



Date: 22 November 2022

**I.T.L. Product Testing Ltd.
FCC/IC Radio Test Report**

for

AeroScout Inc.

Equipment under test:

**Battery-operated, Wall-mounted Tag
Arial ECall (Model B)**

Tested by: 
M. Zohar

Approved by: 
I. Mansky

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Measurement/Technical Report for
AeroScout Inc.
Battery-operated, Wall-mounted Tag
Arial ECall (Model B)

FCC ID: Q3HCSK200I
IC: 5115A-CSK200I

This report concerns: Original Grant

Equipment type: FCC: (DTS) Digital Transmission System

IC: Spread Spectrum Digital Device (2400-2483.5)

Limits used: 47 CFR, Section 15.247

RSS-247, Issue 2, February 2017, Section 5

RSS-Gen, Issue 5, April 2018, AMD1, March 2019, AMD2, February 2021

Measurement procedure used is KDB 558074 D01 v05r01, ANSI C63.10:2013 and RSS-Gen, Issue 5, April 2018

Prepared by:

R. Ezrahi

I.T.L. Product Testing Ltd.

1 Bat Sheva St., Lod 7116002, Israel

Email: rame@itlglobal.org

Applicant:

Reuven Amsalem

AeroScout Inc.

2 Ilan Ramon St. Science Park,

Ness-Ziona 7403635, Israel

Email: reuven.amsalem@sbdinc.com



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1. General Information

1.1 Administrative Information

Manufacturer: AeroScout Inc.
Manufacturer's Address: 2 Ilan Ramon St., Ness-Ziona
7403635, Israel
Manufacturer's Representative: Reuven Amsalem
Tel: +972-8-936-9301
Equipment Under Test (E.U.T): Battery-operated, Wall-mounted Tag
Equipment PMN: Arial ECall (Model B)
Equipment Serial No.: Not designated
Equipment HVIN: CSK200I
Date of Receipt of E.U.T: 3/7/2022
Start of Test: 4/7/2022
End of Test: 26/7/2022
Test Laboratory Location: I.T.L. Product Testing Ltd.
1 Bat Sheva St., Lod 7120101
ISRAEL
Test Specifications: FCC, 47 CFR, Subpart C
RSS-247, Issue 2, February 2017, Section 5
RSS-Gen, Issue 5, April 2018, AMD1, March
2019, AMD2, February 2021

1.2 List of Accreditations

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

The E.U.T. is a battery-operated, wall mounted, fixed tag. The battery (CR123A 3V 1500mAh) is not rechargeable. There is an option for a 5VDC supply from an external AC/DC power supply, through a USB connector.

The E.U.T. can appear in following radio configurations:

- 1) BLE and WIFI 2.4GHz- model A
- 2) BLE and Sub-Giga- model B

Type of Equipment			
☒	Stand Alone (Equipment with/without its own control provisions)		
☐	Combined (Equipment where radio part is fully integrated with another type of equipment)		
☐	Plug in card (Equipment intended for a variety of host systems)		
Intended Use		Condition of use	
☒	Fixed	Always of distance >25mm from the people	
☐	Mobile	Always of distance >20cm from the people	
☐	Portable	Always of distance <20cm to human body	
Assigned frequency band		2.4GHz	
Operational frequencies		BLE: 2402,2462,2480MHz	
Maximum rated output power		At transmitter 50Ω RF output connector [dBm]	BLE: +1dBm
		Effective Radiated Power (for equipment without RF connector)	
Antenna Connection			
☐	Unique Coupling	☐	Standard Connection
☒		☒	Integral
		☐	With temporary RF connector
			Without temporary RF connector
Antenna Gain(peak)		+5.1dBi	
Operating channel bandwidth		BLE: 1,2MHz	
Type of modulation		BLE	
Bit rate		1,2 Mbps	
Maximum transmitter duty cycle		≥98%	
Transmitter power source			
☐	AC	Nominal rated voltage	
☐	DC	Nominal rated voltage	
☒	Battery	Nominal rated voltage	3V

1.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in KDB 558074 D01 v05r01, ANSI C63.10: 2013, 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 Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and its FCC Designation Number is IL1005.

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 contains an IEEE 802.15.1 standard (BLE) and a 900 MHZ FHSS (FCC ID: HCQ3B6T) transceivers (without simultaneously transmission)
2. The unit was evaluated while transmitting at the low channel (2402MHz), the mid channel (2426MHz) and the high channel (2480MHz).
3. Conducted emission tests were performed with the E.U.T. antenna terminal connected by a RF cable to the Spectrum Analyzer.
4. Final radiated emission test was performed when the E.U.T was at orientation install position as defined by the customer

2.2 EUT Exercise Software

No special exercise software was used.

2.3 Special Accessories

No special accessories was used.

2.4 Equipment Modifications

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

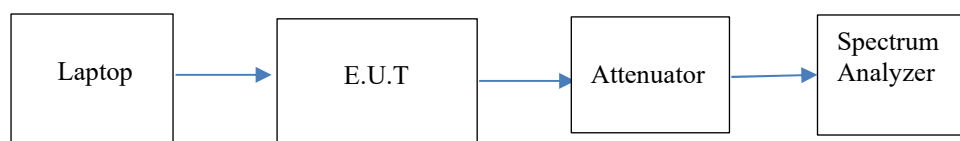


Figure 1. Configuration of Tested System Conducted

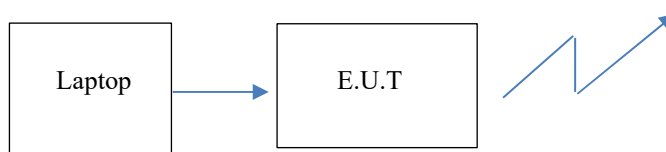


Figure 2. Configuration of Tested System Radiated



3. Setup Photos

See a separate file.



4. 6 dB Minimum Bandwidth

4.1 Test Specification

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

RSS-247, Issue 2, Section 5.2(a)

4.2 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. antenna terminal was connected to the Spectrum Analyzer through an appropriate coaxial cable (total loss=1.0 dB). 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.

4.3 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.

4.4 Test Results

Protocol Type	Operation Frequency	Reading	Limit
	(MHz)	(MHz)	(kHz)
BLE	2402.0	1.178	>500.0
	2426.0	1.178	>500.0
	2480.0	1.178	>500.0

Figure 3 6 dB Minimum Bandwidth

JUDGEMENT: Passed

For additional information see *Figure 4* to *Figure 6*.

