

TEST REPORT

Report Number: R14970733-E1

Applicant : Hunter Industries
1940 Diamond St.
San Marcos, CA 92078, United States

Model : RPT

FCC ID : M3URPT

IC : 2772A-RPT

EUT Description : Repeater

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



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023-10-27	Initial Issue	Charles Moody
V2	2024-06-04	Updated Cal dates for Equipment ID: HI0092	Noah Bennett
V3	2024-07-05	Updated Antenna Gain	Noah Bennett

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS	5
2. TEST RESULTS SUMMARY	6
3. TEST METHODOLOGY	6
4. FACILITIES AND ACCREDITATION	6
5. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
5.1. METROLOGICAL TRACEABILITY	7
5.2. DECISION RULES.....	7
5.3. MEASUREMENT UNCERTAINTY.....	7
5.4. SAMPLE CALCULATION	7
6. EQUIPMENT UNDER TEST	8
6.1. EUT DESCRIPTION	8
6.2. MAXIMUM OUTPUT POWER.....	8
6.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
6.4. SOFTWARE AND FIRMWARE.....	8
6.5. WORST-CASE CONFIGURATION AND MODE.....	8
6.6. DESCRIPTION OF TEST SETUP.....	9
7. MEASUREMENT METHOD.....	10
8. TEST AND MEASUREMENT EQUIPMENT	11
9. ANTENNA PORT TEST RESULTS.....	13
9.1. ON TIME AND DUTY CYCLE.....	13
9.2. 99% BANDWIDTH.....	14
9.2.1. LoRa.....	14
9.3. 6 dB BANDWIDTH.....	15
9.3.1. LoRa.....	15
9.4. OUTPUT POWER.....	16
9.4.1. LoRa.....	16
9.5. AVERAGE POWER.....	17
9.5.1. LoRa.....	17
9.6. POWER SPECTRAL DENSITY	18
9.6.1. LoRa.....	18

9.1.	CONDUCTED SPURIOUS EMISSIONS.....	19
9.1.1.	LoRa.....	19
10.	RADIATED TEST RESULTS	20
10.1.	LIMITS AND PROCEDURE.....	20
10.2.	TRANSMITTER BELOW 1 GHz.....	22
10.3.	TRANSMITTER ABOVE 1 GHz.....	26
10.4.	WORST CASE BELOW 30MHZ.....	30
11.	SETUP PHOTOS	32

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Hunter Industries
1940 Diamond St.
San Marcos, CA 92078, United States

EUT DESCRIPTION: Repeater

MODEL: RPT

SERIAL NUMBER: Radiated Samples: 003722E2
Conducted Samples: 003515B3, 00356071,

SAMPLE RECEIPT DATE: 2021-08-27, 2023-10-11

DATE TESTED: 2021-09-13 (Conducted) and 2023-10-16, 2023-10-17 (Radiated)

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C: 2023	Refer to Section 2
ISED RSS-247 Issue 3: 2023	Refer to Section 2
ISED RSS-GEN Issue 5 + A2: 2021	Refer to 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 Technology Division
UL LLC.

Prepared By:



Charles Moody
Engineer
Consumer Technology Division
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)

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	Complies	None.
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
<input type="checkbox"/>	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

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)
 $36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a repeater that contains a LoRa radio meant to communicate with other Hunter devices. This report covers the full emissions testing of the LoRa radio.

6.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
914.968 - 921	LoRa	13.28	21.28

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WVL RPT App Const_Tx V0.99.053.

The test utility software used during testing was Repeater Production App V1.31.000.

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 30 MHz was performed with the EUT set to transmit at the channel with highest average output power as worst-case scenario. This was found to be low channel. 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 fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation. The fundamental of the antenna was also investigated in 3 positions, antenna position 1, antenna position 2, and antenna position 3. It was determined that antenna position 1 was worst-case orientation; therefore, all final radiated testing was performed with the EUT and antenna in X orientation and antenna position 1.

The EUT utilizes a 6.4V lithium ion battery and therefore, AC line conducted emissions were not performed.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
None.				

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
None.						

TEST SETUP

Test software exercised the radio card.

SETUP DIAGRAMS

Please refer to R14970733-EP1 for setup diagrams

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

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.
	Common Equipment				
	Conducted Room 2				
SA0025	Spectrum Analyzer	Keysight Technologies	N9030A	2021-04-01	2022-04-01
PWM005	RF Power Meter	Keysight Technologies	N1912A	2021-07-27	2022-07-27
PWS004 (PRE0126443)	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2020-08-12	2021-08-12
HI0092	Environmental Meter	Fisher Scientific	160938893	2020-09-23	2021-09-23
SOFTEMI	Antenna Port Software	UL	Version 2021.08.18	NA	NA

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-05-23	2025-05-23
	Gain-Loss Chains				
207640	Gain-loss string: 1-18GHz	Various	Various	2023-05-17	2024-05-17
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-04-10	2024-04-10
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
200540	Environmental Meter	Fisher Scientific	15-077-963	2022-10-05	2023-10-31
82635 (HPF009)	1GHz high-pass filter, 2W, Fhigh =10GHz	Micro-Tronics	HPM17672	2023-02-15	2024-02-29

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

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	9 kHz - 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
	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
	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

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

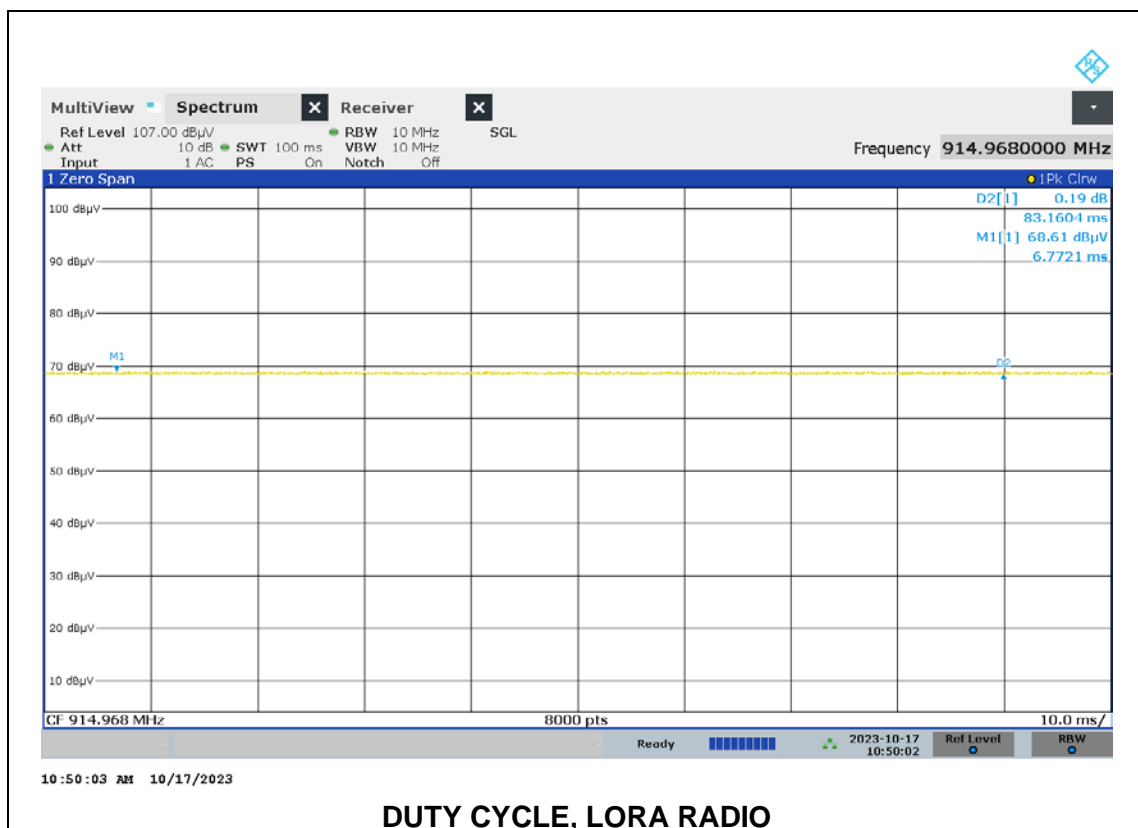
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
900 MHz Band						
LoRa	100.000	100.000	1.000	100.00%	0.00	0.010

