VCCI Test Report

Product Name : USB Hub
Model No. : Expand(XN)

Applicant : Flashbay Electronics
Address : Building2 ,Jixun Industrial Park ,Xinjiao ,Dong'ao Village ,Shatian Town ,Huiyang District ,Huizhou City , Guangdong Province,P.R.China

Date of Receipt	:	May.06, 2022
Test Date	:	May.09, 2022
Issued Date	:	May.26, 2022
Report No.	:	2250075R-IT-JP-P01V01
Report Template Version	:	TRF_VCCI CISPR 32 _EMC_V1.2

Issued Date : May.26, 2022
Report No. : 2250075R -IT-JP-P01V01

Product Name	:	USB Hub
Applicant	:	Flashbay Electronics
Address	:	Building2 ,Jixun Industrial Park ,Xinjiao ,Dong'ao Village ,Shatian Town ,Huiyang District ,Huizhou City , Guangdong Province,P.R.China
Manufacturer	:	Flashbay Electronics
Address	:	Building2 ,Jixun Industrial Park ,Xinjiao ,Dong'ao Village ,Shatian Town ,Huiyang District ,Huizhou City , Guangdong Province,P.R.China
Model No.	:	Expand(XN)
EUT Rated Voltage	:	DC 5V
EUT Test Voltage	:	DC 5V
Trade Name	:	N/A
Applicable Standard	:	VCCI CISPR 32: 2016
Test Result	:	Complied
Performed Location	:	DEKRA Testing and Certification Co., Ltd. No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu, China TEL: +86-512-62515088 / FAX: +86-512-62515098 VCCI Registration Number: AC1: R-12341 (RE Below 1GHz); AC5: G-10041 (RE Above 1GHz) TR1: C-12553 (CE Mains); TR1: T-11531 (CE Telecommunication)

Tested By : David Dai

(Project Engineer: David Dai)

Approved By : oscar shi

(Manager: Oscar Shi)

TABLE OF CONTENTS

Document History

Report NO.	Date	Description
2250075R-IT-JP-P01V01	May.26, 2022	First release

1. General Information

1.1. EUT Description

Product Name	USB Hub
Model No.	Expand(XN)
Brand Name	N/A

Note 1: The EUT information is from customer declaration.

Note 2: The highest internal frequency of the EUT is less than 108MHz.

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1.2. Mode of Operation

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode	
Emission	Mode 1: Working normally

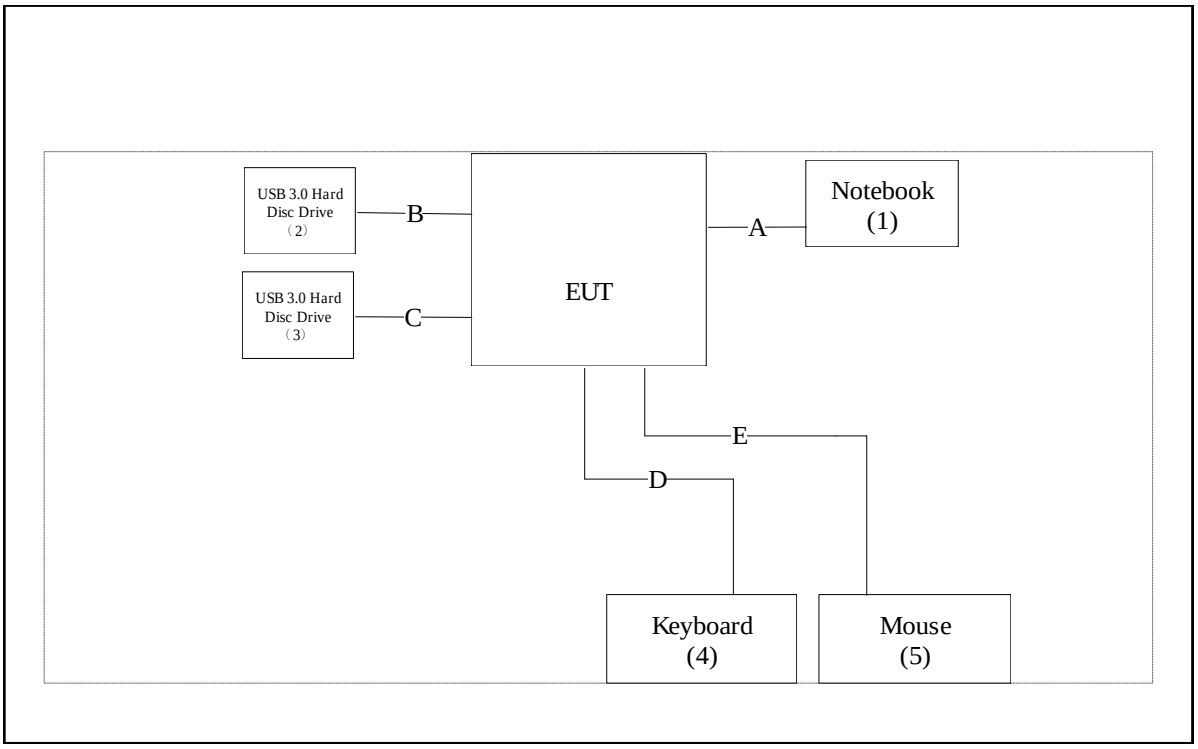
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	DELL	N/A	N/A	Power by adapter
2	USB 3.0 Hard Disc Drive	WD Elements	N/A	N/A	Power by PC
3	USB 3.0 Hard Disc Drive	WD Elements	N/A	N/A	Power by PC
4	Keyboard	DELL	N/A	N/A	Power by PC
5	Mouse	DELL	N/A	N/A	Power by PC

1.1. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal Cable Description
A	USB Hub cable	Shielded, 0.15m
B	USB 3.0 cable	Shielded, 0.5m
C	USB 3.0 cable	Shielded, 0.5m
D	Keyboard cable	Shielded, 1.5m
E	Mouse cable	Shielded, 1.5m

