

TEST REPORT

Report Number: R14558701-E1

Applicant : Smartsky Networks LLC
45610 Woodland Road, Suite 370
Sterling, VA 20166, USA

Model : 700-006-0000

FCC ID : 2APND-SC1

EUT Description : Radio Assembly

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C:2023
ISED RSS-247 ISSUE 2:2017
ISED RSS-GEN ISSUE 5 + A1 + A2:2021

Date Of Issue:
2023-02-16

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	2023-02-07	Initial Issue	Brian Kiewra
V2	2023-02-16	Revised EUT descriptor	Brian Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Smartsky Networks LLC
45610 Woodland Road, Suite 370
Sterling, VA 20166, USA

EUT DESCRIPTION: Radio Assembly

MODEL: 700-006-0000

SERIAL NUMBER: USRP B200

SAMPLE RECEIPT DATE: 2023-01-11

DATE TESTED: 2023-01-11 to 2023-01-12

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Refer to Section 2
ISED RSS-247 Issue 2	Refer to Section 2
ISED RSS-GEN Issue 5 + A1 + A2	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:

Prepared By:



Michael Antola
Staff Engineer
Consumer, Medical and IT Segment
UL LLC



Brian Kiewra
Project Engineer
Consumer, Medical and IT Segment
UL LLC

2. TEST RESULTS SUMMARY

This report contains data/info 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	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Compliant	None
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Compliant	None
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Compliant	None
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Compliant	None
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant	None
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant	None

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 2.

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	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	U _{Lab}
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
Radiated Disturbance (9kHz-40GHz)	6.01 dB
Conducted Disturbance (0.150-30MHz)	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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. EUT DESCRIPTION

The EUT is a Radio Assembly that operates at 2448.2MHz.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Output Power (dBm)	Output Power (mW)
2448.2	11.72	14.86

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer are as follows:

The radio utilizes a GW 15.2113 antenna, with a maximum gain of 2 dBi.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 3.6.10.
The test utility software used during testing was 3.6.10.

6.5. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

Manufacturer stated that regardless of the EUT orientation the antenna would always be in vertical position.

Note: Only one antenna port on the device is supported.
No bandedge data since the only channel supported is located far from the edges of the band.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Support Laptop	Lenovo	T580	N/A	N/A
Minicomputer	Jetway	JBC330U 95-10210	218F864X000126	N/A
AC Adapter Laptop Charger	Niepan Technology	PDADP200325L	2234G00001707	N/A
Switching Power Adapter	FSP Group Inc.	FSP120-ABBN5	H1191000771	N/A

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Mains	1	Barrel	Shielded	>5	Provides AC power to minicomputer
2	USB-A	1	USB-B	Shielded	>5	Cable Connected to Minicomputer (provides power to EUT)
3	Ethernet	2	Ethernet	Shielded	<3	Ethernet to Support Laptop

SETUP DIAGRAMS

Please refer to R14558701-EP1 for setup diagrams and photos

7. MEASUREMENT METHOD

Duty Cycle: ANSI C63.10 Subclause 11.6

6 dB BW: ANSI C63.10 Subclause -11.8.1 RBW \geq DTS BW

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
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)

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

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1

Radiated Spurious Emissions: ANSI C63.10-2013 Section 6.3-6.6

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

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.
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
SA0027	Spectrum Analyzer	Keysight Technologies	N9030A	2022-05-24	2023-05-24
PWM003	RF Power Meter	Keysight Technologies	N1911A	2022-09-10	2023-09-10
PWS001 (PRE0137347)	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-07-07	2023-07-07
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
CBL098	Micro-Coax UTiFLEX Cable Assembly, Low Loss, 40GHz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2022-01-24	2023-01-24
226559	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2022-05-03	2023-05-03

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2022-04-05	2023-04-05
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
LISN003	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2022-08-01	2023-08-01
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2022-08-03	2023-08-03
ATA222	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2022-04-05	2023-04-05
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

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

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
AT0059	Active Loop Antenna	ETS-Lindgren	6502	2022-09-29	2023-09-29
30-1000 MHz					
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2022-09-07	2023-09-07
1-18 GHz					
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-03-21	2023-03-21
18-40 GHz					
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-626	2022-07-11	2023-07-11
Gain-Loss Chains					
C2-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-10	2023-05-10
C2-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2022-05-10	2023-05-10
C2-SAC03	Gain-loss string: 1-18GHz	Various	Various	2022-05-10	2023-05-10
C2-SAC04	Gain-loss string: 18-40GHz	Various	Various	2022-05-10	2023-05-10
Receiver & Software					
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-03-08	2023-03-08
SA0020	Spectrum Analyzer	Agilent	E4446A	2022-06-08	2023-06-08
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
200540	Environmental Meter	Fisher Scientific	15-077-963 s/n 181474409	2022-10-05	2023-10-05

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

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
1-18 GHz					
AT0067	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-24	2023-05-24
Gain-Loss Chains					
C4-SAC03	Gain-loss string: 1-18GHz	Various	Various	2022-05-20	2023-05-20
Receiver & Software					
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-02-15	2023-02-15
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
21642	Environmental Meter	Fisher Scientific	15-077-963 (s/n 210701692)	2021-08-16	2023-08-16

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

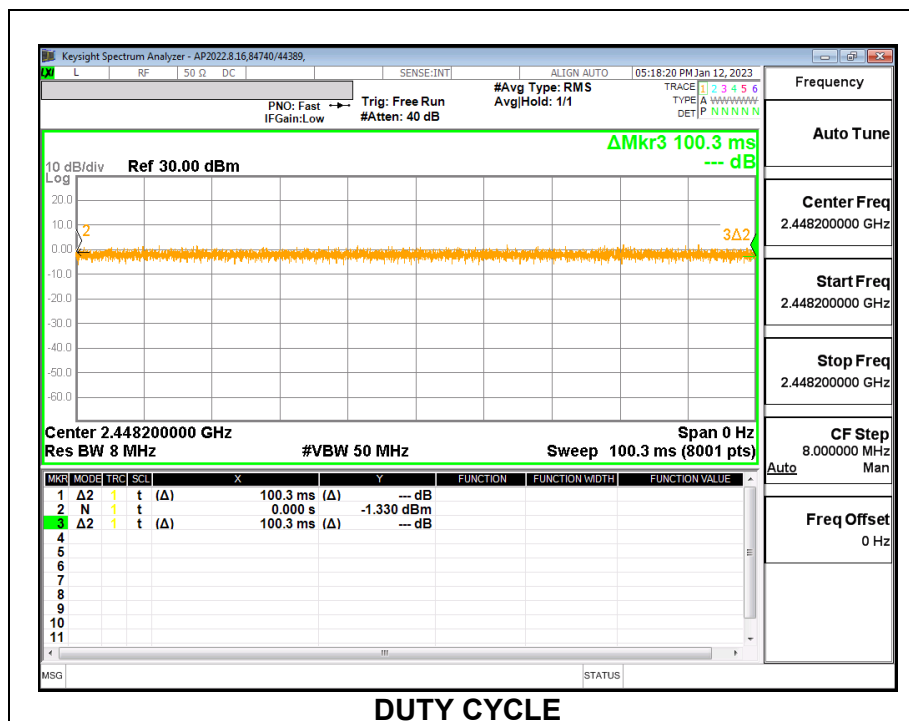
LIMITS

None; for reporting purposes only.

