



FCC PART 22H/24E

MEASUREMENT AND TEST REPORT

For

PAX Technology Limited

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

FCC ID: V5PS90

Report Type: Class II Permissive Change	Product Type: Mobile Payment Terminal
Test Engineer: <u>Back Huang</u>	
Report Number: <u>RSZ10092503-22H&24E</u>	
Report Date: <u>2010-12-14</u>	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *PAX Technology Limited*'s product, model number: *S90 (FCC ID: V5PS90)* or the "EUT" as referred to in this report is a *Mobile Payment Terminal*, which measures approximately: 19.90 cm (L) x 8.70 cm (W) x 6.10 cm (H), rated input voltage: DC 7.4 V li-ion rechargeable battery or DC 9.5V from adapter .

Adapter information:

Model: ADP036-094B;

Input: AC 100-240V 50/60 Hz 1.0 A;

Output: DC 9.5V 4A.

All measurement and test data in this report was gathered from production sample serial number: 32511164 (Assigned by Applicant). The EUT was received on 2010-09-28.

Objective

This type approval report is prepared on behalf of *PAX Technology Limited* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The device has been modified by the manufacturer, the GSM/GPRS module built in is same as the original product, the changes made by the manufacturer are:

- 1) The antenna and its location.
- 2) Add RJ11 port
- 3) A small change of PCB layout.

Please refer to the Class 2 Permissive Change request letter provided by the manufacturer for the details.

The objective is to determine compliance with FCC rules for output power, spurious radiated emission.

Related Submittal(s)/Grant(s)

FCC Part 22H&24E submission with FCC ID: V5PS90.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Note: The uncertainty of any RF tests which use conducted method measurement is ± 0.96 dB, the uncertainty of any radiation emissions measurement is ± 4.0 dB.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-C.

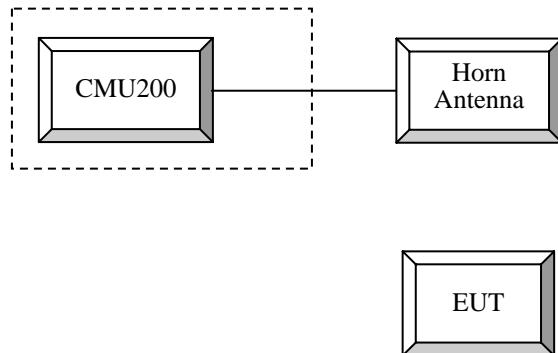
The GSM/PCS item test was performed with the EUT operating at normal mode

The GPRS item test was performed with the EUT operating at engineering mode

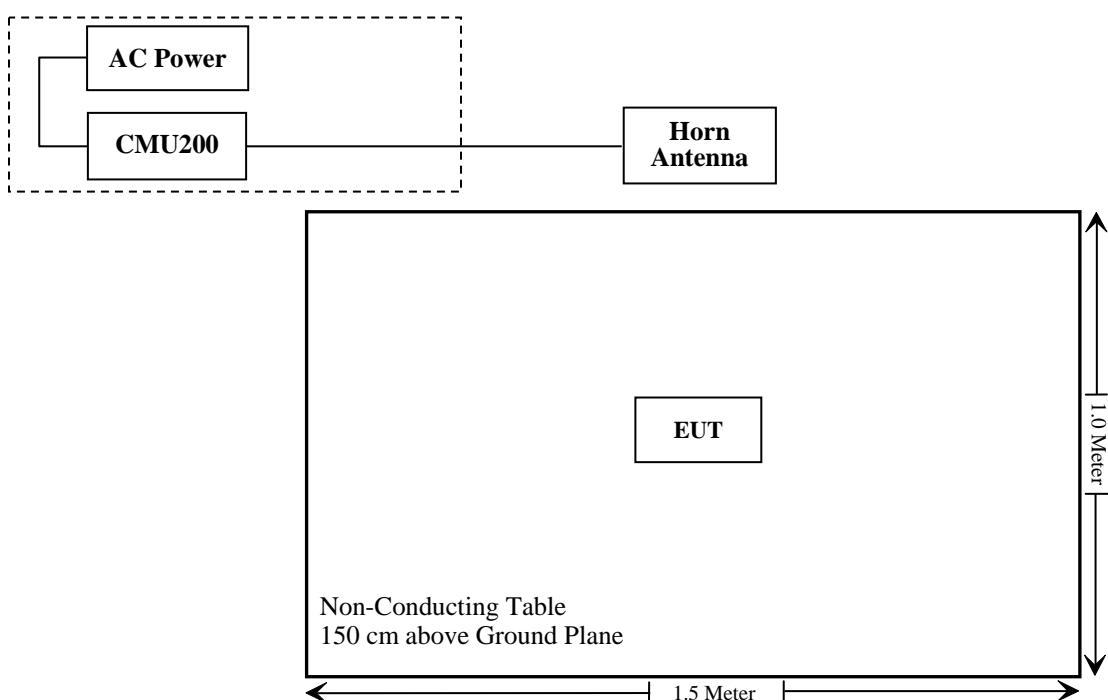
Equipment Modifications

No modifications were made to the EUT.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307, §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; §22.913 (a); §24.232 (c)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	N/A
§2.1049; §22.905 §22.917; §24.238	99% & -26 dB Occupied Bandwidth	N/A**
§2.1051, §22.917 (a); §24.238 (a)	Spurious Emissions at Antenna Terminal	N/A**
§2.1053 §22.917 (a); §24.238 (a)	Field Strength of Spurious Radiation	Compliance
§22.917 (a); §24.238 (a)	Out of band emission, Band Edge	N/A**
§2.1055 §22.355; §24.235	Frequency stability vs. temperature Frequency stability vs. voltage	N/A**

Note: * Please refer to SAR report released by BACL, Report Number: RSZ10092503-SAR
N/A**, please refer to the original FCC ID.

