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Date: 1 December 2024

I.T.L. Product Testing Ltd.

FCC/ISED Radio Test Report

for

Itamar Medical Ltd.

Equipment under test:

Sleep Related Breathing Disorders Device

WatchPAT 400

FCC ID: 2APUBWP400

IC: 27705WP400

Tested by: 
L. Tenenbaum

Approved by: 
M. Zohar

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This report concerns:	Original Grant
Equipment type:	FCC: Digital Transmission System (DTS) IC: Spread Spectrum Digital Device (2400-2483.5)
Limits used:	47CFR15 Section 15.247 RSS-247, Issue 3, August 2023, Section 5 RSS-Gen, Issue 5, April 2018, Amendment 2 (February 2021)
Measurement procedure used:	KDB 558074 D01 v03r05, ANSI C63.10:2013 and RSS-Gen, Issue 5, April 2018

Prepared by:

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Applicant:

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1. General Information

1.1 Administrative Information

Manufacturer: Itamar Medical Ltd.
 Manufacturer's Address: 9 Halamish St., P.O.Box 3579, Caesarea 3088900
 Israel
 Tel: +972.4.617.7000
 Equipment Under Test (E.U.T): Sleep Related Breathing Disorders Device
 Equipment Model/PMN: WatchPAT 400
 Equipment Serial No.: 000010001
 Equipment HVIN: WatchPAT 400
 Date of Receipt of E.U.T: 1 Jul. 2024
 Start of Test: 1 Jul. 2024
 End of Test: 21 Jul. 2024
 Test Laboratory Location: I.T.L Product Testing Ltd.
 3 HaOreg Street, Modi'in 7177909, Israel
 Test Specifications: FCC Part 15, Subpart C
 RSS-247, Issue 3, August 2023, Section 5
 RSS-Gen, Issue 5, April 2018, Amendment 2
 (February 2021)

1.2 Test Lab Description

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), FCC Designation No. IL1005.
3. Department of Innovation, Science and Economic Development (ISED) Canada, CAB identifier: IL1002

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

EUT	A non-invasive home care device for use with patients suspected to have sleep related breathing disorders ¹	
Brand	Itamar Medical	
Test Model	WatchPAT400/WP400	
Equipment Type	☒	Standalone
	☐	Combined/integrated

¹ The information above was provided by the customer.

	☐	Plug-in		
Intended Use	☐	Fixed (min. distance of 200 cm from human body)		
	☐	Mobile (minimum distance of 200 cm from human body)		
	☒	Portable (max. distance of 20 cm from human body)		
Assigned frequency band/s	-			
Operational frequencies	-			
Maximum rated output power	At transmitter's 50 Ω RF output connector (dBm)		4dBm	
	Effective radiated power (for equipment with no RF connector)			
Antenna	☐ Unique Coupling	☐ Standard Connection	☒ Integral	
	☐ Temporary RF connector	Gain (peak): +3.71 dBi		
Operating channel bandwidth	2402MHz -2480MHz			
Modulation type	GFSK			
Bit rate	1 Mbps			
Transmitter	Max. duty cycle	10%		
	Power source	☐ AC	Nominal rated voltage	
		☐ DC		
		☒ Battery		1.5V
Receiver Class	2			
Extreme temperature conditions	0-40 deg C			

1.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in KDB 558074 D01 v03r05, ANSI C63.10: 2013 and RSS-Gen, Issue 5, April 2018. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

Emissions tests were performed at I.T.L.'s testing facility in Modi'in, Israel.

1.6 Measurement Uncertainty

Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4)

0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 3.44 dB

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site:



30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):
 ± 4.96 dB

1 GHz to 6 GHz

Expanded Uncertainty (95% Confidence, K=2):
 ± 5.19 dB

>6 GHz

Expanded Uncertainty (95% Confidence, K=2):
 ± 5.51 dB

2. System Test Configuration

2.1 Justification

1. The E.U.T. was evaluated while transmitting at the low channel (2402MHz), the mid channel (2440MHz) and the high channel (2480MHz).
2. Final radiated emission tests were performed after exploratory emission testing that was performed in three orthogonal polarities to determine the “worst case” radiation.
6. The “worst case” for the low, high, and mid channels was the X-axis.

Orientation	Frequency	Field Strength	2 rd Harmonic
	(MHz)	(dBuV/m)	(dBuV/m)
X-axis	2440.0	99.9	54.8

Figure 1. Screening Results

2.2 EUT Exercise Software

No special exercise software was used.

2.3 Special Accessories

No special accessory was used.

2.4 Equipment Modifications

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

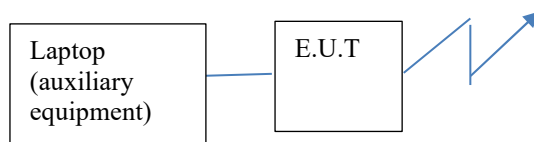


Figure 2. Configuration of Tested System



3. 6 dB Minimum Bandwidth

3.1 Test Specification

FCC Part 15, Subpart C, Section 247(a)(2)

RSS-247, Section 5.2(a)

3.2 Test Procedure

(Temperature (22°C)/ Humidity (61%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T was tested in the chamber, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The emissions were measured at a distance of 3 meters.

The spectrum bandwidth of the E.U.T. at the point of 6 dB below maximum peak power was measured and recorded. The RBW was set to 100 kHz.

3.3 Test Limit

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.

3.4 Test Results

Operation Frequency	Reading	Specification
(MHz)	(kHz)	(kHz)
2402.0	504	≥ 500.0
2440.0	514	≥ 500.0
2480.0	522	≥ 500.0

