



# TEST REPORT

**Report Number. :** R13899779-E2

**Applicant :** Stryker Instruments  
1941 Stryker Way  
Portage, MI 49002, USA

**Model :** 120V Neptune S Rover (0711-001-000)  
120V Neptune S Rover Canadian (0711-004-000)  
120V Neptune S Rover Spanish (0711-005-000)

**FCC ID :** Q9R-492866

**IC ID :** 4919A-492866

**EUT Description :** RFID tag reader

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C: 2021  
ISED RSS-210 ISSUE 10: 2019  
ISED RSS-GEN ISSUE 5 + A2: 2021

**Date Of Issue:**  
2022-01-05

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### Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2021-09-08	Initial Issue	Cristian Melara
V2	2021-12-14	Added note for model differences Added note to the calibration tables Added note for 20dB bandwidth plots Updated Below 30MHz data Added additional note in Radiated Results section Separated photos in to its own Photos Exhibit	Cristian Melara
V3	2021-12-20	Updated EUT description Added additional information to EUT description	Cristian Melara
V4	2022-01-05	Updated Radiated Emissions statement	Cristian Melara

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Stryker Instruments  
1941 Stryker Way  
Portage, MI 49002, USA

**EUT DESCRIPTION:** RFID tag reader

**MODEL:** 120V Neptune S Rover (0711-001-000)  
120V Neptune S Rover Canadian (0711-004-000)  
120V Neptune S Rover Spanish (0711-005-000)

**SERIAL NUMBER:** BTRRKI6543

**SAMPLE RECEIPT DATE:** 2021-07-12

**DATE TESTED:** 2021-07-19 to 2021-07-28 and 2021-08-18

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C : 2021	See Section 2
ISED RSS-210 Issue 10, Annex B.6	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. This report must not be used by the client to claim product certification, approval, or endorsement by a2La, NIST, or any agency of the U.S. government.

Approved & Released For  
UL LLC. By:

Prepared By:



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Mike Antola  
Staff Engineer  
Consumer Technology Division  
UL LLC.

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Cristian Melara  
Engineer  
Consumer Technology Division  
UL LLC.

## 2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
-	RSS-GEN 6.7	99% OBW	Complies	None
-	RSS-GEN 6.7	20dB BW	Complies	None
§15.225(e)	RSS-210 Annex B.6 (b)	Frequency Stability	Complies	None
§15.225(a)	RSS-210 Annex B.6 (a)(i)	Fundamental Field Strength	Complies	None
§15.225 (b-d) §15.209	RSS-210 Annex B.6 (a) (ii-iv) RSS-GEN 8.9	Radiated Emissions	Complies	See Note 1
§15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Complies	None

Note 1: For the 30MHz to 1000MHz scans, tag on, tag off, and radio off scans were performed. The radio off scan was performed in order to investigate if the observed failures were radio related. It was determined that these failures were non-radio related. Additionally, digital (i.e. non-radio related) emissions are subject to Class A limits and would not be compared to 15.209 limits (which are effectively Class B limits).

This report contains data provided by the applicant 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.

### 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15: 2021, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A2: 2021, and RSS-210 Issue 10: 2019.

### 4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 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	703469
<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)

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

### **MAINS CONDUCTED EMISSIONS**

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) +

LISN Insertion Loss.

$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

## **6. EQUIPMENT UNDER TEST**

### **6.1. DESCRIPTION OF EUT**

The EUT is an RFID reader that employs a 13.56 MHz RFID radio for detection. The identification numbers & descriptions for the EUT are as follows:

Module HVIN: 700000492866  
Module PMN: 700000492866  
HMN: Neptune S Rover

### **6.2. MAXIMUM ELECTRIC FIELD STRENGTH**

Testing was performed at a distance of 3m. The transmitter has a maximum peak radiated magnetic field strength as follows:

The maximum E-field reading with tag at 30m is -2.66 dBuV/m

The maximum E-field reading without tag at 30m is -3.04 dBuV/m

### **6.3. SOFTWARE AND FIRMWARE**

The test utility software used during testing was 0.6.0.

### **6.4. WORST-CASE CONFIGURATION AND MODE**

The EUT is intended to operate in only one orientation. Therefore, all tests were performed in its intended orientation.

Radiated spurious emissions below 1 GHz, were performed with and without tag.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

The differences in the model numbers is solely based on language translations and labeling on the EUT. The model specifically tested in this case is model 120V Neptune S Rover (0711-001-000).

## 6.5. 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
1	1	1	AC power	AC Mains	<3m	Used to power EUT

### SETUP DIAGRAM

Refer to R13899779-EP1 for setup diagram.

## 7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	<b>0.009-30MHz</b>				
AT0059	Active Loop Antenna	EMCO	6502	2020-08-06	2021-08-06
	<b>30-1000 MHz</b>				
AT0075	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2020-10-27	2021-10-27
	<b>Gain-Loss Chains</b>				
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2021-07-09	2022-07-09
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2021-07-09	2022-07-09
	<b>Receiver &amp; Software</b>				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2021-03-10	2022-03-10
SOFTEMI	EMI Software	UL	Version 9.5 (24 Jun 2021)		
	<b>Additional Equipment used</b>				
s/n 200037635	Environmental Meter	Fisher Scientific	06-662-4	2020-01-22	2022-01-22

\*Note – All testing has been completed within calibration dates.

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

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	<b>30-1000 MHz</b>				
206210	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2021-03-11	2022-03-11
	<b>Gain-Loss Chains</b>				
C4-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2021-05-07	2022-05-07
	<b>Receiver &amp; Software</b>				
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2021-03-09	2022-03-09
SOFTEMI	EMI Software	UL	Version 9.5 (27 May 2021)		
	<b>Additional Equipment used</b>				
s/n 200037635	Environmental Meter	Fisher Scientific	06-662-4	2020-01-21	2022-01-21

\*Note – All testing has been completed within calibration dates.

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	<b>30-1000 MHz</b>				
AT0066	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB1	2021-02-19	2022-02-19
	<b>Gain-Loss Chains</b>				
N-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2021-07-20	2022-07-20
	<b>Receiver &amp; Software</b>				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2021-03-30	2022-03-30
SOFTEMI	EMI Software	UL	Version 9.5 (24 Jun 2021)		
	<b>Additional Equipment used</b>				
s/n 200037610	Environmental Meter	Fisher Scientific	06-662-4	2020-01-22	2022-01-22

\*Note – All testing has been completed within calibration dates.

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2021-04-05	2022-04-05
HI0094	Environmental Meter	Fisher Scientific	06-662-4	2020-01-21	2022-01-21
LISN003	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2020-08-18	2021-08-18
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2020-08-18	2021-08-18
ATA222	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2021-04-05	2022-04-05
PS214	AC Power Source	Elgar	CW2501M (s/n 1523A02396)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (04 Mar 2021)		

\*Note – All testing has been completed within calibration dates.

Test Equipment Used - Wireless Conducted Measurement Equipment

Equip ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	<b>RTP-NEBS</b>				
72882	Spectrum Analyzer	Agilent Technologies	E4446A	2021-02-18	2022-02-18
EC0179	Environmental Chamber	Thermotron	010099	2020-08-04	2021-08-04
SOFTEMI	Antenna Port Software	UL	Version 2021.05.28	NA	NA
	<b>Conducted Room 1</b>				
SA0027	Spectrum Analyzer	Keysight Technologies	N9030A	2021-06-25	2022-06-25
HI0096	Environmental Meter	Fisher Scientific	14-650-118	2020-09-23	2021-09-23
SOFTEMI	Antenna Port Software	UL	Version 2021.05.28	NA	NA

\*Note – All testing has been completed within calibration dates.

## **8. MEASUREMENT METHOD**

Occupied BW (20dB): ANSI C63.10-2013 Section 6.9.2

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

Frequency Stability: ANSI C63.10-2013 Clause 6.8

General Radiated emissions: ANSI C63.10 Section 6.3 to 6.5

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2 and KDB 174176 D01  
Line Conducted FAQ v01r01, Q5.



## 9. OCCUPIED BANDWIDTH AND 20dB BANDWIDTH

### LIMITS

None; for reporting purposes only.

FCC §15.215 (c) and RSS-GEN, ANSI C63.10 Sections 6.9.2 and 6.9.3 were used for the measurement procedure.

