TEST REPORT

Report Number: R14967114-E1

Applicant	:	Hunter Industries 1940 Diamond St. San Marcos, CA 92078, United States
Model	:	WVL-100, WVL-200, WVL-400
FCC ID	:	M3U-WVL
IC	:	2772A-WVL
EUT Description	:	Wireless Valve Link
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C: 2023 ISED RSS-247 ISSUE 3: 2023 ISED RSS-GEN ISSUE 5 + A2:2021

Date Of Issue:
2024-07-05

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 U.S.A.
TEL: (919) 549-1400

ACCREDITED
CERT #0751.06

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023-10-27	Initial Issue	Charles Moody
V2	2024-07-05	Updated Antenna Gain	Noah Bennett

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Hunter Industries
1940 Diamond St.
San Marcos, CA, 92078, U.S.A

EUT DESCRIPTION: Wireless Valve Link

MODEL: WVL-100, WVL-200, WVL-400

SERIAL NUMBER: 003745BB

SAMPLE RECEIPT DATE: 2021-08-03, 2023-10-13 TO 2023-10-17

DATE TESTED: 2021-08-02 TO 2021-08-31 (Conducted) and 2023-10-16 (Radiated)

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C: 2023	See Section 2
ISED RSS-247 Issue 3: 2023	See Section 2
ISED RSS-GEN Issue 5 + A2: 2021	See Section 2

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

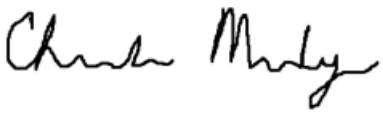
The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released For
UL LLC. By:

Michael Ferrer
Staff Engineer
Consumer, Medical and IT Segment
UL LLC.

Prepared By:



Charles Moody
Engineer
Consumer, Medical and IT Segment
UL LLC.

2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.
Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 6.3)
2. EUT Orientation (see section 6.5)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW		
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW		
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power		
See Comment		Average power		
15.247 (e)	RSS-247 5.2 (b)	PSD		
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Complies	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Not Performed	EUT is battery powered.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15: 2023, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A2: 2021, and RSS-247 Issue 3: 2023.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by a2La, cert. # 0751.06 for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	703469
☒	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	703469

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%
Time	3.39%

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a valve controller that contains a LoRa radio. The EUT contains 2 models (WVL-X00 and WVL-X00-E) that each contain model variants WVL-100, WVL-200, and WVL-400 (domestic application) and WVL-100-E, WVL-200-E, and WVL-400-E (international application).

The difference between each model variant is the station count, where 'X' represents the number of stations. The client declared the WVL-200 as the worst case to represent other models. Therefore, for this testing series, the WVL-200 was tested.

6.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
914.968 - 921	LoRa	14.54	28.44

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a helix antenna, with a maximum gain of -2.64 dBi.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WVL Compliance App Const_Tx: V0.01.053

The test utility software used during testing was WVL Production App: V1.01.000

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 30MHz were performed with the EUT set to transmit at the channel with highest power spectral density as worst-case scenario. This was found to be low channel, 914.968 MHz. For radiated emissions between 30 MHz and 10 GHz, the EUT was set to transmit on low and high channels at the highest power.

The client declared that the EUT only operates in one orthogonal orientation, Z. Therefore, all radiated testing was performed with the EUT operating in the Z orientation.

The EUT utilizes a 9V alkaline battery and therefore, AC line conducted emissions were not performed.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer/Brand	Model	Serial Number	FCC ID
Solenoids	Hunter	-	458200	-

I/O CABLES

5

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	1	2	I/O	Non-shielded	<3m	Cables connected to solenoids

TEST SETUP

Test software exercised the radio card.

SETUP DIAGRAMS

Please refer to R14967114-EP1 for setup diagrams

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7. MEASUREMENT METHOD

Duty Cycle: ANSI C63.10 Section 11.6

6 dB BW: ANSI C63.10 Subclause -11.8.1

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Subclause -11.9.1.3 Method PKPM1 Peak-reading power meter

Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10 Subclause -11.10.2 Method PKPSD (peak PSD)

General Radiated Spurious Emissions: ANSI C63.10 Sections 6.3-6.6

Emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11 and 6.10.4

Emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1

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8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SA0025	Spectrum Analyzer	Keysight Technologies	N9030A	2021-04-01	2022-04-01
PWM001 (PRE0136343)	RF Power Meter	Keysight Technologies	N1912A	2021-07-16	2022-07-16
PWS004 (PRE0126443)	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2020-08-12	2021-08-31
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2021-07-12	2022-07-12
SOFTEMI	Antenna Port Software	UL	AP Version 2021.08.18	NA	NA

*Note: All equipment was in calibration at the time testing was performed.

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Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	9kHz-30 MHz				
135144	Active Loop Antenna	ETS-Lindgren	6502	2023-01-17	2024-01-17
	30-1000 MHz				
85717	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB1	2023-03-13	2024-03-13
	1-18 GHz				
86408	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-06-19	2025-06-19
	Gain-Loss Chains				
91975	Gain-loss string: 0.009-30MHz	Various	Various	2023-06-06	2024-06-06
91978	Gain-loss string: 25-1000MHz	Various	Various	2023-06-06	2024-06-06
91977	Gain-loss string: 1-18GHz	Various	Various	2023-06-06	2024-06-06
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-02-02	2024-02-02
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
239540	Environmental Meter	Fisher Scientific	15-077-963	2023-07-19	2025-07-19
167153 (BRF007)	902-928MHz notch filter, 2W, Fhigh =1.5GHz	Micro-Tronics	BRC17691	2023-02-15	2024-02-29
82635 (HPF009)	1GHz high-pass filter, 2W, Fhigh =10GHz	Micro-Tronics	HPM17672	2023-02-15	2024-02-29

