

TEST REPORT

Applicant: Magtek Incorporated

Address of Applicant: 1710 Apollo Court, Seal Beach, California 90740, United States

Manufacturer/ Factory: Magtek Incorporated

Address of Manufacturer/ Factory: 1710 Apollo Court, Seal Beach, California 90740, United States

Equipment Under Test (EUT)

Product Name: tDynamo

Model No.: 21079821

Trade Mark: MagTek

FCC ID: U73-21079821

Applicable standards: FCC CFR Title 47 Part 15 Subpart B:2016

Date of sample receipt: May 18, 2017

Date of Test: May 19-25, 2017

Date of report issued: May 26, 2017

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Lo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	May 26, 2017	Original

Prepared by:

Bill. Yuan

Date:

May 26, 2017

Project Engineer

Reviewed by:

Andy. Wu

Date:

May 26, 2017

Reviewer

3 Contents

1	COVER PAGE.....	1
2	VERSION.....	2
3	CONTENTS.....	3
4	TEST SUMMARY.....	4
5	GENERAL INFORMATION.....	5
5.1	GENERAL DESCRIPTION OF EUT.....	5
5.2	TEST MODE AND TEST VOLTAGE.....	5
5.3	DESCRIPTION OF SUPPORT UNITS.....	5
5.4	DEVIATION FROM STANDARDS.....	5
5.5	ABNORMALITIES FROM STANDARD CONDITIONS.....	5
5.6	TEST FACILITY.....	6
5.7	TEST LOCATION.....	6
6	TEST INSTRUMENTS LIST.....	7
7	TEST RESULTS AND MEASUREMENT DATA.....	8
7.1	RADIATED EMISSION.....	8
7.2	CONDUCTED EMISSIONS.....	14
8	TEST SETUP PHOTO.....	17
9	EUT CONSTRUCTIONAL DETAILS.....	18

4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part15.107	Pass
Radiated Emissions	Part15.109	Pass

Pass: The EUT comply with the essential requirements in the standard.

5 General Information

5.1 General Description of EUT

Product Name:	tDynamo
Model No.:	21079821
Test Model:	21079821
Power supply:	DC 5V

5.2 Test mode and Test voltage

Test mode:	
PC mode	Keep the EUT in data exchange with PC mode.
NFC card mode	Keep the EUT in read card mode.

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
Apple	PC	A1278	C1MN99ERDTY3
DELL	KEYBOARD	SK-8115	N/A
DELL	MOUSE	N/A	N/A
Emerson Network Power	USB Charger	A1299	N/A

NOTE:FCC DOC APPROVED

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.

- **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016

5.7 Test Location

The test was performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	June.29 2016	June.28 2017
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June.29 2016	June.28 2017
5	Double-ridged horn antenna	SCHWARZBECK	9120D	GTS208	June.29 2016	June.28 2017
6	Horn Antenna	ETS-LINDGREN	3160-09	GTS218	June.29 2016	June.28 2017
7	RF Amplifier	HP	8347A	GTS204	June.29 2016	June.28 2017
8	Broadband Preampfier	SCHWARZBECK	BBV9718	GTS535	June.29 2016	June.28 2017
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS211	June.29 2016	June.28 2017
11	Coaxial Cable	GTS	N/A	GTS210	June.29 2016	June.28 2017
12	Coaxial Cable	GTS	N/A	GTS212	June.29 2016	June.28 2017
13	Thermo meter	N/A	N/A	GTS256	June.29 2016	June.28 2017

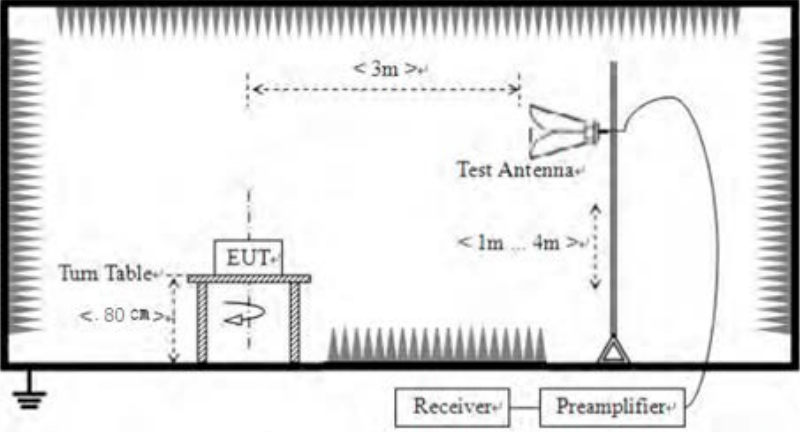
Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 29 2016	June. 28 2017
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June. 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June. 28 2017
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 29 2016	June. 28 2017

