EMC TEST REPORT

Report No.: Q190505S004-FCC-E

Supersede Report No: N/A

Applicant	3Dconnexion
Product Name	CADMOUSE PRO WIRELESS
Model No.	3DX-600065
Serial No.	3DX-700078
Test Standard	FCC Part 15 Subpart B Class B, ANSI C63.4: 2014
Test Date	May 06~June 12, 2019
Issue Date	June 13, 2019
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Evans He	David Huang	
Test Engineer	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

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
Q190505S004-FCC-E	NONE	Original	June 13, 2019

2. Customer information

Applicant Name	3Dconnexion
Applicant Add	7, Boulevard du Jardin Exotique, 98000 Monaco
Manufacturer	3Dconnexion
Manufacturer Add	7, Boulevard du Jardin Exotique, 98000 Monaco

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.	535293
IC Test Site No.	4842E-1
Test Software of Radiated Emission	EZ-EMC(ver.Icp-03A1)
Test Software of Conducted Emission	EZ-EMC(ver.Icp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	CADMOUSE PRO WIRELESS
Main Model:	3DX-600065
Serial Model:	3DX-700078
Antenna Gain:	BLE: 0.5dBi 2.4G: 0.5dBi
Antenna Type:	BLE: CERAMIC Antenna 2.4G: CERAMIC Antenna
Equipment Category：	JBP
Type of Modulation:	BLE: GFSK 2.4G: GFSK
RF Operating Frequency (ies):	BLE: 2402-2480 MHz 2.4G: 2404-2477MHz
Number of Channels:	BLE: 40CH 2.4G: 5CH
Input Power:	**Battery:** Model: 603450 Spec: DC 3.7V 1100mAh 4.07Wh
Port:	Please refer to the user's manual
Trade Name :	3Dconnexion
FCC ID:	2AAHQ-CMPW
Date EUT received:	May 05, 2019
Test Date(s):	May 06~June 12, 2019

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

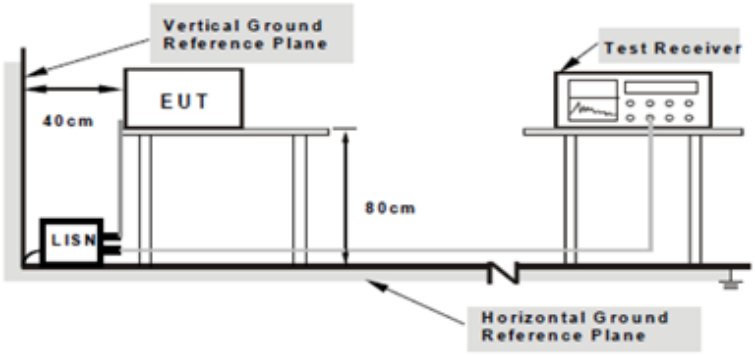
Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±2.70dB
Radiated Emission(30MHz~1GHz)	±3.74dB
Radiated Emission(1GHz~18GHz)	±4.66dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1016mbar
Test date :	June 06, 2019
Tested By :	Evans He

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107</td><td>a)</td><td>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.
<table>
<tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr>
<tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr>
<tr><td>5 ~ 30</td><td>60</td><td>50</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

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.</td></tr>
<tr><td>Procedure</td><td colspan="3">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.</td></tr>
</table>

