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GPS INDUSTRIES, LLC TEST REPORT

SCOPE OF WORK

EMC TESTING – V3-1005AQNS

REPORT NUMBER

105040967LEX-002

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EMC TEST REPORT

(FULL COMPLIANCE)

Report Number: 105040967LEX-002

Project Number: G105040967

Report Issue Date: 5/17/2022

Model(s) Tested: V3-1005AQNS

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



Brian Lackey, Team Leader

Report reviewed by



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

¹ The V3-1005AQNS 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	V3-1005AQNS
Model Number	V3-1005AQNS
Serial Number	G 22 15 1007
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	5/17/2022
Device Received Condition	Good
Test Sample Type	Production
Rated Voltage	12VDC
Description of Equipment Under Test (provided by client)	
The V3-1005AQNS 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

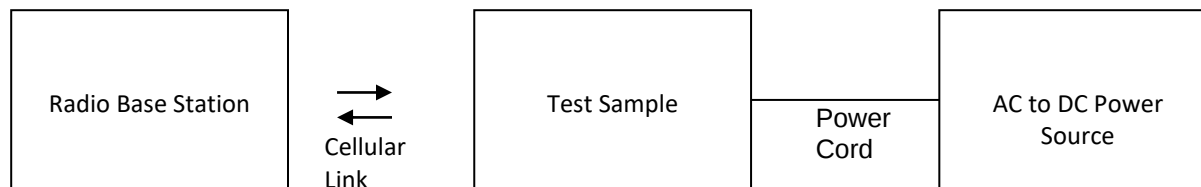
5.1 Method:

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

No.	Descriptions of EUT Exercising
1	The V3-1005AQNS 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:**

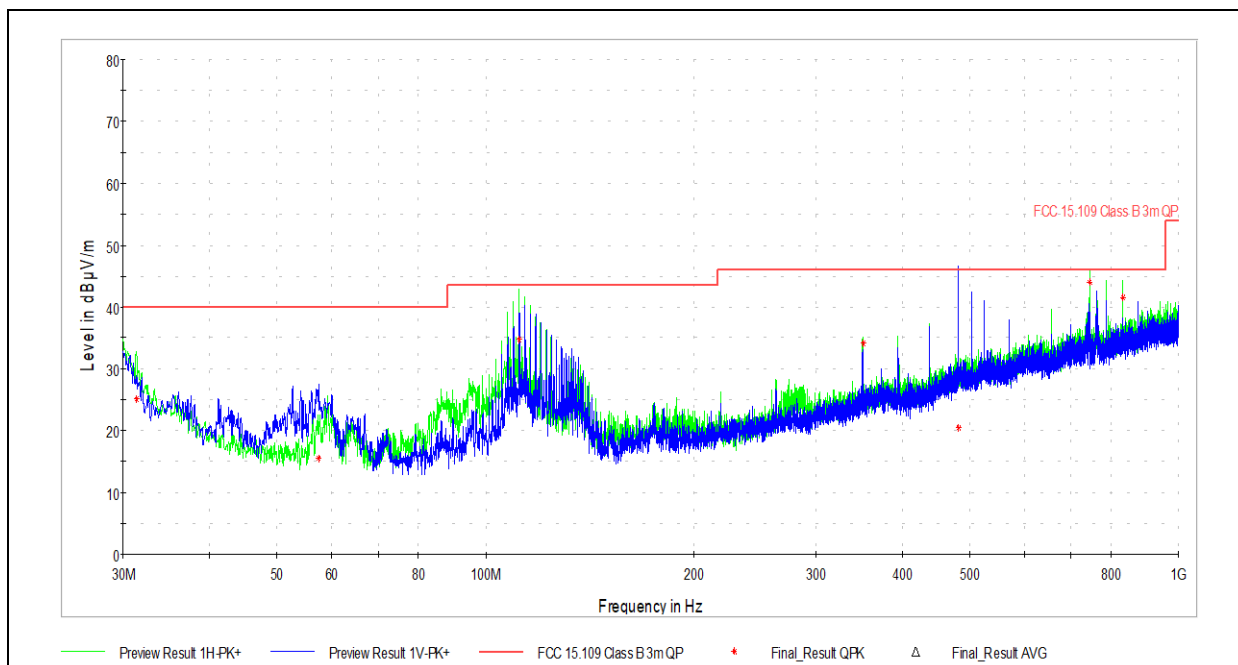
Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8181	Rohde & Schwarz	ESW44	11/16/2021	11/16/2022
Bilog Antenna	3133	ETS	3142C	8/26/2021	8/26/2022
Horn Antenna	3780	ETS	3117	6/28/2021	6/28/2022
System Controller	4096	ETS Lindgren	2090	Verify at Time of Use	Verify at Time of Use
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)
31.347222	25.04	40.000	14.96	120.000	204.0	H	166.0	24.43
57.429444	15.53	40.000	24.47	120.000	104.0	V	-1.0	15.66
111.749444	34.70	43.522	8.82	120.000	180.0	H	178.0	16.46
350.369444	34.12	46.021	11.90	120.000	95.0	H	28.0	25.69
481.750556	20.43	46.021	25.59	120.000	104.0	V	346.0	28.94
744.512778	44.06	46.021	1.96	120.000	100.0	H	326.0	34.22
832.136111	41.56	46.021	4.46	120.000	100.0	H	251.0	35.74

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: (Where Applicable) NA

Product Standard: FCC Part 15B

Input Voltage: ICES-003 Issue 7

Pretest Verification w / Ambient Signals or BB Source: 12 VDC

Yes

Test Date: 4/26/2022

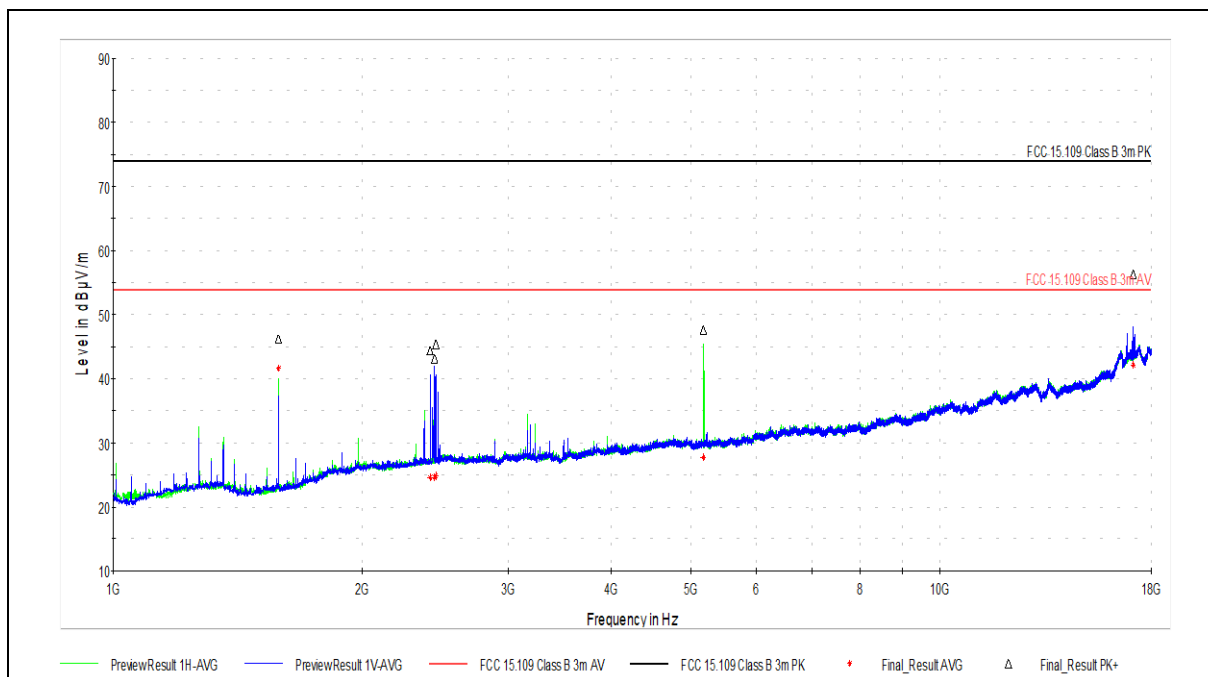
Limit Applied: Class B

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	46.28	73.979	27.70	1000.000	223.0	H	182.0	-0.87
2418.000000	44.44	73.979	29.54	1000.000	212.0	V	0.0	4.38
2448.000000	43.15	73.979	30.83	1000.000	277.0	V	10.0	4.48
2456.000000	45.37	73.979	28.61	1000.000	100.0	V	204.0	4.52
5173.000000	47.61	73.979	26.37	1000.000	194.0	H	34.0	9.64
17122.000000	56.32	73.979	17.66	1000.000	100.0	V	278.0	26.82

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1584.000000	41.64	53.979	12.34	1000.000	223.0	H	182.0	-0.87
2418.000000	24.57	53.979	29.41	1000.000	212.0	V	0.0	4.38
2448.000000	24.61	53.979	29.37	1000.000	277.0	V	10.0	4.48
2456.000000	24.94	53.979	29.04	1000.000	100.0	V	204.0	4.52
5173.000000	27.62	53.979	26.36	1000.000	194.0	H	34.0	9.64
17122.000000	42.11	53.979	11.87	1000.000	100.0	V	278.0	26.82

