Verification Of Conformity
On Behalf of
SPECTRA Technologies Holdings Co. Ltd

EFTPOS
Model No.: SPECTRA T1000

Prepared for	:	SPECTRA Technologies Holdings Co. Ltd
Address	:	Unit1301-1309,19-20,Tower11,Grand Century Place,193 Prince Edward Road West,Kowloon,Hong Kong Tel: (86) 0755-83782872 Fax: (86) 0755-83782852
Prepared By	:	Anbotek Compliance Laboratory Limited
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Report Number	:	201109701F-1
Date of Test	:	May 03~18, 2012
Date of Report	:	May 19, 2012

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Test Report Verification

TEST REPORT VERIFICATION

Applicant	:	SPECTRA Technologies Holdings Co. Ltd
Manufacturer	:	SPECTRA Technologies Holdings Co. Ltd
EUT	:	EFTPOS
Model No.	:	SPECTRA T1000
Rating	:	DC 9V Via Adapter DC 7.4V Via Battery
Trade Mark	:	SPECTRA

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B 2011 & FCC / ANSI C63.4-2009

The device described above is tested by Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Anbotek Compliance Laboratory Limited

Date of Test : May 03~18, 2012

Prepared by : Barak Ban

(Engineer/ Barak Ban)

Reviewer : Jerry Du

(Project Manager/ Jerry Du)

Approved & Authorized Signer : Tom. Chen

(Manager/ Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	EFTPOS
Model Number	:	SPECTRA T1000
Test Power Supply	:	DC 9V Via Adapter DC 7.4V Via Battery
Applicant	:	SPECTRA Technologies Holdings Co. Ltd
Address	:	Unit 1301-09, 19-20, Tower Ⅱ, Grand Century Place, 193 Prince Edward Road West, Kowloon, Hong Kong
Manufacturer	:	SPECTRA Technologies Holdings Co. Ltd
Address	:	Unit 1301-09, 19-20, Tower Ⅱ, Grand Century Place, 193 Prince Edward Road West, Kowloon, Hong Kong
Date of Sample received	:	May 03, 2012
Date of Test	:	May 03~18, 2012

1.2. Description of Test Facility

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

CNAS - LAB Code: L3503
Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021
Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed 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 752021, August 20, 2010

IC-Registration No.: 8058A-1
Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, August 30, 2010

Test Location
All Emissions tests were performed
Anbotek Compliance Laboratory Limited. at 1/F, 1 /Build, SEC Industrial Park, No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

1.3. Measurement Uncertainty

Radiation Uncertainty	**:**	Ur = 4.3dB
Conduction Uncertainty	**:**	Uc = 3.4dB

1.4. Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions.
Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Power Line Conducted Emission Test (150KHz To 30MHz)	√
FCC Part 15 Subpart B	Radiated Emission Test (30MHz To 1000MHz)	√

√ Indicates that the test is applicable
x Indicates that the test is not applicable

2. POWER LINE CONDUCTED MEASUREMENT

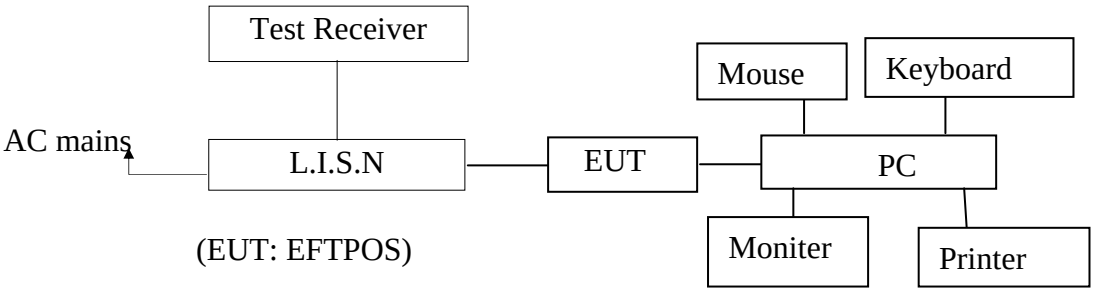
2.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Apr. 25, 2012	1 Year
2.	Two-Line V-network	Rohde & Schwarz	ENV216	10055	Apr. 25, 2012	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 25, 2012	1 Year
4.	EMI Test Software	ES-K1	N/A	N/A	N/A	N/A