	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 ☐ N/A

Test Data ☑ Yes ☐ N/A

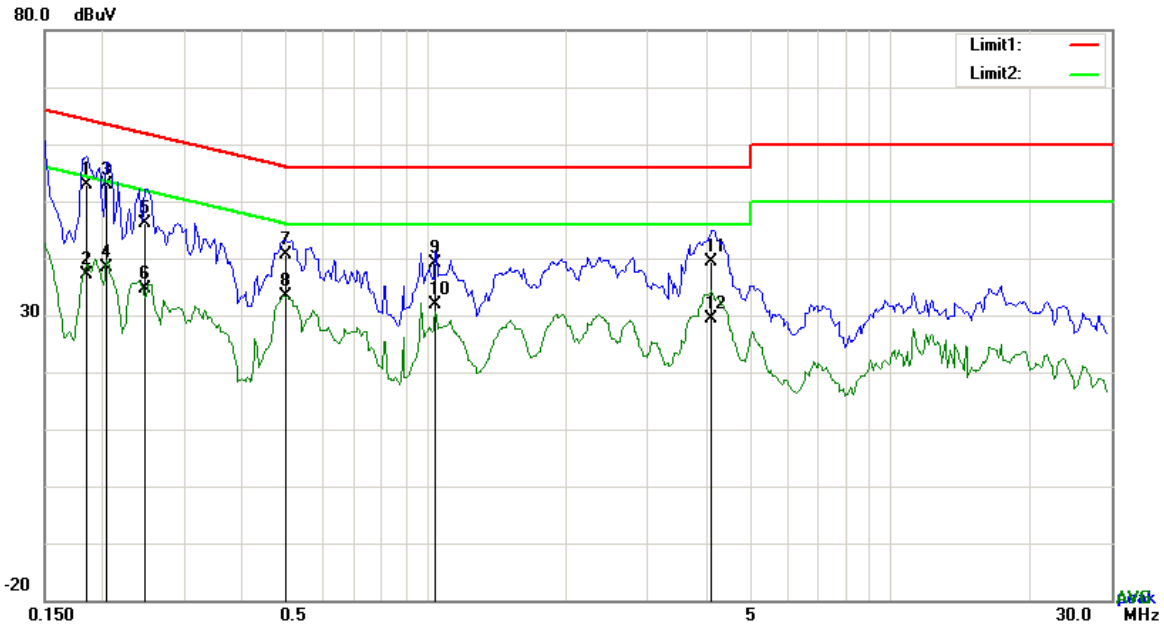
Test Plot ☑ Yes (See below) ☐ N/A

Test Mode 1:	Charging by Adapter

Test Mode 2:	Charging by Laptop

Note: All modes were investigated, the results below show only the worst case(Charging by Laptop mode).