Test Personnel: Ben Coolbear

Supervising/Reviewing Engineer: NA

(Where Applicable) FCC Part 15B

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 %

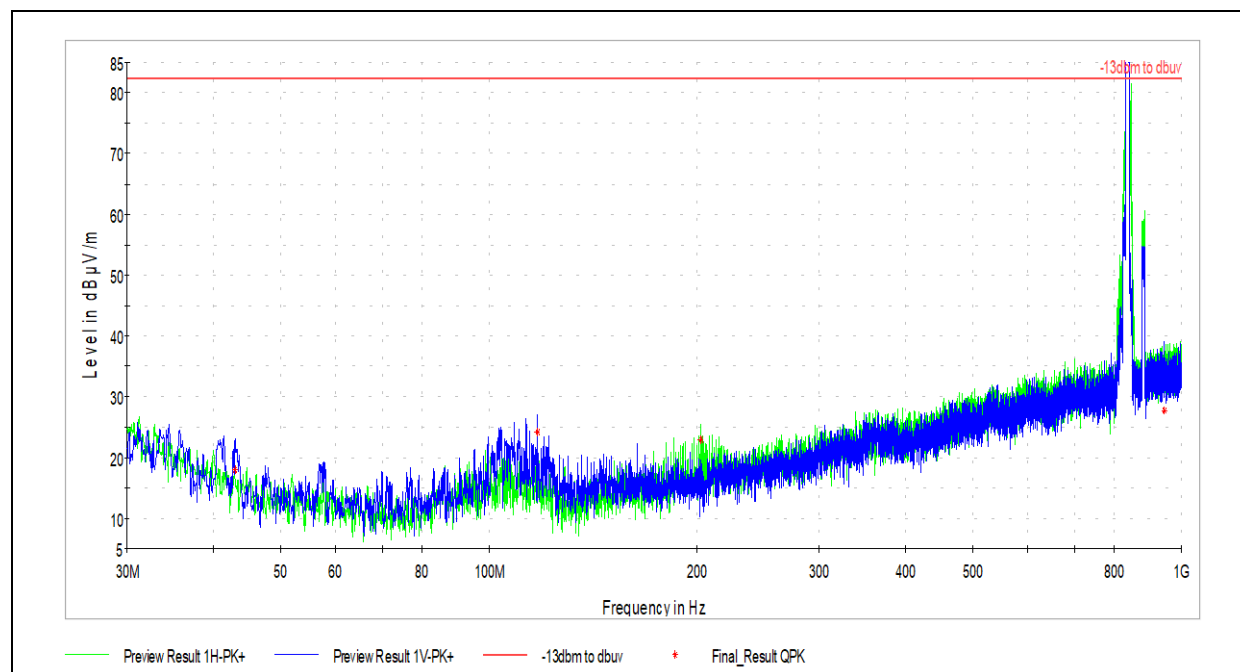
Atmospheric Pressure: 990.9 mbar

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)

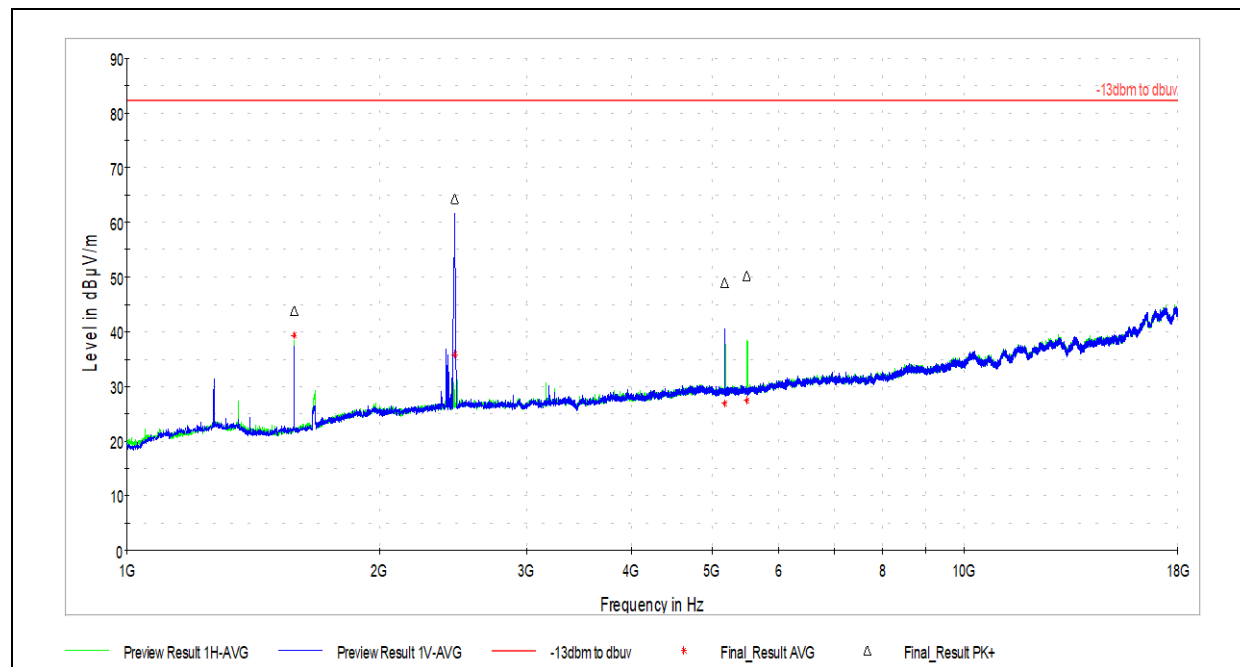


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.933333	18.03	82.250	64.22	120.000	100.0	V	6.0	17.04
117.515556	24.14	82.250	58.11	120.000	100.0	V	183.0	16.22
202.390556	23.04	82.250	59.21	120.000	104.0	H	346.0	19.56
944.332778	27.77	82.250	54.48	120.000	331.0	V	273.0	36.05

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: 5/12/2022
 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)
1584.000000	39.28	82.250	42.97	1000.000	315.0	H	157.0	-0.87
2461.000000	35.81	82.250	46.44	1000.000	100.0	V	183.0	4.55
5178.000000	26.80	82.250	55.45	1000.000	349.0	V	12.0	9.58
5504.000000	27.41	82.250	54.84	1000.000	410.0	H	344.0	10.01

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

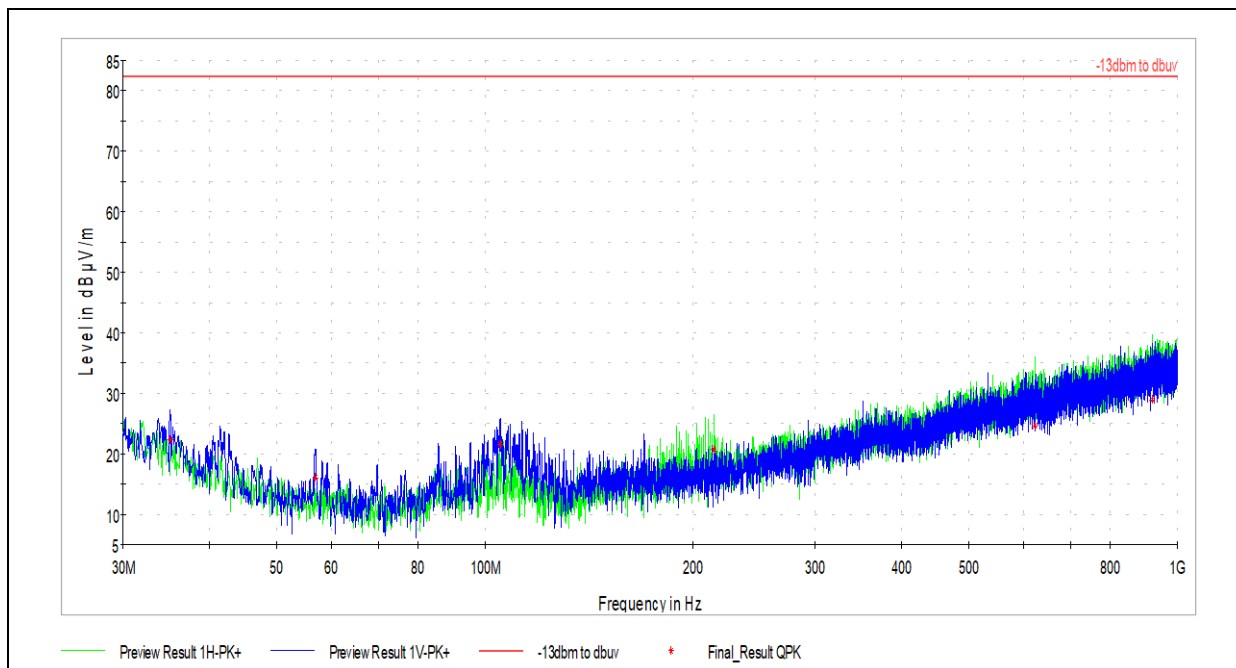
Test Date: 5/11/2022
 Limit Applied: -13dBm converted to field strength
 Ambient Temperature: 24.8 °C
 Relative Humidity: 43.6 %
 Atmospheric Pressure: 987.8 mbar

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)

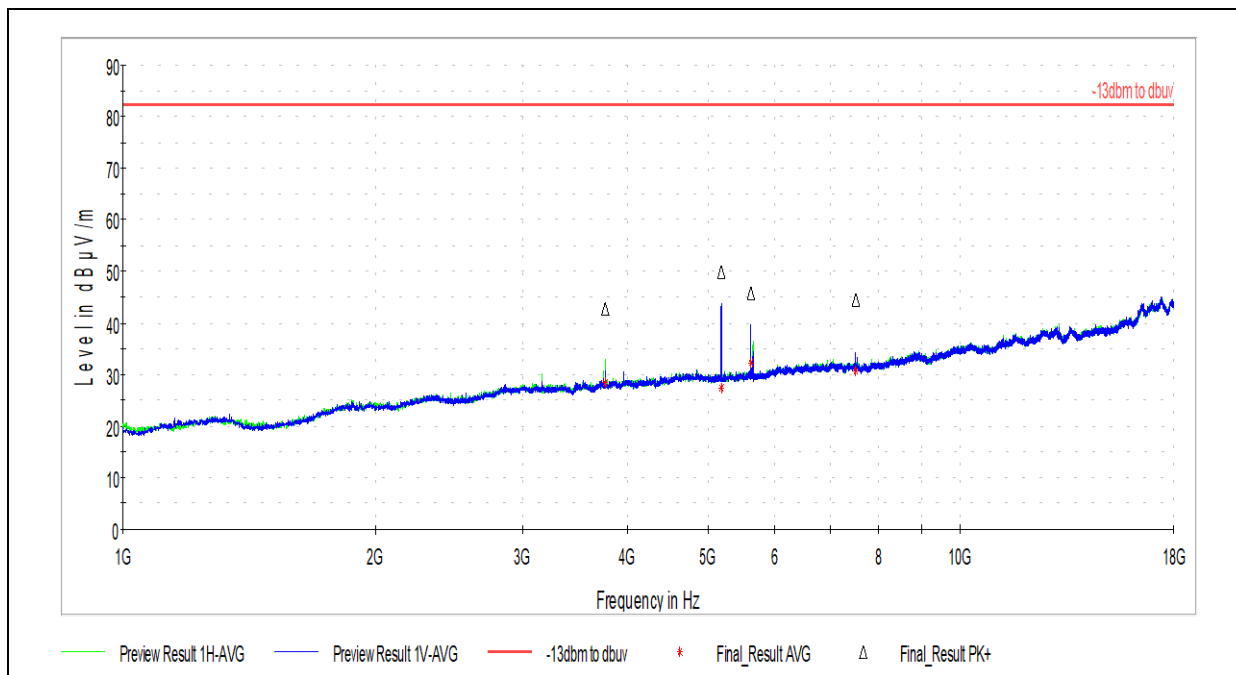


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.119444	22.26	82.250	59.99	120.000	100.0	V	208.0	20.50
56.890556	16.09	82.250	66.16	120.000	100.0	V	0.0	15.73
105.013333	21.63	82.250	60.62	120.000	99.0	V	175.0	17.18
214.192222	20.73	82.250	61.52	120.000	99.0	H	130.0	20.27
621.861667	24.61	82.250	57.64	120.000	99.0	H	102.0	32.70
920.082778	29.01	82.250	53.24	120.000	195.0	H	132.0	36.84

