

FCC Report

Applicant: TOEC TECHNOLOGY CO., LTD.

Address of Applicant: NO.6 Taishan Rd., Hexi District, Tianjin, China

Equipment Under Test (EUT)

Product Name: Portable Printer

Model No.: OEP103W

Trade mark: TOEC

FCC ID: Y9K-OEP103

Applicable standards: FCC CFR Title 47 Part 15 Subpart B:2015

Date of sample receipt: August 15, 2016

Date of Test: August 17-October 13, 2016

Date of report issue: October 14, 2016

Test Result : PASS *

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

Authorized Signature:

A circular blue stamp from GTS Global Testing Services Co., Ltd. is visible. The stamp contains the text "GTS", "GLOBAL TESTING", and "UNITED TECHNOLOGY SERVICES CO., LTD.". Overlaid on the stamp is a handwritten signature in black ink, which appears to be "Robinson Lo".

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	October 14, 2016	Original

Prepared By:

Edward. Pan

Date:

October 14, 2016

Project Engineer

Check By:

Andy. Wu

Date:

October 14, 2016

Reviewer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
4.1 MEASUREMENT UNCERTAINTY	4
5 GENERAL INFORMATION	5
5.1 CLIENT INFORMATION	5
5.2 GENERAL DESCRIPTION OF EUT	5
5.3 TEST MODE	5
5.4 TEST FACILITY	6
5.5 TEST LOCATION	6
5.6 DESCRIPTION OF SUPPORT UNITS	6
5.7 DEVIATION FROM STANDARDS	6
5.8 ABNORMALITIES FROM STANDARD CONDITIONS	6
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER	6
6 TEST INSTRUMENTS LIST	7
7 TEST RESULTS AND MEASUREMENT DATA	8
7.1 CONDUCTED EMISSIONS	8
7.2 RADIATED EMISSION	11
8 TEST SETUP PHOTO	17
9 EUT CONSTRUCTIONAL DETAILS	18

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.

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:	TOEC TECHNOLOGY CO., LTD.
Address of Applicant:	NO.6 Taishan Rd., Hexi District, Tianjin, China
Manufacturer/ Factory:	TOEC TECHNOLOGY CO., LTD.
Address of Manufacturer/ Factory:	NO.6 Taishan Rd., Hexi District, Tianjin, China

5.2 General Description of EUT

Product Name:	Portable Printer
Model No.:	OEP103W
Power Supply:	AC/DC Adapter Model No.: ZF120A-1406000 Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 14V, 6A

5.3 Test mode

Test mode:	
Print mode	Communicate with PC by USB port

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 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

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

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

5.6 Description of Support Units

Manufacturer	Description	Model	
Apple	PC	A1278	FCC DOC
DELL	KEYBOARD	SK-8115	FCC DOC
DELL	MOUSE	N/A	FCC 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	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 2016	June. 28 2017
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June. 29 2016	June. 28 2017
5	Double-ridged horn antenna	SCHWARZBECK	9120D	GTS208	June. 29 2016	June. 28 2017
6	RF Amplifier	HP	8347A	GTS204	June. 29 2016	June. 28 2017
7	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	June. 29 2016	June. 28 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS211	N/A	N/A
11	Thermo meter	N/A	N/A	GTS256	June. 29 2016	June. 28 2017

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 2016	June. 28 2017
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June. 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June. 28 2017
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 2016	June. 28 2017

