

FCC TEST REPORT

Product : EcoID
Trade mark : FingerQ, BIO-key
Model/Type reference : CTTFD2400,
CTTFD240001ERBA,
CTTFD240001URBA
Serial Number : N/A
Ratings : 5V $\leq$ 100mA
FCC ID : 2AEMD-CTTFD2400
Report Number : EED32H000378
Date : Apr. 20, 2015
Regulations : See below

Test Standards	Results
☒ 47 CFR FCC Part 15 Subpart B:2014	PASS

Prepared for:

FingerQ Macao Commercial Offshore Limited
Avenida da Praia Grande No. 401-415, Edif. China Law, 13 andar, C,
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Prepared by:

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Approved by: Jimmy Li

Date: Apr. 20, 2015



Jimmy Li
Lab manager

Check No.: 1022518041

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(Note: N/A means not applicable)

1. GENERAL INFORMATION

Applicant: FingerQ Macao Commercial Offshore Limited
Avenida da Praia Grande No. 401-415, Edif. China Law, 1 andar, C, Macau

Manufacturer: He Shan World Fair Electronics Technology Ltd.
New Material Base, Gonghe Town, Heshan City, Guangdong Province, China

Equipment Authorization: Certification

FCC ID: 2AEMD-CTTFD2400

Product: EcoID

Trade mark: FingerQ, BIO-key

Model/Type reference: CTTFD2400, CTTFD240001ERBA, CTTFD240001URBA

Highest operated frequency: 72MHz

Serial Number: N/A

Report Number: EED32H000378

Sample Received Date: Apr. 04, 2015

Sample tested Date: Apr. 04, 2015 to Apr. 20, 2015

The above equipment was tested by Centre Testing International (Shenzhen) Corporation for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart C and the measurement procedure according to ANSI C63.4:2009 and ANSI C63.10:2013.

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	Test Item	Test
FCC 15.107	Conducted Emission	Yes
FCC 15.109	Radiated Emission	Yes

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted disturbance	3.0
Radiated disturbance (30MHz to 1GHz)	4.9

4. PRODUCT INFORMATION AND TEST SETUP

4.1. PRODUCT INFORMATION

Ratings: 5V --- 100mA

All the models are the same product just different model names and trade names. The test model is CTTFD2400, and test results are applicable to others.

4.2. TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between Product and support equipment.

4.3. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Certified type
1.	PC	HP	340G2	B2-20050246	N/A	FCC DOC
2.	Mouse	HP	FM100	KL851PA#AB2	N/A	FCC DOC

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5. FACILITIES AND ACCREDITATIONS

5.1 TEST FACILITY

All test facilities used to collect the test data are located at Hongwei Industrial Zone, 70 Area, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

5.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

Equipment used during the tests:

Shielding Room No. 1 - Conducted Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESCI	100009	07/08/2015
LISN	R&S	ENV216	100098	11/13/2015

3M Semi-anechoic Chamber (1)- Radiated disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/12/2016
Spectrum Analyzer	Agilent	E4443A	MY45300910	01/15/2016
Receiver	R&S	ESCI	100435	07/08/2015
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	617	07/13/2015
Multi device Controller	ETS-LINGREN	2090	00057230	N/A

