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GPS INDUSTRIES, LLC TEST REPORT

SCOPE OF WORK

EMC TESTING – V3-1004QN

REPORT NUMBER

105040967LEX-001

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EMC TEST REPORT

(FULL COMPLIANCE)

Report Number: 105040967LEX-001

Project Number: G105040967

Report Issue Date: 5/17/2022

Model(s) Tested: V3-1004QN

Standards: FCC Part 15B
ICES-003 Issue 7
FCC Part 22, 24, 27, 90
(Radiated Spurious Emissions)

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

Client:
GPS INDUSTRIES, LLC
1074 N. Orange Ave.
Sarasota, FL 34236
USA

Report prepared by



Ben Coolbear,
Engineer

Report reviewed by



Brian Lackey,
EMC Team Leader

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Table of Contents

1	<i>Introduction and Conclusion.....</i>	4
2	<i>Test Summary</i>	4
3	<i>Client Information</i>	5
4	<i>Description of Equipment under Test and Variant Models.....</i>	6
5	<i>System Setup and Method</i>	7
6	<i>Radiated Emissions</i>	8
7	<i>Revision History</i>	35



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
6	Radiated Spurious Emissions (Transmitters Active) (ANSI C63.26:2015)	Pass
-	Conducted Emissions (ANSI C63.4:2014)	NA ¹

¹ The V3-1004QN will not connect to AC mains during normal operation.



3 Client Information

This product was tested at the request of the following:

Client Information	
Client Name:	GPS INDUSTRIES, LLC
Address:	1074 N. Orange Ave. Sarasota, FL 34236 USA
Contact:	Bruce Tenerowicz
Telephone:	+1 (803) 295-8082
Email:	Bruce.Tenerowicz@clubcar.com
Manufacturer Information	
Manufacturer Name:	GPS INDUSTRIES, LLC
Manufacturer Address:	1074 N. Orange Ave. Sarasota, FL 34236 USA



4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	V3-1004QN
Model Number	V3-1004QN
Serial Number	861364040466987
Hardware Version	Rev D.
Software Version	Android build number vdu3-eng 7.1.1 v1.83 1_83
Supported Transmit Bands	LTE Bands 2, 4, 5, 7, 12, 13, 25, 26, 29, 30, 41, 66
Embedded Module	Quectel EM06
Embedded Module FCCID	XPYTOBYL201 with XMR201906EM06A
Receive Date	4/26/2022
Test Start Date	4/26/2022
Test End Date	5/12/2022
Device Received Condition	Good
Test Sample Type	Production
Rated Voltage	12VDC
Description of Equipment Under Test (provided by client)	
The V3-1004QN is a mobile golf information system with an embedded wireless module.	

4.1 Variant Models:

There were no variant models covered by this evaluation.



5 System Setup and Method

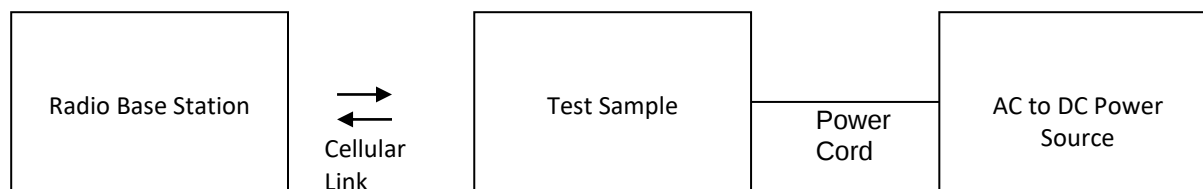
5.1 Method:

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

No.	Descriptions of EUT Exercising
1	The V3-1004QN was powered and operation normally for the duration of the evaluation.
2	During the evaluation for the Part, 22, 27, and 90, a call was established between the embedded wireless module and the radio base station.
3	The wireless call was monitored for connectivity and block error rate for the duration of the evaluation.

Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	Power Cable	1	None	Yes	AC to DC power supply

5.2 EUT Block Diagram:





6 Radiated Emissions

6.1 Method

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

TEST SITE: 10m ALSE

Site Designation: 10m Chamber

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
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 μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ 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 μ 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 μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB/m}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = 32 \text{ dB}\mu\text{V/m}$$

To convert from dB μ V to μ 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:**

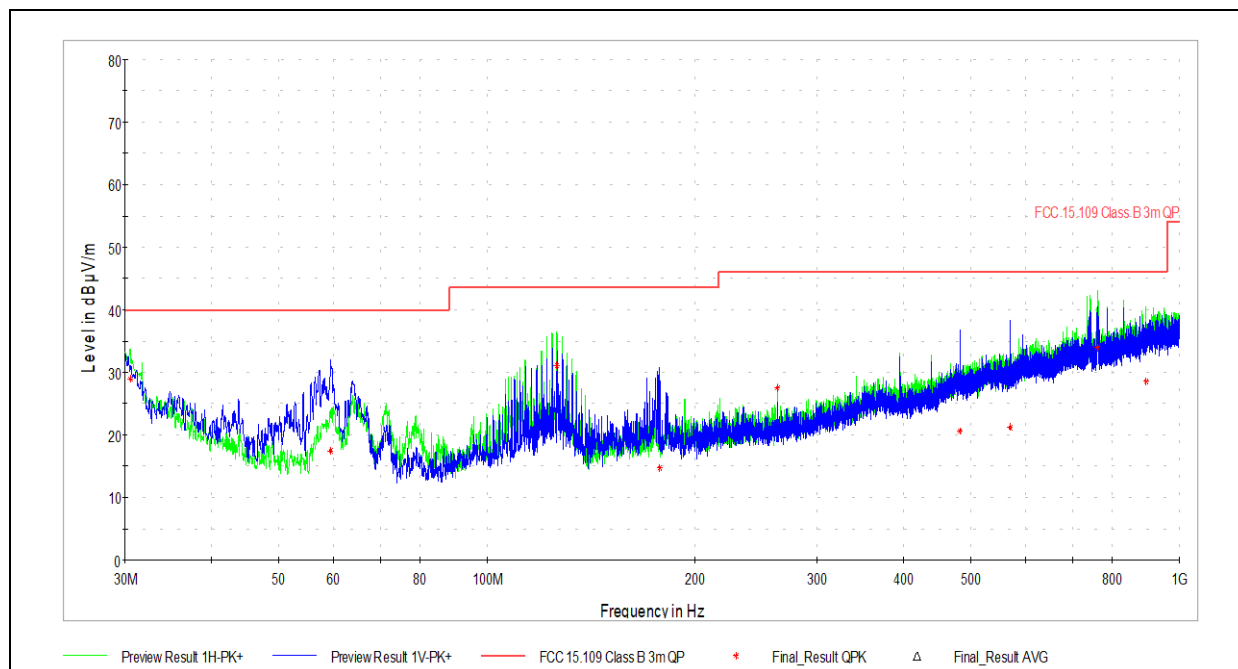
Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8181	Rohde & Schwarz	ESW44	11/16/2021	11/16/2022
Bilog Antenna	3133	ETS	3142C	8/26/2021	8/26/2022
Horn Antenna	3780	ETS	3117	6/28/2021	6/28/2022
System Controller	4096	ETS Lindgren	2090	Verify at Time of Use	Verify at Time of Use
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
Preamplifier	3918	Rohde&Schwarz	TS-PR18	1/13/2022	1/13/2023
Preamplifier	3920	Rohde & Schwarz	TS-PR26	1/13/2022	1/13/2023
Coaxial Cable	3074			1/13/2022	1/13/2023
Coaxial Cable	2588			1/13/2022	1/13/2023
Coaxial Cable	2593			1/13/2022	1/13/2023
Coaxial Cable	2592			1/13/2022	1/13/2023
Coaxial Cable	3339			1/13/2022	1/13/2023

6.5 Software Utilized:

Name	Manufacturer	Version
EMC32	Rohde & Schwarz	Version 10.60.20

6.6 Results:

The sample tested was found to Comply.

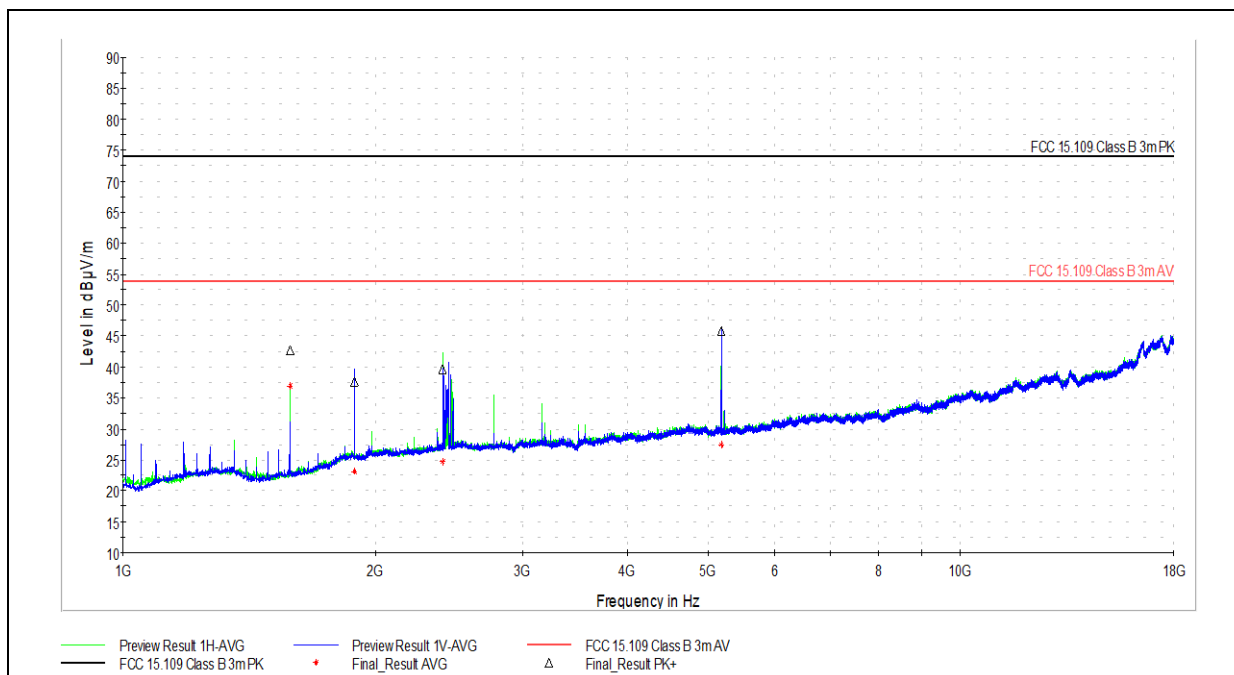
**6.7 Plots/Data: Radiated Emissions, 30MHz – 1GHz (Transmitters Idle)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.485000	29.03	40.000	10.97	120.000	180.0	H	14.0	24.90
59.423333	17.37	40.000	22.63	120.000	105.0	V	9.0	15.11
126.245556	31.10	43.522	12.43	120.000	165.0	H	316.0	15.62
177.655556	14.78	43.522	28.74	120.000	100.0	V	220.0	19.01
262.746111	27.48	46.021	18.54	120.000	95.0	H	240.0	22.25
481.750556	20.55	46.021	25.47	120.000	105.0	V	181.0	28.94
569.320000	21.15	46.021	24.87	120.000	184.0	V	202.0	29.91
760.841111	33.85	46.021	12.17	120.000	336.0	H	6.0	34.20
895.132222	28.50	46.021	17.52	120.000	101.0	H	168.0	36.24