1.4. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the Power of all equipments.
3	Confirm that the EUT can be normally.
4	Start testing

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Emission			
Performed Item	Normative References	Test Performed	Deviation
Conducted Emission	VCCI CISPR 32: 2016	No	No
Asymmetric mode conducted emissions	VCCI CISPR 32: 2016	No	No
Radiated Emission	VCCI CISPR 32: 2016	Yes	No

2.2. List of Test Equipment

Radiated Emission / AC1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100175	2021.07.11	2022.07.10
EMI Test Receiver	R&S	ESCI	100726	2021.10.30	2022.10.29
Preamplifier	Quietek	AP-025C	CHM-0602008	2022.03.31	2023.03.30
Preamplifier	Quietek	AP-025C	CHM-0503006	2022.03.31	2023.03.30
Bilog Antenna	SCHWARZBECK	VULB 9168	01099	2022.03.15	2023.03.14
Bilog Antenna	SCHWARZBECK	VULB 9168	01100	2021.05.20	2022.05.19
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-L	2022.03.31	2023.03.30
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-R	2022.03.31	2023.03.30
Temperature/Humidity Meter	RTS	RTS-8S	AC1-TH	2021.07.09	2022.07.08

2.3. Measurement Uncertainty

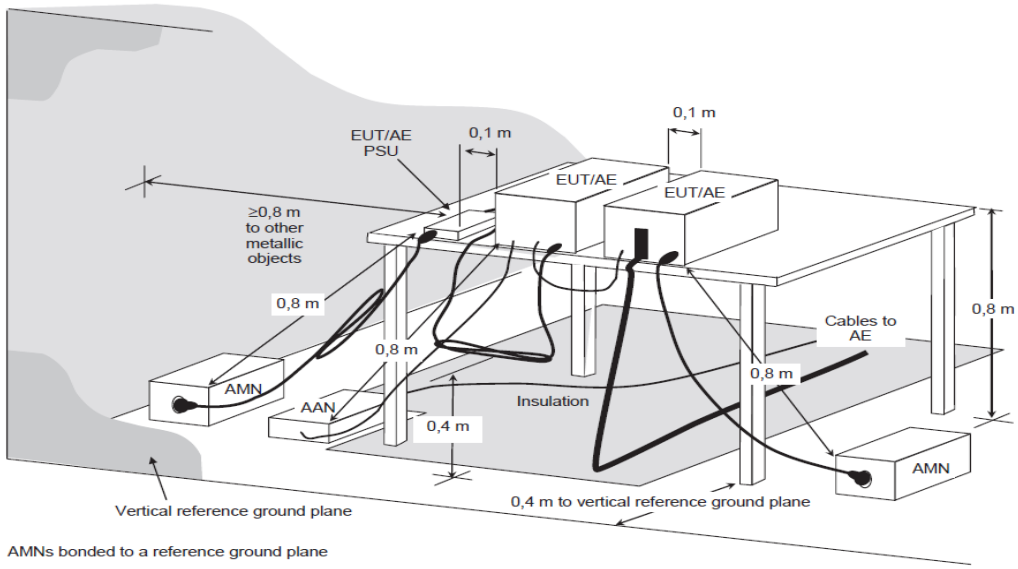
Radiated Emission / AC1
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~200MHz: 5.28 dB 200MHz~1GHz: 4.24 dB Vertical: 30MHz~200MHz: 5.28 dB 200MHz~1GHz: 4.58 dB

3. Conducted Emission (Main Terminals)

3.1. Test Specification

According to EMC Standard: VCCI CISPR 32

3.2. Test Setup



3.3. Limit

Applicable to AC mains power ports			
Frequency range MHz	Coupling device	Detector type/ Bandwidth	Class A limits dB(μV)
0.15 – 0.5	AMN	Quasi Peak / 9 KHz	79
0.5 – 30			73
0.15 – 0.5	AMN	Average / 9 KHz	66
0.5 – 30			60
Both apply across the entire frequency range.			

Applicable to AC mains power ports			
Frequency range MHz	Coupling device	Detector type/ Bandwidth	Class B limits dB(μV)

0.15 – 0.5	AMN	Quasi Peak / 9 KHz	66 – 56
0.5 – 5			56
5 – 30			60
0.15 – 0.5	AMN	Average / 9 KHz	56 – 46
0.5 – 5			46
5 – 30			50
Both apply across the entire frequency range.			

Remarks:

If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurement with the average detector are considered to be met.

3.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
(Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Deviation from Test Standard

No deviation.

3.6. Test Result

The EUT does not contain the power port, so the test item is not necessary performed.

