# 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 Subpa	art B Class B:2016, A	NSI 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			
mas.	He Davi	id Huang	
Evans H Test Engir		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
Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn



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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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# 1. Report Revision History

Report No.	Report Version	Description	Issue Date
17070153-FCC-E	NONE	Original	April 11, 2017
47070452 FCC F V4	V1	Changed the applicant's	April 21, 2017
17070153-FCC-E-V1		name	

# 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	
	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park	
Lab Address	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.lcp-03A1)	



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# 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



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# 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



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# **Measurement Uncertainty**

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



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# 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 Applicabl					
47CFR§15.	a)	For Low-power radio-frequenced to the public voltage that is conducted frequency or frequencies not exceed the limits in [mu] H/50 ohms line in lower limit applies at the	▼				
107		lower limit applies at th	Limit (				
		(MHz)	QP	Average			
		0.15 ~ 0.5	66 – 56	56 – 46			
		0.5 ~ 5	56	46			
	5 ~ 30		60	50			
Test Setup			social Ground brence Plane	Test Receiver			
Procedure	<ol> <li>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.</li> <li>The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains.</li> </ol>						



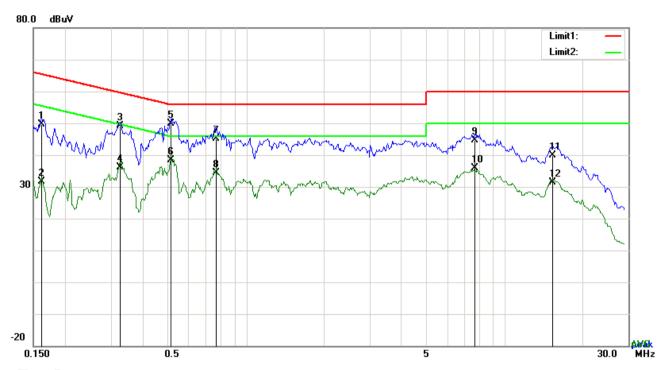
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	3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss
	coaxial cable.
	4. All other supporting equipment were powered separately from another main supply.
	5. The EUT was switched on and allowed to warm up to its normal 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	□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>



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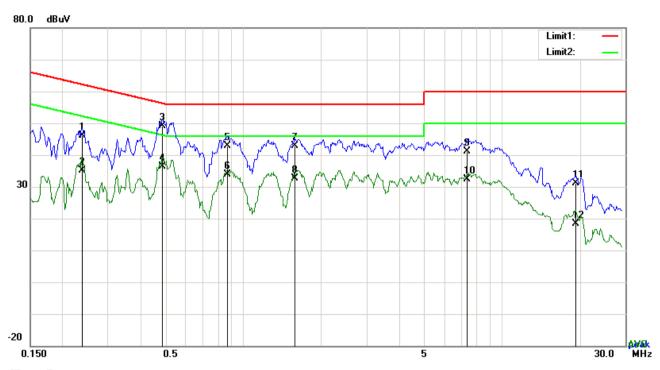
#### Test Data

## 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



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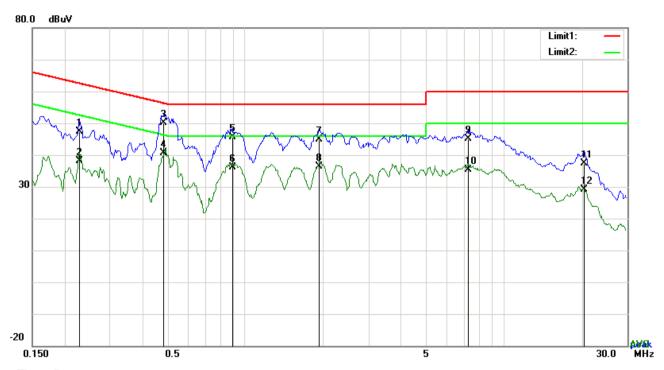
#### Test Data

