

# **TEST REPORT**

**Report Number.**: R13335074-E12

Applicant: eero LLC

660 3<sup>rd</sup> Street

4<sup>th</sup> Floor

San Francisco, CA 94107

**United States** 

Model: K010001

**FCC ID**: 2AEM4-30317

**IC**: 20631-30317

**EUT Description**: Wireless router for home and small office

**Test Standard(s)**: FCC 47 CFR PART 15 SUBPART E (EXCEPT DFS)

ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

**Date Of Issue:** 

2020-09-22

Prepared by:

**UL LLC** 

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Research Triangle Park, NC 27709 U.S.A.

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REPORT NO: R13335074-E12 FCC ID: 2AEM4-30317

# **REPORT REVISION HISTORY**

Rev.	Issue Date	Revisions	Revised By
V1	2020-08-10	Initial Issue	Niklas Haydon
V2	2020-09-22	Updated statement on simultaneous transmission	Niklas Haydon

DATE: 2020-09-22

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** eero LLC

660 3rd Street 4th Floor

San Francisco, CA 94107

**United States** 

**EUT DESCRIPTION:** Wireless router for home and small office

**MODEL:** K010001

SERIAL NUMBER: KA58-0400-4W00-00CG

SAMPLE RECEIPT DATE: 2020-06-02

**DATE TESTED:** 2020-07-15 to 2020-07-30

#### **APPLICABLE STANDARDS**

STANDARD TEST RESULTS

CFR 47 Part 15 Subpart E (EXCEPT DFS)

ISED RSS-247 Issue 2

ISED RSS-GEN Issue 5

Complies

Complies

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 NVLAP, NIST, or any agency of the U.S. government.

DATE: 2020-09-22

Approved & Released For UL Verification Services Inc. By:

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DATE: 2020-09-22

IC: 20631-30317

**UL LLC** 

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# 2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
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.

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#### 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, and RSS-247 Issue 2.

### 4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

12 Laboratory Dr.	2800 Perimeter Park Dr.					
Site Cod	Site Code: 2180C					
Chamber A RTP	North Chamber					
Chamber C RTP	South Chamber					

The above test sites and facilities are covered under FCC Test Firm Registration # 703469. Chambers above are covered under Industry Canada company address and respective code.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

DATE: 2020-09-22

# 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	2.00%
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	4.88 dB
Conducted Emissions (0.150-30MHz) - LISN	3.07 dB
Temperature	2.26°C
Humidity	6.79%
DC Supply voltages	1.70%
Time	3.39%

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

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### **5.4. SAMPLE CALCULATION**

#### **RADIATED EMISSIONS**

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

#### 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 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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# 6. EQUIPMENT UNDER TEST

#### 6.1. EUT DESCRIPTION

The EUT is a wireless router for home and small office.

## 6.2. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Range	Max Gain (dBi)
5.2 GHz U-N11-1 wlan CH0	4.3
5.2 GHz U-N11-1 wlan CH1	3.4
5.8 GHz U-N11-3 wlan CH0	2.8
5.8 GHz U-N11-3 wlan CH1	5.1
5.8 GHz U-N11-3 wlan CH2	5.2
5.8 GHz U-N11-3 wlan CH3	3.4

#### NOTE:

ANT3 = CH0

ANT6 = CH1

ANT2 = CH0

ANT4 = CH1

ANT5 = CH2

ANT7 = CH3

#### 6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was eeroQSDK version builder@4162cb4b0759. The test utility software used during testing was QRCT v4.0.00163.0.

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

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel and data rate with highest power spectral density across all data rates as worst-case scenario. This report only covers this testing. All other testing is performed under UL LLC reports R13335074-E8, R13335074-E9, R13335074-E10, and R13335074-E11.

The EUT only operates in one orientation X, therefore, all final radiated testing was performed with the EUT in X orientation.

