

FCC Report

Applicant: Mitac International Corporation

Address of Applicant: Building B, No.209, Sec.1, Nan Gang Rd., Nan Gang Taipei,
11568 Taiwan

Equipment Under Test (EUT)

Product Name: GPS Portable Navigation Device

Model No.: N509M-7000

Trade Mark: Magellan

FCC ID: P4Q-N509M

Applicable standards: FCC CFR Title 47 Part 15 Subpart B:2014

Date of sample receipt: January 07, 2016

Date of Test: January 07-11, 2016

Date of report issue: January 11, 2016

Test Result : PASS *

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

Authorized Signature:

A circular logo for GTS (Global United Technology Services Co., Ltd.) is visible. The logo contains the text "GTS" in the center, "GLOBAL TESTING" below it, and "GLOBAL UNITED TECHNOLOGY SERVICES CO., LTD." around the perimeter. A handwritten signature, presumably of Robinson Lo, is written over the logo.

Robinson Lo

Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of GTS or testing done by GTS in connection with, distribution or use of the product described in this report must be approved by GTS in writing.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

2 Version

Version No.	Date	Description
00	January 11, 2016	Original

Prepared By:

Edward. Pan

Date:

January 11, 2016

Project Engineer

Check By:

Hank. Yan

Date:

January 11, 2016

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 complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

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

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

Remark: Test according to ANSI C63.4:2009

5 General Information

5.1 Client Information

Applicant:	Mitac International Corporation
Address of Applicant:	Building B, No.209, Sec.1, Nan Gang Rd., Nan Gang Taipei, 11568 Taiwan
Manufacturer:	Dongguan Yuanfeng Technology Co., Ltd.
Address of Manufacturer:	No. 18, Industrial East Road, Songshan Lake Hi-Tech Industrial Development Zone, Dongguan, Guangdong, 523808, China

5.2 General Description of EUT

Product Name:	GPS Portable Navigation Device
Model No.:	N509M-7000
Power Supply:	Car Charger: Model No.: YLS-DC40V Input: DC12V-30V Output: DC5V-1500mA Or DC 3.7V, 1500mAh Li-ion Battery

5.3 Test mode

Test mode:	
PC mode	Keep the EUT in PC mode
TF Card Playing mode	Keep the EUT in TF Card Playing mode

5.4 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 28, 2013.

- **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, June 26, 2013.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Room 301-309, 3th Floor, Block A, Huafeng Jinyuan Business Building, No. 300 Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China

Tel: 0755-27798480

Fax: 0755-27798960

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval
Apple	PC	A1278	C1MN99ERDTY3	DoC
DELTA	ADAPTER	ADP-60ADT	N/A	Verification
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC

5.7 Deviation from Standards

Biconical, log.per. antenna and horn antenna were used instead of dipole antenna. Semi-anechoic Chamber was used as alternation of open air test sites, and all test suites were performed with radiated method in it.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

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	Mar. 27 2015	Mar. 26 2016
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 30 2015	June 29 2016
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June 30 2015	June 29 2016
5	Double -ridged waveguide horn	SCHWARZBECK	9120D	GTS208	June 26 2015	June 25 2016
6	RF Amplifier	HP	8347A	GTS204	June 30 2015	June 29 2016
7	Preamplifier	HP	8349B	GTS206	June 30 2015	June 29 2016
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	Mar. 28 2015	Mar. 27 2016
10	Coaxial Cable	GTS	N/A	GTS211	Mar. 28 2015	Mar. 27 2016

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	7.0(L)x3.0(W)x3.0(H)	GTS264	June 30 2015	June 29 2016
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	June 30 2015	June 29 2016
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	June 30 2015	June 29 2016
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 30 2015	June 29 2016
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	June 30 2015	June 29 2016
6	Coaxial Cable	GTS	N/A	GTS227	June 30 2015	June 29 2016
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	ChangChun	DYM3	GTS257	July 07 2015	July 06 2016