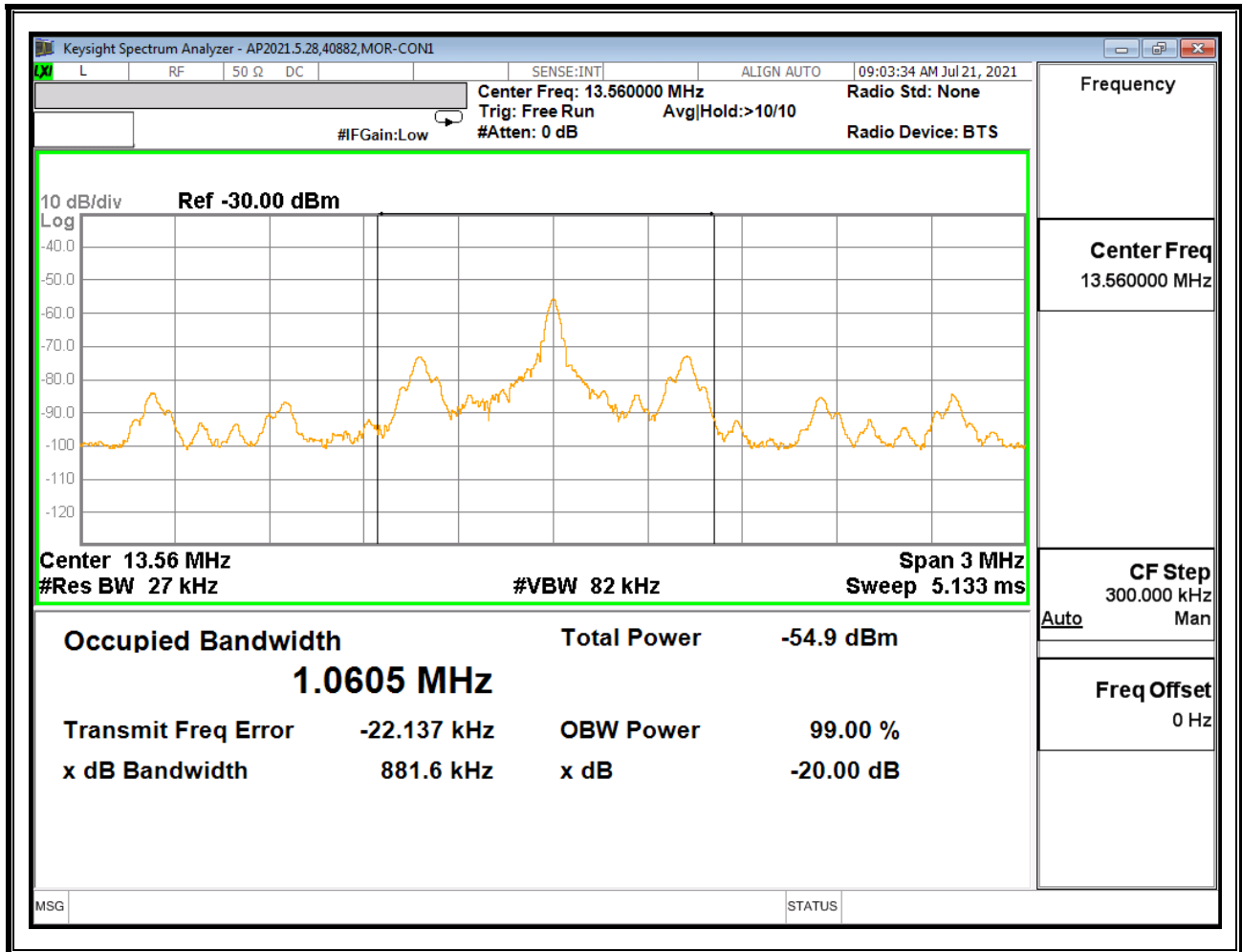
### RESULTS

#### 9.1. With Tag

##### Occupied Bandwidth & 20 dB Bandwidth Results With Tag

Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
13.56	1060.5	876

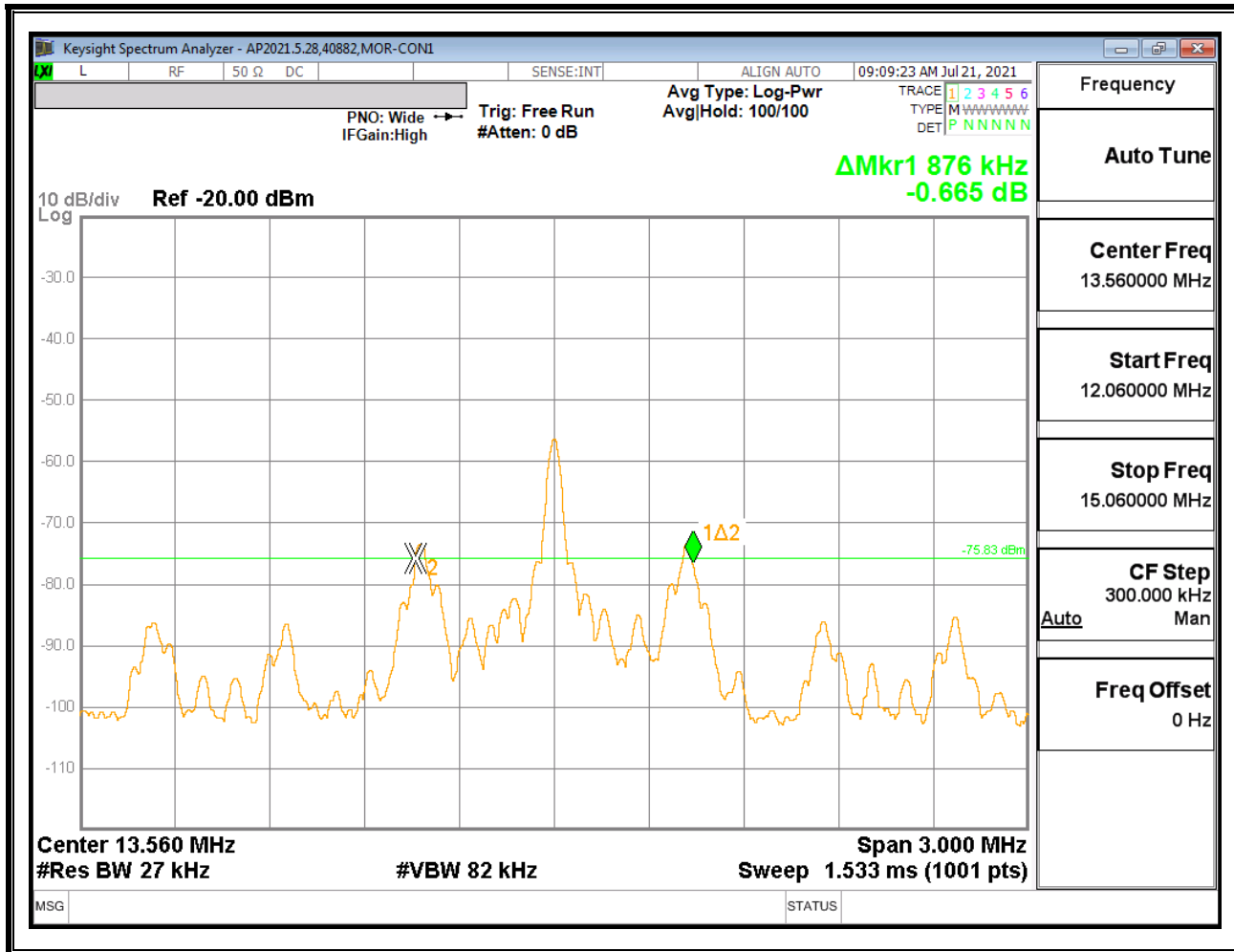
### 9.1.1. 99% BANDWIDTH PLOT



#### TEST INFORMATION

Test Date: 2021-07-21  
 Tested By: 40882

### 9.1.2. 20dB BANDWIDTH PLOT



#### TEST INFORMATION

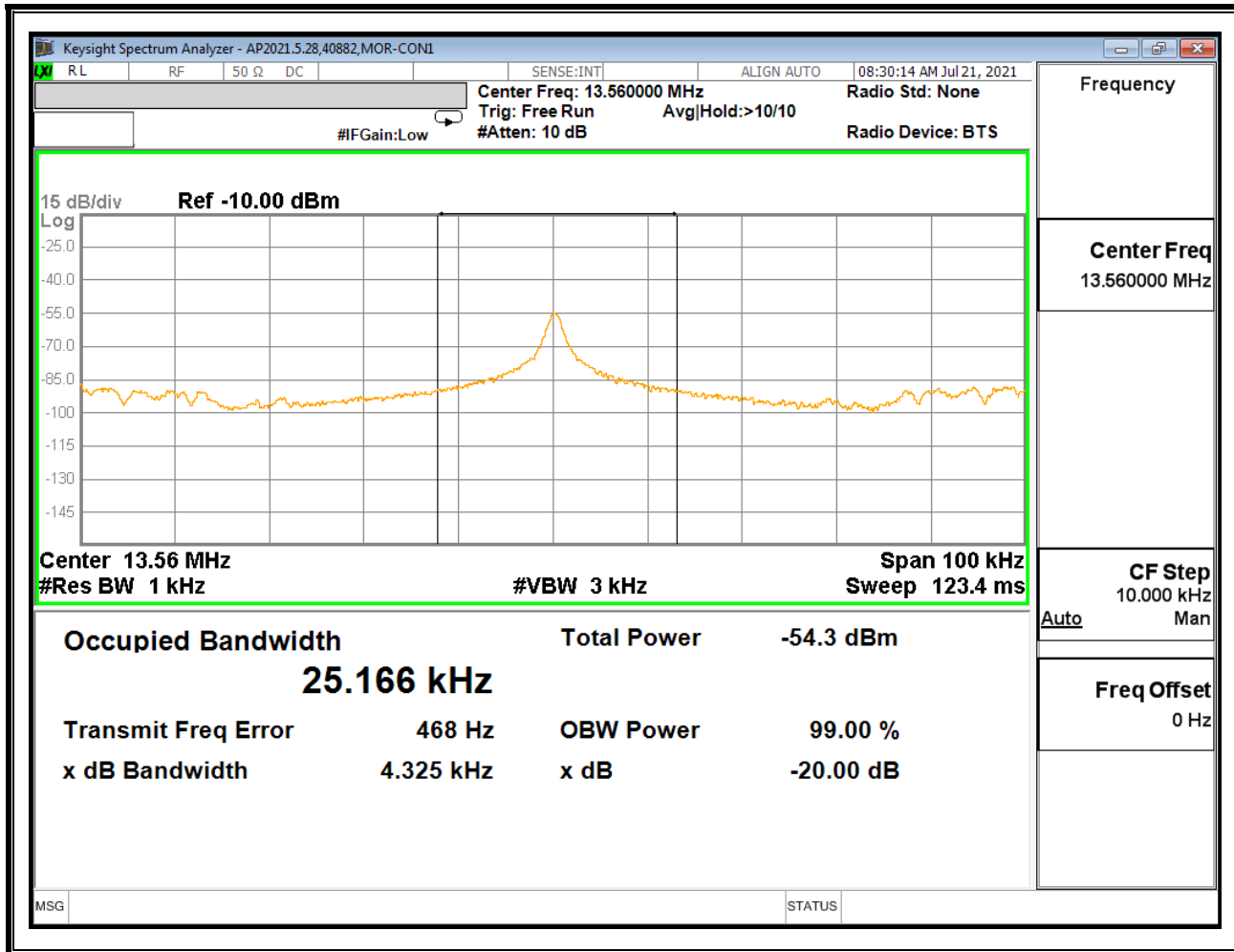
Test Date: 2021-07-21  
 Tested By: 40882

## 9.2. Without Tag

### Occupied Bandwidth & 20 dB Bandwidth Results Without Tag

Frequency (MHz)	99% Bandwidth (KHz)	20dB Bandwidth (KHz)
13.56	25.166	5.08

### 9.2.1. 99% BANDWIDTH PLOT

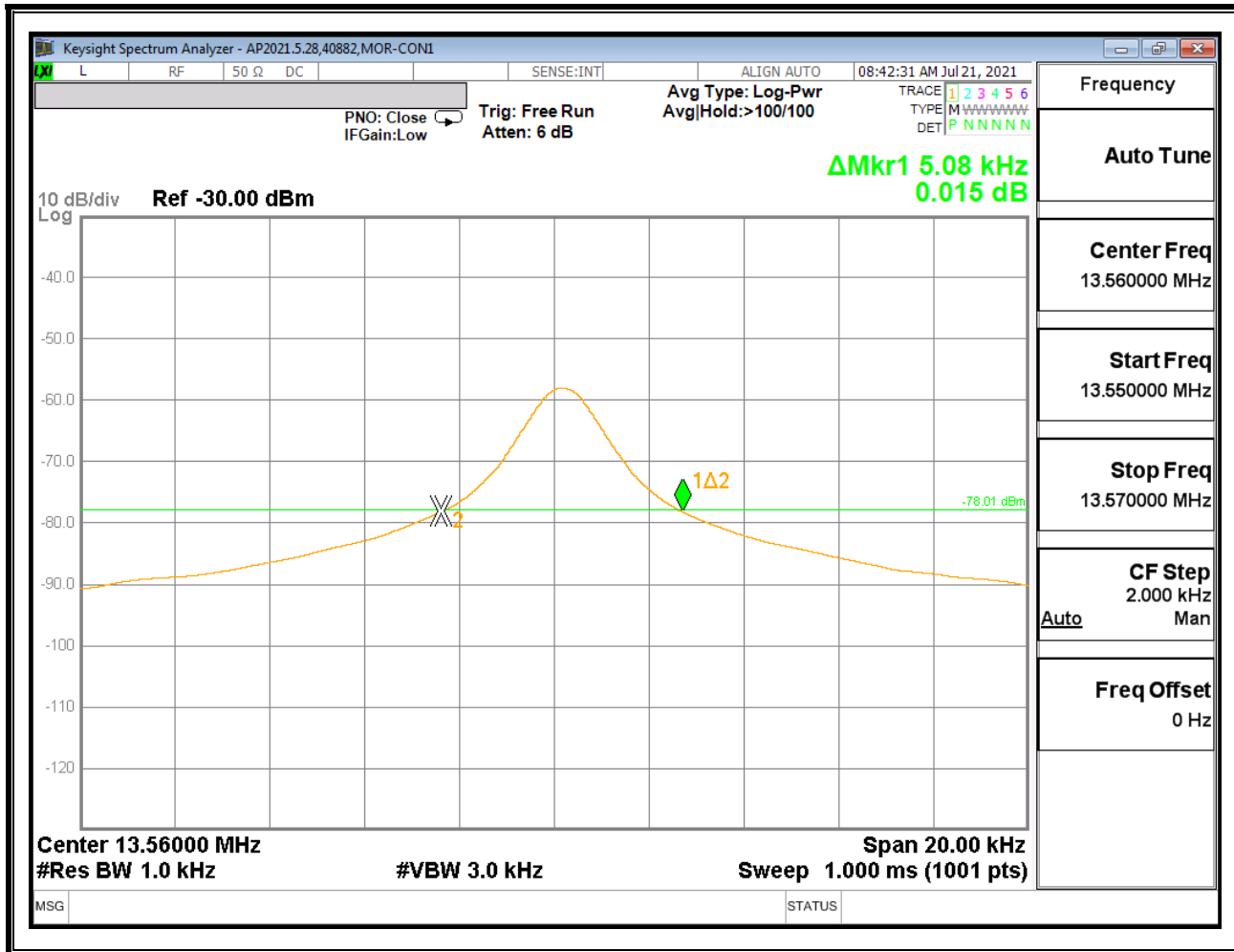


Note: Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since the measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

#### TEST INFORMATION

Test Date: 2021-07-21  
 Tested By: 40882

### 9.2.2. 20dB BANDWIDTH PLOT



Note: Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since the measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

#### TEST INFORMATION

Test Date: 2021-07-21  
 Tested By: 40882

## 10. FREQUENCY STABILITY

### LIMIT

§15.225 (e) The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency, over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

IC RSS-210, Annex B.6

Carrier frequency stability shall be maintained to  $\pm 0.01\%$  ( $\pm 100$  ppm).

### TEST PROCEDURE

ANSI C63.10-2013 Clause 6.8.1 and 6.8.2

### RESULTS

No non-compliance noted.

#### 10.1. With Tag

Reference Frequency: EUT Channel 13.56 MHz @ 20°C Limit: $\pm 100$ ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(VAC or VDC)	(°C)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
120.00	50	13.5601630	-9.956	13.5601690	-10.398	13.5601680	-10.324	13.5601670	-10.251	$\pm 100$
120.00	40	13.5601660	-10.177	13.5601680	-10.324	13.5601680	-10.324	13.5601630	-9.956	$\pm 100$
120.00	30	13.5601890	-11.873	13.5600180	0.737	13.5601450	-8.628	13.5601890	-11.873	$\pm 100$
<b>120.00</b>	<b>20</b>	<b>13.5600280</b>	<b>0.000</b>	<b>13.5602100</b>	<b>-13.422</b>	<b>13.5602100</b>	<b>-13.422</b>	<b>13.5602100</b>	<b>-13.422</b>	<b><math>\pm 100</math></b>
120.00	10	13.5602460	-16.077	13.5602460	-16.077	13.5602450	-16.003	13.5602820	-18.732	$\pm 100$
120.00	0	13.5602600	-17.109	13.5602590	-17.035	13.5602730	-18.068	13.5602590	-17.035	$\pm 100$
120.00	-10	13.5602700	-17.847	13.5602690	-17.773	13.5602750	-18.215	13.5602690	-17.773	$\pm 100$
120.00	-20	13.5602730	-18.068	13.5602730	-18.068	13.5602730	-18.068	13.5602360	-15.339	$\pm 100$
102.00	20	13.5601890	-11.873	13.5601990	-12.611	13.5601620	-9.882	13.5602180	-14.012	$\pm 100$
138.00	20	13.5602310	-14.971	13.5602330	-15.118	13.5602150	-13.791	13.5602310	-14.971	$\pm 100$

### TEST INFORMATION

Date: 2021-07-20

Tester: 40882

## 10.2. Without Tag

Reference Frequency: EUT Channel 13.56 MHz @ 20°C Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(VAC or VDC)	(°C)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
120.00	50	13.5601510	4.499	13.5601690	3.171	13.5601000	8.260	13.5601580	3.982	± 100
120.00	40	13.5601670	3.319	13.5601670	3.319	13.5601670	3.319	13.5601660	3.392	± 100
120.00	30	13.5601910	1.549	13.5601880	1.770	13.5601880	1.770	13.5601960	1.180	± 100
<b>120.00</b>	<b>20</b>	<b>13.5602120</b>	<b>0.000</b>	<b>13.5602120</b>	<b>0.000</b>	<b>13.5602110</b>	<b>0.074</b>	<b>13.5602110</b>	<b>0.074</b>	<b>± 100</b>
120.00	10	13.5605450	-24.558	13.5605460	-24.631	13.5605400	-24.189	13.5605440	-24.484	± 100
120.00	0	13.5602630	-3.761	13.5602620	-3.687	13.5602740	-4.572	13.5602610	-3.614	± 100
120.00	-10	13.5602690	-4.204	13.5602690	-4.204	13.5602680	-4.130	13.5602690	-4.204	± 100
120.00	-20	13.5602720	-4.425	13.5602690	-4.204	13.5602710	-4.351	13.5602330	-1.549	± 100
102.00	20	13.5602230	-0.811	13.5602230	-0.811	13.5602250	-0.959	13.5602090	0.221	± 100
138.00	20	13.5602220	-0.737	13.5602050	0.516	13.5602230	-0.811	13.5601220	6.637	± 100

### TEST INFORMATION

Date: 2021-07-20

Tester: 40882



## 11. RADIATED EMISSIONS TEST RESULTS

### 11.1. LIMITS AND PROCEDURE

#### LIMIT

§15.225

IC RSS-210, Annex B.6

IC RSS-GEN, Section 8.9 (Transmitter)

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/ meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209 as follows:

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Limits for radiated disturbance of an intentional radiator			
Frequency range (MHz)	Limits (µV/m)	Limits (uA/m) - ISED Only	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	6.37/F (F in kHz)	300
0.490 – 1.705	24000 / F (kHz)	63.7/F (F in kHz)	30
1.705 – 30.0	30	0.08	30
30 – 88	100**	-	3
88 - 216	150**	-	3
216 – 960	200**	-	3
Above 960	500	-	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Formula for converting the field strength from uV/m to dBuV/m is:

Limit (dBuV/m) = 20 log limit (uV/m)

In addition:

§15.209 (d) The emission limits shown the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above

1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

§15.209 (d) The provisions in §§ 15.225, measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

### **TEST PROCEDURE**

ANSI C63.10, 2013

The EUT is an intentional radiator that incorporates a digital device, the highest fundamental frequency generated or used in the device is 13.56 MHz; therefore, the frequency range was investigated from 5 MHz to the 10<sup>th</sup> harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater.

