Certificate #4312.01

FCC TEST REPORT

Product Name:	Smart Mobile Payment Terminal
Trade Mark:	PAX
Model No.:	A99
Report Number:	24090313575EMC-1
Test Standards:	FCC 47 CFR Part 15 Subpart B
FCC ID:	V5PA99
Test Result:	PASS
Date of Issue:	November 22, 2024

Prepared for:

PAX Technology Limited
Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China
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Approved by: — Date: November 22, 2024

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Version

Version No.	Date	Description
V1.0	November 22, 2024	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	PAX Technology Limited
Address of Applicant:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong
Manufacturer:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address of Manufacturer:	Room 701, PAX Technology Building, Shanxia Community, Pinghu Sub-district, Longgang District, Shenzhen, China

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Smart Mobile Payment Terminal
Model No.:	A99
Trade Mark:	PAX
Rated Voltage:	☒ Powered by USB port (5Vdc)
	☒ 100-240V~50/60Hz and/or 7.2Vdc (1x7.2V Lithium-ion Polymer Battery)
Classification of digital devices:	Class B
Highest Internal Frequency:	2690 MHz
Sample Received Date:	September 3, 2024
Sample Tested Date:	September 6, 2024 to September 7, 2024
Remark: The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.	

1.2.2 Description of Accessories

Adapter(1)	
Model No.:	SW-0983
Input:	100-240 V~50/60 Hz 0.5 A
Output:	5.0 V ⎓ 2.0 A

Adapter(2)	
Model No.:	GLH50E2000HW
Input:	100-240 V~50/60 Hz 0.40 A
Output:	5.0 V ⎓ 2.0 A

Cable	
Connector:	USB Cable
Cable Type:	Unshielded without ferrite
Length:	1.0 Meter

Battery	
Model No.:	BF1024
Battery Type:	Lithium-ion Polymer Battery
Rated Voltage:	7.2 Vdc
Rated Capacity:	2600 mAh

1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	Lenovo	E450	SL10G10780	UnionTrust
Mouse	DELL	MS111	CN-011D3V-738	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
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1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9kHz-150kHz	±3.2 dB
2	Conducted emission 150kHz-30MHz	±2.7 dB
3	Radiated emission 9kHz-30MHz	±4.7 dB
4	Radiated emission 30MHz-1GHz	±4.6 dB
5	Radiated emission 1GHz-18GHz	±4.4 dB
6	Radiated emission 18GHz-40GHz	±4.6 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart B Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Conducted Emission	FCC 47 CFR Part 15.107	ANSI C63.4-2014	PASS
Radiated Emission	FCC 47 CFR Part 15.109	ANSI C63.4-2014	PASS

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date**	**Cal. Due date**
☒	3m SAC	ETS-LINDGREN	3M	Euroshiedpn-CT001270-1317	11-Nov-2023	10-Nov-2026
☒	Receiver	R&S	ESIB26	100114	27-Oct-2023	26-Oct-2024
☐	Loop Antenna	ETS-LINDGREN	6502	00202525	30-Oct-2023	29-Oct-2024
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	30-Oct-2023	29-Oct-2024
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	30-Oct-2023	29-Oct-2024
☒	Preamplifier	HP	8447F	2805A02960	31-Oct-2023	30-Oct-2024
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	1-Apr-2024	31-Mar-2025
☒	Pre-amplifier	ETS-LINDGREN	00118385	00201874	1-Apr-2024	31-Mar-2025
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	30-Oct-2023	29-Oct-2024
☒	Pre-amplifier	ETS-LINDGREN	00118384	00202652	30-Oct-2023	29-Oct-2024
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

Conducted Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date**	**Cal. Due date**
☒	Receiver	R&S	ESR7	101181	27-Oct-2023	26-Oct-2024
☒	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	27-Oct-2023	26-Oct-2024
☒	LISN	R&S	ESH2-Z5	860014/024	27-Oct-2023	26-Oct-2024
☒	LISN	ETS-Lindgren	3816/2SH	00201088	27-Oct-2023	26-Oct-2024
☒	Test Software	EZ-EMC	EZ-CON	Software Version: EMC-CON 3A1.1		

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	+15 to +35	120V~60 Hz/240V~50 Hz or/and 7.2 V Battery	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment and Test Sample

Test Item	Temp. (°C)	Relative Humidity (%)	Pressure (kPa)	Sample No.	Tested by
Radiated Emission	25.3	61.8	100.2	S202409034259-ZJA04/6	Linson Xie
Conducted Emission	25.1	58.2	100.2		