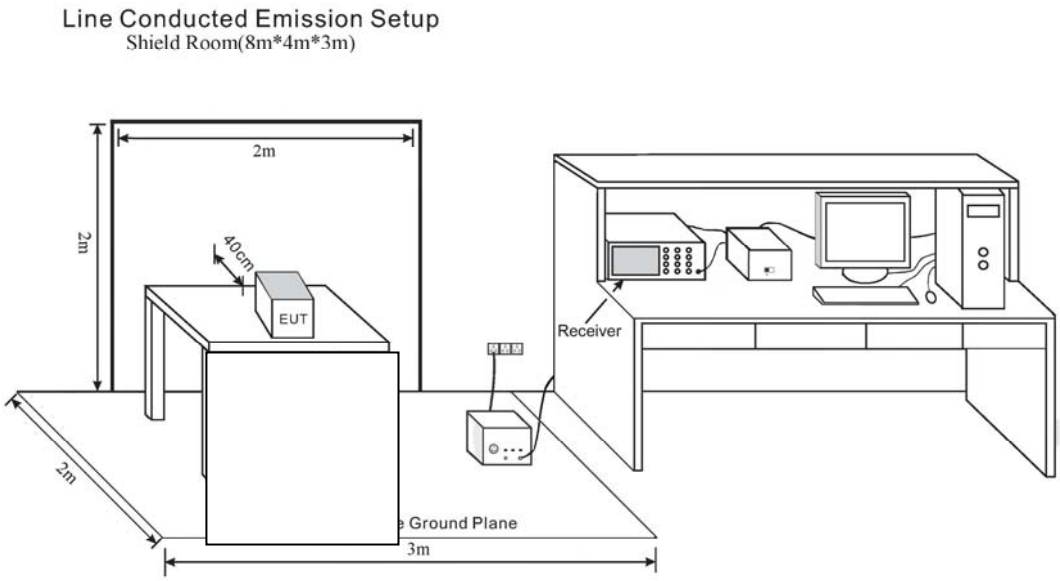
2.2. Block Diagram of Test Setup

2.2.1. Block diagram of connection between the EUT and simulators



(EUT: EFTPOS)

2.2.2. Test setup photo.



2.3. Power Line Conducted Emission Measurement Limits (FCC Part 15 Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

2.4. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : EFTPOS
Model Number : SPECTRA T1000
Applicant : SPECTRA Technologies Holdings Co. Ltd

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown as Section 2.2.
2.5.2. Turn on the power of all equipment.
2.5.3. Let the EUT work in test mode (On) and measure it.

2.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2009 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test result are reported on Section 2.7.

2.7. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150KHz to 30 MHz is investigated.

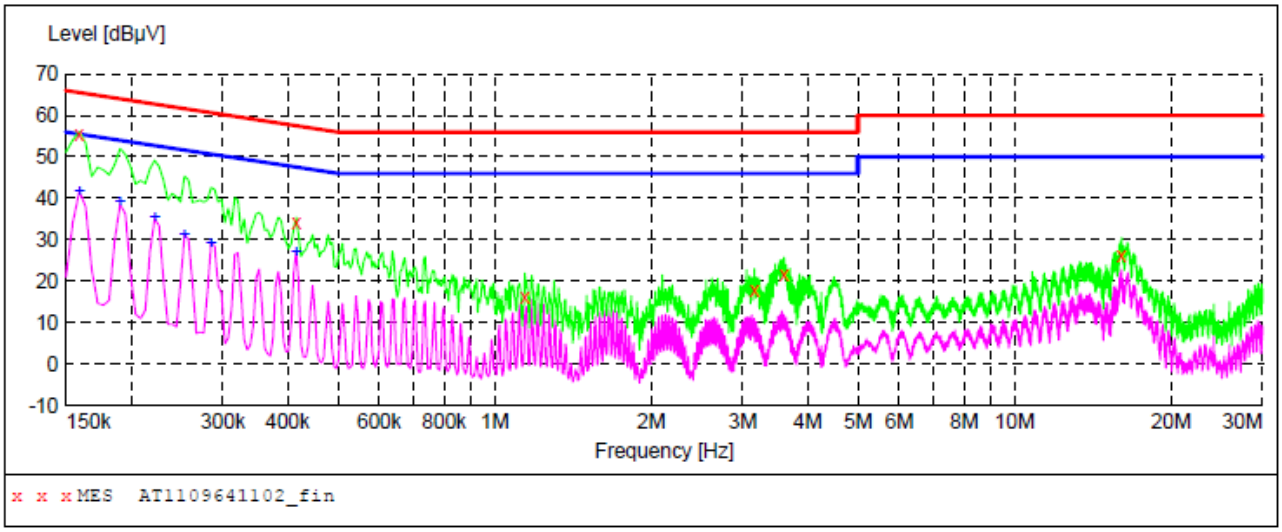
The test curves are shown in the following pages.

Note: The EUT are measured in the Charging, The IC Card Playing, The MSR Card Playing, The SAM, Card Playing, The SD Card Playing, The Printing Mode, And all the mode are pass, So we give the two worsest dates, see the following pages.