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

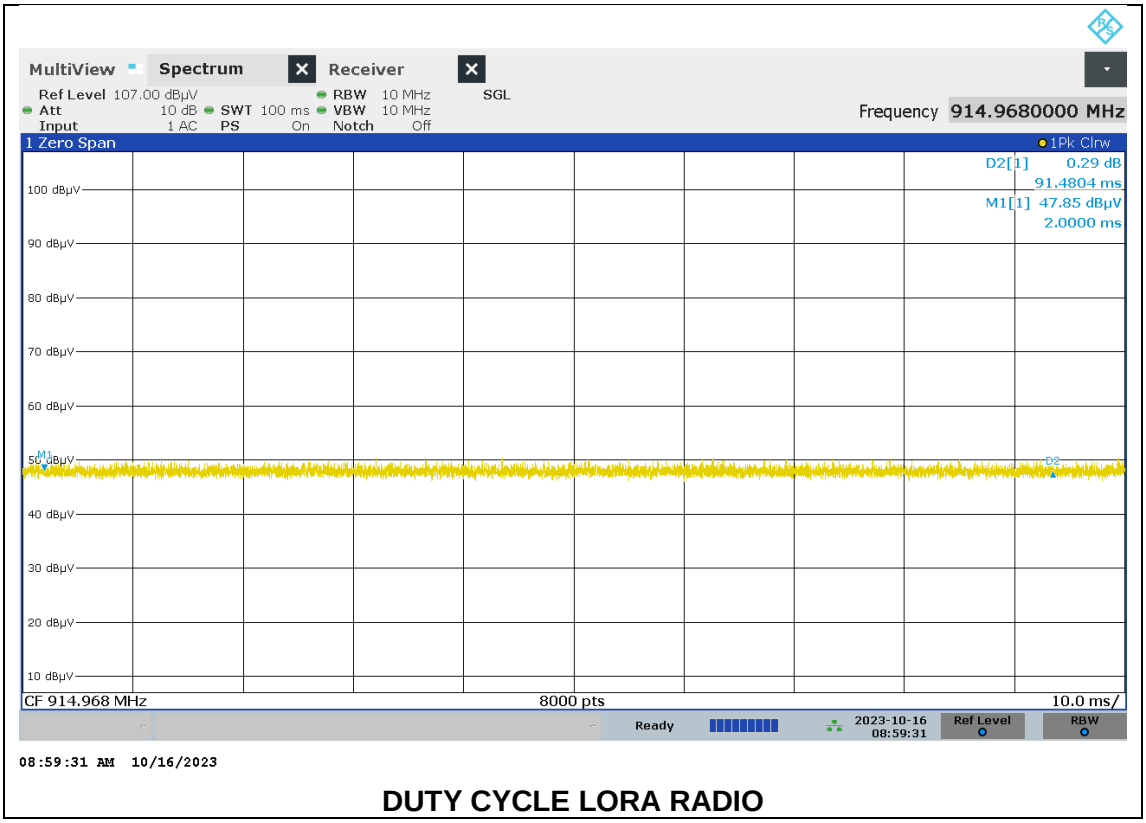
KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
900 MHz Band						
LoRa	100.000	100.000	1.000	100.00%	0.00	0.010

Tested By: 11993
Date: 2023-10-23
Location: Chamber 2

DUTY CYCLE PLOTS



DUTY CYCLE LORA RADIO

9.2. 99% BANDWIDTH

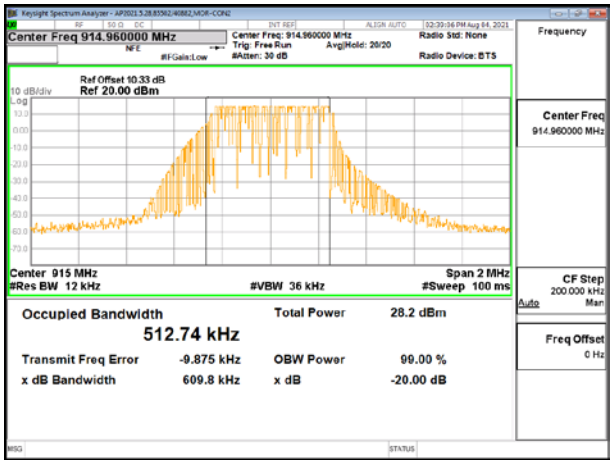
LIMITS

None; for reporting purposes only.

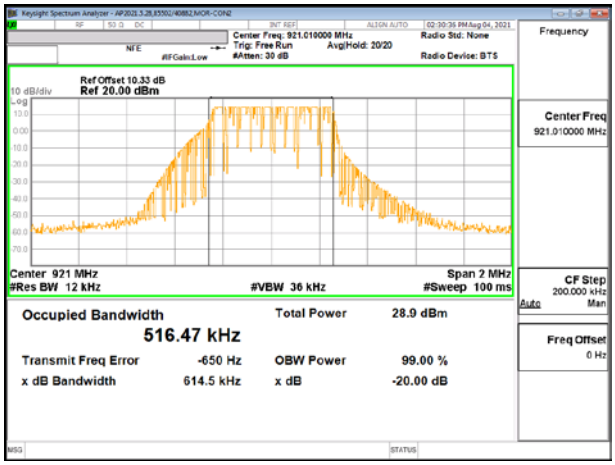
RESULTS

9.2.1. LoRa

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	914.968	0.5127
High	921	0.5165



LOW CHANNEL



HIGH CHANNEL

9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

9.3.1. LoRa

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	914.968	0.7080	0.5
High	921	0.7140	0.5

LOW CHANNEL

HIGH CHANNEL

9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
RSS-247 5.4 (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 9.87 dB (pad) was entered as an offset in the power meter to allow for a peak reading of power.

RESULTS

9.4.1. LoRa

Tested By:	84740/40882
Date:	2021-08-02

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	914.968	14.54	30	-15.460
High	921	14.45	30	-15.550

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9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 9.87 dB (pad) was entered as an offset in the power meter to allow for a gated average reading of power.

RESULTS

9.5.1. LoRa

Tested By:	84740/40882
Date:	2021-08-02

Channel	Frequency (MHz)	AV power (dBm)
Low	914.968	14.46
High	921	14.36

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9.6. POWER SPECTRAL DENSITY

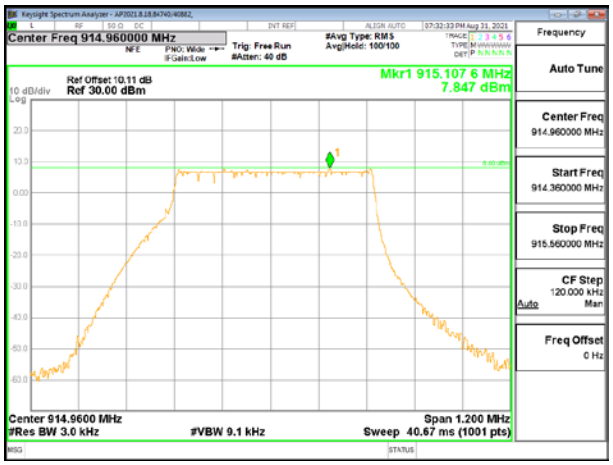
LIMITS

FCC §15.247 (e)
RSS-247 (5.2) (b)
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

