

FCC TEST REPORT

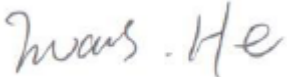
Applicant	3Dconnexion
Address	7, Boulevard du Jardin Exotique, 98000 Monaco

Manufacturer or Supplier	3Dconnexion
Address	7, Boulevard du Jardin Exotique, 98000 Monaco
Product	CadMouse Pro
Brand Name	3Dconnexion
Model	3DX-600067
Additional Model & Model Difference	3DX-700080
Date of tests	Feb. 20, 2020 ~ Feb. 24, 2020

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

☒ **FCC Part 15, Subpart B, Class B**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Evans He Supervisor / EMC Department	Approved by David Huang Supervisor / EMC Department
	 Date: Mar. 04, 2020

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Table of Contents

RELEASE CONTROL RECORD	3
1 SUMMARY OF TEST RESULTS	4
1.1 MEASUREMENT UNCERTAINTY	4
2 GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT	5
2.2 DESCRIPTION OF TEST MODES	6
2.3 DESCRIPTION OF SUPPORT UNITS	6
3 EMISSION TEST	7
3.1 CONDUCTED EMISSION MEASUREMENT	7
3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	7
3.1.2 TEST INSTRUMENTS	7
3.1.3 TEST PROCEDURE	8
3.1.4 DEVIATION FROM TEST STANDARD	8
3.1.5 TEST SETUP	9
3.1.6 EUT OPERATING CONDITIONS	9
3.1.7 TEST RESULTS	10
3.2 RADIATED EMISSION MEASUREMENT	12
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	12
3.2.2 TEST INSTRUMENTS	14
3.2.3 TEST PROCEDURE	15
3.2.4 TEST SETUP	16
3.2.5 EUT OPERATING CONDITIONS	16
3.2.6 TEST RESULTS	17
4 PHOTOGRAPHS OF THE TEST CONFIGURATION	19
5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	20



Test Report No.: FS200102S009

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FS200102S009	Original release	Mar. 04, 2020



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD			
Standard Section	Test Item	Result	Remark
FCC Part 15, Subpart B, Class B	Conducted test	PASS	Meets limits minimum passing margin is -10.24dB at 0.4425MHz
	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets limits minimum passing margin is -6.81dB at 37.4165MHz

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT 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.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emission test	0.15MHz ~ 30MHz	$\pm 2.70\text{dB}$
Radiated emissions	30MHz ~ 1GHz	$\pm 3.74\text{dB}$



Test Report No.: FS200102S009

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	CadMouse Pro
MODEL NO.	3DX-600067
ADDITIONAL MODEL	3DX-700080
FCC ID	2AAHQ-CMP
POWER SUPPLY	DC 5V from Host Unit
CABLE SUPPLIED	DC Line: Unshielded, Non-detachable 2m
THE HIGHEST OPERATING FREQUENCY	Below 108MHz

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 200102S009) for detailed product photos.
4. Additional models (see about table) are identical with the test model 3DX-600067 except the trade name、 model name and packaging for trading purpose.



2.2 DESCRIPTION OF TEST MODES

The EUT were tested under the **Normal Working** mode for all test.

2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	Latitude 5280	P27S001	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Non-detachable 2m



3 EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTE:**
- (1) The lower limit shall apply at the transition frequencies.
 - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	8471241027	Apr. 04, 19	Apr. 03, 20
Artificial Mains Network	SCHWARZBEC K	8127	8127713	Mar. 28, 19	Mar. 27, 20
ISN	Com-Power	ISN T800	34373	Mar. 28, 19	Mar. 27, 20
Test software	EZ-EMC	ICP-03A1	N/A	N/A	N/A

- NOTE:**
1. The test was performed at Shielded Room 553.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



3.1.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2014 (section 7).