PROCEDURE

ANSI C63.10 Subclause 11.6

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
2448.2MHz	100.000	100.000	1.000	100.00	0.00	0.010

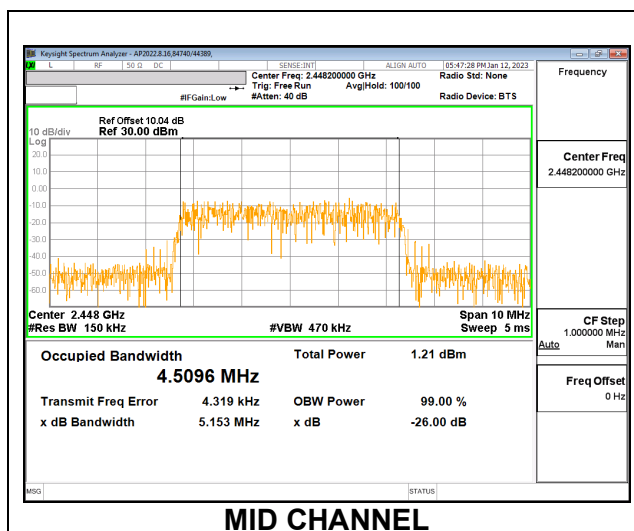


9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Middle	2448.2	4.5096



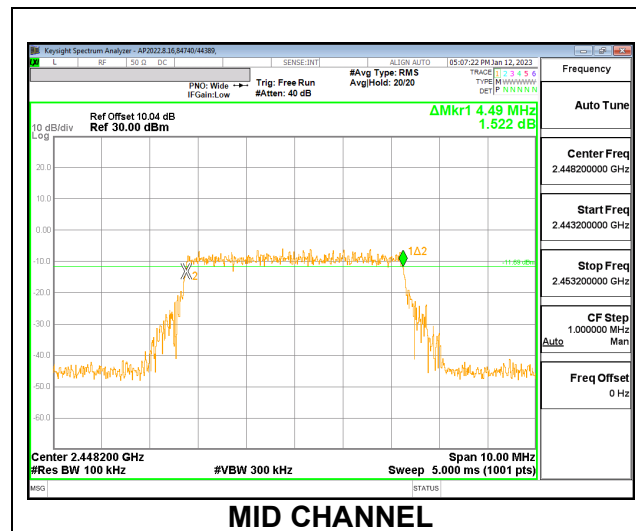
9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
RSS-247 5.2 (a)

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Middle	2448.2	4.49



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 10.04 dB (including 9.64 dB pad and 0.4 dB cable) was entered as an offset in the power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Peak output power was read directly from power meter.

Tested By:	85502/44389
Date:	2023-01-12

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Middle	2448.2	11.720	30	-18.280

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 10.04 dB (including 9.64 dB pad and 0.4 dB cable) was entered as an offset in the power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Peak output power was read directly from power meter.

Tested By:	85502/44389
Date:	2023-01-12

Channel	Frequency (MHz)	Average Power Reading (dBm)	Limit (dBm)	Margin (dB)
Middle	2448.2	0.960	30	-29.040

9.6. POWER SPECTRAL DENSITY

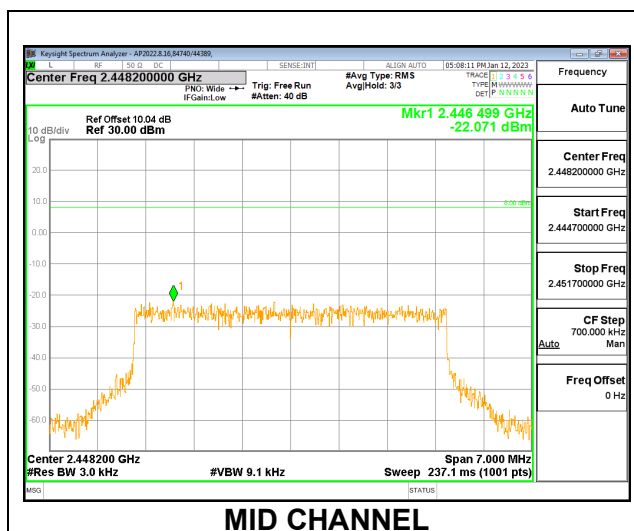
LIMITS

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

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Middle	2448.2	-22.07	8	-30.07

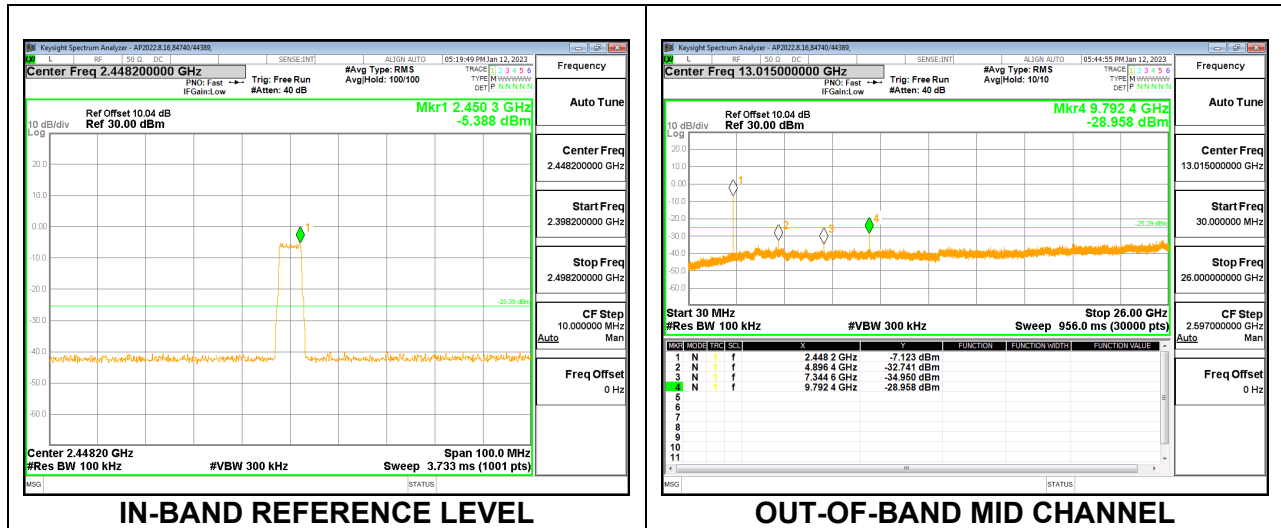


9.7. CONDUCTED SPURIOUS EMISSIONS

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 -20dBc.



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	.08 @ 30m	-
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3m	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 3MHz 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 average measurements. Linear Voltage averaging was used.

The spectrum from 9kHz to 26GHz is investigated with the transmitter set to the only channel supported by this device, 2448.2MHz.

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).

