

TEST REPORT

of

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

FCC ID: 2AHTD-CFXCAM

Equipment Under Test : CleanFLEX
Model Name : CFX-CAM
Variant Model Name(s) : -
Applicant : Ecube Labs Co., Ltd.
Manufacturer : Ecube Labs Co., Ltd.
Date of Receipt : 2021.04.06
Date of Test(s) : 2021.04.06 ~ 2021.05.11
Date of Issue : 2021.05.13

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

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- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
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Tested by:



Nancy Park

Technical
Manager:



Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory



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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

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- Designation number: KR0150

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1.2. Details of Applicant

Applicant : Ecube Labs Co., Ltd.

Address : #710, Daeryungposttower, 288, Digital-ro, Guro-gu, Seoul, South Korea

Contact Person : Park, Jin

Phone No. : +82 2 2109 0294

1.3. Details of Manufacturer

Comapny : Same as applicant

Address : Same as applicant

1.4. Description of EUT

Kind of Product	CleanFLEX
Model Name	CFX-CAM
Approved Module	FCC ID: XMR201510UC20
Power Supply	DC 3.6 V
Rated Power	WCDMA II: 22.5 dB m WCDMA IV: 23.0 dB m
Frequency Range	WCDMA II: 1 850 MHz ~ 1 910 MHz WCDMA V: 824 MHz ~ 849 MHz
Modulation Technique	QPSK, 16QAM
Antenna Type	PCB Pattern Antenna
Antenna Gain	824 MHz ~ 849 MHz: 4.0 dB i 1 850 MHz ~ 1 910 MHz: -7.0 dB i
H/W Version	1.0
S/W Version	1.0

1.5. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL002016	2021.04.27	Initial
1	F690501-RF-RTL002016-1	2021.05.13	Revise antenna gain

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: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where P_d = power density in mW/cm²

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/cm². 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.

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 II

- Maximum tune up tolerance

Frequency Range (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
1 850 ~ 1 910	23.5	-7.0	0.008 886	1

WCDMA V

- Maximum tune up tolerance

Frequency Range (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
824 ~ 849	24	4.0	0.125 525	0.549 333

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.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dB i and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.
- According to KDB 447498 D01 RF Exposure Guidance 4.1.

- End of the Test Report -