TEST REPORT

Reference No.	:	WTF19S12088767W002 V1
FCC ID	:	V5PQ25LWT
Applicant	:	PAX Technology Limited
Address	:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour, Hong Kong
Manufacturer	:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address	:	4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.
Product	:	POS Terminal
Model(s)	:	Q25
Brand	:	PAX
Standards	:	FCC CFR47 Part 15 Section 15.225: 2018
Date of Receipt sample	:	2019-12-20
Date of Test	:	2019-12-21 to 2020-01-06
Date of Issue	:	2020-01-19
Test Result	:	**Pass**

Remarks:
The 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.

Prepared By:
Waltek Services (Shenzhen) Co., Ltd.
Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China
Tel :+86-755-83551033
Fax:+86-755-83552400

Compiled by:

Ford Wang

Ford Wang / Project Engineer

Approved by:

Philo Zhong

Philo Zhong / Manager

2 Contents

3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTF19S12088767W002	2019-12-20	2019-12-21 to 2020-01-06	2020-01-07	original	-	Replaced
WTF19S12088767W002 V1	2019-12-20	2019-12-21 to 2020-01-06	2020-01-19	Version 1	Updated	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	POS Terminal
Model(s):	Q25
Model Description:	N/A
Wi-Fi Specification:	2.4G-802.11b/g/n HT20/n HT40 5G-802.11a/ n(HT20/40)/ac(HT20/40/80)
NFC:	Support
Hardware Version:	Q25-0UA-R75-0xLx
Software Version:	15.00.xx xxxx
Highest frequency (Exclude Radio):	1.25GHz
Storage Location:	Internal Storage
Note:	N/A

4.2 Details of E.U.T.

Operation Frequency:	NFC:13.56MHz
Ratings:	DC 5V, 1.0A, charging from adapter (Adapter Input: 100-240V~50/60Hz 0.4A)
Adapter:	Manufacturer: Shenzhen Sorghum red Electronics Technology Co., Ltd. Model No.: A18A-050100U-US2

4.3 Channel List

Channel No.	Frequency (MHz)
0	13.56MHz

4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests; the worst data were recorded and reported.

Test mode	Lower channel	Middle channel	Upper channel
Transmitting	N/A	13.56MHz	N/A

4.5 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Services(Shenzhen) Co., Ltd. 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 our files. Registration number 523476, September 10, 2019.

5 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emission	15.205(a) 15.209 15.225	PASS
Frequency Tolerance	15.225	PASS
20dB Bandwidth	15.215(c)	PASS
Antenna Requirement	15.203	PASS
Note: C=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

6 Equipment Used during Test

6.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	2019-09-12	2020-09-11
2.	LISN	R&S	ENV216	101215	2019-09-12	2020-09-11
3.	Cable	Top	TYPE16(3.5M)	-	2019-09-12	2020-09-11
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	2019-09-12	2020-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2019-09-12	2020-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2019-09-12	2020-09-11
4.	Cable	LARGE	RF300	-	2019-09-12	2020-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP	100091	2019-04-29	2020-04-28
2	Amplifier	Agilent	8447D	2944A10178	2019-01-13	2020-01-12
3	Active Loop Antenna	Beijing Dazhi	ZN30900A	0703	2019-10-17	2020-10-16
4	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	33 6	2019-04-29	2020-04-28
5	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2019-09-12	2020-09-11
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2019-04-29	2020-04-28
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2019-04-13	2020-04-12
8	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2019-04-13	2020-04-12
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2019-04-13	2020-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2019-04-29	2020-04-28
3	Amplifier	ANRITSU	MH648A	M43381	2019-04-13	2020-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2019-04-13	2020-04-12

RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2019-09-12	2020-09-11
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2019-09-12	2020-09-11
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2019-09-12	2020-09-11

6.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Confidence interval：95%. Confidence factor:k=2	

6.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

7 Conducted Emission

Test Requirement: FCC CFR 47 Part 15 Section 15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Class/Severity: Class B

Limit:

Frequency (MHz)	Limit (dBμV)	
	Qua i-peak	Average
0.15 to 0.5	66 to 56*	56 to46*
0.5 to 5	56	60
5 to 30	60	50