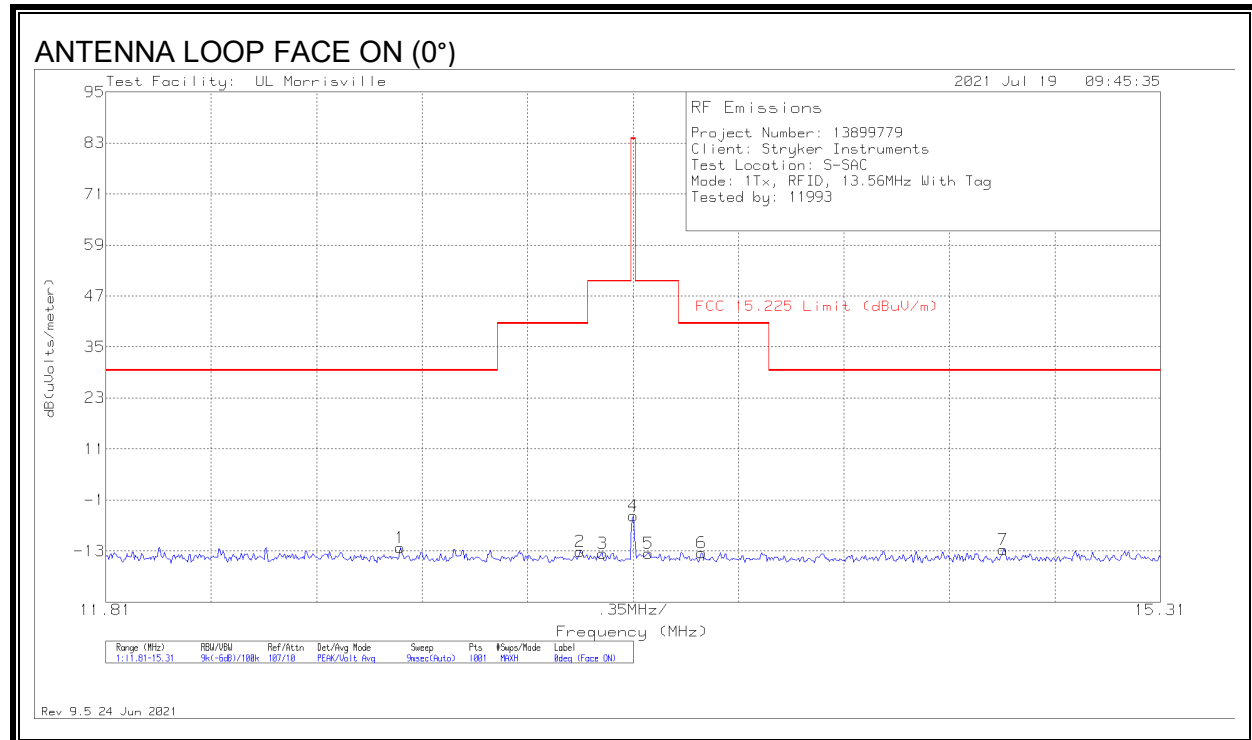
### **RESULTS**

For the 30MHz to 1000MHz scans, tag on, tag off, and radio off scans were performed. The radio off scan was performed in order to investigate if the observed failures were radio related. It was determined that these failures were non-radio related. Additionally, digital (i.e. non-radio related) emissions are subject to Class A limits and would not be compared to 15.209 limits (which are effectively Class B limits).

## 11.2. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.009 - 30 MHz)

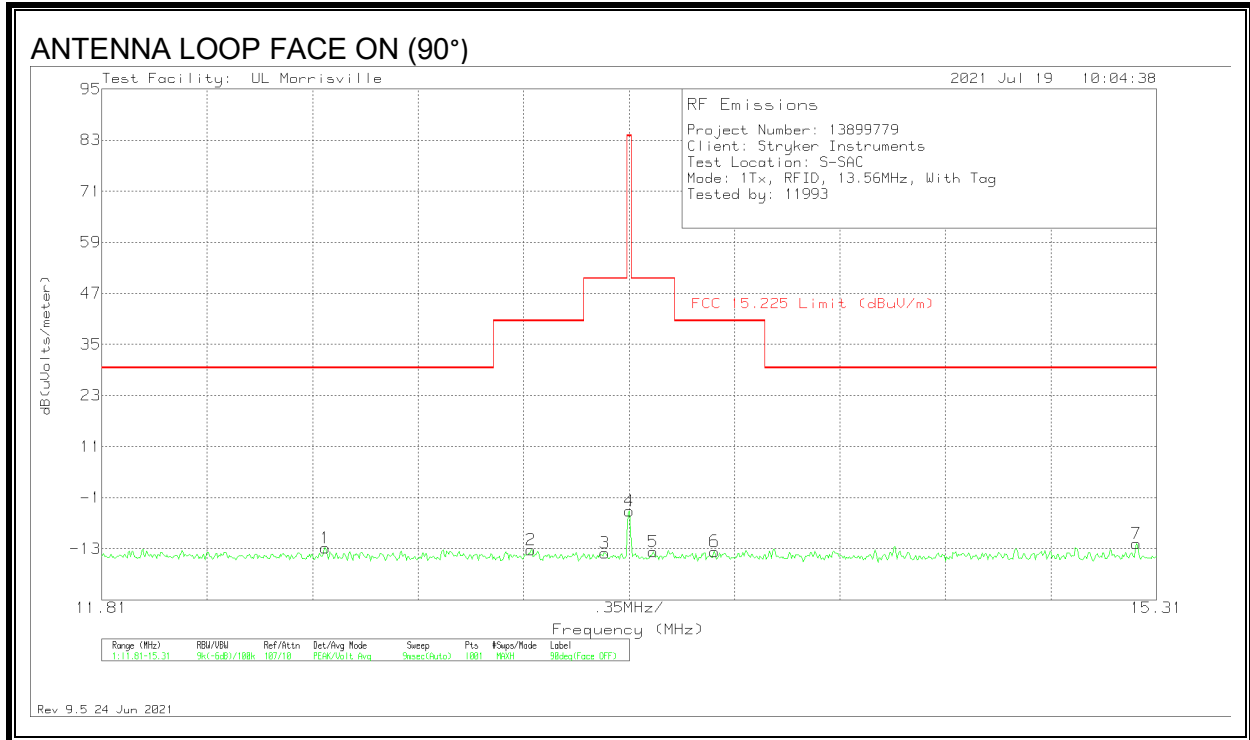
Note for below 30 MHz scans: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions 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  $40 \cdot \log(\text{test distance} / \text{specification distance})$ .

### FUNDAMENTAL WITH TAG



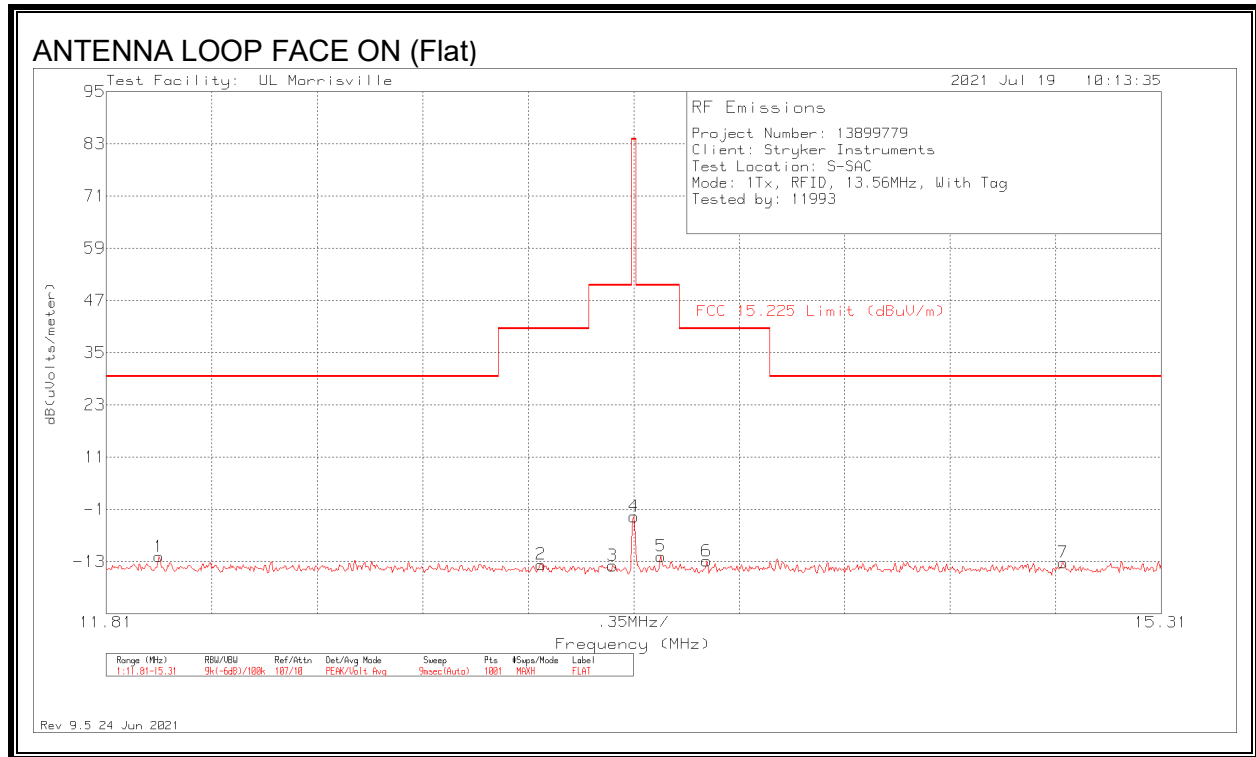
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	12.7865	16.26	Pk	10.8	.7	-40	-12.24	29.5	-41.74	70	0 degs
2	13.385	15.42	Pk	10.8	.7	-40	-13.08	40.5	-53.58	70	0 degs
3	13.4585	14.98	Pk	10.8	.7	-40	-13.52	50.5	-64.02	70	0 degs
4	13.56	23.72	Pk	10.8	.7	-40	-4.78	84	-88.78	70	0 degs
5	13.61075	14.97	Pk	10.8	.7	-40	-13.53	50.5	-64.03	70	0 degs
6	13.7875	15.09	Pk	10.8	.7	-40	-13.41	40.5	-53.91	70	0 degs
7	14.7885	15.69	Pk	10.8	.8	-40	-12.71	29.5	-42.21	70	0 degs

Pk - Peak detector



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	12.552	15.7	Pk	10.8	.7	-40	-12.8	29.5	-42.3	116	90 degs
2	13.2345	15.19	Pk	10.8	.7	-40	-13.31	40.5	-53.81	116	90 degs
3	13.4795	14.49	Pk	10.8	.7	-40	-14.01	50.5	-64.51	116	90 degs
4	13.56	24.42	Pk	10.8	.7	-40	-4.08	84	-88.08	116	90 degs
5	13.6405	14.77	Pk	10.8	.7	-40	-13.73	50.5	-64.23	116	90 degs
6	13.8435	14.85	Pk	10.8	.7	-40	-13.65	40.5	-54.15	116	90 degs
7	15.2435	16.54	Pk	10.8	.8	-40	-11.86	29.5	-41.36	116	90 degs

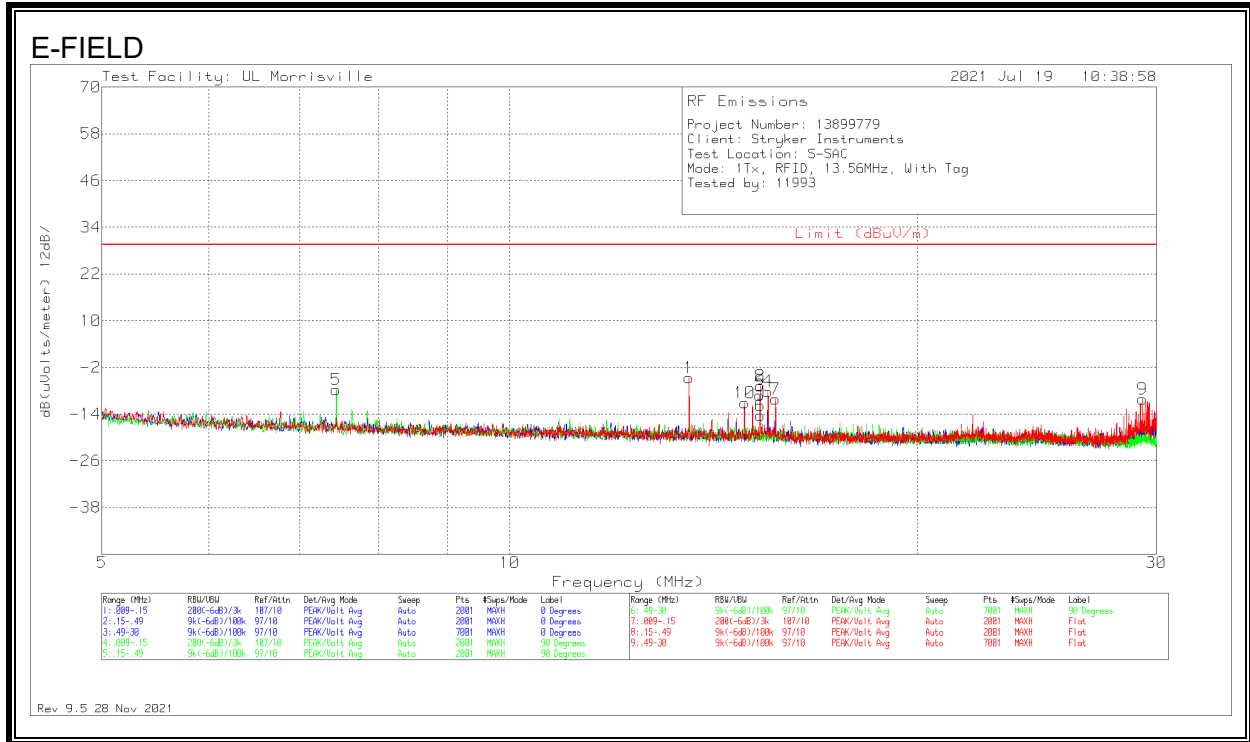
Pk - Peak detector



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	11.985	16.61	Pk	10.8	.7	-40	-11.89	29.5	-41.39	93	Flat
2	13.252	14.82	Pk	10.8	.7	-40	-13.68	40.5	-54.18	93	Flat
3	13.49	14.56	Pk	10.8	.7	-40	-13.94	50.5	-64.44	93	Flat
4	13.56	25.84	Pk	10.8	.7	-40	-2.66	84	-86.66	93	Flat
5	13.651	16.71	Pk	10.8	.7	-40	-11.79	50.5	-62.29	93	Flat
6	13.8015	15.59	Pk	10.8	.7	-40	-12.91	40.5	-53.41	93	Flat
7	14.9845	15.16	Pk	10.8	.8	-40	-13.24	29.5	-42.74	93	Flat