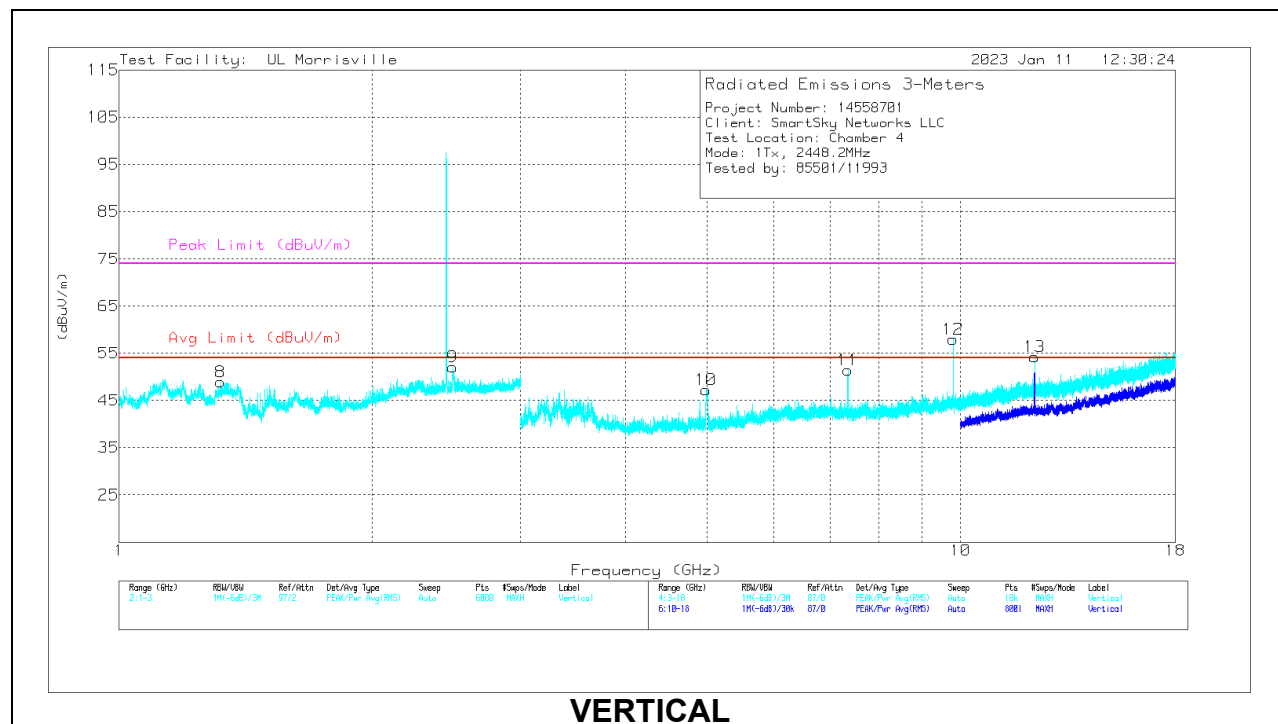
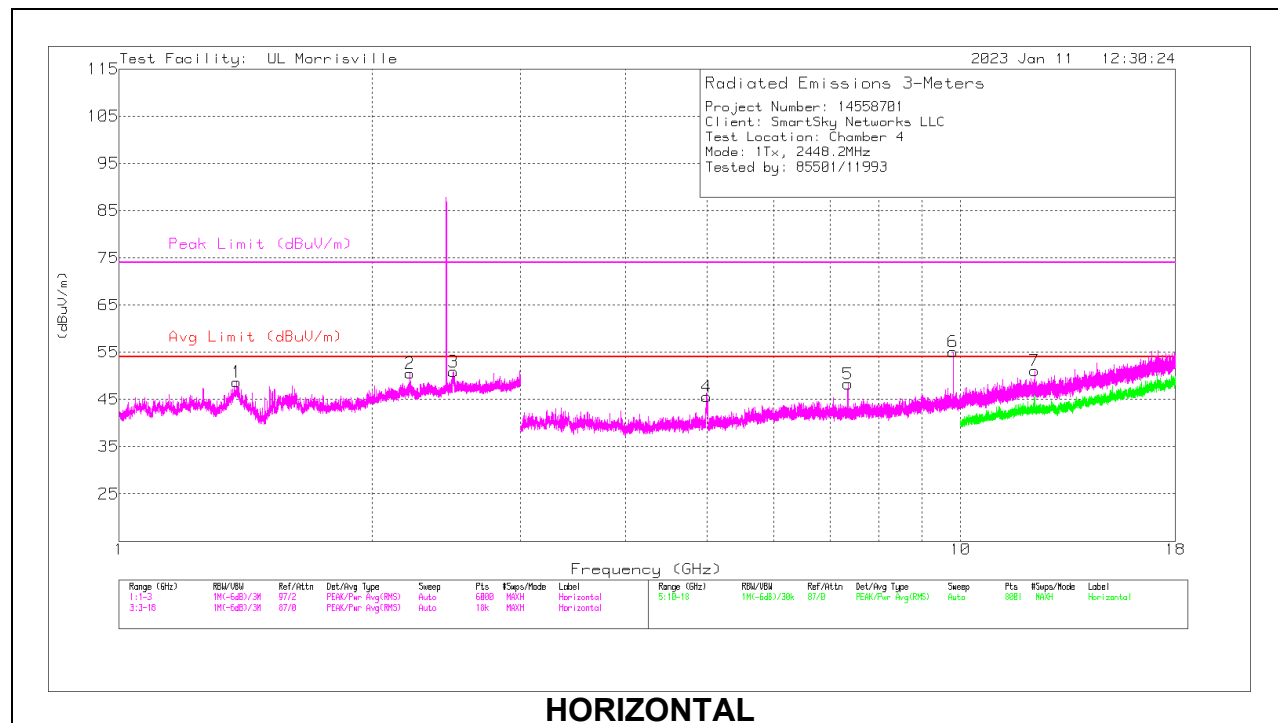
Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