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: 5/12/2022
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

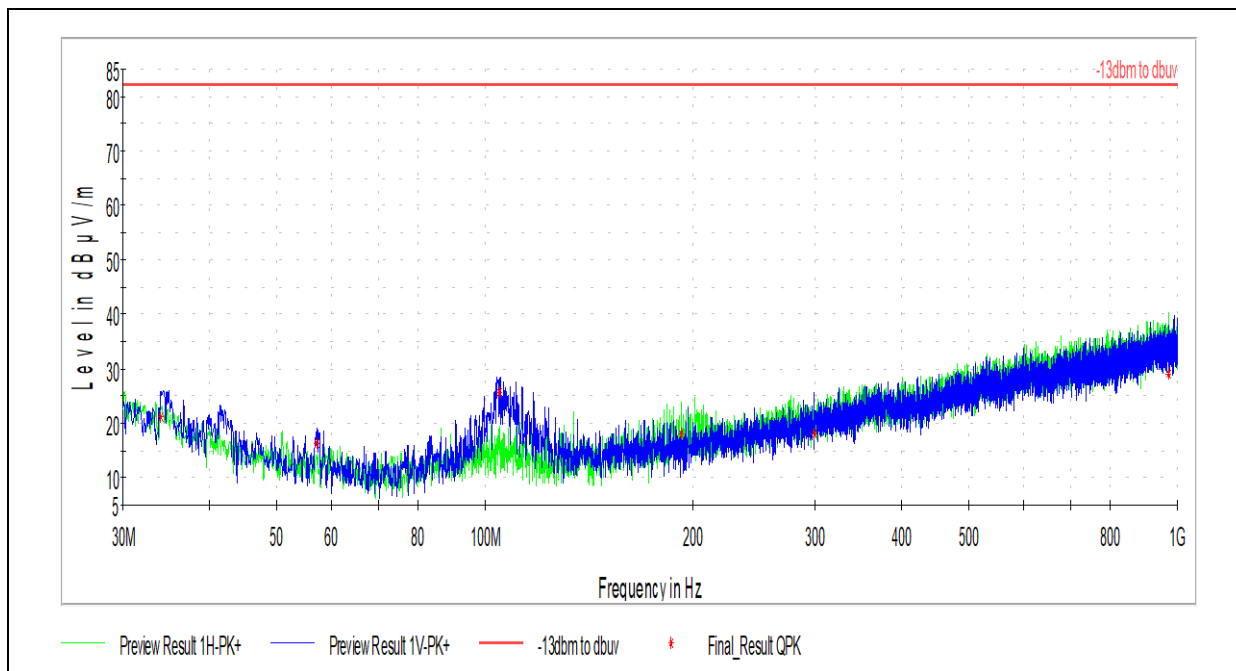
**6.10.2 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE B2)**

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3768.000000	28.27	82.250	53.98	1000.000	308.0	H	142.0	7.30
5184.000000	27.28	82.250	54.97	1000.000	302.0	V	117.0	9.59
5628.000000	32.32	82.250	49.93	1000.000	230.0	V	95.0	10.19
7504.000000	30.73	82.250	51.52	1000.000	189.0	V	327.0	12.73

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: 5/11/2022
 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

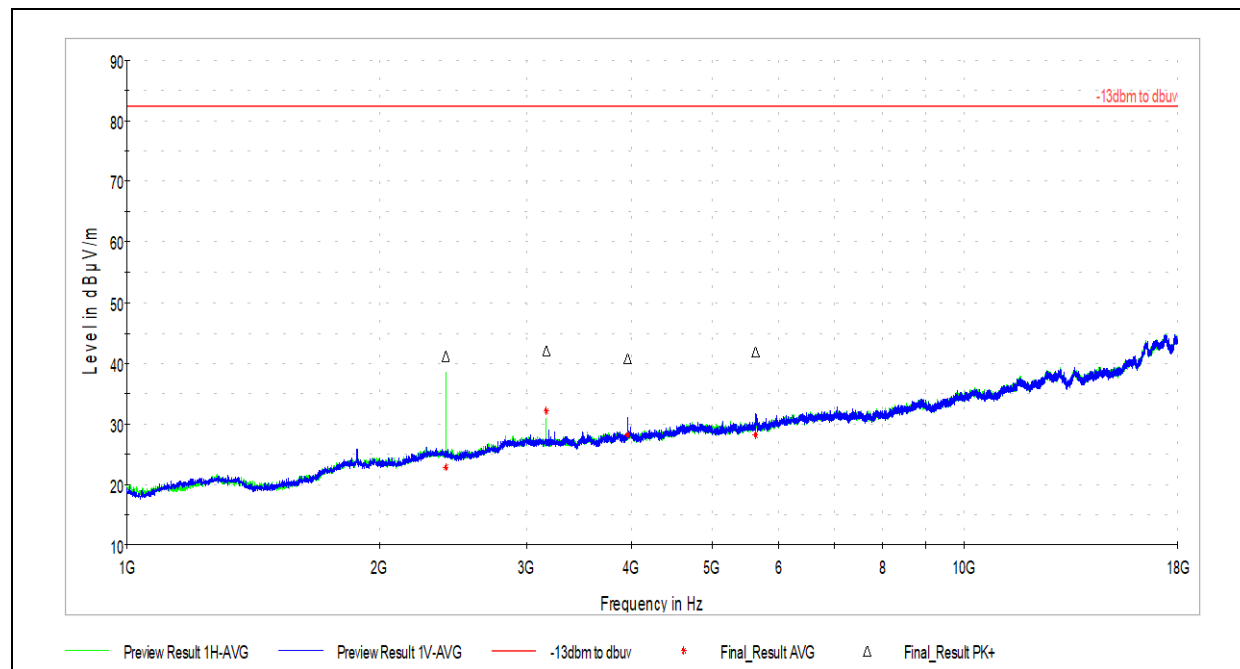
**6.10.3 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE B25)**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.987778	21.23	82.250	61.02	120.000	100.0	V	205.0	21.16
57.106111	16.42	82.250	65.83	120.000	100.0	V	-1.0	15.72
104.959444	25.75	82.250	56.50	120.000	100.0	V	312.0	17.18
192.097778	18.03	82.250	64.22	120.000	116.0	H	342.0	19.78
299.121111	18.09	82.250	64.16	120.000	121.0	V	175.0	23.66
970.199444	29.13	82.250	53.12	120.000	146.0	H	143.0	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: 5/13/2022
 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

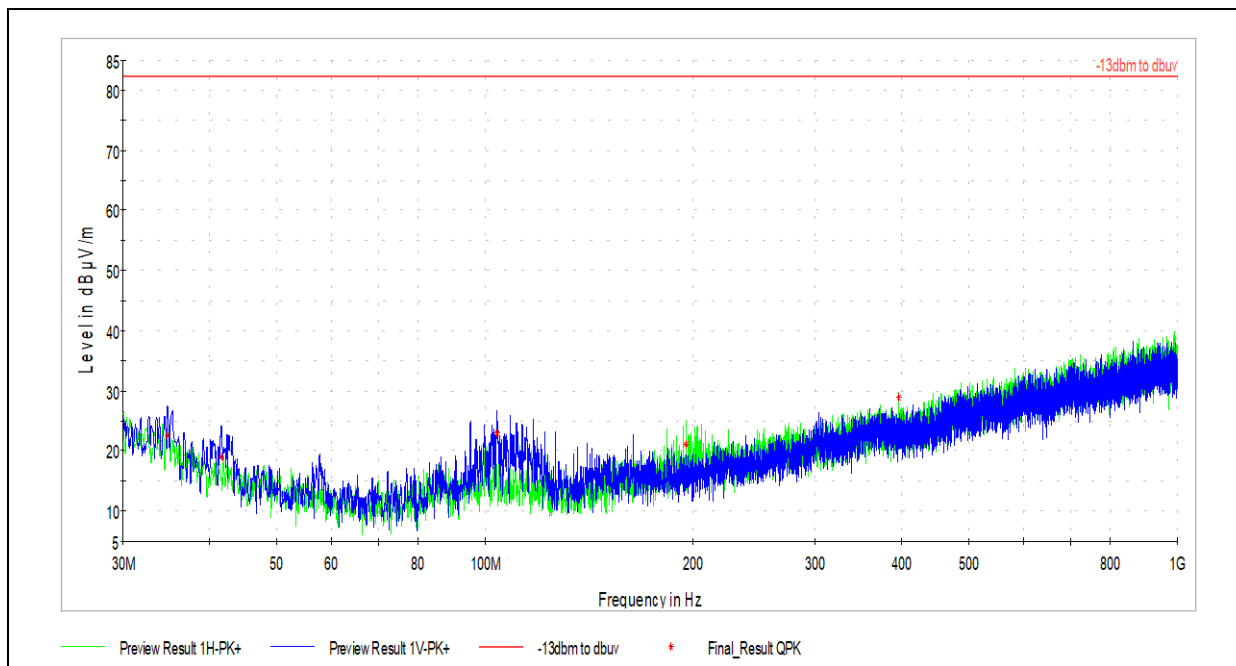
**6.10.4 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE B25)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2402.000000	22.79	82.250	59.46	1000.000	213.0	H	317.0	4.39
3168.000000	32.08	82.250	50.17	1000.000	369.0	H	165.0	5.97
3960.000000	28.26	82.250	53.99	1000.000	100.0	V	194.0	7.61
5640.000000	28.10	82.250	54.15	1000.000	246.0	V	145.0	10.22

