

TEST REPORT


Applicant: Dongguan Yuanfeng Technology Co., Ltd

Address of Applicant: No. 18, Industrial East Road, Songshan Lake Hi-Tech
Industrial Development Zone, Dongguan, Guangdong 523808,
China

Equipment Under Test (EUT)

Product Name: Intelligent Helmet

Model No.: HA002-001, HA01-001, HA06-001, HA08-001, HA09-001

Trade Mark: 

FCC ID: YNGHA01-001

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

Date of sample receipt: March 10, 2016

Date of Test: March 11-21 2016

Date of report issued: March 22, 2016

Test Result : Pass *

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

Authorized Signature:



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.

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2 Version

Version No.	Date	Description
00	March 22, 2016	Original

Prepared by:

Edward.Pan

Date:

March 22, 2016

Project Engineer

Reviewed by:

Hank.yan

Date:

March 22, 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 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	$\pm 4.34\text{dB}$	(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%.			

5 General Information

5.1 Client Information

Applicant:	Dongguan Yuanfeng Technology Co., Ltd
Address of Applicant:	No. 18, Industrial East Road, Songshan Lake Hi-Tech Industrial Development Zone, Dongguan, Guangdong 523808, China
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:	Intelligent Helmet
Model No.:	HA002-001, HA01-001, HA06-001, HA08-001, HA09-001
Power supply:	DC 5V Or DC 3.7V Li-ion Battery

5.3 Test mode and Test voltage

Test mode:	
Receiving mode	Keep the EUT in 433.92MHz receiver mode
Test voltage:	
AC 120V/60Hz	

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval
Emerson Network Power	USB Charger	A1299	N/A	VoC

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

None.

5.7 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.

5.8 Test Location

Tests were 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

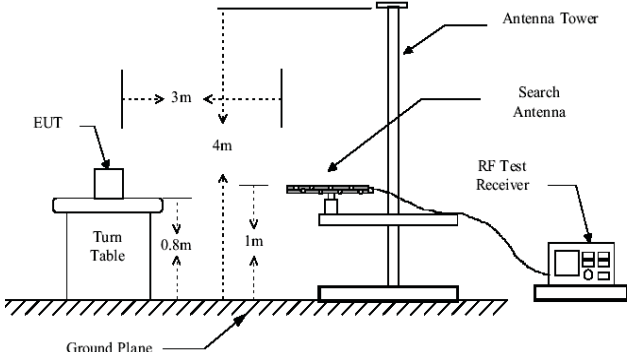
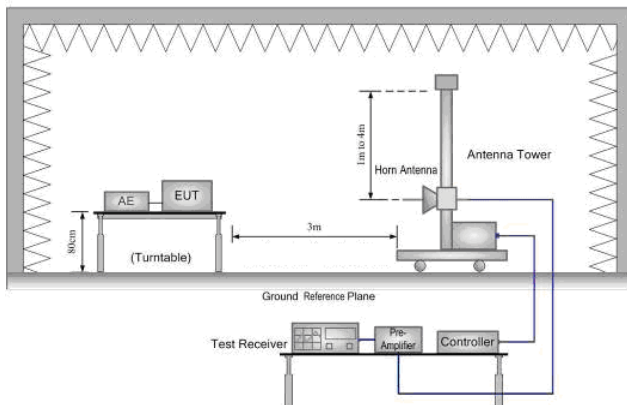
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	July. 03 2015	July. 02 2016
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	July. 06 2015	July. 05 2016
5	Double -ridged waveguide horn	SCHWARZBECK	9120D	GTS208	July. 06 2015	July. 05 2016
6	RF Amplifier	HP	8347A	GTS204	July. 03 2015	July. 02 2016
7	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	July. 03 2015	July. 02 2016
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	July. 05 2015	July. 04 2016
10	Coaxial Cable	GTS	N/A	GTS211	July. 05 2015	July. 04 2016
11	Thermo meter	N/A	N/A	GTS256	July. 06 2015	July. 05 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	7.3(L)x3.1(W)x2.9(H)	GTS252	May. 16 2014	May. 15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April. 29 2015	April. 29 2016
3	Pulse Limiter	R&S	ESH3-Z2	GTS224	July. 03 2015	July. 02 2016
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	July. 03 2015	July. 02 2016
5	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	July. 03 2015	July. 02 2016
6	Coaxial Cable	GTS	N/A	GTS227	Jul. 05 2015	Jul. 04 2016
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	GTS233	July. 07 2015	July. 06 2016

