

MRT Technology (Suzhou) Co., Ltd Phone: +86-512-66308358 Web: www.mrt-cert.com Report No.: 1910RSU009-U4 Report Version: V01 Issue Date: 10-30-2019

RF Exposure Evaluation Declaration

FCC ID: 2AQYK-WWTMXS

APPLICANT: Shenzhen WOWOTO Technology Co., Ltd.

Application Type: Certification

Product: Smart Projector

Model No.: WWT-M5S

Brand Name: WOWOTO

FCC Classification: Digital Transmission System (DTS)

Unlicensed National Information Infrastructure (NII)

Test Procedure(s): KDB 447498 D01 General RF Exposure Guidance v06

Reviewed By:

Sunny Sun

Approved By:

ilac-MRA



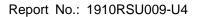
The test results relate only to the samples tested.

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
1910RSU009-U4	Rev. 01	Initial report	10-30-2019	Valid

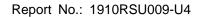


1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	Smart Projector		
Model No.:	WWT-M5S		
	WWT-M1S, WWT-M2S, WWT-M3S, WWT-M4S, WWT-M5S, WWT-M6S,		
Serial Model No.:	WWT-M7S, WWT-M8S, WWT-M9S, WWT-S1S, WWT-S2S, WWT-S3S,		
	WWT-S4S, WWT-S5S, WWT-S6S, WWT-S7S, WWT-S8S, WWT-S9S		
Brand Name:	WOWOTO		
Wi-Fi Specification:	802.11a/b/g/n		
Bluetooth Specification:	v4.0 (BLE only)		
Accessory			
	Model No.: GQ36-120300-AX		
Adapter #1:	Input: 100-240V ~ 50/60Hz 1.0A Max		
	Output: 12V = 3.0A		
	Model No.: KZ1203000		
Adapter #2:	Input: 100-240V ~ 50/60Hz 1.0A Max		
	Output: 12V - 3000mA		
	Model No.: GW48W-120300D		
Adapter #3:	Input: 100-240V ~ 50/60Hz 1.2A		
	Output: 12V = 3.0A		

Note: The different models are only for marketing different clients, others are the same.





1.2. Product Specification Subjective to this Report

Frequency Range:	BLE:			
	Frequency Range: 2402~2480MHz			
	2.4GHz WiFi:			
	802.11b/g/n-HT20: 2412 ~ 2462 MHz			
	802.11n-HT40: 2422 ~ 2452 MHz			
	5GHz WiFi:			
	For 802.11a/n-HT20: 5180~5240MHz, 5745~5825MHz			
	For 802.11n-HT40: 5190~5230MHz, 5755~5795MHz			
Type of Modulation:	BLE: GFSK			
	802.11b: DSSS			
	802.11a/g/n: OFDM			
Data Rate:	BLE: 1Mbps			
	802.11b: 1/2/5.5/11Mbps			
	802.11a/g: 6/9/12/18/24/36/48/54Mbps			
	802.11n: up to 300Mbps			



1.3. Description of Available Antennas

Antenna	Frequency	TX	Max Antenna Gain (dBi)		CDD Directional Gain (dBi)	
Type	Band (MHz)	Paths	Ant A	Ant B	For Power	For PSD
Wi-Fi Antenna						
FPC Antenna	2412 ~ 2462	2	3.44	2.92	3.44	6.45
	5150 ~ 5250	0	3.35	2.18	3.35	6.36
	5725 ~ 5850	2				
Bluetooth Antenna						
FPC Antenna	2402 ~ 2480	1	3.04			

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.

Directional gain = $G_{ANT MAX}$ + 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
$$N_{ANT} \le 4$$
;



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	Averaging Time		
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²)	(Minutes)		
	(A) Limits for Occupational/ Control Exposures					
0.3-3.0	614	1.63	*100	6		
3.0-30	1842/f	4.89/f	*900/f ²	6		
30-300	61.4	0.163	1.0	6		
300-1,500			f/300	6		
1,500-100,000			5	6		
(B) Limits for General Population/ Uncontrolled Exposures						
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		
300-1,500			f/1500	30		
1,500-100,000	-		1.0	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

Pi = 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.

^{* =} Plane-wave equivalent power density



2.2. Test Result of RF Exposure Evaluation

Product	Smart Projector
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to Clause 1.3 of this report.

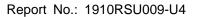
Test Mode	Frequency Band (MHz)	Maximum Total Average Output Power (dBm)	Power Density at $R = 20 \text{ cm}$ (mW/cm^2)	Limit (mW/cm²)
BLE	2402 ~ 2480	-2.94	0.0002	1
802.11b/g/n	2412 ~ 2462	20.75	0.0522	1
802.11a/n	5180 ~ 5240	20.01	0.0431	1
002.118/11	5745 ~ 5825	20.73	0.0509	1

CONCLUSION:

The Bluetooth and 2.4GHz WLAN or 5GHz WLAN can transmit simultaneously, and the 2.4GHz WLAN and 5GHz WLAN can't transmit simultaneously.

Therefore, the Max Power Density at R (20 cm) was calculated as below:

Max Power Density at R (20 cm) = $0.0002 \text{mW/cm}^2 + 0.0522 \text{mW/cm}^2 = 0.0524 \text{mW/cm}^2 < 1 \text{mW/cm}^2$ So the EUT complies with the requirement.





Appendix - EUT Photograph

Refer to "1910RSU009-UE" file.