Worst-case data rates were:

802.11a mode: 6 Mbps 802.11n HT20mode: MCS0 802.11n HT40mode: MCS0 802.11ac VHT80 mode: MCS0

Simultaneous transmission of the following combinations was investigated and there were not any non-conformances found:

802.15.4 radio, 2.4 WLAN radio, and 5.8 WLAN radio 802.15.4 radio, 5.2 WLAN radio, and 5.8 WLAN radio BLE radio, 2.4 WLAN radio, and 5.8 WLAN radio BLE radio, 5.2 WLAN radio, and 5.8 WLAN radio

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# 6.5. DESCRIPTION OF TEST SETUP

#### **SUPPORT EQUIPMENT**

Support Equipment List							
Description	Manufacturer	Model	Serial Number	FCC ID			
Laptop PC	Dell	Latitude E6430	J29SNX1	N/A			
Laptop PC	Dell	Latitude E5450	HRR5N72	N/A			
AC adapter (EUT)	Foxlink	C210001	A019F0000171	N/A			
AC adapter (EUT)	RF Tech	C210001	A027A0000361	N/A			

#### **I/O CABLES**

	I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks	
1	DC In	1	USB-C	Unshielded	1.5	Cable captured to AC power supply	
2	LAN	2	RJ45- unshielded	Unshielded	15	Includes 1.7m cable that accompanied the EUT	

#### **TEST SETUP**

The EUT is connected to a test laptop during the tests. Test software exercised the radio card.

#### **SETUP DIAGRAMS**

Please refer to R13335074-EP1 for setup diagrams.

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## 7. MEASUREMENT METHOD

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections II. G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections II. G.3, G.4, and G.5.

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

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# 8. TEST AND MEASUREMENT EQUIPMENT

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

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

Equip.	Osca - Nadiated Disturbant				<u> </u>
iD .	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	0.009-30MHz	(Loop Ant.)			
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2019-08-08	2020-08-08
	30-1000 MHz				
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2019-008-08	2020-08-08
	18-40 GHz				
AT0076	Horn Antenna, 18- 26.5GHz	ARA	MWH-1826/B	2019-11-07	2020-11-07
	Gain-Loss Chains				
N-SAC01	Gain-loss string: 0.009- 30MHz	Various	Various	2020-04-24	2021-04-24
N-SAC02	Gain-loss string: 25- 1000MHz	Various	Various	2020-04-24	2021-04-24
N-SAC04	Gain-loss string: 18- 40GHz	Various	Various	2020-03-22	2021-03-22
	Receiver & Software				
SA0025	Spectrum Analyzer	Agilent	N9030A	2020-03-17	2021-03-17
SA0027	Spectrum Analyzer	Agilent	N9030A	2020-06-10	2021-06-10
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
s/n 181474341	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27

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

rest Equipment Osed - Line-Conducted Emissions – Voltage (Mornsville – Conducted 1)					
Equipment					
ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Coax cable, RG223, N-male				
CBL087	to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2020-03-26	2021-03-26
s/n 181562858	Environmental Meter	Fisher Scientific	14-650-118	2018-09-04	2020-09-04
	LISN, 50-ohm/50-uH, 2-	Fischer Custom	FCC-LISN-50-25-2-		
LISN003	conductor, 25A	Com.	01-550V	2019-08-19	2020-08-19
75141	EMI Test Receiver 9kHz-	Rohde &			
(PRE0101521)	7GHz	Schwarz	ESCI 7	2019-08-20	2020-08-20
	Transient Limiter, 0.009-				
ATA222	100MHz	Electro-Metrics	EM-7600	2020-03-26	2021-03-26
			CW2501M		
PS215	AC Power Source	Elgar	(s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	ANSI C63.4 1m extension		Per Annex B of		
CDECABLE001	cable.	UL	ANSI C63.4	2019-07-10	2020-07-10
	ANSI C63.4 1m extension		Per Annex B of		
CDECABLE001	cable.	UL	ANSI C63.4	2020-08-08	2021-08-08
	LISN, 50-ohm/50-uH, 2-				
	conductor, 25A (For support	Solar			
LISN008	gear only.)	Electronics	8012-50-R-24-BNC	2019-07-10	2020-07-10