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Barometer	ChangChun	DYM3	GTS257	June. 29 2016	June. 28 2017

7 Test Results and Measurement Data

7.1 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109				
Test Method:	ANSI C63.4:2014				
Test Frequency Range:	30MHz to 25GHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Peak		1MHz	10Hz	Average Value	
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	30MHz-88MHz	40.00		Quasi-peak Value	
	88MHz-216MHz	43.50		Quasi-peak Value	
	216MHz-960MHz	46.00		Quasi-peak Value	
	960MHz-1GHz	54.00		Quasi-peak Value	
	Above 1GHz	54.00		Average Value	
74.00		Peak Value			
Test setup:	Below 1GHz				
	<p>The diagram illustrates the test setup for frequencies below 1GHz. It shows a Semi-Anechoic Chamber with an EUT (Equipment Under Test) on a Turn Table at a height of less than 80cm. A Test Antenna is positioned 3m away from the EUT and at a height of 1m to 4m. The antenna is connected to a Receiver and a Preamplifier.</p>				
Above 1GHz					

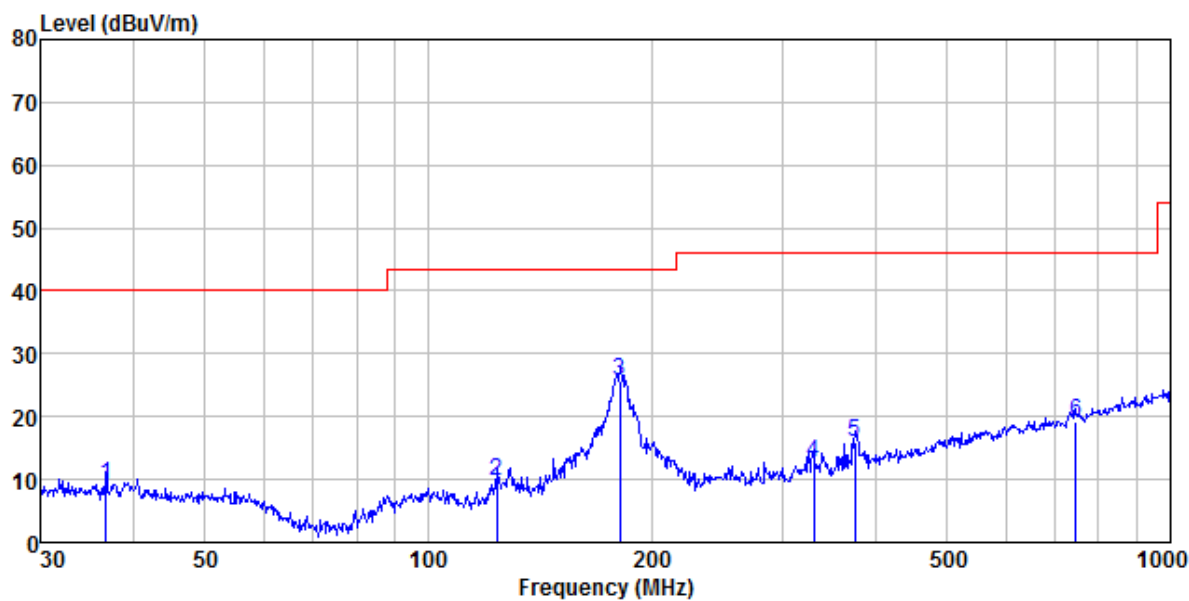
	
<p>Test Procedure:</p>	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four 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. 4. 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. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
<p>Test environment:</p>	<p>Temp.: 25 °C Humid.: 52% Press.: 1 012mbar</p>
<p>Measurement Record:</p>	<p>Uncertainty: ± 4.50dB</p>
<p>Test Instruments:</p>	<p>Refer to section 6 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.2 for details, only show the worst case.</p>
<p>Test results:</p>	<p>Pass</p>