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

NOTE:

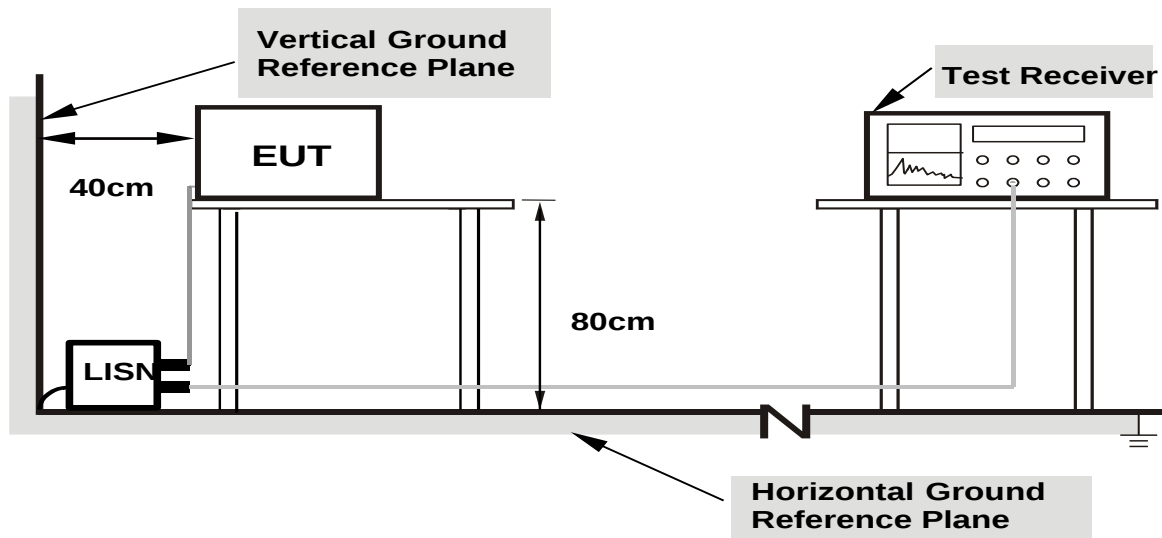
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.



3.1.5 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.**

3.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power of all equipment.
- b. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