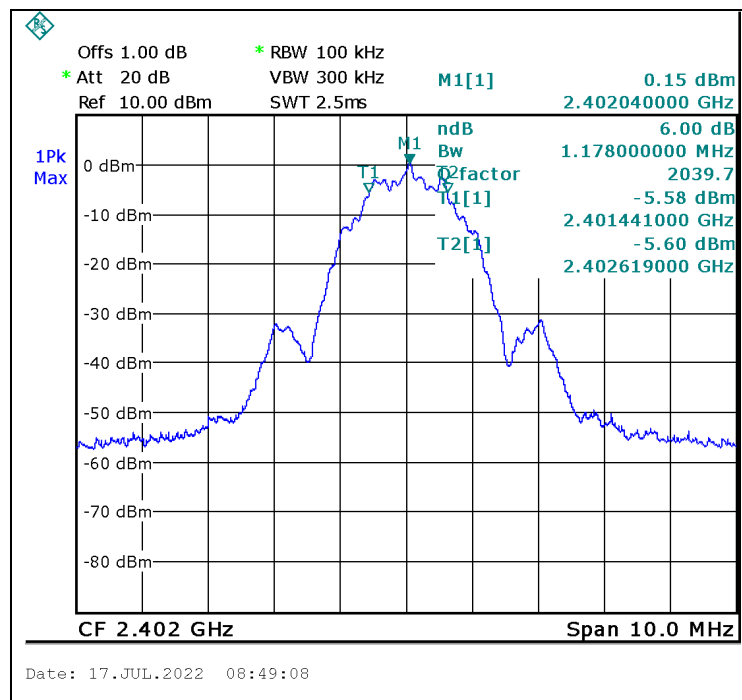


Figure 4. 2402.0 MHz, BLE

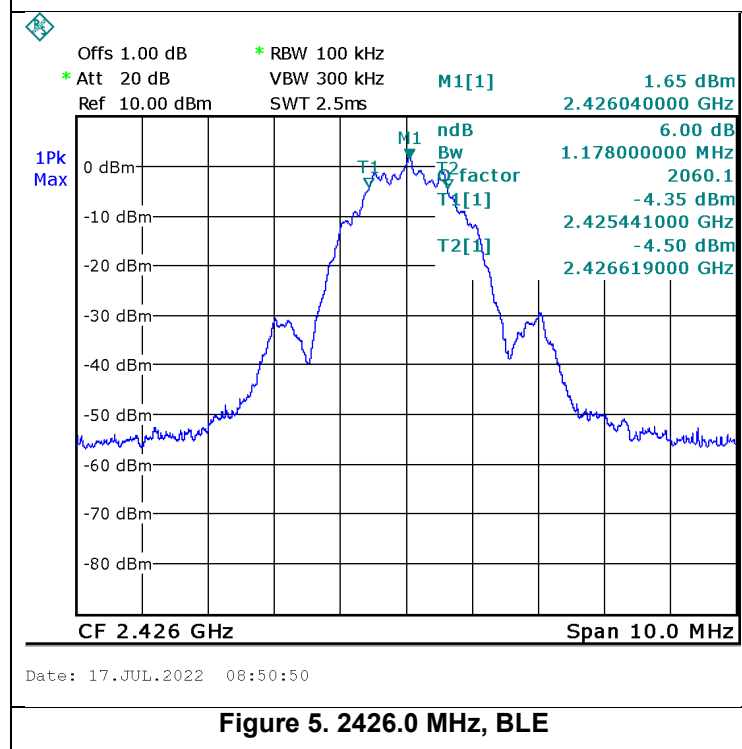
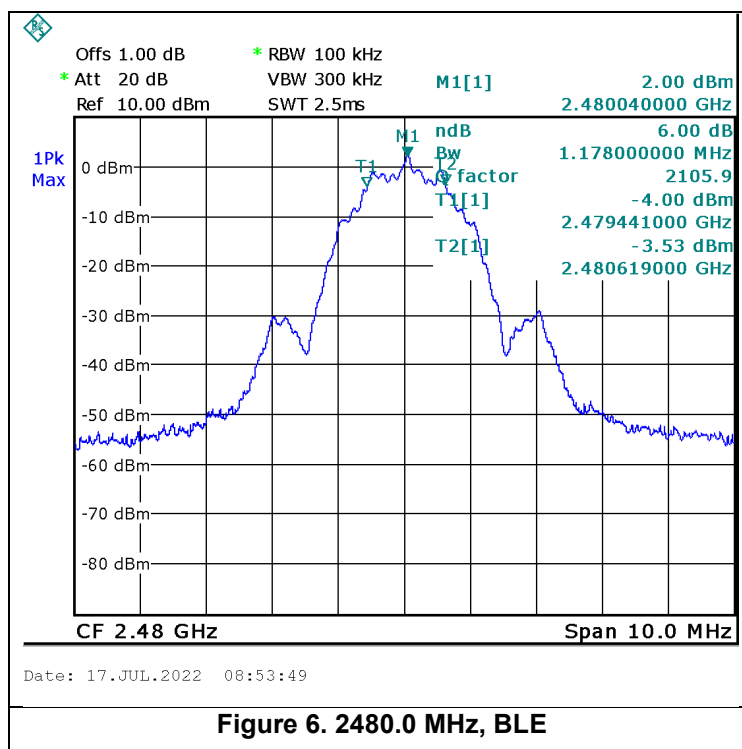


Figure 5. 2426.0 MHz, BLE



4.5 Test Equipment Used; 6dB Bandwidth

Instrument	ITL #	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	1499	R&S	FSL6	100194	20/2/2022	20/2/2023
RF Cable	1844	EIM	705A009301EIM	-	16/5/2022	16/5/2023

Figure 7 Test Equipment Used

5. Maximum Conducted Output Power

5.1 Test Specification

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

RSS-247, Issue 2, Section 5.4(d)

5.2 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. antenna terminal was connected to the Spectrum Analyzer through an appropriate coaxial cable (total loss=1.0 dB).

5.3 Test Limit

The maximum peak conducted 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.

5.4 Test Results

Protocol Type	Operation Frequency	Power	Power	Limit	Margin
	(MHz)	(dBm)	(mW)	(mW)	(mW)
BLE	2402.0	0.26	1.062	1000.0	-998.938
	2426.0	1.79	1.510	1000.0	-998.490
	2480.0	2.17	1.648	1000.0	-998.352

Figure 8 Maximum Peak Power Output

JUDGEMENT: Passed

For additional information see Figure 9 to Figure 11.

