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# Allied Universal Electronic Monitoring TEST REPORT

## SCOPE OF WORK

EMC TESTING – AT1 V2 (WEARABLE TRACKER)

## REPORT NUMBER

105681297LEX-001.2

## ISSUE DATE:

2/21/2024

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Non-Specific EMC Report Shell Rev. December 2017

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## EMC TEST REPORT (FULL COMPLIANCE)

**Report Number:** 105681297LEX-001.2

**Project Number:** G105681297

**Report Issue Date:** 5/15/2024

**Model(s) Tested:** AT1 V2 (Wearable Tracker)

**Standards:** FCC Part 15B  
ICES-003 Issue 7  
FCC Part 15C, 24, 27  
RSS-247 Issue 3, 130 Issue 2, 133 Issue 6,  
139 Issue 4, 210 Issue 10  
(Limited to Radiated Spurious Emissions)

Tested by:  
Intertek Testing Services NA, Inc.  
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Lexington, KY 40510  
USA

Client:  
Allied Universal Electronic Monitoring  
Daniel Williamson  
1838 Gunn Hwy.  
Odessa, FL 33556  
USA

Report prepared by



David Perry,  
EMC Engineer

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## 1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

## 2 Test Summary

Section	Test full name	Result
6	Radiated Emissions (Transmitters Idle) (ANSI C63.4:2014)	Pass
7	Radiated Spurious Emissions (Transmitters Active) (ANSI C63.10:2013)	Pass
7	Radiated Spurious Emissions (Transmitters Active) (ANSI C63.26:2015)	Pass
8	Conducted Emissions (ANSI C63.4:2014)	Pass



### 3 Client Information

This product was tested at the request of the following:

Client Information	
<b>Client Name:</b>	Allied Universal Electronic Monitoring
<b>Address:</b>	Daniel Williamson 1838 Gunn Hwy. Odessa, FL 33556 USA
<b>Contact:</b>	Daniel Williamson
<b>Telephone:</b>	813-322-2847
<b>Email:</b>	Daniel.Williamson@em.aus.com
Manufacturer Information	
<b>Manufacturer Name:</b>	Allied Universal Electronic Monitoring
<b>Manufacturer Address:</b>	Daniel Williamson 1838 Gunn Hwy. Odessa, FL 33556 USA



#### 4 Description of Equipment under Test and Variants

Equipment Under Test	
Product Name	AT1 V2 (Wearable Tracker)
Model Number	14114AVL
Serial Number	34940056
Hardware Version	2.0
Software Version	V4.5.2.65
Supported Transmit Bands	SRD: 433.92MHz Wi-Fi: 2412-2480Mhz Cell: LTE B2, B4, B13
Embedded Module	SRD: Semtech SX1276IMLTRT Wi-Fi: Inventek ISM4343-WBM-L151 Cell: Telit LE910C-NF
Embedded Module hardware Version	SRD: N/A Wi-Fi: N/A Cell: HW 1.30
Embedded Module Software Version	SRD: N/A Wi-Fi: ISM4343_WBML151_C6.2.1.5.ATTENTI_NF_AT1BU3K.RC3 ISM4343_WBML151_MFG_C6.2.1.0.RC3 Cell: M0F.260012
Embedded Module FCCID	SRD: NC3-10424VL Wi-Fi: O7P-4343 Cell: RI7LE910CXNF
Receive Date	1/17/2024
Test Start Date	1/17/2024
Test End Date	2/6/2024
Device Received Condition	Good
Test Sample Type	Production
Rated Voltage	120VAC
Low Voltage	100VAC
High Voltage	240VAC
Description of Equipment Under Test (provided by client)	
Allied Universal EM GPS Offender Tracking Device Model 14114AVL.	

##### 4.1 Variant Models:

The following variant models were not tested as part of this evaluation but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

The below models are electrically identical, the only difference being the SIM card:

- 14124AVL
- 14134AVL



## 5 System Setup and Method

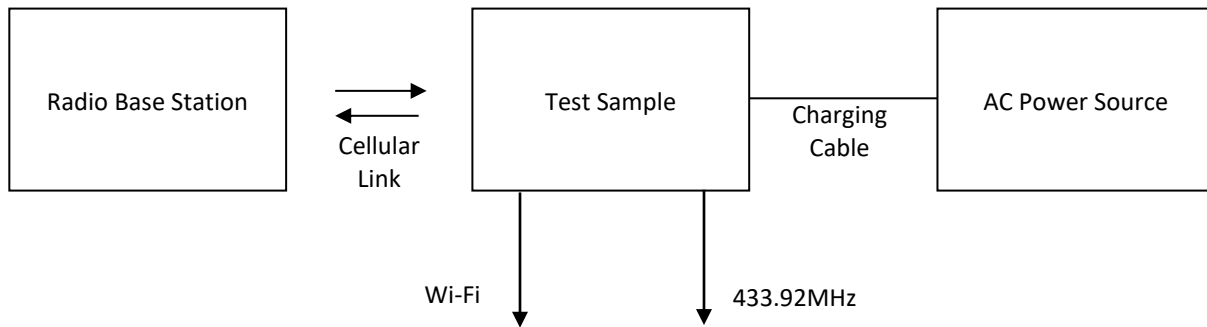
### 5.1 Method:

Configuration as required by ANSI C63.4:2014, ANSI C63.10:2013, and ANSI C63.26:2015.

No.	Descriptions of EUT Exercising
1	The device was transmitting using all three radios simultaneously. <ul style="list-style-type: none"><li>• Cell radio was in a call established with cellular base station</li><li>• SRD was transmitting at 433.92MHz</li><li>• Wi-Fi radio was sent forced continuous transmit commands</li></ul>
2	The device was operating normally with radios idle.

Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	Charging Cable	3M	No	No	AC Mains

### 5.2 EUT Block Diagram:





### 5.3 EUT Photo (Front):







5.4 EUT Photo (Back):





## 6 Radiated Emissions

### 6.1 Method

Tests are performed in accordance with ANSI C63.4:2014, ANSI C63.10:2013, and ANSI C63.26:2015.

**TEST SITE:** 10m ALSE

**Site Designation:** 10m Chamber

#### Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U <sub>cispr</sub>
Radiated Emissions, 10m	30-1000 MHz	3.9dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	4.0dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.7dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	4.7dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	4.7dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	4.7dB	5.5 dB

As shown in the table above our radiated emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.



## 6.2 Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

RA = 52.0 dB $\mu$ V  
AF = 7.4 dB/m  
CF = 1.6 dB  
AG = 29.0 dB  
FS = 32 dB $\mu$ V/m

To convert from dB $\mu$ V to  $\mu$ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$
$$NF = \text{Net Reading in dB}\mu\text{V}$$

### Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$
$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

## 6.3 Field Strength to Power Calculation

As allowable by ANSI C63.26: 2015 section 5.2.7, the output power of unwanted emissions can be calculated from a field strength measurement. The transmitter measurements that follow in this report have applied the following calculation to the -13dBm limit to arrive an equivalent field strength limit at 3 meters as follows:

$E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20\log(D) + 104.8$ ; where D is the measurement distance (in the far field region) in m.