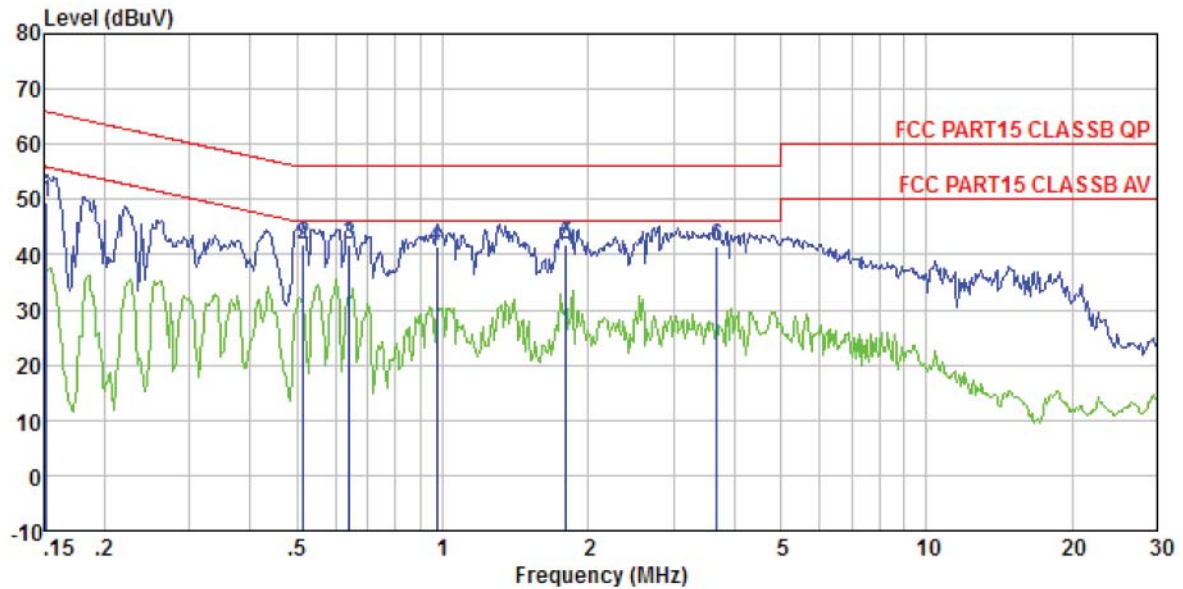
7 Test Results and Measurement Data

7.1 Conducted Emissions

Test Requirement:	FCC Part15 B Section 15.107																
Test Method:	ANSI C63.4:2009																
Test Frequency Range:	150KHz to 30MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto																
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><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></table> * Decreases with the logarithm of the frequency.			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:	Reference Plane <i>Remark: E.U.T.: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i>																
Test procedure:	1. The E.U.T is 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: 2009 on conducted measurement.																
Test Instruments:	Refer to section 6 for details																
Test mode:	Refer to section 5.3 for details																
Test results:	Pass																

Measurement Data

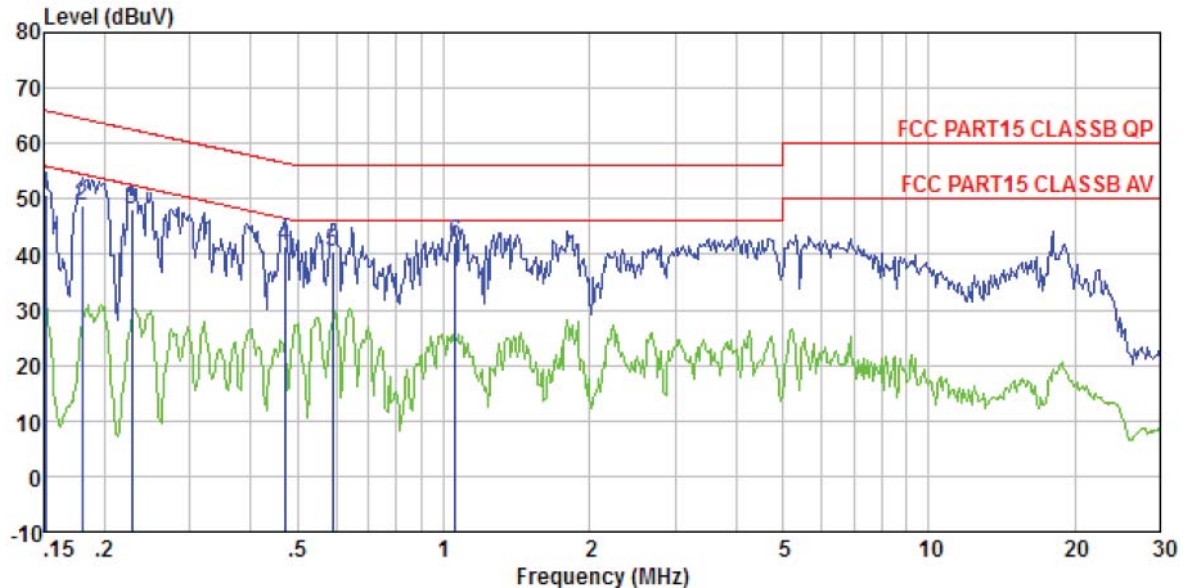
Line:



Site : Shielded room
 Condition : FCC PART15 CLASSB QP LISN-2013 LINE
 Job No. : 0007
 Test mode : PC mode
 Test Engineer: Arslan