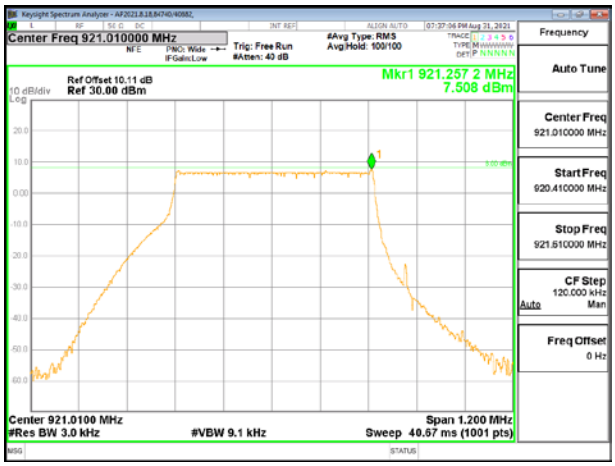
RESULTS

9.6.1. LoRa

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	914.968	7.847	8	-0.15
High	921	7.508	8	-0.49



LOW CHANNEL



HIGH CHANNEL

9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

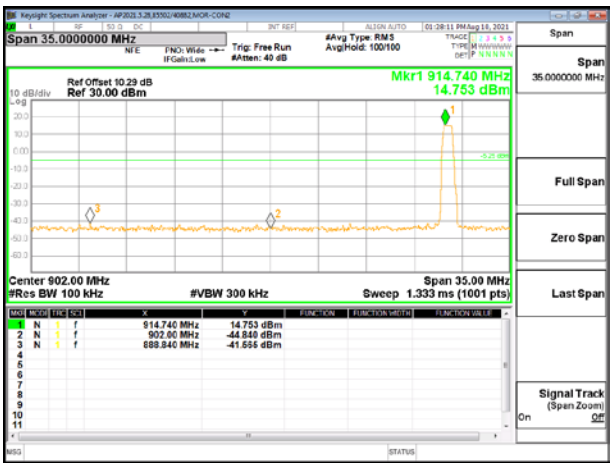
FCC §15.247 (d)

RSS-247 5.5

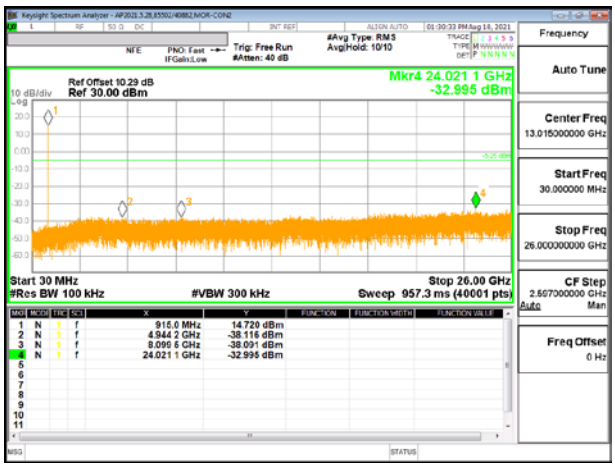
Output power was measured based on the use of a peak measurement, therefore the required attenuation is -20 dBc.

RESULTS

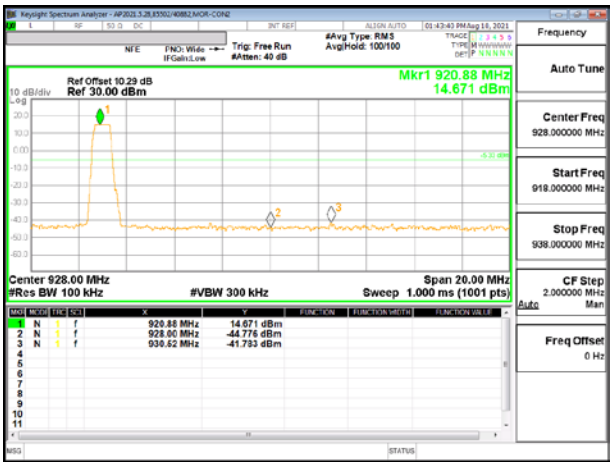
9.7.1. LoRa



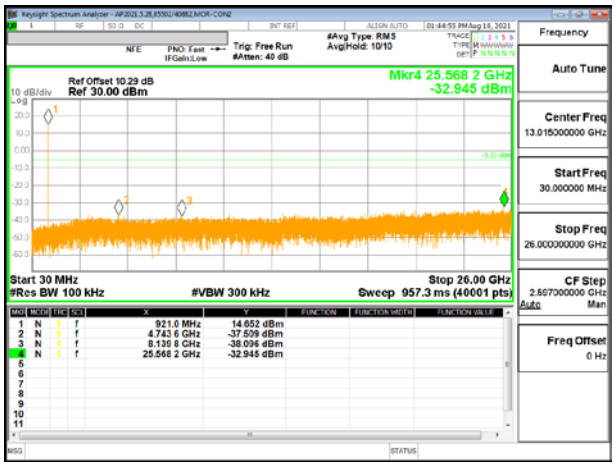
LOW CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuA/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	**Field Strength Limit (uV/m) at 3 m**	**Field Strength Limit (dBuV/m) at 3 m**
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for linear voltage averaging measurements.

The spectrum from 30 MHz to 1000 MHz and 1 GHz to 10 GHz is investigated with the transmitter set to the lowest and highest channels in each applicable band. Below 30 MHz emissions, the channel with the highest power spectral density was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.
3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