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	Jun. 29 2016	Jun. 28 2017

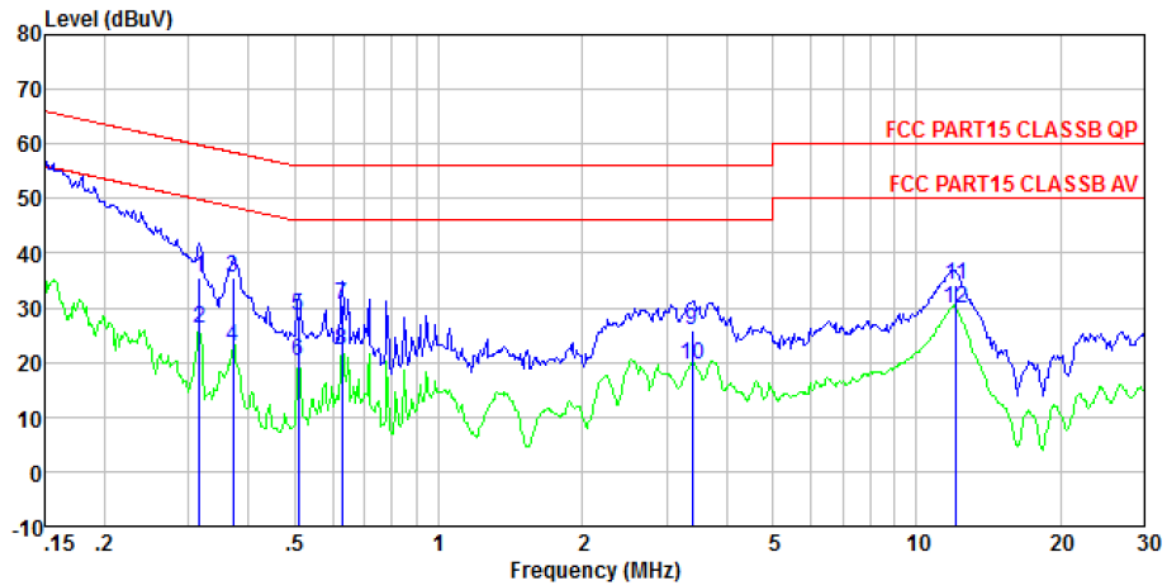
7 Test Results and Measurement Data

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> <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:	<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:	<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 5.3 for details																
Test results:	Pass																

Measurement Data

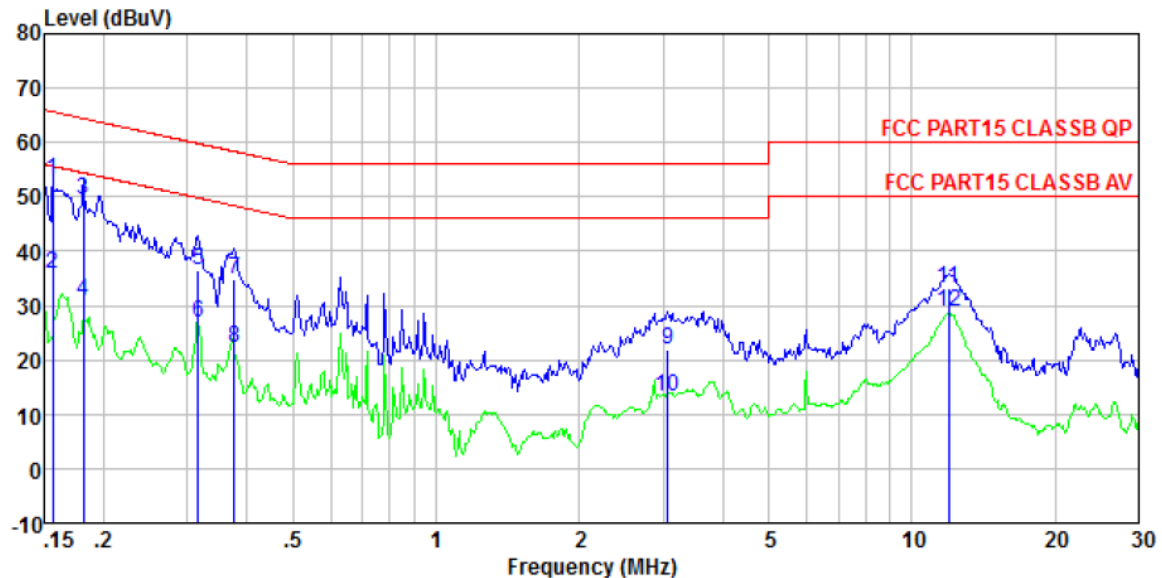
Line:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 LINE
Job No. : 0138
Test mode : Print mode
Test Engineer: Boy