### Example:

$$\text{Limit (dB}\mu\text{V/m)} = -13 - 20\log(3) + 104.8 = 82.25\text{dB}\mu\text{V/m}$$



#### 6.4 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8258	Rohde&Schwarz	ESW44	9/19/2023	9/19/2024
Bilog Antenna	7085	SunAR	JB6	3/7/2023	3/7/2024
Horn Antenna	4001	ETS Lindgren	3117	2/28/2023	2/28/2024
System Controller	4096	ETS Lindgren	2090	Verify at Time of Use	Verify at Time of Use
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
Preamplifier	3918	TS-PR18	122005	1/12/2024	1/12/2025
Coaxial Cable	3074			1/12/2024	1/12/2025
Coaxial Cable	2588			1/12/2024	1/12/2025
Coaxial Cable	2593			1/12/2024	1/12/2025
Coaxial Cable	2592			1/12/2024	1/12/2025
Coaxial Cable	8188			1/12/2024	1/12/2025
Coaxial Cable	8185			1/12/2024	1/12/2025
Preamplifier	7019	Rohde & Schwarz	TS-PR3	1/12/2024	1/12/2025
Coaxial Cable	3172			1/12/2024	1/12/2025
Coaxial Cable	2590			1/12/2024	1/12/2025
Coaxial Cable	2589			1/12/2024	1/12/2025

#### 6.5 Software Utilized:

Name	Manufacturer	Version
EMC32	Rohde & Schwarz	Version 10.60.20

#### 6.6 Results:

The sample tested was found to Comply.

