

FCC Part 15, Subpart C, Section 15.247 Test Report

Put Us To The Test"

On

Communications Management Unit FCC ID: 2ADEPCMUE6-B

Customer Name:	IONX, LLC
Customer P.O:	4500634649
Date of Report:	May 7, 2020
Test Report No:	R-3053P-1
Test Start Date:	July 17, 2019
Test Finish Date:	July 22, 2019
Test Technician:	M. Nowak, S. Macdonald
Approved By:	D. Rybicki
Report Prepared By:	P. Harris
NB1000	4



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### **Technical Information**

Report Number:	R-3053P-1
Customer:	IONX, LLC
Address:	300 Willowbrook Lane, Suite 320
	West Chester, PA 19382
Manufacturer:	IONX, LLC
Manufacturer Address:	300 Willowbrook Lane, Suite 320
_	West Chester, PA 19382
Test Sample:	Communications Management Unit
Model Number:	CMU-E6X
FCC ID:	2ADEPCMUE6-B
Туре:	2.405 to 2.480 GHz Frequency Hopping Spread Spectrum Transceiver
Power Requirements:	7.2 V Provided by 8 D Lithium Thionyl Chloride Batteries
Frequency of Operation:	2405 - 2480 MHz
Equipment Class:	DSS
Equipment Use:	Mobile

#### **Test Specification:**

FCC Rules and Regulations Part 15, Subpart C, Section 15.247

Test Procedure:

ANSI C63.10:2013

#### Test Facility:

Retlif Testing Laboratories 3131 Detwiler Road Harleysville, PA 19438

FCC Designation Number: US2321

#### Table 1 - Tests Performed

FCC Part 15, Subpart C	Test Method
15.247(a)(1)	Channel Separation
15.247(a)(2)	Occupied Bandwidth
15.247(b)(3)	Power Output
15.247(d)	Antenna Port, Conducted Emissions
15.247(a)(1)(iii)	Number of Channels and Occupancy Time
15.247(d)	Spurious Emissions, 30 MHz to 25 GHz
15.247(d)/15.209(a)	Field Strength of Spurious Emissions (Digital Device)

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#### **Certification and Signatures**

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

Arik L. Warwick Senior Test Technician

David M. Rybicki Laboratory Supervisor

#### **Non-Warranty Provision**

The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

#### Non-Endorsement

This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This report must not be used by the client to claim product endorsement by ANSI National Accreditation Board (ANAB).



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# **Requirements and Test Results**

### **Requirement:**

# FCC Section 15.247 (a)(1), Channel Separation and 20 dB Bandwidth

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

#### **Results:**

• The carrier frequencies were separated by greater than the maximum 20 dB Occupied Bandwidth, which complies with the requirements specified above.

# FCC Section 15.247 (a)(1)(iii), Number of Channels and Occupancy Time

Frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

#### **Results:**

• The Frequency Hopping System used 15 channels of operation and had an average time of occupancy on any channel less than 0.4 seconds within a period of six (6) seconds.



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# Requirements and Test Results (con't)

# FCC Section 15.247 (b)(1) and (4), Peak Conducted Output Power

(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

(4) The conducted output power limit specified in Paragraph (b) of Section 15.247 is based on the use of antenna with directional gains that do not exceed 6 dBi. Except as shown in Paragraph (c) of Section 15.247, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in Paragraph (b)(1), (b)(2) and (b)(3) of Section 15.247, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

# **Results:**

• The peak conducted output power was less than 0.125 W and contains an antenna with a directional gain of 6 dBi or less.

# FCC Section 15.247(d) – Unwanted Emissions, Antenna Terminal Out of Band / Band Edge Conducted Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Paragraph (b)(3) of Section 15.247, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

#### Results:

• All measured out of band/band edge conducted emissions were below the specified limits and the device was found to meet the requirements of 15.247 (d).



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# Requirements and Test Results (con't)

# FCC Section 15.247 (d), Spurious Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Paragraph (b)(3) of Section 15.247, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

# FCC Section 15.247 (a), Field Strength of Spurious Radiation

Operation under the provisions of Section 15.247 is limited to frequency hopping and digitally modulated intentional radiators that comply with the provisions stated in Section 15.247(a)(1).

### FCC Section 15.209(a), Radiated Emission Limits, General Requirements

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in Table 2.

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 to 88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960	500	3

#### Table 2 - Radiated Emission Limits

#### **Results:**

• The field strength of spurious radiated emissions did not exceed the limits specified in Table 2.



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# Requirements and Test Results (con't)

#### FCC Section 15.247 (i), RF Exposure Limits

Spread Spectrum Transmitters operating under 15.247 are categorically excluded from routine environmental evaluation for demonstrating RF exposure compliance with respect to MPE or SAR limits however per 15.247(i) must be operated in a manner that ensures the public is not exposed to RF energy levels in excess of the commission's guidelines. The user/installation manual contains the proper cautionary statements and specifies that the device be installed and operated so that a minimum separation distance of 20 cm will be maintained. Based on the transmitter power and maximum antenna gain (see calculation below) the 20 cm separation distance exceeds the calculated distance for acceptable MPE power density levels to meet both the Occupational/Controlled Exposure and the General Population/Uncontrolled Exposure requirements of FCC Part 1.1310. The calculation below uses the more stringent General Population MPE Limits.

$$S = \frac{PG}{4\pi D^2}$$

D = Minimum Separation Distance (cm)

S = Max Allowed Power Density (mW/cm<sup>2</sup>)

P = Max Power Input to Antenna (dBm or mW)

G = Max Power Gain of Antenna (dBi or numeric)

	Cellular Modem		Eterna Manager		Mote	
S	0.57 mW/cm	2	1 mW/cm <sup>2</sup>		1 mW/cm <sup>2</sup>	
Р	31.5 dBm	1.413 W	8 dBm	6.31 mW	15 dBm	31.62 mW
G	2.5 dBi	1.78 numeric	5 dBi	3.16 numeric	3.5 dBi	2.24 numeric

Note: The Eterna Manager and Mote equations below are for the worst-case 2405 - 2480 MHz transmitter of each, while the Cellular Modem equation below based on information found under the modular approval for FCC ID RI7ME910C1WW.

