



RF Exposure Evaluation Declaration

FCC ID: TK4WPQ618HV
Applicant: Compex Systems Pte Ltd
Product: Wireless Access Point
Model No.: WPQ618HV, WPQ618LV
Brand Name: COMPEX
FCC Classification: Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s): FCC Part 2.1091
Result: Complies

Reviewed By:

Jame Yuan

Jame Yuan

Approved By:

Robin Wu

Robin Wu



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.

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Revision History

Report No.	Version	Description	Issue Date	Note
2203RSU059-U5	Rev. 01	Initial Report	2022-08-08	Valid

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1. General Information

1.1. Applicant

Complex Systems Pte Ltd

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

1.2. Manufacturer

Complex 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	Wireless Access Point
Model No.	WPQ618HV, WPQ618LV
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Bluetooth Specification	V4.2 dual mode
Antenna Information	Refer to section 1.5
Power Supply	AC/DC Adapter or PoE Adapter
Remark: 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

Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)	CDD Directional Gain (dBi)	
			For Power	For PSD
Wi-Fi Antenna (2*2 MIMO)				
Omni Antenna 1#	2.4 ~ 2.5	8.00	8.00	11.01
	5.15 ~ 5.85	5.00	5.00	8.01
Omni Antenna 2# (P/NO: WD12020258G)	2.4 ~ 2.5	1.91	1.91	4.92
	5.15 ~ 5.85	3.39	3.39	6.40
Omni Antenna 3# (P/NO: 02S00029A)	2.4 ~ 2.5	3.41	3.41	6.42
	5.15 ~ 5.85	3.55	3.55	6.56
Bluetooth Antenna				
Omni-directional	2.4 ~ 2.5	2.00		

Note: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

If all antennas have the same gain, G_{ANT} , Directional gain = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log (N_{ANT} / N_{SS})$ dB = 3.01;
- For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;

1.6. Device Classification

According to the user manual, the antenna of this device is at least 20cm away from the body of the user, this device is classified as a Mobile Device. So, the RF exposure evaluation requirements of § 2.1091 for Mobile device exposure conditions subject to MPE limits.

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

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

P_d 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.

2.2. Test Result

Product	Wireless Access Point
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.5.

Test Mode	Frequency Band (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
Bluetooth	2400 ~ 2483.5	6.69	2.00	8.69
802.11b/g/n/ax	2400 ~ 2483.5	24.76	8.00	32.76
802.11a/n/ac/ax	5150 ~ 5250	22.72	5.00	27.72
802.11a/n/ac/ax	5725 ~ 5850	24.43	5.00	29.43

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Compliance Distance (cm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
Bluetooth	2400 ~ 2483.5	8.69	20.00	0.0015	1
802.11b/g/n/ax	2400 ~ 2483.5	32.76	20.00	0.3756	1
802.11a/n/ac/ax	5150 ~ 5250	27.72	20.00	0.1177	1
802.11a/n/ac/ax	5725 ~ 5850	29.43	20.00	0.1745	1

Note:

Bluetooth, WLAN 2.4GHz Band and WLAN 5GHz can transmit simultaneously.

The max Power Density at R (20.0 cm) = $0.0015\text{mW/cm}^2 + 0.3756\text{mW/cm}^2 + 0.1745\text{mW/cm}^2 = 0.5516\text{mW/cm}^2 < 1\text{mW/cm}^2$.

Appendix A - EUT Photograph

Refer to “2203RSU059-UE” file.

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