@weidmueller.de
Contact Person:	Franz-Josef Hegener
Contact E-Mail Address:	franz-josef.hegener@weidmueller.com
Contact Phone No.:	+49 5231 14-292445

1.2.Manufacturer Information

Company Name:	Weidmüller Interface GmbH & Co KG
Company Address:	Klingenbergstr. 26, 32758 Detmold, Germany
Company Phone No.:	+49 5231 14-0
Company E-Mail:	weidmueller@weidmueller.de
Contact Person:	Franz-Josef Hegener
Contact E-Mail Address:	franz-josef.hegener@weidmueller.com
Contact Phone No.:	+49 5231 14-292445

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209

Applied Standards

Location

Location of Testing:	UL International Germany GmbH Hedelfinger Str. 61 70327 Stuttgart Germany
Test Firm Registration:	399704

Date information

Order Date:	31 March 2020
EUT arrived:	14 June 2022
Test Dates:	20 June 2022 to 21 June 2022
EUT returned:	-/-

2.2. Summary of Test Results

Clause	Measurement	Complied	Did not comply	Not performed	Not applicable
Part 15.207	Transmitter AC Conducted Emissions ⁽¹⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Part 15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part 15.35(c)	Transmitter Duty Cycle ⁽²⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part 15.247(e)	Transmitter Power Spectral Density ⁽³⁾	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Part 15.247(b)(3)	Transmitter Maximum (Peak) Output Power	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part 15.247(d) & 15.209(a)	Transmitter Radiated Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part 15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Decision rule:
If the decision rule is not included in the applied customer specification or testing standard, the binary statement for simple acceptance, as defined in ILAC G8: 2019 Section 4.2.1, is applied as the decision rule for a pass/ fail statement.
If the measured value is on the limit, the result is defined as a pass. In this case the risk of a false positive is 50%. For further information regarding risk assessment refer to ILAC G8: 2019.

Note(s):

1. Device working with non-chargeable internal battery.
2. The measurement was performed to assist in the calculation of the average measurements.
3. In accordance with ANSI C63.10-2013 Section 11.10.1, PSD is not required if the maximum conducted output power is less than the PSD limit of 8 dBm / 3 kHz. The PSD level is therefore deemed to be equal to the measured total output power.

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

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) *

Brand Name:	u-sense vibration
Model Name or Number:	US67-V1T-BLE / 2751260000
Serial Number:	AW5V24PA5200047 (<i>Radiated RF Test Sample</i>)
Hardware Version Number:	01.04
Software Version Number:	0.1.14
FCC ID:	2BAKG-US67-V1T-BLE

Brand Name:	u-sense vibration
Model Name or Number:	US67-V1T-BLE / 2751260000
Serial Number:	AW5V24PA5200064 (<i>Conducted RF Test Sample with SMA cable</i>)
Hardware Version Number:	01.04
Software Version Number:	0.1.14
FCC ID:	2BAKG-US67-V1T-BLE

3.2. Description of EUT *

The equipment under test was a Triaxial vibration and temperature sensor supporting Bluetooth Low Energy (BLE) operations in 2.4 - 2.4835 GHz 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

Technology Tested:	Bluetooth Low Energy 4.0 / Digital Transmission System		
Type of Unit:	Transceiver		
Power Supply Requirement(s):	Nominal	3.6 V DC / 2.2 A max via Internal Battery	
Channel Spacing:	2 MHz		
Data Rate and Modulation:	125 kbps (S8)	GFSK (coded)	
	500 kbps(S2)	GFSK (coded)	
	1 Mbps	GFSK	
	2 Mbps	GFSK	
Maximum Conducted Output Power:	4.38 dBm		
Declared Antenna Gain:	0.5 dBi		
Antenna Type:	Chip antenna		
Antenna Details:	permanently attached		
Transmit Frequency Range:	2402 MHz to 2480 MHz		
Transmit Channels Tested:	Channel ID	RF Channel	Channel Frequency (MHz)
	Bottom	37	2402
	Middle	18	2442
	Top	39	2480
Highest internally generated clock and/ or oscillator frequency:	80 MHz		

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	Laptop PC	HP	HP Probook 650 G1	5CG614419V

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):

- Continuously transmitting modulated carrier with combination of
 - Bluetooth Low Energy (BLE) | PRBS9 | 1 Mbps | Maximum Power Settings +8 dBm
 - Bluetooth Low Energy (BLE) | PRBS9 | 2 Mbps | Maximum Power Settings +8 dBm
 - Bluetooth Low Energy (BLE) | PRBS9 | S2 | Maximum Power Settings +8 dBm
 - Bluetooth Low Energy (BLE) | PRBS9 | S8 | Maximum Power Settings +8 dBm

4.2. Configuration and Peripherals

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

- The customer supplied a software "nRF Connect" v3.7.1 and this software was used to configure the EUT.

EUT Power Supply:

- The EUT was powered with 3.6 V DC via internal battery.

Test Mode Activation:

- Test mode activated via software with maximum power level 8 dBm.
- The EUT can be connected with the Test laptop via USB-TTL/UART cable supplied by the customer. The cables were only used to set the EUT in respective modes.
- The test modes were activated using the test software / Radio Tool "nRF Connect ver 3.7.1" supplied by the customer. This test software / Radio Tool was installed on the test laptop to enable continuous transmission and to select the required power levels and the test channels.

Conducted Measurements:

- All conducted measurements were carried out by using conducted sample SMA (Female) RF Cable soldered on the PCB by the customer. The maximum attenuation of 0.40 dB at the tested frequencies was added to a reference level offset to each of the conducted plots.

Radiated Measurements:

- The radiated sample with integrated antenna was used.
- Before starting final radiated spurious emission measurements "worst case verification" with the EUT in Standing-position & Laying-position was performed by Lab.
- The EUT in Standing-position was found to be the worst case therefore this report includes relevant results.
- 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 to 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 Measurement Software V11.30.00 was used for the radiated spurious emission measurements.

Duty Cycle Correction Details:

- As the continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and EUT was transmitting continuously at different Duty Cycles with respect to the used data rates (duty cycle variations are less than $\pm 2\%$ at the respective data rate). Therefore, Duty Cycle Correction Factors were added to all average measurements according to the below table, to compute the corrected average values of the emissions that would have been measured had the test been performed at 100% Duty Cycle.

Data rate	Duty cycle	Correction factor
	(%)	(dB)
S8	97.52	0.11
S2	91.3	0.39
1 Mbps	84.97	0.71
2 Mbps	57.69	2.39

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 Minimum 6 dB Bandwidth

Test Summary:

Test Engineer:	Sercan Usta	Test Date:	20 June 2022
Test Sample Serial Number:	AW5V24PA5200064 (Conducted RF Sample)		
Test Site Identification	SR 9		

FCC Reference:	Part 15.247(a)(2)
Test Method Used:	FCC KDB 558074 Section 8.2 referencing ANSI C63.10:2013 Section 11.8.1 Option 1

Environmental Conditions:

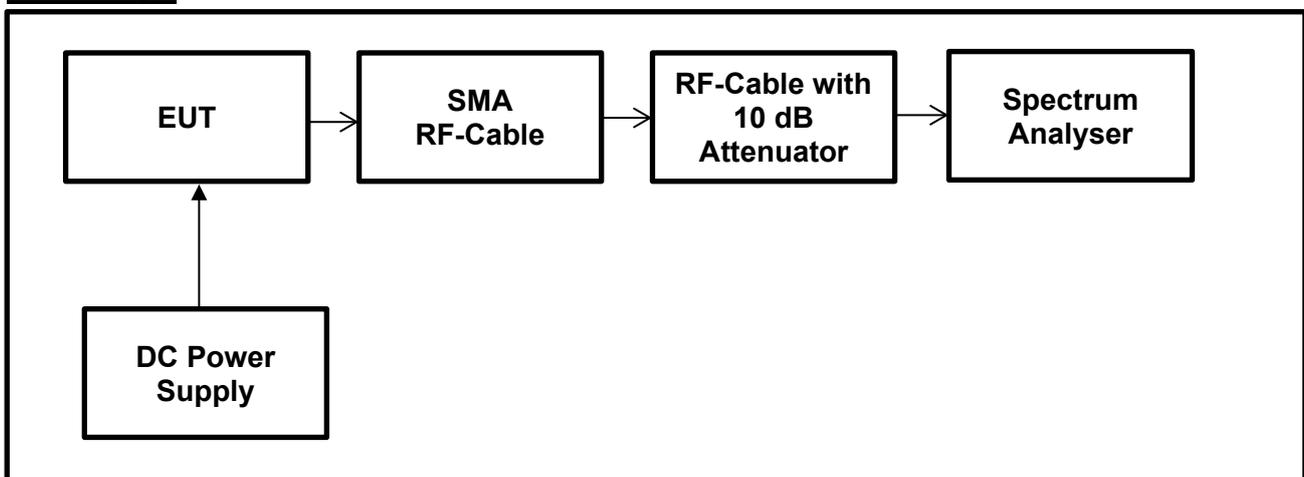
Temperature (°C):	23
Relative Humidity (%):	38

Notes:

- The measurements were performed using the above configurations on the bottom, middle and top channels in accordance FCC KDB 558074 Section 8.2 referencing ANSI C63.10 Section 11.8 (11.8.1 Option 1 measurement procedure).
- The spectrum analyser resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and the trace mode was Max Hold. The DTS bandwidth was measured at 6 dB down from the peak of the signal.
- The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values takes into consideration the external attenuation correction factors.
 - The SMA (Female) RF Cable soldered on PCB with maximum attenuation of 0.4 dB at the tested frequencies.
 - The RF cable attenuation maximum 0.6 dB@2.4GHz from the EUT to Analyzer including the 10 dB attenuation at the input of Spectrum Analyzer

Therefore, total a reference level offset 11.0 dB was added to each of the at the tested frequencies conducted plots.

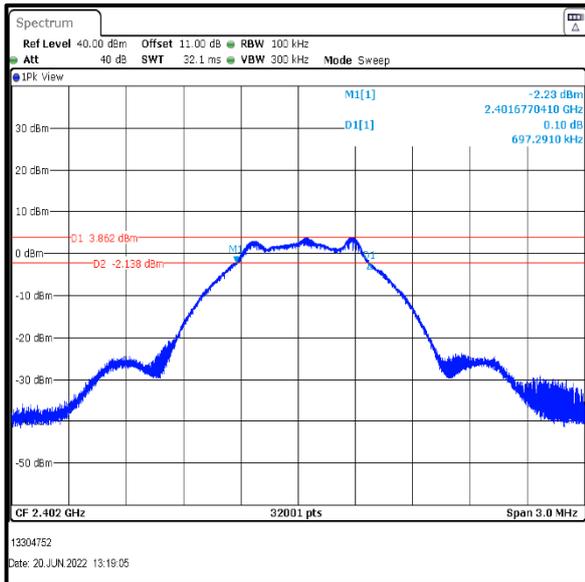
Test Setup :



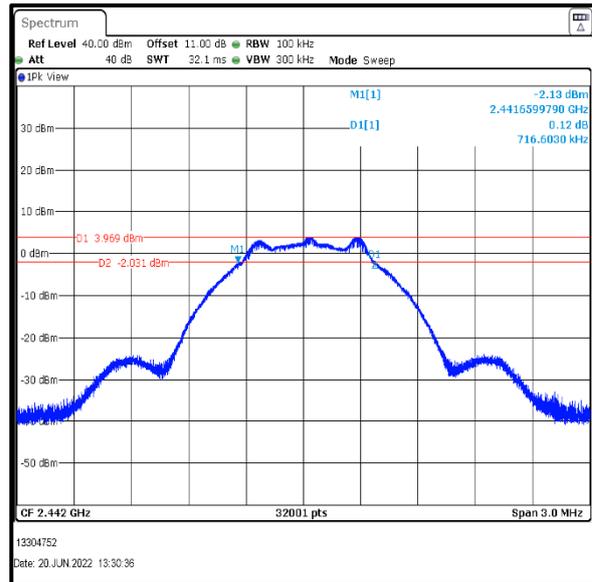
Transmitter Minimum 6 dB Bandwidth (continued)

Results: BLE / PRBS9 / 1 Mbps / PWR 8

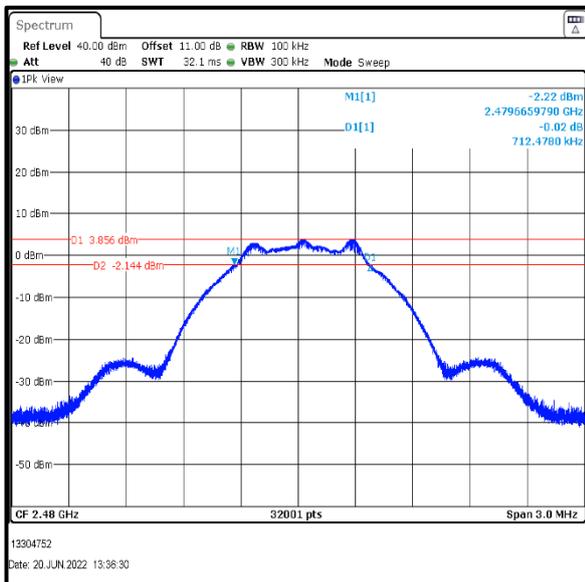
Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	697.291	≥ 500	197.291	Complied
Middle	716.603	≥ 500	216.603	Complied
Top	712.478	≥ 500	212.478	Complied