Figure 3 6 dB Minimum Bandwidth

JUDGEMENT: Passed

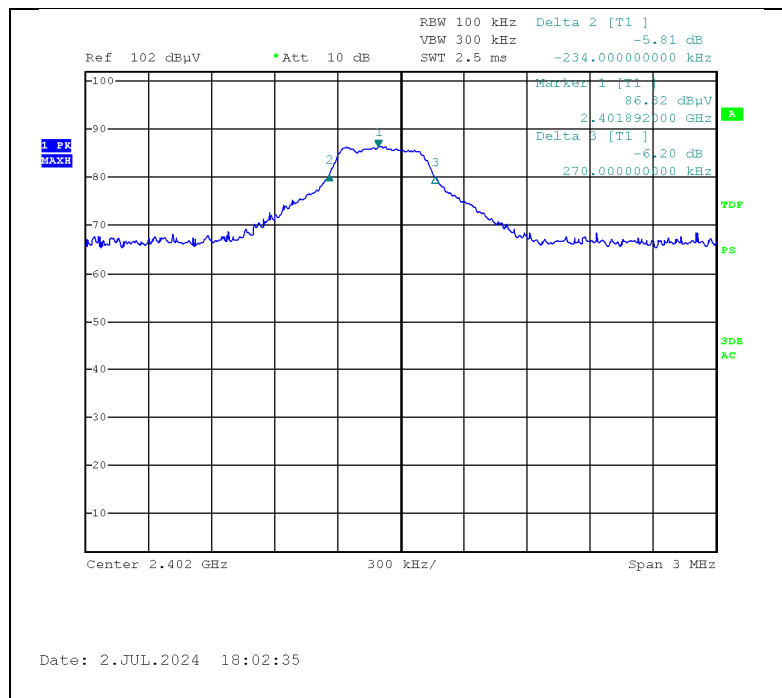


Figure 4. 2402.0 MHz

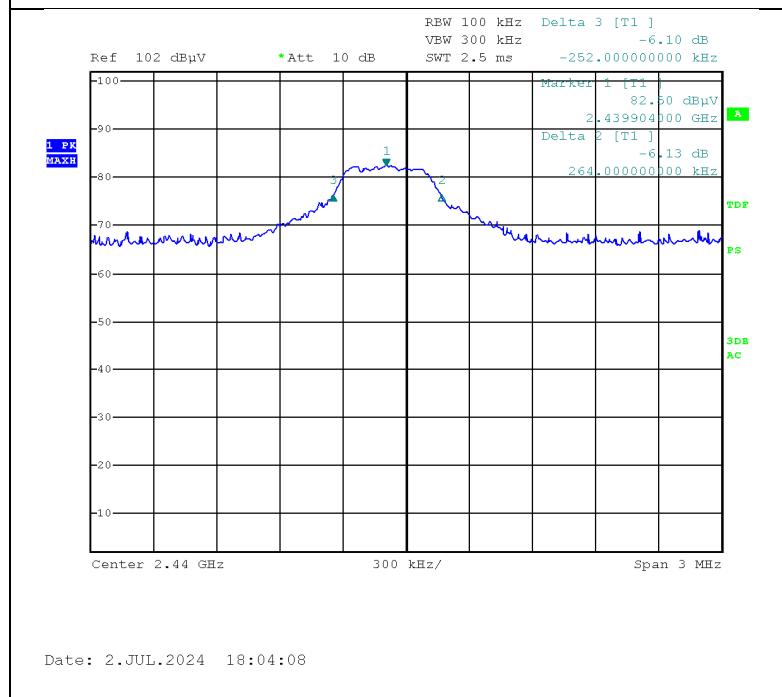
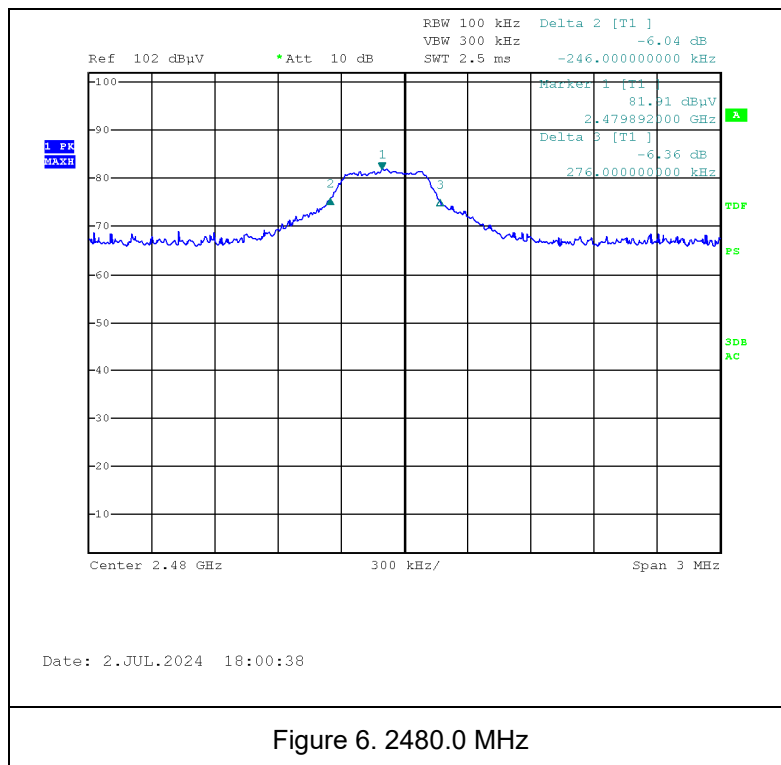


Figure 5. 2440.0 MHz



3.5 Test Equipment Used; 6dB Bandwidth

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2199	Trilog Broadband Antenna 30 MHz-7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025

Figure 7 Test Equipment Used

4. Maximum Conducted Output Power

4.1 Test Specification

FCC, Part 15, Subpart C, Section 247(b)(3)

RSS-247, Section 5.4(d)

4.2 Test Procedure

(Temperature (22°C)/ Humidity (70%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T was tested in the chamber, placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \quad [W]$$

E - Field Strength (V/m)

d – Distance from the transmitter (m)

G – Antenna gain

P – Peak power (W)

4.3 Test Limit

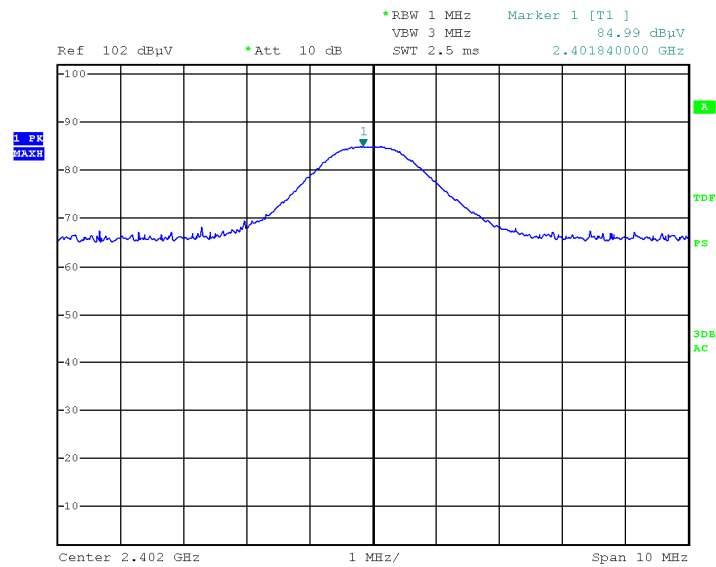
The maximum peak Radiated output power of the intentional radiator for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

4.4 Test Results

Operation Frequency	Polarization	Field Strength	Power	Power	Specification	Margin
(MHz)	(V/H)	(dBuV/m)	(dBm)	(mW)	(mW)	(mW)
2402.0	V	84.99	-10.21	0.09	1000.00	-999.91
	H	90.45	-4.75	0.33	1000.00	-999.67
2440.0	V	85.33	-9.87	0.10	1000.00	-999.90
	H	91.86	-3.34	0.46	1000.00	-999.54
2480.0	V	84.62	-10.58	0.08	1000.00	-999.92
	H	90.64	-4.56	0.34	1000.00	-999.66