CONDUCTED EMISSION TEST DATA

EUT:	EFTPOS M/N: SPECTRA T1000
Operating Condition:	Charging
Test Site:	1# Shielded Room
Operator:	Barak Ban
Test Specification:	DC 9V
Comment:	L
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1109641102_fin"

05/18/2012 13:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	55.30	10.1	66	10.2	QP	L1	GND
0.415500	34.00	10.1	58	23.5	QP	L1	GND
1.144000	16.20	10.2	56	39.8	QP	L1	GND
3.160000	17.90	10.4	56	38.1	QP	L1	GND
3.605500	21.70	10.4	56	34.3	QP	L1	GND
16.061500	26.20	10.7	60	33.8	QP	L1	GND

MEASUREMENT RESULT: "AT1109641102_fin2"

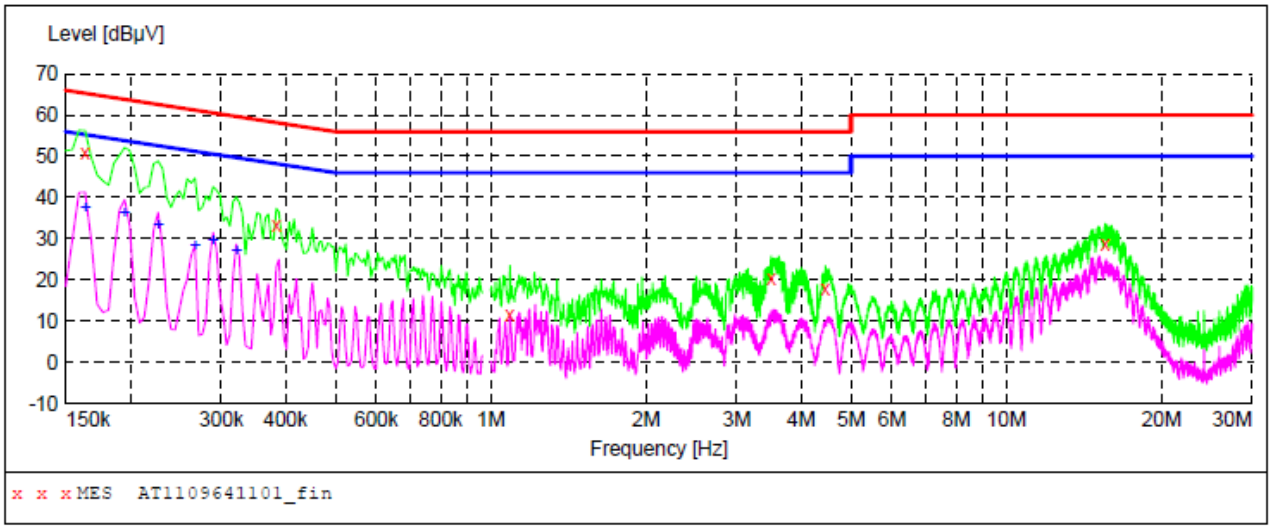
05/18/2012 13:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	41.50	10.1	56	14.0	AV	L1	GND
0.190500	39.00	10.1	54	15.0	AV	L1	GND
0.222000	35.40	10.1	53	17.3	AV	L1	GND
0.253500	31.20	10.1	52	20.4	AV	L1	GND
0.285000	29.00	10.1	51	21.7	AV	L1	GND
0.415500	27.10	10.1	48	20.4	AV	L1	GND

CONDUCTED EMISSION TEST DATA

EUT:	EFTPOS M/N: SPECTRA T1000
Operating Condition:	Charging
Test Site:	1# Shielded Room
Operator:	Barak Ban
Test Specification:	DC 9V
Comment:	N
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1109641101_fin"

05/18/2012 13:39AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.163500	50.90	10.1	65	14.4	QP	N	GND
0.384000	33.50	10.1	58	24.7	QP	N	GND
1.090000	11.70	10.2	56	44.3	QP	N	GND
3.502000	20.20	10.4	56	35.8	QP	N	GND
4.456000	17.70	10.5	56	38.3	QP	N	GND
15.553000	28.80	10.7	60	31.2	QP	N	GND

MEASUREMENT RESULT: "AT1109641101_fin2"

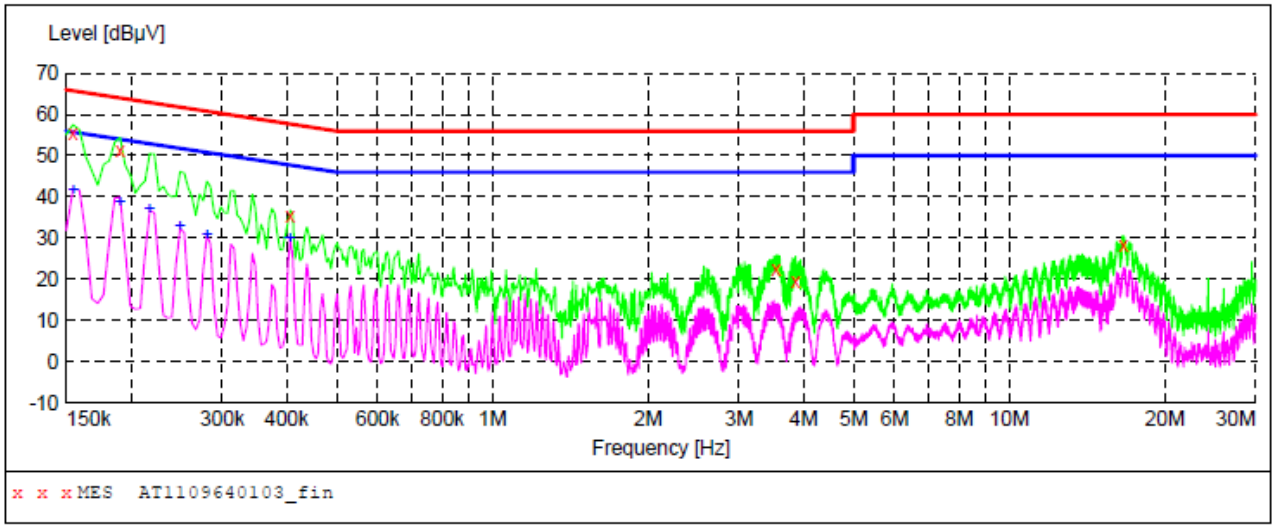
05/18/2011 13:39AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.163500	37.50	10.1	55	17.8	AV	N	GND
0.195000	36.20	10.1	54	17.6	AV	N	GND
0.226500	33.50	10.1	53	19.1	AV	N	GND
0.267000	28.30	10.1	51	22.9	AV	N	GND
0.289500	29.40	10.1	51	21.1	AV	N	GND
0.321000	27.20	10.1	50	22.5	AV	N	GND