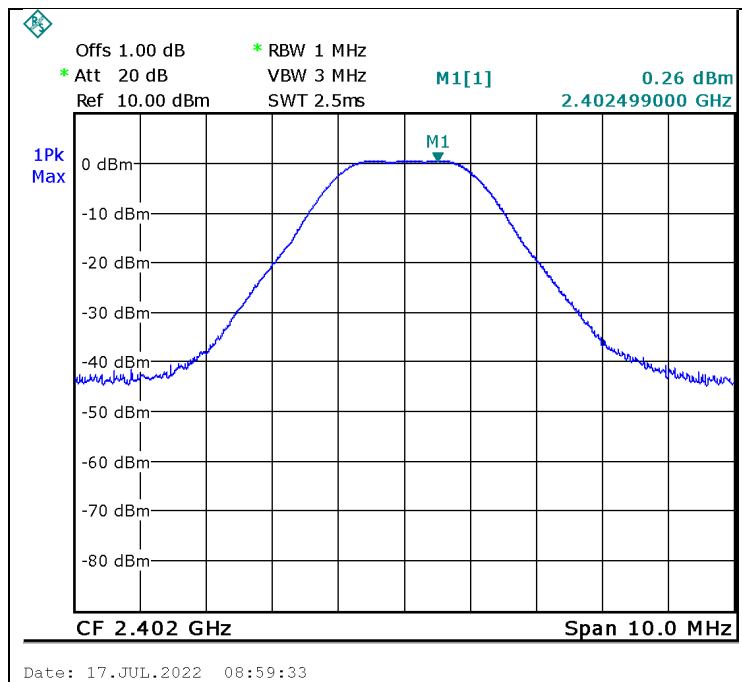


Figure 9. 2402.0 MHz, BLE

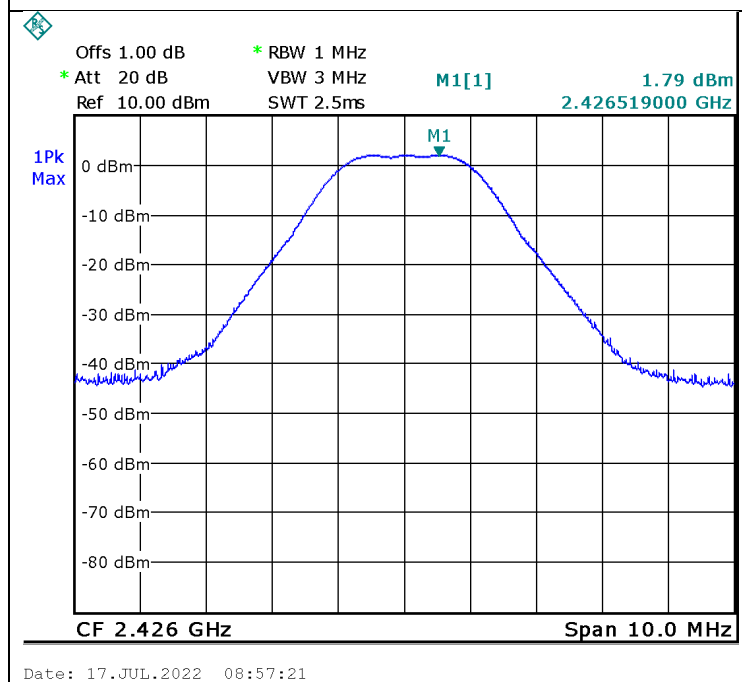
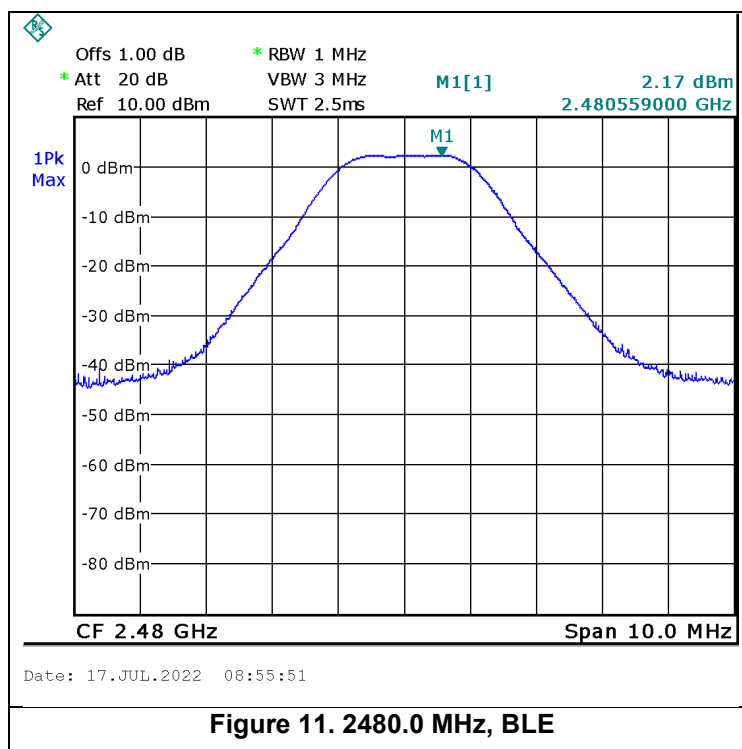


Figure 10. 2426.0 MHz, BLE



5.5 Test Equipment Used; Maximum Peak Power Output

Instrument	ITL #	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	1499	R&S	FSL6	100194	20/2/2022	20/2/2023
RF Cable	1844	EIM	705A009301EIM	-	16/5/2022	16/5/2023

Figure 12 Test Equipment Used

6. Band Edge Spectrum

6.1 Test Specification

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

RSS-247, Issue 2, Section 5.5

6.2 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. antenna terminal was connected to the Spectrum Analyzer through an appropriate coaxial cable (loss=1.0 dB). The RBW was set to 100 kHz.

6.3 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.

6.4 Test Results

Protocol Type	Operation Frequency	Band Edge Frequency	Spectrum Level	Limit	Margin
	(MHz)	(MHz)	(dBm)	(dBm)	(dB)
BLE	2402.0	2400.0	-20.79	-19.74	-1.05
	2480.0	2483.5	-37.99	-17.83	-20.16

Figure 13 Band Edge Spectrum

JUDGEMENT: Passed

For additional information see Figure 14 and Figure 15.