Test Mode 2:	Charging by Laptop

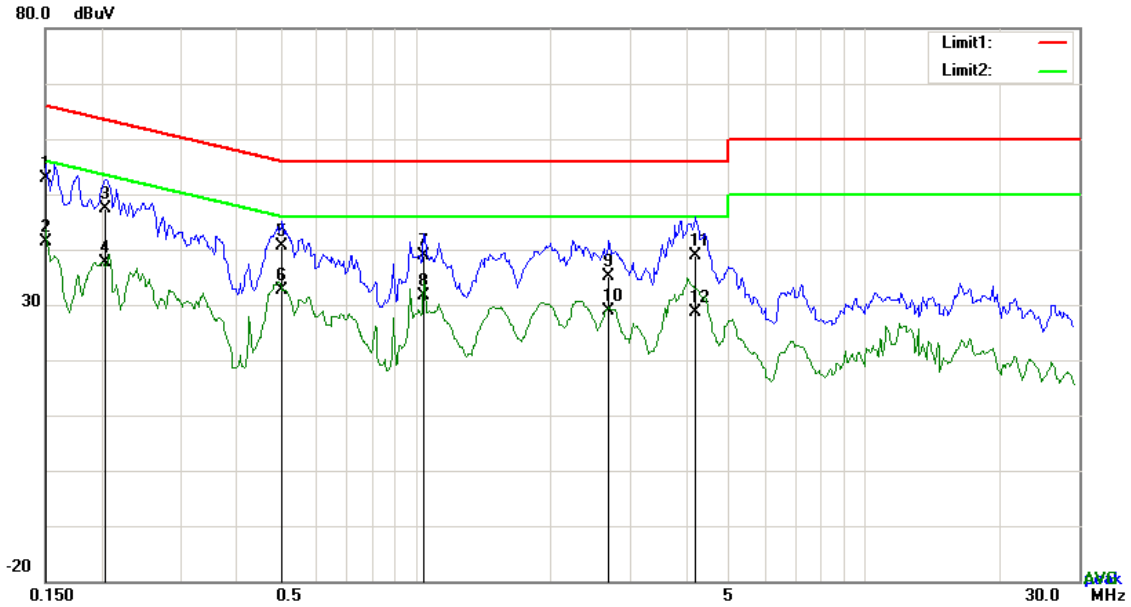


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1851	42.78	QP	10.03	52.81	64.25	-11.44
2	L1	0.1851	27.13	AVG	10.03	37.16	54.25	-17.09
3	L1	0.2046	42.84	QP	10.03	52.87	63.42	-10.55
4	L1	0.2046	28.32	AVG	10.03	38.35	53.42	-15.07
5	L1	0.2475	36.22	QP	10.03	46.25	61.84	-15.59
6	L1	0.2475	24.54	AVG	10.03	34.57	51.84	-17.27
7	L1	0.4971	30.66	QP	10.03	40.69	56.05	-15.36
8	L1	0.4971	23.34	AVG	10.03	33.37	46.05	-12.68
9	L1	1.0470	29.20	QP	10.03	39.23	56.00	-16.77
10	L1	1.0470	21.95	AVG	10.03	31.98	46.00	-14.02
11	L1	4.1193	29.24	QP	10.07	39.31	56.00	-16.69
12	L1	4.1193	19.42	AVG	10.07	29.49	46.00	-16.51

Test Mode 2:	Charging by Laptop



Test Data

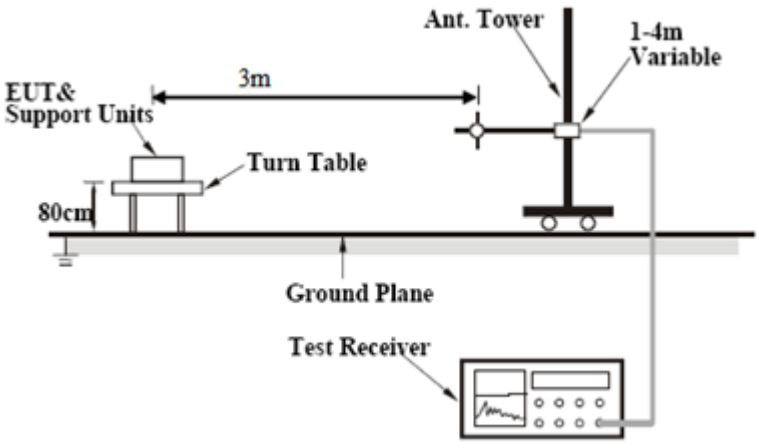
Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1500	42.79	QP	10.02	52.81	66.00	-13.19
2	N	0.1500	31.38	AVG	10.02	41.40	56.00	-14.60
3	N	0.2046	37.44	QP	10.02	47.46	63.42	-15.96
4	N	0.2046	27.56	AVG	10.02	37.58	53.42	-15.84
5	N	0.5049	30.66	QP	10.02	40.68	56.00	-15.32
6	N	0.5049	22.67	AVG	10.02	32.69	46.00	-13.31
7	N	1.0470	28.97	QP	10.03	39.00	56.00	-17.00
8	N	1.0470	21.72	AVG	10.03	31.75	46.00	-14.25
9	N	2.6928	24.97	QP	10.05	35.02	56.00	-20.98
10	N	2.6928	18.94	AVG	10.05	28.99	46.00	-17.01
11	N	4.2012	28.72	QP	10.06	38.78	56.00	-17.22
12	N	4.2012	18.60	AVG	10.06	28.66	46.00	-17.34

6.2 Radiated Emissions

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1016mbar
Test date :	June 06, 2019
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>