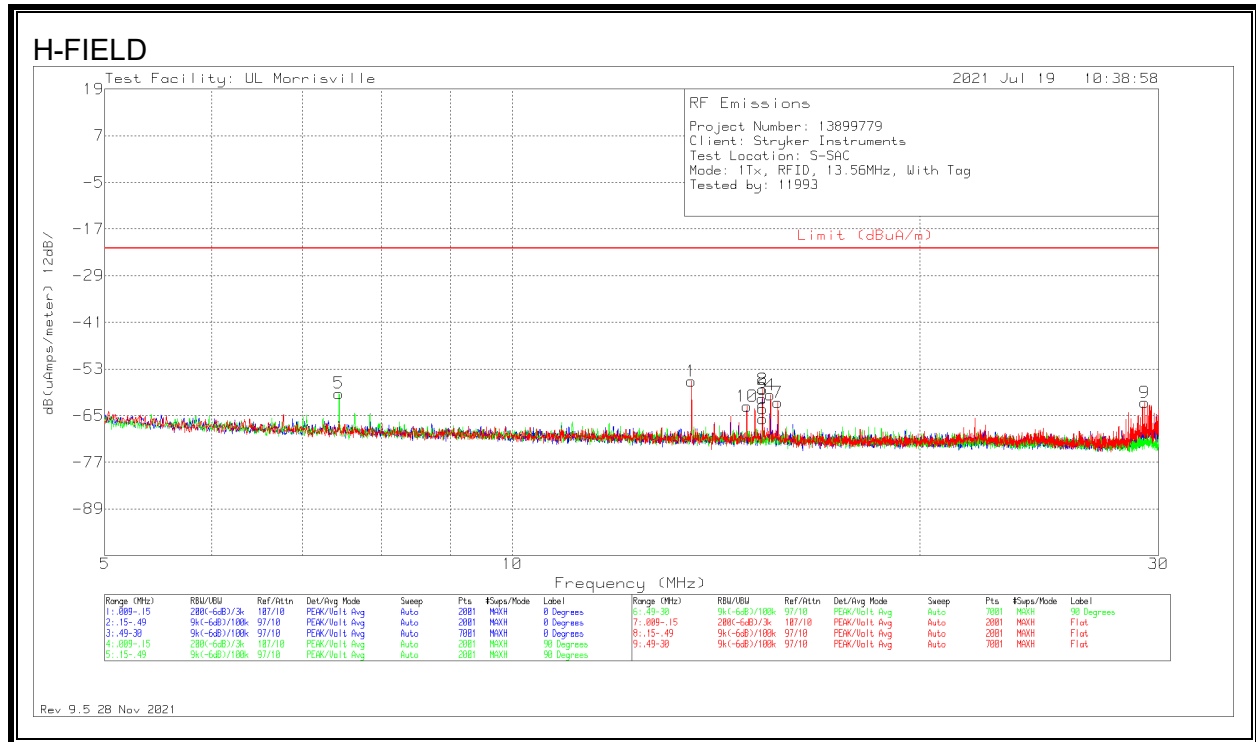
Pk - Peak detector

**SPURIOUS EMISSIONS WITH TAG**



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
5	7.4464	21.01	Pk	10.7	.5	-40	-7.79	29.54	-37.33	0-360	90 degs
1	13.5596	23.91	Pk	10.8	.7	-40	-4.59	29.54	-34.13	0-360	Flat
10	14.9003	17.29	Pk	10.8	.8	-40	-11.11	29.54	-40.65	0-360	Flat
3	15.2966	19.29	Pk	10.8	.8	-40	-9.11	29.54	-38.65	0-360	0 degs
6	15.3008	14.06	Pk	10.8	.8	-40	-14.34	29.54	-43.88	0-360	90 degs
2	15.305	21.66	Pk	10.8	.8	-40	-6.74	29.54	-36.28	0-360	Flat
8	15.305	21.66	Pk	10.8	.8	-40	-6.74	29.54	-36.28	0-360	Flat
4	15.5074	20.37	Pk	10.7	.8	-40	-8.13	29.54	-37.67	0-360	Flat
7	15.7055	18.34	Pk	10.7	.8	-40	-10.16	29.54	-39.7	0-360	Flat
9	29.3106	20.81	Pk	8	1.1	-40	-10.09	29.54	-39.63	0-360	Flat

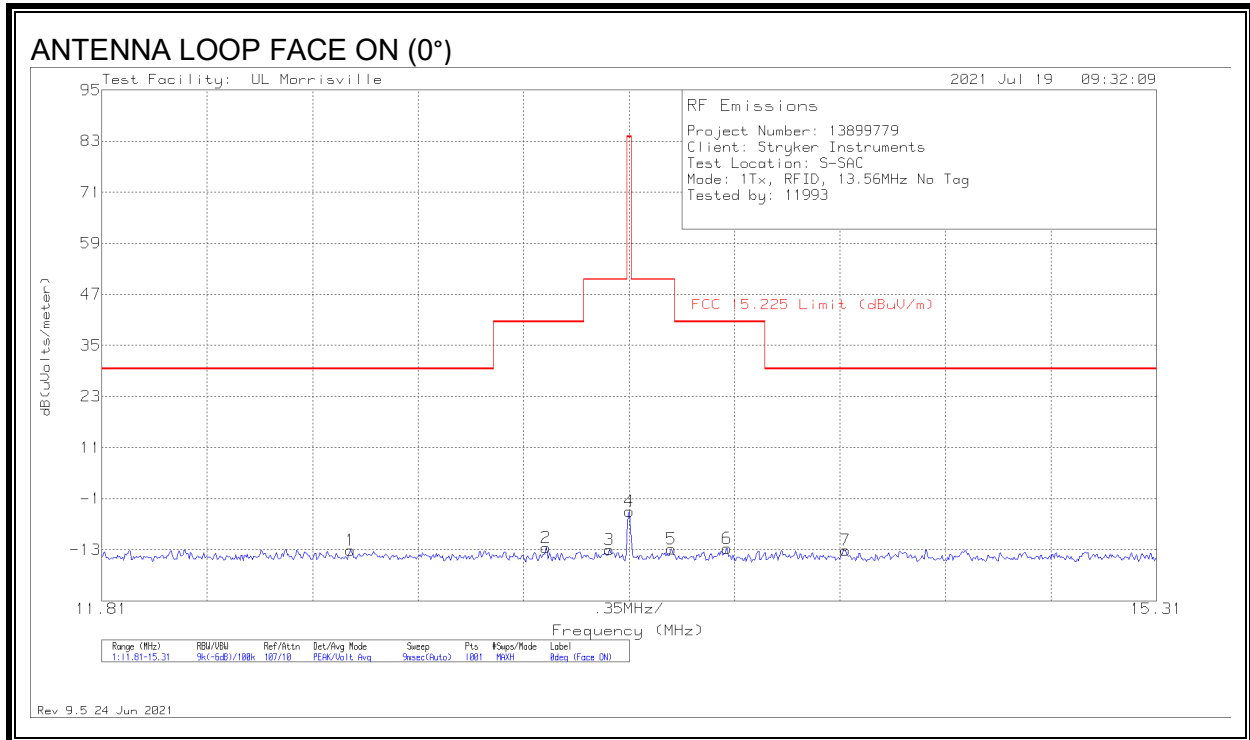
Pk - Peak detector



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
5	7.4464	21.01	Pk	-40.8	.5	-40	-59.29	-21.96	-37.33	0-360	90 degs
1	13.5596	23.91	Pk	-40.7	.7	-40	-56.09	-21.96	-34.13	0-360	Flat
9	14.9003	17.29	Pk	-40.7	.8	-40	-62.61	-21.96	-40.65	0-360	Flat
3	15.2966	19.29	Pk	-40.7	.8	-40	-60.61	-21.96	-38.65	0-360	0 degs
6	15.3008	14.06	Pk	-40.7	.8	-40	-65.84	-21.96	-43.88	0-360	90 degs
2	15.305	21.66	Pk	-40.7	.8	-40	-58.24	-21.96	-36.28	0-360	Flat
4	15.5074	20.37	Pk	-40.8	.8	-40	-59.63	-21.96	-37.67	0-360	Flat
7	15.7055	18.34	Pk	-40.8	.8	-40	-61.66	-21.96	-39.7	0-360	Flat
8	29.3106	20.81	Pk	-43.5	1.1	-40	-61.59	-21.96	-39.63	0-360	Flat

Pk - Peak detector

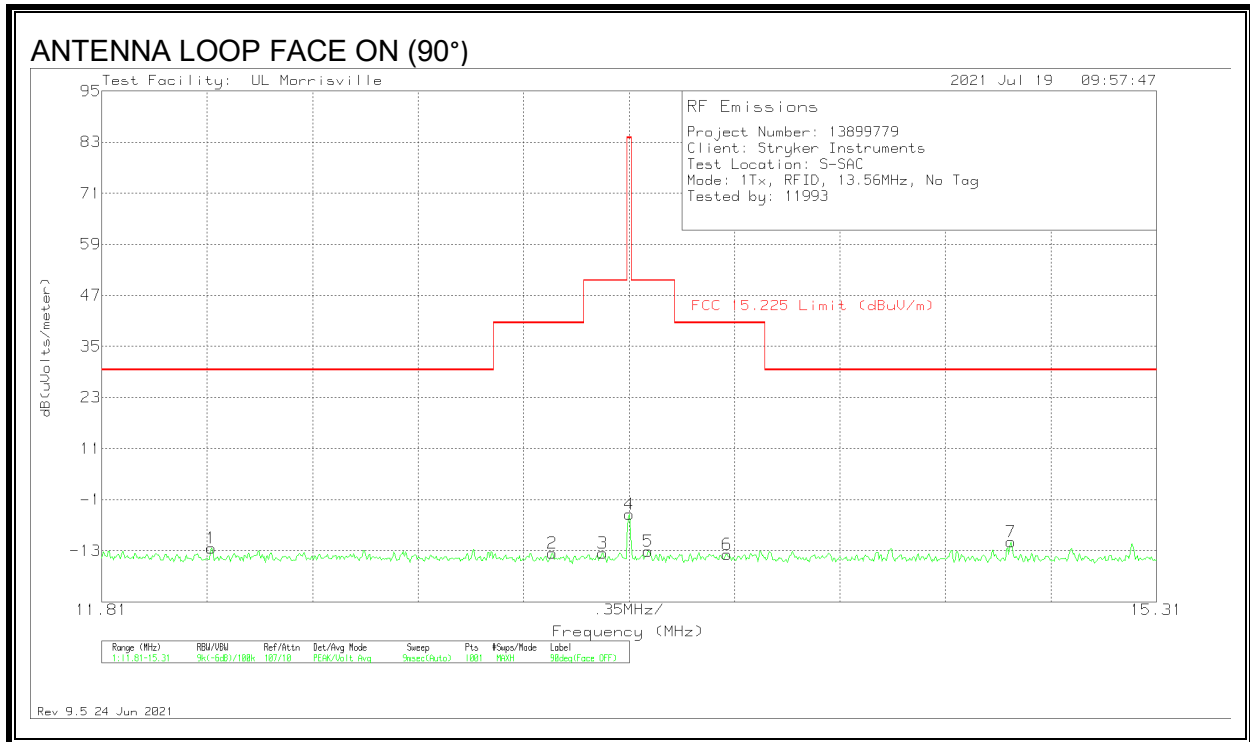
**FUNDAMENTAL WITHOUT TAG**



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	12.636	15.31	Pk	10.8	.7	-40	-13.19	29.5	-42.69	67	0 degs
2	13.2835	16.02	Pk	10.8	.7	-40	-12.48	40.5	-52.98	67	0 degs
3	13.4935	15.48	Pk	10.8	.7	-40	-13.02	50.5	-63.52	67	0 degs
4	13.56	24.45	Pk	10.8	.7	-40	-4.05	84	-88.05	67	0 degs
5	13.7	15.64	Pk	10.8	.7	-40	-12.86	50.5	-63.36	67	0 degs
6	13.8855	15.82	Pk	10.8	.7	-40	-12.68	40.5	-53.18	67	0 degs
7	14.2775	15.24	Pk	10.8	.8	-40	-13.16	29.5	-42.66	67	0 degs