		Read		LISN	Cable	Limit	Over	
	Freq	Level	Level	Factor	Loss	Line	Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.152	49.26	49.53	0.15	0.12	65.91	-16.38	QP
2	0.516	41.50	41.73	0.12	0.11	56.00	-14.27	QP
3	0.641	41.40	41.66	0.13	0.13	56.00	-14.34	QP
4	0.974	41.10	41.37	0.14	0.13	56.00	-14.63	QP
5	1.800	41.38	41.64	0.12	0.14	56.00	-14.36	QP
6	3.681	40.99	41.33	0.19	0.15	56.00	-14.67	QP

Neutral:



Site : Shielded room
 Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
 Job No. : 0007
 Test mode : PC mode
 Test Engineer: Arslan

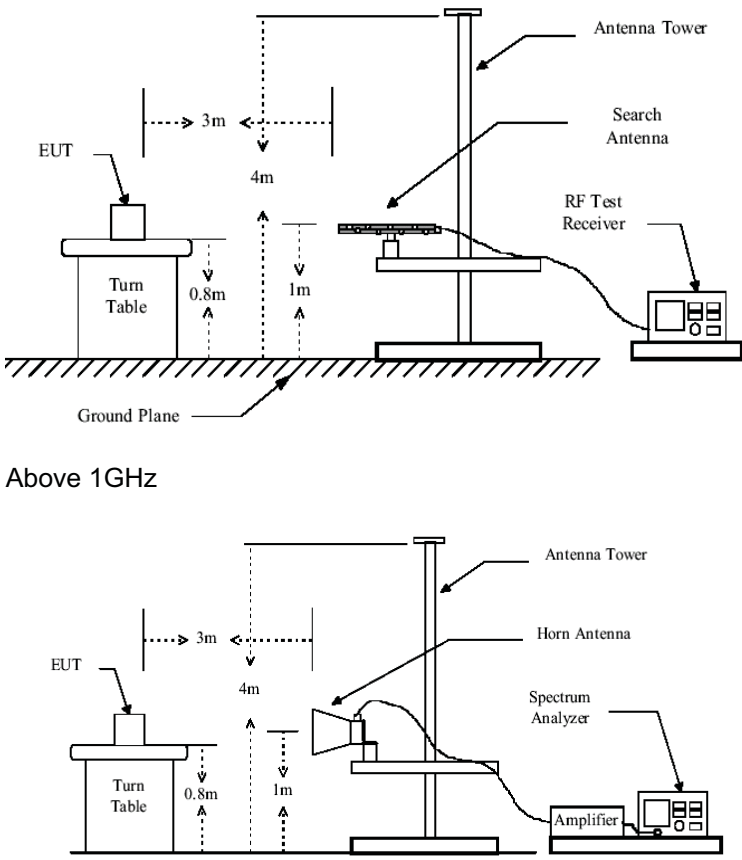
	Read	LISN	Cable	Limit	Over	
Freq	Level	Level	Loss	Line	Limit	Remark
MHz	dBuV	dBuV	dB	dB	dB	
1	0.151	50.44	50.63	0.07	0.12	65.96 -15.33 QP
2	0.180	48.72	48.92	0.07	0.13	64.50 -15.58 QP
3	0.228	47.94	48.12	0.06	0.12	62.52 -14.40 QP
4	0.471	41.15	41.32	0.06	0.11	56.49 -15.17 QP
5	0.592	40.24	40.43	0.07	0.12	56.00 -15.57 QP
6	1.054	41.83	42.03	0.07	0.13	56.00 -13.97 QP

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
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.2 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109																																					
Test Method:	ANSI C63.4:2009																																					
Test Frequency Range:	30MHz to 6GHz																																					
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																																					
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr></table>					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														
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Limit:	<table><tr><td colspan="2">Frequency</td><td>Limit (dBuV/m @3m)</td><td colspan="2">Remark</td></tr><tr><td colspan="2">30MHz-88MHz</td><td>40.00</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2">88MHz-216MHz</td><td>43.50</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2">216MHz-960MHz</td><td>46.00</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2">960MHz-1GHz</td><td>54.00</td><td colspan="2">Quasi-peak Value</td></tr><tr><td colspan="2" rowspan="2">Above 1GHz</td><td>54.00</td><td colspan="2">Average Value</td></tr><tr><td>74.00</td><td colspan="2">Peak Value</td></tr></table>					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	
Frequency		Limit (dBuV/m @3m)	Remark																																			
30MHz-88MHz		40.00	Quasi-peak Value																																			
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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 Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. 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 rota 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.																																					
Test setup:	Below 1GHz																																					

	 Above 1GHz
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details. All of the listed mode were tested and found the "PC mode" is the worst case. Only the data of worst case is reported.
Test results:	Pass

Note:

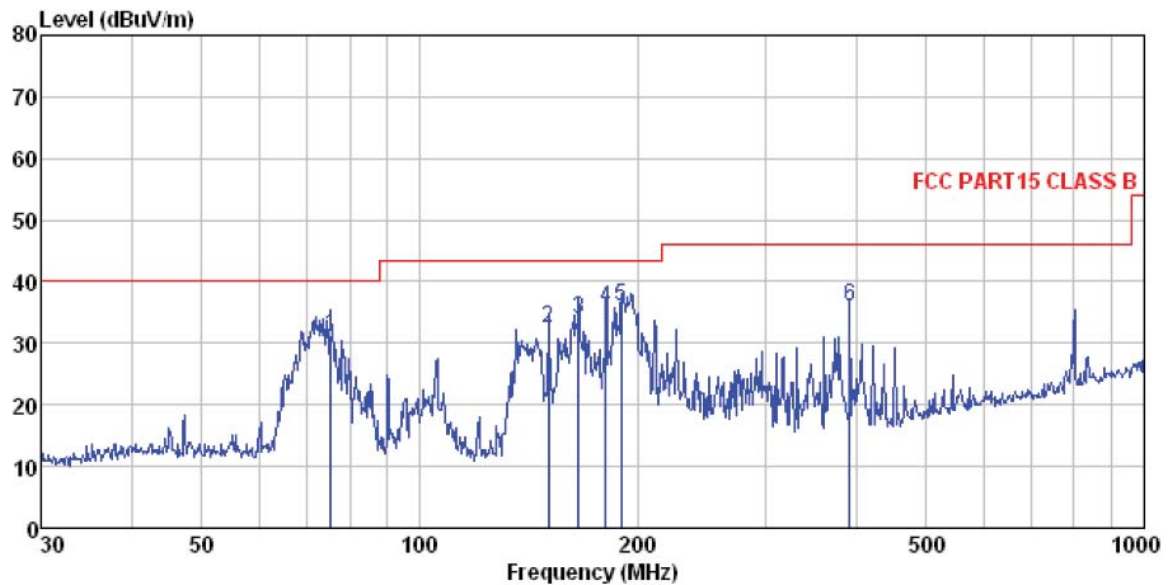
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

Measurement Data

Below 1GHz

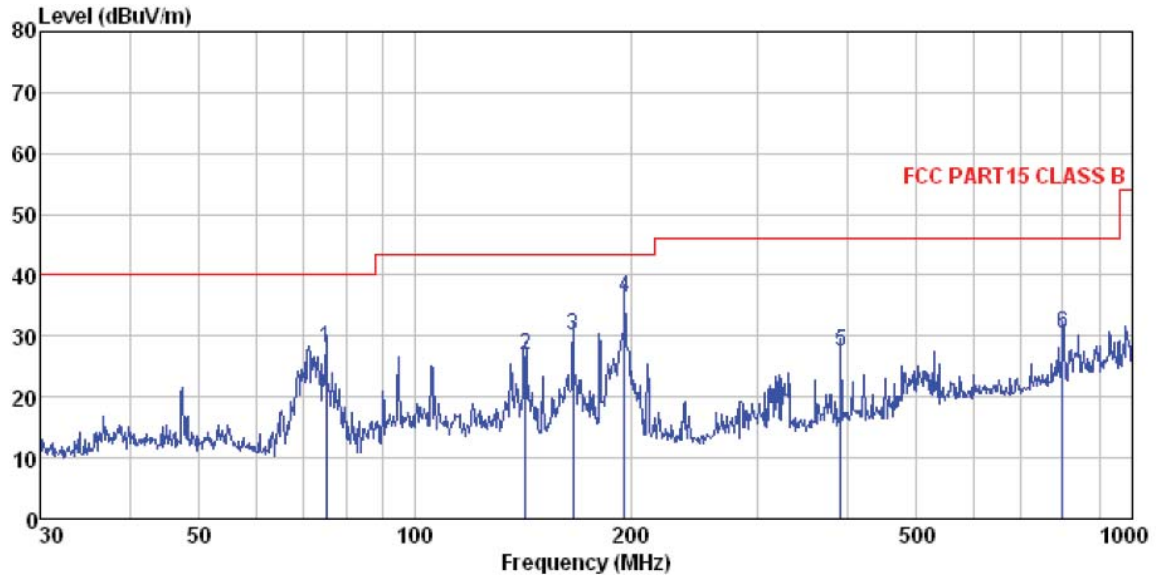
Horizontal:



Condition : FCC PART15 CLASS B VULB9163-2013M HORIZONTAL
 Job No. : 0007RF
 Test Mode : PC mode
 Test Engineer: Rong