Tested By: 11993

Date: 2023-10-17

Location: Chamber 4

DUTY CYCLE PLOTS



9.2. 99% BANDWIDTH

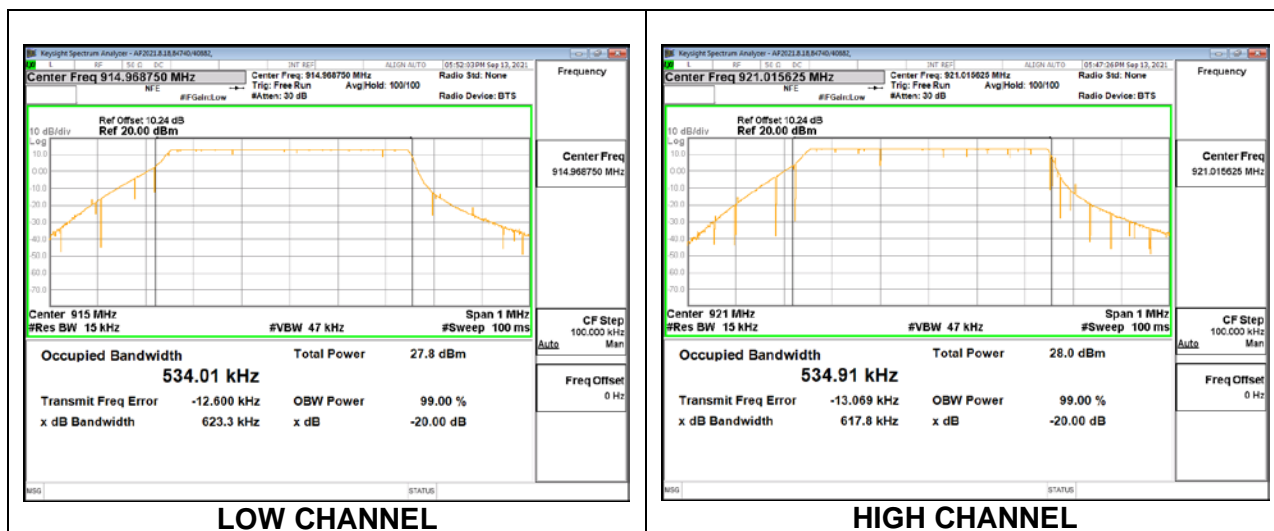
LIMITS

None; for reporting purposes only.

RESULTS

9.2.1. LoRa

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	914.968	0.5340
High	921	0.5349



9.3. 6 dB BANDWIDTH

LIMITS

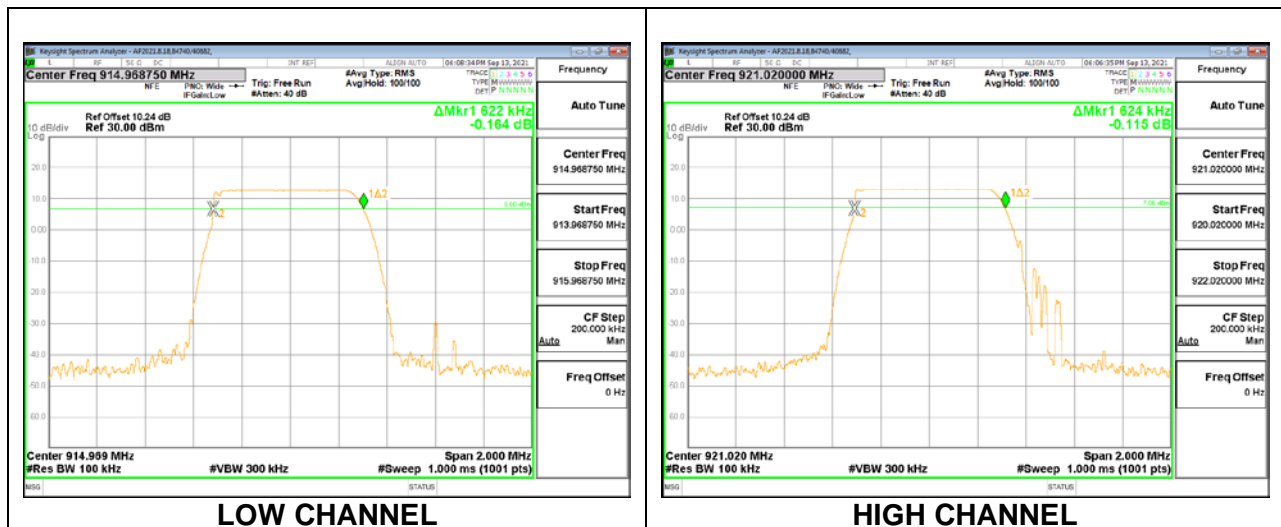
FCC §15.247 (a) (2)
RSS-247 5.2 (a)

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	0.6220	0.5
High	921	0.6240	0.5



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 peak power meter.

The cable assembly insertion loss of 10.11 dB (9.72 dB pad and 0.39 cable) was entered as an offset in the power meter.

RESULTS

9.4.1. LoRa

Tested By:	84740/40882
Date:	2021-09-13

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	914.968	13.28	30	-16.720
High	921	13.16	30	-16.840

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a gated-average power meter.

The cable assembly insertion loss of 10.11 dB (9.72 dB pad and 0.39 cable) was entered as an offset in the power meter.