NOTE: For above 6GHz , no emission found , so only report worse case 30MHz to 6GHz

Measurement Data

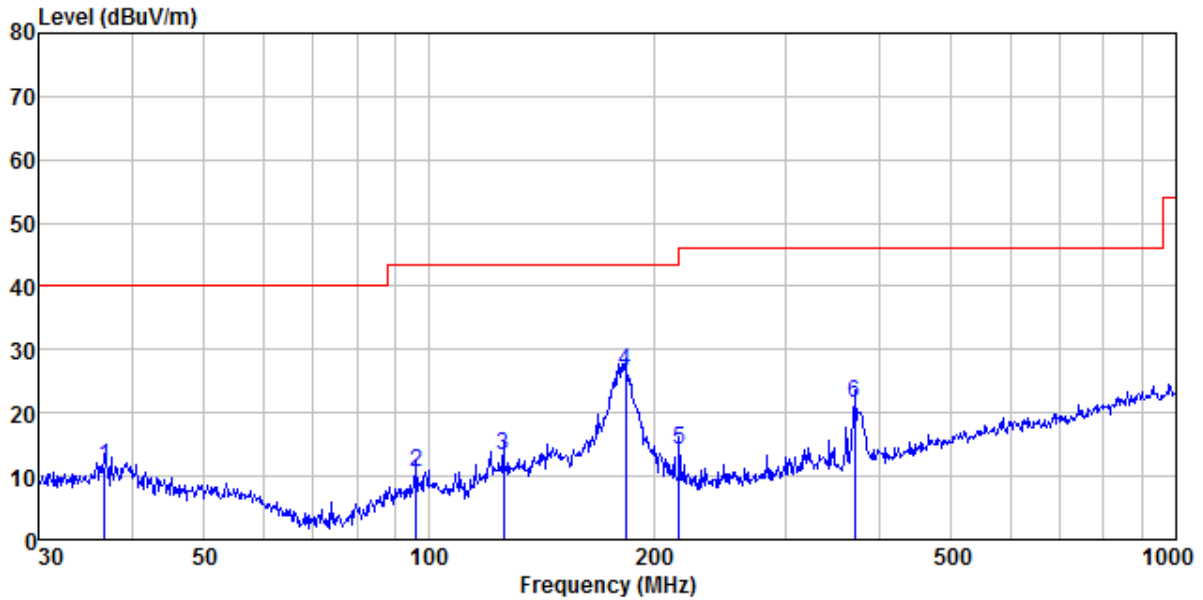
Below 1GHz

Test mode:	PC mode	Antenna Polarity:	Horizontal
------------	---------	-------------------	------------



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
36.766	27.46	11.20	0.63	30.06	9.23	40.00	-30.77	QP
123.699	29.28	8.75	1.39	29.55	9.87	43.50	-33.63	QP
181.283	44.52	8.80	1.75	29.27	25.80	43.50	-17.70	QP
330.195	25.99	14.09	2.52	29.83	12.77	46.00	-33.23	QP
375.939	27.73	14.97	2.75	29.61	15.84	46.00	-30.16	QP
744.866	23.76	20.48	4.26	29.20	19.30	46.00	-26.70	QP