Test Personnel: Brian Lackey
 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: 5/17/2022
 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)
34.796111	22.58	82.250	59.67	120.000	99.0	V	189.0	20.69
41.586111	18.99	82.250	63.26	120.000	101.0	V	6.0	17.56
104.097222	22.85	82.250	59.40	120.000	101.0	V	164.0	17.17
194.900000	21.20	82.250	61.05	120.000	115.0	H	0.0	19.71
395.959444	28.88	82.250	53.37	120.000	145.0	H	164.0	27.08

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: 5/12/2022

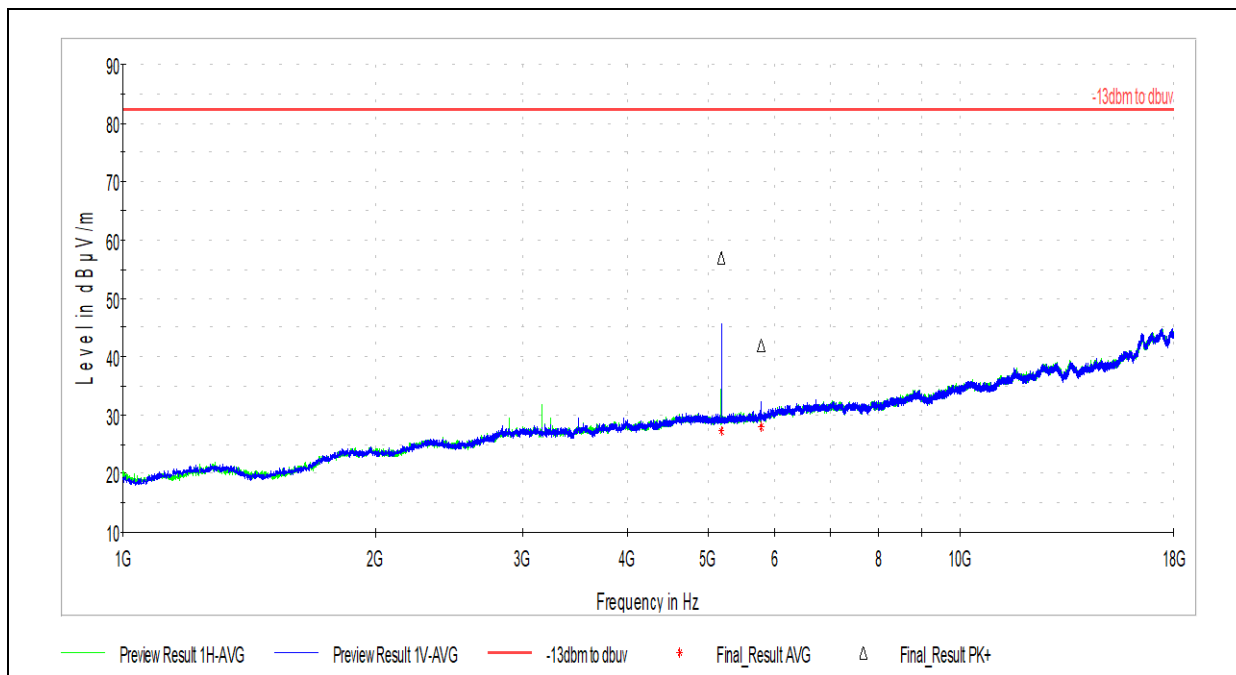
Limit Applied: -13dBm converted to field strength

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)
5182.000000	27.26	82.250	54.99	1000.000	168.0	V	359.0	9.59
5789.500000	27.90	82.250	54.35	1000.000	100.0	V	22.0	10.58

Test Personnel: Brian Lackey

Supervising/Reviewing Engineer: NA

(Where Applicable) NA

Product Standard: FCC Part 27

Input Voltage: 12 VDC

Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 5/17/2022

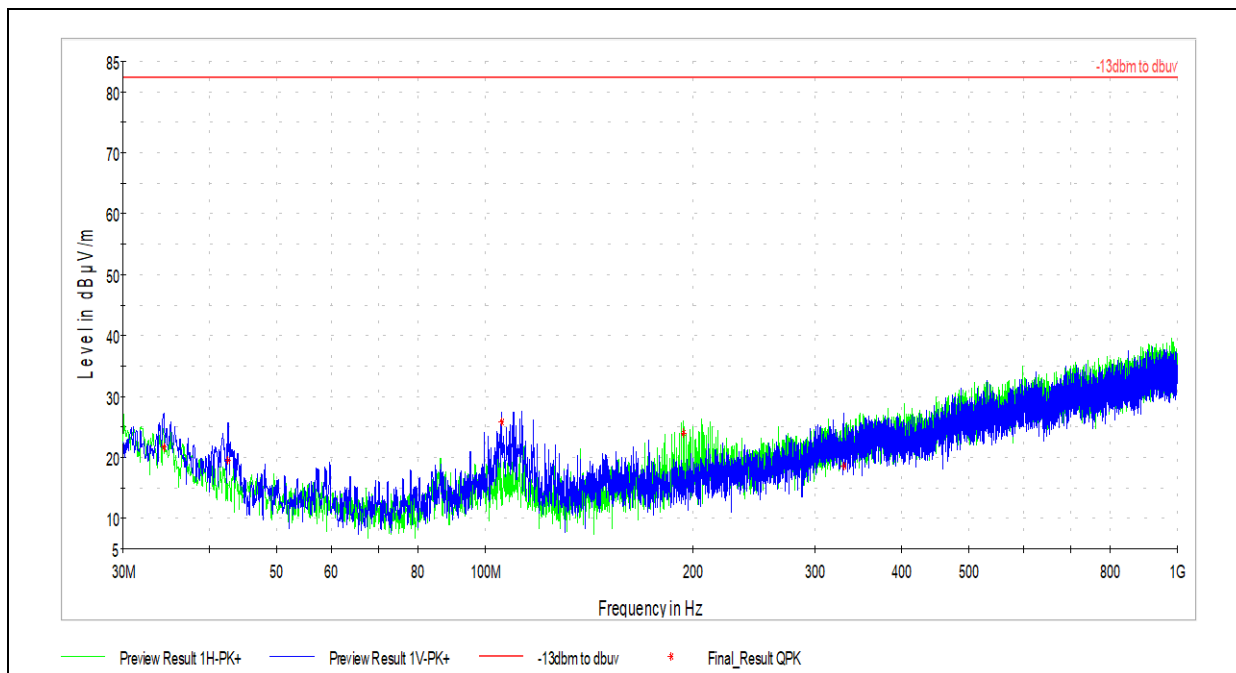
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.8 °C

Relative Humidity: 43.6 %

Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

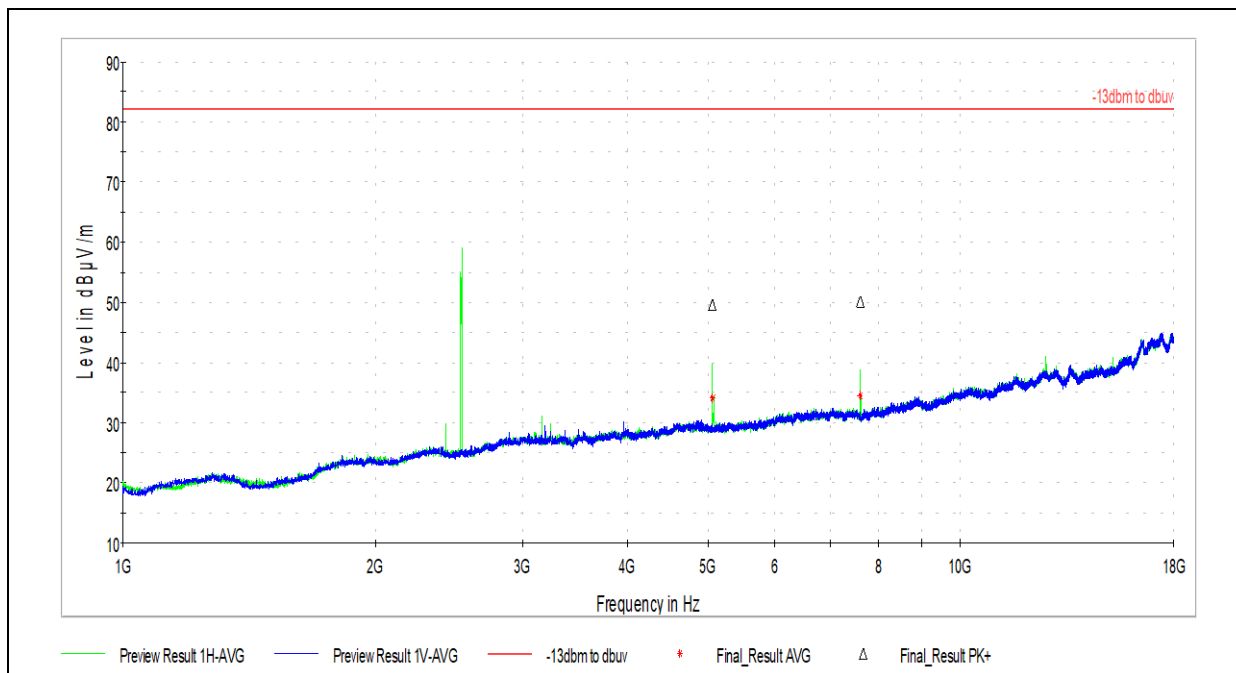
**6.11.3 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 7)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
34.311111	21.56	82.250	60.69	120.000	101.0	V	192.0	20.97
42.556111	19.39	82.250	62.86	120.000	101.0	V	6.0	17.18
105.606111	25.79	82.250	56.46	120.000	101.0	V	189.0	17.13
193.606667	23.92	82.250	58.33	120.000	95.0	H	0.0	19.79
330.107222	18.56	82.250	63.69	120.000	122.0	V	7.0	24.45