	ReadAntenna	Cable Preamp		Limit	Over	
Freq	Level Factor	Loss Factor	Level	Line	Limit	Remark
-----MHz-----	-----dBuV-----	-----dB/m-----	-----dB-----	-----dB-----	-----dB-----	-----
1	75.446	50.28	9.91	0.99	29.82	31.36 40.00 -8.64 QP
2	150.538	50.09	10.29	1.57	29.41	32.54 43.50 -10.96 QP
3	165.487	50.94	10.82	1.66	29.34	34.08 43.50 -9.42 QP
4	180.649	51.36	11.76	1.74	29.27	35.59 43.50 -7.91 QP
5	189.739	51.13	12.48	1.79	29.24	36.16 43.50 -7.34 QP
6	392.095	45.86	16.87	2.82	29.54	36.01 46.00 -9.99 QP

Vertical:

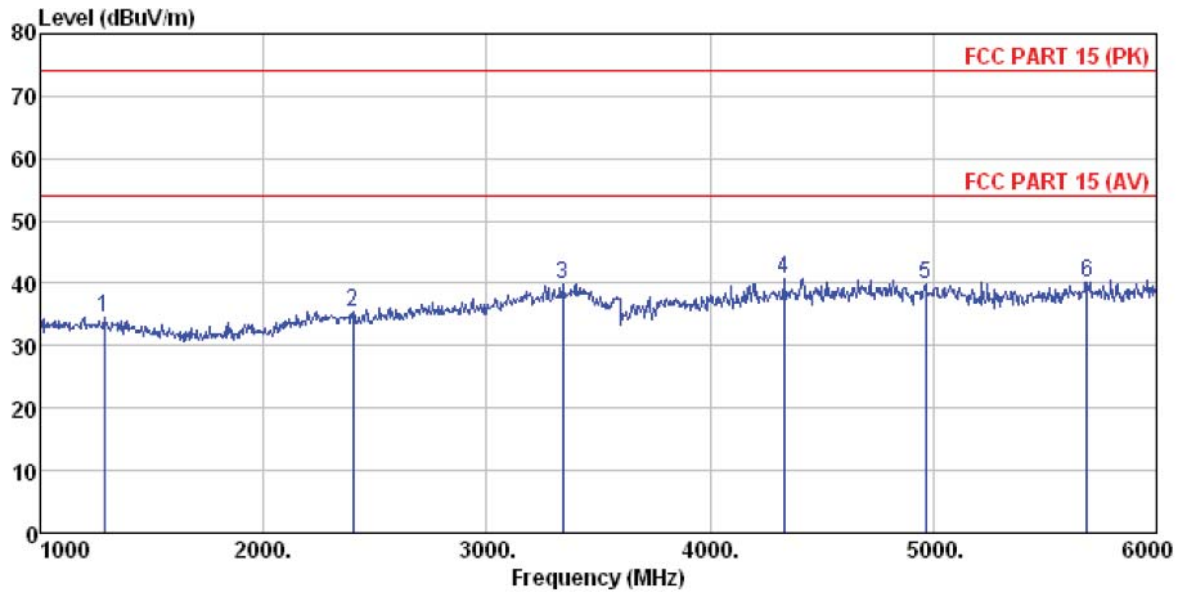


Condition : FCC PART15 CLASS B VULB9163-2013M VERTICAL
 Job No. : 0007RF
 Test Mode : PC mode
 Test Engineer: Rong

	Freq	ReadAntenna	Cable Preamp		Limit	Over		
	MHz	Level	Factor	Loss Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	75.182	47.03	9.86	0.99	29.82	28.06	40.00	-11.94 QP
2	142.324	44.54	10.21	1.52	29.44	26.83	43.50	-16.67 QP
3	166.068	46.92	10.85	1.66	29.33	30.10	43.50	-13.40 QP
4	195.822	51.17	12.57	1.82	29.21	36.35	43.50	-7.15 QP
5	392.095	37.28	16.87	2.82	29.54	27.43	46.00	-18.57 QP
6	798.980	33.06	22.06	4.45	29.20	30.37	46.00	-15.63 QP

