

TEST REPORT

Applicant: Quantum Creations LLC.

Address of Applicant: 15705 NW 13th Ave, Miami Gardens, Miami, Florida 33169, United States

Manufacturer/Factory: Shenzhen Mele Star Technology Ltd.

Address of Manufacturer/Factory: 1F, Bldg#1, 28 Cuijing Road, Pingshan District, Shenzhen, PR China.

Equipment Under Test (EUT)

Product Name: MINI PC

Model No.: A-1153-AB3, A-1153-AB3-1, A-1153-AB3-2, A-1153-AB3-3, A-1153-AB3-4, A-1153-AB3-5, A-1153-AB3-6, A-1153-AB3-7, A-1153-AB3-8, A-1153-AB3-9

Trade Mark: AZULLE®

Applicable standards: FCC CFR Title 47 Part 15 Subpart B:2017

Date of sample receipt: July 03, 2017

Date of Test: July 04-10, 2017

Date of report issued: July 11, 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	July 11, 2017	Original

Prepared by:

Bill. Yuan

Date:

July 11, 2017

Project Engineer

Reviewed by:

Andy. Wu

Date:

July 11, 2017

Reviewer

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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.

Remark: Test according to ANSI:C63.4 2014.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	MINI PC
Model No.:	A-1153-AB3, A-1153-AB3-1, A-1153-AB3-2, A-1153-AB3-3, A-1153-AB3-4, A-1153-AB3-5, A-1153-AB3-6, A-1153-AB3-7, A-1153-AB3-8, A-1153-AB3-9
Test Model No:	A-1153-AB3
<i>Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are color and model name for commercial purpose.</i>	
Power supply:	SWITCHING ADAPTER MODEL:ADS-25D-12 12024E INPUT: AC 100-240V, 50/60Hz, Max 0.7A OUTPUT: DC 12V, 2.0A

5.2 Test mode and Test voltage

Test mode:	
LAN mode	Keep the EUT in Ping with PC mode
HDMI mode	Keep the EUT in HDMI output mode.
USB mode	Keep the EUT in USB port operation status.
SD card playing mode	Keep the EUT in TF card playing mode.
VGA mode	Keep the EUT in VGA working mode
Test voltage:	
AC 120V	

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
PHILIPS	LCD TV	19PFL3120/T3	AU1A1212002906
DELL	KEYBOARD	SK-8115	N/A
DELL	MOUSE	N/A	N/A

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

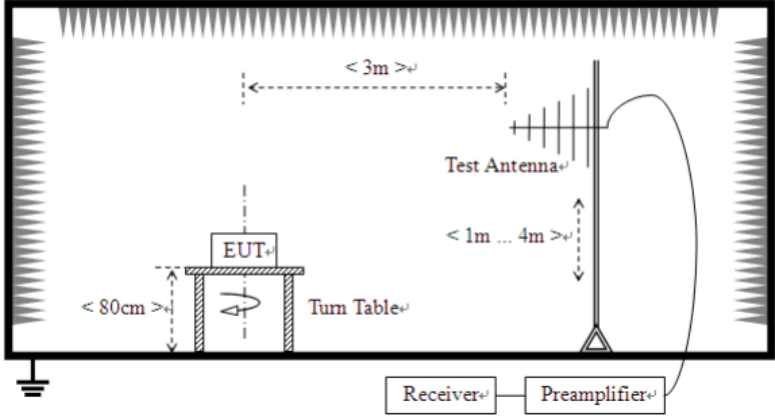
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	June.28 2017	June.27 2018
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June.28 2017	June.27 2018
5	Double-ridged horn antenna	SCHWARZBECK	9120D	GTS208	June.28 2017	June.27 2018
6	Horn Antenna	ETS-LINDGREN	3160-09	GTS218	June.28 2017	June.27 2018
7	RF Amplifier	HP	8347A	GTS204	June.28 2017	June.27 2018
8	Broadband Preampfier	SCHWARZBECK	BBV9718	GTS535	June.28 2017	June.27 2018
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS211	June.28 2017	June.27 2018
11	Coaxial Cable	GTS	N/A	GTS210	June.28 2017	June.27 2018
12	Coaxial Cable	GTS	N/A	GTS212	June.28 2017	June.27 2018
13	Thermo meter	N/A	N/A	GTS256	June.28 2017	June.27 2018

