TEST REPORT

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ACCREDITED
CERT #3657.02

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Manufacturer:	**Orca Water Solutions**
Address:	Suite 107 - 4288 Lozells Ave Burnaby, British Columbia, V5A 0C7
Equipment Tested:	**Orca WaterTag**
Model Number(s):	RCA-TAG-BLSV001
FCC ID:	FCC ID: 2BUOSBLSV001
ISED ID:	IC: 34745-BLSV001
FVIN:	RCA-TAG-BLSV001

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REVISION HISTORY

Date	Report Number	Details	Author's Initials
June 5, 2026	QA-2912-1-R2	Cosmetic changes to clarify index and Results Summary	DJ
March 5, 2026	QA-2912-1-R1	Release Version	DJ
September 11, 2025	QA-2912-1-R0	Initial Draft	DJ
All previous versions of this report have been superseded by the latest dated revision as listed in the above table. Please dispose of all previous electronic and paper printed revisions accordingly.			

REPORT AUTHORIZATION

The data documented in this report is for the test equipment provided by the manufacturer and the results relate only to the item tested. The tests were conducted on the sample equipment as requested by the manufacturer for the purpose of demonstrating compliance with the standards outlined in Section I of this report as agreed upon by the Manufacturer under the quote QAI-1714.

The Manufacturer is responsible for the tested product configurations, continued product compliance, and for the appropriate auditing of subsequent products as required.

This report may comprise a partial list of tests that are required for FCC and ISED. A Declaration of Conformity can only be produced by the manufacturer. This is to certify that the following report is true and correct to the best of our knowledge.

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QAI EMC ACCREDITATION

QAI EMC is your one-stop regulatory compliance partner for electromagnetic compatibility (EMC) and electromagnetic interference (EMI). Products are tested to the latest and applicable EMC/EMI requirements for domestic and international markets. QAI EMC goes above and beyond being a testing facility—we are your regulatory compliance partner. QAI EMC has the capability to perform RF Emissions and Immunity for all types of electronics manufacturing including Industrial, Scientific, Medical, Information Technology, Telecom, Wireless, Automotive, Marine and Avionics.

EMC Laboratory Location	FCC Designation (3m SAC)	IC Registration (3m SAC)	A2LA Certificate
Burnaby, BC, Canada	CA9543 Lab Reg# 669742	9543A	3657.02

EMC Facility Burnaby BC, Canada

TABLE OF CONTENTS

EXECUTIVE SUMMARY

2.1 Purpose

The purpose of this report is to demonstrate and document the compliance of Orca WaterTag as per Sections 1.2 and 1.3.

2.2 Scope

The information documented in this report is based on the test methods and levels as per Quote QAI-1714:

CFR Title 47 FCC Part 15.247 – Radio Frequency Devices, Subpart C – Intentional Radiators Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ISED RSS-247 Issue 4: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

RSS-Gen Issue 5 – General Requirements and Information for the Certification of Radio Apparatus

RSS-102 Issue 6 – Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus

ICES-003 Issue 7 – Information Technology Equipment (Including Digital Apparatus)

ICES-Gen Issue 2 – General Requirements for Compliance of Interference-Causing Equipment

FCC KDB 558074 D01 v05r02 - 15.247 Meas Guidance

ANSI c63.10-2020 - Procedures for Compliance Testing of Unlicensed Wireless Devices.

2.3 Summary of Results

The following testing was performed pursuant to FCC Title 47 Part 15 and Industry Canada ICES-003 to demonstrate the testimony to "FCC, IC, & CE" mark Electromagnetic Compatibility testing for the product.

No.	Test	Applicable Standard	Requirement	Result
1	Antenna Requirement	FCC 47 CFR Part C 15.203 RSS-Gen	No user access to antenna after professional installation.	Complies
2	6 dB Bandwidth	FCC 47 CFR Part C 15.247 RSS-247	Maximum allowed 6 dB bandwidth of the hopping channel is 500 kHz.	Complies
3	99% Occupied Bandwidth	RSS-Gen	the 99% emission bandwidth is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.	Complies
4	Peak Output Power (Conducted & Radiated)	FCC 47 CFR Part C 15.247 RSS-247	Maximum peak conducted output power shall not exceed 1 W	Complies
5	Peak Power Spectral Density	FCC 47 CFR Part 15.247 (a)(2) RSS-247 (6.3.1) RSS-Gen (6.7)	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..	Complies
5	Band Edge	FCC 47 CFR Part C 15.247	In any 100 kHz bandwidth outside the frequency band in which the device is operating, the RF power shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.	Complies
6	Intentional Radiated Emissions	FCC 47 CFR Part A 15.33 FCC 47 CFR Part B 15.109 FCC 47 CFR Part C 15.209 ICES-003 RSS-247	Radiated emissions requirements as stated in the standards.	Complies
7	Radiated Spurious Emissions	FCC 47 CFR Part A 15.33 FCC 47 CFR Part C 15.205 FCC 47 CFR Part C 15.209 FCC 47 CFR Part C 15.247 RSS-Gen RSS-247	Radiated emissions requirements as stated in the standards.	Complies
8	RF Exposure	RSS-102	RF exposure measurements	Complies

Table 1: Applicable test standards and descriptions

Note: The gain of the antenna(s) is provided by the client to measure or calculate test results and is not independently measured by QAI.

2.4 Test Equipment List

The tables below contain all the equipment used by 'QAI Laboratories' in conducting all tests on the Equipment Under Test (EUT) as per Section I.

Emissions Test Equipment

	Manufacturer	Model	Description	Serial No.	S/W Version	Calibration Due Date
1	Com-Power Corporation	LI-220C	Line Impedance Stabilization Network (9kHz-30MHz)	20070025	N/A	2026-Jan-23
2	Sunol Sciences	SC 104V	Turntable Controller	042506-1	N/A	Indication Only
3	Sunol Sciences	SM46C	Turntable	071705-2	N/A	Indication Only
4	Maturo GmbH	BAM 4.0-P	Boresight Antenna Mast	365	3382.01	Indication Only
5	ETS Lindgren	S201	7-meter Semi-Anechoic Chamber	1030	N/A	Indication Only
6	Hewlett Packard	8447F	Amplifier (0.1-1300MHz)	1726A00566	N/A	Indication Only
7	Hewlett Packard	8449B	Preamplifier (1-26.5 GHz)	3008A00982	N/A	Indication Only
8	Microwave Lab	USMC10180	Low Noise Amplifier (0.1-18GHz)	001303JR0802 A2729	N/A	Indication Only
9	Keysight Technologies	N9038B	MXE EMI Receiver, Multi-touch	MY60180014	N/A	2026-Aug-22
10	ETS-Lindgren	3117	Horn, Double-Ridge Guide Ant, 1.0 - 18 GHz	75944	N/A	2026-Jan-25
11	Sunol Sciences	JB3	Biconilog Antenna (30MHz – 3GHz)	A120106	N/A	2026-Mar-28
12	California Instruments	PACS-1	Test System - H&F	72569	N/A	2028-Apr-2
13	California Instruments	OMNI 1-18i	CDN - H&F	7127	N/A	2028-Apr-2
14	California Instruments	3001i	Power Supply - H&F	52117	CTS3.0 v3.2.0.35	2028-Apr-2
15	TESEQ	ISN T800	Impedance Stabilization Network (150kHz – 30MHz)	27133	N/A	2026-Feb-08

Note: Equipment listed above have 3 years calibration interval.

Measurement Software List

	Manufacturer	Model	Version	Description
1	Rohde & Schwarz	EMC 32	10.35.10	Emissions Test Software

GENERAL INFORMATION

3.1 Product Description

The information provided in this section is for the Equipment Under Test (EUT) and the corresponding Auxiliary Equipment needed to perform the tests as a complete system.

Figure 1: Orca WaterTag

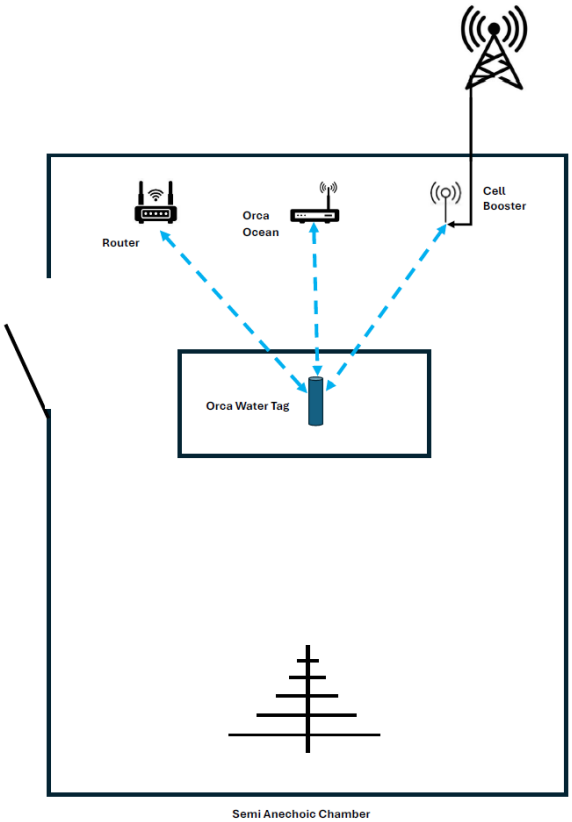

Figure 2: EUT Setup layout inside the chamber

Equipment Under Test (EUT)

Equipment	Orca WaterTag
Description	Orca WaterTag(TM) is a battery powered acoustic flowsensor that determines the presence of water flow in pipes and water lines.
Manufacturer	Orca Water Solution
Model No.	PCA00205-D
Serial No.	Eng001
Clock frequencies tuned upon within the EUT:	2.4 GHz (Thread & Bluetooth)
Highest frequency generated within the EUT:	2.4GHz

Equipment Under Test (EUT) – RF Information

RF device type	2400 – 2483.5 MHz DTS system
Model No. (HVIN)	PCA00205-D
Operating frequency	2405 MHz – 2480 MHz
Number of available	15 Channels
Channel separation	5MHz
Channel bandwidth	1.2 MHz
Output Power/Transmitter (conducted)	5.7 dBm
Modulation type	Thread
Test Channels (L, M, H)	2405 MHz, 2445 MHz, 2480 MHz
Data Rate	250 kbps
Adaptive	No
Geo-location-capable	No
Number of antennas	1
Antenna type	PCB Trace
Antenna gain	0.0dBi (estimated Reference design)

Notes: None.

Equipment Under Test (EUT) – General Information

Tested as	Tabletop
Dimensions	80 x 40 x 20mm
Declared operating temperature range:	0 – 40C
Input power	1,5Vdc Battery
Grounded	No
Device use	Fixed Location – Physically secured & not easily moved.

Notes: None.