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	Jul. 07 2015	Jul. 06 2016

7 Test Results and Measurement Data

7.1 Radiated Emission

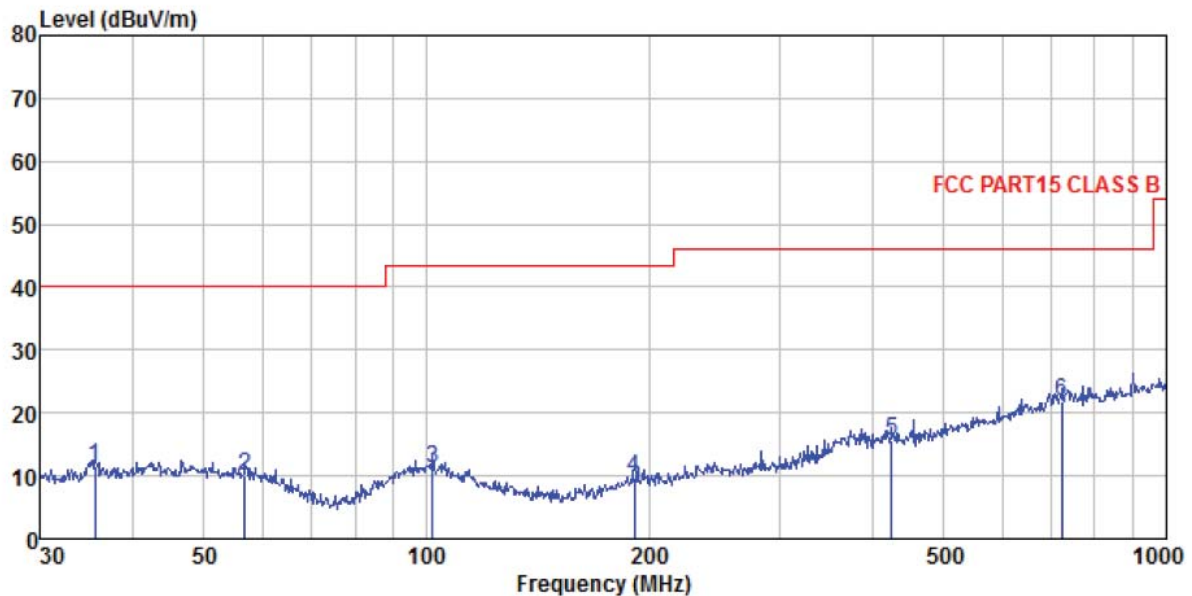
Test Requirement:	FCC Part15 B Section 15.109																								
Test Method:	ANSI C63.4:2014																								
Test Frequency Range:	30MHz to 2GHz																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Value</td></tr><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></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><tr><td>Frequency</td><td>Limit (dBμV/m @3m)</td><td>Value</td></tr><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></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:	<div>Below 1GHz</div> <div></div> <div>Above 1GHz</div> <div></div>																								

Test Procedure:	<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. 					
Test environment:	Temp.:	25 <input type="checkbox"/> C	Humid.:	52%	Press.:	1 012mbar
Measurement Record:	Uncertainty: $\pm 4.50\text{dB}$					
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