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: (Where Applicable) NA
 Product Standard: ICES-003 Issue 7
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 4/26/2022
 Limit Applied: Class B
 Ambient Temperature: 23.9 °C
 Relative Humidity: 32.3 %
 Atmospheric Pressure: 990.9 mbar

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

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

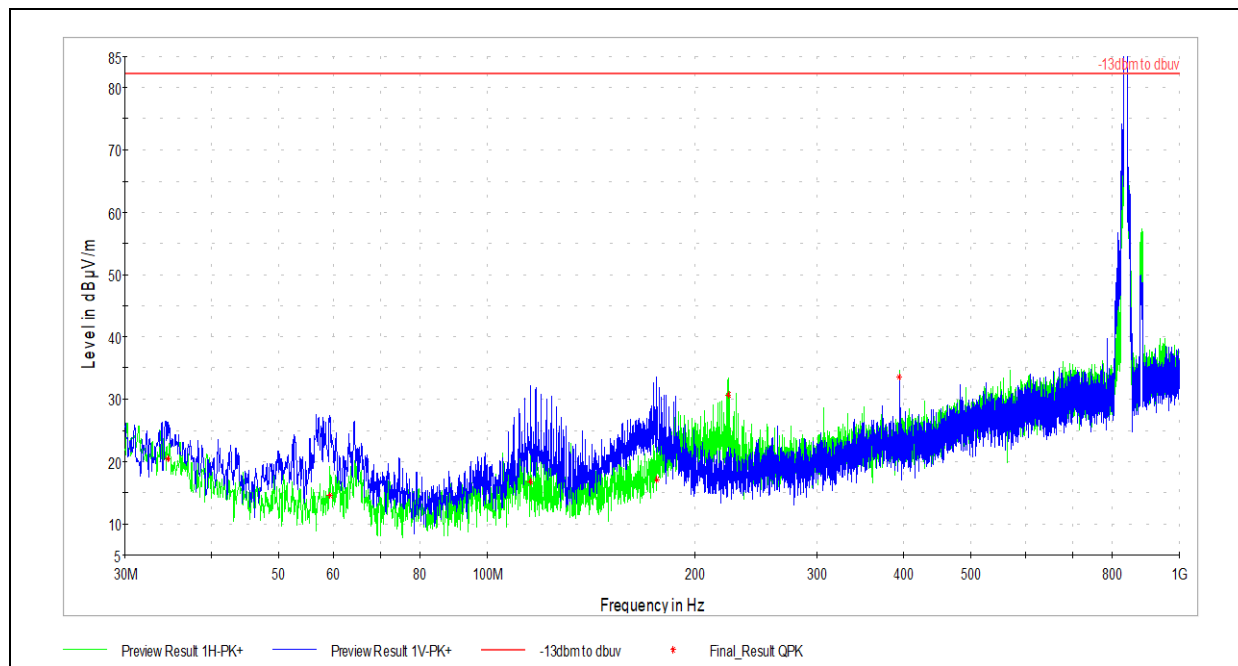
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1584.000000	42.73	73.979	31.25	1000.000	223.0	H	150.0	-0.87
1891.000000	37.69	73.979	36.29	1000.000	173.0	V	175.0	2.71
2410.000000	39.70	73.979	34.28	1000.000	109.0	H	120.0	4.43
5187.000000	45.74	73.979	28.24	1000.000	173.0	V	166.0	9.60

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1584.000000	36.98	53.979	17.00	1000.000	223.0	H	150.0	-0.87
1891.000000	23.07	53.979	30.91	1000.000	173.0	V	175.0	2.71
2410.000000	24.67	53.979	29.31	1000.000	109.0	H	120.0	4.43
5187.000000	27.44	53.979	26.54	1000.000	173.0	V	166.0	9.60

Test Personnel: Ben Coolbear
Supervising/Reviewing Engineer: (Where Applicable) NA
Product Standard: ICES-003 Issue 7
Input Voltage: 12 VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 4/26/2022
Limit Applied: Class B
Ambient Temperature: 23.9 °C
Relative Humidity: 32.3 %
Atmospheric Pressure: 990.9 mbar

Deviations, Additions, or Exclusions: None

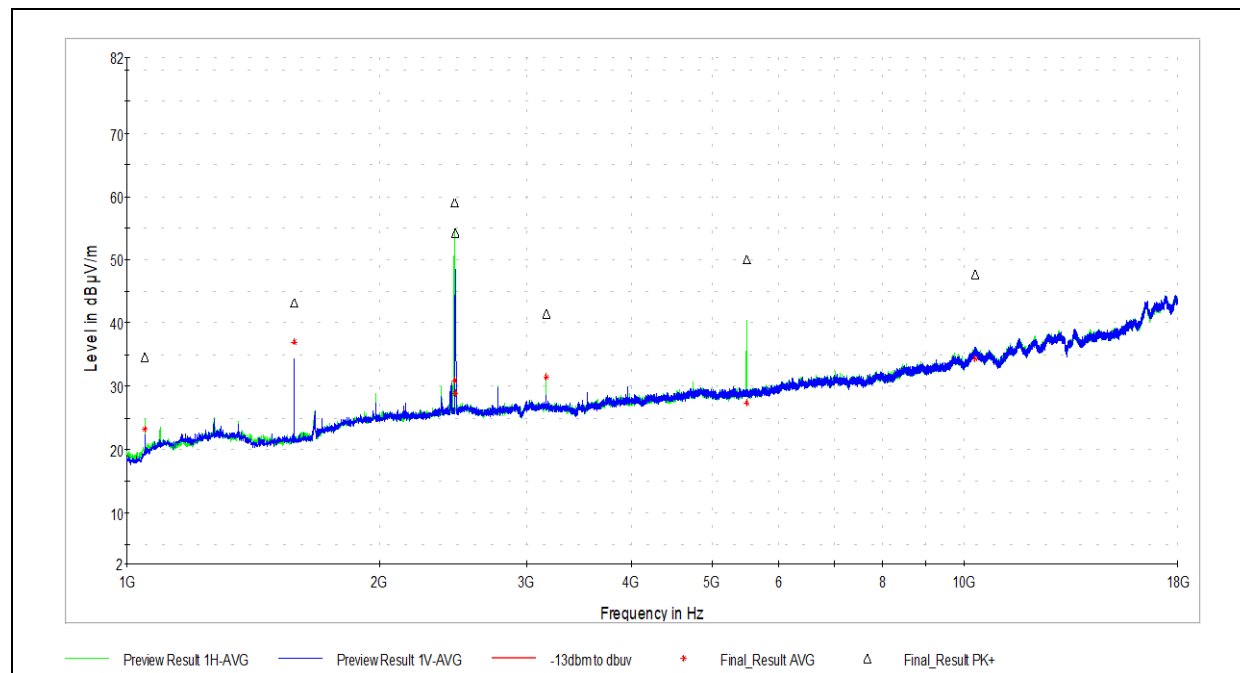
**6.9 FCC Part 22 Radiated Spurious Emissions (LTE B5)****6.9.1 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE B5)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
34.580556	20.37	82.250	61.88	120.000	100.0	V	0.0	20.82
59.261667	14.54	82.250	67.71	120.000	209.0	V	347.0	15.17
115.521667	16.75	82.250	65.50	120.000	100.0	V	208.0	16.25
175.607778	17.02	82.250	65.23	120.000	100.0	V	154.0	18.92
222.868333	30.65	82.250	51.60	120.000	100.0	H	143.0	20.62
394.127222	33.59	82.250	48.66	120.000	203.0	H	37.0	26.97

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: _____
 (Where Applicable) NA
 Product Standard: FCC Part 22
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.2 °C
 Relative Humidity: 42.5 %
 Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: The fundamental frequency for LTE Band 5 was present for this scan. The fundamental was not under evaluation.

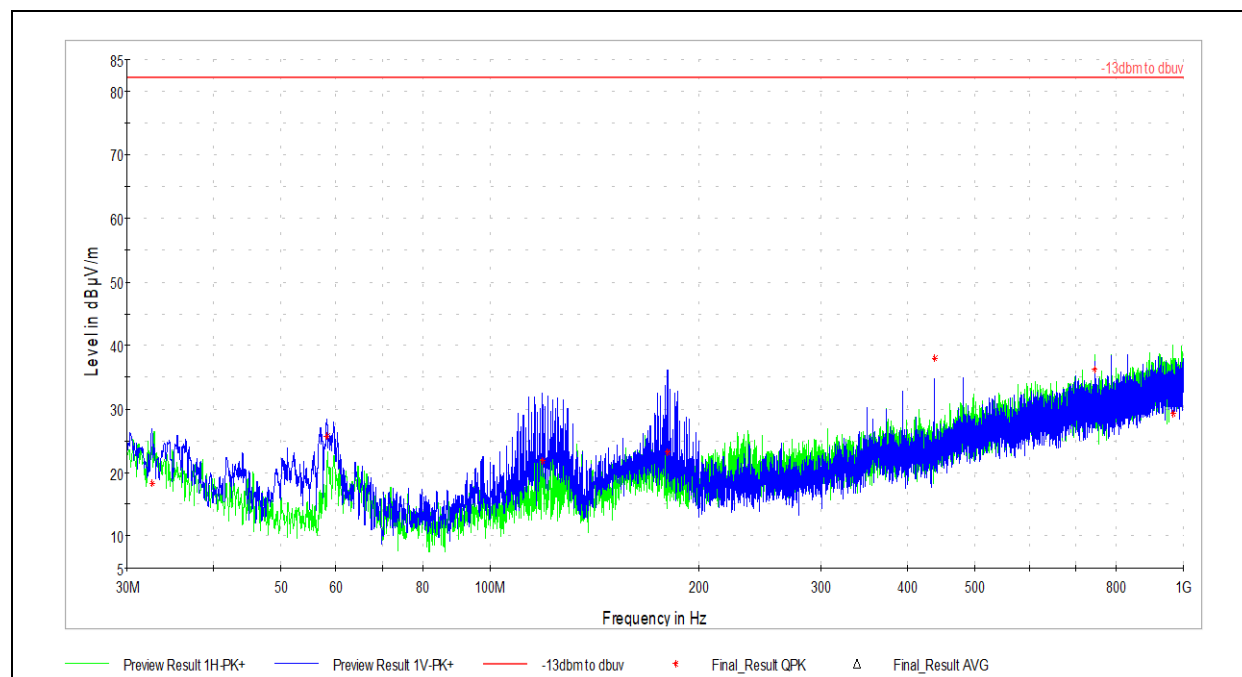
**6.9.2 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE B5)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1051.000000	23.26	82.250	58.99	1000.000	199.0	H	0.0	-2.97
1584.000000	36.96	82.250	45.29	1000.000	190.0	V	169.0	-0.85
2462.500000	30.87	82.250	51.38	1000.000	145.0	H	133.0	4.68
2466.000000	28.85	82.250	53.40	1000.000	190.0	V	304.0	4.61
3168.000000	31.51	82.250	50.74	1000.000	248.0	H	160.0	5.97
5494.000000	27.34	82.250	54.91	1000.000	410.0	H	0.0	10.00
10318.500000	34.34	82.250	47.91	1000.000	410.0	V	0.0	17.64