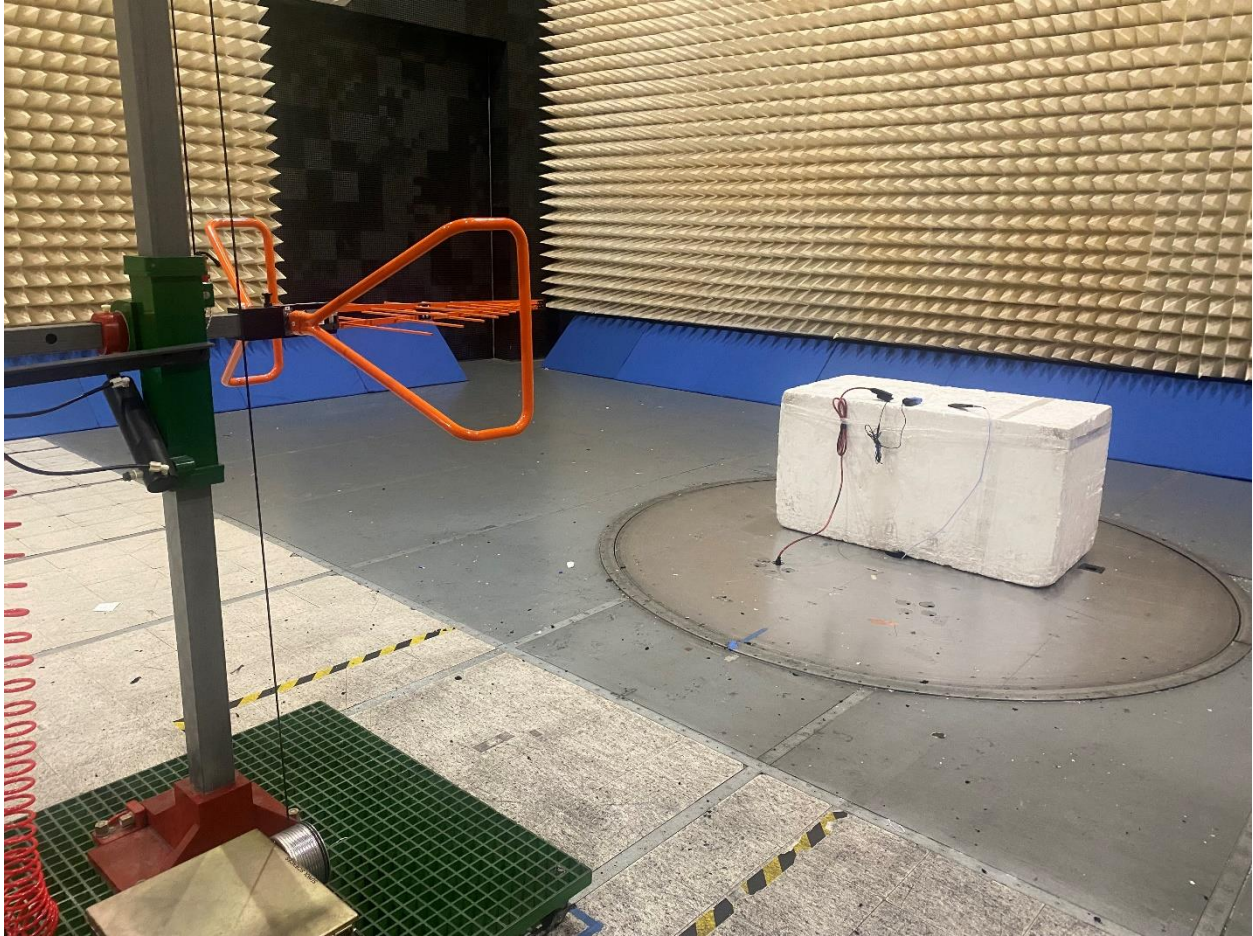


## 6.7 Setup Photographs: Radiated Emissions (FCC Part 15B Below 1GHz)



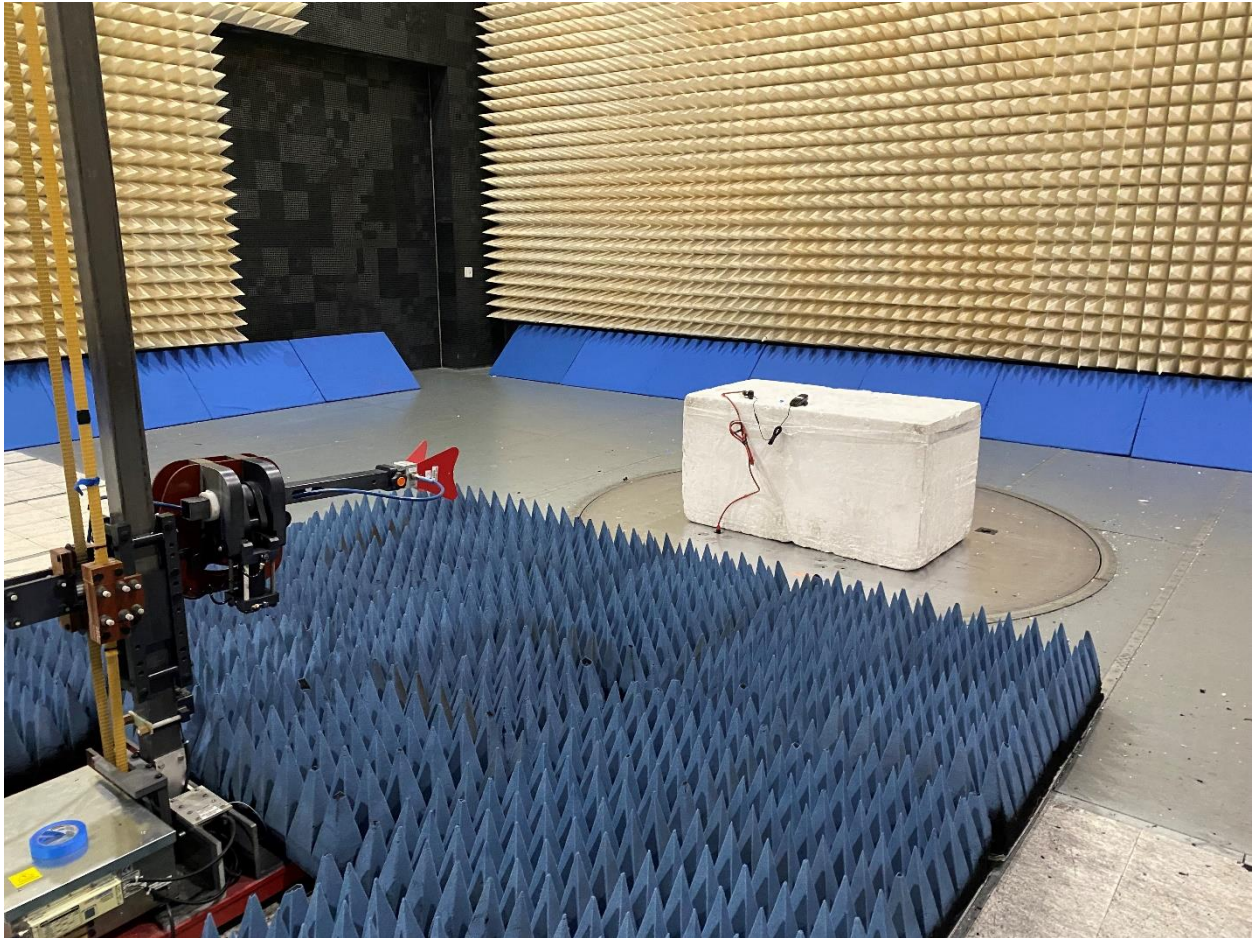


### 6.8 Setup Photographs: Radiated Emissions (FCC Part 15C/24/27 Below 1GHz)



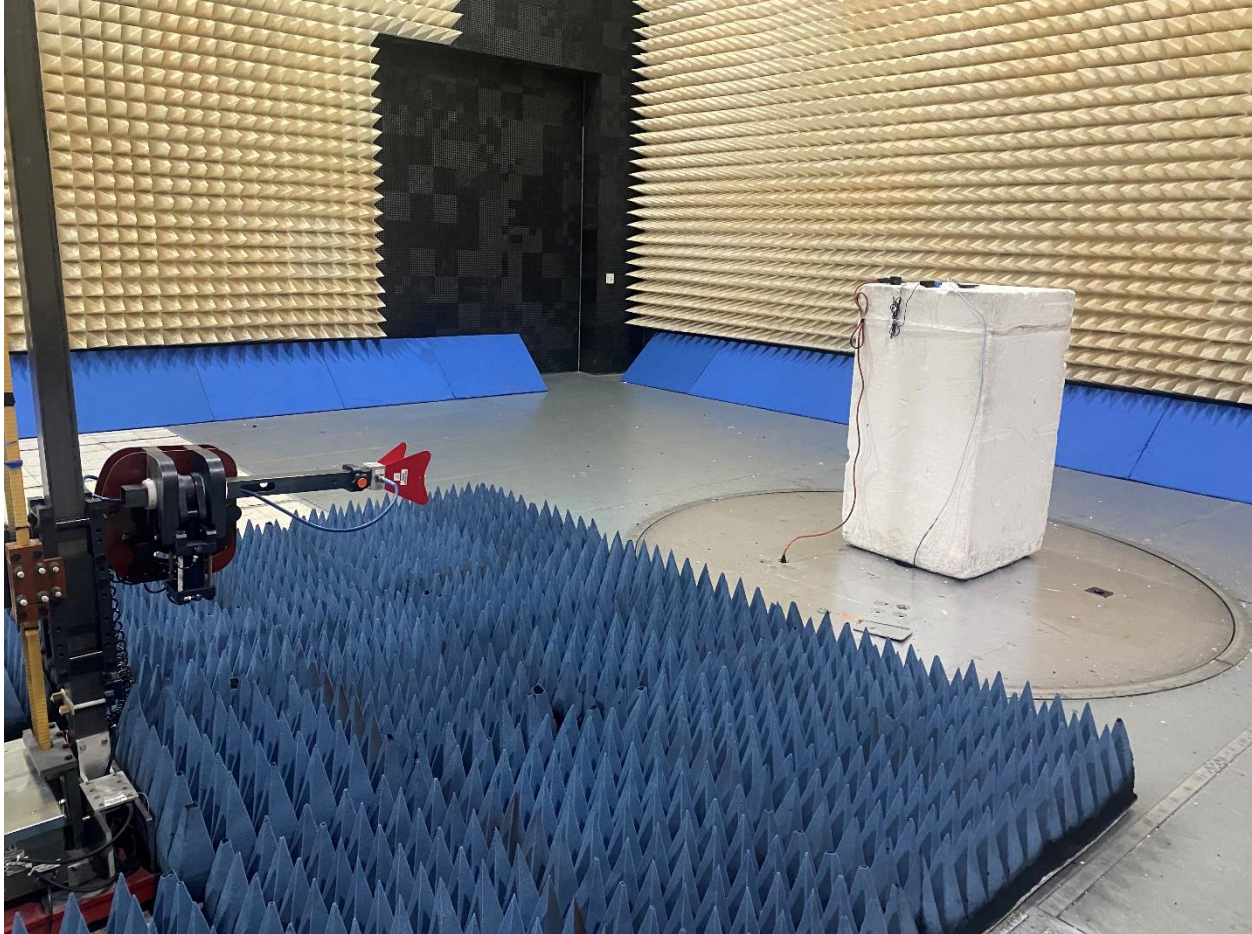


### 6.9 Setup Photographs: Radiated Emissions (FCC Part 15B Above 1GHz)





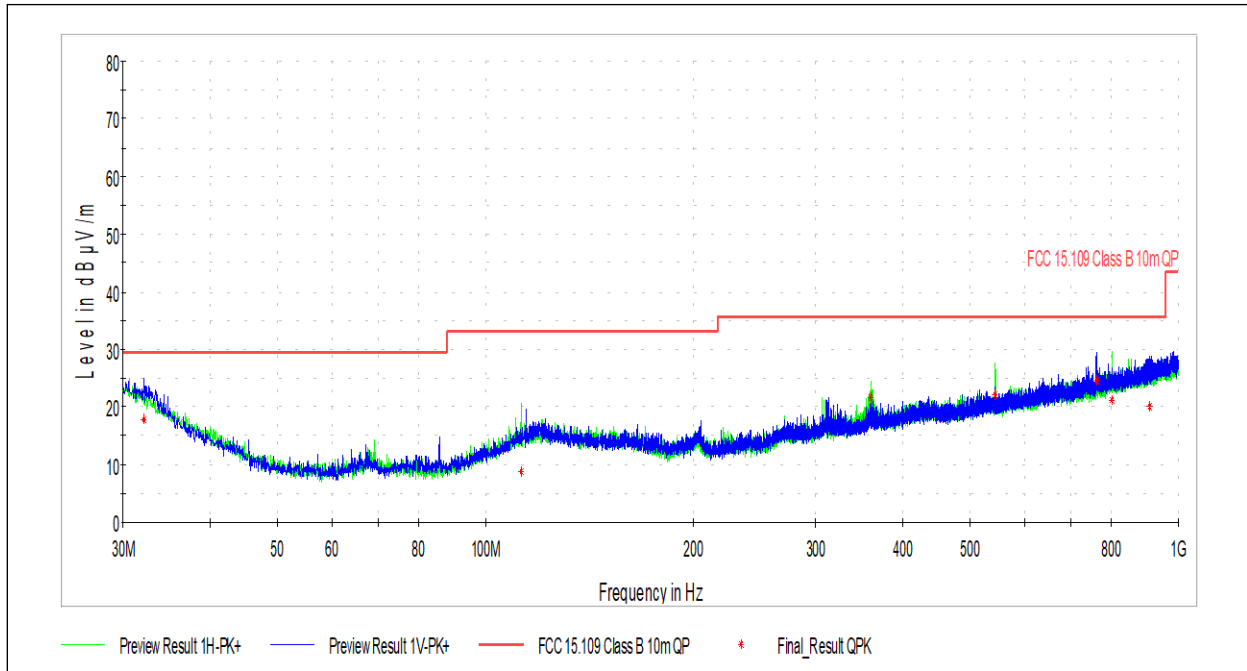
### 6.10 Setup Photographs: Radiated Emissions (FCC Part 15C/24/27 Above 1GHz)







**6.11 Plots/Data: Radiated Emissions, 30MHz – 1GHz (Transmitters Idle)**



Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.102	17.72	29.55	11.83	118.0	V	27.0	-3.7
112.612	8.70	33.10	24.40	400.0	H	221.0	-9.4
359.800	21.55	35.55	14.00	303.0	H	127.0	-6.9
544.100	22.03	35.55	13.52	97.0	H	6.0	-3.1
762.081	24.51	35.55	11.04	149.0	V	304.0	1.3
801.797	21.15	35.55	14.40	202.0	H	96.0	1.8
908.604	19.96	35.55	15.59	166.0	V	336.0	3.9