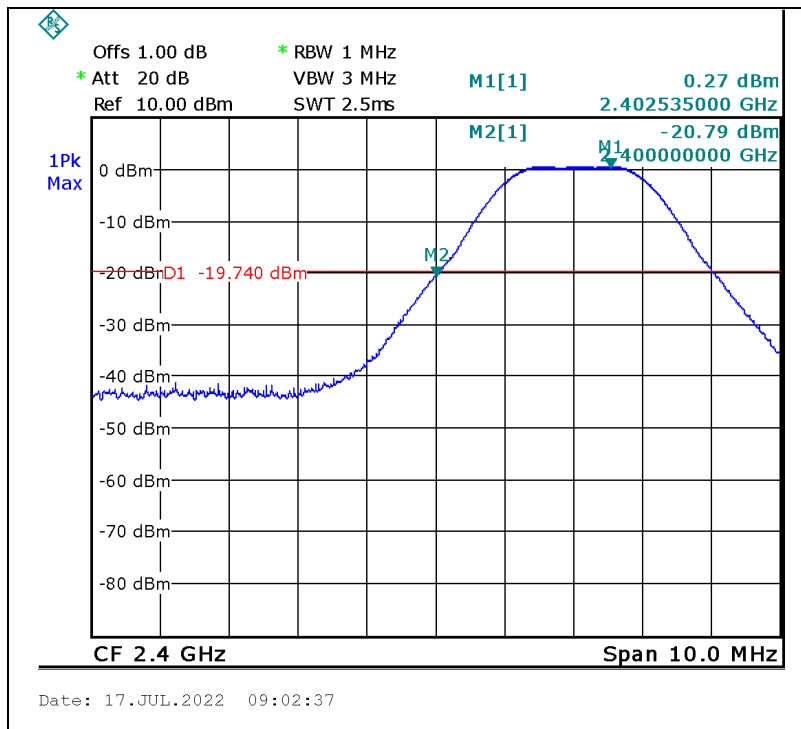


Figure 14. 2402.0 MHz, BLE

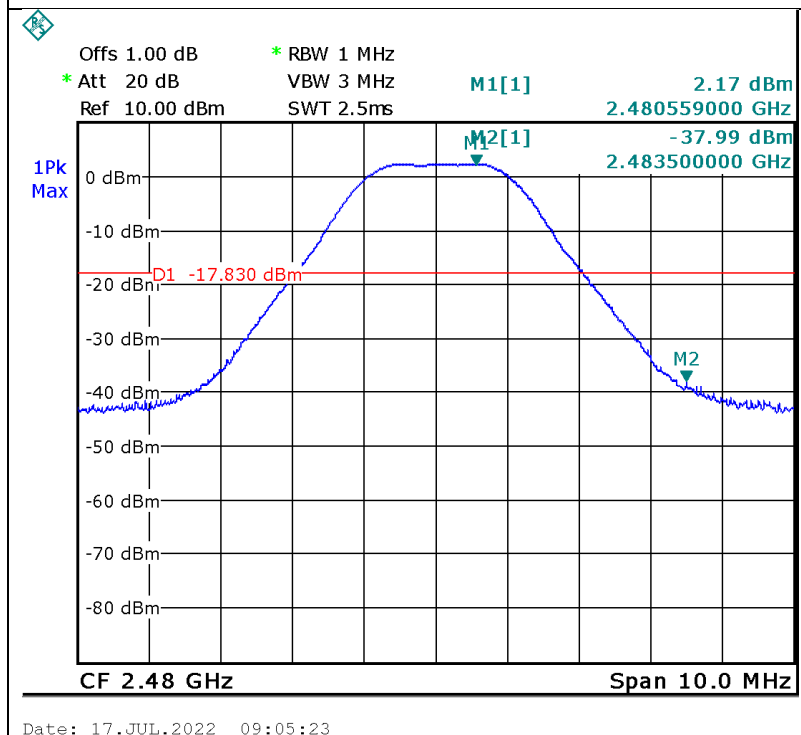


Figure 15. 2480.0 MHz, BLE



6.5 Test Equipment Used; Band Edge

Instrument	ITL #	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	1499	R&S	FSL6	100194	20/2/2022	20/2/2023
RF Cable	1844	EIM	705A009301EIM		16/5/2022	16/5/2023

Figure 16 Test Equipment Used

7. Transmitted Power Density

7.1 Test Specification

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

RSS-247, Issue 2, Section 5.2(b)

7.2 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. antenna terminal was connected to the Spectrum Analyzer through an appropriate coaxial cable (total loss= 1.0dB). The spectrum analyzer was set to 3 kHz RBW.

7.3 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.

7.4 Test Results

Protocol Type	Operation Frequency	PSD Reading	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
BLE	2402.0	-17.52	8.0	-25.52
	2426.0	-16.17	8.0	-24.17
	2480.0	-15.78	8.0	-23.78

Figure 17 Test Results

JUDGEMENT: Passed

For additional information see Figure 18 to Figure 20.