7.1 E.U.T. Operation

Operating Environment **:**

Temperature: 25.5 °C

Humidity: 51 % RH

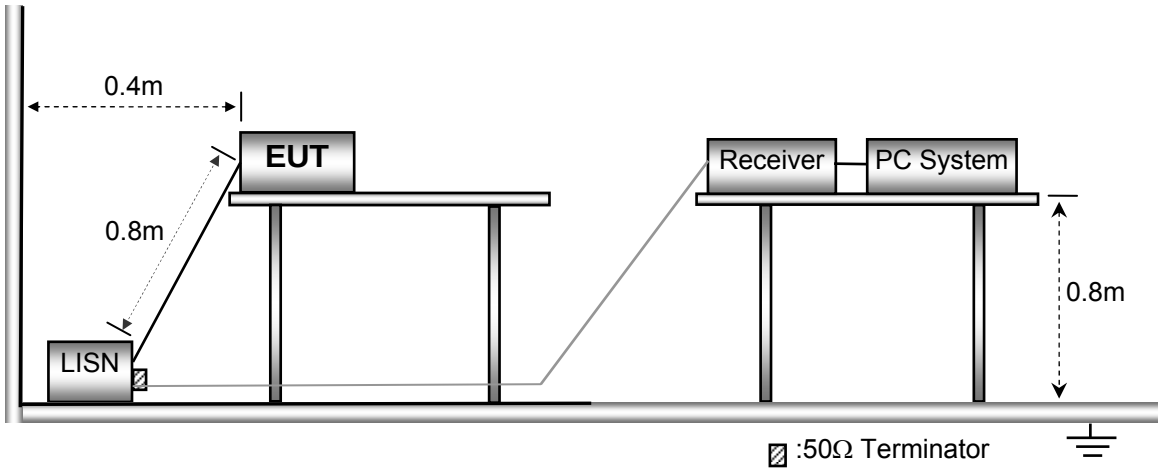
Atmospheric Pressure: 101.2kPa

EUT Operation **:**

The test was performed in transmitting mode, the test data were shown in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013

