

TEST REPORT

Applicant: Shenzhen Jingwah Information Technology Co., Ltd.

Address of Applicant: 4F, Bldg 4, Jinghua Square, No.1 Huafa North Road, Shenzhen, China

Manufacturer/Factory: Shenzhen Jingwah Information Technology Co., Ltd.

Address of Manufacturer/Factory: 4F, Bldg 4, Jinghua Square, No.1 Huafa North Road, Shenzhen, China

Equipment Under Test (EUT)

Product Name: Laptop

Model No.: N1160C, N11300, N11200

Trade Mark: PACKARD BELL

FCC ID: RBD-N1160C

Applicable standards: FCC CFR Title 47 Part 15 Subpart B

Date of sample receipt: January 22, 2018

Date of Test: January 23-30, 2018

Date of report issued: January 31, 2018

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	January 31, 2018	Original

Prepared by:

Bill. Yuan

Date:

January 31, 2018

Project Engineer

Reviewed by:

Andy Wu

Date:

January 31, 2018

Reviewer

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4 Test Summary

Test Item	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission	FCC Part15.107	ANSI C63.4	Class B	PASS
Radiated Emissions #	FCC Part15.109	ANSI C63.4	Class B	PASS

Remark:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. # *Refer to FCC Part 15.33 (b)(1) conditional testing procedure :*

<i>The highest frequency generated or used in the EUT</i>	<i>Test frequency range of Radiated emission</i>
<108MHz	30MHz ~ 1GHz
108MHz ~ 500MHz	30MHz ~ 2GHz
500MHz ~ 1GHz	30MHz ~ 5GHz
>1GHz	<i>30MHz ~ 5th harmonic of the highest frequency or 40 GHz, whichever is lower.</i>

5 General Information

5.1 General Description of EUT

Product Name:	Laptop
Model No.:	N1160C, N11300, N11200
Test Model No:	N1160C
<i>Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The only differences model name for commercial purpose.</i>	
Serial No.:	N1160C20180201
Test sample(s) ID:	GTS201801000118-2
Sample(s) Status	Normal sample
Hardware:	EM_H8316_216B
Software:	Windows 10
Power supply:	Adapter: Model: FJ-SW1260502500DU Input: AC 100-240V, 50/60Hz, 0.4A Max Output: DC 5V, 2500mA Or Rechargeable Li-polymer Battery: DC 3.8V, 8000mAh, 30.4Wh

5.2 Test mode and Test voltage

Test mode:	
TF Card mode	Keep the EUT in TF Card mode.
HDMI mode	Keep the EUT in HDMI mode.
REC mode	Keep the EUT in REC mode.
USB mode	Keep the EUT in USB mode.
Test voltage	
AC120V 60Hz	

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
PHILIPS	LCD TV	19PFL3120/T3	AU1A1212002906
DELL	MONITOR	N/A	N/A
DELL	KEYBOARD	SK-8115	N/A
Kingston	TF card	SD-C01G	N/A
Kingston	USB disk	4GB	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.: 381383**

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 381383, January 08, 2018.

- **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

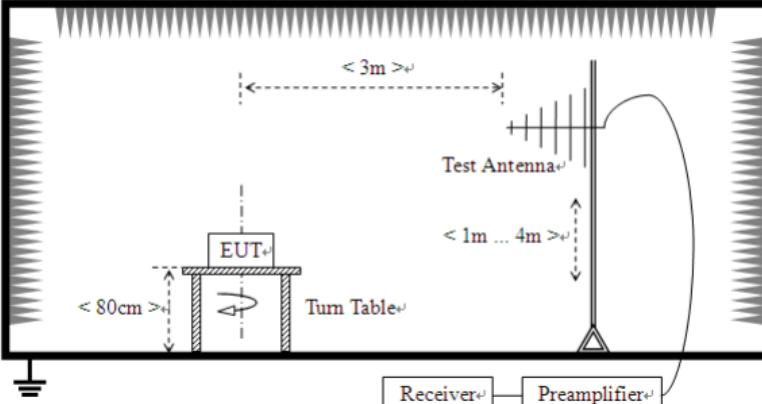
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	June.29 2017	June.28 2018
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June.29 2017	June.28 2018
5	Double-ridged horn antenna	SCHWARZBECK	9120D	GTS208	June.29 2017	June.28 2018
6	Horn Antenna	ETS-LINDGREN	3160-09	GTS218	June.29 2017	June.28 2018
7	RF Amplifier	HP	8347A	GTS204	June.29 2017	June.28 2018
8	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	June.29 2017	June.28 2018
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS211	June.29 2017	June.28 2018
11	Coaxial Cable	GTS	N/A	GTS210	June.29 2017	June.28 2018
12	Coaxial Cable	GTS	N/A	GTS212	June.29 2017	June.28 2018
13	Thermo meter	N/A	N/A	GTS256	June.29 2017	June.28 2018