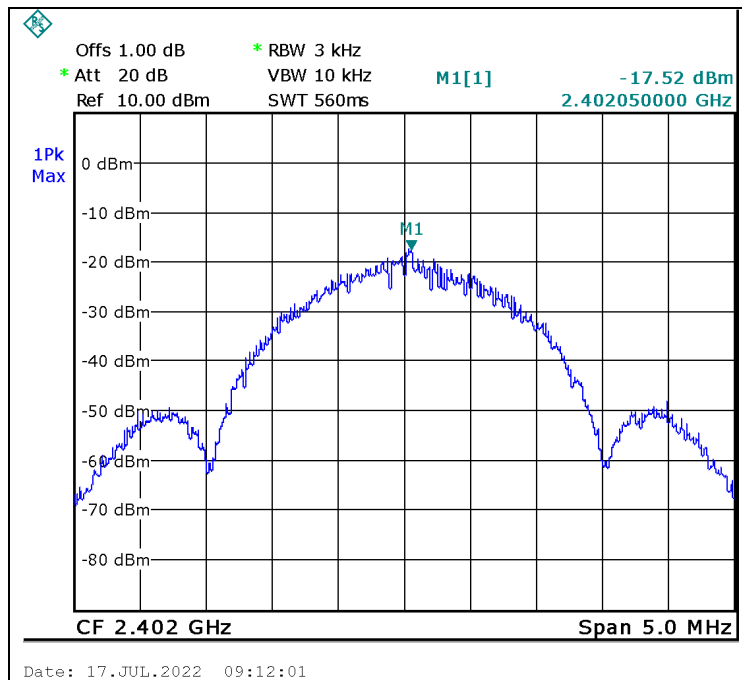


Figure 18. 2402.0 MHz, BLE

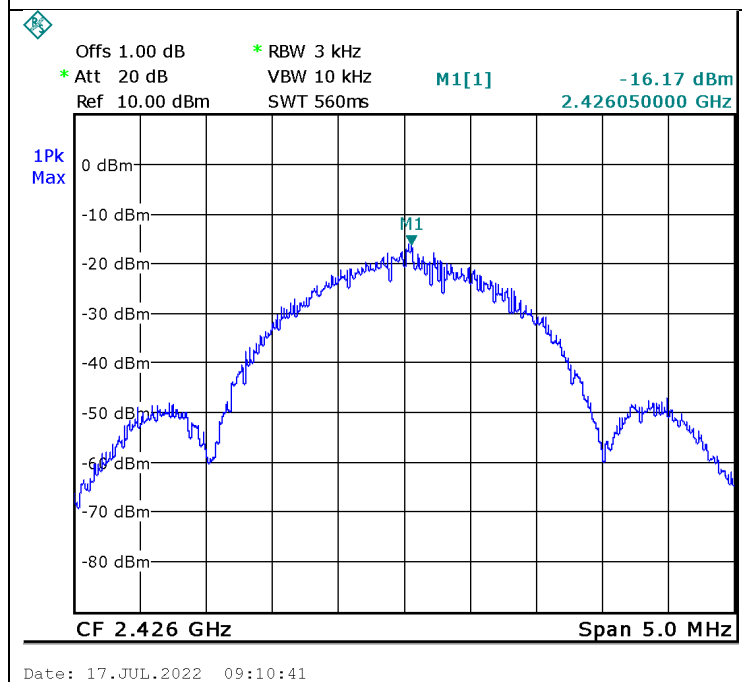
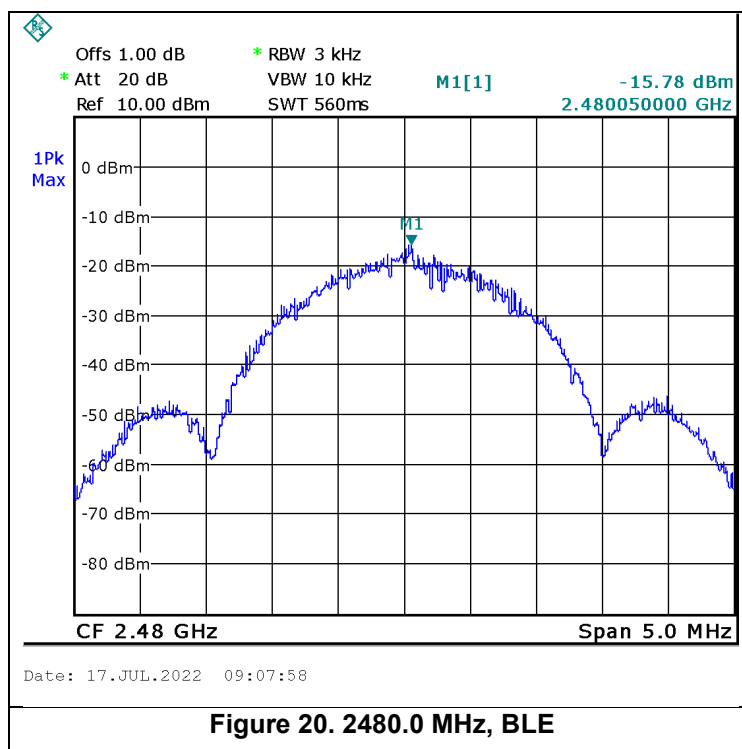


Figure 19. 2426.0 MHz, BLE



7.5 Test Equipment Used; Transmitted Power Density

Instrument	ITL #	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	1499	R&S	FSL6	100194	20/2/2022	20/2/2023
RF Cable	1844	EIM	705A009301EIM	-	16/5/2022	16/5/2023

Figure 21 Test Equipment Used

8. Occupied Bandwidth

8.1 Test Specification

FCC, Part 2, Sub part J, Section 2.1049

RSS-Gen, Issue 5: 2014, Section 6.6

8.2 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. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss= 32.0dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

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.

8.3 Test Limit

N/A

8.4 Test Results

Protocol Type	Operation Frequency	Reading
	(MHz)	(MHz)
BLE	2402.0	2.03
	2426.0	2.03
	2480.0	2.05

Figure 22. Bandwidth Test Results

JUDGEMENT: Passed

For additional information see Figure 23 to Figure 25.