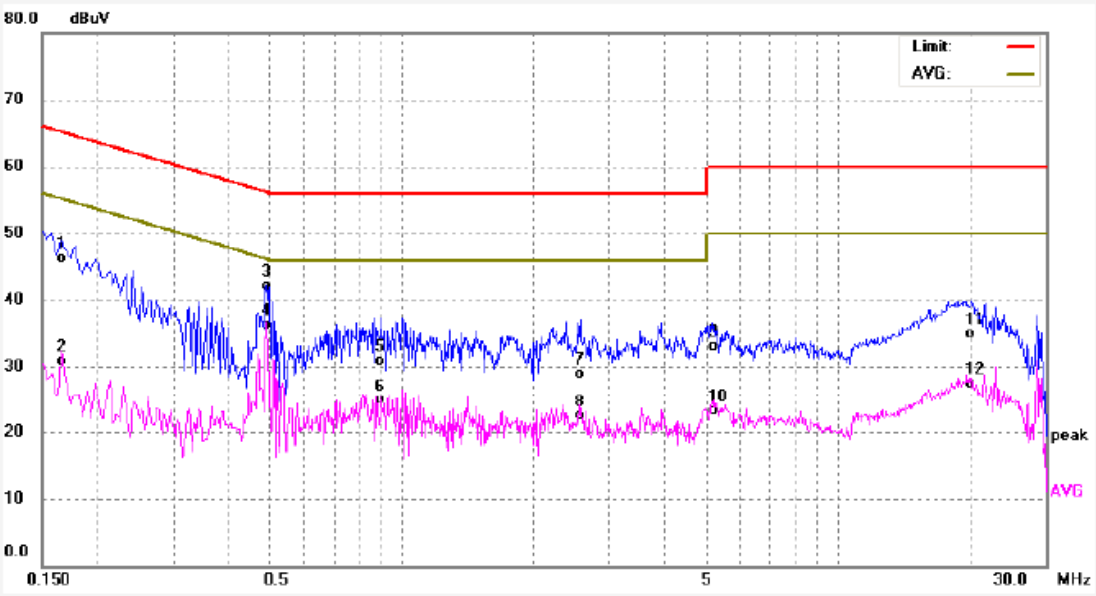


7.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

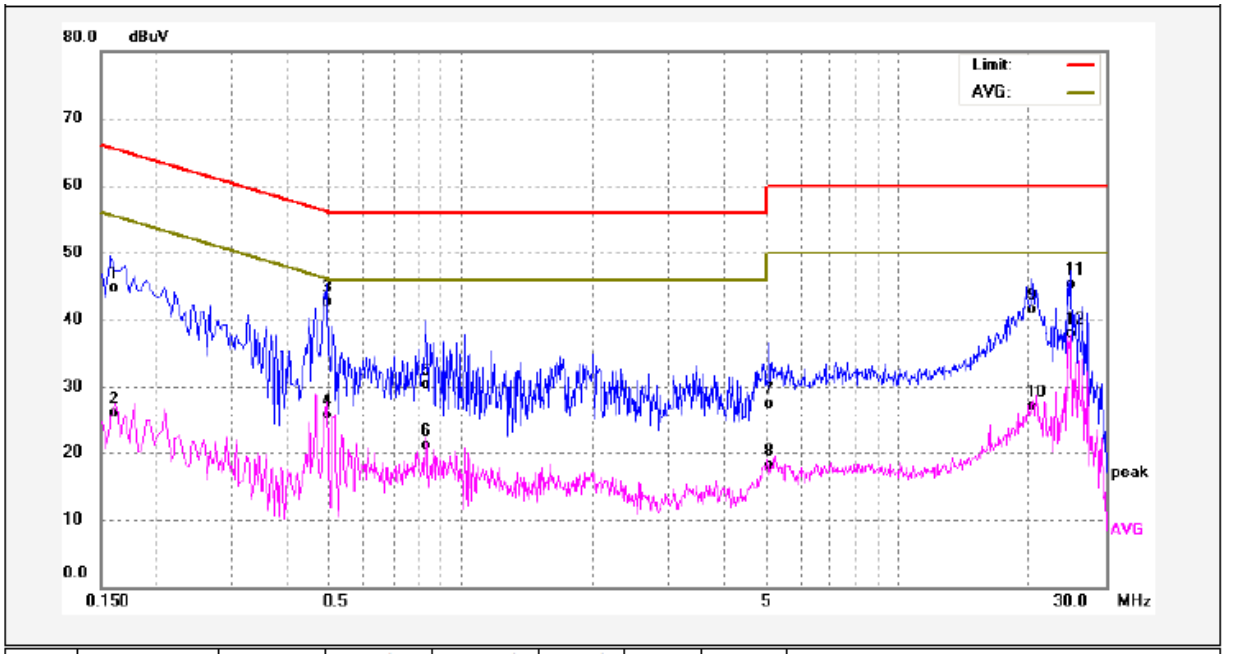
7.4 Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1660	36.48	9.77	46.25	65.15	-18.90	QP	
2	0.1660	21.06	9.77	30.83	55.15	-24.32	AVG	
3	0.4900	32.29	9.81	42.10	56.17	-14.07	QP	
4	0.4900	26.47	9.81	36.28	46.17	-9.89	AVG	
5	0.8980	21.08	9.87	30.95	56.00	-25.05	QP	
6	0.8980	15.08	9.87	24.95	46.00	-21.05	AVG	
7	2.5740	18.98	9.94	28.92	56.00	-27.08	QP	
8	2.5740	12.51	9.94	22.45	46.00	-23.55	AVG	
9	5.1540	22.96	10.08	33.04	60.00	-26.96	QP	
10	5.1540	13.20	10.08	23.28	50.00	-26.72	AVG	
11	20.2540	24.57	10.29	34.86	60.00	-25.14	QP	
12	20.2540	17.21	10.29	27.50	50.00	-22.50	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1620	34.95	9.77	44.72	65.36	-20.64	QP	
2	0.1620	16.25	9.77	26.02	55.36	-29.34	AVG	
3	0.4940	32.97	9.81	42.78	56.10	-13.32	QP	
4	0.4940	15.95	9.81	25.76	46.10	-20.34	AVG	
5	0.8340	20.49	9.86	30.35	56.00	-25.65	QP	
6	0.8340	11.33	9.86	21.19	46.00	-24.81	AVG	
7	5.0980	17.42	10.08	27.50	60.00	-32.50	QP	
8	5.0980	7.98	10.08	18.06	50.00	-31.94	AVG	
9	20.3180	31.19	10.29	41.48	60.00	-18.52	QP	
10	20.3180	16.74	10.29	27.03	50.00	-22.97	AVG	
11	24.8980	34.92	10.34	45.26	60.00	-14.74	QP	
12	24.8980	27.47	10.34	37.81	50.00	-12.19	AVG	