Bottom Channel



Middle Channel



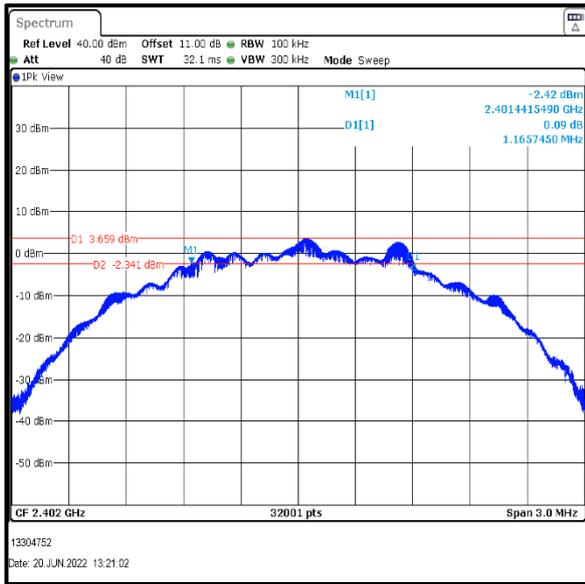
Top Channel

Result: Pass

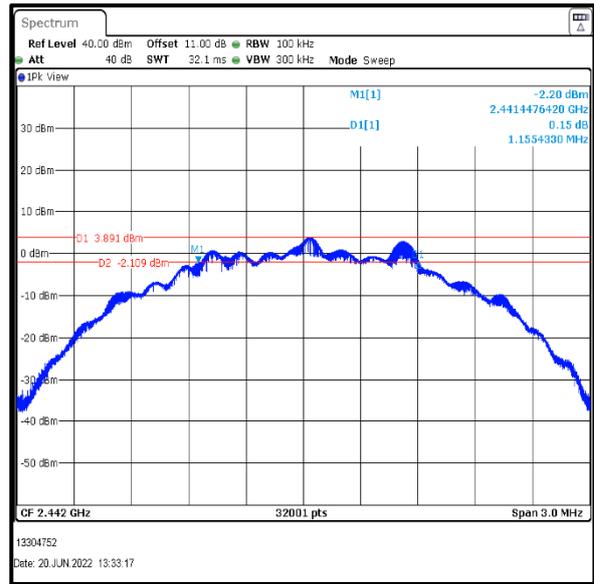
Transmitter Minimum 6 dB Bandwidth (continued)

Results: BLE / PRBS9 / 2 Mbps / PWR 8

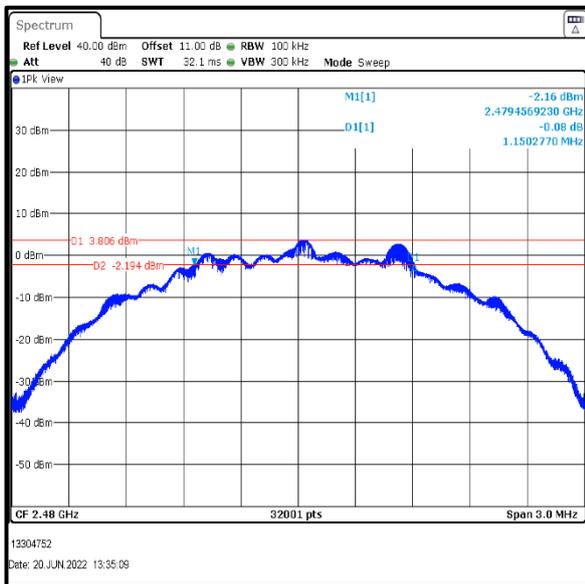
Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	1165.745	≥ 500	665.745	Complied
Middle	1155.433	≥ 500	655.433	Complied
Top	1150.277	≥ 500	650.277	Complied



Bottom Channel



Middle Channel



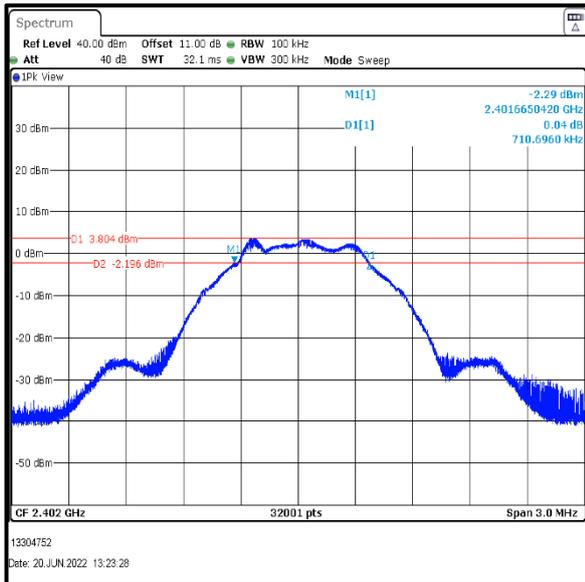
Top Channel

Result: Pass

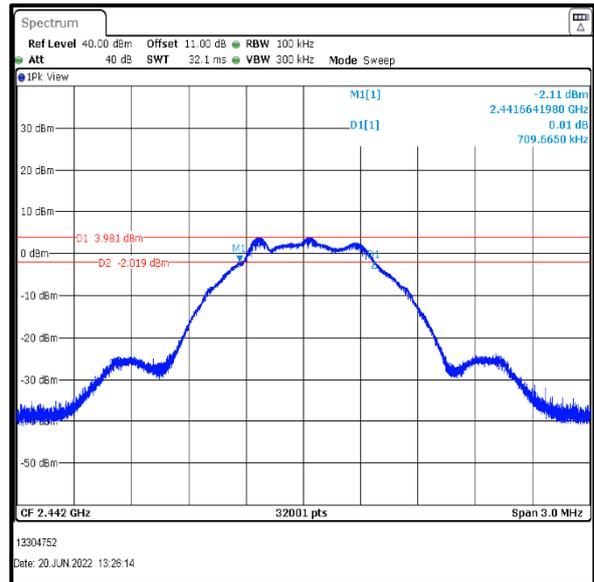
Transmitter Minimum 6 dB Bandwidth (continued)

Results: BLE / PRBS9 / S2 / PWR 8

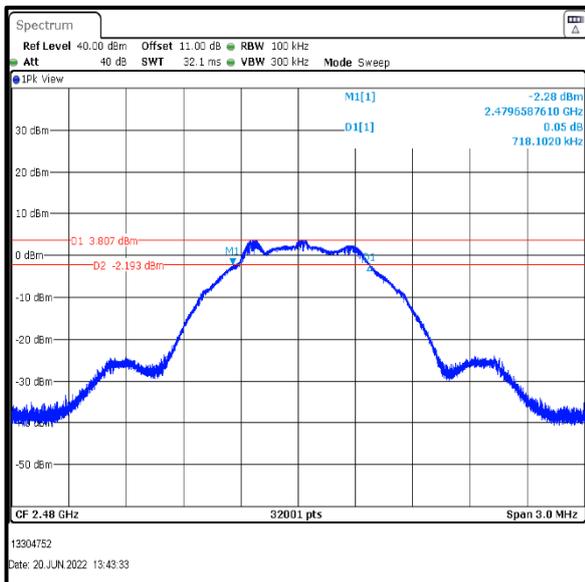
Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	710.696	≥ 500	210.696	Complied
Middle	709.665	≥ 500	209.665	Complied
Top	718.102	≥ 500	218.102	Complied



Bottom Channel



Middle Channel



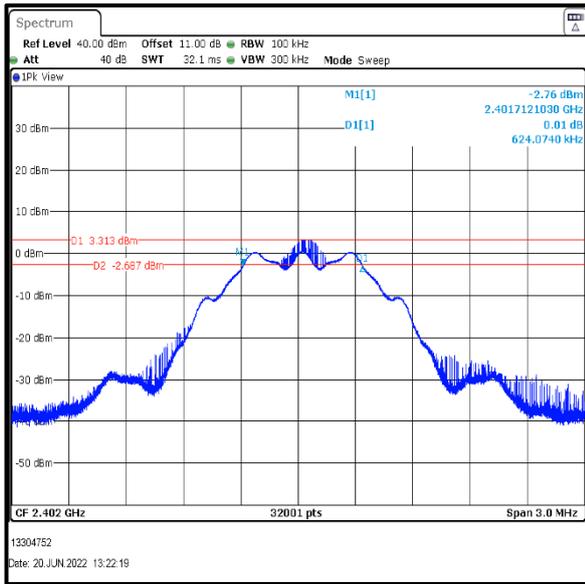
Top Channel

Result: Pass

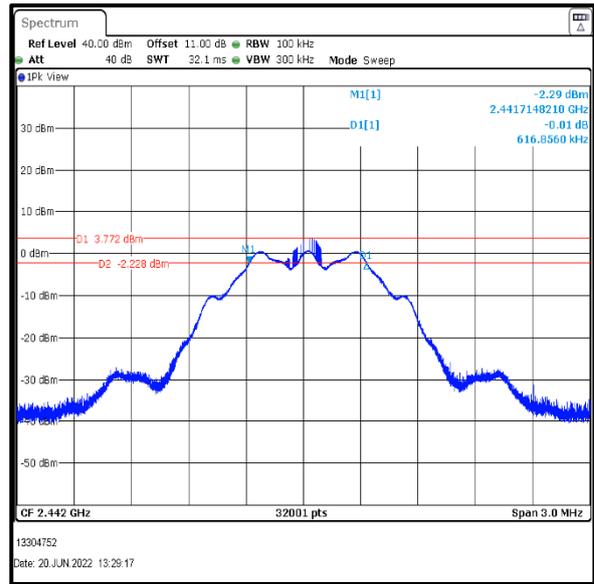
Transmitter Minimum 6 dB Bandwidth (continued)

Results: BLE / PRBS9 / S8 / PWR 8

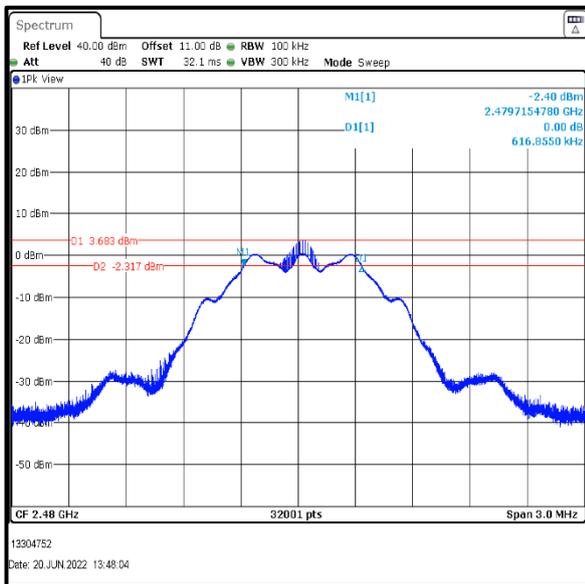
Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	624.074	≥ 500	124.074	Complied
Middle	616.856	≥ 500	116.856	Complied
Top	616.855	≥ 500	116.855	Complied



Bottom Channel



Middle Channel



Top Channel

Result: Pass

5.2.2. Transmitter Duty Cycle

Test Summary:

Test Engineer:	Sercan Usta	Test Date:	20 June 2022
Test Sample Serial Number:	AW5V24PA5200064 (Conducted RF Sample)		
Test Site Identification	SR 9		

FCC Reference:	Part 15.35(c)
Test Method Used:	FCC KDB 558074 Section 6.0 referencing ANSI C63.10 Section 11.6

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	38

Notes:

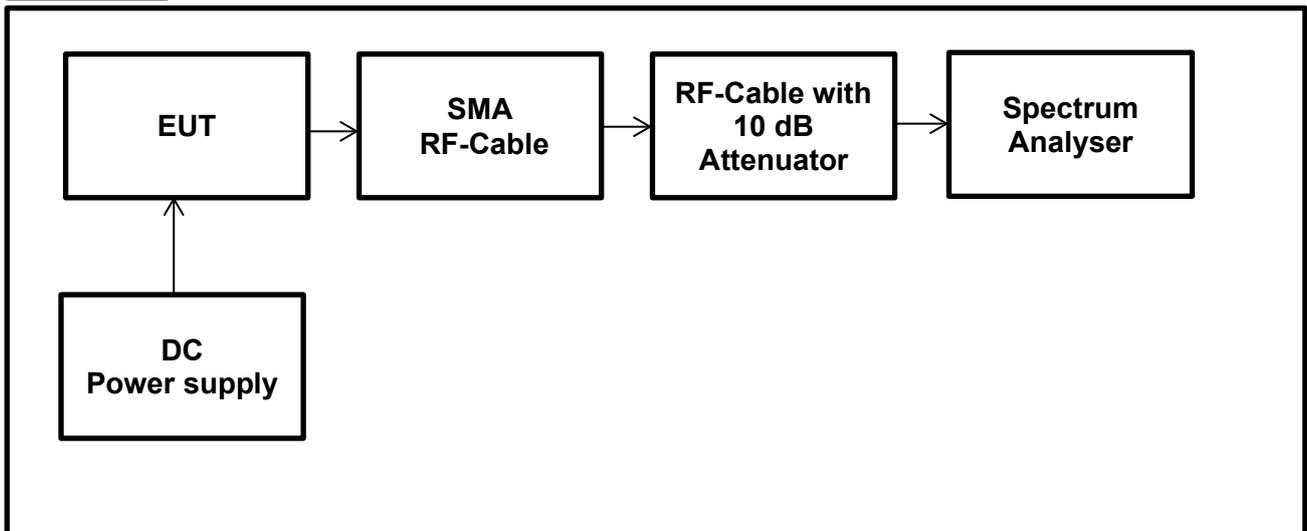
- The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by using the following calculation:

$$\text{Duty Cycle (\%)} = 100 \times [\text{On Time } (T_{ON})] / [\text{Period}(T_{ON} + T_{OFF}) \text{ or } 100\text{ms whichever is the lesser}]$$

$$\text{Duty Cycle Correction Factor} = 10 \log 1 / [\text{On Time } (T_{ON})] / [\text{Period}(T_{ON} + T_{OFF}) \text{ or } 100\text{ms whichever is the lesser}]$$
- The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values takes into consideration the external attenuation correction factors.
 - The SMA (Female) RF Connector soldered on PCB with maximum attenuation of 0.4 dB at the tested frequencies.
 - The RF cable attenuation maximum 0.6 dB@2.4GHz from the EUT to Analyzer including the 10 dB attenuation at the input of Spectrum Analyzer

Therefore, total a reference level offset 11.0 dB was added to each of the at the tested frequencies conducted plots.

