

FCC Report

Applicant: Beat A/S

Address of Applicant: Klingseyvej 15B, 2720 Vanløse, Denmark

Equipment Under Test (EUT)

Product Name: Mini PC
Model No.: MIB X
Trade Mark: MIB by BEAT

FCC ID: 2AFGT-MIBX

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

Date of sample receipt: May 29, 2015

Date of Test: May 29-June 03, 2015

Date of report issue: July 21, 2015

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	July 21, 2015	Original

Tested By:



Date:

July 21, 2015

Project Engineer

Check By:



Date:

July 21, 2015

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%.

5 General Information

5.1 Client Information

Applicant:	Beat A/S
Address of Applicant:	Klingseyvej 15B, 2720 Vanløse, Denmark
Manufacturer:	SHENZHEN MELE STAR TECHNOLOGY LIMITED
Address of Manufacture:	3F,Bldg#1,28 Cuijing Road, Pingshan New District, Shenzhen, PR China.
Factory:	Shenzhen MeLE Precision Technology Limited
Address of Factory:	3F East,Bldg#1,28 Cuijing Road, Pingshan New District, Shenzhen, PR China.

5.2 General Description of EUT

Product Name:	Mini PC
Model No.:	MIB X
Power supply:	Adapter: Model No.: S12B22-120A100-04 Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 12.0V, 1A

5.3 Test mode

Test mode:	
SC Card Playing mode	Keep the EUT in SC Card Playing mode.
USB Playing mode	Keep the EUT in USB Playing mode.
Burning test mode	Keep the EUT in PC working mode.

Remark : Only worse case is reported

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.

Address: Room 301-309, 3th Floor, Block A, Huafeng Jinyuan Business Building, No. 300 Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
AOC	LCD TV	TFT24660AG	T49A5JA0006600 B9	DoC
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	July 01 2014	June 30 2015
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	July 01 2014	June 30 2015
5	Double -ridged waveguide horn	SCHWARZBECK	9120D	GTS208	June 27 2014	June 26 2015
6	RF Amplifier	HP	8347A	GTS204	July 01 2014	June 30 2015
7	Preamplifier	HP	8349B	GTS206	July 01 2014	June 30 2015
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	Sep. 07 2013	Sep. 06 2015
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	July 01 2014	June 30 2015
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	July 01 2014	June 30 2015
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	July 01 2014	June 30 2015
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	July 01 2014	June 30 2015
6	Coaxial Cable	GTS	N/A	GTS227	July 01 2014	June 30 2015
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 08 2014	July 07 2015

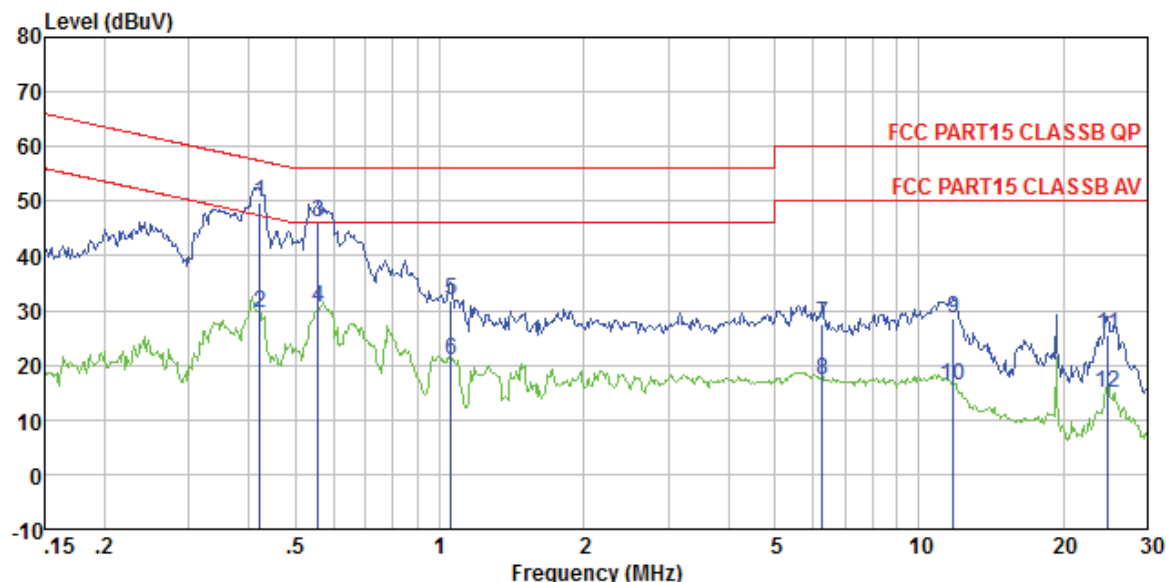
7 Test Results and Measurement Data

7.1 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><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 Test table/Insulation 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 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 5.3 for details														
Test results:	Pass														