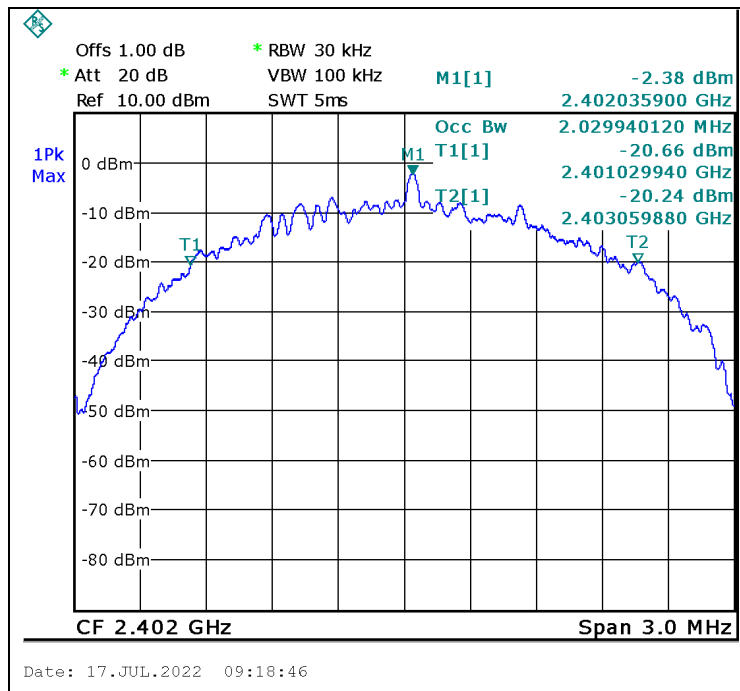


Figure 23. 2402.0 MHz, BLE

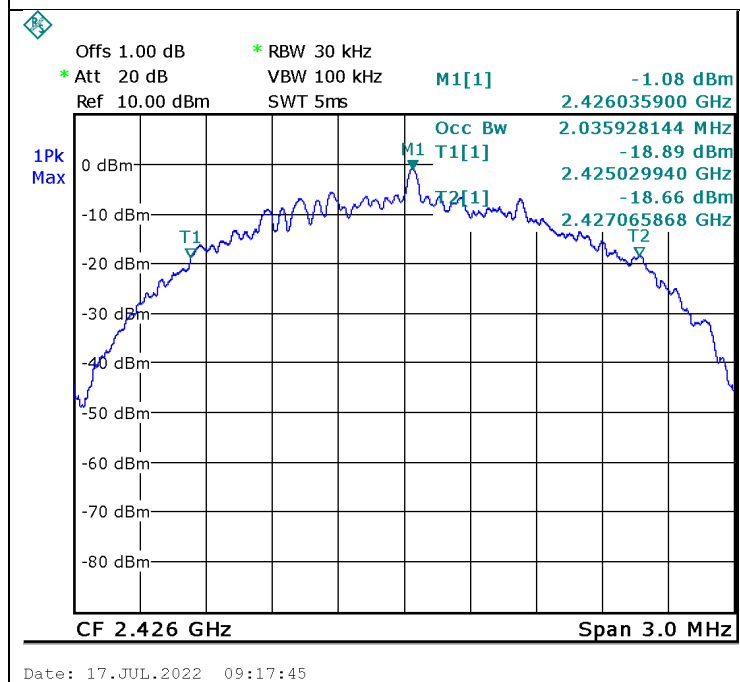
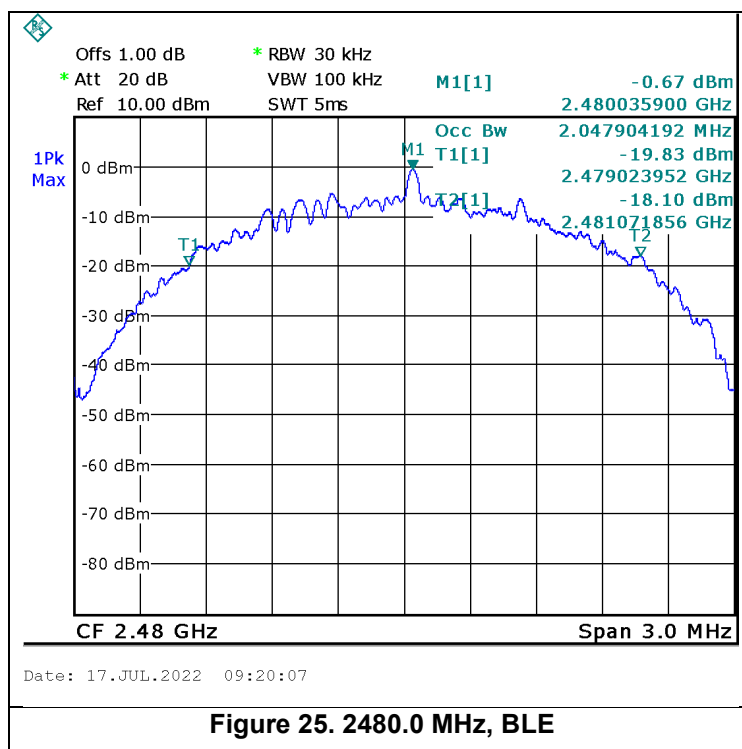


Figure 24. 2426.0 MHz, BLE



8.5 Test Equipment Used; Bandwidth

Instrument	ITL #	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	1499	R&S	FSL6	100194	20/2/2022	20/2/2023
RF Cable	1844	EIM	705A009301EIM	-	16/5/2022	16/5/2023

Figure 26 Test Equipment Used

9. Emissions in Non-Restricted Frequency Bands

9.1 Test Specification

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

RSS-247, Issue 2, Section 5.5

9.2 Test Procedure

(Temperature (22°C)/ Humidity (57%RH))

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

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (max total loss=34.0 dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

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

9.3 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.

9.4 Test Results

JUDGEMENT: Passed

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

For additional information see *Figure 27* to *Figure 29*.

