

Maximum Permissible Exposure Report

For

GCI Science & Technology CO.,Ltd.

No.381, Xingangzhong Road, Guangzhou 510310, P.R. China

FCC ID: 2ANQD-VEBULAPRO

FCC Rule(s): FCC Part 15C

Product Description: Portable Nail Printer

Tested Model: Vebula Pro

Report No.: STR17107001I-2

Tested Date: 2017-10-15 to 2017-11-5

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 OBJECTIVE	4
1.3 GENERAL DESCRIPTION OF TEST.....	4
1.4 HUMAN EXPOSURE ASSESSMENT RESULTS	5

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information	
Applicant:	GCI Science & Technology CO., Ltd.
Address of applicant:	No.381, Xingangzhong Road, Guangzhou 510310, P.R. China
Manufacturer:	GCI Science & Technology CO., Ltd.
Address of manufacturer:	No.381, Xingangzhong Road, Guangzhou 510310, P.R. China

General Description of EUT	
Product Name:	Portable Nail Printer
Trade Name:	Vebula
Model No.:	Vebula Pro
Adding Model(s):	N/A
Rated Voltage:	DC 24V 2Afrom AC-DC Adaptor AC100-240V/50-60HZ
Power Adapter Model:	GRT60-240200
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	IEEE 802.11b : 2412MHz~2462MHz; IEEE 802.11g : 2412MHz~2462MHz; IEEE 802 11n HT20 : 2412MHz~2462MHz; IEEE 802 11n HT40 : 2422MHz~2452MHz;
RF Output Power:	16.89 dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	IEEE 802.11b :11 Channels; IEEE 802.11g :11 Channels; IEEE 802 11n HT20 :11 Channels; IEEE 802 11n HT40 :7 Channels
Channel Separation:	EEE 802.11b : 5MHz IEEE 802.11g : 5MHz IEEE 802 11n HT20 : 5MHz IEEE 802 11n HT40 : 5MHz
Type of Antenna:	Printed PCB Antenna
Antenna Gain:	Antenna 1: 2.5dBi Antenna 2: 2.5dBi

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 1.1310

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 / ☐ WLAN: 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☐ Others: _____
Device category	☐ Portable: (<20cm separation) ☐ Mobile: (>20cm separation) ☒ Others: Fixed location (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²) ☐ Others: _____
Antenna diversity	☐ Single antenna ☒ Multiple antennas: ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation
Note: 1. The maximum output is 16.89dBm at IEEE 802.11b mode 2462MHz (with 1.78 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

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
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 Exposure				
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 * = Plane-wave equivalent power density

Calculation

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

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:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

Yields

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

Equation 1

Where d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW / cm²

EUT parameter (data from the separate report)	
Given $E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
The WiFi module can not transmitting Simultaneously. And the max output power was in low channel of the 802.11b mode.	
Max output power in Watt (TP)	16.89dBm (0.0489W=48.9mW)
Antenna gain (G)	2.5dBi (Numeric gain:1.78)
Exposure classification	S=1mW/cm ²
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)
Yields $S = \frac{30 \times P \times G}{3770 d^2}, \quad P=0.0489W=48.9mW, G=1.78, d=0.2m=20cm$ $S=0.0173mW/cm^2$	
Conclusion: S=0.0173mW/cm² is significant lower than the FCC 47CFR Part 1.1310 Limit 1mW/cm² . (For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm² even if the calculation indicates that the power density would be larger.)	

******* END OF REPORT *******