Test Modes

Test	Transmitter State	Power
1	2.4GHz Radio ON	1.5V DC AAA Cell

Auxiliary Manufacturer Supplied Equipment

Equipment	Manufacturer	Product Description	Model No.
Cell Signal Booster	Wilson Electronics	Cell Booster	460020
LoRaWAN	RAK	LoRaWAN Gateway	RAK7268CV2
Orca Ocean	Orca Ocean	HUB	RCA-OCN-BLSV001
Laptop	Microsoft	Laptop with Tera Term Software	Model No Model: 1769

3.2 Environmental Conditions

The equipment under test was operated and tested under the following environmental conditions:

Parameter	Conditions
Location	QAI – Burnaby
Temperature	26.0 C
Relative Humidity	55.7 %

3.3 Measurement Uncertainty

Parameter	Uncertainty
Radiated Emissions, 30MHz-1GHz	± 2.40 dB
Radiated Emissions, 1GHz-40GHz	± 2.48 dB
Radio Frequency	±1.5 x 10-5 MHz
Total RF Power Conducted	±1.36 dB
Spurious Emissions, Conducted	±1.36 dB
RF Power Density, Conducted	±1.36 dB
Temperature	±1ºC
Humidity	±5 %
DC and low frequency voltages	±3 %

3.4 Worst Test Case

Worst-case orientation was determined during the preliminary testing. The final radiated emissions were performed in the worst-case orientation.

3.5 Sample Calculations of Emissions Data

Radiated and conducted emissions were performed using EMC32 software developed by Rohde & Schwarz. Transducer factors such as antenna factors, cable losses and amplifier gains were stored in the test templates which are used to perform the emissions measurements. After the test is finished, data is generated from the EMC32 consisting of product details, emission plots and final data tables as shown below.

Frequency (MHz)	Q-Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Ant. Ht. (cm)	Pol	Turntable Position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
42.663900	33.0	1000.000	120.000	100.0	H	70.0	13.2	7.5	40.5

Table 2: Sample Quasi-Peak Correction Data – Radiated

Quasi-Peak reading shown in the table above is already corrected by the software using the correction factor shown in column "Corr." The correction factor listed under "Corr." table calculated as:

Corr.(dB) = Antenna factor + Cable loss

Or

Corr.(dB) = Antenna factor + Cable Loss - Amp gain (if pre-amplifier was used)

The final Quasi peak reading shown in the data is calculated by the software using following equation:

Corrected Quasi-Peak (dBµV/m) = Raw Quasi-Peak Reading + Antenna factor + Cable loss

To obtain the final Quasi-Peak or Average reading during power line conducted emissions, transducer factors are included in the final measurement as shown below.

Frequency (MHz)	Q-Peak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	44.3	1000.000	9.000	GND	0.6	21.7	66.0

Table 3: Sample Quasi-Peak Correction Data - Conducted Emissions

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	27.2	1000.000	9.000	GND	0.6	28.8	56.0

Table 4: Sample Average Correction Data- Conducted Emissions

Quasi Peak or Average reading shown in the preceding table is already corrected by the software using the correction factor shown in column “Corr.” The correction factor listed under “Corr.” table calculated as:

Corr.(dB) = Antenna factor + Cable loss

The final Quasi-peak or Average reading shown in the data is calculated by the software using following equation:

Corr. Quasi-Peak/Average Reading (dBµV) = Raw Quasi-Peak/Average Reading + Antenna factor + Cable loss

The allowable margin from the limits, as per the standards, were calculated for both radiated and conducted emissions:

Margin(dB) = Limit – Quasi-Peak or Average reading

DATA & TEST RESULTS

4.1 6 dB Bandwidth

Date Performed: August 27, 2025

Test Standard: FCC 47 CFR Part 15.247 (a)(2)
RSS-247 Issue 4 (5.2)

Test Method: FCC KDB 558074 D01
ANSI c63.10
Relative Measurement Procedure

Modifications: None

Final Result: Complies

Applicable Regulations:

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Setup:

The EUT was tested outside the SAC via output conducted measurements per ANSI C63.10: 2013, 7.4.

A spectrum analyzer or other instrument providing a spectral display is recommended for these measurements. When using a spectrum analyzer or other instrument providing a spectral display, the video bandwidth shall be set to a value at least three times greater than the IF bandwidth of the measuring instrument to avoid the introduction of unwanted amplitude smoothing. Video filtering is not used during occupied bandwidth tests.

Spectrum Analyzer method performing OBW measurements per ANSI c63.10 11.8 and FCC KDB 558074 D01
Spectrum Analyzer settings: Span = 2MHz, RBW = 100kHz, VBW = 300kHz Trace stabilization time: 10 minutes

Measurement Data and Plots:

Channels	Carrier Frequency (MHz)	6dB Bandwidth (kHz)	Limit minimum (kHz)	Result
Low	2405	1204.8	500	Complies
Middle	2445	1212.0	500	Complies
High	2480	1207.2	500	Complies

Table 5: 6 dB Bandwidth Results

Figure 3: 6 dB Bandwidth – Low Channel

Figure 4: 6 dB Bandwidth - Middle Channel

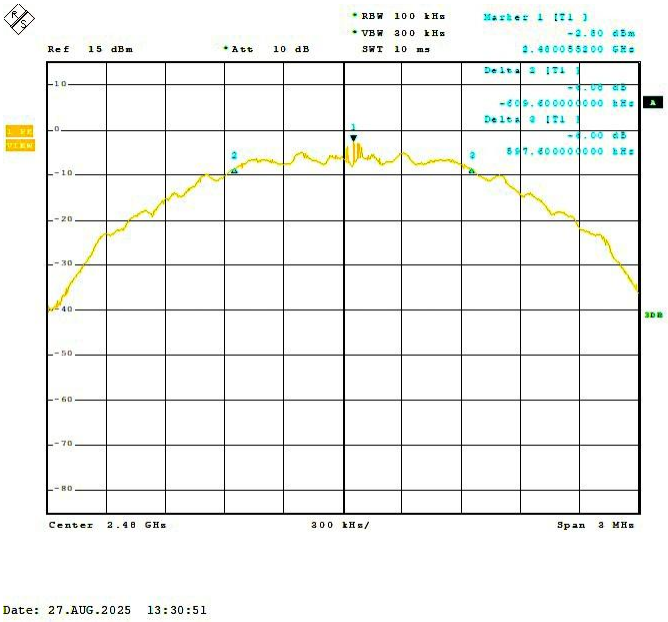

Figure 5: 6 dB Bandwidth - High Channel

4.2 99% dB Bandwidth

Date Performed: August 27, 2025

Test Standard: FCC 47 CFR Part 15.247 (a)(2)
RSS-247 (6.3.1)
RSS-Gen (6.7)

Test Method: FCC KDB 558074 D01
ANSI c63.10
Relative Measurement Procedure

Modifications: None

Final Result: Complies

Applicable Regulations:

The "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

Test Setup:

The EUT was tested outside the SAC via output conducted measurements per ANSI C63.10

A spectrum analyzer or other instrument providing a spectral display is recommended for these measurements. When using a spectrum analyzer or other instrument providing a spectral display, the video bandwidth shall be set to a value at least three times greater than the IF bandwidth of the measuring instrument to avoid the introduction of unwanted amplitude smoothing. Video filtering is not used during occupied bandwidth tests.

Spectrum Analyzer method performing OBW measurements per ANSI c63.10 and FCC KDB 558074 D01
Spectrum Analyzer settings: (Automatic Setting) Span = 3MHz, RBW = 100kHz, VBW = 300kHz Trace stabilization time: 10 minutes

Measurement Data and Plots:

Channels	Carrier Frequency (MHz)	99% Bandwidth (kHz)	Limit minimum (kHz)	Result
Low	2405	2167.2	500	Complies
Middle	2445	2167.2	500	Complies
High	2480	2174.4	500	Complies

Table 6: 99% Bandwidth Results

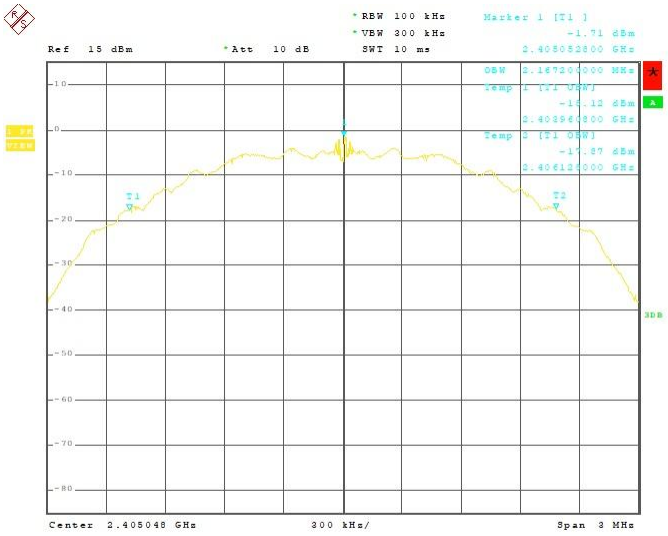

Figure 6: 99% Bandwidth – Low Channel

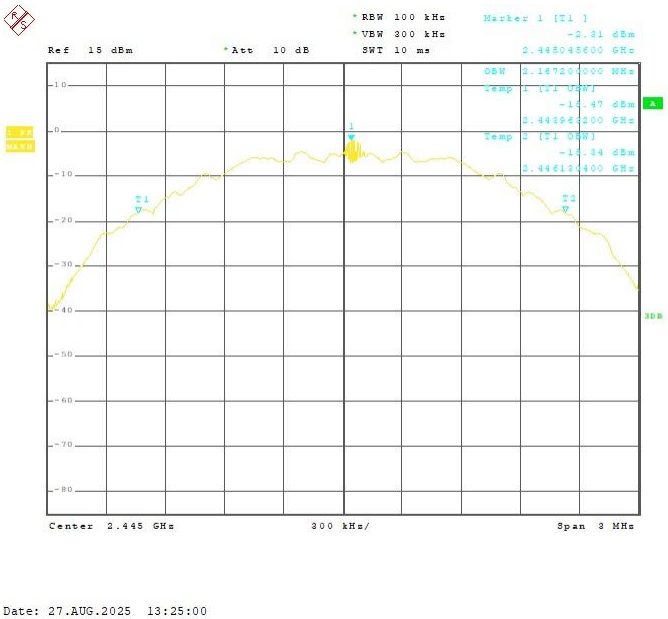

Figure 7: 99% Bandwidth - Middle Channel

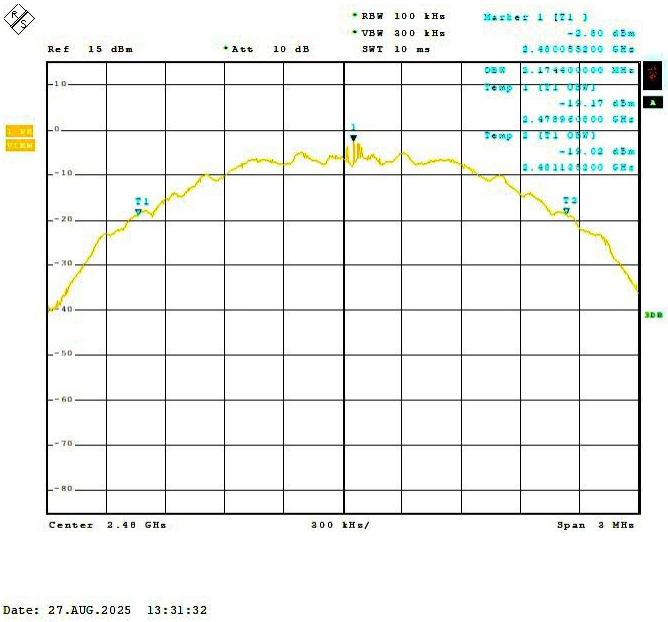

Figure 8: 99% Bandwidth - High Channel

4.3 RF Maximum Peak Output Power

Date Performed: August 27, 2025

Test Standard: FCC CFR 47 Part 15.247 (b)(1)
IC RSS-247 Issue 2

Test Method: FCC KDB 558074 D01
ANSI c63.10

Modifications: None.