Measurement Data

Below 1GHz

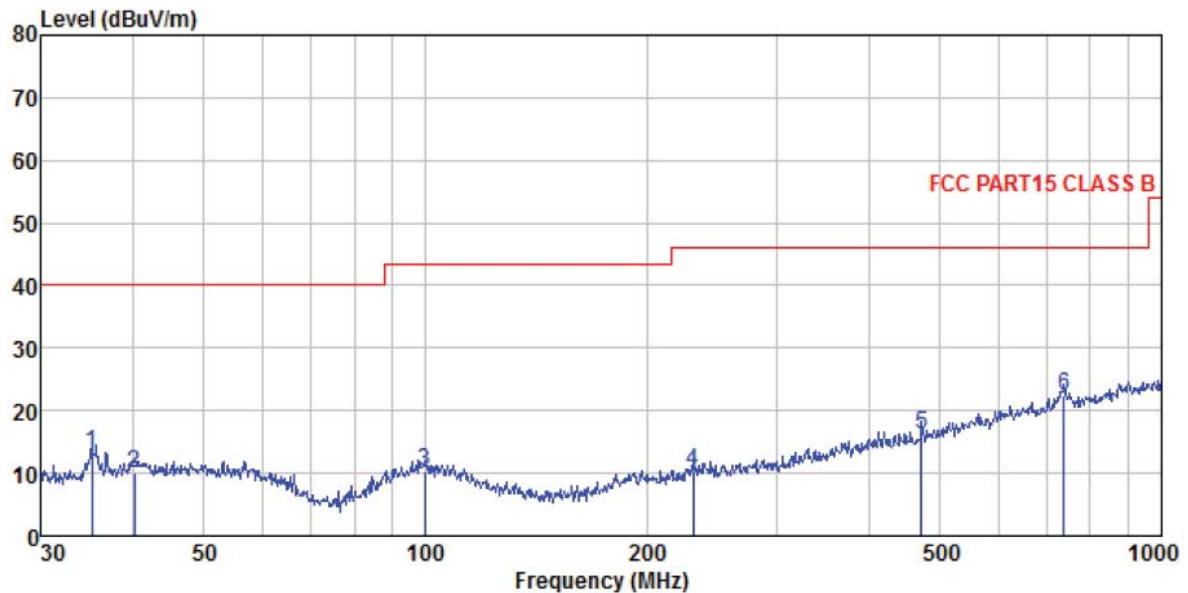
Test mode:	Receiving mode	Antenna Polarity:	Horizontal
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Condition : FCC PART15 CLASS B VULB9163-2013M HORIZONTAL
 Job No. : 0525
 Test Mode : Receiving mode
 Test Engineer: He

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	dBuV/m	dBuV/m	Limit	Remark
		dBuV	dB/m	dB	dB			dB	
1	35.624	26.52	14.49	0.62	30.07	11.56	40.00	-28.44	QP
2	56.792	24.12	14.89	0.83	29.94	9.90	40.00	-30.10	QP
3	102.001	24.83	14.97	1.21	29.69	11.32	43.50	-32.18	QP
4	191.074	24.75	12.56	1.80	29.23	9.88	43.50	-33.62	QP
5	425.028	24.70	17.49	2.97	29.45	15.71	46.00	-30.29	QP
6	721.726	25.82	21.10	4.17	29.20	21.89	46.00	-24.11	QP

Test mode:	Receiving mode	Antenna Polarity:	Vertical
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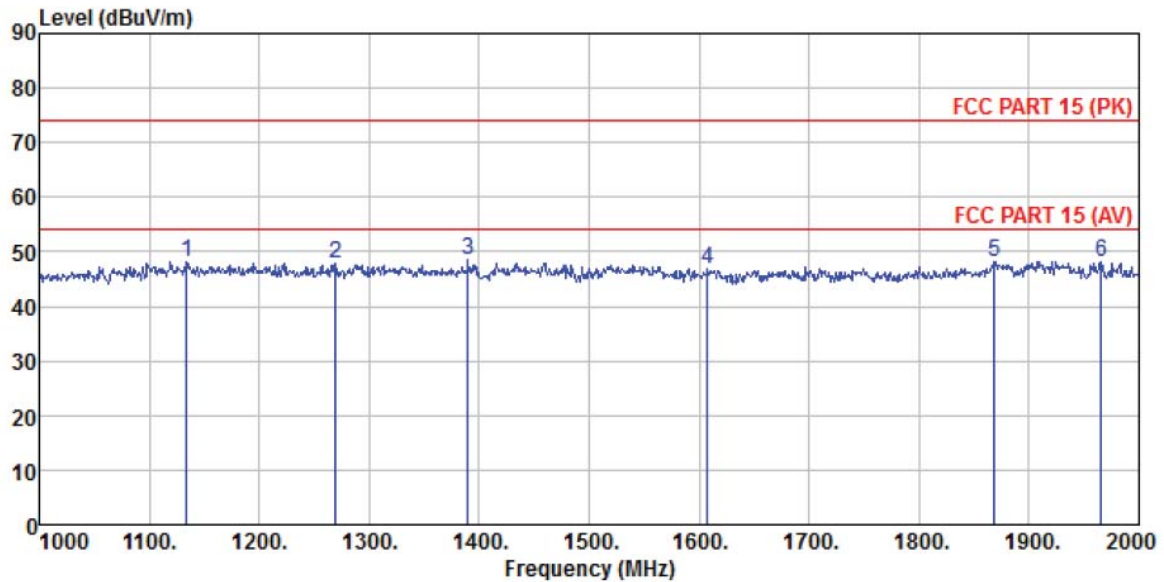