Measurement Data

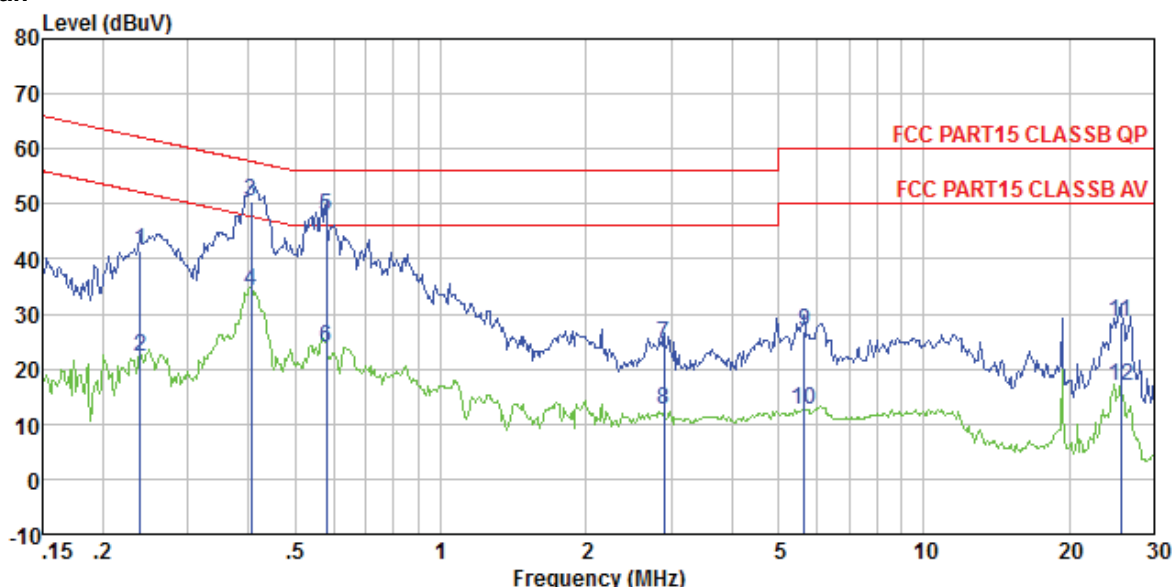
Line:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 LINE
Job No. : 0738RF
Test mode : Burning test mode
Test Engineer: Qing

	Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.421	49.53	0.11	0.12	49.76	57.42	-7.66	QP
2	0.421	29.27	0.11	0.12	29.50	47.42	-17.92	Average
3	0.558	45.98	0.12	0.13	46.23	56.00	-9.77	QP
4	0.558	30.40	0.12	0.13	30.65	46.00	-15.35	Average
5	1.054	31.65	0.13	0.14	31.92	56.00	-24.08	QP
6	1.054	20.75	0.13	0.14	21.02	46.00	-24.98	Average
7	6.285	27.15	0.16	0.23	27.54	60.00	-32.46	QP
8	6.285	16.76	0.16	0.23	17.15	50.00	-32.85	Average
9	11.807	27.98	0.20	0.36	28.54	60.00	-31.46	QP
10	11.807	15.56	0.20	0.36	16.12	50.00	-33.88	Average
11	24.790	24.12	0.23	1.12	25.47	60.00	-34.53	QP
12	24.790	13.53	0.23	1.12	14.88	50.00	-35.12	Average

Neutral:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
Job No. : 0738RF
Test mode : Burning test mode
Test Engineer: Qing