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.317	35.15	0.11	0.10	35.36	59.80	-24.44	QP
2	0.317	25.83	0.11	0.10	26.04	49.80	-23.76	Average
3	0.371	35.22	0.11	0.10	35.43	58.47	-23.04	QP
4	0.371	22.74	0.11	0.10	22.95	48.47	-25.52	Average
5	0.510	28.20	0.12	0.11	28.43	56.00	-27.57	QP
6	0.510	20.12	0.12	0.11	20.35	46.00	-25.65	Average
7	0.627	30.31	0.13	0.12	30.56	56.00	-25.44	QP
8	0.627	21.80	0.13	0.12	22.05	46.00	-23.95	Average
9	3.399	25.45	0.18	0.15	25.78	56.00	-30.22	QP
10	3.399	19.38	0.18	0.15	19.71	46.00	-26.29	Average
11	12.124	33.59	0.37	0.20	34.16	60.00	-25.84	QP
12	12.124	29.42	0.37	0.20	29.99	50.00	-20.01	Average

Neutral:



Site : Shielded room
 Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
 Job No. : 0138
 Test mode : Print mode
 Test Engineer: Boy

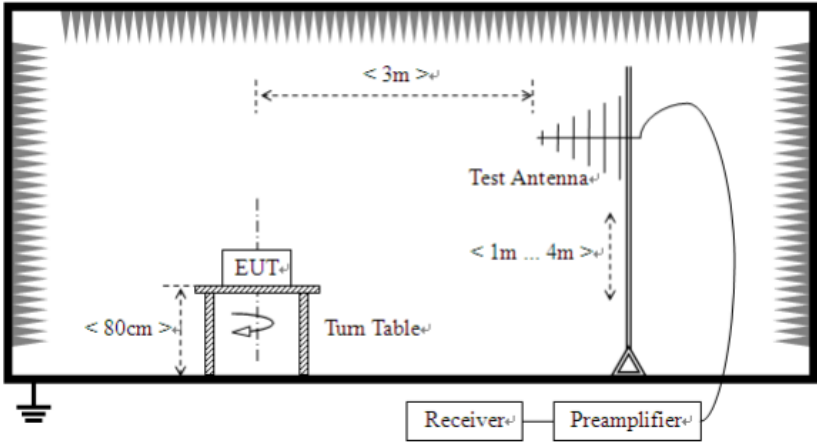
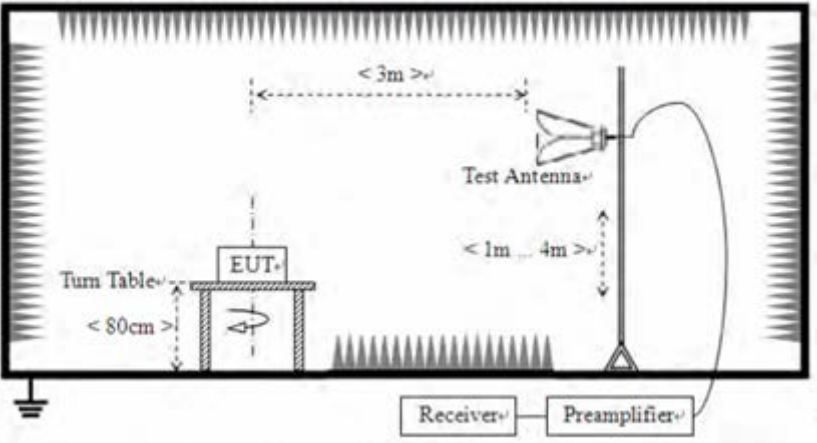
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.156	53.07	0.07	0.12	53.26	65.65	-12.39	QP
2	0.156	35.75	0.07	0.12	35.94	55.65	-19.71	Average
3	0.182	49.26	0.07	0.13	49.46	64.42	-14.96	QP
4	0.182	30.81	0.07	0.13	31.01	54.42	-23.41	Average
5	0.317	36.42	0.06	0.10	36.58	59.80	-23.22	QP
6	0.317	26.56	0.06	0.10	26.72	49.80	-23.08	Average
7	0.377	34.80	0.06	0.10	34.96	58.34	-23.38	QP
8	0.377	22.17	0.06	0.10	22.33	48.34	-26.01	Average
9	3.074	21.58	0.12	0.15	21.85	56.00	-34.15	QP
10	3.074	13.09	0.12	0.15	13.36	46.00	-32.64	Average
11	11.933	32.65	0.32	0.20	33.17	60.00	-26.83	QP
12	11.933	28.18	0.32	0.20	28.70	50.00	-21.30	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 25GHz																																					
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 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																																			
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:	<div>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.</div> <div>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.</div> <div>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.</div> <div>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.</div> <div>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</div> <div>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.</div>																																					
Test setup:	Below 1GHz																																					