FCC §1.1307 & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standards

FCC §1.1307 and §2.1093.

Test Result

Compliance

Due to the antenna and the location have been changed, the SAR evaluation based on the new configuration has been made, please refer to the SAR report released by BACL, Report number: RSZ10092503-SAR.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) - RF OUTPUT POWER

Applicable Standards

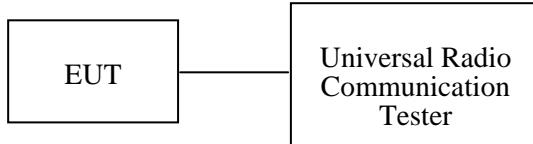
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

TIA 603-C section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-07
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-07
HP	Signal Generator	HP8657A	2849U00982	2010-10-28	2011-10-27
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2010-11-07	2011-11-06
COM POWER	Dipole Antenna	AD-100	041000	2010-09-25	2011-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2010-05-17	2011-05-17
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2010-06-11	2011-06-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Back Huang on 2010-12-14.

ERP & EIRP:

ERP for Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Part 22H Limit (dBm)
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Polar (H/V)				
Middle Channel											
836.6	104.16	80	1.5	H	836.6	29.1	H	0	0.9	28.20	38.45
836.6	101.88	46	1.5	V	836.6	26.3	V	0	0.9	25.40	38.45

EIRP for PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Part 24E Limit (dBm)
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Polar (H/V)				
Low Channel											
1850.2	92.18	120	1.5	H	1850.2	22.7	H	6.2	2.53	26.37	33
1850.2	90.6	100	1.5	V	1850.2	20.5	V	6.2	2.53	24.17	33

Note: all above data were tested with no amplifier.

FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS**Applicable Standards**

FCC §2.1053, §22.917 and §24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \log_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-07
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-07
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HP	Synthesized Sweeper	8341B	2624A00116	2010-11-07	2011-11-06
COM POWER	Dipole Antenna	AD-100	041000	2010-09-25	2011-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2010-05-17	2011-05-17
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2010-06-11	2011-06-10

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Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Back Huang on 2010-11-15.

Test mode: Transmitting

Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Middle Channel, Below 1 GHz											
359.98	43.77	210	1.6	H	359.98	-53.8	0	0.65	-54.45	-13	41.45
269.99	41.66	150	1.5	H	269.99	-55.8	0	0.60	-56.40	-13	43.40
359.98	40.36	240	1.2	V	359.98	-56.4	0	0.65	-57.05	-13	44.05
269.99	39.13	170	1.3	V	269.99	-57.5	0	0.60	-58.1	-13	45.10
Middle Channel, Above 1 GHz											
1673.2	60.34	350	1.8	H	1673.2	-39.5	6.2	2.40	-35.70	-13	22.70
1673.2	58.27	280	1.4	V	1673.2	-41.1	6.2	2.40	-37.30	-13	24.30
2509.8	47.46	290	1.8	H	2509.8	-50.4	7.3	3.21	-46.31	-13	33.31
2509.8	45.57	180	1.5	V	2509.8	-51.8	7.3	3.21	-47.71	-13	34.71
3346.4	42.14	150	1.6	H	3346.4	-53.7	6.7	3.58	-50.58	-13	37.58
3346.4	40.37	280	1.4	V	3346.4	-55.1	6.7	3.58	-51.98	-13	38.98

PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Middle Channel, Below 1 GHz											
590.09	45.79	120	1.5	H	590.09	-55.7	0	0.81	-56.51	-13	43.51
791.85	42.37	240	1.2	H	791.85	-57.0	0	0.90	-57.9	-13	44.90
590.09	43.24	180	1.0	V	590.09	-57.9	0	0.81	-58.71	-13	45.71
791.85	40.62	70	1.5	V	791.85	-59.9	0	0.90	-60.80	-13	47.80
Middle Channel, Above 1 GHz											
5640	53.07	170	1.6	H	5640	-40.7	8.3	4.66	-37.06	-13	24.06
5640	51.38	80	1.2	V	5640	-42.1	8.3	4.66	-38.46	-13	25.46
7520	43.24	180	1.3	H	7520	-48.7	7.6	5.33	-46.43	-13	33.43
3760	45.79	200	1.6	H	3760	-50.1	6.9	3.75	-46.95	-13	33.95
7520	41.89	110	1.5	V	7520	-49.3	7.6	5.33	-47.03	-13	34.03
3760	43.61	190	1.5	V	3760	-51.5	6.9	3.75	-48.35	-13	35.35

***** END OF REPORT *****