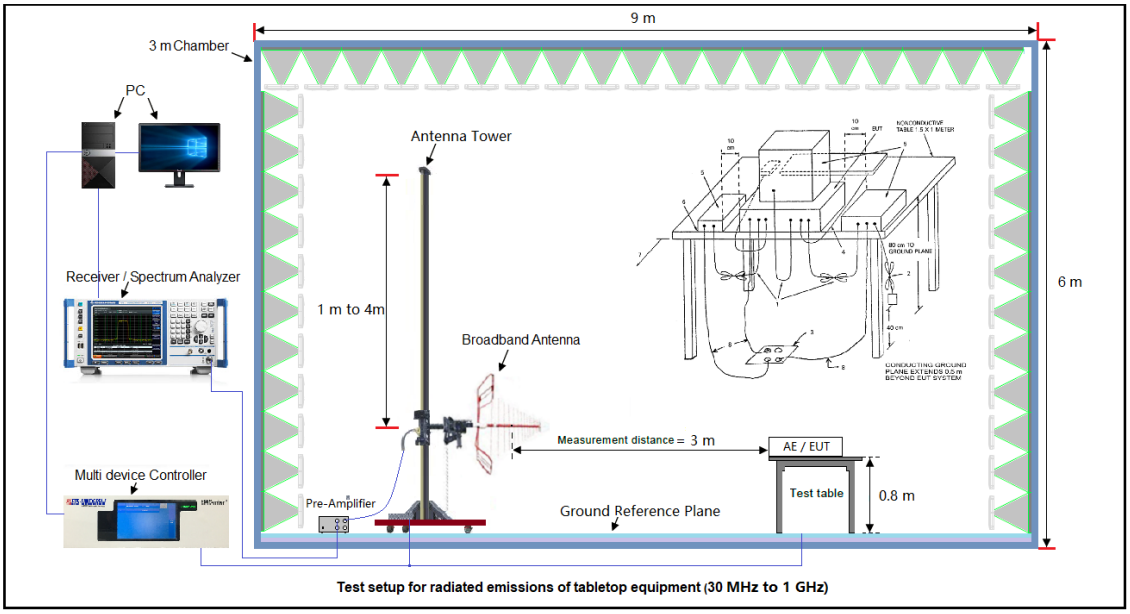
4.2 TEST MODES

Test Item	EMI Test Modes
Radiated Emission	Test Mode 1: Charging from Adapter1 (with 120 Vac) + USB Cable + SD Card + GSM 850 + Wi-Fi + BT **Test Mode 2: Charging from Adapter1 (with 120 Vac) + USB Cable + NFC + WCDMA Band 5 + Wi-Fi + BT** Test Mode 3: Charging from Adapter1 (with 120 Vac) + USB Cable + IC card + LTE Band 2 + Wi-Fi + BT Test Mode 4: Charging from Adapter1 (with 120 Vac) + USB Cable + MSR card + LTE Band 4 + Wi-Fi + BT Test Mode 5: Charging from Adapter1 (with 120 Vac) + USB Cable + Scan + LTE Band 5+ Wi-Fi + BT Test Mode 6: Charging from Adapter1 (with 120 Vac) + USB Cable + back camera + LTE Band 7+ Wi-Fi + BT Test Mode 7: Charging from Adapter1 (with 120 Vac) + USB Cable + print + LTE Band 66+ Wi-Fi + BT **Test Mode 8: Charging from Adapter1 (with 240 Vac) + Worse from test mode 1~7(for Test Mode 2)** Test Mode 9: Worst from mode 1~8 (Adapter 2)
Conducted Emission	**Test Mode 1: Charging from Adapter1 (with 120 Vac) + USB Cable + SD Card + GSM 850 + Wi-Fi + BT** Test Mode 2: Charging from Adapter1 (with 120 Vac) + USB Cable + NFC + WCDMA Band 5 + Wi-Fi + BT Test Mode 3: Charging from Adapter1 (with 120 Vac) + USB Cable + IC card + LTE Band 2 + Wi-Fi + BT Test Mode 4: Charging from Adapter1 (with 120 Vac) + USB Cable + MSR card + LTE Band 4 + Wi-Fi + BT Test Mode 5: Charging from Adapter1 (with 120 Vac) + USB Cable + Scan + LTE Band 5+ Wi-Fi + BT Test Mode 6: Charging from Adapter1 (with 120 Vac) + USB Cable + back camera + LTE Band 7+ Wi-Fi + BT Test Mode 7: Charging from Adapter1 (with 120 Vac) + USB Cable + print + LTE Band 66+ Wi-Fi + BT Test Mode 8: Charging from Adapter1 (with 240 Vac) + Worse from test mode 1~7 Test Mode 9: Worst from mode 1~8 (Adapter 2)
Remark: The above test modes in boldface were the worst cases, only the test data of these modes were reported.	