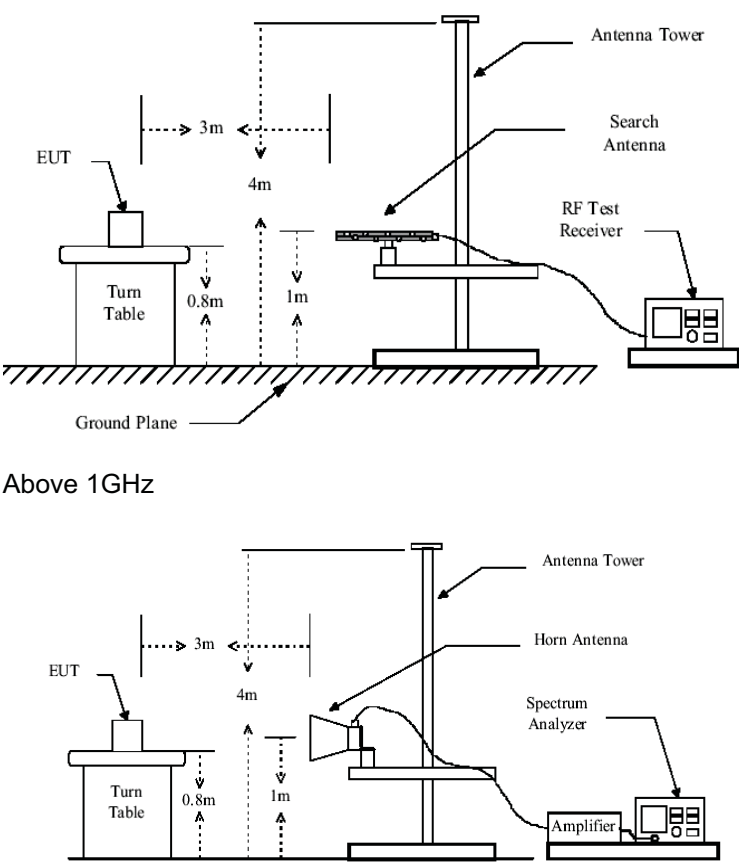
	Freq	Read Level	Cable Loss	LISN Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.239	41.21	0.12	0.06	41.39	62.13	-20.74	QP
2	0.239	22.13	0.12	0.06	22.31	52.13	-29.82	Average
3	0.406	50.21	0.11	0.06	50.38	57.73	-7.35	QP
4	0.406	34.13	0.11	0.06	34.30	47.73	-13.43	Average
5	0.579	47.64	0.12	0.07	47.83	56.00	-8.17	QP
6	0.579	23.54	0.12	0.07	23.73	46.00	-22.27	Average
7	2.900	24.12	0.15	0.11	24.38	56.00	-31.62	QP
8	2.900	12.21	0.15	0.11	12.47	46.00	-33.53	Average
9	5.653	26.64	0.15	0.16	26.95	60.00	-33.05	QP
10	5.653	12.43	0.15	0.16	12.74	50.00	-37.26	Average
11	25.591	27.41	0.23	1.02	28.66	60.00	-31.34	QP
12	25.591	15.55	0.23	1.02	16.80	50.00	-33.20	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
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 C63.4:2014																								
Test Frequency Range:	30MHz to 10GHz																								
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	
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:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr><tr><td>74.00</td><td>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																							
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 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:	Uncertainty: ± 4.5dB
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Note:

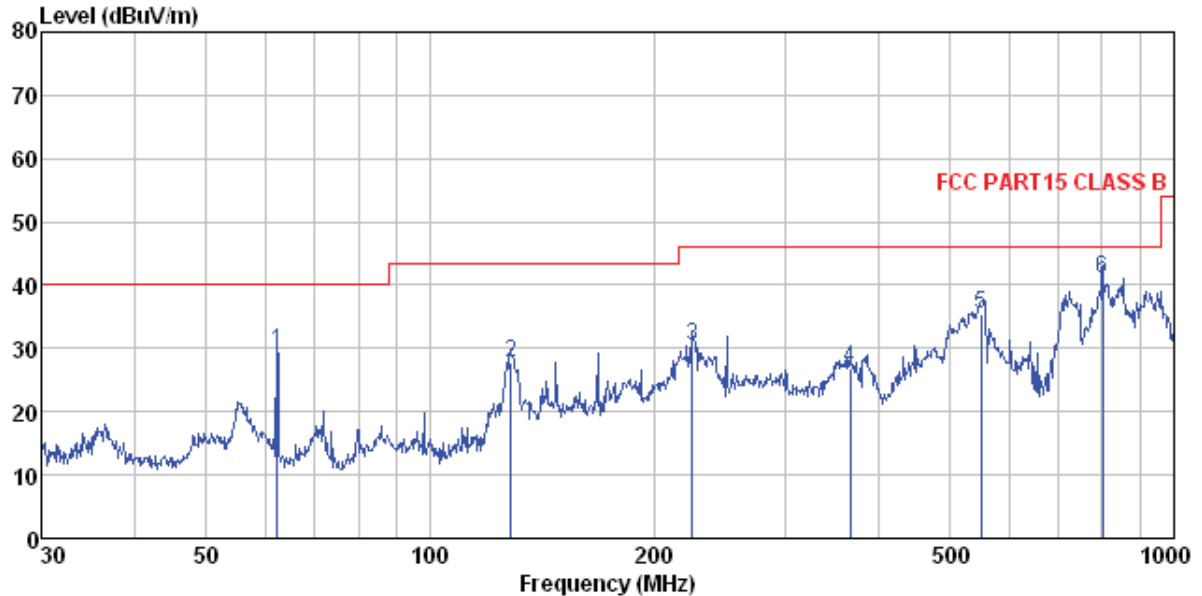
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