RESULTS

9.5.1. LoRa

Tested By:	84740/40882
Date:	2021-09-13

Channel	Frequency (MHz)	AV power (dBm)
Low	914.968	13.19
High	921	13.08

9.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

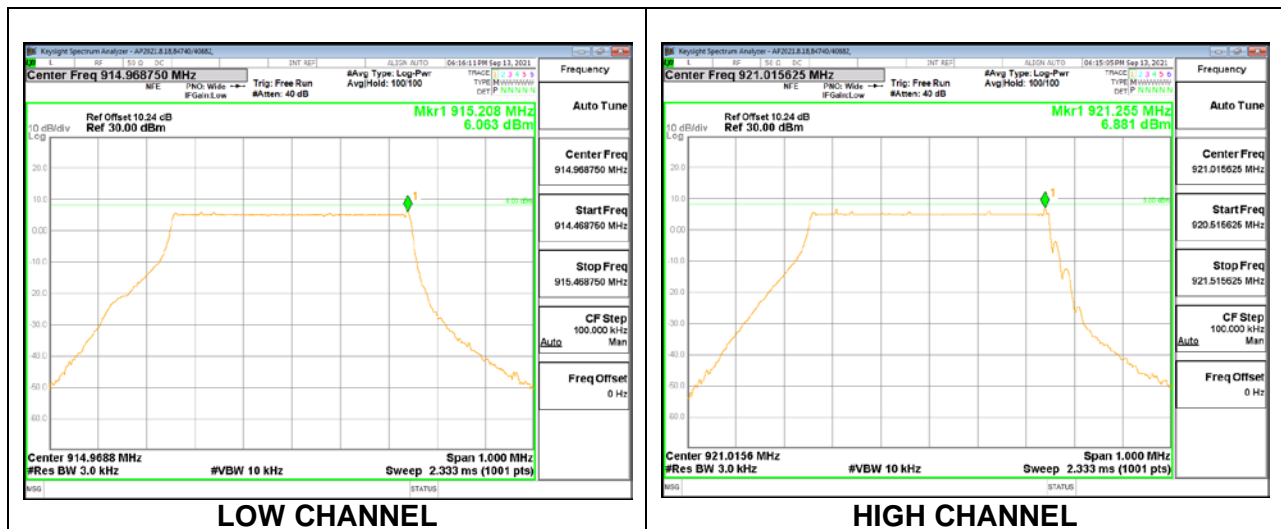
RSS-247 (5.2) (b)

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	6.063	8	-1.94
High	921	6.881	8	-1.12



9.1. CONDUCTED SPURIOUS EMISSIONS

LIMITS

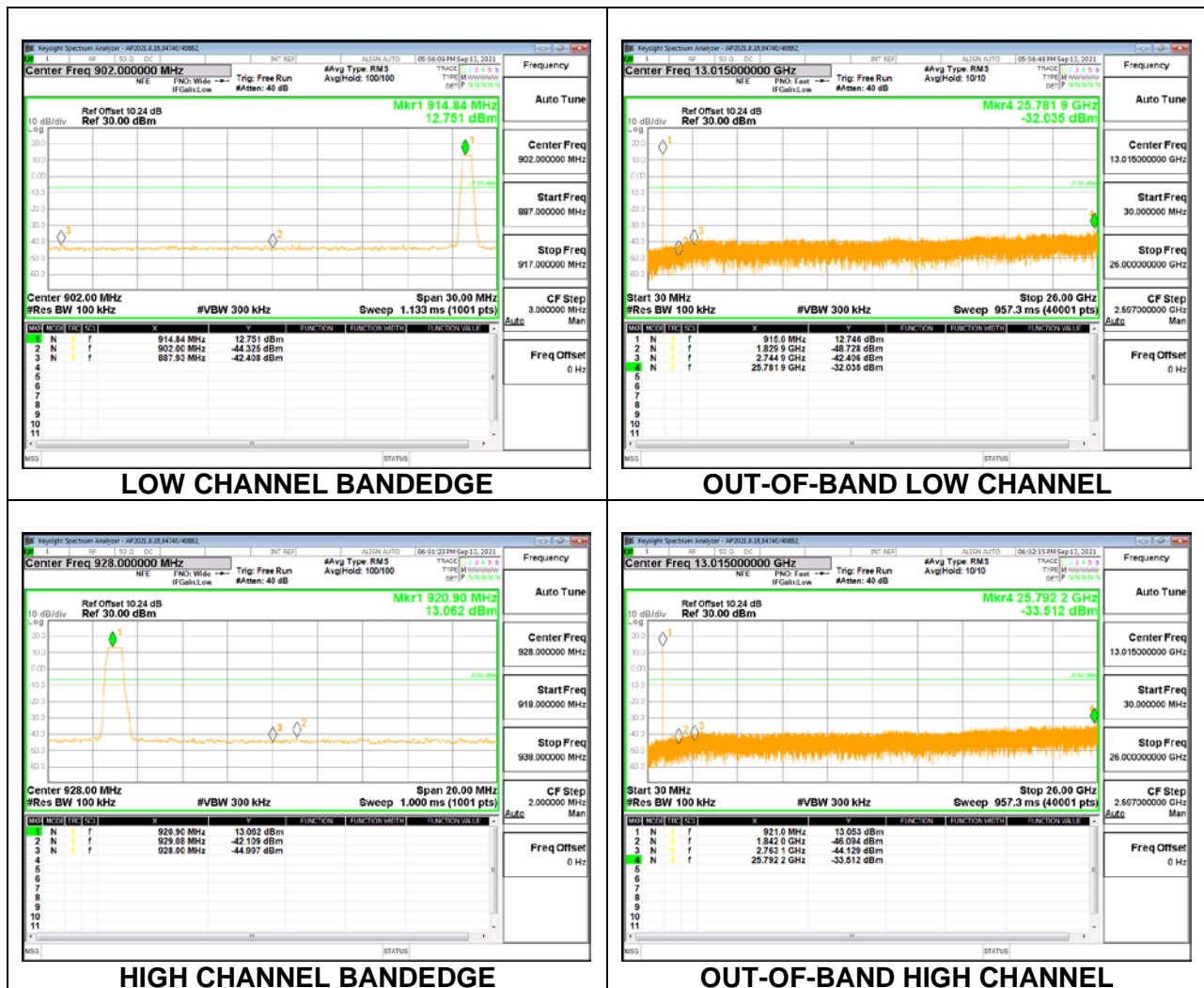
FCC §15.247 (d)

RSS-247 5.5

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

RESULTS

9.1.1. LoRa



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 average output power 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).