8 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209

Test Method: ANSI C63.10

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

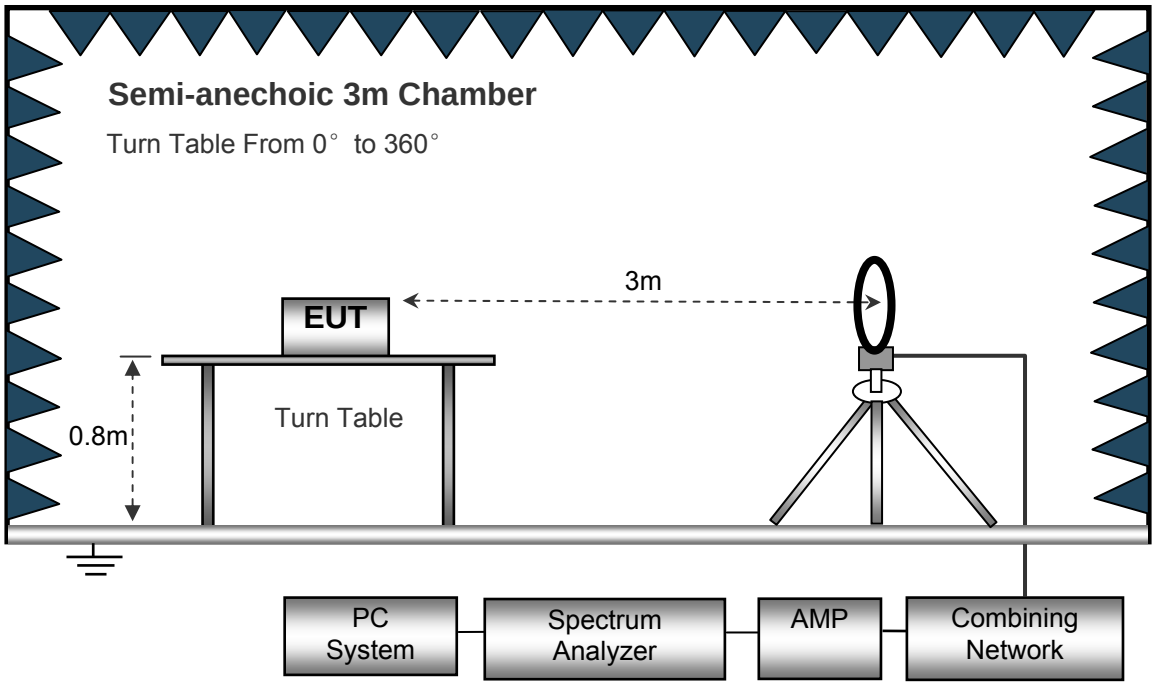
EUT Operation **:**

The test was performed in transmitting mode, the test data were shown in the report.

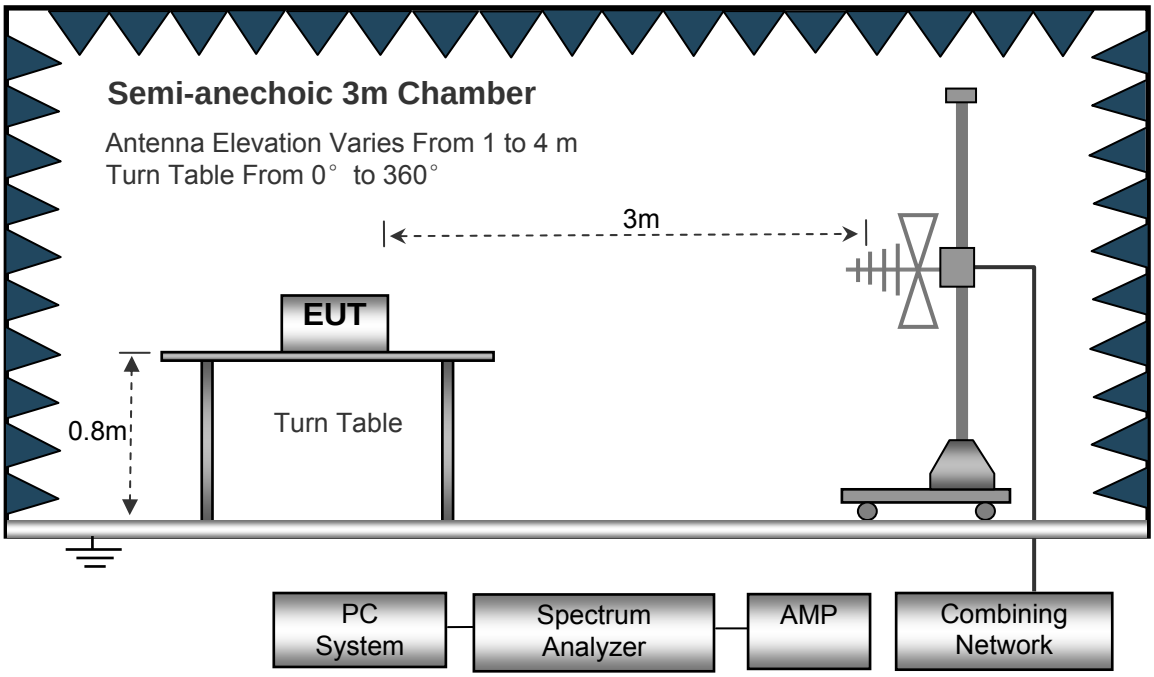
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed .....Auto
IF Bandwidth.....10kHz
Video Bandwidth.....10kHz
Resolution Bandwidth.....10kHz