CONDUCTED EMISSION TEST DATA

EUT:	EFTPOS M/N: SPECTRA T1000
Operating Condition:	IC Card
Test Site:	1# Shielded Room
Operator:	Barak Ban
Test Specification:	DC 7.4V
Comment:	L
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1109641103_fin"

05/18/2012 15:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	55.40	10.1	66	10.4	QP	L1	GND
0.190500	51.30	10.1	64	12.7	QP	L1	GND
0.406500	35.50	10.1	58	22.2	QP	L1	GND
3.538000	22.60	10.4	56	33.4	QP	L1	GND
3.862000	19.50	10.4	56	36.5	QP	L1	GND
16.615000	28.10	10.7	60	31.9	QP	L1	GND

MEASUREMENT RESULT: "AT1109641103_fin2"

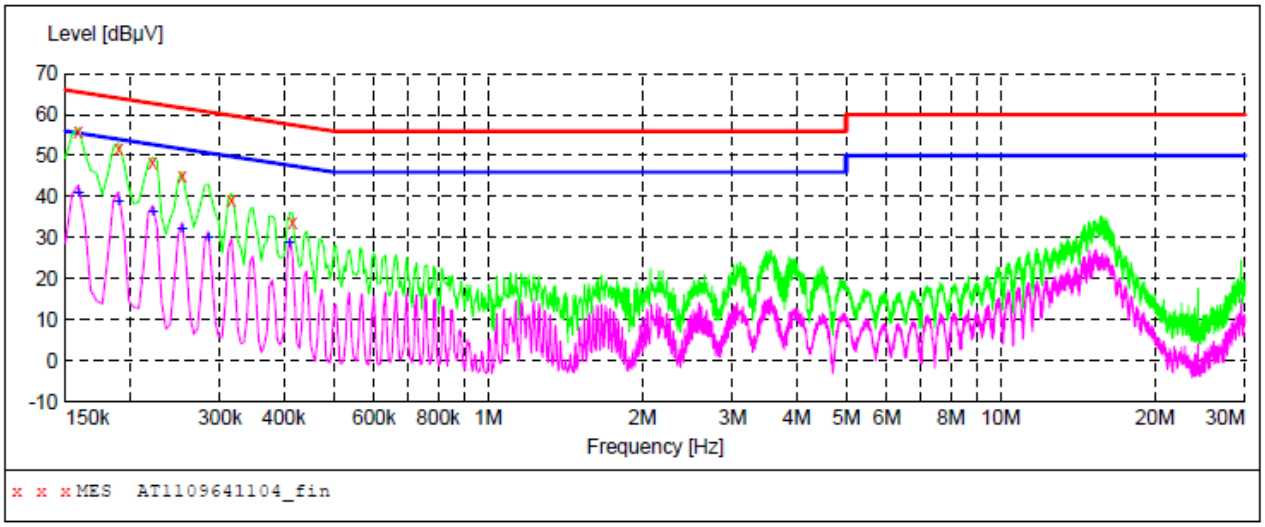
05/18/2012 15:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	41.60	10.1	56	14.2	AV	L1	GND
0.190500	38.90	10.1	54	15.1	AV	L1	GND
0.217500	36.90	10.1	53	16.0	AV	L1	GND
0.249000	33.00	10.1	52	18.8	AV	L1	GND
0.280500	30.90	10.1	51	19.9	AV	L1	GND
0.406500	29.80	10.1	48	17.9	AV	L1	GND

CONDUCTED EMISSION TEST DATA

EUT:	EFTPOS M/N: SPECTRA T1000
Operating Condition:	IC Card
Test Site:	1# Shielded Room
Operator:	Barak Ban
Test Specification:	DC 7.4V
Comment:	N
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1109641104_fin"