## 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



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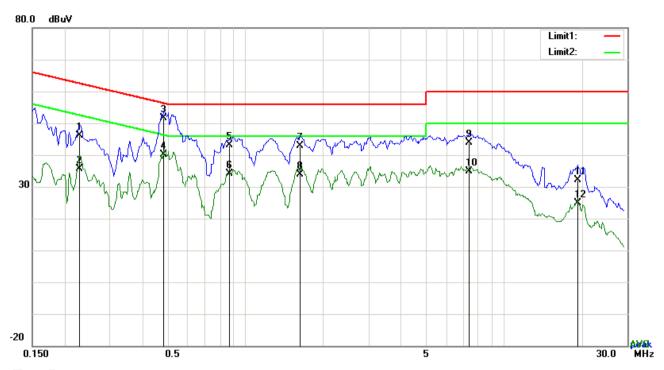
Test Data

## 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



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#### 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	Ν	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



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# 6.2 Radiated Emissions

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

#### Requirement(s):

Spec	Item	Item Requirement Applie				
47CFR§15. 109(d)	a)	Except higher limit as specified else emissions from the low-power radio exceed the field strength levels spethe level of any unwanted emission the fundamental emission. The tight edges  Frequency range (MHz)  30 - 88  88 - 216  216 960	o-frequency devices shall not cified in the following table and s shall not exceed the level of	<b>\</b>		
		Above 960	500 Ant. Tower 1-4m			
Test Setup	Support Units  Turn Table  Ground Plane					
		Test Ro	eceiver			
Procedure  1. The EUT was switched on and allowed to warm up to its normal operation.  2. The test was carried out at the selected frequency points obtained from characterization. Maximization of the emissions, was carried out by rote changing the antenna polarization, and adjusting the antenna height in manner:  a. Vertical or horizontal polarization (whichever gave the higher expression).				ating the EUT, the following		



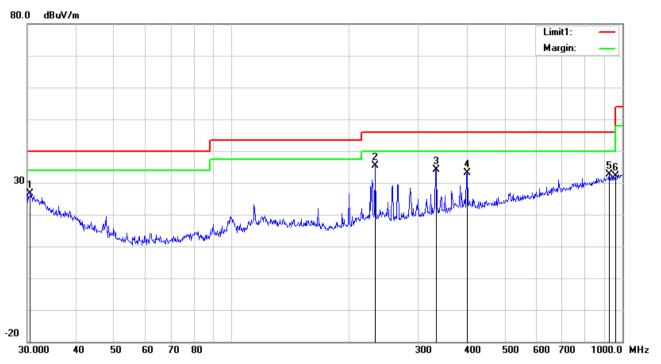
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		over a full rotation of the EUT) was chosen.
	b.	The EUT was then rotated to the direction that gave the maximum
		emission.
	C.	Finally, the antenna height was adjusted to the height that gave the maximum
		emission.
	3. The res	solution bandwidth and video bandwidth of test receiver/spectrum analyzer is
	120 kH	z for Quasiy Peak detection at frequency below 1GHz.
	4. The res	olution bandwidth of test receiver/spectrum analyzer is 1MHz and video
	bandwi	dth is 3MHz with Peak detection for Peak measurement at frequency above
	1GHz.	
	The re	esolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video
	bandw	vidth with Peak detection for Average Measurement as below at frequency
	above	1GHz.
	■ 1 kH	Hz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%)
	5. Steps 2	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 belo	w) N/A



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#### Below 1GHz



#### Test Data

#### Horizontal Polarity Plot @3m

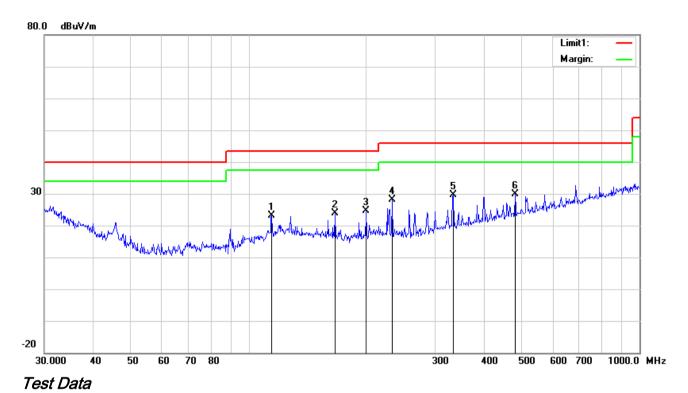
No.	P/L	Frequency	Readi ng	Detecto r	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV /m)		(dB/m)	(dB)	(dB)	(dBuV/ m)	(dBuV/m)	(dB)	(cm)	(°)
1	Н	30.5306	27.38	peak	20.99	22.28	0.63	26.72	40.00	-13.28	100	268
2	Η	233.3487	44.53	peak	11.63	22.32	1.65	35.49	46.00	-10.51	100	60
3	Н	333.6867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