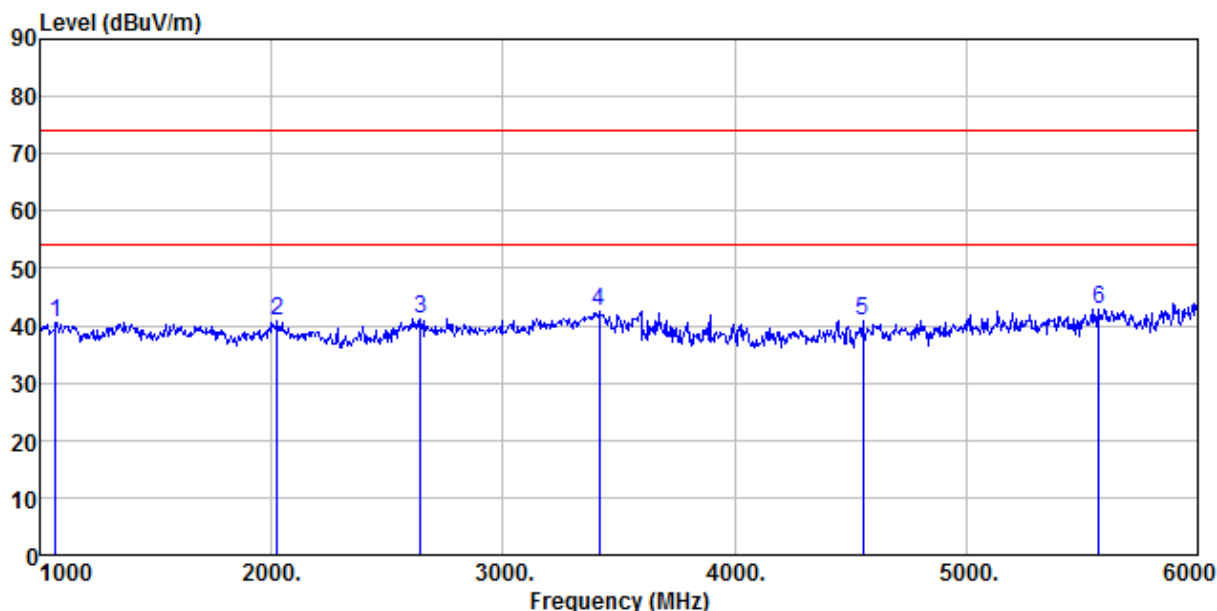
Test mode:	PC mode	Antenna Polarity:	Vertical
------------	---------	-------------------	----------



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
36.766	29.72	11.20	0.63	30.06	11.49	40.00	-28.51	QP
96.099	27.72	11.35	1.16	29.72	10.51	43.50	-32.99	QP
125.886	32.65	8.75	1.41	29.53	13.28	43.50	-30.22	QP
183.201	44.93	9.10	1.75	29.26	26.52	43.50	-16.98	QP
216.024	30.87	10.78	1.93	29.36	14.22	46.00	-31.78	QP
370.702	33.61	14.91	2.72	29.64	21.60	46.00	-24.40	QP

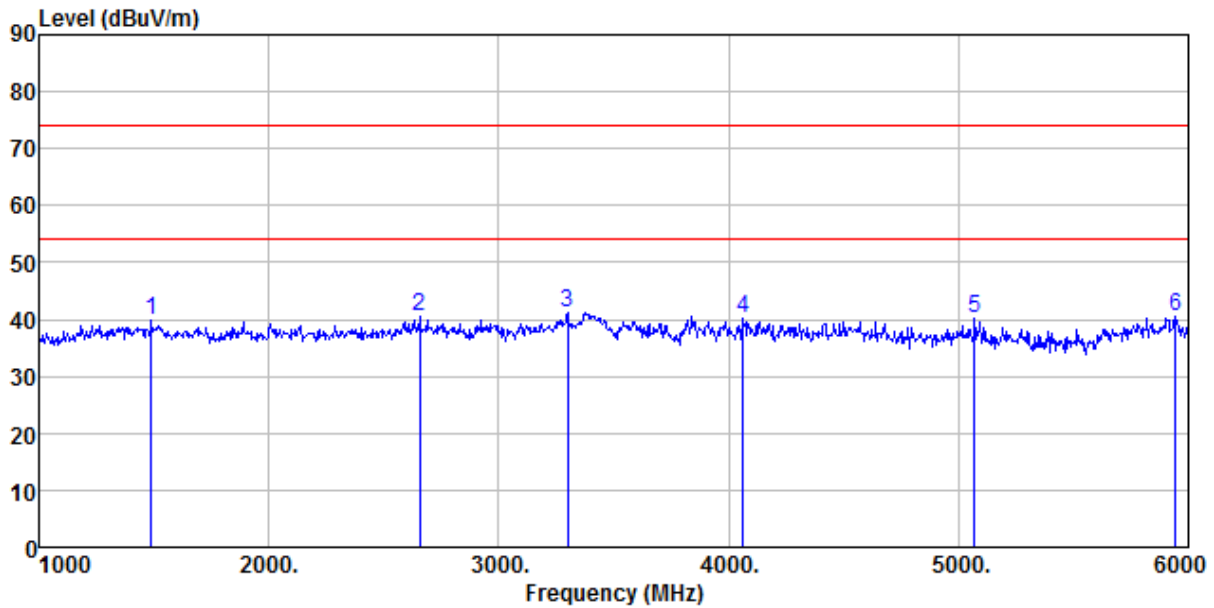
Above 1GHz

Test mode:	PC mode	Antenna Polarity:	Horizontal
------------	---------	-------------------	------------