6. CONDUCTED EMISSION TEST

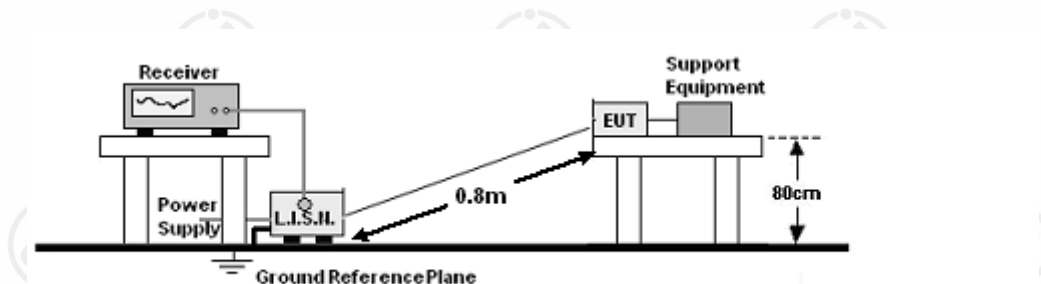
6.1. LIMITS

Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

6.2. BLOCK DIAGRAM OF TEST SETUP



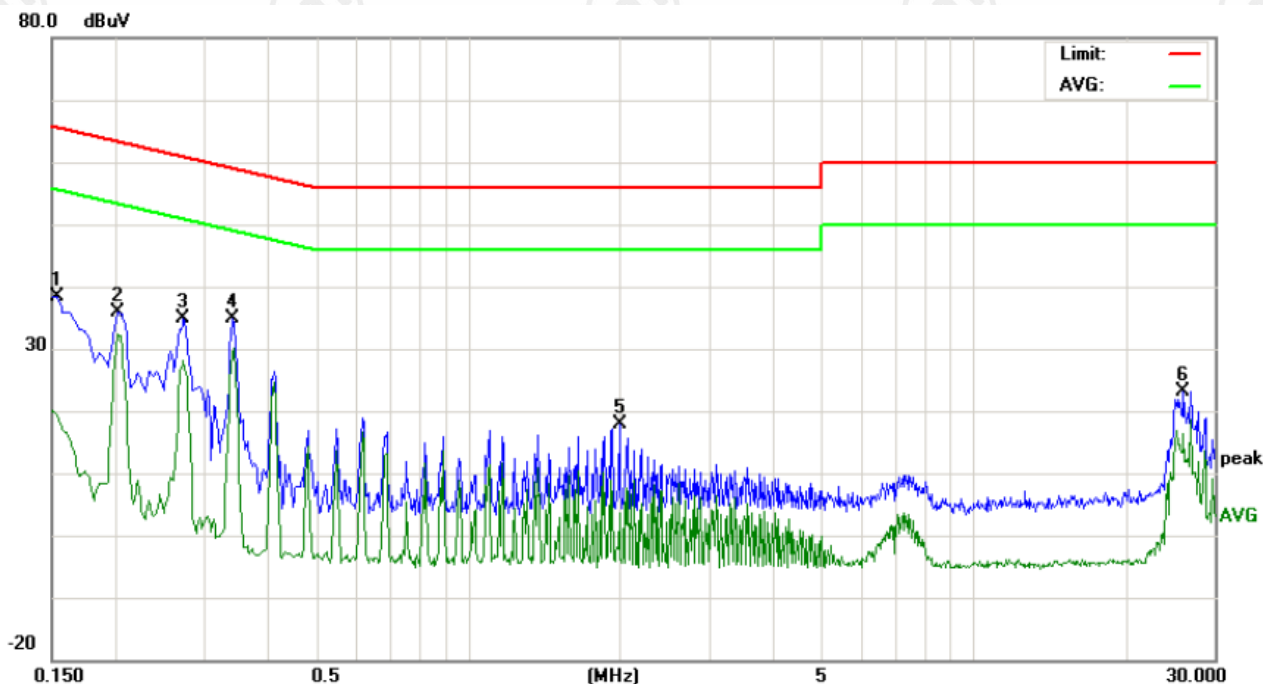
6.3. PROCEDURE OF CONDUCTED EMISSION TEST

- The Product was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4. WORST CASE TEST GRAPHS AND TEST DATA