# Solving for D:

Cellular Modem	Eterna Manager	Mote
$0.57 = \frac{1413x1.78}{4\pi D^2} = \frac{2515.14}{12.57D^2}$	$1 = \frac{6.31x3.16}{4\pi D^2} = \frac{19.94}{12.57D^2}$	$1 = \frac{31.62x2.24}{4\pi D^2} = \frac{70.83}{12.57D^2}$
$D^2 = \frac{2515.14}{12.57x0.57}$	$D^2 = \frac{19.94}{12.57x1}$	$D^2 = \frac{70.83}{12.57x1}$
$D = \sqrt{\frac{2515.14}{7.16}} = \sqrt{351.28}$	$D = \sqrt{\frac{19.94}{12.57}} = \sqrt{1.59}$	$D = \sqrt{\frac{70.83}{12.57}} = \sqrt{5.63}$
$D = 18.74 \ cm$	$D = 1.26 \ cm$	$D = 2.37 \ cm$

#### Max % MPE - 89.0%\*

\*In accordance with KDB 447498 D01 v06, section 7.2 Transmitters used in mobile device exposure conditions for simultaneous transmission operations, excel spreadsheet for simple antenna configurations.



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# **Equipment Lists**

#### FCC Section 15.247(a)(1) Channel Separation

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360- 50U50U	10/5/2018	10/31/2019
8172	NARDA MICROWAVE	ATTENUATOR, STEP	0-60 dB, DC - 18 GHz, 2 W	743-60	3/8/2019	3/31/2020
8619	OMEGA	HYGROMETER	-20 to 70°C,0-99% RH	OM-73	9/11/2018	9/30/2019

#### FCC Section 15.247(a)(1) Occupied Bandwidth

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713E	MICRO-COAX	CABLE, COAXIAL	6 FEET	UFB311A1-0720- 50U50U	10/9/2018	10/31/2019
8496	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 11 GHz, 20 W	768-10	6/11/2019	6/30/2020

# FCC Section 15.247 (a)(1)(iii) Number of Channels and Occupancy Time

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360- 50U50U	10/5/2018	10/31/2019
8172	NARDA MICROWAVE	ATTENUATOR, STEP	0-60 dB, DC - 18 GHz, 2 W	743-60	3/8/2019	3/31/2020
8619	OMEGA	HYGROMETER	-20 to 70°C,0-99% RH	OM-73	9/11/2018	9/30/2019

#### FCC Section 15.247 (b)(3) Peak Conducted Output Power

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360- 50U50U	10/5/2018	10/31/2019
8172	NARDA MICROWAVE	ATTENUATOR, STEP	0-60 dB, DC - 18 GHz, 2 W	743-60	3/8/2019	3/31/2020
8619	OMEGA	HYGROMETER	-20 to 70°C,0-99% RH	OM-73	9/11/2018	9/30/2019

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# FCC Section 15.247 (d) Spurious Emissions, 30 MHz to 25 GHz

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
127A	ETS / EMCO	ANTENNA, BICONICAL	20 - 200 MHz	3104	5/6/2019	11/30/2020
3207	ETS / EMCO	ANTENNA, ACTIVE LOOP	9 kHz - 30 MHz	6502	5/13/2019	5/31/2020
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360- 50U50U	10/5/2018	10/31/2019
713E	MICRO-COAX	CABLE, COAXIAL	6 FEET	UFB311A1-0720- 50U50U	10/9/2018	10/31/2019
8016	ETS / EMCO	ANTENNA, LOG PERIODIC	200 MHz - 1 GHz	3146	2/7/2018	8/31/2019
8018	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3115	5/11/2018	11/30/2019
8300	RETLIF	OPEN AREA TEST SITE, ATTENUATION	3/10 Meter OATS	RPA	3/28/2018	3/31/2020
8300C	UNKNOWN	CABLE, COAXIAL	3/10 METER	3 METER CABLE	10/30/2018	10/31/2019
8317	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5 GHz, 30 dB	8449B	5/28/2019	5/31/2020
8337	MICROLAB / FXR	ANTENNA, HIGH GAIN HORN	18 - 26.5 GHz	K638AF	No Calibratio	n Required
8644	AGILENT / HP	ANALYZER, SPECTRUM	100 Hz - 22 GHz	85662A	9/18/2018	9/30/2019
8644A	AGILENT / HP	ANALYZER, SPECTRUM	100 Hz - 22.5 GHz	8566B	9/18/2018	9/30/2019
8644B	AGILENT / HP	ANALYZER, RF PRESELECTOR	20 Hz - 2 GHz	85685A	9/28/2018	9/30/2019
8644C	AGILENT / HP	ANALYZER, QUASI-PEAK ADAPTOR	100 Hz - 22 GHz	85650A	9/24/2018	9/30/2019

# FCC Section 15.247 (d) Antenna Port, Conducted Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360- 50U50U	10/5/2018	10/31/2019
8172	NARDA MICROWAVE	ATTENUATOR, STEP	0-60 dB, DC - 18 GHz, 2 W	743-60	3/8/2019	3/31/2020
8457	GENERAL TECHNICS	COMPUTER, CONTROL	N/A		No Calibration	n Required