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: 5/12/2022
 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)
5062.000000	34.14	82.250	48.11	1000.000	151.0	H	218.0	9.44
7593.000000	34.45	82.250	47.80	1000.000	277.0	H	232.0	12.88

Test Personnel: Brian Lackey

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: 5/17/2022

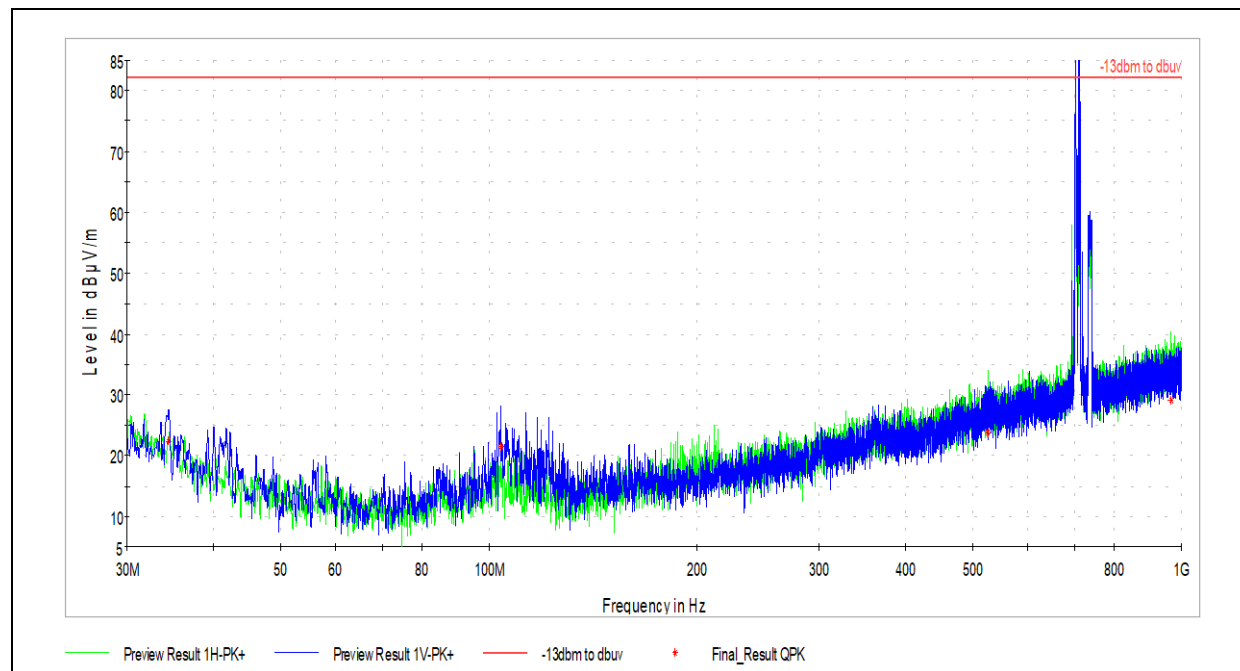
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.8 °C

Relative Humidity: 43.6 %

Atmospheric Pressure: 987.6 mbar

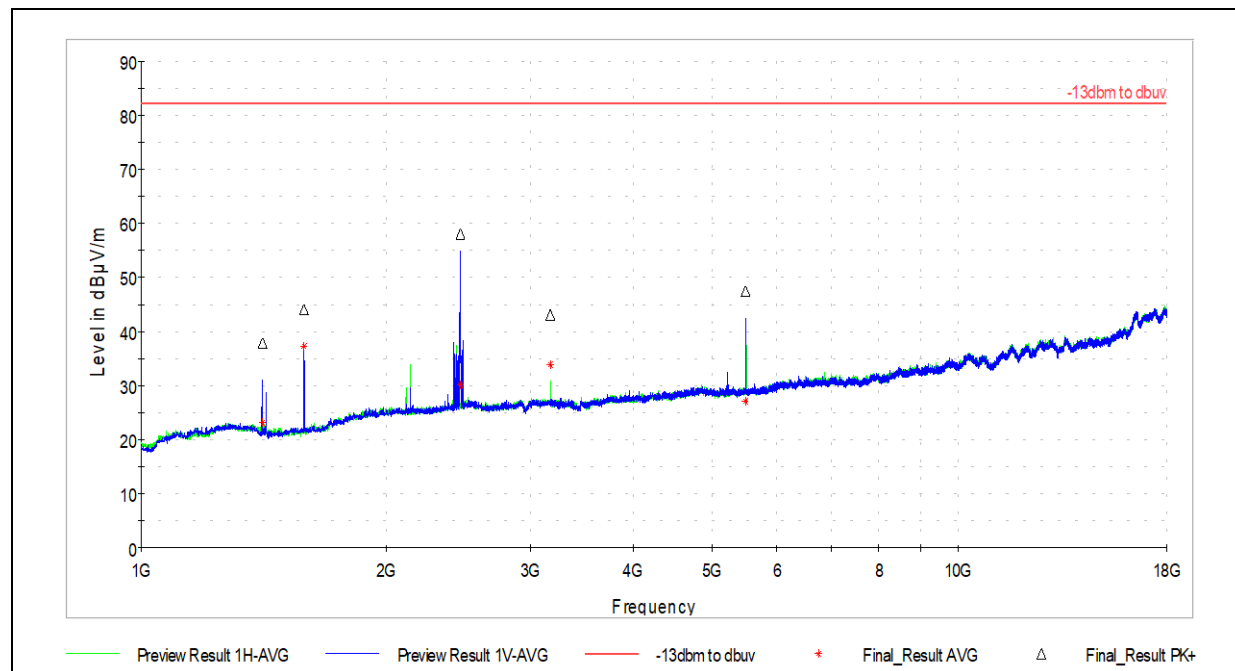
Deviations, Additions, or Exclusions: None

**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)
34.418889	22.41	82.250	59.84	120.000	100.0	V	200.0	20.91
104.043333	21.49	82.250	60.76	120.000	100.0	V	177.0	17.17
525.616111	23.88	82.250	58.37	120.000	105.0	H	16.0	30.17
965.780556	29.07	82.250	53.18	120.000	100.0	H	156.0	37.35

Test Personnel:	Ben Coolbear	Test Date:	5/12/2022
Supervising/Reviewing Engineer:		Limit Applied:	-13dBm converted to field strength
(Where Applicable)	NA	Ambient Temperature:	25.1 °C
Product Standard:	FCC Part 27	Relative Humidity:	43.5 %
Input Voltage:	12 VDC	Atmospheric Pressure:	9869 mbar
Pretest Verification w / Ambient			
Signals or BB Source:	Yes		

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)
1406.500000	23.07	82.250	59.18	1000.000	144.0	V	244.0	-1.30
1584.000000	37.31	82.250	44.94	1000.000	154.0	V	166.0	-0.85
2459.500000	30.10	82.250	52.15	1000.000	154.0	V	215.0	4.54
3168.000000	34.01	82.250	48.24	1000.000	244.0	H	110.0	5.97
5497.500000	27.12	82.250	55.13	1000.000	127.0	V	204.0	10.02

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: 5/11/2022

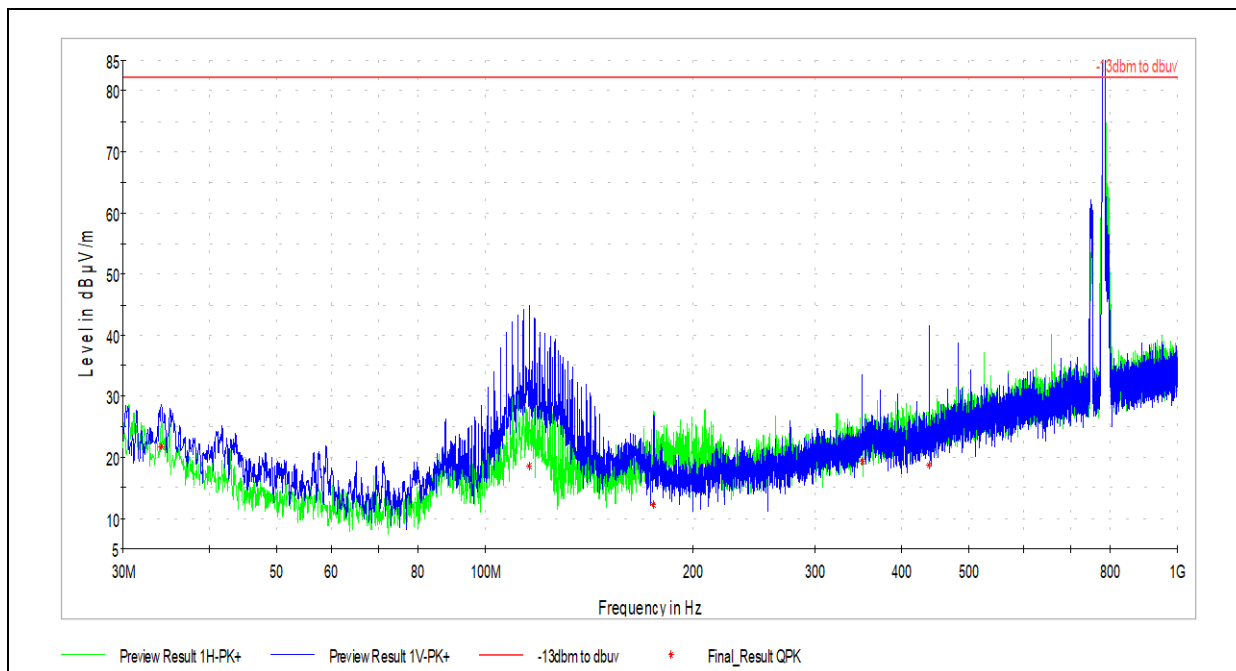
Limit Applied: -13dBm converted to field strength

