EMC TEST REPORT

Report No.: 17070153-FCC-E-V1

Supersede Report No: N/A

Applicant	3Dconnexion
Product Name	SpaceMouse Compact
Model No.	3DX-600053
Serial No.	3DX-700059
Test Standard	FCC Part 15 Subpart B Class B:2016, ANSI C63.4: 2014
Test Date	March 22 to April 10, 2017
Issue Date	April 21, 2017
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Evans He	David Huang	
Evans He Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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CONTENTS

1. REPORT REVISION HISTORY 5

2. CUSTOMER INFORMATION 5

3. TEST SITE INFORMATION 5

4. EQUIPMENT UNDER TEST (EUT) INFORMATION 6

5. TEST SUMMARY 7

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS 9

6.1 AC POWER LINE CONDUCTED EMISSIONS 9

6.2 RADIATED EMISSIONS 15

ANNEX A. TEST INSTRUMENT 19

ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS 20

ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT 28

ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST 31

ANNEX E. DECLARATION OF SIMILARITY 32

1. Report Revision History

Report No.	Report Version	Description	Issue Date
17070153-FCC-E	NONE	Original	April 11, 2017
17070153-FCC-E-V1	V1	Changed the applicant' s name	April 21, 2017

2. Customer information

Applicant Name	3Dconnexion
Applicant Add	33, Rue du Portier, 98000 Monaco
Manufacturer	Xiamen Intretech Inc
Manufacturer Add	No. 588, Jiahe road, Xiamen, Fujian 361006, China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.Icp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	SpaceMouse Compact
Main Model:	3DX-600053
Serial Model:	3DX-700059
Antenna Gain:	N/A
Antenna Type:	PIFA antenna
Input Power:	N/A
Equipment Category：	Class B
Port:	USB Port
Trade Name：	3Dconnexion
FCC ID:	2AAHQ-SMC
Date EUT received:	March 21, 2017
Test Date(s):	March 22 to April 10, 2017

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.71dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

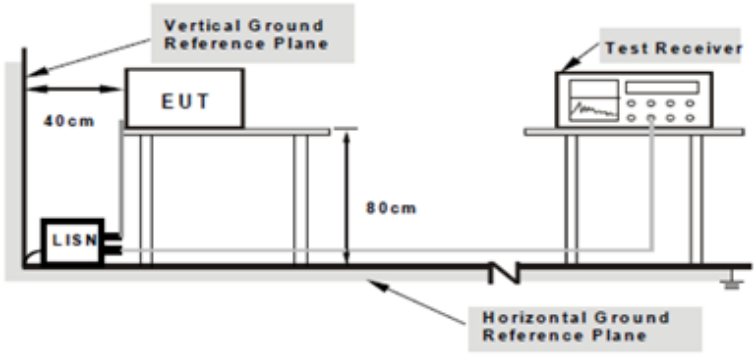
Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1024mbar
Test date :	March 24, 2017
Tested By :	Evans He

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.107	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.	☑

Frequency ranges (MHz)	Limit (dBμV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

Procedure

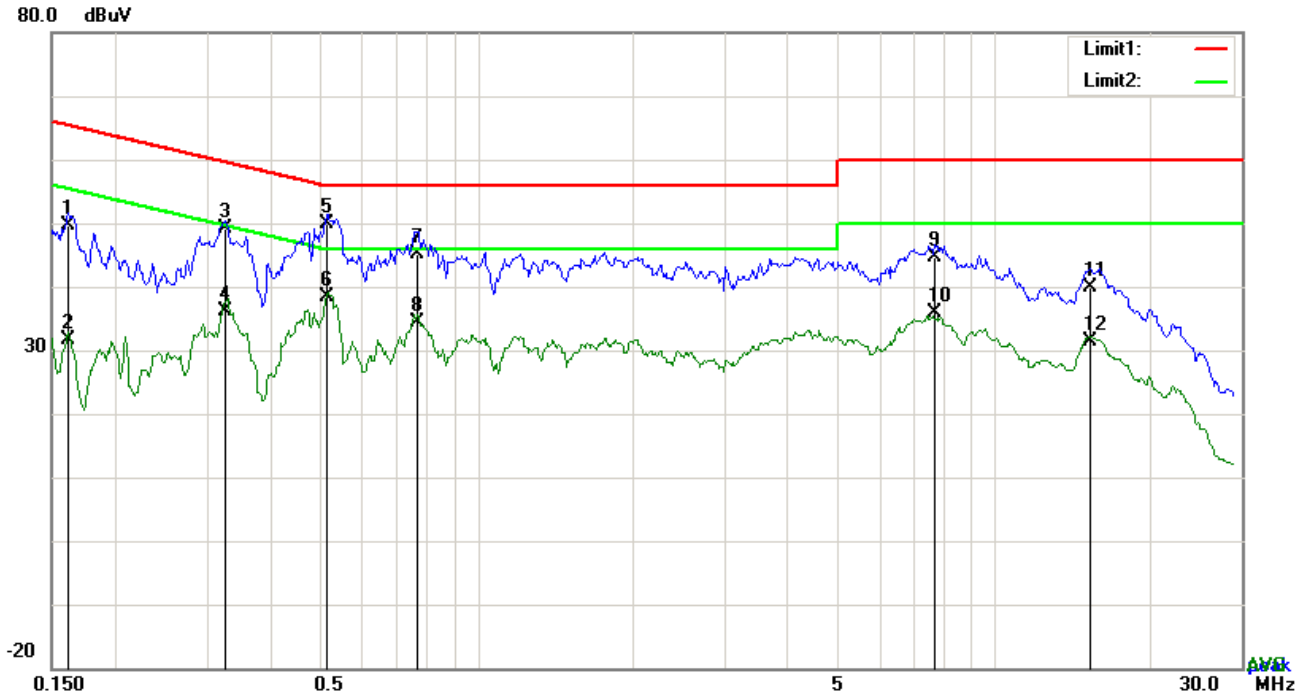
1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.