Final Result: Complies

Applicable Regulation:

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

Test Setup:
The EUT was tested on a test bench with fundamental Modulated and continuous transmission
Spectrum Analyzer method performing conducted measurements per ANSI c63.10 11.9.1.1 and FCC KDB 558074 D01
Spectrum Analyzer settings: Span = 2 MHz, RBW = 3MHz, VBW = 50MHz Trace stabilization time: 10 minutes

Measurement Data:

Carrier Frequency (MHz)	Raw Peak (dBm)	Correction Factor[1] (dB)	Corrected Peak Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)	Results
2405	-1.36	7.05	5.69	30.0	24.31	Complies
2445	-1.83	7.04	5.21	30.0	24.79	Complies
2480	-2.41	7.01	4.60	30.0	25.40	Complies

[1] Correction factor consists of cable loss, external attenuator, and adapter(s)

Table 7: RF Peak Output Power

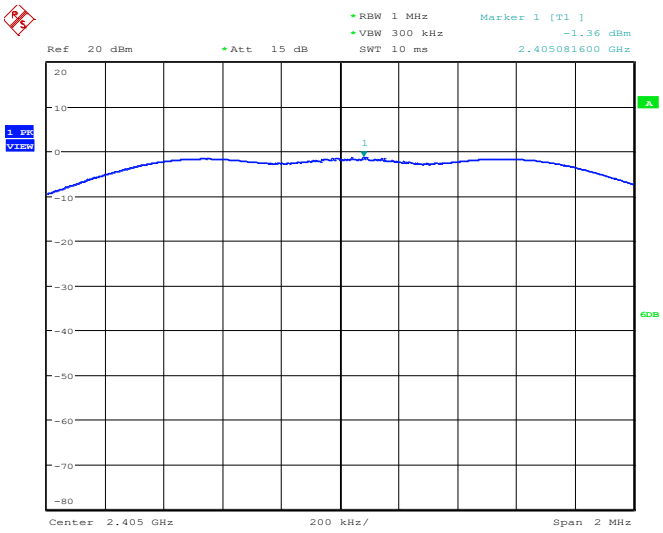

Figure 9: Peak Output Power – Low Channel

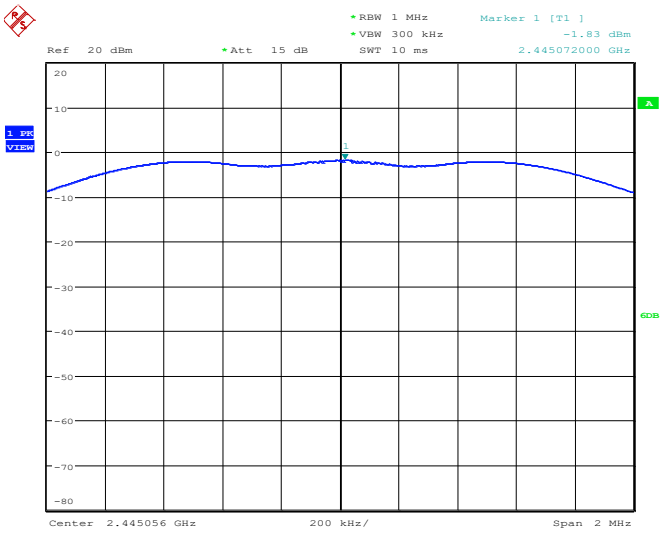

Figure 10: Peak Output Power - Middle Channel

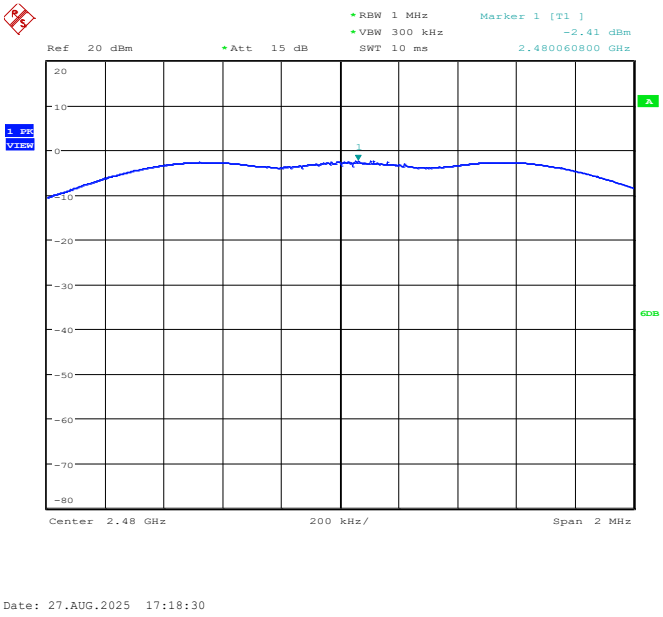

Figure 11: Peak Output Power - High Channel

4.4 Peak Power Spectral Density

Date Performed: August 27, 2025

Test Standard: FCC 47 CFR Part 15.247 (a)(2)
RSS-247 (6.3.1)
RSS-Gen (6.7)

Test Method: FCC KDB 558074 D01
ANSI c63.10 (11.10.2)

Modifications: None

Final Result: Complies

Applicable Regulations:

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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Setup:

The EUT was tested outside the SAC via output conducted measurements per ANSI C63.10

A spectrum analyzer or other instrument providing a spectral display is recommended for these measurements. When using a spectrum analyzer or other instrument providing a spectral display, the video bandwidth shall be set to a value at least three times greater than the IF bandwidth of the measuring instrument to avoid the introduction of unwanted amplitude smoothing. Video filtering is not used during occupied bandwidth tests.

Spectrum Analyzer method performing OBW measurements per ANSI c63.10 and FCC KDB 558074 D01
Spectrum Analyzer settings: Automatic Setting Span = 3MHz, RBW = 100kHz, VBW = 300kHz Trace stabilization time: 10 minutes

Measurement Data and Plots:

Channels	Carrier Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit Maximum (dBm/3kHz)	Result
Low	2405	-7.91	8	Complies
Middle	2445	-7.71	8	Complies
High	2480	-8.32	8	Complies

Table 8: 99% Bandwidth Results

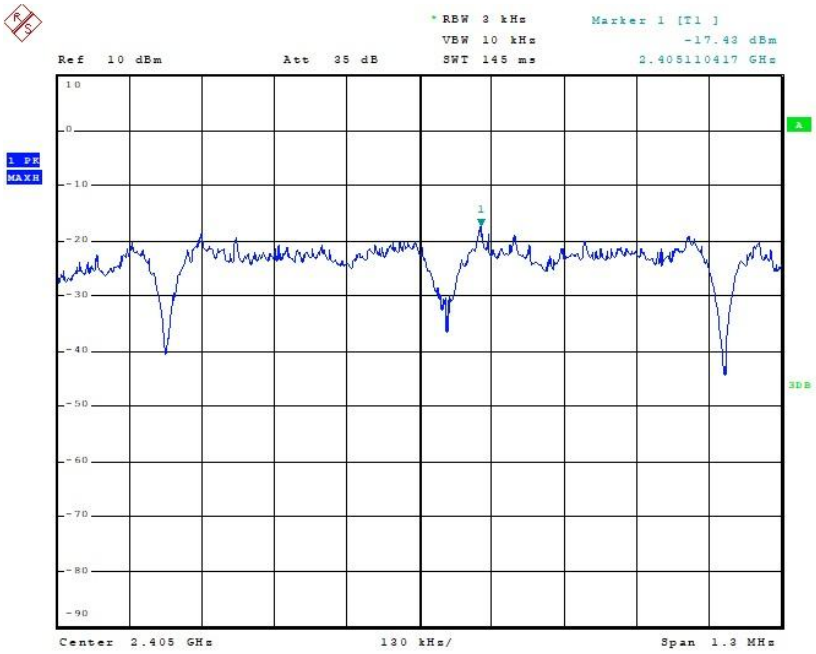

Figure 12: Power spectral Density – Low Channel

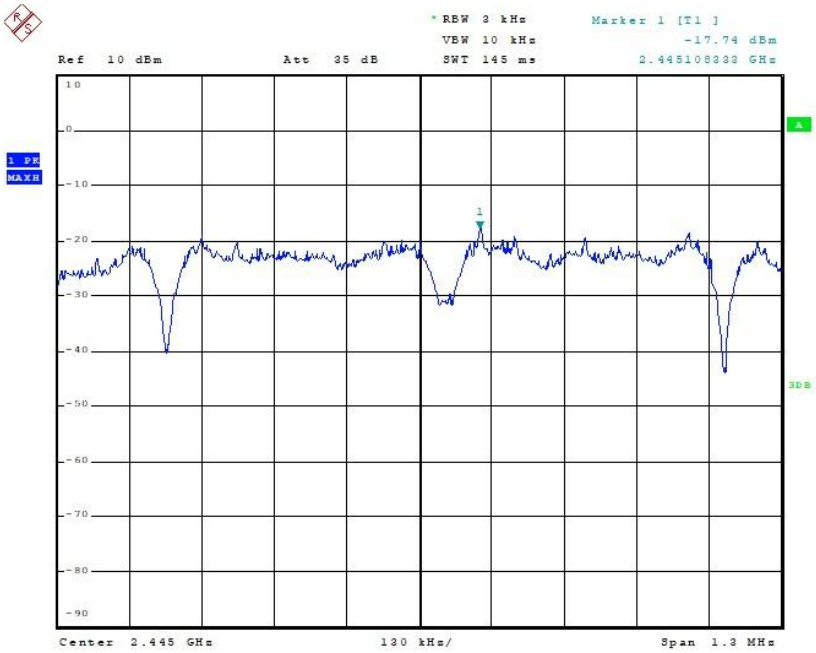

Figure 13: Power spectral Density - Middle Channel

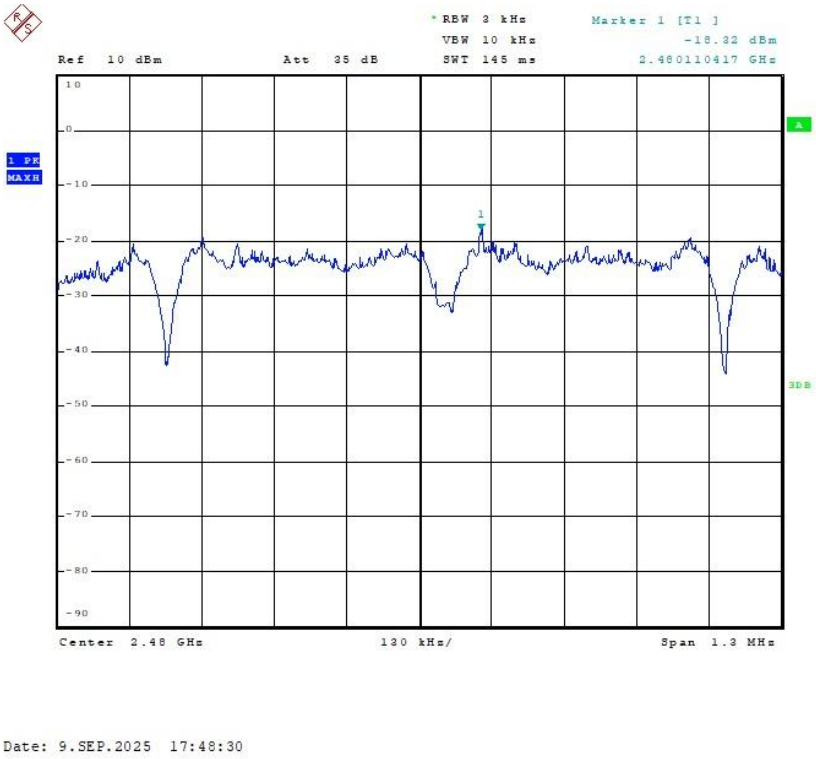

Figure 14: 99% Bandwidth - High Channel

4.5 Out-Of-Band Emissions (Band Edge)

Date Performed: August 27, 2025

Test Standard: FCC 47 CFR Part 15.247 (d)
RSS-247 (6.6)

Test Method: FCC KDB 558074 D01
ANSI C63.10:2013 Relative Method
Span = Wide enough to capture the peak level of the emission closest to the band edge, as well as any modulation products that fall outside of the band.
Ref Level = High enough to keep the signal from overdriving the input mixer
RBW = 100 kHz, VBW = 300 kHz
Trace Detector: Peak, Trace: Max Hold

Modifications: None

Final Result: Complies

Applicable Regulation:
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, the attenuation required shall be 30 dB instead of 20dB.