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
1070.000	47.50	24.67	4.35	35.84	40.68	74.00	-33.32	Peak
2025.000	45.84	26.29	4.99	36.41	40.71	74.00	-33.29	Peak
2645.000	44.62	27.91	5.63	36.92	41.24	74.00	-32.76	Peak
3415.000	44.51	28.67	6.80	37.32	42.66	74.00	-31.34	Peak
4555.000	38.62	31.44	8.39	37.61	40.84	74.00	-33.16	Peak
5575.000	38.02	32.18	9.61	36.89	42.92	74.00	-31.08	Peak

Test mode:	PC mode	Antenna Polarity:	Vertical
------------	---------	-------------------	----------



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
1490.000	46.18	25.24	4.68	36.09	40.01	74.00	-33.99	Peak
2655.000	43.83	27.96	5.63	36.92	40.50	74.00	-33.50	Peak
3300.000	43.52	28.35	6.56	37.29	41.14	74.00	-32.86	Peak
4065.000	39.98	29.83	7.93	37.51	40.23	74.00	-33.77	Peak
5070.000	36.90	32.01	8.87	37.61	40.17	74.00	-33.83	Peak
5945.000	33.99	32.82	10.13	36.37	40.57	74.00	-33.43	Peak

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

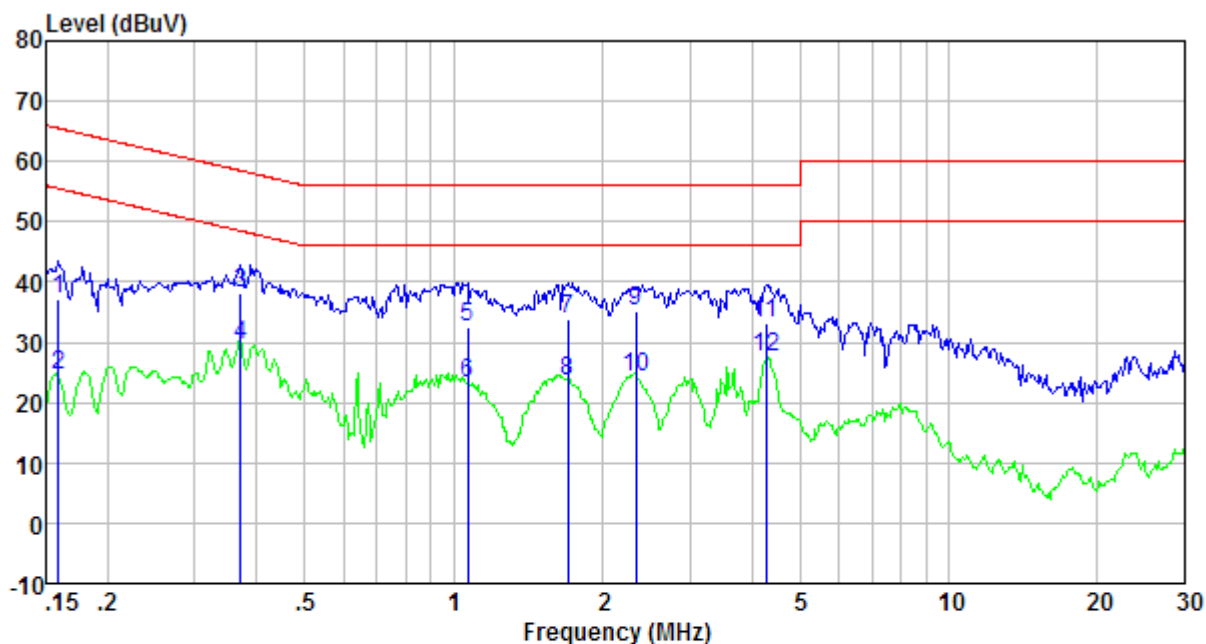
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