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Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber					Chamber)
Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	0.009-30MHz	(Loop Ant.)			
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2019-08-08	2020-08-08
	30-1000 MHz				
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2019-08-08	2020-08-08
	Gain-Loss Chains				
S-SAC01	Gain-loss string: 0.009- 30MHz	Various	Various	2020-07-10	2021-07-10
S-SAC02	Gain-loss string: 25- 1000MHz	Various	Various	2020-07-10	2021-07-10
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2020-03-27	2021-03-27
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
s/n 181474409	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
s/n 200037610	Environmental Meter	Fisher Scientific	06-662-4	2020-1-22	2022-01-22

#### NOTES:

- 1. For equipment listed above that was calibrated during the testing period, please note the equipment was used for testing after calibration.
- 2. For equipment listed above that has a calibration due date during the testing period, the testing was completed before the equipment expiration date.

3. Exception to 1. and 2. CDECABLE001 testing was performed between characterization. CDECABLE001 was found to still be within specification.

## 9. RADIATED TEST RESULTS

#### **LIMITS**

FCC §15.205 and §15.209 RSS-GEN, Section 8.9 and 8.10

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

#### **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. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz 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.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest 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).

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

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.

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

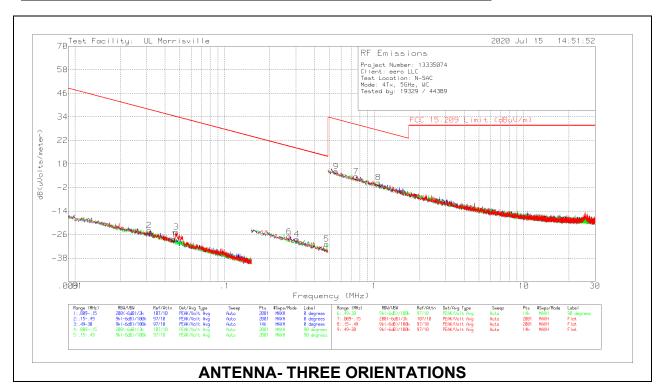
DATE: 2020-09-22 IC: 20631-30317

#### 9.1. WORST CASE BELOW 30MHZ

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

The below 30 MHz limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of  $377\Omega$ . For example, the measurement frequency 167.17 KHz resulted in a level of -22.56 dBuV/m, which is equivalent to -22.56-51.5 = -74.06 dBuA/m, which has the same margin, -63.48 dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

#### SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



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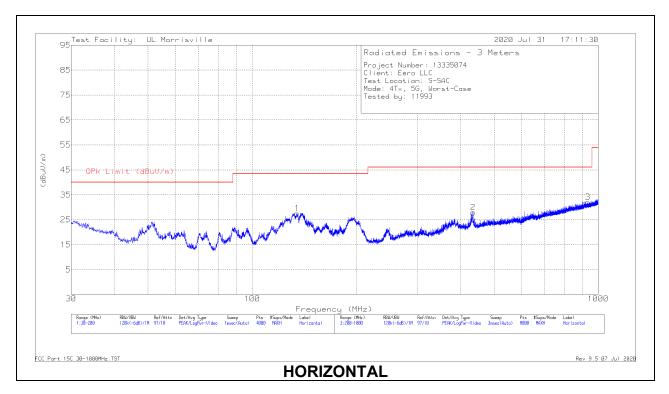
# **Below 30MHz Data**