Above 1GHz

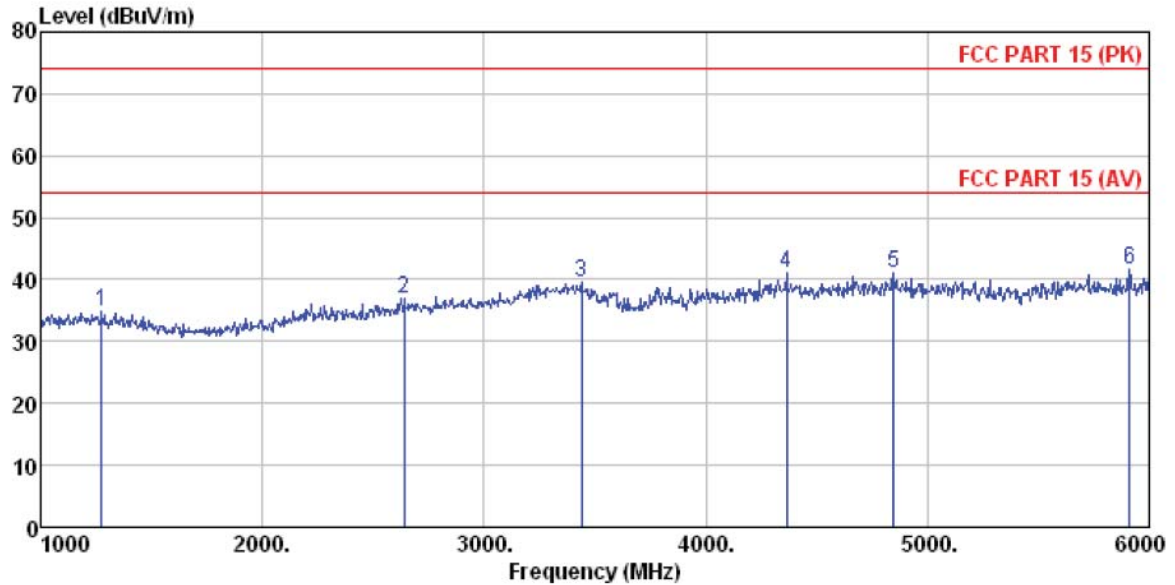
Horizontal:



Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) HORIZONTAL
 Job No. : 0007RF
 Test Mode : PC mode
 Test Engineer: Rong

	Freq	ReadAntenna	Cable Preamp		Limit	Over	
		Level Factor	Loss Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	1285.000	37.72	25.60	4.53	33.24	34.61	74.00 -39.39 Peak
2	2400.000	36.59	27.58	5.39	34.01	35.55	74.00 -38.45 Peak
3	3340.000	37.69	28.43	6.64	32.93	39.83	74.00 -34.17 Peak
4	4330.000	33.45	30.83	8.18	31.86	40.60	74.00 -33.40 Peak
5	4965.000	31.41	31.93	8.73	32.16	39.91	74.00 -34.09 Peak
6	5690.000	30.32	32.47	9.79	32.31	40.27	74.00 -33.73 Peak

Vertical:

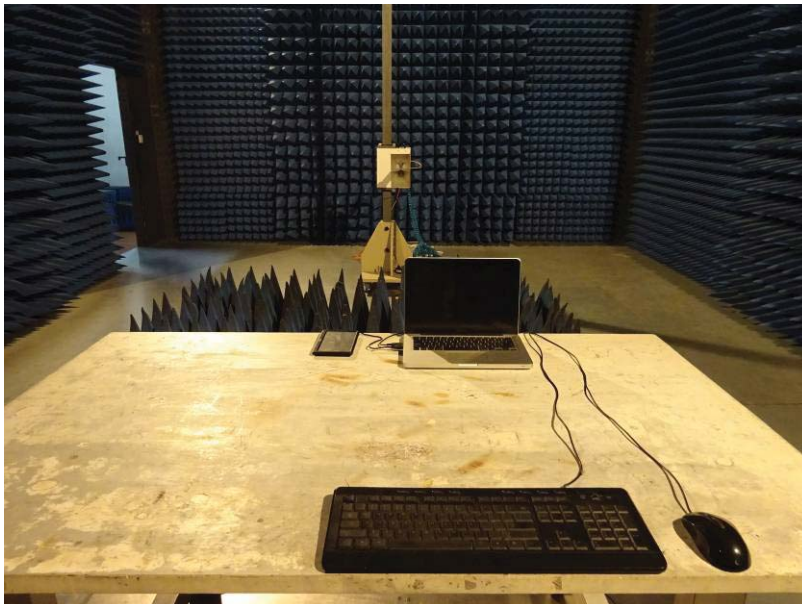
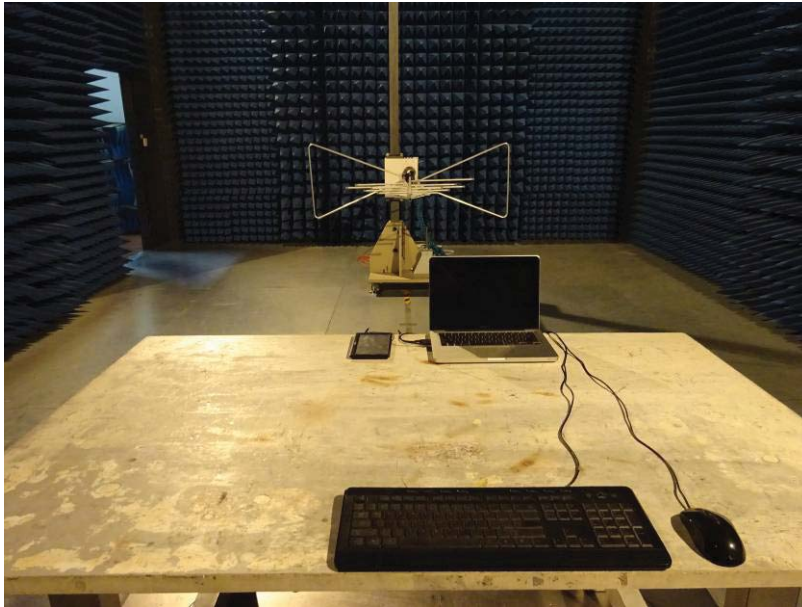


Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) VERTICAL
 Job No. : 0007RF
 Test Mode : PC mode
 Test Engineer: Rong

	Freq	ReadAntenna	Cable Preamp		Limit	Over	
	Level Factor	Loss Factor	Level	Line	Limit	Remark	
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	1275.000	37.95	25.58	4.52	33.21	34.84	74.00
2	2640.000	36.98	27.91	5.62	33.74	36.77	74.00
3	3440.000	36.66	28.76	6.84	32.81	39.45	74.00
4	4365.000	33.84	30.97	8.22	31.87	41.16	74.00
5	4845.000	32.81	31.82	8.63	32.11	41.15	74.00
6	5910.000	30.82	32.78	10.09	32.18	41.51	74.00

8 Test Setup Photo

Radiated Emission

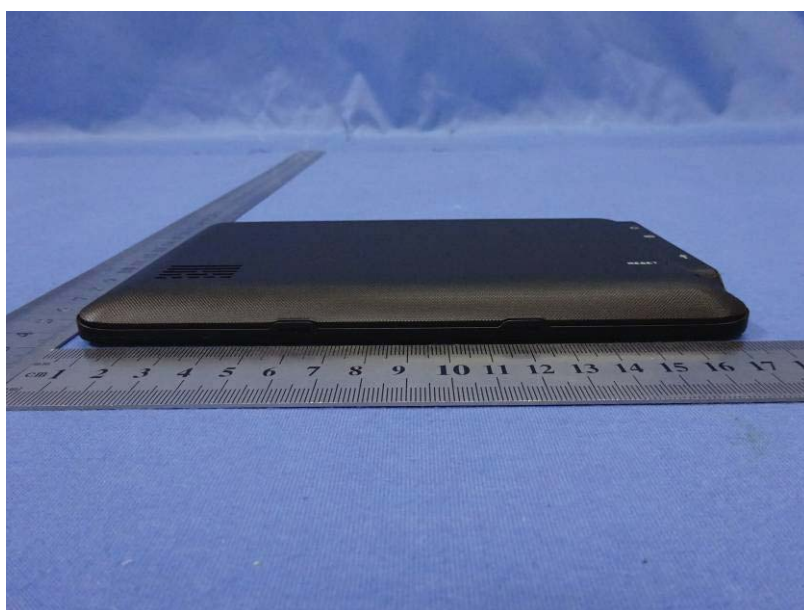


Conducted Emission



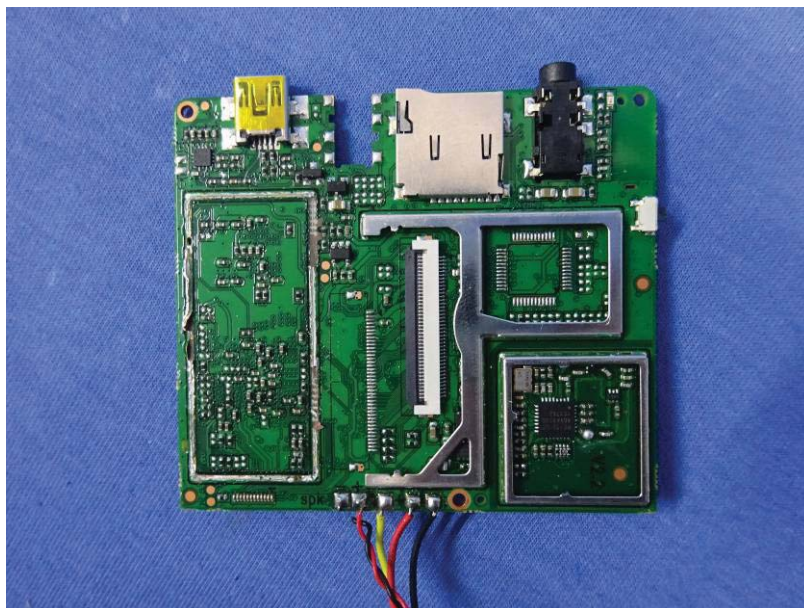
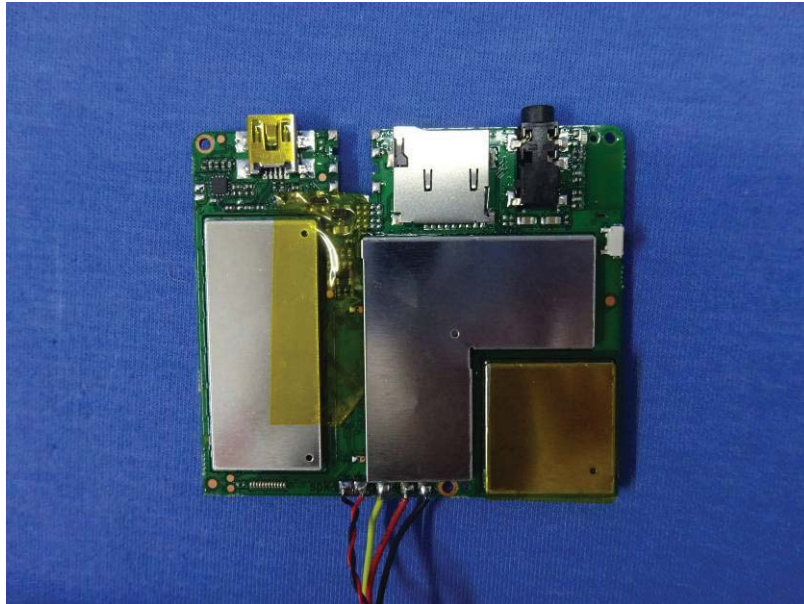
9 EUT Constructional Details