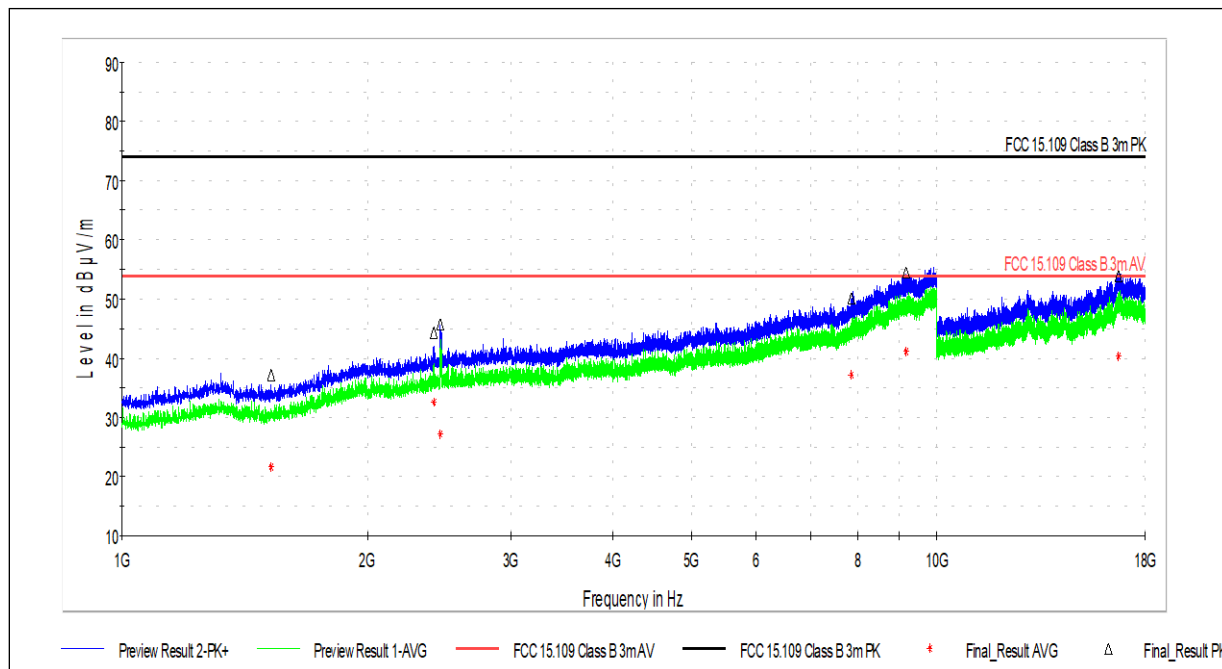
Test Personnel: David perry  
 Supervising/Reviewing Engineer: N/A  
 (Where Applicable) FCC Part 15B  
 Product Standard: ICES-003 Issue 7  
 Input Voltage: 120VAC/60Hz  
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 1/17/2024  
 Limit Applied: Class B  
 Ambient Temperature: 23.2°C  
 Relative Humidity: 38.1%  
 Atmospheric Pressure: 983.4mbar

Deviations, Additions, or Exclusions: The FCC Part 15.109 limits are more stringent than the corresponding limits from ICES-003 Issue 7.



**6.12 Plots/Data: Radiated Emissions, 1GHz – 18GHz (Transmitters Idle)**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1524.000	37.21	73.98	36.77	410.0	V	331.0	-0.2
2410.500	44.22	73.98	29.76	126.0	V	43.0	5.2
2457.000	45.80	73.98	28.18	100.0	V	0.0	5.6
7848.500	50.16	73.98	23.82	126.0	H	160.0	14.2
9159.000	54.55	73.98	19.43	187.0	H	55.0	16.2
16706.500	53.84	73.98	20.14	116.0	H	243.0	26.2

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1524.000	21.66	53.98	32.32	410.0	V	331.0	-0.2
2410.500	32.59	53.98	21.39	126.0	V	43.0	5.2
2457.000	27.14	53.98	26.84	100.0	V	0.0	5.6
7848.500	37.13	53.98	16.85	126.0	H	160.0	14.2
9159.000	41.18	53.98	12.80	187.0	H	55.0	16.2
16706.500	40.35	53.98	13.63	116.0	H	243.0	26.2

Test Personnel: David perry  
 Supervising/Reviewing Engineer: N/A  
 (Where Applicable) FCC Part 15B  
 Product Standard: ICES-003 Issue 7  
 Input Voltage: 120VAC/60Hz  
 Pretest Verification w / Ambient Signals or BB Source: Yes

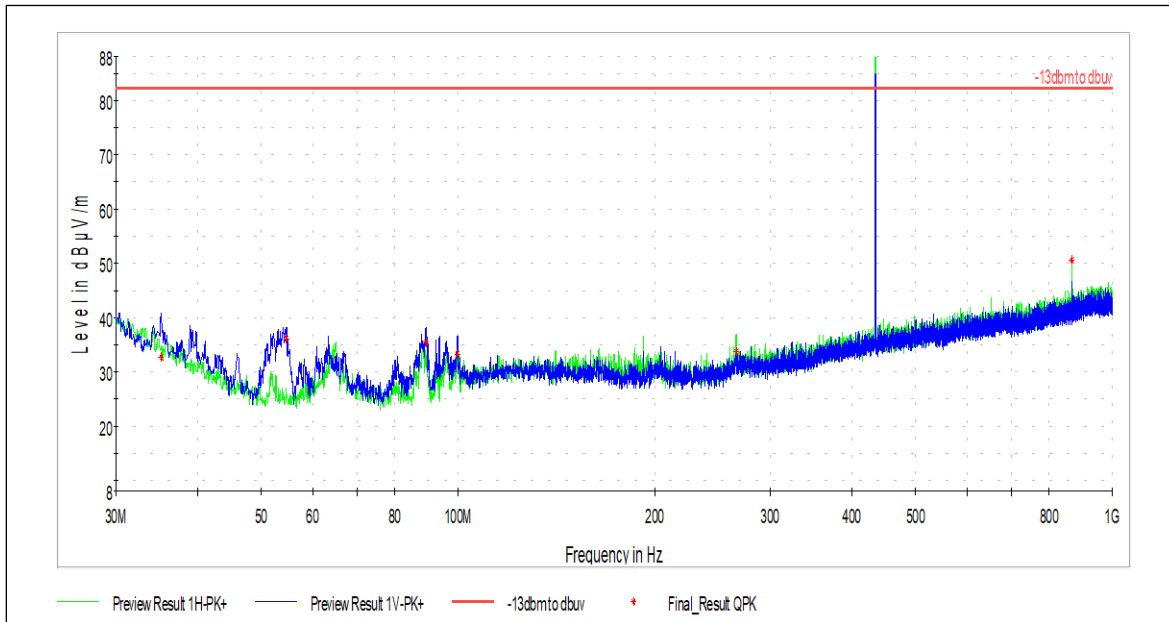
Test Date: 1/17/2024  
 Limit Applied: Class B  
 Ambient Temperature: 23.2°C  
 Relative Humidity: 38.1%  
 Atmospheric Pressure: 983.4mbar