	 <p>Above 1GHz</p> 
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	See 4.1
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:

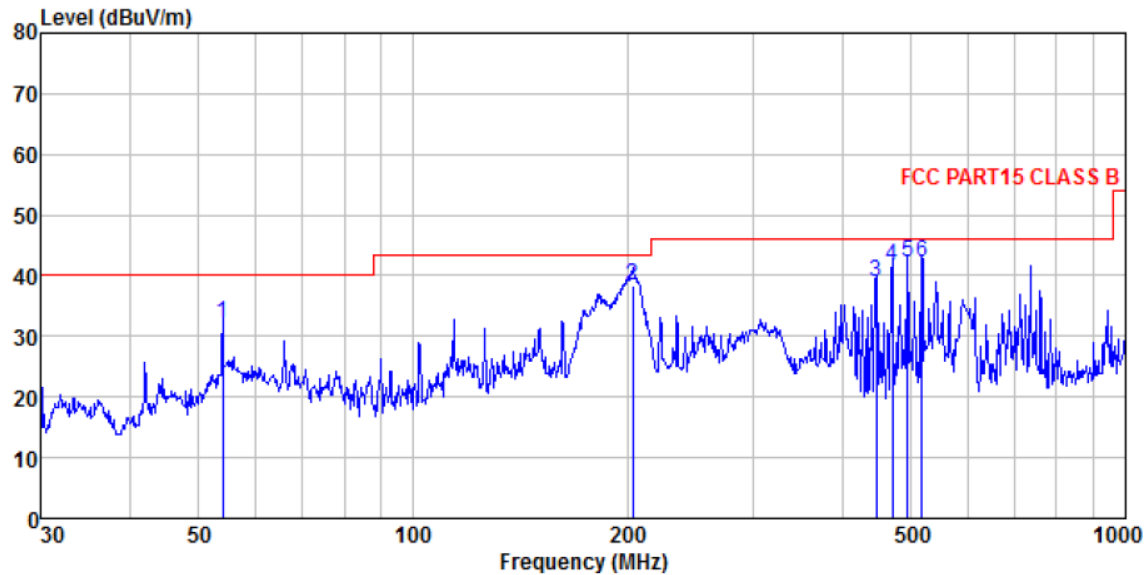
For above 6GHz to 25GHz , no emission found , so only worse case 30MHz to 6GHz is reported.

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

Measurement Data

Below 1GHz

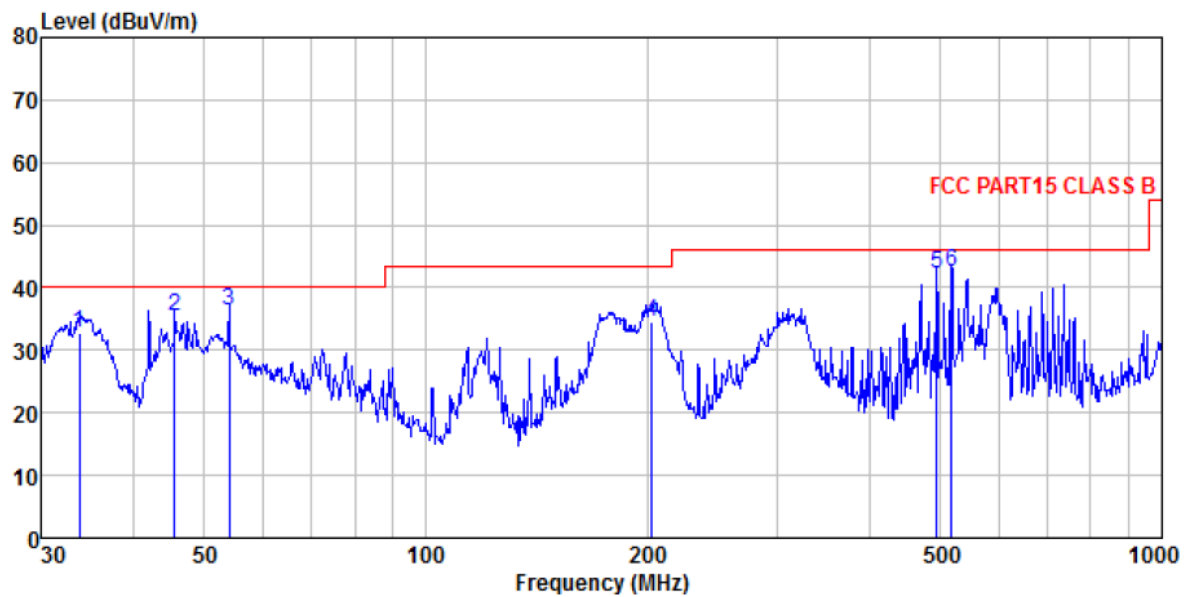
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m HORIZONTAL
 Job No. : 0138
 Test Mode : Print mode
 Test Engineer: Sky