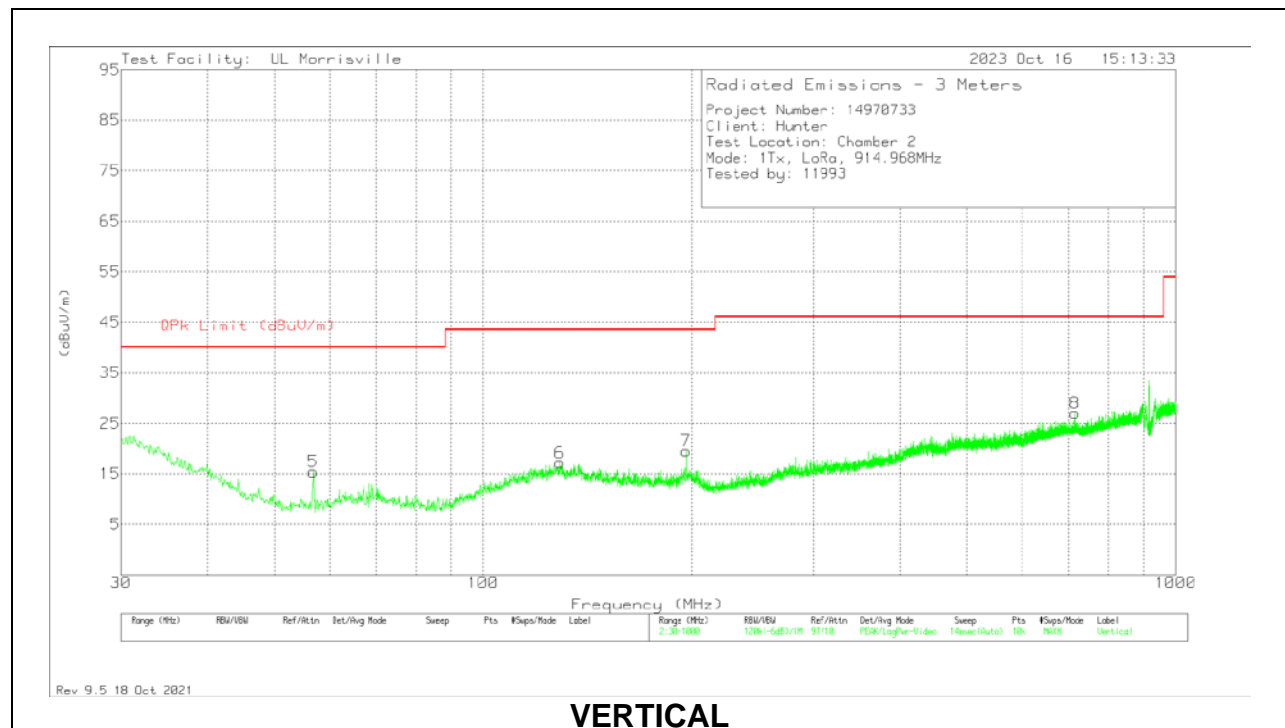
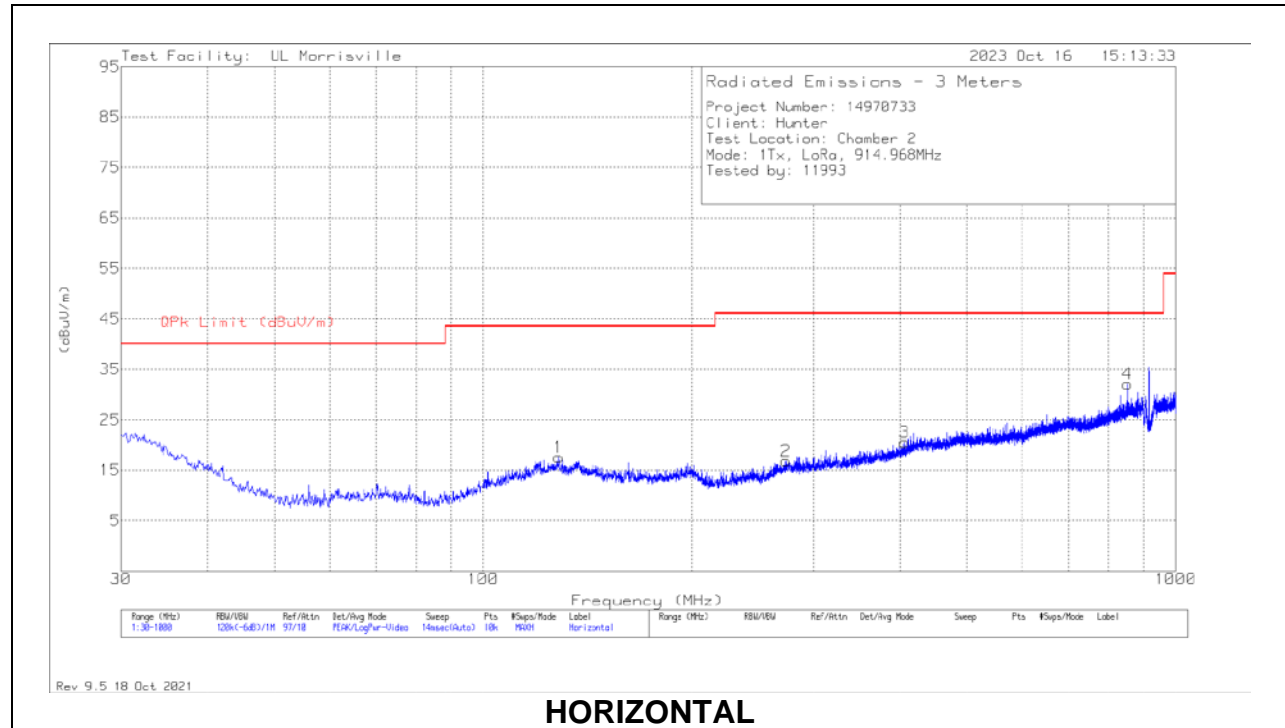
Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