4.3 TEST SETUP

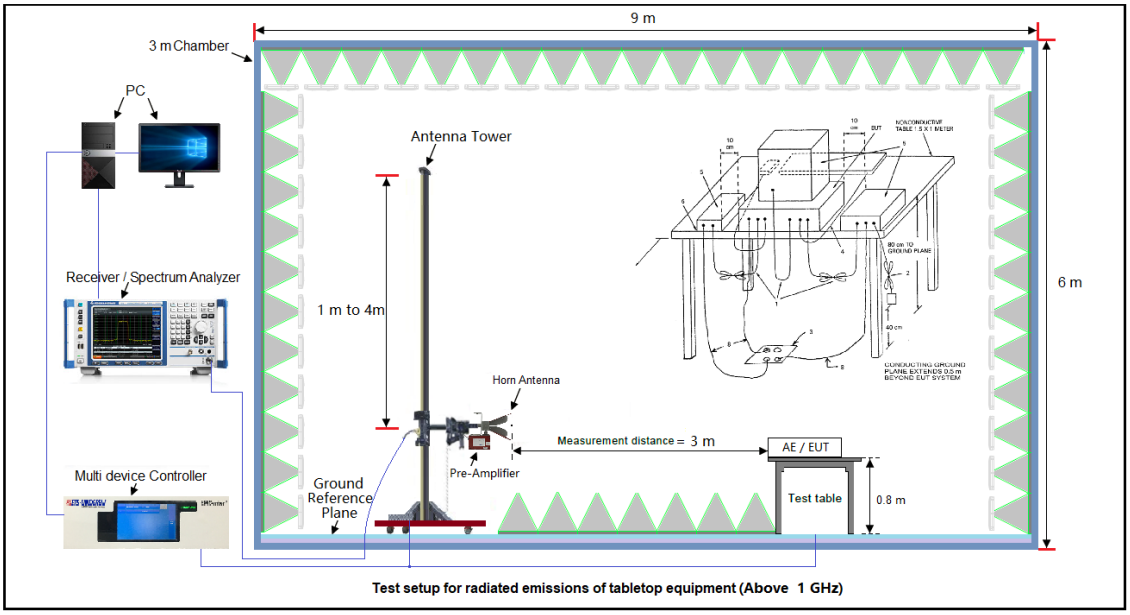
4.3.1 For Radiated Emissions test setup

Figure 1. 30MHz to 1GHz



Test setup for radiated emissions of tabletop equipment (30 MHz to 1 GHz)

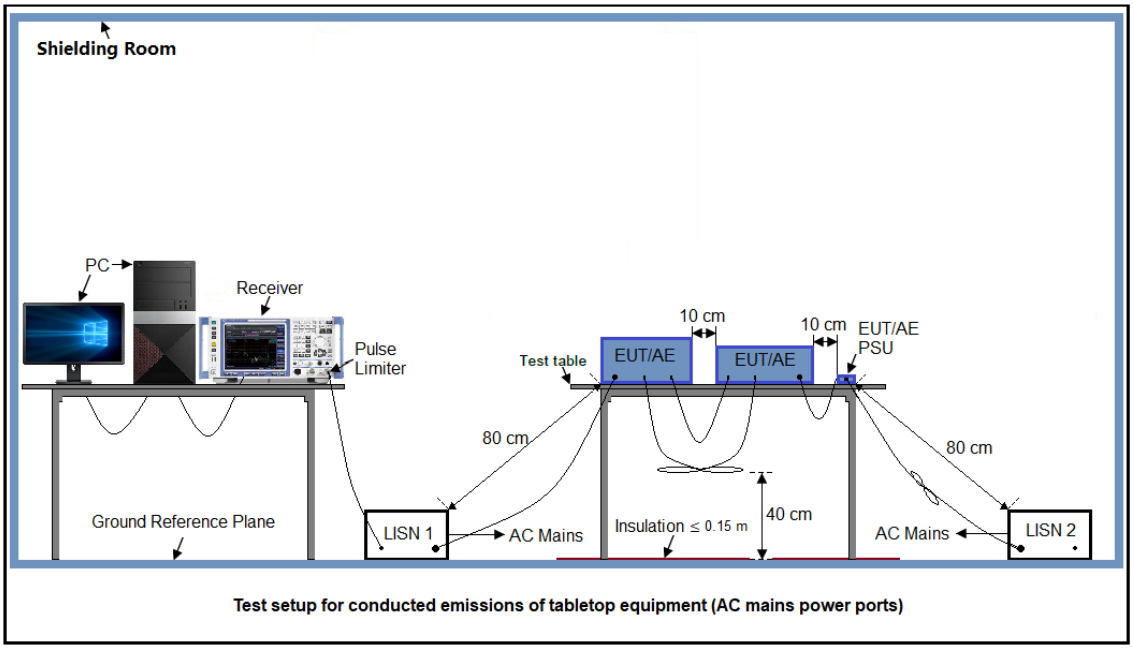
Figure 2. Above 1GHz



Test setup for radiated emissions of tabletop equipment (Above 1 GHz)