	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode :	Operating mode

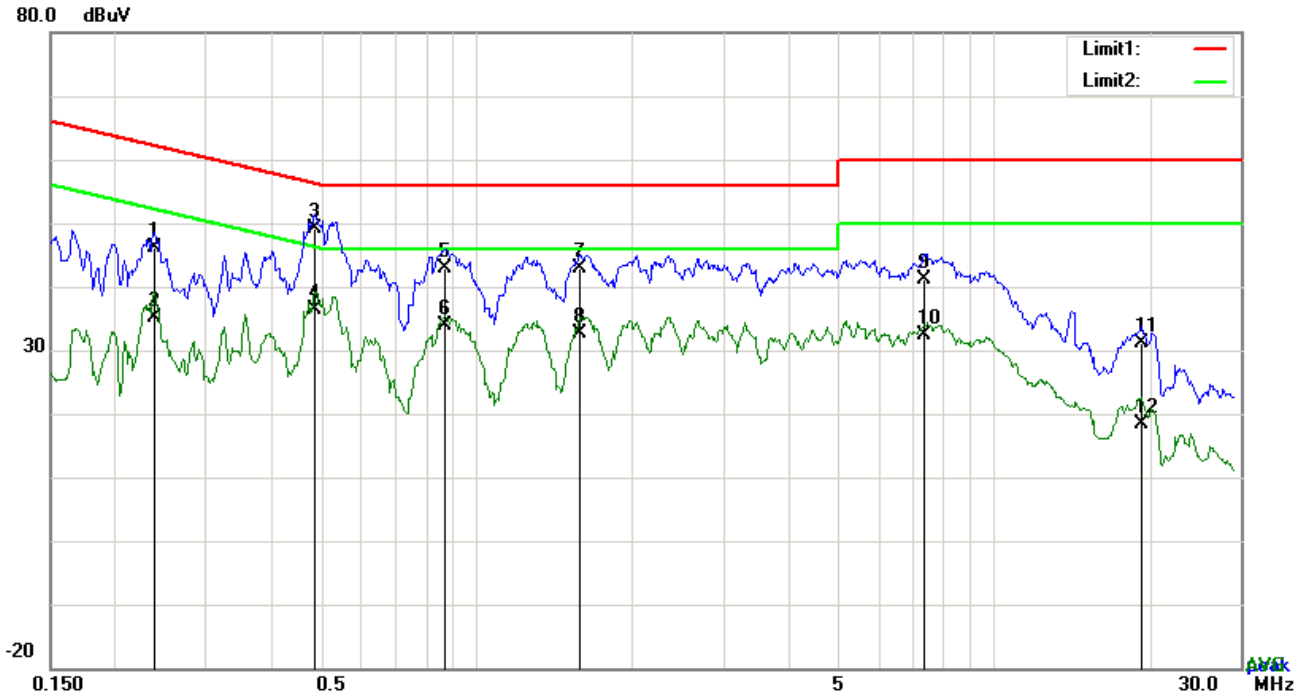


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1617	39.66	QP	10.03	49.69	65.38	-15.69
2	L1	0.1617	21.60	AVG	10.03	31.63	55.38	-23.75
3	L1	0.3255	39.08	QP	10.03	49.11	59.57	-10.46
4	L1	0.3255	26.17	AVG	10.03	36.20	49.57	-13.37
5	L1	0.5127	39.96	QP	10.03	49.99	56.00	-6.01
6	L1	0.5127	28.40	AVG	10.03	38.43	46.00	-7.57
7	L1	0.7662	35.10	QP	10.03	45.13	56.00	-10.87
8	L1	0.7662	24.36	AVG	10.03	34.39	46.00	-11.61
9	L1	7.6761	34.51	QP	10.12	44.63	60.00	-15.37
10	L1	7.6761	25.68	AVG	10.12	35.80	50.00	-14.20
11	L1	15.2928	29.67	QP	10.23	39.90	60.00	-20.10
12	L1	15.2928	21.13	AVG	10.23	31.36	50.00	-18.64

Test Mode :	Operating mode

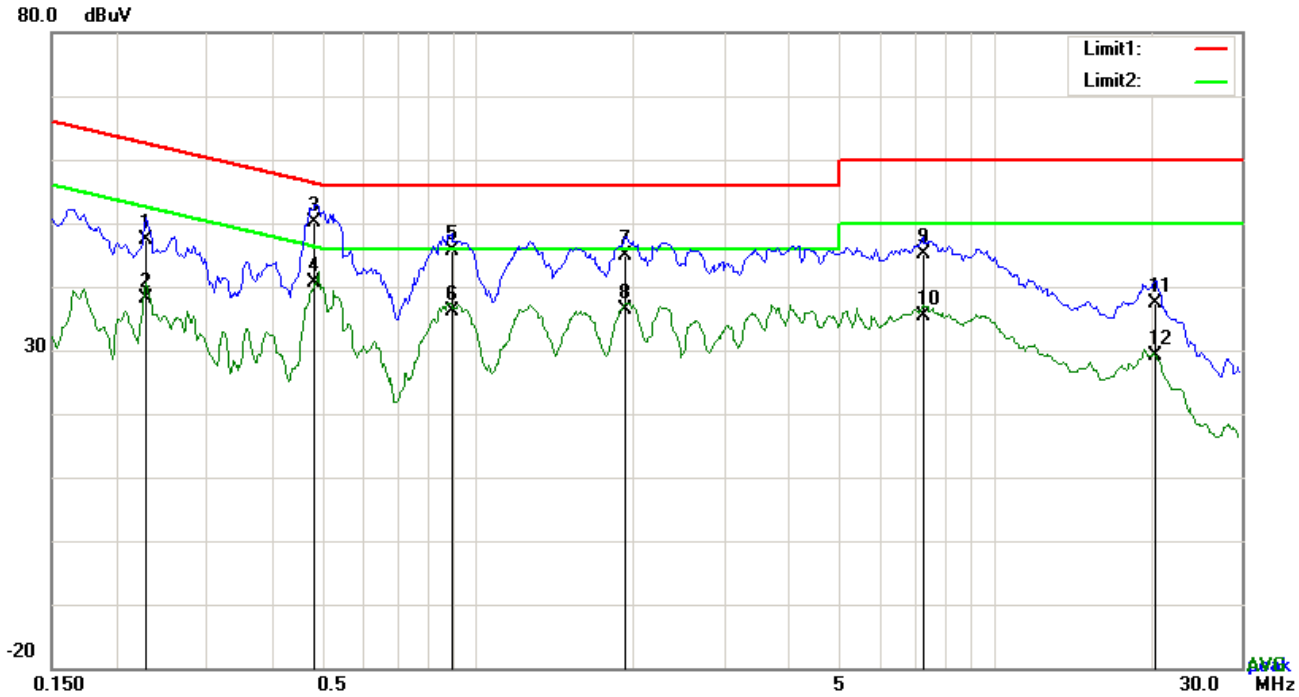


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2378	36.15	QP	10.02	46.17	62.17	-16.00
2	N	0.2378	25.03	AVG	10.02	35.05	52.17	-17.12
3	N	0.4863	39.19	QP	10.02	49.21	56.23	-7.02
4	N	0.4863	26.26	AVG	10.02	36.28	46.23	-9.95
5	N	0.8664	32.79	QP	10.03	42.82	56.00	-13.18
6	N	0.8664	23.87	AVG	10.03	33.90	46.00	-12.10
7	N	1.5851	32.75	QP	10.04	42.79	56.00	-13.21
8	N	1.5851	22.63	AVG	10.04	32.67	46.00	-13.33
9	N	7.3290	31.03	QP	10.10	41.13	60.00	-18.87
10	N	7.3290	22.33	AVG	10.10	32.43	50.00	-17.57
11	N	19.2236	20.97	QP	10.25	31.22	60.00	-28.78
12	N	19.2236	8.12	AVG	10.25	18.37	50.00	-31.63