05/18/2012 15:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	55.90	10.1	66	9.6	QP	N	GND
0.190500	51.90	10.1	64	12.1	QP	N	GND
0.222000	48.30	10.1	63	14.4	QP	N	GND
0.253500	45.00	10.1	62	16.6	QP	N	GND
0.316500	39.00	10.1	60	20.8	QP	N	GND
0.415500	33.70	10.1	58	23.8	QP	N	GND

MEASUREMENT RESULT: "AT1109641104_fin2"

05/18/2012 15:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	41.00	10.1	56	14.5	AV	N	GND
0.190500	38.90	10.1	54	15.1	AV	N	GND
0.222000	36.10	10.1	53	16.6	AV	N	GND
0.253500	31.90	10.1	52	19.7	AV	N	GND
0.285000	29.80	10.1	51	20.9	AV	N	GND
0.411000	28.80	10.1	48	18.8	AV	N	GND

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

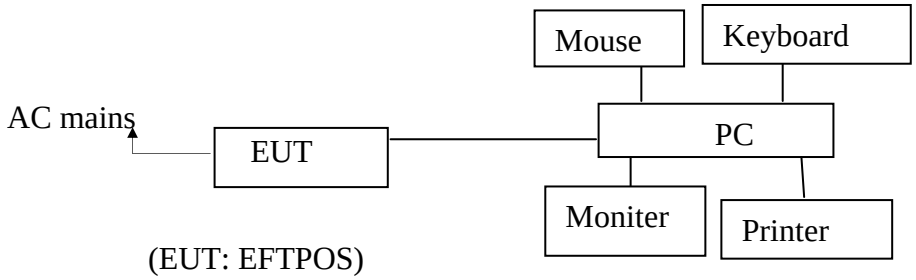
The following test equipments are used during the radiated emission measurement:

3.1.1. For Anechoic Chamber

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 25, 2012	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	100015	Apr. 25, 2012	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 25, 2012	1 Year
4.	EMI Test Software	ES-K1	N/A	N/A	N/A	N/A

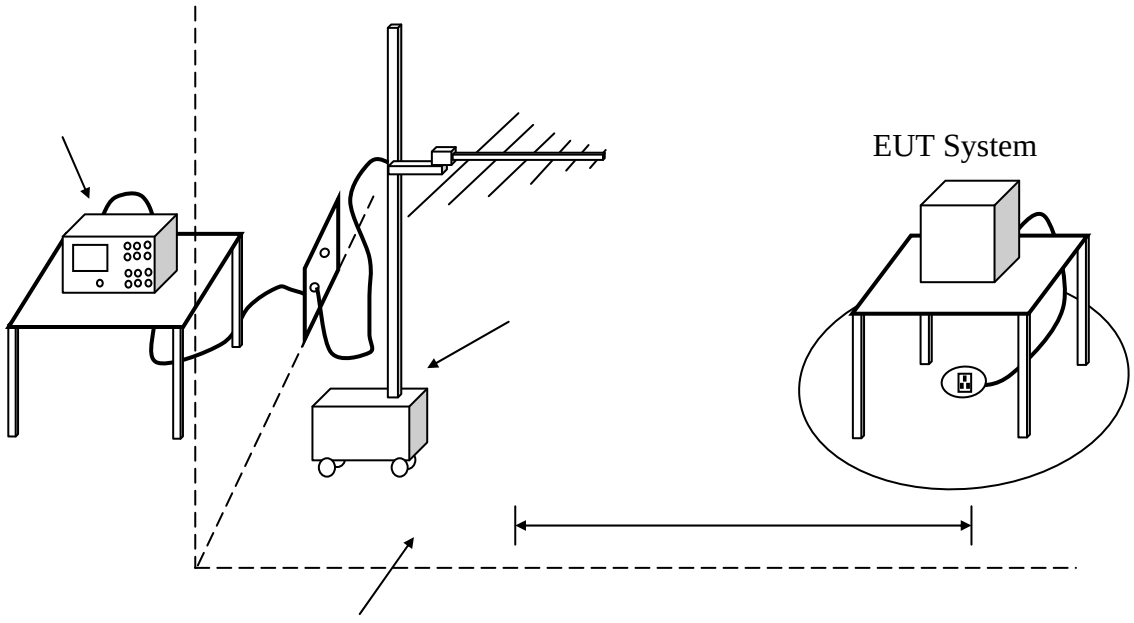
3.2. Block Diagram of Test Setup

3.2.1. Block diagram of connection between the EUT and simulators



(EUT: EFTPOS)

3.2.2. Anechoic Chamber Test Setup Photo.



SEMI-ANECHOIC CHAMBER

3.3. Radiated Emission Limit (Subpart B Class B)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0

Remark： (1) Emission level (dB)μV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.4. EUT Configuration on Measurement

The following equipments are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

EUT	**:**	EFTPOS
Model Number	**:**	SPECTRA T1000
Applicant	**:**	SPECTRA Technologies Holdings Co. Ltd

3.5. Operating Condition of EUT

3.5.1. Setup the EUT as shown in Section 3.2.

3.5.2. Let the EUT work in test mode (On) and measure it.

3.6. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (Trilog Broadband Antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2009 on radiated emission measurement.

