

RF Exposure Report

Report No.: SA190807D08-2

FCC ID: TK4WLE1216V520

Test Model: WLE1216V5-20, WLE1216V5-20-I

Received Date: Aug. 7, 2019

Test Date: Aug. 19 to Sep. 11, 2019

Issued Date: Sep. 16, 2019

Applicant: Compex Systems Pte Ltd

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

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

FCC Registration /
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Release Control Record

Issue No.	Description	Date Issued
SA190807D08-2	Original release.	Sep. 16, 2019

1 Certificate of Conformity

Product: 4x4 Wave-2 802.11ac/a/n Mini PCIe WiFi Module

Equipment Class: Unlicensed National Information Infrastructure TX

Brand: COMPEX

Test Model: WLE1216V5-20, WLE1216V5-20-I

Sample Status: Pre-Production

Applicant: Compex Systems Pte Ltd

Test Date: Aug. 19 to Sep. 11, 2019

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.3 -2002

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 RF characteristics under the conditions specified in this report.

Prepared by :



, **Date:** Sep. 16, 2019

Jessica Cheng / Senior Specialist

Approved by :



, **Date:** Sep. 16, 2019

Rex Lai / Associate Technical Manager

2 General Information

2.1 General Description of EUT

Product	4x4 Wave-2 802.11ac/a/n Mini PCIe WiFi Module
Brand	COMPEX
Test Model	WLE1216V5-20, WLE1216V5-20-I
Status of EUT	Pre-Production
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Output Power	5180 ~ 5240MHz: 92.52mW 5745 ~ 5825MHz: 370.176mW
Antenna Type	Refer to note as below
Antenna Connector	Reverse SMA
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The difference compared with original test report is adding a Platform: Network Security Appliance (Brand: Check Point / Model: V-81W).
2. This report is prepared for FCC class II permissive change.
3. 2.4GHz & 5GHz technologies can transmit at same time.
4. The antenna information is listed as below:(Add new Diploe antenna model: RFDPA171300SBLB801)

Description	Limited Single Modular				Platform: Network Security Appliance (Brand: Check Point / Model: V-81W)	
	5180-5825MHz				2412-2462MHz	5180-5825MHz
Antenna Type	Ant.	Ant.	Ant.	Ant.	Dipole Antenna	Dipole Antenna
	Omni Directional					
Maximum Gain (dBi)	5.0	3.5	4.6	10.0	2.22	4.29
Remark	Original Approved				Additional	

The Platform is authorized for use frequency bands: 2412-2462MHz, 5180-5240MHz and 5745-5825MHz only.

5. The EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	TX FUNCTION
802.11a	1TX
802.11n (20MHz)	4TX
802.11n (40MHz)	4TX
802.11ac (20MHz)	4TX
802.11ac (40MHz)	4TX
802.11ac (80MHz)	4TX

6. Accessory device of Platform as follows.

Brand	Model	Rating
FSP	FSP060-DHAN3	AC I/P : 100-240V ~ 1.8A 50-60Hz DC O/P 12V==5.0A Power cord: AC 2 Pin, Non-shielded DC cable (1.2m) With one Core

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3 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

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 27cm away from the body of the user.

So, this device is classified as **Mobile Device**.

2.4 Calculation Result of Maximum Conducted Power

FCC ID: TK4WLE1216V520 (WLAN 5GHz)

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5180~5240	19.66	10.31	27	0.1084	1
5745~5825	25.68	10.31	27	0.4336	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Directional gain = 4.29dBi + 10log(4) = 10.31dBi

FCC ID: TK4WLE1216V220 (WLAN 2.4GHz)

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	26.00	8.24	27	0.2898	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Directional gain = 2.22dBi + 10log(4) = 8.24dBi

Simultaneously transmitter condition:

FCC ID: TK4WLE1216V220 (WLAN 2.4GHz) + FCC ID: TK4WLE1216V520 (WLAN 5GHz)
 = 0.2898 + 0.4336 = 0.7233

Therefore the maximum calculations of above situations are less than the “1” limit.

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