3.7. Test Photograph

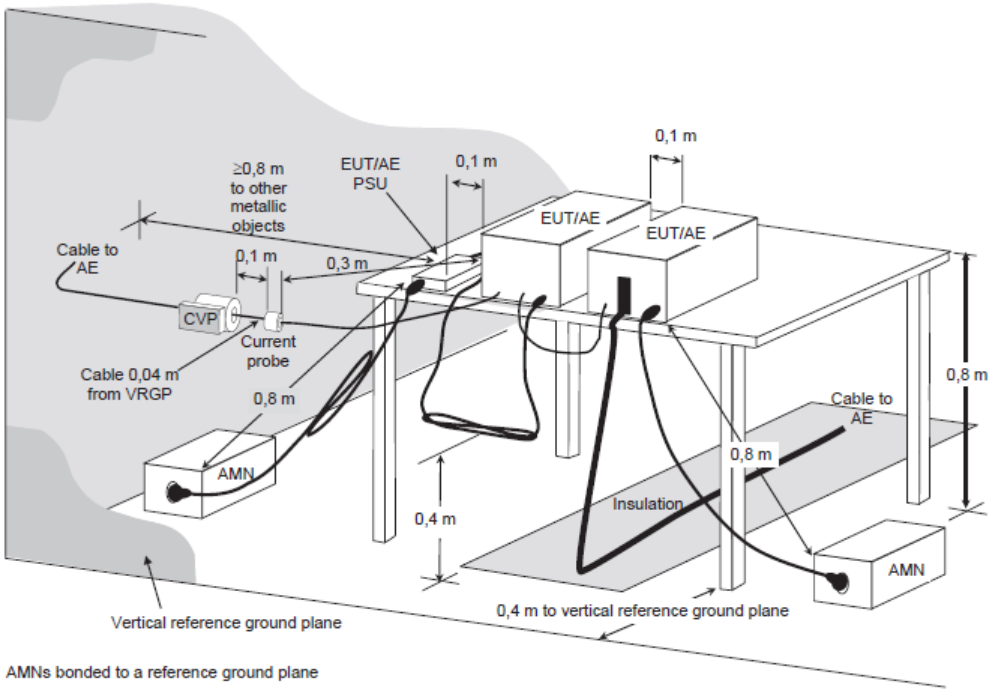
N/A

4. Asymmetric mode conducted emissions

4.1. Test Specification

According to EMC Standard: VCCI CISPR 32

4.2. Test Setup



4.3. Limit

Applicable to 1. wired network ports 2. optical fibre port with metallic shield or tension members 3. antenna ports				
Frequency range MHz	Coupling device	Detector type/ Bandwidth	Class A voltage limits dB(μV)	Class A current limits dB(μA)
0.15 – 0.5	AAN	Quasi Peak / 9 KHz	97 – 87	N / A
0.5 – 30			87	
0.15 – 0.5	AAN	Average / 9 KHz	84 – 74	
0.5 – 30			74	
0.15 – 0.5	CVP	Quasi Peak / 9 KHz	97 – 87	53 – 43

0.5 – 30	And current probe		87	43
0.15 – 0.5	CVP	Average / 9 KHz	84 – 74	40 – 30
0.5 – 30	And current probe		74	30
0.15 – 0.5	Current Probe	Quasi Peak / 9 KHz	N / A	53 – 43
0.5 – 30				43
0.15 – 0.5	Current Probe	Average / 9 KHz		40 – 30
0.5 – 30				30

The choice of coupling device and measurement procedure is defined in CISPR 32 Annex C.
Screened ports including TV broadcast receiver tuner ports are tested with a common-mode impedance of 150 Ω.
This is typically accomplished with the screen terminated by 150 Ω to earth.
AC mains ports that also have the function of a wired network port shall meet the limits given in CISPR 32 Table A.9.
The test shall cover the entire frequency range.
The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to VCCI CISPR 32
Table C.1 for applicability.
Testing is required at only one EUT supply voltage and frequency.

Applicable to ports listed above and intended to connect to cables longer than 3 m

Applicable to
4. wired network ports
5. optical fibre port with metallic shield or tension members
6. antenna ports

Frequency range MHz	Coupling device	Detector type / Bandwidth	Class B voltage limits dB (µV)	Class B current limits dB (µA)
0.15 – 0.5	AAN	Quasi Peak / 9 KHz	84 – 74	N / A
0.5 – 30			74	
0.15 – 0.5	AAN	Average / 9 KHz	74 – 64	
0.5 – 30			64	
0.15 – 0.5	CVP	Quasi Peak / 9 KHz	84 – 74	40 – 30
0.5 – 30	And current probe		74	30
0.15 – 0.5	CVP	Average / 9 KHz	74 – 64	30 – 20
0.5 – 30	And current probe		64	20
0.15 – 0.5	Current Probe	Quasi Peak / 9 KHz	N / A	40 – 30
0.5 – 30				30
0.15 – 0.5	Current Probe	Average / 9 KHz		30 – 20
0.5 – 30				20

The choice of coupling device and measurement procedure is defined in CISPR 32 Annex C.
Screened ports including TV broadcast receiver tuner ports are tested with a common-mode impedance of 150 Ω.
This is typically accomplished with the screen terminated by 150 Ω to earth.
AC mains ports that also have the function of a wired network port shall meet the limits given in CISPR 32 Table A.9.
The test shall cover the entire frequency range.
The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to VCCI CISPR 32
Table C.1 for applicability.

Testing is required at only one EUT supply voltage and frequency. Applicable to ports listed above and intended to connect to cables longer than 3 m

Remarks:

The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz~0.50 MHz.

4.4. Test Procedure

Telecommunication Port:

The mains voltage shall be supplied to the EUT via the LISN when the measurement of telecommunication port is performed. The common mode disturbances at the telecommunication port shall be connected to the ISN, which is 150 ohm impedance.
Both alternative cables are tested related to the LCL requested. The measurement range is from 150kHz to 30MHz. The bandwidth of measurement is set to 9kHz.
The 75dB LCL ISN is used for cat. 6 cable, the 65dB LCL ISN is used for cat. 5 cable, 55dB LCL ISN is used for cat. 3.

4.5. Deviation from Test Standard

No deviation.

4.6. Test Result

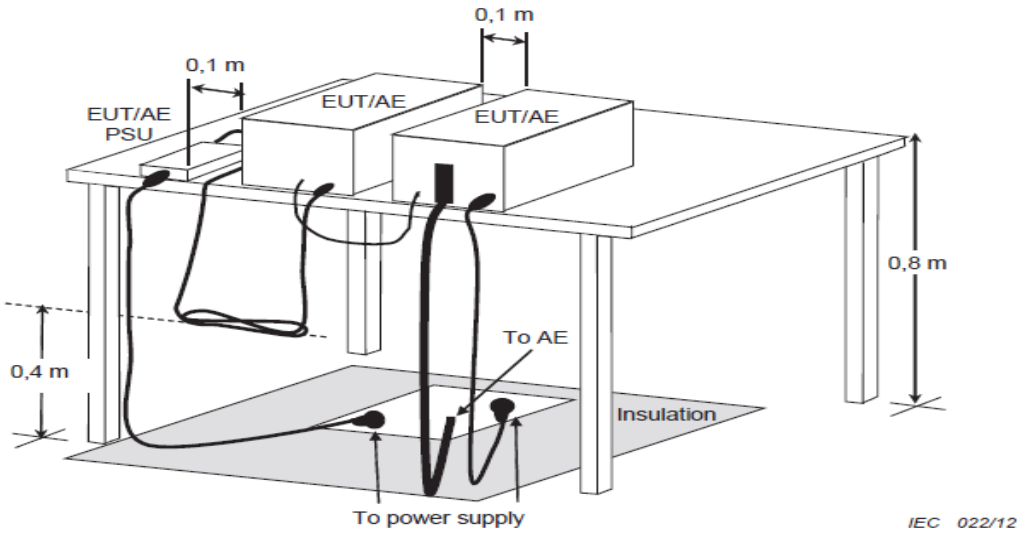
The EUT does not contain the above three ports, so it needs not to perform this test item.

