Radio Frequency Exposure Report

On Behalf of

Mustech Electronics Co., Ltd.

FCC ID:	**2AC5Z- UM018G**
Product Description:	**Wi-Fi Digital Microscope**
Model No.:	**UM018G**
Supplementary Model:	**N/A**
Prepared for:	**Prentke Romich Company** 3F, Building No.B2, Shanghe Industry Park, Nanchang Road, Xixiang Town, Baoan District, Shenzhen, China
Prepared by:	**Shenzhen QC Testing Laboratory Co., Ltd.** 1st Floor,Building A, Huawan Industrial Park, Gushu,Xixiang Street, Baoan,518126,Shenzhen,China Tel: 0755-23008269 Fax: 0755-23726780
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Tested by: Kare.Gao — Kare Gao

Tested by: Carmi Du — Carmi Du

Approved by: Kendy Wang — Kendy Wang

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	Mustech Electronics Co., Ltd.
Address of Applicant:	3F, Building No.B2, Shanghe Industry Park, Nanchang Road, Xixiang Town, Baoan District, Shenzhen, China
Manufacturer :	Mustech Electronics Co., Ltd.
Address of manufacturer:	3F, Building No.B2, Shanghe Industry Park, Nanchang Road, Xixiang Town, Baoan District, Shenzhen, China

General Description of E.U.T

Items	Description
EUT Description:	Wi-Fi Digital Microscope
Trade Name:	N/A
Model No.:	UM018G
Supplementary Model:	N/A
Frequency Band:	IEEE 802.11b/g, IEEE 802.11n HT20 (ISM Band) : 2412MHz～2462MHz, IEEE 802.11n HT40 (ISM Band) : 2422MHz～2452MHz
Channel Spacing:	IEEE 802.11b/g, 802.11n HT20/HT40: 5MHz
Number of Channels:	IEEE 802.11b/g, 802.11n HT20:11 Channels 802.11n HT40:7 Channels
Transmit Data Rate:	maximum of 150Mbps
Type of Modulation:	IEEE 802.11b：DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g：OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20/40：OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type:	Built-in Antenna
Antenna Gain:	0dBi
Power Supply:	3.7VDC from battery
Adapter Information:	MODEL:YeS12W-0500200VU Input: AC 100-240V~ 50/60Hz 0.35A MAX Output:5.0V 2000mA

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*

1.2 Objective

The objective of the following report is used to demonstrate that EUT operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the relative provisions of FCC 47CFR Part 1.1307

1.3 General Description of Test

Items	Description
EUT Frequency band	☐ FHSS: 2.400GHz ~ 2.483GHz ☒ WLAN: 2.400GHz ~ 2.483GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☐Others: _____
Device category	☐Portable (<20cm separation) ☒Mobile (>20cm separation) ☐Others _____
Exposure classification	☐Occupational/Controlled exposure (S = 5mW/cm2) ☒General Population/Uncontrolled exposure (S=1mW/cm^2) ☐Others: _____
Antenna diversity	☒Single antenna ☐Multiple antennas: ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Max. output power	15.41dBm (0.0348W)
Antenna gain (Max)	0 dBi (Numeric gain:1)
Evaluation applied	☒MPE Evaluation ☐SAR Evaluation
Note: *1. The maximum output power is 15.41dBm (0.0348W) at 2412,b mode 20MHz (with 1 numeric antenna gain.)* *2. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*	

1.4 Human Exposure Assessment Results

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = *Field Strength in Volts / meter*
P = *Power in Watts*
G = *Numeric antenna gain*
d = *Distance in meters*
S = *Power Density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and
*d (cm) =100 * d (m)*

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \qquad \textit{Equation 1}$$

Where d = *distance in cm*
P = *Power in mW*
G = *Numeric antenna gain*
S = *Power Density in* mW/cm^2

EUT parameter (data from the separate report)	
Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
Max average output power in Watt (TP)	15.41dBm (0.0348W)
Antenna gain (G)	0dBi (Numeric gain: 1)
Exposure classification	S=1mW/cm^2
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)
Yields $S = \frac{30xPxG}{3770d^2}$, P=0.0348W, G=1, d=0.2 S=0.0069mW/cm^2 Or $d = \sqrt{\frac{30xPxG}{3770S}}$, S=1, P=0.0348W, G=1 d=0.0166m	
Conclusion: S=0.0069mW/cm^2 is significant lower than the General Population Exposure Power Density Limit 1mW/cm^2 or except the distance when human body proximity to the antenna is less than1.66cm then will reach the General Population Exposure Power Density Limit (For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)	