Test Setup:
The EUT was tested inside the SAC via Radiated Emissions measurements per ANSI C63.10:2013.

Measurement Data and Plots:

Band Edge	Highest Out of Band Emission	Limit	Result
Low	-44.55	-14.31dB	Complies
High	-35.50	-14.31dB	Complies

Table 9: Band Edge Results

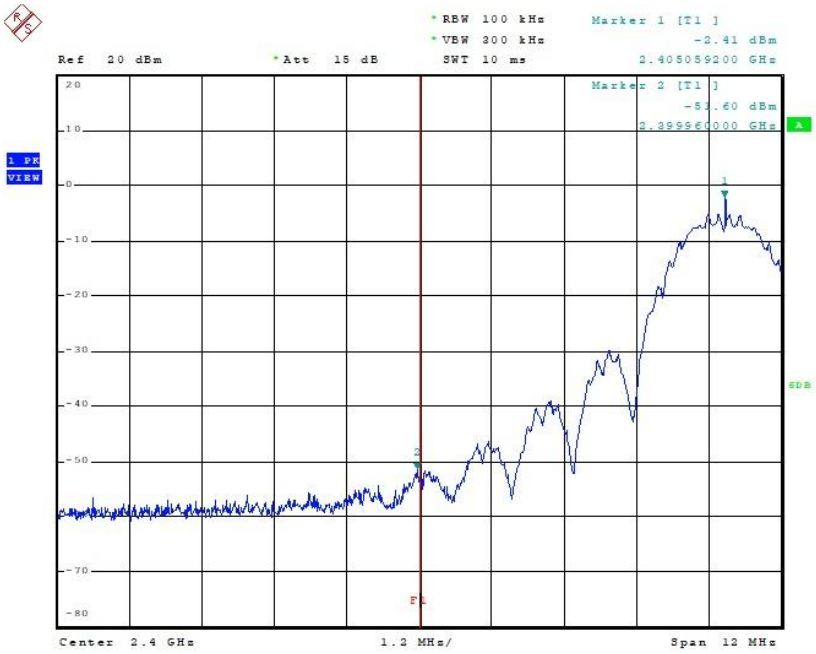

Figure 15: Band Edge - Low Channel

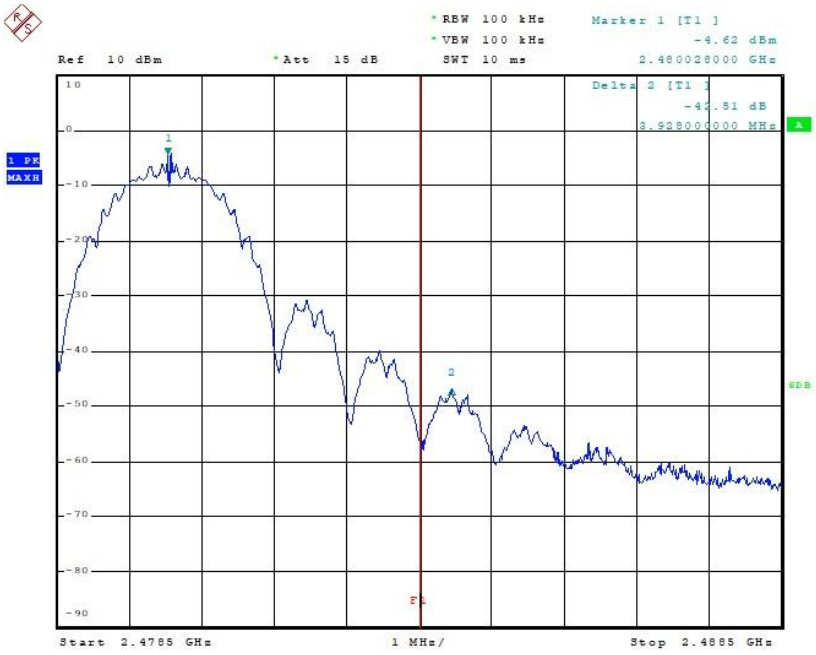

Figure 16: Band Edge - High Channel

4.6 Radiated Emissions – Out of Band 30MHz to 18GHz

Date Performed: August 12 & 13, 2025

Test Standard: FCC 47 CFR Part 15.33 (a)(1), (5)
FCC 47 CFR Part 15.109
FCC 47 CFR Part 15.205 (a), (b)
FCC 47 CFR Part 15.209 (a)
FCC 47 CFR Part 15.247 (d)
ICES-003 Issue 7
RSS-247

Test Method: ANSI C63.4:2014

Modifications: None

Final Result: Complies

Applicable Standard:

FCC 47 CFR Part 15.33 (a)(1), (5): Frequency range of radiated measurements

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.075	30
1.075 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

FCC 47 CFR Part 15.109: Radiated emission limits

a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength (microvolts/meter)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

e) Carrier current systems used as unintentional radiator or other unintentional radiators that are designed to conduct their radio frequency emissions via connecting wires or cables and that operate in the frequency range of 9 kHz to 30 MHz,

including devices that deliver the radio frequency energy to transducers, such as ultrasonic devices not covered under Part 18, shall comply with the radiated emission limits for intentional radiators provided in 15.209 for the frequency range of 9 kHz to 30 MHz.

FCC 47 CFR Part 15.205 (a), (b): Restricted bands of operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
13.36-13.41			

The field strength of emissions appearing within these frequency bands shall not exceed the limits show in § 15.209

FCC 47 CFR Part 15.209 (a): Radiated emission limits; general requirements

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency, *f* (MHz)	Maximum Field strength Quasi-peak (dBµV/m at 3 m)
0.009 – 0.490	20*log(2400/F(kHz)) + 40 dB
0.490 – 1.705	20*log(24000/F(kHz)) + 20 dB
1.705 – 30.0	49.5
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
above 960	54.0

Note 1: The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

Note 2: The emissions limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz., 110-490 kHz. and above 1000 MHz.

Radiated emission limits in these three bands are based on measurements employing an average detector

FCC 47 CFR Part 15.247 (d): Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

ICES-003 3.2.2 Radiated emission limits

The quasi-peak limits for the electric component of the radiated field strength emitted from ITE or digital apparatus, within 30 MHz to 1 GHz, for a measurement distance of 3 m or 10 m, are:

Frequency Range (MHz)	Class A (3 m) Quasi-peak (dBµV/m)	Class A (10 m) Quasi-peak (dBµV/m)	Class B (3 m) Quasi-peak (dBµV/m)	Class B (10 m) Quasi-peak (dBµV/m)
30 – 88	50.0	40.0	40.0	30.0
88 – 216	54.0	43.5	43.5	33.1
216 – 230	56.9	46.4	46.0	35.6
230 – 960	57.0	47.0	47.0	37.0
960 - 1000	60.0	49.5	54.0	43.5

At and above 1 GHz, except for outdoor units of home satellite receiving systems, the ITE or digital apparatus shall comply with:

Frequency Range (MHz)	Class A Average (dBµV/m)	Class A Peak (dBµV/m)	Class B Average (dBµV/m)	Class B Peak (dBµV/m)
1 - F_M	60	80	54	74

F_M is determined by:

Highest internal frequency (F_X)	Highest measurement frequency (F_M)
$F_X \leq 108$ MHz	1 GHz
108 MHz $\leq F_X \leq$ 500 MHz	2 GHz
500 MHz $\leq F_X \leq$ 1 GHz	5 GHz
$F_X >$ 1 GHz	5 x F_X up to a maximum of 40 GHz

Test Setup:

The EUT was tested in a 3 m SAC and was positioned on the front of the turntable and the radiated output of the device was measured for all emissions up to 18 GHz.

Measurement Data and Plots:

4.6 Radiated Emission 30 MHz – 1GHz

4.6.1 Radiated Emission - Ambient Scan (Transmitter Off)

Frequency MHz	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
54.0560	45.01	50.00	4.99	200.0	V	183	-14.4	Complies
163.8600	37.57	50.00	12.43	100.0	V	224	-9.0	Complies
173.4630	35.68	50.00	14.32	100.0	V	224	-9.5	Complies
730.4370	69.82	57.00	-12.82	250.0	V	194	1.2	Complies
734.0260	69.40	57.00	-12.40	100.0	V	250	1.2	Complies
742.4650	67.45	57.00	-10.45	200.0	V	11	1.2	Complies
746.3450	65.66	57.00	-8.66	250.0	V	232	1.5	Complies
753.8140	61.71	57.00	-4.71	250.0	V	86	1.8	Complies
824.4300	86.16	57.00	-29.16	200.0	H	63	3.9	Complies
825.9820	100.61	57.00	-43.61	400.0	H	26	3.6	Complies
827.1460	71.44	57.00	-14.44	400.0	H	26	3.5	Complies
828.7950	82.01	57.00	-25.01	150.0	V	33	3.3	Complies
871.4750	63.21	57.00	-6.21	200.0	V	234	3.5	Complies

Notes: All the harmonics and inter harmonics are obtained from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT. Refer to Figure 2 (page 8) (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 10: Radiated Emissions Ambient Scans from 30 MHz - 1 GHz (Transmitter Off)