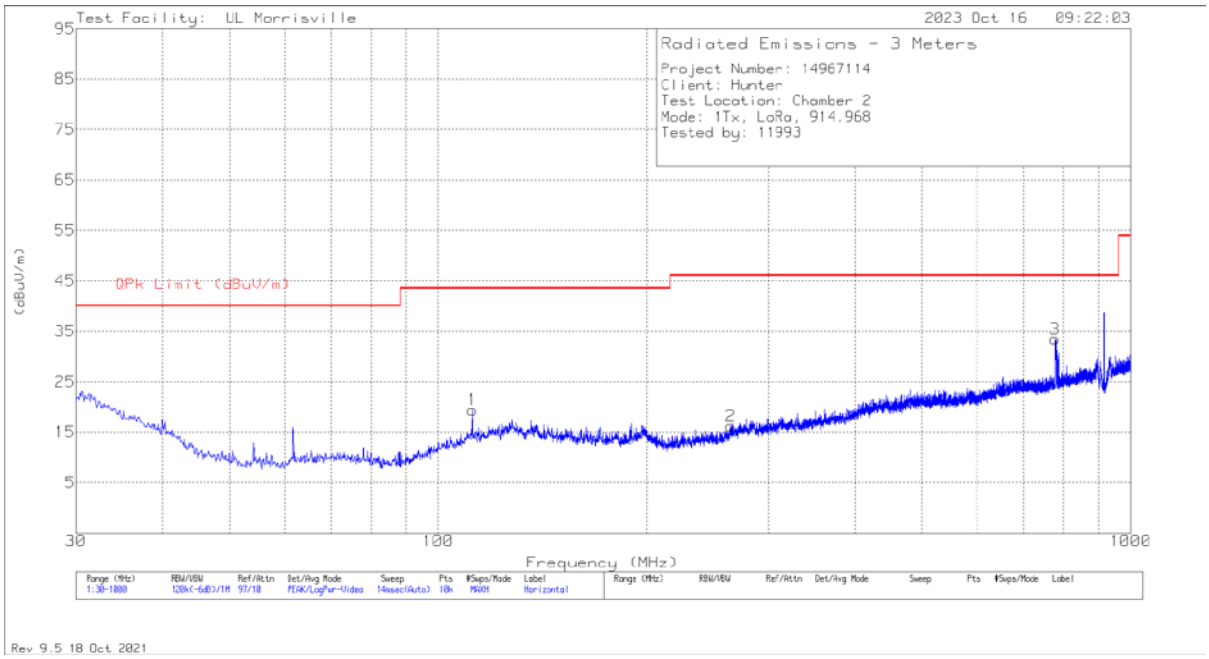
KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