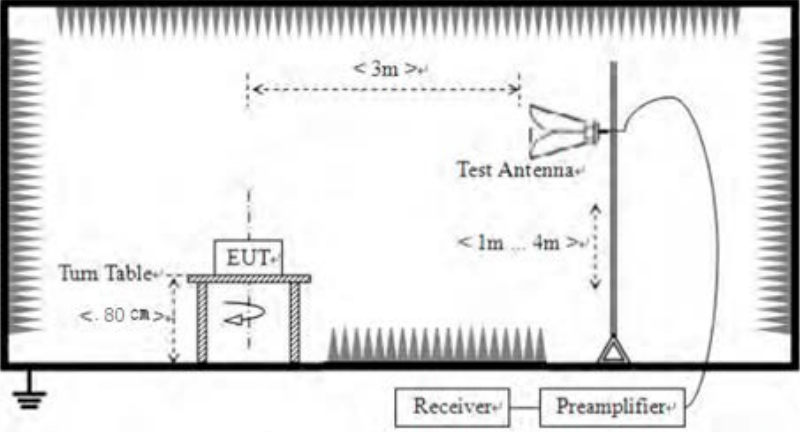
Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June.28 2017	June.27 2018
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June.28 2017	June.27 2018
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June.28 2017	June.27 2018
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.28 2017	June.27 2018

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.28 2017	June.27 2018

7 Test Results and Measurement Data

7.1 Radiated Emission

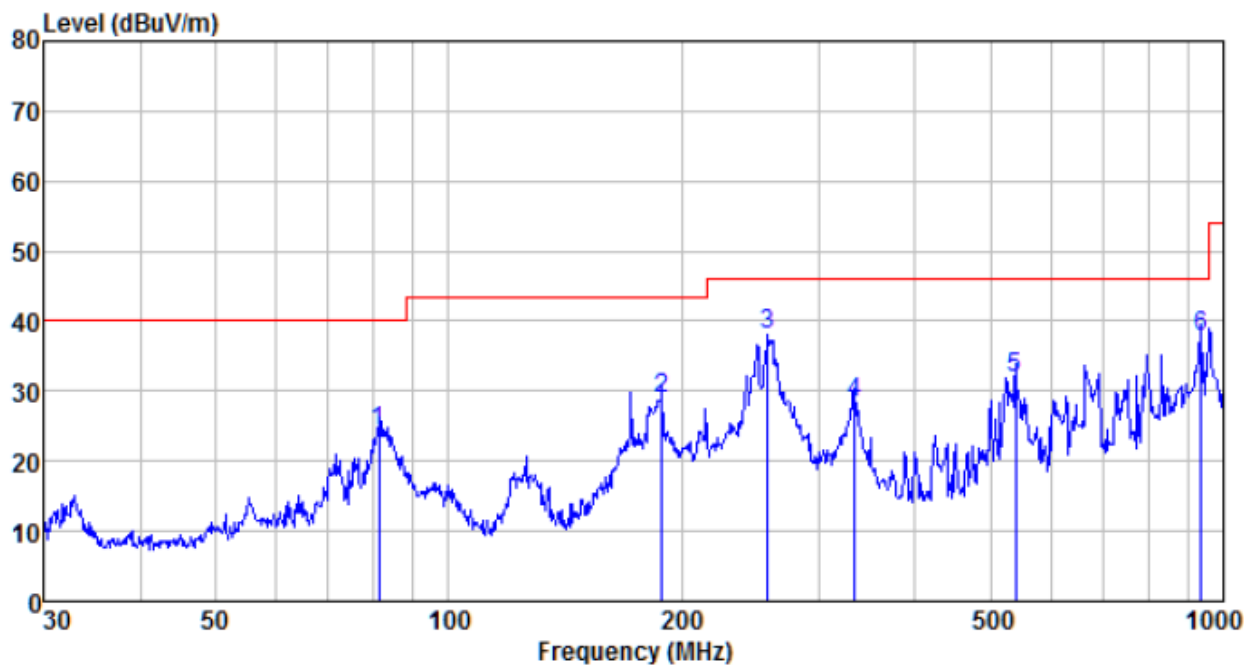
Test Requirement:	FCC Part15 B Section 15.109																				
Test Method:	ANSI C63.4:2014																				
Test Frequency Range:	30MHz to 6GHz																				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																				
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120kHz</td> <td>300kHz</td> <td>Quasi-peak</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak</td> </tr> <tr> <td>Average</td> <td>1MHz</td> <td>3MHz</td> <td>Average</td> </tr> </tbody> </table>	Frequency	Detector	RBW	VBW	Value	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak	Above 1GHz	Peak	1MHz	3MHz	Peak	Average	1MHz	3MHz	Average	
Frequency	Detector	RBW	VBW	Value																	
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak																	
Above 1GHz	Peak	1MHz	3MHz	Peak																	
	Average	1MHz	3MHz	Average																	
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBμV/m @3m)</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td> <td>40.00</td> <td>Quasi-peak</td> </tr> <tr> <td>88MHz-216MHz</td> <td>43.50</td> <td>Quasi-peak</td> </tr> <tr> <td>216MHz-960MHz</td> <td>46.00</td> <td>Quasi-peak</td> </tr> <tr> <td>960MHz-1GHz</td> <td>54.00</td> <td>Quasi-peak</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>54.00</td> <td>Average</td> </tr> <tr> <td>74.00</td> <td>Peak</td> </tr> </tbody> </table>	Frequency	Limit (dB μ V/m @3m)	Value	30MHz-88MHz	40.00	Quasi-peak	88MHz-216MHz	43.50	Quasi-peak	216MHz-960MHz	46.00	Quasi-peak	960MHz-1GHz	54.00	Quasi-peak	Above 1GHz	54.00	Average	74.00	Peak
Frequency	Limit (dB μ V/m @3m)	Value																			
30MHz-88MHz	40.00	Quasi-peak																			
88MHz-216MHz	43.50	Quasi-peak																			
216MHz-960MHz	46.00	Quasi-peak																			
960MHz-1GHz	54.00	Quasi-peak																			
Above 1GHz	54.00	Average																			
	74.00	Peak																			
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>																				