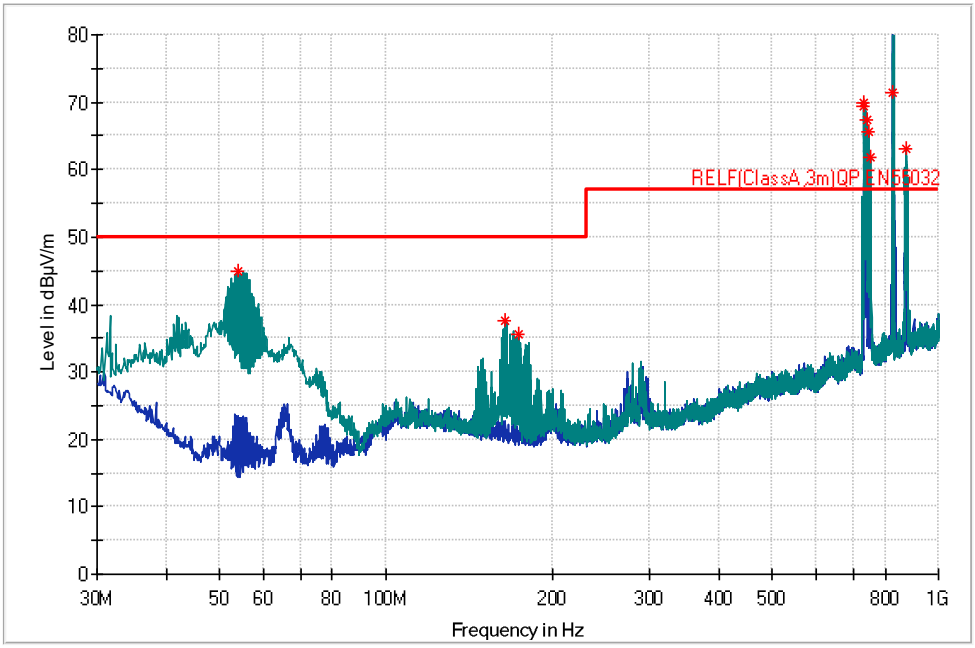

Figure 17: Radiated Emissions Ambient: 30 MHz to 1GHz (Transmitter Off)

4.6.2 Radiated Emission – Low Channel at 2405 MHz (Transmitter On)

Frequency MHz	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
57.4510	41.26	50.00	8.74	350.0	V	96	-14.2	Ambient
75.3960	29.84	50.00	20.16	150.0	V	77	-13.3	Ambient
173.3660	25.27	50.00	24.73	100.0	V	341	-9.5	Ambient
733.1530	69.03	57.00	-12.03	250.0	V	240	1.3	Ambient
740.8160	69.85	57.00	-12.85	250.0	V	249	1.2	Ambient
742.4650	67.53	57.00	-10.53	250.0	V	134	1.2	Ambient
746.4420	65.83	57.00	-8.83	200.0	V	156	1.5	Ambient
824.4300	100.27	57.00	-43.27	250.0	H	267	3.9	Ambient
825.4000	90.71	57.00	-33.71	250.0	H	0	3.8	Ambient
826.4670	94.82	57.00	-37.82	100.0	V	0	3.6	Ambient
828.4070	83.68	57.00	-26.68	200.0	H	54	3.3	Ambient
828.7950	79.05	57.00	-22.05	150.0	H	254	3.3	Ambient
871.9600	62.26	57.00	-5.26	150.0	V	260	3.6	Ambient
No measurable emissions from the EUT were identified.								

Notes: All the harmonics and inter harmonics are obtained from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT. No harmonics of Low channel 2405 MHz is observed. Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 11: Radiated Emissions Low Channel at 2405 MHz: 30 MHz - 1 GHz (Transmitter On)

All frequencies in the above table are ambient from the supporting equipment.
No other emissions from the EUT were identified.

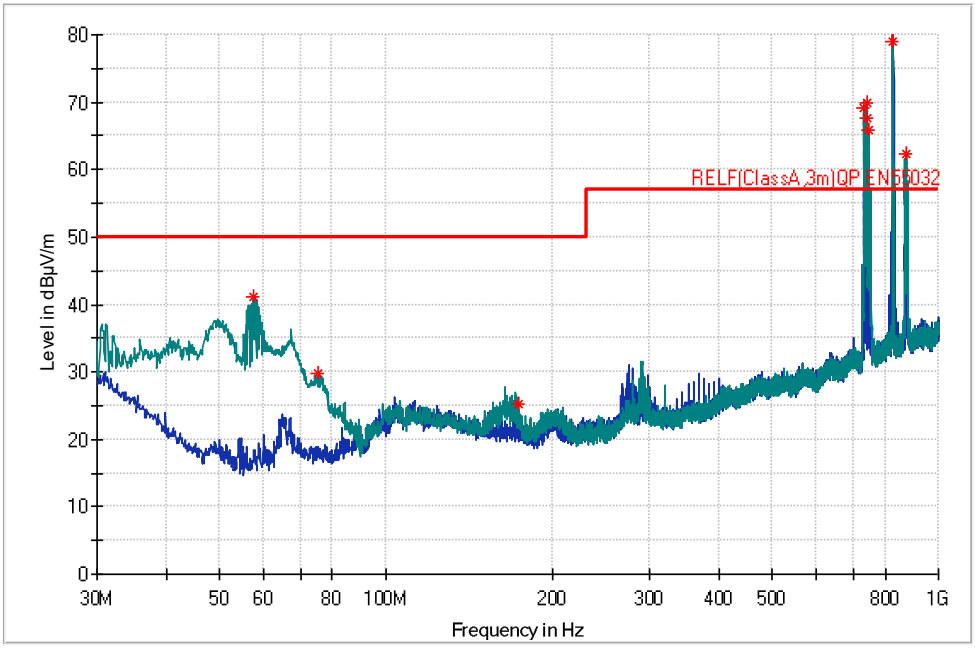

Figure 18: Radiated Emissions Low Channel at 2405 MHz from 30 MHz to 1GHz (Transmitter On)

4.6.3 Radiated Emission – Mid Channel at 2445 MHz (Transmitter On)

Frequency MHz	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
827.2430	77.82	57.00	-20.82	100.0	H	69	3.5	Ambient
827.7280	71.65	57.00	-14.65	150.0	H	258	3.4	Ambient
828.6980	80.55	57.00	-23.55	200.0	H	0	3.3	Ambient
826.8550	97.38	57.00	-40.38	200.0	H	86	3.5	Ambient
825.6910	95.24	57.00	-38.24	200.0	H	224	3.7	Ambient
173.4630	28.61	50.00	21.39	100.0	V	257	-9.5	Ambient
824.6240	72.64	57.00	-15.64	150.0	V	166	3.9	Ambient
72.3890	33.38	50.00	16.62	200.0	V	142	-13.1	Ambient
742.5620	66.69	57.00	-9.69	200.0	V	355	1.3	Ambient
733.6380	70.24	57.00	-13.24	250.0	V	88	1.2	Ambient
730.4370	67.49	57.00	-10.49	250.0	V	222	1.2	Ambient
55.0260	42.48	50.00	7.52	300.0	V	108	-14.4	Ambient
828.4070	84.16	57.00	-27.16	400.0	V	48	3.3	Ambient
No measurable emissions from the EUT were identified.								

Notes: All the harmonics and inter harmonics are obtained from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT. No harmonics of Mid channel 2445 MHz is observed. Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 12: Radiated Emissions Mid Channel at 2445 MHz from 30 MHz to 1 GHz (Transmitter On)

All frequencies in the above table are ambient from the supporting equipment.
No other emissions from the EUT were identified.

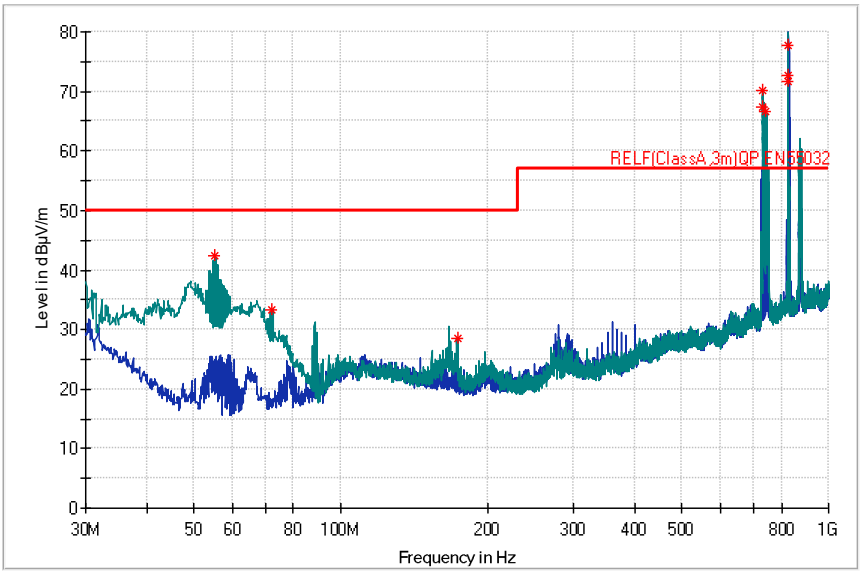

Figure 19: Radiated Emissions Mid Channel at 2445 MHz from 30 MHz to 1GHz (Transmitter On)

4.6.4 Radiated Emission – High Channel at 2480 MHz (Transmitter On)

Frequency MHz	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
824.9150	107.62	57.00	-50.62	250.0	H	25	3.8	Ambient
828.6980	93.37	57.00	-36.37	300.0	H	93	3.3	Ambient
202.2720	27.47	50.00	22.53	350.0	H	348	-8.9	Ambient
55.8990	44.68	50.00	5.32	150.0	V	346	-14.3	Ambient
742.4650	66.77	57.00	-9.77	200.0	V	265	1.2	Ambient
734.1230	68.85	57.00	-11.85	200.0	V	282	1.2	Ambient
827.1460	90.44	57.00	-33.44	250.0	V	148	3.5	Ambient
827.6310	89.97	57.00	-32.98	250.0	V	148	3.4	Ambient
740.8160	69.80	57.00	-12.80	300.0	V	126	1.2	Ambient
826.0790	89.58	57.00	-32.58	300.0	V	190	3.6	Ambient
826.5640	91.80	57.00	-34.80	300.0	V	190	3.5	Ambient
728.4970	67.67	57.00	-10.67	300.0	V	326	1.0	Ambient
79.7610	31.93	50.00	18.07	350.0	V	62	-13.6	Ambient
No measurable emissions from the EUT were identified.								
Notes: All the harmonics and inter harmonics are obtained from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT. No harmonics of High channel 2480 MHz is observed. Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.								

Table 13: Radiated Emissions High Channel at 2480 MHz from 30 MHz to 1 GHz (Transmitter On)

All frequencies in the above table are ambient from the supporting equipment.
No other emissions from the EUT were identified.