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: _____
 (Where Applicable) NA
 Product Standard: FCC Part 22
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.8 °C
 Relative Humidity: 43.6 %
 Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

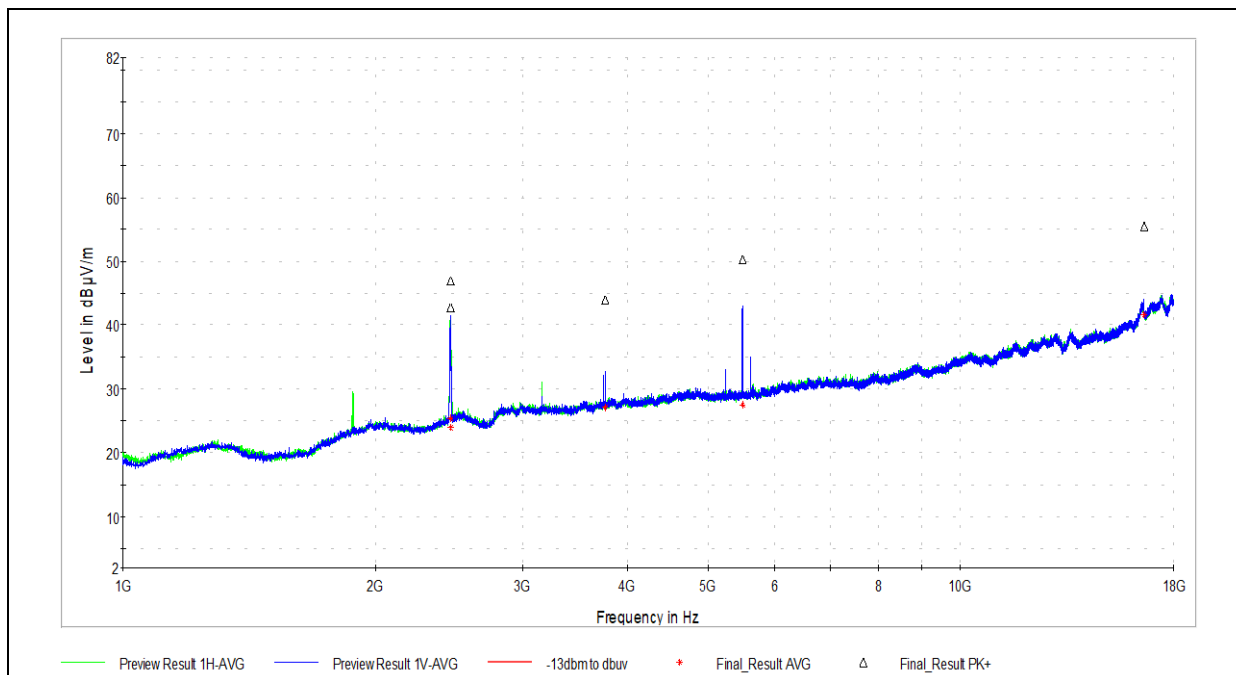
**6.10 FCC Part 24 Radiated Spurious Emissions (LTE B2/B25)****6.10.1 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE B2)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.586667	18.30	82.250	63.95	120.000	100.0	V	285.0	21.87
58.183889	25.73	82.250	56.52	120.000	104.0	V	135.0	15.50
119.132222	21.90	82.250	60.35	120.000	104.0	V	188.0	16.13
180.565556	23.17	82.250	59.08	120.000	99.0	V	313.0	18.97
437.938889	37.97	82.250	44.28	120.000	104.0	V	123.0	26.76
744.566667	36.26	82.250	45.99	120.000	95.0	H	0.0	34.22
965.565000	29.30	82.250	52.95	120.000	95.0	H	178.0	37.35

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: (Where Applicable) NA
 Product Standard: FCC Part 24
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.2 °C
 Relative Humidity: 42.5 %
 Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

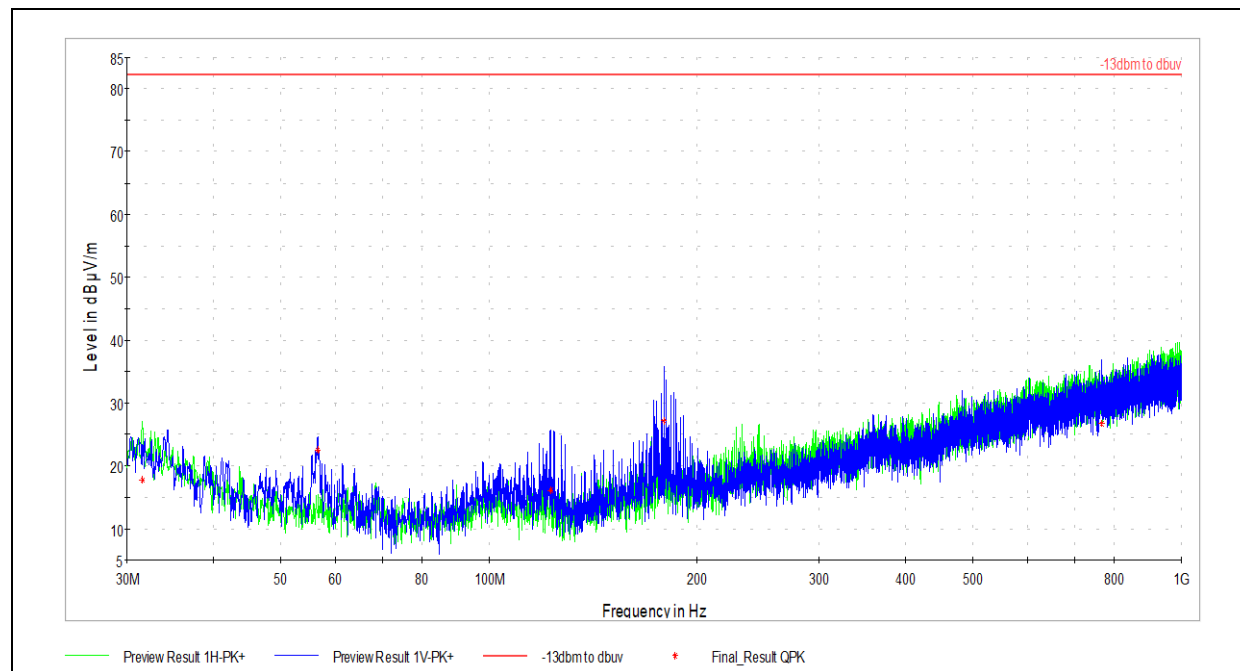
**6.10.2 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE B2)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2460.500000	25.33	82.250	56.92	1000.000	118.0	V	36.0	4.55
2463.500000	23.96	82.250	58.29	1000.000	287.0	H	344.0	4.69
3768.000000	27.02	82.250	55.23	1000.000	137.0	V	302.0	7.26
5493.500000	27.53	82.250	54.72	1000.000	127.0	V	46.0	10.02
16587.000000	41.61	82.250	40.64	1000.000	100.0	V	24.0	26.11

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: Na
 (Where Applicable)
 Product Standard: FCC Part 24
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.8 °C
 Relative Humidity: 43.6 %
 Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

**6.10.3 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE B25)**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.562778	17.78	82.250	64.47	120.000	374.0	H	26.0	24.33
56.513333	22.49	82.250	59.76	120.000	100.0	V	124.0	15.69
122.635000	16.04	82.250	66.21	120.000	100.0	V	198.0	15.98
178.787222	27.08	82.250	55.17	120.000	100.0	V	316.0	19.05
766.122222	26.70	82.250	55.55	120.000	100.0	V	178.0	33.33

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: NA

(Where Applicable)

Product Standard: FCC Part 24

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022

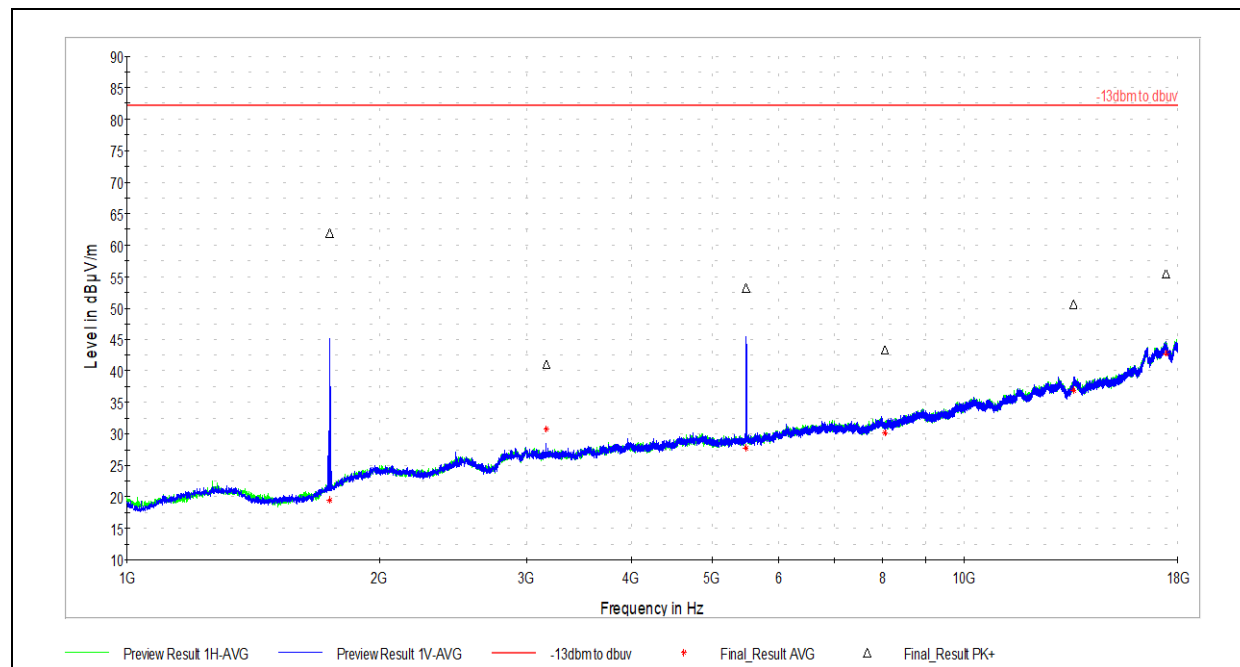
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.2 °C