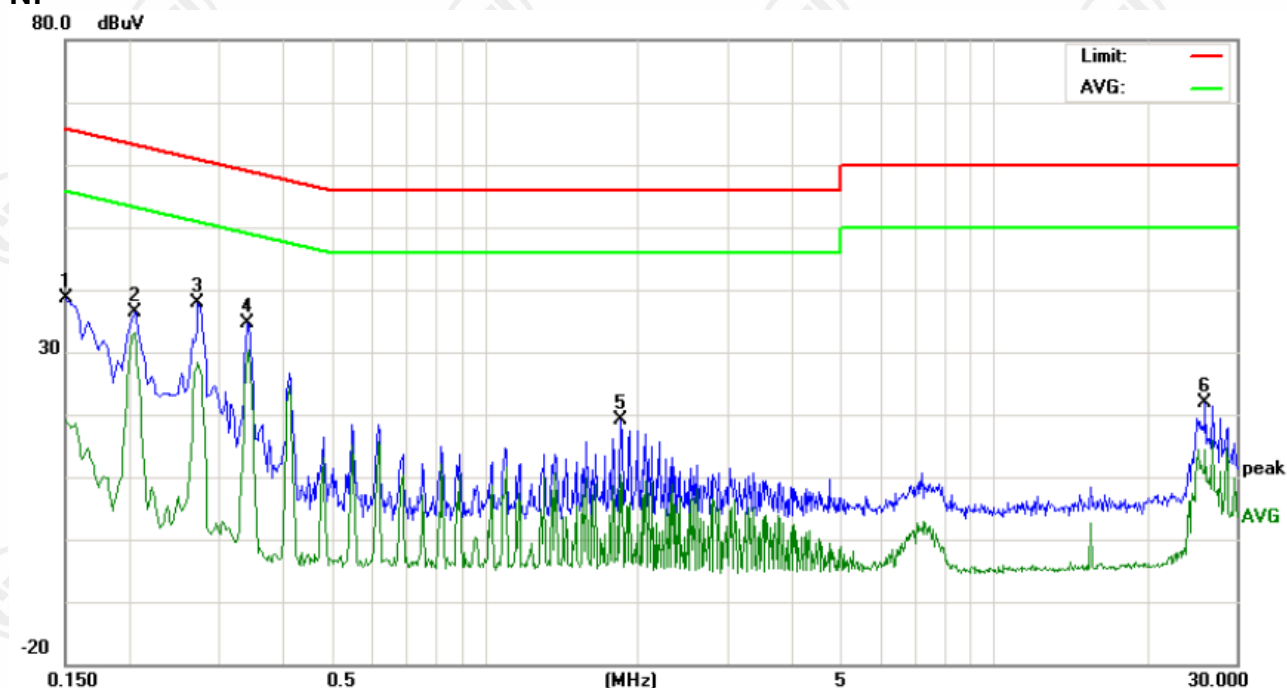
Product : EcoID **Model/Type reference** : CTTFD2400
Power : AC 120V/60Hz **Temperature** : 22℃
Mode : Data transferring **Humidity** : 52%

L:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	28.52		9.38	9.90	38.42		19.28	65.78	55.78	-27.36	-36.50	P	
2	0.2020	25.94		22.57	9.90	35.84		32.47	63.52	53.52	-27.68	-21.05	P	
3	0.2740	25.07		18.18	9.90	34.97		28.08	60.99	50.99	-26.02	-22.91	P	
4	0.3420	24.95		19.50	9.90	34.85		29.40	59.15	49.15	-24.30	-19.75	P	
5	1.9940	8.09		-6.26	9.90	17.99		3.64	56.00	46.00	-38.01	-42.36	P	
6	26.0660	12.47		5.69	10.76	23.23		16.45	60.00	50.00	-36.77	-33.55	P	

N:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1500	28.76		9.16	9.90	38.66		19.06	65.99	55.99	-27.33	-36.93	P	
2	0.2060	26.52		23.15	9.90	36.42		33.05	63.36	53.36	-26.94	-20.31	P	
3	0.2740	28.01		18.37	9.90	37.91		28.27	60.99	50.99	-23.08	-22.72	P	
4	0.3420	24.66		20.01	9.90	34.56		29.91	59.15	49.15	-24.59	-19.24	P	
5	1.8580	9.33		0.53	9.90	19.23		10.43	56.00	46.00	-36.77	-35.57	P	
6	26.0620	11.00		3.69	10.76	21.76		14.45	60.00	50.00	-38.24	-35.55	P	