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 ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0067 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 1.37765	30.04	PK2	29.1	-15.5	43.64	-	-	74	-30.36	11	344	H
	*** 1.37989	17.34	ADV	29.1	-15.4	31.04	54	-22.96	-	-	11	344	H
2	*** 2.21491	32.25	PK2	32	-13.8	50.45	-	-	74	-23.55	351	155	H
	*** 2.21813	19.02	ADV	32	-13.7	37.32	54	-16.68	-	-	351	155	H
3	*** 2.49713	32.79	PK2	32.6	-13.6	51.79	-	-	74	-22.21	354	152	H
	*** 2.49555	17.85	ADV	32.6	-13.6	36.85	54	-17.15	-	-	354	152	H
8	*** 1.31985	37.31	PK2	29.2	-15.3	51.21	-	-	74	-22.79	327	196	V
	*** 1.32004	26.02	ADV	29.2	-15.3	39.92	54	-14.08	-	-	327	196	V
9	*** 2.48961	34.51	PK2	32.6	-13.6	53.51	-	-	74	-20.49	102	116	V
	*** 2.49103	19.14	ADV	32.6	-13.6	38.14	54	-15.86	-	-	102	116	V
5	*** 7.34491	43.91	PK2	35.6	-28.3	51.21	-	-	74	-22.79	129	101	H
	*** 7.34448	30.96	ADV	35.6	-28.3	38.26	54	-15.74	-	-	129	101	H
7	*** 12.24106	38.11	PK2	38.9	-23.6	53.41	-	-	74	-20.59	109	101	H
	*** 12.24038	25.38	ADV	38.9	-23.6	40.68	54	-13.32	-	-	109	101	H
11	*** 7.34445	48.13	PK2	35.6	-28.3	55.43	-	-	74	-18.57	45	206	V
	*** 7.34481	35.08	ADV	35.6	-28.3	42.38	54	-11.62	-	-	45	206	V
13	*** 12.24148	43.69	PK2	38.9	-23.6	58.99	-	-	74	-15.01	211	199	V
	*** 12.24224	31.3	ADV	38.9	-23.5	46.7	54	-7.3	-	-	211	199	V
4	*** 4.99345	43.56	Pk	34	-32	45.56	54	-8.44	74	-28.44	0-360	100	H
10	*** 4.98178	45.26	Pk	34	-32	47.26	54	-6.74	74	-26.74	0-360	200	V
6	9.79205	44.31	Pk	36.9	-26.1	55.11	-	-	-	-	0-360	100	H
12	9.79205	47.21	Pk	36.9	-26.1	58.01	-	-	-	-	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

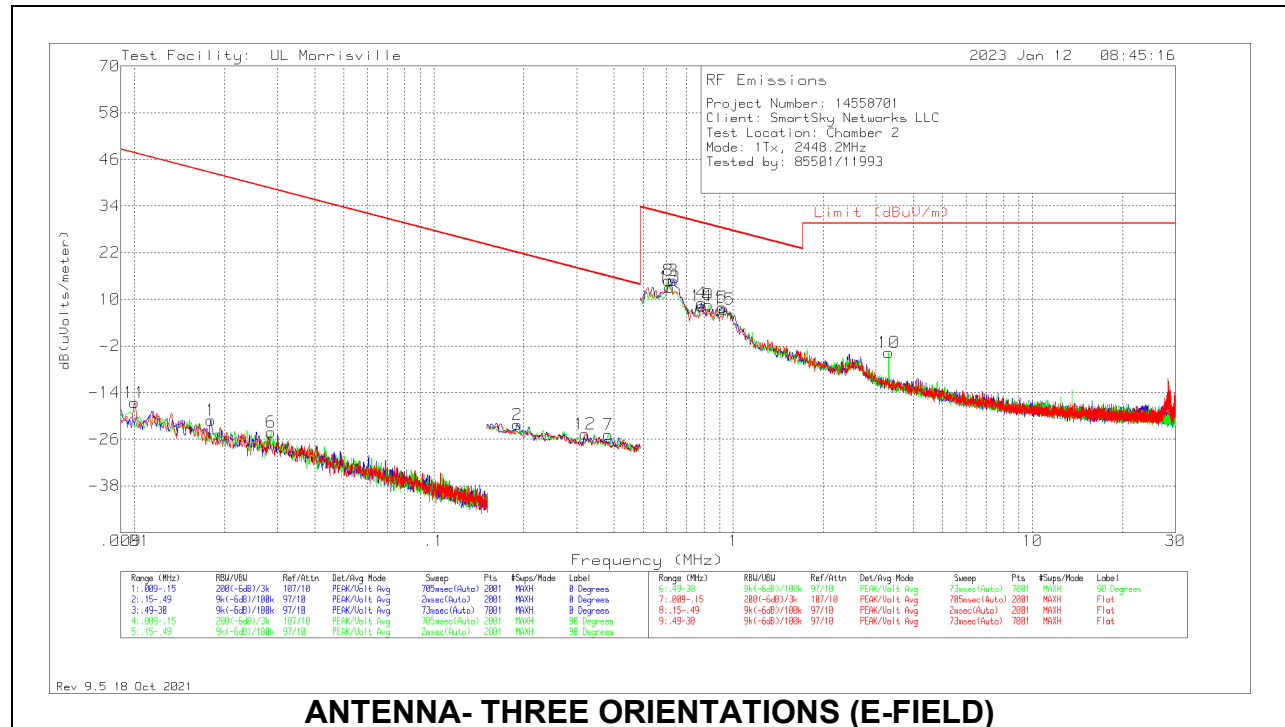
PK2 - Maximum Peak

ADV - Linear Voltage Average

10.3. TRANSMITTER BELOW 1GHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

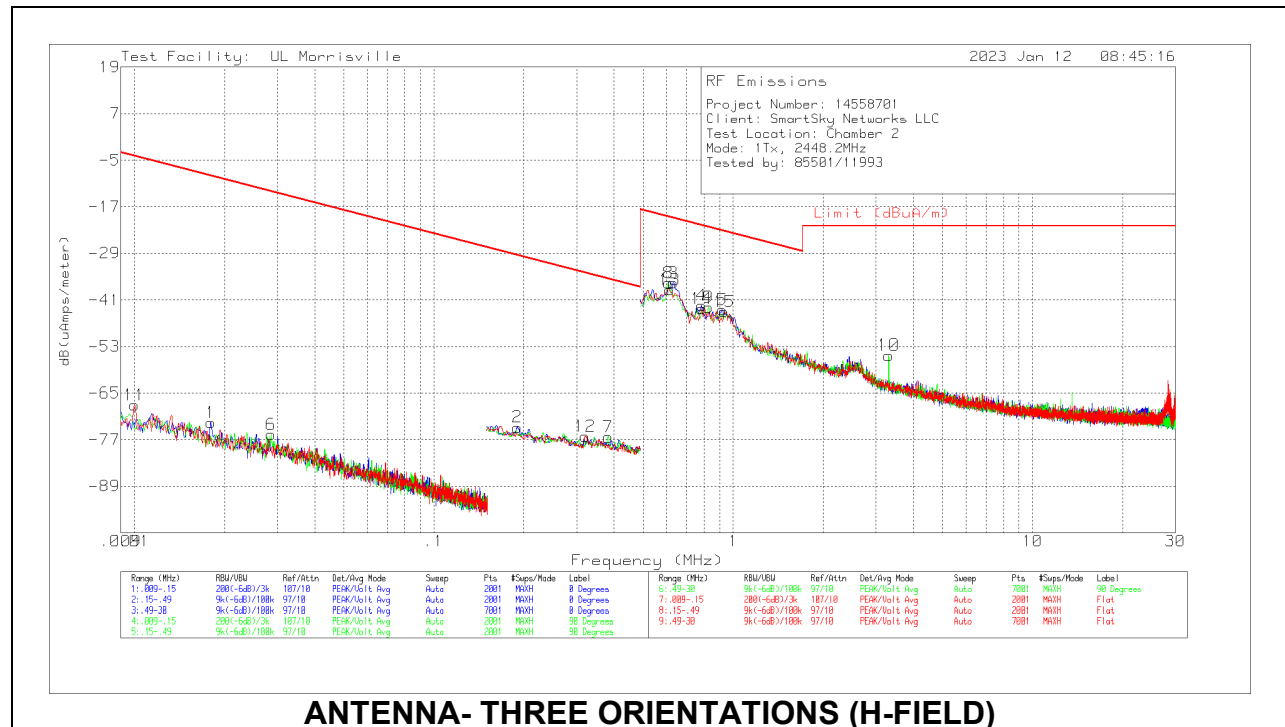
Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance 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).