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# FCC Section 15.247 (d) / 15.209(a) Field Strength of Spurious Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
127A	ETS / EMCO	ANTENNA, BICONICAL	20 - 200 MHz	3104	5/6/2019	11/30/2020
3207	ETS / EMCO	ANTENNA, ACTIVE LOOP	9 kHz - 30 MHz	6502	5/13/2019	5/31/2020
713	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 26.5 GHz	ESIB26	3/25/2019	3/31/2020
713D	MICRO-COAX	CABLE, COAXIAL	3 FT.	UFB311A1-0360- 50U50U	10/5/2018	10/31/2019
713E	MICRO-COAX	CABLE, COAXIAL	6 FEET	UFB311A1-0720- 50U50U	10/9/2018	10/31/2019
8016	ETS / EMCO	ANTENNA, LOG PERIODIC	200 MHz - 1 GHz	3146	2/7/2018	8/31/2019
8018	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3115	5/11/2018	11/30/2019
8300	RETLIF	OPEN AREA TEST SITE, ATTENUATION	3/10 Meter OATS	RPA	3/28/2018	3/31/2020
8300C	UNKNOWN	CABLE, COAXIAL	3/10 METER	3 METER CABLE	10/30/2018	10/31/2019
8317	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5 GHz, 30 dB	8449B	5/28/2019	5/31/2020
8337	MICROLAB / FXR	ANTENNA, HIGH GAIN HORN	18 - 26.5 GHz	K638AF	No Calibratio	n Required
8644	AGILENT / HP	ANALYZER, SPECTRUM	100 Hz - 22 GHz	85662A	9/18/2018	9/30/2019
8644A	AGILENT / HP	ANALYZER, SPECTRUM	100 Hz - 22.5 GHz	8566B	9/18/2018	9/30/2019
8644B	AGILENT / HP	ANALYZER, RF PRESELECTOR	20 Hz - 2 GHz	85685A	9/28/2018	9/30/2019
8644C	AGILENT / HP	ANALYZER, QUASI-PEAK	100 Hz - 22 GHz	85650A	9/24/2018	9/30/2019



**Retlif Testing Laboratories** 

FCC Section 15.247(a)(1) Test Data, Channel Separation



Retlif Testing Laboratories



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FCC Section 15.247(a)(1) Test Data, Occupied Bandwidth



**Retlif Testing Laboratories** 

















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FCC Section 15.247 (a)(1) )(iii) Test Data, Number of Channels and Occupancy Time



**Retlif Testing Laboratories** 







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FCC Section 15.247 (b)(3) Test Data, Peak Conducted Output Power



Retlif Testing Laboratories

	EMISSIONS TEST DATA SHEET
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3)
Method:	ANSI C63.10, Section 7.8.5 Output power test procedure for frequency hopping spread-spectrum (FHSS) devices
Job Number/Customer:	R – 3053P-1 / IONX, LLC
Test Sample:	Communications Management Unit
Model Number:	CMU-E6X
Part Number:	PCBACE-06-NA-4-0-1 Rev A
Serial Number:	0014
Operating Mode:	Transmitting modulated signal at 2.405 GHz
Technician:	S. Macdonald
Date(s):	7/09/19
Temperature:	22.6 °C
Relative Humidity:	50.9 %
Notes:	Peak Power Output = 2.77 dBm



**Retlif Testing Laboratories** 

	EMISSIONS TEST DATA SHEET
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3)
Method:	ANSI C63.10, Section 7.8.5 Output power test procedure for frequency hopping spread-spectrum (FHSS) devices
Job Number/Customer:	R – 3053P-1 / IONX, LLC
Test Sample:	Communications Management Unit
Model Number:	CMU-E6X
Part Number:	PCBACE-06-NA-4-0-1 Rev A
Serial Number:	0014
Operating Mode:	Transmitting modulated signal at 2.440 GHz
Technician:	S. Macdonald
Date(s):	7/09/19
Temperature:	22.6 °C
Relative Humidity:	50.9 %
Notes:	Peak Power Output = 2.76 dBm



	EMISSIONS TEST DATA SHEET
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3)
Method:	ANSI C63.10, Section 7.8.5 Output power test procedure for frequency hopping spread-spectrum (FHSS) devices
Job Number/Customer:	R – 3053P-1 / IONX, LLC
Test Sample:	Communications Management Unit
Model Number:	CMU-E6X
Part Number:	PCBACE-06-NA-4-0-1 Rev A
Serial Number:	0014
Operating Mode:	Transmitting modulated signal at 2.480 GHz
Technician:	S. Macdonald
Date(s):	7/09/19
Temperature:	22.6 °C
Relative Humidity:	50.9 %
Notes:	Peak Power Output = 4.5 dBm







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FCC Section 15.247 (d) Test Data, Antenna Port, Conducted Emissions



**Retlif Testing Laboratories** 



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FCC Section 15.247 (a) / 15.209(a) Test Data, Field Strength of Spurious Emissions



**Retlif Testing Laboratories** 

FCC Part 15, Subpart C, Section 15.209 (d) Test Data, Radiated Emissions, 9 kHz to 25 GHz