Deviations, Additions, or Exclusions: None



## 7 FCC Part 15C/24/27 Radiated Spurious Emissions

### 7.1 Radiated Spurious Emissions, 30 MHz – 1 GHz, (433.92MHz, 802.11b Channel 6, LTE Band 2)



\*Emission at 433.92MHz is from the SRD and is not a failing emission

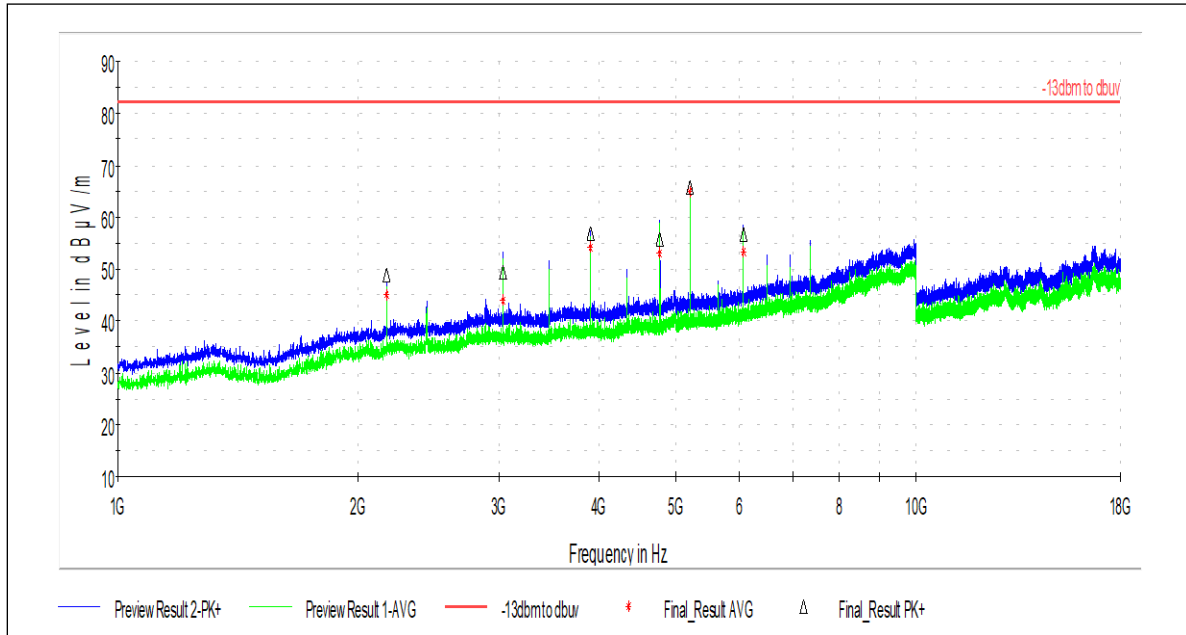
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.173	32.63	82.25	49.62	120.000	100.0	V	173.0	23.4
54.681	36.11	82.25	46.14	120.000	100.0	V	179.0	14.1
89.332	35.44	82.25	46.81	120.000	119.0	V	16.0	15.9
99.948	33.19	82.25	49.06	120.000	105.0	V	48.0	18.1
266.464	33.71	82.25	48.54	120.000	104.0	H	78.0	21.4
867.864	50.55	82.25	31.70	120.000	95.0	H	192.0	31.9

Test Personnel:	David Perry	Test Date:	2/5/2024
Supervising/Reviewing Engineer:	(Where Applicable) N/A	Limit Applied:	-13dBm converted to field strength
Product Standard:	FCC Part 15C, 24 RSS-247 Issue 3, RSS-133 Issue 6, RSS-210 Issue 5	Ambient Temperature:	23.2°C
Input Voltage:	120VAC/60Hz	Relative Humidity:	38.1%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	983.4mbar

Deviations, Additions, or Exclusions: None



**7.2 Radiated Spurious Emissions, 1 GHz – 18 GHz, (433.92Mhz, 802.11b Channel 6, LTE Band 2)**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2169.500	48.94	82.25	33.31	350.0	H	43.0	4.0
3037.000	49.44	82.25	32.81	396.0	V	220.0	6.7
3905.000	56.78	82.25	25.47	325.0	V	208.0	8.3
4773.500	55.81	82.25	26.44	108.0	V	23.0	9.6
5207.000	65.69	82.25	16.56	100.0	V	79.0	10.4
6075.000	56.65	82.25	25.60	325.0	V	67.0	12.0

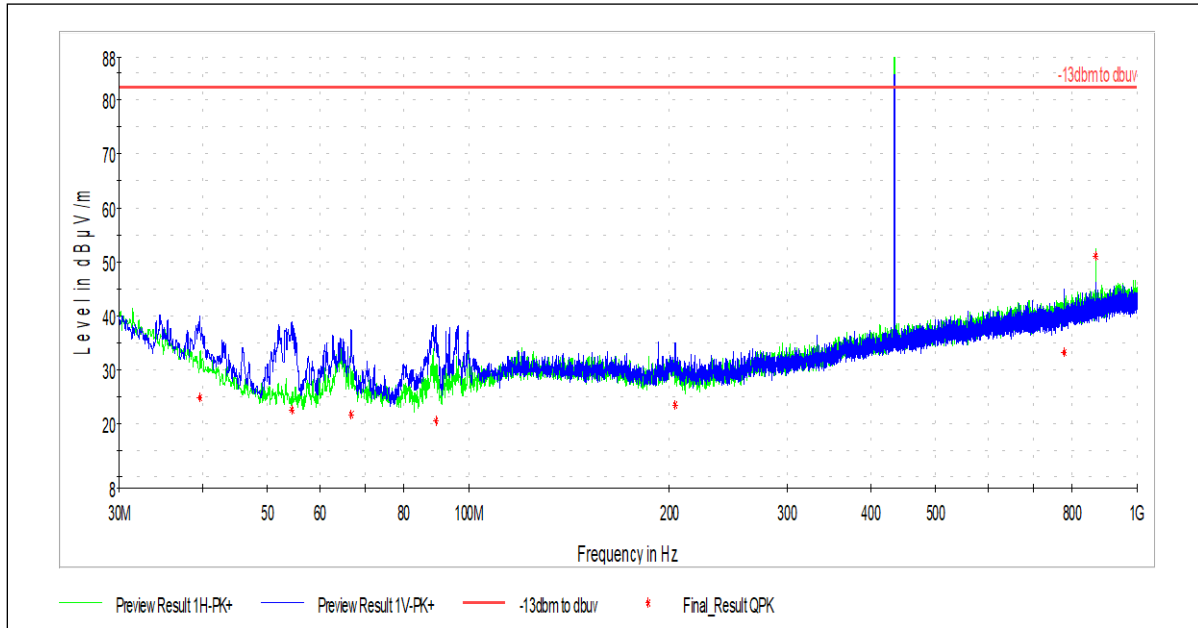
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2169.500	45.08	82.25	37.17	350.0	H	43.0	4.0
3037.000	43.83	82.25	38.42	396.0	V	220.0	6.7
3905.000	54.18	82.25	28.07	325.0	V	208.0	8.3
4773.500	53.14	82.25	29.11	108.0	V	23.0	9.6
5207.000	64.78	82.25	17.47	100.0	V	79.0	10.4
6075.000	53.39	82.25	28.86	325.0	V	67.0	12.0

Test Personnel:	<u>David Perry</u>	Test Date:	<u>2/6/2024</u>
Supervising/Reviewing Engineer:	<u>N/A</u>	Llimit Applied:	<u>-13dBm converted to field strength</u>
(Where Applicable)	<u>FCC Part 15C, 24</u>		
	<u>RSS-247 Issue 3, RSS-133</u>		
Product Standard:	<u>Issue 6, RSS-210 Issue 5</u>	Ambient Temperature:	<u>24.1°C</u>
Input Voltage:	<u>120VAC/60Hz</u>	Relative Humidity:	<u>22.2%</u>
Pretest Verification w / Ambient		Atmospheric Pressure:	<u>988.8mbar</u>
Signals or BB Source:	<u>Yes</u>		