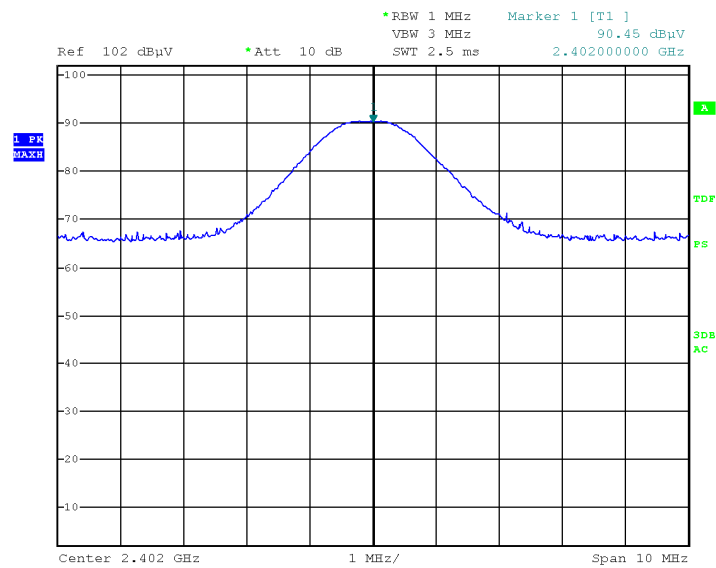
Figure 8 Maximum Peak Power Output

JUDGEMENT: Passed



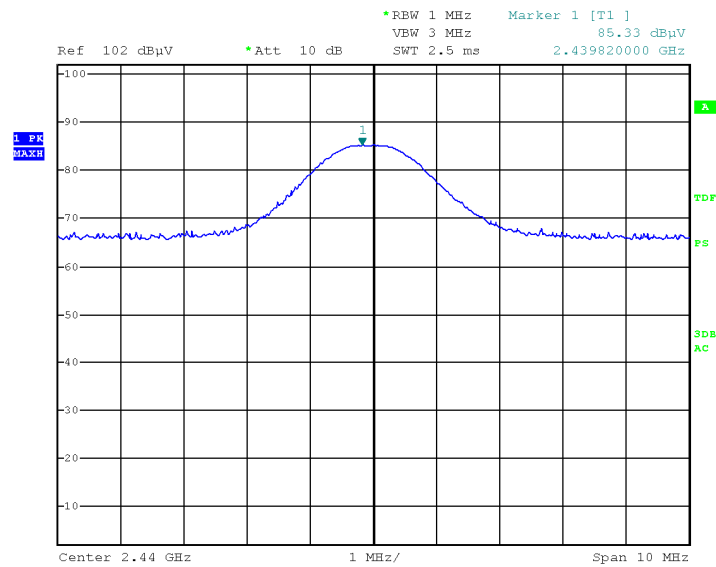
Date: 2.JUL.2024 18:42:51

Figure 9 2402.0 MHz – Vertical



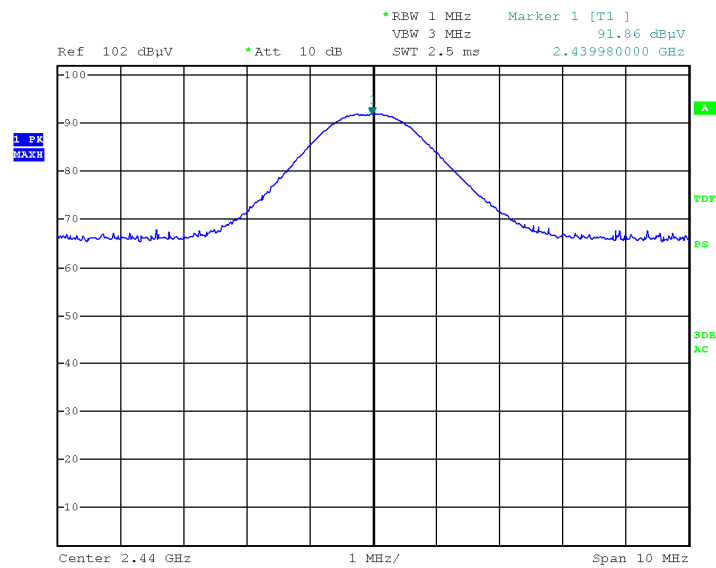
Date: 2.JUL.2024 18:40:38

Figure 10 2402.0 MHz – Horizontal



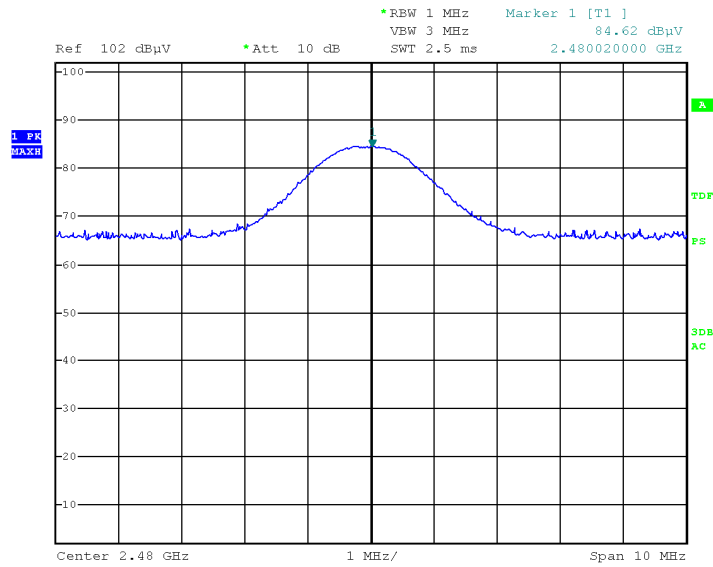
Date: 2.JUL.2024 18:30:18

Figure 11 2440.0 MHz – Vertical



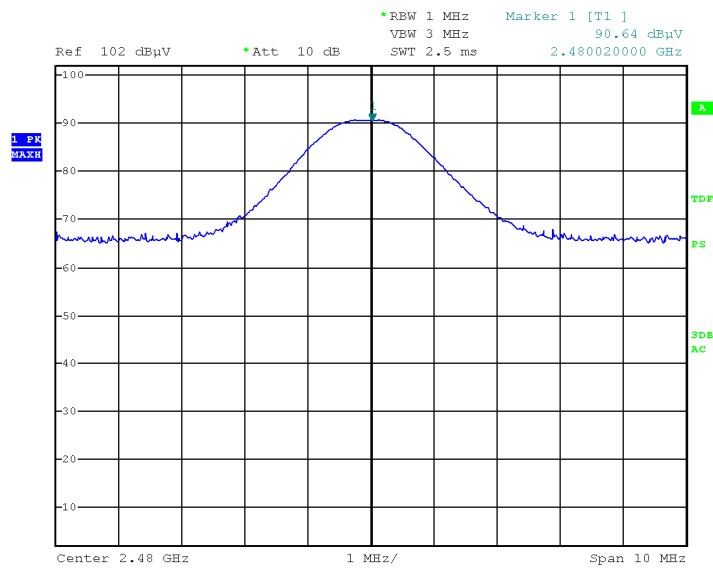
Date: 2.JUL.2024 18:25:29

Figure 12 2440.0 MHz – Horizontal



Date: 2.JUL.2024 18:33:11

Figure 13 2480.0 MHz – Vertical



Date: 2.JUL.2024 18:35:27

Figure 14 2480.0 MHz – Horizontal



4.5 Test Equipment Used; Maximum Conducted Output Power

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2199	Trilog Broadband Antenna 30 MHz-7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025