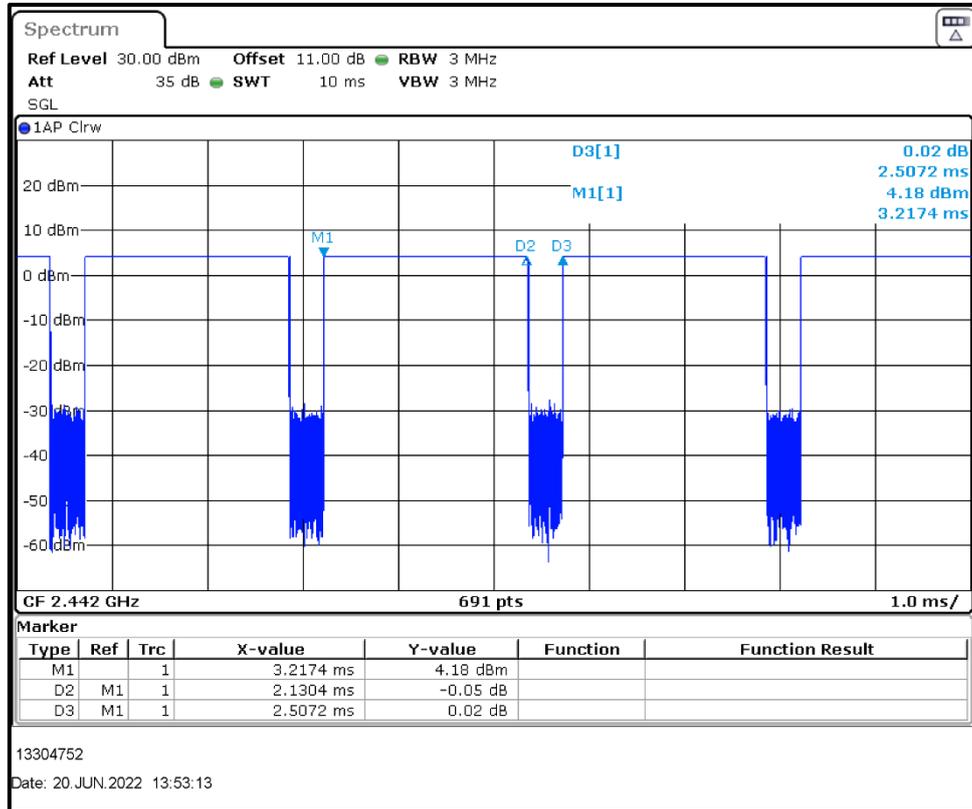
Test Setup:



Transmitter Duty Cycle (continued)

Results: BLE / PRBS9 / 1 Mbps / PWR 8

Pulse On Time (T _{ON}) (µs)	Pulse Period (T _{ON} +T _{OFF}) (µs)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
2130.4	2507.2	84.97	0.71

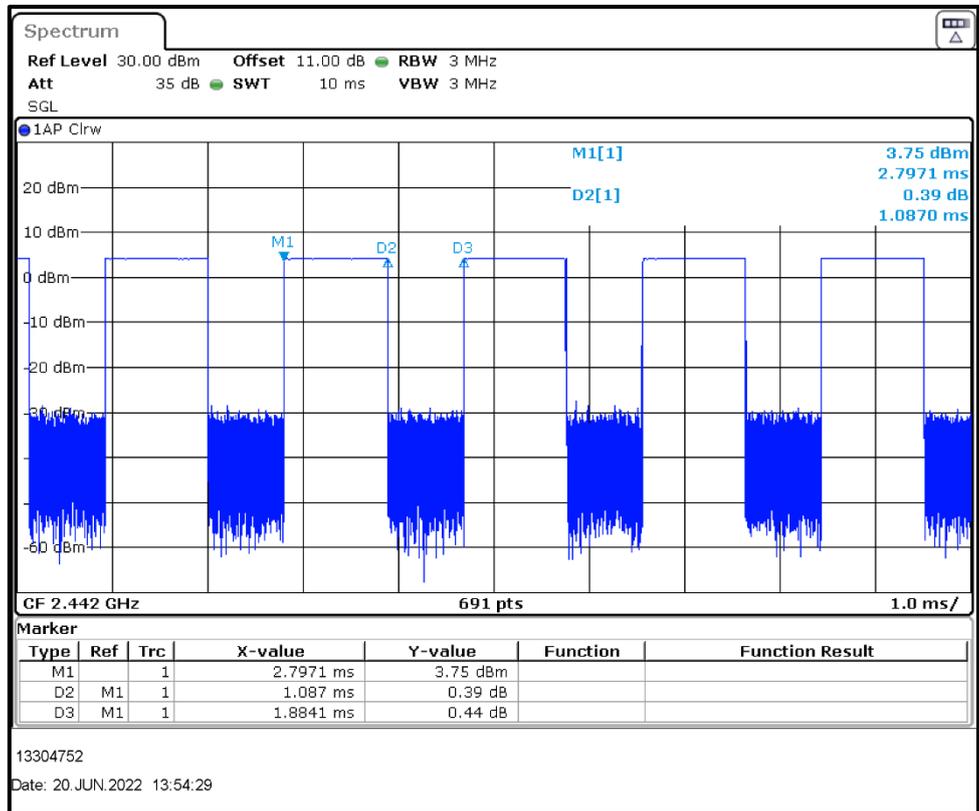


Result: Pass

Transmitter Duty Cycle (continued)

Results: BLE / PRBS9 / 2 Mbps / PWR 8

Pulse On Time (T _{ON}) (µs)	Pulse Period (T _{ON} +T _{OFF}) (µs)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
1087.0	1884.1	57.69	2.39

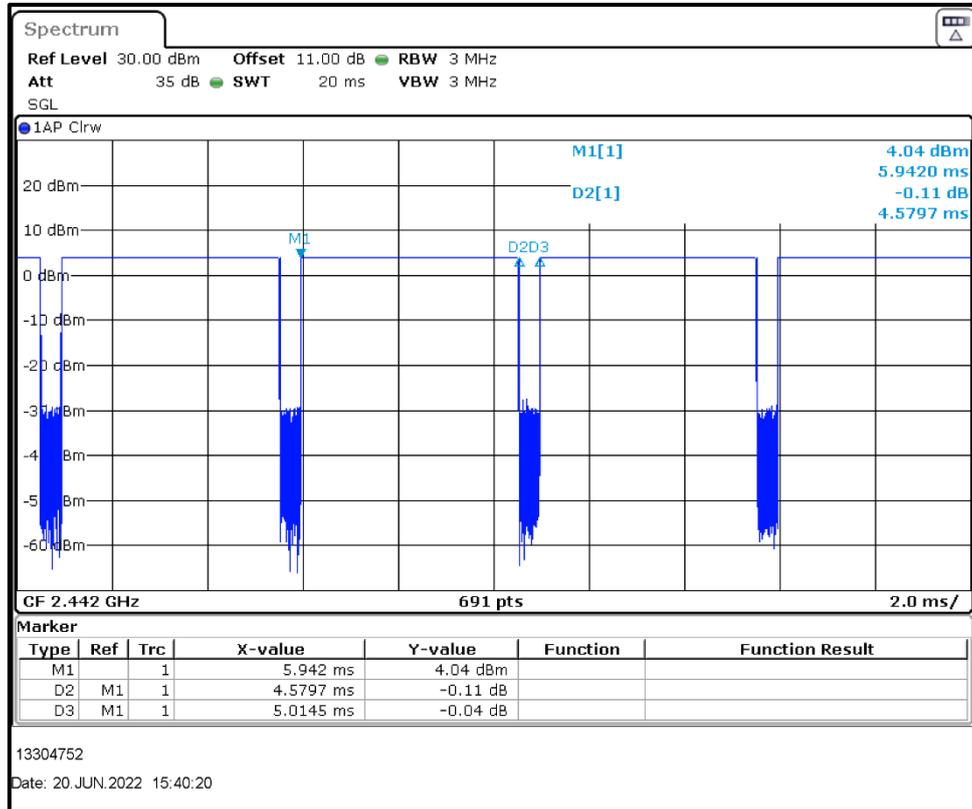


Result: Pass

Transmitter Duty Cycle (continued)

Results: BLE / PRBS9 / S2 / PWR 8

Pulse On Time (T _{ON}) (µs)	Pulse Period (T _{ON} +T _{OFF}) (µs)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
4579.7	5014.5	91.3	0.39

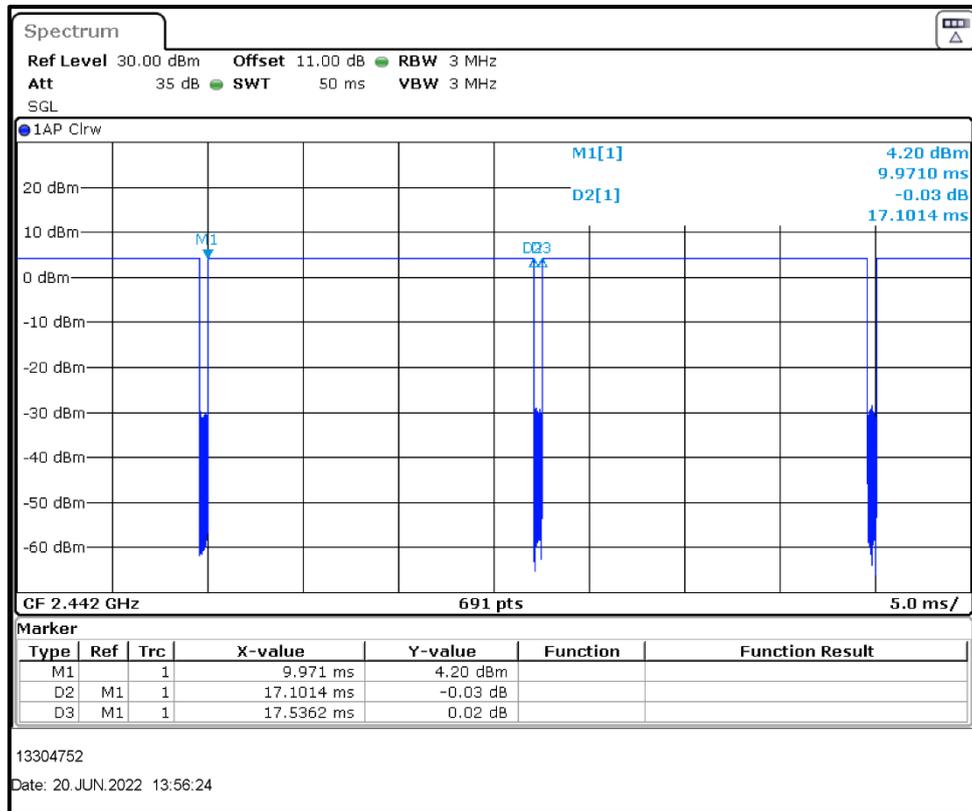


Result: Pass

Transmitter Duty Cycle (continued)

Results: BLE / PRBS9 / S8 / PWR 8

Pulse On Time (T _{ON}) (µs)	Pulse Period (T _{ON} +T _{OFF}) (µs)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
17101.4	17536.2	97.52	0.11



Result: Pass

5.2.3. Transmitter Maximum (Peak) Output Power

Test Summary:

Test Engineer:	Sercan Usta	Test Date:	20 June 2022
Test Sample Serial Number:	AW5V24PA5200064 (Conducted RF Sample)		
Test Site Identification	SR 9		

FCC Reference:	Part 15.247(b)(3)
Test Method Used:	FCC KDB 558074 Section 8.3.1.1 referencing ANSI C63.10 Sections 11.9.1.1

Environmental Conditions:

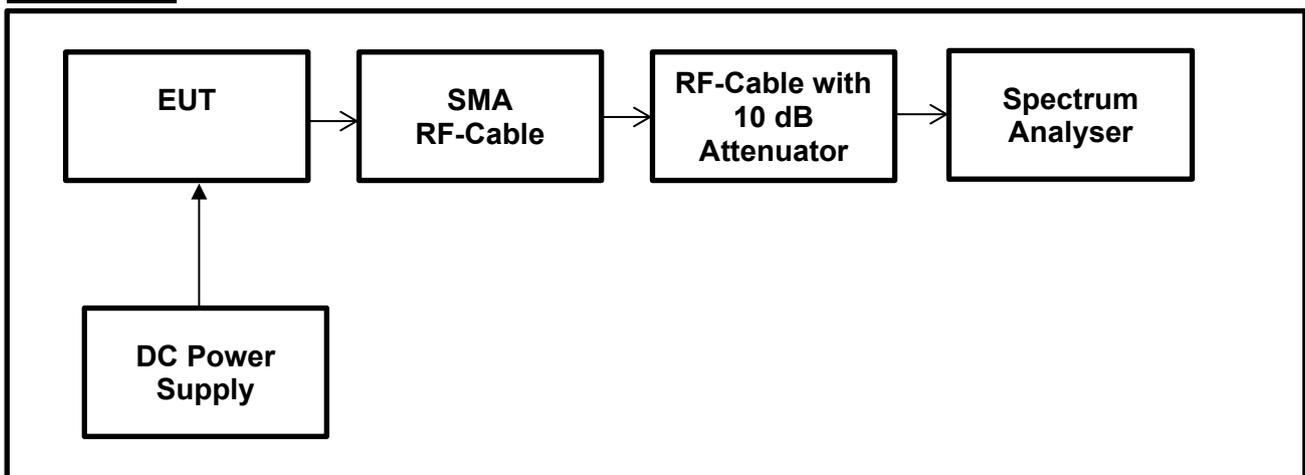
Temperature (°C):	23
Relative Humidity (%):	38

Notes:

- Final measurements were performed using the below configurations on the bottom, middle and top channels.
- The EUT was transmitting at <98% duty cycle and testing was performed in accordance with ANSI C63.10 Section 11.9.1.1 Method Maximum peak conducted output power.
- The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values takes into consideration the external attenuation correction factors.
 - The SMA (Female) RF Connector soldered on PCB with maximum attenuation of 0.4 dB at the tested frequencies.
 - The RF cable attenuation maximum 0.6 dB@2.4GHz from the EUT to RF power meter including the 10 dB attenuation at the input of RF power meter.