ANTENNA- THREE ORIENTATIONS (E-FIELD)

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dBuV/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
11	.00999	43.97	Pk	19.3	.1	-80	-16.63	47.61	67.61	-64.24	0-360	Flat
1	.01802	43.42	Pk	15.4	.1	-80	-21.08	42.49	62.49	-63.57	0-360	0 degs
6	.02867	42.04	Pk	13.7	.1	-80	-24.16	38.46	58.46	-62.62	0-360	90 degs
2	.19029	46.99	Pk	10.6	.1	-80	-22.31	22.02	42.02	-44.33	0-360	0 degs
12	.32017	44.87	Pk	10.4	.1	-80	-24.63	17.5	37.5	-42.13	0-360	Flat
7	.38307	44.61	Pk	10.4	.1	-80	-24.89	15.94	35.94	-40.83	0-360	90 degs
8	.60805	44.05	Pk	10.6	.2	-40	14.85	31.93	-	-17.08	0-360	90 degs
13	.61226	42.31	Pk	10.6	.2	-40	13.11	31.87	-	-18.76	0-360	Flat
3	.63124	44.01	Pk	10.6	.2	-40	14.81	31.6	-	-16.79	0-360	0 degs
4	.78512	38.25	Pk	10.6	.2	-40	9.05	29.71	-	-20.66	0-360	0 degs
14	.78512	37.5	Pk	10.6	.2	-40	8.3	29.71	-	-21.41	0-360	Flat
9	.82728	37.82	Pk	10.6	.2	-40	8.62	29.25	-	-20.63	0-360	90 degs
5	.92003	37.18	Pk	10.6	.2	-40	7.98	28.33	-	-20.35	0-360	0 degs
15	.93268	36.49	Pk	10.7	.2	-40	7.39	28.21	-	-20.82	0-360	Flat
10	3.30629	25.14	Pk	10.8	.3	-40	-3.76	29.54	-	-33.3	0-360	90 degs

Pk - Peak detector

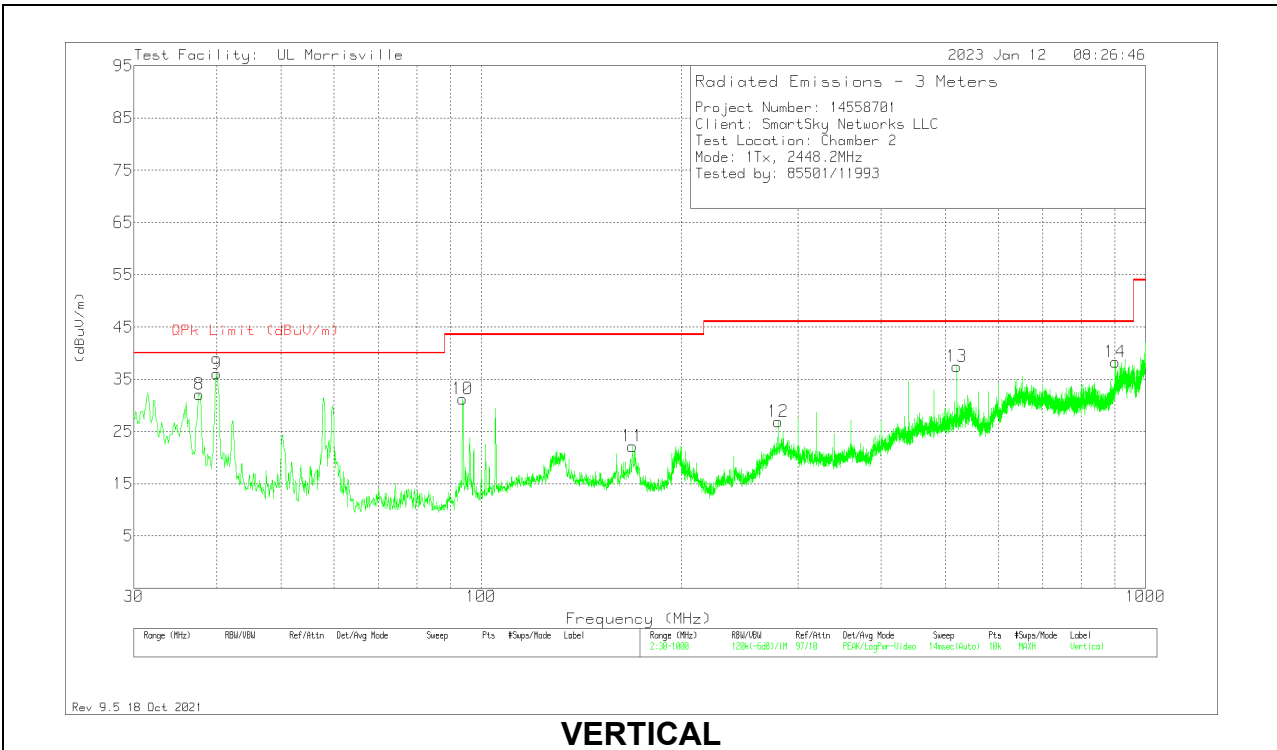
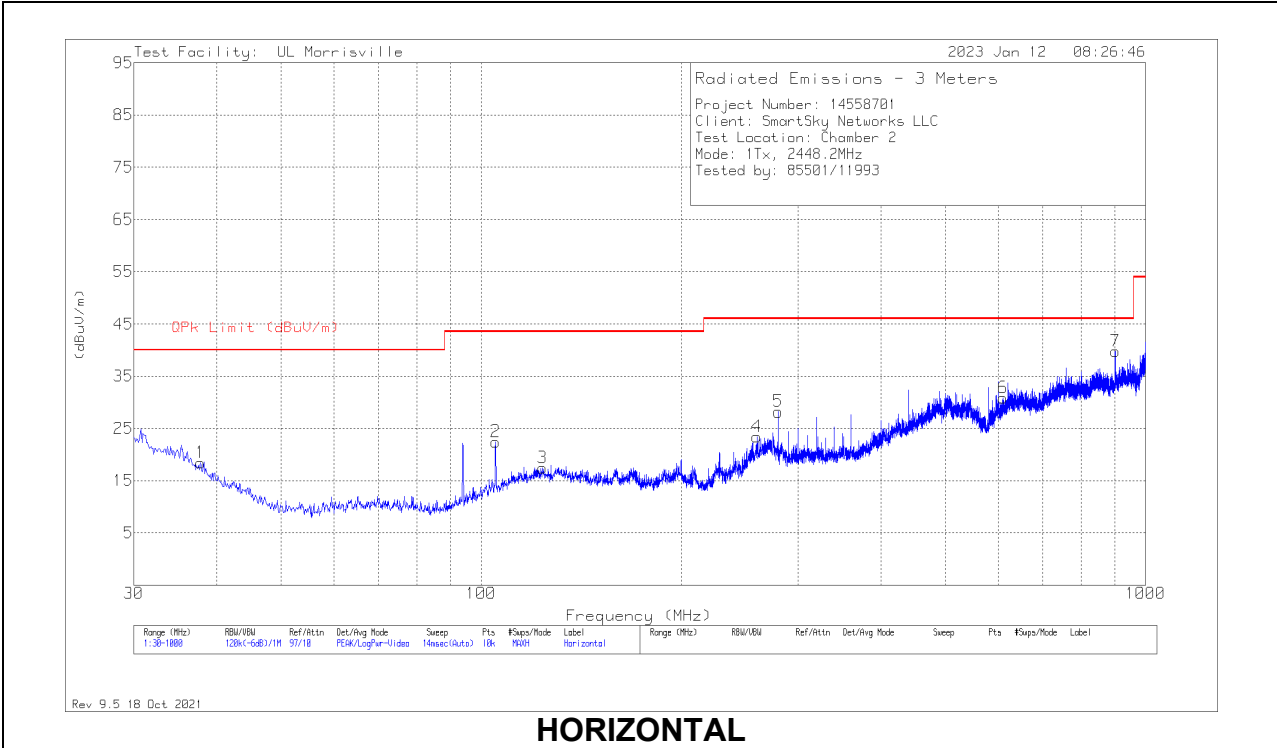