Condition : FCC PART15 CLASS B VULB9163-2013M VERTICAL
 Job No. : 0525
 Test Mode : Receiving mode
 Test Engineer: He

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	35.251	28.44	14.39	0.61	30.07	13.37	40.00	-26.63	QP
2	40.276	23.95	15.58	0.66	30.04	10.15	40.00	-29.85	QP
3	99.878	23.55	15.16	1.19	29.70	10.20	43.50	-33.30	QP
4	230.907	24.04	13.67	2.02	29.48	10.25	46.00	-35.75	QP
5	472.176	24.62	17.89	3.19	29.35	16.35	46.00	-29.65	QP
6	737.071	26.00	21.29	4.23	29.20	22.32	46.00	-23.68	QP

Above 1GHz

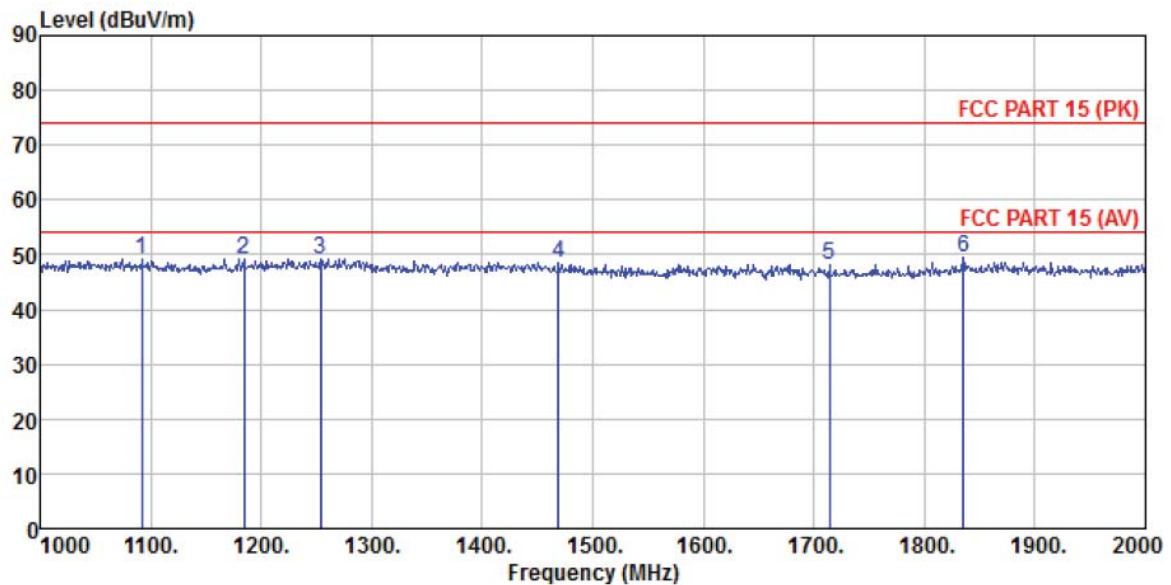
Test mode:	Receiving mode	Antenna Polarity:	Horizontal
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Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) HORIZONTAL
 Job No. : 0525
 Test Mode : Receiving mode
 Test Engineer: He

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Limit Level	Over Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1134.000	51.86	24.91	4.41	32.98	48.20	74.0		Peak
2	1269.000	50.87	25.57	4.52	33.21	47.75	74.0		Peak
3	1390.000	51.66	25.60	4.61	33.42	48.45	74.0		Peak
4	1608.000	50.74	24.96	4.75	33.79	46.66	74.0		Peak
5	1868.000	51.94	25.58	4.89	34.23	48.18	74.0		Peak
6	1966.000	51.71	25.99	4.94	34.40	48.24	74.0		Peak

Test mode:	Receiving mode	Antenna Polarity:	Vertical
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Condition : FCC PART 15 (PK) BBHA9120D ANT(>1GHZ) HORIZONTAL
 Job No. : 0525
 Test Mode : Receiving mode
 Test Engineer: He