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#### Below 1GHz



Vertical Polarity Plot @3m

No.	P/L	Frequency	Readi ng	Detecto r	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.



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# Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use			
mstrument	Wiodei	Serial #	Cai Date	Cai Due	III use			
AC Line Conducted Emissions								
EMI test receiver	ESCS30	8471241027	09/16/2016	09/15/2017	~			
Line Impedance	LI-125A	191106	09/24/2016	09/23/2017	<u>&lt;</u>			
Stabilization Network	L1 120/ (	101100	00/24/2010	00/20/2011				
Line Impedance	LI-125A	191107	09/24/2016	09/23/2017	<b>\</b>			
Stabilization Network	LI-125A	191107	09/24/2010	09/23/2017	1.2			
LISN	ISN T800	34373	09/24/2016	09/23/2017	>			
Transient Limiter	LIT-153	531118	08/31/2016	08/30/2017	<b>&lt;</b>			
Radiated Emissions								
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	<			
OPT 010 AMPLIFIER	8447E	2727A02430	08/31/2016	08/30/2017	₹			
(0.1-1300MHz)	0447	2121A02430	00/31/2010	00/30/2017				
Microwave Preamplifier	8449B	3008A02402	03/23/2017	03/22/2018				
(1 ~ 26.5GHz)	0449D	3000A02402	03/23/2017	03/22/2010				
Bilog Antenna	JB6	A110712	09/20/2016	09/19/2017	<u>&lt;</u>			
(30MHz~6GHz)	JDO	ATTUTTZ	09/20/2016	09/19/2017	•			
Double Ridge Horn	ΛU 110	71250	09/23/2016	09/22/2017				
Antenna	AH-118 71259		03/23/2010	09/22/2017				



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## Annex B. EUT And Test Setup Photographs