ANTENNA- THREE ORIENTATIONS (H-FIELD)

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dBuV/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
11	.00999	43.97	Pk	-32.2	.1	-80	-68.13	-3.89	16.11	-64.24	0-360	Flat
1	.01802	43.42	Pk	-36.1	.1	-80	-72.58	-9.01	10.99	-63.57	0-360	0 degs
6	.02867	42.04	Pk	-37.8	.1	-80	-75.66	-13.04	6.99	-62.62	0-360	90 degs
2	.19029	46.99	Pk	-40.9	.1	-80	-73.81	-29.48	-9.48	-44.33	0-360	0 degs
12	.32017	44.87	Pk	-41.1	.1	-80	-76.13	-34	-14	-42.13	0-360	Flat
7	.38307	44.61	Pk	-41.1	.1	-80	-76.39	-35.56	-15.56	-40.83	0-360	90 degs
8	.60805	44.05	Pk	-40.9	.2	-40	-36.65	-19.57	-	-17.08	0-360	90 degs
13	.61226	42.31	Pk	-40.9	.2	-40	-38.39	-19.63	-	-18.76	0-360	Flat
3	.63124	44.01	Pk	-40.9	.2	-40	-36.69	-19.9	-	-16.79	0-360	0 degs
4	.78512	38.25	Pk	-40.9	.2	-40	-42.45	-21.79	-	-20.66	0-360	0 degs
14	.78512	37.5	Pk	-40.9	.2	-40	-43.2	-21.79	-	-21.41	0-360	Flat
9	.82728	37.82	Pk	-40.9	.2	-40	-42.88	-22.25	-	-20.63	0-360	90 degs
5	.92003	37.18	Pk	-40.9	.2	-40	-43.52	-23.17	-	-20.35	0-360	0 degs
15	.93268	36.49	Pk	-40.8	.2	-40	-44.11	-23.29	-	-20.82	0-360	Flat
10	3.30629	25.14	Pk	-40.7	.3	-40	-55.26	-21.96	-	-33.3	0-360	90 degs

Pk - Peak detector

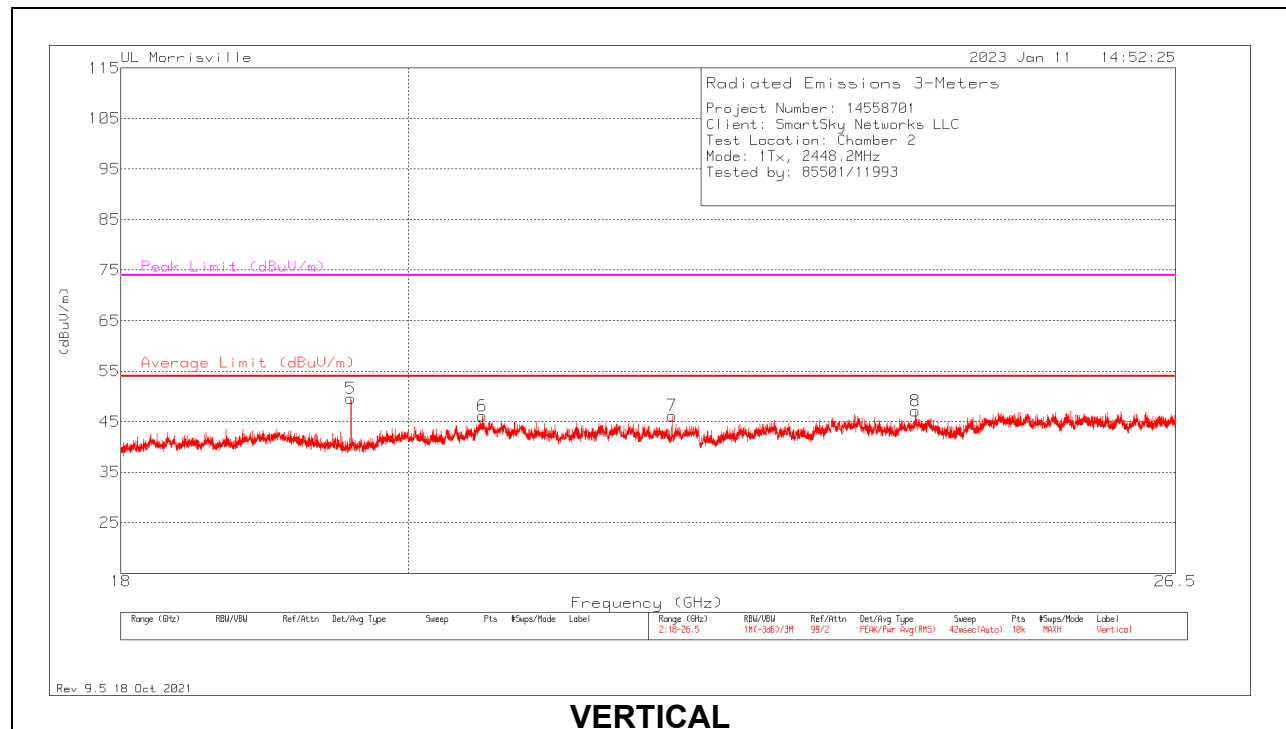
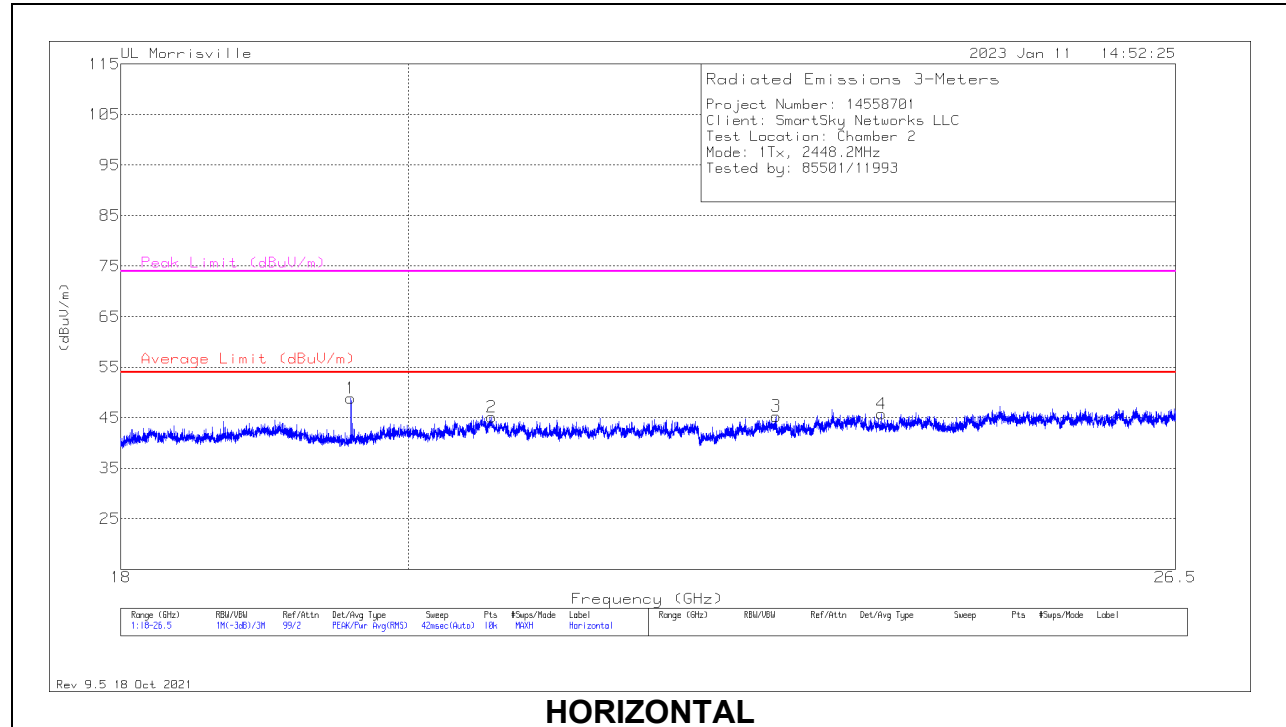
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0074 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 37.76	28.1	Pk	21.6	-31.3	18.4	40	-21.6	0-360	299	H
3	*** 123.605	27.86	Pk	19.9	-30.3	17.46	43.52	-26.06	0-360	199	H
4	*** 259.987	34.53	Pk	17.9	-29	23.43	46.02	-22.59	0-360	100	H
5	*** 279.969	37.78	Pk	19.3	-28.9	28.18	46.02	-17.84	0-360	100	H
6	*** 609.866	33.66	Pk	24.6	-27.4	30.86	46.02	-15.16	0-360	100	H
7	** 900.09	37.15	Pk	28	-25.4	39.75	46.02	-6.27	0-360	199	H
8	*** 37.663	41.65	Pk	21.7	-31.3	32.05	40	-7.95	0-360	101	V
11	*** 168.904	34.01	Pk	18.1	-29.9	22.21	43.52	-21.31	0-360	101	V
12	*** 279.969	36.42	Pk	19.3	-28.9	26.82	46.02	-19.2	0-360	199	V
14	** 900.09	35.66	Pk	28	-25.4	38.26	46.02	-7.76	0-360	101	V
9	39.991	47.58	Pk	19.9	-31.4	36.08	-	-	0-360	101	V
10	93.826	46.87	Pk	14.9	-30.6	31.17	-	-	0-360	101	V
2	105.078	35.06	Pk	17.8	-30.4	22.46	-	-	0-360	199	H
13	520.044	41.51	Pk	23.5	-27.6	37.41	-	-	0-360	101	V