5. Radiated Emission

5.1. Test Specification

According to EMC Standard: VCCI CISPR 32

5.2. Test Setup



5.3. Limit

Radiated emissions at frequencies up to 1 GHz

for Class A equipment

Frequency range MHz	Measurement		Class A limits dB(μV/m)
	Distance m	Detector type/ Bandwidth	OATS / SAC
30-230	10	Quasi Peak / 120 KHz	40
230-1000			47
30-230	3		50
230-1000			57
Apply only 3m or 10m across the entire frequency range			

Radiated emissions at frequencies above 1 GHz

for Class A equipment

Frequency range	Measurement	Class A limits dB(μV/m)

MHz	Distance m	Detector type/ Bandwidth	OATS / SAC
1000-3000	3	Average / 1 MHz	56
3000-6000			60
1000-3000		Peak / 1 MHz	76
3000-6000			80
Apply across the frequency range from 1000 MHz to the highest required frequency of measurement derived from			

for Class B equipment

Frequency range MHz	Measurement		Class B limits dB(μV/m)
	Distance m	Detector type/ Bandwidth	OATS / SAC
30-230	10	Quasi Peak / 120 KHz	30
230-1000			37
30-230	3		40
230-1000			47
Apply only 3m or 10m across the entire frequency range			

Radiated emissions at frequencies above 1 GHz

for Class B equipment

Frequency range MHz	Measurement		Class B limits dB(μV/m)
	Distance m	Detector type/ Bandwidth	OATS / SAC
1000-3000	3	Average / 1 MHz	50
3000-6000			54
1000-3000		Peak / 1 MHz	70
3000-6000			74
Both apply across the frequency range from 1000 MHz to the highest required frequency of measurement derived from			

Required highest frequency for radiated measurement

Highest internal frequency (*F*x)	Highest measured frequency
*F*x ≤ 108 MHz 1 GHz	108 MHz < *F*x ≤ 500 MHz 2 GHz
500 MHz < *F*x ≤ 1 GHz 5 GHz	*F*x > 1 GHz 5 × *F*x up to a maximum of 6 GHz

*F*x ≤ 108 MHz 1 GHz	108 MHz < *F*x ≤ 500 MHz 2 GHz
500 MHz < *F*x ≤ 1 GHz 5 GHz	*F*x > 1 GHz 5 × *F*x up to a maximum of 6 GHz
NOTE 1 For FM and TV broadcast receivers, *F*x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies. NOTE 2 *F*x is defined in 3.1.19.	

5.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3/10 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

All cable leaving the table-top EUT for a connection outsidethe test site (for example, mains cable, telephone lines, connections to auxiliary equipment located outside the test area) shall be fitted with ferrite clamps placed on the floor at the point where the cable reached the floor.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

Radiated emissions were invested over the frequency range from 30MHz to1GHz using a receiver bandwidth of 120kHz and above 1GHz using a receiver bandwidth of 1MHz.

30MHz to1GHz Radiated was performed at an antenna to EUT distance of 10 meters.

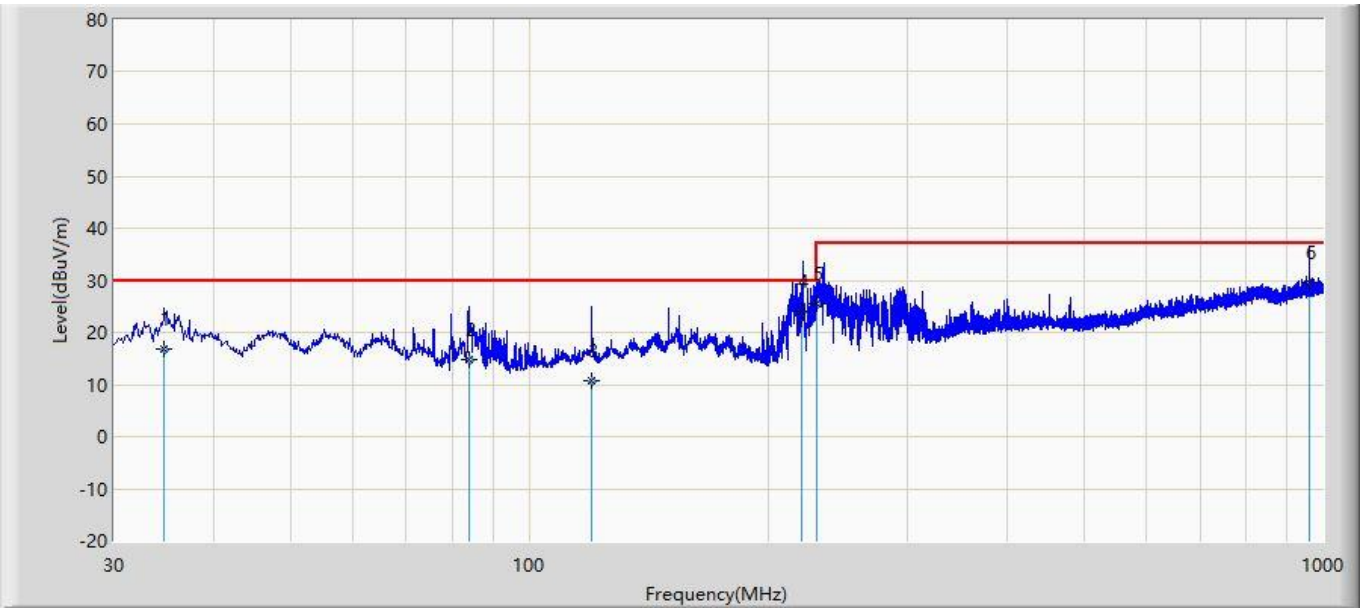
Above1GHz Radiated was performed at an antenna to EUT distance of 3 meters.