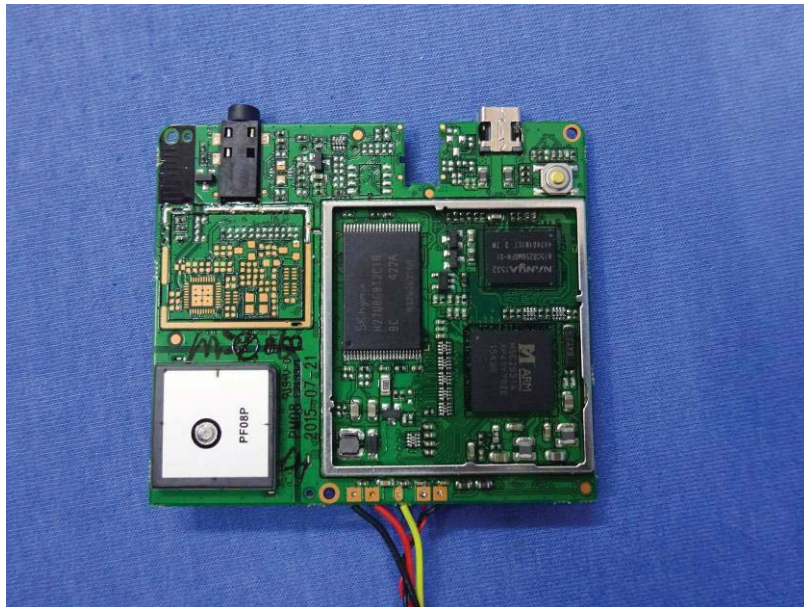


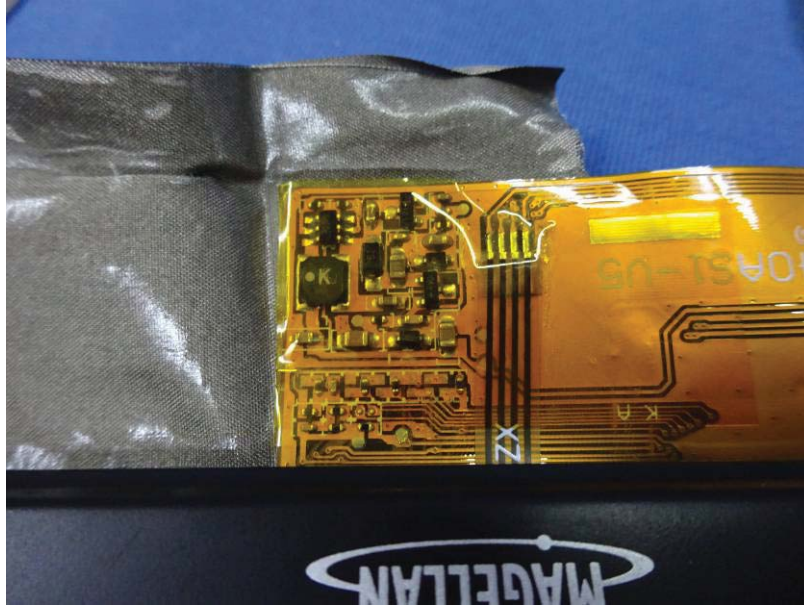












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