



RF Exposure Evaluation Declaration

FCC ID: 2ACS5-ST12

APPLICANT: Yunee Technology Co., Limited

Application Type: Certification

Product: Radio Controller

Model No.: ST12

Brand Name: YUNEEC

FCC Classification: Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (UNII)

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(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.

Revision History

Report No.	Version	Description	Issue Date
1511RSU00704	Rev. 01	Initial report	12-22-2015

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Radio Controller
Model No.	ST12
Power Type	DC 3.6V
Frequency Range	<p><u>For 2.4GHz Band:</u> Zig-Bee: 2405 ~ 2475 MHz</p> <p><u>For 5.0GHz Band:</u> 802.11a: 5725 ~ 5850MHz</p>
Type of Modulation	<p>802.15.4: OQPSK</p> <p>802.11a: OFDM</p>

1.2. Antenna Description

Antenna Type	Manufacturer	Frequency Band (GHz)	Max Peak Gain (dBi)
Dipole Antenna 1#	Yuneec Technology Co., Limited	2.4	1.71
Dipole Antenna 2#		2.4	1.71
Panel Antenna		5	2.48

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 (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: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

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.

2.2. Test Result of RF Exposure Evaluation

Product	Radio Controller
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to Clause 1.2 of antenna description.

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.15.4	2405 ~ 2475	15.80	0.0112	1
802.11a	5745 ~ 5825	6.80	0.0017	1

CONCLUSION:

Both of the Zig-Bee 2.4GHz and WLAN 5GHz can transmit simultaneously. Therefore, the Max Power Density at R (20 cm) = $0.0112\text{mW/cm}^2 + 0.0017\text{mW/cm}^2 = 0.0129\text{mW/cm}^2 < 1\text{mW/cm}^2$. So the EUT complies with the requirement.

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