7.2 Conducted Emissions

Test Requirement:	FCC Part15 B Section 15.107														
Test Method:	ANSI C63.4:2014														
Test Frequency Range:	150kHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9kHz, VBW=30kHz														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>0.5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dB μ V)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	0.5-30	60	50
Frequency range (MHz)	Limit (dB μ V)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
0.5-30	60	50													
Test setup:	<p><i>Remark</i> <i>E.U.T: Equipment Under Test</i> <i>LISN: Line Impedance Stabilization Network</i> <i>Test table height=0.8m</i></p>														
Test procedure	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. 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). 3. 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 according to ANSI C63.4: 2014 on conducted measurement. 														
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar														
Test Instruments:	Refer to section 6 for details														
Test mode:	Refer to section 5.2 for details, only show the worst case.														
Test results:	Pass														

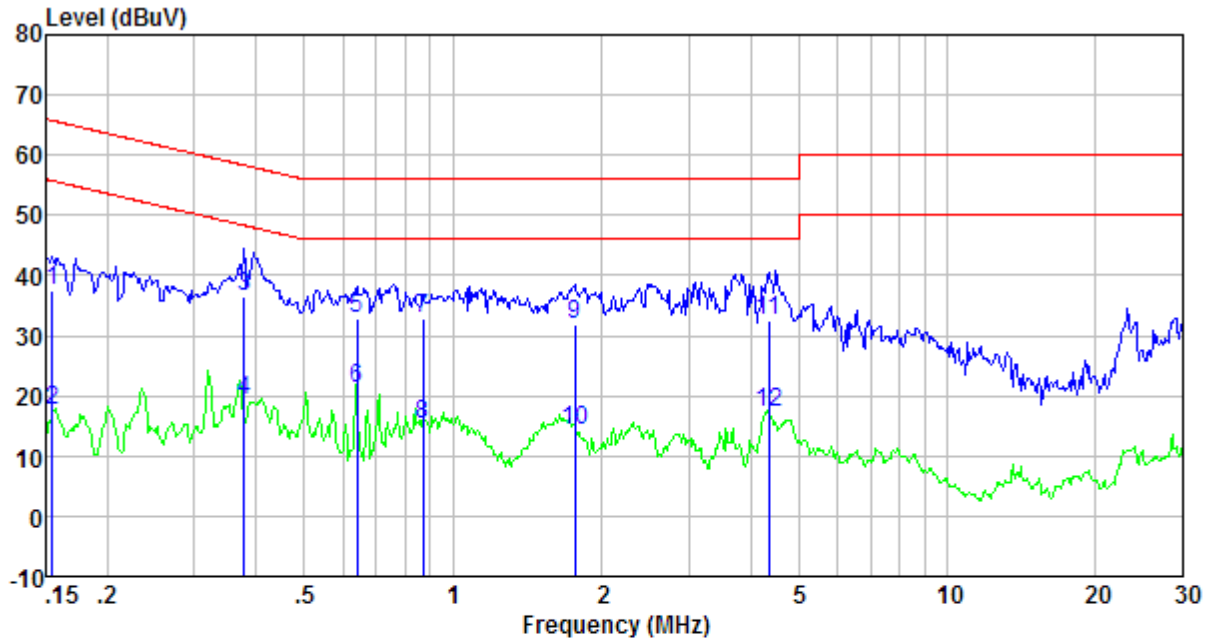
Measurement Data

Test mode:	PC mode	Phase Polarity:	Line
------------	---------	-----------------	------



Freq MHz	Reading level dBuV	IISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.159	36.55	0.42	0.12	37.09	65.52	-28.43	QP
0.159	24.02	0.42	0.12	24.56	55.52	-30.96	Average
0.371	37.65	0.42	0.10	38.17	58.47	-20.30	QP
0.371	29.09	0.42	0.10	29.61	48.47	-18.86	Average
1.065	32.22	0.25	0.13	32.60	56.00	-23.40	QP
1.065	22.86	0.25	0.13	23.24	46.00	-22.76	Average
1.698	33.55	0.21	0.14	33.90	56.00	-22.10	QP
1.698	23.03	0.21	0.14	23.38	46.00	-22.62	Average
2.334	34.89	0.20	0.15	35.24	56.00	-20.76	QP
2.334	23.88	0.20	0.15	24.23	46.00	-21.77	Average
4.269	32.70	0.21	0.15	33.06	56.00	-22.94	QP
4.269	27.11	0.21	0.15	27.47	46.00	-18.53	Average

Test mode:	PC mode	Phase Polarity:	Neutral
------------	---------	-----------------	---------