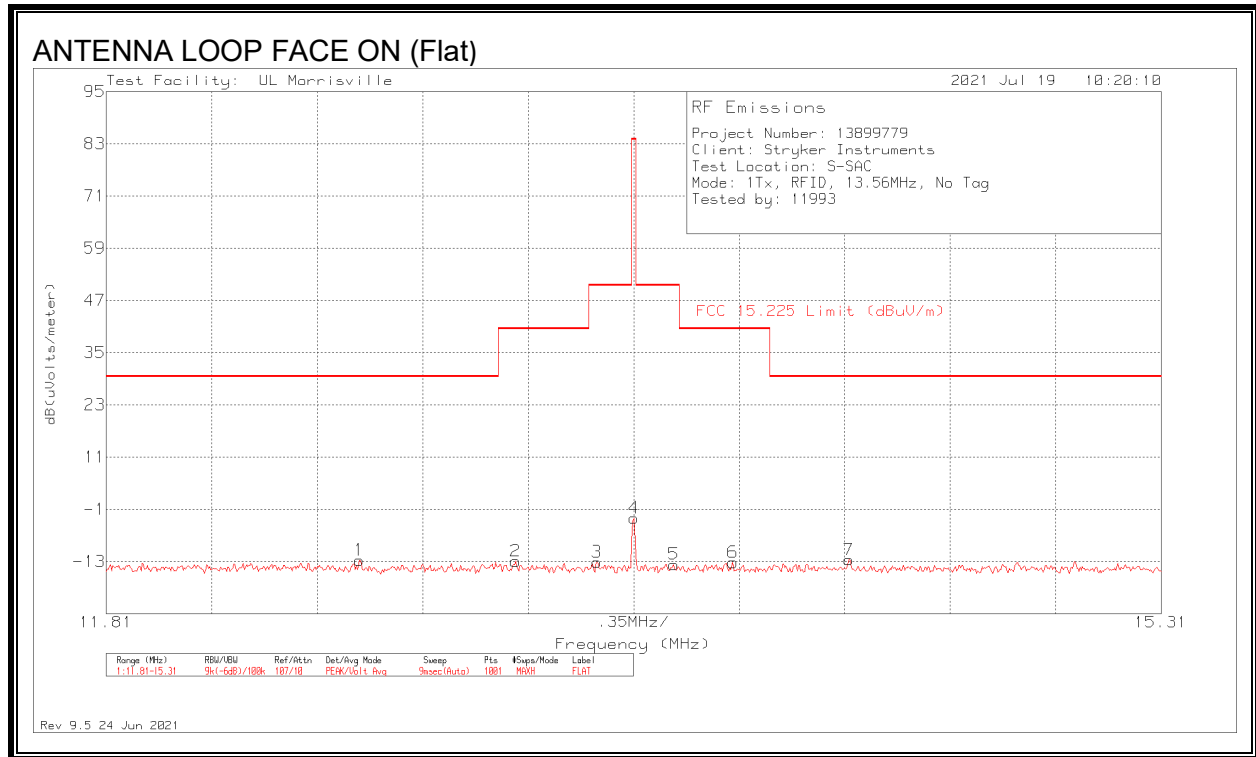
Pk - Peak detector





Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	12.174	16.15	Pk	10.8	.7	-40	-12.35	29.5	-41.85	166	90 degs
2	13.3045	14.96	Pk	10.8	.7	-40	-13.54	40.5	-54.04	166	90 degs
3	13.4725	14.91	Pk	10.8	.7	-40	-13.59	50.5	-64.09	166	90 degs
4	13.56	24	Pk	10.8	.7	-40	-4.5	84	-88.5	166	90 degs
5	13.623	15.34	Pk	10.8	.7	-40	-13.16	50.5	-63.66	166	90 degs
6	13.8855	14.69	Pk	10.8	.7	-40	-13.81	40.5	-54.31	166	90 degs
7	14.827	17.49	Pk	10.8	.8	-40	-10.91	29.5	-40.41	166	90 degs

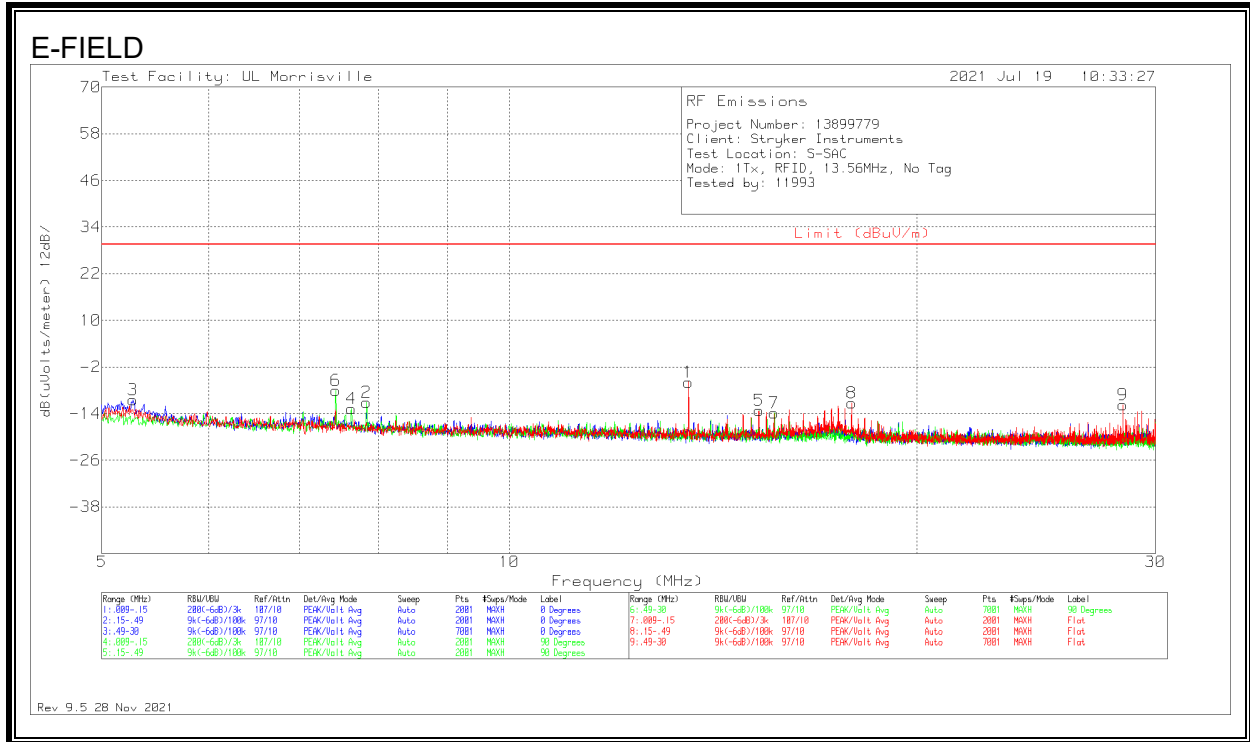
Pk - Peak detector



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
1	12.65	15.79	Pk	10.8	.7	-40	-12.71	29.5	-42.21	86	Flat
2	13.168	15.56	Pk	10.8	.7	-40	-12.94	40.5	-53.44	86	Flat
3	13.4375	15.35	Pk	10.8	.7	-40	-13.15	50.5	-63.65	86	Flat
4	13.56	25.46	Pk	10.8	.7	-40	-3.04	84	-87.04	86	Flat
5	13.693	14.83	Pk	10.8	.7	-40	-13.67	50.5	-64.17	86	Flat
6	13.889	15.29	Pk	10.8	.7	-40	-13.21	40.5	-53.71	86	Flat
7	14.274	15.78	Pk	10.8	.8	-40	-12.62	29.5	-42.12	86	Flat

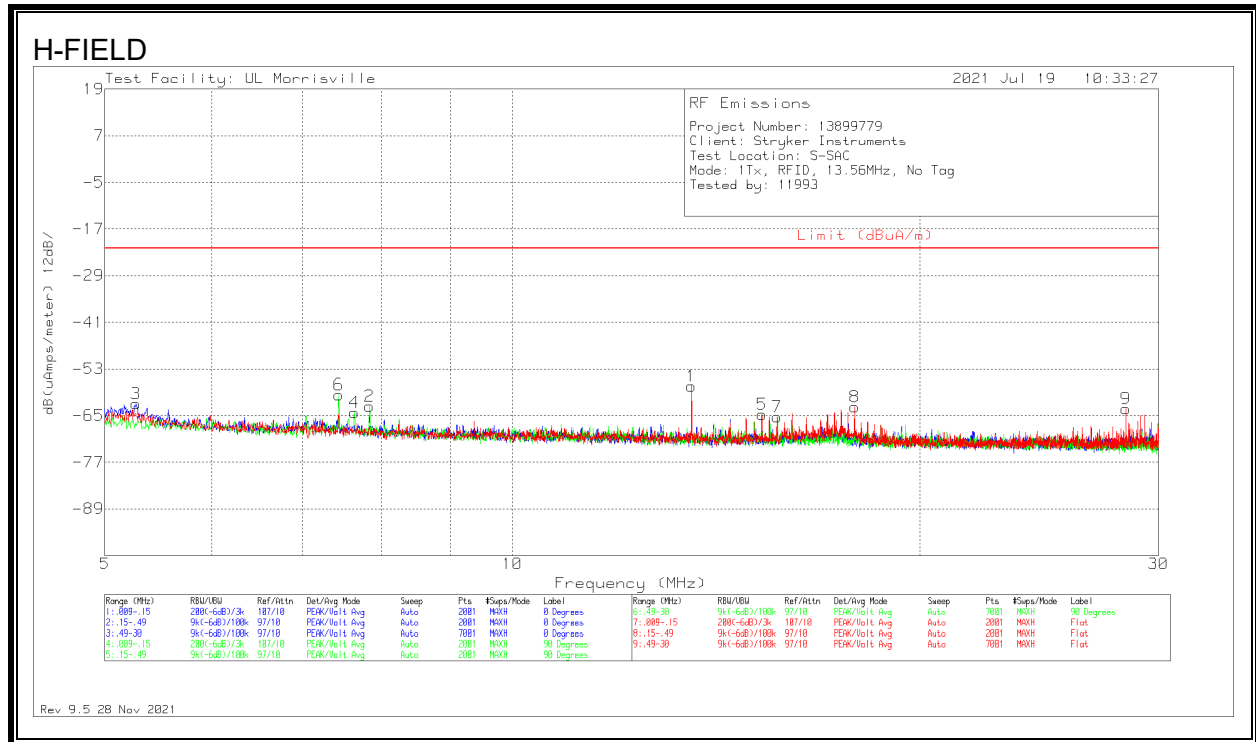
Pk - Peak detector

**SPURIOUS EMISSIONS WITHOUT TAG**



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
3	5.2709	18.35	Pk	10.7	.5	-40	-10.45	29.54	-39.99	0-360	0 degs
6	7.4422	20.68	Pk	10.7	.5	-40	-8.12	29.54	-37.66	0-360	90 degs
4	7.6446	15.93	Pk	10.8	.5	-40	-12.77	29.54	-42.31	0-360	90 degs
2	7.8469	17.43	Pk	10.8	.6	-40	-11.17	29.54	-40.71	0-360	90 degs
1	13.5596	22.59	Pk	10.8	.7	-40	-5.91	29.54	-35.45	0-360	0 degs
5	15.2924	15.2	Pk	10.8	.8	-40	-13.2	29.54	-42.74	0-360	90 degs
7	15.6929	14.68	Pk	10.7	.8	-40	-13.82	29.54	-43.36	0-360	90 degs
8	17.8979	17.41	Pk	10.5	.8	-40	-11.29	29.54	-40.83	0-360	Flat
9	28.3873	18.83	Pk	8.3	1.1	-40	-11.77	29.54	-41.31	0-360	Flat