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1092.000	52.91	24.74	4.37	32.89	49.13	74.00	-24.87	Peak
2	1184.000	52.54	25.27	4.45	33.07	49.19	74.00	-24.81	Peak
3	1254.000	52.41	25.54	4.51	33.18	49.28	74.00	-24.72	Peak
4	1469.000	52.25	25.29	4.66	33.56	48.64	74.00	-25.36	Peak
5	1714.000	52.41	25.00	4.81	33.97	48.25	74.00	-25.75	Peak
6	1835.000	53.38	25.45	4.88	34.17	49.54	74.00	-24.46	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:

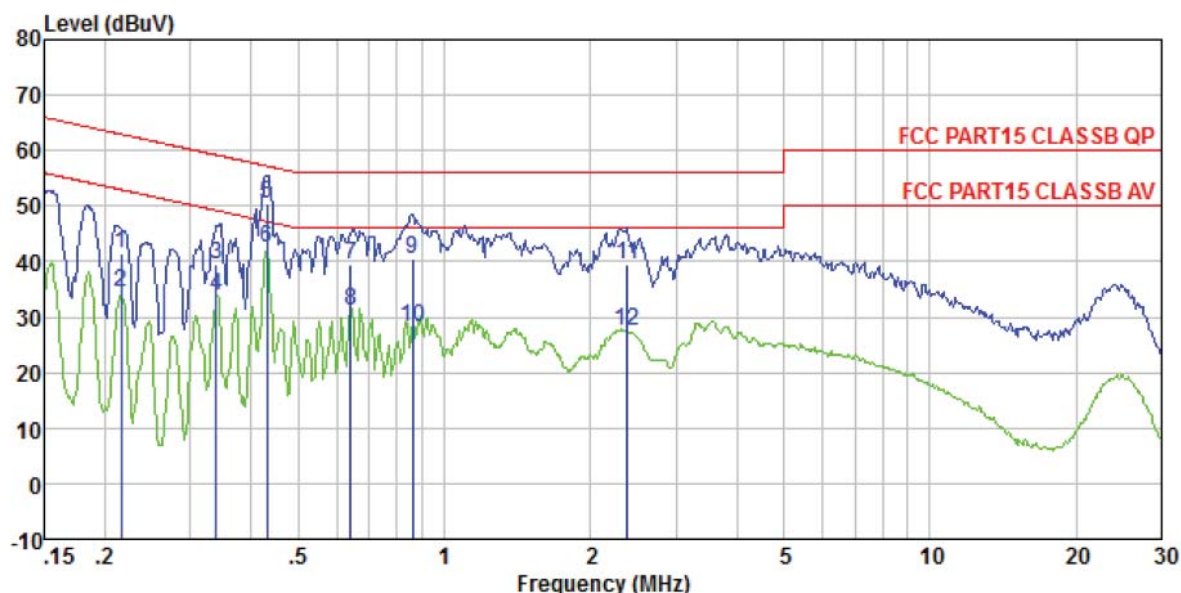
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

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:	Frequency range (MHz)		Limit (dBμV)			
			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:	<div><p style="text-align: center;">Reference Plane</p><p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>					
Test procedure	<div><div>1.</div><div>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.</div></div> <div><div>2.</div><div>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).</div></div> <div><div>3.</div><div>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.</div></div>					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

Measurement Data

Test mode:	receiving mode	Phase Polarity:	Line
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Condition : FCC PART15 CLASSB QP LISN-2013 LINE