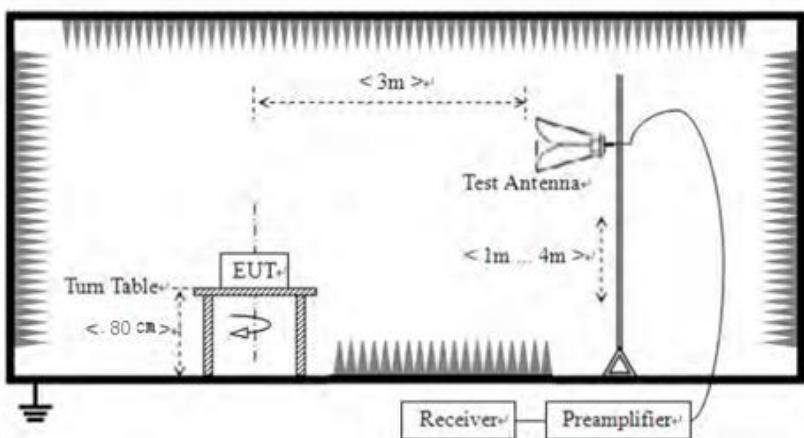
Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June.29 2017	June.28 2018
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June.29 2017	June.28 2018
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June.29 2017	June.28 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.29 2017	June.28 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.29 2017	June.28 2018

7 Test Results and Measurement Data

7.1 Radiated Emission

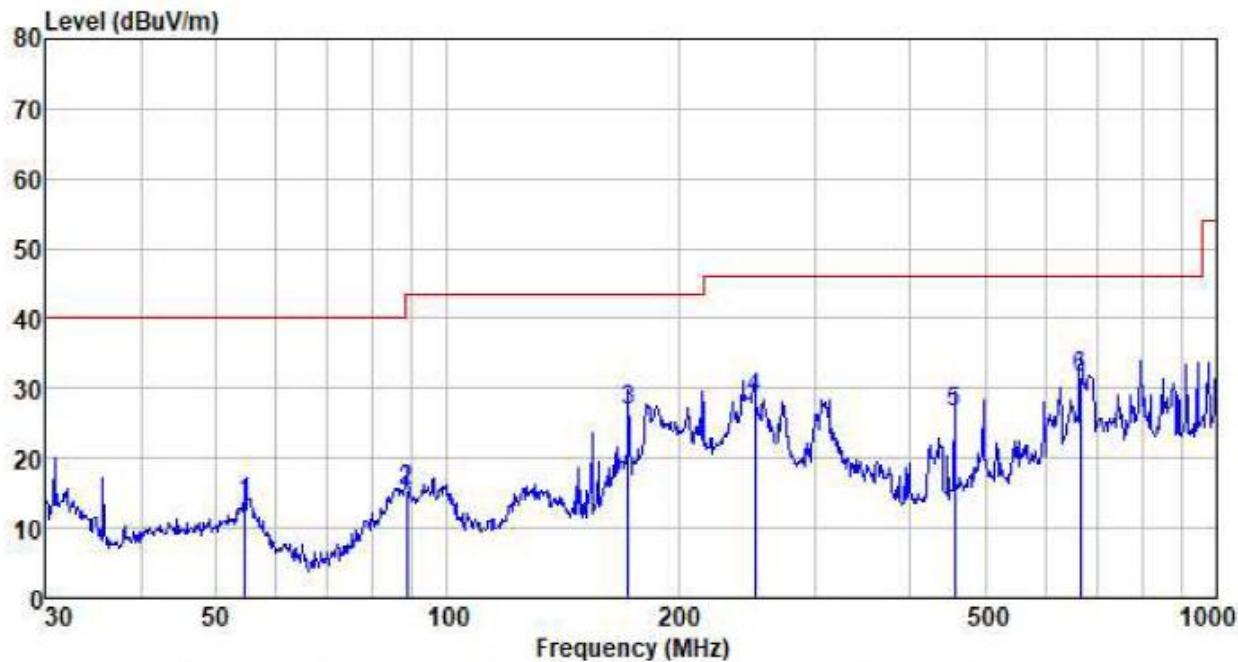
Test Requirement:	FCC Part15 B Section 15.109						
Test Method:	ANSI C63.4:2014						
Test Frequency Range:	30MHz to 6000MHz						
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)						
Receiver setup:	Frequency	Detector	RBW	VBW	Remark		
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value		
	Above 1GHz	Peak	1MHz	3MHz	Peak Value		
Limit:	Peak	1MHz	10Hz	Average Value			
	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			
Test setup:	74.00						
	Peak Value						
Below 1GHz							
Above 1GHz							