4.3.2 For Conducted Emissions test setup

Figure 3. Conducted Emissions setup



4.4 SYSTEM TEST CONFIGURATION

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic (according to KDB 896810 D02 SDoC FAQ v01r01) of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part15 Subpart B	Unintentional Radiators
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
3	KDB 174176 D01 Line Conducted FAQ v01r01	AC power-line conducted emission frequency asked questions
4	KDB 896810 D02 SDoC FAQ v01r02	Supplier's Declaration of Conformity frequency asked questions

6. EMC REQUIREMENTS SPECIFICATION

6.1 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15.109

Test Method: ANSI C63.4-2014

Receiver Setup:

Frequency: (f) (MHz)	Detector type	Measurement receiver bandwidth	
		RBW	VBW
30 ≤ f ≤ 1 000	Quasi Peak	120 kHz	300 kHz
f ≥1000	Peak	1 MHz	3 MHz
	Average	1 MHz	3 MHz

Measured frequency range

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Limits:

Limits for Class B devices

Frequency (MHz)	limits at 3m (dBμV/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Test Setup: Refer to section 4.3.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

2. Above 1GHz test procedure as below:

1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both

horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

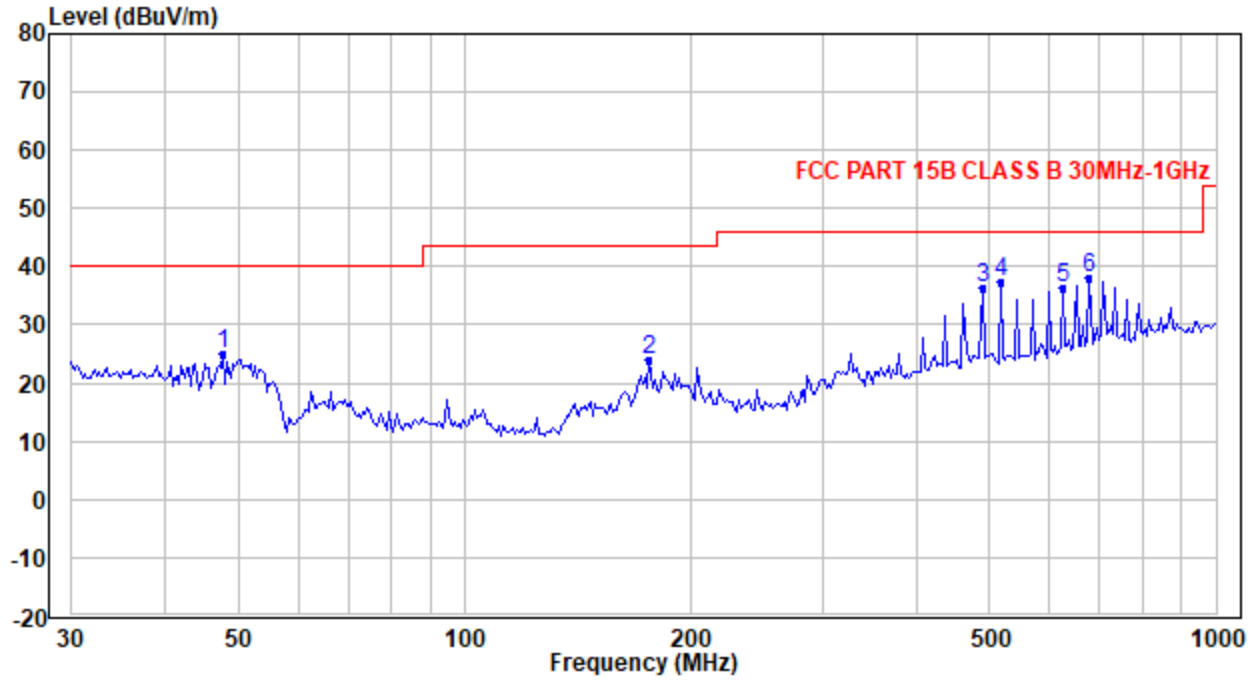
3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