7. RADIATED EMISSION TEST

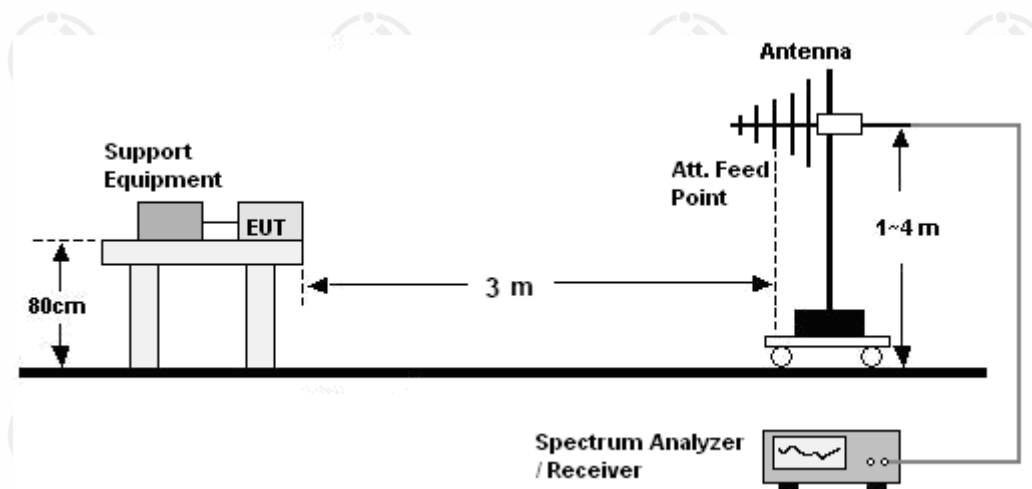
7.1. LIMITS

Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

- NOTE:**
1. The lower limit shall apply at the transition frequency.
 2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
 3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP



7.3. PROCEDURE OF RADIATED EMISSION TEST

30MHz ~ 1GHz:

- a. The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test

frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

7.4. WORST CASE TEST GRAPHS AND TEST DATA

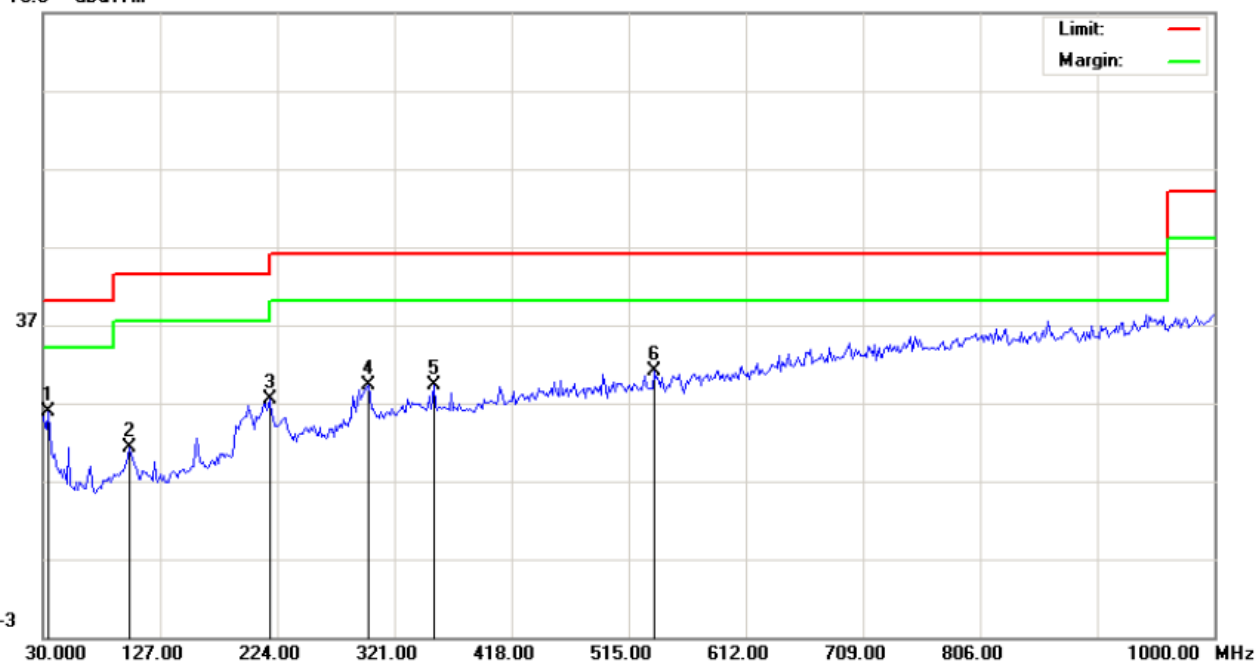
Product : EcoID **Model/Type reference** : CTTFD2400