Test Procedure:	<ol style="list-style-type: none"> 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. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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.
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	Uncertainty: ± 4.50dB
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

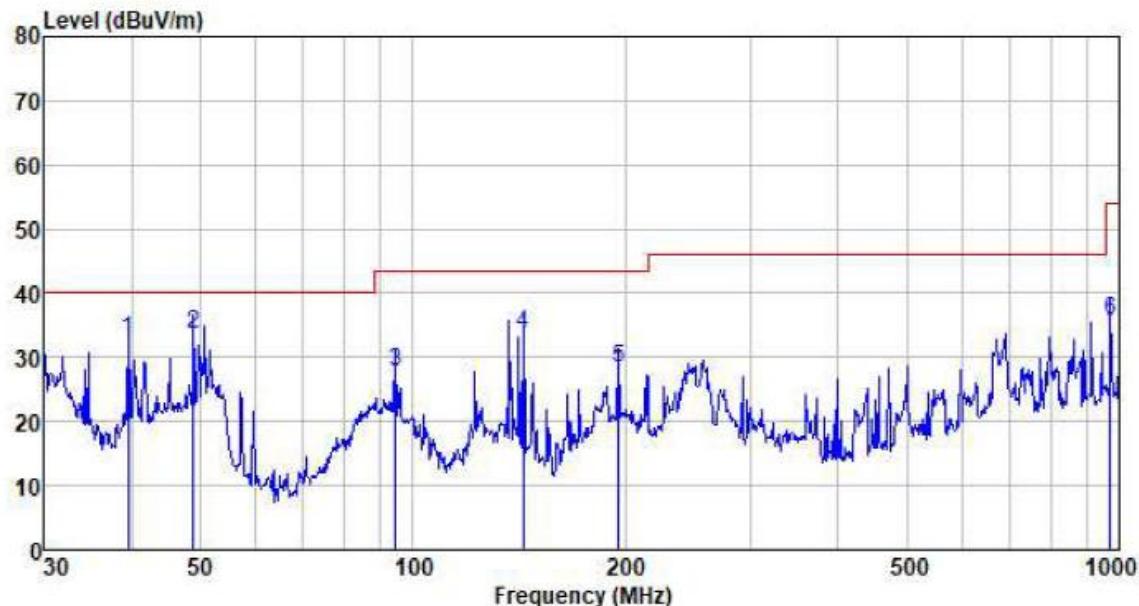
**Measurement Data
Below 1GHz**

Test mode:	HDMI mode	Antenna Polarity:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/n	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
54.643	30.83	11.93	0.81	29.96	13.61	40.00	-26.39	QP
88.652	33.53	10.60	1.10	29.75	15.48	43.50	-28.02	QP
171.995	46.01	8.50	1.70	29.31	26.90	43.50	-16.60	QP
251.180	44.23	11.85	2.13	29.65	28.56	46.00	-17.44	QP
455.906	36.28	16.59	3.11	29.38	26.60	46.00	-19.40	QP
665.804	37.18	19.62	3.97	29.23	31.54	46.00	-14.46	QP