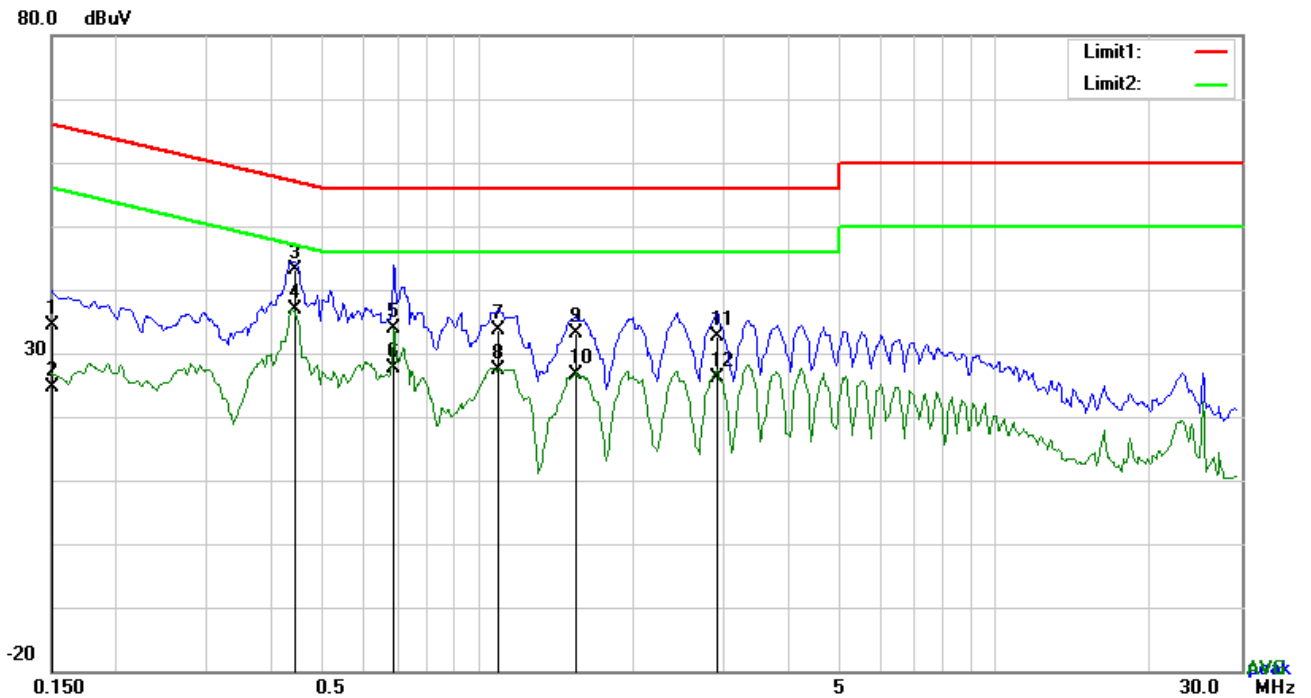


3.1.7 TEST RESULTS

TEST MODE	Normal Working	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from Host Unit	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	23.5deg.C, 56% RH	TESTED BY	Evans He

No	Freq.	Corr. Factor	Detector	Reading Value	Emission Level	Limit	Margin
	[MHz]	(dB)		[dB (uV)]	[dB (uV)]	[dB (uV)]	(dB)
1	0.1500	24.38	QP	10.03	34.41	66.00	-31.59
2	0.1500	14.68	AVG	10.03	24.71	56.00	-31.29
3	0.4425	33.07	QP	10.03	43.10	57.01	-13.91
4	0.4425	26.74	AVG	10.03	36.77	47.01	-10.24
5	0.6882	23.95	QP	10.03	33.98	56.00	-22.02
6	0.6882	17.50	AVG	10.03	27.53	46.00	-18.47
7	1.0977	23.64	QP	10.03	33.67	56.00	-22.33
8	1.0977	17.29	AVG	10.03	27.32	46.00	-18.68
9	1.5540	22.97	QP	10.04	33.01	56.00	-22.99
10	1.5540	16.47	AVG	10.04	26.51	46.00	-19.49
11	2.9073	22.53	QP	10.05	32.58	56.00	-23.42
12	2.9073	15.97	AVG	10.05	26.02	46.00	-19.98

REMARKS: The emission levels of other frequencies were very low against the limit.