	
<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</p>
<p>Test results:</p>	<p>Pass</p>

Measurement Data

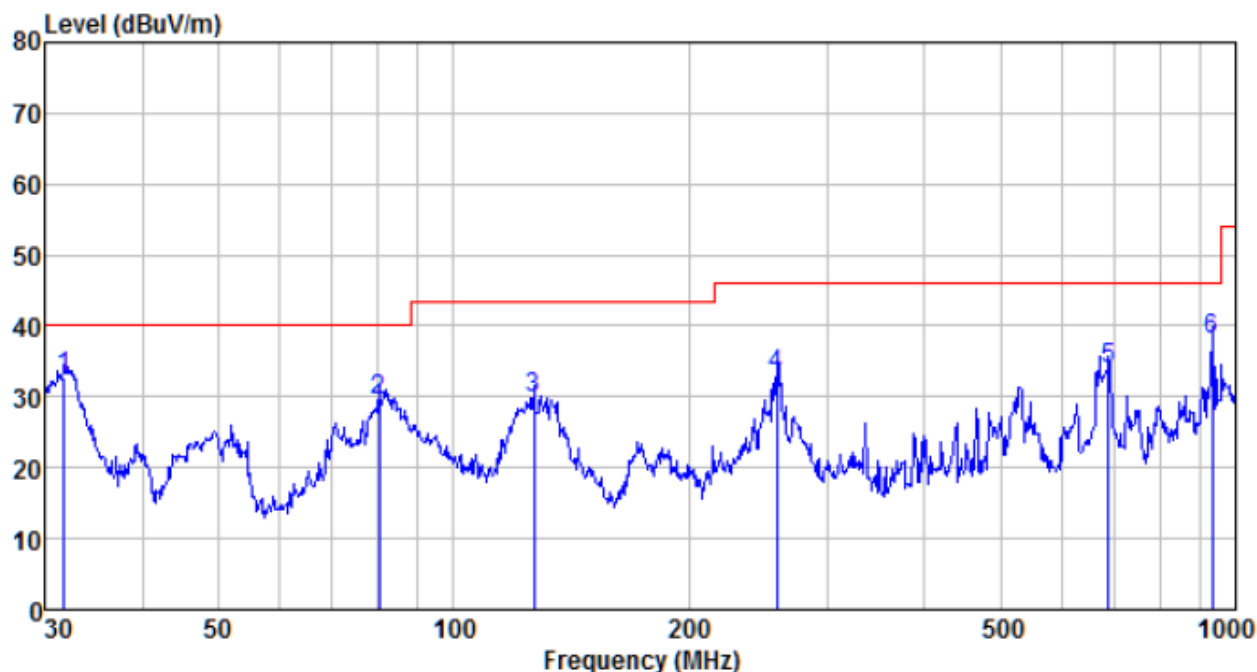
Below 1GHz

Test mode:	LAN mode	Antenna Polarity:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
81.212	45.70	7.30	1.04	29.79	24.25	40.00	-15.75	QP
188.413	46.87	9.40	1.78	29.24	28.81	43.50	-14.69	QP
258.326	53.55	12.14	2.16	29.71	38.14	46.00	-7.86	QP
334.859	41.31	14.21	2.54	29.80	28.26	46.00	-17.74	QP
539.478	39.48	18.24	3.48	29.30	31.90	46.00	-14.10	QP
935.546	39.38	22.41	4.99	29.10	37.68	46.00	-8.32	QP