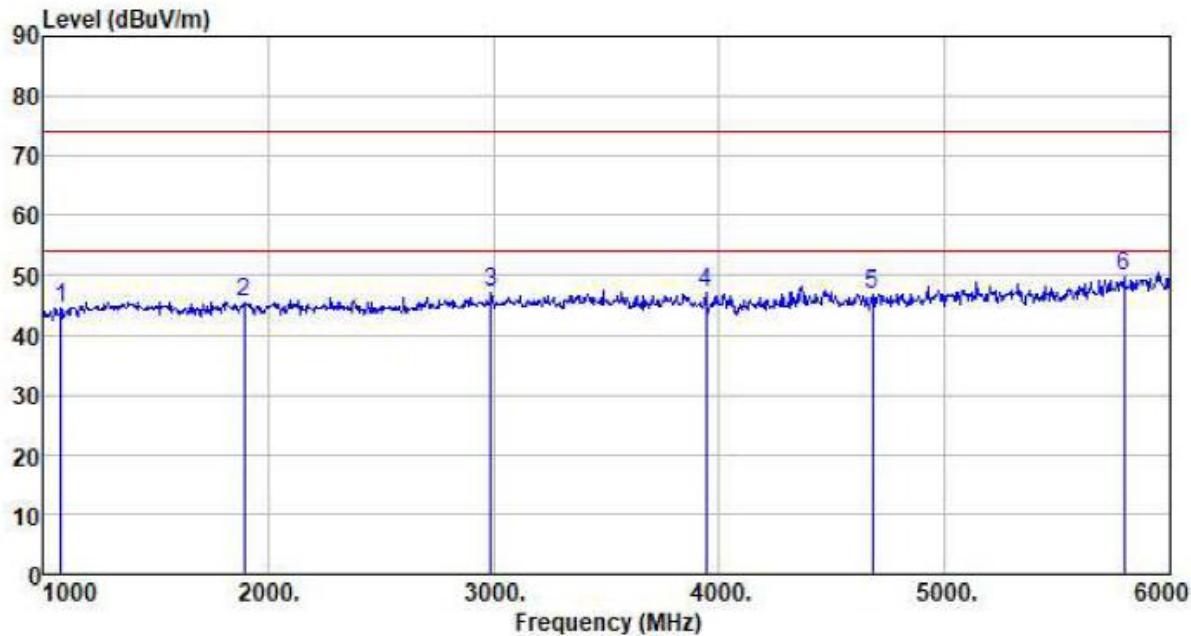
Test mode:	HDMI mode	Antenna Polarity:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
39.576	49.91	12.30	0.66	30.05	32.82	40.00	-7.18	QP
48.843	50.53	12.23	0.76	30.00	33.52	40.00	-6.48	QP
94.428	45.08	11.35	1.15	29.72	27.86	43.50	-15.64	QP
143.326	54.19	7.37	1.53	29.44	33.65	43.50	-9.85	QP
195.822	45.68	10.03	1.82	29.21	28.32	43.50	-15.18	QP
972.337	37.21	22.62	5.12	29.10	35.85	54.00	-18.15	QP