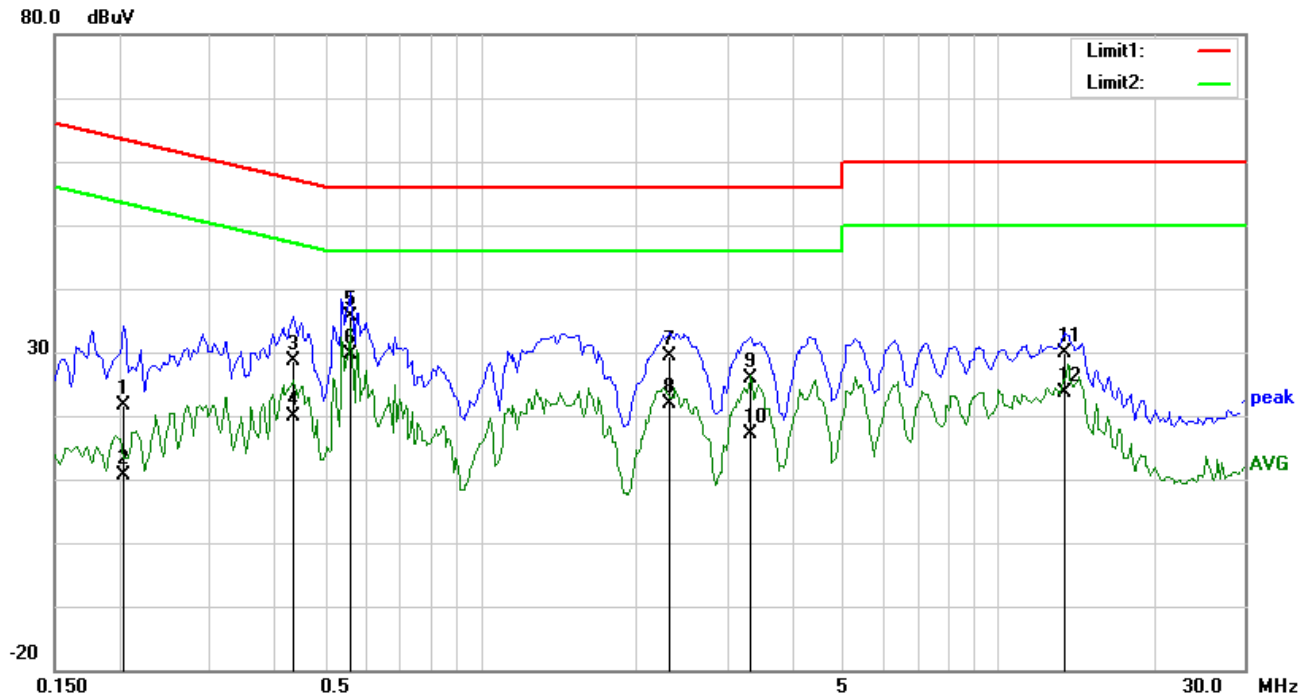




TEST MODE	Normal Working	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from Host Unit	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23.5deg.C, 56% RH	TESTED BY	Evans He

No	Freq.	Corr. Factor	Detector	Reading Value	Emission Level	Limit	Margin
	[MHz]	(dB)		[dB (uV)]	[dB (uV)]	[dB (uV)]	(dB)
1	0.2046	11.70	QP	10.02	21.72	63.42	-41.70
2	0.2046	0.66	AVG	10.02	10.68	53.42	-42.74
3	0.4347	18.55	QP	10.02	28.57	57.16	-28.59
4	0.4347	9.79	AVG	10.02	19.81	47.16	-27.35
5	0.5595	25.49	QP	10.02	35.51	56.00	-20.49
6	0.5595	19.50	AVG	10.02	29.52	46.00	-16.48
7	2.3223	19.44	QP	10.04	29.48	56.00	-26.52
8	2.3223	11.83	AVG	10.04	21.87	46.00	-24.13
9	3.3120	15.77	QP	10.05	25.82	56.00	-30.18
10	3.3120	7.15	AVG	10.05	17.20	46.00	-28.80
11	13.5144	19.79	QP	10.18	29.97	60.00	-30.03
12	13.5144	13.52	AVG	10.18	23.70	50.00	-26.30

REMARKS: The emission levels of other frequencies were very low against the limit.





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.109)

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBµV/m)				
Frequencies (MHz)	FCC 15B/ ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dB μ V/m)		
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B
30-88	49.5	40
88-216	54	43.5
216-230	56.9	46
230-960		
960-1000	60	54
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74
Above 3000		



FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

- Note: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



3.2.2 TEST INSTRUMENTS

FREQUENCY RANGE BELOW 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESL6	1300.5001K06-1 00262-eQ	Apr. 04, 19	Apr. 03, 20
Bilog Antenna	Sunol Sciences	JB6	A110712	Apr. 08, 19	Apr. 07, 20
Active Antenna	CMO-POWER	AL-130	121031	Mar. 27, 19	Mar. 26, 20
Signal Amplifier	HP	8447E	443008	Mar. 28, 19	Mar. 27, 20
3m Semi-anechoic Chamber	SAEMC	9m*6m*6m	N/A	Oct. 18, 18	Oct. 17, 21
Test Software	EZ-EMC	ICP-03A1	N/A	N/A	N/A

- NOTE:** 1. The test was performed in 966 Chamber (a 3m Semi-anechoic chamber).
2. The calibration interval of the above test instruments is 12 months (except 3mSemi-anechoic Chamber). And the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
3. The FCC Site Registration No. is 535293.

3.2.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2014 (section 12).