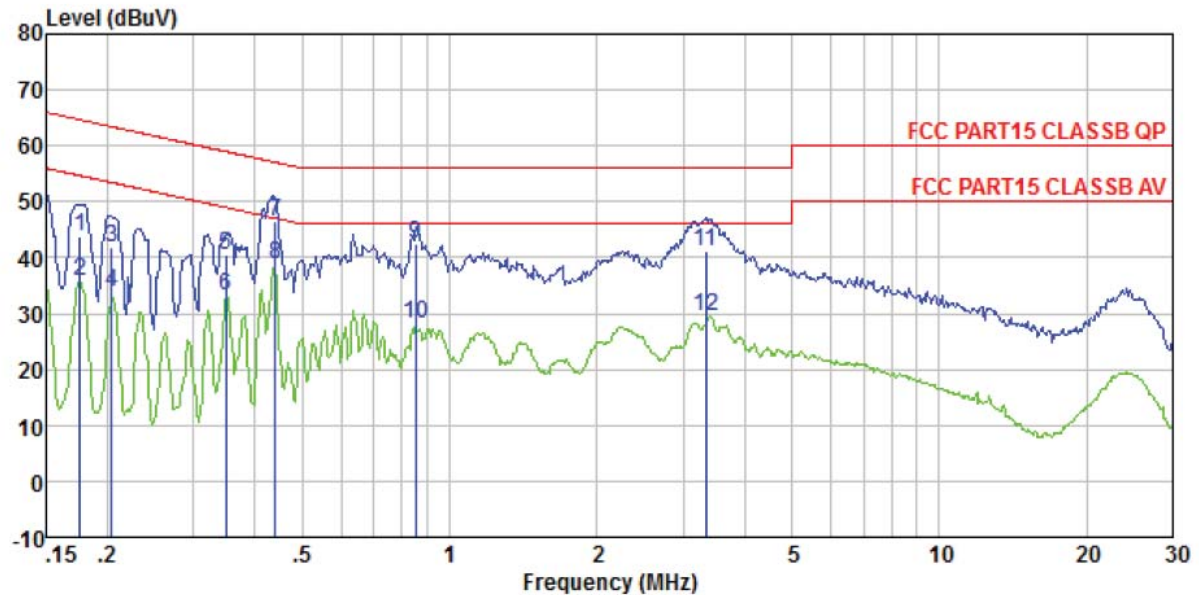
Job No. : 0221

Test mode : receiving mode

Test Engineer: Arslan

	Freq	Read Level	Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.216	41.10	0.26	0.13	41.36	62.96	-21.60	QP
2	0.216	34.12	0.26	0.13	34.38	52.96	-18.58	Average
3	0.339	39.20	0.21	0.10	39.41	59.22	-19.81	QP
4	0.339	33.61	0.21	0.10	33.82	49.22	-15.40	Average
5	0.431	50.24	0.23	0.11	50.47	57.24	-6.77	QP
6	0.431	42.37	0.23	0.11	42.60	47.24	-4.64	Average
7	0.641	39.34	0.26	0.13	39.60	56.00	-16.40	QP
8	0.641	30.82	0.26	0.13	31.08	46.00	-14.92	Average
9	0.862	40.28	0.27	0.13	40.55	56.00	-15.45	QP
10	0.862	27.84	0.27	0.13	28.11	46.00	-17.89	Average
11	2.384	39.17	0.28	0.15	39.45	56.00	-16.55	QP
12	2.384	27.10	0.28	0.15	27.38	46.00	-18.62	Average

Test mode:	receiving mode	Phase Polarity:	Neutral
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Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
 Job No. : 0221
 Test mode : receiving mode
 Test Engineer: Arslan

	Freq	Read	Factor	Cable	Level	Limit	Over	Remark
	MHz	Level		Loss		Line	Limit	
		dBuV	dB	dB	dBuV	dBuV	dB	
1	0.176	43.56	0.20	0.13	43.76	64.68	-20.92	QP
2	0.176	35.62	0.20	0.13	35.82	54.68	-18.86	Average
3	0.204	41.74	0.20	0.13	41.94	63.45	-21.51	QP
4	0.204	33.70	0.20	0.13	33.90	53.45	-19.55	Average
5	0.350	40.37	0.16	0.10	40.53	58.96	-18.43	QP
6	0.350	33.05	0.16	0.10	33.21	48.96	-15.75	Average
7	0.440	46.42	0.17	0.11	46.59	57.07	-10.48	QP
8	0.440	38.50	0.17	0.11	38.67	47.07	-8.40	Average
9	0.853	42.11	0.20	0.13	42.31	56.00	-13.69	QP
10	0.853	27.88	0.20	0.13	28.08	46.00	-17.92	Average
11	3.328	40.76	0.28	0.15	41.04	56.00	-14.96	QP
12	3.328	29.10	0.28	0.15	29.38	46.00	-16.62	Average

Notes:

- The following Quasi-Peak and Average measurements were performed on the EUT:
- 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. GTS16000525E01

----End ----