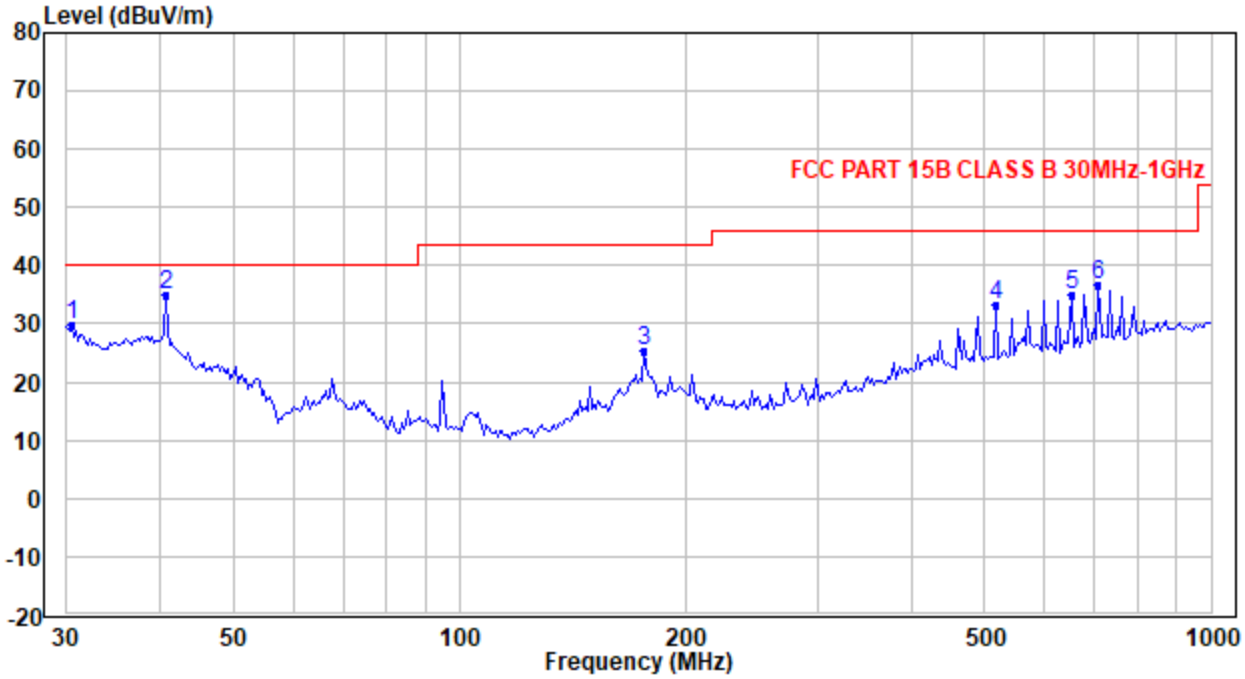
The worst measurement data as follows:

Below 1GHz (Quasi Peak):
Test Mode8
Horizontal



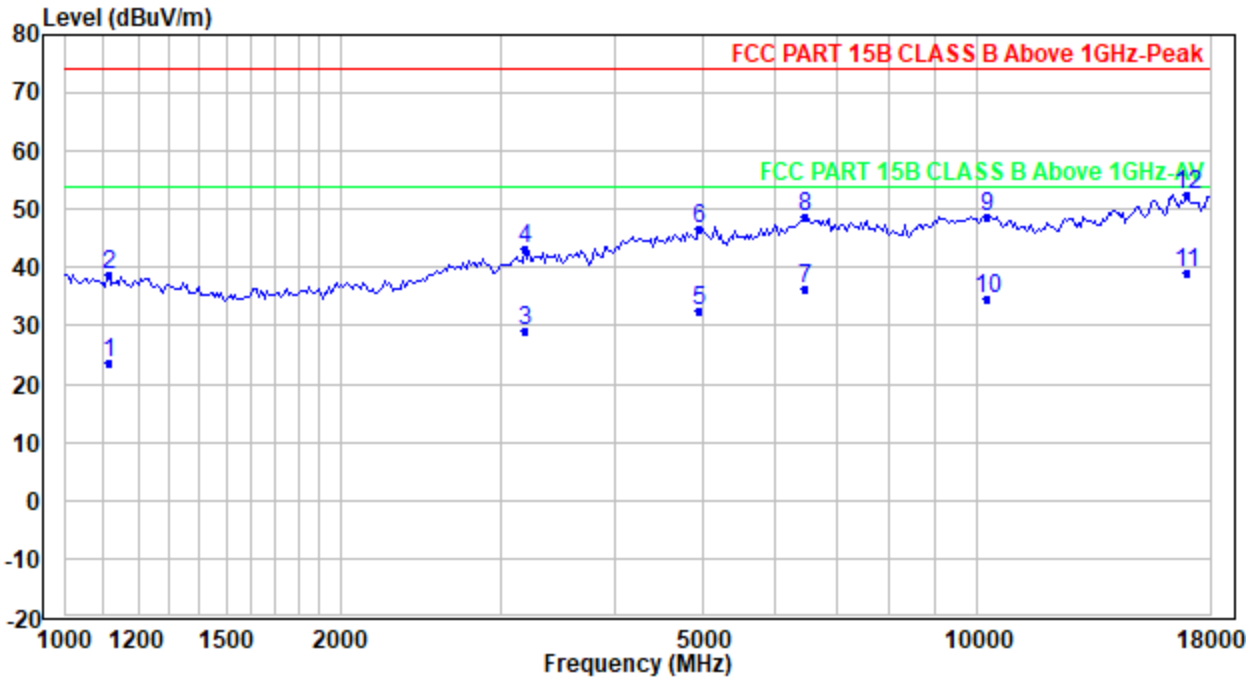
No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	47.703	38.09	-13.10	24.99	40.00	-15.01	QP
2	176.275	35.47	-11.54	23.93	43.50	-19.57	QP
3	488.326	39.43	-2.99	36.44	46.00	-9.56	QP
4	516.565	39.36	-2.02	37.34	46.00	-8.66	QP
5	624.490	36.77	-0.27	36.50	46.00	-9.50	QP
6	679.435	37.04	0.96	38.00	46.00	-8.00	QP