Therefore, total a reference level offset 11.0 dB was added to each of measured value at the tested frequencies.

Test Setup :



Transmitter Maximum (Peak) Output Power (continued)**Results: BLE / PRBS9 / 1 Mbps / PWR 8****Conducted Power Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	4.24	30.0	25.76	Complied
Middle	4.36	30.0	25.64	Complied
Top	4.26	30.0	25.74	Complied

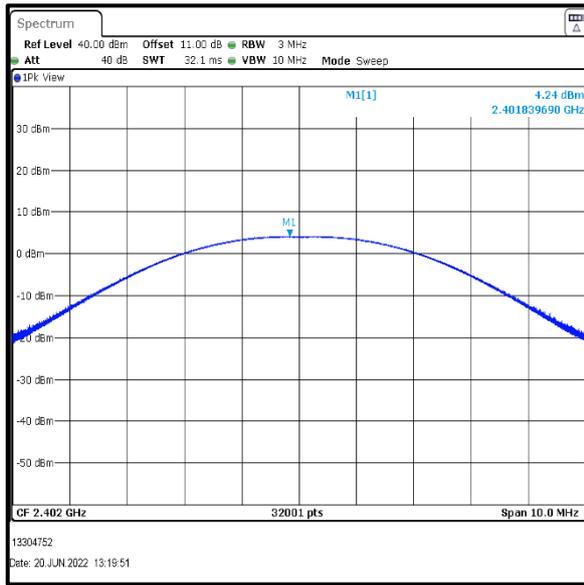
De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	4.24	0.5	4.74	36.0	31.26	Complied
Middle	4.36	0.5	4.86	36.0	31.14	Complied
Top	4.26	0.5	4.76	36.0	31.24	Complied

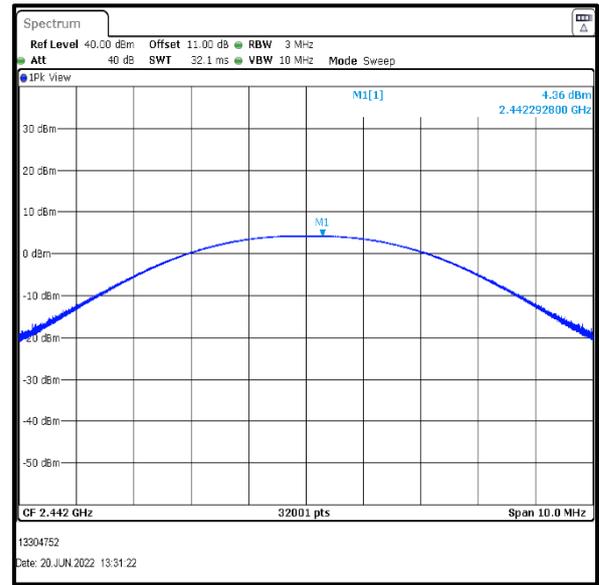
Result: Pass

Transmitter Maximum Peak Output Power (continued)

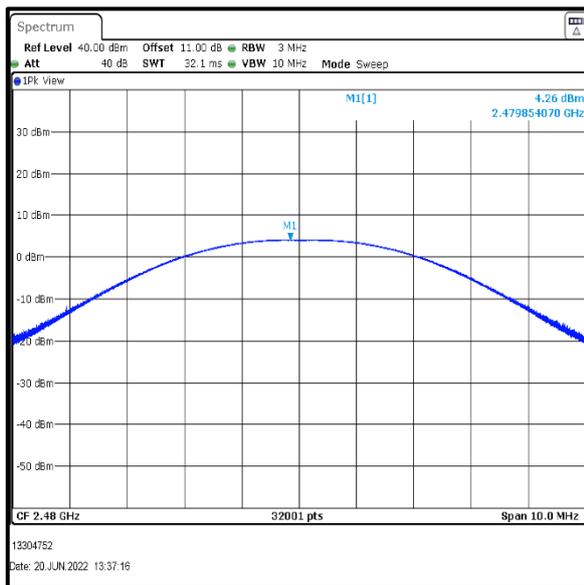
Results: BLE / PRBS9 / 1 Mbps / PWR 4



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum (Peak) Output Power (continued)**Results: BLE / PRBS9 / 2 Mbps / PWR 8****Conducted Power Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	4.22	30.0	25.78	Complied
Middle	4.37	30.0	25.63	Complied
Top	4.25	30.0	25.75	Complied

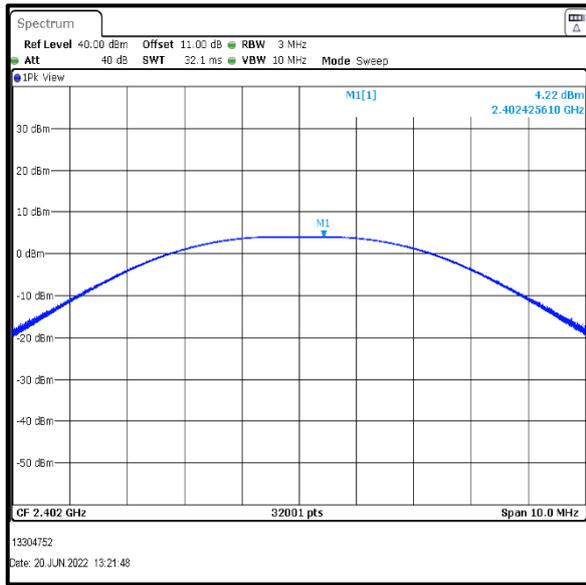
De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	4.22	0.5	4.72	36.0	31.28	Complied
Middle	4.37	0.5	4.87	36.0	31.13	Complied
Top	4.25	0.5	4.75	36.0	31.25	Complied

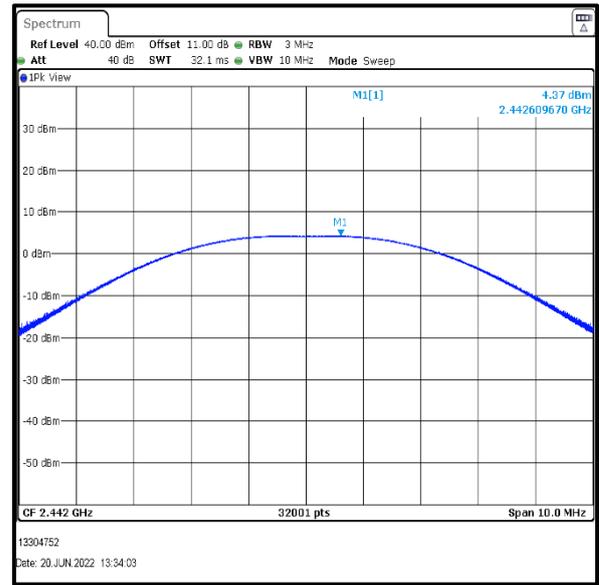
Result: Pass

Transmitter Maximum Peak Output Power (continued)

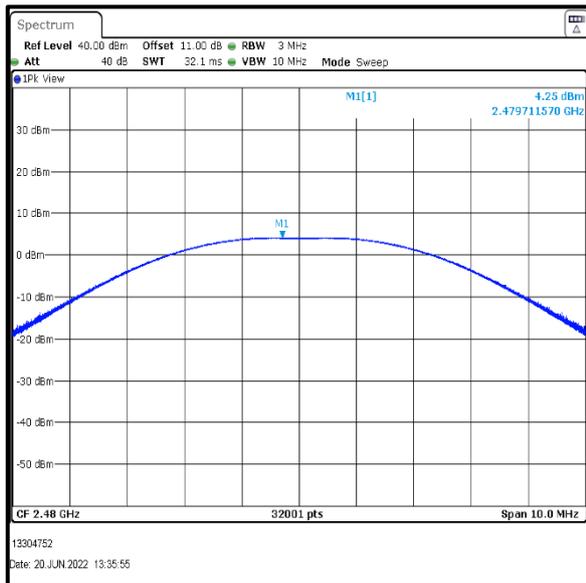
Results: BLE / PRBS9 / 2 Mbps / PWR 4



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum (Peak) Output Power (continued)**Results: BLE / PRBS9 / S2 / PWR 8****Conducted Power Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	4.19	30.0	25.81	Complied
Middle	4.38	30.0	25.62	Complied
Top	4.21	30.0	25.79	Complied

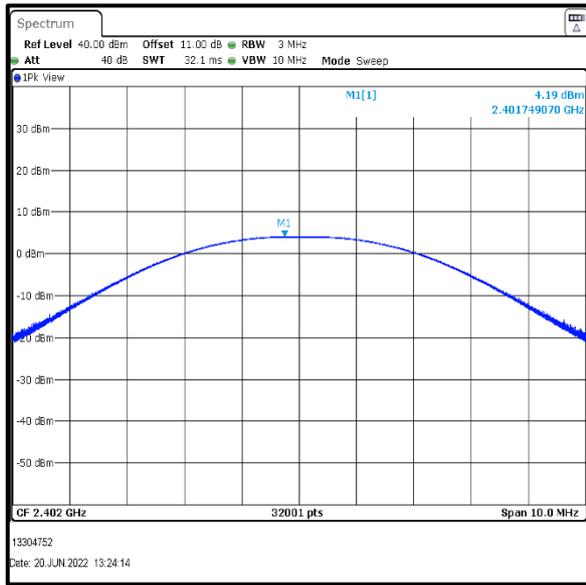
De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	4.19	0.5	4.69	36.0	31.31	Complied
Middle	4.38	0.5	4.88	36.0	31.12	Complied
Top	4.21	0.5	4.71	36.0	31.29	Complied

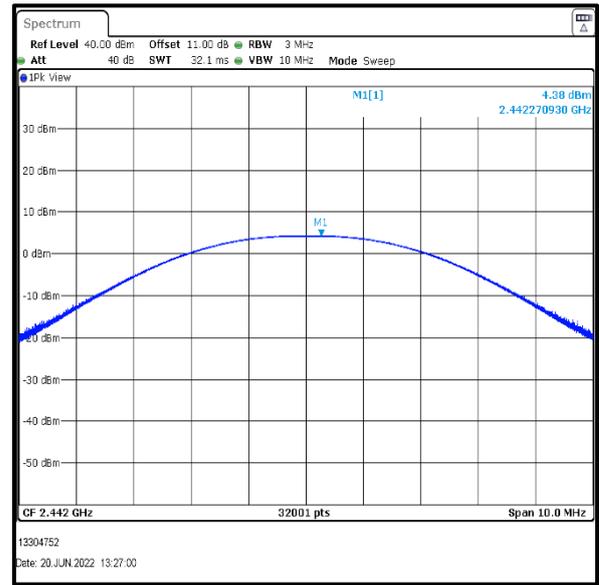
Result: Pass

Transmitter Maximum Peak Output Power (continued)

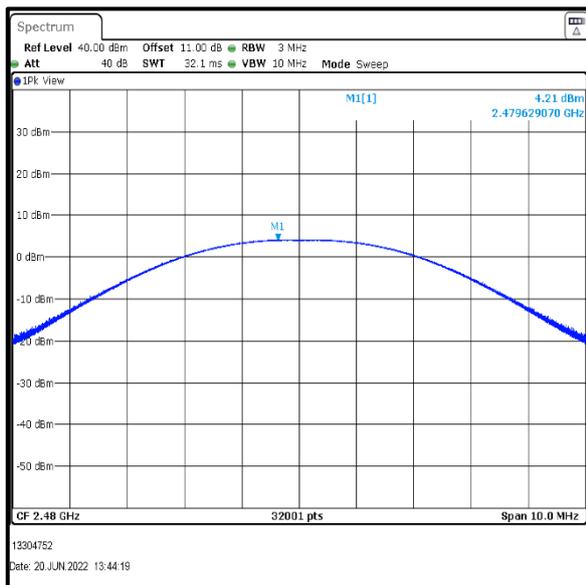
Results: BLE / PRBS9 / S2 / PWR 4



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum (Peak) Output Power (continued)**Results: BLE / PRBS9 / S8 / PWR 8****Conducted Power Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	4.20	30.0	25.80	Complied
Middle	4.38	30.0	25.62	Complied
Top	4.22	30.0	25.78	Complied

