SAR Evaluation Report

Application No.:	SZEM2012012647CR
Applicant:	Tappy Technologies Limited
Address of Applicant:	Unit A 3/F Yee Lim Ind Bldg Stage 2, 8 Ka Ting Rd Kwai Chung NT Hong Kong
Manufacturer:	Tappy Technologies Limited
Address of Manufacturer:	Unit A 3/F Yee Lim Ind Bldg Stage 2, 8 Ka Ting Rd Kwai Chung NT Hong Kong
Equipment Under Test (EUT):	
Product Name:	Universal Passive Provisioning Unit
Model No.:	UPPU CIRCLE
Trade mark:	UPPU
FCC ID:	2AVQ70109-UPPU
Standards:	47 CFR Part 1.1307 47 CFR PART 2, Subpart J, Section 2.1093 KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2020-12-09
Date of Test:	2020-12-10 to 2021-01-04
Date of Issue:	2021-01-04
Test Result :	**PASS***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

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2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2021-01-04		Original

Authorized for issue by:				
				
		Leo Li /Project Engineer		
				
		Eric Fu /Reviewer		

3 Contents

4 General Information

4.1 General Description of EUT

Power Supply:	DC 5V from USB port
Cable:	USB cable: 80cm unshielded
For NFC:	
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	Loop Antenna
Antenna Gain:	0dBi
Max. power (including tune-up tolerance)	-35.26dBm*
For BT:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V4.2 LE
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	Monopole Antenna
Antenna Gain:	0.55dBi
Max. power (including tune-up tolerance)	-5.8dBm

(*) Refer to test report SZEM201201264703 for EUT test Max Conducted Peak Output Power(including tune-up tolerance) value.

E=EIRP-20logD+104.7

E=59.90dBuv/m(Refer to test report SZEM200700682503)

D=3m

EIRP=59.90-（-20log(3)+104.7）

EIRP=-35.26dBm(0.00030mW)

4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation[17]

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

At frequencies below 100 MHz, the following may be considered for SAR test exclusion:

a) The power threshold at the corresponding test separation distance at 100 MHz in below step 1) is multiplied by [1 + log(100/f(MHz))] for test separation distances > 50 mm and < 200 mm

The power threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by ½ for test separation distances ⩽ 50 mm.

[Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz

When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:36

1) [(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg, for test separation distances ≤ 50 mm;

where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.

5.1.3 EUT RF Exposure

For BT:

The Max. power (including tune-up tolerance) is -5.8 dBm on the lowest channel 2.44 GHz (*)
-5.80 dBm logarithmic terms convert to numeric result is nearly 0.26 mW
According to the formula. calculate the test exclusion thresholds:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)]
General RF Exposure = (0.26 mW / 5 mm) x √2.44 GHz = 0.08 *(1)*
SAR requirement:
S = 3.0 *(2)*
(1) < (2)
So the SAR report is not required.

(*) Max. power refer to Report No.:SZEM201201264702

For NFC :

The maximum radiated output power specified is -35.26dBm = 0.00030mW
The SAR Exclusion Threshold Level for 13.56MHz when the minimum test separation distance is < 50mm:
= 474 * [1 + log(100/f(MHz)]/2
= 442.65 mW
Since the source-based time-averaging radiated output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

For BT and NFC mode transmit simultaneously:
According to the formula
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/7.5] W/kg
For Bluetooth:
SAR test exclusion = (0.26mW / 5 mm) x √2.44GHz/7.5 = 0.0108 W/kg
For NFC:
SAR test exclusion = (0.00030mW / 5 mm) x √0.01356GHz/7.5 = $9.3158*10^{-7}$ W/kg
The total SAR test exclusion ≈ 0.0108 W/kg < 1.6 W/kg
So the SAR report is not required.

- End of the Report -

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