Vertical



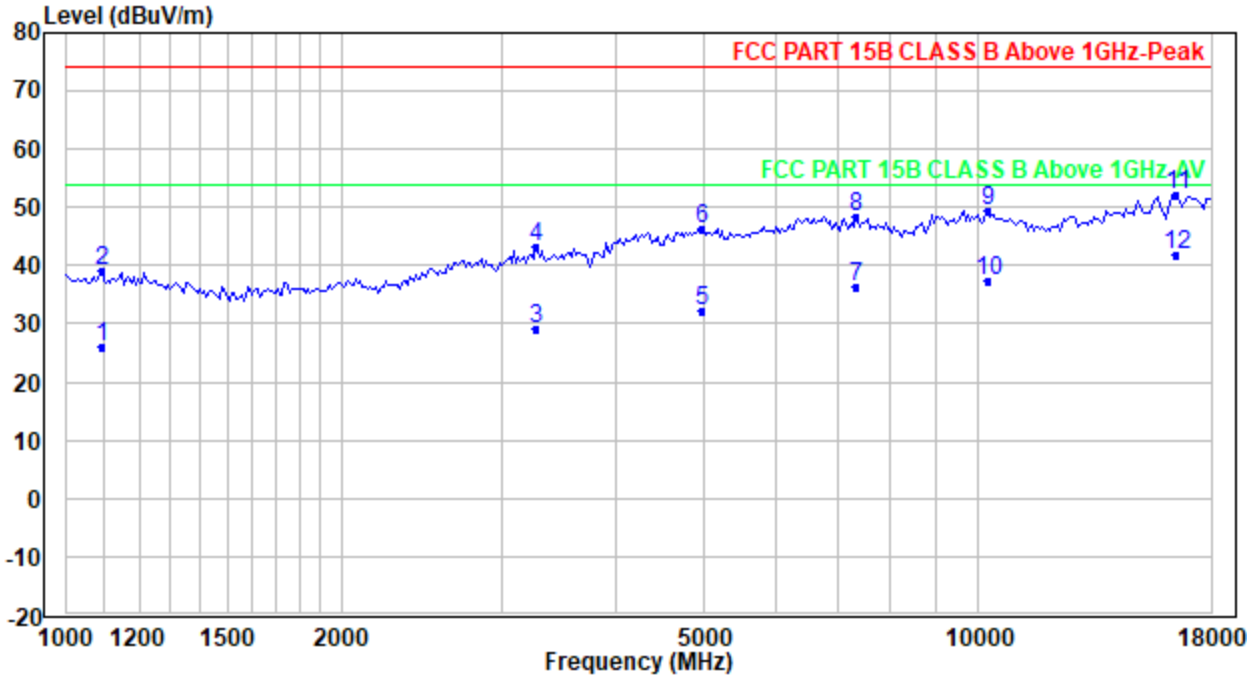
No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.425	34.77	-4.88	29.89	40.00	-10.11	QP
2	40.584	44.14	-9.11	35.03	40.00	-4.97	QP
3	176.275	37.02	-11.54	25.48	43.50	-18.02	QP
4	516.565	35.26	-2.02	33.24	46.00	-12.76	QP
5	651.383	34.56	0.26	34.82	46.00	-11.18	QP
6	708.694	34.87	1.85	36.72	46.00	-9.28	QP