<Frequency Range below 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. $\text{Emission level(dBuV/m)} = \text{Raw Value(dBuV)} + \text{Correction Factor(dB/m)}$
3. $\text{Correction Factor(dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)}$ (if the raw value not contains the amplifier)
4. $\text{Correction Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)} - \text{Amplifier Gain(dB)}$ (if the raw value contains the amplifier)
5. $\text{Margin value} = \text{Emission level} - \text{Limit value}$

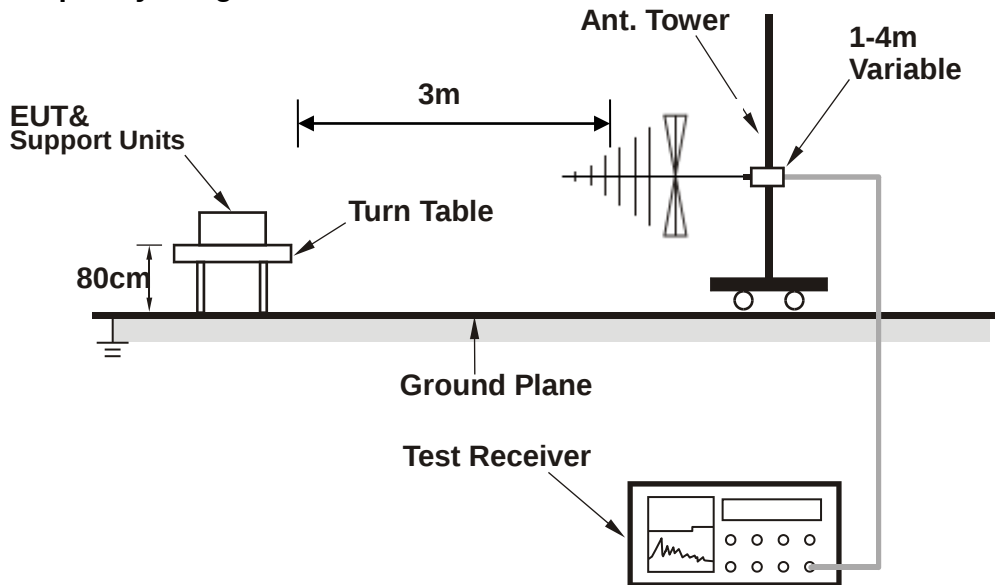
DEVIATION FROM TEST STANDARD

No deviation.

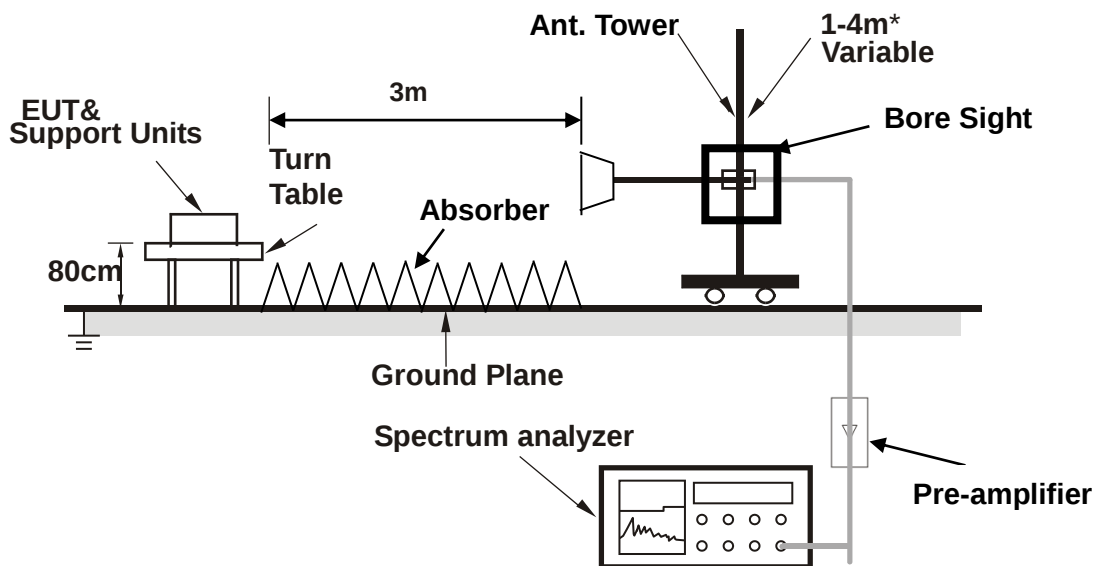


3.2.4 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



* : depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

3.2.5 EUT OPERATING CONDITIONS

See items 3.1.6.