5.5. Deviation from Test Standard

No deviation.

5.6. Test Result

Engineer: Tony	
Site: AC1	Time: 2022/05/09
Limit: VCCI_RE(10m)_Class B	Margin: 0
Probe: VULB9168_01099(30-1000MHz)	Polarity: Horizontal
EUT: USB Hub	Power: DC 5V
Note: Mode 1	

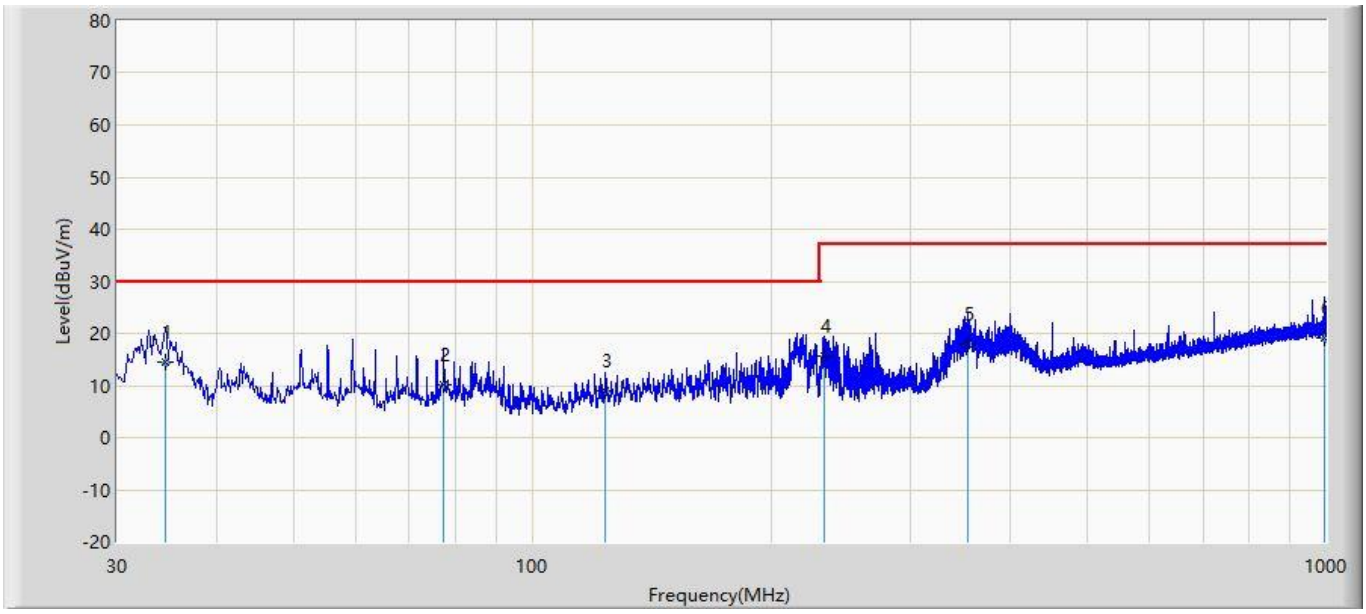


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		34.729	16.712	24.800	-13.288	30.000	12.453	1.047	21.588	200	150	QP
2		83.956	14.806	26.400	-15.194	30.000	8.340	1.695	21.629	100	25	QP
3		119.967	10.739	19.200	-19.261	30.000	11.042	2.065	21.568	100	25	QP
4	*	220.142	24.159	33.100	-5.841	30.000	9.618	2.910	21.469	400	143	QP
5		230.426	25.538	33.560	-11.462	37.000	10.475	2.983	21.480	100	15	QP
6		959.987	29.595	18.800	-7.405	37.000	23.771	6.945	19.921	400	48	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Tony	
Site: AC1	Time: 2022/05/09
Limit: VCCI_RE(10m)_Class B	Margin: 0
Probe: VULB9168_01100(30-1000MHz)	Polarity: Vertical
EUT: USB Hub	Power: DC 5V
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	34.486	14.563	33.800	-15.437	30.000	12.724	1.169	33.130	100	150	QP
2		77.409	10.023	32.100	-19.977	30.000	9.626	1.816	33.519	100	15	QP
3		123.849	8.960	29.500	-21.040	30.000	10.681	2.349	33.570	100	26	QP
4		233.821	15.580	34.800	-21.420	37.000	10.813	3.359	33.392	150	60	QP
5		353.131	17.948	32.500	-19.052	37.000	14.316	4.250	33.117	100	150	QP
6		994.786	19.023	18.500	-17.977	37.000	23.658	7.895	31.029	100	6	QP