The bandwidth of the EMI test receiver (ESCI) is set at 120kHz.

The frequency range from 30MHz to 1000MHz is checked.

he test mode (On) is tested in chamber and all the test results are listed in Section 3.7.

3.7. Radiated Emission Measurement Results

PASS.

Note: The EUT are measured in the Charging, The IC Card Playing, The MSR Card Playing, The SAM, Card Playing, The SD Card Playing, The Printing Mode, And all the mode are pass, So we give the two worsest dates, see the following pages.

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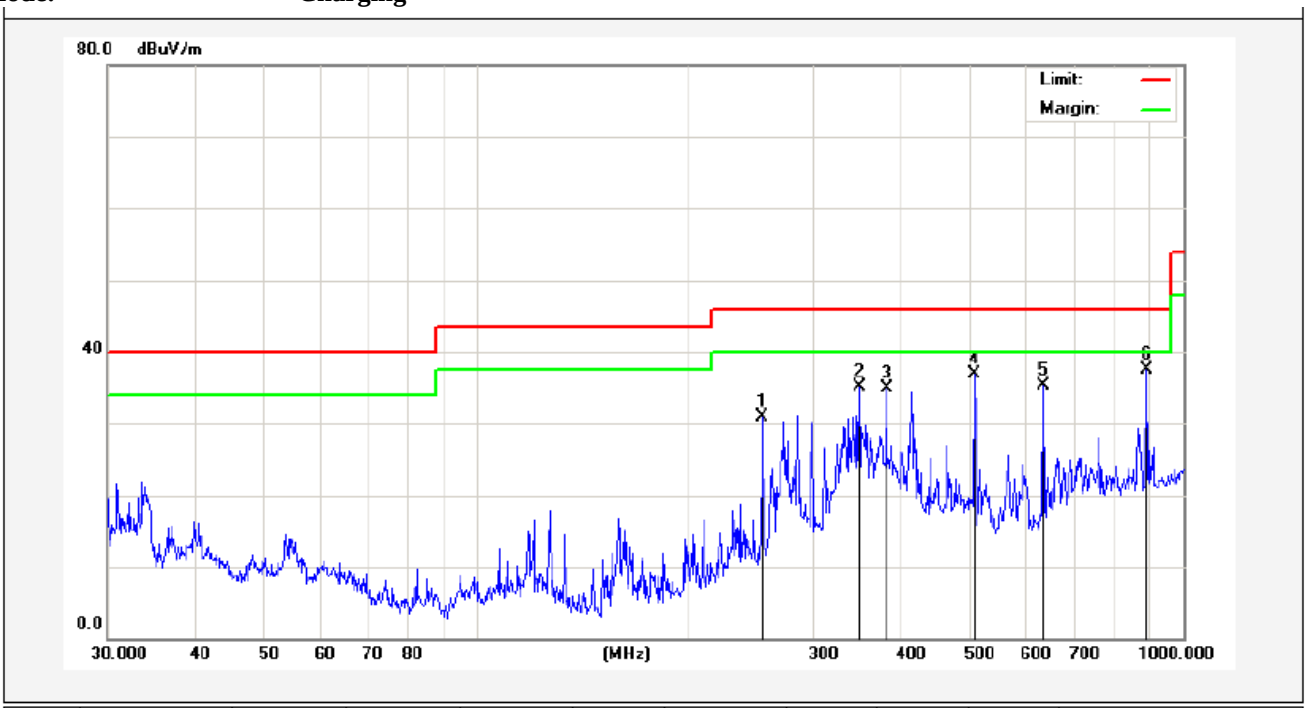
Job No.:	**AT1109641F**	**Polarziation:**	**Horizontal**
Standard:	**(RE)FCC PART15 B _3m**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2012/05/15**
Temp.(C)/Hum.(%RH):	**24.3(C)/55%RH**	**Time:**	**15:30:00**
EUT:	**EFTPOS**	**Test By:**	**Barak Ban**
Model:	**SPECTRA T1000**	**Distance:**	**3m**
Mode:	**Charging**		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	253.8367	59.68	-28.80	30.88	46.00	-15.12	peak			
2	348.0274	59.16	-24.07	35.09	46.00	-10.91	peak			
3	379.9141	58.38	-23.42	34.96	46.00	-11.04	peak			
4	506.4791	58.45	-21.48	36.97	46.00	-9.03	peak			
5	633.9073	56.35	-21.09	35.26	46.00	-10.74	peak			
6	887.6099	52.38	-14.83	37.55	46.00	-8.45	peak			