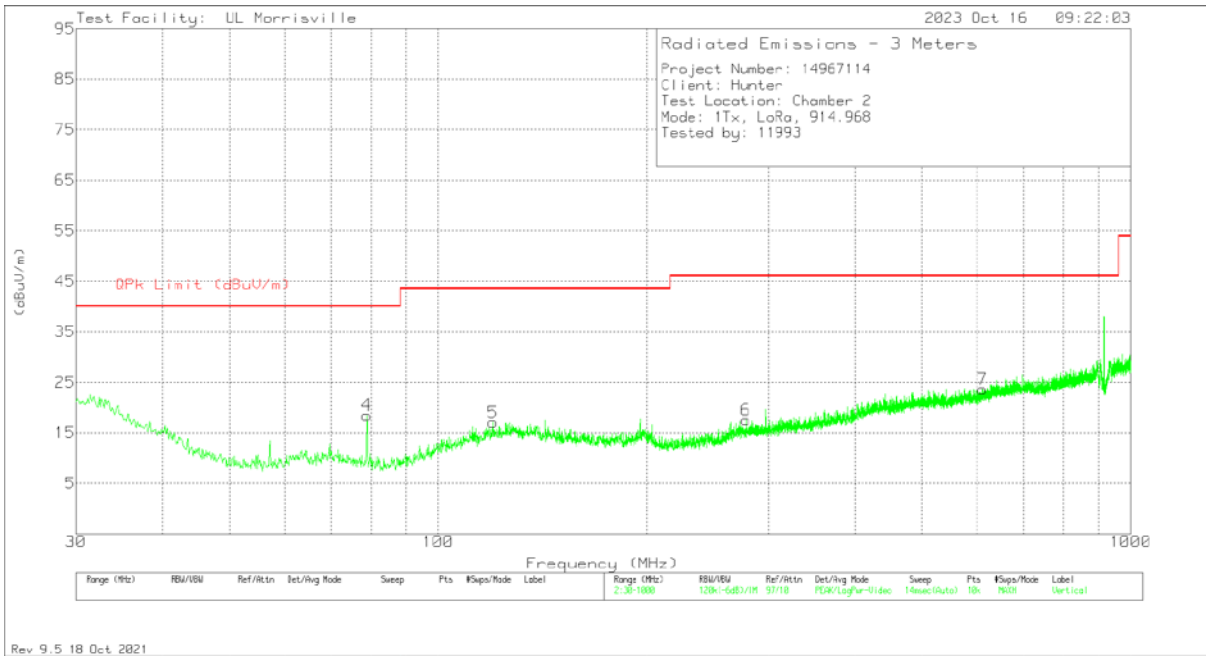
10.2. TRANSMITTER BELOW 1 GHz

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85717 (dB/m)	Gain/Loss (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 112.062	31.36	Pk	18.5	-30.8	.4	19.46	43.52	-24.06	0-360	399	H
2	* ** 264.837	26.78	Pk	18.3	-29.5	.6	16.18	46.02	-29.84	0-360	399	H
3	** 777.773	33.22	Pk	26.4	-27.4	1.2	33.42	46.02	-12.6	0-360	99	H
5	* ** 120.016	28.02	Pk	19.4	-30.7	.4	17.12	43.52	-26.4	0-360	199	V
6	* ** 278.223	27.37	Pk	19.1	-29.5	.6	17.57	46.02	-28.45	0-360	299	V
7	* ** 611.903	26.1	Pk	24.6	-28	1	23.7	46.02	-22.32	0-360	101	V
4	78.888	35.59	Pk	13.6	-31	.3	18.49	40	-21.51	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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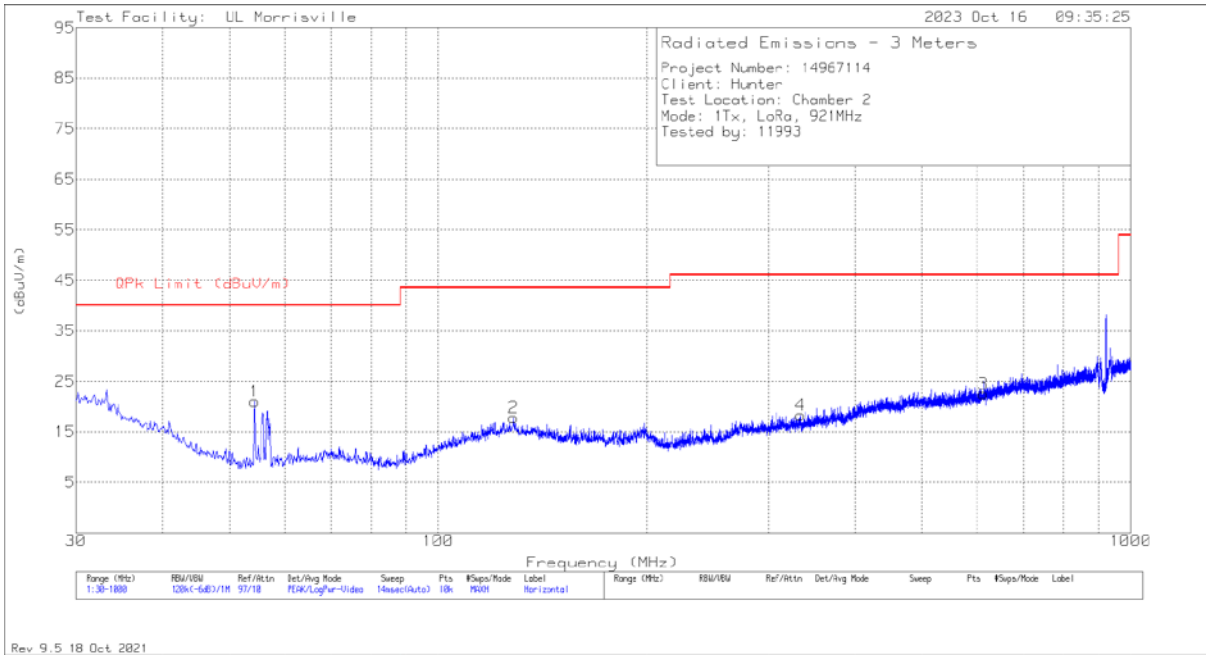
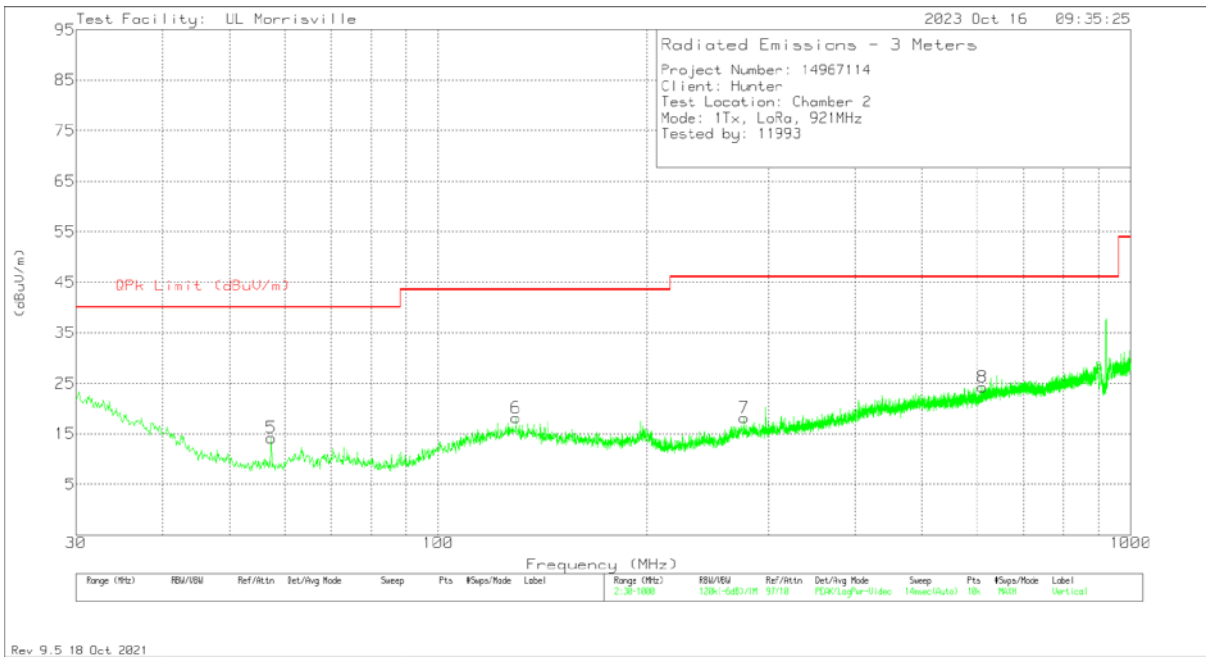
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85717 (dB/m)	Gain/Loss (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 128.455	28.29	Pk	19.8	-30.7	.4	17.79	43.52	-25.73	0-360	101	H
3	* ** 612.291	24.91	Pk	24.6	-28	1	22.51	46.02	-23.51	0-360	101	H
4	* ** 333.222	27.26	Pk	19.6	-29.2	.6	18.26	46.02	-27.76	0-360	101	H
6	* ** 129.522	28.83	Pk	19.7	-30.7	.4	18.23	43.52	-25.29	0-360	199	V
7	* ** 276.574	28.08	Pk	19	-29.5	.6	18.18	46.02	-27.84	0-360	199	V
8	* ** 612	26.61	Pk	24.6	-28	1	24.21	46.02	-21.81	0-360	100	V
1	54.347	38.87	Pk	13.2	-31.3	.3	21.07	40	-18.93	0-360	199	H