Deviations, Additions, or Exclusions: None



**7.3 Radiated Spurious Emissions, 30 MHz – 1 GHz, (433.92MHz, 802.11g Channel 6, LTE Band 4)**



\*Emission at 433.92MHz is from the SRD and is not a failing emission

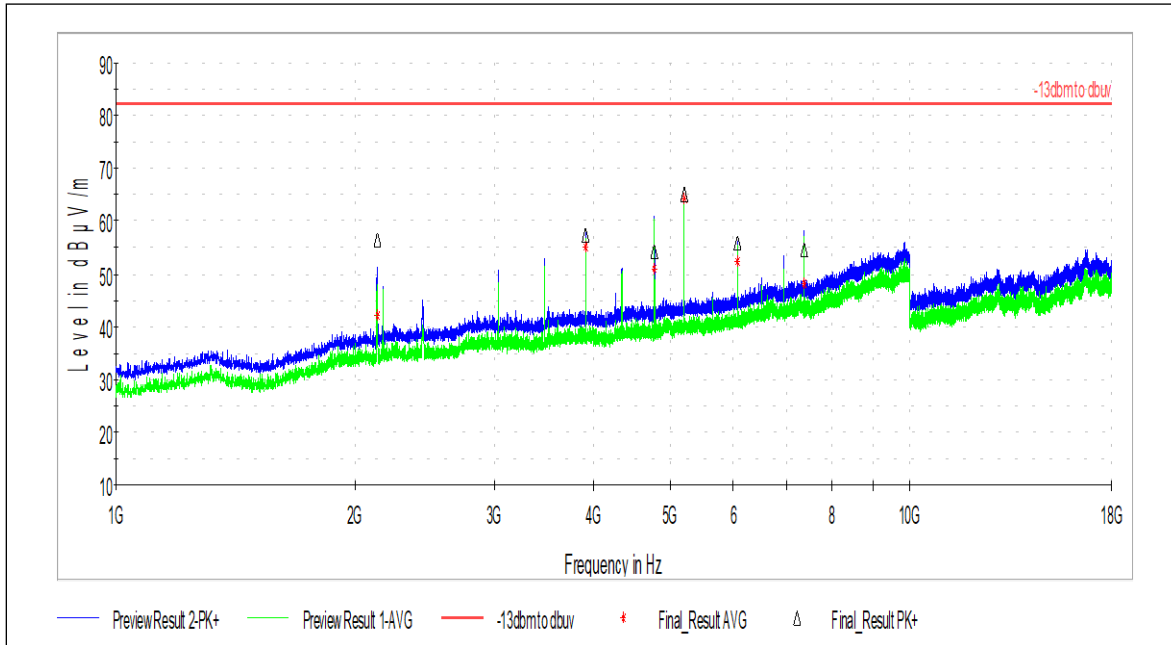
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
39.592	24.67	82.25	57.58	120.000	119.0	V	69.0	20.4
54.358	22.61	82.25	59.64	120.000	99.0	V	58.0	14.1
66.752	21.51	82.25	60.74	120.000	101.0	V	106.0	14.7
89.332	20.39	82.25	61.86	120.000	100.0	V	108.0	15.9
203.953	23.44	82.25	58.81	120.000	101.0	V	161.0	20.3
778.355	33.05	82.25	49.20	120.000	400.0	V	120.0	30.2
867.864	51.04	82.25	31.21	120.000	99.0	H	192.0	31.9

Test Personnel:	<u>David Perry</u>	Test Date:	<u>2/5/2024</u>
Supervising/Reviewing Engineer:	<u>N/A</u>	Limit Applied:	<u>-13dBm converted to field strength</u>
(Where Applicable)	<u>FCC Part 15C, 27</u>		
	<u>RSS-247 Issue 3, RSS-139</u>		
Product Standard:	<u>Issue 3, RSS-210 Issue 5</u>	Ambient Temperature:	<u>23.2°C</u>
Input Voltage:	<u>120VAC/60Hz</u>	Relative Humidity:	<u>38.1%</u>
Pretest Verification w / Ambient Signals or BB Source:	<u>Yes</u>	Atmospheric Pressure:	<u>983.4mbar</u>

Deviations, Additions, or Exclusions: None



**7.4 Radiated Spurious Emissions, 1 GHz – 18 GHz, (433.92Mhz, 802.11g Channel 6, LTE Band 4)**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2134.500	56.58	82.25	25.67	385.0	H	112.0	3.9
3905.000	57.38	82.25	24.87	313.0	H	184.0	8.4
4773.000	54.19	82.25	28.06	275.0	H	93.0	9.6
5207.000	65.19	82.25	17.06	109.0	V	69.0	10.4
6074.500	56.00	82.25	26.25	363.0	V	93.0	12.0
7377.000	54.47	82.25	27.78	373.0	V	256.0	13.5

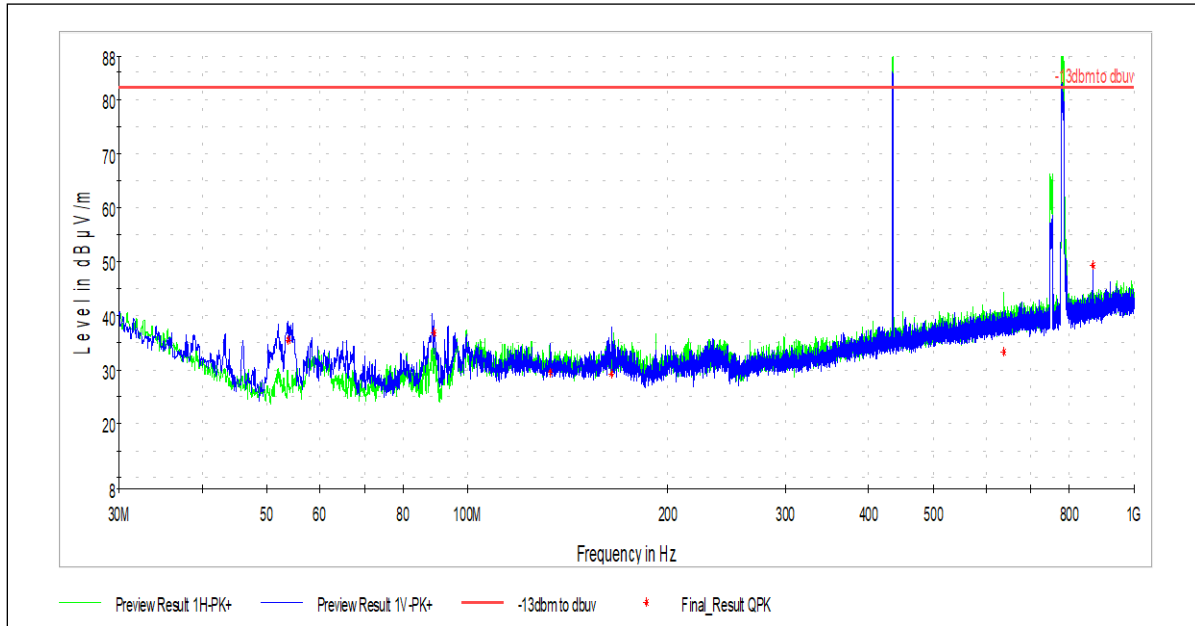
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2134.500	42.15	82.25	40.10	385.0	H	112.0	3.9
3905.000	55.07	82.25	27.18	313.0	H	184.0	8.4
4773.000	50.90	82.25	31.35	275.0	H	93.0	9.6
5207.000	64.13	82.25	18.12	109.0	V	69.0	10.4
6074.500	52.24	82.25	30.01	363.0	V	93.0	12.0
7377.000	48.28	82.25	33.97	373.0	V	256.0	13.5

