




# RF EXPOSURE REPORT



Report No.: 18070600-FCC-H

Applicant	Polygroup Trading Limited	
Product Name	Controller	
Main Model No.	TBC001-24V	
Serial Model No.	N/A	
Test Standard	FCC 2.1091	
Test Date	June 12 to 14, 2018	
Issue Date	June 15, 2018	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification	<input checked="" type="checkbox"/>	
Equipment did not comply with the specification	<input type="checkbox"/>	
		
Aaron Liang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

**SIEMIC (SHENZHEN-CHINA) LABORATORIES**

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## Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

### Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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## 1. Report Revision History

Report No.	Report Version	Description	Issue Date
18070600-FCC-H	NONE	Original	June 15, 2018

## 2. Customer information

Applicant Name	Polygroup Trading Limited
Applicant Add	Unit 606, Fairmont House, 8 Cotton Tree Drive, Central, Hong Kong
Manufacturer	Polygroup Trading Limited
Manufacturer Add	Unit 606, Fairmont House, 8 Cotton Tree Drive, Central, Hong Kong

## 3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Labview of SIEMIC version 2.0

## 4. Equipment under Test (EUT) Information

Description of EUT:	Controller
Main Model:	TBC001-24V
Serial Model:	N/A
Equipment Category :	DTS
Antenna Gain:	WiFi: 2.5dBi
Antenna type :	PCB Antenna
Input Power:	Adapter: Model:TS-48W24V Input:120Vac, 0.83A Output:24Vdc, 2000mA
Trade Name :	Alcidae
Port:	Please refer to the user manual
FCC ID:	2APJZ-TW180427
Type of Modulation:	802.11b/g/n: DSSS, OFDM
RF Operating Frequency (ies):	WiFi: 802.11b/g/n(20M): 2412-2462 MHz
Number of Channels:	WiFi :802.11b/g/n(20M): 11CH

## 5. FCC §2.1091 - Maximum Permissible exposure (MPE)

### 5.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission' s guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

## 5.2 Test Result

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	802.11b	Low	2412	3.69	3±1
		Mid	2437	3.34	3±1
		High	2462	3.46	3±1
	802.11g	Low	2412	2.85	3±1
		Mid	2437	2.95	3±1
		High	2462	3.47	3±1
	802.11n (20M)	Low	2412	3.15	3±1
		Mid	2437	2.89	3±1
		High	2462	3.14	3±1

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

2.4G WIFI:

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 4(dBm)

Maximum output power at antenna input terminal: 2.512(mW)

Prediction distance: >20 (cm)

Predication frequency: 2412 (MHz) Low frequency

Antenna Gain (typical):2.5 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0009(mW/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm<sup>2</sup>)



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0.0009(mW/cm<sup>2</sup>) < 1.0 (mW/cm<sup>2</sup>)

**Result: Pass**