Measurement Data

Below 1GHz

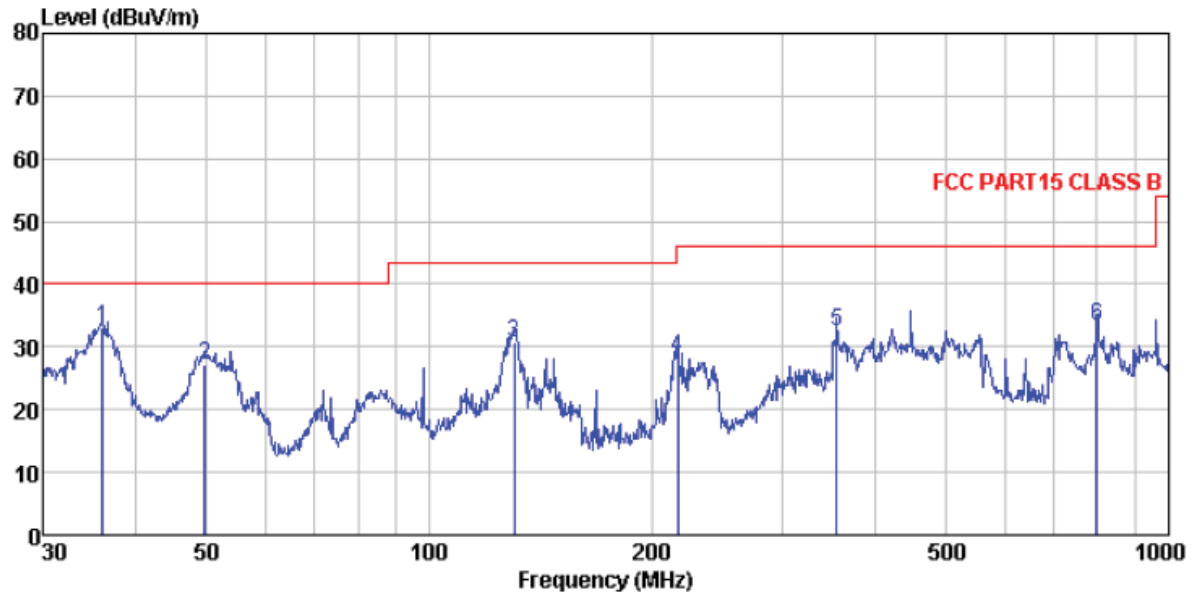
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163-2013M HORIZONTAL
 Job No. : 0738RF
 Test mode : Burning test mode
 Test Engineer: Chen

	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	62.213	44.84	13.77	0.88	29.91	29.58	40.00	-10.42 QP
2	128.563	44.65	11.12	1.43	29.52	27.68	43.50	-15.82 QP
3	225.308	44.50	13.41	1.99	29.44	30.46	46.00	-15.54 QP
4	366.823	37.37	16.48	2.70	29.65	26.90	46.00	-19.10 QP
5	550.948	41.74	19.57	3.53	29.30	35.54	46.00	-10.46 QP
6	801.786	43.85	22.06	4.46	29.20	41.17	46.00	-4.83 QP

Vertical:

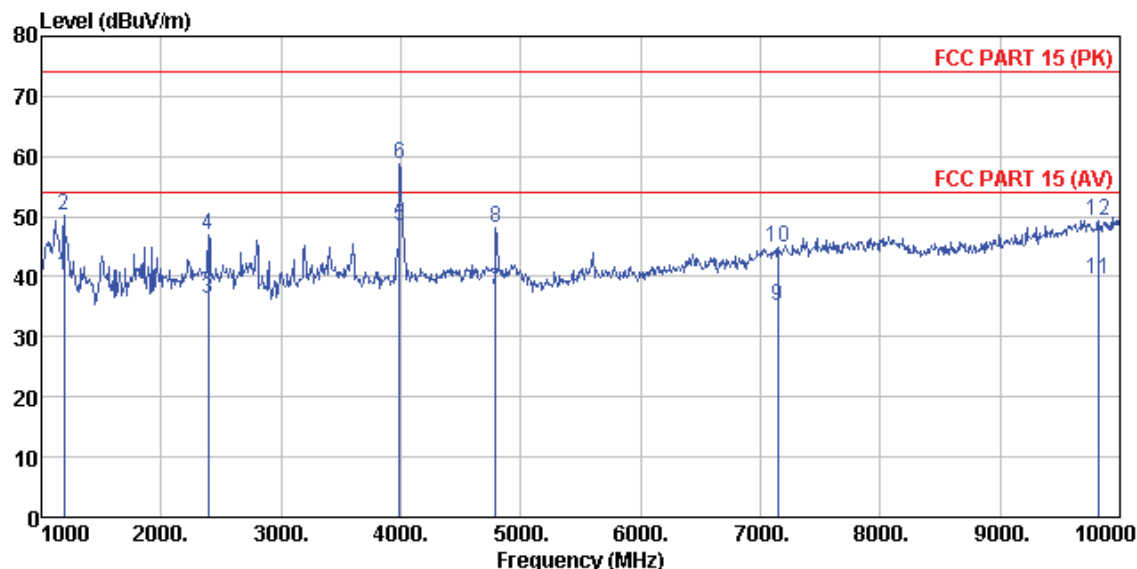


Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163-2013M VERTICAL
 Job No, : 0738RF
 Test mode : Burning test mode
 Test Engineer: Chen

	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	36.127	47.75	14.63	0.62	30.06	32.94	40.00 -7.06 QP
2	49.707	41.17	15.28	0.77	30.00	27.22	40.00 -12.78 QP
3	130.379	47.98	10.93	1.44	29.51	30.84	43.50 -12.66 QP
4	216.783	42.60	13.10	1.94	29.36	28.28	46.00 -17.72 QP
5	355.427	43.28	16.35	2.64	29.71	32.56	46.00 -13.44 QP
6	798.980	35.95	22.06	4.45	29.20	33.26	46.00 -12.74 QP

Above 1GHz

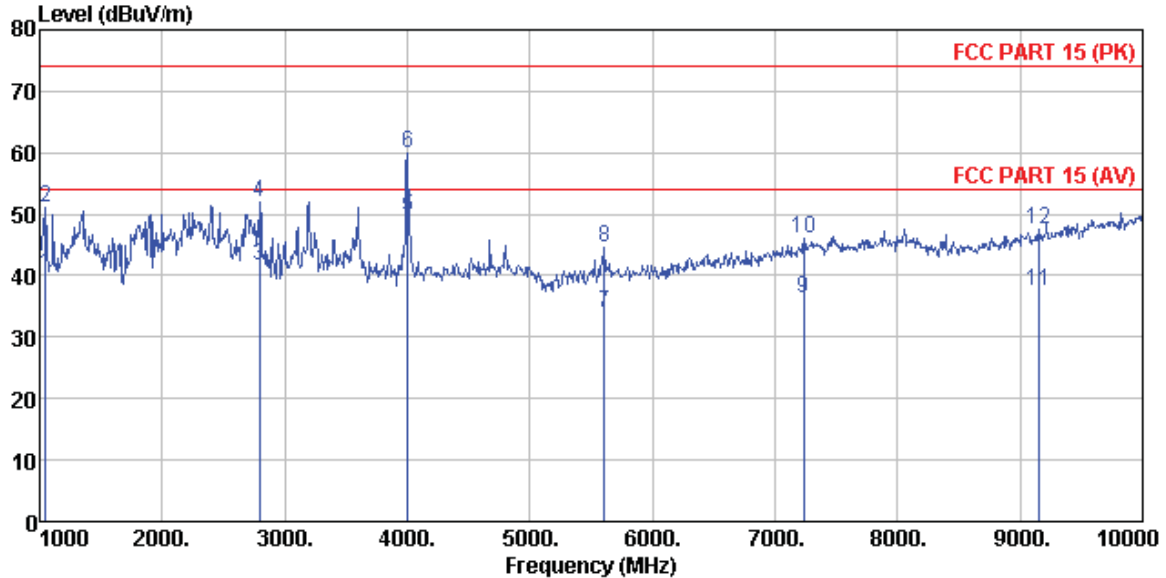
Horizontal:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) HORIZONTAL
 Job No. : 0738RF
 Test Mode : Burning test mode
 Test Engineer: Chen