Test Personnel:	<u>David Perry</u>	Test Date:	<u>2/6/2024</u>
Supervising/Reviewing Engineer: (Where Applicable)	<u>N/A</u> FCC Part 15C, 27 RSS-247 Issue 3, RSS-139	Limit Applied:	<u>-13dBm converted to field strength</u>
Product Standard:	<u>Issue 3, RSS-210 Issue 5</u>	Ambient Temperature:	<u>24.1°C</u>
Input Voltage:	<u>120VAC/60Hz</u>	Relative Humidity:	<u>22.2%</u>
Pretest Verification w / Ambient Signals or BB Source:	<u>Yes</u>	Atmospheric Pressure:	<u>988.8mbar</u>

Deviations, Additions, or Exclusions: None



**7.5 Radiated Spurious Emissions, 30 MHz – 1 GHz, (433.92Mhz, 802.11n Channel 6, LTE Band 13)**



\*Emissions at 433.92MHz and 780MHz are from the SRD and cellular modem respectively and are not failing emissions

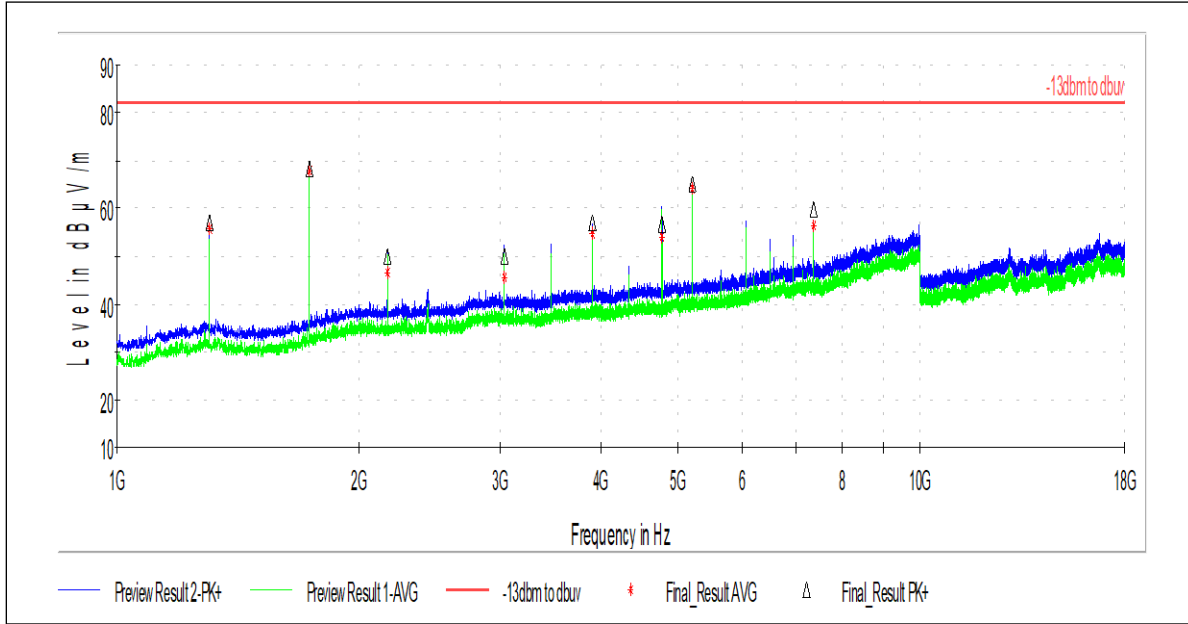
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
53.873	35.51	82.25	46.74	120.000	105.0	V	139.0	14.2
89.224	36.80	82.25	45.45	120.000	99.0	V	110.0	15.9
133.197	29.37	82.25	52.88	120.000	100.0	V	220.0	20.8
164.345	29.19	82.25	53.06	120.000	105.0	V	162.0	20.3
638.406	33.16	82.25	49.09	120.000	114.0	H	69.0	29.1
867.864	49.37	82.25	32.88	120.000	95.0	H	189.0	31.9

Test Personnel:	David Perry	Test Date:	2/5/2024
Supervising/Reviewing Engineer:	(Where Applicable) N/A	Limit Applied:	-13dBm converted to field strength
Product Standard:	FCC Part 15C, 27 RSS-247 Issue 3, RSS-130 Issue 2, RSS-210 Issue 5	Ambient Temperature:	23.2°C
Input Voltage:	120VAC/60Hz	Relative Humidity:	38.1%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	983.4mbar

Deviations, Additions, or Exclusions: None



**7.6 Radiated Spurious Emissions, 1 GHz – 18 GHz, (433.92Mhz, 802.11n Channel 6, LTE Band 13)**



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1301.500	57.22	82.25	25.03	303.0	H	320.0	0.8
1735.500	68.31	82.25	13.94	358.0	H	317.0	1.8
2169.500	50.05	82.25	32.20	197.0	H	258.0	4.0
3037.000	50.11	82.25	32.14	215.0	V	231.0	6.7
3905.000	57.24	82.25	25.01	310.0	V	242.0	8.3
4773.000	56.73	82.25	25.52	386.0	V	262.0	9.6
5207.000	65.22	82.25	17.03	100.0	V	67.0	10.4
7376.500	59.97	82.25	22.28	354.0	V	264.0	13.5

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1301.500	55.73	82.25	26.52	303.0	H	320.0	0.8
1735.500	68.00	82.25	14.25	358.0	H	317.0	1.8
2169.500	46.67	82.25	35.58	197.0	H	258.0	4.0
3037.000	45.62	82.25	36.63	215.0	V	231.0	6.7
3905.000	54.83	82.25	27.42	310.0	V	242.0	8.3
4773.000	54.23	82.25	28.02	386.0	V	262.0	9.6
5207.000	64.14	82.25	18.11	100.0	V	67.0	10.4
7376.500	56.45	82.25	25.80	354.0	V	264.0	13.5

Test Personnel: David Perry  
 Supervising/Reviewing Engineer: N/A  
 (Where Applicable) FCC Part 15C, 27  
RSS-247 Issue 3, RSS-130  
 Product Standard: Issue 2, RSS-210 Issue 5  
 Input Voltage: 120VAC/60Hz  
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 2/5/2024  
 Limit Applied: -13dBm converted to field strength  
 Ambient Temperature: 23.2°C  
 Relative Humidity: 38.1%  
 Atmospheric Pressure: 983.4mbar





Deviations, Additions, or Exclusions: None

## 8 Conducted Emissions

### 8.1 Method

Tests are performed in accordance with ANSI C63.4:2014.

**TEST SITE:** Ground Plane

**Site Designation:** Ground Plane

#### Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U <sub>CISPR</sub>
Power Line Conducted Emissions	150 kHz - 30 MHz	3.1dB	3.4dB

As shown in the table above our conducted emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.

### 8.2 Sample Calculations

The following is how net line-conducted readings were determined:

$$NF = RF + LF + CF + AF$$

Where NF = Net Reading in dB $\mu$ V

RF = Reading from receiver in dB $\mu$ V

LF = LISN or ISN Correction Factor in dB

CF = Cable Correction Factor in dB

AF = Attenuator Loss Factor in dB

To convert from dB $\mu$ V to  $\mu$ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where UF = Net Reading in } \mu\text{V}$$

NF = Net Reading in dB $\mu$ V

#### **Example:**

$$NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V}$$

$$UF = 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 285.1 \mu\text{V/m}$$



### 8.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8296	Rohde & Schwarz	EPL1000	1/1/2024	1/1/2025
LISN	2508	Fischer Custom Communication	FCC-LISN-50-50-2M	7/31/2023	7/31/2024
Coaxial Cable	7024			1/22/2024	1/22/2025

### 8.4 Software Utilized:

Name	Manufacturer	Version
TILE	ETS Lindgren	V7.0.6.545

### 8.5 Results:

The sample tested was found to Comply.