**Retlif Testing Laboratories** 

		EMI	SSIONS -	TEST DAT		Т		
Test	Specification					• tod Emission		
Test	Specification	I. FCC Part	ro, Subpart C	, Section 15.2	209(u), Radia		5	
	Method	1: ANSI C63.	10, Section 6	6, Standard Te	st Methods			
Job Numb	per/Custome	r: R – 3053P	<u>-1 / IONX, LL</u>	<u>_C</u>				
	Test Sample		ations Manag	gement Unit				
IVI	Odel Numbe							
		r: E6B00100						
 	erating Mode	Continuous	ob sly Transmitti	ing Cellular M	odem and 24	GHz Radio	Simultaneous	lv.
00	Techniciar	. M Nowak	Siy mansinitti	ing Cendiar Int			Simulaneous	i y
	Date(s	07/19/19						
	Temperature	<b>27.2 °C</b>						
Relat	tive Humidity	/: 78.0 %						
	Detecto	r: Quasi-pea	k					
	Test Distance	e: 3m						
Noise floor m	neasurement,	minimum sens	sitivity of mea	surement syst	tem.			
Frequency	aneasurement, Antenna Position	minimum sens EUT Orientation	sitivity of mea Meter Reading	Correction	tem. Corrected Reading	Converted to 300m	Converted Reading	Limit at 300m
Frequency MHz	Antenna Position (Par/Perp) / Height	EUT Orientation Degrees	sitivity of mea Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted to 300m dBuV/m	Converted Reading uV/m	Limit at 300m uV/m
Frequency MHz	Antenna Position (Par/Perp) / Height	EUT Orientation Degrees	sitivity of mea Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted to 300m dBuV/m	Converted Reading uV/m	Limit at 300m uV/m 266.67
Frequency MHz	Antenna Position (Par/Perp) / Height	minimum sens         EUT         Orientation         Degrees	sitivity of mea Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted to 300m dBuV/m	Converted Reading uV/m	Limit at 300m uV/m 266.6' I
Frequency MHz 0.009 0.490	Antenna Position (Par/Perp) / Height	EUT Orientation Degrees	sitivity of mea Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted to 300m dBuV/m	Converted Reading uV/m	Limi at 300n uV/n 266.6' I 4.89
Frequency 0.009 0.490	Antenna Position (Par/Perp) / Height Antenna Position	minimum sens	Meter Reading dBuV Meter Reading	Correction Factor dB Correction Factor	corrected Reading dBuV/m Corrected Reading	Converted to 300m dBuV/m Converted to 30m	Converted Reading uV/m Converted Reading	Limi at 300m uV/n 266.6 1 4.89 Limi at 30r
Frequency MHz 0.009 0.490 Frequency MHz	Antenna Position (Par/Perp) / Height Antenna Position (Par/Perp) / Height	minimum sens         EUT         Orientation         Degrees         EUT         Orientation         Begrees         Degrees	Meter Reading dBuV Meter Reading dBuV	Correction Factor dB Correction Factor dB Correction Factor dB	tem. Corrected Reading dBuV/m Corrected Reading dBuV/m	Converted to 300m dBuV/m Converted to 30m dBuV/m	Converted Reading uV/m Converted Reading uV/m	Limi at 300n uV/n 266.6 <sup>°</sup> I 4.89 Limi at 30r uV/n
Frequency MHz 0.009 0.490 Frequency MHz 0.490	Antenna Position (Par/Perp) / Height Antenna Position (Par/Perp) / Height	minimum sens	Meter Reading dBuV Meter Reading dBuV	Correction Factor dB Correction Factor Correction Factor dB	tem. Corrected Reading dBuV/m Corrected Reading dBuV/m	Converted to 300m dBuV/m Converted to 30m dBuV/m	Converted Reading uV/m Converted Reading uV/m	Limi at 300m uV/n 266.6 1 4.89 Limi at 30r uV/n 48.98
Frequency MHz 0.009 0.490 Frequency MHz 0.490	Antenna Position (Par/Perp) / Height Antenna Position (Par/Perp) / Height	minimum sens	Meter Reading dBuV Meter Reading dBuV	Correction Factor dB Correction Factor Correction Factor dB	tem. Corrected Reading dBuV/m Corrected Reading dBuV/m	Converted to 300m dBuV/m Converted to 30m dBuV/m	Converted Reading uV/m Converted Reading uV/m	Limi at 300n uV/n 266.6 I 4.89 Limi at 30r uV/n 48.98 I
Noise floor m           Frequency           MHz           0.009                       0.490           Frequency           MHz           0.190                       0.490                       0.490                       1.705	Antenna Position (Par/Perp) / Height Antenna Position (Par/Perp) / Height	minimum sense	Meter Reading dBuV Meter Reading dBuV	Correction Factor dB Correction Factor Gorrection Factor dB	tem. Corrected Reading dBuV/m Corrected Reading dBuV/m	Converted to 300m dBuV/m Converted to 30m dBuV/m	Converted Reading uV/m Converted Reading uV/m	Limi at 300n uV/n 266.6' I 4.89 Limi at 30r uV/n 48.98 I 14.08
Noise floor m           Frequency           MHz           0.009                       0.490           Frequency           MHz           0.490           I.705           1.705	Antenna Position (Par/Perp) / Height Antenna Position (Par/Perp) / Height	minimum sense EUT Orientation Degrees COTIENTION Degrees	Meter Reading dBuV Meter Reading dBuV	Correction Factor dB Correction Factor Correction Factor dB	tem. Corrected Reading dBuV/m Corrected Reading dBuV/m	Converted to 300m dBuV/m Converted to 30m dBuV/m	Converted Reading uV/m Converted Reading uV/m	Limi at 300n uV/n 266.6' I 4.89 Limi at 30r uV/n 48.98 I 14.08 30.00
Noise floor m           Frequency           MHz           0.009                       0.490           Frequency           MHz           0.490                       1.705           1.705	Antenna Position (Par/Perp) / Height Antenna Position (Par/Perp) / Height	minimum sens	Meter Reading dBuV Meter Reading dBuV	Correction Factor dB Correction Factor Correction Factor dB	tem. Corrected Reading dBuV/m Corrected Reading dBuV/m	Converted to 300m dBuV/m Converted to 30m dBuV/m	Converted Reading uV/m Converted Reading uV/m	Limi at 300m uV/n 266.6 I 4.89 Limi at 30r uV/n 48.98 I 14.08 30.00



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**Retlif Testing Laboratories** 