Pk - Peak detector

SPURIOUS EMISSIONS 18 TO 26GHz (WORST-CASE CONFIGURATION)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	204704 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 19.58559	55.95	PK2	33.4	-39.3	50.05	-	-	74	-23.95	239	101	H
	*** 19.58563	51.62	ADV	33.4	-39.3	45.72	54	-8.28	-	-	239	101	H
2	*** 20.62369	49.55	Pk	34.1	-38.5	45.15	54	-8.85	74	-28.85	0-360	250	H
3	*** 22.88871	48.32	Pk	34.4	-37.4	45.32	54	-8.68	74	-28.68	0-360	100	H
4	*** 23.79217	48.05	Pk	35.1	-37.4	45.75	54	-8.25	74	-28.25	0-360	150	H
5	*** 19.58581	56.5	PK2	33.4	-39.3	50.6	-	-	74	-23.4	170	228	V
	*** 19.58558	52.56	ADV	33.4	-39.3	46.66	54	-7.34	-	-	170	228	V
6	*** 20.55399	50.43	Pk	34.1	-38.4	46.13	54	-7.87	74	-27.87	0-360	250	V
7	*** 22.0354	50.89	Pk	34.5	-39.2	46.19	54	-7.81	74	-27.81	0-360	200	V
8	24.09049	49.33	Pk	35.1	-37.3	47.13	54	-6.87	74	-26.87	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

PK2 - Maximum Peak

ADV - Linear Voltage Average

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

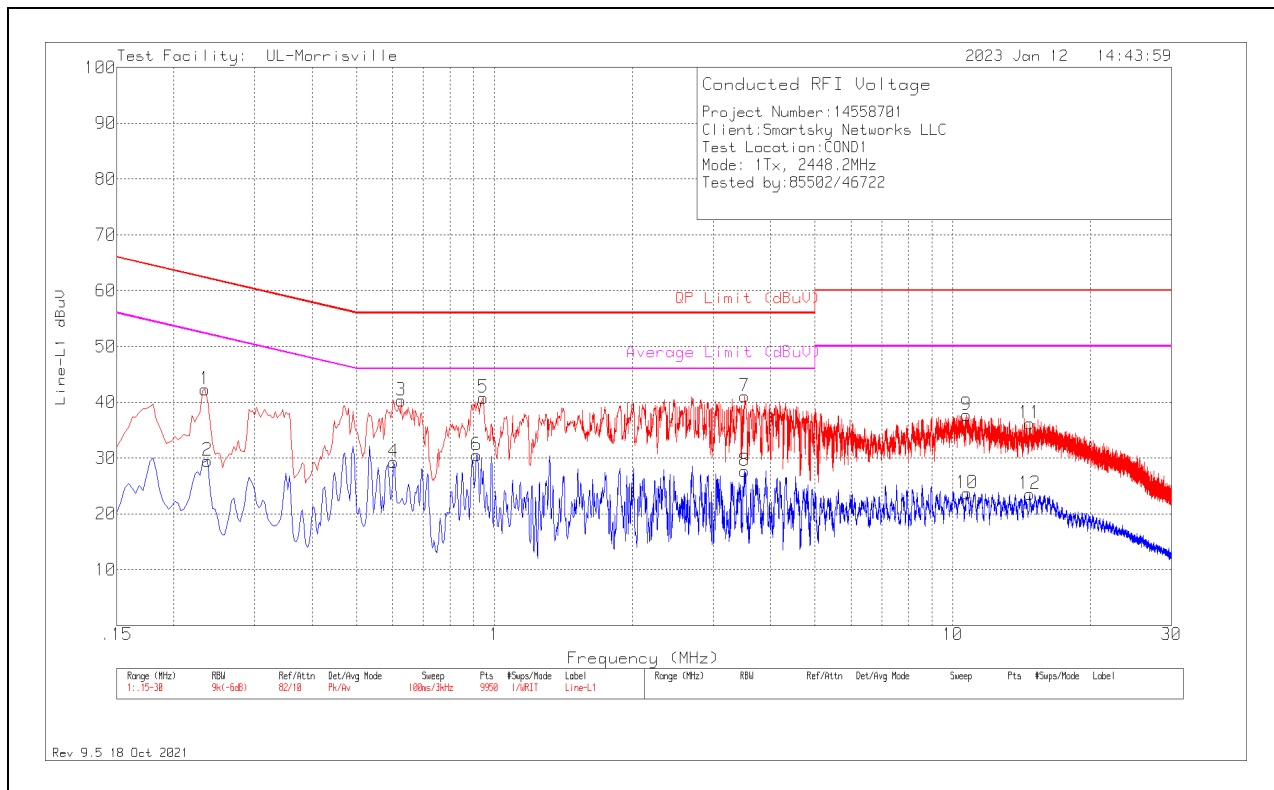
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak Detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both lines.