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



RADIATED EMISSIONS

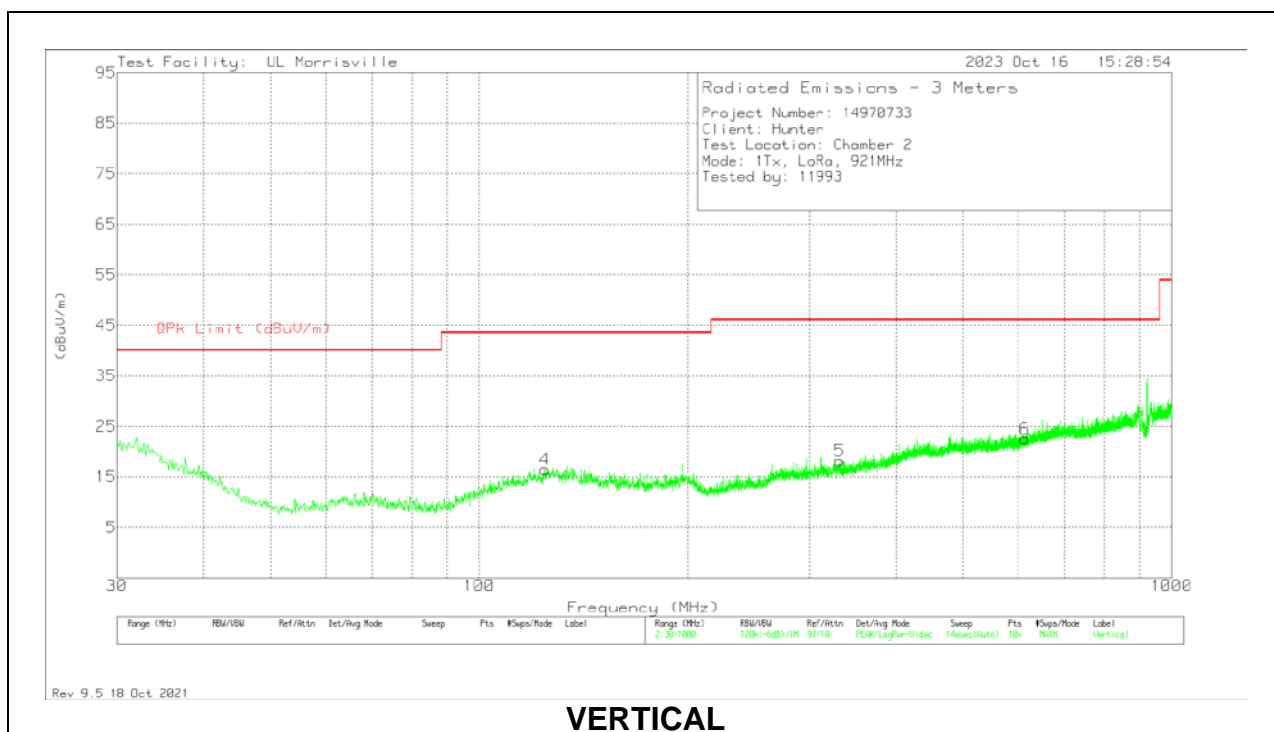
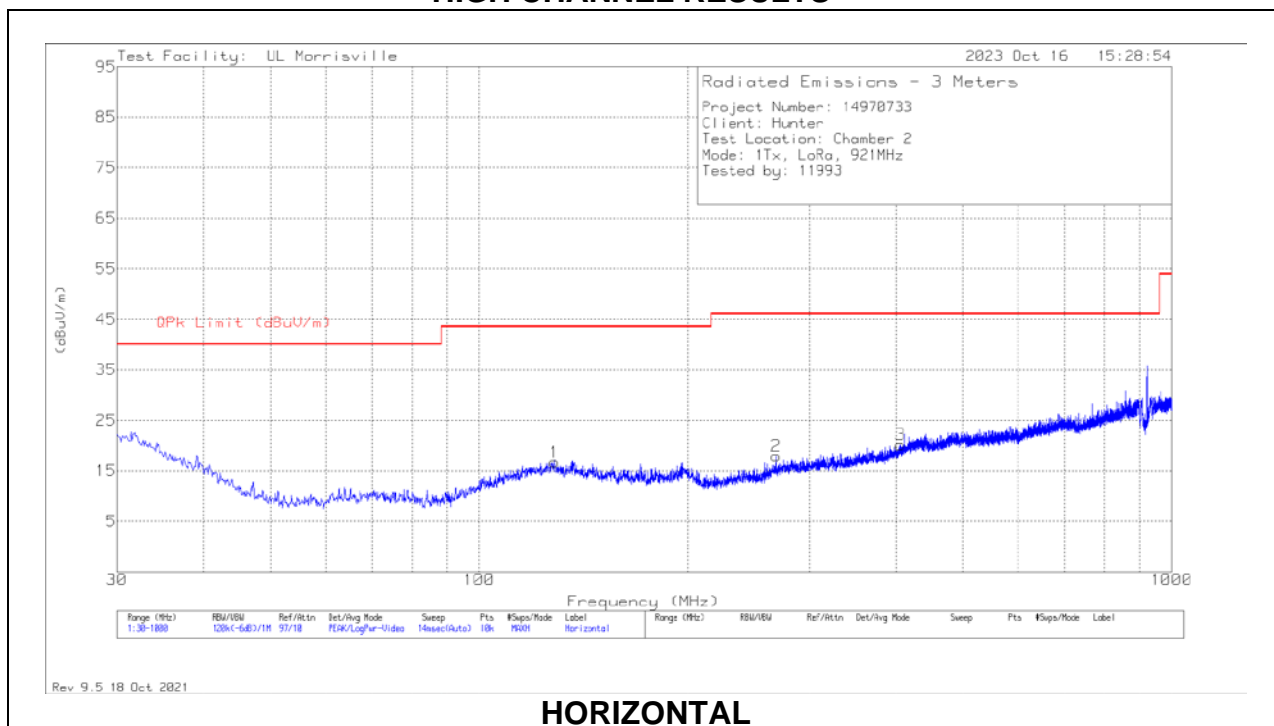
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85717 (dB/m)	Gain/Loss (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 128.552	28.11	Pk	19.7	-30.7	.4	17.51	43.52	-26.01	0-360	299	H
2	* ** 273.373	26.87	Pk	19	-29.6	.6	16.87	46.02	-29.15	0-360	199	H
3	* ** 405.293	26.94	Pk	21.6	-28.8	.8	20.54	46.02	-25.48	0-360	99	H
4	** 851.008	30.54	Pk	27.1	-26.9	1.3	32.04	46.02	-13.98	0-360	99	H
6	* ** 129.037	27.82	Pk	19.7	-30.7	.4	17.22	43.52	-26.3	0-360	101	V
8	** 714.238	27.45	Pk	26	-27.6	1.1	26.95	46.02	-19.07	0-360	101	V
5	56.869	33.09	Pk	13.3	-31.3	.3	15.39	-	-	0-360	299	V
7	196.355	31.1	Pk	18.2	-30.3	.5	19.5	-	-	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

HIGH CHANNEL RESULTS



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	* ** 128.358	27.16	Pk	19.8	-30.7	.4	16.66	43.52	-26.86	0-360	101	H
2	* ** 268.426	28.32	Pk	18.6	-29.6	.6	17.92	46.02	-28.1	0-360	101	H
3	* ** 405.293	26.61	Pk	21.6	-28.8	.8	20.21	46.02	-25.81	0-360	399	H
4	* ** 124.381	26.99	Pk	19.7	-30.6	.4	16.49	43.52	-27.03	0-360	299	V
5	* ** 331.67	27	Pk	19.6	-29.1	.7	18.2	46.02	-27.82	0-360	101	V
6	* ** 613.94	24.87	Pk	24.6	-27.9	1	22.57	46.02	-23.45	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