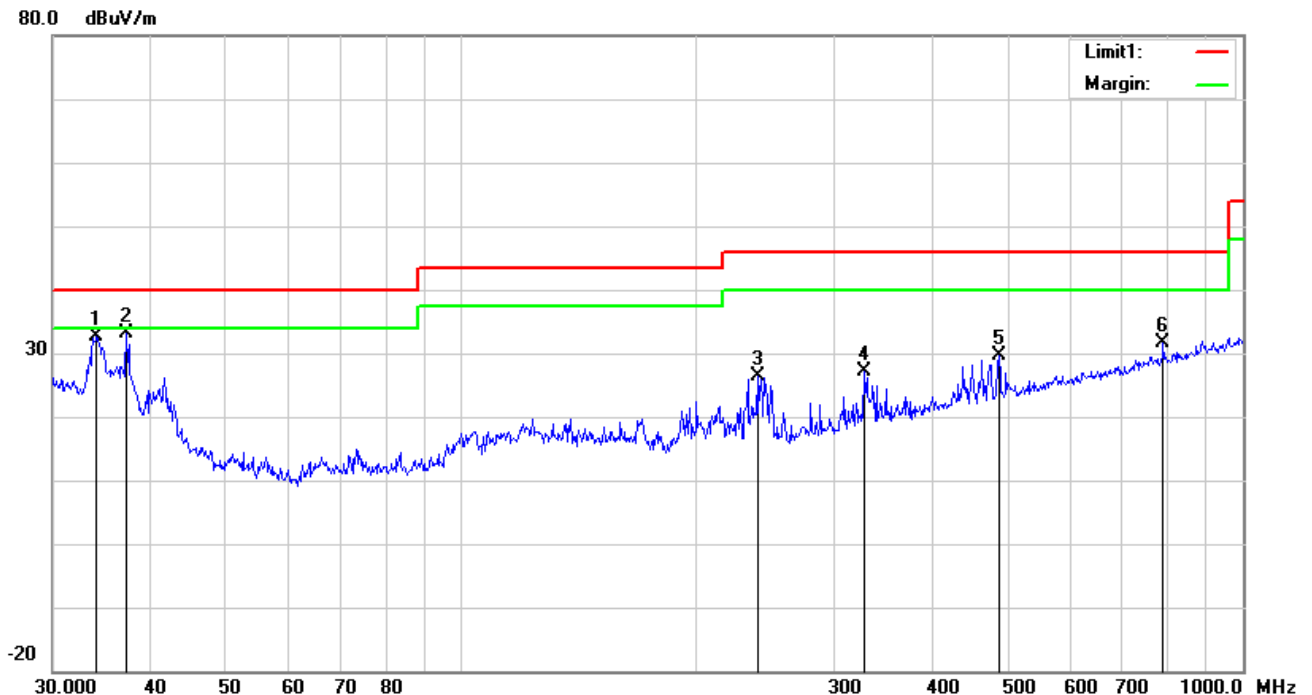


3.2.6 TEST RESULTS

TEST MODE	Normal Working	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 5V from Host Unit	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	23.5deg. C, 56% RH	TESTED BY	Evans He

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBuV/m)	Ant-F (dB/m)	PA-G (dB)	Cab-L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	34.1561	35.98	18.20	22.26	0.74	32.66	40.00	-7.34	100	267
2	37.2855	38.71	15.88	22.26	0.77	33.10	40.00	-6.90	100	295
3	239.1473	35.43	11.55	22.31	1.67	26.34	46.00	-19.66	100	141
4	327.8873	33.25	14.19	22.21	1.93	27.16	46.00	-18.84	100	24
5	487.3151	31.68	17.45	21.84	2.35	29.64	46.00	-16.36	100	83
6	790.6188	28.69	21.29	21.17	2.94	31.75	46.00	-14.25	100	201

- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.