Figure 15 Test Equipment Used



5. Band Edge Spectrum

5.1 Test Specification

FCC, Part 15, Subpart C, Section 247(d)

RSS-247, Section 5.5

5.2 Test Procedure

(Temperature (20°C)/ Humidity (59%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T was tested in the chamber, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization. The emissions were measured at a distance of 3 meters.

The RBW was set to 100 kHz.

5.3 Test Limit

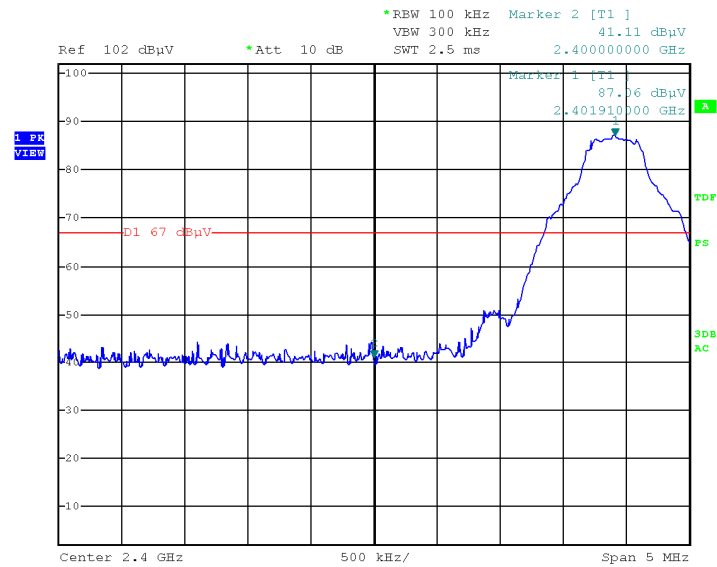
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

5.4 Test Results

Operation Frequency (MHz)	Band Edge Frequency (MHz)	Spectrum Level (dBuV/m)	Specification (dBuV/m)	Margin (dB)
Low	2400.0	41.1	67.0	-25.9
High	2483.5	43.8	80.2	-36.4

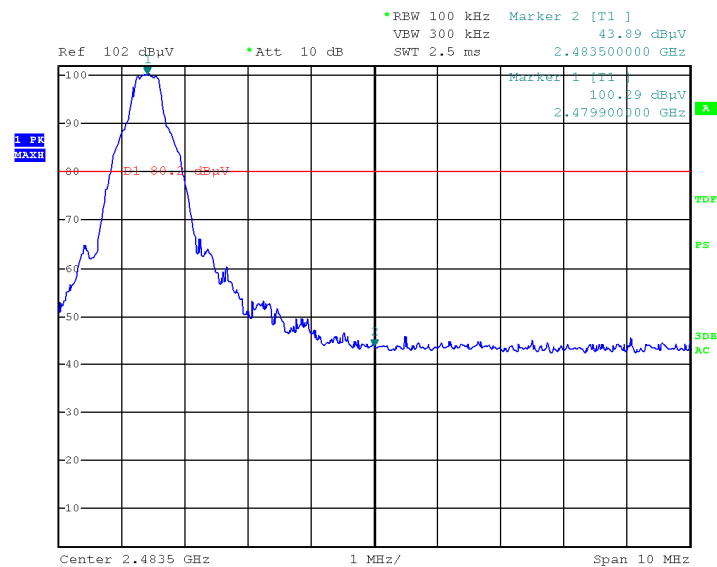
Figure 16 Band Edge Spectrum

JUDGEMENT: Passed



Date: 3.JUL.2024 13:15:06

Figure 17 Band Edge Low



Date: 3.JUL.2024 13:20:30

Figure 18 Band Edge High



5.5 Test Equipment Used; Band Edge

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2199	Trilog Broadband Antenna 30 MHz-7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025

Figure 19 Test Equipment Used

6. Transmitted Power Density

6.1 Test Specification

FCC, Part 15, Subpart C, Section 247(e)

RSS-247, Section 5.2(b)

6.2 Test Procedure

(Temperature (22°C)/ Humidity (70%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.

The E.U.T was placed on a non-metallic table, 1.5 meters above the ground.

The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization. The emissions were measured at a distance of three meters.

The spectrum analyzer was set to 3 kHz RBW and VBW to 10 kHz.

Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \quad [W]$$

E - Field Strength (V/m)

d – Distance from transmitter (m)

G – Antenna gain

P – Peak power (W)

6.3 Test Limit

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.

6.4 Test Results

JUDGEMENT: Passed

Operation Frequency	Reading Spectrum Analyzer	Reading Spectrum Analyzer	Specification	Margin
(MHz)	(dBμV/m)	(dBm)	(dBm)	(dB)
2402.0	88.4	-6.8	8.0	-14.8
2440.0	88.6	-6.6	8.0	-14.6
2480.0	86.7	-8.5	8.0	-16.5