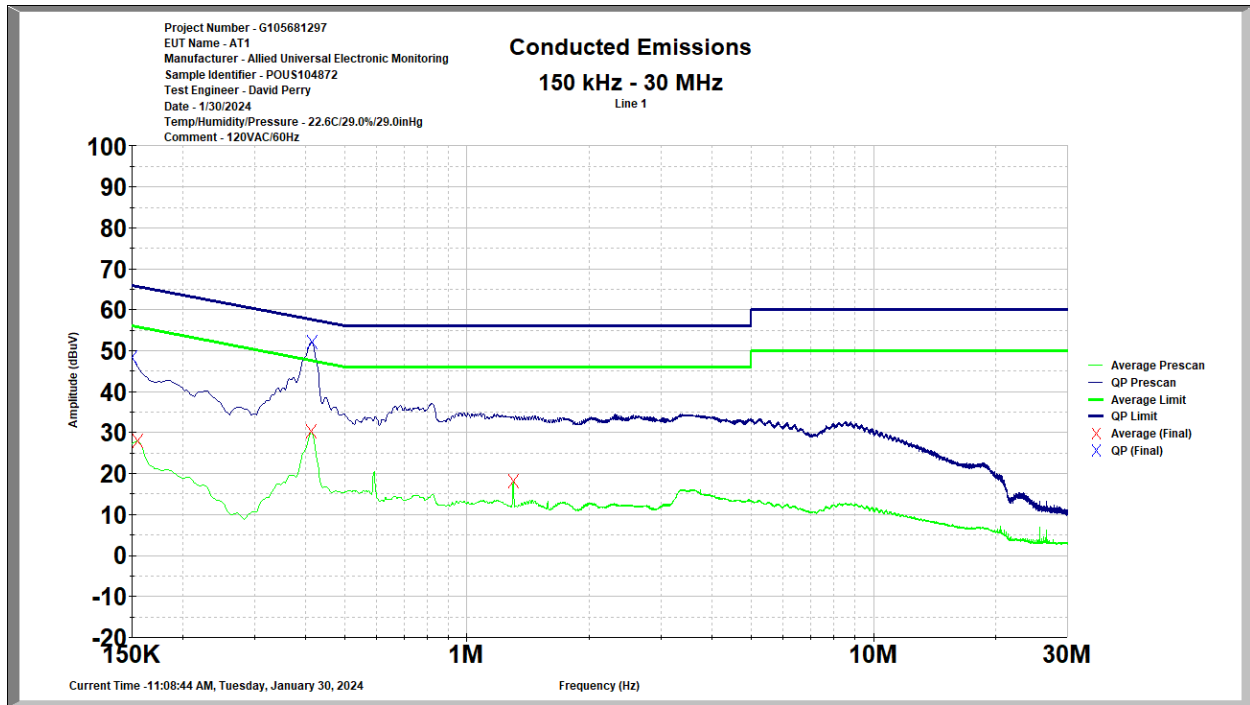


### 8.6 Setup Photographs: Conducted Emissions





### 8.7 Plots/Data: Conducted Emissions (Line)



Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Margin (dB)
0.150	48.225	66.000	17.775
0.415	52.181	58.414	6.233

Frequency (MHz)	Average (dBuV)	Average Limit (dBuV)	Average Margin (dB)
0.155	27.957	55.871	27.914
0.413	30.214	48.479	18.265
1.300	18.112	46.000	27.888

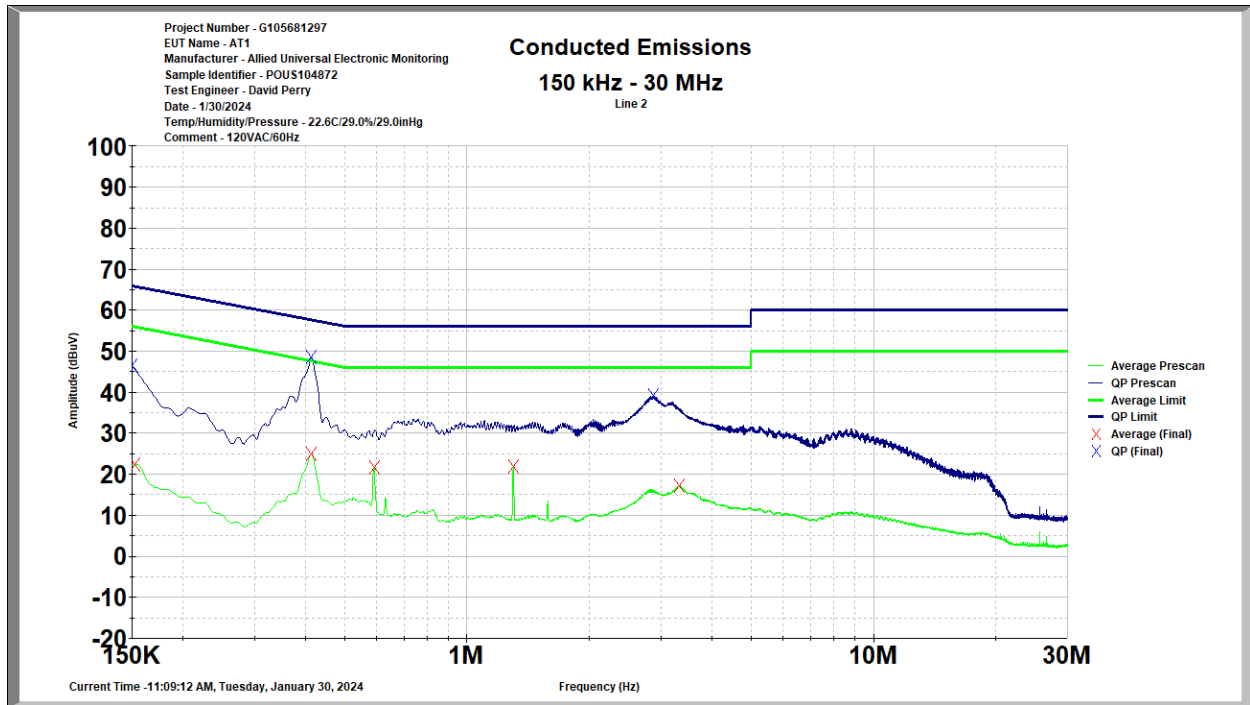
Test Personnel: David Perry  
 Supervising/Reviewing Engineer: \_\_\_\_\_  
 (Where Applicable) N/A  
 FCC Part 15B  
 Product Standard: ICES-003 Issue 7  
 Input Voltage: 120VAC/60Hz  
 Pretest Verification w / Ambient  
 Signals or BB Source: Yes

Test Date: 1/30/2024  
 Limit Applied: Class B  
 Ambient Temperature: 22.6°C  
 Relative Humidity: 29.0%  
 Atmospheric Pressure: 982.0mbar

Deviations, Additions, or Exclusions: None



### 8.8 Plots/Data: Conducted Emissions (Neutral)



Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Margin (dB)
0.150	46.456	66.000	19.544
0.413	48.589	58.479	9.889
2.875	39.084	56.000	16.916

Frequency (MHz)	Average (dBuV)	Average Limit (dBuV)	Average Margin (dB)
0.152	22.371	55.936	33.564
0.413	24.975	48.479	23.503
0.591	21.537	46.000	24.463
1.300	21.842	46.000	24.158
3.332	17.157	46.000	28.843

Test Personnel: David Perry  
 Supervising/Reviewing Engineer: N/A  
 (Where Applicable) FCC Part 15B  
 Product Standard: ICES-003 Issue 7  
 Input Voltage: 120VAC/60Hz  
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 1/30/2024  
 Limit Applied: Class B  
 Ambient Temperature: 22.6°C  
 Relative Humidity: 29.0%  
 Atmospheric Pressure: 982.0mbar

Deviations, Additions, or Exclusions: None



## 9 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	2/21/2024	105681297LEX-001	AP	MC	Original Issue
1	2/22/2024	105681297LEX-001.1	AP	MC	Revised standard references
2	5/15/2024	105681297LEX-001.2	AP	MC	Corrected variant Model numbers and cell FCCID