5	57.451	32.06	Pk	13.3	-31.5	.3	14.16	40	-25.84	0-360	299	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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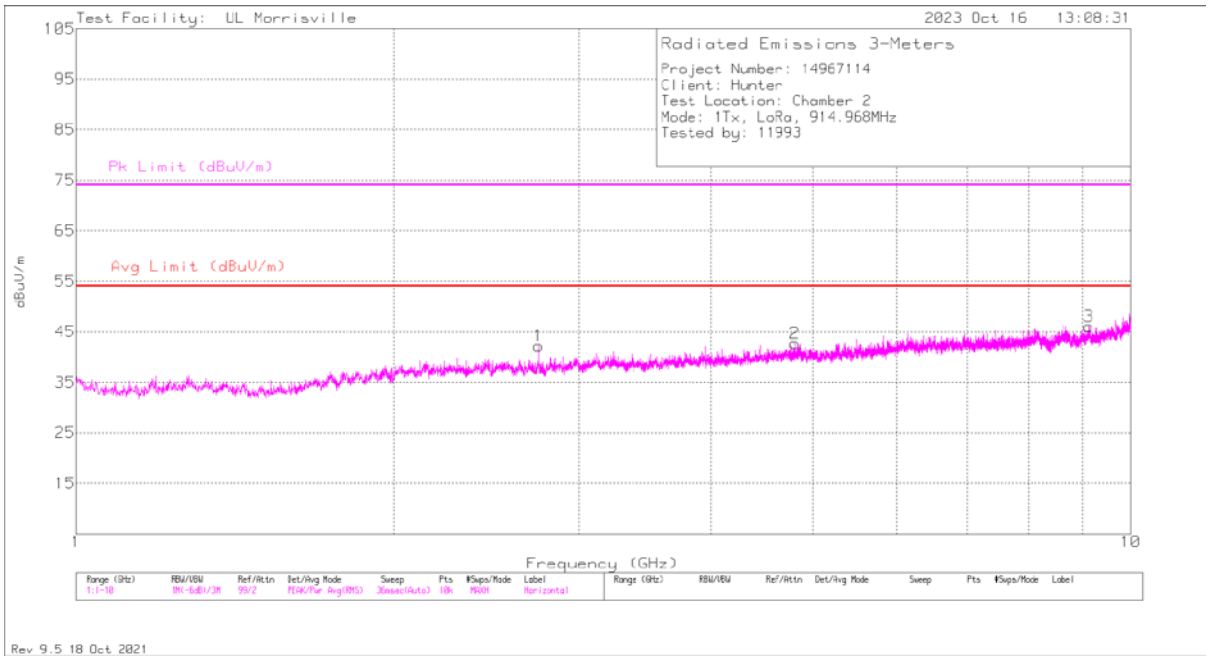
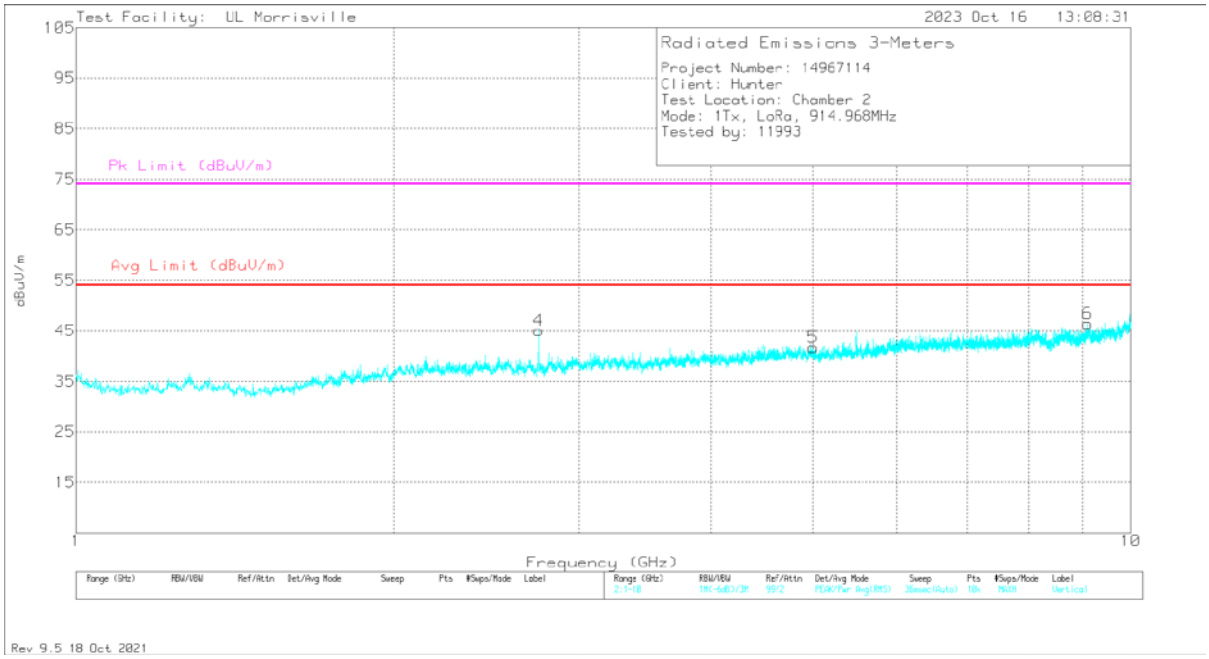
10.3. TRANSMITTER ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.7442	43.22	Pk	32.3	-33.7	.4	42.22	54	-11.78	74	-31.78	0-360	101	H
2	* ** 4.7998	39.17	Pk	34.2	-31	.3	42.67	54	-11.33	74	-31.33	0-360	300	H
3	* ** 9.127	35.58	Pk	35.9	-25.9	.5	46.08	54	-7.92	74	-27.92	0-360	200	H
4	* ** 2.74465	46.11	Pk	32.3	-33.7	.4	45.11	54	-8.89	74	-28.89	0-360	400	V
5	* ** 5.0005	38.57	Pk	34	-31.2	.3	41.67	54	-12.33	74	-32.33	0-360	400	V
6	* ** 9.1036	36.58	Pk	35.9	-26.5	.5	46.48	54	-7.52	74	-27.52	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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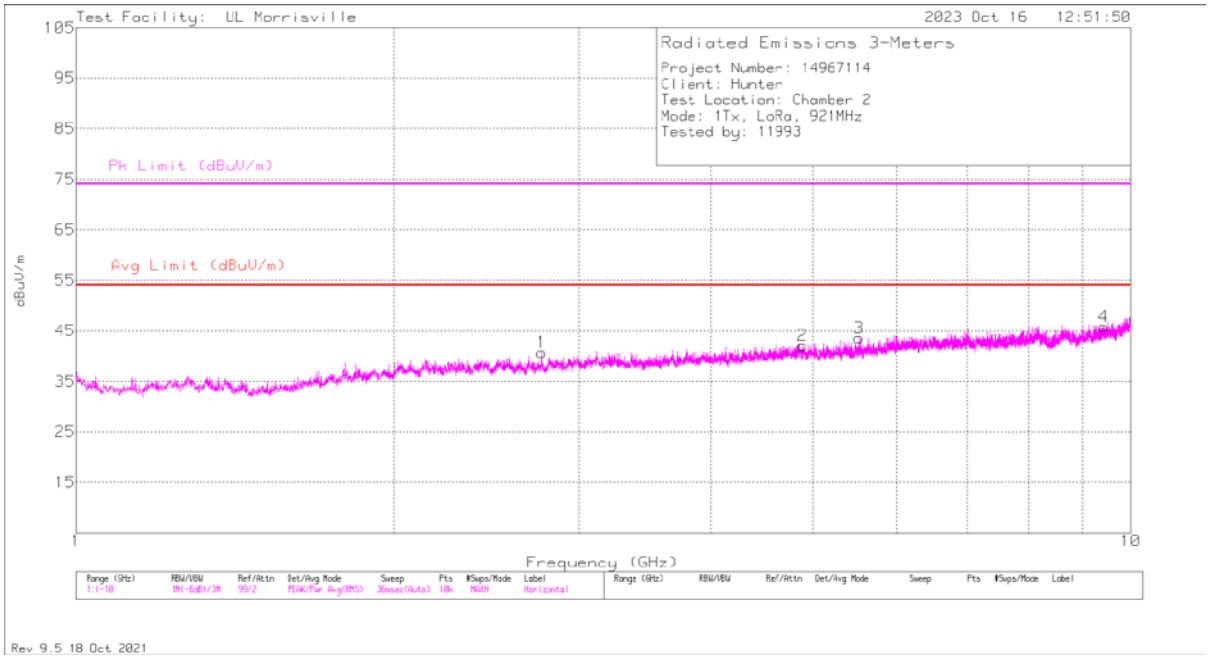
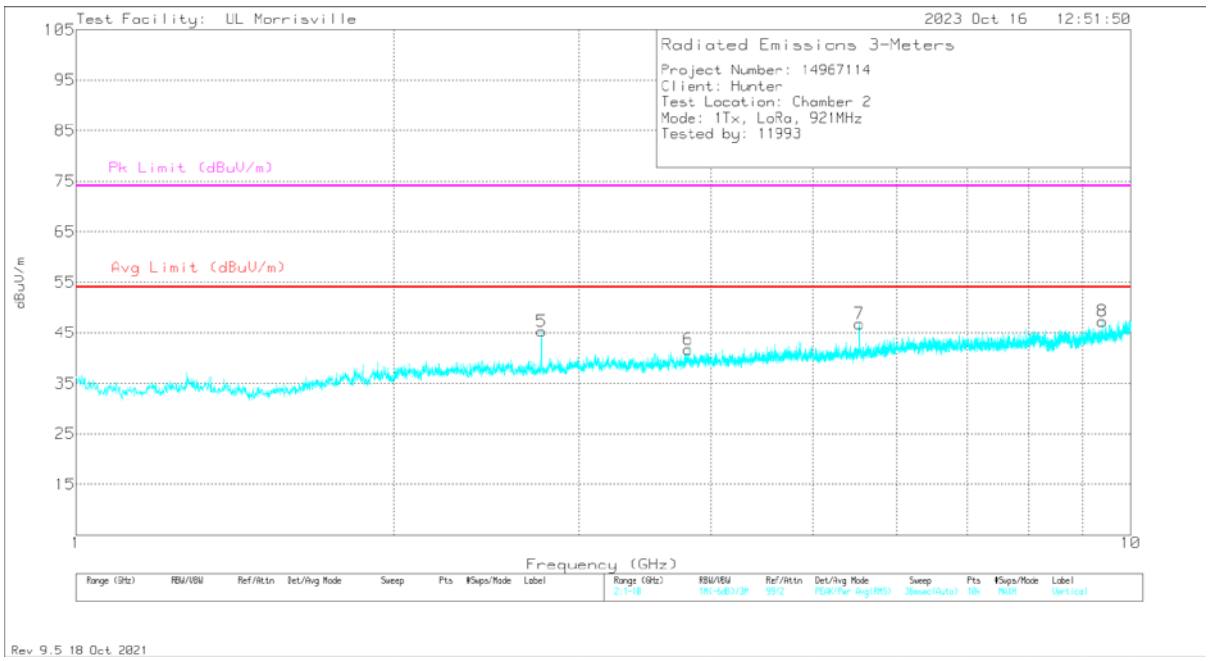
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.7622	41.47	Pk	32.3	-33.4	.4	40.77	54	-13.23	74	-33.23	0-360	399	H
2	* ** 4.8853	38.58	Pk	34.1	-30.9	.3	42.08	54	-11.92	74	-31.92	0-360	200	H
4	* ** 9.4267	35.11	Pk	36.3	-26.1	.5	45.81	54	-8.19	74	-28.19	0-360	100	H
5	* ** 2.7622	46.07	Pk	32.3	-33.4	.4	45.37	54	-8.63	74	-28.63	0-360	399	V
6	* ** 3.8044	40.71	Pk	33.3	-32.5	.2	41.71	54	-12.29	74	-32.29	0-360	200	V
8	* ** 9.406	36.42	Pk	36.2	-25.7	.4	47.32	54	-6.68	74	-26.68	0-360	300	V
3	5.5252	38.88	Pk	34.6	-30.2	.3	43.58	-	-	-	-	0-360	200	H
7	5.5261	42.07	Pk	34.6	-30.2	.3	46.77	-	-	-	-	0-360	300	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