Above 1GHz (Peak & Average)
Test Mode2
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1116.339	36.69	-12.96	23.73	54.00	-30.27	Average
2	1116.339	51.85	-12.96	38.89	74.00	-35.11	Peak
3	3185.042	34.88	-5.76	29.12	54.00	-24.88	Average
4	3185.042	49.03	-5.76	43.27	74.00	-30.73	Peak
5	4946.511	34.49	-2.02	32.47	54.00	-21.53	Average
6	4946.511	48.63	-2.02	46.61	74.00	-27.39	Peak
7	6456.773	35.30	1.16	36.46	54.00	-17.54	Average
8	6456.773	47.43	1.16	48.59	74.00	-25.41	Peak
9	10262.700	45.51	3.36	48.87	74.00	-25.13	Peak
10	10262.700	31.37	3.36	34.73	54.00	-19.27	Average
11	16987.000	30.60	8.63	39.23	54.00	-14.77	Average
12	16987.000	43.75	8.63	52.38	74.00	-21.62	Peak

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1090.771	38.87	-12.95	25.92	54.00	-28.08	Average
2	1090.771	52.00	-12.95	39.05	74.00	-34.95	Peak
3	3278.635	34.61	-5.60	29.01	54.00	-24.99	Average
4	3278.635	48.75	-5.60	43.15	74.00	-30.85	Peak
5	4975.247	34.32	-2.01	32.31	54.00	-21.69	Average
6	4975.247	48.46	-2.01	46.45	74.00	-27.55	Peak
7	7334.292	34.92	1.31	36.23	54.00	-17.77	Average
8	7334.292	47.04	1.31	48.35	74.00	-25.65	Peak
9	10262.700	46.16	3.36	49.52	74.00	-24.48	Peak
10	10262.700	34.04	3.36	37.40	54.00	-16.60	Average
11	16502.090	44.03	8.00	52.03	74.00	-21.97	Peak
12	16502.090	33.89	8.00	41.89	54.00	-12.11	Average

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit
4. All possible modes of operation were investigated, and testing at two nominal voltages of 240V~50Hz and 120V~60Hz, only the worst case emissions reported.
5. For Radiated Emission above 18GHz, there was not any unwanted emission detected.
6. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

6.2 CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15.107

Test Method: ANSI C63.4-2014

Limits:

Limits for Class B devices

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.3.2 for details.

Test Procedures:

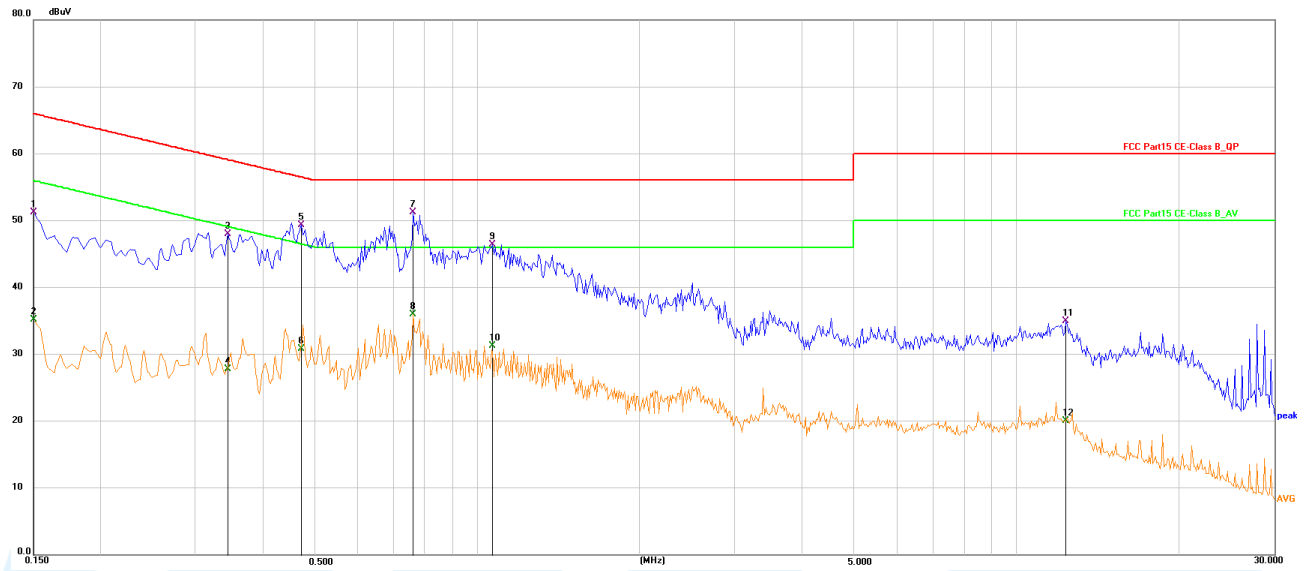
1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
3) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