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)
34.095556	21.77	82.250	60.48	120.000	98.0	V	202.0	21.10
115.791111	18.62	82.250	63.63	120.000	100.0	V	188.0	16.22
175.122778	12.18	82.250	70.07	120.000	100.0	V	143.0	18.91
350.369444	19.22	82.250	63.03	120.000	134.0	V	16.0	25.39
437.992778	18.74	82.250	63.51	120.000	100.0	V	6.0	26.76

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: 5/12/2022

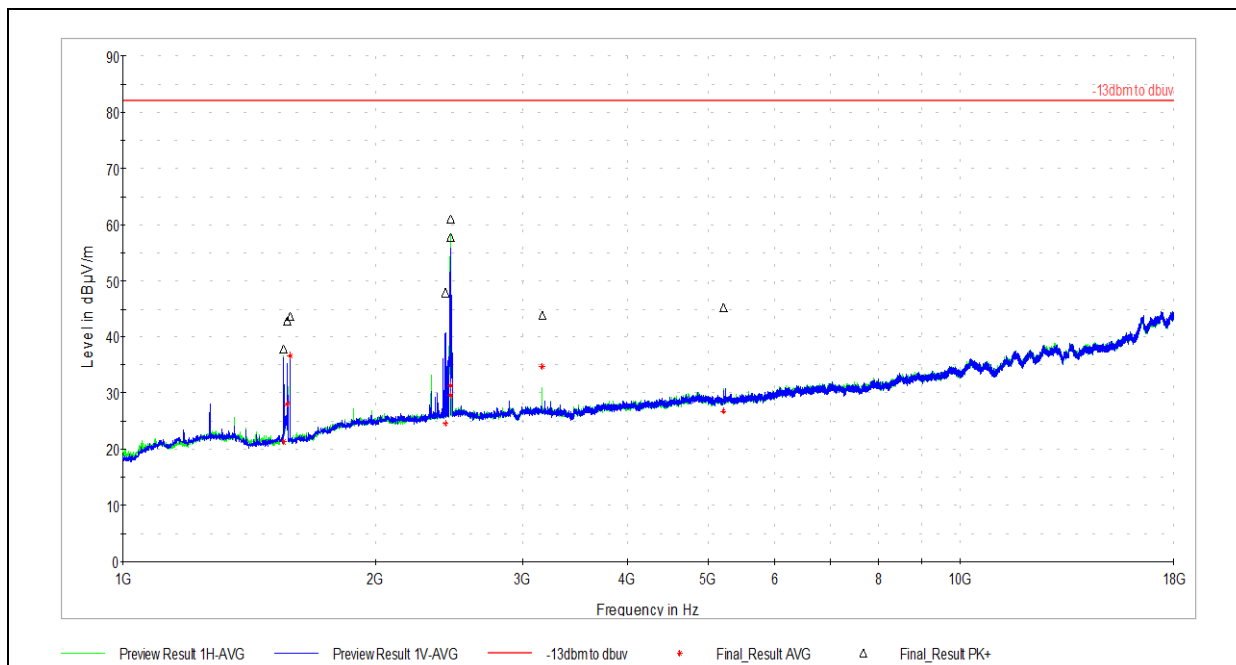
Limit Applied: -13dBm converted to field strength

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	21.26	82.250	60.99	1000.000	284.0	H	183.0	-1.00
1572.000000	27.95	82.250	54.30	1000.000	100.0	V	87.0	-0.80
1584.000000	36.63	82.250	45.62	1000.000	185.0	V	160.0	-0.85
2425.000000	24.63	82.250	57.62	1000.000	154.0	V	0.0	4.42
2460.500000	29.63	82.250	52.62	1000.000	100.0	H	342.0	4.64
2463.500000	31.32	82.250	50.93	1000.000	303.0	V	207.0	4.58
3168.000000	34.80	82.250	47.45	1000.000	248.0	H	109.0	5.97
5216.500000	26.79	82.250	55.46	1000.000	381.0	H	124.0	9.68

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

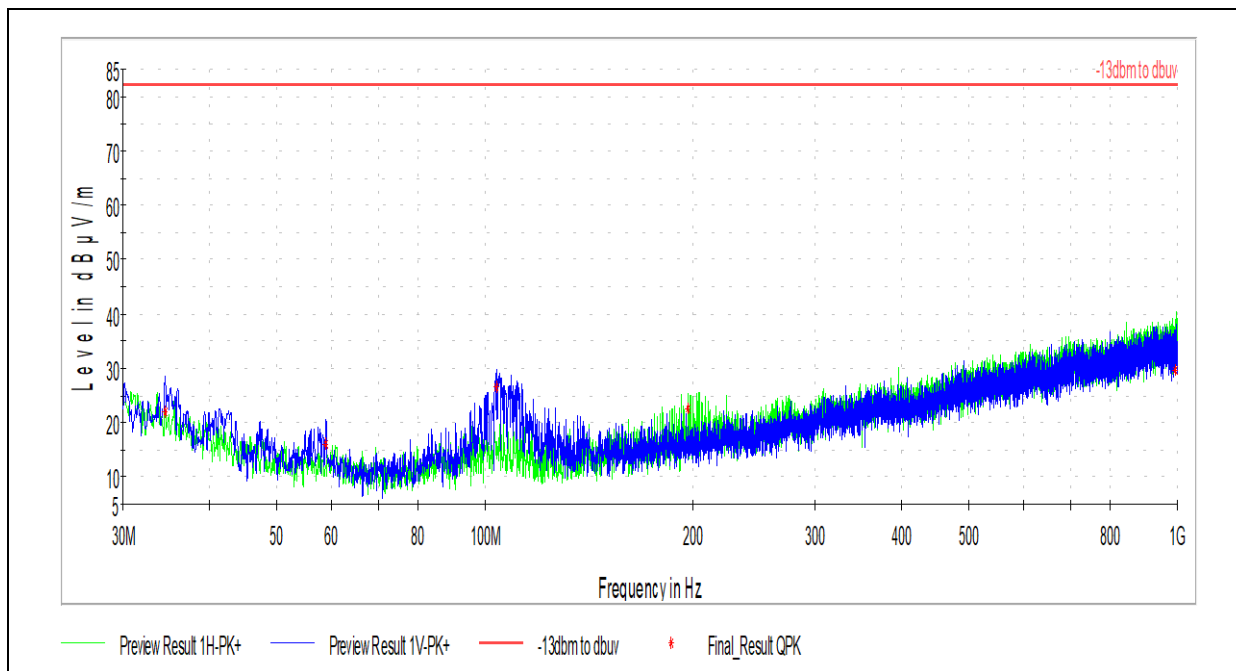
Limit Applied: -13dBm converted to field strength

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)
34.472778	22.10	82.250	60.15	120.000	100.0	V	215.0	20.88
58.884444	15.96	82.250	66.29	120.000	100.0	V	16.0	15.31
103.827778	26.46	82.250	55.79	120.000	100.0	V	154.0	17.18
196.516667	22.55	82.250	59.70	120.000	95.0	H	0.0	19.71
991.970556	29.60	82.250	52.65	120.000	265.0	H	-1.0	37.37

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: 5/13/2022

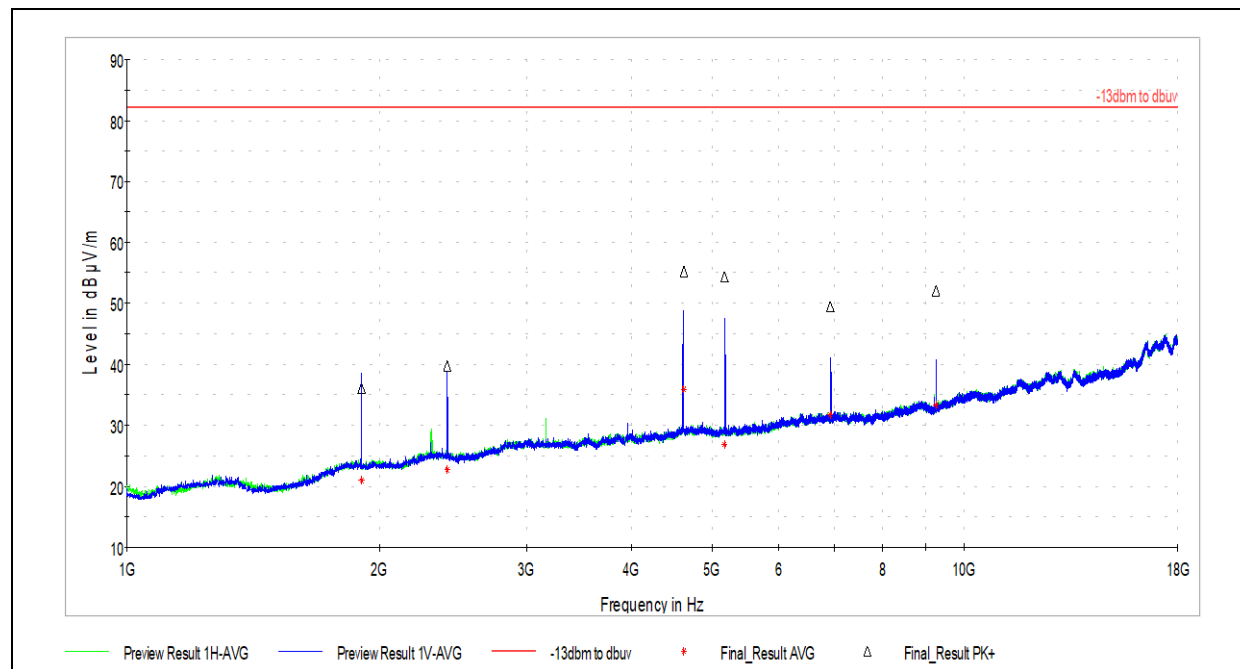
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.2 °C