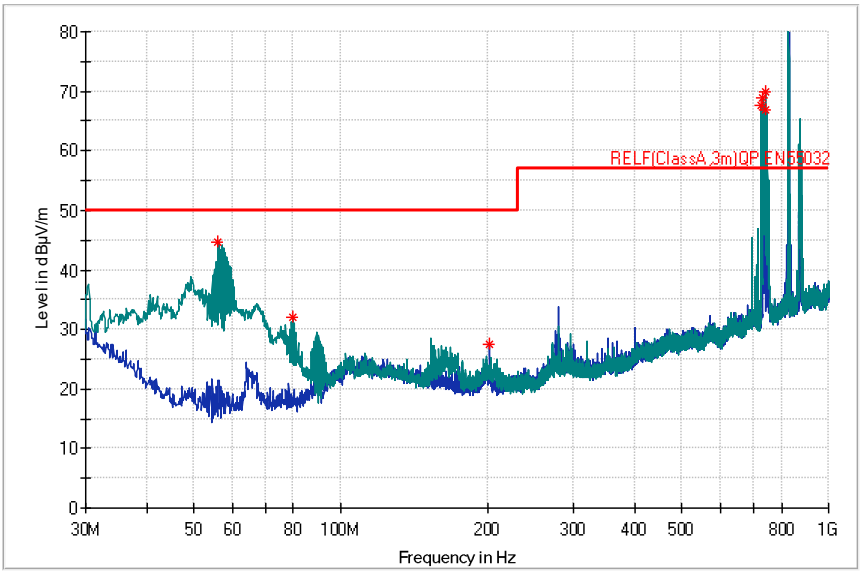

Figure 20: Radiated Emissions High Channel at 2480 MHz from 30 MHz to 1GHz (Transmitter On)

4.7 Radiated Emission 1GHz – 6GHz

4.7.1 Radiated Emission -Ambient Scan with Accessories (Transmitter Off)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
1192.0000	---	40.63	54.00	13.37	300.0	V	292	-5.8	Complies
1192.0000	42.66	---	74.00	31.34	300.0	V	292	-5.8	Complies
1417.0000	46.51	---	74.00	27.49	400.0	V	358	-5.5	Complies
1417.0000	---	44.61	54.00	9.39	400.0	V	358	-5.5	Complies
1650.0000	67.76	---	74.00	6.24	250.0	H	249	-3.9	Complies
1650.5000	---	64.49	54.00	-10.49	250.0	H	249	-3.9	Complies
1886.0000	90.98	---	74.00	-16.99	100.0	V	150	-0.5	Complies
1886.0000	---	89.25	54.00	-35.25	100.0	V	150	-0.5	Complies
1889.0000	78.81	---	74.00	-4.81	100.0	V	150	-0.5	Complies
1889.0000	---	76.92	54.00	-22.92	100.0	V	150	-0.5	Complies
1894.5000	---	89.68	54.00	-35.68	200.0	V	333	-0.4	Complies
1894.5000	90.66	---	74.00	-16.66	200.0	V	333	-0.4	Complies
1898.5000	---	90.22	54.00	-36.22	100.0	V	36	-0.3	Complies
1898.5000	91.29	---	74.00	-17.29	100.0	V	36	-0.3	Complies
1902.0000	---	77.15	54.00	-23.15	100.0	V	150	-0.2	Complies
1902.0000	79.14	---	74.00	-5.14	100.0	V	150	-0.2	Complies
2123.0000	71.48	---	74.00	2.52	150.0	V	17	0.6	Complies
2123.0000	---	69.25	54.00	-15.25	150.0	V	17	0.6	Complies
2424.0000	86.37	---	74.00	-12.37	400.0	H	253	0.2	Complies
2430.5000	---	85.44	54.00	-31.44	400.0	H	253	0.2	Complies
2439.0000	85.60	---	74.00	-11.60	100.0	H	333	0.2	Complies
2440.0000	---	83.37	54.00	-29.37	100.0	H	333	0.2	Complies
2443.0000	86.15	---	74.00	-12.15	100.0	H	65	0.2	Complies
2450.0000	---	85.13	54.00	-31.13	100.0	H	65	0.3	Complies
2470.5000	88.68	---	74.00	-14.68	100.0	H	287	0.3	Complies
2472.5000	---	86.60	54.00	-32.60	250.0	H	0	0.3	Complies
3241.0000	---	45.07	54.00	8.93	350.0	V	79	2.2	Complies
3346.5000	47.04	---	74.00	26.96	150.0	H	107	2.5	Complies
3797.5000	57.21	---	74.00	16.79	250.0	V	247	4.2	Complies
3797.5000	---	55.54	54.00	-1.54	250.0	V	247	4.2	Complies
4677.0000	49.57	---	74.00	24.43	150.0	H	279	6.8	Complies
4833.5000	---	47.81	54.00	6.19	200.0	H	156	7.0	Complies
5697.5000	---	54.13	54.00	-0.13	300.0	V	200	8.0	Complies

Notes: All the harmonics and inter harmonics are obtained from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT. Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 14: Radiated Emissions Ambient from 1 GHz to 6GHz (Transmitter Off)

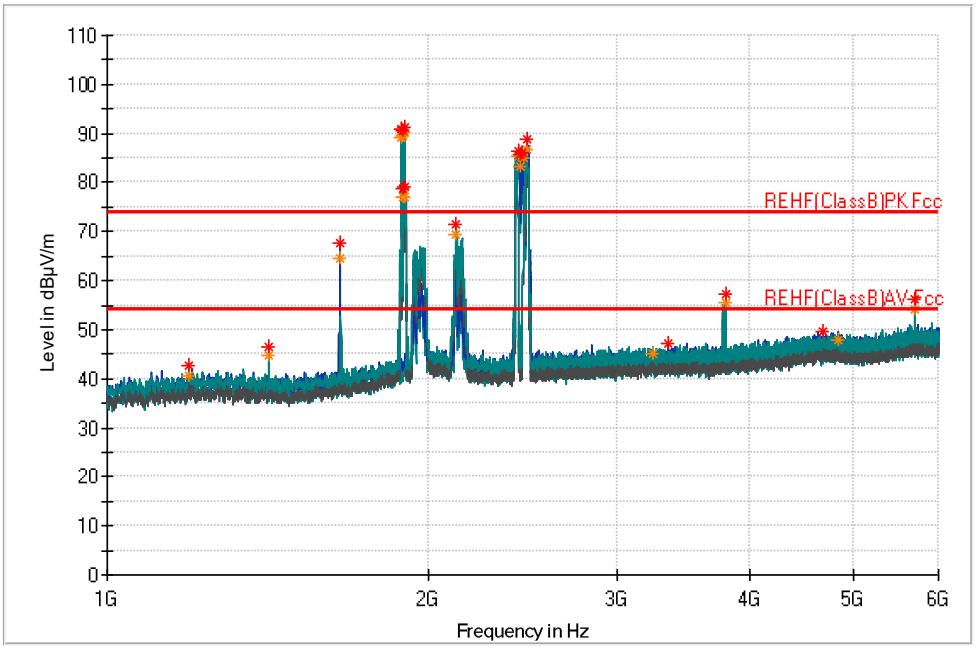

Figure 21: Radiated Emissions Ambient Accessories from 1 GHz to 6GHz (Transmitter Off)

4.7.2 Radiated Emission – Low Channel at 2405 MHz (Transmitter On)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
2405.0000	---	92.98	54.00	-38.98	150.0	H	159	0.1	**Complies**
2405.0000	95.05	---	74.00	-21.05	100.0	H	133	0.1	**Complies**

Notes:
- All other emissions are from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT.
- Using manual procedures, no other emissions or harmonics of Low channel 2405 MHz is observed above the noise floor.
- Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 15: Radiated Emissions Low Channel at 2405 MHz from 1 GHz to 6GHz (Transmitter On)

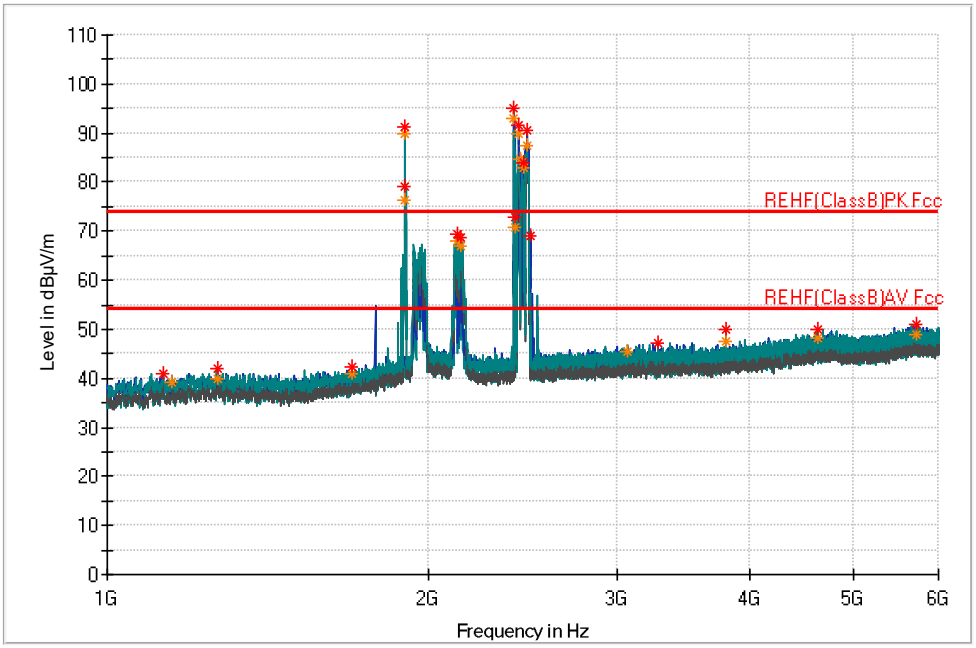

Figure 22: Radiated Emissions Low Channel at 2405 MHz from 1 GHz to 6GHz (Transmitter On)

4.7.3 Radiated Emission – Mid Channel at 2445 MHz (Transmitter On)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
2445	95.12	---	74		100	H	180	0.2	Fundamental
2445	---	93.21	54		100	H	180	0.2	Fundamental
4889	50.74	---	74	23.26	300	V	0	6.9	Complies
4889	---	48.35	54	5.65	100	H	232	7	Complies

Notes:
- All other emissions are from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT.
- Using manual procedures, no other emissions or harmonics of Mid channel 2445 MHz is observed above the noise floor.
- Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 16: Radiated Emissions Mid Channel at 2445 from MHz 1 GHz to 6GHz (Transmitter On)

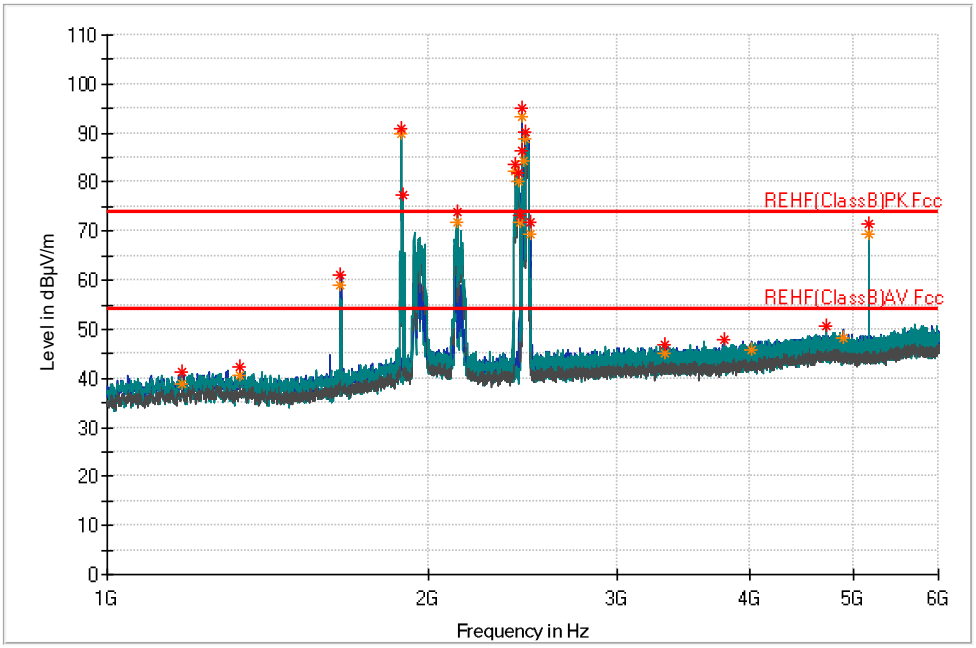

Figure 23: Radiated Emissions Mid Channel at 2445 MHz from 1 GHz to 6GHz (Transmitter On)