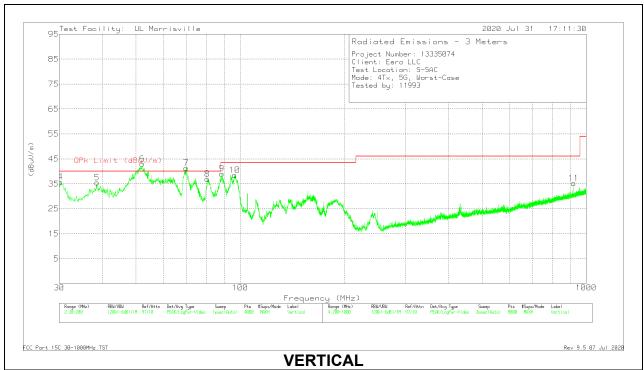
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 AF (dB/m)	Cbl (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.209 Qp/AvgLimit (dBuV/m)	FCC 15.209 Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
2	.03129	42.92	Pk	13.1	.1	-80	-23.88	37.7	37.7	-61.58	0-360
1	.04571	39.58	Pk	11.9	.1	-80	-28.42	34.4	34.4	-62.82	0-360
3	.04755	43.52	Pk	11.7	.1	-80	-24.68	34.06	34.06	-58.74	0-360
6	.27011	41.85	Pk	11	.1	-80	-27.05	18.97	18.97	-46.02	0-360
4	.30479	40.51	Pk	11	.1	-80	-28.39	17.92	17.92	-46.31	0-360
5	.48057	37.99	Pk	11	.1	-80	-30.91	13.97	13.97	-44.88	0-360
9	.55535	35.12	Pk	11	.1	-40	6.22	32.71	32.71	-26.49	0-360
7	.75772	32.48	Pk	11	.1	-40	3.58	30.01	30.01	-26.43	0-360
8	1.06548	29.33	Pk	11	.2	-40	.53	27.05	27.05	-26.52	0-360

Pk - Peak detector

# 9.2. WORST CASE BELOW 1 GHZ

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





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# **Below 1GHz Data**

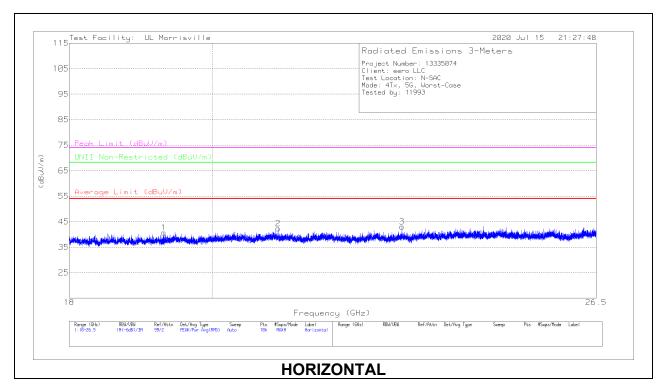
Marker	Frequency	Meter	Det	AT0081 AF	Amp/Cbl (dB)	Corrected	QPk Limit (dBuV/m)	Margin	Azimuth	Height	Polarity
	(MHz)	Reading		(dB/m)		Reading		(dB)	(Degs)	(cm)	
		(dBuV)				(dBuV/m)					
4	30.0765	35.57	Qp	26.8	-31.5	30.87	40	-9.13	283	109	V
5	38.6381	38.11	Qp	21.1	-31.4	27.81	40	-12.19	195	106	V
6	52.134	56.15	Qp	13.7	-31.2	38.65	40	-1.35	14	109	V
7	69.672	53.16	Qp	14.4	-31	36.56	40	-3.44	32	112	V
8	80.294	48.24	Qp	13.8	-30.8	31.24	40	-8.76	275	104	V
9	88.5755	53.67	Qp	13.8	-30.7	36.77	43.52	-6.75	10	108	V
10	96.221	47.08	Qp	15.5	-30.6	31.98	43.52	-11.54	349	122	V
1	134.7046	38.11	Pk	19.6	-30.2	27.51	43.52	-16.01	0-360	199	Н
2	435.2306	33.32	Pk	22.7	-28.1	27.92	46.02	-18.1	0-360	101	Н
11	920.0936	31.97	Pk	28.5	-25.2	35.27	46.02	-10.75	0-360	101	V
3	933.4953	28.45	Pk	28.6	-25	32.05	46.02	-13.97	0-360	101	Н