Test Mode :	Operating mode

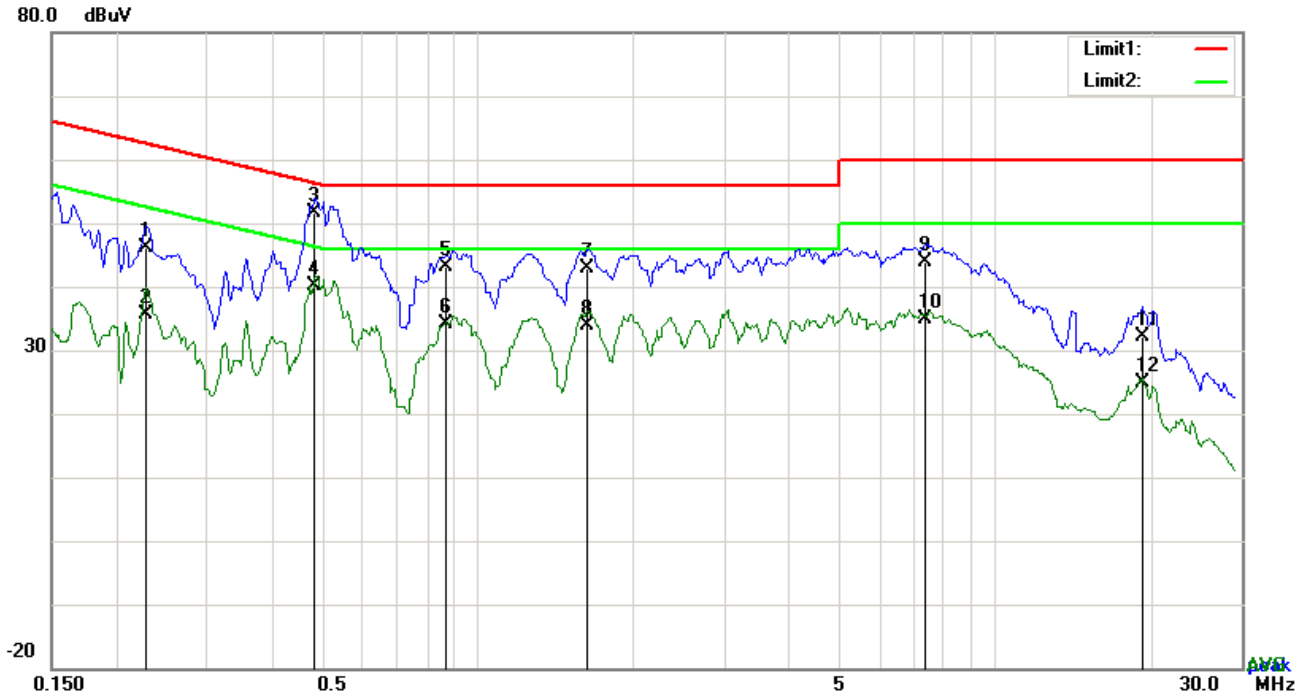


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2280	37.32	QP	10.03	47.35	62.52	-15.17
2	L1	0.2280	28.09	AVG	10.03	38.12	52.52	-14.40
3	L1	0.4854	40.21	QP	10.03	50.24	56.25	-6.01
4	L1	0.4854	30.67	AVG	10.03	40.70	46.25	-5.55
5	L1	0.8910	35.52	QP	10.03	45.55	56.00	-10.45
6	L1	0.8910	26.17	AVG	10.03	36.20	46.00	-9.80
7	L1	1.9362	34.76	QP	10.04	44.80	56.00	-11.20
8	L1	1.9362	26.41	AVG	10.04	36.45	46.00	-9.55
9	L1	7.2549	35.01	QP	10.11	45.12	60.00	-14.88
10	L1	7.2549	25.22	AVG	10.11	35.33	50.00	-14.67
11	L1	20.4759	27.11	QP	10.31	37.42	60.00	-22.58
12	L1	20.4759	18.81	AVG	10.31	29.12	50.00	-20.88

Test Mode :	Operating mode



Test Data

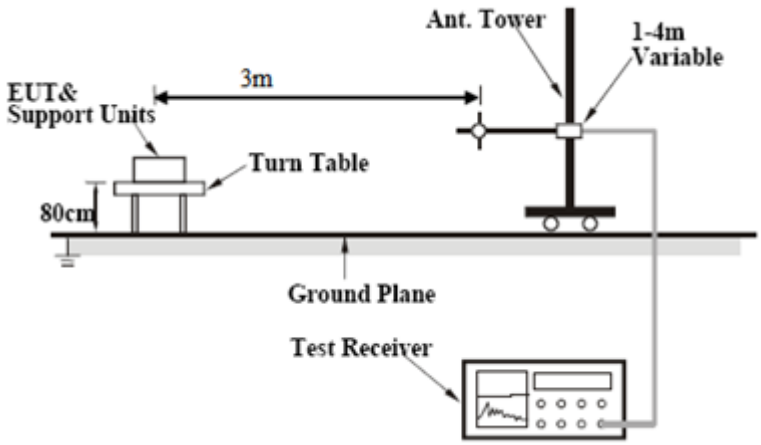
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2280	36.15	QP	10.02	46.17	62.52	-16.35
2	N	0.2280	25.56	AVG	10.02	35.58	52.52	-16.94
3	N	0.4854	41.57	QP	10.02	51.59	56.25	-4.66
4	N	0.4854	30.15	AVG	10.02	40.17	46.25	-6.08
5	N	0.8676	33.10	QP	10.03	43.13	56.00	-12.87
6	N	0.8676	24.15	AVG	10.03	34.18	46.00	-11.82
7	N	1.6359	32.93	QP	10.04	42.97	56.00	-13.03
8	N	1.6359	23.75	AVG	10.04	33.79	46.00	-12.21
9	N	7.3563	33.88	QP	10.10	43.98	60.00	-16.02
10	N	7.3563	24.73	AVG	10.10	34.83	50.00	-15.17
11	N	19.2435	21.77	QP	10.25	32.02	60.00	-27.98
12	N	19.2435	14.74	AVG	10.25	24.99	50.00	-25.01

6.2 Radiated Emissions

Temperature	22 °C
Relative Humidity	53%
Atmospheric Pressure	1029mbar
Test date :	March 29, 2017
Tested By :	Evans He

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.109(d)</td><td>a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
a. Vertical or horizontal polarization (whichever gave the higher emission level</td></tr>
</table>

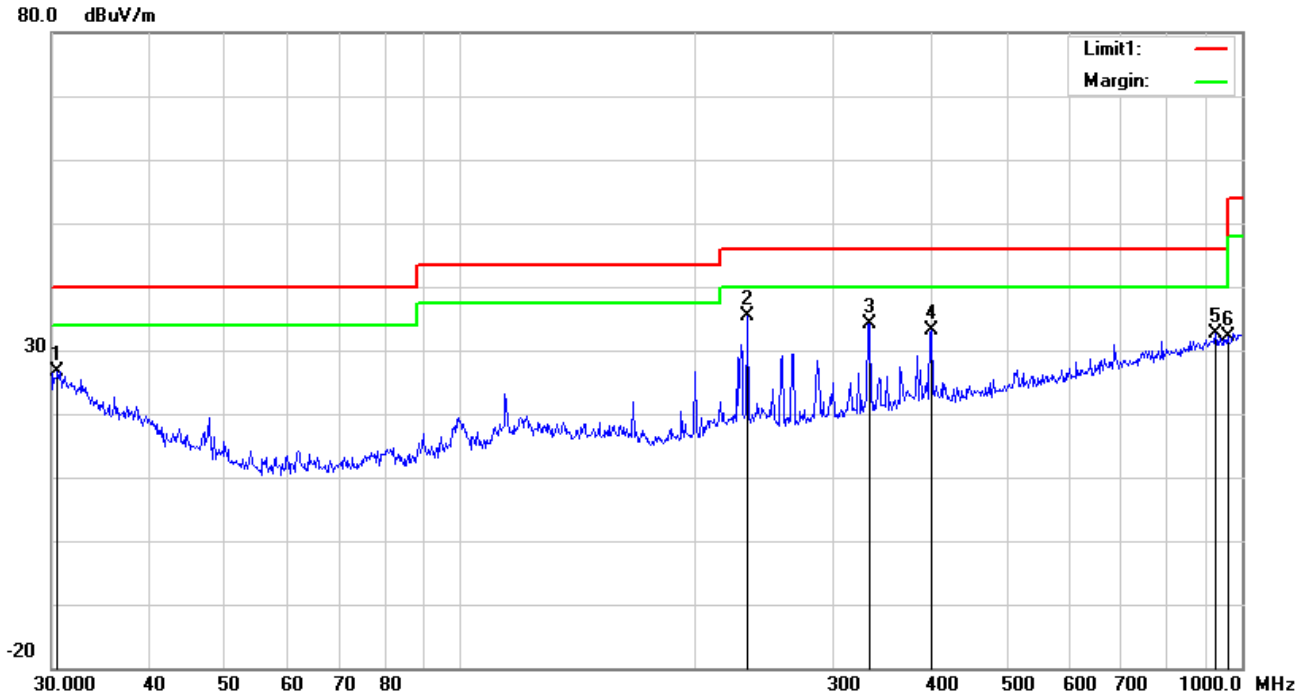
	over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. 4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz. ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode ：	Operating mode