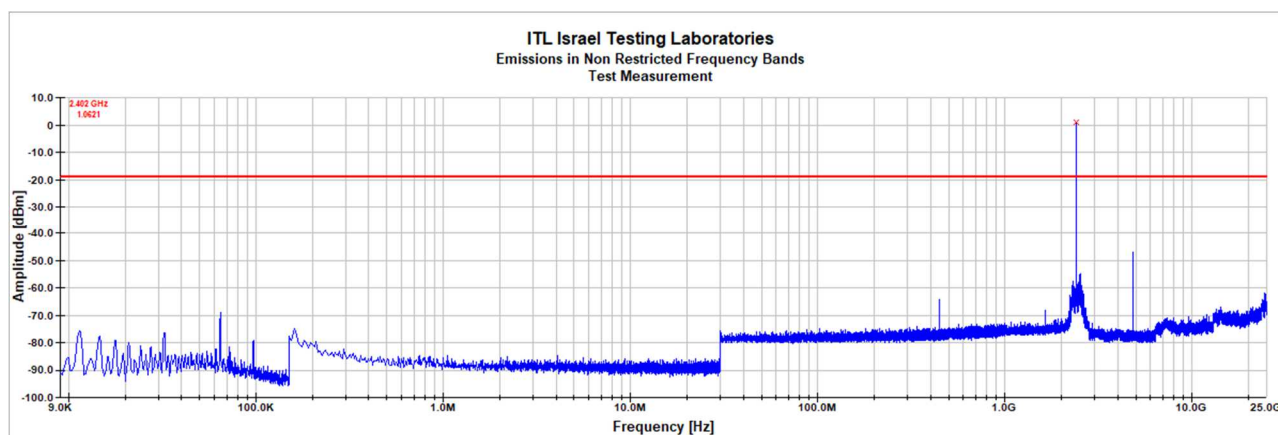


Figure 27 2402.0 MHz, BLE

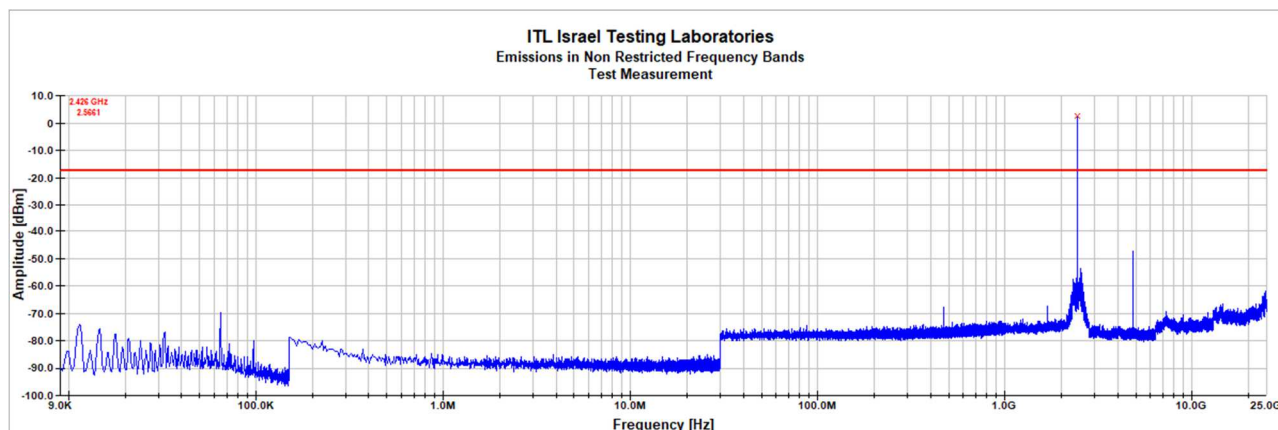


Figure 28 2426.0 MHz, BLE

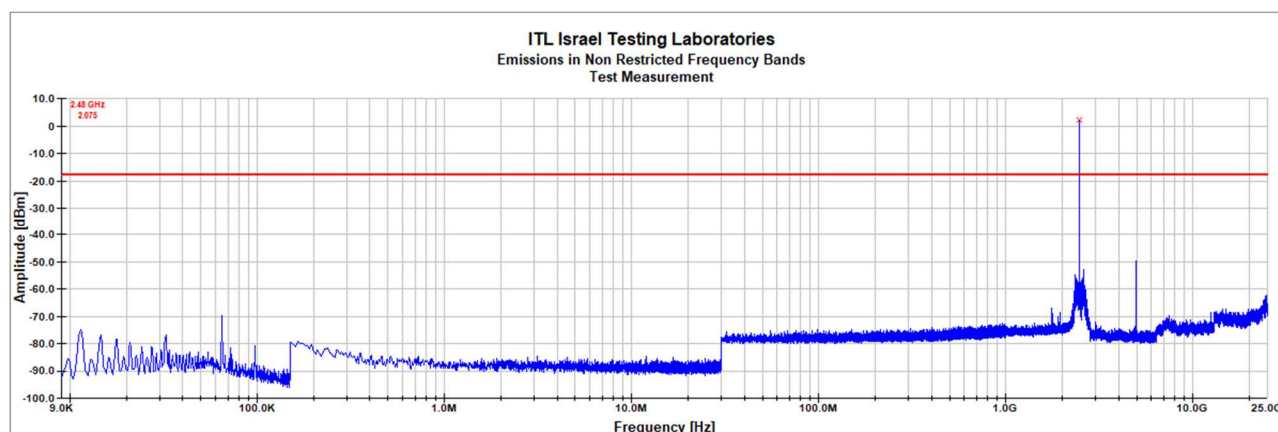


Figure 29 2480.0 MHz, BLE

Note: All peaks in plots are the fundamental transmission frequency.

9.1 Test Instrumentation Used, Emission in Non Restricted Frequency Bands

Instrument	ITL #	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	1175	HP	8564E	3442A00275	20/2/2022	20/2/2023
RF Cable	1844	EIM	705A009301EIM	-	16/5/2022	16/5/2023

Figure 30 Test Equipment Used



10. Emissions in Restricted Frequency Bands

10.1 Test Specification

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

RSS-247, Issue 2, Section 3.3

RSS Gen, Issue 5, Section 8.10

10.2 Test Procedure

(Temperature (23°C)/ Humidity (55%RH))

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

For measurements between 0.009-30MHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The frequency range 0.009MHz-30MHz was scanned.

For measurements between 30-1000MHz:

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The frequency range 30MHz -1000MHz was scanned and the list of the highest emissions was verified and updated accordingly.

For measurements between 1GHz-25GHz:

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

The frequency range 1GHz -25GHz was scanned.

The highest radiation describes in the tables below

10.3 FCC Test Limit

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.

Figure 31 FCC Table of Limits

10.4 IC Test Limit

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

Frequency (MHz)	Magnetic Field strength (microampere/meter)	Measurement distance (meters)	Magnetic Field strength (dBμA/m)	Magnetic Field strength* (dBμA/m)@3m
0.009-0.490	6.37/F(kHz)	300	-3.0-(-37.7)	77.0-42.2
0.490-1.705	63.7/F(kHz)	30	-17.7-(-28.5)	22.3-11.4
1.705-30.0	0.08	30	-21.9	18.0
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength (dBμV/m)	Field strength* (dBμV/m)@3m
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.

Figure 32 IC Table of Limits



10.5 Test Results

JUDGEMENT: Passed by -0.9 dB

For the operation frequency of 2480 MHz, the margin between the emission level and the specification limit is in the worst case -0.9 dB at the frequency of 2483.5 MHz, horizontal polarization.

The EUT met the requirements of the FCC Part 15, Subpart C Sections 15.209, 15.205, 15.247(d) and RSS-247, Issue 2, Section 3.3; RSS Gen, Issue 5, Section 8.10 specifications.

The details of the highest emissions are given in *Figure 33*.



Radiated Emission

E.U.T Description Battery-operated, Wall-mounted Tag
Type Arial ECall (Model B)
Serial Number: Not designated

Specifications: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d)
RSS-247, Issue 2, 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	52.0	74.0		-	54.0	
	2390.0	H	52.7	74.0		-	54.0	
	4804.0	V	45.2	74.0		-	54.0	
	4804.0	H	46.3	74.0		-	54.0	
2426.0	4852.0	V	45.8	74.0		-	54.0	
	4852.0	H	45.9	74.0		-	54.0	
2480.0	4960.0	V	45.2	74.0		-	54.0	
	4960.0	H	46.6	74.0		-	54.0	
	2483.5	V	62.8	74.0		52.8	54.0	-1.2
	2483.5	H	63.0	74.0		53.1	54.0	-0.9

Figure 33. Radiated Emission Results

Measurement results includes correction factor.