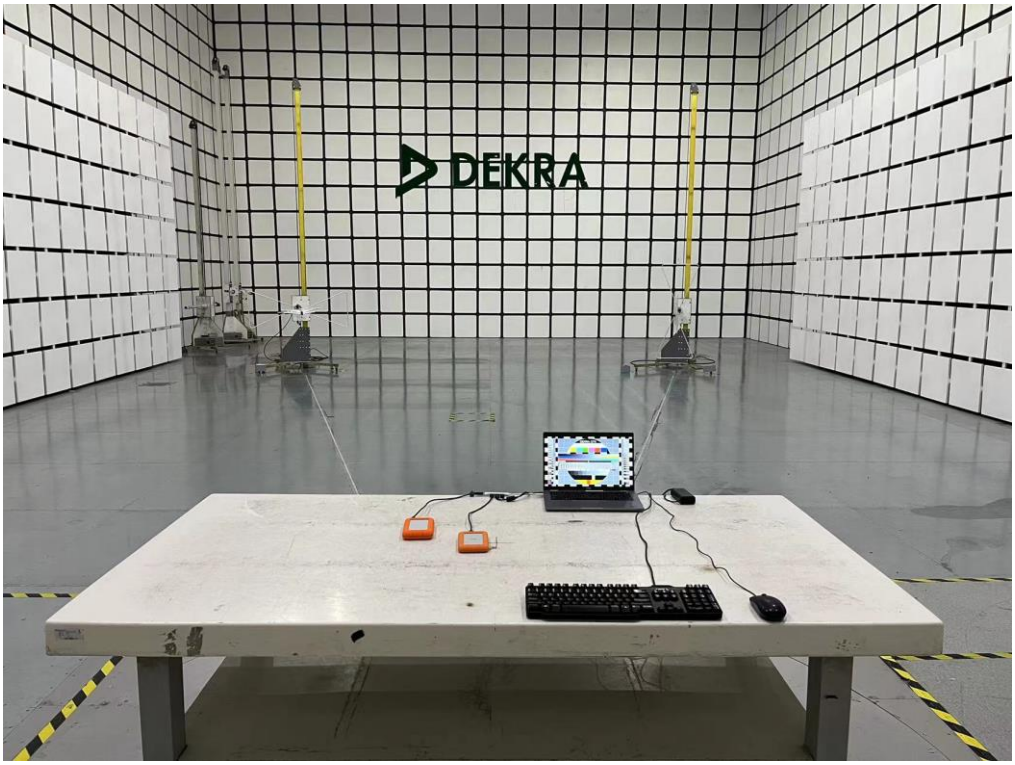
Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

5.7. Test Photograph

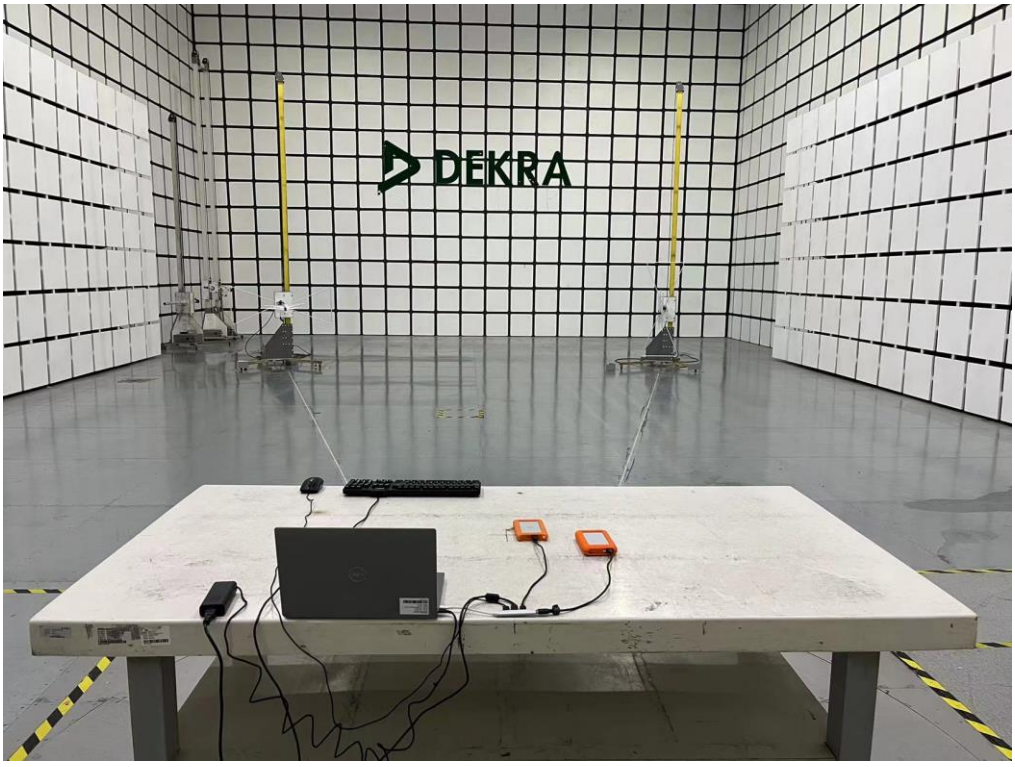
Test Mode: Mode 1

Description: Front View of Radiated Emission Test Setup (Below 1G)