30MHz ~ 1GHz

Sweep Speed .....Auto
Detector .....PK
Resolution Bandwidth.....100kHz
Video Bandwidth.....300kHz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

8.6 Summary of Test Results

Test Frequency: 9 kHz ~ 30MHz Note: Correct factor = Cable loss + Antenna factor

Frequency	Receiver Reading (PK)	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude (PK)	FCC Part 15.225	
			Height	Polar			Limit	Margin
(MHz)	(dBμV) @3m	Degree	(m)	(H/V)	(dB/m)	(dBμV/m) @3m	(dBμV/m)@3m	(dB)
13.56	86.25	105	1.9	H	19.68	105.93	124	-18.07
13.56	81.26	259	1.5	V	19.68	100.94	124	-23.06

Frequency (MHz)	Receiver Reading	Detector	Correct factor	Corrected Amplitude	Limits	Margin
	dBμV @3m	QP	dB/m	dBμV/m @3m	dBμV/m @3m	dB
3.620	25.63	QP	20.20	45.83	69.54	-23.71
10.340	22.54	QP	19.90	42.44	69.54	-27.10

Frequency Range (MHz)	Frequency (MHz)	Maximum Reading	Detector	Correct factor	Corrected Amplitude	Limits	Margin
		dBμV @3m	QP	dB/m	dBμV/m @3m	dBμV/m @3m	dB
13.110~ 13.41	13.395	27.54	QP	21.55	29.09	69.54	-40.45
13.410~ 13.553	13.551	31.24	QP	21.55	52.79	69.54	-16.75
13.567~ 13.71	13.568	35.34	QP	21.55	56.89	69.54	-12.65
13.710~ 14.01	13.842	31.24	QP	21.55	52.79	69.54	-16.75

Test Frequency: 30MHz ~ 1GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Correcte d Factor	Corrected Amplitude	FCC Part 15.225/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV) @3m	(QP)	Degree	(m)	(H/V)	(dB)	(dBμV/m) @3m	(dBμV/m) @3m	(dB)
34.22	18.31	QP	301	1.5	H	14.14	32.45	40.00	-7.55
34.22	18.90	QP	355	1.3	V	14.14	33.04	40.00	-6.96
220.34	21.40	QP	347	1.4	H	12.50	33.90	46.50	-12.60
220.34	21.11	QP	73	1.3	V	12.50	33.61	46.50	-12.89
519.67	13.07	QP	179	1.9	H	21.65	34.72	46.50	-11.78
519.67	13.14	QP	290	1.0	V	21.65	34.79	46.50	-11.71

9 Frequency Tolerance

Test Requirement: FCC Part15.225

Test Method: ANSI C63.10: 2013

Limit The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

9.1 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Centre Frequency = fundamental frequency, RBW=30 Hz, VBW= 100 Hz, Span =3 kHz.
4. Set SPA Max hold. Mark peak.