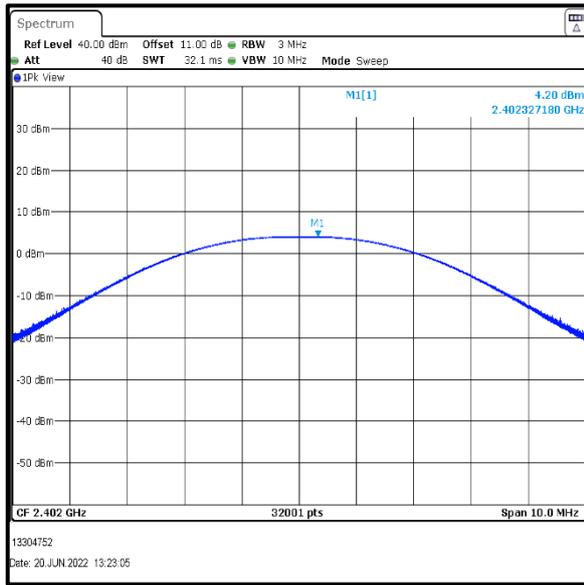
De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	4.20	0.5	4.70	36.0	31.30	Complied
Middle	4.38	0.5	4.88	36.0	31.12	Complied
Top	4.22	0.5	4.72	36.0	31.28	Complied

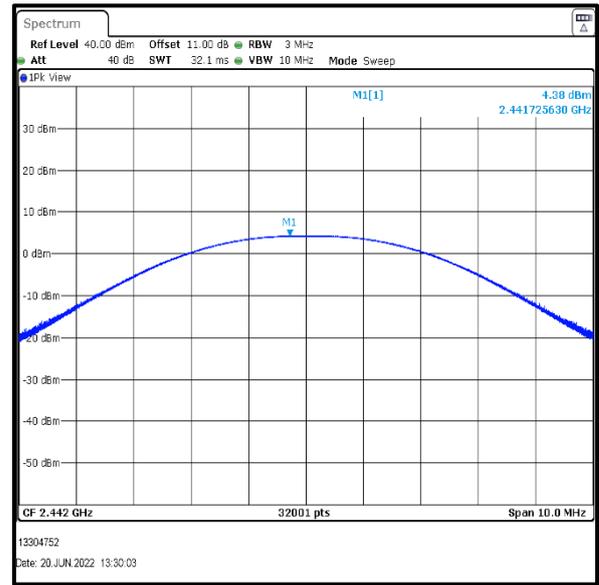
Result: Pass

Transmitter Maximum Peak Output Power (continued)

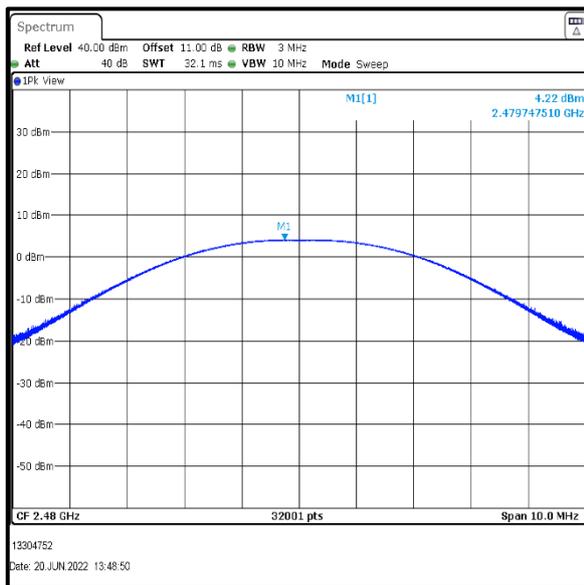
Results: BLE / PRBS9 / S8 / PWR 4



Bottom Channel



Middle Channel



Top Channel

5.2.4. Transmitter Radiated Emissions**Test Summary:**

Test Engineer:	Sercan Usta	Test Date:	21 June 2022
Test Sample Serial Number:	AW5V24PA5200047 (<i>Radiated RF Sample</i>)		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	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
Frequency Range	9 kHz to 30 MHz

Environmental Conditions:

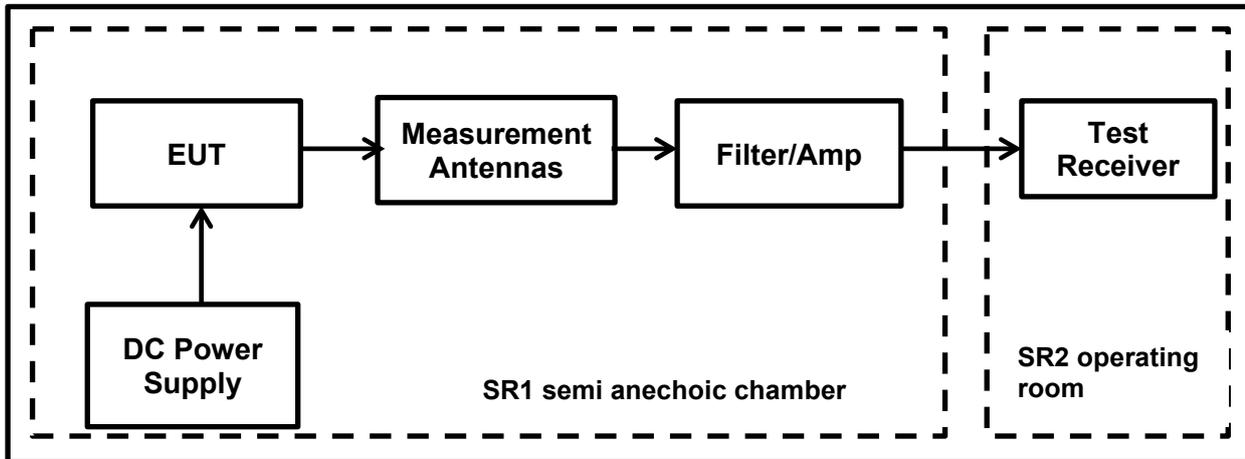
Temperature (°C):	21.6
Relative Humidity (%):	48.3

Note(s):

- 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 a 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).
- The limits are specified at a test distances 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 the limit values are extrapolated to a measurement distance of 3 m.
 - 9 kHz- 490 kHz: limits extrapolated from 300 m to 3 m by adding 80 dB at 40 dB/decade.
 - 490kHz-1705 kHz: limits extrapolated from 30 m to 3 m by adding 40 dB at 40 dB /decade.
- 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 80 cm above the reference ground plane in the centre of the chamber turntable. The measurement loop antenna height was 100 cm.
- Pre-scans were performed and markers placed on the highest measured levels. The test receiver was set to:
 - Frequency range: 9 kHz-150kHz : RBW: 300 Hz /VBW: 1 kHz
 - Frequency range: 150 kHz – 30 MHz: RBW: 10 kHz /VBW: 30 kHz
 - Detector: Max-Peak detector
 - Trace Mode: Max Hold
- The preliminary scans showed similar emission levels below 30 MHz, for each channel & modes of operation. Therefore, final radiated emissions measurements were performed with the EUT set to the Bottom channel and S8 data rate only.
- All emissions shown on the pre-scan plots were investigated and found to be below system noise floor.
- The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss

Transmitter Radiated Emissions (continued)

Test Setup:

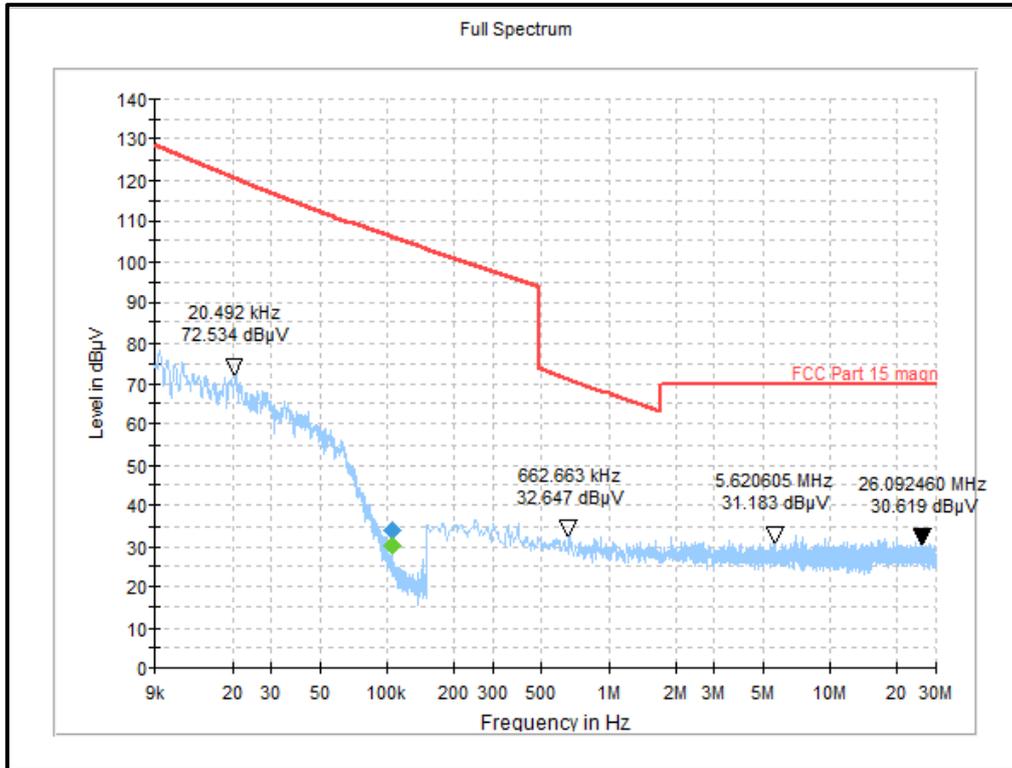


Transmitter Radiated Emissions (continued)

Results: BLE / PRBS9 / S8 / PWR 8 / Bottom Channel

Frequency (MHz)	Loop Antenna Orientation	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
0.105	0° to EUT	34.06	105.93	71.87	Complied

Plot: Radiated Transmitter spurious emission from 9 kHz – 30 MHz



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Result: Pass

Transmitter Radiated Emissions (continued)

Test Summary:

Test Engineer:	Sercan Usta	Test Date:	21 June 2022
Test Sample Serial Number:	AW5V24PA5200047 (Radiated RF Sample)		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	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
Frequency Range	30 MHz to 1000 MHz

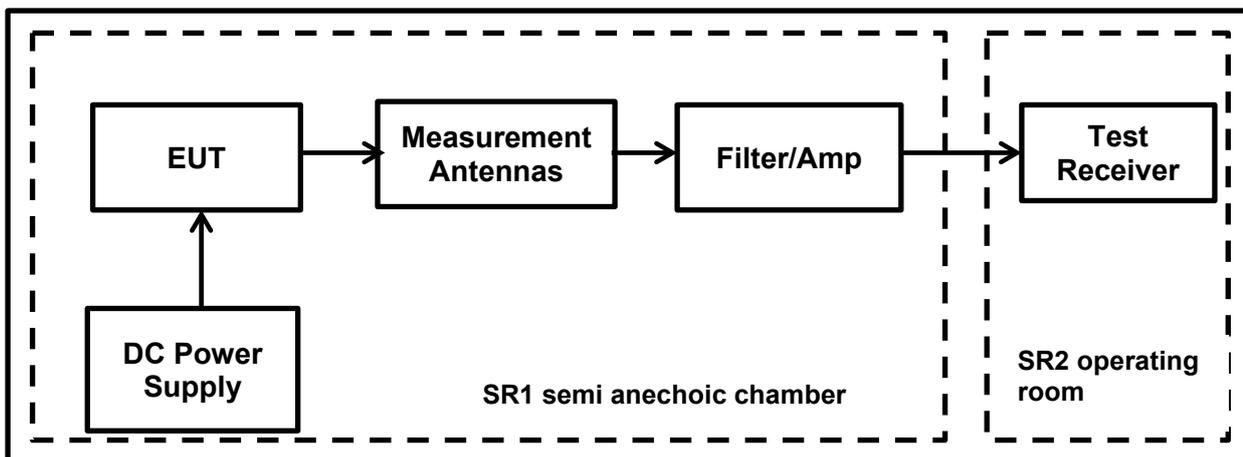
Environmental Conditions:

Temperature (°C):	21.6
Relative Humidity (%):	48.3

Note(s):

1. Measurements below 1 GHz 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 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 m to 4 m.
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 preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore, final radiated emissions measurements were performed with the EUT set to the Bottom channel and S8 data rate only.
4. All emissions shown on the pre-scan plots were investigated and found to be below system noise floor.
5. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.

