

TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: 2AHTD-CFX

Equipment Under Test : CleanFLEX
Model Name : CFX
Applicant : Ecube Labs Co., Ltd.
Manufacturer : Ecube Labs Co., Ltd.
Date of Receipt : 2017.09.29
Date of Test(s) : 2017.11.12 ~ 2018.03.05
Date of Issue : 2018.04.20

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

Tested By:



Date:

2018.04.20

Jinhyoung Cho

Technical
Manager:



Date:

2018.04.20

Jungmin Yang

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1. General information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

-Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Phone No. : +82 31 688 0901

Fax No. : +82 31 688 0921

1.2. Details of applicant

Applicant : Ecube Labs Co., Ltd.

Address : 506, Acetechnotower, 20, Digital-ro 31-gil, Guro-gu, Seoul

Contact Person : Park, Jin

Phone No. : +82 2 2109 0293

1.3. Details of manufacturer

Applicant : Same as applicant

Address : Same as applicant

1.4. Description of EUT

Kind of Product	CleanFLEX
Model Name	CFX
Power Supply	DC 3.6 V
Frequency Range	WCDMA 2: 1 850 MHz ~ 1 910 MHz, WCDMA 5: 824 MHz ~ 849 MHz
Antenna Gain	824 MHz ~ 849 MHz: 1.7 dB i, 1 850 MHz ~ 1 910 MHz: 3.0 dB i

1.5. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL012590	2018.04.20	Initial

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SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

2. RF Exposure Evaluation

2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time
(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
<u>300 – 1 500</u>	-	-	<u>f/1500</u>	<u>30</u>
<u>1 500 – 100 000</u>	-	-	<u>1.0</u>	<u>30</u>

2.1.1. Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, $1 mW/cm^2$. 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 where the MPE limit is reached.

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2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data
 Test Mode : Normal Operation

2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

WCDMA Band 2

- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
9262	1 852.4	23.5	3.0	0.088 865	1

WCDMA Band 5

- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
4132	826.4	24	1.7	0.073 915	0.550 933

Note :

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm².

- End of the Test Report -

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