RF Exposure Report

Report No.:	SA170513E01E
FCC ID:	R68XPICO200
Test Model:	xPico 270
Series Model:	xPico 250, xPico 240
Received Date:	Apr. 15, 2019
Test Date:	May 03 to June 03, 2019
Issued Date:	June 14, 2019
Applicant:	Lantronix, Inc.
Address:	7535 Irvine Center Drive, Suite 100 Irvine, California 92618
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location :	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA170513E01E	Original release.	June 14, 2019

1 Certificate of Conformity

Product:	xPico® 200 Series Wi-Fi® IoT Gateway module
Brand:	Lantronix
Test Model:	xPico 270
Series Model:	xPico 250, xPico 240
Sample Status:	ENGINEERING SAMPLE
Applicant:	Lantronix, Inc.
Test Date:	May 03 to June 03, 2019
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Wendy Wu , **Date:** June 14, 2019

Wendy Wu / Specialist

Approved by : , **Date:** June 14, 2019

May Chen / Manager

2 RF Exposure

2.1 Limits For Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Ant Set.	Brand	Model	Antenna Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type	*Cable Length	*Cable Loss(dB)	excluding cable loss Antenna Gain(dBi)
1	Taoglas	GW.71.5153	2.8	2.4~2.4835	Dipole	R-SMA	45mm	1	3.8
			3.8	5.15~5.85				1.7	5.5
	Taoglas	GW.71.5153	2.8	2.4~2.4835			45mm	1	3.8
			3.8	5.15~5.85				1.7	5.5
2	NA	WSS002	1	2.4~2.4835	Dipole	R-SMA	45mm	1	2
			0.3	5.15~5.85				1.7	2
	NA	WSS002	1	2.4~2.5			45mm	1	2
			0.3	5.15~5.25				1.7	2
3	ethertronics	1000668	2.5	2.4~2.4835	PCB	i-pex(MHF)	50mm	NA	NA
			5	5.15~5.85					
	ethertronics	1000668	2.5	2.4~2.4835					
			5	5.15~5.85					
4	ProAnt	PRO-OB-536	0.02	2.4~2.4835	Metal	NA	NA	NA	NA
			3.31	5.15~5.85					

Note:
1. Ant Set 4 only for model: xPico 240.
2. From the above antennas, Ant Set 1, 3 were selected as representative antenna for the test.

2.5 Calculation Result of Maximum Conducted Power

For WLAN:

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	291.743	2.8	20	0.11059	1
5180-5240	17.14	5.0	20	0.01078	1
5260-5320	17.742	5.0	20	0.01116	1
5500-5700	18.836	5.0	20	0.01185	1
5745-5825	32.961	5.0	20	0.02074	1

For Bluetooth:

BT-EDR

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2402-2480	1.125	2.8	20	0.00043	1

BT-LE

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2402-2480	3.436	2.8	20	0.00130	1

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Simultaneously transmission condition:

Condition	Technology	
1	WLAN (2.4GHz)	Bluetooth
2	WLAN (5GHz)	Bluetooth

Condition 1: WLAN 2.4GHz + Bluetooth = 0.11059 / 1 + 0.00130 / 1 = 0.11189
Condition 2: WLAN 5GHz + Bluetooth = 0.02074 / 1 + 0.00130 / 1 = 0.02204
Therefore the maximum calculations of above situations are less than the "1" limit.

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