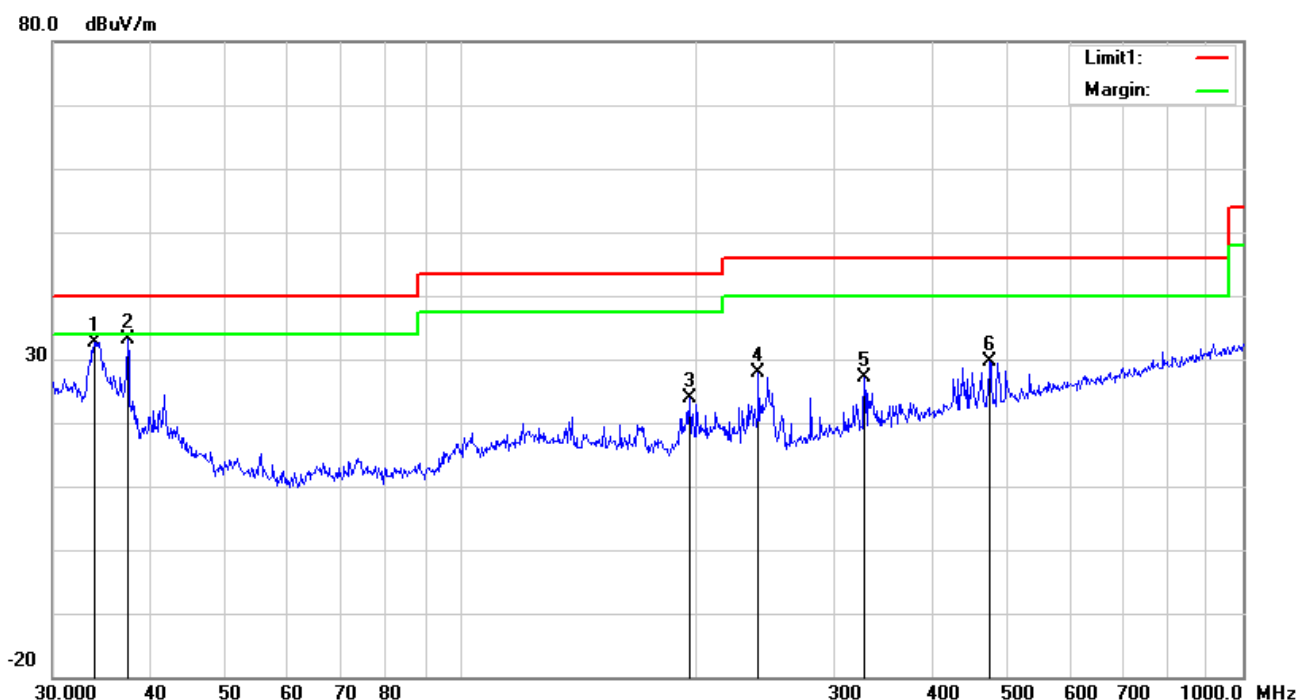




TEST MODE	Normal Working	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 5V from Host Unit	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	23.5deg. C, 56% RH	TESTED BY	Evans He

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
No.	Freq. (MHz)	Reading (dBuV/m)	Ant-F (dB/m)	PA-G (dB)	Cab-L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	33.9174	35.87	18.38	22.26	0.73	32.72	40.00	-7.28	100	128
2	37.4165	38.89	15.79	22.26	0.77	33.19	40.00	-6.81	100	133
3	195.8220	32.90	11.87	22.35	1.54	23.96	43.50	-19.54	100	129
4	239.9873	36.94	11.54	22.31	1.67	27.84	46.00	-18.16	100	167
5	327.8873	33.10	14.19	22.21	1.93	27.01	46.00	-18.99	100	333
6	473.8347	31.95	17.18	21.86	2.27	29.54	46.00	-16.46	100	230

- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.





Test Report No.: FS200102S009

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



Test Report No.: FS200102S009

5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---