Pk - Peak detector

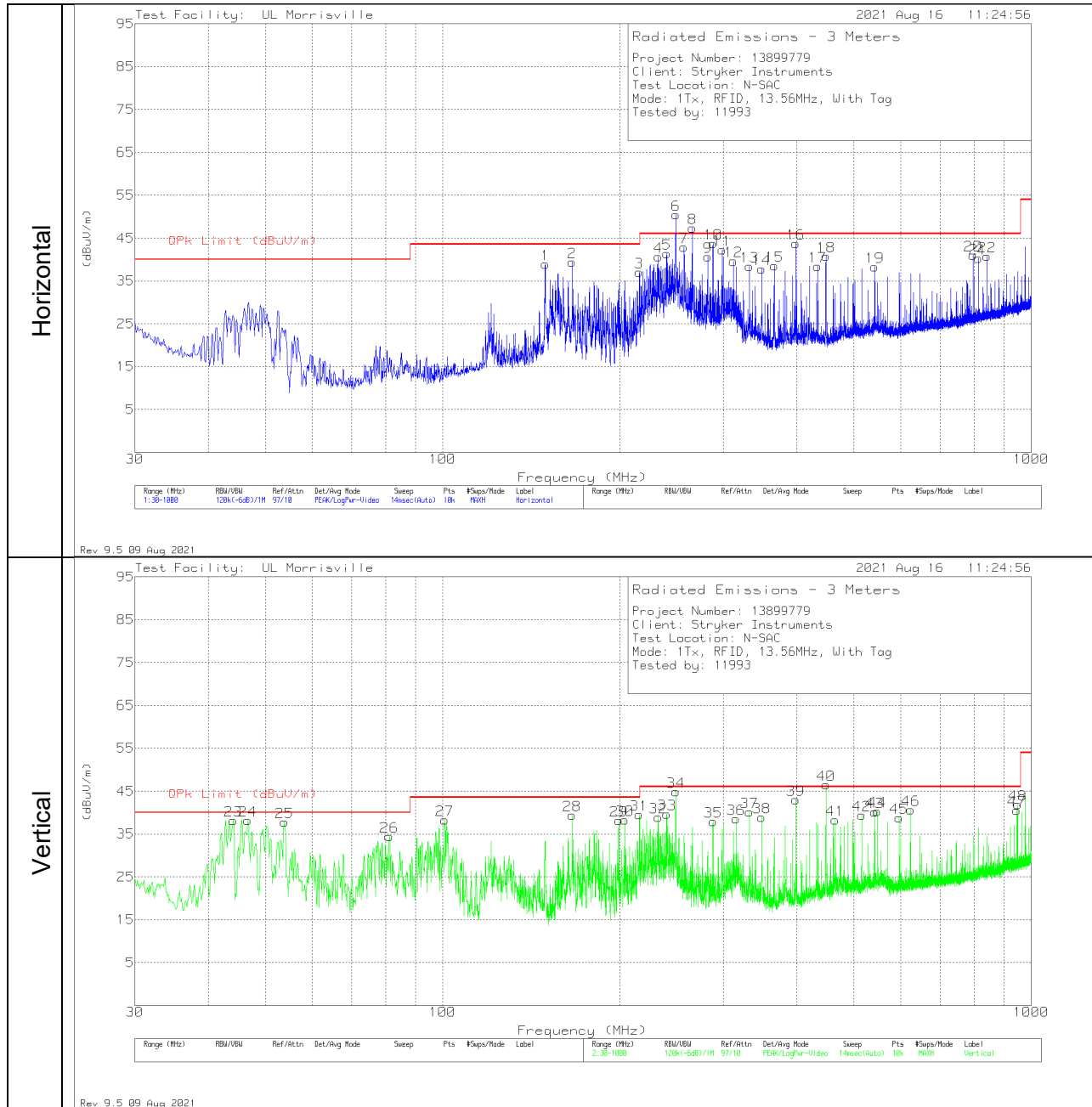


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	RSS-GEN Qp/Av Limit (dBuA/m)	RSS-GEN Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Orientation
3	5.2709	18.35	Pk	-40.8	.5	-40	-61.95	-21.96	-	-39.99	0-360	0 degs
6	7.4422	20.68	Pk	-40.8	.5	-40	-59.62	-21.96	-	-37.66	0-360	90 degs
4	7.6446	15.93	Pk	-40.7	.5	-40	-64.27	-21.96	-	-42.31	0-360	90 degs
2	7.8469	17.43	Pk	-40.7	.6	-40	-62.67	-21.96	-	-40.71	0-360	90 degs
1	13.5596	22.59	Pk	-40.7	.7	-40	-57.41	-21.96	-	-35.45	0-360	0 degs
5	15.2924	15.2	Pk	-40.7	.8	-40	-64.7	-21.96	-	-42.74	0-360	90 degs
7	15.6929	14.68	Pk	-40.8	.8	-40	-65.32	-21.96	-	-43.36	0-360	90 degs
8	17.8979	17.41	Pk	-41	.8	-40	-62.79	-21.96	-	-40.83	0-360	Flat
9	28.3873	18.83	Pk	-43.2	1.1	-40	-63.27	-21.96	-	-41.31	0-360	Flat

Pk - Peak detector

### 11.2.1. TX SPURIOUS EMISSIONS 30-1000 MHz

#### WITH TAG

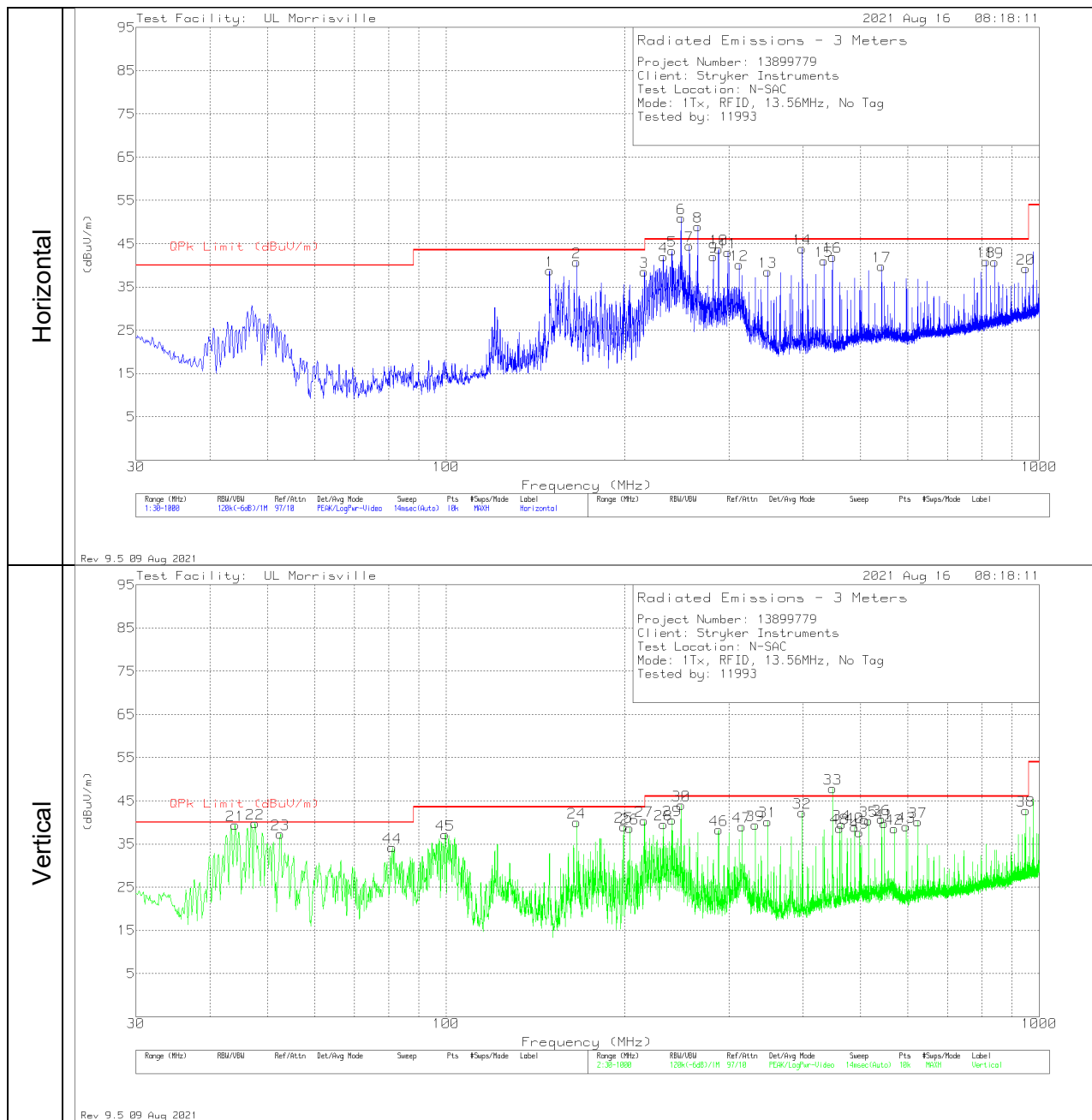


**DATA**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	149.3979	49.69	Qp	18.6	-30	38.29	43.52	-5.23	94	219	H
2	165.9825	51.53	Qp	17.8	-29.9	39.43	43.52	-4.09	93	188	H
3	215.755	49.58	Pk	16.7	-29.2	37.08	43.52	-6.44	0-360	99	H
4	232.4149	49.04	Qp	17.4	-29.1	37.34	46.02	-8.68	132	143	H
5	240.6744	52.75	Qp	17.7	-29	41.45	46.02	-4.57	308	142	H
6	248.9872	62.61	Qp	17.7	-29.1	51.21	46.02	5.19	326	138	H
7	257.2691	54.23	Qp	17.8	-28.9	43.13	46.02	-2.89	280	112	H
8	265.5722	57.92	Qp	19.1	-29	48.02	46.02	2	289	118	H
9	282.2034	49	Qp	19.7	-28.7	40	46.02	-6.02	279	101	H
10	287.9976	52.96	Qp	19.6	-28.5	44.06	46.02	-1.96	353	156	H
11	298.7563	50.88	Qp	19.6	-28.5	41.98	46.02	-4.04	273	110	H
12	311.979	47.9	Pk	20.1	-28.4	39.6	46.02	-6.42	0-360	99	H
13	331.961	46.37	Pk	20.1	-28.1	38.37	46.02	-7.65	0-360	99	H
14	348.548	45.44	Pk	20.5	-28.1	37.84	46.02	-8.18	0-360	99	H
15	366.105	45.5	Pk	20.9	-27.9	38.5	46.02	-7.52	0-360	99	H
16	398.3763	49.82	Qp	21.7	-28.2	43.32	46.02	-2.7	52	100	H
17	433.908	43.37	Pk	22.8	-27.7	38.47	46.02	-7.55	0-360	200	H
18	448.1632	46.87	Qp	23.1	-27.7	42.27	46.02	-3.75	282	159	H
19	542.451	40.94	Pk	24.5	-27.1	38.34	46.02	-7.68	0-360	99	H
20	796.7233	39.05	Qp	27.6	-25.7	40.95	46.02	-5.07	52	102	H
21	813.6022	36.59	Qp	28	-25.5	39.09	46.02	-6.93	165	101	H
22	840.7426	37.48	Qp	28.2	-25.4	40.28	46.02	-5.74	12	100	H
23	43.9988	48.63	Qp	17.2	-31.3	34.53	40	-5.47	17	100	V
24	46.9027	52.26	Qp	15.4	-31.1	36.56	40	-3.44	16	100	V
25	53.8352	47.47	Qp	13.1	-30.9	29.67	40	-10.33	24	101	V
26	81.1636	45.98	Qp	13.5	-30.8	28.68	40	-11.32	60	155	V
27	100.8273	47.14	Qp	16.5	-30.4	33.24	43.52	-10.28	28	106	V
28	165.9825	51.24	Qp	17.8	-29.9	39.14	43.52	-4.38	201	104	V
29	199.1862	48.98	Qp	18.3	-29.3	37.98	43.52	-5.54	5	100	V
30	203.9888	49.59	Qp	17.7	-29.4	37.89	43.52	-5.63	210	103	V
31	216.0069	51.17	Qp	16.7	-29.1	38.77	46.02	-7.25	38	100	V
32	232.342	50.61	Pk	17.4	-29.1	38.91	46.02	-7.11	0-360	100	V
33	240.684	50.96	Pk	17.7	-29	39.66	46.02	-6.36	0-360	100	V
34	248.977	55.43	Qp	17.7	-29.1	44.03	46.02	-1.99	51	100	V
35	288.02	46.78	Pk	19.6	-28.5	37.88	46.02	-8.14	0-360	100	V
36	315.374	46.79	Pk	20.1	-28.4	38.49	46.02	-7.53	0-360	100	V
37	331.9735	48.06	Qp	20.1	-28.1	40.06	46.02	-5.96	37	139	V
38	348.548	46.51	Pk	20.5	-28.1	38.91	46.02	-7.11	0-360	100	V
39	398.3552	49.13	Qp	21.7	-28.2	42.63	46.02	-3.39	57	115	V
40	448.1617	51.1	Qp	23.1	-27.7	46.5	46.02	.48	35	108	V
41	464.754	42.1	Pk	23.6	-27.4	38.3	46.02	-7.72	0-360	100	V
42	515.291	42.63	Pk	24	-27.2	39.43	46.02	-6.59	0-360	100	V
43	542.4109	42.53	Qp	24.5	-27.1	39.93	46.02	-6.09	46	101	V
44	547.741	41.44	Qp	24.5	-26.9	39.04	46.02	-6.98	24	100	V
45	596.674	40.93	Pk	24.6	-26.7	38.83	46.02	-7.19	0-360	100	V
46	623.7739	40.94	Qp	25.6	-26.7	39.84	46.02	-6.18	33	101	V
47	946.1334	33.56	Qp	29.1	-24.1	38.56	46.02	-7.46	19	108	V
48	949.2119	36.74	Qp	29	-24	41.74	46.02	-4.28	42	101	V