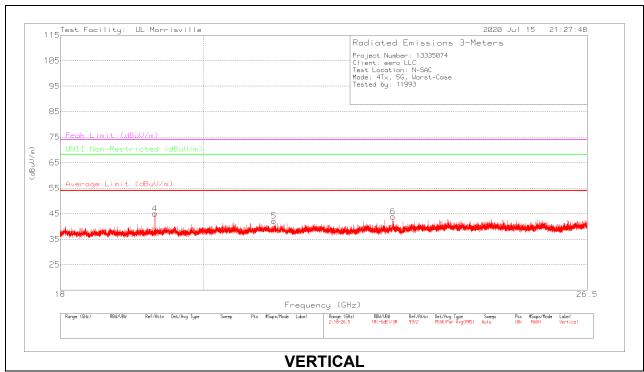
Pk - Peak detector

Qp - Quasi-Peak detector

## 9.3. WORST CASE 18-26 GHZ

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





DATE: 2020-09-22

# 18 – 26 GHz DATA

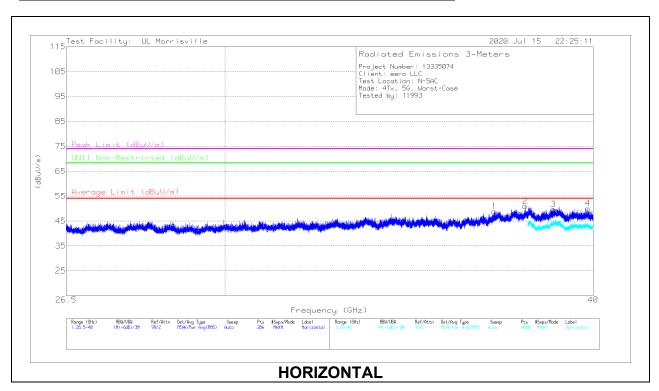
Marker		Meter Reading		AT0076 AF	Amp/Cbl (dB)	Corrected Reading	Average Limit	Margin (dB)	Peak Limit		UNII Non- Restricted		Azimuth (Degs)	Height (cm)	Polarity
	(0112)	(dBuV)		(dB/m)	. ,	(dBuV/m)	_	. ,	(dBuV/m)	` '	(dBuV/m)		(Dega)	(CIII)	
1	* ** 19.29538	47.24	Pk	32.9	-39.4	40.74	54	-13.26	74	-33.26	-	-	0-360	248	Н
2	* ** 20.98414	48.52	Pk	33.2	-39.4	42.32	54	-11.68	74	-31.68	-	-	0-360	148	Н
3	* ** 22.97986	48.4	Pk	33.7	-39	43.1	54	-10.9	74	-30.9	-	-	0-360	198	Н
4	* ** 19.29585	51.49	Pk	32.9	-39.4	44.99	54	-9.01	74	-29.01	-	-	0-360	298	V
5	* ** 21.05545	48.44	Pk	33.1	-39.4	42.14	54	-11.86	74	-31.86	-	-	0-360	298	V
6	* ** 22.97986	49.16	Pk	33.7	-39	43.86	54	-10.14	74	-30.14	-	-	0-360	252	V

<sup>\* -</sup> indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band \*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