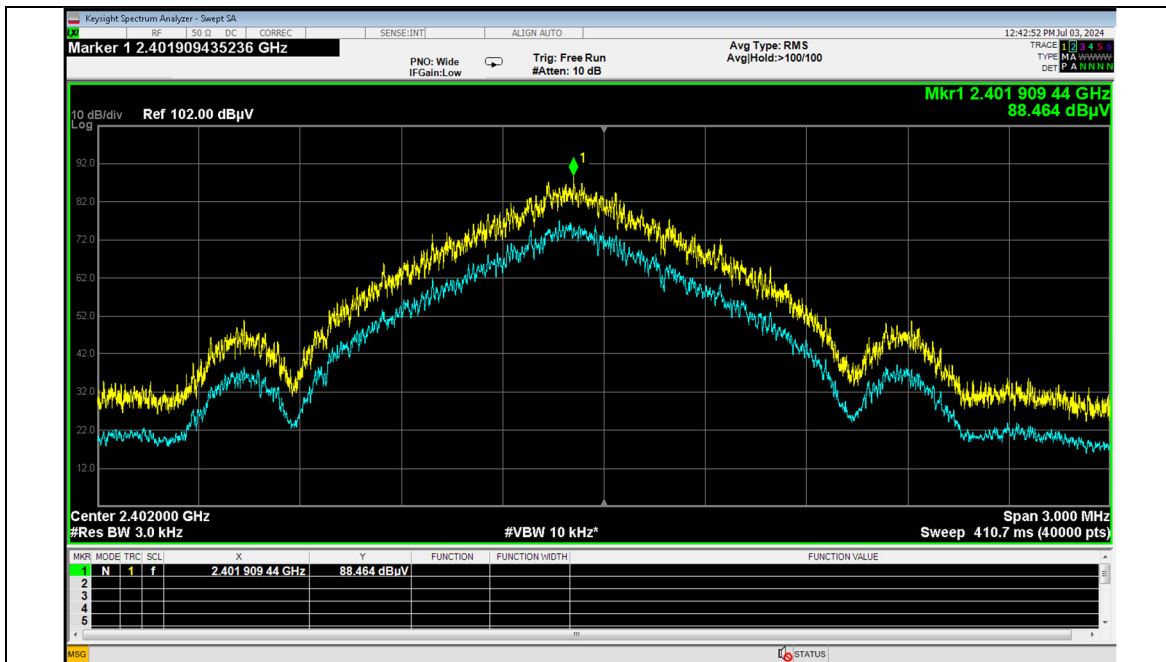


Figure 20 — 2402.0 MHz

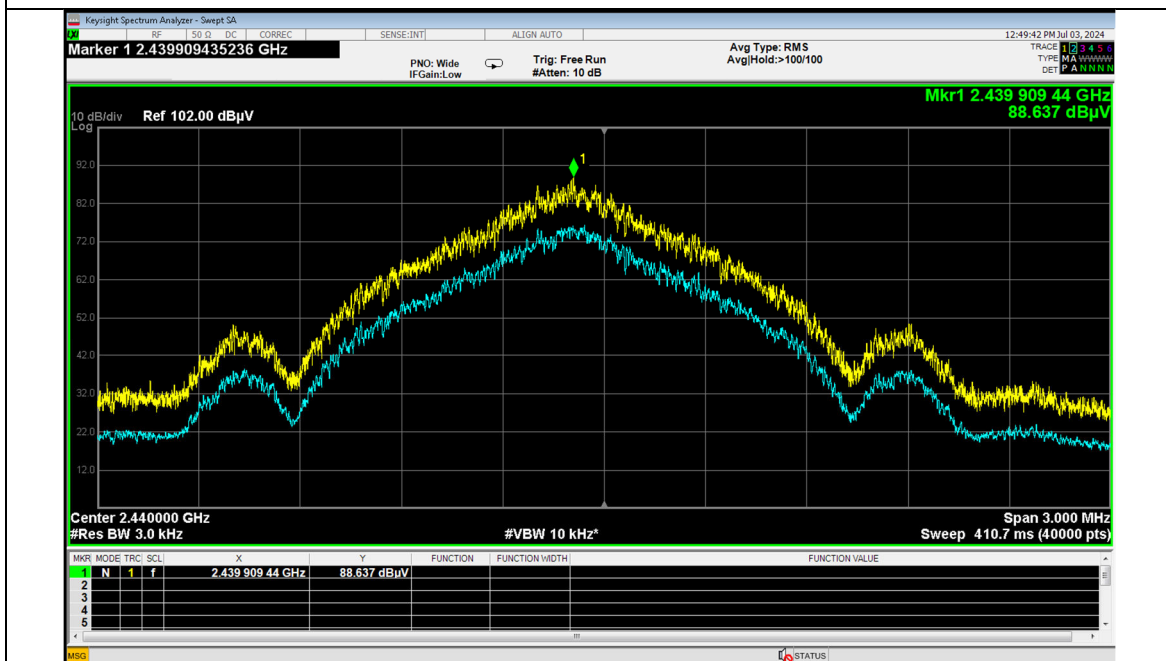
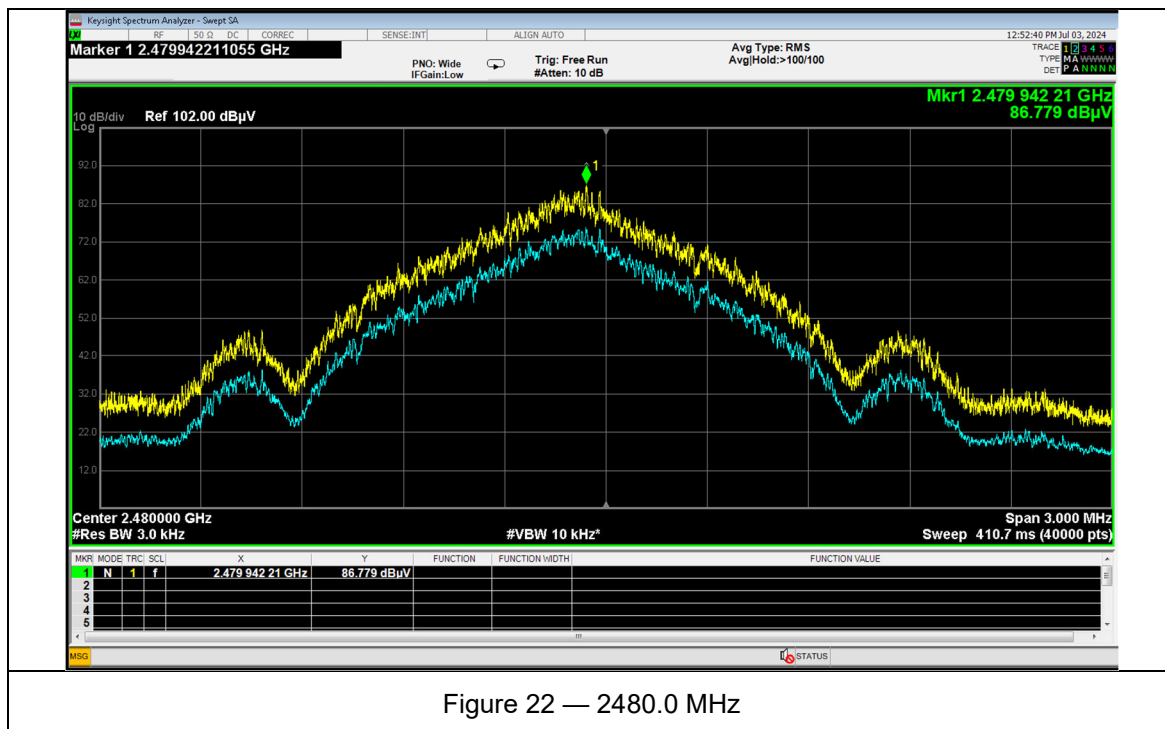


Figure 21 — 2440.0 MHz



6.5 Test Equipment Used; Transmitted Power Density

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2199	Trilog Broadband Antenna 30 MHz-7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025

Figure 23 Test Equipment Used



7. Occupied Bandwidth

7.1 Test Specification

FCC, Part 2, Sub part J, Section 2.1049

RSS-Gen, Issue 4: 2014, Section 6.6

7.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))

The E.U.T. operation mode and test set-up are as described in Section 2 of this report.