#### Annex B.i. Photograph: EUT External Photo



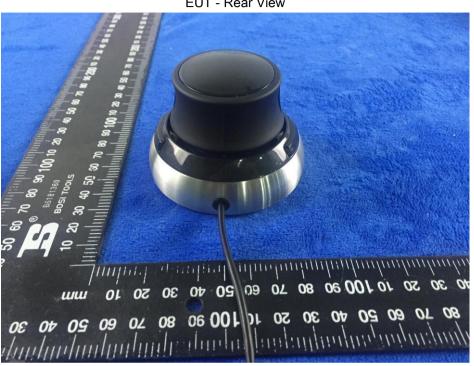
EUT - Front View



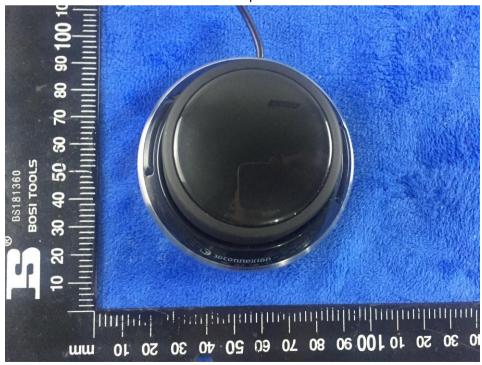


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**EUT - Rear View** 



EUT - Top View



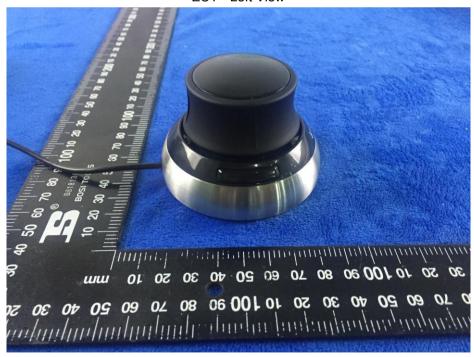


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**EUT - Bottom View** 



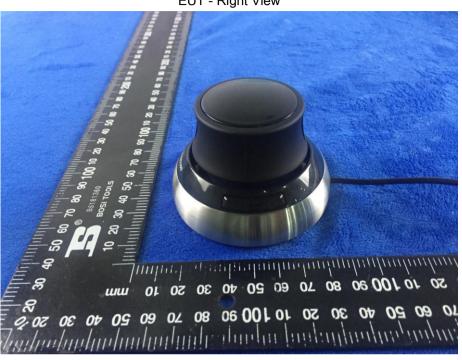
EUT - Left View





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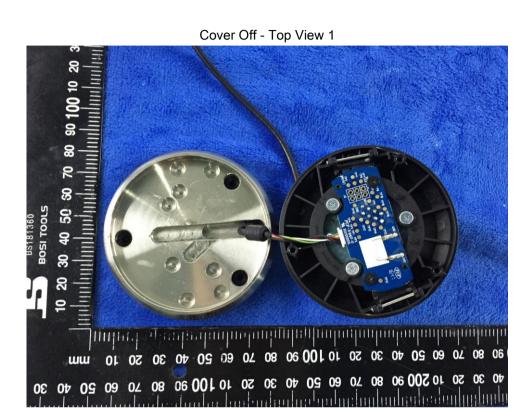
EUT - Right View





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#### Annex B.ii. Photograph: EUT Internal Photo

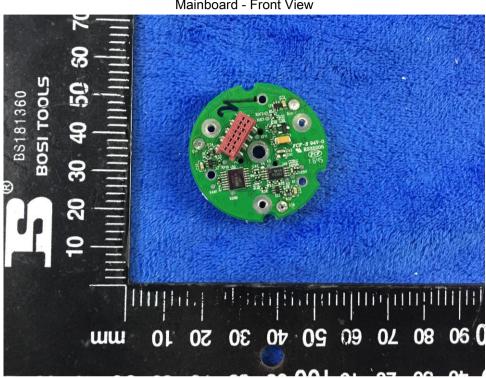




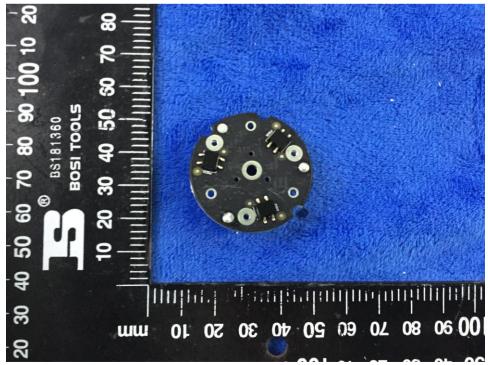


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Mainboard - Front View



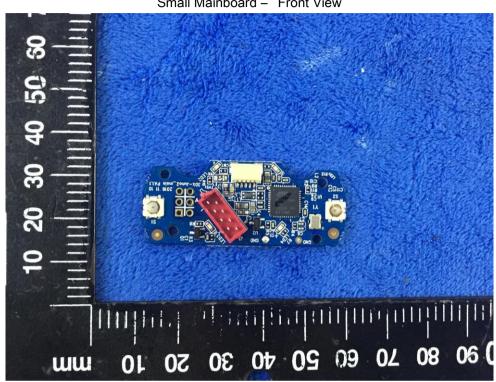
Mainboard - Rear View



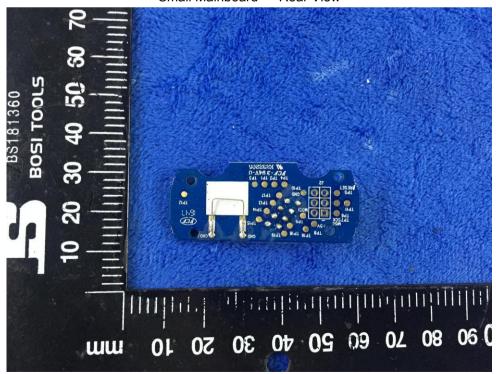


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Small Mainboard - Front View