Report No. R-3053P-1

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\*25.00

30.00

Par / 1.00

180.0

		EMISS	IONS TES	ST DATA S	HEET		
Test	Specification:	FCC Part 15,	Subpart C, Se	ction 15.209(d)	, Radiated Emi	ssions	
	Method:	ANSI C63.10.	Section 6. Sta	undard Test Me	thods		
Job Num	ber/Customer:	R = 3053P-1/					
000 114111	Test Sample:		ns Manageme	nt I Init			
N	Indel Number:		ns manageme				
	Part Number:		1011				
	arial Number:		4011				
 	orating Model	Continuouolu		allular Madam	and 2 4 CH- D	adia Simultanaa	
Op	Tochnician:	M Nowok					Jusiy
		1VI. INOWAK					
	Date(S):	07/19/19					
Dala	Temperature:	27.2 °C					
Rela	tive Humidity:	/8.0 %					
-	Detector:	Quasi-peak					
	lest Distance:	3m					
						<u> </u>	
Frequency	Antenna Pol /Height	EUT Orientation	Meter Reading	Factor	Reading	Converted Reading	Limit
MHz	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
30.00							100
Ι							Ι
*35.00	H / 1.00	180.0	0.1	12.5	12.6	4.27	Ι
Ι							Ι
88.00							100
88.00							150
							Ι
Ι	<b>TT</b> / 1 00	100.0		12.0	10 1	8.04	Ι
I *110.00	H / 1.00	180.0	4.9	13.2	10.1	0.04	
I *110.00 I	H / 1.00	180.0	4.9	15.2	10.1	0.04	Ι
I *110.00 I *195.00	H / 1.00 H / 1.00	180.0	-0.6	13.2	18.2	8.13	I I
I *110.00 I *195.00 I	H / 1.00 H / 1.00	180.0	-0.6	18.8	18.2	8.13	I I I
I *110.00 I *195.00 I *215.00	H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0	4.9 -0.6 3.5	13.2	18.2	8.13 6.77	I I I I
I *110.00 I *195.00 I *215.00 I	H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0	-0.6 3.5	13.2 18.8 13.1	18.1	8.13 6.77	I I I I I
I *110.00 I *195.00 I *215.00 I 216.00	H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0	4.9 -0.6 3.5	13.2 18.8 13.1	18.2	8.13	I I I I 150
I *110.00 I *195.00 I *215.00 I 216.00 216.00	H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0	4.9 -0.6 3.5	13.2 18.8 13.1	18.2	8.13 6.77	I I I I 150 200
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I	H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0	4.9 -0.6 3.5	13.2 18.8 13.1	18.2	8.13 6.77	I I I 150 200 I
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00	H / 1.00 H / 1.00 H / 1.00		-0.6 3.5	13.2	18.2	8.13 6.77	I I I 150 200 I I
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I	H / 1.00 H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0 180.0 180.0 180.0	-0.6 3.5 -0.6	13.2 18.8 13.1 22.6	18.1 18.2 16.6 22.0	8.13 6.77 12.59	I I I I 150 200 I I I I
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I 960.00	H / 1.00 H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0 180.0 180.0 180.0	-0.6 3.5 -0.6	13.2 18.8 13.1 22.6	18.1 18.2 16.6 22.0	8.13 6.77 12.59	I I I 150 200 I I I I 200
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I 960.00 960.00	H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0 180.0 180.0 180.0	4.9 -0.6 3.5 -0.6	13.2 18.8 13.1 22.6	18.1 18.2 16.6 22.0	8.13 6.77 12.59	I I I 150 200 I I I 1 200 500
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I \$605.00 I 960.00 960.00	H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00		4.9 -0.6 3.5 -0.6	13.2 18.8 13.1 22.6	18.1 18.2 16.6 22.0	8.13 6.77 12.59	I I I 150 200 I I I 1 200 500
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I \$605.00 I 960.00 960.00 I \$995.00	H / 1.00 H / 1.00 H / 1.00 H / 1.00		4.9 -0.6 3.5 -0.6	13.2 18.8 13.1 22.6 20.6	18.1 18.2 16.6 22.0 27.6	8.13 6.77 12.59	I I I 150 200 I I I 200 500 I I I
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I *605.00 I 960.00 960.00 I *995.00	H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0 180.0 180.0 180.0 180.0	-0.6 3.5 -0.6 -2.0	13.2 18.8 13.1 22.6 29.6	18.1 18.2 16.6 22.0 27.6	8.13 6.77 12.59 23.99	I I I I 150 200 I I I I I I I I I I I I
I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I \$605.00 I \$960.00 960.00 I \$995.00 I 1 000.00	H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	180.0 180.0 180.0 180.0 180.0 180.0 180.0	4.9 -0.6 3.5 -0.6 -2.0	13.2 18.8 13.1 22.6 29.6	18.1 18.2 16.6 22.0 27.6	8.13 6.77 12.59 23.99	I I I I 150 200 I I I 200 500 I I I I I I