Relative Humidity: 42.5 %

Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

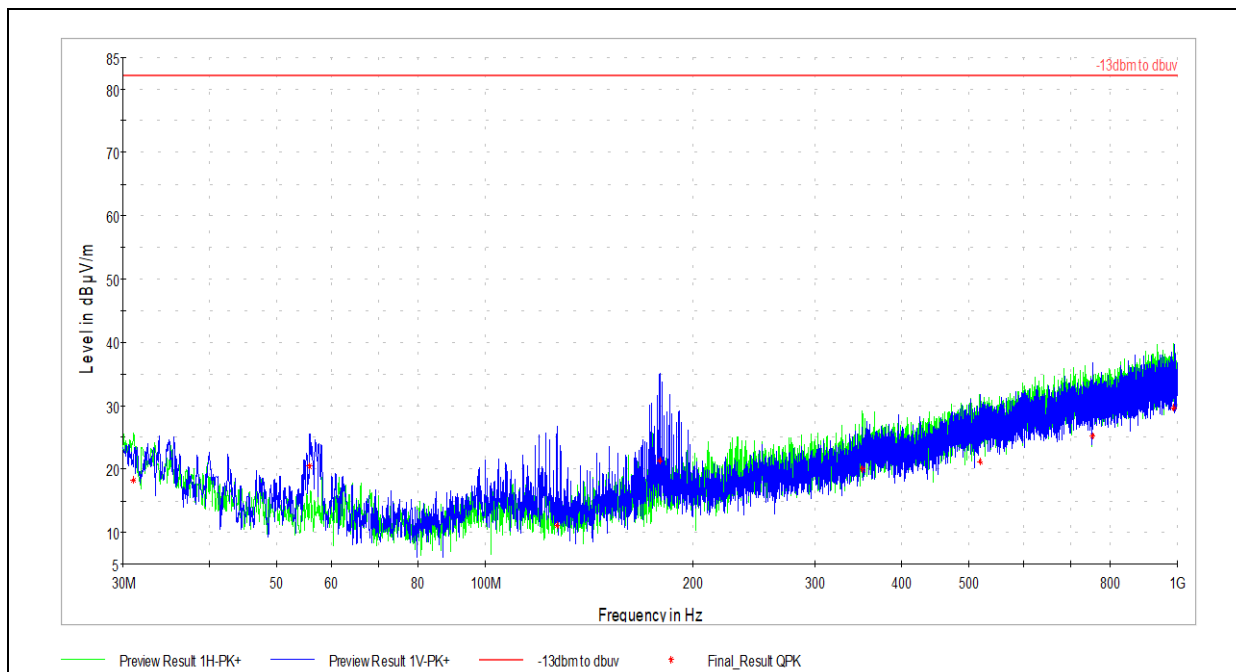
**6.10.4 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE B25)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1747.000000	19.50	82.250	62.75	1000.000	191.0	V	289.0	1.06
3168.000000	30.75	82.250	51.50	1000.000	291.0	V	96.0	5.99
5493.000000	27.79	82.250	54.46	1000.000	100.0	V	22.0	10.01
8037.500000	30.20	82.250	52.05	1000.000	100.0	H	98.0	13.59
13502.000000	36.89	82.250	45.36	1000.000	100.0	H	341.0	21.03
17432.000000	42.81	82.250	39.44	1000.000	100.0	V	0.0	26.90

Test Personnel: Ben Coolbear
Supervising/Reviewing Engineer: _____
(Where Applicable) NA
Product Standard: FCC Part 24
Input Voltage: 12 VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
Limit Applied: -13dBm converted to field strength
Ambient Temperature: 24.8 °C
Relative Humidity: 43.6 %
Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

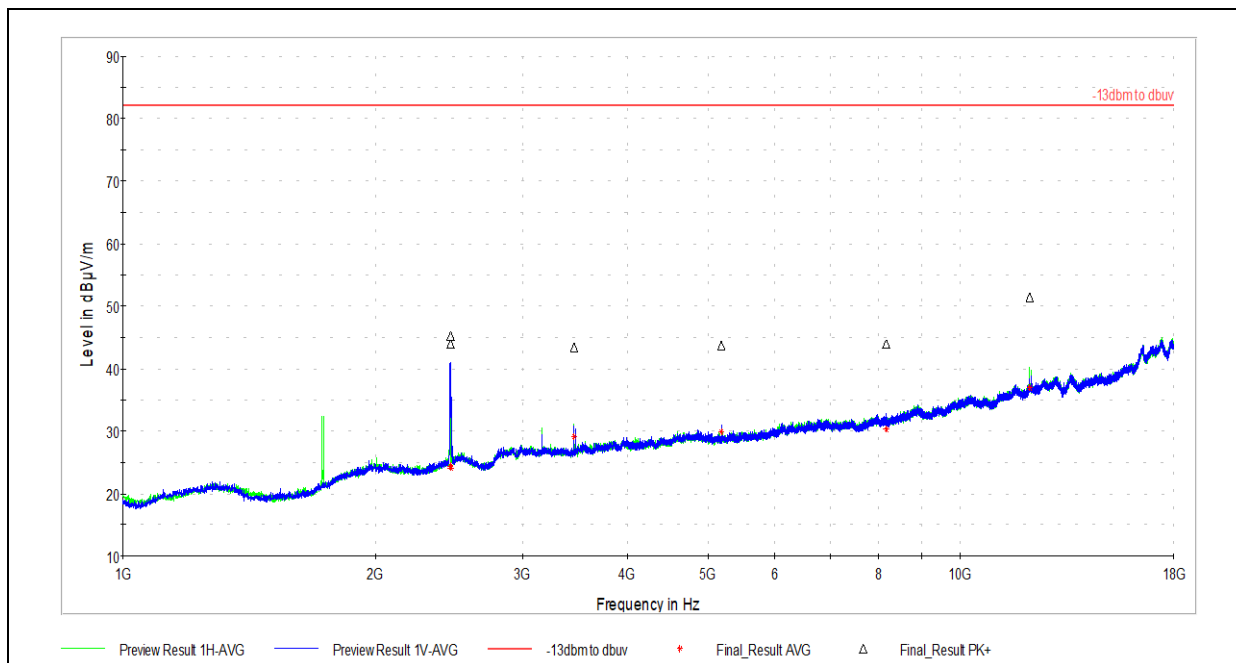
**6.11 FCC Part 27 Radiated Spurious Emissions (LTE B4/B7/B12/B13/B30/B41/B66)****6.11.1 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 4)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.023889	18.26	82.250	63.99	120.000	100.0	H	346.0	24.59
55.812778	20.47	82.250	61.78	120.000	100.0	V	134.0	15.59
126.946111	11.14	82.250	71.11	120.000	100.0	V	209.0	15.93
178.625556	21.28	82.250	60.97	120.000	100.0	V	316.0	19.05
351.123889	19.93	82.250	62.32	120.000	100.0	H	16.0	25.69
519.149444	21.22	82.250	61.03	120.000	120.0	V	123.0	29.45
753.188889	25.22	82.250	57.03	120.000	100.0	V	166.0	33.16
988.629444	29.56	82.250	52.69	120.000	119.0	H	140.0	37.31

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: NA
 (Where Applicable)
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.2 °C
 Relative Humidity: 42.5 %
 Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

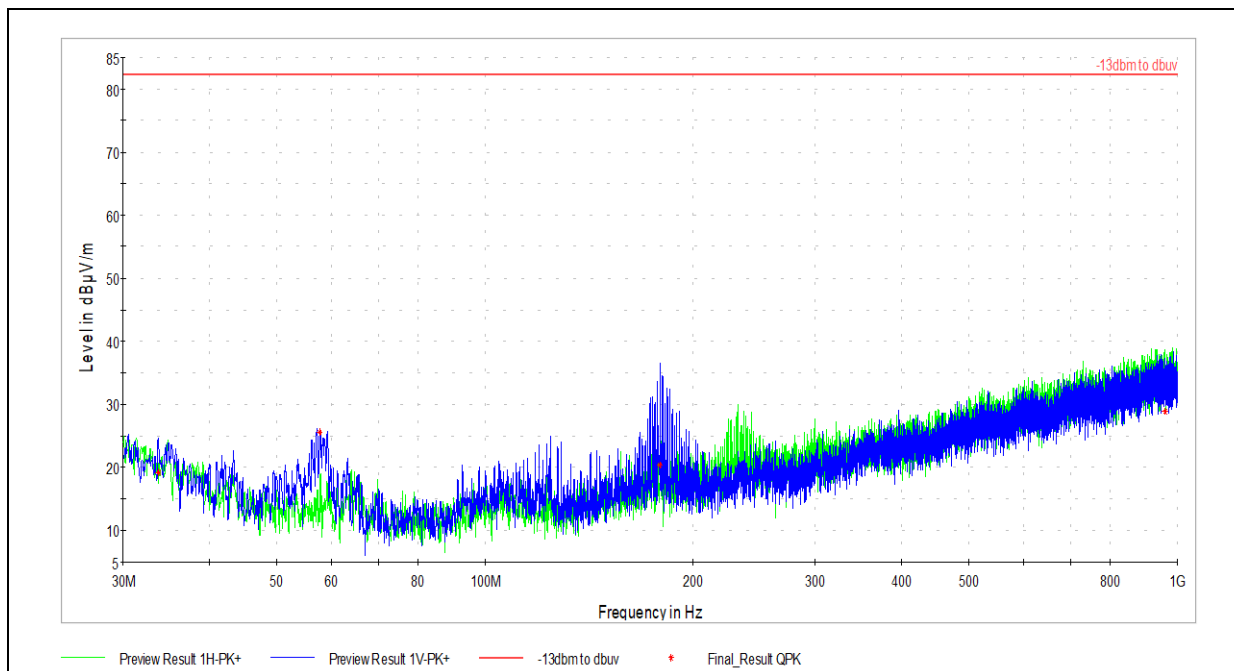
**6.11.2 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 4)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2460.000000	24.43	82.250	57.82	1000.000	145.0	V	193.0	4.54
2463.500000	24.13	82.250	58.12	1000.000	391.0	V	0.0	4.58
3457.000000	29.13	82.250	53.12	1000.000	363.0	H	191.0	6.22
5185.500000	29.84	82.250	52.41	1000.000	266.0	V	170.0	9.60
8165.000000	30.30	82.250	51.95	1000.000	137.0	V	240.0	13.74
12099.000000	36.92	82.250	45.33	1000.000	220.0	H	203.0	20.02

Test Personnel: Ben Coolbear
Supervising/Reviewing Engineer: _____
(Where Applicable) NA
Product Standard: FCC Part 27
Input Voltage: 12 VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
Limit Applied: -13dBm converted to field strength
Ambient Temperature: 24.8 °C
Relative Humidity: 43.6 %
Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

**6.11.3 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 7)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.718333	19.21	82.250	63.04	120.000	102.0	V	294.0	21.29
57.752778	25.57	82.250	56.68	120.000	102.0	V	134.0	15.60
179.002778	20.39	82.250	61.86	120.000	102.0	V	317.0	19.05
957.966667	28.84	82.250	53.41	120.000	95.0	H	219.0	37.22