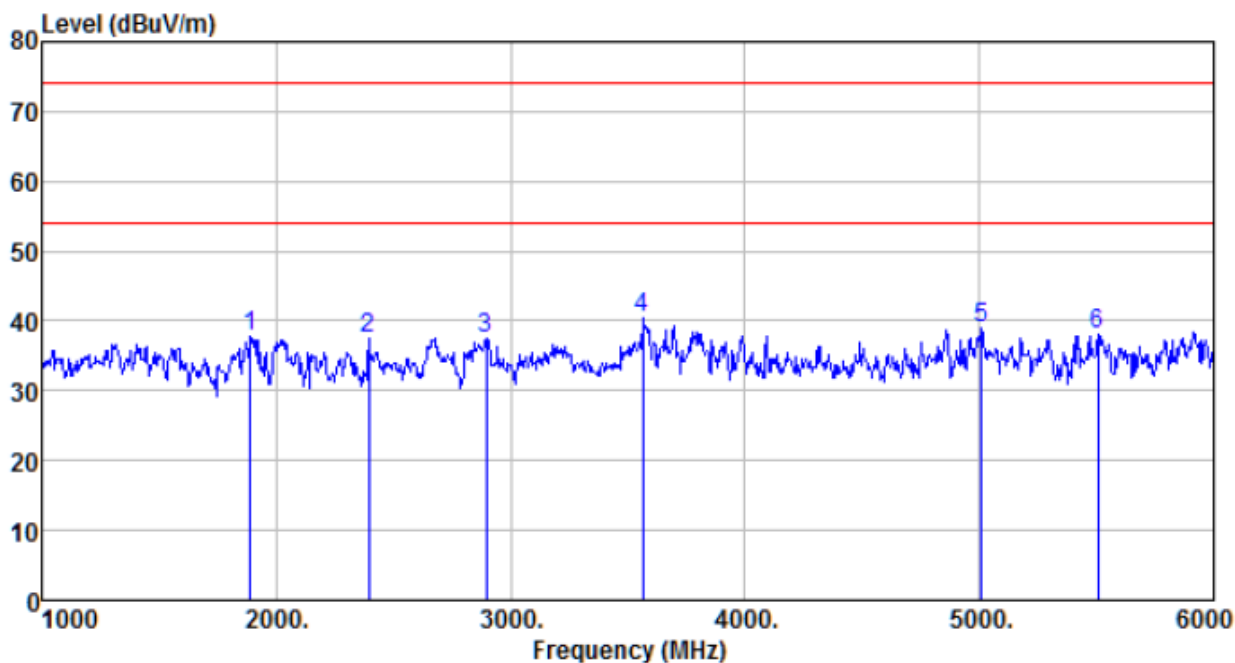
Test mode:	LAN mode	Antenna Polarity:	Vertical
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Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV	Limit level dBUV/m	Over limit dB	Remark
31.731	50.92	11.25	0.57	30.09	32.65	40.00	-7.35	QP
80.362	50.91	7.30	1.03	29.80	29.44	40.00	-10.56	QP
126.772	49.37	8.43	1.41	29.53	29.68	43.50	-13.82	QP
259.234	48.58	12.14	2.17	29.72	33.17	46.00	-12.83	QP
687.151	39.27	19.73	4.05	29.21	33.84	46.00	-12.16	QP
932.272	39.67	22.39	4.98	29.10	37.94	46.00	-8.06	QP