11.1. AC Power Line Norm

LINE 1 RESULTS

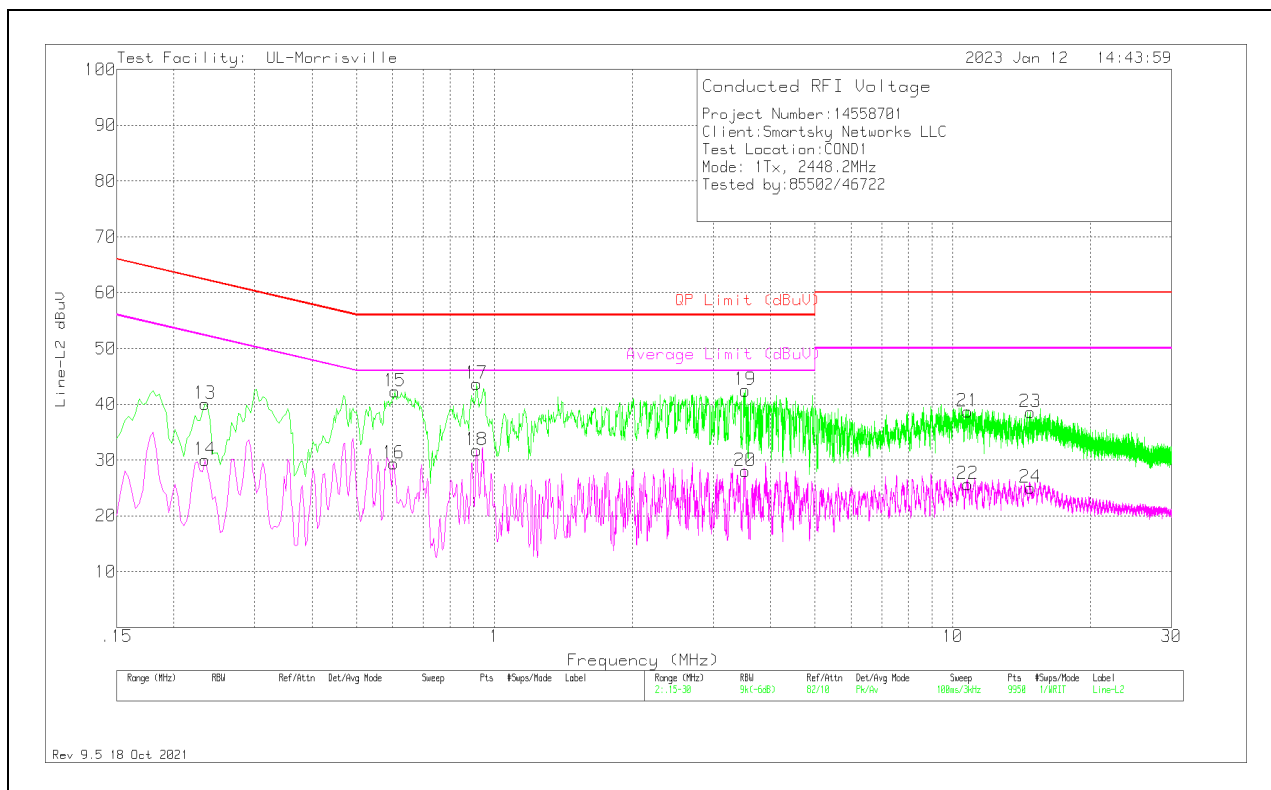


Range 1: Line-L1 .15 - 30MHz

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	.234	32.39	Pk	.1	9.8	42.29	62.31	-20.02	-	-
2	.237	19.58	Av	.1	9.8	29.48	-	-	52.2	-22.72
3	.627	30.55	Pk	0	9.8	40.35	56	-15.65	-	-
4	.603	19.45	Av	0	9.8	29.25	-	-	46	-16.75
5	.945	31.03	Pk	0	9.8	40.83	56	-15.17	-	-
6	.915	20.7	Av	0	9.8	30.5	-	-	46	-15.5
7	3.513	31.2	Pk	0	9.9	41.1	56	-14.9	-	-
8	3.51	17.74	Av	0	9.9	27.64	-	-	46	-18.36
9	10.728	27.57	Pk	.1	10	37.67	60	-22.33	-	-
10	10.761	13.6	Av	.1	10	23.7	-	-	50	-26.3
11	14.742	25.99	Pk	.1	10.1	36.19	60	-23.81	-	-
12	14.721	13.31	Av	.1	10.1	23.51	-	-	50	-26.49

Pk – Peak Detector
Av – Average Detector

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	.234	30.15	Pk	.1	9.8	40.05	62.31	-22.26	-	-
14	.234	20.16	Av	.1	9.8	30.06	-	-	52.31	-22.25
15	.606	32.52	Pk	0	9.8	42.32	56	-13.68	-	-
16	.603	19.59	Av	0	9.8	29.39	-	-	46	-16.61
17	.915	33.91	Pk	0	9.8	43.71	56	-12.29	-	-
18	.915	21.93	Av	0	9.8	31.73	-	-	46	-14.27
19	3.525	32.59	Pk	0	9.9	42.49	56	-13.51	-	-
20	3.525	18.07	Av	0	9.9	27.97	-	-	46	-18.03
21	10.779	28.6	Pk	.1	10	38.7	60	-21.3	-	-
22	10.776	15.52	Av	.1	10	25.62	-	-	50	-24.38
23	14.781	28.39	Pk	.1	10.1	38.59	60	-21.41	-	-
24	14.772	14.86	Av	.1	10.1	25.06	-	-	50	-24.94

Pk – Peak Detector
Av – Average Detector

12. SETUP PHOTOS

Please refer to R14558701-EP1 for setup diagrams and photos

END OF TEST REPORT