Small Mainboard - Rear View





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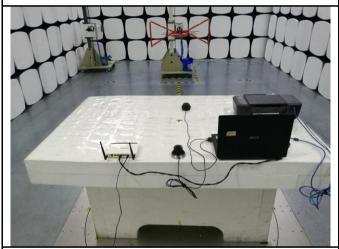
## Annex B.iii. Photograph: Test Setup Photo



Conducted Emissions Test Setup - Front View



Conducted Emissions Test Setup - Side View



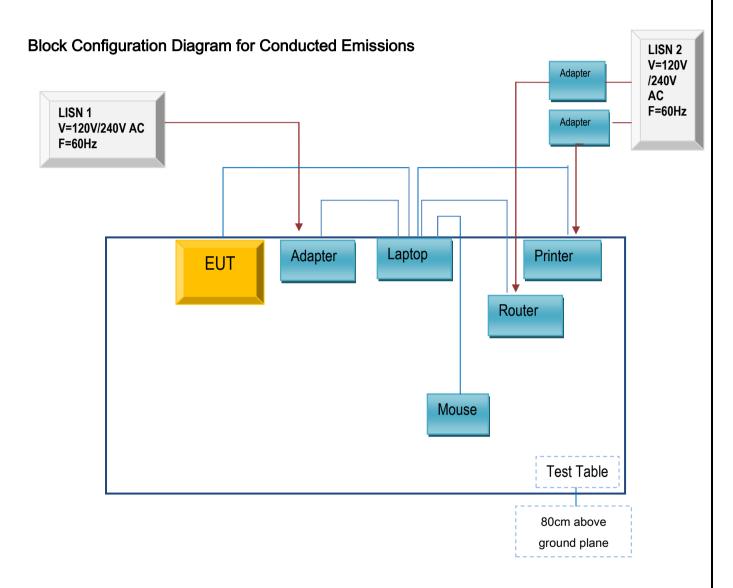
Radiated Emissions Test Setup Below 1GHz



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## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

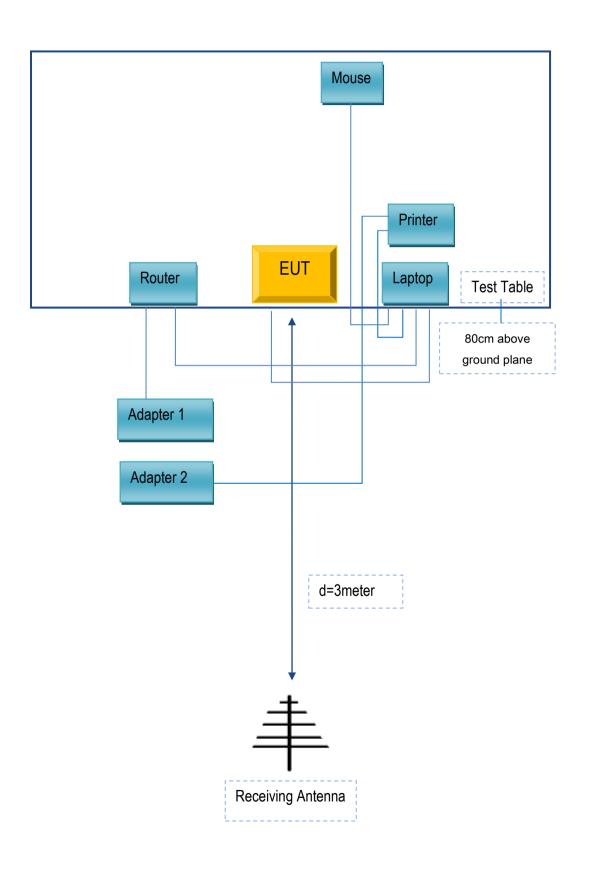
#### Annex C.ii. TEST SET UP BLOCK





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## **Block Configuration Diagram for Radiated Emissions**





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## 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



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

Please see the attachment



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## Annex E. DECLARATION OF SIMILARITY



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