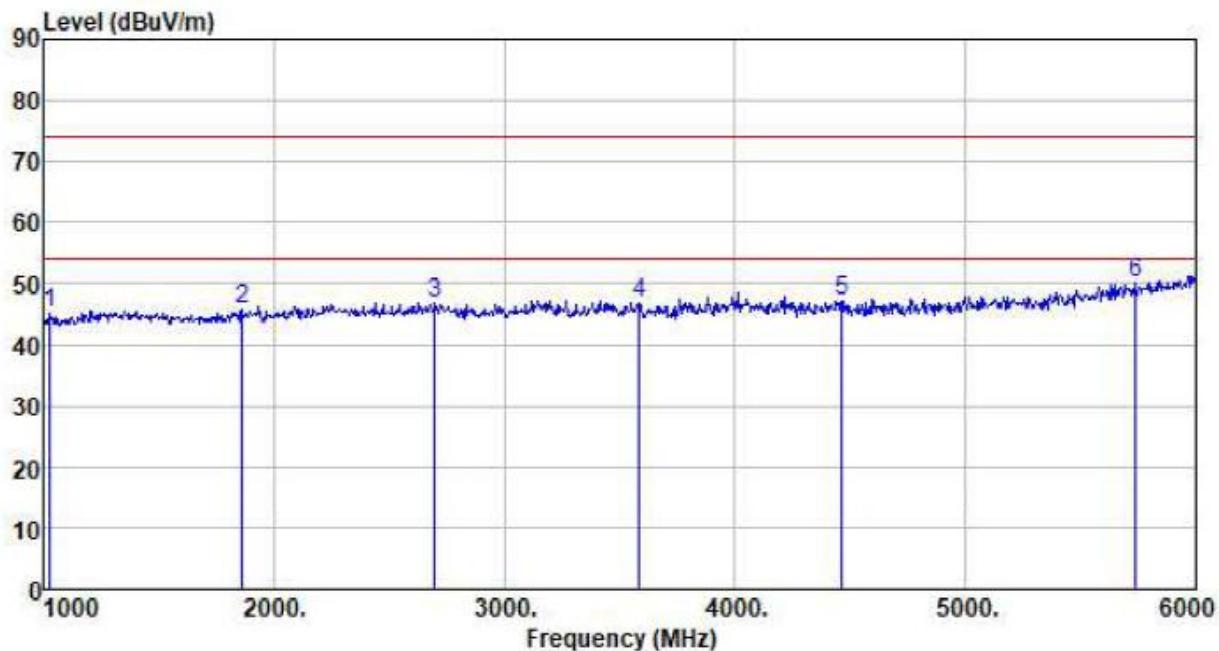
Above 1GHz

Test mode:	HDMI 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
1080.000	51.38	24.70	4.37	35.85	44.60	74.00	-29.40	Peak
1895.000	51.26	25.72	4.91	36.34	45.55	74.00	-28.45	Peak
2990.000	49.97	28.46	5.91	37.19	47.15	74.00	-26.85	Peak
3940.000	47.15	29.58	7.75	37.48	47.00	74.00	-27.00	Peak
4680.000	44.44	31.63	8.49	37.64	46.92	74.00	-27.08	Peak
5795.000	43.83	32.63	9.93	36.58	49.81	74.00	-24.19	Peak

Test mode:	HDMI 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
1030.000	52.10	24.58	4.32	35.82	45.18	74.00	-28.82	Peak
1865.000	51.77	25.58	4.89	36.32	45.92	74.00	-28.08	Peak
2700.000	49.98	28.16	5.67	36.96	46.85	74.00	-27.15	Peak
3585.000	47.95	29.12	7.13	37.38	46.82	74.00	-27.18	Peak
4465.000	45.22	31.26	8.31	37.59	47.20	74.00	-26.80	Peak
5740.000	44.26	32.56	9.86	36.66	50.02	74.00	-23.98	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:

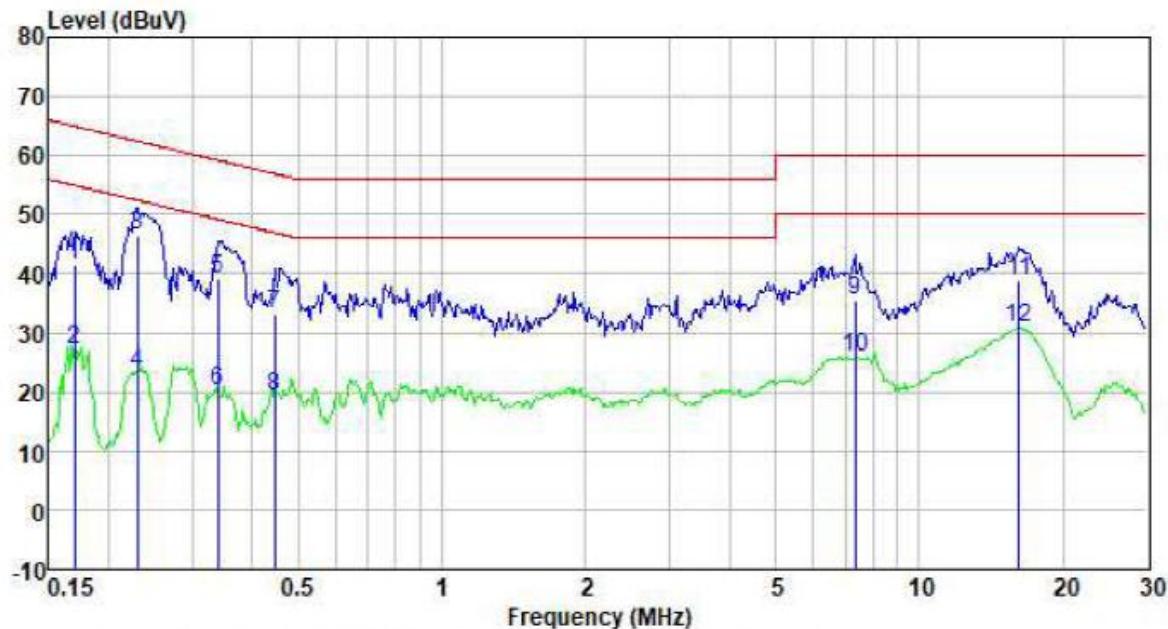
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

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 (dB_uV)</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 _u 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 _u 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.). They 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 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 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																