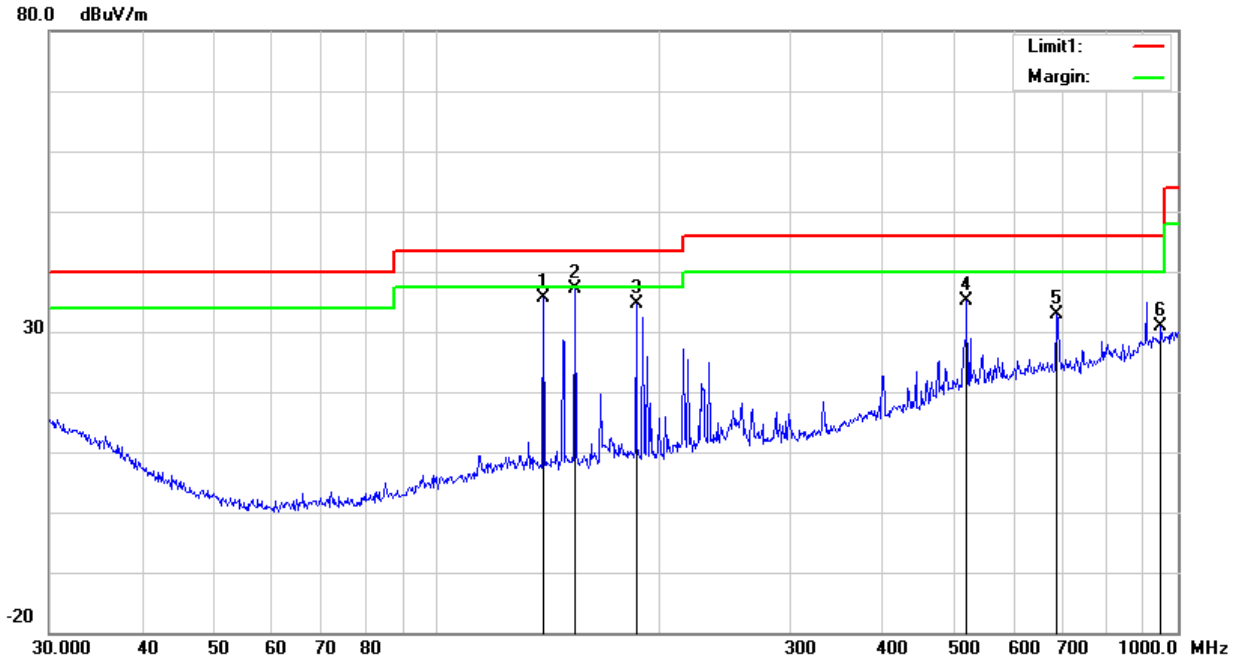
	over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 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 :	Normal Working Mode