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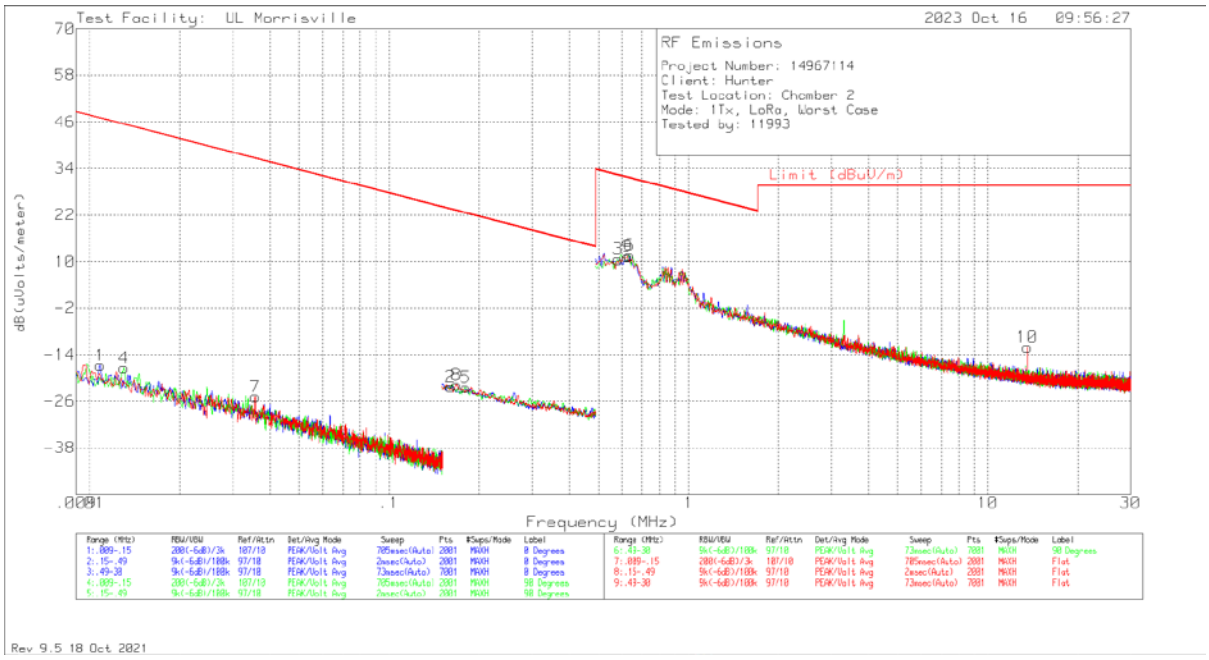
10.4. WORST CASE BELOW 30MHZ