9.2 Test Result

Power Supply	Temperature (℃)	Measured Frequency (MHz)	Frequency Error	Part 15.225 Limit
DC 5V	-20	13.5598	-0.0016%	±0.01%
	-10	13.5601	0.0007%	±0.01%
	0	13.5606	0.0045%	±0.01%
	+10	13.5607	0.0052%	±0.01%
	+20	13.5603	0.0021%	±0.01%
	+30	13.5595	-0.0037%	±0.01%
	+40	13.5602	0.0013%	±0.01%
	+50	13.5607	0.0051%	±0.01%
DC 4.25 V	-20	13.5610	0.0070%	±0.01%
	-10	13.5603	0.0022%	±0.01%
	0	13.5597	-0.0019%	±0.01%

	+10	13.5609	0.0064%	±0.01%
	+20	13.5593	-0.0051%	±0.01%
	+30	13.5604	0.0027%	±0.01%
	+40	13.5608	0.0056%	±0.01%
	+50	13.5601	0.0011%	±0.01%
DC 5.75V	-20	13.5608	0.0063%	±0.01%
	-10	13.5605	0.0037%	±0.01%
	0	13.5602	0.0014%	±0.01%
	+10	13.5613	0.0094%	±0.01%
	+20	13.5596	-0.0030%	±0.01%
	+30	13.5606	0.0045%	±0.01%
	+40	13.5604	0.0029%	±0.01%
	+50	13.5599	-0.0006%	±0.01%

10 20dB Bandwidth

Test Requirement: FCC Part15.215(C)

Test Method: ANSI C63.10: 2013

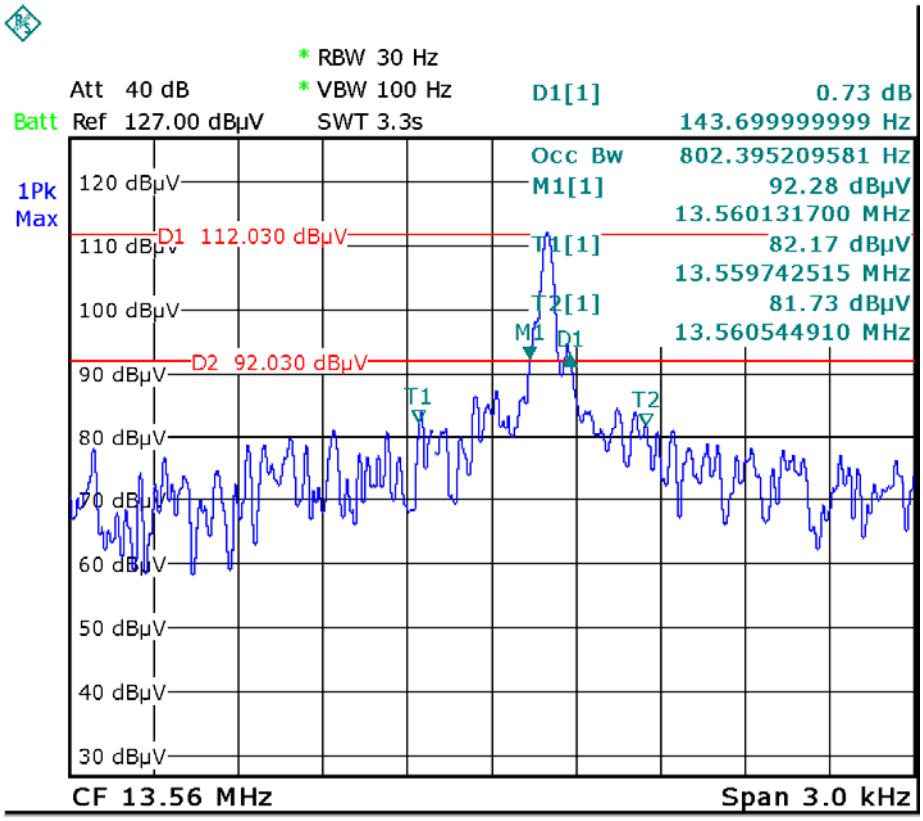
10.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. 20dB Bandwidth the resolution bandwidth of 30 Hz and the video bandwidth of 100 Hz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

10.2 Test Result

Frequency(MHz)	Bandwidth Emission(Hz)
13.56	143.700

Test Plot



11 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. This product has an Loop antenna, fulfil the requirement of this section.

12 RF Exposure

Remark: refer to MPE test report: WTF19S12088767W005.

13 Photographs of EUT.

Note: Please refer to appendix: Appendix-Q25-Photos.

======End of Report======