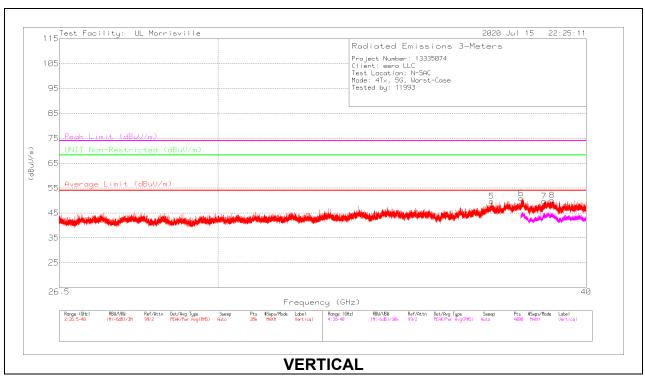
DATE: 2020-09-22

Pk - Peak detector

### SPURIOUS EMISSIONS 26-40 GHz (WORST-CASE CONFIGURATION)



DATE: 2020-09-22



# 26-40 GHz DATA

Marker	Frequency	Meter	Det	AT0077	Amp/Cbl	DC	Corrected	Average	Margin	Peak	Margin	UNII Non-	PK	Azimuth	Height	Polarity
	(GHz)	Reading		AF	(dB)	Corr	Reading	Limit	(dB)	Limit	(dB)	Restricted	Margin	(Degs)	(cm)	
		(dBuV)		(dB/m)		(dB)	(dBuV/m)	(dBuV/m)		(dBuV/m)		(dBuV/m)	(dB)			
3	* ** 38.77703	45.88	PK-U	38.4	-32.6	0	51.68	-	-	74	-22.32	-	-	2	280	Н
	* ** 38.77698	32.25	ADV	38.4	-32.6	1.08	39.13	54	-14.87	-	-	-	-	2	280	Н
4	* ** 39.83447	42.9	PK-U	38.7	-31.3	0	50.3	-	-	74	-23.7	-	-	350	372	Н
	* ** 39.83446	29.74	ADV	38.7	-31.3	1.08	38.22	54	-15.78	-	-	-	-	350	372	Н
7	* ** 38.70602	45.47	PK-U	38.6	-32.4	0	51.67	-	-	74	-22.33	-	-	33	133	V
	* ** 38.70599	31.92	ADV	38.6	-32.4	1.08	39.2	54	-14.8	-	-	-	-	33	133	V
8	* ** 38.94585	45.11	PK-U	38.5	-32.2	0	51.41	-	-	74	-22.59	-	-	70	125	V
	* ** 38.94592	31.92	ADV	38.5	-32.2	1.08	39.3	54	-14.7	-	-	-	-	70	125	V
1	37.02092	45.36	PK-U	37.9	-33.6	0	49.66	-	-	-	-	68.2	-18.54	239	308	Н
5	37.14669	45.88	PK-U	37.9	-33.5	0	50.28	-	-	-	-	68.2	-17.92	355	140	V
2	37.93144	45.74	PK-U	38	-33	0	50.74	-	-	-	-	68.2	-17.46	47	161	Н
6	38.01799	45.98	PK-U	38	-33.1	0	50.88	-	-	-	-	68.2	-17.32	152	102	V

PK-U - Maximum Peak

ADV - Linear Voltage Average

DATE: 2020-09-22 IC: 20631-30317

<sup>\* -</sup> indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band \*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

# **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				

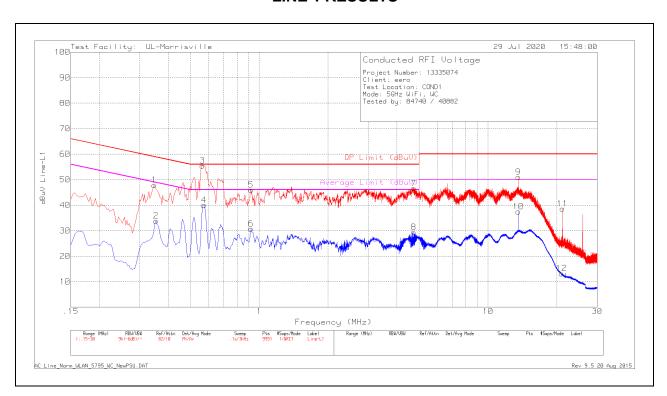
Decreases with the logarithm of the frequency.