Pk - Peak detector  
 Qp - Quasi-Peak detector

**WITHOUT TAG**



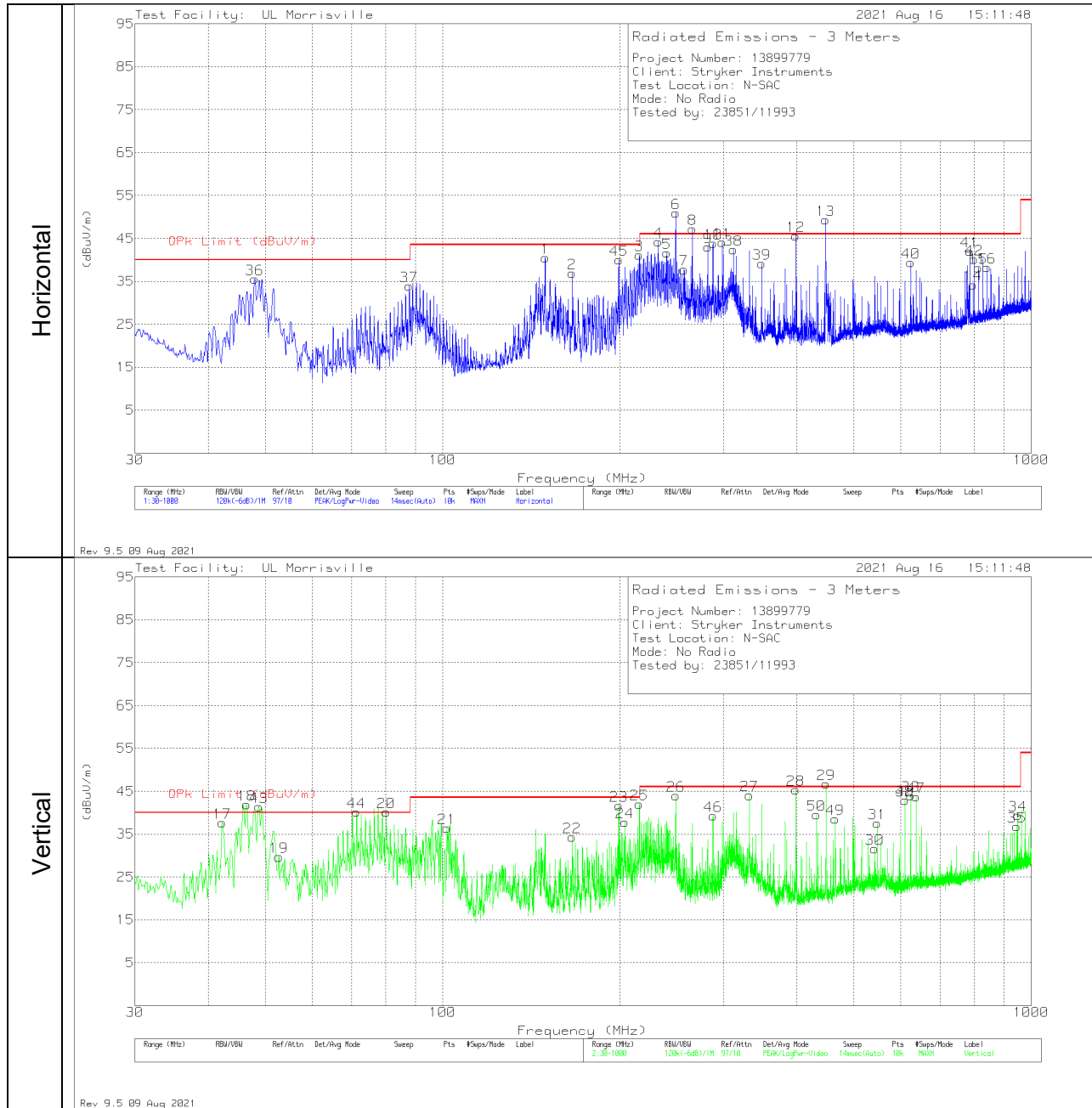
**DATA**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	149.3859	50.77	Qp	18.6	-30	39.37	43.52	-4.15	94	252	H
2	165.9753	51.59	Qp	17.8	-29.9	39.49	43.52	-4.03	83	155	H
3	215.797	47.11	Qp	16.7	-29.1	34.71	43.52	-8.81	29	122	H
4	232.3987	52.83	Qp	17.4	-29.1	41.13	46.02	-4.89	354	156	H
5	240.6946	51.96	Qp	17.7	-29	40.66	46.02	-5.36	338	151	H
6	248.9824	60.98	Qp	17.7	-29.1	49.58	46.02	3.56	307	143	H
7	257.2777	54.23	Qp	17.8	-28.9	43.13	46.02	-2.89	288	119	H
8	265.5842	57.56	Qp	19.1	-29	47.66	46.02	1.64	273	112	H
9	282.1808	49.13	Qp	19.7	-28.7	40.13	46.02	-5.89	261	113	H
10	288.0032	52.9	Qp	19.6	-28.5	44	46.02	-2.02	352	153	H
11	298.775	50.82	Qp	19.6	-28.5	41.92	46.02	-4.1	268	102	H
12	311.9641	46.45	Qp	20.1	-28.4	38.15	46.02	-7.87	29	100	H
13	348.548	46.11	Pk	20.5	-28.1	38.51	46.02	-7.51	0-360	99	H
14	398.3571	48.94	Qp	21.7	-28.2	42.44	46.02	-3.58	44	101	H
15	433.9281	43.72	Qp	22.8	-27.7	38.82	46.02	-7.2	18	183	H
16	448.1708	47.44	Qp	23.1	-27.7	42.84	46.02	-3.18	284	154	H
17	542.451	42.44	Pk	24.5	-27.1	39.84	46.02	-6.18	0-360	199	H
18	813.6074	37.49	Qp	28	-25.5	39.99	46.02	-6.03	75	161	H
19	840.7257	36.77	Qp	28.2	-25.4	39.57	46.02	-6.45	16	100	H
20	949.269	34.37	Pk	29	-24.1	39.27	46.02	-6.75	0-360	299	H
21	44.0698	47.92	Qp	17.2	-31.3	33.82	40	-6.18	25	100	V
22	47.6382	50.39	Qp	14.9	-31	34.29	40	-5.71	5	100	V
23	52.5716	48.98	Qp	13.2	-31.3	30.88	40	-9.12	28	103	V
44	81.1545	47.19	Qp	13.5	-30.8	29.89	40	-10.11	14	125	V
45	99.6945	51.41	Pk	16.2	-30.4	37.21	43.52	-6.31	0-360	100	V
24	165.9993	51.98	Qp	17.8	-29.8	39.98	43.52	-3.54	201	101	V
25	199.1872	48.78	Qp	18.3	-29.3	37.78	43.52	-5.74	13	102	V
26	203.9959	49.64	Qp	17.7	-29.4	37.94	43.52	-5.58	207	101	V
27	215.9866	51.63	Qp	16.7	-29.1	39.23	43.52	-4.29	31	101	V
28	232.342	51.19	Pk	17.4	-29.1	39.49	46.02	-6.53	0-360	100	V
29	240.6859	49.87	Qp	17.7	-29	38.57	46.02	-7.45	24	102	V
30	248.9798	54.37	Qp	17.7	-29.1	42.97	46.02	-3.05	22	103	V
46	288.02	47.19	Pk	19.6	-28.5	38.29	46.02	-7.73	0-360	100	V
47	315.374	47.38	Pk	20.1	-28.4	39.08	46.02	-6.94	0-360	100	V
39	331.961	47.41	Pk	20.1	-28.1	39.41	46.02	-6.61	0-360	100	V
31	348.5739	49.21	Qp	20.5	-28.1	41.61	46.02	-4.41	23	145	V
32	398.3667	49.53	Qp	21.7	-28.2	43.03	46.02	-2.99	67	128	V
33	448.1627	47.33	Qp	23.1	-27.7	42.73	46.02	-3.29	23	112	V
48	461.068	43	Pk	23.4	-27.7	38.7	46.02	-7.32	0-360	100	V
34	464.754	43.35	Pk	23.6	-27.4	39.55	46.02	-6.47	0-360	100	V
40	488.131	42.35	Pk	23.9	-27.3	38.95	46.02	-7.07	0-360	100	V
49	498.025	40.95	Pk	24	-27.3	37.65	46.02	-8.37	0-360	100	V
35	515.2809	42.5	Qp	24	-27.2	39.3	46.02	-6.72	50	103	V
36	542.4048	43.01	Qp	24.5	-27.1	40.41	46.02	-5.61	48	100	V
41	547.786	42.15	Pk	24.5	-26.9	39.75	46.02	-6.27	0-360	100	V
42	569.514	40.59	Pk	25	-27	38.59	46.02	-7.43	0-360	100	V
43	596.674	41.15	Pk	24.6	-26.7	39.05	46.02	-6.97	0-360	100	V
37	623.7647	41.36	Qp	25.6	-26.7	40.26	46.02	-5.76	33	100	V
38	949.2135	37.48	Qp	29	-24.1	42.38	46.02	-3.64	41	102	V

Pk - Peak detector  
 Qp - Quasi-Peak detector



**RADIO OFF**



**DATA**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
36	47.5469	46.96	Qp	15	-31.1	30.86	40	-9.14	110	396	H
37	87.715	51.15	Pk	13.5	-30.7	33.95	40	-6.05	0-360	299	H
1	149.3965	51.18	Qp	18.6	-30	39.78	43.52	-3.74	291	165	H
2	165.994	48.88	Pk	17.8	-29.8	36.88	43.52	-6.64	0-360	199	H
45	199.1891	48.98	Qp	18.3	-29.3	37.98	43.52	-5.54	360	160	H
3	215.9965	52.29	Qp	16.7	-29.1	39.89	43.52	-3.63	4	179	H
4	232.1713	52.66	Qp	17.4	-29.1	40.96	46.02	-5.06	354	143	H
5	240.6648	49.31	Qp	17.7	-29	38.01	46.02	-8.01	339	146	H
6	248.9832	60.89	Qp	17.7	-29.1	49.49	46.02	3.47	326	119	H
7	257.271	48.84	Pk	17.8	-28.9	37.74	46.02	-8.28	0-360	101	H
8	265.5833	57.41	Qp	19.1	-29	47.51	46.02	1.49	279	125	H
9	282.1741	50.6	Qp	19.7	-28.7	41.6	46.02	-4.42	265	105	H
10	287.9997	52.85	Qp	19.6	-28.5	43.95	46.02	-2.07	6	146	H
11	298.7753	52.43	Qp	19.6	-28.5	43.53	46.02	-2.49	250	100	H
38	311.9918	48.88	Qp	20.1	-28.4	40.58	46.02	-5.44	34	102	H
39	348.548	46.73	Pk	20.5	-28.1	39.13	46.02	-6.89	0-360	101	H
12	398.3685	52.31	Qp	21.7	-28.2	45.81	46.02	-.21	32	100	H
13	447.443	41.77	Qp	23.1	-27.6	37.27	46.02	-8.75	19	168	H
40	623.834	40.64	Pk	25.6	-26.8	39.44	46.02	-6.58	0-360	101	H
41	786.2628	24.06	Qp	27.9	-25.7	26.26	46.02	-19.76	1	268	H
14	796.785	32.46	Pk	27.6	-25.8	34.26	46.02	-11.76	0-360	101	H
42	800.0277	23.73	Qp	27.6	-25.4	25.93	46.02	-20.09	296	189	H
15	813.663	35.7	Pk	28	-25.5	38.2	46.02	-7.82	0-360	101	H
16	840.823	35.36	Pk	28.2	-25.3	38.26	46.02	-7.76	0-360	101	H
17	42.0405	44.66	Qp	18.7	-31.4	31.96	40	-8.04	11	100	V
18	46.7288	53.95	Qp	15.5	-31	38.45	40	-1.55	21	101	V
43	48.9801	52.81	Qp	14.2	-31.1	35.91	40	-4.09	3	130	V
19	52.698	47.77	Pk	13.2	-31.3	29.67	40	-10.33	0-360	101	V
44	71.5826	55.53	Qp	14.4	-30.9	39.03	40	-.97	0	104	V
20	80.3737	54.33	Qp	13.6	-30.8	37.13	40	-2.87	75	147	V
21	101.683	50.03	Pk	16.7	-30.3	36.43	43.52	-7.09	0-360	101	V
22	165.994	46.33	Pk	17.8	-29.8	34.33	43.52	-9.19	0-360	101	V
23	199.1763	50.18	Qp	18.3	-29.3	39.18	43.52	-4.34	13	100	V
24	203.9886	48.95	Qp	17.7	-29.4	37.25	43.52	-6.27	214	183	V
25	215.7713	52.57	Qp	16.7	-29.1	40.17	43.52	-3.35	30	197	V
26	248.9776	54.83	Qp	17.7	-29.1	43.43	46.02	-2.59	56	102	V
46	288.02	48.21	Pk	19.6	-28.5	39.31	46.02	-6.71	0-360	101	V
27	331.9681	53.18	Qp	20.1	-28.1	45.18	46.02	-.84	38	152	V
28	398.3654	52.3	Qp	21.7	-28.2	45.8	46.02	-.22	60	133	V
50	431.58	44.39	Pk	22.7	-27.6	39.49	46.02	-6.53	0-360	101	V
29	448.1622	50.36	Qp	23.1	-27.7	45.76	46.02	-.26	7	105	V
49	464.754	42.34	Pk	23.6	-27.4	38.54	46.02	-7.48	0-360	101	V
30	542.451	34.21	Pk	24.5	-27.1	31.61	46.02	-14.41	0-360	101	V
31	547.786	40	Pk	24.5	-26.9	37.6	46.02	-8.42	0-360	101	V
32	610.1908	21.06	Qp	25.2	-26.7	19.56	46.02	-26.46	70	249	V
48	610.2091	20.13	Qp	25.2	-26.7	18.63	46.02	-27.39	55	258	V
33	623.725	21.54	Qp	25.6	-26.7	20.44	46.02	-25.58	11	155	V
47	637.362	21.67	Qp	26	-26.9	20.77	46.02	-25.25	48	102	V
35	946.165	31.76	Pk	29.1	-24.1	36.76	46.02	-9.26	0-360	101	V
34	949.269	34.56	Pk	29	-24.1	39.46	46.02	-6.56	0-360	101	V

Pk - Peak detector  
 Qp - Quasi-Peak detector

## 12. AC POWER LINE CONDUCTED EMISSIONS

§15.207

IC RSS-GEN, Section 8.8

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Notes:  
1. The lower limit shall apply at the transition frequencies  
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### TEST PROCEDURE

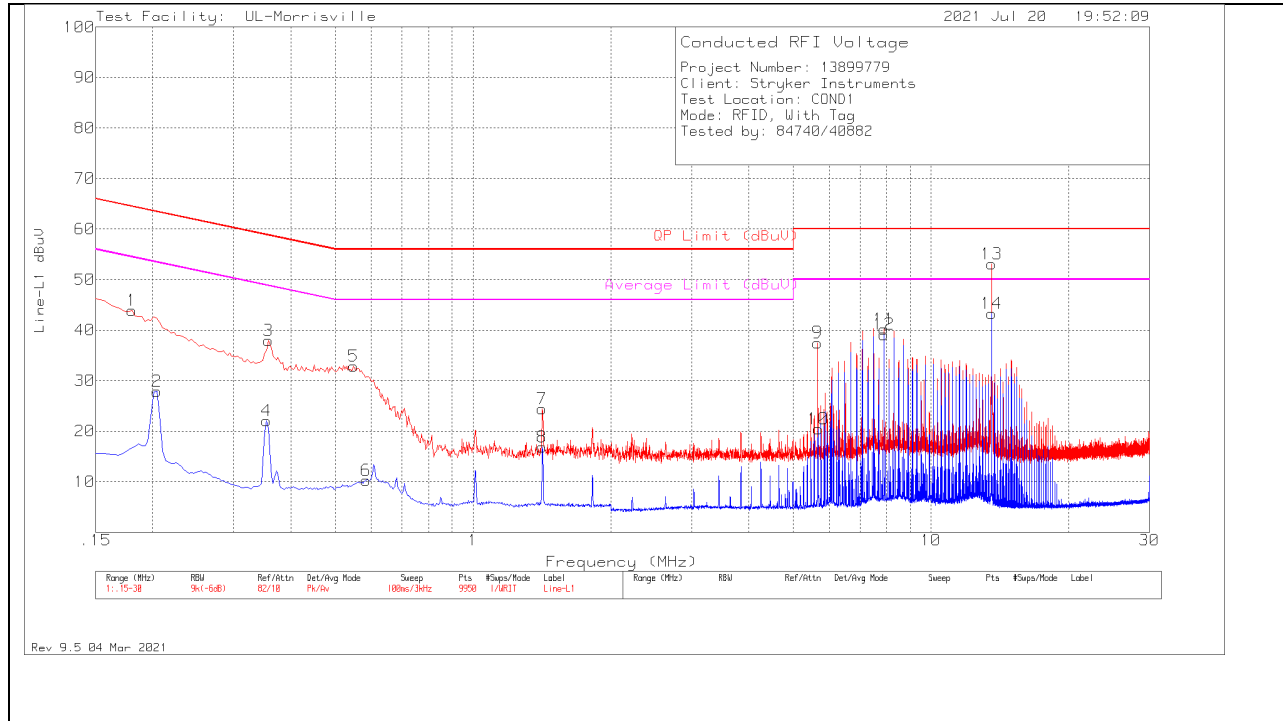
ANSI C63.10:2013 and KDB 174176 D01 Line Conducted FAQ v01r01, Q5.