		EMISS	SIONS TES	<u>ST DATA S</u>	HEET		
Test	Specification:	FCC Part 15,	Subpart C, Se	ction 15.209(d)	, Radiated Emi	ssions	
	Method	ANSI C63 10	Section 6 Sta	andard Test Me	thods		
Job Num	ber/Customer:	R – 3053P-1 /	IONX. LLC				
	Test Sample:	Communicatio	ons Manageme	ent Unit			
N	lodel Number:	CMU-E6X					
	Part Number:	C06L8NC-NA	4011				
5	Serial Number:	E6B001000B					
Op	perating Mode:	Continuously	Transmitting C	Cellular Modem	and 2.4 GHz R	adio Simultaneo	ously
	Technician:	M. Nowak					
	Date(s):	07/22/19					
	Temperature:	27.2 °C					
Rela	tive Humidity:	78.0 %					
	Detector:	Peak					
	Test Distance:	3m					
*Noise floor r	neasurement, r	ninimum sensitiv	ity of measure	ment system,			
*Noise floor r	Antenna	ninimum sensitiv	Meter	Correction	Corrected	Converted	Limit
Frequency	Antenna Pol /Height	EUT Orientation	ity of measure Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
Frequency GHz	Antenna Pol /Height	EUT Orientation	ity of measure Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted Reading uV/m	Limit uV/m
Frequency GHz	Antenna Pol /Height	EUT Orientation	Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted Reading uV/m	Limit uV/m 500 I
Frequency GHz 1.0 +1.05	Antenna Pol /Height (V/H) / (m)	EUT Orientation Degrees 180.0	Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted Reading uV/m	Limit uV/m 500 I I
Frequency GHz 1.0 +1.05	Antenna Pol /Height (V/H) / (m) H / 1.00	EUT Orientation Degrees 1 180.0	ity of measure Meter Reading dBuV 44.2	Correction Factor dB -9.8	Corrected Reading dBuV/m 34.4	Converted Reading uV/m 52.49	Limit uV/m 500 I I I I
Frequency           GHz           1.0           +1.05           +2.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	EUT Orientation Degrees 180.0 180.0	Meter Reading dBuV 44.2 41.3	Correction Factor dB -9.8 -3.7	Corrected Reading dBuV/m 34.4 37.6	Converted Reading uV/m 52.49 75.86	Limit uV/m 500 I I I I I I
Frequency           GHz           1.0           *1.05                       *2.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	EUT Orientation          EUT Orientation         Degrees         180.0         180.0	Meter Reading dBuV 44.2 41.3	Correction Factor dB -9.8 -3.7	Corrected Reading dBuV/m 34.4 37.6	Converted Reading uV/m 52.49 75.86	Limit uV/m 500 I I I I I I I
Frequency           GHz           1.0           +1.05           +           *1.05           +           *2.95           +           *5.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees 1 180.0 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1	Correction Factor dB -9.8 -3.7 2.1	Corrected Reading dBuV/m 34.4 37.6 42.2	Converted Reading uV/m 52.49 75.86 128.83	Limit <u>uV/m</u> 500 I I I I I I I I I
Frequency           GHz           1.0           *1.05           *2.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00	EUT Orientation  EUT Orientation  Degrees  1 180.0 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1	Correction Factor dB -9.8 -3.7 2.1	Corrected Reading dBuV/m 34.4 37.6 42.2	Converted Reading uV/m 52.49 75.86 128.83	Limit <u>uV/m</u> 500 I I I I I I I I I I I I
Frequency           GHz           1.0           *1.05           *2.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees I I I I I I I I I I I I I I I I I I	Meter Reading dBuV 44.2 41.3 40.1 40.3	Correction Factor dB -9.8 -3.7 2.1 6.1	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4	Converted Reading uV/m 52.49 75.86 128.83 208.93	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r         Frequency         GHz         1.0         *1.05         *2.95                   *5.95                   *10.00         I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees 1 180.0 180.0 180.0 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1 40.3	Correction Factor dB -9.8 -3.7 2.1 6.1	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4	Converted Reading uV/m 52.49 75.86 128.83 208.93	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r         Frequency         GHz         1.0         +         *1.05         +         *5.95         +         *10.00         I         *19.56	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees 1 180.0 180.0 180.0 180.0 180.0 180.0 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1 40.3 42.1	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
Frequency         GHz         1.0         *1.05         *1.05         *1.05         *1.05         *1.05         1         *1.05         1         *1.05         1         *1.05         1         *1.05         1         *1.05         1         *5.95         1         *10.00         I         *19.56         I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees 1 180.0	ity of measure           Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06	Limit uV/m 500 I I I I I I I I I I I I I
Frequency         GHz         1.0         *1.05         *2.95         *2.95         *10.00         I         *19.56         I         *22.00	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation           EUT Orientation           Degrees           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0	Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
Frequency         GHz         1.0                   *1.05                   *2.95                   *5.95                   *10.00         I         *19.56         I         *22.00         I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees I I I I I I I I I I I I I I I I I I	Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75	Limit uV/m 500 I I I I I I I I I I I I I
Frequency         GHz         1.0                   *1.05                   *2.95                   *5.95                   *10.00         I         *19.56         I         *22.00         I         *24.45	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	Iminimum sensitiv           EUT Orientation           Degrees           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0	ity of measure           Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8           44.4	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9 0.7	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7 45.1	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75 179.89	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
Frequency         GHz         1.0         +1.05         +         *1.05         +         *1.05         +         *1.05         -         *1.05         -         *1.05         -         *1.05         -         *2.95         -         *10.00         I         *19.56         I         *22.00         I         *24.45         I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	EUT Orientation           Degrees           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0           180.0	ity of measure           Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8           44.4	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9 0.7	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7 45.1	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75 179.89	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I



FCC Part 15, Subpart C, Section 15.247 (d) Test Data, Radiated Emissions, 30 MHz to 25 GHz