4.7.4 Radiated Emission – High Channel at 2480 MHz (Transmitter On)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
2480	---	91.75	54	-37.75	100	H	52	0.3	Complies
2480	93.5	---	74	-19.5	100	H	52	0.3	Complies

Notes:
- All other emissions are from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT.
- Using manual procedures, no other emissions or harmonics of High channel 2480 MHz is observed above the noise floor.
- Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 17: Radiated Emissions High Channel at 2480 MHz from 1 GHz from 6GHz (Transmitter On)

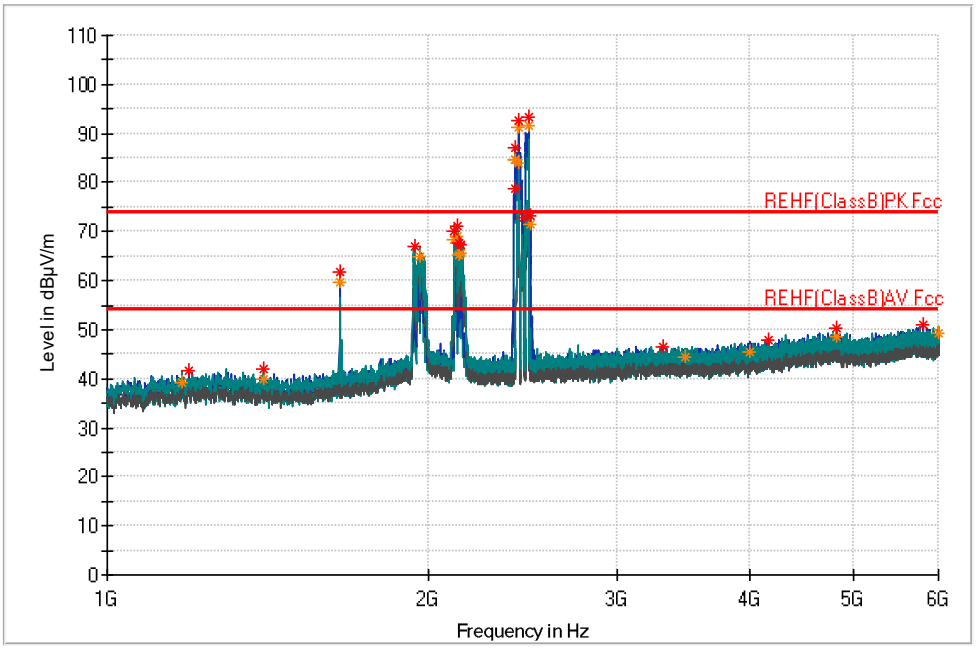

Figure 24: Radiated Emissions High Channel Channel at 2480 MHz from 1 GHz to 6GHz (Transmitter On)

4.8 Radiated Emission 6GHz – 18GHz

4.8.1 Radiated Emission -Ambient Scan Accessories (Transmitter Off)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
6044.4000	44.56	---	74.00	29.44	100.0	V	109	-7.6	Complies
6044.4000	---	40.26	54.00	13.74	100.0	V	109	-7.6	Complies
7437.6000	48.28	---	74.00	25.72	250.0	V	325	-4.7	Complies
7437.6000	---	42.71	54.00	11.29	250.0	V	325	-4.7	Complies
7592.4000	60.55	---	74.00	13.45	200.0	V	237	-4.3	Complies
7593.6000	---	55.95	54.00	-1.95	200.0	V	237	-4.3	Complies
8562.0000	64.73	---	74.00	9.27	300.0	V	209	-2.2	Complies
8563.2000	---	59.41	54.00	-5.41	300.0	V	209	-2.2	Complies
8563.2000	---	59.41	54.00	-5.41	300.0	V	209	-2.2	Complies
9429.6000	---	61.40	54.00	-7.40	250.0	V	239	0.2	Complies
9429.6000	65.13	---	74.00	8.87	250.0	V	239	0.2	Complies
9490.8000	62.78	---	74.00	11.22	200.0	V	237	0.5	Complies
9492.0000	---	59.50	54.00	-5.50	200.0	V	237	0.5	Complies
10370.4000	70.86	---	74.00	3.14	300.0	V	209	3.8	Complies
10370.4000	---	67.28	54.00	-13.28	300.0	V	209	3.8	Complies
11376.0000	61.55	---	74.00	12.45	250.0	H	15	5.2	Complies
11377.2000	---	55.72	54.00	-1.72	250.0	H	15	5.2	Complies
12015.6000	---	56.41	54.00	-2.41	300.0	V	276	8.3	Complies
12016.8000	62.03	---	74.00	11.97	300.0	V	276	8.3	Complies
13786.8000	63.24	---	74.00	10.76	300.0	V	209	6.8	Complies
13788.0000	---	58.44	54.00	-4.44	300.0	V	209	6.8	Complies
13831.2000	63.60	---	74.00	10.40	350.0	V	333	7.1	Complies
13832.4000	---	60.49	54.00	-6.49	350.0	V	333	7.1	Complies
15140.4000	65.02	---	74.00	8.98	250.0	V	239	10.2	Complies
15141.6000	---	62.48	54.00	-8.48	250.0	V	239	10.2	Complies
15507.6000	---	56.46	54.00	-2.46	300.0	V	276	11.0	Complies
17083.2000	59.12	---	74.00	14.88	300.0	H	345	13.0	Complies
17084.4000	---	55.30	54.00	-1.30	300.0	H	345	13.0	Complies

Notes: All the harmonics and inter harmonics are obtained from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT. Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 18: Radiated Emissions Ambient from 6GHz to 18GHz (Transmitter Off)

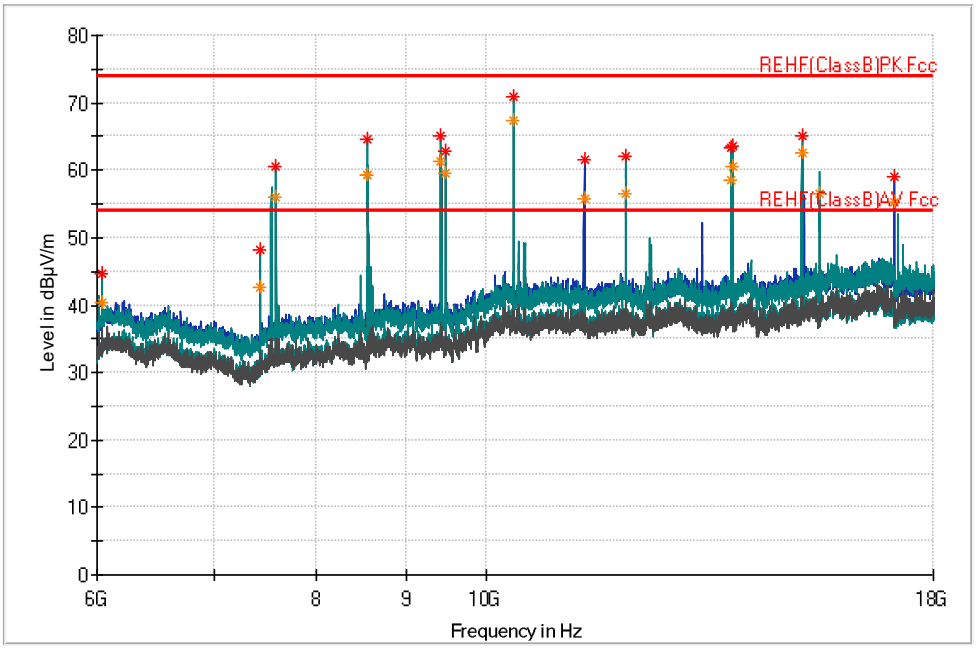

Figure 25: Radiated Emissions Ambient from 6GHz to 18GHz (Transmitter Off)

4.8.2 Radiated Emission – Low Channel at 2405 MHz (Transmitter On)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
7215.6	47.15	---	74	26.85	150	H	73	-5	Complies
7215.6	---	44.64	54	9.36	250	V	108	-5	Complies

Notes:
- All other emissions are from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT.
- Using manual procedures, no other emissions or harmonics of Low channel 2405 MHz is observed above the noise floor.
- Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 19: Radiated Emissions Low Channel at 2405MHz from 6GHz to 18GHz (Transmitter On)

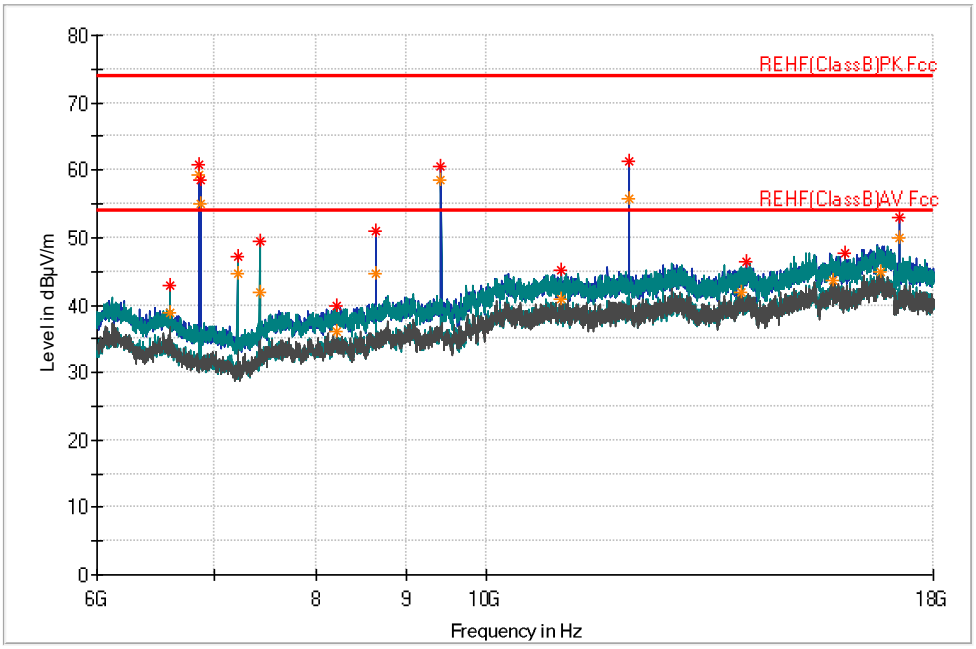

Figure 26: Radiated Emissions Low channel at 2405MHz from 6GHz to 18GHz (Transmitter On)

4.8.3 Radiated Emission – Mid Channel at 2445 MHz (Transmitter On)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
7335.6000	42.02	---	74.00	31.98	100.0	H	171	-4.8	Complies
7335.6000	---	39.41	54.00	14.59	100.0	H	171	-4.8	Complies

Notes:
- All other emissions are from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT.
- Using manual procedures, no other emissions or harmonics of Mid channel 2445 MHz is observed above the noise floor.
- Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 20: Radiated Emissions Mid Channel at 2445 MHz from 6GHz to 18GHz (Transmitter On)