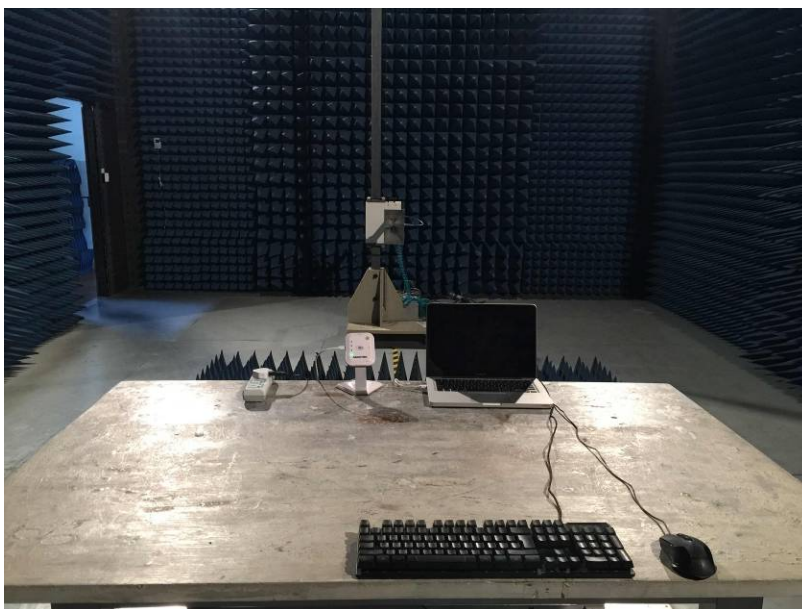
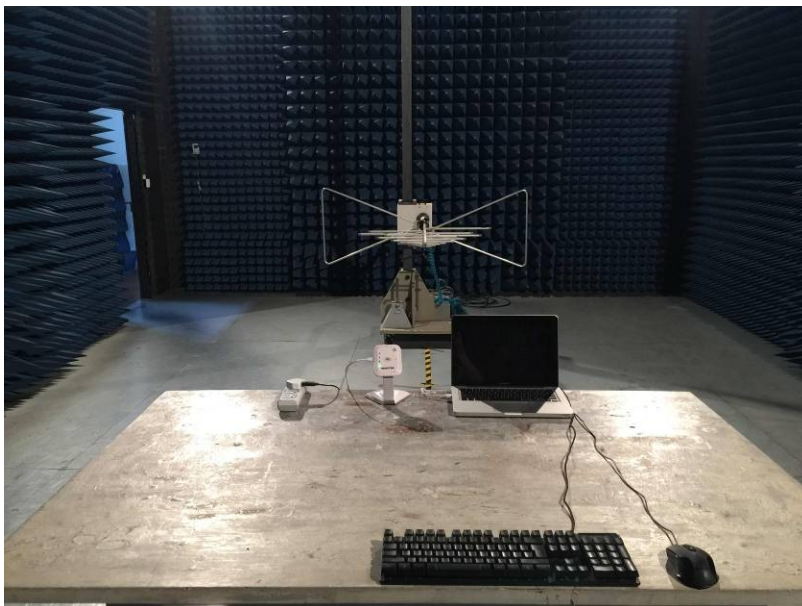
Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.155	36.86	0.41	0.12	37.39	65.74	-28.35	QP
0.155	17.20	0.41	0.12	17.73	55.74	-38.01	Average
0.377	35.94	0.40	0.10	36.44	58.34	-21.90	QP
0.377	18.68	0.40	0.10	19.18	48.34	-29.16	Average
0.641	32.45	0.26	0.13	32.84	56.00	-23.16	QP
0.641	20.91	0.26	0.13	21.30	46.00	-24.70	Average
0.871	32.55	0.22	0.13	32.90	56.00	-23.10	QP
0.871	14.91	0.22	0.13	15.26	46.00	-30.74	Average
1.762	31.43	0.20	0.14	31.77	56.00	-24.23	QP
1.762	13.91	0.20	0.14	14.25	46.00	-31.75	Average
4.361	32.21	0.21	0.15	32.57	56.00	-23.43	QP
4.361	17.03	0.21	0.15	17.39	46.00	-28.61	Average

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

8 Test Setup Photo

Radiated Emission:



Conducted Emission



9 EUT Constructional Details

Reference to the test report No. : GTS201705000043F01

-----End-----