Relative Humidity: 42.5 %

Atmospheric Pressure: 979.1 mbar

Deviations, Additions, or Exclusions: None

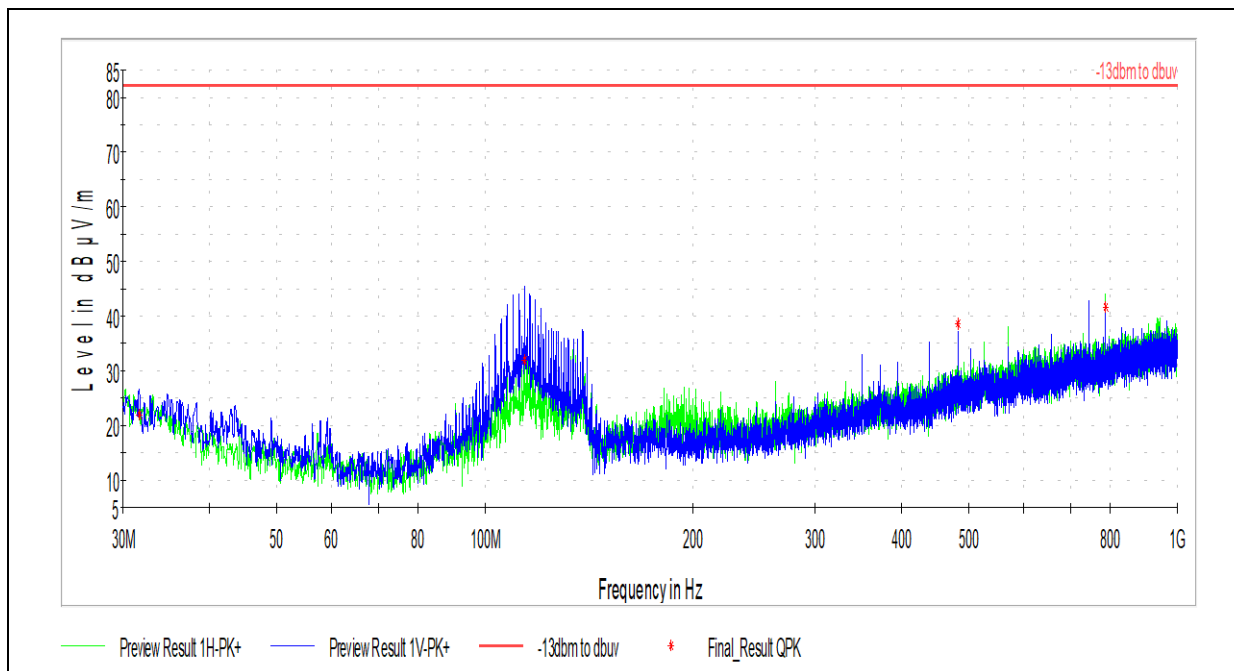
**6.11.10 Radiated Spurious Emissions, 1 GHz – 18 GHz (LTE Band 30)**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1905.000000	21.00	82.250	61.25	1000.000	410.0	V	0.0	2.67
2414.000000	22.62	82.250	59.63	1000.000	354.0	V	58.0	4.38
4628.000000	35.94	82.250	46.31	1000.000	144.0	V	139.0	9.31
5177.500000	26.89	82.250	55.36	1000.000	133.0	V	183.0	9.58
6918.000000	31.82	82.250	50.43	1000.000	100.0	V	213.0	12.33
9256.500000	33.37	82.250	48.88	1000.000	239.0	V	170.0	15.73

Test Personnel: Brian Lackey
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: 5/17/2022
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 (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.670556	22.06	82.250	60.19	120.000	100.0	V	260.0	22.44
114.012778	32.06	82.250	50.19	120.000	100.0	V	190.0	16.38
481.750556	38.58	82.250	43.67	120.000	100.0	V	17.0	28.94
788.324444	41.66	82.250	40.59	120.000	98.0	H	325.0	34.64

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: 5/13/2022

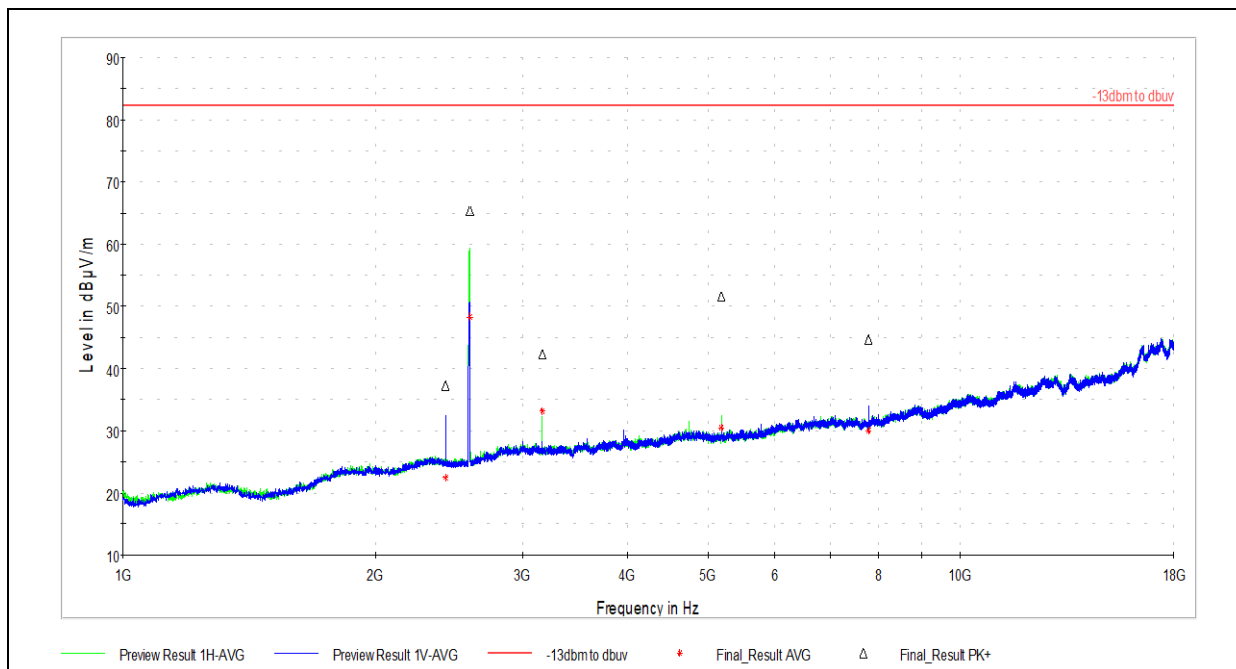
Limit Applied: -13dBm converted to field strength

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)
2428.000000	22.45	82.250	59.80	1000.000	410.0	V	154.0	4.45
2594.500000	48.33	82.250	33.92	1000.000	177.0	H	67.0	4.85
3168.000000	33.11	82.250	49.14	1000.000	219.0	H	198.0	5.97
5185.500000	30.54	82.250	51.71	1000.000	163.0	H	216.0	9.64
7774.000000	30.03	82.250	52.22	1000.000	156.0	V	171.0	13.09

Test Personnel: Brian Lackey

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: 5/17/2022

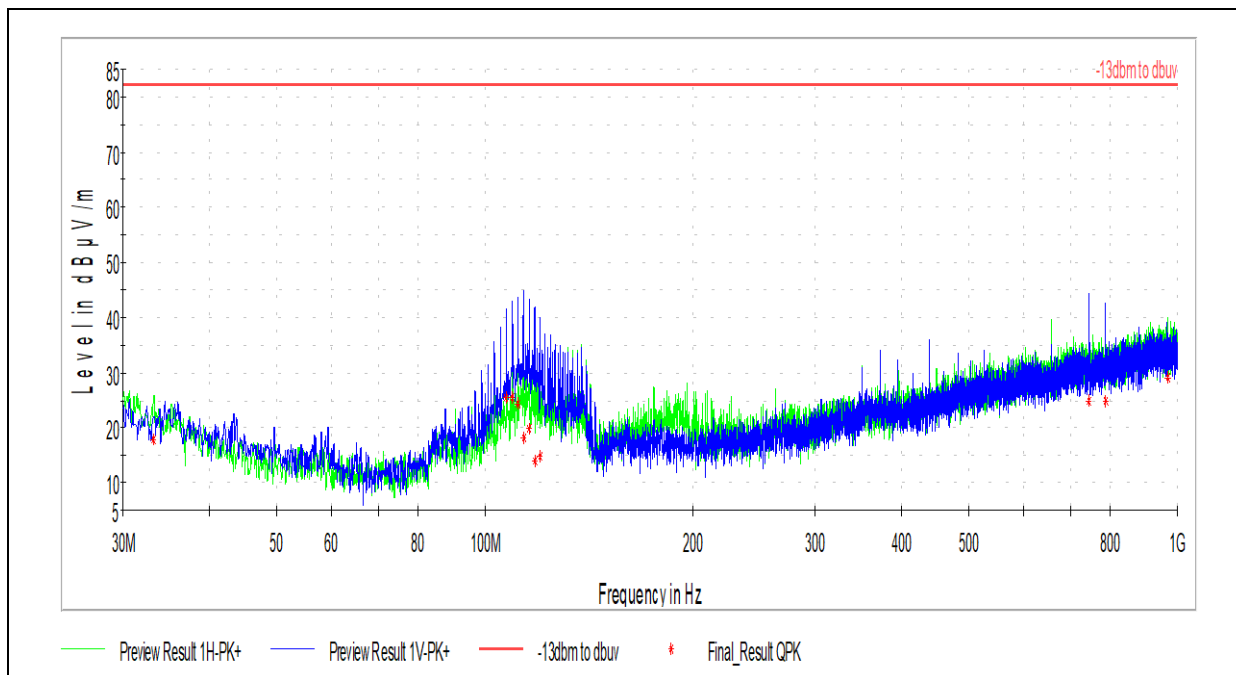
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.8 °C