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: _____

(Where Applicable) NA

Product Standard: FCC Part 27

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022

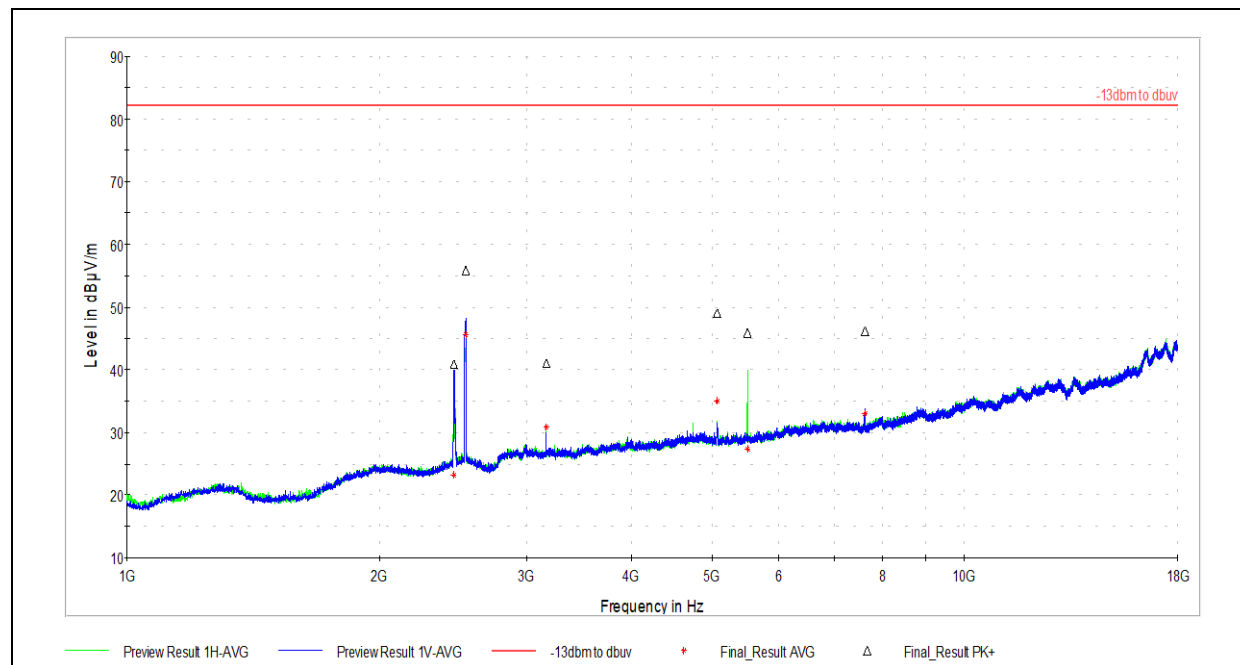
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.2 °C

Relative Humidity: 42.5 %

Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

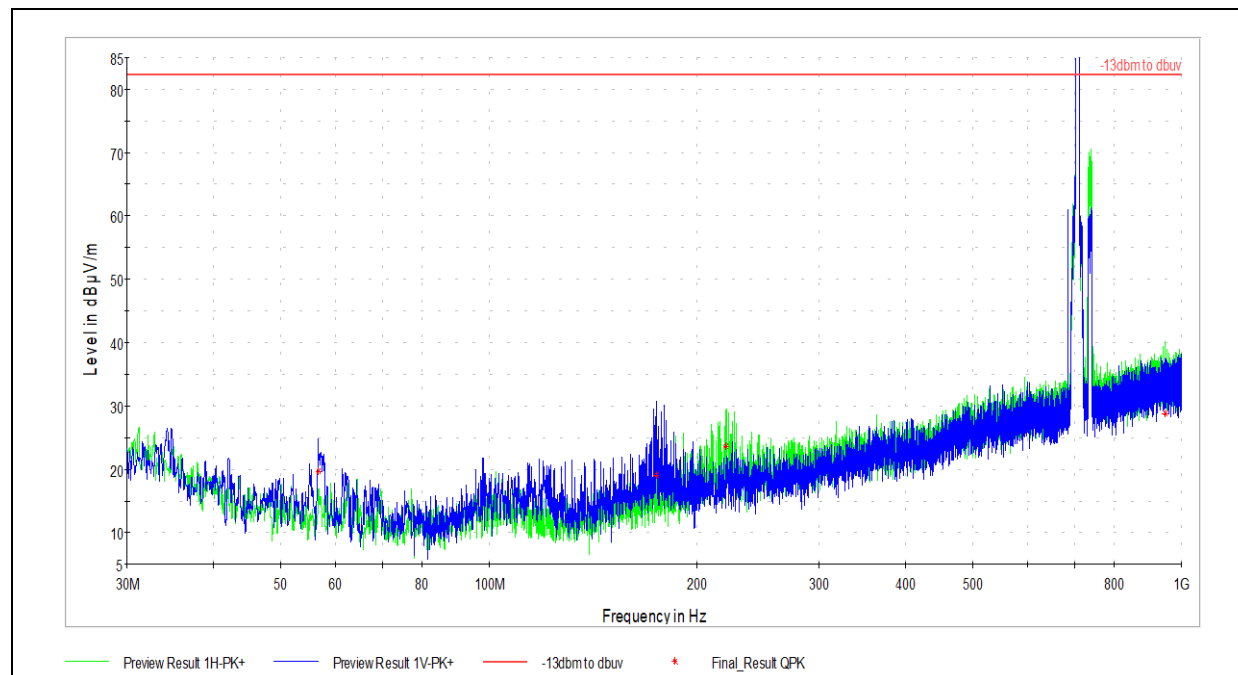
**6.11.4 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 7)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2459.000000	23.28	82.250	58.97	1000.000	220.0	V	171.0	4.53
2538.000000	45.56	82.250	36.69	1000.000	136.0	V	217.0	5.07
3168.000000	30.77	82.250	51.48	1000.000	126.0	H	135.0	5.97
5070.000000	35.01	82.250	47.24	1000.000	237.0	H	228.0	9.46
5507.500000	27.42	82.250	54.83	1000.000	100.0	H	218.0	10.01
7607.000000	32.91	82.250	49.34	1000.000	216.0	V	145.0	12.83

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: _____
 (Where Applicable) NA
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.8 °C
 Relative Humidity: 43.6 %
 Atmospheric Pressure: 987.6 mbar

Deviations, Additions, or Exclusions: None

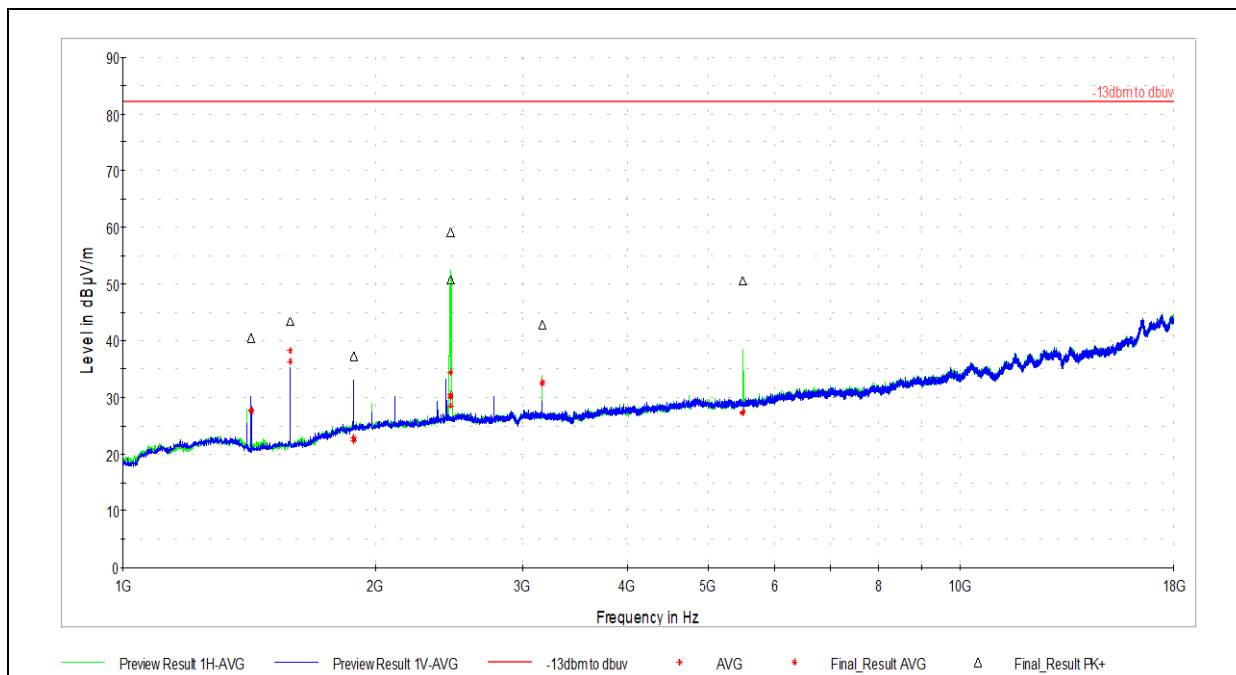
**6.11.5 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 12)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
56.675000	19.77	82.250	62.48	120.000	100.0	V	0.0	15.71
174.368333	19.07	82.250	63.18	120.000	100.0	V	154.0	18.91
220.120000	23.57	82.250	58.68	120.000	119.0	H	142.0	20.42
947.404444	28.79	82.250	53.46	120.000	100.0	H	164.0	37.17

Test Personnel: Ben Cool
 Supervising/Reviewing Engineer: _____
 (Where Applicable) NA
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/11/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 25.1 °C
 Relative Humidity: 43.5 %
 Atmospheric Pressure: 9869 mbar

Deviations, Additions, or Exclusions: The fundamental frequency for LTE Band 12 was present for this scan. The fundamental was not under evaluation.

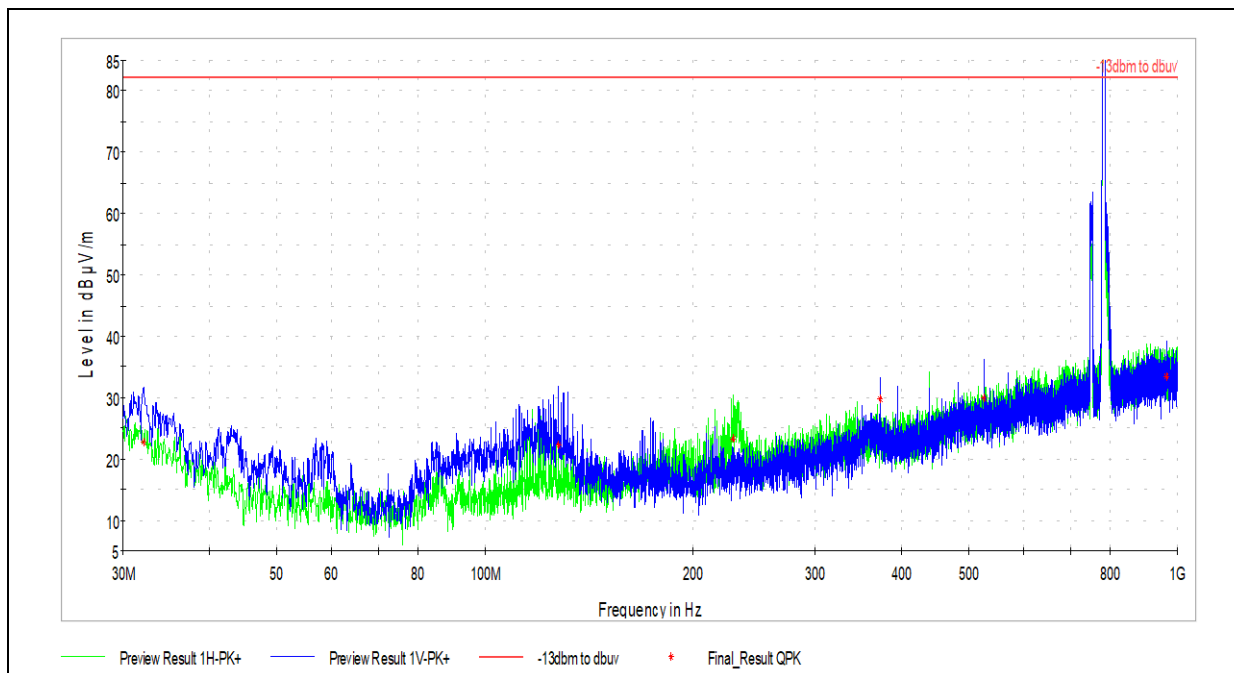
**6.11.6 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 12)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1423.000000	27.49	82.250	54.76	1000.000	209.0	V	118.0	-1.35
1584.000000	36.26	82.250	45.99	1000.000	154.0	V	174.0	-0.85
1885.500000	22.36	82.250	59.89	1000.000	363.0	V	71.0	2.71
2461.000000	30.55	82.250	51.70	1000.000	126.0	H	0.0	4.65
2464.500000	28.60	82.250	53.65	1000.000	329.0	H	199.0	4.71
3168.000000	32.70	82.250	49.55	1000.000	192.0	H	120.0	5.97
5503.000000	27.30	82.250	54.95	1000.000	410.0	H	1.0	10.01