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



10.6 Test Instrumentation Used; Emissions in Restricted Frequency Bands

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Low Noise Amplifier 16-30 GHz	Sophia Wireless	LNA28-B	232	16-May 2022	16-May 2023
Active Loop Antenna	EMCO	6502	2950	05-Jul 2022	05-Jul 2023
Low Noise Amplifier	Narda	DBS-0411N313	13	16-May 2022	16-May 2023
Filter Band pass 8-16 GHz	Serno	MFR01341-HI-3816JJ-1	322	16-May 2022	16-May 2023
Spectrum Analyzer	HP	8564E	3442A00275	23-Feb 2022	23-Feb 2023
EMI Receiver	HP (Agilent)	8542E	3906A00276	22-Feb 2022	22-Feb 2023
RF Filter	HP (Agilent)	85420E	3705A00248	22-Feb 2022	22-Feb 2023
MicroWave System Amplifier (LNA)	HP	83006A	3104A00589	23-Aug 2020	23-Aug 2021
Log-periodic Antenna	EMCO	3146	9505-4081	27-Apr 2021	27-Apr 2024
Horn Antenna	ETS	3115	29845	25-May 2021	25-May 2024
Horn Antenna	ARA	SWH-28	1007	02-Nov 2021	02-Nov 2024
Biconical Antenna	EMCO	3110B	9912-3337	18-Jan 2022	18-Jan 2024
Multi device Controller	EMCO	2090	9908-1456	NCR	NCR
LOD Semi anechoic Civil Chamber	ETS	2070-2	SL 11643	NCR	NCR
Spectrum Analyzer	Rohde & Schwarz	2087	100194	20-Feb 2022	20-Feb 2023
EMI Test Receiver	Rohde & Schwarz	ESCI7	100724	20-Feb 2022	20-Feb 2023
Low Loss cable	Huber Suhner	Sucofelex	27504/4PEA	16-May 2022	16-May 2023
30 dB attenuator	MCL	BW-S30W5	533	16-May 2022	16-May 2023



Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
LNA Horn Antenna amplifier Ka band	OSR Electronics (Serge)	PE9850R-20	J202021732	16-May 2022	16-May 2025
10 m RF cable	CommScope ORS (Serge)	0623 WBC-400	G020133	16-May 2022	16-May 2023
35m coaxial cable for oats	EIM (Huber Suhner)	RG214-11N(X2) RG214/U	0	22-Jun 2022	22-Jun 2023

Figure 34 Test Equipment Used



11. Antenna Gain/Information

The antenna gain is 5.1 dBi, type: integral.

12. R.F Exposure/Safety

See a separate file.



13. Appendix A - Correction Factors

13.1 ITL #1911: OATS RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1.00	0.50		450.00	5.83
10.00	1.00		500.00	6.33
20.00	1.34		550.00	6.67
30.00	1.50		600.00	6.83
50.00	1.83		650.00	7.17
100.00	2.67		700.00	7.66
150.00	3.17		750.00	7.83
200.00	3.83		800.00	8.16
250.00	4.17		850.00	8.50
300.00	4.50		900.00	8.83
350.00	5.17		950.00	8.84
400.00	5.50		1000.00	9.00

13.2 ITL #1840: Semi-Anechoic Chamber RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1,000.0	-1.40		10,000.0	-6.00
1,500.0	-1.70		10,500.0	-6.20
2,000.0	-2.00		11,000.0	-6.20
2,500.0	-2.30		11,500.0	-6.00
3,000.0	-2.60		12,000.0	-6.00
3,500.0	-2.80		12,500.0	-6.10
4,000.0	-3.10		13,000.0	-6.30
4,500.0	-3.30		13,500.0	-6.50
5,000.0	-3.60		14,000.0	-6.70
5,500.0	-3.70		14,500.0	-7.00
6,000.0	-4.00		15,000.0	-7.30
6,500.0	-4.40		15,500.0	-7.50
7,000.0	-4.7		16,000.0	-7.60
7,500.0	-4.80		16,500.0	-8.00
8,000.0	-5.00		17,000.0	-8.00
8,500.0	-5.10		17,500.0	-8.10
9,000.0	-5.60		18,000.0	-8.20
9,500.0	-5.80			

13.3 ITL # 1075: Active Loop Antenna

Frequency (MHz)	MAF (dBs/m)	AF (dB/m)		Frequency (MHz)	MAF (dBs/m)	AF (dB/m)
0.01	-33.10	18.40		3.00	-40.00	11.50
0.02	-37.20	14.30		4.00	-40.10	11.40
0.03	-38.20	13.30		5.00	-40.20	11.30
0.05	-39.80	11.70		6.00	-40.40	11.10



0.10	-40.10	11.40
0.20	-40.30	11.20
0.30	-40.30	11.20
0.50	-40.30	11.20
0.70	-40.30	11.20
1.00	-40.10	11.40
2.00	-40.00	11.50

7.00	-40.40	11.10
8.00	-40.40	11.10
9.00	-40.50	11.00
10.00	-40.50	11.00
20.00	-41.50	10.00
30.00	-43.50	8.00

13.4 ITL #1356: Biconical Antenna

Frequency (MHz)	AF (dB/m)		Frequency (MHz)	AF (dB/m)
30.00	13.00		90.00	8.23
35.00	10.89		100.00	11.12
40.00	10.59		120.00	13.16
45.00	10.63		140.00	13.07
50.00	10.12		160.00	14.80
60.00	9.26		180.00	16.95
70.00	7.74		200.00	17.17
80.00	6.63			

13.5 ITL # 1349: Log Periodic Antenna

Frequency (MHz)	AF (dB/m)
200.00	11.58
250.00	12.04
300.00	14.76
400.00	15.55
500.00	17.85
600.00	18.66
700.00	20.87
800.00	21.15
900.00	22.32
1000.00	24.22



13.6 ITL # 1352: 1-18 GHz Horn Antenna

Frequency (GHz)	AF (dB/m)		Frequency (GHz)	AF (dB/m)
0.75	25.00		9.50	38.00
1.00	23.50		10.00	38.50
1.50	26.00		10.50	38.50
2.00	29.00		11.00	38.50
2.50	27.50		11.50	38.50
3.00	30.00		12.00	38.00
3.50	31.50		12.50	38.50
4.00	32.50		13.00	40.00
4.50	32.50		13.50	41.00
5.00	33.00		14.00	40.00
5.50	35.00		14.50	39.00
6.00	36.50		15.00	38.00
6.50	36.50		15.50	37.50
7.00	37.50		16.00	37.50
7.50	37.50		16.50	39.00
8.00	37.50		17.00	40.00
8.50	38.00		17.50	42.00
9.00	37.50		18.00	42.50

13.7 ITL # 1353: 18-26.5 GHz Horn Antenna

Frequency (MHz)	Measured antenna factor (dB/m) ¹		Frequency (MHz)	Measured antenna factor (dB/m) ¹
18,000.00	32.40		22,500.00	33.00
18,500.00	32.00		23,000.00	33.10
19,000.00	32.30		23,500.00	33.80
19,500.00	32.40		24,000.00	33.50
20,000.00	32.30		24,500.00	33.50
20,500.00	32.80		25,000.00	33.80
21,000.00	32.80		25,500.00	33.90
21,500.00	32.70		26,000.00	34.20
22,000.00	33.10		26,500.00	34.70

End of Test Report

¹ The antenna factor shall be added to the receiver's reading in dBμV, to obtain field strength in dBμ V/m