	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	1189.000	43.54	25.29	4.46	33.07	40.22	54.00	-13.78	Average
2	1189.000	53.47	25.29	4.46	33.07	50.15	74.00	-23.85	Peak
3	2395.000	37.48	27.59	5.39	34.01	36.45	54.00	-17.55	Average
4	2395.000	47.93	27.59	5.39	34.01	46.90	74.00	-27.10	Peak
5	3988.000	43.15	29.66	7.85	32.19	48.47	54.00	-5.53	Average
6	3988.000	53.46	29.66	7.85	32.19	58.78	74.00	-15.22	Peak
7	4789.000	29.64	31.76	8.59	32.08	37.91	54.00	-16.09	Average
8	4789.000	39.86	31.76	8.59	32.08	48.13	74.00	-25.87	Peak
9	7147.000	19.44	35.99	11.62	32.05	35.00	54.00	-19.00	Average
10	7147.000	29.42	35.99	11.62	32.05	44.98	74.00	-29.02	Peak
11	9820.000	18.45	38.52	14.29	31.71	39.55	54.00	-14.45	Average
12	9820.000	28.32	38.52	14.29	31.71	49.42	74.00	-24.58	Peak

Vertical:

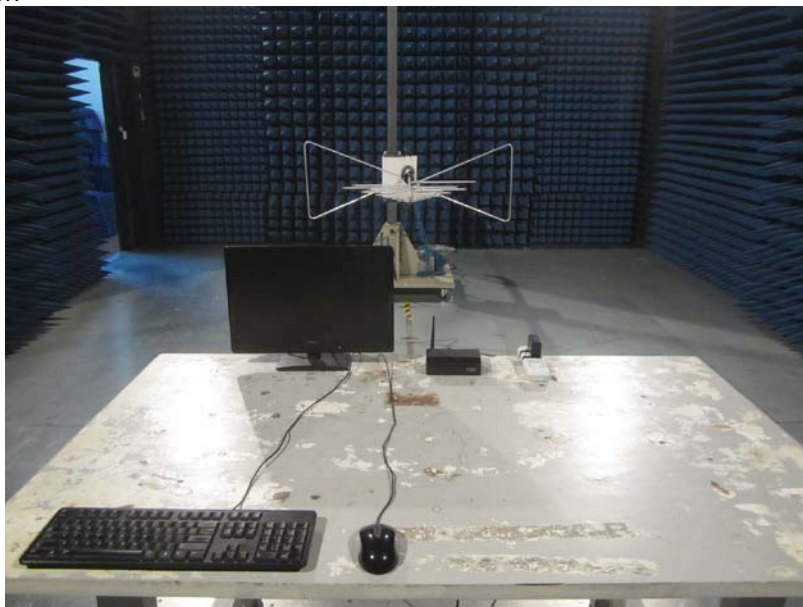


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) VERTICAL
 Job No. : 0738RF
 Test Mode : Burning test mode
 Test Engineer: Chen

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1045.000	44.06	24.61	4.33	32.84	40.16	54.00 -13.84 Average
2	1045.000	54.99	24.61	4.33	32.84	51.09	74.00 -22.91 Peak
3	2791.000	41.12	28.40	5.75	33.57	41.70	54.00 -12.30 Average
4	2791.000	51.49	28.40	5.75	33.57	52.07	74.00 -21.93 Peak
5	4006.000	44.12	29.71	7.87	32.17	49.53	54.00 -4.47 Average
6	4006.000	54.49	29.71	7.87	32.17	59.90	74.00 -14.10 Peak
7	5608.000	24.46	32.27	9.67	32.37	34.03	54.00 -19.97 Average
8	5608.000	34.95	32.27	9.67	32.37	44.52	74.00 -29.48 Peak
9	7237.000	20.45	36.19	11.68	31.97	36.35	54.00 -17.65 Average
10	7237.000	30.06	36.19	11.68	31.97	45.96	74.00 -28.04 Peak
11	9154.000	18.45	37.31	13.78	32.13	37.41	54.00 -16.59 Average
12	9154.000	28.43	37.31	13.78	32.13	47.39	74.00 -26.61 Peak

8 Test Setup Photo

Radiated Emission



Conducted Emission



9 EUT Constructional Details

Reference to the test report No. GTSE15070135501

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