

RF Exposure Evaluation

of

E.U.T. : 10W A4WP Power Transmitter Unit

Model : T1201FOXXA;T1201FUXXA(X=0-9
,A-Z or blank for market use only)

FCC ID : 2AI82T1201

for

APPLICANT : NewVastek Co., Ltd.

ADDRESS : 5F., No.65, Shitan Rd.,Neihu Dist., Taipei City
114, Taiwan

Prepared by

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Report Number : 16-12-RBF-008-MPE

TEST REPORT CERTIFICATION

Applicant : NewVastek Co., Ltd.
5F., No.65, Shitan Rd., Neihu Dist., Taipei City 114, Taiwan

Manufacturer : (1)Lien Chang Electronic Enterprise Co., LTD.
11F., No.501, Sec.6, NanJing E. Rd., Neihu Dist., Taipei City
11469, Taiwan(R.O.C.)
(2) Glownik
2F., No.23, Xinghua Rd., Taoyuan Dist., Taoyuan 33068, Taiwan,
R.O.C.

Description of EUT

- a) Type of EUT : 10W A4WP Power Transmitter Unit
- b) Trade Name : NewVastek Co., Ltd.
- c) Model No. : T1201FOXXXA;T1201FUXXXA(X=0-9,A-Z or blank for market use only)
- d) Power Supply : Adapter Model:A2013
I/P:100-240Vac,50-60Hz,0.7A
O/P:5Vdc 2A, 9Vdc 2A, 12Vdc 1.5A

Regulation Applied : FCC KDB447498 D01. The equipment fulfills the requirements on power density for general population/uncontrolled exposure and therefore fulfills the requirements of section 1.1310 of FCC 47 CFR Part 1.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC

Date Test Item Received : Dec. 05, 2017
Date Test Campaign Completed : Dec. 07, 2017
Date of Issue : Dec. 30, 2017

Test Engineer : Brian Huang
(Brian Huang, Engineer)

Approve & Authorized Signer : S. S. Liou
S. S. Liou, Section Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

Product Information:

Type of EUT:	10W A4WP Power Transmitter Unit		
FCC ID:	2AI82T1201		
Model:	T1201FOXXXA;T1201FUXXXA (X=0-9,A-Z or blank for market use only)		
Description:	The product is the PTU(power transmitter unit) of a wireless charger with BLE & A4WP(6.78MHz).		
Model difference:	None. For marketing purpose only.		
Maximum conducted output power of BLE (rated):		<u>-10</u> dBm or <u>0.1</u> mW	

The following table lists the provided authorized antennas:

Model	Antenna Type	Antenna Gain	
		(dBi)	Numeric
N/A	PCB trace	2.0	1.68

Below is an example of the RF Exposure Statement:

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

Relative Requirement for Compliance

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following:

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 Exposures				
0.3-3.0	614	1.63	*(100)	6
3-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			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
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

RF Exposure Calculations:

(1) For BLE

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1.0 mW/cm² uncontrolled exposure limit. The formula shown in OET Bulletin 65 is used in the calculation.

Equation from page 19 of OET Bulletin 65, Edition 97-01 is:

$$S = PG / 4 \pi R^2$$

where: S = power density (in appropriate units, e.g. mW/cm²)

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

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

hence

$$R = (PG / 4 \pi S)^{1/2}$$

For our device

P = 0.1mW

G = 1.68

R = 20 cm

S = (0.1 * 1.68) / (4 * π * 20²) = **0.00003** mW/cm² < 1.0 mW/cm²

For complying the FCC limits for general population/uncontrolled exposure, the power density limit is 1.0 mW/cm². The calculation result of the power density at a distance of 20 cm of our device is less than the limit.

(2) Co-location with wireless charging part

The Bluetooth transmitter is part of a 6.78 MHz Wireless Charging PTU. The wireless charging feature is approved using the DoC approvals procedures against Part 18 requirements. The wireless charger is evaluated at 10cm distance and worst case Electric Field (112.5V/m) is 92.6% of the limit and worst case Magnetic Field (0.3088 A/m) is 95.6% of the limit (refer to ETC Report No. : 16-12-RBF-008-03). Since the Bluetooth transmitter's contribution is significantly lower than 4.4% of the limit the combination of Bluetooth transmissions and wireless charging transmissions remains compliant with the FCC rules. Wireless charging RF exposure was confirmed under separate KDB enquiry with the FCC.

Summary of Evaluation

Test	Reference	Results
Evaluation	Section 1.1310 of FCC 47 CFR Part 1 FCC KDB447498 D01	Pass