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: _____
 (Where Applicable) NA
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/11/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 25.1 °C
 Relative Humidity: 43.5 %
 Atmospheric Pressure: 986.9 mbar

Deviations, Additions, or Exclusions: None

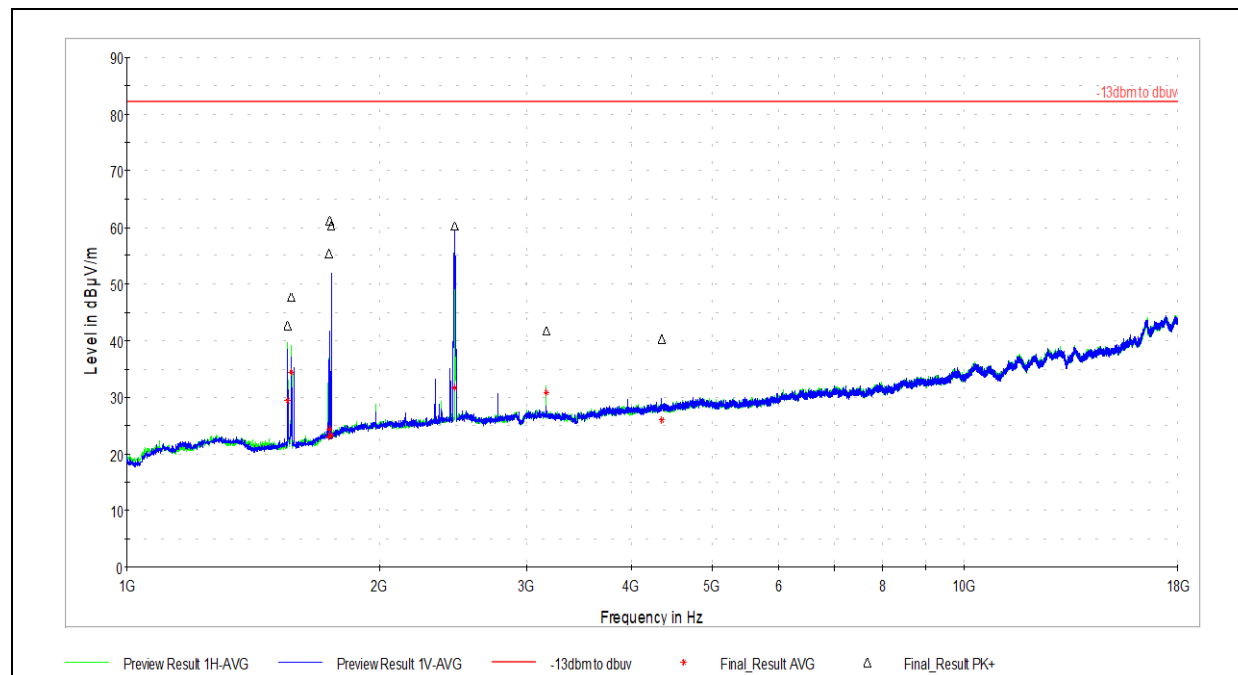
**6.11.7 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 13)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.101667	22.81	82.250	59.44	120.000	100.0	V	207.0	22.16
127.646667	22.20	82.250	60.05	120.000	100.0	V	190.0	15.94
227.987778	23.26	82.250	58.99	120.000	97.0	H	172.0	20.87
372.248333	29.82	82.250	52.43	120.000	100.0	V	16.0	25.85
525.562222	29.94	82.250	52.31	120.000	100.0	V	345.0	29.67
963.571111	33.52	82.250	48.73	120.000	100.0	V	6.0	36.20

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: _____
 (Where Applicable) NA
 Product Standard: FCC Part 27
 Input Voltage: _____
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/11/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.2 °C
 Relative Humidity: 42.5 %
 Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: The fundamental frequency for LTE Band 13 was present for this scan. The fundamental was not under evaluation.

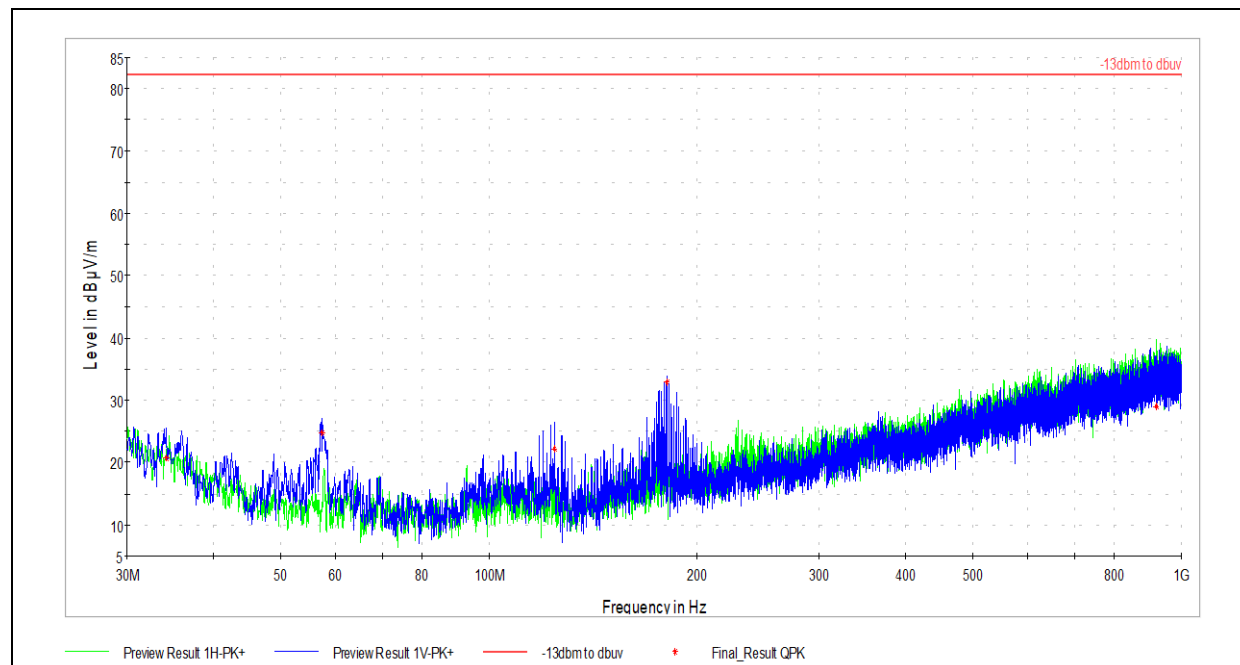
**6.11.8 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 13)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1555.500000	29.45	82.250	52.80	1000.000	100.0	H	245.0	-1.00
1572.000000	34.46	82.250	47.79	1000.000	230.0	H	237.0	-0.96
1741.000000	23.13	82.250	59.12	1000.000	172.0	H	9.0	1.11
1745.500000	24.40	82.250	57.85	1000.000	231.0	V	306.0	1.06
1752.500000	23.37	82.250	58.88	1000.000	127.0	V	247.0	1.09
2462.500000	31.60	82.250	50.65	1000.000	164.0	V	284.0	4.57
3168.000000	30.80	82.250	51.45	1000.000	224.0	H	101.0	5.97
4352.500000	26.06	82.250	56.19	1000.000	100.0	V	183.0	8.50

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: (Where Applicable) NA
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/11/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 25.1 °C
 Relative Humidity: 43.5 %
 Atmospheric Pressure: 986.9 mbar

Deviations, Additions, or Exclusions: None

**6.11.9 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 30)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
34.149444	20.62	82.250	61.63	120.000	100.0	V	282.0	21.07
57.375556	24.69	82.250	57.56	120.000	100.0	V	134.0	15.67
124.197778	22.17	82.250	60.08	120.000	100.0	V	0.0	15.98
180.403889	32.92	82.250	49.33	120.000	100.0	V	296.0	18.97
919.597778	29.01	82.250	53.24	120.000	148.0	H	202.0	36.84

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: _____

(Where Applicable) NA

Product Standard: FCC Part 27

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022

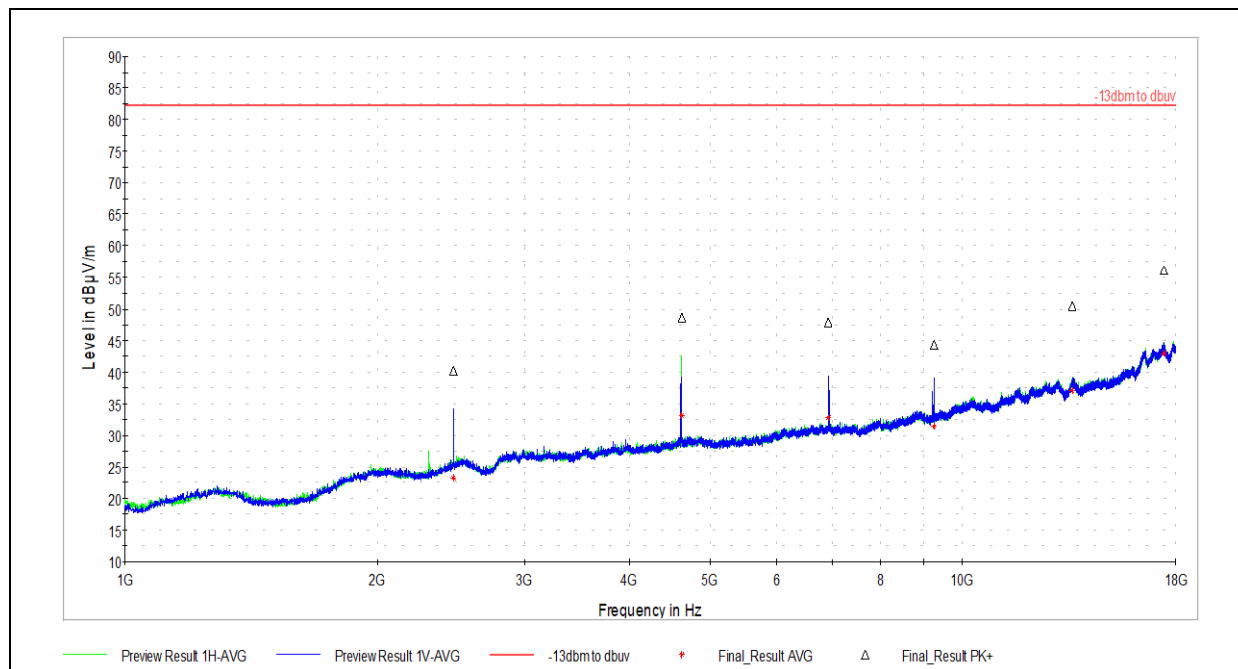
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.2 °C