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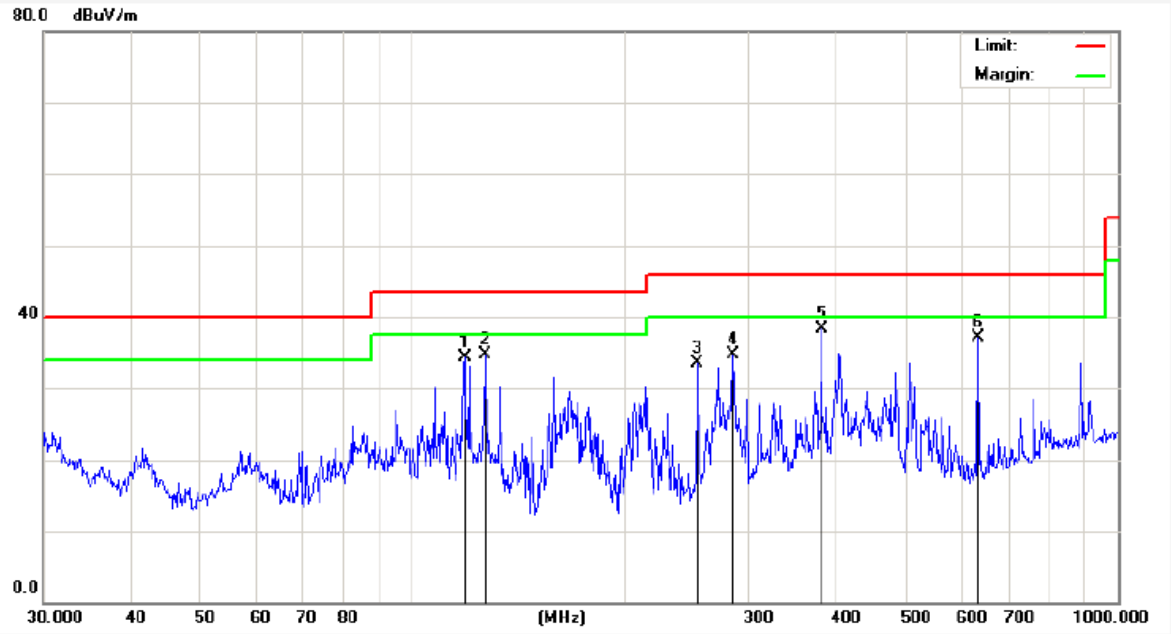
Http://www.anbotek.com

Job No.:	**AT1109641F**	**Polarziation:**	**Vertical**
Standard:	**(RE)FCC PART15 B _3m**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2012/05/15**
Temp.(C)/Hum.(%RH):	**24.3(C)/55%RH**	**Time:**	**15:33:20**
EUT:	**EFTPOS**	**Test By:**	**Barak Ban**
Model:	**SPECTRA T1000**	**Distance:**	**3m**
Mode:			



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	118.6014	61.33	-27.03	34.30	43.50	-9.20	peak			
2	126.7723	62.82	-28.10	34.72	43.50	-8.78	peak			
3	253.8367	57.54	-24.11	33.43	46.00	-12.57	peak			
4	284.9767	59.65	-25.01	34.64	46.00	-11.36	peak			
5	379.9141	60.65	-22.42	38.23	46.00	-7.77	peak			
6	633.9071	56.91	-19.77	37.14	46.00	-8.86	peak			

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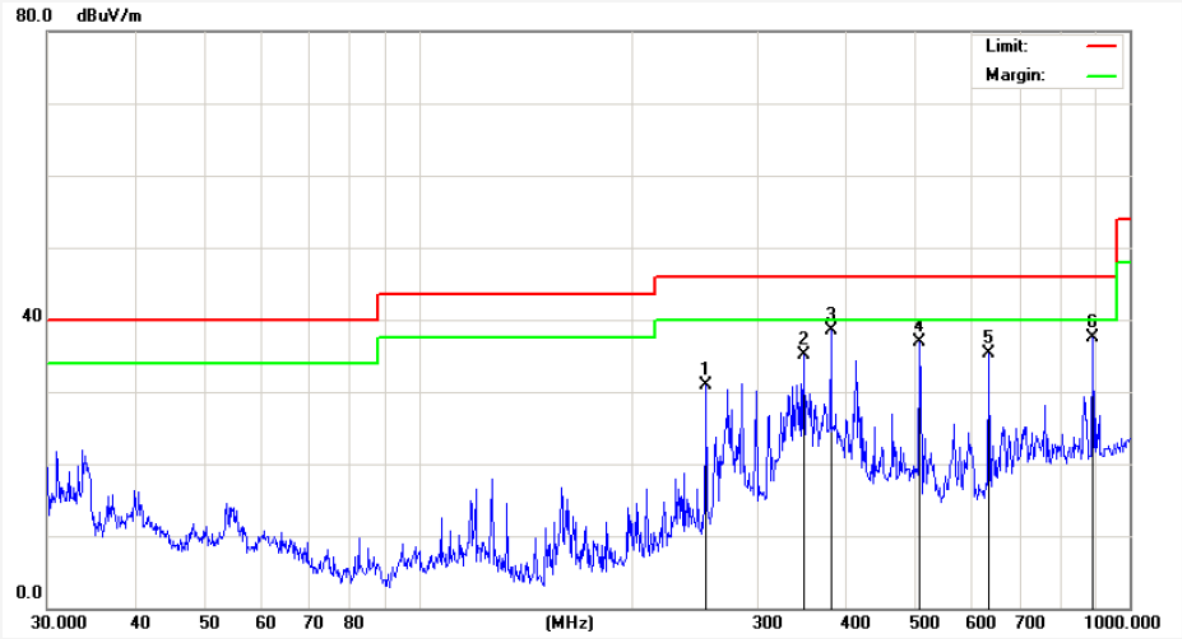
Job No.:	**AT1109641F**	**Polarziation:**	**Horizontal**
Standard:	**(RE)FCC PART15 B _3m**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2012/05/15**
Temp.(C)/Hum.(%RH):	**24.3(C)/55%RH**	**Time:**	**15:34:00**
EUT:	**EFTPOS**	**Test By:**	**Barak Ban**
Model:	**SPECTRA T1000**	**Distance:**	**3m**
Mode:	**IC Card**		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	253.8367	59.68	-28.80	30.88	46.00	-15.12	peak			
2	348.0274	59.16	-24.07	35.09	46.00	-10.91	peak			
3	379.9141	61.88	-23.42	38.46	46.00	-7.54	peak			
4	506.4791	58.45	-21.48	36.97	46.00	-9.03	peak			
5	633.9073	56.35	-21.09	35.26	46.00	-10.74	peak			
6	887.6099	52.38	-14.83	37.55	46.00	-8.45	peak			