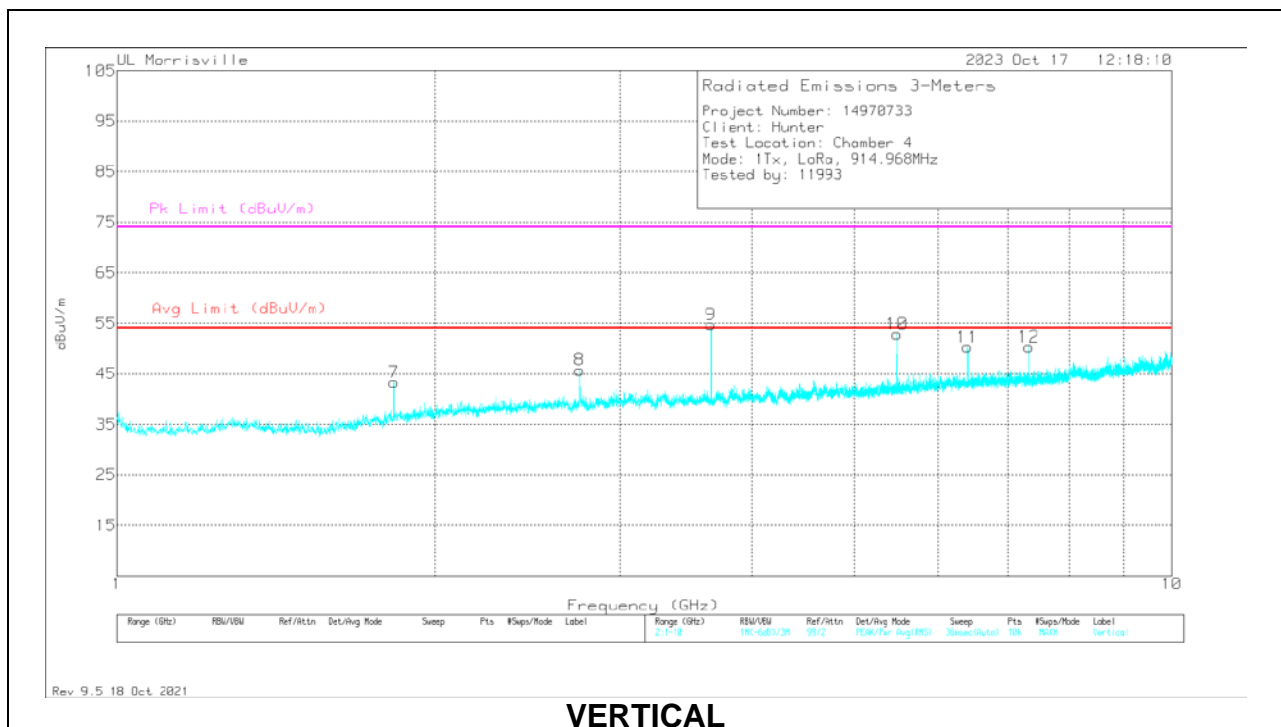
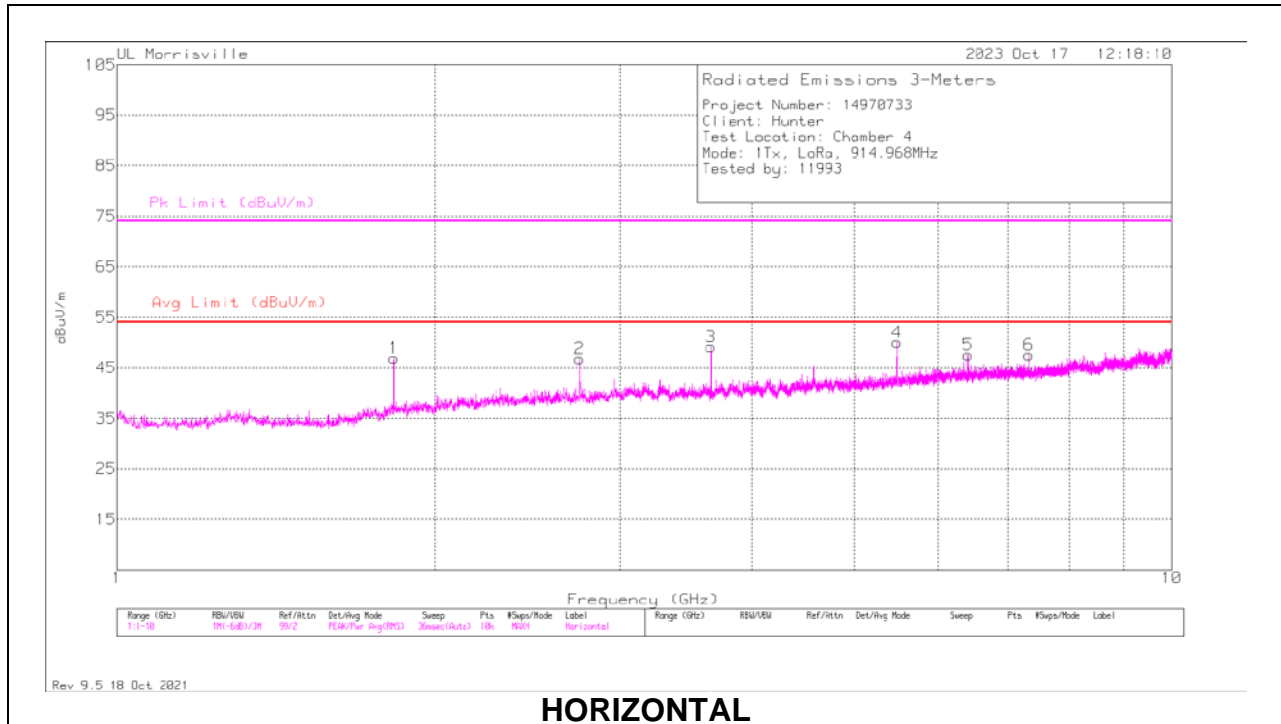
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.3. TRANSMITTER ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	** 1.8298	52.37	Pk	30.3	-36.1	.4	46.97	54	-7.03	74	-27.03	0-360	100	H
2	*** 2.7442	49.79	Pk	32.5	-35.9	.4	46.79	54	-7.21	74	-27.21	0-360	100	H
3	*** 3.66089	50.96	PK2	33	-34	.2	50.16	-	-	74	-23.84	137	112	H
	*** 3.65993	42.18	ADV	33	-34	.2	41.38	54	-12.62	-	-	137	112	H
6	*** 7.3198	40.25	Pk	35.6	-28.7	.4	47.55	54	-6.45	74	-26.45	0-360	100	H
7	** 1.8298	48.68	Pk	30.3	-36.1	.4	43.28	54	-10.72	74	-30.72	0-360	400	V
8	*** 2.7442	48.75	Pk	32.5	-35.9	.4	45.75	54	-8.25	74	-28.25	0-360	200	V
9	*** 3.66004	56.85	PK2	33	-34	.2	56.05	-	-	74	-17.95	202	209	V
	*** 3.65987	50	ADV	33	-34	.2	49.2	54	-4.8	-	-	202	209	V
12	*** 7.31977	45.19	PK2	35.6	-28.7	.4	52.49	-	-	74	-21.51	184	202	V
	*** 7.31991	32.81	ADV	35.6	-28.7	.4	40.11	54	-13.89	-	-	184	202	V
10	5.4883	49.21	Pk	34.6	-31.2	.3	52.91	-	-	-	-	0-360	300	V
4	5.4892	46.44	Pk	34.6	-31.3	.3	50.04	-	-	-	-	0-360	100	H
11	6.4054	43.93	Pk	35.4	-29.3	.3	50.33	-	-	-	-	0-360	200	V
5	6.4063	41.14	Pk	35.4	-29.3	.3	47.54	-	-	-	-	0-360	300	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