Power : AC 120V/60Hz **Temperature** : 22℃

Mode : Data transferring **Humidity** : 52%

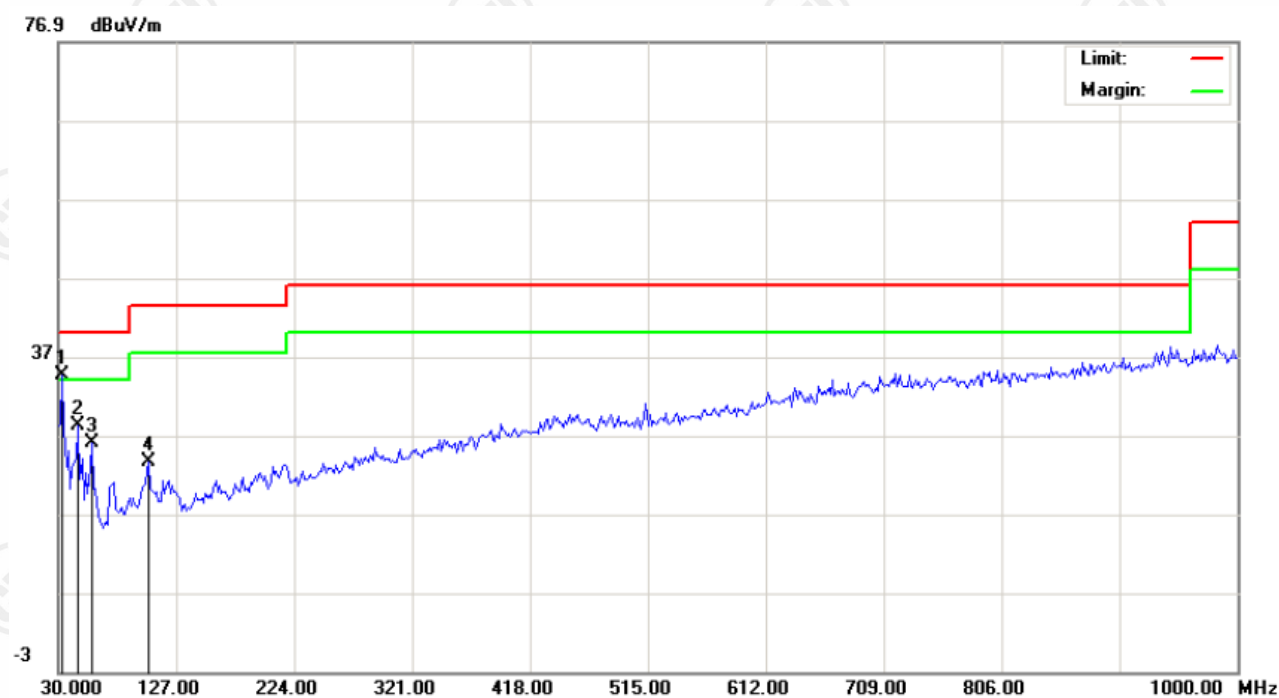
H:

76.9 dBuV/m



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor		Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		dB	peak	QP	AVG	QP	AVG	QP	AVG		
1	34.8500	11.14				14.74	25.88			40.00		-14.12		P	
2	101.1333	10.81				10.35	21.16			43.50		-22.34		P	
3	217.5333	14.77				12.54	27.31			46.00		-18.69		P	
4	299.9833	13.44				15.83	29.27			46.00		-16.73		P	
5	353.3333	11.92				17.20	29.12			46.00		-16.88		P	
6	536.0167	10.29				20.75	31.04			46.00		-14.96		P	

V:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	33.2333	18.86			15.70	34.56			40.00		-5.44		P	
2	46.1667	18.20			10.09	28.29			40.00		-11.71		P	
3	57.4833	17.55			8.54	26.09			40.00		-13.91		P	
4	104.3667	13.43			10.13	23.56			43.50		-19.94		P	

Remark:

The highest frequency of the internal sources of the EUT is 72 MHz, so the measurement shall only be made up to 1 GHz.

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



CONDUCTED EMISSION TEST SETUP



RADIATED EMISSION TEST SETUP

APPENDIX 2 EXTERNAL PHOTOGRAPHS OF PRODUCT



External View of Product-1

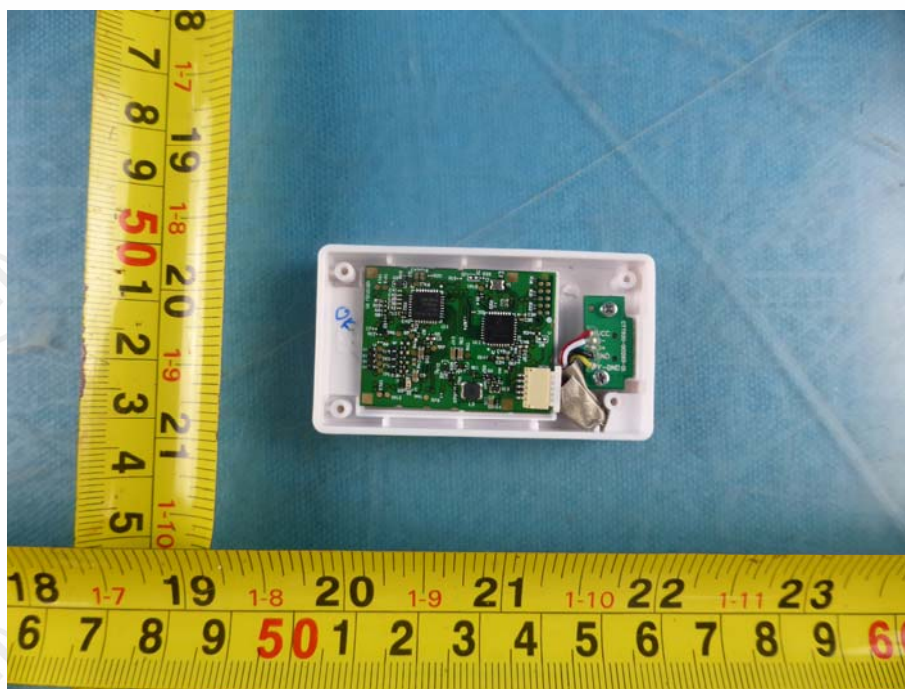


External View of Product-2

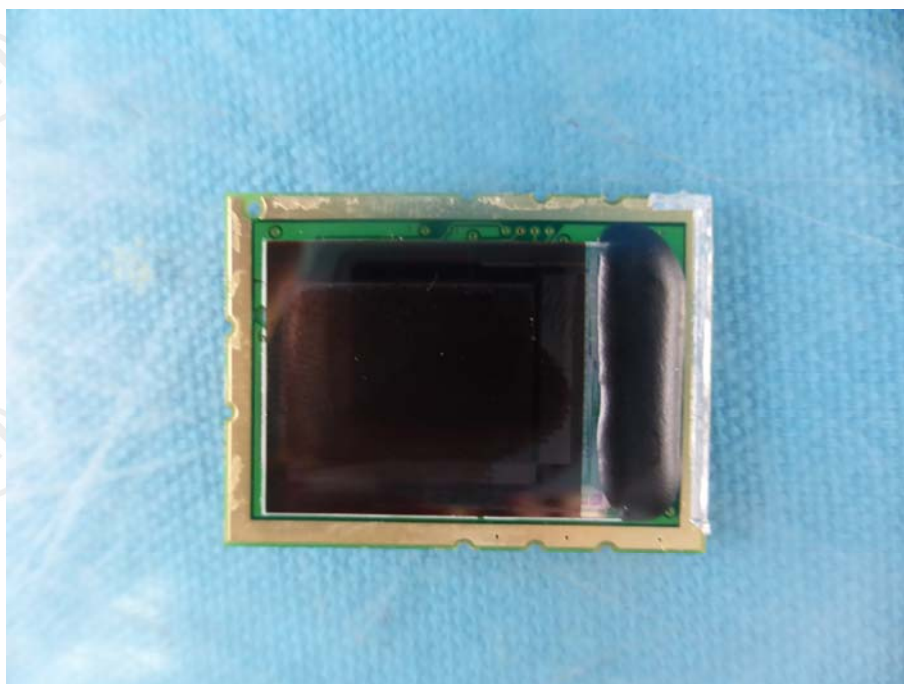
APPENDIX 3 INTERNAL PHOTOGRAPHS OF PRODUCT



Internal View of Product-1



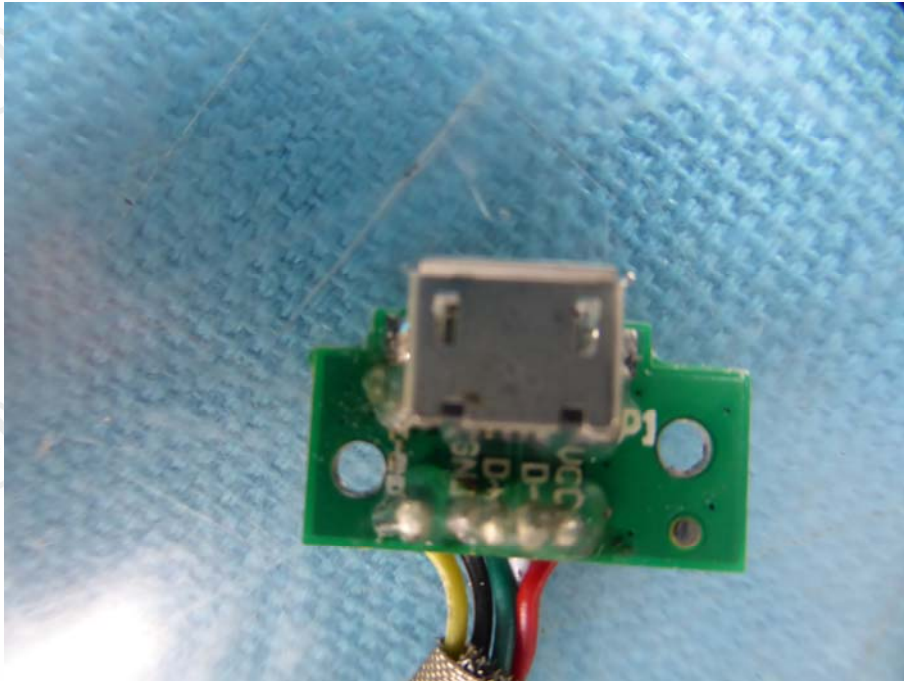
Internal View of Product-2



Internal View of Product-5



Internal View of Product-6



Internal View of Product-7

*** End of Report ***

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