Anbotek Compliance Laboratory Limited
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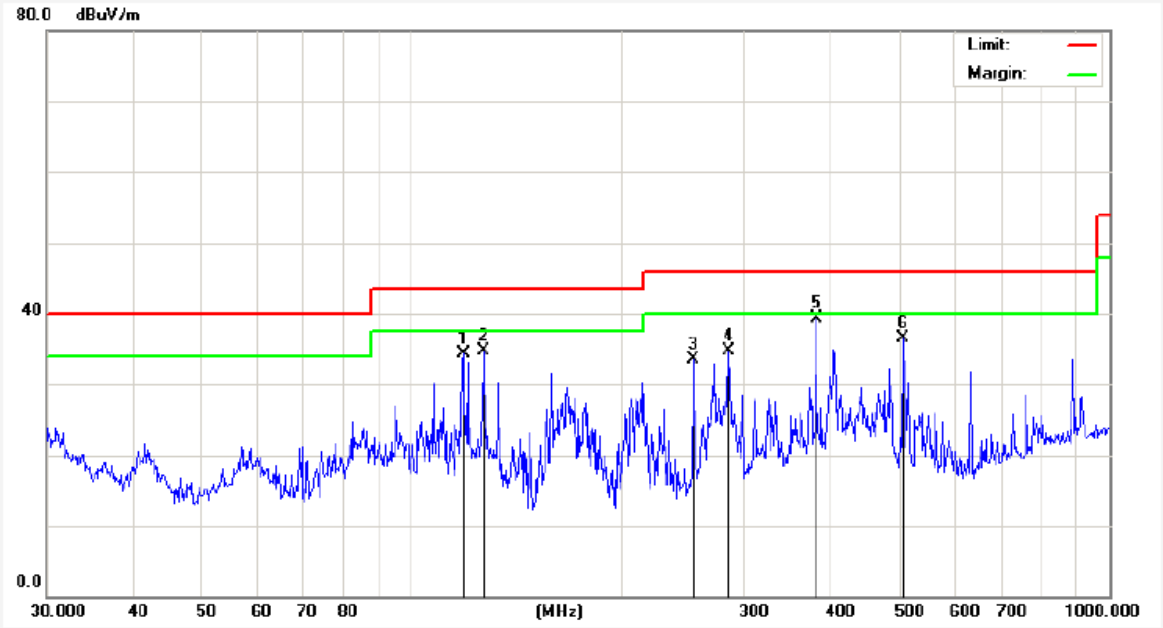
Job No.:	**AT1109641F**	**Polarziation:**	**Vertical**
Standard:	**(RE)FCC PART15 B _3m**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2012/05/15**
Temp.(C)/Hum.(%RH):	**24.3(C)/55%RH**	**Time:**	**15:38:20**
EUT:	**EFTPOS**	**Test By:**	**Barak Ban**
Model:	**SPECTRA T1000**	**Distance:**	**3m**
Mode:	**IC Card**		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	118.6014	61.33	-27.03	34.30	43.50	-9.20	peak			
2	126.7723	62.82	-28.10	34.72	43.50	-8.78	peak			
3	253.8367	57.54	-24.11	33.43	46.00	-12.57	peak			
4	284.9767	59.65	-25.01	34.64	46.00	-11.36	peak			
5	379.9141	61.65	-22.42	39.23	46.00	-6.77	peak			
6	506.4791	57.90	-21.35	36.55	46.00	-9.45	peak			