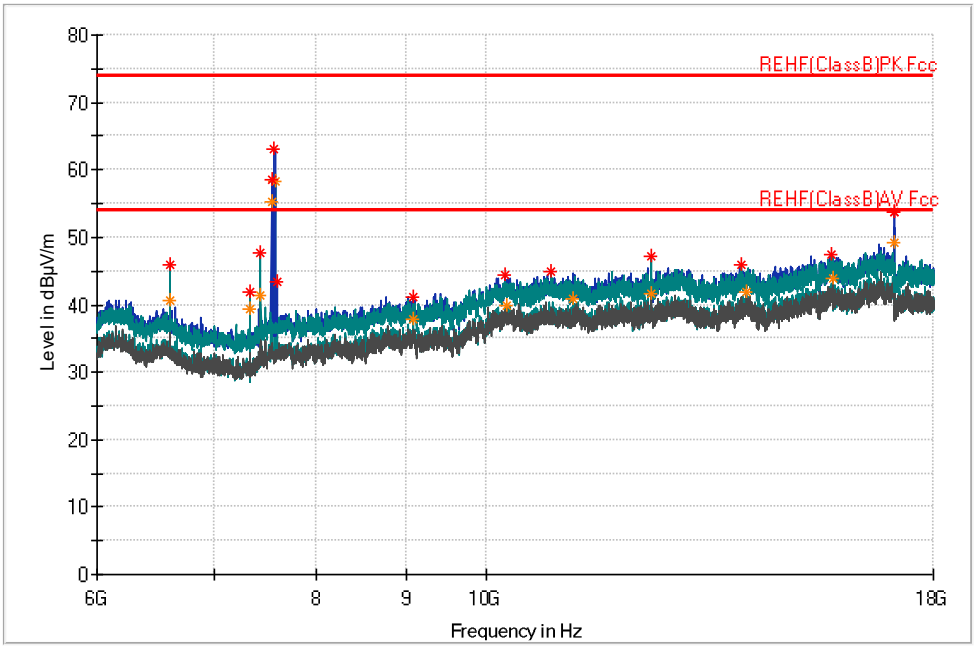

Figure 27: Radiated Emissions Mid channel at 2445 MHz from 6GHz to 18GHz (Transmitter On)

4.8.4 Radiated Emission – High Channel at 2480 MHz (Transmitter On)

Frequency MHz	Max Peak (dBuV/m)	Average dBµV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (°)	Corr. (dB/m)	Result
7440.0000	43.51	---	74.00	30.49	100.0	H	0	-4.7	Complies
7440.0000	---	40.53	54.00	13.47	100.0	H	0	-4.6	Complies
9920.0000	41.97	---	74.00	32.03	150.0	H	7	-0.9	Complies
9920.0000	---	37.77	54.00	16.23	150.0	H	7	-0.9	Complies

Notes:
- All other emissions are from the ancillary units present in the chamber and cell booster kept inside the chamber for the functioning of EUT.
- Using manual procedures, no other emissions or harmonics of High channel 2480 MHz is observed above the noise floor.
- Refer to Figure 2 (page 8) for the EUT setup inside the chamber with 3 other radios of Ancillary parts that supports the operation of EUT.

Table 21: Radiated Emissions High Channel at 2480 MHz from 6GHz to 8GHz (Transmitter On)

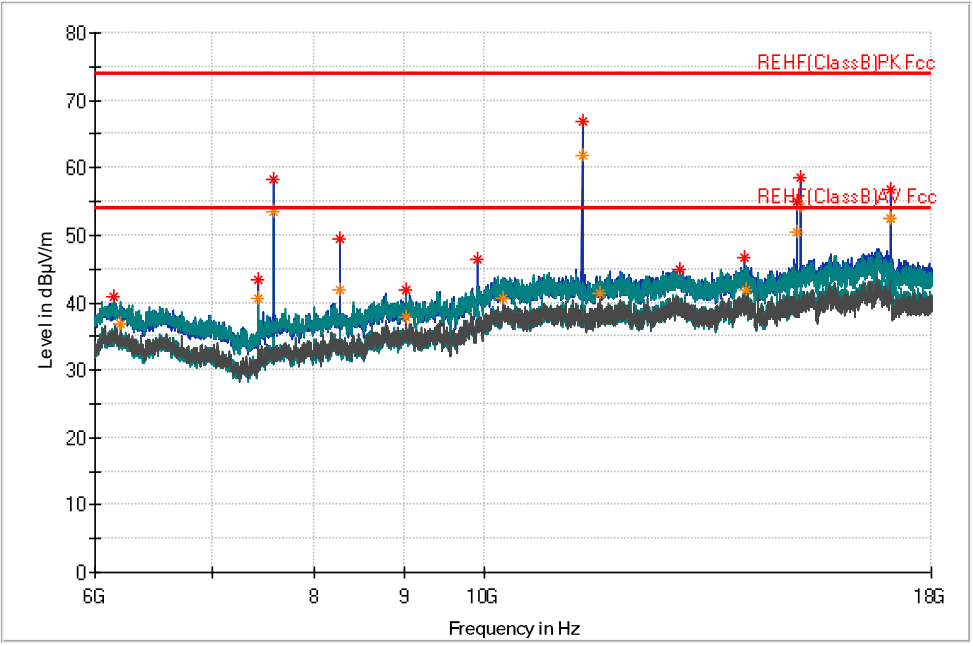

Figure 28: Radiated Emissions High channel at 2480 MHz from 6GHz to 18GHz (Transmitter On)

5 RF Exposure Evaluation

Date Performed: 2025-09-11

Test Standard: FCC 47 CFR 2.1093
FCC 47 CFR 1.1310
ISED RSS-102 Issue 6

Test Method: FCC OET Bulletin 65 Ed 97-01
FCC KDB 477498 D04: v01
RSS-102 Issue 6

Modifications: None

Final Result: Exempt from SAR testing

FCC – KDB 447498

4.2.3: Extremity exposure conditions:

Devices that are designed or intended for use on extremities, or mainly operated in extremity only exposure conditions, i.e. hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity *SAR Test Exclusion Thresholds* in 4.3 should be applied to determine SAR test requirements.

4.3.1 a): Standalone SAR test exclusion considerations: For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$\frac{max.power\ of\ channel, including\ tuneup\ tolerance\ (mW)}{min.test\ separation\ distance\ (mm)} * \sqrt{f_{GHz}} \leq 3.0 \quad \text{for 1g SAR}$$

Eqn. 1

And

$$\frac{max.power\ of\ channel, including\ tuneup\ tolerance\ (mW)}{min.test\ separation\ distance\ (mm)} * \sqrt{f_{GHz}} \leq 7.5 \quad \text{for 10g SAR}$$

Eqn. 2

- f_{GHz} is the RF channel transmit frequency in GHz
- Power and distance are rounded ot the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5mm according to 4.1 f) is applied to determine SAR test exclusion.

4.3.1 b):

For 100 MHz to 6 GHz and *test separation distances* >50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following:

For 100 – 1500 MHz:

$$(Power\ allowed\ at\ numeric\ threshold\ for\ 50\ mm\ in\ step\ a + test\ separation\ distance - 50\ mm) * \frac{f_{MHz}}{150} \quad (mW)$$

Eqn. 3

For 1500 – 6000 MHz:

$$(Power\ allowed\ at\ numeric\ threshold\ for\ 50\ mm\ in\ step\ a + test\ separation\ distance - 50\ mm) * 10 \quad (mW)$$

Eqn. 4

Summary of Measurement Data and Plots (FCC):

Data Collected:

Antenna	Frequency MHz	RF Peak Output Power (Conducted) dBm	Peak Antenna Gain [1] dBi	EIRP		Duty Cycle	EIRP (Avg) dBm	EIRP (Avg) mW
				dBm	mW [2]			
1	2405	5.69	0	5.69	3.70	100	5.69	3.70

[1] Antenna gain provided by manufacturer
[2] Rounded to the nearest mW

Table 22: EIRP Data Collected

FCC KDB 447498 D01: v06

Frequency (MHz)	Min. Separation (mm)	Limit 1-g SAR	Limit 10-g SAR	Result
2405	See Below	3.0	7.5	Exempt

Table 23: FCC SAR Exemption Results

Note: Antenna 1 exempt from 1-g SAR testing at 3.88 mm and exempt from 10-g SAR at 14.70 mm

ISED – RSS-102

Section 2.5.1 Exemption Limits for Routine Evaluation – SAR Evaluation:

RF Exposure evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in the following table.

Exemption Limits (mW)					
Frequency (MHz)	**At separation distance of ≤ 5mm**	**At separation distance of 10 mm**	**At separation distance of 15 mm**	**At separation distance of 20 mm**	**At separation distance of 25 mm**
≤ 300	71	101	132	162	193
450	52	70	88	106	123
835	17	30	42	55	67
1900	7	10	18	34	60
2450	4	7	15	30	52
3500	2	6	16	32	55
5800	1	6	15	27	41

Exemption Limits (mW)					
Frequency (MHz)	**At separation distance of 30 mm**	**At separation distance of 35 mm**	**At separation distance of 40 mm**	**At separation distance of 45 mm**	**At separation distance of ≥ 50 mm**
≤ 300	223	254	284	315	345
450	141	159	177	195	213
835	80	92	105	117	130
1900	99	153	225	316	431
2450	83	123	173	235	309
3500	86	124	170	225	290
5800	56	71	85	97	106

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/Kg for 1 gram of tissue applies, the exemption limits for routine evaluation in the above table are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in the above table are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located int eh table, linear interpolation shall be applied for the applicable separation distance. For test separations distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)				
Frequency Range (MHz)	**Electric Field (V/m rms)**	**Magnetic Field (A/m rms)**	**Power Density (W/m^2)**	**Reference Period (Minutes)**
0.003 – 10	83	90	-	Instantaneous*
0.1 – 10	-	0.73 / f	-	6**
1.1 – 10	$87 / f^{0.5}$	-	-	6**
10 – 20	27.46	0.0728	2	6
20 – 48	$58.07 / f^{0.25}$	$0.1541 / f^{0.25}$	$8.944 / f^{0.5}$	6
48 – 300	22.06	0.05852	1.291	6
300 – 6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000 – 15000	61.4	0.163	10	6
15000 – 150000	61.4	0.163	10	$616000 / f^{1.2}$
150000 – 300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000 / f^{1.2}$

Note: f is frequency in MHz.

* Based on nerve stimulation (NS).

** Based on specific absorption rate (SAR).

Appendix A: TEST SETUP PHOTOS

Figure 29: Radiated Emissions from 30MHz to 1GHz

Figure 30: Radiated Emissions from 1GHz to 18GHz

Appendix B: ABBREVIATIONS

Abbreviation	Definition
AC	Alternating Current
AM	Amplitude Modulation
ASW	Anti-Submarine Warfare
BIT	Built-in-Test
CE	European Conformity
CISPR	Comité International Spécial des Perturbations Radioélectriques (International Special Committee on Radio Interference)
DC	Direct Current
EFT	Electrical Fast Transient
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
ERP	Effective Radiated Power
ESD	Electrostatic Discharge
EUT	Equipment Under Test
FCC	Federal Communications Commission
FVIN	Firmware Version Identification Number FVIN
GFE	Government Furnished Equipment
IC	Industry Canada
ICES	Interference Causing Equipment Standard
IEC	International Electrotechnical Commission
LISN	Line Impedance Stabilizing Network
OATS	Open Area Test Site
RF	Radio Frequency
RMS	Root-Mean-Square
SAC	Semi-Anechoic Chamber
TEM	Transverse Electromagnetic
TPD	Terminal Protection Device

END OF REPORT