Below 1GHz



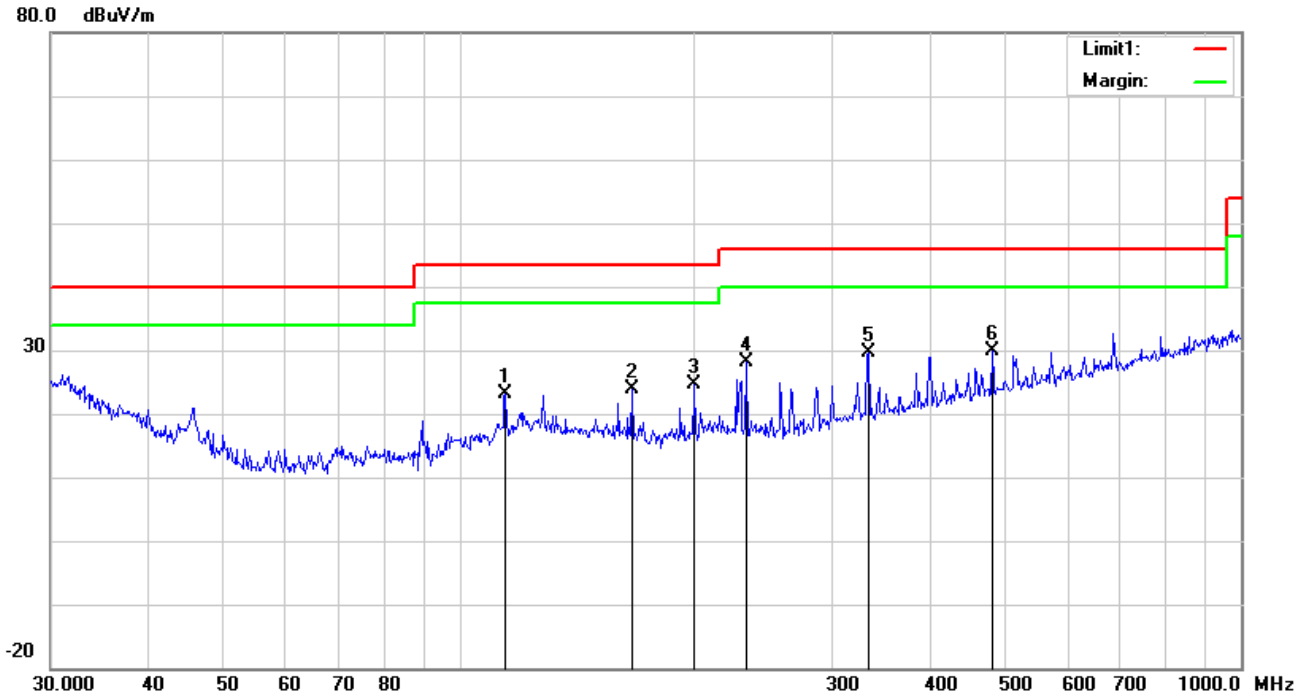
Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	30.5306	27.38	peak	20.99	22.28	0.63	26.72	40.00	-13.28	100	268
2	H	233.3487	44.53	peak	11.63	22.32	1.65	35.49	46.00	-10.51	100	60
3	H	333.6867	40.08	peak	14.31	22.20	1.96	34.15	46.00	-11.85	100	235
4	H	400.4319	37.44	peak	15.71	22.01	2.01	33.15	46.00	-12.85	100	125
5	H	925.7563	27.62	peak	22.63	20.83	3.12	32.54	46.00	-13.46	100	334
6	H	958.7943	26.89	peak	22.79	20.77	3.22	32.13	46.00	-13.87	100	180

Note: The highest frequency of the EUT is less than 108 MHz, so it is no need to be tested against radiated emission above 1GHz.

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	114.5146	31.26	peak	12.94	22.35	1.17	23.02	43.50	-20.48	200	159
2	V	166.0680	32.71	peak	12.11	22.26	1.37	23.93	43.50	-19.57	100	318
3	V	199.9856	33.42	peak	12.10	22.38	1.54	24.68	43.50	-18.82	100	26
4	V	232.5318	37.24	peak	11.64	22.32	1.64	28.20	46.00	-17.80	100	309
5	V	333.6867	35.56	peak	14.31	22.20	1.96	29.63	46.00	-16.37	100	157
6	V	480.5276	32.22	peak	17.31	21.85	2.31	29.99	46.00	-16.01	100	93

Note: The highest frequency of the EUT is less than 108 MHz, so it is no need to be tested against radiated emission above 1GHz.

Annex A. TEST INSTRUMENT

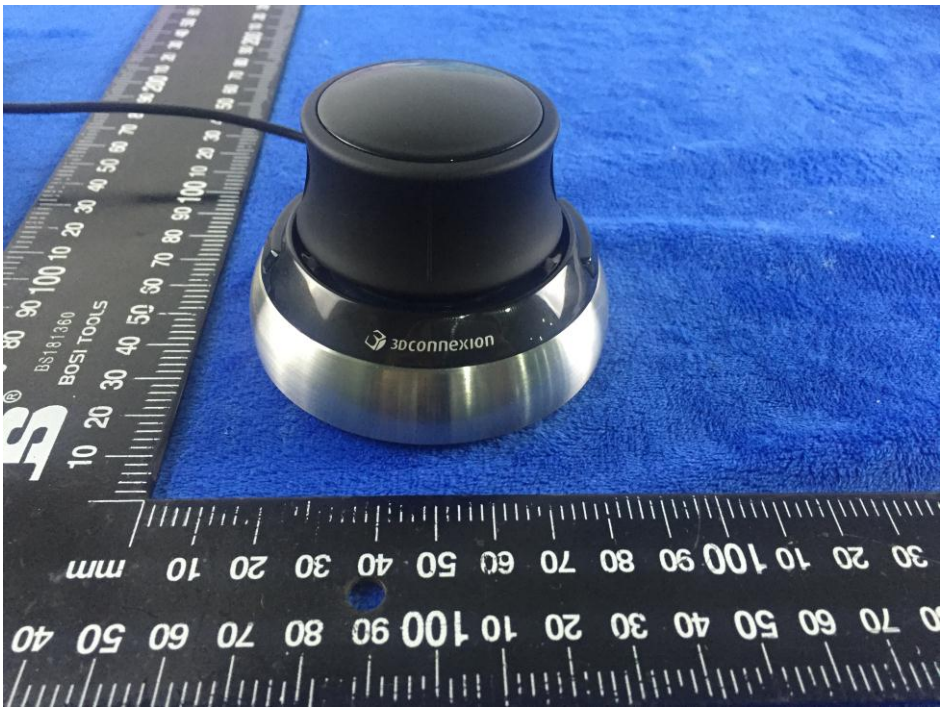
Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/16/2016	09/15/2017	☑
Line Impedance Stabilization Network	LI-125A	191106	09/24/2016	09/23/2017	☑
Line Impedance Stabilization Network	LI-125A	191107	09/24/2016	09/23/2017	☑
LISN	ISN T800	34373	09/24/2016	09/23/2017	☑
Transient Limiter	LIT-153	531118	08/31/2016	08/30/2017	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	☐
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	☑
Double Ridge Horn Antenna	AH-118	71259	09/23/2016	09/22/2017	☐

Annex B. EUT And Test Setup Photographs

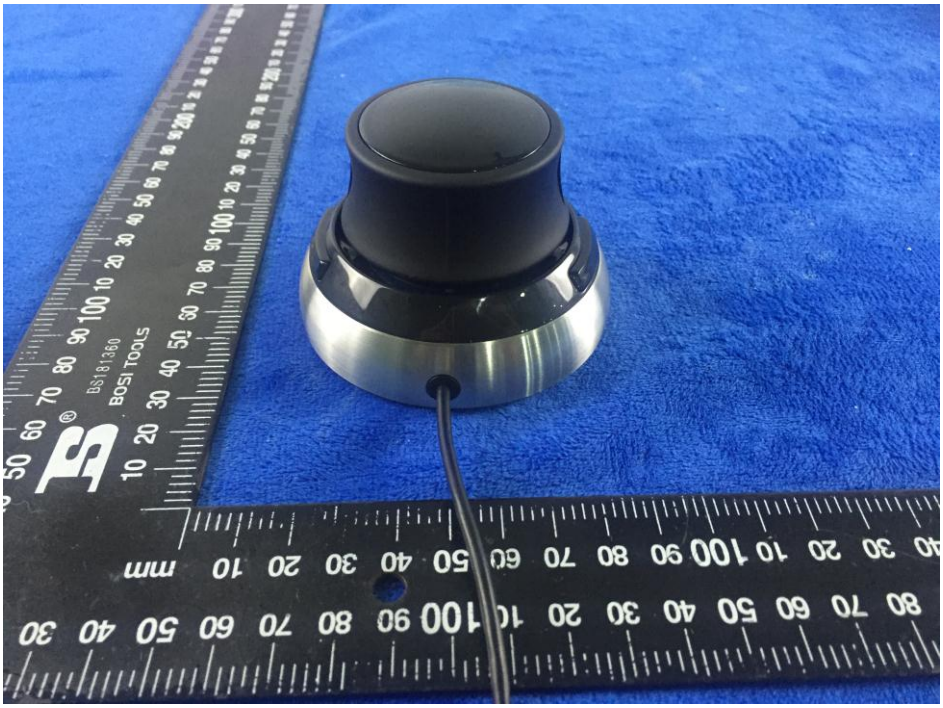
Annex B.i. Photograph: EUT External Photo