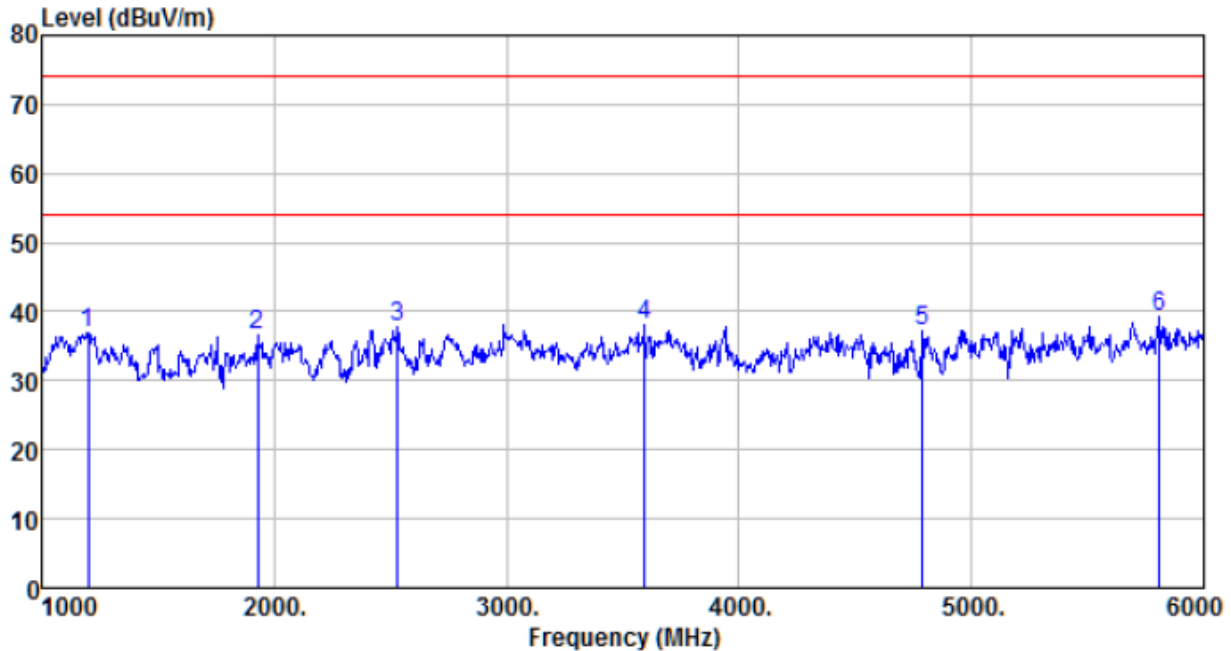
Above 1GHz

Test mode:	LAN mode	Antenna Polarity:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1890.000	43.51	25.70	4.90	36.33	37.78	74.00	-36.22	Peak
2395.000	41.25	27.59	5.39	36.71	37.52	74.00	-36.48	Peak
2895.000	40.33	28.43	5.84	37.11	37.49	74.00	-36.51	Peak
3565.000	41.55	29.10	7.09	37.37	40.37	74.00	-33.63	Peak
5010.000	35.89	31.96	8.78	37.68	38.95	74.00	-35.05	Peak
5505.000	33.55	32.01	9.51	36.99	38.08	74.00	-35.92	Peak