The E.U.T. was placed in the chamber on a non-conductive table, 0.8 meters above the ground.

The distance between the E.U.T. and test antenna was 3 meters.

The transmitter unit was operated with normal modulation. The RBW set to the range of 1% to 5% of the OBW.

The span was set between 1.5 to 5 times of the OBW.

99% occupied bandwidth function was set on.

7.3 Test Limit

N/A

7.4 Test Results

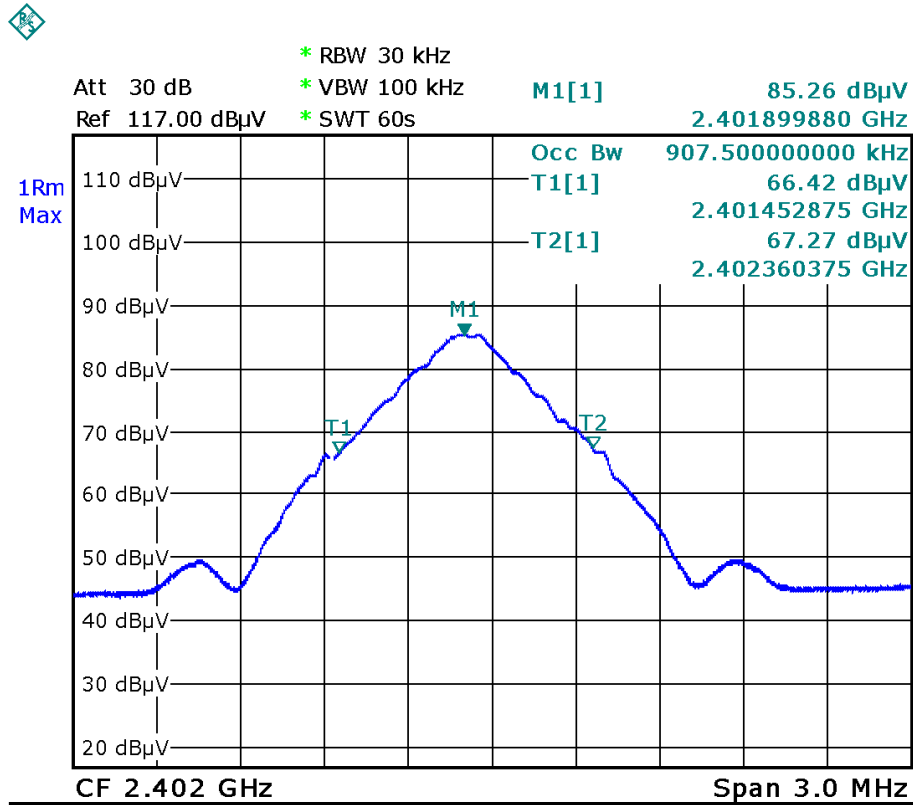
Protocol Type	Operation Frequency	Reading
	(MHz)	(kHz)
BLE	2402.0	907.5
	2440.0	924.0
	2480.0	921.0

Figure 24. Bandwidth Test Results

JUDGEMENT: N/A

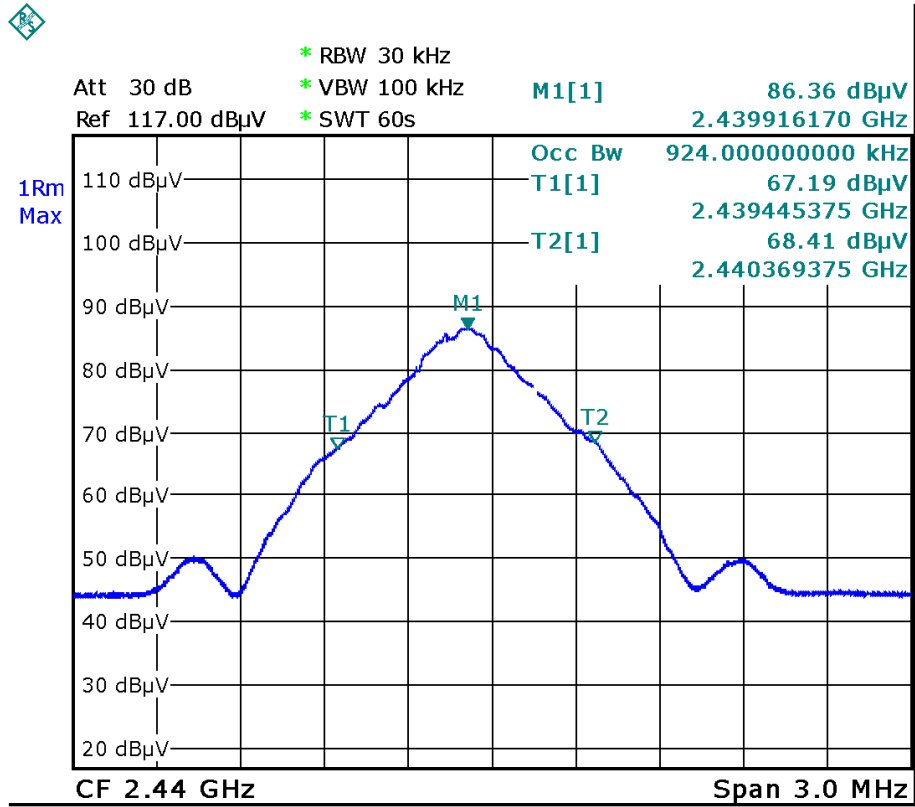
Occupied Bandwidth

E.U.T Description Sleep Related Breathing Disorders Device
Model Number WatchPAT 400
Part Number: 000010001