### RESULTS

## 12.1. RFID

### 12.1.1. NORMAL OPERATION WITH TAGS

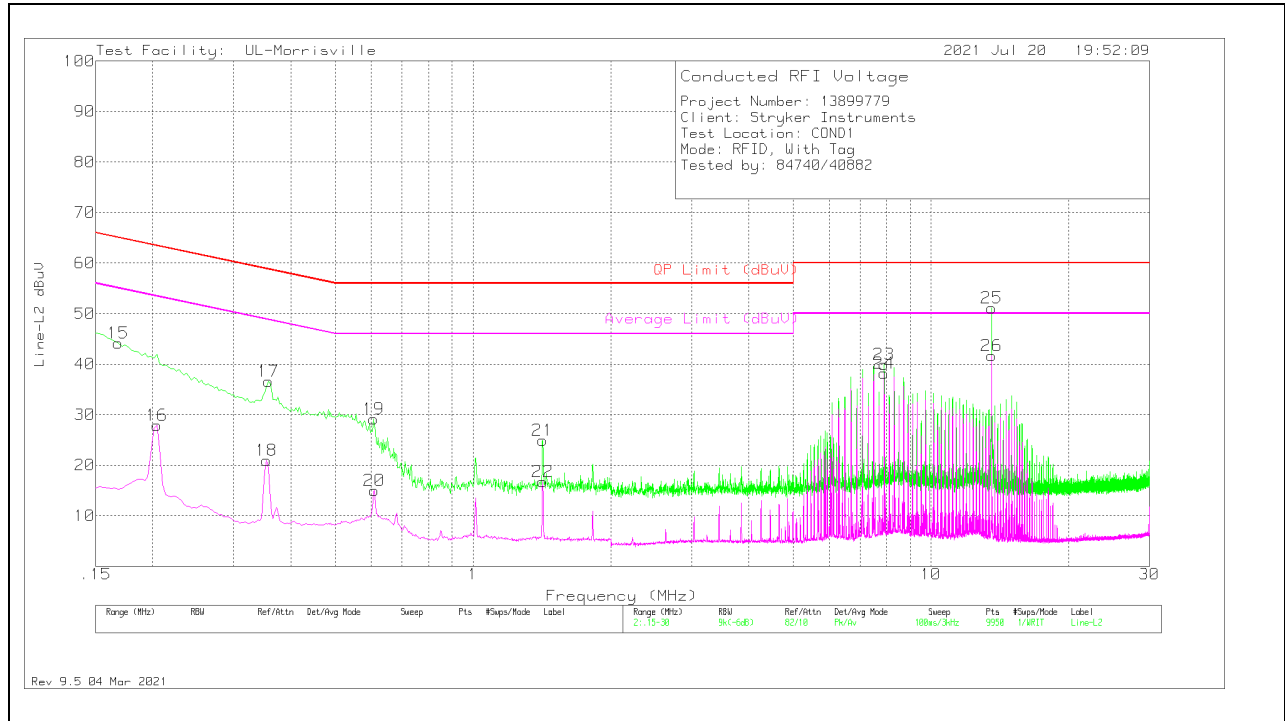
#### LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.18	33.96	Pk	.2	9.8	43.96	64.49	-20.53	-	-
2	.204	18.03	Av	.1	9.8	27.93	-	-	53.45	-25.52
4	.354	12.11	Av	.1	9.8	22.01	-	-	48.87	-26.86
3	.357	28.07	Pk	.1	9.8	37.97	58.8	-20.83	-	-
5	.549	23.08	Pk	0	9.8	32.88	56	-23.12	-	-
6	.585	.42	Av	0	9.8	10.22	-	-	46	-35.78
7	1.416	14.65	Pk	0	9.8	24.45	56	-31.55	-	-
8	1.416	7	Av	0	9.8	16.8	-	-	46	-29.2
9	5.652	27.52	Pk	.1	9.9	37.52	60	-22.48	-	-
10	5.667	10.47	Av	.1	9.9	20.47	-	-	50	-29.53
11	7.896	30.13	Pk	.1	10	40.23	60	-19.77	-	-
12	7.896	29.04	Av	.1	10	39.14	-	-	50	-10.86
13	13.56	42.94	Pk	.1	10.1	53.14	60	-6.86	-	-
14	13.56	33.09	Av	.1	10.1	43.29	-	-	50	-6.71

Pk - Peak detector  
 Av - Average detection

### LINE 2 RESULTS

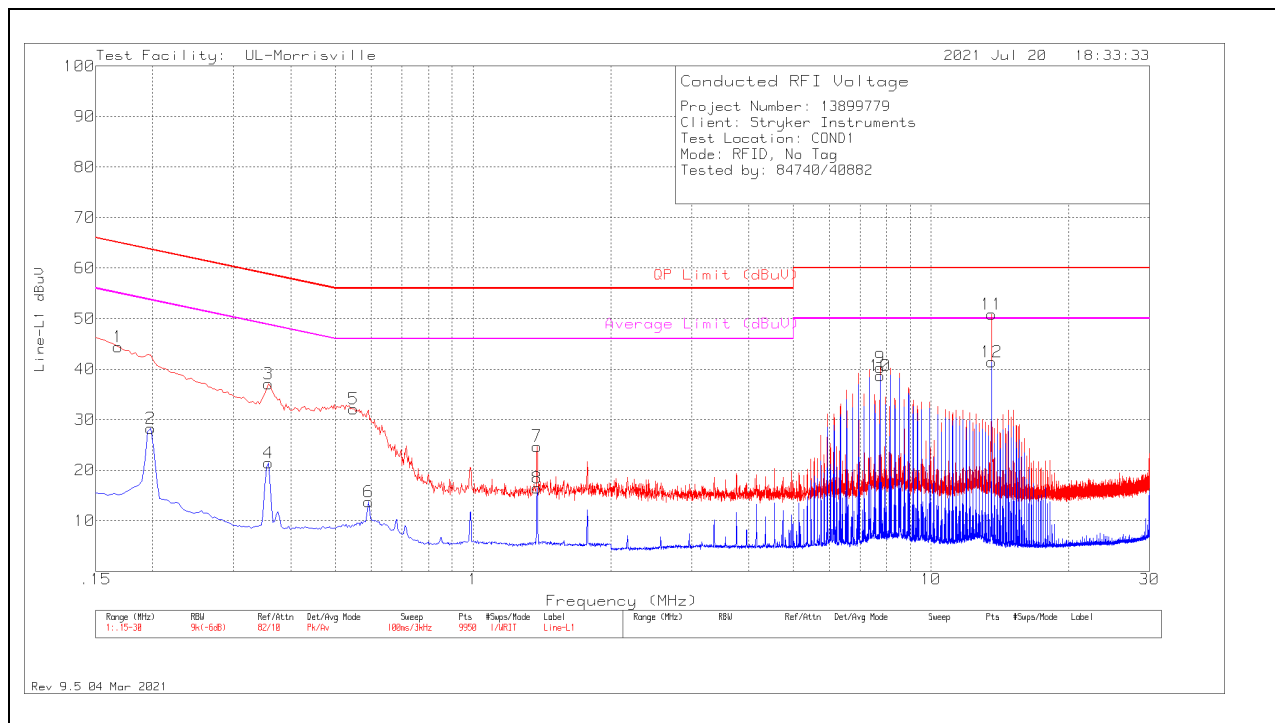


Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
15	.168	34.18	Pk	.2	9.8	44.18	65.06	-20.88	-	-
16	.204	17.93	Av	.2	9.8	27.93	-	-	53.45	-25.52
18	.354	11.08	Av	.1	9.8	20.98	-	-	48.87	-27.89
17	.357	26.71	Pk	.1	9.8	36.61	58.8	-22.19	-	-
19	.606	19.36	Pk	0	9.8	29.16	56	-26.84	-	-
20	.609	5.24	Av	0	9.8	15.04	-	-	46	-30.96
21	1.419	15.08	Pk	0	9.8	24.88	56	-31.12	-	-
22	1.419	6.98	Av	0	9.8	16.78	-	-	46	-29.22
23	7.902	29.85	Pk	.1	10	39.95	60	-20.05	-	-
24	7.902	28.16	Av	.1	10	38.26	-	-	50	-11.74
25	13.56	40.86	Pk	.1	10.1	51.06	60	-8.94	-	-
26	13.56	31.47	Av	.1	10.1	41.67	-	-	50	-8.33

Pk - Peak detector  
 Av - Average detection

## 12.1.2. NORMAL OPERATION WITHOUT TAGS

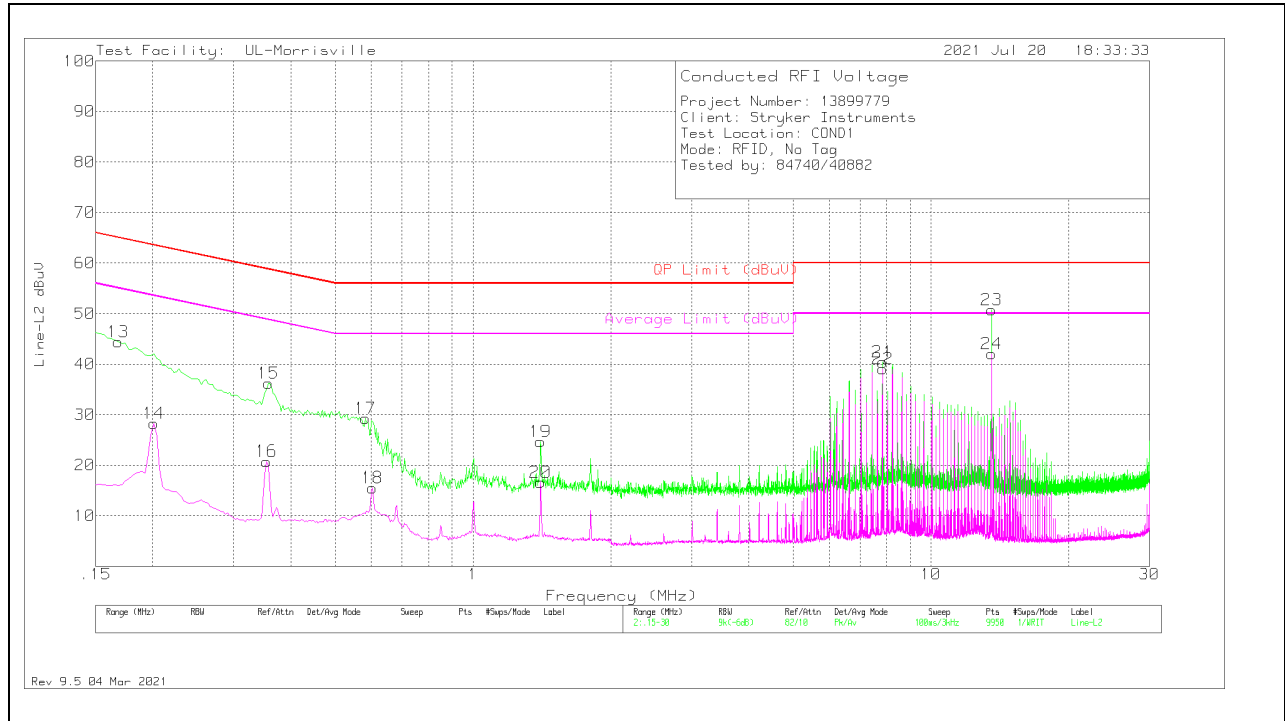
### LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.168	34.39	Pk	.2	9.8	44.39	65.06	-20.67	-	-
2	.198	18.28	Av	.2	9.8	28.28	-	-	53.69	-25.41
3	.357	27.15	Pk	.1	9.8	37.05	58.8	-21.75	-	-
4	.357	11.49	Av	.1	9.8	21.39	-	-	48.8	-27.41
5	.549	22.36	Pk	0	9.8	32.16	56	-23.84	-	-
6	.591	3.92	Av	0	9.8	13.72	-	-	46	-32.28
7	1.38	14.93	Pk	0	9.8	24.73	56	-31.27	-	-
8	1.38	6.73	Av	0	9.8	16.53	-	-	46	-29.47
9	7.74	30.24	Pk	.1	10	40.34	60	-19.66	-	-
10	7.74	28.6	Av	.1	10	38.7	-	-	50	-11.3
11	13.56	40.66	Pk	.1	10.1	50.86	60	-9.14	-	-
12	13.56	31.21	Av	.1	10.1	41.41	-	-	50	-8.59

Pk - Peak detector  
 Av - Average detection

### LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.168	34.39	Pk	.2	9.8	44.39	65.06	-20.67	-	-
14	.201	18.28	Av	.2	9.8	28.28	-	-	53.57	-25.29
16	.354	10.86	Av	.1	9.8	20.76	-	-	48.87	-28.11
15	.357	26.36	Pk	.1	9.8	36.26	58.8	-22.54	-	-
17	.582	19.52	Pk	0	9.8	29.32	56	-26.68	-	-
18	.603	5.74	Av	0	9.8	15.54	-	-	46	-30.46
19	1.404	14.91	Pk	0	9.8	24.71	56	-31.29	-	-
20	1.404	6.83	Av	0	9.8	16.63	-	-	46	-29.37
21	7.836	30.28	Pk	.1	10	40.38	60	-19.62	-	-
22	7.836	28.96	Av	.1	10	39.06	-	-	50	-10.94
23	13.56	40.6	Pk	.1	10.1	50.8	60	-9.2	-	-
24	13.56	31.87	Av	.1	10.1	42.07	-	-	50	-7.93

Pk - Peak detector  
 Av - Average detection

### **13. SETUP PHOTOS**

Refer to R13899779-EP1 for setup photos.



## END OF REPORT