Test mode:	LAN mode	Antenna Polarity:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1200.000	43.07	25.34	4.47	35.92	36.96	74.00	-37.04	Peak
1930.000	42.12	25.86	4.92	36.36	36.54	74.00	-37.46	Peak
2530.000	41.58	27.58	5.52	36.82	37.86	74.00	-36.14	Peak
3595.000	39.20	29.13	7.15	37.38	38.10	74.00	-35.90	Peak
4790.000	34.49	31.76	8.59	37.66	37.18	74.00	-36.82	Peak
5810.000	33.21	32.66	9.95	36.56	39.26	74.00	-34.74	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:

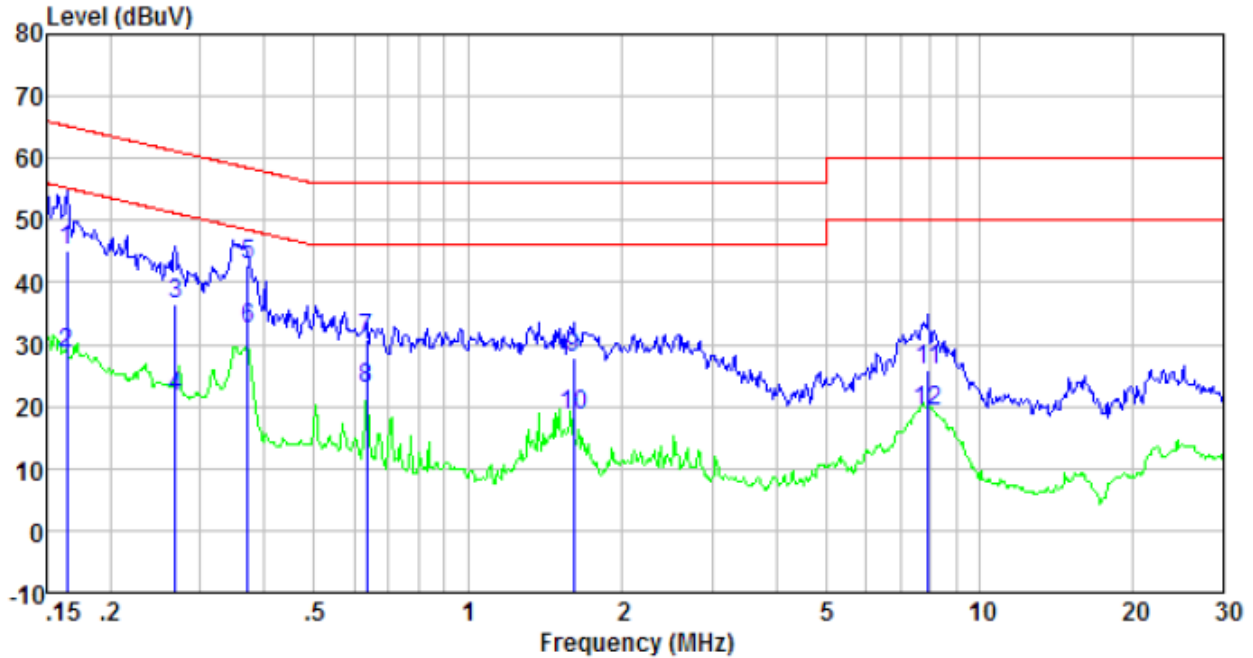
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

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, Sweep time=auto														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</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>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test setup:	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</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.). This provides 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 refer 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 Instruments:	Refer to section 6 for details														
Test mode:	Refer to section 5.2 for details														
Test results:	Pass														