Relative Humidity: 43.6 %

Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

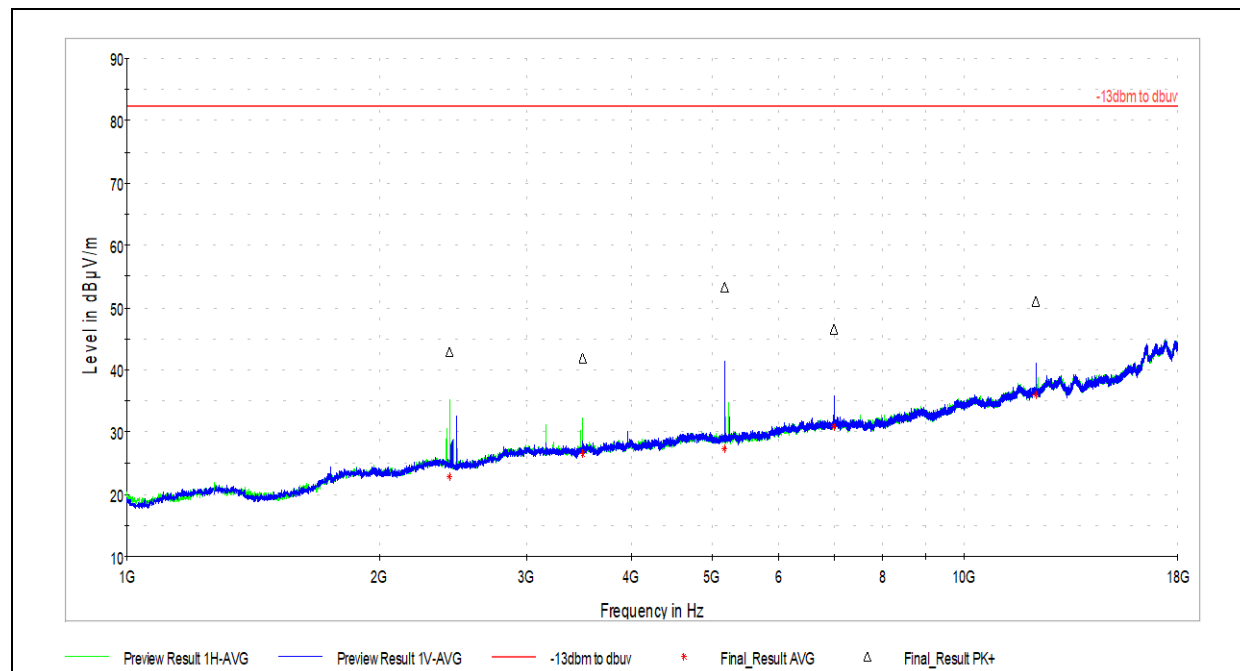
**6.11.13 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE Band 66)**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.179444	17.75	82.250	64.50	120.000	95.0	H	150.0	23.43
107.330556	25.35	82.250	56.90	120.000	100.0	V	188.0	16.98
109.432222	25.30	82.250	56.95	120.000	100.0	V	186.0	16.69
111.587778	24.41	82.250	57.84	120.000	100.0	V	186.0	16.50
113.689444	18.23	82.250	64.02	120.000	100.0	V	0.0	16.38
115.791111	19.90	82.250	62.35	120.000	100.0	V	176.0	16.22
117.892778	14.05	82.250	68.20	120.000	121.0	V	70.0	16.23
119.994444	14.65	82.250	67.60	120.000	100.0	V	164.0	16.05
744.566667	24.90	82.250	57.35	120.000	100.0	V	80.0	33.22
788.324444	24.94	82.250	57.31	120.000	165.0	V	261.0	33.74
967.666667	28.97	82.250	53.28	120.000	381.0	H	186.0	37.36

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)
2429.000000	22.77	82.250	59.48	1000.000	151.0	H	328.0	4.56
3498.000000	26.44	82.250	55.81	1000.000	100.0	H	242.0	6.52
5172.000000	27.24	82.250	55.01	1000.000	100.0	V	0.0	9.57
6996.000000	30.79	82.250	51.46	1000.000	100.0	V	219.0	12.45
12186.500000	35.92	82.250	46.33	1000.000	100.0	V	193.0	20.12

Test Personnel: Brian Lackey

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: 5/17/2022

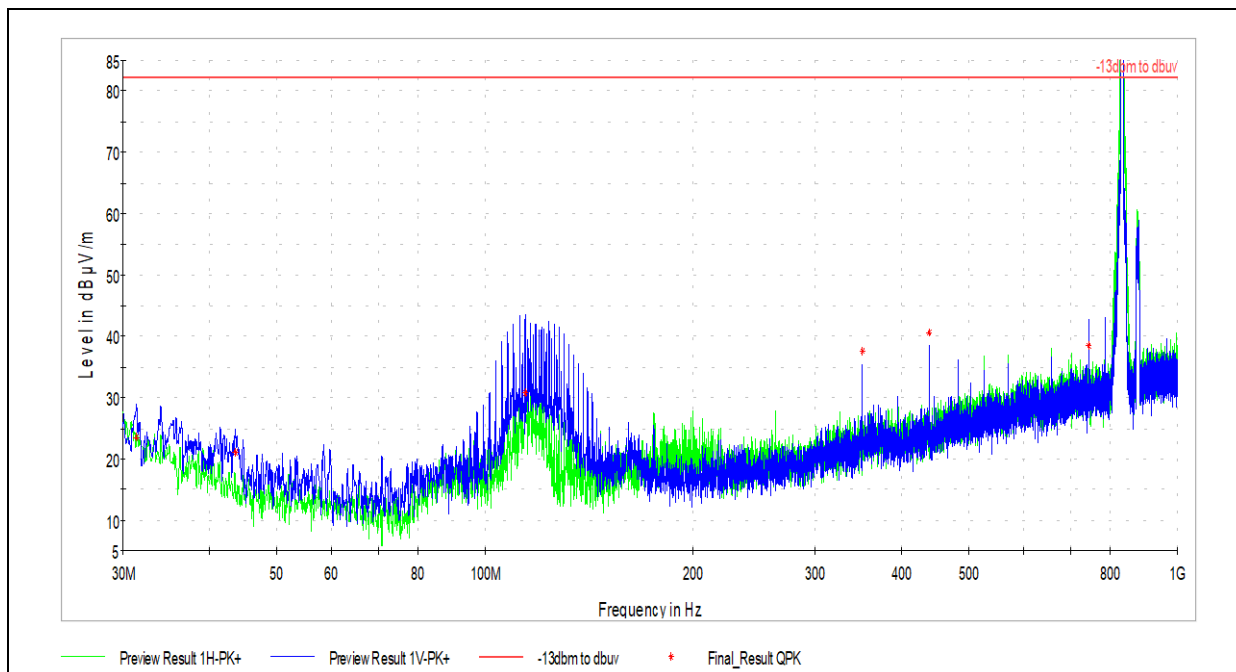
Limit Applied: -13dBm converted to field strength

Ambient Temperature: 24.8°C

Relative Humidity: 43.6 %

Atmospheric Pressure: 987.8 mbar

Deviations, Additions, or Exclusions: None

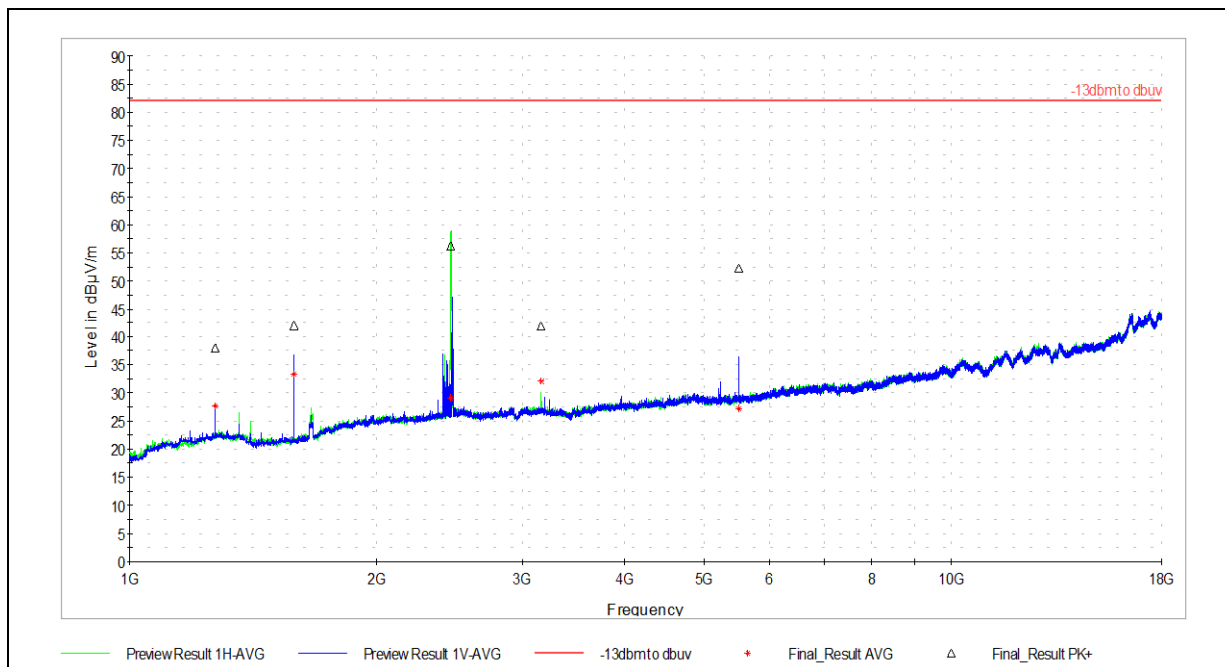
**6.12 FCC Part 90 Radiated Spurious Emissions (LTE B26)****6.12.1 Radiated Spurious Emissions, 30 MHz – 1 GHz (LTE B26)**

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.347222	23.56	82.250	58.69	120.000	100.0	V	210.0	22.66
43.580000	20.99	82.250	61.26	120.000	100.0	V	6.0	16.85
114.174444	30.66	82.250	51.59	120.000	100.0	V	193.0	16.37
350.369444	37.57	82.250	44.68	120.000	120.0	V	16.0	25.39
437.992778	40.67	82.250	41.58	120.000	100.0	V	16.0	26.76
744.512778	38.48	82.250	43.77	120.000	100.0	V	169.0	33.22

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)
1270.000000	27.70	82.250	54.55	1000.000	284.0	V	34.0	-0.44
1583.500000	33.35	82.250	48.90	1000.000	163.0	V	172.0	-0.85
2460.000000	29.16	82.250	53.09	1000.000	176.0	H	298.0	4.63
3168.000000	32.09	82.250	50.16	1000.000	188.0	H	99.0	5.97
5507.500000	27.29	82.250	54.96	1000.000	154.0	V	157.0	10.03

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-002	BZ	JTS	Original Issue