Below 1GHz

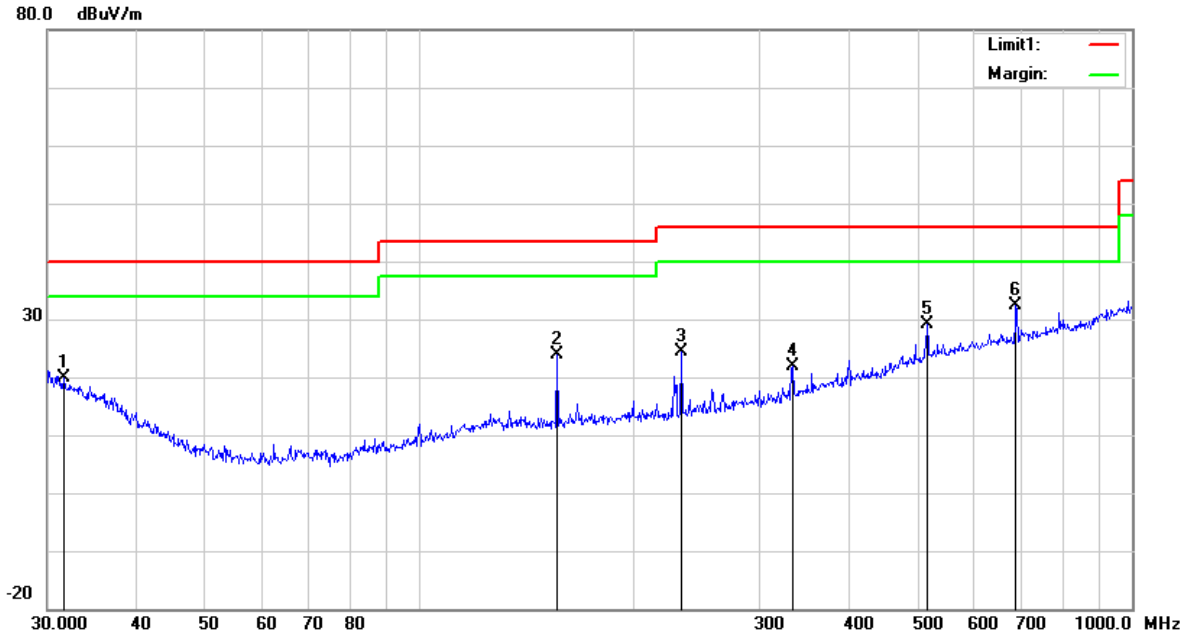


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	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	139.3613	45.54	11.24	22.41	1.20	35.57	43.50	-7.93	200	147
2	H	153.7385	47.20	10.94	22.31	1.29	37.12	43.50	-6.38	100	185
3	H	185.7882	44.19	11.33	22.29	1.49	34.72	43.50	-8.78	100	166
4	H	519.0649	35.52	19.08	21.77	2.18	35.01	46.00	-10.99	100	78
5	H	687.1507	30.84	20.99	21.39	2.40	32.84	46.00	-13.16	100	118
6	H	948.7610	25.17	23.69	20.79	2.70	30.77	46.00	-15.23	100	276

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	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	31.6202	22.93	19.06	22.27	0.14	19.86	40.00	-20.14	100	235
2	V	155.9101	33.87	10.97	22.30	1.30	23.84	43.50	-19.66	100	327
3	V	232.5318	33.50	11.55	22.32	1.59	24.32	46.00	-21.68	100	198
4	V	333.6867	27.81	14.37	22.20	1.81	21.79	46.00	-24.21	100	195
5	V	515.4374	29.81	19.01	21.77	2.17	29.22	46.00	-16.78	100	35
6	V	687.1507	30.39	20.99	21.39	2.40	32.39	46.00	-13.61	100	159

Above 1GHz

Frequency (MHz)	Read_level (dBμV/m)	Azimuth	Height (cm)	Polarity (H/V)	Factors (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector (PK/AV)
1154.6	68.07	62	100	V	-19.38	48.69	74	-25.31	PK
1254.3	63.48	218	100	V	-15.96	47.52	74	-26.48	PK
1333.9	63.41	195	100	V	-14.18	49.23	74	-24.77	PK
1445.2	66.04	235	100	H	-18.52	47.52	74	-26.48	PK
1999.6	59.96	168	100	H	-13.68	46.28	74	-27.72	PK
2112.5	63.34	305	100	H	-16.75	46.59	74	-27.41	PK

*Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to 5*2480MHz=12,400MHz.*

Note2: The frequency that above 3GHz is mainly from the environment noise.

Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

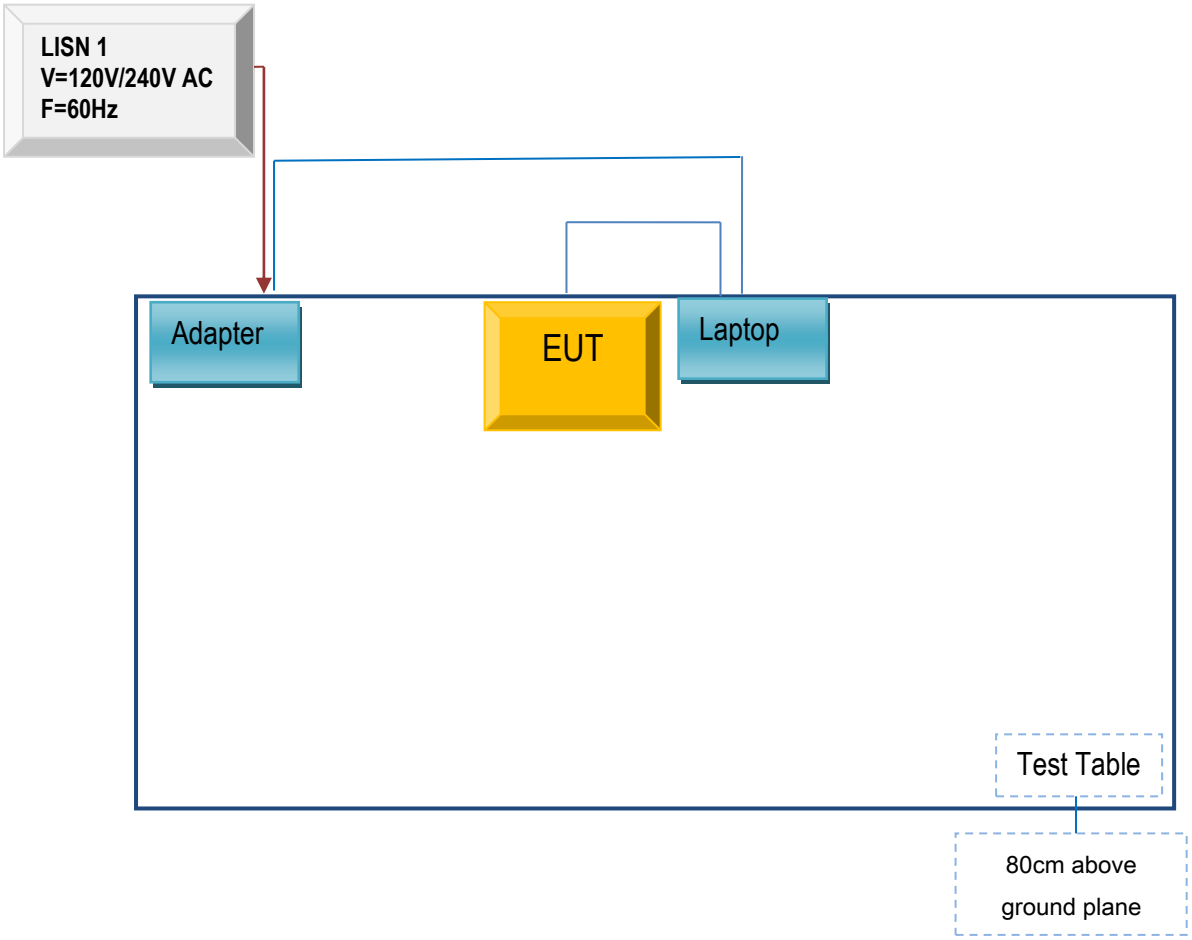
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due
AC Line Conducted Emissions				
EMI test receiver	ESCS30	8471241027	01/04/2019	01/03/2020
Artificial Mains Network	8127	8127713	01/04/2019	01/03/2020
ISN	ISN T800	34373	01/04/2019	01/03/2020
Radiated Emissions				
EMI test receiver	ESL6	1300.5001K06-100262-eQ	01/04/2019	01/03/2020
Active Antenna	AL-130	121031	02/07/2019	02/06/2020
3m Semi-anechoic Chamber	9m*6m*6m	N/A	10/18/2018	10/17/2019
Signal Amplifier	8447E	443008	01/24/2019	01/23/2020
MXA signal analyzer	N9020A	MY49100060	01/04/2019	01/03/2020
Horn Antenna	HAH-118	71259	01/25/2019	01/24/2020
Horn Antenna	HAH-118	71283	02/01/2019	01/31/2020
AMPLIFIER	EM01G26G	60613	01/24/2019	01/23/2020
AMPLIFIER	Emc012645	980077	01/04/2019	01/03/2020
Bilog Antenna (30MHz~6GHz)	JB6	A110712	02/07/2019	02/06/2020