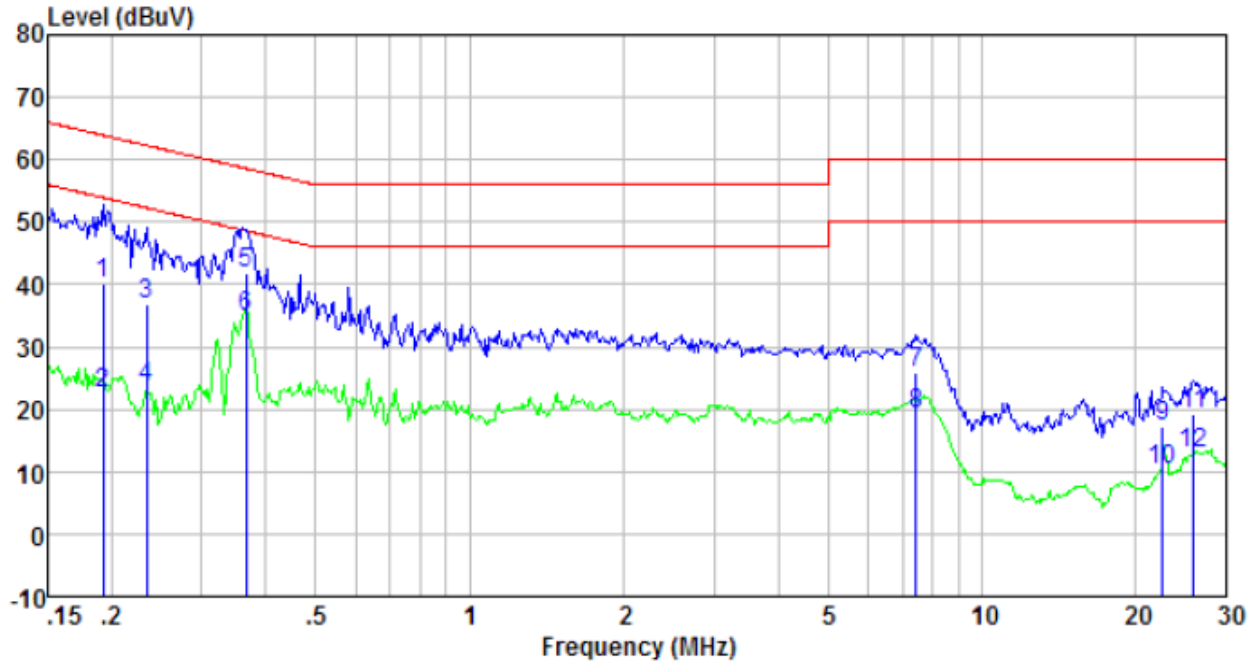
Measurement Data

Test mode:	LAN mode	Phase Polarity:	Line
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Freq MHz	Reading level dBuV	IISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.164	44.61	0.42	0.12	45.15	65.25	-20.10	QP
0.164	27.99	0.42	0.12	28.53	55.25	-26.72	Average
0.267	36.04	0.44	0.11	36.59	61.20	-24.61	QP
0.267	20.91	0.44	0.11	21.46	51.20	-29.74	Average
0.371	42.39	0.42	0.10	42.91	58.47	-15.56	QP
0.371	31.94	0.42	0.10	32.46	48.47	-16.01	Average
0.634	30.48	0.30	0.13	30.91	56.00	-25.09	QP
0.634	22.38	0.30	0.13	22.81	46.00	-23.19	Average
1.610	27.45	0.21	0.14	27.80	56.00	-28.20	QP
1.610	18.17	0.21	0.14	18.52	46.00	-27.48	Average
7.935	25.42	0.22	0.18	25.82	60.00	-34.18	QP
7.935	18.70	0.22	0.18	19.10	50.00	-30.90	Average