**Retlif Testing Laboratories** 

		EMIS	SIONS TE	ST DATA	SHEET		
Test	Specification:	FCC Part 15	, Subpart C, S	Section 15.209(	d), Radiated Em	nissions	
	Method:	ANSI C63.10	). Section 6. S	Standard Test N	lethods		
Job Num	ber/Customer:	R – 3053P-1	/ IONX, LLC				
	Test Sample:	Communicat	ions Manager	ment Unit			
R.	Indel Number:	CMU-F6X	iono managoi				
	Part Number:	C06L8NC-N/	A4011				
ç	Serial Number:	E6B001000E	3				
	perating Mode:	Continuously	, Transmitting	Cellular Mode	m and 2.4 GHz	Radio Simultar	
0	Technician:	M Nowak	Transmitting				leously
	Date(s)	07/10/10					
	Tomporaturo:	27.2 °C					
Pola	tivo Humidity:	79.0.%					
INEId	Detector						
	Delector.	Quasi-peak					
are presented *Noise floor r	d. neasurement, n	ninimum sensiti	vity of measu	rement system	3		
Frequency	Antenna Pol /Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
MHz 30.00	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m 100
MHz 30.00 I	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m 100 I
MHz 30.00 I *35.00	(V/H) / (m) H / 1.00	Degrees	dBuV 0.1	dB 12.5	dBuV/m 12.6	4.27	uV/m 100 I I
MHz 30.00 I *35.00 I	(V/H) / (m) H / 1.00	Degrees	dBuV 0.1	dB 12.5	dBuV/m 12.6	<u>uV/m</u> 4.27	uV/m 100 I I I I
MHz 30.00 I *35.00 I 88.00	(V/H) / (m) H / 1.00	Degrees	dBuV 0.1	dB 12.5	dBuV/m	4.27	uV/m 100 I I I I 100
MHz 30.00 I *35.00 I 88.00 88.00	(V/H) / (m) H / 1.00	Degrees	0.1	dB 12.5	dBuV/m	4.27	uV/m 100 I I I 100 150
MHz 30.00 I *35.00 I 88.00 88.00 I I	(V/H) / (m) H / 1.00	Degrees	dBuV 0.1	dB 12.5	dBuV/m	4.27	uV/m 100 I I I 100 150 I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9	dB 12.5	dBuV/m 12.6 18.1	4.27 8.04	uV/m 100 I I I 100 150 I I I I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00	Degrees 180.0 180.0 180.0	dBuV 0.1 4.9	dB 12.5 13.2	dBuV/m  dBuV/m  12.6  13.6  14.1  18.1	<u>uV/m</u> 4.27 8.04	uV/m 100 I I I 100 150 I I I I I I I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees  180.0  180.0  180.0  180.0  180.0	dBuV 0.1 4.9 -0.6	dB 12.5 13.2 18.8	dBuV/m 12.6 13.6 14.1 18.1 18.2	<u>uV/m</u> 4.27 8.04 8.13	uV/m 100 I I I 100 150 I I I I I I I I I I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00 I	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6	dB 12.5 13.2 18.8	dBuV/m 12.6 12.6 18.1 18.2	<u>uV/m</u> 4.27 8.04 8.13	uV/m 100 I I I 100 150 I I I I I I I I I I I I I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00 I *215.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees  180.0  180.0  180.0  180.0  180.0  180.0	dBuV 0.1 4.9 -0.6 3.5	dB 12.5 13.2 18.8 13.1	dBuV/m 12.6 12.6 18.1 18.2 16.6	uV/m 4.27 8.04 8.13 6.77	uV/m           100           I           I           I           100           100           150           I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00 I *215.00 I I	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6 3.5	dB 12.5 13.2 18.8 13.1	dBuV/m 12.6 12.6 18.1 18.2 16.6	uV/m 4.27 8.04 8.13 6.77	uV/m           100           I           I           I           100           I           100           100           100           150           I
MHz           30.00           I           *35.00           I           88.00           88.00           I           *110.00           I           *195.00           I           *215.00           I           216.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6 3.5	dB 12.5 13.2 13.1	dBuV/m  dBuV/m  12.6  12.6  18.1  18.2  16.6	<u>uV/m</u> 4.27 8.04 8.13 6.77	uV/m           100           I           I           I           100           I           100           100           100           150           I
MHz           30.00           I           *35.00           I           88.00           88.00           I           *110.00           I           *195.00           I           *215.00           I           216.00           216.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6 3.5	dB 12.5 13.2 13.1 13.1	dBuV/m 12.6 12.6 18.1 18.2 16.6 16.6	<u>uV/m</u> 4.27 8.04 8.13 6.77	uV/m           100           I           I           I           100           I           100           150           I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00 I *215.00 I 216.00 I I 1 216.00 I I	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6 3.5	dB 12.5 13.2 13.1 13.1	dBuV/m	uV/m 4.27 8.04 8.13 6.77	uV/m           100           I           I           I           100           100           100           150           I
MHz           30.00           I           *35.00           I           88.00           88.00           I           *110.00           I           *195.00           I           *215.00           I           216.00           I           *605.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6 -0.6	dB 12.5 13.2 18.8 13.1 22.6	dBuV/m 12.6 12.6 18.1 18.2 16.6 22.0	uV/m 4.27 8.04 8.13 6.77 12.59	uV/m           100           I           I           I           100           100           100           100           150           I
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I X	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 0.1 4.9 -0.6 3.5 -0.6	dB 12.5 13.2 13.2 18.8 13.1 22.6	dBuV/m 12.6 12.6 18.1 18.2 16.6 22.0	uV/m 4.27 8.04 8.13 6.77 12.59	uV/m           100           I           I           I           100           I           100           150           I
MHz           30.00           I           *35.00           I           88.00           88.00           I           *110.00           I           *195.00           I           *215.00           I           216.00           I           *605.00           I           960.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 0.1 -0.6 -0.6 -0.6	dB 12.5 13.2 13.2 18.8 13.1 22.6	dBuV/m	uV/m 4.27 8.04 8.13 6.77 12.59	uV/m           100           I           I           I           100           I           100           100           100           150           I
MHz           30.00           I           *35.00           I           88.00           88.00           I           *110.00           I           *195.00           I           *215.00           I           216.00           216.00           I           *605.00           I           960.00           960.00	(V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	Degrees	dBuV 0.1 4.9 -0.6 3.5 -0.6	dB 12.5 13.2 13.2 13.1 22.6	dBuV/m 12.6 12.6 18.1 18.1 18.2 16.6 22.0	<u>uV/m</u> 4.27 8.04 8.13 6.77 12.59	uV/m           100           I           I           I           100           I           100           150           I <t< td=""></t<>
MHz           30.00           I           *35.00           I           88.00           88.00           I           *110.00           I           *195.00           I           *215.00           I           216.00           216.00           I           *605.00           I           960.00           J	<pre>(V/H) / (m) (V/H) / (m) (V/H) / (m) (H / 1.00 (H /</pre>	Degrees	dBuV 0.1 4.9 -0.6 3.5 -0.6	dB 12.5 13.2 13.2 13.1 22.6	dBuV/m 12.6 12.6 18.1 18.2 16.6 22.0	uV/m 4.27 8.04 8.13 6.77 12.59	uV/m           100           I           I           I           100           I           100           150           I <t< td=""></t<>
MHz         30.00         I         *35.00         I         88.00         88.00         I         *110.00         I         *195.00         I         *215.00         I         216.00         I         *605.00         I         960.00         I         *995.00	(V/H) / (m) H / 1.00 H / 1.00	Degrees	dBuV 0.1 0.1 4.9 -0.6 -0.6 -0.6 -2.0	dB 12.5 13.2 13.2 18.8 13.1 22.6 22.6	dBuV/m 12.6 12.6 12.6 18.1 18.1 18.2 16.6 22.0 22.0	uV/m           4.27           4.27           8.04           8.13           6.77           12.59           23.99	uV/m           100           I           I           I           100           I           100           150           I <t< td=""></t<>
MHz 30.00 I *35.00 I 88.00 88.00 I *110.00 I *195.00 I *195.00 I *195.00 I *215.00 I 216.00 216.00 I *605.00 I 960.00 960.00 I *995.00 I	<pre>(V/H) / (m) (V/H) / (m) (V/H) / (m) (H / 1.00) (H</pre>	Degrees	dBuV 0.1 4.9 -0.6 -0.6 -0.6 -2.0	dB 12.5 13.2 13.2 18.8 13.1 22.6 22.6	dBuV/m 12.6 12.6 12.6 18.1 18.2 16.6 22.0 22.0	uV/m           4.27           8.04           8.13           6.77           12.59           23.99	uV/m           100           I           I           I           100           I           100           150           I <t< td=""></t<>