	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	54.071	46.20	15.06	0.81	29.97	32.10	40.00 -7.90 QP
2	203.523	52.99	12.67	1.86	29.23	38.29	43.50 -5.21 QP
3	446.414	47.80	17.57	3.07	29.40	39.04	46.00 -6.96 QP
4	470.523	50.01	17.83	3.18	29.36	41.66	46.00 -4.34 QP
5	494.199	49.75	18.45	3.28	29.31	42.17	46.00 -3.83 QP
6	517.248	49.09	18.94	3.38	29.30	42.11	46.00 -3.89 QP

Vertical:

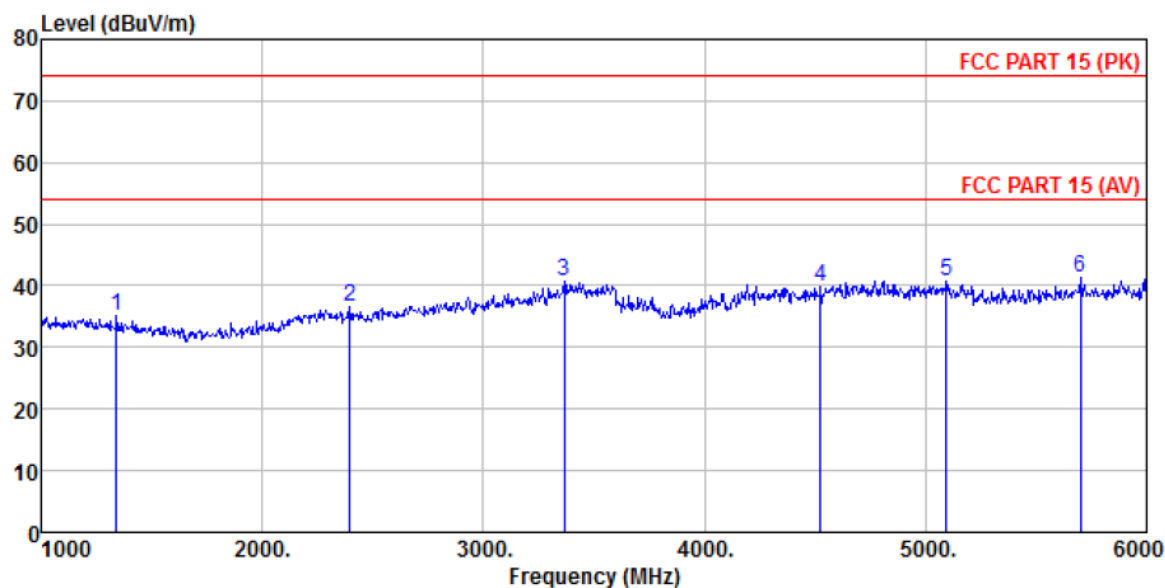


Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VERTICAL
 Job No. : 0138
 Test Mode : Print mode
 Test Engineer: Sky