## **RESULTS**

DATE: 2020-09-22

## 10.1. AC POWER LINE HOST

#### **LINE 1 RESULTS**



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	.348	38.09	Pk	.1	9.7	47.89	59.01	-11.12	-	-
2	.354	24.07	Αv	.1	9.7	33.87	-	-	48.87	-15
3	.56179	43.77	Qp	.1	9.8	53.67	56	-2.33	-	-
4	.56833	30.39	Ca	.1	9.8	40.29	-	-	46	-5.71
5	.921	36.19	Pk	0	9.8	45.99	56	-10.01	-	-
6	.921	21	Av	0	9.8	30.8	-	-	46	-15.2
7	4.731	36.61	Pk	.1	9.9	46.61	56	-9.39	-	-
8	4.731	19.43	Av	.1	9.9	29.43	-	-	46	-16.57
9	13.563	40.95	Pk	.1	10	51.05	60	-8.95	-	-
10	13.56	27.36	Αv	.1	10	37.46	-	-	50	-12.54
11	21.147	28.31	Pk	.2	10.1	38.61	60	-21.39	-	-
12	20.946	2.94	Αv	.2	10.1	13.24	-	-	50	-36.76

Pk - Peak detector

Av - Average detection

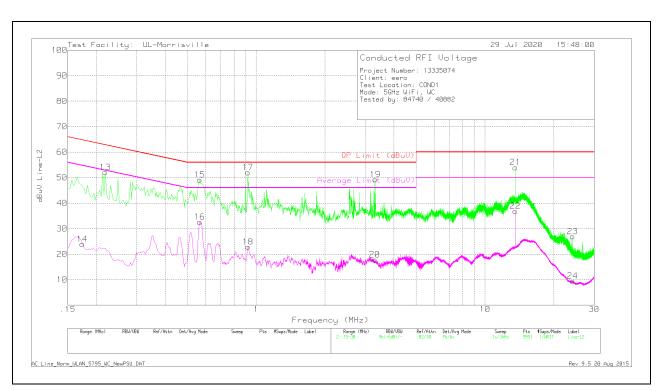
Qp - Quasi-Peak detector

Ca - CISPR average detection

NOTE: Markers 9 and 10, 13.56MHz is an external NFC signal unrelated to the EUT.

DATE: 2020-09-22

# **LINE 2 RESULTS**



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	.219	42.33	Pk	.1	9.7	52.13	62.86	-10.73	-	-
14	.174	14.09	Αv	.2	9.7	23.99	-	-	54.77	-30.78
15	.567	39.35	Pk	0	9.8	49.15	56	-6.85	-	-
16	.567	22.86	Αv	0	9.8	32.66	-	-	46	-13.34
17	.91938	23.74	Qp	0	9.8	33.54	56	-22.46	-	-
18	.921	13.07	Αv	0	9.8	22.87	-	-	46	-23.13
19	3.318	39.47	Pk	0	9.8	49.27	56	-6.73	-	-
20	3.297	8.09	Av	0	9.8	17.89	-	-	46	-28.11
21	13.5626	37.63	Qp	.1	10	47.73	60	-12.27	-	-
22	13.56	26.76	Αv	.1	10	36.86	-	-	50	-13.14
23	24.129	16.56	Pk	.2	10.2	26.96	60	-33.04	-	-
24	24.132	88	Av	.2	10.2	9.52	-	-	50	-40.48

Pk - Peak detector

Av - Average detection

Qp - Quasi-Peak detector

NOTE: Markers 21 and 22, 13.56MHz is an external NFC signal unrelated to the EUT.

DATE: 2020-09-22

#### 11. **SETUP PHOTOS**

Please refer to R13335074-EP1 for setup photos.

# **END OF TEST REPORT**

DATE: 2020-09-22