Test Setup:

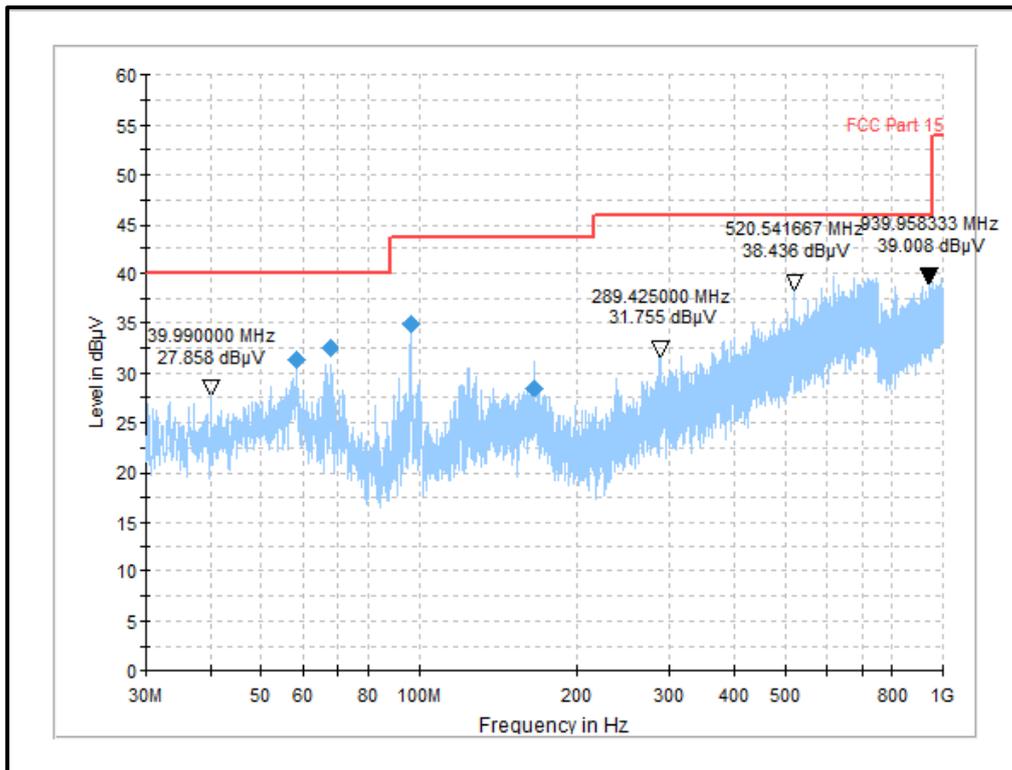


Transmitter Radiated Emissions (continued)

Results: BLE / PRBS9 / S8 / PWR 8 / Bottom Channel

Frequency (MHz)	Antenna Polarization	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
58.17	Vertical	31.37	40.00	8.63	Complied
67.44	Vertical	32.57	40.00	7.43	Complied
96.24	Vertical	34.78	43.50	8.72	Complied
166.35	Vertical	28.56	43.50	14.94	Complied

Plot: Radiated Transmitter spurious emission from 30 MHz – 1 GHz



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Result: Pass

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

Test Engineer:	Sercan Usta	Test Date:	20 & 21 June 2022
Test Sample Serial Number:	AW5V24PA5200047 (<i>Radiated RF Sample</i>)		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d), 15.209(a) & 15.205(a)
Test Method Used:	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 6.6
Frequency Range	1 GHz to 25 GHz

Environmental Conditions:

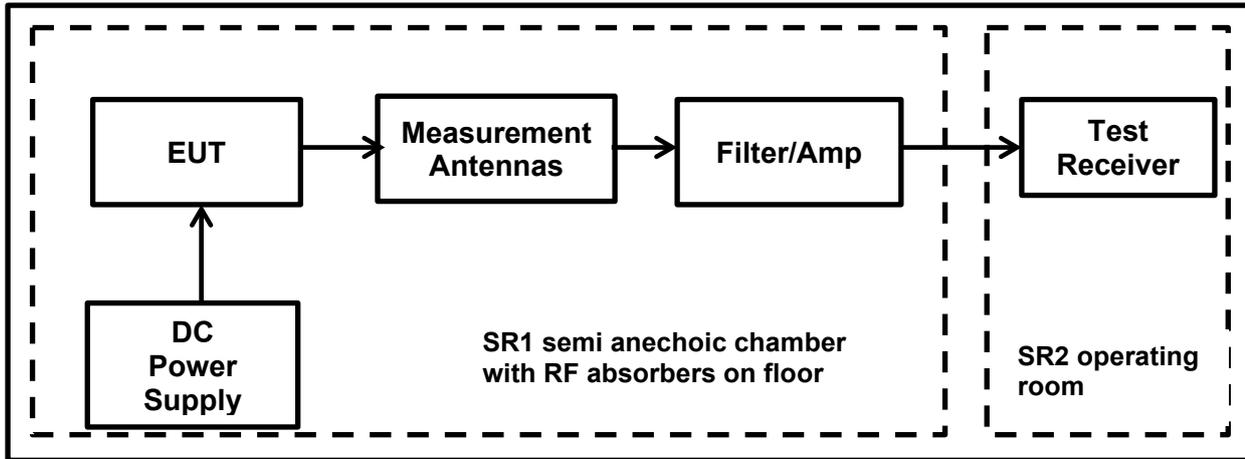
Temperature (°C):	22.0 & 21.6
Relative Humidity (%):	48.8 & 48.3

Note(s):

- Pre-scans 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. The EUT was placed at a height of 1.5 m above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 m above the test chamber floor, in line with the EUT. 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. The EUT was placed at a height of 1.5 m 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 m to 4 m.
- Pre-scans were performed and a marker placed on the highest measured level of the appropriate plot. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. The sweep time was set to auto.
- 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.
- All emissions shown on the pre-scans were investigated and found to be below the noise floor of the measurement system.
- The measurements above 18 GHz were performed only on Bottom channel with S2 data rate since it was found out to be the worst-case.
- The measurements from 1GHz till 18 GHz were performed on Bottom, Middle and Top channels with S2 data rates since it was found out to be the worst-case.
- In accordance with ANSI C63.10-2013 Section 5.3.3 & 6.5.3 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.
- The Restricted Band Emissions were performed in accordance with ANSI C63.10 Section 11.12.2.4 & 11.12.2.5.1.
- For frequency range between 1 GHz and 18 GHz, the final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
- For frequency range between 18 GHz and 25 GHz, no critical emissions were found. All emissions shown on the pre-scans were investigated and found to be below the noise floor of the measurement system.

Transmitter Radiated Emissions (continued)

Test Setup:



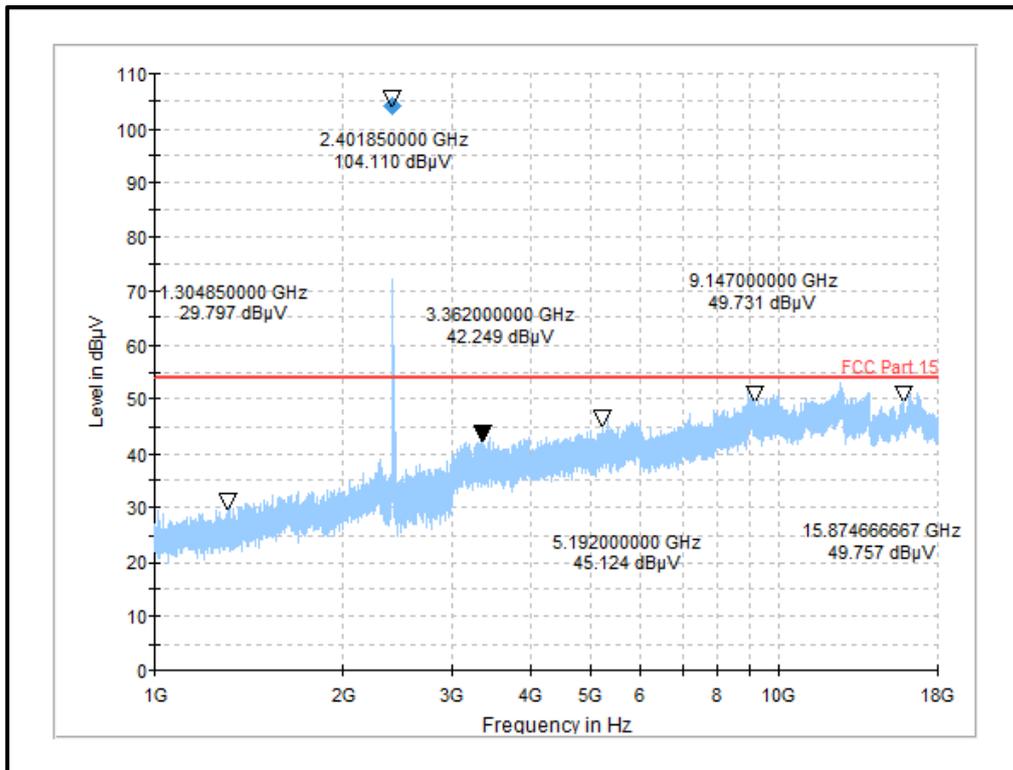
Transmitter Radiated Emissions (continued)

Results: BLE / PRBS9 / S8 / PWR 8 / Bottom Channel

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
No critical spurious emissions were found					

Results: BLE / PRBS9 / S8 / PWR 8 / Bottom Channel

Plot: Radiated Transmitter spurious emission from 1 GHz – 18 GHz



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Result: Pass

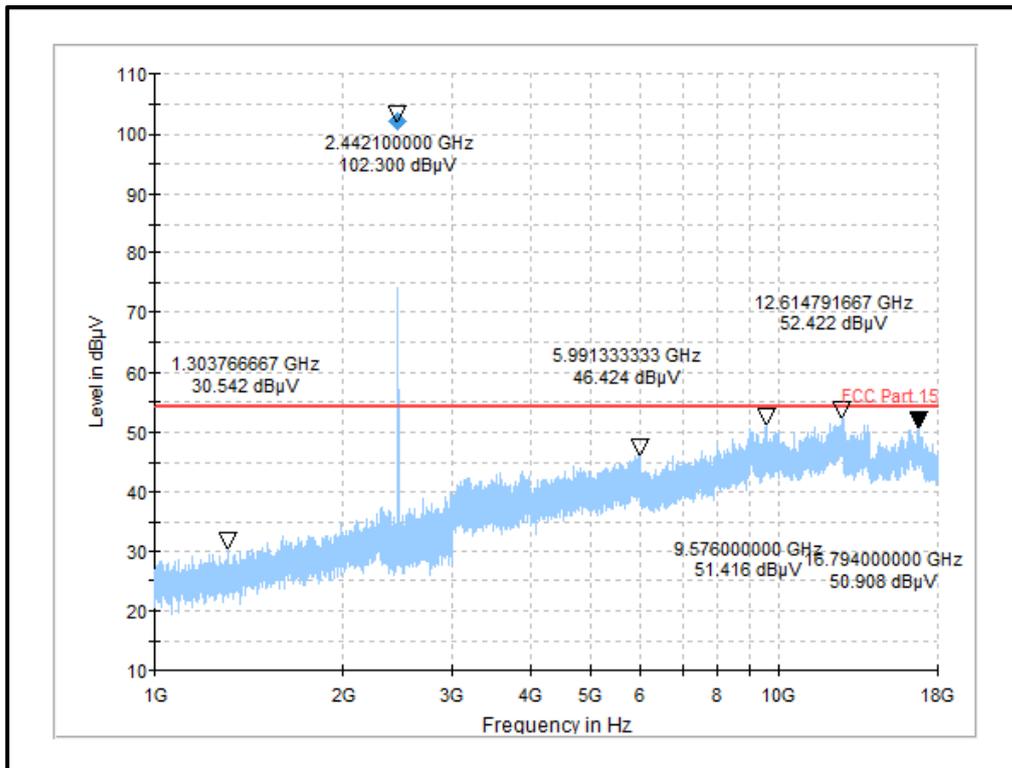
Transmitter Radiated Emissions (continued)

Results: BLE / PRBS9 / S8 / PWR 8 / Middle Channel

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
No critical spurious emissions were found					

Results: BLE / PRBS9 / S8 / PWR 8 / Middle Channel

Plot: Radiated Transmitter spurious emission from 1 GHz – 18 GHz



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Result: Pass

Transmitter Radiated Emissions (continued)

Results: BLE / PRBS9 / S8 / PWR 8 / Top Channel

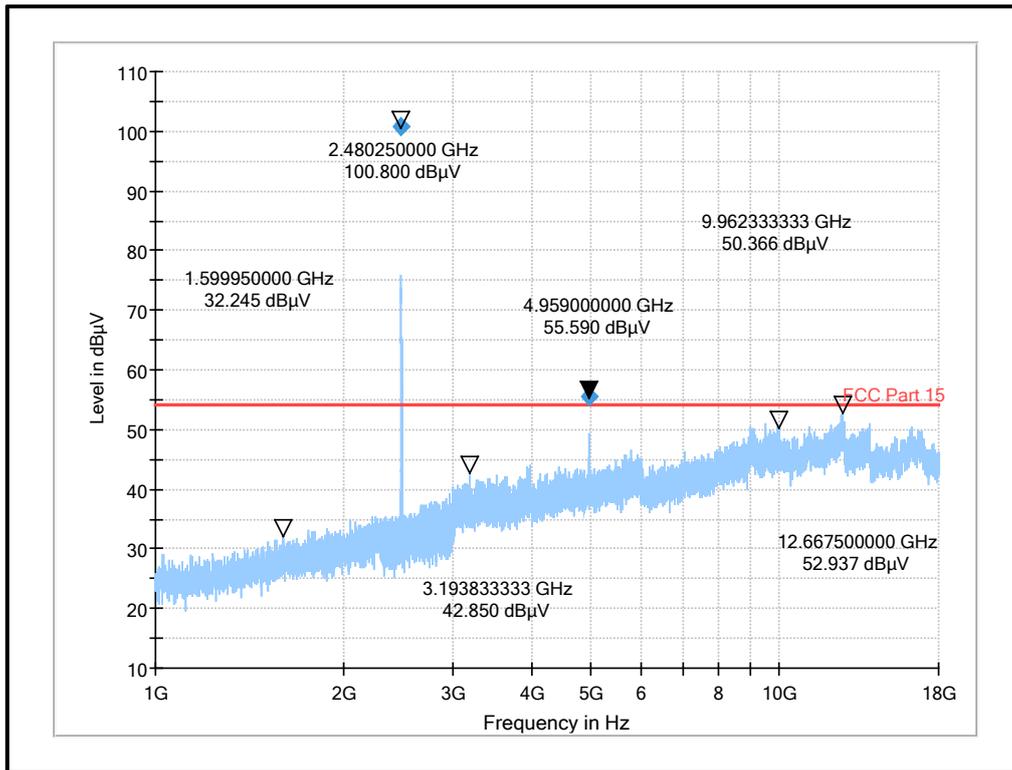
Restricted Band Emission:

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
4960.98	Horizontal	55.69	74.00	18.31	Complied

Frequency (MHz)	Antenna Polarization	Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
4960.98	Horizontal	44.51	54.00	9.49	Complied