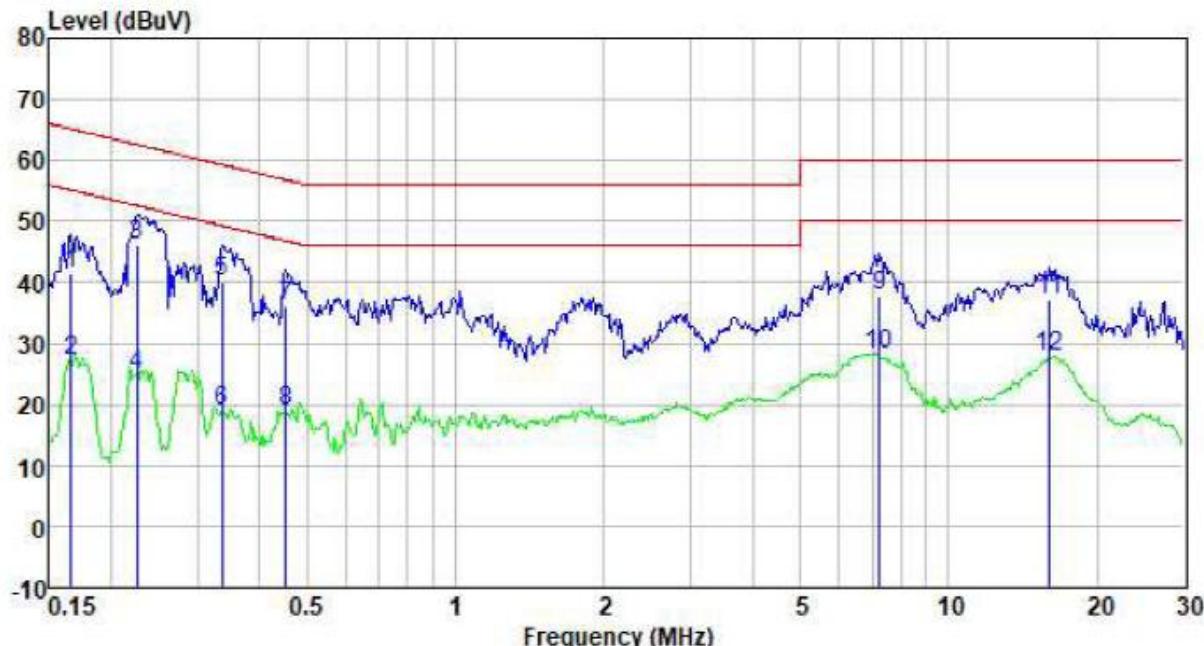
Measurement Data

Test mode:	TF card mode	Phase Polarity:	Line
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Freq MHz	Reading level dBuV	11SN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.170	41.15	0.40	0.09	41.64	64.94	-23.30	QP
0.170	26.86	0.40	0.09	27.35	54.94	-27.59	Average
0.230	45.85	0.40	0.11	46.36	62.44	-16.08	QP
0.230	22.73	0.40	0.11	23.24	52.44	-29.20	Average
0.339	38.65	0.38	0.10	39.13	59.22	-20.09	QP
0.339	19.61	0.38	0.10	20.09	49.22	-29.13	Average
0.447	32.81	0.33	0.11	33.25	56.93	-23.68	QP
0.447	18.83	0.33	0.11	19.27	46.93	-27.66	Average
7.329	35.08	0.20	0.19	35.47	60.00	-24.53	QP
7.329	25.44	0.20	0.19	25.83	50.00	-24.17	Average
16.226	38.23	0.23	0.22	38.68	60.00	-21.32	QP
16.226	30.51	0.23	0.22	30.96	50.00	-19.04	Average

Test mode:	TF card 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
0.166	41.03	0.40	0.08	41.51	65.16	-23.65	QP
0.166	26.80	0.40	0.08	27.28	55.16	-27.88	Average
0.226	45.76	0.40	0.11	46.27	62.61	-16.34	QP
0.226	24.45	0.40	0.11	24.96	52.61	-27.65	Average
0.336	39.56	0.38	0.10	40.04	59.31	-19.27	QP
0.336	18.53	0.38	0.10	19.01	49.31	-30.30	Average
0.452	35.64	0.33	0.11	36.08	56.85	-20.77	QP
0.452	18.33	0.33	0.11	18.77	46.85	-28.08	Average
7.252	37.33	0.20	0.19	37.72	60.00	-22.28	QP
7.252	27.67	0.20	0.19	28.06	50.00	-21.94	Average
16.055	36.60	0.22	0.21	37.03	60.00	-22.97	QP
16.055	27.27	0.22	0.21	27.70	50.00	-22.30	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. GTS201801000118F01

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