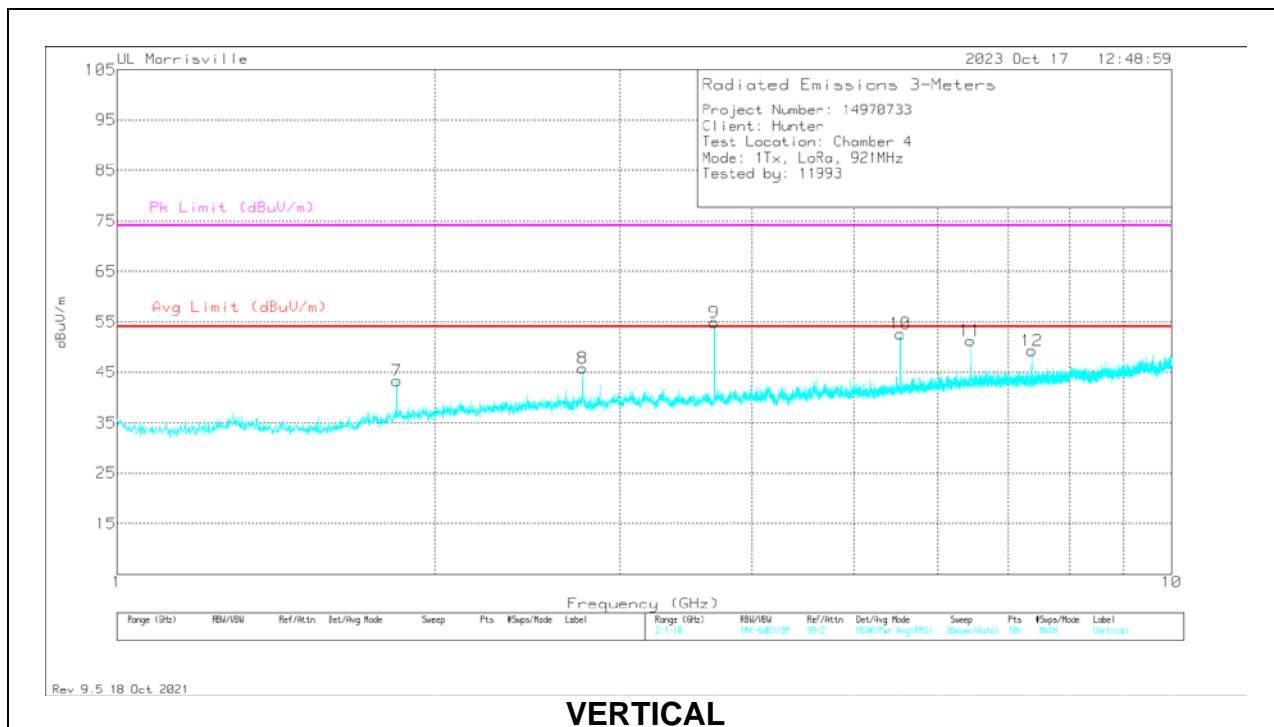
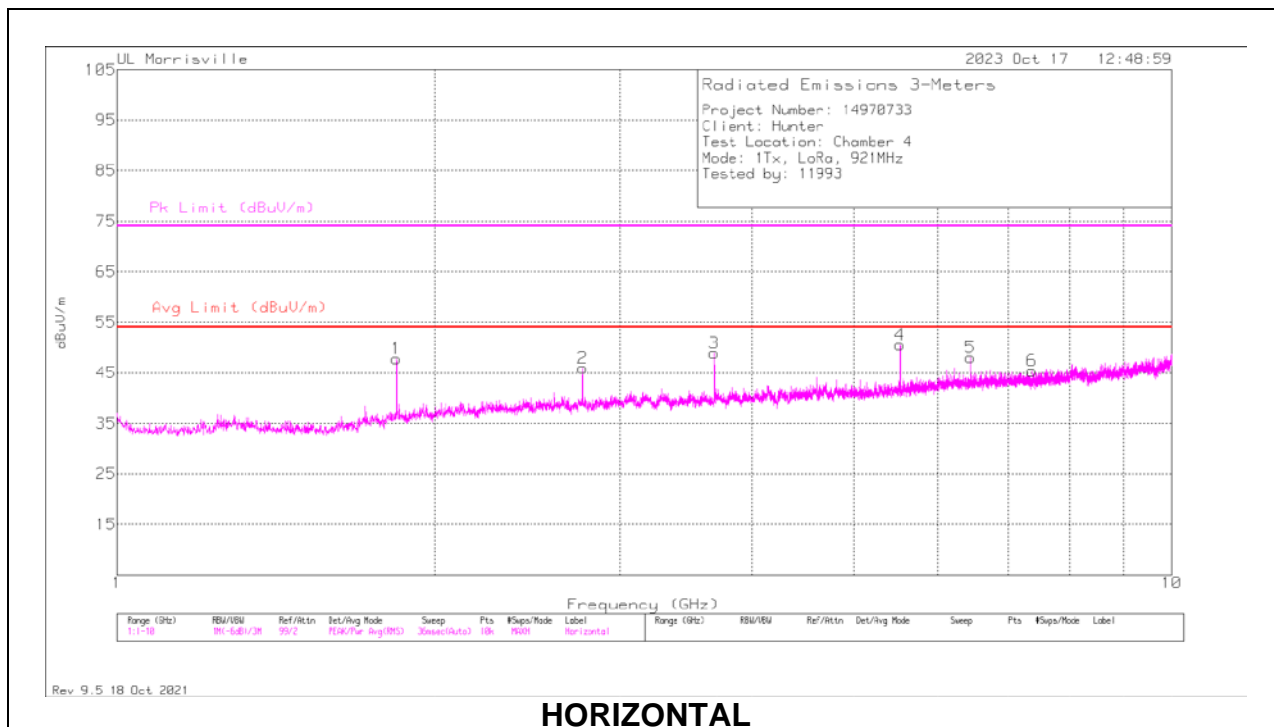
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	** 1.8415	53.02	Pk	30.4	-36	.4	47.82	-	-	-	-	0-360	100	H
2	*** 2.7622	48.79	Pk	32.5	-35.8	.4	45.89	54	-8.11	74	-28.11	0-360	100	H
3	*** 3.68357	50.91	PK2	33.1	-33.8	.4	50.61	-	-	74	-23.39	127	366	H
	*** 3.68382	42.54	ADV	33.1	-33.8	.4	42.24	54	-11.76	-	-	127	366	H
6	*** 7.3684	38.08	Pk	35.5	-28.6	.4	45.38	54	-8.62	74	-28.62	0-360	100	H
7	** 1.8424	48.52	Pk	30.4	-36	.4	43.32	-	-	-	-	0-360	400	V
8	*** 2.7622	48.74	Pk	32.5	-35.8	.4	45.84	54	-8.16	74	-28.16	0-360	200	V
9	*** 3.68487	56.17	PK2	33.1	-33.7	.4	55.97	-	-	74	-18.03	202	118	V
	*** 3.68412	49.22	ADV	33.1	-33.8	.4	48.92	54	-5.08	-	-	202	118	V
12	*** 7.36667	43.28	PK2	35.5	-28.7	.4	50.48	54	-	-	-23.52	179	205	V
	*** 7.36715	30.35	ADV	35.5	-28.7	.4	37.55	54	-16.45	-	-	179	205	V
4	5.5252	47.2	Pk	34.6	-31.6	.3	50.5	-	-	-	-	0-360	100	H
10	5.5279	49.47	Pk	34.6	-31.6	.2	52.67	-	-	-	-	0-360	300	V
5	6.4459	41.49	Pk	35.4	-29.2	.3	47.99	-	-	-	-	0-360	300	H
11	6.4486	44.6	Pk	35.4	-29.1	.4	51.3	-	-	-	-	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

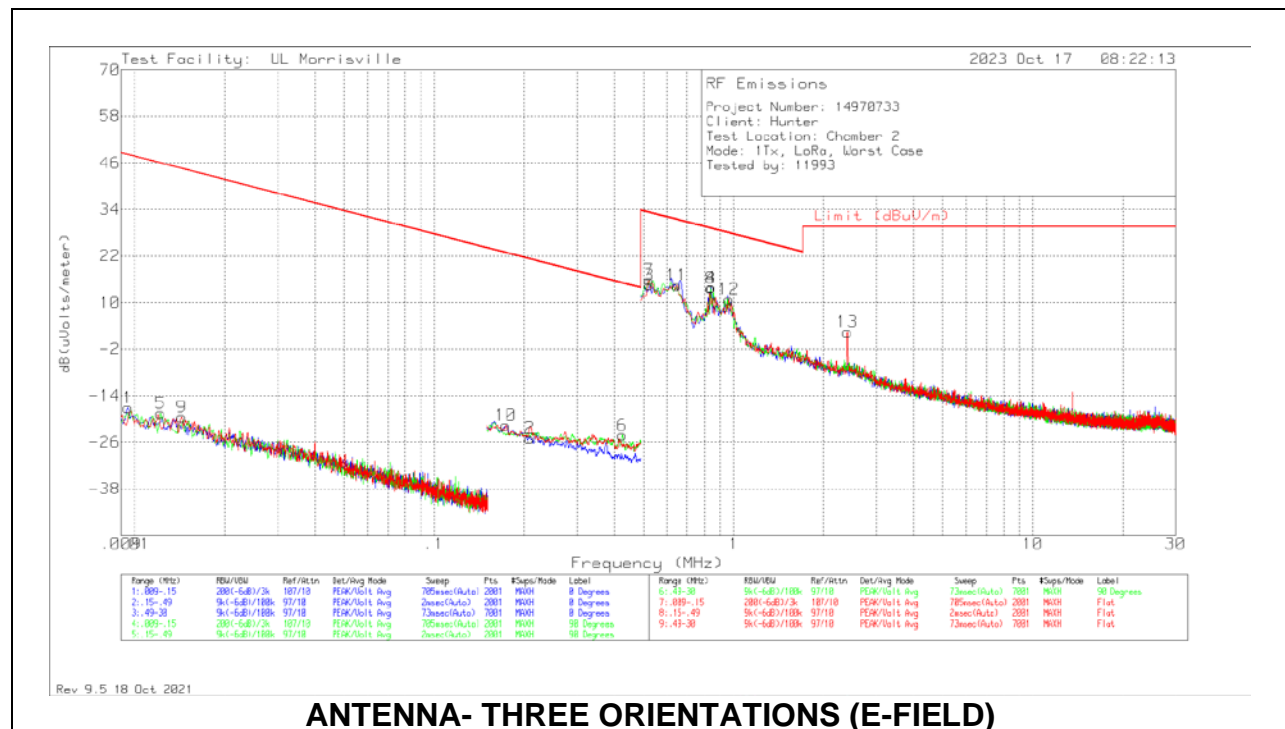
PK2 - Maximum Peak

ADV - Linear Voltage Average

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 $40 \cdot \log(\text{test distance} / \text{specification distance})$.