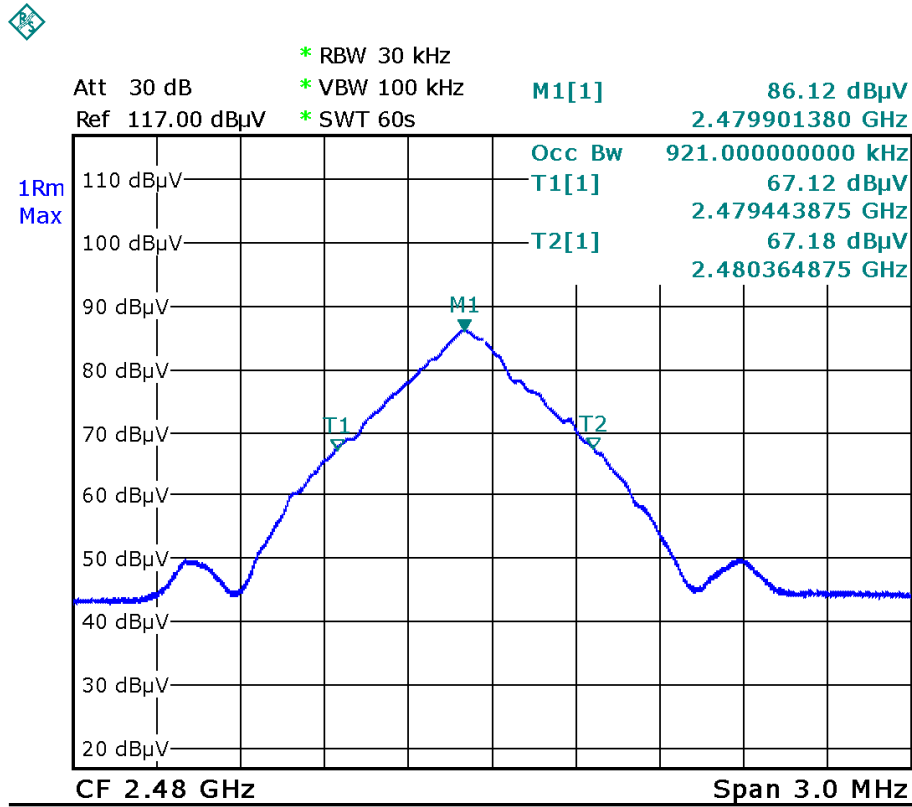
Date: 18.AUG.2024 14:24:10

Figure 25. 2402.0 MHz, BLE



Date: 18.AUG.2024 14:19:39

Figure 26. 2440.0 MHz, BLE



Date: 18.AUG.2024 14:21:25

Figure 27. 2480.0 MHz, BLE

7.5 Test Equipment Used; Occupied Bandwidth

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2199	Trilog Broadband Antenna 30 MHz-7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025

Figure 28 Test Equipment Used



8. Emissions in non-Restricted Frequency Bands

8.1 Test Specification

FCC, Part 15, Subpart C, Section 247(d)

RSS-247, Section 5.5

8.2 Test Procedure

(Temperature (°C)/ Humidity (%RH))

The E.U.T. operation mode and test setup are described in Section 2 of this report.

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8/1.5 meters above the ground. The emissions were measured at a distance of three meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The frequency range 0.009MHz -25.0GHz was scanned.

RBW was set to 100 kHz, the detector set to max peak and the trace to “max hold”.

8.3 Test Limit

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.

8.4 Test Results

JUDGEMENT: Passed

No emissions were detected within 20 dB of the limit.

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 247(d) specification.

8.5 Test Instrumentation Used, Emission in non-Restricted Frequency Bands

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1075	Active Loop Antenna	EMCO	6502	2950	23 May 2024	23 May 2025
1366	Horn Antenna	EMCO	3115	9702-511	18 Oct 2023	18 Oct 2025
1777	LNA Horn Antenna Amplifier Ka band	OSR Electronics	PE9850R-20	J202021732	22 Sep 2022	22 Sep 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2163	Signal Analyzer	Keysight	WO-004002 56-23	MY54430182	25 Feb 2023	25 Feb 2025



ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
2199	Trilog Broadband Antenna 30 MHz-7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025
2215	Horn Antenna - 3Ghz-40GHz	Schwarzbeck	BBHA 9120 L	12	11 Oct 2023	11 Oct 2024
2227	Broadband LNA 10MHz-50GHz 44Db	Aeroflex	35822-000-30001-08	014	1 Oct 2023	1 Oct 2024
2228	RF Cable up to 40Ghz 6M	Huber Suhner	-	-	1 Oct 2023	1 Oct 2024
2229	Low Loss 2.92mm Cable up to 40GHz	Micro-Coax	UFX40-Z-0362 0-210200	322365-001	1 Oct 2023	1 Oct 2024

Figure 29 Test Equipment Used

8.6 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors", using the following equation:

$$FS = RA + AF + CF$$

FS: Field Strength [dB μ v/m]

RA: Receiver Amplitude [dB μ v]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable Attenuation Factor [dB]

No external pre-amplifiers were used.

9. Emissions in Restricted Frequency Bands

9.1 Test Specification

FCC Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)

RSS-247, Section 3.3

RSS-Gen, Section 8.10

9.2 Test Procedure

(Temperature (23°C)/ Humidity (65%RH))

The E.U.T. operation mode and test setup are described in Section 2 of this report.

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8/1.5 meters above the ground. The emissions were measured at a distance of three meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The frequency range 0.009MHz -25.0GHz was scanned.

RBW was set to 100 kHz, the detector set to max peak and the trace to “max hold”.

The tests were done for all “worst cases” for each protocol type. The highest radiations are described in the tables below.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

9.3 Test Limit

FCC:

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)).

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength* (dBμV/m)	Field strength* (dBμV/m)@3m
0.009-0.490	2400/F(kHz)	300	48.5-13.8	128.5-73.8
0.490-1.705	24000/F(kHz)	30	33.8-23.0	73.8-63.0
1.705-30.0	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission 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. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

ISED:

Table 5 – General field strength limits at frequencies above 30 MHz	
Frequency (MHz)	Field strength (µV/m at 3 m)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)
9 - 490 kHz ^{Note 1}	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

9.4 Test Results

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C Sections 15.209, 15.205, 15.247(d), and RSS-Gen, Section 8.10 specifications.

E.U.T Description Sleep Related Breathing Disorders Device

Type WatchPAT 400

Serial Number: 000010001

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)
RSS-247, Section 3.3; RSS-Gen, Issue 5, Section 8.10

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 25.0 GHz
Protocol Type: BLE Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
2402.0	2390.0	V	59.9	74.0	-14.1	49.4	54.0	-4.6
	2390.0	H	60.8	74.0	-13.2	49.3	54.0	-4.7
	4804.0	V	51.6	74.0	-22.4	-	54.0	-
	4804.0	H	50.7	74.0	-23.3	-	54.0	-
2440.0	4880.0	V	47.6	74.0	-26.4	-	54.0	-
	4880.0	H	48.1	74.0	-25.9	-	54.0	-
	7320.0	V	43.3	74.0	-30.7	-	54.0	-



	7320.0	H	36.6	74.0	-37.4	-	54.0	-
2480.0	4960.0	V	47.7	74.0	-26.3	-	54.0	-
	4960.0	H	49.3	74.0	-24.7	-	54.0	-
	2483.5	V	58.2	74.0	-15.8	49.5	54.0	-4.5
	2483.5	H	58.3	74.0	-15.7	49.5	54.0	-4.5