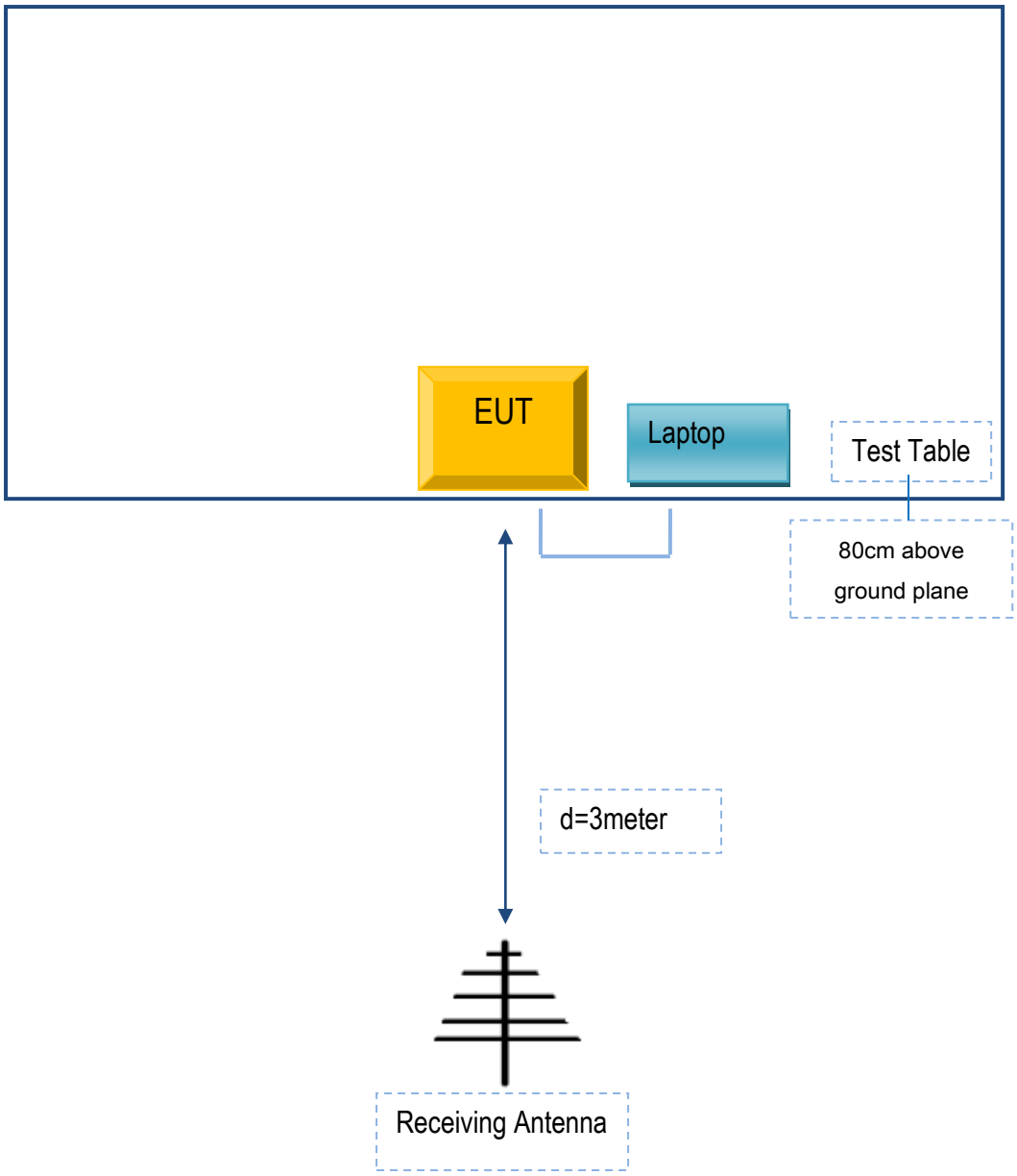
Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.i. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex B. 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

Supporting Cable:

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 2.8m USB Line: Unshielded, Detachable 0.8m

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

Please see the attachment

Annex D. DECLARATION OF SIMILARITY

3D Connexion

To：SIEMIC.INC
775 Montague Expressway Mlpitas,CA 95035,USA

Declaration Letter

Dear Sir，

For our business issue and marketing requirement, we would like to list serial model numbers on the reports, as following:

Model No: 3DX-600065,

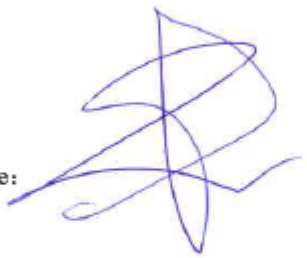
Serial Model No: 3DX-700078

We declare that : all models the same PCB , accessories ,the difference of these is listed as below
Thank you very much.

Main Model No	Serial Model No	Difference
3DX-600065,	3DX-700078	3DX-600065 is Product model 3DX-700078 is Market model

Sincerely,

Client's signature：



Second Party
Address： 33, Rue du Portier, 98000 Monaco
Name of Corporation: 3Dconnexion.
Name: Xiaobing Lin
Date: 2019-6-18