Results: BLE / PRBS9 / S8 / PWR 8 / Top Channel

Plot: Radiated Transmitter spurious emission from 1 GHz – 18 GHz



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Result: Pass

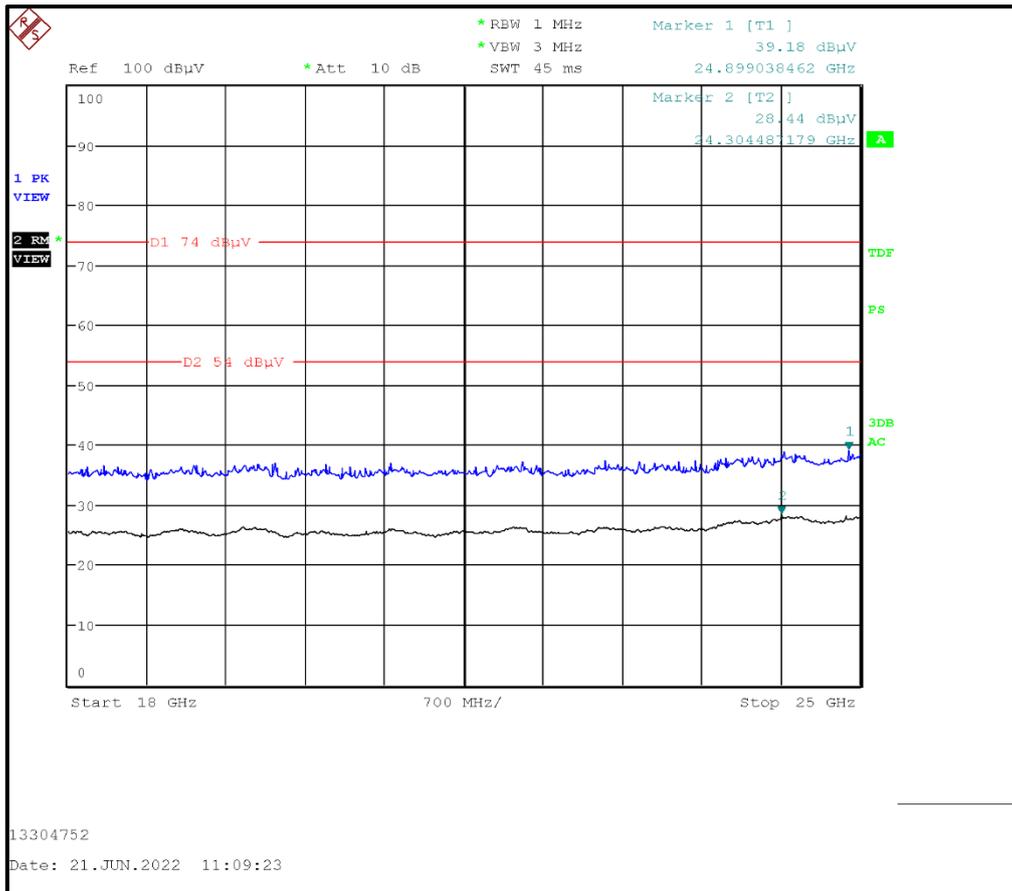
Transmitter Radiated Emissions (continued)

Results: BLE / PRBS9 / S8 / PWR 8 / Bottom Channel

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
No critical spurious emissions were found					

Results: BLE / PRBS9 / S8 / PWR 8 / Bottom Channel

Plot: Radiated Transmitter spurious emission from 18 GHz – 25 GHz



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Result: Pass

5.2.5. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	Sercan Usta	Test Date:	20 June 2022
Test Sample Serial Number:	AW5V24PA5200047 (<i>Radiated RF Sample</i>)		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d), 15.209(a) & 15.205(a)
Test Method Used:	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
	ANSI C63.10:2013 Sections 6.10.4, 6.10.5

Environmental Conditions:

Temperature (°C):	21.6
Relative Humidity (%):	48.3

Note(s):

- 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 1.5 m above the test chamber floor 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
- 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. Since maximum conducted (Peak) 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.
- 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.
- The restricted band peak measurements were performed in accordance with ANSI C63.10 Section 11.12.2.4.
- 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. A RMS detector in 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.

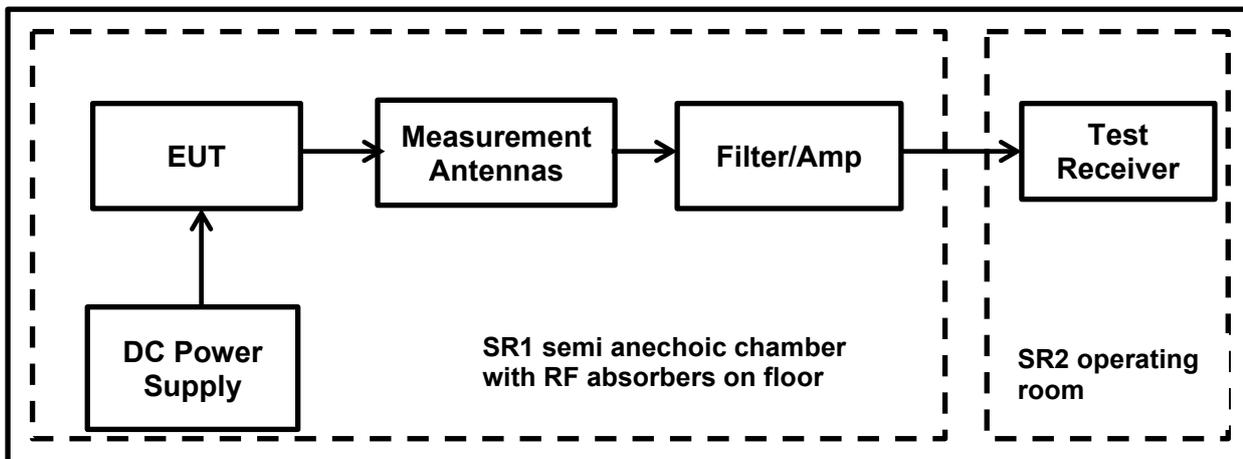
Transmitter Band Edge Radiated Emissions (continued)

Note(s): (continued)

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.
7. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
8. The radiated Band edge measurements were performed with S2, S8 1 Mbps and 2 Mbps data rates.
9. As the continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and EUT was transmitting continuously at different Duty Cycles with respect to the used data rates (duty cycle variations are less than $\pm 2\%$ at the respective data rate). Therefore, Duty Cycle Correction Factors were added to all average measurements according to the below table, to compute the corrected average values of the emissions that would have been measured had the test been performed at 100% Duty Cycle.

Data rate	Duty cycle	Correction factor
	(%)	(dB)
S8	97.52	0.11
S2	91.3	0.39
1 Mbps	84.97	0.71
2 Mbps	57.69	2.39

Test Setup:



Transmitter Band Edge Radiated Emissions (Continued)

Results: BLE / PRBS9 / 1 Mbps / PWR 8

Results: Lower Band Edge / Peak

Frequency (MHz)	Peak Level (dBµV/m)	-20 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.10	47.30	82.70	35.40	Complied
2400.00	47.30	82.70	35.40	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
2369.98	49.00	74.00	25.00	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBµV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
2370.14	39.04	0.71	39.75**	54.00	14.25	Complied

Results: Upper Band Edge / Peak

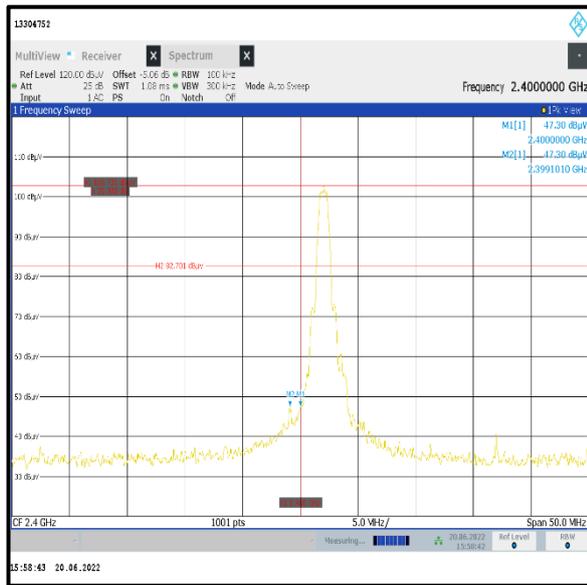
Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
2483.50	61.37	74.00	12.63	Complied
2483.90	58.42	74.00	15.58	Complied

Results: Upper Band Edge / Average

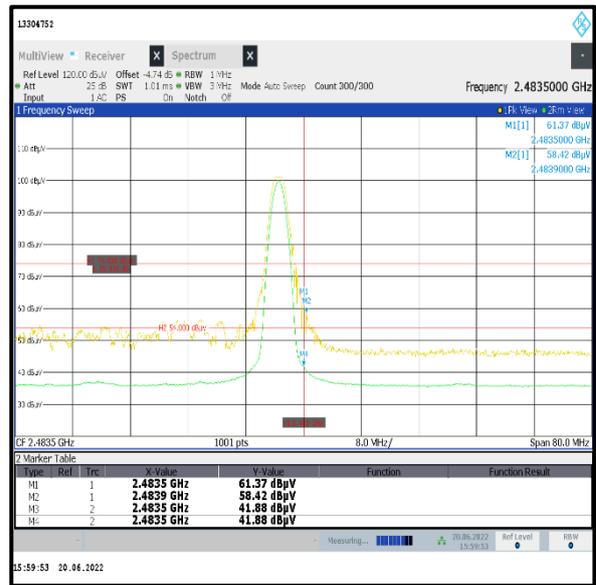
Frequency (MHz)	Average Level (dBµV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
2483.50	41.88	0.71	42.59**	54.00	11.41	Complied
2483.62	41.88	0.71	42.59**	54.00	11.41	Complied

Transmitter Band Edge Radiated Emissions (Continued)

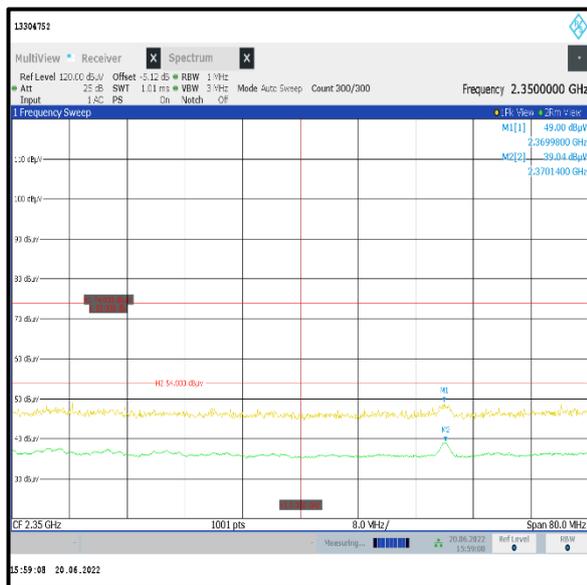
Results: BLE / PRBS9 / 1 Mbps / PWR 8



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: Pass

Transmitter Band Edge Radiated Emissions (Continued)

Results: BLE / PRBS9 / 2 Mbps / PWR 8

Results: Lower Band Edge / Peak

Frequency (MHz)	Peak Level (dBµV/m)	-20 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.95	66.68	82.10	15.42	Complied
2400.00	69.21	82.10	12.89	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
2389.80	49.14	74.00	24.86	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBµV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
2370.14	37.74	2.39	40.13**	54.00	13.87	Complied

Results: Upper Band Edge / Peak

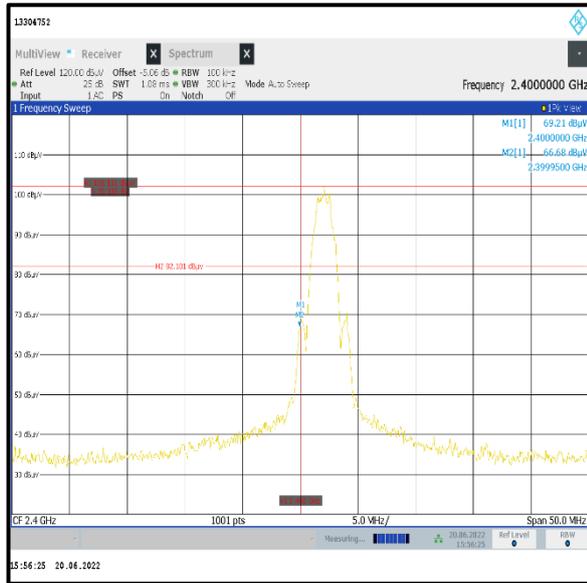
Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
2483.50	60.37	74.00	13.63	Complied
2483.58	59.85	74.00	14.15	Complied

Results: Upper Band Edge / Average

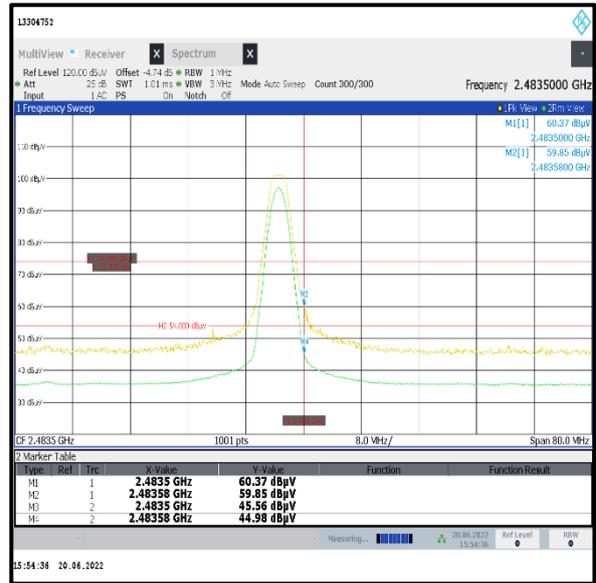
Frequency (MHz)	Average Level (dBµV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
2483.50	45.56	2.39	47.95**	54.00	6.05	Complied
2483.58	44.98	2.39	47.37**	54.00	6.63	Complied