Test Mode: Mode 1

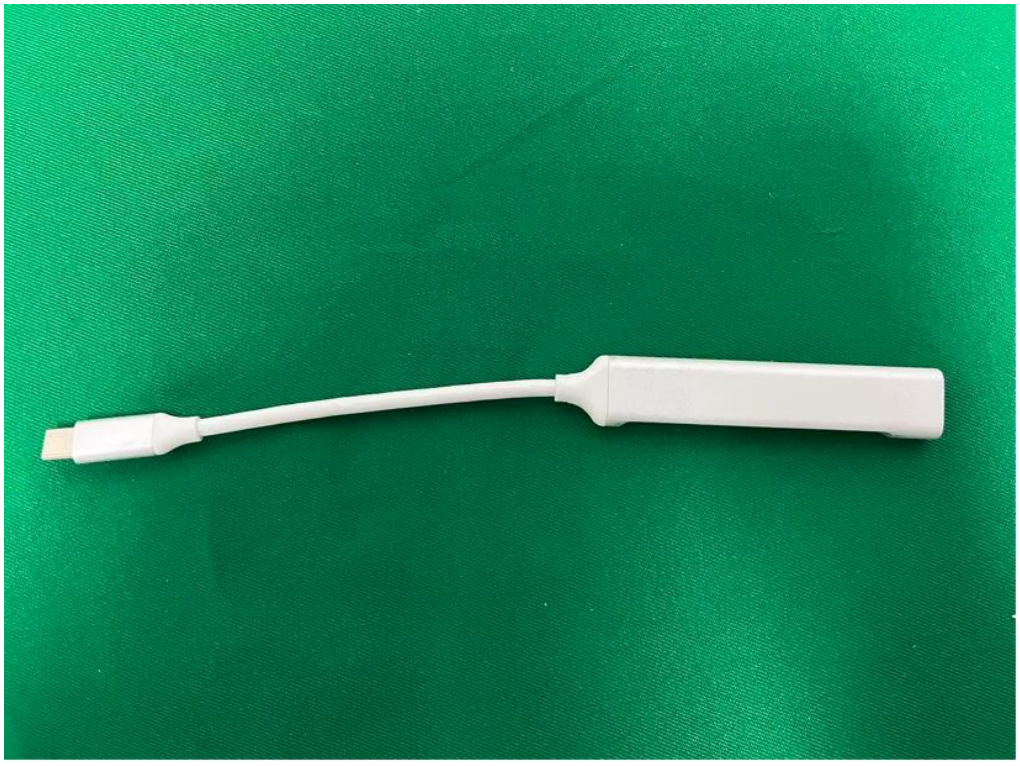
Description: Back View of Radiated Emission Test Setup (Below 1G)