Relative Humidity: 42.5 %

Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

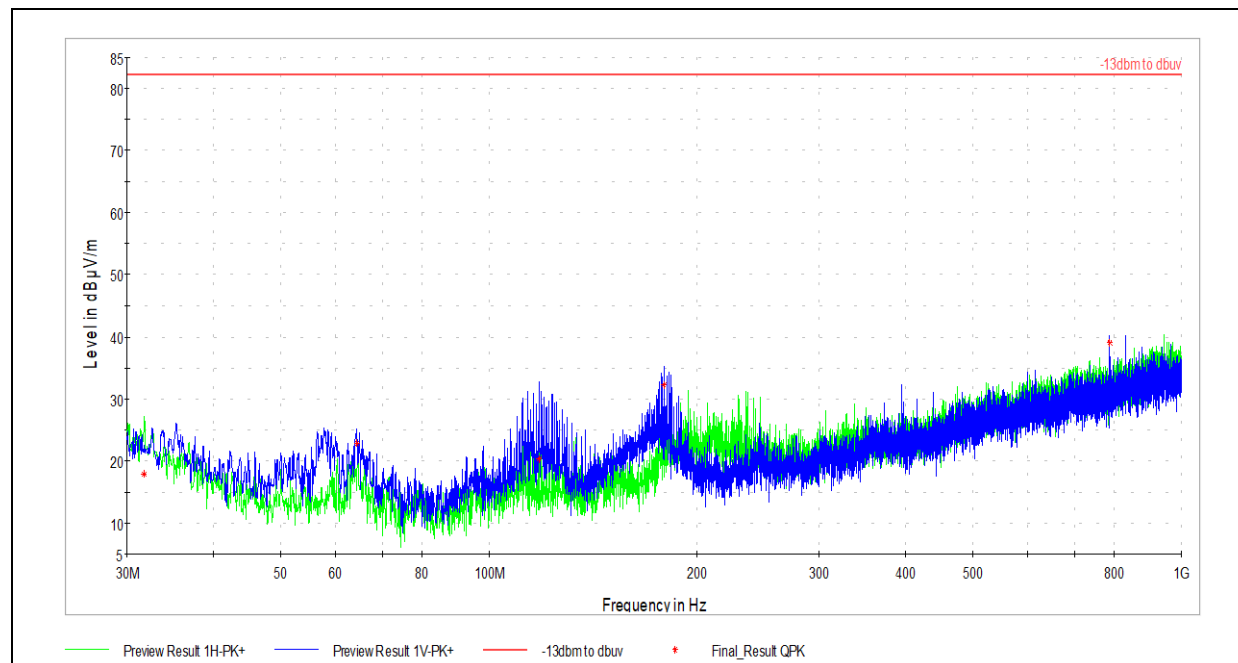
**6.11.10 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 30)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2466.000000	23.32	82.250	58.93	1000.000	410.0	V	0.0	4.61
4628.000000	33.08	82.250	49.17	1000.000	100.0	H	46.0	9.36
6918.000000	32.87	82.250	49.38	1000.000	340.0	V	350.0	12.33
9256.500000	31.39	82.250	50.86	1000.000	100.0	V	219.0	15.73
13536.000000	37.15	82.250	45.10	1000.000	100.0	H	329.0	20.98
17416.000000	42.87	82.250	39.38	1000.000	410.0	H	0.0	26.92

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: NA
 (Where Applicable)
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.8 °C
 Relative Humidity: 43.6 %
 Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

**6.11.11 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 41)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.778333	17.87	82.250	64.38	120.000	94.0	H	0.0	24.22
64.381111	22.82	82.250	59.43	120.000	102.0	V	336.0	14.38
117.946667	20.25	82.250	62.00	120.000	102.0	V	187.0	16.23
178.895000	32.26	82.250	49.99	120.000	102.0	V	257.0	19.05
788.378333	39.10	82.250	43.15	120.000	102.0	V	198.0	33.74

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: _____

(Where Applicable) NA

Product Standard: FCC Part 27

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022

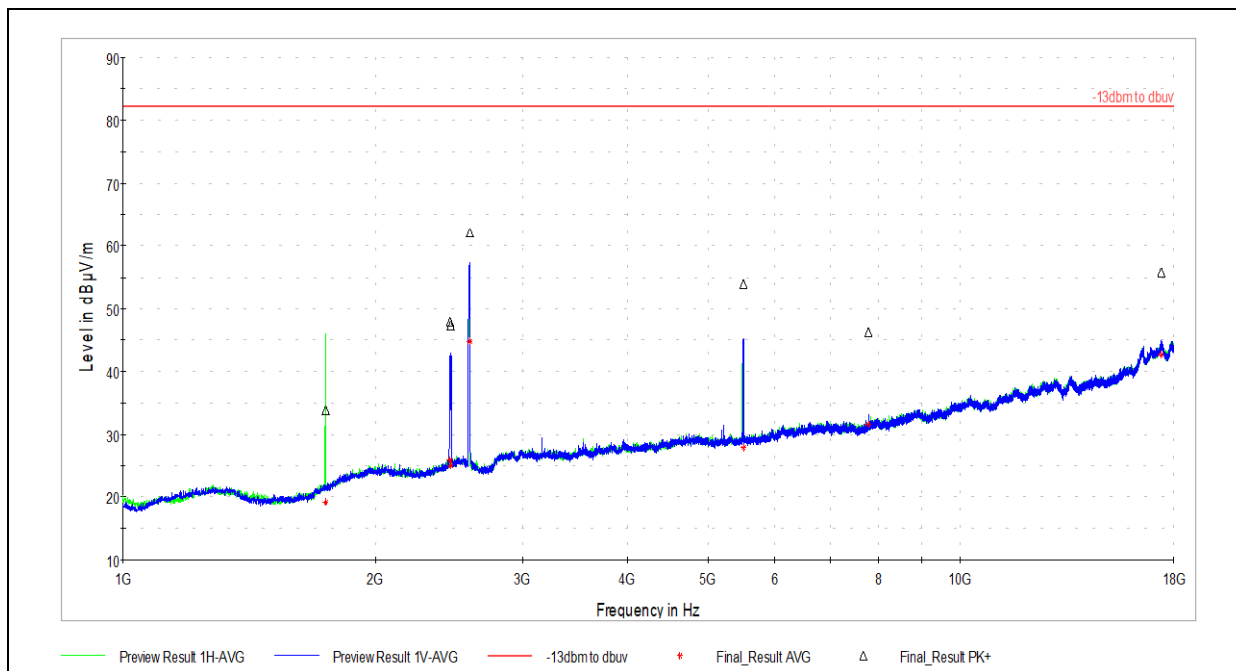
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.2 °C

Relative Humidity: 42.5 %

Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

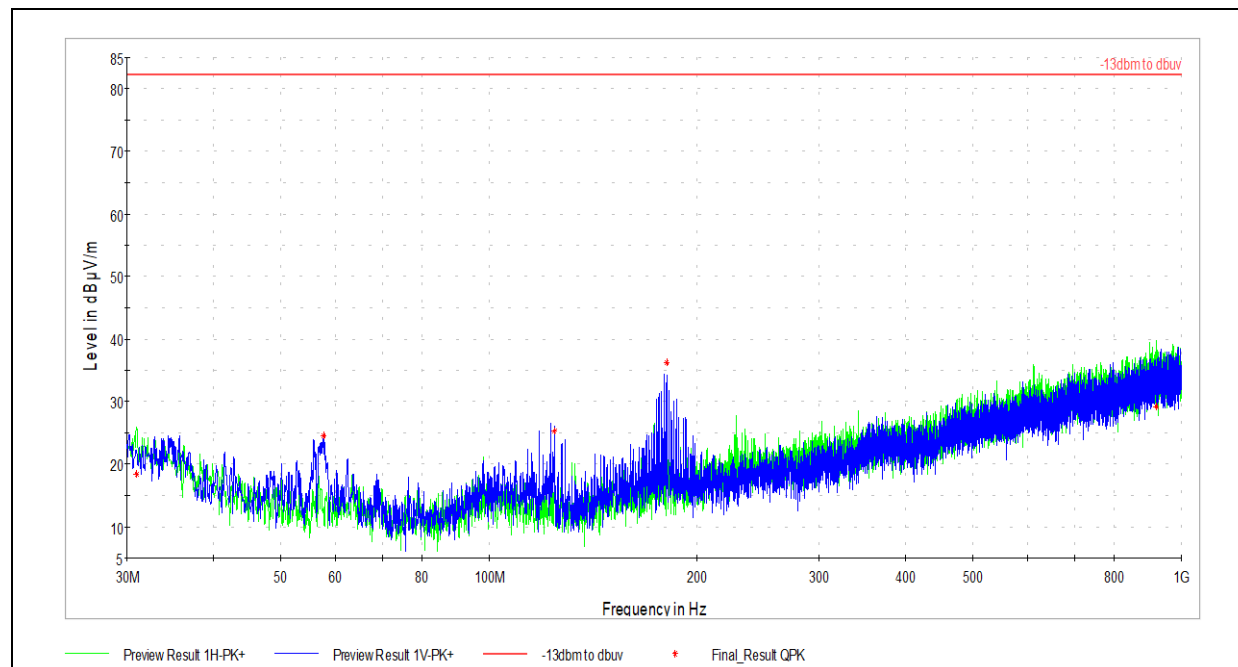
**6.11.12 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 41)**

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1745.000000	19.19	82.250	63.06	1000.000	410.0	H	139.0	1.17
2459.500000	25.87	82.250	56.38	1000.000	153.0	V	48.0	4.54
2464.500000	24.97	82.250	57.28	1000.000	261.0	V	24.0	4.59
2595.500000	44.76	82.250	37.49	1000.000	383.0	V	317.0	4.83
5504.500000	27.76	82.250	54.49	1000.000	319.0	V	73.0	10.03
7775.500000	31.54	82.250	50.71	1000.000	226.0	V	342.0	13.09
17400.500000	42.64	82.250	39.61	1000.000	100.0	V	0.0	26.85

Test Personnel: Ben Coolbear
Supervising/Reviewing Engineer: _____
(Where Applicable) NA
Product Standard: FCC Part 27
Input Voltage: 12 VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
Limit Applied: -13dBm converted to field strength
Ambient Temperature: 24.8 °C
Relative Humidity: 43.6 %
Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

**6.11.13 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 66)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.970000	18.39	82.250	63.86	120.000	130.0	H	0.0	24.62
57.645000	24.52	82.250	57.73	120.000	100.0	V	136.0	15.62
124.251667	25.29	82.250	56.96	120.000	100.0	V	0.0	15.97
180.457778	36.24	82.250	46.01	120.000	100.0	V	314.0	18.97
919.274444	29.19	82.250	53.06	120.000	100.0	H	164.0	36.84