Test mode:	LAN mode	Phase Polarity:	Neutral
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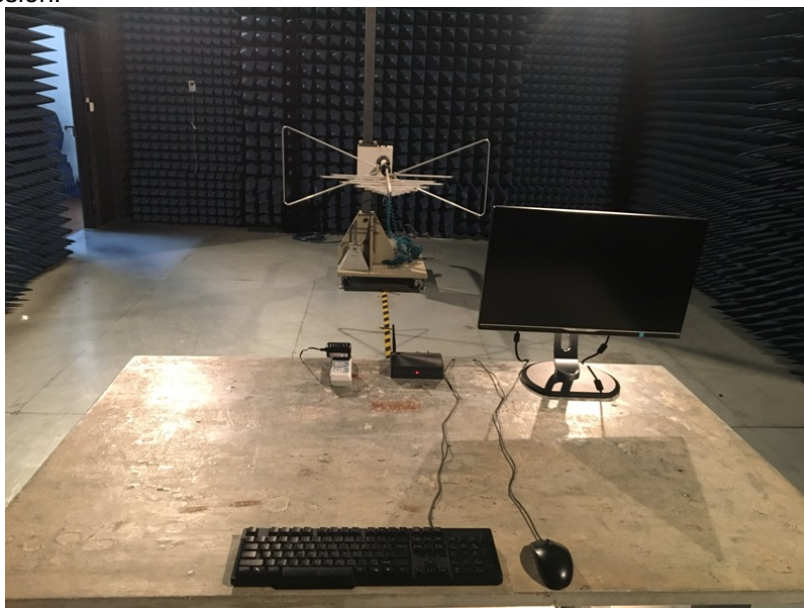
Freq MHz	Reading level dBUV	LISN/ISN factor dB	Cable loss dB	level dBUV	Limit level dBUV	Over limit dB	Remark
0.192	39.47	0.41	0.13	40.01	63.93	-23.92	QP
0.192	21.88	0.41	0.13	22.42	53.93	-31.51	Average
0.234	36.32	0.42	0.12	36.86	62.30	-25.44	QP
0.234	23.03	0.42	0.12	23.57	52.30	-28.73	Average
0.365	41.40	0.40	0.10	41.90	58.61	-16.71	QP
0.365	34.34	0.40	0.10	34.84	48.61	-13.77	Average
7.446	25.33	0.22	0.18	25.73	60.00	-34.27	QP
7.446	18.96	0.22	0.18	19.36	50.00	-30.64	Average
22.535	16.59	0.33	0.23	17.15	60.00	-42.85	QP
22.535	9.56	0.33	0.23	10.12	50.00	-39.88	Average
25.864	18.71	0.38	0.23	19.32	60.00	-40.68	QP
25.864	12.40	0.38	0.23	13.01	50.00	-36.99	Average

Notes:

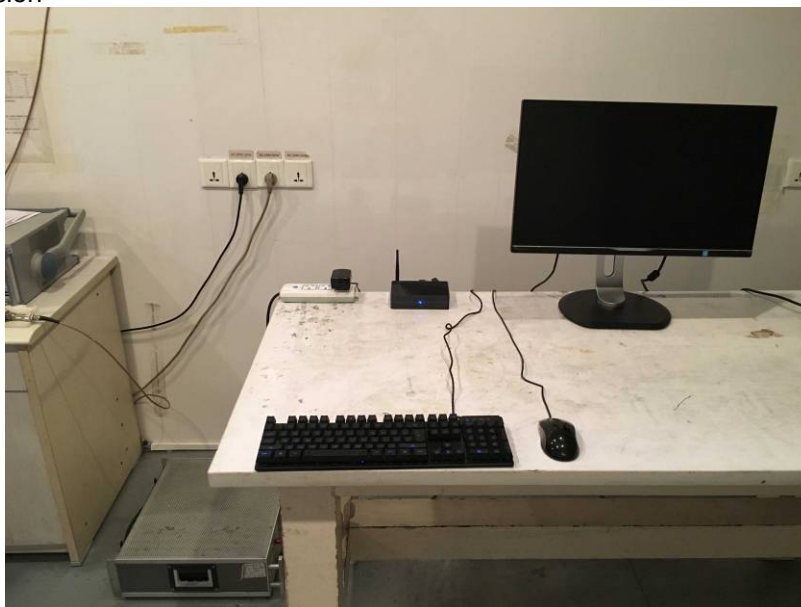
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss

8 Test Setup Photo

Radiated Emission:



Conducted Emission



9 EUT Constructional Details

Reference to the test report No. : GTS201708000157F01

-----End -----