		EMISS	IONS TES	<u>ST DATA S</u>	HEET		
Test	Specification:	FCC Part 15,	Subpart C, Se	ction 15.209(d)	, Radiated Emi	ssions	
	Method	ANSI C63 10	Section 6 Sta	andard Test Met	thods		
Job Num	ber/Customer:	R = 3053P-1/			11003		
	Test Sample:	Communicatio	ons Managem	ent Unit			
N	lodel Number:	CMU-E6X	ine managem				
	Part Number:	C06L8NC-NA	4011				
ç	Serial Number:	E6B001000B	-				
Or	erating Mode:	Continuously	Transmitting C	ellular Modem	and 2.4 GHz R	adio Simultaneo	ously
	Technician:	M. Nowak					
	Date(s):	07/22/19					
	Temperature:	27.2 °C					
Rela	tive Humidity:	78.0 %					
	Detector:	Peak					
	Test Distance:	3m					
*Noise floor r	neasurement r	ninimum sensitiv	ity of measure	ment system			
*Noise floor r	neasurement, r	ninimum sensitiv	ity of measure	ment system,	Corrottad	Converted	
*Noise floor r Frequency	Antenna Pol /Height	EUT Orientation	ity of measure Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
*Noise floor r Frequency GHz	Antenna Pol /Height (V/H) / (m)	EUT Orientation	Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted Reading uV/m	Limit uV/m
*Noise floor r Frequency GHz 1.0	Antenna Pol /Height (V/H) / (m)	EUT Orientation Degrees	Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted Reading uV/m	Limit uV/m 500
*Noise floor r Frequency GHz 1.0	Antenna Pol /Height (V/H) / (m)	EUT Orientation Degrees	Meter Reading dBuV	Correction Factor dB	Corrected Reading dBuV/m	Converted Reading uV/m	Limit uV/m 500 I
*Noise floor r Frequency GHz 1.0   *1.05	Antenna Pol /Height (V/H) / (m) H / 1.00	EUT Orientation Degrees 180.0	Meter Reading dBuV 44.2	Correction Factor dB -9.8	Corrected Reading dBuV/m 34.4	Converted Reading uV/m 52.49	Limit uV/m 500 I I I
*Noise floor r Frequency GHz 1.0   *1.05	Antenna Pol /Height (V/H) / (m) H / 1.00	EUT Orientation Degrees 180.0	Meter Reading dBuV 44.2	Correction Factor dB -9.8	Corrected Reading dBuV/m 34.4	Converted Reading uV/m 52.49	Limit uV/m 500 I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	EUT Orientation Degrees 1 1 180.0 1 180.0	Meter Reading dBuV 44.2 41.3	Correction Factor dB -9.8 -3.7	Corrected Reading dBuV/m 34.4 37.6	Converted Reading uV/m 52.49 75.86	Limit uV/m 500 I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.05	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	EUT Orientation Degrees 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3	Correction Factor dB -9.8 -3.7	Corrected Reading dBuV/m 34.4 37.6	Converted Reading uV/m 52.49 75.86	Limit uV/m 500 I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00	EUT Orientation Degrees 1 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1	Correction Factor dB -9.8 -3.7 2.1	Corrected Reading dBuV/m 34.4 37.6 42.2	Converted Reading uV/m 52.49 75.86 128.83	Limit <u>uV/m</u> 500 I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00	EUT Orientation Degrees 180.0 180.0 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1	Correction Factor dB -9.8 -3.7 2.1 6 1	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4	Converted Reading uV/m 52.49 75.86 128.83	Limit <u>uV/m</u> 500 I I I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00 I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation EUT Orientation Degrees 1 1 180.0 180.0 180.0 180.0 180.0 180.0	Meter Reading dBuV 44.2 41.3 40.1 40.3	Correction Factor dB -9.8 -3.7 2.1 6.1	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4	Converted Reading uV/m 52.49 75.86 128.83 208.93	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00 I *19.56	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation          EUT Orientation         Degrees         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0	Meter Reading dBuV 44.2 41.3 40.1 40.3 42.1	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00 I *19.56 I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation Degrees IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06	Limit uV/m 500 I I I I I I I I I I I I I
Frequency         GHz         1.0         +         *1.05         +         *5.95         +         *10.00         I         *19.56         I         *22.00	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation  EUT Orientation  Degrees  180.0  1	ity of measure           Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00 I *19.56 I *22.00 I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation          EUT Orientation         Degrees         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0         180.0	Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00 I *19.56 I *22.00 I *24.45	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00	EUT Orientation  EUT Orientation  Degrees  1 180.0 180	Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8           44.4	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9 0.7	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7 45.1	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75 179.89	Limit <u>uV/m</u> 500 I I I I I I I I I I I I I
*Noise floor r Frequency GHz 1.0   *1.05   *2.95   *5.95   *10.00 I *19.56 I *22.00 I *24.45 I	Antenna Pol /Height (V/H) / (m) H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00 H / 1.00	EUT Orientation  EUT Orientation  Degrees  1 1 180.0 1	Meter Reading           dBuV           44.2           41.3           40.1           40.3           42.1           43.8           44.4	Correction Factor dB -9.8 -3.7 2.1 6.1 2.2 1.9 0.7	Corrected Reading dBuV/m 34.4 37.6 42.2 46.4 44.3 45.7 45.1	Converted Reading uV/m 52.49 75.86 128.83 208.93 164.06 192.75 179.89	Limit uV/m 500 I I I I I I I I I I I I I