Figure 30. Radiated Emission Results

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

9.5 Test Instrumentation Used; Emissions in Restricted Frequency Bands

ITL #	Instrument	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
1507	EMI Receiver	Rohde & Schwarz	ESCI7	100794	7 Feb 2024	7 Feb 2025
1075	Active Loop Antenna	EMCO	6502	2950	23 May 2024	23 May 2025
1366	Horn Antenna	EMCO	3115	9702-511	18 Oct 2023	18 Oct 2025
1777	LNA Horn Antenna Amplifier Ka band	OSR Electronics	PE9850R-20	J202021732	22 Sep 2022	22 Sep 2025
1778	Antenna Cable for KA Band	OSR Electronics	37297C KPS	1503-590 (05032006)	9 Aug 2023	9 Aug 2024
2163	Signal Analyzer	Keysight	WO-004002 56-23	MY54430182	25 Feb 2023	25 Feb 2025
2199	Trilog Broadband Antenna 30 MHz- 7 GHz	Schwarzbeck	VULB 9162	585	16 Oct 2023	16 Oct 2025
2215	Horn Antenna - 3Ghz-40GHz	Schwarzbeck	BBHA 9120 L	12	11 Oct 2023	11 Oct 2024
2227	Broadband LNA 10MHz-50GHz 44Db	Aeroflex	35822-000-30001-08	014	1 Oct 2023	1 Oct 2024
2228	RF Cable up to 40Ghz 6M	Huber Suhner	-	-	1 Oct 2023	1 Oct 2024
2229	Low Loss 2.92mm Cable up to 40GHz	Micro-Coax	UFX40-Z-0362 0-210200	322365-001	1 Oct 2023	1 Oct 2024

Figure 31 Test Equipment Used



10. Test Photos

See a separate document.

11. RF Exposure

See a separate document.

12. Appendix A - Correction Factors

ITL # 1075: Active Loop Antenna						
Frequency (MHz)	MAF (dBs/m)	AF (dB/m)		Frequency (MHz)	MAF (dBs/m)	AF (dB/m)
0.01	-33.1	18.4		2.0	-40.0	11.5
0.02	-37.2	14.3		3.0	-40.0	11.5
0.03	-38.2	13.3		4.0	-40.1	11.4
0.05	-39.8	11.7		5.0	-40.2	11.3
0.1	-40.1	11.4		6.0	-40.4	11.1
0.2	-40.3	11.2		7.0	-40.4	11.1
0.3	-40.3	11.2		8.0	-40.4	11.1
0.5	-40.3	11.2		9.0	-40.5	11.0
0.7	-40.3	11.2		10.0	-40.5	11.0
1.0	-40.1	11.4		20.0	-41.5	10.0

ITL # 1352: Horn Antenna			
Frequency (MHz)	AF (dB/m)	Frequency (MHz)	AF (dB/m)
0.75	25	9.5	38
1.0	23.5	10.0	38.5
1.5	26.0	10.5	38.5
2.0	29.0	11.0	38.5
2.5	27.5	11.5	38.5
3.0	30.0	12.0	38.0
3.5	31.5	12.5	38.5
4.0	32.5	13.0	40.0
4.5	32.5	13.5	41.0
5.0	33.0	14.0	40.0
5.5	35.0	14.5	39.0
6.0	36.5	15.0	38.0
6.5	36.5	15.5	37.5
7.0	37.5	16.0	37.5
7.5	37.5	16.5	39.0
8.0	37.5	17.0	40.0
8.5	38.0	17.5	42.0
9.0	37.5	18.0	42.5

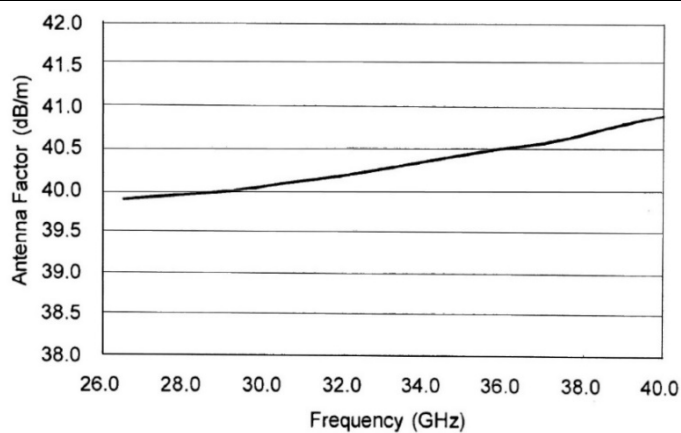


ITL # 1353: Horn Antenna (@ 3m distance) ²			
Frequency (MHz)	Measured antenna factor (dB/m)	Frequency (MHz)	Measured antenna factor (dB/m)
18000.0	32.4	22500.0	33.0
18500.0	32.0	23000.0	33.1
19000.0	32.3	23500.0	33.8
19500.0	32.4	24000.0	33.5
20000.0	32.3	24500.0	33.5
20500.0	32.8	25000.0	33.8
21000.0	32.8	25500.0	33.9
21500.0	32.7	26000.0	34.2
22000.0	33.1	26500.0	34.7
ITL #1840: Anechoic Chamber RF Cable			
Frequency (MHz)	Cable Loss (dB)	Frequency (MHz)	Cable Loss (dB)
1000.0	-1.4	10000.0	-6.0
1500.0	-1.7	10500.0	-6.2
2000.0	-2.0	11000.0	-6.2
2500.0	-2.3	11500.0	-6.0
3000.0	-2.6	12000.0	-6.0
3500.0	-2.8	12500.0	-6.1
4000.0	-3.1	13000.0	-6.3
4500.0	-3.3	13500.0	-6.5
5000.0	-3.6	14000.0	-6.7
5500.0	-3.7	14500.0	-7.0
6000.0	-4.0	15000.0	-7.3
6500.0	-4.4	15500.0	-7.5
7000.0	-4.7	16000.0	-7.6
7500.0	-4.8	16500.0	-8.0
8000.0	-5.0	17000.0	-8.0
8500.0	-5.1	17500.0	-8.1
9000.0	-5.6	18000.0	-8.2
9500.0	-5.8		

² The antenna factor shall be added to the receiver reading in dBμV to obtain field strength in dBμV/m



ITL # 1777: 26.5-40 GHz Horn Antenna



ITL # 2199 Trilog Broadband Antenna30 MHz - 1 GHz + RF cables

Frequency (MHz)	Measured antenna factor (dB/m)	Frequency (MHz)	Measured antenna factor (dB/m)
30.00	14.30	80.00	11.10
40.00	16.20	90.00	13.40
50.00	17.40	100.00	15.20
60.00	16.30	150.00	11.40
70.00	13.00	200.00	14.10
80.00	11.10	300.00	16.10
90.00	13.40	400.00	18.10
100.00	15.20	500.00	19.50
150.00	11.40	600.00	21.10
30.00	14.30	700.00	22.50
40.00	16.20	800.00	23.50
50.00	17.40	900.00	24.70
60.00	16.30	1000.00	25.50
70.00	13.00		

End of Report