Whole Package View

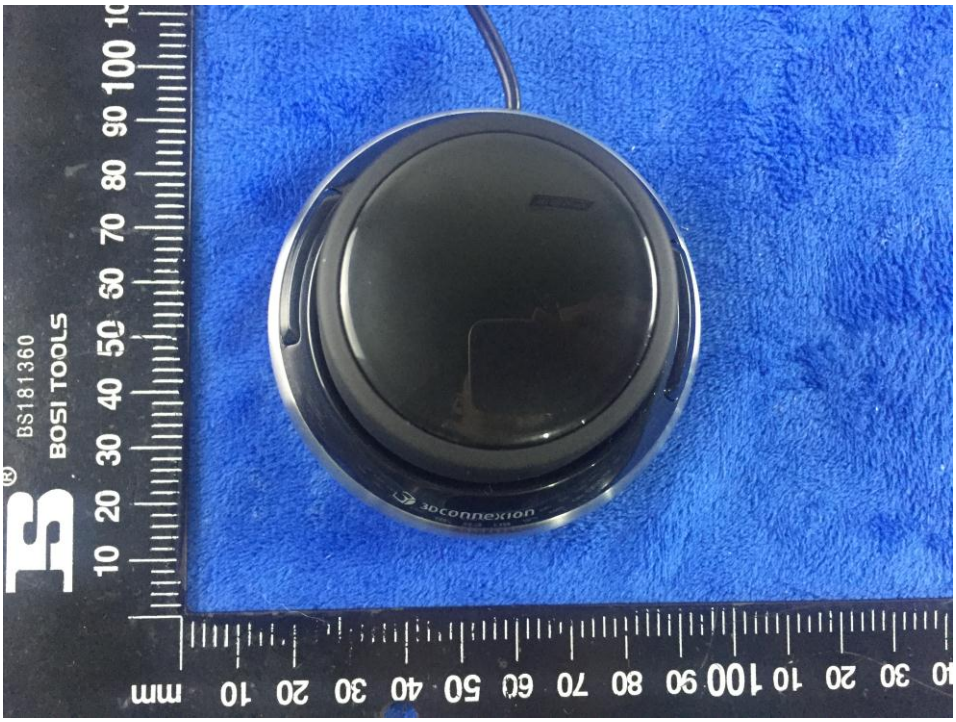
EUT - Front View



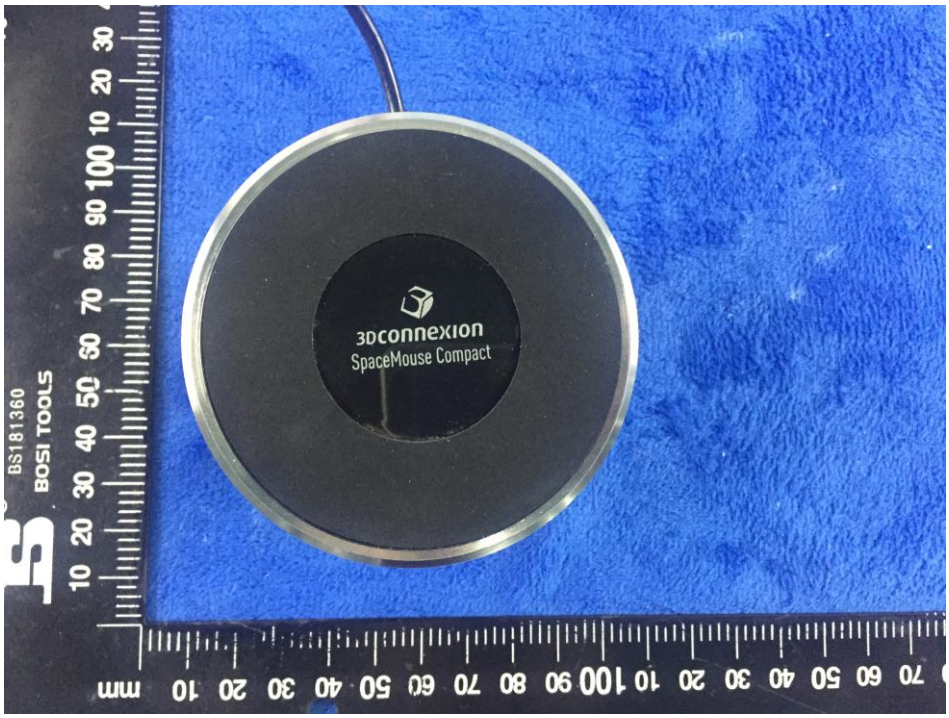
EUT - Rear View



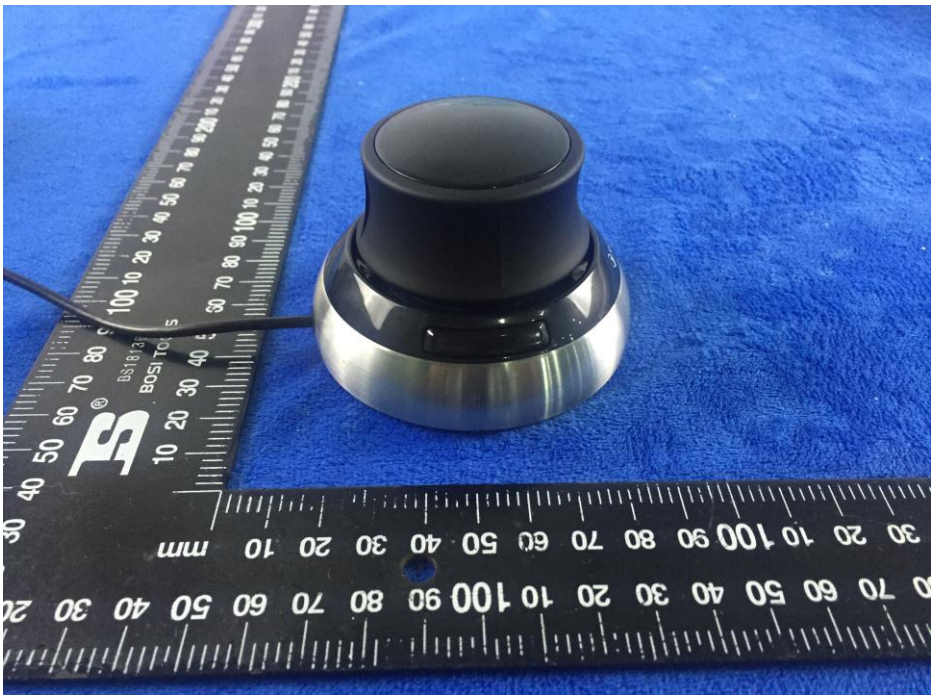
EUT - Top View



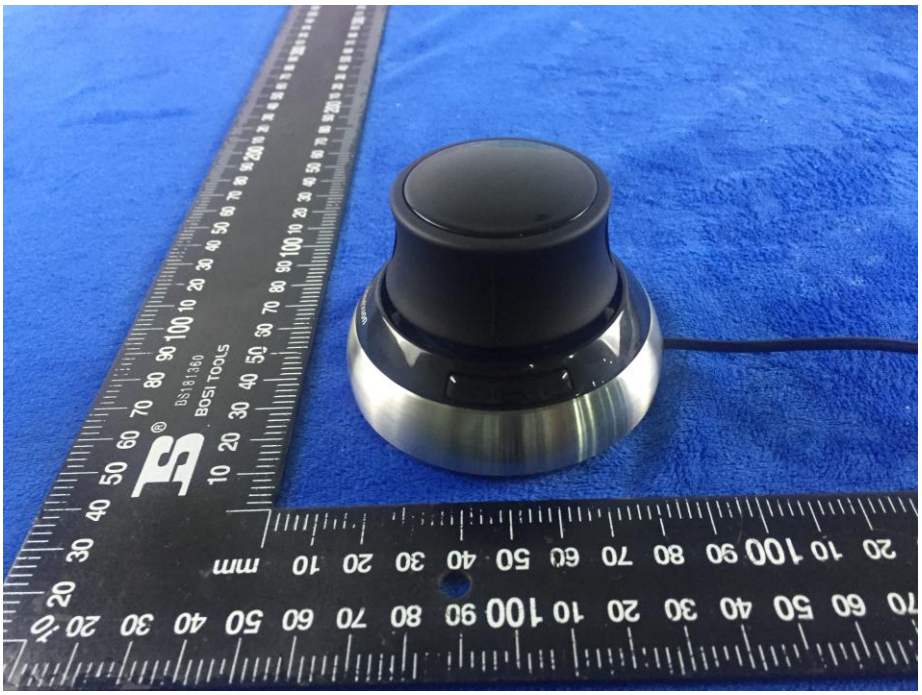
EUT - Bottom View



EUT - Left View

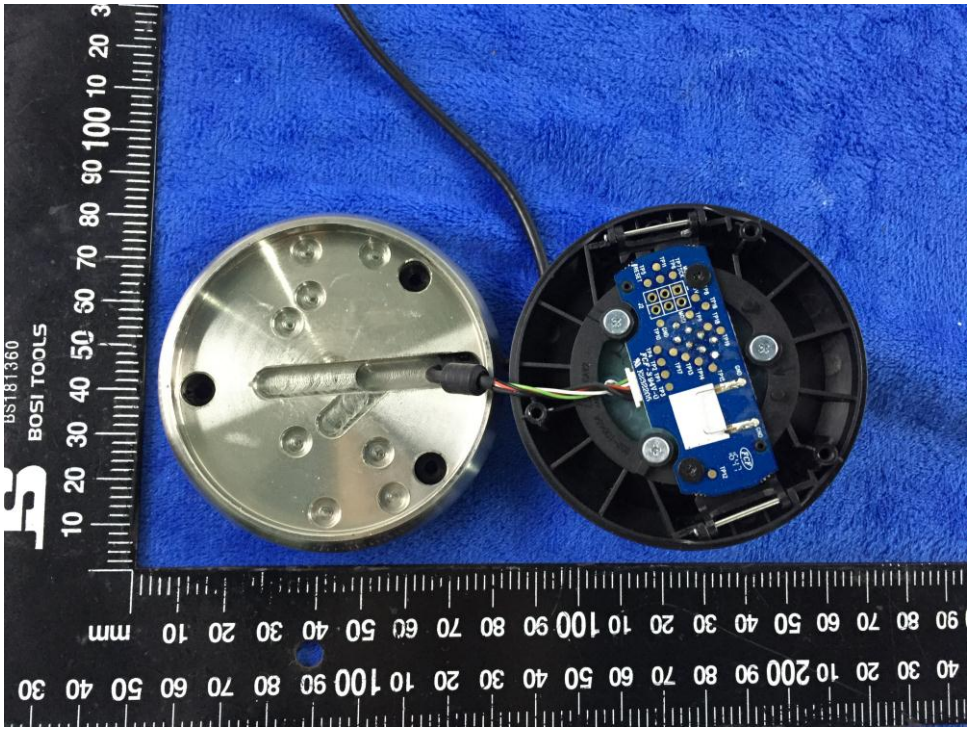


EUT - Right View

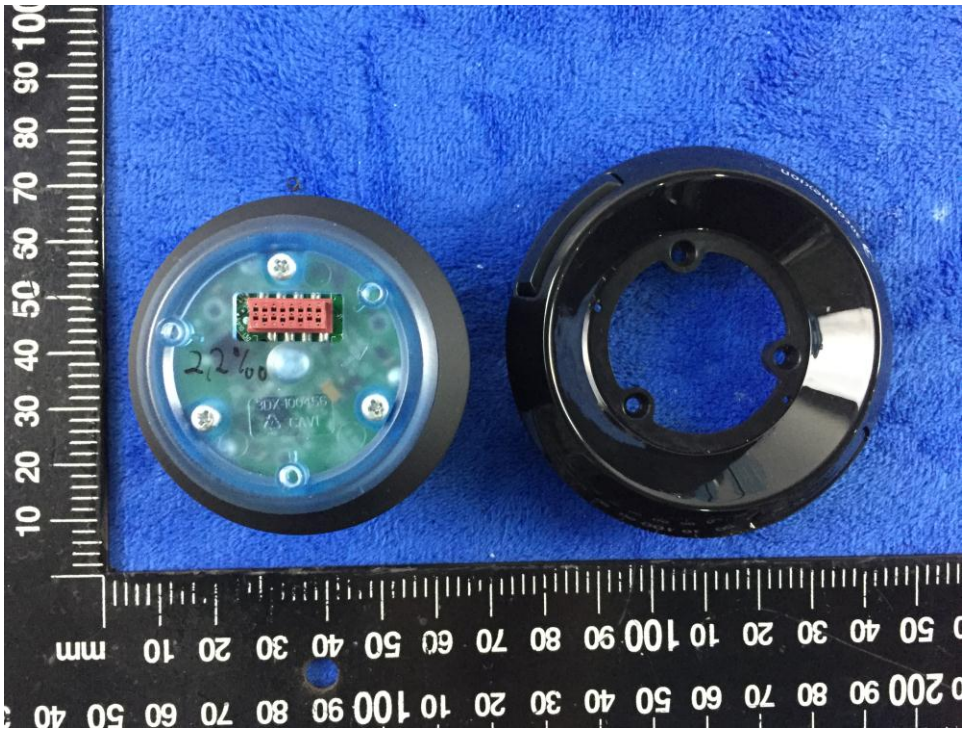


Annex B.ii. Photograph: EUT Internal Photo

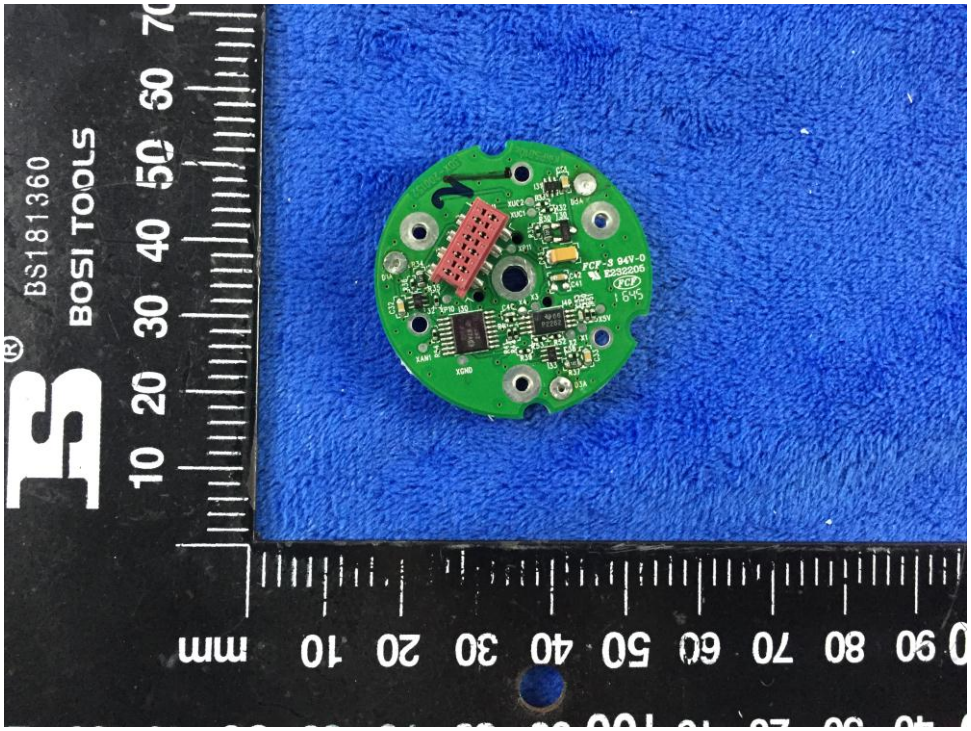
Cover Off - Top View 1



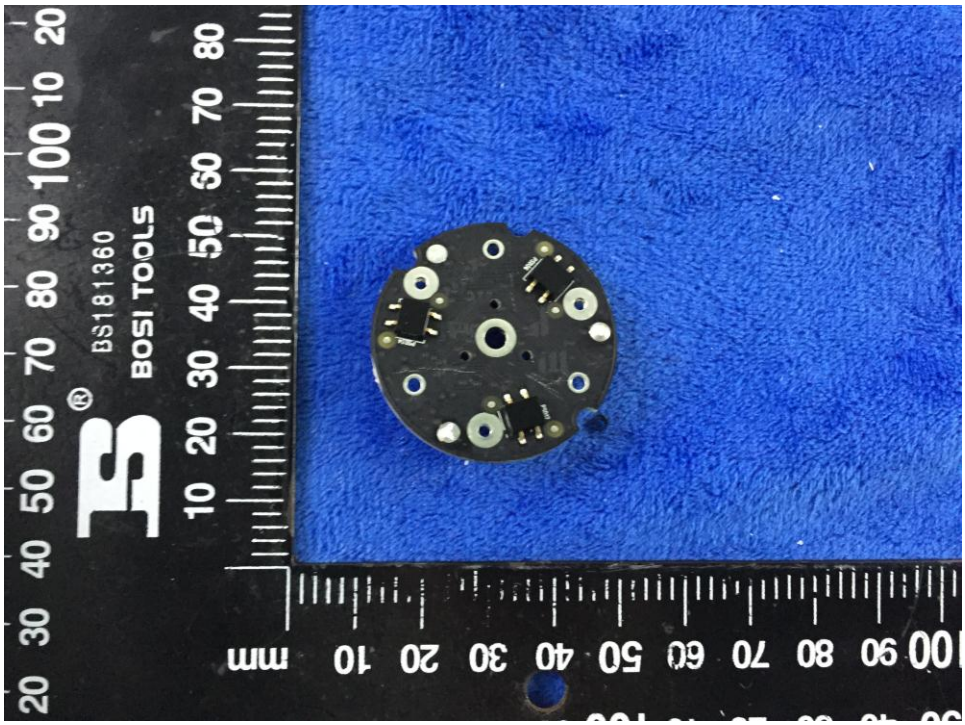