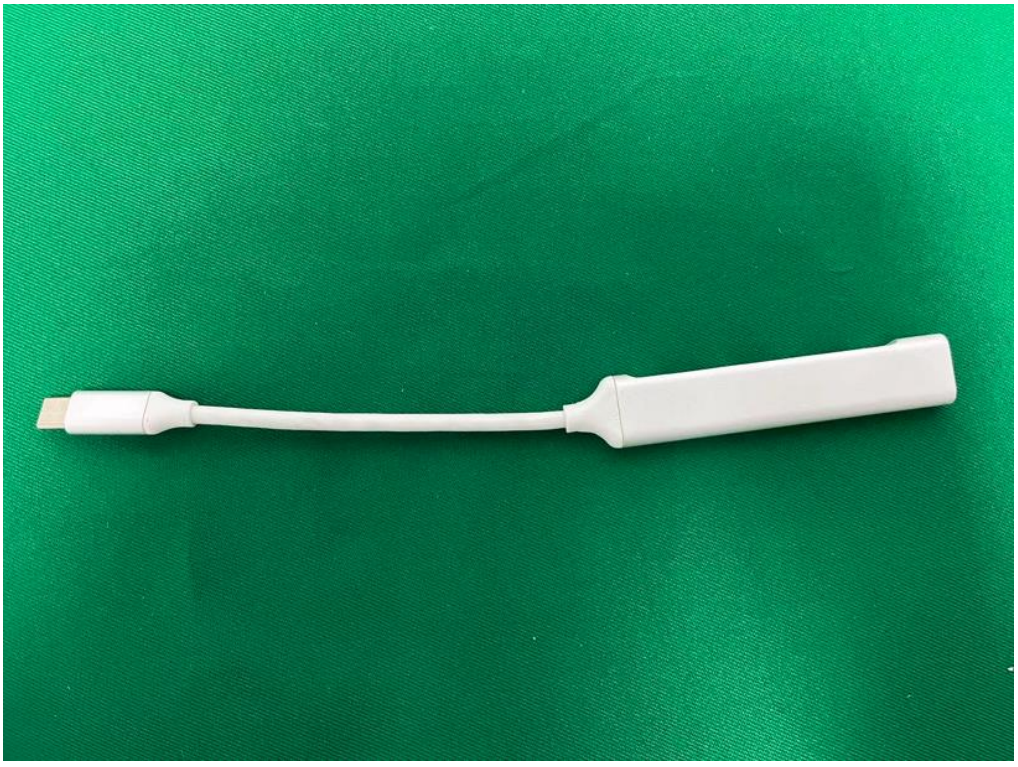
6. Attachment

➢ EUT Photograph

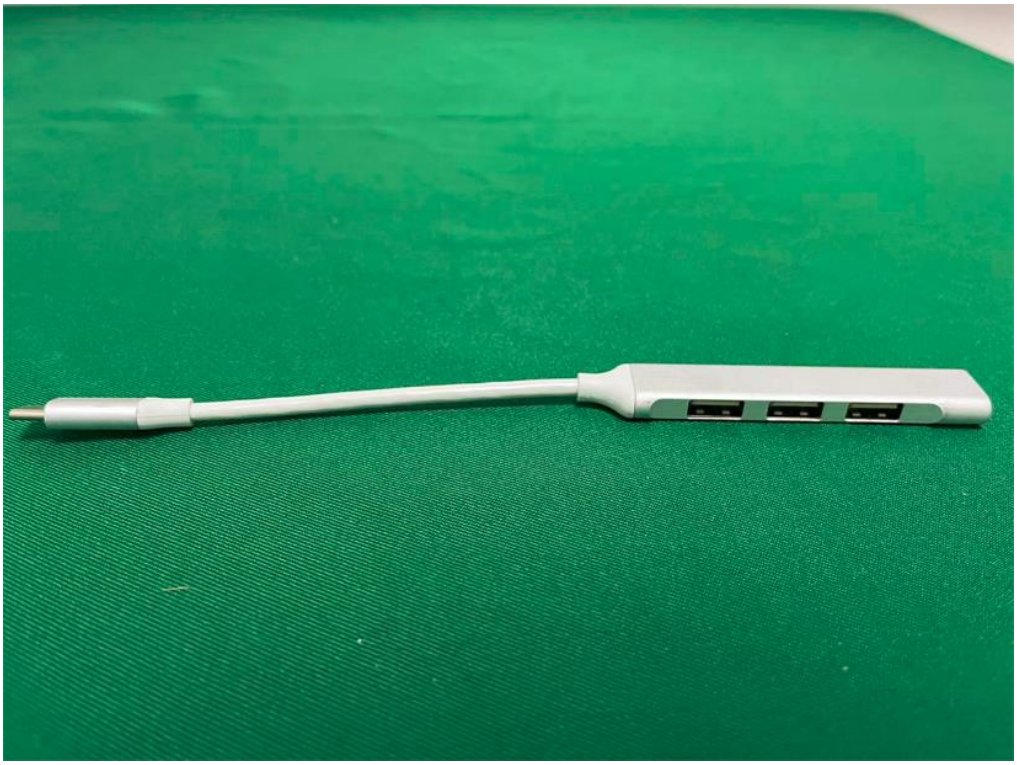
(1) EUT Photo



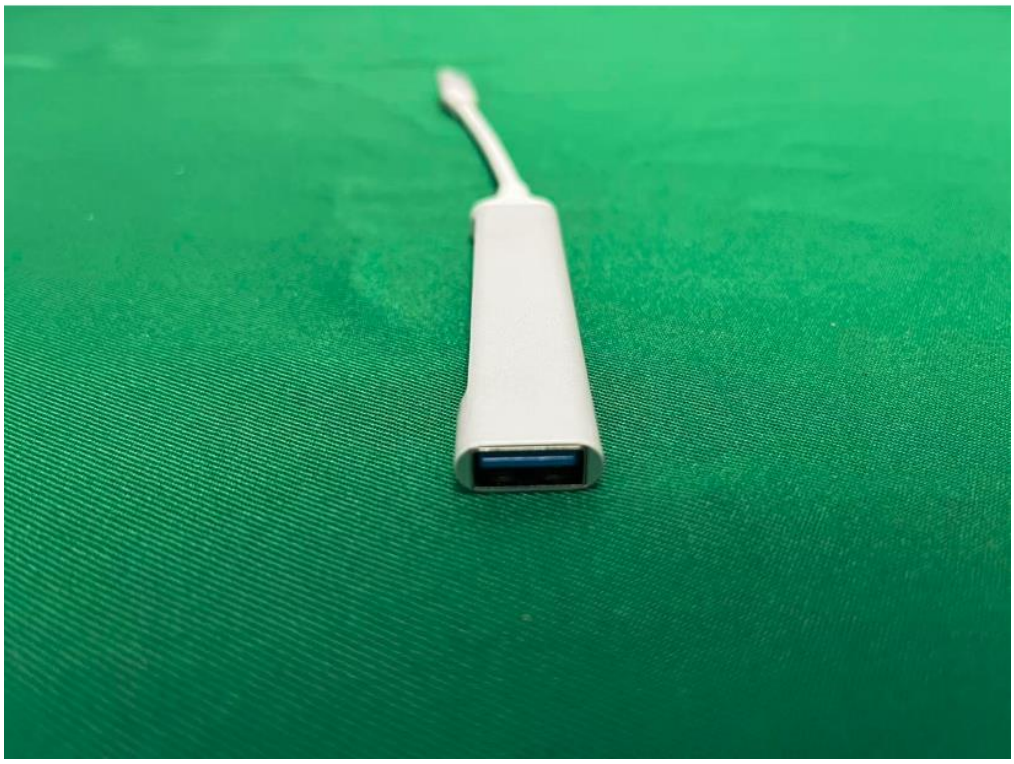
(2) EUT Photo



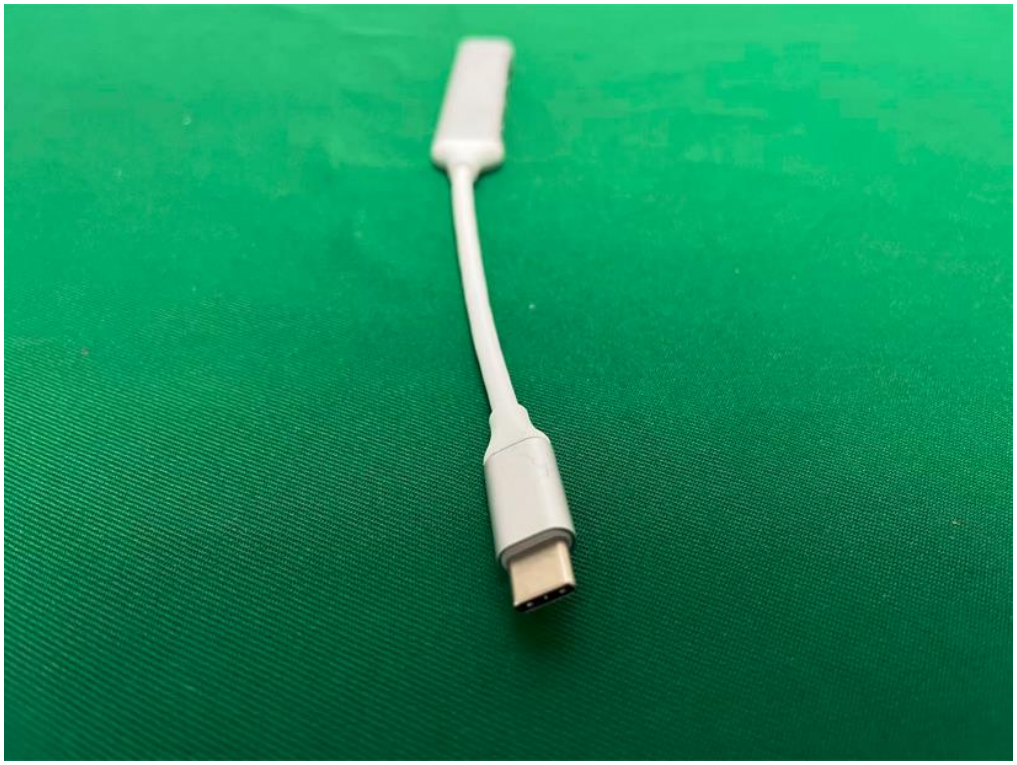
(3) EUT Photo



(4) EUT Photo



(5) EUT Photo



The End