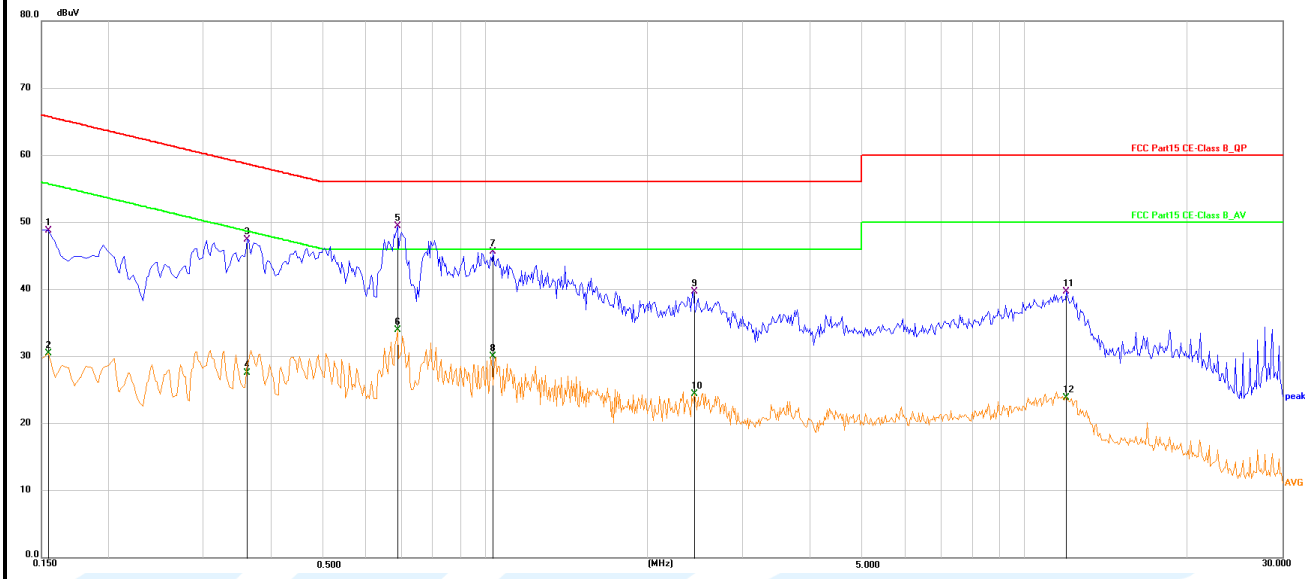
The worst measurement data as follows:
Quasi Peak and Average:
Test Mode1

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	41.05	10.20	51.25	66.00	-14.75	QP
2	0.1500	24.99	10.20	35.19	56.00	-20.81	AVG
3	0.3435	37.77	10.17	47.94	59.12	-11.18	QP
4	0.3435	17.57	10.17	27.74	49.12	-21.38	AVG
5	0.4693	39.14	10.18	49.32	56.53	-7.21	QP
6	0.4693	20.60	10.18	30.78	46.53	-15.75	AVG
7	0.7620	40.98	10.23	51.21	56.00	-4.79	QP
8	0.7620	25.70	10.23	35.93	46.00	-10.07	AVG
9	1.0680	36.02	10.34	46.36	56.00	-9.64	QP
10	1.0680	20.95	10.34	31.29	46.00	-14.71	AVG
11	12.3315	24.46	10.50	34.96	60.00	-25.04	QP
12	12.3315	9.52	10.50	20.02	50.00	-29.98	AVG

Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1544	38.61	10.18	48.79	65.76	-16.97	QP
2	0.1544	20.28	10.18	30.46	55.76	-25.30	AVG
3	0.3613	37.29	10.15	47.44	58.70	-11.26	QP
4	0.3613	17.39	10.15	27.54	48.70	-21.16	AVG
5	0.6854	39.14	10.25	49.39	56.00	-6.61	QP
6	0.6854	23.70	10.25	33.95	46.00	-12.05	AVG
7	1.0320	35.41	10.16	45.57	56.00	-10.43	QP
8	1.0320	19.83	10.16	29.99	46.00	-16.01	AVG
9	2.4405	29.32	10.30	39.62	56.00	-16.38	QP
10	2.4405	14.14	10.30	24.44	46.00	-21.56	AVG
11	11.9760	29.20	10.50	39.70	60.00	-20.30	QP
12	11.9760	13.35	10.50	23.85	50.00	-26.15	AVG

Remark:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.
5. All possible modes of operation were investigated, and testing at two nominal voltages of 240V~50Hz and 120V~60Hz, only the worst case emissions reported.

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

********** End of Report **********
