RF Exposure Evaluation Declaration

FCC ID:	TK4WLE900VX
Applicant:	Compex Systems Pte Ltd
Application Type:	Class II Permissive Change
Product:	802.11ac Dual Band Module
Model No.:	WLE900VX, WLE900VX-I
Brand Name:	COMPEX
FCC Classification:	Unlicensed National Information Infrastructure (UNII) Digital Transmission System (DTS)
FCC Rule Part(s):	FCC Part 2.1091
Result:	Complies

Reviewed By: Jame Yuan

Approved By: Robin Wu

Revision History

Report No.	Version	Description	Issue Date	Note
2208RSU014-U3	Rev. 01	Initial Report	2022-09-27	Valid

Note: This report was based on MRT original report No.1801RSU027-U3. Adding one new antenna information and antenna gain is less than before, so it has no effect on the results.

CONTENTS

1. General Information

1.1. Applicant

Compex Systems Pte Ltd

No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651

1.2. Manufacturer

Compex Systems Pte Ltd

No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**				
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China **Laboratory Location (Suzhou - SIP)** 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China				
	Laboratory Accreditations				
	A2LA: 3628.01		CNAS: L10551		
	FCC: CN1166		ISED: CN0001		
	VCCI:	☐R-20025	☐G-20034	☐C-20020	☐T-20020
		☐R-20141	☐G-20134	☐C-20103	☐T-20104
☐	**Test Site – MRT Shenzhen Laboratory**				
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China				
	Laboratory Accreditations				
	A2LA: 3628.02		CNAS: L10551		
	FCC: CN1284		ISED: CN0105		
☐	**Test Site – MRT Taiwan Laboratory**				
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)				
	Laboratory Accreditations				
	TAF: L3261-190725				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	802.11ac Dual Band Module
Model No.	WLE900VX, WLE900VX-I
Wi-Fi Specification	802.11a/b/g/n/ac
Antenna Information	Refer to section 1.5
Remark: 1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Antenna Details

Original Antenna List

Antenna Type	Manufacturer	Max Directional Gain (dBi)	
		2.4GHz	5GHz
Panel Antenna 1#	Compex Systems Pte Ltd	11.0	--
Panel Antenna 2#	Kenbotong Communication LTD	10.0	10.0
Panel Antenna 3#	Smart Ant Inc	7.0	7.0
Panel Antenna 4#	TAOGLAS Inc	4.5	6.7
Panel Antenna 5#	Compex Systems Pte Ltd	5.0	5.0
Panel Antenna 6#	Compex Systems Pte Ltd	5.0	5.0
Omni Antenna 1#	Kunshan Wavelink Electronic Co., Ltd	2.0	2.0
Omni Antenna 2#	Smart Ant Co., Ltd	2.5	5.0
Omni Antenna 3#	Smart Ant Co., Ltd	3.0	6.0
Omni Antenna 4#	Smart Ant Co., Ltd	2.0	2.0
Omni Antenna 5#	Smart Ant Co., Ltd	5.0	7.0
Omni Antenna 6#	Smart Ant Co., Ltd	3.0	6.0
Omni Antenna 7#	Smart Ant Co., Ltd	2.0	2.0
Omni Antenna 8#	Smart Ant Co., Ltd	4.5	7.0

Add New Antenna

Antenna Type	Manufacturer	Max Directional Gain (dBi)	
		2.4GHz	5GHz
Omni Antenna	Ethertronics Inc	3.6	5.1

Note: The antenna gain is from antenna data sheet provided by the manufacturer.

1.6. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 2.1091 & KDB 447498 D04 Interim General RF Exposure Guidance v01

2. RF Exposure Evaluation

2.1. Test Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

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

Pd is the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Calculated Result

Product	802.11ac Dual Band Module
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to Clause 1.2 of antenna description.

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)
802.11b/g/n	2412 ~ 2462	35.30	0.6741	1
802.11a/n/ac	5180 ~ 5240 5260 ~ 5320 5500 ~ 5720 5745 ~ 5825	35.96	0.7847	1

CONCULISON:

The max Power Density at R (20 cm) = 0.7847mW/cm^2 < 1mW/cm^2

Therefore, the Min Safety Distance is 20cm.

The End