Note for below 30 MHz scans: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

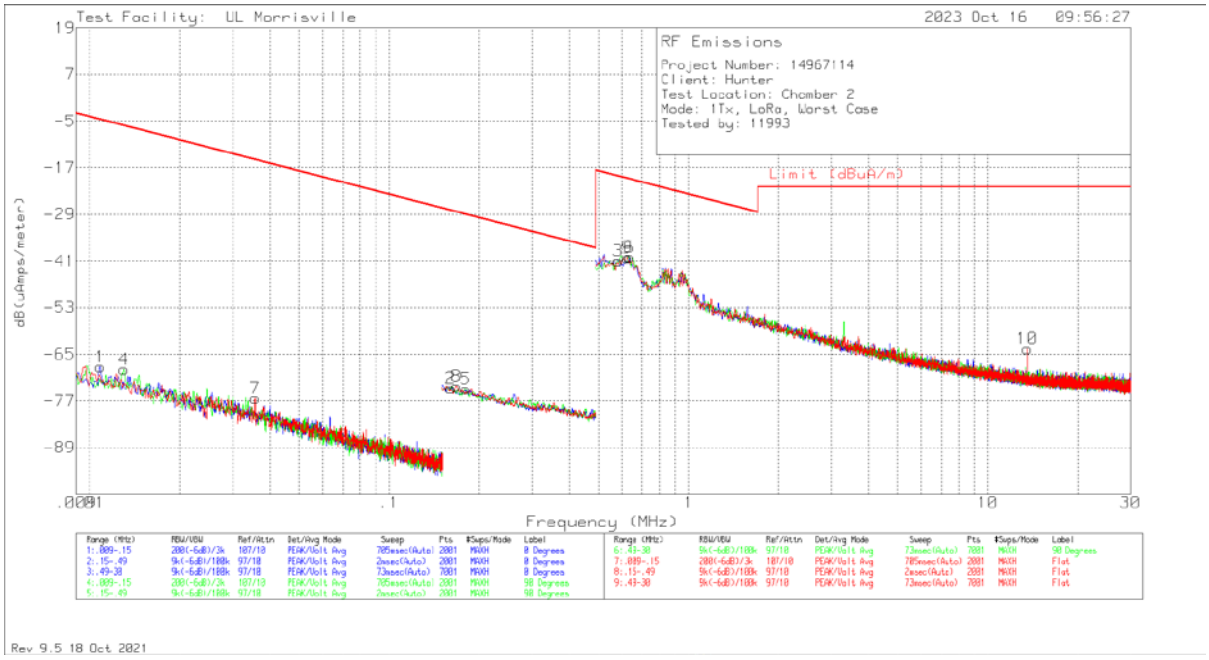


ANTENNA- THREE ORIENTATIONS (E-Field)

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
1	.01085	44.26	Pk	18.9	.1	-80	-16.74	46.9	66.9	-63.64	0-360	0 degs
4	.01305	44.5	Pk	18	.1	-80	-17.4	45.29	65.29	-62.69	0-360	90 degs
7	.03563	41.34	Pk	13.7	.1	-80	-24.86	36.57	56.57	-61.43	0-360	Flat
2	.16071	45.45	Pk	12.2	.1	-80	-22.25	23.48	43.48	-45.73	0-360	0 degs
8	.16768	46.01	Pk	12.2	.1	-80	-21.69	23.11	43.11	-44.8	0-360	Flat
5	.18043	45.27	Pk	12.2	.1	-80	-22.43	22.48	42.48	-44.91	0-360	90 degs
3	.58275	38.29	Pk	12.2	.1	-40	10.59	32.29	-	-21.7	0-360	0 degs
9	.62491	38.98	Pk	12.2	.1	-40	11.28	31.69	-	-20.41	0-360	Flat
6	.63334	39.26	Pk	12.2	.1	-40	11.56	31.57	-	-20.01	0-360	90 degs
10	13.5596	16.71	Pk	10.6	.6	-40	-12.09	29.54	-	-41.63	0-360	Flat

Pk - Peak detector



ANTENNA- THREE ORIENTATIONS (H-Field)

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QP/AV Limit (dBuA/m)	PK Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
1	.01085	44.26	Pk	-32.6	.1	-80	-68.24	-4.6	15.4	-63.64	0-360	401	0 degs
4	.01305	44.5	Pk	-33.5	.1	-80	-68.9	-6.21	13.79	-62.69	0-360	401	90 degs
7	.03563	41.34	Pk	-37.8	.1	-80	-76.36	-14.93	5.07	-61.43	0-360	401	Flat
2	.16071	45.45	Pk	-39.3	.1	-80	-73.75	-28.02	-8.02	-45.73	0-360	401	0 degs
8	.16768	46.01	Pk	-39.3	.1	-80	-73.19	-28.39	-8.39	-44.8	0-360	401	Flat
5	.18043	45.27	Pk	-39.3	.1	-80	-73.93	-29.02	-9.02	-44.91	0-360	401	90 degs
3	.58275	38.29	Pk	-39.3	.1	-40	-40.91	-19.21	-	-21.7	0-360	401	0 degs
9	.62491	38.98	Pk	-39.3	.1	-40	-40.22	-19.81	-	-20.41	0-360	401	Flat
6	.63334	39.26	Pk	-39.3	.1	-40	-39.94	-19.93	-	-20.01	0-360	401	90 degs
10	13.5596	16.71	Pk	-40.9	.6	-40	-63.59	-21.96	-	-41.63	0-360	401	Flat

Pk - Peak detector

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11. SETUP PHOTOS

Please refer to R14967114-EP1 for setup photos

END OF TEST REPORT

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