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: _____

(Where Applicable) NA

Product Standard: FCC Part 27

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/5/2022

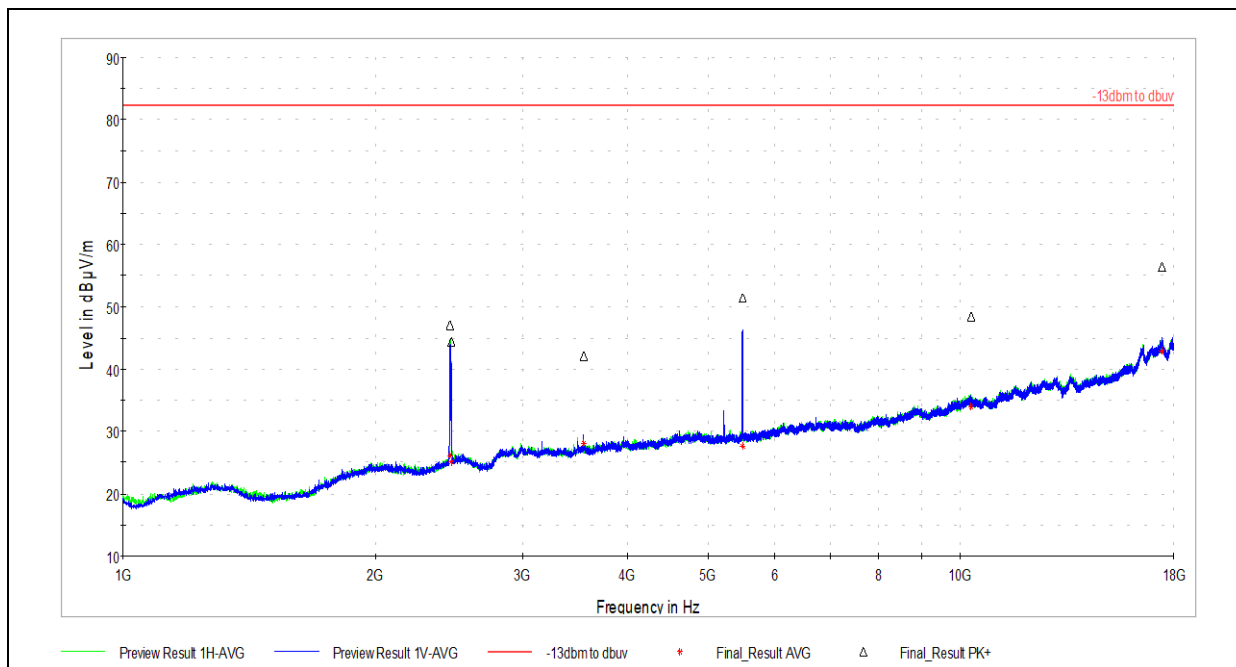
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.2 °C

Relative Humidity: 42.5 %

Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

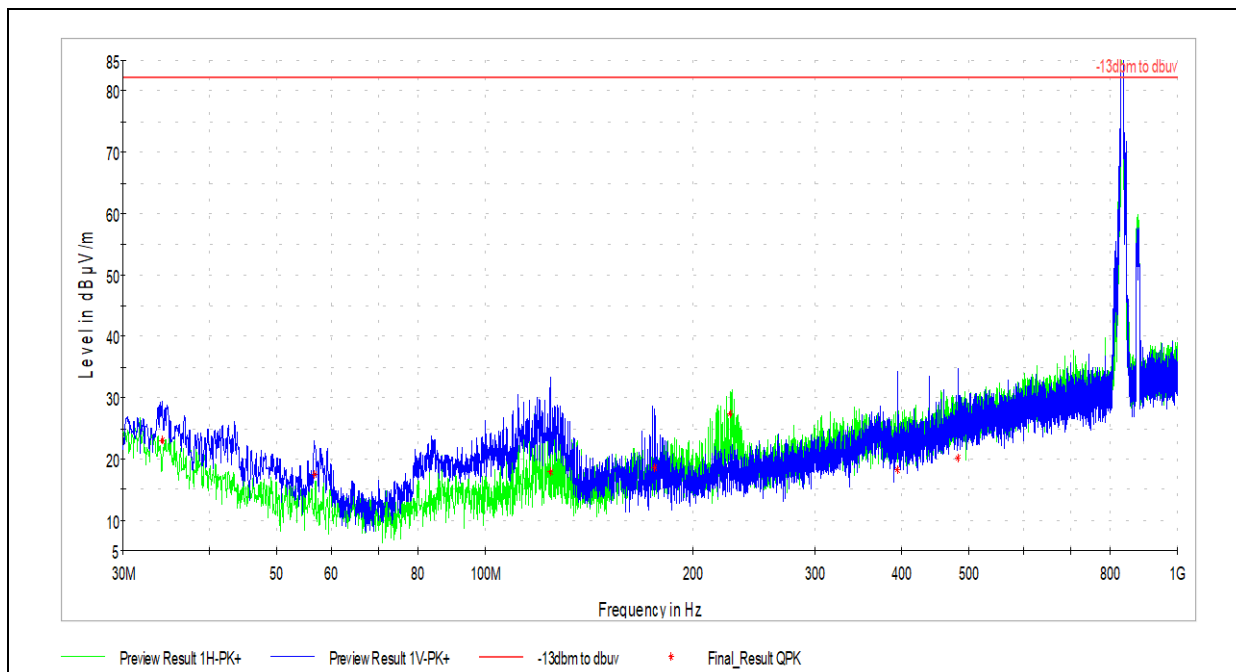
**6.11.14 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 66)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2459.500000	26.05	82.250	56.20	1000.000	371.0	H	346.0	4.63
2465.500000	25.08	82.250	57.17	1000.000	240.0	H	348.0	4.73
3547.500000	28.03	82.250	54.22	1000.000	292.0	V	94.0	6.67
5493.500000	27.68	82.250	54.57	1000.000	100.0	V	243.0	10.02
10311.500000	33.90	82.250	48.35	1000.000	410.0	V	0.0	17.63
17414.000000	42.78	82.250	39.47	1000.000	100.0	V	280.0	26.87

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: NA
 (Where Applicable)
 Product Standard: FCC Part 27
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/10/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.8 °C
 Relative Humidity: 43.6 %
 Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

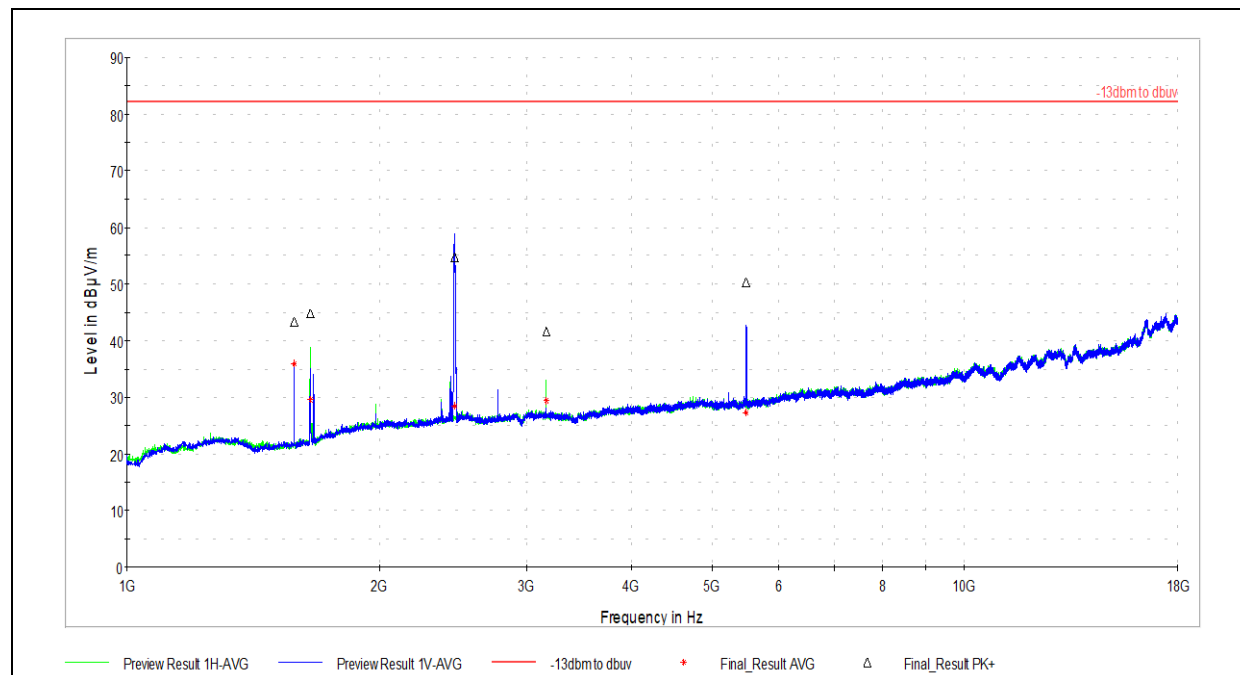
**6.12 FCC Part 90 Radiated Spurious Emissions (LTE B26)****6.12.1 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE B26)**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
34.149444	22.91	82.250	59.34	120.000	100.0	V	197.0	21.07
56.675000	17.53	82.250	64.72	120.000	102.0	V	6.0	15.71
124.197778	17.94	82.250	64.31	120.000	100.0	V	177.0	15.98
175.931111	18.49	82.250	63.76	120.000	100.0	V	135.0	18.92
226.155556	27.40	82.250	54.85	120.000	95.0	H	17.0	20.76
394.127222	18.16	82.250	64.09	120.000	107.0	V	236.0	25.79
481.750556	20.18	82.250	62.07	120.000	105.0	V	154.0	28.94

Test Personnel: Ben Coolbear
 Supervising/Reviewing Engineer: (Where Applicable) NA
 Product Standard: FCC Part 90
 Input Voltage: 12 VDC
 Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/11/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 25.1 °C
 Relative Humidity: 43.5 %
 Atmospheric Pressure: 986.9 mbar

Deviations, Additions, or Exclusions: The fundamental frequency for LTE Band 26 was present for this scan. The fundamental was not under evaluation.

**6.12.2 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE B26)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1584.000000	35.90	82.250	46.35	1000.000	182.0	V	169.0	-0.85
1654.500000	29.57	82.250	52.68	1000.000	136.0	H	243.0	-0.22
2462.500000	28.41	82.250	53.84	1000.000	163.0	V	0.0	4.57
3168.000000	29.40	82.250	52.85	1000.000	125.0	H	113.0	5.97
5493.000000	27.34	82.250	54.91	1000.000	410.0	V	284.0	10.01

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: (Where Applicable) NA

Product Standard: FCC Part 90

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/11/2022

Limit Applied: -13dBm converted to field strength

Ambient Temperature: 25.1 °C

Relative Humidity: 43.5 %

Atmospheric Pressure: 986.9 mbar

Deviations, Additions, or Exclusions: None



7 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	5/17/2022	105040967LEX-001	<i>JB</i>	<i>BL</i>	Original Issue