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	33.799	47.80	14.31	0.59	30.08	32.62	40.00	-7.38 QP
2	45.535	49.31	15.52	0.72	30.02	35.53	40.00	-4.47 QP
3	54.071	50.27	15.06	0.81	29.97	36.17	40.00	-3.83 QP
4	202.810	49.23	12.64	1.86	29.23	34.50	43.50	-9.00 QP
5	494.199	49.67	18.45	3.28	29.31	42.09	46.00	-3.91 QP
6	517.248	49.55	18.94	3.38	29.30	42.57	46.00	-3.43 QP

Above 1GHz

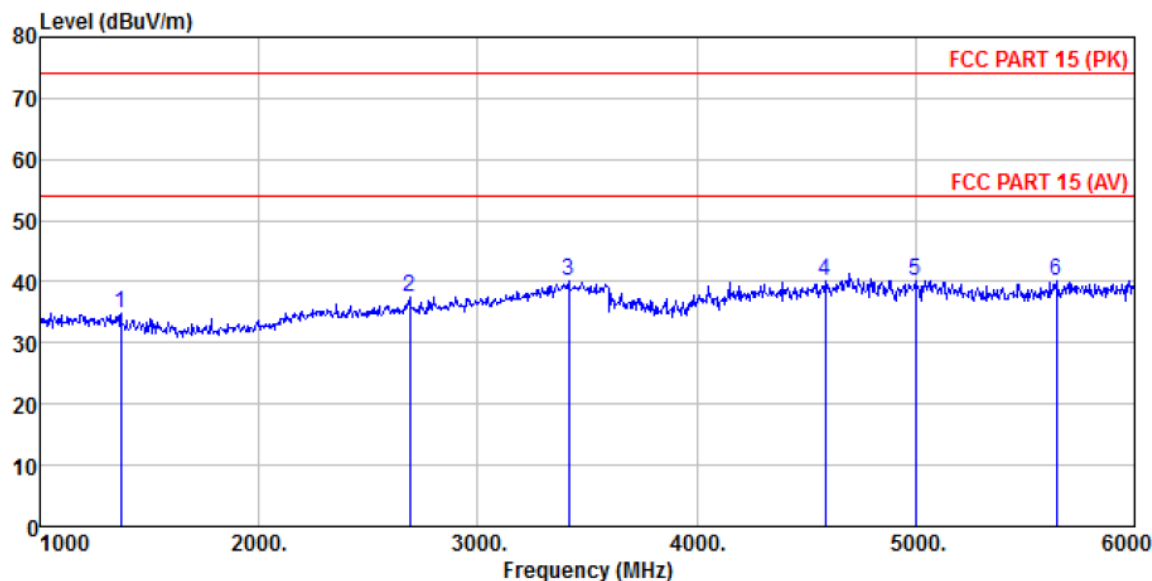
Horizontal:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m HORIZONTAL
 Job No. : 0138
 Test Mode : Print mode
 Test Engineer: Sky

	Freq	ReadAntenna	Cable	Preamp	Limit	Over	
	Level	Factor	Loss	Factor	Line	Limit	Remark
	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	1340.000	38.26	25.69	4.57	33.33	35.19	74.00 -38.81 Peak
2	2395.000	37.66	27.59	5.39	34.01	36.63	74.00 -37.37 Peak
3	3365.000	38.31	28.51	6.70	32.91	40.61	74.00 -33.39 Peak
4	4525.000	32.09	31.37	8.36	31.95	39.87	74.00 -34.13 Peak
5	5095.000	31.94	32.03	8.90	32.23	40.64	74.00 -33.36 Peak
6	5700.000	31.30	32.50	9.79	32.31	41.28	74.00 -32.72 Peak

Vertical:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m VERTICAL
 Job No. : 0138
 Test Mode : Print mode
 Test Engineer: Sky

	ReadAntenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	1370.000	37.88	25.66	4.59	33.39	34.74
2	2690.000	37.25	28.12	5.66	33.68	37.35
3	3415.000	37.44	28.67	6.80	32.85	40.06
4	4585.000	32.18	31.49	8.41	31.98	40.10
5	5000.000	31.66	31.96	8.76	32.18	40.20
6	5645.000	30.52	32.36	9.72	32.35	40.25

8 Test Setup Photo

Radiated Emission



Conducted Emission



9 EUT Constructional Details

Reference to the test report No. GTS20160800138E01

----- End-----