Cover Off - Top View 2



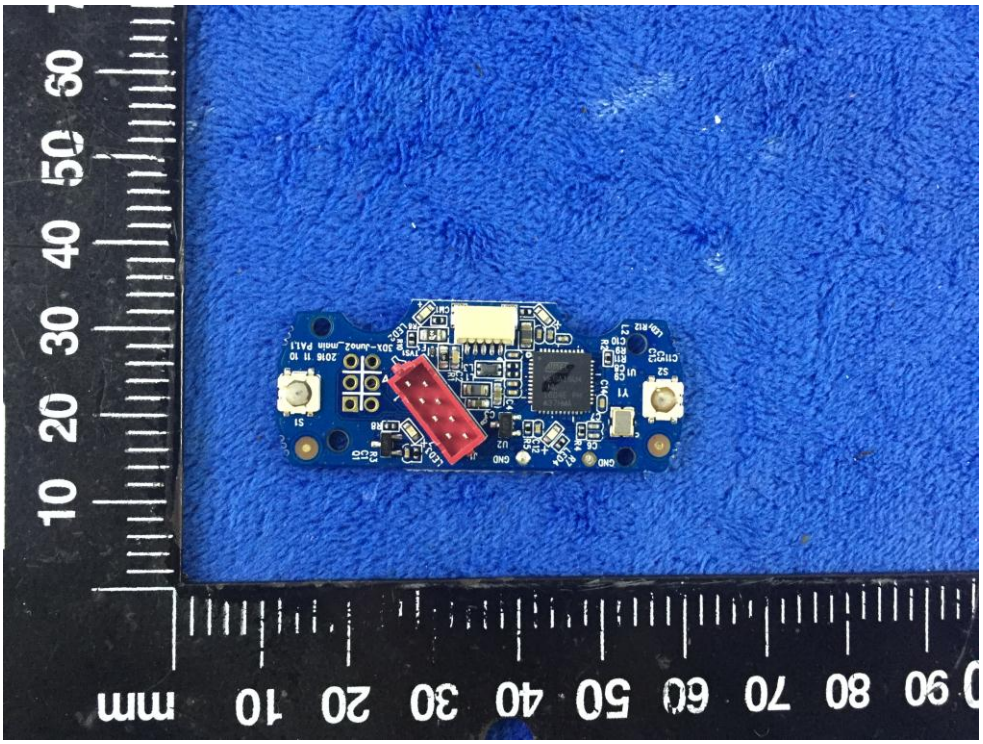
Mainboard - Front View



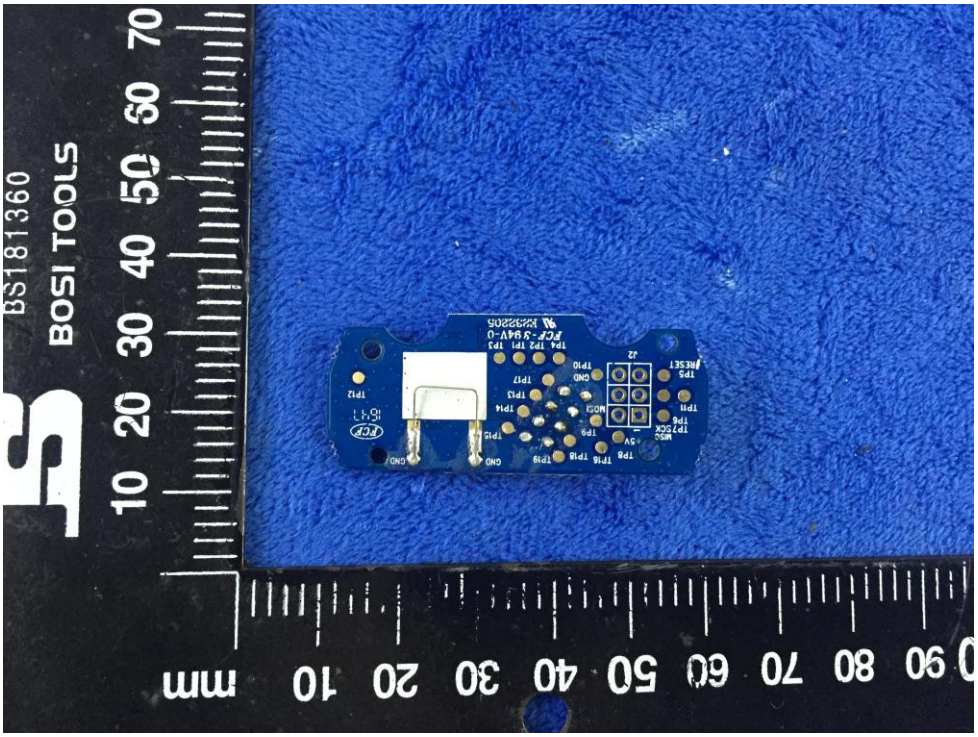
Mainboard - Rear View



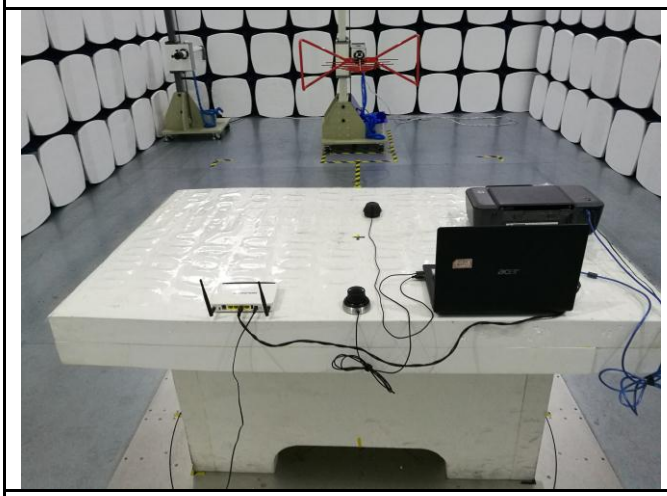
Small Mainboard – Front View



Small Mainboard – Rear View



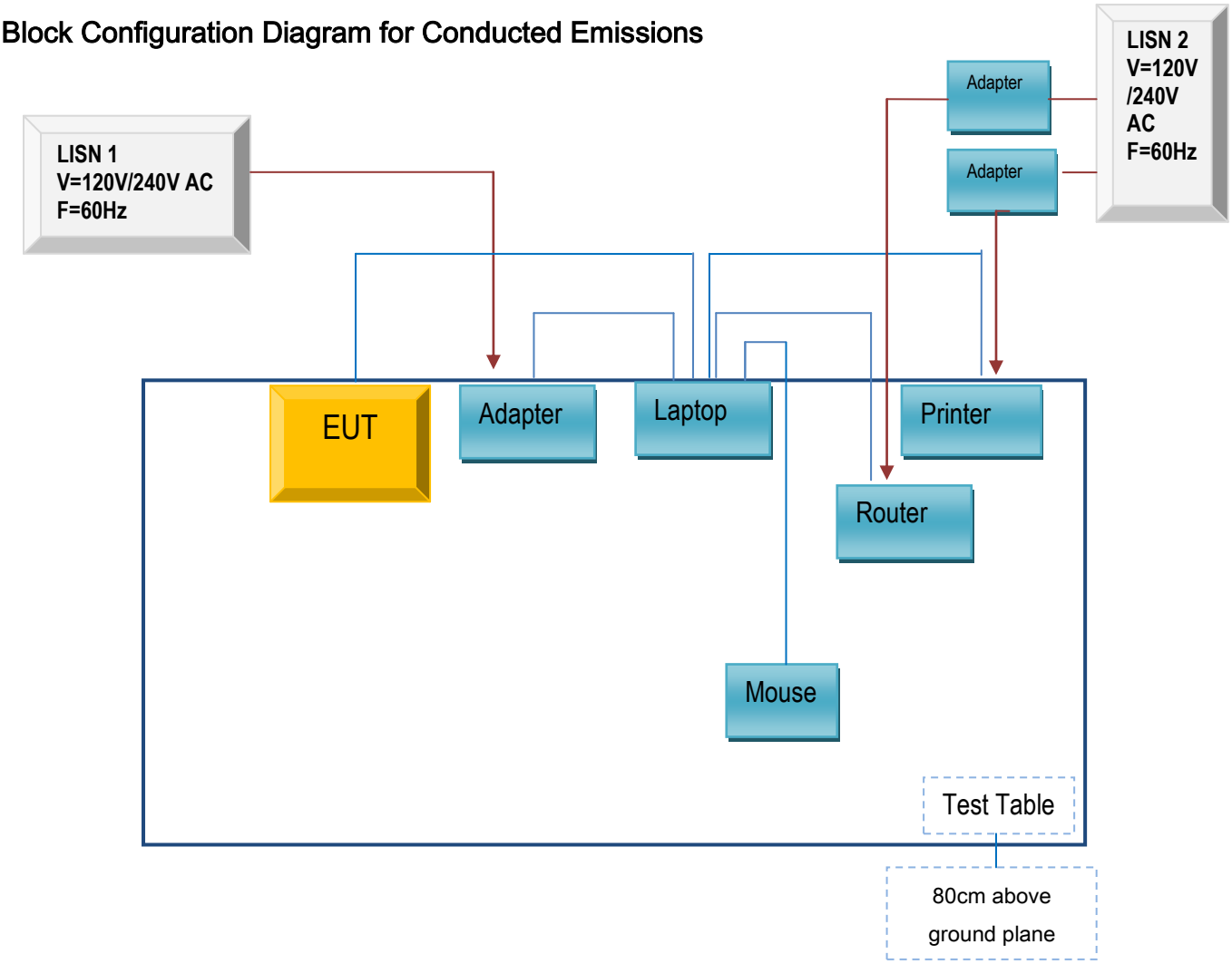
Annex B.iii. Photograph: Test Setup Photo

	
Conducted Emissions Test Setup – Front View	Conducted Emissions Test Setup – Side View
	
Radiated Emissions Test Setup Below 1GHz	

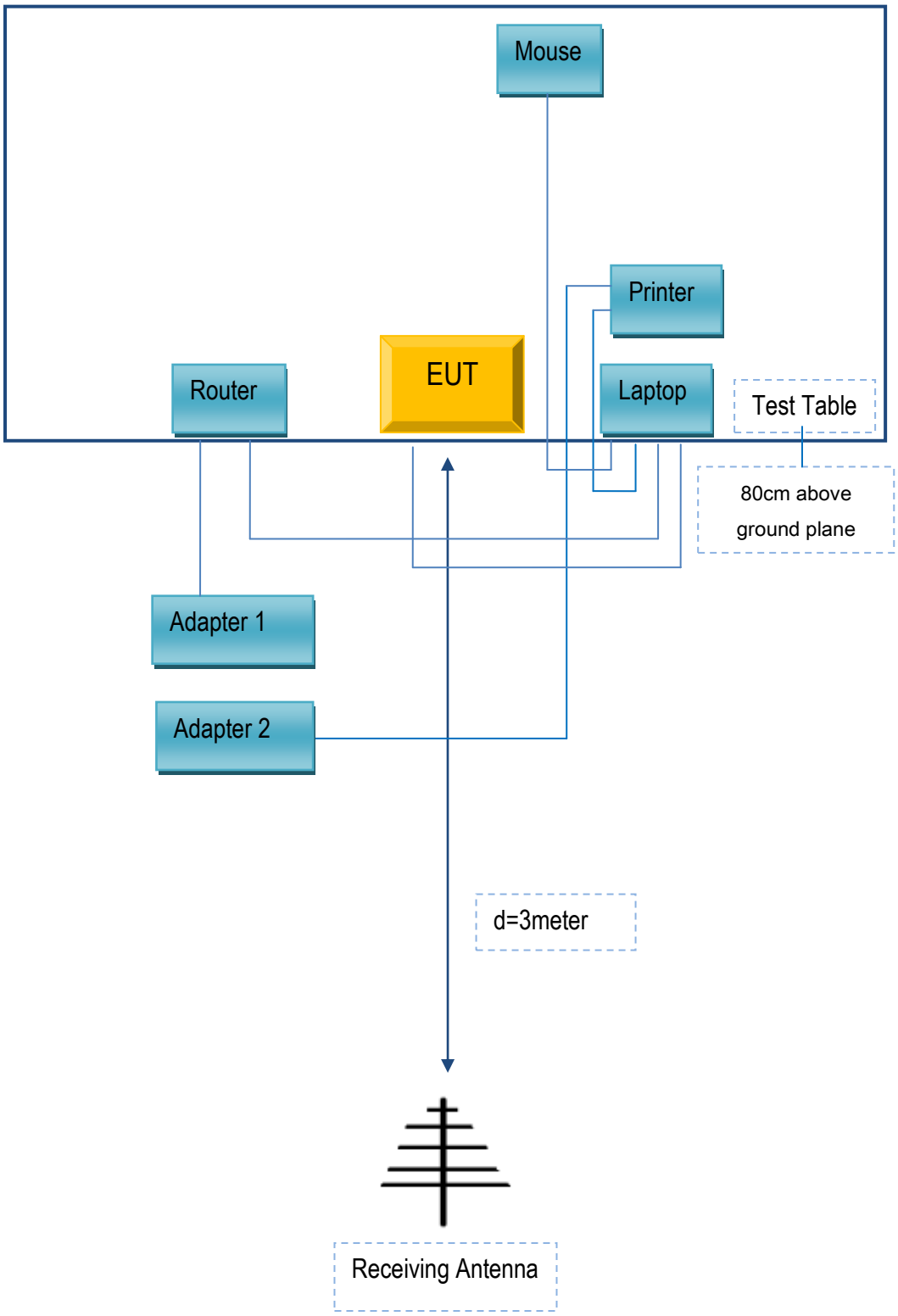
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	LR-1EHRX
GOLDWEB	Router	R102	1202032094
Lenovo	AC Adapter	42T4416	21D9JU
HP	Printer	VCVRA-1003	CN36M19JWX
DELL	Mouse	E100	912NMTUT41481
BULL	Socket	GN-403	GN201203

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
USB Cable	Un-shielding	No	2m	CBA3000AH0C1
RJ45 Cable	Un-shielding	No	2m	KX156327541
Router Power cable	Un-shielding	No	2m	13274630Z
Printer Power cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	0.8m	GT211032

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

Annex E. DECLARATION OF SIMILARITY

3DCONNEXION

To： 775 Montague Expressway Mlpitas, CA 95035,USA

Declaration Letter

We declare that, 3DX-700059, 3DX-600053 PCB and Appearance shape are the same.
For our business issue and marketing requirement:
3DX-700059 is the marketing model,
3DX-600053 the EUT model.

Thank you!

Sincerely,
Client's signature：

Client' s name / title: Xiaobing Lin/ Compliance Manager
Contact information / Address : 33, rue du Portier, 98000 Monaco