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Report No.: 1710RSU02003 Report Version: Issue Date: 11-20-2017

RF Exposure Evaluation Declaration

FCC ID: TK4WLE1216V520

APPLICANT: Compex Systems Pte Ltd

Application Type: Certification

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

Model No.: WLE1216V5-20, WLE1216V5-20-I

COMPEX Brand Name:

FCC Classification: Unlicensed National Information Infrastructure (UNII)

Reviewed By : Jame Yuan)

Approved By : Marlinchen

(Marlin Chen)





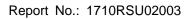
The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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Revision History

Report No.	Version	Description	Issue Date	Note
1710RSU02003	Rev. 01	Initial Report	11-20-2017	Valid



1. PRODUCT INFORMATION

1.1. Equipment Description

4x4 Wave-2 802.11ac/a/n Mini PCIe WiFi Module
WLE1216V5-20, WLE1216V5-20-I
COMPEX
802.11a/n/ac
For 802.11a/n-HT20/ac-VHT20:
5180~5320MHz, 5500~5720MHz, 5745~5825MHz
For 802.11n-HT40/ac-VHT40:
5190~5310MHz, 5510~5710MHz, 5755~5795MHz
For 802.11ac-VHT80:
5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz
802.11a/n/ac: OFDM
802.11a: 22.72dBm
802.11n-HT20: 25.74dBm
802.11n-HT40: 25.82dBm
802.11ac-VHT20: 25.89dBm
802.11ac-VHT40: 25.60dBm
802.11ac-VHT80/802.11ac-VHT80+80: 21.30dBm

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1.2. Antenna Description

No.	Antenna	Manufacturer	Frequency Band	Max Peak Gain (dBi)
			(MHz)	
Wi-Fi External Antenna List (5GHz 4*4 MIMO)				
1# Omni Direction	Omni Directional	Exceltek Electronics Technology	2400 ~ 2500	3.0
	Offini Directional	Co., Ltd.	5150 ~ 5850	5.0
2#	2# Omni Directional	Laird Smart Technology Co., Ltd.	2400 ~ 2500	2.2
2#			5150 ~ 5850	3.5
3# Omi	Omni Directional	Linx Technologies	2400 ~ 2500	2.5
	Onini Directional		5150 ~ 5850	4.6
4#	Omni Directional	Kenbotong Technology Co., Ltd.	5150 ~ 5850	10.0

Note 1: The device didn't support beam-forming technology and Cyclic Delay Diversity (CDD) technology, and the transmit signals are uncorrected, so no add array gain to the band power and band PSD.

Note 2: We selected the max peak gain antenna 4# to perform all RF testing.

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2. RF Exposure Evaluation

2.1. 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	Electric Field	Magnetic Field	Power Density	Average Time
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²)	(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/cm²

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/cm². 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.

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2.2. Test Result of RF Exposure Evaluation

Product	4x4 Wave-2 802.11ac/a/n Mini PCle WiFi Module	
Test Item	RF Exposure Evaluation	

Antenna Gain: Refer to clause 1.2.

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)	Power Density at $R = 20 \text{ cm}$ (mW/cm^2)	Limit (mW/cm²)
802.11a/n/ac	5180 ~ 5240	05.00	0.7722	1
	5260 ~ 5320			
	5500 ~ 5720	25.89		
	5745 ~ 5825			

CONCULISON:

Therefore, the Min Safety Distance R = 20cm.

_____ The End _____