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION E-FIELD)



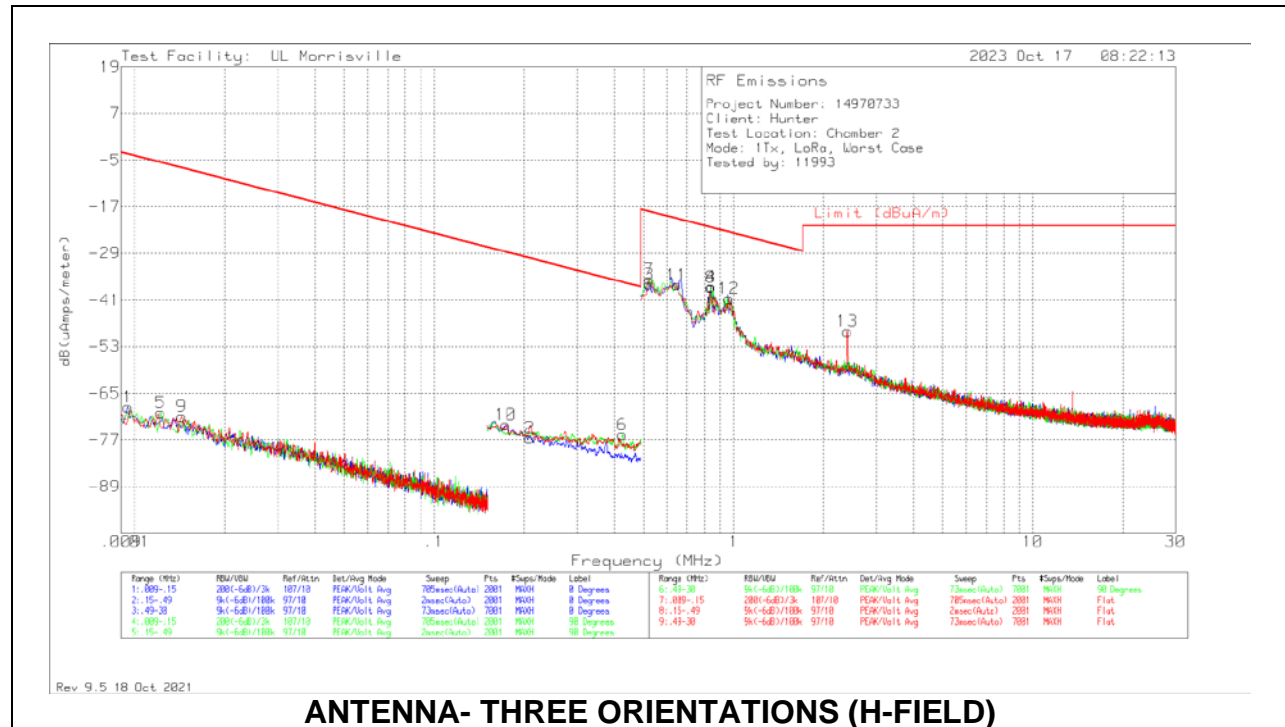
ANTENNA- THREE ORIENTATIONS (E-FIELD)

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	.0095	43.06	Pk	19.7	.1	-80	-17.14	48.05	68.05	-65.19	0-360	0 degs
5	.0122	43.09	Pk	18.3	.1	-80	-18.51	45.88	65.88	-64.39	0-360	90 degs
9	.01433	42.96	Pk	17.4	.1	-80	-19.54	44.48	64.48	-64.02	0-360	Flat
10	.17346	46.04	Pk	12.2	.1	-80	-21.66	22.82	42.82	-44.48	0-360	Flat
2	.20848	42.79	Pk	12.2	.1	-80	-24.91	21.22	41.22	-46.13	0-360	0 degs
6	.426	43.46	Pk	12.2	.1	-80	-24.24	15.02	35.02	-39.26	0-360	90 degs
3	.52373	42.31	Pk	12.2	.1	-40	14.61	33.22	-	-18.61	0-360	0 degs
7	.52373	43.59	Pk	12.2	.1	-40	15.89	33.22	-	-17.33	0-360	90 degs
11	.64599	42.16	Pk	12.2	.1	-40	14.46	31.4	-	-16.94	0-360	Flat
8	.83993	41.29	Pk	12.2	.2	-40	13.69	29.12	-	-15.43	0-360	90 degs
4	.84414	41.55	Pk	12.2	.2	-40	13.95	29.08	-	-15.13	0-360	0 degs
12	.96641	38.43	Pk	12.2	.2	-40	10.83	27.9	-	-17.07	0-360	Flat
13	2.39563	29.88	Pk	12.3	.3	-40	2.48	29.54	-	-27.06	0-360	Flat

Pk - Peak detector

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION H-FIELD)



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)	Loop Angle
1	.0095	43.06	Pk	-31.8	.1	-80	-68.64	-3.45	16.55	-65.19	0-360	0 degs
5	.0122	43.09	Pk	-33.2	.1	-80	-70.01	-5.62	14.38	-64.39	0-360	90 degs
9	.01433	42.96	Pk	-34.1	.1	-80	-71.04	-7.02	12.98	-64.02	0-360	Flat
10	.17346	46.04	Pk	-39.3	.1	-80	-73.16	-28.68	-8.68	-44.48	0-360	Flat
2	.20848	42.79	Pk	-39.3	.1	-80	-76.41	-30.28	-10.28	-46.13	0-360	0 degs
6	.426	43.46	Pk	-39.3	.1	-80	-75.74	-36.48	-16.48	-39.26	0-360	90 degs
3	.52373	42.31	Pk	-39.3	.1	-40	-36.89	-18.28	-	-18.61	0-360	0 degs
7	.52373	43.59	Pk	-39.3	.1	-40	-35.61	-18.28	-	-17.33	0-360	90 degs
11	.64599	42.16	Pk	-39.3	.1	-40	-37.04	-20.1	-	-16.94	0-360	Flat
8	.83993	41.29	Pk	-39.3	.2	-40	-37.81	-22.38	-	-15.43	0-360	90 degs
4	.84414	41.55	Pk	-39.3	.2	-40	-37.55	-22.42	-	-15.13	0-360	0 degs
12	.96641	38.43	Pk	-39.3	.2	-40	-40.67	-23.6	-	-17.07	0-360	Flat
13	2.39563	29.88	Pk	-39.2	.3	-40	-49.02	-21.96	-	-27.06	0-360	Flat

Pk - Peak detector

11. SETUP PHOTOS

Please refer to R14970733-EP1 for setup photos

END OF TEST REPORT