Transmitter Band Edge Radiated Emissions (Continued)

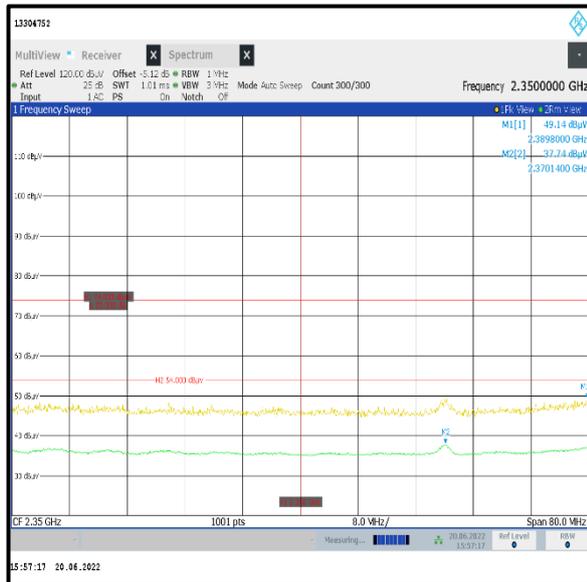
Results: BLE / PRBS9 / 2 Mbps / PWR 8



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: Pass

Transmitter Band Edge Radiated Emissions (Continued)

Results: BLE / PRBS9 / S2 / PWR 8

Results: Lower Band Edge / Peak

Frequency (MHz)	Peak Level (dBµV/m)	-20 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.65	49.49	82.80	33.31	Complied
2400.00	48.90	82.80	33.90	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
2370.06	50.73	74.00	23.27	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBµV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
2370.14	39.16	0.39	39.55**	54.00	14.45	Complied

Results: Upper Band Edge / Peak

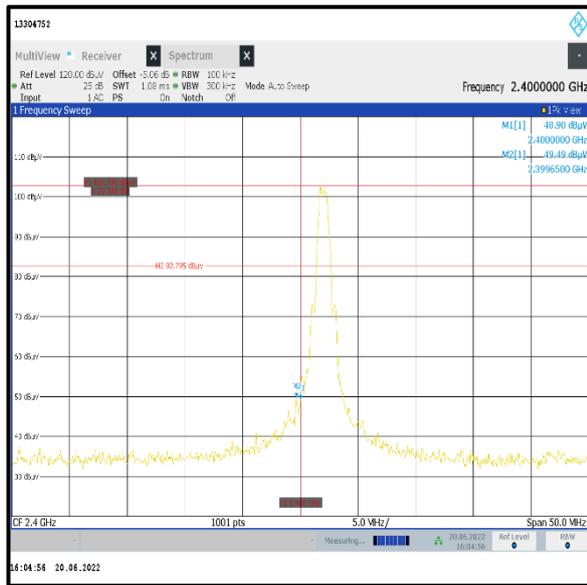
Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	Result
2483.50	60.46	74.00	13.54	Complied
2483.58	57.10	74.00	16.90	Complied

Results: Upper Band Edge / Average

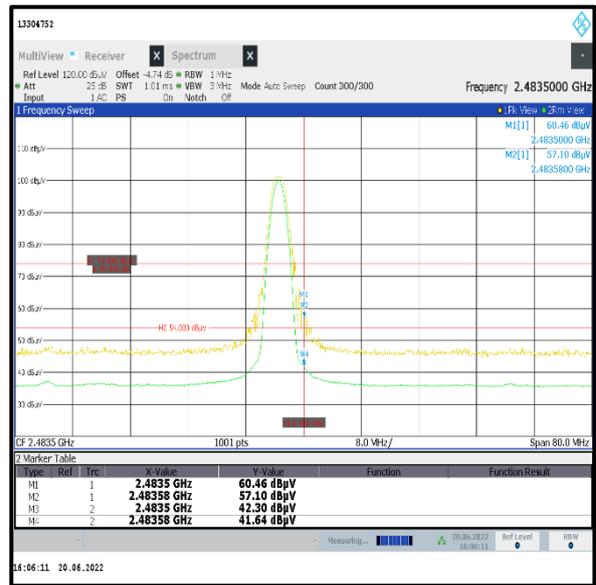
Frequency (MHz)	Average Level (dBµV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
2483.50	42.30	0.39	42.69**	54.00	11.31	Complied
2483.58	41.64	0.39	42.03**	54.00	11.97	Complied

Transmitter Band Edge Radiated Emissions (Continued)

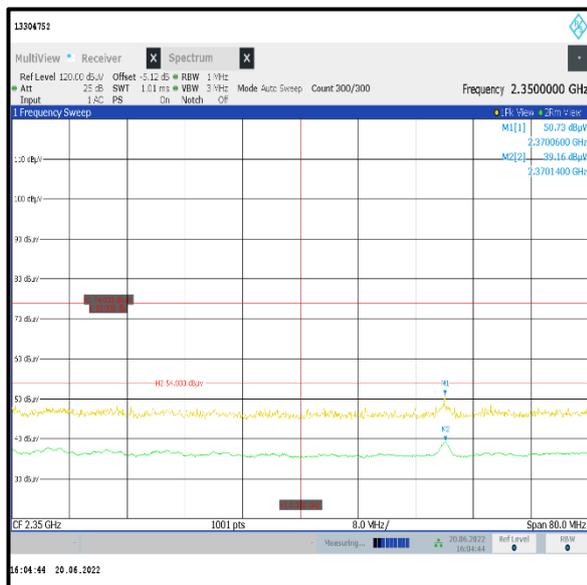
Results: BLE / PRBS9 / S2 / PWR 8



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: **Pass**

Transmitter Band Edge Radiated Emissions (Continued)**Results: BLE / PRBS9 / S8 / PWR 8****Results: Lower Band Edge / Peak**

Frequency (MHz)	Peak Level (dB μ V/m)	-20 dBc Limit (dB μ V/m)	Margin (dB)	Result
2399.95	47.15	79.58	32.43	Complied
2400.00	47.49	79.58	32.09	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)	Result
2369.98	49.05	74.00	24.95	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dB μ V/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
2370.06	39.49	0.11	39.60**	54.00	14.40	Complied

Results: Upper Band Edge / Peak

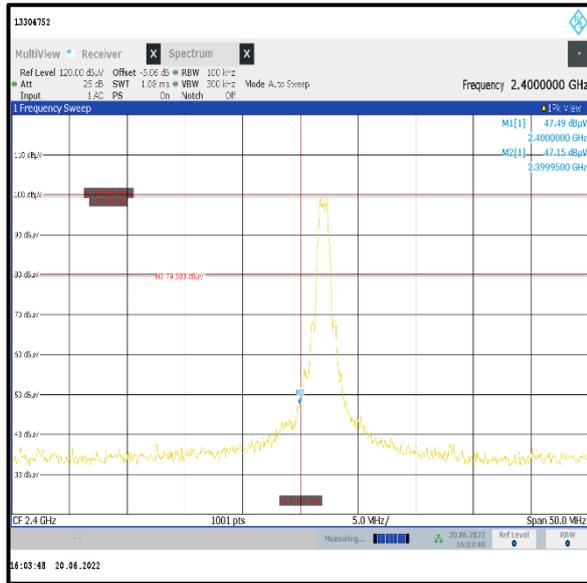
Frequency (MHz)	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)	Result
2483.50	52.58	74.00	21.42	Complied
2483.50	52.58	74.00	21.42	Complied

Results: Upper Band Edge / Average

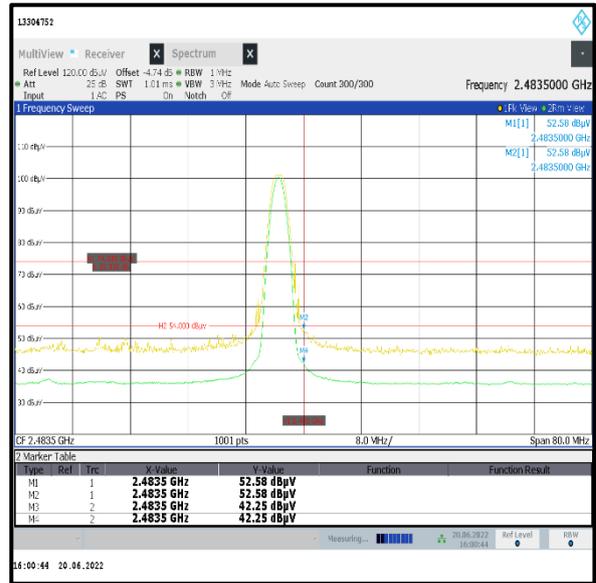
Frequency (MHz)	Average Level (dB μ V/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
2483.50	42.25	0.11	42.36**	54.00	11.64	Complied
2483.50	42.25	0.11	42.36**	54.00	11.64	Complied

Transmitter Band Edge Radiated Emissions (Continued)

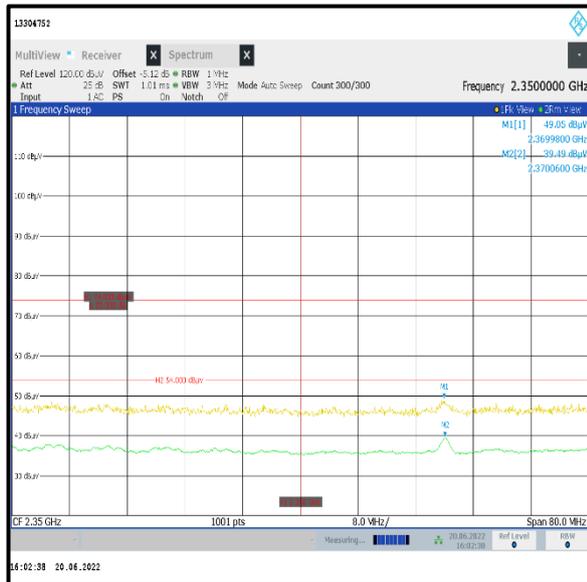
Results: BLE / PRBS9 / S8 / PWR 8



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

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
Minimum 6 dB Bandwidth	95%	±0.87 %
Transmitter Duty Cycle	95%	±3.4%
Conducted Maximum Peak Output Power	95%	±0.59 dB
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	10/07/2020	36
377	BONN Elektronik	Amplifier, Low Noise Pre	BLMA 0118-1A	025294B	16/07/2021	12
423	Bonn Elektronik	Amplifier, Low Noise Pre	BLMA 1840-1A	55929	16/07/2021	12
460	Deisel	Turntable	DT 4250 S	n/a	n/a	n/a
452	Schwarzbeck	Antenna, Trilog Broadband	VULB 9168	9168-240	02/09/2020	24
496	Rohde & Schwarz	Antenna, log. - periodical	HL050	100297	05/08/2020	36
607	Schwarzbeck	Antenna broadband horn antenna	BBHA 9170	9170-561	15/10/2019	36
587	Maturo	antenna mast, tilting	TAM 4.0-E	011/7180311	n/a	n/a
588	Maturo	Controller	NCD	029/7180311	n/a	n/a
591	Rohde & Schwarz	Receiver	ESU 40	100244/040	28/06/2021	12
669	Rohde & Schwarz	Receiver	ESW44	103087	03/02/2022	12
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
1603665	Siemens Matsushita Components	semi-anechoic chamber SR1/ 2	-/-	B83117-A1421- T161	n/a	n/a

Test site: SR 7/8

ID	Manufacturer	Type	Model	Serial	Calibration Date	Cal. Cycle (months)
23	Rohde & Schwarz	Artificial Mains Network	ESH3-Z5	831767/013	14/07/2021	12
349	Rohde & Schwarz	Receiver, EMI Test	ESIB7	836697/009	13/07/2021	12
-/-	Testo	Thermo-Hygrometer	608-H1	08	lab verification	n/a
327	SPS	AC/DC power distribution system	PAS 5000	A2464 00/1 0200	lab verification	n/a

Test site: SR 9

ID	Manufacturer	Type	Model	Serial	Calibration Date	Cal. Cycle (months)
-/-	Huber+Suhner	10 dB Attenuator	0047	-/-	lab verification	n/a
637	Rohde & Schwarz	Spectrum Analyzer	FSV40	101587	12/07/2023	12
636	Rohde & Schwarz	Switching Unit Power Meter	OSP-B157W8	101698	13/07/2021	24
-/-	Testo	Thermo-Hygrometer	608-H1	07	lab verification	n/a
-/-	Huber+Suhner	RF Cable -OSP120-DUT1	ST18/SMAM/S MAM/72	605505	lab verification	n/a
327	SPS	AC/DC power distribution system	PAS 5000	A2464 00/1 0200	lab verification	n/a
1603668	Siemens Matsushita Components	shielded room		B83117- B1422-T161	n/a	n/a

8. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	54	-	Initial Version
1.1	1 & 7	-	FCC ID info updated
	-	-	Report Template updated
	53	-	Test site SR9 tabel updated
Test Report Version 1.2 supersede Version 1.1 with immediate effect Test Report No. UL-RPT-RP-13304752-916-FCC Version 1.2, Issue Date 15 SEPTEMBER 2023 replaces Test Report No. UL-RPT-RP-13304752-916-FCC Version 1.1, Issue Date 11 SEPTEMBER 2022, which is no longer valid.			
1.2	as below	as below	Current Version
	6	2.3	Methods and procedure updated
	7	3.1	Identification of equipment table updated
	8	3.4	Additional Information related testing table updated
	22-30	5.2.3	Antenna gain info and the measurement tables updated

--- END of Test Report ---